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# SAR TEST REPORT



The following samples were submitted and identified on behalf of the client as:

Equipment Under Test	Cellular Phone
Company Name	Sharp Corporation, Mobile Communication B.U.
Company Address	2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi,Hiroshima 739-0192, Japan
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013,
	KDB248227D01v02r02,KDB865664D01v01r04,
	KDB865664D02v01r02,KDB941225D01v03r01,
	KDB941225D06v02r01,KDB447498D01v06,
	KDB648474D04v01r03
FCC ID	APYHRO00271
Date of Receipt	Nov. 26, 2018
Date of Test(s)	Dec. 13, 2018 ~ Dec. 16, 2018
Date of Issue In the configuration tested, the El	Dec. 26, 2018 JT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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#### Signed on behalf of SGS

Clerk / Ruby Ou	Engineer / Bond Tsai	Asst. Manager / John Yeh
Kuby Ou	Bonditrai	John Teh
		Date: Dec. 26, 2018

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	Highest SAR Summary				
Equipment class	Frequency Band	Head Body-worn Hotspot (Separation 0mm) (Separation 10mm)		Highest Simultaneous Transmission	
1g SAR(W/Kg)				AR(W/Kg)	
Licensed	GSM 850	0.40	0.91	-	
Licensed	GPRS 850	-	-	- 1.10	
DTS	2.4GHz WLAN	0.13	0.13	0.18	1.23
DSS	Bluetooth	0.10	0.12	-	
Date	Date of Testing 2018/12/13~2018/12/16				

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# **Revision History**

Report Number	Revision	Description	Issue Date
E5/2018/C0044	Rev.00	Initial creation of document	Dec. 26, 2018

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# **1. General Information**

# 1.1 Testing Laboratory

SGS Taiwan Ltd. Electronics & Communication Laboratory			
No. 2, Keji 1 <sup>st</sup> Rd., Guishan Township, Taoyuan County, 33383, Taiwan			
Tel	+886-2-2299-3279		
Fax +886-2-2298-0488			
Internet	http://www.tw.sgs.com/		

# **1.2 Details of Applicant**

Company Name Sharp Corporation, Mobile Communication B.U.	
1 Compony / Addrood	2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi,Hiroshima 739-0192, Japan

# 1.2.1 Details of Manufacturer

Company Name	Sharp Corporation
Company Address	1 Takumi-cho, Sakai-ku, Sakai City,Osaka 590-8522,Japan

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# **1.3 Description of EUT**

EUT Name	Cellular Phone				
FCC ID	APYHRO00271				
Mode of Operation	WCDMA HSDPA HSU	JPA			
	WLAN802.11 b/g/n(20M)	uetooth			
	GSM (DTM multi class B)		1/8.3		
Duty Cycle	GPRS         1/2 (1Dn4UP)           (support multi class 12 max)         1/2.76 (1Dn3UP)           1/4.1 (1Dn2UP)         1/8.3 (1Dn1UP)				
	WCDMA		1	,	
	WLAN802.11 b/g/n(20M)	1			
	Bluetooth		1		
	GSM850	824	_	849	
	GSM1900	1850	—	1910	
TX Frequency Range (MHz)	WCDMA Band V	824		849	
	WiFi 2.4GHz	2400	—	2462	
	Bluetooth	2402	—	2480	
	GSM850	128	_	251	
	GSM1900	512	_	810	
Channel Number (ARFCN)	WCDMA Band V	4132	_	4233	
	WiFi 2.4GHz	1	_	11	
	Bluetooth	0	_	78	

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Max. SAR (1-g) (Unit: W/Kg)						
Mode	Band	Measured	Reported	Position / Channel		
	GSM 850	0.29	0.40	☐Left ☐Right ☐Cheek ☐Tilt <u>251</u> Channel		
	GSM 1900	0.19	0.24	⊠Left □Right ⊠Cheek □Tilt <u>661</u> Channel		
Head	WCDMA Band V	0.25	0.27	□Left □Right □Cheek □Tilt 4233 Channel		
	WLAN 802.11b	0.13	0.13	□Left ⊠Right ⊠Cheek □Tilt <u>6</u> Channel		
	Bluetooth	0.08	0.10	□Left ⊠Right ⊠Cheek □Tilt <u>78</u> Channel		

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Max. SAR (1-g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GSM 850	0.67	0.91	☐Front ⊠Back <u>251</u> Channel	
Body-worn	GSM 1900	0.29	0.40	☐Front ⊠Back <u>810</u> Channel	
	WCDMA Band V	0.76	0.83	☐Front ⊠Back <u>4233</u> Channel	
	WLAN 802.11b	0.13	0.13	□Front ⊠Back <u>6</u> Channel	
	Bluetooth	0.09	0.12	☐Front ⊠Back 78Channel	

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Max. SAR (1-g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GPRS 850 (1Dn4UP)	0.71	1.10	☐Front ⊠Back ☐Top ☐Right ☐Left <u>251</u> Channel	
Hotspot	GPRS 1900 (1Dn4UP)	0.40	0.57	☐Front ⊠Back ☐Top ☐Right ☐Left 512 Channel	
mode	WCDMA Band V	0.76	0.83	☐Front ⊠Back ☐Top ☐Right ☐Left 4233Channel	
	WLAN 802.11b	0.17	0.18	☐Front ☐Back ☐Top ⊠Right ☐Left <u>6</u> Channel	

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#### GSM 850 - conducted power table:

EUT mode	Frequency (MHz)	СН	Max. Rated Avg. Power + Max.Tolerance	Burst average power	Source-based time average power		
	(11112)		(dBm)	Avg. (dBm)	Avg. (dBm)		
0014 050	824.2	128	33.4	31.72	22.69		
GSM 850 (GMSK)	836.6	190	33.4	31.91	22.88		
	848.8	251	33.4	32.05	23.02		
	The d	ivision factor	compared to the nu	umber of TX time slot			
	Divi	sion factor		1 TX time slot			
	DIM	SIGNIACION		-9.03			

#### GPRS 850 - conducted power table:

			Burst avera	age power		
	ted Avg. Powe olerance (dBr		33.4	31.2	29.4	28.2
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS	824.2	128	31.75	29.54	27.62	26.48
850	836.6	190	31.97	29.58	27.59	26.38
000	848.8	251	32.08	29.44	27.52	26.31
		Sc	ource-based tim	e average powe	er	
GPRS	824.2	128	22.72	23.52	23.36	23.47
850	836.6	190	22.94	23.56	23.33	23.37
050	848.8	251	23.05	23.42	23.26	23.30
	The div	ision fa	actor compared	to the number c	of TX time slot	
Div	ision factor		1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

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#### GSM 1900 - conducted power table:

EUT mode	Frequency (MHz)	СН	Max. Rated Avg. Power + Max.Tolerance	Burst average power	Source-based time average power		
	(11112)		(dBm)	Avg. (dBm)	Avg. (dBm)		
0014000	1850.2	512	30.4	29.22	20.19		
GSM1900 (GMSK)	1800	661	30.4	29.33	20.30		
	1909.8	810	30.4	28.96	19.93		
	The d	ivision factor	compared to the nu	Imber of TX time slot			
	Divi	sion factor		1 TX time slot			
	DIM			-9.03			

#### GPRS 1900 - conducted power table:

			Burst avera	age power		
	ted Avg. Powe olerance (dBr		30.4	28.2	26.4	25.2
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS	1850.2	512	29.28	26.72	24.92	23.65
1900	1880	661	29.37	26.67	24.93	23.79
1900	1909.8	810	29.01	26.65	24.73	23.78
		Sc	ource-based tim	e average powe	er	
GPRS	1850.2	512	20.25	20.70	20.66	20.64
1900	1880	661	20.34	20.65	20.67	20.78
1900	1909.8	810	19.98	20.63	20.47	20.77
	The div	ision fa	actor compared	to the number c	of TX time slot	
Div	ision factor		1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

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	Band		WCDMA V	
	TX Channel	4132	4183	4233
	Frequency (MHz)	826.4	836.6	846.6
Max. Rated Av	g. Power+Max. Tolerance (dBm)		23.80	
3GPP Rel 99	RMC 12.2Kbps	23.05	23.26	23.44
	HSDPA Subtest-1	22.19	22.23	22.24
3GPP Rel 5	HSDPA Subtest-2	21.49	21.69	21.62
JOFF Rei J	HSDPA Subtest-3	21.45	21.66	21.82
	HSDPA Subtest-4	21.44	21.56	21.80
	HSUPA Subtest-1	21.82	22.09	21.43
	HSUPA Subtest-2	20.03	20.26	20.66
3GPP Rel 6	HSUPA Subtest-3	19.88	20.05	20.09
	HSUPA Subtest-4	20.94	21.08	21.02
	HSUPA Subtest-5	21.90	22.00	22.10

#### WCDMA Band V - HSDPA / HSUPA Conducted power table (Unit: dBm):

#### Subtests for WCDMA Release 5 HSDPA

SUB-TEST	β <sub>c</sub>	$\beta_d$	β <sub>d</sub> (SF)	β <sub>c</sub> /β <sub>d</sub>	β <sub>HS</sub> (Note1, Note 2)	CM (dB) <i>(Note 3)</i>	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15	15/15	64	12/15	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

#### Subtests for WCDMA Release 6 HSUPA

SUB-TEST	βο	βd	β₀ (SF)	β₀/βd	β <sub>HS</sub> (Note1)	β <sub>ec</sub>	<sup>β<sub>ed</sub> (Note 5) (Note 6)</sup>	β <sub>ed</sub> (SF)	β <sub>ed</sub> (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15	15/15	64	11/15	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β <sub>ed</sub> 1: 47/15 β <sub>ed</sub> 2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	15/15	64	15/15	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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		Main /	Antenna			
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
		1	2412		12.00	11.81
		2	2417		15.00	14.85
	802.11b	6	2437	1Mbps	15.00	14.86
		10	2457		15.00	14.82
		11	2462		12.00	11.76
		1	2412		12.00	11.84
		2	2417		15.00	14.86
2450 MHz	802.11g	6	2437	6Mbps	15.00	14.81
		10	2457		15.00	14.79
		11	2462		12.00	11.87
		1	2412		12.00	11.80
		2	2417		15.00	14.89
	802.11n-HT20	6	2437	MCS0	15.00	14.74
		10	2457		15.00	14.81
		11	2462		12.00	11.81

#### WLAN802.11 b/g/n (20M) conducted power table:

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#### Bluetooth maximum power table:

Mode	Channel	Frequency	Average	Average Output Power (dBm)					
	Channel	(MHz)	1Mbps	2Mbps	3Mbps	Tolerance (dBm)			
	CH 00	2402	10.23	9.17	9.29				
BR/EDR	CH 39	2441	10.17	9.14	9.21	11.5			
	CH 78	2480	10.37	9.18	9.28				

Mode	Channel	Frequency	Average Output Power (dBm)	Max. Rated Avg. Power + Max.	
	Channel	(MHz)	GFSK	Tolerance (dBm)	
	CH 00	2402	3.89		
LE	CH 19 2440		3.71	11.5	
	CH 39	2480	3.91	]	

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#### **1.4 Test Environment**

Ambient Temperature: 22±2° C Tissue Simulating Liquid: 22±2° C

# **1.5 Operation Description**

- 1. The EUT is controlled by using a Radio Communication Tester (MT8820C), and the communication between the EUT and the tester is established by air link.
- 2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
- 3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
- 4. SAR test reduction for GPRS mode is determined by the source-based time-averaged output power. The data mode with highest specified time-averaged output power should be tested for SAR compliance.
- The 3G SAR test reduction procedure is applied to HSDPA with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSDPA) is  $\leq \frac{1}{4}$  dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSDPA). The following 4 sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

Sub-test	βα	βa	βd (SF) βc/βd		β <sub>HS</sub> <sup>(1)(2)</sup>	CM <sup>(3)</sup> (dB)	MPR <sup>(3)</sup> (dB)					
1	2/15	15/15	64	2/15	4/15	0.0	0.0					
2	12/15 <sup>(4)</sup>	15/15 <sup>(4)</sup>	64	12/15 <sup>(4)</sup>	24/15	1.0	0.0					
3	15/15 8/15 64 15/8 30/15 1.5 0.5											
4	15/15 4/15 64 15/4 30/15 1.5 0.5											
24/15 with	S-DPCCH power r I3.1A, and HSDPA 1 $\beta_{HS}$ = 24/15 * $\beta_c$ .	mask requirement EVM with phase of	test in clause 5.20 discontinuity in cla	use 5.13.1AA, Δ <sub>AC</sub>	$_{\rm K}$ and $\Delta_{\rm NACK} = 30/1$	15 with β <sub>HS</sub> = 30/15	$5 * \beta_{c}$ , and $\Delta_{CQ} =$					
relative CI	Note 3: CM = 1 for β <sub>d</sub> /β <sub>d</sub> = 12/15, β <sub>HS</sub> /β <sub>c</sub> = 24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases. Note 4: For subtest 2 the β <sub>d</sub> /β <sub>d</sub> ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain											
	st 2 the β∂βd ratio ∙the reference TF(				IF1, IFU) is achie	vea by setting the	signalled gain					

6. The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSPA) is  $\leq \frac{1}{4}$  dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA). The following

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5 sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

Sub-test	βε	βd	β₀ (SF)	βc/βd	β <sub>HS</sub> (1)	βes	$\beta_{ed}^{(4)(5)}$	β <sub>ed</sub> (SF)	β <sub>ed</sub> (Codes)	CM <sup>(2)</sup> (dB)	MPR <sup>(2)(6)</sup> (dB)	AG (5) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	βed1: 47/15 βed2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67
Note 2: CM diffe Note 3: For (TF Note 4: In c Note 5: βed (	3       13/13       0       -       -       3/13       2/17.3       4/17.3       4       1       1.0       0.0       12       67         Note 1: For sub-test 1 to 4, Δ <sub>ACK</sub> , Δ <sub>MACK</sub> and Δ <sub>COI</sub> = 30/15 with β <sub>HS</sub> = 30/15 * β <sub>c</sub> .       For sub-test 5, Δ <sub>ACK</sub> , Δ <sub>MACK</sub> and Δ <sub>COI</sub> = 5/15 * β <sub>c</sub> .       Note 2: CM = 1 for β <sub>J</sub> β <sub>d</sub> = 12/15, β <sub>HS</sub> β <sub>c</sub> = 24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.         Note 3: For subtest 1 the β <sub>J</sub> β <sub>d</sub> ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β <sub>c</sub> = 10/15 and β <sub>d</sub> = 15/15.       Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.         Note 5: Γρ <sub>64</sub> can not be set directly; it is set by Absolute Grant Value.       Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.												

#### **WLAN**

802.11b DSSS SAR Test Requirements:

- 7. SAR is measured for 2.4 GHz 802.11b DSSS mode using the highest measured maximum output power channel, when the reported SAR of the highest measured maximum output power channel for the exposure configuration is  $\leq 0.8$  W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 8. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

802.11g/n OFDM SAR Test Exclusion Requirements:

- 9. SAR is not required for 802.11g/n since the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.
- 10. BT and WLAN use the same antenna path and Bluetooth can't transmit with WLAN simultaneously.
- 11. According to KDB447498D01v06, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is  $\leq$  0.8 W/kg, when the transmission band is  $\leq$  100MHz.

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12. According to KDB865664D01v01r04, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is ≥ 0.8 W/kg, repeated that measurement once. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is  $\geq$  1.45 W/kg (~ 10% from the 1-g SAR limit)

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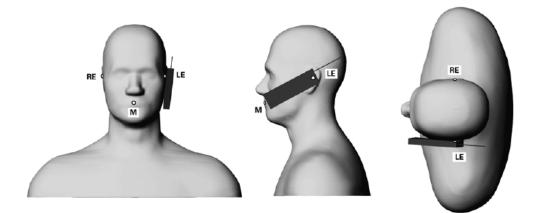
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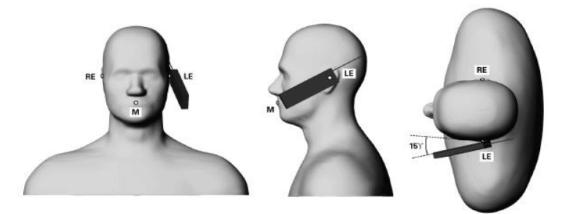
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# **1.6 Positioning Procedure**

Head SAR measurement statement



Phone position 1, "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.



Phone position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.

#### Cheek/Touch Position:

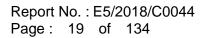
The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

#### Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

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#### Body SAR measurement statement

1. Body-worn exposure: 10mm

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

2. Hotspot exposure: 10mm

A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge when the form factor of a handset is larger than 9 cm x 5 cm,

Test configurations of WWAN:

- (1) Front side
- (2) Back side
- (3) Top side
- (4) Right side
- (5) Left side

Test configurations of WLAN:

- (1) Front side
- (2) Back side
- (3) Top side
- (4) Right side

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3. Based on KDB941225D06v02r01, the hotspot mode and body-worn accessory SAR test configurations may overlap for handsets. When the same wireless mode transmission configurations for voice and data are required for SAR measurements, the more conservative configuration with a smaller separation distance should be tested for the overlapping SAR configurations. For WCDMA /WLAN, since the maximum power is the same between body-worn and hotspot mode, and the test distance of hotspot mode is the same with that of body-worn mode, hotspot mode SAR is used to support body-worn SAR. For GSM850/1900, since the wireless mode transmission configurations is different between body-worn and hotspot mode, body-worn SAR is performed.

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# **1.7 Evaluation Procedures**

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- 1. The extraction of the measured data (grid and values) from the Zoom Scan.
- 2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
- 3. The generation of a high-resolution mesh within the measured volume.
- 4. The interpolation of all measured values from the measurement grid to the high-resolution grid.
- 5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
- 6. The calculation of the averaged SAR within masses of 1g and 10g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is

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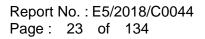
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the moved around until the highest averaged SAR is found.

If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

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# **1.8 Probe Calibration Procedures**

For the calibration of E-field probes in lossy liquids, an electric field with an accurately known field strength must be produced within the measured liquid. For standardization purposes it would be desirable if all measurements which are necessary to assess the correct field strength would be traceable to standardized measurement procedures. In the following two different calibration techniques are summarized:

# **1.8.1 Transfer Calibration with Temperature Probes**

In lossy liquids the specific absorption rate (SAR) is related both to the electric field (E) and the temperature gradient ( $\delta T / \delta t$ ) in the liquid.

$$SAR = C \frac{\delta T}{\delta t}$$
,

Whereby  $\sigma$  is the conductivity,  $\rho$  the density and c the heat capacity of the liquid.

Hence, the electric field in lossy liquid can be measured indirectly by measuring the temperature gradient in the liquid. Non-disturbing temperature probes (optical probes or thermistor probes with resistive lines) with high spatial resolution (<1-2 mm) and fast reaction time (<1 s) are available and can be easily calibrated with high precision [1]. The setup and the exciting source have no influence on the calibration; only the relative positioning uncertainties of the standard temperature probe and the E-field probe to be calibrated must be considered. However, several problems limit the available accuracy of probe calibrations with temperature probes:

1. The temperature gradient is not directly measurable but must be evaluated from temperature measurements at different time steps. Special precaution is necessary to avoid measurement errors caused by temperature gradients due to energy equalizing effects or convection currents in the liquid. Such effects cannot be completely avoided, as the measured field itself destroys the thermal equilibrium in the liquid. With a careful setup these errors can be kept

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small.

- 2. The measured volume around the temperature probe is not well defined. It is difficult to calculate the energy transfer from a surrounding gradient temperature field into the probe. These effects must be considered, since temperature probes are calibrated in liquid with homogeneous temperatures. There is no traceable standard for temperature rise measurements.
- 3. The calibration depends on the assessment of the specific density, the heat capacity and the conductivity of the medium. While the specific density and heat capacity can be measured accurately with standardized procedures (~ 2% for c; much better for  $\rho$ ), there is no standard for the measurement of the conductivity. Depending on the method and liquid, the error can well exceed ±5%.
- 4. Temperature rise measurements are not very sensitive and therefore are often performed at a higher power level than the E-field measurements. The nonlinearities in the system (e.g., power measurements, different components, etc.) must be considered.

Considering these problems, the possible accuracy of the calibration of E-field probes with temperature gradient measurements in a carefully designed setup is about ±10% (RSS) [2]. Recently, a setup which is a combination of the waveguide techniques and the thermal measurements was presented in [3]. The estimated uncertainty of the setup is ±5% (RSS) when the same liquid is used for the calibration and for actual measurements and ±7-9% (RSS) when not, which is in good agreement with the estimates given in [2].

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# **1.8.2 Calibration with Analytical Fields**

In this method a technical setup is used in which the field can be calculated analytically from measurements of other physical magnitudes (e.g., input power). This corresponds to the standard field method for probe calibration in air; however, there is no standard defined for fields in lossy liquids.

When using calculated fields in lossy liquids for probe calibration, several points must be considered in the assessment of the uncertainty:

- 1. The setup must enable accurate determination of the incident power.
- 2. The accuracy of the calculated field strength will depend on the assessment of the dielectric parameters of the liquid.
- 3. Due to the small wavelength in liquids with high permittivity, even small setups might be above the resonant cutoff frequencies. The field distribution in the setup must be carefully checked for conformity with the theoretical field distribution.

#### References

- (1) N. Kuster, Q. Balzano, and J.C. Lin, Eds., Mobile Communications Safety, Chapman & Hall, London, 1997.
- (2) K. Meier, M. Burkhardt, T. Schmid, and N. Kuster, \Broadband calibration of E-field probes in lossy media", IEEE Transactions on Microwave Theory and Techniques, vol. 44, no. 10, pp. 1954{1962, Oct. 1996.
- (3) K. Jokela, P. Hyysalo, and L. Puranen, \Calibration of specific absorption rate (SAR) probes in waveguide at 900 MHz", IEEE Transactions on Instrumentation and Measurements, vol. 47, no. 2, pp. 432{438, Apr. 1998.

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#### 1.9 The SAR Measurement System

A block diagram of the SAR measurement system is given in Fig. a. This SAR measurement system uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). Model EX3DV4 field probes are used to determine the internal electric fields. The SAR can be obtained from the equation SAR=  $\sigma$  (|Ei|2)/ $\rho$ where  $\sigma$  and  $\rho$  are the conductivity and mass density of the tissue-simulant.

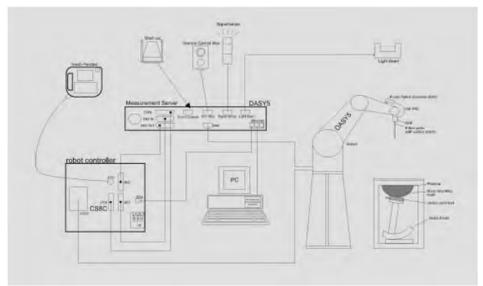


Fig. a A block diagram of the SAR measurement system

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The DASY 5 system for performing compliance tests consists of the following items:

- 1. A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- 2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- 3. Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- 4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- 5. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- 6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- 7. A computer operating Windows7
- 8. DASY 5 software.
- 9. Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- 10. The SAM twin phantom enabling testing left-hand and right-hand usage.
- 11. The device holder for handheld mobile phones.
- 12. Tissue simulating liquid mixed according to the given recipes.
- 13. Validation dipole kits allowing to validate the proper functioning of the system.

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# **1.10 System Components**

#### **EX3DV4 E-Field Probe**

Construction	Symmetrical design with triangular core							
	Built-in shielding against static charges							
	PEEK enclosure material (resistant to							
	organic solvents, e.g., DGBE)							
Calibration	Basic Broad Band Calibration in air							
	Conversion Factors (CF) for							
	HSL835/1900/2450MHz Additional CF for							
	other liquids and frequencies upon request							
Frequency	10 MHz to > 6 GHz, Linearity: ± 0.6 dB							
Directivity	± 0.3 dB in HSL (rotation around probe axis)							
	± 0.5 dB in tissue material (rotation normal to probe axis)							
Dynamic	10 μW/g to > 100 mW/g							
Range	Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ W/g)							
Dimensions	Tip diameter: 2.5 mm							
Application	High precision dosimetric measurements in any exposure scenario							
	(e.g., very strong gradient fields). Only probe which enables compliance							
	testing for frequencies up to 6 GHz with precision of better 30%.							

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Phantom	
Model	Twin SAM
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
Shell Thickness	2 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Height: 850 mm; Length: 1000 mm; Width: 500 mm

# **DEVICE HOLDER**

Construction	In combination with the Twin SAM Phantom	14
	V4.0/V4.0C or Twin SAM, the Mounting	ALC: NO.
	Device (made from POM) enables the	
	rotation of the mounted transmitter in	
	spherical coordinates, whereby the rotation	
	point is the ear opening. The devices can	
	be easily and accurately positioned	A STORE
	according to IEC, IEEE, CENELEC, FCC or	
	other specifications. The device holder can	
	be locked at different phantom locations	Device Holder
	(left head, right head, flat phantom).	

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#### **1.11 SAR System Verification**

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% (according to KDB865664D01) from the target SAR values.

These tests were done at 835/1900/2450 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the liquid depth above the ear reference points was above 15 cm (≤3G) or 10 cm (>3G) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

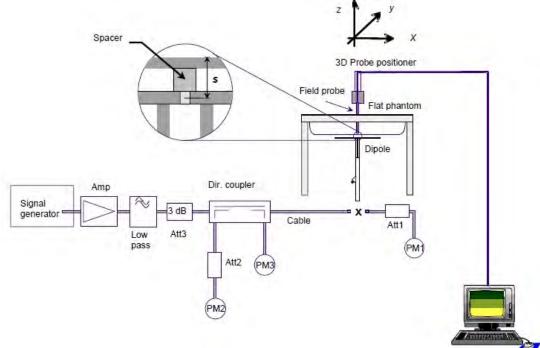


Fig. b The block diagram of system verification

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Validation Kit	S/N	Frequ (Mł	-	1W Target SAR-1g (mW/g)	Pin=250mW Measured SAR-1g (mW/g)	Measured SAR-1g normalized to 1W (mW/g)	Deviation (%)	Measured Date								
D835V2	4d063	025	835	Head	9.48	2.44	9.76	2.95%	Dec. 13, 2018							
D035V2	40003	4000	40005	40003	40003	40003	40000	40003	40003	000	Body	9.56	2.45	9.80	2.51%	Dec. 13, 2018
D1900V2	5d173	1900	Head	40.7	9.88	39.52	-2.90%	Dec. 14, 2018								
D1900V2		1900	Body	40.9	9.95	39.80	-2.69%	Dec. 14, 2018								
D2450V2	727	2450	Head	52.1	13.20	52.80	1.34%	Dec. 15, 2018								
D2430V2	D2450V2 /2/		121	121	2430	Body	50.8	12.80	51.20	0.79%	Dec. 16, 2018					

Table 1. Results of system validation

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# 1.12 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the Agilent Model 85070E Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Network Analyzer.

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the flat section of the phantom was at least 15 cm (≤3G) or 10 cm (>3G) during all tests. (Appendix Fig. 2)

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Base         824.2         41.556         0.899         41.472         0.892         0.20%         0.80%           Back.4         41.500         0.090         41.465         0.892         0.19%         0.82%           Bass         41.500         0.900         41.440         0.894         0.14%         0.67%           Bass         41.500         0.912         41.437         0.897         0.15%         0.52%           Bass         41.500         0.915         41.413         0.910         0.21%         0.53%           Bass         41.500         0.915         41.413         0.910         0.21%         0.53%           Bass         41.500         0.915         41.413         0.910         0.21%         0.53%           Bass         40.000         1.400         39.531         1.382         1.17%         1.29%           Bass         1900         40.000         1.400         39.450         1.398         1.37%         0.42%           2417         39.259         1.767         39.716         1.759         -1.16%         0.66%           2417         39.223         1.788         39.667         1.780         -1.13%         0.23%	Tissue Type	Measurement Date	Measured Frequency (MHz)	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	% dev ɛr	% dev σ
Bec, 13. 2018         835         41.500         0.900         41.440         0.894         0.14%         0.67%           836.6         41.500         0.902         41.437         0.897         0.15%         0.52%           846.8         41.500         0.912         41.417         0.900         0.20%         1.37%           948.8         41.500         0.915         41.417         0.900         0.20%         1.37%           948.8         41.500         0.915         41.413         0.910         0.20%         1.37%           948.8         41.500         0.915         41.417         0.900         0.20%         1.37%           948.8         41.500         0.001         1.400         39.531         1.382         1.17%         1.29%           904.1         1909.8         40.000         1.400         39.450         1.388         1.37%         0.14%           9199.8         40.000         1.400         39.450         1.388         1.37%         0.14%           2417         39.253         1.771         39.766         1.750         1.16%         0.66%           2437         39.251         1.787         39.641         1.787         1.13%			824.2	41.556	0.899	41.472	0.892	0.20%	0.80%
Bec, 13. 2018         836.6         41.500         0.902         41.437         0.897         0.15%         0.52%           846.6         41.500         0.912         41.417         0.900         0.20%         1.37%           848.8         41.500         0.915         41.413         0.910         0.21%         0.53%           96c, 14. 2018         1850.2         40.000         1.400         39.528         1.389         1.17%         1.29%           96c, 14. 2018         1880         40.000         1.400         39.528         1.389         1.17%         0.50%           1909.8         40.000         1.400         39.501         1.393         1.25%         0.50%           2402         39.285         1.757         39.776         1.750         1.16%         0.64%           2412         39.289         1.771         39.716         1.760         -1.13%         0.58%           2417         39.259         1.771         39.716         1.760         -1.13%         0.68%           2450         39.200         1.800         39.667         1.760         -1.13%         0.28%           2450         39.162         1.827         39.641         1.812			826.4	41.545	0.899	41.465	0.892	0.19%	0.82%
Head         836.6         41.500         0.902         41.437         0.897         0.15%         0.52%           846.8         41.500         0.915         41.417         0.900         0.20%         1.37%           948.8         41.500         0.915         41.413         0.910         0.21%         0.53%           948.8         41.500         0.915         41.413         0.910         0.21%         0.53%           948.8         41.500         0.915         41.417         0.901         0.20%         1.33%           948.8         40.000         1.400         39.528         1.389         1.18%         0.79%           9190.8         40.000         1.400         39.526         1.338         1.37%         0.14%           9190.8         40.000         1.400         39.525         1.755         1.16%         0.66%           2417         39.259         1.771         39.716         1.759         1.13%         0.59%           945.1         1.787         1.13%         1.59%         0.42%         0.42%           2450         39.200         1.800         39.656         1.788         1.16%         0.67%           2450         39		Dec. 12, 2019	835	41.500	0.900	41.440	0.894	0.14%	0.67%
Bee         848.8         41.500         0.915         41.413         0.910         0.21%         0.53%           Dec, 14. 2018         1850.2         40.000         1.400         39.531         1.382         1.17%         1.29%           Head         1900         40.000         1.400         39.528         1.389         1.18%         0.79%           1909.8         40.000         1.400         39.501         1.398         1.37%         0.14%           1909.8         40.000         1.400         39.516         1.750         1.25%         0.42%           2412         39.285         1.757         39.766         1.750         -1.16%         0.42%           2417         39.223         1.771         39.766         1.750         -1.16%         0.66%           2437         39.223         1.788         39.661         1.787         -1.13%         0.28%           2450         39.200         1.800         39.686         1.788         -1.16%         0.67%           2460         39.162         1.827         39.641         1.812         -1.17%         0.75%           2460         39.162         1.827         39.643         1.809         0.93%		Dec, 13. 2016	836.6	41.500	0.902	41.437	0.897	0.15%	0.52%
Head         1850.2         40.000         1.400         39.531         1.382         1.17%         1.29%           Head         1880         40.000         1.400         39.528         1.389         1.18%         0.79%           1900         40.000         1.400         39.501         1.333         1.25%         0.50%           1909.8         40.000         1.400         39.450         1.388         1.37%         0.14%           2402         39.285         1.757         39.776         1.750         -1.15%         0.42%           2417         39.259         1.771         39.716         1.780         -1.13%         0.66%           2417         39.259         1.771         39.661         1.787         -1.16%         0.66%           2417         39.223         1.788         39.661         1.780         -1.13%         0.28%           2450         39.200         1.800         39.665         1.788         -1.16%         0.67%           2462         39.162         1.827         39.641         1.794         -1.17%         0.23%           2462         39.162         1.827         39.643         1.809         1.17%         0.33%			846.6	41.500	0.912	41.417	0.900	0.20%	1.37%
Bec, 14. 2018         1880         40.000         1.400         39.528         1.389         1.18%         0.79%           Head         1900         40.000         1.400         39.501         1.393         1.25%         0.50%           1909.8         40.000         1.400         39.450         1.388         1.37%         0.14%           1909.8         40.000         1.400         39.450         1.388         1.37%         0.42%           2412         39.285         1.757         39.776         1.750         -1.16%         0.66%           2417         39.259         1.771         39.716         1.750         -1.13%         0.59%           2417         39.233         1.788         39.667         1.760         -1.13%         0.59%           2450         39.201         1.800         39.666         1.787         -1.16%         0.67%           2450         39.102         1.827         39.648         1.794         -1.17%         0.23%           2462         39.162         1.827         39.644         1.812         -1.23%         0.80%           835         55.200         0.970         54.160         0.961         1.82%         0.98%			848.8	41.500	0.915	41.413	0.910	0.21%	0.53%
Bec, 14. 2018         1900         40.000         1.400         39.501         1.393         1.25%         0.50%           Head         1909.8         40.000         1.400         39.450         1.398         1.37%         0.14%           Pressort         2402         39.285         1.757         39.776         1.750         -1.25%         0.42%           2412         39.286         1.767         39.776         1.750         -1.16%         0.66%           2417         39.223         1.788         39.667         1.760         -1.13%         0.69%           2450         39.200         1.800         39.656         1.788         -1.16%         0.66%           2457         39.191         1.808         39.648         1.794         -1.17%         0.23%           2462         39.185         1.813         39.644         1.812         -1.25%         0.80%           2462         39.185         1.817         39.644         1.812         -1.25%         0.80%           2462         39.185         1.813         39.644         1.812         -1.25%         0.80%           824.2         55.242         0.969         54.186         0.957         1.91% </td <td></td> <td></td> <td>1850.2</td> <td>40.000</td> <td>1.400</td> <td>39.531</td> <td>1.382</td> <td>1.17%</td> <td>1.29%</td>			1850.2	40.000	1.400	39.531	1.382	1.17%	1.29%
Head         1900         40.000         1.400         39.501         1.393         1.25%         0.50%           190.8         40.000         1.400         39.450         1.398         1.37%         0.14%           2402         39.285         1.757         39.776         1.750         1.25%         0.42%           2412         39.285         1.757         39.776         1.750         1.16%         0.66%           2417         39.259         1.771         39.716         1.750         1.16%         0.66%           2437         39.223         1.788         39.667         1.760         -1.13%         1.59%           2450         39.200         1.800         39.646         1.787         -1.13%         0.28%           2452         39.101         1.808         39.645         1.809         -1.17%         0.75%           2462         39.162         1.827         39.644         1.812         -1.23%         0.80%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           826.4         55.234         0.969         54.188         0.957         1.91%         0.25%           826		Dec. 14, 2018	1880	40.000	1.400	39.528	1.389	1.18%	0.79%
Body         2402         39.285         1.757         39.776         1.750         -1.25%         0.42%           2412         39.268         1.766         39.725         1.755         -1.16%         0.64%           2417         39.259         1.771         39.716         1.759         -1.16%         0.66%           2437         39.223         1.788         39.667         1.760         -1.13%         0.56%           2441         39.200         1.800         39.666         1.788         -1.16%         0.66%           2457         39.191         1.808         39.648         1.794         -1.17%         0.23%           2462         39.185         1.813         39.645         1.809         -1.17%         0.23%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           835.         55.200         0.972         54.145         0.960         1.92%         0.92%		Dec, 14. 2016	1900	40.000	1.400	39.501	1.393	1.25%	0.50%
Born 1         2412         39.268         1.766         39.725         1.755         -1.16%         0.64%           2417         39.259         1.771         39.716         1.759         -1.16%         0.66%           2437         39.223         1.788         39.667         1.760         -1.13%         1.59%           2441         39.216         1.792         39.661         1.787         -1.13%         0.28%           2450         39.200         1.800         39.656         1.788         -1.16%         0.67%           2452         39.191         1.808         39.645         1.809         -1.17%         0.75%           2462         39.185         1.813         39.645         1.809         -1.17%         0.23%           2462         39.185         1.817         39.644         1.812         -1.23%         0.80%           824.2         55.242         0.969         54.188         0.957         1.91%         1.25%           826.4         55.234         0.969         54.174         0.960         1.92%         0.96%           835         55.200         0.972         54.160         0.961         1.88%         0.93% <td< td=""><td>Head</td><td></td><td>1909.8</td><td>40.000</td><td>1.400</td><td>39.450</td><td>1.398</td><td>1.37%</td><td>0.14%</td></td<>	Head		1909.8	40.000	1.400	39.450	1.398	1.37%	0.14%
Body         2417         39.259         1.771         39.716         1.759         -1.16%         0.66%           2437         39.223         1.788         39.667         1.760         -1.13%         1.59%           2441         39.216         1.792         39.661         1.787         -1.13%         0.28%           2450         39.200         1.800         39.656         1.788         -1.16%         0.67%           2457         39.191         1.808         39.661         1.787         -1.17%         0.75%           2460         39.162         1.807         39.648         1.794         -1.17%         0.23%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           826.4         55.242         0.969         54.174         0.960         1.92%         0.96%           835         55.200         0.970         54.160         0.961         1.88%         0.93%           836.6         55.195         0.972         54.145         0.963         1.90%         0.25%           8			2402	39.285	1.757	39.776	1.750	-1.25%	0.42%
Bec, 15. 2018         2437         39.223         1.788         39.667         1.760         -1.13%         1.59%           2441         39.216         1.792         39.661         1.787         -1.13%         0.28%           2450         39.200         1.800         39.656         1.788         -1.16%         0.67%           2457         39.191         1.808         39.648         1.794         -1.17%         0.23%           2462         39.162         1.827         39.644         1.812         -1.23%         0.80%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           826.4         55.242         0.969         54.188         0.957         1.91%         1.25%           826.4         55.234         0.969         54.174         0.960         1.92%         0.96%           836.6         55.164         0.984         54.114         0.972         1.80%         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           9ec, 14. 2018         1880         53.300         1.520         52.807         1.515         0.			2412	39.268	1.766	39.725	1.755	-1.16%	0.64%
Dec, 15. 2018         2441         39.216         1.792         39.661         1.787         1.13%         0.28%           2450         39.200         1.800         39.656         1.788         1.16%         0.67%           2457         39.191         1.808         39.648         1.794         1.17%         0.75%           2462         39.185         1.813         39.645         1.809         1.17%         0.23%           2480         39.162         1.827         39.644         1.812         1.23%         0.80%           2480         39.162         1.827         39.644         1.812         1.23%         0.80%           90c, 13. 2018         826.4         55.242         0.969         54.188         0.957         1.91%         1.25%           826.4         55.200         0.970         54.160         0.961         1.88%         0.93%           835.         55.200         0.972         54.145         0.963         1.90%         0.25%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           960, 14. 2018         1880         53.300         1.520         52.807         1.515         0			2417	39.259	1.771	39.716	1.759	-1.16%	0.66%
Body         2450         39.200         1.800         39.656         1.788         -1.16%         0.67%           2457         39.191         1.808         39.648         1.794         -1.17%         0.75%           2462         39.185         1.813         39.645         1.809         -1.17%         0.23%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           2480         39.162         0.969         54.188         0.957         1.91%         1.25%           826.4         55.234         0.969         54.174         0.960         1.92%         0.96%           835         55.200         0.970         54.160         0.961         1.88%         0.93%           836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         0.53%           9bc, 14. 2018         1880         53.300         1.520         52.807         1.515         0.92%         0.33%		Dec, 15. 2018	2437	39.223	1.788	39.667	1.760	-1.13%	1.59%
Body         2457         39.191         1.808         39.648         1.794         -1.17%         0.75%           2462         39.185         1.813         39.645         1.809         -1.17%         0.23%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           9.064         1.812         -1.23%         0.80%         0.957         1.91%         1.25%           9.061         55.242         0.969         54.188         0.957         1.91%         1.25%           9.061         1.82%         55.200         0.970         54.160         0.961         1.88%         0.93%           835         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           9.05, 14. 2018         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           9.04, 1900         53.300         1.520         52.792         1.523         0.95% <td>2441</td> <td>39.216</td> <td>1.792</td> <td>39.661</td> <td>1.787</td> <td>-1.13%</td> <td>0.28%</td>			2441	39.216	1.792	39.661	1.787	-1.13%	0.28%
Body         2462         39.185         1.813         39.645         1.809         -1.17%         0.23%           2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           824.2         55.242         0.969         54.188         0.957         1.91%         1.25%           826.4         55.234         0.969         54.174         0.960         1.92%         0.96%           835         55.200         0.970         54.180         0.963         1.90%         0.92%           836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           90c, 14. 2018         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           1900         53.300         1.520         52.792         1.523         0.95%         -0.20%			2450	39.200	1.800	39.656	1.788	-1.16%	0.67%
Body         2480         39.162         1.827         39.644         1.812         -1.23%         0.80%           Bec, 13. 2018         824.2         55.242         0.969         54.188         0.957         1.91%         1.25%           Bec, 13. 2018         835         55.200         0.970         54.160         0.961         1.88%         0.93%           Bec, 13. 2018         835         55.200         0.970         54.160         0.961         1.88%         0.93%           Bec, 13. 2018         836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           Bec, 14. 2018         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           1909.8         53.300         1.520         52.803         1.522         0.93%         0.13%           1909.8         53.300         1.520         52.792         1.523         0.95%         0.20%           2412         52.751<			2457	39.191	1.808	39.648	1.794	-1.17%	0.75%
Body         824.2         55.242         0.969         54.188         0.957         1.91%         1.25%           Bec, 13. 2018         826.4         55.234         0.969         54.174         0.960         1.92%         0.96%           835         55.200         0.970         54.160         0.961         1.88%         0.93%           836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           Bec, 14. 2018         1850.2         53.300         1.520         52.811         1.512         0.92%         0.53%           1900         53.300         1.520         52.807         1.515         0.92%         0.33%           1909.8         53.300         1.520         52.803         1.522         0.93%         -0.13%           1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2412         52.751         1.914         53.151         1.925         -			2462	39.185	1.813	39.645	1.809	-1.17%	0.23%
Body         826.4         55.234         0.969         54.174         0.960         1.92%         0.96%           835         55.200         0.970         54.160         0.961         1.88%         0.93%           836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           Bec, 14. 2018         1850.2         53.300         1.520         52.811         1.512         0.92%         0.53%           1900         53.300         1.520         52.807         1.515         0.92%         0.53%           1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2417         52.744         1.918         53.131         1.936         -0.75%         -0.95% <td>2480</td> <td>39.162</td> <td>1.827</td> <td>39.644</td> <td>1.812</td> <td>-1.23%</td> <td>0.80%</td>			2480	39.162	1.827	39.644	1.812	-1.23%	0.80%
Body         B35         55.200         0.970         54.160         0.961         1.88%         0.93%           836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.195         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           Dec, 14. 2018         1850.2         53.300         1.520         52.807         1.515         0.92%         0.53%           1900         53.300         1.520         52.807         1.515         0.92%         0.33%           1900         53.300         1.520         52.807         1.515         0.92%         0.33%           1900         53.300         1.520         52.807         1.515         0.92%         0.33%           1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2411         52.7164         1.904         53.151         1.925         -0.73%         -0.19%			824.2	55.242	0.969	54.188	0.957	1.91%	1.25%
Body         Dec, 13. 2018         836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           Dec, 14. 2018         1850.2         53.300         1.520         52.811         1.512         0.92%         0.53%           Body         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           Body         1900         53.300         1.520         52.807         1.515         0.92%         0.33%           Body         1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           Body         2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.717         1.938         53.112         1.956         -0.75%         -0.95%           Dec, 16. 2018 <t< td=""><td></td><td></td><td>826.4</td><td>55.234</td><td>0.969</td><td>54.174</td><td>0.960</td><td>1.92%</td><td>0.96%</td></t<>			826.4	55.234	0.969	54.174	0.960	1.92%	0.96%
Body         836.6         55.195         0.972         54.145         0.963         1.90%         0.92%           846.6         55.164         0.984         54.114         0.972         1.90%         1.25%           848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           Dec, 14. 2018         1850.2         53.300         1.520         52.811         1.512         0.92%         0.53%           Body         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.717         1.938         53.112         1.936         -0.73%         -0.95%           Dec, 16. 2018         2441         52.717         1.938         53.112 <td< td=""><td></td><td>D</td><td>835</td><td>55.200</td><td>0.970</td><td>54.160</td><td>0.961</td><td>1.88%</td><td>0.93%</td></td<>		D	835	55.200	0.970	54.160	0.961	1.88%	0.93%
Body         848.8         55.158         0.987         54.101         0.975         1.92%         1.21%           Dec, 14. 2018         1850.2         53.300         1.520         52.811         1.512         0.92%         0.53%           Body         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           1900         53.300         1.520         52.807         1.515         0.92%         0.33%           1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.717         1.938         53.112         1.956         -0.73%         -0.91%           2437         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%<		Dec, 13. 2018	836.6	55.195	0.972	54.145	0.963	1.90%	0.92%
Body         1850.2         53.300         1.520         52.811         1.512         0.92%         0.53%           Body         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           Body         1900         53.300         1.520         52.807         1.515         0.92%         0.33%           Body         1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           Body         1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.717         1.938         53.112         1.936         -0.73%         -0.91%           2437         52.717         1.938         53.12         1.956         -0.75%         -0.95%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.86%           2457         52.691         1.960         52.920			846.6	55.164	0.984	54.114	0.972	1.90%	1.25%
Dec, 14. 2018         1880         53.300         1.520         52.807         1.515         0.92%         0.33%           Body         1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           Body         1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           Lambda Lambda         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.151         1.932         -0.75%         -0.96%           2417         52.744         1.918         53.131         1.936         -0.73%         -0.91%           2437         52.717         1.938         53.112         1.956         -0.75%         -0.95%           Dec, 16. 2018         2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%			848.8	55.158	0.987	54.101	0.975	1.92%	1.21%
Dec, 14. 2018         1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           Body         1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.744         1.918         53.131         1.936         -0.73%         -0.91%           2437         52.717         1.938         53.112         1.956         -0.75%         -0.95%           2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%			1850.2	53.300	1.520	52.811	1.512	0.92%	0.53%
Body         1900         53.300         1.520         52.803         1.522         0.93%         -0.13%           Body         1909.8         53.300         1.520         52.792         1.523         0.95%         -0.20%           2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.744         1.918         53.131         1.936         -0.73%         -0.91%           2437         52.717         1.938         53.112         1.956         -0.75%         -0.95%           2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%		Dog 14 2019	1880	53.300	1.520	52.807	1.515	0.92%	0.33%
2402         52.764         1.904         53.151         1.925         -0.73%         -1.10%           2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.744         1.918         53.131         1.936         -0.73%         -0.91%           2437         52.717         1.938         53.112         1.956         -0.75%         -0.95%           2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%		Dec, 14. 2016	1900	53.300	1.520	52.803	1.522	0.93%	-0.13%
2412         52.751         1.914         53.145         1.932         -0.75%         -0.96%           2417         52.744         1.918         53.131         1.936         -0.73%         -0.91%           2437         52.717         1.938         53.112         1.956         -0.75%         -0.95%           2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%	Body		1909.8	53.300	1.520	52.792	1.523	0.95%	-0.20%
2417         52.744         1.918         53.131         1.936         -0.73%         -0.91%           2437         52.717         1.938         53.112         1.956         -0.75%         -0.95%           2437         52.717         1.938         53.12         1.956         -0.75%         -0.95%           2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%			2402	52.764	1.904	53.151	1.925	-0.73%	-1.10%
2437         52.717         1.938         53.112         1.956         -0.75%         -0.95%           Dec, 16. 2018         2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%			2412	52.751	1.914	53.145	1.932	-0.75%	-0.96%
Dec, 16. 2018         2441         52.712         1.941         53.022         1.958         -0.59%         -0.86%           2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%			2417	52.744	1.918	53.131	1.936	-0.73%	-0.91%
2450         52.700         1.950         52.971         1.967         -0.51%         -0.87%           2457         52.691         1.960         52.920         1.975         -0.43%         -0.77%           2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%			2437	52.717	1.938	53.112	1.956	-0.75%	-0.95%
245752.6911.96052.9201.975-0.43%-0.77%246252.6851.96752.8981.985-0.40%-0.91%		Dec, 16. 2018	2441	52.712	1.941	53.022	1.958	-0.59%	-0.86%
2462         52.685         1.967         52.898         1.985         -0.40%         -0.91%			2450	52.700	1.950	52.971	1.967	-0.51%	-0.87%
			2457	52.691	1.960	52.920	1.975	-0.43%	-0.77%
2480 52.662 1.993 52.887 2.010 -0.43% -0.88%			2462	52.685	1.967	52.898	1.985	-0.40%	-0.91%
			2480	52.662	1.993	52.887	2.010	-0.43%	-0.88%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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The composition of the tissue simulating liquid:	The composition	of the	tissue	simulating	liquid:
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Frequency			Ingredient					
(MHz)	Mode	DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	Total amount
050	Head	1	532.98 g	18.3 g	2.4 g	3.2 g	766 g	1.3L(Kg)
850	Body		631.68 g	11.72 g	1.2 g	-	600 g	1.0L(Kg)
1000	Head	444.52 g	552.42 g	3.06 g	_		Ι	1.0L(Kg)
1900	Body	300.67 g	716.56 g	4.0 g	_		Ι	1.0L(Kg)
2450	Head	550 g	450 g		_	-	Ι	1.0L(Kg)
	Body	301.7 g	698.3 g	_	_	_	_	1.0L(Kg)

Table 3. Recipes for tissue simulating liquid

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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# 1.13 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1, By the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

1. Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over a 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Occupational/Controlled limits apply when persons are exposed as а consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

2. Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube).

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section. (Table .6)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR (Brain)	1.60 W/kg	8.00 W/kg
Spatial Average SAR (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

Table 4. RF exposure limits

Notes:

- Uncontrolled environments are defined as locations where there is potential exposure of 1. individuals who have no knowledge or control of their potential exposure.
- 2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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# 2. Summary of Results

#### **GSM 850**

Mode	Position	Position Distance CH Freq. Power + Max. Avg. Po		Measured Avg. Power (dBm)	Scaling	Averaged S (W/	0	Plot page		
						()		Measured	Reported	
	Re Cheek	-	251	848.8	33.40	32.05	36.46%	0.26	0.35	-
	Re Tilt	-	251	848.8	33.40	32.05	36.46%	0.08	0.11	-
Head	Le Cheek	-	128	824.2	33.40	31.72	47.23%	0.26	0.38	-
(GSM)	Le Cheek	-	190	836.6	33.40	31.91	40.93%	0.28	0.39	-
	Le Cheek	-	251	848.8	33.40	32.05	36.46%	0.29	0.40	47
	Le Tilt	-	251	848.8	33.40	32.05	36.46%	0.09	0.12	-
	Front side	10	251	848.8	33.40	32.05	36.46%	0.29	0.40	-
Body-worn	Back side	10	128	824.2	33.40	31.72	47.23%	0.58	0.85	-
(GSM)	Back side	10	190	836.6	33.40	31.91	40.93%	0.61	0.86	-
	Back side	10	251	848.8	33.40	32.05	36.46%	0.67	0.91	48
	Front side	10	128	824.2	28.20	26.48	48.59%	0.29	0.43	-
	Back side	10	128	824.2	28.20	26.48	48.59%	0.58	0.86	-
Hotspot	Back side	10	190	836.6	28.20	26.38	52.05%	0.66	1.00	-
(GPRS)	Back side	10	251	848.8	28.20	26.31	54.53%	0.71	1.10	49
<1Dn4Up>	Top side	10	128	824.2	28.20	26.48	48.59%	0.03	0.04	-
	Right side	10	128	824.2	28.20	26.48	48.59%	0.22	0.33	-
	Left side	10	128	824.2	28.20	26.48	48.59%	0.36	0.53	-

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#### **GSM 1900**

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling		′kg)	Plot page
								Measured	Reported	
	Re Cheek	-	661	1880	30.40	29.33	27.94%	0.18	0.23	-
	Re Tilt	-	661	1880	30.40	29.33	27.94%	0.14	0.18	-
Head	Le Cheek	-	512	1850.2	30.40	29.22	31.22%	0.17	0.22	-
(GSM)	Le Cheek	-	661	1880	30.40	29.33	27.94%	0.19	0.24	50
	Le Cheek	-	810	1909.8	30.40	28.96	39.32%	0.16	0.22	-
	Le Tilt	-	661	1880	30.40	29.33	27.94%	0.15	0.19	-
	Front side	10	661	1880	30.40	29.33	27.94%	0.20	0.26	-
Body-worn	Back side	10	512	1850.2	30.40	29.22	31.22%	0.25	0.33	-
(GSM)	Back side	10	661	1880	30.40	29.33	27.94%	0.25	0.32	-
	Back side	10	810	1909.8	30.40	28.96	39.32%	0.29	0.40	51
	Front side	10	661	1880	25.20	23.79	38.36%	0.27	0.37	-
	Back side	10	512	1850.2	25.20	23.65	42.89%	0.40	0.57	52
Hotspot	Back side	10	661	1880	25.20	23.79	38.36%	0.39	0.54	-
(GPRS)	Back side	10	810	1909.8	25.20	23.78	38.68%	0.38	0.53	-
<1Dn4Up>	Top side	10	661	1880	25.20	23.79	38.36%	0.15	0.21	-
	Right side	10	661	1880	25.20	23.79	38.36%	0.07	0.10	-
	Left side	10	661	1880	25.20	23.79	38.36%	0.23	0.32	-

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#### WCDMA Band V

Mode	Mode Position		istance (mm) CH		Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
						. ,		Measured	Reported	
	RE Cheek	-	4233	846.6	23.8	23.44	8.64%	0.23	0.25	-
	RE Tilt	-	4233	846.6	23.8	23.44	8.64%	0.10	0.11	-
R99	LE Cheek	-	4132	826.4	23.8	23.05	18.85%	0.22	0.26	-
(Head)	LE Cheek	-	4183	836.6	23.8	23.26	13.24%	0.23	0.26	-
	LE Cheek	-	4233	846.6	23.8	23.44	8.64%	0.25	0.27	53
	LE Tilt	-	4233	846.6	23.8	23.44	8.64%	0.09	0.10	-
Body-Worn	Front side	10	4233	846.6	23.8	23.44	8.64%	0.33	0.36	-
Body-wom	Back side	10	4233	846.6	23.8	23.44	8.64%	0.76	0.83	-
	Front side	10	4233	846.6	23.8	23.44	8.64%	0.33	0.36	-
	Back side	10	4132	826.4	23.8	23.05	18.85%	0.67	0.80	-
	Back side	10	4183	836.6	23.8	23.26	13.24%	0.72	0.82	-
Hotspot	Back side	10	4233	846.6	23.8	23.44	8.64%	0.76	0.83	54
	Top side	10	4233	846.6	23.8	23.44	8.64%	0.05	0.05	-
	Right side	10	4233	846.6	23.8	23.44	8.64%	0.24	0.26	-
	Left side	10	4233	846.6	23.8	23.44	8.64%	0.37	0.40	-

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#### WLAN 802.11b

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged S (W/	0	Plot page
						(dBill)		Measured	Reported	
	RE Cheek	-	1	2412	12	11.81	4.45%	0.06	0.06	-
	RE Cheek	-	2	2417	15	14.85	3.49%	0.11	0.11	- 1
	RE Cheek	-	6	2437	15	14.86	3.26%	0.13	0.13	55
Head	RE Cheek	-	10	2457	15	14.82	4.21%	0.11	0.11	-
neau	RE Cheek	-	11	2462	12	11.76	5.66%	0.07	0.07	-
	RE Tilt	-	6	2437	15	14.86	3.26%	0.04	0.04	-
	LE Cheek	-	6	2437	15	14.86	3.26%	0.09	0.09	-
	LE Tilt	-	6	2437	15	14.86	3.26%	0.04	0.04	-
Body-	Front side	10	6	2437	15	14.86	3.26%	0.04	0.04	-
worn	Back side	10	6	2437	15	14.86	3.26%	0.13	0.13	- 1
	Front side	10	6	2437	15	14.86	3.26%	0.04	0.04	-
	Back side	10	6	2437	15	14.86	3.26%	0.13	0.13	- 1
	Top side	10	6	2437	15	14.86	3.26%	0.02	0.02	- 1
Hotspot	Right side	10	1	2412	12	11.81	4.45%	0.09	0.09	-
inuispui	Right side	10	2	2417	15	14.85	3.49%	0.15	0.16	-
	Right side	10	6	2437	15	14.86	3.26%	0.17	0.18	56
	Right side	10	10	2457	15	14.82	4.21%	0.16	0.17	-
	Right side	10	11	2462	12	11.76	5.66%	0.09	0.10	-

#### Bluetooth

Mode	Mode Position		CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)		Averaged SAR over 1g (W/kg)		Plot page
						(ubiii)		Measured	Reported	
	RE Cheek	-	0	2402	11.5	10.23	33.97%	0.07	0.09	-
	RE Cheek	-	39	2441	11.5	10.17	35.83%	0.07	0.10	-
Head	RE Cheek	-	78	2480	11.5	10.37	29.72%	0.08	0.10	57
Tiedu	RE Tilt	-	78	2480	11.5	10.37	29.72%	0.02	0.03	-
	LE Cheek	-	78	2480	11.5	10.37	29.72%	0.04	0.05	-
	LE Tilt	-	78	2480	11.5	10.37	29.72%	0.02	0.03	-
	Front side	10	78	2480	11.5	10.37	29.72%	0.02	0.03	-
Body-	Back side	10	0	2402	11.5	10.23	33.97%	0.08	0.11	-
worn	Back side	10	39	2441	11.5	10.17	35.83%	0.09	0.12	-
	Back side	10	78	2480	11.5	10.37	29.72%	0.09	0.12	58

#### Note:

Scaling =  $\frac{\text{reported SAR}}{\text{measured SAR}} = \frac{P2(mW)}{P1(mW)} = 10^{\left(\frac{P2-P1}{10}\right)(dBm)}$ Reported SAR = measured SAR \* (scaling) Where P2 is maximum specified power, P1 is measured conducted power

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### 3. Simultaneous Transmission Analysis Simultaneous Transmission Scenarios:

Simultaneous Transmit Configurations	Head	Body-Worn	Hotspot
GSM+2.4GHz Wi-Fi	Yes	Yes	No
GPRS + 2.4GHz Wi-Fi	No	No	Yes
WCDMA + 2.4GHz Wi-Fi	Yes	Yes	Yes
GSM+BT	Yes	Yes	No
GPRS + BT	No	Yes	No
WCDMA + BT	Yes	Yes	No

Note:

1. The device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

2. Based on KDB447498D01 note 36, when SAR test exclusion is allowed by other published RF exposure KDB procedures, such as the 2.5 cm hotspot mode SAR test exclusion for an edge or surface, then estimated SAR is not required to determine simultaneous SAR test exclusion.

3: Based on KDB 648474 D04v01r03 note 6, simultaneous transmission SAR for 10-g extremity SAR requires consideration only when standalone 10-g SAR is required.

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#### 3.1 Estimated SAR calculation

According to KDB447498 D01v06 – When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

> $\frac{\text{Max.tune up power (mW)}}{\text{Min.test separation distance(mm)}} \times \frac{\sqrt{f(\text{GHz})}}{7.5}$ Estimated SAR =

If the minimum test separation distance is < 5mm, a distance of 5mm is used for estimated SAR calculation. When the test separation distance is >50mm, the 0.4W/kg is used for SAR-1g.

#### 3.2 SPLSR evaluation and analysis

Per KDB447498D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR sum to peak location separation ratio(SPLSR).

The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion.

The ratio is determined by (SAR1 + SAR2)^1.5/Ri, rounded to two decimal digits, and must be  $\leq$  0.04 for all antenna pairs in the configuration to gualify for 1-g SAR test exclusion.

SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair, and Ri is the separation distance between the peak SAR locations for the antenna pair in mm.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna.

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repo	rted SAR \	ΣSAR evalua	tion		
Frequency			reported \$	SAR / W/kg	ΣSAR
band		osition	WWAN	WLAN	<1.6W/kg
		Right cheek	0.35	0.13	0.48
GSM 850	Head	Right tilt	0.11	0.04	0.15
GSIM 850	neau	Left cheek	0.40	0.09	0.49
		Left tilt	0.12	0.04	0.16
		Front side	0.43	0.04	0.47
		Back side	1.10	0.13	1.23
GPRS 850 (1Dn4UP)	Hotspot	Top side	0.04	0.02	0.06
(1211101)		Right side	0.33	0.18	0.51
		Left side	0.53	-	-
		Right cheek	0.23	0.13	0.36
GSM 1900	Head	Right tilt	0.18	0.04	0.22
G2101 1900		Left cheek	0.24	0.09	0.33
		Left tilt	0.19	0.04	0.23
		Front side	0.37	0.04	0.41
		Back side	0.57	0.13	0.70
GPRS 1900 (1Dn4UP)	Hotspot	Top side	0.21	0.02	0.23
(1211101)		Right side	0.10	0.18	0.28
		Left side	0.32	-	-
		Right cheek	0.25	0.13	0.38
	Head	Right tilt	0.11	0.04	0.15
	neau	Left cheek	0.27	0.09	0.36
		Left tilt	0.10	0.04	0.14
WCDMA Band V		Front side	0.36	0.04	0.40
Balla		Back side	0.83	0.13	0.96
	Hotspot	Top side	0.05	0.02	0.07
		Right side	0.26	0.18	0.44
		Left side	0.40	-	-

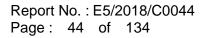
#### Simultaneous Transmission Combination

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reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation								
Frequency	Position		reported S	reported SAR / W/kg				
band	F	051001	WWAN	WLAN	<1.6W/kg			
GSM 850	body-	Front side	0.40	0.04	0.44			
G3W 830	worn	Back side	0.91	0.13	1.04			
GSM 1900	body-	Front side	0.26	0.04	0.30			
0.511 1900	worn	Back side	0.40	0.13	0.53			
WCDMA Band V	body-	Front side	0.36	0.04	0.40			
	worn	Back side	0.83	0.13	0.96			

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report	reported SAR WWAN and Bluetooth, ΣSAR evaluation						
Frequency		osition	reported S	AR / W/kg	ΣSAR		
band	F	OSITION	WWAN	BT	<1.6W/kg		
		Right cheek	0.35	0.10	0.45		
	Head	Right tilt	0.11	0.03	0.14		
GSM 850	Tieau	Left cheek	0.40	0.05	0.45		
6310 030		Left tilt	0.12	0.03	0.15		
	body-	Front side	0.40	0.03	0.43		
	worn	Back side	0.91	0.12	1.03		
	Head	Right cheek	0.23	0.10	0.33		
		Right tilt	0.18	0.03	0.21		
GSM 1900		Left cheek	0.24	0.05	0.29		
GSM 1900		Left tilt	0.19	0.03	0.22		
	body-	Front side	0.26	0.03	0.29		
	worn	Back side	0.40	0.12	0.52		
		Right cheek	0.25	0.10	0.35		
	Head	Right tilt	0.11	0.03	0.14		
WCDMA Band V	Tieau	Left cheek	0.27	0.05	0.32		
		Left tilt	0.10	0.03	0.13		
	body-	Front side	0.36	0.03	0.39		
	worn	Back side	0.83	0.12	0.95		

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## 4. Instruments List

Manufacturer	Device	Туре	Serial number	Date of last calibration	Date of next calibration
SPEAG	Dosimetric E-Field Probe	EX3DV4	3938	Oct.24,2018	Oct.23,2019
		D835V2	4d063	Aug.23,2018	Aug.22,2019
SPEAG	System Validation Dipole	D1900V2	5d173	Apr.25,2018	Apr.25,2019
		D2450V2	727	Apr.24,2018	Apr.23,2019
SPEAG	Data acquisition Electronics	DAE4	1336	Aug.06,2018	Aug.05,2019
SPEAG	Software	DASY 52 V52.8.8	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	SAM	N/A	Calibration not required	Calibration not required
Network Analyzer	Agilent	E5071C	MY46107530	Feb.26,2018	Feb.25,2019
Agilent	Dielectric Probe Kit	85070E	MY44300677	Calibration not required	Calibration not required
Agilopt	Dual-directional	772D	MY52180142	Jul.04,2018	Jul.03,2019
Agilent	coupler	778D	MY52180302	Jul.05,2018	Jul.04,2019
Agilent	RF Signal Generator	N5181A	MY50144143	Mar.14,2018	Mar.13,2019
Agilent	Power Meter	E4417A	MY52240003	Dec.21,2017	Dec.20,2018
Agilent	Power Sensor	E9301H	MY52200003	Dec.21,2017	Dec.20,2018
Aglient	i ower oensor	LSSOIT	MY52200004	Dec.21,2017	Dec.20,2018
TECPEL	Digital thermometer	DTM-303A	TP130077	Mar.09,2018	Mar.08,2019
Anritsu	Radio Communication Test	MT8820C	6201061049	Apr.08,2018	Apr.07,2019

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### 5. Measurements

Date: 2018/12/13

### GSM 850 Head Le Cheek CH 251

Communication System: GSM; Frequency: 848.8 MHz; Duty Cycle: 1:8.30042 Medium parameters used: f = 848.8 MHz;  $\sigma$  = 0.91 S/m;  $\epsilon$ r = 41.413;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Left Section Ambient temperature: 22.3°C; Liquid temperature: 21.5°C

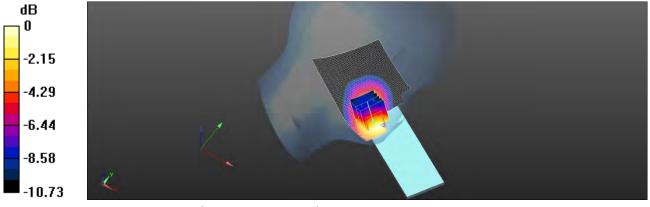
**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.5, 9.5, 9.5); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.354 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 2.946 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 0.416 W/kg SAR(1 g) = 0.288 W/kg; SAR(10 g) = 0.194 W/kgMaximum value of SAR (measured) = 0.359 W/kg



0 dB = 0.359 W/kg = -4.45 dBW/kg

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Date: 2018/12/13

### GSM 850\_Body-worn\_Back side\_CH 251\_10mm

Communication System: GSM; Frequency: 848.8 MHz; Duty Cycle: 1:8.30042 Medium parameters used: f = 848.8 MHz;  $\sigma$  = 0.975 S/m;  $\epsilon_r$  = 54.101;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

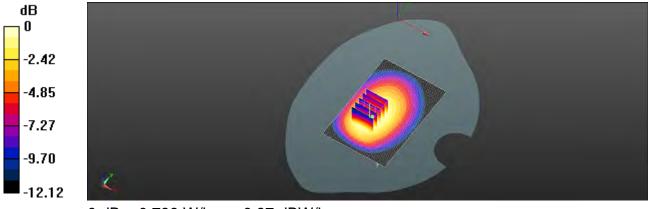
Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.807 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 26.31 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 0.926 W/kg

SAR(1 g) = 0.668 W/kg; SAR(10 g) = 0.465 W/kg

Maximum value of SAR (measured) = 0.799 W/kg



0 dB = 0.799 W/kg = -0.97 dBW/kg

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Date: 2018/12/13

### GPRS 850 Hotspot Back side CH 251 10mm

Communication System: GPRS (1Dn4Up); Frequency: 848.8 MHz; Duty Cycle: 1:1.99986 Medium parameters used: f = 848.8 MHz;  $\sigma$  = 0.975 S/m;  $\epsilon_r$  = 54.101;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

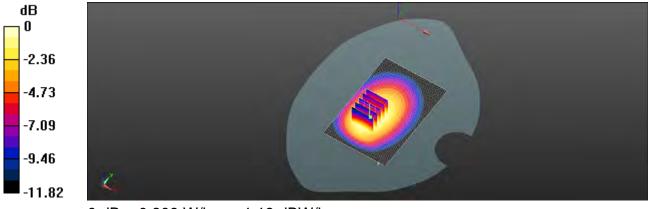
Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.815 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 24.27 V/m; Power Drift = -0.05 dB Peak SAR (extrapolated) = 0.917 W/kg

SAR(1 g) = 0.706 W/kg; SAR(10 g) = 0.585 W/kg

Maximum value of SAR (measured) = 0.809 W/kg



0 dB = 0.809 W/kg = -1.19 dBW/kg

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Date: 2018/12/14

### GSM 1900 Head Le Cheek CH 661

Communication System: GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.30042 Medium parameters used: f = 1880 MHz;  $\sigma$  = 1.389 S/m;  $\epsilon_r$  = 39.528;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Left Section Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

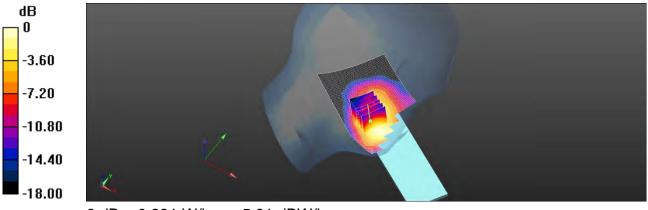
Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.255 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 3.112 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 0.287 W/kg

SAR(1 g) = 0.194 W/kg; SAR(10 g) = 0.126 W/kg

Maximum value of SAR (measured) = 0.231 W/kg



0 dB = 0.231 W/kg = -5.91 dBW/kg

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Date: 2018/12/14

#### GSM 1900 Body-worn Back side CH 810 10mm

Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042 Medium parameters used: f = 1909.8 MHz;  $\sigma$  = 1.523 S/m;  $\epsilon_r$  = 52.792;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

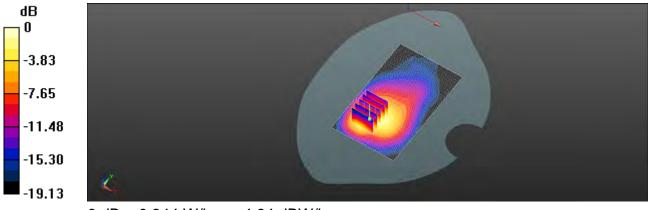
Area Scan (61x101x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.354 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 6.787 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 0.439 W/kg

SAR(1 g) = 0.287 W/kg; SAR(10 g) = 0.156 W/kg

Maximum value of SAR (measured) = 0.344 W/kg



0 dB = 0.344 W/kg = -4.64 dBW/kg

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Date: 2018/12/14

### GPRS 1900 Hotspot Back side CH 512 10mm

Communication System: GPRS (1Dn4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:1.99986 Medium parameters used: f = 1850.2 MHz;  $\sigma$  = 1.512 S/m;  $\epsilon_r$  = 52.811;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

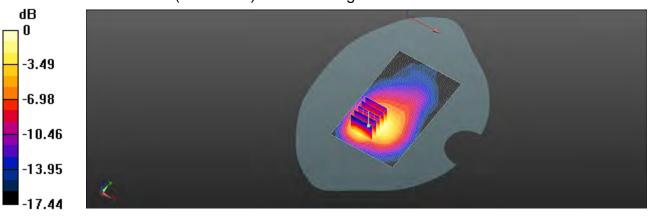
- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.713 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 7.019 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 0.722 W/kg

SAR(1 g) = 0.404 W/kg; SAR(10 g) = 0.221 W/kgMaximum value of SAR (measured) = 0.693 W/kg



0 dB = 0.693 W/kg = -2.10 dBW/kg

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Date: 2018/12/13

### WCDMA Band V Head Le Cheek CH 4233

Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1 Medium parameters used: f = 846.6 MHz;  $\sigma$  = 0.9 S/m;  $\epsilon_r$  = 41.417;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Left Section Ambient temperature: 22.3°C; Liquid temperature: 21.5°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.5, 9.5, 9.5); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

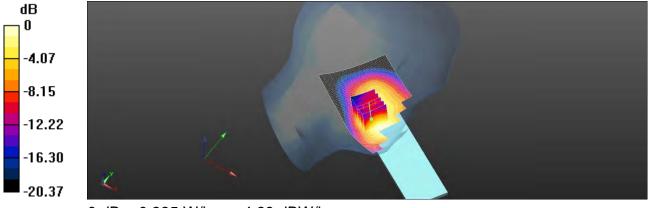
Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.412 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 3.227 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 0.383 W/kg

SAR(1 g) = 0.252 W/kg; SAR(10 g) = 0.146 W/kg

Maximum value of SAR (measured) = 0.385 W/kg



0 dB = 0.385 W/kg = -4.69 dBW/kg

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### WCDMA Band V Hotspot Back side CH 4233 10mm

Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1 Medium parameters used: f = 846.6 MHz;  $\sigma$  = 0.972 S/m;  $\epsilon_r$  = 54.114;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

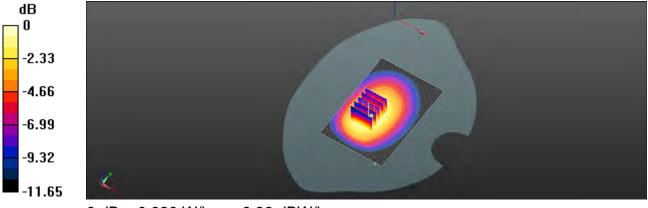
Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.878 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 27.74 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.758 W/kg; SAR(10 g) = 0.528 W/kg

Maximum value of SAR (measured) = 0.920 W/kg



0 dB = 0.920 W/kg = -0.36 dBW/kg

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Date: 2018/12/15

### WLAN 802.11b Head Re Cheek CH 6

Communication System: WLAN 2.45G; Frequency: 2437 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2437 MHz;  $\sigma$  = 1.76 S/m;  $\epsilon_r$  = 39.667;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Right Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

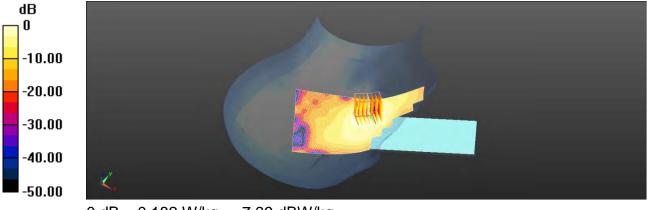
Area Scan (71x151x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.186 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 1.359 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 0.233 W/kg

SAR(1 g) = 0.131 W/kg; SAR(10 g) = 0.066 W/kg

Maximum value of SAR (measured) = 0.182 W/kg



0 dB = 0.182 W/kg = -7.39 dBW/kg

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Date: 2018/12/16

### WLAN 802.11b Hotspot Right side CH 6 10mm

Communication System: WLAN 2.45G; Frequency: 2437 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2437 MHz;  $\sigma$  = 1.956 S/m;  $\epsilon_r$  = 53.112;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.9°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

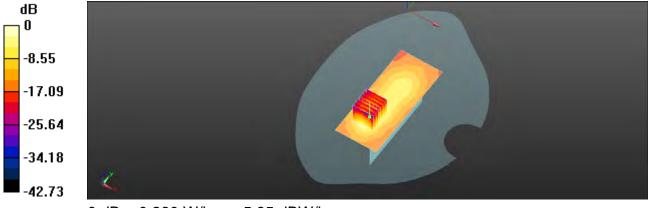
Area Scan (51x121x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.273 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 5.081 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 0.354 W/kg

SAR(1 g) = 0.167 W/kg; SAR(10 g) = 0.073 W/kg

Maximum value of SAR (measured) = 0.260 W/kg



0 dB = 0.260 W/kg = -5.85 dBW/kg

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Date: 2018/12/15

### Bluetooth(GFSK) Head Re Cheek CH 78

Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2480 MHz;  $\sigma$  = 1.812 S/m;  $\epsilon_r$  = 39.644;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Right Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

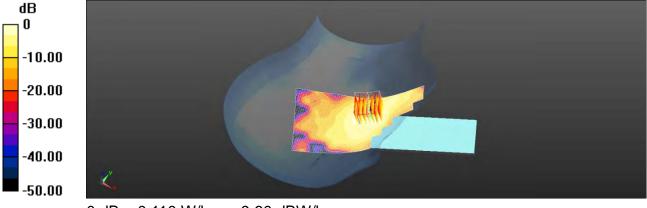
Area Scan (71x151x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.111 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 1.342 V/m; Power Drift = -0.09 dB Peak SAR (extrapolated) = 0.143 W/kg

SAR(1 g) = 0.076 W/kg; SAR(10 g) = 0.037 W/kg

Maximum value of SAR (measured) = 0.110 W/kg



0 dB = 0.110 W/kg = -9.60 dBW/kg

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Date: 2018/12/16

#### Bluetooth(GFSK)\_Body-worn\_Back side\_CH 78\_10mm

Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2480 MHz;  $\sigma$  = 2.01 S/m;  $\epsilon_r$  = 52.887;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.9°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

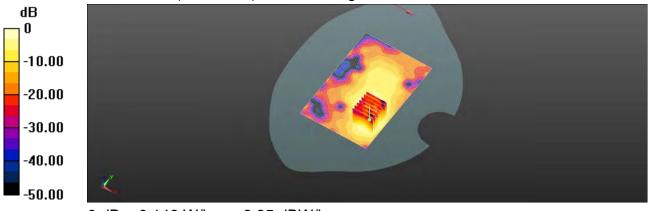
Area Scan (81x121x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.144 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 3.629 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 0.200 W/kg

SAR(1 g) = 0.094 W/kg; SAR(10 g) = 0.041 W/kg

Maximum value of SAR (measured) = 0.146 W/kg



0 dB = 0.146 W/kg = -8.35 dBW/kg

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# 6. SAR System Performance Verification

Date: 2018/12/13

#### Dipole 835 MHz SN:4d063 Head

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium parameters used: f = 835 MHz;  $\sigma$  = 0.894 S/m;  $\epsilon_r$  = 41.44;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.3°C; Liquid temperature: 21.5°C

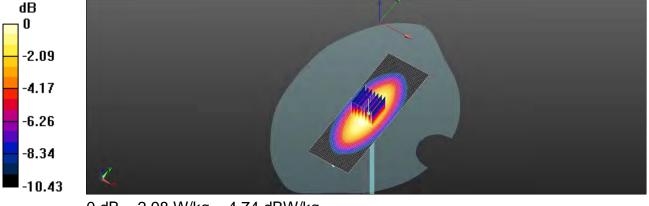
**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.5, 9.5, 9.5); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (41x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.98 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 59.99 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 3.43 W/kg SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.56 W/kgMaximum value of SAR (measured) = 2.98 W/kg



0 dB = 2.98 W/kg = 4.74 dBW/kg

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Date: 2018/12/13

### Dipole 835 MHz SN:4d063 Body

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium parameters used: f = 835 MHz;  $\sigma$  = 0.961 S/m;  $\epsilon_r$  = 54.16;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (51x131x1): Interpolated grid: dx=15 mm, dy=15 mm

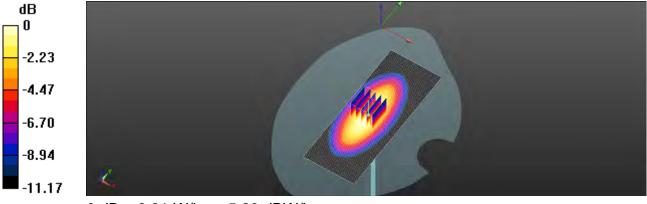
Maximum value of SAR (interpolated) = 3.30 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 57.03 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.92 W/kg

SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.57 W/kg

Maximum value of SAR (measured) = 3.31 W/kg



0 dB = 3.31 W/kg = 5.20 dBW/kg

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Date: 2018/12/14

### Dipole 1900 MHz SN:5d173 Head

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz;  $\sigma$  = 1.393 S/m;  $\epsilon_r$  = 39.501;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

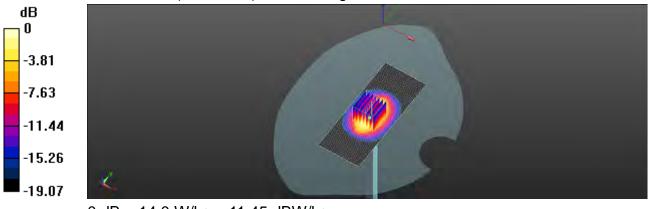
Area Scan (41x101x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.2 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 100.8 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.88 W/kg; SAR(10 g) = 5.17 W/kg

Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kg = 11.45 dBW/kg

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Date: 2018/12/14

### Dipole 1900 MHz SN:5d173 Body

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz;  $\sigma$  = 1.522 S/m;  $\epsilon_r$  = 52.803;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.2°C; Liquid temperature: 21.7°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

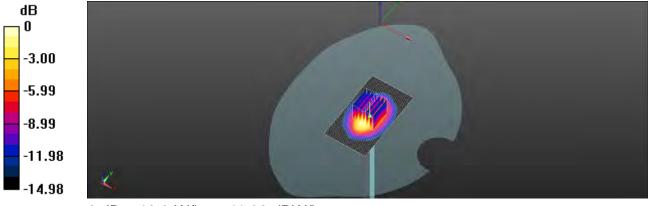
Area Scan (51x61x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.1 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.06 V/m; Power Drift = 0.02 dB Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.35 W/kg

Maximum value of SAR (measured) = 13.8 W/kg



0 dB = 13.8 W/kg = 11.39 dBW/kg

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Date: 2018/12/15

### Dipole 2450 MHz SN:727 Head

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz;  $\sigma$  = 1.788 S/m;  $\epsilon_r$  = 39.656;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

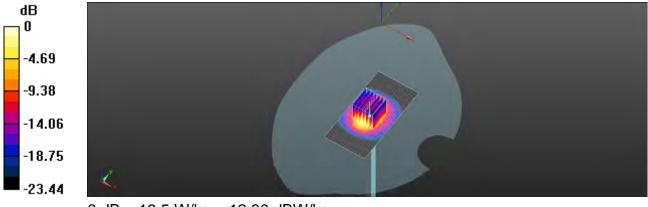
Area Scan (51x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 20.0 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 107.3 V/m; Power Drift = 0.02 dB Peak SAR (extrapolated) = 26.7 W/kg

SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.15 W/kg

Maximum value of SAR (measured) = 19.5 W/kg



0 dB = 19.5 W/kg = 12.90 dBW/kg

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Date: 2018/12/16

### Dipole 2450 MHz SN:727 Body

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz;  $\sigma$  = 1.967 S/m;  $\epsilon_r$  = 52.971;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.9°C

**DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

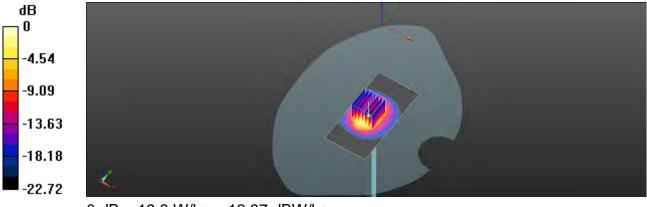
Area Scan (51x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 20.3 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 103.5 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 26.9 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.97 W/kg

Maximum value of SAR (measured) = 19.8 W/kg



0 dB = 19.8 W/kg = 12.97 dBW/kg

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# 7. DAE & Probe Calibration Certificate

Engineering AG aughausstrasse 43, 8004 Zuric	y of		S Schweizerischer Kalibrierdienst C Service suisse d'étalonnage Servizio svizzero di taratura Swise Calibration Service
Accredited by the Swiss Accredite The Swiss Accreditation Service Autilateral Agreement for the n	a is one of the signatories	to the EA	ton No.: SCS 0108
Signt SGS-TW (Aude	in)	Certificate	No: DAE4-1336_Aug18
CALIBRATION C	ERTIFICATE		
Optect	DAE4 - SD 000 D	04 BM - SN: 1336	
Calibration procedure(s)	OA CAL-05.v29 Calibration proces	dure for the data acquisition e	lectronics (DAE)
Calibration date:	August 06, 2018		
The measurements and the unce	riainties with confidence pr	onal standards, which realize the physica obability are given on the following page y facility: environment temperature (22 ±	and are part of the certificate
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Certificate No: DAE4-1336\_Aug18

Page 1 of 5

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Calibration Laboratory of Schmid & Partner Engineering AG aughausstrasse 43, 8004 Zurich, Switzerland Zeughau





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Acquestanion No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration cortification

#### Glossary DAF

Connector angle

data acquisition electronics. information used in DASY system to align probe sensor X to the robot coordinate system.

#### Methods Applied and Interpretation of Parameters.

- DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle. The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - DC Voltage Measurement Linearity. Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement,
  - Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.
  - Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.
  - AD Converter Values with inputs shorted: Values on the Internal AD converter corresponding to zero input voltage
  - Input Offset Measurement: Output voltage and statistical results over a large number of zero voltage measurements.
  - Input Offset Current: Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - Input resistance: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated.
  - Power consumption: Typical value for information. Supply currents in various operating modes.

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#### DC Voltage Measurement

A/D - Converter Resolution nominal High Flange: 1LSB -6.1µV full range = -100...+300 mV Low Range 1LSB = SinV tull range = -1 .....+3mV DASY measurement parameters; Auto Zero Time: 3 sec; Measuring time: 3 sec

<b>Calibration Factors</b>	X	Y	z
High Range	403.344 ± 0.02% (k=2)	403.624 ± 0.02% (k=2)	403.107 ± 0.02% (k=2)
Low Range	3.95102 ± 1.50% (k=2)	3,98703 ± 1,50% (k=2)	3.99683 ± 1.50% (k=2)

#### **Connector Angle**

connector Angle to be used in DASY system	287.0° ± 1°
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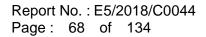
Certilicate No: DAE4-1336\_Aug18

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#### Appendix (Additional assessments outside the scope of SCS0108)

#### 1. DC Voltage Linearity

High Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	200042.98	8.65	0.00
Channel X	+ Input	20006.34	1.71	0.01
Channel X	~Input	-20005,65	-0.58	0.00
Channel Y	+ Input	200034.32	0.12	0.00
Channel Y	+ Input	20003.47	-1:57	0.01
Channel Y	- Input	20008.39	-1.21	0.01
Channel Z	+ Input	200032.22	-2.05	-0.00
Channel Z	+ Input	20002.78	-2.14	-0.01
Channel Z	- Input	-20007.34	-2.09	0.01

Low Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	2001.47	0.30	0,01
Channel X + Input	201.92	0.79	0.39
Channel X - Input	-198.26	0.59	-0.30
Channel Y + Input	2001,55	0.37	0.02
Channel Y + Input	200.97	-0.11	-0.05
Channel Y - Input	-199.34	-0.43	0,22
Channel Z + Input	2001.12	0.04	0.00
Channel Z + Input	200.15	-0.89	-0.44
Channel Z - Input	-200.14	1.15	0.58

#### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec. Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	B:04	4.72
	- 200	4.13	-4.79
Channel Y	200	-3,65	-3,78
	200	2.68	2.45
Channel Z	200	22,40	22.16
	- 200	-24.83	-25.10

#### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	+1	6.12	+1,64
Channel Y	200	9.19		6.46
Channel Z	200	8.44	6.31	

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#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15666	16509
Channel Y	15907	15587
Channel Z	15855	15507

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec. Measuring time: 3 sec. Inimit 10MO

	Average (µV)	min. Offset (µV)	max. Offset (µV)	Std. Deviation (µV)
Channel X	0.87	-0.00	2.62	0.36
Channel Y	3.53	2.87	4.58	0.34
Channel Z	-0.18	-1.34	1.53	0.54

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels <25fA

#### 7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

#### 8. Low Battery Alarm Voltage (Typical values for information)

Typical values Alarm Level (VDC)		
Supply (+ Vcc)	+7.9	
Supply (- Vcc)	-7,6	

#### 9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	36	+14
Supply (- Vcc)	-0.01	В	-9

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Ca ate No. EX3-3938\_0(216 Page 1 of 39

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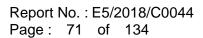
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**Callbration Laboratory of** Schmid & Partner Engineering AG Zoughtusstrasse 43, 1004 Zunch, Switzerland



Sohweizunscher Kallwierdlunst Service suisse d'étalormade Servizia svizzero di terment Swiee Calibration Sorvice

Accorditation No.: SCS 0108

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Accountined by the Swiss Accreditation Service (SAS) The Swiss Accorditation Service is one of the signatories to the EA.

#### stateral Agreement for the recognition of calibration certificants Glossary:

TSL	tissue simulating liquid
NORMAYIZ	sensitivity in free space
CONVE	sensitivity in TSL / NORMx, y.z.
DCP	dicide compression point
CF	creat factor (1/duty, cycle) of the RF signal
A, B, C, D	modulation dependent lineerization parameters
Poisnzation (p	orotation around probe axis
Polanization II	9 relation around an oxis first is in the plane normal to probe axis (a) measurement center), i.e. 3 = 0 is normal to probe even.

Connector Angle information used in DASY system to align proce senser X to the robot coordinalin system

#### Calibration is Performed According to the Following Standards:

- IEEE Str 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Witeless Communications Devices: Measurement
- Techniques: June 2013 IEC 62209-1.1 "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from handb) held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016 c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices
- used in close proximity to the human body (finguency range of 30 MHz to 6 GHz)\*, March 2010 u) KDB 865684, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization # = 0 (f ≤ 900 MHz in TEN-cell, f = 1800 MHz; R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E<sup>2</sup>-field. uncertainty inside TSL (see below ConvF).
- NORM(()x,y,z = NORMx,y,z \* frequency\_response (see Frequency Response Chart), This linearization is implemented in DASY4 adtware versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx, y, z: DCP are numerical linearization patameters assessed based on the data of power sweep with DW alginal (no uncurtainty required). DCP does not depend on frequency nor money.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the eignal characteristics
- Ax, y, z', Bx, y, z', Cx, y, z', Dx, y, z', VRx, y, z', A, B, C, D are numerical linearization parameters assessed based on
- AX, Y, Z, DX, Y, Z, DX, Y, Z, WXX, Y, Z, A, B, C, D are numerical innanzation parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nar-media. WR is the maximum calibration range expressed in RMS voltage across the data. *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f < 800 MHz) and inside waveguide using analytical field distributions based on power meaburomonts for f < 800 MHz. The aamo octupo dro used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve prote accuracy close to the boundary. The sensitivity in TSL corresponds: to *NORMX*, y, z ' *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz. MHz
- Schwitchl isotropy (3D deviation from (soliopy): In a field of low gradients realized using a flat plramom exposed by a patch anterina.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe to (on probe axis). No tolerance required:
- Connector Angle: The angle is assessed using the information gained by determining the NORMs (no uncertainty required).

Certificate No: EX3-3938\_Oct18

Page ≥ cf 39

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EX3DV4 - Sel-serge

Report No. : E5/2018/C0044 Page: 72 of 134

Chiefer 24, 2816

# Probe EX3DV4

# SN:3938

Manufactured: Calibrated:

May 2, 2013 October 24, 2018

Calibrated for DASY/EASY Systems (Note: non-compatible with DASY2 system!)

Certificate No: EK3 3508, Done

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EX30V4-SN 3808

Optaber 24, 2018

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

#### **Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm [uV/(V/m) <sup>2</sup> ) <sup>6</sup>	0.51	0.57	0.33	± 10.7 %
DCP (mV) <sup>e</sup>	103.2	100.5	107.8	2 16-1 10

#### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	c	D dB	VR mV	Unc <sup>e</sup> (k=2)
D	CW	X	0.0	0,0	1.0	0.00	164.0	±3:5 %
		- Y	0.0	0.0	1.0		1742	-
		Z	0.0	0.0	1.0		176.3	-

Note: For details on UID parameters see Appendix.

#### Sensor Model Parameters

	G1 fF	C2 IF	a V 1	T1 ms.V-2	T2 ms.V <sup>-1</sup>	T3 ms	T4 V1	75 V"	Tê
X	59.09	436.9	35.15	26.09	1.205	5,10	1.012	0.575	1.009
¥	53.22	40B.3	37.24	24.25	1.457	5.10	0.000	0.766	1.013
Z	46.65	332.5	32.92	15.26	1.153	4.98	2.000	0.225	1.005

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%

The uncertainties of Norm X,Y,Z an installed the E<sup>1</sup>-faint uncertainty minute TSL (see Pages 5 and 6)

\* Numerical insurtation parameters interceives the containing and a TSL (and Pages 5 and 6) \* Numerical insurtation parameters interceiving no required. \* Numerically is determined using the mail dentation from insuronal implying michinguing dents from and is expressed for the square of the field value.

Certificate No: Ex3-3938 Oct18

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EX3DV4~EN:3938

October 24 (2017)

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

t (MHz) <sup>G</sup>	Relative Permittivity	Conductivity (S(m) <sup>r</sup>	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth <sup>a</sup> (mm)	Une (k=2)
750	41.9	0.89	9.82	9.82	9,82	0.45	0.80	± 12.0 %
835	41,5	0.90	9.50	9.50	9.50	0.50	0.85	± 12.0 %
900	41,5	0.97	9.25	9.25	9.25	0.33	1.04	+12.0 %
1450	40.5	1.20	8.53	8.53	8,53	0.30	0,88	± 12.0 %
1750	40:1	1.37	8.32	8.32	8.32	0.36	0,90	± 12.0 %
1900	40.0	1.40	7.95	7.95	7 95	0.29	0,90	± 12.0%
2000	40.0	1.40	7.93	7.93	7:93	0.36	0.80	± 12.0 %
2300	39.5	1.67	7.69	7.59	7.53	0.37	0.80	112.0%
2450	39.2	1.80	7.17	7,17	7:17	0.39	0.83	± 12.0 %
2600	39.0	1.96	7.11	7.11	7.11	0.38	0:87	± 12.0 %
5250	35.9	4.71	5.00	5.00	5.00	0.40	1.80	£ 13.1 8
5600	35.5	6.07	4.65	4.65	4.65	0,40	1.80	± 13.1 %
5750	35.4	6.22	4.76	4.76	4.76	0,40	1.80	-13.1 %

### Calibration Parameter Determined in Head Tissue Simulating Media

<sup>12</sup> Findumicy which where 300 MHz of ± 100 MHz andy applies the DASY v4.4 and higher (see Page 2), test h is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvE uncertainty at calibration frequency and the uncertainty for the missing Higher V Her. If the uncertainty is the RSS of the ConvE uncertainty at calibration frequency and the uncertainty for the missing Higher V Her. If the uncertainty is the RSS of the ConvE uncertainty at calibration frequency and the uncertainty for the missing Higher respectively. Above 5 GHz the uncertainty of the test 20, 64, 120, 150 and 220 MHz respectively. Above 5 GHz the uncertainty of the uncertainty of the uncertainty of the test 100 MHz.
<sup>14</sup> A trapporties below 3 GHz the validity of teste parameters (*u* and *u*) can be released to ± 10% if Equal complementation termule a upbled to measured SAR values. At frequencies active 13 GHz, the validity of teste parameters (*u* and *u*) is many like that the distance and the test set of the ConvE model. The uncertainty is the RSS of the complementation.
<sup>24</sup> An dependent balance atom a set of S GHz, the validity of teste parameters (*u* and *u*) can be released to ± 10% if Equal complementation termule a upbled to the ConvE uncertainty for middlesid target these parameters.
<sup>34</sup> April Depth and datamined during calibration. SPEAG werearts that the memory deviation due to the balance and without 15 for the option of SHZ AG werearts that the memory datameters 3.6 GHz is any disconce larger than their the single balance.

Certificate No: EX3-3938\_Oct18-

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EX30V4- SN:3935

Octobes 24, 2018

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

F(MHz) <sup>12</sup>	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvF Y	Contel	Alpha <sup>0</sup>	Depth <sup>is</sup> (mm)	Une (k=2)
750	55.5	0,96	9.72	9.72	9.72	0,46	0.87	± 12.0 %
835	55.2	0.97	9.56	9.56	8.55	0.41	0.92	± 12.0 %
000	55.0	1.05	9.33	9.33	9.33	0.48	0.87	±12.0 %
1450	54.0	1,30	7.98	7,98	7.98	0.32	0.90	± 12.0 %
1750	53.4	1.49	7.83	7.83	7.83	0.43	0.90	+ 12.0 %
1900	53.3	1.52	7.52	7.52	7.52	0.33	0.95	± 12.0 %
2000	53.3	1.52	7.62	7,62	7.82	0.36	0,89	= 12.0 %
2300	52.9	1.81	7.35	7.33	7.33	0.42	11.87	= 12.0 %
2450	52.7	1,95	7.30	7.30	7.30	0.35	0.87	= 12.0 %
2600	52.5	2.16	7.15	7.15	7.16	0.33	0.95	± 12.0 %
5250	48,9	5,36	4.23	4.23	4,23	0.50	1.90	± 13.1 %
5800	48.5	5.77	3.77	3.77	3.77	0.50	1.90	±13.1%
6800	48.2	6.00	4.00	4.00	4,00	0.50	1.90	± 13.1 %

Calibration Parameter Determined In Body Tissue Simulating Media

<sup>6</sup> Finguency validity dopie 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (sun Page 2), etc. It is instituted to ± 30 MHz. The anomality is the RSS of the ConvE undertainty at unitivation (inspective) and the uncertainty is the resoluted flocausity band. Finguency wanty balax 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvE assessments ± 30, 64, 128, 150 and 220 MHz respectively. None 6 GHz theorem yieldly can be evidended to ± 110 MHz. The enclosed flocausity band. Finguency wanty balax 50, 64, 128, 150 and 220 MHz respectively. None 6 GHz theorem yieldly can be evidended to ± 110 MHz. The enclosed flocausity band. Finguency with the enclosed to ± 100 MHz. The enclosed 50 MHz is ± 100 MHz respectively. None 6 GHz theorem yieldly can be evidended to ± 100 MHz. The enclosed 50 MHz is ± 100 MHz is ± 100 MHz respectively. The enclosed 50 MHz is ± 500 MHz is ± 500 MHz is ± 500 MHz. The enclosed 50 MHz is ± 500 MHz is ± 500 MHz. The enclosed 50 MHz is ± 500 MHz is ± 500 MHz. The enclosed 50 MHz is ± 500 MHz is ± 500 MHz. The enclosed 50 MHz is ± 500 MHz. The enclosed 50 MHz is ± 500 MHz is ± 50

Earthcath No. EX2 3935\_Oct18

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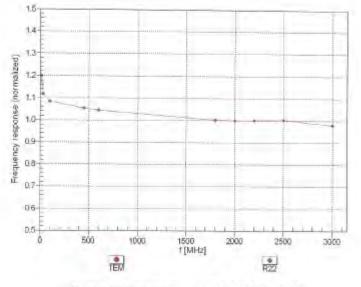


### Report No. : E5/2018/C0044 Page: 76 of 134

EX3DV4- SN 3938

October 24, 2019

Frequency Response of E-Field (TEM-Cell;ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Gertificate No: EX3-3938\_Oct18

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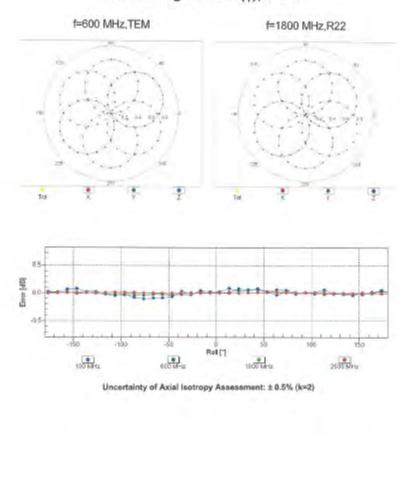
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EX3DV4-SN:3938

October 24, 2018



Receiving Pattern (\$), 9 = 0°

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EX3DV4- 5N 3938

October 24, 2018

Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f<sub>eval</sub>= 1900 MHz) 10 Input Signal [M/] 10 10 10 109 10 10-1 10<sup>2</sup> SAR (mW/cm3) 10 not comper ۰ sated aled Error [dB] 6 -2 10-10: 102 in 10 SAR [mW/cm3] . \* not co Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Cartificate No: EX3-3938\_Oci18

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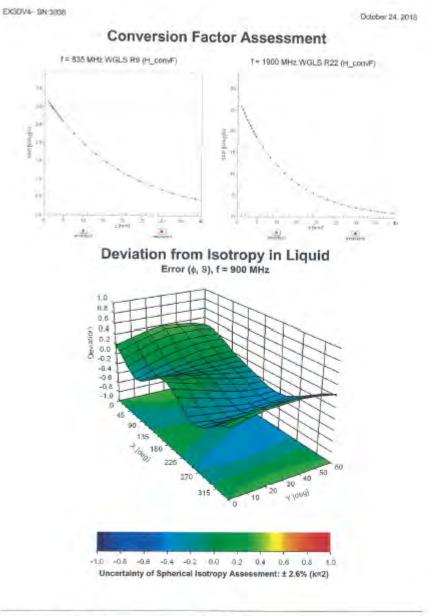
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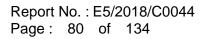
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EX30V4--SN:3838

Octoher 24, 2018

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

#### Other Probe Parameters

Sensor Amangement	Trlangular
Connector Angle (*)	-26.4
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	.337 mm
Probe Body Diameter	10 mm
Tip Length	enm @
Tip Diamater	2.5 mm
Proba Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Proba Tip to Sensor Z Calibration Point	1 mm
Recommonided Massurement Distance from Surface	1.4 mm

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EX3DV4-SN:3965

Steel March 1996

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October 24, 2018

UID	Communication System Name	nete	A dB	BdBõV	c	D tfB	VR mV	Max Unc <sup>*</sup> (k=2)
0	CW	X.	0.00	0.00	1.00	0.00	164,0	± 3.5 %
_		Y.	0.00	0.00	1.00		174.2	-
		Z	0.00	0.00	1,00		176.3	
10010- CAA	SAH Validation (Square. 100ms. 10ms)	x	11.84	84.28	19.03	10.00	20.0	29.6%
1.0		Y	175	72.52	14.55		20.0	
-		7	2.70	85.86	10.62		20.0	1.00
10011- CAB	UNITS-FED (WCDMA)	×	1,25	71.04	17.46	0,00	150,0	196%
_		Y	0.87	85.19	13,50	-	150.0	_
ANNAN	server have a sublimiting of etcla despected of	Z	1 10	89.84	16,56		150.0	- How all
10012- CÁB	IEEE 802,11b WIFI 2.4 GHz (DSSS, 1 W6ps)	X	1.29	65.77 53.57	16.62	0.43	100.0	3.9.6 %
		YZ	113				150.0	
10013-	IEEE 802.11g WIFI 2.4 GHz (DSSS	X	1.17	64.77	15.66	1,46	150.0	29.6%
CAB	OFDM, 6 Mbps)	Y	4.93	66.63	17.09	1,40	100.0	2 9/0 %
_		Z	4.79	66.72	16.84		150.0	
10021- DAC	GBM-FOD (TDMA, GMSK)	×	100.00	118.51	30,68	9,39	50,0	±9.8.%
Parto.		v	100.00	117.47	30.14		50.0	
_		Z	9.68	81.65	18.25		50.0	
10023- DAC	OPRS-FDD (TDMA, GMSK, TN 0)	×	100.00	118,45	30.70	9.57	50.0	± 9.6 %
		Y.	100.00	117,42	30.17		0.00	
		Z	8.28	79.56	17.55		50.0	
10024- DAC	GPRS-FDD (TDMA; GMSK, TN 0-1)	×	100.00	116.27	28.62	6,56	60.0	± 9,6 %
		Y	100.00	113.88	27.38		63.0	-
	the second se	Z	17.36	88.43	18.89		60.0	
10025- DAC	EDGE-EDD (TDMA, IIPSK, TN 0)	×	14.85	105,13	41,16	12,57	50.0	主要自动
1.11		Ŷ	0.09	80.08	30.32		50.0	
	and the second sec	Z	5,13	73.32	26.13		50.0	
10026- DAC	EDGE-FDD ITDMA, 8PSK, TN 0-1)	×	28.61	116.31	40.38	9.56	60/0	4 0.G %
		9	17.18	103.12	35.82		60.0	_
	and the second sec	Z	10.76	92.22	31.22	-	ED.D	1000
10027- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	×	100,00	116.23	27.82	4,80	80.0	± 9.6 %
		Ŷ	100.00	112.20	25.80		80.0	
	CONTRACTOR AND ALL ALL ALL ALL ALL ALL ALL ALL ALL AL	Z	100.00	105.42	22.06	3.55	BOD	100.018
10028- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	117.56	27.68	3.65	100.0	± 9.6 %
_		Y Z	100,00	111.19	24.62	-	100.0	
488.85	EDGE-FDO (TDMA, BPSK, TN 0-1-2)		14.44	99.44	33.73	7.80	80.0	±9.6%
10029- DAC	EDODEDU (TUNA, DESK. 10/0-1-2)	X	10.38	91.48	30.62	1.200	80.0	7.8.6.9
		2	6.98	83.31	26.90	-	80.0	-
10030- CAA	IEEE B02.15.1 Bluetonth (GFSK, DH1)	8	100.00	115.12	27.62	5,30	70.0	18.6%
Serves		Y	100.00	111.80	25.93		70.0	
		Z	13 15	85.08	t7.21		70.0	
10031- CAA	IEEE 802.15.1 Bluelooth (GFSK, DH3)	X	100.00	120.41	27.44	1.86	100.0	± 9.6 %
3		Y	100.00	105.85	20.53		100.0	
-		Z	100.00	102.30	18.50		100.0	1

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10032	IEEE 802:15 1 Bluetooth (GESK, DH5)	T X	100.00	129.17	29.93	1.17	100.0	1106%
CA4	and a second control (	1			1.22			1.000
		N.	100.00	101.34	18.13	-	100-0	1
10033-	IEEE 802,15,1 Bluetoath (PIM-DQPSK	Ž	103.00	104.25	18.92	1.00	100.0	-
CAA	DH1)	×	100.00	428.B1	35,11	5.30	70,0	19.6 N
_		Y	30.25	106.06	28.70		70.0	-
10034-	IEEE 802.15.1 Bluniooth (Pi/4-DOPSK)	Z	7.06	82.85	20.38		70,0	
GAA	DH3)	×	31.82	111.82	29.61	1.88	100.0	±9.6-8
		Y	1.94	81.70	19,61	-	100,0	
10635-	IEEE 802 15 1 Bluelooth (PI/4-DOPSK	Z	3.36	77.14	17.43	1.14	100.0	
CAA	DH5)	X	8.75	93.74	24,54	1,17	100,0	2.9.0%
-		Y.	2.58	74.38	16.81		100.0	
10035-	IEEE 802.15.1 Bluexoth (8-DPSK, DH1)	2	2.45	74./B	16.51		109,0	-
CA4	IEEE SAL (5.) BUIRDODI (B-LPSK, DH3)	×	100.00	128.23	35.27	5.30	70.0	19.0%
-	-	Y	49.55	114.02	30.85	1	70.0	
10037-	(EEE B02.15.1 Bitelooth (II-DPSK, DH3)	2	8,61	95.86	21.44		70.0	
E,AA	HERE MAR TO T PROBIDIOUS (D-DPSK, DH3)	X	28.47	109:85	29.14	1,88	109.0	± 9.6 %
		Y	4,63	60.65	15,28		100.0	-
10038-	IFFE WY 16 4 This leads in provid chate	Z	11.6	76.20	17.05		100.0	
CAA	IEEE 802 10 1 Bluniocth (8-DPSK, DHS)		0.40	95,18	25.08	1.07	100,0	29.6%
		Y	2.66	74.97	16.94	-	100.0	
10039	CDMA2000 (1xRTT, RC1)	Z	2.52	75,38	16.85		100.0	10 C 1
CAB	CDWW2000 [1XRT1.RC1]	x	2.91	79.68	19.30	0.00	158.0	+96%
_		Y	1.40	67.94	13.51		150.0	
10042	In the last state property states where the	Z	2.58	79.60	18.81		150.0	
CAB	IS-54 / IS-136 FOD (TDMA/FDM, PI/4- DQPSK, Halirate)	×	100.00	114,29	27.89	7.78	50.0	±96%
_		Y.	100.00	112.24	26.83		50.0	
10044-	the second second second second	Z	7.08	77.78	15.66		50.0	
CAA	IS-BITELAITIA-553 FOD (FDMA, FMI	×	0.00	111.10	2,98	0.00	150.0	±9.6%
		Y	0.12	121.97	13.25		150.0	
10046-	Particle Lines and Lines and Lines and Lines	Z	0.02	124,98	11.44	1	150.0	1
CAA	DECT (TDD, TDMA/FDM, GFSK, Full Skot 24)	x	100.00	120.31	32.96	13.60	25.0	19,8%
-		Y.	26.80	98.60	27.12	1000	25.0	
10045-	Brot other states and a	Z.	6.10	73.04	88,61		25.0	1000
CAA	DECT (TDD, TDMA/FDM, GFSK, Double Silot (12)	X	109.00	118.79	31,19	10.79	40.0	498%
		Ŷ.	42.73	105.35	27.69		40.0	
10058-	TOUTS THE DRIVE COMPANY & SALE	7	6.52	75.70	16,44		40.0	Erac.
SAA.	UMTS-TOD (7D-SCDMA, 1-28 Mops)	x	59.92	116.40	32.89	9,03	50.0	±0.8%
		Ŷ	20.27	96.61	26.81		50.0	
10058-	EDGE SDO/Trata anne then a ser	4	8,72	#1.4R	20.30		30.0	-
DAC	EDGE-FDO (TDMA, BPSK, TN 0-1-2-3)	X	3.95	90.34	29,75	6.55	100.0	19.6%
		Y	7.41	E4.68	27.34		100.0	
10059-	IEEE 802 110 WIFI 2.4 GHz (DSSS, 2	Z	5.31	78.46	24.34		100.0	· · · · · · · · · · · · · · · · · · ·
CAB	Mops)	X	1.45	68,16	17.83	0.67	118.0	29.6 ×
_		Y	1.24	65.28	15,64		110.0	
0060-	IEEE 802.11b WIFI 24 GHz (DSSS, 5.5	Z	1:24	66,08	15.24		110.0	-
CAB	Moosi	×	100.00	136.52	35.86	1,30	110.0	186%
		Y	100.00	127.82	31.55		110.0	
		Z	75.11	127.04	31.74		110.0	

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10061-	IEEE 802 11b WIFI 2 4 GHz (DSSS. 1)	X	37.93	122.29	34,76	2,04	T10.0	±9.6 K
CAB	Mbps)	Y	7.04	91.70	25.29	-	110.0	
		2	3.71	82.53	21.92	_	110.0	-
0062- CAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 6 Mbps)	X	4.83	66.93	16.78	0.49	100.0	*96%
		Y'	4.68	66.44	16.40		100.0	
	and the second sec	Z	4.61	66.82	16.41	See. 1	100,0	
10083- CAC	IEEE 802,11a/h WIFI 5 GH2 (OFDM, 9 Mbps)	x	4,86	87.07	16.91	0.72	100.0	⇒9.6.%
		Y	4.71	66.58	16.52		100.0	
		Z	4.62	86.89	16.47		100.0	
10054- CAC	IEEE 802.11a/h WIFI 5 GH2 (OFDM, 12 Mops)	×	5.19	67.38	17,15	0.86	100.0	±9.6 %
		Ŷ	5.02	66.91	16.79	_	100.0	
100E5-	IEEE 802.11ah WIFI 5 GHz (OFDM, 18	Z	4.90	67 10	16.66	-	100.0	- 0.0.1
CAC	Mops)	x		67.37	17.30	1.21	100.0	± 9,6 %
_		Y	4.91	66.89	16.94	_	100.0	
10086-	IEEE 802.11a/h WiFi 5 GHz IOFDM. 24	Z	4.77	66.99 67.44	16.73	1.46	100.0	19.6%
EAC	Mbps)	Y	4.95	67.44	17,15	1.40	100.0	19.0%
		Z	4.80	66.99	16.85	-	100.0	-
10067- CAC	(EEE 802.11a/h WiFI 5 GHz (OFDM, 36 Mbps)	X	5,40	67.52	17.91	2.04	100.0	主日日参
and the	(index)	Y	5.26	67.17	17.62		100.0	
		Z	5.06	67.09	17.23		100.0	-
10058- DAC	JEEE 802 11a/h WIFI 5 GHz (OFDM, 48 Mbps)	X	5.51	67.80	18.25	2.55	100.0	± 9.6 %
	C-Tar	9	5.36	87.48	17.94		100,0	
		Z	5.11	67.14	17.41		100.0	
10069- CAC	IEEE 802 11a/n WIFI 5 CH2 (OFDM, 54 Mbps)	×	5.58	67.69	18.40	2.67	100,0	±9.0%
_		Y	5,44	67.37	18.13		100.0	
	these sectors and it is not	2	5.19	67.11	17.58		100.0	
10071- CAB	EEE 802.11g WF(2.4 GHz (DSSS/OFDM, 9 Mpps)	×	5.17	67.17	17.75	1.99	100.0	29.6%
		Y	5.05	66.81	17.46	-	100.0	
12124	The second state of the contrast of the length	Z	4.88	66.78	17.09	0.00	100.0	1.680.0
10072- CAB	(DSSS/OFDM, 12 Mbps)	×	5.21	67.68	18.06	.2.30	100,0	±9.6 %
		YZ	5.08	67.27	17.74		100.0	
10073- CAB	(EEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	5.30	67.92	18.44	2.83	100.0	2.9.8 %
- dec	The second second considered	Y	5.18	67.55	18.13		100.0	-
		Z	4 94	57.26	17.56		100.0	1.000
10074- CAB	IEEE 802 11g WIFI 2.4 GHz (DSSS/OFDM, 24 Mbps)	x	5.29	67,90	18.65	3.30	100.0	+86%
-		·Υ	5.19	67.54	18,34		100.0	-
		Z	4.93	67.18	17.70		100.0	1000
10075- CAB	(DSSS/OFDM, 36 Mbps)	×	5.40	68.28	19.10	3.82	ACA.	7.0 B.W
-		Y	5.28	67.86	18,77		90.0	-
10076-	IEEE 802.11g WFi 2.4 GHz	X	4.98	67.33 67,97	17.99 19.17	4.15	90.0	19.6%
CAE	(DSSS/OFDML 48 Mbps)	Y	5.29	67.64	18.88	-	90.0	-
		Z	5.00	87.13	10.00	-	90.0	-
10077-	IEEE 802.11g WiFi 2.4 GHz	X	5.41	68.03	19.26	4.30	90.0	196%
CAB	(DSSS/OFDM, 54 Mbps)	Ŷ	5.32	67.72	18.98		90.0	
		Z	5.93	67.21	18.19		50.0	-

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	150.0	0.00	15.87	70.94	1.20	X	CDMA2000 (1xRTT, RC3)	10081-
19,6	150/0	0,00	1000			1.1	Concentral Intel 1, heat	CAE
	150.0		10.59	63.33	0.68	Y		
	150.0	in the second second	14.01	69.12	0.97	Z		
1 8.6 t	80.0	4.77	6.54	61,30	1.85	x	IS-54) IS-138 FDO. (TDMA/FDM, PV4- DQPSK, Fulirate)	10082- CAB
	80.0		5.56	60.10	1.15	4	1. X	_
100.00	80.0	· · · · · · · · · · · · · · · · · · ·	4.82	60.00	0.90	Z		
±9,6	60.0	6.56	28.67	116.34	100.00	X	GPRS-FDD (TDMA, GMSK, TN/0-4)	10090- DAC
	60.0	· · · · · · · · · · · · · · · · · · ·	27.45	113.98	100.00	Y.		
	80.0	1000	18.81	88.08	16;90	Z	LANKS CORE DISCOURSES	10097
19.65	150.0	6.00	16,78	69,10	1.98	×	UMTS-EDD (HSDPA)	CAR
	\$50.0	10.00	14.64	66.14	1.66	Y		_
1.00	180.0	122.2	16.52	69.38	1.52	Z	The latter, proposed in portion of the second second	10000
198	150,0	0.00	16.77	69.09	1.94	<u>×</u>	UMTS-FDD (HSUPA, Subjes) 2;	10088- CAB
-	150.0		14,59	66,08	182	Y		_
1	150.0	1.12.1.11	16.49	69.33	1.87	2	PROPERTY OF AND ADDRESS OF	-
±9.63	00.0	9.56	40,37	116.31	38.67	×	EDGE-FOD (TDMA, 8PSK, TN 0-4)	10099- DAC
-	60.0	1.1.1.1	35.83	103.14	17.22	Y		
	60.0		31.22	92.24	10.80	2	The line is a set of the set	A DO A DO A
±969	159,0	0.00	17.62	72.21	3.51	×	LTE-FOD (SC-FDMA, 100% RB, 20 MHz, OPSK)	10100- CAE
	150.0		15,85	69.12	2.94	Y.		
	150.0	1.000	17.33	71.84	3.29	2	The second second second second	a la la
±9.6 9	150,0	0.00	16.44	68.37	3,42	x	LTE FOD (SIC-FDMA, 100% RE, 20 MH2_16-CIAM)	10101- CAE
	150.0		15.45	66.88	3.15	Y.		_
	150.0		16.19	58 19	3.26	Z		
+961	1502.0	0,00	16.50	63.25	3.51	×	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-DAM)	CAE
-	158.0		15.57	55.87	3.25	Y-		
	150.0		18,28	88.16	3:35	Z ]	the second se	
1961	85.0	3,98	22.32	80,51	9.10	×	LTE-TOD (SC-FDMA, 100% RB, 20 MHz, QPSK)	10103- SAG
	65.0		21.05	77.60	7.71	Y		
	65.0		19.85	75.88	6.72	2	1.40.0000	0.061
\$9.67	85/0	3.98	22.08	77.67	8.36	X	ME-TOD (SC-EDMA, 100% RB, 20 MH2_10-QAM)	10108- SAG
	65.0		21.18	75,78	7,66	¥ .		
-	65.0		19,84	73.78	6.54	Z		
± 9,8 %	65.0	3.98	22.27	77.35	8.22	x	HTE TOD (SC-FOMA, 100% RE, 20 MH2, 64-QAM)	10105- 0AG
	65.0		20.84	74.28	7.00	Y.		_
-	65.0		19.96	73.36	8.41	Z		-
±9.6 %	150.0	0.00	17.44	71.32	3/17	3	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	01(85- 7AG
	150.0		15.87	68.37	2.58	Y		
-	180.0		17,15	71.00	-2.85	2.	1 THE REAL CONTRACTOR OF A	0103
¥88%	150.0	9.00	10,43	68.24	3.09	.X.	LTE+PDD (SC+DMA, 100% RB, 10 MHz, 16-DAM)	0109- CAG
	153.0		15.30	66,64	2.80	Y		
	150.0		16.17	68.15	2.62	2	I TE EDD IDO EDITE AND DE TO	0110-
±9/61	150.0	0.00	17,16	70.39	2.51	x	LTE-FDD (SC-FDMA, 100% RB, 5 MHz. OPSK)	0110- MG
-	150.0		15.21	67.38	2.08	Y.		_
	150.0	-	16.80	70.10	2,30	Z	I WE REAL THE REAL PROPERTY AND ADDRESS	0110
主动药物	150.0	11.60	16,90	69,15	2.83	×	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-OAM)	0111- 2//G
	150.0	-	15.44	67.13	2.49	Y		_
-	150.0	-	16.76	69.56	271	Z		_

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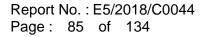
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0112-	LTE-FOD (SC-FDMA, URPS RB, 10	x	3.20	88.13	16.43	0.00	150.0	主导剧系
CAG	MH2, 64-QAMI	10	8.00	an ar	15.00	100	( in the second	
_		YZ	2.93	80.85	15.39	-	150.0	_
0113-	LTE-FIDD (SC-FIDMA: 100% RB, 5 MHz	x	2.58	68 13 69 16	16.21 16.06	0.40	150.0	1965
CAIG	BI-DAM	Y	2.64	87.31	15.65	-	150.0	-
-		ż	2.87	69.66	16.87		150.0	
10114- CAC	GEE 802-11n (HT Greenhold, 13.5 Mbps: BPSK)	x	5.21	67.32	16.54	n nu	150.0	198%
-11.110	Contraction of the	Y	5.08	66.85	16 21	-	150.0	
		Ż	5,00	67.43	16.43	10000	150.0	
10115- CAC	IEEE 802.11n (H1 Grownfield, 81 Mbps, 16-QAM)	×	5.95	67.00	16.68	0.00	150.0	±9.8%
		Y	5.42	67.15	16.37		150.0	
A 1 1 1 1	The second secon	Z	5:34	67.52	18.48		150.0	
10116- CAC	IEEE 802,111 (HT Greenbeld, 135 Mbps. 64-GAM)	x	5,33	67.58	16.60	0.00	150.0	<b>美国田 </b>
		Y.	5.10	67.09	16.26		150.0	
1000	And the second se	-Z.	互复	67.61	16.44	1	150.0	
10117- CAC	IEEE 802 11n (HT Mixed, 13.5 Mbds, BPSK)	×	5,21	67.33	18.56	0,00	150.0	±9,6 %
-	-	4	5,06	66,76	16.19		150.0	
10116-	EEE 802 110 (HT Mored, 81 Mbps. 16-	Z	5,03	67.31	15.39	0.00	150.0	*9E =
CAC	GAMI	1			1.8,750	0.00	1000	110 -
		Y	5.56	07.54	15.45	-	150.0	_
10115-	IEEE 802.11n (HT Mimd, 135 Mbps, 64-	Z X	8.44 6.20	67 66 67 52	15.55	0,00	150,0 150,0	19.6%
DAG	QAM)	Y	5.16	67.02	18.24		150.0	-
		Z	0.13	87.5h	16.43		150.0	-
10140- CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.55	80.24	16.42	0.00	150.0	296%
LIPPL	and to solve	Y	5.29	60.88	15.49		150.0	
T		Z	1.39	68.15	10.19		150.0	
10141- CAE	LTE-FDD (90-FDMA, 100% RB, 15 MHz, 04-QAM)	×	3.65	68,26	18.55	0,00	150.0	= 0.6 %
		.Y.	3.42	66.98	15.00		tablo	1
		Z	3.52	88.25	16.36		150.0	1
10142- CAE	LTE-FDD (EC-FDMA, 100% RB, 3 MHz, DPSK)	8	2.31	70.61	17,10	0,00	150 0	*96%
6. m		×.	1 B4	67.11	14.76	-	150.0	
		2	2.12	70.48	16.65		150.0	1
10140- CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-0AM)	×	211	70.28	16.99	0.00	150.0	49.6%
		X.	2.81	17.48	15.00		150.0	-
10:44-	LTE-EDD (60-EDM), 100% RB, 3 MHz.	X	2.68	70.99 67.88	16.78 15.37	00.0	150.0	± 9.6 %
GAE	64-GAMI	V	234	85.80	13.59	-	150.0	
_	-	2	2.29	57,85	14.87		150.0	
10145- CAF	LTE-FED (SD-FDMA, 100% RB, 1.4 MHz, GPSK)	x	1.73	10.80	15.10	.0.60	160,0	±0.6%
	the rest of the second	Y	1.11	03.06	10,90		150.0	
	the second s	Z	133	67.08	12 73	100	100.0	
10146- CAF	LTE FDD (SC-FDMA, 100% RB, 1.4 MHz, 18-QAM)	X	4.28	75.06		0.00	160.0	394%
		Y.	2.47	68.71	13.45		150.0	
		Z	2.38	66.35	12.25	0.00	150.0	1.000
10147- DAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	×	6,45	B1,86	19,47	0.00	150.0	19.8 %
		Y.	3.10	7179	14.97		100.0	-
		- Z	3.20	72.21	14.01		1000	

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10149=	LIE FOD (SC-FDMA, 50% RB, 20 MHz,	1.8	3,10	68.31	16.47	0.00	150.0	± 9.6 %
CAE	16-DAM)		Patria	00.01	10.40	0.00	100.0	13,0 %
		¥.	2,81	66.69	15,35		150.0	
		. Z	2.93	68.23	16,22	1.000	150.0	
10150- CAE	LTE-FDD.(SC-FDMA, 50% RB, 20 MHz, 84-DAM)	x	3.21	68,18	18,48	0,00	150.0	±9.0%
_		·Y	2.94	66.70	15.43	_	150.0	
		Z	3.05	68,20	16.26		150.0	1
10161- CAG	LTE-TOD (SC-FDMA, 50% RB, 20 MHz. QPSK)	×	10.13	83.77	23.67	3.98	85.0	296%
		Y.	842	80.52	22.26		85.0	
10152-	LTE-TED (SC-FDMA 50% RB 20 MHz	Z	6.89	77.61	20.59	-	65.0	
CAG	16-QAM)	×	0.04	78.08	22.05	3,98	65.0	±9.6%
		Y	7 13	75.91	20.98		65.0	
10153	LTE-TDD (SC-FDMA, 50% RB, 20 MHz)	X	6.04	73.58	19.44		65.0	
CAG	64-QAMJ	1.1	8.44	78,92	22.75	3.98	85.0	± 9.6 %
		Y	7.56	76.89	21.74		65.0	
10154-	LTE-FDD (BC-FDMA, 50% RB, 10 MHz,	Z	6.48	74.70	20.30	and a second	65.0	
CAE	GPSK)	X	2.50	70.97	17.50	0.00	150.0	± 9.6 %
		Y.	2.12	67.77	15:47		160.0	-
10155-	LTE-FDD (SC-FDMA, 50% RB) 10 MHz.	Z	2.38	70.74	37,16		150.0	
CAG	16-QAMU	×	2,83	69.15	16.90	0.00	150.0	39,6 S
		Y	2.49	67.14	15.45		150,0	
10158-	1 WE DON'T COMPANY AND AND THE REAL	Z	2.71	89.67	16.78	Trans. F.	160.D	1.00
CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	×	2.21	71.19	17.23	0.00	150,0	±9.6 %
		Y	1.65	67.01	14.46	the second second	150.0	
10157-	LITE PRODUCE PLATE AND DEC STREET	Z	2.01	71.01	16.65	10000	150.0	
CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz 16-QAM)	×	2.40	88.89	15.72	0.00	150,0	*96%
		Y.	1.95	65.89	13.48		150.0	
10158-	LTE-FOD (SIC-FDMA, SV% RB, 10 MHz	2	2.15	68.70	14.94		150.0	
GAG	64-QAM	x	2.98	69.22	17.01	0.00	150 0	198%
		: Y .	2.65	67.36	15.65		150.0	
10159-	LTE-FOD (SC-FDMA, 50% RB, 5 MHz.	2	2.68	69.75	16.53		150.0	1000
CAG	64-DAM)	X	2.54	69.44	16.05	0.00	150.0	+86%
		Y	2.05	86.31	13.77		150.0	
10160-	LTE-FOD (SC-FDMA, 50% RB, 18 MHz	Z	2.34	69.42	15.34	-	150.0	
CAE	CTE-FOD (SC-FDMA, 50% RB, 15 MHz, QPGK)	×	2.96	69.71	18.97	0.00	150.0	196%
_		Ϋ́	2.62	67.67	15.60	_	150.0	-
10101-	LTE-FDO (SC-FDMA, 50% RB, 15 MHz)	Z	2.78	69.58	16.72		150.0	
CAE	16-CIAMI	X	3,11	\$8.11	16:44	0.00	150.0	主目。告张
		Y	2.83	66.60	15.34		150.0	
10162-	LTE FDD (SC-FDMA, 50% RB, 15 MHz,	2	2.95	68,19	16/22	1	150.0	
CAE	64-QAW)	X	3.21	68.15	16.50	0.00	150.0	±96%
			2.94	66.74	10.46	1	150.0	
10188-	LTE-FDD (SC-PDMA, 50% RB, 1.4 MHz,	2	3.08	68.32	16.32		150.0	
LAF	OPSK)	X	4.07	71.03	19.91	3.01	150.0	÷9.6%
-	F	Y	3.79	69.95	19.36		150.0	1
10187-	LTE-FDO (SC-FDMA, 50% RE, 1 4 MHz	7	3.83	71.38	19.76		150.0	1000
JAF .	TR-CAM)	8	5.42	74.80	20.07	3.01	150.0	+9.6%
		Y	4.77	72.79	19.75		150.0	
		2	5.29	76.01	20.77	-	150.0	

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10168-	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz,	X	6.05	77.17	21.98	3.01	150.0	±9.6 %
AF	64-QAM)	Y	5.30	75.09	21.09	_	150.0	
_		Z	6.36	79.86	22.71		150.0	
0169- AE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	3.85	72.93	20.70	3.01	150.0	± 9.6 %
		Y	3.33	70.15	19.41		150.0	
		Z	3.47	72.51	20.23		150.0	
10170- CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	x	6.37	81.48	23.72	3.01	150.0	±9.6 %
2022	296.350655	Y	4.75	78.10	21.63		150.0	
0.471.2	LITE FOR AND FRAME A PR COLUMN	Z	7.01	85.04	24.72	2.04	150.0	1.00.00.00
0171- VAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	x	4.87	75.76	20.53	3.01	150.0	±9.6 %
		YZ	3.87	71.72	18,83 20.23	_	150.0	
10172- CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	80.41	131,60	39.78	6.02	65.0	± 9.6 %
		Y.	18.51	103.18	32.14		65.0	
		Z	14.22	97.99	29.18		65.0	
10173- CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	×	100.00	127.75	36.65	6.02	65.0	±9.6 %
220.04	Design of the	Y	30.31	107.15	31.45		65.0	
	Carl and the second second second second second	Z	25.08	102.02	28.13	0.00	65.0	
10174- CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	×	60.73	116.92 99.84	33.35	8.02	65.0	± 9.6 %
_		YZ	21.73	99.84	25.80		65.0 65.0	
0175- CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz. OPSK)	X	3.78	72.50	20.40	3.01	150.0	± 9.6 %
unita	urany	Y	3.29	69.80	19.15		150.0	
		Z	3.40	71.98	19.88		150.0	
10176- CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	x	6.38	81.51	23.73	3,01	150.0	± 9.6 %
		Y	4.76	76.12	21.65	-	150.0	
		Z	7.03	85.08	24.74		150.0	
10177- CAL	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	3.82	72.71	20.53	3.01	150.0	±9.6 %
		Y	3.32	69.97	19.25		150.0	
		Z	3.44	72.23	20.02	3.01	150.0	± 9.6 %
10178- CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16- QAM)	X	6.26	81.12	23.55	3.01	150.0	10.0.%
		Z	6.85	84.54	24.51		150.0	
10179- CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	5.53	78.38	21.95	3.01	150.0	± 9.6 %
		Y	4.28	73.73	20.08		150.0	
		Z	5,53	80.03	22.20		150.0	
10180- CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64- QAM)	×	4.85	75.63	20.45	3.01	150.0	± 9.6 %
		Y	3.85	71.63	18.78		150.0	
1000000		Z	4.51	75.97	20.14 20.52	3.01	150.0	±9.6 %
10181- CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	3.82	72.60		3,01	150.0	± 9.6 %
		Y	3.31	69.95 72.20	19,24 20.01	-	150.0	-
10182- CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	6.25	81.09	23.54	3.01	150.0	±9.6 %
CAL	To sarsing	Y	4.70	75.84	21.50	-	150.0	
		ż	6.83	84.50	24.49		150.0	
10183- AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	×	4.84	75.60	20.44	3.01	150.0	±9.6 %
		Y	3.85	71,61	18.77		150.0	
		Z	4.50	75.94	20.13		150.0	

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10184- GAE	LTE-FOD (SC-FDMA, 1 RE.3 MHz, QPSK)	8	3.83	72.74	20.54	3.01	150.0	19.6%
Ser au	Sar any	Y	3.32	70.00	19.27	-	150.0	-
		Z	3.45	72.28	20.04		150.0	-
CAE	LTE-FDD (SIC-FDMA, 1 RB, 3 MHz, 16- QAM)	x	6.29	81.18	23.59	3.01	150.0	±8,6 %
_		Y	4.72	75.91	21.53	-	150.0	-
	and the second sec	Z	5.88	84.63	24.55		150.0	
10106- AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64- QAM)	x	4.86	75.68	20.48	3.01	150.0	2.9.6 %
_		Y	3.87	71.68	18.80	-	150.0	
10187-		Z	4.53	75.04	20.17		150.0	
CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz. QPSK)	×	3.84	72.79	20.60	3.01	100.0	19.6 5
_			3,33	70.05	19.38		150.0	i
10188.	LTE-FOD (SC-FOMA, 1 RB, 1.4 MHz,	Z	3.46	72.24	20.11		160.0	-
IZAF	16-OAM)	×	6.59	82.17	24,08	3.01	150.0	#96%
-		Y	4.88	76.63	21.93		150,0	
10.199 AAF	LTE-FOD (SC-FOWAL 1 RB, 1.4 MHz, 54-QAM)	X	7.44	86.21 76.28	25.23 20.81	3.01	150.0	±96%
	and sacond	Y	3.96	72.12	40.00	-	1000	-
-		2	4,72	72.12	19.08	-	150.0	-
10193- GAC	IEEE B02 11n (HT Greenfield, 6.5 Mbps. BPSK)	X	4.64	66.78	16.35	0.00	150.0 150.0	196%
GAL	drany	Y	4.48	66.72	15.91		150.0	1.1.1
	The second se	Z	4.48	66.93	15.91		150.0	
10194- CAC	IESE 802 11n (HT Greenfield 39 Mops: 16-QAM)	X	4.84	67.15	16,19	0.00	150.0	49.6%
_		8	4.66	66 55	15.03		160.0	
		Z	4.65	67.23	16.31		160.0	-
10195- CAC	IEEE 802 11n (H7 Grounbeld, 55 Mbps, 64-QAM)	X	4.88	67.16	16.47	0,00	150,0	全电后 弊
		Y	470	66.58	16.05	-	150.0	-
_	1	2	4.69	87.26	16.32		150.0	
10191 CAC	IEEE 802 11n (HT Mixed, 6.5 Mbps, BPSK)	x	4.66	88.88	15.38	0.00	150.0	主题后指
_		Y	4.49	66.29	15.93		150.0	
and allow		Z	4.48	66.99	16.21	1.000	150.0	
DAC	EEE 802 11n (HT Mood 39 Mbps. 16- GAM)	x	4,85	67.17	16.47	0.00	150.0	± 9.6 %
		N.	4,67	66,56	16.04		150.0	
10198-	IFFE BOT IT- OF LA-SI OF LE	Z	4.86	67.25	16.32	-	150.0	
CAC	IEEE 802.11n (HT Mised, 86 Mbps, 64- QAMI	×	4.89	67 18	16.48	0.00	150,0	±9.6 %
-		Y	4.70	66,60	16.06		150.0	-
10219i	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	Z X	4.81	67.27 66.90	18.33 18,35	0,db	150.0 150.0	± 9.6 %
		¥	4.43	66.30	15.89	-	100.0	
		2	4.40	67,01	16.10		150,0	
10220- CAC	EEE 802.11n (HT Maxed 43.3 Mopt, 16- GAM)	×	4,86	67,15	16.10	0.00	100.0 150.0	±9.5%
_		Y	4.67	66.55	16.04		150.0	
(nou)		Z	4,65	67.22	16.31		150.0	-
0221 3AG	TEEE 802.11n (HT Mixed) 72.2 Mbps, 64- GAM)	x	4.88	67.10	10.46	0.00	150.0	主题电影
-		Y ]	4.71	66.53	16.05		160.0	
0222-	International Conception of Conception	Z	4.70	67.20	18.31		150.0	1.00
0222- SAC	IEEE 802.11n (HT Mixed, 15 Mbps) BPSK)	×	5,19	87.35	16.57	0.00	150.0	10.6 %
_		Y	5.03	06,77	18.1#	1	150.0	
		Z	5.01	67.33	16.30		150.0	-

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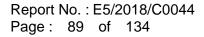
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10223- GAC	IEEE 802.11n (HT Mixed, 90 Mbbs: 16- DAMI	x	5.54	67.61	16.71	0.00	150.0	1.05
Lar year	Sacrant.	Y.	0.35	68.99	16.32		150:0	
		Z	5.29	67.45	16.47		150.0	-
10224- CAC	JEEE 802 11n (HT Make: 150 Maps, 64- DAM)	x	5.24	67,46	16,55	0.00	150.0	1965
		Y	5.08	66.87	16.16		150.0	
		Z	5.06	87,45	16.38		150.0	
10225- CAB	UMITS-FDO (HSPA+)	x	2,94	66.61	15,90	0.00	150.0	594%
-		¥	2.72	65.45	14.90		150.0	
		Z	2.80	66.78	15.59		150.0	
10226- CAA	LTE-TDD (SC-FDWA, 1 RB, 1.4 MHz, 18-QAM)	×	100.00	127.97	36.79	6.02	65.0	19.6%
		Y	33.01	108.86	32.02		65.0	
		Z	28.60	104.35	28.88		65.0	
10227- CAA	LTE-TOD (SC-FDWA, 1 RB, 1.4 MHz, 64-GAM)	х	71.64	120.02	34.24	6.02	65.0	#90%
		Y	27.56	104.08	30,11		65.0	
	a state of the second second	Z	21.67	.98.19	26.50	the second	85 D	
10228- CAA	LTE-TOD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	×	83.76	133.19	40,33	6.02	65.0	±9,6 %
	the second se	Ϋ́Υ.	27.23	111,37	34.65	· · · · · ·	65.0	1
	Contraction of the second seco	Z	14,92	99.20	29.65		65.0	
10229- CAC	LTE-TOD (SC-FDMA, 1 RB, 3 MHz, 16- QAM)	×	100.00	127.75	36.66	6.02	85.0	± 9.0 %
		Y	30.45	107.22	31.48	1.00	65.0	
		Z	25.36	102.20	28.19	I familie	65.0	
10230- DAC	LTE-TOD (SC-FDMA, 1 RB, 3 MHz 64- GAM)	x	64.64	118.06	33.66	6.02	65.0	± 9,6 %
		Y	25.67	102,71	29.64		65,0	
_		Z	19.55	96.45	25.91		55.0	1.
10231- CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, OPSK)	×	74.78	130.72	39.63	6.02	65.0	196%
	1.2.3.3	Y	25.26	109.74	34.10		65.0	
		Z	13.64	97.69	29.10		65.0	
10232- CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz; 16- DAM)	X	100.00	127.76	36.66	8.02	65.0	296 W
	1	Y	.30,44	107.22	31.48	-	85.0	
		Z	25.32	102.18	28.18		85.0	1
10233- GAF	LTE-TOD (SC-FDMA, 1 RB, 5 MHz, 54- DAM)	X	64,74	118.10	33.67	8,02	65.0	法自在物
(arti	- Second	8	25.00	102.71	29.64		85.0	1
	Support of the second states o	Z	19.51	96.43	25.91		65.0	
10234- CAF	LTE-TOD (SC-FDMA, 1 RE, 5 MHz OPSK)	x	68.79	128.16	38.87	8.02	65.0	± 9,6 %
		Y	23.59	108.16	33.53		65,0	
		Z	12.92	98.23	28.52		65.0	
10235- CAF	LTE-TDD (SC-FDMA_1 RE, 10 MHz, 18-QAM)	×	100,00	127 77	36,66	6.02	65.0	196 5
		Y	30.53	107.29	31.50		65.0	
	No. of the second s	2	25.37	102.23	28.19		65.0	k
10238- CAF	LTE-TDD (SC-FDMA, 1 RE, (8 MHz, 84-QAM)	x	65.78	118.34	33.72	0.02	05.0	≡8 <i>6</i> 8
1. Carlos 1. Car		Y	25.93	102.87	29,68		65.D	-
		Z	19.72	96.57	25.94		65.0	
10237- CAF	LTE-TOD (SC-FDMA, 1 RB, 10 MHz, QPSK)	×	78.22	131-13	39.74	6.02	88.0	19.6%
		Y.	25.46	109.93	34.16		65.0	-
A 10 -		2	13.89	97.78	29.12		65.0	1.1.1.1
10238- CAF	LTE-TDB (SC-FDINA, 1 RB, 15 MHz, 16-OAM)	×	100.00	127.76	36,66	6.02	65,0	± 9,6 %
-		Y	30.42	107.23	31,48		65.0	
		2	25.26	102.15	28.17		65.0	

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10239-	LTE-TDD (SE-FDMA, 1 RB, 15 MHz.	X	64.82	118:13	33.68	6.02	65.0	1 19.6%
CAF	64-CIAM)					0.04	1000	1.4.0.1
		Y	25.62	102.71	.29.64		65.0	
10240-	I all place send parts of a new life and	Z	19.45	06,60	35.90	-	65.0	
CAF	LTE-TOD (SC-FDMA, 1 RE, 15 MHz, QP5K)	×	75,84	131.04	39,71	6.02	65.0	± 9.6 %
		Ŷ	25.37	109.88	34.14	6	65.0	
10241-	LTE-TDD (SC-FDMA, 50% RB, 14 MHz.	2	13.84	97.74	29.11		65.0	
CAA	16-QAMJ	x	12.34	87.77	28.09	6.98	65,0	± 9.8%
		Y	10.07	84,69	26.80		65.0	
18242-	LTE-TOD (SC-FDMA, 50% RB, 1.4 MHz	Z	9.45	E3.27	25.34		65.0	
CAA	64-DANI	1	11.90	66.96	27.58	6.98	65.0	2 3/6 %
_		X	948	82.13	25.70	-	65.0	
10243-	LTE-TOD (SC-FDMA, 50% RB, 1.4 MHz,	2	8.88	82.07	24.81		65.0	
CAA	QPSK)	*	9,29	B3.62	27.37	6.98	85.0	÷96%
		4	7.60	79 19	25,41	_	65.0	1
TITZAA.	LTE-TOD (SC-FDMA, 50% RE 3 MHz	Z	6.90	78.25	24.23	1.00	85.0	
CAC	16-QAM).	×	11.62	86.25	22.95	3,96	85.0	± 9.6 %
		Y	9.05	81.02	21.07		85.0	
10:245-	LTE-TOD (SC-FDMA, 50% R9, 3 MHz	Z	5.90	74.19	17.01		65.0	
CAC	64-QAM)	×	11,21	84.37	22.69	3.98	85.0	19,6 %
		Y	8.74	80.23	20.72	-	85,0	
10246- CAC	LTE-TDD (SC-FDMA, 80% RB, 3 MHz, QPSK)	X	5.76	73.60 91.33	16.72 25.01	3.98	65.0 65.0	19.8%
urv.	(aran)		8.67	200.00			_	
		Y Z	8.27	82.50	21.35		65.0	
10247-	LTE-TOD (SC-FDMA, 50% R8: 5 MHz	X	5 24	75.79	17.95	10100	65.0	
CAF	16-QAM	1		80.38	21.81	3.98	65.0	2.9.6%
		Y	6.57	76.53	18,78		66.0	
10248+	LTE-TDD (SC-FOMA, 50% RE, 5 MHz.	2	5.10	72.95	17.62	12000	65,0	
DAF	64-QAM	8	7.96	79,46	21,43	3.98	65.0	1965
		Y	6.50	75.86	19,49	-	85,0	
10249-	LTE-TOD (SC-FDMA 50% FIB 5 MHZ	Z	5.09	72.45	17.30		65.0	
AF	OPSK)	×	14.67	92.89	28.21	3.90	65,0	195%
		Y	9.72	85.51	23.23	-	65.0	
10250- CAF	LTE-TOD (SC/FDMA, 50% RB, 10 MHz, 15-QAMI	X	8.59	79.52 81.74	20.29 23.60	3.98	65.0 65.0	196 %
010	(a) Grist	8	7.53	75.65	10.000			
		2	6.20	78.89	22.19		65.0	
0251- CAF	LTE-TOD (SC-EDMA, 50% RB, 10 MHz, 54-QAM)	X	8.02	78,02	20.42 22.12	3.98	65.0 65.0	19.6 %
-		Y	7.01	78:38	20.84	_	65.0	-
	and the second sec	2	5.03	73.77	19.14		65.0	
CO25C	LTE-TOD (SC-FDMA, 50% RB, 10 MHz, DPSK)	×	12.21	89.16	25,66	3.98	65.0	19.6 N
		Y	8.34	B4.33	23.86	-	65.0	-
		Z	7.06	50.06	21.46		65.0	
0253- AF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 18-QAM)	x	7.75	17.29	21.77	3.98	65.0	19,6%
-		Y	6.0G	75.28	20.72		65.0	
and a second		Z	5.82	73,10	19.25	1	65.0	
0254- CAF	LTE-TOD (SC-FDMA, 50% RB; 15 MHz; 64-DAM)	×	£.16	78,13	22.42	3,98	65.0	±9.6%
		N	7.34	76.22	31.12	-	85.0	
		Z	6.32	74.11	18.09		65.0	

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+9.6%	65.0	3.98	23.60	62.96	0.52	X [	LTE-TDD (BC-FOMA, 50% FRB. 15 MHz	10255+
	1.0		-			×	(OPSK)	CAF
	65.0	_	22.27	79.93	8/03			
1000	65,0	100	20.60	17:07	6.80	ZX	LTE-TDD (SC-FDMA, 100% RB, 1.4	0255-
土田市 %	15.0	3.96	21.18	82.65	10.25	100	MHz, 18-DAMI	CAA
	65.0	_	18.77	77.45	7,42	9		
	65 0		14.06	69.73	4.27	Z		
#86%	65.0	3.98	20.00	81.35	11.67	8	LTE-TOD (SC-FOMA, 100%) RB, 1.4 MRz, 64-QAM)	0257- AA
	65.0		13.24	76.38	7.07	Y		
	65.0	12.00	13.71	69.13	-4,27	2	A MER MARK THE PERSON AND A MARK THE A	
1962	65.0	96.6	23 95	87 41	11.24	x	LTE-TOD (SC-FDIMA, 100%) RB, 1.4 (MH2, QPSK)	10258- 3AA
_	65,0	_	18.86	77,82	6.22	Y		_
	65.U		t5.20	71,16	1.68	Z		-
100%	65.0	3,98	22.38	80,75	8.37	x	LTE-TDD (SC-FDMA, 100% R8, 4 MHz, 16-DAM)	10259- 2AC
_	55.U	-	20.63	11:37	16.95	*		
	65.0		18.58	74,09	5.53	Z	and the second se	
生日日外	65,0	3.88	22.23	80.29	8.81	×	LTE-TOD (SC-FDMA, 100% RB, SMHz, 64-DAM)	10260- IAC
	65.0		20.51	27.04	6.94	Y		
	65.0		18.49	73.86	5.55	2	and the second se	-
主题原则	65.0	3.98	25.58	89,95	12.47	×	LTE-TOD (SC-EDMA_100% R8_3 MHz OPSK)	10261- CAC
	85.0		23.10	84.05	0.00	Y		
1.000	05.0	1.000	20.51	78.99	6.47	2		
÷0.6 %	65.0	3.98	23.56	61,65	878	X	LTE-TOD (SC-FDMA, 100% RB, 5 MHz 16-0AM)	10262- JAF
	65.0		22.15	78.83	7.52	Y		
	65.0		20.36	75.95	6,19	Z	Contraction Contraction of Contraction	
59.6 %	65.0	3.88	22.12	78.76	6.01	x	LTE-TOD (SC-FDMA: 100% SB, 5 MHz) 84-CAM)	10263- CAF
_	65.0		20.65	76.35	1.00	Y.	a second part	
	65.0		19.13	73.75	5.82	Z.	the second se	-
19.0%	650	1.98	35,56	88.92	12.07	3.	LTE-TOD (SC-FDMA, 100% RB, 5 MHz, QPSK)	10264- CAF
	68.0	-	23.56	8411	8.25	- W -		0.0
	65.0	1.1.1	21.36	79.85	7.01	Z		
± 9.0 %	85.0	3.98	22.05	78.00	8.7.4	X.	LIE TOD (SC FDMA, 1025 RB 10 MHz, 16-DAM)	10266- CAF
-	65.0		20.07	75.81	7.13	Ŷ	The second	ar u
	0.60		19.44	73.58	6.64	贫	Party and a second second second second	
196%	65.0	3.98	22.74	79.91	8.44	X,	LTE-TOD (SC-EDMA, 1005 RB 10 MHz, E4 GAM)	LODE
	85.0	1	21.73	76.88	7.55	Y		
	66.0	1	20.29	74.68	E 47	z		
3989	85,0	3,98	23,66	83.73	10.11	×	LTE-TDD (SC-FDMA, 100% RSI 10 MHz, QPSK)	10267- DAF
	85.0		22.26	111.47	5 41	¥		
	85.0		20.67	77.07	0.47	Z	at the attenue the set of Dealer The	
292.0	88.0	3.96	22.02	77,18	65.6	2	LTE-ITRO (SUFFLIMA, NUMERIE 15) MHz 10-DAMI	10288- CAF
	肠草		21.20	75.61	7.95	Y.		
	B5 0	1.000	18,92	73.87	B.70	2	1	
1 8,0 %	85.0	3.98	21.88	76.63	0.28	×	LTE-TOD (SC-FDMA, 100% RB, 19 MHz; 84-DAW)	10269- DAF
	65.0	/	21.07	75.05	Y.58	V		
	65,0		19.83	73.30	6.67	Z		-
± 9.6 %	0.50	8.98	22.20	79.53	88.8	×	L'TE-TEID (SC-FEIMA, 100% RE: 15 MHz (2PSK)	10270- CAF
	10 H		21,20	77.34	7.84	Y		200
	95.0		19.85	75.30	6.74	2		-

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10274-	UMTS FDD (HSUPA Subtest 5, 30PP	8	2.69	67.00	15.83	0.00	150.0	1 E B 0 %
CAB	Rel8.10	-			1		1000	
		Y	2.47	65.81	14.87	-	150.0	-
10275-	UMTS-FDD (HSUPA, Sublest 5, 3GPP	Z	2.60	67.27	15.58		150.0	
CAE	Relia 4	x	1.83	70.14	16.98	0.00	150.0	± 8,6 %
_		1Y .	1,44	66.20	14.31		150.0	1.000
10277-	phis lander	Z	1,70	69.74	16.44	-	150.0	12
CAA	PHS (OPSK)	×	3,93	66.44	11.35	9.03	50.0	1.9,0 %
_		Y	3.47	64.75	10.20		50.0	
10278-	PHS (QPSK, BW 884MHz, Rollett 0.5)	Z	2.82	62.17	7.82	1000	50.0	
CAA	THIS (CONSIGNING COMPANY COMPANY CONTROL (C.E.)	×	14,82	89.25	23.47	9.03	50.0	19.8%
		9	7,61	78.00	18.87		60.0	
10279	PHS (OPSK, B/V 884MHz, Rolloff 0.38)	Z	4.20	69.20	13.78		50.0	
CAA	PHS (GPSK, BIV 684MHZ, Rolloff 0.36)	x	14,85	89.41	23.56	5.63	50.0	29.6%
		Y Z	7.77	76.24	18.99		50.0	
10290-	CDMA2000, RC1 SO55, Full Rinkin		4.39	69.44	13.93		50.0	· · · · · ·
AAB	Server 2000, NG1, SUSD, FULKOW	×	2.10	73.72	17.08	0.00	150,0	29.6%
		78	1.20	65.83	12.24		150.0	1.0
10291-	CDAW2000, RC3, SO55, Full Ride	Z	1.79	72:49	15.56	in and it	150.0	
BAA	CONV2000, RGS, SOBS, Full Rale	×	1 16	70.51	15.66	0.00	150.0	2.9.6 %
		Y	0.67	63.17	10.49	2	150.0	
10292-	DESCRIPTION DOG DOGS DISTRICT	Z	D.04	68.71	13.80		150.0	-
AAB	CDM/s2000, RC3, SO32, Full Rele	ж	1.93	78.24	19.72	0.00	150/0	± 9.6 %
		Y.	0.78	65.41	12.01		150.0	
10293-	COMA2000, RC3; SO3, Full Rate	Z	2.04	30.04	18.65		150.0	
AAB	Conscrabo, NG3, SO3, Full Kitte	×	4.24	91.88	24,62	0.00	150.0	2.9.8%
-		· ¥ ·	0.99	63.94	14.19		150.0	
10290-	CDMA2000, RC1, SOS, 1/8th Rate 25 hr.	2	16.88	110.82	28.51	2000	150.0	
AAB.	COMPOUND, RC1, SUS, With Rale 25 m.	×	12.27	89,66	26,50	9,08	9D.0	÷46%
		Y	10.64	85.72	24.40	1	50.0	
11297-	LTE-FOD (SC-FUMA, 50% RE 20 MHz	Z	6.99	77.74	20,11		50.0	
AAD	DPSK)	8	3.09	¥1.44	17.51	0.00	150.0	19.6%
		Ŷ	2.59	58.47	15.73	_	158.0	
10298-	LTE-FDD (SC-FDMA, 50% RB, 3 MHz.	Z	2.87	71,14	17.24		150.0	
AAD	OPSK)	x	2.03	71.15	18.52	0,00	150.0	19.6%
		Y	1.39	65.75	12.91		150.0	
10266	LTE-FOD (SC-FDMA, 50% RB, 3 MH2,	Z	1.75	70.22	15.26		150.0	
VAD	16-QAM	×	4,86	77,12	18.36	0.00	150.0	19.6%
		Y	3.14	71.60	15,64	_	150.0	
0300-	LTE-FDD (SC-FDMA, 50% RB, 3 MHz.	6	3,75	74.00	15.70	-	150.0	
AD	64-QAM)	×.	2.97	69.66	14.52	0,00	150.0	±9.6.%
		Y	2.26	88.25	12.48		150.0	-
0301-	IEEE 802.16e WWAX (29:10, 5ms.	2	2.17	06.32	11.62		150.0	1
AA	10MH2, DPSK, PUSC)	X	6.32	86.98	15.36	4.17	0,02	主乐影响
		Y	0.22	66.88	18,11	_	50.0	
0302-	IEEE 802 10a WIMAX (29:18, 5ms,	Z	4.67	65.61	17.38		50.0	
AA	10MHz, OPSK, PUSC, 3 CTRL symbols)	x	1,74	67.34	16.93	4:90	0.02	± 9.8 %
		Y	5,58	66.87	18,46		50.0	
		4	5.18	68:25	18.09		50.0	

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-E0E01	IEEE 802.16e WIMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	x	5.54	67.22	18.91	4.95	50.0	± 9.6 %
		Y	5.37	66.70	18.39		50.0	
		Z	4.93	65.95	17.95		50.0	
0304- AA	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	х	5.28	66.83	18.25	4.17	50.0	± 9.6 %
		Y	5.10	66.29	17.74		50.0	
		Z	4.73	65.82	17.46		50.0	
0306-	IEEE 802.16e WIMAX (31:15, 10ms,	X	5.67	72.27	22.34	6.02	35.0	±9.6 %
AA	10MHz, 64QAM, PUSC, 15 symbols)			12022	10000		1000	
C21V		Y	5.72	72.48	21.90		35.0	
12000		Z	4.66	68.90	20.05	100000	35.0	- X0100
10306- AA	IEEE 802.16s WIMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	5.47	68.37	20.21	6.02	35.0	±9.6 %
		Y	5.52	69.50	20.64		35.0	
		Z	4.82	67.24	19.32		35.0	
10307- VAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	х	5.58	70.12	21.19	6.02	35.0	±9.6 %
		Y	5.54	70.11	20.79		35.0	
	the second s	Z	4.75	67.57	19.37		35.0	
0308-	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	5,58	70.46	21.39	6,02	35.0	± 9.8 %
	card and construction of the second	Y	5.56	70.49	21.00		35.0	
		Z	4.74	67.84	19.54		35.0	11111
10309- AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	5.56	68.68	20.38	6.02	35.0	±9,6%
v.v.s.	Total and Total and Total Erson To appropriate	Y	5.61	69.80	20.81		35.0	
		Z	4.87	67.43	19.45		35.0	
0310- AA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	5.54	69.67	21.04	6.02	35.0	± 9.6 %
<u></u>	TOWER, GROW, HIMO 240, TO Symbolis)	Y	5.51	69.73	20.68		35.0	
		Z	4.78	67.38	19.33		35.0	
0311-	LTE-FDD (9C-FDMA, 100% RB, 15	X	3.47	70.67	17.10	0.00	150.0	±9.5 %
AAD	MHz, QPSK)	- 88.			1000	0.00	150.0	2.5.0 %
		Y	2.93	87.81	15.48			
		Z	3.26	70.40	16.86		150.0	+96%
10313- AAA	DEN 1:3	×	10.55	84.71	20.54	6.99	70.0	±9.6 %
		Y	5.52	75.51	16.93		70.0	-
	100 Street	Z	3.35	69.99	14,11		70.0	
10314- AAA	IDEN 1:6	×	24.93	102.67	28.79	10.00	30.0	±9.6 %
10/02		Y	8.40	84.46	22.81		30.0	
	The second s	Z	4.59	75.67	18.98		30.0	- needer
10315- AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	×	1.16	65.40	16.44	0.17	150.0	± 9.6 %
		Y	1.01	63.11	14.44		150.0	
		Z	1.08	64.77	15.73	-	150.0	
10316- AAB	IEEE 802.11g WiFi 2.4 GHz (ERP- OFDM, 6 Mbps, 96pc duty cycle)	X	4.72	66.92	16.53	0.17	150.0	± 9.6 %
Course of	Provide and the second second second second	Y	4.56	66.38	16.12		150.0	
255.017	The second se	Z	4.51	66.86	16.22		150.0	
10317- AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	×	4.72	66.92	16.53	0.17	150.0	±9.6%
		Y.	4,58	66.38	16.12	-	150.0	2
		Z	4.51	66.86	16.22	10.000	150.0	10000
10400- AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	×	4.84	67.20	16.45	0.00	150:0	±9.6 %
		Y	4.66	66.61	16.02		150.0	
		Z	4.63	67.25	16.28		150.0	-
10401- AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	×	5.48	67.20	16.49	0.00	150.0	±9.6 %
		Y	5.35	66.85	16.23		150.0	
		Z	5.28	67.24	16.32		150.0	-

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10402	TEEF- BUZ 11ac WIFT (SDMHz, 64-CAM.	X	6.76	67.76	16.60	0.00	150.0	+ 9,6 9
AAD	\$9pp.auty cycle)	-			1			
		Y	5.61	67.21	16.26	-	150.0	-
10403-	CDMA2000 (DEV-DD, Rev. 0)	Z	2.10	67.70	16.42	0.00	150.0	
AAE	COMPENSION (THE VIDIOL NEW D)	~	2.10	13.12	17.08	0.00	115.0	2 9.6 5
		· Y	1.20	65.83	12:24	-	115.0	-
		Z	1.79	72.49	15.56	-	115.0	
10404- AAS	CDMA2000 (1xEV-DD, Rev. A)	×	2:10	73.72	17.06	0.00	115.0	2.9.8.5
_		¥.,	1.20	65.83	12.24		115.0	
inane.		2	1,79	72.49	15.56	1	115.0	1000
AAB	CBMA2000, RC3, SO32, SCH3, Full Rate	×	100.00	122.19	31,29	0.00	100.0	19.63
_		Ŷ	28.24	105.80	27.50	· · · ·	108.0	
10410-	LIE-TOD (SC-FDMA, 1 RB, 10 MHz	Z	100.00	114.73	27.11		100.0	
AAF	CPSK, UL Subfame=2.3,4,7,8,9 Subframe Cohf=4)	×	100,00	121,06	30.81	3.23	30.0	1963
		Ŷ	100.00	121.88	31.03	-	80.0	
an in a		2	83,71	111.58	25.89		30.0	
10415- AAA	IEEE 802 116 W F12.4 GHz (DSSS. 1 Mbps. 99pc duty cycla)	×	1.62	63.90	15.54	0.00	150.0	±9.6%
_		Y	0.51	61.92	13.65		150.0	-
10416-	IEEE 802 110 WFI 2.4 GHz (ERP)	2	D.99	63.88	15.24		150.0	
AA4	OFDM, 8 Mbps, 99pc duty cyce)	×	9,84	66.82	16.39	0.60	150.0	÷9/6 %
-	1	1	-4.48 -4.48	66.26	16.97		150.0	-
10417-	IEEE 802:11 mit WIFI 5 GHz (OFDM, 6	X	4.84	66.96	16.25		150.0	
AAB	Mbps, 99pc duty cycle)	Ŷ	4.4%		16.39	0,00	150.0	29.6%
		Z	4,48	66.96 66.96	15.97	-	150.0	_
10410 AAA	IEEE 802 11g WIFI 2.4 GHz (DSSS- OFDM, 6 Maps, PRoc Only cycle, Long preservoule)	X	4.53	68.97	10.25 10.41	0,00	150.0	±26%
		Y	4.47	66.40	15.97		150.0	-
		Z	4.47	97.14	10.29		150.0	-
10419 AAA	EEE 802,11g WFI 2.4 GHz (DSSS OFDM, 6 Mitps, 99pc duty cycle Short greambule)	×	4,65	66.92	16.41	0.00	150.0	± 9.6 %
-		Y.	4.49	66.36	15.96		150.0	
10422-	IEEE 802 11/1/HT Greenfield, 7.2 Mbps.	Z. 1	4,49	67.08	†6.28		150.0	
NAE	BPSK)	×	4 78	66.82	16,42	0.00	160.0	190%
		YZ	4.51	68.37	16;01	-	150.0	
1U423- AAB	IEEE 802.11in IHT Greeviteld, 43.3 Mbos. 16-GAMI	X	4.51	67,65 67.29	16.28	0.00	150.0 150.0	± 9.8 %
		Y	4,79	08.71	16.13		150.0	
		Z.	0,77	67.38	16.39		150.0	-
10424- AAB	IEEE 802.11n (HT Greenfield, 72.2. Mbps; 64-DAM)	X	4 89	67.24	18.52	0.00	150.0	1 8.0 %
-		1.2	4.70	66.65	16.10		150.0	
0420-	Interior Date: An of the last	Z	4.69	67.32	16.37		150.0	
0428- UAB	IEEE 802.11n (HT Greenfield: 15 Mbps. BPSK)	*	5,44	-67.47	16.62	0,00	150.0	±9.0%
		Y	5.32	67,05	16.33		150.0	
0426	IEBE 802.11n (HT Grownfield, 90 Mbps.	Z	6.25	67.48	16.46	-	150.0	
AAE	T6-QAM)	x	5.45	67,50	16.63	0.00	150.0	1907¥
		Ŷ	5.32	87.06	16.33	1.1.1.1	150.0	
		Z	5.26	67.50	16.46		150.0	

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10427-	IEEE 802.11n (HT Greatfield, 150 Mbps,	-8	5.47	87.52	18.63	00.0	\$50.0	+98%
AAS	64-QAMI			87.64		_		
		Y Z	533	67.50	15.31	_	150,0	-
10430-	LTE-PDD (OFDMA, 5 MHz, E-TM 3.1)	8	4.44	70.94	18.66	11.00	150.0	±0.6 %
AAD	STEPDO (OPDING, SIMPL, EPIMIST)	0	38,64	10/04	10.00	11.00	190.0	6.941.5
		X	4.14	70.00	17.76		150.0	-
	and the second sec	Z.	4.53	72.71	19.D4		150.0	
AAD	LTE FOD (OFDMA, 10 MHz, E-TM 3.1)	x	4,38	67.45	16.50	0.00	100	± 9.6 %
		Y.	4,17	05.74	15.93		150.0	_
	A DESTRUCTION AND ADDRESS OF TAXABLE	Z	4.70	67.60	16.51	10.000	150.0	1 4 10 10
10432- AAC	LIE-FDD (OFDMA, 15 MHz, E-TM 21)	8	4.87	87.30	16.51	0.00	150.0	7 0.0 A
		YZ	4.47	66.68	10.03		150.0	-
10433-	LTE FOD (OFDMA, 20 MHz E-TM 3 I)	X	4.90	67.28	16.54	0.00	150.0	1969
AAC-	LIEFOD (UPDMA, 20 WHS IE IN A II		1000	1.2.2.		0,00		These
-		Y	4.72	66.69	16.12		150,0	-
10434-	W-CDMA (BS Test Model 1, 84 DPCH)	X	4.58	71.86	18.83	0.00	150.0	+96%
10434- AAA	Wiscum tos Laor Wadai II du Du Cut)	0	4.00	1100	10.02	o titi	190.0	2409
- set		Y	4.21	70.69	17.07		150.0	
		Z	4.78	74.00	19.21		150.0	N
10435 AAF	LTE-TOD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subtrame=2.3,4,7,8,9)	×	100.00	120.88	30.73	3.22	80.0	39.6.5
		Y	100.00	(21.69	30,95	1	60.0	
1000		Z.	66.38	108.66	25.18	1000	80.0	
10447 AAD	LTE FDD (OFDMA: 5 MHz, E-TM 3,1, Gloping 44%)	×	3,72	67.65	48,90	0.00	150.0	=0,6.%
1		Y	3.44	66.58	15.18	-	150.0	
	and the second se	Z	3.50	67.81	15.74	-	150 D	- 200.00
10440- AAD	LTE-FDD (OFDMA: 10 MHz, E-TM 3.1) Clupm 44%)	×	4.21	67.23	16.37	0.00	150.0	± 9.6 %
-		N.	6.00	66.50	15.77	_	150.0	_
	the second transmission of	Z	4,02	67.40	1E-18	11.000	150.0	
10448- AAC	LTE-FDD (OFDMA) 15 MHz, E-TM 3-1 Cliping 44%)	×	4,46	67.14	16.42	0.00	150.0	\$9.6 9
		Y	4.27	66.49	15.91	-	150.0	
21.2.4.4	Las manufacture others which he	Z	4.28	67.27	16.29	0.00	150.0	+1.6 7
10400- AAG	LTE-FDD (OFDMA, 20) MHz E-TM 3 1 Clipping 44%)	×	4.64	65.43	15.42	0.00	150.0	19.6-3
_		Y	4.47	67.16	15.96		150.0	-
10451-	W-CDMA (BS Teal Model 1, 64 DPCH, Clipping 44%)	X	3.96	68.00	15,09	0.00	150.0	2969
MAR.	cubburd mean	- W.	3.33	66.69	14.77	-	150.0	
		Z	540	68.00	15.28	-	150.0	1
10458- AAB	IEEE 802,11ac W/F) (160MHz: 64-DAM 99pc duty cycle)	×	6.29	68.08	16.78	0.00	150.0	2981
		×	6.17	67.63	15.50	-	150.0	
	the state of the s	XX	6.11	68.01	16.58	1.111	150.0	-
10457- AAA	UMTS-FDD (DC-HSDPA)	1	3,63	66,45	10.13	0.60	150.0	+0.6.9
		A.	3.72	64.49	15.67	-	150.0	-
10100		Z	3.74	65,80	15.95	0.65	150.0	1000
10458- AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carries)	X	4.16	70.93	18,07	0.00	150.0	± 9.6 1
_	1 *	Y	3.83	09.00	17.01	-	150.0	
A 10 - 4 17 17	ODUBRICH TV DO NO. T.	ZX	4,25	73.12	18:00	0.00	150.0	+9.64
10459- AAA	CDMA2000 (1sEV-DO, Rev. B. 3 camera)				18,25	0.00	1.0000	289.3
		W Z	0.25	09.85	18.70	-	150.0	
		1.4	0:40	00000	10/10		330.75	-

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10460-	LIMTS-FOD (WCOMA, AMR)	X	1.12	72.77	16.83	0.00	150.0	1 2 3 6 5
AAA		- 24	0.22					1.000
		Y	0.73	80.44 71.76	13.95		150.0	
10461-	LTE-TDD (SC-FDMA, 1 RB: 1.4 MHz,	X	100.00	126.43	33.83	3.25	80.0	-=9.63
AAA	OPSK, UL Submand=2.3,4,7,8,9)			10000		3.69		19.0.7
-		Y	100.00	125.87	32.93		80,0	-
10482-	LTE-TDD (SC-FDMA, 1'R5, 1/4 MHz.	Z	90.37	116.03	27.82	-	80.0	
AAA	16-GAM, UL Subframe=2.3.4.7,8,9)	X	100.00	109.98	25.58	3.23	30,0	78 B 4
_		Y	100,00	109.45	25.28		80.0	
10463-	LATE THIS IS & FRAME & DOLLAR AND	2	1.10	60.79	7.88		0.08	1
AAA	LTE-TOD (SC-FDMA, 1 R8, 1.4 MHz, 64-QAM, UL Subframe-2.3.4,7.8,9)	×	100.00	106.70	.24.02	3.23	30.0	± 9.6 ×
		N.	49.13	.98.79	22.03		80.0	1
10464-	INT TOD IGO POLIS LESS CARDS	2	1.03	60.00	7.05		30.0	-
AAB	LTE-TDD (SC-FDMA, 1 RE, 3 MHz DPSK, UL Subtrame=2.3,4,7,8,9)	×	100,00	124.44	32.24	3.23	80.0	±06%
-		14	100.00	123.71	31.77		80.0	3
10.000	1 THE THIRD COLD PERSON A LODG IN THE	Z	25,98	98.94	23.07		80.0	1.000
10460- AAB	LT5-TDD (SC-FDMA, 1 R9, 3 MHz, 15- CAM, UL Subframe=2.3,4,7,8,9)	8	100.00	109.41	25,30	3,23	80.0	#8.6 W
		· 8	100.00	108.89	24.99	1	80.0	P
10456-	LET THE LOSS STATE AND A THE AT	Z	1.05	80.34	7.60		80.0	1
AVR:	LTE-TDD (SC-FDMA, 1 RB 3 MHz, 64 GAM, UL Subtraine=2,3,4,7,8,9)	×	100.00	106,17	23.77	3.23	80.0	695 N
1.1	A CONTRACTOR OF A CONTRACTOR A CONT	Y	17.42	87.73	19.16		0.06	1
an hore		Z	1.03	60,00	7.00		80.0	
104/07 AAE	LTE-TDD (SC-FDWA, 1 RB, 5 MHz, OPSK, UL Subframe=2,3,4,7,9,9)	8	100.00	124.87	32.33	3.23	90.0	± 9,8%
		Y	100.00	123.85	31.88	1	80.0	
-		Z	34.96	102.47	23.56	1	0.06	
TD40E- AAE	LTE-TOD (SC-FDMA, T HE 3 MHz 16- QAM, UL Subtrame-2,3,4,7,8,9)	x	100,00	109.58	26.38	3.23	80.0	1989
		Y.	108.00	109.05	25.07		80.0	-
		2	1.06	60.45	7.67		80.0	
10489 AAE	LTE-TOD (SC-FDMA, 1 RB, 5 MHz, 64- GAM, UL Subframo=2.3.4 7.8.9)	×	100.00	106.18	23.77	3.23	80.0	#98.9
_		Y	19.04	88.11	19.26	-	80.0	
	Lange and the second second	Z	1.03	60.00	7.00		80.D	
10470- AAE	LTE-TOD (SC-FDMA, 1 RB, 18 MHz DPSK, UL Subframe=2,3,4,7,8,9)	8	100.00	124.71	32.35	3.23	90.0	⇒9.6 %
		N.	100.00	123.98	31.88	-	80.0	-
THE PARTY		2	35.24	102.56	23.97		50.0	
10471- AAE	LTE-TDD (SC #DMA, 1 RB, 10 MHz, 16- QAM, UL Subtrame=2,3,4,7,9,9)	x	100.00	109.53	25.35	3,23	80.0	19.8%
_	11.01.01.01.01.01.01.01.01.01.01.01.01.0	Y	100.00	109.01	25.04		86.0	
	The second se	Z	1.05	60.40	7.64		80.0	
10472- AAE	LTE-TOD (SC FDMA, 1 RB, 10 MHz, 64- DAM, UL Subframe-2 3.4, 7 8,9)	*	100,00	106.13	23.74	3,73	80.0	土筑在特
-		4	17.90	00.88	19,24		80.0	_
10473	Lite The As have a second	Z	1.02	60.00	8.92		90.0	
10473 AAE	LTE-TDO (SC-FDMA, 1 RB, 15 MHz, GPSK, LL Subtramer(2,3,4,7,8,9)	x	100.00	124.67	32.34	3.23	86.0	:96%
_		Y.	100.00	123.95	31,87		80.0	-
0474	I TE THE ISS SHALL SHALL	Z	34.67	102:54	23:81		90,9	1
MAE	LTE-TDD (SC-FDMA, 1 RE: 15 MHz, 16- QAM, UL Subtrame=2.3,4,7,0,9)	x	100.00	103.54	25.35	3.23	80,0	+9.6%
		Y	100.00	109.01	25.04		80.0	1
0475	A THE DESIGN OF AN ADDRESS AS A SHOP OF A SHOP	Z	1,05	00.39	7.63		0,08	
AA2	LTE TOD (SC-FDMA, 1 RB; 15 MHz, 64- QAM, UL Subframe=2 3,4,7,8,9)	8	100.00	106,14	23,74	3,23	80.0	196%
_		W.	17.52	67.78	19.16		80.0	
		7	1.03	60.00	6,00		80.0	

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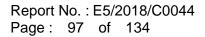
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0877-	LTE-TOD (SO-FDMA, 1 R6 20 MHz 10-	×.	100.00	109.37	25.27	3.22	80.0	± 9.6 %
UA.F.	GAM, UL Subtrame=2,3,4,7,8,9)	Y	100.00	1000.004	-			
_		2	1.00	*DE 84 80.28	24.96 7.55		80.0 80.0	
0478-	LTE-TOD (SC-FDMA URB 20 MHz 84-	X	100.00	108.28	23.72	1.22	80.0	+96%
WF	DAM, UL Subframe=2,3,47,8,9)					1.22		30,0 %
		Y.	17:03	67.46	19,06		H0.0	_
0.070	LAT THE OWN PROFESSION FOR A LADY	Z	1.03	80.00	92.9	11 and 1	BDD	1200
10479- VA	LTE-TOD (8C-FDMA 50% R8, 1.4 MHz DPSK, UL Subtranie=2,3,4,7,8,9)	7	32,47	108.40	30.35	.3.28	80.0	÷9.8 %
_	a dia ana ara ara ara ara ara ara ara ara ar	4	23.42	102.56	26.35		80.0	
	Treat store with Territory when the of Local	Ĩ.	8,33	85.84	29.97		BD.0	
10480- 4AA	175-TDD (SC-FDMA, 93% RB, 1.4 MHz, 18-GAM, UL Subframe=2,3,4,7,8,9)	x	42.90	105.02	27.50	3.25	80.0	2.9,8 %
		P.,	20,70	94.12	24.14		80.0	
	I success and the second secon	7	6.08	7674	17.00	1.1.1.1	80.0	10.00
- HEAGI	LTE-TOD (SC-FOMA 505) RB, 1.4 MHz, 04-QAM, UL Subframe#2,3,4,7,8,9)	8	32,63	100.01	25.80	3.23	80.0	10,6%
		4	15.67	39.36	22.38	_	80.0	
	a share the second second second second	Z	4.46	72.49	15.13		80.0	
10482- AA由	LTE-TOD (SC-FDMA, 50% RB, 5 MHz, OPSK, UL Subframe=2.3,4,7,6,9)	×	0.20.	87.35	23.04	2.23	\$0.0	10.6%
-		Y.	3.94	74.35	17.65		80.0	
	A CONTRACTOR OF A DECK	2	2.70	70.00	15.33	-	30.0	
10483- AAE	LTE-TOD (SC-FDMA, 50% R5, 3 MHz) 16-QAM, UL Subframe=2.3.4,7.5,9)	*	15.24	90,75	23,81	2.23	80.0	10.6%
		Y	9.75	83.78	21:08	-	80.0	
-		Z	3.87	71.04	15 18		80.0	
10484- AAE	LTE-TDD (SC-FDMA, 50% R9, 3 MH): 84-DAM, UL Subhame=2.3 4.7 (3.9)	x	12.87	88.08	23.00	2.23	80.0	e 0.6 %
PUPIE .	o-creation of subrand-crait (a)	N	844	81.59	20.85	-	80.0	-
		Z	3.68	70.14	14.84		30.0	
10185- AAE	LTE-TDD (SC-FDMA 50% RB 5 MHz OPSK, UL Subfame=2.3.4.7.8.9)	×	7.98	25.70	23.26	2.22	80.0	±9.6%
Phone:	san case one capating income and we have	V.	4.36	75.94	19.15		80.0	-
		2	3.22	72.55	17.26		BD.0	
10498-	LTE-TOD (SC-FOMA, 50% RB, 5 MHz	2	5.38	76.17	19.55	2.23	BD.D	198%
AAE	15-GAM, UL Subiraner 2,3,4,7,8,8)	N		70.74	16.72	EE-M	EO.O	
_			3.78			-		
10133	The second as beauty have not beauty	1	3.08	ES.57	15.26	10.000	80.0 80.0	10.0.0
10407- AAE	LTE-TOD (SC-FDMA, 50% RB, 5 MHz. 64-DAM, UL Subtrame=2,1,4 7,6,9)	×	5.22	75.40	19.25	2.23	1.5.5	± 9:0 %
		Y	TTE	70.31	16.54	-	80.0	-
10107	the second data which is the second	12	3.08	68.23	15.40	1007	60.0	1070
10488- AAE	LTE-TOD (SC-FDIMA, 50% RB, 10 MHz, GPSK, UL Sobhame=2:3.4,7.6,91	x	6,58	81.08	22.14	2.23	60.0	±0.6%
		Υ.	4.43	74.73	19.31	-	BOUL	
		Z	2.08	72.12	17:94		80.0	
10489- AAE	LTE-TDD (SC-FDMA, 50% RE, 10 MHz 16-QAM, UL Sobhame=2.3.4,7.6.0)	x	68.1	73.47	19,42	2.23	90,0	±9.6%
	the start is seen and the start of the	Y	4.01	70.32	17,71	(	80.0	1
	and the second s	2	3.48	08.92	16.70		90.0	
10430- AAE	LTE-TDO (SC-FDMA, 50% RB, 10 MHz 64-QAM, UL Skbirame=2.3,4,7,8,8)	×	4.90	72.95	19.23	2.2.5	0.08	+5.8 %
		Y	4.10	70.09	17.64		0.08	-
		-Z	3.07	68.77	16.66	1	60.0	
10491- AAE	LTE-TOD (SC-FDMA, 50% FB, 15 MHz, QPSK, UL Subhamer 2.3.4.7.8.9)	×	5.95	76.95	20.70	2.25	60.0	±9.6 %
		Y.	4,52	72.00	18.69		80.0	
	A COMPANY OF THE OWNER AND A COMPANY	Z	0.02	70.84	17.60	1.1	80.0	
10482- AAE	LTE-TDD (BC-FDMA, 50% RE, 15 MHz, 10-DAM, UL Sabhame-2,3,4,7,8,9)	X	4.04	71.68	18.90	2.23	80,0	18,61
	to be be see Shering the second wild	Y	4.21	09.40	17.83		0.05	
		1 Z	1.83	68.32	18.75	-	50.0	

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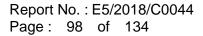
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10493-	LTE-TOD (SC-FDMA SUS RE 15 MHz	X	4.97	71.38	18.79	2.23	80.0	1 2985
AAE	84-QAM, LL Subframe=2.3,4,T,8,9)				1.000			2009
_		X	4.37	89.24	47.58	1	80,0	
an and	I TE THE OUT PRICE AND AND AND	Z	3.90	68.20	16.76		80.0	1.000
10494- AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, DPSK, UL Subhame=2,3,4,7,8,9)	×	6.95	79.86	21.50	2.23	80,0	196
		Y	4.99	74.37	19,18		80.0	
10495	A REAL PROPERTY AND A REAL PROPERTY AND AND AND A REAL	Z	4.13	72.26	18.02		80.0	-
AAF	LTE-TDD (SC-FDMA: 50% RB; 20 Metz. 16-QAM, UL Subframe=2:8.4,7,8,9)	×	6.07	72,39	18.10	2.23	0.08	±969
		Y	4.37	89.87	17-84	_	80.0	
10496-	LTE-TOD (SC-FDMA, 50% RB; 20 MHz,	Z	3.87	88.70	16.98		80.0	-
AAF	64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.07	71.80	18,98	2.23	30.0	±969
-		Y	4,43	69.53	17.74	_	80.0	-
10497-	LTE-TOD (SC-FDMA, 100%, RB, 1.4	X	3.96	68.45	16.92	2.00	80.0	
AAA	MHz, OPSK, UL Subframe=2.3,4,7,9,9		1 77	64.28	21.25	2.23	80.0	1968
		Y	2.76	69.51	14.83	-	80.0	_
10498-	LT5-TDD (SC-FDMA, 100% RB, 1.4	Z	1.83	65.26	12.27	2.40	80.0	
AAA	MHz, 16-QAM (JL Subframo=2,3,4,7,8,9)	1	-9.50	15.22	15.94	2.23	80.0	186%
		Y	2.08	63.53	11.20		80.0	-
	and the second sec	Z	1.49	60.84	9.11		80.0	-
10499 AAA	ITE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, LT, S. foltemer-2,3,4,7,6,9)	×	3.88	73,30	15.38	2,23	80.0	196%
		W.	2.02	62.98	10.80	-	0.08	-
-	CONTRACTOR OF ALL AND A	2	1.45	60,40	8,75	-	BD D	
-00801 AAB	LTE-TDD (SC FDMA: 100% RB, 3 MHz, QPBK, UL Subframer2 3,4,7,8,9)	x	6.85	\$2.59	Z2.44	2.23	0.08	+8.6%
_		<u>8</u>	4.30	75.01	19.09		0.06	-
10001-		Z	3 32	71.99	17.46		80.0	1.
10001- AAB	LTE-TOD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, LL Subfraime=2,3,4,7,8,9)	8	5.08	74.80	19.39	2.23	0.08	± 9.6 %
_		Y	3,90	70.59	17.11	-	88.0	
10502-	LU IDDIGO POLIS ISSO DE PARI	Z	3.27	68.63	15.87		0.08	
NAB	L16-TDD (SC-FDMA, 100% RB, 3 MHz. 84-GAM, UL Soptrama=2,3,4,7,8,9)	8	5,08	74.42	18,19	2.23	80.0	±9,6 %
		Ŷ	3.94	70.38	16.98		80,0	
10503-	LTE-TOD (SC-FDMA, 100% RB 5 MHz	Z	3.32	56.58	15.78		80.0	1000
ME	QPSK, UL Subframe=2.3.4,7,8,9)	X	5.47	80.7E	22.03	2.23	80.0	± 9.8 %
		Y Z	VI.42	74,51	15.24	-	50.0	
10604-	LTE-TED (SC-FDMA, 100% RE 5 MHz	X	3,53	71.90	17.84	-	80,0	-
AAE	15-QAM, UL Subimme=2.3.4.7.8.9	× ×	3.50	73.36	19.37	2.23	30,0	±9.6%
		Z	3.46	70.22	17.65	_	60.0	-
10505- AAE	LTE-TOD (SC FDMA, 100% RB, 5 MHz, 84-GAVA, UL Subiramer 2, 3, 4, 7, 8, 9)	X	4.85	68.82 72.84	10.64 19.17	2.23	80.0 80.0	± 8.6 %
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Y I	4.07	69.98	17.58		80.0	
		2	3.65	68.67	16.80	-	80.0	-
10506 MAE	LTE-TDO (SC-FDMA, 100% R8, 10 MHz, OPSK, UL Su/Visitier 2,3,4,7,8,5)	x	6.87	79.65	21.49	2,23	80.0	1984
		Y	0.94	74.20	19.10	-	80.0	
	Lan	Z	4.10	72.10	17.94		80.0	-
10507- AAE	LTE TOD (SC-FDMA, 100% RB, 10. MHZ, 16-QAM, UL Subframe=2.3.4 7,6,9)	×	5,05	72.32	19.14	223	80.0	1.8,6 %
		Y	4.35	68.81	17.80		60.0	
		Z	3.05	68.63	16.94		80.0	

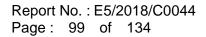
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#### EX3DV4-- SN:3938

#### October 24, 2018

10508- AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subtrame=2,3,4,7,8,9)	x	5.05	71.72	18.93	2.23	80.0	± 9.6 %
		Y.	4.41	69.46	17.70		80.0	
-00000	A second second a second second second second second	Z	3.93	68.38	16.87	0.416404	80.0	131313700
10609- VAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	×	6.42	76.31	20.23	2.23	80.0	±9.6 %
-		Y	5.10	72.45	18.45		80.0	
		Z	4,44	71.04	17.56		80.0	
10510- VAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	×	5.41	71.43	18.82	2.23	80.0	±9.6 %
	12	Y.	4.81	69.39	17.73		80.0	
	and the second se	Z	4.34	68.44	16.99	CHANK!	80.0	Same
10511- NAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	×	5.40	70.96	18.67	2.23	80.0	± 9.6 %
		Y	4.84	69.09	17.65		80.0	
		Z	4.39	68.21	16.94		80.0	
10512- AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	x	7,47	79.47	21.24	2.23	80.0	± 9.6 %
		Y	5.46	74.25	18.99		80.0	
		Z	4.64	72.47	17.97		0.06	
10513- AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	x	5.39	72.08	19.07	2.23	80,0	±9.6 %
		Y	4.72	69.76	17.86		80.0	
3024357-	PROPERTY AND A DAMAGE AND AND A DAMAGE AND A DAMAGE AND A DAMAGE AND A DAMAGE AND AND A DAMAGE AND	Z	4.23	68.69	17.07		80.0	incluse.
10514- AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	x	5 30	71.34	18.83	2.23	80.0	19.6 %
		Y.	4.71	69.27	17.73		80.0	
		Z	4.25	68.30	16.97		80.08	
10515- AAA	IEEE 802.11b WIFI 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.99	64.18	15.67	0.00	150.0	± 9.6 %
102262		Y	0.87	62.03	13.65		150.0	
00000	States of the state of the stat	Z	0.96	64.13	15.35	-cond	150.0	10500005
10516- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	×	1.07	82.62	23.29	0.00	150.0	± 9.6 %
		Y	0.42	66.18	13.67		150.0	
		Z	0.79	78.03	21.08		150.0	
10517- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	×	0.89	67.34	17.01	0.00	150.0	± 9.6 %
		Y	0.70	63,35	13.75		150.0	-
		Z	0.83	66.82	16.43		150.0	1.0.0.0
10518- AAB	IEEE 802.11a/h WIFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	×	4.64	66.90	16.38	0.00	150.0	± 9.6 %
		Y	4,47	67.04	15.94	-	150.0	-
10519- AAB	IEEE 802.11a/h WIFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.47	67.18	16.24	0.00	150.0	±9.6 %
AAD	weeks, sale only cyclut	Y	4.67	66.59	16.08		150.0	
		L	4.65	67.25	16.34		150.0	
10520-	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18	X	4.71	67.17	16.45	0.00	150.0	±9.6 %
AAB	Mbps, 99pc duty cycle)	Ŷ	4.52	66.54	15.99		150.0	
		Z	4.51	67.23	16.28		150.0	
10521- AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.64	67.19	16.44	0.00	150.0	± 9.6 %
		Y	4.45	66.53	15.97		150.0	
		Z	4.44	67.24	16.27		150.0	1.1.1.1.1.1.1
10522- AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	×	4.69	67.17	16.48	0.00	150.0	± 9.6 %
		Y	4.51	66.60	16.04		150.0	
		Z	4.50	67.33	16.35		150.0	

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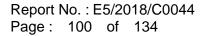
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10523-	IEEE 802 11am WiFi 5 GHz (OFDM, 48	X	4.56	67.08	16.34	0.00	150.0	1 18.6%
AAB	Mbps, 98pc duty cycle)	8	4.28					
			4.39	66.45	15.88	-	150.0	_
10524-	IEEE 802 11am WAR 5 GHz (OFDM, 54	2		67.23	16.22		150.0	
AAE	Mbps, Bloc duty cycle)	8	4.64	67.13	16.48	0.00	150.0	+9.6 %
_		Y	4.45	66.57	16.01		150.0	1.00
10525-	JEEE 802, 11ac WiFi (20MHz, MCSO)	2 8	4.44	67.24	16.32	2.62	150.0	
AAE	Webc auty pysial	8	4.60	06.17	16.06	0.00	150.0	± 9,6 %
_			4.43	65.55	15.60		160.0	_
10526-	IEEE 802.11an WIFI (20MHz, MCS1,	Z	4.64	86.33	15.94		150.0	-
AAH	Solic thity syste)	X	4.80	06.57	16.20	0.00	150.0	396.2
		Y.	19.1	85.93	15.75		150.0	
10527-	IEEE 802.11ac WFr (20MHz, MCS2,	Z	4.61	66,68	16.07		150.0	hinds.
AAE	Sabe and Article a	X	4.72	66.55	16.16	0.00	150,0	3985
_		Ŷ	4.52	65.88	15,69		150.0	
10528-	ALL SOLAR AND WALL LAND	2:	4.53	96.66	16.02		1.50.0	
185.28- AAE	(FEE 802.11ac WIF (20MHz, MCS3, 99pc duty cycle)	×	4.73	66,57	16,19	CL.00	150.0	I B.B.S
		Y	4 54	B5.90	16.72		150,0	-
- HARDO	THE AND ADDITION TO BE ADDITION.	2	4.55	88.87	16.05		150.0	1.000
10529- AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99bc dudy cycle).	X	4.73	66.57	16.19	0.00	150.0	± 9,6 %
_		X	4.54	05/90	15.72	-	150.0	-
		2	4.55	66.67	16.05	100 C	150.0	1
10631- AAB	(EEE 802 11ac W/FI (20MHz, MCS6, 90pc duty c)icle)	×	4.74	66.72	16,22	0,00	150.0	19.6%
_		Y.	4.53	68.01	15.73		150.0	
_		Z	4.53	66.77	18.00		150.0	
10532+ AAB	IEEE 802.11ac WIFI (20MHz, MCS7, 99pc duty tryole)	×	# 60	66.59	16.17	0.00	156.0	196%
_		Y	4.39	65.86	15.88		150.0	-
_	- And	Z	4.40	66.64	16.01		150.0	
AAB	(EEE 802,11ac WF) (20MHz, MCS8) 98pc duty cycla)	×	4.75	66,60	16.17	0.00	150.0	±9.6 %
		Y	4.55	65.94	15.70		150.0	
_	and the second sec	2	4.56	66.73	18.05		150.0	
0634 AAB	IEEE 802 11ac WIFI (40MHz, MOS0, 99bc duty cycle)	×	5.24	66.67	16.21	0.00	150.0	19.6%
-		Y	5,08	66.08	15.82		150 0	
		Z	5,06	66.70	16.06		150.0	
10535- VAE	IEEE 802 11ac WiFr (40MHz, MCS1, 99pc duty cycle)	x	5.31	06.61	18.26	0.00	150.0	± 9,8 %
		Y	5.14	66.24	15:89		150.0	-
-	A REAL STATISTICS	Z	5.12	86.85	16.13	1000	150.0	
0536- VAB	IEEE 302.11ec WF/ (40MHz, MCS2, 99pt chily cycle)	×	5.13	66.81	16.25	0.00	150.0	19,8%
	1	Y	5,01	86.19	15.84	-	150.0	-
and and		2	0.00	66.34	16.11		130.0	1
0637 AB	IEEE 802 1 fac WiFI (40MHz, MCS3, 99pc duty cycle)	x	5.24	68.77	16.23	0.00	150.0	主動管機
-		Y	5.07	66.17	15.84		150.0	-
A Real	Terms (add a company)	Z.	5.06	66.79	16.08		150.0	-
0538- AB	IEEE 002.11ac WIFI (40MHz, MCS4) B9pc duty cycle)	×	8.35	66.82	16.29	0,00	150.0	±9.6%
_		Y	5.17	86.21	15.90		150.0	
		2	8.14	66.79	16.12		150.0	
0540 AE	IEEE S02 11ac WIFI (40MH); MCSB. 99pc duty cycle)	x	5.25	56,76	15.29	0.00	150.0	±9.6 %
		Y	5.09	66.21	15.91		150.0	
		Z	5.07	66.78	16.13		150.0	-

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10541-	IEEE 802.11ec WIFi (40MHz, MCS7	TXI	5.24	66.69	16.24	0.00	150.0	* S. R 54
AAB	99ps duty cycle)	Y	5.05	66.08	15.84	1.11	150.0	1000
-		Z	5.05	66.69	16.08		150.0	
10542-	IEEE 802.11ac.WFI (40MHz, MCS8.	X	5.30	66.72	16.08	0.00	150.0	±9.8%
AAB	99pc duty cycle]	1.1	0.00	00.12	19.21	0,00	100.0	3-3/8-20
		Y.	5.22	86.16	15.50		150.0	
		Z	5.20	66.74	16:12	-	150.0	
10543- AAB	IEEE 802.11ac WIFI (40MHz, MCS9 88pc duty cycle)	x	5.47	66.74	16.29	0.00	150.0	±9.6 %
		Y	5.30	66.21	15.95		150.0	
	and the second sec	Z	5.27	66.76	16.14		150.0	
10544- AA日	IEEE 802.11ec WIFI (80MHz: MCS0, 98pc duty cycle)	X	5.52	66,77	16.19	0.00	150.0	1.8,6 %
		Y	5.38	56.20	15.82	_	150.0	
LOB (P	Landard Barrier and Constant and the Constant	Z	5.37	66.80	16.04		150.0	
10545- AAB	IEEE 802.11ac WiFi (80MHz, MCS1 99pc duty cycle)	X	5.72	67.14	16,31	0.00	150.0	主要度強
		Y	5.58	66.63	15.99		150,0	
		Z	5.53	67.12	16.15		150.0	
10546- AAB	IEEE 802.11ec WiFi (80MHz, MC62, 99pc duty syste)	×	5.61	67,04	16.28	0.00	150/0	±9.8%
		Y	5.45	66.44	15.91		150/0	
		Z	5,43	66.99	16.10	-	150,0	
10547- AAB	IEEE 802.11ac WiFi (80MHz, MCB3, 99pc duty cycle)	x	5.70	67.12	16,31	0.00	150.0	± 9.6 %
		Y	5.53	66.49	15.92		150,0	-
	and the state of t	Z	5.50	67/02	16.11		150.0	
10548- AAB	EEE 802 11ac WiFi (89MHz, MDS4, 98pc duty cycle)	×	5.93	67.90	16.70	0.00	150.0	£9.6 %
		Y	5.82	87.53	16.41		150.0	-
		2	5.64	67.E3	46.39		150.0	
10550- AAB	IEEE 802 11ac WIFI (BDMHz, MCB6, 99pc duty cycle)	x	5.63	67.00	16.27	0,00	150.0	± 9.6 %
	the second se	· 9	5.47	66.43	15.91		150.0	
	and the second second second second	2	5,45	67.00	16.12		150.0	
10551- AAB	IEEE 802,11ar: WIFI (80MHz, MCS7, 99pc duty cycle)	×	5,65	67.07	18.26	0,00	150.0	± 9.6 %
	and the second s	1.8	5.48	65.48	15.89		150.0	
		Z	5.46	67.04	18.10		150.0	
10552- AAB	IEEE 802 11ac WIFI (80MHz, MCS8 99pc duty cycle)	x	9.50	66.66	18.18	0.00	150.0	19.8%
		Y.	5,39	66.26	15.80		150,0	
		Z	5.39	65.89	16.04	-	150.0	
10553- AAB	IEEE 802 T1ac WIFI (80MHz, MCS9, 99pc duty cycle)	×	5.05	66.91	16.22	0.00	150,0	± 9.6 %
_		Y	5,48	58.32	15.86		150.0	
	the second	2	5.47	66.91	16.07	20.0	150.0	
10554- AAC	IEEE 802 11ac WIFI (100MHz, MCS0, 99bc duly cycle)	×	5.92	67.13	18.27	0.00	150.0	±9.6%
		Z	6.78 5.77	68.58	15.93		150,0	-
10555-	IEEE 802 11ac WIFI (100MHz, MCS1,	x	8.06	67,44	16.11	0.00	150.0	+ 9.6 %
AAC AAC	99pc duty uyde)	12.24	245	88 89	16.06	0.40	150.0	TRUM
_		7	5.92		18.06		150.0	-
10056-	IEEE 502.11ac WIFI (160MHz, MCS2	X	5,88 6,07	67.38 67.47	16.40	0.00	150.0	10,6.%
AAC	99pc duty cycle)	Y	5.94	66.94	16.07	-	150.D	-
		Z	5.90	67.42	16.23		150.0	
10557-	IEEE 502.11ac WFT (180MHz, MCS3.	X	5.06	67.43	16.40	0.00	150.0	29.6%
AAC.	88pc duly cycle)	Ŷ	5.91	66.85	16.05	8.662	150.0	- 20.0

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0058	LEEP BIZ 11ac WiFi (180MHz, MCS4,	X	6.11	67.60	16.50	-0.00	1 150.0	1 19.6 %
AAC	99pc duty cycle)	1	1.00			2140		1.2.0 3
		Y	5.96	67.02	16.15	-	150.0	
These .	THE REAL PROPERTY AND AND ADDRESS	2	5.91	67.50	16.30	1.00	150,0	
10560- AAC	IEEE 802.11ad WIFT (160MHz. MCS8, 990crduly cycle)	×	E.97	67.48	16,47	0.00	150.0	± 9.6 %
_		Ŷ	5.95	66.87	18,11		150.0	
10561		1	5.92	67.38	16.28		150.0	
AAC	IEEE 802.11ad WIFI (160MHz MCS7, \$600 000 ggde)	×	8.02	67.40	16:48	0.00	150.0	±9.6 %
_		8	5.87	EE BA	16:13		160.0	-
10562-	IEEE 802.11sc WIFT (100MHz, MCSB)	Z	5.84	67.33	15.29	-	150.0	
AAS	99pc.duty.cycle)	Х	6.16	67.82	16.69	0.00	150.0	2905
-		× .	6.01	67.26	16.35		150.0	-
10563-	IEEE 802.11ac WiFi (160MHz, MCS9)	2	5.03	67.63	*6.44	-	150.0	
ANC:	Bépic duty ayole)	*	9,47	68,29	16,80	0.00	150.0	±9.8 %
_		Y	6.34	67.8Z	15.58	-	150.0	
10551	IF THE MORE AND A DOTE IN A POLL OF COME	2	6.09	87.70	16.43	in the second	150.0	
1056a- AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS- DFDM, 9 Mbps, 98pc duty cycle)	×	4.97	68.98	16.53	0,46	150.0	E 3.6 %
		Y	4.81	68.45	15.14		150.0	
10985-	HERE'S AND AND AND ADDRESS OF A REAL OF A REAL	2	4.78	67.02	<b>16.32</b>		150.0	
AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS- OFDM: 12 Moos: 39pc duty cycle)	8	5,23	87.46	16.85	0.46	150.0	1965
_		Y	5,05	86.93	16.47	-	150.0	
10566-	Tokan Ann 11 Tokan Print man 1	2	5.01	67.49	16.65		150.0	1
AAA	DEBE 802.11g WiFi 2.4 GHz (DSBS- OFDM, 18 Mbps, 29pc & (y cycle)	×	5.00	67.34	16 69	0.46	150,0	19.6%
		Ý	4.88	96.77	16.28		150.0	1
		Z	4,84	87.32	16.46		150.0	
10567 AAA	GEEE 802 11g WF/ 2.4 GHz (DSSS- OFDM, 24 Mbps, 59pc duty cycle)	×	90.0	67.74	17.04	0.46	150.0	19.6%
		- P.	4,91	87.15	16.63		150.0	
10568-	WERE AND ADDRESS OF AD	X	4.85	87.80	16:87	1.00	150.0	
AAA	IEEE 802 11g WIFi 2.4 GHz (DSSS- OFOM, 38 Mbps, 99pc duly cycle)	1.00	4.97)	67 07	16,45	0.46	150.0	19.6 %
		Y	4.80	68.54	16.05		150.0	
4115.000	THE REPORT OF THE PARTY OF THE	Z	4,74	67.63	10.19	1	150.0	
10589+ AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- DFDM 48 Mbps: 39pc daty cycle)	8	5.03	67.78	17.08	0.46	150,0	± 9,8 %
		Y	4.86	67.22	18.68	-	150,0	-
10570-	Intraduct and a second second	2	4.85	67.93	10.95	1000	150,0	
AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS- OFDM, 54 Mbp)/, 30ps duty cyclej	x	5.08	#7 62	17,01	0.46	150.0	1965
_		Ŷ	4.90	67.08	16.62		150,0	1
10571-	more than 4 as the ready of the second	2	4,88	67.73	16.86		150.0	1.000
AAA	IEEE 802,11b WIFI 2:4 GHz (DS85, 1 Mbps: 90po duty cycle)	×	1.32	65.77	17 12	0.46	130,0	± 0.8 %
		Y	1.14	64.23	15.06	_	130.0	
0572-	IFEE 002 HAL MOTO & A PRIVATE STATE	5	1,17	05:20	15.80		130.0	
10572- AAA	IEEE 802,115 VIIE 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	x	1,36	67.80	17.59	D,46	130.0	± 9.8 %
		Y	1.16	64.80	15.38		120.0	
10573	ATTENDED AND AND AND A MALE INCOME.	T	1.19	65.98	18.20	1.	130.0	1
AAA	IEEE 802,11b WIFI 2,4 GHz (DSSS, 5,5 / Mops, 90pc duty cycle)	×	100,00	100.25	40,35	0.46	130.0	±0.6 %
		Y	1.94	61,80	20.21		138.0	2
11574	REFERENCE AND	Z	5.37	101.40	27.76		130.0	
W4	lette 802,110 WiFi 2.4 GHz (DSSS, 11 Mitos: 90pp duty cycle)	x	1.88	77.53	22:17	0,46	130/0	+ 9.6 %
_		Ŷ	1,28	70.31	17.98	1.0	130.0	-
		Z	1,45	73.83	20.12		130.0	

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10576- AAA 10577- AAA 10578- AAA 10579- AAA 10580- AAA 10581- AAA 10581- AAA	OFDM, 6 Mbps, 90pc duty cycle) IEEE 802,11g WFI 2.4 GHz (DSSS- OFDM, 9 Mbps, 90pc duty cycle) IEEE 802,11g WFI 2.4 GHz (DSSS- OFDM, 12 Mbps, 90pc duty cycle) IEEE 802,11g WFI 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle) IEEE 802,11g WFI 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802,11g WFI 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle) IEEE 802,11g WFI 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle) IEEE 802,11g WFI 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X X Y Z X X Y Z X X Y Z X X Y Z X X Y Z X X X Y Z X X X Y Z X X X X	4.52 4.56 4.60 4.64 4.59 5.03 4.65 4.78 4.93 4.75 4.69 4.59 4.59 4.59 4.59 4.59	66.32 66.75 66.99 66.47 66.94 67.31 66.78 67.21 67.50 66.94 67.42 66.84	16.23 16.29 16.69 16.29 16.38 16.86 16.47 16.54 16.54 16.57 16.68 16.57	0.46 0.46 0.46	130.0 130.0 130.0 130.0 130.0 130.0 130.0 130.0 130.0 130.0 130.0	±9.6% ±9.6%
10577- 10578- 10578- 10578- 10578- 10578- 10580- 10580- 10581- 10581- 10582-	OFDM, 9 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 12 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	X Y Z X Y Z X Y Z X Y Z X Y Z	4.80 4.64 4.59 5.03 4.85 4.78 4.93 4.75 4.69 4.69 4.69 4.69	66.99 66.47 66.94 67.31 67.21 67.50 66.94 67.42 66.84	16.89 16.29 16.38 16.86 16.47 16.54 16.98 16.57 16.68	0.46	130.0 130.0 130.0 130.0 130.0 130.0 130.0 130.0 130.0	± 9.6 %
0578- 0578- 0578- 0578- 0578- 0579- 00580- 00580- 00580- 00581- 0058	OFDM, 9 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 12 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Y Z X Y Z X Y Z X Y Z X Y Z X Y Z	4.64 4.59 5.03 4.65 4.78 4.93 4.75 4.69 4.69 4.69 4.52	66.47 66.94 67.31 66.78 67.21 67.50 66.54 67.42 68.84	15.29 16.38 16.86 16.47 16.54 16.98 16.57 16.68	0.46	130.0 130.0 130.0 130.0 130.0 130.0 130.0	± 9.6 %
0578- 0578- 0579- 00580- 00580- 00581- 00581- 00581- 00582-	OFDM, 12 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Z X Y Z X Y Z X Y Z	4.59 5.03 4.85 4.78 4.93 4.75 4.69 4.69 4.52	66.94 67.31 66.78 67.21 67.50 66.94 67.42 66.84	16.38 16.86 16.47 16.54 16.96 16.57 16.68		130.0 130.0 130.0 130.0 130.0	
0578- 0578- 0579- 00580- 00580- 00581- 00581- 00581- 00582-	OFDM, 12 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	X Y Z X Y Z X Y Z	5.03 4.85 4.78 4.93 4.93 4.75 4.69 4.69 4.69	67.31 66.78 67.21 67.50 66.94 67.42 66.84	16.86 16.47 16.54 16.96 16.57 16.68		130.0 130.0 130.0 130.0	
10578- 10579- 10580- 10580- 10581- 10581- 10582-	OFDM, 12 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Y Z X Y Z X Y Z	4.85 4.78 4.93 4.75 4.69 4.69 4.69	66.78 67.21 67.50 66.94 67.42 66.84	16.47 16.54 16.96 16.57 16.68		130.0 130.0 130.0	
10579- VAA 10580- VAA 10581- VAA 10582-	DFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Z X Y Z X Y Z	4.78 4.93 4.75 4.69 4.69 4.52	67.21 67.50 66.94 67.42 66.84	16.54 16.96 16.57 16.68	0.46	130.0 130.0	±9.6 %
10579- VAA 10580- VAA 10581- VAA 10582-	DFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	X Y Z X Y Z	4.93 4.75 4.69 4.69 4.52	67.50 66.94 67.42 66.84	16.98 16.57 16.68	0.46	130.0	± 9.6 %
0579- 04 0580- 04 0581- 04 0581- 04 0582-	DFDM, 18 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Y Z X Y Z	4.75 4.69 4.69 4.52	66.94 67.42 66.84	16.57 16.68	0.46	2868-	±9.6%
10580- AAA 10581- AAA	OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHtz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Z X Y Z	4.69 4.69 4.52	67.42 66.84	16.68		130.0	
10580- AAA 10581- AAA 10582-	OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHtz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	X Y Z	4.69 4.52	66.84				
10580- AAA 10581- AAA 10582-	OFDM, 24 Mbps, 90pc duty cycle) IEEE 802.11g WiFi 2.4 GHtz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Y Z	4.52	C 0000.0	40.00		130.0	
10581- 10582-	OFDM, 36 Mbps, 90pc duty cycla)	Z			16.33	0.46	130.0	±9.6 %
10581- 10582-	OFDM, 36 Mbps, 90pc duty cycla)		4.43	66.24	15.89		130.0	
10581- AAA 10682-	OFDM, 36 Mbps, 90pc duty cycla)			66.57	15.89		130.0	
10581- AAA 10682-			4.74	66.81	16.32	0.46	130.0	± 9.6 %
10582-	IEEE 802.11g WFi 2.4 GHz (DSSS-	Y	4.57	66.26	15.90		130.0	
10582-	IEEE 802.11g WFi 2.4 GHz (DSSS-	Z	4.47	66.59	15.90		130.0	1710-171
10582-	OFDM, 48 Mbps, 90pc duty cycla)	X	4.83	67.59	16.95	0.46	130.0	±9.6 %
	and the second second second	Y	4.65	66.98	18.51	-	130.0	
		Z	4.59	67.47	16.62	-	130.0	
AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 54 Mbps, 90pc duty cycle)	X	4.64	66.58	16.12	0.46	130.0	±9.6 %
		Y	4.47	66.00	15.67		130.0	
		Z	4.36	66.28	15.65		130.0	
10583- AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	×	4.77	66.82	16.63	0.46	130.0	±9.6 %
		Y	4.62	66.32	16.23		130.0	
		Z	4.56	66.75	16.29		130.0	
10584- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.80	66.99	16.69	0.46	130.0	± 9.6 %
	and start and start and start	Y.	4.64	66.47	16.29		130.0	
		Z	4.59	65.94	16.38		130.0	
10585- AAB	IEEE 802.11a/h WIFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	x	5.03	67.31	16.86	0.46	130.0	± 9.6 %
	Company of the second second	Y	4.85	66.78	16.47		130.0	
	Received and the second second second	Z	4.78	67.21	16.54	and the second	130.0	1.12-1.202
10586- AAB	IEEE 802.11a/h W/Fi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	×	4.93	67.50	16.98	0.46	130.0	± 9.6 %
		Y	4.75	66.94	16.57		130.0	
		Z	4.69	67.42	16.68		130.0	
10587- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.69	66.84	16.33	0.46	130.0	± 9.6 %
		Y	4.52	66.24	15.89		130.0	
		Z	4.43	66.57	15.89		130.0	0
10588- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.74	66.81	16.32	0.46	130.0	± 9.6 %
		Y	4.57	66.26	15.90		130.0	1
1.1.1.1	The second second second second second	Z	4.47	66.59	15,90		130.0	
10589- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	×	4.83	67.59	16.95	0.46	130.0	± 9.6 %
and a Property of the local data		Y	4.65	66.98	16.51		130.0	1.1
		Z	4.59	67.47	16.62		130.0	1
10590- AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.64	66.58	16.12	0.46	130.0	±9.6%
	transfer and aparel	Y	4.47	66.00	15,67		130.0	
		Z	4.36	66.28				

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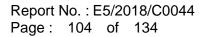
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10591- AAB	IEEE 802.11/v (HT Moved, 20MHz MCSD, 90xx duity cycle)	×	4,02	66.87	16.71	0.46	130.0	18.6 %
	weeks and weeks weeks	4	4.77	E6.38	16:34		130.0	-
		Z	4,71	106.82	16.40	-	130.0	-
10592- AAB	IEEE 802.11h (HT Mixed, 20MHz, MC31, 90pt duty dycle)	8	5.09	67.22	16.84	0.46	130.0	19.6 %
		· 9·	4.98	6672	16.47	-	130.0	
		2	4.86	87.13	16.53	-	130.0	-
10583- AAE	IEEE 802-11n (HT Mixed, 20MRz, MGS2, 90pc duty cycle)	×	5,02	67.17	16.74	11.46	130.0	2.9.6%
		Y	4.85	88.64	18.36	-	130.0	-
		2	4.77	87.04	16.40		130.0	-
10594- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)		5.07	67.32	16.89	0.46	130.0	19.6%
_		Y	4.90	66.80	16,51		130,0	
A HERE A		- 2	4.83	67.23	16.57	100,000	130.0	100
10685- AAB	IEEE 802.11n (HT Mosel, 20MHz, MCS4, 90pc duty cycle)	×	5,05	67.29	16.79	0.46	130.0	196%
_		Y	4.87	06.75	16.40	· · · · · ·	130.0	-
10596-	IDEC DODAL - DITAL -C. MET	2	4.80	67.17	16.45		130.0	Same
AAB	IEEE B02:11+: (HT Model; 20MHz MCS5, 90pc duty cyste)	×	4,58	67.29	16.80	0.46	130.0	± 9.6 %
_		Y	4.81	86.75	16,40		130.0	
10597-	IEEE 802 11n (HT Mixed, SDMI-52	Z	4.73	57.16	16.45		130.0	
AAB	MC86, 90pc duly cycle)	×	4.94	67.23	16,70	0.46	130.0	196%
		Y.	4.76	65.66	16.29		130.0	
10598-	IEEE S02.11n (HT Mixed, 20Mile)	2	4.68	67.05	15.33		130.0	
AAB	MCS7, 90pc duty cycle)	*	4.82	67.49	18.98	0.46	130.0	196%
		4	4.74	86,90	18.65	1	130.0	
10599-	IEEE 802.11n IHT Mixed 40MHz.	1	4.68	67,34	16.63	-	190,0	
AAB	MOSO, ROpe duty cycle)	×	5.58	87.43	16,88	0.46	130.0	±9.6%
		Ŷ	5.44	56.96	16.56		130.0	
10600-	IEEE 802.11n (HT Mixed, 40MHz	Z X	5.34	67.25	16.55	-	1.30,0	
AAB	MDS1, 90pc duly cycle)		5.74	67.88	17.07	0.46	139,0	±9.6%
		X	5,60	57.47	16.79	-	130.0	1
10621	IEEE 802.11n (HT Mixed, 40MHz)	2	5.43	67.51	16.64		130.0	1.000
AAB	MCS2, 90pc duty syde)	- *	5,87	67.61	16.95	0.46	130.0	±9,8%
		2	5,48	67.17	16.66	-	130.0	
10602- AAB	IEEE 802.11n (HT Mixed, 40MHz, MDS3, 90pc duty pycle)	X	5,35	67.37 67.56	15,60 +6.86	0.46	130.0 130.0	+9.6%
		Y	5.58	67.17	18.58		130.0	
		Z	5.45	67.40	16.52		130.0	
10603- AAB	EEE 802.11n (HT Mixed: 40MHz MCS4, 90pc duty cycle)	X	5.80	67.83	17.16	0.46	130.0	± 9,6 %
		Y	5,65	67.48	16.87		130.0	
A REAL PROPERTY.		2	1.62	67.69	10.01		130.0	-
10604- AAB	(EEE 902.11n (HT Mixed, 30MHz, MCSS, 93pc duty cycla)	.8	5.58	67.37	36,87	0.46	130.0	±96%
		Y	5.44	86.52	16.57		130.0	-
(Adda	Internet which was in the second second	2	5.37	67.27	16.58		130.0	
10005- AAB	HEEE 302 11n (HT Mixed, 40MHz, MCSB, 90pc duty cycle)	8	6.68	67.64	17.00	0.46	130.0	+9.6%
		Y	5,56	67,28	16.75	_	130.0	-
(BCOD)	Inter add 14, contact in the	Z	5.48	\$7.44	16.68		130.0	
10606- AAB	IEEE BOZ 11n (HT Moved, 40MHz, MCS7, 90pc duty cycle)	×	5,46	57.15	16,84	0.48	150,0	± 9.6 %
_		Y	5.33	66.89	16.32	_	150.0	
		Z	5.20	88.87	16.23	_		-

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October 24, 2018

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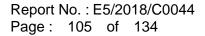
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10517- 4,45	TEEE 902 T1uc WIFI (20MHz, MCS0, 80pc duty cycl4)	x	476	95.21	16.35	17.48	130.0	± 9.6 %
_		¥ 7	4.60	55.56 56.17	15.94		130.0	
1000B	IEEE 802.1 (ac WFI (20MHz MCS1), 90pc duty cycla)	x	4.57	85.64	16.51	0.46	130.0	796%
110	and and change	Y	4.79	65.07	18.11		150.0	-
		Z	4.73	86.56	16.21		130.0	-
AB	BEE BOJ 11ac WFH (20MHz, MCB2, 90pc duty cycle)	×	4.56	68,52	16,38	0.46	130.0	295 %
		Y	4.63	85.92	15,94		130.0	
		2	4.62	06.40	10.04		130.0	
IDETIO-	IEEE 802 11ac WIFI (20MHz, MCSS, 100pc duty cycle)	*	4.91	88,68	78.9d	0.48	130.0	394 %
		Y	4.73	66.08	16:11	_	130.0	
dime a	1000 000 000 000 0000 00000	Z	\$407	86.58	16:22	10.60	130.0	200.00
AAB	IEEE 802,11ac WFr (20MHz, MCS4. 90pc duty cyclo)	×	4.93	88.50	16,39	0.46	190.0	A BEE
		Y	4/65	65.89	15.96		130,0	-
Arrend In	LINE AND ALL DEPENDENCE AND ADDRESS	Z	4.59	06.30	16.05	77.40	130.0	1000
10612. AAS	IEEE 802.11ac WIFI (20MHz, MCSS. 90pc duty cycle)	×	4.85	96,66	16.44	0.48	130.0	# 9.6 %
		Y	4,66	05.04	16.00	-	130.0	
10613-	IEEE 802 11ac WIFI (20MHz MCS6)	X	4.89	66.57	16.33	0.46	130.0	19.6%
AAB	BEEE BOZ TTAC WIFI (2008-12: MCSO: 90pc/duty cycla)	Ŷ	4.00	05.94	15.89	0,40	130.0	19.0 %
		Z	4.69	65.36	15.95	-	130.0	-
MAE	(EEE 802 11ac WIFI (20MHz, MCS7, 90pc duty cycle)	X	4.80	68.77	15.57	0.68	130.0	1.0.0 %
nine.	Prine Only Pring!	Ŷ	4.00	66.11	18.11	-	130.0	
		Z	4.55	66.63	16.24		130.0	-
1DE15-	IEEE 802.11mc/WiF+ (20MHz, MCS8, 90pc duty cycle)	×	4.83	66,33	16 17	0,48	130.0	# 0,6 %
	1000 000 0000	14	4.65	65.72	15.74		130.0	
		Z	4.57	66.14	15.79		130.0	
1DG16- AAE	IEEE 932   I ac WIFI (40MHz, MCSU, 90pc duly cyce)	8	5.40	66.72	16.51	0,46	130.0	= 9.6 %
		¥.	5.25	86:20	16.17		130.0	-
_		2	5.18	66.58	46,21	1000	136.0	1.00
10617- AAB	IEEE 902 that WiFi (30MHz, MCS1. 90pc duty cycle)	X	5.46	66.82	16.52	0.46	120.0	± 9.6 %
	Espectra April	- W	5.32	66.35	16.21		130,0	
	and the second second second	2	5.23	66.70	1E.24		130.0	
10618- AAE	IEEE 802 1 Iao W(F) (104412, MCS2, 90pc daay cycle)	×	5.36	68.91	16.59	0.46	130.0	19.0%
		Y	5.20	66.37	16.23	_	130.0	-
	The second second second second second	- 3-	5,13	66,77	16.30	2.45	130.0	1000
10619. AAB	IEEE 802.11as WiFi (40MHz, MCS3, 90pc duty cycle)	X	E.38	66.73	16.44	0,48	130.0	19.0%
_		Y.	5.23	86.21 86.53	16.09		130.0	
incer	IEEE E02.11ap WIFr (4000Hz, MCS4,	2	5.14	66.81	16.52	0.48	130.0	1 19.0 %
10620- AAB	BEEE BOZ.11ac Willy (40MHz; MGS4, 90pc duty cycle)	X	5.49	66.26	16.02	0.40	130.0	180.9
			5.23	66.26	16.17		130.0	-
10621-	TEEE eu2.11ac WFs (40MHz, MCS5	X	5,47	66.89	18.17	0.46	130.0	29.6%
AAB	Tilling doty cyclin	4	5.31	66.35	16.33	-	130.0	-
_		Z	5.24	66.76	16.40	-	130.0	1
10622- AAE	IEEE 802,116c With (40MH); MG56, Stipp: auty-cyclel	X	5.47	67.00	18 72	0.48	130.0	±.9.6 %
1996	and out chant	Y	5.33	66.52	16.41		130.0	-

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10823-	IEEE 802, 1 Aac-WIFI (40MHz, MCS7,	X	5.38	68.59	16.41	0.46	130.0	19.8%
AAB.	90pc tudy cyclaj	Y .	5.20	66.04	16.05	-	130.0	-
		Z	512	68.39	16.07		130.0	-
10624- AAB	IEEE 802 11ac WEH (40MHz, MCSS) 90pc duty syste)	N	5.54	66,74	16.54	0,46	130.0	29.6%
	- And And	Y	5.40	198.26	16.22	-	130.0	
	In a contract the state of the	Z	5.31	88.69	16.23		130.0	
HEREZS-	IEEE 802 11ec WFr (60MHz, MCSB, 90pc duty cycle)	×	5.91	67.68	17.05	1),46	130.0	±9.6 %
		Ŷ.	5.81	87.35	16.82		130.0	
AR-DOD		Z.	5.90	87.33	16.65	10.000	130.0	
10628 AAB	IEEE 902.11ab WFr (80MHz, MCS6, 90pc duty cycle)	x	5,60	86.70	16,44	0.46	130.0	19.6%
		Y	6.54	66.25	16.12	_	130,0	
10627-	JEEP WAY ALCOHOLD STORE IN A STORE	Z	5.47	86.64	16.16		130.0	i a constituite
AAB	IEEE 802.11ab WIFI (80MHz, MCS1, 90pt duty cycle)	X	5.90	57.28	16,64	0.40	130.0	±96%
_		Ŷ	5.79	86.84	16,38		130.0	
10628-	STOT OF ALL OF TAXABLE AND TAXABLE	2	5,67	87/08	16.34		130.0	1
AAB	IEEE 802 11ac W/IT (80MHz, MCS2, 90bb duty cycla)	x	5.73	66.91	16.42	0,46	130.0	106%
		Y	5.58	86.38	16.08		130.0	-
10629-	HERE and some with weath -	2	5.49	66.66	18.06		130.0	1.000
10629- AAB	IEEE 802.11ac WiFI (BDMHz, MCB3, 90pc dbty cycla)	×	5.81	68.97	18.43	0.46	130.0	土田市林
_		Y .	5.67	66.48	18.13	-	130.0	· · · · · · · · · · · · · · · · · · ·
1000		Z	5.56	66.69	16.07	100	130.0	1
AAB	IEEE 802.118c W/FI (BOMHz, MCE4. 90pc duty cycle)	18	6.26	68,5Q	17.18	0,46	130.0	* 9.6 %
		Y	6.18	88 17	18,96		130.0	
100000.0	Lange and a second seco	Z	5,83	67,70	18.58		130.0	
10631- AAB	IEEE 802.11an WFi (80MHz, MCS5, 90pp.duty.cycle)	×	6.19	68.38	17.32	0.46	130.0	†9.8%
		Y	8.03	67.83	18.99		130.0	-
10.000		Z	5.88	67.92	16.89	1.000	130.0	
AAB	IEEE 802 11ac WHH (SOMHz MCS6), 90pc outy cycle)	x	5,89	67 37	16,83	0.46	130.0	#9.6 %
		1.4	5.75	86.88	16.53		130.0	
10835	APPER DATE AND ADDRESS OF THE OWNER OWNER OF THE OWNER	12	5,87	67.23	16.67	100 C 10 C	130.0	
AAH	IEEE 802 11ac WiFi (BDMHz, MCS7, 90pc duty cycla)	x	5.81	67_14	18.55	0,46	130.0	±9.6 %
		W.	5,84	66.53	16 16	A	130.0	
10834-	IEEE 802,11ac WFI (BIMHz, MCS8	ZX	5.57	66.89	18.21		130.0	
AAE	POpe duty cycle)		5 79	87.15	18.62	0.48	130.0	主机反常
		Y Z	5.63	66.56	16.28		130.0	-
10835-	IEEE 802.11ac VIIII (BUMH2, MC89)	X	5,56	68.95	16.31	P. 100	130.0	
AAB	Sobe dray cycle)	x	5.52	86.48	16.03	0.68	130,0	786 <i>%</i>
-		Z	5.52	65.92	15.67		130.0	
0836-	JEEE 802 TERC WIFI (160MHz: MCSO.	X	6.07	66.16 67.13	15.67	- A . A	130.0	-
4AC	BODIC duty cycle)	* *	0.07		18.52	0.46	120,0	大家市场
				86.65	16.23		130.0	
10037	IEEE.802.11ac/WIFI (160MHz, MCS1,	X	5.87	68.97	16.23		130.0	-
AAC	Blipe daty cycle)	× v		67.50	18.68	0,48	130.0	±9.6%
		Z	6.11	67.04	15.40	_	130.0	_
62001	IEEE 802 11ac WiFI (160MHz, MCS2,	X	6.00	57.28	16.35	-	130.0	-
345	Bolic duty cycle)			67,47	16.65	0.48	130.0	+0.6%
		Y	5.11	67.00	16.38		130.0	
	in.	Z	8.01	67.28	16.34	50 E F	130.07	

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10539-	JEEE 802 11ac WIFI (160MHz, MCS3	X	6.25	67 49	18.70	0.46	1000	+96%
NAC-	90pc duty dycla)	1.1			100	alan.		= 7 M M
_		Y	6.09	66.87	16.38		130.0	1
( William	APPER ONCE AND DEPENDENCE APPEND	Z	6.00	87.25	16.37		130.0	1.000
NAC	IFEE 802 11a:: WIFI (160MHz, MCS4, 90pc duty cycle)	×	6.25	87.53	16.67	11.46	130.0	2.9.6 %
		٧.	6.11	67,01	16.35	-	130.0	
10641-	IEEE BOZ 11ac WIFI (160MHz, MCS5	2	6.99	87.21	16.25	11.40	130.0	
AAC	Sobergink citige (Leanurs, MC22)	8		87.31	16.67	0.46	180 0	#88%
		Y	6.13	66.85	15,30	-	130.0	-
10642-	EEE 802 11ec WFI (160MHz, MCS6,	ZX	6.03	87.11	16.26	11.46	1000	
MC:	30pc duty cycle)	-	8.63	67,65	16,91	12,40	130.0	4 0.6 %
_		Z	6.10	67.47	16.62	-	136.0	-
10643-	IEEE 802 11ac WFI (160MHz, MCS7	X	6.10	67.31	16.62	0.46	130.0	49.6%
AAC	B0pc duty cycles					0,40	1000	49.6 6
_		8	6.02	05.62	10.34		130.0	-
10644	IEEE 802,11ac WIFI (160MHz, MCS8	X	5.91 8,35	67.06 67.93	16.30 16.98	0.46	130.0	19.0%
AAC:	90pc duty cycle)	Y	6.21	87.40	15.65		130.0	-
		Z	6.05	67.40	16.65		130.0	-
10645-	IEEE 802 11ac WFI (160MHz, MCS9.	X	8.05	88.51	17.21	11.46	130.0	1965
AAC.	BODE duty system	18	8.88	68.36	17/29	11.40	15010	2.846.50
		Z	6.60	67.70	16.50		130.0	-
10846-	LTE-TOD (SC-FDMA, 1 RB, 5 MHz	X	86.17	140.32	45.40	05.0	60.0	± 0.6 %
AAF	OPSR, UL Subframe=2,7)	Y	39.64	122.44	40.63		-60.0	
		Z	18.10	164.43	33.83	-	60.0	
10647-	LTE-TOD (SC-FDMA, 1 RB, 20 MHz	X	80.45	139.77	45.45	9.30	60.0	19.6 %
AAF	DPSK, UL Subframe=2.7)	V	36.72	121.04	40.88		60.0	Twee
		2	16.41	102.06	33.52	-	60.0	-
10648-	COMA2000 (1s Advanced)	X	10.87	56.51	13.20	0.00	150.0	1505
AAA	Some and the second and	Y	0.58	1	9.15	0.00	150.0	2.2.0 1
		Z	0.58	61.72 64.60	11.24		150.0	
10652-	LTE-TOD (OFDMA & MHz E-TM 3.1.	X	431	69,60	17.79	2.73	80.0	=96%
AAD	Clipping 44%)	Ŷ	3.89	67.30	10.71	245	80.0	100.0
		Z	3.64	67.00	16.29		80.0	-
HD653- AAD	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Cligging 44%)	x	4.72	07.91	17.64	2.22	80,0	198%
mul	colligned as all	Y	4.49	EE.72	16.87		U.DB	
		Z.	4.16	66.48	10.48	1000	80.0	
10854- AAD	LTE-TOD (OFDMA: 15 MHz E-TM 3.1 Clipping 44%)	X	4,64	67.52	17,60	2.25	80.0	19.6%
1.5.942	Sold and all all all all all all all all all al	Y	4.35	60.39	18.88		80.0	
-		I	6.14	65.16	76.60	1. 1. 1	80.0	
10855- AAE	(TE-TDD (GFOMA, 20 MHz, E-TM 3.1, Olipping 44%)	×	4.69	137.54	17.64	2,23	60.0	± 9,6 %
-		¥.	4.42	65.40	16.92	-	80.0	
		2	4,19	66.14	16.53		0.08	
10658- AAA	Palas Weikform (200Hz, 10%)	8	100.00	116,82	30.15	10.00	50.0	+9.6%
		Y	27.27	97.34	24.81		50,0	
		Z	5.41	78.00	14.99	1000	60.0	
10fffls-	Palso Waveform (200Hz, 20%)	8	100.00	114,08	97 78	6.99	60,0	±0,6 %
		Y	100.00	111.99	26.70		00.00	
_		7	5.06	74.98	14.50		eu u	

Certificaté No: EX3-3835\_Got18

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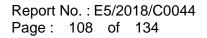
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#### EX3DV4- SN:3938

#### October 24, 2018

10660- AAA	Pulse Waveform (200Hz, 40%)	×	100.00	113.57	26.20	3.98	80.0	± 9.6 %
		Y	100.00	108.48	23.71		80.0	
		Z	17.55	86.88	16.64		0.06	
10661- AAA	Pulse Waveform (200Hz, 60%)	×	100.00	116.76	26.28	2.22	100.0	± 9.6 %
		Y	100.00	105.43	21.11		100.0	
		Z	100.00	100.82	18.62		100.0	
10662- AAA	Pulse Waveform (200Hz, 80%)	×	100.00	127.89	28.96	0.97	120.0	± 9.6 %
		Y	3.43	74.94	10.68	-	120.0	
day warde	Exercise and the second second	Z.	100.00	98.67	16.42		120.0	-
10670- AAA	Bluetooth Low Energy	×	100.00	117.22	26.83	2.19	100.0	± 9.6 %
		Y	100.00	107.88	22.47		100.0	
		Z	100.00	104.58	20.49	-	100.0	

<sup>2</sup> Uncartainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Certificate No: EX3-3938\_Oct18

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# 8. Uncertainty Budget

A	с	D	е		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distributio	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	$\infty$
lsotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	$\infty$
lsotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	~
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	~
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	~
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	$\infty$
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	~
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	~
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	~
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	~
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	~
Probe Positioning with respect to phantom shell	2.90%	R	√3	1.732	1	1	1.67%	1.67%	~
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	~
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	$\infty$
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	~
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Liquid permittivity (mea.)	1.92%	N	1	1	0.64	0.43	1.23%	0.83%	М
Liquid Conductivity (mea.)	1.59%	N	1	1	0.6	0.49	0.95%	0.78%	М
Combined standard uncertainty		RSS					11.52%	11.46%	
Expant uncertainty (95% confidence interval), K=2							23.05%	22.93%	

Measurement Uncertainty evaluation template for DUT SAR test (0.3-3G)

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# 9. Phantom Description

Schmid & Panner Engineering AG

e s o

Zeughsunstnates 43, 8004 Zurich, Switzellar Phone +41 1 245 9700, Fax +41 1 245 9779 Info@spasg.com, Http://www.spasg.com

Certificate of Conformity / First Article Inspection

item	SAM Twin Phantom V4.0	
Type No .	QD 000 P40 C	
Series No	TP-1150 and higher	
Manufacturer	SPEAG Zeughausstrasse 43 GH-8004 Zürich Switzenand	

#### Tests

The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. CD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

Test	Requirement	Details	Units tested
Dimensions	Compliant with the geometry according to the CAD model.	(T'IS CAD File (")	First article, Samples
Material thickness of shell	Compliant with the requirements according to the standards	2mm +/- 0.2mm in flat and specific areas of head section	First article, Samples, TP-1314 ff.
Material thickness at ERP	Compliant with the requirements according to the standards	6mm +/- 0.2mm at ERP	First article, All items
Material parameters	Dielectric parameters for required frequencies	300 MHz - 0 GHz: Relative permittivity < 5. Loss tangent < 0.05	Material samples
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility.	DEGMBE based simulating liquids	Pre-series, First article, Material samples
Sagging	Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid	< 1% typical < 0.8% if blied with 155mm of HSL900 and without DUT below	Prototypes, Sample testing

- CENELEC EN 50361 (1)
- IEEE Std 1528-2005 IEC 62209 Part I
- 134
- The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4]

Date	07.07.2005	3 D 8 8 9
Signature / Stamp		Solgento & Parcellin Englinearing AC Childhousgateses 43, 8004 20161, Solitowiand Phone VCL 1996 (1900 Solitowian) An 2019 Into Breaked, com. http://www.sheed.com

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# **10. System Validation from Original Equipment Supplier**

credited by the Swiss Accred be Swise Accreditation Service			ccreditation No.: SCS 0108
utilitateral Agreement for the	recognition of calibration	oprtificatos	
lient SGS-TW (Auc	len)	Certificate N	o: D835V2-4d063_Aug18
CALIBRATION	CERTIFICATI		
Doject	D835V2 - SN:4d	063	
Calibration procedure(s)	QA CAL-05.v10		
	Calibration proce	edure for dipole validation kits ab	ove 700 MHz
Calibration state:	August 23, 2018		
The measurements and the un	containties with conflidence p ucted in the closed laborato	ional standards, which realize the physical un instability are given on the following pages a ny facility: environment temperature $(22 \pm 3)^2$	nd are part of the certificate
The measurements and the un Al calibrations have been conc Calibration Equipment used (M	containties with conflidence p ucted in the closed laborato	probability are given on the following pages ar	nd are part of the certificate
The measurements and the un VI calibrations have been conc Calibration Equipment used (M Primary Standards Power meter NRP	certainties with conflidence ) ucted in the closed laborato &TE onlical for cellocation) ID # SN: 104776	Instability are given on the following pages any facility, environment temperature (22 ± 3)* Carl Cate (Cemficate No.) 04-Apr-15 (No. 217-02672)02673)	nd are part of the pertilicate C and humility < 70%. Scheduled Calibration Apr:19
he measurements and the un al calibration Equipment used (M remary Standards fower meter NRP lower sensor NRP-201	certainfiles with conflictence ) ucted in the closed laborato ATE onlicel for cellocation) ID # SN: 104778 SN: 104244	Instability are given on the following pages any facility, environment temperature (22 ± 3)* Call Date (Centificate 60,) 04-Apr-16 (No. 217-02872)02673) 04-Apr-15 (No. 217-02672)	nd are part of the pertilicate C and humienty < 70%: Scheduled Calibration Apr 19 Apr 10
he measurements and the un al calibrations have been conc calibration Equipment used (M rimary Standards 'ower meter NRP 'ower sensor NRP-281 'ower sensor NRP-281	estaintine with confidence ) butted in the closed laborato &TE chilical for cellocation) ID # SN: 104276 SN: 104244 SN: 104245	Instability are given on the following pages as ing facility; environment temperature (22 ± 3)* Carl Date (Centificate 4%), 04-Apr-15 (%), 217-02672(02573) 04-Apr-15 (%), 217-02672) 04-Apr-15 (%), 217-02672) 04-Apr-16 (%), 217-02672)	c and humeny < 70%. Scheduled Calibration Apr-10 Apr-18
he measurements and the un VII calibrations have been conc calibration Equipment used (M Primary Standards Yower sensor NRP-201 Yower sensor NRP-201 Telerence 20 dB Attenuator	exterimes with confidence ) butted in the closed laborato & TE critical for celloration) ID # SN: 104778 SN: 10244 SN: 10245 SN: 3058 (20k)	Instability are given on the following pages as availability environment temperature (22 ± 3)* Call Date (Certificate 6kg.) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672)	c and humidity < 70%. Scheduled Calibration Apr-19 Apr-19 Apr-18 Apr-19
he measurements and the un all calibrations have been conc calibration Equipment used (M Primary Standards Yower meter NRP Yower sensor NRP-281 Prover sensor NRP-281 Heterance 2018 Attenuator Yope-N mismatch combination	estainties with confidence ) ucted in the closed laborator ATE chilical for calibration) ID # SN: 104776 SN: 10244 SN: 103245 SN: 103245 SN: 5047.2 / 06327	Cal Date (Certificate No.) Cal Date (Certificate No.) 04-Apr-15 (No. 217-02072/02573) 04-Apr-15 (No. 217-02672) 04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02682)	c and number < 70%. C and number < 70%. Scheduled Calibration Apr-19 Apr-19 Apr-19 Apr-18 Apr-19 Apr-19
The measurements and the un VII calibration Equipment used (M Primary Standards *ower meter NRP Power sensor NRP-281 Power sensor NRP-281 Telefence 20 dB Attenustor (ype-N mismatch combination featering Probe EX3DV4	exterimes with confidence ) butted in the closed laborato & TE critical for celloration) ID # SN: 104778 SN: 10244 SN: 10245 SN: 3058 (20k)	Instability are given on the following pages as availability environment temperature (22 ± 3)* Call Date (Certificate 6kg.) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672) 04-Apr-16 (Mac 217-02672)	c and humidity < 70%. Scheduled Calibration Apr-19 Apr-19 Apr-18 Apr-19
The measurements and the un VII calibration Equipment used (M Primary Standards Primary Standards Prim	estaintine with confidence ) ucted in the closed laborato ATE critical for cellocation) ID # SN: 104776 SN: 104244 SN: 104244 SN: 104245 SN: 3056 (20k) SN: 5047, 27 (0527) SN: 7349	Instability are given on the following pages are replacibly, environment temperature (22 ± 3)* Call Callé (Certificate No.) 04-Apr-16 (No. 217-02672) 04-Apr-16 (No. 217-02673) 04-Apr-16 (No. 217-02683) 04-Apr-16 (No. 217-02683) 30-Dac-17 (No. EX3-7340, Dac-17)	nd are part of the perificate C and humility < 70%. Scheduled Calibration Apr-19 Apr-19 Apr-19 Apr-18 Apr-19 Dec-18
The measurements and the un VII calibrations have been conc Calibration Equipment used (M 20mary Standards 20mer meter NRP 20mer sensor NRP-281 1elemence 20 dB Attenustor (ype-N mismatich combination Teletrance Protos EX30/v4 DAE4 Secundary Standards	extentions with confidence ) butted in the closed laborato & TE critical for celloration) ID # SN: 104778 SN: 104778 SN: 10244 SN: 10245 SN: 5058 (20k) SN: 5047.2.7 06327 SN: 5047.2.7 06327 SN: 5047.2.7 06327 SN: 5047.2.7 06327	Instability are given on the following pages at Ay facility: environment temperature (22 ± 3)* Call Date (Certificate No.) 04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02682) 04-Apr-17 (No. EXS-7349_Dec-17) 26-Oct-17 (No. DAE+601_Oct17)	C and humidity < 70%. Scheduled Calibration Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-18 Apr-18 Apr-18 Apr-18 Apr-18 Apr-18 Apr-18 Apr-18 Apr-18
The measurements and the un VII calibrations have been conc Calibration Equipment used (M Primary Standards Prover sensor NRP-281 Prover sensor NRP-281 Prover sensor NRP-281 Telefence 20 dB Attenustor (ype-N mismatich combination Telefance Probe EX3DV4 DAE4 Securidary Standards Prover mator EPM-442A	ATE chilical for collocation) ID # SN: 104776 SN: 104776 SN: 104778 SN: 104245 SN: 5056 (20k) SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 601 ID #	Instability are given on the following pages at ry facility: environment temperature (22 ± 3)* Call Date (Certificate No.) 04-Apr-16 (No. 217-02672) 024-Apr-16 (No. 217-02672) 04-Apr-16 (No. 217-02672) 04-Apr-16 (No. 217-02682) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02682) 05-Dac-17 (No. DAE4-601_02(17) Check Date (in house)	c and number < 70%. Scheduled Calibration Apr 19 Apr 19 Apr 19 Apr 18 Apr 18 Apr 18 Apr 18 Dec 18 Oct 10 Scheduled Check
The measurements and the un VII calibrations have been conc Calibration Equipment used (M Primary Standards "ower sensor NRP-201 Peterence 20 dB Attenuator Type-N mismatich combination Peterence Proba EX30V4 DAE4 Securidary Standards "ower mean PM 448A "ower sensor HP S481A Power sensor HP S481A	extaintine with confidence ) ucted in the closed laborato ATE critical for celloration) ID # SN: 104776 SN: 102244 SN: 103245 SN: 3058 (200) SN: 5067, 27 (95877 SN: 5349 SN: 601 ID # SN: GB37480704	Instability are given on the following pages as any facility; environment temperature (22 ± 3)* Call Callé (Certificate No.) 04-Apr-16 (No. 217-02672)(02673) 04-Apr-16 (No. 217-02672) 04-Apr-16 (No. 217-02682) 04-Apr-16 (No. 217-02682) 04-Apr-16 (No. 217-02683) 30-Dac-17 (No. EX2-7342, Dac-17) 26-Col-17 (No. DAE4-601_Oct17) Check Cate (in house) 07-Oct-15 (in house check Oct-16)	nd are part of the pertificate C and humidity < 70%: Scheduled Calibration Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-16 Scheduled Check In house check: Oct-18 In house check: Oct-18 In house check: Oct-18
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Certificate No: D835V2-4d063\_Aug18

Page 1 of 8

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# Report No. : E5/2018/C0044 Page: 112 of 134

Calibration Laboratory of Schmid & Partner Engineering AG ugheusstrasse 43, 8004 Zurich, Switzerland



Schweizerischer Kalibrierdienst S Service suisse d'Melonnage C Servizio svizzero di lorabine S Stries Calibration Service

Accreditation No.: SCS 0108

According by the Swiss Accredit/itim Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Mullilateral Agreement for the racognition of calibration certificates

Glossary: TSL ConvF

N/A

Ilssue simulating liquid sensitivity in TSL / NORM x,y,z not applicable or not measured

#### Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) In the Human Head from Wireless
- Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1. "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)\*, July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

e) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required,
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Gertificate No: D635V2-4d063 Aug18

Patter 2 of II

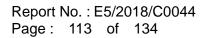
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#### Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantóm	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	ctx, dy, dz, = 5 mm	
Frequency	835 MHz = 1 MHz	

#### **Head TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	mortin 06.0
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.7 ± 6 %	0.92 mho/m ± 8 %
Head TSL temperature change during test	< 0.5 °C	_	1000

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>1</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.48 W/kg ± 17.0 % (k=2)
PAB automatic over 10 and (18 c) of Used 701	asadilias	
SAR averaged over 10 cm² (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>2</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	1.55 W/kg

#### **Body TSL parameters**

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	65.2	0.97 mholm
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.9±6%	0.99 mha/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

#### SAR result with Body TSL

SAR averaged over 1 cm <sup>0</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input pawer	2.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.56 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR averaged over 10 cm <sup>5</sup> (10 g) of Body TSL SAR measured	condition 250 mW input power	1.59 W/kg

Certificate No. DB35V2-4d063\_Aug18

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## Appendix (Additional assessments outside the scope of SCS 0108)

#### Antenna Parameters with Head TSL

Projudance, transformed to feed point	51.3 Ω - 1.8 μΩ	
Return Loss	- 33.3 dB	

#### Antenna Parameters with Body TSL

impedance, transformed to feed point	47.7 Ω - 4.4 jΩ
Return Loss	-125,8 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.393 ns

After long term use with 100W radiated power, only a slight warming of the cipole near the leedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged

#### Additional EUT Data

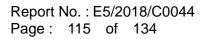
Manufactured by	SPEAG
Menulactured on	November 27, 2006

Certificate No: D835V2-4d063\_Aup16

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#### **DASY5 Validation Report for Head TSL**

Date: 22.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

### DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

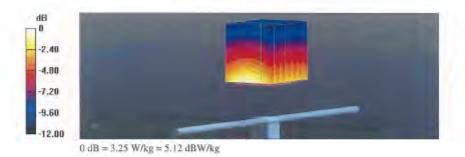
Communication System: UID 0 - CW; Frequency: 835 MHz Medium parameters used: f = 835 MHz;  $\sigma = 0.92$  S/m;  $\varepsilon = 40.7$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(9.9, 9.9, 9.9) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10,2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

#### Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0;

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 62.96 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 3.70 W/kg SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.55 W/kg Maximum value of SAR (measured) = 3.25 W/kg



Certificate No: D835V2-4d063\_Aug18

Page 5 of 8

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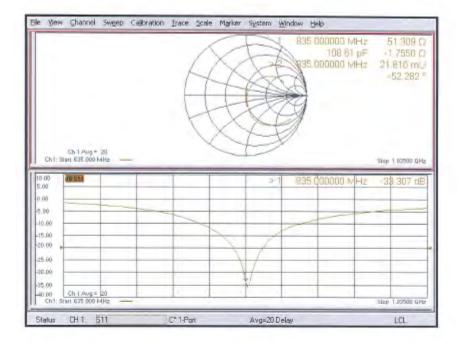
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Impedance Measurement Plot for Head TSL



Certificate No: D635V2-4d063\_Aug18

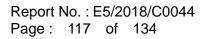
Page 6 of 8

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Date: 23.08.2018



#### **DASY5 Validation Report for Body TSL**

Test Laboratory: SPEAG, Zurich, Switzerland

#### DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

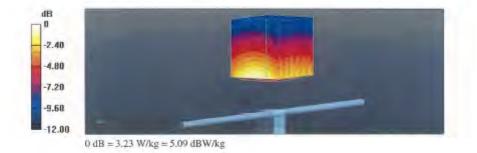
Communication System: UID 0 - CW; Frequency; 835 MHz Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε = 54.9; p = 1000 kg/m<sup>4</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(10.05, 10.05, 10.05) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439) .

#### Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 60.67 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 3.61 W/kg SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.59 W/kg Maximum value of SAR (measured) = 3.23 W/kg



Certificate No: D635V2-4d063\_Aug18

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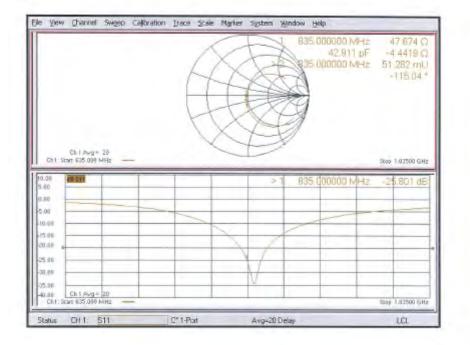
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Report No. : E5/2018/C0044 Page: 118 of 134

Impedance Measurement Plot for Body TSL



Certificate No: D835V2-4d063 Aug18

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# Report No. : E5/2018/C0044 Page: 119 of 134

Calibration Laborator Schmid & Partner Engineering AG eughausstrasse 43, 8004 Zurie			Service suisse d'étalonnage Servizio svizzero di teratura
corectind by the Swess Accredits the Swiss Accreditation Servic Aultilateral Agreement for the n	e is one of the signatori	es to lhe EA	Accreditation No SCS 0108
Client SGS-TW (Aude			te: D1900V2-5d173_Apr18
CALIBRATION C	CERTIFICATI	E	
Object	D1900V2 - SN:5	id173	
Collocation procedure(s)	QA CAL-05.v10 Calibration proce	edure for dipole validation kits ab	ove 700 MHz
Calibration date:	April 25, 2018		
Calibration Equipment used (M& Primary Standards		ny lacitry environment temperature (22 ± 3) Cal Date (Certificate No.)	Scheduselt Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
ower sensor NRP-291	SN: 103244	04-Apr-16 (No. 217-02672)	Apr-19
ower sensor NRP-Z91	SN 103245	04-Apr-16 (No. 217-02573)	Apr-19
Reference 20 dB Altenuator	SN: 5068 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-1B
Reletence Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349 Dec17)	Dec-18
DAE4	SN: 601	28-Doi-17 (No. DAE4-601_Oct17)	Oct-18
Secondary Standards	10 P	Check Dain (In house)	Scheduled Check
Nower meter EPM-442A	BN. GB37480704	07-Oct-15 (in house check Oct-16)	In house check. Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18
	Namo	Function	Signature
Calibrated by	Claudio Loubler	Laboratory Technician-	(A)
Approved by	Kalja Pokovic	Table of Manager	7
	канра ланкомис	Technical Manager	11ht

Certificate No: D1900V2-50173\_Apr16

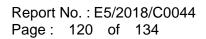
Page 1 of 8

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Calibration Laboratory of Schmid & Partner

Engineering AG Zeugheusstrasez 43, 8604 Zurich, Switzerland



Schweizerischer Kalibrierdienst S Service suisso d'étalonnage C Servizio sviziero di taratura S Swiss Calibration Service

Accreditation No.: SCS 0108

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The Swiss Accreditation Service is one of the signatorias to the EA Multilateral Agreement for the recognition of calibration ourtificates

Glossary: TSL

tissue simulating liquid ConvF sensitivity in TSL / NORM x,y,z not applicable or not measured N/A

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless. communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)\*, March 2010
- dy KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

e) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole. positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized. SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Camilcate No: D1900V2-5d173 April

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#### Measurement Conditions

DASY system configuration, as far as not given on page

DASY Version	DASY5	V52:10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Fist Phantom	
Distance Dipole Center - TSL	10 men	with Spacer
Zoom Scan Resolution	ctx, dy', dz = 5 mm	
Frequency	1900 MHz ± T MHz	

#### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	411±8%	1,35 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C.		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.89 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	40.7 W/kg = 17.0 % (k=2)
SAB averaged over 10 cm <sup>2</sup> (10 p) of Head TSL	oppetition	
SAR averaged over 10 cm <sup>2</sup> (10 g) of Head TSL SAR measured	opridition 250 mW input power	5.21 W/kg

#### Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mhorm
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.3 ± 6 %	1.47 mho/m±6 %
Body TSL temperature change during test	≤ 0.5 °C	-	

#### SAR result with Body TSL

SAR averaged over 1 cm <sup>2</sup> (1 g) of Body TSL	Contition	
SAR measured	250 mW input power	9.93 W/kg
SAR for nominal Body TSL parameters	W1 of besilemon	40.9 W/kg ± 17.0 % (k=2)
264		
SAR averaged over 10 cm <sup>2</sup> (10 g) of Body TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL SAR measured	condition 250 mW input power	5.30 W/kg

Certificate No: D1900V2-5d173\_April8

Page 3 of 8

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## Appendix (Additional assessments outside the scope of SCS 0108)

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	514 Q + 5 1 JQ
Return Loss	- 25,8 dB

#### Antenna Parameters with Body TSL

Impedance, transformed to feed pully	47.3 41 + 7.2 j0
Return Loss	- 22 1 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1,195 ns
electronic for the presentation of the second s	1.190 /05

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The clipple is made of standard semirigid conxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipola. The antenna is therefore short-circuited for DC-signals, Or nome of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurament Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 08, 2012

Centricate No: D1900V2-5d173\_Apr1II

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#### **DASY5 Validation Report for Head TSL**

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

## DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

Communication System: UID 0 - CW: Frequency: 1900 MHz Medium parameters used: f = 1900 MHz;  $\sigma = 1.35$  S/m;  $\varepsilon_c = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(8.18, 8.18, 8.18); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26,10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

# Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 110.9 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 18.3 W/kg SAR(1 g) = 9.89 W/kg; SAR(10 g) = 5.21 W/kg

Maximum value of SAR (measured) = 15.2 W/kg



0 dB = 15.2 W/kg = 11.82 dBW/kg

Certificate No: D1900V2-5d173\_Apr18

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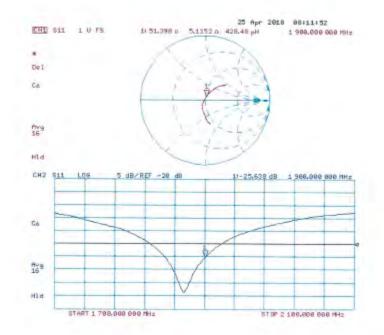
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#### Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d173 Apr18

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### **DASY5 Validation Report for Body TSL**

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

Communication System: UID 0 - CW; Frequency: 1900 MHz Medium parameters used: f = 1900 MHz;  $\sigma = 1.47 \text{ S/m}$ ;  $c_f = 55.3$ ;  $p = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(8.15, 8.15, 8.15); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26,10,2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Señal: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 104.6 V/m; Power Drift = -0.09 dB Peak SAR (extrapolated) = 17.7 W/kg SAR(1 g) = 9.93 W/kg; SAR(10 g) = 5.3 W/kg Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

Certificate No: D1900V2-5d173\_Apr18

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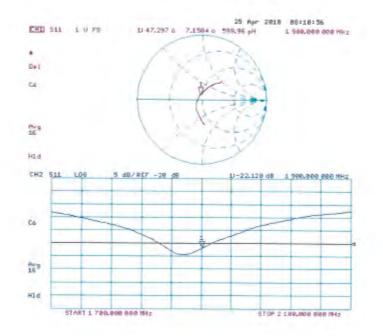
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#### Impedance Measurement Plot for Body TSL



Certificate No: D1900V2-5d173\_Apr18

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# Report No. : E5/2018/C0044 Page: 127 of 134

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	Calibration proce	dure for dipole validation kits abo	ove 700 MHz
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Certificate No: D2450V2-727\_Apr18

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Calibration Laboratory of Schmid & Partner Engineering AG astrases 43, 8004 Zurich, Switzerland Zeugh



Sanweizerischer Kallbrierdi s Service suisse d'italonnage C Servizio svizzero di tarati s Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of collibution comflicative Glossary:

tissue simulating liquid TSL sensitivity in TSL / NORM x,y,z ConvF not applicable or not measured N/A

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate 6) (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010.
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

e) DASY4/5 System Handbook

# Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented. parallel to the body axis.
- Feed Point impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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#### Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASYS	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	da, dy, dz. – 5 mm	
Frequency	2450 MHz = 1 MHz	

#### **Head TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 "C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.3 ± 6 %	1.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>5</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	hormalized to 1W	52.1 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	B-16 W/kg

#### **Body TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mhd/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	2.01 mhc/m = 6 %.
Body TSL temperature change during test	< 0,5 °C	_	(1997)

#### SAR result with Body TSL

SAR sveraged over 1 cm <sup>1</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	50.8 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL. SAR measured	contrilion 250 mW input power	6.00 W/kg

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#### Appendix (Additional assessments outside the scope of SCS 0108)

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.2 Ω + 2.7 JΩ
Return Loss	= 25.1 dB

#### Antenna Parameters with Body TSL

Impledance, transformed to lead point	51.2 Q + 5.6 jQ
Return Loss	- 25.0 dB

#### General Antenna Parameters and Design

ictrical Delay (one direction)	1.149 ns
--------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semingid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAP data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might both or the soldered connections rear the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	January 09, 2003	

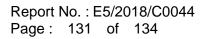
Certificate No: D2450V2-727\_Apr18

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Date: 24.04.2018



#### **DASY5 Validation Report for Head TSL**

Test Laboratory: SPEAG, Zurich, Switzerland

#### DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

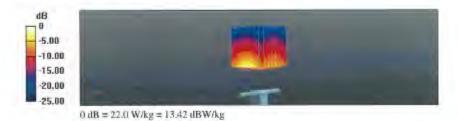
Communication System: UID 0 - CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz;  $\sigma = 1.86$  S/m;  $\varepsilon_t = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(7.88, 7.88, 7.88); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017 .
- Phantom: Flat Phantom 5.0 (front); Type; QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

#### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 116.0 V/m; Power Drift = -0.06 dB Peak SAR (extrapolated) = 26.7 W/kg SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.16 W/kg Maximum value of SAR (measured) = 22.0 W/kg



Certificate No: D2450V2-727\_April8

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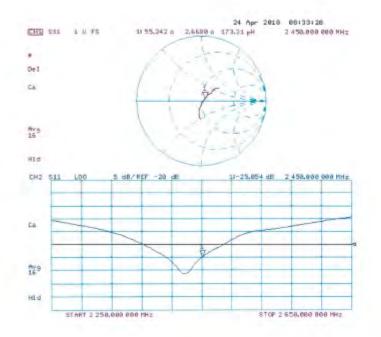
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#### Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-727 Apr18

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#### **DASY5 Validation Report for Body TSL**

Date: 24.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

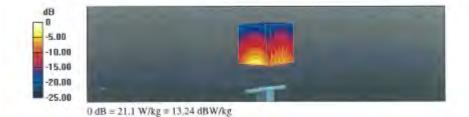
#### DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

Communication System: UID 0 - CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz;  $\sigma = 2.01$  S/m;  $v_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(8.01, 8.01, 8.01); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 108.4 V/m; Power Drift = -0.07 dB Peak SAR (extrapolated) = 25.5 W/kg SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6 W/kg Maximum value of SAR (measured) = 21.1 W/kg



Certificate No: D2450V2-727 April8

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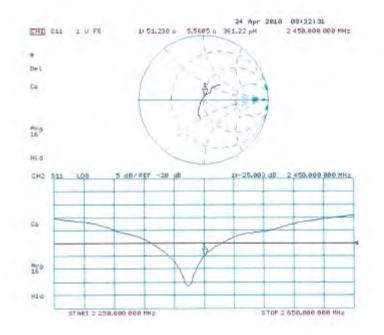
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#### Impedance Measurement Plot for Body TSL





# - End of report -

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