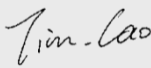
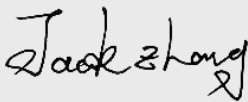


Test report No:
2390387R-RF-US-P03V01

SAR TEST REPORT

Product Name	POS
Trademark	Elo
Model and /or type reference	EMC-M100C
FCC ID	RBWEMCM100C
IC	10757B-EMCM100C
Applicant's name / address	Elo Touch Solutions, Inc 670 N. McCarthy Blvd., Suite 100, Milpitas, CA 95035, USA.
Test method requested, standard	FCC 47CFR §2.1093 IEEE Std 1528-2013 EN IEC/IEEE 62209-1528:2021 ANSI C95.1-2005 RSS-102 Measurement (SAR) Issue 5: 2015
Highest Measurement SAR 1g SAR (W/kg)	MAX SAR: 1.258 W/kg
Highest Simultaneous Transmission 1g SAR (W/kg)	MAX SAR: 1.590 W/kg
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Tim Cao/Project Manager 
Approved by (name / position & signature)	Jack Zhang/Manager 
Date of issue	2024-06-07
Report Version	V1.1
Report template No	Template_FCC SAR-RF-V1.0

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Dec. 26, 2023
Date (start test)	Jan. 15, 2024
Date (finish test)	Mar. 15, 2024

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	18 °C – 25 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
Tx	: Transmitter
Rx	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
2390387R-RF-US-P03V01	V1.0	Initial issue of report.	2024-05-28
2390387R-RF-US-P03V01	V1.1	Page 28 :Add liquid depth information. Page 108: Add note about reduction function. (The test report No.: 2390387R-RF-US-P03V01 V1.1 is to replace the test report No.: 2390387R-RF-US-P03V01 V1.0, and test report 2390387R-RF-US-P03V01 V1.0 is obsoleted.)	2024-06-07

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with FCC 47CFR §2.1093, IEEE Std. 1528-2013, EN IEC/IEEE 62209-1528:2021, ANSI C95.1-2005, RSS - 102 Issue 5: 2015.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
 - Chapter 1.1 General Description of the Item(s);
 - Chapter 1.2 Antenna Information.
 - Chapter 1.3 Antenna location diagram.
 - Chapter 1.4 Data Rate.
 - Chapter 1.5 Channel List.

1 General Information

1.1 General Description of the Item(s)

Product Name	POS
Model No.	EMC-M100C
Trademark.....	Elo
FCC ID.....	RBWEMCM100C
IC.....	10757B-EMCM100C
Hardware Version.....	V1.00
Software Version.....	T14
Manufacturer	Elo Touch Solutions, Inc
Manufacturer Address	670 N. McCarthy Blvd., Suite 100, Milpitas, CA 95035, USA.
Factory.....	ShuoGe Intelligent Technology Co.,Ltd.
Factory address	Room 308-310, Building 1, No.2 8th Road, Baiyang Street, Qiantang New Area, Hangzhou City, Zhejiang Province, P.R. China(310018)

Wireless specification	WIFI
Operating frequency range(s)	For 2.4G 2412~2462MHz
	For 5G 5.2GHz: 5180 ~ 5240 MHz 5.3GHz: 5260 ~ 5320MHz 5.6GHz: 5500 ~ 5700MHz 5.8GHz: 5745 ~ 5825MHz
Type of Modulation & Data Rate	Refer to clause 1.4
Number of channel	For 2.4G: 802.11b/g/n(20MHz): 11 802.11n(40MHz): 7
	For 5G: 802.11a/n/ac(20MHz): 24 802.11n/ac(40MHz): 11 802.11ac(80MHz): 5
Wireless specification	Bluetooth (BR/EDR&LE)
Operating frequency range(s)	2402~2480MHz
Type of Modulation	FHSS: 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK) LE : 1Mbps(GFSK); 2Mbps(GFSK);
Number of channel	FHSS: 79 LE : 40
BT Channel Separation	FHSS: 1MHz LE : 2MHz
BT Data Rate	FHSS: 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK) LE : 1Mbps(GFSK); 2Mbps(GFSK);

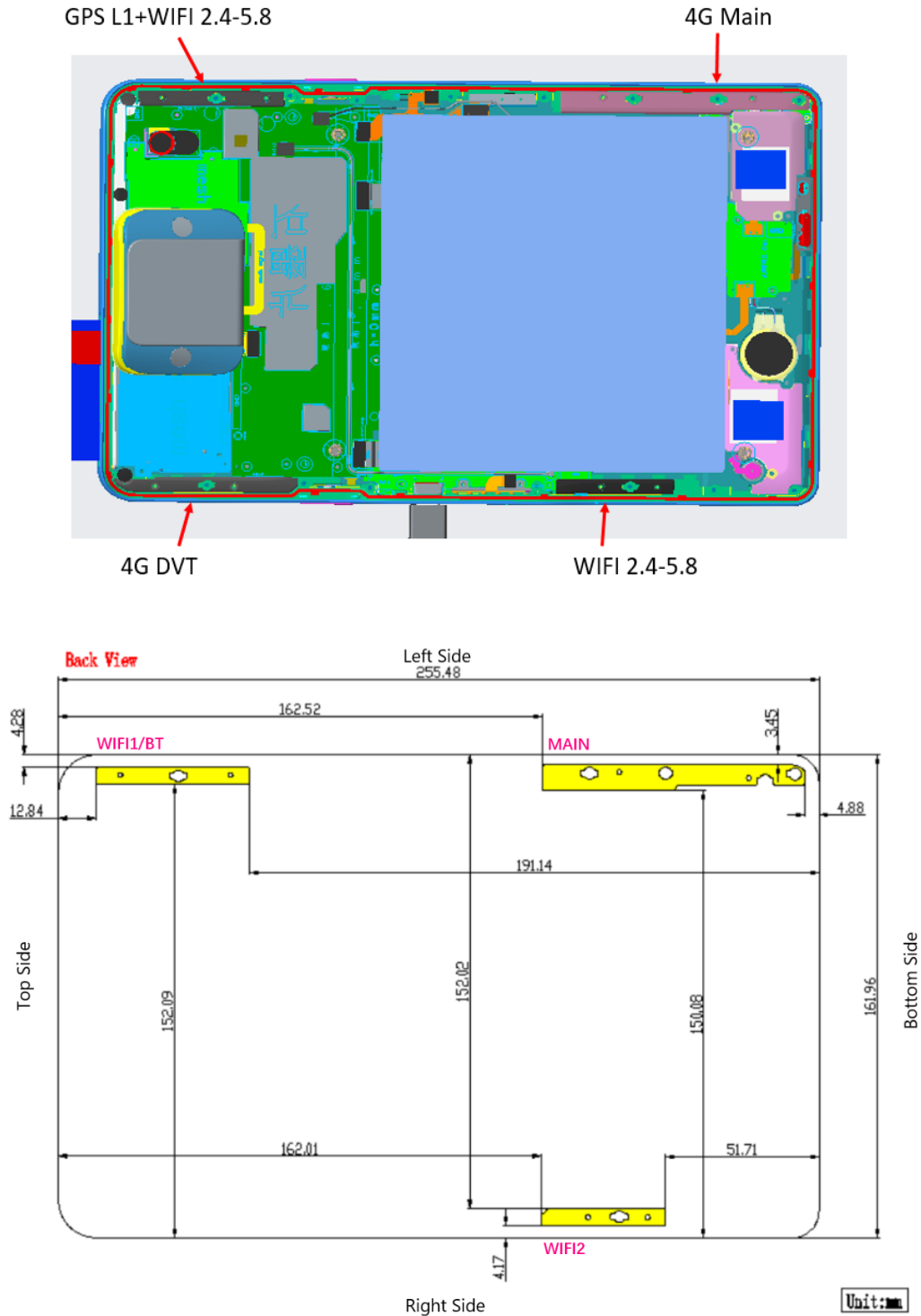
Wireless module.....:	SLM750	
Wireless specification.....:	WCDMA/LTE	
Support Band.....:	WCDMA Band II/IV/V LTE Band 2/4/5/12/13/17/26/41	
Uplink.....:	WCDMA Band II: 1850 MHz to 1910 MHz WCDMA Band IV: 1710 MHz to 1755 MHz WCDMA Band V: 824 MHz to 849 MHz LTE FDD Band 2: 1850 MHz to 1910 MHz LTE FDD Band 4: 1710 MHz to 1755 MHz LTE FDD Band 5: 824 MHz to 849 MHz LTE FDD Band 12: 699 MHz to 716 MHz LTE FDD Band 13: 777 MHz to 787 MHz LTE FDD Band 17: 704 MHz to 716 MHz LTE FDD Band 25: 1850 MHz to 1915 MHz LTE FDD Band 26: 814 MHz to 849 MHz LTE TDD Band 41: 2496 MHz to 2690 MHz	
Downlink.....:	WCDMA Band II: 1930 MHz to 1990 MHz WCDMA Band IV: 2110 MHz to 2155 MHz WCDMA Band V: 869 MHz to 894 MHz LTE FDD Band 2: 1930 MHz to 1990 MHz LTE FDD Band 4: 2110 MHz to 2155 MHz LTE FDD Band 5: 869 MHz to 894 MHz LTE FDD Band 12: 729 MHz to 746 MHz LTE FDD Band 13: 746 MHz to 756 MHz LTE FDD Band 17: 734 MHz to 746 MHz LTE FDD Band 25: 1930 MHz to 1995 MHz LTE FDD Band 26: 859 MHz to 894 MHz LTE TDD Band 41: 2496 MHz to 2690 MHz	
Supported Channel Bandwidth(MHz):	Band	Bandwidth
	WCDMA II	5 MHz
	WCDMA IV	5 MHz
	WCDMA V	5 MHz
	Band 2:	1.4 MHz / 3 MHz / 5 MHz / 10 MHz / 15 MHz / 20 MHz
	Band 4:	1.4 MHz / 3 MHz / 5 MHz / 10 MHz / 15 MHz / 20 MHz
	Band 5:	1.4 MHz / 3 MHz / 5 MHz / 10 MHz
	Band 12:	1.4 MHz / 3 MHz / 5 MHz / 10 MHz
	Band 13:	5 MHz / 10 MHz
	Band 17:	5 MHz / 10 MHz
	Band 25:	1.4 MHz / 3 MHz / 5 MHz / 10 MHz / 15 MHz / 20 MHz
	Band 26:	1.4 MHz / 3 MHz / 5 MHz / 10 MHz / 15 MHz
	Band 41:	5 MHz / 10 MHz / 15 MHz / 20 MHz
WCDMA Type of modulation	BPSK / QPSK	
LTE Type of modulation	QPSK / 16QAM	
Operating temperature range.....:	-40℃ ~ 80℃	

Rated power supply..... :	Voltage and Frequency	
	☐	AC: 220 - 240 V, 50/60 Hz
	☐	AC: 100 - 240 V, 50/60 Hz
	☒	Battery:
	☐	Poe:
	☒	Adapter:
Adapter Model..... :	UES45LCP-SPC	
	Input: 100-240V ~ 50/60Hz, 1.3A Output: 5.0V/3.0A, 15.0W; 9.0V/3.0A, 27.0W; 12.0V/3.0A, 36.0W; 15V/3.0A, 45W; 20V/2.25A, 45W Max	
Mounting position :	☐	Tabletop equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☒	Hand-held/Portable equipment
	☐	Other:

1.2 Antenna Information

Antenna Delivery	☒	1TX + 1RX	
	☒	2TX + 2RX	
	☐	Others:.....	
Antenna technology.....	☒	SISO	
	☒	MIMO	☒ CDD ☐ Beam-forming
	☐	External	☐ Dipole ☐ Sectorized
Antenna Type	☒	Internal	☒ FPC ☐ PCB ☐ Metal Monopole Antenna ☐ Ceramic chip ☐ Others.....

1.3 Antenna location diagram



Note: GPS L1 and 4G DVT are RX Only antennas.

1.4 Data Rate

IEEE 802.11b

Modulation	Data Rate(Mb/s)
DSSS	1
DSSS	2
CCK	5.5
CCK	11

IEEE 802.11g

Modulation	R	Data Rate(Mb/s)
BPSK	1/2	6
BPSK	3/4	9
QPSK	1/2	12
QPSK	3/4	18
16-QAM	1/2	24
16-QAM	3/4	36
64-QAM	2/3	48
64-QAM	3/4	54

IEEE 802.11n

Spatial streames	MCS Index	Modulation	R	Data Rate(Mb/s)			
				800ns GI		400ns GI	
				20MHz	40MHz	20MHz	40MHz
1	0	BPSK	1/2	6.5	13.5	7.2	15.0
1	1	QPSK	1/2	13.0	27.0	14.4	30.0
1	2	QPSK	3/4	19.5	40.5	21.7	45.0
1	3	16-QAM	1/2	26.0	54.0	28.9	60.0
1	4	16-QAM	3/4	39.0	81.0	43.3	90.0
1	5	64-QAM	2/3	52.0	108.0	57.8	120.0
1	6	64-QAM	3/4	58.5	121.5	65.0	135.0
1	7	64-QAM	5/6	65.0	135.0	72.2	150.0
2	8	BPSK	1/2	13	27	14.4	30
2	9	QPSK	1/2	26	54	28.8	60
2	10	QPSK	3/4	39	81	43.4	90
2	11	16-QAM	1/2	52	108	57.8	120
2	12	16-QAM	3/4	78	162	86.6	180
2	13	64-QAM	2/3	104	216	115.6	240
2	14	64-QAM	3/4	117	243	130	270
2	15	64-QAM	5/6	130	270	144.4	300

IEEE 802.11a

Modulation	R	Data Rate(Mb/s)
BPSK	1/2	6
BPSK	3/4	9
QPSK	1/2	12
QPSK	3/4	18
16-QAM	1/2	24
16-QAM	3/4	36
64-QAM	2/3	48
64-QAM	3/4	54

IEEE 802.11n/ac

Spatial streames	MCS Index	Modulation	R	Data Rate(Mb/s)					
				400ns GI			800ns GI		
				20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
1	0	BPSK	1/2	7.2	15	32.5	6.5	13.5	29.3
1	1	QPSK	1/2	14.4	30	65	13	27	58.5
1	2	QPSK	3/4	21.7	45	97.5	19.5	40.5	87.8
1	3	16-QAM	1/2	28.9	60	130	26	54	117
1	4	16-QAM	3/4	43.3	90	195	39	81	175.5
1	5	64-QAM	2/3	57.8	120	260	52	108	234
1	6	64-QAM	3/4	65	135	292.5	58.5	121.5	263.3
1	7	64-QAM	5/6	72.2	150	325	65	135	292.5
1	8	256QAM	3/4	86.7	180	390	78	162	351
1	9	256QAM	5/6	N/A	200	433.3	N/A	180	390
2	0	BPSK	1/2	14.4	30	65	13	27	58.6
2	1	QPSK	1/2	28.8	60	130	26	54	117
2	2	QPSK	3/4	43.4	90	195	39	81	175.6
2	3	16-QAM	1/2	57.8	120	260	52	108	234
2	4	16-QAM	3/4	86.6	180	390	78	162	351
2	5	64-QAM	2/3	115.6	240	520	104	216	468
2	6	64-QAM	3/4	130	270	585	117	243	526.6
2	7	64-QAM	5/6	144.4	300	650	130	270	585
2	8	256QAM	3/4	173.4	360	780	156	324	702
2	9	256QAM	5/6	N/A	400	866.6	N/A	360	780

Note : We have evaluated low/mid/high data rate, the blue font is the highest power data rate.

1.5 Channel List

Transmission (H, M, L) channel numbers and frequencies in each WCDMA band

WCDMA II		
	Ch. #	Freq. (MHz)
L	9262	1852.4
M	9400	1880.0
H	9538	1907.6
WCDMA IV		
	Ch. #	Freq. (MHz)
L	1312	1712.4
M	1413	1732.6
H	1513	1752.6
WCDMA V		
	Ch. #	Freq. (MHz)
L	4132	826.4
M	4182	836.4
H	4233	846.6

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5		
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5		
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 13												
	Bandwidth 5 MHz					Bandwidth 10 MHz						
	Channel #		Freq.(MHz)			Channel #		Freq.(MHz)				
L	23205		779.5			23230		782				
M	23230		782									
H	23255		784.5									
LTE Band 17												
	Bandwidth 5 MHz					Bandwidth 10 MHz						
	Channel #		Freq.(MHz)			Channel #		Freq. (MHz)				
L	23755		706.5			23780		709				
M	23790		710			23790		710				
H	23825		713.5			23800		711				
LTE Band 25												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905
LTE Band 26												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz			
	Ch. #	Freq. (MHz)	Ch. #	Ch. #	Freq. (MHz)	Ch. #	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5		
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5		
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5		
LTE Band 26 for IC												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26797	824.7	26805	825.5	26815	826.5	26840	829	26865	831.5		
M	26915	836.5	26915	836.5	26915	836.5	26915	836.5	26915	836.5		
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5		



LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	40265	2557.5	40290	2560	40315	2562.5	40340	2565
M	40740	2605	40740	2605	40740	2605	40740	2605
H	41215	2652.5	41190	2650	41165	2647.5	41140	2645

IEEE 802.11b/g & IEEE 802.11n (20MHz) Working Frequency of Each Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412 MHz	2	2417 MHz	3	2422 MHz	4	2427 MHz
5	2432 MHz	6	2437 MHz	7	2442 MHz	8	2447 MHz
9	2452 MHz	10	2457 MHz	11	2462 MHz	-	-

IEEE 802.11n(40MHz)Working Frequency of Each Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
3	2422 MHz	4	2427 MHz	5	2432 MHz	6	2437 MHz
7	2442 MHz	8	2447 MHz	9	2452 MHz	-	-

Bluetooth Working Frequency of Each Channel: (For FHSS)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz	03	2405 MHz
04	2406 MHz	05	2407 MHz	06	2408 MHz	07	2409 MHz
08	2410 MHz	09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz	15	2417 MHz
16	2418 MHz	17	2419 MHz	18	2420 MHz	19	2421 MHz
20	2422 MHz	21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz	27	2429 MHz
28	2430 MHz	29	2431 MHz	30	2432 MHz	31	2433 MHz
32	2434 MHz	33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz	39	2441 MHz
40	2442 MHz	41	2443 MHz	42	2444 MHz	43	2445 MHz
44	2446 MHz	45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz	51	2453 MHz
52	2454 MHz	53	2455 MHz	54	2456 MHz	55	2457 MHz
56	2458 MHz	57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz	63	2465 MHz
64	2466 MHz	65	2467 MHz	66	2468 MHz	67	2469 MHz
68	2470 MHz	69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz	75	2477 MHz
76	2478 MHz	77	2479 MHz	78	2480 MHz	N/A	N/A

Bluetooth Working Frequency of Each Channel: (For LE)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz	03	2408 MHz
04	2410 MHz	05	2412 MHz	06	2414 MHz	07	2416 MHz
08	2418 MHz	09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz	15	2432 MHz
16	2434 MHz	17	2436 MHz	18	2438 MHz	19	2440 MHz
20	2442 MHz	21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz	27	2456 MHz

28	2458 MHz	29	2460 MHz	30	2462 MHz	31	2464 MHz
32	2466 MHz	33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz	39	2480 MHz

802.11a/n/ac(20MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz	48	5240 MHz
52	5260 MHz	56	5280 MHz	60	5300 MHz	64	5320 MHz
100	5500 MHz	104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz	128	5640 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz	149	5745 MHz
153	5765 MHz	157	5785 MHz	161	5805 MHz	165	5825 MHz

802.11n/ac(40MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz	62	5310 MHz
102	5510 MHz	110	5550 MHz	118	5590 MHz	126	5630 MHz
134	5670 MHz	151	5755 MHz	159	5795 MHz	N/A	N/A

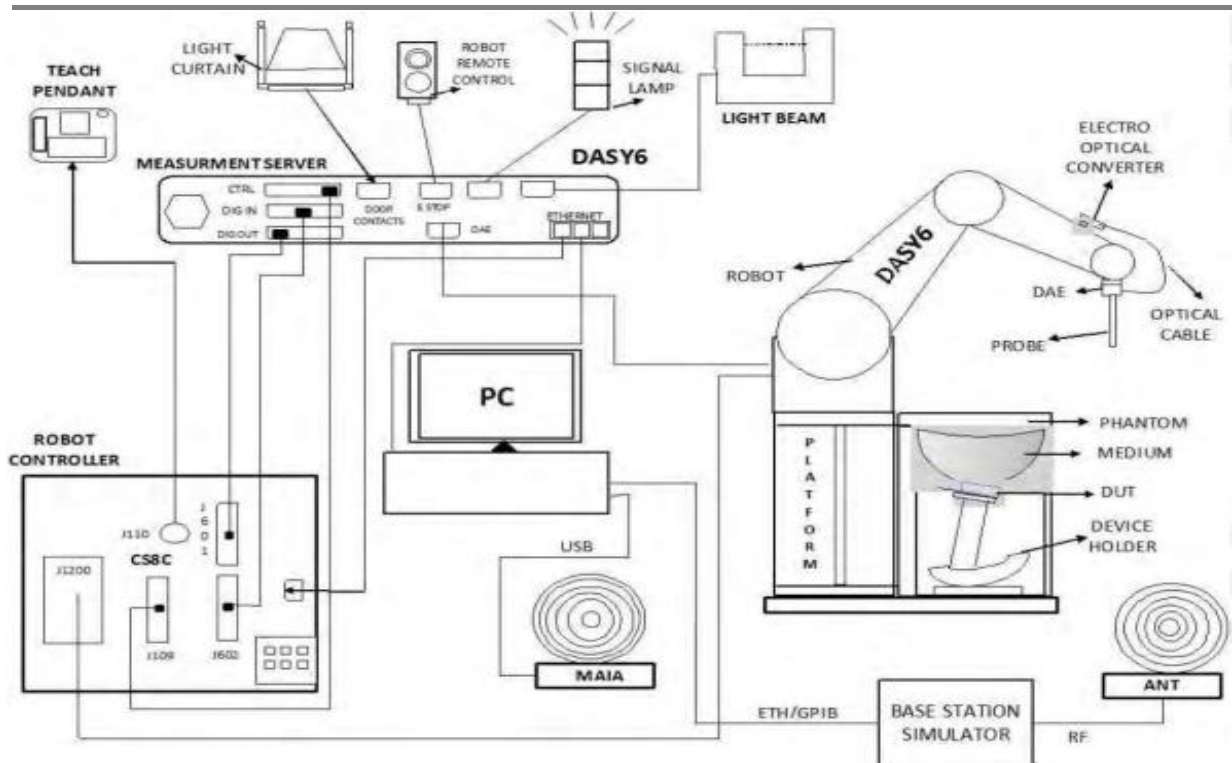
802.11ac(80MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530MHz	122	5610 MHz
138	5690 MHz	155	5775 MHz	N/A	N/A	N/A	N/A

Note: The General Description of the Item, antenna information and Channel List in clause 1 are provided and confirmed by the client.

2 SAR MEASUREMENT SYSTEM

2.1 DASY6 System Description



The DASY6 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A 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.
3. The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
4. The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
5. A computer running Windows 11 and the DASY6 software.
6. Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
7. The phantom, the device holder and other accessories according to the targeted measurement.

2.1.1. Applications

Predefined procedures and evaluations for automated compliance testing with all worldwide standards, e.g., IEC/IEEE 62209-1528, KDB 865664 and others.

2.1.2. Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures points and step size follow as below. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution. The measure settings are referred to KDB 865664 D01v01r04:

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Area} , Δy_{Area}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	Graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5 · $\Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.				
* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

2.1.3. Uncertainty of Inter-/Extrapolation and Averaging

In order to evaluate the uncertainty of the interpolation, extrapolation and averaged SAR calculation algorithms of the Postprocessor, DASY6 allows the generation of measurement grids which are artificially predefined by analytically based test functions. Therefore, the grids of area scans and zoom scans can be filled with uncertainty test data, according to the SAR benchmark functions of IEC/IEEE 62209-1528. The three analytical functions shown in equations as below are used to describe the possible range of the expected SAR distributions for the tested handsets. The field gradients are covered by the spatially flat distribution f1, the spatially steep distribution f3 and f2 accounts for H-field cancellation on the phantom/tissue surface.

$$f_1(x, y, z) = Ae^{-\frac{z}{2a}} \cos^2 \left(\frac{\pi}{2} \frac{\sqrt{x'^2 + y'^2}}{5a} \right)$$

$$f_2(x, y, z) = Ae^{-\frac{z}{a}} \frac{a^2}{a^2 + x'^2} \left(3 - e^{-\frac{2z}{a}} \right) \cos^2 \left(\frac{\pi}{2} \frac{y'}{3a} \right)$$

$$f_3(x, y, z) = A \frac{a^2}{\frac{a^2}{4} + x'^2 + y'^2} \left(e^{-\frac{2z}{a}} + \frac{a^2}{2(a + 2z)^2} \right)$$

2.2 DASY6 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEC/IEEE 62209-1528, etc.) under ISO 17025. The calibration data are in Appendix D.

Model	EX3DV4	
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 μ W/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)	
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 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%.	

2.3 Boundary Detection Unit and Probe Mounting Device

The DASY probes use a precise connector and an additional holder for the probe, consisting of a plastic tube and a flexible silicon ring to center the probe. The connector at the DAE is flexibly mounted and held in the default position with magnets and springs. Two switching systems in the connector mount detect frontal and lateral probe collisions and trigger the necessary software response.



2.4 DATA Acquisition Electronics (DAE) and Measurement Server

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit.

Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE4 is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.



The DASY6 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chipdisk and 128MB RAM. The necessary circuits for communication with the DAE electronics box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY6 I/O board, which is directly connected to the PC/104 bus of the CPU board.



2.5 Robot

The DASY6 system uses the high precision robots TX90 XL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY6 system, the CS8C robot controller version from Stäubli is used. The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller



2.6 Light Beam Unit

The light beam switch allows automatic "tooling" of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.

The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.



2.7 Device Holder

The DASY6 device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).

Thus the device needs no repositioning when changing the angles.

The DASY6 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon_r = 3$ and loss tangent $\delta = 0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.



The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

The DASY6 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon_r = 3$ and loss tangent $\delta = 0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.



2.8 Phantom

SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left head
- Right head
- Flat phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.



ELI Phantom

The SAM phantom is a fiberglass shell phantom with 2mm shell thickness. It has one measurement areas:

- ELI phantom

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 7.125 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.



3 TISSUE SIMULATING LIQUID

3.1 The composition of the tissue simulating liquid

Simulate 600MHz~10000MHz liquid, manufactured by SPEAG

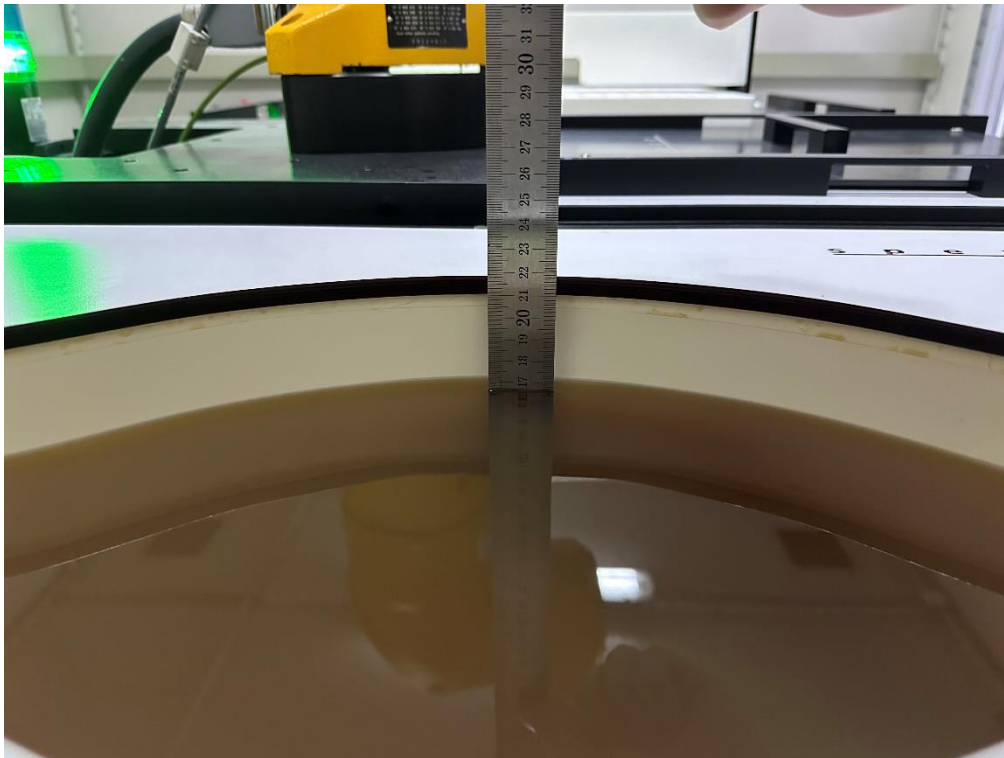
Table F.1 – Suggested recipes for achieving target dielectric properties, 30 MHz to 900 MHz

Frequency (MHz)	30	50		144		450		835	900	
Recipe source number	3	3	2	2	3	2	4	2	2	4
Ingredients (% by weight)										
De-ionized water	48,30	48,30	53,53	55,12	48,30	48,53	56	50,36	50,31	56
Tween 20			44,70	43,31		49,51		48,39	48,34	
Oxidized mineral oil							44			44
Diethyleneglycol monohexylether										
Triton X-100										
Diacetin	50,00	50,00			50,00					
DGBE										
NaCl	1,60	1,60	1,77	1,57	1,60	1,96		1,25	1,35	
Additives and salt	0,10	0,10			0,10					
Measured temperature dependence										
Temp. (°C)			21	21		21	20	21	21	20
$\epsilon_{\text{liquid temp. unc.}}$ (%)	0,8	0,1			0,1	0,1		0,04	0,04	
$\sigma_{\text{liquid temp. unc.}}$ (%)	2,8	2,8			2,6	4,2		1,6	1,6	

Table F.2 – Suggested recipes for achieving target dielectric properties, 1 800 MHz to 10 000 MHz

Frequency (MHz)	1 800		2 450		4 000	5 000	5 200	5 800	6 000	8 000	10 000
Recipe source number	2	4	4	4	4	4	1	1	4	5	5
Ingredients (% by weight)											
De-ionized water	54,23	56	56	56	56	56	65,53	65,53	56	67,8	66,0
Tween	45,27									31,1	33,0
Oxidized mineral oil		44	44	44	44	44			44		
Diethyleneglycol monohexylether							17,24	17,24			
Triton X-100							17,24	17,24			
Diacetin											
DGBE											
NaCl	0,50										
Additives and salt											
Measured temperature dependence											
Temp. (°C)	21	20	20	20	20	20	22	22	20	20	20
$\epsilon_{\text{liquid temp. unc.}}$ (%)	0,4						1,7	1,8			
$\sigma_{\text{liquid temp. unc.}}$ (%)	2,3						2,7	2,6			
NOTE 1 Multiple columns under a single frequency indicate optional recipes.											
NOTE 2 Recipe source numbers: 1 verified by different labs, 2 Reference [59], 3 developed by IT'IS Foundation, 4 developed by IT'IS Foundation, 5 Reference [60].											
NOTE 3 The values of $\epsilon_{\text{liquid temp. unc.}}$ and $\sigma_{\text{liquid temp. unc.}}$ are liquid temperature uncertainties described in O.9.6, based on measurements of the applicable liquid recipes given above. These are not part of the original publications but have been subsequently developed by the project team.											
NOTE 4 The recipes at 8 000 MHz and 10 000 MHz are sufficiently broadband that they cover the frequency range of 6 000 MHz to 10 000 MHz within a tolerance of ± 10 % for permittivity and conductivity.											

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.



The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528, and KDB 865664 D01 Appendix A. For the body tissue simulating liquids, the dielectric properties are defined in KDB 865664 D01 Appendix A. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using a dielectric assessment kit and a network analyzer.

3.2 Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY6 Dielectric Probe Kit and Agilent Vector Network Analyzer E5071C

Head Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ϵ_r	σ [s/m]	
750MHz	Reference result ± 5% window	41.9 39.81 to 44.0	0.89 0.85 to 0.93	N/A
	15-01-2024	41.70	0.89	22.0
835MHz	Reference result ± 5% window	41.5 39.43 to 43.58	0.90 0.86 to 0.95	N/A
	20-01-2024	41.16	0.90	22.0
1800MHz	Reference result ± 5% window	40.0 38 to 42	1.40 1.33 to 1.47	N/A
	25-01-2024	38.82	1.41	22.0
1900MHz	Reference result ± 5% window	40.0 38 to 42	1.40 1.33 to 1.47	N/A
	30-01-2024	39.09	1.40	22.0
2600MHz	Reference result ± 5% window	39.0 37.05 to 40.95	1.96 1.86 to 2.06	N/A
	05-02-2024	37.93	2.03	22.0
2450 MHz	Reference result ± 5% window	39.2 37.24 to 41.16	1.80 1.71 to 1.89	N/A
	20-02-2024	38.54	1.86	22.0
5250 MHz	Reference result ± 5% window	35.9 34.11 to 37.70	4.71 4.47 to 4.95	N/A
	25-02-2024	36.38	4.60	22.0
5600 MHz	Reference result ± 5% window	35.5 33.73 to 37.28	5.07 4.82 to 5.32	N/A
	01-03-2024	35.8	4.99	22.0
5750 MHz	Reference result ± 5% window	35.4 33.63 to 37.17	5.22 4.96 to 5.48	N/A
	15-03-2024	35.55	5.17	22.0

Head Tissue Simulant Measurement									
CH	Frequency (MHz)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
9262	1852.4	1.36	39.30	1.40	40.00	-2.86	-1.75	±5	WCDMA II
9400	1880	1.38	39.19	1.40	40.00	-1.43	-2.03	±5	WCDMA II
9538	1907.6	1.41	39.06	1.40	40.00	0.71	-2.35	±5	WCDMA II
1312	1712.4	1.32	39.24	1.35	40.16	-2.30	-2.39	±5	WCDMA IV
1413	1732.6	1.34	39.13	1.36	40.13	-1.40	-2.42	±5	WCDMA IV
1513	1752.6	1.36	39.04	1.37	40.09	-0.51	-2.64	±5	WCDMA IV
4132	826.4	0.89	41.28	0.90	41.54	-0.89	-0.53	±5	WCDMA V
4183	836.6	0.90	41.14	0.91	41.52	-0.81	-0.87	±5	WCDMA V
4233	846.6	0.91	41.02	0.91	41.50	0.23	-1.16	±5	WCDMA V
26140	1860	1.36	39.28	1.40	40.00	-2.64	-1.80	±5	LTE Band25/2
26365	1882.5	1.38	39.19	1.40	40.00	-1.14	-2.03	±5	LTE Band25/2
26590	1905	1.41	39.07	1.40	40.00	0.57	-2.33	±5	LTE Band25/2
20050	1720	1.33	39.20	1.36	40.15	-2.43	-2.24	±5	LTE Band4
20175	1732.5	1.34	39.11	1.36	40.13	-1.18	-2.47	±5	LTE Band4
20300	1745	1.36	39.07	1.37	40.11	-1.09	-2.57	±5	LTE Band4
26765	821.5	0.89	41.33	0.90	41.56	-1.32	-0.65	±5	LTE Band26/5
26865	831.5	0.90	41.20	0.90	41.52	-0.24	-0.72	±5	LTE Band26/5
26915	836.5	0.90	41.14	0.90	41.50	0.29	-0.87	±5	LTE Band26/5 For IC
26965	841.5	0.91	41.08	0.91	41.50	-0.29	-1.01	±5	LTE Band26/5
23060	704	0.85	42.31	0.89	42.15	-4.66	0.50	±5	LTE Band12/17
23095	707.5	0.85	42.25	0.89	42.13	-4.21	0.36	±5	LTE Band12/17
23130	711	0.86	42.20	0.89	42.11	-3.92	0.24	±5	LTE Band12/17
23230	782	0.92	41.27	0.89	41.75	3.74	-1.03	±5	LTE Band13
40340	2565	1.99	38.08	1.93	39.05	3.32	-2.61	±5	LTE Band41
40740	2605	2.04	39.92	1.97	39.00	3.45	2.36	±5	LTE Band41
41140	2645	2.09	37.75	2.01	38.95	3.78	-3.21	±5	LTE Band41
1	2412	1.81	38.70	1.77	39.27	2.43	-1.53	±5	WLAN2.4GHz
6	2437	1.84	38.92	1.79	39.22	2.96	-0.71	±5	WLAN2.4GHz
11	2462	1.87	38.50	1.81	39.18	3.54	-1.79	±5	WLAN2.4GHz
0	2402	1.80	38.73	1.76	39.29	2.39	-1.45	±5	Bluetooth
39	2441	1.85	38.58	1.79	39.22	3.24	-1.58	±5	Bluetooth
78	2480	1.89	38.44	1.83	39.15	3.44	-1.94	±5	Bluetooth
52	5260	4.62	36.37	4.72	35.94	-2.18	1.31	±5	WLAN5GHz
60	5300	4.65	36.30	4.76	35.90	-2.25	1.11	±5	WLAN5GHz
64	5320	4.68	36.28	4.78	35.87	-2.13	1.06	±5	WLAN5GHz
100	5500	4.87	35.97	4.97	35.63	-1.93	1.04	±5	WLAN5GHz
116	5580	4.97	35.87	5.05	35.53	-1.56	1.04	±5	WLAN5GHz
140	5700	5.11	35.64	5.17	35.40	-1.24	0.68	±5	WLAN5GHz
149	5745	5.16	35.56	5.22	35.36	-1.15	0.45	±5	WLAN5GHz
157	5785	5.20	35.53	5.26	35.32	-1.06	0.65	±5	WLAN5GHz
165	5825	5.25	35.44	5.30	35.28	-0.94	0.40	±5	WLAN5GHz

Note:

1. The delta (ϵ_r) and (σ) are within $\pm 5\%$, delta SAR value was not calculated in this report.
2. As per IEC/IEEE 62209-1528 Annex F, the SAR correction factor is given by:

$$\Delta SAR = C_{\epsilon} \Delta \epsilon_r + C_{\sigma} \Delta \sigma$$

For the 1g average SAR C_{ϵ} and C_{σ} are given by:

$$C_{\epsilon} = -7.854 \times 10^{-4} f^3 + 9.402 \times 10^{-3} f^2 - 2.742 \times 10^{-2} f - 0.2026$$

$$C_{\sigma} = 9.804 \times 10^{-3} f^3 - 8.661 \times 10^{-2} f^2 + 2.981 \times 10^{-2} f + 0.7829$$

Where f is the frequency in GHz.

3.3 Tissue Dielectric Parameters for Head Phantoms

The head tissue dielectric parameters recommended by the IEC/IEEE 62209-1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head tissue parameters that have not been specified in IEC/IEEE 62209-1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in IEC/IEEE 62209-1528.

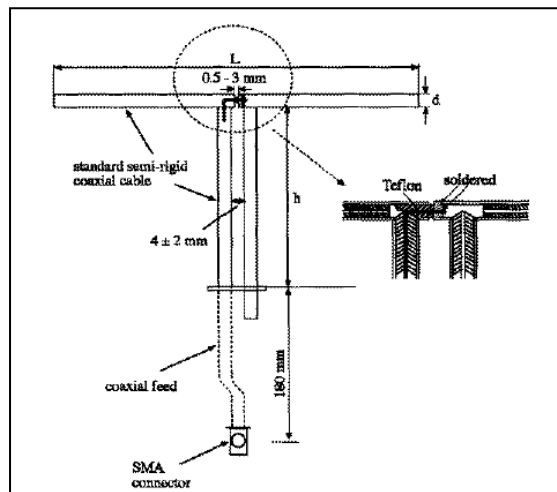
Target Frequency (MHz)	Head	
	ϵ_r	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
750	41.9	0.89
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40
5800	35.3	5.07

(ϵ_r = relative permittivity, σ = conductivity and $\rho = 1000 \text{ kg/m}^3$)

4 SAR MEASUREMENT PROCEDURE

4.1 SAR System Validation

4.1.1. Validation Dipoles



The dipoles used is based on the IEC/IEEE 62209-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. the table below provides details for the mechanical and electrical specifications for the dipoles.

Frequency	L (mm)	h (mm)	d (mm)
750MHz	176.0	100.0	6.35
835MHz	161.0	89.8	3.6
900MHz	149.0	83.3	3.6
1800MHz	72.0	41.7	3.6
2000MHz	64.5	37.5	3.6
2600MHz	48.5	28.8	3.6
3500MHz	37.0	26.4	3.6
3700MHz	34.7	26.4	3.6
3900MHz	32.4	26.4	3.6
5000 to 6000MHz	20.6	40.3	3.6

4.1.2. Validation Result

System Performance Check at 750MHz, 835MHz, 1800MHz, 1900MHz, 2450MHz, 2600MHz, 5250MHz, 5600MHz, 5750MHz				
Validation Dipole: D750V3, SN: 1086				
Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
750 MHz	Reference result ± 10% window	8.41 7.57 to 9.25	5.50 4.95 to 6.05	N/A
	15-01-2024	8.56	5.72	22.0
Validation Dipole: D835V2, SN: 4d094				
835 MHz	Reference result ± 10% window	9.44 8.50 to 10.38	6.20 5.58 to 6.82	N/A
	20-01-2024	10.04	6.64	22.0
Validation Dipole: D1800V2, SN: 2d179				
1800 MHz	Reference result ± 10% window	39.00 35.1 to 42.9	20.50 18.45 to 22.55	N/A
	25-01-2024	35.96	18.76	22.0
Validation Dipole: D1900V2, SN: 5d121				
1900 MHz	Reference result ± 10% window	39.50 39.55 to 43.45	20.30 18.27 to 22.33	N/A
	30-01-2024	36.56	18.92	22.0
Validation Dipole: D2450V2, SN: 839				
2450 MHz	Reference result ± 10% window	52.60 47.34 to 57.86	24.30 21.87 to 26.73	N/A
	20-02-2024	51.20	23.72	22.0
Validation Dipole: D2600V2, SN: 1029				
2600 MHz	Reference result ± 10% window	55.60 50.04 to 61.16	24.80 22.32 to 27.28	N/A
	05-02-2024	54.00	24.40	22.0
Validation Dipole: D5GHzV2, SN: 1078				
5250 MHz	Reference result ± 10% window	76.00 68.40 to 83.60	21.60 19.44 to 23.76	N/A
	25-02-2024	77.00	21.70	22.0
Validation Dipole: D5GHzV2, SN: 1078				
5600 MHz	Reference result ± 10% window	79.50 71.55 to 87.45	22.40 20.16 to 24.64	N/A



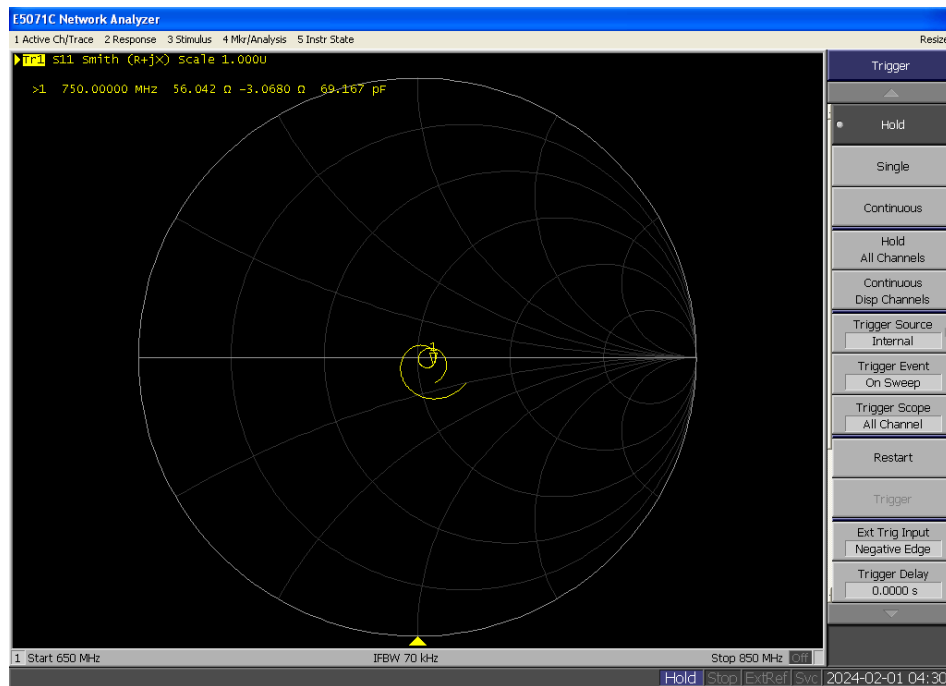
	03-03-2024	78.60	22.00	22.0
Validation Dipole: D5GHzV2, SN: 1078				
5750 MHz	Reference result ± 10% window	75.70 68.13 to 83.27	21.30 19.17 to 23.43	N/A
	15-03-2024	73.30	20.80	22.0
Note: All SAR values are normalized to 1W forward power.				

4.1.3. Dipole Calibration Data

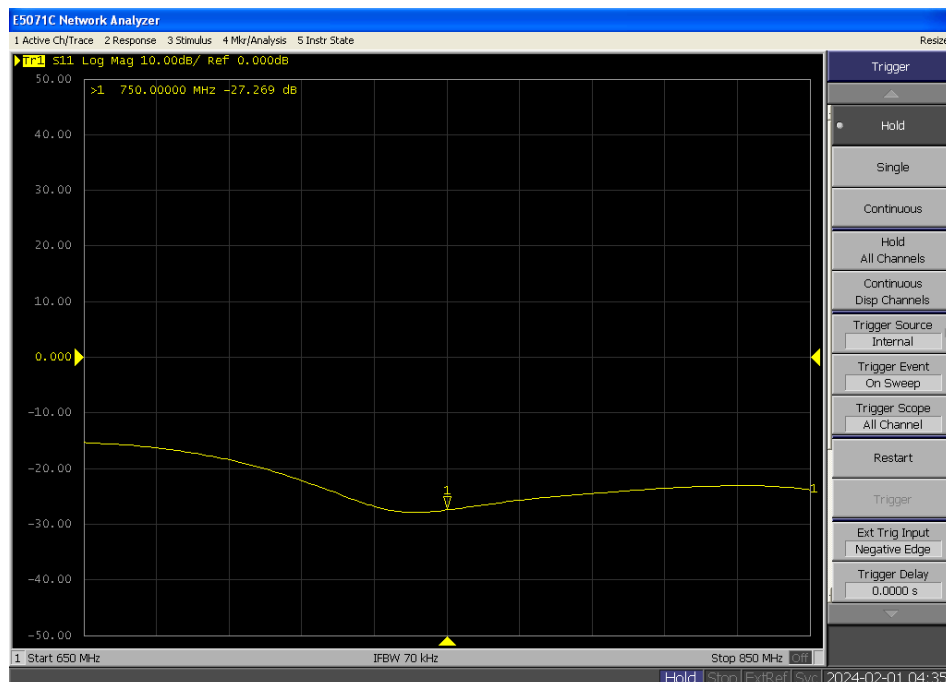
Impedance Plot for D750V3

750MHz Head

Calibrated impedance: 55.283 Ω ; Measured impedance: 56.042 Ω (within 5 Ω)



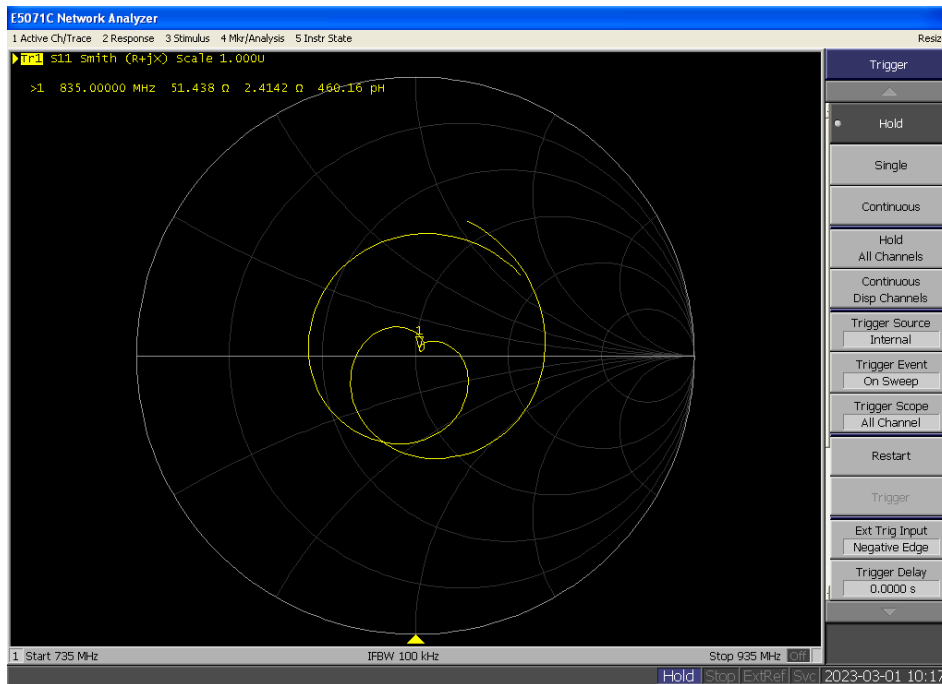
Calibrated return loss: -25.938 dB; Measured impedance: -27.269 dB (within 20%)



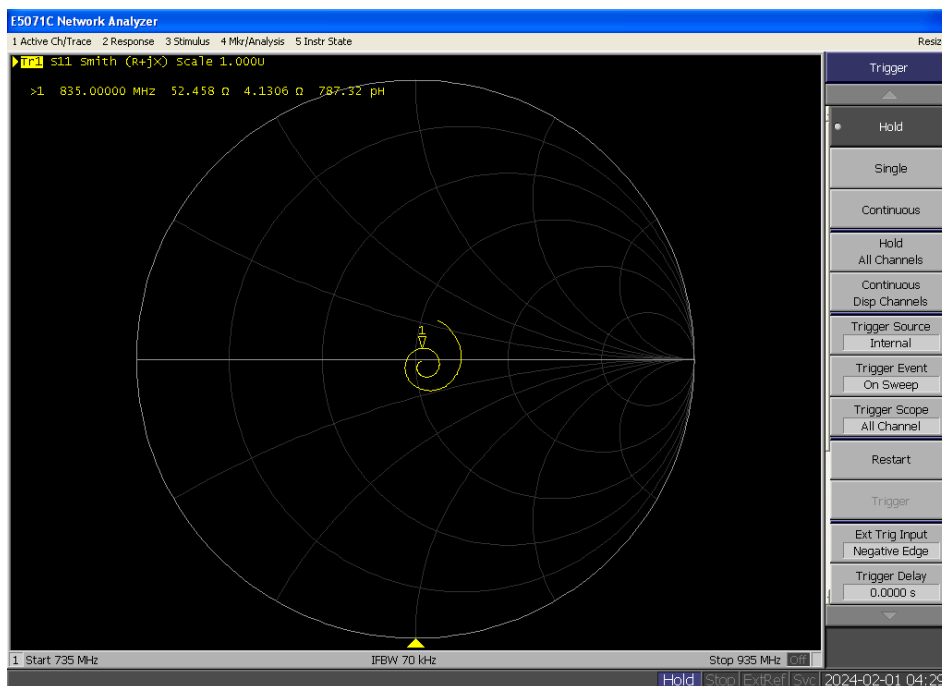
Impedance Plot for D835V2

835MHz Head

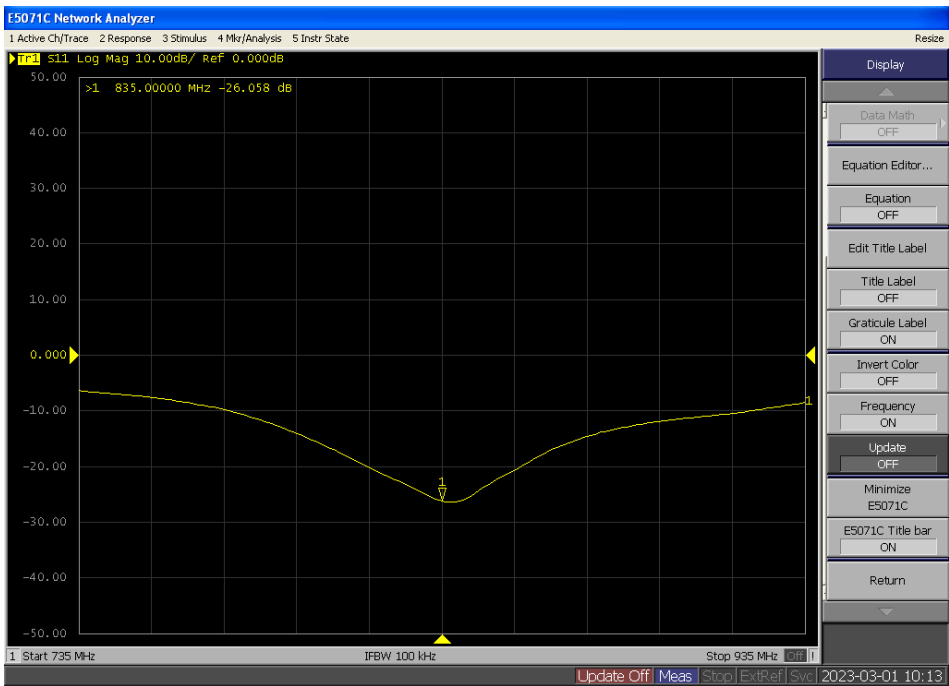
Calibrated impedance: 50.234 Ω ; Measured impedance: 51.438 Ω (within 5 Ω)



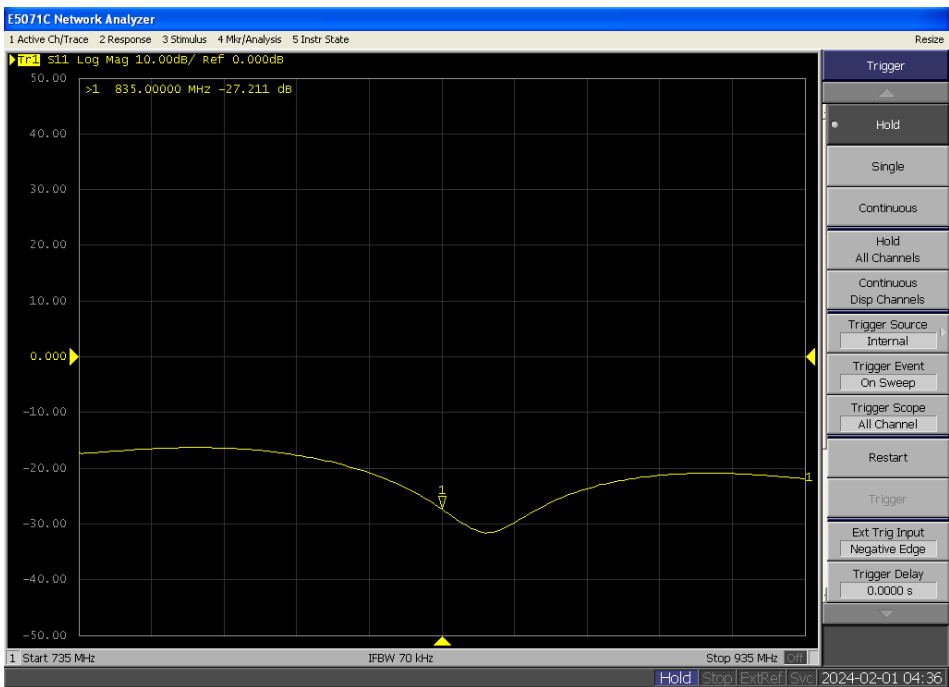
Calibrated impedance: 50.234 Ω ; Measured impedance: 52.458 Ω (within 5 Ω)



Calibrated return loss: -27.673 dB; Measured impedance: -26.058 dB (within 20%)



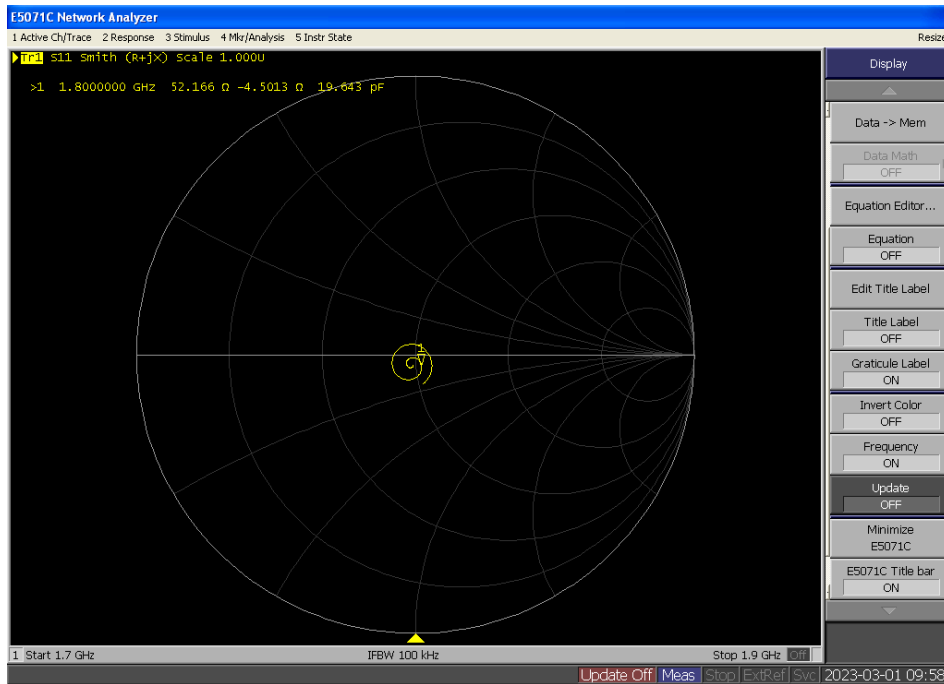
Calibrated return loss: -27.673 dB; Measured impedance: -27.211 dB (within 20%)



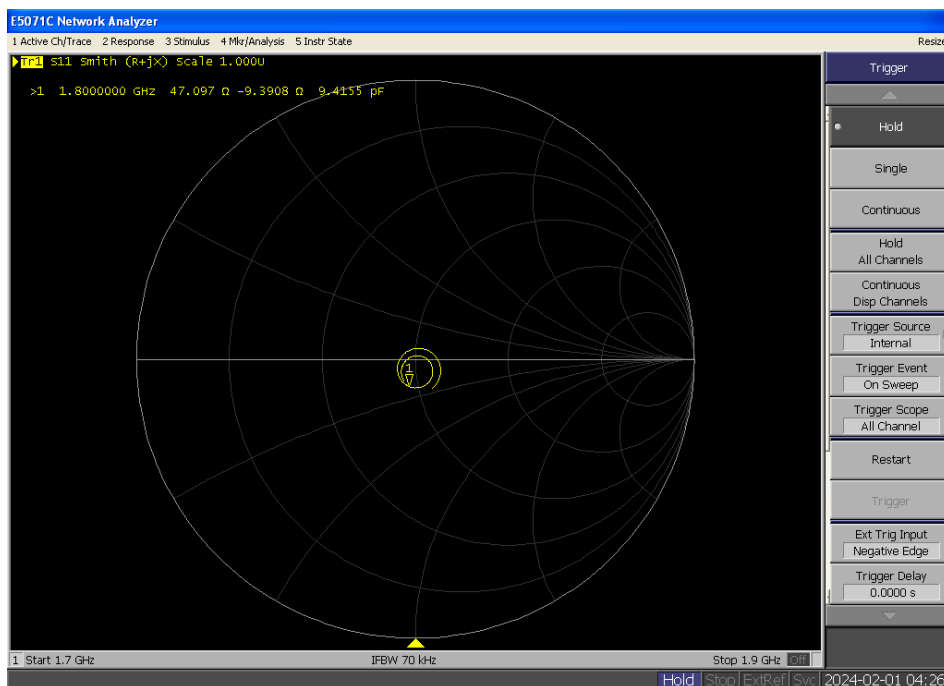
Impedance Plot for D1800V2

1800MHz Head

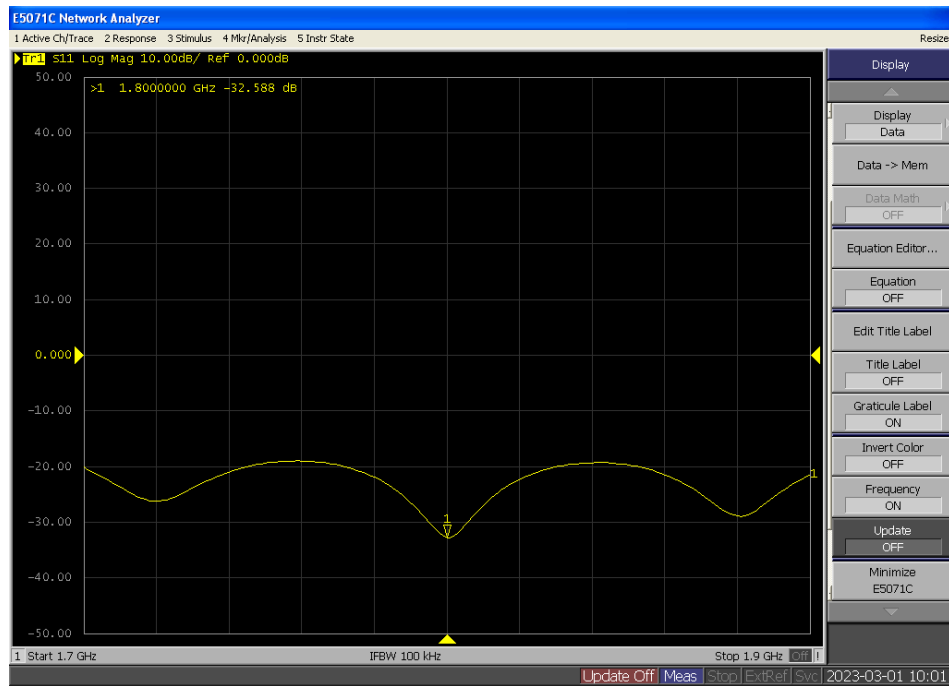
Calibrated impedance: 49.000 Ω ; Measured impedance: 52.166 Ω (within 5 Ω)



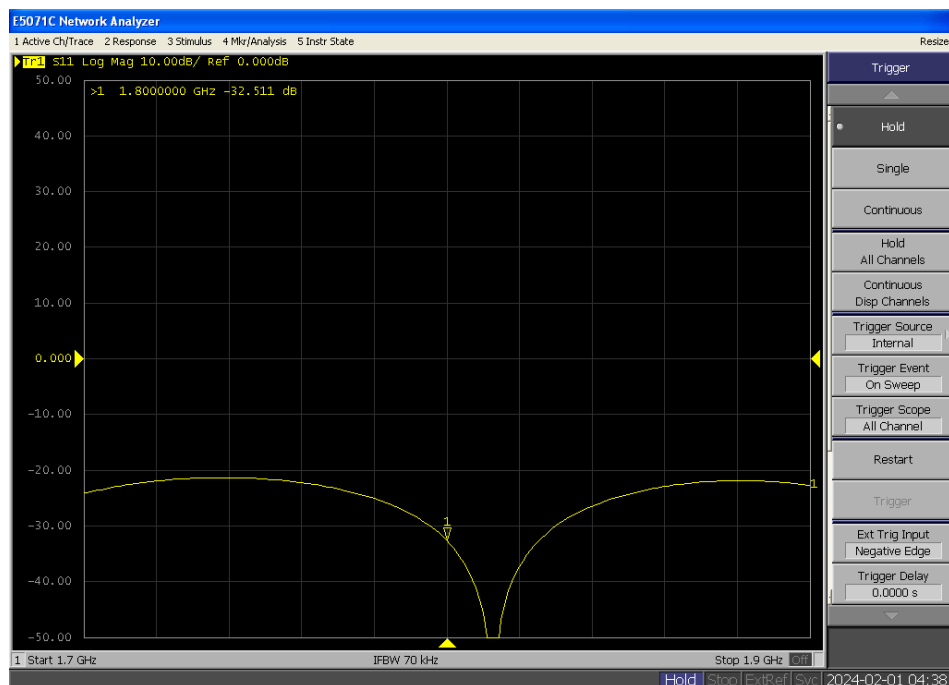
Calibrated impedance: 49.000 Ω ; Measured impedance: 47.097 Ω (within 5 Ω)



Calibrated return loss: -31.568 dB; Measured impedance: -32.588 dB (within 20%)



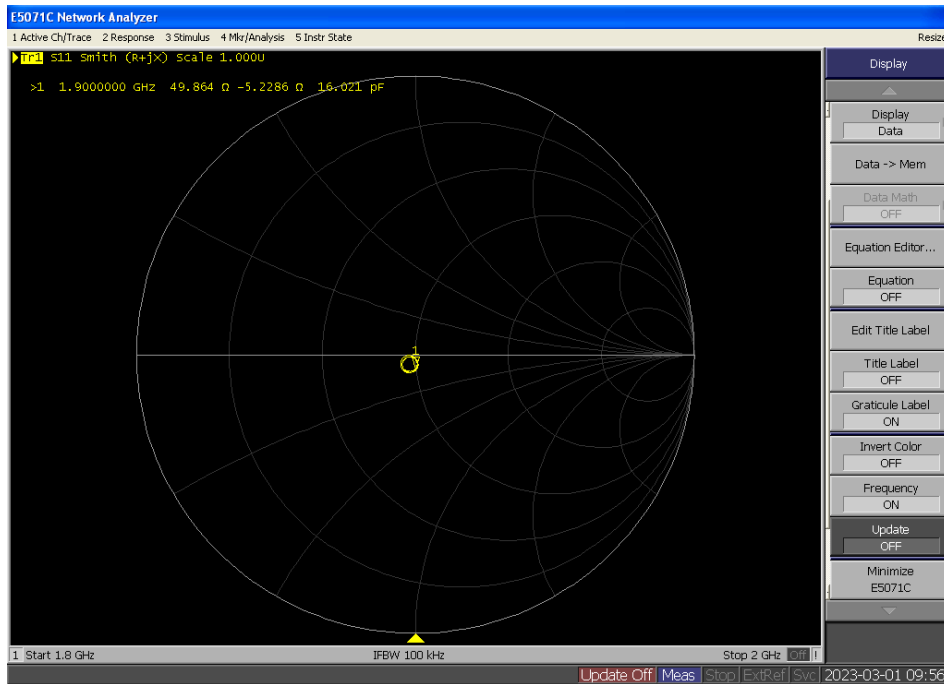
Calibrated return loss: -31.568 dB; Measured impedance: -32.511 dB (within 20%)



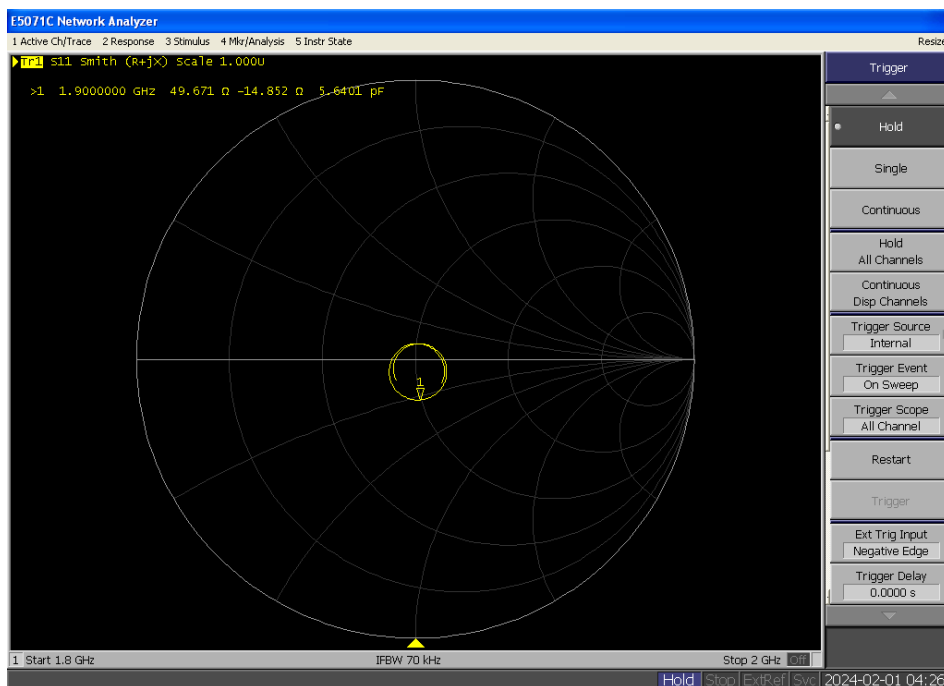
Impedance Plot for D1900V2

1900MHz Head

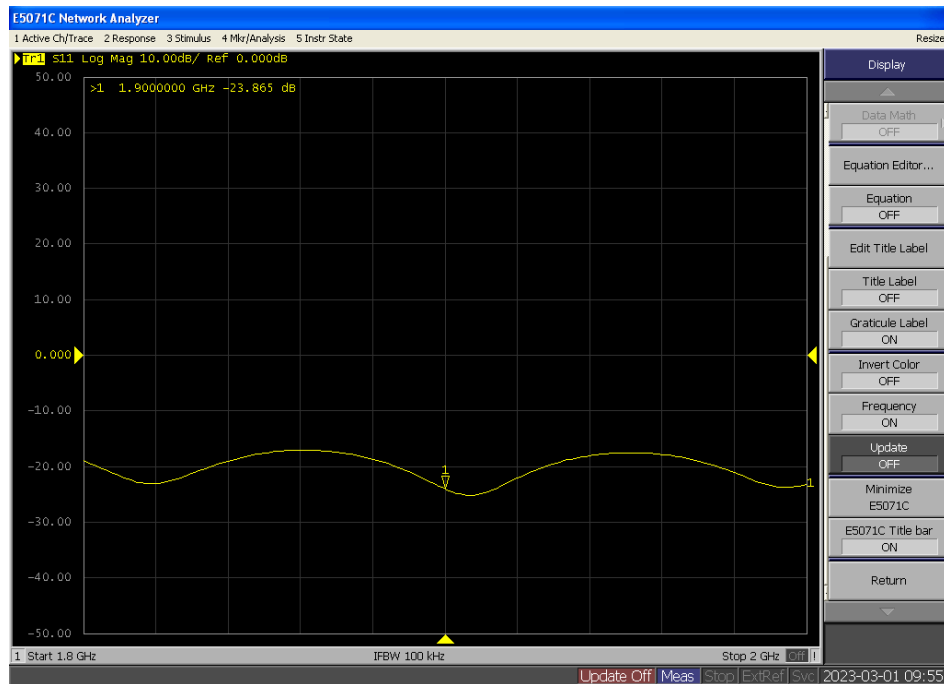
Calibrated impedance: 49.116 Ω ; Measured impedance: 49.864 Ω (within 5 Ω)



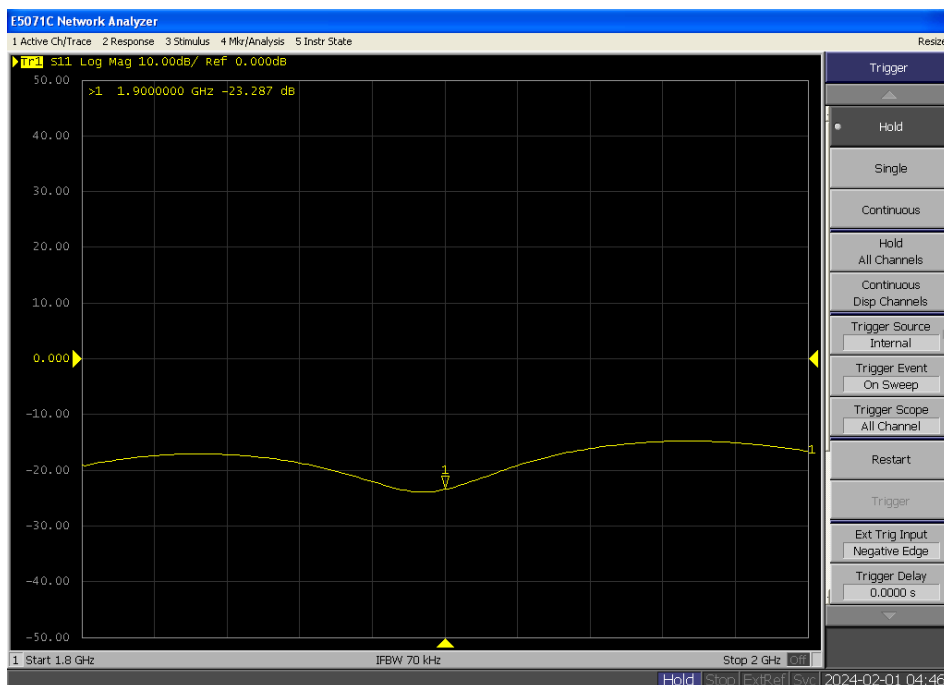
Calibrated impedance: 49.116 Ω ; Measured impedance: 49.671 Ω (within 5 Ω)



Calibrated return loss: -24.371 dB; Measured impedance: -23.865 dB (within 20%)



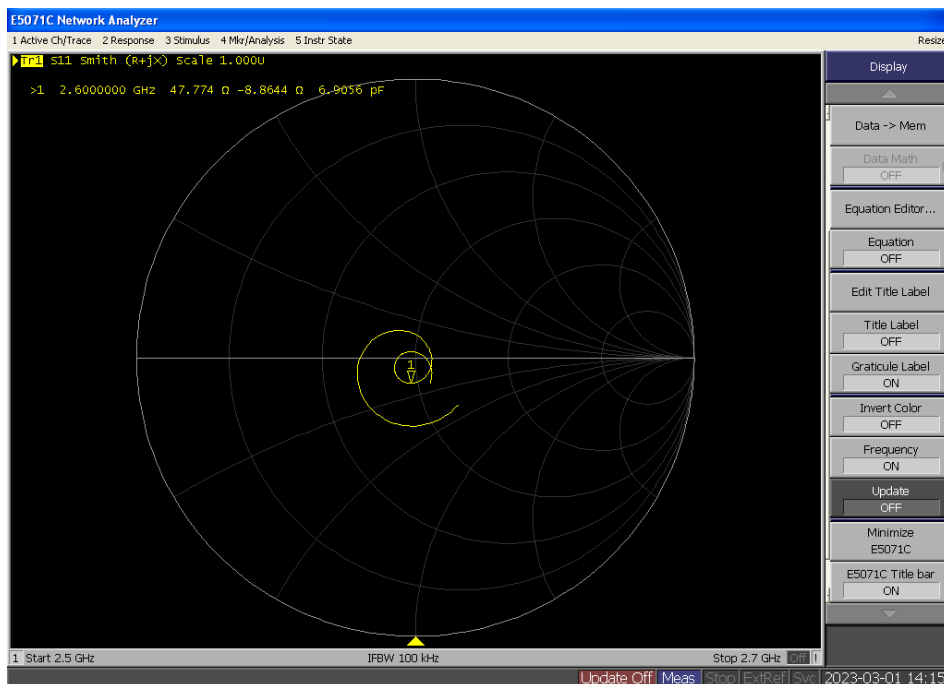
Calibrated return loss: -24.371 dB; Measured impedance: -23.287 dB (within 20%)



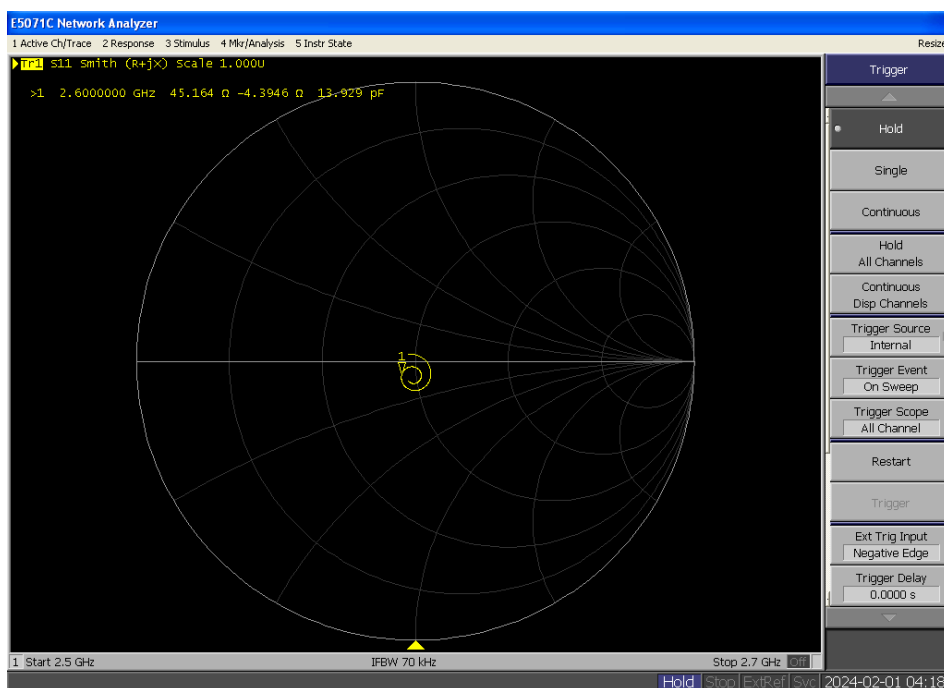
Impedance Plot for D2600V2

2600MHz Head

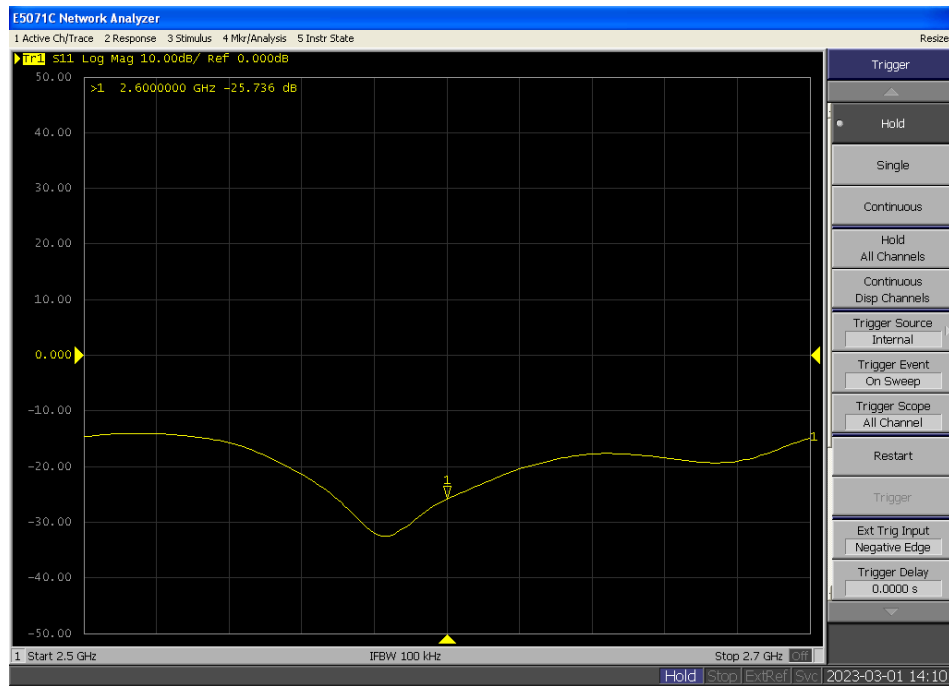
Calibrated impedance: 48.200 Ω ; Measured impedance: 47.774 Ω (within 5 Ω)



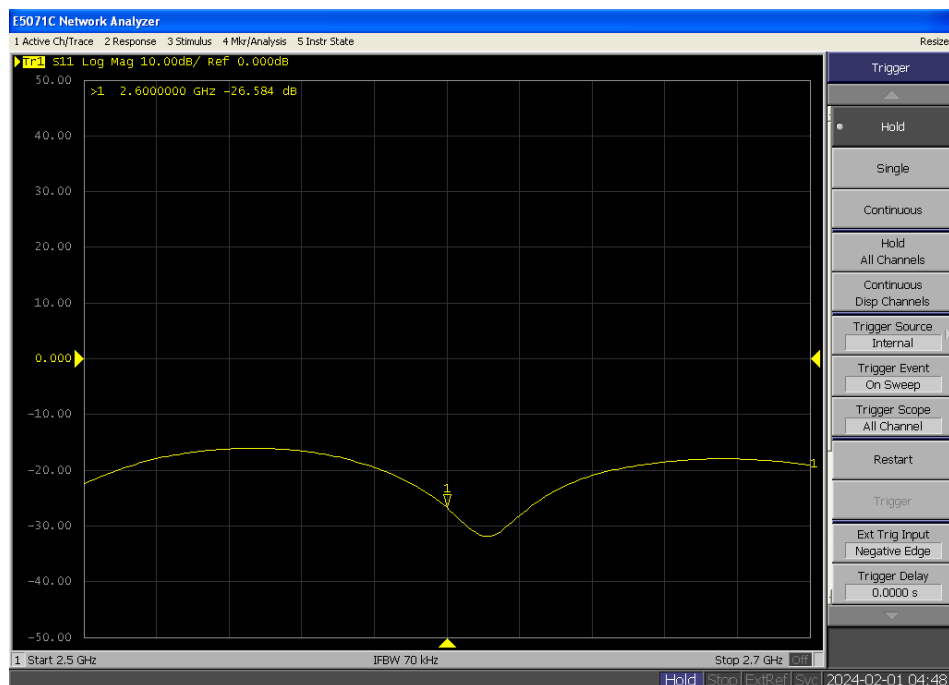
Calibrated impedance: 48.200 Ω ; Measured impedance: 45.164 Ω (within 5 Ω)



Calibrated return loss: -26.012 dB; Measured impedance: -25.736 dB (within 20%)



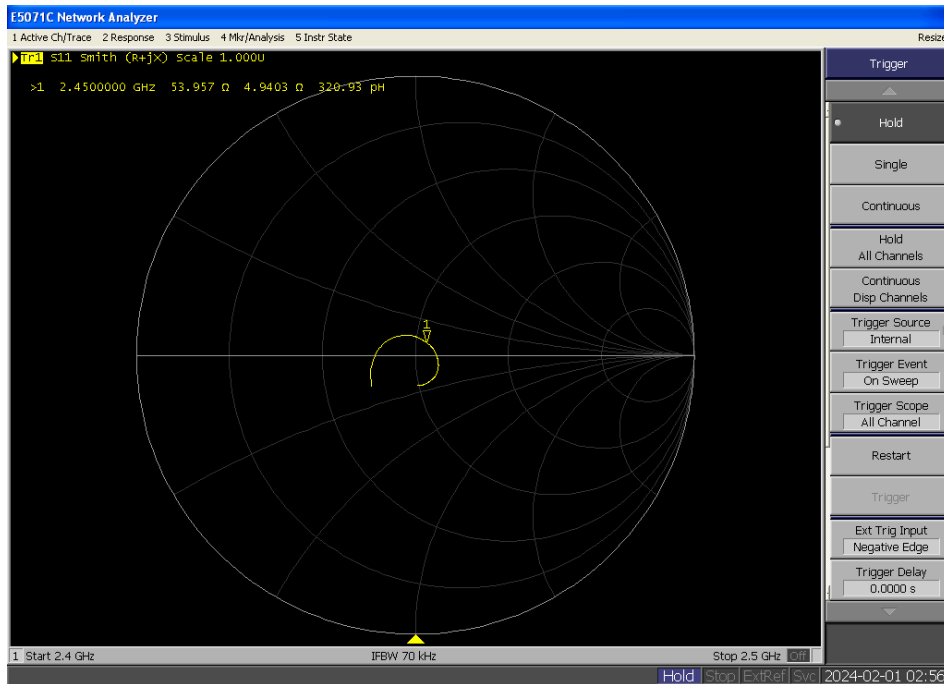
Calibrated return loss: -26.012 dB; Measured impedance: -26.584 dB (within 20%)



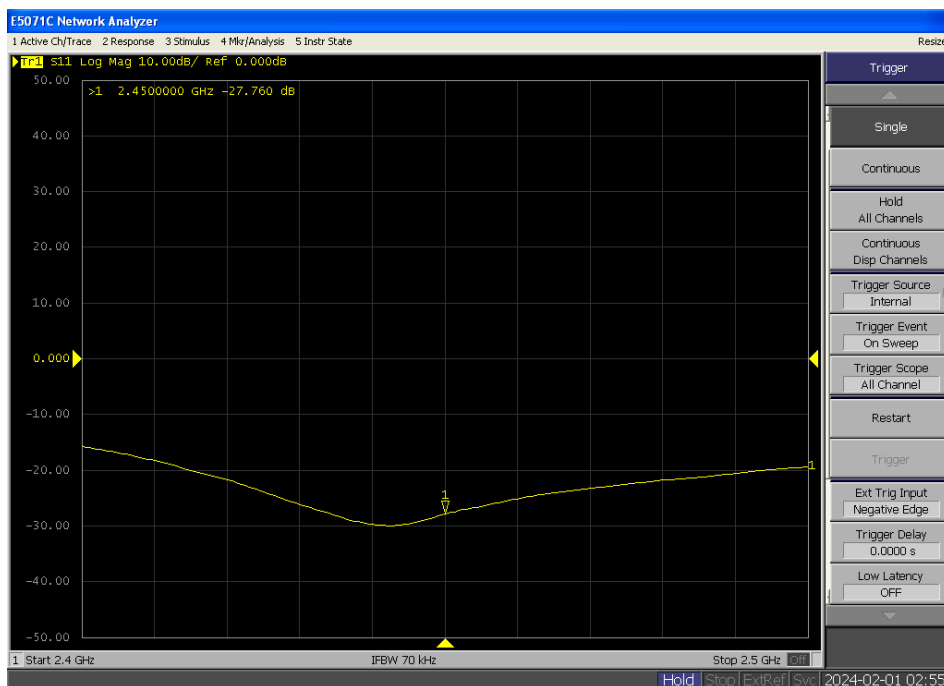
Impedance Plot for D2450V2

2450MHz Head

Calibrated impedance: 54.028 Ω ; Measured impedance: 53.957 Ω (within 5 Ω)



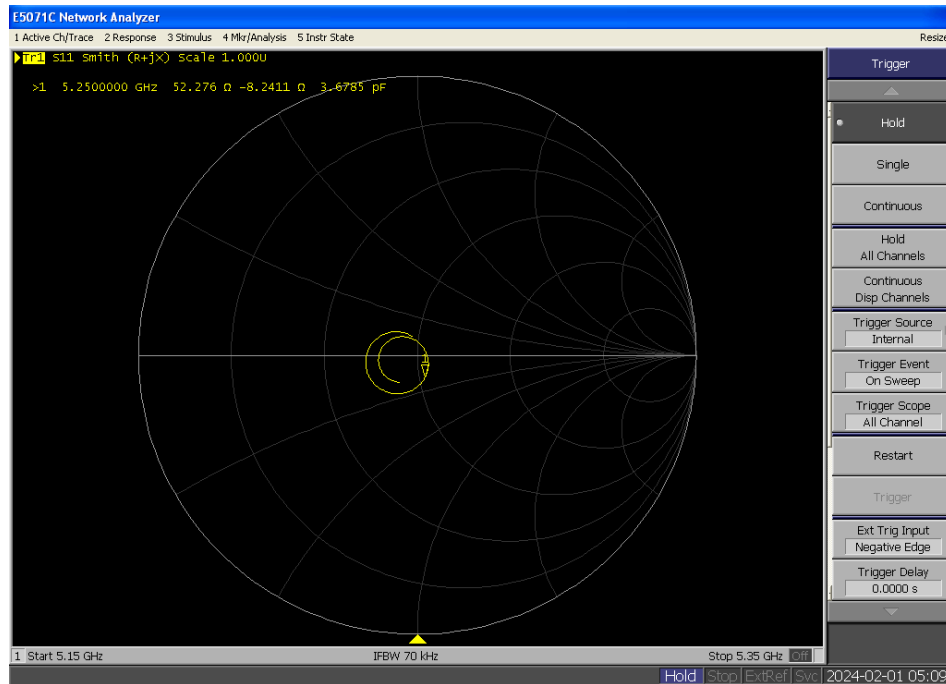
Calibrated return loss: -25.693 dB; Measured impedance: -27.760 dB (within 20%)



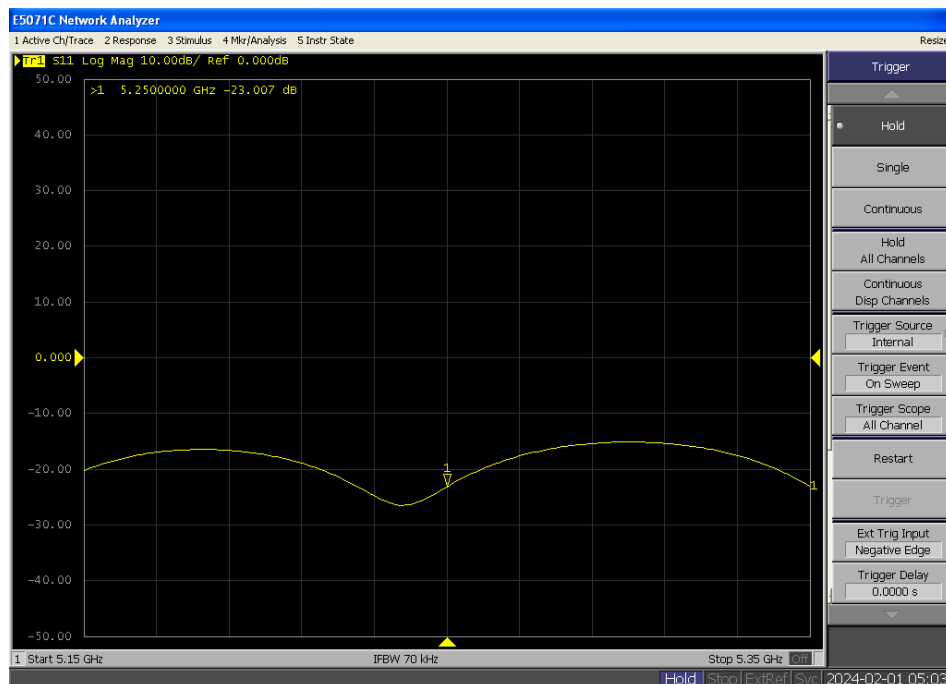
Impedance Plot for D5250V2

5250MHz Head

Calibrated impedance: 52.316 Ω ; Measured impedance: 52.276 Ω (within 5 Ω)

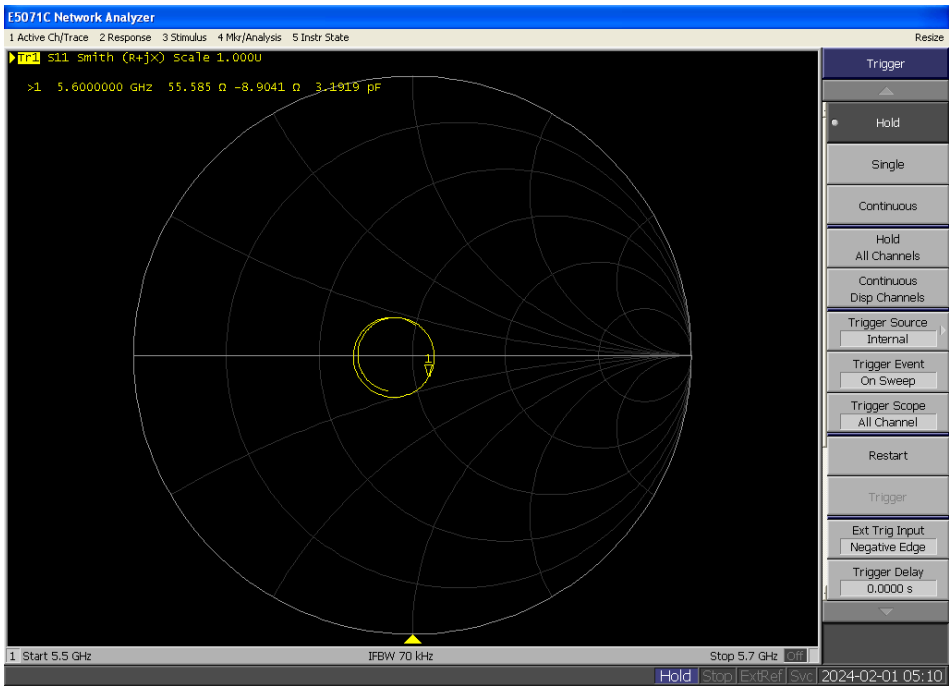


Calibrated return loss: -22.294 dB; Measured impedance: -23.007 dB (within 20%)

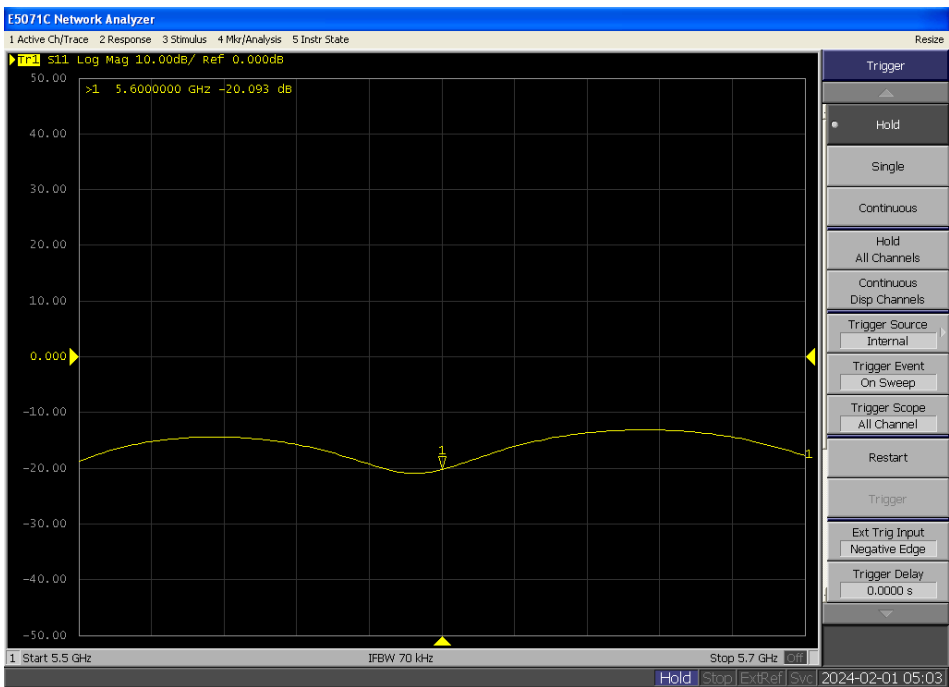


Impedance Plot for D5600V2
5600MHz Head

Calibrated impedance: 58.284 Ω ; Measured impedance: 55.585 Ω (within 5 Ω)



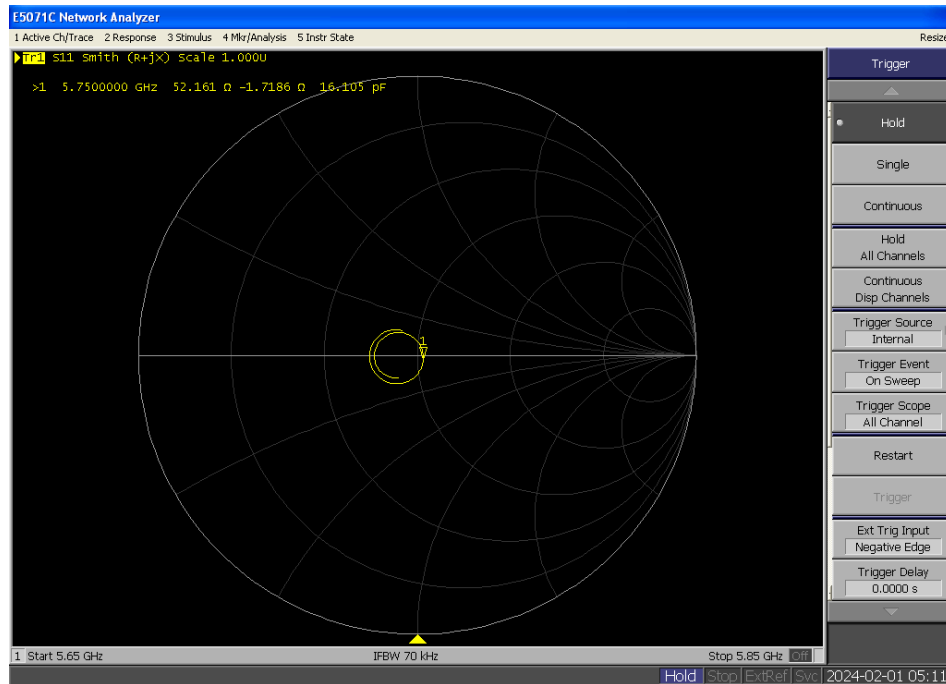
Calibrated return loss: -21.282 dB; Measured impedance: -20.093 dB (within 20%)



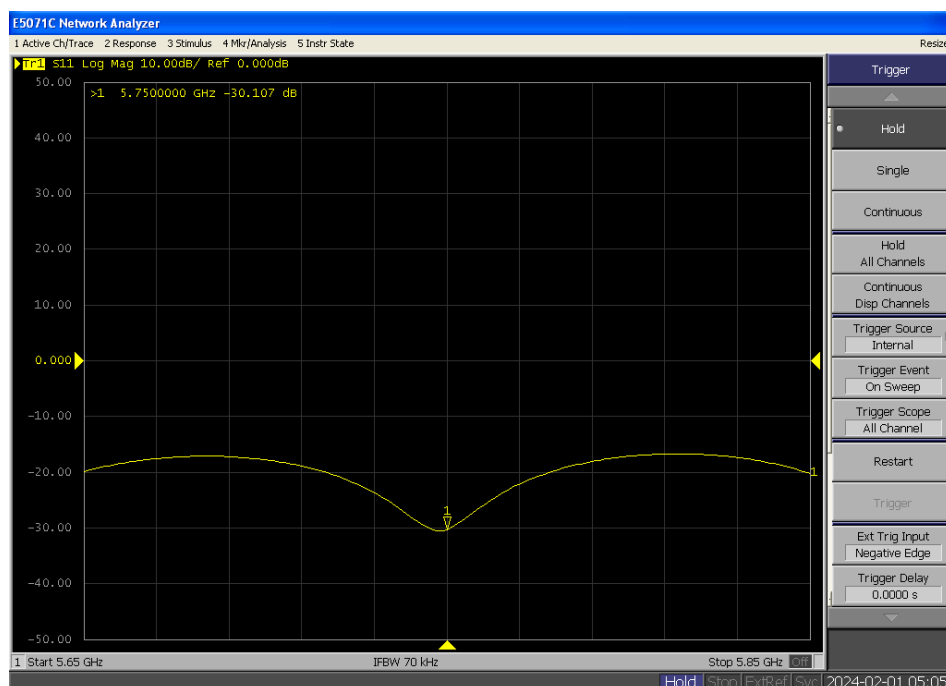
Impedance Plot for D5750V2

5750MHz Head

Calibrated impedance: 53.508 Ω ; Measured impedance: 52.161 Ω (within 5 Ω)



Calibrated return loss: -29.164 dB; Measured impedance: -30.107 dB (within 20%)



Note: Per KDB 450824 D02 requirements for dipole calibration, DEKRA Lab has adopted three years calibration interval. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement (Show above);
4. Impedance is within 5Ω of calibrated measurement (Show above).

4.2 SAR Measurement Procedure

The DASY 6 calculates SAR using the following equation,

$$SAR = \frac{\sigma |E|^2}{\rho}$$

σ : represents the simulated tissue conductivity

ρ : represents the tissue density

The EUT is set to transmit at the required power in line with product specification, at each frequency relating to the LOW, MID, and HIGH channel settings.

Pre-scans are made on the device to establish the location for the transmitting antenna, using a large area scan in either air or tissue simulation fluid.

The EUT is placed against the Universal Phantom where the maximum area scan dimensions are larger than the physical size of the resonating antenna. When the scan size is not large enough to cover the peak SAR distribution, it is modified by either extending the area scan size in both the X and Y directions, or the device is shifted within the predefined area.

The area scan is then run to establish the peak SAR location (interpolated resolution set at 1mm²) which is then used to orient the center of the zoom scan. The zoom scan is then executed and the 1g and 10g averages are derived from the zoom scan volume (interpolated resolution set at 1mm³).

5 SAR EXPOSURE LIMITS

SAR assessments have been made in line with the requirements of IEEE-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1-1992 “Uncontrolled Environments” limits. These limits apply to a location which is deemed as “Uncontrolled Environment” which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

Limits for General Population/Uncontrolled Exposure (W/kg)

Type Exposure	Uncontrolled Environment Limit
Spatial Peak SAR (1g cube tissue for brain or Body)	1.6 W/kg
Spatial Average SAR (whole Body)	0.08 W/kg
Spatial Peak SAR (10g for hands, feet, ankles and wrist)	4.00 W/kg

6 TEST EQUIPMENT LIST

Instrument	Manufacturer	Model No.	Serial No.	Cal.Date	Next Cal. Date	Firmware Version	Software Version
Stäubli Robot TX60L	Stäubli	TX60L	F10/5C90A1/A/01	N/A	N/A	N/A	N/A
Controller	Stäubli	SP1	S-0034	N/A	N/A	N/A	N/A
Dipole Validation Kits	Speag	D750V3	1086	2023.03.20	2026.03.19	N/A	N/A
Dipole Validation Kits	Speag	D835V2	4d094	2022.03.31	2025.03.30	N/A	N/A
Dipole Validation Kits	Speag	D1800V2	2d179	2022.03.31	2025.03.30	N/A	N/A
Dipole Validation Kits	Speag	D1900V2	5d121	2022.03.28	2025.03.27	N/A	N/A
Dipole Validation Kits	Speag	D2450V2	839	2022.04.01	2025.03.31	N/A	N/A
Dipole Validation Kits	Speag	D2600V2	1029	2022.03.31	2025.03.30	N/A	N/A
Dipole Validation Kits	Speag	D5GHzV2	1078	2022.03.28	2025.03.27	N/A	N/A
SAM Twin Phantom	Speag	SAM	TP-1562	N/A	N/A	N/A	N/A
Device Holder	Speag	SD 000 H01 HA	N/A	N/A	N/A	N/A	N/A
Data Acquisition Electronic	Speag	DAE4	1220	2023.03.20	2024.03.19	N/A	N/A
Data Acquisition Electronic	Speag	DAE4	679	2023.06.26	2024.06.25	N/A	N/A
E-Field Probe	Speag	EX3DV4	7761	2023.09.13	2024.09.12	N/A	N/A
SAR Software	Speag	DASY6	V5.2 Build 162	N/A	N/A	N/A	V16.2.4.2448
Power Amplifier	MVE	MPC1018.50	C30002D	2023.07.09	2024.07.08	N/A	N/A
Dual Directional Coupler	woken	0110A05A82Z-20	CMLC66W1A1	2023.07.23	2024.07.22	N/A	N/A
Tissue fluid test probe	SPEAG	DAK 3.5	1308	2023.02.10	2024.02.09	N/A	N/A
Vector Network	Agilent	E5071C	MY46103316	2023.08.26	2024.08.25	A.11.31	N/A
Signal Generator	R&S	SMBV100A	263697	2023.05.14	2024.05.13	V4.15.125.49	N/A
Power Meter	Keysight	N1912A	MY60300004	2023.08.26	2024.08.25	A2.06.01	N/A
Wideband Radio Communication Tester	R&S	CMW 500	170870	2023.05.20	2024.05.19	4.0.62.11	N/A
Temperature/Humidity Meter	Rites	RTS-8S	RF06	2023.05.19	2024.05.18	N/A	N/A
Temperaturer	LKM	DTM3000	3777	2023.07.08	2024.07.07	N/A	N/A

7 MEASUREMENT UNCERTAINTY

DASY6 SAR Uncertainty								
Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram / 10 gram.								
Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) v _{eff}
Measurement System								
Probe Calibration	±5.5%	N	1	1	1	±5.5%	±5.5%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.26	0.26	±0.6%	±0.7%	∞
Combined Std. Uncertainty						±10.6%	±10.5%	361
Expanded STD Uncertainty						±21.2%	±21.1%	

DASY6 SAR Uncertainty								
Measurement uncertainty for 3 GHz to 6 GHz averaged over 1 gram / 10 gram.								
Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) V _{eff}
Measurement System								
Probe Calibration	±6.65%	N	1	1	1	±6.65%	±6.65%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±2.0%	R	$\sqrt{3}$	1	1	±1.2%	±1.2%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Probe Positioning	±6.7%	R	$\sqrt{3}$	1	1	±3.9%	±3.9%	∞
Max. SAR Eval.	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.26	0.26	±0.6%	±0.7%	∞
Combined Std. Uncertainty						±12.0%	±12.0%	784
Expanded STD Uncertainty						±24.0%	±23.9%	

8 CONDUCTED POWER MEASUREMENT

WCDMA Power (Full Power)

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA II
TX Channel		9262	9400	9538		Ch Delta > 0.5
Rx Channel		9662	9800	9938		
Frequency (MHz)		1852.4	1880	1907.6		
3GPP Rel 99	RMC 12.2Kbps	22.64	22.69	22.59	24.00	0.10
3GPP Rel 6	HSDPA Subtest-1	21.98	21.90	21.86	23.00	0.12
3GPP Rel 6	HSDPA Subtest-2	21.83	21.63	21.67	23.00	0.20
3GPP Rel 6	HSDPA Subtest-3	21.43	21.39	21.54	22.50	0.15
3GPP Rel 6	HSDPA Subtest-4	21.34	21.41	21.33	22.50	0.08
3GPP Rel 8	DC-HSDPA Subtest-1	21.88	21.87	21.87	23.00	0.01
3GPP Rel 8	DC-HSDPA Subtest-2	21.85	21.58	21.62	23.00	0.27
3GPP Rel 8	DC-HSDPA Subtest-3	21.46	21.37	21.59	22.50	0.22
3GPP Rel 8	DC-HSDPA Subtest-4	21.32	21.42	21.41	22.50	0.10
3GPP Rel 6	HSUPA Subtest-1	21.83	21.80	21.76	23.00	0.07
3GPP Rel 6	HSUPA Subtest-2	20.30	20.26	20.30	21.00	0.04
3GPP Rel 6	HSUPA Subtest-3	21.07	21.01	21.07	22.00	0.06
3GPP Rel 6	HSUPA Subtest-4	20.30	20.25	20.22	21.00	0.08
3GPP Rel 6	HSUPA Subtest-5	21.82	21.76	21.85	23.00	0.09
Mode			Max.	22.69		

Band		WCDMA IV			Tune-up Limit (dBm)	WCDMA IV
TX Channel		1312	1413	1513		Ch Delta > 0.5
Rx Channel		1537	1638	1738		
Frequency (MHz)		1712.4	1732.6	1752.6		
3GPP Rel 99	RMC 12.2Kbps	22.84	22.92	22.77	24.00	0.15
3GPP Rel 6	HSDPA Subtest-1	22.21	22.06	22.07	23.00	0.15
3GPP Rel 6	HSDPA Subtest-2	22.05	21.85	21.88	23.00	0.20
3GPP Rel 6	HSDPA Subtest-3	21.64	21.62	21.79	22.50	0.17
3GPP Rel 6	HSDPA Subtest-4	21.49	21.60	21.51	22.50	0.11
3GPP Rel 8	DC-HSDPA Subtest-1	22.06	22.10	22.11	23.00	0.05
3GPP Rel 8	DC-HSDPA Subtest-2	22.10	21.81	21.86	23.00	0.29
3GPP Rel 8	DC-HSDPA Subtest-3	21.70	21.56	21.84	22.50	0.28
3GPP Rel 8	DC-HSDPA Subtest-4	21.48	21.59	21.63	22.50	0.15
3GPP Rel 6	HSUPA Subtest-1	22.08	21.96	21.95	23.00	0.13
3GPP Rel 6	HSUPA Subtest-2	20.47	20.47	20.51	21.00	0.04
3GPP Rel 6	HSUPA Subtest-3	21.28	21.20	21.23	22.00	0.08
3GPP Rel 6	HSUPA Subtest-4	20.52	20.49	20.46	21.00	0.06
3GPP Rel 6	HSUPA Subtest-5	21.98	21.98	22.07	23.00	0.09
Mode			Max.	22.92		

Band		WCDMA V			Tune-up Limit (dBm)	WCDMA V
TX Channel		4132	4183	4233		Ch Delta > 0.5
Rx Channel		4357	4408	4458		
Frequency (MHz)		826.4	836.6	846.6		
3GPP Rel 99	RMC 12.2Kbps	23.07	23.16	22.92	24.00	0.24
3GPP Rel 6	HSDPA Subtest-1	22.36	22.22	22.26	23.00	0.14
3GPP Rel 6	HSDPA Subtest-2	22.27	22.01	22.11	23.00	0.26
3GPP Rel 6	HSDPA Subtest-3	21.82	21.81	21.99	22.50	0.18
3GPP Rel 6	HSDPA Subtest-4	21.68	21.84	21.73	22.50	0.16
3GPP Rel 8	DC-HSDPA Subtest-1	22.28	22.25	22.34	23.00	0.09
3GPP Rel 8	DC-HSDPA Subtest-2	22.27	22.00	22.02	23.00	0.27
3GPP Rel 8	DC-HSDPA Subtest-3	21.86	21.75	22.00	22.50	0.25
3GPP Rel 8	DC-HSDPA Subtest-4	21.67	21.83	21.83	22.50	0.16
3GPP Rel 6	HSUPA Subtest-1	22.24	22.16	22.16	23.00	0.08
3GPP Rel 6	HSUPA Subtest-2	20.69	20.63	20.76	21.00	0.13
3GPP Rel 6	HSUPA Subtest-3	21.46	21.38	21.39	22.00	0.08
3GPP Rel 6	HSUPA Subtest-4	20.71	20.69	20.65	21.00	0.06
3GPP Rel 6	HSUPA Subtest-5	22.15	22.22	22.30	23.00	0.15
Mode			Max.	23.16		

WCDMA Power (Sensor on)

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA II
TX Channel		9262	9400	9538		Ch Delta > 0.5
Rx Channel		9662	9800	9938		
Frequency (MHz)		1852.4	1880	1907.6		
3GPP Rel 99	RMC 12.2Kbps	17.32	17.48	17.45	18.50	0.16
3GPP Rel 6	HSDPA Subtest-1	16.54	16.44	16.37	17.50	0.17
3GPP Rel 6	HSDPA Subtest-2	16.38	16.10	16.15	17.50	0.28
3GPP Rel 6	HSDPA Subtest-3	15.83	15.80	15.94	17.00	0.14
3GPP Rel 6	HSDPA Subtest-4	15.79	15.83	15.94	17.00	0.15
3GPP Rel 8	DC-HSDPA Subtest-1	16.31	16.29	16.36	17.50	0.07
3GPP Rel 8	DC-HSDPA Subtest-2	16.26	16.15	16.11	17.50	0.15
3GPP Rel 8	DC-HSDPA Subtest-3	15.87	15.96	16.02	17.00	0.15
3GPP Rel 8	DC-HSDPA Subtest-4	15.76	16.03	15.98	17.00	0.27
3GPP Rel 6	HSUPA Subtest-1	16.43	16.19	16.25	17.50	0.24
3GPP Rel 6	HSUPA Subtest-2	14.87	14.67	14.80	15.50	0.20
3GPP Rel 6	HSUPA Subtest-3	15.49	15.41	15.56	16.50	0.15
3GPP Rel 6	HSUPA Subtest-4	14.75	14.64	14.62	15.50	0.13
3GPP Rel 6	HSUPA Subtest-5	16.40	16.26	16.39	17.50	0.14
Mode			Max.	17.48		

Band		WCDMA IV			Tune-up Limit (dBm)	WCDMA IV
TX Channel		1312	1413	1513		Ch Delta > 0.5
Rx Channel		1537	1638	1738		
Frequency (MHz)		1712.4	1732.6	1752.6		
3GPP Rel 99	RMC 12.2Kbps	19.38	19.47	19.36	20.50	0.11
3GPP Rel 6	HSDPA Subtest-1	18.65	18.48	18.49	19.50	0.17
3GPP Rel 6	HSDPA Subtest-2	18.60	18.24	18.34	19.50	0.36
3GPP Rel 6	HSDPA Subtest-3	18.19	18.00	18.19	19.00	0.19
3GPP Rel 6	HSDPA Subtest-4	18.08	18.06	17.93	19.00	0.15
3GPP Rel 8	DC-HSDPA Subtest-1	18.58	18.57	18.63	19.50	0.06
3GPP Rel 8	DC-HSDPA Subtest-2	18.52	18.39	18.41	19.50	0.13
3GPP Rel 8	DC-HSDPA Subtest-3	18.29	17.95	18.44	19.00	0.49
3GPP Rel 8	DC-HSDPA Subtest-4	17.89	18.17	18.09	19.00	0.28
3GPP Rel 6	HSUPA Subtest-1	18.65	18.54	18.53	19.50	0.12
3GPP Rel 6	HSUPA Subtest-2	16.92	17.01	17.09	17.50	0.17
3GPP Rel 6	HSUPA Subtest-3	17.75	17.81	17.85	18.50	0.10
3GPP Rel 6	HSUPA Subtest-4	17.08	16.92	16.94	17.50	0.16
3GPP Rel 6	HSUPA Subtest-5	18.48	18.49	18.51	19.50	0.03
Mode			Max.	19.47		

LTE FDD Power (Full Power)

Band 2				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				18700	18900	19100					
Frequency (MHz)				1860	1880	1900					
20	QPSK	1	0	22.16	22.17	22.26	24	0	1.84	1.74	0.35
20	QPSK	1	49	22.39	22.43	22.34			1.66	1.57	
20	QPSK	1	99	22.08	22.13	22.15			1.92	1.85	
20	QPSK	50	0	21.10	21.14	21.17	23	1	1.90	1.83	0.11
20	QPSK	50	24	21.14	21.12	21.14			1.88	1.86	
20	QPSK	50	50	21.07	21.07	21.06			1.94	1.93	
20	QPSK	100	0	21.12	21.09	21.21	23	1	1.91	1.79	0.12
20	16QAM	1	0	21.60	21.66	21.66		1	1.40	1.34	0.26
20	16QAM	1	49	21.86	21.83	21.78			1.22	1.14	
20	16QAM	1	99	21.78	21.71	21.80	22	2	1.29	1.20	0.23
20	16QAM	50	0	20.24	20.18	20.29			1.82	1.71	
20	16QAM	50	24	20.06	20.13	20.10			1.94	1.87	
20	16QAM	50	50	20.14	20.22	20.22			1.86	1.78	0.06
20	16QAM	100	0	20.06	20.12	20.10			1.94	1.88	
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1857.5	1880	1902.5					
15	QPSK	1	0	22.07	22.04	22.17	24	0	1.96	1.83	0.29
15	QPSK	1	37	22.30	22.30	22.25			1.75	1.70	
15	QPSK	1	74	22.01	22.04	22.03			1.99	1.96	
15	QPSK	36	0	21.01	21.03	21.05	23	1	1.99	1.95	0.13
15	QPSK	36	20	21.05	21.00	21.06			2.00	1.94	
15	QPSK	36	39	21.13	21.11	21.11			1.89	1.87	
15	QPSK	75	0	21.01	21.01	21.13	23	1	1.99	1.87	0.12
15	16QAM	1	0	21.49	21.55	21.55		1	1.51	1.45	0.29
15	16QAM	1	37	21.78	21.75	21.68			1.32	1.22	
15	16QAM	1	74	21.67	21.61	21.67	22	2	1.39	1.33	0.14
15	16QAM	36	0	20.14	20.10	20.16			1.90	1.84	
15	16QAM	36	20	20.11	20.02	20.02			1.98	1.89	
15	16QAM	36	39	20.02	20.14	20.12			1.98	1.86	0.02
15	16QAM	75	0	20.03	20.02	20.01			1.99	1.97	
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1855	1880	1905					

10	QPSK	1	0	22.06	22.04	22.15	24	0	1.96	1.85	0.28
10	QPSK	1	25	22.30	22.31	22.23			1.77	1.69	
10	QPSK	1	49	22.03	22.05	22.07			1.97	1.93	
10	QPSK	25	0	21.02	21.05	21.09	23	1	1.98	1.91	0.09
10	QPSK	25	12	21.04	21.01	21.04			1.99	1.96	
10	QPSK	25	25	21.00	21.01	21.05			2.00	1.95	
10	QPSK	50	0	21.04	21.01	21.13	23	1	1.99	1.87	0.12
10	16QAM	1	0	21.53	21.58	21.55			1.47	1.42	
10	16QAM	1	25	21.77	21.72	21.66			1.34	1.23	
10	16QAM	1	49	21.69	21.58	21.68	22	2	1.42	1.31	0.22
10	16QAM	25	0	20.13	20.10	20.22			1.90	1.78	
10	16QAM	25	12	20.03	20.01	20.00			2.00	1.97	
10	16QAM	25	25	20.03	20.09	20.11	22	2	1.97	1.89	0.13
10	16QAM	50	0	20.13	20.00	20.08			2.00	1.87	
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1852.5	1880	1907.5					
5	QPSK	1	0	22.05	22.10	22.17	24	0	1.95	1.83	0.34
5	QPSK	1	12	22.32	22.34	22.27			1.73	1.66	
5	QPSK	1	24	22.00	22.06	22.06			2.00	1.94	
5	QPSK	12	0	21.02	21.05	21.06	23	1	1.98	1.94	0.13
5	QPSK	12	7	21.02	21.00	21.02			2.00	1.98	
5	QPSK	12	13	21.13	21.11	21.09			1.91	1.87	
5	QPSK	25	0	21.05	21.00	21.08	23	1	2.00	1.92	0.08
5	16QAM	1	0	21.50	21.56	21.58			1.50	1.42	
5	16QAM	1	12	21.76	21.72	21.67			1.33	1.24	
5	16QAM	1	24	21.67	21.59	21.69	22	2	1.41	1.31	0.17
5	16QAM	12	0	20.15	20.11	20.17			1.89	1.83	
5	16QAM	12	7	20.03	20.02	20.00			2.00	1.97	
5	16QAM	12	13	20.05	20.13	20.09	22	2	1.95	1.87	0.10
5	16QAM	25	0	20.11	20.01	20.02			1.99	1.89	
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1851.5	1880	1908.5					
3	QPSK	1	0	22.06	22.08	22.14	24	0	1.94	1.86	0.34
3	QPSK	1	8	22.30	22.35	22.22			1.78	1.65	
3	QPSK	1	14	22.01	22.01	22.08			1.99	1.92	
3	QPSK	8	0	21.11	21.06	21.06	23	1	1.94	1.89	0.10
3	QPSK	8	4	21.02	21.05	21.07			1.98	1.93	
3	QPSK	8	7	21.11	21.12	21.09			1.91	1.88	
3	QPSK	15	0	21.00	21.01	21.11	23	1	2.00	1.89	0.11
3	16QAM	1	0	21.48	21.55	21.57			1.52	1.43	
3	16QAM	1	8	21.75	21.73	21.69			1.31	1.25	
3	16QAM	1	14	21.69	21.62	21.71	22	2	1.38	1.29	0.19
3	16QAM	8	0	20.16	20.07	20.21			1.93	1.79	
3	16QAM	8	4	20.13	20.05	20.02			1.98	1.87	
3	16QAM	8	7	20.04	20.15	20.09	22	2	1.96	1.85	0.10
3	16QAM	15	0	20.11	20.01	20.02			1.99	1.89	
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1850.7	1880	1909.3					
1.4	QPSK	1	0	22.09	22.06	22.14	24	0	1.94	1.94	0.34

1.4	QPSK	1	3	22.27	22.34	22.22			1.78	1.78	0.35
1.4	QPSK	1	5	22.00	22.01	22.04			2.00	2.00	
1.4	QPSK	3	0	22.05	22.09	22.15			1.95	1.95	
1.4	QPSK	3	1	22.29	22.35	22.27			1.73	1.73	
1.4	QPSK	3	3	22.03	22.00	22.04			2.00	2.00	
1.4	QPSK	6	0	21.01	21.00	21.09	23	1	2.00	2.00	0.09
1.4	16QAM	1	0	21.51	21.59	21.57	23	1	1.49	1.49	0.22
1.4	16QAM	1	3	21.73	21.72	21.68			1.32	1.32	
1.4	16QAM	1	5	21.68	21.59	21.70			1.41	1.41	
1.4	16QAM	3	0	21.11	21.02	21.08			1.98	1.98	0.15
1.4	16QAM	3	1	21.03	21.00	21.02			2.00	2.00	
1.4	16QAM	3	3	21.03	21.15	21.09			1.97	1.97	
1.4	16QAM	6	0	20.11	20.02	20.11	22	2	1.98	1.98	0.09

Band 4				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				20050	20175	20300	24	0	1.47	1.37	0.35
Frequency (MHz)				1720	1732.5	1745					
20	QPSK	1	0	22.61	22.63	22.53					
20	QPSK	1	49	22.30	22.29	22.48	23	1	1.71	1.52	0.16
20	QPSK	1	99	22.28	22.33	22.31			1.72	1.67	
20	QPSK	50	0	21.27	21.31	21.33			1.73	1.67	
20	QPSK	50	24	21.23	21.27	21.27			1.77	1.73	0.15
20	QPSK	50	50	21.17	21.29	21.25			1.83	1.71	
20	QPSK	100	0	21.25	21.20	21.35	23	1	1.80	1.65	0.32
20	16QAM	1	0	21.78	21.86	21.76			1.24	1.14	
20	16QAM	1	49	22.08	22.02	21.88			1.12	0.92	
20	16QAM	1	99	21.99	21.88	21.93	22	2	1.12	1.01	0.25
20	16QAM	50	0	20.43	20.32	20.47			1.68	1.53	
20	16QAM	50	24	20.22	20.32	20.26			1.78	1.68	
20	16QAM	50	50	20.31	20.41	20.42			1.69	1.58	0.14
20	16QAM	100	0	20.17	20.31	20.29			1.83	1.69	
Channel				20025	20175	20325	24	0	1.80	1.69	0.33
Frequency (MHz)				1717.5	1732.5	1747.5					
15	QPSK	1	0	22.20	22.24	22.31					
15	QPSK	1	37	22.49	22.49	22.37	24	0	1.63	1.51	0.33
15	QPSK	1	74	22.18	22.22	22.16			1.84	1.78	

15	QPSK	36	0	21.18	21.19	21.24	23	1	1.82	1.76	0.16
15	QPSK	36	20	21.21	21.22	21.15			1.85	1.78	
15	QPSK	36	39	21.16	21.08	21.14			1.92	1.84	
15	QPSK	75	0	21.20	21.14	21.28			1.86	1.72	0.14
15	16QAM	1	0	21.64	21.68	21.75	23	1	1.36	1.25	0.31
15	16QAM	1	37	21.95	21.86	21.82			1.18	1.05	
15	16QAM	1	74	21.83	21.73	21.82			1.27	1.17	
15	16QAM	36	0	20.38	20.28	20.31	22	2	1.72	1.62	0.25
15	16QAM	36	20	20.20	20.13	20.17			1.87	1.80	
15	16QAM	36	39	20.26	20.35	20.34			1.74	1.65	
15	16QAM	75	0	20.07	20.18	20.22			1.93	1.78	0.15
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1715	1732.5	1750					
10	QPSK	1	0	22.25	22.24	22.38	24	0	1.76	1.62	0.33
10	QPSK	1	25	22.48	22.51	22.41			1.59	1.49	
10	QPSK	1	49	22.21	22.23	22.18			1.82	1.77	
10	QPSK	25	0	21.11	21.16	21.30	23	1	1.89	1.70	0.22
10	QPSK	25	12	21.24	21.17	21.20			1.83	1.76	
10	QPSK	25	25	21.08	21.18	21.17			1.92	1.82	
10	QPSK	50	0	21.17	21.17	21.21			1.83	1.79	0.04
10	16QAM	1	0	21.64	21.66	21.69	23	1	1.36	1.31	0.30
10	16QAM	1	25	21.94	21.91	21.92			1.09	1.06	
10	16QAM	1	49	21.82	21.82	21.86			1.18	1.14	
10	16QAM	25	0	20.34	20.25	20.42	22	2	1.75	1.58	0.32
10	16QAM	25	12	20.16	20.25	20.10			1.90	1.75	
10	16QAM	25	25	20.27	20.35	20.24			1.76	1.65	
10	16QAM	50	0	20.18	20.14	20.19			1.86	1.81	0.05
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1712.5	1732.5	1752.5					
5	QPSK	1	0	22.24	22.18	22.30	24	0	1.82	1.70	0.35
5	QPSK	1	12	22.46	22.51	22.37			1.63	1.49	
5	QPSK	1	24	22.16	22.24	22.20			1.84	1.76	
5	QPSK	12	0	21.16	21.26	21.26	23	1	1.84	1.74	0.19
5	QPSK	12	7	21.23	21.23	21.27			1.77	1.73	
5	QPSK	12	13	21.17	21.16	21.08			1.92	1.83	
5	QPSK	25	0	21.17	21.14	21.27			1.86	1.73	0.13
5	16QAM	1	0	21.63	21.68	21.73	23	1	1.37	1.27	0.30
5	16QAM	1	12	21.93	21.85	21.88			1.15	1.07	
5	16QAM	1	24	21.90	21.79	21.91			1.21	1.09	
5	16QAM	12	0	20.32	20.20	20.30	22	2	1.80	1.68	0.19
5	16QAM	12	7	20.13	20.26	20.18			1.87	1.74	
5	16QAM	12	13	20.18	20.28	20.23			1.82	1.72	
5	16QAM	25	0	20.16	20.25	20.16			1.84	1.75	0.09
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1711.5	1732.5	1753.5					
3	QPSK	1	0	22.23	22.20	22.34	24	0	1.80	1.66	0.42
3	QPSK	1	8	22.41	22.50	22.46			1.59	1.50	
3	QPSK	1	14	22.08	22.25	22.23			1.92	1.75	
3	QPSK	8	0	21.13	21.17	21.23	23	1	1.87	1.77	0.11

3	QPSK	8	4	21.19	21.22	21.16			1.84	1.78	
3	QPSK	8	7	21.18	21.12	21.18			1.88	1.82	
3	QPSK	15	0	21.22	21.10	21.32			1.90	1.68	0.22
3	16QAM	1	0	21.61	21.76	21.71	23	1	1.39	1.24	0.35
3	16QAM	1	8	21.96	21.85	21.89			1.15	1.04	
3	16QAM	1	14	21.83	21.72	21.94			1.28	1.06	
3	16QAM	8	0	20.30	20.24	20.34	22	2	1.76	1.66	0.16
3	16QAM	8	4	20.19	20.20	20.20			1.81	1.80	
3	16QAM	8	7	20.18	20.28	20.25			1.82	1.72	
3	16QAM	15	0	20.11	20.13	20.11			1.89	1.87	0.02
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1710.7	1732.5	1754.3					
1.4	QPSK	1	0	22.27	22.25	22.35	24	0	1.75	1.75	0.41
1.4	QPSK	1	3	22.43	22.54	22.40			1.60	1.60	
1.4	QPSK	1	5	22.22	22.13	22.19			1.87	1.87	
1.4	QPSK	3	0	22.16	22.30	22.29			1.84	1.84	0.49
1.4	QPSK	3	1	22.48	22.56	22.44			1.56	1.56	
1.4	QPSK	3	3	22.07	22.23	22.14			1.93	1.93	
1.4	QPSK	6	0	21.17	21.19	21.30	23	1	1.83	1.83	0.13
1.4	16QAM	1	0	21.65	21.79	21.73	23	1	1.35	1.35	0.26
1.4	16QAM	1	3	21.88	21.82	21.91			1.18	1.18	
1.4	16QAM	1	5	21.89	21.71	21.83			1.29	1.29	
1.4	16QAM	3	0	21.13	21.25	21.25			1.87	1.87	0.13
1.4	16QAM	3	1	21.24	21.13	21.13			1.87	1.87	
1.4	16QAM	3	3	21.20	21.12	21.15			1.88	1.88	
1.4	16QAM	6	0	20.08	20.18	20.13	22	2	1.92	1.92	0.10

Band 5

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Channel				20450	20525	20600	24	0			
Frequency (MHz)				829	836.5	844					
10	QPSK	1	0	23.15	23.22	23.15			0.85	0.78	0.19
10	QPSK	1	25	23.03	23.11	23.15	23	1	0.97	0.85	
10	QPSK	1	49	23.05	23.09	23.13			0.95	0.87	
10	QPSK	25	0	22.30	22.37	22.29			0.71	0.63	0.20
10	QPSK	25	12	22.21	22.17	22.17			0.83	0.79	
10	QPSK	25	25	22.19	22.18	22.19			0.82	0.81	

10	QPSK	50	0	22.15	22.21	22.37	23	1	0.85	0.63	0.22
10	16QAM	1	0	22.20	22.32	22.20			0.80	0.68	0.24
10	16QAM	1	25	22.14	22.12	22.08			0.92	0.86	
10	16QAM	1	49	22.15	22.10	22.09			0.91	0.85	
10	16QAM	25	0	21.22	21.37	21.45	22	2	0.78	0.55	0.41
10	16QAM	25	12	21.04	21.32	21.33			0.96	0.67	
10	16QAM	25	25	21.33	21.29	21.45			0.71	0.55	
10	16QAM	50	0	21.02	21.25	21.22			0.98	0.75	0.23
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				826.5	836.5	846.5					
5	QPSK	1	0	23.00	23.09	23.09	24	0	1.00	0.91	0.19
5	QPSK	1	12	22.94	23.06	23.13			1.06	0.87	
5	QPSK	1	24	22.99	22.97	23.06			1.03	0.94	
5	QPSK	12	0	22.28	22.35	22.25	23	1	0.75	0.65	0.32
5	QPSK	12	7	22.18	22.11	22.03			0.97	0.82	
5	QPSK	12	13	22.16	22.13	22.14			0.87	0.84	
5	QPSK	25	0	22.05	22.16	22.29			0.95	0.71	0.24
5	16QAM	1	0	22.27	22.29	22.18	23	1	0.82	0.71	0.22
5	16QAM	1	12	22.11	22.12	22.07			0.93	0.88	
5	16QAM	1	24	22.16	22.08	22.10			0.92	0.84	
5	16QAM	12	0	21.08	21.33	21.35	22	2	0.92	0.65	0.45
5	16QAM	12	7	20.90	21.21	21.23			1.10	0.77	
5	16QAM	12	13	21.31	21.15	21.35			0.85	0.65	
5	16QAM	25	0	20.91	21.15	21.18			1.09	0.82	0.27
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				825.5	836.5	847.5					
3	QPSK	1	0	23.04	23.19	23.13	24	0	0.96	0.81	0.29
3	QPSK	1	8	22.95	22.97	23.03			1.05	0.97	
3	QPSK	1	14	22.90	23.06	23.00			1.10	0.94	
3	QPSK	8	0	22.21	22.28	22.26	23	1	0.79	0.72	0.20
3	QPSK	8	4	22.15	22.10	22.09			0.91	0.85	
3	QPSK	8	7	22.12	22.09	22.08			0.92	0.88	
3	QPSK	15	0	22.10	22.15	22.32			0.90	0.68	0.22
3	16QAM	1	0	22.24	22.31	22.17	23	1	0.83	0.69	0.27
3	16QAM	1	8	22.09	22.08	22.04			0.96	0.91	
3	16QAM	1	14	22.12	22.15	22.13			0.88	0.85	
3	16QAM	8	0	21.14	21.29	21.37	22	2	0.86	0.63	0.40
3	16QAM	8	4	20.97	21.27	21.18			1.03	0.73	
3	16QAM	8	7	21.24	21.19	21.37			0.81	0.63	
3	16QAM	15	0	20.94	21.15	21.09			1.06	0.85	0.21
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				824.7	836.5	848.3					
1.4	QPSK	1	0	23.14	23.08	23.11	24	0	0.92	0.92	0.24
1.4	QPSK	1	3	23.18	23.03	23.01			0.99	0.99	
1.4	QPSK	1	5	23.02	22.94	22.95			1.06	1.06	
1.4	QPSK	3	0	23.02	23.12	23.07			0.98	0.98	0.20
1.4	QPSK	3	1	23.05	23.01	23.03			0.99	0.99	
1.4	QPSK	3	3	22.92	23.08	23.02			1.08	1.08	
1.4	QPSK	6	0	22.00	22.03	22.06	23	1	1.00	1.00	0.06

1.4	16QAM	1	0	22.28	22.26	22.16	23	1	0.84	0.84	0.22
1.4	16QAM	1	3	22.10	22.06	22.10			0.94	0.94	
1.4	16QAM	1	5	22.13	22.12	22.08			0.92	0.92	
1.4	16QAM	3	0	22.01	22.13	22.05			0.99	0.99	0.22
1.4	16QAM	3	1	22.06	22.00	21.97			1.03	1.03	
1.4	16QAM	3	3	22.04	21.99	21.91			1.09	1.09	
1.4	16QAM	6	0	20.90	20.99	20.93	22	2	1.10	1.10	0.09

Band 12				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				23060	23095	23130	24	0	0.92	0.85	0.22
Frequency (MHz)				704	707.5	711					
10	QPSK	1	0	23.08	23.15	23.09					
10	QPSK	1	25	22.93	23.05	23.07	23	1	1.07	0.93	0.20
10	QPSK	1	49	22.97	23.00	23.05			1.03	0.95	
10	QPSK	25	0	22.24	22.28	22.20			0.80	0.72	
10	QPSK	25	12	22.13	22.10	22.08			0.92	0.87	0.24
10	QPSK	25	25	22.13	22.12	22.11			0.89	0.87	
10	QPSK	50	0	22.05	22.14	22.29			0.95	0.71	
10	16QAM	1	0	22.22	22.23	22.18	23	1	0.82	0.77	0.19
10	16QAM	1	25	22.11	22.08	22.04			0.96	0.89	
10	16QAM	1	49	22.10	22.10	22.07			0.93	0.90	
10	16QAM	25	0	21.16	21.28	21.39	22	2	0.84	0.61	0.43
10	16QAM	25	12	20.96	21.22	21.23			1.04	0.77	
10	16QAM	25	25	21.26	21.21	21.37			0.79	0.63	
10	16QAM	50	0	20.96	21.18	21.13			1.04	0.82	0.22
Channel				23035	23095	23155	24	0	0.97	0.93	0.15
Frequency (MHz)				701.5	707.5	713.5					
5	QPSK	1	0	23.03	23.07	23.04					
5	QPSK	1	12	22.92	22.98	23.04	23	1	1.08	0.96	0.21
5	QPSK	1	24	22.93	22.95	23.01			1.07	0.99	
5	QPSK	12	0	22.15	22.23	22.17			0.85	0.77	
5	QPSK	12	7	22.06	22.02	22.04			0.98	0.94	0.22
5	QPSK	12	13	22.05	22.07	22.06	23	1	0.95	0.93	
5	QPSK	25	0	22.03	22.08	22.25			0.97	0.75	
5	16QAM	1	0	22.19	22.27	22.17			0.83	0.73	0.24
5	16QAM	1	12	22.11	22.07	22.03			0.97	0.89	

5	16QAM	1	24	22.09	22.08	22.09	22	2	0.92	0.91	0.42
5	16QAM	12	0	21.09	21.23	21.31			0.91	0.69	
5	16QAM	12	7	20.91	21.19	21.18			1.09	0.81	
5	16QAM	12	13	21.22	21.18	21.33			0.82	0.67	
5	16QAM	25	0	20.89	21.14	21.09			1.11	0.86	0.25
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				700.5	707.5	714.5					
3	QPSK	1	0	23.01	23.11	23.01	24	0	0.99	0.89	0.22
3	QPSK	1	8	22.89	22.96	23.03			1.11	0.97	
3	QPSK	1	14	22.90	22.95	23.02			1.10	0.98	
3	QPSK	8	0	22.18	22.22	22.15	23	1	0.85	0.78	0.18
3	QPSK	8	4	22.10	22.04	22.04			0.96	0.90	
3	QPSK	8	7	22.07	22.06	22.06			0.94	0.93	
3	QPSK	15	0	22.01	22.10	22.25			0.99	0.75	0.24
3	16QAM	1	0	22.21	22.23	22.16	23	1	0.84	0.77	0.20
3	16QAM	1	8	22.12	22.08	22.03			0.97	0.88	
3	16QAM	1	14	22.09	22.10	22.09			0.91	0.90	
3	16QAM	8	0	21.09	21.25	21.31	22	2	0.91	0.69	0.42
3	16QAM	8	4	20.90	21.19	21.20			1.10	0.80	
3	16QAM	8	7	21.19	21.15	21.32			0.85	0.68	
3	16QAM	15	0	20.89	21.11	21.11			1.11	0.89	0.22
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				699.7	707.5	715.3					
1.4	QPSK	1	0	22.96	22.90	22.92	24	0	1.10	1.10	0.25
1.4	QPSK	1	3	23.00	22.85	22.84			1.16	1.16	
1.4	QPSK	1	5	22.86	22.75	22.78			1.25	1.25	
1.4	QPSK	3	0	22.85	22.94	22.91			1.15	1.15	0.21
1.4	QPSK	3	1	22.86	22.84	22.84			1.16	1.16	
1.4	QPSK	3	3	22.73	22.89	22.85			1.27	1.27	
1.4	QPSK	6	0	21.82	21.86	21.87	23	1	1.18	1.18	0.05
1.4	16QAM	1	0	22.21	22.37	22.38	23	1	0.79	0.79	0.28
1.4	16QAM	1	3	22.27	22.27	22.17			0.83	0.83	
1.4	16QAM	1	5	22.10	22.11	22.12			0.90	0.90	
1.4	16QAM	3	0	22.11	22.17	22.07			0.93	0.93	0.42
1.4	16QAM	3	1	21.88	21.84	21.78			1.22	1.22	
1.4	16QAM	3	3	21.87	21.81	21.75			1.25	1.25	
1.4	16QAM	6	0	20.71	20.81	20.74	22	2	1.29	1.29	0.10

Band 13

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				23230							
Frequency (MHz)				782							
10	QPSK	1	0	23.24			24	0	0.76	0.76	0.18
10	QPSK	1	25	23.10					0.90	0.90	
10	QPSK	1	49	23.06					0.94	0.94	
10	QPSK	25	0	22.33			23	1	0.67	0.67	0.15
10	QPSK	25	12	22.18					0.82	0.82	
10	QPSK	25	25	22.20					0.80	0.80	
10	QPSK	50	0	22.21			23	1	0.79	0.79	0.00
10	16QAM	1	0	22.27					0.73	0.73	0.21
10	16QAM	1	25	22.06					0.94	0.94	
10	16QAM	1	49	22.10			0.90	0.90			
10	16QAM	25	0	21.33			22	2	0.67	0.67	0.06
10	16QAM	25	12	21.27					0.73	0.73	
10	16QAM	25	25	21.28					0.72	0.72	
10	16QAM	50	0	21.24					0.76	0.76	0.00
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				779.5	782	784.5					
5	QPSK	1	0	22.98	23.04	23.02	24	0	1.02	0.96	0.14
5	QPSK	1	12	22.90	22.96	23.01			1.10	0.99	
5	QPSK	1	24	22.91	22.92	22.96			1.09	1.04	
5	QPSK	12	0	22.12	22.20	22.12	23	1	0.88	0.80	0.21
5	QPSK	12	7	22.05	22.01	21.99			1.01	0.95	
5	QPSK	12	13	22.00	22.05	22.03			1.00	0.95	
5	QPSK	25	0	21.99	22.06	22.21	23	1	1.01	0.79	0.22
5	16QAM	1	0	22.28	22.25	22.15			0.85	0.72	0.19
5	16QAM	1	12	22.09	22.12	22.09			0.91	0.88	
5	16QAM	1	24	22.16	22.11	22.09	0.91	0.84			
5	16QAM	12	0	21.07	21.18	21.27	22	2	0.93	0.73	0.41
5	16QAM	12	7	20.88	21.18	21.15			1.12	0.82	
5	16QAM	12	13	21.19	21.15	21.29			0.85	0.71	
5	16QAM	25	0	20.87	21.09	21.06			1.13	0.91	0.22

Band 17

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
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Channel				23780	23790	23800					
Frequency (MHz)				709	710	711					
10	QPSK	1	0	23.26	23.34	23.25	24	0	0.75	0.66	0.25
10	QPSK	1	25	23.09	23.22	23.24			0.91	0.76	
10	QPSK	1	49	23.14	23.15	23.22			0.86	0.78	
10	QPSK	25	0	22.40	22.46	22.37	23	1	0.63	0.54	0.20
10	QPSK	25	12	22.30	22.26	22.26			0.74	0.70	
10	QPSK	25	25	22.29	22.29	22.30			0.71	0.70	
10	QPSK	50	0	22.22	22.29	22.47			0.78	0.53	0.25
10	16QAM	1	0	22.23	22.24	22.19	23	1	0.81	0.76	0.16
10	16QAM	1	25	22.18	22.12	22.10			0.90	0.82	
10	16QAM	1	49	22.12	22.12	22.08			0.92	0.88	
10	16QAM	25	0	21.33	21.46	21.56	22	2	0.67	0.44	0.42
10	16QAM	25	12	21.14	21.40	21.40			0.86	0.60	
10	16QAM	25	25	21.44	21.37	21.53			0.63	0.47	
10	16QAM	50	0	21.13	21.34	21.30			0.87	0.66	0.21
Channel				23755	23790	23825	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				706.5	710	713.5					
5	QPSK	1	0	23.16	23.28	23.15	24	0	0.85	0.72	0.35
5	QPSK	1	12	22.93	23.15	23.13			1.07	0.85	
5	QPSK	1	24	23.02	23.02	23.13			0.98	0.87	
5	QPSK	12	0	22.33	22.32	22.21	23	1	0.79	0.67	0.17
5	QPSK	12	7	22.16	22.17	22.16			0.84	0.83	
5	QPSK	12	13	22.22	22.17	22.18			0.83	0.78	
5	QPSK	25	0	22.15	22.20	22.41			0.85	0.59	0.26
5	16QAM	1	0	22.16	22.09	22.10	23	1	0.91	0.84	0.24
5	16QAM	1	12	22.06	21.98	21.96			1.04	0.94	
5	16QAM	1	24	22.02	22.05	21.92			1.08	0.95	
5	16QAM	12	0	21.22	21.39	21.50	22	2	0.78	0.50	0.42
5	16QAM	12	7	21.08	21.24	21.27			0.92	0.73	
5	16QAM	12	13	21.30	21.24	21.43			0.76	0.57	
5	16QAM	25	0	21.04	21.24	21.18			0.96	0.76	0.20

Band 25				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				26140	26365	26590					
Frequency (MHz)				1860	1882.5	1905					

20	QPSK	1	0	22.43	22.55	22.44	24	0	1.57	1.45	0.31
20	QPSK	1	49	22.37	22.42	22.39			1.63	1.58	
20	QPSK	1	99	22.24	22.26	22.31			1.76	1.69	
20	QPSK	50	0	21.28	21.33	21.38	23	1	1.72	1.62	0.17
20	QPSK	50	24	21.31	21.25	21.29			1.75	1.69	
20	QPSK	50	50	21.23	21.21	21.25			1.79	1.75	
20	QPSK	100	0	21.29	21.26	21.38	23	1	1.74	1.62	0.12
20	16QAM	1	0	21.74	21.79	21.86			1.26	1.14	
20	16QAM	1	49	22.08	21.95	21.95			1.05	0.92	
20	16QAM	1	99	22.00	21.91	21.94	22	2	1.09	1.00	0.23
20	16QAM	50	0	20.42	20.39	20.41			1.61	1.58	
20	16QAM	50	24	20.19	20.33	20.23			1.81	1.67	
20	16QAM	50	50	20.32	20.35	20.37	22	2	1.68	1.63	0.08
20	16QAM	100	0	20.19	20.27	20.23			1.81	1.73	
Channel				26115	26365	26615	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1857.5	1882.5	1907.5					
15	QPSK	1	0	22.21	22.29	22.37	24	0	1.79	1.63	0.18
15	QPSK	1	37	22.22	22.23	22.27			1.78	1.73	
15	QPSK	1	74	22.19	22.19	22.23			1.81	1.77	
15	QPSK	36	0	21.17	21.23	21.23	23	1	1.83	1.77	0.09
15	QPSK	36	20	21.26	21.22	21.24			1.78	1.74	
15	QPSK	36	39	21.17	21.18	21.19			1.83	1.81	
15	QPSK	75	0	21.18	21.21	21.26	23	1	1.82	1.74	0.08
15	16QAM	1	0	21.71	21.79	21.78			1.29	1.21	
15	16QAM	1	37	21.95	21.91	21.86			1.14	1.05	
15	16QAM	1	74	21.83	21.83	21.90	22	2	1.17	1.10	0.28
15	16QAM	36	0	20.35	20.27	20.41			1.73	1.59	
15	16QAM	36	20	20.13	20.23	20.17			1.87	1.77	
15	16QAM	36	39	20.24	20.32	20.29	22	2	1.76	1.68	0.08
15	16QAM	75	0	20.17	20.25	20.17			1.83	1.75	
Channel				26090	26365	26640	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1855	1882.5	1910					
10	QPSK	1	0	22.22	22.28	22.34	24	0	1.78	1.66	0.20
10	QPSK	1	25	22.15	22.20	22.28			1.85	1.72	
10	QPSK	1	49	22.14	22.23	22.25			1.86	1.75	
10	QPSK	25	0	21.17	21.26	21.29	23	1	1.83	1.71	0.12
10	QPSK	25	12	21.25	21.22	21.28			1.78	1.72	
10	QPSK	25	25	21.22	21.17	21.21			1.83	1.78	
10	QPSK	50	0	21.21	21.24	21.29	23	1	1.79	1.71	0.08
10	16QAM	1	0	21.68	21.81	21.77			1.32	1.19	
10	16QAM	1	25	22.01	21.91	21.86			1.14	0.99	
10	16QAM	1	49	21.90	21.80	21.86	22	2	1.20	1.10	0.33
10	16QAM	25	0	20.39	20.32	20.38			1.68	1.61	
10	16QAM	25	12	20.19	20.23	20.21			1.81	1.77	
10	16QAM	25	25	20.24	20.36	20.34	22	2	1.76	1.64	0.20
10	16QAM	50	0	20.14	20.27	20.20			1.86	1.73	
Channel				26065	26365	26665	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1852.5	1882.5	1912.5					
5	QPSK	1	0	22.29	22.28	22.41	24	0	1.72	1.59	0.23

5	QPSK	1	12	22.21	22.18	22.26	23	1	1.82	1.74	0.13
5	QPSK	1	24	22.20	22.25	22.21			1.80	1.75	
5	QPSK	12	0	21.23	21.20	21.27			1.80	1.73	
5	QPSK	12	7	21.20	21.21	21.20			1.80	1.79	
5	QPSK	12	13	21.18	21.14	21.16			1.86	1.82	
5	QPSK	25	0	21.25	21.15	21.30	23	1	1.85	1.70	0.15
5	16QAM	1	0	21.72	21.80	21.81			1.28	1.19	0.23
5	16QAM	1	12	21.95	21.93	21.88			1.12	1.05	
5	16QAM	1	24	21.84	21.79	21.86	22	2	1.21	1.14	
5	16QAM	12	0	20.32	20.25	20.36			1.75	1.64	0.19
5	16QAM	12	7	20.17	20.21	20.23			1.83	1.77	
5	16QAM	12	13	20.21	20.33	20.31			1.79	1.67	
5	16QAM	25	0	20.14	20.19	20.18			1.86	1.81	0.05
Channel				26055	26365	26675	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1851.5	1882.5	1913.5					
3	QPSK	1	0	22.28	22.29	22.34	24	0	1.72	1.66	0.14
3	QPSK	1	8	22.20	22.22	22.23			1.80	1.77	
3	QPSK	1	14	22.22	22.27	22.24			1.78	1.73	
3	QPSK	8	0	21.20	21.24	21.28	23	1	1.80	1.72	0.15
3	QPSK	8	4	21.20	21.22	21.26			1.80	1.74	
3	QPSK	8	7	21.19	21.21	21.13			1.87	1.79	
3	QPSK	15	0	21.25	21.20	21.28			1.80	1.72	0.08
3	16QAM	1	0	21.74	21.73	21.77	23	1	1.27	1.23	0.26
3	16QAM	1	8	21.99	21.92	21.93			1.08	1.01	
3	16QAM	1	14	21.85	21.82	21.95			1.18	1.05	
3	16QAM	8	0	20.38	20.26	20.39	22	2	1.74	1.61	0.19
3	16QAM	8	4	20.20	20.23	20.21			1.80	1.77	
3	16QAM	8	7	20.20	20.33	20.28			1.80	1.67	
3	16QAM	15	0	20.19	20.20	20.20			1.81	1.80	0.01
Channel				26047	26365	26683	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1850.7	1882.5	1914.3					
1.4	QPSK	1	0	22.28	22.24	22.30	24	0	1.76	1.76	0.18
1.4	QPSK	1	3	22.21	22.17	22.30			1.83	1.83	
1.4	QPSK	1	5	22.16	22.12	22.17			1.88	1.88	
1.4	QPSK	3	0	22.23	22.27	22.33			1.77	1.77	0.44
1.4	QPSK	3	1	22.41	22.50	22.41			1.59	1.59	
1.4	QPSK	3	3	22.06	22.15	22.23			1.94	1.94	
1.4	QPSK	6	0	21.13	21.14	21.24	23	1	1.87	1.87	0.11
1.4	16QAM	1	0	21.68	21.79	21.74	23	1	1.32	1.32	0.22
1.4	16QAM	1	3	21.85	21.90	21.86			1.15	1.15	
1.4	16QAM	1	5	21.88	21.77	21.90			1.23	1.23	
1.4	16QAM	3	0	21.18	21.16	21.24			1.84	1.84	0.16
1.4	16QAM	3	1	21.16	21.15	21.13			1.87	1.87	
1.4	16QAM	3	3	21.11	21.08	21.09			1.92	1.92	
1.4	16QAM	6	0	20.10	20.14	20.17	22	2	1.90	1.90	0.07

Band 26 For FCC

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				26765	26865	26965					
Frequency (MHz)				821.5	831.5	841.5					
15	QPSK	1	0	23.16	23.24	23.18					
15	QPSK	1	37	23.06	23.13	23.16	24	0	0.84	0.76	0.18
15	QPSK	1	74	23.06	23.11	23.13	23	1	0.94	0.84	0.21
15	QPSK	36	0	22.33	22.38	22.29			0.94	0.87	
15	QPSK	36	20	22.22	22.17	22.17			0.71	0.62	
15	QPSK	36	39	22.20	22.19	22.21			0.83	0.78	0.20
15	QPSK	75	0	22.18	22.24	22.38	23	1	0.81	0.79	
15	16QAM	1	0	22.34	22.39	22.29			0.82	0.62	
15	16QAM	1	37	22.22	22.19	22.17			0.71	0.61	0.22
15	16QAM	1	74	22.22	22.21	22.23			0.83	0.78	
15	16QAM	36	0	21.23	21.39	21.47	22	2	0.79	0.77	
15	16QAM	36	20	21.06	21.33	21.33			0.77	0.53	0.41
15	16QAM	36	39	21.34	21.32	21.46			0.94	0.67	
15	16QAM	75	0	21.05	21.26	21.24			0.68	0.54	
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				819	831.5	844					
10	QPSK	1	0	23.02	23.10	23.04					
10	QPSK	1	25	22.93	23.00	23.01	24	0	0.98	0.90	0.17
10	QPSK	1	49	22.94	22.97	22.98	23	1	1.07	0.99	
10	QPSK	25	0	22.18	22.23	22.17			1.06	1.02	
10	QPSK	25	12	22.08	22.03	22.03			0.83	0.77	0.20
10	QPSK	25	25	22.08	22.06	22.06			0.97	0.92	
10	QPSK	50	0	22.04	22.12	22.26	23	1	0.94	0.92	
10	16QAM	1	0	22.21	22.26	22.17			0.96	0.74	0.22
10	16QAM	1	25	22.08	22.05	22.04			0.83	0.74	
10	16QAM	1	49	22.09	22.08	22.11			0.96	0.92	
10	16QAM	25	0	21.08	21.25	21.33	22	2	0.92	0.89	0.41
10	16QAM	25	12	20.92	21.19	21.20			0.92	0.67	
10	16QAM	25	25	21.19	21.18	21.31			1.08	0.80	
10	16QAM	50	0	20.91	21.14	21.09			0.82	0.69	0.23
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				816.5	831.5	846.5					
5	QPSK	1	0	23.03	23.12	23.06					
5	QPSK	1	12	22.92	22.99	23.01	24	0	0.97	0.88	0.21
5	QPSK	1	24	22.91	22.98	23.00	23	1	1.08	0.99	
5	QPSK	12	0	22.19	22.24	22.16			1.09	1.00	
5	QPSK	12	0	22.19	22.24	22.16	23	1	0.84	0.76	0.20

5	QPSK	12	7	22.07	22.04	22.04			0.96	0.93	0.19
5	QPSK	12	13	22.08	22.05	22.08			0.95	0.92	
5	QPSK	25	0	22.05	22.10	22.24			0.95	0.76	
5	16QAM	1	0	22.20	22.25	22.16	23	1	0.84	0.75	0.22
5	16QAM	1	12	22.08	22.04	22.03			0.97	0.92	
5	16QAM	1	24	22.09	22.09	22.11			0.91	0.89	
5	16QAM	12	0	21.11	21.25	21.32	22	2	0.89	0.68	0.40
5	16QAM	12	7	20.93	21.20	21.20			1.07	0.80	
5	16QAM	12	13	21.21	21.19	21.33			0.81	0.67	
5	16QAM	25	0	20.92	21.12	21.10			1.08	0.88	0.20
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				815.5	831.5	847.5					
3	QPSK	1	0	23.01	23.09	23.05	24	0	0.99	0.91	0.18
3	QPSK	1	8	22.93	23.00	23.03			1.07	0.97	
3	QPSK	1	14	22.91	22.96	22.99			1.09	1.01	
3	QPSK	8	0	22.19	22.24	22.17	23	1	0.83	0.76	0.21
3	QPSK	8	4	22.09	22.03	22.03			0.97	0.91	
3	QPSK	8	7	22.05	22.05	22.09			0.95	0.91	
3	QPSK	15	0	22.03	22.11	22.23			0.97	0.77	0.20
3	16QAM	1	0	22.22	22.25	22.17	23	1	0.83	0.75	0.20
3	16QAM	1	8	22.09	22.06	22.05			0.95	0.91	
3	16QAM	1	14	22.09	22.07	22.09			0.93	0.91	
3	16QAM	8	0	21.09	21.26	21.34	22	2	0.91	0.66	0.43
3	16QAM	8	4	20.91	21.20	21.19			1.09	0.80	
3	16QAM	8	7	21.21	21.19	21.32			0.81	0.68	
3	16QAM	15	0	20.92	21.12	21.09			1.08	0.88	0.20
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				814.7	831.5	848.3					
1.4	QPSK	1	0	23.15	23.05	23.07	24	0	0.95	0.95	0.22
1.4	QPSK	1	3	23.17	23.00	22.98			1.02	1.02	
1.4	QPSK	1	5	23.02	22.95	22.96			1.05	1.05	
1.4	QPSK	3	0	23.07	23.17	23.06			0.94	0.94	0.30
1.4	QPSK	3	1	23.03	23.03	22.99			1.01	1.01	
1.4	QPSK	3	3	22.87	23.12	22.98			1.13	1.13	
1.4	QPSK	6	0	21.96	22.08	22.08	23	1	1.04	1.04	0.12
1.4	16QAM	1	0	22.44	22.51	22.61	23	1	0.56	0.56	0.30
1.4	16QAM	1	3	22.62	22.59	22.74			0.41	0.41	
1.4	16QAM	1	5	22.66	22.52	22.61			0.48	0.48	
1.4	16QAM	3	0	22.02	22.17	22.07			0.98	0.98	0.28
1.4	16QAM	3	1	22.02	22.00	22.01			1.00	1.00	
1.4	16QAM	3	3	22.01	21.98	21.89			1.11	1.11	
1.4	16QAM	6	0	20.86	21.05	20.92	22	2	1.14	1.14	0.19

Band 26 For IC

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
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QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				26865	26915	26965	24	0	0.85	0.76	0.14
Frequency (MHz)				831.5	836.5	841.5					
15	QPSK	1	0	23.24	23.15	23.18					
15	QPSK	1	37	23.13	23.17	23.16	23	1	0.87	0.83	0.21
15	QPSK	1	74	23.11	23.10	23.13			0.90	0.87	
15	QPSK	36	0	22.38	22.26	22.29			0.74	0.62	
15	QPSK	36	20	22.17	22.22	22.17			0.83	0.78	0.14
15	QPSK	36	39	22.19	22.26	22.21	23	1	0.81	0.74	
15	QPSK	75	0	22.24	22.38	22.38			0.76	0.62	
15	16QAM	1	0	22.39	22.30	22.29			0.71	0.61	0.23
15	16QAM	1	37	22.19	22.16	22.17			0.84	0.81	
15	16QAM	1	74	22.21	22.25	22.23	22	2	0.79	0.75	
15	16QAM	36	0	21.39	21.44	21.47			0.61	0.53	0.15
15	16QAM	36	20	21.33	21.37	21.33			0.67	0.63	
15	16QAM	36	39	21.32	21.42	21.46			0.68	0.54	
15	16QAM	75	0	21.26	21.28	21.24	24	0	0.76	0.72	0.04
Channel				26840	26915	26990	24	0	0.97	0.90	0.13
Frequency (MHz)				829	836.5	844					
10	QPSK	1	0	23.10	23.03	23.04					
10	QPSK	1	25	23.00	23.02	23.01	23	1	1.00	0.98	0.20
10	QPSK	1	49	22.97	23.02	22.98			1.03	0.98	
10	QPSK	25	0	22.23	22.22	22.17			0.83	0.77	
10	QPSK	25	12	22.03	22.06	22.03			0.97	0.94	0.14
10	QPSK	25	25	22.06	22.08	22.06	23	1	0.94	0.92	
10	QPSK	50	0	22.12	22.23	22.26			0.88	0.74	
10	16QAM	1	0	22.26	22.19	22.17			0.83	0.74	0.26
10	16QAM	1	25	22.05	22.00	22.04			1.00	0.95	
10	16QAM	1	49	22.08	22.07	22.11	22	2	0.93	0.89	
10	16QAM	25	0	21.25	21.37	21.33			0.75	0.63	0.20
10	16QAM	25	12	21.19	21.17	21.20			0.83	0.80	
10	16QAM	25	25	21.18	21.30	21.31			0.82	0.69	
10	16QAM	50	0	21.14	21.11	21.09	24	0	0.91	0.86	0.05
Channel				26815	26915	27015	24	0	0.94	0.88	0.14
Frequency (MHz)				826.5	836.5	846.5					
5	QPSK	1	0	23.12	23.07	23.06					
5	QPSK	1	12	22.99	23.08	23.01	23	1	1.01	0.92	0.20
5	QPSK	1	24	22.98	23.01	23.00			1.02	0.99	
5	QPSK	12	0	22.24	22.17	22.16			0.84	0.76	
5	QPSK	12	7	22.04	22.04	22.04			0.96	0.96	0.19
5	QPSK	12	13	22.05	22.14	22.08	23	1	0.95	0.86	
5	QPSK	25	0	22.10	22.29	22.24			0.90	0.71	

5	16QAM	1	0	22.25	22.17	22.16	23	1	0.84	0.75	0.23
5	16QAM	1	12	22.04	22.02	22.03			0.98	0.96	
5	16QAM	1	24	22.09	22.14	22.11			0.91	0.86	
5	16QAM	12	0	21.25	21.29	21.32	22	2	0.75	0.68	0.14
5	16QAM	12	7	21.20	21.22	21.20			0.80	0.78	
5	16QAM	12	13	21.19	21.30	21.33			0.81	0.67	
5	16QAM	25	0	21.12	21.07	21.10			0.93	0.88	0.05
Channel				26805	26915	27025	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				825.5	836.5	847.5					
3	QPSK	1	0	23.09	23.11	23.05	24	0	0.95	0.89	0.15
3	QPSK	1	8	23.00	23.02	23.03			1.00	0.97	
3	QPSK	1	14	22.96	23.00	22.99			1.04	1.00	
3	QPSK	8	0	22.24	22.20	22.17	23	1	0.83	0.76	0.21
3	QPSK	8	4	22.03	22.04	22.03			0.97	0.96	
3	QPSK	8	7	22.05	22.12	22.09			0.95	0.88	
3	QPSK	15	0	22.11	22.26	22.23			0.89	0.74	0.15
3	16QAM	1	0	22.25	22.14	22.17	23	1	0.86	0.75	0.23
3	16QAM	1	8	22.06	22.02	22.05			0.98	0.94	
3	16QAM	1	14	22.07	22.08	22.09			0.93	0.91	
3	16QAM	8	0	21.26	21.29	21.34	22	2	0.74	0.66	0.19
3	16QAM	8	4	21.20	21.22	21.19			0.81	0.78	
3	16QAM	8	7	21.19	21.38	21.32			0.81	0.62	
3	16QAM	15	0	21.12	21.11	21.09			0.91	0.88	0.03
Channel				26797	26915	27033	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				824.7	836.5	848.3					
1.4	QPSK	1	0	23.05	23.08	23.07	24	0	0.95	0.95	0.13
1.4	QPSK	1	3	23.00	23.03	22.98			1.02	1.02	
1.4	QPSK	1	5	22.95	23.01	22.96			1.05	1.05	
1.4	QPSK	3	0	23.17	23.12	23.06			0.94	0.94	0.19
1.4	QPSK	3	1	23.03	23.11	22.99			1.01	1.01	
1.4	QPSK	3	3	23.12	23.01	22.98			1.02	1.02	
1.4	QPSK	6	0	22.08	22.30	22.08	23	1	0.92	0.92	0.22
1.4	16QAM	1	0	22.51	22.34	22.61	23	1	0.66	0.66	0.40
1.4	16QAM	1	3	22.59	22.54	22.74			0.46	0.46	
1.4	16QAM	1	5	22.52	22.44	22.61			0.56	0.56	
1.4	16QAM	3	0	22.17	22.01	22.07			0.99	0.99	0.28
1.4	16QAM	3	1	22.00	22.03	22.01			1.00	1.00	
1.4	16QAM	3	3	21.98	22.09	21.89			1.11	1.11	
1.4	16QAM	6	0	21.05	21.16	20.92	22	2	1.08	1.08	0.24

LTE TDD Power (Full Power)

Band 41				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	24	0	0
QPSK	50%/100% RB	23	1	0~1
16QAM	1 RB	23	1	0~1
16QAM	50%/100% RB	22	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				40340	40740	41140	24	0	1.50	1.38	0.37
Frequency (MHz)				2565	2605	2645					
20	QPSK	1	0	22.53	22.62	22.50					
20	QPSK	1	49	22.25	22.28	22.28	23	1	1.76	1.68	0.14
20	QPSK	1	99	22.25	22.28	22.26					
20	QPSK	50	0	21.24	21.31	21.32					
20	QPSK	50	24	21.32	21.31	21.29	23	1	1.76	1.64	0.12
20	QPSK	50	50	21.21	21.18	21.24					
20	QPSK	100	0	21.24	21.36	21.32					
20	16QAM	1	0	21.76	21.84	21.79	23	1	1.24	1.16	0.27
20	16QAM	1	49	22.03	21.94	21.94					
20	16QAM	1	99	21.88	21.95	21.98					
20	16QAM	50	0	20.42	20.47	20.39	22	2	1.61	1.53	0.30
20	16QAM	50	24	20.17	20.24	20.21					
20	16QAM	50	50	20.33	20.34	20.33					
20	16QAM	100	0	20.21	20.25	20.24	22	2	1.79	1.75	0.04
Channel				40315	40740	41165					
Frequency (MHz)				2562.5	2605	2647.5					
15	QPSK	1	0	22.41	22.35	22.35	24	0	1.65	1.59	0.36
15	QPSK	1	37	22.12	22.12	22.16					
15	QPSK	1	74	22.05	22.20	22.19					
15	QPSK	36	0	21.14	21.20	21.13	23	1	1.87	1.80	0.18
15	QPSK	36	20	21.17	21.10	21.14					
15	QPSK	36	39	21.02	21.05	21.09					
15	QPSK	75	0	21.12	21.24	21.23	23	1	1.88	1.76	0.12
15	16QAM	1	0	21.60	21.66	21.71					
15	16QAM	1	37	21.89	21.78	21.77					
15	16QAM	1	74	21.74	21.80	21.78	22	2	1.23	1.11	0.29
15	16QAM	36	0	20.28	20.30	20.26					
15	16QAM	36	20	20.06	20.10	20.10					
15	16QAM	36	39	20.12	20.26	20.26	22	2	1.74	1.70	0.24
15	16QAM	36	0	20.06	20.10	20.10					
15	16QAM	36	39	20.12	20.26	20.26					
15	16QAM	75	0	20.06	20.09	20.08	22	2	1.88	1.74	0.03
Channel				40290	40740	41190					
Frequency (MHz)				2560	2605	2650					
10	QPSK	1	0	22.36	22.32	22.38	24	0	1.68	1.62	0.31

10	QPSK	1	25	22.07	22.16	22.11			1.93	1.84	
10	QPSK	1	49	22.07	22.15	22.19			1.93	1.81	
10	QPSK	25	0	21.15	21.17	21.14	23	1	1.86	1.83	0.15
10	QPSK	25	12	21.18	21.14	21.17			1.86	1.82	
10	QPSK	25	25	21.03	21.07	21.06			1.97	1.93	
10	QPSK	50	0	21.08	21.21	21.25			1.92	1.75	0.17
10	16QAM	1	0	21.58	21.64	21.69	23	1	1.42	1.31	0.28
10	16QAM	1	25	21.86	21.81	21.78			1.22	1.14	
10	16QAM	1	49	21.83	21.82	21.85			1.18	1.15	
10	16QAM	25	0	20.26	20.33	20.24	22	2	1.76	1.67	0.26
10	16QAM	25	12	20.07	20.09	20.13			1.93	1.87	
10	16QAM	25	25	20.17	20.27	20.18			1.83	1.73	
10	16QAM	50	0	20.04	20.09	20.08			1.96	1.91	0.05
Channel				40265	40740	41215	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune- up	Ch Delta > 0.5
Frequency (MHz)				2557.5	2605	2652.5					
5	QPSK	1	0	22.36	22.39	22.34	24	0	1.66	1.61	0.33
5	QPSK	1	12	22.11	22.17	22.14			1.89	1.83	
5	QPSK	1	24	22.06	22.14	22.13			1.94	1.86	
5	QPSK	12	0	21.12	21.13	21.18	23	1	1.88	1.82	0.13
5	QPSK	12	7	21.17	21.16	21.16			1.84	1.83	
5	QPSK	12	13	21.10	21.10	21.05			1.95	1.90	
5	QPSK	25	0	21.13	21.21	21.17			1.87	1.79	0.08
5	16QAM	1	0	21.58	21.61	21.65	23	1	1.42	1.35	0.30
5	16QAM	1	12	21.88	21.73	21.81			1.27	1.12	
5	16QAM	1	24	21.75	21.81	21.81			1.25	1.19	
5	16QAM	12	0	20.19	20.26	20.31	22	2	1.81	1.69	0.23
5	16QAM	12	7	20.08	20.11	20.09			1.92	1.89	
5	16QAM	12	13	20.11	20.19	20.20			1.89	1.80	
5	16QAM	25	0	20.11	20.09	20.14			1.91	1.86	0.05

LTE FDD Power (Sensor on)

Band 2				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	17	0	0
QPSK	50%/100% RB	16	1	0~1
16QAM	1 RB	16	1	0~1
16QAM	50%/100% RB	15	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				18700	18900	19100					
Frequency (MHz)				1860	1880	1900					
20	QPSK	1	0	15.92	15.98	15.88					
20	QPSK	1	49	15.74	15.87	15.79	17	0	1.12	1.02	0.55
20	QPSK	1	99	15.43	15.87	15.71			1.26	1.13	
20	QPSK	1	99	15.43	15.87	15.71			1.57	1.13	
20	QPSK	50	0	14.82	14.89	14.87	16	1	1.18	1.11	0.36
20	QPSK	50	24	14.72	14.75	14.85			1.28	1.15	
20	QPSK	50	50	14.63	14.69	14.53			1.47	1.31	
20	QPSK	100	0	14.78	14.85	14.76	16	1	1.24	1.15	0.09
20	16QAM	1	0	14.64	14.65	14.66			1.36	1.34	
20	16QAM	1	49	14.52	14.53	14.67			1.48	1.33	
20	16QAM	1	99	14.45	14.49	14.30	16	1	1.70	1.51	0.37
20	16QAM	50	0	13.63	13.77	13.59		15	1.41	1.23	
20	16QAM	50	24	13.59	13.52	13.70			1.48	1.30	
20	16QAM	50	50	13.48	13.47	13.55	15	2	1.53	1.45	0.30
20	16QAM	100	0	13.47	13.41	13.38			1.62	1.53	
20	16QAM	100	0	13.47	13.41	13.38			1.62	1.53	
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1857.5	1880	1902.5					
15	QPSK	1	0	15.70	15.79	15.62					
15	QPSK	1	37	15.56	15.66	15.66	17	0	1.38	1.21	0.60
15	QPSK	1	74	15.19	15.67	15.52			1.44	1.34	
15	QPSK	1	74	15.19	15.67	15.52			1.81	1.33	
15	QPSK	36	0	14.64	14.70	14.62	16	1	1.38	1.30	0.40
15	QPSK	36	20	14.52	14.52	14.65			1.48	1.35	
15	QPSK	36	39	14.48	14.45	14.30			1.70	1.52	
15	QPSK	75	0	14.54	14.57	14.62	16	1	1.46	1.38	0.08
15	16QAM	1	0	14.51	14.38	14.44			1.62	1.49	
15	16QAM	1	37	14.37	14.36	14.39			1.64	1.61	
15	16QAM	1	74	14.30	14.35	14.12	16	1	1.88	1.65	0.39
15	16QAM	36	0	13.46	13.50	13.37			1.63	1.50	
15	16QAM	36	20	13.34	13.34	13.58			1.66	1.42	
15	16QAM	36	39	13.21	13.25	13.22	15	2	1.79	1.75	0.37
15	16QAM	36	39	13.21	13.25	13.22			1.79	1.75	
15	16QAM	75	0	13.27	13.26	13.25			1.75	1.73	
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1855	1880	1905					
				1855	1880	1905					

10	QPSK	1	0	15.79	15.74	15.65	17	0	1.35	1.21	0.62
10	QPSK	1	25	15.60	15.62	15.55			1.45	1.38	
10	QPSK	1	49	15.17	15.61	15.48			1.83	1.39	
10	QPSK	25	0	14.67	14.76	14.61	16	1	1.39	1.24	0.46
10	QPSK	25	12	14.45	14.61	14.68			1.55	1.32	
10	QPSK	25	25	14.43	14.51	14.30			1.70	1.49	
10	QPSK	50	0	14.57	14.69	14.50	16	1	1.50	1.31	0.19
10	16QAM	1	0	14.47	14.47	14.41			1.59	1.53	0.33
10	16QAM	1	25	14.40	14.38	14.50			1.62	1.50	
10	16QAM	1	49	14.21	14.26	14.17	15	2	1.83	1.74	
10	16QAM	25	0	13.46	13.62	13.42			1.58	1.38	0.39
10	16QAM	25	12	13.46	13.25	13.53			1.75	1.47	
10	16QAM	25	25	13.28	13.29	13.23			1.77	1.71	
10	16QAM	50	0	13.30	13.25	13.15	Tune-up limit (dBm)	MPR (dB)	1.85	1.70	0.15
Channel				18625	18900	19175			< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1852.5	1880	1907.5	17	0	1.24	1.17	0.68
5	QPSK	1	0	15.76	15.83	15.76			1.53	1.35	
5	QPSK	1	12	15.47	15.65	15.59			1.85	1.27	
5	QPSK	1	24	15.15	15.73	15.57	16	1	1.38	1.28	0.47
5	QPSK	12	0	14.62	14.72	14.67			1.48	1.30	
5	QPSK	12	7	14.52	14.55	14.70			1.75	1.53	
5	QPSK	12	13	14.37	14.47	14.25			1.48	1.32	0.16
5	QPSK	25	0	14.60	14.68	14.52	16	1	1.60	1.50	0.40
5	16QAM	1	0	14.44	14.40	14.50			1.76	1.52	
5	16QAM	1	12	14.24	14.29	14.48			1.90	1.66	
5	16QAM	1	24	14.29	14.34	14.10	15	2	1.63	1.42	0.38
5	16QAM	12	0	13.50	13.58	13.37			1.61	1.48	
5	16QAM	12	7	13.40	13.39	13.52			1.80	1.70	
5	16QAM	12	13	13.30	13.20	13.23			1.82	1.72	0.10
5	16QAM	25	0	13.28	13.18	13.23	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				18615	18900	19185					
Frequency (MHz)				1851.5	1880	1908.5	17	0	1.37	1.15	0.66
3	QPSK	1	0	15.74	15.85	15.63			1.49	1.26	
3	QPSK	1	8	15.51	15.74	15.59			1.81	1.41	
3	QPSK	1	14	15.19	15.59	15.48	16	1	1.45	1.32	0.34
3	QPSK	8	0	14.55	14.62	14.68			1.52	1.40	
3	QPSK	8	4	14.48	14.48	14.60			1.66	1.53	
3	QPSK	8	7	14.47	14.45	14.34			1.46	1.33	0.13
3	QPSK	15	0	14.57	14.67	14.54	16	1	1.64	1.50	0.49
3	16QAM	1	0	14.36	14.50	14.39			1.74	1.48	
3	16QAM	1	8	14.26	14.41	14.52			1.97	1.69	
3	16QAM	1	14	14.31	14.25	14.03	15	2	1.62	1.36	0.50
3	16QAM	8	0	13.38	13.64	13.43			1.66	1.55	
3	16QAM	8	4	13.34	13.37	13.45			1.86	1.67	
3	16QAM	8	7	13.26	13.33	13.14			1.81	1.79	0.02
3	16QAM	15	0	13.21	13.19	13.21	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				18607	18900	19193					
Frequency (MHz)				1850.7	1880	1909.3	17	0	1.36	1.36	0.62
1.4	QPSK	1	0	15.79	15.71	15.64					

1.4	QPSK	1	3	15.50	15.69	15.54			1.50	1.50	0.55
1.4	QPSK	1	5	15.17	15.71	15.47			1.83	1.83	
1.4	QPSK	3	0	15.75	15.85	15.74			1.26	1.26	
1.4	QPSK	3	1	15.47	15.64	15.66			1.53	1.53	
1.4	QPSK	3	3	15.30	15.68	15.47			1.70	1.70	
1.4	QPSK	6	0	14.55	14.69	14.58	16	1	1.45	1.45	0.14
1.4	16QAM	1	0	14.45	14.44	14.46	16	1	1.56	1.56	0.45
1.4	16QAM	1	3	14.35	14.33	14.50			1.67	1.67	
1.4	16QAM	1	5	14.22	14.28	14.05			1.95	1.95	
1.4	16QAM	3	0	14.62	14.62	14.64			1.38	1.38	0.32
1.4	16QAM	3	1	14.50	14.48	14.54			1.52	1.52	
1.4	16QAM	3	3	14.38	14.32	14.43			1.68	1.68	0.12
1.4	16QAM	6	0	13.26	13.20	13.14	15	2	1.86	1.86	

Band 4				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	20	0	0
QPSK	50%/100% RB	19	1	0~1
16QAM	1 RB	19	1	0~1
16QAM	50%/100% RB	18	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				20050	20175	20300	20	0	1.15	1.07	0.48
Frequency (MHz)				1720	1732.5	1745					
20	QPSK	1	0	18.85	18.93	18.90					
20	QPSK	1	49	18.77	18.66	18.61	19	1	1.39	1.23	0.62
20	QPSK	1	99	18.45	18.54	18.65			1.55	1.35	
20	QPSK	50	0	17.88	17.95	17.73			1.27	1.05	
20	QPSK	50	24	17.85	17.76	17.66			1.34	1.15	0.25
20	QPSK	50	50	17.51	17.33	17.38			1.67	1.49	
20	QPSK	100	0	17.44	17.69	17.51	19	1	1.56	1.31	0.47
20	16QAM	1	0	17.83	17.94	17.89			1.17	1.06	
20	16QAM	1	49	17.85	17.66	17.64			1.36	1.15	
20	16QAM	1	99	17.50	17.47	17.72	18	2	1.53	1.28	0.56
20	16QAM	50	0	16.93	16.93	16.79			1.21	1.07	
20	16QAM	50	24	16.91	16.75	16.72			1.28	1.09	
20	16QAM	50	50	16.46	16.37	16.39			1.63	1.54	0.21
20	16QAM	100	0	16.45	16.66	16.54			1.55	1.34	
Channel				20025	20175	20325	20	0	1.22	1.15	0.48
Frequency (MHz)				1717.5	1732.5	1747.5					
15	QPSK	1	0	18.82	18.85	18.78					
15	QPSK	1	37	18.60	18.57	18.46	20	0	1.54	1.40	0.48
15	QPSK	1	74	18.37	18.39	18.49			1.63	1.51	

15	QPSK	36	0	17.79	17.92	17.67	19	1	1.33	1.08	0.63
15	QPSK	36	20	17.79	17.70	17.57			1.43	1.21	
15	QPSK	36	39	17.39	17.29	17.34			1.71	1.61	
15	QPSK	75	0	17.35	17.62	17.48			1.65	1.38	0.27
15	16QAM	1	0	17.81	17.91	17.86	19	1	1.19	1.09	0.56
15	16QAM	1	37	17.74	17.49	17.52			1.51	1.26	
15	16QAM	1	74	17.35	17.37	17.64			1.65	1.36	
15	16QAM	36	0	16.76	16.89	16.63	18	2	1.37	1.11	0.55
15	16QAM	36	20	16.88	16.68	16.62			1.38	1.12	
15	16QAM	36	39	16.41	16.34	16.35			1.66	1.59	
15	16QAM	75	0	16.31	16.50	16.43			1.69	1.50	0.19
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1715	1732.5	1750					
10	QPSK	1	0	18.70	18.88	18.79	20	0	1.30	1.12	0.61
10	QPSK	1	25	18.60	18.62	18.57			1.43	1.38	
10	QPSK	1	49	18.27	18.40	18.62			1.73	1.38	
10	QPSK	25	0	17.80	17.80	17.63	19	1	1.37	1.20	0.55
10	QPSK	25	12	17.80	17.69	17.61			1.39	1.20	
10	QPSK	25	25	17.49	17.25	17.27			1.75	1.51	
10	QPSK	50	0	17.41	17.62	17.42			1.59	1.38	0.21
10	16QAM	1	0	17.74	17.88	17.84	19	1	1.26	1.12	0.44
10	16QAM	1	25	17.71	17.61	17.55			1.45	1.29	
10	16QAM	1	49	17.44	17.44	17.57			1.56	1.43	
10	16QAM	25	0	16.76	16.78	16.66	18	2	1.34	1.22	0.53
10	16QAM	25	12	16.77	16.61	16.58			1.42	1.23	
10	16QAM	25	25	16.31	16.25	16.33			1.75	1.67	
10	16QAM	50	0	16.32	16.58	16.42			1.68	1.42	0.26
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1712.5	1732.5	1752.5					
5	QPSK	1	0	18.78	18.75	18.88	20	0	1.25	1.12	0.55
5	QPSK	1	12	18.66	18.57	18.44			1.56	1.34	
5	QPSK	1	24	18.33	18.37	18.61			1.67	1.39	
5	QPSK	12	0	17.83	17.84	17.66	19	1	1.34	1.16	0.61
5	QPSK	12	7	17.68	17.62	17.49			1.51	1.32	
5	QPSK	12	13	17.45	17.30	17.23			1.77	1.55	
5	QPSK	25	0	17.28	17.56	17.47			1.72	1.44	0.28
5	16QAM	1	0	17.72	17.79	17.80	19	1	1.28	1.20	0.50
5	16QAM	1	12	17.74	17.50	17.49			1.51	1.26	
5	16QAM	1	24	17.44	17.30	17.62			1.70	1.38	
5	16QAM	12	0	16.85	16.79	16.65	18	2	1.35	1.15	0.68
5	16QAM	12	7	16.88	16.59	16.63			1.41	1.12	
5	16QAM	12	13	16.41	16.20	16.36			1.80	1.59	
5	16QAM	25	0	16.33	16.61	16.44			1.67	1.39	0.28
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1711.5	1732.5	1753.5					
3	QPSK	1	0	18.83	18.89	18.85	20	0	1.17	1.11	0.46
3	QPSK	1	8	18.64	18.49	18.57			1.51	1.36	
3	QPSK	1	14	18.43	18.46	18.58			1.57	1.42	
3	QPSK	8	0	17.83	17.91	17.69	19	1	1.31	1.09	0.71

3	QPSK	8	4	17.70	17.68	17.50			1.50	1.30	0.24
3	QPSK	8	7	17.40	17.30	17.20			1.80	1.60	
3	QPSK	15	0	17.39	17.63	17.45			1.61	1.37	
3	16QAM	1	0	17.75	17.76	17.80	19	1	1.25	1.20	0.43
3	16QAM	1	8	17.69	17.51	17.53			1.49	1.31	
3	16QAM	1	14	17.37	17.40	17.65			1.63	1.35	
3	16QAM	8	0	16.83	16.84	16.62	18	2	1.38	1.16	0.57
3	16QAM	8	4	16.76	16.70	16.61			1.39	1.24	
3	16QAM	8	7	16.40	16.27	16.30			1.73	1.60	
3	16QAM	15	0	16.38	16.49	16.43			1.62	1.51	0.11
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1710.7	1732.5	1754.3					
1.4	QPSK	1	0	18.80	18.83	18.80	20	0	1.20	1.20	0.55
1.4	QPSK	1	3	18.69	18.60	18.51			1.49	1.49	
1.4	QPSK	1	5	18.28	18.41	18.50			1.72	1.72	
1.4	QPSK	3	0	18.71	18.89	18.83			1.29	1.29	0.55
1.4	QPSK	3	1	18.60	18.55	18.47			1.53	1.53	
1.4	QPSK	3	3	18.34	18.40	18.62			1.66	1.66	
1.4	QPSK	6	0	17.34	17.66	17.34	19	1	1.66	1.66	0.32
1.4	16QAM	1	0	17.70	17.76	17.77	19	1	1.30	1.30	0.37
1.4	16QAM	1	3	17.74	17.59	17.59			1.41	1.41	
1.4	16QAM	1	5	17.42	17.40	17.67			1.60	1.60	
1.4	16QAM	3	0	17.74	17.92	17.71			1.29	1.29	0.57
1.4	16QAM	3	1	17.80	17.59	17.46			1.54	1.54	
1.4	16QAM	3	3	17.35	17.43	17.64			1.65	1.65	
1.4	16QAM	6	0	16.29	16.53	16.48	18	2	1.71	1.71	0.24

Band 5

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	22.5	0	0
QPSK	50%/100% RB	21.5	1	0~1
16QAM	1 RB	21.5	1	0~1
16QAM	50%/100% RB	20.5	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Channel				20450	20525	20600	22.5	0	1.56	1.50	0.42
Frequency (MHz)				829	836.5	844			1.87	1.68	
10	QPSK	1	0	20.94	21.00	20.99			1.92	1.72	
10	QPSK	1	25	20.82	20.69	20.63	21.5	1	1.67	1.46	0.58
10	QPSK	1	49	20.58	20.69	20.78			1.70	1.49	
10	QPSK	25	0	20.04	19.99	19.83			2.04	1.86	
10	QPSK	25	12	20.01	19.85	19.80					
10	QPSK	25	25	19.64	19.50	19.46					

10	QPSK	50	0	19.57	19.86	19.64	21.5	1	1.93	1.64	0.29
10	16QAM	1	0	19.90	20.02	19.93			1.60	1.48	0.48
10	16QAM	1	25	19.93	19.83	19.67			1.83	1.57	
10	16QAM	1	49	19.54	19.60	19.89			1.96	1.61	
10	16QAM	25	0	19.06	19.10	18.85	20.5	2	1.65	1.40	0.60
10	16QAM	25	12	18.99	18.79	18.80			1.71	1.51	
10	16QAM	25	25	18.61	18.50	18.53			2.00	1.89	
10	16QAM	50	0	18.51	18.71	18.65			1.99	1.79	0.20
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				826.5	836.5	846.5					
5	QPSK	1	0	20.98	21.07	21.02	22.5	0	1.52	1.43	0.57
5	QPSK	1	12	20.83	20.68	20.63			1.87	1.67	
5	QPSK	1	24	20.50	20.67	20.81			2.00	1.69	
5	QPSK	12	0	19.98	19.98	19.79	21.5	1	1.71	1.52	0.57
5	QPSK	12	7	19.98	19.81	19.84			1.69	1.52	
5	QPSK	12	13	19.59	19.43	19.41			2.09	1.91	
5	QPSK	25	0	19.58	19.79	19.69			1.92	1.71	0.21
5	16QAM	1	0	19.96	19.96	19.99	21.5	1	1.54	1.51	0.44
5	16QAM	1	12	19.93	19.83	19.69			1.81	1.57	
5	16QAM	1	24	19.56	19.55	19.93			1.95	1.57	
5	16QAM	12	0	19.03	19.15	18.93	20.5	2	1.57	1.35	0.69
5	16QAM	12	7	19.00	18.77	18.85			1.73	1.50	
5	16QAM	12	13	18.64	18.46	18.54			2.04	1.86	
5	16QAM	25	0	18.48	18.69	18.61			2.02	1.81	0.21
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				825.5	836.5	847.5					
3	QPSK	1	0	20.98	20.98	20.97	22.5	0	1.53	1.52	0.46
3	QPSK	1	8	20.87	20.65	20.58			1.92	1.63	
3	QPSK	1	14	20.52	20.62	20.78			1.98	1.72	
3	QPSK	8	0	20.00	19.92	19.86	21.5	1	1.64	1.50	0.61
3	QPSK	8	4	20.07	19.89	19.79			1.71	1.43	
3	QPSK	8	7	19.68	19.46	19.46			2.04	1.82	
3	QPSK	15	0	19.53	19.86	19.68			1.97	1.64	0.33
3	16QAM	1	0	19.93	20.01	19.87	21.5	1	1.63	1.49	0.53
3	16QAM	1	8	19.95	19.76	19.63			1.87	1.55	
3	16QAM	1	14	19.48	19.57	19.81			2.02	1.69	
3	16QAM	8	0	19.09	19.13	18.93	20.5	2	1.57	1.37	0.69
3	16QAM	8	4	18.98	18.84	18.79			1.71	1.52	
3	16QAM	8	7	18.62	18.44	18.60			2.06	1.88	
3	16QAM	15	0	18.49	18.65	18.72			2.01	1.78	0.23
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				824.7	836.5	848.3					
1.4	QPSK	1	0	20.89	20.97	21.04	22.5	0	1.61	1.61	0.48
1.4	QPSK	1	3	20.80	20.75	20.57			1.93	1.93	
1.4	QPSK	1	5	20.56	20.70	20.75			1.94	1.94	
1.4	QPSK	3	0	20.92	20.97	21.06			1.58	1.58	0.52
1.4	QPSK	3	1	20.85	20.74	20.61			1.89	1.89	
1.4	QPSK	3	3	20.54	20.70	20.79			1.96	1.96	
1.4	QPSK	6	0	19.61	19.81	19.60	21.5	1	1.90	1.90	0.21

1.4	16QAM	1	0	19.97	20.00	19.90	21.5	1	1.60	1.60	0.45
1.4	16QAM	1	3	19.90	19.83	19.73			1.77	1.77	
1.4	16QAM	1	5	19.57	19.55	19.82			1.95	1.95	
1.4	16QAM	3	0	19.86	20.02	19.94			1.64	1.64	0.50
1.4	16QAM	3	1	19.86	19.83	19.67			1.83	1.83	
1.4	16QAM	3	3	19.59	19.52	19.88			1.98	1.98	
1.4	16QAM	6	0	18.51	18.67	18.72	20.5	2	1.99	1.99	0.21

Band 12

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	23	0	0
QPSK	50%/100% RB	22	1	0~1
16QAM	1 RB	22	1	0~1
16QAM	50%/100% RB	21	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				23060	23095	23130	23	0	1.54	1.50	0.37
Frequency (MHz)				704	707.5	711					
10	QPSK	1	0	21.46	21.50	21.49					
10	QPSK	1	25	21.26	21.25	21.33	22	1	1.75	1.67	0.40
10	QPSK	1	49	21.23	21.13	21.24			1.87	1.76	
10	QPSK	25	0	20.54	20.59	20.33			1.67	1.41	
10	QPSK	25	12	20.48	20.36	20.32			1.68	1.52	0.23
10	QPSK	25	25	20.19	20.33	20.23			1.81	1.67	
10	QPSK	50	0	20.11	20.34	20.23			1.89	1.66	
10	16QAM	1	0	20.47	20.55	20.47	22	1	1.53	1.45	0.43
10	16QAM	1	25	20.44	20.30	20.13			1.87	1.56	
10	16QAM	1	49	20.23	20.12	20.33			1.88	1.67	
10	16QAM	25	0	19.56	19.66	19.42	21	2	1.58	1.34	0.53
10	16QAM	25	12	19.48	19.32	19.24			1.76	1.52	
10	16QAM	25	25	19.13	19.22	19.27			1.87	1.73	
10	16QAM	50	0	19.33	19.26	19.18			1.82	1.67	0.15
Channel				23035	23095	23155	23	0	1.69	1.59	0.38
Frequency (MHz)				701.5	707.5	713.5			1.84	1.69	
5	QPSK	1	0	21.31	21.41	21.35			1.97	1.78	
5	QPSK	1	12	21.19	21.16	21.31	22	1	1.81	1.57	0.48
5	QPSK	1	24	21.21	21.03	21.22			1.83	1.63	
5	QPSK	12	0	20.43	20.31	20.19			2.05	1.80	
5	QPSK	12	7	20.37	20.26	20.17			2.03	1.71	0.32
5	QPSK	12	13	20.16	19.95	20.20	22	1	1.69	1.49	0.50
5	QPSK	25	0	19.97	20.29	20.13			1.90	1.69	
5	16QAM	1	0	20.33	20.51	20.31					
5	16QAM	1	12	20.31	20.16	20.10					

5	16QAM	1	24	20.19	20.01	20.19	21	2	1.99	1.81	0.48
5	16QAM	12	0	19.47	19.51	19.39			1.61	1.49	
5	16QAM	12	7	19.45	19.23	19.14			1.86	1.55	
5	16QAM	12	13	19.03	19.15	19.13			1.97	1.85	
5	16QAM	25	0	19.16	19.21	19.06			1.94	1.79	0.15
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				700.5	707.5	714.5					
3	QPSK	1	0	21.31	21.41	21.35	23	0	1.69	1.59	0.38
3	QPSK	1	8	21.19	21.16	21.31			1.84	1.69	
3	QPSK	1	14	21.21	21.03	21.22			1.97	1.78	
3	QPSK	8	0	20.43	20.31	20.19	22	1	1.81	1.57	0.48
3	QPSK	8	4	20.37	20.26	20.17			1.83	1.63	
3	QPSK	8	7	20.16	19.95	20.20			2.05	1.80	
3	QPSK	15	0	19.97	20.29	20.13			2.03	1.71	0.32
3	16QAM	1	0	20.33	20.51	20.31	22	1	1.69	1.49	0.50
3	16QAM	1	8	20.31	20.16	20.10			1.90	1.69	
3	16QAM	1	14	20.19	20.01	20.19			1.99	1.81	
3	16QAM	8	0	19.47	19.51	19.39	21	2	1.61	1.49	0.48
3	16QAM	8	4	19.45	19.23	19.14			1.86	1.55	
3	16QAM	8	7	19.03	19.15	19.13			1.97	1.85	
3	16QAM	15	0	19.16	19.21	19.06			1.94	1.79	0.15
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				699.7	707.5	715.3					
1.4	QPSK	1	0	21.31	21.41	21.35	23	0	1.69	1.69	0.38
1.4	QPSK	1	3	21.19	21.16	21.31			1.84	1.84	
1.4	QPSK	1	5	21.21	21.03	21.22			1.97	1.97	
1.4	QPSK	3	0	20.43	20.31	20.19			2.81	2.81	0.48
1.4	QPSK	3	1	20.37	20.26	20.17			2.83	2.83	
1.4	QPSK	3	3	20.16	19.95	20.20			3.05	3.05	
1.4	QPSK	6	0	19.97	20.29	20.13	22	1	2.03	2.03	0.32
1.4	16QAM	1	0	20.33	20.51	20.31	22	1	1.69	1.69	0.50
1.4	16QAM	1	3	20.31	20.16	20.10			1.90	1.90	
1.4	16QAM	1	5	20.19	20.01	20.19			1.99	1.99	
1.4	16QAM	3	0	19.47	19.51	19.39			2.61	2.61	0.48
1.4	16QAM	3	1	19.45	19.23	19.14			2.86	2.86	
1.4	16QAM	3	3	19.03	19.15	19.13			2.97	2.97	
1.4	16QAM	6	0	19.16	19.21	19.06	21	2	1.94	1.94	0.15

Band 13

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	23.5	0	0
QPSK	50%/100% RB	22.5	1	0~1
16QAM	1 RB	22.5	1	0~1
16QAM	50%/100% RB	21.5	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Channel				23230							
Frequency (MHz)				782							
10	QPSK	1	0	22.14			23.5	0	1.36	1.36	0.26
10	QPSK	1	25	22.09					1.41	1.41	
10	QPSK	1	49	21.88					1.62	1.62	
10	QPSK	25	0	21.32			22.5	1	1.18	1.18	0.51
10	QPSK	25	12	21.31					1.19	1.19	
10	QPSK	25	25	20.81					1.69	1.69	
10	QPSK	50	0	21.12			22.5	1	1.38	1.38	0.00
10	16QAM	1	0	21.50					1.00	1.00	0.97
10	16QAM	1	25	21.06					1.44	1.44	
10	16QAM	1	49	20.53			1.97	1.97			
10	16QAM	25	0	20.16			21.5	2	1.34	1.34	0.49
10	16QAM	25	12	20.14					1.36	1.36	
10	16QAM	25	25	19.67					1.83	1.83	
10	16QAM	50	0	19.90					1.60	1.60	0.00
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				779.5	782	784.5					
5	QPSK	1	0	21.92	22.05	21.92	23.5	0	1.58	1.45	0.36
5	QPSK	1	12	21.90	21.94	21.96			1.60	1.54	
5	QPSK	1	24	21.73	21.80	21.69			1.81	1.70	
5	QPSK	12	0	21.00	21.08	21.05	22.5	1	1.50	1.42	0.55
5	QPSK	12	7	21.09	21.13	21.17			1.41	1.33	
5	QPSK	12	13	20.64	20.62	20.63			1.88	1.86	
5	QPSK	25	0	21.04	20.99	21.04	22.5	1	1.51	1.46	0.05
5	16QAM	1	0	21.36	21.43	21.29			1.21	1.07	1.12
5	16QAM	1	12	20.94	20.92	20.94			1.58	1.56	
5	16QAM	1	24	20.34	20.44	20.31	21.5	2	2.19	2.06	
5	16QAM	12	0	20.06	20.07	19.94			1.56	1.43	0.62
5	16QAM	12	7	19.99	20.01	19.94			1.56	1.49	
5	16QAM	12	13	19.51	19.45	19.49			2.05	1.99	
5	16QAM	25	0	19.76	19.69	19.82			1.81	1.68	0.13

Band 17

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	23	0	0
QPSK	50%/100% RB	22	1	0~1
16QAM	1 RB	22	1	0~1
16QAM	50%/100% RB	21	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
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Channel				23780	23790	23800					
Frequency (MHz)				709	710	711					
10	QPSK	1	0	21.40	21.47	21.40	23	0	1.60	1.53	0.51
10	QPSK	1	25	21.20	21.15	21.30			1.85	1.70	
10	QPSK	1	49	21.06	20.96	21.09			2.04	1.91	
10	QPSK	25	0	20.42	20.44	20.18	22	1	1.82	1.56	0.39
10	QPSK	25	12	20.31	20.34	20.27			1.73	1.66	
10	QPSK	25	25	20.12	20.05	20.08			1.95	1.88	
10	QPSK	50	0	20.08	20.22	20.09			1.92	1.78	0.14
10	16QAM	1	0	20.37	20.42	20.32	22	1	1.68	1.58	0.44
10	16QAM	1	25	20.34	20.15	20.07			1.93	1.66	
10	16QAM	1	49	20.10	19.98	20.28			2.02	1.72	
10	16QAM	25	0	19.43	19.59	19.33	21	2	1.67	1.41	0.57
10	16QAM	25	12	19.44	19.16	19.21			1.84	1.56	
10	16QAM	25	25	19.02	19.10	19.13			1.98	1.87	
10	16QAM	50	0	19.29	19.19	19.07			1.93	1.71	0.22
Channel				23755	23790	23825	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				706.5	710	713.5					
5	QPSK	1	0	21.43	21.36	21.45	23	0	1.64	1.55	0.43
5	QPSK	1	12	21.18	21.11	21.22			1.89	1.78	
5	QPSK	1	24	21.17	21.02	21.06			1.98	1.83	
5	QPSK	12	0	20.48	20.38	20.24	22	1	1.76	1.52	0.40
5	QPSK	12	7	20.31	20.19	20.21			1.81	1.69	
5	QPSK	12	13	20.12	20.08	20.19			1.92	1.81	
5	QPSK	25	0	19.95	20.18	20.21			2.05	1.79	0.26
5	16QAM	1	0	20.39	20.44	20.45	22	1	1.61	1.55	0.48
5	16QAM	1	12	20.32	20.19	20.06			1.94	1.68	
5	16QAM	1	24	20.08	19.97	20.26			2.03	1.74	
5	16QAM	12	0	19.49	19.57	19.39	21	2	1.61	1.43	0.50
5	16QAM	12	7	19.39	19.28	19.08			1.92	1.61	
5	16QAM	12	13	19.07	19.18	19.20			1.93	1.80	
5	16QAM	25	0	19.23	19.21	19.03			1.97	1.77	0.20

Band 25

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	17	0	0
QPSK	50%/100% RB	16	1	0~1
16QAM	1 RB	16	1	0~1
16QAM	50%/100% RB	15	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Channel				26140	26365	26590					
Frequency (MHz)				1860	1882.5	1905					

20	QPSK	1	0	16.22	16.29	16.14	17	0	0.86	0.71	0.76
20	QPSK	1	49	15.77	15.92	15.92			1.23	1.08	
20	QPSK	1	99	15.53	15.99	15.86			1.47	1.01	
20	QPSK	50	0	14.91	15.02	14.94	16	1	1.09	0.98	0.35
20	QPSK	50	24	14.77	14.82	15.00			1.23	1.00	
20	QPSK	50	50	14.79	14.82	14.67			1.33	1.18	
20	QPSK	100	0	14.84	14.99	14.87	16	1	1.16	1.01	0.15
20	16QAM	1	0	14.77	14.81	14.77			1.23	1.19	0.40
20	16QAM	1	49	14.63	14.58	14.69			1.42	1.31	
20	16QAM	1	99	14.53	14.53	14.41	15	2	1.59	1.47	
20	16QAM	50	0	13.74	13.80	13.62			1.38	1.20	0.33
20	16QAM	50	24	13.70	13.54	13.87			1.46	1.13	
20	16QAM	50	50	13.58	13.62	13.67			1.42	1.33	
20	16QAM	100	0	13.61	13.44	13.55	Tune-up limit (dBm)	MPR (dB)	1.56	1.39	0.17
Channel				26115	26365	26615			< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1857.5	1882.5	1907.5	17	0	1.20	1.09	0.63
15	QPSK	1	0	15.80	15.91	15.82			1.36	1.30	
15	QPSK	1	37	15.65	15.70	15.64			1.72	1.22	
15	QPSK	1	74	15.28	15.78	15.64	16	1	1.32	1.19	0.39
15	QPSK	36	0	14.68	14.81	14.78			1.42	1.18	
15	QPSK	36	20	14.58	14.64	14.82			1.57	1.35	
15	QPSK	36	39	14.55	14.65	14.43			1.40	1.24	0.16
15	QPSK	75	0	14.71	14.76	14.60	16	1	1.48	1.39	0.35
15	16QAM	1	0	14.57	14.52	14.61			1.58	1.42	
15	16QAM	1	37	14.42	14.49	14.58			1.74	1.64	
15	16QAM	1	74	14.36	14.36	14.26	15	2	1.51	1.29	0.36
15	16QAM	36	0	13.49	13.71	13.54			1.62	1.45	
15	16QAM	36	20	13.55	13.38	13.52			1.65	1.58	
15	16QAM	36	39	13.35	13.42	13.42			1.80	1.57	0.23
15	16QAM	75	0	13.43	13.32	13.20	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				26090	26365	26640					
Frequency (MHz)				1855	1882.5	1910	17	0	1.22	1.13	0.56
10	QPSK	1	0	15.85	15.87	15.78			1.38	1.17	
10	QPSK	1	25	15.66	15.83	15.62			1.69	1.23	
10	QPSK	1	49	15.31	15.77	15.58	16	1	1.32	1.26	0.46
10	QPSK	25	0	14.68	14.74	14.72			1.37	1.19	
10	QPSK	25	12	14.63	14.73	14.81			1.65	1.45	
10	QPSK	25	25	14.52	14.55	14.35			1.29	1.26	0.03
10	QPSK	50	0	14.71	14.74	14.73	16	1	1.50	1.46	0.45
10	16QAM	1	0	14.50	14.53	14.54			1.59	1.37	
10	16QAM	1	25	14.44	14.41	14.63			1.82	1.62	
10	16QAM	1	49	14.38	14.38	14.18	15	2	1.55	1.35	0.25
10	16QAM	25	0	13.51	13.65	13.45			1.52	1.36	
10	16QAM	25	12	13.54	13.48	13.64			1.60	1.47	
10	16QAM	25	25	13.43	13.40	13.53			1.69	1.63	0.06
10	16QAM	50	0	13.37	13.31	13.35	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				26065	26365	26665					
Frequency (MHz)				1852.5	1882.5	1912.5	17	0	1.21	1.05	0.64
5	QPSK	1	0	15.79	15.95	15.84					

5	QPSK	1	12	15.59	15.69	15.75	16	1	1.41	1.25	0.45
5	QPSK	1	24	15.31	15.83	15.57			1.69	1.17	
5	QPSK	12	0	14.71	14.80	14.74			1.29	1.20	
5	QPSK	12	7	14.61	14.71	14.83			1.39	1.17	
5	QPSK	12	13	14.49	14.54	14.38			1.62	1.46	
5	QPSK	25	0	14.75	14.75	14.74	16	1	1.26	1.25	0.01
5	16QAM	1	0	14.51	14.47	14.57			1.53	1.43	0.34
5	16QAM	1	12	14.34	14.49	14.60			1.66	1.40	
5	16QAM	1	24	14.30	14.41	14.26	15	2	1.74	1.59	
5	16QAM	12	0	13.47	13.74	13.50			1.53	1.26	0.38
5	16QAM	12	7	13.56	13.48	13.60			1.52	1.40	
5	16QAM	12	13	13.45	13.36	13.47			1.64	1.53	
5	16QAM	25	0	13.33	13.29	13.23			1.77	1.67	0.10
Channel				26055	26365	26675	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1851.5	1882.5	1913.5					
3	QPSK	1	0	15.77	15.89	15.75	17	0	1.25	1.11	0.61
3	QPSK	1	8	15.61	15.84	15.76			1.39	1.16	
3	QPSK	1	14	15.28	15.79	15.62			1.72	1.21	
3	QPSK	8	0	14.69	14.81	14.74	16	1	1.31	1.19	0.38
3	QPSK	8	4	14.63	14.61	14.77			1.39	1.23	
3	QPSK	8	7	14.45	14.52	14.43			1.57	1.48	
3	QPSK	15	0	14.71	14.67	14.65			1.35	1.29	0.06
3	16QAM	1	0	14.56	14.51	14.53	16	1	1.49	1.44	0.42
3	16QAM	1	8	14.44	14.37	14.62			1.63	1.38	
3	16QAM	1	14	14.35	14.44	14.20			1.80	1.56	
3	16QAM	8	0	13.53	13.73	13.43	15	2	1.57	1.27	0.39
3	16QAM	8	4	13.44	13.45	13.59			1.56	1.41	
3	16QAM	8	7	13.34	13.43	13.41			1.66	1.57	
3	16QAM	15	0	13.37	13.33	13.29			1.71	1.63	0.08
Channel				26047	26365	26683	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				1850.7	1882.5	1914.3					
1.4	QPSK	1	0	15.90	15.92	15.92	17	0	1.10	1.10	0.50
1.4	QPSK	1	3	15.80	15.88	15.77			1.23	1.23	
1.4	QPSK	1	5	15.42	15.91	15.77			1.58	1.58	
1.4	QPSK	3	0	15.90	16.00	15.84			1.16	1.16	0.53
1.4	QPSK	3	1	15.75	15.79	15.78			1.25	1.25	
1.4	QPSK	3	3	15.47	15.80	15.70			1.53	1.53	
1.4	QPSK	6	0	14.85	14.85	14.80	16	1	1.20	1.20	0.05
1.4	16QAM	1	0	14.60	14.71	14.62	16	1	1.40	1.40	0.37
1.4	16QAM	1	3	14.54	14.54	14.62			1.46	1.46	
1.4	16QAM	1	5	14.40	14.54	14.34			1.66	1.66	
1.4	16QAM	3	0	14.71	14.88	14.76			1.29	1.29	0.34
1.4	16QAM	3	1	14.58	14.60	14.70			1.42	1.42	
1.4	16QAM	3	3	14.54	14.56	14.60			1.46	1.46	
1.4	16QAM	6	0	13.40	13.39	13.40	15	2	1.61	1.61	0.01

Band 26 For FCC

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	22.5	0	0
QPSK	50%/100% RB	21.5	1	0~1
16QAM	1 RB	21.5	1	0~1
16QAM	50%/100% RB	20.5	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				26765	26865	26965					
Frequency (MHz)				821.5	831.5	841.5					
15	QPSK	1	0	21.11	21.19	21.18					
15	QPSK	1	37	21.04	20.85	20.70	22.5	0	1.39	1.31	0.49
15	QPSK	1	74	20.70	20.76	20.93	21.5	1	1.80	1.46	
15	QPSK	36	0	20.21	20.20	20.01			1.80	1.57	
15	QPSK	36	20	20.22	19.96	20.03			1.49	1.29	0.59
15	QPSK	36	39	19.73	19.63	19.67			1.54	1.28	
15	QPSK	75	0	19.79	20.07	19.78			1.87	1.77	
15	16QAM	1	0	20.12	20.11	20.10	21.5	1	1.72	1.43	0.29
15	16QAM	1	37	20.06	19.96	19.75			1.40	1.38	0.39
15	16QAM	1	74	19.73	19.73	20.10			1.75	1.44	
15	16QAM	36	0	19.13	19.19	19.04	20.5	2	1.77	1.40	0.56
15	16QAM	36	20	19.18	18.87	18.87			1.46	1.31	
15	16QAM	36	39	18.68	18.63	18.71			1.63	1.32	
15	16QAM	36	75	18.63	18.82	18.84			1.87	1.79	0.21
15	16QAM	75	0	18.63	18.82	18.84			1.87	1.66	
Channel				26740	26865	26990					
Frequency (MHz)				819	831.5	844					
10	QPSK	1	0	20.93	20.96	21.01					
10	QPSK	1	25	20.78	20.67	20.58	22.5	0	1.57	1.49	0.47
10	QPSK	1	49	20.54	20.61	20.77	21.5	1	1.92	1.72	
10	QPSK	25	0	20.04	20.01	19.79			1.96	1.73	
10	QPSK	25	12	19.91	19.76	19.68			1.71	1.46	0.65
10	QPSK	25	25	19.66	19.45	19.39			1.82	1.59	
10	QPSK	50	0	19.59	19.75	19.66			2.11	1.84	
10	16QAM	1	0	19.79	19.97	19.85	21.5	1	1.91	1.75	0.16
10	16QAM	1	25	19.82	19.73	19.70			1.71	1.53	0.53
10	16QAM	1	49	19.44	19.58	19.90			1.80	1.68	
10	16QAM	25	0	19.09	19.04	18.85	20.5	2	2.06	1.60	0.64
10	16QAM	25	12	18.87	18.76	18.81			1.65	1.41	
10	16QAM	25	25	18.55	18.45	18.52			1.74	1.63	
10	16QAM	50	0	18.48	18.59	18.60			2.05	1.95	0.12
10	16QAM	50	0	18.48	18.59	18.60			2.02	1.90	
Channel				26715	26865	27015					
Frequency (MHz)				816.5	831.5	846.5					
5	QPSK	1	0	20.92	20.88	21.01					
5	QPSK	1	12	20.81	20.64	20.52	22.5	0	1.62	1.49	0.56
5	QPSK	1	24	20.45	20.69	20.71	21.5	1	1.98	1.69	
5	QPSK	12	0	19.98	19.98	19.71			2.05	1.79	
5	QPSK	12	0	19.98	19.98	19.71	21.5	1	1.79	1.52	0.61

5	QPSK	12	7	19.98	19.85	19.69			1.81	1.52	0.19
5	QPSK	12	13	19.55	19.37	19.44			2.13	1.95	
5	QPSK	25	0	19.58	19.77	19.65			1.92	1.73	
5	16QAM	1	0	19.89	19.99	19.86	21.5	1	1.64	1.51	0.56
5	16QAM	1	12	19.95	19.85	19.55			1.95	1.55	
5	16QAM	1	24	19.43	19.52	19.84			2.07	1.66	
5	16QAM	12	0	18.94	19.07	18.78	20.5	2	1.72	1.43	0.60
5	16QAM	12	7	18.91	18.70	18.74			1.80	1.59	
5	16QAM	12	13	18.56	18.47	18.54			2.03	1.94	
5	16QAM	25	0	18.43	18.60	18.65			2.07	1.85	0.22
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				815.5	831.5	847.5					
3	QPSK	1	0	20.93	21.03	20.87	22.5	0	1.63	1.47	0.43
3	QPSK	1	8	20.74	20.69	20.62			1.88	1.76	
3	QPSK	1	14	20.60	20.69	20.72			1.90	1.78	
3	QPSK	8	0	19.95	20.00	19.71	21.5	1	1.79	1.50	0.64
3	QPSK	8	4	20.02	19.84	19.70			1.80	1.48	
3	QPSK	8	7	19.66	19.44	19.38			2.12	1.84	
3	QPSK	15	0	19.50	19.79	19.54			2.00	1.71	0.29
3	16QAM	1	0	19.85	19.91	19.89	21.5	1	1.65	1.59	0.49
3	16QAM	1	8	19.95	19.78	19.54			1.96	1.55	
3	16QAM	1	14	19.46	19.62	19.86			2.04	1.64	
3	16QAM	8	0	19.06	19.07	18.77	20.5	2	1.73	1.43	0.59
3	16QAM	8	4	18.91	18.82	18.73			1.77	1.59	
3	16QAM	8	7	18.55	18.48	18.49			2.02	1.95	
3	16QAM	15	0	18.41	18.71	18.61			2.09	1.79	0.30
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				814.7	831.5	848.3					
1.4	QPSK	1	0	20.90	20.93	20.89	22.5	0	1.61	1.61	0.34
1.4	QPSK	1	3	20.79	20.70	20.59			1.91	1.91	
1.4	QPSK	1	5	20.61	20.69	20.71			1.89	1.89	
1.4	QPSK	3	0	20.97	20.98	20.94			1.56	1.56	0.42
1.4	QPSK	3	1	20.75	20.56	20.57			1.94	1.94	
1.4	QPSK	3	3	20.56	20.60	20.74			1.94	1.94	
1.4	QPSK	6	0	19.59	19.80	19.56	21.5	1	1.94	1.94	0.24
1.4	16QAM	1	0	19.79	20.04	19.85	21.5	1	1.71	1.71	0.53
1.4	16QAM	1	3	19.92	19.86	19.61			1.89	1.89	
1.4	16QAM	1	5	19.53	19.51	19.90			1.99	1.99	
1.4	16QAM	3	0	19.92	19.96	19.88			1.62	1.62	0.44
1.4	16QAM	3	1	19.90	19.82	19.69			1.81	1.81	
1.4	16QAM	3	3	19.55	19.52	19.88			1.98	1.98	
1.4	16QAM	6	0	18.52	18.68	18.64	20.5	2	1.98	1.98	0.16

Band 26 For IC

Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
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QPSK	1 RB	22.5	0	0
QPSK	50%/100% RB	21.5	1	0~1
16QAM	1 RB	21.5	1	0~1
16QAM	50%/100% RB	20.5	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				26865	26915	26965					
Frequency (MHz)				831.5	836.5	841.5					
15	QPSK	1	0	21.19	21.15	21.18					
15	QPSK	1	37	20.85	20.89	20.70	22.5	0	1.35	1.31	0.49
15	QPSK	1	74	20.76	20.79	20.93	21.5	1	1.80	1.61	
15	QPSK	36	0	20.20	20.16	20.01			1.74	1.57	
15	QPSK	36	20	19.96	20.04	20.03			1.49	1.30	0.57
15	QPSK	36	39	19.63	19.63	19.67			1.54	1.46	
15	QPSK	75	0	20.07	20.06	19.78			1.87	1.83	
15	16QAM	1	0	20.11	20.17	20.10	21.5	1	1.72	1.43	0.29
15	16QAM	1	37	19.96	19.89	19.75			1.40	1.33	0.44
15	16QAM	1	74	19.73	19.75	20.10			1.75	1.54	
15	16QAM	36	0	19.19	19.24	19.04	20.5	2	1.77	1.40	0.61
15	16QAM	36	20	18.87	18.81	18.87			1.46	1.26	
15	16QAM	36	39	18.63	18.64	18.71			1.69	1.63	
15	16QAM	36	75	18.82	18.76	18.84			1.87	1.79	0.08
15	16QAM	75	0						1.74	1.66	
Channel				26840	26915	26990					
Frequency (MHz)				829	836.5	844					
10	QPSK	1	0	20.85	20.95	21.01					
10	QPSK	1	25	20.76	20.73	20.58	22.5	0	1.65	1.49	0.49
10	QPSK	1	49	20.52	20.54	20.77	21.5	1	1.92	1.74	
10	QPSK	25	0	20.05	20.06	19.79			1.98	1.73	
10	QPSK	25	12	19.92	19.76	19.68			1.71	1.44	0.67
10	QPSK	25	25	19.71	19.52	19.39			1.82	1.58	
10	QPSK	50	0	19.62	19.77	19.66			2.11	1.79	
10	16QAM	1	0	19.84	19.96	19.85	21.5	1	1.88	1.73	0.15
10	16QAM	1	25	19.90	19.67	19.70			1.66	1.54	0.59
10	16QAM	1	49	19.37	19.54	19.90			1.83	1.60	
10	16QAM	25	0	19.01	19.01	18.85	20.5	2	2.13	1.60	0.55
10	16QAM	25	12	18.89	18.74	18.81			1.65	1.49	
10	16QAM	25	25	18.62	18.46	18.52			1.76	1.61	
10	16QAM	25	75	18.50	18.57	18.60			2.04	1.88	0.10
10	16QAM	50	0						2.00	1.90	
Channel				26815	26915	27015					
Frequency (MHz)				826.5	836.5	846.5					
5	QPSK	1	0	20.95	20.85	21.01					
5	QPSK	1	12	20.78	20.67	20.52	22.5	0	1.65	1.49	0.58
5	QPSK	1	24	20.43	20.76	20.71	21.5	1	1.98	1.72	
5	QPSK	12	0	19.94	19.97	19.71			2.07	1.74	
5	QPSK	12	7	20.04	19.86	19.69			1.79	1.53	0.71
5	QPSK	12	13	19.55	19.33	19.44			1.81	1.46	
5	QPSK	25	0	19.57	19.75	19.65			2.17	1.95	
									1.93	1.75	0.18

5	16QAM	1	0	19.91	20.02	19.86	21.5	1	1.64	1.48	0.65
5	16QAM	1	12	19.89	19.93	19.55			1.95	1.57	
5	16QAM	1	24	19.37	19.60	19.84			2.13	1.66	
5	16QAM	12	0	18.93	19.01	18.78	20.5	2	1.72	1.49	0.54
5	16QAM	12	7	18.87	18.78	18.74			1.76	1.63	
5	16QAM	12	13	18.51	18.47	18.54			2.03	1.96	
5	16QAM	25	0	18.46	18.55	18.65			2.04	1.85	0.19
Channel				26805	26915	27025	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				825.5	836.5	847.5					
3	QPSK	1	0	20.95	21.04	20.87	22.5	0	1.63	1.46	0.51
3	QPSK	1	8	20.67	20.73	20.62			1.88	1.77	
3	QPSK	1	14	20.53	20.66	20.72			1.97	1.78	
3	QPSK	8	0	19.92	20.07	19.71	21.5	1	1.79	1.43	0.69
3	QPSK	8	4	20.06	19.80	19.70			1.80	1.44	
3	QPSK	8	7	19.61	19.44	19.38			2.12	1.89	
3	QPSK	15	0	19.52	19.78	19.54			1.98	1.72	0.26
3	16QAM	1	0	19.78	19.96	19.89	21.5	1	1.72	1.54	0.48
3	16QAM	1	8	19.99	19.70	19.54			1.96	1.51	
3	16QAM	1	14	19.51	19.58	19.86			1.99	1.64	
3	16QAM	8	0	19.10	19.02	18.77	20.5	2	1.73	1.40	0.61
3	16QAM	8	4	18.85	18.81	18.73			1.77	1.65	
3	16QAM	8	7	18.54	18.52	18.49			2.01	1.96	
3	16QAM	15	0	18.41	18.74	18.61			2.09	1.76	0.33
Channel				26797	26915	27033	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				824.7	836.5	848.3					
1.4	QPSK	1	0	20.91	20.95	20.89	22.5	0	1.61	1.61	0.36
1.4	QPSK	1	3	20.73	20.78	20.59			1.91	1.91	
1.4	QPSK	1	5	20.67	20.68	20.71			1.83	1.83	
1.4	QPSK	3	0	20.90	20.91	20.94			1.60	1.60	0.38
1.4	QPSK	3	1	20.81	20.58	20.57			1.93	1.93	
1.4	QPSK	3	3	20.56	20.64	20.74			1.94	1.94	
1.4	QPSK	6	0	19.66	19.86	19.56	21.5	1	1.94	1.94	0.30
1.4	16QAM	1	0	19.71	20.00	19.85	21.5	1	1.79	1.79	0.54
1.4	16QAM	1	3	19.85	19.83	19.61			1.89	1.89	
1.4	16QAM	1	5	19.46	19.55	19.90			2.04	2.04	
1.4	16QAM	3	0	19.93	19.92	19.88			1.62	1.62	0.43
1.4	16QAM	3	1	19.83	19.74	19.69			1.81	1.81	
1.4	16QAM	3	3	19.52	19.50	19.88			2.00	2.00	
1.4	16QAM	6	0	18.45	18.65	18.64	20.5	2	2.05	2.05	0.20

LTE TDD Power (Sensor on)

Band 41				
Modulation	RB size	Tune-up Limit Power	Target MPR	3GPP MPR
QPSK	1 RB	19	0	0
QPSK	50%/100% RB	18	1	0~1
16QAM	1 RB	18	1	0~1
16QAM	50%/100% RB	17	2	0~2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Channel				40340	40740	41140					
Frequency (MHz)				2565	2605	2645					
20	QPSK	1	0	17.29	17.32	17.31					
20	QPSK	1	49	17.22	17.11	17.15	19	0	1.71	1.68	0.21
20	QPSK	1	99	17.25	17.17	17.23	18	1	1.89	1.78	
20	QPSK	50	0	16.38	16.39	16.30			1.83	1.75	
20	QPSK	50	24	16.32	16.28	16.19			1.70	1.61	0.27
20	QPSK	50	50	16.12	16.23	16.19			1.81	1.68	
20	QPSK	100	0	16.23	16.25	16.14			1.88	1.77	
20	16QAM	1	0	16.43	16.46	16.28	18	1	1.86	1.75	0.11
20	16QAM	1	49	16.43	16.15	16.17			1.72	1.54	0.35
20	16QAM	1	99	16.11	16.11	16.17			1.85	1.57	
20	16QAM	50	0	15.33	15.41	15.20	17	2	1.89	1.83	0.36
20	16QAM	50	24	15.28	15.31	15.25			1.80	1.59	
20	16QAM	50	50	15.56	15.23	15.33			1.75	1.69	
20	16QAM	100	0	15.44	15.19	15.23			1.77	1.44	0.25
20	16QAM	100	0	15.44	15.19	15.23			1.81	1.56	
Channel				40315	40740	41165	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				2562.5	2605	2647.5					
15	QPSK	1	0	17.22	17.29	17.19					
15	QPSK	1	37	17.15	17.12	17.02	19	0	1.81	1.71	0.28
15	QPSK	1	74	17.23	17.01	17.20			1.98	1.85	
15	QPSK	36	0	16.31	16.30	16.24			1.99	1.77	
15	QPSK	36	20	16.23	16.14	16.03	18	1	1.76	1.69	0.28
15	QPSK	36	39	16.03	16.09	16.17			1.97	1.77	
15	QPSK	75	0	16.10	16.05	16.10			1.97	1.83	
15	16QAM	1	0	16.36	16.39	16.16	18	1	1.95	1.90	0.05
15	16QAM	1	37	16.34	16.12	16.23			1.84	1.61	0.36
15	16QAM	1	74	16.08	16.03	16.08			1.88	1.66	
15	16QAM	36	0	15.28	15.30	15.07	17	2	1.97	1.92	0.40
15	16QAM	36	20	15.12	15.24	15.09			1.93	1.70	
15	16QAM	36	39	15.47	15.13	15.17			1.91	1.76	
15	16QAM	75	0	15.26	15.11	15.10			1.87	1.53	0.16
15	16QAM	75	0	15.26	15.11	15.10			1.90	1.74	
Channel				40290	40740	41190	Tune-up limit (dBm)	MPR (dB)	< Tune-up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				2560	2605	2650					
10	QPSK	1	0	17.22	17.20	17.17					

10	QPSK	1	25	17.16	17.01	17.03	18	1	1.99	1.84	0.22
10	QPSK	1	49	17.11	17.07	17.12			1.93	1.88	
10	QPSK	25	0	16.30	16.32	16.27			1.73	1.68	
10	QPSK	25	12	16.16	16.11	16.11			1.89	1.84	
10	QPSK	25	25	16.12	16.10	16.12			1.90	1.88	
10	QPSK	50	0	16.17	16.03	16.04	18	1	1.97	1.83	0.14
10	16QAM	1	0	16.27	16.41	16.22			1.78	1.59	
10	16QAM	1	25	16.29	16.02	16.06			1.98	1.71	
10	16QAM	1	49	16.03	16.08	16.07			1.97	1.92	
10	16QAM	25	0	15.24	15.25	15.11			1.89	1.75	
10	16QAM	25	12	15.18	15.26	15.19	17	2	1.82	1.74	0.38
10	16QAM	25	25	15.49	15.20	15.23			1.80	1.51	
10	16QAM	50	0	15.37	15.08	15.08			1.92	1.63	
Channel				40265	40740	41215	Tune-up limit (dBm)	MPR (dB)	< Tune- up-2	> Tune-up	Ch Delta > 0.5
Frequency (MHz)				2557.5	2605	2652.5					
5	QPSK	1	0	17.12	17.21	17.18	19	0	1.88	1.79	0.21
5	QPSK	1	12	17.08	17.06	17.04			1.96	1.92	
5	QPSK	1	24	17.22	17.01	17.05			1.99	1.78	
5	QPSK	12	0	16.22	16.30	16.13	18	1	1.87	1.70	0.26
5	QPSK	12	7	16.20	16.26	16.15			1.85	1.74	
5	QPSK	12	13	16.04	16.06	16.11			1.96	1.89	
5	QPSK	25	0	16.15	16.12	16.03			1.97	1.85	
5	16QAM	1	0	16.31	16.32	16.23	18	1	1.77	1.68	0.31
5	16QAM	1	12	16.29	16.11	16.01			1.99	1.71	
5	16QAM	1	24	16.14	16.23	16.07			1.93	1.77	
5	16QAM	12	0	15.31	15.33	15.15	17	2	1.85	1.67	0.37
5	16QAM	12	7	15.22	15.18	15.22			1.82	1.78	
5	16QAM	12	13	15.52	15.18	15.17			1.83	1.48	
5	16QAM	25	0	15.37	15.11	15.12			1.89	1.63	

Wi-Fi 2.4G Power (Full Power)

2.4GHz WLAN				Ant 1			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	17.45	18.00	18.00	99.20
		6	2437	17.47	18.00	17.00	
		11	2462	16.93	18.00	16.50	
	802.11g 6Mbps	1	2412	15.61	17.00	16.50	98.10
		6	2437	15.95	17.00	16.00	
		11	2462	15.53	17.00	15.00	
	802.11n-HT20 MCS0	1	2412	13.91	15.00	15.00	97.96
		6	2437	13.73	15.00	14.00	
		11	2462	13.56	15.00	13.50	
	802.11n-HT40 MCS0	3	2422	13.78	15.00	13.00	94.00
		6	2437	13.47	15.00	13.00	
		9	2452	13.62	15.00	12.50	

2.4GHz WLAN				Ant 2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	17.26	18.00	18.00	99.20
		6	2437	17.06	18.00	16.50	
		11	2462	17.17	18.00	16.50	
	802.11g 6Mbps	1	2412	15.41	17.00	16.50	98.10
		6	2437	15.67	17.00	15.50	
		11	2462	15.70	17.00	15.50	
	802.11n-HT20 MCS0	1	2412	13.99	15.00	15.00	97.96
		6	2437	13.70	15.00	13.50	
		11	2462	13.73	15.00	13.50	
	802.11n-HT40 MCS0	3	2422	13.62	15.00	12.50	94.00
		6	2437	13.49	15.00	12.50	
		9	2452	13.54	15.00	12.50	

2.4GHz WLAN				Ant 1+2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	N/A			99.20
		6	2437				
		11	2462				
	802.11g 6Mbps	1	2412				98.10
		6	2437				
		11	2462				
	802.11n-HT20 MCS0	1	2412	16.71	17.00	15.00	97.96
		6	2437	16.36	17.00	13.50	
		11	2462	16.54	17.00	13.50	
	802.11n-HT40 MCS0	3	2422	16.33	17.00	12.50	94.00
		6	2437	16.12	17.00	12.50	
		9	2452	16.58	17.00	12.50	

Wi-Fi 5G Power (Full Power)

5GHz WLAN				Ant 1			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	15.27	16.00	15.50	98.10
		44	5220	15.13	16.00	16.00	
		48	5240	15.25	16.00	16.50	
		52	5260	15.21	16.00	16.00	
		60	5300	14.90	16.00	14.00	
		64	5320	15.00	16.00	14.50	
		100	5500	15.04	16.00	14.50	
		116	5580	15.47	16.00	15.50	
		140	5700	15.45	16.00	14.00	
		149	5745	15.48	16.00	14.00	
		157	5785	15.13	16.00	15.00	
		165	5825	15.06	16.00	15.50	
	802.11n-HT20 MCS0	36	5180	13.32	14.00	13.50	97.96
		44	5220	13.36	14.00	14.00	
		48	5240	13.33	14.00	14.50	
		52	5260	13.41	14.00	14.50	
		60	5300	13.30	14.00	12.50	
		64	5320	13.36	14.00	13.00	
		100	5500	13.16	14.00	13.00	
		116	5580	13.30	14.00	13.50	
		140	5700	13.32	14.00	12.00	
		149	5745	13.40	14.00	12.00	
		157	5785	13.12	14.00	13.00	
		165	5825	13.49	14.00	14.00	
	802.11n-HT40 MCS0	38	5190	13.29	14.00	13.00	96.94
		46	5230	13.35	14.00	13.50	
		54	5270	13.22	14.00	13.00	
		62	5310	13.29	14.00	12.00	
		102	5510	13.14	14.00	11.50	
		118	5590	13.13	14.00	13.00	
		134	5670	13.49	14.00	12.00	
		151	5755	13.17	14.00	11.50	
		159	5795	13.33	14.00	12.50	
		36	5180	13.33	14.00	13.50	98.48

	802.11ac-VHT20 MCS0	44	5220	13.16	14.00	14.00	
		48	5240	13.32	14.00	14.50	
		52	5260	13.46	14.00	14.50	
		60	5300	13.32	14.00	12.50	
		64	5320	13.33	14.00	13.00	
		100	5500	13.23	14.00	13.00	
		116	5580	13.29	14.00	13.50	
		140	5700	13.36	14.00	12.00	
		149	5745	13.42	14.00	12.00	
		157	5785	13.09	14.00	13.00	
		165	5825	13.47	14.00	14.00	
	802.11ac-VHT40 MCS0	38	5190	13.32	14.00	13.00	95.96
		46	5230	13.35	14.00	13.50	
		54	5270	13.12	14.00	13.00	
		62	5310	13.29	14.00	12.00	
		102	5510	13.11	14.00	11.50	
		118	5590	13.09	14.00	13.00	
		134	5670	13.49	14.00	12.00	
		151	5755	13.16	14.00	11.50	
		159	5795	13.23	14.00	12.50	
	802.11ac-VHT80 MCS0	42	5210	13.23	14.00	14.00	94.00
		58	5290	13.38	14.00	12.50	
		106	5530	13.48	14.00	12.50	
		112	5610	13.05	14.00	13.00	
		155	5775	13.40	14.00	13.00	

5GHz WLAN				Ant 2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5GHz WLAN	802.11a 6Mbps	36	5180	14.92	16.00	15.50	98.10
		44	5220	15.14	16.00	14.50	
		48	5240	15.36	16.00	15.00	
		52	5260	15.38	16.00	14.50	
		60	5300	15.19	16.00	15.00	
		64	5320	15.04	16.00	15.00	
		100	5500	15.00	16.00	15.00	
		116	5580	15.16	16.00	14.00	
		140	5700	15.14	16.00	16.00	
		149	5745	15.04	16.00	14.00	

		157	5785	15.16	16.00	13.50	
		165	5825	15.26	16.00	13.50	
	802.11n-HT20 MCS0	36	5180	12.87	14.00	14.00	97.96
		44	5220	13.08	14.00	12.50	
		48	5240	13.47	14.00	13.00	
		52	5260	12.91	14.00	12.00	
		60	5300	13.27	14.00	13.00	
		64	5320	13.02	14.00	13.00	
		100	5500	13.12	14.00	13.00	
		116	5580	13.21	14.00	12.00	
		140	5700	13.24	14.00	14.00	
		149	5745	13.30	14.00	12.00	
		157	5785	13.20	14.00	11.50	
		165	5825	13.40	14.00	11.50	
	802.11n-HT40 MCS0	38	5190	13.07	14.00	13.00	96.94
		46	5230	13.49	14.00	12.00	
		54	5270	13.23	14.00	11.50	
		62	5310	13.48	14.00	12.50	
		102	5510	13.16	14.00	12.00	
		118	5590	13.42	14.00	12.00	
		134	5670	13.26	14.00	13.50	
		151	5755	13.24	14.00	11.00	
		159	5795	13.23	14.00	10.50	
	802.11ac-VHT20 MCS0	36	5180	13.07	14.00	14.00	98.48
		44	5220	13.21	14.00	12.50	
		48	5240	13.36	14.00	13.00	
		52	5260	12.91	14.00	12.00	
		60	5300	13.16	14.00	13.00	
		64	5320	12.96	14.00	13.00	
		100	5500	13.07	14.00	13.00	
		116	5580	13.18	14.00	12.00	
		140	5700	13.13	14.00	14.00	
		149	5745	13.27	14.00	12.00	
		157	5785	13.19	14.00	11.50	
		165	5825	13.34	14.00	11.50	
	802.11ac-VHT40 MCS0	38	5190	13.01	14.00	13.00	95.96
		46	5230	13.44	14.00	12.00	
		54	5270	13.17	14.00	11.50	
		62	5310	13.42	14.00	12.50	
		102	5510	13.14	14.00	12.00	

		118	5590	13.43	14.00	12.00	
		134	5670	13.30	14.00	13.50	
		151	5755	13.28	14.00	11.00	
		159	5795	13.25	14.00	10.50	
	802.11ac-VHT80 MCS0	42	5210	13.42	14.00	13.00	94.00
		58	5290	13.46	14.00	12.50	
		106	5530	13.16	14.00	12.50	
		112	5610	13.42	14.00	12.50	
		155	5775	13.38	14.00	12.00	

5GHz WLAN				Ant 1+2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5GHz WLAN	802.11a 6Mbps	36	5180	N/A			98.10
		44	5220				
		48	5240				
		52	5260				
		60	5300				
		64	5320				
		100	5500				
		116	5580				
		140	5700				
		149	5745				
		157	5785				
		165	5825				
	802.11n-HT20 MCS0	36	5180	14.51	16.50	12.00	97.96
		44	5220	14.05	16.50	11.00	
		48	5240	13.76	16.50	11.00	
		52	5260	15.13	16.50	12.00	
		60	5300	16.26	16.50	12.50	
		64	5320	16.27	16.50	13.00	
		100	5500	16.26	16.50	13.00	
		116	5580	15.35	16.50	11.50	
		140	5700	15.64	16.50	12.00	
		149	5745	16.13	16.50	11.50	
		157	5785	15.51	16.50	11.50	
		165	5825	15.23	16.50	11.50	
	802.11n-HT40 MCS0	38	5190	16.36	16.50	13.00	96.94
		46	5230	15.43	16.50	11.50	

		54	5270	15.54	16.50	11.50	
		62	5310	16.25	16.50	12.00	
		102	5510	16.14	16.50	11.50	
		118	5590	15.61	16.50	11.50	
		134	5670	15.41	16.50	11.50	
		151	5755	16.06	16.50	11.00	
		159	5795	15.55	16.50	10.50	
	802.11ac-VHT20 MCS0	36	5180	14.47	16.50	12.00	98.48
		44	5220	14.37	16.50	11.00	
		48	5240	13.70	16.50	11.00	
		52	5260	15.21	16.50	12.00	
		60	5300	16.31	16.50	12.50	
		64	5320	16.37	16.50	13.00	
		100	5500	16.30	16.50	13.00	
		116	5580	15.37	16.50	11.50	
		140	5700	15.64	16.50	12.00	
		149	5745	16.46	16.50	12.00	
		157	5785	15.55	16.50	11.50	
		165	5825	15.24	16.50	11.50	
	802.11ac-VHT40 MCS0	38	5190	16.35	16.50	13.00	95.96
		46	5230	15.42	16.50	11.50	
		54	5270	15.59	16.50	11.50	
		62	5310	16.21	16.50	12.00	
		102	5510	16.07	16.50	11.50	
		118	5590	15.59	16.50	11.50	
		134	5670	15.86	16.50	12.00	
		151	5755	15.63	16.50	10.50	
		159	5795	15.46	16.50	10.50	
	802.11ac-VHT80 MCS0	42	5210	15.65	16.50	12.50	94.00
		58	5290	16.14	16.50	12.00	
		106	5530	16.12	16.50	12.00	
		112	5610	15.83	16.50	12.00	
		155	5775	15.58	16.50	11.50	

Bluetooth Power

Mode	Channel	Frequency (MHz)	Average power (dBm)			Duty cycle:	77.50
			1Mbps	2Mbps	3Mbps		
BR / EDR	CH 00	2402	11.69	9.29	8.98	PDF Factor :	1.290
	CH 39	2441	11.55	8.78	8.88		
	CH 78	2480	11.25	9.56	9.61	SAR Excel :	1.075
Tune-up Limit			12.00	10.00	10.00		

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402	6.40	6.30
	CH 19	2440	4.72	5.46
	CH 39	2480	7.57	7.75
Tune-up Limit			8.00	8.00

Wi-Fi 2.4G Power (Sensor on)

2.4GHz WLAN				Ant 1			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	11.78	12.00	11.00	99.20
		6	2437	11.93	12.00	11.50	
		11	2462	11.76	12.00	10.50	
	802.11g 6Mbps	1	2412	11.39	12.00	11.00	98.10
		6	2437	11.76	12.00	11.50	
		11	2462	11.56	12.00	10.50	
	802.11n-HT20 MCS0	1	2412	11.19	12.00	11.00	97.96
		6	2437	11.29	12.00	11.50	
		11	2462	11.23	12.00	10.50	
	802.11n-HT40 MCS0	3	2422	11.18	12.00	9.50	94.00
		6	2437	11.36	12.00	10.50	
		9	2452	11.50	12.00	10.00	

2.4GHz WLAN				Ant 2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	11.23	12.00	11.50	99.20
		6	2437	11.78	12.00	11.00	
		11	2462	11.57	12.00	10.50	
	802.11g 6Mbps	1	2412	11.12	12.00	11.50	98.10
		6	2437	11.56	12.00	11.00	
		11	2462	11.47	12.00	11.00	
	802.11n-HT20 MCS0	1	2412	10.11	12.00	11.00	97.96
		6	2437	11.38	12.00	11.00	
		11	2462	11.35	12.00	11.00	
	802.11n-HT40 MCS0	3	2422	11.26	12.00	10.00	94.00
		6	2437	11.34	12.00	10.50	
		9	2452	11.17	12.00	10.50	

2.4GHz WLAN				Ant 1+2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	N/A			99.20
		6	2437				
		11	2462				
	802.11g 6Mbps	1	2412				98.10
		6	2437				
		11	2462				
	802.11n-HT20 MCS0	1	2412	11.14	12.00	9.00	97.96
		6	2437	11.00	12.00	8.00	
		11	2462	11.31	12.00	8.00	
	802.11n-HT40 MCS0	3	2422	11.29	12.00	7.00	94.00
		6	2437	11.36	12.00	7.50	
		9	2452	11.05	12.00	7.00	

Wi-Fi 5G Power (Sensor on)

5GHz WLAN				Ant 1			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	11.55	12.50	11.00	98.10
		44	5220	11.86	12.50	12.00	
		48	5240	11.61	12.50	12.50	
		52	5260	12.13	12.50	13.00	
		60	5300	12.05	12.50	11.00	
		64	5320	12.02	12.50	11.00	
		100	5500	12.17	12.50	12.00	
		116	5580	12.02	12.50	12.50	
		140	5700	12.09	12.50	10.00	
		149	5745	12.23	12.50	10.50	
		157	5785	12.14	12.50	12.00	
		165	5825	12.09	12.50	13.00	
	802.11n-HT20 MCS0	36	5180	11.89	12.50	11.50	97.96
		44	5220	11.58	12.50	12.00	
		48	5240	11.79	12.50	13.00	
		52	5260	11.59	12.50	12.50	
		60	5300	11.65	12.50	10.50	
		64	5320	11.74	12.50	11.00	
		100	5500	11.62	12.50	11.00	
		116	5580	12.02	12.50	12.00	
		140	5700	11.64	12.50	10.00	
		149	5745	11.90	12.50	10.50	
		157	5785	11.88	12.50	11.50	
		165	5825	11.59	12.50	12.00	
	802.11n-HT40 MCS0	38	5190	11.78	12.00	11.00	96.94
		46	5230	11.79	12.00	11.50	
		54	5270	11.88	12.00	11.50	
		62	5310	11.55	12.00	10.00	
		102	5510	11.94	12.00	10.00	
		118	5590	11.74	12.00	11.50	
		134	5670	11.67	12.00	10.50	
		151	5755	11.91	12.00	10.00	
		159	5795	11.89	12.00	11.00	
		36	5180	11.82	12.50	11.50	98.48

	802.11ac-VHT20 MCS0	44	5220	11.63	12.50	12.00	
		48	5240	11.76	12.50	13.00	
		52	5260	11.65	12.50	12.50	
		60	5300	11.66	12.50	10.50	
		64	5320	11.74	12.50	11.00	
		100	5500	11.63	12.50	11.00	
		116	5580	12.01	12.50	12.00	
		140	5700	11.63	12.50	10.00	
		149	5745	11.92	12.50	10.50	
		157	5785	11.88	12.50	11.50	
		165	5825	11.53	12.50	12.00	
	802.11ac-VHT40 MCS0	38	5190	11.77	12.00	11.00	95.96
		46	5230	11.80	12.00	11.50	
		54	5270	11.86	12.00	11.50	
		62	5310	11.53	12.00	10.00	
		102	5510	11.97	12.00	10.00	
		118	5590	11.77	12.00	11.50	
		134	5670	11.78	12.00	10.50	
		151	5755	11.93	12.00	10.00	
		159	5795	11.91	12.00	11.00	
	802.11ac-VHT80 MCS0	42	5210	11.92	12.00	12.00	94.00
		58	5290	11.78	12.00	10.50	
		106	5530	11.85	12.00	10.50	
		112	5610	11.82	12.00	11.50	
		155	5775	11.93	12.00	11.50	

5GHz WLAN				Ant 2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5GHz WLAN	802.11a 6Mbps	36	5180	11.72	12.50	12.00	98.10
		44	5220	11.90	12.50	11.00	
		48	5240	11.67	12.50	11.00	
		52	5260	12.21	12.50	11.00	
		60	5300	11.98	12.50	11.50	
		64	5320	12.06	12.50	12.00	
		100	5500	12.23	12.50	12.50	
		116	5580	12.08	12.50	11.00	
		140	5700	12.11	12.50	13.00	
		149	5745	12.35	12.50	11.50	

		157	5785	12.21	12.50	10.50	
		165	5825	12.33	12.50	11.00	
	802.11n-HT20 MCS0	36	5180	11.55	12.50	12.00	97.96
44		5220	11.76	12.50	11.00		
48		5240	11.93	12.50	11.50		
52		5260	11.96	12.50	11.00		
60		5300	11.77	12.50	11.50		
64		5320	11.98	12.50	12.00		
100		5500	11.91	12.50	12.00		
116		5580	12.07	12.50	11.00		
140		5700	11.79	12.50	12.50		
149		5745	11.66	12.50	10.50		
157		5785	11.65	12.50	10.00		
165		5825	11.80	12.50	10.00		
802.11n-HT40 MCS0	38	5190	11.78	12.00	12.00	96.94	
	46	5230	11.65	12.00	11.00		
	54	5270	11.45	12.00	10.50		
	62	5310	11.79	12.00	11.00		
	102	5510	11.54	12.00	11.00		
	118	5590	11.93	12.00	10.50		
	134	5670	11.75	12.00	12.00		
	151	5755	11.78	12.00	10.00		
	159	5795	11.61	12.00	9.00		
802.11ac-VHT20 MCS0	36	5180	11.50	12.50	12.00	98.48	
	44	5220	11.73	12.50	11.00		
	48	5240	11.89	12.50	11.50		
	52	5260	11.96	12.50	11.00		
	60	5300	11.69	12.50	11.50		
	64	5320	11.96	12.50	12.00		
	100	5500	11.82	12.50	12.00		
	116	5580	12.06	12.50	11.00		
	140	5700	11.56	12.50	12.50		
	149	5745	12.04	12.50	11.00		
	157	5785	11.98	12.50	10.50		
	165	5825	11.47	12.50	10.00		
802.11ac-VHT40 MCS0	38	5190	11.59	12.00	12.00	95.96	
	46	5230	11.78	12.00	11.00		
	54	5270	11.71	12.00	10.50		
	62	5310	11.95	12.00	11.00		
	102	5510	11.83	12.00	11.00		

		118	5590	11.79	12.00	10.50	
		134	5670	11.77	12.00	12.00	
		151	5755	11.67	12.00	10.00	
		159	5795	11.77	12.00	9.00	
	802.11ac-VHT80 MCS0	42	5210	11.77	12.00	12.00	94.00
		58	5290	11.83	12.00	11.00	
		106	5530	11.50	12.00	11.50	
		112	5610	11.91	12.00	11.00	
		155	5775	11.88	12.00	10.50	

5GHz WLAN				Ant 1+2			
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5GHz WLAN	802.11a 6Mbps	36	5180	N/A			98.10
		44	5220				
		48	5240				
		52	5260				
		60	5300				
		64	5320				
		100	5500				
		116	5580				
		140	5700				
		149	5745				
		157	5785				
		165	5825				
	802.11n-HT20 MCS0	36	5180	11.82	12.50	9.50	97.96
		44	5220	12.05	12.50	9.50	
		48	5240	11.74	12.50	9.50	
		52	5260	12.08	12.50	9.50	
		60	5300	11.82	12.50	8.50	
		64	5320	11.79	12.50	9.00	
		100	5500	12.12	12.50	9.00	
		116	5580	11.82	12.50	8.50	
		140	5700	12.06	12.50	8.50	
		149	5745	12.05	12.50	8.00	
		157	5785	11.75	12.50	8.00	
		165	5825	11.99	12.50	8.50	
	802.11n-HT40 MCS0	38	5190	11.74	12.50	9.00	96.94
		46	5230	11.67	12.50	9.00	

		54	5270	11.73	12.50	8.00	
		62	5310	11.80	12.50	8.00	
		102	5510	11.69	12.50	7.50	
		118	5590	11.82	12.50	8.50	
		134	5670	11.99	12.50	8.50	
		151	5755	11.91	12.50	7.00	
		159	5795	11.78	12.50	7.50	
	802.11ac-VHT20 MCS0	36	5180	11.74	12.50	9.50	98.48
		44	5220	11.95	12.50	9.50	
		48	5240	11.70	12.50	9.50	
		52	5260	12.01	12.50	9.50	
		60	5300	11.83	12.50	8.50	
		64	5320	11.79	12.50	9.00	
		100	5500	11.88	12.50	8.50	
		116	5580	11.79	12.50	8.50	
		140	5700	12.00	12.50	8.50	
		149	5745	11.70	12.50	7.50	
		157	5785	11.73	12.50	8.00	
		165	5825	11.97	12.50	8.50	
	802.11ac-VHT40 MCS0	38	5190	11.81	12.50	9.00	95.96
		46	5230	11.76	12.50	8.50	
		54	5270	11.72	12.50	8.00	
		62	5310	11.81	12.50	8.00	
		102	5510	11.72	12.50	7.50	
		118	5590	11.79	12.50	8.50	
		134	5670	11.81	12.50	8.50	
		151	5755	11.99	12.50	7.00	
		159	5795	11.95	12.50	7.50	
	802.11ac-VHT80 MCS0	42	5210	11.86	12.50	9.50	94.00
		58	5290	11.79	12.50	8.50	
		106	5530	11.98	12.50	8.00	
		112	5610	11.99	12.50	9.00	
		155	5775	11.90	12.50	8.50	

Note: The device has two versions of power setting, full power and reduction power. When the P-sensor HX9031AS senses a human body approaching, it automatically adjusts the power to reduction power.

The HX9031AS integrates a capacitance sense AFE used for Specific Absorption Rate (SAR) application. The HX9031AS has high sensitivity which enables the detection of human body proximity. The device can reduce the emission power upon the presence of human body according to the detection result of HX9031AS.

9 TEST RESULTS

9.1 SAR Test Results Summary

Band	Mode	Test Position	Gap (mm)	Channel	Frequency	Antenna	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dBm)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
Body SAR Limit 1g 1.6(W/kg)														
WCDMA II	RMC 12.2K	Back	0	9400	1880	N/A	17.48	18.50	1.265	100	1.000	0.13	0.956	1.209
WCDMA II	RMC 12.2K	Back	0	9262	1852.4	N/A	17.32	18.50	1.312	100	1.000	-0.13	0.823	1.080
WCDMA II	RMC 12.2K	Back	0	9538	1907.6	N/A	17.45	18.50	1.274	100	1.000	-0.09	0.927	1.181
WCDMA II	RMC 12.2K	Left Side	0	9400	1880	N/A	17.48	18.50	1.265	100	1.000	-0.12	0.975	1.233
WCDMA II	RMC 12.2K	Left Side	0	9262	1852.4	N/A	17.32	18.50	1.312	100	1.000	-0.13	0.896	1.176
WCDMA II	RMC 12.2K	Left Side	0	9538	1907.6	N/A	17.45	18.50	1.274	100	1.000	-0.09	0.988	1.258
WCDMA II	RMC 12.2K	Bottom Side	0	9400	1880	N/A	22.69	24.00	1.352	100	1.000	-0.03	0.342	0.462
WCDMA II	RMC 12.2K	Right Side	0	9400	1880	N/A	22.69	24.00	1.352	100	1.000	0.03	0.001	0.001
WCDMA II	RMC 12.2K	Top Side	0	9400	1880	N/A	22.69	24.00	1.352	100	1.000	0.01	0.001	0.001
WCDMA II	RMC 12.2K	Back	15	9400	1880	N/A	22.69	24.00	1.352	100	1.000	0.03	0.543	0.734
WCDMA II	RMC 12.2K	Left Side	15	9400	1880	N/A	22.69	24.00	1.352	100	1.000	-0.11	0.710	0.960
WCDMA II	RMC 12.2K	Left Side	15	9262	1852.4	N/A	22.64	24.00	1.368	100	1.000	0.12	0.599	0.819
WCDMA II	RMC 12.2K	Left Side	15	9538	1907.6	N/A	22.59	24.00	1.384	100	1.000	0.03	0.612	0.847
WCDMA IV	RMC 12.2K	Back	0	1413	1732.6	N/A	19.47	20.50	1.268	100	1.000	0.08	0.807	1.023
WCDMA IV	RMC 12.2K	Back	0	1312	1712.4	N/A	19.38	20.50	1.294	100	1.000	0.03	0.787	1.019
WCDMA IV	RMC 12.2K	Back	0	1513	1752.6	N/A	19.36	20.50	1.300	100	1.000	0.11	0.781	1.015
WCDMA IV	RMC 12.2K	Left Side	0	1413	1732.6	N/A	19.47	20.50	1.268	100	1.000	-0.14	0.589	0.747
WCDMA IV	RMC 12.2K	Bottom Side	0	1413	1732.6	N/A	22.92	24.00	1.282	100	1.000	-0.12	0.325	0.417
WCDMA IV	RMC 12.2K	Right Side	0	1413	1732.6	N/A	22.92	24.00	1.282	100	1.000	0.04	0.001	0.001
WCDMA IV	RMC 12.2K	Top Side	0	1413	1732.6	N/A	22.92	24.00	1.282	100	1.000	0.02	0.001	0.001
WCDMA IV	RMC 12.2K	Back	15	1413	1732.6	N/A	22.92	24.00	1.282	100	1.000	0.13	0.301	0.386
WCDMA IV	RMC 12.2K	Left Side	15	1413	1732.6	N/A	22.92	24.00	1.282	100	1.000	0.11	0.375	0.481
WCDMA V	RMC 12.2K	Back	0	4183	836.6	N/A	23.16	24.00	1.213	100	1.000	0.01	0.950	1.153
WCDMA V	RMC 12.2K	Back	0	4132	826.4	N/A	23.07	24.00	1.239	100	1.000	0.03	0.890	1.103
WCDMA V	RMC 12.2K	Back	0	4233	846.6	N/A	22.92	24.00	1.282	100	1.000	0.04	0.893	1.145
WCDMA V	RMC 12.2K	Left Side	0	4183	836.6	N/A	23.16	24.00	1.213	100	1.000	-0.02	0.590	0.716
WCDMA V	RMC 12.2K	Right Side	0	4183	836.6	N/A	23.16	24.00	1.213	100	1.000	0.02	0.001	0.001
WCDMA V	RMC 12.2K	Top Side	0	4183	836.6	N/A	23.16	24.00	1.213	100	1.000	0.01	0.001	0.001
WCDMA V	RMC 12.2K	Bottom Side	0	4183	836.6	N/A	23.16	24.00	1.213	100	1.000	0.04	0.102	0.124
LTE Band25/2	BW20_QPSK_1 RB0Offset	Back	0	26365	1882.5	N/A	16.29	17.00	1.178	100	1.000	-0.06	0.887	1.045
LTE Band25/2	BW20_QPSK_1 RB0Offset	Back	0	26140	1860	N/A	16.22	17.00	1.197	100	1.000	-0.17	0.815	0.975
LTE Band25/2	BW20_QPSK_1 RB0Offset	Back	0	26590	1905	N/A	16.14	17.00	1.219	100	1.000	-0.15	0.853	1.040
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Back	0	26365	1882.5	N/A	15.02	16.00	1.253	100	1.000	0.01	0.732	0.917
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Back	0	26140	1860	N/A	14.91	16.00	1.285	100	1.000	-0.19	0.741	0.952
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Back	0	26590	1905	N/A	14.94	16.00	1.276	100	1.000	0.04	0.733	0.936
LTE Band25/2	BW20_QPSK_1 00RB0Offset	Back	0	26365	1882.5	N/A	14.99	16.00	1.262	100	1.000	0.12	0.725	0.915
LTE Band25/2	BW20_QPSK_1 RB0Offset	Left Side	0	26365	1882.5	N/A	16.29	17.00	1.178	100	1.000	-0.09	1.020	1.201
LTE Band25/2	BW20_QPSK_1 RB0Offset	Left Side	0	26140	1860	N/A	16.22	17.00	1.197	100	1.000	-0.07	0.873	1.045

LTE Band25/2	BW20_QPSK_1 RB0Offset	Left Side	0	26590	1905	N/A	16.14	17.00	1.219	100	1.000	0.01	0.916	1.117
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Left Side	0	26365	1882.5	N/A	15.02	16.00	1.253	100	1.000	-0.13	0.863	1.081
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Left Side	0	26140	1860	N/A	14.91	16.00	1.285	100	1.000	0.04	0.810	1.041
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Left Side	0	26590	1905	N/A	14.94	16.00	1.276	100	1.000	0.11	0.823	1.051
LTE Band25/2	BW20_QPSK_1 00RB0Offset	Left Side	0	26365	1882.5	N/A	14.99	16.00	1.262	100	1.000	0.19	0.856	1.080
LTE Band25/2	BW20_QPSK_1 RB0Offset	Bottom Side	0	26365	1882.5	N/A	22.55	24.00	1.396	100	1.000	0.01	0.221	0.309
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Bottom Side	0	26365	1882.5	N/A	21.38	23.00	1.452	100	1.000	0.03	0.189	0.274
LTE Band25/2	BW20_QPSK_1 RB0Offset	Right Side	0	26365	1882.5	N/A	22.55	24.00	1.396	100	1.000	0.03	0.001	0.001
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Right Side	0	26365	1882.5	N/A	21.38	23.00	1.452	100	1.000	0.02	0.001	0.001
LTE Band25/2	BW20_QPSK_1 RB0Offset	Top Side	0	26365	1882.5	N/A	22.55	24.00	1.396	100	1.000	0.01	0.001	0.001
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Top Side	0	26365	1882.5	N/A	21.38	23.00	1.452	100	1.000	0.04	0.001	0.001
LTE Band25/2	BW20_QPSK_1 RB0Offset	Back	15	26365	1882.5	N/A	22.55	24.00	1.396	100	1.000	0.01	0.550	0.768
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Back	15	26365	1882.5	N/A	21.38	23.00	1.452	100	1.000	-0.12	0.473	0.687
LTE Band25/2	BW20_QPSK_1 RB0Offset	Left Side	15	26365	1882.5	N/A	22.55	24.00	1.396	100	1.000	-0.03	0.857	1.197
LTE Band25/2	BW20_QPSK_1 RB0Offset	Left Side	15	26140	1860	N/A	22.43	24.00	1.435	100	1.000	-0.01	0.834	1.197
LTE Band25/2	BW20_QPSK_1 RB0Offset	Left Side	15	26590	1905	N/A	22.44	24.00	1.432	100	1.000	0.11	0.836	1.197
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Left Side	15	26365	1882.5	N/A	21.38	23.00	1.452	100	1.000	0.01	0.785	1.140
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Left Side	15	26140	1860	N/A	21.28	23.00	1.486	100	1.000	0.04	0.694	1.031
LTE Band25/2	BW20_QPSK_5 0RB0Offset	Left Side	15	26590	1905	N/A	21.33	23.00	1.469	100	1.000	0.02	0.725	1.065
LTE Band25/2	BW20_QPSK_1 00RB0Offset	Left Side	15	26365	1882.5	N/A	21.33	23.00	1.469	100	1.000	0.01	0.751	1.103
LTE Band4	BW20_QPSK_1 RB0Offset	Back	0	20175	1732.5	N/A	18.93	20.00	1.279	100	1.000	-0.12	0.929	1.189
LTE Band4	BW20_QPSK_1 RB0Offset	Back	0	20050	1720	N/A	18.85	20.00	1.303	100	1.000	-0.18	0.903	1.177
LTE Band4	BW20_QPSK_1 RB0Offset	Back	0	20300	1745	N/A	18.90	20.00	1.288	100	1.000	0.15	0.973	1.253
LTE Band4	BW20_QPSK_5 0RB0Offset	Back	0	20175	1732.5	N/A	17.95	19.00	1.274	100	1.000	-0.12	0.770	0.981
LTE Band4	BW20_QPSK_5 0RB0Offset	Back	0	20050	1720	N/A	17.88	19.00	1.294	100	1.000	-0.11	0.723	0.936
LTE Band4	BW20_QPSK_5 0RB0Offset	Back	0	20300	1745	N/A	17.73	19.00	1.340	100	1.000	-0.06	0.865	1.159
LTE Band4	BW20_QPSK_1 00RB0Offset	Back	0	20175	1732.5	N/A	17.69	19.00	1.352	100	1.000	0.01	0.761	1.029
LTE Band4	BW20_QPSK_1 RB0Offset	Left Side	0	20175	1732.5	N/A	18.93	20.00	1.279	100	1.000	0.12	0.775	0.992
LTE Band4	BW20_QPSK_1 RB0Offset	Left Side	0	20050	1720	N/A	18.85	20.00	1.303	100	1.000	-0.12	0.816	1.063
LTE Band4	BW20_QPSK_1 RB0Offset	Left Side	0	20300	1745	N/A	18.90	20.00	1.288	100	1.000	-0.07	0.911	1.174
LTE Band4	BW20_QPSK_5 0RB0Offset	Left Side	0	20175	1732.5	N/A	17.95	19.00	1.274	100	1.000	-0.03	0.662	0.843
LTE Band4	BW20_QPSK_5 0RB0Offset	Left Side	0	20050	1720	N/A	17.88	19.00	1.294	100	1.000	0.12	0.712	0.921
LTE Band4	BW20_QPSK_5 0RB0Offset	Left Side	0	20300	1745	N/A	17.73	19.00	1.340	100	1.000	0.05	0.778	1.042
LTE Band4	BW20_QPSK_1 00RB0Offset	Left Side	0	20175	1732.5	N/A	17.69	19.00	1.352	100	1.000	0.03	0.685	0.926
LTE Band4	BW20_QPSK_1 RB0Offset	Bottom Side	0	20175	1732.5	N/A	22.63	24.00	1.371	100	1.000	0.07	0.312	0.428
LTE Band4	BW20_QPSK_5 0RB0Offset	Bottom Side	0	20175	1732.5	N/A	21.34	23.00	1.466	100	1.000	0.11	0.231	0.339
LTE Band4	BW20_QPSK_1 RB0Offset	Right Side	0	20175	1732.5	N/A	22.63	24.00	1.371	100	1.000	0.00	0.001	0.001
LTE Band4	BW20_QPSK_5 0RB0Offset	Right Side	0	20175	1732.5	N/A	21.34	23.00	1.466	100	1.000	0.04	0.001	0.001
LTE Band4	BW20_QPSK_1 RB0Offset	Top Side	0	20175	1732.5	N/A	22.63	24.00	1.371	100	1.000	0.03	0.001	0.001
LTE Band4	BW20_QPSK_5 0RB0Offset	Top Side	0	20175	1732.5	N/A	21.34	23.00	1.466	100	1.000	0.04	0.001	0.001
LTE Band4	BW20_QPSK_1 RB0Offset	Back	15	20175	1732.5	N/A	22.63	24.00	1.371	100	1.000	0.05	0.309	0.424

LTE Band4	BW20_QPSK_5 0RB0Offset	Back	15	20175	1732.5	N/A	21.34	23.00	1.466	100	1.000	0.13	0.266	0.390
LTE Band4	BW20_QPSK_1 RB0Offset	Left Side	15	20175	1732.5	N/A	22.63	24.00	1.371	100	1.000	0.04	0.380	0.521
LTE Band4	BW20_QPSK_5 0RB0Offset	Left Side	15	20175	1732.5	N/A	21.34	23.00	1.466	100	1.000	-0.03	0.310	0.454
LTE Band26/5	BW15_QPSK_1 RB0Offset	Back	0	26865	831.5	N/A	21.19	22.50	1.352	100	1.000	0.09	0.663	0.896
LTE Band26/5	BW15_QPSK_1 RB0Offset	Back	0	26765	821.5	N/A	21.11	22.50	1.377	100	1.000	-0.17	0.783	1.078
LTE Band26/5	BW15_QPSK_1 RB0Offset	Back	0	26915	836.5	N/A	21.15	22.50	1.365	100	1.000	0.03	0.610	0.832
LTE Band26/5	BW15_QPSK_1 RB0Offset	Back	0	26965	841.5	N/A	21.18	22.50	1.355	100	1.000	0.01	0.640	0.867
LTE Band26/5	BW15_QPSK_3 6RB0Offset	Back	0	26865	831.5	N/A	20.20	21.50	1.349	100	1.000	0.11	0.583	0.786
LTE Band26/5	BW15_QPSK_7 5RB0Offset	Back	0	26865	831.5	N/A	20.07	21.50	1.390	100	1.000	0.11	0.563	0.783
LTE Band26/5	BW15_QPSK_1 RB0Offset	Left Side	0	26865	831.5	N/A	21.19	22.50	1.352	100	1.000	-0.15	0.539	0.729
LTE Band26/5	BW15_QPSK_3 6RB0Offset	Left Side	0	26865	831.5	N/A	20.20	21.50	1.349	100	1.000	-0.11	0.433	0.584
LTE Band26/5	BW15_QPSK_1 RB0Offset	Bottom Side	0	26865	831.5	N/A	23.24	24.00	1.191	100	1.000	-0.03	0.311	0.370
LTE Band26/5	BW15_QPSK_3 6RB0Offset	Bottom Side	0	26865	831.5	N/A	22.38	23.00	1.153	100	1.000	0.11	0.212	0.245
LTE Band26/5	BW15_QPSK_1 RB0Offset	Right Side	0	26865	831.5	N/A	23.24	24.00	1.191	100	1.000	0.03	0.001	0.001
LTE Band26/5	BW15_QPSK_3 6RB0Offset	Right Side	0	26865	831.5	N/A	22.38	23.00	1.153	100	1.000	0.02	0.001	0.001
LTE Band26/5	BW15_QPSK_1 RB0Offset	Top Side	0	26865	831.5	N/A	23.24	24.00	1.191	100	1.000	0.01	0.001	0.001
LTE Band26/5	BW15_QPSK_3 6RB0Offset	Top Side	0	26865	831.5	N/A	22.38	23.00	1.153	100	1.000	0.02	0.001	0.001
LTE Band26/5	BW15_QPSK_1 RB0Offset	Back	15	26865	831.5	N/A	23.24	24.00	1.191	100	1.000	0.03	0.209	0.249
LTE Band26/5	BW15_QPSK_3 6RB0Offset	Back	15	26865	831.5	N/A	22.38	23.00	1.153	100	1.000	-0.03	0.177	0.204
LTE Band26/5	BW15_QPSK_1 RB0Offset	Left Side	15	26865	831.5	N/A	23.24	24.00	1.191	100	1.000	-0.15	0.131	0.156
LTE Band26/5	BW15_QPSK_3 6RB0Offset	Left Side	15	26865	831.5	N/A	22.38	23.00	1.153	100	1.000	0.03	0.115	0.133
LTE Band12/17	BW10_QPSK_1 RB0Offset	Back	0	23095	707.5	N/A	21.50	23.00	1.413	100	1.000	0.03	0.640	0.904
LTE Band12/17	BW10_QPSK_1 RB0Offset	Back	0	23060	704	N/A	21.46	23.00	1.426	100	1.000	0.14	0.773	1.102
LTE Band12/17	BW10_QPSK_1 RB0Offset	Back	0	23130	711	N/A	21.49	23.00	1.416	100	1.000	0.05	0.680	0.963
LTE Band12/17	BW10_QPSK_2 5RB0Offset	Back	0	23095	707.5	N/A	20.59	22.00	1.384	100	1.000	0.03	0.553	0.765
LTE Band12/17	BW10_QPSK_5 0RB0Offset	Back	0	23095	707.5	N/A	20.34	22.00	1.466	100	1.000	-0.03	0.551	0.808
LTE Band12/17	BW10_QPSK_1 RB0Offset	Left Side	0	23095	707.5	N/A	21.50	23.00	1.413	100	1.000	-0.03	0.478	0.675
LTE Band12/17	BW10_QPSK_2 5RB0Offset	Left Side	0	23095	707.5	N/A	20.59	22.00	1.384	100	1.000	-0.01	0.432	0.598
LTE Band12/17	BW10_QPSK_1 RB0Offset	Bottom Side	0	23095	707.5	N/A	23.15	24.00	1.216	100	1.000	0.03	0.194	0.236
LTE Band12/17	BW10_QPSK_2 5RB0Offset	Bottom Side	0	23095	707.5	N/A	22.28	23.00	1.180	100	1.000	0.01	0.147	0.174
LTE Band12/17	BW10_QPSK_1 RB0Offset	Right Side	0	23095	707.5	N/A	23.15	24.00	1.216	100	1.000	0.04	0.001	0.001
LTE Band12/17	BW10_QPSK_2 5RB0Offset	Right Side	0	23095	707.5	N/A	22.28	23.00	1.180	100	1.000	0.02	0.001	0.001
LTE Band12/17	BW10_QPSK_1 RB0Offset	Top Side	0	23095	707.5	N/A	23.15	24.00	1.216	100	1.000	0.01	0.001	0.001
LTE Band12/17	BW10_QPSK_2 5RB0Offset	Top Side	0	23095	707.5	N/A	22.28	23.00	1.180	100	1.000	0.03	0.001	0.001
LTE Band12/17	BW10_QPSK_1 RB0Offset	Back	15	23095	707.5	N/A	23.15	24.00	1.216	100	1.000	0.03	0.202	0.246
LTE Band12/17	BW10_QPSK_2 5RB0Offset	Back	15	23095	707.5	N/A	22.28	23.00	1.180	100	1.000	0.13	0.163	0.192
LTE Band12/17	BW10_QPSK_1 RB0Offset	Left Side	15	23095	707.5	N/A	23.15	24.00	1.216	100	1.000	-0.11	0.117	0.142
LTE Band12/17	BW10_QPSK_2 5RB0Offset	Left Side	15	23095	707.5	N/A	22.28	23.00	1.180	100	1.000	-0.03	0.101	0.119
LTE Band13	BW10_QPSK_1 RB0Offset	Back	0	23230	782	N/A	22.14	23.50	1.368	100	1.000	-0.12	0.720	0.985
LTE Band13	BW10_QPSK_2 5RB0Offset	Back	0	23230	782	N/A	21.32	22.50	1.312	100	1.000	-0.09	0.678	0.890

LTE Band13	BW10_QPSK_5 0RB0Offset	Back	0	23230	782	N/A	21.12	22.50	1.374	100	1.000	-0.04	0.655	0.900
LTE Band13	BW10_QPSK_1 RB0Offset	Left Side	0	23230	782	N/A	22.14	23.50	1.368	100	1.000	0.05	0.716	0.979
LTE Band13	BW10_QPSK_2 5RB0Offset	Left Side	0	23230	782	N/A	21.32	22.50	1.312	100	1.000	0.01	0.654	0.858
LTE Band13	BW10_QPSK_5 0RB0Offset	Left Side	0	23230	782	N/A	21.12	22.50	1.374	100	1.000	-0.04	0.651	0.895
LTE Band13	BW10_QPSK_1 RB0Offset	Bottom Side	0	23230	782	N/A	23.24	24.00	1.191	100	1.000	-0.03	0.213	0.254
LTE Band13	BW10_QPSK_2 5RB0Offset	Bottom Side	0	23230	782	N/A	22.33	23.00	1.167	100	1.000	0.09	0.162	0.189
LTE Band13	BW10_QPSK_1 RB0Offset	Right Side	0	23230	782	N/A	23.24	24.00	1.191	100	1.000	0.04	0.001	0.001
LTE Band13	BW10_QPSK_2 5RB0Offset	Right Side	0	23230	782	N/A	22.33	23.00	1.167	100	1.000	0.02	0.001	0.001
LTE Band13	BW10_QPSK_1 RB0Offset	Top Side	0	23230	782	N/A	23.24	24.00	1.191	100	1.000	0.01	0.001	0.001
LTE Band13	BW10_QPSK_2 5RB0Offset	Top Side	0	23230	782	N/A	22.33	23.00	1.167	100	1.000	0.03	0.001	0.001
LTE Band13	BW10_QPSK_1 RB0Offset	Back	15	23230	782	N/A	23.24	24.00	1.191	100	1.000	0.03	0.217	0.258
LTE Band13	BW10_QPSK_1 RB0Offset	Back	15	23230	782	N/A	22.33	23.00	1.167	100	1.000	-0.01	0.199	0.232
LTE Band13	BW10_QPSK_1 RB0Offset	Left Side	15	23230	782	N/A	23.24	24.00	1.191	100	1.000	0.01	0.108	0.129
LTE Band13	BW10_QPSK_1 RB0Offset	Left Side	15	23230	782	N/A	22.33	23.00	1.167	100	1.000	0.13	0.089	0.104
LTE Band41	BW20_QPSK_1 RB0Offset	Back	0	40740	2605	N/A	17.32	19.00	1.472	62.90	1.006	-0.15	0.552	0.818
LTE Band41	BW20_QPSK_1 RB0Offset	Back	0	40340	2565	N/A	17.29	19.00	1.483	62.90	1.006	-0.03	0.483	0.720
LTE Band41	BW20_QPSK_1 RB0Offset	Back	0	41140	2645	N/A	17.31	19.00	1.476	62.90	1.006	0.19	0.466	0.692
LTE Band41	BW20_QPSK_5 0RB0Offset	Back	0	40740	2605	N/A	16.39	18.00	1.449	62.90	1.006	-0.03	0.477	0.695
LTE Band41	BW20_QPSK_5 0RB0Offset	Back	0	40340	2565	N/A	16.38	18.00	1.452	62.90	1.006	0.11	0.433	0.633
LTE Band41	BW20_QPSK_5 0RB0Offset	Back	0	41140	2645	N/A	16.30	18.00	1.479	62.90	1.006	0.14	0.412	0.613
LTE Band41	BW20_QPSK_1 00RB0Offset	Back	0	40740	2605	N/A	16.25	18.00	1.496	62.90	1.006	0.09	0.423	0.637
LTE Band41	BW20_QPSK_1 RB0Offset	Left Side	0	40740	2605	N/A	17.32	19.00	1.472	62.90	1.006	0.06	0.724	1.072
LTE Band41	BW20_QPSK_1 RB0Offset	Left Side	0	40340	2565	N/A	17.29	19.00	1.483	62.90	1.006	-0.03	0.769	1.147
LTE Band41	BW20_QPSK_1 RB0Offset	Left Side	0	41140	2645	N/A	17.31	19.00	1.476	62.90	1.006	0.01	0.727	1.079
LTE Band41	BW20_QPSK_5 0RB0Offset	Left Side	0	40740	2605	N/A	16.39	18.00	1.449	62.90	1.006	-0.03	0.603	0.879
LTE Band41	BW20_QPSK_5 0RB0Offset	Left Side	0	40340	2565	N/A	16.38	18.00	1.452	62.90	1.006	0.11	0.588	0.859
LTE Band41	BW20_QPSK_5 0RB0Offset	Left Side	0	41140	2645	N/A	16.30	18.00	1.479	62.90	1.006	0.14	0.591	0.879
LTE Band41	BW20_QPSK_1 00RB0Offset	Left Side	0	40740	2605	N/A	16.25	18.00	1.496	62.90	1.006	0.09	0.592	0.891
LTE Band41	BW20_QPSK_1 RB0Offset	Bottom Side	0	40740	2605	N/A	22.62	24.00	1.374	62.90	1.006	0.03	0.278	0.384
LTE Band41	BW20_QPSK_5 0RB0Offset	Bottom Side	0	40740	2605	N/A	21.33	23.00	1.469	62.90	1.006	-0.01	0.195	0.288
LTE Band41	BW20_QPSK_1 RB0Offset	Right Side	0	40740	2605	N/A	22.62	24.00	1.374	62.90	1.006	0.04	0.001	0.001
LTE Band41	BW20_QPSK_5 0RB0Offset	Right Side	0	40740	2605	N/A	21.33	23.00	1.469	62.90	1.006	0.02	0.001	0.001
LTE Band41	BW20_QPSK_1 RB0Offset	Top Side	0	40740	2605	N/A	22.62	24.00	1.374	62.90	1.006	0.01	0.001	0.001
LTE Band41	BW20_QPSK_5 0RB0Offset	Top Side	0	40740	2605	N/A	21.33	23.00	1.469	62.90	1.006	0.04	0.001	0.001
LTE Band41	BW20_QPSK_1 RB0Offset	Back	15	40740	2605	N/A	22.62	24.00	1.374	62.90	1.006	0.04	0.231	0.319
LTE Band41	BW20_QPSK_5 0RB0Offset	Back	15	40740	2605	N/A	21.33	23.00	1.469	62.90	1.006	-0.03	0.214	0.316
LTE Band41	BW20_QPSK_1 RB0Offset	Left Side	15	40740	2605	N/A	22.62	24.00	1.374	62.90	1.006	0.03	0.580	0.802
LTE Band41	BW20_QPSK_1 RB0Offset	Left Side	15	40340	2565	N/A	22.53	24.00	1.403	62.90	1.006	0.03	0.554	0.782
LTE Band41	BW20_QPSK_1 RB0Offset	Left Side	15	41140	2645	N/A	22.50	24.00	1.413	62.90	1.006	0.12	0.561	0.797
LTE Band41	BW20_QPSK_5 0RB0Offset	Left Side	15	40740	2605	N/A	21.33	23.00	1.469	62.90	1.006	0.03	0.433	0.640
LTE Band41	BW20_QPSK_5 0RB0Offset	Left Side	15	40340	2565	N/A	21.24	23.00	1.500	62.90	1.006	0.04	0.421	0.635

LTE Band41	BW20_QPSK_5 0RB0Offset	Left Side	15	41140	2645	N/A	21.32	23.00	1.472	62.90	1.006	0.01	0.435	0.644
LTE Band41	BW20_QPSK_1 00RB0Offset	Left Side	15	40740	2605	N/A	21.36	23.00	1.459	62.90	1.006	-0.03	0.422	0.619
WLAN 2.4G	802.11b_1Mbps	Back	0	6	2437	Ant 1	11.93	12.00	1.016	99.20	1.008	0.01	0.651	0.667
WLAN 2.4G	802.11b_1Mbps	Back	0	1	2412	Ant 1	11.78	12.00	1.052	99.20	1.008	-0.05	0.680	0.721
WLAN 2.4G	802.11b_1Mbps	Back	0	11	2462	Ant 1	11.76	12.00	1.057	99.20	1.008	0.12	0.709	0.755
WLAN 2.4G	802.11b_1Mbps	Back	0	6	2437	Ant 2	11.78	12.00	1.052	99.20	1.008	0.05	0.125	0.133
WLAN 2.4G	802.11b_1Mbps	Left Side	0	6	2437	Ant 1	11.93	12.00	1.016	99.20	1.008	0.10	1.050	1.076
WLAN 2.4G	802.11b_1Mbps	Left Side	0	1	2412	Ant 1	11.78	12.00	1.052	99.20	1.008	0.02	1.080	1.145
WLAN 2.4G	802.11b_1Mbps	Left Side	0	11	2462	Ant 1	11.76	12.00	1.057	99.20	1.008	0.15	1.080	1.150
WLAN 2.4G	802.11b_1Mbps	Left Side	0	1	2412	Ant 2	17.26	18.00	1.186	99.20	1.008	0.03	0.001	0.001
WLAN 2.4G	802.11b_1Mbps	Right Side	0	6	2437	Ant 1	17.47	18.00	1.130	99.20	1.008	0.02	0.001	0.001
WLAN 2.4G	802.11b_1Mbps	Right Side	0	6	2437	Ant 2	11.78	12.00	1.052	99.20	1.008	0.04	0.128	0.136
WLAN 2.4G	802.11b_1Mbps	Top Side	0	6	2437	Ant 1	17.47	18.00	1.130	99.20	1.008	-0.12	0.010	0.012
WLAN 2.4G	802.11b_1Mbps	Top Side	0	6	2437	Ant 2	17.26	18.00	1.186	99.20	1.008	0.01	0.001	0.001
WLAN 2.4G	802.11b_1Mbps	Bottom Side	0	6	2437	Ant 1	17.47	18.00	1.130	99.20	1.008	0.03	0.001	0.001
WLAN 2.4G	802.11b_1Mbps	Bottom Side	0	1	2412	Ant 2	17.26	18.00	1.186	99.20	1.008	0.02	0.001	0.001
WLAN 2.4G	802.11b_1Mbps	Back	10	6	2437	Ant 1	17.47	18.00	1.130	99.20	1.008	0.03	0.364	0.415
WLAN 2.4G	802.11b_1Mbps	Left Side	10	6	2437	Ant 1	17.47	18.00	1.130	99.20	1.008	-0.02	0.843	0.960
WLAN 2.4G	802.11b_1Mbps	Left Side	10	1	2412	Ant 1	17.45	18.00	1.135	99.20	1.008	0.14	0.792	0.906
WLAN 2.4G	802.11b_1Mbps	Left Side	10	11	2462	Ant 1	16.93	18.00	1.279	99.20	1.008	0.11	0.781	1.007
WLAN 2.4G	802.11b_1Mbps	Back	5	1	2412	Ant 2	17.26	18.00	1.186	99.20	1.008	0.01	0.140	0.167
WLAN 2.4G	802.11b_1Mbps	Right Side	5	1	2412	Ant 2	17.26	18.00	1.186	99.20	1.008	0.01	0.114	0.136
WLAN 2.4G	802.11n-HT40 MCS0	Back	0	6	2437	Ant 1+2	11.36	12.00	1.159	94.00	1.064	0.12	0.270	0.333
WLAN 2.4G	802.11n-HT40 MCS0	Left Side	0	6	2437	Ant 1+2	11.36	12.00	1.159	94.00	1.064	0.10	0.035	0.043
WLAN 2.4G	802.11n-HT40 MCS0	Right Side	0	6	2437	Ant 1+2	11.36	12.00	1.159	94.00	1.064	0.03	0.044	0.054
WLAN 2.4G	802.11n-HT40 MCS0	Top Side	0	6	2437	Ant 1+2	16.12	17.00	1.225	94.00	1.064	0.00	0.034	0.044
WLAN 2.4G	802.11n-HT40 MCS0	Bottom Side	0	6	2437	Ant 1+2	16.12	17.00	1.225	94.00	1.064	0.02	0.001	0.001
Bluetooth	DH5_1Mbps	Back	0	39	2441	Ant 1	11.93	12.00	1.016	77.50	1.290	0.12	0.163	0.214
Bluetooth	DH5_1Mbps	Back	0	00	2402	Ant 1	11.78	12.00	1.052	77.50	1.290	-0.03	0.144	0.195
Bluetooth	DH5_1Mbps	Back	0	78	2480	Ant 1	11.76	12.00	1.057	77.50	1.290	0.04	0.147	0.200
Bluetooth	DH5_1Mbps	Left Side	0	39	2441	Ant 1	11.93	12.00	1.016	77.50	1.290	0.01	0.158	0.207
Bluetooth	DH5_1Mbps	Right Side	0	39	2441	Ant 1	11.93	12.00	1.016	77.50	1.290	0.01	0.001	0.001
Bluetooth	DH5_1Mbps	Top Side	0	39	2441	Ant 1	11.93	12.00	1.016	77.50	1.290	0.03	0.001	0.001
Bluetooth	DH5_1Mbps	Bottom Side	0	39	2441	Ant 1	11.93	12.00	1.016	77.50	1.290	0.04	0.001	0.001
WLAN 5G	802.11a_6Mbps	Back	0	52	5260	Ant 1	12.13	12.50	1.089	98.10	1.019	0.15	0.469	0.520
WLAN 5G	802.11a_6Mbps	Back	0	60	5300	Ant 1	12.05	12.50	1.109	98.10	1.019	0.12	0.433	0.489
WLAN 5G	802.11a_6Mbps	Back	0	64	5320	Ant 1	12.02	12.50	1.117	98.10	1.019	0.03	0.453	0.516
WLAN 5G	802.11a_6Mbps	Back	0	52	5260	Ant 2	12.21	12.50	1.069	98.10	1.019	0.07	0.327	0.356
WLAN 5G	802.11a_6Mbps	Left Side	0	52	5260	Ant 1	12.13	12.50	1.089	98.10	1.019	0.17	0.965	1.071
WLAN 5G	802.11a_6Mbps	Left Side	0	60	5300	Ant 1	12.05	12.50	1.109	98.10	1.019	0.02	0.911	1.030
WLAN 5G	802.11a_6Mbps	Left Side	0	64	5320	Ant 1	12.02	12.50	1.117	98.10	1.019	-0.11	0.964	1.097
WLAN 5G	802.11a_6Mbps	Left Side	0	52	5260	Ant 2	15.21	16.00	1.199	98.10	1.019	0.01	0.001	0.001
WLAN 5G	802.11a_6Mbps	Right Side	0	52	5260	Ant 1	15.38	16.00	1.153	98.10	1.019	0.03	0.001	0.001
WLAN 5G	802.11a_6Mbps	Right Side	0	52	5260	Ant 2	12.21	12.50	1.069	98.10	1.019	0.02	0.639	0.696
WLAN 5G	802.11a_6Mbps	Right Side	0	60	5300	Ant 2	11.98	12.50	1.127	98.10	1.019	0.01	0.534	0.613
WLAN 5G	802.11a_6Mbps	Right Side	0	64	5320	Ant 2	12.06	12.50	1.107	98.10	1.019	-0.12	0.505	0.569
WLAN 5G	802.11a_6Mbps	Top Side	0	52	5260	Ant 1	15.21	16.00	1.199	98.10	1.019	0.12	0.388	0.474
WLAN 5G	802.11a_6Mbps	Top Side	0	52	5260	Ant 2	15.38	16.00	1.153	98.10	1.019	0.01	0.001	0.001

WLAN 5G	802.11a_6Mbps	Bottom Side	0	52	5260	Ant 1	15.21	16.00	1.199	98.10	1.019	0.02	0.001	0.001
WLAN 5G	802.11a_6Mbps	Bottom Side	0	52	5260	Ant 2	15.38	16.00	1.153	98.10	1.019	0.02	0.001	0.001
WLAN 5G	802.11a_6Mbps	Back	10	52	5260	Ant 1	15.21	16.00	1.199	98.10	1.019	0.03	0.265	0.324
WLAN 5G	802.11a_6Mbps	Left Side	10	52	5260	Ant 1	15.21	16.00	1.199	98.10	1.019	0.01	0.482	0.589
WLAN 5G	802.11a_6Mbps	Back	5	52	5260	Ant 2	15.38	16.00	1.153	98.10	1.019	-0.03	0.355	0.417
WLAN 5G	802.11a_6Mbps	Right Side	5	52	5260	Ant 2	15.38	16.00	1.153	98.10	1.019	0.01	0.578	0.679
WLAN 5G	802.11ac-VHT80 MCS0	Back	0	58	5290	Ant 1+2	11.79	12.50	1.178	94.00	1.064	0.02	0.158	0.198
WLAN 5G	802.11ac-VHT80 MCS0	Left Side	0	58	5290	Ant 1+2	11.79	12.50	1.178	94.00	1.064	0.09	0.264	0.331
WLAN 5G	802.11ac-VHT80 MCS0	Right Side	0	58	5290	Ant 1+2	11.79	12.50	1.178	94.00	1.064	0.01	0.408	0.511
WLAN 5G	802.11ac-VHT80 MCS0	Top Side	0	58	5290	Ant 1+2	16.14	16.50	1.086	94.00	1.064	-0.03	0.021	0.024
WLAN 5G	802.11ac-VHT80 MCS0	Bottom Side	0	58	5290	Ant 1+2	16.14	16.50	1.086	94.00	1.064	0.01	0.001	0.001
WLAN 5G	802.11a_6Mbps	Back	0	100	5500	Ant 1	12.17	12.50	1.079	98.10	1.019	0.02	0.454	0.499
WLAN 5G	802.11a_6Mbps	Back	0	116	5580	Ant 1	12.02	12.50	1.117	98.10	1.019	0.03	0.476	0.542
WLAN 5G	802.11a_6Mbps	Back	0	140	5700	Ant 1	12.09	12.50	1.099	98.10	1.019	0.12	0.493	0.552
WLAN 5G	802.11a_6Mbps	Back	0	100	5500	Ant 2	12.23	12.50	1.064	98.10	1.019	0.15	0.342	0.371
WLAN 5G	802.11a_6Mbps	Left Side	0	100	5500	Ant 1	12.17	12.50	1.079	98.10	1.019	0.05	0.915	1.006
WLAN 5G	802.11a_6Mbps	Left Side	0	116	5580	Ant 1	12.02	12.50	1.117	98.10	1.019	0.16	0.973	1.107
WLAN 5G	802.11a_6Mbps	Left Side	0	140	5700	Ant 1	12.09	12.50	1.099	98.10	1.019	0.09	0.967	1.083
WLAN 5G	802.11a_6Mbps	Left Side	0	116	5580	Ant 2	15.16	16.00	1.213	98.10	1.019	0.03	0.001	0.001
WLAN 5G	802.11a_6Mbps	Right Side	0	116	5580	Ant 1	15.47	16.00	1.130	98.10	1.019	0.02	0.001	0.001
WLAN 5G	802.11a_6Mbps	Right Side	0	100	5500	Ant 2	12.23	12.50	1.064	98.10	1.019	0.01	0.723	0.784
WLAN 5G	802.11a_6Mbps	Right Side	0	116	5580	Ant 2	12.08	12.50	1.102	98.10	1.019	0.12	0.971	1.090
WLAN 5G	802.11a_6Mbps	Right Side	0	140	5700	Ant 2	12.11	12.50	1.094	98.10	1.019	-0.12	0.890	0.992
WLAN 5G	802.11a_6Mbps	Top Side	0	100	5500	Ant 1	15.47	16.00	1.130	98.10	1.019	0.02	0.263	0.303
WLAN 5G	802.11a_6Mbps	Top Side	0	100	5500	Ant 2	15.16	16.00	1.213	98.10	1.019	0.01	0.001	0.001
WLAN 5G	802.11a_6Mbps	Bottom Side	0	116	5580	Ant 1	15.47	16.00	1.130	98.10	1.019	0.03	0.001	0.001
WLAN 5G	802.11a_6Mbps	Bottom Side	0	116	5580	Ant 2	15.16	16.00	1.213	98.10	1.019	0.02	0.001	0.001
WLAN 5G	802.11a_6Mbps	Back	10	116	5580	Ant 1	15.47	16.00	1.130	98.10	1.019	0.14	0.210	0.242
WLAN 5G	802.11a_6Mbps	Left Side	10	116	5580	Ant 1	15.47	16.00	1.130	98.10	1.019	-0.03	0.260	0.299
WLAN 5G	802.11a_6Mbps	Back	5	116	5580	Ant 2	15.16	16.00	1.213	98.10	1.019	0.03	0.365	0.451
WLAN 5G	802.11a_6Mbps	Right Side	5	100	5500	Ant 2	15.00	16.00	1.259	98.10	1.019	0.09	0.625	0.802
WLAN 5G	802.11a_6Mbps	Right Side	5	116	5580	Ant 2	15.16	16.00	1.213	98.10	1.019	0.01	0.633	0.783
WLAN 5G	802.11a_6Mbps	Right Side	5	140	5700	Ant 2	15.14	16.00	1.219	98.10	1.019	-0.02	0.679	0.843
WLAN 5G	802.11ac-VHT80 MCS0	Back	0	112	5610	Ant 1+2	11.99	12.50	1.125	94.00	1.064	0.01	0.164	0.196
WLAN 5G	802.11ac-VHT80 MCS0	Left Side	0	112	5610	Ant 1+2	11.99	12.50	1.125	94.00	1.064	0.11	0.281	0.336
WLAN 5G	802.11ac-VHT80 MCS0	Right Side	0	112	5610	Ant 1+2	11.99	12.50	1.125	94.00	1.064	0.03	0.407	0.487
WLAN 5G	802.11ac-VHT80 MCS0	Top Side	0	112	5610	Ant 1+2	15.83	16.50	1.167	94.00	1.064	-0.03	0.032	0.040
WLAN 5G	802.11ac-VHT80 MCS0	Bottom Side	0	112	5610	Ant 1+2	15.83	16.50	1.167	94.00	1.064	0.03	0.001	0.001
WLAN 5G	802.11a_6Mbps	Back	0	149	5745	Ant 1	12.23	12.50	1.064	98.10	1.019	0.02	0.447	0.485
WLAN 5G	802.11a_6Mbps	Back	0	157	5785	Ant 1	12.14	12.50	1.086	98.10	1.019	-0.03	0.423	0.468
WLAN 5G	802.11a_6Mbps	Back	0	165	5825	Ant 1	12.09	12.50	1.099	98.10	1.019	0.12	0.431	0.483
WLAN 5G	802.11a_6Mbps	Back	0	149	5745	Ant 2	12.35	12.50	1.035	98.10	1.019	0.05	0.235	0.248
WLAN 5G	802.11a_6Mbps	Left Side	0	149	5745	Ant 1	12.23	12.50	1.064	98.10	1.019	0.06	0.937	1.016
WLAN 5G	802.11a_6Mbps	Left Side	0	157	5785	Ant 1	12.14	12.50	1.086	98.10	1.019	0.02	0.850	0.941
WLAN 5G	802.11a_6Mbps	Left Side	0	165	5825	Ant 1	12.09	12.50	1.099	98.10	1.019	0.02	0.991	1.110
WLAN 5G	802.11a_6Mbps	Left Side	0	165	5825	Ant 2	15.26	16.00	1.186	98.10	1.019	0.03	0.001	0.001
WLAN 5G	802.11a_6Mbps	Right Side	0	149	5745	Ant 1	15.48	16.00	1.127	98.10	1.019	0.02	0.001	0.001
WLAN 5G	802.11a_6Mbps	Right Side	0	149	5745	Ant 2	12.35	12.50	1.035	98.10	1.019	0.02	0.907	0.957

WLAN 5G	802.11a_6Mbps	Right Side	0	157	5785	Ant 2	12.21	12.50	1.069	98.10	1.019	0.16	0.974	1.061
WLAN 5G	802.11a_6Mbps	Right Side	0	165	5825	Ant 2	12.33	12.50	1.040	98.10	1.019	0.03	0.806	0.854
WLAN 5G	802.11a_6Mbps	Top Side	0	149	5745	Ant 1	15.48	16.00	1.127	98.10	1.019	0.02	0.472	0.542
WLAN 5G	802.11a_6Mbps	Top Side	0	149	5745	Ant 2	12.35	12.50	1.035	98.10	1.019	0.04	0.001	0.001
WLAN 5G	802.11a_6Mbps	Bottom Side	0	149	5745	Ant 1	15.48	16.00	1.127	98.10	1.019	0.02	0.001	0.001
WLAN 5G	802.11a_6Mbps	Bottom Side	0	165	5825	Ant 2	15.26	16.00	1.186	98.10	1.019	0.01	0.001	0.001
WLAN 5G	802.11a_6Mbps	Back	10	149	5745	Ant 1	15.48	16.00	1.127	98.10	1.019	0.11	0.130	0.149
WLAN 5G	802.11a_6Mbps	Left Side	10	149	5745	Ant 1	15.48	16.00	1.127	98.10	1.019	0.03	0.190	0.218
WLAN 5G	802.11a_6Mbps	Back	5	165	5825	Ant 2	15.26	16.00	1.186	98.10	1.019	0.03	0.219	0.265
WLAN 5G	802.11a_6Mbps	Right Side	5	165	5825	Ant 2	15.26	16.00	1.186	98.10	1.019	0.09	0.430	0.520
WLAN 5G	802.11ac-VHT80 MCS0	Back	0	155	5775	Ant 1+2	11.90	12.50	1.148	94.00	1.064	0.01	0.127	0.155
WLAN 5G	802.11ac-VHT80 MCS0	Left Side	0	155	5775	Ant 1+2	11.90	12.50	1.148	94.00	1.064	0.13	0.267	0.326
WLAN 5G	802.11ac-VHT80 MCS0	Right Side	0	155	5775	Ant 1+2	11.90	12.50	1.148	94.00	1.064	0.12	0.480	0.586
WLAN 5G	802.11ac-VHT80 MCS0	Top Side	0	155	5775	Ant 1+2	15.58	16.50	1.236	94.00	1.064	-0.03	0.098	0.129
WLAN 5G	802.11ac-VHT80 MCS0	Bottom Side	0	155	5775	Ant 1+2	15.58	16.50	1.236	94.00	1.064	0.08	0.001	0.001

SAR Test Note:

1. Per KDB648474 D04y01r03, this device is considered a phablet since the display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm. Therefore, phablet SAR tests are required when wireless mode does not apply or if wireless router 1g SAR > 1.2W/kg.
2. Due to the distance between the antenna and the test edge, the result of 0.001 in the table is the result of decimal point rounding, and the actual test results are ≤ 0.001 .
3. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
4. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA/ HSUPA/ DC-HSDPA is $\leq 1/4$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC 12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA/ DC-HSDPA to RMC 12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA/ HSUPA/ DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than 1/4 dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA/ HSUPA/ DC-HSDPA.
5. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
6. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
7. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
8. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

9. Duty cycle of TDD was fixed, therefore not require scaled to 100% of duty cycle. For SAR system, the crest factor 1:1.59 (62.9%) was used perform testing.
10. Considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The reported TDD LTE SAR (W/kg) = Measured SAR (W/kg)* scaling factor for extended cyclic prefix.
11. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not 1/2 dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225D05v02r05.16QAM SAR testing is not required.
12. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not 1/2 dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
13. LTE Band 2/5/17 SAR test was covered by LTE Band 25/26/12, due to the output power level and have duplicate frequency range.
14. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band. The largest channel bandwidth, lowest or demodulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, additional output power measurements were not necessary.
15. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
- 0.4 W/ka. SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested For subsequent test position with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested. When it is unclear, all equivalent conditions must be tested.
 - For all positions/configurations tested using the initial test position and subsequent test positions, when the

reported SAR is > 0.8 W/kg, measure the SAR for positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.

- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
 - When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.
16. The Bluetooth duty cycle is 77.50%, Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 100%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation.
17. The ratio is the difference in percentage between original and repeated measured SAR.
18. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

9.2 SAR Measurement Variability

Band	Mode	Test Position	Ch.	Antenna	Freq. (MHz)	Original 1g SAR (W/kg)	First 1g SAR (W/kg)	First Ratio SAR 1g
WCDMA II	RMC 12.2K	Back	9400	N/A	1880	0.956	0.921	3.8%
WCDMA II	RMC 12.2K	Left Side	9538	N/A	1907.6	0.975	0.943	3.4%
WCDMA IV	RMC 12.2K	Back	1413	N/A	1732.6	0.807	0.779	3.6%
WCDMA V	RMC 12.2K	Back	4183	N/A	836.6	0.95	0.926	2.6%
LTE Band25/2	BW20_QPSK_1RB0Offset	Back	26365	N/A	1882.5	0.887	0.833	6.5%
LTE Band25/2	BW20_QPSK_1RB0Offset	Left Side	26365	N/A	1882.5	1.02	0.978	4.3%
LTE Band4	BW20_QPSK_1RB0Offset	Back	20300	N/A	1745	0.973	0.961	1.2%
LTE Band4	BW20_QPSK_1RB0Offset	Left Side	20300	N/A	1745	0.911	0.903	0.9%
WLAN 2.4G	802.11b_1Mbps	Left Side	11	Ant 1	2462	1.08	1.03	4.9%
WLAN 5G	802.11a_6Mbps	Left Side	64	Ant 1	5320	0.964	0.954	1.0%
WLAN 5G	802.11a_6Mbps	Left Side	116	Ant 1	5580	0.973	0.965	0.8%
WLAN 5G	802.11a_6Mbps	Right Side	116	Ant 2	5580	0.971	0.966	0.5%
WLAN 5G	802.11a_6Mbps	Left Side	165	Ant 1	5825	0.991	0.988	0.3%
WLAN 5G	802.11a_6Mbps	Right Side	157	Ant 2	5785	0.974	0.971	0.3%

Note:

According to KDB 865664 D01v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required:

1. The original highest measured Reported SAR 1-g ≥ 0.80 W/kg, repeated that measurement once.
2. Perform a second repeated measurement the ratio of the largest to the smallest SAR for the original and first repeated measurements is < 1.2 W/kg, or when the original or repeated measurement ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

9.3 Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Body SAR
1.	WWAN+ 2.4GHz WLAN Ant 1+2	Yes
2.	WWAN+ 5GHz WLAN Ant 1+2	Yes
3.	WWAN+ Bluetooth Ant 1	Yes
4.	2.4GHz WLAN Ant 1+2 + Bluetooth Ant 1	Yes
5.	5GHz WLAN Ant 1+2 + Bluetooth Ant 1	Yes

Reported SAR										
WWAN Band	Exposure Position	WWAN	2.4GHz WLAN Ant 1+2	5GHz WLAN Ant 1+2	Bluetooth Ant 1	NO.1	NO.2	NO.3	NO.4	NO.5
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	10g SAR (W/kg)	Summed	Summed	Summed	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	10g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
WCDMA II	Back	1.209	0.333	0.198	0.214	1.54	1.41	1.42	0.55	0.41
	Left Side	1.258	0.043	0.336	0.207	1.30	1.59	1.47	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.462	0.001	0.001	0.001	0.46	0.46	0.46	0.00	0.00
WCDMA IV	Back	1.023	0.333	0.198	0.214	1.36	1.22	1.24	0.55	0.41
	Left Side	0.747	0.043	0.336	0.207	0.79	1.08	0.95	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.417	0.001	0.001	0.001	0.42	0.42	0.42	0.00	0.00
WCDMA V	Back	1.153	0.333	0.198	0.214	1.49	1.35	1.37	0.55	0.41
	Left Side	0.716	0.043	0.336	0.207	0.76	1.05	0.92	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.124	0.001	0.001	0.001	0.13	0.13	0.13	0.00	0.00
LTE Band25/2	Back	1.045	0.333	0.198	0.214	1.38	1.24	1.26	0.55	0.41
	Left Side	1.201	0.043	0.336	0.207	1.24	1.54	1.41	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.309	0.001	0.001	0.001	0.31	0.31	0.31	0.00	0.00
LTE Band4	Back	1.253	0.333	0.198	0.214	1.59	1.45	1.47	0.55	0.41
	Left Side	1.174	0.043	0.336	0.207	1.22	1.51	1.38	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.428	0.001	0.001	0.001	0.43	0.43	0.43	0.00	0.00
LTE Band26/5	Back	1.078	0.333	0.198	0.214	1.41	1.28	1.29	0.55	0.41
	Left Side	0.729	0.043	0.336	0.207	0.77	1.07	0.94	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13

	Bottom Side	0.584	0.001	0.001	0.001	0.59	0.59	0.59	0.00	0.00
LTE Band12/17	Back	1.102	0.333	0.198	0.214	1.44	1.30	1.32	0.55	0.41
	Left Side	0.675	0.043	0.336	0.207	0.72	1.01	0.88	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.236	0.001	0.001	0.001	0.24	0.24	0.24	0.00	0.00
LTE Band13	Back	0.985	0.333	0.198	0.214	1.32	1.18	1.20	0.55	0.41
	Left Side	0.979	0.043	0.336	0.207	1.02	1.32	1.19	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.254	0.001	0.001	0.001	0.26	0.26	0.26	0.00	0.00
LTE Band41	Back	0.818	0.333	0.198	0.214	1.15	1.02	1.03	0.55	0.41
	Left Side	1.147	0.043	0.336	0.207	1.19	1.48	1.35	0.25	0.54
	Right Side	0.001	0.054	0.586	0.001	0.06	0.59	0.00	0.06	0.59
	Top Side	0.001	0.044	0.129	0.001	0.05	0.13	0.00	0.05	0.13
	Bottom Side	0.384	0.001	0.001	0.001	0.39	0.39	0.39	0.00	0.00

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6 W/kg, simultaneous SAR measurement is not necessary.

Appendix A. SAR System Validation Data

Date: 15/01/2024

Test Laboratory: DEKRA Lab

System Check Head 750MHz

DUT: Dipole D750MHzV2

Communication System: UID 0, CW (0); Communication System Band: D750MHz; Duty Cycle: 1:1; Frequency: 750 MHz; Medium parameters used: $f = 750$ MHz; $\sigma = 0.894$ S/m; $\epsilon_r = 41.699$; $\rho = 1000$ kg/m³; Phantom section: Flat Section; Input Power=250mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(9.48, 9.03, 9.03); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.74 W/kg

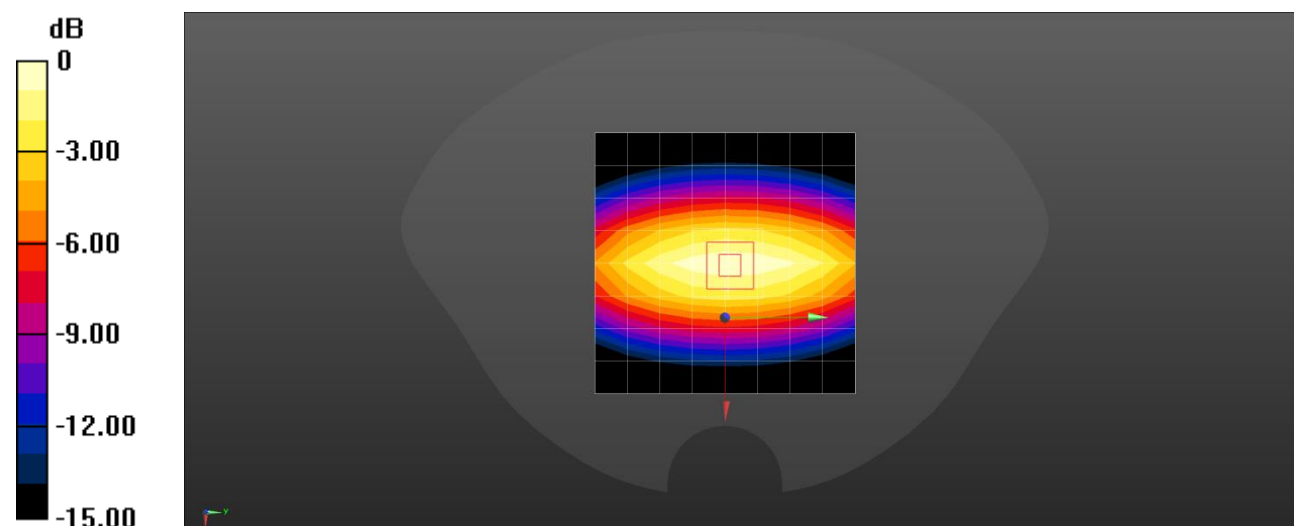
System Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 59.43 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.02 W/kg

SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.43 W/kg

Maximum value of SAR (measured) = 2.77 W/kg



0 dB = 2.77 W/kg = 4.42 dBW/kg

Date: 20/01/2024

Test Laboratory: DEKRA Lab

System Check Head 835MHz

DUT: Dipole D835MhzV2

Communication System: UID 0, CW (0); Communication System Band: D835MHz; Duty Cycle: 1:1; Frequency: 835 MHz; Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.901 \text{ S/m}$; $\epsilon_r = 41.16$; $\rho = 1000 \text{ kg/m}^3$; Phantom section: Flat Section; Input Power=250mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(9.3, 8.98, 8.83); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.89 W/kg

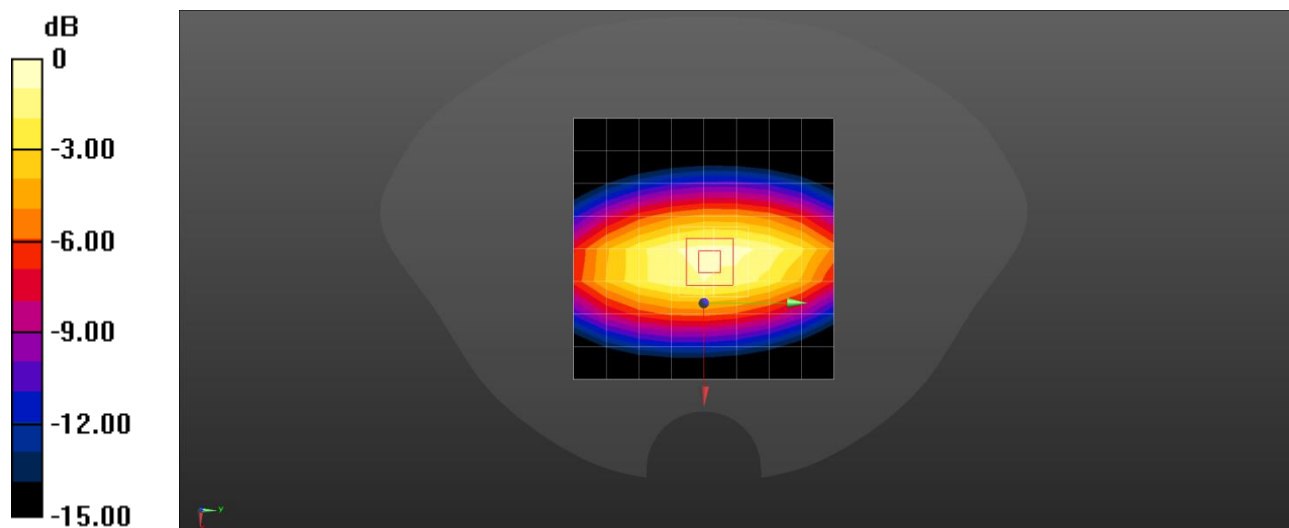
System Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 60.73 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 3.58 W/kg

SAR(1 g) = 2.51 W/kg; SAR(10 g) = 1.66 W/kg

Maximum value of SAR (measured) = 3.27 W/kg



0 dB = 3.27 W/kg = 5.15 dBW/kg

Date: 25/01/2024

Test Laboratory: DEKRA Lab

System Check Head 1800MHz

DUT: Dipole D1800MHzV2

Communication System: UID 0, CW (0); Communication System Band: D1800MHz; Duty Cycle: 1:1; Frequency: 1800 MHz; Medium parameters used: $f = 1800$ MHz; $\sigma = 1.41$ S/m; $\epsilon_r = 38.82$; $\rho = 1000$ kg/m³; Phantom section: Flat Section; Input Power=250mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.46, 8.26, 8.16); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check Head 1800MHz/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 13.1 W/kg

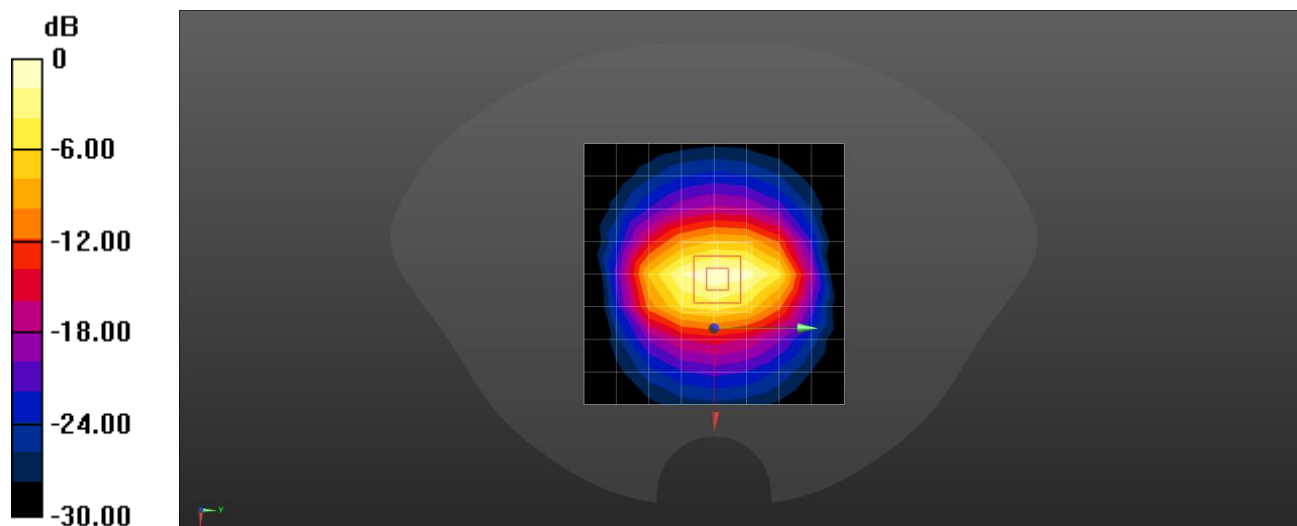
System Check Head 1800MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 102.3 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 16.2 W/kg

SAR(1 g) = 8.99 W/kg; SAR(10 g) = 4.69 W/kg

Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

Date: 30/01/2024

Test Laboratory: DEKRA Lab

System Check Head 1900MHz

DUT: Dipole D1900MHzV2

Communication System: UID 0, CW (0); Communication System Band: D1900MHz; Duty Cycle: 1:1; Frequency: 1900 MHz; Medium parameters used: $f = 1900$ MHz; $\sigma = 1.403$ S/m; $\epsilon_r = 39.09$; $\rho = 1000$ kg/m³; Phantom section: Flat Section; Input Power=250mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.39, 8.14, 8.04); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check Head 1900MHz/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

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

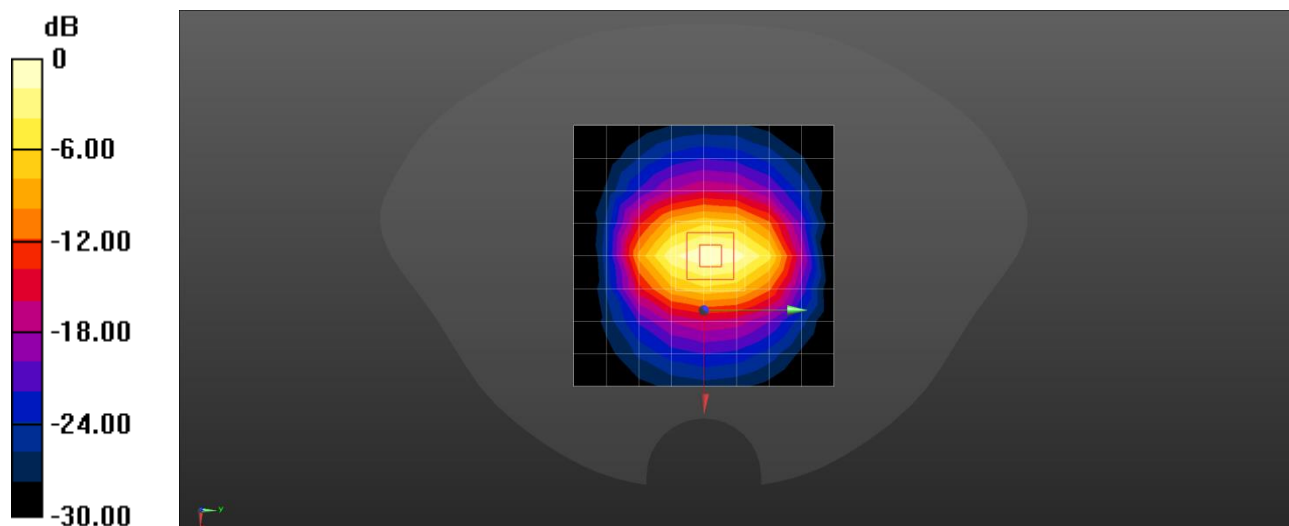
System Check Head 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 104.7 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 9.14 W/kg; SAR(10 g) = 4.73 W/kg

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



0 dB = 14.2 W/kg = 11.52 dBW/kg

Date: 20/02/2024

Test Laboratory: DEKRA Lab

System Check Head 2450MHz

DUT: Dipole D2450V2

Communication System: UID 0, CW; Communication System Band: D2450MHz; Duty Cycle: 1:1; Frequency: 2450 MHz; Medium parameters used: $f = 2450$ MHz; $\sigma = 1.86$ S/m; $\epsilon_r = 38.54$; $\rho = 1000$ kg/m³; Phantom section: Flat Section; Input Power=250mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.55, 7.31, 7.22); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check Head 2450MHz/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 12.3 W/kg

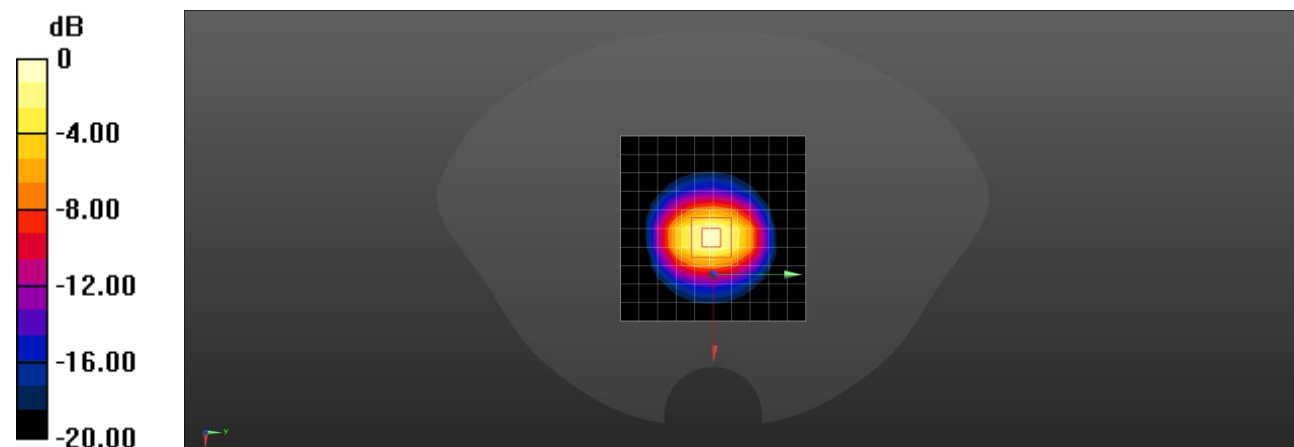
System Check Head 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 81.98 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 26.1 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.93 W/kg

Maximum value of SAR (measured) = 14.6 W/kg



0 dB = 14.6 W/kg = 11.64 dBW/kg

Date: 05/02/2024

Test Laboratory: DEKRA Lab

System Check Head 2600MHz

DUT: Dipole 2600 MHz

Communication System: UID 0, CW (0); Communication System Band: D2600MHz; Duty Cycle: 1:1; Frequency: 2600 MHz; Medium parameters used: $f = 2600$ MHz; $\sigma = 2.032$ S/m; $\epsilon_r = 37.93$; $\rho = 1000$ kg/m³; Phantom section: Flat Section; Input Power=250mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.5, 7.28, 7.2); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check Head 2600MHz/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

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

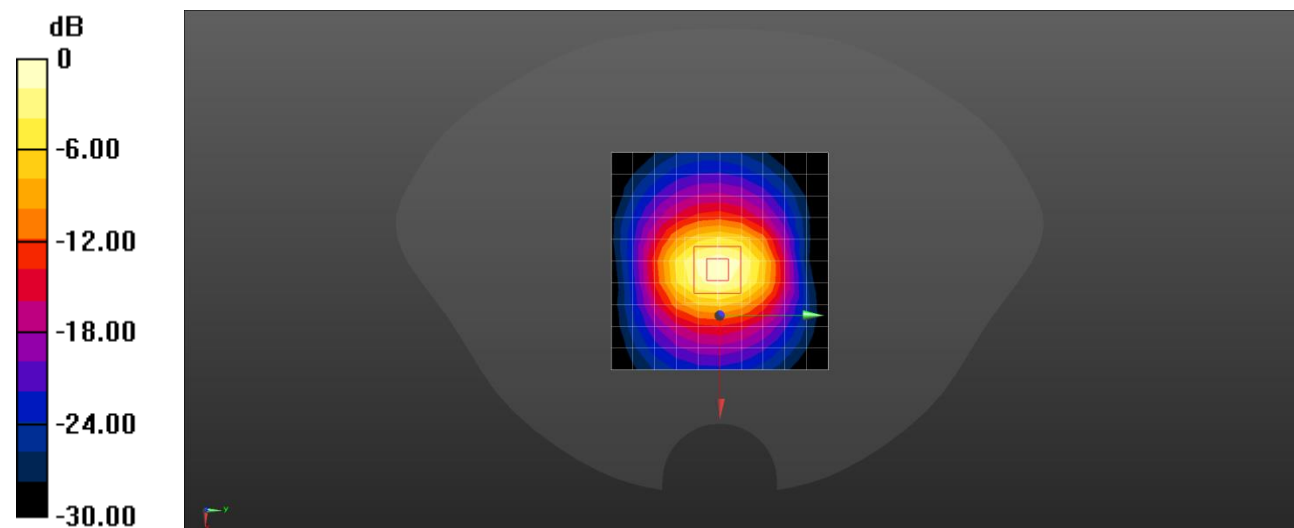
System Check Head 2600MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 83.55 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 29.0 W/kg

SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.1 W/kg

Maximum value of SAR (measured) = 15.5 W/kg



0 dB = 15.5 W/kg = 11.90 dBW/kg

Date: 25/02/2024

Test Laboratory: DEKRA Lab

System Check Head 5250MHz

DUT: Dipole D5GHzV2

Communication System: UID 0, CW (0); Communication System Band: 5GHz; Duty Cycle: 1:1; Frequency: 5250 MHz;

Medium parameters used: $f = 5250$ MHz; $\sigma = 4.6$ S/m; $\epsilon_r = 36.38$; $\rho = 1000$ kg/m³; Phantom section: Flat Section ;

Input Power=100mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.57, 5.5, 5.46) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check Head 5250MHz/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 8.02 W/kg

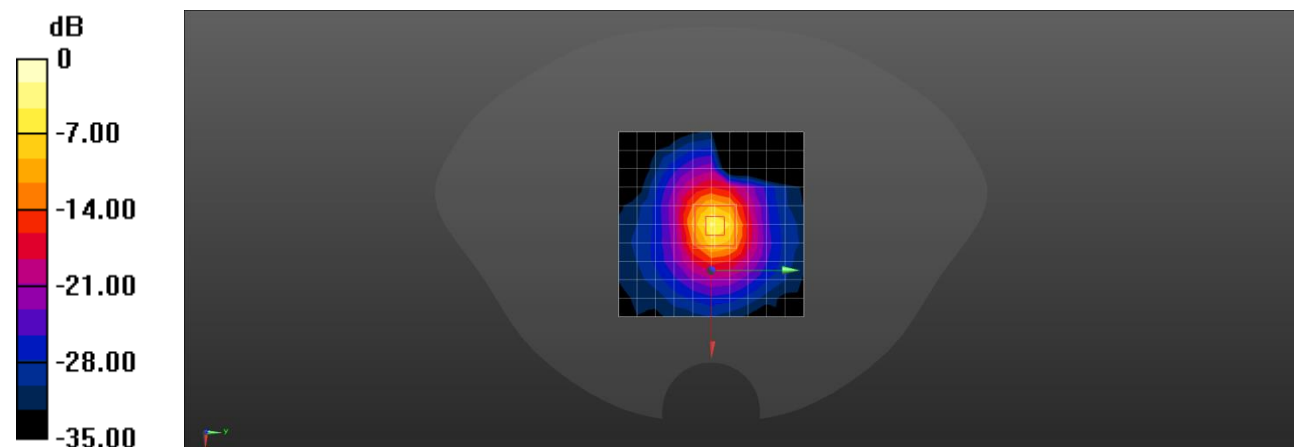
System Check Head 5250MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 42.33 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 33.7 W/kg

SAR(1 g) = 7.7 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 20.2 W/kg



0 dB = 20.2 W/kg = 13.05 dBW/kg

Date: 03/03/2024

Test Laboratory: DEKRA Lab

System Check Head 5600MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2

Communication System: UID 0, CW (0); Communication System Band: 5GHz; Duty Cycle: 1:1; Frequency: 5600 MHz;

Medium parameters used: $f = 5600$ MHz; $\sigma = 4.99$ S/m; $\epsilon_r = 35.8$; $\rho = 1000$ kg/m³; Phantom section: Flat Section ;

Input Power=100mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.84, 4.73, 4.74) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check Head 5600MHz/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 7.88 W/kg

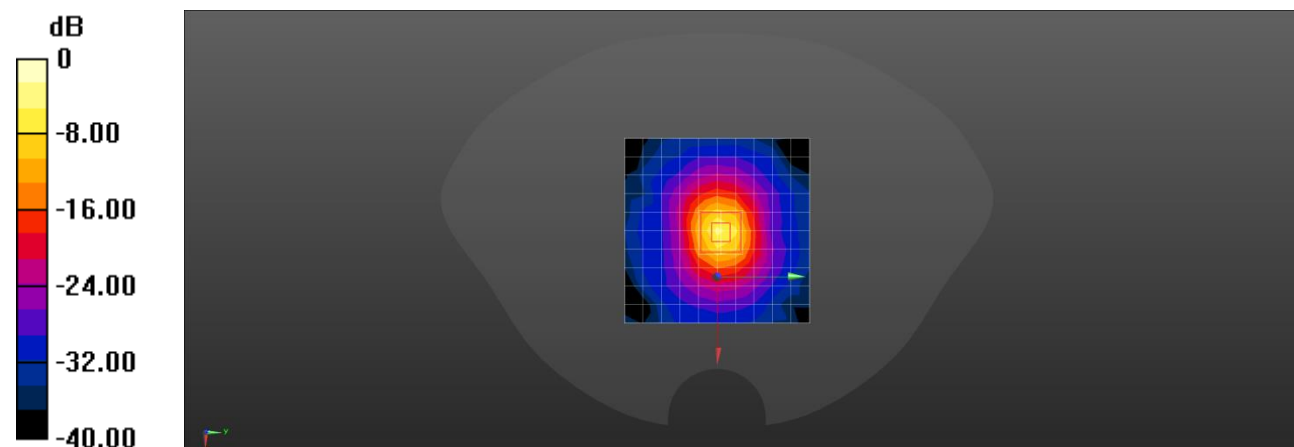
System Check Head 5600MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 40.48 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 37.5 W/kg

SAR(1 g) = 7.86 W/kg; SAR(10 g) = 2.2 W/kg

Maximum value of SAR (measured) = 21.1 W/kg



0 dB = 21.1 W/kg = 13.24 dBW/kg

Date: 15/03/2024

Test Laboratory: DEKRA Lab

System Check Head 5750MHz

DUT: Dipole D5GHzV2

Communication System: UID 0, CW (0); Communication System Band: 5GHz; Duty Cycle: 1:1; Frequency: 5750 MHz;
Medium parameters used: $f = 5750$ MHz; $\sigma = 5.167$ S/m; $\epsilon_r = 35.55$; $\rho = 1000$ kg/m³; Phantom section: Flat Section ;
Input Power=100mW

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.1, 4.88, 4.91); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

System Check Head 5750MHz/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 18.9 W/kg

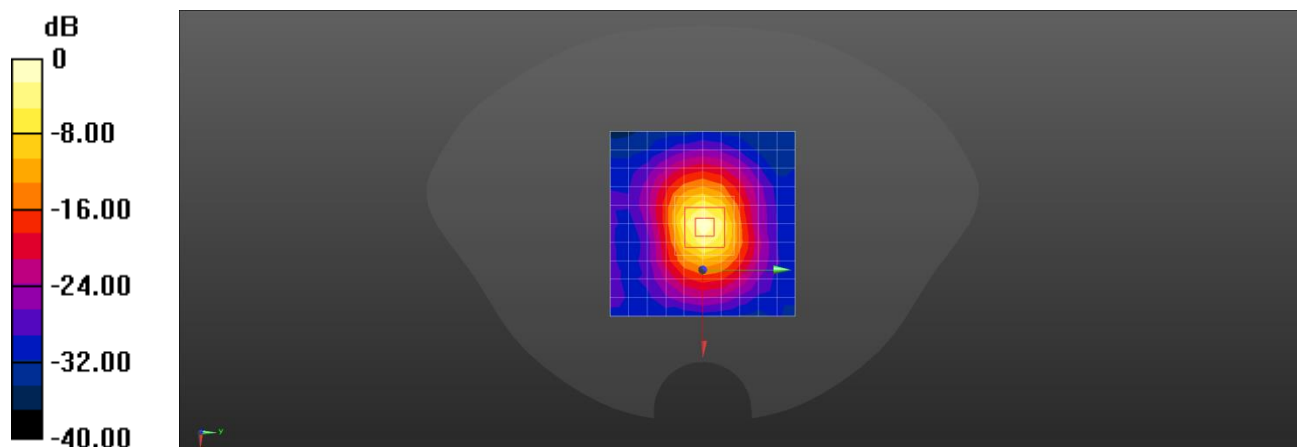
System Check Head 5750MHz/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.41 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 34.8 W/kg

SAR(1 g) = 7.33 W/kg; SAR(10 g) = 2.08 W/kg

Maximum value of SAR (measured) = 19.6 W/kg



0 dB = 19.6 W/kg = 12.92 dBW/kg

Appendix B. SAR measurement Data

Date: 30/01/2024

Test Laboratory: DEKRA Lab

WCDMA II_RMC 12.2K_Back_CH9400_1880MHz

DUT: TABLET_MT578

Communication System: UID 0, WCDMA (0); Communication System Band: WCDMA II; Duty Cycle: 1:1.0;

Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.381$ S/m; $\epsilon_r = 39.189$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.39, 8.14, 8.04); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.38 W/kg

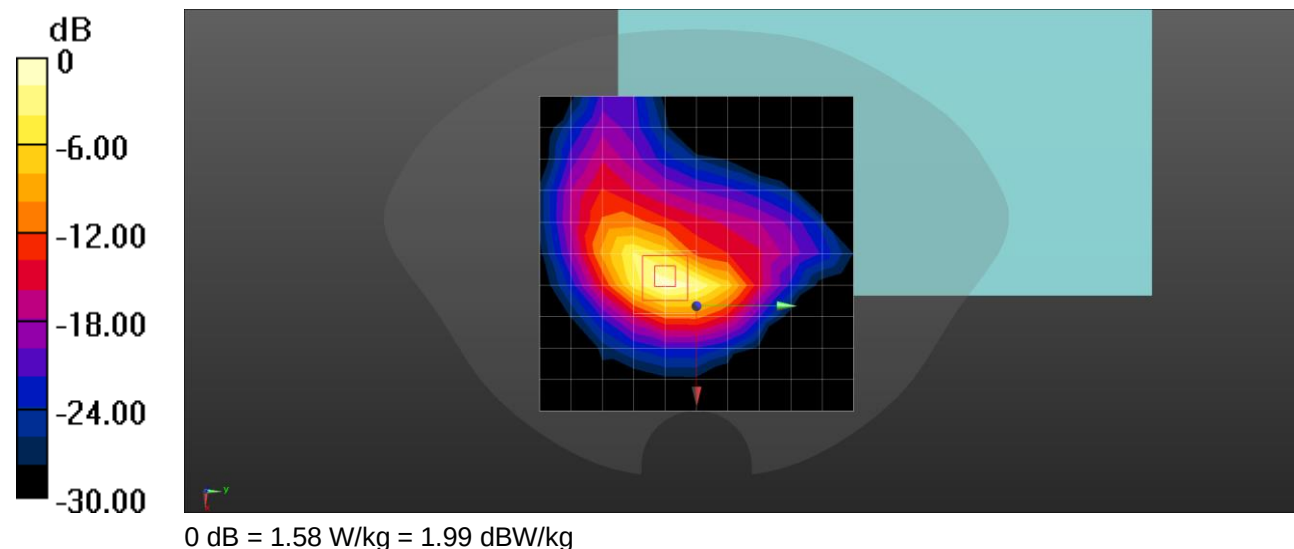
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.172 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 2.12 W/kg

SAR(1 g) = 0.956 W/kg; SAR(10 g) = 0.437 W/kg

Maximum value of SAR (measured) = 1.58 W/kg



Date: 30/01/2024

Test Laboratory: DEKRA Lab

WCDMA II_RMC 12.2K_Left Side_CH9538_1907.6MHz

DUT: TABLET_MT578

Communication System: UID 0, WCDMA (0); Communication System Band: WCDMA II; Duty Cycle: 1:1.0;

Frequency: 1907.6 MHz; Medium parameters used: $f = 1908$ MHz; $\sigma = 1.41$ S/m; $\epsilon_r = 39.056$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.39, 8.14, 8.04) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.78 W/kg

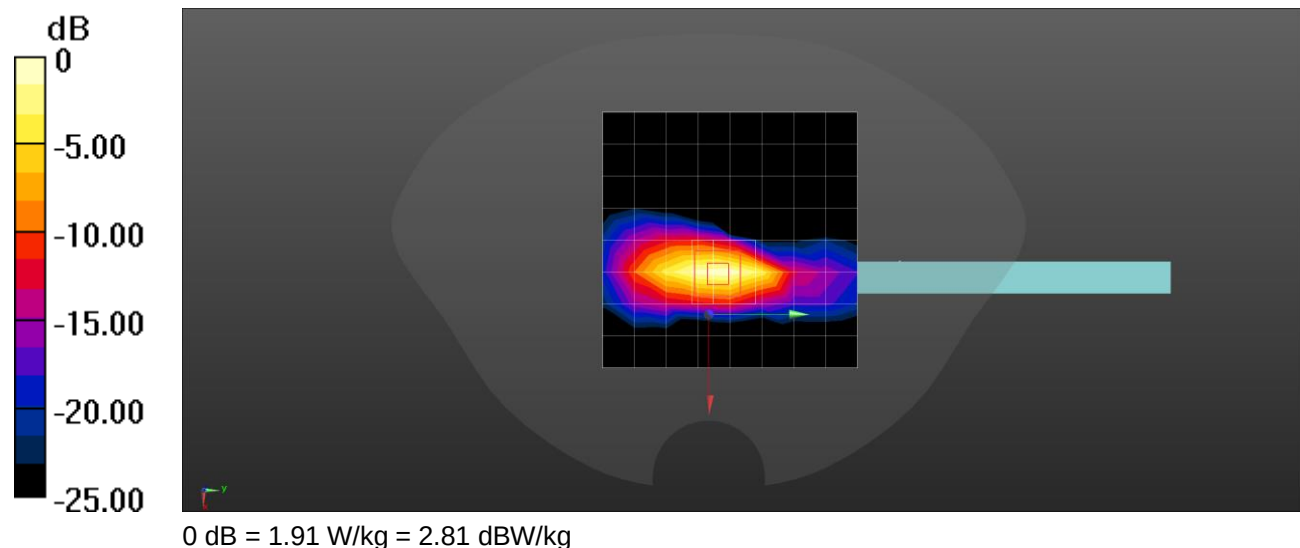
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.84 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 2.59 W/kg

SAR(1 g) = 0.988 W/kg; SAR(10 g) = 0.464 W/kg

Maximum value of SAR (measured) = 1.91 W/kg



Date: 25/01/2024

Test Laboratory: DEKRA Lab

WCDMA IV_RMC 12.2K_Back_CH1413_1732.6MHz

DUT: TABLET_MT578

Communication System: UID 0, WCDMA (0); Communication System Band: WCDMA IV; Duty Cycle: 1:1.0;

Frequency: 1732.6 MHz; Medium parameters used: $f = 1733$ MHz; $\sigma = 1.341$ S/m; $\epsilon_r = 39.13$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.46, 8.26, 8.16) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.15 W/kg

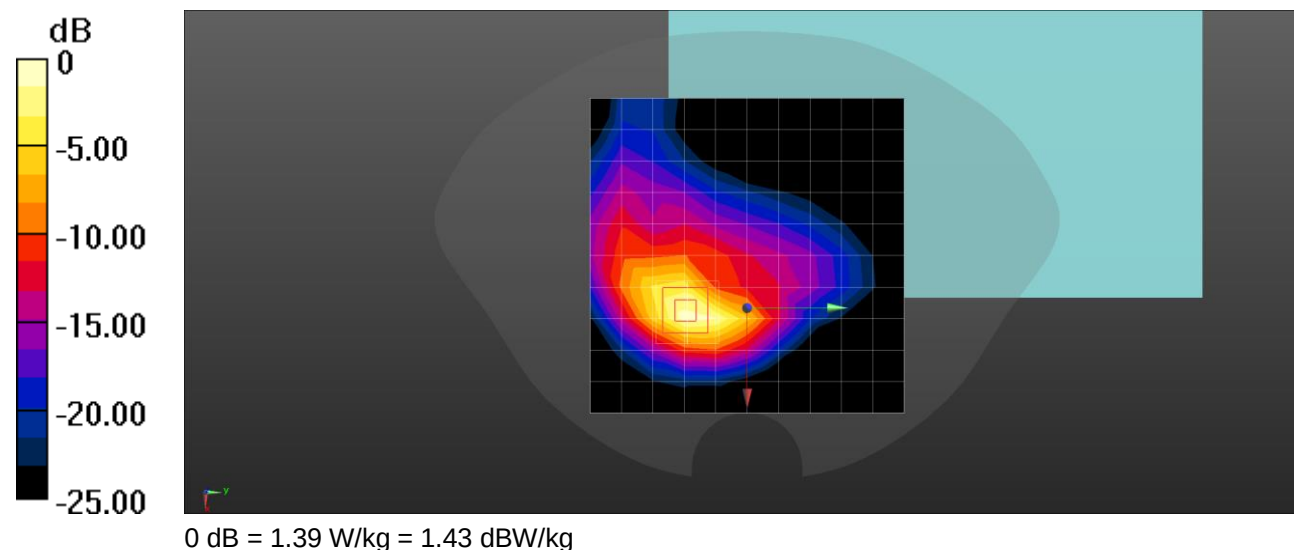
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.419 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 1.75 W/kg

SAR(1 g) = 0.807 W/kg; SAR(10 g) = 0.378 W/kg

Maximum value of SAR (measured) = 1.39 W/kg



Date: 20/01/2024

Test Laboratory: DEKRA Lab

WCDMA V_RMC-12.2K_Back_CH4183_836.6MHz

DUT: TABLET_MT578

Communication System: UID 0, WCDMA (0); Communication System Band: WCDMA V; Duty Cycle: 1:1.0;

Frequency: 836.6 MHz; Medium parameters used: $f = 837$ MHz; $\sigma = 0.903$ S/m; $\epsilon_r = 41.139$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(9.3, 8.98, 8.83) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.72 W/kg

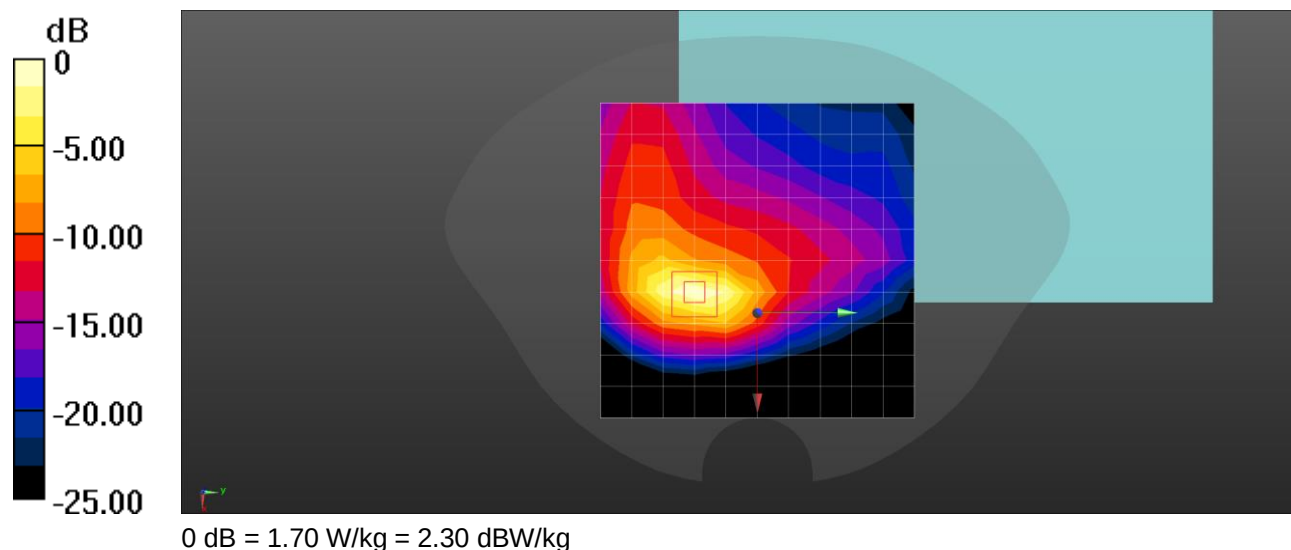
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.86 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 2.20 W/kg

SAR(1 g) = 0.950 W/kg; SAR(10 g) = 0.464 W/kg

Maximum value of SAR (measured) = 1.70 W/kg



Date: 30/01/2024

Test Laboratory: DEKRA Lab

LTE Band25_BW20_QPSK_1RB0Offset_Back_CH26365_1882.5MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE FDD (0); Communication System Band: Band25; Duty Cycle: 1:1.0; Frequency: 1882.5 MHz; Medium parameters used: $f = 1882.5$ MHz; $\sigma = 1.384$ S/m; $\epsilon_r = 39.188$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.39, 8.14, 8.04) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.27 W/kg

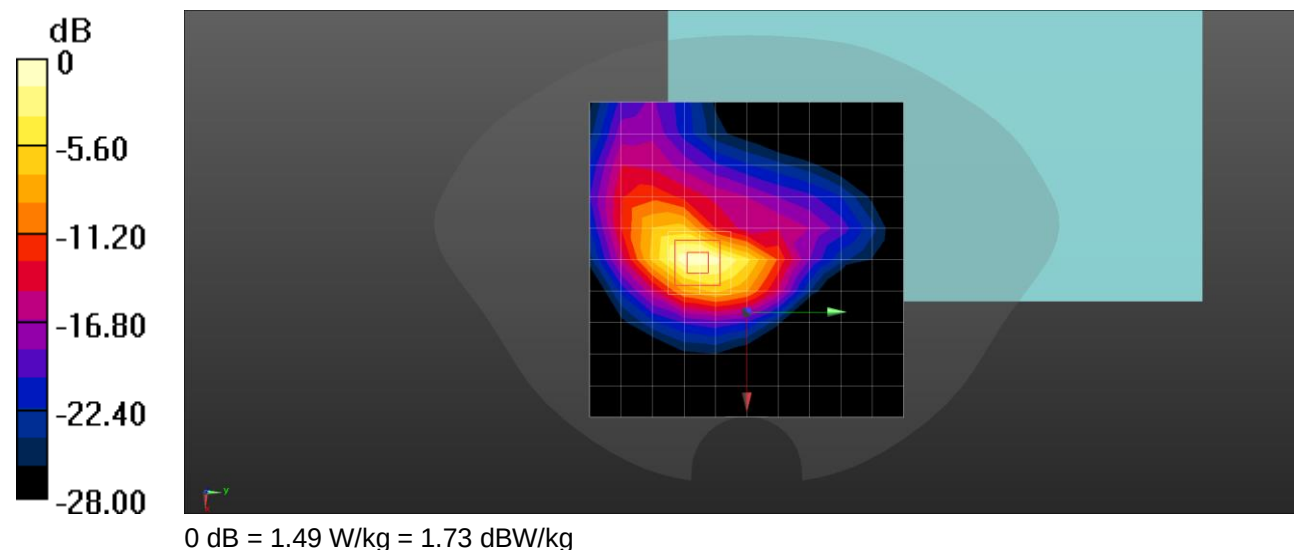
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.38 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.88 W/kg

SAR(1 g) = 0.887 W/kg; SAR(10 g) = 0.411 W/kg

Maximum value of SAR (measured) = 1.49 W/kg



Date: 30/01/2024

Test Laboratory: DEKRA Lab

LTE Band25_BW20_QPSK_1RB0Offset_Left Side_CH26365_1882.5MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE FDD (0); Communication System Band: Band25; Duty Cycle: 1:1.0; Frequency: 1882.5 MHz; Medium parameters used: $f = 1882.5$ MHz; $\sigma = 1.384$ S/m; $\epsilon_r = 39.188$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.39, 8.14, 8.04) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.83 W/kg

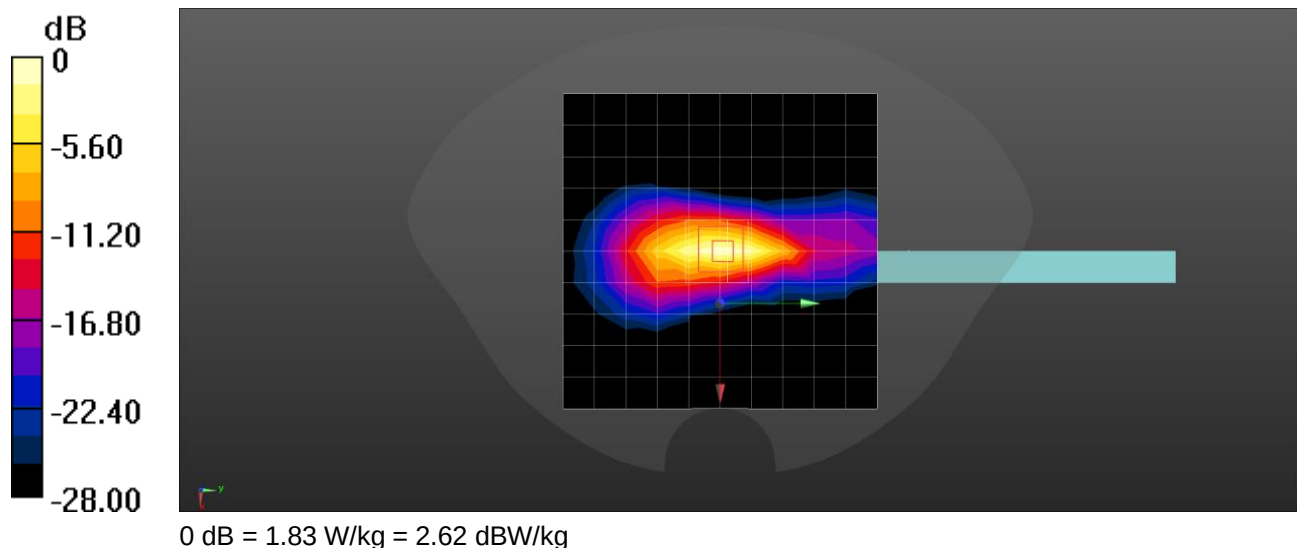
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 29.58 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 2.36 W/kg

SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.441 W/kg

Maximum value of SAR (measured) = 1.83 W/kg



Date: 25/01/2024

Test Laboratory: DEKRA Lab

LTE Band4_BW20_QPSK_1RB0Offset_Back_CH20300_1745MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE FDD (0); Communication System Band: Band4; Duty Cycle: 1:1.0; Frequency: 1745 MHz; Medium parameters used: $f = 1745$ MHz; $\sigma = 1.355$ S/m; $\epsilon_r = 39.075$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(8.46, 8.26, 8.16) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.52 W/kg

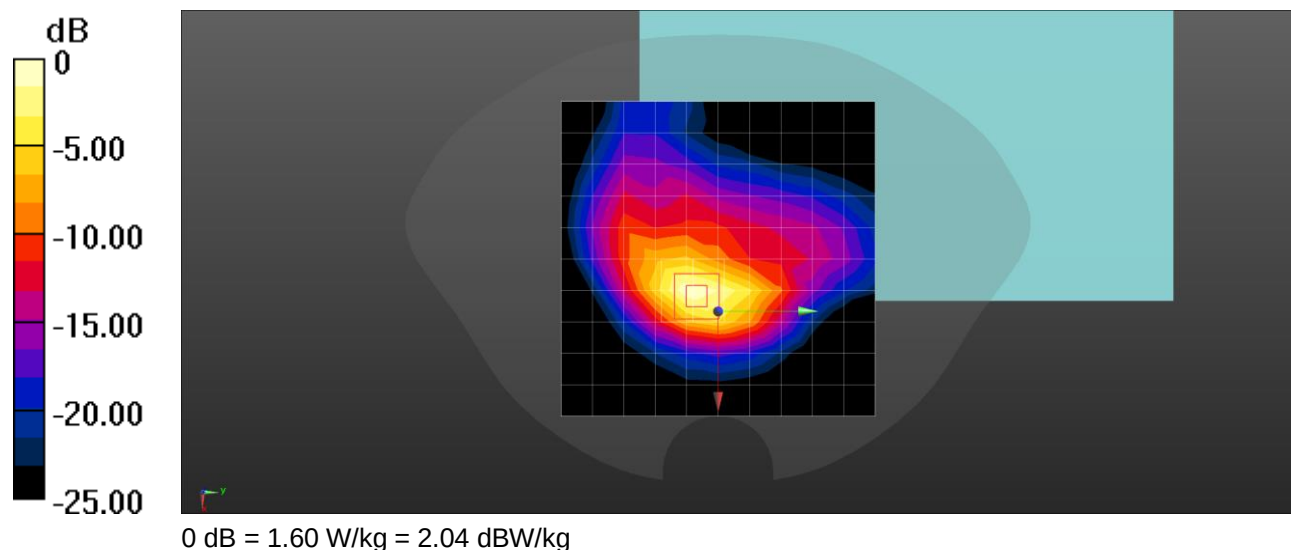
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.97 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 2.06 W/kg

SAR(1 g) = 0.973 W/kg; SAR(10 g) = 0.462 W/kg

Maximum value of SAR (measured) = 1.60 W/kg



Date: 20/01/2024

Test Laboratory: DEKRA Lab

LTE Band26_BW15_QPSK_1RB0Offset_Back_CH26765_821.5MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE FDD (0); Communication System Band: Band26; Duty Cycle: 1:1.0; Frequency: 821.5 MHz; Medium parameters used: $f = 821.5$ MHz; $\sigma = 0.891$ S/m; $\epsilon_r = 41.333$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(9.3, 8.98, 8.83) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.918 W/kg

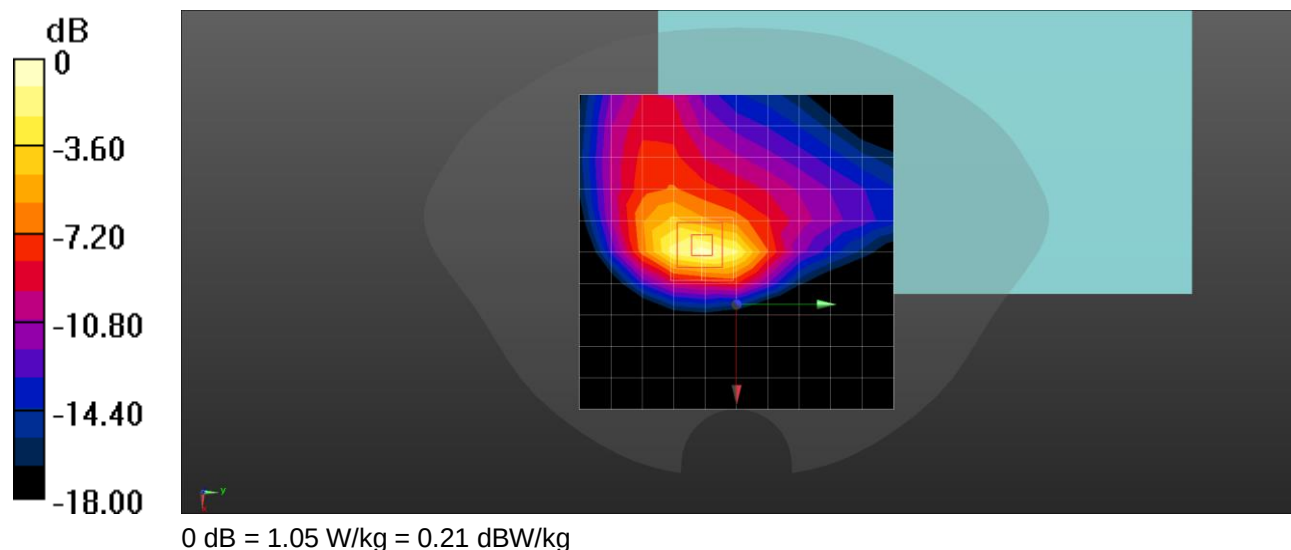
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.51 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 1.42 W/kg

SAR(1 g) = 0.783 W/kg; SAR(10 g) = 0.388 W/kg

Maximum value of SAR (measured) = 1.05 W/kg



Date: 15/01/2024

Test Laboratory: DEKRA Lab

LTE Band12_BW10_QPSK_1RB0Offset_Back_CH23060_704MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE FDD (0); Communication System Band: Band12; Duty Cycle: 1:1.0; Frequency: 704 MHz; Medium parameters used: $f = 704$ MHz; $\sigma = 0.852$ S/m; $\epsilon_r = 42.309$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(9.48, 9.03, 9.03); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.21 W/kg

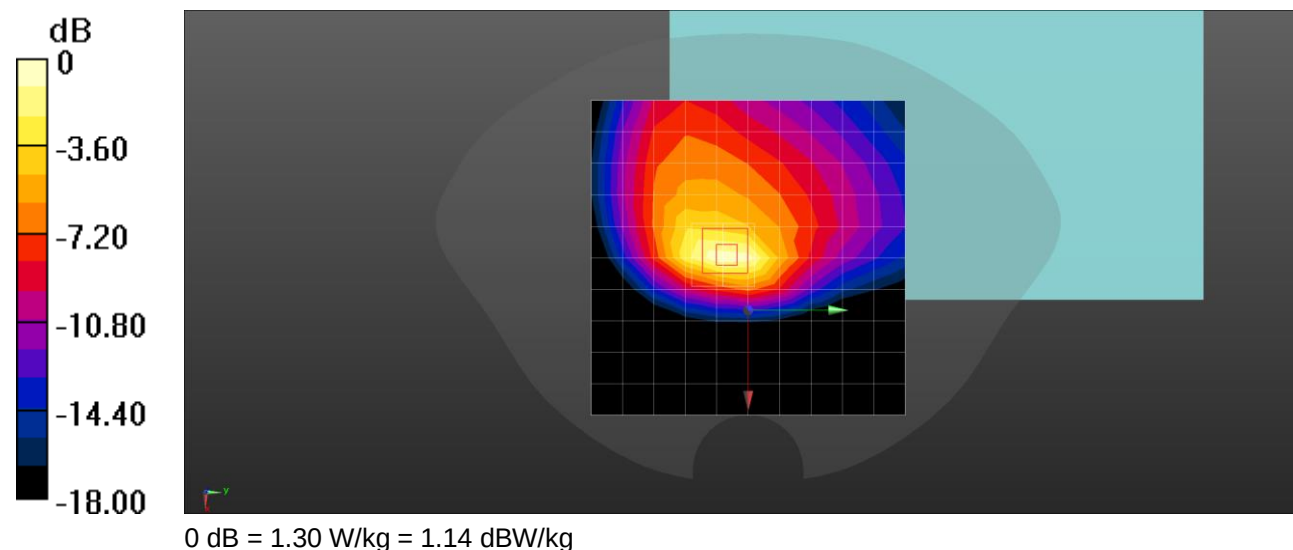
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 29.75 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 0.773 W/kg; SAR(10 g) = 0.419 W/kg

Maximum value of SAR (measured) = 1.30 W/kg



Date: 15/01/2024

Test Laboratory: DEKRA Lab

LTE Band13_BW10_QPSK_1RB0Offset_Back_CH23230_782MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE FDD (0); Communication System Band: Band13; Duty Cycle: 1:1.0; Frequency: 782 MHz; Medium parameters used: $f = 782 \text{ MHz}$; $\sigma = 0.923 \text{ S/m}$; $\epsilon_r = 41.271$; $\rho = 1000 \text{ kg/m}^3$; Phantom section: Flat Section

Ambient temperature ($^{\circ}\text{C}$): 22.5, Liquid temperature ($^{\circ}\text{C}$): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(9.48, 9.03, 9.03) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.990 W/kg

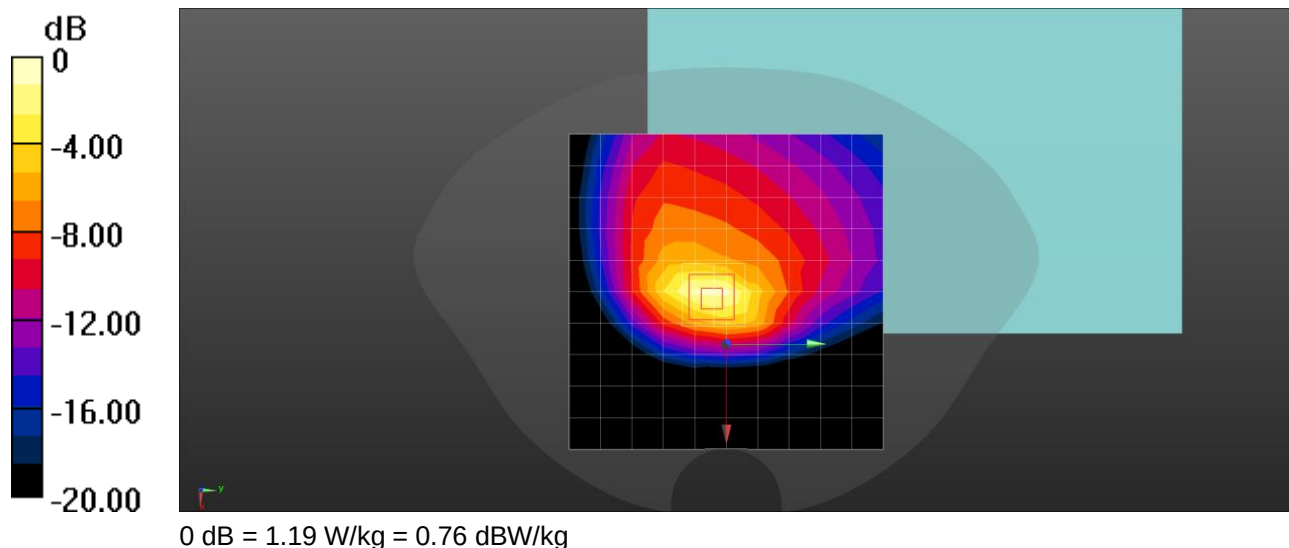
Zoom Scan (7x7x5)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 27.42 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.720 W/kg; SAR(10 g) = 0.366 W/kg

Maximum value of SAR (measured) = 1.19 W/kg



Date: 05/02/2024

Test Laboratory: DEKRA Lab

LTE Band41_BW20_QPSK_1RB0Offset_Back_CH40740_2605MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE TDD (0); Communication System Band: Band 41; Duty Cycle: 1:1.59; Frequency: 2605 MHz; Medium parameters used: $f = 2605$ MHz; $\sigma = 2.04$ S/m; $\epsilon_r = 39.921$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.5, 7.28, 7.2) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 0.693 W/kg

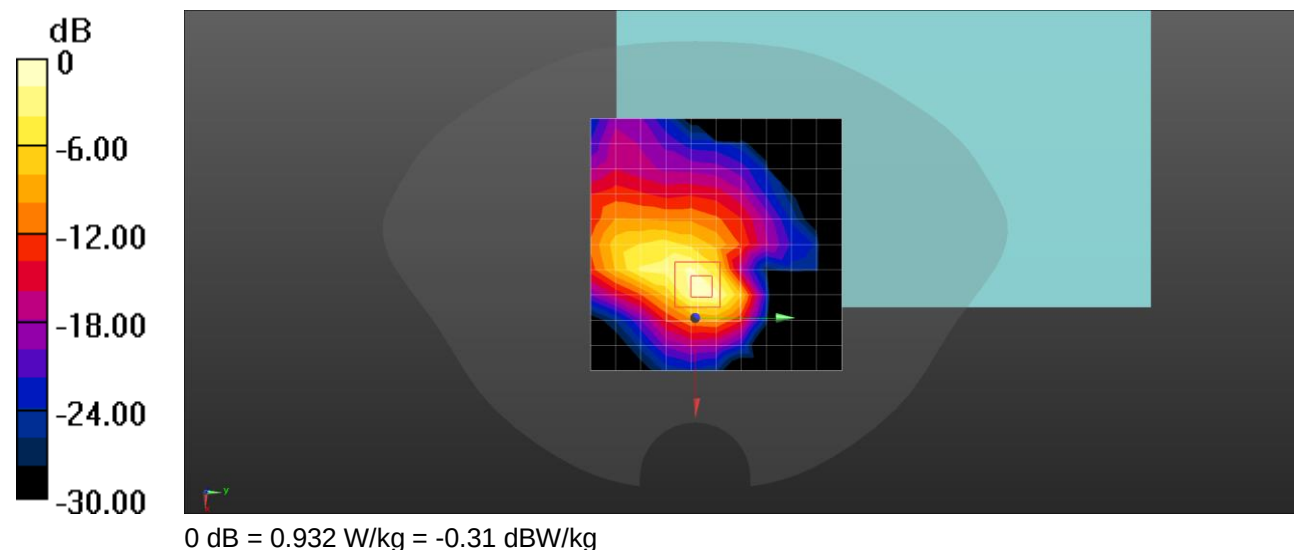
Zoom Scan (8x8x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.12 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.27 W/kg

SAR(1 g) = 0.552 W/kg; SAR(10 g) = 0.231 W/kg

Maximum value of SAR (measured) = 0.932 W/kg



Date: 05/02/2024

Test Laboratory: DEKRA Lab

LTE Band41_BW20_QPSK_1RB0Offset_Left Side_CH40340_2565MHz

DUT: TABLET_MT578

Communication System: UID 0, LTE TDD (0); Communication System Band: Band 41; Duty Cycle: 1:1.59; Frequency: 2565 MHz; Medium parameters used: $f = 2565$ MHz; $\sigma = 1.991$ S/m; $\epsilon_r = 38.084$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.5, 7.28, 7.2); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (7x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 1.28 W/kg

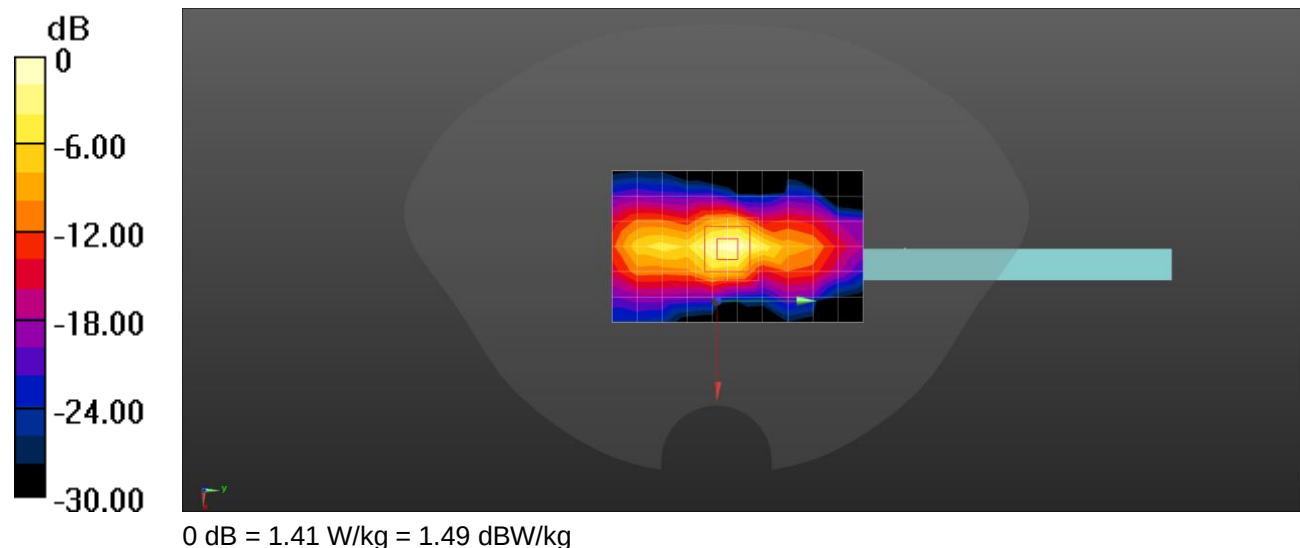
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.74 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.81 W/kg

SAR(1 g) = 0.769 W/kg; SAR(10 g) = 0.306 W/kg

Maximum value of SAR (measured) = 1.41 W/kg



Date: 20/2/2024

Test Laboratory: DEKRA Lab

WLAN2.4GHz_802.11b 1Mbps_Back_CH11_2462MHz_Ant 1

DUT: TABLET_MT578

Communication System: UID 0, WIFI 2.4G (0); Communication System Band: 802.11b(20M); Duty Cycle: 1:1.008;

Frequency: 2462 MHz; Medium parameters used: $f = 2462$ MHz; $\sigma = 1.874$ S/m; $\epsilon_r = 38.504$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.55, 7.31, 7.22) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.992 W/kg

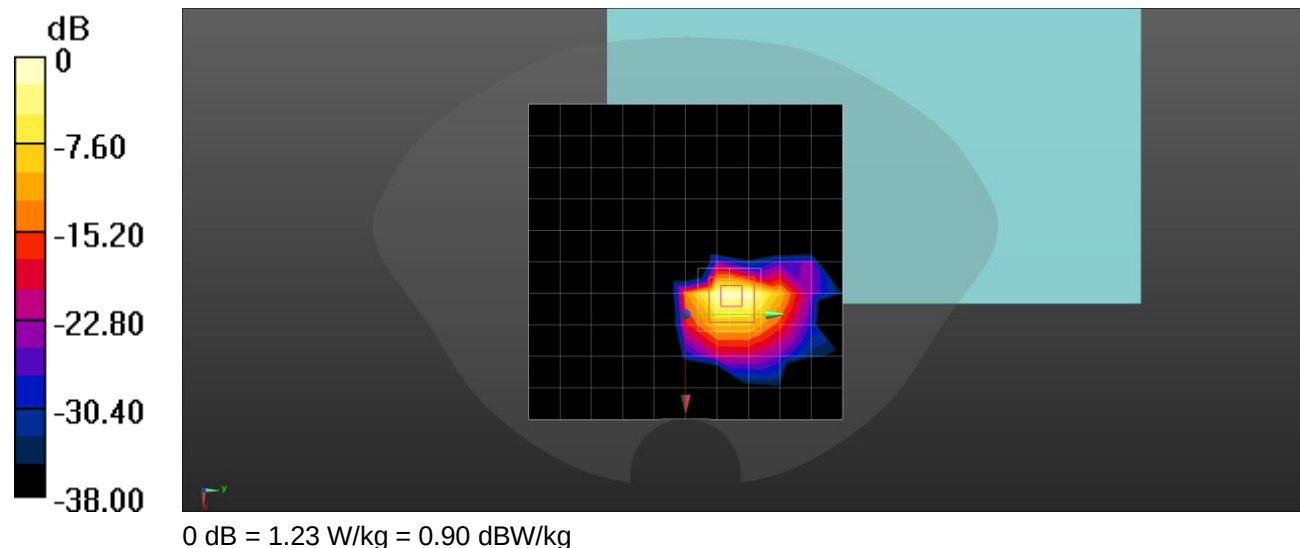
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.2950 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 0.709 W/kg; SAR(10 g) = 0.279 W/kg

Maximum value of SAR (measured) = 1.23 W/kg



Date: 20/2/2024

Test Laboratory: DEKRA Lab

WLAN2.4GHz_802.11b 1Mbps_Left side_CH11_2462MHz_Ant 1

DUT: TABLET_MT578

Communication System: UID 0, WIFI 2.4G (0); Communication System Band: 802.11b(20M); Duty Cycle: 1:1.008;

Frequency: 2462 MHz; Medium parameters used: $f = 2462$ MHz; $\sigma = 1.874$ S/m; $\epsilon_r = 38.504$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.55, 7.31, 7.22) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.78 W/kg

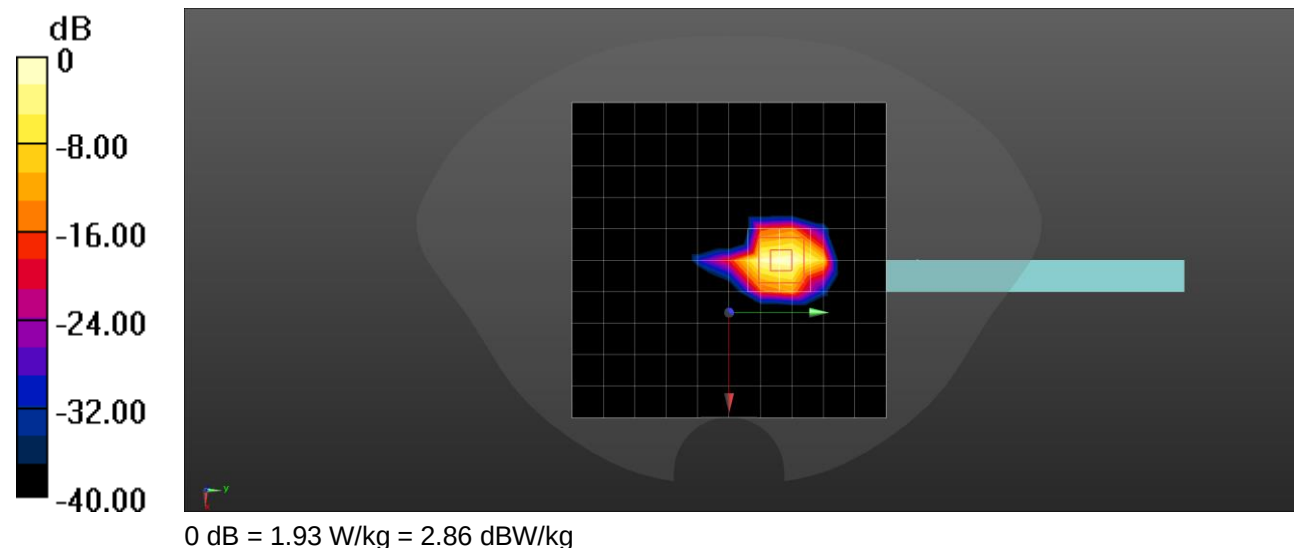
Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.932 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 2.48 W/kg

SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.412 W/kg

Maximum value of SAR (measured) = 1.93 W/kg



Date: 20/02/2024

Test Laboratory: DEKRA Lab

Bluetooth_DH5_1Mbps_Back_CH39_2441MHz

DUT: TABLET_MT578

Communication System: UID 0, Bluetooth (0); Communication System Band: BLE; Duty Cycle: 1:1.29; Frequency: 2480 MHz; Medium parameters used: $f = 2480$ MHz; $\sigma = 1.853$ S/m; $\epsilon_r = 38.576$; $\rho = 1000$ kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.55, 7.31, 7.22); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.172 W/kg

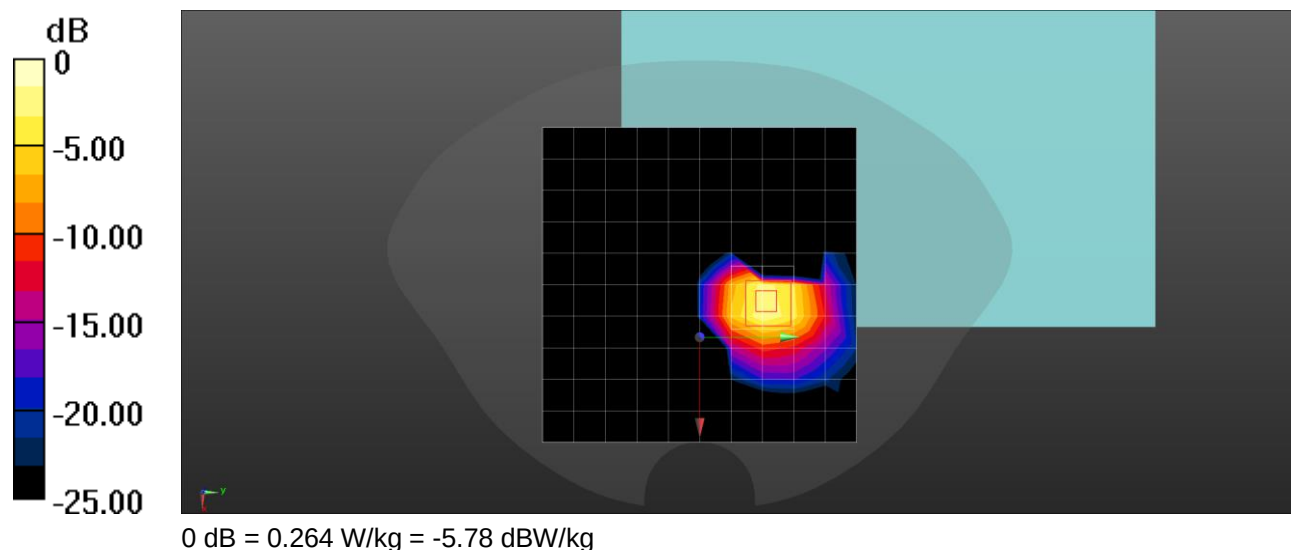
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.8440 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.334 W/kg

SAR(1 g) = 0.163 W/kg; SAR(10 g) = 0.073 W/kg

Maximum value of SAR (measured) = 0.264 W/kg



Date: 25/2/2024

Test Laboratory: DEKRA Lab

WLAN5GHz_802.11a 6Mbps_Left Side_CH64_5320MHz_Ant 1

DUT: TABLET_MT578

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.019;

Frequency: 5320 MHz; Medium parameters used: $f = 5320$ MHz; $\sigma = 4.671$ S/m; $\epsilon_r = 36.279$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.57, 5.5, 5.46) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (9x13x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 2.29 W/kg

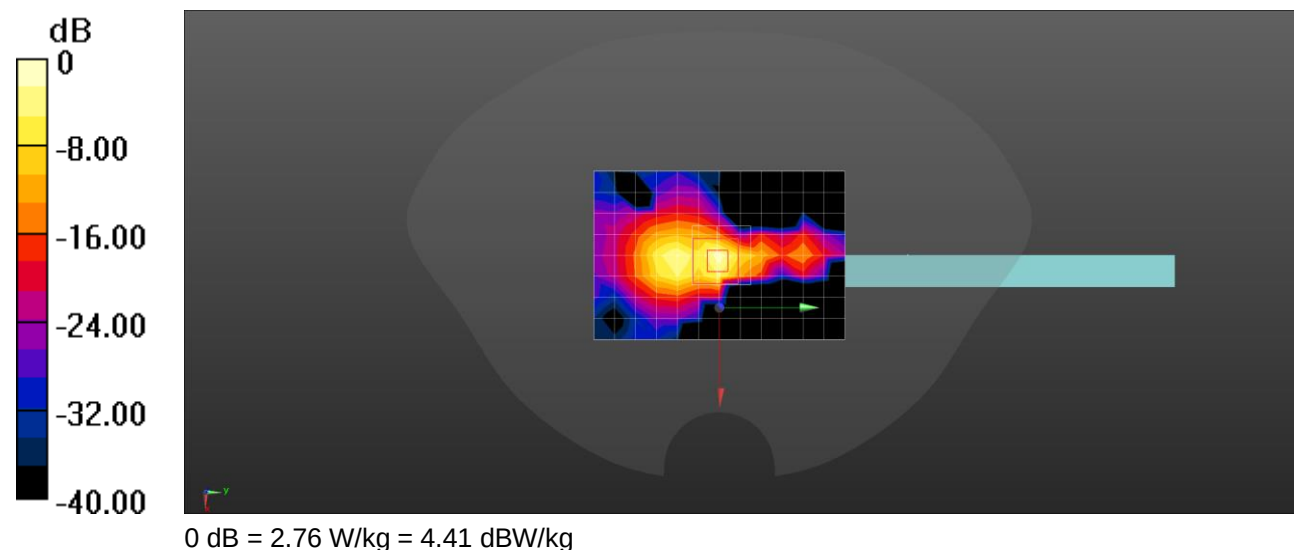
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 15.15 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 4.67 W/kg

SAR(1 g) = 0.964 W/kg; SAR(10 g) = 0.209 W/kg

Maximum value of SAR (measured) = 2.76 W/kg



Date/Time: 25/02/2024

Test Laboratory: DEKRA Lab

WLAN5GHz_802.11a 6Mbps_Right Side_CH52_5260MHz_Ant 2

DUT: TABLET_MT578

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.019;

Frequency: 5260 MHz; Medium parameters used: $f = 5260$ MHz; $\sigma = 4.617$ S/m; $\epsilon_r = 36.368$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.57, 5.5, 5.46); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (9x13x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.13 W/kg

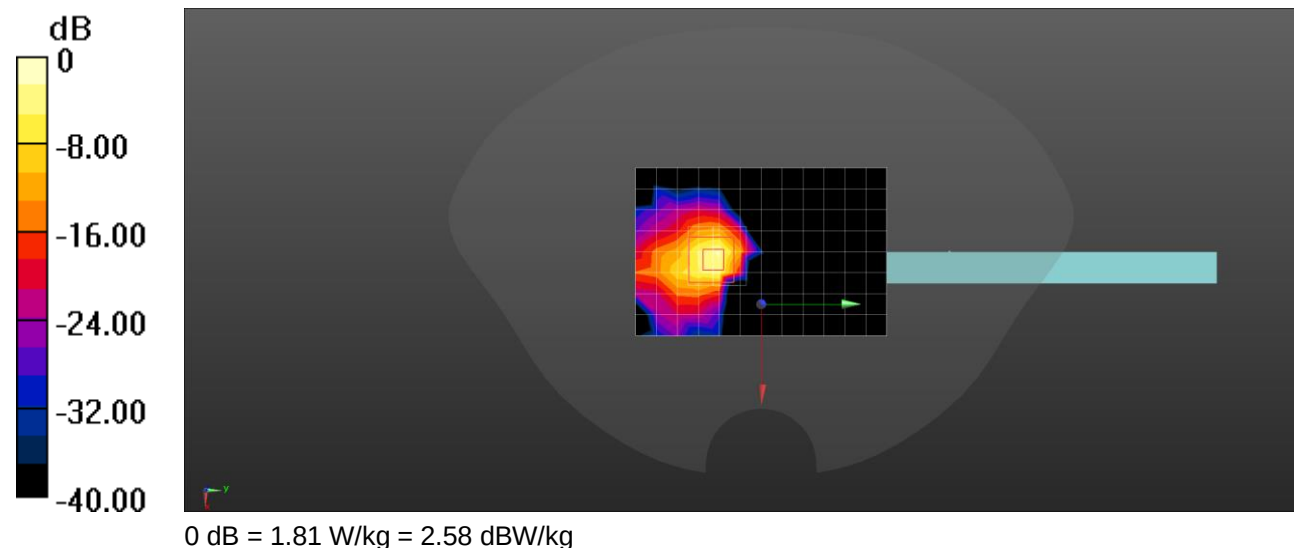
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0.4550 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 3.06 W/kg

SAR(1 g) = 0.639 W/kg; SAR(10 g) = 0.144 W/kg

Maximum value of SAR (measured) = 1.81 W/kg



Date: 03/03/2024

Test Laboratory: DEKRA Lab

WLAN5GHz_802.11a 6Mbps_Left Side_CH116_5580MHz_Ant 1

DUT: TABLET_MT578

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.019;

Frequency: 5580 MHz; Medium parameters used: $f = 5580$ MHz; $\sigma = 4.971$ S/m; $\epsilon_r = 35.869$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.84, 4.73, 4.74); Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (9x13x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 2.02 W/kg

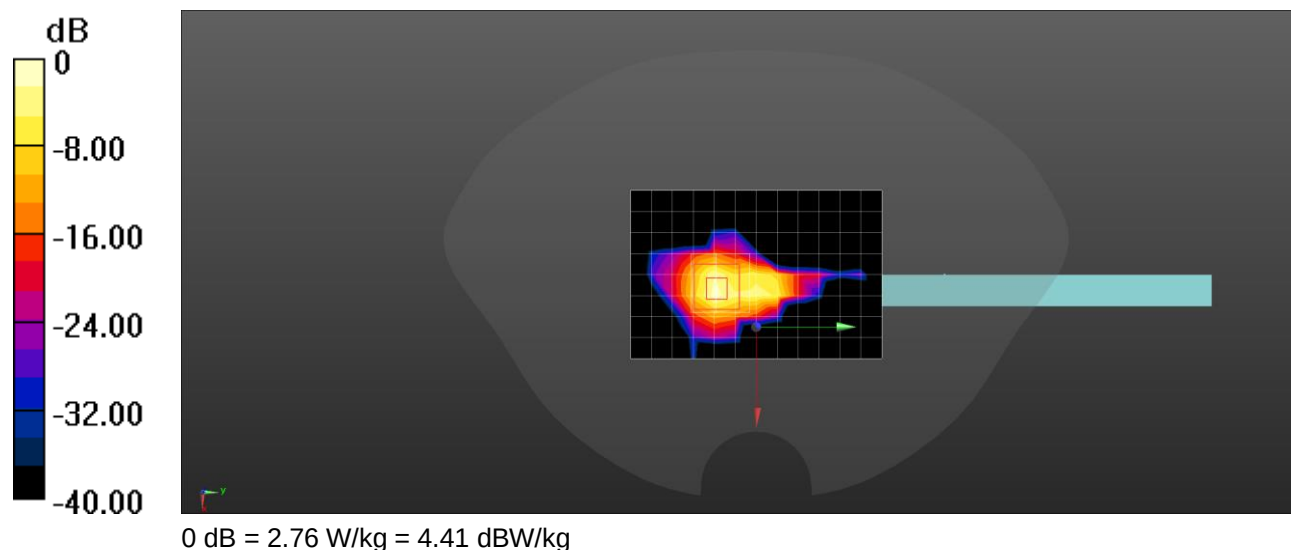
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 7.751 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 4.61 W/kg

SAR(1 g) = 0.973 W/kg; SAR(10 g) = 0.226 W/kg

Maximum value of SAR (measured) = 2.76 W/kg



Date: 03/03/2024

Test Laboratory: DEKRA Lab

WLAN5GHz_802.11a 6Mbps_Right Side_CH116_5580MHz_Ant 2

DUT: TABLET_MT578

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.019;

Frequency: 5580 MHz; Medium parameters used: $f = 5580$ MHz; $\sigma = 4.971$ S/m; $\epsilon_r = 35.869$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.84, 4.73, 4.74) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (9x13x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 2.42 W/kg

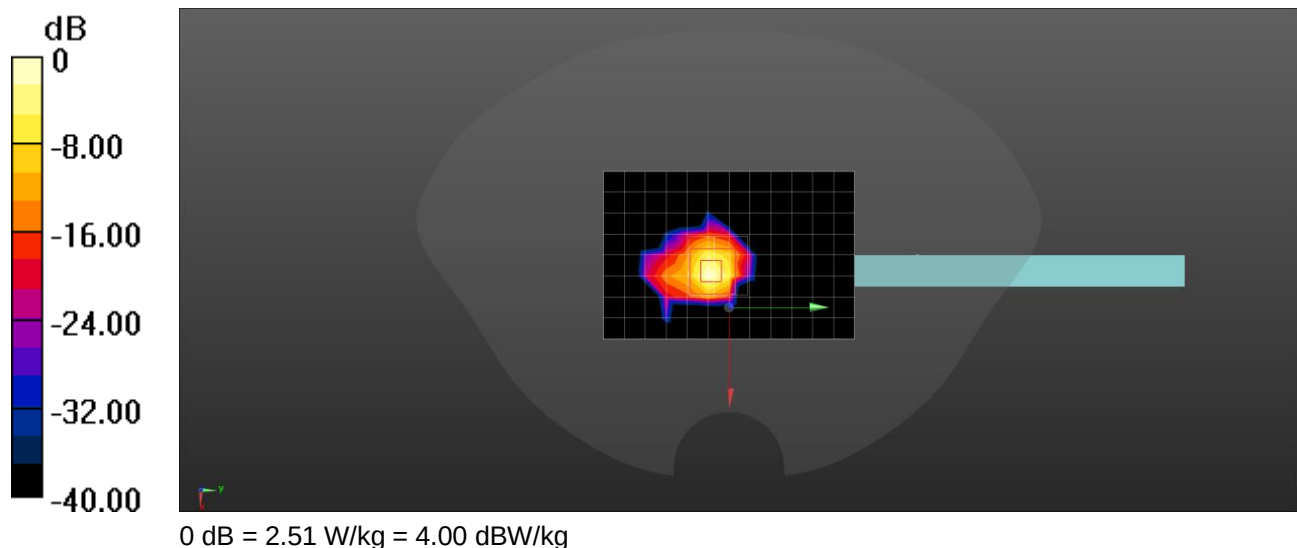
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 5.062 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 4.82 W/kg

SAR(1 g) = 0.971 W/kg; SAR(10 g) = 0.220 W/kg

Maximum value of SAR (measured) = 2.51 W/kg



Date: 15/03/2024

Test Laboratory: DEKRA Lab

WLAN5GHz_802.11a 6Mbps_Left Side_CH165_5825MHz_Ant 1

DUT: TABLET_MT578

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.019;

Frequency: 5825 MHz; Medium parameters used: $f = 5825$ MHz; $\sigma = 5.25$ S/m; $\epsilon_r = 35.438$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.1, 4.88, 4.91) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 2.00 W/kg

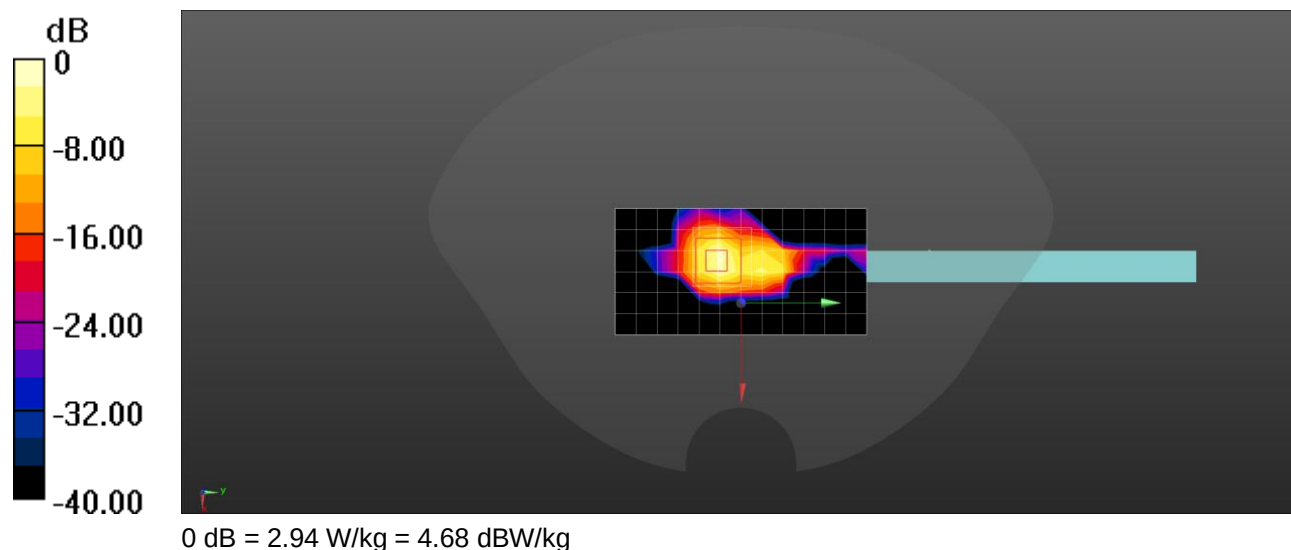
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 4.930 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 5.16 W/kg

SAR(1 g) = 0.991 W/kg; SAR(10 g) = 0.224 W/kg

Maximum value of SAR (measured) = 2.94 W/kg



Date: 15/03/2024

Test Laboratory: DEKRA Lab

WLAN5GHz_802.11a 6Mbps_Right Side_CH157_5785MHz_Ant 2

DUT: TABLET_MT578

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.019;

Frequency: 5785 MHz; Medium parameters used: $f = 5785$ MHz; $\sigma = 5.204$ S/m; $\epsilon_r = 35.531$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 22.5, Liquid temperature (°C): 22.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.1, 4.88, 4.91) ; Calibrated: 13/9/2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (9x13x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 2.23 W/kg

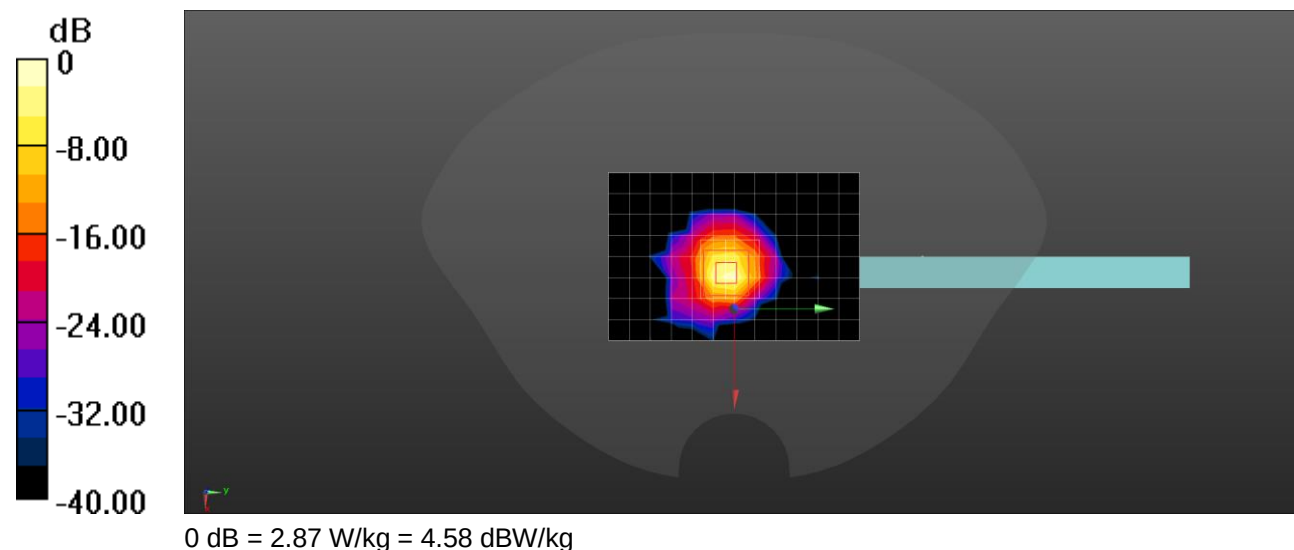
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 7.755 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 5.09 W/kg

SAR(1 g) = 0.974 W/kg; SAR(10 g) = 0.215 W/kg

Maximum value of SAR (measured) = 2.87 W/kg



Note: We evaluated all channels, antennas, and RB, providing data for only the worst channel mode.

Appendix C. Probe Calibration Data

Calibration Laboratory of
Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

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 certificates

Accreditation No.: **SCS 0108**

Client

Dekra
Suzhou

Certificate No.

EX-7761_Sep23**CALIBRATION CERTIFICATE**Object **EX3DV4 - SN:7761**Calibration procedure(s) **QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6,
QA CAL-25.v8
Calibration procedure for dosimetric E-field probes**Calibration date **September 13, 2023**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-Z91	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-22 (OCP-DAK3.5-1249_Oct22)	Oct-23
OCP DAK-12	SN: 1016	20-Oct-22 (OCP-DAK12-1016_Oct22)	Oct-23
Reference 20 dB Attenuator	SN: CC2552 (20x)	30-Mar-23 (No. 217-03809)	Mar-24
DAE4	SN: 660	16-Mar-23 (No. DAE4-660_Mar23)	Mar-24
Reference Probe ES3DV2	SN: 3013	06-Jan-23 (No. ES3-3013_Jan23)	Jan-24

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by	Aidonia Georgiadou	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	
Issued: September 13, 2023			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Calibration Laboratory of

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

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 certificates

Accreditation No.: SCS 0108

Glossary

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,y,z}**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are 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 probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,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.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).

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Parameters of Probe: EX3DV4 - SN:7761**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.62	0.61	0.68	±10.1%
DCP (mV) ^B	107.9	109.9	108.1	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Max Unc ^E k = 2
0	CW	X	0.00	0.00	1.00	0.00	123.8	±1.6%	±4.7%
		Y	0.00	0.00	1.00		131.7		
		Z	0.00	0.00	1.00		128.2		
10352	Pulse Waveform (200Hz, 10%)	X	1.49	60.35	6.07	10.00	60.0	±3.4%	±9.6%
		Y	1.50	60.00	5.95		60.0		
		Z	1.45	60.35	6.39		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	20.00	74.00	9.00	6.99	80.0	±2.7%	±9.6%
		Y	1.02	60.00	5.06		80.0		
		Z	0.81	60.00	5.05		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	0.20	143.63	0.15	3.98	95.0	±3.1%	±9.6%
		Y	0.68	60.00	4.06		95.0		
		Z	0.09	132.31	0.06		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	6.92	159.98	12.10	2.22	120.0	±1.9%	±9.6%
		Y	15.04	148.39	0.01		120.0		
		Z	5.85	159.99	13.73		120.0		
10387	QPSK Waveform, 1 MHz	X	0.50	62.19	10.27	1.00	150.0	±5.0%	±9.6%
		Y	0.42	60.73	9.99		150.0		
		Z	0.52	61.86	10.36		150.0		
10388	QPSK Waveform, 10 MHz	X	1.23	64.29	12.69	0.00	150.0	±1.2%	±9.6%
		Y	1.26	65.10	13.06		150.0		
		Z	1.24	63.98	12.77		150.0		
10396	64-QAM Waveform, 100 kHz	X	1.83	66.04	16.68	3.01	150.0	±0.9%	±9.6%
		Y	1.79	65.41	16.18		150.0		
		Z	1.67	64.09	15.79		150.0		
10399	64-QAM Waveform, 40 MHz	X	2.73	65.63	14.50	0.00	150.0	±3.0%	±9.6%
		Y	2.78	66.19	14.75		150.0		
		Z	2.73	65.32	14.44		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	3.76	65.43	14.84	0.00	150.0	±5.1%	±9.6%
		Y	3.77	65.93	15.00		150.0		
		Z	3.96	65.90	15.17		150.0		

Note: For details on UID parameters see Appendix

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%.

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Linearization parameter uncertainty for maximum specified field strength.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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Parameters of Probe: EX3DV4 - SN:7761**Sensor Model Parameters**

	C1 fF	C2 fF	α V^{-1}	T1 $ms V^{-2}$	T2 $ms V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
x	10.9	78.78	33.07	3.82	0.00	4.93	0.65	0.00	1.01
y	9.8	68.53	31.49	10.46	0.00	4.90	0.73	0.00	1.01
z	11.9	86.75	33.70	3.52	0.00	4.96	0.00	0.10	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	27.6°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3–4 mm for an *Area Scan* job.

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Parameters of Probe: EX3DV4 - SN:7761**Calibration Parameter Determined in Head Tissue Simulating Media**

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
450	43.5	0.87	10.32	10.32	10.32	0.16	1.30	±13.3%
750	41.9	0.89	9.48	9.03	9.03	0.41	1.27	±12.0%
835	41.5	0.90	9.30	8.98	8.83	0.39	1.27	±12.0%
900	41.5	0.97	9.06	8.36	8.53	0.38	1.27	±12.0%
1750	40.1	1.37	8.46	8.26	8.16	0.28	1.27	±12.0%
1900	40.0	1.40	8.39	8.14	8.04	0.30	1.27	±12.0%
2100	39.8	1.49	8.16	7.89	7.80	0.31	1.27	±12.0%
2300	39.5	1.67	8.00	7.77	7.66	0.32	1.27	±12.0%
2450	39.2	1.80	7.55	7.31	7.22	0.31	1.27	±12.0%
2600	39.0	1.96	7.50	7.28	7.20	0.30	1.27	±12.0%
3300	38.2	2.71	7.00	6.80	6.69	0.36	1.27	±14.0%
3500	37.9	2.91	6.99	6.77	6.68	0.35	1.27	±14.0%
3700	37.7	3.12	6.83	6.62	6.53	0.36	1.27	±14.0%
3900	37.5	3.32	6.54	6.36	6.30	0.37	1.27	±14.0%
4100	37.2	3.53	6.42	6.22	6.18	0.37	1.27	±14.0%
4200	37.1	3.63	6.41	6.21	6.16	0.38	1.27	±14.0%
4400	36.9	3.84	6.34	6.13	6.09	0.39	1.27	±14.0%
4600	36.7	4.04	6.26	6.05	6.01	0.40	1.27	±14.0%
4800	36.4	4.25	6.25	6.04	6.00	0.38	1.27	±14.0%
4950	36.3	4.40	6.01	5.76	5.74	0.41	1.36	±14.0%
5250	35.9	4.71	5.57	5.50	5.46	0.37	1.53	±14.0%
5600	35.5	5.07	4.84	4.73	4.74	0.36	1.75	±14.0%
5750	35.4	5.22	5.10	4.88	4.91	0.35	1.84	±14.0%

^C Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

^F The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are 11.1% for 0.7 - 3 GHz and 13.1% for 3 - 6 GHz.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.



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Parameters of Probe: EX3DV4 - SN:7761
Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
6500	34.5	6.07	5.35	5.08	5.06	0.20	2.00	±18.6%

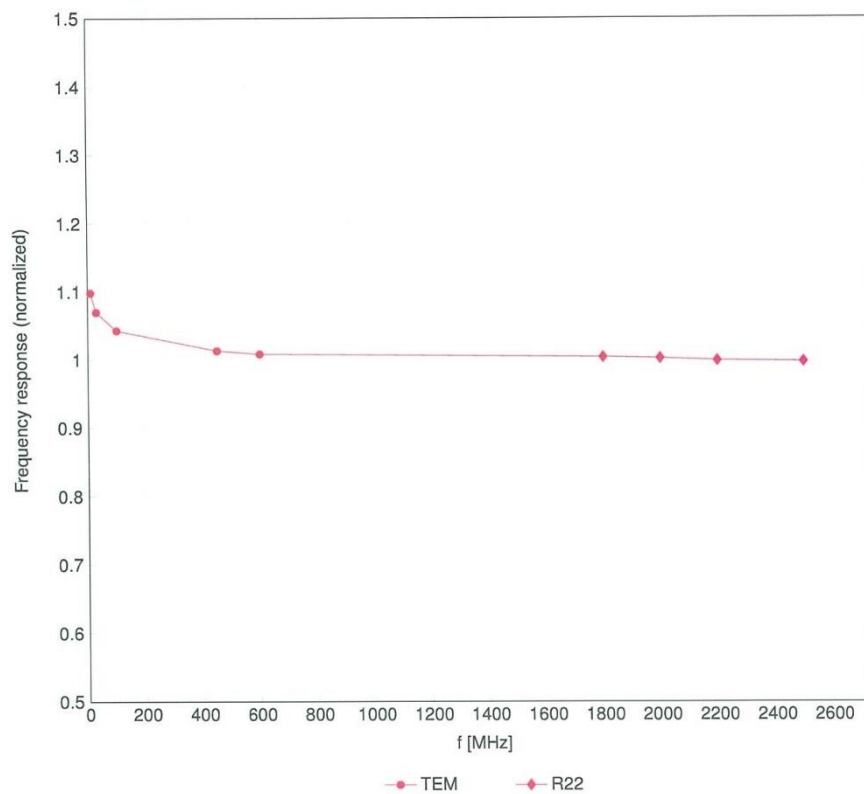
^C Frequency validity at 6.5 GHz is -600/+700 MHz, and ±700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
^F The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±10%.
^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3–6 GHz; and below ±4% for frequencies between 6–10 GHz at any distance larger than half the probe tip diameter from the boundary.

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Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide:R22)

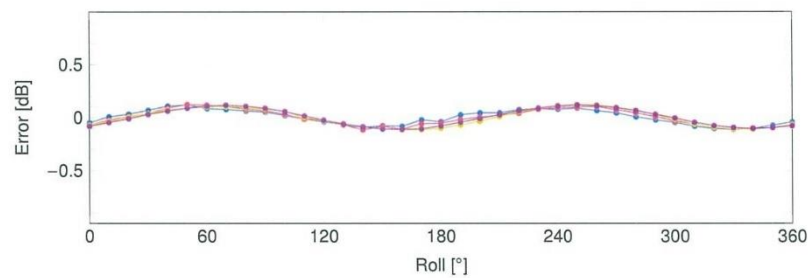
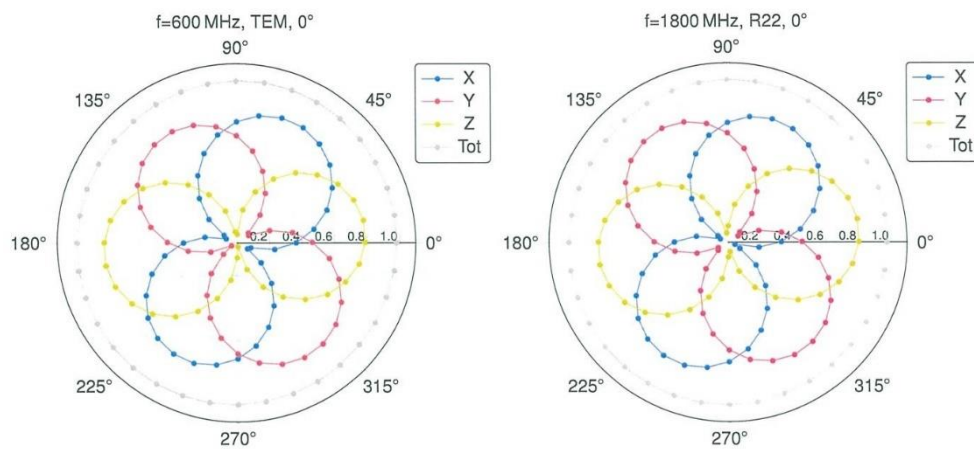


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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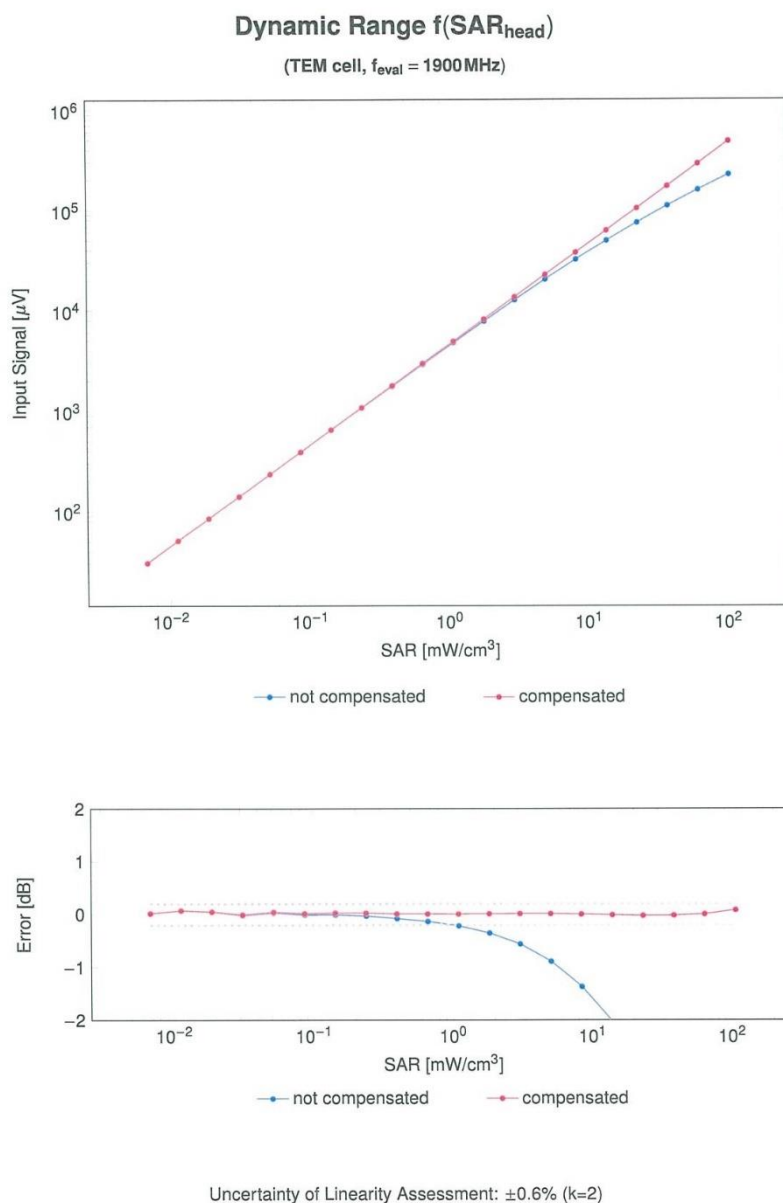
Receiving Pattern (ϕ), $\vartheta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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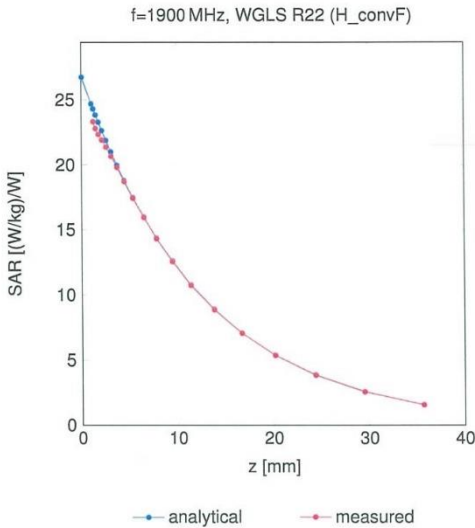
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Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ), f = 900MHz

