RF Exposure report

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

Product Name	NAUTIZ X81
Brand Name	Handheld
Model No.	NX81-RF0-A00
Applicant	Handheld Group AB
	Strandgatan 40, 531 60 Lidköping Sweden
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013
FCC ID	YY3-142481
Date of EUT Receipt	Mar. 16, 2023
Date of Test(s)	Apr. 18, 2023 ~ Apr. 19, 2023
Date of Issue	Jun. 29, 2023

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

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

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Ltd. Central RF Lab or testing done by SGS Taiwan Ltd. Central RF Lab in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Ltd. Central RF Lab in writing.

Signed on behalf of SGS

Clerk / Cindy Chou	PM / Kiki Lin	Approved By / John Yeh
Cindy Chou	Kiki Lin	John Teh

Date: Jun. 29, 2023

Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TESA2303000156EN	00	Initial creation of document	May. 12, 2023	Cindy Chou	*
TESA2303000156EN	01	Modify comment	Jun. 05, 2023	Cindy Chou	*
TESA2303000156EN	02	Modify CO-SAR	Jun. 29, 2023	Cindy Chou	

Note:

1. The mark " * " is the revised version of the report due to comments submitted by the certification.
2. Measurement results in the NFC test report TERF2303000620E2 are fully leveraged in this test report.

Contents

1 GENERAL INFORMATION

1.1 Test Methodology

The SAR testing method and procedure for this device is in accordance with the following standards:
IEEE/ANSI C95.1-1992
IEEE 1528-2013
KDB447498D01v06
KDB865664D01v01r04
KDB865664D02v01r02
KDB941225D07v01r02
KDB248227D01v02r01

1.2 Description of EUT

Product Name	NAUTIZ X81	
Brand Name	Handheld	
Model No.	NX81-RF0-A00	
FCC ID	YY3-142481	
Duty Cycle	WLAN802.11	Please refer to section 6
	Bluetooth	Please refer to section 6
Supported radios (TX Frequency Range, MHz)	802.11 b/g/n	2.4GHz (2400.0 – 2483.5 MHz)
	802.11a/n/ac	5.2GHz (5150.0 –5350.0 MHz) 5.8GHz (5725.0 – 5850.0 MHz)
	Bluetooth 5.2	2.4GHz (2400.0 – 2483.5 MHz)

1.3 Maximum value

Summary of Maximum SAR	
Mode	Highest SAR 1g Body (W/kg)
Bluetooth(GFSK)	0.08
2.4G WLAN	0.66
5G WLAN	0.64

2 MEASUREMENT SYSTEM

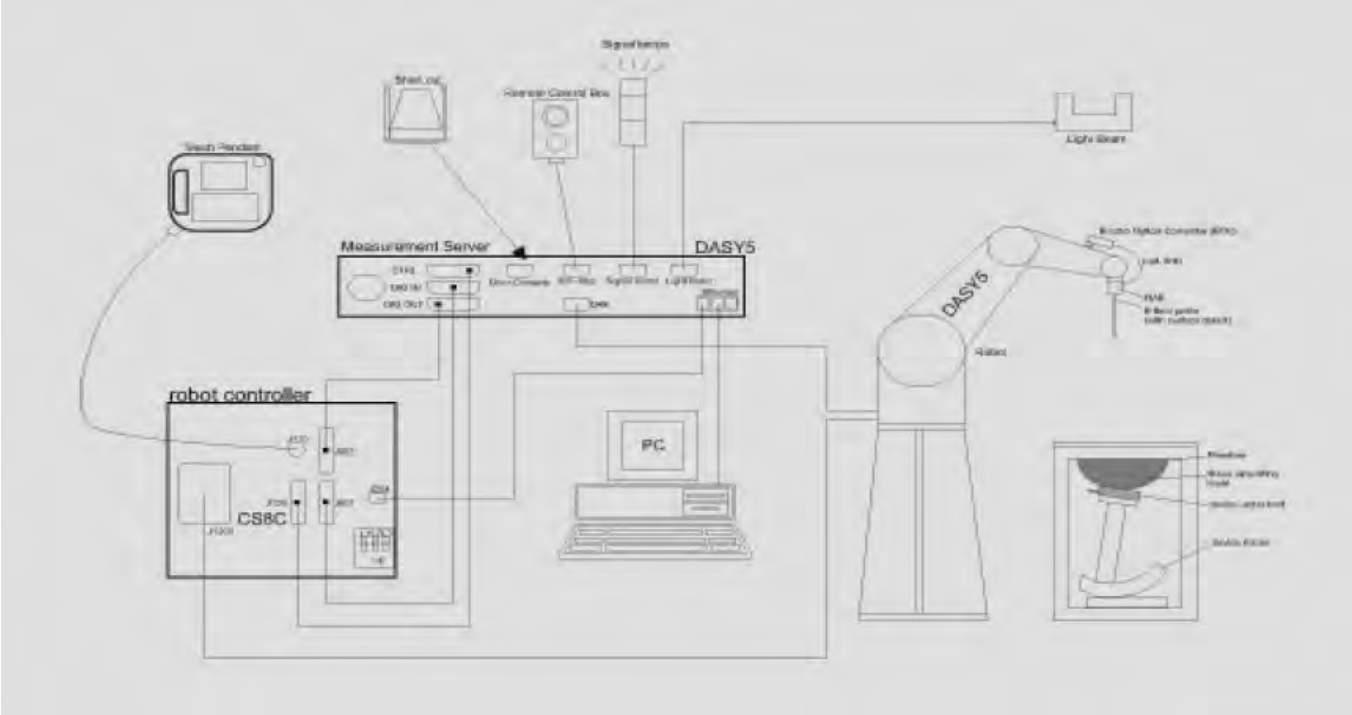
2.1 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	**1F, No. 8, Alley 15, Lane 120, Sec. 1, NeiHu Road, Neihu District, Taipei City, 11493, Taiwan.**	SAR 2	TW0029	TW3702
		SAR 6		
	No. 2, Keji 1st Rd., Guishan Township, Taoyuan County, 33383, Taiwan	SAR 1	TW0028	
		SAR 4		
	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan	SAR 3	TW0027	
		SAR 7		
Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.				

2.2 SAR System

Block Diagram (DASY5)

A block diagram of the SAR measurement System is given in below. This SAR measurement system uses a computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). The model EX3DV4 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ ($|Ei|^2$)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.



EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 2450/5250/5750 MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 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 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Tip diameter: 2.5 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

PHANTOM (SAM)

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

DEVICE HOLDER (SAM)

Construction	In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Device Holder

3 SAR SYSTEM VERIFICATION

3.1 Tissue Simulating Liquid

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with homogeneous tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.

3.2 Tissue Simulant Liquid measurement

The dielectric properties for this Head-simulant fluid were measured by using the SPEAG Dielectric Assessment Kit (DAKS-3.5)
All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The measured conductivity and permittivity are all within ± 5% of the target values.

3.3 Measurement results of Tissue Simulant Liquid

Measured Frequency (MHz)	Liquid Temp. (°C)	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	% dev εr	% dev σ	Limit	Measurement Date
2402	22.1	39.282	1.757	38.590	1.745	-1.76%	-0.71%	± 5%	Apr. 18, 2023
2412	22.1	39.265	1.766	38.556	1.754	-1.81%	-0.70%	± 5%	Apr. 18, 2023
2437	22.1	39.222	1.788	38.522	1.773	-1.79%	-0.87%	± 5%	Apr. 18, 2023
2441	22.1	39.215	1.792	38.516	1.776	-1.78%	-0.89%	± 5%	Apr. 18, 2023
2450	22.1	39.200	1.800	38.511	1.783	-1.76%	-0.94%	± 5%	Apr. 18, 2023
2462	22.1	39.184	1.813	38.492	1.793	-1.77%	-1.09%	± 5%	Apr. 18, 2023
2480	22.1	39.160	1.832	38.474	1.807	-1.75%	-1.36%	± 5%	Apr. 18, 2023
5190	21.9	36.010	4.650	36.308	4.574	0.83%	-1.62%	± 5%	Apr. 19, 2023
5230	21.9	35.970	4.690	36.174	4.628	0.57%	-1.32%	± 5%	Apr. 19, 2023
5250	21.9	35.950	4.710	36.131	4.667	0.50%	-0.91%	± 5%	Apr. 19, 2023
5750	22.1	35.350	5.220	35.136	5.320	-0.61%	1.92%	± 5%	Apr. 19, 2023
5775	22.1	35.325	5.245	35.113	5.353	-0.60%	2.06%	± 5%	Apr. 19, 2023

3.4 The composition of the tissue simulating liquid:

Simulating Liquids for 600 MHz -10 GHz, Manufactured by SPEAG:

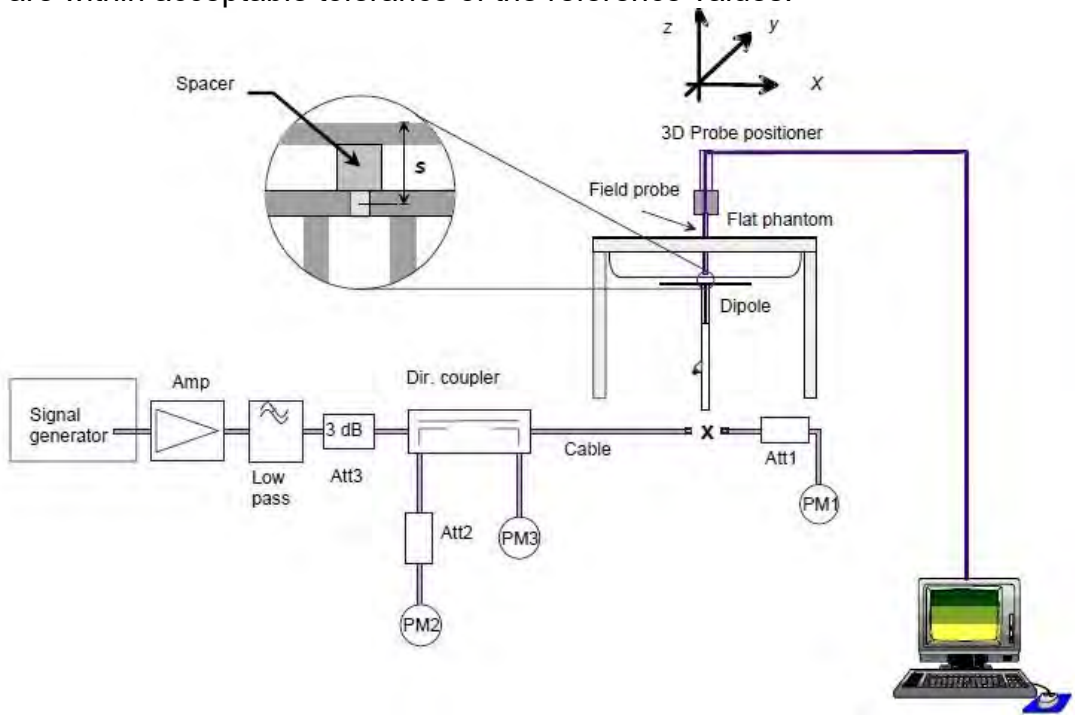
Broad-band head tissue simulating liquids	SPEAG Product	Frequency range (MHz)	Main Ingredients
	HBBL600-10000V6	600 - 10000	Water, Oil

3.5 System check

The microwave circuit arrangement for system check is sketched in below. The daily system accuracy verification occurs within the flat section of the SAM phantom and ELI phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values.

The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed with SAR values normalized to 1W forward power delivered to the dipole.

During the tests, the liquid depth from the center of the flat phantom to the liquid top surface was 15 cm above in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



The block diagram of system check

3.6 System check results

Validation Kit	S/N	Frequency (MHz)	1W Target 1g-SAR (W/kg)	pin=250mW Measured 1g-SAR (W/kg)	Normalized to 1W 1g-SAR (W/kg)	Deviation (%)	Limit	Measurement Date
D2450V2	727	2450	52.8	13	52	-1.52	± 10%	Apr.18,2023
Validation Kit	S/N	Frequency (MHz)	1W Target 1g-SAR (W/kg)	pin=100mW Measured 1g-SAR (W/kg)	Normalized to 1W 1g-SAR (W/kg)	Deviation (%)	Limit	Measurement Date
D5GHzV2	1023	5250	80.5	8.09	80.9	0.50	± 10%	Apr.19,2023
D5GHzV2	1023	5750	80.4	8.26	82.6	2.74	± 10%	Apr.19,2023

4 TEST CONFIGURATIONS

4.1 Test Environment

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

4.2 Test Note

- **General:** Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s).
- **General:** The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
- **General:** During the SAR testing, the DASY system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
- **General:** According to KDB447498D01v06, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is ≤ 0.8 W/kg, when the transmission band is ≤ 100 MHz.
- **General:** According to KDB865664D01v01r04, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is ≥ 0.8 W/kg, repeated that measurement once. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
- **WLAN 2.4GHz:** 802.11b DSSS SAR Test Requirements: SAR is measured for 2.4 GHz 802.11b DSSS mode using the highest measured maximum output power channel, when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.
- **WLAN 2.4GHz:** 802.11g/n OFDM SAR Test Exclusion Requirements: SAR is not required for 802.11g/n since the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
- **WLAN 5GHz:** Initial Test Configuration: An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. Since the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial

test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for subsequent test configuration.

- **WLAN 5GHz:** Based on FCC guidance, general principles of KDB248227D01 can be applied to 802.11ax to determine initial test configuration with 802.11ax being considered as the highest 802.11 mode for the appropriate frequency band.

- **Test exclusion for NFC:** Based on KDB447498D01v06 4.3.1 c), SAR test exclusion threshold for NFC (13.56MHz) shall be evaluated as below,

a)For test separation distances ≤ 50 mm, the power threshold determined by the equation in 4.3.1 c) 1) for 50 mm and 100 MHz is multiplied by ½
b)The power threshold at 50mm/100 MHz in 4.3.1 b) is multiplied by [1 + log(100/f(MHz))] where f is 13.56MHz
c)The power threshold in 4.3.1 b) is [Power allowed at numeric threshold for 50 mm in 4.3.1 a)] + [(test separation distance – 50 mm)·(f(MHz)/150)] mW, for 100 MHz to 1500 MHz where test separation distance is 50mm, frequency is 100MHz.
d)Power allowed at numeric threshold for 50 mm in 4.3.1 a) is [3/√f(GHz)]·(test separation distance)
Hence, SAR test exclusion threshold is calculated in reverse sequence:
d) : [3/√0.1]·50 = 474.3416mW
c) : 474.3416 + (50-50)·(100/150) = 474.3416mW
b) : 474.3416·[1+log(100/13.56)] = 885.9470mW
a) : 885.9470 · 0.5 = 442.974mW
So the SAR test exclusion power threshold for NFC(13.56MHz) is 442.974mW(equal to 26.464dBm).
Also, the maximum power of NFC is -71.47dBm (converted from 23.76 dBuV/m at 3m) and it is far below the exclusion threshold (26.464dBm), so SAR test for NFC can be excluded.

- **Estimated SAR for NFC:** Based on KDB447498D01v06 4.3.2 b), when an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

1) [(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg, for test separation distances ≤ 50 mm, where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.
Using the most conservative test separation distance 5mm, so the estimated 1g-SAR for NFC would be 0.000000000221 W/Kg.
[0.0000000713/5]·[√0.01356/7.5] = 0.000000000221 W/Kg

4.3 Test position

Body SAR_5mm

Based on KDB 941225 D07v01r02, the device is belong to UMPC mini-tablet device and SAR is tested for 1-g SAR on all surfaces and side edges with a transmitting antenna located at ≤ 25 mm from that surface or edge, at 5 mm separation from a flat phantom, to determine SAR compliance.

4.4 Test limit

§ 2.1093(d)(1)

Applications for equipment authorization of portable RF sources subject to routine environmental evaluation must contain a statement confirming compliance with the limits specified in § 1.1310 as part of their application. Technical information showing the basis for this statement must be submitted to the Commission upon request. The SAR limits specified in § 1.1310(a) through (c) of this chapter shall be used for evaluation of portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz shall be evaluated in terms of the MPE limits specified in Table 1 to § 1.1310(e)(1). A minimum separation distance applicable to the operating configurations and exposure conditions of the device shall be used for the evaluation. In general, maximum time-averaged power levels must be used for evaluation. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

Radiofrequency radiation exposure limits.

§ 1.1310(a)

Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) within the frequency range of 100 kHz to 6 GHz (inclusive).

§ 1.1310(b)

The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

§ 1.1310(c)

The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

Note to paragraphs (a) through (c):

SAR is a measure of the rate of energy absorption due to exposure to RF electromagnetic energy. These SAR limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized SAR in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE Std C95.1-1992, copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5, copyright 1986 by NCRP, Bethesda, Maryland 20814. Limits for whole body SAR and peak spatial-average SAR are based on recommendations made in both of these documents. The MPE

limits in Table 1 are based generally on criteria published by the NCRP in “Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields,” NCRP Report No. 86, Sections 17.4.1, 17.4.1.1, 17.4.2 and 17.4.3, copyright 1986 by NCRP, Bethesda, Maryland 20814. In the frequency range from 100 MHz to 1500 MHz, these MPE exposure limits for field strength and power density are also generally based on criteria recommended by the ANSI in Section 4.1 of “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” ANSI/IEEE Std C95.1-1992, copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

Portable devices that transmit at frequencies above 6 GHz shall be evaluated in terms of the MPE limits specified in Table 1 to § 1.1310(e)(1).
According to ANSI/IEEE C95.1-1992, the criteria listed in the following Table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.
Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm2 per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*($900/f^2$)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*($180/f^2$)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.
Table 1 to § 1.1310(e)(1) - Limits for Maximum Permissible Exposure (MPE)

5 MAXIMUM OUTPUT POWER

5.1 WLAN

Ant 1							
Band	Mode	Channel	Frequency (MHz)	Data Rate	Set	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
2.45GHz	802.11b	1	2412	1Mbps	20.500	20.50	19.96
		6	2437		20.500	20.50	20.03
		11	2462		20.500	20.50	19.97
	802.11g	1	2412	6Mbps	15.000	15.50	14.64
		6	2437		16.000	15.50	15.46
		11	2462		16.000	15.50	15.37
	802.11n20-HT0	1	2412	MCS0	14.500	15.50	13.93
		6	2437		16.000	15.50	15.38
		11	2462		16.000	15.50	15.27
	802.11ac20-VHT0	1	2412	MCS0	14.500	15.50	13.88
		6	2437		16.000	15.50	15.32
		11	2462		16.000	15.50	15.25
	802.11n40-HT0	3	2422	MCS0	12.000	12.00	11.83
		6	2437		16.000	16.00	15.67
		9	2452		15.000	15.00	14.75
	802.11ac40-VHT0	3	2422	MCS0	12.000	12.00	11.79
		6	2437		16.000	16.00	15.49
		9	2452		15.000	15.00	14.73

Ant 1							
Band	Mode	Channel	Frequency (MHz)	Data Rate	Set	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.15-5.25 GHz	802.11a	36	5180	6Mbps	20.000	19.00	18.52
		40	5200		20.000	19.00	18.42
		44	5220		20.000	19.00	18.50
		48	5240		20.000	19.00	18.48
	802.11n20-HT0	36	5180	MCS0	20.000	19.00	18.29
		40	5200		20.000	19.00	18.31
		44	5220		20.000	19.00	18.35
		48	5240		20.000	19.00	18.43
	802.11ac20-VHT0	36	5180	MCS0	20.000	19.00	18.27
		40	5200		20.000	19.00	18.29
		44	5220		20.000	19.00	18.35
		48	5240		20.000	19.00	18.42
	802.11n40-HT0	38	5190	MCS0	17.500	16.00	15.90
		46	5230		20.000	19.00	18.27
	802.11ac40-VHT0	38	5190	MCS0	17.500	16.00	15.87
		46	5230		20.000	19.00	18.21
	802.11ac80-VHT0	42	5210	MCS0	15.500	15.00	14.44

Ant 1							
Mode	Mode	Channel	Frequency (MHz)	Data Rate	Set	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.8GHz	802.11a	149	5745	6Mbps	20.000	19.00	18.38
		157	5785		20.000	19.00	18.27
		165	5825		20.000	19.00	18.34
	802.11n20-HT0	149	5745	MCS0	20.000	19.00	18.28
		157	5785		20.000	19.00	18.23
		165	5825		20.000	19.00	18.24
	802.11ac20-VHT0	149	5745	MCS0	20.000	19.00	18.22
		157	5785		20.000	19.00	18.16
		165	5825		20.000	19.00	18.19
	802.11n40-HT0	151	5755	MCS0	20.000	19.00	18.10
		159	5795		20.000	19.00	18.15
	802.11ac40-VHT0	151	5755	MCS0	20.000	19.00	18.06
		159	5795		20.000	19.00	18.09
	802.11ac80-VHT0	155	5775	MCS0	20.000	19.50	19.20

5.2 Bluetooth

Mode	Channel	Frequency (MHz)	1Mbps		2Mbps		3Mbps	
			Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
BR/EDR	CH 00	2402	7.50	6.41	4.50	3.61	4.50	3.66
	CH 39	2441		6.84		4.13		4.21
	CH 78	2480		7.02		4.27		4.34

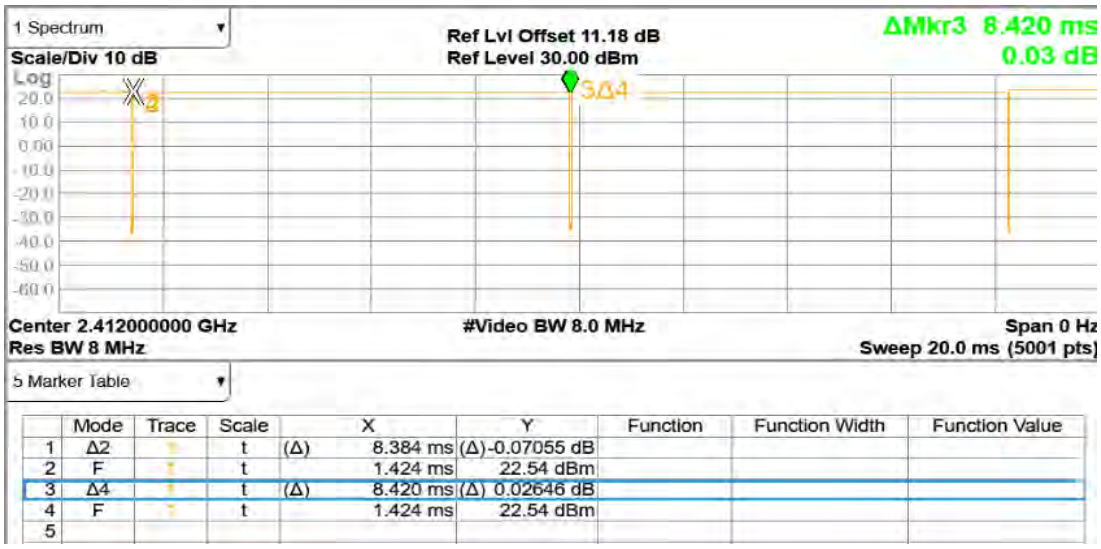
5.3 BLE

Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg.Power + Max. Tolerance (dBm)	Average Output Power (dBm)
BLE_1M	CH 00	2402	0	-1.30
	CH 19	2440		-0.89
	CH 39	2480		-0.73

Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg.Power + Max. Tolerance (dBm)	Average Output Power (dBm)
BLE_2M	CH 00	2402	0	-1.11
	CH 19	2440		-0.98
	CH 39	2480		-0.62

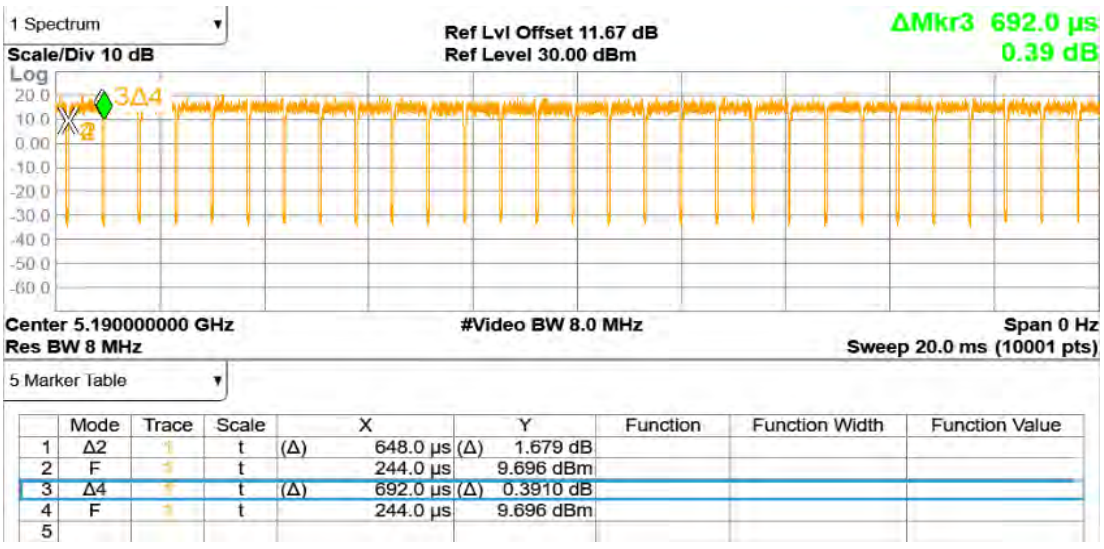
6 DUTY CYCLE

2.4G b duty	(8.384/8.42=0.996) Scaling Factor=1.005



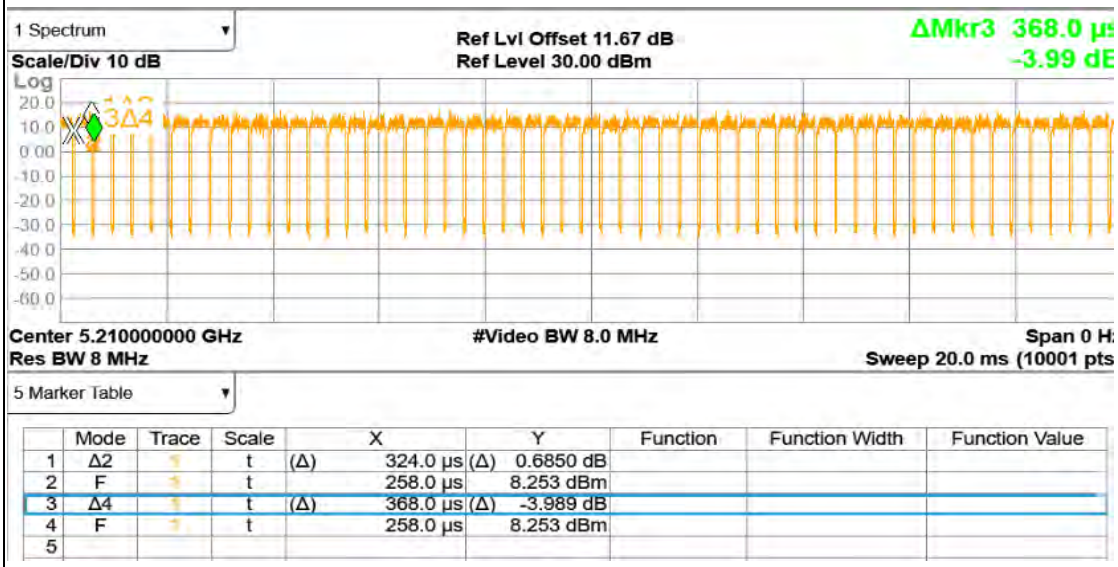
	Mode	Trace	Scale		X	Y	Function	Function Width	Function Value
1	Δ2	1	t	(Δ)	8.384 ms	(Δ)-0.07055 dB			
2	F	1	t		1.424 ms	22.54 dBm			
3	Δ4	1	t	(Δ)	8.420 ms	(Δ) 0.02646 dB			
4	F	1	t		1.424 ms	22.54 dBm			
5									

5G n(40M) duty	(0.648/0.692=0.936) Scaling Factor=1.068



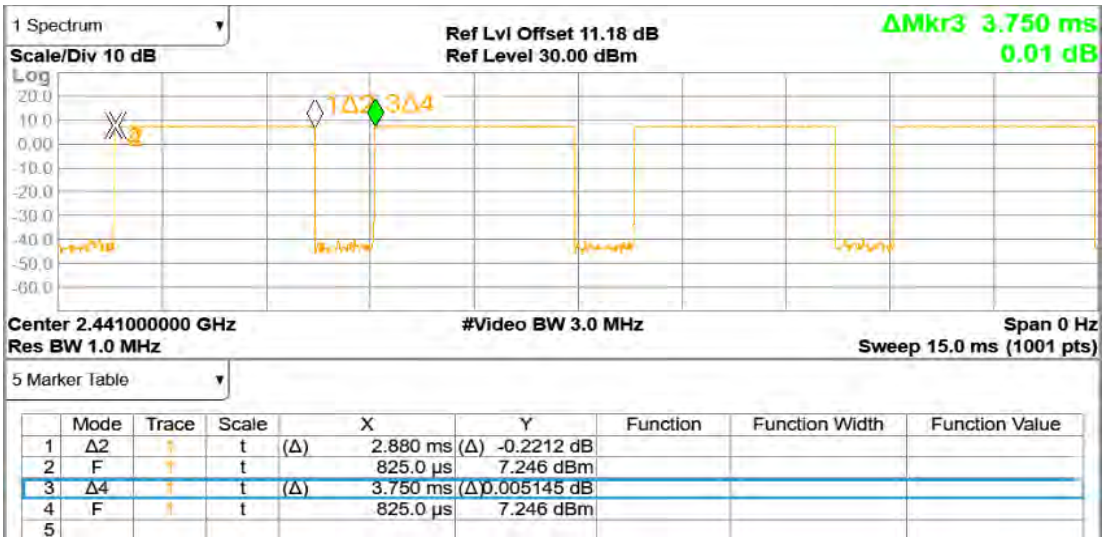
	Mode	Trace	Scale		X	Y	Function	Function Width	Function Value
1	Δ2	1	t	(Δ)	648.0 µs	(Δ) 1.679 dB			
2	F	1	t		244.0 µs	9.696 dBm			
3	Δ4	1	t	(Δ)	692.0 µs	(Δ) 0.3910 dB			
4	F	1	t		244.0 µs	9.696 dBm			
5									

5G ac(80M) duty	(0.324/0.368=0.880) Scaling Factor=1.136



	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	Δ2	1	t	(Δ) 324.0 µs	(Δ) 0.6850 dB			
2	F	1	t	258.0 µs	8.253 dBm			
3	Δ4	1	t	(Δ) 368.0 µs	(Δ) -3.989 dB			
4	F	1	t	258.0 µs	8.253 dBm			
5								

BT	(2.88/3.75=0.768) Scaling Factor=1.302



	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	Δ2	1	t	(Δ) 2.880 ms	(Δ) -0.2212 dB			
2	F	1	t	825.0 µs	7.246 dBm			
3	Δ4	1	t	(Δ) 3.750 ms	(Δ) 0.005145 dB			
4	F	1	t	825.0 µs	7.246 dBm			
5								

7 SUMMARY OF RESULTS

7.1 Decision rules

Reported measurement data comply with Test Methodology in section 1.1.
Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

7.2 Summary of SAR Results

Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11b	Ant 1	Front Surface	5	6	2437	20.50	20.03	1.01	111.43%	0.097	0.108	-
WLAN 802.11b	Ant 1	Back Surface	5	6	2437	20.50	20.03	1.01	111.43%	0.181	0.203	-
WLAN 802.11b	Ant 1	Top Edge	5	6	2437	20.50	20.03	1.01	111.43%	0.067	0.075	-
WLAN 802.11b	Ant 1	Bottom Edge	5	6	2437	20.50	20.03	1.01	111.43%	0.024	0.027	-
WLAN 802.11b	Ant 1	Left Edge	5	6	2437	20.50	20.03	1.01	111.43%	0.010	0.012	-
WLAN 802.11b	Ant 1	Right Edge	5	1	2412	20.50	19.96	1.01	113.24%	0.580	0.660	001
WLAN 802.11b	Ant 1	Right Edge	5	6	2437	20.50	20.03	1.01	111.43%	0.540	0.605	-
WLAN 802.11b	Ant 1	Right Edge	5	11	2462	20.50	19.97	1.01	112.98%	0.449	0.510	-
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
Bluetooth(GFSK)	Ant 1	Front Surface	5	78	2480	7.50	7.02	1.30	111.69%	0.014	0.020	-
Bluetooth(GFSK)	Ant 1	Back Surface	5	78	2480	7.50	7.02	1.30	111.69%	0.018	0.026	-
Bluetooth(GFSK)	Ant 1	Top Edge	5	78	2480	7.50	7.02	1.30	111.69%	0.006	0.009	-
Bluetooth(GFSK)	Ant 1	Bottom Edge	5	78	2480	7.50	7.02	1.30	111.69%	0.002	0.003	-
Bluetooth(GFSK)	Ant 1	Left Edge	5	78	2480	7.50	7.02	1.30	111.69%	0.001	0.001	-
Bluetooth(GFSK)	Ant 1	Right Edge	5	0	2402	7.50	6.41	1.30	128.53%	0.048	0.081	002
Bluetooth(GFSK)	Ant 1	Right Edge	5	39	2441	7.50	6.84	1.30	116.41%	0.035	0.053	-
Bluetooth(GFSK)	Ant 1	Right Edge	5	78	2480	7.50	7.02	1.30	111.69%	0.022	0.032	-
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11n(40M) 5.2G	Ant 1	Front Surface	5	46	5230	19.00	18.27	1.07	118.30%	0.013	0.016	-
WLAN 802.11n(40M) 5.2G	Ant 1	Back Surface	5	46	5230	19.00	18.27	1.07	118.30%	0.130	0.164	-
WLAN 802.11n(40M) 5.2G	Ant 1	Top Edge	5	46	5230	19.00	18.27	1.07	118.30%	0.023	0.030	-
WLAN 802.11n(40M) 5.2G	Ant 1	Bottom Edge	5	46	5230	19.00	18.27	1.07	118.30%	0.025	0.031	-
WLAN 802.11n(40M) 5.2G	Ant 1	Left Edge	5	46	5230	19.00	18.27	1.07	118.30%	0.015	0.019	-
WLAN 802.11n(40M) 5.2G	Ant 1	Right Edge	5	38	5190	16.00	15.90	1.07	102.33%	0.104	0.114	-
WLAN 802.11n(40M) 5.2G	Ant 1	Right Edge	5	46	5230	19.00	18.27	1.07	118.30%	0.159	0.201	003
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11ac(80M) 5.8G	Ant 1	Front Surface	5	155	5775	19.50	19.20	1.14	107.15%	0.086	0.104	-
WLAN 802.11ac(80M) 5.8G	Ant 1	Back Surface	5	155	5775	19.50	19.20	1.14	107.15%	0.313	0.381	-
WLAN 802.11ac(80M) 5.8G	Ant 1	Top Edge	5	155	5775	19.50	19.20	1.14	107.15%	0.045	0.055	-
WLAN 802.11ac(80M) 5.8G	Ant 1	Bottom Edge	5	155	5775	19.50	19.20	1.14	107.15%	0.010	0.012	-
WLAN 802.11ac(80M) 5.8G	Ant 1	Left Edge	5	155	5775	19.50	19.20	1.14	107.15%	0.014	0.017	-
WLAN 802.11ac(80M) 5.8G	Ant 1	Right Edge	5	155	5775	19.50	19.20	1.14	107.15%	0.522	0.635	004

Note:
Reported SAR = measured SAR * Power scaling * Duty cycle scaling

7.3 Reporting statements of conformity

The conformity statement in this report is based solely on the test results, measurement uncertainty is excluded.

7.4 Conclusion

The device is compliant because all the standalone results are less than their corresponding criteria.

8 SIMULTANEOUS TRANSMISSION ANALYSIS

8.1 Simultaneous Transmission Scenarios:

Simultaneous Transmit Configurations	Body
WLAN 2.4GHz + NFC	Yes
Bluetooth + NFC	Yes
WLAN 5GHz + NFC	Yes

8.2 Estimated SAR calculation

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

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

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

8.3 SPLSR evaluation and analysis

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

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

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

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

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

Simultaneous Transmission Combination

Exposure position 10g(W/kg)	0 WLAN 2.4GHz	1 Bluetooth	2 WLAN 5GHz	3 NFC	0+3 Sum	1+3 Sum	2+3 Sum
Front Surface_5mm	0.108	0.020	0.104	0.000000000221	0.108	0.020	0.104
Back Surface_5mm	0.203	0.026	0.381	0.000000000221	0.203	0.026	0.381
Top Edge_5mm	0.075	0.009	0.055	0.000000000221	0.075	0.009	0.055
Bottom Edge_5mm	0.027	0.003	0.031	0.000000000221	0.027	0.003	0.031
Left Edge_5mm	0.012	0.001	0.019	0.000000000221	0.012	0.001	0.019
Right Edge_5mm	0.660	0.081	0.635	0.000000000221	0.660	0.081	0.635

8.4 Conclusion

The simultaneous transmission is compliant because both SAR sum and/or SPLSR are less than their corresponding criteria.

9 INSTRUMENTS LIST

Equipment List					
Manufacturer	**Device**	**Type**	**Serial number**	**Date of last calibration**	**Date of next calibration**
SPEAG	Data acquisition Electronics	DAE4	1260	Sep/22/2022	Sep/21/2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7642	Feb/20/2023	Feb/19/2024
SPEAG	System Validation Dipole	D2450V2	727	Apr/25/2022	Apr/24/2023
SPEAG	System Validation Dipole	D5GHzV2	1023	Jan/19/2023	Jan/18/2024
SPEAG	Dielectric Assessment Kit	DAKS-3.5	0004	Jan/25/2023	Jan/24/2024
R&S	MXG Analog Signal Generator	SMB100A03	182012	Jun/13/2022	Jun/12/2023
Agilent	Dual-directional coupler	772D	MY46151258	Oct/03/2022	Oct/02/2023
Agilent	Dual-directional coupler	778D	MY46151242	Aug/30/2022	Aug/29/2023
EMCI	Amplifier	EMC 2830P	980156	Calibration not required	Calibration not required
R&S	Power Meter	NRX	105651	Nov/25/2022	Nov/24/2023
R&S	Power Sensor	NRP6A	104246	Nov/22/2022	Nov/21/2023
R&S	Power Sensor	NRP6A	104247	Nov/22/2022	Nov/21/2023
SPEAG	Software	DASY 52 V52.10.4.1527	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	SAM	N/A	Calibration not required	Calibration not required
TECPEL	Digital thermometer	DTM-303A	TP130074	May/13/2022	May/12/2023

10 UNCERTAINTY BUDGET

Measurement Uncertainty evaluation template for DUT SAR test (3-6G)

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distributio	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.55%	N	1	1	1	1	6.55%	6.55%	∞
Isotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom shell	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	0.83%	N	1	1	0.64	0.43	0.53%	0.36%	M
Liquid Conductivity (mea.)	2.06%	N	1	1	0.6	0.49	1.24%	1.01%	M
Combined standard uncertainty		RSS					11.79%	11.76%	
Expant uncertainty (95% confidence interval), K=2							23.59%	23.51%	

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

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distributio	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	∞
Isotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom shell	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	1.81%	N	1	1	0.64	0.43	1.16%	0.78%	M
Liquid Conductivity (mea.)	1.36%	N	1	1	0.6	0.49	0.82%	0.67%	M
Combined standard uncertainty		RSS					11.51%	11.45%	
Expant uncertainty (95% confidence interval), K=2							23.01%	22.91%	

11 SAR MEASUREMENT RESULTS

Date: 2023/4/18

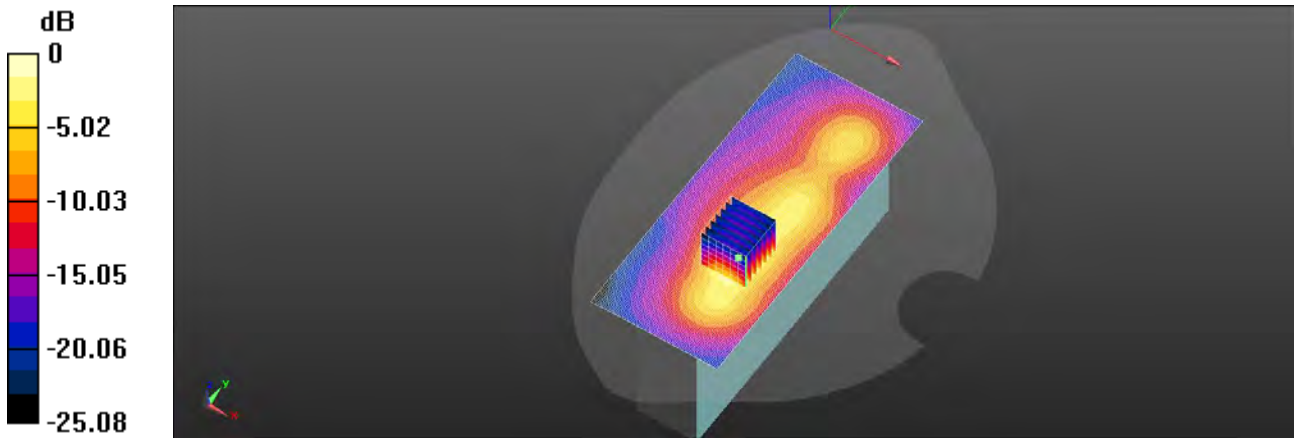
ID: 001
Report No. :TESA2303000156EN
WLAN 802.11b_Body_Right Edge_CH 1_5mm_Ant1
Communication System: WLAN 2.45G; Frequency: 2412 MHz; Duty cycle= 1:1.005
Medium parameters used: f = 2412 MHz; σ = 1.754 S/m; ε_r = 38.556; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.4°C; Liquid temperature: 22.1℃

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(7.89, 7.8, 7.84) @ 2412 MHz; Calibrated: 2023/2/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2022/9/22
- Phantom: SAM
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x171x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.790 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.943 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.580 W/kg; SAR(10 g) = 0.300 W/kg
Smallest distance from peaks to all points 3 dB below = 10.3 mm
Ratio of SAR at M2 to SAR at M1 = 56.5%
Maximum value of SAR (measured) = 0.816 W/kg



0 dB = 0.790 W/kg = -1.03 dBW/kg

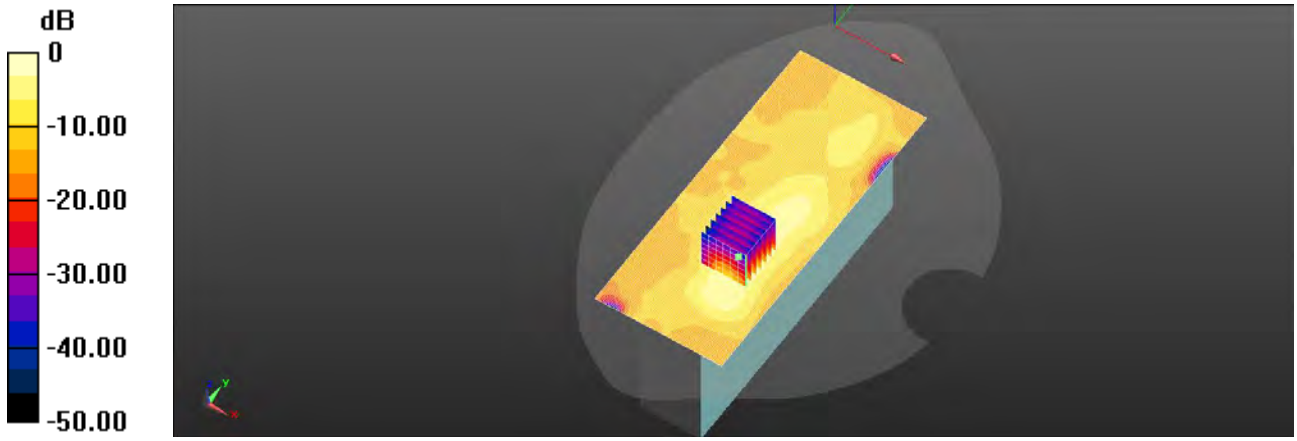
ID: 002
Report No. :TESA2303000156EN
Bluetooth(GFSK)_Body_Right Edge_CH 0_5mm_Ant1
Communication System: Bluetooh; Frequency: 2402 MHz; Duty cycle= 1:1.302
Medium parameters used: f = 2402 MHz; σ = 1.745 S/m; ε_r = 38.59; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.4°C; Liquid temperature: 22.1℃

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(7.89, 7.8, 7.84) @ 2402 MHz; Calibrated: 2023/2/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2022/9/22
- Phantom: SAM
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x171x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0671 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.261 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0920 W/kg
SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.024 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 54.4%
Maximum value of SAR (measured) = 0.0712 W/kg



0 dB = 0.0671 W/kg = -11.73 dBW/kg

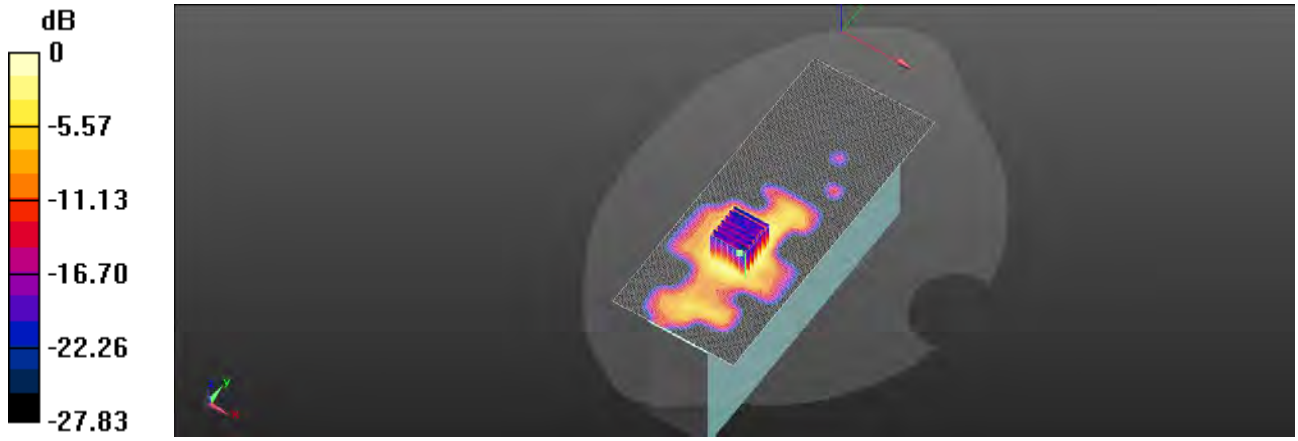
ID: 003
Report No. :TESA2303000156EN
WLAN 802.11n(40M) 5.2G_Body_Right Edge_CH 46_5mm_Ant1
Communication System: WLAN 5G; Frequency: 5230 MHz; Duty cycle= 1:1.068
Medium parameters used: f = 5230 MHz; σ = 4.628 S/m; ε_r = 36.174; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.9℃

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.84, 5.72, 5.77) @ 5230 MHz; Calibrated: 2023/2/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2022/9/22
- Phantom: SAM
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (81x201x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.279 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.521 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.523 W/kg
SAR(1 g) = 0.159 W/kg; SAR(10 g) = 0.057 W/kg
Smallest distance from peaks to all points 3 dB below = 8.2 mm
Ratio of SAR at M2 to SAR at M1 = 61.1%
Maximum value of SAR (measured) = 0.289 W/kg



0 dB = 0.289 W/kg = -5.39 dBW/kg

Date: 2023/4/19

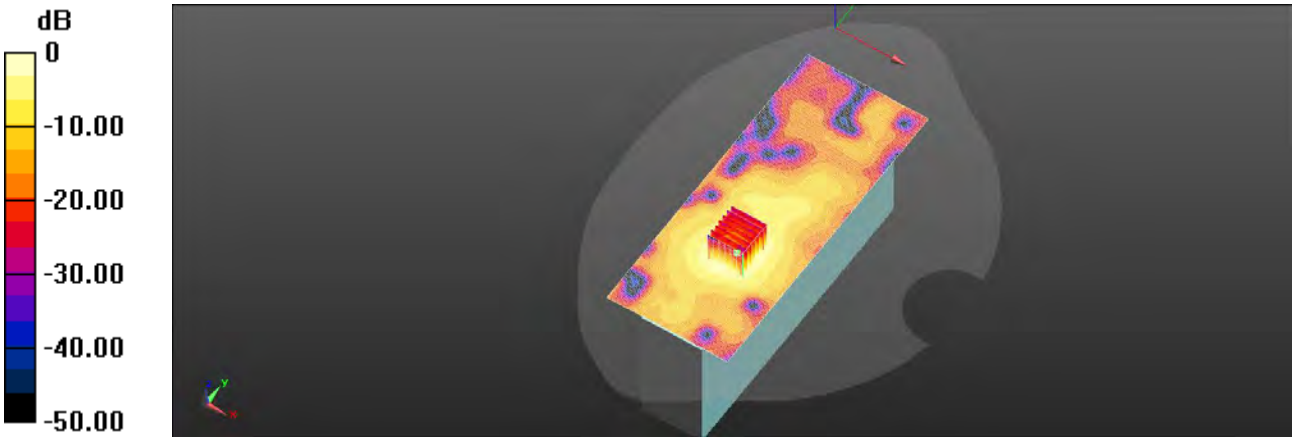
ID: 004
Report No. :TESA2303000156EN
WLAN 802.11ac(80M) 5.8G_Body_Right Edge_CH 155_5mm_Ant1
Communication System: WLAN 5G; Frequency: 5775 MHz; Duty cycle= 1:1.136
Medium parameters used: f = 5775 MHz; σ = 5.353 S/m; ε_r = 35.113; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 22.1℃

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.44, 5.18, 4.93) @ 5775 MHz; Calibrated: 2023/2/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2022/9/22
- Phantom: SAM
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (81x201x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 1.01 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.983 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 0.522 W/kg; SAR(10 g) = 0.182 W/kg
Smallest distance from peaks to all points 3 dB below = 9.1 mm
Ratio of SAR at M2 to SAR at M1 = 59.1%
Maximum value of SAR (measured) = 0.964 W/kg



0 dB = 0.964 W/kg = -0.16 dBW/kg

12 SAR SYSTEM CHECK RESULTS

Date: 2023/4/18

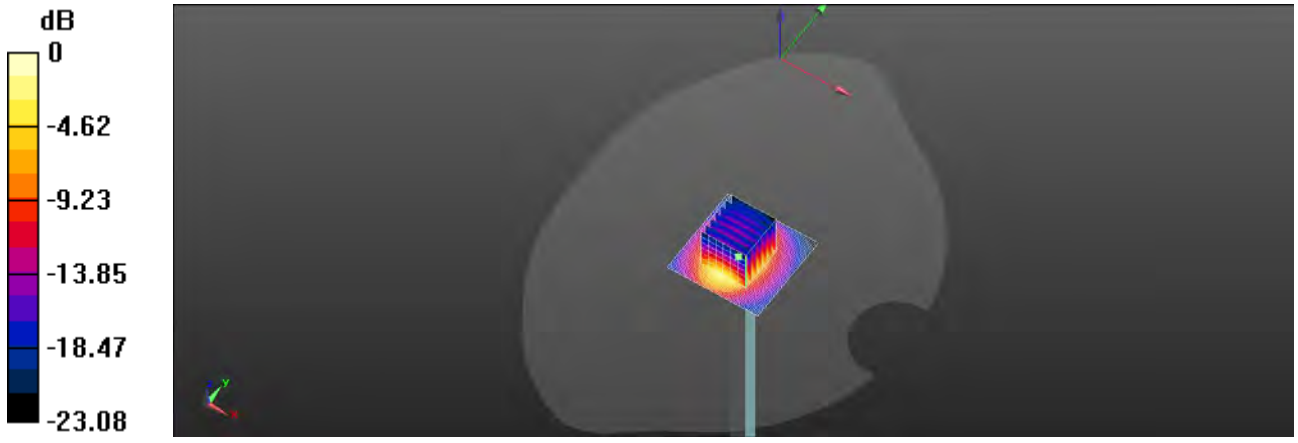
Report No. :TESA2303000156EN
Dipole 2450 MHz_SN:727
Communication System: CW; Frequency: 2450 MHz; Duty cycle= 1:1
Medium parameters used: f = 2450 MHz; σ = 1.783 S/m; ε_r = 38.511; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.4°C; Liquid temperature: 22.1℃

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(7.89, 7.8, 7.84) @ 2450 MHz; Calibrated: 2023/2/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2022/9/22
- Phantom: SAM
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (51x51x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 20.4 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 107.6 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 26.6 W/kg
SAR(1 g) = 13 W/kg; SAR(10 g) = 6.2 W/kg
Smallest distance from peaks to all points 3 dB below = 10 mm
Ratio of SAR at M2 to SAR at M1 = 47.7%
Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 20.4 W/kg = 13.09 dBW/kg

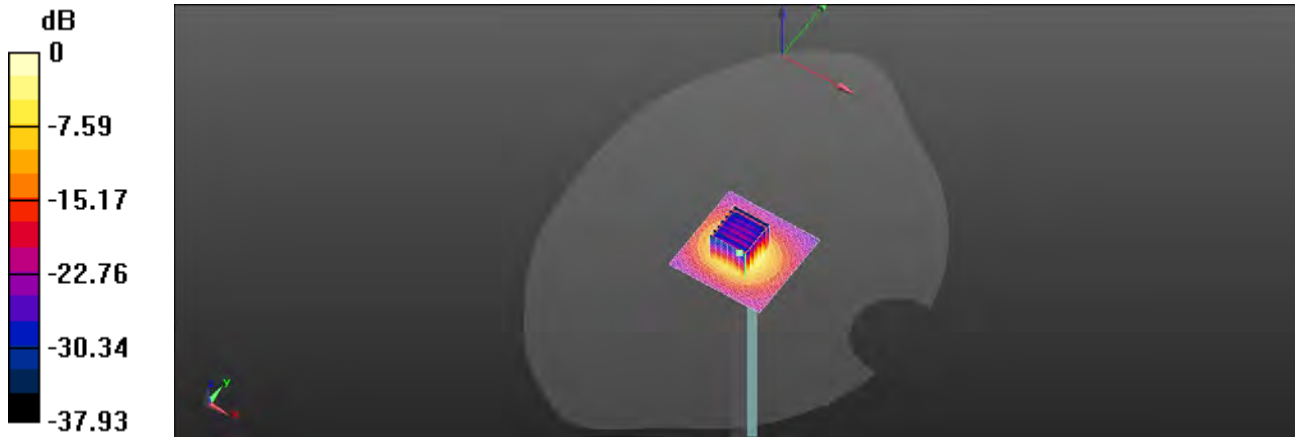
Report No. :TESA2303000156EN
Dipole 5250 MHz_SN:1023
Communication System: CW; Frequency: 5250 MHz; Duty cycle= 1:1
Medium parameters used: f = 5250 MHz; σ = 4.667 S/m; ε_r = 36.131; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.9℃

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.84, 5.72, 5.77) @ 5250 MHz; Calibrated: 2023/2/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2022/9/22
- Phantom: SAM
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (61x61x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 16.3 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 61.57 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 8.09 W/kg; SAR(10 g) = 2.35 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 56.5%
Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.9 W/kg = 12.28 dBW/kg

Date: 2023/4/19

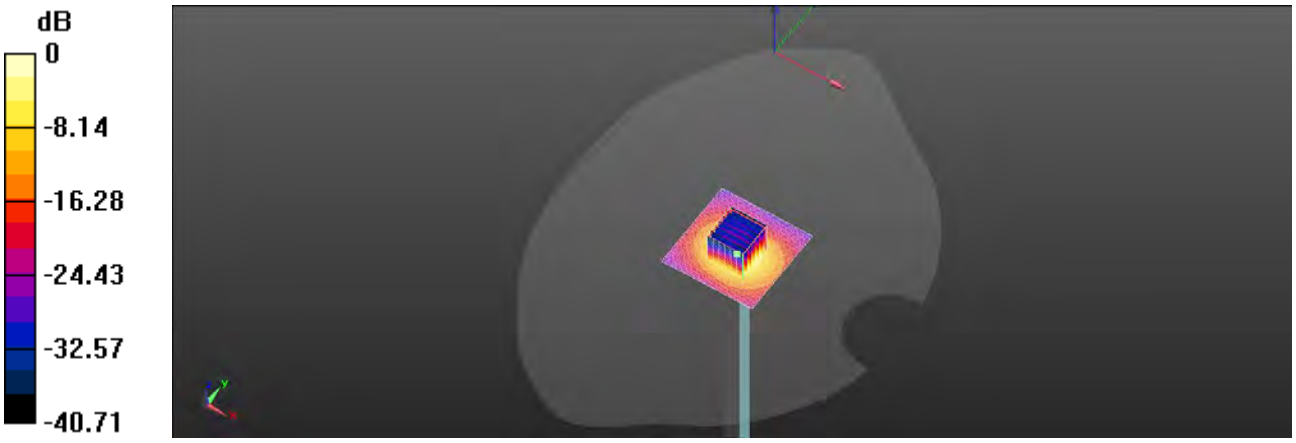
Report No. :TESA2303000156EN
Dipole 5750 MHz_SN:1023
Communication System: CW; Frequency: 5750 MHz; Duty cycle= 1:1
Medium parameters used: f = 5750 MHz; σ = 5.32 S/m; ε_r = 35.136; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 22.1℃

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.44, 5.18, 4.93) @ 5750 MHz; Calibrated: 2023/2/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2022/9/22
- Phantom: SAM
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (61x61x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 18.0 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 54.34 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 41.4 W/kg
SAR(1 g) = 8.26 W/kg; SAR(10 g) = 2.23 W/kg
Smallest distance from peaks to all points 3 dB below = 7.5 mm
Ratio of SAR at M2 to SAR at M1 = 49.4%
Maximum value of SAR (measured) = 18.6 W/kg



0 dB = 18.6 W/kg = 12.70 dBW/kg

13 APPENDIXES

Refer to separated files for the following appendixes.

13.1 SAR_Appendix A Photographs

13.2 SAR_Appendix B DAE & Probe Cal. Certificate

13.3 SAR_Appendix C Phantom Description & Dipole Cal. Certificate

- End of report -