

## RF Exposure report



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

<b>Product Name</b>	Pan & Tilt Video Monitor
<b>Brand Name</b>	Vtech
<b>Model No.</b>	VM901HD PU, VM901-2HD PU
<b>Applicant</b>	VTech Telecommunications Ltd. 23/F., Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong
<b>Standards</b>	IEEE/ANSI C95.1-1992, IEEE 1528-2013 RSS102 Issue 5, IEC/IEEE 62209-1528:2020, FCC 47CFR §2.1093
<b>FCC ID</b>	EW780-1957-01D
<b>IC</b>	1135B-80195701D
<b>HVIN</b>	35-201964PUA
<b>Date of EUT Receipt</b>	Oct. 05, 2022
<b>Date of Test(s)</b>	Oct. 21, 2022
<b>Date of Issue</b>	Dec. 13, 2022

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.

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This test report is within the scope of TAF certification, except for the standard FCC 47CFR §2.1093.

**Signed on behalf of SGS**

Clerk / Kimmy Chiou	PM / Tom Chiang	Approved By / John Yeh

Date: Dec. 13, 2022

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## Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TESA2210000390E5	00	Initial creation of document	Dec. 13, 2022	Kimmy Chiou	

Note:

- The mark " \* " is the revised version of the report due to comments submitted by the certification.

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## 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

RSS102 Issue 5

IEC/IEEE 62209-1528:2020

FCC 47CFR §2.1093

KDB248227D01v02r01

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## 1.2 Description of EUT

### General Information of Host:

Power supply	Model: VT07EUS05200 Input: AC 100-240V, 50/60Hz, Max 0.5A Output: DC 5.0V, 2.0A  Or  Battery Model: GSP806090-5Ah-3.7V-1S1P Rated capacity: 5000mAh, 18.5Wh Voltage: 3.7VDC
Test voltage	AC 120V
Cable	Power Cable: 200cm unshielded 2 wires DC cable
Antenna Gain	2 dBi
Antenna Type	Dipole
Channel Spacing	5MHz
Modulation Type	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(64QAM, 16 QAM, QPSK, BPSK)
Data rate	802.11b: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps, 802.11g: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps, 802.11n: 6.5Mbps, 13Mbps, 19.5Mbps, 26Mbps, 39Mbps, 52Mbps, 58.5Mbps, 65Mbps,
Number of Channels	802.11b/g/n(HT20): 11
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz
Tested Channels:	2412MHz, 2437MHz, 2462MHz
Version code:	T31N
Series number:	A1
Hardware Version:	35-201964PUA
Software Version:	V1.0.2.0

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1.3 Maximum value

Summary of Maximum SAR	
Mode	Highest SAR 1g Body (W/kg)
2.4 WLAN	1.11

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## 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		
	<b>No. 2, Keji 1st Rd., Guishan Township, Taoyuan County, 33383, Taiwan</b>	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.

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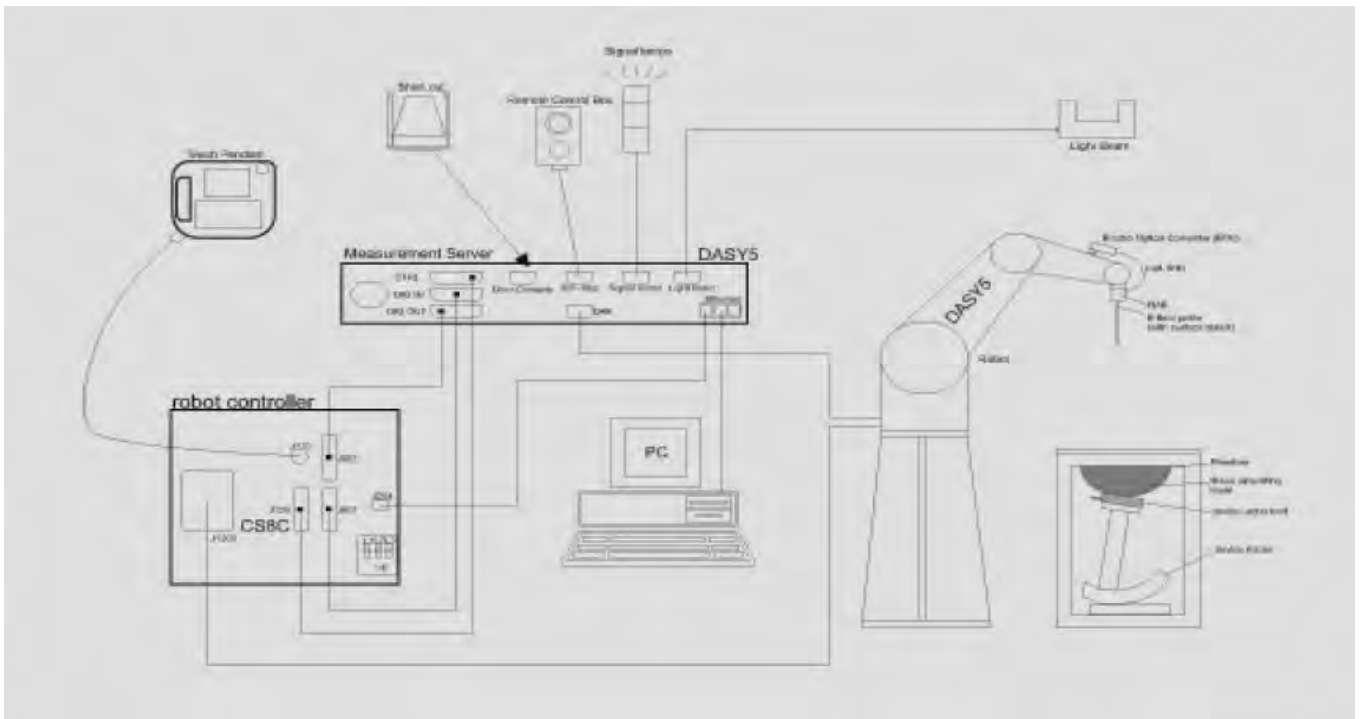
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## 2.2 SAR System

### 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  $SAR = \sigma (|E_i|^2) / \rho$  where  $\sigma$  and  $\rho$  are the conductivity and mass density of the tissue-simulant.



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**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 2450MHz 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%.	


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**PHANTOM (ELI)**

Model	ELI	
Construction	The ELI phantom is used for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Shell Thickness	2 ± 0.2 mm	
Filling Volume	Approx. 30 liters	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	

**DEVICE HOLDER (ELI)**

Construction	The device holder (Supporter) for Notebook is made by POM (polyoxymethylene resin), which is non-metal and non-conductive. The height can be adjusted to fit varies kind of notebooks.	 <p style="text-align: center;">Device Holder</p>
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### 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  $\pm 5\%$  of the target values.

#### 3.3 Measurement results of Tissue Simulant Liquid

Measurement Date	Measured Frequency (MHz)	Target Dielectric Constant, $\epsilon_r$	Target Conductivity, $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon_r$	Measured Conductivity, $\sigma$ (S/m)	% dev $\epsilon_r$	% dev $\sigma$
Oct, 21. 2022	2412	39.265	1.766	40.668	1.853	3.57%	4.92%
	2437	39.222	1.788	40.623	1.876	3.57%	4.87%
	2450	39.200	1.800	40.600	1.887	3.57%	4.85%
	2462	39.184	1.813	40.585	1.898	3.57%	4.72%

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### 3.4 The composition of the tissue simulating liquid:

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

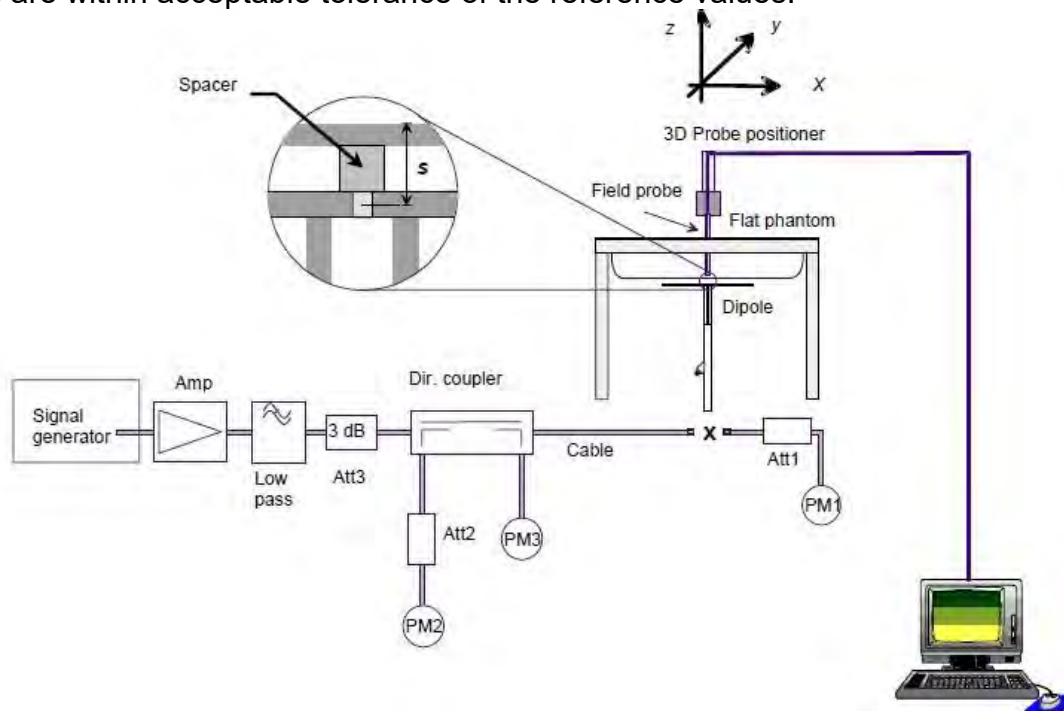
Broad-band head tissue simulating liquids	SPEAG Product	Frequency range (MHz)	Main Ingredients
	HBBL600-10000V6	600 - 10000	Water, Oil

### 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

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### 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	13.6	54.4	3.03	± 10%	Oct.21,2022

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## 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. 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.

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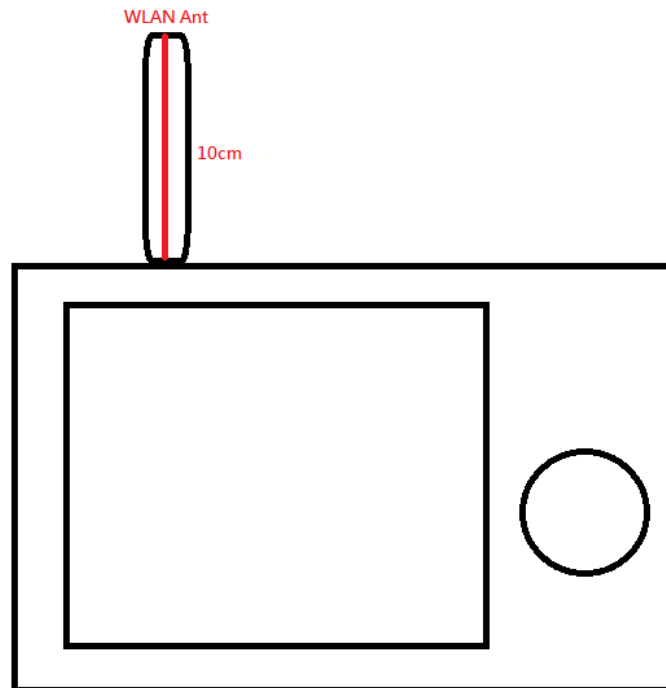
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#### 4.3 Test position

The test distance between the back side of ant and the right side were 5mm, and the front test distance were 0mm.

#### 4.4 Antenna location



Front veiw

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## 4.5 FCC 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

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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 4cm<sup>2</sup> per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

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

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#### 4.6 ISED Test limit

For SAR limit, refer to the following table 3 from RSS 102.

Table 3: SAR Limits for Devices Used by the General Public (Uncontrolled Environment)

Body Region	Average SAR (W/kg)	Averaging Time (minutes) <sup>20</sup>	Mass Average (g)
Whole Body	0.08	6	Whole Body
Localized Head, Neck and Trunk	1.6	6	1
Localized Limbs	4	6	10

For localized exposures to radiofrequency EMF in the 6 GHz to 300 GHz frequency range, Health Canada's recommendations are as follows:

Table 1: Basic restrictions for local electromagnetic field exposure above 6 GHz up to 300 GHz

Exposure scenario	Exposure duration (t)	Local absorbed energy density [ kJ/m <sup>2</sup> ]	Local absorbed power density [ W/m <sup>2</sup> ]
Controlled Environment	0 sec < t < 360 sec	36 [0.05+0.95(t/360) <sup>0.5</sup> ]	n/a
	t ≥ 6 min	n/a	100
Uncontrolled Environment	0 sec < t < 360 sec	7.2 [0.05+0.95(t/360) <sup>0.5</sup> ]	n/a
	t ≥ 6 min	n/a	20

Notes:

- "n/a" signifies "not applicable" and does not need to be taken into account when determining compliance.
- "t" is time in seconds, and restrictions must be satisfied for all values of t between >0 s and <360 s, regardless of the temporal characteristics of the exposure itself.
- Local absorbed power density exposures are to be averaged over 6 min.
- Local absorbed power density is to be averaged over a square 4-cm<sup>2</sup> surface area of the body. Above 30 GHz, an additional constraint is imposed, such that the spatial peak exposure is restricted to two times that of the 4-cm<sup>2</sup> restriction.
- Local absorbed energy density is to be averaged over a square 4-cm<sup>2</sup> surface area of the body. Above 30 GHz, an additional constraint is imposed, such that the spatial peak exposure is restricted to 72[0.025+0.975(t/360)<sup>0.5</sup>] kJ/m<sup>2</sup> for controlled environment and 14.4[0.025+0.975(t/360)<sup>0.5</sup>] kJ/m<sup>2</sup> for uncontrolled environment exposure.
- Exposure from any pulse, group of pulses, or subgroup of pulses in a train, as well as from the summation of exposures (including non-pulsed EMFs), delivered in t s, where t is the sum of all periods in which there is non-zero exposure, must not exceed these levels.

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## 5 MAXIMUM OUTPUT POWER

### 5.1 WLAN

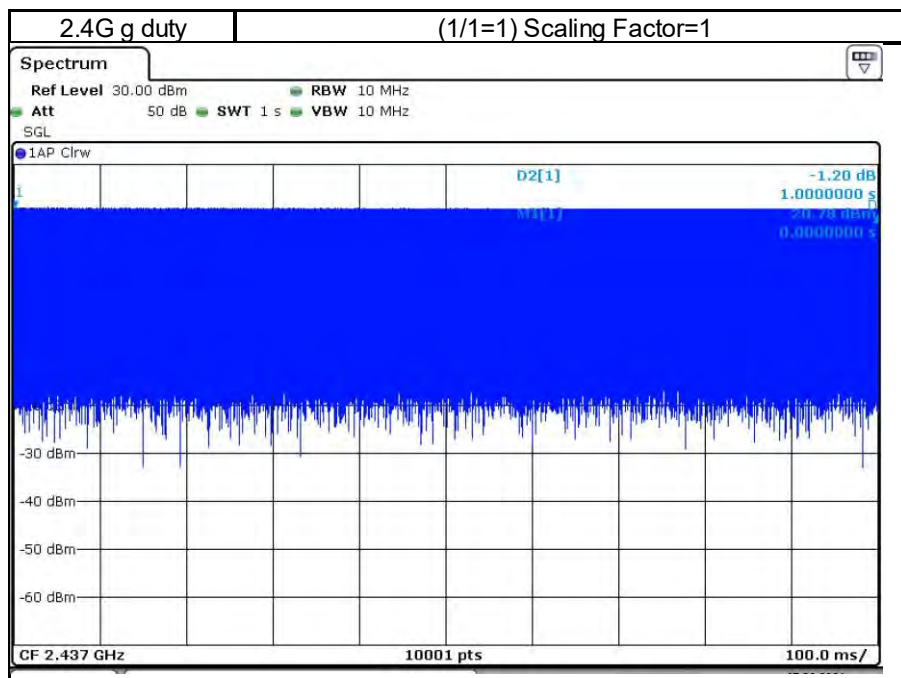
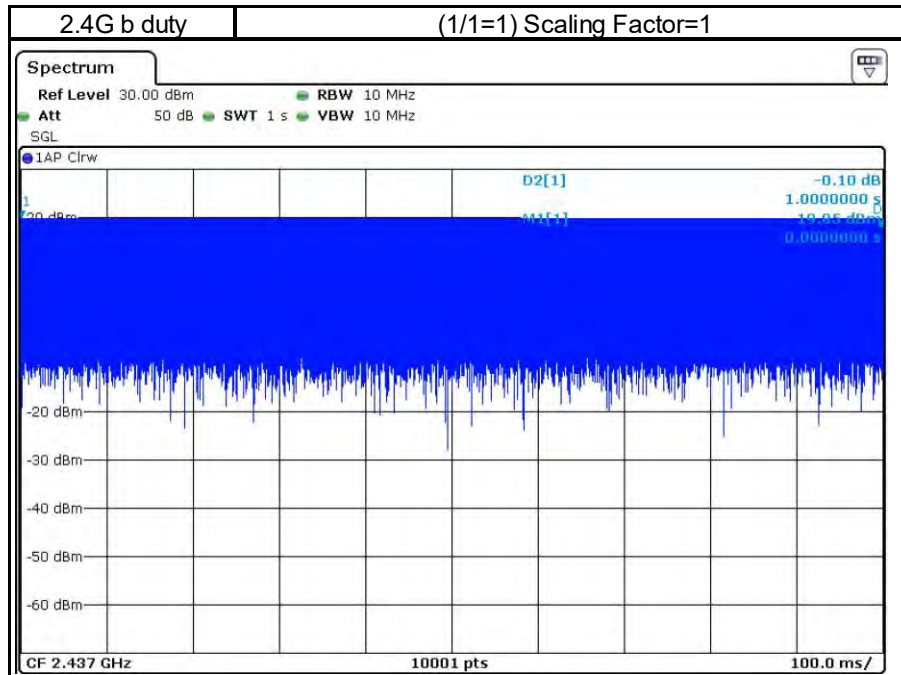
Ant 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
2.45GHz	802.11b	1	2412	1Mbps	12.00	11.50
		6	2437		11.00	10.30
		11	2462		12.00	11.20
	802.11g	1	2412	6Mbps	11.00	9.10
		6	2437		10.00	8.10
		11	2462		11.00	9.20
	802.11n20-HTO	1	2412	MCS0	10.00	8.30
		6	2437		10.00	8.20
		11	2462		11.00	9.80

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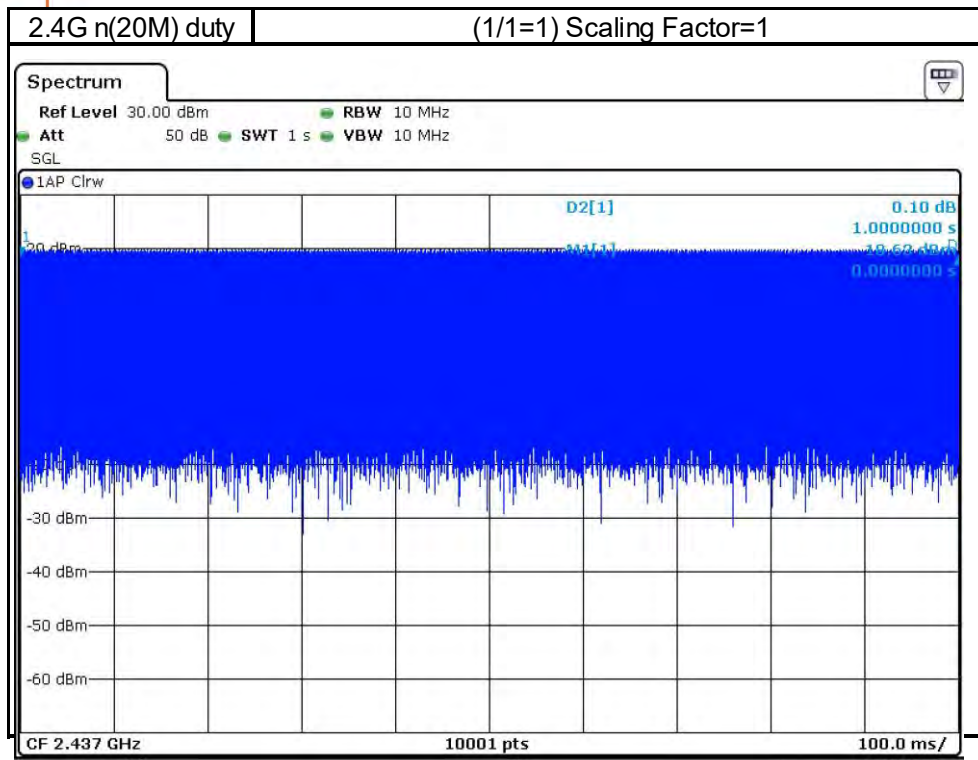
## 6 DUTY CYCLE



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## 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	Ant1	Back side of Ant	5	1	2412	12.00	11.50	1.00	112.20%	0.987	1.107	001
Repeat	Ant1	Back side of Ant	5	1	2412	12.00	11.50	1.00	112.20%	0.965	1.083	-
WLAN 802.11b	Ant1	Back side of Ant	5	6	2437	11.00	10.30	1.00	117.49%	0.755	0.887	-
WLAN 802.11b	Ant1	Back side of Ant	5	11	2462	12.00	11.20	1.00	120.23%	0.568	0.683	-
WLAN 802.11b	Ant1	Front side	0	1	2412	12.00	11.50	1.00	112.20%	0.396	0.444	-
WLAN 802.11b	Ant1	Right side_(folding the antenna)	5	1	2412	12.00	11.50	1.00	112.20%	0.674	0.756	-

#### 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.

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## 8 INSTRUMENTS LIST

Equipment List					
Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
SPEAG	Data acquisition Electronics	DAE4	547	Mar/23/2022	Mar/22/2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3938	Jan/25/2022	Jan/24/2023
SPEAG	System Validation Dipole	D2450V2	727	Apr/25/2022	Apr/24/2023
SPEAG	Dielectric Assessment Kit	DAKS-3.5	1053	Feb/28/2022	Feb/27/2023
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	ZHL-42	980189	Calibration not required	Calibration not required
EMCI	Amplifier	ZVE-8G	980190	Calibration not required	Calibration not required
R&S	Power Sensor	NRP18S	101973	Jan/22/2022	Jan/21/2023
R&S	Power Meter	NRX	102191	Jan/22/2022	Jan/21/2023
R&S	Power Sensor	NRP18S	101358	Jan/22/2022	Jan/21/2023
SPEAG	Software	DASY 52 V52.10.4.152 7	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	ELI	N/A	Calibration not required	Calibration not required
LKM	Digital thermometer	DTM3000	EC14010603	Sep/27/2022	Sep/26/2023
TECPEL	Digital thermometer	DTM-303A	TP130077	Sep/29/2022	Sep/28/2023

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## 9 UNCERTAINTY BUDGET

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
<b>Measurement system</b>									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	∞
<i>Isotropy, Axial</i>	3.50%	R	$\sqrt{3}$	1.732	1	1	2.02%	2.02%	∞
<i>Isotropy, Hemispherical</i>	9.60%	R	$\sqrt{3}$	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	$\sqrt{3}$	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	$\sqrt{3}$	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	$\sqrt{3}$	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	$\sqrt{3}$	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	$\sqrt{3}$	1.732	1	1	1.50%	1.50%	∞
<b>Measurement drift (class A evaluation)</b>	1.75%	R	$\sqrt{3}$	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	$\sqrt{3}$	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	$\sqrt{3}$	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	$\sqrt{3}$	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom shell	2.90%	R	$\sqrt{3}$	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
<b>Test Sample related</b>									
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	$\sqrt{3}$	1.732	1	1	2.89%	2.89%	∞
<b>Phantom and Setup</b>									
Phantom Uncertainty	4.00%	R	$\sqrt{3}$	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	3.57%	N	1	1	0.64	0.43	2.28%	1.54%	M
Liquid Conductivity (mea.)	4.92%	N	1	1	0.6	0.49	2.95%	2.41%	M
Liquid conductivity $\sigma$ – temperature uncertainty	2.60%	R	$\sqrt{3}$	1.732	0.78	0.71	1.17%	1.07%	∞
Liquid permittivity $\epsilon$ – temperature uncertainty	1.80%	R	$\sqrt{3}$	1.732	0.23	0.26	0.24%	0.27%	∞
Combined standard uncertainty		RSS					12.01%	11.76%	
Expant uncertainty (95% confidence interval), K=2							24.02%	23.52%	

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## 10 SAR MEASUREMENT RESULTS

Date: 2022/10/21

ID: 001

Report No. : TESA2210000390E5

WLAN 802.11b\_Body\_Back side of Ant\_CH 1\_5mm\_Ant1

Communication System: WLAN; Frequency: 2412 MHz; Duty Cycle: 1:1.005

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.853$  S/m;  $\epsilon_r = 40.668$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.7°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(7.39, 7.39, 7.39); Calibrated: 2022/1/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2022/3/23
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (101x71x1):** Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 1.62 W/kg

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

Reference Value = 1.223 V/m; Power Drift = -0.04 dB

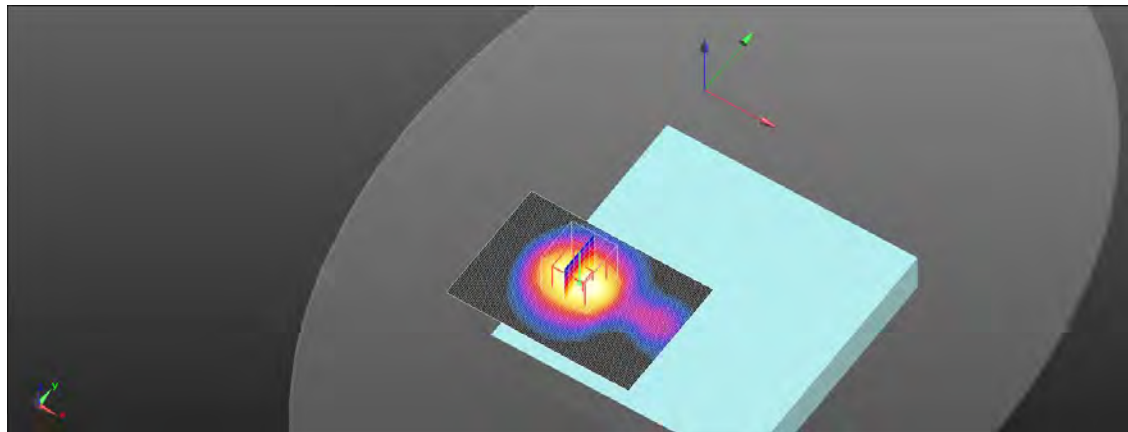
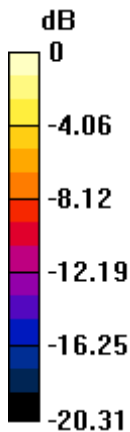
Peak SAR (extrapolated) = 1.89 W/kg

**SAR(1 g) = 0.987 W/kg; SAR(10 g) = 0.488 W/kg**

Smallest distance from peaks to all points 3 dB below = 10.8 mm

Ratio of SAR at M2 to SAR at M1 = 53%

Maximum value of SAR (measured) = 1.45 W/kg



0 dB = 1.45 W/kg = 1.63 dBW/kg

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## 11 SAR SYSTEM CHECK RESULTS

Date: 2022/10/21

Report No. : TESA2210000390E5

Dipole 2450 MHz\_SN:727

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.887$  S/m;  $\epsilon_r = 40.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.7°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(7.39, 7.39, 7.39); Calibrated: 2022/1/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2022/3/23
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (51x71x1):** Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 22.9 W/kg

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

Reference Value = 105.0 V/m; Power Drift = -0.02 dB

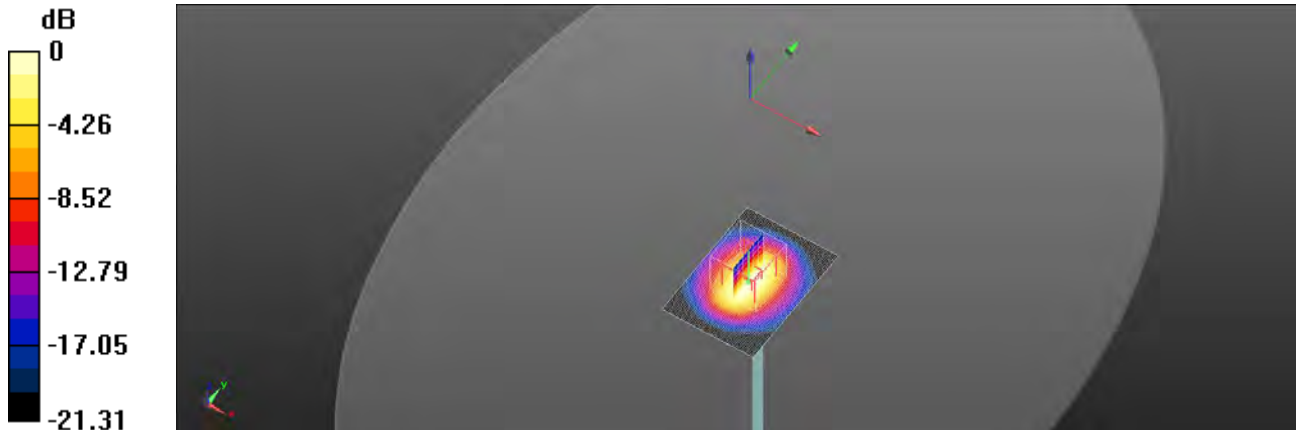
Peak SAR (extrapolated) = 27.5 W/kg

**SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.43 W/kg**

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 50.2%

Maximum value of SAR (measured) = 20.7 W/kg



0 dB = 20.7 W/kg = 13.17 dBW/kg

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## 12 APPENDIXES

**Refer to separated files for the following appendixes.**

- 12.1 SAR\_Appendix A Photographs
- 12.2 SAR\_Appendix B DAE & Probe Cal. Certificate
- 12.3 SAR\_Appendix C Phantom Description & Dipole Cal. Certificate

**- End of report -**

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