Prüfbericht-Nr.: *Test Report No.:*	**17048716 005**	**Auftrags-Nr.:** *Order No.:*	164033146	Seite 1 von 22 *Page 1 of 22*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	30.03.2015	
Auftraggeber: *Client:*	Lightcomm Technology Co., Ltd. RM1708-10, 17/F, PROSPERITY CENTRE, 25 CHONG YIP STREET, KWUN TONG, HONG KONG			
Prüfgegenstand: *Test item:*	8" Wi-Fi Android™ Tablet			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	NS-P16AT08, MID8005-L			
Auftrags-Inhalt: *Order content:*	FCC/IC Certification			
Prüfgrundlage: *Test specification:*	CFR Title 47 Part 2 Subpart J Section 2.1093 ANSI/IEEE C95.1-1992 IEEE 1528-2003 FCC OET Bulletin 65 Supplement C (Edition 01-01) RSS-102 Issue 5 March 2015			
Wareneingangsdatum: *Date of receipt:*	15.04.2015			
Prüfmuster-Nr.: *Test sample No.:*	1500845			
Prüfzeitraum: *Testing period:*	07.05.2015 - 11.05.2015			
Ort der Prüfung: *Place of testing:*	Shenzhen EMTEK Co., Ltd.			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			

geprüft von / *tested by:*			**kontrolliert von** / *reviewed by:*		
26.05.2015	Owen Tian/Senior Project Manager		26.05.2015	Winnie Hou/Technical Certicier	
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other:*

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

STATEMENT OF COMPLIANCE

TEST ITEM	SPECIFICATION	RESULT
Specific Absorption Rate - Wi-Fi 802.11 b/g/n - 2.4GHz Band	OET Bulletin 65 Supplement C (Edition 01-01): *Evaluating compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*	PASS
Specific Absorption Rate - Wi-Fi 802.11 a - 5.2GHz Band	OET Bulletin 65 Supplement C (Edition 01-01): *Evaluating compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*	PASS
Specific Absorption Rate - Wi-Fi 802.11 a - 5.8GHz Band	OET Bulletin 65 Supplement C (Edition 01-01): *Evaluating compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*	PASS
Specific Absorption Rate – Bluetooth BDR - 2.4GHz Band	OET Bulletin 65 Supplement C (Edition 01-01): *Evaluating compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*	PASS

This device complies with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/kg) specified in CFR Title 47 Part 2 Subpart J Section 2.1093 and ANSI/IEEE C95.1-1992.

This device has been testd in accordance with the measurement methods and procedure specified in IEEE 1528-2003 and FCC OET Bulletin 65 Supplement C (edition 01-01).

Refer to the maximum results of Specific Absorption Rate (SAR) durning testing as below.

FREQUENCY BAND	EXPOSURE POSITION	EQUIPMENT CLASS	HIGHEST REPORTED SAR VALUE (W/KG)
802.11 b/g/n - 2.4GHz Band	Body	DTS	0.89
802.11 a - 5.8GHz Band	Body		1.18
802.11 a - 5.2GHz Band	Body	NII	1.06
Bluetooth BDR - 2.4GHz Band	Body	DSS	0.01

Contents

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: System Performance Check
Appendix B: Test Plots of SAR Measurement
Appendix C: Calibration Certificate

2. Test Sites

2.1 Test Facilities

Shenzhen EMTEK Co., Ltd.

Bldg 69, Majialong Industry Zone, Nanshan District,
Shenzhen, Guangdong, P.R. China

The tests at the test site have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal Date	Cal. Interval
Signal Generator	Agilent	N5181A	MY50145187	2014-05-17	1year
RF Power Meter. Dual Channel	BOONTON	4232A	10539	2014-05-17	1year
Power Sensor	BOONTON	51011EMC	34236/34238	2014-05-17	1year
Wideband Radio Communication Tester	R&S	CMW500	1201.0002K50 -140822zk	2014-05-17	1year
E-Field Probe	SPEAG	EX3DV4	3801	2014-06-18	1year
DAE	SPEAG	DAE4	918	2014-11-29	1year
Validation Kit 5GHz	SPEAG	D5GHzV2	1169	2014-01-13	2year
Validation Kit 2450MHz	SPEAG	D2450V2	927	2014-01-13	2year

3. General Product Information

3.1 Product Function and Intended Use

The EUTs are 8'' tablet with Wi-Fi, Bluetooth & GPS function.
Two models are identical except the model name.
For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification

Device type:	Portable device				
EUT Name:	8" Wi-Fi Android™ Tablet				
Type Identification:	NS-P16AT08, MID8005-L				
Serial Number	1500845				
FCC ID:	XMF-MID8005				
IC number:	20064-MID8005				
Operating mode(s) / WiFi:	IEEE 802.11b	IEEE 802.11g	IEEE 802.11n (HT20)	IEEE 802.11n (HT40)	IEEE 802.11a
Test modulation	DSSS (DBPSK, DQPSK), CCK)	OFDM (DBPSK, DQPSK)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Transmit Frequency Range (MHz):	2412 - 2472	2412 - 2472	2412 - 2472	2422 - 2462	5180 - 5240, 5745 - 5825
Maximum tune-up average output power (dBm):	14	13	12	12	11
Operating mode(s) / Bluetooth:	Bluetooth 4.0				
Test modulation	GFSK, π/4DQPSK, 8DPSK for BDR & EDR mode, GFSK for LE mode				
Transmit Frequency Range (MHz):	2402-2480				
Maximum tune-up average output power (dBm):	7				
Hardware version:	MID8005L-MT8127-LPDDR3 VER1.1				
Software version:	LRX21M release-keys V01.00.03				
Antenna type:	Integrated antenna				
Battery options:	DC 3.7V				

Table 3: List of WLAN Channel of 802.11b/g/n mode

802.11b		802.11g		802.11n (HT20)		802.11n (HT40)	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	2412	1	2412	1	2412	3	2422
2	2417	2	2417	2	2417	4	2427
3	2422	3	2422	3	2422	5	2432
4	2427	4	2427	4	2427	6	2437
5	2432	5	2432	5	2432	7	2442
6	2437	6	2437	6	2437	8	2447
7	2442	7	2442	7	2442	9	2452
8	2447	8	2447	8	2447	10	2457
9	2452	9	2452	9	2452	11	2462
10	2457	10	2457	10	2457		
11	2462	11	2462	11	2462		

Table 4: List of WLAN Channel of 802.11a mode

802.11a	
Channel Number	Frequency (MHz)
36	5180
40	5200
44	5220
48	5240
149	5745
153	5765
157	5785
161	5805
165	5825

Table 5: List of Bluetooth Channel

Bluetooth (BDR & EDR)		Bluetooth (LE)	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
0	2402	0	2402
39	2441	19	2440
78	2480	39	2480

3.3 Independent Operation Modes

The basic operation modes are:

A. On, transmitting
   1. 802.11b
      a) CH1
      b) CH6
      c) CH11
   2. 802.11g
      a) CH1
      b) CH6
      c) CH11
   3. 802.11n (HT20)
      a) CH1
      b) CH6
      c) CH11
   4. 802.11n (HT40)
      a) CH3
      b) CH7
      c) CH11
   5. 802.11a
      a) CH40
      b) CH44
      c) CH149
      d) CH157
      e) CH165
   6. Bluetooth BDR
      a) CH0
      b) CH39
      c) CH78

B. Off

3.4 Submitted Documents

- Bill of Material
- Constructional Drawing
- PCB Layout
- Photo Document
- Circuit Diagram
- Instruction Manual
- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The EUT is commanded to operate at maximum transmitting power. The EUT shall use its internal transmitter. The antenna, battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

Table 6: Configuration of EUT

Operation mode	Frequency Range (MHz)	Modulation	Default Test Channel			Power Control Level
			Low	Middle	High	
802.11b/g/n(HT20)	2412-2462	DSSS, OFDM	CH1	CH6	CH11	Test software was used to configure the EUT to transmit at maximum output power
802.11n(HT40)	2422-2462	OFDM	CH3	CH7	CH11	
802.11a	5180-5240	OFDM	CH40	---	CH44	
	5745-5825	OFDM	CH149	CH157	CH165	
Bluetooth (BDR & EDR)	2402-2480	FHSS	CH0	CH39	CH78	
Bluetooth (LE)	2402-2480	GFSK	CH0	CH19	CH39	

5. Tissue Simulating Liquid Ingredients

The liquid is consisted of Water, Salt, Glycol and DGBE. The liquid has previously been proven to be suited for worst-case. The following table shows the detail solution.

Table 7: Composition of Tissue Simulating Liquid

MIXTURE%(Weight)	FREQUENCY (Body) 2450MHz
Water	73.2
Glycol	26.7
Salt	0.1
Dielectric Parameters Target Value	f=2450MHz ε=52.70 σ=1.95

MIXTURE%(Weight)	FREQUENCY (Body) 5GHz
Water	75.68
DGBE	4.42
Triton X-100	19.47
Salt	0.43
Dielectric Parameters Target Value	f=5200MHz ε=49.00 σ=5.30 f=5300MHz ε=48.90 σ=5.42 f=5500MHz ε=48.60 σ=5.65 f=5600MHz ε=48.50 σ=5.77 f=5800MHz ε=48.20 σ=6.00

5.1 Specific Absorption Rate (SAR) System Check

Dielectric parameters of the tissue simulating liquid were verified prior to the SAR evaluation using the dielectric proble kit and the network analyzer.

A system check measurement was made following the determination of the dielectric parameters of the tissue simulating liquid, using the dipole validation kit. A power level of 250 mW for 2.4GHz band or 100mW for 5GHz band as supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the following table.

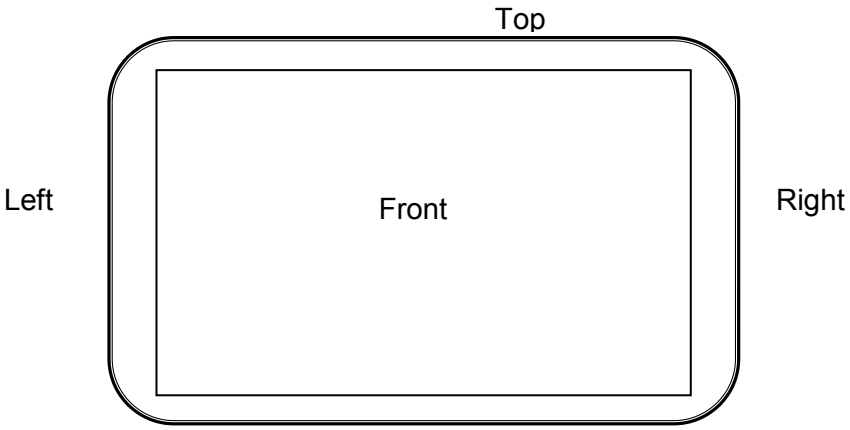
Table 8: System Check Results of for Body of Tissue Simulating Liquid

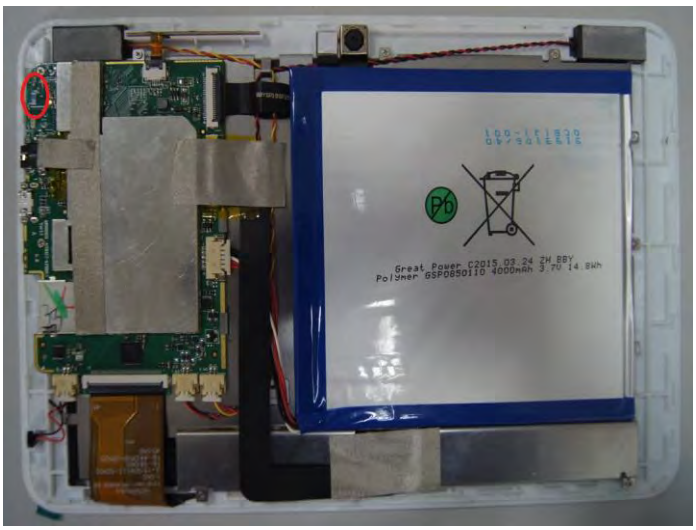
Tissue Verification										
CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
1	2412	Body	1.953	52.977	1.91	52.75	2.25	0.34	±5	2015-05-07
6	2437	Body	1.987	52.936	1.94	52.72	2.42	0.45	±5	2015-05-07
11	2462	Body	2.024	52.847	1.97	52.68	2.74	0.28	±5	2015-05-07
0	2402	Body	1.939	52.99	1.90	52.76	2.05	0.36	±5	2015-05-07
39	2441	Body	1.993	52.922	1.94	52.71	2.73	0.42	±5	2015-05-07
78	2480	Body	2.041	52.767	1.95	52.70	4.67	0.13	±5	2015-05-07
40	5200	Body	5.264	49.3	5.30	49.00	-0.68	0.61	±5	2015-05-11
44	5220	Body	5.302	49.235	5.32	48.98	-0.34	0.48	±5	2015-05-11
149	5745	Body	6.026	48.398	5.94	48.28	1.45	0.20	±5	2015-05-11
157	5785	Body	6.076	48.116	5.98	48.22	1.61	-0.17	±5	2015-05-11
165	5825	Body	6.203	48.118	6.00	48.20	3.38	-0.17	±5	2015-05-11

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
2450	Body	22.6	2.006	52.889	1.95	52.70	2.87	0.36	±5	2015-5-7
5200	Body	22.7	5.264	49.300	5.30	49.00	-0.68	0.61	±5	2015-5-11
5800	Body	22.7	6.128	48.040	6.00	48.20	2.13	-0.33	±5	2015-5-11

Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)	SAR (1g or 10g)
2450	Body	250	927	3801	918	12.09	50.40	48.36	-4.05	1g
5200	Body	100	1169	3801	918	7.75	73.80	77.5	5.01	1g
5800	Body	100	1169	3801	918	7.87	74.30	78.7	5.92	1g

5.2 Exposure Positions Consideration





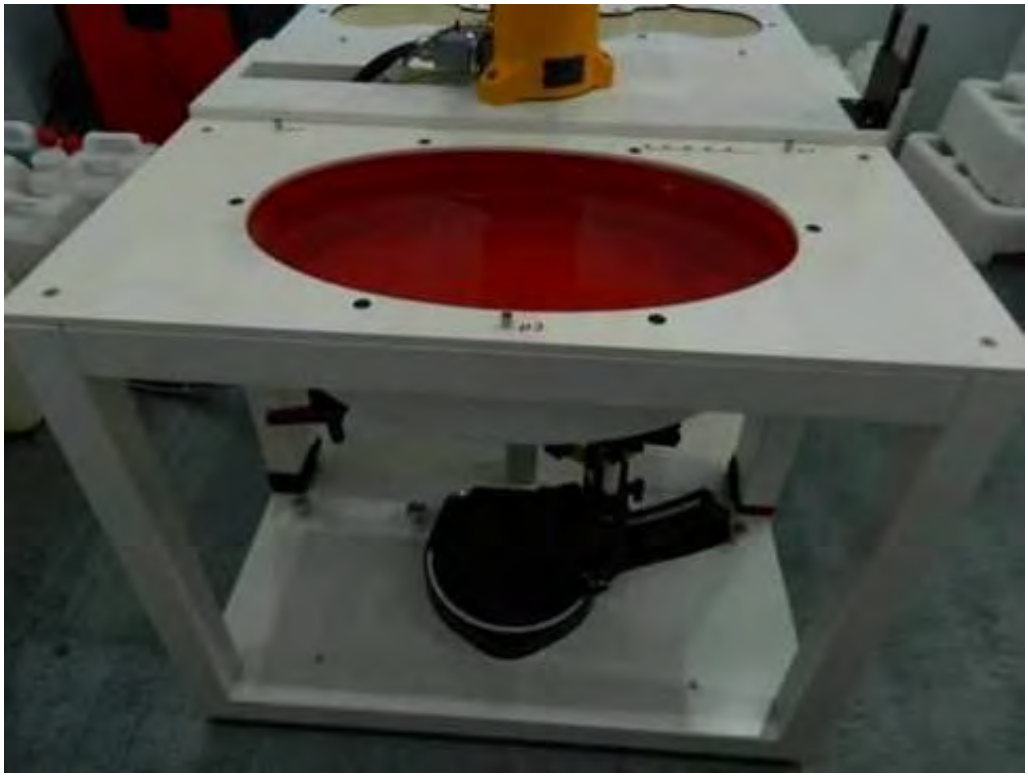
5.3 Phantom Description

Phantom 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 190×600×0 mm (H x L x W)



Picture of ELI Phantom

5.4 Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5%.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing is set according to FCC KDB Publication 865664. During scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan

After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm.

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

• maximum search

• extrapolation

• boundary correction

• peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic

Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space.

They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

5.5 Test Operation and Test Software

Test operation refers to test setup in chapter 5.

A communication link is set up with the test mode software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode.

802.11b/g/n operating modes are tested independently according to the service requirements in each frquency band.802.11b/g/n modes are tested on channel 1, 6, 11. However, if output power reduction is necessary for channels 1 and/or 11 to meet restricted band requirements the highest output channel closest to each of these channels must be tested instead.

802.11a is tested for UNII operations on channel 40 and 44 in 5.18 - 5.24GHz band. Also 5.8GHz band is alos available for §15.247, hence channels 149, 157 and 165 should be tested instead of the UNII channels.

SAR is not required for 802.11g/n when the maximum average output power is less than ¼ dB higher than that measured on the corresponding 802.11b channels.

Each channel should be tested at the lowest data rate, and repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.

For each frequency band testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than ¼ dB higher than those measured at the lowest data rate.

5.6 Special Accessories and Auxiliary Equipment

None.

6. Test Results

6.1 Huaman Exposure to Radiofrequency Electromagnetic Fields

RESULT: **Passed**

Date of testing	:	2015-05-07 to 2015-05-11
Test standard	:	CFR Title 47 Part 2 Subpart J Section 2.1093 ANSI/IEEE C95.1-1992 IEEE 1528-2003 FCC OET Bulletin 65 Suppplement C (Edition 01-01)
FCC KDB Publication	:	KDB 447498 D01 v05r01 KDB 248227 D01 v01r02 KDB 616217 D04 v01r01 KDB 865664 D01 v01r01
Limits	:	1.6W/kg

Test setup

Operation mode	:	A.1, A.3, A.4, A.5, A.6
Ambient temperature	:	23℃
Relative humidity	:	50%
Atmospheric pressure	:	101.0kPa

Table 9: Conducted Power of 802.11b/g/n (HT20)

802.11b/g/n (HT20)	Conducted Power (dBm)					
	CH1 / 2412		CH6 / 2437		CH11 / 2462	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11b (1Mbps)	14	13.9	14	13.9	14	13.8
802.11b (5.5Mbps)	14	13.3	14	13.3	14	13.2
802.11b (11Mbps)	14	13.4	14	13.4	14	13.4
802.11g (6Mbps)	12	12.0	12	12.0	12	11.8
802.11g (24Mbps)	12	11.9	12	12.0	12	12.0
802.11g (54Mbps)	12	12.3	12	12.3	12	12.1
802.11n (HT20) (MSC0)	12	11.4	12	11.3	12	11.3
802.11n (HT20) (MSC4)	12	11.4	12	11.3	12	11.3
802.11n (HT20) (MSC7)	12	11.3	12	11.4	12	11.4

Table 10: Conducted Power of 802.11n (HT40)

802.11n (HT40)	Conducted Power (dBm)					
	CH3 / 2422		CH7 / 2442		CH11 / 2462	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11n (HT40) (MSC0)	12	11.4	12	11.3	12	11.3
802.11n (HT40) (MSC4)	12	11.4	12	11.3	12	11.3
802.11n (HT40) (MSC7)	12	11.3	12	11.4	12	11.4

Table 11: Conducted Power of 802.11a Band 1

802.11a	Conducted Power (dBm)							
	CH36 / 5180		CH40 / 5200		CH44 / 5220		CH48 / 5240	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11a (6Mbps)	12	7.5	12	7.9	12	7.0	12	6.3
802.11a (24Mbps)	12	7.3	12	7.2	12	7.0	12	6.2
802.11a (54Mbps)	12	7.7	12	7.3	12	7.2	12	7.0

Table 12: Conducted Power of 802.11a Band 4

802.11a	Conducted Power (dBm)					
	CH149 / 5745		CH157 / 5785		CH165 / 5825	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11a (6Mbps)	14	9.1	14	8.9	14	8.9
802.11a (24Mbps)	14	9.9	14	9.8	14	10.6
802.11a (54Mbps)	14	10.0	14	10.4	14	10.3

Table 13: Conducted Power of Bluetooth (BDR & EDR)

Bluetooth	Conducted Power (dBm)		
	CH0 / 2402	CH39 / 2441	CH78 / 2480
Basic Date Rate	6.5	6.8	6.8
Enhanced Data Rate	4.1	4.4	4.5

Table 14: Conducted Power of Bluetooth (LE)

Bluetooth	Conducted Power (dBm)		
	CH0 / 2402	CH13 / 2440	CH39 / 2480
LE	-1.1	-0.9	-0.8

Table 15: Test result of SAR Values

Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Power Setting	Data Rate	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
WLAN2.4G	802.11b	Bottom Face	0	6	2437	14	1Mbps	13.90	14.00	1.023	98.1	1.019	-0.03	0.639	**0.666**
WLAN2.4G	802.11b	Edge 1	0	6	2437	14	1Mbps	13.90	14.00	1.023	98.1	1.019	-0.03	0.024	**0.025**
WLAN2.4G	802.11b	Edge 2	0	6	2437	14	1Mbps	13.90	14.00	1.023	98.1	1.019	-0.06	0.216	**0.225**
WLAN2.4G	802.11b	Bottom Face	0	1	2412	14	1Mbps	13.90	14.00	1.023	98.1	1.019	-0.03	0.705	**0.735**
WLAN2.4G	802.11b	Bottom Face	0	11	2462	14	1Mbps	13.80	14.00	1.047	98.1	1.019	-0.09	0.835	**0.891**
WLAN2.4G	802.11b	Bottom Face	0	11	2462	14	1Mbps	13.80	14.00	1.047	98.1	1.019	-0.07	0.802	**0.856**
WLAN2.4G	802.11n-HT40	Bottom Face	0	6	2437	12	1Mbps	11.30	12.00	1.175	79.3	1.261	-0.05	0.371	**0.550**
WLAN2.4G	802.11n-HT20	Bottom Face	0	6	2437	12	1Mbps	11.60	12.00	1.096	88.4	1.131	-0.11	0.378	**0.469**
WLAN2.4G	802.11b	Curved surface of Edge 2	0	11	2462	14	1Mbps	13.80	14.00	1.047	98.1	1.019	-0.07	0.711	**0.759**
Bluetooth	BT	Bottom Face	0	39	2441	-	1Mbps	6.80	7.00	1.047	76.7	1.304	-0.02	0.00585	**0.008**
Bluetooth	BT	Edge 1	0	39	2441	-	1Mbps	6.80	7.00	1.047	76.7	1.304	-0.08	0.00207	**0.003**
Bluetooth	BT	Edge 2	0	39	2441	-	1Mbps	6.80	7.00	1.047	76.7	1.304	-0.03	0.00348	**0.005**
Bluetooth	BT	Bottom Face	0	0	2402	-	1Mbps	6.50	7.00	1.122	76.7	1.304	-0.04	0.00596	**0.009**
Bluetooth	BT	Bottom Face	0	78	2480	-	1Mbps	6.80	7.00	1.047	76.7	1.304	-0.06	0.00697	**0.010**
WLAN5G Band 1	802.11a	Bottom Face	0	40	5200	12	6Mbps	7.90	8.00	1.023	89.1	1.122	-0.08	0.692	**0.795**
WLAN5G Band 1	802.11a	Edge 1	0	40	5200	12	6Mbps	7.90	8.00	1.023	89.1	1.122	-0.13	0.063	**0.072**
WLAN5G Band 1	802.11a	Edge 2	0	40	5200	12	6Mbps	7.90	8.00	1.023	89.1	1.122	-0.04	0.564	**0.648**
WLAN5G Band 1	802.11a	Bottom Face	0	44	5220	12	6Mbps	7.00	8.00	1.259	89.1	1.122	-0.02	0.698	**0.986**
WLAN5G Band 1	802.11a	Curved surface of Edge 2	0	44	5220	12	6Mbps	7.00	8.00	1.259	89.1	1.122	-0.09	0.753	**1.064**
WLAN5G Band 1	802.11a	Curved surface of Edge 2	0	40	5220	12	6Mbps	7.90	8.00	1.023	89.1	1.122	0.07	0.818	**0.939**
WLAN5G Band 1	802.11a	Curved surface of Edge 2	0	40	5220	12	6Mbps	7.90	8.00	1.023	89.1	1.122	-0.06	0.798	**0.916**
WLAN5G Band 4	802.11a	Bottom Face	0	157	5785	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.03	0.859	**1.107**
WLAN5G Band 4	802.11a	Edge 1	0	157	5785	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.03	0.036	**0.046**
WLAN5G Band 4	802.11a	Edge 2	0	157	5785	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.04	0.787	**1.014**
WLAN5G Band 4	802.11a	Bottom Face	0	149	5745	14	6Mbps	9.10	9.50	1.096	89.1	1.122	-0.09	0.802	**0.987**
WLAN5G Band 4	802.11a	Bottom Face	0	165	5825	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.08	0.905	**1.166**
WLAN5G Band 4	802.11a	Edge 2	0	149	5745	14	6Mbps	9.10	9.50	1.096	89.1	1.122	0.02	0.816	**1.004**
WLAN5G Band 4	802.11a	Edge 2	0	165	5825	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.06	0.777	**1.001**
WLAN5G Band 4	802.11a	Bottom Face	0	165	5825	14	24Mbps	10.60	11.00	1.096	89.1	1.122	-0.09	0.472	**0.581**
WLAN5G Band 4	802.11a	Bottom Face	0	157	5785	14	54Mbps	10.40	11.00	1.148	89.1	1.122	-0.05	0.443	**0.571**
WLAN5G Band 4	802.11a	Curved surface of Edge 2	0	165	5825	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.09	0.916	**1.180**
WLAN5G Band 4	802.11a	Curved surface of Edge 2	0	165	5825	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.07	0.909	**1.171**
WLAN5G Band 4	802.11a	Curved surface of Edge 2	0	149	5745	14	6Mbps	9.10	9.50	1.096	89.1	1.122	-0.06	0.827	**1.017**
WLAN5G Band 4	802.11a	Curved surface of Edge 2	0	157	5785	14	6Mbps	8.90	9.50	1.148	89.1	1.122	-0.11	0.908	**1.170**

Refer to attached Appendix B for details of test results.

6.2 Measurement Uncertainty

6.2.1 Measurement uncertainty evaluation

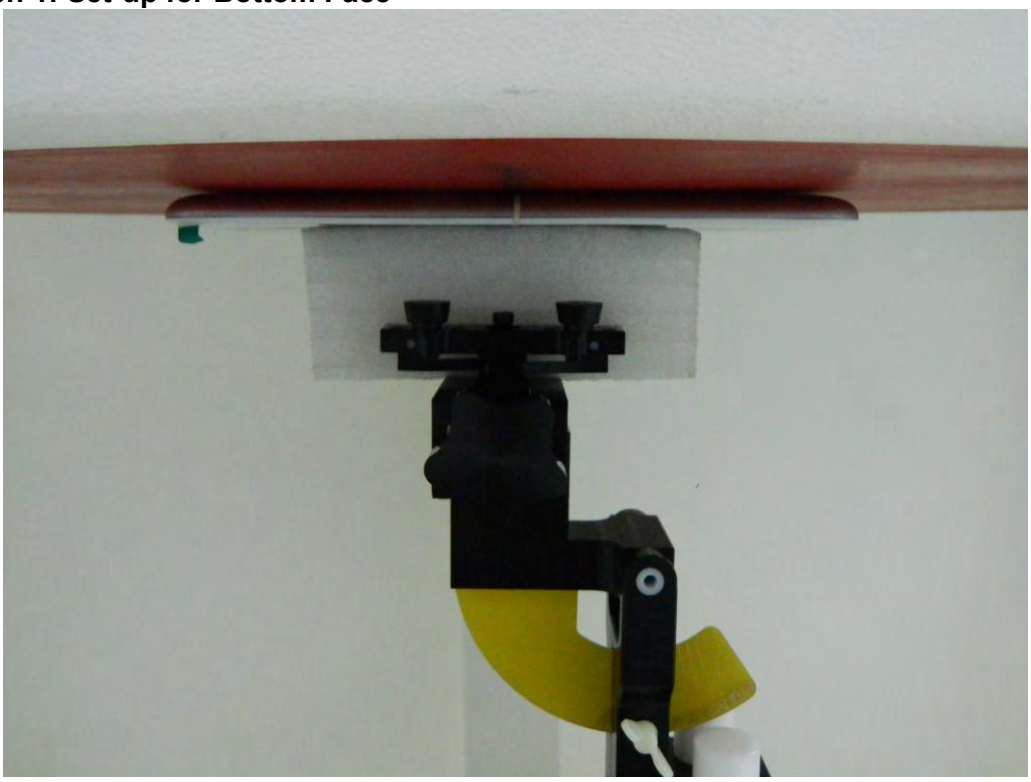
This measurement uncertainty budget is suggested by IEEE P1528. The breakdown of the individual uncertainties is as follows:

Table 16: Measurement Uncertainties

No.	Description	Type	Uncertainty Value (%)	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	N	1	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						9.25	9.12	257
Expanded uncertainty (Confidence interval of 95%)		$u_e = 2u_c$						18.5	18.2	\

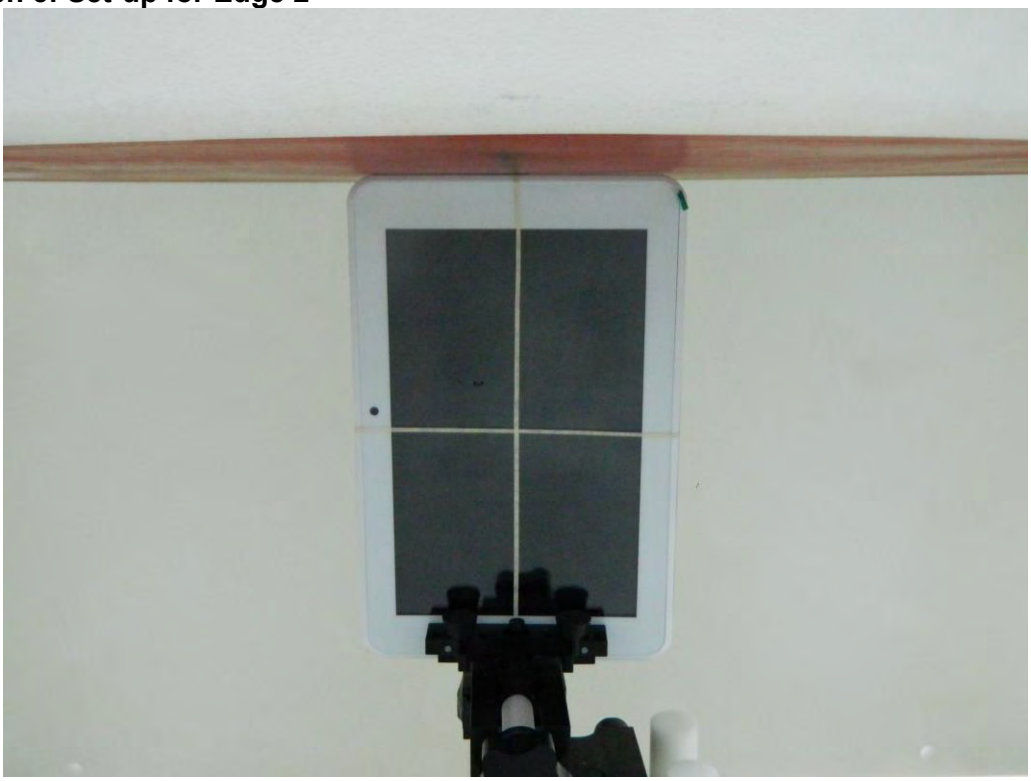
7. Photographs of the Test Set-Up

Photograph 1: Set-up for Bottom Face



Photograph 2: Set-up for Edge 1

Photograph 3: Set-up for Edge 2



Photograph 4: Set-up for Curved surface of Edge 2

8. List of Tables

9. List of Photographs