RF EXPOSURE EVALUATION REPORT

FCC ID	**: MSQZ01QD**
Equipment	**: ASUS Phone (Mobile Phone)**
Brand Name	**: ASUS**
Model Name	**: ASUS_Z01QD**
Applicant	**: ASUSTeK COMPUTER INC. 4F, No. 150, LI-TE RD., PEITOU, TAIPEI, TAIWAN**
Manufacturer	**: Arima Communications (Jiangsu) Co., LTD No. 168, Jiao Tong North Road, Wu Jiang, Su Zhou, Jiang Su, PRC.**
Standard	**: FCC 47 CFR Part 2 (2.1093)**

We, SPORTON INTERNATIONAL INC have been evaluated in accordance with 47 CFR Part 2.1091 for the device and pass the limit.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Cona Huang

Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA852405-06	01	Initial issue of report	Oct. 13, 2018
FA852405-06	02	Update section9	Dec. 04, 2018

1. Summary

The maximum measured average power density found during testing for ASUSTeK COMPUTER INC., ASUS Phone (Mobile Phone), ASUS_Z01QD, are as follows.

Standalone transmission			Simultaneous transmission with other transmitters
	Highest Total Power Density, averaging over 4cm^2 (mW/cm^2)	Limit (FCC part 1.310) (mW/cm^2)	Summation of Exposure Ratio
802.11ad, 60GHz	0.3208	1	0.956

2. Guidance Applied

The Power Density testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2.1091
- FCC 47 CFR Part 2.1093
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- TCBC workshop notes
- IEC Draft TR 63170

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	ASUS Phone (Mobile Phone)
Brand Name	ASUS
Model Name	ASUS_Z01QD
FCC ID	MSQZ01QD
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz 802.11ad 60GHz
Mode	GSM/GPRS/EGPRS AMR / RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK 802.11ad
HW Version	R2.0
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype
Remark: 1. Additional consideration of simultaneous transmission with WWAN and WLAN, the WWAN and WLAN SAR test results were referring the report of FCC ID: MSQZ01QD (Sporton SAR Report No. FA852405)	

Reviewed by: Jason Wang
Report Producer: Wan Liu

4. RF Exposure Limits

4.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

4.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure above 6GHz to radio frequency (RF) radiation as specified in §1.1310.

General Population Basic restriction for power density for frequencies between 1.5GHz and 100 GHz is 1.0 mW/cm^2 = 10 W/m^2

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

5. System Description and Setup

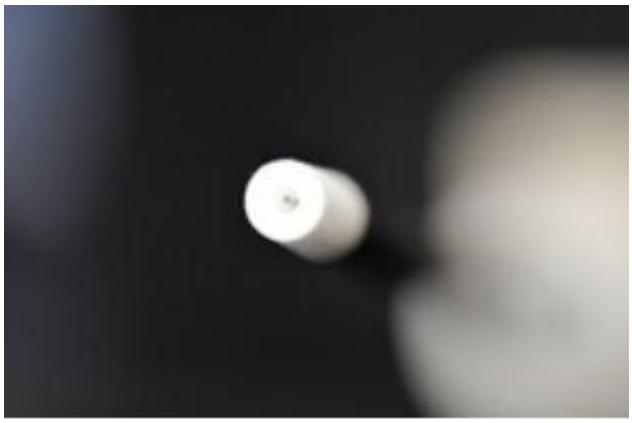
The system to be used for the near field power density measurement

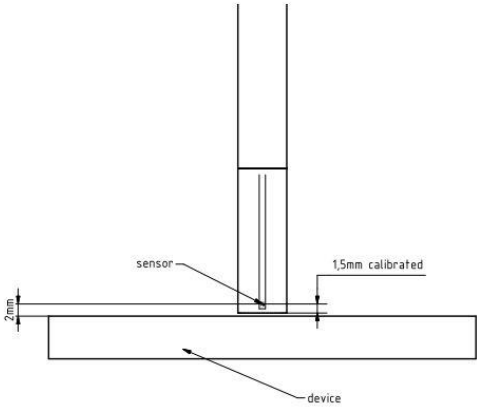
- SPEAG DASY6 system
- SPEAG cDASY6 5G module software
- EUmmWV2 probe
- 5G Phantom cover

5.1 EUmmWave Probe / E-Field 5G Probe

The probe design allows measurements at distances as small as 2 mm from the sensors to the surface of the device under test (DUT). The typical sensor to probe tip distance is 1.5 mm.

Frequency	750 MHz – 110 GHz
Probe Overall Length	320 mm
Probe Body Diameter	8.0 mm
Tip Length	23.0 mm
Tip Diameter	8.0 mm
Probe's two dipoles length	0.9 mm – Diode loaded
Dynamic Range	< 20 V/m - 10000 V/m with PRE-10 (min < 50 V/m - 3000 V/m)
Position Precision	< 0.2 mm
Distance between diode sensors and probe's tip	1.5 mm
Minimum Mechanical separation between probe tip and a Surface	0.5 mm
Applications	E-field measurements of 5G devices and other mm-wave transmitters operating above 10GHz in < 2 mm distance from device (free-space) Power density, H-field and far-field analysis using total field reconstruction.
Compatibility	cDASY6 + 5G-Module SW1.0 and higher





5.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

5.3 Scan configuration

Fine-resolution scans on 2 different planes are performed to reconstruct the E- and H-fields as well as the power density; the z-distance between the 2 planes is set to $\lambda/4$.
The (x, y) grid step is also set $\lambda/4$, the grid extent is set to sufficiently large to identify the field pattern and the peak.

5.4 Total Field and Power Flux Density Reconstruction

Computation of the power density in general requires knowledge of the electric and magnetic field amplitudes and phases in the plane of incidence. Reconstruction of these quantities from pseudo-vector E-field measurements is feasible, as they are constrained by Maxwell's equations. SPEAG have developed a reconstruction approach based on the Gerchberg-Saxton algorithm, which benefits from the availability of the E-field polarization ellipse information obtained with the EUmmWV2 probe.
The average of the reconstructed power density is evaluated over a circular area in each measurement plane. Two average power density values can be computed, the average total power density and the average incident power density, and the average total power density is used to determine compliance.

6. Test Equipment List

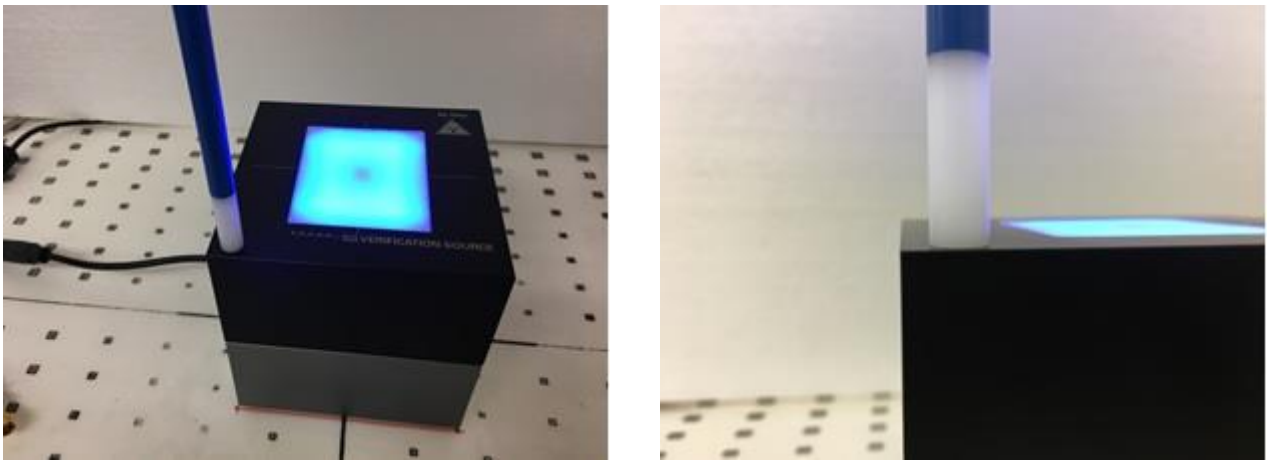
Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	5G Verification Source	60 GHz	1009	Apr. 05, 2018	Apr. 04, 2019
SPEAG	EUmmWV Probe	EUmmWV2	9388	Apr. 10, 2018	Apr. 09, 2019
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 18, 2018	Jan. 17, 2019
SPEAG	Data Acquisition Electronics	DAE4	917	Dec. 14, 2017	Dec. 13, 2018
SPEAG	Data Acquisition Electronics	DAE4	854	Jun. 14, 2018	Jun. 13, 2019
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 24, 2018	Jul. 23, 2019
SPEAG	Data Acquisition Electronics	DAE4	910	Jun. 21,2018	Jun. 20,2019
TESTO	Hygro meter	608-H1	34852481	Sep. 20, 2017	Sep. 19, 2018
TESTO	Hygro meter	608-H1	34913631	Aug. 27, 2018	Aug. 26, 2019
Rohde & Schwarz	Spectrum Analyzer	FSV40	101408	Jul. 30, 2018	Jul. 29, 2019
OML	Mixer	M15HW/A	V91113-1	Oct. 12, 2017	Oct. 11, 2018
Custom Microwave	Standard Horn antenna	M15RH	V91113-A	NCR	NCR

7. System Verification

The system performance check verifies that the system operates within its specifications.

The EUT is replaced by a calibrated source, the same spatial resolution, measurement region and the test separation used in the calibration was applied to system check. Through visual inspection into the measured power density distribution, both spatially (shape) and numerically (level) have no noticeable difference. The measured results should be within 10% of the calibrated targets

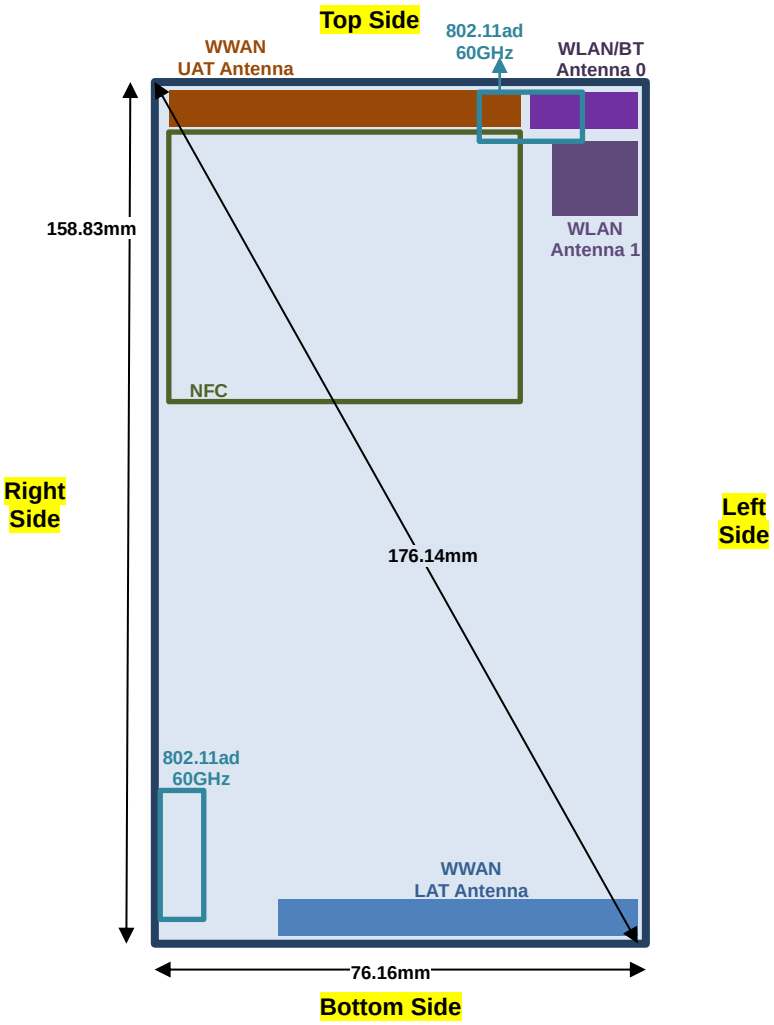
Date	Frequency (GHz)	Source S/N	Probe S/N	DAE S/N	Distance (mm)	Measured 4cm^2 Avg Power Density (W/m^2)	Target 4cm^2 Avg Power Density (W/m^2)	Deviation (%)
2018/7/25	60Hz	1009	9388	854	10	229.00	239.00	-4.18
2018/7/27	60Hz	1009	9388	854	10	229.00	239.00	-4.18
2018/7/30	60Hz	1009	9388	854	10	226.00	239.00	-5.44
2018/8/1	60Hz	1009	9388	854	10	228.00	239.00	-4.60
2018/8/2	60Hz	1009	9388	1424	10	226.00	239.00	-5.44
2018/8/30	60Hz	1009	9388	853	10	227.00	239.00	-5.02
2018/9/28	60Hz	1009	9388	917	10	230.00	239.00	-3.77
2018/9/29	60Hz	1009	9388	917	10	229.00	239.00	-4.18
2018/9/30	60Hz	1009	9388	917	10	229.00	239.00	-4.18
2018/10/01	60Hz	1009	9388	917	10	230.00	239.00	-3.77
2018/10/04	60Hz	1009	9388	910	10	221.00	239.00	-7.53



Verification Setup photo

8. Antenna Location

<Mobile Phone>



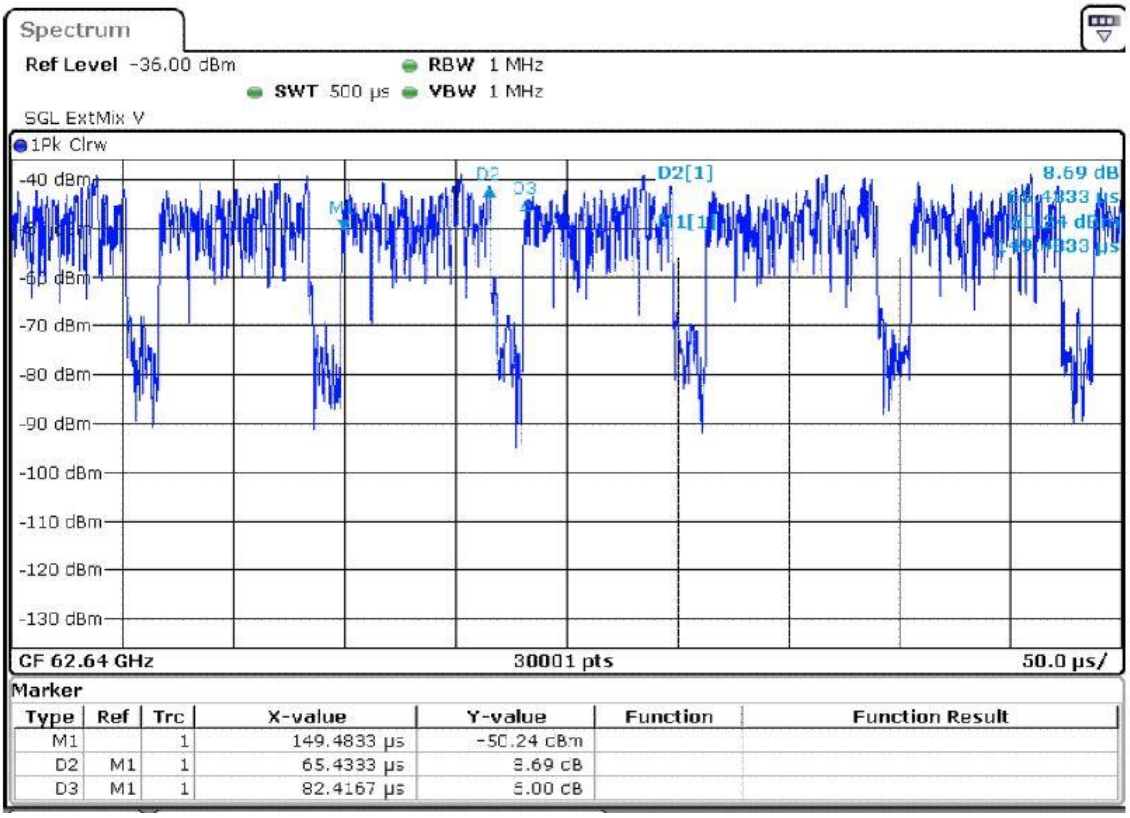
Back View

9. 802.11ad Duty cycle

<Duty Cycle>

The actual 11ad RF signal is a wideband signal and is limited to transmit at 80% duty cycle.

Mode	On Time(ms)	On+Off Time(ms)	Duty Cycle(%)
802.11ad	0.0654333	0.0824167	79.39%



10. Test Setup

1. The 802.11ad PD test was performed of a 2mm separation between sensor and EUT surface (the probe tip is 0.5mm to the EUT surface), to account for exposure conditions in handheld use
2. Using test software, the device under test was configured to transmit maximum power and at 100% duty cycle, at the center frequency of each desired channel. The actual 11ad RF signal is a wideband signal and is limited to transmit at 80% duty cycle. Therefore the measured maximum 4cm^2 average power density was scaled to account for the 80% duty factor.
3. From Qualcomm simulation test results for different antenna modules and exposure planes, limited worst cases were selected for power density measurement
4. The measurement frequency was set at the center frequency of each desired channel.
5. According to TCBC Workshop in October 2018, 4 cm2 averaging area may now be considered.
6. Above 6 GHz, Maximum Permissible Exposure (MPE) limits apply to portable exposure conditions according to 47 CFR §2.1093.

11. RF Exposure Evaluation Results

Plot No.	Wireless Technology	Exposure Plane	Probe Sensor to EUT surface (mm)	Antenna Module	Ch.	Freq. (GHz)	Antenna Configuration	Average EIRP dBm	Measured E peak (V/m)	Measured H peak (A/m)	Measured 4cm^2 Average Normal PD (W/m^2)	Measured 4cm^2 Average Total PD (W/m^2)	4cm^2 Average Total PD (W/m^2)
												100% duty Cycle	80% duty Cycle
1	802.11ad	Back	2mm	Bottom	2	60.48	6	7.35	61.200	0.173	1.660	2.270	1.816
2	802.11ad	Back	2mm	Bottom	1	58.32	2	4.86	81.900	0.218	2.680	3.500	2.800
3	802.11ad	Back	2mm	Bottom	3	62.64	25	9.05	56.800	0.158	1.330	1.910	1.528
4	802.11ad	Back	2mm	Bottom	1	58.32	16	7.62	76.800	0.182	1.360	2.000	1.600
5	802.11ad	Back	2mm	Bottom	2	60.48	25	8.82	68.100	0.198	1.480	2.190	1.752
6	802.11ad	Back	2mm	Bottom	3	62.64	1	8.93	92.600	0.239	2.960	4.010	3.208
7	802.11ad	Back	2mm	Bottom	1	58.32	28	8.09	70.400	0.194	2.280	2.930	2.344
8	802.11ad	Back	2mm	Bottom	2	60.48	13	6.73	63.500	0.190	1.540	2.250	1.800
9	802.11ad	Right Side	2mm	Bottom	2	60.48	29	6.36	33.500	0.088	0.708	1.010	0.808
10	802.11ad	Front	2mm	Bottom	2	60.48	31	10.67	29.600	0.086	0.395	0.536	0.429
11	802.11ad	Front	2mm	Top	1	58.32	50	7.99	78.100	0.235	1.180	1.890	1.512
12	802.11ad	Front	2mm	Top	3	62.64	35	6.86	87.600	0.247	1.830	2.790	2.232
13	802.11ad	Front	2mm	Top	3	62.64	45	9.86	65.100	0.197	1.100	1.690	1.352
14	802.11ad	Front	2mm	Top	1	58.32	63	7.23	97.500	0.388	2.160	2.890	2.312
15	802.11ad	Front	2mm	Top	2	60.48	57	8.31	45.300	0.126	0.662	0.944	0.755
16	802.11ad	Front	2mm	Top	2	60.48	33	8.25	74.700	0.223	1.650	2.270	1.816
17	802.11ad	Front	2mm	Top	3	62.64	62	5.61	53.600	0.141	0.587	0.878	0.702
18	802.11ad	Front	2mm	Top	1	58.32	44	7.00	30.000	0.093	0.262	0.402	0.322
19	802.11ad	Left Side	2mm	Top	2	60.48	53	8.15	23.000	0.070	0.354	0.430	0.344
20	802.11ad	Top Side	2mm	Top	3	62.64	45	9.86	49.100	0.153	1.030	1.290	1.032
21	802.11ad	Back	2mm	Top	2	60.48	51	7.81	30.900	0.087	0.459	0.636	0.509

12. Simultaneous Transmission Analysis

Simultaneous transmission combination scenarios	WWAN LAT	WWAN UAT	2.4GHz WLAN/BT Ant 0	2.4GHz WLAN Ant 1	5GHz WLAN Ant 0	5GHz WLAN Ant 1	802.11ad (Top Ant)	802.11ad (Bottom Ant)
1	☑		☑			☑	☑	
2	☑		☑	☑			☑	
3	☑				☑	☑	☑	
4		☑	☑			☑	☑	
5		☑	☑	☑			☑	
6		☑			☑	☑	☑	
7			☑	☑			☑	
8					☑	☑	☑	
9			☑			☑	☑	
10				☑	☑		☑	
11	☑		☑			☑		☑
12	☑		☑	☑				☑
13	☑				☑	☑		☑
14		☑	☑			☑		☑
15		☑	☑	☑				☑
16		☑			☑	☑		☑
17			☑	☑				☑
18					☑	☑		☑
19			☑			☑		☑
20				☑	☑			☑

General Note:

1. The WWAN and WLAN SAR test results were referring the report of FCC ID: MSQZ01QD (Sporton SAR Report No. FA852405)
2. For 802.11ad, the top and bottom antennas can't transmit simultaneously.
3. The 802.11ad PD test was performed of a 2mm separation between sensor and EUT surface, the test results are conservatively used in simultaneous transmission analysis in body exposure conditions
4. Considering 802.11ad with WWAN / WLAN and Bluetooth can transmit simultaneously, the basic restrictions are on SAR and power density, and summation of these quantities should follow below formula and the simultaneous transmission analysis was following below step:
   i) Use the standalone SAR according original report to collocate with 802.11ad power density at each exposure positions, if the result < 1, additional analysis is not necessary.

   ii) If this ratio is larger than 1, use surface single point SAR measurements and treat as 1 g measurements with 1.6 W/kg as the limit. Use these measurement for the point by point summation and confirm the ratio summation does not exceed 1

$$\sum_{i=100\ \text{kHz}}^{10\ \text{GHz}} \frac{SAR_i}{SAR_L} + \sum_{i>10\ \text{GHz}}^{300\ \text{GHz}} \frac{S_i}{S_L} \le 1$$

12.1 Analysis for 802.11ad top antenna

<For Head Exposure condition>

Head		Reported SAR						AD	100% Power Density	80% Power Density	Step1 Reported SAR/1.6 + 80% PD/10 Summed					Step2 Single Point SAR Value from Top AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)	Step2 Single Point SAR Value from Top AD Location (5G WIFI 0 Use 1g SAR Instead)			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)	Step2 Single Point SAR Value from Top AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)
WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN WIFI0 1g SAR (W/kg)	3 2.4GHz WLAN WIFI1 1g SAR (W/kg)	4 5GHz WLAN WIFI0 1g SAR (W/kg)	5 5GHz WLAN WIFI1 1g SAR (W/kg)	6 Bluetooth Ant 0 1g SAR (W/kg)	Exposure Position	7 Top AD 4cm^2 P (W/m^2)	9 Top AD 4cm^2 P (W/m^2)	1+2+3+9 Summed	1+4+5+9 Summed	1+6+9 Summed	1+2+5+9 Summed	1+5+6+9 Summed	1 WWAN (W/kg)	2 2.4GHz WLAN WIFI0 (W/kg)	3 2.4GHz WLAN WIFI1 (W/kg)	1+2+3+9 Summed	1 WWAN (W/kg)	4 5GHz WLAN WIFI0 (W/kg)	5 5GHz WLAN WIFI1 (W/kg)	1+4+5+9 Summed	1 WWAN (W/kg)	2 2.4GHz WLAN WIFI0 (W/kg)	5 5GHz WLAN WIFI1 (W/kg)	1+2+5+9 Summed
GSM850_LAT	Right Cheek	0.405	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.914**	**1.004**	**0.658**	**0.967**	**0.734**					**0.023**	**0.723**	**0.090**	**0.746**				
	Right Tilted	0.144	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.639**	**0.631**	**0.417**	**0.681**	**0.475**												
	Left Cheek	0.257	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.641**	**0.666**	**0.451**	**0.696**	**0.509**												
	Left Tilted	0.133	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.479**	**0.573**	**0.347**	**0.526**	**0.399**												
GSM1900_LAT	Right Cheek	0.070	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.705**	**0.794**	**0.449**	**0.758**	**0.524**												
	Right Tilted	0.059	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.586**	**0.578**	**0.364**	**0.628**	**0.422**												
	Left Cheek	0.049	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.511**	**0.536**	**0.321**	**0.566**	**0.379**												
	Left Tilted	0.028	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.414**	**0.507**	**0.281**	**0.461**	**0.333**												
WCDMA II_LAT	Right Cheek	0.077	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.709**	**0.799**	**0.453**	**0.762**	**0.529**												
	Right Tilted	0.085	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.603**	**0.594**	**0.380**	**0.644**	**0.438**												
	Left Cheek	0.065	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.521**	**0.546**	**0.331**	**0.576**	**0.389**												
	Left Tilted	0.037	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.419**	**0.513**	**0.287**	**0.466**	**0.339**												
WCDMA IV_LAT	Right Cheek	0.102	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.725**	**0.814**	**0.469**	**0.778**	**0.544**												
	Right Tilted	0.095	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.609**	**0.601**	**0.386**	**0.650**	**0.444**												
	Left Cheek	0.120	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.555**	**0.581**	**0.366**	**0.610**	**0.424**												
	Left Tilted	0.052	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.429**	**0.522**	**0.296**	**0.476**	**0.348**												
WCDMA V_UAT	Right Cheek	0.574	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**1.020**	**1.109**	**0.764**	**1.073**	**0.839**	**0.360**	**0.640**	**0.010**	**0.854**	**0.360**	**0.723**	**0.090**	**0.956**	**0.360**	**0.640**	**0.090**	**0.904**
	Right Tilted	0.421	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.813**	**0.804**	**0.590**	**0.854**	**0.648**												
	Left Cheek	0.660	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.893**	**0.918**	**0.703**	**0.948**	**0.761**												
	Left Tilted	0.468	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.689**	**0.782**	**0.556**	**0.736**	**0.608**												
WCDMA V_LAT	Right Cheek	0.381	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.899**	**0.989**	**0.643**	**0.952**	**0.719**												
	Right Tilted	0.151	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.644**	**0.636**	**0.421**	**0.685**	**0.479**												
	Left Cheek	0.238	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.629**	**0.654**	**0.439**	**0.684**	**0.498**												
	Left Tilted	0.144	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.486**	**0.579**	**0.354**	**0.533**	**0.406**												
LTE Band 2_LAT	Right Cheek	0.103	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.726**	**0.815**	**0.469**	**0.778**	**0.545**												
	Right Tilted	0.101	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.613**	**0.604**	**0.390**	**0.654**	**0.448**												
	Left Cheek	0.071	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.524**	**0.550**	**0.335**	**0.579**	**0.393**												
	Left Tilted	0.034	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.418**	**0.511**	**0.285**	**0.464**	**0.337**												
LTE Band 4_LAT	Right Cheek	0.089	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.717**	**0.806**	**0.461**	**0.769**	**0.536**												
	Right Tilted	0.099	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.611**	**0.603**	**0.389**	**0.653**	**0.447**												
	Left Cheek	0.113	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.551**	**0.576**	**0.361**	**0.606**	**0.419**												
	Left Tilted	0.045	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.424**	**0.518**	**0.292**	**0.471**	**0.344**												
LTE Band 7_LAT	Right Cheek	0.094	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.720**	**0.809**	**0.464**	**0.773**	**0.539**												
	Right Tilted	0.098	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.611**	**0.603**	**0.388**	**0.652**	**0.446**												
	Left Cheek	0.182	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.594**	**0.619**	**0.404**	**0.649**	**0.463**												
	Left Tilted	0.057	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.432**	**0.525**	**0.299**	**0.479**	**0.351**												
LTE Band 12_UAT	Right Cheek	0.379	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.898**	**0.988**	**0.642**	**0.951**	**0.718**												
	Right Tilted	0.281	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.725**	**0.717**	**0.503**	**0.766**	**0.561**												
	Left Cheek	0.443	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.757**	**0.783**	**0.568**	**0.812**	**0.626**												
	Left Tilted	0.316	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.594**	**0.687**	**0.461**	**0.641**	**0.513**												
LTE Band 12_LAT	Right Cheek	0.159	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.761**	**0.850**	**0.504**	**0.813**	**0.580**												
	Right Tilted	0.063	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.589**	**0.581**	**0.366**	**0.630**	**0.424**												
	Left Cheek	0.109	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.548**	**0.574**	**0.359**	**0.603**	**0.417**												
	Left Tilted	0.069	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.439**	**0.533**	**0.307**	**0.486**	**0.359**												
LTE Band 13_UAT	Right Cheek	0.569	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**1.017**	**1.106**	**0.761**	**1.069**	**0.836**	**0.170**	**0.640**	**0.010**	**0.736**	**0.170**	**0.723**	**0.090**	**0.838**	**0.170**	**0.640**	**0.090**	**0.786**
	Right Tilted	0.411	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.806**	**0.798**	**0.584**	**0.848**	**0.642**												
	Left Cheek	0.681	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.906**	**0.931**	**0.716**	**0.961**	**0.774**												
	Left Tilted	0.483	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.698**	**0.791**	**0.566**	**0.745**	**0.618**												
LTE Band 13_LAT	Right Cheek	0.216	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.796**	**0.886**	**0.540**	**0.849**	**0.616**												
	Right Tilted	0.105	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.615**	**0.607**	**0.393**	**0.656**	**0.451**												
	Left Cheek	0.142	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.569**	**0.594**	**0.379**	**0.624**	**0.438**												
	Left Tilted	0.094	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.455**	**0.548**	**0.323**	**0.502**	**0.374**												
LTE Band 26_UAT	Right Cheek	0.725	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**1.114**	**1.204**	**0.858**	**1.167**	**0.934**	**0.214**	**0.640**	**0.010**	**0.763**	**0.214**	**0.723**	**0.090**	**0.865**	**0.214**	**0.640**	**0.090**	**0.813**
	Right Tilted	0.521	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.875**	**0.867**	**0.653**	**0.916**	**0.711**												
	Left Cheek	0.780	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.968**	**0.993**	**0.778**	**1.023**	**0.836**									**0.113**	**0.640**	**0.090**	**0.750**
	Left Tilted	0.568	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.751**	**0.844**	**0.619**	**0.798**	**0.671**												
LTE Band 26_LAT	Right Cheek	0.226	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.803**	**0.892**	**0.546**	**0.855**	**0.622**												
	Right Tilted	0.097	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.610**	**0.602**	**0.388**	**0.651**	**0.446**												
	Left Cheek	0.156	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.578**	**0.603**	**0.388**	**0.633**	**0.446**												
	Left Tilted	0.105	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.462**	**0.555**	**0.329**	**0.509**	**0.381**												
LTE Band 41_LAT	Right Cheek	0.088	0.664	0.037	0.723	0.121	0.291	Front	2.790	2.232	**0.716**	**0.806**	**0.460**	**0.769**	**0.536**												
	Right Tilted	0.097	0.495	0.027	0.416	0.093	0.166	Front	2.790	2.232	**0.610**	**0.602**	**0.388**	**0.651**	**0.446**												
	Left Cheek	0.177	0.406	0.005	0.359	0.093	0.108	Front	2.790	2.232	**0.591**	**0.616**	**0.401**	**0.646**	**0.459**												
	Left Tilted	0.058	0.269	0.008	0.343	0.083	0.065	Front	2.790	2.232	**0.433**	**0.526**	**0.300**	**0.479**	**0.352**												

<For Body Exposure condition>

Hotspot		Reported SAR						AD	100% Power Density	80% Power Density	Step1 Reported SAR/1.6 + 80% PD/10 Summed					Step2 Single Point SAR Value from Top AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)	Step2 Single Point SAR Value from Top AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)
		1	2	3	4	5	6		7	9						1	4	5		1	2	5	
WWAN Band	Exposure Position	WWAN	2.4GHz WLAN WIFI0	2.4GHz WLAN WIFI1	5GHz WLAN WIFI0	5GHz WLAN WIFI1	Bluetooth Ant 0	Exposure Position	Top AD	Top AD	1+2+3+9 Summed	1+4+5+9 Summed	1+6+9 Summed 1g SAR (W/kg)	1+2+5+9 Summed	1+5+6+9 Summed	WWAN	5GHz WLAN WIFI0	5GHz WLAN WIFI1	1+4+5+9 Summed	WWAN	2.4GHz WLAN WIFI0	5GHz WLAN WIFI1	1+2+5+9 Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		4cm^2 P (W/m^2)	4cm^2 P (W/m^2)						(W/kg)	(W/kg)	(W/kg)		(W/kg)	(W/kg)	(W/kg)	
GSM850_LAT	Front	0.704	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.738**	**0.698**	**0.686**	**0.738**	**0.692**								
	Back	0.807	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.663**	**1.009**	**0.573**	**1.012**	**0.974**	**0.020**	**0.174**	**0.737**	**0.633**	**0.020**	**0.028**	**0.737**	**0.541**
	Left side	0.079	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.156**	**0.195**	**0.096**	**0.213**	**0.179**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
GSM1900_LAT	Front	0.466	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.589**	**0.549**	**0.538**	**0.589**	**0.543**								
	Back	0.517	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.482**	**0.828**	**0.392**	**0.831**	**0.793**								
	Left side	0.040	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.131**	**0.171**	**0.071**	**0.189**	**0.155**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
WCDMA II_LAT	Front	0.601	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.673**	**0.634**	**0.622**	**0.674**	**0.628**								
	Back	0.658	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.570**	**0.916**	**0.480**	**0.919**	**0.881**								
	Left side	0.080	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.156**	**0.196**	**0.096**	**0.214**	**0.180**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
WCDMA IV_LAT	Front	0.688	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.728**	**0.688**	**0.676**	**0.728**	**0.682**								
	Back	0.753	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.630**	**0.975**	**0.539**	**0.978**	**0.940**								
	Left side	0.103	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.171**	**0.210**	**0.111**	**0.228**	**0.194**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
WCDMA V_UAT	Front	0.231	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.442**	**0.403**	**0.391**	**0.443**	**0.396**								
	Back	0.265	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.325**	**0.670**	**0.234**	**0.673**	**0.635**								
	Left side	0.161	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.207**	**0.246**	**0.147**	**0.264**	**0.231**								
	Top side	0.146	0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.240**	**0.263**	**0.204**	**0.245**	**0.216**								
WCDMA V_LAT	Front	0.669	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.716**	**0.676**	**0.664**	**0.716**	**0.670**								
	Back	0.736	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.619**	**0.965**	**0.528**	**0.968**	**0.930**								
	Left side	0.101	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.169**	**0.209**	**0.109**	**0.227**	**0.193**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
LTE Band 2_LAT	Front	0.591	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.667**	**0.628**	**0.616**	**0.668**	**0.621**								
	Back	0.657	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.570**	**0.915**	**0.479**	**0.918**	**0.880**								
	Left side	0.021	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.119**	**0.159**	**0.059**	**0.177**	**0.143**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
LTE Band 4_LAT	Front	0.618	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.684**	**0.644**	**0.633**	**0.684**	**0.638**								
	Back	0.711	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.603**	**0.949**	**0.513**	**0.952**	**0.914**								
	Left side	0.106	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.173**	**0.212**	**0.113**	**0.230**	**0.196**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
LTE Band 7_LAT	Front	0.542	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.636**	**0.597**	**0.585**	**0.637**	**0.591**								
	Back	0.509	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.477**	**0.823**	**0.387**	**0.826**	**0.788**								
	Left side	0.513	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.427**	**0.466**	**0.367**	**0.484**	**0.451**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
LTE Band 12_UAT	Front	0.091	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.354**	**0.315**	**0.303**	**0.355**	**0.309**								
	Back	0.102	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.223**	**0.568**	**0.132**	**0.572**	**0.533**								
	Left side	0.053	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.139**	**0.179**	**0.079**	**0.197**	**0.163**								
	Top side	0.039	0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.173**	**0.196**	**0.137**	**0.178**	**0.149**								
LTE Band 12_LAT	Front	0.466	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.589**	**0.549**	**0.538**	**0.589**	**0.543**								
	Back	0.487	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.463**	**0.809**	**0.373**	**0.812**	**0.774**								
	Left side	0.177	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.217**	**0.256**	**0.157**	**0.274**	**0.241**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
LTE Band 13_UAT	Front	0.151	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.392**	**0.353**	**0.341**	**0.393**	**0.346**								
	Back	0.160	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.259**	**0.605**	**0.168**	**0.608**	**0.570**								
	Left side	0.109	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.174**	**0.214**	**0.114**	**0.232**	**0.198**								
	Top side	0.085	0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.202**	**0.225**	**0.166**	**0.207**	**0.178**								
LTE Band 13_LAT	Front	0.565	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.651**	**0.611**	**0.599**	**0.651**	**0.605**								
	Back	0.576	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.519**	**0.865**	**0.428**	**0.868**	**0.830**								
	Left side	0.183	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.221**	**0.260**	**0.161**	**0.278**	**0.244**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
LTE Band 26_UAT	Front	0.165	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.401**	**0.361**	**0.349**	**0.401**	**0.355**								
	Back	0.164	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.262**	**0.607**	**0.171**	**0.610**	**0.572**								
	Left side	0.118	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.180**	**0.219**	**0.120**	**0.238**	**0.204**								
	Top side	0.107	0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.216**	**0.239**	**0.179**	**0.221**	**0.192**								
LTE Band 26_LAT	Front	0.658	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.709**	**0.669**	**0.658**	**0.709**	**0.663**								
	Back	0.680	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.584**	**0.930**	**0.493**	**0.933**	**0.895**								
	Left side	0.095	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.166**	**0.205**	**0.106**	**0.223**	**0.189**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								
LTE Band 41_LAT	Front	0.598	0.111	0.008	0.047	0.009	0.037	Front	2.790	2.232	**0.671**	**0.632**	**0.620**	**0.672**	**0.626**								
	Back	0.801	0.089	0.084	0.084	0.642	0.028	Back	0.636	0.509	**0.660**	**1.005**	**0.569**	**1.008**	**0.970**	**0.000**	**0.174**	**0.737**	**0.620**	**0.000**	**0.028**	**0.737**	**0.529**
	Left side	0.535	0.073	0.042	0.044	0.134	0.019	Left side	0.430	0.344	**0.441**	**0.480**	**0.381**	**0.498**	**0.464**								
	Top side		0.061	0.012	0.090	0.020	0.015	Top side	1.290	1.032	**0.149**	**0.172**	**0.113**	**0.154**	**0.125**								

12.2 Analysis for 802.11ad bottom antenna

<For Head Exposure condition>

Head		Reported SAR						AD	100% Power Density	80% Power Density	Step1 Reported SAR/1.6 + 80% PD/10 Summed					Step2 Single Point SAR Value from Bottom AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + PD/10)
WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Ant 1 1g SAR (W/kg)	3 2.4GHz WLAN Ant 2 1g SAR (W/kg)	4 5GHz WLAN Ant 1 1g SAR (W/kg)	5 5GHz WLAN Ant 2 1g SAR (W/kg)	6 Bluetooth Ant 0 1g SAR (W/kg)	Exposure Position	8 Bottom AD 4cm^2 P (W/m^2)	10 Bottom AD 4cm^2 P W/m^2)	1+2+3+10 Summed	1+4+5+10 Summed	1+6+10 Summed 1g SAR (W/kg)	1+2+5+10 Summed	1+5+6+10 Summed	1 WWAN (W/kg)	4 5GHz WLAN Ant 1 (W/kg)	5 5GHz WLAN Ant 2 (W/kg)	1+4+5+10 Summed
GSM850_LAT	Right Cheek	0.405	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.734**	**0.824**	**0.478**	**0.787**	**0.554**				
	Right Tilted	0.144	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.459**	**0.451**	**0.237**	**0.500**	**0.295**				
	Left Cheek	0.257	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.460**	**0.486**	**0.271**	**0.515**	**0.329**				
	Left Tilted	0.133	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.299**	**0.392**	**0.167**	**0.346**	**0.219**				
GSM1900_LAT	Right Cheek	0.070	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.525**	**0.614**	**0.269**	**0.577**	**0.344**				
	Right Tilted	0.059	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.406**	**0.398**	**0.184**	**0.447**	**0.242**				
	Left Cheek	0.049	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.330**	**0.356**	**0.141**	**0.385**	**0.199**				
	Left Tilted	0.028	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.234**	**0.327**	**0.101**	**0.280**	**0.153**				
WCDMA II_LAT	Right Cheek	0.077	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.529**	**0.619**	**0.273**	**0.582**	**0.349**				
	Right Tilted	0.085	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.422**	**0.414**	**0.200**	**0.464**	**0.258**				
	Left Cheek	0.065	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.340**	**0.366**	**0.151**	**0.395**	**0.209**				
	Left Tilted	0.037	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.239**	**0.332**	**0.107**	**0.286**	**0.159**				
WCDMA IV_LAT	Right Cheek	0.102	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.545**	**0.634**	**0.289**	**0.597**	**0.364**				
	Right Tilted	0.095	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.429**	**0.420**	**0.206**	**0.470**	**0.264**				
	Left Cheek	0.120	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.375**	**0.400**	**0.185**	**0.430**	**0.244**				
	Left Tilted	0.052	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.249**	**0.342**	**0.116**	**0.295**	**0.168**				
WCDMA V_UAT	Right Cheek	0.574	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.840**	**0.929**	**0.584**	**0.892**	**0.659**				
	Right Tilted	0.421	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.632**	**0.624**	**0.410**	**0.674**	**0.468**				
	Left Cheek	0.660	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.712**	**0.738**	**0.523**	**0.767**	**0.581**				
	Left Tilted	0.468	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.509**	**0.602**	**0.376**	**0.555**	**0.428**				
WCDMA V_LAT	Right Cheek	0.381	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.719**	**0.809**	**0.463**	**0.772**	**0.539**				
	Right Tilted	0.151	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.464**	**0.455**	**0.241**	**0.505**	**0.299**				
	Left Cheek	0.238	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.449**	**0.474**	**0.259**	**0.504**	**0.317**				
	Left Tilted	0.144	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.306**	**0.399**	**0.174**	**0.353**	**0.225**				
LTE Band 2_LAT	Right Cheek	0.103	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.545**	**0.635**	**0.289**	**0.598**	**0.365**				
	Right Tilted	0.101	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.432**	**0.424**	**0.210**	**0.474**	**0.268**				
	Left Cheek	0.071	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.344**	**0.370**	**0.155**	**0.399**	**0.213**				
	Left Tilted	0.034	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.237**	**0.330**	**0.105**	**0.284**	**0.157**				
LTE Band 4_LAT	Right Cheek	0.089	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.537**	**0.626**	**0.280**	**0.589**	**0.356**				
	Right Tilted	0.099	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.431**	**0.423**	**0.209**	**0.472**	**0.267**				
	Left Cheek	0.113	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.370**	**0.396**	**0.181**	**0.425**	**0.239**				
	Left Tilted	0.045	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.244**	**0.337**	**0.112**	**0.291**	**0.164**				
LTE Band 7_LAT	Right Cheek	0.094	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.540**	**0.629**	**0.284**	**0.592**	**0.359**				
	Right Tilted	0.098	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.430**	**0.422**	**0.208**	**0.472**	**0.266**				
	Left Cheek	0.182	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.414**	**0.439**	**0.224**	**0.469**	**0.282**				
	Left Tilted	0.057	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.252**	**0.345**	**0.119**	**0.299**	**0.171**				
LTE Band 12_UAT	Right Cheek	0.379	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.718**	**0.807**	**0.462**	**0.770**	**0.537**				
	Right Tilted	0.281	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.545**	**0.537**	**0.322**	**0.586**	**0.380**				
	Left Cheek	0.443	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.577**	**0.602**	**0.387**	**0.632**	**0.445**				
	Left Tilted	0.316	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.414**	**0.507**	**0.281**	**0.460**	**0.333**				
LTE Band 12_LAT	Right Cheek	0.159	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.580**	**0.670**	**0.324**	**0.633**	**0.400**				
	Right Tilted	0.063	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.409**	**0.400**	**0.186**	**0.450**	**0.244**				
	Left Cheek	0.109	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.368**	**0.394**	**0.179**	**0.423**	**0.237**				
	Left Tilted	0.069	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.259**	**0.352**	**0.127**	**0.306**	**0.179**				
LTE Band 13_UAT	Right Cheek	0.569	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.837**	**0.926**	**0.580**	**0.889**	**0.656**				
	Right Tilted	0.411	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.626**	**0.618**	**0.404**	**0.667**	**0.462**				
	Left Cheek	0.681	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.725**	**0.751**	**0.536**	**0.780**	**0.594**				
	Left Tilted	0.483	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.518**	**0.611**	**0.385**	**0.565**	**0.437**				
LTE Band 13_LAT	Right Cheek	0.216	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.616**	**0.705**	**0.360**	**0.669**	**0.435**				
	Right Tilted	0.105	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.435**	**0.427**	**0.212**	**0.476**	**0.270**				
	Left Cheek	0.142	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.389**	**0.414**	**0.199**	**0.444**	**0.257**				
	Left Tilted	0.094	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.275**	**0.368**	**0.142**	**0.322**	**0.194**				
LTE Band 26_UAT	Right Cheek	0.725	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.934**	**1.024**	**0.678**	**0.987**	**0.754**	**0.000**	**0.000**	**0.000**	**0.043**
	Right Tilted	0.521	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.695**	**0.687**	**0.472**	**0.736**	**0.530**				
	Left Cheek	0.780	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.787**	**0.813**	**0.598**	**0.842**	**0.656**				
	Left Tilted	0.568	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.571**	**0.664**	**0.439**	**0.618**	**0.490**				
LTE Band 26_LAT	Right Cheek	0.226	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.622**	**0.712**	**0.366**	**0.675**	**0.442**				
	Right Tilted	0.097	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.430**	**0.422**	**0.207**	**0.471**	**0.265**				
	Left Cheek	0.156	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.397**	**0.423**	**0.208**	**0.452**	**0.266**				
	Left Tilted	0.105	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.282**	**0.375**	**0.149**	**0.329**	**0.201**				
LTE Band 41_LAT	Right Cheek	0.088	0.664	0.037	0.723	0.121	0.291	Front	0.536	0.429	**0.536**	**0.625**	**0.280**	**0.589**	**0.355**				
	Right Tilted	0.097	0.495	0.027	0.416	0.093	0.166	Front	0.536	0.429	**0.430**	**0.422**	**0.207**	**0.471**	**0.265**				
	Left Cheek	0.177	0.406	0.005	0.359	0.093	0.108	Front	0.536	0.429	**0.410**	**0.436**	**0.221**	**0.465**	**0.279**				
	Left Tilted	0.058	0.269	0.008	0.343	0.083	0.065	Front	0.536	0.429	**0.252**	**0.345**	**0.120**	**0.299**	**0.172**				

<For Body Exposure condition>

Hotspot		Reported SAR						AD	100% Power Density	80% Power Density	Step1 Reported SAR/1.6 + 80% PD/10 Summed					Step2 Single Point SAR Value from Bottom AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)	Step2 Single Point SAR Value from Bottom AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)	Step2 Single Point SAR Value from Bottom AD Location			Step2 Single Point SAR from Bottom AD Location Summed (Peak SAR/1.6 + 80% PD/10)
WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN WIFI0 1g SAR (W/kg)	3 2.4GHz WLAN WIFI1 1g SAR (W/kg)	4 5GHz WLAN WIFI0 1g SAR (W/kg)	5 5GHz WLAN WIFI1 1g SAR (W/kg)	6 Bluetooth Ant 0 1g SAR (W/kg)	Exposure Position	8 Bottom AD 4cm^2 P (W/m^2)	10 Bottom AD 4cm^2 P (W/m^2)	1+2+3+10 Summed	1+4+5+10 Summed	1+6+10 Summed	1+2+5+10 Summed	1+5+6+10 Summed	1 WWAN (W/kg)	4 5GHz WLAN WIFI0 (W/kg)	5 5GHz WLAN WIFI1 (W/kg)	1+4+5+10 Summed	1 WWAN (W/kg)	2 2.4GHz WLAN WIFI0 (W/kg)	5 5GHz WLAN WIFI1 (W/kg)	1+2+5+10 Summed	1 WWAN (W/kg)	5 5GHz WLAN WIFI1 (W/kg)	6 Bluetooth Ant 0 (W/kg)	1+5+6+10 Summed
GSM850_LAT	Front	0.704	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.557**	**0.518**	**0.506**	**0.558**	**0.512**												
	Back	0.807	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.933**	**1.279**	**0.843**	**1.282**	**1.244**	**0.379**	**0.000**	**0.000**	**0.558**	**0.379**	**0.000**	**0.000**	**0.558**	**0.379**	**0.000**	**0.000**	**0.558**
	Right side	0.438						Right side	1.010	0.808	**0.355**	**0.355**	**0.355**	**0.355**	**0.355**												
GSM1900_LAT	Front	0.466	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.409**	**0.369**	**0.357**	**0.409**	**0.363**												
	Back	0.517	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.752**	**1.098**	**0.661**	**1.101**	**1.063**	**0.429**	**0.000**	**0.000**	**0.589**	**0.429**	**0.000**	**0.000**	**0.589**	**0.429**	**0.000**	**0.000**	**0.589**
	Right side	0.109						Right side	1.010	0.808	**0.149**	**0.149**	**0.149**	**0.149**	**0.149**												
WCDMA II_LAT	Front	0.601	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.493**	**0.454**	**0.442**	**0.494**	**0.447**												
	Back	0.658	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.840**	**1.186**	**0.750**	**1.189**	**1.151**	**0.444**	**0.000**	**0.000**	**0.598**	**0.444**	**0.000**	**0.000**	**0.598**	**0.444**	**0.000**	**0.000**	**0.598**
	Right side	0.107						Right side	1.010	0.808	**0.148**	**0.148**	**0.148**	**0.148**	**0.148**												
WCDMA IV_LAT	Front	0.688	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.547**	**0.508**	**0.496**	**0.548**	**0.502**												
	Back	0.753	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.900**	**1.245**	**0.809**	**1.248**	**1.210**	**0.370**	**0.000**	**0.000**	**0.552**	**0.370**	**0.000**	**0.000**	**0.552**	**0.370**	**0.000**	**0.000**	**0.552**
	Right side	0.066						Right side	1.010	0.808	**0.122**	**0.122**	**0.122**	**0.122**	**0.122**												
WCDMA V_UAT	Front	0.231	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.262**	**0.222**	**0.210**	**0.262**	**0.216**												
	Back	0.265	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.595**	**0.940**	**0.504**	**0.943**	**0.905**												
	Right side	0.034						Right side	1.010	0.808	**0.102**	**0.102**	**0.102**	**0.102**	**0.102**												
WCDMA V_LAT	Front	0.669	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.535**	**0.496**	**0.484**	**0.536**	**0.490**												
	Back	0.736	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.889**	**1.235**	**0.798**	**1.238**	**1.200**	**0.484**	**0.000**	**0.000**	**0.623**	**0.484**	**0.000**	**0.000**	**0.623**	**0.484**	**0.000**	**0.000**	**0.623**
	Right side	0.454						Right side	1.010	0.808	**0.365**	**0.365**	**0.365**	**0.365**	**0.365**												
LTE Band 2_LAT	Front	0.591	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.487**	**0.447**	**0.435**	**0.487**	**0.441**												
	Back	0.657	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.840**	**1.185**	**0.749**	**1.188**	**1.150**	**0.274**	**0.000**	**0.000**	**0.492**	**0.274**	**0.000**	**0.000**	**0.492**	**0.274**	**0.000**	**0.000**	**0.492**
	Right side	0.103						Right side	1.010	0.808	**0.145**	**0.145**	**0.145**	**0.145**	**0.145**												
LTE Band 4_LAT	Front	0.618	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.504**	**0.464**	**0.452**	**0.504**	**0.458**												
	Back	0.711	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.873**	**1.219**	**0.783**	**1.222**	**1.184**	**0.070**	**0.000**	**0.000**	**0.365**	**0.070**	**0.000**	**0.000**	**0.365**	**0.070**	**0.000**	**0.000**	**0.365**
	Right side	0.093						Right side	1.010	0.808	**0.139**	**0.139**	**0.139**	**0.139**	**0.139**												
LTE Band 7_LAT	Front	0.542	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.456**	**0.417**	**0.405**	**0.457**	**0.410**												
	Back	0.509	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.747**	**1.093**	**0.656**	**1.096**	**1.058**	**0.134**	**0.000**	**0.000**	**0.405**	**0.134**	**0.000**	**0.000**	**0.405**	**0.134**	**0.000**	**0.000**	**0.405**
	Right side	0.065						Right side	1.010	0.808	**0.121**	**0.121**	**0.121**	**0.121**	**0.121**												
LTE Band 12_UAT	Front	0.091	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.174**	**0.135**	**0.123**	**0.175**	**0.129**												
	Back	0.102	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.493**	**0.838**	**0.402**	**0.841**	**0.803**												
	Right side	0.027						Right side	1.010	0.808	**0.098**	**0.098**	**0.098**	**0.098**	**0.098**												
LTE Band 12_LAT	Front	0.466	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.409**	**0.369**	**0.357**	**0.409**	**0.363**												
	Back	0.487	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.733**	**1.079**	**0.643**	**1.082**	**1.044**	**0.187**	**0.000**	**0.000**	**0.438**	**0.187**	**0.000**	**0.000**	**0.438**	**0.187**	**0.000**	**0.000**	**0.438**
	Right side	0.330						Right side	1.010	0.808	**0.287**	**0.287**	**0.287**	**0.287**	**0.287**												
LTE Band 13_UAT	Front	0.151	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.212**	**0.172**	**0.160**	**0.212**	**0.166**												
	Back	0.160	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.529**	**0.875**	**0.438**	**0.878**	**0.840**												
	Right side	0.038						Right side	1.010	0.808	**0.105**	**0.105**	**0.105**	**0.105**	**0.105**												
LTE Band 13_LAT	Front	0.565	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.470**	**0.431**	**0.419**	**0.471**	**0.425**												
	Back	0.576	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.789**	**1.135**	**0.698**	**1.138**	**1.100**	**0.389**	**0.000**	**0.000**	**0.564**	**0.389**	**0.000**	**0.000**	**0.564**	**0.389**	**0.000**	**0.000**	**0.564**
	Right side	0.358						Right side	1.010	0.808	**0.305**	**0.305**	**0.305**	**0.305**	**0.305**												
LTE Band 26_UAT	Front	0.165	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.220**	**0.181**	**0.169**	**0.221**	**0.175**												
	Back	0.164	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.531**	**0.877**	**0.441**	**0.880**	**0.842**												
	Right side	0.030						Right side	1.010	0.808	**0.100**	**0.100**	**0.100**	**0.100**	**0.100**												
LTE Band 26_LAT	Front	0.658	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.529**	**0.489**	**0.477**	**0.529**	**0.483**												
	Back	0.680	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.854**	**1.200**	**0.763**	**1.203**	**1.165**	**0.559**	**0.000**	**0.000**	**0.670**	**0.559**	**0.000**	**0.000**	**0.670**	**0.559**	**0.000**	**0.000**	**0.670**
	Right side	0.397						Right side	1.010	0.808	**0.329**	**0.329**	**0.329**	**0.329**	**0.329**												
LTE Band 41_LAT	Front	0.598	0.111	0.008	0.047	0.009	0.037	Front	0.536	0.429	**0.491**	**0.452**	**0.440**	**0.492**	**0.445**												
	Back	0.801	0.089	0.084	0.084	0.642	0.028	Back	4.010	3.208	**0.930**	**1.275**	**0.839**	**1.278**	**1.240**	**0.289**	**0.000**	**0.000**	**0.501**	**0.289**	**0.000**	**0.000**	**0.501**	**0.289**	**0.000**	**0.000**	**0.501**
	Right side	0.062						Right side	1.010	0.808	**0.120**	**0.120**	**0.120**	**0.120**	**0.120**												

Test Engineer： San Lin and Nick Yu

13. Uncertainty Assessment

Preliminary uncertainty budget for Module mmWave based on the IEC 62209 standard family and in compliance with the WG10 draft report. The budget is valid for evaluation distances > λ/2π. For specific tests and configurations, the Uncertainty could be considerably smaller.

Preliminary Module mmWave Uncertainty Budget Evaluation Distances to the Antennas > λ / 2π Base on the 62209 Standard Family						
Error Description	**Uncertainty Value (±%)**	**Probability**	**Divisor**	**(Ci)**	**Standard Uncertainty (±%)**	**(Vi) Veff**
Measurement System						
Probe Calibration	0.49	N	1	1	0.49	∞
Hemispherical Isotrop	0.50	R	1.732	1	0.29	∞
Linearity	0.20	R	1.732	0	0.00	∞
System Detection Limits	0.04	R	1.732	1	0.02	∞
Modulation Response	0.40	R	1.732	1	0.23	∞
Readout Electronics	0.03	N	1	1	0.03	∞
Response Time	0.00	R	1.732	1	0.00	∞
Integration Time	0.00	R	1.732	1	0.00	∞
RF Ambient Noise	0.04	R	1.732	1	0.02	∞
RF Ambient Reflections	0.21	R	1.732	1	0.12	∞
Probe Positioner	0.04	R	1.732	1	0.02	∞
Probe Positioning	0.30	R	1.732	1	0.17	∞
S_{avg} Reconstruction	0.60	R	1.732	1	0.35	∞
Test Sample Related						
Power Drift	0.10	R	1.732	1	0.06	∞
Input Power	0.27	N	1	0	0.00	∞
Combined Std. Uncertainty					0.74%	∞
Coverage Factor for 95 %					K=2	
Expanded STD Uncertainty					1.48%	

14. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[3] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.