

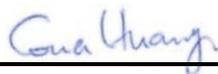
RF Exposure Report

(Part 1 : Test under static transmission scenario)

FCC ID : PY322300575
Equipment : Netgear 5G MHS Travel Router
Brand Name : Netgear
Model Name : MR6550
Applicant : Netgear Inc
350 E. Plumeria Drive, San Jose, CA
95134, United States
Standard : FCC 47 CFR Part 2 (2.1093)

We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR part2.1093 and has been pass the FCC requirement.

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



Approved by: Cona Huang / Deputy Manager



Sporton International Inc. EMC & Wireless Communications Laboratory
No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan



Table of Contents

1. Summary..... 4

2. Guidance Applied..... 4

3. Equipment Under Test (EUT) Information..... 5

 3.1 General Information 5

4. RF Exposure Limits..... 6

 4.1 Uncontrolled Environment..... 6

 4.2 Controlled Environment..... 6

5. System Description and Setup 7

 5.1 Test Site Location..... 7

 5.2 EUMmWave Probe / E-Field 5G Probe 8

 5.3 Data Acquisition Electronics (DAE) 9

 5.4 Scan configuration 9

6. Test Equipment List..... 9

7. System Verification Source.....10

8. Power Density System Verification11

9. System Verification Results11

 9.1 Computation of the Electric Field Polarization Ellipse12

 9.2 Total Field and Power Flux Density Reconstruction12

 9.3 Test Positions.....13

10. RF Exposure Evaluation Results13

11. Simultaneous-Tx analysis14

 11.1 5G NR + LTE + WLAN Sim-Tx analysis14

 11.2 Simultaneous transmission analysis for WiFi + 5G NR15

12. Uncertainty Assessment16

13. References.....17

Appendix A. Plots of System Performance Check

Appendix B. Plots of Power Density Measurement

Appendix C. DASY Calibration Certificate

Appendix D. Combined PD Verification for 2nd Generation of Qualcomm Smart Transmit

Appendix E. Test Setup Photo



1. Summary

The maximum measured average power density found during testing for Netgear Inc, Netgear 5G MHS Travel Router, are as follows.

Standalone transmission			Simultaneous transmission with other transmitters
RF Transmitter		Measured PD (mW/cm ²)	Reported PD (mW/cm ²)
5G FR2	n260	0.403	0.75
	n261	0.398	0.75
Result			PASS
Test Date			2022/10/1 ~ 2022/10/23
			Summation of Exposure Ratio
			0.848

This device is in compliance with Human Exposure to RF Radiation Limits (1.0 mW/cm²) specified in FCC 47 CFR part 1.1310

Reviewed by: Jason Wang
Report Producer: Paula Chen

2. Guidance Applied

The Power Density testing specification, method, and procedure for this device is in accordance with the following standards, below KDB may not include TAF scope:

- 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
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- TCBC workshop notes
- IEC Draft TR 63170



3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Netgear 5G MHS Travel Router
Brand Name	Netgear
Model Name	MR6550
FCC ID	PY322300575
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n30: 2305 MHz ~ 2315 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n77: 3450MHz ~ 3550MHz, 3700 MHz ~ 3980 MHz 5G NR n260: 37GHz ~ 40GHz 5G NR n261: 27.5GHz ~ 28.35GHz WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz WLAN 6E: 5925 MHz ~ 6425 MHz, 6425 MHz ~ 6525 MHz, 6525 MHz ~ 6875 MHz, 6875 MHz ~ 7125 MHz
Mode	LTE: QPSK, 16QAM, 64QAM, 256QAM 5G FR1: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM 5G FR2: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160
EUT Stage	Identical Prototype



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 $1.0 \text{ mW/cm}^2 = 10 \text{ W/m}^2$

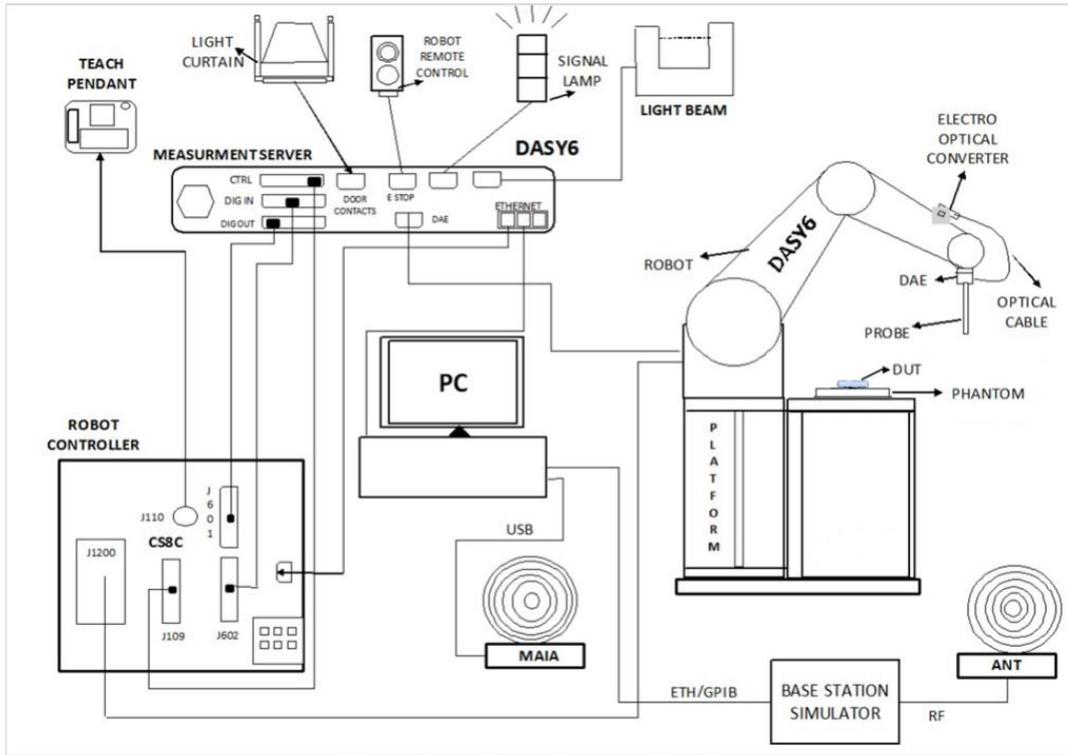
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000	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

Table 1

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
- EUmmWVx probe
- 5G Phantom cover



5.1 Test Site Location

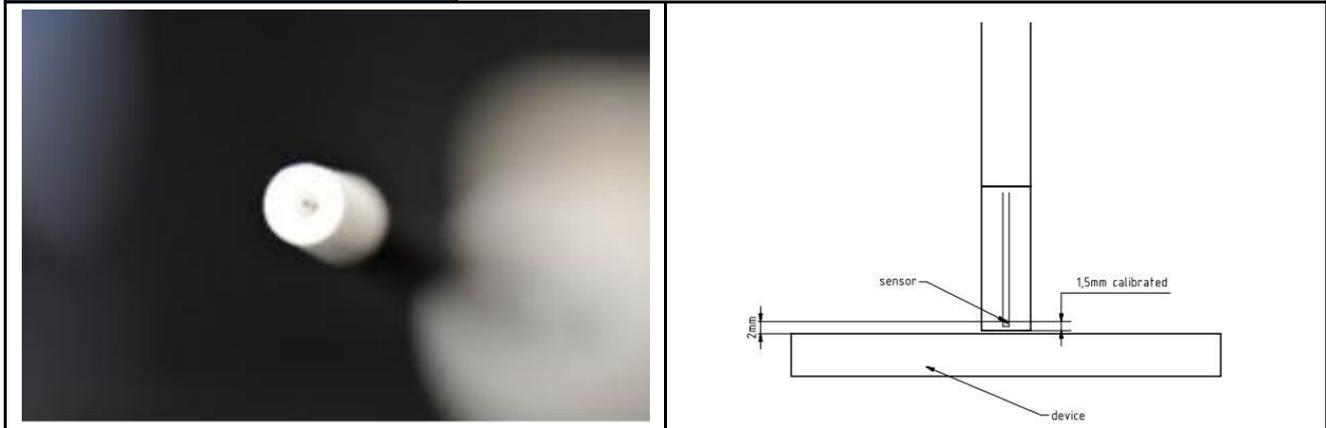
Sporton Lab and below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No.TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	TW1190 No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, CHINESE TAIPEI
Test Site No.	SAR06-HY

5.2 E UmmWave 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.

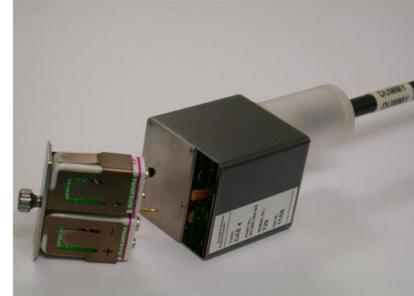
Frequency	750 MHz – 110 GHz
Probe Overall Length	320 mm
Probe Body Diameter	8.0 mm
Tip Length	23.0 mm
Tip Diameter	8.0 mm
Probe's two dipoles length	0.9 mm – Diode loaded
Dynamic Range	< 20 V/m - 10000 V/m with PRE-10 (min < 50 V/m - 3000 V/m)
Position Precision	< 0.2 mm
Distance between diode sensors 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



5.3 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.



5.4 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.

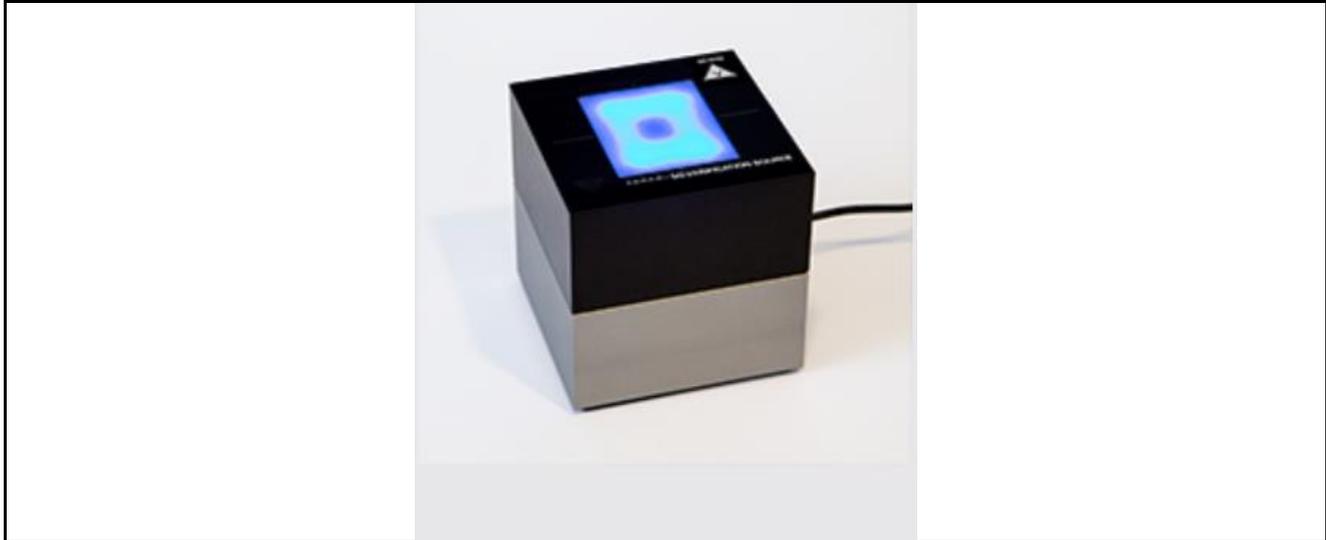
6. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	5G Verification Source	30GHz	1007	Nov. 15, 2021	Nov. 14, 2022
SPEAG	5G Verification Source	30GHz	1009	May. 24, 2022	May. 23, 2023
SPEAG	EUmmWV Probe Tip Protection	EUmmWV4	9441	Nov. 24, 2021	Nov. 23, 2022
SPEAG	Data Acquisition Electronics	DAE4	376	Nov. 22, 2021	Nov. 21, 2022
TESTO	Hygro meter	608-H1	45256952	Oct. 29, 2021	Oct. 28, 2022
TESTO	Hygro meter	608-H1	45256953	Oct. 29, 2021	Oct. 28, 2022
Aglient	Spectrum Analyzer	E4408B	MY44211028	Aug. 19, 2021	Aug. 17, 2023
Custom Microwave	Standard Horn antenna	M15RH	V91113-A	NCR	NCR

7. System Verification Source

The System Verification sources at 30 GHz and above comprise horn-antennas and very stable signal generators.

Model	Ka-band horn antenna
Calibrated frequency:	30 GHz at 10mm from the case surface
Frequency accuracy	± 100 MHz
E-field polarization	linear
Harmonics	-20 dBc
Total radiated power	14 dBm
Power stability	0.05 dB
Power consumption	5 W
Size	00 x 100 x 100 mm
Weight	1 kg



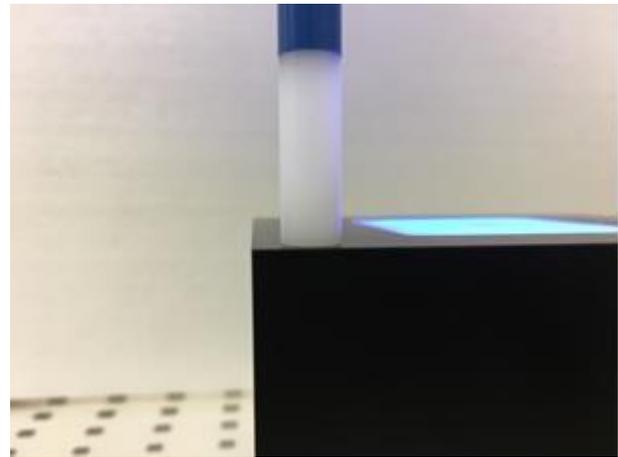
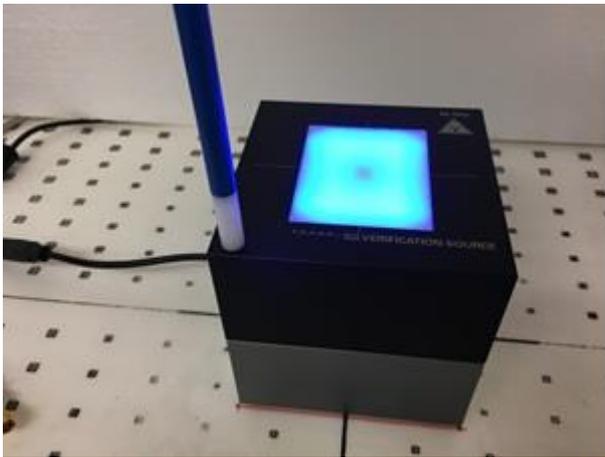
8. Power Density System Verification

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 0.66dB of the calibrated targets.

Frequency [GHz]	Grid step	Grid extent X/Y [mm]	Measurement points
10	0.25 ($\frac{\lambda}{4}$)	120/120	16 × 16
30	0.25 ($\frac{\lambda}{4}$)	60/60	24 × 24
60	0.25 ($\frac{\lambda}{4}$)	32.5/32.5	26 × 26
90	0.25 ($\frac{\lambda}{4}$)	30/30	36 × 36

Settings for measurement of verification sources



Verification Setup photo

9. System Verification Results

Frequency (GHz)	5G Verification Source	Probe S/N	DAE S/N	Distance (mm)	Measured 4 cm ² (W/m ²)	Targeted 4 cm ² (W/m ²)	Deviation (dB)	Date
30G	30GHz_1007	9441	376	10	32.2	35.9	-0.47	2022/10/1
30G	30GHz_1009	9441	854	10	27.1	29.8	-0.41	2022/10/22

9.1 Computation of the Electric Field Polarization Ellipse

For the numerical description of an arbitrarily oriented ellipse in three-dimensional space, five parameters are needed: the semi-major axis (a), the semi-minor axis (b), two angles describing the orientation of the normal vector of the ellipse (ϕ , θ), and one angle describing the tilt of the semi-major axis (ψ). For the two extreme cases, i.e., circular and linear polarizations, three parameters only (a , ϕ and θ) are sufficient for the description of the incident field.

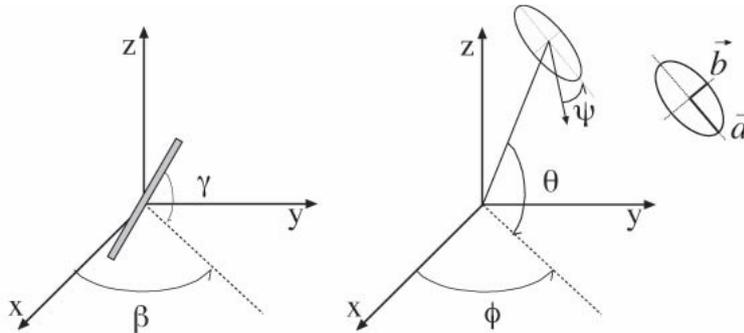


Illustration of the angles used for the numerical description of the sensor and the orientation of an ellipse in 3-D space.

For the reconstruction of the ellipse parameters from measured data, the problem can be reformulated as a nonlinear search problem. The semi-major and semi-minor axes of an elliptical field can be expressed as functions of the three angles (ϕ , θ and ψ). The parameters can be uniquely determined towards minimizing the error based on least-squares for the given set of angles and the measured data. In this way, the number of free parameters is reduced from five to three, which means that at least three sensor readings are necessary to gain sufficient information for the reconstruction of the ellipse parameters. However, to suppress the noise and increase the reconstruction accuracy, it is desirable that the system of equations be over determined. The solution to use a probe consisting of two sensors angled by r_1 and r_2 toward the probe axis and to perform measurements at three angular positions of the probe, i.e., at β_1 , β_2 and β_3 , results in over-determinations by a factor of two. If there is a need for more information or increased accuracy, more rotation angles can be added. The reconstruction of the ellipse parameters can be separated into linear and non-linear parts that are best solved by the Givens algorithm combined with a downhill simplex algorithm. To minimize the mutual coupling, sensor angles are set with a shift of 90 degree ($r_2 = r_1 + 90$ degree), and to simplify, the first rotation angle of the probe (β_1) can be set to 0 degree.

9.2 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.

- $|Re\{S\}|$ is the total Poynting vector
- $\mathbf{n} \cdot Re\{S\}$ is the normal Poynting vector

The software post-processing reports to values, "S avg tot" and "S avg inc". "S avg tot" represents average total power density (all three xyz components included), and "S avg inc" represents average normal power density. The average total power density "S avg tot" is reported to determine the device compliance.

9.3 Test Positions

Band	Antenna Module	Measurement Plane					
		Front 10mm	Back 10mm	Left Side 10mm	Right Side 10mm	Top Side 10mm	Bottom Side 10mm
5G NR Band 260 / 261	0	No	No	Yes	No	No	No
	1	No	No	No	Yes	No	No

From the Part 0 and simulation report, beam IDs with highest PD and corresponding input power limit were selected to be tested for each antenna module and for each frequency band.

10. RF Exposure Evaluation Results

- The PD test was performed of a 10mm separation between sensor and EUT surface.
- According to TCBC Workshop in October 2018, 4 cm² averaging area are used.
- This device is enabled with Qualcomm® Smart Transmit feature, smart transmit will manage and ensure LTE and 5G simultaneous transmission is compliant. The validation of the time-averaging algorithm and compliance under the Tx varying transmission scenario for WWAN technologies are reported in Part 2 report.
- The device was configured to transmit CW wave signal for testing, due to Qualcomm® Smart Transmit feature, additional testing was not required for different modulations (CP-OFDM QPSK, CP-OFDM 16QAM, CP-OFDM 64QAM), RB configurations, component carriers, channel configurations (low channel, mid channel, high channel).
- From the Part 0 and simulation report, beam IDs with highest PD and corresponding input power limit were selected to be tested for each antenna module and for each frequency band. Power density measurements were performed with DUT transmitting at input.power.limit for one single beam for each polarization (H & V) and one beam-pair, for each antenna type and for each antenna module on the worst-surfaces.
- It's illustrated in Part 0 reports that, for 5G mmW NR since there is total design-related uncertainty arising from TxAGC and device-to-device variation, the worst-case RF exposure should be determined by accounting for this device uncertainty of 2.0 dB, as well as PD design target of 0.475 mW/cm². Therefore, 5G mmW NR RF exposure for this DUT is evaluated by reported PD calculated as:

$$\text{Reported PD} = (\text{PD design target} + 2.0 \text{ dB}) = 0.75 \text{ mW/cm}^2$$
- The 2nd generation of Smart Transmit (GEN2) operates based on mmW module groups (MG) and was implemented on this device
 - Per QC's guidance, for simultaneous TER analysis, the device needs to demonstrate that combined PD for these identified PD beams at each QTM's dominant surface are less than PD_design_target+total uncertainty, the combined PD verification for 2nd Generation of Qualcomm Smart Transmit refer to Appendix D.

Test Number	Antenna Module	Beam ID 1	Beam ID 2	Band	Frequency (GHz)	Exposure Surface	Input Power limit	Test Separation (mm)	Modulation	Measured Savg inc 4cm ² (W/m ²)	Measured Savg tot 4cm ² (W/m ²)
01	Module 0	39	-	n261	28.35	Left Side	2.89	10	CW	3.79	3.98
	Module 0	-	167	n261	28.35	Left Side	2.82	10	CW	3.56	3.86
	Module 0	39	167	n261	28.35	Left Side	-0.59	10	CW	3.38	3.51
	Module 0	9	-	n261	28.35	Left Side	11.43	10	CW	2.90	3.09
	Module 1	36	-	n261	28.35	Right Side	2.44	10	CW	3.74	3.9
	Module 1	-	164	n261	28.35	Right Side	2.32	10	CW	3.21	3.46
	Module 1	36	164	n261	28.35	Right Side	-1.01	10	CW	3.09	3.27
	Module 0	31	-	n260	37	Left Side	3.31	10	CW	3.22	3.45
	Module 0	-	159	n260	37	Left Side	3.18	10	CW	3.24	3.44
	Module 0	31	159	n260	40	Left Side	-0.15	10	CW	1.35	1.41
02	Module 0	31	-	n260	37	Left Side	2.82	10	CW	2.60	2.78
	Module 0	5	-	n260	37	Left Side	11.53	10	CW	3.14	3.41
	Module 1	36	-	n260	37	Right Side	3.5	10	CW	3.84	4.03
	Module 1	-	164	n260	37	Right Side	3.33	10	CW	3.41	3.68
	Module 1	36	164	n260	37	Right Side	0.11	10	CW	2.35	2.66

11. Simultaneous-Tx analysis

NO.	Simultaneous Transmission Configurations	Exposure Positions
		Hotspot
1.	LTE + 5G FR2 + 2.4GHz WiFi Ant 3 + 2.4GHz WiFi Ant 4	Yes
2.	LTE + 5G FR2 + 2.4GHz WiFi Ant 3 + 5GHz WiFi Ant 4	Yes
3.	LTE + 5G FR2 + 2.4GHz WiFi Ant 4 + 5GHz WiFi Ant 3	Yes
4.	LTE + 5G FR2 + 5GHz WiFi Ant 3 + 5GHz WiFi Ant 4	Yes

General Note:

- Following the analysis in Section 11, the simultaneous transmission compliance can be justified from LTE + WiFi (which is addressed in Part 1 SAR report), and FR2 + WiFi which is addressed in this section. WiFi SAR test results are referenced from Part 1 SAR report of FCC ID: PY322300575 (Sporton SAR Report No. FA190614-06A).
- Considering n260/n261 transmitter with WLAN 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.
 - Use the standalone SAR according original report to collocate with n260/n261 transmitter power density at each exposure positions, if the result < 1, additional analysis is not necessary.

The $[\sum \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg} + \sum \text{ of MPE ratios}] \leq 1.0$.

11.1 5G NR + LTE + WLAN Sim-Tx analysis

In 5G NR + LTE + WLAN simultaneous transmission, 5G NR and LTE transmission are managed and controlled by Qualcomm® Smart Transmit, while the RF exposure from WLAN radios is managed using legacy approach, i.e., through a fixed power back-off if needed.

Since WLAN do not employ time-averaging, 1gSAR and 10gSAR measurement for WLAN need to be conducted at their corresponding rated power following current FCC test procedures to determine reported SAR values.

Smart Transmit current implementation assumes hotspots from 5G NR and LTE are collocated. Therefore, for a total of 100% exposure margin, if LTE uses x%, then the exposure margin left for 5G NR is capped to (100-x)%. Thus, the compliance equation for LTE + 5G NR is

$$x\% * A + (100-x)\% * B \leq 1.0,$$

Where, A is normalized reported time-averaged SAR exposure ratio from LTE, and $A \leq 1.0$; B is normalized reported time-averaged exposure ratio from 5G NR (i.e., PD exposure for mmW NR or SAR exposure for sub6 NR), and $B \leq 1.0$.

Let C = normalized reported SAR exposure ratio from WLAN, then for compliance,

$$x\% * A + (100-x)\% * B + C \leq 1.0 \quad (1)$$

$$x\% * A + (100-x)\% * B \leq x\% * \max(A, B) + (100-x)\% * \max(A, B) \leq \max(A, B)$$

$$x\% * A + (100-x)\% * B + C \leq \max(A, B) + C \leq 1.0 \quad (2)$$

if $A + C \leq 1.0$ and $B + C \leq 1.0$ can be proven, then " $x\% * A + (100-x)\% * B + C \leq 1.0$ ". Therefore simultaneous transmission analysis for 5G NR + LTE + WLAN can be performed in two steps

Step 1: Prove total exposure ratio (TER) of LTE + WLAN < 1

Step 2: Prove total exposure ratio (TER) of 5G NR + WLAN < 1

Else, if $A + C > 1.0$ and/or $B + C > 1.0$, then the followings need to hold true for compliance:

- Since A and C are decoupled based on the SAR distribution, and
- $(100-x)\% * B + C \leq 1.0$, and
- $x\% * A + (100-x)\% * B \leq 1.0$

Note iii. is covered in Part 2 report; i. and ii. is addressed in Part 1 report.

11.2 Simultaneous transmission analysis for WiFi + 5G NR

<Hotspot Exposure Condition>

<Module 0/1>

Hotspot		Reported SAR				Reported PD	Single Point SAR from Power Density Location Summation (Peak SAR/1.6 + PD/10)				
WWAN Band	Exposure Position	1	2	3	4	5	1+2+5 Summed	1+4+5 Summed	2+3+5 Summed	3+4+5 Summed	
		2.4GHz WLAN Ant 3 1g SAR (W/kg)	2.4GHz WLAN Ant 4 1g SAR (W/kg)	5GHz WLAN Ant 3 1g SAR (W/kg)	5GHz WLAN Ant 4 1g SAR (W/kg)	PD 4cm ² (W/m ²)					
n260 / n261	Antenna Module 0	Top Surface at 10mm	0.041	0.085	0.071	0.066	7.5	0.829	0.817	0.848	0.836
	Antenna Module 1	Bottom Surface at 10mm	0.052	0.035	0.058	0.062	7.5	0.804	0.821	0.808	0.825
		Left side at 10mm	0.097		0.121		7.5	0.811	0.811	0.826	0.826
		Right side at 10mm		0.042		0.073	7.5	0.776	0.796	0.776	0.796
		Front side at 10mm					7.5	0.750	0.750	0.750	0.750
		Back side at 10mm	0.018	0.024	0.052	0.084	7.5	0.776	0.814	0.798	0.835

Test Engineer : Jacky Chen, Dennis Hsieh and Mood Huang



12. Uncertainty Assessment

The budget is valid for evaluation distances $> \lambda/2\pi$. For specific tests and configurations, the Uncertainty could be considerably smaller.

cDASY6 Module mmWave Uncertainty Budget Evaluation Distances to the Antennas $> \lambda/2\pi$					
Error Description	Uncertainty Value (\pm dB)	Probability	Divisor	(Ci)	Standard Uncertainty (\pm dB)
Uncertainty terms dependent on the measurement system					
Probe Calibration	0.49	N	1	1	0.49
Probe correction	0.00	R	1.732	1	0.00
Frequency response (BW \leq 1 GHz)	0.20	R	1.732	1	0.12
Sensor cross coupling	0.00	R	1.732	1	0.00
Isotropy	0.50	R	1.732	1	0.29
Linearity	0.20	R	1.732	1	0.12
Probe scattering	0.00	R	1.732	1	0.00
Probe positioning offset	0.30	R	1.732	1	0.17
Probe positioning repeatability	0.04	R	1.732	1	0.02
Sensor mechanical offset	0.00	R	1.732	1	0.00
Probe spatial resolution	0.00	R	1.732	1	0.00
Field impedance dependence	0.00	R	1.732	1	0.00
Amplitude and phase drift	0.00	R	1.732	1	0.00
Amplitude and phase noise	0.04	R	1.732	1	0.02
Measurement area truncation	0.00	R	1.732	1	0.00
Data acquisition	0.03	N	1	1	0.03
Sampling	0.00	R	1.732	1	0.00
Field reconstruction	0.60	R	1.732	1	0.35
Forward transformation	0.00	R	1.732	1	0.00
Power density scaling	0.00	R	1.732	1	0.00
Spatial averaging	0.10	R	1.732	1	0.06
System detection limit	0.04	R	1.732	1	0.02
Uncertainty terms dependent on the DUT and environmental factors					
Probe coupling with DUT	0.00	R	1.732	1	0.0
Modulation response	0.40	R	1.732	1	0.2
Integration time	0.00	R	1.732	1	0.0
Response time	0.00	R	1.732	1	0.0
Device holder influence	0.10	R	1.732	1	0.1
DUT alignment	0.00	R	1.732	1	0.0
RF ambient conditions	0.04	R	1.732	1	0.0
Ambient reflections	0.04	R	1.732	1	0.0
Immunity / secondary reception	0.00	R	1.732	1	0.0
Drift of the DUT		R	1.732	1	
Combined Std. Uncertainty					0.76 dB
Expanded STD Uncertainty (95%)					1.52 dB
Declaration of Conformity: The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.					
Comments and Explanations: The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.					



13. 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.
- [4] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.