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COMPLIANCE SUMMARY REPORT

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Test Site/Location:
Element, Columbia, MD, USA
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FCC ID:	**A3LSMS938U**
APPLICANT:	**SAMSUNG ELECTRONICS CO., LTD**

Report Type: Compliance Summary
DUT Type: Portable Handset
Model: SM-S938U
Additional Model(s): SM-S938U1

TABLE OF CONTENTS

1 STRATEGY FOR COMPLIANCE DEMONSTRATION

1.1 RF Exposure Evaluation Strategy

The FCC RF exposure limits defined based on time-averaged RF exposure. The device under test (DUT) uses the Qualcomm Smart Transmit Gen2 feature to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with the FCC requirement for 2G/3G/4G/5G NR, WLAN, and Bluetooth operations. Additionally, this device supports NTN/UWB and NFC non Smart Tx Radio technologies but the output power of these modems is not controlled by the smart transmit algorithm.

Demonstrating compliance of DUT enabled with Qualcomm Smart Transmit feature is completed in three parts:

0. **RF Exposure Compliance Test Report Part 0: SAR Characterization and PD Characterization**

   The SAR and PD Characterization, denoted as SAR Char and PD Char, determines the power limit that meets FCC exposure requirement after accounting for device design related uncertainties for each supported radio configuration and RF exposure usage scenario. The determined power limits will be loaded and stored in the EUT via the Embedded File System (EFS), and then used as inputs for Smart Transmit to operate.

   For 2G/3G/4G/5G Sub6, WLAN, and Bluetooth, SAR Char is derived from SAR test measurements and conducted power measurements to determine P_{Limit} for each technology/band. For 5G mmW NR, PD Char is derived using simulation in combination with measurement as validation to determine the *input.power.limit* for each radio/antenna configuration (each beam). The P_{Limit} and *input.power.limit* represents the maximum time-averaged power level for the corresponding radio/antenna configuration.

1. **RF Exposure Compliance Test Report Part 1: Test in Static Transmission Condition**

   Part 1 demonstrates that DUT meets FCC SAR and PD limits when transmitting at pre-determined maximum time-averaged power level: P_{Limit} for 2G/3G/4G/5G Sub6 NR, WLAN, and Bluetooth, and *input.power.limit* for 5G mmW NR. The SAR and PD measurement in Part 1 is under static transmission condition.

   The exposure from the simultaneous transmission of WWAN and WLAN/BT is evaluated in Part 2 report.

2. **RF Exposure Compliance Test Report Part 2: Test in Dynamic Transmission Condition**

   Part 2 demonstrates compliance in Tx varying transmission conditions and validates Qualcomm Smart Transmit algorithm. The test results reported in Part 2 demonstrates that DUT complies with FCC RF exposure requirement under Tx varying transmission scenarios, thereby validity of Qualcomm Smart Transmit algorithm.

1.2 Nomenclature

Applicable Technologies	Term	Description
2G/3G/4G/5G Sub6/WLAN/BT	P_{Limit}	Power level that corresponds to the exposure design target (*SAR_design_target)* after accounting for all device design related uncertainties
	P_{Max}	Maximum tune up output power
	T_{SAR}	Defined time averaging window for *f* < 6 GHz
	SAR_design_target	Target SAR level resulting in maximum time-averaged exposure optimized from total uncertainty
	SAR Char	Table containing *Plimit* for all technologies
5G mmW NR	*input.power.limit*	Power level at antenna element for each beam corresponding to the exposure design target (*PD_design_target)*
	T_{PD}	Defined time averaging window for *f* > 6 GHz
	PD_design_target	Target PD level resulting in maximum time-averaged exposure optimized from total uncertainty
	PD Char	Table containing *input.power.limit* for all beams
2G/3G/4G/5G Sub6/5G mmW NR/WLAN/BT	*regulatory body*	Regulatory body that the algorithm is designed to comply. Algorithm's time averaging window is dependent on either FCC or ICNIRP requirements.
	reserve_power_margin	Margin below P_{Limit} reserved for future transmission
	$P_{reserve}$	Minimum transmit power with a designated margin below P_{Limit}

1.3 Bibliography

Report Type	Report Serial Number
SAR Evaluation Report (Part 1)	1M2408260067-23.A3L
PD Evaluation Report (Part 1)	1M2408260067-25.A3L
SAR Evaluation Report (Part 0)	1M2408260067-31.A3L
PD Evaluation Report (Part 0)	
RF Exposure Part 2 Test Report	1M2408260067-24.A3L

2 TIME AVERAGING ALGORITHM

2.1 Algorithm Description

The FCC RF exposure limit is defined based on time-averaged RF exposure. When running in a wireless device, Qualcomm Smart Transmit algorithm enables more elegant power control mechanisms for RF exposure management. It ensures at all times the wireless device is in compliance with the FCC limit of RF exposure time-averaged over a defined time window, denoted as T_{SAR} and T_{PD} for specific absorption rate (SAR for transmit frequency < 6 GHz) and power density (PD for transmit frequency > 6 GHz) time windows, respectively.

The Smart Transmit algorithm not only ensures the wireless device complies with RF exposure requirement, but also improves the user experience and network performance.

For a given wireless device, RF exposure is proportional to the transmitting power.

- Once the SAR and PD of the wireless device is characterized at a transmit power level, RF exposure at a different power level for the characterized configurations can be scaled by the change in the corresponding power level.
- Therefore, for a characterized device, RF exposure compliance can be achieved through transmit power control and management.

The Smart Transmit algorithm embedded in Qualcomm modems reliably controls the transmit power of the wireless device in real time to maintain the time-averaged transmit power, in turn, time-averaged RF exposure, below the predefined time-averaged power limit for each characterized technology and band.

- This predefined time-averaged power limit is denoted as P_{Limit} corresponding SAR limit (frequency < 6 GHz) and *input.power.limit* corresponding PD limit (frequency > 6 GHz) in this report.
- The wireless device continuously transmitting at P_{Limit} level or *input.power.limit* level complies with the FCC RF exposure requirement.

In a simultaneous transmission scenario, the algorithm manages all active transmitters and make sure the total exposure ratio from each transmitter not exceeding to 1.

2.2 Basic concept of the algorithm

The Smart Transmit algorithm controls and manages the instantaneous transmit power (Tx) to maintain the time-averaged Tx power and therefore, time-averaged RF exposure in compliance with FCC limits.

- If time-averaged transmit power approaches P_{Limit} or *input.power.limit*, then the modem needs to limit instantaneous transmit power to ensure the time-averaged transmit power does not exceed P_{Limit} or *input.power.limit* in any T_{SAR} and T_{PD} time windows since the time-averaged RF exposure is required to comply with the FCC RF exposure limit in any T_{SAR} or T_{PD} time window.
- The wireless device can instantaneously transmit at high transmit powers and exceed the P_{Limit} or *input.power.limit* level for a short duration before limiting the power to maintain the time-averaged transmit power under P_{Limit} or *input.power.limit*.
- If the wireless device transmits at high power for a long time, then the radio link needs to be dropped to be compliant with time-averaged Tx power requirement (see Figure 2-1).
- To avoid dropping the radio link, Smart Transmit algorithm starts the power limiting enforcement earlier in time to back off the Tx power to a reserve level (denoted as $P_{reserve}$), so the wireless device can maintain the radio link at a minimum reserve power level for as long as needed, and at the same time ensure the time-averaged Tx power over any defined time window is less than P_{Limit} at all times (see Figure 2-2). At all times, Smart Transmit meets the below equation:

$$time.avg.Tx\ power = \frac{1}{T_{SAR}} \int_{t-T_{SAR}}^{t} inst.Tx\ power(t)\, dt \leq P_{limit}$$

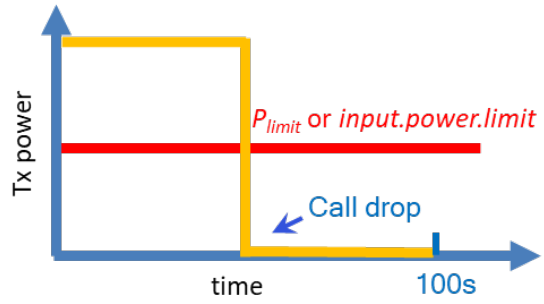
Equation 2-1

where, $time.avg.Tx\ power$ is the transmit power averaged between *t*-T_{SAR} and *t* time period; T_{SAR} is the time window defined by FCC for time-averaging RF exposure for Tx frequency less than 6GHz (sub6); *inst. Tx power (t)* is the instantaneous transmit power at *t* time instant; P_{Limit} is the predefined time-averaged power limit. Similarly, Smart Transmit meets the below equation for mmW transmission:

$$mmW\_time.avg.Tx\ power = \frac{1}{T_{PD}} \int_{t-T_{PD}}^{t} mmW\_Tx\ power(t)\, dt \leq input.power.limit$$

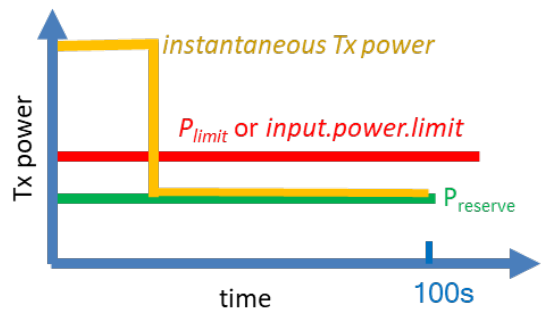
Equation 2-2

where, $mmW\_time.avg.Tx\ power$ is the mmW transmit power averaged between *t*-T_{PD} and *t* time period; T_{PD} is the time window defined by FCC for time-averaging RF exposure for mmW bands; *mmW_Tx power (t)* is the instantaneous mmW transmit power at *t* time instant; $input.power.limit$ is the predefined time-averaged power limit for the beam under test.



(a)

Figure 2-1
Transmit at high power when needed and permitted



(b)

Figure 2-2
Transmit with reserve power to support continuous transmission at a minimum power level ($P_{reserve}$)

- In the case of simultaneous transmission, Smart Transmit manages all active transmitters and make sure the total exposure ratio is less than 1

$$\sum \frac{\frac{1}{T_{SAR}}\int_{t-T_{SAR}}^{t} SAR(t)\,dt}{FCC\ SAR\ limit} + \sum \frac{\frac{1}{T_{PD}}\int_{t-T_{psPD}}^{t} 4cm^2 psPD(t)\,dt}{FCC\ psPD\ limit} \leq 1$$

Equation 2-3

2.3 Configurable Parameters

The following input parameters are required for functionality of Qualcomm Smart Transmit algorithm. These parameters cannot be accessed by the end user, because at the factory they are entered through the embedded file system (EFS) entries by the OEM

Input Parameter	Description
regulatory body	• Inputs of "0" and "1" corresponding to FCC and ICNIRP requirements for the averaging time windows. • For FCC, algorithm uses an averaging window of 100 seconds for $f < 3$ GHz, 60 seconds for 3 GHz $< f <$ 6 GHz, and 4 seconds for 24 GHz $< f <$ 42 GHz.
Tx_power_at_SAR_design_target (P_{Limit} *in dBm*) $f < 6$ GHz	The maximum time-averaged transmit power, in dBm, corresponding to the *SAR_design_target*. *SAR_design_target* is pre-determined for this DUT and it is less than regulatory SAR limit after accounting for all design related tolerances. The time-averaged SAR is assessed against this *SAR_design_target* in real time to determine the compliance. P_{Limit} could vary with technology, band and Device State Index (DSI) and therefore, it has the unique value for each technology, band and DSI.
reserve_power_margin ($P_{reserve}$ *in dBm*)	The margin below P_{Limit} reserved for future transmission with a minimum transmit power $P_{reserve}$ $P_{reserve}\,(\text{dBm}) = P_{limit}\,(\text{dBm}) - Reserve\_power\_margin\,(\text{dB})$ When the *Reserve_power_margin* is set to 0 dB, Smart Transmit effectively limits the upper bound of the transmit power to P_{limit} and the DUT transmits continuously at P_{limit} without utilizing Smart Transmit dynamic control feature.
input.power.limit in *dBm* $f \geq 6$ GHz	Maximum time-averaged power at the input of antenna element port at which each antenna configuration/beam meets *PD_design_target.*

3 DUT DESCRIPTION

3.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 14	Voice/Data	790.5 - 795.5 MHz
LTE Band 26	Voice/Data	814.7 - 848.3 MHz
LTE Band 5	Voice/Data	824.7 - 848.3 MHz
LTE Band 66	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
LTE Band 48	Voice/Data	3552.5 - 3697.5 MHz
NR Band n71	Voice/Data	665.5 - 695.5 MHz
NR Band n12	Voice/Data	701.5 - 713.5 MHz
NR Band n14	Voice/Data	790.5 - 795.5 MHz
NR Band n26	Voice/Data	816.5 - 846.5 MHz
NR Band n5	Voice/Data	826.5 - 846.5 MHz
NR Band n70	Voice/Data	1697.5 - 1707.5 MHz
NR Band n66	Voice/Data	1712.5 - 1777.5 MHz
NR Band n25	Voice/Data	1852.5 - 1912.5 MHz
NR Band n2	Voice/Data	1852.5 - 1907.5 MHz
NR Band n30	Voice/Data	2307.5 - 2312.5 MHz
NR Band n7	Voice/Data	2502.5 - 2567.5 MHz
NR Band n41	Voice/Data	2501.01 - 2685 MHz
NR Band n38	Voice/Data	2575 - 2615 MHz
NR Band n48	Voice/Data	3555 - 3694.98 MHz
NR Band n78	Voice/Data	3455.01 - 3544.98 MHz; 3705 - 3795 MHz
NR Band n77	Voice/Data	3455.01 - 3544.98 MHz; 3705 - 3975 MHz
NTN Band 255	Data	1629 - 1658 MHz
NR Band n258	Data	24250 - 24450 MHz; 24750 - 25250 MHz
NR Band n260	Data	37000 - 40000 MHz
NR Band n261	Data	27500 - 28350 MHz
2.4 GHz WIFI	Voice/Data	2412 - 2462 MHz
5 GHz WIFI	Voice/Data	U-NII-1: 5180 - 5240 MHz U-NII-2A: 5260 - 5320 MHz U-NII-2C: 5500 - 5720 MHz U-NII-3: 5745 - 5825 MHz U-NII-4: 5845 - 5885 MHz
6 GHz WIFI	Voice/Data	U-NII-5: 5935 - 6415 MHz U-NII-6: 6435 - 6515 MHz U-NII-7: 6535 - 6875 MHz U-NII-8: 6895 - 7115 MHz
2.4 GHz Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
UWB	Data	6489.6 - 7987.2 MHz

This device uses the Qualcomm Smart Transmit feature to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with the FCC requirement for 2G/3G/4G/5G/WLAN/Bluetooth operations. Additionally, this device supports NFC/UWB/NTN technologies but the output power of these modems is not controlled by the smart transmit algorithm.

4 COMPLIANCE SUMMARY

4.1 RF Exposure Compliance Summary

All transmission scenarios that the DUT supports comply with FCC time-averaged RF exposure requirements, as shown in Table 4-1.

Table 4-1
Reported RF Exposure Levels

	RFx Evaluation	Power Level	FCC Limit	*Reported* RF Exposure Level	Test Report
SAR (W/kg)	Standalone 1g SAR	P_{limit}	1.6	1.26	FCC SAR Evaluation Report (Part 1)
	Standalone 10g SAR	P_{limit}	4.0	2.80	
	Simultaneous Tx 1g SAR	P_{limit}	1.6	1.59	
	Simultaneous Tx 10g SAR	P_{limit}	4.0	1.87	
psPD (mW/cm^2)	Standalone 4cm^2 psPD	*input.power.limit*	1.0	0.891	FCC PD Evaluation Report (Part 1)
	Simultaneous Tx 4cm^2 psPD	*input.power.limit*	1.0	0.895	FCC SAR Evaluation Report (Part 1)
TER	Total Exposure Ratio	P_{limit} for SAR, *input.power.limit* for psPD	1.0	0.996	FCC SAR Evaluation Report (Part 1)

FCC ID: A3LSMS938U

Power Density Simulation Report

Revision A

October 14, 2024

SAMSUNG ELECTRONICS

1. Simulation methodology for Power Density (PD)

1.1 Simulation tool

1.1.1 Tool description

For the simulation approach to calculating power density (PD) evaluation for mobile phone with mmWave antenna module, ANSYS Electromagnetics suite version 2023.R2 (HFSS) is used. ANSYS HFSS is one of several commercial tools for 3D full-wave electromagnetic simulation used for antenna and RF structure design of high frequency component. ANSYS Electromagnetics suite version 2023.R2 (HFSS) is implemented based on Finite Element Method (FEM), which operates in the frequency domain.

1.1.2 Mesh and Convergence criteria

To solve the PD analysis using FEM, volume area containing simulated objects should be subdivided into electrically small parts that are called finite elements as the unknown functions. To subdivide system, the adaptive mesh technique in ANSYS Electromagnetics suite version 2023.R2 (HFSS) is used. ANSYS Electromagnetics suite version 2023.R2 (HFSS) starts to refine the initial mesh based on wavelength and calculate the error to iterative process for adaptive mesh refinement. The determination parameter of the number of iteration in ANSYS Electromagnetics suite version 2023.R2 (HFSS) is defined as convergence criteria, delta S, and the iterative adaptive mesh process repeats until the delta S is met. In ANSYS Electromagnetics suite version 2023.R2 (HFSS), the accuracy of converged results depends on the delta S. Figure 1 is an example of adaptive mesh of the device (cross-section of top view).

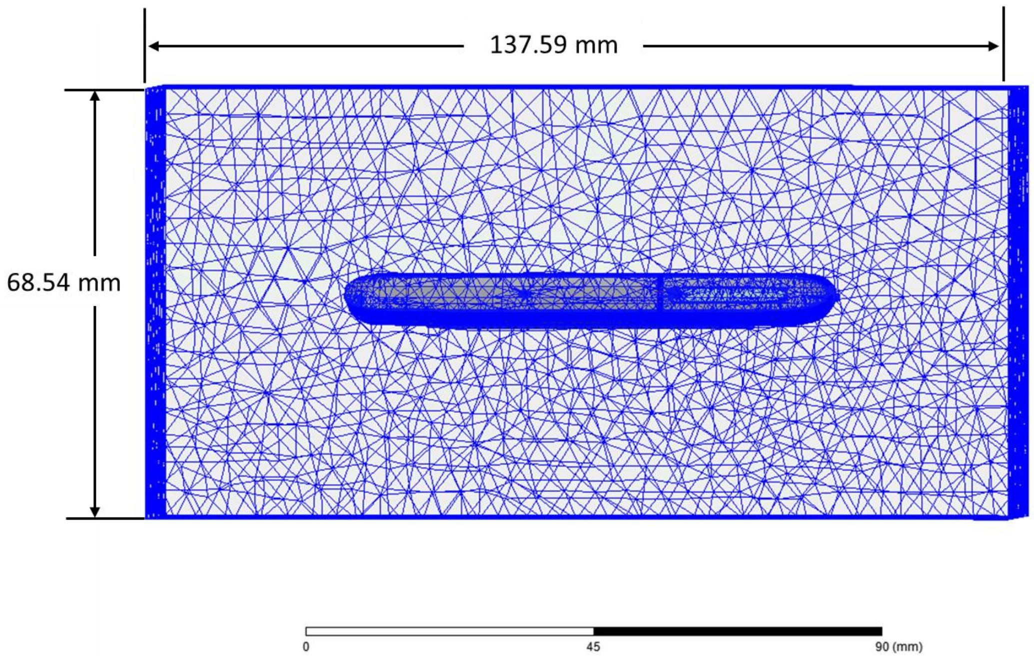


Figure 1 Example of the adaptive mesh technique (Top view)

1.1.3 Power density calculation

After solving 3D full-wave electromagnetic simulation, various kinds of physical quantities can be obtained. To calculate PD evaluation, two physical quantities, an electric field ($\vec{E}$) and a magnetic field ($\vec{H}$) are needed. The actual consumption power can be expressed as the real term of the Poynting vector ($\vec{S}$) from the cross product of $\vec{E}$ and complex conjugation of $\vec{H}$ as shown below:

$$\langle\vec{S}\rangle = \mathrm{Re}\left(\frac{1}{2}\vec{E} \times \vec{H}^*\right)$$

$\langle\vec{S}\rangle$ can be expressed as point power density based on a peak value of each spatial point on mesh grids, and obtained directly from ANSYS Electromagnetics suite version 2023.R2 (HFSS).

From the point power density $\langle\vec{S}\rangle$, the spatial-averaged power density (PD_{av}) on an evaluated area (A) can be derived as shown below:

$$\mathrm{PD}_{av} = \frac{1}{A}\int_{A} \langle\vec{S}\rangle \cdot ds = \frac{1}{2A_{av}}\iint_{A_{av}} \|Re\{ExH^*\}\|\, dA$$

, where the spatial-averaged power density (PD_{av}) is total power density value considering on x, y and z components of point power density $\langle\vec{S}\rangle$ and the evaluated area (A) is $4\mathrm{cm}^2$.

1.2 Simulation setup

1.2.1 3D modeling

Figure 2 shows the simulation model which is mounted single mmWave antenna module. The simulation modeling includes most of the entire structure of device itself such as PCB, metal frame, battery, cables, and legacy antennas as well as mmWave antenna module called as Ant M. The modeling contains the entire EUT to enable a Smart transmit GEN2, as well. Ant M is placed on the right side and antennas are facing the right side of the device.

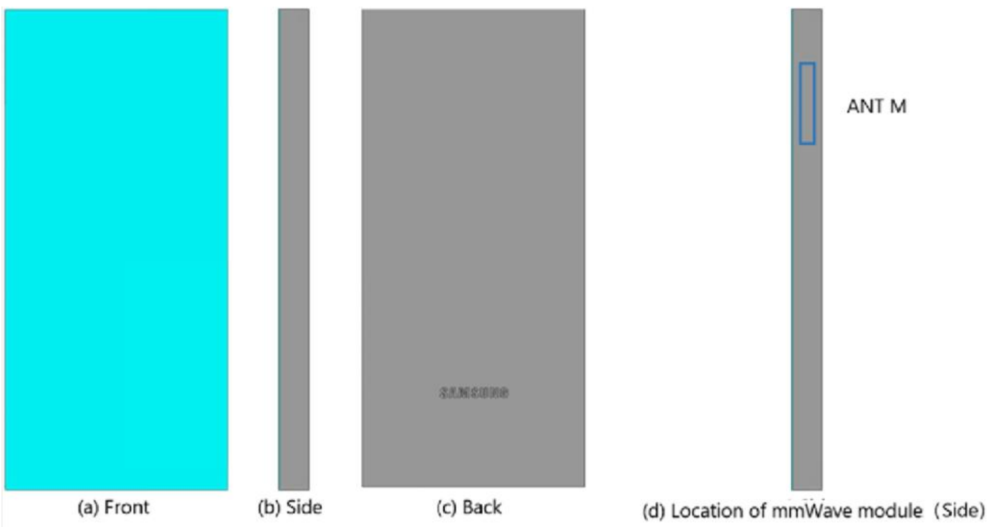


Figure 2. Simulation model which is mounted single mmWave antenna module

1.2.2 PD evaluation planes

Table 1 shows the PD evaluation planes for each mmWave antenna module and Figure 3 shows the PD evaluation planes and truncation area of the simulation model to find worst case of beamforming cases.

Please note that the "right" and "left" edge of mentioned in this report are defined from the perspective of looking at the device from the front side.

Table 1. PD evaluation planes

Module	Front	Back	Left From Front View	Right From Front View	Top	Bottom
	S1	S2	S3	S4	S5	S6
Ant M	O	O	O	O	O	O

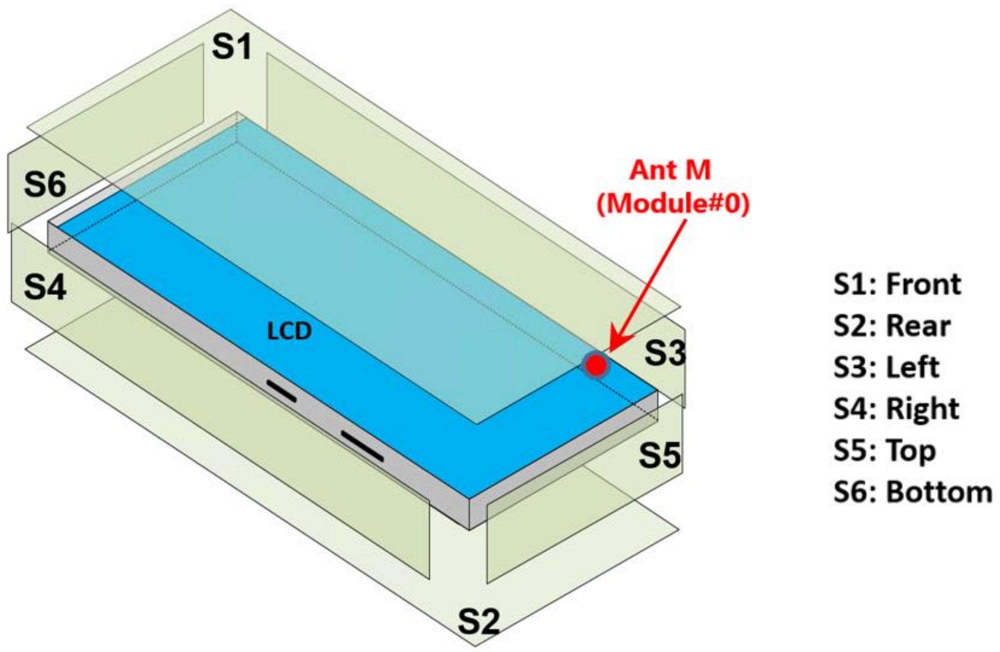


Figure 3. PD evaluation planes

1.2.3 Boundary condition

To simulate electromagnetic tool based on FEM, the boundary condition allows electromagnetic waves to be electrically open at the boundary and radiated far away without reflection. ANSYS Electromagnetics suite version 2023.R2 (HFSS) can support the absorbing boundary condition (ABC) for radiation boundary and make normally a quarter wave length from the radiating structure. In this report, to cover all beamforming cases of mmWave antenna module, 40 mm spacing from the device for each surfaces were adopted. This distance is sufficiently large enough for “Qualcomm IPLG script” to extract valid E- and H-fields from all adjacent exposure surfaces of the EUT.

1.2.4 Source excitation condition

The number of antenna ports of ANT M for source excitation are the same. The antenna port of ANT M is divided into 10 ports for n261 and n258 1 x 5 patch array antennas, 10 ports for n260 1 x 5 patch array antennas. In the 10 ports included in each patch antenna, 5 ports are divided into vertical polarization feeding, and the other 5 ports are divided into horizontal polarization feeding.

The ANT M module is encrypted in the ANSYS Electromagnetics suite (HFSS) and can only check the feeding position.

After finishing 3D full wave electromagnetic simulation of modeling structure, the magnitude and phase information can be loaded for each port by using “Edit Sources” function in ANSYS Electromagnetics suite (HFSS). Figure 4 shows an example of antenna port excitations.

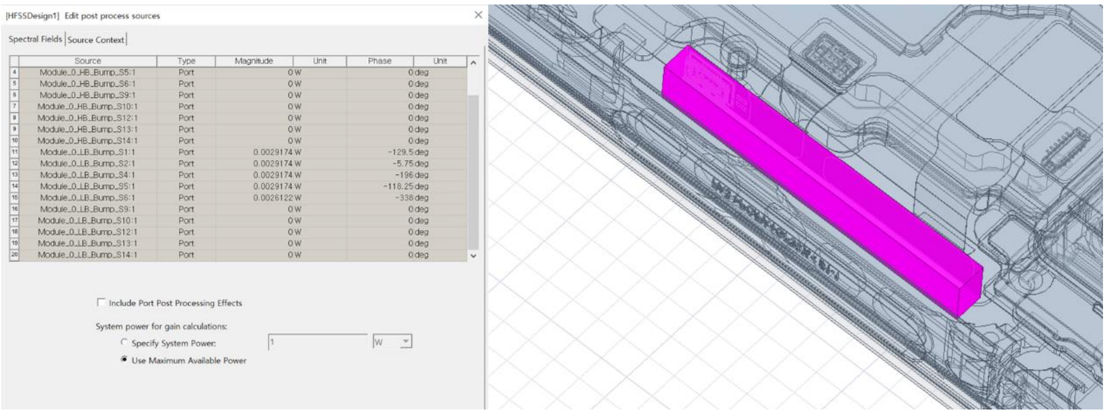


Figure 4. An example of port excitation (ANT M)

Since ANSYS Electromagnetics suite (HFSS) uses FEM solver based on frequency domain analysis method, the input source for the port excitation applies sinusoidal waveform for each frequency.

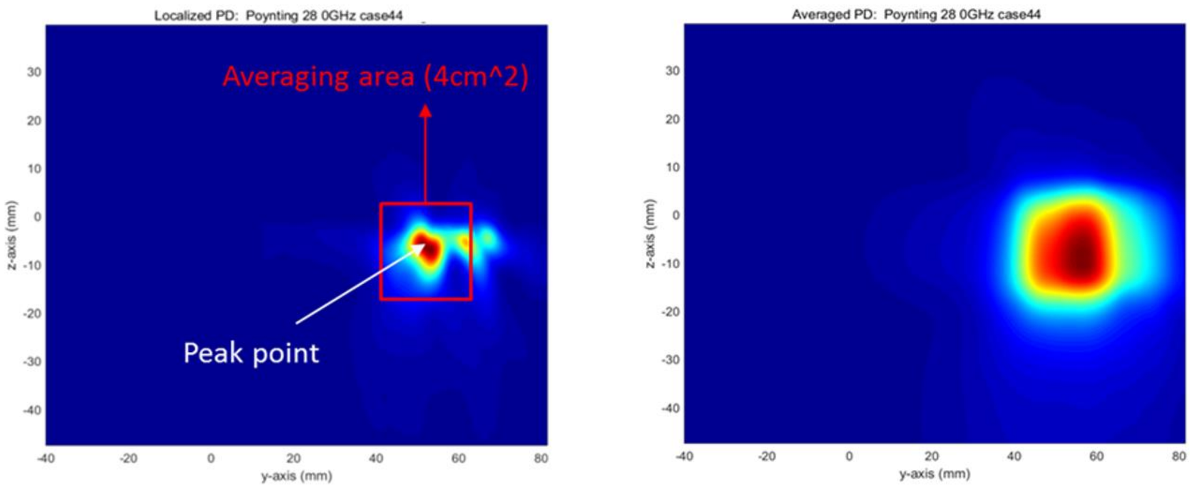
1.2.5 Condition of simulation completion

The simulation completion condition of ANSYS Electromagnetics suite (HFSS) is defined as delta S. The ANSYS Electromagnetics suite (HFSS) calculates the S-parameter for the mesh conditions of each step and determines whether to proceed with the operation of the next step by comparing the difference between the S-parameters in the previous step. A difference between the previous step and the current step of S-parameter is expressed as delta S, and the delta S generally sets 0.02. The simulation result of this report is the result of setting delta S to 0.02.

2. Simulation verification

2.1 Spatial-averaged power density and $sim.power_{limit}$

As mentioned in the previous chapter, the Poynting vector $(\vec{S})$ can be obtained through cross product of an electric field $(\vec{E})$ and complex conjugate of a magnetic field $(\vec{H})$. The real term of the Poynting vector can be described as the point power density or peak power density. Using the point power density, the spatial-averaged power density can be obtained by the integral of 4 cm^2 at 2.5 mm intervals of the point power density result. Figure 5 shows examples of the distribution plot of point power density and the averaged power density.



(a) Point power density (b) Averaged power density

Figure 5. Power density distribution (Example)

For the Smart Transmit, the "Qualcomm Input Power Limit Generator(Qualcomm IPLG script)" were used to assess the mutual coupling between all the mmWave module and all the beams in the codebook for each mmWave module. Once the script is done with assessment, it will provide the $sim.power_{limit}$ for all the beams for all three channels for the specified PD_design_target. This mode take the minimum $sim.power_{limit}$ out of all three channels (low, mid and high) and use the resulted $sim.power_{limit}$.

2.2 Comparison between simulation, measurement

In this section, the simulated-power density distributions and measured-power density distributions are compared to each mmWave antenna. Furthermore, to verify the Smart transmit GEN2, the PD distributions printing out from the "Qualcomm IPLG script" are added.

"Qualcomm IPLG script" prints the simulated 4cm^2 averaged PD values at the reference level (6dBm) for all channels on all surfaces.

Based on comparison of power density distributions, the power densities of simulated, measured and the "Qualcomm IPLG Script" have a good correlation. The discrepancy in amplitude between the

"Qualcomm IPLG Script" 4cm^2 averaged power density and measured 4cm^2 averaged power density is considered as housing influence and used in determining input power limit for each beam for RF exposure compliance.

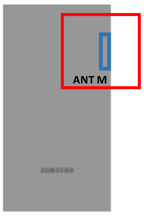
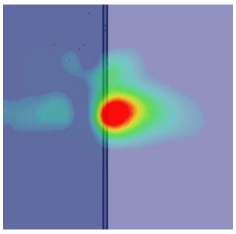
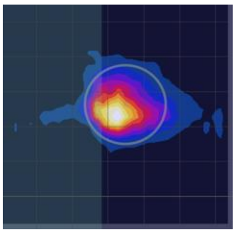
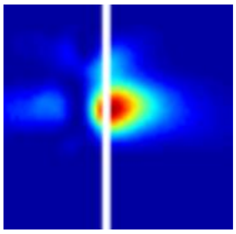
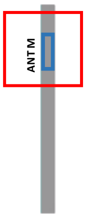
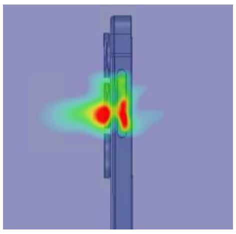
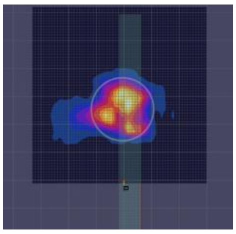
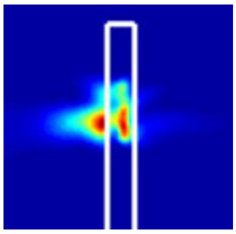
The input powers per each active port are listed below for both Simulation and Measurement validation and power density characterization. For Simulation, these values were entered directly into HFSS model. For measurement, FTM S/W was used to input these values for each active port also.

Mode/Band	Antenna	Input Power (dBm) SISO	Input Power (dBm) MIMO
5G NR n261	M Patch	6.0	6.0
5G NR n260	M Patch	6.0	6.0
5G NR n258	M Patch	6.0	6.0

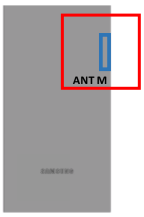
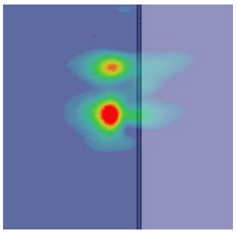
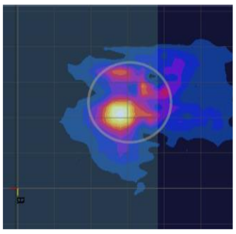
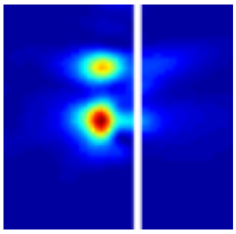
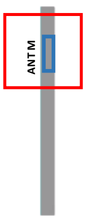
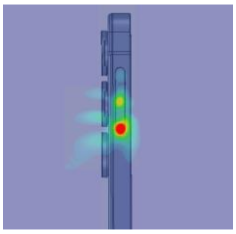
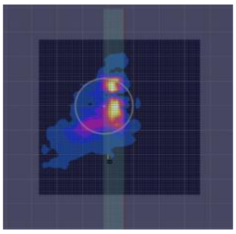
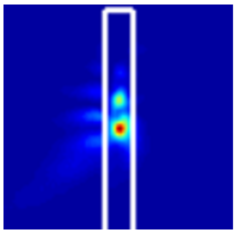
* The below simulation and measurement result were performed at 2mm evaluation distance and 28GHz / 38.5GHz / 24.8 GHz. The *input.power.limit* was determined based on below results.

Band	Channel	Module	Type	Side	Beam ID	PLS (10 dBm)	Sim. PD (mW/cm2)	4Cm^2 Meas. PD (mW/cm2) * Circle Avg
n261	**Mid Ch. 2077915 (27924.96 MHz)**	M	Patch	Rear	14	60	1.035	0.51
				Left			1.478	0.73
				Rear	274		0.604	0.25
				Left	273		0.821	0.30
n260	**Mid Ch. 2254165 (38499.96 MHz)**	M	Patch	Left	20	60	1.391	0.64
				Left	269		1.630	0.69
n258	**Mid Ch. 2025833 (24800.04 MHz)**	M	Patch	Rear	15	60	0.974	0.48
				Left	13		1.259	0.67
				Rear	271		1.144	0.60

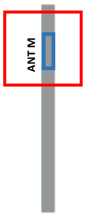
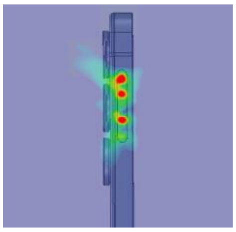
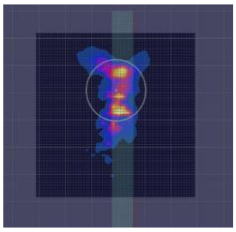
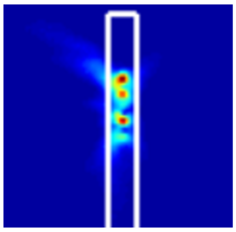
- Table 2-1, n261 ANT M-Patch

Beam ID	Surface	View	Simulated PD	Measured PD	Print out from Qualcomm IPLG Script
14	S2 (Rear)				
	S3 (Left)				

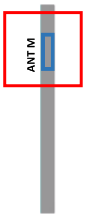
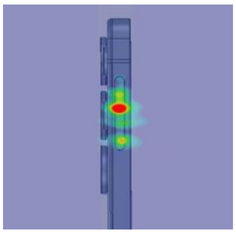
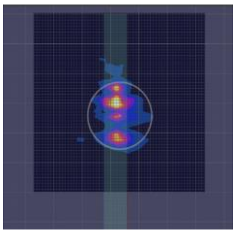
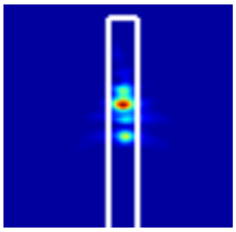
- Table 2-2, n261 ANT M-Patch

Beam ID	Surface	View	Simulated PD	Measured PD	Print out from Qualcomm IPLG Script
274	S2 (Rear)				
273	S3 (Left)				

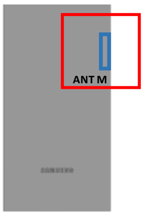
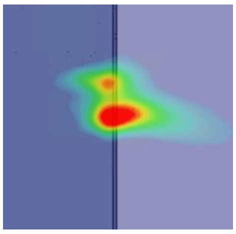
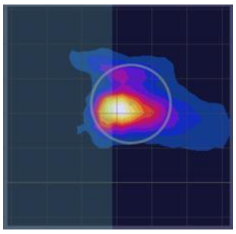
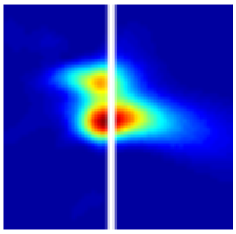
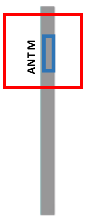
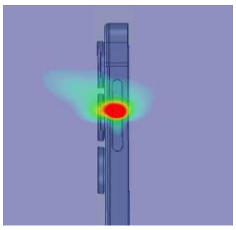
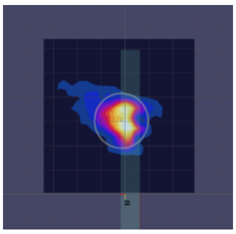
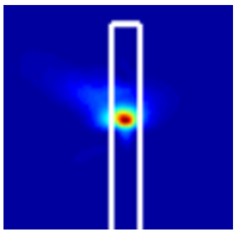
- Table 2-3, n260 ANT M-Patch

Beam ID	Surface	View	Simulated PD	Measured PD	Print out from Qualcomm IPLG Script
20	S3 (Left)				

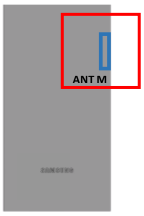
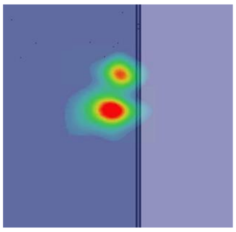
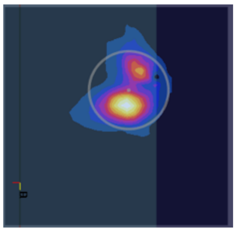
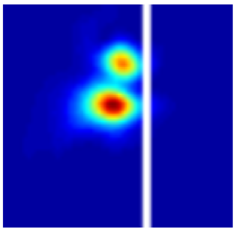
- Table 2-4, n260 ANT M-Patch

Beam ID	Surface	View	Simulated PD	Measured PD	Print out from Qualcomm IPLG Script
269	S3 (Left)				

- Table 2-5, n258 ANT M-Patch

Beam ID	Surface	View	Simulated PD	Measured PD	Print out from Qualcomm IPLG Script
15	S2 (Rear)				
13	S3 (Left)				

- Table 2-6, n258 ANT M-Patch

Beam ID	Surface	View	Simulated PD	Measured PD	Print out from Qualcomm IPLG Script
271	S2 (Rear)				

The Smart transmit GEN2 cannot be finalized until the additional verifications are performed and passed. Follow the below steps for verifications in the mid channel:

VERIFICATION 1: Use "Qualcomm IPLG script" to print the PD plots for all the beams selected and evaluated for model validation.

- Throughout above comparisons (Table 2-1 to 2-6), the model validation including IPLG script were verified.

This model take "GEN2_SUB6" mode, thus, only verification 1 is required.

3. Simulation results

This section shows the PD simulation results of Ant M at 28GHz, 39GHz and 24GHz for each evaluation plane specified in Table 1 at two separation distances of 2mm and 10mm. The ratio of PD exposure from front surface to the worst surface at 2mm, and the ratio of PD exposure from 2mm to 10mm evaluation distance for each beam are also reported in this section to support RF exposure analysis for simultaneous transmission scenarios performed in the Part 1 Near Field PD report.

The relative phase between beam pairs is not controlled in the chipset design. Therefore, the relative phase between each beam pair was considered mathematically to identify the worst case conditions. The below MIMO results represent the highest reported MIMO simulation results after sweeping across the relative phase between beams a 5° step interval from 0° to 360°.

The worst-case simulated PD determined from the tables in this section were used for conservativeness in *input.power.limit* determination in RF Exposure Part 0 Report.

3.1 PD for Low/Mid/High Channel at 28GHz / 39GHz / 24GHz

3.1.1 Ant M– Patch Antenna

Table 3 to 5 show the PD simulation evaluation of Ant M patch antenna at 28GHz / 39GHz / 24GHz for the all surfaces.

Table 3. PD of Ant M – patch antenna (28GHz – n261)

- M–patch Low CH

No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2) S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fornt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)	4cm2 PD(mW/cm2) at 10mm evaluation distance S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	ratio worst-surface (10mm/2mm)	ratio (Right 10mm)/(worst-surface 2mm)	ratio (Left 10mm)/(worst-surface 2mm)	ratio (Top 10mm)/(worst-surface 2mm)	ratio (Bottom 10mm)/(worst-surface 2mm)	ratio (Front 10mm)/(worst-surface 2mm)	ratio (Rear 10mm)/(worst-surface 2mm)
max ratio out of all beams													6.5%	100.0%	17.9%	3.8%	66.7%	100.0%							59.5%	5.0%	59.5%	12.2%	2.5%	21.5%	58.5%
1			0		1	0.00	0.17	0.01	0.00	0.08	0.17		2.3%	100.0%	3.5%	1.2%	49.1%	98.2%	0.00	0.06	0.01	0.00	0.02	0.07	39.8%	1.8%	35.7%	2.9%	1.2%	14.0%	39.8%
2			1		1	0.00	0.25	0.01	0.00	0.07	0.16		1.6%	100.0%	4.4%	0.4%	29.6%	64.4%	0.00	0.09	0.01	0.00	0.02	0.07	35.2%	1.2%	35.2%	3.6%	0.4%	9.2%	29.2%
3			2		1	0.00	0.23	0.01	0.00	0.08	0.14		1.8%	100.0%	3.5%	0.4%	33.2%	61.5%	0.00	0.07	0.01	0.00	0.02	0.06	32.7%	1.2%	32.7%	2.7%	0.4%	8.0%	26.5%
4			3		1	0.01	0.16	0.02	0.00	0.08	0.12		3.8%	100.0%	14.6%	0.6%	51.9%	78.5%	0.01	0.06	0.02	0.00	0.02	0.06	37.3%	3.2%	37.3%	9.5%	0.6%	12.7%	34.8%
5			4		1	0.00	0.14	0.01	0.00	0.09	0.11		2.8%	100.0%	8.5%	0.7%	66.7%	78.7%	0.00	0.05	0.01	0.00	0.03	0.05	35.5%	2.1%	35.5%	5.0%	0.7%	20.6%	34.8%
6			5		2	0.01	0.43	0.02	0.00	0.10	0.31		1.6%	100.0%	3.7%	0.5%	24.2%	74.2%	0.01	0.17	0.01	0.00	0.04	0.17	40.2%	1.4%	40.2%	2.8%	0.2%	8.6%	40.2%
7			6		2	0.01	0.50	0.01	0.00	0.22	0.41		2.4%	100.0%	2.6%	0.4%	44.6%	81.3%	0.01	0.23	0.01	0.00	0.08	0.22	46.0%	1.8%	46.0%	1.6%	0.4%	15.7%	44.0%
8			7		2	0.02	0.53	0.02	0.00	0.18	0.34		2.8%	100.0%	3.2%	0.6%	34.3%	64.2%	0.01	0.23	0.01	0.00	0.07	0.19	44.1%	2.3%	44.1%	2.3%	0.4%	12.6%	36.0%
9			8		2	0.01	0.38	0.03	0.00	0.19	0.23		2.9%	100.0%	6.8%	0.3%	49.5%	58.9%	0.01	0.15	0.02	0.00	0.05	0.12	38.2%	2.4%	38.2%	4.7%	0.3%	13.9%	31.9%
10			9		2	0.01	0.50	0.01	0.00	0.21	0.35		1.8%	100.0%	1.6%	0.8%	40.8%	70.2%	0.01	0.20	0.01	0.00	0.07	0.18	39.6%	1.4%	39.6%	1.2%	0.8%	14.1%	35.2%
11			10		2	0.01	0.43	0.02	0.00	0.17	0.36		2.6%	100.0%	5.6%	0.5%	38.5%	83.5%	0.01	0.21	0.01	0.00	0.05	0.20	48.7%	2.1%	48.7%	3.2%	0.2%	11.4%	45.7%
12			11		2	0.01	0.42	0.03	0.00	0.16	0.37		2.4%	100.0%	6.0%	0.2%	38.1%	90.1%	0.01	0.20	0.02	0.00	0.05	0.19	47.2%	1.7%	47.2%	4.3%	0.2%	12.8%	45.8%
13			12		5	0.02	0.83	0.05	0.01	0.37	0.62		2.0%	100.0%	6.2%	0.8%	44.1%	74.2%	0.01	0.33	0.03	0.01	0.12	0.28	39.0%	1.6%	39.0%	3.8%	0.7%	14.5%	33.3%
14			13		5	0.03	0.97	0.04	0.01	0.37	0.69		2.8%	100.0%	3.9%	0.5%	38.2%	71.8%	0.02	0.46	0.02	0.00	0.16	0.47	48.3%	2.0%	47.8%	2.5%	0.3%	16.0%	48.3%
15			14		5	0.04	1.16	0.02	0.01	0.58	0.93		3.7%	100.0%	1.9%	0.4%	49.9%	80.1%	0.03	0.65	0.02	0.01	0.20	0.62	56.4%	2.9%	56.4%	1.3%	0.4%	16.8%	53.2%
16			15		5	0.07	1.02	0.05	0.00	0.51	0.84		6.5%	100.0%	4.5%	0.3%	49.5%	82.1%	0.05	0.60	0.03	0.00	0.18	0.55	59.1%	4.8%	59.1%	2.6%	0.2%	17.5%	53.8%
17			16		5	0.01	0.80	0.14	0.00	0.31	0.57		1.4%	100.0%	17.1%	0.2%	38.5%	70.6%	0.01	0.30	0.10	0.00	0.12	0.30	37.0%	1.2%	37.0%	12.0%	0.1%	14.6%	37.0%
18			17		5	0.02	0.92	0.05	0.00	0.36	0.66		2.6%	100.0%	5.5%	0.4%	39.1%	71.2%	0.02	0.41	0.03	0.00	0.14	0.39	44.7%	1.7%	44.7%	3.5%	0.3%	15.4%	42.4%
19			18		5	0.04	1.02	0.03	0.01	0.51	0.80		4.1%	100.0%	3.2%	0.9%	50.0%	78.8%	0.03	0.54	0.02	0.01	0.19	0.56	54.8%	3.1%	52.8%	1.9%	0.6%	18.4%	54.8%
20			19		5	0.05	1.17	0.03	0.00	0.47	0.97		4.6%	100.0%	2.6%	0.3%	39.8%	82.7%	0.04	0.66	0.02	0.00	0.16	0.60	56.4%	3.6%	56.4%	1.8%	0.3%	13.6%	51.4%
21			20		5	0.05	0.85	0.09	0.00	0.53	0.68		6.1%	100.0%	11.0%	0.4%	62.9%	79.8%	0.04	0.45	0.04	0.00	0.18	0.41	53.1%	5.0%	53.1%	5.1%	0.2%	21.5%	48.2%
22			256		1	0.01	0.15	0.01	0.00	0.06	0.19		2.7%	81.4%	4.3%	0.5%	29.3%	100.0%	0.00	0.05	0.01	0.00	0.02	0.07	34.6%	2.1%	27.7%	3.2%	0.5%	10.6%	34.6%
23			257		1	0.00	0.09	0.01	0.00	0.03	0.08		3.2%	100.0%	6.5%	1.1%	30.1%	86.0%	0.00	0.03	0.00	0.00	0.01	0.03	36.6%	2.2%	35.5%	4.3%	1.1%	8.6%	36.6%
24			258		1	0.00	0.08	0.01	0.00	0.03	0.10		3.0%	83.0%	7.0%	2.0%	31.0%	100.0%	0.00	0.03	0.01	0.00	0.01	0.05	45.0%	2.0%	32.0%	5.0%	2.0%	10.0%	45.0%
25			259		1	0.00	0.12	0.01	0.00	0.03	0.13		3.1%	91.4%	9.4%	2.3%	22.7%	100.0%	0.00	0.04	0.01	0.00	0.01	0.04	34.4%	2.3%	34.4%	6.3%	1.6%	8.6%	33.6%
26			260		1	0.00	0.09	0.02	0.00	0.04	0.13		2.3%	73.4%	13.3%	2.3%	28.9%	100.0%	0.00	0.04	0.01	0.00	0.01	0.05	40.6%	1.6%	28.9%	7.8%	1.6%	10.2%	40.6%
27			261		2	0.01	0.20	0.03	0.01	0.06	0.32		4.4%	62.4%	10.0%	3.8%	17.9%	100.0%	0.01	0.05	0.02	0.01	0.02	0.13	39.8%	2.8%	15.7%	6.9%	2.5%	6.0%	39.8%
28			262		2	0.01	0.23	0.01	0.00	0.07	0.24		2.5%	93.0%	5.4%	0.4%	30.6%	100.0%	0.01	0.10	0.01	0.00	0.02	0.11	43.4%	2.1%	39.3%	3.3%	0.4%	9.1%	43.4%
29			263		2	0.01	0.19	0.02	0.00	0.06	0.21		2.4%	90.4%	11.5%	1.4%	27.4%	100.0%	0.00	0.08	0.02	0.00	0.02	0.07	40.4%	1.9%	40.4%	7.7%	1.0%	9.6%	34.1%
30			264		2	0.01	0.18	0.02	0.00	0.09	0.24		3.3%	77.0%	7.1%	0.4%	37.7%	100.0%	0.01	0.06	0.01	0.00	0.04	0.09	36.0%	2.5%	23.4%	5.0%	0.4%	15.5%	36.0%
31			265		2	0.01	0.27	0.01	0.00	0.08	0.26		3.4%	100.0%	4.1%	1.1%	28.1%	95.9%	0.01	0.10	0.01	0.00	0.02	0.09	39.0%	3.0%	39.0%	1.9%	0.7%	7.9%	33.7%
32	M	Patch	266		2	0.01	0.30	0.01	0.00	0.09	0.33		3.4%	92.0%	3.1%	0.9%	26.3%	100.0%	0.01	0.13	0.01	0.00	0.03	0.14	44.0%	3.1%	38.2%	1.5%	0.6%	8.9%	44.0%
33			267		2	0.01	0.24	0.01	0.00	0.10	0.31		2.9%	76.9%	4.5%	0.3%	33.4%	100.0%	0.01	0.08	0.01	0.00	0.04	0.13	42.5%	2.3%	26.0%	2.9%	0.3%	13.3%	42.5%
34			268		5	0.03	0.59	0.02	0.03	0.20	0.70		4.1%	83.7%	3.3%	3.7%	28.5%	100.0%	0.02	0.13	0.02	0.02	0.05	0.31	43.6%	3.0%	18.5%	2.6%	2.4%	7.7%	43.6%
35			269		5	0.02	0.51	0.05	0.02	0.19	0.64		3.1%	79.7%	8.2%	2.3%	29.7%	100.0%	0.02	0.22	0.04	0.01	0.07	0.35	53.7%	2.3%	33.5%	5.9%	1.4%	10.1%	53.7%
36			270		5	0.02	0.51	0.02	0.01	0.17	0.50		3.7%	100.0%	4.3%	1.2%	34.1%	98.0%	0.02	0.25	0.02	0.00	0.07	0.26	50.0%	2.9%	49.4%	2.9%	0.8%	13.7%	50.0%
37			271		5	0.02	0.49	0.03	0.00	0.22	0.47		4.3%	100.0%	6.7%	0.4%	44.4%	94.7%	0.02	0.25	0.02	0.00	0.11	0.22	50.3%	3.0%	50.3%	4.3%	0.2%	21.5%	44.6%
38			272		5	0.02	0.48	0.09	0.00	0.20	0.51		4.1%	94.1%	17.9%	0.8%	38.3%	100.0%	0.02	0.19	0.06	0.00	0.08	0.24	46.6%	2.9%	37.3%	11.8%	0.6%	16.1%	46.6%
39			273		5	0.03	0.62	0.02	0.02	0.21	0.66		4.1%	93.9%	3.4%	2.6%	31.9%	100.0%	0.02	0.16	0.01	0.01	0.07	0.28	42.7%	2.7%	24.8%	2.1%	1.8%	9.9%	42.7%
40			274		5	0.02	0.58	0.04	0.01	0.23	0.67		3.1%	87.0%	5.4%	0.7%	34.1%	100.0%	0.02	0.27	0.03	0.00	0.08	0.37	55.1%	2.4%	40.5%	3.7%	0.4%	11.8%	55.1%
41			275		5	0.02	0.50	0.04	0.00	0.18	0.53		3.4%	95.3%	7.6%	0.6%	34.3%	100.0%	0.02	0.25	0.03	0.00	0.08	0.27	50.8%	2.8%	46.8%	4.9%	0.6%	15.0%	50.8%
42			276		5	0.02	0.48	0.05	0.00	0.21	0.48		3.1%	100.0%	9.4%	0.6%	42.8%	100.0%	0.01	0.22	0.03	0.00	0.10	0.21	45.3%	2.5%	45.3%	5.4%	0.4%	20.0%	43.6%
43			0	256	2	0.02	0.41	0.02	0.00	0.22	0.48		3.2%	85.3%	4.0%	0.8%	45.6%	100.0%	0.01	0.17	0.01	0.00	0.07	0.19	39.3%	2.1%	35.1%	2.9%	0.6%	14.1%	39.3%
44			1	257	2	0.01	0.41	0.02	0.00	0.10	0.28		1.7%	100.0%	5.1%	0.7%	24.8%	67.7%	0.01	0.14	0.02	0.00	0.03	0.09	35.0%	1.5%	35.0%	3.6%	0.7%	7.5%	22.8%
45			2	258	2	0.01	0.40	0.02	0.00	0.12	0.23		1.5%	100.0%	5.5%	1.0%	31.2%	58.4%	0.01	0.14	0.02	0.00	0.03	0.12	35.8%	1.3%	35.8%	4.0%	0.8%	8.6%	30.0%
46			3	259	2	0.01	0.30	0.04	0.01	0.13	0.28		3.7%	100.0%	13.7%	1.7%	42.7%	93.3%	0.01	0.11	0.03	0.00	0.04	0.11	38.0%	3.0%	38.0%	8.7%	1.3%	11.7%	37.0%
47			4	260	2	0.01	0.26	0.04	0.01	0.17	0.29		3.1%	90.7%	12.5%	1.7%	59.9%	100.0%	0.01	0.08	0.02	0.00	0.05	0.11	39.4%	2.4%	28.4%	6.9%	1.0%	15.9%	39.4%
48			5	261	4	0.02	0.78	0.05	0.02	0.18	0.70		2.4%	100.0%	6.0%	2.2%	22.8%	89.8%	0.02	0.31	0.03	0.01	0.06	0.38	49.4%	1.9%	39.8%	4.0%	1.4%	7.6%	49.4%
49			6	262	4	0.02	0.82	0.03	0.01	0.32	0.69		2.2%	100.0%	3.9%	0.6%	39.0%	84.1%	0.02	0.33	0.02	0.00	0.11	0.39	47.5%	1.9%	40.5%	2.8%	0.4%	13.2%	47.5%
50			7	263	4	0.02	0.87	0.05	0.01	0.25	0.65		2.6%	100.0%	5.5%	0.7%	28.9%	74.6%	0.02	0.39	0.03	0.01	0.09	0.34	44.5%	2.1%	44.5%	3.4%	0.6%	10.1%	39.0%
51			8	264	4	0.02	0.64	0.05	0.00	0.35	0.46		3.1%	100.0%	7.6%	0.5%	53.8%	71.5%	0.02	0.21	0.04	0.00	0.12	0.18	32.2%	2.6%	32.2%	5.6%	0.3%	18.7%	28.0%
52			9	265	4	0.02	0.84	0.03	0.01	0.36	0.75		2.5%	100.0%	3.2%	1.1%	43.5%	90.1%	0.02	0.32	0.01	0.01	0.13	0.33	39.5%	1.9%	37.9%	1.7%	1.0%	15.4%	39.5%
53			10	266	4	0.03	0.77	0.03	0.01	0.21	0.66		3.4%	100.0%	4.3%	0.9%	27.8%	85.8%	0.02	0.34	0.02	0.01	0.07	0.32	44.5%	3.0%	44.5%	2.1%	0.7%	9.4%	41.4%
54			11	267	4	0.02	0.70	0.05	0.00	0.38	0.88		2.6%	79.9%	6.2%	0.2%	42.9%	100.0%	0.02	0.35	0.04	0.00	0.14	0.33	39.3%	1.8%	39.3%	4.7%	0.2%	15.4%	37.9%
55			12	268	10	0.06	1.58	0.09	0.04	0.73	1.37		3.9%	100.0%	5.8%	2.6%	46.3%	86.7%	0.04	0.56	0.06	0.03	0.26	0.55	35.5%	2.4%	35.5%	4.0%	1.8%	16.2%	34.8%
56			13	269	10	0.06	1.59	0.13	0.02	0.67	1.48		3.7%	100.0%	8.4%	1.4%	42.3%	93.3%	0.04	0.64	0.10	0.02	0.23	0.72	45.2%	2.5%	40.0%	6.1%	0.9%	14.2%	45.2%
57			14	270	10	0.06	1.83	0.08	0.02	0.92	1.50		3.4%	100.0%	4.1%	0.8%	50.1%	81.8%	0.05	0.83	0.05	0.01	0.29	0.96	52.6%	2.6%	45.1%	2.8%	0.5%	15.7%	52.6%
58			15	271	10	0.09	1.88	0.09	0.01	0.82	1.72		4.8%	100.0%	4.8%	0.3%	43.8%	91.4%	0.07	1.12	0.05	0.01	0.34	1.08	59.5%	3.9%	59.5%	2.5%	0.3%	18.1%	57.3%
59			16	272	10	0.04	1.62	0.27	0.01	0.72	1.38		2.5%	100.0%	16.6%	0.6%	44.3%	85.2%	0.04	0.66	0.20	0.01	0.30	0.56	40.7%	2.3%	40.7%	12.2%	0.4%	18.5%	34.6%
60			17	273	10	0.07	1.77	0.12	0.03	0.70	1.40		4.1%	100.0%	6.6%	1.6%	39.7%	79.1%	0.05	0.71	0.08	0.02	0.29	0.74	41.8%	2.5%	39.9%	4.5%	1.1%	16.3%	41.8%
61			18	274	10	0.08	1.78	0.10	0.01	0.88	1.71		4.2%	100.0%	5.5%	0.8%	49.2%	96.1%	0.06	0.82	0.06	0.01	0.27	1.04	58.5%	3.2%	45.9%	3.5%	0.6%	15.2%	58.5%
62			19	275	10	0.09	1.81	0.10	0.01	0.81	1.77		5.0%	100.0%	5.4%	0.4%	44.7%	97.7%	0.07	1.07	0.07	0.01	0.28	1.04	59.4%	3.9%	59.4%	3.6%	0.3%	15.6%	57.6%
63			20	276	10	0.08	1.69	0.18	0.01	0.78	1.51		4.4%	100.0%	10.7%	0.5%	46.2%	89.7%	0.06	0.88	0.10	0.01	0.32	0.88	52.3%	3.6%	52.3%	5.9%	0.4%	19.1%	51.9%

- M–patch Mid CH

No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2) S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fornt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)	4cm2 PD(mW/cm2) at 10mm evaluation distance S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	ratio worst-surface (10mm/2mm)	ratio (Right 10mm)/(worst-surface 2mm)	ratio (Left 10mm)/(worst-surface 2mm)	ratio (Top 10mm)/(worst-surface 2mm)	ratio (Bottom 10mm)/(worst-surface 2mm)	ratio (Front 10mm)/(worst-surface 2mm)	ratio (Rear 10mm)/(worst-surface 2mm)
max ratio out of all beams													4.7%	100.0%	16.7%	2.1%	49.7%	100.0%							58.0%	3.3%	58.0%	10.6%	1.6%	23.1%	54.8%
1			0		1	0.00	0.22	0.01	0.00	0.09	0.18		1.8%	100.0%	3.6%	0.5%	39.8%	82.4%	0.00	0.08	0.01	0.00	0.03	0.09	38.5%	1.4%	36.2%	2.3%	0.5%	13.6%	38.5%
2			1		1	0.00	0.26	0.01	0.00	0.07	0.16		1.6%	100.0%	4.3%	0.4%	28.6%	63.9%	0.00	0.09	0.01	0.00	0.02	0.07	34.9%	1.2%	34.9%	3.1%	0.4%	8.6%	29.0%
3			2		1	0.00	0.24	0.01	0.00	0.08	0.13		1.3%	100.0%	3.3%	0.4%	35.1%	55.2%	0.00	0.09	0.01	0.00	0.03	0.06	35.6%	0.8%	35.6%	2.1%	0.4%	10.9%	26.4%
4			3		1	0.00	0.19	0.03	0.00	0.08	0.13		2.1%	100.0%	15.5%	0.5%	40.2%	69.1%	0.00	0.07	0.02	0.00	0.02	0.06	36.1%	2.1%	36.1%	9.3%	0.5%	11.9%	29.9%
5			4		1	0.00	0.17	0.01	0.00	0.07	0.13		2.3%	100.0%	7.6%	0.6%	40.7%	74.4%	0.00	0.07	0.01	0.00	0.02	0.05	41.9%	1.7%	41.9%	4.7%	0.6%	12.2%	29.1%
6			5		2	0.01	0.40	0.02	0.00	0.13	0.29		2.2%	100.0%	5.7%	0.5%	32.3%	71.1%	0.01	0.14	0.02	0.00	0.05	0.15	37.3%	1.2%	34.8%	4.2%	0.5%	12.7%	37.3%
7			6		2	0.01	0.63	0.01	0.00	0.24	0.45		1.8%	100.0%	2.1%	0.3%	37.4%	71.5%	0.01	0.26	0.01	0.00	0.09	0.26	41.6%	1.3%	41.6%	1.3%	0.3%	14.0%	40.8%
8			7		2	0.01	0.58	0.02	0.00	0.18	0.34		1.7%	100.0%	2.6%	0.3%	31.5%	58.2%	0.01	0.27	0.01	0.00	0.07	0.20	46.6%	1.4%	46.6%	1.4%	0.3%	11.6%	34.0%
9			8		2	0.01	0.43	0.03	0.00	0.16	0.24		1.9%	100.0%	7.5%	0.2%	37.3%	56.2%	0.01	0.17	0.02	0.00	0.05	0.13	39.4%	1.4%	39.4%	4.2%	0.2%	11.4%	29.4%
10			9		2	0.01	0.58	0.01	0.00	0.23	0.37		1.4%	100.0%	2.6%	0.5%	39.9%	63.4%	0.01	0.21	0.01	0.00	0.08	0.19	36.3%	1.0%	36.3%	1.0%	0.5%	13.5%	33.3%
11			10		2	0.01	0.54	0.03	0.00	0.18	0.40		1.7%	100.0%	5.6%	0.4%	33.5%	74.2%	0.01	0.24	0.02	0.00	0.06	0.21	45.0%	1.3%	45.0%	3.2%	0.2%	11.4%	39.6%
12			11		2	0.01	0.49	0.02	0.00	0.13	0.41		1.8%	100.0%	4.0%	0.5%	26.8%	83.3%	0.01	0.23	0.02	0.00	0.05	0.22	46.3%	1.2%	46.3%	3.5%	0.2%	9.1%	44.7%
13			12		5	0.03	0.86	0.09	0.01	0.42	0.59		3.7%	100.0%	10.8%	0.8%	48.9%	68.8%	0.02	0.27	0.05	0.01	0.16	0.24	31.3%	2.2%	31.3%	6.3%	0.7%	18.3%	28.1%
14			13		5	0.04	1.07	0.06	0.00	0.44	0.73		3.6%	100.0%	5.8%	0.4%	41.4%	68.3%	0.02	0.46	0.03	0.00	0.18	0.41	42.8%	2.3%	42.8%	3.1%	0.3%	16.6%	38.2%
15			14		5	0.04	1.48	0.02	0.00	0.52	1.04		2.4%	100.0%	1.4%	0.3%	35.0%	70.0%	0.03	0.73	0.01	0.00	0.19	0.69	49.5%	1.8%	49.5%	0.8%	0.3%	12.7%	46.8%
16			15		5	0.05	1.26	0.04	0.00	0.38	0.95		4.1%	100.0%	3.3%	0.2%	29.9%	75.1%	0.04	0.71	0.02	0.00	0.14	0.61	56.4%	3.1%	56.4%	1.7%	0.2%	11.4%	48.1%
17			16		5	0.01	0.79	0.13	0.00	0.28	0.57		1.3%	100.0%	15.9%	0.3%	35.4%	72.0%	0.01	0.35	0.08	0.00	0.11	0.25	44.8%	1.3%	44.8%	9.6%	0.3%	13.4%	32.2%
18			17		5	0.04	0.97	0.09	0.01	0.45	0.64		3.7%	100.0%	9.4%	0.5%	45.9%	65.4%	0.02	0.37	0.05	0.00	0.18	0.32	37.9%	2.2%	37.9%	5.3%	0.4%	18.7%	33.0%
19			18		5	0.03	1.28	0.04	0.00	0.47	0.94		2.6%	100.0%	3.3%	0.4%	36.8%	73.1%	0.02	0.63	0.03	0.00	0.18	0.61	48.8%	1.9%	48.8%	1.9%	0.3%	14.1%	47.7%
20			19		5	0.05	1.35	0.03	0.00	0.48	1.01		3.4%	100.0%	2.2%	0.4%	35.1%	74.4%	0.04	0.71	0.02	0.00	0.18	0.65	52.8%	2.6%	52.8%	1.6%	0.2%	12.9%	48.2%
21			20		5	0.04	1.08	0.13	0.00	0.33	0.77		3.2%	100.0%	11.6%	0.2%	30.0%	70.6%	0.03	0.59	0.06	0.00	0.12	0.47	54.8%	2.5%	54.8%	5.2%	0.1%	11.1%	43.4%
22			256		1	0.00	0.18	0.01	0.00	0.06	0.17		2.2%	100.0%	4.9%	0.5%	30.4%	92.9%	0.00	0.06	0.01	0.00	0.02	0.06	34.2%	1.6%	31.5%	2.7%	0.5%	10.3%	34.2%
23			257		1	0.00	0.12	0.01	0.00	0.04	0.08		2.5%	100.0%	5.0%	0.8%	33.6%	64.7%	0.00	0.04	0.00	0.00	0.01	0.03	32.8%	1.7%	32.8%	3.4%	0.8%	9.2%	25.2%
24			258		1	0.00	0.09	0.01	0.00	0.03	0.09		2.1%	100.0%	6.4%	2.1%	34.0%	93.6%	0.00	0.03	0.01	0.00	0.01	0.03	36.2%	2.1%	31.9%	5.3%	1.1%	11.7%	36.2%
25			259		1	0.00	0.12	0.01	0.00	0.03	0.11		2.5%	100.0%	9.9%	1.7%	25.6%	91.7%	0.00	0.05	0.01	0.00	0.01	0.04	38.0%	2.5%	38.0%	6.6%	0.8%	9.1%	35.5%
26			260		1	0.00	0.12	0.01	0.00	0.04	0.10		1.7%	100.0%	11.0%	0.8%	37.3%	87.3%	0.00	0.05	0.01	0.00	0.02	0.05	43.2%	0.8%	39.0%	5.9%	0.8%	14.4%	43.2%
27			261		2	0.01	0.25	0.02	0.00	0.07	0.28		2.5%	87.9%	8.2%	1.4%	23.4%	100.0%	0.01	0.06	0.01	0.00	0.02	0.14	47.9%	2.5%	22.0%	5.0%	1.1%	7.8%	47.9%
28			262		2	0.01	0.27	0.01	0.00	0.09	0.21		2.2%	100.0%	4.4%	0.4%	32.0%	76.5%	0.01	0.11	0.01	0.00	0.03	0.09	40.4%	1.8%	40.4%	2.6%	0.4%	10.7%	33.8%
29			263		2	0.01	0.18	0.02	0.00	0.06	0.18		3.3%	100.0%	13.3%	1.1%	33.7%	100.0%	0.00	0.08	0.02	0.00	0.02	0.07	45.9%	2.8%	45.9%	8.8%	0.6%	12.2%	37.6%
30			264		2	0.01	0.22	0.02	0.00	0.06	0.25		2.4%	89.6%	7.1%	0.8%	25.4%	100.0%	0.01	0.07	0.01	0.00	0.03	0.08	32.9%	2.0%	28.4%	4.8%	0.8%	10.7%	32.9%
31			265		2	0.01	0.32	0.01	0.00	0.09	0.23		2.5%	100.0%	3.1%	0.6%	28.5%	70.0%	0.01	0.12	0.01	0.00	0.03	0.09	37.5%	1.9%	37.5%	1.9%	0.6%	9.6%	26.9%
32	M	Patch	266		2	0.01	0.34	0.01	0.00	0.11	0.27		2.6%	100.0%	1.7%	0.6%	31.1%	77.6%	0.01	0.14	0.00	0.00	0.04	0.11	41.0%	1.7%	41.0%	1.2%	0.3%	11.0%	30.8%
33			267		2	0.01	0.30	0.01	0.00	0.12	0.29		2.7%	100.0%	4.7%	0.5%	41.9%	97.0%	0.01	0.10	0.01	0.00	0.05	0.08	38.9%	2.0%	33.1%	3.4%	0.3%	16.2%	38.9%
34			268		5	0.02	0.79	0.03	0.02	0.26	0.58		2.4%	100.0%	3.6%	1.9%	32.6%	74.1%	0.01	0.20	0.02	0.01	0.08	0.27	34.5%	1.5%	25.1%	2.2%	1.6%	10.0%	34.5%
35			269		5	0.02	0.54	0.05	0.01	0.20	0.60		3.5%	89.8%	7.7%	1.2%	33.7%	100.0%	0.01	0.17	0.03	0.01	0.07	0.33	54.8%	2.5%	28.4%	5.0%	0.8%	11.5%	54.8%
36			270		5	0.01	0.58	0.01	0.00	0.20	0.39		2.4%	100.0%	2.4%	0.7%	35.2%	67.9%	0.01	0.29	0.01	0.00	0.08	0.19	50.5%	1.2%	50.5%	1.2%	0.3%	14.2%	32.8%
37			271		5	0.02	0.54	0.04	0.00	0.25	0.40		3.3%	100.0%	7.2%	0.4%	45.8%	74.0%	0.02	0.28	0.02	0.00	0.13	0.19	50.9%	2.8%	50.9%	4.1%	0.2%	23.1%	34.9%
38			272		5	0.02	0.55	0.07	0.00	0.23	0.45		2.9%	100.0%	12.9%	0.5%	42.5%	81.8%	0.01	0.20	0.05	0.00	0.10	0.20	36.9%	2.2%	36.9%	8.9%	0.4%	18.9%	35.6%
39			273		5	0.02	0.82	0.03	0.01	0.28	0.56		2.2%	100.0%	3.5%	1.3%	33.6%	68.7%	0.01	0.24	0.02	0.01	0.10	0.28	34.1%	1.6%	28.6%	2.4%	1.1%	11.7%	34.1%
40			274		5	0.02	0.63	0.04	0.00	0.24	0.60		3.7%	100.0%	5.7%	0.6%	38.8%	96.3%	0.02	0.29	0.02	0.00	0.09	0.33	52.3%	2.9%	46.9%	3.8%	0.5%	13.7%	52.3%
41			275		5	0.02	0.55	0.02	0.00	0.22	0.42		3.4%	100.0%	4.4%	0.4%	40.7%	76.0%	0.01	0.27	0.02	0.00	0.10	0.22	49.4%	2.5%	49.4%	3.1%	0.2%	18.1%	39.4%
42			276		5	0.02	0.56	0.04	0.00	0.24	0.41		2.7%	100.0%	7.0%	0.7%	43.5%	73.7%	0.01	0.26	0.02	0.00	0.12	0.19	46.2%	2.2%	46.2%	3.4%	0.5%	20.8%	34.2%
43			0	256	2	0.01	0.48	0.03	0.00	0.18	0.46		2.5%	100.0%	6.1%	0.6%	38.6%	97.1%	0.01	0.19	0.02	0.00	0.06	0.21	43.0%	1.9%	39.6%	3.1%	0.6%	12.2%	43.0%
44			1	257	2	0.01	0.45	0.02	0.00	0.13	0.28		1.7%	100.0%	5.4%	0.7%	29.7%	61.4%	0.01	0.15	0.02	0.00	0.04	0.11	32.8%	0.9%	32.8%	3.8%	0.4%	8.9%	23.9%
45			2	258	2	0.01	0.42	0.02	0.00	0.15	0.22		1.7%	100.0%	4.8%	1.0%	36.1%	52.3%	0.01	0.14	0.02	0.00	0.05	0.10	33.7%	1.2%	33.7%	3.6%	0.7%	13.0%	25.1%
46			3	259	2	0.01	0.35	0.06	0.00	0.12	0.26		2.5%	100.0%	16.7%	0.8%	33.4%	73.9%	0.01	0.12	0.04	0.00	0.04	0.12	34.0%	1.7%	34.0%	10.2%	0.6%	10.8%	32.9%
47			4	260	2	0.01	0.32	0.04	0.00	0.14	0.25		2.2%	100.0%	12.3%	0.6%	42.0%	77.2%	0.01	0.12	0.03	0.00	0.04	0.11	37.7%	1.5%	37.7%	6.8%	0.6%	11.7%	32.7%
48			5	261	4	0.01	0.74	0.05	0.01	0.23	0.62		3.2%	100.0%	6.9%	1.2%	30.2%	83.5%	0.01	0.27	0.03	0.00	0.09	0.38	50.8%	1.8%	36.4%	4.4%	0.8%	12.0%	50.8%
49			6	262	4	0.01	1.02	0.03	0.00	0.36	0.73		1.4%	100.0%	2.8%	0.4%	35.7%	71.1%	0.01	0.38	0.02	0.00	0.13	0.42	41.5%	1.2%	37.7%	2.1%	0.3%	13.0%	41.5%
50			7	263	4	0.02	0.89	0.04	0.00	0.25	0.58		1.7%	100.0%	4.9%	0.5%	27.7%	65.3%	0.01	0.40	0.03	0.00	0.09	0.32	45.5%	1.5%	45.5%	3.3%	0.3%	9.8%	36.6%
51			8	264	4	0.02	0.75	0.07	0.00	0.37	0.49		2.1%	100.0%	9.2%	0.5%	49.7%	64.8%	0.01	0.29	0.03	0.00	0.15	0.23	38.0%	1.9%	38.0%	4.5%	0.5%	20.4%	30.3%
52			9	265	4	0.02	1.01	0.03	0.01	0.36	0.67		1.7%	100.0%	2.7%	0.8%	35.1%	65.8%	0.01	0.36	0.02	0.01	0.11	0.36	35.8%	1.1%	35.8%	1.9%	0.7%	11.2%	35.2%
53			10	266	4	0.02	0.88	0.05	0.01	0.24	0.62		2.3%	100.0%	5.6%	0.6%	27.6%	70.5%	0.02	0.36	0.02	0.00	0.08	0.34	40.2%	2.0%	40.2%	2.7%	0.5%	9.5%	38.2%
54			11	267	4	0.02	0.86	0.06	0.00	0.36	0.91		2.3%	94.5%	6.6%	0.3%	39.4%	100.0%	0.02	0.41	0.04	0.00	0.12	0.40	44.9%	1.9%	44.9%	4.6%	0.2%	13.5%	43.6%
55			12	268	10	0.09	1.84	0.12	0.02	0.87	1.33		4.7%	100.0%	6.2%	1.3%	47.1%	72.2%	0.05	0.58	0.06	0.02	0.35	0.63	34.0%	2.8%	31.5%	3.5%	1.1%	18.7%	34.0%
56			13	269	10	0.06	1.66	0.13	0.02	0.66	1.27		3.9%	100.0%	7.7%	1.0%	39.8%	76.3%	0.04	0.67	0.09	0.01	0.23	0.61	40.6%	2.5%	40.6%	5.1%	0.7%	13.8%	37.0%
57			14	270	10	0.05	2.44	0.07	0.01	0.75	1.45		2.0%	100.0%	2.7%	0.3%	30.9%	59.3%	0.04	1.00	0.03	0.01	0.27	1.01	41.4%	1.6%	40.9%	1.2%	0.4%	10.9%	41.4%
58			15	271	10	0.09	2.23	0.09	0.01	0.78	1.83		3.9%	100.0%	4.2%	0.3%	34.9%	82.4%	0.07	1.29	0.05	0.01	0.35	1.17	58.0%	3.3%	58.0%	2.0%	0.3%	15.7%	52.4%
59			16	272	10	0.04	1.67	0.26	0.01	0.81	1.40		2.2%	100.0%	15.6%	0.5%	48.3%	83.9%	0.03	0.71	0.18	0.01	0.34	0.55	42.4%	1.9%	42.4%	10.6%	0.4%	20.5%	32.6%
60			17	273	10	0.09	2.06	0.12	0.02	0.89	1.47		4.3%	100.0%	5.7%	0.8%	43.5%	71.7%	0.06	0.76	0.07	0.01	0.38	0.82	40.0%	2.7%	36.9%	3.4%	0.6%	18.3%	40.0%
61			18	274	10	0.06	2.24	0.09	0.01	0.74	1.68		2.5%	100.0%	4.1%	0.4%	33.1%	74.7%	0.05	0.93	0.06	0.01	0.27	1.04	46.2%	2.1%	41.4%	2.5%	0.4%	12.2%	46.2%
62			19	275	10	0.06	1.98	0.07	0.01	0.79	1.58		3.2%	100.0%	3.3%	0.5%	39.9%	79.5%	0.05	1.04	0.05	0.01	0.29	0.98	52.6%	2.7%	52.6%	3.6%	0.3%	14.6%	49.4%
63			20	276	10	0.05	2.06	0.24	0.01	0.66	1.62		2.6%	100.0%	11.8%	0.4%	32.1%	78.9%	0.04	1.12	0.11	0.01	0.31	0.94	54.3%	2.0%	54.3%	5.3%	0.3%	14.2%	45.9%

- M–patch High CH

													max ratio out of all beams					
No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2)							3.5%	100.0%	17.3%	2.0%	49.7%	89.3%
						S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fornt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)
1			0		1	0.00	**0.24**	0.01	0.00	0.10	0.19		1.6%	100.0%	3.7%	0.4%	40.3%	76.1%
2			1		1	0.00	**0.25**	0.01	0.00	0.07	0.15		1.2%	100.0%	4.5%	0.4%	28.9%	62.2%
3			2		1	0.00	**0.28**	0.01	0.00	0.10	0.13		1.1%	100.0%	2.5%	0.4%	35.6%	47.1%
4			3		1	0.00	**0.21**	0.03	0.00	0.08	0.13		1.4%	100.0%	13.5%	0.5%	36.7%	64.7%
5			4		1	0.00	**0.19**	0.02	0.00	0.07	0.14		1.6%	100.0%	8.8%	0.5%	38.3%	71.0%
6			5		2	0.01	**0.46**	0.02	0.00	0.16	0.27		1.8%	100.0%	4.8%	0.7%	34.5%	58.5%
7			6		2	0.01	**0.67**	0.01	0.00	0.26	0.42		1.8%	100.0%	1.6%	0.1%	39.1%	63.3%
8			7		2	0.01	**0.58**	0.02	0.00	0.19	0.32		1.2%	100.0%	2.8%	0.3%	32.2%	55.5%
9			8		2	0.01	**0.47**	0.03	0.00	0.17	0.24		1.5%	100.0%	6.8%	0.2%	35.2%	50.8%
10			9		2	0.01	**0.63**	0.01	0.00	0.26	0.36		1.4%	100.0%	1.6%	0.3%	40.7%	57.4%
11			10		2	0.01	**0.58**	0.03	0.00	0.21	0.39		1.4%	100.0%	5.2%	0.2%	35.9%	67.1%
12			11		2	0.01	**0.47**	0.03	0.00	0.13	0.39		1.7%	100.0%	5.9%	0.2%	27.0%	81.2%
13			12		5	0.03	**0.96**	0.09	0.01	0.47	0.56		3.4%	100.0%	8.9%	0.8%	48.7%	58.8%
14			13		5	0.04	**1.17**	0.06	0.00	0.51	0.75		3.2%	100.0%	5.4%	0.3%	43.1%	64.0%
15			14		5	0.03	**1.56**	0.02	0.00	0.53	0.98		2.2%	100.0%	1.5%	0.2%	34.0%	63.0%
16			15		5	0.04	**1.36**	0.04	0.00	0.40	0.96		3.1%	100.0%	2.9%	0.2%	29.4%	70.5%
17			16		5	0.02	**0.74**	0.13	0.00	0.27	0.55		2.2%	100.0%	17.3%	0.4%	36.5%	74.9%
18			17		5	0.04	**1.08**	0.09	0.01	0.51	0.64		3.5%	100.0%	8.1%	0.5%	46.9%	59.1%
19			18		5	0.03	**1.37**	0.04	0.01	0.50	0.90		2.0%	100.0%	2.9%	0.4%	36.7%	65.6%
20			19		5	0.04	**1.50**	0.03	0.00	0.47	1.04		2.4%	100.0%	1.8%	0.3%	31.6%	69.5%
21			20		5	0.03	**1.12**	0.14	0.00	0.33	0.79		2.9%	100.0%	12.2%	0.2%	29.3%	70.0%
22			256		1	0.00	**0.19**	0.01	0.00	0.06	0.14		1.6%	100.0%	4.3%	0.5%	30.5%	75.4%
23			257		1	0.00	**0.14**	0.01	0.00	0.04	0.07		1.4%	100.0%	3.5%	0.7%	31.2%	51.8%
24			258		1	0.00	**0.12**	0.01	0.00	0.04	0.07		1.7%	100.0%	6.0%	1.7%	32.8%	61.2%
25			259		1	0.00	**0.13**	0.01	0.00	0.03	0.11		2.2%	100.0%	9.7%	0.7%	24.6%	79.1%
26			260		1	0.00	**0.13**	0.01	0.00	0.04	0.09		0.8%	100.0%	7.8%	0.8%	30.5%	70.3%
27			261		2	0.01	**0.29**	0.02	0.00	0.06	0.26		2.4%	100.0%	7.9%	1.4%	21.4%	89.3%
28			262		2	0.01	**0.30**	0.01	0.00	0.10	0.18		1.6%	100.0%	3.0%	0.3%	31.3%	58.6%
29			263		2	0.00	**0.20**	0.02	0.00	0.06	0.18		2.0%	100.0%	11.3%	0.5%	31.4%	88.7%
30			264		2	0.01	**0.30**	0.02	0.00	0.13	0.21		1.7%	100.0%	6.3%	0.7%	44.3%	70.7%
31			265		2	0.01	**0.33**	0.01	0.00	0.10	0.20		1.8%	100.0%	2.4%	0.9%	29.5%	60.8%
32	M	Patch	266		2	0.01	**0.34**	0.01	0.00	0.12	0.23		2.1%	100.0%	1.5%	0.6%	34.3%	66.0%
33			267		2	0.01	**0.34**	0.02	0.00	0.14	0.24		1.8%	100.0%	4.8%	0.3%	42.3%	71.7%
34			268		5	0.02	**0.93**	0.03	0.02	0.28	0.56		1.8%	100.0%	2.9%	2.0%	30.3%	59.6%
35			269		5	0.02	**0.63**	0.05	0.00	0.23	0.51		3.0%	100.0%	8.3%	0.6%	36.0%	82.1%
36			270		5	0.01	**0.62**	0.01	0.00	0.23	0.31		1.6%	100.0%	2.0%	0.5%	36.6%	50.1%
37			271		5	0.01	**0.58**	0.04	0.00	0.25	0.35		2.4%	100.0%	6.7%	0.3%	42.7%	59.6%
38			272		5	0.01	**0.60**	0.06	0.00	0.23	0.44		2.2%	100.0%	9.9%	0.7%	39.1%	74.1%
39			273		5	0.01	**0.91**	0.03	0.01	0.28	0.53		1.2%	100.0%	3.2%	1.4%	30.6%	58.9%
40			274		5	0.02	**0.69**	0.03	0.00	0.27	0.52		2.7%	100.0%	4.2%	0.3%	39.0%	74.7%
41			275		5	0.02	**0.58**	0.02	0.00	0.24	0.31		2.8%	100.0%	3.1%	0.2%	42.4%	54.5%
42			276		5	0.01	**0.61**	0.04	0.00	0.24	0.37		2.0%	100.0%	6.1%	0.7%	39.8%	60.5%
43			0	256	2	0.01	**0.49**	0.03	0.00	0.19	0.41		1.8%	100.0%	5.9%	0.4%	37.9%	83.9%
44			1	257	2	0.01	**0.44**	0.02	0.00	0.14	0.28		1.4%	100.0%	5.2%	0.7%	31.8%	63.1%
45			2	258	2	0.01	**0.49**	0.02	0.00	0.19	0.23		1.4%	100.0%	4.3%	0.8%	39.2%	46.1%
46			3	259	2	0.01	**0.36**	0.06	0.00	0.12	0.27		2.2%	100.0%	16.7%	0.8%	32.9%	73.8%
47			4	260	2	0.01	**0.37**	0.04	0.00	0.13	0.23		1.4%	100.0%	11.1%	0.8%	35.3%	62.8%
48			5	261	4	0.01	**0.83**	0.05	0.01	0.26	0.54		1.7%	100.0%	6.3%	0.8%	30.6%	65.4%
49			6	262	4	0.01	**1.09**	0.02	0.00	0.39	0.68		1.3%	100.0%	2.0%	0.4%	35.7%	62.2%
50			7	263	4	0.02	**0.92**	0.04	0.00	0.25	0.56		1.6%	100.0%	4.7%	0.4%	27.2%	60.2%
51			8	264	4	0.01	**0.82**	0.07	0.00	0.41	0.45		1.6%	100.0%	8.8%	0.5%	49.7%	54.8%
52			9	265	4	0.02	**1.06**	0.03	0.01	0.37	0.62		1.4%	100.0%	2.4%	0.5%	35.2%	57.9%
53			10	266	4	0.01	**0.88**	0.05	0.00	0.31	0.55		1.6%	100.0%	5.5%	0.5%	35.3%	62.8%
54			11	267	4	0.02	**0.92**	0.07	0.00	0.37	0.82		2.1%	100.0%	7.2%	0.3%	40.0%	89.3%
55			12	268	10	0.07	**2.09**	0.14	0.03	0.96	1.33		3.3%	100.0%	6.9%	1.5%	46.1%	63.8%
56			13	269	10	0.05	**1.80**	0.15	0.01	0.68	1.15		2.9%	100.0%	8.2%	0.6%	37.8%	64.0%
57			14	270	10	0.04	**2.55**	0.06	0.01	0.74	1.40		1.6%	100.0%	2.5%	0.3%	29.1%	54.8%
58			15	271	10	0.07	**2.38**	0.09	0.01	0.84	1.81		2.8%	100.0%	3.6%	0.3%	35.5%	76.2%
59			16	272	10	0.05	**1.61**	0.26	0.01	0.78	1.30		3.0%	100.0%	16.1%	0.6%	48.5%	80.8%
60			17	273	10	0.08	**2.28**	0.14	0.02	0.97	1.48		3.3%	100.0%	6.0%	0.9%	42.6%	64.9%
61			18	274	10	0.05	**2.42**	0.09	0.01	0.80	1.54		1.9%	100.0%	3.8%	0.3%	33.0%	63.7%
62			19	275	10	0.05	**2.14**	0.06	0.01	0.81	1.49		2.5%	100.0%	2.9%	0.3%	37.7%	69.8%
63			20	276	10	0.05	**2.18**	0.24	0.01	0.72	1.60		2.5%	100.0%	11.2%	0.5%	33.2%	73.4%

TABLE1RIGHT

Table 4. PD of Ant M – patch antenna (39GHz – n260)

- M–patch Low CH

													max ratio out of all beams					
No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2)							3.3%	100.0%	15.5%	2.6%	60.4%	67.3%
						S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fornt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)
1			0		1	0.00	**0.18**	0.01	0.00	0.06	0.07		1.1%	100.0%	5.1%	0.6%	36.2%	37.3%
2			1		1	0.00	**0.18**	0.01	0.00	0.05	0.10		1.1%	100.0%	6.0%	1.1%	28.4%	53.6%
3			2		1	0.00	**0.23**	0.01	0.00	0.07	0.09		0.9%	100.0%	5.2%	1.3%	31.6%	39.4%
4			3		1	0.00	**0.19**	0.01	0.00	0.04	0.10		1.6%	100.0%	6.3%	0.5%	22.0%	52.9%
5			4		1	0.00	**0.24**	0.01	0.00	0.07	0.11		0.8%	100.0%	5.8%	0.8%	28.9%	43.8%
6			5		2	0.00	**0.52**	0.04	0.01	0.10	0.20		0.6%	100.0%	8.5%	1.0%	19.9%	37.7%
7			6		2	0.01	**0.26**	0.01	0.00	0.12	0.14		1.9%	100.0%	4.2%	0.8%	46.6%	53.8%
8			7		2	0.00	**0.44**	0.03	0.00	0.14	0.22		0.9%	100.0%	5.7%	0.9%	32.9%	49.1%
9			8		2	0.00	**0.36**	0.03	0.00	0.09	0.13		0.8%	100.0%	8.4%	1.1%	23.8%	36.4%
10			9		2	0.00	**0.54**	0.04	0.01	0.16	0.17		0.6%	100.0%	7.1%	1.1%	30.0%	30.8%
11			10		2	0.01	**0.34**	0.02	0.00	0.13	0.22		1.8%	100.0%	5.3%	0.3%	37.4%	64.1%
12			11		2	0.00	**0.50**	0.04	0.00	0.13	0.22		0.6%	100.0%	8.8%	0.8%	26.1%	44.1%
13			12		5	0.01	**1.03**	0.14	0.03	0.27	0.47		1.0%	100.0%	13.4%	2.6%	26.3%	45.8%
14			13		5	0.01	**1.05**	0.09	0.00	0.46	0.47		1.0%	100.0%	8.6%	0.3%	43.7%	44.8%
15			14		5	0.02	**0.75**	0.04	0.00	0.30	0.50		2.4%	100.0%	5.5%	0.4%	40.5%	67.3%
16			15		5	0.01	**0.96**	0.09	0.01	0.33	0.54		0.8%	100.0%	9.6%	0.9%	34.3%	55.9%
17			16		5	0.01	**1.30**	0.19	0.01	0.32	0.40		0.5%	100.0%	14.5%	0.4%	24.4%	31.0%
18			17		5	0.01	**1.13**	0.15	0.02	0.25	0.45		0.7%	100.0%	13.1%	1.9%	22.3%	39.5%
19			18		5	0.02	**0.64**	0.03	0.00	0.27	0.40		3.3%	100.0%	5.0%	0.3%	42.6%	62.4%
20			19		5	0.02	**0.84**	0.05	0.01	0.32	0.42		1.9%	100.0%	6.0%	0.8%	37.8%	50.2%
21			20		5	0.01	**1.24**	0.16	0.02	0.29	0.55		0.6%	100.0%	12.6%	1.4%	23.3%	44.6%
22			256		1	0.00	**0.31**	0.01	0.00	0.12	0.10		0.6%	100.0%	2.5%	0.0%	39.2%	32.8%
23			257		1	0.00	**0.28**	0.01	0.00	0.12	0.07		0.4%	100.0%	4.6%	0.4%	42.0%	26.1%
24			258		1	0.00	**0.27**	0.01	0.00	0.11	0.08		0.7%	100.0%	3.7%	0.4%	39.3%	28.9%
25			259		1	0.00	**0.33**	0.02	0.00	0.10	0.10		0.6%	100.0%	4.9%	0.3%	30.2%	29.5%
26			260		1	0.00	**0.29**	0.01	0.00	0.11	0.10		0.7%	100.0%	2.7%	0.3%	36.8%	33.7%
27			261		2	0.00	**0.64**	0.04	0.00	0.23	0.16		0.6%	100.0%	5.6%	0.2%	35.6%	25.0%
28			262		2	0.01	**0.59**	0.01	0.00	0.22	0.25		1.0%	100.0%	2.2%	0.2%	37.5%	42.4%
29			263		2	0.00	**0.50**	0.03	0.00	0.16	0.20		0.6%	100.0%	6.0%	0.2%	31.0%	39.9%
30			264		2	0.00	**0.66**	0.04	0.00	0.22	0.17		0.5%	100.0%	5.8%	0.2%	34.0%	26.2%
31			265		2	0.01	**0.73**	0.02	0.00	0.30	0.19		0.8%	100.0%	3.0%	0.3%	41.0%	26.3%
32	M	Patch	266		2	0.01	**0.49**	0.02	0.00	0.17	0.26		1.0%	100.0%	3.7%	0.2%	35.2%	53.8%
33			267		2	0.00	**0.66**	0.05	0.00	0.20	0.17		0.6%	100.0%	6.9%	0.3%	31.0%	26.0%
34			268		5	0.02	**1.17**	0.12	0.01	0.44	0.38		2.0%	100.0%	10.3%	0.6%	37.5%	32.8%
35			269		5	0.02	**1.45**	0.06	0.00	0.63	0.42		1.1%	100.0%	4.1%	0.1%	43.8%	28.8%
36			270		5	0.01	**1.15**	0.02	0.00	0.45	0.56		1.0%	100.0%	2.0%	0.3%	38.8%	49.0%
37			271		5	0.01	**1.32**	0.12	0.01	0.56	0.48		0.7%	100.0%	8.8%	0.5%	42.1%	36.2%
38			272		5	0.02	**1.19**	0.12	0.01	0.45	0.40		1.7%	100.0%	10.5%	0.4%	37.6%	34.0%
39			273		5	0.02	**1.31**	0.09	0.01	0.52	0.41		1.8%	100.0%	7.1%	0.4%	39.6%	31.3%
40			274		5	0.01	**1.54**	0.02	0.00	0.76	0.60		0.6%	100.0%	1.4%	0.1%	49.2%	39.1%
41			275		5	0.01	**1.36**	0.06	0.00	0.59	0.51		0.7%	100.0%	4.5%	0.2%	43.2%	37.6%
42			276		5	0.02	**1.10**	0.16	0.01	0.37	0.34		1.5%	100.0%	14.5%	0.5%	33.6%	30.9%
43			0	256	2	0.00	**0.54**	0.02	0.00	0.20	0.21		0.7%	100.0%	3.3%	0.2%	36.7%	37.8%
44			1	257	2	0.01	**0.61**	0.03	0.01	0.21	0.20		0.8%	100.0%	4.6%	0.8%	34.6%	33.1%
45			2	258	2	0.00	**0.60**	0.03	0.00	0.24	0.19		0.7%	100.0%	5.4%	0.7%	39.8%	31.4%
46			3	259	2	0.01	**0.54**	0.03	0.00	0.17	0.19		1.1%	100.0%	5.5%	0.4%	32.0%	35.7%
47			4	260	2	0.00	**0.60**	0.03	0.00	0.21	0.21		0.5%	100.0%	4.2%	0.5%	35.0%	34.7%
48			5	261	4	0.01	**0.89**	0.10	0.01	0.30	0.34		1.1%	100.0%	11.5%	1.0%	33.2%	37.7%
49			6	262	4	0.01	**0.83**	0.02	0.00	0.36	0.35		1.2%	100.0%	2.9%	0.2%	43.4%	42.5%
50			7	263	4	0.01	**0.93**	0.05	0.01	0.34	0.42		0.9%	100.0%	5.3%	0.6%	36.9%	45.8%
51			8	264	4	0.01	**1.26**	0.08	0.01	0.37	0.44		0.9%	100.0%	6.1%	0.6%	29.2%	35.4%
52			9	265	4	0.01	**1.36**	0.08	0.01	0.69	0.51		1.0%	100.0%	5.6%	0.7%	50.4%	37.4%
53			10	266	4	0.01	**0.92**	0.04	0.00	0.35	0.45		1.1%	100.0%	4.6%	0.2%	38.1%	49.1%
54			11	267	4	0.01	**1.32**	0.10	0.01	0.35	0.39		0.8%	100.0%	7.9%	0.5%	26.9%	29.7%
55			12	268	10	0.03	**2.43**	0.33	0.04	0.86	0.87		1.3%	100.0%	13.6%	1.6%	35.5%	35.8%
56			13	269	10	0.04	**2.79**	0.21	0.01	1.69	1.05		1.3%	100.0%	7.4%	0.3%	60.4%	37.5%
57			14	270	10	0.03	**2.16**	0.09	0.01	0.85	1.08		1.5%	100.0%	4.2%	0.5%	39.5%	50.1%
58			15	271	10	0.03	**2.44**	0.25	0.02	1.21	1.13		1.4%	100.0%	10.1%	0.7%	49.4%	46.3%
59			16	272	10	0.05	**2.60**	0.38	0.01	1.11	0.90		1.9%	100.0%	14.6%	0.5%	42.7%	34.8%
60			17	273	10	0.05	**2.65**	0.33	0.03	1.13	0.91		1.9%	100.0%	12.4%	1.2%	42.5%	34.3%
61			18	274	10	0.03	**2.53**	0.08	0.01	1.46	0.96		1.0%	100.0%	3.0%	0.2%	57.6%	37.8%
62			19	275	10	0.03	**2.35**	0.13	0.01	1.11	0.99		1.1%	100.0%	5.6%	0.5%	47.1%	42.1%
63			20	276	10	0.03	**2.52**	0.39	0.03	0.89	1.09		1.2%	100.0%	15.5%	1.1%	35.4%	43.3%

							max ratio out of all beams						
No.	4cm2 PD(mW/cm2) at 10mm evaluation distance						60.2%	2.7%	60.2%	11.5%	2.5%	29.0%	34.7%
	S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	ratio worst-surface (10mm/2mm)	ratio (Right 10mm)/(worst-surface 2mm)	ratio (Left 10mm)/(worst-surface 2mm)	ratio (Top 10mm)/(worst-surface 2mm)	ratio (Bottom 10mm)/(worst-surface 2mm)	ratio (Front 10mm)/(worst-surface 2mm)	ratio (Rear 10mm)/(worst-surface 2mm)
1	0.00	**0.09**	0.01	0.00	0.02	0.03	48.0%	0.6%	48.0%	3.4%	0.6%	12.4%	14.7%
2	0.00	**0.07**	0.01	0.00	0.02	0.03	35.5%	1.1%	35.5%	3.8%	1.1%	8.7%	18.0%
3	0.00	**0.09**	0.01	0.00	0.02	0.04	39.4%	0.9%	39.4%	3.9%	0.9%	8.7%	16.5%
4	0.00	**0.06**	0.01	0.00	0.01	0.04	30.9%	1.0%	30.9%	4.2%	0.5%	6.8%	21.5%
5	0.00	**0.10**	0.01	0.00	0.02	0.04	40.1%	0.4%	40.1%	3.7%	0.8%	9.1%	14.9%
6	0.00	**0.16**	0.03	0.01	0.04	0.09	31.3%	0.4%	31.3%	5.4%	1.0%	7.2%	16.4%
7	0.00	**0.15**	0.01	0.00	0.05	0.06	56.8%	1.5%	56.8%	2.3%	0.8%	17.4%	21.6%
8	0.00	**0.20**	0.02	0.00	0.05	0.08	45.0%	0.7%	45.0%	4.1%	0.7%	12.3%	18.9%
9	0.00	**0.09**	0.02	0.00	0.03	0.06	25.5%	0.6%	25.5%	6.4%	0.8%	8.4%	15.4%
10	0.00	**0.19**	0.03	0.01	0.06	0.07	36.0%	0.4%	36.0%	4.9%	0.9%	10.6%	12.1%
11	0.01	**0.18**	0.01	0.00	0.04	0.10	51.9%	1.5%	51.9%	3.6%	0.3%	13.1%	30.9%
12	0.00	**0.20**	0.03	0.00	0.05	0.10	39.7%	0.6%	39.7%	5.8%	0.8%	9.6%	20.8%
13	0.01	**0.41**	0.10	0.03	0.10	0.27	39.6%	0.5%	39.6%	9.6%	2.5%	9.2%	26.0%
14	0.01	**0.54**	0.06	0.00	0.21	0.23	51.7%	0.8%	51.7%	6.0%	0.3%	20.1%	21.5%
15	0.02	**0.43**	0.02	0.00	0.14	0.26	57.8%	2.0%	57.8%	2.9%	0.4%	18.6%	34.7%
16	0.01	**0.46**	0.05	0.01	0.15	0.28	47.8%	0.6%	47.8%	5.4%	0.8%	15.5%	29.0%
17	0.00	**0.41**	0.13	0.00	0.12	0.17	31.8%	0.3%	31.8%	10.3%	0.3%	8.8%	13.3%
18	0.00	**0.34**	0.10	0.02	0.09	0.22	30.3%	0.4%	30.3%	9.2%	1.8%	7.5%	19.2%
19	0.02	**0.34**	0.02	0.00	0.13	0.21	52.9%	2.7%	52.9%	3.4%	0.3%	20.1%	33.4%
20	0.01	**0.43**	0.04	0.01	0.14	0.21	51.1%	1.6%	51.1%	4.3%	0.8%	16.3%	25.3%
21	0.00	**0.44**	0.11	0.02	0.11	0.31	35.7%	0.3%	35.7%	9.0%	1.3%	8.6%	24.7%
22	0.00	**0.13**	0.01	0.00	0.05	0.05	42.4%	0.3%	42.4%	1.9%	0.0%	14.6%	15.9%
23	0.00	**0.12**	0.01	0.00	0.05	0.03	41.0%	0.4%	41.0%	3.2%	0.4%	16.3%	11.0%
24	0.00	**0.12**	0.01	0.00	0.04	0.03	44.4%	0.4%	44.4%	2.2%	0.4%	15.2%	12.2%
25	0.00	**0.12**	0.01	0.00	0.03	0.04	37.8%	0.3%	37.8%	2.8%	0.3%	9.5%	12.6%
26	0.00	**0.15**	0.00	0.00	0.04	0.04	50.2%	0.3%	50.2%	1.4%	0.3%	12.0%	13.7%
27	0.00	**0.22**	0.03	0.00	0.07	0.06	33.6%	0.3%	33.6%	4.1%	0.2%	10.9%	9.2%
28	0.00	**0.33**	0.01	0.00	0.09	0.11	56.7%	0.7%	56.7%	1.2%	0.0%	15.7%	17.9%
29	0.00	**0.25**	0.02	0.00	0.06	0.09	48.6%	0.4%	48.6%	3.0%	0.2%	12.1%	18.5%
30	0.00	**0.24**	0.03	0.00	0.08	0.07	36.6%	0.3%	36.6%	4.3%	0.2%	12.2%	10.8%
31	0.00	**0.33**	0.01	0.00	0.13	0.08	45.9%	0.4%	45.9%	1.8%	0.3%	17.3%	10.9%
32	0.00	**0.29**	0.01	0.00	0.07	0.12	59.9%	0.6%	59.9%	1.6%	0.2%	14.5%	24.0%
33	0.00	**0.24**	0.02	0.00	0.07	0.07	36.0%	0.3%	36.0%	3.4%	0.3%	10.4%	11.1%
34	0.01	**0.45**	0.09	0.01	0.16	0.17	38.9%	1.0%	38.9%	7.5%	0.5%	13.9%	14.6%
35	0.01	**0.72**	0.04	0.00	0.29	0.22	49.4%	0.7%	49.4%	2.6%	0.1%	19.8%	14.9%
36	0.01	**0.65**	0.01	0.00	0.20	0.30	56.5%	0.6%	56.5%	1.1%	0.3%	17.7%	25.9%
37	0.01	**0.73**	0.05	0.01	0.24	0.23	55.0%	0.5%	55.0%	4.1%	0.4%	17.8%	17.5%
38	0.01	**0.48**	0.09	0.00	0.18	0.21	40.6%	0.8%	40.6%	7.9%	0.3%	14.8%	17.5%
39	0.01	**0.55**	0.07	0.00	0.20	0.19	42.1%	1.0%	42.1%	5.4%	0.3%	15.3%	14.7%
40	0.01	**0.89**	0.01	0.00	0.37	0.28	57.3%	0.4%	57.3%	0.8%	0.1%	24.1%	18.3%
41	0.01	**0.70**	0.04	0.00	0.26	0.26	51.3%	0.5%	51.3%	2.9%	0.2%	19.3%	19.3%
42	0.01	**0.47**	0.11	0.01	0.16	0.16	42.2%	0.8%	42.2%	9.6%	0.5%	14.1%	14.9%
43	0.00	**0.23**	0.02	0.00	0.08	0.10	41.5%	0.6%	41.5%	2.8%	0.2%	14.6%	17.5%
44	0.00	**0.22**	0.02	0.00	0.08	0.07	35.2%	0.5%	35.2%	3.4%	0.7%	13.6%	12.0%
45	0.00	**0.25**	0.02	0.00	0.09	0.07	41.6%	0.5%	41.6%	3.8%	0.5%	14.2%	12.4%
46	0.00	**0.18**	0.02	0.00	0.06	0.07	33.8%	0.7%	33.8%	3.7%	0.4%	11.8%	13.4%
47	0.00	**0.29**	0.02	0.00	0.07	0.09	48.2%	0.3%	48.2%	2.7%	0.3%	12.3%	14.3%
48	0.01	**0.37**	0.07	0.01	0.11	0.16	41.4%	0.6%	41.4%	8.2%	1.0%	12.0%	17.8%
49	0.01	**0.50**	0.01	0.00	0.15	0.17	60.2%	0.7%	60.2%	1.7%	0.2%	17.5%	20.4%
50	0.01	**0.44**	0.04	0.01	0.14	0.19	47.1%	0.6%	47.1%	3.9%	0.6%	15.5%	20.6%
51	0.01	**0.41**	0.06	0.01	0.16	0.19	32.4%	0.4%	32.4%	4.5%	0.6%	12.7%	15.5%
52	0.01	**0.59**	0.05	0.01	0.28	0.21	43.6%	0.5%	43.6%	3.8%	0.7%	20.6%	15.2%
53	0.01	**0.52**	0.02	0.00	0.14	0.21	56.9%	0.8%	56.9%	2.5%	0.1%	15.0%	23.1%
54	0.01	**0.50**	0.07	0.01	0.15	0.20	37.7%	0.5%	37.7%	5.0%	0.5%	11.0%	15.1%
55	0.02	**0.74**	0.25	0.04	0.27	0.52	30.2%	0.7%	30.2%	10.2%	1.5%	11.3%	21.2%
56	0.02	**1.46**	0.13	0.01	0.81	0.51	52.2%	0.8%	52.2%	4.8%	0.3%	29.0%	18.4%
57	0.03	**1.28**	0.06	0.01	0.38	0.62	59.1%	1.2%	59.1%	2.5%	0.4%	17.6%	28.8%
58	0.03	**1.22**	0.15	0.02	0.53	0.64	49.8%	1.0%	49.8%	6.0%	0.7%	21.9%	26.3%
59	0.02	**1.00**	0.27	0.01	0.48	0.44	38.7%	0.9%	38.7%	10.6%	0.4%	18.3%	17.0%
60	0.02	**0.99**	0.24	0.03	0.42	0.40	37.2%	0.9%	37.2%	9.1%	1.1%	15.7%	15.1%
61	0.02	**1.47**	0.04	0.01	0.73	0.53	57.9%	0.8%	57.9%	1.5%	0.2%	28.7%	20.9%
62	0.02	**1.24**	0.09	0.01	0.52	0.59	52.5%	1.0%	52.5%	3.6%	0.4%	21.9%	25.1%
63	0.02	**0.97**	0.29	0.03	0.36	0.65	38.4%	0.6%	38.4%	11.5%	1.0%	14.5%	25.8%

- M–patch Mid CH

													max ratio out of all beams													max ratio out of all beams						
No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2)							1.5%	100.0%	16.4%	2.1%	57.9%	57.4%	4cm2 PD(mW/cm2) at 10mm evaluation distance						62.1%	1.1%	62.1%	11.3%	1.9%	29.1%	27.1%
						S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fornt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)	S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	ratio worst-surface (10mm/2mm)	ratio (Right 10mm)/(worst-surface 2mm)	ratio (Left 10mm)/(worst-surface 2mm)	ratio (Top 10mm)/(worst-surface 2mm)	ratio (Bottom 10mm)/(worst-surface 2mm)	ratio (Front 10mm)/(worst-surface 2mm)	ratio (Rear 10mm)/(worst-surface 2mm)
1			0		1	0.00	0.21	0.01	0.00	0.06	0.07		0.5%	100.0%	3.8%	0.5%	30.5%	32.4%	0.00	0.08	0.01	0.00	0.02	0.03	37.1%	0.5%	37.1%	2.9%	0.5%	11.0%	13.3%
2			1		1	0.00	0.24	0.01	0.00	0.06	0.09		0.4%	100.0%	5.5%	0.8%	27.0%	35.9%	0.00	0.09	0.01	0.00	0.02	0.03	37.1%	0.4%	37.1%	4.6%	0.8%	8.4%	12.2%
3			2		1	0.00	0.29	0.01	0.00	0.09	0.11		0.7%	100.0%	4.5%	0.7%	31.4%	36.6%	0.00	0.13	0.01	0.00	0.03	0.04	44.1%	0.3%	44.1%	3.1%	0.3%	9.7%	13.8%
4			3		1	0.00	0.30	0.03	0.00	0.08	0.12		0.7%	100.0%	8.6%	0.3%	25.9%	41.2%	0.00	0.12	0.02	0.00	0.02	0.05	39.9%	0.3%	39.9%	5.6%	0.3%	8.0%	15.3%
5			4		1	0.00	0.25	0.01	0.00	0.08	0.10		0.4%	100.0%	4.0%	0.4%	33.7%	40.6%	0.00	0.12	0.01	0.00	0.03	0.04	47.8%	0.4%	47.8%	2.4%	0.4%	10.8%	16.9%
6			5		2	0.00	0.59	0.06	0.00	0.13	0.21		0.3%	100.0%	9.3%	0.7%	22.8%	36.0%	0.00	0.21	0.03	0.00	0.05	0.09	35.3%	0.3%	35.3%	5.8%	0.7%	8.0%	15.8%
7			6		2	0.00	0.27	0.02	0.00	0.12	0.13		1.1%	100.0%	6.6%	0.4%	42.1%	48.7%	0.00	0.13	0.01	0.00	0.05	0.06	46.9%	1.1%	46.9%	3.7%	0.4%	16.8%	20.5%
8			7		2	0.00	0.57	0.03	0.01	0.18	0.20		0.5%	100.0%	5.6%	0.9%	32.3%	34.4%	0.00	0.23	0.03	0.00	0.07	0.09	41.1%	0.5%	41.1%	4.6%	0.7%	11.9%	15.8%
9			8		2	0.00	0.50	0.03	0.01	0.12	0.15		0.6%	100.0%	5.2%	1.0%	23.8%	30.2%	0.00	0.15	0.02	0.01	0.04	0.06	31.0%	0.4%	31.0%	4.0%	1.0%	7.3%	11.7%
10			9		2	0.00	0.59	0.05	0.01	0.13	0.21		0.5%	100.0%	8.8%	0.8%	22.2%	35.3%	0.00	0.16	0.03	0.01	0.05	0.09	27.5%	0.3%	27.5%	5.8%	0.8%	9.2%	14.4%
11			10		2	0.00	0.49	0.02	0.00	0.21	0.23		0.8%	100.0%	4.3%	0.2%	41.8%	46.4%	0.00	0.30	0.01	0.00	0.08	0.12	60.3%	0.6%	60.3%	2.4%	0.2%	15.7%	24.2%
12			11		2	0.00	0.60	0.05	0.00	0.16	0.25		0.5%	100.0%	9.1%	0.7%	27.6%	41.3%	0.00	0.27	0.04	0.00	0.06	0.11	45.7%	0.3%	45.7%	5.9%	0.7%	10.4%	18.0%
13			12		5	0.01	1.22	0.15	0.03	0.28	0.46		0.6%	100.0%	12.3%	2.1%	23.4%	38.0%	0.00	0.47	0.09	0.02	0.11	0.25	38.4%	0.3%	38.4%	7.7%	1.9%	9.4%	20.6%
14			13		5	0.01	0.88	0.07	0.00	0.34	0.50		1.3%	100.0%	8.4%	0.2%	38.2%	57.4%	0.01	0.45	0.06	0.00	0.17	0.24	51.1%	1.0%	51.1%	6.5%	0.1%	18.8%	27.1%
15			14		5	0.01	0.89	0.04	0.00	0.41	0.43		1.2%	100.0%	4.7%	0.5%	46.7%	48.1%	0.01	0.52	0.03	0.00	0.19	0.24	58.4%	1.0%	58.4%	3.4%	0.5%	21.3%	26.6%
16			15		5	0.01	1.30	0.14	0.01	0.45	0.56		1.0%	100.0%	10.7%	1.0%	34.8%	42.9%	0.01	0.68	0.07	0.01	0.21	0.32	52.0%	0.8%	52.0%	5.5%	0.9%	16.2%	24.6%
17			16		5	0.01	1.28	0.20	0.00	0.27	0.44		0.5%	100.0%	15.7%	0.3%	21.4%	34.8%	0.00	0.40	0.14	0.00	0.10	0.21	31.2%	0.3%	31.2%	11.2%	0.2%	8.1%	16.4%
18			17		5	0.01	1.21	0.13	0.02	0.25	0.43		0.7%	100.0%	10.7%	1.6%	20.6%	35.8%	0.01	0.38	0.08	0.02	0.10	0.20	31.0%	0.4%	31.0%	6.9%	1.4%	8.3%	16.4%
19			18		5	0.01	0.95	0.04	0.00	0.42	0.45		0.8%	100.0%	3.8%	0.2%	44.1%	47.2%	0.01	0.50	0.03	0.00	0.19	0.24	52.5%	0.6%	52.5%	3.0%	0.2%	19.8%	24.6%
20			19		5	0.01	1.27	0.06	0.01	0.54	0.49		0.7%	100.0%	4.3%	0.4%	42.6%	38.8%	0.01	0.79	0.04	0.01	0.25	0.27	62.1%	0.6%	62.1%	3.3%	0.4%	19.3%	21.5%
21			20		5	0.01	1.39	0.18	0.02	0.35	0.60		0.4%	100.0%	12.9%	1.2%	24.9%	42.8%	0.00	0.56	0.12	0.02	0.14	0.33	40.4%	0.3%	40.4%	8.4%	1.1%	10.1%	23.6%
22			256		1	0.00	0.30	0.01	0.00	0.13	0.08		0.3%	100.0%	3.4%	0.3%	42.4%	28.3%	0.00	0.13	0.01	0.00	0.04	0.04	44.1%	0.3%	44.1%	2.4%	0.0%	14.5%	13.5%
23			257		1	0.00	0.24	0.01	0.00	0.09	0.05		0.8%	100.0%	5.9%	0.4%	37.0%	22.7%	0.00	0.08	0.01	0.00	0.03	0.02	34.5%	0.4%	34.5%	4.2%	0.4%	12.2%	8.8%
24			258		1	0.00	0.34	0.01	0.00	0.12	0.07		0.3%	100.0%	4.2%	0.3%	36.8%	20.8%	0.00	0.12	0.01	0.00	0.05	0.03	35.6%	0.3%	35.6%	3.0%	0.0%	13.9%	8.6%
25			259		1	0.00	0.42	0.02	0.00	0.15	0.10		0.7%	100.0%	3.8%	0.2%	35.1%	22.9%	0.00	0.16	0.01	0.00	0.04	0.04	38.2%	0.2%	38.2%	1.9%	0.2%	10.5%	8.4%
26			260		1	0.00	0.31	0.01	0.00	0.12	0.09		0.3%	100.0%	3.8%	0.3%	36.9%	27.6%	0.00	0.14	0.01	0.00	0.04	0.04	46.2%	0.3%	46.2%	2.2%	0.3%	13.1%	11.2%
27			261		2	0.01	0.65	0.04	0.00	0.23	0.14		0.8%	100.0%	6.2%	0.5%	35.8%	21.4%	0.00	0.21	0.03	0.00	0.07	0.05	32.5%	0.5%	32.5%	4.5%	0.3%	10.1%	8.0%
28			262		2	0.00	0.71	0.02	0.00	0.29	0.27		0.6%	100.0%	2.2%	0.3%	40.3%	37.6%	0.00	0.39	0.01	0.00	0.12	0.11	55.2%	0.3%	55.2%	1.3%	0.1%	16.9%	16.0%
29			263		2	0.00	0.67	0.05	0.00	0.25	0.23		0.4%	100.0%	7.1%	0.1%	36.8%	33.7%	0.00	0.32	0.03	0.00	0.11	0.10	47.5%	0.3%	47.5%	4.0%	0.1%	15.9%	15.0%
30			264		2	0.00	0.66	0.04	0.00	0.23	0.16		0.6%	100.0%	6.7%	0.5%	35.4%	23.4%	0.00	0.23	0.03	0.00	0.07	0.06	35.1%	0.5%	35.1%	4.7%	0.3%	11.2%	8.9%
31			265		2	0.01	0.90	0.03	0.00	0.37	0.23		0.7%	100.0%	3.4%	0.3%	41.1%	25.3%	0.00	0.42	0.02	0.00	0.16	0.10	46.8%	0.3%	46.8%	2.3%	0.2%	17.7%	10.6%
32	M	Patch	266		2	0.00	0.55	0.02	0.00	0.25	0.22		0.5%	100.0%	3.6%	0.2%	44.6%	39.3%	0.00	0.30	0.01	0.00	0.11	0.10	54.3%	0.4%	54.3%	1.8%	0.2%	19.0%	18.5%
33			267		2	0.00	0.78	0.05	0.00	0.25	0.16		0.5%	100.0%	5.9%	0.4%	32.4%	20.1%	0.00	0.26	0.03	0.00	0.09	0.07	33.1%	0.3%	33.1%	3.5%	0.3%	11.9%	8.8%
34			268		5	0.02	1.52	0.15	0.01	0.56	0.38		1.4%	100.0%	9.7%	0.5%	37.1%	25.3%	0.01	0.65	0.10	0.01	0.21	0.18	42.8%	0.7%	42.8%	6.6%	0.5%	13.9%	11.7%
35			269		5	0.02	1.63	0.07	0.00	0.75	0.44		1.2%	100.0%	4.2%	0.2%	46.3%	27.1%	0.01	0.88	0.05	0.00	0.34	0.21	54.0%	0.7%	54.0%	3.3%	0.1%	20.7%	13.1%
36			270		5	0.01	1.06	0.03	0.00	0.41	0.49		0.9%	100.0%	3.0%	0.3%	38.8%	46.5%	0.01	0.59	0.02	0.00	0.19	0.25	55.9%	0.5%	55.9%	1.7%	0.2%	17.7%	23.8%
37			271		5	0.01	1.25	0.09	0.01	0.61	0.42		0.8%	100.0%	7.4%	0.9%	49.3%	33.4%	0.01	0.70	0.03	0.01	0.27	0.22	56.0%	0.6%	56.0%	2.7%	0.7%	22.0%	17.4%
38			272		5	0.02	1.47	0.20	0.01	0.57	0.36		1.2%	100.0%	13.6%	0.4%	39.1%	24.3%	0.01	0.60	0.14	0.01	0.24	0.17	41.0%	0.6%	41.0%	9.5%	0.3%	16.2%	11.9%
39			273		5	0.02	1.61	0.12	0.01	0.64	0.41		1.4%	100.0%	7.2%	0.4%	39.6%	25.5%	0.01	0.74	0.08	0.01	0.24	0.20	45.8%	0.7%	45.8%	5.2%	0.4%	14.8%	12.4%
40			274		5	0.01	1.48	0.03	0.00	0.72	0.56		0.6%	100.0%	2.3%	0.3%	48.8%	37.6%	0.01	0.81	0.02	0.00	0.36	0.28	54.6%	0.4%	54.6%	1.2%	0.2%	24.3%	19.1%
41			275		5	0.01	1.46	0.11	0.00	0.67	0.46		0.5%	100.0%	7.8%	0.2%	46.0%	31.5%	0.01	0.73	0.08	0.00	0.30	0.21	50.4%	0.4%	50.4%	5.3%	0.1%	20.3%	14.7%
42			276		5	0.02	1.46	0.23	0.01	0.46	0.41		1.0%	100.0%	15.7%	0.4%	31.7%	28.2%	0.01	0.63	0.14	0.01	0.21	0.20	43.0%	0.5%	43.0%	9.8%	0.4%	14.2%	13.3%
43			0	256	2	0.00	0.62	0.02	0.00	0.22	0.18		0.5%	100.0%	3.2%	0.3%	35.0%	28.9%	0.00	0.24	0.02	0.00	0.08	0.09	38.9%	0.5%	38.9%	2.4%	0.2%	12.3%	14.7%
44			1	257	2	0.01	0.66	0.04	0.01	0.21	0.18		0.9%	100.0%	5.3%	0.8%	32.1%	26.9%	0.00	0.23	0.03	0.01	0.08	0.07	34.8%	0.6%	34.8%	4.0%	0.8%	11.4%	10.5%
45			2	258	2	0.00	0.67	0.04	0.00	0.25	0.19		0.4%	100.0%	5.8%	0.4%	36.8%	29.0%	0.00	0.29	0.03	0.00	0.10	0.08	42.9%	0.4%	42.9%	3.9%	0.4%	14.9%	11.7%
46			3	259	2	0.01	0.81	0.05	0.00	0.26	0.23		0.6%	100.0%	6.1%	0.4%	31.8%	28.1%	0.00	0.30	0.03	0.00	0.09	0.09	36.9%	0.5%	36.9%	4.0%	0.2%	10.6%	11.2%
47			4	260	2	0.00	0.64	0.03	0.00	0.23	0.22		0.5%	100.0%	4.2%	0.3%	35.5%	34.0%	0.00	0.28	0.02	0.00	0.08	0.09	43.9%	0.3%	43.9%	2.4%	0.3%	12.9%	14.3%
48			5	261	4	0.01	0.89	0.13	0.01	0.30	0.36		0.9%	100.0%	14.2%	0.9%	33.8%	40.8%	0.01	0.41	0.08	0.01	0.10	0.18	46.1%	0.6%	46.1%	9.4%	0.9%	11.2%	19.7%
49			6	262	4	0.01	0.93	0.04	0.00	0.39	0.37		1.3%	100.0%	4.5%	0.4%	42.1%	39.5%	0.01	0.52	0.03	0.00	0.16	0.15	56.1%	0.8%	56.1%	3.5%	0.3%	17.7%	16.4%
50			7	263	4	0.01	1.15	0.08	0.01	0.50	0.42		0.5%	100.0%	7.0%	0.6%	43.6%	36.4%	0.01	0.51	0.06	0.01	0.22	0.20	44.4%	0.4%	44.4%	5.2%	0.5%	19.1%	17.7%
51			8	264	4	0.01	1.42	0.08	0.01	0.38	0.41		1.0%	100.0%	5.7%	0.6%	26.8%	29.0%	0.01	0.43	0.06	0.01	0.15	0.19	30.2%	0.6%	30.2%	4.2%	0.6%	10.5%	13.4%
52			9	265	4	0.01	1.55	0.11	0.01	0.73	0.51		0.6%	100.0%	7.1%	0.6%	47.3%	33.1%	0.01	0.63	0.08	0.01	0.32	0.23	40.6%	0.4%	40.6%	5.2%	0.5%	20.6%	15.1%
53			10	266	4	0.01	1.16	0.05	0.00	0.48	0.45		0.8%	100.0%	4.5%	0.3%	41.2%	39.1%	0.01	0.65	0.03	0.00	0.19	0.24	56.4%	0.6%	56.4%	2.9%	0.2%	16.0%	20.3%
54			11	267	4	0.01	1.47	0.12	0.01	0.48	0.48		0.5%	100.0%	8.4%	0.6%	32.4%	32.8%	0.01	0.61	0.08	0.01	0.20	0.24	41.3%	0.3%	41.3%	5.4%	0.5%	13.8%	16.3%
55			12	268	10	0.04	2.97	0.33	0.04	1.17	0.96		1.3%	100.0%	11.2%	1.4%	39.5%	32.3%	0.02	0.99	0.22	0.04	0.45	0.52	33.4%	0.7%	33.4%	7.4%	1.3%	15.1%	17.5%
56			13	269	10	0.04	2.93	0.21	0.01	1.64	1.13		1.5%	100.0%	7.1%	0.2%	56.1%	38.7%	0.03	1.59	0.16	0.01	0.79	0.56	54.5%	0.9%	54.5%	5.4%	0.2%	26.9%	19.0%
57			14	270	10	0.02	2.06	0.09	0.01	1.01	0.92		1.1%	100.0%	4.5%	0.5%	49.2%	44.5%	0.02	1.13	0.06	0.01	0.47	0.50	55.0%	0.9%	55.0%	2.7%	0.3%	22.7%	24.1%
58			15	271	10	0.04	3.00	0.32	0.02	1.46	1.26		1.2%	100.0%	10.5%	0.8%	48.5%	42.0%	0.03	1.57	0.15	0.02	0.67	0.71	52.2%	0.9%	52.2%	5.1%	0.7%	22.4%	23.6%
59			16	272	10	0.04	3.19	0.52	0.01	1.15	1.09		1.2%	100.0%	16.4%	0.4%	36.0%	34.2%	0.02	1.14	0.36	0.01	0.53	0.61	35.8%	0.7%	35.8%	11.3%	0.3%	16.7%	19.0%
60			17	273	10	0.04	3.11	0.34	0.03	1.29	1.21		1.3%	100.0%	10.8%	1.0%	41.5%	38.9%	0.02	1.27	0.23	0.03	0.54	0.47	40.8%	0.7%	40.8%	7.5%	0.9%	17.3%	15.2%
61			18	274	10	0.03	2.88	0.09	0.01	1.67	0.91		0.9%	100.0%	3.0%	0.3%	57.9%	31.7%	0.02	1.63	0.06	0.01	0.84	0.51	56.5%	0.6%	56.5%	1.9%	0.2%	29.1%	17.8%
62			19	275	10	0.03	3.07	0.19	0.01	1.37	1.03		0.8%	100.0%	6.1%	0.4%	44.5%	33.4%	0.02	1.66	0.13	0.01	0.60	0.56	54.0%	0.7%	54.0%	4.1%	0.4%	19.6%	18.2%
63			20	276	10	0.04	3.19	0.45	0.03	1.11	1.29		1.1%	100.0%	14.2%	0.9%	34.9%	40.4%	0.02	1.30	0.30	0.03	0.50	0.74	40.8%	0.6%	40.8%	9.4%	0.8%	15.5%	23.4%

- M–patch High CH

													max ratio out of all beams													max ratio out of all beams						
No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2)							1.9%	100.0%	16.4%	1.8%	59.3%	47.7%	4cm2 PD(mW/cm2) at 10mm evaluation distance						63.3%	1.6%	63.3%	11.0%	1.7%	29.5%	26.1%
						S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fornt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)	S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	ratio worst-surface (10mm/2mm)	ratio (Right 10mm)/(worst-surface 2mm)	ratio (Left 10mm)/(worst-surface 2mm)	ratio (Top 10mm)/(worst-surface 2mm)	ratio (Bottom 10mm)/(worst-surface 2mm)	ratio (Front 10mm)/(worst-surface 2mm)	ratio (Rear 10mm)/(worst-surface 2mm)
1			0		1	0.00	0.26	0.01	0.00	0.08	0.07		0.4%	100.0%	3.8%	0.4%	31.4%	24.9%	0.00	0.11	0.01	0.00	0.02	0.02	40.6%	0.4%	40.6%	3.1%	0.4%	9.2%	9.2%
2			1		1	0.00	0.25	0.01	0.00	0.08	0.09		0.4%	100.0%	3.3%	0.8%	32.5%	35.0%	0.00	0.10	0.01	0.00	0.03	0.03	41.1%	0.4%	41.1%	2.0%	0.4%	10.2%	12.6%
3			2		1	0.00	0.39	0.02	0.00	0.12	0.12		0.3%	100.0%	4.6%	0.8%	29.7%	29.7%	0.00	0.17	0.01	0.00	0.04	0.05	43.7%	0.3%	43.7%	3.6%	0.8%	8.9%	11.4%
4			3		1	0.00	0.36	0.04	0.00	0.09	0.14		0.6%	100.0%	11.1%	0.6%	25.3%	38.2%	0.00	0.14	0.03	0.00	0.03	0.06	38.4%	0.6%	38.4%	7.8%	0.3%	7.5%	15.9%
5			4		1	0.00	0.25	0.01	0.00	0.07	0.10		0.4%	100.0%	4.0%	0.8%	28.8%	41.2%	0.00	0.10	0.01	0.00	0.02	0.04	41.6%	0.4%	41.6%	2.4%	0.8%	9.6%	15.2%
6			5		2	0.00	0.74	0.08	0.01	0.15	0.26		0.3%	100.0%	10.3%	0.8%	20.3%	35.2%	0.00	0.26	0.05	0.01	0.05	0.12	35.1%	0.3%	35.1%	6.8%	0.8%	7.3%	15.8%
7			6		2	0.00	0.40	0.01	0.00	0.19	0.14		0.8%	100.0%	1.8%	0.3%	46.3%	34.0%	0.00	0.24	0.00	0.00	0.07	0.06	59.5%	0.5%	59.5%	1.0%	0.3%	17.8%	15.8%
8			7		2	0.00	0.56	0.02	0.00	0.19	0.20		0.5%	100.0%	4.1%	0.7%	33.6%	34.7%	0.00	0.25	0.02	0.00	0.07	0.09	43.6%	0.4%	43.6%	3.2%	0.7%	12.8%	15.8%
9			8		2	0.00	0.53	0.02	0.00	0.15	0.16		0.6%	100.0%	4.1%	0.6%	27.3%	29.0%	0.00	0.17	0.02	0.00	0.05	0.05	31.3%	0.4%	31.3%	3.0%	0.4%	9.7%	10.1%
10			9		2	0.00	0.80	0.09	0.01	0.20	0.21		0.2%	100.0%	11.3%	1.0%	24.9%	26.4%	0.00	0.21	0.06	0.01	0.08	0.10	26.2%	0.2%	26.2%	7.8%	0.9%	10.1%	12.1%
11			10		2	0.00	0.44	0.02	0.00	0.19	0.21		0.9%	100.0%	5.4%	0.5%	41.9%	47.7%	0.00	0.25	0.02	0.00	0.07	0.10	56.8%	0.7%	56.8%	3.6%	0.5%	15.5%	22.1%
12			11		2	0.00	0.67	0.06	0.01	0.18	0.26		0.4%	100.0%	8.9%	0.9%	26.6%	38.8%	0.00	0.29	0.04	0.01	0.07	0.11	43.2%	0.3%	43.2%	5.9%	0.9%	10.0%	16.6%
13			12		5	0.01	1.55	0.17	0.03	0.35	0.55		0.5%	100.0%	11.0%	1.8%	22.2%	35.7%	0.01	0.55	0.12	0.03	0.15	0.32	35.4%	0.4%	35.4%	7.7%	1.7%	9.4%	20.9%
14			13		5	0.01	1.17	0.14	0.00	0.49	0.44		0.9%	100.0%	12.2%	0.2%	41.4%	37.7%	0.01	0.57	0.10	0.00	0.23	0.25	48.5%	0.5%	48.5%	8.8%	0.2%	19.8%	21.3%
15			14		5	0.01	1.05	0.04	0.01	0.52	0.38		0.8%	100.0%	3.6%	0.6%	49.1%	36.1%	0.01	0.66	0.03	0.01	0.23	0.22	63.3%	0.6%	63.3%	2.7%	0.6%	21.9%	20.9%
16			15		5	0.01	1.35	0.13	0.02	0.47	0.61		0.7%	100.0%	9.8%	1.3%	34.8%	45.6%	0.01	0.74	0.06	0.02	0.23	0.35	54.6%	0.6%	54.6%	4.6%	1.1%	16.7%	26.1%
17			16		5	0.01	1.59	0.23	0.01	0.37	0.54		0.5%	100.0%	14.6%	0.5%	23.1%	34.2%	0.00	0.51	0.17	0.01	0.16	0.26	31.9%	0.3%	31.9%	10.4%	0.5%	10.0%	16.4%
18			17		5	0.01	1.64	0.19	0.02	0.38	0.52		0.4%	100.0%	11.8%	1.1%	23.3%	31.6%	0.01	0.51	0.14	0.02	0.16	0.29	30.8%	0.3%	30.8%	8.4%	1.1%	9.7%	17.5%
19			18		5	0.01	1.09	0.07	0.00	0.49	0.40		0.6%	100.0%	6.1%	0.4%	44.9%	36.3%	0.00	0.59	0.04	0.00	0.22	0.23	54.2%	0.4%	54.2%	3.5%	0.4%	20.4%	21.0%
20			19		5	0.01	1.21	0.03	0.00	0.53	0.49		0.7%	100.0%	2.8%	0.3%	43.5%	40.1%	0.01	0.76	0.03	0.00	0.24	0.27	62.6%	0.6%	62.6%	2.2%	0.3%	19.5%	22.5%
21			20		5	0.01	1.64	0.20	0.02	0.41	0.64		0.5%	100.0%	12.1%	1.2%	24.7%	38.9%	0.01	0.63	0.14	0.02	0.18	0.37	38.4%	0.4%	38.4%	8.4%	1.1%	10.9%	22.5%
22			256		1	0.00	0.23	0.01	0.00	0.10	0.06		0.4%	100.0%	3.5%	0.4%	43.7%	24.2%	0.00	0.10	0.01	0.00	0.04	0.02	41.6%	0.4%	41.6%	2.6%	0.4%	15.2%	9.5%
23			257		1	0.00	0.21	0.01	0.00	0.07	0.06		0.5%	100.0%	6.8%	0.5%	34.6%	26.8%	0.00	0.08	0.01	0.00	0.02	0.02	38.5%	0.5%	38.5%	4.9%	0.5%	11.7%	11.2%
24			258		1	0.00	0.20	0.01	0.00	0.08	0.05		1.0%	100.0%	4.9%	0.5%	40.2%	23.0%	0.00	0.07	0.01	0.00	0.03	0.02	33.8%	0.5%	33.8%	3.4%	0.5%	16.2%	9.8%
25			259		1	0.00	0.40	0.03	0.00	0.14	0.08		0.5%	100.0%	6.5%	0.3%	35.5%	20.7%	0.00	0.13	0.01	0.00	0.05	0.04	32.0%	0.3%	32.0%	3.5%	0.3%	12.1%	9.1%
26			260		1	0.00	0.23	0.02	0.00	0.10	0.05		0.4%	100.0%	6.4%	0.4%	42.3%	20.5%	0.00	0.10	0.01	0.00	0.04	0.02	41.9%	0.4%	41.9%	4.7%	0.4%	16.7%	8.5%
27			261		2	0.00	0.64	0.04	0.00	0.22	0.16		0.6%	100.0%	5.7%	0.3%	34.8%	25.5%	0.00	0.23	0.03	0.00	0.07	0.07	35.2%	0.3%	35.2%	4.2%	0.3%	11.5%	11.0%
28			262		2	0.00	0.55	0.03	0.00	0.25	0.18		0.7%	100.0%	5.6%	0.2%	44.8%	33.0%	0.00	0.28	0.02	0.00	0.12	0.07	50.5%	0.4%	50.5%	3.8%	0.2%	20.8%	12.8%
29			263		2	0.00	0.58	0.06	0.00	0.22	0.20		0.3%	100.0%	10.0%	0.5%	38.1%	33.6%	0.00	0.25	0.03	0.00	0.10	0.09	43.6%	0.3%	43.6%	5.0%	0.3%	17.2%	15.9%
30			264		2	0.00	0.68	0.04	0.00	0.24	0.18		0.4%	100.0%	5.7%	0.4%	35.0%	26.4%	0.00	0.26	0.03	0.00	0.09	0.08	37.8%	0.3%	37.8%	4.1%	0.3%	13.2%	11.4%
31			265		2	0.00	0.69	0.04	0.00	0.25	0.14		0.4%	100.0%	5.5%	0.3%	36.2%	20.9%	0.00	0.26	0.03	0.00	0.11	0.06	38.2%	0.3%	38.2%	3.8%	0.1%	16.6%	9.0%
32	M	Patch	266		2	0.00	0.41	0.02	0.00	0.21	0.11		0.7%	100.0%	5.6%	0.5%	51.0%	26.6%	0.00	0.18	0.01	0.00	0.09	0.04	44.4%	0.5%	44.4%	2.9%	0.2%	22.7%	9.8%
33			267		2	0.00	0.77	0.06	0.00	0.26	0.20		0.3%	100.0%	8.3%	0.4%	33.6%	26.4%	0.00	0.27	0.04	0.00	0.10	0.09	34.4%	0.3%	34.4%	5.2%	0.3%	12.9%	11.4%
34			268		5	0.01	1.17	0.16	0.01	0.39	0.32		0.9%	100.0%	13.4%	0.5%	33.2%	27.1%	0.01	0.50	0.10	0.01	0.14	0.16	42.6%	0.5%	42.6%	8.6%	0.4%	11.9%	13.7%
35			269		5	0.01	1.09	0.12	0.00	0.47	0.32		0.6%	100.0%	11.1%	0.3%	42.9%	28.9%	0.01	0.59	0.09	0.00	0.21	0.13	54.2%	0.5%	54.2%	7.9%	0.2%	19.0%	11.7%
36			270		5	0.01	0.52	0.03	0.01	0.25	0.20		1.9%	100.0%	5.8%	1.0%	48.1%	39.5%	0.01	0.26	0.02	0.00	0.13	0.09	49.4%	1.6%	49.4%	3.5%	0.4%	25.6%	17.8%
37			271		5	0.01	1.29	0.09	0.02	0.66	0.41		0.5%	100.0%	6.7%	1.2%	51.3%	32.0%	0.00	0.65	0.04	0.01	0.32	0.22	50.2%	0.3%	50.2%	2.9%	0.9%	25.1%	16.8%
38			272		5	0.01	1.49	0.22	0.01	0.37	0.45		0.4%	100.0%	14.7%	0.3%	25.0%	30.1%	0.00	0.56	0.15	0.00	0.13	0.22	37.7%	0.3%	37.7%	10.0%	0.3%	8.7%	15.1%
39			273		5	0.01	1.14	0.14	0.00	0.40	0.31		1.1%	100.0%	12.4%	0.4%	35.3%	27.0%	0.01	0.53	0.10	0.00	0.15	0.16	46.3%	0.5%	46.3%	8.5%	0.4%	13.0%	13.9%
40			274		5	0.01	1.14	0.04	0.00	0.64	0.33		1.1%	100.0%	3.7%	0.3%	55.7%	29.2%	0.01	0.60	0.03	0.00	0.32	0.16	52.2%	0.5%	52.2%	2.6%	0.2%	28.0%	14.0%
41			275		5	0.01	1.19	0.12	0.00	0.58	0.34		0.8%	100.0%	10.3%	0.3%	48.5%	28.9%	0.01	0.56	0.08	0.00	0.26	0.16	46.6%	0.7%	46.6%	7.0%	0.3%	22.0%	13.2%
42			276		5	0.01	1.30	0.21	0.01	0.39	0.44		0.5%	100.0%	16.4%	0.5%	30.3%	33.8%	0.00	0.58	0.13	0.01	0.17	0.22	44.8%	0.2%	44.8%	9.6%	0.5%	13.2%	16.9%
43			0	256	2	0.00	0.59	0.03	0.00	0.23	0.14		0.5%	100.0%	4.4%	0.3%	38.3%	23.3%	0.00	0.25	0.02	0.00	0.07	0.06	41.9%	0.3%	41.9%	3.4%	0.3%	11.8%	10.6%
44			1	257	2	0.00	0.59	0.03	0.00	0.18	0.19		0.7%	100.0%	5.3%	0.7%	30.5%	32.1%	0.00	0.22	0.02	0.00	0.07	0.07	37.4%	0.3%	37.4%	3.6%	0.7%	11.4%	11.6%
45			2	258	2	0.00	0.67	0.03	0.00	0.24	0.18		0.6%	100.0%	4.2%	0.6%	35.3%	26.8%	0.00	0.25	0.02	0.00	0.09	0.07	36.6%	0.4%	36.6%	3.3%	0.6%	13.2%	10.5%
46			3	259	2	0.01	0.96	0.09	0.00	0.30	0.29		0.5%	100.0%	9.7%	0.4%	31.1%	30.2%	0.00	0.35	0.06	0.00	0.10	0.13	36.2%	0.3%	36.2%	6.5%	0.4%	10.8%	13.8%
47			4	260	2	0.00	0.57	0.04	0.00	0.18	0.19		0.5%	100.0%	6.7%	0.7%	31.2%	33.9%	0.00	0.20	0.02	0.00	0.07	0.09	35.6%	0.5%	35.6%	4.2%	0.7%	12.0%	15.0%
48			5	261	4	0.01	1.14	0.15	0.01	0.31	0.41		0.8%	100.0%	13.1%	0.9%	27.1%	35.4%	0.00	0.44	0.11	0.01	0.11	0.19	38.5%	0.3%	38.5%	9.3%	0.9%	9.3%	16.6%
49			6	262	4	0.01	0.88	0.05	0.00	0.39	0.36		1.4%	100.0%	5.4%	0.2%	44.1%	40.9%	0.01	0.50	0.04	0.00	0.18	0.16	57.0%	0.7%	57.0%	4.2%	0.2%	20.5%	18.5%
50			7	263	4	0.01	1.00	0.10	0.01	0.44	0.38		0.7%	100.0%	9.8%	0.8%	44.1%	38.0%	0.01	0.45	0.05	0.01	0.22	0.19	45.2%	0.6%	45.2%	5.0%	0.8%	21.5%	18.5%
51			8	264	4	0.01	1.44	0.09	0.01	0.42	0.40		0.6%	100.0%	5.9%	0.7%	28.8%	28.0%	0.00	0.44	0.06	0.01	0.18	0.18	30.4%	0.3%	30.4%	4.2%	0.4%	12.5%	12.7%
52			9	265	4	0.01	1.70	0.18	0.01	0.65	0.43		0.6%	100.0%	10.5%	0.6%	38.2%	25.3%	0.01	0.53	0.13	0.01	0.30	0.18	31.3%	0.3%	31.3%	7.4%	0.6%	17.3%	10.6%
53			10	266	4	0.01	1.08	0.05	0.01	0.50	0.41		0.9%	100.0%	4.2%	0.5%	45.9%	37.6%	0.01	0.54	0.03	0.00	0.19	0.17	50.0%	0.7%	50.0%	2.9%	0.3%	17.9%	15.5%
54			11	267	4	0.01	1.71	0.21	0.01	0.52	0.65		0.4%	100.0%	12.1%	0.8%	30.5%	38.1%	0.01	0.70	0.13	0.01	0.22	0.31	40.8%	0.3%	40.8%	7.8%	0.8%	12.9%	18.1%
55			12	268	10	0.03	2.97	0.45	0.04	1.04	1.22		0.9%	100.0%	15.3%	1.4%	35.2%	40.9%	0.01	1.26	0.32	0.04	0.41	0.72	42.6%	0.4%	42.6%	10.6%	1.3%	13.8%	24.3%
56			13	269	10	0.03	2.73	0.40	0.01	1.47	1.05		1.0%	100.0%	14.6%	0.3%	54.0%	38.5%	0.02	1.37	0.29	0.01	0.72	0.53	50.2%	0.6%	50.2%	10.5%	0.2%	26.5%	19.3%
57			14	270	10	0.02	1.92	0.08	0.01	0.99	0.66		0.9%	100.0%	3.9%	0.6%	51.5%	34.6%	0.02	1.11	0.06	0.01	0.47	0.37	58.0%	0.8%	58.0%	3.0%	0.6%	24.3%	19.2%
58			15	271	10	0.02	3.06	0.33	0.04	1.45	1.35		0.6%	100.0%	10.7%	1.4%	47.3%	44.2%	0.01	1.60	0.14	0.03	0.75	0.76	52.2%	0.4%	52.2%	4.6%	0.9%	24.4%	25.0%
59			16	272	10	0.03	3.94	0.62	0.02	1.04	1.48		0.7%	100.0%	15.8%	0.4%	26.5%	37.5%	0.01	1.46	0.43	0.02	0.49	0.80	37.0%	0.3%	37.0%	11.0%	0.4%	12.5%	20.3%
60			17	273	10	0.03	3.19	0.50	0.03	1.17	1.23		0.9%	100.0%	15.7%	1.0%	36.7%	38.4%	0.01	1.14	0.35	0.03	0.50	0.70	35.8%	0.4%	35.8%	10.9%	0.9%	15.7%	21.9%
61			18	274	10	0.02	2.79	0.16	0.01	1.65	0.87		0.7%	100.0%	5.9%	0.4%	59.3%	31.2%	0.01	1.62	0.11	0.01	0.82	0.46	58.3%	0.4%	58.3%	4.0%	0.3%	29.5%	16.5%
62			19	275	10	0.03	2.71	0.21	0.01	1.18	0.93		1.0%	100.0%	7.7%	0.4%	43.6%	34.2%	0.02	1.41	0.14	0.01	0.50	0.50	52.0%	0.8%	52.0%	5.3%	0.4%	18.6%	18.5%
63			20	276	10	0.03	3.54	0.55	0.03	1.03	1.50		0.7%	100.0%	15.4%	1.0%	29.2%	42.4%	0.01	1.61	0.37	0.03	0.49	0.87	45.4%	0.4%	45.4%	10.4%	0.9%	13.7%	24.6%

Table 5. PD of Ant M – patch antenna (24GHz – n258)

- M–patch Low CH

No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2)							max ratio out of all beams						4cm2 PD(mW/cm2) at 10mm evaluation distance						max ratio out of all beams						
													4.0%	100.0%	23.3%	3.3%	70.1%	100.0%							60.4%	2.8%	44.9%	14.0%	2.3%	27.1%	60.4%
						S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fomt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)	S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	ratio worst-surface (10mm/2mm)	ratio (Right 10mm)/(worst-surface 2mm)	ratio (Left 10mm)/(worst-surface 2mm)	ratio (Top 10mm)/(worst-surface 2mm)	ratio (Bottom 10mm)/(worst-surface 2mm)	ratio (Front 10mm)/(worst-surface 2mm)	ratio (Rear 10mm)/(worst-surface 2mm)
1			0		1	0.00	0.10	0.01	0.00	0.06	0.18		1.6%	56.8%	5.5%	0.5%	30.6%	100.0%	0.00	0.03	0.01	0.00	0.02	0.09	46.4%	1.1%	18.0%	4.4%	0.5%	10.4%	46.4%
2			1		1	0.00	0.23	0.01	0.00	0.07	0.13		1.3%	100.0%	4.0%	0.4%	32.2%	55.1%	0.00	0.05	0.01	0.00	0.02	0.06	25.6%	0.9%	22.0%	2.6%	0.4%	10.6%	25.6%
3			2		1	0.00	0.20	0.01	0.00	0.09	0.09		1.5%	100.0%	3.9%	1.0%	44.3%	42.9%	0.00	0.06	0.00	0.00	0.04	0.04	31.5%	1.0%	31.5%	2.0%	1.0%	20.2%	21.7%
4			3		1	0.00	0.18	0.02	0.00	0.06	0.16		1.7%	100.0%	9.4%	0.6%	33.7%	86.7%	0.00	0.06	0.01	0.00	0.02	0.06	34.3%	1.1%	30.4%	5.5%	0.6%	8.3%	34.3%
5			4		1	0.00	0.22	0.01	0.00	0.07	0.17		1.4%	100.0%	6.0%	0.5%	31.7%	76.6%	0.00	0.08	0.01	0.00	0.02	0.07	35.3%	1.4%	35.3%	4.1%	0.5%	9.6%	33.9%
6			5		2	0.01	0.39	0.02	0.00	0.15	0.17		1.3%	100.0%	4.9%	1.0%	37.7%	43.1%	0.00	0.12	0.01	0.00	0.06	0.09	30.1%	1.0%	30.1%	3.6%	0.8%	15.8%	24.2%
7			6		2	0.00	0.39	0.03	0.00	0.08	0.36		0.8%	100.0%	7.3%	0.5%	20.3%	94.0%	0.00	0.12	0.02	0.00	0.03	0.18	46.5%	0.5%	31.4%	5.5%	0.5%	8.6%	46.5%
8			7		2	0.01	0.33	0.02	0.00	0.16	0.33		1.5%	99.4%	5.1%	0.3%	47.4%	100.0%	0.00	0.11	0.01	0.00	0.06	0.18	53.2%	1.2%	34.4%	3.9%	0.3%	17.2%	53.2%
9			8		2	0.01	0.26	0.01	0.00	0.19	0.27		3.3%	95.9%	3.7%	1.1%	70.1%	100.0%	0.01	0.06	0.01	0.00	0.07	0.13	46.5%	2.6%	23.2%	2.6%	0.7%	25.5%	46.5%
10			9		2	0.00	0.34	0.03	0.00	0.06	0.33		1.2%	100.0%	8.5%	0.9%	18.2%	95.6%	0.00	0.09	0.02	0.00	0.02	0.13	38.2%	0.9%	27.1%	6.2%	0.6%	7.1%	38.2%
11			10		2	0.00	0.36	0.02	0.00	0.14	0.36		1.1%	100.0%	5.3%	0.3%	37.9%	100.0%	0.00	0.13	0.02	0.00	0.05	0.19	53.7%	0.8%	35.1%	4.2%	0.3%	14.0%	53.7%
12			11		2	0.01	0.32	0.01	0.00	0.13	0.24		2.2%	100.0%	4.0%	0.9%	38.9%	74.4%	0.01	0.08	0.01	0.00	0.05	0.12	36.1%	1.9%	23.5%	2.5%	0.9%	16.7%	36.1%
13			12		5	0.01	1.02	0.12	0.01	0.33	0.58		1.2%	100.0%	12.0%	1.0%	32.6%	57.3%	0.01	0.33	0.08	0.01	0.09	0.30	32.3%	0.9%	32.3%	7.9%	0.8%	9.1%	29.8%
14			13		5	0.01	1.17	0.07	0.00	0.46	0.61		1.2%	100.0%	6.1%	0.3%	39.6%	52.0%	0.01	0.42	0.05	0.00	0.17	0.34	35.5%	0.9%	35.5%	4.2%	0.3%	14.7%	28.8%
15			14		5	0.03	0.82	0.06	0.00	0.47	0.78		3.1%	100.0%	7.3%	0.4%	57.3%	95.7%	0.02	0.31	0.04	0.00	0.22	0.46	56.6%	2.4%	37.7%	4.9%	0.2%	26.7%	56.6%
16			15		5	0.02	0.90	0.03	0.00	0.36	0.95		2.1%	94.5%	2.9%	0.4%	37.8%	100.0%	0.02	0.43	0.02	0.00	0.16	0.52	54.7%	1.7%	44.9%	1.7%	0.3%	16.4%	54.7%
17			16		5	0.02	1.11	0.03	0.01	0.38	0.69		1.4%	100.0%	2.4%	0.8%	34.5%	62.6%	0.01	0.40	0.02	0.01	0.15	0.32	36.1%	1.0%	36.1%	1.5%	0.8%	13.9%	28.5%
18			17		5	0.01	1.10	0.11	0.01	0.38	0.59		1.2%	100.0%	10.2%	0.8%	34.7%	53.9%	0.01	0.38	0.08	0.01	0.11	0.31	34.1%	0.9%	34.1%	6.9%	0.6%	10.3%	27.8%
19			18		5	0.02	1.04	0.06	0.00	0.47	0.64		2.1%	100.0%	5.4%	0.3%	45.2%	61.4%	0.02	0.32	0.03	0.00	0.20	0.39	37.0%	1.6%	31.1%	2.7%	0.2%	19.2%	37.0%
20			19		5	0.02	0.73	0.07	0.00	0.38	0.92		2.4%	79.2%	7.9%	0.3%	41.4%	100.0%	0.02	0.31	0.05	0.00	0.16	0.53	57.7%	2.0%	33.9%	5.1%	0.2%	17.9%	57.7%
21			20		5	0.02	0.99	0.03	0.01	0.37	0.82		1.7%	100.0%	2.7%	0.6%	37.0%	83.1%	0.01	0.40	0.02	0.01	0.16	0.38	39.9%	1.3%	39.9%	1.7%	0.5%	16.2%	38.5%
22			256		1	0.00	0.08	0.01	0.00	0.05	0.14		2.1%	59.2%	7.0%	0.7%	33.8%	100.0%	0.00	0.03	0.01	0.00	0.02	0.07	49.3%	1.4%	21.8%	4.2%	0.7%	13.4%	49.3%
23			257		1	0.00	0.06	0.01	0.00	0.02	0.11		1.8%	56.9%	4.6%	0.9%	13.8%	100.0%	0.00	0.02	0.00	0.00	0.00	0.06	52.3%	1.8%	14.7%	3.7%	0.9%	3.7%	52.3%
24			258		1	0.01	0.07	0.01	0.00	0.02	0.15		3.3%	48.0%	6.7%	2.0%	13.3%	100.0%	0.00	0.02	0.01	0.00	0.01	0.05	36.0%	2.0%	16.0%	4.0%	2.0%	3.3%	36.0%
25			259		1	0.01	0.06	0.03	0.00	0.02	0.23		2.2%	27.5%	13.5%	0.9%	6.6%	100.0%	0.00	0.02	0.02	0.00	0.01	0.10	43.7%	1.3%	8.3%	7.9%	0.9%	2.2%	43.7%
26			260		1	0.00	0.06	0.02	0.00	0.01	0.18		2.3%	31.8%	9.1%	1.7%	8.0%	100.0%	0.00	0.02	0.01	0.00	0.00	0.08	42.6%	1.7%	10.2%	5.7%	1.1%	1.7%	42.6%
27			261		2	0.01	0.13	0.08	0.00	0.04	0.45		1.8%	29.6%	17.0%	0.4%	8.6%	100.0%	0.01	0.04	0.04	0.00	0.02	0.21	46.0%	1.3%	9.5%	9.3%	0.2%	3.3%	46.0%
28			262		2	0.01	0.11	0.02	0.00	0.07	0.37		1.6%	30.5%	4.9%	0.5%	18.1%	100.0%	0.01	0.04	0.01	0.00	0.03	0.20	53.5%	1.4%	11.4%	3.0%	0.3%	7.0%	53.5%
29			263		2	0.01	0.12	0.02	0.00	0.05	0.40		1.5%	30.1%	4.2%	0.5%	13.2%	100.0%	0.00	0.04	0.01	0.00	0.02	0.21	53.0%	1.0%	9.2%	3.2%	0.5%	5.0%	53.0%
30			264		2	0.01	0.12	0.04	0.01	0.02	0.39		3.6%	30.5%	10.3%	2.6%	6.2%	100.0%	0.01	0.03	0.02	0.01	0.01	0.15	39.5%	2.6%	8.8%	5.2%	1.8%	1.3%	39.5%
31			265		2	0.01	0.14	0.06	0.00	0.03	0.47		1.1%	30.3%	12.4%	0.4%	6.0%	100.0%	0.01	0.05	0.04	0.00	0.01	0.22	46.3%	1.1%	10.0%	7.9%	0.4%	2.1%	46.3%
32	M	Patch	266		2	0.01	0.17	0.02	0.01	0.03	0.57		1.0%	29.2%	3.5%	0.9%	5.1%	100.0%	0.01	0.05	0.01	0.00	0.01	0.29	50.0%	0.9%	8.2%	2.1%	0.7%	1.7%	50.0%
33			267		2	0.01	0.14	0.02	0.00	0.04	0.39		1.6%	35.7%	4.1%	0.8%	11.4%	100.0%	0.00	0.04	0.01	0.00	0.02	0.20	51.9%	1.0%	9.6%	3.1%	0.5%	4.1%	51.9%
34			268		5	0.01	0.32	0.16	0.00	0.12	0.98		1.1%	32.2%	16.1%	0.4%	12.1%	100.0%	0.01	0.11	0.10	0.00	0.04	0.47	47.7%	0.9%	10.7%	10.1%	0.3%	4.0%	47.7%
35			269		5	0.03	0.35	0.08	0.01	0.16	0.96		2.6%	36.7%	8.0%	0.6%	17.1%	100.0%	0.02	0.12	0.04	0.00	0.07	0.56	58.0%	2.1%	12.5%	4.2%	0.4%	6.9%	58.0%
36			270		5	0.02	0.27	0.06	0.01	0.10	0.90		2.3%	29.3%	6.3%	0.7%	11.1%	100.0%	0.02	0.10	0.04	0.00	0.04	0.55	60.4%	1.9%	11.2%	4.1%	0.4%	4.2%	60.4%
37			271		5	0.02	0.32	0.04	0.00	0.08	1.19		2.0%	26.9%	3.4%	0.2%	6.6%	100.0%	0.02	0.12	0.02	0.00	0.03	0.68	57.0%	1.4%	10.3%	1.8%	0.2%	2.3%	57.0%
38			272		5	0.04	0.43	0.04	0.02	0.14	0.93		3.8%	46.5%	4.0%	1.6%	14.7%	100.0%	0.03	0.15	0.02	0.01	0.04	0.34	36.5%	2.8%	16.4%	2.2%	1.2%	4.5%	36.5%
39			273		5	0.02	0.32	0.12	0.01	0.16	0.94		2.0%	33.9%	13.2%	0.5%	17.0%	100.0%	0.02	0.11	0.08	0.00	0.06	0.52	55.0%	1.6%	11.9%	8.7%	0.3%	5.8%	55.0%
40			274		5	0.03	0.35	0.05	0.00	0.15	0.97		2.6%	36.0%	5.0%	0.2%	15.7%	100.0%	0.02	0.12	0.02	0.00	0.07	0.58	59.7%	2.1%	11.9%	2.4%	0.2%	6.7%	59.7%
41			275		5	0.03	0.29	0.06	0.01	0.07	0.99		2.7%	29.4%	5.7%	0.7%	7.3%	100.0%	0.02	0.10	0.04	0.01	0.03	0.59	59.6%	2.1%	10.2%	4.0%	0.5%	2.9%	59.6%
42			276		5	0.04	0.31	0.02	0.02	0.08	1.24		3.2%	24.8%	1.5%	1.5%	6.5%	100.0%	0.03	0.09	0.01	0.01	0.03	0.59	48.0%	2.2%	7.4%	1.1%	1.1%	2.3%	48.0%
43			0	256	2	0.01	0.21	0.03	0.00	0.15	0.49		1.2%	43.1%	5.9%	0.6%	29.8%	100.0%	0.01	0.07	0.02	0.00	0.05	0.25	50.2%	1.0%	13.5%	4.5%	0.6%	9.6%	50.2%
44			1	257	2	0.01	0.37	0.02	0.00	0.13	0.27		1.6%	100.0%	5.1%	1.1%	34.5%	72.5%	0.00	0.10	0.01	0.00	0.04	0.11	28.3%	1.1%	25.4%	3.7%	0.8%	9.9%	28.3%
45			2	258	2	0.01	0.37	0.03	0.01	0.14	0.27		2.4%	100.0%	7.0%	2.2%	36.9%	72.8%	0.01	0.13	0.02	0.01	0.06	0.11	34.5%	1.3%	34.5%	4.3%	1.6%	15.1%	30.5%
46			3	259	2	0.01	0.25	0.07	0.01	0.09	0.39		2.1%	65.0%	18.8%	1.3%	22.6%	100.0%	0.01	0.07	0.04	0.00	0.03	0.19	49.6%	1.5%	18.3%	11.1%	0.8%	6.9%	49.6%
47			4	260	2	0.01	0.32	0.04	0.01	0.11	0.38		1.8%	85.3%	10.5%	1.3%	30.0%	100.0%	0.01	0.12	0.02	0.00	0.04	0.15	38.7%	1.6%	30.3%	6.3%	1.1%	9.7%	38.7%
48			5	261	4	0.01	0.51	0.16	0.01	0.23	0.68		1.8%	74.7%	23.3%	1.6%	33.1%	100.0%	0.01	0.19	0.09	0.01	0.09	0.33	47.9%	1.3%	27.2%	13.3%	1.2%	13.0%	47.9%
49			6	262	4	0.01	0.58	0.05	0.01	0.26	0.88		1.4%	65.4%	5.4%	0.8%	29.3%	100.0%	0.01	0.16	0.04	0.01	0.11	0.47	53.6%	1.0%	17.7%	4.2%	0.6%	12.1%	53.6%
50			7	263	4	0.01	0.52	0.05	0.01	0.33	0.95		1.1%	54.6%	5.7%	0.5%	34.6%	100.0%	0.01	0.16	0.04	0.00	0.12	0.48	50.4%	0.7%	17.0%	4.1%	0.4%	12.6%	50.4%
51			8	264	4	0.03	0.39	0.06	0.02	0.21	0.70		4.0%	55.4%	9.1%	3.3%	30.1%	100.0%	0.02	0.13	0.04	0.02	0.08	0.33	46.7%	2.6%	18.0%	5.7%	2.3%	11.9%	46.7%
52			9	265	4	0.01	0.54	0.12	0.01	0.12	0.80		1.4%	68.0%	15.6%	0.9%	15.2%	100.0%	0.01	0.16	0.09	0.01	0.05	0.36	44.9%	1.1%	20.3%	11.0%	0.8%	6.5%	44.9%
53			10	266	4	0.01	0.52	0.06	0.01	0.16	0.83		1.4%	62.1%	7.3%	1.2%	19.4%	100.0%	0.01	0.19	0.04	0.01	0.07	0.46	55.0%	1.0%	22.3%	5.2%	0.8%	7.9%	55.0%
54			11	267	4	0.01	0.50	0.04	0.01	0.19	0.66		2.0%	75.8%	6.4%	1.1%	29.1%	100.0%	0.01	0.11	0.03	0.01	0.09	0.33	49.8%	1.5%	16.8%	5.0%	0.8%	13.0%	49.8%
55			12	268	10	0.04	1.81	0.40	0.02	0.72	1.90		2.0%	95.3%	20.9%	0.9%	37.8%	100.0%	0.03	0.62	0.27	0.02	0.23	0.83	44.0%	1.6%	32.8%	14.0%	0.8%	11.9%	44.0%
56			13	269	10	0.04	1.81	0.16	0.01	0.95	1.60		2.1%	100.0%	8.6%	0.8%	52.4%	88.9%	0.03	0.69	0.10	0.01	0.42	0.92	50.9%	1.8%	38.3%	5.5%	0.6%	23.1%	50.9%
57			14	270	10	0.05	1.18	0.20	0.01	0.82	1.81		2.5%	65.0%	11.1%	0.8%	45.4%	100.0%	0.04	0.50	0.14	0.01	0.37	1.01	55.7%	2.1%	27.6%	7.5%	0.6%	20.4%	55.7%
58			15	271	10	0.04	1.40	0.10	0.01	0.49	2.33		1.5%	59.9%	4.4%	0.3%	21.1%	100.0%	0.03	0.65	0.06	0.01	0.22	1.19	50.9%	1.2%	27.8%	2.4%	0.3%	9.3%	50.9%
59			16	272	10	0.08	1.86	0.07	0.03	0.64	1.97		3.8%	94.4%	3.5%	1.4%	32.6%	100.0%	0.05	0.74	0.05	0.03	0.27	0.77	39.3%	2.7%	37.7%	2.5%	1.4%	13.9%	39.3%
60			17	273	10	0.04	1.79	0.34	0.02	0.82	1.76		2.2%	100.0%	19.0%	0.8%	45.7%	98.0%	0.03	0.61	0.23	0.01	0.30	0.83	46.2%	1.8%	34.1%	12.8%	0.7%	16.8%	46.2%
61			18	274	10	0.05	1.61	0.10	0.01	0.96	1.68		2.9%	95.6%	5.7%	0.5%	57.3%	100.0%	0.04	0.57	0.05	0.01	0.46	1.01	60.0%	2.3%	33.9%	3.2%	0.4%	27.1%	60.0%
62			19	275	10	0.04	1.16	0.23	0.02	0.55	2.15		2.0%	54.1%	10.5%	0.8%	25.6%	100.0%	0.04	0.52	0.15	0.01	0.21	1.14	53.1%	1.6%	24.1%	6.9%	0.6%	9.7%	53.1%
63			20	276	10	0.08	1.53	0.07	0.04	0.53	2.26		3.5%	67.8%	3.1%	1.7%	23.3%	100.0%	0.05	0.58	0.05	0.03	0.25	1.09	48.4%	2.2%	25.5%	2.3%	1.2%	10.9%	48.4%

- M–patch Mid CH

No.	Module	Type	Beam ID_1	Bema ID_2	Feed no.	4cm2 PD(mW/cm2)							max ratio out of all beams						4cm2 PD(mW/cm2) at 10mm evaluation distance						max ratio out of all beams						
													4.4%	100.0%	26.3%	3.7%	72.1%	100.0%							62.6%	3.2%	48.7%	16.0%	2.5%	30.0%	62.6%
						S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	per Beam Back-off (dB)	ratio (Right 2mm)/(worst-surface 2mm)	ratio (Left 2mm)/(worst-surface 2mm)	ratio (Top 2mm)/(worst-surface 2mm)	ratio (Bottom 2mm)/(worst-surface 2mm)	ratio (Fomt 2mm)/(worst-surface 2mm)	ratio (Rear 2mm)/(worst-surface 2mm)	S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Rear)	ratio worst-surface (10mm/2mm)	ratio (Right 10mm)/(worst-surface 2mm)	ratio (Left 10mm)/(worst-surface 2mm)	ratio (Top 10mm)/(worst-surface 2mm)	ratio (Bottom 10mm)/(worst-surface 2mm)	ratio (Front 10mm)/(worst-surface 2mm)	ratio (Rear 10mm)/(worst-surface 2mm)
1			0		1	0.00	0.12	0.01	0.00	0.07	0.19		1.6%	65.4%	5.4%	0.5%	36.2%	100.0%	0.00	0.04	0.01	0.00	0.02	0.09	47.0%	1.1%	18.9%	3.8%	0.5%	12.4%	47.0%
2			1		1	0.00	0.23	0.01	0.00	0.07	0.12		1.3%	100.0%	3.9%	0.4%	32.0%	53.5%	0.00	0.05	0.01	0.00	0.03	0.05	23.7%	0.9%	22.8%	3.1%	0.4%	11.0%	23.7%
3			2		1	0.00	0.18	0.01	0.00	0.08	0.10		1.7%	100.0%	7.4%	0.6%	47.2%	58.0%	0.00	0.05	0.01	0.00	0.04	0.05	27.3%	1.1%	26.7%	4.0%	0.6%	21.0%	27.3%
4			3		1	0.00	0.21	0.02	0.00	0.08	0.17		1.5%	100.0%	7.8%	0.5%	40.3%	83.0%	0.00	0.07	0.01	0.00	0.03	0.06	34.5%	1.0%	34.5%	3.9%	0.5%	12.1%	30.1%
5			4		1	0.00	0.22	0.01	0.00	0.07	0.17		1.4%	100.0%	6.5%	0.5%	34.4%	78.1%	0.00	0.07	0.01	0.00	0.02	0.07	32.1%	0.9%	32.1%	3.7%	0.5%	11.2%	32.1%
6			5		2	0.01	0.35	0.04	0.00	0.14	0.20		2.0%	100.0%	10.9%	0.6%	39.7%	56.3%	0.01	0.09	0.02	0.00	0.06	0.11	30.3%	1.4%	24.9%	6.6%	0.6%	16.0%	30.3%
7			6		2	0.01	0.40	0.03	0.00	0.10	0.35		1.2%	100.0%	6.7%	0.2%	24.4%	87.1%	0.00	0.12	0.02	0.00	0.04	0.19	46.0%	1.0%	30.6%	5.2%	0.2%	10.0%	46.0%
8			7		2	0.01	0.35	0.01	0.00	0.18	0.32		1.7%	100.0%	3.7%	0.6%	52.7%	90.8%	0.01	0.13	0.01	0.00	0.07	0.18	51.0%	1.4%	36.3%	2.9%	0.3%	19.6%	51.0%
9			8		2	0.01	0.28	0.01	0.00	0.20	0.27		2.9%	100.0%	4.3%	1.4%	72.1%	95.4%	0.01	0.09	0.01	0.00	0.07	0.11	38.6%	2.5%	31.1%	2.9%	1.1%	25.7%	38.6%
10			9		2	0.01	0.36	0.03	0.00	0.07	0.33		2.0%	100.0%	8.5%	0.6%	19.7%	91.8%	0.01	0.10	0.02	0.00	0.03	0.14	38.9%	1.4%	27.3%	6.5%	0.6%	7.3%	38.9%
11			10		2	0.01	0.37	0.02	0.00	0.16	0.34		1.3%	100.0%	4.3%	0.5%	43.6%	89.8%	0.00	0.13	0.01	0.00	0.06	0.19	51.6%	1.1%	35.6%	3.5%	0.3%	16.6%	51.6%
12			11		2	0.01	0.35	0.01	0.00	0.13	0.23		1.7%	100.0%	3.8%	0.9%	37.9%	65.0%	0.01	0.09	0.01	0.00	0.06	0.12	35.0%	1.4%	26.3%	2.3%	0.9%	15.9%	35.0%
13			12		5	0.01	1.06	0.13	0.01	0.36	0.68		1.3%	100.0%	12.6%	0.6%	34.0%	63.9%	0.01	0.34	0.09	0.01	0.11	0.37	35.0%	1.1%	32.2%	8.7%	0.5%	10.2%	35.0%
14			13		5	0.02	1.26	0.10	0.00	0.49	0.73		1.3%	100.0%	7.6%	0.2%	39.0%	58.1%	0.01	0.46	0.06	0.00	0.19	0.42	36.6%	1.0%	36.6%	4.5%	0.2%	15.2%	33.3%
15			14		5	0.03	0.92	0.05	0.00	0.59	0.78		3.5%	100.0%	5.7%	0.3%	63.8%	85.1%	0.03	0.39	0.03	0.00	0.27	0.47	50.9%	2.8%	42.6%	3.6%	0.2%	29.1%	50.9%
16			15		5	0.02	0.98	0.02	0.01	0.45	0.97		2.1%	100.0%	1.9%	0.8%	46.3%	99.4%	0.02	0.48	0.01	0.01	0.19	0.53	54.3%	1.6%	48.7%	1.1%	0.6%	19.5%	54.3%
17			16		5	0.02	1.01	0.04	0.01	0.36	0.64		1.6%	100.0%	3.5%	0.9%	35.4%	63.3%	0.01	0.35	0.02	0.01	0.15	0.31	34.5%	1.2%	34.5%	2.4%	0.8%	15.0%	30.4%
18			17		5	0.01	1.16	0.13	0.01	0.40	0.70		1.2%	100.0%	10.8%	0.5%	34.9%	61.0%	0.01	0.39	0.09	0.01	0.12	0.38	33.7%	1.0%	33.7%	7.4%	0.4%	10.7%	33.1%
19			18		5	0.03	1.12	0.06	0.00	0.52	0.76		2.4%	100.0%	5.6%	0.2%	46.4%	67.7%	0.02	0.43	0.03	0.00	0.23	0.45	40.6%	1.9%	38.4%	2.6%	0.2%	20.7%	40.6%
20			19		5	0.03	0.82	0.05	0.00	0.50	0.91		3.4%	90.3%	5.4%	0.4%	54.5%	100.0%	0.03	0.38	0.03	0.00	0.21	0.51	56.3%	2.7%	42.2%	3.5%	0.3%	23.3%	56.3%
21			20		5	0.02	0.95	0.03	0.01	0.40	0.78		1.8%	100.0%	2.6%	0.7%	41.7%	82.2%	0.01	0.38	0.02	0.01	0.17	0.38	40.3%	1.4%	39.6%	1.9%	0.6%	18.1%	40.3%
22			256		1	0.00	0.08	0.01	0.00	0.04	0.13		2.3%	59.4%	9.8%	0.8%	33.1%	100.0%	0.00	0.03	0.01	0.00	0.02	0.07	50.4%	1.5%	23.3%	6.0%	0.8%	12.0%	50.4%
23			257		1	0.00	0.06	0.01	0.00	0.02	0.12		1.7%	50.9%	4.3%	0.9%	13.8%	100.0%	0.00	0.02	0.00	0.00	0.00	0.06	54.3%	1.7%	12.9%	2.6%	0.9%	3.4%	54.3%
24			258		1	0.00	0.08	0.01	0.00	0.03	0.13		3.0%	57.5%	4.5%	1.5%	23.9%	100.0%	0.00	0.03	0.00	0.00	0.01	0.05	38.1%	2.2%	20.1%	2.2%	1.5%	6.0%	38.1%
25			259		1	0.00	0.06	0.02	0.00	0.02	0.22		1.8%	29.0%	11.1%	0.9%	7.8%	100.0%	0.00	0.02	0.02	0.00	0.01	0.10	45.6%	1.4%	7.8%	6.9%	0.5%	2.8%	45.6%
26			260		1	0.00	0.05	0.02	0.00	0.02	0.17		1.7%	27.6%	9.2%	1.7%	10.3%	100.0%	0.00	0.02	0.01	0.00	0.01	0.07	39.7%	1.1%	8.6%	4.6%	1.1%	2.9%	39.7%
27			261		2	0.01	0.12	0.07	0.00	0.04	0.42		1.4%	27.6%	16.0%	0.7%	10.5%	100.0%	0.01	0.04	0.04	0.00	0.02	0.20	48.1%	1.4%	9.0%	9.3%	0.5%	4.5%	48.1%
28			262		2	0.01	0.13	0.02	0.00	0.07	0.40		1.8%	33.7%	5.3%	0.5%	18.3%	100.0%	0.01	0.05	0.02	0.00	0.03	0.22	56.3%	1.5%	11.8%	3.8%	0.3%	6.5%	56.3%
29			263		2	0.01	0.14	0.02	0.00	0.06	0.41		1.7%	34.8%	5.3%	0.5%	15.0%	100.0%	0.01	0.05	0.02	0.00	0.02	0.23	55.3%	1.4%	11.6%	3.9%	0.2%	5.6%	55.3%
30			264		2	0.01	0.12	0.03	0.01	0.02	0.38		2.6%	30.6%	8.4%	2.6%	5.0%	100.0%	0.01	0.04	0.02	0.01	0.01	0.15	40.3%	2.1%	11.0%	4.7%	1.8%	1.6%	40.3%
31			265		2	0.01	0.15	0.04	0.00	0.04	0.41		1.2%	37.1%	9.8%	0.5%	8.5%	100.0%	0.00	0.05	0.03	0.00	0.01	0.19	45.6%	1.0%	11.0%	6.6%	0.5%	3.2%	45.6%
32	M	Patch	266		2	0.01	0.15	0.02	0.00	0.04	0.55		1.3%	27.8%	3.5%	0.5%	7.3%	100.0%	0.01	0.04	0.01	0.00	0.01	0.28	51.1%	1.1%	8.0%	1.6%	0.4%	2.5%	51.1%
33			267		2	0.01	0.15	0.02	0.00	0.05	0.38		1.6%	39.5%	5.6%	0.5%	13.6%	100.0%	0.01	0.05	0.01	0.00	0.02	0.20	53.9%	1.3%	13.3%	3.7%	0.5%	5.1%	53.9%
34			268		5	0.01	0.28	0.12	0.00	0.13	0.89		1.3%	31.8%	13.6%	0.3%	14.4%	100.0%	0.01	0.08	0.08	0.00	0.04	0.46	51.7%	1.1%	9.2%	8.7%	0.2%	4.9%	51.7%
35			269		5	0.03	0.38	0.08	0.00	0.19	0.90		2.9%	42.7%	9.3%	0.4%	21.1%	100.0%	0.02	0.13	0.05	0.00	0.08	0.52	57.4%	2.6%	14.9%	5.4%	0.3%	9.0%	57.4%
36			270		5	0.02	0.30	0.06	0.00	0.12	0.88		2.7%	33.5%	6.3%	0.5%	13.0%	100.0%	0.02	0.11	0.04	0.00	0.05	0.53	59.9%	2.0%	12.6%	4.0%	0.3%	5.3%	59.9%
37			271		5	0.03	0.32	0.04	0.00	0.10	1.14		2.3%	28.1%	3.3%	0.2%	8.5%	100.0%	0.02	0.09	0.02	0.00	0.03	0.67	58.4%	1.6%	8.2%	2.0%	0.1%	2.6%	58.4%
38			272		5	0.03	0.38	0.03	0.01	0.13	0.93		3.4%	40.9%	2.9%	1.4%	13.9%	100.0%	0.03	0.11	0.02	0.01	0.04	0.37	40.2%	2.8%	12.1%	1.7%	1.0%	4.0%	40.2%
39			273		5	0.02	0.35	0.11	0.00	0.18	0.86		2.5%	41.1%	12.4%	0.5%	20.9%	100.0%	0.02	0.10	0.06	0.00	0.07	0.48	55.7%	2.0%	12.0%	7.2%	0.4%	7.9%	55.7%
40			274		5	0.03	0.38	0.05	0.00	0.18	0.93		2.7%	40.7%	5.4%	0.2%	19.0%	100.0%	0.02	0.14	0.03	0.00	0.07	0.56	60.3%	2.4%	14.7%	2.9%	0.2%	7.9%	60.3%
41			275		5	0.03	0.33	0.06	0.01	0.09	0.96		3.1%	34.1%	6.3%	0.5%	9.1%	100.0%	0.02	0.12	0.04	0.00	0.03	0.58	59.7%	2.5%	12.6%	3.9%	0.4%	3.1%	59.7%
42			276		5	0.03	0.30	0.02	0.02	0.10	1.14		3.0%	25.9%	1.9%	1.4%	9.0%	100.0%	0.02	0.08	0.01	0.01	0.03	0.53	46.6%	2.1%	7.4%	1.2%	1.1%	2.9%	46.6%
43			0	256	2	0.01	0.25	0.03	0.00	0.17	0.46		1.8%	54.8%	7.2%	0.4%	36.2%	100.0%	0.01	0.08	0.02	0.00	0.05	0.23	50.9%	1.3%	16.9%	5.3%	0.4%	11.4%	50.9%
44			1	257	2	0.01	0.34	0.02	0.01	0.13	0.28		2.1%	100.0%	6.2%	1.5%	37.8%	81.2%	0.00	0.10	0.01	0.00	0.04	0.11	31.4%	1.2%	28.4%	4.1%	0.9%	11.1%	31.4%
45			2	258	2	0.01	0.35	0.03	0.01	0.14	0.27		2.0%	100.0%	8.2%	1.4%	38.5%	77.6%	0.01	0.11	0.02	0.00	0.05	0.11	32.0%	1.4%	32.0%	5.1%	1.1%	14.2%	31.4%
46			3	259	2	0.01	0.29	0.06	0.00	0.13	0.41		2.0%	71.0%	15.2%	0.7%	31.2%	100.0%	0.01	0.09	0.04	0.00	0.04	0.17	42.3%	1.2%	21.4%	9.1%	0.7%	9.8%	42.3%
47			4	260	2	0.01	0.31	0.03	0.01	0.14	0.35		2.0%	90.5%	9.5%	1.7%	41.2%	100.0%	0.01	0.11	0.02	0.00	0.05	0.16	45.0%	1.7%	32.0%	5.5%	1.2%	13.5%	45.0%
48			5	261	4	0.01	0.50	0.18	0.01	0.25	0.70		2.0%	71.0%	26.3%	0.9%	35.3%	100.0%	0.01	0.14	0.11	0.01	0.10	0.33	47.3%	1.4%	20.4%	16.0%	0.7%	14.6%	47.3%
49			6	262	4	0.02	0.61	0.06	0.00	0.30	0.94		1.7%	64.4%	6.0%	0.4%	32.2%	100.0%	0.01	0.21	0.04	0.00	0.12	0.52	55.4%	1.4%	22.4%	4.7%	0.3%	13.0%	55.4%
50			7	263	4	0.01	0.58	0.06	0.01	0.37	0.87		1.4%	67.3%	6.4%	0.7%	43.1%	100.0%	0.01	0.21	0.04	0.00	0.14	0.46	53.2%	1.2%	24.6%	4.7%	0.5%	15.8%	53.2%
51			8	264	4	0.03	0.47	0.06	0.03	0.22	0.68		4.4%	68.4%	8.2%	3.7%	32.6%	100.0%	0.02	0.18	0.04	0.02	0.09	0.28	41.2%	3.1%	26.8%	5.4%	2.5%	12.7%	41.2%
52			9	265	4	0.02	0.55	0.10	0.01	0.14	0.70		2.1%	78.3%	14.0%	0.9%	20.1%	100.0%	0.01	0.20	0.07	0.01	0.06	0.32	45.7%	1.6%	28.5%	9.7%	0.7%	8.7%	45.7%
53			10	266	4	0.01	0.50	0.05	0.01	0.20	0.78		1.8%	64.4%	6.4%	0.6%	25.1%	100.0%	0.01	0.17	0.03	0.00	0.08	0.46	58.6%	1.3%	22.3%	4.4%	0.5%	10.1%	58.6%
54			11	267	4	0.01	0.55	0.05	0.01	0.21	0.62		2.2%	88.9%	8.5%	1.3%	33.4%	100.0%	0.01	0.16	0.03	0.01	0.09	0.32	50.6%	1.4%	26.0%	5.5%	0.8%	15.1%	50.6%
55			12	268	10	0.03	1.55	0.31	0.01	0.80	1.67		2.0%	92.8%	18.3%	0.8%	47.7%	100.0%	0.03	0.55	0.20	0.01	0.27	0.80	47.8%	1.7%	32.7%	11.9%	0.6%	16.0%	47.8%
56			13	269	10	0.05	1.74	0.18	0.01	1.07	1.70		2.6%	100.0%	10.5%	0.6%	61.2%	97.9%	0.04	0.79	0.10	0.01	0.49	0.96	55.1%	2.2%	45.5%	5.8%	0.5%	27.9%	55.1%
57			14	270	10	0.06	1.37	0.20	0.01	1.04	1.69		3.4%	81.1%	11.8%	0.5%	61.8%	100.0%	0.05	0.68	0.13	0.01	0.46	0.97	57.4%	2.7%	40.4%	7.5%	0.4%	27.2%	57.4%
58			15	271	10	0.04	1.57	0.08	0.02	0.61	2.18		1.7%	72.2%	3.5%	0.8%	28.0%	100.0%	0.03	0.73	0.05	0.01	0.25	1.22	56.3%	1.4%	33.7%	2.3%	0.5%	11.4%	56.3%
59			16	272	10	0.08	1.68	0.07	0.03	0.63	1.77		4.3%	94.8%	4.0%	1.5%	35.6%	100.0%	0.06	0.66	0.05	0.02	0.27	0.77	43.5%	3.2%	37.2%	2.8%	1.3%	15.0%	43.5%
60			17	273	10	0.04	1.63	0.25	0.01	0.92	1.62		2.4%	100.0%	15.6%	0.8%	56.2%	99.4%	0.03	0.64	0.17	0.01	0.36	0.80	49.0%	2.0%	39.5%	10.3%	0.7%	21.8%	49.0%
61			18	274	10	0.06	1.59	0.13	0.01	1.11	1.74		3.6%	91.3%	7.2%	0.3%	63.6%	100.0%	0.05	0.78	0.06	0.00	0.52	1.09	62.6%	2.8%	44.7%	3.3%	0.2%	30.0%	62.6%
62			19	275	10	0.05	1.41	0.18	0.01	0.78	2.00		2.6%	70.8%	9.2%	0.7%	39.2%	100.0%	0.04	0.70	0.12	0.01	0.30	1.15	57.5%	2.1%	35.1%	5.8%	0.5%	14.9%	57.5%
63			20	276	10	0.05	1.47	0.06	0.03	0.59	1.95		2.6%	75.6%	3.1%	1.5%	30.4%	100.0%	0.04	0.55	0.04	0.02	0.27	0.99	50.6%	1.9%	28.1%	2.2%	1.2%	14.1%	50.6%

- M–patch High CH

No.	2mm R	2mm L	2mm T	2mm B	2mm F	2mm Rear	S4	S3	S5	S6	S1	S2	worst	R10
1	1.9%	81.9%	5.0%	0.6%	46.3%	100.0%	0.00	0.04	0.01	0.00	0.02	0.07	44.4%	1.3%
2	1.0%	100.0%	4.4%	1.0%	26.6%	66.0%	0.00	0.06	0.01	0.00	0.02	0.06	28.6%	1.0%
3	2.0%	100.0%	9.5%	0.7%	48.6%	62.8%	0.00	0.04	0.01	0.00	0.03	0.04	29.7%	1.4%
4	1.4%	100.0%	6.5%	0.5%	44.4%	80.8%	0.00	0.08	0.01	0.00	0.03	0.06	37.9%	0.9%
5	2.1%	100.0%	6.8%	0.5%	43.7%	76.8%	0.00	0.06	0.01	0.00	0.03	0.06	32.1%	1.6%
6	1.5%	100.0%	9.3%	0.6%	35.8%	56.5%	0.00	0.09	0.02	0.00	0.05	0.09	28.1%	1.2%
7	1.3%	100.0%	5.5%	0.5%	21.3%	84.5%	0.00	0.14	0.02	0.00	0.03	0.17	44.9%	1.0%
8	2.1%	100.0%	2.4%	0.6%	53.0%	97.6%	0.01	0.14	0.01	0.00	0.06	0.18	54.6%	1.5%
9	2.9%	100.0%	4.7%	1.1%	67.0%	95.3%	0.01	0.10	0.01	0.00	0.06	0.12	43.4%	2.2%
10	1.5%	100.0%	7.6%	0.9%	16.9%	82.8%	0.01	0.12	0.02	0.00	0.02	0.12	36.0%	1.5%
11	1.7%	100.0%	3.2%	0.3%	44.3%	96.0%	0.01	0.15	0.01	0.00	0.06	0.19	54.0%	1.4%
12	2.4%	100.0%	6.2%	1.4%	37.5%	79.4%	0.01	0.08	0.01	0.00	0.04	0.11	38.1%	1.7%
13	0.9%	100.0%	13.6%	0.5%	33.1%	59.4%	0.01	0.33	0.09	0.00	0.09	0.32	34.3%	0.8%
14	1.4%	100.0%	9.1%	0.3%	37.4%	62.6%	0.01	0.46	0.06	0.00	0.16	0.38	41.4%	1.1%
15	4.2%	100.0%	4.9%	0.2%	67.8%	89.5%	0.03	0.46	0.03	0.00	0.26	0.49	54.4%	3.5%
16	3.1%	90.8%	2.6%	0.6%	48.6%	100.0%	0.02	0.42	0.01	0.00	0.17	0.49	54.8%	2.5%
17	2.1%	100.0%	3.5%	0.8%	37.6%	61.6%	0.02	0.33	0.02	0.01	0.14	0.29	34.3%	1.5%
18	1.0%	100.0%	12.1%	0.4%	33.3%	58.9%	0.01	0.38	0.09	0.00	0.10	0.33	36.4%	0.9%
19	3.8%	100.0%	6.9%	0.3%	52.9%	84.5%	0.03	0.44	0.03	0.00	0.21	0.46	49.8%	3.0%
20	4.0%	93.3%	3.3%	0.3%	57.7%	100.0%	0.03	0.42	0.02	0.00	0.21	0.53	58.9%	3.3%
21	3.2%	100.0%	3.2%	0.6%	45.4%	86.5%	0.02	0.32	0.02	0.00	0.14	0.31	40.0%	2.2%
22	2.2%	50.0%	7.4%	0.7%	27.9%	100.0%	0.00	0.03	0.01	0.00	0.01	0.07	50.7%	1.5%
23	1.7%	46.2%	3.4%	0.8%	12.6%	100.0%	0.00	0.02	0.00	0.00	0.00	0.06	52.9%	1.7%
24	2.9%	52.9%	5.0%	1.4%	26.4%	100.0%	0.00	0.03	0.00	0.00	0.01	0.06	40.0%	2.1%
25	2.0%	36.0%	10.3%	2.0%	10.3%	100.0%	0.00	0.02	0.01	0.00	0.01	0.09	46.3%	1.5%
26	1.8%	27.8%	9.5%	2.4%	10.1%	100.0%	0.00	0.01	0.01	0.00	0.01	0.07	41.4%	1.8%
27	1.4%	29.0%	16.1%	1.2%	11.5%	100.0%	0.01	0.04	0.04	0.00	0.02	0.21	51.3%	1.4%
28	1.7%	31.4%	4.5%	0.2%	18.0%	100.0%	0.01	0.05	0.01	0.00	0.02	0.22	55.1%	1.2%
29	1.7%	31.7%	4.4%	0.2%	15.5%	100.0%	0.01	0.05	0.01	0.00	0.02	0.22	54.5%	1.2%
30	2.6%	31.1%	9.2%	4.0%	5.5%	100.0%	0.01	0.04	0.02	0.01	0.01	0.14	35.9%	2.1%
31	1.3%	42.9%	9.2%	0.5%	11.1%	100.0%	0.00	0.06	0.02	0.00	0.02	0.18	47.1%	1.1%
32	1.4%	29.6%	3.6%	0.4%	10.5%	100.0%	0.01	0.05	0.01	0.00	0.02	0.26	52.3%	1.2%
33	1.7%	34.8%	4.4%	0.6%	14.1%	100.0%	0.01	0.05	0.01	0.00	0.02	0.20	53.9%	1.4%
34	1.8%	38.0%	16.4%	0.4%	16.3%	100.0%	0.01	0.11	0.07	0.00	0.04	0.46	55.7%	1.5%
35	2.5%	42.9%	8.9%	0.3%	22.2%	100.0%	0.02	0.15	0.05	0.00	0.08	0.55	61.7%	2.2%
36	3.2%	37.3%	6.0%	0.4%	14.5%	100.0%	0.02	0.13	0.03	0.00	0.04	0.49	60.4%	2.3%
37	2.3%	28.4%	2.6%	0.2%	11.8%	100.0%	0.02	0.13	0.02	0.00	0.04	0.64	58.9%	1.8%
38	2.6%	38.8%	4.1%	1.9%	14.4%	100.0%	0.02	0.13	0.02	0.01	0.04	0.36	37.9%	2.1%
39	2.2%	41.3%	14.5%	0.3%	20.3%	100.0%	0.02	0.12	0.08	0.00	0.07	0.50	58.2%	1.7%
40	2.4%	41.9%	4.3%	0.2%	20.9%	100.0%	0.02	0.15	0.03	0.00	0.07	0.55	61.8%	2.1%
41	3.1%	34.3%	5.3%	0.4%	11.2%	100.0%	0.02	0.14	0.03	0.00	0.03	0.58	64.1%	2.5%
42	2.9%	27.4%	2.1%	1.5%	11.9%	100.0%	0.02	0.11	0.02	0.01	0.04	0.52	47.7%	1.9%
43	2.3%	62.3%	8.7%	0.5%	42.5%	100.0%	0.01	0.09	0.02	0.00	0.05	0.20	51.7%	2.0%
44	2.3%	98.0%	5.9%	1.6%	30.9%	100.0%	0.01	0.11	0.01	0.00	0.03	0.12	38.8%	1.6%
45	2.4%	100.0%	9.1%	1.3%	42.1%	93.9%	0.01	0.09	0.02	0.00	0.04	0.11	35.7%	1.7%
46	2.3%	80.7%	13.2%	1.3%	40.7%	100.0%	0.01	0.11	0.03	0.00	0.05	0.17	42.0%	1.5%
47	2.6%	93.9%	11.6%	1.9%	47.7%	100.0%	0.01	0.10	0.02	0.00	0.05	0.14	45.2%	1.9%
48	2.0%	74.5%	23.4%	1.5%	34.7%	100.0%	0.01	0.14	0.09	0.01	0.10	0.33	50.2%	1.5%
49	1.5%	74.0%	6.3%	0.6%	30.7%	100.0%	0.01	0.26	0.04	0.00	0.10	0.47	55.4%	1.2%
50	1.8%	81.2%	5.2%	0.5%	46.8%	100.0%	0.01	0.25	0.03	0.00	0.12	0.41	54.7%	1.6%
51	2.9%	68.5%	8.8%	4.0%	31.1%	100.0%	0.02	0.21	0.04	0.02	0.08	0.26	36.8%	2.2%
52	1.9%	82.2%	13.3%	1.3%	18.5%	100.0%	0.01	0.25	0.06	0.01	0.06	0.32	47.9%	1.6%
53	1.8%	64.2%	4.5%	0.7%	28.5%	100.0%	0.01	0.18	0.02	0.00	0.07	0.41	56.7%	1.2%
54	2.0%	84.1%	8.8%	1.3%	26.7%	100.0%	0.01	0.17	0.04	0.01	0.07	0.33	53.2%	1.6%
55	1.8%	92.8%	16.4%	0.7%	49.3%	100.0%	0.02	0.60	0.18	0.01	0.24	0.74	48.4%	1.6%
56	2.4%	92.0%	12.0%	0.6%	53.9%	100.0%	0.03	0.86	0.12	0.01	0.43	0.95	53.1%	1.9%
57	4.6%	86.7%	10.0%	0.4%	66.7%	100.0%	0.06	0.80	0.10	0.00	0.46	0.92	56.2%	3.5%
58	2.9%	71.4%	3.5%	0.5%	34.9%	100.0%	0.04	0.66	0.04	0.01	0.25	1.10	55.8%	2.2%
59	3.0%	95.7%	5.5%	2.0%	40.8%	100.0%	0.04	0.64	0.06	0.02	0.25	0.64	39.5%	2.3%
60	1.7%	90.9%	15.5%	0.8%	49.4%	100.0%	0.03	0.71	0.19	0.01	0.32	0.86	50.3%	1.6%
61	4.5%	83.4%	8.0%	0.3%	59.2%	100.0%	0.06	0.82	0.07	0.00	0.47	1.01	58.5%	3.5%
62	3.1%	74.7%	6.3%	0.6%	42.6%	100.0%	0.05	0.75	0.07	0.01	0.31	1.12	57.5%	2.5%
63	3.1%	69.9%	3.1%	1.4%	33.2%	100.0%	0.04	0.52	0.04	0.02	0.24	0.78	41.8%	2.3%

FCC ID: A3LSMS938U

Part 0 Power Density Report
Power Density Characterization

Revision E

October 27, 2024

SAMSUNG ELECTRONICS

Power Density Characterization

1 Exposure Scenarios

At frequencies > 6 GHz, the total peak spatial averaged power density (psPD) is required to be assessed for all antenna configurations (beams) from all mmW antenna modules installed inside the device. This device has 1 patch antenna array.

As shown in Figure 1, the surfaces near-by each mmW antenna module for PD characterization are identified and listed in Table 1.

Table 1
Evaluation Surfaces for PD Characterization

Band/Mode	Antenna Module	Back	Front	Top	Bottom	Right	Left
NR n258	**M**	Yes	No	No	No	No	Yes
NR n260	**M**	No	No	No	No	No	Yes
NR n261	**M**	Yes	No	No	No	No	Yes

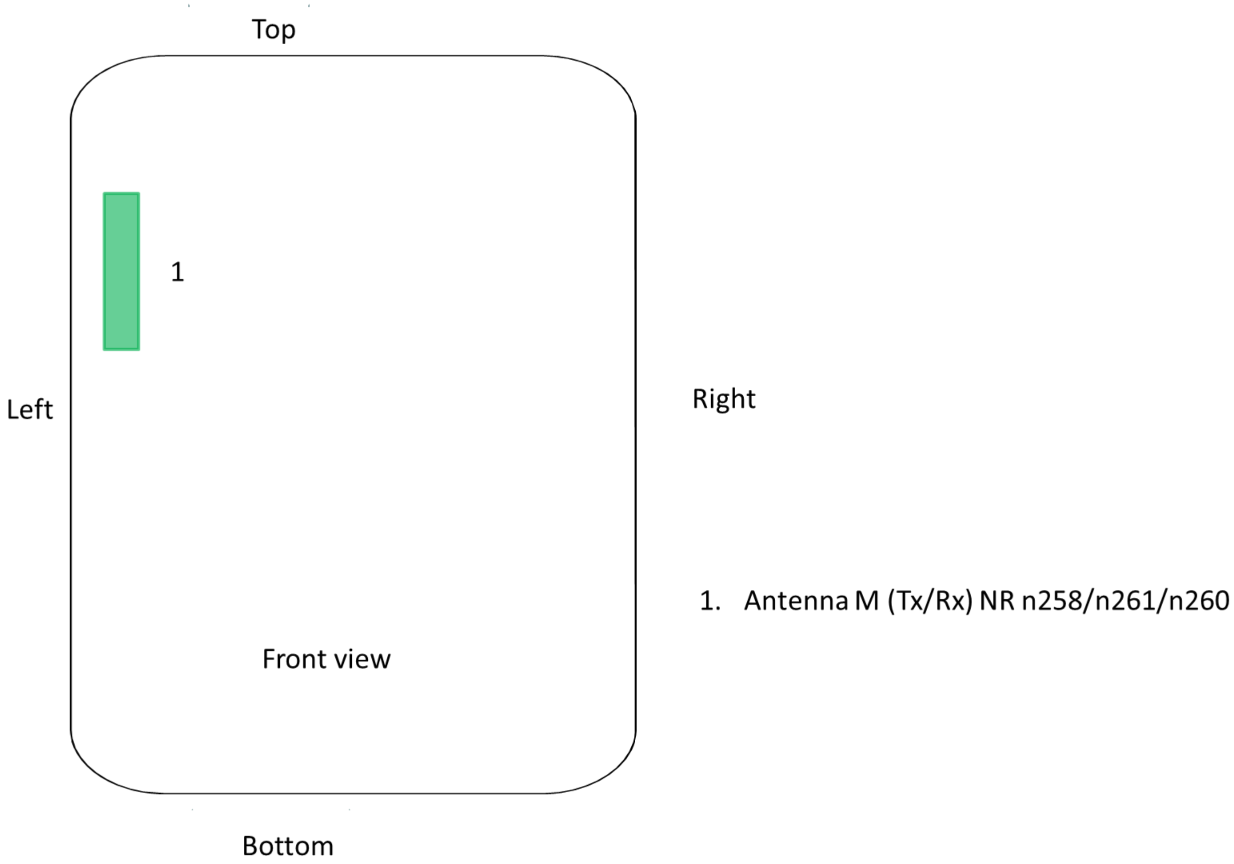
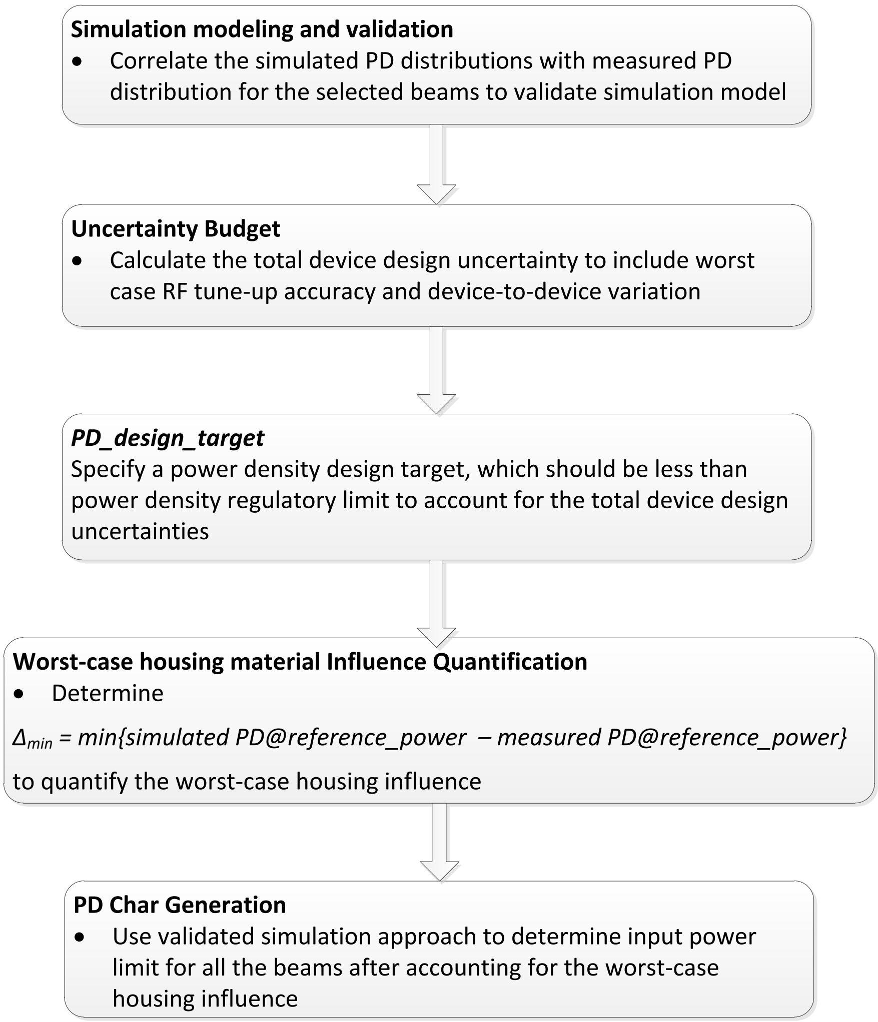


Figure 1: Location of mmW antenna modules looking from front of the DUT

2 Power Density Characterization Method



3 Codebook for all supported beams

Table 2
5G mmW NR Band n258 Antenna M Codebook

Band	Antenna Module	Antenna Type	Beam ID	Feed no.	Paired With
n258	M	Patch	0	2	256
n258	M	Patch	1	2	257
n258	M	Patch	2	2	258
n258	M	Patch	3	2	259
n258	M	Patch	4	2	260
n258	M	Patch	5	4	261
n258	M	Patch	6	4	262
n258	M	Patch	7	4	263
n258	M	Patch	8	4	264
n258	M	Patch	9	4	265
n258	M	Patch	10	4	266
n258	M	Patch	11	4	267
n258	M	Patch	12	10	268
n258	M	Patch	13	10	269
n258	M	Patch	14	10	270
n258	M	Patch	15	10	271
n258	M	Patch	16	10	272
n258	M	Patch	17	10	273
n258	M	Patch	18	10	274
n258	M	Patch	19	10	275
n258	M	Patch	20	10	276
n258	M	Patch	256	2	0
n258	M	Patch	257	2	1
n258	M	Patch	258	2	2
n258	M	Patch	259	2	3
n258	M	Patch	260	2	4
n258	M	Patch	261	4	5
n258	M	Patch	262	4	6
n258	M	Patch	263	4	7
n258	M	Patch	264	4	8
n258	M	Patch	265	4	9
n258	M	Patch	266	4	10
n258	M	Patch	267	4	11
n258	M	Patch	268	10	12
n258	M	Patch	269	10	13
n258	M	Patch	270	10	14
n258	M	Patch	271	10	15
n258	M	Patch	272	10	16
n258	M	Patch	273	10	17
n258	M	Patch	274	10	18
n258	M	Patch	275	10	19
n258	M	Patch	276	10	20

Table 3
5G mmW NR Band n261 Antenna M Codebook

Band	Antenna Module	Antenna Type	Beam ID	Feed no.	Paired With
n261	M	Patch	0	2	256
n261	M	Patch	1	2	257
n261	M	Patch	2	2	258
n261	M	Patch	3	2	259
n261	M	Patch	4	2	260
n261	M	Patch	5	4	261
n261	M	Patch	6	4	262
n261	M	Patch	7	4	263
n261	M	Patch	8	4	264
n261	M	Patch	9	4	265
n261	M	Patch	10	4	266
n261	M	Patch	11	4	267
n261	M	Patch	12	10	268
n261	M	Patch	13	10	269
n261	M	Patch	14	10	270
n261	M	Patch	15	10	271
n261	M	Patch	16	10	272
n261	M	Patch	17	10	273
n261	M	Patch	18	10	274
n261	M	Patch	19	10	275
n261	M	Patch	20	10	276
n261	M	Patch	256	2	0
n261	M	Patch	257	2	1
n261	M	Patch	258	2	2
n261	M	Patch	259	2	3
n261	M	Patch	260	2	4
n261	M	Patch	261	4	5
n261	M	Patch	262	4	6
n261	M	Patch	263	4	7
n261	M	Patch	264	4	8
n261	M	Patch	265	4	9
n261	M	Patch	266	4	10
n261	M	Patch	267	4	11
n261	M	Patch	268	10	12
n261	M	Patch	269	10	13
n261	M	Patch	270	10	14
n261	M	Patch	271	10	15
n261	M	Patch	272	10	16
n261	M	Patch	273	10	17
n261	M	Patch	274	10	18
n261	M	Patch	275	10	19
n261	M	Patch	276	10	20

Table 4
5G mmW NR Band n260 Antenna M Codebook

Band	Antenna Module	Antenna Type	Beam ID	Feed no.	Paired With
n260	M	Patch	0	2	256
n260	M	Patch	1	2	257
n260	M	Patch	2	2	258
n260	M	Patch	3	2	259
n260	M	Patch	4	2	260
n260	M	Patch	5	4	261
n260	M	Patch	6	4	262
n260	M	Patch	7	4	263
n260	M	Patch	8	4	264
n260	M	Patch	9	4	265
n260	M	Patch	10	4	266
n260	M	Patch	11	4	267
n260	M	Patch	12	10	268
n260	M	Patch	13	10	269
n260	M	Patch	14	10	270
n260	M	Patch	15	10	271
n260	M	Patch	16	10	272
n260	M	Patch	17	10	273
n260	M	Patch	18	10	274
n260	M	Patch	19	10	275
n260	M	Patch	20	10	276
n260	M	Patch	256	2	0
n260	M	Patch	257	2	1
n260	M	Patch	258	2	2
n260	M	Patch	259	2	3
n260	M	Patch	260	2	4
n260	M	Patch	261	4	5
n260	M	Patch	262	4	6
n260	M	Patch	263	4	7
n260	M	Patch	264	4	8
n260	M	Patch	265	4	9
n260	M	Patch	266	4	10
n260	M	Patch	267	4	11
n260	M	Patch	268	10	12
n260	M	Patch	269	10	13
n260	M	Patch	270	10	14
n260	M	Patch	271	10	15
n260	M	Patch	272	10	16
n260	M	Patch	273	10	17
n260	M	Patch	274	10	18
n260	M	Patch	275	10	19
n260	M	Patch	276	10	20

4 Simulation and Modeling Validation

Power density simulations of all beams and surfaces were performed. Details of these simulations and modeling validation can be found in the Power Density Simulation Report. Table below includes a summary of the validation results to support worst-case housing influence quantification in power density characterization for this model.

With an input power of 6 dBm for n258 band, 6 dBm for n261 band, and 6 dBm for n260 band, PD measurements are conducted for at least one single beam per antenna module on worst-surface(s). PD measurements are performed at mid channel of each mmW band and with CW modulation. All measured PD values are listed in table below along with corresponding simulated PD values for the same configuration.

PD value will be used to determine worst-case housing influence for conservative assessment.

Table 5

Band	Antenna	Beam ID	Surface	4cm^2 psPD Measured (mW/cm^2)	4cm^2 psPD Simulated (mW/cm^2)	Delta = Simulated - Measured (dB)
n258	M	15	Rear	0.479	0.974	3.08
		13	Left	0.674	1.259	**2.71**
		271	Rear	0.604	1.144	2.77
n261	M	14	Rear	0.514	1.035	**3.04**
			Left	0.731	1.478	3.06
		274	Rear	0.245	0.604	3.92
		273	Left	0.304	0.821	4.31
n260	M	20	Left	0.637	1.391	**3.39**
		269	Left	0.687	1.63	3.75

5 *PD_design_target*

Table 6

PD_design_target	
$PD\_design\_target < PD\_regulatory\_limit \; x \; 10^{\frac{-Total\ Uncertainty}{10}}$	
psPD over 4 cm2 Averaging Area (mW/cm^2)	
Total Uncertainty	1.4 dB
PD_regulatory_limit	1.0 mW/cm^2
PD_design_target	0.724 mW/cm^2

6 Δmin

For non-metal material, the material property cannot be accurately characterized at mmW frequencies to date. The estimated material property for the device housing is used in the simulation model, which could influence the accuracy in simulation for PD amplitude quantification. Since the housing influence on PD could vary from surface to surface where the EM field propagates through, the most underestimated surface is used to quantify the worst-case housing influence for conservative assessment.

Since the mmW antenna modules are placed at different locations, only surrounding material/housing has impact on EM field propagation, and in turn power density. Furthermore, depending on the type of antenna array, i.e., dipole antenna array or patch antenna array, the nature of EM field propagation in the near field is different. Therefore, the worst-case housing influence is determined per antenna module and per antenna type.

For this DUT, the below procedure was used to determine worst-case housing influence, Δmin:

1. Based on PD simulation, for each module and antenna type, determine one or more worst-surface(s) that has highest 4cm2 PD for all the single beams per antenna module and per antenna type in the mid channel of each band.
2. For identified worst surface(s) per antenna module and per antenna type group,
    a. First determine Δmin based on identified worst surface(s), and derive input.power.limit
    b. Then prove all other near-by surface(s), i.e., non-selected surface(s), is not required for housing material loss quantification (in other words, these non-evaluated surfaces have no influence on the determined input.power.limit) by:
        i. re-scale all simulated 4cm2 PD values to input.power.limit to identify the worst-PD beam per each non-evaluated surface
        ii. Measure 4cm2 PD at input.power.limit on identified worst-PD beam per each non-evaluated surface
        iii. Demonstrate all measured 4cm2 PD values are below PD_design_target

3. If any of the above surface(s) in Step (2.b.iii) have measured 4cm2 PD ≥ PD_design_target, then those surfaces must be included in the Δmin determination in Step (2.a), and re-evaluate input.power.limit with these added surfaces.

Following above procedure, based on the Samsung PD simulation report, the worst-surface(s) having highest 4cm2 PD for all the single beams per each antenna type and each antenna module group in the mid channel of n258, n261, and n260 bands are identified in the following table:

Table 7

Worst-surface(s)

Band/Mode	Antenna Module	Back	Front	Top	Bottom	Right	Left
NR n258	**M**	Yes	No	No	No	No	Yes
NR n260	**M**	No	No	No	No	No	Yes
NR n261	**M**	Yes	No	No	No	No	Yes

Thus, when comparing a simulated 4cm2-averaged PD and measured 4 cm2-averaged PD for the identified worst surface(s), the worst error introduced for each antenna type and each antenna module group when using the estimated material property in the simulation is highlighted in bold numbers in the table below. Thus, the worst-case housing influence, denoted as $\Delta_{min} = \mathrm{Sim.PD} - \mathrm{Meas.PD}$, is determined as

Table 8

Δ_{min}

Band	Antenna	Δmin (dB)
n258	M	**2.71**
n261	M	**3.04**
n260	M	**3.39**

Δ_{min} represents the worst case where RF exposure is underestimated the most in simulation when using the estimated material property of the housing. For conservative assessment, the Δ_{min} is used as the worst-case factor and applied to all the beams in the corresponding antenna type and antenna module group to determine input power limits in PD char for compliance.

The detail input.power.limit derivation is described in Section 7.

Simulated 4cm2 PD values in the Power Density Simulation Report are scaled to input.power.limit and are listed in the tables below for all single beams for all identified surfaces, when assuming the simulation is performed with correct housing influence.

Determine the worst beam for each of non-selected surface(s), identified in the table below:

Table 9

Non-Selected Surface(s)

Band/Mode	Antenna Module	Back	Front	Top	Bottom	Right	Left
NR n258	**M**	No	Yes	Yes	No	No	Yes
NR n261	**M**	No	Yes	Yes	No	No	No
NR n260	**M**	Yes	Yes	Yes	No	No	No

Then perform PD measurement for all determined worst-case beams, highlighted in orange in the tables below, on the corresponding surface. Measurement is performed in the mid channel of each band with CW modulation. The evaluation distance is at 2 mm.

Table 10
n258/mid channel, Antenna M Patch simulated 4cm2 PD at PD_Design_Target (if simulation performed with correct housing material properties) (Δmin)

Antenna	Beam ID_1	Paired With	Simulated 4cm^2 PD (mW/cm^2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties					
			S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Back)
M	0		0.019655635	0.792777296	0.065518785	0.006551878	0.438975858	1.212097518
M	1		0.015976700	1.214229222	0.047930101	0.005325567	0.388766374	0.649719145
M	2		0.017926153	1.051667617	0.077679994	0.005975384	0.495956888	0.609489187
M	3		0.017001494	1.167435926	0.090674635	0.005667165	0.470374669	0.969085162
M	4		0.016729659	1.198958893	0.078071742	0.005576553	0.412664921	0.936860903
M	5		0.022052807	1.102640342	0.119715237	0.006300802	0.437905736	0.620628993
M	6		0.015077726	1.212249145	0.081419719	0.003015545	0.295523424	1.055440798
M	7		0.020966073	1.212537862	0.045426490	0.006988691	0.639465212	1.100718808
M	8		0.034710096	1.214853376	0.052065145	0.017355048	0.876429936	1.158449469
M	9		0.023958734	1.215050103	0.102680290	0.006845353	0.239587344	1.115792489
M	10		0.016230647	1.214052411	0.051938071	0.006492259	0.529119099	1.090699492
M	11		0.021014404	1.211830649	0.045531209	0.010507202	0.458814494	0.788040162
M	12		0.015976950	1.213106970	0.152922233	0.006847264	0.411977061	0.774882063
M	13		0.015434260	1.214483346	0.092605561	0.002893924	0.473638858	0.705152761
M	14		0.042317092	1.213971566	0.068765274	0.003967227	0.774931741	1.032801518
M	15		0.025976769	1.212249209	0.023502791	0.009895912	0.561593001	1.204827275
M	16		0.017558435	1.108376240	0.038409078	0.009876620	0.392869994	0.701240017
M	17		0.014705977	1.213243066	0.131303362	0.006302561	0.423322039	0.739500535
M	18		0.029358212	1.213472750	0.068502494	0.002174682	0.563242728	0.820942586
M	19		0.041089185	1.089526132	0.064947421	0.005301830	0.657426960	1.206166399
M	20		0.020836019	1.165591443	0.030641205	0.008579537	0.486582337	0.958456896
M	256		0.025614571	0.674517039	0.110996475	0.008538190	0.375680376	1.135579319
M	257		0.020435997	0.602861910	0.051089992	0.010217998	0.163487976	1.185287823
M	258		0.032316612	0.622094782	0.048474918	0.016158306	0.258532897	1.082606504
M	259		0.021155623	0.333201067	0.126933740	0.010577812	0.089911399	1.147692563
M	260		0.020676979	0.330831665	0.110277222	0.020676979	0.124061874	1.199264786
M	261		0.016088557	0.311045428	0.179655549	0.008044278	0.117982749	1.126198965
M	262		0.021206250	0.405948211	0.063618750	0.006058929	0.221150891	1.205726776
M	263		0.020533542	0.422404295	0.064533990	0.005866726	0.181868516	1.214412349
M	264		0.031359262	0.366903365	0.100349638	0.031359262	0.059582598	1.197923808
M	265		0.012922182	0.392834319	0.103377452	0.005168873	0.090455271	1.059618886
M	266		0.014841024	0.324382386	0.040282780	0.006360439	0.084805853	1.166080474
M	267		0.018815557	0.464117078	0.065854450	0.006271852	0.159932236	1.175972325
M	268		0.014809728	0.349262750	0.149331423	0.003702432	0.157970431	1.097154009
M	269		0.032835163	0.483687214	0.104819945	0.005051564	0.238686380	1.132813137
M	270		0.032253517	0.397793374	0.075258206	0.005375586	0.154548101	1.186660639
M	271		0.026505694	0.327243377	0.038739091	0.002038900	0.098886628	1.166250541
M	272		0.041163833	0.488820522	0.034731984	0.016722807	0.165941703	1.195037539
M	273		0.027076039	0.453845984	0.136669529	0.005157341	0.230790998	1.103670916
M	274		0.031139085	0.469577397	0.062278169	0.002491127	0.219219156	1.153391696
M	275		0.036684879	0.401088008	0.074592587	0.006114146	0.107608978	1.177584609
M	276		0.033330724	0.289193049	0.021566939	0.015685047	0.099992173	1.116579262
M	0	256	0.019836079	0.619877456	0.081823824	0.004959020	0.409119121	1.130656480
M	1	257	0.022722906	1.106930139	0.068168718	0.016230647	0.418750698	0.899177855
M	2	258	0.022880414	1.153826579	0.094790286	0.016343153	0.444533753	0.895604767
M	3	259	0.023848212	0.861516652	0.184823642	0.008943079	0.378590363	1.213277777
M	4	260	0.022308166	1.000680603	0.105167070	0.019121285	0.455723969	1.105847673
M	5	261	0.024293711	0.862426757	0.319288779	0.010411591	0.428610481	1.214685574
M	6	262	0.020676919	0.781845981	0.072369215	0.005169230	0.390276837	1.213476655
M	7	263	0.015365514	0.746507866	0.070425270	0.007682757	0.477611379	1.108877894
M	8	264	0.052057953	0.812104069	0.097174846	0.043381628	0.386964118	1.186921332
M	9	265	0.022827434	0.837005907	0.149139234	0.009130974	0.214577878	1.068323903
M	10	266	0.020440611	0.732941902	0.073002181	0.007300218	0.286168551	1.138834031
M	11	267	0.025911578	1.025358175	0.098093833	0.014806616	0.384972022	1.153065240
M	12	268	0.021769314	0.992424625	0.195283555	0.008963835	0.509658065	1.069257499
M	13	269	0.030911755	1.168598745	0.122303031	0.007391941	0.715674332	1.143734942
M	14	270	0.038886050	0.919185761	0.134089827	0.006034042	0.699948895	1.133059035
M	15	271	0.019776500	0.817602138	0.040073434	0.008847382	0.316423998	1.131944399
M	16	272	0.047517826	1.036135443	0.043198023	0.016044980	0.388782209	1.092909988
M	17	273	0.026389456	1.102943938	0.171869792	0.008796485	0.619813894	1.096177411
M	18	274	0.043326891	1.109028637	0.088051423	0.004192925	0.772895824	1.215249401
M	19	275	0.028836066	0.798928650	0.104036003	0.007915783	0.442718424	1.127999049
M	20	276	0.027411702	0.790102013	0.032786546	0.015587047	0.317653258	1.045407085

Table 11
n261/mid channel, Antenna M Patch simulated 4cm2 PD at PD_Design_Target (if simulation performed with correct housing material properties) (Δmin)

Antenna	Beam ID_1	Paired With	Simulated 4cm² PD (mW/cm²) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties					
			S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Back)
M	0		0.021529663	1.189513854	0.043059325	0.005382416	0.473652575	0.979599644
M	1		0.020513380	1.307727966	0.056411795	0.005128345	0.374369182	0.835920229
M	2		0.014128579	1.125576797	0.037676211	0.004709526	0.395600213	0.621657478
M	3		0.025236971	1.223993075	0.189277280	0.006309243	0.492120927	0.845438516
M	4		0.027104239	1.165482288	0.088088778	0.006776060	0.474324187	0.867335656
M	5		0.025895228	1.156653520	0.066176694	0.005754495	0.374042183	0.822892803
M	6		0.021595831	1.232925612	0.025522345	0.003926515	0.461365476	0.881502548
M	7		0.022645256	1.306631260	0.033967884	0.004529051	0.412143656	0.760880595
M	8		0.022185398	1.189691950	0.088741591	0.002773175	0.443707953	0.668335105
M	9		0.016713493	1.215906599	0.018802679	0.008356746	0.484691290	0.770909854
M	10		0.020427713	1.214314030	0.068092376	0.004539492	0.406284507	0.901089103
M	11		0.023945270	1.309008099	0.061193468	0.002660586	0.351197295	1.090840082
M	12		0.043765028	1.174817466	0.127192112	0.009573600	0.574415990	0.808285358
M	13		0.042340972	1.186661462	0.069082639	0.004456944	0.491378127	0.810049656
M	14		0.030288637	1.243516823	0.017668372	0.003365404	0.434978483	0.870798316
M	15		0.050116482	1.213397123	0.040478697	0.002891335	0.362380713	0.910770676
M	16		0.016329663	1.281878571	0.204120792	0.003265933	0.453964640	0.922625978
M	17		0.043679709	1.178138805	0.110412597	0.006066626	0.541143056	0.770461525
M	18		0.031585748	1.228972753	0.040200043	0.004785719	0.451771916	0.897800968
M	19		0.040247144	1.182916045	0.026248137	0.004374690	0.415595504	0.880187530
M	20		0.040742275	1.260682393	0.146672190	0.002328130	0.378321124	0.890509724
M	256		0.027863600	1.281725586	0.062693099	0.006965900	0.390090396	1.191168887
M	257		0.027867531	1.105412044	0.055735061	0.009289177	0.371567074	0.715266617
M	258		0.022646820	1.064400536	0.067940460	0.022646820	0.362349118	0.996460076
M	259		0.029315580	1.182395045	0.127034178	0.019543720	0.302927656	1.084676446
M	260		0.020370760	1.201874824	0.132409938	0.010185380	0.448156714	1.049094126
M	261		0.028646744	1.014913225	0.094125017	0.016369568	0.270097874	1.154054554
M	262		0.025830242	1.170970987	0.051660485	0.004305040	0.374538514	0.895448402
M	263		0.037768391	1.139346456	0.151073563	0.012589464	0.383978640	1.139346456
M	264		0.026189577	1.095597297	0.078568730	0.008729859	0.501966889	1.099962227
M	265		0.031846904	1.285818746	0.039808630	0.007961726	0.366239395	0.899675036
M	266		0.034215252	1.307782957	0.022810168	0.007603389	0.406781327	1.015052470
M	267		0.031121980	1.151513256	0.054463465	0.003890247	0.482390688	1.116501029
M	268		0.026652063	1.105359246	0.039276724	0.021041102	0.360504221	0.819200253
M	269		0.042677260	1.093350748	0.093483521	0.014225753	0.410514593	1.217318026
M	270		0.029792385	1.225743825	0.029792385	0.008512110	0.431989577	0.832058743
M	271		0.040667712	1.224549985	0.088113375	0.004518635	0.560310694	0.905986244
M	272		0.035002351	1.203205810	0.155322932	0.006562941	0.511909381	0.984441117
M	273		0.026016552	1.186643837	0.041915556	0.015899004	0.398920462	0.815185291
M	274		0.043421524	1.183708515	0.067964125	0.007551569	0.458757845	1.140286990
M	275		0.043224585	1.253512963	0.054599476	0.004549956	0.509595107	0.953215847
M	276		0.032290033	1.201189230	0.083954086	0.008610675	0.523098536	0.884746906
M	0	256	0.032000626	1.272024891	0.077334847	0.008000157	0.490676268	1.234690828
M	1	257	0.017543994	1.309951585	0.070175978	0.008771997	0.388891877	0.804099745
M	2	258	0.018667032	1.106688323	0.053334377	0.010666875	0.400007828	0.578677990
M	3	259	0.032826134	1.287513929	0.215193546	0.010942045	0.430387092	0.951957891
M	4	260	0.024835635	1.149535112	0.141917915	0.007095896	0.482520911	0.886986969
M	5	261	0.037686731	1.168288674	0.080084304	0.014132524	0.353313107	0.975144175
M	6	262	0.016792110	1.223425146	0.034783656	0.004797746	0.436594856	0.869591403
M	7	263	0.021235793	1.252911806	0.060875941	0.005662878	0.346851291	0.825364500
M	8	264	0.025650581	1.202371003	0.110618132	0.006412645	0.597979179	0.779136410
M	9	265	0.020913473	1.247427132	0.033215515	0.009841634	0.437952721	0.820546249
M	10	266	0.029580617	1.307463266	0.066556388	0.007395154	0.360883526	0.921436215
M	11	267	0.030005200	1.233070837	0.085729143	0.004286457	0.514374857	1.304511789
M	12	268	0.054512548	1.153535646	0.072056817	0.015037944	0.543245739	0.833352748
M	13	269	0.046468345	1.203094494	0.092936690	0.012343154	0.479204807	0.918475881
M	14	270	0.024616056	1.248751999	0.033334242	0.004102676	0.386164376	0.741045847
M	15	271	0.047917757	1.225482873	0.051222430	0.003855452	0.427404364	1.009577576
M	16	272	0.028918713	1.308376347	0.203994162	0.006252695	0.631522156	1.097347904
M	17	273	0.050403408	1.177034132	0.067013622	0.009164256	0.512052805	0.844257086
M	18	274	0.030821380	1.213389083	0.049746790	0.005407260	0.401218672	0.906256731
M	19	275	0.039098240	1.211434521	0.040320060	0.005498190	0.483229806	0.962794153
M	20	276	0.031860538	1.235948404	0.145476417	0.005410280	0.396152723	0.975653823

Table 12
n260/mid channel, Antenna M Patch simulated 4cm2 PD at PD_Design_Target
(if simulation performed with correct housing material properties) (Δmin)

Antenna	Beam ID_1	Paired With	Simulated 4cm^2 PD (mW/cm^2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties					
			S4(Right)	S3(Left)	S5(Top)	S6(Bottom)	S1(Front)	S2(Back)
M	0		0.005422352	1.138693895	0.043378815	0.005422352	0.347030521	0.368719928
M	1		0.005756887	1.364382196	0.074839530	0.011513774	0.368440762	0.489335387
M	2		0.007198097	1.043724061	0.046787630	0.007198097	0.327513412	0.381499140
M	3		0.007892556	1.187829736	0.102603233	0.003946278	0.307809699	0.489338496
M	4		0.005664841	1.410545321	0.056648406	0.005664841	0.475846614	0.572148905
M	5		0.003865607	1.138421246	0.106304191	0.007731214	0.258995666	0.409754337
M	6		0.010649003	0.969059280	0.063894018	0.003549668	0.408211784	0.472105803
M	7		0.007469800	1.419261929	0.079677863	0.012449666	0.458147711	0.488026909
M	8		0.007967259	1.317253539	0.069049581	0.013278766	0.313378866	0.398362966
M	9		0.005300404	1.042412737	0.091873665	0.008834006	0.231450964	0.367494660
M	10		0.011567718	1.419937372	0.060730519	0.002891929	0.592845542	0.659359920
M	11		0.006328619	1.255176106	0.113915142	0.008438159	0.345964507	0.518946760
M	12		0.006401559	1.111127703	0.137176260	0.022862710	0.259720385	0.422502880
M	13		0.013322336	1.062153516	0.089622988	0.002422243	0.405725687	0.609194092
M	14		0.014879227	1.198454139	0.056811596	0.005410628	0.560000015	0.576231900
M	15		0.013681416	1.371298855	0.147338327	0.013681416	0.477797145	0.588300890
M	16		0.006241453	1.138619441	0.179218878	0.003566545	0.243416686	0.395886478
M	17		0.006906813	1.045518786	0.112235708	0.016403680	0.215837900	0.374694594
M	18		0.010429841	1.243758530	0.046934284	0.002607460	0.548870379	0.586678552
M	19		0.010032986	1.417995357	0.061312692	0.005573881	0.604208714	0.549584679
M	20		0.005192051	1.203690485	0.155761529	0.013845469	0.299408273	0.514878389
M	256		0.004520513	1.342592284	0.045205127	0.004520513	0.569584605	0.379723070
M	257		0.010028078	1.193341255	0.070196544	0.005014039	0.441235422	0.270758100
M	258		0.004209085	1.418461650	0.058927190	0.004209085	0.521926542	0.294635951
M	259		0.010146329	1.417103989	0.054113756	0.003382110	0.497170135	0.324682537
M	260		0.004541378	1.416910086	0.054496542	0.004541378	0.522258525	0.390558549
M	261		0.010994050	1.420431241	0.087952399	0.006596430	0.507925103	0.303435776
M	262		0.007966135	1.417972118	0.031864542	0.003983068	0.571570222	0.533731078
M	263		0.006328619	1.419720201	0.101257904	0.002109540	0.523165839	0.478865506
M	264		0.008303242	1.372110719	0.091335661	0.006227431	0.485739649	0.321750623
M	265		0.009513470	1.419092592	0.047567349	0.004756735	0.583492820	0.358340699
M	266		0.007714521	1.419471821	0.051430138	0.002571507	0.632590703	0.558017002
M	267		0.007248492	1.417080268	0.083357663	0.005436369	0.458467145	0.284503327
M	268		0.019652011	1.417752202	0.137564075	0.006550670	0.525925239	0.358415243
M	269		0.016555462	1.420284351	0.060122466	0.002614020	0.656990430	0.385132321
M	270		0.011102741	1.301487967	0.039476412	0.003700914	0.504557894	0.605716201
M	271		0.010719825	1.334618219	0.098622390	0.011791808	0.658197258	0.445944722
M	272		0.017197297	1.401579741	0.191081083	0.005732432	0.548402707	0.341079733
M	273		0.020319618	1.417955934	0.102481550	0.005300770	0.560998142	0.362219273
M	274		0.008268566	1.358801043	0.031236806	0.003674918	0.663322754	0.510813644
M	275		0.006827878	1.420198575	0.110221455	0.002926233	0.653525443	0.446738288
M	276		0.014563943	1.419498933	0.223313786	0.005825577	0.450511289	0.400993885
M	0	256	0.006859760	1.417683834	0.045731737	0.004573174	0.496189342	0.409299042
M	1	257	0.012952063	1.420409575	0.075553701	0.010793386	0.455480882	0.382085858
M	2	258	0.006357831	1.417796224	0.082651798	0.006357831	0.521342109	0.411139712
M	3	259	0.007415795	1.193942957	0.072674789	0.004449477	0.379688692	0.335193923
M	4	260	0.006688195	1.417897423	0.060193759	0.004458797	0.503844053	0.481550068
M	5	261	0.009914657	1.106723563	0.157395176	0.009914657	0.374278293	0.451116883
M	6	262	0.018423364	1.420134344	0.064481776	0.006141121	0.597224065	0.560377336
M	7	263	0.007418890	1.419481006	0.098918537	0.008655372	0.618240856	0.516849356
M	8	264	0.013782111	1.393962052	0.079739355	0.008859928	0.374085861	0.404603392
M	9	265	0.008340416	1.294432518	0.091744573	0.007506374	0.612186513	0.428697368
M	10	266	0.011026310	1.417493436	0.063707570	0.003675437	0.584394442	0.553765802
M	11	267	0.006641676	1.221238172	0.102945978	0.007471885	0.396009931	0.400991188
M	12	268	0.018631692	1.419830505	0.159085989	0.020542635	0.560383978	0.458626273
M	13	269	0.021361924	1.420082476	0.100983643	0.002912990	0.797188179	0.549584056
M	14	270	0.015132669	1.352729023	0.061188618	0.007237363	0.665837437	0.602017051
M	15	271	0.016265063	1.396007096	0.146385564	0.010688470	0.677556041	0.586006974
M	16	272	0.014068646	1.149300165	0.188303417	0.004328814	0.414123223	0.393200621
M	17	273	0.017752016	1.378887869	0.149560738	0.014201613	0.572058727	0.536110893
M	18	274	0.012798558	1.418178692	0.042825945	0.004430270	0.821076730	0.449426292
M	19	275	0.011564523	1.420123366	0.086502628	0.005550971	0.632348092	0.474145423
M	20	276	0.014036400	1.277713458	0.180869043	0.012031200	0.446357526	0.516138487

The test results in the table below shows that the all measured 4cm2 PD values are less than PD_design_target of 0.741 mW/cm2, thus, the non-selected surfaces have no influence on the determined Δ_{min} and input.power.limit in Section 7.

Table 13
4cm2 PD of the selected beams measured on the corresponding surfaces that are not selected for Δmin determination

Band	Antenna	Beam ID	Surface	Tested Power Level (dBm)	input.power.limit (dBm)	Meas. 4cm^2 PD (mW/cm^2)
n258	M	8	Front	12.4	11.9	0.304
		261	Top	10.3	9.8	0.207
		256	Left	15.3	14.9	0.286
n261	M	12	Front	7.4	6.9	0.204
		16	Top	8.1	7.7	0.169
n260	M	274	Back	5.6	5.2	0.344
		276	Front	5.9	5.4	0.0591
		10	Top	10.6	10.2	0.389

7 PD Char

7.1 Single Beams

To determine the input power limit at each antenna port, simulation was performed at low, mid, and high channel for each mmW band supported, with 6 dBm input power per active port for n258 band, 6 dBm input power per active port for n261 band, and 6 dBm input power per active port for n260 band:

1. Obtained PDsurface value (the worst PD among all identified surfaces of the DUT) at all three channels for all single beams specified in the codebook.
2. Derived a scaling factor at low, mid and high channel, $s(i)_{low\_or\_mid\_or\_high}$, by:

$$s(i)_{low\_or\_mid\_or\_high} = \frac{PD\ design\ target}{sim.PD_{surface}(i)},\ i \in single\ beams \quad (1)$$

3. Determined the worst-case scaling factor, $\boldsymbol{s(i)}$, among low, mid and high channels:

$$\boldsymbol{s(i)} = min\{s_{low}(i), s_{mid}(i), s_{high}(i)\},\ i \in single\ beams \quad (2)$$

and this scaling factor applies to the input power at each antenna port.

7.2 Beam Pairs

Per the manufacturer, the relative phase between beam pair is not controlled in the chipset design and could vary from run to run. Therefore, for each beam pair, based on the simulation results, the worst-case scaling factor was determined mathematically to ensure the compliance. The worst-case PD for MIMO operations was found by sweeping the relative phase for all possible angles to ensure a conservative assessment. The power density simulation report contains the worst-case power density for each surface after sweeping through all relative phases between beams.

Once the power density was determined for the worst-case ∅, the scaling factor was obtained by the below equation for low, mid and high channels:

$$s(i)_{low\_or\_mid\_or\_high} = \frac{PD\ design\ target}{total\ PD\ (\emptyset(i)_{worstcase})}, i \in beam\ pairs \qquad (3)$$

The $total\ PD\ (\emptyset_{worstcase})$ varies with channel and beam pair, the lowest scaling factor among all three channels, $s(i)$, is determined for the beam pair i:

$$\boldsymbol{s(i)} = min\{s_{low}(i), s_{mid}(i), s_{high}(i)\},\ i \in beam\ pairs \qquad (4)$$

7.3 *Input.Power.Limit* Calculations

The PD Char specifies the limit of input power at antenna port that corresponds to PD_design_target for all the beams.

Ideally, if there is no uncertainty associated with hardware design, the input power limit, denoted as $input.power.limit(i)$, for beam i can be obtained after accounting for the housing influence (Δ_{min}), given by:

- For n258, n261, and n260

$$input.power.limit(i) = sim.power_{limit} + 10 * \log(s(i)) + \Delta_{min}, \; i \in all\ beams \quad (5)$$

where 6 dBm is the input power used in simulation for n258, n261 and n260, respectively; $s(i)$ is the scaling factor obtained from Eq. (2) or Eq. (4) for beam i; Δ_{min} is the worst-case housing influence factor for beam i.

If simulation overestimates the housing influence, then Δ_{min} (= simulated PD – measured PD) is negative, which means that the measured PD would be higher than the simulated PD. The input power to antenna elements determined via simulation must be decreased for compliance.

Similarly, if simulation underestimates the loss, then Δ_{min} is positive (measured PD would be lower than the simulated value). Input power to antenna elements determined via simulation can be increased and still be PD compliant.

In reality the hardware design has uncertainty which must be properly considered. The device design related uncertainty is embedded in the process of Δ_{min} determination. Since the device uncertainty is already accounted for in PD_design_target, it needs to be removed to avoid double counting this uncertainty.

Thus, Equation 5 is modified to:

If -TxAGC uncertainty < Δmin < TxAGC uncertainty,

$$input.power.limit(i) = sim.power_{limit}(\mathrm{i}), \; i \in all\ beams, \text{ for n258, n261, and n260} \quad (6)$$

else if Δmin < -TxAGC uncertainty,

$$input.power.limit(i) = sim.power_{limit}(\mathrm{i}) + (\Delta_{min} + \text{TxAGC uncertainty}),$$
$$i \in all\ beams, \text{ for n258, n261, and n260} \quad (7)$$

else if Δmin > TxAGC uncertainty,

$$input.power.limit(i) = sim.power_{limit}(\mathrm{i}) + (\Delta_{min} - \text{TxAGC uncertainty}),$$
$$i \in all\ beams, \text{ for n258, n261, and n260} \quad (8)$$

Following above logic, the input.power.limit for this DUT can be calculated using Equations (6), (7), and (8), i.e.,

Table 14
***input.power.limit* Calculation**

Band	Antenna	Δmin	TxAGC Uncertainty	*input.power.limit*	Notes
n258	M	2.71	0.47	*input.power.limit(i) = sim.power_limit + 2.24*	Using Eq.8
n261	M	3.04	0.47	*input.power.limit(i) = sim.power_limit + 2.57*	Using Eq.8
n260	M	1.92	0.47	*input.power.limit(i) = sim.power_limit + 1.45*	Using Eq.8

Table 15
Permanent backoff applied to calculated input.power.limit

Band	Antenna	backoff (dB)
n258	M	0.5
n261	M	0.5
n260	M	0.5

Note: The above backoff values have been permanently applied to the input.power.limits calculated from the equations above. The final input.power.limits implemented in the device are in the tables below.

Table 16

5G mmWave NR n258 Antenna M Patch *input.power.limit*

Band	Beam ID	Paired With	input.power.limit
n258	0		13.7
n258	1		12.8
n258	2		13.3
n258	3		13.1
n258	4		13.0
n258	5		10.5
n258	6		10.3
n258	7		11.0
n258	8		11.9
n258	9		10.9
n258	10		10.7
n258	11		11.0
n258	12		6.1
n258	13		5.4
n258	14		6.8
n258	15		6.5
n258	16		6.0
n258	17		5.8
n258	18		5.9
n258	19		6.8
n258	20		6.4
n258	256		14.9
n258	257		15.6
n258	258		14.6
n258	259		12.8
n258	260		13.9
n258	261		9.8
n258	262		10.4
n258	263		10.2
n258	264		10.5
n258	265		9.7
n258	266		8.8
n258	267		10.5
n258	268		6.5
n258	269		6.6
n258	270		6.8
n258	271		5.6
n258	272		6.6
n258	273		6.7
n258	274		6.5
n258	275		6.4
n258	276		5.5
n258	0	256	9.5
n258	1	257	10.7
n258	2	258	10.7
n258	3	259	10.3
n258	4	260	10.6
n258	5	261	7.9
n258	6	262	6.7
n258	7	263	6.6
n258	8	264	7.9
n258	9	265	7.4
n258	10	266	7.2
n258	11	267	8.2
n258	12	268	3.6
n258	13	269	3.8
n258	14	270	3.8
n258	15	271	2.7
n258	16	272	3.5
n258	17	273	3.9
n258	18	274	4.0
n258	19	275	3.1
n258	20	276	2.9

Table 17

5G mmWave NR n261 Antenna M Patch *input.power.limit*

Band	Beam ID	Paired With	input.power.limit
n261	0		12.9
n261	1		12.6
n261	2		12.3
n261	3		13.5
n261	4		13.9
n261	5		10.1
n261	6		8.5
n261	7		9.1
n261	8		10.0
n261	9		8.7
n261	10		9.1
n261	11		9.8
n261	12		6.9
n261	13		6.0
n261	14		4.8
n261	15		5.4
n261	16		7.7
n261	17		6.4
n261	18		5.4
n261	19		5.0
n261	20		6.2
n261	256		14.0
n261	257		15.2
n261	258		16.1
n261	259		15.4
n261	260		15.6
n261	261		11.7
n261	262		11.9
n261	263		13.5
n261	264		11.9
n261	265		11.5
n261	266		11.3
n261	267		11.4
n261	268		6.7
n261	269		8.6
n261	270		8.8
n261	271		9.1
n261	272		8.9
n261	273		7.1
n261	274		8.3
n261	275		9.1
n261	276		8.9
n261	0	256	9.8
n261	1	257	10.2
n261	2	258	9.8
n261	3	259	11.2
n261	4	260	11.0
n261	5	261	7.5
n261	6	262	6.3
n261	7	263	7.1
n261	8	264	7.6
n261	9	265	6.4
n261	10	266	7.2
n261	11	267	7.1
n261	12	268	3.5
n261	13	269	4.2
n261	14	270	2.6
n261	15	271	3.0
n261	16	272	4.5
n261	17	273	3.1
n261	18	274	2.9
n261	19	275	3.4
n261	20	276	3.3

Table 18

5G mmWave NR n260 Antenna M Patch *input.power.limit*

Band	Beam ID	Paired With	input.power.limit
n260	0		12.9
n260	1		13.2
n260	2		11.1
n260	3		11.5
n260	4		13.1
n260	5		8.4
n260	6		11.1
n260	7		9.5
n260	8		9.8
n260	9		8.0
n260	10		10.2
n260	11		8.8
n260	12		5.2
n260	13		6.4
n260	14		6.9
n260	15		5.8
n260	16		5.1
n260	17		4.9
n260	18		6.7
n260	19		6.0
n260	20		4.9
n260	256		12.1
n260	257		12.6
n260	258		11.8
n260	259		10.8
n260	260		12.1
n260	261		9.0
n260	262		8.5
n260	263		8.8
n260	264		8.7
n260	265		7.6
n260	266		9.7
n260	267		8.1
n260	268		5.3
n260	269		5.0
n260	270		6.5
n260	271		5.9
n260	272		5.4
n260	273		5.0
n260	274		5.2
n260	275		5.4
n260	276		5.4
n260	0	256	9.1
n260	1	257	8.9
n260	2	258	8.8
n260	3	259	7.3
n260	4	260	9.0
n260	5	261	6.5
n260	6	262	7.4
n260	7	263	6.5
n260	8	264	5.5
n260	9	265	4.8
n260	10	266	6.4
n260	11	267	4.7
n260	12	268	2.3
n260	13	269	2.4
n260	14	270	3.7
n260	15	271	2.2
n260	16	272	1.1
n260	17	273	2.0
n260	18	274	2.5
n260	19	275	2.2
n260	20	276	1.6

element

ELEMENT MATERIALS TECHNOLOGY
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NEAR-FIELD POWER DENSITY EVALUATION REPORT

Applicant Name
Samsung Electronics Co., Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing
10/06/2024 -10/11/2024
Test Site/Location
Element, Columbia, MD, USA
Document Serial No:
1M2408260067-25.A3L

FCC ID:	**A3LSMS938U**
APPLICANT:	**SAMSUNG ELECTRONICS CO., LTD.**

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SM-S938U, SM-S938U1

Band & Mode	Tx Frequency	Measured psPD	Reported psPD
	MHz	mW/cm²	mW/cm²
n258	24250 - 24450; 24750 - 25250	0.587	0.891
n261	27500 - 28350	0.726	0.891
n260	37000 - 40000	0.673	0.891
Verdict		**PASS**	

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

RJ Ortanez
Executive Vice President

ilac-MRA
ACCREDITED
CERTIFICATE # 2041.01

TABLE OF CONTENTS

1 DEVICE UNDER TEST

1.1 NR FR2 Checklist

NR FR2 Operations Information	
Form Factor	Portable Handset
Subcarrier Spacing (kHz)	120
Total Number of Supported Uplink CCs (SISO)	4
Total Number of Supported Uplink CCs (MIMO)	4
Total Number of Supported DL CCs	8
CP-OFDM Modulations Supported in UL	PI/2 BPSK, QPSK, 16QAM, 64QAM
DFT-s-OFDM Modulations Supported in UL	PI/2 BPSK, QPSK, 16QAM, 64QAM
LTE Anchor Bands	n258: 2/5/12/66/71, n261: 2/5/12/13/48/66, n260: 2/5/12/13/14/30/48/66
NR FR1 Anchor Bands	n258: 2/12/25/41/66/77, n261: 2/5/25/41/48/66/77, n260: 2/5/12/25/30/41/48/66/77
Duplex Type (mmWave)	TDD

NR FR2 Channels & Frequencies							
NR Band	Bandwidth (MHz)	Low		Mid		High	
		Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
n258	100	2018333	24350.04	2025833	24800.04	2032499	25200.00
n258	50	2018333	24350.04	2025833	24800.04	2032915	25224.96
n261	100	2071667	27550.08	2077915	27924.96	2084165	28299.96
n261	50	2071249	27525.00	2077915	27924.96	2084581	28324.92
n260	100	2229999	37050.00	2254165	38499.96	2278331	39949.92
n260	50	2229599	37026.00	2254165	38499.96	2278749	39975.00

1.2 Time-Averaging Algorithm for RF Exposure Compliance

The device is enabled with Qualcomm® Smart Transmit GEN2 feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. Refer to Compliance Summary document for detailed description of Qualcomm® Smart Transmit.

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of *SAR_design_target* or *PD_design_target*, below the predefined time-averaged power limit (i.e., P_{limit} for sub-6 radio and WLAN radio, and *input.power.limit* for 5G mmW NR), for each characterized technology and band (see RF Exposure Part 0 Test Report).

Smart Transmit allows the device to transmit at higher power instantaneously when needed, but manages power limiting to maintain time-averaged transmit power to *input.power.limit*.

The purpose of this report (Part 1 test) is to demonstrate that the EUT meets FCC PD limits when transmitting in static transmission scenario at maximum allowable time-averaged power level given by *input.power.limit.*

1.3 Power Density Design Target and Uncertainty

Power Density Design Specifications	
PD_design_target **(mW/m^2)**	0.724
Design Related Total Uncertainty (dB)	1.4

1.4 Input Power Specifications

All power density measurements for this device were performed at the *input.power.limit* given in below tables. Input power is per antenna element and polarization for each antenna module. When input.power.limit is calculated to be above the maximum input power, the device is limited to the maximum input power.

Table 1-1
5G mmWave NR n258 Antenna M Patch input.power.limit

Band	Beam ID	Paired With	input.power.limit
n258	0		13.7
n258	1		12.8
n258	2		13.3
n258	3		13.1
n258	4		13.0
n258	5		10.5
n258	6		10.3
n258	7		11.0
n258	8		11.9
n258	9		10.9
n258	10		10.7
n258	11		11.0
n258	12		6.1
n258	13		5.4
n258	14		6.8
n258	15		6.5
n258	16		6.0
n258	17		5.8
n258	18		5.9
n258	19		6.8
n258	20		6.4
n258	256		14.9
n258	257		15.6
n258	258		14.6
n258	259		12.8
n258	260		13.9
n258	261		9.8
n258	262		10.4
n258	263		10.2
n258	264		10.5
n258	265		9.7
n258	266		8.8
n258	267		10.5
n258	268		6.5
n258	269		6.6
n258	270		6.8
n258	271		5.6
n258	272		6.6
n258	273		6.7
n258	274		6.5
n258	275		6.4
n258	276		5.5
n258	0	256	9.5
n258	1	257	10.7
n258	2	258	10.7
n258	3	259	10.3
n258	4	260	10.6
n258	5	261	7.9
n258	6	262	6.7
n258	7	263	6.6
n258	8	264	7.9
n258	9	265	7.4
n258	10	266	7.2
n258	11	267	8.2
n258	12	268	3.6
n258	13	269	3.8
n258	14	270	3.8
n258	15	271	2.7
n258	16	272	3.5
n258	17	273	3.9
n258	18	274	4.0
n258	19	275	3.1
n258	20	276	2.9

Table 1-2
5G mmWave NR n261 Antenna M Patch *input.power.limit*

Band	Beam ID	Paired With	input.power.limit
n261	0		12.9
n261	1		12.6
n261	2		12.3
n261	3		13.5
n261	4		13.9
n261	5		10.1
n261	6		8.5
n261	7		9.1
n261	8		10.0
n261	9		8.7
n261	10		9.1
n261	11		9.8
n261	12		6.9
n261	13		6.0
n261	14		4.8
n261	15		5.4
n261	16		7.7
n261	17		6.4
n261	18		5.4
n261	19		5.0
n261	20		6.2
n261	256		14.0
n261	257		15.2
n261	258		16.1
n261	259		15.4
n261	260		15.6
n261	261		11.7
n261	262		11.9
n261	263		13.5
n261	264		11.9
n261	265		11.5
n261	266		11.3
n261	267		11.4
n261	268		6.7
n261	269		8.6
n261	270		8.8
n261	271		9.1
n261	272		8.9
n261	273		7.1
n261	274		8.3
n261	275		9.1
n261	276		8.9
n261	0	256	9.8
n261	1	257	10.2
n261	2	258	9.8
n261	3	259	11.2
n261	4	260	11.0
n261	5	261	7.5
n261	6	262	6.3
n261	7	263	7.1
n261	8	264	7.6
n261	9	265	6.4
n261	10	266	7.2
n261	11	267	7.1
n261	12	268	3.5
n261	13	269	4.2
n261	14	270	2.6
n261	15	271	3.0
n261	16	272	4.5
n261	17	273	3.1
n261	18	274	2.9
n261	19	275	3.4
n261	20	276	3.3

Table 1
5G mmWave NR n260 Antenna M Patch *input.power.limit*

Band	Beam ID	Paired With	input.power.limit
n260	0		12.9
n260	1		13.2
n260	2		11.1
n260	3		11.5
n260	4		13.1
n260	5		8.4
n260	6		11.1
n260	7		9.5
n260	8		9.8
n260	9		8.0
n260	10		10.2
n260	11		8.8
n260	12		5.2
n260	13		6.4
n260	14		6.9
n260	15		5.8
n260	16		5.1
n260	17		4.9
n260	18		6.7
n260	19		6.0
n260	20		4.9
n260	256		12.1
n260	257		12.6
n260	258		11.8
n260	259		10.8
n260	260		12.1
n260	261		9.0
n260	262		8.5
n260	263		8.8
n260	264		8.7
n260	265		7.6
n260	266		9.7
n260	267		8.1
n260	268		5.3
n260	269		5.0
n260	270		6.5
n260	271		5.9
n260	272		5.4
n260	273		5.0
n260	274		5.2
n260	275		5.4
n260	276		5.4
n260	0	256	9.1
n260	1	257	8.9
n260	2	258	8.8
n260	3	259	7.3
n260	4	260	9.0
n260	5	261	6.5
n260	6	262	7.4
n260	7	263	6.5
n260	8	264	5.5
n260	9	265	4.8
n260	10	266	6.4
n260	11	267	4.7
n260	12	268	2.3
n260	13	269	2.4
n260	14	270	3.7
n260	15	271	2.2
n260	16	272	1.1
n260	17	273	2.0
n260	18	274	2.5
n260	19	275	2.2
n260	20	276	1.6

1.5 DUT Antenna Locations

The table below indicates the surfaces evaluated for near field power density (part 1) evaluation. Refer to RF Exposure Part 0 Test Report for justification of these worst-surfaces.

Table 1-3
Device Surfaces

Band	Antenna	Back	Front	Top	Bottom	Right	Left
n258	M	Yes	No	No	No	No	Yes
n261	M	Yes	No	No	No	No	Yes
n260	M	Yes	Yes	No	No	No	Yes

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures. Please see Part 1 SAR Multi-TX and Antenna SAR Considerations Appendix for simultaneous transmission analysis.

1.7 Guidance Applied

- November 2017, October 2018, April 2019, November 2019 TCBC Workshop Notes
- SPEAG DASY6 System Handbook
- IEC/IEEE 63195-1:2022
- FCC KDB 865664 D02 v01r04
- FCC KDB 447498 D01 v02r01

1.8 Bibliography

Table 1-4
Bibliography

Report Type	Report Serial Number
FCC SAR Evaluation Report (Part 1)	1M2408260067-23.A3L
Power Density Part 0 Test Report	
RF Exposure Part 2 Test Report	1M2408260067-24.A3L
RF Exposure Compliance Summary Report	1M2408260067-26.A3L
Power Density Simulation Report	

2 MEASUREMENT SYSTEM

2.1 Measurement Setup

Peak spatially averaged power density (psPD) measurements for mmWave frequencies were performed using the DASY6 with cDASY6 5G module. The DASY6 is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland and consists of a high precision robotics system (Staubli), robot controller, desktop computer, near-field probe, probe alignment sensor, and the 5G phantom. The robot is a six-axis industrial robot, performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF).

2.2 SPEAG EUmmWVx Probe / E-Field 5G Probe

The EUmmWVx probe consists of two dipoles optimally arranged to obtain pseudo-vector information.

Frequency Range	750 MHz – 110 GHz
Dynamic Range	< 20 V/m – 10,000 V/m with PRE-10 (min < 50 V/m – 3,000 V/m)
Position Precision	< 0.2 mm (cDASY6)
Dimensions	Probe Overall Length: 320 mm Probe Body Diameter: 8 mm Probe Tip Length: 23 mm Probe Tip Diameter: Encapsulation 8 mm Distance from Probe Tip to Sensor X Calibration Point: 1.5 mm Distance from Probe Tip to Sensor Y Calibration Point: 1.5 mm
Applications	E-field measurements of 5G devices and other mm-wave transmitters operating above 10 GHz in < 2 mm distance from device (free-space) Power density, H-field and far-field analysis using total field reconstruction
Compatibility	cDASY6 + 5G-Module SW

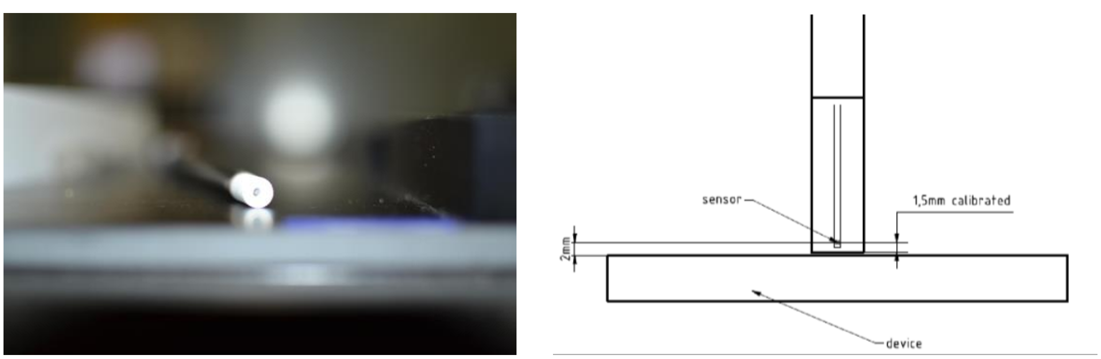

Figure 2-1
EUmmWVx Probe

2.3 Peak Spatially Averaged Power Density Assessment Based on E-field Measurements

Within a short distance from the transmitting source, power density was determined based on both electric and magnetic fields. Generally, the magnitude and phase of two components of either the E-field or H-field were needed on a sufficiently large surface to fully characterize the total E-field and H-field distributions. Nevertheless, solutions based on direct measurement of E-field and H-field can be used to compute power density. The general measurement approach used for this device was:

a) The local E field on the measurement surface was measured at a reference location where the field is well above the noise level. This reference level was used at the end of this procedure to assess output power drift of the DUT during the measurement.

b) The electric field on the measurement surface was scanned. Measurements are conducted according to the instructions provided by the measurement system manufacturer. Measurement spatial resolution can depend on the measured field characteristic and measurement methodology used by the system. The planar scan step size was configured at λ/4.

c) For cDASY6, H-field was calculated from the measured E-field using a reconstruction algorithm. As the power density calculation requires knowledge of both amplitude and phase, reconstruction algorithms can also be used to obtain field information from the measured E-field data (e.g. the phase from the amplitude if only the amplitude is measured). H-field and phase data was reconstructed from repeated measurements (three per measurement point) on two measurement planes separated by λ/4.

d) The total Peak spatially averaged power density (psPD) distribution on the evaluation surface is determined per the below equation. The spatial averaging area, *A*, is specified by the applicable exposure limits or regulatory requirements. A circular shape was used.

$$psPD = \frac{1}{2A_{av}} \iint_{A_{av}} || Re\{E \times H^*\} || \, dA$$

e) The maximum spatial-average on the evaluation surface is the final quantity to determine compliance against applicable limits.

f) The local E field reference value, at the same location as step 2, was re-measured after the scan was complete to calculate the power drift. If the drift deviated by more than 5%, the power density test and drift measurements were repeated.

2.4 Reconstruction Algorithm

Computation of the power density in general requires measurement information from the both E-field and H-field amplitudes and phases in the plane of incidence. Reconstruction of these quantities from pseudo-vector E-field measurements is feasible according to the manufacturer, as they are determined via Maxwell's equations. As such, the SPEAG reconstruction approach was based on the Gerchberg-Saxton algorithm, which benefits from the availability of the E-field polarization ellipse information obtained with the EUmmWVx probe.

3 RF EXPOSURE LIMITS FOR POWER DENSITY

3.1 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.

3.2 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. This 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.

3.3 RF Exposure Limits for Frequencies Above 6 GHz

Per §1.1310 (d)(3), the MPE limits are applied for frequencies above 6 GHz. Power Density is expressed in units of W/m^2 or mW/cm^2.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4 cm^2 per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes.

Table 3-1
Human Exposure Limits Specified in FCC 47 CFR §1.1310

Human Exposure to Radiofrequency (RF) Radiation Limits		
Frequency Range [MHz]	**Power Density** [mW/cm^2]	**Average Time** [Minutes]
(A) Limits For Occupational / Controlled Environments		
1,500 – 100,000	5.0	6
(B) Limits For General Population / Uncontrolled Environments		
1,500 – 100,000	1.0	30

Note: 1.0 mW/cm^2 is 10 W/m^2

4 SYSTEM VERIFICATION

4.1 Test System Verification

The system was verified to be within ±0.66 dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check.

The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes.

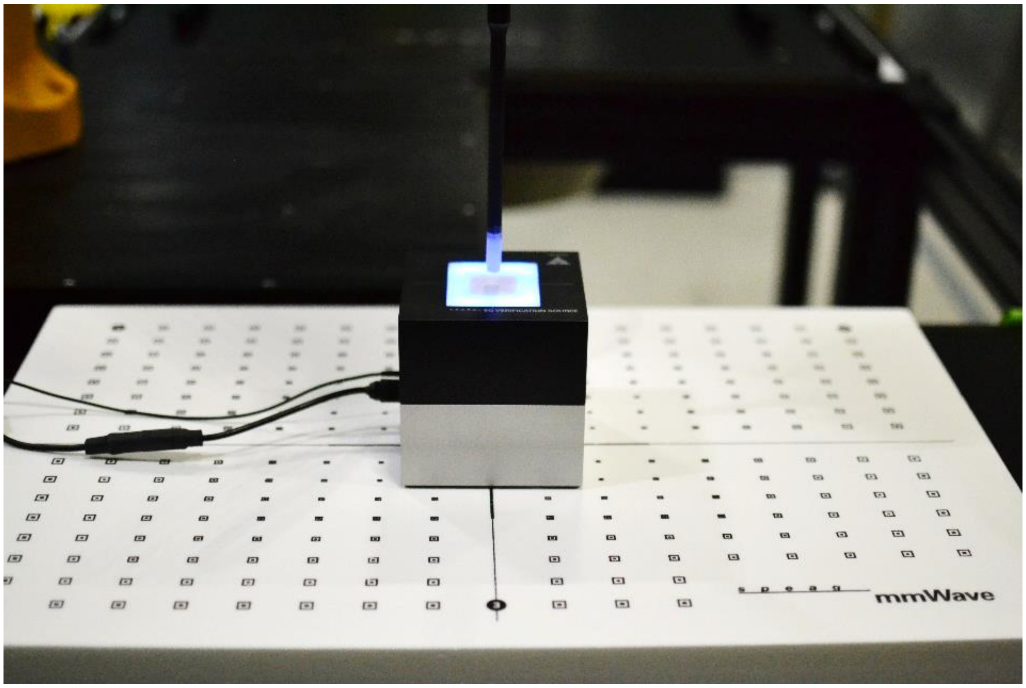

Figure 4-1
System Verification Setup Photo

Table 4-2
30 GHz Verifications

System	Frequency	Date	Source S/N	Probe S/N	Normal psPD (W/m² over 4 cm²)		Deviation (dB)	Total psPD (W/m² over 4 cm²)		Deviation (dB)	Plot #
					Measured	Target		Measured	Target		
Q	30	10/06/2024	1044	9622	38.30	34.00	0.52	38.90	34.00	0.58	B1
Q	30	10/13/2024	1035	9622	34.00	33.80	0.03	34.50	34.30	0.03	B2

Note: A **10 mm distance spacing** was used from the reference horn antenna aperture to the probe element.
This includes 4.45 mm from the reference antenna horn aperture to the surface of the verification source plus 5.55 mm from the surface to the probe. The SPEAG software requires a setting of “5.55 mm” for the correct set up.

5 POWER DENSITY DATA @ INPUT.POWER.LIMIT

5.1 Power Density Results

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 on each worst-surface.

Table 5-1
5G mmWave NR Band n258

MEASUREMENT RESULTS															
Band	Module	Antenna Type	Frequency	Channel	Beam ID 1	Beam ID 2	input.power.limit	Signal Type	DUT S/N	Power Drift	Distance	DUT Surface	Normal psPD	Total psPD	Plot #
			MHz		V	H	dBm			dB	mm		mW/cm²	mW/cm²	
n258	M	Patch	24800.04	Mid	15	-	6.5	CW	1161M	-0.03	2	Back	0.457	0.587	A1
n258	M	Patch	24350.04	Low	-	276	5.5	CW	1161M	0.00	2	Back	0.423	0.564	
n258	M	Patch	24350.04	Low	15	271	2.7	CW	1161M	-0.16	2	Back	0.369	0.419	
n258	M	Patch	24800.04	Mid	13	-	5.4	CW	1161M	-0.05	2	Left	0.415	0.585	
n258	M	Patch	24350.04	Low	-	272	6.6	CW	1161M	-0.17	2	Left	0.223	0.300	
n258	M	Patch	24350.04	Low	16	272	3.5	CW	1161M	-0.06	2	Left	0.240	0.320	
47 CFR §1.1310 - SAFETY LIMIT Spatial Average Uncontrolled Exposure / General Population									Power Density 1 mW/cm² averaged over 4 cm²						

Table 5-2
5G mmWave NR Band n261

MEASUREMENT RESULTS															
Band	Module	Antenna Type	Frequency	Channel	Beam ID 1	Beam ID 2	input.power.limit	Signal Type	DUT S/N	Power Drift	Distance	DUT Surface	Normal psPD	Total psPD	Plot #
			MHz		V	H	dBm			dB	mm		mW/cm²	mW/cm²	
n261	M	Patch	28299.96	High	19		5.0	CW	1222M	-0.03	2	Back	0.320	0.397	
n261	M	Patch	27550.08	Low	-	268	6.7	CW	1222M	0.07	2	Back	0.304	0.409	
n261	M	Patch	27924.96	Mid	15	271	3.0	CW	1222M	0.13	2	Back	0.271	0.375	
n261	M	Patch	28299.96	High	14	-	4.8	CW	1222M	0.09	2	Left	0.470	0.653	
n261	M	Patch	28299.96	High	-	268	6.7	CW	1222M	-0.13	2	Left	0.399	0.726	A2
n261	M	Patch	28299.96	High	14	270	2.6	CW	1222M	-0.07	2	Left	0.304	0.338	
47 CFR §1.1310 - SAFETY LIMIT Spatial Average Uncontrolled Exposure / General Population									Power Density 1 mW/cm² averaged over 4 cm²						

Table 5-3
5G mmWave NR Band n260

MEASUREMENT RESULTS														
Band	Module	Antenna Type	Frequency	Channel	Beam ID 1	Beam ID 2	input.power.limit	Signal Type	DUT S/N	Power Drift	Distance	DUT Surface	Normal psPD	Total psPD	Plot #
			MHz		V	H	dBm			dB	mm		mW/cm²	mW/cm²	
n260	M	Patch	39949.92	High	20	-	4.9	CW	1161M	0.02	2	Back	0.267	0.324	
n260	M	Patch	39949.92	High	20	276	1.6	CW	1161M	0.13	2	Back	0.187	0.222	
n260	M	Patch	37050.00	Low	-	274	5.2	CW	1161M	0.05	2	Front	0.245	0.398	
n260	M	Patch	37050.00	Low	13	269	2.4	CW	1161M	0.07	2	Front	0.253	0.329	
n260	M	Patch	39949.92	High	17	-	4.9	CW	1161M	-0.01	2	Left	0.376	0.522	
n260	M	Patch	38499.96	Mid	-	269	5.0	CW	1161M	0.12	2	Left	0.441	0.673	A3
n260	M	Patch	39949.92	High	16	272	1.1	CW	1161M	0.01	2	Left	0.419	0.665	
47 CFR §1.1310 - SAFETY LIMIT Spatial Average Uncontrolled Exposure / General Population									Power Density 1 mW/cm² averaged over 4 cm²						

5.2 Power Density Test Notes

General Notes:

1. The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
2. Batteries are fully charged at the beginning of the measurements. The DUT was connected to a wall charger for some measurements due to the test duration. It was confirmed that the charger plugged into this DUT did not impact the near-field PD test results.
3. Power density was calculated by repeated E-field measurements on two measurement planes separated by $\lambda/4$.
4. DUT was configured to transmit with a manufacturer provided test software to control specific antenna(s), Beam ID(s), and signal type to ensure the test configurations constant for the entire evaluation.
5. *Input.power.limit* parameter for 5G mmW NR radio was calculated in RF Exposure Part 0 test report.
6. This device is enabled with Qualcomm® Smart Transmit feature to control and manage transmitting power in real time and to ensure that the time-averaged RF exposure from WWAN and WLAN is in compliance with FCC requirements. Per FCC guidance for devices enabled with Qualcomm® Smart Transmit feature, 4G LTE/5G NR FR1, WLAN/BT, and 5G mmW NR FR2 simultaneous transmission scenario does not need to be evaluated under Total Exposure Ratio (TER). The validation of the time-averaging algorithm and compliance under the Tx varying transmission scenario for WWAN and WLAN technologies are reported in Part 2 report.
7. Per FCC guidance for devices enabled with Qualcomm® Smart Transmit feature, simultaneous transmission analysis is evaluated by combining the exposure from each WWAN and WLAN antenna. 5G mmW NR and NFC/UWB simultaneous transmission scenario is evaluated under the SAR Part 1 Multi-TX and Antenna SAR Considerations Appendix.
8. The Beam IDs with one of the highest initial simulated power density for that surface and distance was selected for Part 1 Power Density measurements.
9. The device was configured to transmit CW wave signal for testing. Per FCC guidance for devices enabled with Qualcomm® Smart Transmit feature, additional testing was not required for different modulations (CP-OFDM: QPSK, 16QAM, 64QAM, DFT-s-OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM), RB configurations, component carriers, channel configurations (low channel, mid channel, high channel) since the smart transmit algorithm monitors powers on a per symbol basis, which is independent of these signal characteristics.
10. The device was configured to MIMO configuration with H and V polarization beams transmitting together.

6 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	WL25-1	Conducted Cable Set (25GHz)	N/A	N/A	N/A	WL25-1
-	WL40-1	Conducted Cable Set (40GHz)	N/A	N/A	N/A	WL40-1
Agilent	N9038A	MXE EMI Receiver	N/A	N/A	N/A	MY51210133
EMCO	3160-09	Small Horn (18 - 26.5GHz)	N/A	N/A	N/A	00135427
Emco	3116	Horn Antenna (18 - 40GHz)	N/A	N/A	N/A	9203-2178
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	N/A	N/A	N/A	102133
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	N/A	N/A	N/A	103200
SPEAG	EUmmWV4	EUmmWV4 Probe	02/02/2024	Annual	02/02/2025	9622
SPEAG	SM 003 100 AA	30GHz System Verification Ka- Band Source Antenna	02/07/2024	Annual	02/07/2025	1035
SPEAG	SM 003 100 AA	30GHz System Verification Ka- Band Source Antenna	05/07/2024	Annual	05/07/2025	1044
SPEAG	DAE4ip	Dasy Data Acquisition Electronics	11/15/2023	Annual	11/15/2024	1639
Agilent	N9030A	PXA Signal Analyzer (44GHz)	N/A	N/A	N/A	MY52350166
Emco	3115	Horn Antenna (1-18GHz)	N/A	N/A	N/A	9704-5182
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	N/A	N/A	N/A	MY49430494
Rohde & Schwarz	180-442-KF	Horn (Small)	N/A	N/A	N/A	U157403-01
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	N/A	N/A	N/A	100342
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	N/A	N/A	N/A	102134
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	N/A	N/A	N/A	A051107
Virginia Diodes Inc	SAX252	Spectrum Analyzer Extension Module	N/A	N/A	N/A	SAX252
Virginia Diodes Inc	SAX253	Spectrum Analyzer Extension Module	N/A	N/A	N/A	SAX253
Virginia Diodes Inc	SAX254	Spectrum Analyzer Extension Module	N/A	N/A	N/A	SAX254

Note:
1. Each equipment item was used solely within its respective calibration period.

7 MEASUREMENT UNCERTAINTIES

a	b	c	d	e	f = c x f/e	g
Uncertainty Component	Unc. (± dB)	Prob. Dist.	Div.	c_i	u_i (± dB)	v_i
Measurement System						
Calibration	0.49	N	1	1	0.49	∞
Probe Correction	0.00	R	1.73	1	0.00	∞
Frequency Response	0.20	R	1.73	1	0.12	∞
Sensor Cross Coupling	0.00	R	1.73	1	0.00	∞
Isotropy	0.50	R	1.73	1	0.29	∞
Linearity	0.20	R	1.73	1	0.12	∞
Probe Scattering	0.00	R	1.73	1	0.00	∞
Probe Positioning offset	0.30	R	1.73	1	0.17	∞
Probe Positioning Repeatability	0.04	R	1.73	1	0.02	∞
Sensor MechanicalOffset	0.00	R	1.73	1	0.00	∞
Probe Spatial Resolution	0.00	R	1.73	1	0.00	∞
Field Impedence Dependance	0.00	R	1.73	1	0.00	∞
Amplitude and Phase Drift	0.00	R	1.73	1	0.00	∞
Amplitude and Phase Noise	0.04	R	1.73	1	0.02	∞
Measurement Area Truncation	0.00	R	1.73	1	0.00	∞
Data Acquisition	0.03	N	1	1	0.03	∞
Sampling	0.00	R	1.73	1	0.00	∞
Field Reconstruction	0.60	R	1.73	1	0.35	∞
Forward Transformation	0.00	R	1.73	1	0.00	∞
Power Density Scaling	0.00	R	1.73	1	0.00	∞
Spatial Averaging	0.10	R	1.73	1	0.06	∞
System Detection Limit	0.04	R	1.73	1	0.02	∞
Test Sample Related						
Probe Coupling with DUT	0.00	R	1.73	1	0.00	∞
Modulation Response	0.40	R	1.73	1	0.23	∞
Integration Time	0.00	R	1.73	1	0.00	∞
Response Time	0.00	R	1.73	1	0.00	∞
Device Holder Influence	0.10	R	1.73	1	0.06	∞
DUT alignment	0.00	R	1.73	1	0.00	∞
RF Ambient Conditions	0.04	R	1.73	1	0.02	∞
Ambient Reflections	0.04	R	1.73	1	0.02	∞
Immunity/Secondary Reception	0.00	R	1.73	1	0.00	∞
Drift of DUT	0.21	R	1.73	1	0.12	∞
Combined Standard Uncertainty (k=1)		RSS			0.76	∞
Expanded Uncertainty (95% CONFIDENCE LEVEL)		k=2			1.52	

8 CONCLUSION

8.1 Measurement Conclusion

The power density measurements and total exposure ratio analysis indicate that the DUT complies with the RF radiation exposure limits of the FCC, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the RF Exposure and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

9 REFERENCES

[1] ANSI/IEEE C95.1-1992, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, Sept. 1992.

[2] IEC/IEEE 63195-1:2022, Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz)

[3] IEC TR 62630 : 2010, Guidance for Evaluating Exposure from Multiple Electromagnetic Sources

[4] K. Pokovic, T. Schmid, J. Frohlich, and N. Kuster. Novel Probes and Evaluation Procedures to Assess Field Magnitude and Polarization. IEEE Transactions on Electromagnetic Compatibility 42(2): 240 -244, 2000

[5] R. W. Gerchberg and W. O. Saxton. A Practical Algorithm for the Determination of Phase from Image and Diffraction Plane Pictures. Optik 35(2): 237 – 246, 1972

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[7] FCC KDB 865664 D02 v01r04: SAR Measurement Requirements for 100 MHz to 6 GHz. Federal Communications Commission – Office of Engineering and Technology, Laboratory Division.

[8] FCC KDB 447498 D01 v02r01: RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices. Federal Communications Commission – Office of Engineering and Technology, Laboratory Division.

[9] November 2017 Telecommunications Certification Body Council (TCBC) Workshop Notes

[10] October 2018 Telecommunications Certification Body Council (TCBC) Workshop Notes

[11] April 2019 Telecommunications Certification Body Council (TCBC) Workshop Notes

[12] November 2019 Telecommunications Certification Body Council (TCBC) Workshop Notes

[13] SPEAG DASY6 System Handbook (September 2019)

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PART 0 SAR CHAR REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
09/11/2024 - 10/24/2024
Test Site/Location:
Element, Columbia, MD, USA
Element Morgan Hill, CA, USA
Element, Suwon, Korea
Document Serial No.:
1M2408260067-31.A3L

FCC ID:	**A3LSMS938U**
APPLICANT:	**SAMSUNG ELECTRONICS CO., LTD**

Report Type:	Part 0 SAR Characterization
DUT Type:	Portable Handset
Model(s):	SM-S938U
Additional Model:	SM-S938U1

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Test results reported herein relate only to the item(s) tested.

RJ Ortanez
Executive Vice President

ilac-MRA
ACCREDITED
CERT #2041.01

TABLE OF CONTENTS

1 DEVICE UNDER TEST

1.1 Device Overview

This device uses the Qualcomm® Gen2 Smart Transmit feature to control and manage transmitting power in real time and to ensure the time-averaged RF exposure is in compliance with the FCC requirement at all times for 2G/3G/4G/5G WWAN operations. Additionally, this device supports WLAN/BT/NFC/MST technologies, but the output power of these modems is not controlled by the Smart Transmit algorithm.

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 14	Voice/Data	790.5 - 795.5 MHz
LTE Band 26	Voice/Data	814.7 - 848.3 MHz
LTE Band 5	Voice/Data	824.7 - 848.3 MHz
LTE Band 66	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
LTE Band 48	Voice/Data	3552.5 - 3697.5 MHz
NR Band n71	Voice/Data	665.5 - 695.5 MHz
NR Band n12	Voice/Data	701.5 - 713.5 MHz
NR Band n14	Voice/Data	790.5 - 795.5 MHz
NR Band n26	Voice/Data	816.5 - 846.5 MHz
NR Band n5	Voice/Data	826.5 - 846.5 MHz
NR Band n70	Voice/Data	1697.5 - 1707.5 MHz
NR Band n66	Voice/Data	1712.5 - 1777.5 MHz
NR Band n25	Voice/Data	1852.5 - 1912.5 MHz
NR Band n2	Voice/Data	1852.5 - 1907.5 MHz
NR Band n30	Voice/Data	2307.5 - 2312.5 MHz
NR Band n7	Voice/Data	2502.5 - 2567.5 MHz
NR Band n41	Voice/Data	2501.01 - 2685 MHz
NR Band n38	Voice/Data	2575 - 2615 MHz
NR Band n48	Voice/Data	3555 - 3694.98 MHz
NR Band n78	Voice/Data	3455.01 - 3544.98 MHz; 3705 - 3795 MHz
NR Band n77	Voice/Data	3455.01 - 3544.98 MHz; 3705 - 3975 MHz
NTN Band 255	Data	1629 - 1658 MHz
NR Band n258	Data	24250 - 24450 MHz; 24750 - 25250 MHz
NR Band n260	Data	37000 - 40000 MHz
NR Band n261	Data	27500 - 28350 MHz
2.4 GHz WIFI	Voice/Data	2412 - 2462 MHz
5 GHz WIFI	Voice/Data	U-NII-1: 5180 - 5240 MHz U-NII-2A: 5260 - 5320 MHz U-NII-2C: 5500 - 5720 MHz U-NII-3: 5745 - 5825 MHz U-NII-4: 5845 - 5885 MHz
6 GHz WIFI	Voice/Data	U-NII-5: 5935 - 6415 MHz U-NII-6: 6435 - 6515 MHz U-NII-7: 6535 - 6875 MHz U-NII-8: 6895 - 7115 MHz
2.4 GHz Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
UWB	Data	6489.6 - 7987.2 MHz

1.2 Time-Averaging for SAR and Power Density

This device is enabled with Qualcomm® Gen2 Smart Transmit algorithm to control and manage transmitting power in real time and to ensure that the time-averaged RF exposure from 2G/3G/4G/5G Sub-6 NR WWAN is in compliance with FCC requirements. This Part 0 report shows SAR characterization of WWAN radios for 2G/3G/4G/5G Sub-6 NR. Characterization is achieved by determining P_{Limit} for 2G/3G/4G/5G Sub-6 NR that corresponds to the exposure design targets after accounting for all device design related uncertainties, i.e., SAR_design_target (< FCC SAR limit) for sub-6 radio. The SAR characterization is denoted as SAR Char in this report. Section 1.3 includes a nomenclature of the specific terms used in this report.

The compliance test under the static transmission scenario and simultaneous transmission analysis are reported in Part 1 report. The validation of the time-averaging algorithm and compliance under the dynamic (time- varying) transmission scenario for WWAN technologies are reported in Part 2 report (report SN could be found in Section 1.4 – Bibliography).

1.3 Nomenclature for Part 0 Report

Technology	Term	Description
2G/3G/4G/5G Sub-6 NR	P_{limit}	Power level that corresponds to the exposure design target (*SAR_design_target)* after accounting for all device design related uncertainties
	P_{max}	Maximum tune up output power
	SAR_design_target	Target SAR level < FCC SAR limit after accounting for all device design related uncertainties
	SAR Char	Table containing *Plimit* for all technologies and bands

1.4 Bibliography

Report Type	Report Serial Number
Near Field PD Report (Part 0)	
RF Exposure SAR Evaluation Report (Part 1)	1M2408260067-23.A3L
Near Field PD Report (Part 1)	1M2408260067-25.A3L
RF Exposure Part 2 Test Report	1M2408260067-24.A3L
RF Exposure Compliance Summary	1M2408260067-26.A3L

2 SAR AND POWER DENSITY MEASUREMENTS

2.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 2-1).

Equation 2-1
SAR Mathematical Equation

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho dv}\right)$$

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

σ	=	conductivity of the tissue-simulating material (S/m)
ρ	=	mass density of the tissue-simulating material (kg/m^3)
E	=	Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

2.2 SAR Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

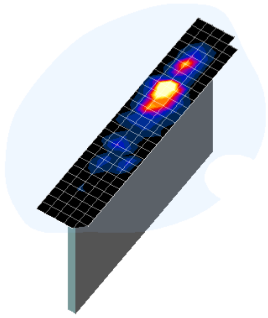

Figure 2-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 2-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 2-1) and IEEE 1528-2013. On the

basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):

a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 2-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).

b. 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. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.

c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

Table 2-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Frequency	Maximum Area Scan Resolution (mm) (Δx_{area}, Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom}, Δy_{zoom})	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{zoom}(n)$	$\Delta z_{zoom}(1)$*	$\Delta z_{zoom}(n>1)$*	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

3 SAR CHARACTERIZATION

3.1 DSI and SAR Determination

This device uses different Device State Index (DSI) to configure different time averaged power levels based on certain exposure scenarios. Depending on the detection scheme implemented in the smartphone, the worst-case SAR was determined by measurements for the relevant exposure conditions for that DSI. Detailed descriptions of the detection mechanisms are included in the operational description.

When 1g SAR and 10g SAR exposure comparison is needed, the worst-case was determined from SAR normalized to 1g or 10g SAR limit.

The device state index (DSI) conditions used in Table 3-1 represent different exposure scenarios.

Table 3-1
DSI and Corresponding Exposure Scenarios

Scenario	Description	SAR Test Cases
Head (DSI = 1)	▪ Device positioned next to head ▪ Receiver Active	*Head SAR per KDB Publication 648474 D04*
Hotspot mode (DSI = 0)	▪ Device transmits in hotspot mode near body ▪ Hotspot Mode Active	*Hotspot SAR per KDB Publication 941225 D06*
Phablet (DSI = 0)	▪ Device is held with hand.	*Phablet SAR per KDB Publication 648474 D04 & KDB Publication 616217 D04*
Body-worn (DSI = 0)	▪ Device being used with a body-worn accessory	*Body-worn SAR per KDB Publication 648474 D04*

3.2 SAR Design Target

SAR_design_target is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer (see Table 3-2).

Table 3-2
***SAR_design_target* Calculations**

SAR_design_target			
$SAR\_design\_target < SAR\_regulatory\_limit \times 10^{\frac{-Total\ Uncertainty}{10}}$			
1g SAR (W/kg)		**10g SAR (W/kg)**	
Total Uncertainty	1.0 dB	*Total Uncertainty*	1.0 dB
SAR_regulatory_limit	1.6 W/kg	*SAR_regulatory_limit*	4.0 W/kg
SAR_design_target	1.0 W/kg	*SAR_design_target*	2.5 W/kg

3.3 SAR Char

SAR test results corresponding to *Pmax* for each antenna/technology/band/DSI can be found in Appendix A.

Plimit is calculated by linearly scaling with the measured SAR at the Ppart0 to correspond to the *SAR_design_target*. When *Plimit* < *Pmax*, *Ppart0* was used as Plimit in the Smart Transmit EFS. When *Plimit* > *Pmax* and *Ppart0*=Pmax, calculated *Plimit* was used in the Smart Transmit EFS. All reported SAR obtained from the Ppart0 SAR tests was less than *SAR_Design_target*+ 1 dB Uncertainty. The final *Plimit* determination for each exposure scenario corresponding to *SAR_design_target* are shown in Table 3-3.

Table 3-3
***PLimit* Determination**

Device State Index (DSI)	***PLimit* Determination Scenarios**
0	The worst-case SAR exposure is determined as maximum SAR normalized to the limit (i.e. lowest P_{limit}) among: 1. Body Worn SAR 2. Extremity SAR measured at 0 mm spacing for back, front, top, bottom, right and left.
1	P_{limit} is calculated based on 1g Head SAR

Notes:

- When P_{max} < P_{limit} EFS, the DUT will operate at a power level up to P_{max}

- All P_{limit} EFS and maximum tune up output power P_{max} levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of TDD, GMSK, or OFDM modulation schemes (e.g. GSM, LTE TDD and WLAN/BT).

- Maximum tune up output power P_{max} is used to configure EUT during RF tune up procedure. The maximum allowed output power is equal to maximum Tune up output power + 1dB device design uncertainty.

- All MIMO P_{max} and P_{limit} are defined per antenna chain.

Measurement Condition: All conducted power and SAR measurements in this report (Part 1 test) were performed by setting Reserve_power_margin (Smart Transmit EFS entry) to 0dB.

Table 3-4
SAR Characterizations

Exposure Scenario			Maximum Tune-Up Output Power*	Body-Worn, Hotspot, or Phablet	Head
Averaging Volume				1g/10g	1g
Spacing				10mm, 0mm	0mm
DSI				0	1
Technology/Band	Antenna	Antenna Group	P_{max}	P_{limit}	P_{limit}
GSM 850	A	AG0	25.3	29.7	31.5
GSM 850	E	AG1	25.3	27.7	20.3
GSM 1900	A	AG0	22.1	18.8	28.8
UMTS 850	A	AG0	24.0	25.9	29.0
UMTS 850	E	AG1	24.0	26.9	20.5
UMTS 1750	A	AG0	23.0	19.0	29.4
UMTS 1900	A	AG0	23.0	18.0	29.0
LTE Band 71	A	AG0	24.0	27.2	28.6
LTE Band 71	E	AG1	24.0	27.0	21.5
LTE Band 12	A	AG0	24.0	27.0	28.5
LTE Band 12	E	AG1	24.0	26.2	21.5
LTE Band 13	A	AG0	24.0	27.0	28.0
LTE Band 13	E	AG1	24.0	25.9	21.5
LTE Band 14	A	AG0	24.0	26.7	28.3
LTE Band 14	E	AG1	24.0	26.2	21.5
LTE Band 26/5	A	AG0	24.0	27.1	29.3
LTE Band 26/5	E	AG1	24.0	26.4	21.0
LTE Band 66/4	A	AG0	23.5	19.0	29.0
LTE Band 66/4	F	AG1	23.5	20.5	18.5
LTE Band 25/2	A	AG0	23.5	18.0	28.5
LTE Band 25/2	F	AG1	23.5	20.0	18.5
LTE Band 30	A	AG0	22.5	19.5	34.2
LTE Band 30	F	AG1	22.0	20.0	17.0
LTE Band 7	B	AG0	23.5	20.0	29.2
LTE Band 7	F	AG1	23.5	19.5	16.0
LTE Band 41/38	B	AG0	22.0	20.0	30.1
LTE Band 41/38	F	AG1	22.0	19.5	16.0
LTE Band 48	F	AG1	20.0	19.5	16.0
NR Band n71	A	AG0	24.0	26.4	29.5
NR Band n71	E	AG1	24.0	27.6	21.5
NR Band n12	A	AG0	24.0	26.2	28.2
NR Band n12	E	AG1	24.0	27.0	21.5
NR Band n14	A	AG0	24.0	26.7	29.3
NR Band n14	E	AG1	24.0	26.9	21.5
NR Band n26/n5	A	AG0	24.0	28.1	30.2
NR Band n26/n5	E	AG1	24.0	27.3	21.0
NR Band n70	A	AG0	23.5	19.0	29.0
NR Band n70	F	AG1	23.5	21.0	18.5
NR Band n66	A	AG0	23.5	19.0	29.2
NR Band n66	F	AG1	23.5	20.5	18.5
NR Band n25/n2	A	AG0	23.5	18.0	29.1
NR Band n25/n2	F	AG1	23.5	20.0	18.5
NR Band n30	A	AG0	22.5	19.5	33.9
NR Band n30	F	AG1	22.0	20.0	17.0
NR Band n7	B	AG0	23.5	20.0	28.2
NR Band n7	F	AG1	23.5	19.5	16.0
NR Band n41 PC2 (Path 1)	F	AG1	26.0	19.5	16.5
NR Band n41 PC2 (Path 1)	B	AG0	23.0	19.5	16.5
NR Band n41 PC2 (Path 1)	E	AG1	23.5	18.0	15.0
NR Band n41 PC2 (Path 1)	D	AG0	22.0	19.5	16.5
NR Band n41 PC2 (Path 2)	B	AG0	26.0	20.0	21.0
NR Band n41 PC2 (Path 2)	F	AG1	21.5	19.5	16.5
NR Band n41 PC2 (Path 2)	D	AG0	25.0	20.0	21.0
NR Band n41 PC2 (Path 2)	E	AG1	20.0	17.5	17.5
NR Band n38 (Path 1)	F	AG1	24.0	19.5	16.5
NR Band n38 (Path 2)	B	AG0	24.0	20.0	21.0
NR Band n48	F	AG1	22.0	19.5	16.0
NR Band n48	C	AG0	16.5	14.5	11.0
NR Band n48	I	AG1	21.0	19.0	15.5
NR Band n48	D	AG0	16.5	14.5	11.0
NR Band n78 PC2	F	AG1	26.0	18.0	16.0
NR Band n78 PC2	C	AG0	21.0	13.5	11.0
NR Band n78 PC2	I	AG1	25.5	18.0	15.5
NR Band n78 PC2	D	AG0	20.0	13.0	10.5
NR Band n77 PC2	F	AG1	26.0	18.0	16.0
NR Band n77 PC2	C	AG0	21.0	13.5	11.0
NR Band n77 PC2	I	AG1	25.5	18.0	15.5
NR Band n77 PC2	D	AG0	20.0	13.0	10.5
2.4 GHz WIFI	H	AG1	19.0	19.5	16.0
2.4 GHz WIFI	J	AG1	19.0	25.4	16.0
2.4 GHz WIFI	MIMO	AG1	19.0	19.4	16.0
5 GHz WIFI	H	AG1	17.0	15.0	15.0
5 GHz WIFI	E	AG1	17.0	15.0	15.0
5 GHz WIFI	MIMO	AG1	17.0	15.0	15.0
6 GHz WIFI	H	AG1	16.0	8.0	18.4
6 GHz WIFI	E	AG1	16.0	8.0	19.3
6 GHz WIFI	MIMO	AG1	16.0	8.0	17.0
2.4 GHz Bluetooth	H	AG1	18.9	21.3	18.9
2.4 GHz Bluetooth	J	AG1	18.4	25.9	20.4
2.4 GHz Bluetooth	MIMO	AG1	16.9	18.7	17.8

4 EQUIPMENT LIST

For SAR measurements

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
Agilent	E4438C	ESG Vector Signal Generator	11/14/2023	Annual	11/14/2024	MY45093852
Agilent	E4438C	ESG Vector Signal Generator	11/15/2023	Annual	11/15/2024	MY45092078
Agilent	N5182A	MXG Vector Signal Generator	10/12/2023	Annual	10/12/2024	MY47400015
Agilent	N5182A	MXG Vector Signal Generator	3/7/2024	Annual	3/7/2025	MY47420603
Agilent	8753ES	S-Parameter Vector Network Analyzer	1/10/2024	Annual	1/10/2025	MY40001472
Agilent	8753ES	S-Parameter Vector Network Analyzer	7/21/2023	Annual	7/21/2024	US39170118
Agilent	E5515C	Wireless Communications Test Set	CBT	N/A	CBT	GB46310798
Agilent	E5515C	Wireless Communications Test Set	CBT	N/A	CBT	US41140256
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433973
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433974
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Anritsu	MN8110B	I/O Adaptor	CBT	N/A	CBT	6261747881
Anritsu	ML2496A	Power Meter	6/24/2024	Annual	6/24/2025	1840005
Anritsu	ML2495A	Power Meter	7/8/2024	Annual	7/8/2025	1039008
Anritsu	MA2411B	Pulse Power Sensor	8/22/2023	Annual	8/22/2024	1726262
Anritsu	MA2411B	Pulse Power Sensor	11/8/2023	Annual	11/8/2024	1027293
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	12/15/2023	Annual	12/15/2024	6200901190
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	5/15/2024	Annual	5/15/2025	6262150047
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	5/30/2024	Annual	5/30/2025	6262044715
Anritsu	MT8000A	Radio Communication Test Station	CBT	N/A	CBT	626196-7072
Anritsu	MT8000A	Radio Communication Test Station	4/10/2024	Annual	4/10/2025	6261987983
Anritsu	MT8000A	Radio Communication Test Station	5/2/2024	Annual	5/2/2025	6272337436
Anritsu	MA24106A	USB Power Sensor	12/4/2023	Annual	12/4/2024	1520501
Anritsu	MA24106A	USB Power Sensor	4/15/2024	Annual	4/15/2025	1827528
Mini-Circuits	PWR-4GHS	USB Power Sensor	6/12/2024	Annual	6/12/2025	12001070013
Control Company	4052	Long Stem Thermometer	2/27/2024	Biennial	2/27/2026	240174346
Control Company	4052	Long Stem Thermometer	2/27/2024	Biennial	2/27/2026	240171096
Control Company	4052	Long Stem Thermometer	2/27/2024	Biennial	2/27/2026	240171059
Control Company	4040	Therm./ Clock/ Humidity Monitor	4/15/2024	Biennial	4/15/2026	240310280
Control Company	4040	Therm./ Clock/ Humidity Monitor	4/15/2024	Biennial	4/15/2026	240310282
Control Company	S66279	Therm./ Clock/ Humidity Monitor	2/16/2024	Biennial	2/16/2026	240140051
Mitutoyo	500-196-30	CD-6"ASX 6Inch Digital Caliper	2/16/2022	Triennial	2/16/2025	A20238413
Keysight Technologies	N9020A	MXA Signal Analyzer	4/11/2024	Annual	4/11/2025	MY54500644
Agilent	N9020A	MXA Signal Analyzer	6/14/2024	Annual	6/14/2025	MY56470202
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	7/5/2023	Annual	7/5/2024	31634
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	ZUDC10-83-S+	Directional Coupler	CBT	N/A	CBT	2050
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Seekonk	NC-100	Torque Wrench	CBT	N/A	CBT	22217
Seekonk	NC-100	Torque Wrench	4/2/2024	Biennial	4/2/2026	1262
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	1/11/2024	Annual	1/11/2025	150117
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	1/10/2024	Annual	1/10/2025	131454
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	8/10/2023	Annual	8/10/2024	140144
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	8/9/2023	Annual	8/9/2024	162125
SPEAG	DAK-3.5	Dielectric Assessment Kit	11/13/2023	Annual	11/13/2024	1277
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/14/2023	Annual	8/14/2024	1041
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1331
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1390
SPEAG	DAK-12	Dielectric Assessment Kit (4MHz - 3GHz)	3/11/2024	Annual	3/11/2025	1102
SPEAG	CLA-13	Confined Loop Antenna	11/9/2023	Annual	11/9/2024	1004
SPEAG	D750V3	750 MHz SAR Dipole	10/19/2021	Triennial	10/19/2024	1161
SPEAG	D750V3	750 MHz SAR Dipole	3/14/2022	Triennial	3/14/2025	1054
SPEAG	D750V3	750 MHz SAR Dipole	9/13/2023	Biennial	9/13/2025	1097
SPEAG	D835V2	835 MHz SAR Dipole	11/18/2022	Biennial	11/18/2024	4d108
SPEAG	D835V2	835 MHz SAR Dipole	5/16/2022	Triennial	5/16/2025	4d040
SPEAG	D835V2	835 MHz SAR Dipole	4/8/2024	Annual	4/8/2025	4d119
SPEAG	D835V2	835 MHz SAR Dipole	3/14/2022	Triennial	3/14/2025	4d047
SPEAG	D1640V2	1640 MHz SAR Dipole	12/13/2022	Biennial	12/13/2024	321
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2021	Triennial	10/22/2024	1150
SPEAG	D1750V2	1750 MHz SAR Dipole	4/15/2024	Annual	4/15/2025	1051
SPEAG	D1900V2	1900 MHz SAR Dipole	8/8/2022	Triennial	8/8/2025	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2022	Triennial	2/21/2025	5d148
SPEAG	D1900V2	1900 MHz SAR Dipole	4/12/2024	Annual	4/12/2025	5d141
SPEAG	D1900V2	1900 MHz SAR Dipole	5/10/2024	Annual	5/10/2025	5d026
SPEAG	D2300V2	2300 MHz SAR Dipole	11/14/2023	Annual	11/14/2024	1064
SPEAG	D2300V2	2300 MHz SAR Dipole	3/11/2024	Annual	3/11/2025	1038
SPEAG	D2450V2	2450 MHz SAR Dipole	2/8/2024	Annual	2/8/2025	882
SPEAG	D2450V2	2450 MHz SAR Dipole	5/10/2024	Annual	5/10/2025	945
SPEAG	D2450V2	2450 MHz SAR Dipole	5/11/2022	Triennial	5/11/2025	750
SPEAG	D2450V2	2450 MHz SAR Dipole	11/15/2022	Biennial	11/15/2024	855
SPEAG	D2600V2	2600 MHz SAR Dipole	5/11/2022	Triennial	5/11/2025	1042
SPEAG	D2600V2	2600 MHz SAR Dipole	11/15/2022	Biennial	11/15/2024	1068
SPEAG	D2600V2	2600 MHz SAR Dipole	9/12/2023	Biennial	9/12/2025	1069
SPEAG	D2600V2	2600 MHz SAR Dipole	6/14/2024	Annual	6/14/2025	1009
SPEAG	D3500V2	3500 MHz SAR Dipole	12/13/2023	Annual	12/13/2024	1068
SPEAG	D3500V2	3500 MHz SAR Dipole	1/10/2023	Biennial	1/10/2025	1097
SPEAG	D3700V2	3700 MHz SAR Dipole	12/13/2023	Annual	12/13/2024	1029
SPEAG	D3700V2	3700 MHz SAR Dipole	1/13/2023	Biennial	1/13/2025	1067
SPEAG	D3900V2	3900 MHz SAR Dipole	10/19/2023	Annual	10/19/2024	1056
SPEAG	D3900V2	3900 MHz SAR Dipole	6/10/2024	Annual	6/10/2025	1073
SPEAG	D5GHzV2	5 GHz SAR Dipole	4/9/2024	Annual	4/9/2025	1237
SPEAG	D6.5GHzV2	6.5 GHz SAR Dipole	10/11/2023	Annual	10/11/2024	1019
SPEAG	D8GHzV2	8GHz SAR Dipole	3/4/2024	Annual	3/4/2025	1007
SPEAG	5G Verification Source 10GHz	10GHz System Verification Antenna	3/5/2024	Annual	3/5/2025	1002
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2024	Annual	1/16/2025	1582
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/8/2024	Annual	7/8/2025	1677
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/9/2024	Annual	4/9/2025	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/8/2024	Annual	5/8/2025	701
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/8/2024	Annual	5/8/2025	1678
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/10/2024	Annual	9/10/2025	1449
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/10/2024	Annual	9/10/2025	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2024	Annual	1/16/2025	1466
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/8/2024	Annual	8/8/2025	1532
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/11/2024	Annual	6/11/2025	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/8/2024	Annual	7/8/2025	1583
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/18/2024	Annual	4/18/2025	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2024	Annual	2/9/2025	467
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/8/2024	Annual	5/8/2025	1683
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/9/2024	Annual	4/9/2025	1652
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2024	Annual	2/9/2025	1645
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/8/2024	Annual	5/8/2025	1502
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/4/2024	Annual	9/4/2025	1682
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/6/2024	Annual	3/6/2025	604
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/6/2024	Annual	3/6/2025	534
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/12/2024	Annual	3/12/2025	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2024	Annual	1/16/2025	1530
SPEAG	EX3DV4	SAR Probe	4/16/2024	Annual	4/16/2025	7357
SPEAG	EX3DV4	SAR Probe	7/18/2024	Annual	7/18/2025	7406
SPEAG	EX3DV4	SAR Probe	9/11/2024	Annual	9/11/2025	7558
SPEAG	EX3DV4	SAR Probe	5/13/2024	Annual	5/13/2025	7416
SPEAG	EX3DV4	SAR Probe	1/16/2024	Annual	1/16/2025	7565
SPEAG	EX3DV4	SAR Probe	9/2/2024	Annual	9/2/2025	7491
SPEAG	EX3DV4	SAR Probe	3/8/2024	Annual	3/8/2025	7488
SPEAG	EX3DV4	SAR Probe	6/17/2024	Annual	6/17/2025	7409
SPEAG	EX3DV4	SAR Probe	5/8/2024	Annual	5/8/2025	7660
SPEAG	EX3DV4	SAR Probe	6/28/2024	Annual	6/28/2025	7803
SPEAG	EX3DV4	SAR Probe	2/9/2024	Annual	2/9/2025	7427
SPEAG	EX3DV4	SAR Probe	4/17/2024	Annual	4/17/2025	7659
SPEAG	EX3DV4	SAR Probe	5/13/2024	Annual	5/13/2025	7682
SPEAG	EX3DV4	SAR Probe	4/17/2024	Annual	4/17/2025	7637
SPEAG	EX3DV4	SAR Probe	2/9/2024	Annual	2/9/2025	7640
SPEAG	EX3DV4	SAR Probe	5/10/2024	Annual	5/10/2025	7402
SPEAG	EX3DV4	SAR Probe	9/9/2024	Annual	9/9/2025	3949
SPEAG	EX3DV4	SAR Probe	3/11/2024	Annual	3/11/2025	7421
SPEAG	EX3DV4	SAR Probe	3/8/2024	Annual	3/8/2025	7527
SPEAG	EX3DV4	SAR Probe	2/9/2024	Annual	2/9/2025	7308
SPEAG	EX3DV4	SAR Probe	1/15/2024	Annual	1/15/2025	7570
SPEAG	EUmmWV4	EUmmWV4 Probe	2/2/2024	Annual	2/2/2025	9622
SPEAG	EUmmWV4	EUmmWV4 Probe	3/4/2024	Annual	3/4/2025	9421

Note:

1. CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.
2. Each equipment item was used solely within its respective calibration period.

5 MEASUREMENT UNCERTAINTIES

For SAR Measurements

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	IEEE 1528 Sec.	Tol. (± %)	Prob. Dist.	Div.	c_i 1gm	c_i 10 gms	1gm u_i (± %)	10gms u_i (± %)	v_i
Measurement System									
Probe Calibration	E.2.1	7	N	1	1	1	7.0	7.0	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	E.2.3	2	R	1.732	1	1	1.2	1.2	∞
Linearity	E.2.4	0.3	N	1	1	1	0.3	0.3	∞
System Detection Limits	E.2.4	0.25	R	1.732	1	1	0.1	0.1	∞
Modulation Response	E.2.5	4.8	R	1.732	1	1	2.8	2.8	∞
Readout Electronics	E.2.6	0.3	N	1	1	1	0.3	0.3	∞
Response Time	E.2.7	0.8	R	1.732	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.732	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.8	R	1.732	1	1	0.5	0.5	∞
Probe Positioning w/ respect to Phantom	E.6.3	6.7	R	1.732	1	1	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	4	R	1.732	1	1	2.3	2.3	∞
Test Sample Related									
Test Sample Positioning	E.4.2	3.12	N	1	1	1	3.1	3.1	35
Device Holder Uncertainty	E.4.1	1.67	N	1	1	1	1.7	1.7	5
Output Power Variation - SAR drift measurement	E.2.9	5	R	1.732	1	1	2.9	2.9	∞
SAR Scaling	E.6.5	0	R	1.732	1	1	0.0	0.0	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	E.3.3	4.3	N	1	0.78	0.71	3.3	3.0	76
Liquid Permittivity - measurement uncertainty	E.3.3	4.2	N	1	0.23	0.26	1.0	1.1	75
Liquid Conductivity - Temperature Uncertainty	E.3.4	3.4	R	1.732	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Unceritainty	E.3.4	0.6	R	1.732	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)			RSS				12.2	12.0	191
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.4	24.0	

The above measurement uncertainties are according to IEEE Std. 1528-2013

Applicable for SAR measurements > 6GHz:

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	IEEE 1528 Sec.	Tol. (± %)	Prob. Dist.	Div.	c_i 1gm	c_i 10 gms	1gm u_i (± %)	10gms u_i (± %)	v_i
Measurement System									
Probe Calibration	E.2.1	9.3	N	1	1	1	9.3	9.3	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	E.2.3	2	R	1.73	1	1	1.2	1.2	∞
Linearity	E.2.4	0.3	N	1	1	1	0.3	0.3	∞
System Detection Limits	E.2.4	0.25	R	1.73	1	1	0.1	0.1	∞
Modulation Response	E.2.5	4.8	R	1.73	1	1	2.8	2.8	∞
Readout Electronics	E.2.6	0.3	N	1	1	1	0.3	0.3	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	E.6.1	3	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	3	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.8	R	1.73	1	1	0.5	0.5	∞
Probe Positioning w/ respect to Phantom	E.6.3	6.7	R	1.73	1	1	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	4	R	1.73	1	1	2.3	2.3	∞
Test Sample Related									
Test Sample Positioning	E.4.2	3.12	N	1	1	1	3.1	3.1	35
Device Holder Uncertainty	E.4.1	1.67	N	1	1	1	1.7	1.7	5
Output Power Variation - SAR drift measurement	E.2.9	5	R	1.73	1	1	2.9	2.9	∞
SAR Scaling	E.6.5	0	R	1.73	1	1	0.0	0.0	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	E.3.3	4.3	N	1	0.78	0.71	3.3	3.0	76
Liquid Permittivity - measurement uncertainty	E.3.3	4.2	N	1	0.23	0.26	1.0	1.1	75
Liquid Conductivity - Temperature Uncertainty	E.3.4	3.4	R	1.73	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Unceritainty	E.3.4	0.6	R	1.73	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)			RSS				13.8	13.6	191
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				27.6	27.1	

The above measurement uncertainties are according to IEEE Std. 1528-2013

APPENDIX A: SAR TEST RESULTS FOR P_{LIMIT} CALCULATIONS

For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.
See RF Exposure SAR Evaluation Report (Part 1) section 12 for 5/6 GHz WLAN SAR data.

Table A-1
DSI = 0 P_{Limit} Calculations – GPRS 850 Phablet SAR

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	GPRS 850	GPRS 3 Tx Slots	A	0015M	1:2.76	-0.05	836.60	190	29.77	Back	0	0.562	31.8	30.2	29.7
Phablet	GPRS 850	GPRS 3 Tx Slots	A	0015M	1:2.76	0.04	836.60	190	29.77	Front	0	0.539	32.0		
Phablet	GPRS 850	GPRS 3 Tx Slots	A	0015M	1:2.76	-0.03	836.60	190	29.77	Bottom	0	0.620	31.3		
Phablet	GPRS 850	GPRS 3 Tx Slots	A	0015M	1:2.76	-0.02	836.60	190	29.77	Right	0	0.812	30.2		
Phablet	GPRS 850	GPRS 3 Tx Slots	A	0015M	1:2.76	-0.01	836.60	190	29.77	Left	0	0.078	40.3		
Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	GPRS 850	GPRS 3 Tx Slots	E	0015M	1:2.76	-0.08	836.60	190	29.77	Back	0	0.853	30.0	27.7	27.7
Phablet	GPRS 850	GPRS 3 Tx Slots	E	0015M	1:2.76	-0.01	836.60	190	29.77	Front	0	1.430	27.7		
Phablet	GPRS 850	GPRS 3 Tx Slots	E	0015M	1:2.76	0.06	836.60	190	29.77	Top	0	0.708	30.8		
Phablet	GPRS 850	GPRS 3 Tx Slots	E	0015M	1:2.76	-0.04	836.60	190	29.77	Right	0	1.090	28.9		

Table A-2
DSI = 0 P_{Limit} Calculations – GPRS 1900 Phablet SAR

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	GPRS 1900	GPRS 4 Tx Slots	A	0015M	1:2.076	-0.06	1850.20	512	21.75	Back	0	0.865	23.1	23.1	18.8
Phablet	GPRS 1900	GPRS 4 Tx Slots	A	0015M	1:2.076	0.09	1850.20	512	21.75	Front	0	0.806	23.4		
Phablet	GPRS 1900	GPRS 4 Tx Slots	A	0015M	1:2.076	-0.01	1850.20	512	21.75	Bottom	0	0.433	26.1		
Phablet	GPRS 1900	GPRS 4 Tx Slots	A	0015M	1:2.076	-0.10	1850.20	512	21.75	Right	0	0.085	33.2		
Phablet	GPRS 1900	GPRS 4 Tx Slots	A	0015M	1:2.076	-0.01	1850.20	512	21.75	Left	0	0.081	33.4		
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Phablet 4.0 W/kg (mW/g) averaged over 10 grams					

Table A-3
DSI = 0 P_{Limit} Calculations – UMTS 850 Phablet SAR

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	UMTS 850	RMC	A	0015M	1:1	0.03	836.60	4183	23.79	Back	0	0.806	28.7	25.9	25.9
Phablet	UMTS 850	RMC	A	0015M	1:1	0.02	836.60	4183	23.79	Front	0	0.939	28.0		
Phablet	UMTS 850	RMC	A	0015M	1:1	0.02	836.60	4183	23.79	Bottom	0	1.130	27.2		
Phablet	UMTS 850	RMC	A	0015M	1:1	-0.01	836.60	4183	23.79	Right	0	1.520	25.9		
Phablet	UMTS 850	RMC	A	0015M	1:1	-0.01	836.60	4183	23.79	Left	0	0.104	37.5		
Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	UMTS 850	RMC	E	0015M	1:1	-0.14	836.60	4183	24.32	Back	0	1.010	28.2	26.9	26.9
Phablet	UMTS 850	RMC	E	0015M	1:1	0.02	836.60	4183	24.32	Front	0	1.370	26.9		
Phablet	UMTS 850	RMC	E	0015M	1:1	-0.12	836.60	4183	24.32	Top	0	0.704	29.8		
Phablet	UMTS 850	RMC	E	0015M	1:1	-0.04	836.60	4183	24.32	Right	0	1.320	27.0		

Table A-4
DSI = 0 P_{Limit} Calculations – UMTS 1750 Phablet SAR

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	UMTS 1750	RMC	A	0015M	1:1	-0.01	1752.60	1513	19.69	Back	0	1.560	21.7	21.7	19.0
Phablet	UMTS 1750	RMC	A	0015M	1:1	0.04	1752.60	1513	19.69	Front	0	1.410	22.1		
Phablet	UMTS 1750	RMC	A	0015M	1:1	0.03	1752.60	1513	19.69	Bottom	0	1.560	21.7		
Phablet	UMTS 1750	RMC	A	0015M	1:1	-0.01	1752.60	1513	19.69	Right	0	0.186	30.9		
Phablet	UMTS 1750	RMC	A	0015M	1:1	0.01	1752.60	1513	19.69	Left	0	0.118	32.9		

Table A-5
DSI = 0 P_{Limit} Calculations – UMTS 1900 Phablet SAR

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	UMTS 1900	RMC	A	0015M	1:1	0.02	1907.60	9538	18.52	Back	0	1.180	21.7	21.5	18.0
Phablet	UMTS 1900	RMC	A	0015M	1:1	0.03	1907.60	9538	18.52	Front	0	1.030	22.3		
Phablet	UMTS 1900	RMC	A	0015M	1:1	-0.01	1907.60	9538	18.52	Bottom	0	1.240	21.5		
Phablet	UMTS 1900	RMC	A	0015M	1:1	0.05	1907.60	9538	18.52	Right	0	0.111	32.0		
Phablet	UMTS 1900	RMC	A	0015M	1:1	0.00	1907.60	9538	18.52	Left	0	0.090	32.9		

Table A-6
DSI = 0 P_{Limit} Calculations – LTE Band 71 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 71	20	QPSK	A	0058M	1:1	-0.02	680.50	133297	0.0	24.08	1	50	Back	0	0.925	28.3	27.2	27.2
Phablet	LTE Band 71	20	QPSK	A	0058M	1:1	0.05	680.50	133297	0.0	24.08	1	50	Front	0	0.896	28.5		
Phablet	LTE Band 71	20	QPSK	A	0058M	1:1	-0.05	680.50	133297	0.0	24.08	1	50	Bottom	0	0.524	30.8		
Phablet	LTE Band 71	20	QPSK	A	0058M	1:1	-0.04	680.50	133297	0.0	24.08	1	50	Right	0	1.200	27.2		
Phablet	LTE Band 71	20	QPSK	A	0058M	1:1	-0.04	680.50	133297	0.0	24.08	1	50	Left	0	0.089	38.5		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 71	20	QPSK	E	0058M	1:1	-0.05	680.50	133297	0.0	24.49	1	0	Back	0	0.854	29.1	27.2	27.0
Phablet	LTE Band 71	20	QPSK	E	0058M	1:1	-0.05	680.50	133297	0.0	24.49	1	0	Front	0	1.300	27.3		
Phablet	LTE Band 71	20	QPSK	E	0058M	1:1	0.07	680.50	133297	0.0	24.49	1	0	Top	0	1.250	27.5		
Phablet	LTE Band 71	20	QPSK	E	0058M	1:1	-0.04	680.50	133297	0.0	24.49	1	0	Right	0	1.310	27.2		

Table A-7
DSI = 0 P_{Limit} Calculations – LTE Band 12 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 12	10	QPSK	A	0058M	1:1	0.01	707.50	23095	0.0	24.01	1	25	Back	0	0.988	28.0	27.0	27.0
Phablet	LTE Band 12	10	QPSK	A	0058M	1:1	0.01	707.50	23095	0.0	24.01	1	25	Front	0	0.850	28.6		
Phablet	LTE Band 12	10	QPSK	A	0058M	1:1	0.04	707.50	23095	0.0	24.01	1	25	Bottom	0	0.618	30.0		
Phablet	LTE Band 12	10	QPSK	A	0058M	1:1	-0.02	707.50	23095	0.0	24.01	1	25	Right	0	1.250	27.0		
Phablet	LTE Band 12	10	QPSK	A	0058M	1:1	0.00	707.50	23095	0.0	24.01	1	25	Left	0	0.100	37.9		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 12	10	QPSK	E	0058M	1:1	-0.01	707.50	23095	0.0	24.06	1	49	Back	0	0.978	28.1	26.2	26.2
Phablet	LTE Band 12	10	QPSK	E	0058M	1:1	0.00	707.50	23095	0.0	24.06	1	49	Front	0	1.230	27.1		
Phablet	LTE Band 12	10	QPSK	E	0058M	1:1	0.09	707.50	23095	0.0	24.06	1	49	Top	0	1.380	26.6		
Phablet	LTE Band 12	10	QPSK	E	0058M	1:1	-0.02	707.50	23095	0.0	24.06	1	49	Right	0	1.510	26.2		

Table A-8
DSI = 0 P_{Limit} Calculations – LTE Band 13 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 13	10	QPSK	A	0058M	1:1	-0.03	782.00	23230	0.0	23.85	1	0	Back	0	0.977	27.9	27.7	27.0
Phablet	LTE Band 13	10	QPSK	A	0058M	1:1	-0.06	782.00	23230	0.0	23.85	1	0	Front	0	0.731	29.1		
Phablet	LTE Band 13	10	QPSK	A	0058M	1:1	-0.04	782.00	23230	0.0	23.85	1	0	Bottom	0	0.790	28.8		
Phablet	LTE Band 13	10	QPSK	A	0058M	1:1	0.03	782.00	23230	0.0	23.85	1	0	Right	0	1.010	27.7		
Phablet	LTE Band 13	10	QPSK	A	0058M	1:1	-0.05	782.00	23230	0.0	23.85	1	0	Left	0	0.142	36.3		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 13	10	QPSK	E	0058M	1:1	0.02	782.00	23230	0.0	23.94	1	49	Back	0	1.100	27.5	26.7	25.9
Phablet	LTE Band 13	10	QPSK	E	0058M	1:1	-0.02	782.00	23230	0.0	23.94	1	49	Front	0	1.030	27.7		
Phablet	LTE Band 13	10	QPSK	E	0058M	1:1	-0.09	782.00	23230	0.0	23.94	1	49	Top	0	1.310	26.7		
Phablet	LTE Band 13	10	QPSK	E	0058M	1:1	0.00	782.00	23230	0.0	23.94	1	49	Right	0	1.110	27.4		

Table A-9
DSI = 0 P_{Limit} Calculations – LTE Band 14 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 14	10	QPSK	A	0058M	1:1	0.04	793.00	23330	0.0	23.83	1	25	Back	0	1.040	27.6	27.6	26.7
Phablet	LTE Band 14	10	QPSK	A	0058M	1:1	-0.06	793.00	23330	0.0	23.83	1	25	Front	0	0.775	28.9		
Phablet	LTE Band 14	10	QPSK	A	0058M	1:1	-0.01	793.00	23330	0.0	23.83	1	25	Bottom	0	0.828	28.6		
Phablet	LTE Band 14	10	QPSK	A	0058M	1:1	0.08	793.00	23330	0.0	23.83	1	25	Right	0	0.893	28.3		
Phablet	LTE Band 14	10	QPSK	A	0058M	1:1	-0.02	793.00	23330	0.0	23.83	1	25	Left	0	0.135	36.5		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 14	10	QPSK	E	0058M	1:1	-0.01	793.00	23330	0.0	23.97	1	25	Back	0	1.080	27.6	27.2	26.2
Phablet	LTE Band 14	10	QPSK	E	0058M	1:1	-0.02	793.00	23330	0.0	23.97	1	25	Front	0	0.960	28.1		
Phablet	LTE Band 14	10	QPSK	E	0058M	1:1	0.03	793.00	23330	0.0	23.97	1	25	Top	0	1.170	27.2		
Phablet	LTE Band 14	10	QPSK	E	0058M	1:1	0.01	793.00	23330	0.0	23.97	1	25	Right	0	1.030	27.8		

Table A-10
DSI = 0 P_{Limit} Calculations – LTE Band 26 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 26	15	QPSK	A	0058M	1:1	0.01	831.50	26865	0.0	24.46	1	36	Back	0	0.993	28.4	27.1	27.1
Phablet	LTE Band 26	15	QPSK	A	0058M	1:1	-0.11	831.50	26865	0.0	24.46	1	36	Front	0	0.790	29.4		
Phablet	LTE Band 26	15	QPSK	A	0058M	1:1	0.02	831.50	26865	0.0	24.46	1	36	Bottom	0	0.841	29.1		
Phablet	LTE Band 26	15	QPSK	A	0058M	1:1	-0.04	831.50	26865	0.0	24.46	1	36	Right	0	1.360	27.1		
Phablet	LTE Band 26	15	QPSK	A	0058M	1:1	-0.09	831.50	26865	0.0	24.46	1	36	Left	0	0.097	38.5		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 26	15	QPSK	E	0058M	1:1	-0.06	831.50	26865	0.0	24.60	1	36	Back	0	1.250	27.6	26.9	26.4
Phablet	LTE Band 26	15	QPSK	E	0058M	1:1	-0.05	831.50	26865	0.0	24.60	1	36	Front	0	1.450	26.9		
Phablet	LTE Band 26	15	QPSK	E	0058M	1:1	0.02	831.50	26865	0.0	24.60	1	36	Top	0	1.140	28.0		
Phablet	LTE Band 26	15	QPSK	E	0058M	1:1	-0.01	831.50	26865	0.0	24.60	1	36	Right	0	1.420	27.0		

Table A-11
DSI = 0 P_{Limit} Calculations – LTE Band 66 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 66	20	QPSK	A	0068M	1:1	0.01	1770.00	132572	0.0	19.10	1	0	Back	0	0.860	23.7	21.6	19.0
Phablet	LTE Band 66	20	QPSK	A	0068M	1:1	0.01	1770.00	132572	0.0	19.10	1	0	Front	0	0.944	23.3		
Phablet	LTE Band 66	20	QPSK	A	0068M	1:1	0.00	1770.00	132572	0.0	19.10	1	0	Bottom	0	1.390	21.6		
Phablet	LTE Band 66	20	QPSK	A	0068M	1:1	-0.07	1770.00	132572	0.0	19.10	1	0	Right	0	0.116	32.4		
Phablet	LTE Band 66	20	QPSK	A	0068M	1:1	0.06	1770.00	132572	0.0	19.10	1	0	Left	0	0.068	34.7		
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Phablet 4.0 W/kg (mW/g) averaged over 10 grams					
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 66	20	QPSK	F	0087M	1:1	-0.13	1770.00	132572	0.0	21.09	1	50	Back	0	0.833	25.8	22.9	21.0
Phablet	LTE Band 66	20	QPSK	F	0087M	1:1	0.01	1770.00	132572	0.0	21.09	1	50	Front	0	1.030	24.9		
Phablet	LTE Band 66	20	QPSK	F	0087M	1:1	0.01	1770.00	132572	0.0	21.09	1	50	Top	0	1.640	22.9		
Phablet	LTE Band 66	20	QPSK	F	0087M	1:1	-0.07	1770.00	132572	0.0	21.09	1	50	Left	0	0.349	29.6		

Table A-12
DSI = 0 P_{Limit} Calculations – LTE Band 25 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 25	20	QPSK	A	0068M	1:1	0.02	1860.00	26140	0.0	17.85	1	50	Back	0	0.707	23.3	20.7	18.0
Phablet	LTE Band 25	20	QPSK	A	0068M	1:1	0.01	1860.00	26140	0.0	17.85	1	50	Front	0	0.842	22.5		
Phablet	LTE Band 25	20	QPSK	A	0068M	1:1	0.09	1860.00	26140	0.0	17.85	1	50	Bottom	0	1.290	20.7		
Phablet	LTE Band 25	20	QPSK	A	0068M	1:1	0.05	1860.00	26140	0.0	17.85	1	50	Right	0	0.081	32.7		
Phablet	LTE Band 25	20	QPSK	A	0068M	1:1	0.02	1860.00	26140	0.0	17.85	1	50	Left	0	0.068	33.5		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 25	20	QPSK	F	0087M	1:1	-0.11	1882.50	26365	0.0	20.19	50	50	Back	0	0.794	25.1	22.2	20.0
Phablet	LTE Band 25	20	QPSK	F	0087M	1:1	0.01	1882.50	26365	0.0	20.19	50	50	Front	0	0.986	24.2		
Phablet	LTE Band 25	20	QPSK	F	0087M	1:1	0.02	1882.50	26365	0.0	20.19	50	50	Top	0	1.550	22.2		
Phablet	LTE Band 25	20	QPSK	F	0087M	1:1	-0.12	1882.50	26365	0.0	20.19	50	50	Left	0	0.130	33.0		

Table A-13
DSI = 0 P_{Limit} Calculations – LTE Band 30 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 30	10	QPSK	A	0055M	1:1	-0.02	2310.00	27710	0.0	19.84	25	0	Back	0	1.260	22.8	22.8	19.5
Phablet	LTE Band 30	10	QPSK	A	0055M	1:1	0.01	2310.00	27710	0.0	19.84	25	0	Front	0	0.671	25.5		
Phablet	LTE Band 30	10	QPSK	A	0055M	1:1	-0.04	2310.00	27710	0.0	19.84	25	0	Bottom	0	0.953	24.0		
Phablet	LTE Band 30	10	QPSK	A	0055M	1:1	-0.01	2310.00	27710	0.0	19.84	25	0	Right	0	0.226	30.2		
Phablet	LTE Band 30	10	QPSK	A	0055M	1:1	0.03	2310.00	27710	0.0	19.84	25	0	Left	0	0.140	32.3		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 30	10	QPSK	F	0055M	1:1	0.02	2310.00	27710	0.0	19.46	1	0	Back	0	0.851	24.1	19.5	20.0
Phablet	LTE Band 30	10	QPSK	F	0055M	1:1	0.01	2310.00	27710	0.0	19.46	1	0	Front	0	1.160	22.7		
Phablet	LTE Band 30	10	QPSK	F	0055M	1:1	-0.10	2310.00	27710	0.0	19.46	1	0	Top	0	2.440	19.5		
Phablet	LTE Band 30	10	QPSK	F	0055M	1:1	-0.15	2310.00	27710	0.0	19.46	1	0	Left	0	0.204	30.3		

Table A-14
DSI = 0 P_{Limit} Calculations – LTE Band 7 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 7	20	QPSK	F	0055M	1:1	0.01	2510.00	20850	0.0	19.72	1	0	Back	0	1.070	23.4	20.2	19.5
Phablet	LTE Band 7	20	QPSK	F	0055M	1:1	0.01	2510.00	20850	0.0	19.72	1	0	Front	0	1.180	22.9		
Phablet	LTE Band 7	20	QPSK	F	0055M	1:1	0.00	2510.00	20850	0.0	19.72	1	0	Top	0	2.230	20.2		
Phablet	LTE Band 7	20	QPSK	F	0055M	1:1	-0.13	2510.00	20850	0.0	19.72	1	0	Left	0	0.205	30.5		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 7	20	QPSK	B	0055M	1:1	0.01	2510.00	20850	0.0	20.49	50	25	Back	0	1.890	21.7	20.8	20.0
Phablet	LTE Band 7	20	QPSK	B	0055M	1:1	0.05	2510.00	20850	0.0	20.49	50	25	Front	0	1.230	23.5		
Phablet	LTE Band 7	20	QPSK	B	0055M	1:1	-0.06	2510.00	20850	0.0	20.49	50	25	Bottom	0	2.290	20.8		
Phablet	LTE Band 7	20	QPSK	B	0055M	1:1	0.02	2510.00	20850	0.0	20.49	50	25	Right	0	1.860	21.7		

Table A-15
DSI = 0 P_{Limit} Calculations – LTE Band 41 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 41	20	QPSK	B	0088M	1:1.58	0.06	2506.00	39750	0.0	22.62	50	50	Back	0	2.420	20.7	20.7	20.0
Phablet	LTE Band 41	20	QPSK	B	0088M	1:1.58	0.06	2506.00	39750	0.0	22.62	50	50	Front	0	1.450	23.0		
Phablet	LTE Band 41	20	QPSK	B	0088M	1:1.58	0.06	2506.00	39750	0.0	22.62	50	50	Bottom	0	2.320	20.9		
Phablet	LTE Band 41	20	QPSK	B	0088M	1:1.58	-0.12	2506.00	39750	0.0	22.62	50	50	Right	0	1.610	22.5		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 41	20	QPSK	F	0088M	1:1.58	-0.02	2549.50	40185	0.0	21.97	1	0	Back	0	0.807	24.8	20.6	19.5
Phablet	LTE Band 41	20	QPSK	F	0088M	1:1.58	-0.02	2549.50	40185	0.0	21.97	1	0	Front	0	1.090	23.5		
Phablet	LTE Band 41	20	QPSK	F	0088M	1:1.58	0.00	2549.50	40185	0.0	21.97	1	0	Top	0	2.140	20.6		
Phablet	LTE Band 41	20	QPSK	F	0088M	1:1.58	0.04	2549.50	40185	0.0	21.97	1	0	Left	0	0.248	30.0		

Table A-16
DSI = 0 P_{Limit} Calculations – LTE Band 48 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	LTE Band 48	20	QPSK	F	0078M	1:1.58	0.05	3646.70	56207	0.0	21.90	1	0	Back	0	0.743	25.1	20.1	19.5
Phablet	LTE Band 48	20	QPSK	F	0078M	1:1.58	0.00	3646.70	56207	0.0	21.90	1	0	Front	0	1.210	23.0		
Phablet	LTE Band 48	20	QPSK	F	0078M	1:1.58	0.00	3646.70	56207	0.0	21.90	1	0	Top	0	2.350	20.1		
Phablet	LTE Band 48	20	QPSK	F	0078M	1:1.58	0.06	3646.70	56207	0.0	21.90	1	0	Left	0	0.209	30.6		
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Phablet 4.0 W/kg (mW/g) averaged over 10 grams					

Table A-17
DSI = 0 P_{Limit} Calculations – NR Band n71 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n71	35	QPSK	A	0085M	1:1	0.04	680.50	136100	DFT-s-OFDM	0.0	24.11	90	49	Back	0	0.844	28.8	26.4	26.4
Phablet	NR Band n71	35	QPSK	A	0085M	1:1	0.10	680.50	136100	DFT-s-OFDM	0.0	24.11	90	49	Front	0	0.681	29.7		
Phablet	NR Band n71	35	QPSK	A	0085M	1:1	-0.13	680.50	136100	DFT-s-OFDM	0.0	24.11	90	49	Bottom	0	0.789	29.1		
Phablet	NR Band n71	35	QPSK	A	0085M	1:1	0.06	680.50	136100	DFT-s-OFDM	0.0	24.11	90	49	Right	0	1.470	26.4		
Phablet	NR Band n71	35	QPSK	A	0085M	1:1	-0.01	680.50	136100	DFT-s-OFDM	0.0	24.11	90	49	Left	0	0.093	38.4		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n71	35	QPSK	E	0085M	1:1	0.04	680.50	136100	DFT-s-OFDM	0.0	24.39	1	94	Back	0	0.773	29.4	27.6	27.6
Phablet	NR Band n71	35	QPSK	E	0085M	1:1	-0.01	680.50	136100	DFT-s-OFDM	0.0	24.39	1	94	Front	0	1.110	27.9		
Phablet	NR Band n71	35	QPSK	E	0085M	1:1	0.02	680.50	136100	DFT-s-OFDM	0.0	24.39	1	94	Top	0	1.190	27.6		
Phablet	NR Band n71	35	QPSK	E	0085M	1:1	-0.04	680.50	136100	DFT-s-OFDM	0.0	24.39	1	94	Right	0	0.936	28.6		

Table A-18
DSI = 0 P_{Limit} Calculations – NR Band n12 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n12	15	QPSK	A	0085M	1:1	0.01	707.50	141500	DFT-s-OFDM	0.0	24.15	36	22	Back	0	0.921	28.4	26.2	26.2
Phablet	NR Band n12	15	QPSK	A	0085M	1:1	-0.06	707.50	141500	DFT-s-OFDM	0.0	24.15	36	22	Front	0	0.734	29.4		
Phablet	NR Band n12	15	QPSK	A	0085M	1:1	-0.12	707.50	141500	DFT-s-OFDM	0.0	24.15	36	22	Bottom	0	0.821	28.9		
Phablet	NR Band n12	15	QPSK	A	0085M	1:1	0.05	707.50	141500	DFT-s-OFDM	0.0	24.15	36	22	Right	0	1.530	26.2		
Phablet	NR Band n12	15	QPSK	A	0085M	1:1	-0.03	707.50	141500	DFT-s-OFDM	0.0	24.15	36	22	Left	0	0.097	38.2		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n12	15	QPSK	E	0085M	1:1	-0.01	707.50	141500	DFT-s-OFDM	0.0	24.44	1	40	Back	0	0.787	29.4	27.0	27.0
Phablet	NR Band n12	15	QPSK	E	0085M	1:1	0.03	707.50	141500	DFT-s-OFDM	0.0	24.44	1	40	Front	0	1.370	27.0		
Phablet	NR Band n12	15	QPSK	E	0085M	1:1	-0.05	707.50	141500	DFT-s-OFDM	0.0	24.44	1	40	Top	0	1.330	27.1		
Phablet	NR Band n12	15	QPSK	E	0085M	1:1	0.02	707.50	141500	DFT-s-OFDM	0.0	24.44	1	40	Right	0	1.220	27.5		

Table A-19
DSI = 0 P_{Limit} Calculations – NR Band n14 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n14	10	QPSK	A	0085M	1:1	0.01	793.00	158600	DFT-s-OFDM	0.0	23.84	1	1	Back	0	1.020	27.7	27.7	27.7
Phablet	NR Band n14	10	QPSK	A	0085M	1:1	0.03	793.00	158600	DFT-s-OFDM	0.0	23.84	1	1	Front	0	0.778	28.9		
Phablet	NR Band n14	10	QPSK	A	0085M	1:1	-0.03	793.00	158600	DFT-s-OFDM	0.0	23.84	1	1	Bottom	0	1.020	27.7		
Phablet	NR Band n14	10	QPSK	A	0085M	1:1	-0.06	793.00	158600	DFT-s-OFDM	0.0	23.84	1	1	Right	0	0.675	29.5		
Phablet	NR Band n14	10	QPSK	A	0085M	1:1	0.02	793.00	158600	DFT-s-OFDM	0.0	23.84	1	1	Left	0	0.136	36.4		

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n14	10	QPSK	E	0085M	1:1	-0.02	793.00	158600	DFT-s-OFDM	0.0	24.07	1	1	Back	0	0.911	28.4	27.2	26.9
Phablet	NR Band n14	10	QPSK	E	0085M	1:1	0.08	793.00	158600	DFT-s-OFDM	0.0	24.07	1	1	Front	0	0.958	28.2		
Phablet	NR Band n14	10	QPSK	E	0085M	1:1	-0.07	793.00	158600	DFT-s-OFDM	0.0	24.07	1	1	Top	0	1.190	27.2		
Phablet	NR Band n14	10	QPSK	E	0085M	1:1	-0.06	793.00	158600	DFT-s-OFDM	0.0	24.07	1	1	Right	0	0.997	28.0		

Table A-20
DSI = 0 P_{Limit} Calculations – NR Band n26 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n26	20	QPSK	A	0085M	1:1	0.02	831.50	166300	DFT-s-OFDM	0.0	24.22	1	53	Front	0	0.728	29.5	28.1	28.1
Phablet	NR Band n26	20	QPSK	A	0085M	1:1	0.07	831.50	166300	DFT-s-OFDM	0.0	24.22	1	53	Bottom	0	1.010	28.1		
Phablet	NR Band n26	20	QPSK	A	0085M	1:1	-0.04	831.50	166300	DFT-s-OFDM	0.0	24.22	1	53	Right	0	0.895	28.6		
Phablet	NR Band n26	20	QPSK	A	0085M	1:1	0.11	831.50	166300	DFT-s-OFDM	0.0	24.22	1	53	Left	0	0.099	38.2		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n26	20	QPSK	E	0085M	1:1	-0.01	831.50	166300	DFT-s-OFDM	0.0	24.42	50	28	Back	0	0.908	28.8	27.3	27.3
Phablet	NR Band n26	20	QPSK	E	0085M	1:1	-0.04	831.50	166300	DFT-s-OFDM	0.0	24.42	50	28	Front	0	1.260	27.3		
Phablet	NR Band n26	20	QPSK	E	0085M	1:1	-0.13	831.50	166300	DFT-s-OFDM	0.0	24.42	50	28	Top	0	1.080	28.0		
Phablet	NR Band n26	20	QPSK	E	0085M	1:1	0.02	831.50	166300	DFT-s-OFDM	0.0	24.42	50	28	Right	0	1.230	27.5		

Table A-21
DSI = 0 P_{Limit} Calculations – NR Band n70 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n70	15	QPSK	A	0085M	1:1	0.06	1702.50	340500	CP-OFDM	0.0	19.01	1	1	Back	0	1.390	21.5	20.2	19.0
Phablet	NR Band n70	15	QPSK	A	0085M	1:1	0.01	1702.50	340500	CP-OFDM	0.0	19.01	1	1	Front	0	1.060	22.7		
Phablet	NR Band n70	15	QPSK	A	0085M	1:1	-0.03	1702.50	340500	CP-OFDM	0.0	19.01	1	1	Bottom	0	1.900	20.2		
Phablet	NR Band n70	15	QPSK	A	0085M	1:1	-0.05	1702.50	340500	CP-OFDM	0.0	19.01	1	1	Right	0	0.158	31.0		
Phablet	NR Band n70	15	QPSK	A	0078M	1:1	-0.05	1702.50	340500	CP-OFDM	0.0	19.01	1	1	Left	0	0.090	33.4		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n70	15	QPSK	F	0085M	1:1	-0.01	1702.50	340500	DFT-s-OFDM	0.0	21.15	1	77	Back	0	0.803	26.0	21.6	21.0
Phablet	NR Band n70	15	QPSK	F	0085M	1:1	0.02	1702.50	340500	DFT-s-OFDM	0.0	21.15	1	77	Front	0	1.070	24.8		
Phablet	NR Band n70	15	QPSK	F	0085M	1:1	0.01	1702.50	340500	DFT-s-OFDM	0.0	21.15	1	77	Top	0	2.240	21.6		
Phablet	NR Band n70	15	QPSK	F	0085M	1:1	-0.04	1702.50	340500	DFT-s-OFDM	0.0	21.15	1	77	Left	0	0.359	29.5		

Table A-22
DSI = 0 P_{Limit} Calculations – NR Band n66 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n66	45	QPSK	A	0085M	1:1	0.01	1745.00	349000	DFT-s-OFDM	0.0	19.23	120	0	Back	0	1.410	21.7	20.6	19.0
Phablet	NR Band n66	45	QPSK	A	0085M	1:1	0.00	1745.00	349000	DFT-s-OFDM	0.0	19.23	120	0	Front	0	1.040	23.0		
Phablet	NR Band n66	45	QPSK	A	0085M	1:1	-0.01	1745.00	349000	DFT-s-OFDM	0.0	19.23	120	0	Bottom	0	1.800	20.6		
Phablet	NR Band n66	45	QPSK	A	0085M	1:1	-0.01	1745.00	349000	DFT-s-OFDM	0.0	19.23	120	0	Right	0	0.177	30.7		
Phablet	NR Band n66	45	QPSK	A	0078M	1:1	-0.02	1745.00	349000	DFT-s-OFDM	0.0	19.23	120	0	Left	0	0.099	33.2		
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n66	45	QPSK	F	0085M	1:1	-0.03	1745.00	349000	DFT-s-OFDM	0.0	21.43	1	1	Back	0	0.748	26.6	22.1	20.5
Phablet	NR Band n66	45	QPSK	F	0085M	1:1	0.01	1745.00	349000	DFT-s-OFDM	0.0	21.43	1	1	Front	0	1.030	25.2		
Phablet	NR Band n66	45	QPSK	F	0085M	1:1	-0.06	1745.00	349000	DFT-s-OFDM	0.0	21.43	1	1	Top	0	2.140	22.1		
Phablet	NR Band n66	45	QPSK	F	0085M	1:1	-0.09	1745.00	349000	DFT-s-OFDM	0.0	21.43	1	1	Left	0	0.339	30.1		

Table A-23
DSI = 0 P_{Limit} Calculations – NR Band n25 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n25	40	QPSK	A	0085M	1:1	0.02	1882.50	376500	CP-OFDM	0.0	17.92	1	1	Back	0	1.070	21.6	20.1	18.0
Phablet	NR Band n25	40	QPSK	A	0085M	1:1	-0.01	1882.50	376500	CP-OFDM	0.0	17.92	1	1	Front	0	0.859	22.5		
Phablet	NR Band n25	40	QPSK	A	0085M	1:1	-0.04	1882.50	376500	CP-OFDM	0.0	17.92	1	1	Bottom	0	1.490	20.1		
Phablet	NR Band n25	40	QPSK	A	0085M	1:1	0.05	1882.50	376500	CP-OFDM	0.0	17.92	1	1	Right	0	0.122	31.0		
Phablet	NR Band n25	40	QPSK	A	0078M	1:1	-0.06	1882.50	376500	CP-OFDM	0.0	17.92	1	1	Left	0	0.089	32.4		

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n25	40	QPSK	F	0085M	1:1	0.03	1882.50	376500	CP-OFDM	0.0	20.20	1	1	Back	0	0.528	26.9	21.7	20.0
Phablet	NR Band n25	40	QPSK	F	0085M	1:1	0.00	1882.50	376500	CP-OFDM	0.0	20.20	1	1	Front	0	0.675	25.8		
Phablet	NR Band n25	40	QPSK	F	0085M	1:1	-0.03	1882.50	376500	CP-OFDM	0.0	20.20	1	1	Top	0	1.750	21.7		
Phablet	NR Band n25	40	QPSK	F	0085M	1:1	-0.11	1882.50	376500	CP-OFDM	0.0	20.20	1	1	Left	0	0.092	34.5		

Table A-24
DSI = 0 P_{Limit} Calculations – NR Band n30 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n30	10	QPSK	A	0129M	1:1	0.09	2310.00	462000	CP-OFDM	0.0	19.40	1	1	Back	0	1.030	23.2	23.2	19.5
Phablet	NR Band n30	10	QPSK	A	0129M	1:1	0.01	2310.00	462000	CP-OFDM	0.0	19.40	1	1	Front	0	0.692	24.9		
Phablet	NR Band n30	10	QPSK	A	0129M	1:1	-0.06	2310.00	462000	CP-OFDM	0.0	19.40	1	1	Bottom	0	0.878	23.9		
Phablet	NR Band n30	10	QPSK	A	0129M	1:1	-0.07	2310.00	462000	CP-OFDM	0.0	19.40	1	1	Right	0	0.191	30.5		
Phablet	NR Band n30	10	QPSK	A	0129M	1:1	0.06	2310.00	462000	CP-OFDM	0.0	19.40	1	1	Left	0	0.127	32.3		

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n30	10	QPSK	F	0129M	1:1	0.05	2310.00	462000	CP-OFDM	0.0	19.33	1	1	Back	0	0.631	25.3	19.1	20.0
Phablet	NR Band n30	10	QPSK	F	0129M	1:1	0.04	2310.00	462000	CP-OFDM	0.0	19.33	1	1	Front	0	1.370	21.9		
Phablet	NR Band n30	10	QPSK	F	0129M	1:1	-0.04	2310.00	462000	CP-OFDM	0.0	19.33	1	1	Top	0	2.600	19.1		
Phablet	NR Band n30	10	QPSK	F	0129M	1:1	0.01	2310.00	462000	CP-OFDM	0.0	19.33	1	1	Left	0	0.215	29.9		

Table A-25
DSI = 0 P_{Limit} Calculations – NR Band n7 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n7	50	QPSK	B	0129M	1:1	0.05	2535.00	507000	CP-OFDM	0.0	20.68	1	1	Back	0	2.090	21.4	20.8	20.0
Phablet	NR Band n7	50	QPSK	B	0129M	1:1	0.01	2535.00	507000	CP-OFDM	0.0	20.68	1	1	Front	0	1.100	24.2		
Phablet	NR Band n7	50	QPSK	B	0129M	1:1	-0.05	2535.00	507000	CP-OFDM	0.0	20.68	1	1	Bottom	0	2.420	20.8		
Phablet	NR Band n7	50	QPSK	B	0129M	1:1	-0.09	2535.00	507000	CP-OFDM	0.0	20.68	1	1	Right	0	1.880	21.9		

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n7	50	QPSK	F	0129M	1:1	0.09	2535.00	507000	CP-OFDM	0.0	20.07	1	1	Back	0	0.852	24.7	20.2	19.5
Phablet	NR Band n7	50	QPSK	F	0129M	1:1	0.01	2535.00	507000	CP-OFDM	0.0	20.07	1	1	Front	0	1.300	22.9		
Phablet	NR Band n7	50	QPSK	F	0129M	1:1	-0.01	2535.00	507000	CP-OFDM	0.0	20.07	1	1	Top	0	2.410	20.2		
Phablet	NR Band n7	50	QPSK	F	0129M	1:1	0.08	2535.00	507000	CP-OFDM	0.0	20.07	1	1	Left	0	0.282	29.5		

Table A-26
DSI = 0 P_{Limit} Calculations – NR Band n41 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Path	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n41	100	QPSK	F	1	0044M	1:1	0.02	2592.99	518598	CP-OFDM	0.0	20.24	1	1	Back	0	0.708	25.7	22.1	19.5
Phablet	NR Band n41	100	QPSK	F	1	0044M	1:1	-0.01	2592.99	518598	CP-OFDM	0.0	20.24	1	1	Front	0	1.250	23.2		
Phablet	NR Band n41	100	QPSK	F	1	0044M	1:1	-0.03	2592.99	518598	CP-OFDM	0.0	20.24	1	1	Top	0	1.600	22.1		
Phablet	NR Band n41	100	QPSK	F	1	0044M	1:1	0.04	2592.99	518598	CP-OFDM	0.0	20.24	1	1	Left	0	0.234	30.5		

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Path	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n41	100	QPSK	B	2	0044M	1:1	0.02	2592.99	518598	CP-OFDM	0.0	20.97	1	1	Back	0	1.920	22.1	20.1	20.0
Phablet	NR Band n41	100	QPSK	B	2	0044M	1:1	-0.01	2592.99	518598	CP-OFDM	0.0	20.97	1	1	Front	0	1.850	22.2		
Phablet	NR Band n41	100	QPSK	B	2	0044M	1:1	-0.07	2592.99	518598	CP-OFDM	0.0	20.97	1	1	Bottom	0	3.050	20.1		
Phablet	NR Band n41	100	QPSK	B	2	0044M	1:1	0.03	2592.99	518598	CP-OFDM	0.0	20.97	1	1	Right	0	2.280	21.3		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Path	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n41	100	E	1	0044M	1:1	0.10	2592.99	518598	CW/SRS	18.63	Back	0	0.438	26.1	23.0	18.0
Phablet	NR Band n41	100	E	1	0044M	1:1	-0.08	2592.99	518598	CW/SRS	18.63	Front	0	0.502	25.6		
Phablet	NR Band n41	100	E	1	0044M	1:1	-0.03	2592.99	518598	CW/SRS	18.63	Top	0	0.470	25.8		
Phablet	NR Band n41	100	E	1	0044M	1:1	0.06	2592.99	518598	CW/SRS	18.63	Right	0	0.901	23.0		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Path	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n41	100	D	2	0044M	1:1	-0.06	2592.99	518598	CW/SRS	20.26	Back	0	1.050	24.0	24.0	20.0
Phablet	NR Band n41	100	D	2	0044M	1:1	-0.03	2592.99	518598	CW/SRS	20.26	Front	0	0.138	32.8		
Phablet	NR Band n41	100	D	2	0044M	1:1	-0.05	2592.99	518598	CW/SRS	20.26	Bottom	0	0.480	27.4		
Phablet	NR Band n41	100	D	2	0044M	1:1	0.01	2592.99	518598	CW/SRS	20.26	Left	0	0.084	34.9		

Table A-27
DSI = 0 P_{Limit} Calculations – NR Band n48 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n48	40	QPSK	F	0080M	1:1	0.06	3570.00	638000	DFT-s-OFDM	0.0	20.20	50	56	Back	0	0.568	26.6	20.2	19.5
Phablet	NR Band n48	40	QPSK	F	0080M	1:1	-0.07	3570.00	638000	DFT-s-OFDM	0.0	20.20	50	56	Front	0	1.120	23.6		
Phablet	NR Band n48	40	QPSK	F	0080M	1:1	0.02	3570.00	638000	DFT-s-OFDM	0.0	20.20	50	56	Top	0	2.500	20.2		
Phablet	NR Band n48	40	QPSK	F	0080M	1:1	-0.02	3570.00	638000	DFT-s-OFDM	0.0	20.20	50	56	Left	0	0.193	31.3		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n48	40	C	0080M	1:1	-0.03	3570.00	638000	CW/SRS	15.36	Back	0	0.846	20.0	18.0	14.5
Phablet	NR Band n48	40	C	0080M	1:1	-0.01	3570.00	638000	CW/SRS	15.36	Front	0	0.492	22.4		
Phablet	NR Band n48	40	C	0080M	1:1	-0.05	3570.00	638000	CW/SRS	15.36	Bottom	0	0.110	28.9		
Phablet	NR Band n48	40	C	0080M	1:1	-0.03	3570.00	638000	CW/SRS	15.36	Right	0	1.340	18.0		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n48	40	I	0080M	1:1	0.01	3679.98	645332	CW/SRS	19.50	Back	0	0.581	25.8	22.2	19.0
Phablet	NR Band n48	40	I	0080M	1:1	0.00	3679.98	645332	CW/SRS	19.50	Front	0	1.330	22.2		
Phablet	NR Band n48	40	I	0080M	1:1	0.02	3679.98	645332	CW/SRS	19.50	Left	0	0.422	27.2		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n48	40	D	0080M	1:1	0.01	3679.98	645332	CW/SRS	15.16	Back	0	0.386	23.2	23.2	14.5
Phablet	NR Band n48	40	D	0080M	1:1	0.02	3679.98	645332	CW/SRS	15.16	Front	0	0.049	32.2		
Phablet	NR Band n48	40	D	0080M	1:1	0.05	3679.98	645332	CW/SRS	15.16	Bottom	0	0.061	31.2		
Phablet	NR Band n48	40	D	0080M	1:1	0.03	3679.98	645332	CW/SRS	15.16	Left	0	0.005	42.1		

Table A-28
DSI = 0 P_{Limit} Calculations – NR Band n77 Phablet SAR

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	MPR [dB]	Conducted Power [dBm]	RB Size	RB Offset	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n77	100	QPSK	F	0045M	1:1	0.04	3930.00	662000	DFT-s-OFDM	0.0	18.94	1	1	Back	0	1.240	21.9	20.4	18.0
Phablet	NR Band n77	100	QPSK	F	0045M	1:1	0.00	3930.00	662000	DFT-s-OFDM	0.0	18.94	1	1	Front	0	0.413	26.7		
Phablet	NR Band n77 DoD	100	QPSK	F	0045M	1:1	-0.01	3500.01	633334	DFT-s-OFDM	0.0	18.99	1	271	Top	0	1.800	20.4		
Phablet	NR Band n77	100	QPSK	F	0045M	1:1	-0.09	3930.00	662000	DFT-s-OFDM	0.0	18.94	1	1	Top	0	1.510	21.1		
Phablet	NR Band n77	100	QPSK	F	0045M	1:1	-0.03	3930.00	662000	DFT-s-OFDM	0.0	18.94	1	1	Left	0	0.194	30.0		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n77	100	C	0045M	1:1	-0.11	3930.00	662000	CW/SRS	14.29	Back	0	0.271	23.9	17.9	13.5
Phablet	NR Band n77	100	C	0045M	1:1	0.02	3930.00	662000	CW/SRS	14.29	Front	0	0.261	24.1		
Phablet	NR Band n77	100	C	0045M	1:1	-0.11	3930.00	662000	CW/SRS	14.29	Bottom	0	0.153	26.4		
Phablet	NR Band n77 DoD	100	C	0045M	1:1	-0.04	3500.01	633334	CW/SRS	14.32	Right	0	1.090	17.9		
Phablet	NR Band n77	100	C	0045M	1:1	0.04	3930.00	662000	CW/SRS	14.29	Right	0	1.050	18.0		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n77 DoD	100	I	0045M	1:1	-0.04	3500.01	633334	CW/SRS	17.90	Back	0	0.505	24.8	23.7	18.0
Phablet	NR Band n77	100	I	0045M	1:1	-0.01	3930.00	662000	CW/SRS	18.87	Back	0	0.807	23.7		
Phablet	NR Band n77	100	I	0045M	1:1	0.03	3930.00	662000	CW/SRS	18.87	Front	0	0.346	27.4		
Phablet	NR Band n77	100	I	0045M	1:1	0.07	3930.00	662000	CW/SRS	18.87	Left	0	0.249	28.8		

Exposure	Band / Mode	Bandwidth [MHz]	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Waveform	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	NR Band n77 DoD	100	D	0045M	1:1	-0.06	3500.01	633334	CW/SRS	13.65	Back	0	0.367	21.9	21.9	13.0
Phablet	NR Band n77	100	D	0045M	1:1	0.00	3930.00	662000	CW/SRS	13.40	Back	0	0.267	23.1		
Phablet	NR Band n77	100	D	0045M	1:1	-0.07	3930.00	662000	CW/SRS	13.40	Front	0	0.009	37.8		
Phablet	NR Band n77	100	D	0045M	1:1	0.11	3930.00	662000	CW/SRS	13.40	Bottom	0	0.050	30.3		
Phablet	NR Band n77	100	D	0045M	1:1	0.01	3930.00	662000	CW/SRS	13.40	Left	0	0.001	47.3		

Table A-29
DSI = 0 P_{Limit} Calculations – 2.4 GHz WLAN Phablet SAR

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	H	0105M	98.74	-0.01	2462.00	11	1	19.97	Back	0	0.902	24.3	19.5	19.5
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	H	0105M	98.74	-0.02	2462.00	11	1	19.97	Front	0	1.360	22.5		
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	H	0105M	98.74	-0.01	2462.00	11	1	19.97	Top	0	0.805	24.8		
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	H	0105M	98.74	0.00	2462.00	11	1	19.97	Left	0	2.690	19.5		

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	J	0105M	97.51	-0.03	2412.00	1	1	19.55	Back	0	0.285	28.8	25.4	25.4
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	J	0105M	97.51	0.02	2412.00	1	1	19.55	Front	0	0.626	25.4		
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	J	0105M	97.51	0.08	2412.00	1	1	19.55	Top	0	0.003	48.6		
Phablet	2.4 GHz WIFI/ IEEE 802.11b	DSSS	J	0105M	97.51	-0.02	2412.00	1	1	19.55	Right	0	0.106	33.1		

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Conducted Power [dBm]	Conducted Power (2nd ant) [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	2.4 GHz WIFI/ IEEE 802.11g	OFDM	MIMO	0105M	97.64	-0.01	2412.00	1	6	17.96	17.77	Back	0	0.927	21.9	19.4	19.4
Phablet	2.4 GHz WIFI/ IEEE 802.11g	OFDM	MIMO	0105M	97.64	-0.01	2412.00	1	6	17.96	17.77	Front	0	0.898	22.1		
Phablet	2.4 GHz WIFI/ IEEE 802.11g	OFDM	MIMO	0105M	97.64	0.03	2412.00	1	6	17.96	17.77	Top	0	0.415	25.4		
Phablet	2.4 GHz WIFI/ IEEE 802.11g	OFDM	MIMO	0105M	97.64	0.04	2412.00	1	6	17.96	17.77	Right	0	0.074	32.9		
Phablet	2.4 GHz WIFI/ IEEE 802.11g	OFDM	MIMO	0105M	97.64	-0.03	2412.00	1	6	17.96	17.77	Left	0	1.640	19.4		

Note: To achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.

Table A-30
DSI = 0 P_{Limit} Calculations – 2.4 GHz Bluetooth Phablet SAR

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	2.4 GHz Bluetooth LE	DSSS	H	0120M	85.33	0.03	2440.00	19	1	19.94	Back	0	0.798	24.2	21.3	21.3
Phablet	2.4 GHz Bluetooth LE	DSSS	H	0120M	85.33	0.04	2440.00	19	1	19.94	Front	0	0.753	24.4		
Phablet	2.4 GHz Bluetooth LE	DSSS	H	0120M	85.33	0.01	2440.00	19	1	19.94	Top	0	0.460	26.6		
Phablet	2.4 GHz Bluetooth LE	DSSS	H	0120M	85.33	-0.01	2440.00	19	1	19.94	Left	0	1.540	21.3		

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	2.4 GHz Bluetooth LE	DSSS	J	0120M	85.43	-0.02	2440.00	19	1	19.37	Back	0	0.217	29.3	25.9	25.9
Phablet	2.4 GHz Bluetooth LE	DSSS	J	0120M	85.43	0.02	2440.00	19	1	19.37	Front	0	0.469	25.9		
Phablet	2.4 GHz Bluetooth LE	DSSS	J	0120M	85.43	0.05	2440.00	19	1	19.37	Top	0	0.003	47.8		
Phablet	2.4 GHz Bluetooth LE	DSSS	J	0120M	85.43	-0.03	2440.00	19	1	19.37	Right	0	0.088	33.2		

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Conducted Power [dBm]	Conducted Power (2nd ant) [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plimit [dBm]	Overall Plimit [dBm]	EFS Plimit [dBm]
Phablet	2.4 GHz Bluetooth LE	DSSS	MIMO	0120M	85.45	-0.02	2440.00	19	1	15.44	13.92	Back	0	0.392	21.2	18.7	18.7
Phablet	2.4 GHz Bluetooth LE	DSSS	MIMO	0120M	85.45	0.00	2440.00	19	1	15.44	13.92	Front	0	0.402	21.1		
Phablet	2.4 GHz Bluetooth LE	DSSS	MIMO	0120M	85.45	0.02	2440.00	19	1	15.44	13.92	Top	0	0.224	23.7		
Phablet	2.4 GHz Bluetooth LE	DSSS	MIMO	0120M	85.45	0.06	2440.00	19	1	15.44	13.92	Right	0	0.032	32.1		
Phablet	2.4 GHz Bluetooth LE	DSSS	MIMO	0120M	85.45	0.00	2440.00	19	1	15.44	13.92	Left	0	0.698	18.7		

Note: To achieve the 18.5 dBm maximum allowed MIMO power for Bluetooth LE shown in the documentation, Antenna H transmits at a maximum allowed power of 15.5 dBm, and Antenna J transmits at a maximum allowed power of 14.0 dBm. To achieve the 18.5 dBm maximum allowed MIMO power for Bluetooth BDR shown in the documentation, each antenna transmits at a maximum allowed power of 15.5 dBm.