1. Electromagnetic simulation method for power density

1.1 EM simulation tool

1.1.1 EM simulation tool description

The mmWave power density (PD) simulation method for calculating PD (Power Density) of mobile phones with mmWave antenna modules is available in ANSYS Electromagnetics suite HFSS ver. 19.4 (2019 R2) 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 HFSS ver. 19.4 (2019 R2) is implemented based on Finite Element Method (FEM), which operates in the frequency domain.

1.1.2 Mesh and convergence criteria

ANSYS Electromagnetic suite HFSS ver. 19.4 (2019 R2) uses the Finite Element Method (FEM) to solve the structure for 3D EM simulations to analyze power density. The volume area containing the simulated object should be subdivided into electrically small parts called finite elements with unknown functions. To subdivide system, the adaptive mesh technique in ANSYS Electromagnetics suite HFSS ver. 19.4 (2019 R2) is used. ANSYS Electromagnetics suite HFSS ver. 19.4 (2019 R2) 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 HFSS ver. 19.4 (2019 R2) is defined as convergence criteria, delta S, and the iterative adaptive mesh process repeats until the delta S is met. In ANSYS Electromagnetics suite HFSS ver. 19.4 (2019 R2), the accuracy of converged results depends on the delta S. Figure 1 is an example of final adaptive mesh of the device (cross-section of top view).

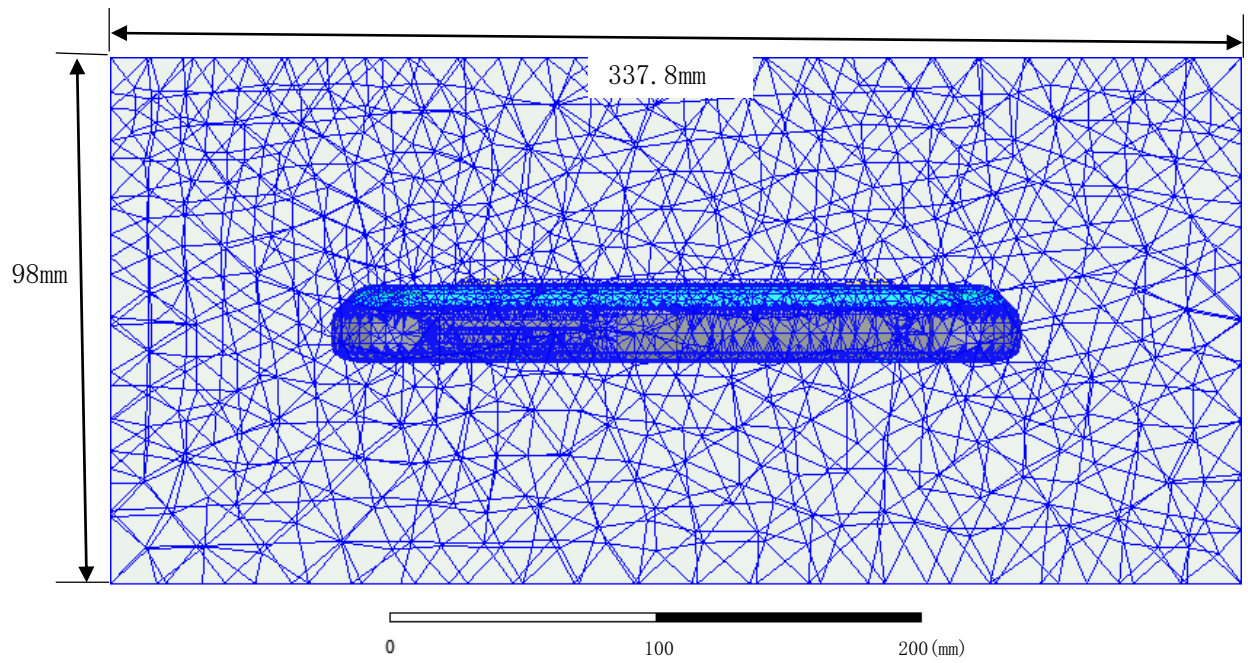


Figure 1. Example of HFSS mesh in a model of the device (Top view)

1.1.3 Time-averaged power density calculation

It is possible to get various kinds of physical quantities can be obtained after finishing 3D full-wave electromagnetic simulation. 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 time-averaged Poynting vector ($\vec{S}$) from the cross product of $\vec{E}$ and complex conjugation of $\vec{H}$ as shown below:

$$(\vec{S}) = \mathrm{Re}\,(\frac{1}{2}\vec{E}\times\vec{H}^*)$$

($\vec{S}$) 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 HFSS 19.4 (2019 R2).

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

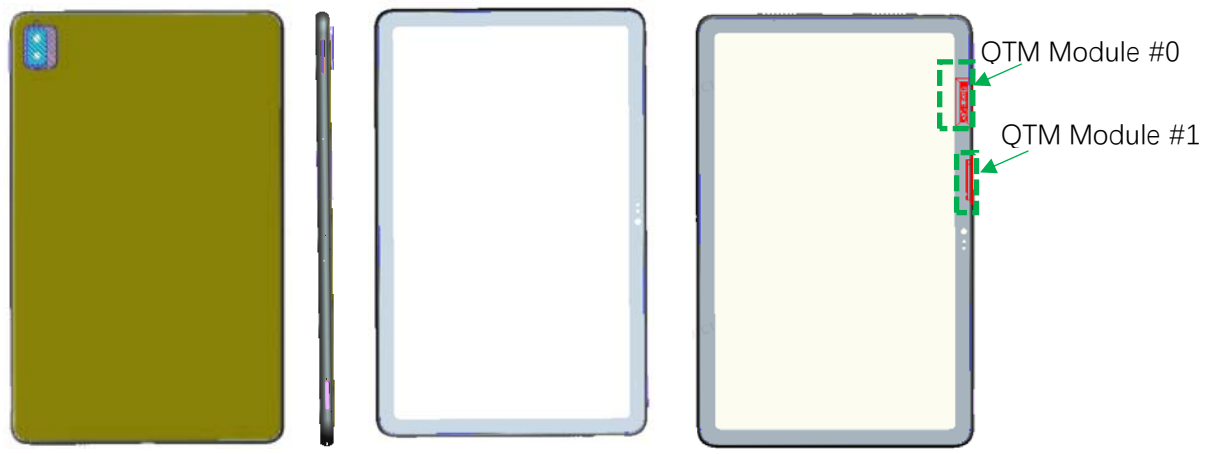
$$PD_{av}=\frac{1}{A}\int_A (\vec{S}).\mathrm{ds}=\frac{1}{2A}\int_A |Re(\vec{E}\times\vec{H}^*)|.\mathrm{ds}$$

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

1.2 Simulation setup

1.2.1 Modeling for simulation

The simulation approach to perform PD assessment for a smartphone requires accurate modeling for mmWave antenna module as well as the smartphone itself. Figure 2 shows the simulation model which is mounted two mmWave antenna modules. The simulation modeling includes most of the entire structure of device itself such as PCB, metal frame, battery, cables, large components and legacy antennas as well as mmWave antenna modules called as QTM0# and QTM1#. On the back side view, QTM0# is placed on the left side and antennas are facing the left side of device. QTM1# is placed at the top sideand antennas are facing the backside of the device.



(a) Back (b)top (c)front (d)Position of QTM Modules

Figure 2. HFSS simulation model which is mounted two mmWave antenna

1.2.2 PD evaluation surfaces

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. In QTM#0, 5 PD evaluation planes except right side are set up. QTM#0 is placed at the left side of the device and the right side is excluded from the worst case because the distance from the left side is more than 10 lambda at 28GHz and 39 GHz. QTM#1 is also placed at the left of the device and the right side is excluded from the worst case for the same reason as QTM#0. 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 surfaces

	Front	Back	Left from Front View	Right from Front View	Top	Bottom
QTM#0	O	O	O	X	O	O
QTM#1	O	O	O	X	O	O

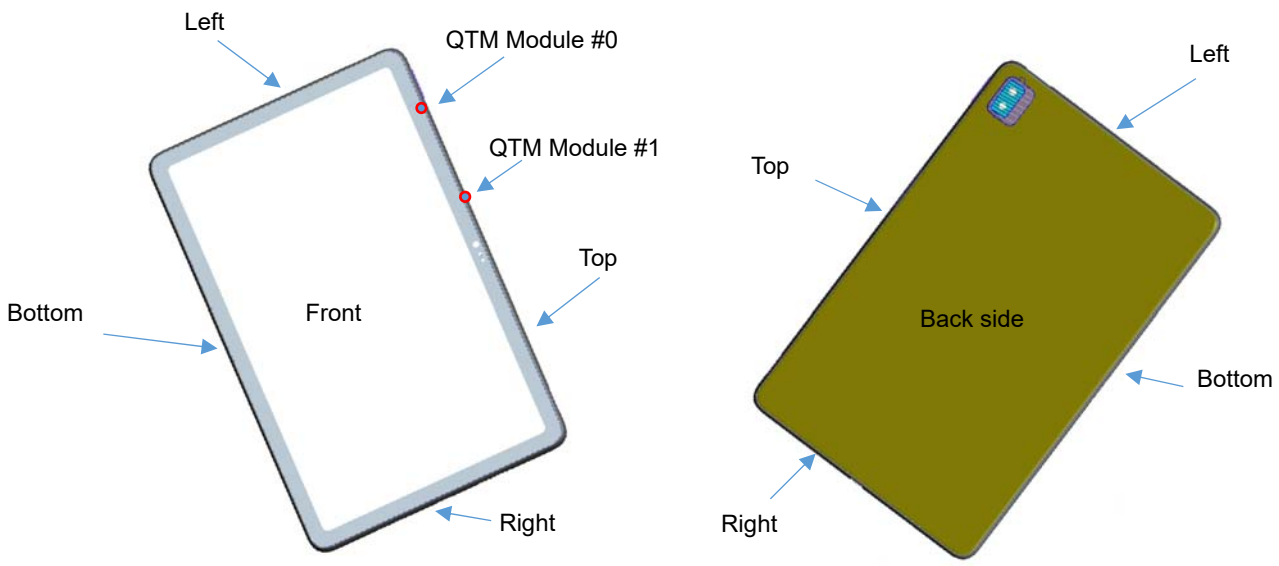


Figure 3. PD evaluation

1.2.3 Radiation boundary condition

For radiation boundary, the 2nd order absorbing boundary condition (ABC) is used for all simulations in this report. This radiation boundary simulates an electrically open surface that allows waves to radiate infinitely far into space. The system absorbs the wave via the 2nd order radiation boundary, essentially ballooning the boundary infinitely far away from the structure and into space. The radiation boundaries may also be placed relatively close to a structure and can be of arbitrary shape.

Per ANSYS recommendations for their simulation tool, the radiation boundary plane must be located at least a quarter wavelength from strongly radiating structure, or at least a tenth of a wavelength from a weakly radiating structure. In this simulation report, about two or three wavelengths spacing from the device surfaces in all main beam directions are applied to ensure convergence.

By changing convergence error (i.e., maximum magnitude delta S) from 2% to 4% and moving the radiation boundary closer towards the device by 20%, the combined influence in PD value is < 0.04 dB which confirms that the simulation model is reliable using this setup.

1.2.4 Source excitation condition

Each of the two 5G mmWave array modules is the same part containing a 1x4 element array of dual-polarization patch antennas. The number of antenna ports of QTM#0 and QTM#1 for source excitation is equal to 16. The port of each patch antenna are separated in frequency and polarization. That is, the ports of each patch antenna are divided into a feed for 28 GHz and a feed for 39 GHz, and a vertical polarity feed and a horizontal polarity feed are divided.

Figure 4 shows the QTM#0 module structure and surrounding structure. The QTM#0 module is encrypted in the ansys electromagnetics suite (hfss) and can only check the feeding position.

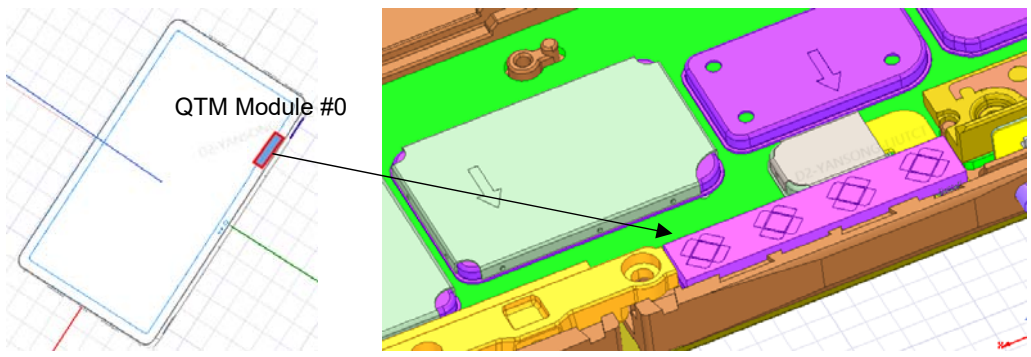


Figure 4. QTM Module #0

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 5 shows an example of antenna port excitations.

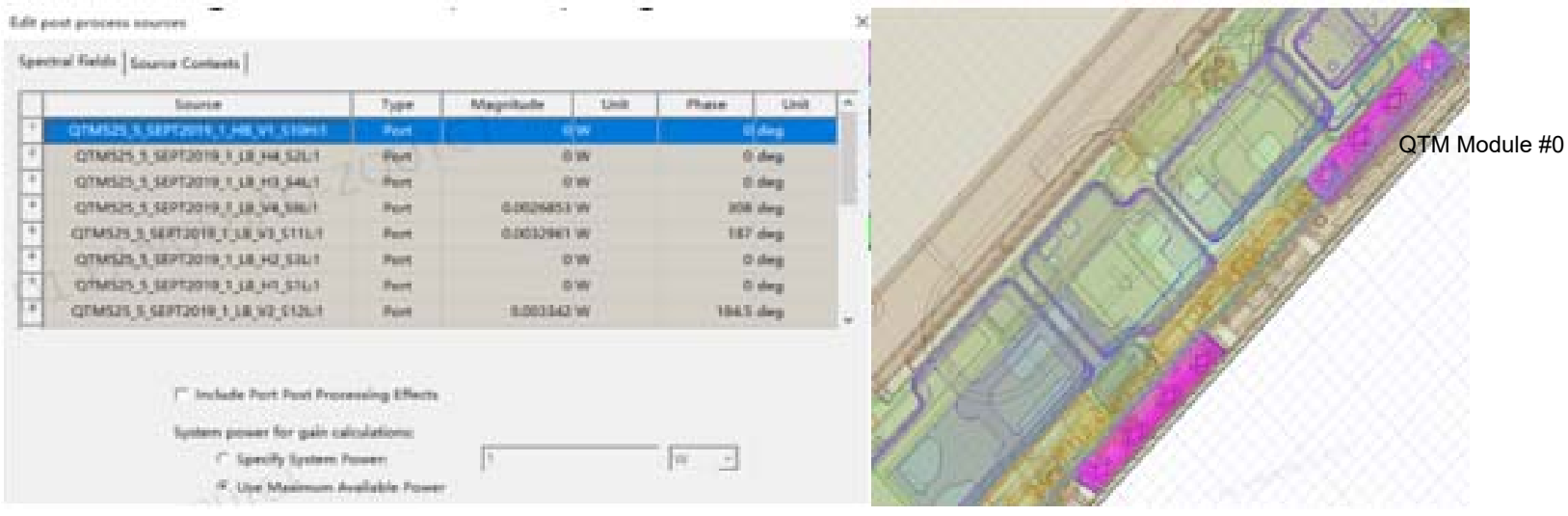


Figure 5. An example of port excitation (QTM#0)

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.

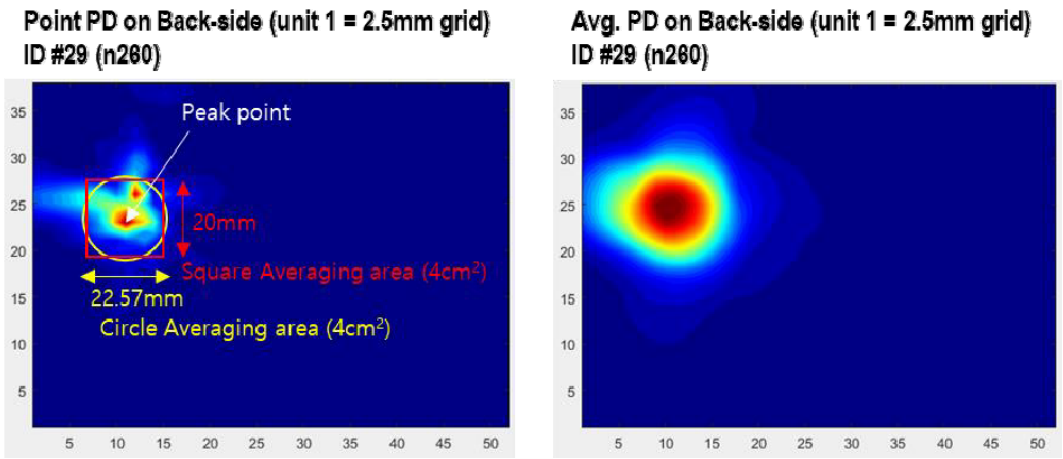
1.2.5 Condition of simulation completion

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

As mentioned in the previous chapter, the Poynting vector ($\vec{S}$) can be obtained through crossproduct 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 $4cm^2$ at 2.5 mm intervals of the point power density result. Figure 6 shows examples of the distribution plot of point power density and the averaged power density



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

Figure 6. Power density distribution (Example)

2.2 Comparison between simulation and measurement

In this section, the simulated and measured power density distributions are compared with each mmWave antenna. Based on the comparison of the power density distribution, the simulated power density and the measured power density have a good correlation. The amplitude mismatch between the simulated 4 cm^2 average power density and the measured 4 cm^2 average power density is considered a housing influence and is used to determine the input power limit of each beam for RF exposure compliance (see RF Exposure Part 0 Report).

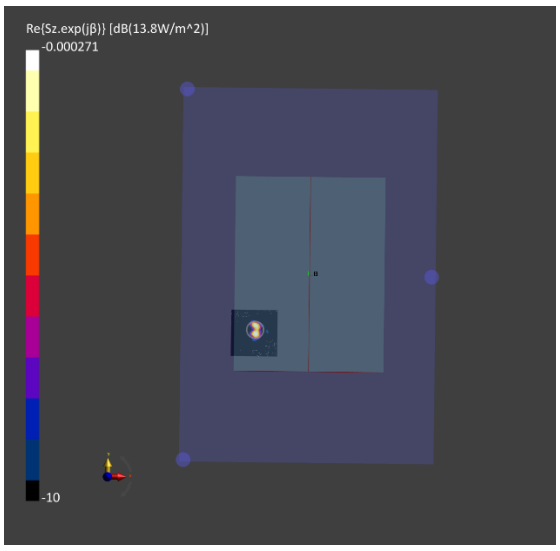
Input power per each active port is listed below for both simulation and measurement verification and power density characterization. For simulation, these values were entered directly into the HFSS model. For measurement, it was used to input these values for each active port using Factory Test Mode S/W.

Mode/Band	Antenna	Input Power (dBm) SISO	Input Power (dBm) MIMO
5G NR n261 (28 GHz)	QTM#0 Patch	6	6
	QTM#1 Patch	6	6
5G NR n260 (39 GHz)	QTM#0 Patch	6	6
	QTM#1 Patch	6	6

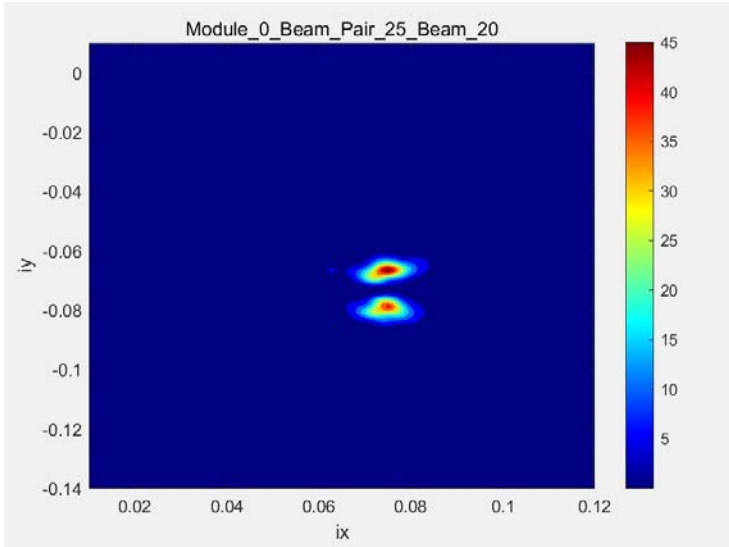
The simulation and measurement results below were performed at 2mm evaluation distance and 28GHz / 38.5GHz. The input.power.limit was determined based on the results below in the RF Exposure Part 0 Report.

6dBm input measurement / simulation							4cm2 avg. PD(W/m2)	
Band	**Ant Type**	**Module**	**Ant Group (Ant Polarization)**	**beam ID**	**Surface**	**Channel**	**Measured**	**Simulated**
n261	Patch	QTM0	AG0(V)	20	Front	Mid	**5.53**	**13.68**
				20	Top	Mid	**2.32**	**6.86**
			AG1(H)	148	Front	Mid	**7.06**	**13.22**
				157	Top	Mid	**2.71**	**7.08**
		QTM1	AG0(V)	15	Top	Mid	**8.76**	**16.77**
				15	Front	Mid	**3.59**	**9.05**
			AG1(H)	153	Top	Mid	**9.3**	**15.97**
				153	Front	Mid	**4.39**	**9.44**
n260	Patch	QTM0	AG0(V)	24	Front	Mid	**3.6**	**11.07**
				21	Top	Mid	**1.36**	**4.34**
			AG1(H)	152	Front	Mid	**3.47**	**9.95**
				149	Top	Mid	**1.43**	**4.2**
		QTM1	AG0(V)	25	Top	Mid	**7.57**	**15.13**
				18	Back	Mid	**3.39**	**7.47**
			AG1(H)	146	Top	Mid	**5.95**	**14.51**
				146	Front	Mid	**3.46**	**7.17**

n261 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 20 Front side Mid ch.



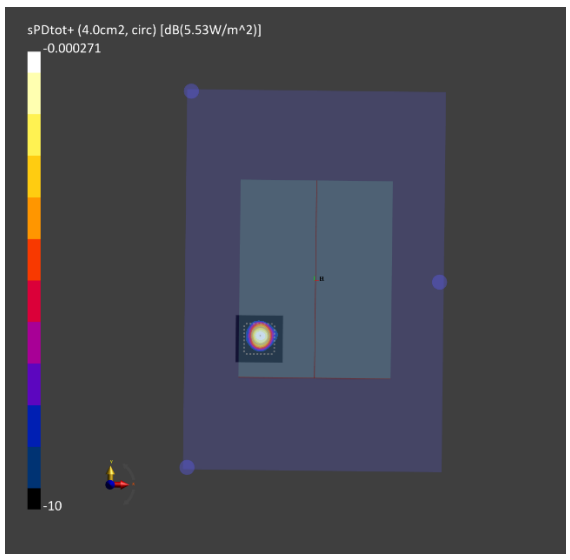
(a) Measurement



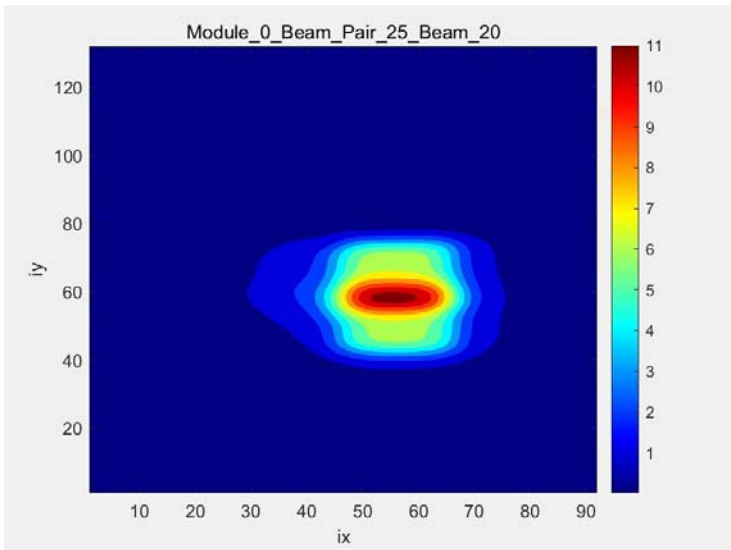
(b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 20, Point power density

n261 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 20 Front side Mid ch.



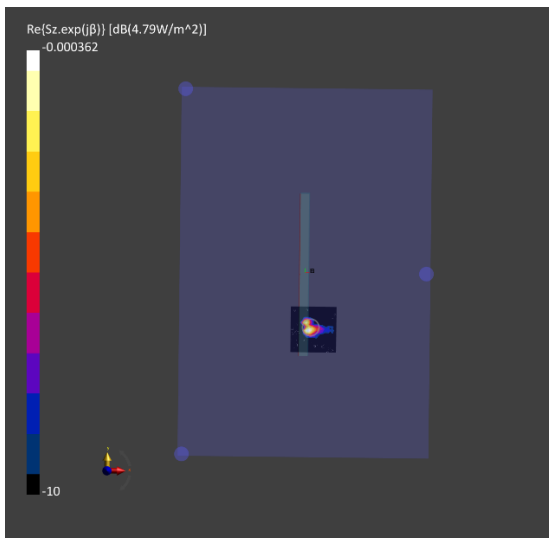
(a) Measurement



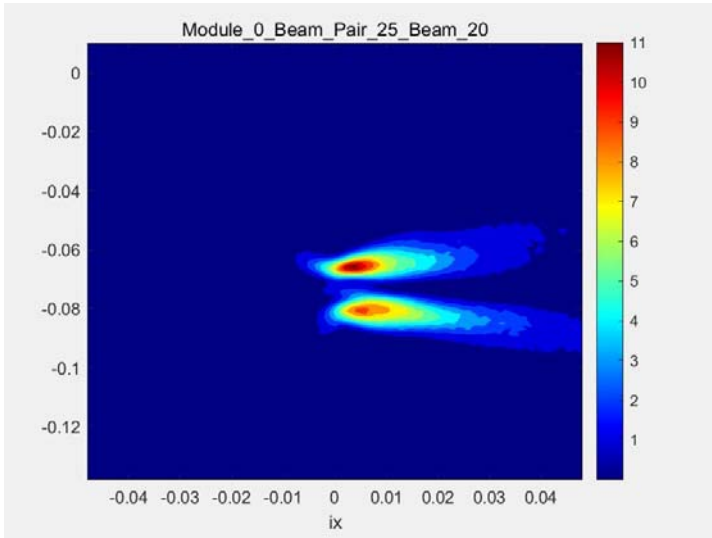
(a) Measurement (b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 20, 4cm^2 Averaged power density

n261 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 20 Top side Mid ch.



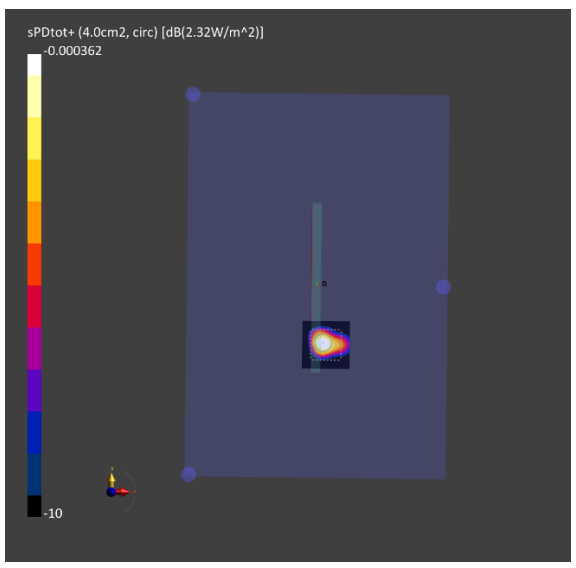
(a) Measurement

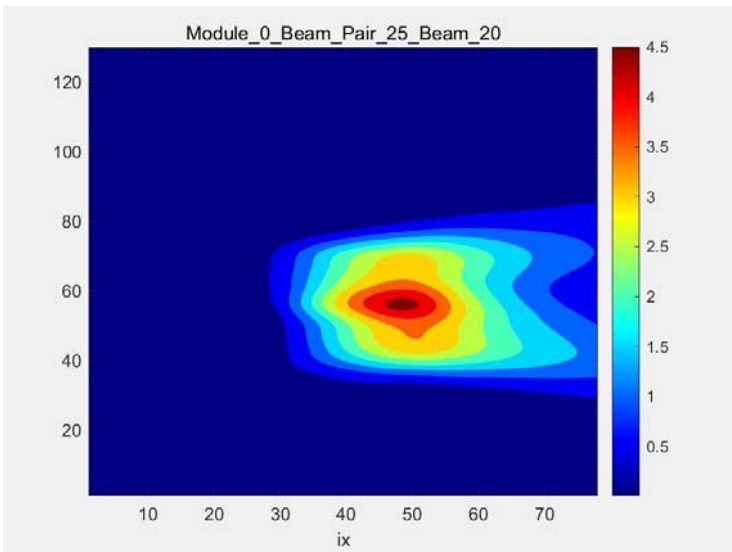


(b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 20, Point power density

n261 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 20 Top side Mid ch.

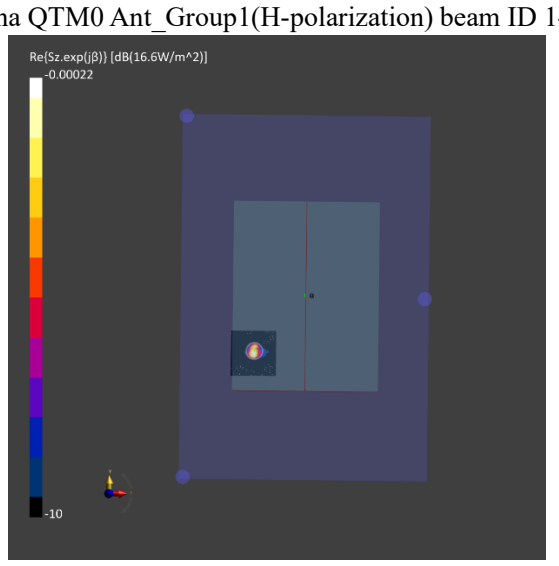


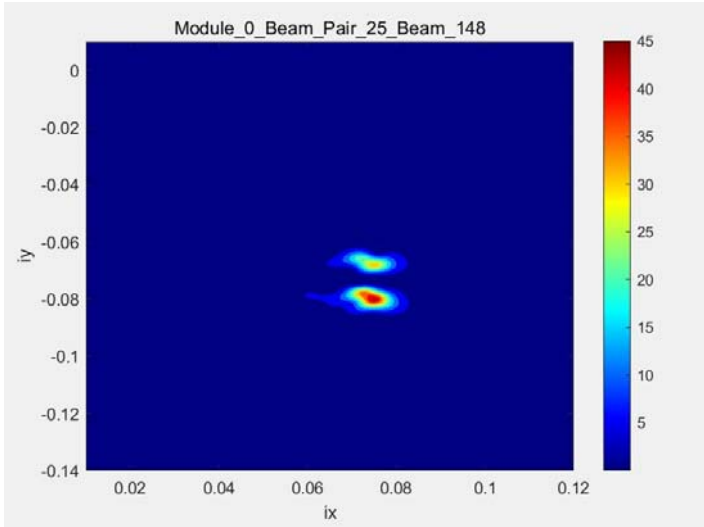


(a) Measurement (b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 20, 4cm^2 Averaged power density

n261 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 148 Front-side Mid ch.

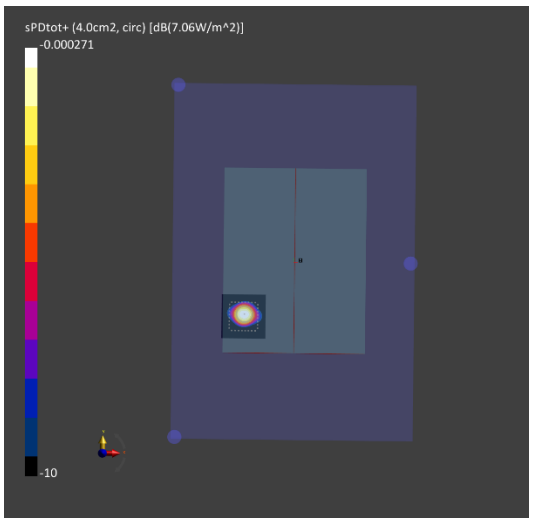


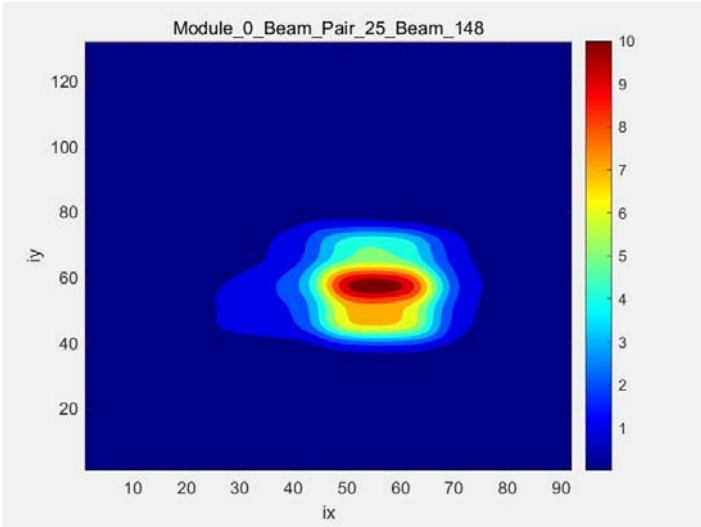


(a) Measurement (b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 148, Point power density

n261 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 148 Front-side Mid ch.

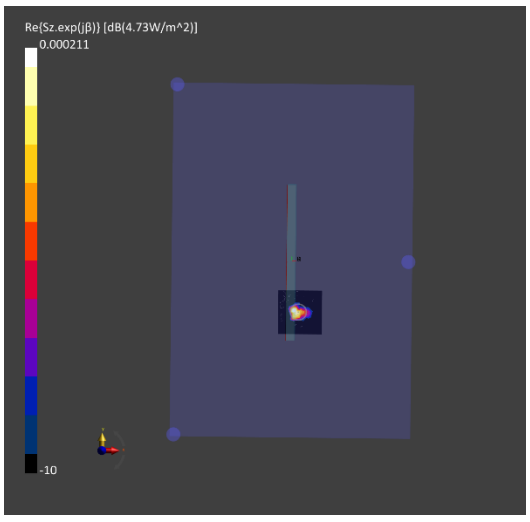




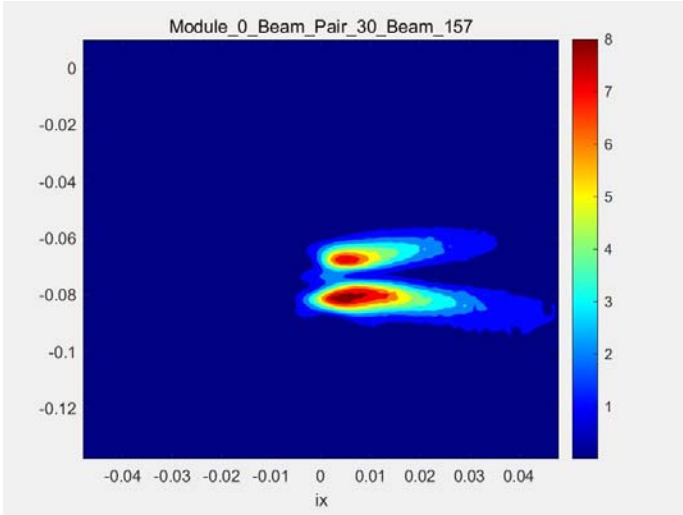
(a) Measurement (b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 148, 4cm^2 Averaged power density

n261 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 157 Top-side Mid ch.



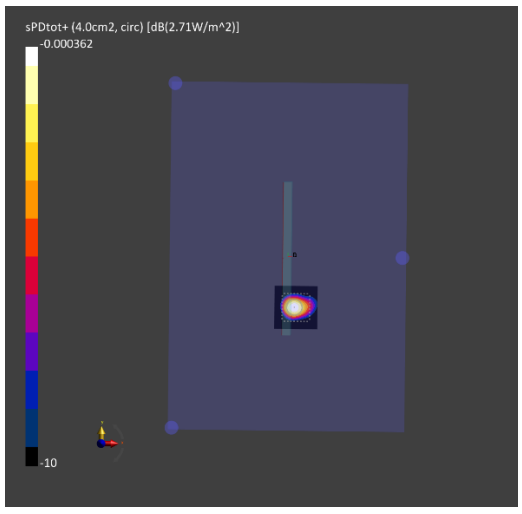
(a) Measurement



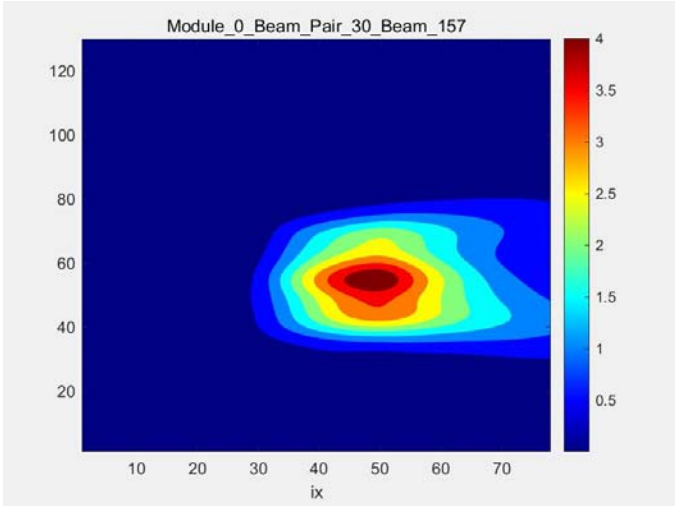
(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 157, Point power density

n261 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 157 Top-side Mid ch.



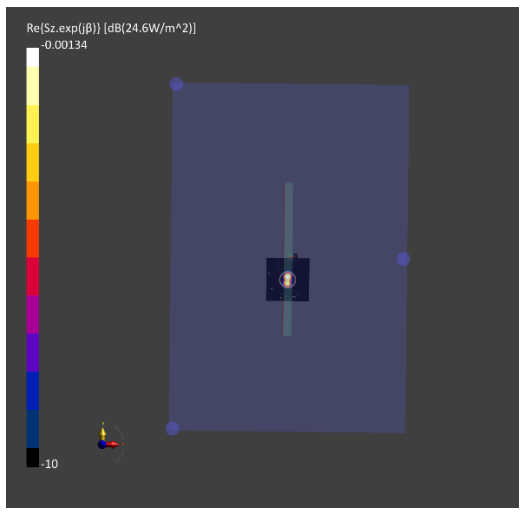
(a) Measurement



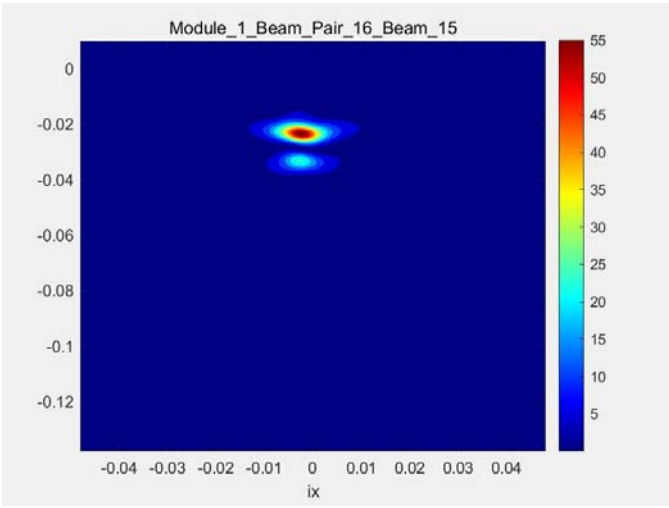
(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 157, 4cm^2 Averaged power density

n261 Patch antenna QTM1 Ant_Group0(V-polarization) beam ID 15 Top side Mid ch.



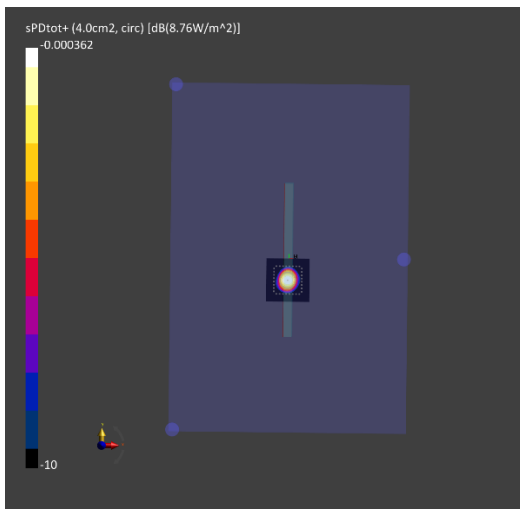
(a) Measurement

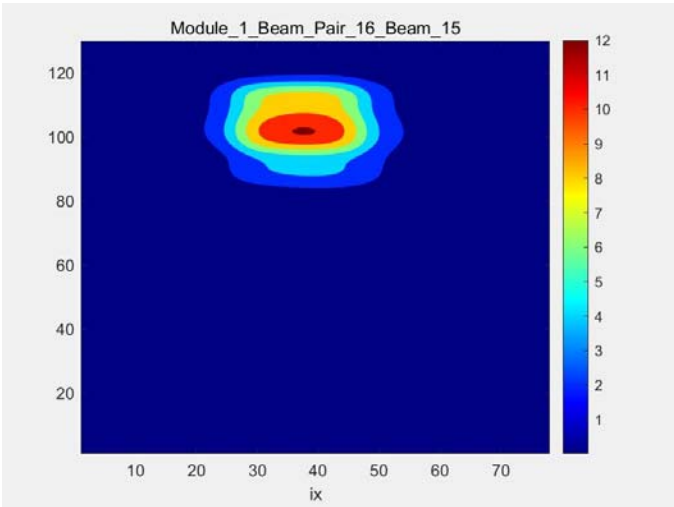


(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 15, Point power density

n261 Patch antenna QTM1 Ant_Group0(V-polarization) beam ID 15 Top side Mid ch.

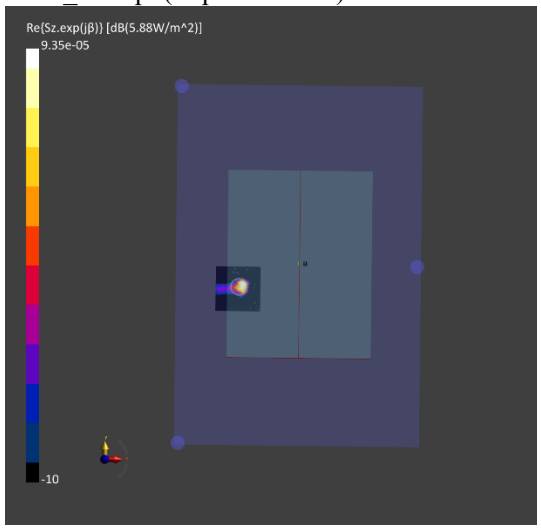


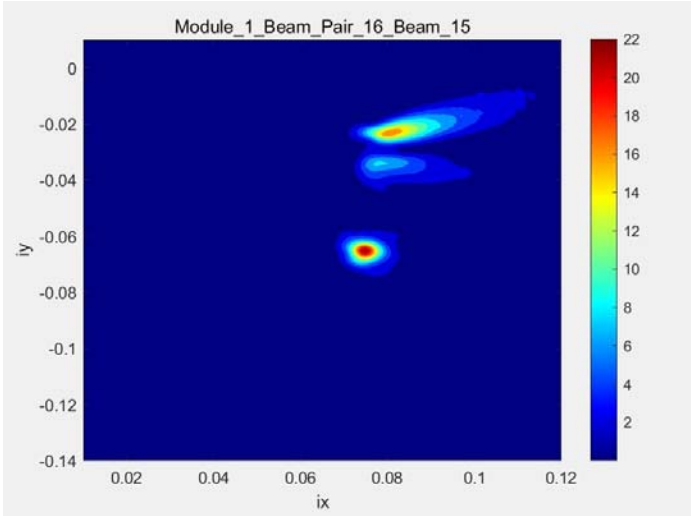


(a) Measurement (b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 15, 4cm^2 Averaged power density

n261 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 15 Front side Mid ch.

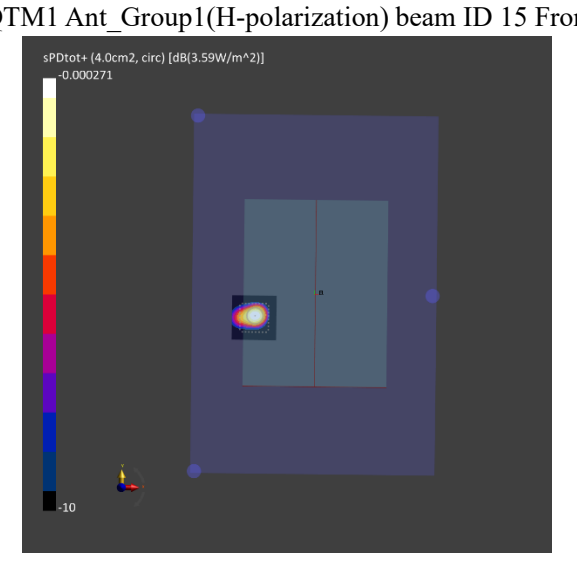


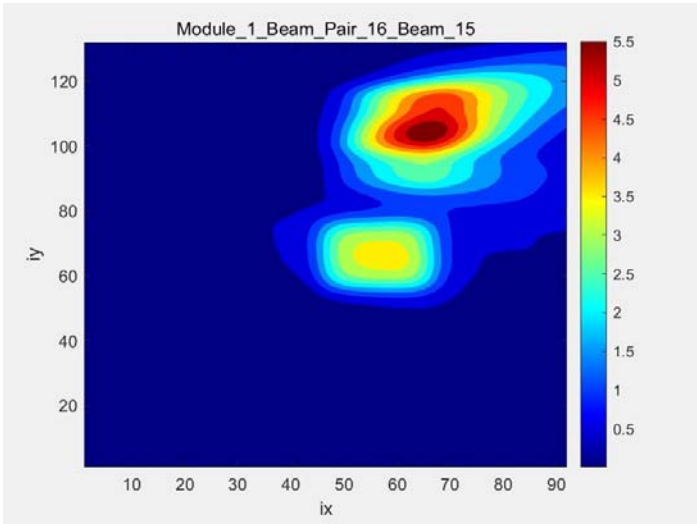


(a) Measurement (b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 15, Point power density

n261 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 15 Front side Mid ch.

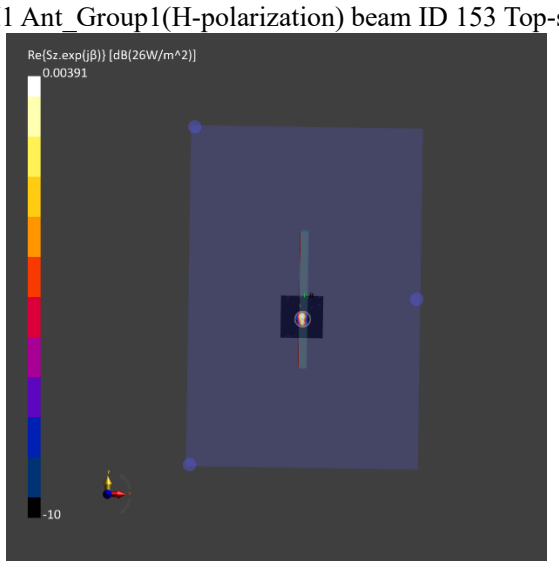




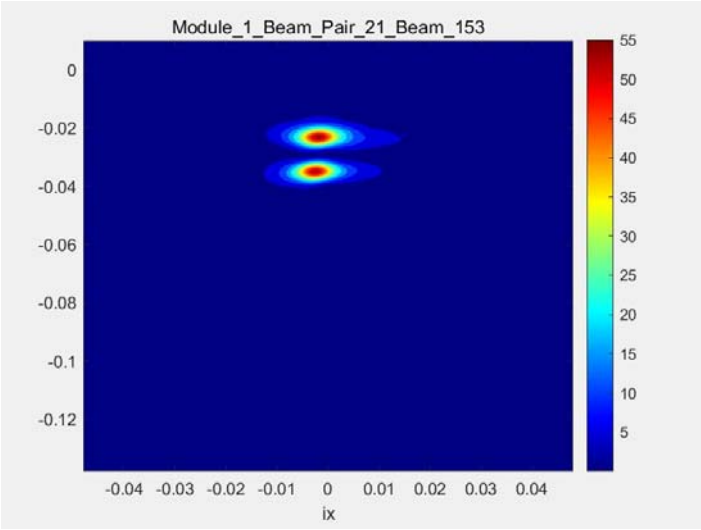
(a) Measurement (b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 15, 4cm^2 Averaged power density

n261 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 153 Top-side Mid ch.



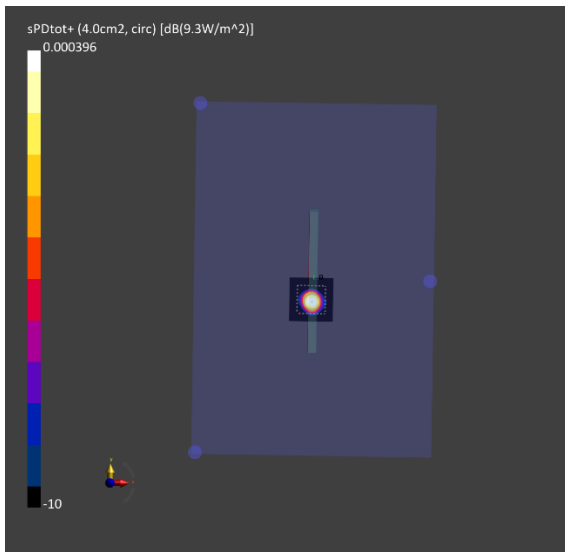
(a) Measurement



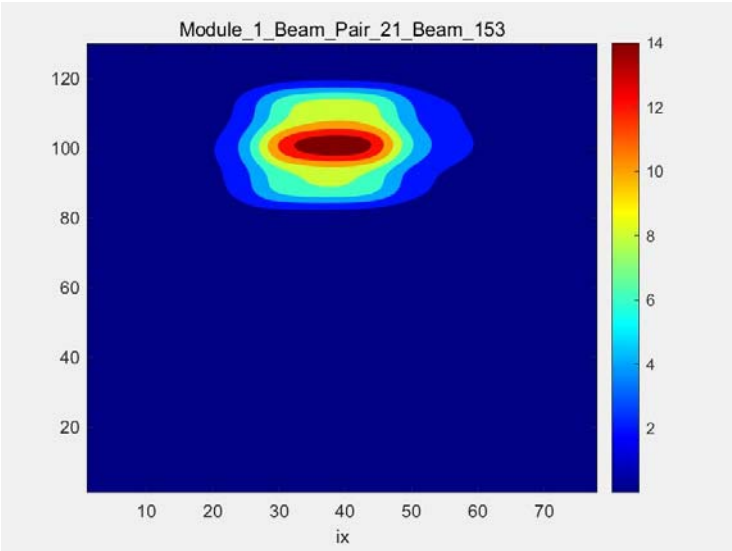
(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 153, Point power density

n261 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 153 Top-side Mid ch.



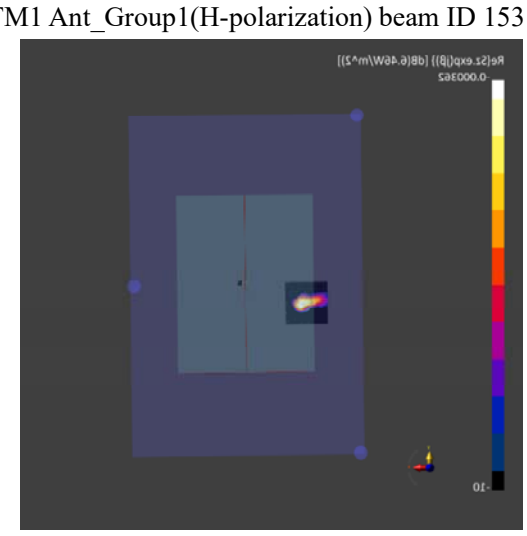
(a) Measurement



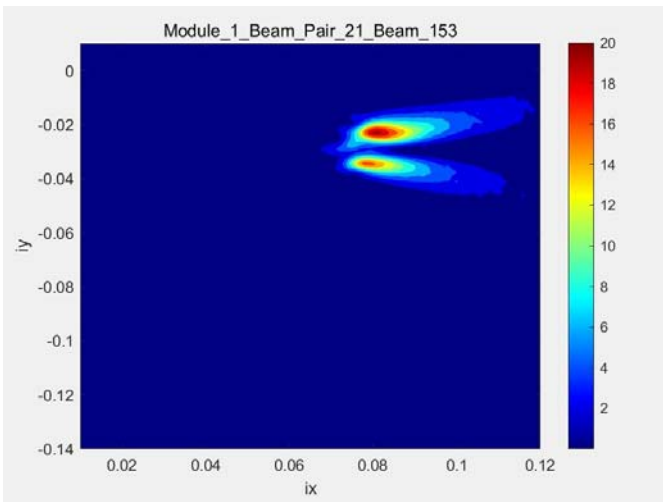
(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 153, 4cm^2 Averaged power density

n261 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 153 Front-side Mid ch.



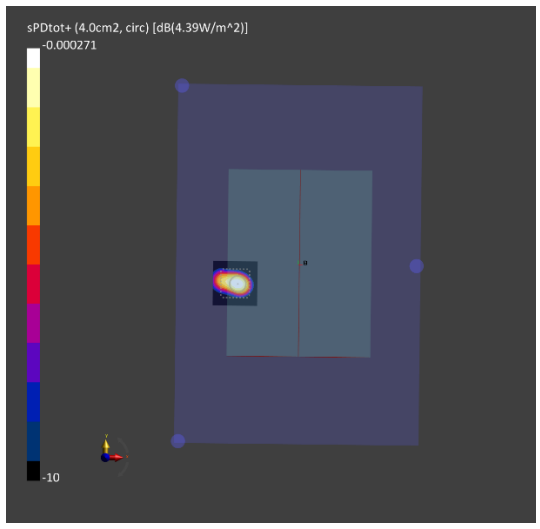
(a) Measurement



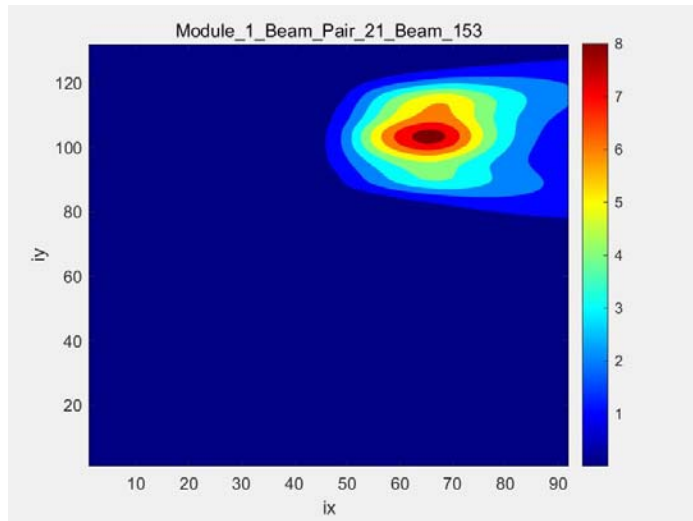
(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 153, Point power density

n261 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 153 Front-side Mid ch.



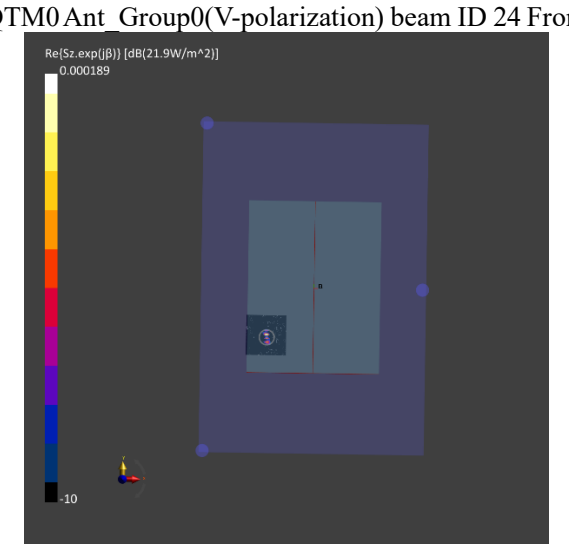
(a) Measurement



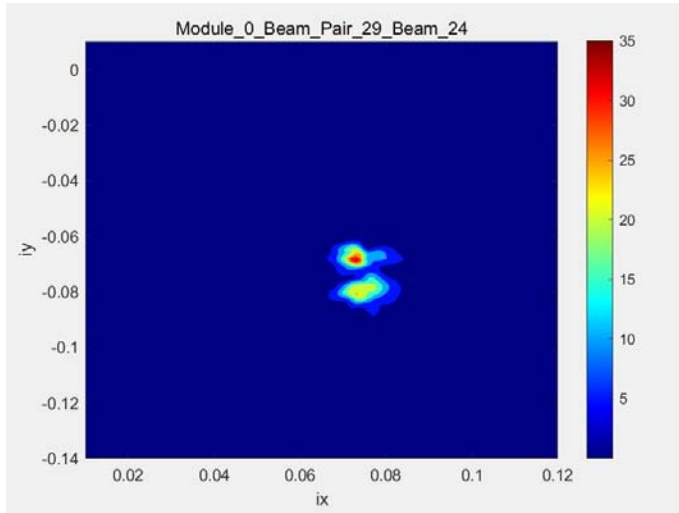
(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 153, 4cm^2 Averaged power density

n260 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 24 Front-side Mid ch.



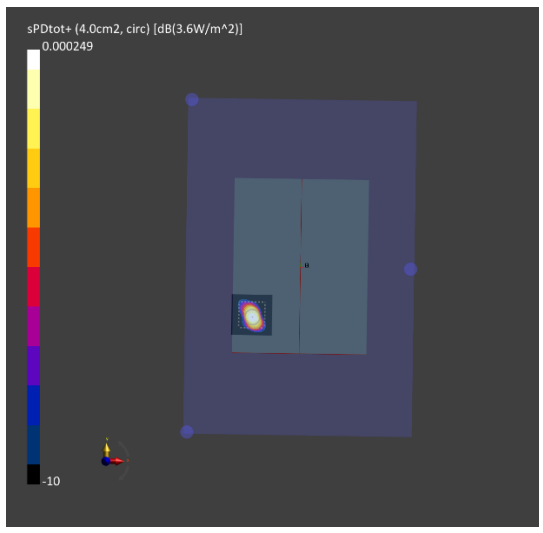
(a) Measurement



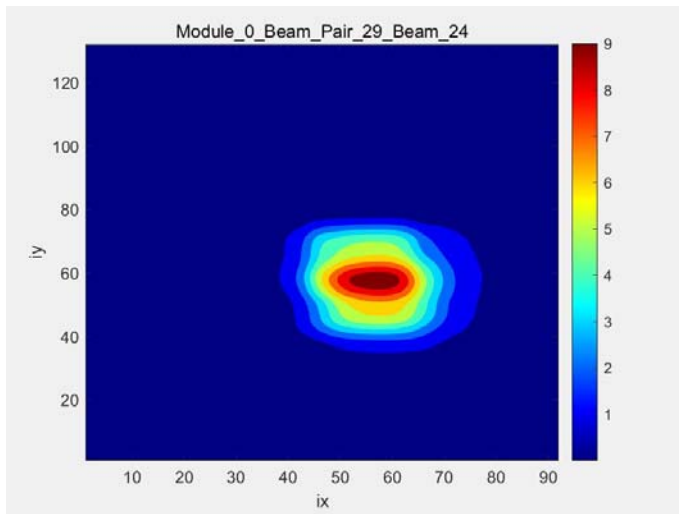
(b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 24, Point power density

n260 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 24 Front-side Mid ch.



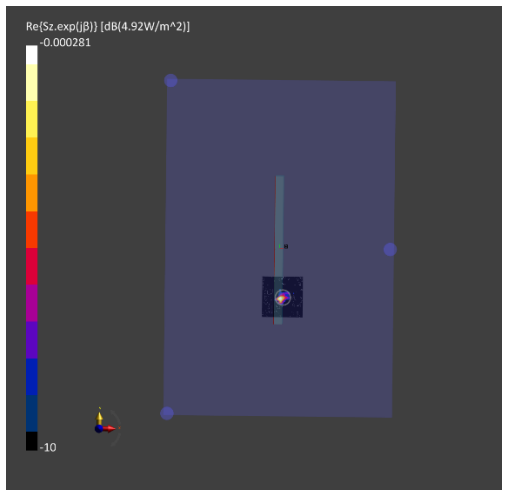
(a) Measurement



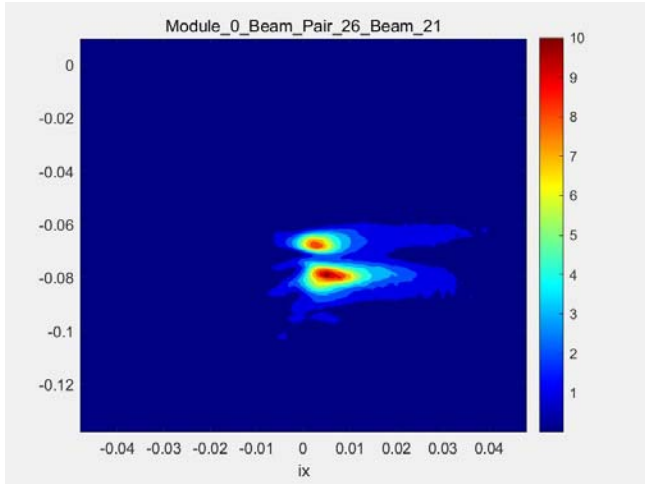
(b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 24, 4cm^2 Averaged power density

n260 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 21 Top side Mid ch.



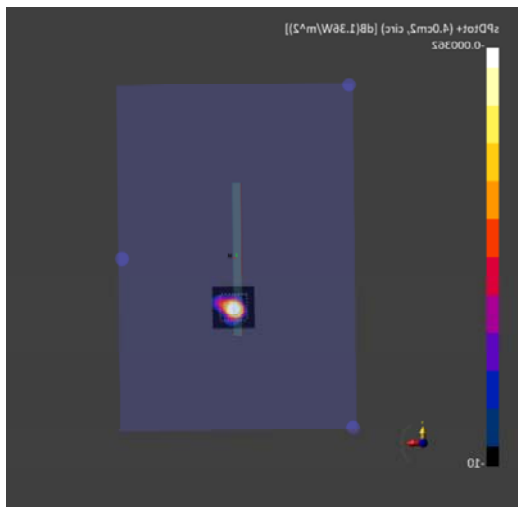
(a) Measurement



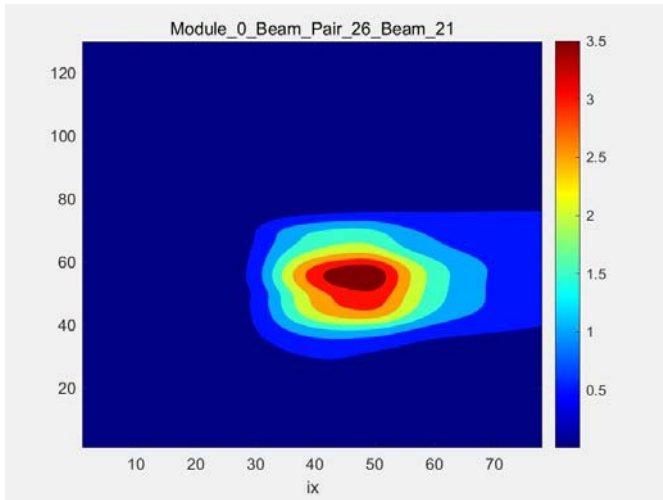
(b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 21, Point power density

n260 Patch antenna QTM0 Ant_Group0(V-polarization) beam ID 21 Top side Mid ch.



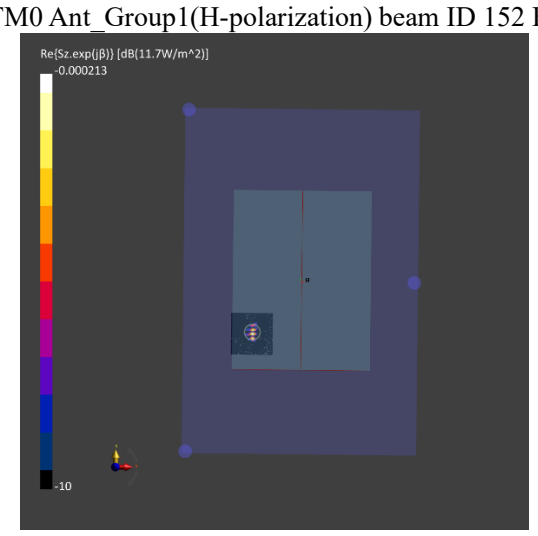
(a) Measurement



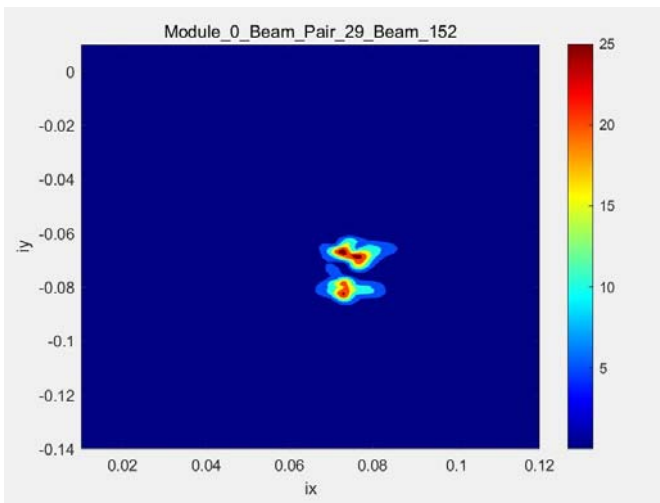
(b) Simulation

Patch antenna QTM0 AG0(V-polarization) beam ID 21, 4cm^2 Averaged power density

n260 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 152 Front-side Mid ch.



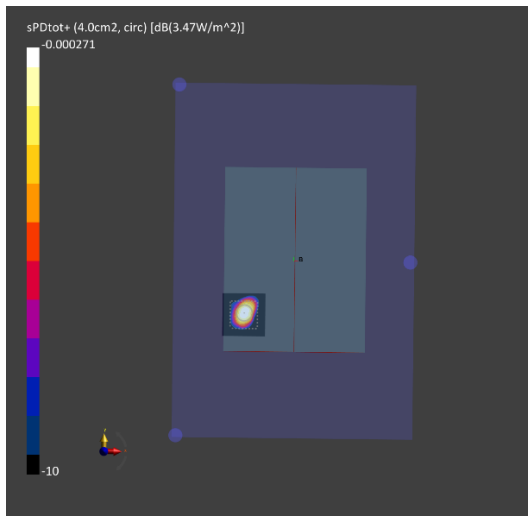
(a) Measurement



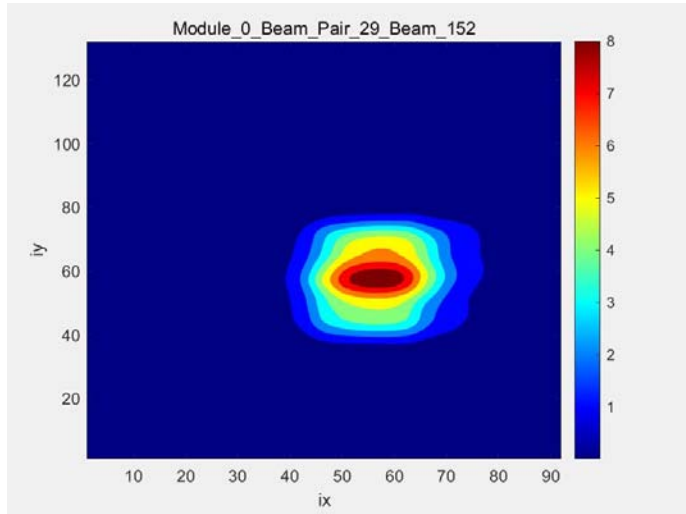
(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 152, Point power density

n260 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 152 Front-side Mid ch.



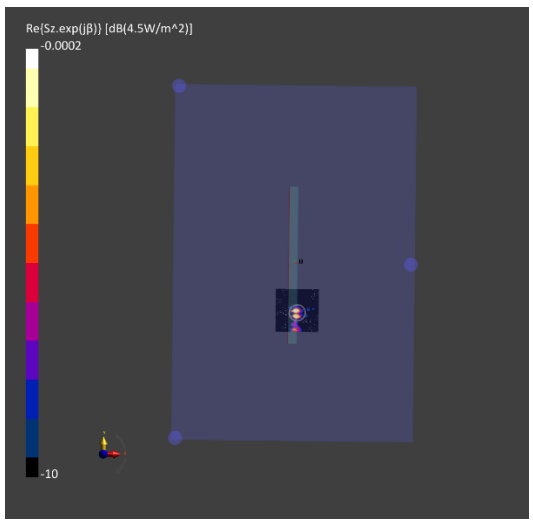
(a) Measurement



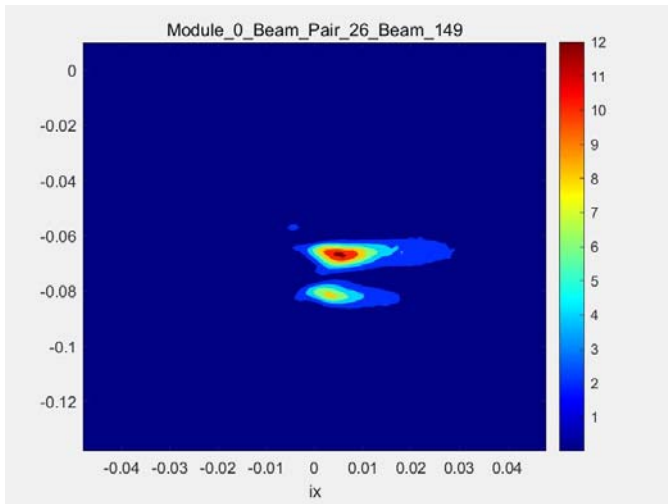
(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 152, 4cm^2 Averaged power density

n260 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 149 Top-side Mid ch.



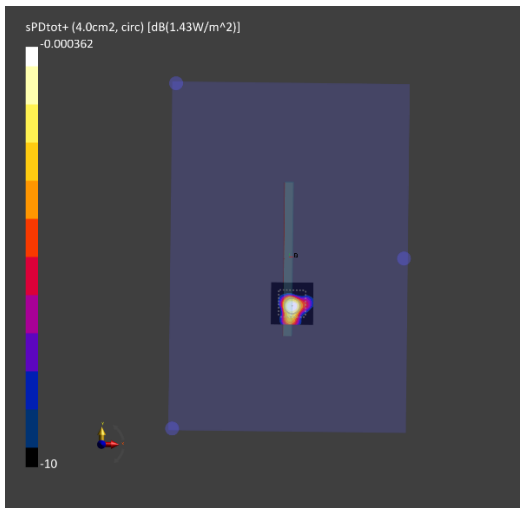
(a) Measurement



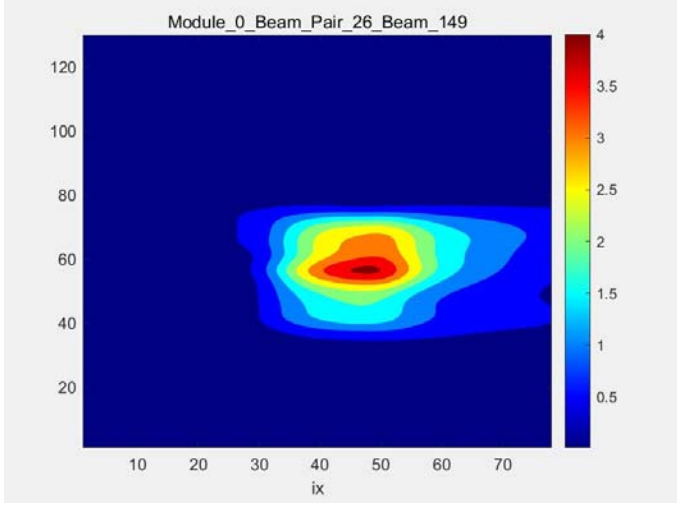
(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 149, Point power density

n260 Patch antenna QTM0 Ant_Group1(H-polarization) beam ID 149 Top-side Mid ch.



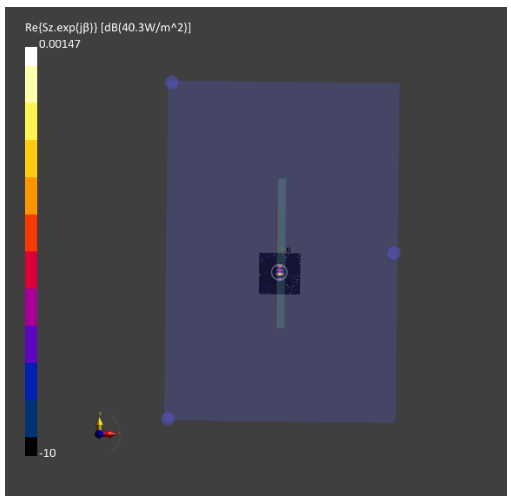
(a) Measurement



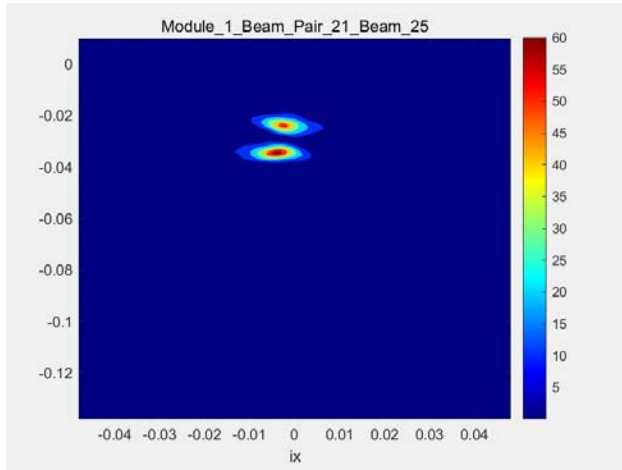
(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 149, 4cm^2 Averaged power density

n260 Patch antenna QTM1 Ant_Group0(V-polarization) beam ID 25 Top-side Mid ch.



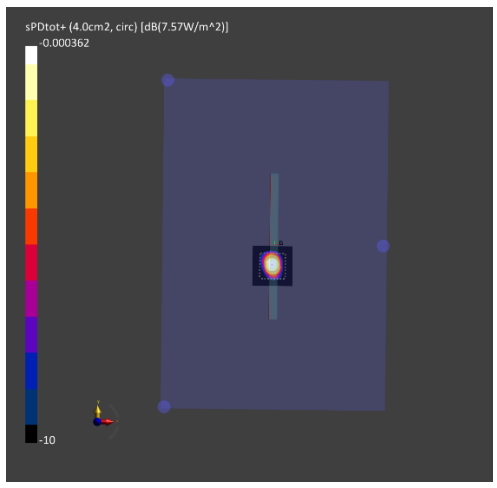
(a) Measurement



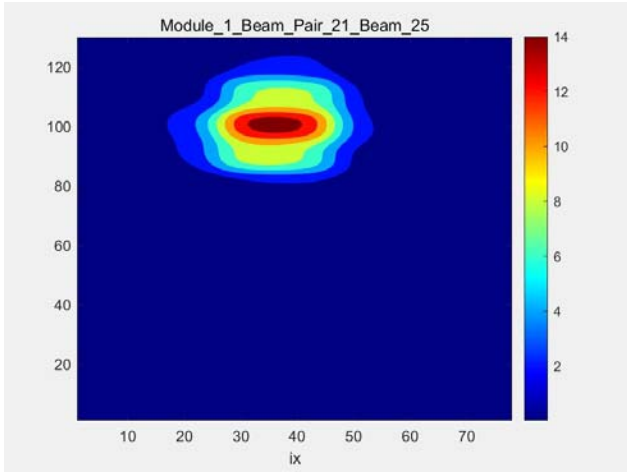
(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 25, Point power density

n260 Patch antenna QTM1 Ant_Group0(V-polarization) beam ID 25 Top-side Mid ch.



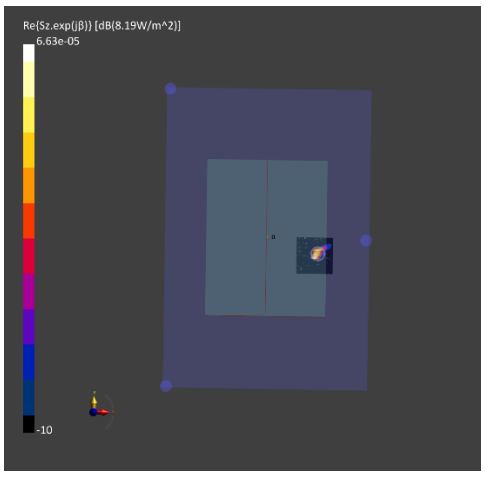
(a) Measurement



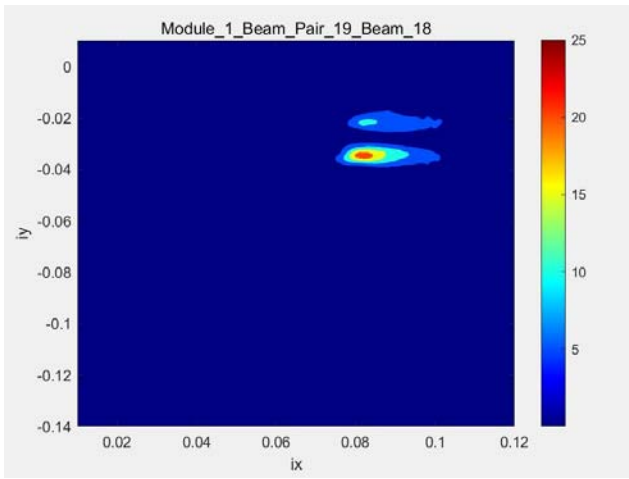
(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 25, 4cm^2 Averaged power density

n260 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 18 Back-side Mid ch.



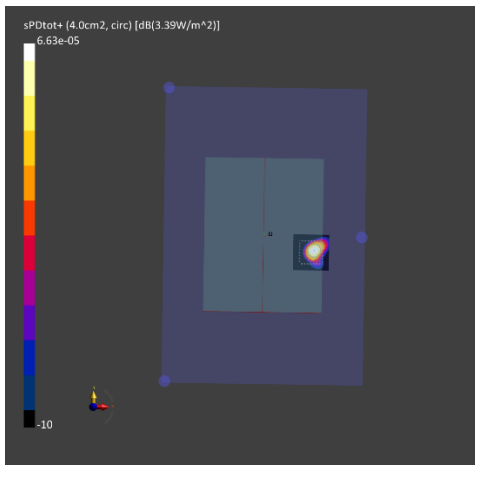
(a) Measurement

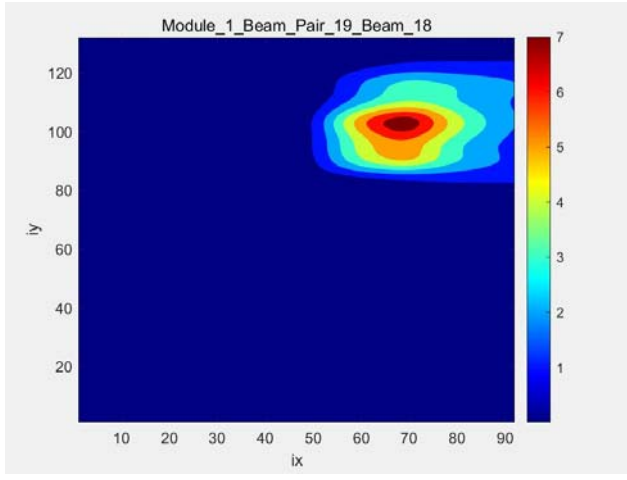


(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 18, Point power density

n260 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 18 Back-side Mid ch.

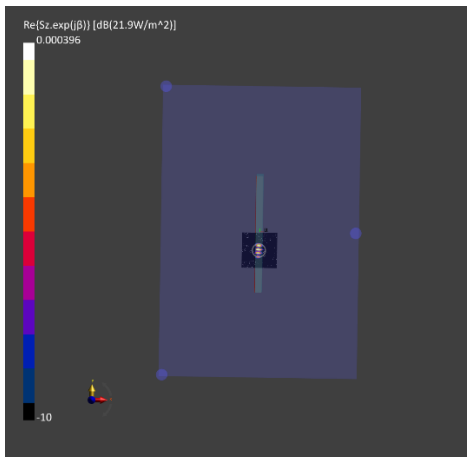


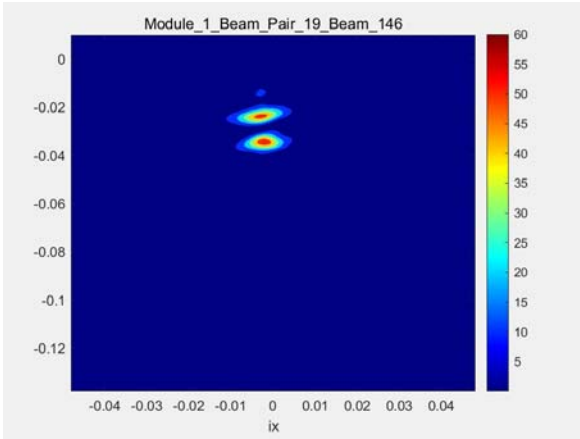


(a) Measurement (b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 18, 4cm^2 Averaged power density

n260 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 146 Top-side Mid ch.

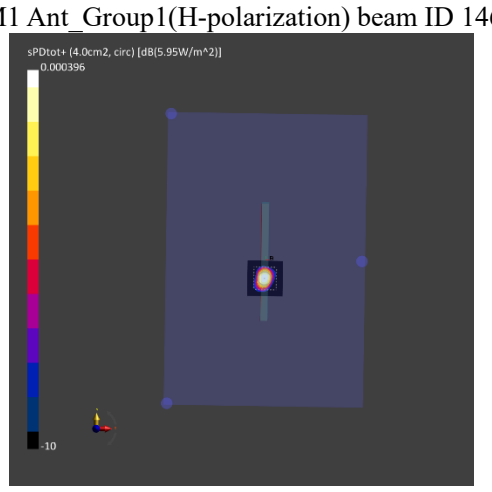


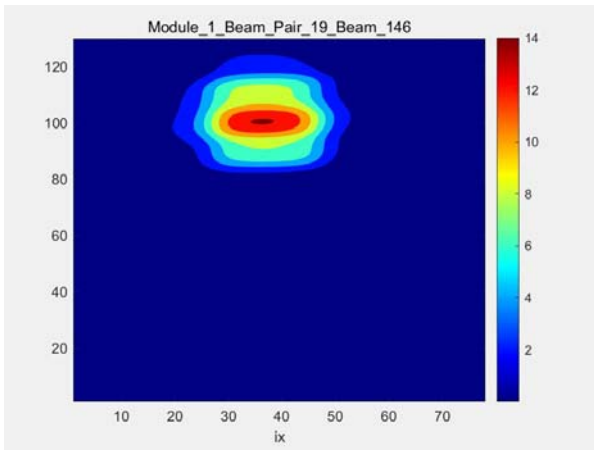


(a) Measurement (b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 146, Point power density

n260 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 146 Top-side Mid ch.

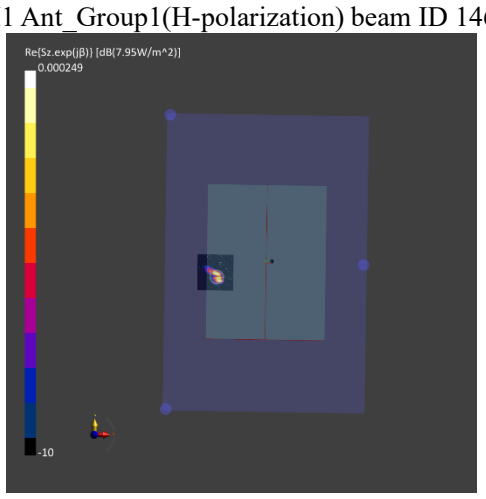




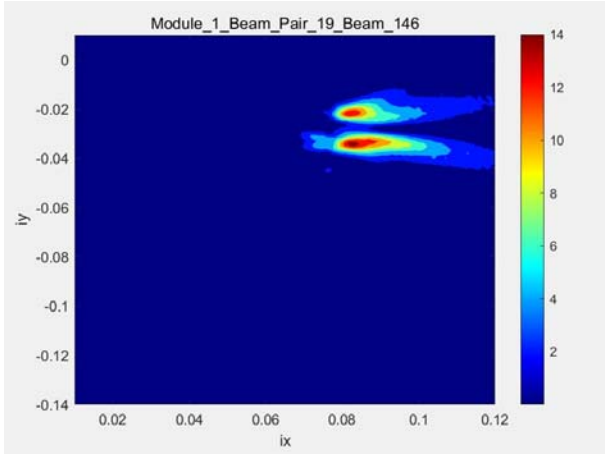
(a) Measurement (b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 146, 4cm^2 Averaged power density

n260 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 146 Front-side Mid ch.



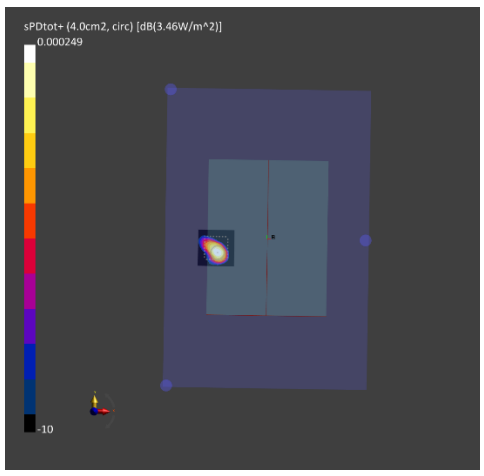
(a) Measurement



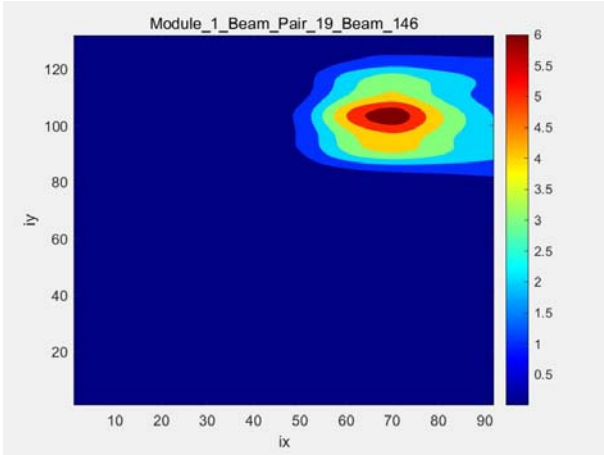
(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 146, Point power density

n260 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 146 Front-side Mid ch.



(a) Measurement



(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 146, 4cm^2 Averaged power density

3. Simulation results:

This section shows the PD simulation results of QTM#0 and QTM#1 at 28GHz and 39GHz for each evaluation plane specified in Table 1 at two separation distances of 2mm and 10mm distance. 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 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 tables MIMO results represent worst case of MIMO. After sweeping the relative phase between beams at 5° intervals from 0° to 360 °, the highest value is attached to the MIMO simulation results. 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.

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.

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

3.1.1 QTM#0 – Patch Antenna

Table 2 & Table 3 show the PD simulation evaluation of QTM#0 patch antenna at 28GHz /39GHz for the corresponding evaluation surfaces specified in Table 2.

Table 2. PD of QTM#0 – patch antenna

QTM#0 Low Ch.

n261 Low ch.(27.5 GHz)							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Top 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
261	2		QTM0	PATCH	1	3.93	0.09	0.04	1.52	0.04	0.39	1.62	0.04	0.03	0.6	0.02	0.41
261	6		QTM0	PATCH	2	7.09	0.2	0.08	3.46	0.08	0.49	3.76	0.1	0.05	1.54	0.04	0.53
261	7		QTM0	PATCH	2	6.67	0.11	0.09	3.16	0.09	0.47	3.57	0.05	0.06	1.55	0.045	0.54
261	8		QTM0	PATCH	2	6.77	0.32	0.11	2.18	0.07	0.32	2.06	0.12	0.09	0.83	0.035	0.30
261	11		QTM0	PATCH	2	7.19	0.13	0.05	3.65	0.06	0.51	3.88	0.06	0.03	1.73	0.035	0.54
261	12		QTM0	PATCH	2	7.51	0.19	0.06	3.98	0.07	0.53	4.05	0.1	0.04	1.83	0.035	0.54
261	18		QTM0	PATCH	4	10.44	0.29	0.45	4.23	0.09	0.41	3.97	0.15	0.33	1.94	0.045	0.38
261	19		QTM0	PATCH	4	13.77	0.24	0.14	7.01	0.14	0.51	7.26	0.13	0.1	3.44	0.07	0.53
261	20		QTM0	PATCH	4	14.5	0.36	0.11	7.37	0.19	0.51	7.67	0.17	0.09	3.59	0.1	0.53
261	21		QTM0	PATCH	4	12.5	0.34	0.17	6.1	0.2	0.49	6.65	0.17	0.11	2.86	0.1	0.53
261	22		QTM0	PATCH	4	9.37	0.58	0.3	3.74	0.14	0.40	3.92	0.2	0.23	1.43	0.07	0.42
261	27		QTM0	PATCH	4	12.52	0.22	0.16	5.86	0.14	0.47	6.18	0.11	0.11	2.88	0.075	0.49
261	28		QTM0	PATCH	4	14.43	0.3	0.11	7.35	0.16	0.51	7.43	0.14	0.09	3.6	0.08	0.51
261	29		QTM0	PATCH	4	13.82	0.37	0.11	7.04	0.22	0.51	7.58	0.18	0.08	3.4	0.115	0.55
261	30		QTM0	PATCH	4	10.64	0.32	0.23	4.82	0.17	0.45	5.23	0.16	0.16	2.12	0.085	0.49
261		130	QTM0	PATCH	1	3.5	0.06	0.02	1.53	0.04	0.44	1.46	0.02	0.02	0.59	0.02	0.42
261		134	QTM0	PATCH	2	5.79	0.25	0.08	1.94	0.04	0.34	2.27	0.07	0.06	0.85	0.02	0.39
261		135	QTM0	PATCH	2	7.9	0.2	0.05	4.14	0.07	0.52	4.34	0.09	0.03	1.88	0.04	0.55
261		136	QTM0	PATCH	2	7.22	0.1	0.09	2.95	0.1	0.41	3.15	0.04	0.07	1.28	0.05	0.44
261		139	QTM0	PATCH	2	7.64	0.2	0.12	3.48	0.08	0.46	3.77	0.1	0.07	1.51	0.04	0.49
261		140	QTM0	PATCH	2	7.73	0.2	0.07	4.13	0.08	0.53	4.15	0.09	0.05	1.89	0.04	0.54
261		146	QTM0	PATCH	4	8.37	0.36	0.39	3.45	0.09	0.41	3.57	0.19	0.25	1.42	0.045	0.43
261		147	QTM0	PATCH	4	11.6	0.38	0.22	5.4	0.16	0.47	5.8	0.18	0.18	2.6	0.085	0.50
261		148	QTM0	PATCH	4	13.84	0.33	0.05	7.59	0.19	0.55	7.51	0.15	0.04	3.67	0.1	0.54
261		149	QTM0	PATCH	4	12.52	0.27	0.11	7.18	0.19	0.57	6.91	0.13	0.07	3.36	0.095	0.55
261		150	QTM0	PATCH	4	11	0.27	0.18	5.6	0.13	0.51	5.5	0.13	0.13	2.6	0.065	0.50
261		155	QTM0	PATCH	4	10.22	0.42	0.29	4.58	0.14	0.45	4.82	0.22	0.19	2.06	0.07	0.47
261		156	QTM0	PATCH	4	12.92	0.34	0.08	6.69	0.16	0.52	6.94	0.18	0.06	3.31	0.085	0.54
261		157	QTM0	PATCH	4	13.58	0.3	0.06	7.71	0.21	0.57	7.51	0.15	0.04	3.66	0.11	0.55
261		158	QTM0	PATCH	4	11.73	0.24	0.17	6.46	0.17	0.55	6.25	0.12	0.11	2.94	0.085	0.53
261	2	130	QTM0	PATCH	1	7.88	0.23	0.1	4.2	0.09	0.53	3.42	0.09	0.08	1.7	0.045	0.43
261	6	134	QTM0	PATCH	2	13.57	0.48	0.22	6.96	0.17	0.51	6.84	0.24	0.16	3.22	0.085	0.50
261	7	135	QTM0	PATCH	2	15.66	0.46	0.23	9.21	0.23	0.59	8.54	0.2	0.16	4.51	0.12	0.55
261	8	136	QTM0	PATCH	2	14.67	0.58	0.26	6.29	0.16	0.43	5.83	0.19	0.2	2.4	0.08	0.40
261	11	139	QTM0	PATCH	2	16.25	0.52	0.24	9.1	0.18	0.56	7.98	0.22	0.13	4.34	0.09	0.49
261	12	140	QTM0	PATCH	2	16.4	0.61	0.19	10.01	0.19	0.61	9.75	0.29	0.12	4.6	0.09	0.59
261	18	146	QTM0	PATCH	4	22.17	1.01	1.11	10.56	0.21	0.48	8.6	0.52	0.79	4.41	0.11	0.39
261	19	147	QTM0	PATCH	4	27.4	0.82	0.61	13.36	0.35	0.49	13.96	0.31	0.45	6.42	0.175	0.51
261	20	148	QTM0	PATCH	4	28.82	0.83	0.16	15.79	0.46	0.55	18.46	0.42	0.12	7.99	0.24	0.64
261	21	149	QTM0	PATCH	4	25.85	0.73	0.45	14.35	0.54	0.56	15.32	0.37	0.27	6.95	0.27	0.59
261	22	150	QTM0	PATCH	4	24.62	0.9	0.62	11.95	0.45	0.49	10.92	0.41	0.46	5.19	0.225	0.44
261	27	155	QTM0	PATCH	4	26.22	0.99	0.75	13.08	0.33	0.50	12.01	0.42	0.54	6.1	0.165	0.46
261	28	156	QTM0	PATCH	4	28.27	0.83	0.26	15.35	0.38	0.54	16.95	0.43	0.2	7.59	0.19	0.60
261	29	157	QTM0	PATCH	4	28.25	0.75	0.21	15.45	0.49	0.55	18.09	0.35	0.14	7.5	0.245	0.64
261	30	158	QTM0	PATCH	4	24.97	0.75	0.61	13.33	0.52	0.53	12.13	0.39	0.4	6.11	0.265	0.49

QTM#0 Mid Ch.

n261 Mid ch.(28 GHz)							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Top 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
261	2		QTM0	PATCH	1	3.66	0.07	0.04	1.34	0.03	0.37	1.43	0.03	0.03	0.51	0.015	0.39
261	6		QTM0	PATCH	2	6.61	0.19	0.07	3.19	0.08	0.48	3.35	0.1	0.06	1.37	0.04	0.51
261	7		QTM0	PATCH	2	6.18	0.13	0.1	3.04	0.09	0.49	3.26	0.06	0.08	1.47	0.045	0.53
261	8		QTM0	PATCH	2	6.59	0.24	0.11	1.9	0.07	0.29	1.95	0.1	0.09	0.75	0.035	0.30
261	11		QTM0	PATCH	2	6.6	0.15	0.05	3.51	0.07	0.53	3.52	0.07	0.04	1.65	0.035	0.53
261	12		QTM0	PATCH	2	6.85	0.19	0.06	3.66	0.06	0.53	3.56	0.09	0.04	1.63	0.03	0.52
261	18		QTM0	PATCH	4	9.98	0.33	0.46	4.37	0.1	0.44	3.85	0.16	0.34	2	0.05	0.39
261	19		QTM0	PATCH	4	12.38	0.22	0.13	6.24	0.18	0.50	6.34	0.13	0.09	3.16	0.09	0.51
261	20		QTM0	PATCH	4	13.68	0.31	0.12	6.86	0.18	0.50	6.99	0.16	0.09	3.35	0.09	0.51
261	21		QTM0	PATCH	4	11.44	0.33	0.19	5.59	0.18	0.49	5.98	0.17	0.12	2.55	0.09	0.52
261	22		QTM0	PATCH	4	8.57	0.62	0.33	3.46	0.13	0.40	3.67	0.19	0.26	1.39	0.065	0.43
261	27		QTM0	PATCH	4	11.1	0.21	0.16	5.34	0.16	0.48	5.37	0.1	0.09	2.7	0.08	0.48
261	28		QTM0	PATCH	4	13.46	0.26	0.12	6.71	0.17	0.50	6.71	0.14	0.09	3.36	0.085	0.50
261	29		QTM0	PATCH	4	12.8	0.33	0.11	6.49	0.19	0.51	6.77	0.17	0.08	3.09	0.095	0.53
261	30		QTM0	PATCH	4	9.74	0.36	0.28	4.43	0.15	0.45	4.83	0.17	0.2	1.96	0.075	0.50
261		130	QTM0	PATCH	1	3.08	0.08	0.02	1.36	0.04	0.44	1.22	0.03	0.02	0.51	0.02	0.40
261		134	QTM0	PATCH	2	5.15	0.25	0.06	1.76	0.05	0.34	1.94	0.08	0.04	0.75	0.025	0.38
261		135	QTM0	PATCH	2	7.43	0.18	0.05	3.8	0.09	0.51	3.98	0.08	0.03	1.72	0.045	0.54
261		136	QTM0	PATCH	2	6.5	0.1	0.09	2.52	0.11	0.39	2.58	0.05	0.07	1.07	0.055	0.40
261		139	QTM0	PATCH	2	7.14	0.16	0.08	3.08	0.07	0.43	3.37	0.08	0.06	1.35	0.035	0.47
261		140	QTM0	PATCH	2	7.25	0.2	0.06	3.82	0.09	0.53	3.81	0.09	0.04	1.74	0.045	0.53
261		146	QTM0	PATCH	4	7.63	0.41	0.33	3.05	0.1	0.40	3.05	0.14	0.2	1.16	0.05	0.40
261		147	QTM0	PATCH	4	9.82	0.31	0.21	4.76	0.12	0.48	5.01	0.15	0.16	2.24	0.06	0.51
261		148	QTM0	PATCH	4	13.22	0.32	0.04	7.04	0.2	0.53	7.02	0.15	0.04	3.36	0.1	0.53
261		149	QTM0	PATCH	4	11.57	0.27	0.1	6.48	0.21	0.56	6.24	0.13	0.06	3.04	0.105	0.54
261		150	QTM0	PATCH	4	10.13	0.28	0.16	5.18	0.14	0.51	4.85	0.15	0.12	2.24	0.07	0.48
261		155	QTM0	PATCH	4	8.72	0.33	0.23	3.96	0.11	0.45	4.16	0.13	0.18	1.73	0.055	0.48
261		156	QTM0	PATCH	4	11.8	0.35	0.07	6.17	0.15	0.52	6.17	0.18	0.05	2.95	0.075	0.52
261		157	QTM0	PATCH	4	12.83	0.3	0.06	7.08	0.23	0.55	6.97	0.15	0.04	3.39	0.115	0.54
261		158	QTM0	PATCH	4	10.76	0.25	0.13	5.8	0.18	0.54	5.49	0.12	0.09	2.57	0.095	0.51
261	2	130	QTM0	PATCH	1	7.42	0.24	0.09	3.95	0.09	0.53	3.06	0.1	0.08	1.57	0.045	0.41
261	6	134	QTM0	PATCH	2	12.29	0.49	0.19	6.3	0.15	0.51	5.9	0.27	0.13	2.8	0.08	0.48
261	7	135	QTM0	PATCH	2	14.65	0.49	0.25	8.91	0.25	0.61	7.85	0.22	0.18	4.32	0.13	0.54
261	8	136	QTM0	PATCH	2	13.36	0.52	0.25	5.74	0.2	0.43	5.01	0.19	0.2	2.32	0.105	0.38
261	11	139	QTM0	PATCH	2	15.24	0.49	0.19	8.66	0.21	0.57	7.41	0.22	0.14	4.09	0.105	0.49
261	12	140	QTM0	PATCH	2	15.22	0.62	0.17	9.65	0.19	0.63	9.12	0.3	0.13	4.38	0.095	0.60
261	18	146	QTM0	PATCH	4	20.96	0.95	0.94	10.15	0.25	0.48	7.86	0.47	0.67	4.08	0.125	0.38
261	19	147	QTM0	PATCH	4	25.26	0.73	0.55	12.21	0.34	0.48	11.92	0.27	0.42	6.02	0.18	0.47
261	20	148	QTM0	PATCH	4	27.81	0.75	0.16	14.5	0.49	0.52	16.56	0.36	0.12	6.99	0.25	0.60
261	21	149	QTM0	PATCH	4	23.67	0.71	0.47	13.37	0.51	0.56	13.72	0.34	0.28	6.56	0.26	0.58
261	22	150	QTM0	PATCH	4	21.89	1.06	0.56	11.07	0.41	0.51	9.91	0.45	0.43	4.93	0.205	0.45
261	27	155	QTM0	PATCH	4	23.94	0.86	0.62	11.81	0.28	0.49	10.24	0.36	0.46	5.6	0.14	0.43
261	28	156	QTM0	PATCH	4	26.53	0.71	0.3	14.04	0.39	0.53	14.64	0.36	0.23	6.94	0.2	0.55
261	29	157	QTM0	PATCH	4	26.22	0.73	0.24	14.34	0.5	0.55	16.19	0.36	0.16	6.99	0.255	0.62
261	30	158	QTM0	PATCH	4	22.63	0.77	0.6	12.41	0.48	0.55	11.31	0.39	0.42	5.89	0.245	0.50

QTM#0 High Ch.

n261 High ch.(28.35 GHz)						4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10mm evaluation surface @6dBm					Ratio
						relative phase worst PD for MIMO					Top 2mm/worst surface 2mm	relative phase worst PD for MIMO					worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
261	2		QTM0	PATCH	1	3.39	0.07	0.04	1.21	0.03	0.36	1.29	0.03	0.03	0.45	0.02	0.38
261	6		QTM0	PATCH	2	6.07	0.17	0.07	2.89	0.07	0.48	3	0.09	0.06	1.24	0.035	0.49
261	7		QTM0	PATCH	2	5.97	0.14	0.11	2.99	0.09	0.50	2.96	0.07	0.08	1.48	0.045	0.50
261	8		QTM0	PATCH	2	6.21	0.2	0.12	1.6	0.06	0.26	1.79	0.08	0.09	0.63	0.03	0.29
261	11		QTM0	PATCH	2	6.2	0.16	0.05	3.39	0.07	0.55	3.18	0.07	0.03	1.64	0.035	0.51
261	12		QTM0	PATCH	2	6.26	0.18	0.07	3.37	0.07	0.54	3.21	0.08	0.05	1.52	0.035	0.51
261	18		QTM0	PATCH	4	9.68	0.33	0.41	4.26	0.09	0.44	3.7	0.15	0.28	1.9	0.045	0.38
261	19		QTM0	PATCH	4	11.11	0.22	0.11	5.55	0.18	0.50	5.5	0.11	0.08	2.84	0.095	0.50
261	20		QTM0	PATCH	4	12.87	0.28	0.11	6.28	0.18	0.49	6.34	0.14	0.08	3.12	0.095	0.49
261	21		QTM0	PATCH	4	10.46	0.27	0.22	5.09	0.18	0.49	5.36	0.15	0.14	2.28	0.095	0.51
261	22		QTM0	PATCH	4	8.05	0.63	0.36	3.07	0.12	0.38	3.44	0.2	0.28	1.25	0.06	0.43
261	27		QTM0	PATCH	4	10.02	0.2	0.13	4.89	0.14	0.49	4.8	0.09	0.07	2.5	0.075	0.48
261	28		QTM0	PATCH	4	12.32	0.26	0.11	5.97	0.18	0.48	5.89	0.13	0.08	3.04	0.095	0.48
261	29		QTM0	PATCH	4	11.92	0.27	0.11	5.98	0.19	0.50	6.14	0.15	0.07	2.88	0.095	0.52
261	30		QTM0	PATCH	4	8.96	0.4	0.33	3.93	0.16	0.44	4.37	0.14	0.24	1.68	0.08	0.49
261		130	QTM0	PATCH	1	2.8	0.08	0.02	1.25	0.04	0.45	1.07	0.03	0.01	0.49	0.02	0.38
261		134	QTM0	PATCH	2	4.51	0.23	0.06	1.57	0.06	0.35	1.68	0.09	0.04	0.69	0.03	0.37
261		135	QTM0	PATCH	2	6.88	0.15	0.05	3.42	0.08	0.50	3.63	0.07	0.04	1.55	0.04	0.53
261		136	QTM0	PATCH	2	5.97	0.1	0.09	2.24	0.11	0.38	2.28	0.06	0.07	0.95	0.06	0.38
261		139	QTM0	PATCH	2	6.63	0.14	0.07	2.71	0.07	0.41	3.03	0.05	0.05	1.19	0.035	0.46
261		140	QTM0	PATCH	2	6.85	0.18	0.06	3.56	0.08	0.52	3.52	0.08	0.04	1.6	0.04	0.51
261		146	QTM0	PATCH	4	7.43	0.4	0.29	2.84	0.09	0.38	2.73	0.15	0.17	1.03	0.045	0.37
261		147	QTM0	PATCH	4	8.67	0.34	0.22	4.35	0.08	0.50	4.39	0.13	0.17	1.96	0.045	0.51
261		148	QTM0	PATCH	4	12.28	0.32	0.03	6.4	0.2	0.52	6.39	0.15	0.02	3.1	0.105	0.52
261		149	QTM0	PATCH	4	10.62	0.27	0.1	5.89	0.21	0.55	5.53	0.13	0.06	2.86	0.105	0.52
261		150	QTM0	PATCH	4	9.32	0.26	0.15	4.92	0.12	0.53	4.45	0.13	0.12	2.14	0.06	0.48
261		155	QTM0	PATCH	4	7.9	0.36	0.22	3.61	0.08	0.46	3.62	0.11	0.17	1.46	0.04	0.46
261		156	QTM0	PATCH	4	10.87	0.31	0.08	5.64	0.13	0.52	5.56	0.17	0.06	2.67	0.065	0.51
261		157	QTM0	PATCH	4	11.88	0.32	0.06	6.4	0.23	0.54	6.23	0.15	0.04	3.15	0.12	0.52
261		158	QTM0	PATCH	4	9.82	0.24	0.09	5.34	0.17	0.54	4.91	0.11	0.06	2.45	0.085	0.50
261	2	130	QTM0	PATCH	1	7.09	0.24	0.08	3.66	0.09	0.52	2.77	0.1	0.07	1.45	0.045	0.39
261	6	134	QTM0	PATCH	2	11.16	0.46	0.16	5.8	0.15	0.52	5.23	0.24	0.12	2.62	0.08	0.47
261	7	135	QTM0	PATCH	2	14.13	0.48	0.27	8.36	0.25	0.59	7.07	0.22	0.19	4.05	0.125	0.50
261	8	136	QTM0	PATCH	2	12.26	0.42	0.28	5.1	0.21	0.42	4.5	0.17	0.21	2.07	0.11	0.37
261	11	139	QTM0	PATCH	2	14.64	0.46	0.19	8.2	0.22	0.56	6.81	0.2	0.13	3.88	0.11	0.47
261	12	140	QTM0	PATCH	2	14.17	0.58	0.17	9.03	0.18	0.64	8.33	0.29	0.13	4.08	0.09	0.59
261	18	146	QTM0	PATCH	4	20.68	1	0.78	9.83	0.24	0.48	7.4	0.45	0.52	3.9	0.12	0.36
261	19	147	QTM0	PATCH	4	23.5	0.75	0.52	11.48	0.3	0.49	10.52	0.25	0.4	5.6	0.155	0.45
261	20	148	QTM0	PATCH	4	25.88	0.66	0.15	13.13	0.51	0.51	14.86	0.3	0.11	6.49	0.265	0.57
261	21	149	QTM0	PATCH	4	22.21	0.66	0.45	12.35	0.45	0.56	11.8	0.33	0.28	6.16	0.225	0.53
261	22	150	QTM0	PATCH	4	20.33	1.15	0.5	10.26	0.36	0.50	9.13	0.48	0.39	4.65	0.185	0.45
261	27	155	QTM0	PATCH	4	22.48	0.91	0.54	10.96	0.26	0.49	9.29	0.31	0.39	5.11	0.135	0.41
261	28	156	QTM0	PATCH	4	24.92	0.6	0.32	12.74	0.37	0.51	12.66	0.31	0.24	6.38	0.19	0.51
261	29	157	QTM0	PATCH	4	24.33	0.7	0.24	13.12	0.5	0.54	14.31	0.33	0.15	6.6	0.25	0.59
261	30	158	QTM0	PATCH	4	21.22	0.76	0.57	11.41	0.43	0.54	10.22	0.34	0.39	5.48	0.215	0.48

Table 3. PD of QTM#0 – patch antenna

QTM#0 Low Ch.

n260 Mid ch.(37 GHz)							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Top 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
260	4		QTM0	PATCH	1	2.23	0.06	0.06	0.74	0.03	0.33	0.67	0.03	0.05	0.34	0.015	0.30
260	8		QTM0	PATCH	2	5.26	0.23	0.12	1.5	0.11	0.29	1.36	0.1	0.1	0.65	0.055	0.26
260	9		QTM0	PATCH	2	3.86	0.11	0.09	1.61	0.06	0.42	1.59	0.06	0.06	0.82	0.03	0.41
260	10		QTM0	PATCH	2	5.02	0.23	0.12	1.85	0.09	0.37	1.36	0.1	0.1	0.75	0.04	0.27
260	13		QTM0	PATCH	2	4.57	0.14	0.08	1.88	0.05	0.41	1.81	0.07	0.07	0.97	0.025	0.40
260	14		QTM0	PATCH	2	4.59	0.19	0.07	1.58	0.11	0.34	1.51	0.08	0.05	0.92	0.055	0.33
260	20		QTM0	PATCH	4	9.41	0.49	0.27	3.71	0.19	0.39	3.07	0.19	0.24	1.65	0.09	0.33
260	21		QTM0	PATCH	4	7.43	0.3	0.22	3.03	0.08	0.41	2.95	0.14	0.18	1.61	0.04	0.40
260	22		QTM0	PATCH	4	6.77	0.25	0.12	2.84	0.2	0.42	2.8	0.12	0.1	1.55	0.1	0.41
260	23		QTM0	PATCH	4	7.62	0.29	0.17	2.84	0.24	0.37	2.43	0.14	0.12	1.54	0.12	0.32
260	24		QTM0	PATCH	4	9.43	0.45	0.3	3.53	0.19	0.37	2.96	0.19	0.26	1.52	0.09	0.31
260	29		QTM0	PATCH	4	8.69	0.35	0.31	3.38	0.11	0.39	3.31	0.15	0.26	1.68	0.055	0.38
260	30		QTM0	PATCH	4	6.42	0.31	0.1	2.7	0.16	0.42	2.48	0.13	0.08	1.49	0.08	0.39
260	31		QTM0	PATCH	4	7.12	0.29	0.17	2.81	0.21	0.39	2.32	0.14	0.12	1.57	0.105	0.33
260	32		QTM0	PATCH	4	9.26	0.46	0.26	3.32	0.25	0.36	2.74	0.19	0.18	1.39	0.12	0.30
260		132	QTM0	PATCH	1	2.01	0.09	0.04	0.94	0.02	0.47	0.7	0.04	0.03	0.39	0.01	0.35
260		136	QTM0	PATCH	2	5.07	0.19	0.12	1.77	0.1	0.35	1.53	0.08	0.1	0.86	0.05	0.30
260		137	QTM0	PATCH	2	3.72	0.18	0.07	1.42	0.08	0.38	1.24	0.07	0.04	0.7	0.04	0.33
260		138	QTM0	PATCH	2	5.07	0.19	0.12	1.77	0.1	0.35	1.53	0.08	0.1	0.86	0.05	0.30
260		141	QTM0	PATCH	2	4.3	0.16	0.08	1.76	0.08	0.41	1.53	0.07	0.06	1.02	0.035	0.36
260		142	QTM0	PATCH	2	4.68	0.24	0.09	1.54	0.06	0.33	1.3	0.09	0.07	0.49	0.03	0.28
260		148	QTM0	PATCH	4	8.16	0.47	0.37	3.46	0.15	0.42	2.58	0.21	0.28	1.34	0.075	0.32
260		149	QTM0	PATCH	4	7.25	0.3	0.19	2.99	0.22	0.41	2.7	0.16	0.15	1.5	0.105	0.37
260		150	QTM0	PATCH	4	6	0.24	0.07	2.57	0.16	0.43	2.27	0.13	0.05	1.45	0.085	0.38
260		151	QTM0	PATCH	4	6.98	0.33	0.1	3.12	0.07	0.45	2.69	0.11	0.07	1.61	0.035	0.39
260		152	QTM0	PATCH	4	8.19	0.47	0.32	3.74	0.1	0.46	2.87	0.19	0.24	1.68	0.05	0.35
260		157	QTM0	PATCH	4	7.75	0.32	0.3	3.14	0.22	0.41	2.72	0.14	0.24	1.3	0.105	0.35
260		158	QTM0	PATCH	4	5.91	0.22	0.06	2.85	0.15	0.48	2.43	0.11	0.05	1.54	0.075	0.41
260		159	QTM0	PATCH	4	6.19	0.32	0.1	2.74	0.11	0.44	2.27	0.13	0.07	1.47	0.055	0.37
260		160	QTM0	PATCH	4	8.1	0.37	0.22	3.55	0.09	0.44	3.02	0.17	0.13	1.64	0.045	0.37
260	4	132	QTM0	PATCH	1	4.76	0.24	0.14	1.9	0.06	0.40	1.61	0.1	0.11	0.81	0.03	0.34
260	8	136	QTM0	PATCH	2	8.7	0.48	0.23	3.12	0.18	0.36	2.89	0.22	0.19	1.48	0.085	0.33
260	9	137	QTM0	PATCH	2	8.36	0.34	0.28	3.46	0.16	0.41	2.95	0.16	0.2	1.87	0.08	0.35
260	10	138	QTM0	PATCH	2	10.2	0.64	0.25	4.12	0.17	0.40	2.98	0.3	0.2	1.87	0.08	0.29
260	13	141	QTM0	PATCH	2	9.67	0.45	0.26	4.23	0.15	0.44	3.51	0.21	0.19	2.57	0.075	0.36
260	14	142	QTM0	PATCH	2	8.49	0.46	0.14	3.12	0.21	0.37	2.71	0.18	0.12	1.42	0.105	0.32
260	20	148	QTM0	PATCH	4	20.72	1.33	0.71	8.43	0.41	0.41	5.77	0.56	0.53	3.84	0.19	0.28
260	21	149	QTM0	PATCH	4	16.87	0.99	0.58	7.81	0.34	0.46	6.31	0.5	0.47	4.37	0.17	0.37
260	22	150	QTM0	PATCH	4	13.63	0.58	0.23	5.72	0.43	0.42	6	0.29	0.17	3.28	0.22	0.44
260	23	151	QTM0	PATCH	4	17.26	0.95	0.45	7.87	0.38	0.46	5.74	0.41	0.31	4.48	0.19	0.33
260	24	152	QTM0	PATCH	4	21.26	1.42	0.64	8.86	0.41	0.42	5.81	0.62	0.48	4.14	0.195	0.27
260	29	157	QTM0	PATCH	4	19.07	1.11	0.68	8.16	0.33	0.43	6.7	0.5	0.56	4.02	0.16	0.35
260	30	158	QTM0	PATCH	4	12.82	0.63	0.31	6.01	0.33	0.47	5.81	0.34	0.25	3.57	0.165	0.45
260	31	159	QTM0	PATCH	4	15.31	0.82	0.48	6.79	0.36	0.44	5.23	0.41	0.32	4.11	0.18	0.34
260	32	160	QTM0	PATCH	4	21.13	1.31	0.49	8.98	0.48	0.42	5.83	0.49	0.33	4.01	0.235	0.28

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QTM#0 Mid Ch.

n260 Mid ch.(38.5 GHz)							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Top 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
260	4		QTM0	PATCH	1	2.65	0.1	0.04	0.89	0.05	0.34	0.86	0.04	0.03	0.35	0.025	0.32
260	8		QTM0	PATCH	2	6.09	0.33	0.07	2.08	0.11	0.34	1.75	0.15	0.05	0.93	0.055	0.29
260	9		QTM0	PATCH	2	5.83	0.21	0.11	2.98	0.06	0.51	2.62	0.1	0.07	1.54	0.03	0.45
260	10		QTM0	PATCH	2	6.31	0.29	0.08	2.66	0.08	0.42	2.09	0.12	0.06	0.97	0.04	0.33
260	13		QTM0	PATCH	2	6.14	0.27	0.13	2.69	0.05	0.44	2.79	0.1	0.1	1.38	0.025	0.45
260	14		QTM0	PATCH	2	5.72	0.25	0.03	1.66	0.15	0.29	2.09	0.1	0.02	0.97	0.075	0.37
260	20		QTM0	PATCH	4	11.01	0.4	0.26	3.76	0.15	0.34	3.95	0.2	0.2	1.55	0.075	0.36
260	21		QTM0	PATCH	4	9.35	0.44	0.18	4.34	0.11	0.46	3.88	0.2	0.14	2.01	0.05	0.41
260	22		QTM0	PATCH	4	9.18	0.4	0.15	3.9	0.17	0.42	3.88	0.16	0.11	2	0.085	0.42
260	23		QTM0	PATCH	4	9.21	0.49	0.14	4.07	0.21	0.44	3.39	0.25	0.1	2.18	0.105	0.37
260	24		QTM0	PATCH	4	11.07	0.58	0.3	3.83	0.16	0.35	3.96	0.28	0.21	1.44	0.08	0.36
260	29		QTM0	PATCH	4	10.3	0.51	0.27	4.33	0.13	0.42	4.04	0.2	0.19	1.78	0.065	0.39
260	30		QTM0	PATCH	4	8.87	0.4	0.15	3.89	0.16	0.44	3.79	0.17	0.11	1.96	0.08	0.43
260	31		QTM0	PATCH	4	9.23	0.48	0.13	4.25	0.2	0.46	3.4	0.25	0.09	2.2	0.095	0.37
260	32		QTM0	PATCH	4	10.49	0.42	0.2	3.57	0.2	0.34	3.88	0.22	0.16	1.41	0.1	0.37
260		132	QTM0	PATCH	1	2.6	0.11	0.03	1.44	0.02	0.55	1.04	0.05	0.02	0.67	0.01	0.40
260		136	QTM0	PATCH	2	6.15	0.16	0.13	2	0.1	0.33	2.22	0.06	0.09	0.99	0.05	0.36
260		137	QTM0	PATCH	2	4.79	0.14	0.08	1.6	0.1	0.33	1.56	0.06	0.06	0.79	0.055	0.33
260		138	QTM0	PATCH	2	6.15	0.16	0.13	2	0.1	0.33	2.22	0.06	0.09	0.99	0.05	0.36
260		141	QTM0	PATCH	2	5.56	0.15	0.1	1.92	0.13	0.35	2.1	0.08	0.07	1.07	0.065	0.38
260		142	QTM0	PATCH	2	5.55	0.18	0.13	1.78	0.06	0.32	1.83	0.08	0.07	0.66	0.03	0.33
260		148	QTM0	PATCH	4	9.77	0.28	0.38	3.68	0.13	0.38	3.44	0.13	0.24	1.53	0.065	0.35
260		149	QTM0	PATCH	4	8.3	0.47	0.15	4.2	0.16	0.51	3.46	0.26	0.11	2.16	0.08	0.42
260		150	QTM0	PATCH	4	8.3	0.26	0.1	3.37	0.2	0.41	3.44	0.11	0.09	1.73	0.1	0.41
260		151	QTM0	PATCH	4	8.52	0.29	0.1	3.53	0.08	0.41	3.52	0.14	0.07	1.78	0.04	0.41
260		152	QTM0	PATCH	4	9.95	0.32	0.32	3.69	0.14	0.37	3.73	0.16	0.2	1.88	0.07	0.37
260		157	QTM0	PATCH	4	8.75	0.36	0.26	4.02	0.14	0.46	3.44	0.18	0.2	1.82	0.07	0.39
260		158	QTM0	PATCH	4	8.48	0.35	0.15	3.6	0.21	0.42	3.29	0.17	0.12	1.89	0.11	0.39
260		159	QTM0	PATCH	4	8.33	0.29	0.1	3.37	0.16	0.40	3.43	0.14	0.06	1.73	0.08	0.41
260		160	QTM0	PATCH	4	9.62	0.32	0.2	3.82	0.1	0.40	3.83	0.16	0.12	1.75	0.05	0.40
260	4	132	QTM0	PATCH	1	5.57	0.3	0.08	2.51	0.09	0.45	2.23	0.12	0.05	1.17	0.045	0.40
260	8	136	QTM0	PATCH	2	10.4	0.58	0.26	4.05	0.16	0.39	3.62	0.26	0.2	2.09	0.085	0.35
260	9	137	QTM0	PATCH	2	11.44	0.43	0.3	5.29	0.21	0.46	4.28	0.2	0.22	2.67	0.105	0.37
260	10	138	QTM0	PATCH	2	12.62	0.51	0.27	5.75	0.2	0.46	4.95	0.26	0.19	2.56	0.1	0.39
260	13	141	QTM0	PATCH	2	12.43	0.41	0.31	5.92	0.26	0.48	5.6	0.22	0.24	3.17	0.135	0.45
260	14	142	QTM0	PATCH	2	9.89	0.5	0.17	3.32	0.25	0.34	3.65	0.21	0.11	1.76	0.13	0.37
260	20	148	QTM0	PATCH	4	23.22	1.2	0.82	7.92	0.33	0.34	7.49	0.6	0.55	3.71	0.165	0.32
260	21	149	QTM0	PATCH	4	20.46	1.01	0.48	10.72	0.36	0.52	8.97	0.51	0.37	5.42	0.18	0.44
260	22	150	QTM0	PATCH	4	18.07	0.79	0.31	7.88	0.48	0.44	8.83	0.37	0.23	3.99	0.245	0.49
260	23	151	QTM0	PATCH	4	20.96	1.04	0.4	9.03	0.42	0.43	7.37	0.49	0.26	5.29	0.21	0.35
260	24	152	QTM0	PATCH	4	23.83	1.47	0.81	8.23	0.32	0.35	8.07	0.73	0.53	3.93	0.165	0.34
260	29	157	QTM0	PATCH	4	21.8	1.24	0.63	9.67	0.3	0.44	8.4	0.46	0.48	4.67	0.15	0.39
260	30	158	QTM0	PATCH	4	17.84	0.92	0.39	9.12	0.53	0.51	8.59	0.42	0.32	4.83	0.27	0.48
260	31	159	QTM0	PATCH	4	19.4	0.98	0.31	8.84	0.48	0.46	7.2	0.5	0.21	5.13	0.245	0.37
260	32	160	QTM0	PATCH	4	23.73	1.15	0.59	8.62	0.32	0.36	8.16	0.6	0.43	4.21	0.15	0.34

QTM#0 High Ch.

n260 Mid ch.(40 GHz)							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Top 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
260	4		QTM0	PATCH	1	3.29	0.13	0.06	1.34	0.05	0.41	0.94	0.05	0.06	0.53	0.025	0.29
260	8		QTM0	PATCH	2	5.98	0.34	0.09	2.62	0.1	0.44	1.44	0.14	0.07	1.22	0.055	0.24
260	9		QTM0	PATCH	2	5.86	0.25	0.14	2.79	0.07	0.48	2.31	0.11	0.1	1.22	0.035	0.39
260	10		QTM0	PATCH	2	6.95	0.37	0.15	3.23	0.1	0.46	2.03	0.15	0.13	1.13	0.05	0.29
260	13		QTM0	PATCH	2	5.71	0.3	0.22	2.61	0.05	0.46	2.28	0.13	0.16	1.17	0.025	0.40
260	14		QTM0	PATCH	2	5.44	0.22	0.06	1.86	0.12	0.34	1.74	0.11	0.06	1.08	0.06	0.32
260	20		QTM0	PATCH	4	9.91	0.51	0.34	4.25	0.11	0.43	2.94	0.26	0.28	1.8	0.055	0.30
260	21		QTM0	PATCH	4	10.55	0.54	0.26	5.75	0.08	0.55	4.12	0.24	0.2	2.3	0.04	0.39
260	22		QTM0	PATCH	4	9.41	0.61	0.21	4.15	0.1	0.44	3.42	0.27	0.16	1.79	0.05	0.36
260	23		QTM0	PATCH	4	9.46	0.39	0.13	3.28	0.23	0.35	3.46	0.17	0.09	1.68	0.115	0.37
260	24		QTM0	PATCH	4	10	0.75	0.34	4.35	0.13	0.44	2.83	0.38	0.29	1.63	0.065	0.28
260	29		QTM0	PATCH	4	10.28	0.62	0.26	5.23	0.11	0.51	3.57	0.29	0.19	2.14	0.05	0.35
260	30		QTM0	PATCH	4	9.94	0.57	0.27	5.04	0.08	0.51	3.83	0.25	0.21	2.05	0.04	0.39
260	31		QTM0	PATCH	4	9.49	0.41	0.13	3.19	0.22	0.34	3.51	0.19	0.09	1.56	0.11	0.37
260	32		QTM0	PATCH	4	9.53	0.42	0.27	3.78	0.15	0.40	2.93	0.22	0.23	1.57	0.075	0.31
260		132	QTM0	PATCH	1	3	0.12	0.05	1.49	0.04	0.50	1.08	0.05	0.04	0.63	0.02	0.36
260		136	QTM0	PATCH	2	5.97	0.21	0.15	2.26	0.14	0.38	1.87	0.1	0.11	1.11	0.07	0.31
260		137	QTM0	PATCH	2	5.67	0.19	0.08	2.2	0.06	0.39	1.84	0.09	0.06	1.06	0.03	0.32
260		138	QTM0	PATCH	2	5.97	0.21	0.15	2.26	0.14	0.38	1.87	0.1	0.11	1.11	0.07	0.31
260		141	QTM0	PATCH	2	5.81	0.19	0.14	1.97	0.13	0.34	2.09	0.09	0.1	1.09	0.065	0.36
260		142	QTM0	PATCH	2	5.83	0.21	0.13	2.44	0.11	0.42	1.7	0.09	0.09	0.86	0.05	0.29
260		148	QTM0	PATCH	4	8.96	0.42	0.3	3.46	0.18	0.39	2.71	0.19	0.23	1.43	0.09	0.30
260		149	QTM0	PATCH	4	8.2	0.32	0.15	2.92	0.27	0.36	2.95	0.19	0.11	1.66	0.135	0.36
260		150	QTM0	PATCH	4	9.7	0.34	0.13	4.67	0.15	0.48	3.94	0.18	0.1	2.15	0.07	0.41
260		151	QTM0	PATCH	4	9.4	0.39	0.16	5.09	0.07	0.54	3.97	0.21	0.12	2.19	0.035	0.42
260		152	QTM0	PATCH	4	9.13	0.37	0.29	3.79	0.14	0.42	3.03	0.18	0.23	1.62	0.07	0.33
260		157	QTM0	PATCH	4	8.57	0.36	0.22	3.24	0.24	0.38	2.83	0.15	0.17	1.62	0.12	0.33
260		158	QTM0	PATCH	4	9.31	0.38	0.27	3.31	0.16	0.36	3.31	0.16	0.2	1.57	0.08	0.36
260		159	QTM0	PATCH	4	9.4	0.39	0.1	4.99	0.1	0.53	3.96	0.21	0.09	2.23	0.09	0.045
260		160	QTM0	PATCH	4	9.39	0.38	0.29	4.57	0.11	0.49	3.4	0.19	0.21	1.71	0.11	0.055
260	4	132	QTM0	PATCH	1	7.1	0.44	0.19	3.86	0.09	0.54	2.31	0.19	0.16	1.59	0.09	0.045
260	8	136	QTM0	PATCH	2	10.83	0.57	0.31	5.22	0.25	0.48	3.57	0.27	0.23	2.81	0.25	0.125
260	9	137	QTM0	PATCH	2	12.42	0.67	0.25	6.39	0.18	0.51	5.28	0.26	0.18	2.86	0.19	0.095
260	10	138	QTM0	PATCH	2	12.85	0.77	0.35	6.88	0.25	0.54	4.16	0.34	0.27	3.06	0.25	0.125
260	13	141	QTM0	PATCH	2	12.62	0.53	0.4	6.23	0.23	0.49	5.4	0.28	0.3	3.12	0.23	0.115
260	14	142	QTM0	PATCH	2	10.37	0.44	0.21	4.52	0.26	0.44	3.24	0.21	0.15	2.33	0.27	0.135
260	20	148	QTM0	PATCH	4	20.62	1.64	0.84	8.53	0.41	0.41	6.06	0.8	0.61	3.72	0.42	0.21
260	21	149	QTM0	PATCH	4	20.25	1.23	0.68	10.52	0.36	0.52	7.73	0.48	0.54	5.42	0.36	0.18
260	22	150	QTM0	PATCH	4	21.08	1.1	0.45	9.61	0.39	0.46	8.49	0.48	0.33	4.57	0.39	0.195
260	23	151	QTM0	PATCH	4	20.54	0.98	0.37	10.95	0.45	0.53	8.18	0.47	0.26	5.38	0.45	0.225
260	24	152	QTM0	PATCH	4	21.4	1.96	0.98	8.89	0.33	0.42	6.38	0.96	0.69	3.75	0.34	0.17
260	29	157	QTM0	PATCH	4	20.69	1.82	0.7	9.99	0.39	0.48	6.71	0.79	0.54	5	0.4	0.2
260	30	158	QTM0	PATCH	4	20.05	1.06	0.59	9.34	0.35	0.47	8.22	0.44	0.45	4.6	0.35	0.175
260	31	159	QTM0	PATCH	4	19.88	0.9	0.31	10.42	0.53	0.52	8.17	0.47	0.24	5.28	0.53	0.265
260	32	160	QTM0	PATCH	4	21.2	1.28	0.73	10.05	0.34	0.47	6.98	0.73	0.58	4.33	0.32	0.16

3.1.2 QTM#1 – Patch Antenna

Table 4 & Table 5 show the PD simulation evaluation of QTM#1 patch antenna at 28GHz / 39GHz for the corresponding evaluation planes specified in Table 1.

Table 4. PD of QTM#1 – patch antenna

QTM#1 Low Ch.

n261 Mid ch.27.5 GHz						4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10mm evaluation surface @6dBm					Ratio
						relative phase worst PD for MIMO					Front 2mm/worst surface 2mm	relative phase worst PD for MIMO					worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
261	0		QTM1	PATCH	1	2.5	1.67	0.01	4.93	0.01	0.51	0.81	0.63	0.01	2.12	0.005	0.43
261	1		QTM1	PATCH	2	2.38	1.75	0.01	4.68	0.01	0.51	0.87	0.65	0.01	2.03	0.005	0.43
261	3		QTM1	PATCH	2	3.57	1.75	0.04	7.48	0.02	0.48	1.03	0.63	0.04	2.22	0.01	0.30
261	4		QTM1	PATCH	2	4.37	3.82	0.01	8.55	0.02	0.51	1.8	1.63	0.01	4.94	0.01	0.58
261	5		QTM1	PATCH	2	2.88	2.64	0.04	7.64	0.02	0.38	1.06	0.82	0.03	2.49	0.01	0.33
261	9		QTM1	PATCH	2	4.71	3.61	0.03	9.34	0.02	0.50	2.14	1.49	0.03	4.55	0.01	0.49
261	10		QTM1	PATCH	4	4.84	3.67	0.01	8.9	0.02	0.54	1.98	1.47	0.01	5.05	0.01	0.57
261	13		QTM1	PATCH	4	4.58	4.8	0.16	10.49	0.06	0.44	1.86	1.65	0.15	4.42	0.03	0.42
261	14		QTM1	PATCH	4	7.86	6.92	0.04	15.53	0.05	0.51	3.57	3.13	0.03	8.31	0.025	0.54
261	15		QTM1	PATCH	4	9.58	7.92	0.02	17.21	0.04	0.56	4.69	3.92	0.02	10.23	0.02	0.59
261	16		QTM1	PATCH	4	9.08	7.36	0.01	16.38	0.05	0.55	4.25	3.59	0.01	9.54	0.025	0.58
261	17		QTM1	PATCH	4	7.52	4.3	0.07	13.17	0.05	0.57	2.97	1.83	0.06	6.58	0.025	0.50
261	23		QTM1	PATCH	4	6.71	6.05	0.09	14.03	0.06	0.48	3.04	2.33	0.07	6.73	0.03	0.48
261	24		QTM1	PATCH	4	8.8	7.97	0.02	16.72	0.06	0.53	4.17	3.93	0.02	9.7	0.03	0.58
261	25		QTM1	PATCH	4	9.55	7.56	0.01	16.69	0.06	0.57	4.63	3.83	0.01	9.83	0.03	0.59
261	26		QTM1	PATCH	4	8.65	5.79	0.03	15.28	0.03	0.57	3.88	2.69	0.02	8.3	0.015	0.54
261		128	QTM1	PATCH	1	2.2	1.91	0.01	4.79	0.01	0.46	0.75	0.73	0.01	2.26	0.005	0.47
261		129	QTM1	PATCH	2	2.13	1.49	0.01	4.17	0.01	0.51	0.73	0.57	0.01	1.75	0.005	0.42
261		131	QTM1	PATCH	2	3.54	2.64	0.03	7.81	0.02	0.45	1.28	1.2	0.03	2.99	0.01	0.38
261		132	QTM1	PATCH	2	5.25	3.95	0	9.03	0.01	0.58	2.11	1.79	0	5.31	0.005	0.59
261		133	QTM1	PATCH	2	3.32	1.43	0.03	6.43	0.01	0.52	0.96	0.44	0.03	1.8	0.005	0.28
261		137	QTM1	PATCH	2	3.96	2.91	0.03	7.88	0.02	0.50	1.51	1.26	0.02	3.67	0.01	0.47
261		138	QTM1	PATCH	4	4.43	4.02	0.01	9.03	0.02	0.49	1.7	1.64	0.01	4.75	0.01	0.53
261		141	QTM1	PATCH	4	5.44	2.59	0.1	9.23	0.07	0.59	1.89	1.12	0.1	3.69	0.035	0.40
261		142	QTM1	PATCH	4	8.41	6.58	0.02	15.58	0.05	0.54	3.85	3.09	0.02	8.34	0.025	0.54
261		143	QTM1	PATCH	4	9.14	7.52	0.01	16.18	0.04	0.56	4.26	3.82	0.01	9.62	0.02	0.59
261		144	QTM1	PATCH	4	8.72	6.74	0.02	15.89	0.04	0.55	4.21	3.24	0.01	8.78	0.02	0.55
261		145	QTM1	PATCH	4	5.37	4.79	0.09	11.36	0.06	0.47	2.16	1.77	0.08	5.15	0.03	0.45
261		151	QTM1	PATCH	4	6.78	4.06	0.07	12.08	0.05	0.56	3.04	1.92	0.06	5.57	0.025	0.46
261		152	QTM1	PATCH	4	8.51	7.67	0.01	15.88	0.05	0.54	3.83	3.79	0.01	9.32	0.025	0.59
261		153	QTM1	PATCH	4	9.66	6.93	0.01	16.35	0.03	0.59	4.61	3.43	0.01	9.58	0.015	0.59
261		154	QTM1	PATCH	4	6.83	6.17	0.06	14.18	0.06	0.48	3.02	2.36	0.05	6.8	0.03	0.48
261	0	128	QTM1	PATCH	2	5.65	4.66	0.04	10.15	0.03	0.56	2.03	1.85	0.03	4.62	0.015	0.46
261	1	129	QTM1	PATCH	2	5.52	4.19	0.04	9.42	0.04	0.59	2.08	1.62	0.03	4.21	0.02	0.45
261	3	131	QTM1	PATCH	2	8.37	4.45	0.12	15.31	0.06	0.55	2.38	1.93	0.11	5.36	0.03	0.35
261	4	132	QTM1	PATCH	2	11.62	9.67	0.02	18.43	0.05	0.63	4.97	4.42	0.02	10.61	0.03	0.58
261	5	133	QTM1	PATCH	2	7.26	4.68	0.11	14.82	0.04	0.49	2.14	1.46	0.09	4.87	0.025	0.33
261	9	137	QTM1	PATCH	4	9.26	6.94	0.08	17.18	0.05	0.54	4.13	2.77	0.07	8.84	0.025	0.51
261	10	138	QTM1	PATCH	4	11.94	10.09	0.03	18.62	0.05	0.64	4.91	4	0.02	10.5	0.025	0.56
261	13	141	QTM1	PATCH	4	14.4	9.98	0.35	22.42	0.14	0.64	5.1	3.8	0.33	9.11	0.07	0.41
261	14	142	QTM1	PATCH	4	18.55	16.14	0.08	33.33	0.12	0.56	9.02	7.9	0.08	18.13	0.06	0.54
261	15	143	QTM1	PATCH	4	21.49	17.09	0.04	34.67	0.11	0.62	10.74	8.45	0.03	20.78	0.055	0.60
261	16	144	QTM1	PATCH	4	21.73	16.12	0.04	35.29	0.11	0.62	10.51	7.89	0.04	20.3	0.055	0.58
261	17	145	QTM1	PATCH	4	17.58	11.82	0.22	27.3	0.16	0.64	6.59	4.71	0.2	13.51	0.085	0.49
261	23	151	QTM1	PATCH	4	16.53	13.4	0.22	27.05	0.18	0.61	7.58	5.91	0.19	12.75	0.09	0.47
261	24	152	QTM1	PATCH	4	20.03	17.54	0.05	34.14	0.12	0.59	9.79	8.78	0.04	20.08	0.06	0.59
261	25	153	QTM1	PATCH	4	22.16	15.72	0.03	34.67	0.12	0.64	11.13	7.85	0.02	20.64	0.065	0.60
261	26	154	QTM1	PATCH	4	19.85	13.76	0.11	32.67	0.11	0.61	8.65	5.82	0.09	16.77	0.055	0.51

QTM#1 Mid Ch.

n261 Mid ch.28 GHz							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Front 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
261	0		QTM1	PATCH	1	2.55	1.48	0.02	4.77	0.01	0.53	0.84	0.55	0.02	2.05	0.005	0.43
261	1		QTM1	PATCH	2	2.09	1.81	0.01	4.42	0.01	0.47	0.78	0.67	0.01	1.97	0.005	0.45
261	3		QTM1	PATCH	2	3.51	1.63	0.06	7.26	0.02	0.48	0.98	0.55	0.06	2.07	0.01	0.29
261	4		QTM1	PATCH	2	4.37	3.63	0.01	8.29	0.02	0.53	1.78	1.47	0.01	4.77	0.01	0.58
261	5		QTM1	PATCH	2	2.39	2.57	0.04	6.93	0.03	0.34	0.91	0.83	0.03	2.32	0.015	0.33
261	9		QTM1	PATCH	2	4.53	3.33	0.03	8.82	0.02	0.51	2.01	1.36	0.03	4.32	0.015	0.49
261	10		QTM1	PATCH	4	4.85	3.52	0.01	8.62	0.02	0.56	1.97	1.4	0.01	4.88	0.01	0.57
261	13		QTM1	PATCH	4	4.3	4.93	0.18	10.2	0.06	0.42	1.69	1.69	0.16	4.32	0.03	0.42
261	14		QTM1	PATCH	4	7.34	6.63	0.04	14.7	0.05	0.50	3.25	3.03	0.04	8.05	0.025	0.55
261	15		QTM1	PATCH	4	9.05	7.9	0.02	16.77	0.04	0.54	4.42	3.91	0.02	9.87	0.02	0.59
261	16		QTM1	PATCH	4	8.31	7.37	0.02	15.54	0.04	0.53	3.91	3.54	0.02	9.07	0.02	0.58
261	17		QTM1	PATCH	4	6.9	4.15	0.09	12.11	0.05	0.57	2.77	1.76	0.08	6.17	0.025	0.51
261	23		QTM1	PATCH	4	6.32	5.99	0.09	13.41	0.06	0.47	2.67	2.3	0.08	6.69	0.03	0.50
261	24		QTM1	PATCH	4	8.27	7.68	0.03	16.05	0.05	0.52	3.9	3.81	0.02	9.23	0.025	0.58
261	25		QTM1	PATCH	4	9.01	7.53	0.01	16.3	0.05	0.55	4.34	3.67	0.01	9.63	0.03	0.59
261	26		QTM1	PATCH	4	7.75	5.85	0.03	14.22	0.03	0.55	3.41	2.64	0.02	7.71	0.015	0.54
261		128	QTM1	PATCH	1	2.06	1.94	0.01	4.62	0.01	0.45	0.71	0.73	0.01	2.16	0.005	0.47
261		129	QTM1	PATCH	2	2.15	1.42	0.01	4.13	0.01	0.52	0.71	0.54	0.01	1.75	0.005	0.42
261		131	QTM1	PATCH	2	3.51	2.68	0.04	7.67	0.02	0.46	1.17	1.14	0.03	2.95	0.01	0.38
261		132	QTM1	PATCH	2	5.17	3.89	0	8.89	0.01	0.58	2.11	1.67	0	5.16	0.005	0.58
261		133	QTM1	PATCH	2	3.27	1.46	0.04	6.35	0.02	0.51	0.91	0.44	0.03	1.89	0.01	0.30
261		137	QTM1	PATCH	2	3.93	2.86	0.03	7.57	0.02	0.52	1.46	1.21	0.03	3.49	0.01	0.46
261		138	QTM1	PATCH	4	4.17	4.34	0.02	9.01	0.01	0.46	1.68	1.79	0.01	4.82	0.005	0.53
261		141	QTM1	PATCH	4	5.67	2.77	0.11	9.68	0.07	0.59	1.94	1.17	0.1	3.86	0.035	0.40
261		142	QTM1	PATCH	4	8.04	6.38	0.02	14.81	0.05	0.54	3.43	2.99	0.02	7.96	0.025	0.54
261		143	QTM1	PATCH	4	8.95	7.2	0.01	15.71	0.04	0.57	4.08	3.62	0.01	9.27	0.02	0.59
261		144	QTM1	PATCH	4	8.31	6.89	0.01	15.6	0.03	0.53	4.04	3.19	0.01	8.74	0.015	0.56
261		145	QTM1	PATCH	4	4.69	4.81	0.12	10.7	0.05	0.44	1.9	1.8	0.09	4.87	0.025	0.46
261		151	QTM1	PATCH	4	6.58	3.95	0.07	11.82	0.06	0.56	2.73	1.73	0.07	5.41	0.03	0.46
261		152	QTM1	PATCH	4	8.41	7.36	0.01	15.33	0.04	0.55	3.62	3.67	0.01	8.98	0.02	0.59
261		153	QTM1	PATCH	4	9.44	6.73	0.01	15.97	0.03	0.59	4.54	3.28	0.01	9.27	0.015	0.58
261		154	QTM1	PATCH	4	6.23	6.19	0.08	13.46	0.05	0.46	2.81	2.52	0.06	6.62	0.025	0.49
261	0	128	QTM1	PATCH	2	5.74	4.61	0.04	9.96	0.02	0.58	2.13	1.87	0.04	4.46	0.01	0.45
261	1	129	QTM1	PATCH	2	5.34	4.27	0.04	9.13	0.05	0.58	2.01	1.64	0.03	4.14	0.025	0.45
261	3	131	QTM1	PATCH	2	8.33	4.4	0.16	15.73	0.05	0.53	2.27	1.85	0.15	5.67	0.025	0.36
261	4	132	QTM1	PATCH	2	11.77	9.69	0.03	18.41	0.05	0.64	5.14	4.27	0.02	10.52	0.025	0.57
261	5	133	QTM1	PATCH	2	6.78	4.35	0.1	14.07	0.06	0.48	1.94	1.48	0.09	4.66	0.03	0.33
261	9	137	QTM1	PATCH	4	9.35	6.64	0.1	16.55	0.06	0.56	4.2	2.62	0.09	8.4	0.035	0.51
261	10	138	QTM1	PATCH	4	11.68	10.57	0.04	18.64	0.04	0.63	5.01	4.32	0.03	10.57	0.025	0.57
261	13	141	QTM1	PATCH	4	13.78	9.89	0.4	22.55	0.15	0.61	4.76	3.91	0.38	9.33	0.075	0.41
261	14	142	QTM1	PATCH	4	17.23	14.52	0.1	31.5	0.14	0.55	8.13	7.09	0.09	17.49	0.07	0.56
261	15	143	QTM1	PATCH	4	20.43	16.28	0.03	33.56	0.09	0.61	10.33	7.99	0.03	19.89	0.045	0.59
261	16	144	QTM1	PATCH	4	20.87	15.81	0.05	35.15	0.09	0.59	10.35	7.7	0.04	20.28	0.045	0.58
261	17	145	QTM1	PATCH	4	15.99	11.89	0.23	24.3	0.16	0.66	6.35	5.09	0.22	11.86	0.08	0.49
261	23	151	QTM1	PATCH	4	15.14	12.55	0.24	26.05	0.2	0.58	6.58	5.46	0.22	12.4	0.1	0.48
261	24	152	QTM1	PATCH	4	19.47	16.2	0.05	33.82	0.12	0.58	9.4	8.17	0.05	19.96	0.06	0.59
261	25	153	QTM1	PATCH	4	21.03	15.17	0.04	34.07	0.11	0.62	10.93	7.38	0.03	20.05	0.06	0.59
261	26	154	QTM1	PATCH	4	18.3	14.23	0.18	29.64	0.11	0.62	8.15	6.19	0.14	15.28	0.055	0.52

QTM#1 High Ch.

n261 Mid ch.28.35 GHz							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Front 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
261	0		QTM1	PATCH	1	2.49	1.39	0.02	4.51	0.01	0.55	0.83	0.51	0.02	1.95	0.005	0.43
261	1		QTM1	PATCH	2	1.87	1.84	0.01	4.17	0.01	0.45	0.69	0.67	0.01	1.92	0.005	0.46
261	3		QTM1	PATCH	2	3.29	1.65	0.07	6.79	0.02	0.48	0.93	0.55	0.06	1.88	0.01	0.28
261	4		QTM1	PATCH	2	4.12	3.56	0.01	7.86	0.02	0.52	1.68	1.44	0.01	4.44	0.01	0.56
261	5		QTM1	PATCH	2	2.05	2.57	0.03	6.45	0.03	0.32	0.7	0.82	0.03	2.17	0.015	0.34
261	9		QTM1	PATCH	2	4.3	3.12	0.03	8.24	0.02	0.52	1.86	1.27	0.03	4.06	0.015	0.49
261	10		QTM1	PATCH	4	4.64	3.28	0.01	8.08	0.02	0.57	1.87	1.33	0.01	4.52	0.01	0.56
261	13		QTM1	PATCH	4	3.82	4.71	0.17	9.26	0.06	0.41	1.43	1.53	0.15	4.05	0.03	0.44
261	14		QTM1	PATCH	4	6.69	6.35	0.04	13.65	0.05	0.49	2.94	2.94	0.03	7.61	0.025	0.56
261	15		QTM1	PATCH	4	8.26	7.84	0.01	16.02	0.04	0.52	4.01	3.82	0.01	9.34	0.02	0.58
261	16		QTM1	PATCH	4	7.57	7.1	0.01	14.51	0.04	0.52	3.42	3.44	0.01	8.52	0.02	0.59
261	17		QTM1	PATCH	4	6.11	4.07	0.11	10.97	0.05	0.56	2.42	1.67	0.09	5.63	0.025	0.51
261	23		QTM1	PATCH	4	5.57	5.74	0.07	12.17	0.05	0.46	2.3	2.3	0.07	6.39	0.025	0.53
261	24		QTM1	PATCH	4	7.74	7.3	0.03	15.25	0.05	0.51	3.64	3.57	0.02	8.74	0.025	0.57
261	25		QTM1	PATCH	4	8.18	7.71	0.01	15.67	0.04	0.52	3.9	3.73	0.01	9.19	0.02	0.59
261	26		QTM1	PATCH	4	6.87	5.72	0.04	13.02	0.03	0.53	2.84	2.52	0.03	7.17	0.015	0.55
261		128	QTM1	PATCH	1	1.91	1.89	0.01	4.34	0.01	0.44	0.67	0.73	0.01	2	0.005	0.46
261		129	QTM1	PATCH	2	2.12	1.36	0.01	3.95	0.01	0.54	0.7	0.52	0.01	1.68	0.005	0.43
261		131	QTM1	PATCH	2	3.38	2.64	0.04	7.26	0.02	0.47	1.07	1.12	0.03	2.82	0.01	0.39
261		132	QTM1	PATCH	2	4.79	3.93	0	8.58	0.01	0.56	1.99	1.69	0	4.88	0.005	0.57
261		133	QTM1	PATCH	2	3.21	1.41	0.03	6.03	0.02	0.53	0.93	0.44	0.03	1.79	0.01	0.30
261		137	QTM1	PATCH	2	3.82	2.67	0.03	7.18	0.02	0.53	1.38	1.18	0.03	3.24	0.01	0.45
261		138	QTM1	PATCH	4	3.75	4.44	0.02	8.62	0.01	0.44	1.54	1.92	0.01	4.65	0.005	0.54
261		141	QTM1	PATCH	4	5.49	2.78	0.11	9.14	0.06	0.60	1.84	1.04	0.1	3.77	0.03	0.41
261		142	QTM1	PATCH	4	7.6	6.02	0.02	13.88	0.04	0.55	3.09	2.91	0.02	7.52	0.02	0.54
261		143	QTM1	PATCH	4	8.42	7.01	0.01	15.09	0.04	0.56	3.89	3.5	0.01	8.76	0.02	0.58
261		144	QTM1	PATCH	4	7.8	6.67	0.01	14.72	0.03	0.53	3.75	3.19	0.01	8.13	0.015	0.55
261		145	QTM1	PATCH	4	4.2	4.51	0.12	9.53	0.04	0.44	1.77	1.61	0.09	4.39	0.02	0.46
261		151	QTM1	PATCH	4	6.35	3.61	0.07	11.22	0.06	0.57	2.49	1.55	0.07	5.24	0.03	0.47
261		152	QTM1	PATCH	4	8.15	6.95	0.02	14.68	0.03	0.56	3.44	3.48	0.02	8.57	0.02	0.58
261		153	QTM1	PATCH	4	8.75	6.54	0.01	15.16	0.03	0.58	4.21	3.19	0.01	8.67	0.015	0.57
261		154	QTM1	PATCH	4	5.51	5.8	0.08	12	0.04	0.46	2.51	2.47	0.06	6.02	0.02	0.50
261	0	128	QTM1	PATCH	2	5.63	4.52	0.04	9.57	0.02	0.59	2.12	1.81	0.04	4.25	0.01	0.44
261	1	129	QTM1	PATCH	2	5.15	4.32	0.03	8.75	0.05	0.59	1.92	1.64	0.03	4.04	0.025	0.46
261	3	131	QTM1	PATCH	2	8.06	4.52	0.17	15.22	0.05	0.53	2.21	1.86	0.16	5.52	0.025	0.36
261	4	132	QTM1	PATCH	2	11.25	9.96	0.03	17.8	0.05	0.63	4.94	4.31	0.02	10.12	0.025	0.57
261	5	133	QTM1	PATCH	2	6.58	4.43	0.09	13.21	0.06	0.50	1.87	1.52	0.08	4.45	0.03	0.34
261	9	137	QTM1	PATCH	4	9.2	6.29	0.09	15.84	0.06	0.58	4.02	2.44	0.08	7.92	0.03	0.50
261	10	138	QTM1	PATCH	4	10.78	10.47	0.05	17.88	0.04	0.60	4.71	4.37	0.04	10.02	0.02	0.56
261	13	141	QTM1	PATCH	4	12.4	9.39	0.37	20.95	0.13	0.59	4.33	3.7	0.35	8.9	0.065	0.42
261	14	142	QTM1	PATCH	4	15.9	13.88	0.09	28.94	0.13	0.55	7.31	6.84	0.08	16.17	0.065	0.56
261	15	143	QTM1	PATCH	4	19.31	16.26	0.03	31.99	0.08	0.60	9.55	7.77	0.03	18.86	0.045	0.59
261	16	144	QTM1	PATCH	4	19.06	14.95	0.03	33.1	0.09	0.58	9.4	7.24	0.03	19.12	0.045	0.58
261	17	145	QTM1	PATCH	4	13.99	11.58	0.24	22.71	0.15	0.62	5.79	4.89	0.22	10.84	0.075	0.48
261	23	151	QTM1	PATCH	4	13.44	12.16	0.22	25.11	0.17	0.54	5.73	5.41	0.2	12.29	0.085	0.49
261	24	152	QTM1	PATCH	4	18.45	15.34	0.05	32.54	0.1	0.57	8.68	7.56	0.05	19.26	0.055	0.59
261	25	153	QTM1	PATCH	4	19.29	14.89	0.04	32.47	0.1	0.59	9.82	7.27	0.03	19.06	0.05	0.59
261	26	154	QTM1	PATCH	4	15.72	14.12	0.18	25.74	0.09	0.61	7.13	6.12	0.14	13.38	0.045	0.52

Table 5. PD of QTM#1 – patch antenna

QTM#1 Low Ch.

n260 Mid ch.37 GHz							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Front 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
260	0		QTM1	PATCH	1	1.19	0.92	0.01	2.96	0	0.40	0.34	0.35	0.01	1.21	0	0.41
260	1		QTM1	PATCH	2	1.85	1.15	0.01	3.53	0.01	0.52	0.6	0.39	0.01	1.69	0.005	0.48
260	2		QTM1	PATCH	2	1.23	1.78	0.02	3.85	0.01	0.32	0.34	0.6	0.02	1.68	0.005	0.44
260	3		QTM1	PATCH	2	0.88	1.32	0.02	2.81	0	0.31	0.28	0.51	0.01	1.26	0	0.45
260	5		QTM1	PATCH	2	2.32	3.36	0.06	6.64	0.01	0.35	0.88	1.51	0.05	3.4	0.005	0.51
260	6		QTM1	PATCH	2	2.41	2.21	0.02	5.26	0.02	0.46	0.98	1.01	0.01	2.84	0.01	0.54
260	7		QTM1	PATCH	4	3.11	2.27	0.01	6.17	0.02	0.50	1.26	0.97	0.01	3.31	0.01	0.54
260	11		QTM1	PATCH	4	1.9	2.86	0.01	6.35	0.01	0.30	0.76	1.25	0	2.71	0.005	0.43
260	12		QTM1	PATCH	4	2.98	1.9	0.04	6.69	0.01	0.45	0.92	0.65	0.03	2.5	0.005	0.37
260	15		QTM1	PATCH	4	4.7	5.75	0.15	11.84	0.02	0.40	1.5	2.4	0.13	5.91	0.01	0.50
260	16		QTM1	PATCH	4	4.77	5.54	0.02	10.55	0.02	0.45	2.12	2.53	0.02	6.19	0.01	0.59
260	17		QTM1	PATCH	4	4.44	3.99	0.04	8.62	0.02	0.52	1.93	1.65	0.03	5.4	0.01	0.63
260	18		QTM1	PATCH	4	4.64	6.08	0.12	11.76	0.02	0.39	1.63	2.81	0.11	6.34	0.01	0.54
260	19		QTM1	PATCH	4	5.05	4.72	0.01	11.63	0.03	0.43	1.85	1.56	0.01	5.24	0.015	0.45
260	25		QTM1	PATCH	4	5.49	5.6	0.11	12.93	0.02	0.42	1.84	2.27	0.09	5.18	0.01	0.40
260	26		QTM1	PATCH	4	4.19	5.26	0.02	9.73	0.04	0.43	1.76	2.43	0.02	5.91	0.02	0.61
260	27		QTM1	PATCH	4	4.86	5.11	0.09	10	0.03	0.49	2.08	2.45	0.07	6.11	0.015	0.61
260	28		QTM1	PATCH	4	5.56	4.75	0.03	12.4	0.03	0.45	1.83	1.74	0.02	5.3	0.015	0.43
260		128	QTM1	PATCH	1	1.42	1.09	0.01	3.49	0	0.41	0.5	0.32	0.01	1.4	0	0.40
260		129	QTM1	PATCH	2	1.16	1.64	0.02	3.64	0.01	0.32	0.31	0.62	0.02	1.59	0.005	0.44
260		130	QTM1	PATCH	2	1.51	0.98	0.01	3.13	0.01	0.48	0.45	0.32	0.01	1.47	0.005	0.47
260		131	QTM1	PATCH	2	1.05	0.77	0.02	2.42	0	0.43	0.32	0.28	0.01	1.08	0	0.45
260		133	QTM1	PATCH	2	2.79	1.88	0.06	5.33	0.01	0.52	1.11	0.81	0.05	2.87	0.005	0.54
260		134	QTM1	PATCH	2	2.28	2.73	0.03	5.59	0.01	0.41	0.89	1.18	0.03	3.07	0.005	0.55
260		135	QTM1	PATCH	4	2.43	1.6	0.01	5.32	0.02	0.46	0.64	0.66	0.01	2.23	0.01	0.42
260		139	QTM1	PATCH	4	2.78	2.8	0.01	7.07	0.01	0.39	1.16	1.25	0.01	3.25	0.005	0.46
260		140	QTM1	PATCH	4	2.29	2.48	0.04	7.22	0.01	0.32	0.72	0.85	0.04	2.55	0.005	0.35
260		143	QTM1	PATCH	4	5.32	3.77	0.1	11.51	0.03	0.46	2.06	1.41	0.09	5.13	0.015	0.45
260		144	QTM1	PATCH	4	4.79	4.65	0.02	10.28	0.03	0.47	2.12	2.24	0.01	5.96	0.015	0.58
260		145	QTM1	PATCH	4	4	4.46	0.08	8.32	0.02	0.48	1.69	2.07	0.06	5.41	0.01	0.65
260		146	QTM1	PATCH	4	5.87	4	0.09	12.18	0.03	0.48	2.28	1.55	0.08	5.1	0.015	0.42
260		147	QTM1	PATCH	4	4.8	4.33	0.01	10.46	0.02	0.46	1.65	1.84	0.01	5.36	0.01	0.51
260		153	QTM1	PATCH	4	5.03	4.65	0.05	11.42	0.01	0.44	1.46	2	0.04	5.33	0.005	0.47
260		154	QTM1	PATCH	4	4.47	4.39	0.02	8.83	0.04	0.51	2	2	0.01	5.68	0.02	0.64
260		155	QTM1	PATCH	4	4.76	4.74	0.13	9.79	0.02	0.49	1.89	2.25	0.1	5.69	0.01	0.58
260		156	QTM1	PATCH	4	4.89	4.61	0.03	11.33	0.01	0.43	1.42	1.95	0.02	5.27	0.005	0.47
260	0	128	QTM1	PATCH	1	3.08	2.44	0.02	6.77	0.01	0.45	1.02	0.83	0.02	2.99	0.005	0.44
260	1	129	QTM1	PATCH	2	3.55	3.03	0.05	7.47	0.02	0.48	1.04	1.08	0.05	3.61	0.01	0.48
260	2	130	QTM1	PATCH	2	3.19	2.98	0.06	7.22	0.02	0.44	0.98	1.02	0.04	3.39	0.01	0.47
260	3	131	QTM1	PATCH	2	2.36	2.28	0.06	5.79	0.01	0.41	0.76	0.89	0.05	2.52	0.005	0.44
260	5	133	QTM1	PATCH	2	6.58	6.01	0.22	13.18	0.03	0.50	2.52	2.57	0.16	7.12	0.015	0.54
260	6	134	QTM1	PATCH	2	5.52	5.71	0.08	11.63	0.04	0.47	2.25	2.52	0.07	6.39	0.02	0.55
260	7	135	QTM1	PATCH	4	5.9	3.9	0.02	9.88	0.06	0.60	2.15	1.57	0.02	5.77	0.03	0.58
260	11	139	QTM1	PATCH	4	4.44	6.01	0.02	11.46	0.02	0.39	1.89	2.71	0.02	5.75	0.01	0.50
260	12	140	QTM1	PATCH	4	6.57	4.9	0.13	15.31	0.03	0.43	2.33	2.01	0.11	6.14	0.015	0.40
260	15	143	QTM1	PATCH	4	11.91	10.73	0.31	25.83	0.05	0.46	4.42	4.49	0.27	11.75	0.025	0.45
260	16	144	QTM1	PATCH	4	10.33	10.61	0.06	22.22	0.08	0.46	4.55	5.25	0.05	12.8	0.04	0.58
260	17	145	QTM1	PATCH	4	9.44	9.38	0.2	19.08	0.06	0.49	4.25	4.28	0.15	11.42	0.03	0.60
260	18	146	QTM1	PATCH	4	12.5	11.24	0.25	26.23	0.05	0.48	4.4	5.05	0.21	11.86	0.025	0.45
260	19	147	QTM1	PATCH	4	11.18	9.95	0.03	23.83	0.07	0.47	4.08	4.16	0.03	10.94	0.035	0.46
260	25	153	QTM1	PATCH	4	12.67	11.18	0.21	26.89	0.06	0.47	3.68	4.41	0.18	11.26	0.025	0.42
260	26	154	QTM1	PATCH	4	9.47	10.54	0.04	19.32	0.11	0.49	4.17	5.02	0.03	11.85	0.055	0.61
260	27	155	QTM1	PATCH	4	10.9	10.59	0.36	22.05	0.08	0.49	4.59	5.03	0.28	12.39	0.04	0.56
260	28	156	QTM1	PATCH	4	12.78	10.27	0.07	25.98	0.06	0.49	3.79	4.08	0.06	11.29	0.03	0.43

QTM#1 Mid Ch

n260 Mid ch.38.5 GHz							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Front 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
260	0		QTM1	PATCH	1	1.53	1.26	0.01	3.66	0.01	0.42	0.48	0.46	0.01	1.56	0.005	0.43
260	1		QTM1	PATCH	2	2.19	1.6	0.01	4.73	0.01	0.46	0.83	0.52	0.01	2.2	0.005	0.47
260	2		QTM1	PATCH	2	1.75	2.16	0.02	5.01	0.01	0.35	0.47	0.82	0.02	2.25	0.005	0.45
260	3		QTM1	PATCH	2	1.1	1.68	0.03	3.45	0	0.32	0.33	0.68	0.02	1.52	0.005	0.44
260	5		QTM1	PATCH	2	2.93	4	0.07	8.39	0.01	0.35	1.11	1.85	0.05	4.13	0.005	0.49
260	6		QTM1	PATCH	2	3.25	2.72	0.03	7	0.03	0.46	1.36	1.26	0.03	3.56	0.02	0.51
260	7		QTM1	PATCH	4	4.19	2.79	0.01	7.81	0.02	0.54	1.87	1.27	0.01	4.16	0.01	0.53
260	11		QTM1	PATCH	4	2.68	3.25	0.01	8	0.01	0.34	0.97	1.37	0.01	3.34	0.005	0.42
260	12		QTM1	PATCH	4	3.09	2.95	0.03	8.58	0.02	0.36	0.9	1.12	0.03	3.43	0.01	0.40
260	15		QTM1	PATCH	4	5.19	7.28	0.15	14.75	0.05	0.35	1.88	3.01	0.12	7.03	0.025	0.48
260	16		QTM1	PATCH	4	6.95	6.85	0.02	14.38	0.04	0.48	3	3.16	0.01	7.98	0.02	0.55
260	17		QTM1	PATCH	4	5.43	6.01	0.07	12.17	0.02	0.45	2.31	2.54	0.05	7.02	0.01	0.58
260	18		QTM1	PATCH	4	5.8	7.47	0.12	15.01	0.03	0.39	2.22	3.41	0.1	8.01	0.015	0.53
260	19		QTM1	PATCH	4	7.31	4.91	0.03	14.69	0.03	0.50	2.94	1.73	0.02	6.9	0.015	0.47
260	25		QTM1	PATCH	4	5.64	6.68	0.11	15.13	0.02	0.37	2.12	2.96	0.09	6.31	0.01	0.42
260	26		QTM1	PATCH	4	5.87	6.7	0.07	13.18	0.06	0.45	2.42	3.14	0.06	7.46	0.03	0.57
260	27		QTM1	PATCH	4	6.35	7.33	0.09	13.99	0.04	0.45	2.75	3.42	0.07	8.34	0.02	0.60
260	28		QTM1	PATCH	4	6.5	5.95	0.04	14.64	0.02	0.44	2.44	2.23	0.03	6.38	0.01	0.44
260		128	QTM1	PATCH	1	1.81	1.44	0.01	4.35	0	0.42	0.64	0.46	0.01	1.76	0	0.40
260		129	QTM1	PATCH	2	1.59	2.05	0.02	4.5	0	0.35	0.49	0.82	0.01	2.11	0	0.47
260		130	QTM1	PATCH	2	1.82	1.43	0.01	4.13	0.01	0.44	0.58	0.44	0.01	1.98	0.005	0.48
260		131	QTM1	PATCH	2	1.56	0.91	0.02	3.02	0	0.52	0.49	0.31	0.01	1.48	0	0.49
260		133	QTM1	PATCH	2	3.55	2.66	0.05	6.77	0.02	0.52	1.51	1.11	0.04	3.81	0.01	0.56
260		134	QTM1	PATCH	2	3.26	3.37	0.04	7.28	0.01	0.45	1.45	1.51	0.03	3.79	0.005	0.52
260		135	QTM1	PATCH	4	3.13	2.05	0.01	7.08	0.01	0.44	0.9	0.85	0.01	2.93	0.005	0.41
260		139	QTM1	PATCH	4	3.2	3.72	0.01	8.53	0.01	0.38	1.27	1.71	0.01	4.13	0.005	0.48
260		140	QTM1	PATCH	4	3.53	2.75	0.04	8.94	0.01	0.39	1.29	0.97	0.03	3.5	0.005	0.39
260		143	QTM1	PATCH	4	7.03	4.39	0.13	14.23	0.04	0.49	2.96	1.8	0.11	6.84	0.025	0.48
260		144	QTM1	PATCH	4	6.66	6.21	0.04	13.72	0.02	0.49	2.75	2.9	0.03	7.92	0.01	0.58
260		145	QTM1	PATCH	4	5.6	6.08	0.07	11.77	0.02	0.48	2.28	2.96	0.06	7.21	0.01	0.61
260		146	QTM1	PATCH	4	7.17	4.1	0.09	14.51	0.02	0.49	2.95	1.55	0.07	6.63	0.01	0.46
260		147	QTM1	PATCH	4	5.26	6.35	0.03	13.18	0.02	0.40	1.89	2.89	0.02	6.87	0.01	0.52
260		153	QTM1	PATCH	4	5.79	5.83	0.04	13.65	0.02	0.42	1.81	2.63	0.04	6.71	0.01	0.49
260		154	QTM1	PATCH	4	6.07	5.44	0.05	11.78	0.02	0.52	2.56	2.47	0.04	7.34	0.01	0.62
260		155	QTM1	PATCH	4	6.92	6.12	0.06	13.46	0.03	0.51	2.95	2.86	0.05	7.76	0.015	0.58
260		156	QTM1	PATCH	4	5.81	5.82	0.03	13.39	0.02	0.43	1.73	2.63	0.02	6.51	0.01	0.49
260	0	128	QTM1	PATCH	1	4.56	3.77	0.03	8.75	0.02	0.52	1.56	1.3	0.02	3.47	0.01	0.40
260	1	129	QTM1	PATCH	2	4.84	4.59	0.04	9.59	0.02	0.50	1.55	1.59	0.03	5.06	0.01	0.53
260	2	130	QTM1	PATCH	2	4.64	4.59	0.06	9.51	0.02	0.49	1.39	1.6	0.05	4.85	0.01	0.51
260	3	131	QTM1	PATCH	2	3.37	3.34	0.08	7.17	0.02	0.47	1.09	1.37	0.06	3.27	0.01	0.46
260	5	133	QTM1	PATCH	2	9.07	8.69	0.22	16.08	0.04	0.56	3.74	4.04	0.17	8.76	0.02	0.54
260	6	134	QTM1	PATCH	2	8.45	8.07	0.1	15.29	0.05	0.55	3.73	3.67	0.09	8.89	0.025	0.58
260	7	135	QTM1	PATCH	4	7.6	5.11	0.02	13.2	0.05	0.58	3.12	2.06	0.02	7.36	0.025	0.56
260	11	139	QTM1	PATCH	4	5.82	7.46	0.03	14.71	0.03	0.40	2.33	3.18	0.03	7.79	0.015	0.53
260	12	140	QTM1	PATCH	4	8.81	7.41	0.11	18.27	0.05	0.48	3.21	3.02	0.09	8.6	0.025	0.47
260	15	143	QTM1	PATCH	4	14.33	13.53	0.31	30.81	0.17	0.47	5.88	5.71	0.23	14.68	0.085	0.48
260	16	144	QTM1	PATCH	4	16.62	15	0.07	30.29	0.11	0.55	7.34	7.01	0.05	17.34	0.055	0.57
260	17	145	QTM1	PATCH	4	12.57	13.15	0.22	25.9	0.07	0.49	5.5	6.26	0.18	14.75	0.035	0.57
260	18	146	QTM1	PATCH	4	16.08	13.16	0.2	32.44	0.08	0.50	6.44	6	0.16	15.6	0.04	0.48
260	19	147	QTM1	PATCH	4	15.11	12.64	0.08	29.79	0.09	0.51	6.47	5.96	0.06	14.78	0.045	0.50
260	25	153	QTM1	PATCH	4	13.77	12.65	0.23	30.8	0.04	0.45	4.46	5.24	0.19	13.53	0.02	0.44
260	26	154	QTM1	PATCH	4	13.49	13.33	0.17	25.34	0.12	0.53	5.85	6.42	0.14	16.45	0.06	0.65
260	27	155	QTM1	PATCH	4	15.27	15.27	0.25	29.73	0.09	0.51	6.97	7.71	0.21	16.47	0.045	0.55
260	28	156	QTM1	PATCH	4	14.05	11.75	0.11	30.25	0.07	0.46	4.99	5.22	0.09	13.83	0.035	0.46

QTM#1 High Ch.

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n260 Mid ch.40 GHz							4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm				Ratio		4cm2 PD(W/m2) at 10mm evaluation surface @6dBm				Ratio
							relative phase worst PD for MIMO				Front 2mm/worst surface 2mm		relative phase worst PD for MIMO				worst surface 10mm/ worst surface 2mm
Band	Beam_ID		Ant module	Ant Type	Num. of Feed	Front	Back	Left	Top	bottom		Front	Back	Left	Top	bottom	
260	0		QTM1	PATCH	1	1.48	1.46	0.01	3.74	0.01	0.40	0.45	0.54	0.01	1.61	0.005	0.43
260	1		QTM1	PATCH	2	2.14	1.76	0.01	4.99	0.01	0.43	0.79	0.55	0.01	2.18	0.005	0.44
260	2		QTM1	PATCH	2	1.85	2.22	0.01	5	0.01	0.37	0.54	0.8	0.01	2.3	0.005	0.46
260	3		QTM1	PATCH	2	1.26	1.65	0.03	3.64	0.01	0.35	0.38	0.64	0.02	1.55	0.005	0.43
260	5		QTM1	PATCH	2	3.16	3.82	0.05	8.76	0.02	0.36	1.22	1.76	0.04	3.93	0.005	0.45
260	6		QTM1	PATCH	2	3.49	2.9	0.03	7.54	0.03	0.46	1.42	1.38	0.03	3.78	0.015	0.50
260	7		QTM1	PATCH	4	4.02	3.2	0.01	7.97	0.03	0.50	1.77	1.3	0.01	4.21	0.015	0.53
260	11		QTM1	PATCH	4	2.93	3.4	0.03	8.35	0.01	0.35	1.18	1.24	0.02	3.61	0.005	0.43
260	12		QTM1	PATCH	4	2.94	3.21	0.03	8.83	0.02	0.33	1.02	1.2	0.03	3.23	0.01	0.37
260	15		QTM1	PATCH	4	4.55	6.8	0.11	13.65	0.03	0.33	1.59	2.83	0.1	6.45	0.02	0.47
260	16		QTM1	PATCH	4	7.33	6.23	0.04	14.2	0.04	0.52	3.08	2.77	0.04	8.05	0.02	0.57
260	17		QTM1	PATCH	4	5.72	6.08	0.09	12.9	0.05	0.44	2.4	2.61	0.07	6.7	0.025	0.52
260	18		QTM1	PATCH	4	5.27	7.37	0.09	14.46	0.02	0.36	1.88	3.27	0.08	7.25	0.01	0.50
260	19		QTM1	PATCH	4	6.82	4.93	0.02	14.33	0.03	0.48	2.6	1.65	0.02	7.01	0.015	0.49
260	25		QTM1	PATCH	4	4.83	6.1	0.06	14.16	0.02	0.34	1.76	2.64	0.04	6.2	0.01	0.44
260	26		QTM1	PATCH	4	6.64	6.3	0.08	13.76	0.06	0.48	2.73	2.89	0.06	7.8	0.03	0.57
260	27		QTM1	PATCH	4	5.95	8.16	0.1	15.07	0.02	0.39	2.44	3.74	0.08	7.76	0.01	0.51
260	28		QTM1	PATCH	4	5.64	5.85	0.04	14	0.02	0.40	1.97	2.25	0.03	6.36	0.01	0.45
260		128	QTM1	PATCH	1	2.06	1.33	0.01	4.42	0.01	0.47	0.75	0.45	0.01	1.89	0.005	0.43
260		129	QTM1	PATCH	2	1.65	2.16	0.01	4.56	0	0.36	0.46	0.89	0.01	2.11	0	0.46
260		130	QTM1	PATCH	2	2.08	1.52	0.01	4.28	0	0.49	0.63	0.44	0.01	2.16	0	0.50
260		131	QTM1	PATCH	2	1.51	0.93	0.02	3.08	0	0.49	0.5	0.27	0.02	1.44	0	0.47
260		133	QTM1	PATCH	2	3.75	2.45	0.06	6.91	0.02	0.54	1.6	0.96	0.04	3.89	0.01	0.56
260		134	QTM1	PATCH	2	3.05	3.92	0.03	7.89	0.01	0.39	1.39	1.8	0.03	4.11	0.005	0.52
260		135	QTM1	PATCH	4	3.14	2.49	0.01	7.47	0.01	0.42	0.86	1.03	0.01	3.12	0.005	0.42
260		139	QTM1	PATCH	4	3.79	3.34	0.01	8.28	0.01	0.46	1.34	1.56	0.01	4.03	0.005	0.49
260		140	QTM1	PATCH	4	4.12	2.59	0.04	9.2	0.01	0.45	1.45	0.98	0.03	3.57	0.005	0.39
260		143	QTM1	PATCH	4	7.16	4.07	0.11	13.41	0.04	0.53	2.74	1.7	0.1	6.59	0.02	0.49
260		144	QTM1	PATCH	4	6.13	6.21	0.04	12.87	0.02	0.48	2.43	2.86	0.03	7.12	0.01	0.55
260		145	QTM1	PATCH	4	6.61	5.88	0.06	12.91	0.02	0.51	2.6	2.79	0.05	7.61	0.01	0.59
260		146	QTM1	PATCH	4	7.04	4.22	0.05	13.39	0.02	0.53	2.75	1.68	0.04	6.5	0.01	0.49
260		147	QTM1	PATCH	4	5.28	6.01	0.03	12.52	0.02	0.42	1.7	2.43	0.02	6.76	0.01	0.54
260		153	QTM1	PATCH	4	6	5.44	0.04	13.48	0.02	0.45	1.8	2.03	0.04	6.34	0.01	0.47
260		154	QTM1	PATCH	4	5.8	6.35	0.07	12.43	0.03	0.47	2.4	2.92	0.06	7.25	0.015	0.58
260		155	QTM1	PATCH	4	7.79	5.71	0.09	14.35	0.03	0.54	3.17	2.62	0.07	7.75	0.015	0.54
260		156	QTM1	PATCH	4	6.04	5.28	0.03	12.63	0.02	0.48	1.98	2.07	0.03	6.2	0.01	0.49
260	0	128	QTM1	PATCH	1	4.83	3.84	0.03	9.49	0.03	0.51	1.68	1.35	0.02	3.93	0.02	0.41
260	1	129	QTM1	PATCH	2	5.54	5.63	0.05	10.59	0.02	0.52	1.68	2.08	0.04	5.72	0.01	0.54
260	2	130	QTM1	PATCH	2	5.73	5.23	0.03	10.41	0.02	0.55	1.8	1.65	0.03	5.61	0.01	0.54
260	3	131	QTM1	PATCH	2	3.85	3.54	0.09	7.53	0.02	0.51	1.28	1.29	0.08	3.55	0.01	0.47
260	5	133	QTM1	PATCH	2	10.2	8.76	0.19	16.75	0.04	0.61	4.29	4.07	0.15	8.52	0.02	0.51
260	6	134	QTM1	PATCH	2	8.73	9.04	0.11	16.82	0.06	0.52	3.79	4.31	0.09	9.8	0.03	0.58
260	7	135	QTM1	PATCH	4	7.4	5.75	0.04	13.77	0.04	0.54	2.9	2.26	0.03	7.35	0.02	0.53
260	11	139	QTM1	PATCH	4	6.51	7.66	0.05	15.06	0.03	0.43	2.67	3.11	0.04	7.98	0.015	0.53
260	12	140	QTM1	PATCH	4	10.12	8.24	0.11	20.01	0.04	0.51	4.12	3.55	0.1	9.94	0.02	0.50
260	15	143	QTM1	PATCH	4	12.93	11.65	0.27	29.28	0.14	0.44	5.18	5.35	0.21	15.2	0.07	0.52
260	16	144	QTM1	PATCH	4	16.56	14.57	0.14	28.56	0.09	0.58	7.35	7.17	0.11	17.04	0.045	0.60
260	17	145	QTM1	PATCH	4	15.05	13.84	0.2	26.15	0.1	0.58	6.75	6.57	0.18	17.33	0.05	0.66
260	18	146	QTM1	PATCH	4	15.38	14.23	0.19	30.72	0.07	0.50	6.17	6.62	0.16	16.01	0.035	0.52
260	19	147	QTM1	PATCH	4	13.22	12.19	0.09	29.51	0.08	0.45	5.35	5.19	0.07	15.88	0.04	0.54
260	25	153	QTM1	PATCH	4	13.91	14.08	0.17	30.38	0.07	0.46	4.71	5.93	0.15	14.18	0.03	0.47
260	26	154	QTM1	PATCH	4	15.3	16.15	0.19	27.48	0.13	0.56	6.72	8.29	0.16	18.29	0.065	0.67
260	27	155	QTM1	PATCH	4	16.25	15.55	0.31	30.78	0.1	0.53	7.49	7.77	0.25	16.38	0.05	0.53
260	28	156	QTM1	PATCH	4	13.57	12.79	0.13	29.61	0.08	0.46	4.12	5.06	0.11	14.67	0.035	0.50