

FCC ID : T790S

Power Density Simulation Report

Revision: V1.0

Jul. 22nd 2020

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).

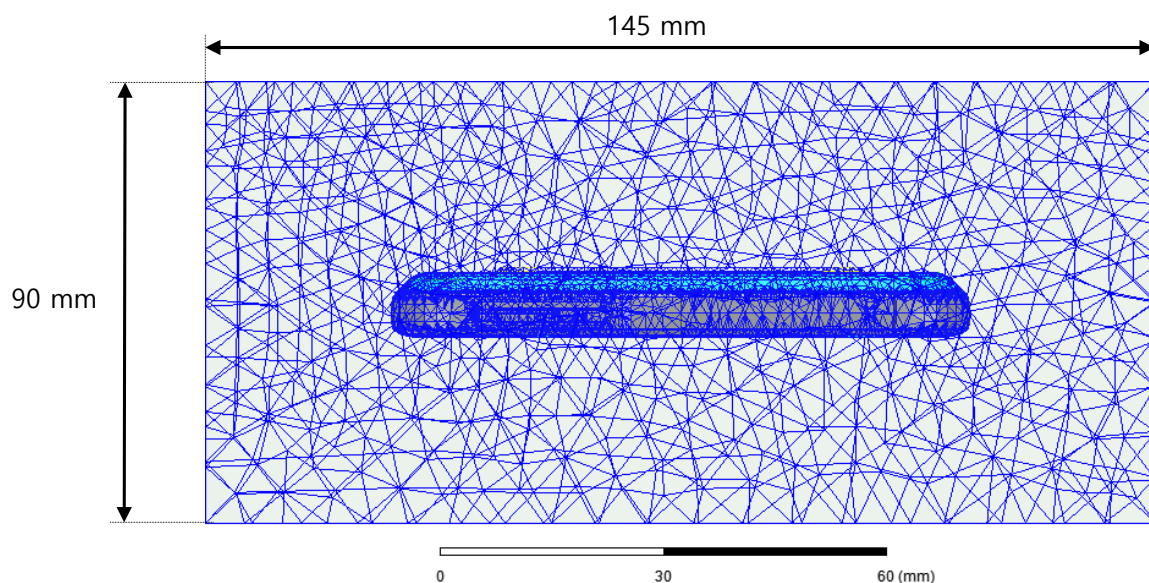


Figure 1. Example of HFSS mesh in a model of the device (Top view)

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:

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

\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:

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

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 QMT0# and QMT1#. On the back side view, QMT0# is placed on the left side and antennas are facing the left side of device. QMT1# is placed at the top side and antennas are facing the backside of the device.

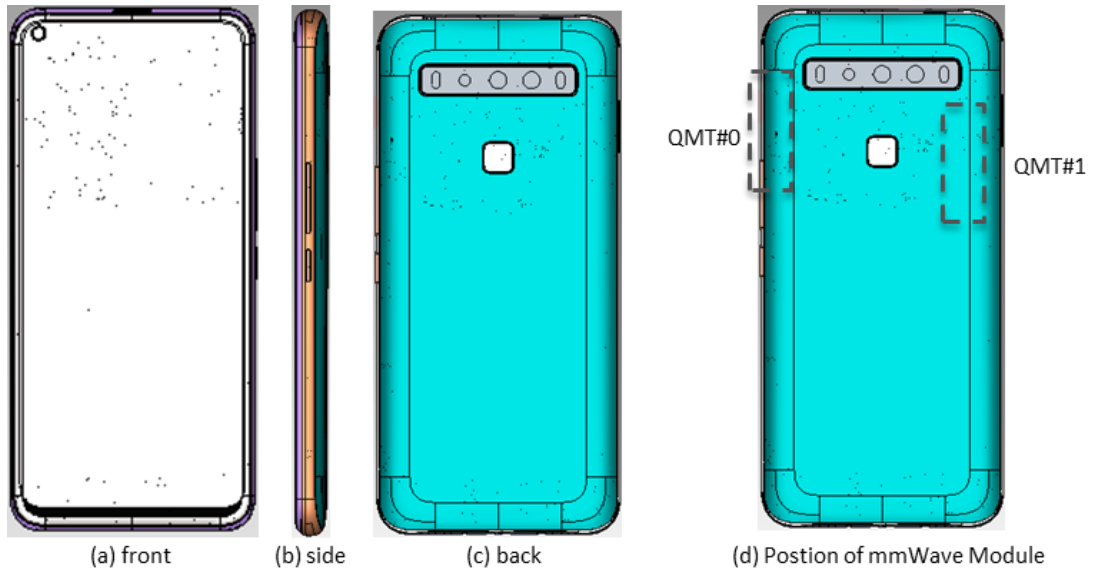


Figure 2. HFSS simulation model which is mounted two mmWave antenna modules

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 bottom side are set up. QTM#0 is placed at the upper of the device and the bottom side is excluded from the worst case because the distance from the bottom side is more than 10 lambda at 28GHz and 39 GHz. QTM#1 is also placed at the upper of the device and the bottom 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
	S1	S2	S3	S4	S5	S6
QTM#0	O	O	O	O	O	X
QTM#1	O	O	O	O	O	X

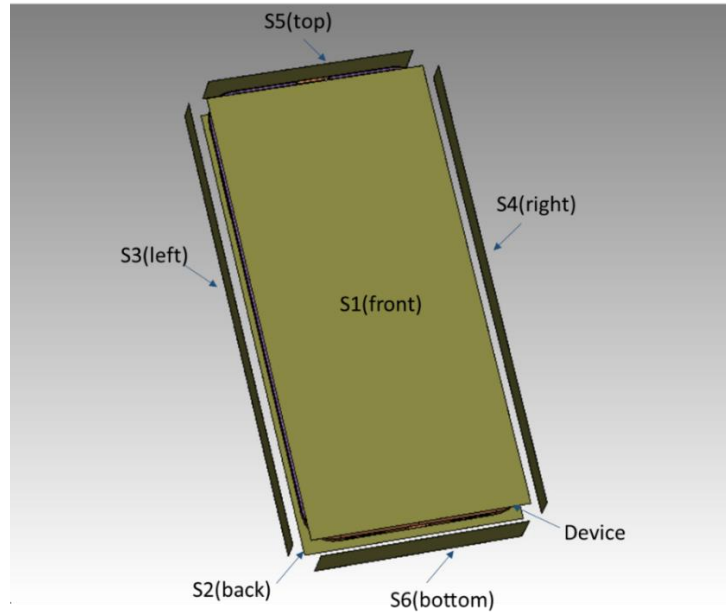


Figure 3. PD evaluation Surfaces

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 three 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.

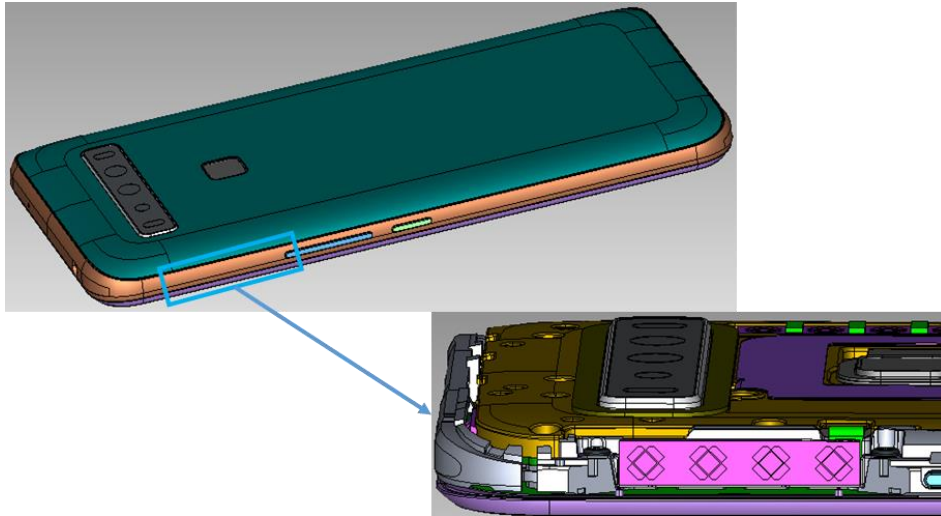


Figure 4. mmWave module (QTM#0)

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.

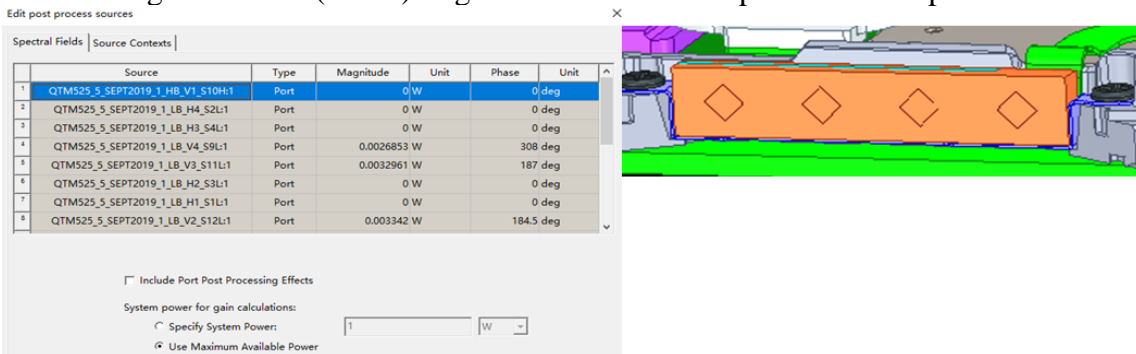


Figure 5. An example of port excitation (QTM#0)

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 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 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.

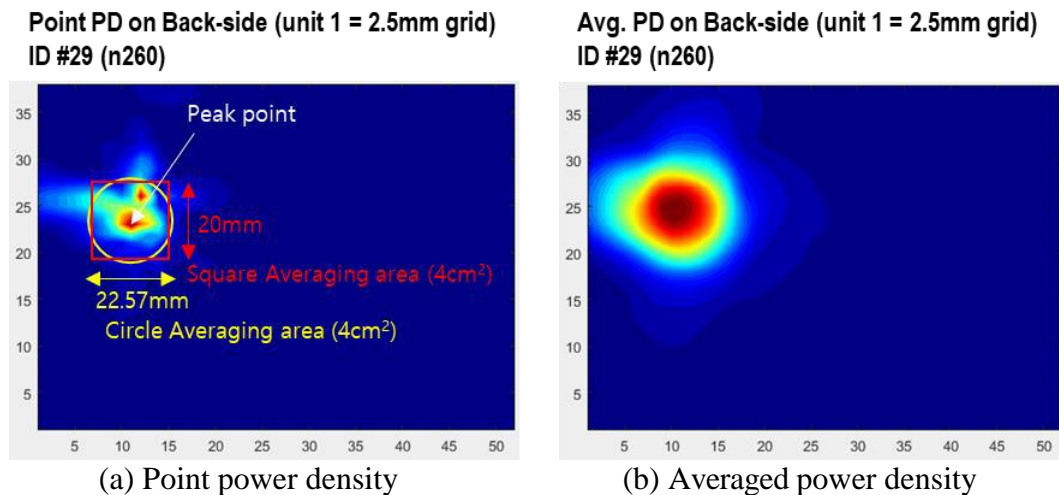


Figure 6. Power density distribution (Example)

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 4cm^2 average power density and the measured 4cm^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).

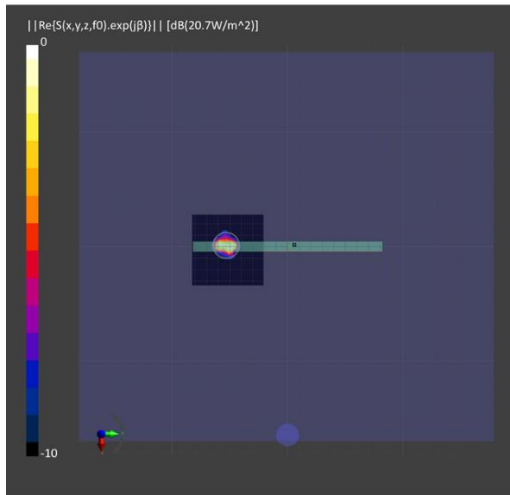
Input power per each active port is listed below for both simulation and measurement verification and power density characterization. For simulation, these values were entered directly into the HFSS model. For measurement, it was used to input these values for each active port using Factory Test Mode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

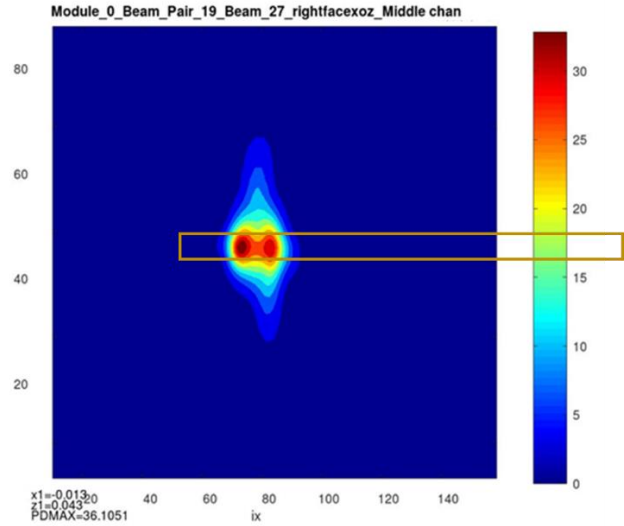
The simulation and measurement results below were performed at 2mm evaluation distance and 28GHz / 38.5GHz. The input.power.limit was determined based on the results below in the RF Exposure Part 0 Report.

6dBm input measurement / simulation							4cm2 avg. PD(W/m2)	
Band	Ant Type	Module	Ant Group	beam ID	Surface	Channel	Measured	Simulated
			(Ant Polarization)					
n261	Patch	QTM0	AG0(V)	27	right	Mid	7.68	14.84
				28	back		2.86	8.04
			AG1(H)	155	right	Mid	7.76	14.19
				155	back		3.86	7.89
		QTM1	AG0(V)	15	back	Mid	6.52	17.05
				23	left		2.11	4.07
			AG1(H)	152	back	Mid	5.21	15.92
				152	left		1.44	3.30
n260	Patch	QTM0	AG0(V)	29	right	Mid	5.66	17.31
				29	front		4.51	9.33
			AG1(H)	146	right	Mid	8.87	16.50
				146	front		4.91	9.17
		QTM1	AG0(V)	12	back	Mid	4.73	14.04
				12	left		0.91	3.58
			AG1(H)	140	back	Mid	4.32	13.53
				144	left		1.37	3.23

n261 Patch antenna QTM0 Ant_Group0 (V-polarization) beam ID 27 Right-side Mid ch.

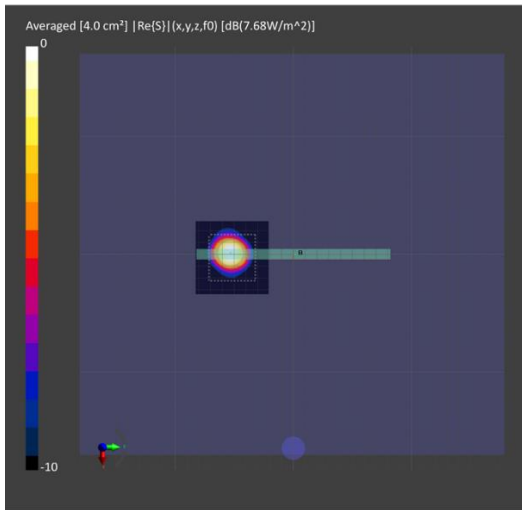


(a) Measurement

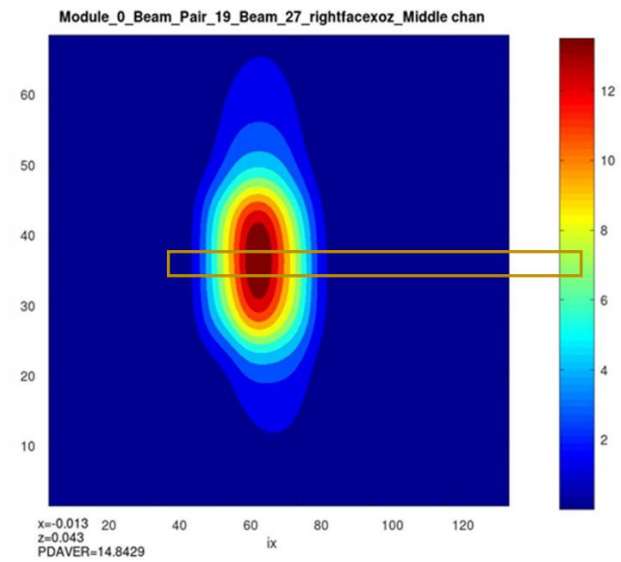


(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 27, Point power density



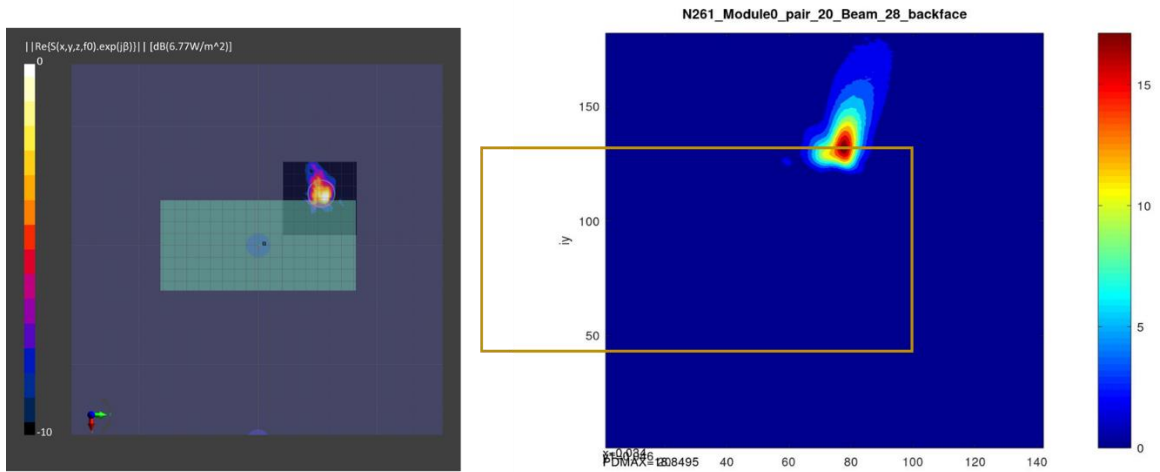
(a) Measurement



(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 27, 4cm² Averaged power density

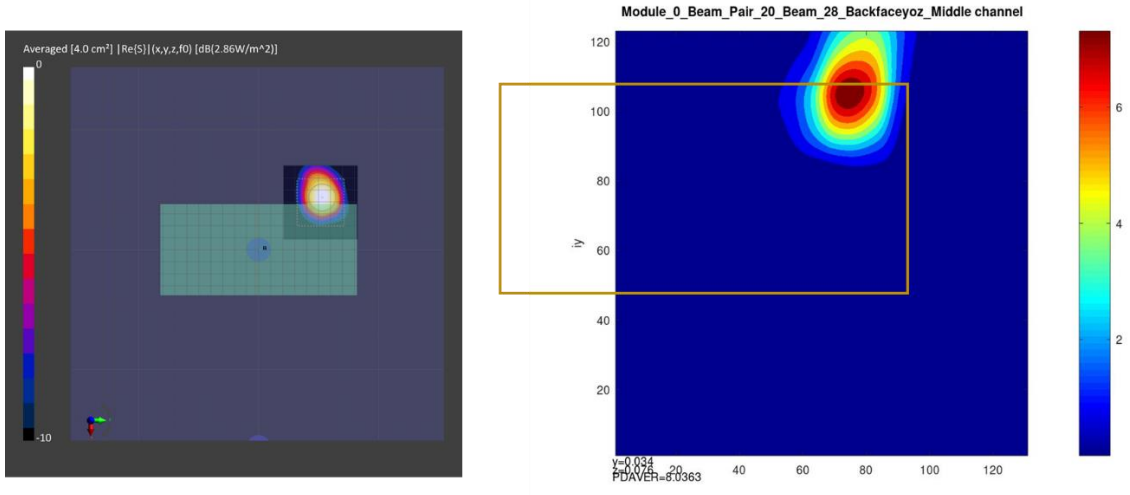
n261 Patch antenna QTM0 Ant_Group0 (V-polarization) beam ID 28 Back-side Mid ch.



(a) Measurement

(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 28, Point power density

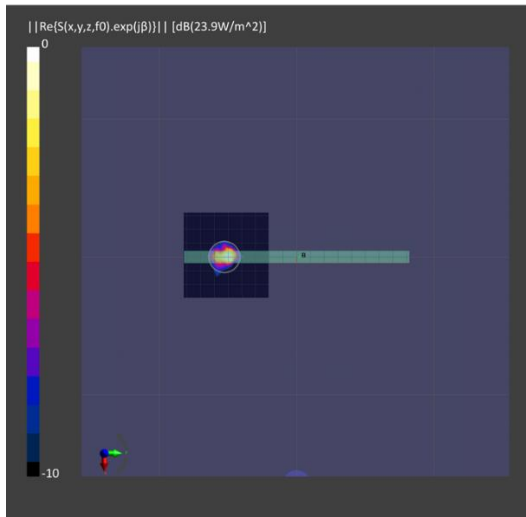


(a) Measurement

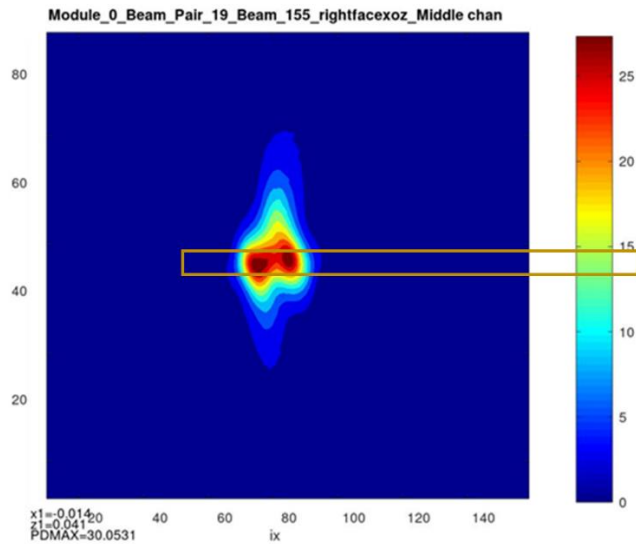
(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 28, 4cm² Averaged power density

n261 Patch antenna QTM0 Ant_Group1 (H-polarization) beam ID 155 Right-side Mid ch.

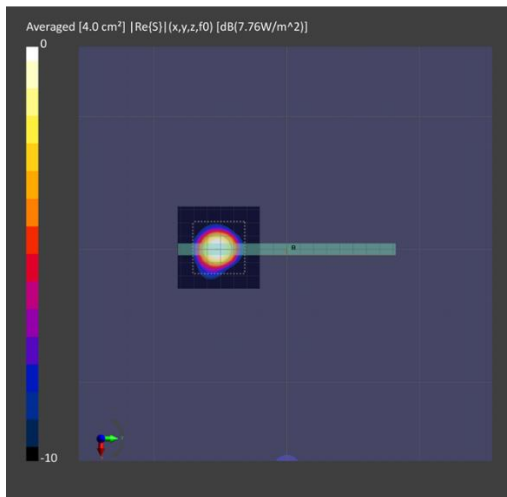


(a) Measurement

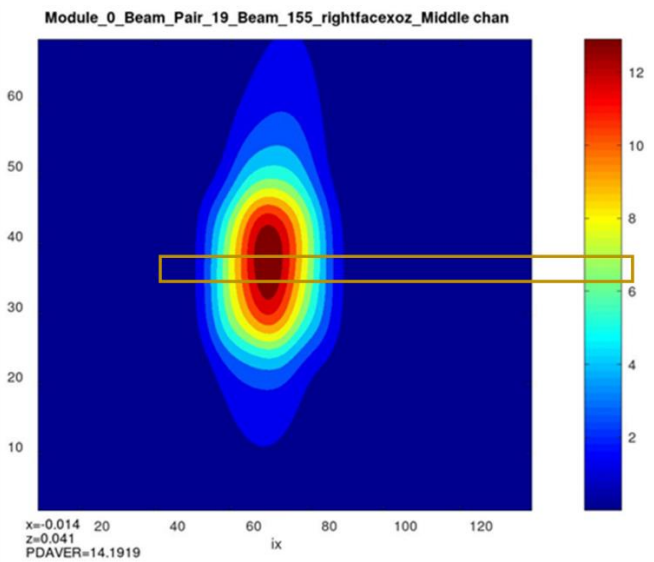


(b) Simulation

Patch antenna QTM0 AG1 (H-polarization) beam ID 155, Point power density



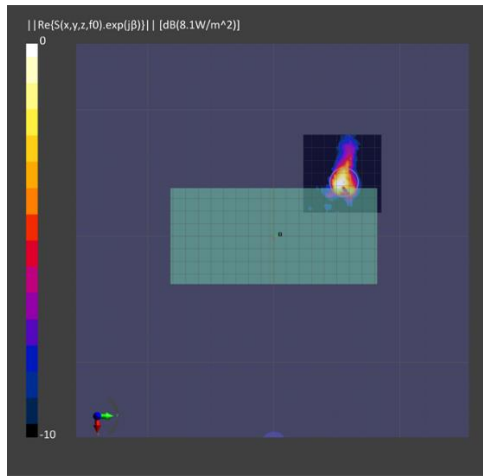
(a) Measurement



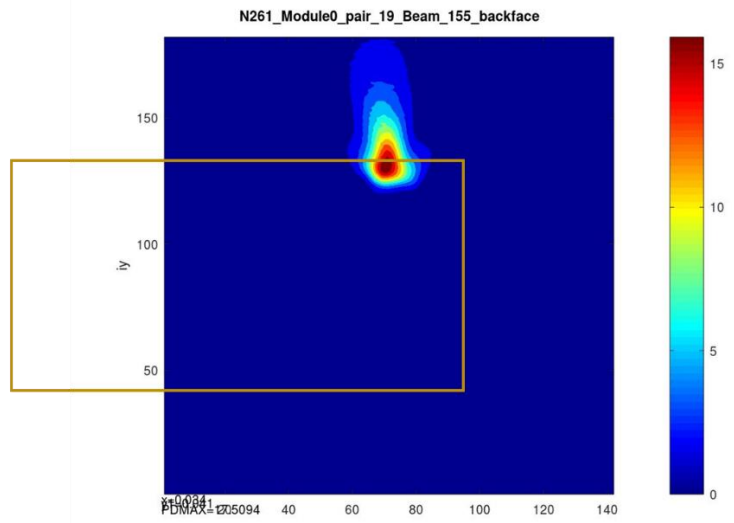
(b) Simulation

Patch antenna QTM0 AG1 (H-polarization) beam ID 155, 4cm² Averaged power density

n261 Patch antenna QTM0 Ant_Group1 (H-polarization) beam ID 155 Back-side Mid ch.

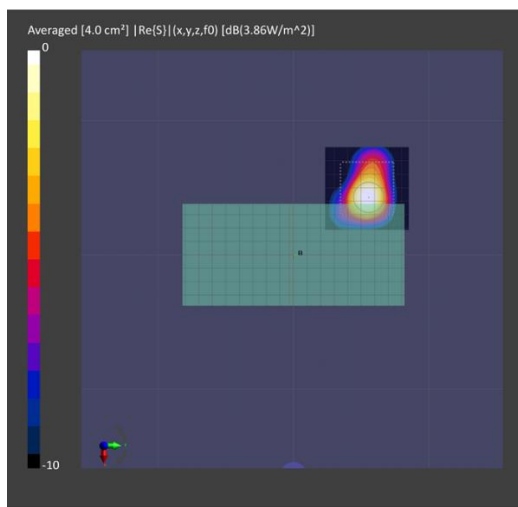


(a) Measurement

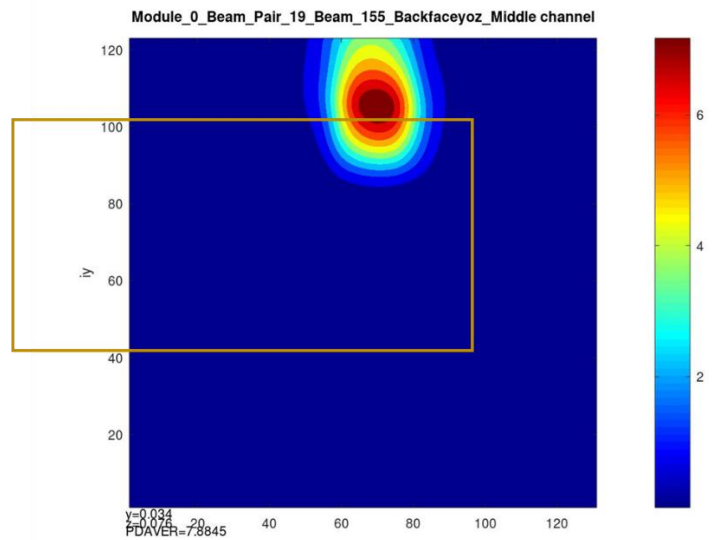


(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 155, Point power density



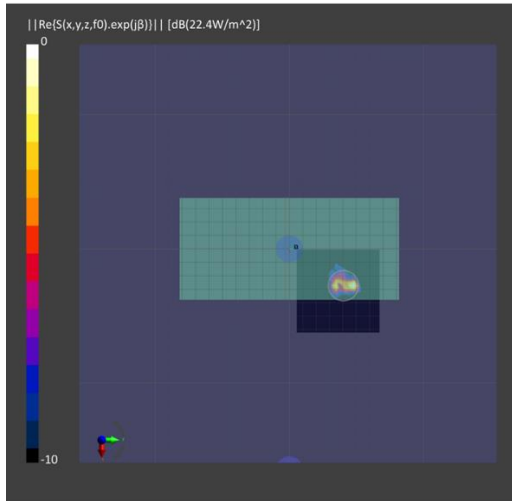
(a) Measurement



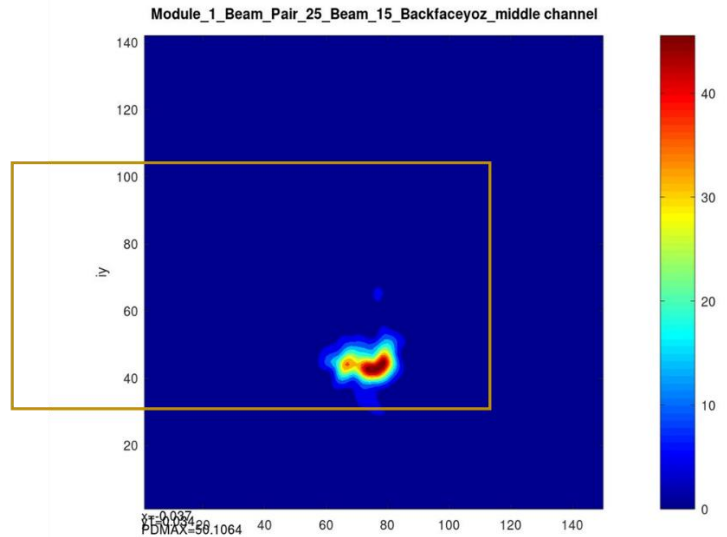
(b) Simulation

Patch antenna QTM0 AG1(H-polarization) beam ID 155, 4cm² Averaged power density

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

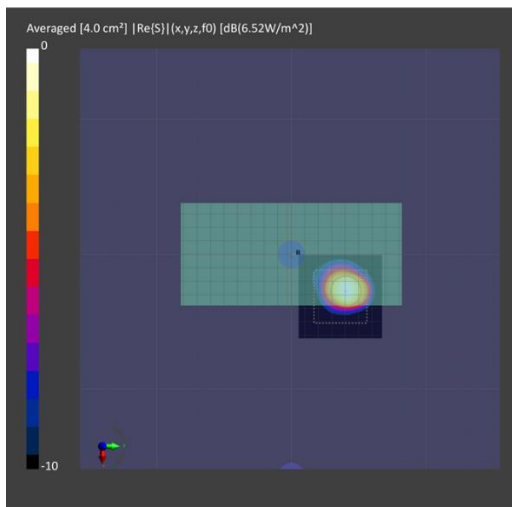


(a) Measurement

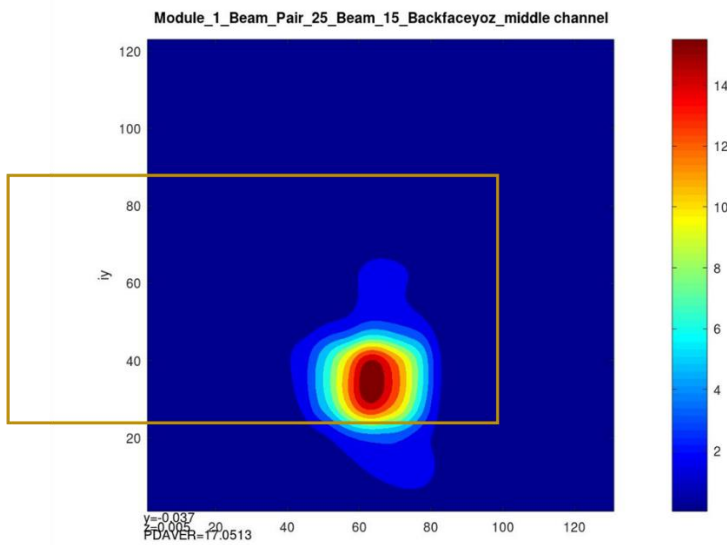


(b) Simulation

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



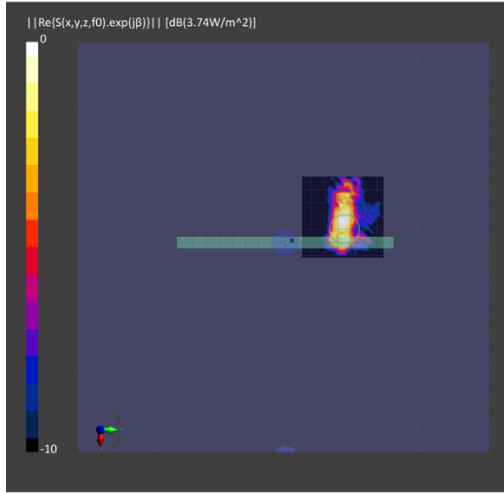
(a) Measurement



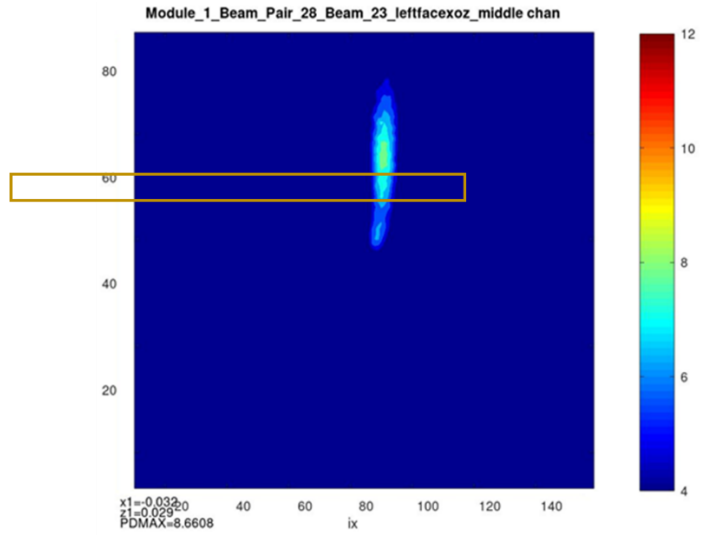
(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 15, 4cm² Averaged power density

n261 Patch antenna QTM1 Ant_Group0 (V-polarization) beam ID 23 Left-side Mid ch

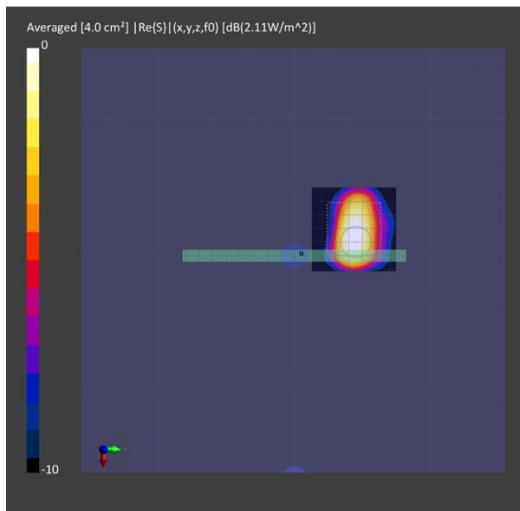


(a) Measurement

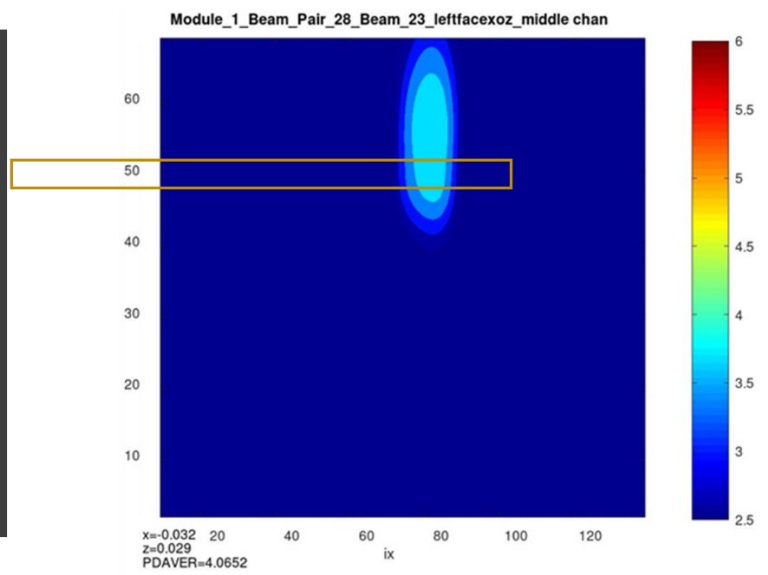


(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 23, Point power density



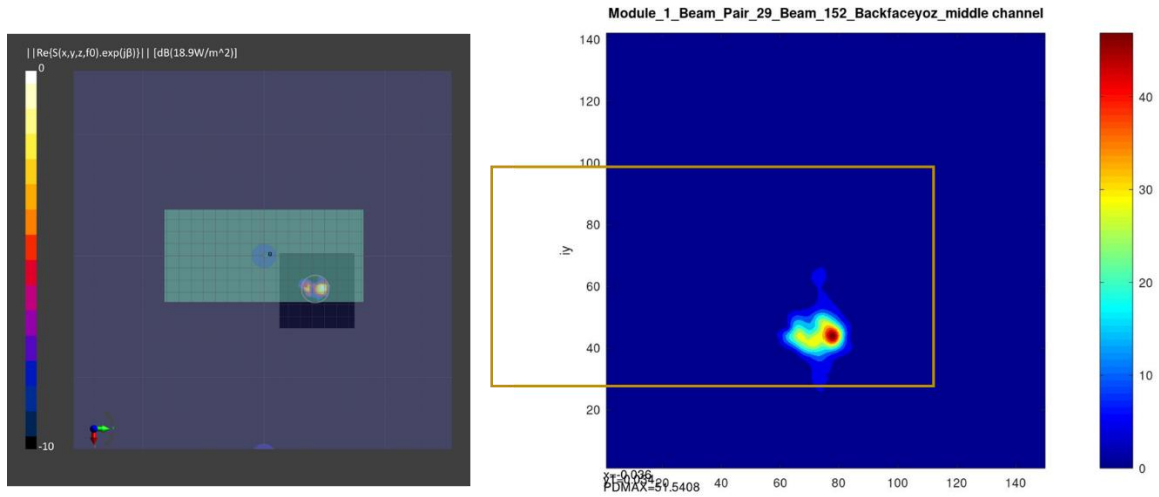
(a) Measurement



(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 23, 4cm² Averaged power density

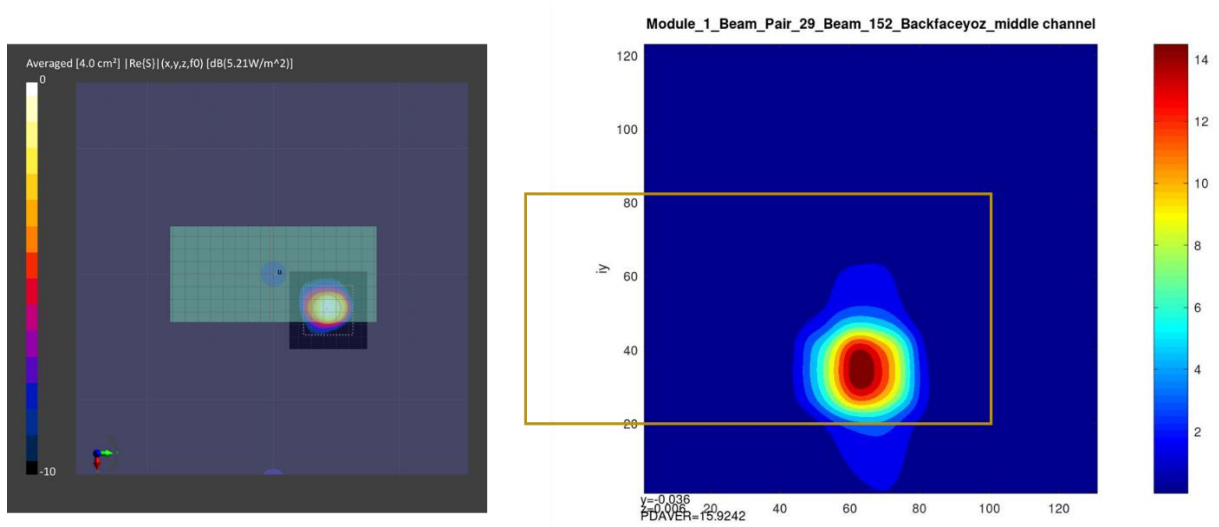
n261 Patch antenna QTM1 Ant_Group1 (H-polarization) beam ID 152 Back-side Mid ch



(a) Measurement

(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 152, Point power density

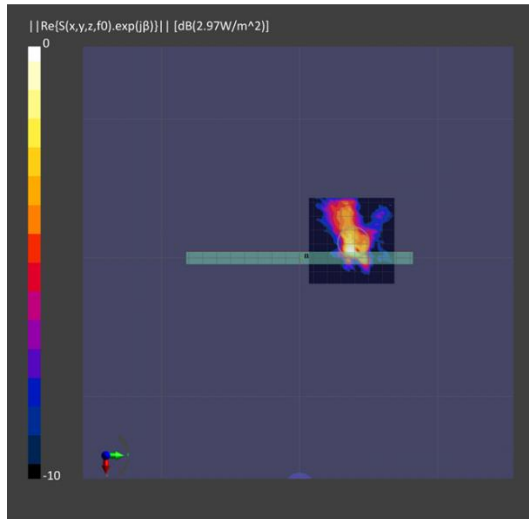


(a) Measurement

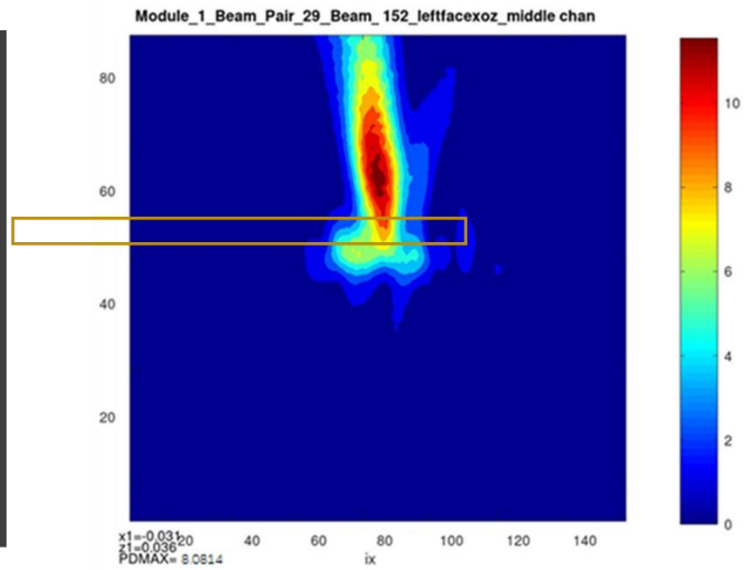
(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 152, 4cm² Averaged power density

n261 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 152 Left-side Mid ch.

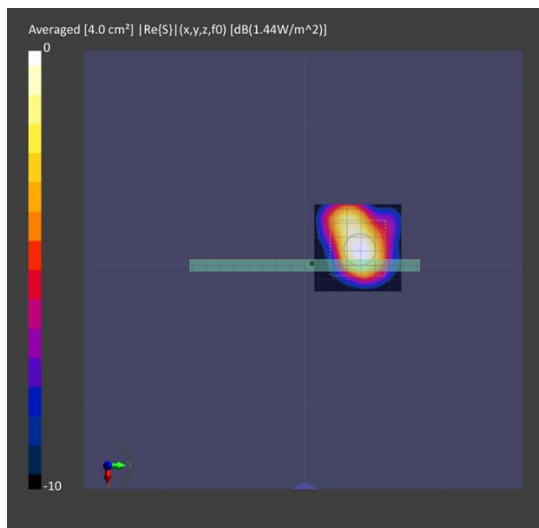


(a) Measurement

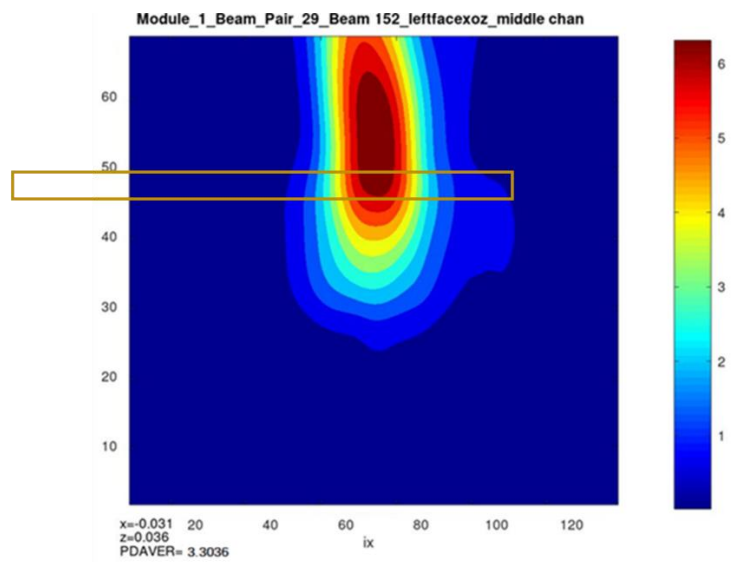


(b) Simulation

Patch antenna QTM1 AG1(H-polarization) beam ID 152, Point power density



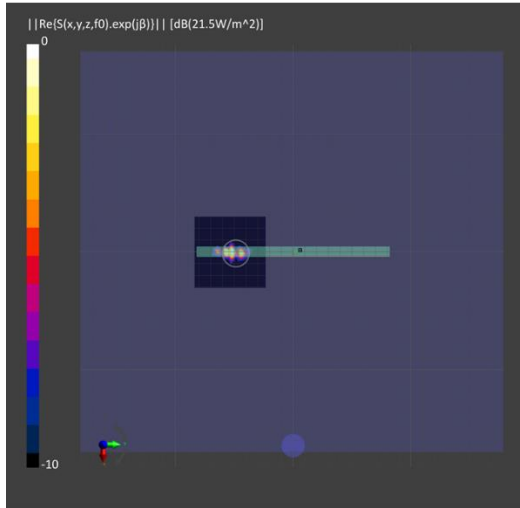
(a) Measurement



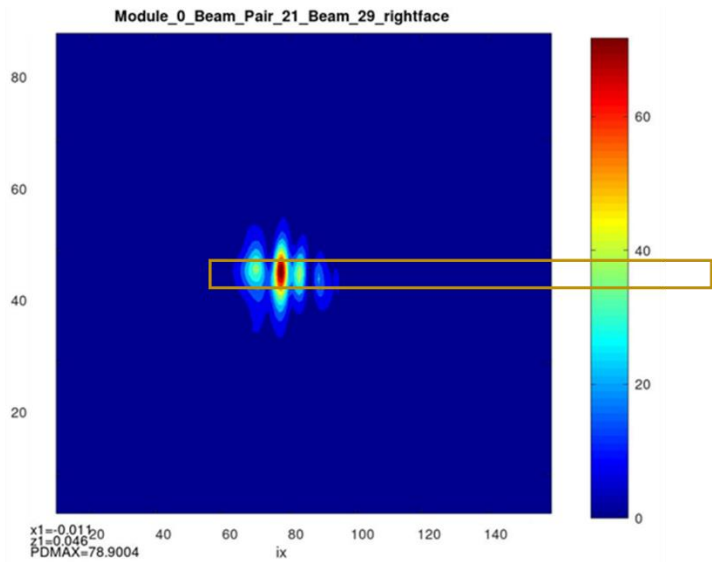
(b) Simulation

Patch antenna QTM1 AG1(H-polarization) beam ID 152, 4cm² Averaged power densi

n260 Patch antenna QTM0 Ant_Group0 (V-polarization) beam ID 29 Right-side Mid ch

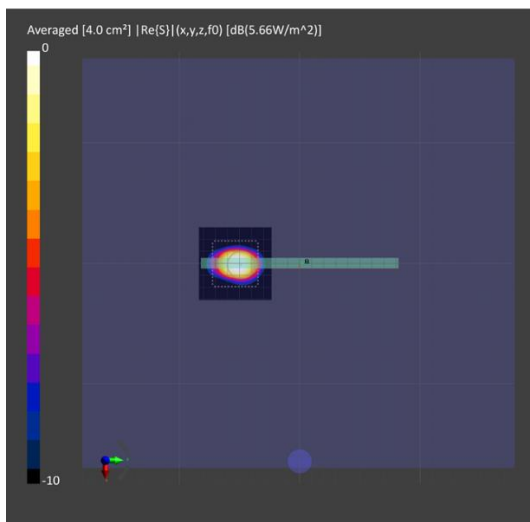


(a) Measurement

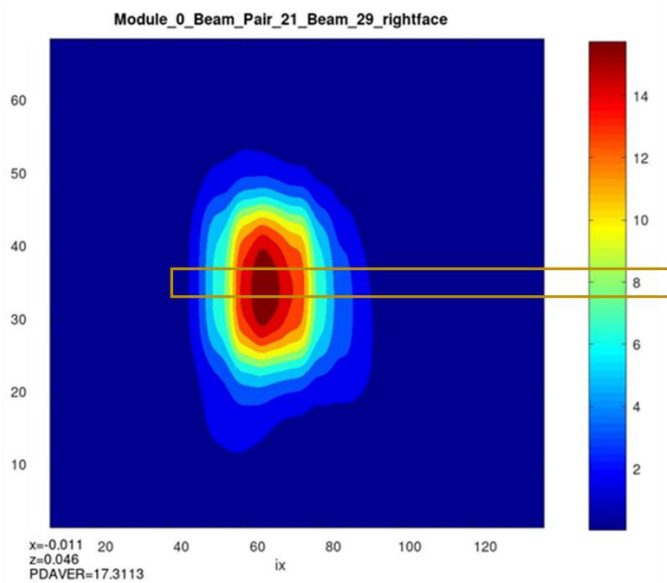


(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 29, Point power density



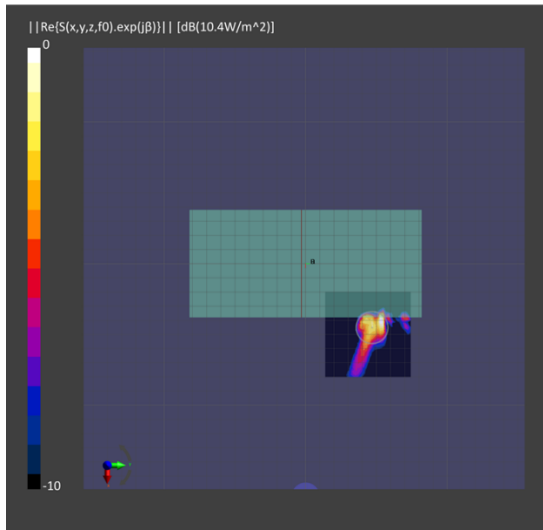
(a) Measurement



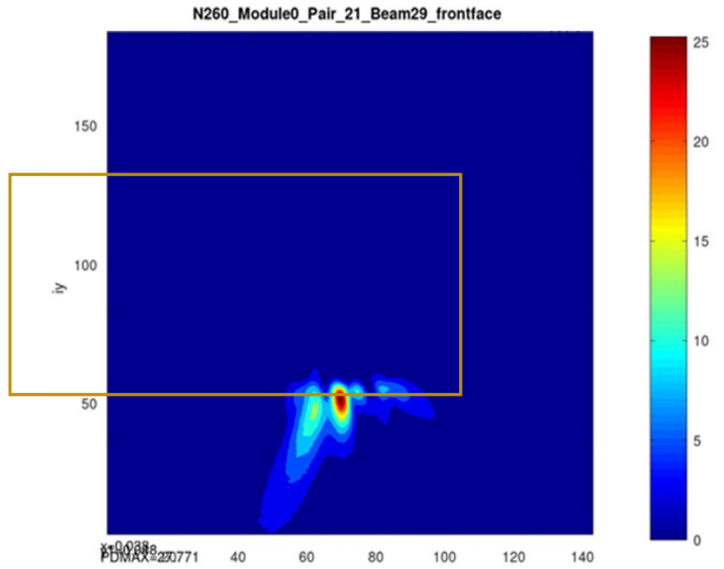
(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 29, 4cm² Averaged power density

n260 Patch antenna QTM0 Ant_Group0 (V-polarization) beam ID 29 Front-side Mid ch

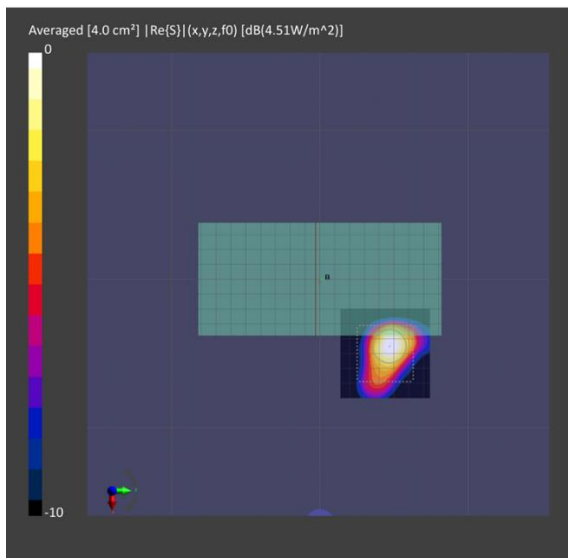


(a) Measurement

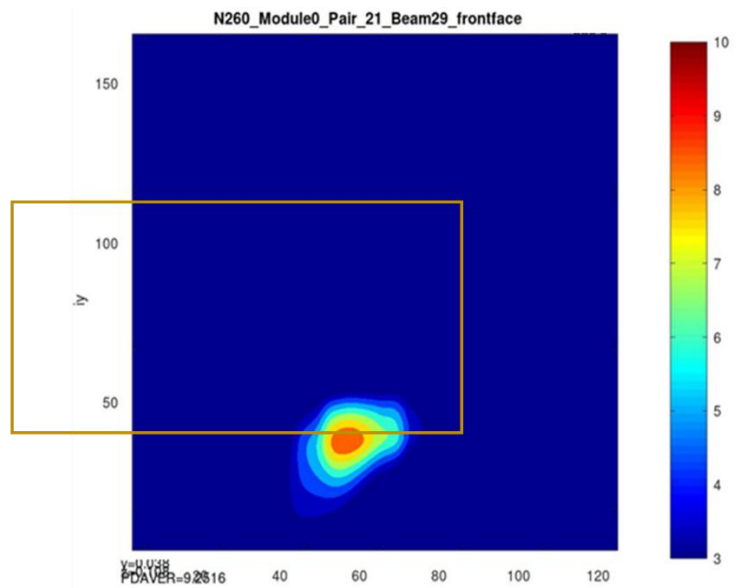


(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 29, Point power density



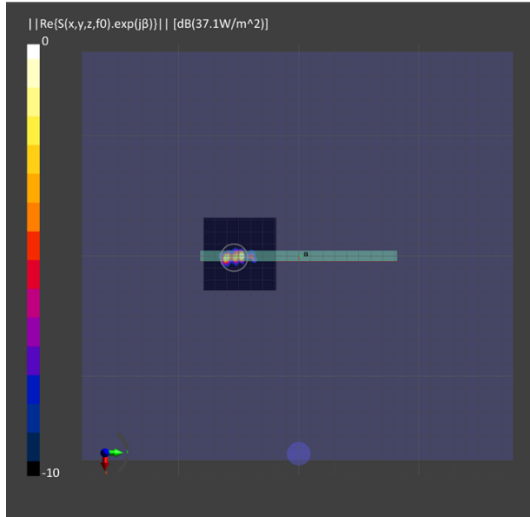
(a) Measurement



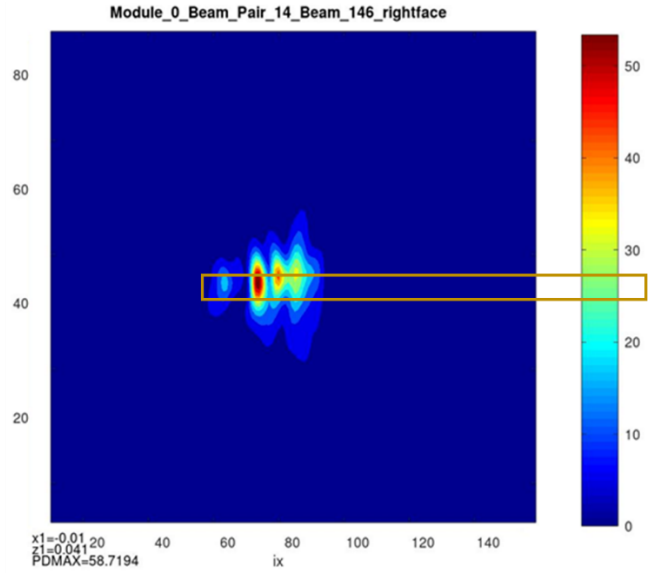
(b) Simulation

Patch antenna QTM0 AG0 (V-polarization) beam ID 29, 4cm² Averaged power density

n260 Patch antenna QTM0 Ant_Group1 (H-polarization) beam ID 146 Right-side Mid ch

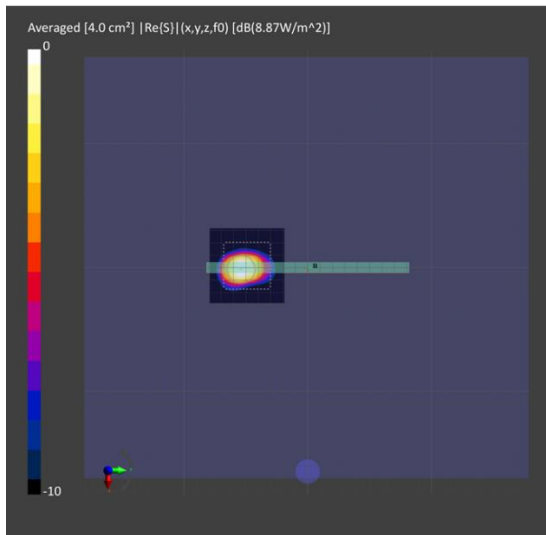


(a) Measurement

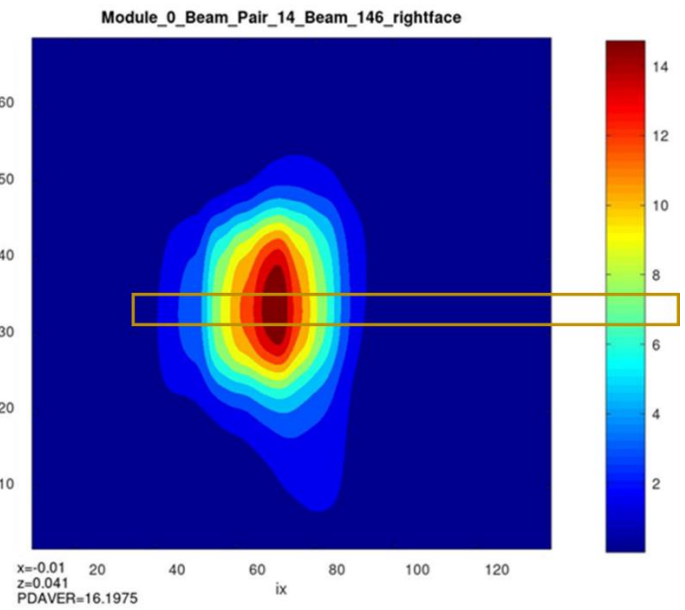


(b) Simulation

Patch antenna QTM0 AG1 (H-polarization) beam ID 146, Point power density



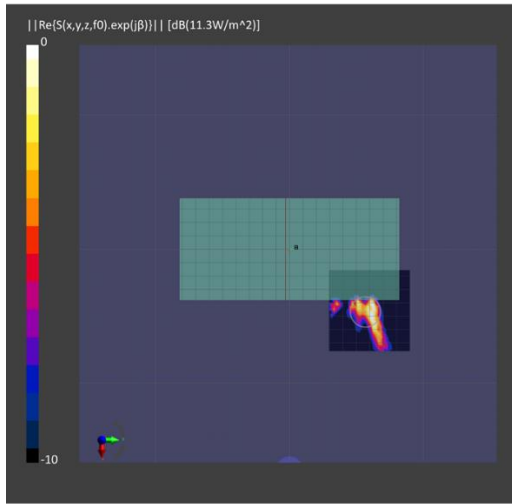
(a) Measurement



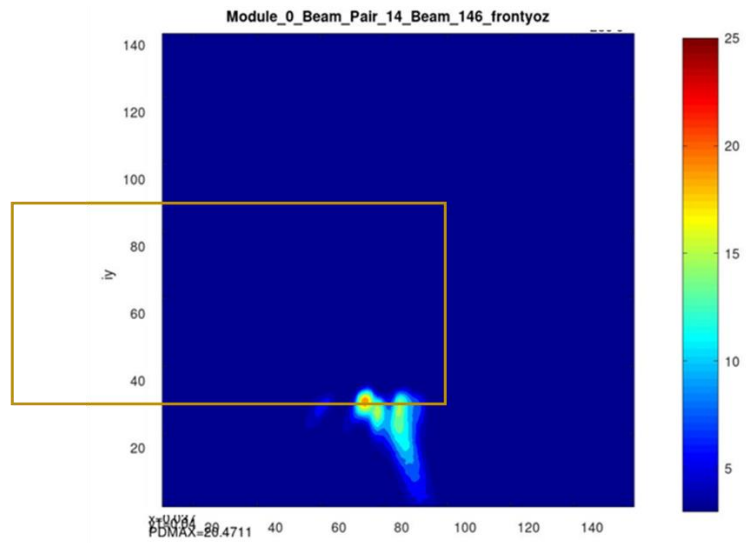
(b) Simulation

Patch antenna QTM0 AG1 (H-polarization) beam ID 146, 4cm² Averaged power density

n260 Patch antenna QTM0 Ant_Group1 (H-polarization) beam ID 146 Front-side Mid ch.

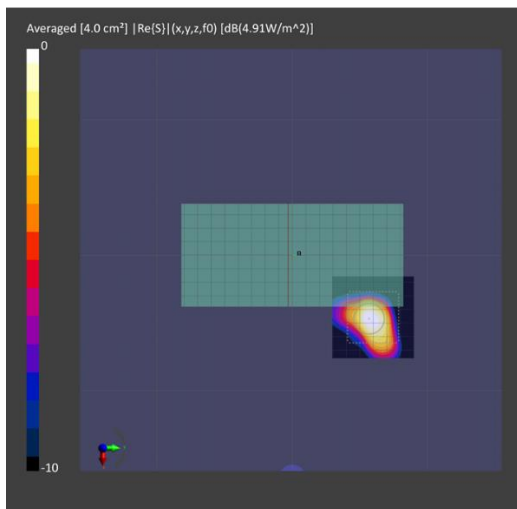


(a) Measurement

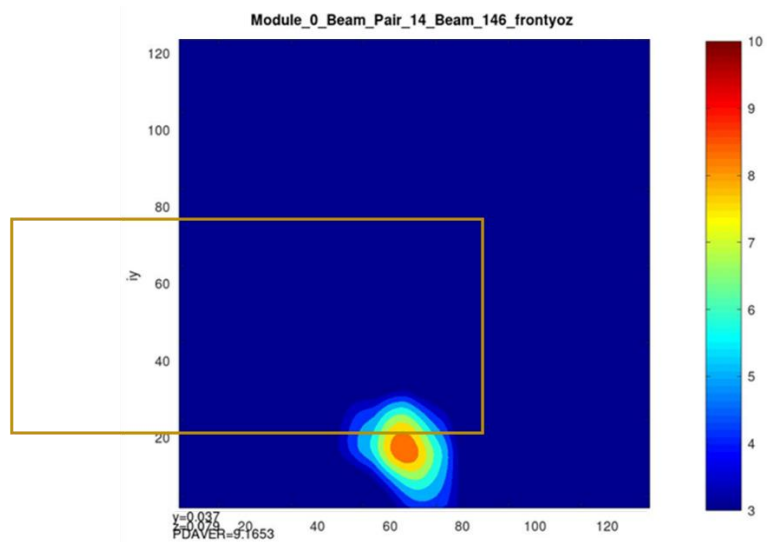


(b) Simulation

Patch antenna QTM0 AG1 (H-polarization) beam ID 146, Point power density



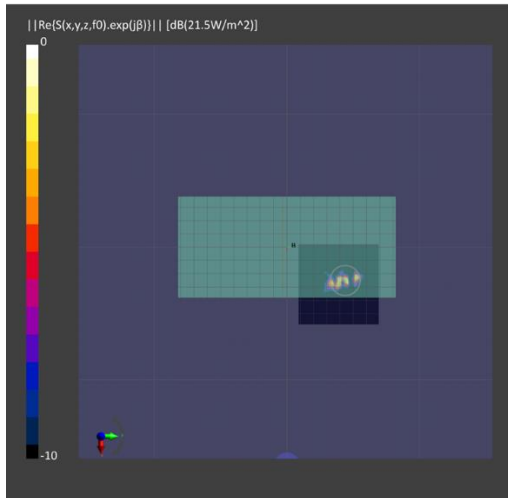
(a) Measurement



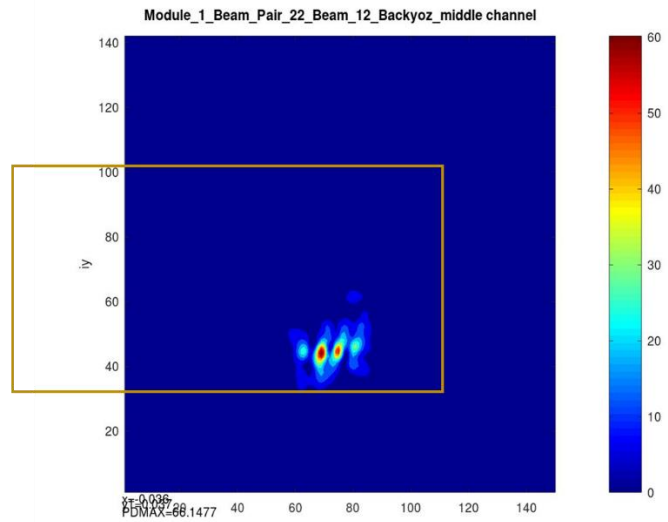
(b) Simulation

Patch antenna QTM0 AG1 (H-polarization) beam ID 146, 4cm² Averaged power density

n260 Patch antenna QTM1 Ant_Group0 (V-polarization) beam ID 12 Back-side Mid ch.

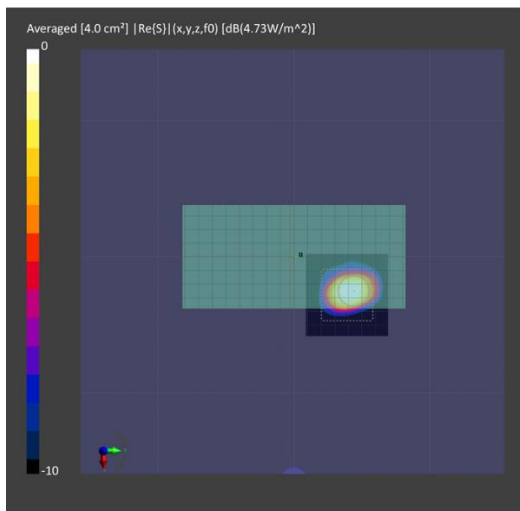


(a) Measurement

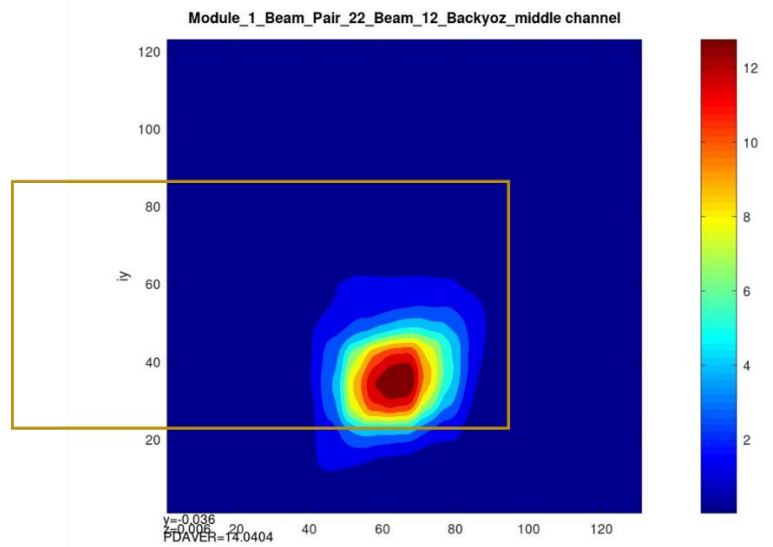


(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 12, Point power density



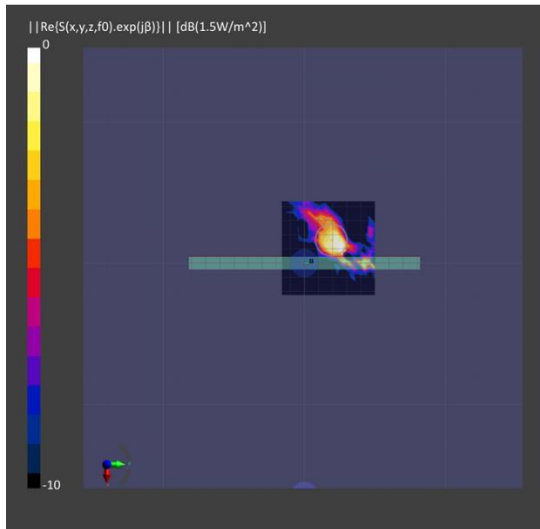
(a) Measurement



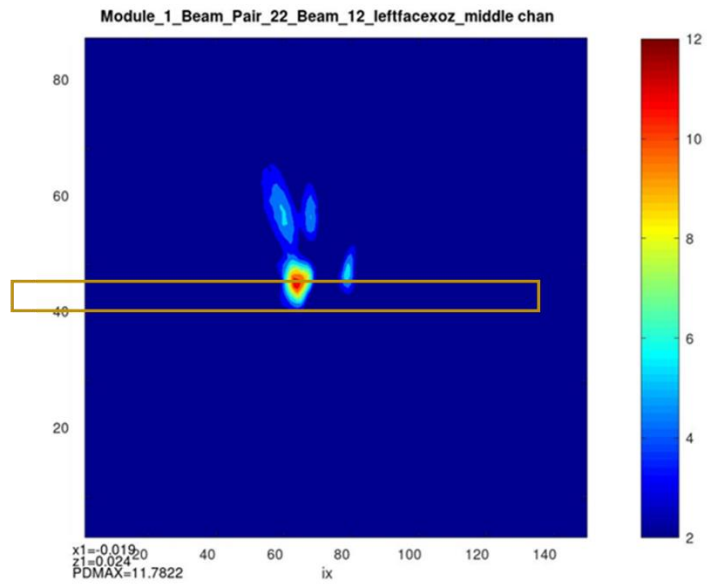
(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 12, 4cm² Averaged power density

n260 Patch antenna QTM1 Ant_Group0 (V-polarization) beam ID 12 Left-side Mid ch

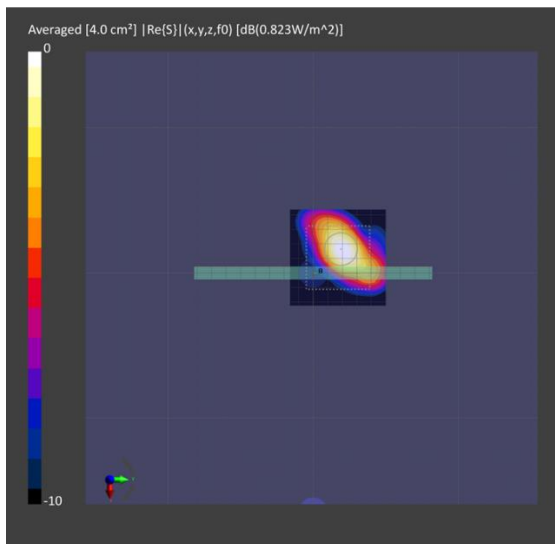


(a) Measurement

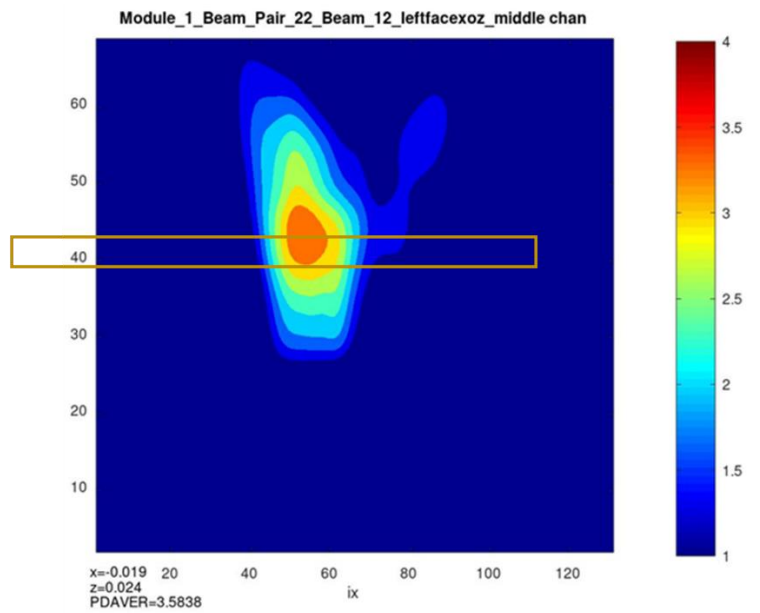


(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 12, Point power density



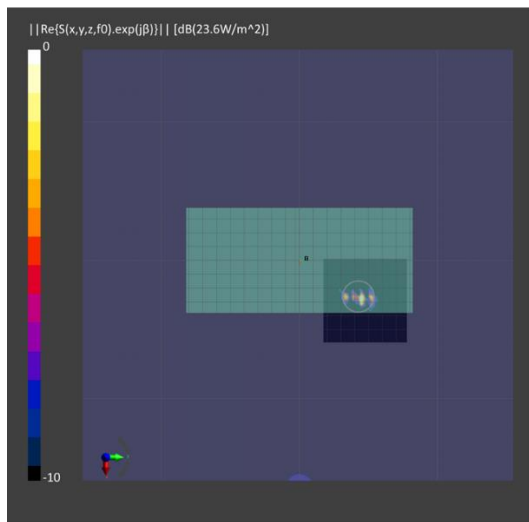
(a) Measurement



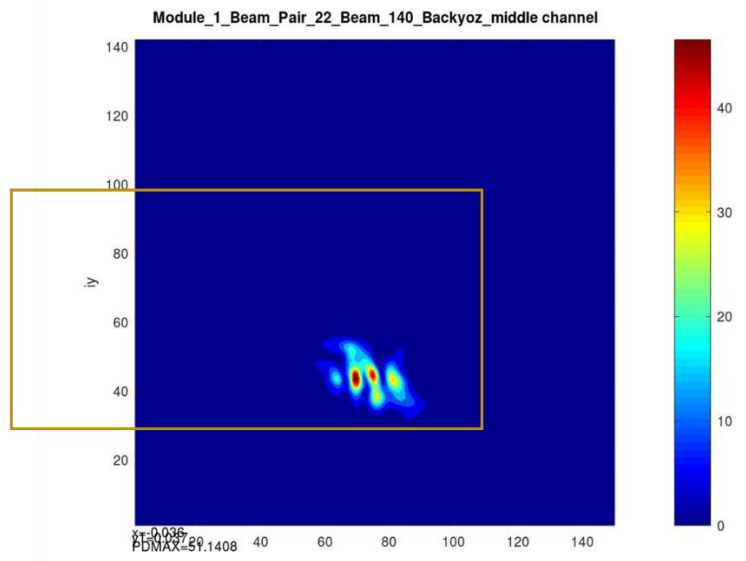
(b) Simulation

Patch antenna QTM1 AG0 (V-polarization) beam ID 12, 4cm² Averaged power density

n260 Patch antenna QTM1 Ant_Group1 (H-polarization) beam ID 140 Back-side Mid ch.

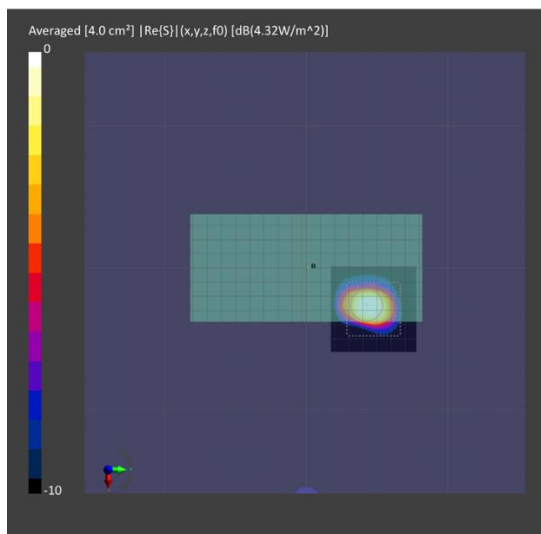


(a) Measurement

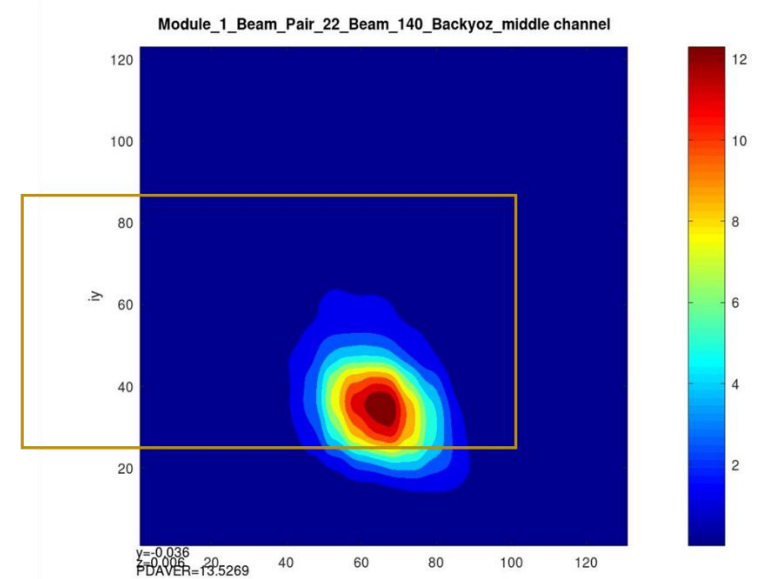


(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 140, Point power density



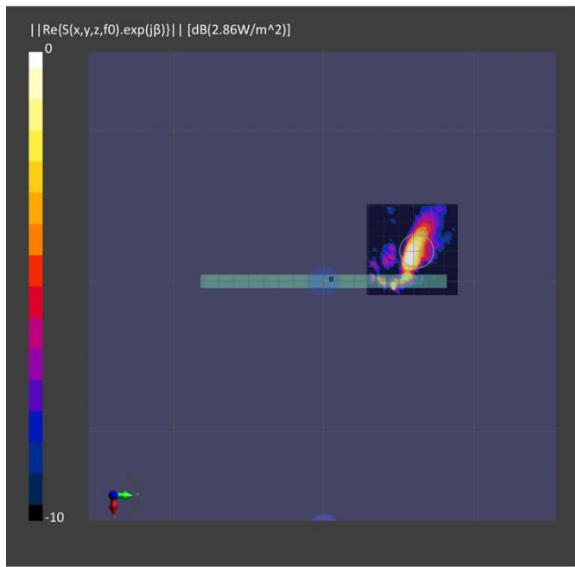
(a) Measurement



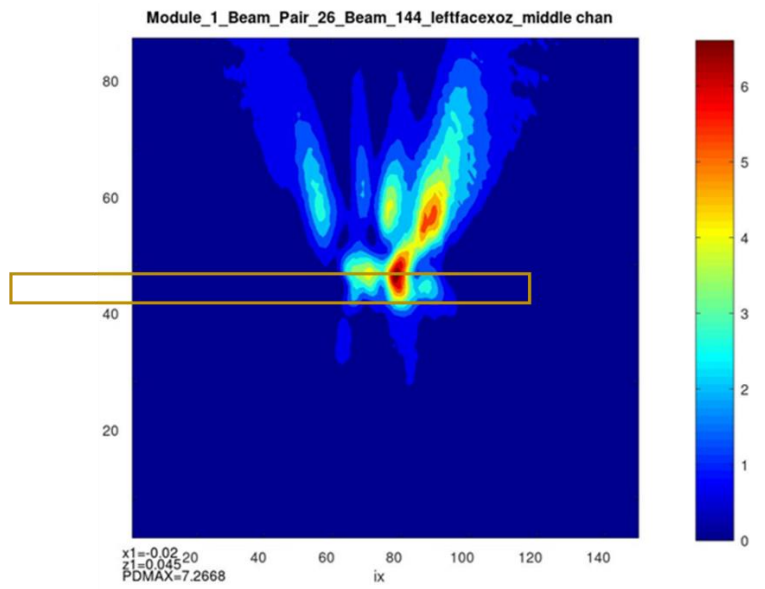
(b) Simulation

Patch antenna QTM1 AG1 (H-polarization) beam ID 140, 4cm² Averaged power density

n260 Patch antenna QTM1 Ant_Group1(H-polarization) beam ID 144 Left-side Mid ch.

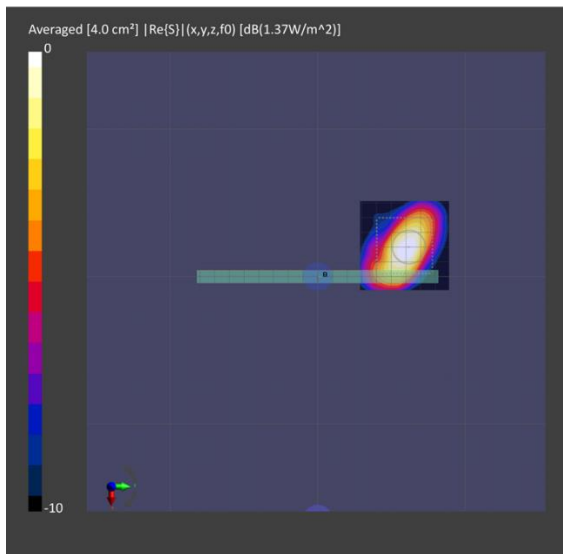


(a) Measurement

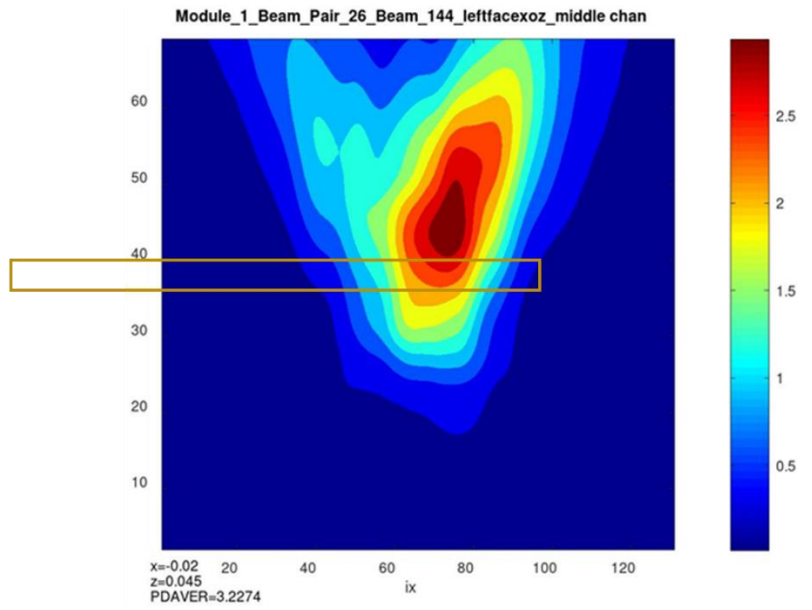


(b) Simulation

Patch antenna QTM1 AG1(H-polarization) beam ID 144, Point power density



(a) Measurement



(b) Simulation

Patch antenna QTM1 AG1(H-polarization) beam ID 144, 4cm² 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.

3.1 PD 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 1.

Table 2. PD of QTM#0 – patch antenna (28GHz)
QTM#0 Low Ch.

n261 Low ch.(27.5 GHz) /					4cm2 PD(W/m2) at 2 mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	relative phase worst PD for MIMO					Front 2mm/worst surface 2 mm	relative phase worst PD for MIMO					worst surface 10 mm/worst surface 2mm	
					top	left	right	back	front		top	left	right	back	front		
261	1		QTM1	PATCH	1	0.065	0.010	3.153	1.303	1.251	0.397	0.043	0.009	1.172	0.404	0.436	0.372
261	5		QTM1	PATCH	2	0.455	0.042	7.658	3.717	3.266	0.426	0.250	0.035	3.829	1.699	1.276	0.500
261	6		QTM1	PATCH	2	0.182	0.017	8.264	4.374	3.736	0.452	0.089	0.014	4.464	2.007	1.612	0.540
261	7		QTM1	PATCH	2	0.837	0.036	6.273	2.227	2.134	0.340	0.494	0.029	2.109	0.789	0.739	0.336
261	10		QTM1	PATCH	2	0.131	0.024	8.337	4.406	3.680	0.441	0.058	0.020	4.489	2.035	1.575	0.538
261	11		QTM1	PATCH	2	0.578	0.027	6.992	3.155	3.015	0.431	0.336	0.024	3.260	1.352	1.203	0.466
261	17		QTM1	PATCH	4	0.892	0.081	11.469	4.595	5.662	0.494	0.493	0.069	5.638	2.227	2.557	0.492
261	18		QTM1	PATCH	4	0.134	0.084	14.919	8.148	6.685	0.448	0.063	0.070	8.028	4.210	3.369	0.538
261	19		QTM1	PATCH	4	0.141	0.067	15.058	8.425	6.966	0.463	0.093	0.054	7.957	4.254	3.583	0.528
261	20		QTM1	PATCH	4	0.583	0.048	12.784	6.871	6.218	0.486	0.323	0.043	6.979	2.942	2.940	0.546
261	21		QTM1	PATCH	4	1.908	0.074	9.355	3.398	4.285	0.458	1.187	0.065	3.871	1.248	1.682	0.414
261	26		QTM1	PATCH	4	0.237	0.067	14.252	7.288	6.501	0.456	0.097	0.056	7.460	3.662	3.193	0.523
261	27		QTM1	PATCH	4	0.101	0.087	15.177	8.340	6.899	0.455	0.053	0.073	8.171	4.288	3.543	0.538
261	28		QTM1	PATCH	4	0.256	0.053	14.556	8.344	6.736	0.463	0.115	0.045	7.835	4.066	3.451	0.538
261	29		QTM1	PATCH	4	1.502	0.063	10.373	4.459	4.735	0.456	0.902	0.054	4.551	1.602	2.011	0.439
261	129		QTM1	PATCH	1	0.045	0.011	4.115	1.522	1.601	0.389	0.028	0.010	1.486	0.475	0.551	0.361
261	133		QTM1	PATCH	2	0.274	0.028	7.410	3.867	3.219	0.434	0.167	0.024	3.656	1.573	1.397	0.493
261	134		QTM1	PATCH	2	0.137	0.024	6.907	3.416	3.467	0.502	0.084	0.022	3.787	1.480	1.620	0.548
261	135		QTM1	PATCH	2	0.470	0.030	5.527	1.842	2.301	0.416	0.287	0.024	2.004	0.654	1.008	0.362
261	138		QTM1	PATCH	2	0.054	0.028	6.918	3.576	3.430	0.496	0.027	0.022	3.695	1.507	1.591	0.534
261	139		QTM1	PATCH	2	0.372	0.030	6.071	2.424	2.923	0.482	0.241	0.024	2.862	0.952	1.329	0.471
261	145		QTM1	PATCH	4	0.515	0.049	12.267	6.030	5.594	0.456	0.322	0.041	5.966	2.755	2.650	0.486
261	146		QTM1	PATCH	4	0.068	0.043	14.298	7.765	6.687	0.468	0.034	0.033	7.603	3.790	3.330	0.532
261	147		QTM1	PATCH	4	0.080	0.062	14.471	7.824	6.607	0.457	0.053	0.052	7.853	3.981	3.309	0.543
261	148		QTM1	PATCH	4	0.636	0.075	12.004	5.843	6.053	0.504	0.346	0.057	6.651	2.614	2.827	0.554
261	149		QTM1	PATCH	4	1.174	0.060	8.900	3.708	3.882	0.436	0.701	0.048	3.438	1.298	1.461	0.386
261	154		QTM1	PATCH	4	0.146	0.040	13.641	7.107	6.459	0.474	0.072	0.031	7.142	3.360	3.182	0.524
261	155		QTM1	PATCH	4	0.071	0.042	14.635	8.056	6.720	0.459	0.041	0.036	7.821	4.116	3.403	0.534
261	156		QTM1	PATCH	4	0.207	0.061	13.965	7.197	6.693	0.479	0.081	0.055	7.744	3.600	3.330	0.555
261	157		QTM1	PATCH	4	0.997	0.089	9.540	4.247	4.792	0.502	0.568	0.060	4.964	1.865	2.160	0.520
261	1	129	QTM1	PATCH	1	0.132	0.026	6.796	1.883	3.602	0.530	0.069	0.024	2.729	0.584	1.394	0.402
261	5	133	QTM1	PATCH	2	0.723	0.064	15.791	6.895	7.569	0.479	0.408	0.050	7.905	2.817	2.959	0.501
261	6	134	QTM1	PATCH	2	0.400	0.058	15.778	9.520	6.009	0.381	0.246	0.054	8.376	4.297	2.475	0.531
261	7	135	QTM1	PATCH	2	1.598	0.081	13.070	5.412	4.715	0.361	0.967	0.071	4.634	2.031	1.745	0.355
261	10	138	QTM1	PATCH	2	0.196	0.057	15.840	9.581	6.271	0.396	0.093	0.050	8.299	4.513	2.645	0.524
261	11	139	QTM1	PATCH	2	1.117	0.084	14.886	5.883	7.502	0.504	0.670	0.069	7.006	2.407	2.970	0.471
261	17	145	QTM1	PATCH	4	1.826	0.130	21.520	8.998	10.866	0.505	0.914	0.108	10.621	4.329	5.415	0.494
261	18	146	QTM1	PATCH	4	0.176	0.122	30.612	16.301	15.110	0.494	0.064	0.095	16.825	8.562	7.774	0.550
261	19	147	QTM1	PATCH	4	0.137	0.102	29.746	16.103	15.007	0.505	0.074	0.089	16.588	8.440	7.609	0.558
261	20	148	QTM1	PATCH	4	1.254	0.120	24.498	12.117	12.561	0.513	0.742	0.106	13.443	5.387	5.793	0.549
261	21	149	QTM1	PATCH	4	2.616	0.122	17.465	6.013	8.360	0.479	1.607	0.094	5.511	2.473	2.509	0.316
261	26	154	QTM1	PATCH	4	0.431	0.105	28.110	14.199	14.090	0.501	0.155	0.087	15.233	6.952	7.222	0.542
261	27	155	QTM1	PATCH	4	0.129	0.124	30.821	16.741	15.203	0.493	0.054	0.097	17.011	8.989	7.858	0.552
261	28	156	QTM1	PATCH	4	0.553	0.142	28.844	15.381	14.623	0.507	0.185	0.129	16.429	7.777	7.197	0.570
261	29	157	QTM1	PATCH	4	2.097	0.120	16.415	6.675	7.948	0.484	1.209	0.098	7.199	2.531	3.397	0.439

QTM#0 Mid Ch.

n261 Middle ch.(28 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)
					top	left	right	back	front		top	left	right	back	front	
261	1	QTM1	PATCH	1	0.070	0.010	3.197	1.028	1.437	0.449	0.043	0.009	1.217	0.288	0.521	0.381
261	5	QTM1	PATCH	2	0.517	0.040	7.213	3.441	3.017	0.418	0.259	0.035	3.697	1.577	1.126	0.513
261	6	QTM1	PATCH	2	0.180	0.020	7.759	4.356	3.209	0.414	0.078	0.019	4.216	2.026	1.388	0.543
261	7	QTM1	PATCH	2	0.832	0.040	5.952	2.260	1.945	0.327	0.503	0.035	1.810	0.853	0.654	0.304
261	10	QTM1	PATCH	2	0.159	0.023	7.858	4.250	3.292	0.419	0.058	0.021	4.320	1.976	1.380	0.550
261	11	QTM1	PATCH	2	0.510	0.028	6.538	3.234	2.629	0.402	0.317	0.025	2.931	1.423	1.020	0.448
261	17	QTM1	PATCH	4	1.060	0.072	10.596	4.043	5.172	0.488	0.551	0.062	5.129	1.942	2.532	0.484
261	18	QTM1	PATCH	4	0.173	0.063	14.659	7.559	6.700	0.457	0.070	0.055	8.017	3.752	3.363	0.547
261	19	QTM1	PATCH	4	0.124	0.069	14.397	8.029	6.454	0.448	0.081	0.058	7.688	4.058	3.318	0.534
261	20	QTM1	PATCH	4	0.659	0.053	11.684	6.677	5.325	0.456	0.317	0.045	6.282	3.057	2.631	0.538
261	21	QTM1	PATCH	4	1.860	0.078	9.394	3.895	4.002	0.426	1.227	0.066	3.628	1.410	1.696	0.386
261	26	QTM1	PATCH	4	0.243	0.059	13.794	6.760	6.165	0.447	0.098	0.048	7.231	3.299	3.060	0.524
261	27	QTM1	PATCH	4	0.153	0.069	14.843	7.809	6.896	0.465	0.055	0.058	8.134	3.860	3.531	0.548
261	28	QTM1	PATCH	4	0.290	0.048	13.655	8.036	5.965	0.437	0.103	0.041	7.314	4.024	3.056	0.536
261	29	QTM1	PATCH	4	1.300	0.071	10.220	4.776	4.303	0.421	0.895	0.059	3.977	1.826	1.867	0.389
261	129	QTM1	PATCH	1	0.054	0.011	3.977	1.791	1.602	0.403	0.027	0.009	1.498	0.624	0.577	0.377
261	133	QTM1	PATCH	2	0.245	0.021	7.045	3.675	2.934	0.416	0.156	0.019	3.391	1.672	1.251	0.481
261	134	QTM1	PATCH	2	0.127	0.030	6.479	2.928	3.466	0.535	0.065	0.028	3.598	1.240	1.638	0.555
261	135	QTM1	PATCH	2	0.419	0.037	5.331	1.658	2.258	0.424	0.246	0.030	1.831	0.541	0.941	0.344
261	138	QTM1	PATCH	2	0.068	0.039	6.411	2.999	3.412	0.532	0.033	0.033	3.435	1.272	1.589	0.536
261	139	QTM1	PATCH	2	0.328	0.038	5.808	2.151	2.823	0.486	0.180	0.032	2.722	0.816	1.322	0.469
261	145	QTM1	PATCH	4	0.495	0.049	11.554	5.865	5.088	0.440	0.275	0.042	5.587	2.778	2.455	0.484
261	146	QTM1	PATCH	4	0.111	0.043	13.675	7.631	6.118	0.447	0.046	0.037	7.113	3.964	3.008	0.520
261	147	QTM1	PATCH	4	0.081	0.044	13.842	7.416	6.547	0.473	0.054	0.039	7.406	3.889	3.196	0.535
261	148	QTM1	PATCH	4	0.613	0.075	11.105	5.527	5.458	0.491	0.270	0.062	5.981	2.646	2.581	0.539
261	149	QTM1	PATCH	4	0.916	0.056	8.718	4.103	3.593	0.412	0.524	0.045	2.788	1.600	1.260	0.320
261	154	QTM1	PATCH	4	0.205	0.044	12.768	6.913	5.715	0.448	0.090	0.037	6.544	3.518	2.820	0.513
261	155	QTM1	PATCH	4	0.080	0.048	14.192	7.885	6.461	0.455	0.045	0.039	7.420	4.197	3.214	0.523
261	156	QTM1	PATCH	4	0.186	0.051	13.101	6.637	6.506	0.497	0.082	0.043	7.198	3.333	3.171	0.549
261	157	QTM1	PATCH	4	0.762	0.067	8.577	4.014	4.084	0.476	0.457	0.055	4.201	1.913	1.826	0.490
261	1	QTM1	PATCH	1	0.123	0.022	7.016	1.764	3.946	0.563	0.074	0.019	2.866	0.587	1.586	0.408
261	5	QTM1	PATCH	2	0.795	0.068	15.132	6.649	7.308	0.483	0.439	0.055	7.491	2.758	2.750	0.495
261	6	QTM1	PATCH	2	0.414	0.073	14.846	9.213	5.533	0.373	0.200	0.067	7.832	4.312	2.346	0.528
261	7	QTM1	PATCH	2	1.533	0.094	12.710	5.417	4.519	0.356	0.934	0.077	4.172	2.049	1.573	0.328
261	10	QTM1	PATCH	2	0.254	0.053	14.629	8.708	5.758	0.394	0.108	0.051	7.686	4.261	2.436	0.525
261	11	QTM1	PATCH	2	1.102	0.092	14.369	5.759	7.268	0.506	0.686	0.078	6.634	2.369	2.989	0.462
261	17	QTM1	PATCH	4	2.070	0.110	20.203	8.125	9.571	0.474	0.875	0.090	9.706	3.998	5.026	0.480
261	18	QTM1	PATCH	4	0.137	0.091	29.861	15.114	14.697	0.492	0.054	0.073	16.552	8.065	7.530	0.554
261	19	QTM1	PATCH	4	0.168	0.077	29.325	15.147	14.960	0.510	0.072	0.066	16.283	8.128	7.587	0.555
261	20	QTM1	PATCH	4	1.436	0.132	22.505	12.152	10.880	0.483	0.642	0.111	11.780	5.818	5.285	0.523
261	21	QTM1	PATCH	4	2.245	0.088	17.026	5.481	7.530	0.442	1.515	0.073	5.177	2.156	2.162	0.304
261	26	QTM1	PATCH	4	0.409	0.091	26.528	12.846	12.835	0.484	0.163	0.078	14.209	6.599	6.668	0.536
261	27	QTM1	PATCH	4	0.128	0.086	30.590	15.649	15.437	0.505	0.049	0.071	17.047	8.463	7.948	0.557
261	28	QTM1	PATCH	4	0.570	0.118	27.301	14.902	13.481	0.494	0.152	0.105	15.163	7.788	6.738	0.555
261	29	QTM1	PATCH	4	1.754	0.117	16.055	7.054	7.986	0.497	1.114	0.099	6.162	2.882	3.025	0.384

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 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO						Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front			top	left	right	back	front	
261	1		QTM1	PATCH	1	0.072	0.010	3.194	0.913	1.430	0.448	0.044	0.009	1.183	0.243	0.531	0.370
261	5		QTM1	PATCH	2	0.456	0.031	6.796	3.302	2.757	0.406	0.245	0.027	3.546	1.436	1.032	0.522
261	6		QTM1	PATCH	2	0.166	0.022	7.162	4.180	2.786	0.389	0.073	0.018	4.009	1.928	1.185	0.560
261	7		QTM1	PATCH	2	0.706	0.046	5.826	2.370	1.821	0.313	0.448	0.041	1.834	0.854	0.591	0.315
261	10		QTM1	PATCH	2	0.157	0.027	7.253	4.045	2.912	0.401	0.056	0.022	4.077	1.845	1.206	0.562
261	11		QTM1	PATCH	2	0.439	0.032	6.222	3.239	2.332	0.375	0.278	0.030	2.865	1.376	0.884	0.460
261	17		QTM1	PATCH	4	1.020	0.069	9.653	3.629	4.648	0.482	0.529	0.055	4.739	1.607	2.240	0.491
261	18		QTM1	PATCH	4	0.167	0.048	14.002	7.248	6.402	0.457	0.076	0.040	7.727	3.461	3.239	0.552
261	19		QTM1	PATCH	4	0.128	0.074	13.249	7.317	6.042	0.456	0.074	0.060	7.124	3.597	2.973	0.538
261	20		QTM1	PATCH	4	0.559	0.056	10.877	5.950	5.078	0.467	0.331	0.048	5.932	2.693	2.415	0.545
261	21		QTM1	PATCH	4	1.737	0.054	9.721	3.984	4.103	0.422	1.188	0.050	3.771	1.451	1.675	0.388
261	26		QTM1	PATCH	4	0.237	0.047	13.130	6.515	5.773	0.440	0.101	0.039	7.057	3.011	2.877	0.537
261	27		QTM1	PATCH	4	0.142	0.062	13.907	7.332	6.530	0.470	0.057	0.052	7.629	3.526	3.336	0.549
261	28		QTM1	PATCH	4	0.279	0.053	12.670	7.184	5.664	0.447	0.099	0.041	6.899	3.487	2.786	0.545
261	29		QTM1	PATCH	4	1.164	0.054	10.155	4.590	4.062	0.400	0.800	0.049	4.178	1.650	1.698	0.411
261		129	QTM1	PATCH	1	0.059	0.009	3.867	1.907	1.485	0.384	0.029	0.007	1.488	0.676	0.531	0.385
261		133	QTM1	PATCH	2	0.273	0.026	6.742	3.195	2.878	0.427	0.174	0.023	3.368	1.430	1.225	0.499
261		134	QTM1	PATCH	2	0.118	0.026	5.999	2.674	3.270	0.545	0.050	0.023	3.349	1.112	1.536	0.558
261		135	QTM1	PATCH	2	0.454	0.033	5.278	1.554	2.182	0.413	0.276	0.029	1.758	0.497	0.891	0.333
261		138	QTM1	PATCH	2	0.073	0.035	5.961	2.693	3.265	0.548	0.033	0.029	3.249	1.104	1.523	0.545
261		139	QTM1	PATCH	2	0.327	0.033	5.549	1.959	2.654	0.478	0.180	0.030	2.536	0.731	1.221	0.457
261		145	QTM1	PATCH	4	0.526	0.054	11.034	5.706	4.655	0.422	0.309	0.049	5.708	2.546	2.224	0.517
261		146	QTM1	PATCH	4	0.109	0.041	12.934	6.987	5.949	0.460	0.046	0.036	6.903	3.689	2.864	0.534
261		147	QTM1	PATCH	4	0.104	0.038	13.050	6.873	6.277	0.481	0.053	0.034	6.958	3.603	3.087	0.533
261		148	QTM1	PATCH	4	0.482	0.070	10.327	5.221	4.871	0.472	0.207	0.062	5.494	2.540	2.319	0.532
261		149	QTM1	PATCH	4	1.050	0.045	8.300	3.588	3.373	0.406	0.592	0.039	2.894	1.509	1.214	0.349
261		154	QTM1	PATCH	4	0.195	0.056	12.017	6.350	5.489	0.457	0.083	0.050	6.382	3.253	2.652	0.531
261		155	QTM1	PATCH	4	0.087	0.041	13.432	7.223	6.259	0.466	0.043	0.034	7.097	3.887	3.080	0.528
261		156	QTM1	PATCH	4	0.186	0.058	12.416	6.478	6.041	0.487	0.081	0.049	6.739	3.237	2.964	0.543
261		157	QTM1	PATCH	4	0.792	0.046	8.328	3.779	3.808	0.457	0.401	0.041	4.001	1.740	1.613	0.480
261	1	129	QTM1	PATCH	1	0.122	0.023	6.986	1.603	3.965	0.568	0.067	0.019	2.901	0.565	1.602	0.415
261	5	133	QTM1	PATCH	2	0.812	0.067	14.582	6.443	6.883	0.472	0.473	0.058	7.304	2.647	2.732	0.501
261	6	134	QTM1	PATCH	2	0.373	0.058	13.860	8.971	4.872	0.352	0.172	0.053	7.428	4.234	2.088	0.536
261	7	135	QTM1	PATCH	2	1.459	0.100	12.714	5.478	4.575	0.360	0.933	0.092	4.267	2.003	1.591	0.336
261	10	138	QTM1	PATCH	2	0.260	0.049	13.260	8.031	5.118	0.386	0.096	0.038	7.054	3.952	2.160	0.532
261	11	139	QTM1	PATCH	2	1.027	0.086	14.014	5.828	7.092	0.506	0.666	0.081	6.592	2.365	2.847	0.470
261	17	145	QTM1	PATCH	4	1.840	0.104	18.841	7.129	8.828	0.469	0.859	0.088	9.438	3.246	4.420	0.501
261	18	146	QTM1	PATCH	4	0.147	0.065	28.168	13.452	14.382	0.511	0.060	0.057	16.077	7.022	7.237	0.571
261	19	147	QTM1	PATCH	4	0.193	0.062	27.902	13.653	14.681	0.526	0.087	0.051	15.824	7.137	7.282	0.567
261	20	148	QTM1	PATCH	4	1.201	0.145	21.108	10.934	9.993	0.473	0.603	0.126	11.270	5.171	4.929	0.534
261	21	149	QTM1	PATCH	4	2.471	0.084	16.582	5.484	7.347	0.443	1.676	0.068	5.120	2.793	2.136	0.309
261	26	154	QTM1	PATCH	4	0.403	0.072	24.671	11.129	12.280	0.498	0.148	0.064	13.740	5.612	6.198	0.557
261	27	155	QTM1	PATCH	4	0.153	0.070	29.141	14.057	15.253	0.523	0.057	0.060	16.600	7.393	7.721	0.570
261	28	156	QTM1	PATCH	4	0.473	0.101	25.748	13.459	12.753	0.495	0.145	0.087	14.383	6.991	6.258	0.559
261	29	157	QTM1	PATCH	4	1.749	0.082	15.679	6.345	7.379	0.471	1.149	0.073	6.200	2.458	2.864	0.395

Table 3. PD of QTM#0 – patch antenna (39GHz)
QTM#0 Low Ch.

n260 Low ch.(37 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
Band	Beam_ID	Ant	Ant	Num. of	relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
		module	Type		Feed	top	left	right	back		front	top	left	right	back		front
260	1		QTM1	PATCH	1	0.129	0.009	4.177	1.516	1.858	0.445	0.076	0.008	2.129	0.475	0.630	0.510
260	5		QTM1	PATCH	2	0.685	0.019	10.071	3.588	3.982	0.395	0.418	0.016	4.377	1.527	1.699	0.435
260	6		QTM1	PATCH	2	0.151	0.021	8.282	3.145	4.468	0.539	0.093	0.018	4.612	1.311	2.071	0.557
260	7		QTM1	PATCH	2	0.528	0.014	11.984	4.075	3.855	0.322	0.264	0.012	4.282	1.593	1.426	0.357
260	10		QTM1	PATCH	2	0.341	0.026	10.253	3.625	4.350	0.424	0.228	0.021	4.127	1.420	1.736	0.402
260	11		QTM1	PATCH	2	0.491	0.015	11.691	3.589	3.883	0.332	0.219	0.012	4.096	1.199	1.622	0.350
260	17		QTM1	PATCH	4	1.457	0.026	16.113	5.743	7.895	0.490	0.916	0.019	7.081	2.036	3.415	0.439
260	18		QTM1	PATCH	4	1.058	0.048	14.789	6.101	7.441	0.503	0.703	0.041	8.074	2.753	3.609	0.546
260	19		QTM1	PATCH	4	0.666	0.042	15.433	5.663	8.057	0.522	0.303	0.031	8.642	2.546	3.963	0.560
260	20		QTM1	PATCH	4	0.348	0.039	15.141	5.685	8.392	0.554	0.187	0.034	8.511	2.340	4.221	0.562
260	21		QTM1	PATCH	4	1.503	0.031	16.002	5.016	8.232	0.514	0.874	0.020	7.561	2.016	3.965	0.472
260	26		QTM1	PATCH	4	1.182	0.044	16.856	6.650	7.187	0.426	0.782	0.040	7.591	2.851	2.900	0.450
260	27		QTM1	PATCH	4	0.222	0.034	15.320	6.374	8.151	0.532	0.129	0.029	8.972	2.995	4.247	0.586
260	28		QTM1	PATCH	4	0.566	0.043	15.254	5.836	8.101	0.531	0.272	0.032	8.743	2.586	4.151	0.573
260	29		QTM1	PATCH	4	0.592	0.043	15.038	5.268	8.738	0.581	0.232	0.033	8.384	2.034	4.212	0.558
260	129		QTM1	PATCH	1	0.226	0.011	4.286	1.039	2.340	0.546	0.134	0.010	1.453	0.332	0.737	0.339
260	133		QTM1	PATCH	2	0.462	0.022	9.184	2.237	5.168	0.563	0.266	0.018	4.055	0.814	2.363	0.442
260	134		QTM1	PATCH	2	0.279	0.017	8.161	2.316	4.756	0.583	0.165	0.014	4.155	0.907	2.289	0.509
260	135		QTM1	PATCH	2	0.390	0.024	9.726	2.141	5.500	0.565	0.242	0.021	3.249	0.737	2.210	0.334
260	138		QTM1	PATCH	2	0.404	0.017	8.305	2.446	4.675	0.563	0.235	0.014	4.037	0.941	2.074	0.486
260	139		QTM1	PATCH	2	0.265	0.024	9.406	1.648	5.226	0.556	0.142	0.021	2.890	0.600	1.801	0.307
260	145		QTM1	PATCH	4	1.856	0.038	14.126	6.096	5.517	0.391	1.053	0.029	6.661	2.695	2.271	0.472
260	146		QTM1	PATCH	4	0.477	0.036	16.641	4.964	9.242	0.555	0.340	0.032	7.977	2.153	4.553	0.479
260	147		QTM1	PATCH	4	0.448	0.033	13.644	5.671	7.704	0.565	0.259	0.027	8.224	2.872	4.121	0.603
260	148		QTM1	PATCH	4	0.626	0.041	14.930	5.426	8.581	0.575	0.402	0.034	7.107	2.372	3.968	0.476
260	149		QTM1	PATCH	4	1.632	0.036	14.459	6.520	5.812	0.402	0.891	0.025	7.196	2.926	2.498	0.498
260	154		QTM1	PATCH	4	1.595	0.041	16.281	4.792	9.249	0.568	1.102	0.028	7.270	1.660	4.580	0.447
260	155		QTM1	PATCH	4	0.303	0.028	15.138	4.798	8.798	0.581	0.159	0.025	7.948	2.246	4.362	0.525
260	156		QTM1	PATCH	4	0.487	0.040	14.756	5.590	8.757	0.593	0.260	0.033	8.453	2.776	4.701	0.573
260	157		QTM1	PATCH	4	0.946	0.038	14.224	5.785	6.988	0.491	0.528	0.031	6.650	2.392	2.902	0.468
260	1	129	QTM1	PATCH	1	0.213	0.018	6.613	2.055	3.460	0.523	0.124	0.015	3.250	0.760	1.390	0.492
260	5	133	QTM1	PATCH	2	0.521	0.021	19.713	8.316	8.087	0.410	0.274	0.016	9.737	3.381	3.454	0.494
260	6	134	QTM1	PATCH	2	0.400	0.054	16.425	4.066	10.618	0.646	0.228	0.044	9.102	1.673	5.198	0.554
260	7	135	QTM1	PATCH	2	0.246	0.026	22.108	8.298	9.177	0.415	0.127	0.023	8.704	3.248	3.283	0.394
260	10	138	QTM1	PATCH	2	0.353	0.038	17.570	5.954	8.677	0.494	0.207	0.030	7.520	2.313	3.805	0.428
260	11	139	QTM1	PATCH	2	0.292	0.036	19.675	6.215	7.755	0.394	0.094	0.030	6.343	2.314	2.698	0.322
260	17	145	QTM1	PATCH	4	3.153	0.065	30.791	10.615	14.160	0.460	1.952	0.041	13.504	4.199	5.479	0.439
260	18	146	QTM1	PATCH	4	1.298	0.104	30.360	11.182	16.050	0.529	0.836	0.090	15.687	5.178	7.953	0.517
260	19	147	QTM1	PATCH	4	1.025	0.080	27.446	10.115	16.046	0.585	0.522	0.067	16.128	4.840	8.357	0.588
260	20	148	QTM1	PATCH	4	0.608	0.097	29.869	11.681	15.991	0.535	0.421	0.086	15.180	4.905	7.674	0.508
260	21	149	QTM1	PATCH	4	3.444	0.095	29.831	9.915	15.687	0.526	2.060	0.048	14.099	4.322	7.418	0.473
260	26	154	QTM1	PATCH	4	2.622	0.086	31.511	10.457	16.529	0.525	1.741	0.076	14.158	4.246	7.730	0.449
260	27	155	QTM1	PATCH	4	0.596	0.079	29.721	9.724	18.179	0.612	0.216	0.064	16.916	4.726	9.368	0.569
260	28	156	QTM1	PATCH	4	0.887	0.097	29.142	11.144	16.647	0.571	0.445	0.083	16.650	5.199	8.817	0.571
260	29	157	QTM1	PATCH	4	1.327	0.088	29.807	12.530	14.369	0.482	0.679	0.073	15.017	4.840	6.516	0.504

QTM#0 Mid Ch.

n260 Middle ch.(38.5 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front		top	left	right	back	front		
260	1		QTM1	PATCH	1	0.129	0.017	3.825	1.167	1.803	0.471	0.064	0.010	1.550	0.313	0.556	0.405
260	5		QTM1	PATCH	2	0.576	0.022	9.854	3.358	4.579	0.465	0.464	0.019	4.760	1.517	1.915	0.483
260	6		QTM1	PATCH	2	0.387	0.037	8.983	3.138	4.855	0.540	0.102	0.030	4.839	1.281	2.366	0.539
260	7		QTM1	PATCH	2	0.682	0.022	11.296	3.346	4.422	0.391	0.344	0.019	4.413	1.452	1.679	0.391
260	10		QTM1	PATCH	2	0.523	0.035	10.469	3.001	4.777	0.456	0.305	0.032	4.113	1.244	2.054	0.393
260	11		QTM1	PATCH	2	0.575	0.025	10.568	3.005	4.228	0.400	0.298	0.024	4.027	1.130	1.636	0.381
260	17		QTM1	PATCH	4	1.552	0.032	16.939	5.088	8.895	0.525	0.836	0.025	7.814	1.976	3.563	0.461
260	18		QTM1	PATCH	4	1.296	0.058	15.656	5.423	8.023	0.512	1.161	0.044	7.792	2.486	3.868	0.498
260	19		QTM1	PATCH	4	0.669	0.062	14.270	5.171	7.936	0.556	0.359	0.051	8.675	2.335	4.086	0.608
260	20		QTM1	PATCH	4	0.837	0.050	16.993	6.333	9.122	0.537	0.279	0.043	9.391	2.494	4.449	0.553
260	21		QTM1	PATCH	4	1.546	0.037	16.867	4.812	8.973	0.532	0.765	0.024	8.046	2.072	4.015	0.477
260	26		QTM1	PATCH	4	1.871	0.064	16.692	5.647	7.948	0.476	1.092	0.041	7.297	2.366	3.265	0.437
260	27		QTM1	PATCH	4	0.388	0.049	15.395	6.087	7.916	0.514	0.259	0.049	8.054	2.656	3.858	0.523
260	28		QTM1	PATCH	4	0.692	0.063	15.258	5.674	8.411	0.551	0.386	0.049	9.039	2.480	4.244	0.592
260	29		QTM1	PATCH	4	0.513	0.042	17.311	6.160	9.333	0.539	0.233	0.031	9.567	2.250	4.661	0.553
260	129		QTM1	PATCH	1	0.222	0.009	4.505	1.099	2.251	0.500	0.171	0.008	1.717	0.331	0.806	0.381
260	133		QTM1	PATCH	2	0.692	0.013	8.900	2.313	4.288	0.482	0.415	0.016	4.492	0.896	2.616	0.505
260	134		QTM1	PATCH	2	0.395	0.031	7.942	1.882	5.122	0.645	0.269	0.017	4.250	0.781	2.396	0.535
260	135		QTM1	PATCH	2	0.460	0.016	10.130	2.050	4.839	0.478	0.394	0.013	3.660	0.843	2.194	0.361
260	138		QTM1	PATCH	2	0.621	0.025	9.004	2.283	5.475	0.608	0.432	0.017	4.116	0.878	2.135	0.457
260	139		QTM1	PATCH	2	0.316	0.015	9.185	1.760	4.412	0.480	0.252	0.011	3.412	0.619	1.961	0.372
260	145		QTM1	PATCH	4	1.250	0.036	14.978	5.286	6.754	0.451	0.634	0.028	6.225	2.349	3.024	0.416
260	146		QTM1	PATCH	4	1.257	0.060	16.198	5.040	9.165	0.566	0.789	0.039	7.603	2.161	4.108	0.469
260	147		QTM1	PATCH	4	0.425	0.050	13.622	4.687	8.295	0.609	0.374	0.045	8.152	2.414	4.180	0.598
260	148		QTM1	PATCH	4	0.570	0.040	15.560	5.540	8.876	0.570	0.503	0.037	8.551	2.246	4.265	0.550
260	149		QTM1	PATCH	4	1.038	0.032	15.407	5.443	6.686	0.434	0.559	0.027	6.737	2.557	2.487	0.437
260	154		QTM1	PATCH	4	1.801	0.063	15.449	4.643	8.005	0.518	0.965	0.054	7.327	1.669	4.362	0.474
260	155		QTM1	PATCH	4	0.653	0.052	14.670	4.752	8.477	0.578	0.401	0.044	7.938	2.147	4.196	0.541
260	156		QTM1	PATCH	4	0.266	0.051	13.626	4.798	8.568	0.629	0.298	0.047	8.561	2.408	4.588	0.628
260	157		QTM1	PATCH	4	0.886	0.034	15.690	5.635	8.186	0.522	0.633	0.034	7.560	2.304	3.216	0.482
260	1	129	QTM1	PATCH	1	0.281	0.013	5.837	1.764	3.409	0.584	0.224	0.011	2.672	0.545	1.345	0.458
260	5	133	QTM1	PATCH	2	0.586	0.026	19.594	8.973	8.106	0.414	0.396	0.026	11.123	3.756	3.840	0.568
260	6	134	QTM1	PATCH	2	0.926	0.069	17.372	4.471	10.715	0.617	0.527	0.062	9.533	1.795	4.981	0.549
260	7	135	QTM1	PATCH	2	0.542	0.030	21.670	8.213	8.310	0.383	0.393	0.023	10.317	3.551	3.443	0.476
260	10	138	QTM1	PATCH	2	0.434	0.051	18.448	4.844	10.858	0.589	0.316	0.045	8.121	2.112	4.537	0.440
260	11	139	QTM1	PATCH	2	0.249	0.041	18.720	5.939	7.548	0.403	0.238	0.031	7.985	2.585	3.372	0.427
260	17	145	QTM1	PATCH	4	3.216	0.065	34.475	10.085	16.556	0.480	1.776	0.056	15.055	3.824	5.988	0.437
260	18	146	QTM1	PATCH	4	2.222	0.115	31.695	11.425	17.303	0.546	1.650	0.099	15.650	5.369	7.808	0.494
260	19	147	QTM1	PATCH	4	0.887	0.098	27.548	9.984	17.032	0.618	0.785	0.081	16.752	4.728	8.875	0.608
260	20	148	QTM1	PATCH	4	1.082	0.089	32.888	12.386	17.578	0.534	0.615	0.091	17.468	4.878	8.745	0.531
260	21	149	QTM1	PATCH	4	3.362	0.056	34.642	9.049	17.905	0.517	1.870	0.051	15.869	3.927	7.986	0.458
260	26	154	QTM1	PATCH	4	4.208	0.083	31.364	9.898	15.409	0.491	2.507	0.082	13.647	4.425	7.477	0.435
260	27	155	QTM1	PATCH	4	0.991	0.109	29.616	9.880	17.239	0.582	0.689	0.099	16.178	4.659	8.394	0.546
260	28	156	QTM1	PATCH	4	0.929	0.106	28.771	10.702	17.234	0.599	0.704	0.092	17.238	4.955	9.254	0.599
260	29	157	QTM1	PATCH	4	1.072	0.082	35.403	13.494	18.086	0.511	0.543	0.069	18.144	5.098	7.822	0.512

QTM#0 High Ch.

n260 High ch.(40 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front		top	left	right	back	front		
260	1		QTM1	PATCH	1	0.078	0.009	3.675	1.113	1.854	0.504	0.036	0.008	1.613	0.361	0.602	0.439
260	5		QTM1	PATCH	2	0.645	0.020	10.201	2.533	4.946	0.485	0.487	0.017	4.467	1.170	2.181	0.438
260	6		QTM1	PATCH	2	0.435	0.037	7.722	2.354	4.256	0.551	0.163	0.030	4.070	1.041	2.106	0.527
260	7		QTM1	PATCH	2	0.773	0.038	11.033	2.398	5.000	0.453	0.406	0.036	3.827	0.939	1.913	0.347
260	10		QTM1	PATCH	2	0.584	0.034	9.700	2.404	4.209	0.434	0.365	0.029	3.880	0.941	1.938	0.400
260	11		QTM1	PATCH	2	0.652	0.051	10.195	2.173	4.537	0.445	0.313	0.049	3.495	0.709	1.700	0.343
260	17		QTM1	PATCH	4	1.514	0.043	17.339	3.991	9.164	0.529	0.789	0.038	7.853	1.557	3.527	0.453
260	18		QTM1	PATCH	4	1.409	0.040	13.738	4.526	7.494	0.545	1.114	0.037	7.289	2.097	3.852	0.531
260	19		QTM1	PATCH	4	0.595	0.054	13.155	4.462	7.379	0.561	0.283	0.044	7.673	1.942	3.776	0.583
260	20		QTM1	PATCH	4	0.682	0.057	13.571	3.912	7.655	0.564	0.307	0.050	7.055	1.649	3.678	0.520
260	21		QTM1	PATCH	4	1.557	0.060	17.459	3.720	8.830	0.506	0.694	0.055	7.782	1.638	3.825	0.446
260	26		QTM1	PATCH	4	1.646	0.041	16.051	4.541	8.295	0.517	1.071	0.035	7.629	1.959	3.625	0.475
260	27		QTM1	PATCH	4	0.420	0.043	13.087	4.469	6.987	0.534	0.287	0.040	7.041	1.980	3.458	0.538
260	28		QTM1	PATCH	4	0.632	0.051	12.917	4.206	7.347	0.569	0.325	0.050	7.201	1.830	3.747	0.557
260	29		QTM1	PATCH	4	0.420	0.053	14.545	3.797	8.306	0.571	0.166	0.044	7.737	1.468	3.852	0.532
260	129		QTM1	PATCH	1	0.233	0.006	3.860	0.776	1.973	0.511	0.121	0.004	1.374	0.219	0.661	0.356
260	133		QTM1	PATCH	2	0.790	0.014	8.498	1.748	3.900	0.459	0.473	0.012	3.716	0.554	2.172	0.437
260	134		QTM1	PATCH	2	0.450	0.023	6.564	1.349	3.963	0.604	0.292	0.017	3.484	0.506	1.997	0.531
260	135		QTM1	PATCH	2	0.496	0.012	9.120	1.707	4.354	0.477	0.298	0.007	3.246	0.631	1.584	0.356
260	138		QTM1	PATCH	2	0.704	0.018	7.717	1.606	4.354	0.564	0.445	0.014	3.437	0.584	1.872	0.445
260	139		QTM1	PATCH	2	0.331	0.010	8.288	1.786	4.015	0.484	0.187	0.007	3.576	0.664	1.808	0.431
260	145		QTM1	PATCH	4	0.918	0.052	15.245	4.165	7.372	0.484	0.602	0.057	6.259	1.709	3.324	0.411
260	146		QTM1	PATCH	4	1.690	0.074	13.512	3.188	7.830	0.579	1.126	0.050	6.518	1.442	3.421	0.482
260	147		QTM1	PATCH	4	0.255	0.074	14.399	4.191	9.005	0.625	0.174	0.062	8.457	1.935	4.490	0.587
260	148		QTM1	PATCH	4	0.597	0.047	13.423	4.529	8.050	0.600	0.343	0.038	7.766	1.802	3.760	0.579
260	149		QTM1	PATCH	4	0.701	0.039	14.861	4.200	7.183	0.483	0.381	0.043	6.436	1.797	2.967	0.433
260	154		QTM1	PATCH	4	1.697	0.073	15.249	3.344	8.430	0.553	1.039	0.055	7.162	1.346	4.124	0.470
260	155		QTM1	PATCH	4	1.253	0.050	12.052	3.057	7.019	0.582	0.855	0.036	6.570	1.362	3.465	0.545
260	156		QTM1	PATCH	4	0.313	0.083	13.109	4.213	8.036	0.613	0.214	0.069	8.033	1.917	4.218	0.613
260	157		QTM1	PATCH	4	0.594	0.030	13.602	4.443	7.687	0.565	0.356	0.030	6.960	1.785	3.249	0.512
260	1	129	QTM1	PATCH	1	0.259	0.017	4.912	1.485	2.778	0.565	0.149	0.010	2.298	0.526	1.130	0.468
260	5	133	QTM1	PATCH	2	1.093	0.037	18.494	6.262	6.837	0.370	0.676	0.033	8.950	2.621	3.493	0.484
260	6	134	QTM1	PATCH	2	0.886	0.096	14.377	3.795	8.264	0.575	0.568	0.077	7.410	1.703	4.155	0.515
260	7	135	QTM1	PATCH	2	1.052	0.056	19.618	5.595	6.989	0.356	0.537	0.053	7.419	2.092	2.738	0.378
260	10	138	QTM1	PATCH	2	0.522	0.040	16.266	3.225	10.164	0.625	0.384	0.035	7.867	1.372	4.356	0.484
260	11	139	QTM1	PATCH	2	0.625	0.066	17.627	3.750	7.601	0.431	0.311	0.065	6.405	1.361	2.862	0.363
260	17	145	QTM1	PATCH	4	2.333	0.068	34.533	8.223	16.219	0.470	1.366	0.058	13.635	3.341	6.381	0.395
260	18	146	QTM1	PATCH	4	2.258	0.115	27.792	8.988	16.236	0.584	1.609	0.078	15.154	4.431	7.827	0.545
260	19	147	QTM1	PATCH	4	0.529	0.114	25.343	9.380	14.790	0.584	0.380	0.098	14.311	4.225	7.918	0.565
260	20	148	QTM1	PATCH	4	0.931	0.113	28.488	8.693	15.097	0.530	0.535	0.106	13.769	3.651	6.939	0.483
260	21	149	QTM1	PATCH	4	2.471	0.088	34.902	7.721	16.510	0.473	1.222	0.079	12.777	3.159	6.541	0.366
260	26	154	QTM1	PATCH	4	3.266	0.102	31.942	8.825	17.188	0.538	2.108	0.079	15.875	4.264	8.232	0.497
260	27	155	QTM1	PATCH	4	2.001	0.104	24.547	6.941	14.336	0.584	1.364	0.081	13.688	3.103	7.183	0.558
260	28	156	QTM1	PATCH	4	0.827	0.128	24.520	9.055	13.946	0.569	0.530	0.117	13.867	4.048	7.484	0.566
260	29	157	QTM1	PATCH	4	0.880	0.082	31.221	8.821	16.780	0.537	0.386	0.073	14.527	3.460	6.826	0.465

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 (28GHz)

QTM#1 Low Ch.

n261 Low ch.(27.5 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front		top	left	right	back	front		
261	0	QTM1	PATCH	1	0.142	0.777	0.103	5.384	0.060	0.011	0.103	0.345	0.083	2.324	0.036	0.432	
261	2	QTM1	PATCH	2	0.235	1.284	0.166	8.631	0.211	0.024	0.169	0.662	0.146	3.267	0.118	0.379	
261	3	QTM1	PATCH	2	0.095	1.794	0.162	9.807	0.131	0.013	0.071	0.838	0.128	5.451	0.076	0.556	
261	4	QTM1	PATCH	2	0.452	1.571	0.156	8.807	0.226	0.026	0.335	0.802	0.131	3.926	0.069	0.446	
261	8	QTM1	PATCH	2	0.130	1.458	0.173	9.172	0.202	0.022	0.096	0.736	0.145	4.169	0.116	0.455	
261	9	QTM1	PATCH	2	0.218	1.881	0.137	10.009	0.106	0.011	0.145	1.000	0.114	4.524	0.056	0.452	
261	12	QTM1	PATCH	4	0.308	1.810	0.596	13.604	0.560	0.041	0.204	0.974	0.516	6.716	0.273	0.494	
261	13	QTM1	PATCH	4	0.098	3.783	0.503	16.592	0.674	0.041	0.075	2.265	0.423	8.376	0.431	0.505	
261	14	QTM1	PATCH	4	0.103	4.323	0.467	18.140	0.271	0.015	0.075	2.521	0.390	9.439	0.162	0.520	
261	15	QTM1	PATCH	4	0.204	3.876	0.268	17.588	0.369	0.021	0.137	2.130	0.243	10.361	0.186	0.589	
261	16	QTM1	PATCH	4	0.874	2.405	0.300	13.314	0.338	0.025	0.631	1.086	0.243	5.715	0.185	0.429	
261	22	QTM1	PATCH	4	0.243	2.311	0.693	14.902	0.544	0.037	0.152	1.328	0.606	7.390	0.293	0.496	
261	23	QTM1	PATCH	4	0.100	4.181	0.506	17.545	0.447	0.025	0.062	2.448	0.421	8.786	0.275	0.501	
261	24	QTM1	PATCH	4	0.171	4.343	0.393	17.959	0.323	0.018	0.126	2.472	0.342	10.035	0.160	0.559	
261	25	QTM1	PATCH	4	0.777	2.877	0.346	15.105	0.339	0.022	0.488	1.430	0.291	8.043	0.201	0.532	
261	128	QTM1	PATCH	1	0.191	0.509	0.065	3.959	0.148	0.037	0.131	0.253	0.049	1.820	0.066	0.460	
261	130	QTM1	PATCH	2	0.298	0.943	0.136	8.796	0.152	0.017	0.250	0.522	0.110	3.380	0.082	0.384	
261	131	QTM1	PATCH	2	0.109	1.452	0.118	9.663	0.237	0.025	0.061	0.797	0.085	5.826	0.130	0.603	
261	132	QTM1	PATCH	2	0.396	1.213	0.194	9.418	0.281	0.030	0.291	0.606	0.159	4.367	0.146	0.464	
261	136	QTM1	PATCH	2	0.141	1.287	0.124	9.201	0.222	0.024	0.087	0.745	0.097	5.428	0.111	0.590	
261	137	QTM1	PATCH	2	0.257	1.542	0.161	9.973	0.282	0.028	0.192	0.743	0.127	5.551	0.154	0.557	
261	140	QTM1	PATCH	4	0.472	2.338	0.191	13.094	0.252	0.019	0.360	1.169	0.167	5.681	0.130	0.434	
261	141	QTM1	PATCH	4	0.177	2.458	0.433	15.132	0.512	0.034	0.134	1.487	0.366	8.100	0.201	0.535	
261	142	QTM1	PATCH	4	0.159	2.906	0.331	16.076	0.427	0.027	0.081	1.658	0.269	9.314	0.237	0.579	
261	143	QTM1	PATCH	4	0.166	3.114	0.386	15.847	0.529	0.033	0.121	1.727	0.328	9.021	0.329	0.569	
261	144	QTM1	PATCH	4	0.925	1.171	0.332	12.535	0.418	0.033	0.571	0.581	0.232	6.391	0.245	0.510	
261	150	QTM1	PATCH	4	0.231	2.300	0.364	13.999	0.354	0.025	0.159	1.367	0.311	6.706	0.138	0.479	
261	151	QTM1	PATCH	4	0.147	2.696	0.380	15.495	0.564	0.036	0.102	1.512	0.318	8.905	0.275	0.575	
261	152	QTM1	PATCH	4	0.207	3.427	0.359	16.345	0.485	0.030	0.180	2.025	0.305	8.879	0.305	0.543	
261	153	QTM1	PATCH	4	0.691	1.466	0.443	13.200	0.477	0.036	0.539	0.718	0.338	7.447	0.291	0.564	
261	0	128	QTM1	PATCH	1	0.453	1.372	0.114	9.199	0.255	0.028	0.352	0.654	0.089	3.399	0.109	0.370
261	2	130	QTM1	PATCH	2	0.351	1.923	0.232	12.548	0.459	0.037	0.248	1.027	0.200	4.350	0.253	0.347
261	3	131	QTM1	PATCH	2	0.158	3.763	0.170	18.054	0.596	0.033	0.101	1.713	0.142	10.340	0.304	0.573
261	4	132	QTM1	PATCH	2	0.427	2.911	0.394	15.510	0.354	0.023	0.281	1.426	0.329	8.064	0.210	0.520
261	8	136	QTM1	PATCH	2	0.290	3.243	0.263	17.989	0.665	0.037	0.201	1.544	0.206	8.974	0.323	0.499
261	9	137	QTM1	PATCH	2	0.751	3.320	0.216	20.372	0.311	0.015	0.533	1.541	0.177	10.093	0.196	0.495
261	12	140	QTM1	PATCH	4	1.031	5.905	0.769	33.413	0.606	0.018	0.907	3.173	0.715	16.494	0.314	0.494
261	13	141	QTM1	PATCH	4	0.272	8.260	0.706	33.018	1.184	0.036	0.197	4.784	0.586	17.449	0.629	0.528
261	14	142	QTM1	PATCH	4	0.250	7.642	0.526	34.825	0.727	0.021	0.146	4.115	0.425	19.244	0.430	0.553
261	15	143	QTM1	PATCH	4	0.294	6.822	0.598	37.125	0.593	0.016	0.163	4.056	0.483	21.433	0.249	0.577
261	16	144	QTM1	PATCH	4	2.390	4.334	0.503	30.940	0.705	0.023	1.414	2.125	0.412	14.451	0.400	0.467
261	22	150	QTM1	PATCH	4	0.537	6.746	0.885	33.716	0.624	0.018	0.432	3.726	0.829	17.764	0.294	0.527
261	23	151	QTM1	PATCH	4	0.213	8.123	0.615	33.508	1.073	0.032	0.137	4.558	0.500	18.137	0.562	0.541
261	24	152	QTM1	PATCH	4	0.305	6.925	0.676	37.619	0.513	0.014	0.224	4.311	0.603	20.948	0.212	0.557
261	25	153	QTM1	PATCH	4	2.004	5.205	0.592	33.009	0.758	0.023	1.212	2.488	0.493	17.449	0.372	0.529

Table 4. PD of QTM#1 – patch antenna (28GHz)

QTM#1 Mid Ch

n261 Middle ch.(28 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
					top	left	right	back	front		top	left	right	back	front		
261	0	QTM1	PATCH	1	0.151	0.837	0.092	4.988	0.079	0.016	0.116	0.355	0.072	2.187	0.035	0.438	
261	2	QTM1	PATCH	2	0.273	1.250	0.136	8.134	0.217	0.027	0.196	0.599	0.114	3.157	0.118	0.388	
261	3	QTM1	PATCH	2	0.071	1.728	0.207	9.375	0.131	0.014	0.057	0.827	0.161	5.309	0.054	0.566	
261	4	QTM1	PATCH	2	0.497	1.548	0.121	8.792	0.285	0.032	0.373	0.805	0.099	3.879	0.106	0.441	
261	8	QTM1	PATCH	2	0.138	1.427	0.178	8.622	0.186	0.022	0.100	0.722	0.139	4.076	0.100	0.473	
261	9	QTM1	PATCH	2	0.256	1.934	0.165	9.452	0.127	0.013	0.179	1.094	0.140	4.252	0.069	0.450	
261	12	QTM1	PATCH	4	0.378	1.810	0.462	11.818	0.528	0.045	0.263	1.048	0.414	5.632	0.291	0.477	
261	13	QTM1	PATCH	4	0.149	3.645	0.630	16.191	0.669	0.041	0.078	2.182	0.528	8.205	0.411	0.507	
261	14	QTM1	PATCH	4	0.081	3.938	0.615	16.936	0.331	0.020	0.061	2.334	0.522	8.628	0.177	0.509	
261	15	QTM1	PATCH	4	0.244	3.793	0.309	17.051	0.434	0.025	0.187	2.121	0.276	9.614	0.182	0.564	
261	16	QTM1	PATCH	4	0.902	2.326	0.253	13.279	0.335	0.025	0.671	1.034	0.204	5.953	0.142	0.448	
261	22	QTM1	PATCH	4	0.332	2.212	0.545	13.264	0.590	0.044	0.188	1.284	0.489	6.411	0.362	0.483	
261	23	QTM1	PATCH	4	0.064	4.065	0.678	16.993	0.471	0.028	0.043	2.385	0.548	8.442	0.297	0.497	
261	24	QTM1	PATCH	4	0.178	4.050	0.491	16.984	0.408	0.024	0.128	2.356	0.431	9.165	0.195	0.540	
261	25	QTM1	PATCH	4	0.808	2.712	0.263	15.102	0.346	0.023	0.556	1.368	0.224	7.954	0.136	0.527	
261	128	QTM1	PATCH	1	0.144	0.467	0.089	4.259	0.177	0.042	0.110	0.193	0.068	1.988	0.087	0.467	
261	130	QTM1	PATCH	2	0.270	0.887	0.129	8.050	0.151	0.019	0.183	0.415	0.113	3.143	0.086	0.390	
261	131	QTM1	PATCH	2	0.080	1.309	0.161	9.720	0.360	0.037	0.052	0.690	0.110	5.733	0.231	0.590	
261	132	QTM1	PATCH	2	0.417	1.021	0.223	9.210	0.263	0.029	0.257	0.501	0.188	4.271	0.164	0.464	
261	136	QTM1	PATCH	2	0.106	1.162	0.158	9.279	0.388	0.042	0.067	0.629	0.111	5.322	0.224	0.574	
261	137	QTM1	PATCH	2	0.256	1.355	0.199	9.862	0.306	0.031	0.150	0.634	0.161	5.382	0.200	0.546	
261	140	QTM1	PATCH	4	0.533	1.947	0.204	12.154	0.268	0.022	0.364	0.994	0.154	5.061	0.179	0.416	
261	141	QTM1	PATCH	4	0.172	2.578	0.441	15.019	0.650	0.043	0.118	1.434	0.367	7.719	0.293	0.514	
261	142	QTM1	PATCH	4	0.079	2.758	0.411	15.875	0.753	0.047	0.059	1.521	0.340	9.023	0.392	0.568	
261	143	QTM1	PATCH	4	0.206	2.946	0.360	15.420	0.758	0.049	0.142	1.781	0.302	8.400	0.495	0.545	
261	144	QTM1	PATCH	4	0.784	1.138	0.338	11.557	0.426	0.037	0.377	0.505	0.239	5.951	0.196	0.515	
261	150	QTM1	PATCH	4	0.307	2.170	0.321	13.542	0.400	0.030	0.176	1.200	0.261	6.271	0.194	0.463	
261	151	QTM1	PATCH	4	0.123	2.713	0.433	15.537	0.771	0.050	0.085	1.528	0.367	8.539	0.369	0.550	
261	152	QTM1	PATCH	4	0.201	3.304	0.374	15.924	0.879	0.055	0.178	2.031	0.283	8.476	0.603	0.532	
261	153	QTM1	PATCH	4	0.572	1.387	0.455	12.378	0.433	0.035	0.266	0.639	0.350	7.002	0.213	0.566	
261	0	128	QTM1	PATCH	1	0.493	1.450	0.114	9.458	0.346	0.037	0.373	0.665	0.087	3.428	0.170	0.362
261	2	130	QTM1	PATCH	2	0.278	1.925	0.176	11.543	0.488	0.042	0.201	0.886	0.159	4.574	0.294	0.396
261	3	131	QTM1	PATCH	2	0.112	3.433	0.222	17.863	0.754	0.042	0.075	1.512	0.167	10.801	0.463	0.605
261	4	132	QTM1	PATCH	2	0.383	2.604	0.384	14.898	0.513	0.034	0.273	1.257	0.326	8.118	0.301	0.545
261	8	136	QTM1	PATCH	2	0.232	3.157	0.285	17.394	0.969	0.056	0.191	1.470	0.219	8.964	0.540	0.515
261	9	137	QTM1	PATCH	2	0.748	3.209	0.287	19.794	0.505	0.026	0.523	1.502	0.239	9.276	0.355	0.469
261	12	140	QTM1	PATCH	4	1.279	5.581	0.565	29.821	1.018	0.034	1.071	3.166	0.523	14.083	0.471	0.472
261	13	141	QTM1	PATCH	4	0.270	8.603	0.839	33.101	1.442	0.044	0.187	5.061	0.750	16.593	0.853	0.501
261	14	142	QTM1	PATCH	4	0.149	6.638	0.718	34.222	1.103	0.032	0.111	3.482	0.591	18.351	0.689	0.536
261	15	143	QTM1	PATCH	4	0.323	6.560	0.604	35.389	0.640	0.018	0.241	3.781	0.502	18.929	0.292	0.535
261	16	144	QTM1	PATCH	4	2.246	3.924	0.474	29.291	0.693	0.024	1.340	1.870	0.396	13.835	0.402	0.472
261	22	150	QTM1	PATCH	4	0.638	6.497	0.818	31.346	1.055	0.034	0.523	3.749	0.695	15.519	0.581	0.495
261	23	151	QTM1	PATCH	4	0.184	8.004	0.824	33.648	1.397	0.042	0.138	4.485	0.660	17.154	0.822	0.510
261	24	152	QTM1	PATCH	4	0.331	6.943	0.674	35.768	0.674	0.019	0.252	4.119	0.573	18.674	0.388	0.522
261	25	153	QTM1	PATCH	4	1.839	5.054	0.579	31.109	0.820	0.026	1.073	2.486	0.469	16.065	0.298	0.516

QTM#1 High Ch

n261 High ch.(28.35 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front		top	left	right	back	front		
261	0		QTM1	PATCH	1	0.133	0.839	0.076	4.501	0.117	0.026	0.108	0.357	0.059	2.083	0.062	0.463
261	2		QTM1	PATCH	2	0.248	1.133	0.156	7.370	0.218	0.030	0.179	0.560	0.130	2.881	0.118	0.391
261	3		QTM1	PATCH	2	0.071	1.782	0.185	8.764	0.173	0.020	0.049	0.853	0.145	4.960	0.096	0.566
261	4		QTM1	PATCH	2	0.448	1.463	0.108	8.369	0.247	0.029	0.330	0.723	0.086	3.787	0.107	0.453
261	8		QTM1	PATCH	2	0.141	1.352	0.184	7.846	0.213	0.027	0.094	0.667	0.146	3.707	0.116	0.472
261	9		QTM1	PATCH	2	0.251	1.792	0.202	8.696	0.124	0.014	0.193	1.035	0.173	3.847	0.056	0.442
261	12		QTM1	PATCH	4	0.328	1.493	0.438	10.540	0.589	0.056	0.228	0.888	0.412	4.972	0.281	0.472
261	13		QTM1	PATCH	4	0.217	3.581	0.610	15.379	0.741	0.048	0.096	2.102	0.523	7.624	0.456	0.496
261	14		QTM1	PATCH	4	0.079	4.000	0.524	15.963	0.398	0.025	0.055	2.321	0.442	7.978	0.232	0.500
261	15		QTM1	PATCH	4	0.228	3.941	0.289	16.455	0.449	0.027	0.173	2.250	0.260	8.979	0.213	0.546
261	16		QTM1	PATCH	4	0.866	2.173	0.192	12.599	0.315	0.025	0.623	1.005	0.151	5.901	0.153	0.468
261	22		QTM1	PATCH	4	0.279	1.992	0.490	12.086	0.619	0.051	0.172	1.149	0.450	5.742	0.270	0.475
261	23		QTM1	PATCH	4	0.075	4.017	0.657	16.143	0.577	0.036	0.038	2.333	0.535	7.834	0.384	0.485
261	24		QTM1	PATCH	4	0.163	4.161	0.405	16.226	0.441	0.027	0.113	2.422	0.355	8.527	0.230	0.526
261	25		QTM1	PATCH	4	0.749	2.655	0.211	14.515	0.325	0.022	0.525	1.361	0.179	7.531	0.141	0.519
261		128	QTM1	PATCH	1	0.131	0.413	0.092	4.202	0.175	0.042	0.109	0.177	0.073	1.877	0.113	0.447
261		130	QTM1	PATCH	2	0.252	0.961	0.126	7.617	0.129	0.017	0.159	0.489	0.112	2.885	0.065	0.379
261		131	QTM1	PATCH	2	0.082	1.328	0.146	9.308	0.391	0.042	0.051	0.666	0.103	5.340	0.281	0.574
261		132	QTM1	PATCH	2	0.388	0.854	0.212	8.798	0.234	0.027	0.296	0.408	0.183	3.848	0.150	0.437
261		136	QTM1	PATCH	2	0.113	1.229	0.138	8.940	0.442	0.049	0.066	0.618	0.098	5.002	0.294	0.560
261		137	QTM1	PATCH	2	0.251	1.177	0.201	9.412	0.272	0.029	0.172	0.572	0.166	4.892	0.189	0.520
261		140	QTM1	PATCH	4	0.502	1.891	0.172	11.642	0.404	0.035	0.359	1.055	0.149	4.895	0.268	0.420
261		141	QTM1	PATCH	4	0.200	2.623	0.339	14.542	0.560	0.039	0.124	1.549	0.290	7.318	0.286	0.503
261		142	QTM1	PATCH	4	0.095	2.816	0.395	14.967	0.784	0.052	0.055	1.560	0.339	8.455	0.458	0.565
261		143	QTM1	PATCH	4	0.244	2.928	0.365	14.479	0.926	0.064	0.129	1.747	0.293	7.448	0.658	0.514
261		144	QTM1	PATCH	4	0.690	1.023	0.344	11.109	0.425	0.038	0.418	0.456	0.248	5.528	0.203	0.498
261		150	QTM1	PATCH	4	0.328	2.213	0.255	13.158	0.420	0.032	0.190	1.334	0.209	6.041	0.233	0.459
261		151	QTM1	PATCH	4	0.139	2.713	0.364	14.937	0.648	0.043	0.102	1.562	0.317	8.041	0.334	0.538
261		152	QTM1	PATCH	4	0.156	3.285	0.360	15.037	1.080	0.072	0.128	1.965	0.268	7.774	0.796	0.517
261		153	QTM1	PATCH	4	0.550	1.149	0.444	11.835	0.345	0.029	0.310	0.607	0.338	6.400	0.178	0.541
261	0	128	QTM1	PATCH	1	0.469	1.390	0.097	8.940	0.383	0.043	0.385	0.648	0.078	3.233	0.234	0.362
261	2	130	QTM1	PATCH	2	0.328	1.878	0.179	10.558	0.393	0.037	0.222	0.918	0.156	4.327	0.234	0.410
261	3	131	QTM1	PATCH	2	0.152	3.388	0.189	16.660	0.918	0.055	0.078	1.469	0.144	10.075	0.633	0.605
261	4	132	QTM1	PATCH	2	0.380	2.300	0.353	13.674	0.482	0.035	0.293	1.130	0.307	7.394	0.291	0.541
261	8	136	QTM1	PATCH	2	0.258	2.915	0.294	15.881	1.122	0.071	0.181	1.488	0.227	8.048	0.743	0.507
261	9	137	QTM1	PATCH	2	0.767	3.136	0.346	18.479	0.505	0.027	0.580	1.516	0.294	8.408	0.369	0.455
261	12	140	QTM1	PATCH	4	1.157	5.228	0.580	28.012	1.217	0.043	0.942	2.951	0.493	13.072	0.608	0.467
261	13	141	QTM1	PATCH	4	0.309	8.001	0.952	31.664	1.636	0.052	0.215	4.866	0.851	14.924	1.074	0.471
261	14	142	QTM1	PATCH	4	0.175	6.676	0.703	32.553	1.305	0.040	0.115	3.432	0.579	17.018	0.870	0.523
261	15	143	QTM1	PATCH	4	0.377	6.545	0.614	33.532	0.804	0.024	0.239	3.850	0.510	16.841	0.463	0.502
261	16	144	QTM1	PATCH	4	2.032	3.921	0.464	27.404	0.748	0.027	1.334	1.773	0.400	12.556	0.323	0.458
261	22	150	QTM1	PATCH	4	0.638	6.014	0.864	29.438	1.316	0.045	0.483	3.532	0.761	14.020	0.728	0.476
261	23	151	QTM1	PATCH	4	0.168	7.484	0.849	32.630	1.509	0.046	0.127	4.218	0.700	15.853	1.043	0.486
261	24	152	QTM1	PATCH	4	0.372	6.970	0.703	34.051	0.854	0.025	0.241	4.161	0.565	16.919	0.538	0.497
261	25	153	QTM1	PATCH	4	1.718	5.080	0.599	29.141	0.773	0.027	1.129	2.677	0.473	14.150	0.313	0.486

Table 5. PD of QTM#1 – patch antenna (39GHz)

QTM#1 Low Ch.

n260 Low ch.(37 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front		top	left	right	back	front		
260	0		QTM1	PATCH	1	0.075	0.425	0.047	2.750	0.095	0.035	0.053	0.232	0.054	1.036	0.061	0.377
260	2		QTM1	PATCH	2	0.337	1.092	0.110	6.798	0.256	0.038	0.242	0.633	0.111	1.871	0.157	0.275
260	3		QTM1	PATCH	2	0.221	1.375	0.120	4.865	0.299	0.061	0.108	0.551	0.123	1.854	0.096	0.381
260	4		QTM1	PATCH	2	0.246	1.884	0.098	6.728	0.497	0.074	0.161	0.711	0.091	1.992	0.173	0.296
260	8		QTM1	PATCH	2	0.269	0.871	0.182	6.172	0.258	0.042	0.239	0.433	0.187	2.008	0.158	0.325
260	9		QTM1	PATCH	2	0.152	1.245	0.147	6.109	0.395	0.065	0.094	0.721	0.095	2.232	0.216	0.365
260	12		QTM1	PATCH	4	0.642	3.178	0.178	12.376	0.929	0.075	0.438	1.298	0.166	4.502	0.406	0.364
260	13		QTM1	PATCH	4	0.415	2.351	0.208	9.251	0.485	0.052	0.372	0.994	0.207	3.658	0.173	0.395
260	14		QTM1	PATCH	4	0.304	2.380	0.232	7.972	0.562	0.071	0.175	1.177	0.241	3.217	0.216	0.404
260	15		QTM1	PATCH	4	0.243	1.856	0.160	10.433	0.531	0.051	0.108	1.130	0.133	4.621	0.246	0.443
260	16		QTM1	PATCH	4	0.631	3.147	0.200	12.779	1.067	0.083	0.392	1.379	0.188	4.169	0.502	0.326
260	22		QTM1	PATCH	4	0.593	2.872	0.201	11.245	0.716	0.064	0.473	1.104	0.177	4.246	0.304	0.378
260	23		QTM1	PATCH	4	0.364	1.944	0.364	7.918	0.344	0.043	0.262	1.580	0.328	4.314	0.164	0.545
260	24		QTM1	PATCH	4	0.207	2.484	0.217	9.119	0.606	0.066	0.132	1.213	0.217	3.739	0.227	0.410
260	25		QTM1	PATCH	4	0.478	2.467	0.219	11.486	0.872	0.076	0.247	1.051	0.179	4.359	0.412	0.380
260		128	QTM1	PATCH	1	0.061	0.412	0.025	2.357	0.104	0.044	0.050	0.225	0.027	0.762	0.069	0.323
260		130	QTM1	PATCH	2	0.270	0.996	0.107	6.509	0.197	0.030	0.164	0.533	0.105	2.210	0.107	0.340
260		131	QTM1	PATCH	2	0.274	1.148	0.154	4.737	0.183	0.039	0.202	0.626	0.116	2.397	0.094	0.506
260		132	QTM1	PATCH	2	0.250	1.004	0.107	6.194	0.214	0.035	0.153	0.507	0.081	2.080	0.089	0.336
260		136	QTM1	PATCH	2	0.254	1.008	0.118	5.631	0.226	0.040	0.161	0.625	0.087	2.465	0.075	0.438
260		137	QTM1	PATCH	2	0.159	0.961	0.097	5.760	0.194	0.034	0.125	0.571	0.063	2.451	0.090	0.425
260		140	QTM1	PATCH	4	0.735	2.388	0.151	11.545	0.578	0.050	0.563	1.105	0.106	3.759	0.312	0.326
260		141	QTM1	PATCH	4	0.618	2.126	0.134	9.958	0.432	0.043	0.460	1.521	0.157	4.037	0.189	0.405
260		142	QTM1	PATCH	4	0.338	2.035	0.250	6.630	0.412	0.062	0.159	1.528	0.202	3.336	0.204	0.503
260		143	QTM1	PATCH	4	0.258	2.581	0.133	9.873	0.537	0.054	0.148	1.291	0.130	4.184	0.301	0.424
260		144	QTM1	PATCH	4	0.791	2.372	0.230	10.976	0.538	0.049	0.502	1.390	0.174	3.927	0.263	0.358
260		150	QTM1	PATCH	4	0.651	2.143	0.115	10.739	0.484	0.045	0.518	1.292	0.125	3.836	0.254	0.357
260		151	QTM1	PATCH	4	0.312	2.423	0.266	7.630	0.473	0.062	0.191	1.442	0.209	3.367	0.228	0.441
260		152	QTM1	PATCH	4	0.346	1.841	0.206	7.325	0.434	0.059	0.205	1.289	0.146	3.805	0.223	0.519
260		153	QTM1	PATCH	4	0.389	2.958	0.124	11.208	0.602	0.054	0.170	1.402	0.132	4.116	0.291	0.367
260	0	128	QTM1	PATCH	1	0.100	1.110	0.093	5.091	0.296	0.058	0.090	0.547	0.100	1.666	0.154	0.327
260	2	130	QTM1	PATCH	2	0.509	1.970	0.185	11.408	0.508	0.045	0.330	0.942	0.192	4.195	0.238	0.368
260	3	131	QTM1	PATCH	2	0.350	2.839	0.373	9.197	0.493	0.054	0.198	1.392	0.291	3.708	0.197	0.403
260	4	132	QTM1	PATCH	2	0.449	3.426	0.267	13.959	0.619	0.044	0.285	1.371	0.224	4.674	0.238	0.335
260	8	136	QTM1	PATCH	2	0.424	1.982	0.237	9.829	0.397	0.040	0.335	0.969	0.222	3.602	0.177	0.366
260	9	137	QTM1	PATCH	2	0.338	2.360	0.123	10.886	0.287	0.026	0.201	1.277	0.108	5.921	0.172	0.544
260	12	140	QTM1	PATCH	4	1.639	6.100	0.329	25.675	1.633	0.064	1.193	2.209	0.282	7.892	0.781	0.307
260	13	141	QTM1	PATCH	4	1.167	6.616	0.393	21.159	1.180	0.056	0.990	2.711	0.306	6.822	0.475	0.322
260	14	142	QTM1	PATCH	4	0.426	4.957	0.695	15.740	1.228	0.078	0.327	2.295	0.596	5.755	0.471	0.366
260	15	143	QTM1	PATCH	4	0.577	5.588	0.394	21.302	1.559	0.073	0.381	2.509	0.240	7.443	0.672	0.349
260	16	144	QTM1	PATCH	4	1.657	4.131	0.206	21.603	1.819	0.084	0.996	2.813	0.154	7.764	1.088	0.359
260	22	150	QTM1	PATCH	4	1.463	5.861	0.345	22.395	1.409	0.063	1.165	2.143	0.216	8.161	0.685	0.364
260	23	151	QTM1	PATCH	4	0.459	5.026	0.542	17.111	1.193	0.070	0.331	2.563	0.381	6.772	0.571	0.396
260	24	152	QTM1	PATCH	4	0.632	4.819	0.535	16.890	1.274	0.075	0.428	2.339	0.463	6.615	0.476	0.392
260	25	153	QTM1	PATCH	4	1.125	5.855	0.349	24.213	1.867	0.077	0.488	2.808	0.212	7.666	0.798	0.317

QTM#1 Mid Ch

n260 Middle ch.(38.5 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front		top	left	right	back	front		
260	0	QTM1	PATCH	1	0.118	0.373	0.078	3.079	0.086	0.028	0.062	0.266	0.096	1.054	0.059	0.342	
260	2	QTM1	PATCH	2	0.432	1.180	0.093	7.573	0.341	0.045	0.267	0.786	0.068	2.241	0.190	0.296	
260	3	QTM1	PATCH	2	0.483	1.233	0.176	5.393	0.316	0.059	0.237	0.541	0.138	2.355	0.149	0.437	
260	4	QTM1	PATCH	2	0.194	1.626	0.102	7.128	0.507	0.071	0.125	0.729	0.064	2.188	0.189	0.307	
260	8	QTM1	PATCH	2	0.356	1.004	0.103	6.935	0.330	0.048	0.229	0.590	0.090	2.167	0.188	0.312	
260	9	QTM1	PATCH	2	0.315	1.155	0.198	6.377	0.320	0.050	0.154	0.616	0.140	2.236	0.145	0.351	
260	12	QTM1	PATCH	4	0.950	3.584	0.180	14.040	1.042	0.074	0.672	1.533	0.117	4.528	0.418	0.322	
260	13	QTM1	PATCH	4	0.421	2.058	0.182	10.276	0.604	0.059	0.343	0.928	0.124	4.574	0.315	0.445	
260	14	QTM1	PATCH	4	0.953	1.700	0.240	8.072	0.404	0.050	0.468	1.013	0.226	3.891	0.152	0.482	
260	15	QTM1	PATCH	4	0.242	2.074	0.190	10.884	0.555	0.051	0.157	1.251	0.132	5.544	0.274	0.509	
260	16	QTM1	PATCH	4	0.593	3.565	0.195	13.742	1.100	0.080	0.367	1.722	0.158	4.780	0.409	0.348	
260	22	QTM1	PATCH	4	0.849	3.000	0.201	12.788	0.840	0.066	0.599	1.322	0.116	4.564	0.346	0.357	
260	23	QTM1	PATCH	4	0.475	1.913	0.269	8.423	0.439	0.052	0.360	1.290	0.229	4.399	0.251	0.522	
260	24	QTM1	PATCH	4	0.686	1.971	0.283	9.218	0.579	0.063	0.361	1.139	0.248	5.172	0.262	0.561	
260	25	QTM1	PATCH	4	0.397	2.943	0.204	12.184	0.886	0.073	0.216	1.369	0.152	4.994	0.382	0.410	
260	128	QTM1	PATCH	1	0.062	0.468	0.032	2.531	0.115	0.045	0.060	0.250	0.039	0.726	0.063	0.287	
260	130	QTM1	PATCH	2	0.317	1.085	0.105	7.751	0.217	0.028	0.194	0.600	0.082	2.540	0.104	0.328	
260	131	QTM1	PATCH	2	0.339	1.461	0.138	5.496	0.331	0.060	0.171	1.020	0.118	2.617	0.132	0.476	
260	132	QTM1	PATCH	2	0.289	1.212	0.109	7.429	0.241	0.032	0.204	0.639	0.087	2.592	0.113	0.349	
260	136	QTM1	PATCH	2	0.221	1.371	0.128	6.757	0.275	0.041	0.197	0.823	0.085	2.842	0.103	0.421	
260	137	QTM1	PATCH	2	0.272	1.107	0.158	6.639	0.221	0.033	0.146	0.719	0.119	2.462	0.096	0.371	
260	140	QTM1	PATCH	4	1.057	2.950	0.197	13.527	0.660	0.049	0.793	1.367	0.140	4.649	0.341	0.344	
260	141	QTM1	PATCH	4	0.711	2.421	0.230	10.706	0.507	0.047	0.591	1.756	0.181	4.777	0.225	0.446	
260	142	QTM1	PATCH	4	0.417	2.140	0.345	8.130	0.583	0.072	0.283	1.161	0.273	3.181	0.210	0.391	
260	143	QTM1	PATCH	4	0.264	2.021	0.279	9.899	0.793	0.080	0.162	1.144	0.275	4.594	0.369	0.464	
260	144	QTM1	PATCH	4	0.899	3.227	0.177	13.099	0.689	0.053	0.623	1.479	0.130	3.992	0.335	0.305	
260	150	QTM1	PATCH	4	0.958	2.467	0.238	12.225	0.591	0.048	0.762	1.381	0.181	4.607	0.303	0.377	
260	151	QTM1	PATCH	4	0.235	2.740	0.285	8.690	0.517	0.059	0.192	1.818	0.182	3.712	0.241	0.427	
260	152	QTM1	PATCH	4	0.578	2.262	0.239	8.375	0.774	0.092	0.284	1.442	0.190	4.051	0.342	0.484	
260	153	QTM1	PATCH	4	0.348	2.303	0.246	11.461	0.637	0.056	0.253	1.066	0.227	4.391	0.319	0.383	
260	0	128	QTM1	PATCH	1	0.141	0.912	0.116	5.829	0.246	0.042	0.139	0.476	0.132	1.826	0.125	0.313
260	2	130	QTM1	PATCH	2	0.692	2.574	0.255	13.592	0.552	0.041	0.446	1.148	0.200	4.819	0.271	0.355
260	3	131	QTM1	PATCH	2	0.520	3.115	0.321	11.227	0.764	0.068	0.271	1.901	0.214	5.217	0.339	0.465
260	4	132	QTM1	PATCH	2	0.395	2.591	0.313	15.291	0.630	0.041	0.264	1.018	0.217	5.126	0.326	0.335
260	8	136	QTM1	PATCH	2	0.408	2.065	0.316	10.573	0.640	0.060	0.321	1.059	0.226	4.110	0.303	0.389
260	9	137	QTM1	PATCH	2	1.021	2.701	0.308	12.443	0.434	0.035	0.447	1.340	0.277	5.518	0.206	0.443
260	12	140	QTM1	PATCH	4	2.110	5.858	0.532	30.454	1.526	0.050	1.557	2.593	0.336	9.318	0.691	0.306
260	13	141	QTM1	PATCH	4	0.828	5.428	0.602	22.132	1.613	0.073	0.751	2.462	0.408	8.802	0.858	0.398
260	14	142	QTM1	PATCH	4	0.705	3.684	0.641	18.317	1.059	0.058	0.592	2.022	0.558	7.996	0.387	0.437
260	15	143	QTM1	PATCH	4	0.528	4.914	0.512	22.004	1.546	0.070	0.379	2.485	0.457	9.696	0.636	0.441
260	16	144	QTM1	PATCH	4	1.852	5.896	0.341	25.013	1.644	0.066	1.217	2.933	0.277	8.798	0.782	0.352
260	22	150	QTM1	PATCH	4	1.635	5.649	0.650	26.112	1.556	0.060	1.262	2.870	0.417	9.411	0.784	0.360
260	23	151	QTM1	PATCH	4	0.513	4.347	0.765	18.916	1.179	0.062	0.384	2.754	0.445	8.086	0.582	0.427
260	24	152	QTM1	PATCH	4	0.524	3.839	0.707	18.678	1.484	0.079	0.433	1.952	0.601	9.550	0.623	0.511
260	25	153	QTM1	PATCH	4	0.708	4.926	0.514	27.596	1.655	0.060	0.451	2.374	0.396	9.345	0.638	0.339

QTM#1 High Ch

n260 High ch.(40 GHz) /					4cm2 PD(W/m2) at 2mm evaluation surfaces @6dBm					Ratio	4cm2 PD(W/m2) at 10 mm evaluation surfaces @6dBm					Ratio	
					relative phase worst PD for MIMO					Ratio (Front 2mm/worst surface 2 mm)	relative phase worst PD for MIMO					Ratio (worst surface 10 mm/worst surface 2mm)	
Band	Beam_ID	Ant module	Ant Type	Num. of Feed	top	left	right	back	front		top	left	right	back	front		
260	0		QTM1	PATCH	1	0.086	0.429	0.072	2.653	0.112	0.042	0.067	0.205	0.084	0.931	0.068	0.351
260	2		QTM1	PATCH	2	0.230	1.187	0.129	6.789	0.388	0.057	0.163	0.574	0.108	2.311	0.164	0.340
260	3		QTM1	PATCH	2	0.449	1.521	0.176	5.403	0.196	0.036	0.227	0.667	0.173	2.535	0.071	0.469
260	4		QTM1	PATCH	2	0.212	0.814	0.129	6.713	0.182	0.027	0.146	0.471	0.092	2.185	0.087	0.325
260	8		QTM1	PATCH	2	0.237	1.135	0.165	6.262	0.365	0.058	0.186	0.540	0.140	2.620	0.153	0.418
260	9		QTM1	PATCH	2	0.385	1.162	0.186	6.276	0.142	0.023	0.193	0.662	0.155	2.198	0.064	0.350
260	12		QTM1	PATCH	4	0.658	1.853	0.216	11.882	0.459	0.039	0.501	1.127	0.186	5.180	0.203	0.436
260	13		QTM1	PATCH	4	0.305	2.674	0.289	10.009	0.694	0.069	0.189	1.268	0.208	5.096	0.302	0.509
260	14		QTM1	PATCH	4	0.706	1.996	0.287	8.698	0.265	0.030	0.416	1.161	0.281	4.080	0.165	0.469
260	15		QTM1	PATCH	4	0.508	2.454	0.328	10.817	0.377	0.035	0.258	1.775	0.329	4.795	0.152	0.443
260	16		QTM1	PATCH	4	0.481	1.736	0.282	12.191	0.509	0.042	0.306	1.081	0.229	3.921	0.194	0.322
260	22		QTM1	PATCH	4	0.594	2.097	0.277	11.179	0.449	0.040	0.480	1.168	0.196	5.511	0.196	0.493
260	23		QTM1	PATCH	4	0.392	2.365	0.344	8.836	0.458	0.052	0.302	1.415	0.242	4.271	0.270	0.483
260	24		QTM1	PATCH	4	0.827	2.133	0.380	9.071	0.301	0.033	0.439	1.324	0.392	4.600	0.114	0.507
260	25		QTM1	PATCH	4	0.286	2.066	0.313	11.603	0.487	0.042	0.211	1.419	0.255	4.136	0.191	0.356
260		128	QTM1	PATCH	1	0.050	0.249	0.041	2.255	0.085	0.038	0.049	0.111	0.037	0.711	0.042	0.315
260		130	QTM1	PATCH	2	0.293	1.408	0.106	7.309	0.363	0.050	0.185	0.671	0.091	2.486	0.149	0.340
260		131	QTM1	PATCH	2	0.367	1.180	0.194	5.613	0.263	0.047	0.229	0.736	0.142	2.427	0.117	0.432
260		132	QTM1	PATCH	2	0.273	1.404	0.143	7.123	0.354	0.050	0.206	0.680	0.106	2.646	0.121	0.372
260		136	QTM1	PATCH	2	0.227	1.330	0.191	6.645	0.320	0.048	0.193	0.651	0.142	2.732	0.124	0.411
260		137	QTM1	PATCH	2	0.350	1.336	0.135	6.365	0.330	0.052	0.216	0.763	0.108	2.682	0.132	0.421
260		140	QTM1	PATCH	4	0.743	1.938	0.221	11.285	0.360	0.032	0.584	1.294	0.178	4.282	0.168	0.379
260		141	QTM1	PATCH	4	0.566	2.203	0.246	10.170	0.355	0.035	0.463	1.610	0.173	4.322	0.141	0.425
260		142	QTM1	PATCH	4	0.446	1.719	0.379	8.531	0.559	0.066	0.359	0.839	0.287	3.477	0.205	0.408
260		143	QTM1	PATCH	4	0.463	2.206	0.313	9.513	0.801	0.084	0.237	1.302	0.233	4.887	0.349	0.514
260		144	QTM1	PATCH	4	0.712	2.556	0.214	11.460	0.455	0.040	0.521	1.289	0.160	4.119	0.182	0.359
260		150	QTM1	PATCH	4	0.731	2.203	0.249	10.860	0.350	0.032	0.593	1.563	0.198	4.387	0.129	0.404
260		151	QTM1	PATCH	4	0.282	1.650	0.282	8.120	0.509	0.063	0.223	1.095	0.178	3.597	0.214	0.443
260		152	QTM1	PATCH	4	0.556	1.984	0.371	8.264	0.799	0.097	0.374	0.998	0.281	3.439	0.363	0.416
260		153	QTM1	PATCH	4	0.304	2.316	0.254	11.018	0.603	0.055	0.224	1.274	0.202	5.229	0.305	0.475
260	0	128	QTM1	PATCH	1	0.160	0.550	0.133	5.092	0.181	0.035	0.125	0.220	0.133	1.574	0.080	0.309
260	2	130	QTM1	PATCH	2	0.484	2.344	0.327	11.472	0.581	0.051	0.325	0.912	0.254	4.089	0.236	0.356
260	3	131	QTM1	PATCH	2	0.450	2.906	0.471	11.403	0.474	0.042	0.267	1.760	0.372	4.911	0.256	0.431
260	4	132	QTM1	PATCH	2	0.343	1.652	0.454	14.838	0.351	0.024	0.263	0.748	0.336	4.869	0.156	0.328
260	8	136	QTM1	PATCH	2	0.280	2.437	0.238	10.272	0.679	0.066	0.215	1.154	0.174	4.494	0.288	0.438
260	9	137	QTM1	PATCH	2	1.303	2.948	0.337	12.559	0.341	0.027	0.657	1.624	0.270	5.830	0.169	0.464
260	12	140	QTM1	PATCH	4	1.304	4.643	0.706	24.732	1.089	0.044	0.978	2.532	0.430	9.159	0.438	0.370
260	13	141	QTM1	PATCH	4	0.594	5.462	0.816	22.014	1.374	0.062	0.466	3.375	0.594	9.959	0.566	0.452
260	14	142	QTM1	PATCH	4	1.129	3.212	0.973	19.373	0.857	0.044	0.922	1.868	0.754	8.036	0.359	0.415
260	15	143	QTM1	PATCH	4	0.726	4.917	0.953	21.542	1.134	0.053	0.598	3.324	0.908	10.342	0.475	0.480
260	16	144	QTM1	PATCH	4	1.129	3.378	0.368	22.077	0.869	0.039	0.699	1.608	0.267	8.528	0.349	0.386
260	22	150	QTM1	PATCH	4	1.069	5.035	0.874	23.299	1.067	0.046	0.835	3.036	0.593	9.419	0.424	0.404
260	23	151	QTM1	PATCH	4	0.643	4.151	1.030	19.102	1.241	0.065	0.528	2.486	0.674	8.427	0.561	0.441
260	24	152	QTM1	PATCH	4	0.893	3.530	0.777	19.113	1.243	0.065	0.738	1.890	0.728	8.997	0.557	0.471
260	25	153	QTM1	PATCH	4	0.669	4.086	0.748	23.504	1.104	0.047	0.526	2.555	0.668	9.757	0.424	0.415

