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FCC ID: ACJ9TGFZ40

Power Density (PD) Simulation Report

Revision A

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Model: FZ-40

Applicant: Panasonic Corporation North of America

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1. Power Density (PD) Simulation Methodology

1.1 Simulation Tool

1.1.1 Tool Description

In this report, we used 5G Post-Processing Wizard of CST Studio Suite 2021 (CST) to simulate Power Density (PD) and Effective Isotropic Radiated Power (EIRP) at millimeter-wave band. CST is a 3D electromagnetic full-wave simulation software consisting of several different solvers. In this project, the Time Domain Solver that is based on Transmission Line Method (TLM) and Integral Equation Solver that is based on the Method of Moments Technique (MOM) were used.

The simulation workflow is split into a full 3D simulation of the device using the Time Domain Solver and separate runs of Farfield and Field exposure evaluations using the Integral Equation Solver. The simulation workflow used Field Exposure result templates to calculate spatial-average Power Density (sPD) and Farfield Results templates to calculate EIRP.

The Time Domain Solver divides the calculation domain into small hexahedral cells, creates a transmission line matrix, and calculates the equations step by step. The energy in calculation domain is calculated at each step, and simulation stopped when the energy is smaller than the criteria -30 dB as default. To improve the accuracy of the simulation, local mesh refinement is used on the domain of at the QTM simulation model. Figure 1 shows the mesh through one cross-section of this device as an example. Integral Equation Solver analyzes in the frequency domain based on a surface mesh. When running this solver, we import the information for beam generation (Code Book).

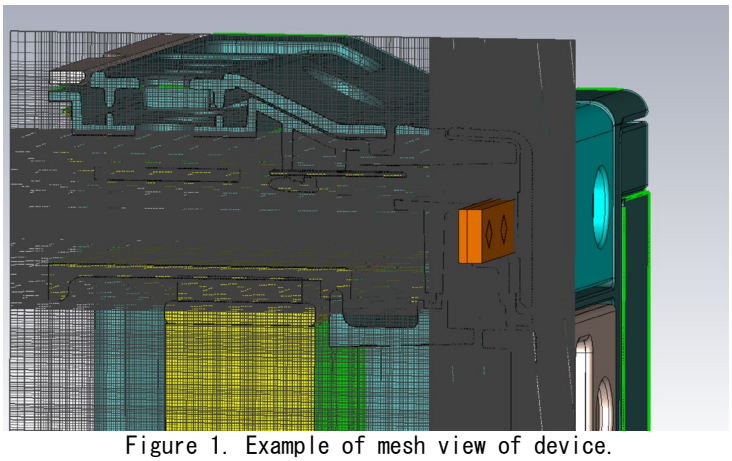


Figure 1. Example of mesh view of device.

1.1.2 Boundary and Convergence condition

CST uses TLM to represent the electromagnetic field. Perfectly Matched Layer (PML) is used for boundary conditions. The distance between the simulation model and the PML boundary is greater than 1/4λ of the target frequency. TLM transient solver in CST Studio Suite ensures the convergence level of S-parameter and radiated powers lower than 0.001. For reducing simulation time while keeping the simulation accuracy, the simulation model of this project is divided into 3 parts and simulated one by one.

1.1.3 Power Density Calculation

$$PD_{average} = \frac{1}{N}\sum_{x=1}^{N} <\vec{S}> \qquad (1)$$

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

In the power flow results of CST, the average PD of 4 cm^2 is calculated by (1) and (2), where N is the number of calculated points in the 4 cm^2 area around the target point, <S> is the real part of pointing vector from the cross product of electric field (E) and complex conjugation of magnetic field (H) at each mesh cells.

1.2 Simulation Setup

1.2.1 3D Modeling

The simulation model integrated with three mmWave antenna module shows in Figure 2. The simulation modeling includes complete mechanical structure of device such as Chassis, Main board, battery, and mmWave antenna modules call as mmwave#0, mmwave#1 and mmwave#2. mmwave#0 is placed on the right side and antennas are facing the right side of the device. mmwave#1 is placed on the left side and antennas are facing the top side of the device. mmwave#2 is placed on the rear side and antennas are facing the rear side of the device.

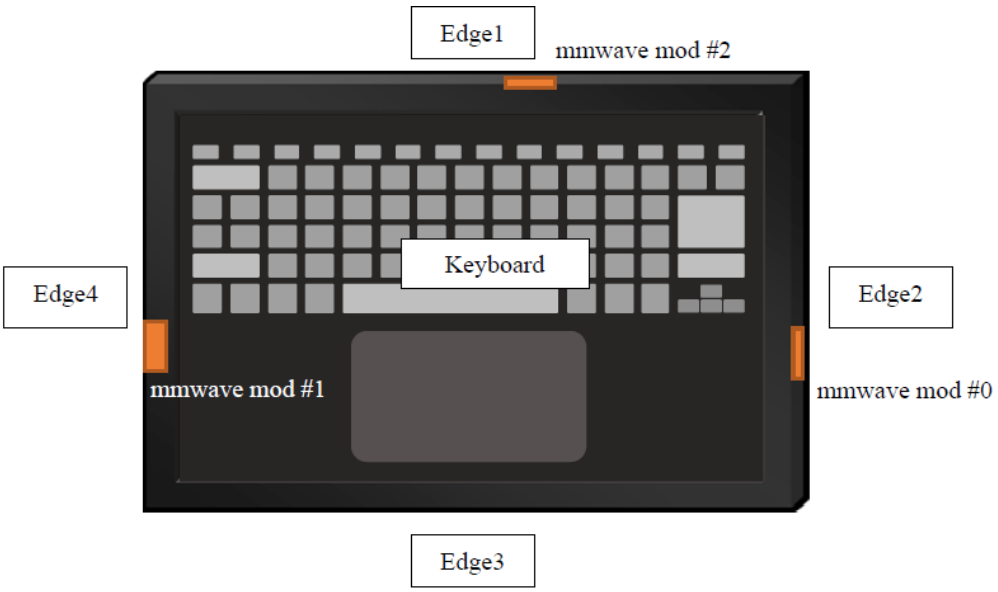


Figure 2. Simulation model which is mounted three mmWave antenna modules.

1.2.2 PD Evaluation Planes

For this DUT, based on the location of mmwave#0, mmwave#1 and mmwave#2, the surface planes identified for PD evaluation to determine the worst-case PDs are selected and listed in Table 1. Figure 3 shows the PD evaluation planes of the simulation model to find worst case of beamforming IDs. The relevant PD evaluation planes, S1(Keyboard), S2(Bottom), S3(Rear Side), S4(Right Side), S5(Front Side) and S6(Left Side) are spaced 2mm from the device.

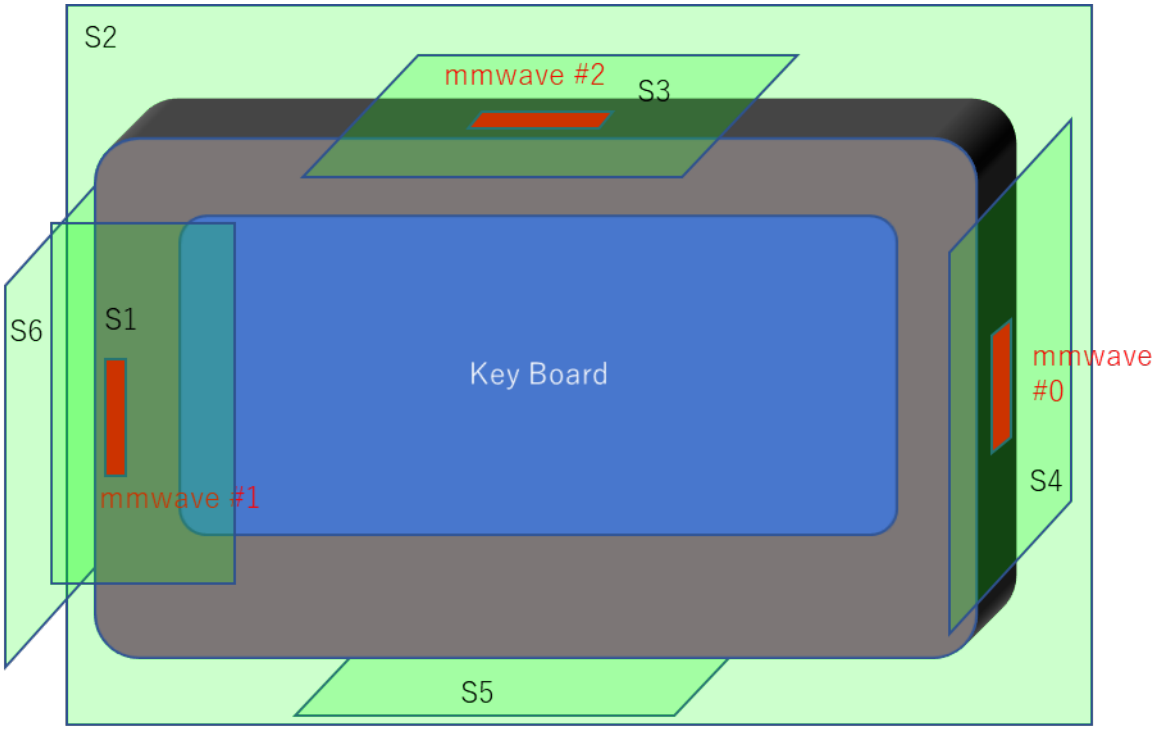


Figure 3. Evaluating surfaces for PD.

Table 1. PD Evaluation Planes

Antenna module	Keyboard side (S1)	Bottom side (S2)	Rear side (S3)	Right side (S4)	Front side (S5)	Left side (S6)
mmwave#0	Yes	Yes	No	Yes	No	No
mmwave#1	Yes	Yes	No	No	No	Yes
mmwave#2	Yes	Yes	Yes	No	No	No

1.2.3 Source Excitation Condition

Each antenna modules of mmwave#0, mmwave#1 and mmwave#2 are identical and has 16 feed-in ports. Out of 16 ports, 8 ports are for 1x4 patch array antenna at n258 and n261 bands and others are for 1x4 patch array antenna at n260 band. Out of 8 ports of the patch array, 4ports are for vertical polarization and 4 ports are for horizontal polarization.

The antenna ports are controlled by the software to create the appropriate mmWave beam. And the phase, magnitude and used ports are defined in the codebook which is referred by the software.

Figure 4 shows the mmWave module (mmwave#0) structure. The simulation model of QTM525-5 module is encrypted in the CST simulator and can only be checked the feed-in location.

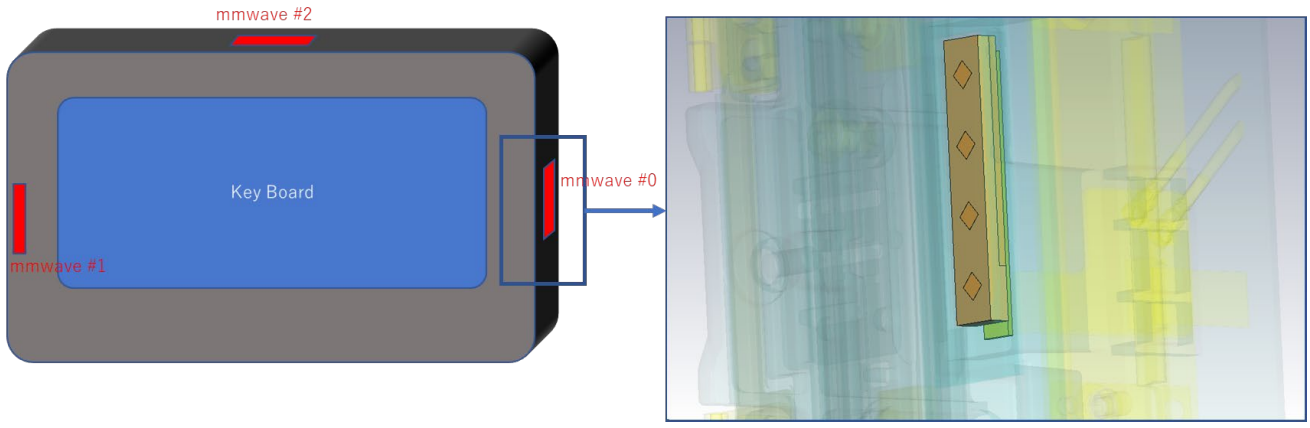
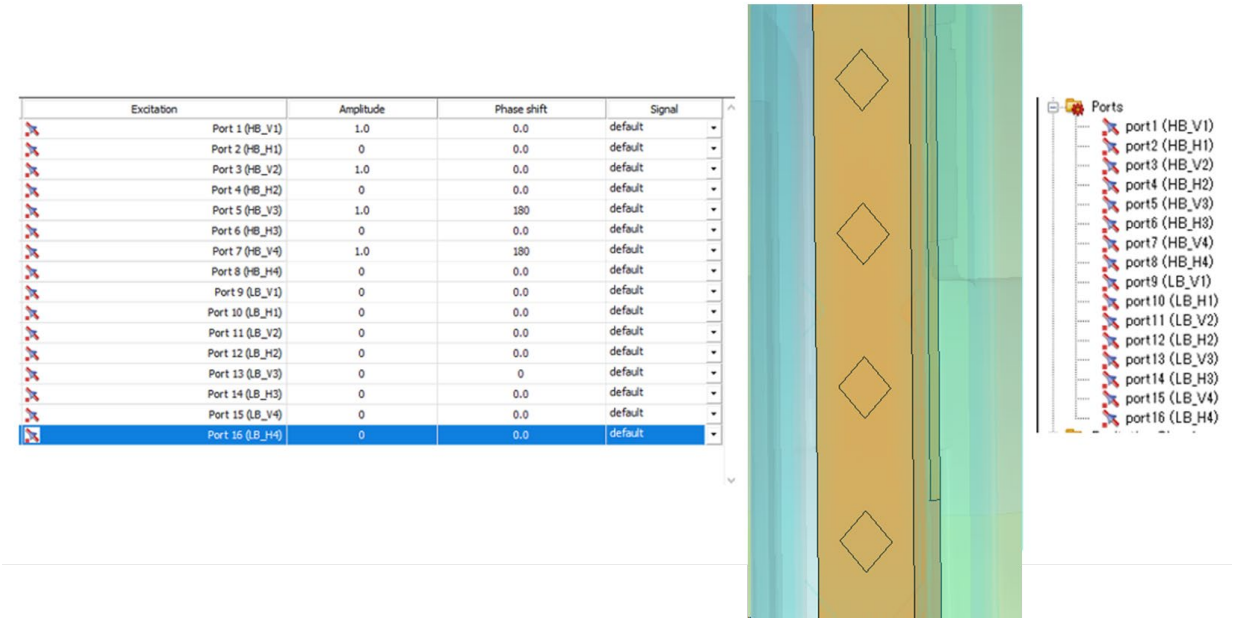


Figure 4. mmWave module

After finished the electromagnetic simulation of mmWave antenna module in CST simulator, the magnitude and phase information can be defined at each ports based on the codebook information and set up by using "Setup Solver" function in CST Studio Suite 2021. Figure 5 shows an example of the mmWave antenna ports excitation in mmwave#0.

The PD simulation is executed for Low, Middle and High channels at each band. The relative phase between beam pairs is not controlled by the chipset. Therefore, the relative phase between beams is swept from 0° to 360° at 5° step intervals and the highest PD is identified as a worst-case.



Excitation	Amplitude	Phase shift	Signal
Port 1 (HB_V1)	1.0	0.0	default
Port 2 (HB_H1)	0	0.0	default
Port 3 (HB_V2)	1.0	0.0	default
Port 4 (HB_H2)	0	0.0	default
Port 5 (HB_V3)	1.0	180	default
Port 6 (HB_H3)	0	0.0	default
Port 7 (HB_V4)	1.0	180	default
Port 8 (HB_H4)	0	0.0	default
Port 9 (LB_V1)	0	0.0	default
Port 10 (LB_H1)	0	0.0	default
Port 11 (LB_V2)	0	0.0	default
Port 12 (LB_H2)	0	0.0	default
Port 13 (LB_V3)	0	0	default
Port 14 (LB_H3)	0	0.0	default
Port 15 (LB_V4)	0	0.0	default
Port 16 (LB_H4)	0	0.0	default

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

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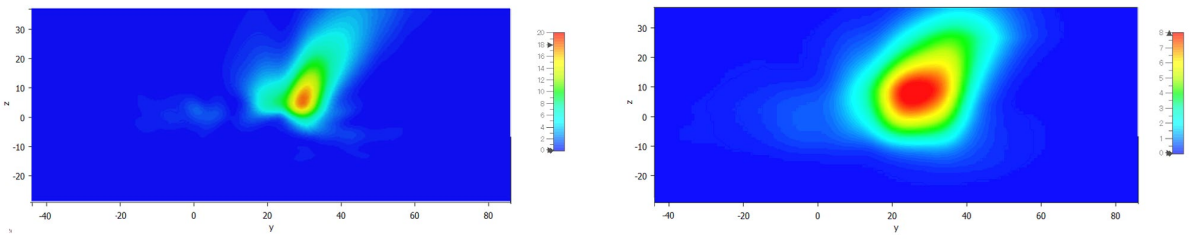
2. Simulation Verification

2.1 Spatial Averaged Power Density

Spatial averaging is needed to determine the MPE values from power density simulation results over the 4 cm² area required by the FCC. Using the localized power density, the total spatial power density can be obtained by the integral of 4 cm² of the localized power density result. Figure 6 shows examples of the distribution plot of the localized and averaged power density.



(a) Localized power density

(b) Averaged power density

Figure 6. Power density distribution example

2.2 Comparison between Simulation and Measurement

The simulated and measured power density distributions are compared to each mmWave antennas in this section.

Based on comparison of power density distributions, simulated power density and measured power density have a good correlation. Measurement uncertainty in mmWave frequency in measurement side and inaccuracy of material properties in mmWave frequency in the simulation side are considered as error factors.

The input powers per each active port are below for both simulation and measurement validation and power density characterization. For simulation, these values were entered directly into CST model. For measurement, FTM software was used to input these values for each active port.

Table 2. Input Power for mmWave modules

Mode / Band	Antenna	Input Power (dBm) SISO	Input Power (dBm) MIMO
5G NR n258	mmwave#0	6	6
	mmwave#1	6	6
	mmwave#2	6	6
5G NR n260	mmwave#0	6	6
	mmwave#1	6	6
	mmwave#2	6	6
5G NR n261	mmwave#0	6	6
	mmwave#1	6	6
	mmwave#2	6	6

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The below simulation and measurement result were performed at 2mm distance at 24GHz, 28GHz and 39GHz. Since 24GHz band is separated in two FCC bands, the middle channel is also defined separately in Mid-low and Mid-high channels. The input.power.limit was decided according to the simulation results.

Table 3. PD comparison result between Simulation and Measurement

Band	Surface ID	Antenna	Power Density 4cm² avg. PD (W/m²) Beam ID	Polarization	Channel	Measured (W/m²)	Simulated (W/m²)	Sim. vs Meas. Δ dB
n258	S4	mmwave#0	37	V	Mid-low	13.60	12.25	-0.45
			165	H	Mid-high	13.50	11.76	-0.60
	S1	mmwave#1	29	V	Mid-low	13.50	11.96	-0.53
			157	H	Mid-low	12.20	11.73	-0.17
	S3	mmwave#2	32	V	Mid-low	12.60	11.29	-0.47
			170	H	Mid-low	12.20	12.06	-0.05
n261	S4	mmwave#0	38	V	Mid	13.70	9.99	-1.37
			150	H	Mid	13.00	10.12	-1.09
	S1	mmwave#1	29	V	Mid	14.40	10.60	-1.33
			157	H	Mid	15.70	10.91	-1.58
	S3	mmwave#2	33	V	Mid	13.40	10.57	-1.03
			174	H	Mid	13.90	10.38	-1.27
n260	S4	mmwave#0	25	V	Mid	11.40	10.53	-0.35
			153	H	Mid	9.81	10.26	0.20
	S1	mmwave#1	30	V	Mid	12.80	10.25	-0.97
			155	H	Mid	10.50	9.23	-0.56
	S3	mmwave#2	31	V	Mid	13.70	11.00	-0.95
			173	H	Mid	8.72	9.38	0.32

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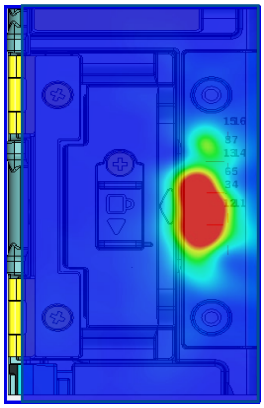
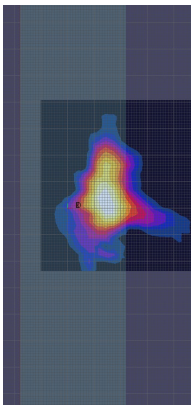
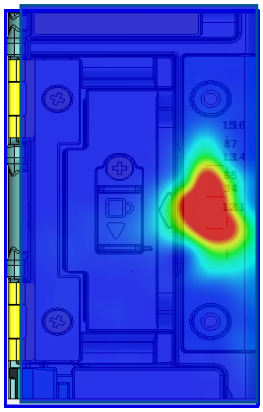
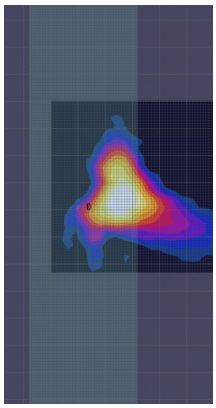
mmwave#0 / Band: n258

Polarization: V		Polarization: H	
Beam ID: 37		Beam ID: 165	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
12.25	13.60	11.76	13.50

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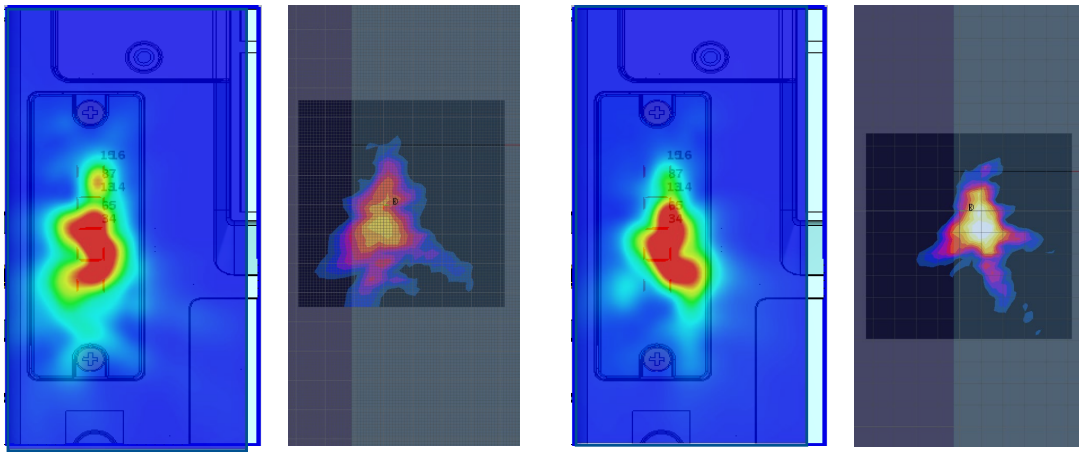
mmwave#1 / Band: n258

Polarization: V		Polarization: H.	
Beam ID: 29		Beam ID: 157	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
11.96	13.50	11.73	12.20



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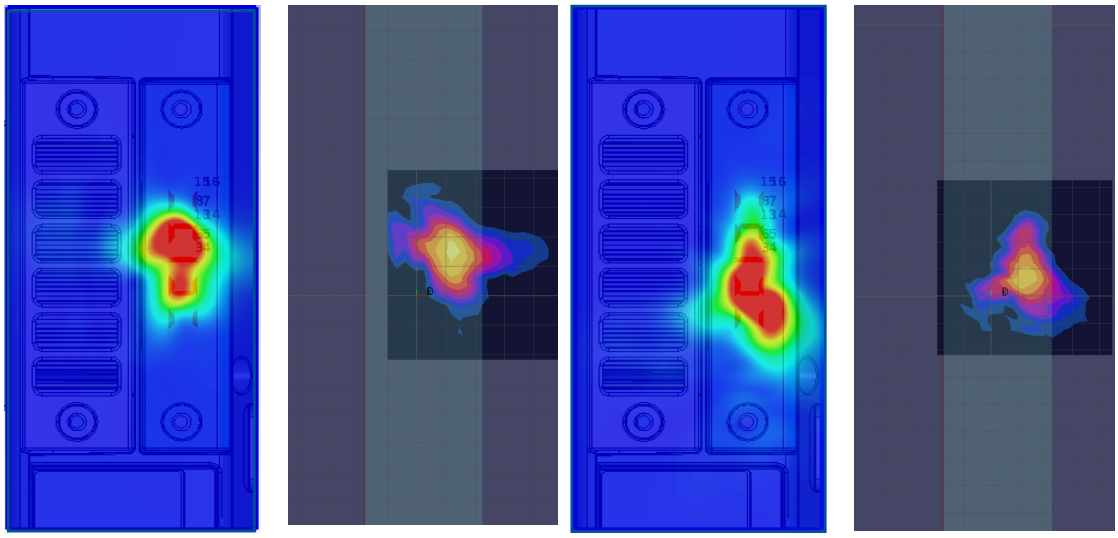
mmwave#2 / Band: n258

Polarization: V		Polarization: H	
Beam ID: 32		Beam ID: 170	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
11.29	12.60	12.06	12.20



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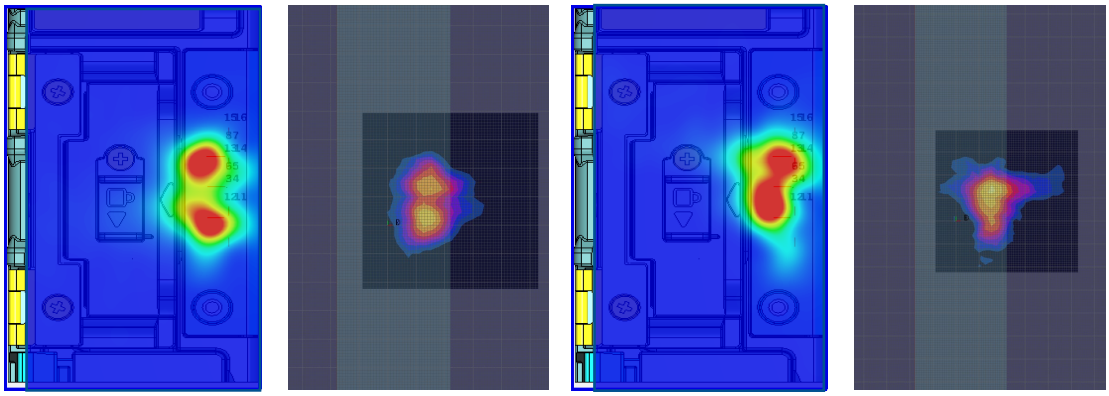
mmwave#0 / Band: n261

Polarization: V		Polarization: H	
Beam ID: 38		Beam ID: 150	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
9.99	13.70	10.12	13.00



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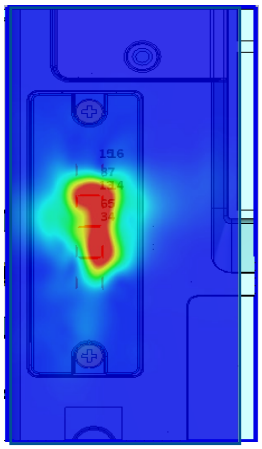
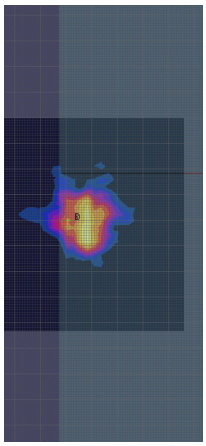
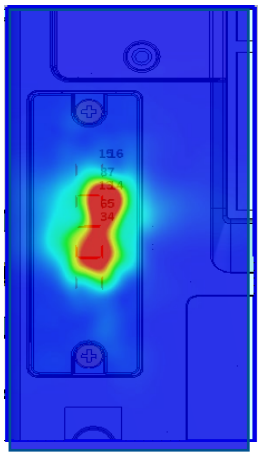
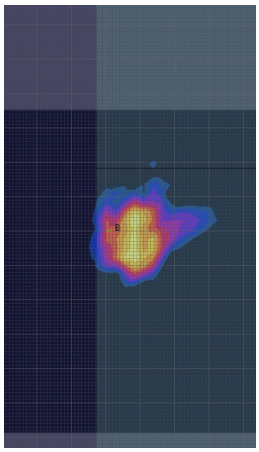
mmwave#1 / Band: n261

Polarization: V		Polarization: H	
Beam ID: 29		Beam ID: 157	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
10.60	14.40	10.91	15.70

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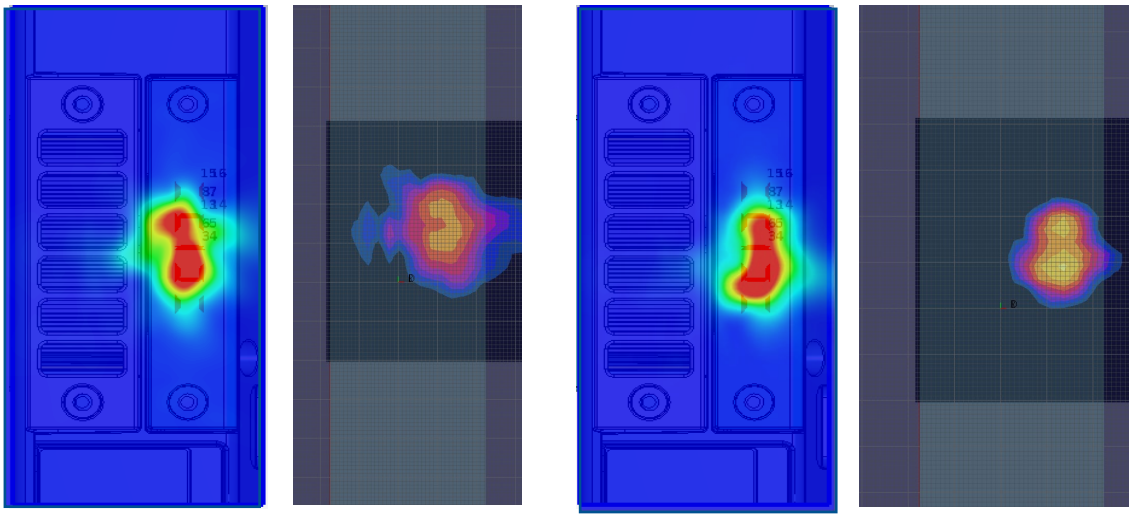
mmwave#2 / Band: n261

Polarization: V		Polarization: H	
Beam ID: 33		Beam ID: 174	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
10.57	13.40	10.38	13.90



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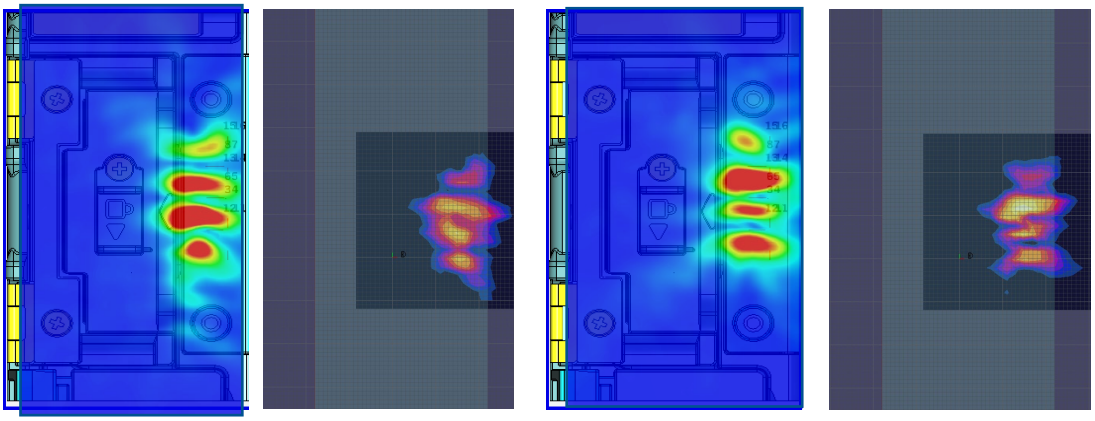
mmwave#0 / Band: n260

Polarization: V		Polarization: H	
Beam ID: 25		Beam ID: 153	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
10.53	11.40	10.26	9.81



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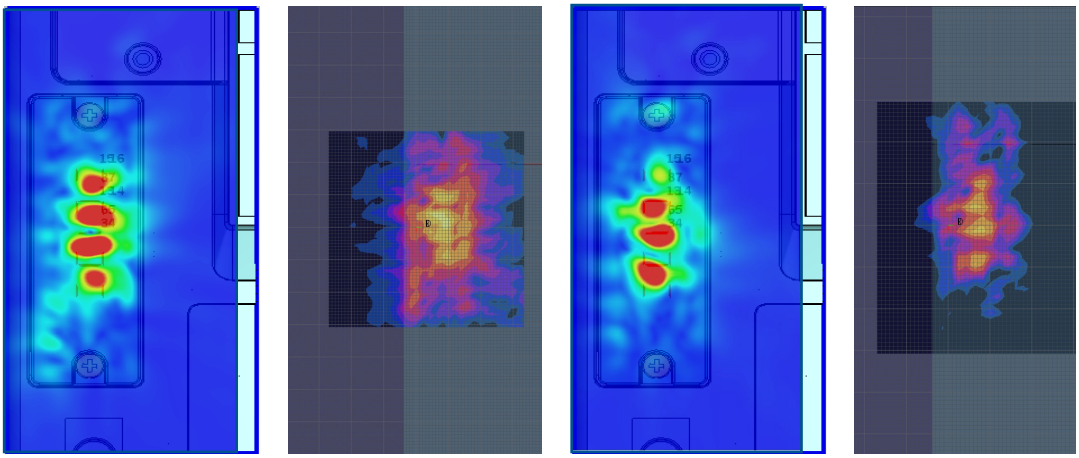
mmwaave#1 / Band: n260

Polarization: V		Polarization: H	
Beam ID: 30		Beam ID: 155	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
10.25	12.80	9.23	10.50



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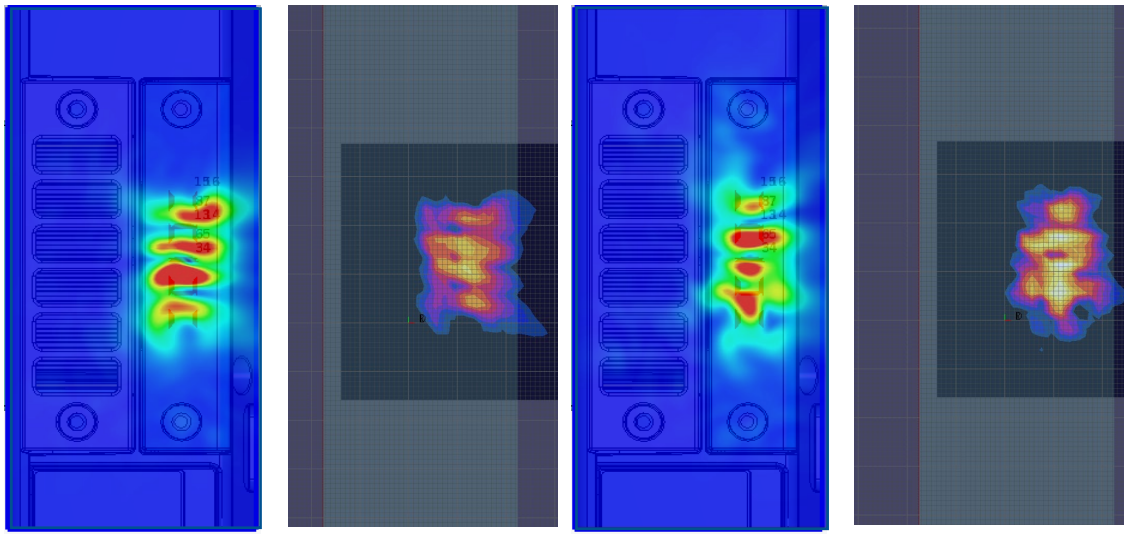
mmwave#2 / Band: n260

Polarization: V		Polarization: H	
Beam ID: 31		Beam ID: 173	
Sim. (W/m^2)	Meas. (W/m^2)	Sim. (W/m^2)	Meas. (W/m^2)
11.00	13.70	9.38	8.72



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3. Simulation Result

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

The following Table 4-12 show the PD simulation evaluation of mmwave#0 / mmwave#1 / mmwave#2 mmWave modules at 24GHz / 28GHz / 39GHz for each evaluation plane.

Table 4. Simulated PD of n258 mmwave#0

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)											
			Low ch			Mid-low ch			Mid-high ch			High ch		
			S4	S1	S2	S4	S1	S2	S4	S1	S2	S4	S1	S2
0	-	1	3.62	0.02	0.01	3.64	0.02	0.01	3.67	0.04	0.01	3.50	0.07	0.01
1	-	1	2.03	0.04	0.01	2.03	0.04	0.01	2.01	0.03	0.01	2.18	0.03	0.01
6	-	2	6.61	0.05	0.03	6.66	0.05	0.03	6.78	0.04	0.02	6.67	0.03	0.02
7	-	2	6.91	0.03	0.03	6.89	0.03	0.03	6.80	0.02	0.02	6.70	0.02	0.02
8	-	2	5.80	0.02	0.02	5.77	0.02	0.02	5.70	0.03	0.02	5.49	0.03	0.01
15	-	2	6.89	0.04	0.02	6.92	0.04	0.02	6.95	0.03	0.02	6.88	0.03	0.02
16	-	2	6.09	0.03	0.02	6.06	0.03	0.02	5.96	0.03	0.02	5.76	0.03	0.01
21	-	4	11.94	0.12	0.03	12.11	0.11	0.03	12.06	0.10	0.03	11.32	0.11	0.03
22	-	4	11.45	0.05	0.04	11.40	0.05	0.04	11.13	0.04	0.04	11.06	0.05	0.05
23	-	4	11.41	0.06	0.03	11.40	0.05	0.03	11.46	0.03	0.03	11.65	0.03	0.04
24	-	4	11.42	0.11	0.05	11.28	0.11	0.05	10.72	0.18	0.05	10.03	0.30	0.04
35	-	4	11.96	0.12	0.05	12.04	0.11	0.05	11.93	0.09	0.04	11.60	0.08	0.04
36	-	4	11.88	0.05	0.05	11.83	0.04	0.05	11.59	0.04	0.05	11.55	0.04	0.06
37	-	4	12.26	0.05	0.05	12.25	0.04	0.05	12.13	0.07	0.05	11.83	0.14	0.05
128	-	1	3.68	0.02	0.01	3.68	0.02	0.01	3.68	0.02	0.01	3.58	0.03	0.01
129	-	1	2.18	0.12	0.00	2.12	0.12	0.00	1.98	0.16	0.00	2.21	0.16	0.01
134	-	2	5.12	0.11	0.02	5.08	0.12	0.01	5.01	0.16	0.01	5.15	0.17	0.01
135	-	2	5.57	0.01	0.01	5.59	0.01	0.01	5.64	0.01	0.01	5.55	0.01	0.01
136	-	2	6.39	0.20	0.01	6.30	0.21	0.02	5.90	0.27	0.02	5.68	0.27	0.02
143	-	2	5.73	0.01	0.01	5.74	0.01	0.01	5.80	0.01	0.01	5.79	0.01	0.01
144	-	2	5.35	0.02	0.01	5.37	0.02	0.01	5.41	0.02	0.01	5.27	0.02	0.01
149	-	4	11.14	0.08	0.02	11.14	0.09	0.02	11.03	0.13	0.02	10.85	0.14	0.02
150	-	4	10.48	0.10	0.04	10.45	0.11	0.03	10.36	0.15	0.03	10.51	0.15	0.03
151	-	4	10.95	0.11	0.02	10.95	0.10	0.02	10.90	0.11	0.03	11.01	0.10	0.05
152	-	4	11.72	0.21	0.03	11.45	0.22	0.03	10.49	0.33	0.03	9.57	0.32	0.03
163	-	4	11.32	0.10	0.04	11.27	0.10	0.04	11.09	0.14	0.03	11.04	0.15	0.03
164	-	4	10.54	0.08	0.02	10.53	0.08	0.02	10.58	0.09	0.03	11.05	0.09	0.03
165	-	4	11.72	0.14	0.03	11.75	0.15	0.03	11.76	0.19	0.04	11.27	0.16	0.05
0	128	1	7.55	0.04	0.01	7.63	0.04	0.01	7.79	0.03	0.01	7.69	0.05	0.01

Panasonic

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)											
			Low ch			Mid-low ch			Mid-high ch			High ch		
			S4	S1	S2	S4	S1	S2	S4	S1	S2	S4	S1	S2
1	129	1	2.85	0.27	0.02	2.75	0.28	0.02	2.40	0.30	0.01	2.91	0.25	0.02
6	134	2	10.72	0.12	0.04	10.69	0.12	0.04	10.53	0.15	0.04	10.33	0.16	0.03
7	135	2	12.74	0.02	0.03	12.78	0.02	0.02	12.79	0.03	0.02	12.67	0.02	0.02
8	136	2	9.20	0.19	0.03	9.24	0.18	0.03	9.19	0.21	0.04	9.09	0.18	0.05
15	143	2	12.00	0.06	0.04	12.04	0.06	0.04	12.20	0.04	0.04	12.13	0.04	0.04
16	144	2	11.89	0.05	0.02	11.93	0.04	0.02	12.03	0.04	0.02	11.75	0.04	0.02
21	149	4	21.67	0.35	0.05	21.86	0.35	0.06	21.65	0.41	0.06	20.61	0.41	0.05
22	150	4	18.21	0.28	0.09	18.02	0.28	0.09	17.62	0.28	0.09	18.31	0.21	0.10
23	151	4	21.17	0.25	0.06	21.17	0.22	0.06	21.40	0.17	0.09	21.94	0.11	0.13
24	152	4	22.99	0.33	0.11	22.28	0.37	0.11	19.67	0.61	0.11	17.17	0.74	0.10
35	163	4	22.10	0.40	0.11	22.10	0.40	0.11	21.59	0.44	0.09	21.12	0.40	0.08
36	164	4	20.48	0.20	0.09	20.36	0.18	0.09	20.09	0.14	0.11	21.06	0.11	0.13
37	165	4	23.60	0.17	0.09	23.54	0.18	0.09	23.00	0.23	0.12	21.57	0.30	0.15

Table 5. Simulated PD of n258 mmwave#1

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)											
			Low ch			Mid-low ch			Mid-high ch			High ch		
			S1	S6	S2	S1	S6	S2	S1	S6	S2	S1	S6	S2
2	-	1	3.60	0.02	0.01	3.58	0.02	0.01	3.54	0.02	0.01	3.51	0.03	0.01
3	-	1	2.00	0.14	0.01	2.01	0.12	0.01	2.15	0.05	0.01	2.26	0.07	0.01
9	-	2	7.09	0.05	0.02	7.04	0.06	0.02	6.91	0.06	0.02	6.68	0.06	0.02
10	-	2	6.91	0.04	0.03	6.92	0.04	0.03	6.88	0.04	0.02	6.78	0.04	0.02
11	-	2	5.97	0.04	0.02	5.92	0.04	0.02	5.82	0.04	0.02	5.78	0.04	0.02
17	-	2	7.09	0.04	0.02	7.09	0.04	0.02	7.06	0.04	0.02	6.93	0.04	0.02
18	-	2	6.33	0.04	0.02	6.31	0.04	0.02	6.21	0.04	0.03	6.14	0.04	0.02
25	-	4	8.45	0.30	0.03	8.39	0.28	0.03	8.68	0.23	0.03	8.00	0.30	0.03
26	-	4	11.53	0.33	0.05	11.58	0.31	0.05	11.55	0.25	0.06	11.25	0.22	0.07
27	-	4	11.70	0.30	0.07	11.74	0.29	0.07	11.84	0.25	0.07	11.66	0.21	0.07
28	-	4	11.58	0.19	0.07	11.59	0.18	0.07	11.74	0.17	0.08	11.97	0.14	0.07
29	-	4	12.06	0.23	0.05	11.96	0.22	0.06	11.41	0.18	0.05	10.95	0.18	0.06
38	-	4	11.46	0.24	0.04	11.48	0.23	0.04	11.36	0.27	0.06	10.93	0.24	0.07
39	-	4	11.48	0.36	0.06	11.55	0.34	0.06	11.64	0.24	0.06	11.43	0.20	0.07
40	-	4	11.66	0.21	0.08	11.68	0.21	0.08	11.73	0.20	0.08	11.72	0.16	0.08
41	-	4	11.93	0.18	0.06	11.90	0.18	0.07	11.88	0.16	0.07	11.94	0.17	0.07

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)											
			Low ch			Mid-low ch			Mid-high ch			High ch		
			S1	S6	S2	S1	S6	S2	S1	S6	S2	S1	S6	S2
130	-	1	3.15	0.04	0.01	3.14	0.04	0.01	3.16	0.04	0.01	3.18	0.04	0.01
131	-	1	2.31	0.09	0.01	2.29	0.07	0.01	2.45	0.09	0.01	2.60	0.10	0.01
137	-	2	5.80	0.08	0.02	5.77	0.08	0.02	5.78	0.07	0.02	5.78	0.07	0.02
138	-	2	5.78	0.09	0.02	5.79	0.09	0.02	5.87	0.08	0.02	5.78	0.10	0.02
139	-	2	6.36	0.19	0.02	6.28	0.15	0.02	6.26	0.14	0.03	6.09	0.17	0.03
145	-	2	5.91	0.08	0.02	5.92	0.08	0.02	6.06	0.09	0.02	6.03	0.09	0.02
146	-	2	5.39	0.09	0.02	5.38	0.09	0.02	5.35	0.08	0.02	5.26	0.08	0.02
153	-	4	10.85	0.16	0.03	10.86	0.16	0.03	10.89	0.21	0.03	10.65	0.25	0.04
154	-	4	11.36	0.20	0.05	11.39	0.20	0.06	11.53	0.25	0.06	11.52	0.22	0.07
155	-	4	10.88	0.19	0.07	10.93	0.18	0.08	11.13	0.17	0.08	11.18	0.19	0.07
156	-	4	11.40	0.24	0.08	11.39	0.23	0.07	11.60	0.20	0.08	11.44	0.20	0.08
157	-	4	11.84	0.26	0.06	11.73	0.24	0.07	11.60	0.22	0.08	11.11	0.20	0.09
166	-	4	11.28	0.17	0.04	11.29	0.18	0.04	11.33	0.23	0.04	11.22	0.23	0.05
167	-	4	10.96	0.20	0.07	11.00	0.19	0.07	11.21	0.18	0.07	11.35	0.18	0.07
168	-	4	10.94	0.21	0.08	10.96	0.20	0.08	11.17	0.19	0.09	11.06	0.21	0.08
169	-	4	11.69	0.25	0.07	11.64	0.24	0.07	11.70	0.21	0.08	11.45	0.20	0.09
2	130	1	6.33	0.08	0.01	6.29	0.07	0.01	6.12	0.06	0.02	6.09	0.06	0.01
3	131	1	2.43	0.35	0.01	2.42	0.29	0.01	2.87	0.21	0.01	3.36	0.19	0.01
9	137	2	14.27	0.07	0.05	14.22	0.08	0.05	14.14	0.12	0.05	13.67	0.12	0.05
10	138	2	12.37	0.13	0.03	12.38	0.12	0.03	12.35	0.12	0.03	12.19	0.15	0.03
11	139	2	9.65	0.22	0.06	9.54	0.19	0.06	9.33	0.18	0.06	9.37	0.19	0.06
17	145	2	12.39	0.13	0.03	12.36	0.12	0.03	12.32	0.12	0.03	12.23	0.13	0.03
18	146	2	12.06	0.11	0.03	12.06	0.11	0.03	11.98	0.10	0.03	11.82	0.12	0.04
25	153	4	21.16	0.38	0.08	21.18	0.35	0.08	21.68	0.34	0.06	19.95	0.49	0.06
26	154	4	21.69	0.54	0.10	21.71	0.59	0.10	21.51	0.68	0.13	20.94	0.57	0.14
27	155	4	20.52	0.48	0.07	20.60	0.45	0.07	20.90	0.37	0.08	20.98	0.36	0.08
28	156	4	22.17	0.49	0.09	22.19	0.45	0.09	22.73	0.37	0.10	22.96	0.40	0.09
29	157	4	22.69	0.69	0.13	22.45	0.68	0.14	21.87	0.58	0.17	20.98	0.51	0.18
38	166	4	21.21	0.51	0.09	21.10	0.56	0.09	20.46	0.73	0.12	19.61	0.58	0.14
39	167	4	20.52	0.53	0.08	20.59	0.53	0.08	20.76	0.49	0.10	20.55	0.44	0.11
40	168	4	21.27	0.47	0.08	21.34	0.43	0.08	21.73	0.35	0.08	21.95	0.34	0.07
41	169	4	22.86	0.59	0.13	22.80	0.56	0.13	23.01	0.48	0.14	22.75	0.45	0.15

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Table 6. Simulated PD of n258 mmwave#2

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)											
			Low ch			Mid-low ch			Mid-high ch			High ch		
			S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2
4	-	1	3.41	0.01	0.03	3.44	0.01	0.03	3.45	0.01	0.03	3.47	0.02	0.02
5	-	1	2.08	0.04	0.01	2.01	0.04	0.01	1.72	0.04	0.01	1.94	0.11	0.01
12	-	2	5.81	0.02	0.03	5.80	0.02	0.03	5.76	0.02	0.03	5.79	0.03	0.03
13	-	2	6.63	0.02	0.06	6.66	0.02	0.06	6.71	0.01	0.07	6.73	0.01	0.06
14	-	2	5.68	0.05	0.02	5.75	0.05	0.02	5.58	0.08	0.02	5.40	0.13	0.02
19	-	2	6.30	0.02	0.05	6.30	0.02	0.05	6.24	0.02	0.04	6.24	0.02	0.04
20	-	2	6.61	0.01	0.06	6.65	0.01	0.06	6.70	0.02	0.06	6.69	0.02	0.05
30	-	4	10.71	0.13	0.06	10.63	0.13	0.06	9.81	0.21	0.07	9.05	0.34	0.09
31	-	4	10.80	0.08	0.07	10.73	0.08	0.06	10.73	0.05	0.06	10.75	0.06	0.07
32	-	4	11.41	0.04	0.11	11.29	0.04	0.11	10.91	0.03	0.11	11.12	0.07	0.13
33	-	4	10.58	0.06	0.04	10.60	0.06	0.04	10.06	0.06	0.03	10.10	0.13	0.05
34	-	4	7.02	0.15	0.04	7.00	0.17	0.04	6.37	0.22	0.04	6.27	0.36	0.05
42	-	4	11.26	0.09	0.06	11.14	0.10	0.06	10.81	0.08	0.06	10.53	0.15	0.08
43	-	4	11.18	0.07	0.09	11.07	0.07	0.09	10.85	0.04	0.10	11.17	0.07	0.10
44	-	4	10.88	0.06	0.09	10.81	0.06	0.09	10.44	0.06	0.10	11.00	0.14	0.09
45	-	4	9.99	0.11	0.04	10.02	0.12	0.04	9.50	0.17	0.04	9.31	0.28	0.03
132	-	1	3.08	0.01	0.01	3.10	0.01	0.01	3.15	0.01	0.01	3.19	0.01	0.01
133	-	1	2.30	0.08	0.01	2.19	0.09	0.01	2.07	0.11	0.01	2.41	0.09	0.01
140	-	2	5.65	0.04	0.02	5.69	0.04	0.02	5.50	0.05	0.02	5.22	0.04	0.02
141	-	2	5.73	0.01	0.01	5.79	0.01	0.01	5.85	0.01	0.01	5.78	0.01	0.01
142	-	2	5.16	0.04	0.02	5.24	0.04	0.02	5.31	0.05	0.02	5.43	0.05	0.01
147	-	2	5.33	0.01	0.02	5.38	0.01	0.02	5.40	0.01	0.02	5.34	0.01	0.02
148	-	2	5.93	0.01	0.01	5.97	0.01	0.01	6.02	0.01	0.01	5.99	0.01	0.01
158	-	4	7.55	0.24	0.03	7.37	0.26	0.03	6.32	0.28	0.03	5.92	0.16	0.04
159	-	4	11.09	0.06	0.05	11.01	0.06	0.05	10.77	0.07	0.06	10.82	0.04	0.09
160	-	4	10.59	0.10	0.06	10.51	0.11	0.06	10.42	0.18	0.05	10.70	0.20	0.04
161	-	4	10.44	0.13	0.05	10.51	0.14	0.04	10.43	0.21	0.03	10.78	0.15	0.03
162	-	4	8.25	0.21	0.04	8.34	0.23	0.04	8.64	0.31	0.04	9.12	0.18	0.04
170	-	4	12.25	0.12	0.05	12.06	0.12	0.06	11.21	0.10	0.07	10.50	0.11	0.08
171	-	4	10.88	0.07	0.05	10.81	0.08	0.05	10.73	0.09	0.04	11.15	0.14	0.05
172	-	4	10.67	0.12	0.07	10.64	0.13	0.07	10.72	0.20	0.04	11.09	0.17	0.05
173	-	4	9.73	0.16	0.03	9.80	0.18	0.03	9.86	0.26	0.04	10.18	0.17	0.04
4	132	1	5.94	0.02	0.05	5.97	0.02	0.05	5.99	0.03	0.05	5.92	0.03	0.04
5	133	1	2.85	0.16	0.02	2.53	0.16	0.02	1.80	0.14	0.02	2.88	0.18	0.03

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)											
			Low ch			Mid-low ch			Mid-high ch			High ch		
			S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2
12	140	2	9.98	0.09	0.07	9.97	0.09	0.07	9.48	0.09	0.06	9.01	0.10	0.07
13	141	2	12.75	0.03	0.05	12.90	0.03	0.05	13.04	0.02	0.05	12.94	0.02	0.05
14	142	2	10.43	0.04	0.04	10.50	0.05	0.04	10.16	0.09	0.03	9.63	0.14	0.03
19	147	2	11.14	0.03	0.07	11.12	0.03	0.07	10.87	0.03	0.07	10.71	0.04	0.07
20	148	2	11.52	0.02	0.09	11.58	0.02	0.09	11.73	0.02	0.09	11.64	0.02	0.09
30	158	4	16.68	0.24	0.08	16.23	0.26	0.08	14.00	0.33	0.09	13.11	0.45	0.12
31	159	4	20.73	0.17	0.14	20.45	0.18	0.15	20.11	0.10	0.17	20.19	0.11	0.26
32	160	4	18.59	0.18	0.22	18.32	0.20	0.21	17.93	0.15	0.21	18.98	0.16	0.24
33	161	4	17.92	0.27	0.10	17.66	0.29	0.10	16.54	0.30	0.07	17.36	0.21	0.11
34	162	4	12.10	0.37	0.06	12.01	0.41	0.07	10.97	0.50	0.07	10.51	0.47	0.10
42	170	4	22.96	0.10	0.11	22.32	0.11	0.12	20.08	0.17	0.14	18.90	0.29	0.19
43	171	4	19.11	0.21	0.17	18.93	0.21	0.18	19.14	0.13	0.19	20.53	0.22	0.22
44	172	4	18.82	0.25	0.24	18.59	0.26	0.23	18.32	0.23	0.20	19.78	0.22	0.19
45	173	4	16.79	0.27	0.07	16.74	0.30	0.07	15.65	0.38	0.07	15.19	0.33	0.08

Table 7. Simulated PD of n261 mmwave#0

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S4	S1	S2	S4	S1	S2	S4	S1	S2
0	-	1	3.17	0.02	0.01	3.01	0.02	0.01	2.85	0.01	0.01
1	-	1	2.92	0.04	0.01	2.78	0.04	0.01	2.58	0.04	0.01
6	-	2	4.98	0.07	0.01	4.65	0.07	0.01	4.26	0.07	0.01
7	-	2	5.77	0.02	0.02	5.47	0.02	0.02	5.08	0.02	0.02
8	-	2	5.45	0.04	0.02	5.39	0.05	0.02	5.17	0.06	0.02
15	-	2	5.82	0.02	0.02	5.54	0.02	0.02	5.20	0.02	0.02
16	-	2	5.31	0.05	0.02	4.99	0.05	0.02	4.68	0.03	0.02
21	-	4	6.90	0.10	0.02	6.52	0.11	0.02	6.18	0.12	0.02
22	-	4	9.13	0.16	0.04	8.84	0.18	0.04	8.25	0.18	0.04
23	-	4	10.38	0.13	0.05	9.90	0.12	0.05	9.22	0.11	0.05
24	-	4	10.21	0.03	0.04	9.88	0.04	0.04	9.49	0.04	0.05
25	-	4	8.02	0.13	0.04	8.15	0.12	0.04	8.11	0.10	0.03
36	-	4	7.48	0.13	0.03	7.17	0.12	0.03	6.83	0.12	0.03
37	-	4	10.48	0.08	0.05	9.92	0.11	0.05	9.08	0.13	0.05
38	-	4	10.40	0.12	0.05	9.99	0.13	0.05	9.42	0.11	0.05

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S4	S1	S2	S4	S1	S2	S4	S1	S2
39	-	4	8.63	0.09	0.04	8.68	0.06	0.04	8.62	0.05	0.03
128	-	1	2.80	0.01	0.01	2.70	0.02	0.01	2.59	0.02	0.01
129	-	1	3.08	0.04	0.01	2.97	0.02	0.01	2.80	0.02	0.01
134	-	2	5.20	0.06	0.01	4.95	0.05	0.01	4.73	0.06	0.01
135	-	2	4.65	0.02	0.01	4.43	0.02	0.01	4.17	0.02	0.01
136	-	2	5.43	0.04	0.01	5.41	0.03	0.01	5.24	0.07	0.01
143	-	2	4.91	0.01	0.01	4.67	0.01	0.01	4.36	0.01	0.01
144	-	2	4.41	0.02	0.01	4.23	0.02	0.01	4.02	0.03	0.01
149	-	4	8.13	0.10	0.02	7.72	0.07	0.02	7.54	0.12	0.02
150	-	4	10.46	0.11	0.05	10.12	0.05	0.04	9.44	0.08	0.04
151	-	4	9.92	0.09	0.04	9.68	0.08	0.04	9.11	0.14	0.03
152	-	4	9.41	0.02	0.03	9.10	0.02	0.02	8.56	0.02	0.02
153	-	4	6.55	0.09	0.02	6.42	0.09	0.02	6.23	0.16	0.01
164	-	4	9.93	0.10	0.04	9.46	0.06	0.04	8.90	0.08	0.04
165	-	4	10.26	0.10	0.03	9.93	0.07	0.03	9.23	0.11	0.03
166	-	4	10.32	0.04	0.03	10.09	0.07	0.03	9.57	0.11	0.03
167	-	4	6.88	0.08	0.02	6.81	0.05	0.02	6.58	0.08	0.02
0	128	1	5.02	0.02	0.02	4.73	0.01	0.02	4.46	0.01	0.02
1	129	1	7.18	0.15	0.01	7.06	0.12	0.01	6.67	0.11	0.01
6	134	2	9.13	0.05	0.02	8.55	0.04	0.02	8.02	0.05	0.02
7	135	2	10.78	0.06	0.05	10.31	0.05	0.05	9.67	0.04	0.05
8	136	2	9.13	0.04	0.04	8.65	0.06	0.03	7.89	0.11	0.02
15	143	2	9.46	0.03	0.03	8.87	0.03	0.02	8.16	0.03	0.02
16	144	2	8.90	0.02	0.04	8.29	0.02	0.03	7.71	0.02	0.03
21	149	4	13.75	0.08	0.03	12.67	0.09	0.04	12.02	0.14	0.05
22	150	4	18.96	0.14	0.14	18.00	0.15	0.14	16.81	0.18	0.12
23	151	4	19.82	0.15	0.13	19.24	0.18	0.13	18.17	0.24	0.12
24	152	4	19.49	0.07	0.08	19.09	0.06	0.08	18.12	0.07	0.08
25	153	4	14.07	0.17	0.05	13.52	0.25	0.04	12.86	0.33	0.04
36	164	4	18.65	0.12	0.08	17.68	0.13	0.09	16.80	0.17	0.09
37	165	4	20.39	0.10	0.12	19.62	0.09	0.11	18.23	0.15	0.10
38	166	4	20.08	0.12	0.11	19.55	0.17	0.12	18.64	0.20	0.11
39	167	4	15.74	0.10	0.06	15.39	0.12	0.06	14.56	0.15	0.05

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Table 8. Simulated PD of n261 mmwave#1

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S1	S6	S2	S1	S6	S2	S1	S6	S2
2	-	1	3.14	0.08	0.01	3.07	0.05	0.01	2.98	0.05	0.01
3	-	1	2.37	0.03	0.01	2.42	0.05	0.01	2.33	0.06	0.01
9	-	2	5.30	0.07	0.02	4.96	0.11	0.02	4.47	0.10	0.02
10	-	2	5.55	0.07	0.03	5.20	0.08	0.02	4.75	0.10	0.02
11	-	2	4.41	0.16	0.03	4.28	0.12	0.03	4.12	0.15	0.02
17	-	2	5.29	0.06	0.02	4.95	0.10	0.02	4.46	0.10	0.02
18	-	2	6.00	0.06	0.03	5.60	0.06	0.02	5.21	0.06	0.02
26	-	4	7.88	0.12	0.04	7.75	0.13	0.05	7.55	0.15	0.05
27	-	4	7.97	0.15	0.06	8.34	0.13	0.07	8.10	0.12	0.07
28	-	4	10.56	0.19	0.09	10.22	0.23	0.08	9.51	0.23	0.08
29	-	4	11.14	0.19	0.08	10.60	0.18	0.08	10.13	0.18	0.07
30	-	4	7.10	0.23	0.04	6.82	0.22	0.04	6.56	0.24	0.04
40	-	4	7.33	0.15	0.05	7.67	0.15	0.06	7.48	0.17	0.07
41	-	4	9.41	0.15	0.07	9.47	0.16	0.08	9.01	0.15	0.08
42	-	4	11.00	0.19	0.08	10.60	0.18	0.07	10.32	0.24	0.07
43	-	4	8.67	0.21	0.08	8.20	0.15	0.08	8.05	0.23	0.06
130	-	1	3.10	0.05	0.01	3.06	0.04	0.01	2.98	0.04	0.01
131	-	1	2.63	0.07	0.01	2.65	0.07	0.01	2.60	0.03	0.01
137	-	2	4.49	0.04	0.02	4.22	0.04	0.02	3.80	0.05	0.02
138	-	2	4.93	0.09	0.02	4.71	0.08	0.02	4.34	0.08	0.02
139	-	2	4.86	0.04	0.02	4.58	0.04	0.02	4.16	0.05	0.02
145	-	2	5.26	0.12	0.03	5.26	0.14	0.03	5.09	0.07	0.03
146	-	2	5.48	0.07	0.02	5.23	0.07	0.02	4.89	0.07	0.02
154	-	4	6.80	0.21	0.06	6.40	0.25	0.06	6.60	0.15	0.06
155	-	4	7.93	0.19	0.07	7.79	0.16	0.08	7.67	0.13	0.08
156	-	4	10.92	0.19	0.07	10.53	0.20	0.07	10.11	0.17	0.06
157	-	4	10.98	0.14	0.08	10.91	0.15	0.08	10.38	0.16	0.07
158	-	4	6.87	0.21	0.06	6.77	0.19	0.06	6.88	0.12	0.06
168	-	4	5.30	0.20	0.02	5.39	0.16	0.04	5.37	0.11	0.03
169	-	4	8.81	0.22	0.08	8.48	0.19	0.08	8.28	0.15	0.09
170	-	4	10.57	0.21	0.08	10.25	0.20	0.07	9.76	0.18	0.06
171	-	4	9.51	0.22	0.09	9.68	0.19	0.08	9.60	0.17	0.08
2	130	1	7.61	0.22	0.02	7.55	0.14	0.02	7.20	0.16	0.02
3	131	1	4.49	0.06	0.02	4.58	0.15	0.02	4.50	0.10	0.02

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S1	S6	S2	S1	S6	S2	S1	S6	S2
9	137	2	7.94	0.11	0.03	7.21	0.13	0.03	6.33	0.15	0.02
10	138	2	10.93	0.19	0.06	10.56	0.20	0.06	9.62	0.21	0.04
11	139	2	8.23	0.21	0.05	7.99	0.15	0.04	7.74	0.17	0.04
17	145	2	9.45	0.21	0.04	8.94	0.30	0.03	8.57	0.19	0.03
18	146	2	12.90	0.13	0.05	12.50	0.11	0.04	11.95	0.11	0.04
26	154	4	15.02	0.36	0.07	14.64	0.26	0.07	14.53	0.18	0.07
27	155	4	15.22	0.32	0.08	14.75	0.27	0.07	13.73	0.20	0.07
28	156	4	22.01	0.32	0.10	20.88	0.43	0.09	20.03	0.39	0.11
29	157	4	21.68	0.28	0.13	21.18	0.25	0.13	20.56	0.30	0.15
30	158	4	16.39	0.40	0.07	16.21	0.32	0.08	15.53	0.28	0.09
40	168	4	11.34	0.32	0.05	12.09	0.25	0.06	11.70	0.25	0.07
41	169	4	18.79	0.34	0.09	17.95	0.48	0.08	16.94	0.40	0.08
42	170	4	20.85	0.32	0.14	20.03	0.34	0.12	19.53	0.38	0.13
43	171	4	18.59	0.40	0.12	18.73	0.32	0.12	18.85	0.31	0.12

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Table 9. Simulated PD of n261 mmwave#2

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S3	S1	S2	S3	S1	S2	S3	S1	S2
4	-	1	3.03	0.01	0.02	2.95	0.02	0.02	2.77	0.02	0.01
5	-	1	3.08	0.02	0.02	3.01	0.02	0.02	2.87	0.03	0.02
12	-	2	5.45	0.01	0.03	5.26	0.02	0.02	5.00	0.02	0.02
13	-	2	5.53	0.02	0.06	5.34	0.03	0.06	5.07	0.04	0.05
14	-	2	5.66	0.02	0.06	5.67	0.02	0.05	5.48	0.03	0.05
19	-	2	5.75	0.01	0.04	5.52	0.02	0.03	5.27	0.02	0.03
20	-	2	5.01	0.01	0.04	4.81	0.03	0.04	4.46	0.04	0.04
31	-	4	6.32	0.06	0.04	5.98	0.04	0.04	5.57	0.06	0.03
32	-	4	9.73	0.05	0.13	9.56	0.06	0.11	9.22	0.15	0.09
33	-	4	10.65	0.05	0.11	10.57	0.06	0.08	10.07	0.11	0.06
34	-	4	9.52	0.03	0.09	9.30	0.04	0.10	9.07	0.06	0.09
35	-	4	7.72	0.04	0.07	7.87	0.05	0.05	7.61	0.07	0.04
44	-	4	6.82	0.06	0.03	6.43	0.04	0.04	6.15	0.06	0.05
45	-	4	10.65	0.04	0.12	10.54	0.05	0.08	9.95	0.13	0.06
46	-	4	10.63	0.04	0.13	10.49	0.06	0.13	10.07	0.10	0.13
47	-	4	8.42	0.04	0.07	8.47	0.05	0.06	8.25	0.06	0.05
132	-	1	2.85	0.01	0.01	2.74	0.01	0.01	2.51	0.01	0.01
133	-	1	3.07	0.03	0.01	2.98	0.02	0.01	2.84	0.03	0.01
140	-	2	4.85	0.02	0.03	4.64	0.02	0.03	4.35	0.03	0.03
141	-	2	4.94	0.01	0.02	4.70	0.01	0.01	4.27	0.01	0.01
142	-	2	5.76	0.02	0.02	5.46	0.02	0.03	5.13	0.03	0.03
147	-	2	5.22	0.01	0.03	4.95	0.01	0.03	4.56	0.02	0.03
148	-	2	5.12	0.02	0.02	4.94	0.02	0.02	4.58	0.03	0.02
159	-	4	6.95	0.04	0.04	6.43	0.04	0.04	5.90	0.09	0.03
160	-	4	10.28	0.06	0.09	10.00	0.04	0.09	9.47	0.11	0.07
161	-	4	10.41	0.07	0.08	10.22	0.05	0.06	9.49	0.11	0.04
162	-	4	10.20	0.02	0.08	9.87	0.02	0.07	9.23	0.04	0.06
163	-	4	7.57	0.03	0.04	6.96	0.04	0.04	6.31	0.07	0.04
172	-	4	7.98	0.05	0.06	7.61	0.04	0.07	7.21	0.09	0.06
173	-	4	10.37	0.07	0.10	10.18	0.04	0.09	9.65	0.11	0.07
174	-	4	10.50	0.07	0.08	10.38	0.06	0.05	9.73	0.11	0.03
175	-	4	7.99	0.03	0.05	7.76	0.04	0.05	7.12	0.05	0.04
4	132	1	4.99	0.02	0.04	4.72	0.02	0.03	4.30	0.02	0.02
5	133	1	7.26	0.07	0.02	7.17	0.05	0.02	6.77	0.10	0.02

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S3	S1	S2	S3	S1	S2	S3	S1	S2
12	140	2	10.16	0.05	0.09	9.64	0.05	0.08	9.06	0.04	0.07
13	141	2	10.55	0.03	0.06	10.12	0.04	0.05	9.32	0.04	0.03
14	142	2	10.27	0.04	0.08	10.01	0.04	0.06	9.22	0.04	0.05
19	147	2	9.12	0.02	0.07	8.54	0.02	0.06	7.87	0.02	0.05
20	148	2	10.01	0.03	0.05	9.93	0.04	0.05	9.43	0.07	0.04
31	159	4	10.44	0.06	0.05	8.87	0.05	0.05	8.15	0.10	0.06
32	160	4	20.21	0.08	0.32	19.59	0.11	0.29	18.93	0.21	0.22
33	161	4	21.35	0.06	0.25	21.06	0.06	0.16	19.90	0.10	0.09
34	162	4	20.45	0.05	0.27	19.40	0.09	0.27	18.56	0.13	0.23
35	163	4	15.27	0.08	0.07	14.56	0.11	0.06	13.71	0.15	0.07
44	172	4	15.12	0.10	0.10	13.86	0.09	0.14	13.13	0.15	0.15
45	173	4	20.72	0.06	0.35	20.51	0.09	0.27	19.80	0.10	0.18
46	174	4	21.23	0.07	0.30	20.91	0.09	0.25	20.17	0.13	0.18
47	175	4	17.05	0.06	0.15	16.38	0.09	0.13	14.99	0.09	0.12

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Table 10. Simulated PD of n260 mmwave#0

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S4	S1	S2	S4	S1	S2	S4	S1	S2
0	-	1	2.74	0.01	0.00	2.69	0.01	0.01	2.44	0.01	0.01
1	-	1	3.29	0.03	0.02	3.46	0.02	0.02	3.20	0.02	0.01
6	-	2	6.61	0.05	0.02	7.04	0.06	0.02	6.55	0.11	0.02
7	-	2	5.74	0.04	0.01	5.85	0.03	0.01	5.06	0.08	0.01
8	-	2	6.10	0.06	0.01	6.47	0.07	0.02	5.99	0.06	0.03
15	-	2	6.35	0.05	0.02	6.86	0.05	0.02	6.47	0.12	0.02
16	-	2	5.69	0.03	0.02	6.04	0.05	0.02	5.35	0.08	0.01
21	-	4	10.24	0.06	0.04	10.10	0.10	0.03	9.17	0.14	0.03
22	-	4	9.55	0.11	0.03	10.08	0.08	0.05	9.67	0.10	0.04
23	-	4	9.39	0.19	0.03	9.35	0.11	0.03	8.65	0.12	0.03
24	-	4	9.40	0.07	0.09	10.40	0.08	0.06	9.53	0.09	0.04
25	-	4	10.70	0.09	0.05	10.53	0.14	0.04	9.67	0.11	0.03
36	-	4	10.46	0.15	0.03	10.50	0.15	0.05	9.85	0.11	0.03
37	-	4	8.04	0.12	0.02	9.87	0.10	0.03	9.52	0.21	0.03
38	-	4	8.75	0.11	0.07	10.22	0.05	0.06	9.62	0.06	0.05
39	-	4	9.77	0.06	0.09	10.40	0.10	0.06	9.46	0.09	0.04
128	-	1	2.30	0.02	0.00	2.32	0.01	0.00	2.02	0.01	0.01
129	-	1	3.17	0.05	0.01	3.33	0.03	0.01	3.09	0.04	0.01
134	-	2	5.08	0.08	0.02	5.33	0.05	0.03	4.68	0.03	0.02
135	-	2	4.80	0.02	0.01	4.87	0.03	0.01	4.25	0.03	0.01
136	-	2	5.00	0.06	0.02	5.21	0.04	0.03	4.60	0.03	0.02
143	-	2	4.95	0.03	0.01	5.01	0.03	0.02	4.39	0.03	0.02
144	-	2	6.19	0.10	0.02	6.42	0.06	0.02	5.70	0.04	0.02
149	-	4	9.70	0.13	0.06	9.75	0.06	0.07	9.33	0.12	0.06
150	-	4	8.93	0.06	0.04	9.85	0.05	0.07	9.01	0.12	0.05
151	-	4	9.06	0.07	0.03	8.37	0.09	0.04	7.96	0.15	0.05
152	-	4	9.23	0.16	0.04	9.16	0.07	0.04	8.42	0.06	0.06
153	-	4	10.28	0.08	0.04	10.26	0.14	0.07	9.84	0.04	0.08
164	-	4	10.38	0.12	0.04	10.07	0.14	0.08	9.38	0.06	0.08
165	-	4	7.75	0.05	0.03	9.35	0.09	0.06	8.85	0.19	0.05
166	-	4	8.96	0.08	0.03	8.56	0.07	0.03	8.22	0.11	0.03
167	-	4	10.28	0.10	0.04	10.03	0.12	0.08	9.31	0.05	0.08
0	128	1	5.17	0.02	0.01	5.19	0.02	0.01	4.50	0.02	0.02
1	129	1	6.40	0.12	0.03	6.78	0.07	0.03	6.73	0.07	0.03

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S4	S1	S2	S4	S1	S2	S4	S1	S2
6	134	2	12.84	0.11	0.05	12.27	0.12	0.03	10.51	0.20	0.03
7	135	2	10.53	0.05	0.02	10.35	0.07	0.01	9.21	0.12	0.01
8	136	2	9.97	0.14	0.03	11.15	0.09	0.04	10.41	0.06	0.04
15	143	2	11.55	0.09	0.03	11.50	0.12	0.02	9.83	0.23	0.01
16	144	2	11.22	0.12	0.03	12.00	0.07	0.05	10.83	0.09	0.04
21	149	4	20.78	0.26	0.10	20.83	0.20	0.12	18.70	0.41	0.09
22	150	4	15.60	0.15	0.08	18.41	0.15	0.13	18.67	0.17	0.12
23	151	4	18.37	0.30	0.08	17.40	0.30	0.08	16.71	0.30	0.10
24	152	4	18.96	0.23	0.18	19.99	0.12	0.15	18.75	0.12	0.16
25	153	4	18.16	0.15	0.11	18.89	0.22	0.13	18.61	0.11	0.15
36	164	4	21.40	0.33	0.08	21.35	0.37	0.08	18.72	0.10	0.09
37	165	4	16.53	0.22	0.06	19.42	0.28	0.07	18.02	0.44	0.09
38	166	4	18.96	0.27	0.07	19.37	0.21	0.08	18.00	0.21	0.11
39	167	4	19.18	0.13	0.15	19.57	0.14	0.16	18.85	0.12	0.15

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Table 11. Simulated PD of n260 mmwave#1

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S1	S6	S2	S1	S6	S2	S1	S6	S2
2	-	1	2.98	0.06	0.02	3.56	0.06	0.02	3.33	0.05	0.03
3	-	1	2.66	0.05	0.02	2.43	0.10	0.01	2.54	0.11	0.02
9	-	2	5.99	0.11	0.05	6.83	0.13	0.06	6.78	0.13	0.07
10	-	2	5.14	0.11	0.06	5.51	0.13	0.06	4.99	0.07	0.05
11	-	2	5.82	0.11	0.03	5.87	0.17	0.05	5.48	0.12	0.04
17	-	2	5.30	0.10	0.05	5.56	0.10	0.05	4.83	0.07	0.06
18	-	2	5.34	0.11	0.04	5.65	0.17	0.05	5.33	0.11	0.05
26	-	4	8.98	0.29	0.09	9.31	0.40	0.11	9.34	0.31	0.10
27	-	4	9.11	0.20	0.08	10.14	0.27	0.10	9.80	0.23	0.11
28	-	4	8.82	0.30	0.13	8.72	0.36	0.13	9.16	0.35	0.13
29	-	4	8.09	0.19	0.11	9.51	0.33	0.12	8.15	0.18	0.11
30	-	4	10.43	0.19	0.06	10.25	0.21	0.08	9.58	0.23	0.08
40	-	4	9.98	0.13	0.06	9.80	0.14	0.07	9.80	0.21	0.09
41	-	4	8.33	0.27	0.07	9.85	0.29	0.11	9.84	0.26	0.11
42	-	4	8.70	0.27	0.13	8.85	0.32	0.13	8.79	0.28	0.13
43	-	4	9.54	0.19	0.08	9.98	0.23	0.09	9.17	0.26	0.10
130	-	1	2.98	0.06	0.01	3.09	0.10	0.02	2.80	0.09	0.02
131	-	1	2.95	0.05	0.02	2.53	0.09	0.02	2.63	0.05	0.02
137	-	2	5.18	0.07	0.04	5.22	0.10	0.03	4.95	0.07	0.03
138	-	2	4.16	0.05	0.05	4.59	0.08	0.06	4.37	0.08	0.05
139	-	2	6.17	0.11	0.04	5.47	0.20	0.06	5.72	0.16	0.06
145	-	2	4.59	0.08	0.06	4.78	0.13	0.04	4.36	0.10	0.05
146	-	2	4.36	0.04	0.04	4.77	0.06	0.06	4.65	0.07	0.05
154	-	4	9.69	0.23	0.09	8.71	0.36	0.11	8.59	0.27	0.09
155	-	4	7.75	0.23	0.11	9.23	0.36	0.13	9.11	0.25	0.11
156	-	4	8.26	0.19	0.12	8.40	0.38	0.15	8.18	0.21	0.13
157	-	4	7.30	0.18	0.08	8.43	0.27	0.13	8.95	0.26	0.11
158	-	4	10.16	0.13	0.06	9.11	0.19	0.07	8.40	0.17	0.08
168	-	4	9.01	0.28	0.12	8.83	0.42	0.13	8.80	0.29	0.10
169	-	4	7.57	0.18	0.11	8.88	0.40	0.15	8.66	0.24	0.13
170	-	4	8.22	0.17	0.12	8.26	0.35	0.14	8.24	0.19	0.14
171	-	4	9.87	0.10	0.07	9.00	0.14	0.07	8.31	0.16	0.10
2	130	1	5.54	0.15	0.04	6.50	0.15	0.06	6.21	0.12	0.05
3	131	1	5.73	0.12	0.03	5.19	0.24	0.04	4.98	0.16	0.04

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S1	S6	S2	S1	S6	S2	S1	S6	S2
9	137	2	11.35	0.21	0.06	11.57	0.29	0.09	10.98	0.26	0.08
10	138	2	9.78	0.19	0.16	9.92	0.31	0.11	8.65	0.24	0.08
11	139	2	9.56	0.32	0.07	9.65	0.42	0.11	9.51	0.28	0.10
17	145	2	10.45	0.24	0.12	10.98	0.26	0.11	9.14	0.19	0.10
18	146	2	9.75	0.19	0.12	9.67	0.29	0.08	9.07	0.25	0.08
26	154	4	15.18	0.63	0.13	17.09	1.10	0.18	18.06	0.67	0.16
27	155	4	14.39	0.34	0.24	18.69	0.46	0.32	18.00	0.40	0.26
28	156	4	16.21	0.45	0.22	16.30	0.72	0.26	16.42	0.43	0.25
29	157	4	15.46	0.48	0.23	18.79	0.48	0.33	18.70	0.31	0.29
30	158	4	21.53	0.34	0.13	21.03	0.42	0.19	18.14	0.44	0.21
40	168	4	15.97	0.47	0.22	17.99	0.53	0.34	18.55	0.35	0.28
41	169	4	13.86	0.28	0.22	18.10	0.52	0.26	17.04	0.26	0.26
42	170	4	15.49	0.39	0.22	16.05	0.58	0.25	17.04	0.36	0.26
43	171	4	19.43	0.30	0.23	18.79	0.43	0.27	18.23	0.35	0.29

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Table 12. Simulated PD of n260 mmwave#2

Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S3	S1	S2	S3	S1	S2	S3	S1	S2
4	-	1	3.20	0.02	0.01	3.70	0.02	0.01	3.37	0.02	0.01
5	-	1	2.86	0.03	0.02	3.29	0.03	0.01	3.34	0.04	0.01
12	-	2	6.43	0.05	0.02	7.48	0.03	0.03	6.85	0.05	0.03
13	-	2	4.98	0.03	0.03	5.93	0.06	0.03	6.20	0.06	0.03
14	-	2	5.48	0.05	0.02	6.27	0.03	0.03	5.58	0.04	0.04
19	-	2	4.66	0.03	0.03	5.41	0.06	0.03	5.31	0.07	0.03
20	-	2	5.33	0.02	0.02	5.88	0.02	0.02	5.40	0.03	0.02
31	-	4	10.03	0.09	0.05	11.00	0.08	0.04	10.08	0.10	0.04
32	-	4	8.03	0.06	0.07	9.95	0.07	0.09	9.83	0.08	0.10
33	-	4	7.98	0.06	0.07	8.88	0.12	0.05	8.95	0.15	0.03
34	-	4	8.92	0.07	0.06	10.38	0.06	0.03	9.55	0.08	0.04
35	-	4	9.64	0.10	0.05	10.48	0.08	0.05	9.97	0.11	0.05
44	-	4	9.93	0.09	0.04	10.75	0.08	0.06	9.94	0.09	0.06
45	-	4	7.50	0.04	0.06	9.70	0.08	0.06	9.66	0.11	0.07
46	-	4	8.06	0.06	0.07	8.80	0.12	0.05	8.85	0.15	0.03
47	-	4	9.05	0.07	0.06	10.49	0.06	0.04	9.58	0.09	0.03
132	-	1	2.48	0.02	0.01	2.89	0.02	0.02	2.81	0.03	0.02
133	-	1	2.78	0.02	0.01	3.14	0.02	0.01	3.09	0.03	0.01
140	-	2	5.54	0.05	0.02	5.79	0.06	0.02	6.15	0.06	0.02
141	-	2	4.70	0.03	0.02	5.38	0.02	0.03	5.53	0.05	0.03
142	-	2	4.58	0.03	0.01	5.13	0.03	0.02	4.89	0.04	0.02
147	-	2	5.05	0.05	0.02	5.99	0.06	0.02	5.72	0.07	0.02
148	-	2	4.30	0.03	0.03	4.65	0.03	0.03	4.31	0.04	0.03
159	-	4	8.56	0.09	0.03	8.88	0.07	0.05	8.88	0.12	0.05
160	-	4	8.38	0.08	0.03	9.33	0.11	0.03	9.03	0.09	0.04
161	-	4	8.15	0.05	0.05	8.28	0.06	0.05	8.00	0.11	0.05
162	-	4	6.94	0.05	0.05	8.63	0.07	0.07	8.87	0.10	0.09
163	-	4	9.05	0.11	0.05	9.25	0.09	0.07	9.43	0.12	0.07
172	-	4	8.97	0.11	0.04	8.92	0.09	0.05	9.26	0.12	0.06
173	-	4	8.07	0.07	0.03	9.38	0.11	0.04	8.79	0.09	0.04
174	-	4	7.09	0.05	0.06	8.15	0.05	0.07	8.52	0.07	0.06
175	-	4	7.48	0.05	0.04	9.06	0.07	0.07	8.95	0.12	0.10
4	132	1	6.51	0.04	0.02	7.06	0.05	0.03	6.35	0.05	0.05
5	133	1	5.29	0.05	0.03	6.17	0.06	0.02	6.32	0.10	0.03

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Beam ID 1	Beam ID2	Feed no.	4cm² PD simulation result (W/m²)								
			Low ch			Mid ch			High ch		
			S3	S1	S2	S3	S1	S2	S3	S1	S2
12	140	2	11.37	0.10	0.04	12.91	0.11	0.04	12.60	0.12	0.06
13	141	2	10.36	0.07	0.06	11.56	0.07	0.07	11.84	0.08	0.08
14	142	2	11.02	0.08	0.04	12.40	0.06	0.05	11.07	0.09	0.07
19	147	2	9.60	0.09	0.05	10.94	0.12	0.05	10.85	0.18	0.07
20	148	2	9.72	0.05	0.06	10.37	0.07	0.08	9.44	0.08	0.09
31	159	4	18.80	0.17	0.07	20.84	0.15	0.06	19.90	0.25	0.10
32	160	4	18.80	0.20	0.11	21.21	0.20	0.15	19.28	0.21	0.17
33	161	4	14.73	0.12	0.12	14.69	0.22	0.10	14.59	0.22	0.11
34	162	4	14.92	0.11	0.12	18.26	0.13	0.09	17.63	0.15	0.09
35	163	4	18.20	0.26	0.08	19.80	0.19	0.11	19.78	0.29	0.11
44	172	4	19.07	0.26	0.10	20.25	0.19	0.12	19.87	0.27	0.12
45	173	4	17.07	0.13	0.11	19.59	0.22	0.13	17.79	0.25	0.15
46	174	4	14.10	0.10	0.14	15.67	0.20	0.14	16.37	0.14	0.15
47	175	4	16.19	0.13	0.10	18.47	0.15	0.09	17.06	0.14	0.08

3.2 Ratio of PD results for simultaneous transmission evaluation

The ratio of non-worst surface PD result to the worst surface PD result for each beam ID and channel is used to support RF exposure analysis for simultaneous transmission consideration(s) in the part1 RF exposure test report. The highest ratio of non-worst surface PD result to the worst surface PD result for each mmWave module and each band is listed in Table 13 - 15.

Table 13. Ratio of PD results (mmwave#0)

Band	S1 / S4	Beam ID	Channel	S2 / S4	Beam ID	Channel
n258	0.10	1/129	Low ch	0.01	8/136	High ch
n261	0.03	25/153	High ch	0.01	22/150	Mid ch
n260	0.02	37/165	High ch	0.01	24	Low ch

Table 14. Ratio of PD results (mmwave#1)

Band	S6 / S1	Beam ID	Channel	S2 / S1	Beam ID	Channel
n258	0.15	3/131	Low ch	0.01	29/157	High ch
n261	0.04	154	Mid ch	0.01	155	High ch
n260	0.06	26/154	Mid ch	0.02	40/168	Mid ch

Table 15. Ratio of PD results (mmwave#2)

Band	S1 / S3	Beam ID	Channel	S2 / S3	Beam ID	Channel
n258	0.08	5/133	Mid-high ch	0.01	44/172	Low ch
n261	0.02	32	High ch	0.02	45/173	Low ch
n260	0.02	19/147	High ch	0.01	175	High ch

3.3 EIRP simulation results

The EIRP simulation result for each beam ID and channel is used to support RF test consideration(s) in the FCC Part 30 RF test report. The EIRP simulation result for each mmWave module and each band is listed in each Tables. The worst value is shown in the red cell.

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Band n258a, n258b

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)			
					L-ch (n258a)	H-ch (n258a)	L-ch (n258b)	H-ch (n258b)
0		0	V	1	12.04	12.11	12.49	12.58
1		0	V	1	10.16	10.26	10.05	10.49
2		1	V	1	10.27	10.41	10.8	11.02
3		1	V	1	8.89	8.75	9.03	9.83
4		2	V	1	11.86	12.02	11.86	11.53
5		2	V	1	11.22	11.2	10.49	10.54
6		0	V	2	16.15	16.26	16.52	16.34
7		0	V	2	16.97	16.95	16.8	16.8
8		0	V	2	15.34	15.17	15.19	15.54
9		1	V	2	14.6	14.64	14.54	15.11
10		1	V	2	15.35	15.44	15.5	15.44
11		1	V	2	14.47	14.59	15.01	15.36
12		2	V	2	16.21	16.04	16.04	16.81
13		2	V	2	16.77	16.82	16.86	16.8
14		2	V	2	15.81	16.1	16.33	16.22
15		0	V	2	16.83	16.95	17.26	17.14
16		0	V	2	16.01	15.9	15.73	16.24
17		1	V	2	15.2	15.21	14.58	14.84
18		1	V	2	15.12	15.21	15.72	16.05
19		2	V	2	16.64	16.49	16.85	17.48
20		2	V	2	15.87	16.81	16.11	16.21
21		0	V	4	19.06	19.18	19.73	19.57
22		0	V	4	21.35	21.39	21.43	21.52
23		0	V	4	21.4	21.37	21.2	21.12
24		0	V	4	20.03	20.21	20.54	20.49
25		1	V	4	16.88	16.8	15.96	16.9
26		1	V	4	19.6	19.57	19.61	20.02
27		1	V	4	19.41	19.35	19.56	20.22
28		1	V	4	20.21	20.11	20.1	20.5
29		1	V	4	19.35	19.2	18.89	19.28
30		2	V	4	19.22	19.4	19.78	20.06
31		2	V	4	20.96	21.01	21.02	21.15

Panasonic

Band n258a, n258b

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)			
					L-ch (n258a)	H-ch (n258a)	L-ch (n258b)	H-ch (n258b)
32		2	V	4	20.63	20.59	20.27	20.43
33		2	V	4	19.77	19.83	19.85	19.59
34		2	V	4	17.59	17.64	17.34	17.45
35		0	V	4	20.38	20.3	20.4	20.66
36		0	V	4	21.13	21.1	21.48	21.65
37		0	V	4	20.96	20.94	20.87	21.01
38		1	V	4	19.09	19.07	19.43	19.96
39		1	V	4	19.51	19.46	19.68	20.09
40		1	V	4	20.04	19.9	19.84	20.54
41		1	V	4	19.96	19.92	19.55	20.31
42		2	V	4	20.94	21.05	20.84	20.81
43		2	V	4	20.95	21.02	21.23	21.11
44		2	V	4	21.6	21.65	21.27	20.54
45		2	V	4	19.3	19.32	18.88	18.46
128		0	H	1	12.24	12.18	11.94	12.18
129		0	H	1	11.13	11.01	9.6	10.3
130		1	H	1	10.94	10.79	10.33	10.95
131		1	H	1	10.02	10	9.89	10.15
132		2	H	1	11.1	11.37	11.68	11.78
133		2	H	1	11.91	11.54	10.18	10.66
134		0	H	2	14.91	14.68	14.15	15.17
135		0	H	2	16.62	16.58	16.41	16.26
136		0	H	2	16.13	15.81	14.49	14.34
137		1	H	2	14.36	14.33	13.97	14.01
138		1	H	2	14.81	14.87	15.02	15.03
139		1	H	2	14.89	14.86	14.42	14.22
140		2	H	2	16.14	16.26	15.89	15.47
141		2	H	2	15.53	15.59	15.52	15.49
142		2	H	2	15.14	15.82	15.6	15.42
143		0	H	2	15.61	15.54	15.28	15.28
144		0	H	2	16.23	16.24	16.26	16.12
145		1	H	2	14.21	14.16	14.55	14.7

Panasonic

Band n258a, n258b

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)			
					L-ch (n258a)	H-ch (n258a)	L-ch (n258b)	H-ch (n258b)
146		1	H	2	15.24	15.23	15.57	16.04
147		2	H	2	15.87	16.07	16.42	16.64
148		2	H	2	15.47	15.52	15.45	15.44
149		0	H	4	19.57	19.42	18.97	18.94
150		0	H	4	20.48	20.43	20.14	20.3
151		0	H	4	21.72	21.73	21.39	20.88
152		0	H	4	19.61	19.6	19.01	18.78
153		1	H	4	19.16	19.16	18.86	18.85
154		1	H	4	19.38	19.4	19.39	19.95
155		1	H	4	20.13	20.14	20.23	20.27
156		1	H	4	20.02	20.1	20.5	20.67
157		1	H	4	18.63	18.53	18.59	19.33
158		2	H	4	17.79	17.76	16.97	16.12
159		2	H	4	20.74	20.78	20.63	20.55
160		2	H	4	19.94	19.99	19.9	20.16
161		2	H	4	19.26	19.11	18.62	18.89
162		2	H	4	18.46	18.53	17.82	18.34
163		0	H	4	20.76	20.68	20.55	21.1
164		0	H	4	21.38	21.34	20.93	20.64
165		0	H	4	20.95	21.34	20.66	20.56
166		1	H	4	18.74	18.7	18.81	19.12
167		1	H	4	19.61	19.59	19.73	19.77
168		1	H	4	20.36	20.26	20.21	20.21
169		1	H	4	19.24	19.25	19.6	20.06
170		2	H	4	20.52	20.59	20.42	20.15
171		2	H	4	20	20	19.71	20.02
172		2	H	4	20.87	20.8	20.48	20.07
173		2	H	4	18.67	18.64	18.1	18.63
0	128	0	V&H	1	14.76	14.82	15.2	15.22
1	129	0	V&H	1	13.04	12.77	11.42	12.04
2	130	1	V&H	1	13.63	13.72	14.41	14.47

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Band n258a, n258b

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)			
					L-ch (n258a)	H-ch (n258a)	L-ch (n258b)	H-ch (n258b)
3	131	1	V&H	1	12.84	12.5	11.32	11.65
4	132	2	V&H	1	14.59	14.57	14.31	14.4
5	133	2	V&H	1	13.58	12.83	9.41	11.85
6	134	0	V&H	2	19.31	19.27	19.43	19.71
7	135	0	V&H	2	19.99	20.03	19.98	19.8
8	136	0	V&H	2	18.83	18.72	18.15	18.41
9	137	1	V&H	2	18.79	18.79	18.47	18.44
10	138	1	V&H	2	17.76	17.69	17.97	18.06
11	139	1	V&H	2	18.31	18.54	19.07	19.15
12	140	2	V&H	2	17.33	17.53	18.48	19.36
13	141	2	V&H	2	19.58	19.58	19.51	19.44
14	142	2	V&H	2	17.35	17.67	18.89	19.31
15	143	0	V&H	2	19.23	19.17	19.21	19.02
16	144	0	V&H	2	19.05	19.13	19.14	19.4
17	145	1	V&H	2	17.67	17.6	17.44	17.71
18	146	1	V&H	2	18.33	18.52	18.86	19.2
19	147	2	V&H	2	18.42	18.38	19.26	19.81
20	148	2	V&H	2	18.12	18.03	17.66	18.11
21	149	0	V&H	4	22.09	21.88	21.83	21.84
22	150	0	V&H	4	22.45	22.38	22.04	22.42
23	151	0	V&H	4	23.3	23.28	22.95	22.42
24	152	0	V&H	4	23.65	23.65	23.34	22.43
25	153	1	V&H	4	22.41	22.4	22.31	22.47
26	154	1	V&H	4	21.63	21.48	21.61	21.92
27	155	1	V&H	4	21.21	21.22	21.77	23.04
28	156	1	V&H	4	22.04	21.88	21.7	22.58
29	157	1	V&H	4	20.88	20.79	20.88	21.29
30	158	2	V&H	4	20.26	20.31	19.78	19.02
31	159	2	V&H	4	21.6	21.51	21.42	20.86
32	160	2	V&H	4	21.17	21.11	20.4	21.71
33	161	2	V&H	4	21.67	21.77	21.49	20.93

Panasonic

Band n258a, n258b

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)			
					L-ch (n258a)	H-ch (n258a)	L-ch (n258b)	H-ch (n258b)
34	162	2	V&H	4	20	19.8	19.4	19.25
35	163	0	V&H	4	22.78	22.58	22.52	22.69
36	164	0	V&H	4	23.23	22.91	22.57	23.24
37	165	0	V&H	4	23.01	22.86	22.22	21.57
38	166	1	V&H	4	20.87	20.67	20.67	20.63
39	167	1	V&H	4	21.18	21.21	21.85	22.35
40	168	1	V&H	4	21.25	21.12	21.75	23.07
41	169	1	V&H	4	21.37	21.26	21.02	22.3
42	170	2	V&H	4	22.86	22.6	21.82	20.84
43	171	2	V&H	4	22.48	22.35	21.94	20.82
44	172	2	V&H	4	22.89	22.81	21.74	21.37
45	173	2	V&H	4	20.75	21.03	21.18	21.22

Panasonic

Band n261

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
0		0	V	1	11.71	11.82	11.64
1		0	V	1	11.09	10.90	11.09
2		1	V	1	9.8	10.3	10.3
3		1	V	1	10.4	9.7	9.5
4		2	V	1	11.5	11.1	11.0
5		2	V	1	11.0	11.1	11.4
6		0	V	2	15.60	15.39	15.19
7		0	V	2	16.77	16.29	15.48
8		0	V	2	16.04	16.11	16.12
9		1	V	2	14.0	14.5	14.1
10		1	V	2	15.3	14.8	14.7
11		1	V	2	14.7	14.9	13.6
12		2	V	2	16.0	15.6	15.1
13		2	V	2	16.5	16.9	16.8
14		2	V	2	15.9	16.0	16.3
15		0	V	2	16.36	16.09	15.73
16		0	V	2	16.38	16.16	15.95
17		1	V	2	14.5	14.9	14.6
18		1	V	2	15.5	15.1	14.5
19		2	V	2	15.2	15.0	14.5
20		2	V	2	16.1	15.6	14.9
21		0	V	4	18.13	18.23	18.49
22		0	V	4	21.42	21.20	20.85
23		0	V	4	22.11	21.54	20.95
24		0	V	4	22.30	22.02	21.66
25		0	V	4	22.04	21.82	21.52
26		1	V	4	19.3	19.2	19.0
27		1	V	4	19.5	19.8	19.7
28		1	V	4	20.8	20.7	20.1
29		1	V	4	19.5	19.3	18.8
30		1	V	4	18.3	18.6	18.0
31		2	V	4	18.3	17.7	17.7

Panasonic

Band n261

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
32		2	V	4	20.0	19.7	18.8
33		2	V	4	21.7	21.7	21.4
34		2	V	4	21.4	21.2	20.7
35		2	V	4	20.0	20.3	20.4
36		0	V	4	19.12	19.30	19.58
37		0	V	4	21.46	21.09	20.59
38		0	V	4	21.99	21.70	21.31
39		0	V	4	22.45	22.20	21.87
40		1	V	4	19.7	20.0	19.7
41		1	V	4	19.9	20.2	20.2
42		1	V	4	20.4	20.1	19.5
43		1	V	4	19.6	19.9	19.1
44		2	V	4	19.8	19.3	18.5
45		2	V	4	20.8	20.7	20.4
46		2	V	4	21.9	21.8	21.6
47		2	V	4	20.7	20.3	20.2
128		0	H	1	11.39	11.47	11.13
129		0	H	1	11.23	11.09	10.71
130		1	H	1	11.2	11.3	11.4
131		1	H	1	12.1	12.0	11.0
132		2	H	1	11.1	11.2	10.8
133		2	H	1	11.8	12.1	12.0
134		0	H	2	15.94	16.13	15.78
135		0	H	2	15.22	14.97	14.57
136		0	H	2	16.43	16.54	16.47
137		1	H	2	13.6	13.3	12.7
138		1	H	2	14.3	13.9	13.6
139		1	H	2	14.9	14.6	13.9
140		2	H	2	15.4	15.6	15.3
141		2	H	2	15.7	15.5	15.5
142		2	H	2	15.2	15.3	15.3
143		0	H	2	15.12	14.96	14.81

Panasonic

Band n261

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
144		0	H	2	15.70	15.40	14.74
145		1	H	2	14.7	14.7	14.4
146		1	H	2	15.1	14.7	14.5
147		2	H	2	15.6	15.5	15.0
148		2	H	2	15.9	16.1	15.7
149		0	H	4	18.59	18.88	19.05
150		0	H	4	21.43	21.08	20.63
151		0	H	4	21.49	21.27	21.14
152		0	H	4	21.79	21.45	21.12
153		0	H	4	17.60	17.37	17.16
154		1	H	4	18.2	18.0	18.6
155		1	H	4	19.4	19.4	19.5
156		1	H	4	20.3	19.9	19.6
157		1	H	4	21.2	20.9	20.3
158		1	H	4	19.4	18.9	19.2
159		2	H	4	18.7	18.0	17.7
160		2	H	4	20.9	20.6	20.0
161		2	H	4	21.8	21.9	21.5
162		2	H	4	21.4	21.3	20.8
163		2	H	4	18.8	18.4	17.8
164		0	H	4	21.29	21.42	21.16
165		0	H	4	21.37	21.00	20.89
166		0	H	4	21.87	21.63	21.17
167		0	H	4	20.47	20.16	19.83
168		1	H	4	16.1	16.1	16.5
169		1	H	4	20.2	19.8	20.0
170		1	H	4	20.4	20.3	19.9
171		1	H	4	22.0	21.8	21.5
172		2	H	4	20.2	19.8	19.5
173		2	H	4	21.1	21.0	20.8
174		2	H	4	21.7	21.3	21.4
175		2	H	4	19.6	19.7	19.8

Panasonic

Band n261

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
0	128	0	V&H	1	13.69	13.72	13.60
1	129	0	V&H	1	16.11	16.09	15.92
2	130	1	V&H	1	14.2	14.6	15.2
3	131	1	V&H	1	13.7	13.6	13.8
4	132	2	V&H	1	14.2	13.4	12.7
5	133	2	V&H	1	15.5	15.6	15.6
6	134	0	V&H	2	17.97	18.05	18.02
7	135	0	V&H	2	19.03	18.78	18.42
8	136	0	V&H	2	17.56	17.08	16.74
9	137	1	V&H	2	18.1	18.1	17.7
10	138	1	V&H	2	17.0	17.3	17.4
11	139	1	V&H	2	16.9	17.0	16.5
12	140	2	V&H	2	18.8	18.7	18.4
13	141	2	V&H	2	18.3	18.1	17.8
14	142	2	V&H	2	18.2	18.0	17.6
15	143	0	V&H	2	18.03	17.69	17.20
16	144	0	V&H	2	19.28	18.84	18.20
17	145	1	V&H	2	17.7	17.5	17.1
18	146	1	V&H	2	17.5	17.6	17.5
19	147	2	V&H	2	17.1	16.9	16.7
20	148	2	V&H	2	19.1	19.2	18.8
21	149	0	V&H	4	20.70	20.24	20.12
22	150	0	V&H	4	23.96	23.52	23.08
23	151	0	V&H	4	24.20	23.43	22.81
24	152	0	V&H	4	24.33	24.02	23.62
25	153	0	V&H	4	22.62	22.19	21.85
26	154	1	V&H	4	20.7	20.3	20.1
27	155	1	V&H	4	21.9	22.0	21.7
28	156	1	V&H	4	23.3	23.3	23.3
29	157	1	V&H	4	24.3	23.9	23.6
30	158	1	V&H	4	20.5	20.6	22.0
31	159	2	V&H	4	19.7	19.0	19.1

Panasonic

Band n261

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
32	160	2	V&H	4	23.3	22.8	22.0
33	161	2	V&H	4	24.9	24.8	24.2
34	162	2	V&H	4	24.2	23.7	22.8
35	163	2	V&H	4	21.0	20.9	20.9
36	164	0	V&H	4	23.05	23.08	23.05
37	165	0	V&H	4	24.28	24.15	23.64
38	166	0	V&H	4	24.46	24.24	23.74
39	167	0	V&H	4	24.13	23.74	23.33
40	168	1	V&H	4	20.5	21.0	20.4
41	169	1	V&H	4	22.6	23.0	22.5
42	170	1	V&H	4	24.1	23.8	23.4
43	171	1	V&H	4	22.6	22.6	21.9
44	172	2	V&H	4	22.7	22.3	21.7
45	173	2	V&H	4	23.6	23.3	22.7
46	174	2	V&H	4	24.4	24.4	24.0
47	175	2	V&H	4	23.1	22.7	22.0

Panasonic

Band n260

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
32		0	V	4	20.9	21.0	20.8
33		2	V	4	22.6	21.9	21.7
34		1	V	4	19.5	20.6	20.6
35		2	V	4	19.4	20.1	20.6
36		0	V	4	22.4	18.4	19.3
37		0	V	4	21.2	20.8	20.3
38		0	V	4	25.6	24.3	19.9
39		0	V	4	19.2	20.2	20.0
48		0	V	4	16.9	15.9	16.8
41		1	V	4	19.5	19.8	20.7
40		1	V	4	17.4	16.8	26.5
43		1	V	4	20.8	20.3	19.9
44		2	V	4	25.2	26.0	26.2
45		2	V	4	21.0	21.6	22.4
46		2	V	4	22.6	26.0	27.3
47		2	V	4	19.4	19.6	19.7
126		0	H	2	16.9	16.9	16.2
129		0	H	1	12.7	12.6	13.3
130		1	H	2	15.9	16.8	16.0
131		1	H	1	12.2	12.6	12.4
120		2	H	2	16.5	16.0	16.8
133		2	H	1	13.4	12.7	12.3
124		0	H	2	25.4	26.9	26.5
135		0	H	2	16.6	16.3	15.7
136		0	H	2	19.3	20.6	20.6
137		1	H	2	14.7	16.1	14.9
138		1	H	2	17.8	18.2	18.5
139		1	H	2	15.4	17.6	16.1
140		2	H	2	20.7	20.5	25.9
141		2	H	2	16.4	17.4	15.7
142		2	H	2	19.0	20.2	19.8
143		0	H	2	16.0	15.9	15.4

Panasonic

Band n260

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
144		0	H	2	15.3	16.2	17.0
145		1	H	2	15.4	15.9	15.7
146		1	H	2	14.6	16.7	14.6
147		2	H	2	15.5	15.3	16.1
148		2	H	2	16.2	17.4	17.1
149		0	H	4	19.4	19.1	17.5
150		0	H	4	20.7	22.1	20.4
151		0	H	4	21.4	21.4	20.8
152		0	H	4	19.2	20.4	21.1
153		0	H	4	19.7	19.9	19.3
154		1	H	4	20.5	20.5	19.5
155		1	H	4	19.8	21.6	21.0
156		1	H	4	21.7	21.7	20.3
157		1	H	4	19.9	21.3	20.5
158		1	H	4	20.2	18.6	19.2
159		2	H	4	18.3	19.0	19.2
160		2	H	4	19.0	20.5	20.6
161		2	H	4	21.3	22.0	20.7
162		2	H	4	19.1	20.2	21.5
163		2	H	4	18.9	20.4	19.8
164		0	H	4	19.9	21.7	19.0
165		0	H	4	20.3	21.1	20.9
166		0	H	4	20.8	20.0	20.9
167		0	H	4	20.6	20.4	20.6
168		1	H	4	20.2	20.0	20.1
169		1	H	4	20.9	22.0	21.7
170		1	H	4	21.2	20.5	20.2
171		1	H	4	20.7	19.7	20.1
172		2	H	4	18.5	19.2	19.2
173		2	H	4	19.7	21.0	19.9
174		2	H	4	19.5	21.3	22.7
175		2	H	4	18.2	20.5	21.5

Panasonic

Band n260

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
0	128	0	V&H	1	14.6	14.9	13.7
1	129	0	V&H	1	14.7	15.5	15.7
2	130	1	V&H	1	15.4	15.9	15.4
3	131	1	V&H	1	13.4	14.9	15.2
4	132	2	V&H	1	14.6	14.6	15.3
5	133	2	V&H	1	15.9	16.2	15.9
6	134	0	V&H	2	19.7	20.5	18.4
7	135	0	V&H	2	20.2	19.6	18.9
8	136	0	V&H	2	17.5	17.0	17.8
9	137	1	V&H	2	17.6	18.6	17.7
10	138	1	V&H	2	19.9	20.2	18.7
11	139	1	V&H	2	17.5	17.8	18.4
12	140	2	V&H	2	18.8	19.6	19.4
13	141	2	V&H	2	20.2	19.6	20.0
14	142	2	V&H	2	18.8	19.0	19.7
15	143	0	V&H	2	19.5	19.4	18.1
16	144	0	V&H	2	18.7	18.5	19.7
17	145	1	V&H	2	19.3	19.9	18.9
18	146	1	V&H	2	19.0	19.1	18.0
19	147	2	V&H	2	18.7	18.2	19.1
20	148	2	V&H	2	20.2	20.8	21.6
21	149	0	V&H	4	21.7	23.0	21.2
22	150	0	V&H	4	22.9	23.7	23.0
23	151	0	V&H	4	24.7	24.2	23.4
24	152	0	V&H	4	21.8	22.3	22.3
25	153	0	V&H	4	22.3	22.1	21.7
26	154	1	V&H	4	20.5	21.8	20.9
27	155	1	V&H	4	22.1	23.1	22.6
28	156	1	V&H	4	24.3	24.0	22.9
29	157	1	V&H	4	23.9	23.6	23.4
30	158	1	V&H	4	21.8	23.3	21.5
31	159	2	V&H	4	22.4	21.5	22.1

Beam ID 1	Beam ID2	mmwave#	Ant Pol (V/H)	# of Antenna port	EIRP simulation result (dBm)		
					L-ch	M-ch	H-ch
32	160	2	V&H	4	23.0	23.5	23.4
33	161	2	V&H	4	25.5	25.2	23.7
34	162	2	V&H	4	21.4	22.7	24.0
35	163	2	V&H	4	21.8	22.2	22.1
36	164	0	V&H	4	22.5	23.1	22.0
37	165	0	V&H	4	24.1	24.0	24.0
38	166	0	V&H	4	23.5	23.8	23.8
39	167	0	V&H	4	22.0	22.2	22.0
40	168	1	V&H	4	22.7	22.8	22.0
41	169	1	V&H	4	23.7	24.1	23.8
42	170	1	V&H	4	23.7	23.0	23.1
43	171	1	V&H	4	22.3	22.6	22.2
44	172	2	V&H	4	21.7	22.4	22.8
45	173	2	V&H	4	21.5	22.8	23.3
46	174	2	V&H	4	23.7	23.1	25.0
47	175	2	V&H	4	21.9	23.2	24.2

4. Uncertainty

The amplitude level of PD simulation is biased due to material property parameter configuration in device housing at high frequencies. Material property is difficult to model due to complexity of material and operating frequency. Therefore, it is not possible to assign an exact uncertainty for simulation result. However, for this RF exposure evaluation, simulation results were only used to select highest Beam ID for measurement. Power density results between measurement and simulation showed similar trend to justify selection of Beam ID used for measurement. All final power density evaluations were performed on measurement system with mmWave module design related uncertainty of 2.1dB.