RF EXPOSURE REPORT
(Part 0: SAR and PD Char Evaluation)

No. I221Z60808-SEM12

For

Razer Inc.

Gaming Tablet

Model Name: RZ45-0460VWQ

With

Hardware Version: V4

Software Version: Razer Edge 5G-12-user

FCC ID: RWO-RZ450460

Issued Date: 2022-9-28

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I22Z60808-SEM12	Rev.0	2022-8-15	Initial creation of test report
I22Z60808-SEM12	Rev.1	2022-8-23	Update the information on section 3
I22Z60808-SEM12	Rev.2	2022-8-27	Update the information on section 3
I22Z60808-SEM12	Rev.3	2022-9-28	Update the information on section 3

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL
Address:	No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

1.2 Testing Environment

Temperature:	18°C~25°C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω
Ambient noise & Reflection:	< 0.012 W/kg

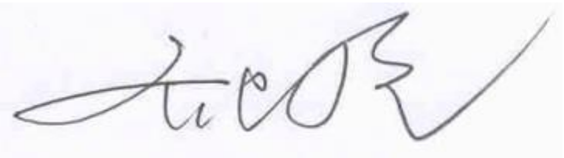
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	June 8, 2022
Testing End Date:	August 14, 2022

1.4 Signature

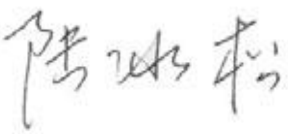
Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2 Introduction

The FCC RF exposure limit is defined based on time-averaged RF exposure. The product implements Qualcomm Smart Transmit feature which controls the instantaneous transmitting power for WWAN transmitter sto ensure the product in compliance with FCC RF exposure limit over a defined time window, for SAR (transmit frequency ≤ 6GHz) and power density (transmit frequency > 6GHz), to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance to the regulation requirement.

This report describes the procedures for the SAR char and PD char generation, and the parameters obtained from SAR and PD characterization (refer to as SAR char and PD char) will be used as input for Smart Transmit. Both SAR char and PD char will be entered via the Embedded File System (EFS) to enable the Smart Transmit Feature.

Terminologies in this Report

Term	Description
P_{limit}	The time-averaged RF power which corresponds to SAR_design_target.
P_{max}	Maximum target power level
SAR_design_target:	The design target for SAR compliance. It should be less than regulatory power density limit to account for all device design related uncertainties.
SAR Char	P_{limit} for all the technologies/bands for all applicable DSI
PD_design_target:	The design target for PD compliance. It should be less than regulatory power density limit to account for all device design related uncertainties.
Input.power.limit	For a PD characterized wireless device, the input power level at antenna port(s) for each beam corresponding to PD_design_targe.
PD Char	The table that contains input.power.limit fed to antenna port(s) for all supported beams.

3 Equipment Under Test (EUT) Overview

Description:	Gaming Tablet	
Model name:	RZ45-0460VWQ	
Operating mode(s):	WCDMA B2/B5 LTE Band2/4/5/12/13/46/48/66 5G NR n2/5/48/66/77/n260/261/257 BT, Wi-Fi(2.4G), Wi-Fi(5G), Wi-Fi(6G)	
Tested Tx Frequency:	824–849 MHz (WCDMA 850 Band V)	
	1850–1910 MHz (WCDMA1900 Band II)	
	850.7 – 1909.3 MHz (LTE Band 2)	
	824.7 – 848.3 MHz (LTE Band 5)	
	699.7 – 715.3 MHz (LTE Band 12)	
	779.5 – 784.5 MHz (LTE Band 13)	
	3550 – 3700 MHz (LTE Band 48)	
	1710.7 –1779.3 MHz (LTE Band 66)	
	2412 – 2462 MHz (WLAN 2.4G)	
	2400 – 2483.5 MHz (Bluetooth)	
	5150 – 5250 MHz	WLAN 5G
	5250 – 5350 MHz	
	5500 – 5720 MHz	
	5745 – 5825 MHz	
	5845 – 5885 MHz	
	5925 – 6425 MHz	WLAN 6E
	6425 – 6525 MHz	
	6525 – 6875 MHz	
	6875 – 7125 MHz	
	1850 – 1910 MHz(n2)	
	824 – 849 MHz(n5)	
	1710 – 1780 MHz (n66)	
	3700 – 3980 MHz (n77H)	
	37000– 40000 MHz (n260)	
	27500– 28350 MHz (n257/261)	
Test device Production information:	Production unit	
Device type:	Portable device	
Antenna type:	Integrated antenna	

4 SAR Characterization

4.1 DSI and SAR Determination

This device uses different Device State Index (DSI) to configure different time averaged power levels based on certain exposure scenarios. Depending on the detection scheme implemented in the smartphone, the worst-case SAR is further grouped and determined for each or combined exposure scenario

DSI and Corresponding Exposure Scenarios

Scenario	Description
DSI 0	Sensor active
DSI 1	Sensor deactive

4.2 SAR Design Target and Uncertainty

SAR_design_target is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer.

To account for total uncertainty, SAR_design_target should be determined as:

$$SAR\_design\_target < SARregulatory\_limit \times 10^{\frac{-total\ uncertainty}{10}}$$

Exposure conditions	DSI	SAR design target W/kg(1g)	Remark
Body	0/1	0.3	For LTE B2/5/12/13/66/n2/5/66
Body	0/1	0.7	For WCDMA B5/2&LTE B4/48/n77

Total uncertainty	DSI	
	0	1
	1	1

4.3 SAR Char Table

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating. P_{limit} is calculated by linearly scaling with the measured SAR at the P_{part0} to correspond to the SAR_design_target. When P_{limit} < P_{max}, P_{part0} was used as P_{limit} in the Smart Transmit EFS. When P_{limit} >P_{max} and P_{part0}=P_{max}, calculated Pmax was used in the Smart Transmit EFS. All reported SAR obtained from the P_{part0} SAR tests was less than SAR_Design_target+ device uncertainty.

<P_{limit} for supported technologies and bands (P_{limit} in EFS file)>

Band	Antenna	Sensor active	Sensor deactive	Pmax*
		DSI0	DSI1	
WCDMA1900	0	15	23	23
WCDMA850	1	18.5	23	23
LTE B2	0	13.5	24	24
LTE B4	0	18.5	24	24
LTE B5	1	15	24	24
LTE B12	1	20	23	23
LTE B13	1	15.5	24	24
LTE B48	2	15.5	24	24
LTE B66	0	14.5	24	24
n2	0	12	24	24
n5	1	15.3	24	24
n66	0	15	24	24
n77**	2	11.9	25.5	25.5

*P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to P_{max} + 1dB uncertainty.

**All P_{limit} power levels entered in the Table correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD & NR TDD).

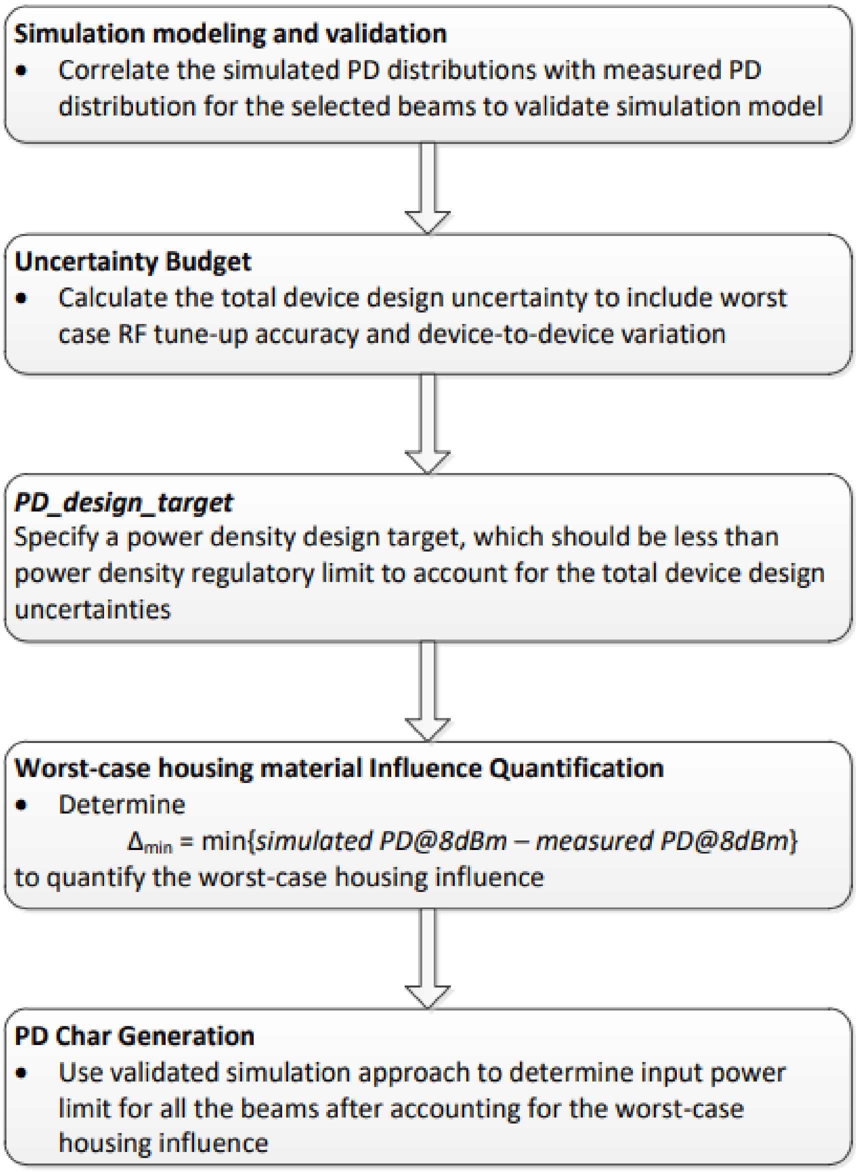
The max allowed output power is the P_{limit} + 1dB device uncertainty, and if P_{limit} is higher than P_{max}, the device output power will be P_{max} instead.

5 Power Density Characterization

The device with 5G mmW NR typically supports many beams and contains multiple mmW antenna arrays installed at different locations to achieve good coverage in the field. The power density (PD) measurement is a time-consuming test, and it is not practical to measure the power density for all the beams on all the surfaces of the device, thus a hybrid approach using electromagnetic (EM) simulation in combination with measurement is recommended for PD char generation.

5.1 PD Char Table

The mmW device supports total N beams, where M out of N are single beams and the rest of (N-M) are beam pairs (where 2 single beams are excited at the same time).
The following figure outlines the PD char process.



5.2 Codebook for all beams

All the beams that the device supports are specified in the pre-defined codebook, The codebook for this device is specified as below.

Band	Beam_ID	Module	Ant_Type	Ant_Feed	Paired_With
261	0	1	PATCH	1	128
261	1	0	PATCH	1	129
261	2	1	PATCH	1	130
261	3	0	PATCH	1	131
261	4	1	PATCH	1	132
261	5	0	PATCH	1	133
261	6	1	PATCH	1	134
261	7	0	PATCH	1	135
261	8	1	PATCH	2	136
261	9	1	PATCH	2	137
261	10	1	PATCH	2	138
261	11	1	PATCH	2	139
261	12	0	PATCH	2	140
261	13	0	PATCH	2	141
261	14	0	PATCH	2	142
261	15	0	PATCH	2	143
261	16	1	PATCH	2	144
261	17	1	PATCH	2	145
261	18	1	PATCH	2	146
261	19	0	PATCH	2	147
261	20	0	PATCH	2	148
261	21	0	PATCH	2	149
261	22	1	PATCH	4	150
261	23	1	PATCH	4	151
261	24	1	PATCH	4	152
261	25	1	PATCH	4	153
261	26	1	PATCH	4	154
261	27	0	PATCH	4	155
261	28	0	PATCH	4	156
261	29	0	PATCH	4	157
261	30	0	PATCH	4	158
261	31	0	PATCH	4	159
261	32	1	PATCH	4	160
261	33	1	PATCH	4	161
261	34	1	PATCH	4	162
261	35	1	PATCH	4	163
261	36	0	PATCH	4	164
261	37	0	PATCH	4	165

261	38	0	PATCH	4	166
261	39	0	PATCH	4	167
261	128	1	PATCH	1	0
261	129	0	PATCH	1	1
261	130	1	PATCH	1	2
261	131	0	PATCH	1	3
261	132	1	PATCH	1	4
261	133	0	PATCH	1	5
261	134	1	PATCH	1	6
261	135	0	PATCH	1	7
261	136	1	PATCH	2	8
261	137	1	PATCH	2	9
261	138	1	PATCH	2	10
261	139	1	PATCH	2	11
261	140	0	PATCH	2	12
261	141	0	PATCH	2	13
261	142	0	PATCH	2	14
261	143	0	PATCH	2	15
261	144	1	PATCH	2	16
261	145	1	PATCH	2	17
261	146	1	PATCH	2	18
261	147	0	PATCH	2	19
261	148	0	PATCH	2	20
261	149	0	PATCH	2	21
261	150	1	PATCH	4	22
261	151	1	PATCH	4	23
261	152	1	PATCH	4	24
261	153	1	PATCH	4	25
261	154	1	PATCH	4	26
261	155	0	PATCH	4	27
261	156	0	PATCH	4	28
261	157	0	PATCH	4	29
261	158	0	PATCH	4	30
261	159	0	PATCH	4	31
261	160	1	PATCH	4	32
261	161	1	PATCH	4	33
261	162	1	PATCH	4	34
261	163	1	PATCH	4	35
261	164	0	PATCH	4	36
261	165	0	PATCH	4	37
261	166	0	PATCH	4	38
261	167	0	PATCH	4	39

Band	Beam_ID	Module	Ant_Type	Ant_Feed	Paired_With
260	0	1	PATCH	1	128
260	1	0	PATCH	1	129
260	2	1	PATCH	1	130
260	3	0	PATCH	1	131
260	4	1	PATCH	1	132
260	5	0	PATCH	1	133
260	6	1	PATCH	1	134
260	7	0	PATCH	1	135
260	8	1	PATCH	2	136
260	9	1	PATCH	2	137
260	10	1	PATCH	2	138
260	11	1	PATCH	2	139
260	12	0	PATCH	2	140
260	13	0	PATCH	2	141
260	14	0	PATCH	2	142
260	15	0	PATCH	2	143
260	16	1	PATCH	2	144
260	17	1	PATCH	2	145
260	18	1	PATCH	2	146
260	19	0	PATCH	2	147
260	20	0	PATCH	2	148
260	21	0	PATCH	2	149
260	22	1	PATCH	4	150
260	23	1	PATCH	4	151
260	24	1	PATCH	4	152
260	25	1	PATCH	4	153
260	26	1	PATCH	4	154
260	27	0	PATCH	4	155
260	28	0	PATCH	4	156
260	29	0	PATCH	4	157
260	30	0	PATCH	4	158
260	31	0	PATCH	4	159
260	32	1	PATCH	4	160
260	33	1	PATCH	4	161
260	34	1	PATCH	4	162
260	35	1	PATCH	4	163
260	36	0	PATCH	4	164
260	37	0	PATCH	4	165
260	38	0	PATCH	4	166
260	39	0	PATCH	4	167

260	128	1	PATCH	1	0
260	129	0	PATCH	1	1
260	130	1	PATCH	1	2
260	131	0	PATCH	1	3
260	132	1	PATCH	1	4
260	133	0	PATCH	1	5
260	134	1	PATCH	1	6
260	135	0	PATCH	1	7
260	136	1	PATCH	2	8
260	137	1	PATCH	2	9
260	138	1	PATCH	2	10
260	139	1	PATCH	2	11
260	140	0	PATCH	2	12
260	141	0	PATCH	2	13
260	142	0	PATCH	2	14
260	143	0	PATCH	2	15
260	144	1	PATCH	2	16
260	145	1	PATCH	2	17
260	146	1	PATCH	2	18
260	147	0	PATCH	2	19
260	148	0	PATCH	2	20
260	149	0	PATCH	2	21
260	150	1	PATCH	4	22
260	151	1	PATCH	4	23
260	152	1	PATCH	4	24
260	153	1	PATCH	4	25
260	154	1	PATCH	4	26
260	155	0	PATCH	4	27
260	156	0	PATCH	4	28
260	157	0	PATCH	4	29
260	158	0	PATCH	4	30
260	159	0	PATCH	4	31
260	160	1	PATCH	4	32
260	161	1	PATCH	4	33
260	162	1	PATCH	4	34
260	163	1	PATCH	4	35
260	164	0	PATCH	4	36
260	165	0	PATCH	4	37
260	166	0	PATCH	4	38
260	167	0	PATCH	4	39

5.3 PD design target determination

To account for total uncertainty, PD_design_target should meet the criteria:

$$PD\_design\_target < PD_{regulatory\_limit} \times 10^{\frac{-totaluncertainty}{10}}$$

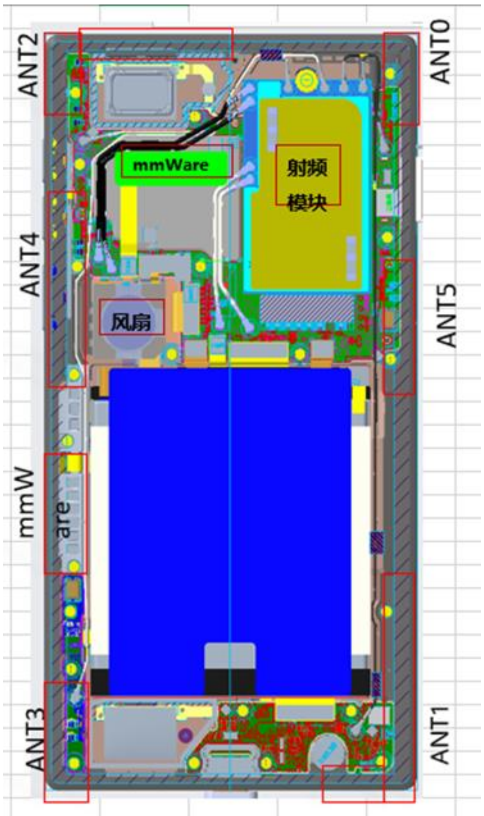
For this EUT, the PD design target and the uncertainty value are listed below

N260	PD_desigh_target	Antenna Module	W/m^2
		0/1	4.6

N261	PD_desigh_target	Antenna Module	W/m^2
		0/1	4.6

Item	Uncertainty db (k=2)
Total Uncertainty	2.1

5.4 Exposure positions for PD evaluation



Evaluation surfaces

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

Note:

1. Referring to the PD simulation report for the reason of selecting surfaces/edges.
2. The exposure positions selection is based on the all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge.

5.5 Simulation and modeling validation

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

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

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

Band	Beam ID		Antenna		Selected Surface	4cm² psPD(W/m²)		Delta=Sim-Meas(dB)
			Moudule	Type		Meas. PD	Sim. PD	
n260	39		QTM0	PATCH	Back	8.89	15.79	2.49
n260	27		QTM0	PATCH	Top	0.311	1.66	7.27
n260		159	QTM0	PATCH	Back	6.92	14.54	3.22
n260		158	QTM0	PATCH	Top	0.958	1.41	1.68
n260	23		QTM1	PATCH	Right	6.73	14.82	3.43
n260	23		QTM1	PATCH	Back	2.44	5.94	3.86
n260		151	QTM1	PATCH	Right	7.11	14	2.94
n260		154	QTM1	PATCH	Back	2.0	5.79	4.62

Band	Beam ID		Antenna		Selected Surface	4cm² psPD(W/m²)		Delta=Sim-Meas(dB)
			Moudule	Type		Meas. PD	Sim. PD	
n261	37		QTM0	PATCH	Back	7.37	17.58	3.78
n261	37		QTM0	PATCH	Top	1.29	2.37	2.64
n261		165	QTM0	PATCH	Back	7.11	16.74	3.72
n261		158	QTM0	PATCH	Top	0.959	2.12	3.45
n261	33		QTM1	PATCH	Right	6.27	10.45	2.22
n261	24		QTM1	PATCH	Back	1.55	5.36	5.39
n261		152	QTM1	PATCH	Right	6.38	9.96	1.93
n261		153	QTM1	PATCH	Back	1.29	5.26	6.10

5.6 Worst-case housing Influence Determination:△min

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

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

1. Based on PD simulation, for each module and antenna type, determine one or more worst-surface(s) that has highest 4cm^2 PD for all the single beams per antenna module and per antenna type in the mid channel of each band.
2. For identified worst surface(s) per antenna module and per antenna type group,
    a. First determine △min based on identified worst surface(s), and derive input.power.linit
    b. Then prove all other near-by surface(s), i.e., non-selected surface(s), is not required for housing material loss quantification (in other words, these non-evaluated surfaces have no influence on the determined input.power.limit) bu:
        i. re-scale all simulated 4cm^{2}PD values to *input.power.limit* to identify the worst-PD beam per each non-evaluated surface
        ii. Measure 4cm^{2}PD at *input.power.limit* on identified worst-PD beam per each non-evaluated surface
        iii. Demonstrate all measured 4cm^{2}PD values are below *PD_design_target*
3. If any of the above surface(s) in Step (2.b.iii) have measured 4cm^2 PD ≥ PD_design_target, then those surfaces must e included in the △min determination in Setp (2.a), and re-evaluate input.power.limit with these added surfaces.

Therefore, when comparing a simulated 4cm2 averaged PD and measured 4cm2 averaged PD for the above identified surfaces, the worst errors introduced when using the estimated material property in the simulation per module and per antenna type (worst out of both polarizations) is highlighted in bolded numbers in section4.5. thus, the worst-case housing influence, denoted as △min (= minimum of (sim.PD –MEAS.pd) for the same antenna type of each module), is determined as:

Band	Antenna Module	Delta Min	TxAGC uncertainty (dB)	Adjusted Delta Min
n261	0	2.64	0.5	2.14
		3.45	0.5	2.95
	1	2.22	0.5	1.72
		1.93	0.5	1.43
n260	0	2.49	0.50	1.99
		1.68	0.50	1.18
	1	3.43	0.50	2.93
		2.94	0.50	2.44

△min represents the worst case where RF exposure is underestimated the most by simulation upon using the estimated material property for glass/plastics of the housing. For conservative assessment, the △min is used as the worst case correction and applied to each corresponding beam group to determine power limits in PD char for compliance. To ensure that condition described in Step (2.b.iii) is met, apply the correct input.power.limit to derive the PD simulated results for all beams, and select the worst beams (yellow highlighted in the PD table) for each of non-selected applicable surface(s).

The PD test results for non-selected surfaces are less the PD_design_target, and meets condition in step (2.b.iii), thus performing step (3) is not needed.

Simulated 4cm^2 averaged PD at input.power.limit

Determine the worst beam for each of non-selected surface(s)

Band	Beam ID	Polarization	Antenna		Front	Back	Left	Right	Top	Bottom
			Moudule	Type						
n261	1	AG0	QTM0	PATCH	0.059	4.600	0.070	0.363	0.293	0.023
n261	3	AG0	QTM0	PATCH	0.062	4.342	0.044	0.205	0.338	0.027
n261	5	AG0	QTM0	PATCH	0.053	4.361	0.097	0.088	0.274	0.027
n261	7	AG0	QTM0	PATCH	0.066	4.347	0.110	0.154	0.231	0.022
n261	12	AG0	QTM0	PATCH	0.114	4.575	0.064	0.406	0.550	0.020
n261	13	AG0	QTM0	PATCH	0.082	4.458	0.046	0.146	0.407	0.032
n261	14	AG0	QTM0	PATCH	0.086	4.370	0.029	0.038	0.450	0.038
n261	15	AG0	QTM0	PATCH	0.057	4.272	0.099	0.260	0.297	0.016
n261	19	AG0	QTM0	PATCH	0.108	4.600	0.049	0.337	0.528	0.024
n261	20	AG0	QTM0	PATCH	0.097	4.362	0.087	0.053	0.437	0.024
n261	21	AG0	QTM0	PATCH	0.047	4.481	0.071	0.451	0.190	0.036
n261	27	AG0	QTM0	PATCH	0.097	4.310	0.193	0.587	0.657	0.015
n261	28	AG0	QTM0	PATCH	0.123	4.600	0.126	0.187	0.620	0.024
n261	29	AG0	QTM0	PATCH	0.119	4.543	0.044	0.091	0.518	0.039
n261	30	AG0	QTM0	PATCH	0.084	4.374	0.053	0.213	0.467	0.060
n261	31	AG0	QTM0	PATCH	0.081	4.432	0.165	0.374	0.398	0.017
n261	36	AG0	QTM0	PATCH	0.111	4.451	0.143	0.360	0.597	0.018
n261	37	AG0	QTM0	PATCH	0.138	4.590	0.110	0.136	0.619	0.034
n261	38	AG0	QTM0	PATCH	0.109	4.541	0.035	0.083	0.506	0.064
n261	39	AG0	QTM0	PATCH	0.072	4.426	0.078	0.292	0.389	0.035
n261	129	AG1	QTM0	PATCH	0.051	4.600	0.081	0.397	0.244	0.020
n261	131	AG1	QTM0	PATCH	0.064	4.399	0.055	0.210	0.301	0.018
n261	133	AG1	QTM0	PATCH	0.071	4.346	0.092	0.132	0.295	0.020
n261	135	AG1	QTM0	PATCH	0.042	4.321	0.139	0.139	0.209	0.028
n261	140	AG1	QTM0	PATCH	0.052	4.388	0.119	0.419	0.269	0.021
n261	141	AG1	QTM0	PATCH	0.083	4.296	0.072	0.191	0.392	0.015
n261	142	AG1	QTM0	PATCH	0.099	4.472	0.085	0.099	0.368	0.033
n261	143	AG1	QTM0	PATCH	0.079	4.549	0.124	0.566	0.317	0.011
n261	147	AG1	QTM0	PATCH	0.077	4.257	0.089	0.221	0.354	0.017
n261	148	AG1	QTM0	PATCH	0.084	4.577	0.014	0.122	0.454	0.023
n261	149	AG1	QTM0	PATCH	0.098	4.600	0.087	0.506	0.376	0.016
n261	155	AG1	QTM0	PATCH	0.084	4.317	0.232	0.567	0.269	0.028
n261	156	AG1	QTM0	PATCH	0.075	4.334	0.127	0.361	0.445	0.014
n261	157	AG1	QTM0	PATCH	0.115	4.480	0.035	0.112	0.513	0.046
n261	158	AG1	QTM0	PATCH	0.141	4.512	0.039	0.218	0.586	0.039
n261	159	AG1	QTM0	PATCH	0.088	4.429	0.244	0.511	0.496	0.022
n261	164	AG1	QTM0	PATCH	0.079	4.166	0.173	0.517	0.373	0.015
n261	165	AG1	QTM0	PATCH	0.093	4.472	0.118	0.182	0.529	0.024
n261	166	AG1	QTM0	PATCH	0.147	4.574	0.035	0.158	0.537	0.056
n261	167	AG1	QTM0	PATCH	0.104	4.475	0.141	0.376	0.590	0.034

Band	Beam ID	Polarization	Antenna		Front	Back	Left	Right	Top	Bottom
			Moudule	Type						
n261	0		QTM1	PATCH	1.150	1.775	0.000	4.237	0.020	0.061
n261	2		QTM1	PATCH	1.096	1.868	0.015	4.446	0.015	0.046
n261	4		QTM1	PATCH	1.353	1.879	0.000	4.420	0.015	0.030
n261	6		QTM1	PATCH	1.621	1.923	0.019	4.411	0.019	0.057
n261	8		QTM1	PATCH	1.662	1.956	0.009	4.416	0.037	0.064
n261	9		QTM1	PATCH	1.123	2.262	0.008	4.365	0.015	0.030
n261	10		QTM1	PATCH	1.272	1.948	0.000	4.519	0.009	0.009
n261	11		QTM1	PATCH	1.136	1.894	0.009	4.369	0.037	0.083
n261	16		QTM1	PATCH	1.233	1.774	0.019	4.268	0.028	0.076
n261	17		QTM1	PATCH	1.200	1.976	0.007	4.279	0.007	0.030
n261	18		QTM1	PATCH	1.241	2.034	0.009	4.563	0.028	0.056
n261	22		QTM1	PATCH	1.890	1.821	0.019	4.500	0.094	0.125
n261	23		QTM1	PATCH	1.254	2.377	0.014	4.530	0.009	0.033
n261	24		QTM1	PATCH	1.022	2.350	0.009	4.574	0.004	0.004
n261	25		QTM1	PATCH	1.565	1.609	0.004	4.279	0.009	0.031
n261	26		QTM1	PATCH	2.266	1.773	0.012	4.440	0.055	0.099
n261	32		QTM1	PATCH	1.790	2.335	0.023	4.600	0.053	0.094
n261	33		QTM1	PATCH	1.068	2.322	0.009	4.535	0.004	0.013
n261	34		QTM1	PATCH	1.175	2.124	0.005	4.428	0.005	0.005
n261	35		QTM1	PATCH	2.015	1.431	0.005	4.232	0.010	0.086
n261	128		QTM1	PATCH	1.283	2.267	0.017	4.600	0.017	0.017
n261	130		QTM1	PATCH	1.484	1.706	0.000	4.288	0.000	0.030
n261	132		QTM1	PATCH	0.965	1.843	0.000	4.600	0.017	0.069
n261	134		QTM1	PATCH	1.040	1.734	0.000	4.600	0.000	0.046
n261	136		QTM1	PATCH	1.043	1.742	0.000	4.558	0.021	0.083
n261	137		QTM1	PATCH	1.201	1.961	0.008	4.363	0.008	0.016
n261	138		QTM1	PATCH	1.160	2.383	0.008	4.482	0.016	0.024
n261	139		QTM1	PATCH	1.479	1.684	0.016	4.321	0.025	0.049
n261	144		QTM1	PATCH	1.730	1.774	0.009	4.435	0.017	0.035
n261	145		QTM1	PATCH	1.077	2.447	0.008	4.543	0.008	0.008
n261	146		QTM1	PATCH	0.863	1.555	0.009	4.477	0.019	0.104
n261	150		QTM1	PATCH	2.080	1.738	0.006	4.503	0.026	0.065
n261	151		QTM1	PATCH	1.294	1.978	0.005	4.399	0.005	0.014
n261	152		QTM1	PATCH	0.966	2.256	0.004	4.414	0.004	0.004
n261	153		QTM1	PATCH	1.186	2.456	0.014	4.497	0.014	0.065
n261	154		QTM1	PATCH	1.468	1.712	0.018	4.439	0.042	0.113
n261	160		QTM1	PATCH	1.911	1.702	0.006	4.356	0.017	0.046
n261	161		QTM1	PATCH	1.127	2.164	0.005	4.438	0.005	0.010
n261	162		QTM1	PATCH	1.008	2.389	0.014	4.505	0.014	0.009
n261	163		QTM1	PATCH	1.210	2.292	0.020	4.380	0.010	0.097

Band	Beam ID	Polarization	Antenna		Front	Back	Left	Right	Top	Bottom
			Moudule	Type						
n260	1	AG0	QTM0	PATCH	0.038	4.600	0.089	0.369	0.330	0.000
n260	3	AG0	QTM0	PATCH	0.049	4.600	0.088	0.226	0.236	0.010
n260	5	AG0	QTM0	PATCH	0.058	4.600	0.087	0.164	0.250	0.019
n260	7	AG0	QTM0	PATCH	0.052	4.600	0.091	0.170	0.222	0.013
n260	12	AG0	QTM0	PATCH	0.061	4.600	0.080	0.141	0.329	0.009
n260	13	AG0	QTM0	PATCH	0.080	4.600	0.192	0.126	0.351	0.027
n260	14	AG0	QTM0	PATCH	0.048	4.600	0.077	0.192	0.221	0.010
n260	15	AG0	QTM0	PATCH	0.079	4.600	0.074	0.184	0.347	0.011
n260	19	AG0	QTM0	PATCH	0.049	4.600	0.097	0.205	0.373	0.005
n260	20	AG0	QTM0	PATCH	0.055	4.600	0.136	0.566	0.266	0.014
n260	21	AG0	QTM0	PATCH	0.061	4.600	0.044	0.415	0.343	0.011
n260	27	AG0	QTM0	PATCH	0.101	4.600	0.128	0.297	0.508	0.006
n260	28	AG0	QTM0	PATCH	0.096	4.600	0.138	0.110	0.516	0.014
n260	29	AG0	QTM0	PATCH	0.079	4.592	0.225	0.572	0.284	0.025
n260	30	AG0	QTM0	PATCH	0.070	4.600	0.050	0.447	0.303	0.020
n260	31	AG0	QTM0	PATCH	0.082	4.600	0.134	0.329	0.430	0.003
n260	36	AG0	QTM0	PATCH	0.108	4.600	0.114	0.199	0.516	0.009
n260	37	AG0	QTM0	PATCH	0.077	4.600	0.151	0.295	0.413	0.015
n260	38	AG0	QTM0	PATCH	0.069	4.600	0.199	0.520	0.348	0.027
n260	39	AG0	QTM0	PATCH	0.087	4.600	0.079	0.428	0.452	0.009
n260	129	AG1	QTM0	PATCH	0.068	4.600	0.080	0.274	0.274	0.023
n260	131	AG1	QTM0	PATCH	0.054	4.600	0.097	0.259	0.216	0.011
n260	133	AG1	QTM0	PATCH	0.045	4.600	0.101	0.158	0.203	0.011
n260	135	AG1	QTM0	PATCH	0.030	4.600	0.106	0.182	0.167	0.015
n260	140	AG1	QTM0	PATCH	0.084	4.600	0.063	0.243	0.322	0.011
n260	141	AG1	QTM0	PATCH	0.048	4.600	0.091	0.218	0.236	0.006
n260	142	AG1	QTM0	PATCH	0.097	4.600	0.073	0.481	0.408	0.018
n260	143	AG1	QTM0	PATCH	0.072	4.600	0.067	0.222	0.284	0.015
n260	147	AG1	QTM0	PATCH	0.063	4.600	0.125	0.233	0.222	0.017
n260	148	AG1	QTM0	PATCH	0.074	4.600	0.161	0.443	0.355	0.027
n260	149	AG1	QTM0	PATCH	0.082	4.600	0.104	0.229	0.328	0.016
n260	155	AG1	QTM0	PATCH	0.079	4.600	0.092	0.445	0.314	0.007
n260	156	AG1	QTM0	PATCH	0.072	4.600	0.145	0.197	0.345	0.014
n260	157	AG1	QTM0	PATCH	0.074	4.600	0.291	0.601	0.379	0.018
n260	158	AG1	QTM0	PATCH	0.125	4.600	0.064	0.360	0.535	0.034
n260	159	AG1	QTM0	PATCH	0.101	4.600	0.073	0.345	0.376	0.006
n260	164	AG1	QTM0	PATCH	0.071	4.600	0.091	0.377	0.338	0.006
n260	165	AG1	QTM0	PATCH	0.063	4.600	0.214	0.368	0.336	0.020
n260	166	AG1	QTM0	PATCH	0.092	4.600	0.267	0.513	0.439	0.035
n260	167	AG1	QTM0	PATCH	0.120	4.600	0.050	0.392	0.469	0.017

Band	Beam ID	Polarization	Antenna		Front	Back	Left	Right	Top	Bottom
			Moudule	Type						
n260	0		QTM1	PATCH	1.759	2.033	0.013	4.600	0.013	0.026
n260	2		QTM1	PATCH	1.212	2.322	0.011	4.578	0.022	0.022
n260	4		QTM1	PATCH	1.569	1.307	0.010	4.300	0.010	0.019
n260	6		QTM1	PATCH	1.946	1.225	0.014	4.600	0.027	0.014
n260	8		QTM1	PATCH	1.528	1.612	0.011	4.600	0.011	0.028
n260	9		QTM1	PATCH	1.358	1.828	0.005	4.600	0.015	0.030
n260	10		QTM1	PATCH	1.333	1.821	0.005	4.041	0.015	0.026
n260	11		QTM1	PATCH	1.452	2.067	0.012	4.582	0.018	0.018
n260	16		QTM1	PATCH	1.445	1.848	0.016	4.600	0.021	0.021
n260	17		QTM1	PATCH	1.421	1.868	0.005	4.543	0.010	0.036
n260	18		QTM1	PATCH	1.568	2.204	0.012	4.477	0.025	0.012
n260	22		QTM1	PATCH	1.664	1.922	0.014	4.600	0.017	0.028
n260	23		QTM1	PATCH	1.462	1.844	0.009	4.600	0.012	0.025
n260	24		QTM1	PATCH	1.572	1.795	0.010	4.600	0.019	0.032
n260	25		QTM1	PATCH	1.581	1.739	0.010	3.939	0.048	0.021
n260	26		QTM1	PATCH	1.648	1.829	0.014	4.446	0.017	0.027
n260	32		QTM1	PATCH	1.622	1.732	0.013	4.600	0.013	0.032
n260	33		QTM1	PATCH	1.576	1.930	0.007	4.600	0.020	0.040
n260	34		QTM1	PATCH	1.807	1.487	0.006	4.299	0.013	0.029
n260	35		QTM1	PATCH	1.515	2.009	0.017	4.316	0.024	0.021
n260	128		QTM1	PATCH	1.537	1.713	0.012	4.600	0.012	0.023
n260	130		QTM1	PATCH	1.654	1.216	0.011	4.600	0.011	0.066
n260	132		QTM1	PATCH	1.420	2.174	0.013	4.600	0.013	0.038
n260	134		QTM1	PATCH	1.378	2.494	0.000	4.600	0.015	0.015
n260	136		QTM1	PATCH	1.559	2.166	0.007	4.517	0.007	0.034
n260	137		QTM1	PATCH	1.602	1.377	0.006	4.600	0.013	0.075
n260	138		QTM1	PATCH	1.590	1.773	0.006	4.600	0.012	0.061
n260	139		QTM1	PATCH	1.656	1.396	0.006	4.600	0.011	0.057
n260	144		QTM1	PATCH	1.529	1.712	0.006	4.600	0.012	0.065
n260	145		QTM1	PATCH	1.218	2.343	0.007	4.600	0.022	0.014
n260	146		QTM1	PATCH	1.574	1.586	0.006	4.600	0.012	0.029
n260	150		QTM1	PATCH	1.672	2.011	0.011	4.600	0.008	0.101
n260	151		QTM1	PATCH	1.636	1.722	0.007	4.600	0.007	0.043
n260	152		QTM1	PATCH	1.286	1.914	0.019	4.592	0.023	0.042
n260	153		QTM1	PATCH	1.519	2.015	0.008	4.401	0.023	0.031
n260	154		QTM1	PATCH	1.631	2.201	0.008	4.585	0.011	0.046
n260	160		QTM1	PATCH	1.769	1.786	0.007	4.600	0.007	0.091
n260	161		QTM1	PATCH	1.303	1.902	0.010	4.600	0.020	0.017
n260	162		QTM1	PATCH	1.424	1.924	0.012	4.365	0.023	0.035
n260	163		QTM1	PATCH	1.566	1.999	0.012	4.424	0.023	0.035

4cm2 average PD for the selected beams on non-selected surfaces for △min determination

Band	Beam ID		Antenna		Selected Surface	Input power limit	Measured results
			Moudule	Type			4cm^2 psPD (W/m^2)
n261		166	QTM0	PATCH	Front	3.62	0.282
		159			Left	4.57	0.258
	27				Right	3.84	1.97
	38				Bottom	2.40	0.224
	26		QTM1	PATCH	Front	5.61	2.77
	32				Left	5.40	0.07
	22				Top	5.68	0.041
	22				Bottom	5.68	0.05

Band	Beam ID		Antenna		Selected Surface	Input power limit	Measured results
			Moudule	Type			4cm^2 psPD (W/m^2)
n260		158	QTM0	PATCH	Front	2.97	0.062
		157			Left	3.83	0.106
		157			Right	3.83	0.355
		166			Bottom	3.60	0.032
	6		QTM1	PATCH	Front	10.27	3.44
		152			Left	4.22	0.049
	25				Top	4.27	0.097
		150			Bottom	4.19	0.241

5.7 PD Char

5.7.1 Scaling Factor for Single Beams

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

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

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

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

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

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

5.7.2 Scaling Factor for Beams Pairs

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

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

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

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

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

5.7.3 Input.Power.Limit calculations

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

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

- For n260 and n261

$$input.power.limit(i) = 6\ dBm + 10 * \log(s(i)) + \Delta_{min},\ i \in all\ beams \qquad (5)$$

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

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

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

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

Thus, Equation 5 is modified to:

If -TxAGC uncertainty < Δ_{min} < TxAGC uncertainty,

$$input.power.limit(i) = 6\,dBm + 10 * \log(s(i)),\ i \in all\ beams, \text{ for n260 and n261} \quad (6)$$

else if Δ_{min} < -TxAGC uncertainty,

$$input.power.limit(i) = 6\,dBm + 10 * \log(s(i)) + (\Delta_{min} + \text{TxAGC uncertainty}),$$
$$i \in all\ beams, \text{ for n260 and n261} \quad (7)$$

else if Δ_{min} > TxAGC uncertainty,

$$input.power.limit(i) = 6\,dBm + 10 * \log(s(i)) + (\Delta_{min} - \text{TxAGC uncertainty}),$$
$$i \in all\ beams, \text{ for n260 and n261} \quad (8)$$

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

Band	Antenna Module	Delta Min	TxAGC uncertainty (dB)	Input power limit(db)
n261	0	2.64	0.5	Input power limit(i)-6dbm+10*log(s(i))+2.14
		3.45	0.5	Input power limit(i)-6dbm+10*log(s(i))+2.95
	1	2.22	0.5	Input power limit(i)-6dbm+10*log(s(i))+1.72
		1.93	0.5	Input power limit(i)-6dbm+10*log(s(i))+1.43
n260	0	2.49	0.50	Input power limit(i)-6dbm+10*log(s(i))+1.99
		1.68	0.50	Input power limit(i)-6dbm+10*log(s(i))+1.18
	1	3.43	0.50	Input power limit(i)-6dbm+10*log(s(i))+2.93
		2.94	0.50	Input power limit(i)-6dbm+10*log(s(i))+2.44

5G NR n260 Antenna 0 input.power.limit

Band	Beam ID		Antenna		Input Power Limit
			Moudule	Type	6+10log(S(i))+Delta min
n260	1		QTM0	PATCH	9.04
n260	3		QTM0	PATCH	7.92
n260	5		QTM0	PATCH	7.83
n260	7		QTM0	PATCH	9.16
n260	12		QTM0	PATCH	4.71
n260	13		QTM0	PATCH	6.21
n260	14		QTM0	PATCH	4.81
n260	15		QTM0	PATCH	5.20
n260	19		QTM0	PATCH	5.32
n260	20		QTM0	PATCH	6.34
n260	21		QTM0	PATCH	5.43
n260	27		QTM0	PATCH	2.85
n260	28		QTM0	PATCH	3.36
n260	29		QTM0	PATCH	4.20
n260	30		QTM0	PATCH	3.22
n260	31		QTM0	PATCH	2.84
n260	36		QTM0	PATCH	3.00
n260	37		QTM0	PATCH	3.66
n260	38		QTM0	PATCH	3.82
n260	39		QTM0	PATCH	2.64
n260		129	QTM0	PATCH	7.75
n260		131	QTM0	PATCH	7.51
n260		133	QTM0	PATCH	7.70
n260		135	QTM0	PATCH	8.99
n260		140	QTM0	PATCH	4.40
n260		141	QTM0	PATCH	5.00
n260		142	QTM0	PATCH	5.03
n260		143	QTM0	PATCH	4.30
n260		147	QTM0	PATCH	4.73
n260		148	QTM0	PATCH	5.44
n260		149	QTM0	PATCH	4.55
n260		155	QTM0	PATCH	2.33
n260		156	QTM0	PATCH	2.56
n260		157	QTM0	PATCH	3.83
n260		158	QTM0	PATCH	2.97
n260		159	QTM0	PATCH	2.18
n260		164	QTM0	PATCH	2.30
n260		165	QTM0	PATCH	3.15
n260		166	QTM0	PATCH	3.60
n260		167	QTM0	PATCH	2.40
n260	129	1	QTM0	PATCH	4.76
n260	131	3	QTM0	PATCH	4.00
n260	133	5	QTM0	PATCH	4.01
n260	135	7	QTM0	PATCH	5.42
n260	140	12	QTM0	PATCH	1.10
n260	141	13	QTM0	PATCH	2.23
n260	142	14	QTM0	PATCH	1.45
n260	143	15	QTM0	PATCH	1.33
n260	147	19	QTM0	PATCH	1.29
n260	148	20	QTM0	PATCH	2.21
n260	149	21	QTM0	PATCH	1.42
n260	155	27	QTM0	PATCH	-1.25
n260	156	28	QTM0	PATCH	-0.91
n260	157	29	QTM0	PATCH	-0.29
n260	158	30	QTM0	PATCH	-0.66
n260	159	31	QTM0	PATCH	-1.38
n260	164	36	QTM0	PATCH	-1.16
n260	165	37	QTM0	PATCH	-0.53
n260	166	38	QTM0	PATCH	-0.06
n260	167	39	QTM0	PATCH	-1.28

5G NR n260 Antenna 1 input.power.limit

Band	Beam ID		Antenna		Input Power Limit
			Moudule	Type	6+10log(S(i))+Delta min
n260	0		QTM1	PATCH	10.08
n260	2		QTM1	PATCH	9.43
n260	4		QTM1	PATCH	8.79
n260	6		QTM1	PATCH	10.27
n260	8		QTM1	PATCH	6.44
n260	9		QTM1	PATCH	5.96
n260	10		QTM1	PATCH	6.03
n260	11		QTM1	PATCH	6.69
n260	16		QTM1	PATCH	6.18
n260	17		QTM1	PATCH	6.09
n260	18		QTM1	PATCH	6.83
n260	22		QTM1	PATCH	4.35
n260	23		QTM1	PATCH	3.85
n260	24		QTM1	PATCH	3.96
n260	25		QTM1	PATCH	4.27
n260	26		QTM1	PATCH	4.28
n260	32		QTM1	PATCH	4.04
n260	33		QTM1	PATCH	4.20
n260	34		QTM1	PATCH	3.94
n260	35		QTM1	PATCH	4.32
n260		128	QTM1	PATCH	9.14
n260		130	QTM1	PATCH	8.84
n260		132	QTM1	PATCH	9.44
n260		134	QTM1	PATCH	10.34
n260		136	QTM1	PATCH	6.83
n260		137	QTM1	PATCH	6.41
n260		138	QTM1	PATCH	6.29
n260		139	QTM1	PATCH	5.96
n260		144	QTM1	PATCH	6.14
n260		145	QTM1	PATCH	7.02
n260		146	QTM1	PATCH	6.10
n260		150	QTM1	PATCH	4.19
n260		151	QTM1	PATCH	3.61
n260		152	QTM1	PATCH	4.22
n260		153	QTM1	PATCH	4.36
n260		154	QTM1	PATCH	4.24
n260		160	QTM1	PATCH	3.88
n260		161	QTM1	PATCH	3.76
n260		162	QTM1	PATCH	4.37
n260		163	QTM1	PATCH	4.36
n260	128	0	QTM1	PATCH	6.00
n260	130	2	QTM1	PATCH	5.42
n260	132	4	QTM1	PATCH	5.29
n260	134	6	QTM1	PATCH	6.74
n260	136	8	QTM1	PATCH	2.86
n260	137	9	QTM1	PATCH	2.91
n260	138	10	QTM1	PATCH	2.44
n260	139	11	QTM1	PATCH	2.96
n260	144	16	QTM1	PATCH	2.60
n260	145	17	QTM1	PATCH	2.56
n260	146	18	QTM1	PATCH	3.02
n260	150	22	QTM1	PATCH	0.34
n260	151	23	QTM1	PATCH	0.28
n260	152	24	QTM1	PATCH	0.32
n260	153	25	QTM1	PATCH	0.85
n260	154	26	QTM1	PATCH	0.64
n260	160	32	QTM1	PATCH	0.23
n260	161	33	QTM1	PATCH	0.36
n260	162	34	QTM1	PATCH	0.35
n260	163	35	QTM1	PATCH	0.71

5G NR n261 Antenna 0 input.power.limit

Band	Beam ID		Antenna		Input Power Limit
			Moudule	Type	6+10log(S(i))+Delta min
n261	1		QTM0	PATCH	8.83
n261	3		QTM0	PATCH	7.63
n261	5		QTM0	PATCH	7.61
n261	7		QTM0	PATCH	8.55
n261	12		QTM0	PATCH	5.09
n261	13		QTM0	PATCH	4.74
n261	14		QTM0	PATCH	4.95
n261	15		QTM0	PATCH	5.30
n261	19		QTM0	PATCH	5.03
n261	20		QTM0	PATCH	5.01
n261	21		QTM0	PATCH	5.88
n261	27		QTM0	PATCH	3.84
n261	28		QTM0	PATCH	2.41
n261	29		QTM0	PATCH	2.27
n261	30		QTM0	PATCH	2.33
n261	31		QTM0	PATCH	3.42
n261	36		QTM0	PATCH	2.81
n261	37		QTM0	PATCH	2.31
n261	38		QTM0	PATCH	2.40
n261	39		QTM0	PATCH	2.43
n261		129	QTM0	PATCH	9.02
n261		131	QTM0	PATCH	8.55
n261		133	QTM0	PATCH	9.02
n261		135	QTM0	PATCH	10.39
n261		140	QTM0	PATCH	6.08
n261		141	QTM0	PATCH	6.07
n261		142	QTM0	PATCH	5.69
n261		143	QTM0	PATCH	6.47
n261		147	QTM0	PATCH	6.38
n261		148	QTM0	PATCH	5.65
n261		149	QTM0	PATCH	6.30
n261		155	QTM0	PATCH	5.62
n261		156	QTM0	PATCH	3.55
n261		157	QTM0	PATCH	3.30
n261		158	QTM0	PATCH	3.36
n261		159	QTM0	PATCH	4.57
n261		164	QTM0	PATCH	4.71
n261		165	QTM0	PATCH	3.21
n261		166	QTM0	PATCH	3.62
n261		167	QTM0	PATCH	3.80
n261	129	1	QTM0	PATCH	5.18
n261	131	3	QTM0	PATCH	4.30
n261	133	5	QTM0	PATCH	4.53
n261	135	7	QTM0	PATCH	5.74
n261	140	12	QTM0	PATCH	1.54
n261	141	13	QTM0	PATCH	1.77
n261	142	14	QTM0	PATCH	1.89
n261	143	15	QTM0	PATCH	2.33
n261	147	19	QTM0	PATCH	2.03
n261	148	20	QTM0	PATCH	2.13
n261	149	21	QTM0	PATCH	2.35
n261	155	27	QTM0	PATCH	0.73
n261	156	28	QTM0	PATCH	-1.03
n261	157	29	QTM0	PATCH	-0.97
n261	158	30	QTM0	PATCH	-0.97
n261	159	31	QTM0	PATCH	0.36
n261	164	36	QTM0	PATCH	-0.11
n261	165	37	QTM0	PATCH	-1.15
n261	166	38	QTM0	PATCH	-0.76
n261	167	39	QTM0	PATCH	-0.77

5G NR n261 Antenna 1 input.power.limit

Band	Beam ID		Antenna		Input Power Limit
			Moudule	Type	6+10log(S(i))+Delta min
n261	0		QTM1	PATCH	10.77
n261	2		QTM1	PATCH	9.60
n261	4		QTM1	PATCH	9.49
n261	6		QTM1	PATCH	10.47
n261	8		QTM1	PATCH	7.35
n261	9		QTM1	PATCH	6.52
n261	10		QTM1	PATCH	7.27
n261	11		QTM1	PATCH	7.37
n261	16		QTM1	PATCH	7.49
n261	17		QTM1	PATCH	6.44
n261	18		QTM1	PATCH	7.42
n261	22		QTM1	PATCH	5.68
n261	23		QTM1	PATCH	4.40
n261	24		QTM1	PATCH	4.14
n261	25		QTM1	PATCH	4.21
n261	26		QTM1	PATCH	5.61
n261	32		QTM1	PATCH	5.40
n261	33		QTM1	PATCH	4.09
n261	34		QTM1	PATCH	4.27
n261	35		QTM1	PATCH	4.74
n261		128	QTM1	PATCH	9.65
n261		130	QTM1	PATCH	9.15
n261		132	QTM1	PATCH	9.80
n261		134	QTM1	PATCH	11.07
n261		136	QTM1	PATCH	7.62
n261		137	QTM1	PATCH	6.56
n261		138	QTM1	PATCH	6.41
n261		139	QTM1	PATCH	6.58
n261		144	QTM1	PATCH	6.83
n261		145	QTM1	PATCH	6.55
n261		146	QTM1	PATCH	7.20
n261		150	QTM1	PATCH	5.54
n261		151	QTM1	PATCH	4.23
n261		152	QTM1	PATCH	3.90
n261		153	QTM1	PATCH	4.13
n261		154	QTM1	PATCH	5.19
n261		160	QTM1	PATCH	5.07
n261		161	QTM1	PATCH	4.21
n261		162	QTM1	PATCH	4.01
n261		163	QTM1	PATCH	4.51
n261	128	0	QTM1	PATCH	6.82
n261	130	2	QTM1	PATCH	5.64
n261	132	4	QTM1	PATCH	5.90
n261	134	6	QTM1	PATCH	7.04
n261	136	8	QTM1	PATCH	3.88
n261	137	9	QTM1	PATCH	2.39
n261	138	10	QTM1	PATCH	3.12
n261	139	11	QTM1	PATCH	3.69
n261	144	16	QTM1	PATCH	3.87
n261	145	17	QTM1	PATCH	2.79
n261	146	18	QTM1	PATCH	4.35
n261	150	22	QTM1	PATCH	2.17
n261	151	23	QTM1	PATCH	0.42
n261	152	24	QTM1	PATCH	-0.07
n261	153	25	QTM1	PATCH	0.47
n261	154	26	QTM1	PATCH	1.71
n261	160	32	QTM1	PATCH	1.83
n261	161	33	QTM1	PATCH	0.09
n261	162	34	QTM1	PATCH	0.08
n261	163	35	QTM1	PATCH	1.30

6 Measurement Uncertainty

The budget is valid for evaluation distance ＞λ/2π. For specific tests and configurations, the uncertainty can be considered smaller.

Error Description		Unc. Value (±dB)	Prob. Dist.	Div.	(C_i)	Std.Unc. (±dB)	(V_i) V_{eff}
Uncertainty terms dependent on the measurement system							
CAL	Calibration	0.49	N	1	1	0.49	∞
FRS	Frequency response	0.20	R	$\sqrt{3}$	1	0.12	∞
ISO	Isotropy	0.50	R	$\sqrt{3}$	1	0.29	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	1	0.12	∞
PPO	Probe positioning offset	0.30	R	$\sqrt{3}$	1	0.17	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	1	0.02	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	1	0.02	∞
DAQ	Data acquisition	0.03	N	1	1	0.03	∞
REC	Field reconstruction	0.60	R	$\sqrt{3}$	1	0.35	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	1	0.06	∞
SDL	System detection limit	0.04	R	$\sqrt{3}$	1	0.02	∞
Uncertainty terms dependent on the DUT and environmental factors							
MOD	Modulation response	0.40	R	$\sqrt{3}$	1	0.23	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	1	0.06	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	1	0.02	∞
AR	Ambient reflections	0.04	R	$\sqrt{3}$	1	0.02	∞
DRI	Drift of the DUT	0.02	R	$\sqrt{3}$	1	0.01	∞
Combined Standard Uncertainty						0.76	∞
Expanded Standard Uncertainty (95%)						1.52	