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

No. I21Z60861-SEM03

For

TCL Communication Ltd

Tablet PC

9198S

With

Hardware Version: 03

Software Version: 2C61

FCC ID: 2ACCJB155

Issued Date: 2021-9-6

Note:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I21Z60861-SEM03	Rev.0	2021-9-6	Initial creation of test report

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1 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.

2 Equipment Under Test (EUT) Overview

Description:	Tablet PC
Model name:	9198S
Operating mode(s):	GSM850/1900, WCDMA850/900/1900/2100, BT, Wi-Fi (2.4G/5G), n2/n5/n66/n77/n260/261 LTE Band 2/3/4/5/7/12/13/20/28/46/48/66
Tested Tx Frequency:	824 – 849 MHz (GSM 850)
	1850 – 1910 MHz (GSM 1900)
	824–849 MHz (WCDMA 850 Band V)
	1710 – 1755 MHz (WCDMA 1700 Band IV)
	1850–1910 MHz (WCDMA1900 Band II)
	1850 – 1910 MHz(LTE Band 2)
	1710 – 1755 MHz (LTE Band 4)
	824 – 849 MHz (LTE Band 5)
	2500 – 2570 MHz(LTE Band 7)
	699 – 716 MHz (LTE Band 12)
	779.5 –784.5 MHz (LTE Band 13)
	3550 – 3700 MHz (LTE Band 48)
	1710 – 1780 MHz (LTE Band 66)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	5150-5825 MHz (Wi-Fi 5G)
	1850 – 1910 MHz(n2)
	824 – 849 MHz(n5)
	1710 – 1780 MHz (n66)
	3700– 3980 MHz (n77)
	37000– 40000 MHz (n260)
	27500– 28350 MHz (n261)
GPRS/EGPRS Multislot Class:	12
GPRS capability Class:	B
Antenna type:	Integrated antenna
Hotspot mode:	Support

3 SAR Characterization

3.1 DSI and SAR Determination

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

DSI and Corresponding Exposure Scenarios

Exposure conditions	Trigger Conditions	DSI	SAR design target	W/kg	Remark
Body	Sensor Off	2	1g SAR design target	0.70	/
Body	Sensor On	1	1g SAR design target	0.70	/

	Band	Ant	DSI	
			1	2
Total uncertainty	GSM850	0	1	1.5
	GSM1900	0	2	1.5
	WCDMA1900	0	1	1.5
	WCDMA850	0	2	1
	LTE Band2	0	1	1
	LTE Band2	1	1.5	1.5
	LTE Band4	0	1	1
	LTE Band5	0	1	1
	LTE Band7	0	1	1
	LTE Band12	0	1	1
	LTE Band13	0	1	1
	LTE Band48	6	1	1
	LTE Band66	0	1.5	2
	LTE Band66	1	1	1.5
	Sub6 n2	0	1.5	1
	Sub6 n5	0	1.5	1
	Sub6 n66	0	2	2
	Sub6 n77	6	1.5	1

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

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

3.2 SAR Char Table

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating. Plimit is calculated by linearly scaling with the measured SAR at the Ppart0 to correspond to the SAR_design_target. When Plimit < Pmax, Ppart0 was used as Plimit in the Smart Transmit EFS. When Plimit >Pmax and Ppart0=Pmax, calculated Pmax was used in the Smart Transmit EFS. All reported SAR obtained from the Ppart0 SAR tests was less than SAR_Design_target+ device uncertainty.

For FCC				
Band	Antenna	Sensor active	Sensor deactive	Pmax*
		DSI1	DSI2	
GSM850 (1 Tx slots)	0	25	30	32.5
GSM1900 (1 Tx slots)	0	17.5	27.5	30
WCDMA II	0	10	20.5	24
WCDMA V	0	16.5	23.5	23.5
LTE Band 2	0	9.5	20.5	24
LTE Band 2	1	11	19	24
LTE Band 4	0	10	18	24
LTE Band 5	0	17	23.5	23.5
LTE Band 7	0	10.5	21	24
LTE Band 12	0	17	23.5	23.5
LTE Band 13	0	17	24	24
LTE Band 48	6	9	19	23.5
LTE Band 66	0	10	19	24
LTE Band 66	1	10	16.5	24
FR1 N2	0	9.5	19.5	23.5
FR1 N5	0	18.5	22	23.5
FR1 N66	0	9.5	16.5	23.5
FR1 N77**	6	6.5	18.5	25

Note:

1 When Pmax <Plimit, the DUT will operate at a power level up to Pmax.

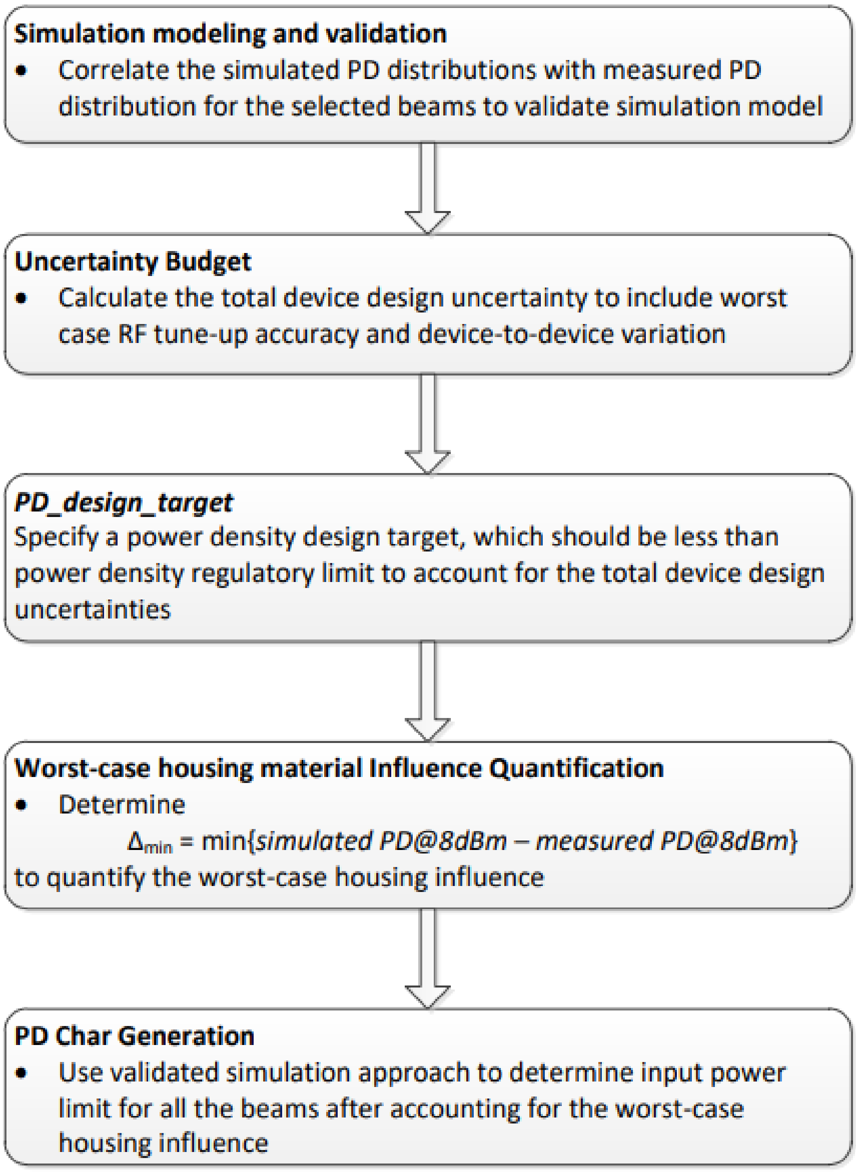
2 Pmax is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + device uncertainty.

4 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.

4.1 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.



4.2 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		Ant module	Ant Type	Num. of Feed
261	2		QTM0	PATCH	1
261	6		QTM0	PATCH	2
261	7		QTM0	PATCH	2
261	8		QTM0	PATCH	2
261	11		QTM0	PATCH	2
261	12		QTM0	PATCH	2
261	18		QTM0	PATCH	4
261	19		QTM0	PATCH	4
261	20		QTM0	PATCH	4
261	21		QTM0	PATCH	4
261	22		QTM0	PATCH	4
261	27		QTM0	PATCH	4
261	28		QTM0	PATCH	4
261	29		QTM0	PATCH	4
261	30		QTM0	PATCH	4
261		130	QTM0	PATCH	1
261		134	QTM0	PATCH	2
261		135	QTM0	PATCH	2
261		136	QTM0	PATCH	2
261		139	QTM0	PATCH	2
261		140	QTM0	PATCH	2
261		146	QTM0	PATCH	4
261		147	QTM0	PATCH	4
261		148	QTM0	PATCH	4
261		149	QTM0	PATCH	4
261		150	QTM0	PATCH	4
261		155	QTM0	PATCH	4
261		156	QTM0	PATCH	4
261		157	QTM0	PATCH	4
261		158	QTM0	PATCH	4
261	2	130	QTM0	PATCH	1
261	6	134	QTM0	PATCH	2
261	7	135	QTM0	PATCH	2
261	8	136	QTM0	PATCH	2
261	11	139	QTM0	PATCH	2
261	12	140	QTM0	PATCH	2
261	18	146	QTM0	PATCH	4
261	19	147	QTM0	PATCH	4
261	20	148	QTM0	PATCH	4
261	21	149	QTM0	PATCH	4
261	22	150	QTM0	PATCH	4
261	27	155	QTM0	PATCH	4
261	28	156	QTM0	PATCH	4
261	29	157	QTM0	PATCH	4
261	30	158	QTM0	PATCH	4

Band	Beam_ID		Ant module	Ant Type	Num. of Feed
260	4		QTM0	PATCH	1
260	8		QTM0	PATCH	2
260	9		QTM0	PATCH	2
260	10		QTM0	PATCH	2
260	13		QTM0	PATCH	2
260	14		QTM0	PATCH	2
260	20		QTM0	PATCH	4
260	21		QTM0	PATCH	4
260	22		QTM0	PATCH	4
260	23		QTM0	PATCH	4
260	24		QTM0	PATCH	4
260	29		QTM0	PATCH	4
260	30		QTM0	PATCH	4
260	31		QTM0	PATCH	4
260	32		QTM0	PATCH	4
260		132	QTM0	PATCH	1
260		136	QTM0	PATCH	2
260		137	QTM0	PATCH	2
260		138	QTM0	PATCH	2
260		141	QTM0	PATCH	2
260		142	QTM0	PATCH	2
260		148	QTM0	PATCH	4
260		149	QTM0	PATCH	4
260		150	QTM0	PATCH	4
260		151	QTM0	PATCH	4
260		152	QTM0	PATCH	4
260		157	QTM0	PATCH	4
260		158	QTM0	PATCH	4
260		159	QTM0	PATCH	4
260		160	QTM0	PATCH	4
260	4	132	QTM0	PATCH	1
260	8	136	QTM0	PATCH	2
260	9	137	QTM0	PATCH	2
260	10	138	QTM0	PATCH	2
260	13	141	QTM0	PATCH	2
260	14	142	QTM0	PATCH	2
260	20	148	QTM0	PATCH	4
260	21	149	QTM0	PATCH	4
260	22	150	QTM0	PATCH	4
260	23	151	QTM0	PATCH	4
260	24	152	QTM0	PATCH	4
260	29	157	QTM0	PATCH	4
260	30	158	QTM0	PATCH	4
260	31	159	QTM0	PATCH	4
260	32	160	QTM0	PATCH	4

Band	Beam_ID		Ant module	Ant Type	Num. of Feed
261	0		QTM1	PATCH	1
261	1		QTM1	PATCH	1
261	3		QTM1	PATCH	2
261	4		QTM1	PATCH	2
261	5		QTM1	PATCH	2
261	9		QTM1	PATCH	2
261	10		QTM1	PATCH	2
261	13		QTM1	PATCH	4
261	14		QTM1	PATCH	4
261	15		QTM1	PATCH	4
261	16		QTM1	PATCH	4
261	17		QTM1	PATCH	4
261	23		QTM1	PATCH	4
261	24		QTM1	PATCH	4
261	25		QTM1	PATCH	4
261	26		QTM1	PATCH	4
261		128	QTM1	PATCH	1
261		129	QTM1	PATCH	1
261		131	QTM1	PATCH	2
261		132	QTM1	PATCH	2
261		133	QTM1	PATCH	2
261		137	QTM1	PATCH	2
261		138	QTM1	PATCH	2
261		141	QTM1	PATCH	4
261		142	QTM1	PATCH	4
261		143	QTM1	PATCH	4
261		144	QTM1	PATCH	4
261		145	QTM1	PATCH	4
261		151	QTM1	PATCH	4
261		152	QTM1	PATCH	4
261		153	QTM1	PATCH	4
261		154	QTM1	PATCH	4
261	0	128	QTM1	PATCH	1
261	1	129	QTM1	PATCH	1
261	3	131	QTM1	PATCH	2
261	4	132	QTM1	PATCH	2
261	5	133	QTM1	PATCH	2
261	9	137	QTM1	PATCH	2
261	10	138	QTM1	PATCH	2
261	13	141	QTM1	PATCH	4
261	14	142	QTM1	PATCH	4
261	15	143	QTM1	PATCH	4
261	16	144	QTM1	PATCH	4
261	17	145	QTM1	PATCH	4
261	23	151	QTM1	PATCH	4
261	24	152	QTM1	PATCH	4
261	25	153	QTM1	PATCH	4
261	26	154	QTM1	PATCH	4

Band	Beam_ID		Ant module	Ant Type	Num. of Feed
260	0		QTM1	PATCH	1
260	1		QTM1	PATCH	1
260	2		QTM1	PATCH	1
260	3		QTM1	PATCH	1
260	5		QTM1	PATCH	2
260	6		QTM1	PATCH	2
260	7		QTM1	PATCH	2
260	11		QTM1	PATCH	2
260	12		QTM1	PATCH	2
260	15		QTM1	PATCH	4
260	16		QTM1	PATCH	4
260	17		QTM1	PATCH	4
260	18		QTM1	PATCH	4
260	19		QTM1	PATCH	4
260	25		QTM1	PATCH	4
260	26		QTM1	PATCH	4
260	27		QTM1	PATCH	4
260	28		QTM1	PATCH	4
260		128	QTM1	PATCH	1
260		129	QTM1	PATCH	1
260		130	QTM1	PATCH	1
260		131	QTM1	PATCH	1
260		133	QTM1	PATCH	2
260		134	QTM1	PATCH	2
260		135	QTM1	PATCH	2
260		139	QTM1	PATCH	2
260		140	QTM1	PATCH	2
260		143	QTM1	PATCH	4
260		144	QTM1	PATCH	4
260		145	QTM1	PATCH	4
260		146	QTM1	PATCH	4
260		147	QTM1	PATCH	4
260		153	QTM1	PATCH	4
260		154	QTM1	PATCH	4
260		155	QTM1	PATCH	4
260		156	QTM1	PATCH	4
260	0	128	QTM1	PATCH	1
260	1	129	QTM1	PATCH	1
260	2	130	QTM1	PATCH	1
260	3	131	QTM1	PATCH	1
260	5	133	QTM1	PATCH	2
260	6	134	QTM1	PATCH	2
260	7	135	QTM1	PATCH	2
260	11	139	QTM1	PATCH	2
260	12	140	QTM1	PATCH	2
260	15	143	QTM1	PATCH	4
260	16	144	QTM1	PATCH	4
260	17	145	QTM1	PATCH	4
260	18	146	QTM1	PATCH	4
260	19	147	QTM1	PATCH	4
260	25	153	QTM1	PATCH	4
260	26	154	QTM1	PATCH	4
260	27	155	QTM1	PATCH	4
260	28	156	QTM1	PATCH	4

4.3 PD design target determination

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

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

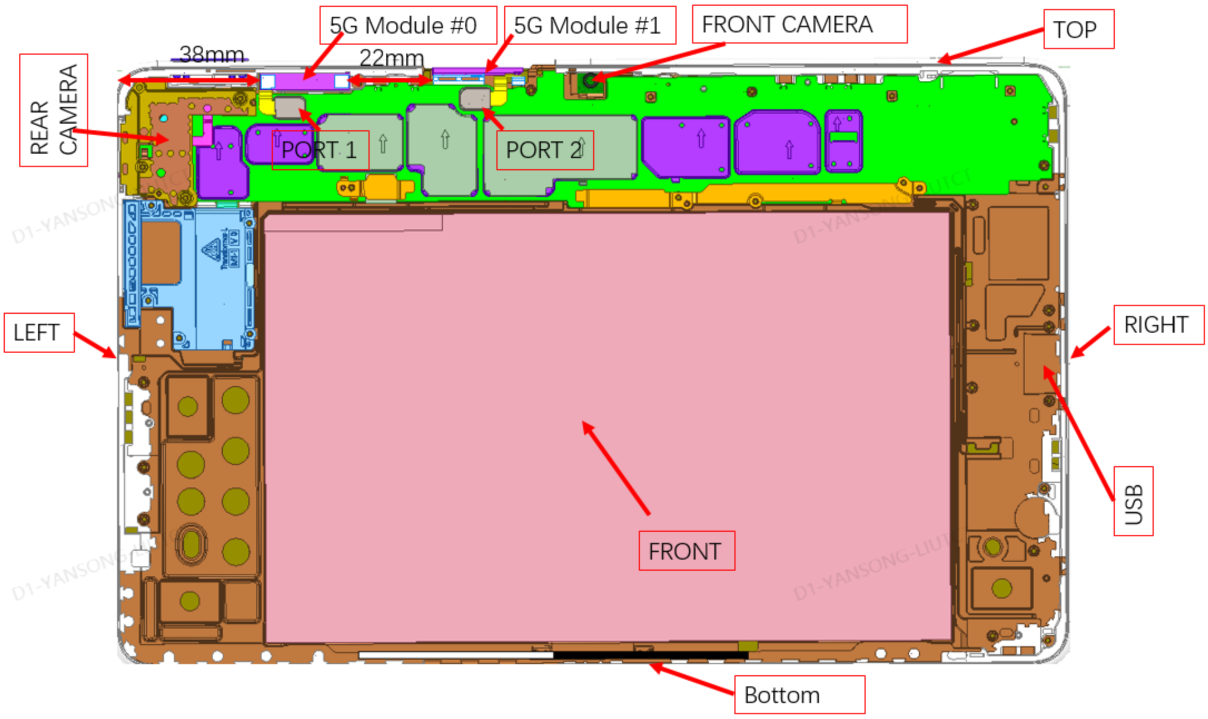
For this EUT, the PD design target and the uncertainty value are listed below

N260	PD design target	Antenna Module	W/m^2
		Antenna Module 0/1	4.6

N261	PD design target	Antenna Module	W/m^2
		Antenna Module 0/1	4.6

Item	Uncertainty dB (k=2)
Total uncertainty	2.1

4.4 Exposure positions for PD evaluation



Evaluation surfaces

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

4.5 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	$4cm^2$ psPD(W/m^2)		Delta=Sim-Meas(dB)
			Moudule	Type		Meas. PD	Sim. PD	
n261	20		QTM0	PATCH	Front	5.53	13.68	**3.93**
n261	20		QTM0	PATCH	Top	2.32	6.86	**4.71**
n261		148	QTM0	PATCH	Front	7.06	13.22	**2.72**
n261		157	QTM0	PATCH	Top	2.71	7.08	**4.17**
n261	15		QTM1	PATCH	Top	8.76	16.77	**2.82**
n261	15		QTM1	PATCH	Front	3.59	9.05	**4.02**
n261		153	QTM1	PATCH	Top	9.3	15.97	**2.35**
n261		153	QTM1	PATCH	Front	4.39	9.44	**3.33**
n260	24		QTM0	PATCH	Front	3.6	11.07	**4.88**
n260	21		QTM0	PATCH	Top	1.36	4.34	**5.04**
n260		152	QTM0	PATCH	Front	3.47	9.95	**4.57**
n260		149	QTM0	PATCH	Top	1.43	4.2	**4.68**
n260	25		QTM1	PATCH	Top	7.57	15.13	**3.01**
n260	18		QTM1	PATCH	Back	3.39	7.47	**3.43**
n260		146	QTM1	PATCH	Top	5.95	14.51	**3.87**
n260		146	QTM1	PATCH	Front	3.46	7.17	**3.16**

4.6 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	Polariaztion	Delta Min
n261		AG0	3.93
		AG1	2.72
	1	AG0	2.82
		AG1	2.35
n260		AG0	4.88
		AG1	4.57
	1	AG0	3.01
		AG1	3.16

△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		Top	Bottom	Front	Back	Left
			Moudule	Type					
n260	4	AG0	QTM0	PATCH	1.244	0.070	3.705	0.140	0.056
n260	8	AG0	QTM0	PATCH	1.571	0.083	4.600	0.249	0.053
n260	9	AG0	QTM0	PATCH	2.339	0.047	4.576	0.165	0.086
n260	10	AG0	QTM0	PATCH	1.761	0.053	4.176	0.192	0.053
n260	13	AG0	QTM0	PATCH	2.015	0.037	4.600	0.202	0.097
n260	14	AG0	QTM0	PATCH	1.335	0.121	4.600	0.201	0.024
n260	20	AG0	QTM0	PATCH	1.571	0.063	4.600	0.167	0.109
n260	21	AG0	QTM0	PATCH	1.892	0.048	4.077	0.192	0.078
n260	22	AG0	QTM0	PATCH	1.906	0.083	4.488	0.196	0.073
n260	23	AG0	QTM0	PATCH	1.979	0.102	4.478	0.238	0.068
n260	24	AG0	QTM0	PATCH	1.592	0.066	4.600	0.241	0.125
n260	29	AG0	QTM0	PATCH	1.934	0.058	4.600	0.228	0.121
n260	30	AG0	QTM0	PATCH	1.800	0.074	4.105	0.185	0.069
n260	31	AG0	QTM0	PATCH	2.060	0.097	4.474	0.233	0.063
n260	32	AG0	QTM0	PATCH	1.565	0.088	4.600	0.184	0.088
n260	132	AG1	QTM0	PATCH	2.208	0.031	3.987	0.169	0.046
n260	136	AG1	QTM0	PATCH	1.496	0.075	4.600	0.120	0.097
n260	137	AG1	QTM0	PATCH	1.298	0.081	3.886	0.114	0.065
n260	138	AG1	QTM0	PATCH	1.496	0.075	4.600	0.120	0.097
n260	141	AG1	QTM0	PATCH	1.520	0.103	4.402	0.119	0.079
n260	142	AG1	QTM0	PATCH	1.404	0.047	4.379	0.142	0.103
n260	148	AG1	QTM0	PATCH	1.733	0.061	4.600	0.132	0.179
n260	149	AG1	QTM0	PATCH	2.328	0.089	4.600	0.260	0.083
n260	150	AG1	QTM0	PATCH	1.598	0.095	3.936	0.123	0.047
n260	151	AG1	QTM0	PATCH	1.727	0.039	4.169	0.142	0.049
n260	152	AG1	QTM0	PATCH	1.706	0.065	4.600	0.148	0.148
n260	157	AG1	QTM0	PATCH	2.113	0.074	4.600	0.189	0.137
n260	158	AG1	QTM0	PATCH	1.779	0.104	4.190	0.173	0.074
n260	159	AG1	QTM0	PATCH	1.649	0.078	4.076	0.142	0.049
n260	160	AG1	QTM0	PATCH	1.827	0.048	4.600	0.153	0.096

Band	Beam ID	Polarization	Antenna		Top	Bottom	Front	Back	Left
			Moudule	Type					
n260	0		QTM1	PATCH	4.502	0.012	1.882	1.550	0.012
n260	1		QTM1	PATCH	4.360	0.009	2.019	1.475	0.009
n260	2		QTM1	PATCH	4.600	0.009	1.607	1.983	0.018
n260	3		QTM1	PATCH	4.360	0.000	1.390	2.123	0.038
n260	5		QTM1	PATCH	4.406	0.005	1.539	2.100	0.037
n260	6		QTM1	PATCH	4.271	0.018	1.983	1.659	0.018
n260	7		QTM1	PATCH	4.508	0.012	2.418	1.610	0.006
n260	11		QTM1	PATCH	4.407	0.006	1.476	1.790	0.006
n260	12		QTM1	PATCH	4.470	0.010	1.610	1.537	0.016
n260	15		QTM1	PATCH	4.600	0.016	1.619	2.270	0.047
n260	16		QTM1	PATCH	4.600	0.013	2.223	2.191	0.006
n260	17		QTM1	PATCH	4.600	0.006	1.715	2.031	0.033
n260	18		QTM1	PATCH	4.406	0.020	1.962	2.240	0.023
n260	19		QTM1	PATCH	4.270	0.012	1.938	2.237	0.027
n260	25		QTM1	PATCH	4.600	0.006	2.042	1.870	0.013
n260	26		QTM1	PATCH	4.600	0.006	2.042	1.870	0.013
n260	27		QTM1	PATCH	4.527	0.000	1.884	1.499	0.010
n260	28		QTM1	PATCH	4.539	0.000	1.604	2.068	0.020
n260	128		QTM1	PATCH	4.527	0.000	1.884	1.499	0.010
n260	129		QTM1	PATCH	4.539	0.000	1.604	2.068	0.020
n260	130		QTM1	PATCH	4.439	0.011	1.956	1.537	0.011
n260	131		QTM1	PATCH	4.510	0.000	2.330	1.359	0.030
n260	133		QTM1	PATCH	4.510	0.000	2.330	1.359	0.030
n260	134		QTM1	PATCH	4.507	0.013	2.363	1.771	0.033
n260	135		QTM1	PATCH	4.244	0.006	1.901	1.965	0.023
n260	139		QTM1	PATCH	4.360	0.006	1.927	1.262	0.006
n260	140		QTM1	PATCH	4.600	0.005	1.726	2.006	0.005
n260	143		QTM1	PATCH	4.194	0.007	1.995	2.166	0.025
n260	144		QTM1	PATCH	4.600	0.006	2.273	1.300	0.029
n260	145		QTM1	PATCH	4.600	0.007	1.836	2.216	0.010
n260	146		QTM1	PATCH	4.600	0.007	1.951	1.965	0.013
n260	147		QTM1	PATCH	4.359	0.007	2.246	2.013	0.019
n260	153		QTM1	PATCH	4.315	0.010	2.218	1.962	0.019
n260	154		QTM1	PATCH	4.600	0.007	1.996	1.999	0.010
n260	155		QTM1	PATCH	4.241	0.010	2.210	1.827	0.015
n260	156		QTM1	PATCH	4.166	0.009	2.102	1.994	0.017

Band	Beam ID	Polarization	Antenna		Top	Bottom	Front	Back	Left
			Moudule	Type					
n261	2	AG0	QTM0	PATCH	1.568	0.035	4.284	0.082	0.047
n261	6	AG0	QTM0	PATCH	2.070	0.052	4.289	0.123	0.045
n261	7	AG0	QTM0	PATCH	2.097	0.062	4.262	0.090	0.069
n261	8	AG0	QTM0	PATCH	1.291	0.048	4.478	0.163	0.075
n261	11	AG0	QTM0	PATCH	2.246	0.045	4.223	0.096	0.032
n261	12	AG0	QTM0	PATCH	2.242	0.037	4.196	0.116	0.037
n261	18	AG0	QTM0	PATCH	1.925	0.044	4.397	0.145	0.203
n261	19	AG0	QTM0	PATCH	2.085	0.060	4.136	0.073	0.043
n261	20	AG0	QTM0	PATCH	2.176	0.057	4.340	0.098	0.038
n261	21	AG0	QTM0	PATCH	2.057	0.066	4.210	0.121	0.070
n261	22	AG0	QTM0	PATCH	1.699	0.064	4.207	0.304	0.162
n261	27	AG0	QTM0	PATCH	1.962	0.059	4.078	0.077	0.059
n261	28	AG0	QTM0	PATCH	2.139	0.054	4.291	0.083	0.038
n261	29	AG0	QTM0	PATCH	2.160	0.063	4.260	0.110	0.037
n261	30	AG0	QTM0	PATCH	1.915	0.065	4.211	0.156	0.121
n261	130	AG1	QTM0	PATCH	1.787	0.053	4.048	0.105	0.026
n261	134	AG1	QTM0	PATCH	1.398	0.040	4.092	0.199	0.048
n261	135	AG1	QTM0	PATCH	2.213	0.052	4.326	0.105	0.029
n261	136	AG1	QTM0	PATCH	1.606	0.070	4.141	0.064	0.057
n261	139	AG1	QTM0	PATCH	1.854	0.042	4.299	0.096	0.048
n261	140	AG1	QTM0	PATCH	2.273	0.054	4.314	0.119	0.036
n261	146	AG1	QTM0	PATCH	1.676	0.055	4.193	0.225	0.181
n261	147	AG1	QTM0	PATCH	1.888	0.048	3.894	0.123	0.083
n261	148	AG1	QTM0	PATCH	2.340	0.066	4.394	0.106	0.013
n261	149	AG1	QTM0	PATCH	2.381	0.077	4.251	0.099	0.037
n261	150	AG1	QTM0	PATCH	2.166	0.059	4.236	0.117	0.067
n261	155	AG1	QTM0	PATCH	1.782	0.050	3.925	0.149	0.104
n261	156	AG1	QTM0	PATCH	2.197	0.053	4.201	0.125	0.025
n261	157	AG1	QTM0	PATCH	2.398	0.078	4.346	0.102	0.020
n261	158	AG1	QTM0	PATCH	2.275	0.071	4.220	0.098	0.051

Band	Beam ID	Polarization	Antenna		Top	Bottom	Front	Back	Left
			Moudule	Type					
n261	0		QTM1	PATCH	4.451	0.009	2.379	1.381	0.019
n261	1		QTM1	PATCH	4.344	0.010	2.054	1.779	0.010
n261	3		QTM1	PATCH	4.465	0.012	2.159	1.002	0.037
n261	4		QTM1	PATCH	4.460	0.011	2.351	1.953	0.005
n261	5		QTM1	PATCH	4.173	0.018	1.439	1.547	0.024
n261	9		QTM1	PATCH	4.344	0.010	2.231	1.640	0.015
n261	10		QTM1	PATCH	4.455	0.010	2.507	1.819	0.005
n261	13		QTM1	PATCH	4.473	0.026	1.886	2.162	0.079
n261	14		QTM1	PATCH	4.354	0.015	2.174	1.964	0.012
n261	15		QTM1	PATCH	4.482	0.011	2.419	2.112	0.005
n261	16		QTM1	PATCH	4.364	0.011	2.334	2.070	0.006
n261	17		QTM1	PATCH	4.230	0.017	2.410	1.450	0.031
n261	23		QTM1	PATCH	4.397	0.020	2.072	1.964	0.030
n261	24		QTM1	PATCH	4.493	0.014	2.483	2.075	0.003
n261	25		QTM1	PATCH	4.281	0.009	2.333	1.761	0.009
n261	26		QTM1	PATCH	4.281	0.009	2.333	1.761	0.009
n261	128		QTM1	PATCH	4.437	0.010	1.978	1.863	0.010
n261	129		QTM1	PATCH	4.556	0.011	2.372	1.566	0.011
n261	131		QTM1	PATCH	4.518	0.012	2.067	1.578	0.024
n261	132		QTM1	PATCH	4.529	0.005	2.634	1.982	0.000
n261	133		QTM1	PATCH	4.529	0.005	2.634	1.982	0.000
n261	137		QTM1	PATCH	4.543	0.014	2.339	1.044	0.029
n261	138		QTM1	PATCH	4.419	0.012	2.294	1.670	0.018
n261	141		QTM1	PATCH	4.590	0.005	2.124	2.211	0.010
n261	142		QTM1	PATCH	4.600	0.033	2.694	1.316	0.052
n261	143		QTM1	PATCH	4.373	0.015	2.374	1.884	0.006
n261	144		QTM1	PATCH	4.516	0.009	2.406	1.995	0.003
n261	145		QTM1	PATCH	4.333	0.020	1.899	1.948	0.049
n261	151		QTM1	PATCH	4.501	0.023	2.506	1.504	0.027
n261	152		QTM1	PATCH	4.441	0.012	2.436	2.132	0.003
n261	153		QTM1	PATCH	4.493	0.008	2.656	1.893	0.003
n261	154		QTM1	PATCH	4.366	0.016	2.021	2.008	0.026

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		157	QTM0	PATCH	Bottom	3. 52	0. 031
	22				Rear	6. 34	0. 198
	18				Left	5. 87	0. 215
		142	QTM1	PATCH	Bottom	2. 55	0. 014
		141			Rear	4. 62	0. 947
	13				Left	4. 74	0. 106
n260	14		QTM0	PATCH	Bottom	9. 43	0. 018
		149			Rear	7. 51	0. 485
		148			Left	6. 80	0. 184
	18		QTM1	PATCH	Bottom	3. 37	0. 01
	7				Front	6. 12	1. 56
	15				Left	3. 45	0. 018

4.7 PD Char

4.7.1 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.

4.7.2 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*:

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

4.7.3 Input.Power.Limit calculations

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

Ideally, if there is no uncertainty associated with hardware design, the input.power.limit, denoted as input.power.limit (i), for beam i can be obtained after accounting for the housing influence (△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	Polariaztion	Delta Min	TxAGC uncertainty (dB)	Input.poer.limit (dB)
n261	0	AG0	3.93	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +3.43
		AG1	2.72	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +2.22
	0	AG0	2.82	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +2.32
		AG1	2.35	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +1.85
n260	0	AG0	4.88	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +4.38
		AG1	4.57	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +4.07
	1	AG0	3.01	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +2.51
		AG1	3.16	0.5	Input.power.limit(i) =6dBm +10*log(s(i)) +3.66

5G NR n261 Antenna 0 input.power.limit

Band	Beam ID		Antenna		Input Power Limit
			Moudule	Type	6+10log(S(i))+Delta min
n261	2		QTM0	PATCH	10.12
n261	6		QTM0	PATCH	7.55
n261	7		QTM0	PATCH	7.82
n261	8		QTM0	PATCH	7.76
n261	11		QTM0	PATCH	7.49
n261	12		QTM0	PATCH	7.30
n261	18		QTM0	PATCH	5.87
n261	19		QTM0	PATCH	4.67
n261	20		QTM0	PATCH	4.45
n261	21		QTM0	PATCH	5.09
n261	22		QTM0	PATCH	6.34
n261	27		QTM0	PATCH	5.09
n261	28		QTM0	PATCH	4.47
n261	29		QTM0	PATCH	4.66
n261	30		QTM0	PATCH	5.79
n261		130	QTM0	PATCH	9.41
n261		134	QTM0	PATCH	7.23
n261		135	QTM0	PATCH	5.88
n261		136	QTM0	PATCH	6.27
n261		139	QTM0	PATCH	6.02
n261		140	QTM0	PATCH	5.97
n261		146	QTM0	PATCH	5.62
n261		147	QTM0	PATCH	4.21
n261		148	QTM0	PATCH	3.44
n261		149	QTM0	PATCH	3.88
n261		150	QTM0	PATCH	4.44
n261		155	QTM0	PATCH	4.76
n261		156	QTM0	PATCH	3.74
n261		157	QTM0	PATCH	3.52
n261		158	QTM0	PATCH	4.16
n261	2	130	QTM0	PATCH	5.89
n261	6	134	QTM0	PATCH	3.53
n261	7	135	QTM0	PATCH	2.90
n261	8	136	QTM0	PATCH	3.19
n261	11	139	QTM0	PATCH	2.74
n261	12	140	QTM0	PATCH	2.70
n261	18	146	QTM0	PATCH	1.39
n261	19	147	QTM0	PATCH	0.47
n261	20	148	QTM0	PATCH	0.25
n261	21	149	QTM0	PATCH	0.73
n261	22	150	QTM0	PATCH	0.94
n261	27	155	QTM0	PATCH	0.67
n261	28	156	QTM0	PATCH	0.34
n261	29	157	QTM0	PATCH	0.34
n261	30	158	QTM0	PATCH	0.88

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	8.02
n261	1		QTM1	PATCH	8.25
n261	3		QTM1	PATCH	6.21
n261	4		QTM1	PATCH	5.63
n261	5		QTM1	PATCH	6.12
n261	9		QTM1	PATCH	5.24
n261	10		QTM1	PATCH	5.45
n261	13		QTM1	PATCH	4.74
n261	14		QTM1	PATCH	3.04
n261	15		QTM1	PATCH	2.59
n261	16		QTM1	PATCH	2.80
n261	17		QTM1	PATCH	3.75
n261	23		QTM1	PATCH	3.48
n261	24		QTM1	PATCH	2.72
n261	25		QTM1	PATCH	2.72
n261	26		QTM1	PATCH	3.11
n261		128	QTM1	PATCH	7.67
n261		129	QTM1	PATCH	8.27
n261		131	QTM1	PATCH	5.55
n261		132	QTM1	PATCH	4.92
n261		133	QTM1	PATCH	6.39
n261		137	QTM1	PATCH	5.51
n261		138	QTM1	PATCH	4.92
n261		141	QTM1	PATCH	4.62
n261		142	QTM1	PATCH	2.55
n261		143	QTM1	PATCH	2.39
n261		144	QTM1	PATCH	2.46
n261		145	QTM1	PATCH	3.92
n261		151	QTM1	PATCH	3.66
n261		152	QTM1	PATCH	2.47
n261		153	QTM1	PATCH	2.34
n261		154	QTM1	PATCH	2.96
n261	0	128	QTM1	PATCH	4.41
n261	1	129	QTM1	PATCH	4.74
n261	3	131	QTM1	PATCH	2.51
n261	4	132	QTM1	PATCH	1.82
n261	5	133	QTM1	PATCH	2.77
n261	9	137	QTM1	PATCH	2.13
n261	10	138	QTM1	PATCH	1.77
n261	13	141	QTM1	PATCH	0.94
n261	14	142	QTM1	PATCH	-0.75
n261	15	143	QTM1	PATCH	-0.92
n261	16	144	QTM1	PATCH	-1.00
n261	17	145	QTM1	PATCH	0.11
n261	23	151	QTM1	PATCH	0.15
n261	24	152	QTM1	PATCH	-0.86
n261	25	153	QTM1	PATCH	-0.92
n261	26	154	QTM1	PATCH	-0.67

5G NR n260 Antenna 0 input.power.limit

Band	Beam ID		Antenna		Input Power Limit
			Moudule	Type	6+10log(S(i))+Delta min
n260	4		QTM0	PATCH	11.83
n260	8		QTM0	PATCH	9.16
n260	9		QTM0	PATCH	9.33
n260	10		QTM0	PATCH	8.59
n260	13		QTM0	PATCH	9.12
n260	14		QTM0	PATCH	9.43
n260	20		QTM0	PATCH	6.59
n260	21		QTM0	PATCH	6.77
n260	22		QTM0	PATCH	7.27
n260	23		QTM0	PATCH	7.25
n260	24		QTM0	PATCH	6.56
n260	29		QTM0	PATCH	6.88
n260	30		QTM0	PATCH	7.03
n260	31		QTM0	PATCH	7.23
n260	32		QTM0	PATCH	6.80
n260		132	QTM0	PATCH	11.93
n260		136	QTM0	PATCH	8.81
n260		137	QTM0	PATCH	9.17
n260		138	QTM0	PATCH	8.81
n260		141	QTM0	PATCH	9.06
n260		142	QTM0	PATCH	9.05
n260		148	QTM0	PATCH	6.80
n260		149	QTM0	PATCH	7.51
n260		150	QTM0	PATCH	6.83
n260		151	QTM0	PATCH	6.97
n260		152	QTM0	PATCH	6.72
n260		157	QTM0	PATCH	7.28
n260		158	QTM0	PATCH	7.01
n260		159	QTM0	PATCH	6.97
n260		160	QTM0	PATCH	6.87
n260	4	132	QTM0	PATCH	8.19
n260	8	136	QTM0	PATCH	6.36
n260	9	137	QTM0	PATCH	5.76
n260	10	138	QTM0	PATCH	5.61
n260	13	141	QTM0	PATCH	5.69
n260	14	142	QTM0	PATCH	6.54
n260	20	148	QTM0	PATCH	3.04
n260	21	149	QTM0	PATCH	3.59
n260	22	150	QTM0	PATCH	3.46
n260	23	151	QTM0	PATCH	3.49
n260	24	152	QTM0	PATCH	2.93
n260	29	157	QTM0	PATCH	3.32
n260	30	158	QTM0	PATCH	3.68
n260	31	159	QTM0	PATCH	3.72
n260	32	160	QTM0	PATCH	2.95

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	9.41
n260	1		QTM1	PATCH	8.15
n260	2		QTM1	PATCH	8.14
n260	3		QTM1	PATCH	9.52
n260	5		QTM1	PATCH	5.71
n260	6		QTM1	PATCH	6.36
n260	7		QTM1	PATCH	6.12
n260	11		QTM1	PATCH	5.92
n260	12		QTM1	PATCH	5.68
n260	15		QTM1	PATCH	3.45
n260	16		QTM1	PATCH	3.56
n260	17		QTM1	PATCH	4.03
n260	18		QTM1	PATCH	3.37
n260	19		QTM1	PATCH	3.46
n260	25		QTM1	PATCH	3.34
n260	26		QTM1	PATCH	3.75
n260	27		QTM1	PATCH	3.35
n260	28		QTM1	PATCH	3.48
n260		128	QTM1	PATCH	8.84
n260		129	QTM1	PATCH	8.70
n260		130	QTM1	PATCH	8.98
n260		131	QTM1	PATCH	10.41
n260		133	QTM1	PATCH	6.90
n260		134	QTM1	PATCH	6.32
n260		135	QTM1	PATCH	6.56
n260		139	QTM1	PATCH	5.98
n260		140	QTM1	PATCH	5.65
n260		143	QTM1	PATCH	3.76
n260		144	QTM1	PATCH	3.92
n260		145	QTM1	PATCH	4.18
n260		146	QTM1	PATCH	3.68
n260		147	QTM1	PATCH	4.09
n260		153	QTM1	PATCH	3.94
n260		154	QTM1	PATCH	4.35
n260		155	QTM1	PATCH	3.72
n260		156	QTM1	PATCH	4.02
n260	0	128	QTM1	PATCH	5.36
n260	1	129	QTM1	PATCH	4.89
n260	2	130	QTM1	PATCH	4.96
n260	3	131	QTM1	PATCH	6.37
n260	5	133	QTM1	PATCH	2.89
n260	6	134	QTM1	PATCH	2.88
n260	7	135	QTM1	PATCH	3.75
n260	11	139	QTM1	PATCH	3.36
n260	12	140	QTM1	PATCH	2.12
n260	15	143	QTM1	PATCH	0.25
n260	16	144	QTM1	PATCH	0.32
n260	17	145	QTM1	PATCH	0.96
n260	18	146	QTM1	PATCH	0.02
n260	19	147	QTM1	PATCH	0.39
n260	25	153	QTM1	PATCH	0.25
n260	26	154	QTM1	PATCH	0.74
n260	27	155	QTM1	PATCH	0.25
n260	28	156	QTM1	PATCH	0.33

5 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	