Cellular TAS and Dynamic Budget Sharing Validation Test Report

FCC ID: BCG-E8948A
Model: A3260

Report Number: 15496282-S7V3
Issue Date: 2025/08/01

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Revision History

Rev.	Date	Revisions	Revised By
V1	2025/07/30	Initial Issue	--
V2	2025/07/31	• §4: Updated the Upper and Lower boundary lines of the plots • §5.1.2.: Updated validation plots to denote p[n] as power normalized and not TER • §5.1.2.7.: Updated note to properly reflect the test case • §5.1.2.9.: Added the missing P_{Limit} lines • §5.1.2.10.: Added the missing P_{Limit} lines	Nathan Sousa
V3	2025/08/01	• §1: Removed note	Nathan Sousa

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1. Test Specifications, Methods/Procedures, and Facilities

The tests documented in this report were performed following the OEM's pre-approval guidance (KDB 388624 D02 Pre-Approval Guidance List v18r06, PWRCNG).

The test sites and measurement facilities used to collect data are located at:

47173 Benicia Street	47266 Benicia Street	5440 Patrick Henry Drive
SAR Labs A to I	SAR Labs 1 to 26	SAR Labs PHD 1 to 4

2. Introduction

The modem is enabled with Cellular TAS technology feature with dynamic budgeting to control and manage transmitting power, in real time. Only cellular technologies implement dynamic budgeting. All other technologies will use static budget assignments. Connectivity, Wi-Fi, Bluetooth, NB U-NII, and 802.15.4, implements its own independent algorithm that is not controlled by this modem.

This DUT supports a time-averaged method of transmit power control for Cellular and MSS technologies. Consumed SAR from active radios is tracked and stored for the duration of the applicable regulatory averaging window. Rolling time-averaged SAR values are calculated from the consumed SAR reported from active radios. The time-averaged SAR is always maintained less than the appliable $SAR_{Design\ Limit}$.

The purpose of this document is to demonstrate the validity of the Cellular TAS and Budget Sharing feature implemented in the modem.

The table(s) below define the applicable time-averaging durations per regulatory body:

Table 2-1: FCC Time-averaging Duration

Frequency (GHz)	Cellular (s)	MSS (s)
< 3	100	99.84
3 - 6	60	N/A

3. Key TAS Parameters

This section defines the relevant power and RF Exposure parameters related to the cellular TAS mechanism for this DUT.

3.1. On-Body Detection (OBD)/Operating State Summary (OPS)

The table below summarizes the operating states supported by the DUT:

Table 3-1: DUT Supported OBD/OPS

OBD/OPS	Description
Cell PS1[1] & PS2[2] Mode A	Head
Cell PS1[1] & PS2[2] Mode B	Body

3.2. TAS Parameter Definitions

$P_{Max,\ nom}$:	The maximum possible instantaneous power, excluding total device uncertainty
P_{Max}:	The maximum possible instantaneous power
$P_{Limit,\ nom}$:	The listed target power, excluding total device uncertainty
P_{Limit}:	The maximum possible time-averaged power
$SAR_{Design\ Target}$:	The maximum spatial peak averaged SAR value corresponding to the $P_{Limit,\ nom}$
$SAR_{Design\ Limit}$:	The maximum spatial peak averaged SAR value inclusive of the total device uncertainty

$P_{Limit,\ nom}$, P_{Limit}, $P_{Max,\ nom}$, and P_{Max} values are defined for all antennas, technologies, bands, and OBD/OPS combinations supporting TAS on the DUT. The $P_{Limit,\ nom}$ value is defined to ensure measured SAR is not greater than the $SAR_{Design\ Target}$. Instantaneous power for the specified antenna/technology/band/OBD/OPS combinations is capped at P_{Max}.

[1] Cellular Power State 1 (Cell PS 1) operates at its maximum budget in conjunction with its relative Connectivity budgets (Connectivity Power States 5 and 6).
[2] Cellular Power State 2 (Cell PS 2) operates at its maximum budget in conjunction with its relative Connectivity budgets (Connectivity Power States 3 and 4).

Table 3-2: FCC SAR Characterizations

Transmitter	Technology	1-g Averaging Volume																							
		Mode A (Head)												Mode B (Body)											
		Uncert. (+)	Uncert. (-)	Cell PS1 + Connectivity PS5/6					Cell PS2 + Connectivity PS3/4					Uncert. (+)	Uncert. (-)	Cell PS1 + Connectivity PS5/6					Cell PS2 + Connectivity PS3/4				
				$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)	$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)			$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)	$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)
ANT 1	GSM 1900 GMSK 1 Slot	1.3	-1.3	29.2	30.5	30.5	N/A	N/A	29.2	30.5	30.5	N/A	N/A	1.5	-1.5	29.0	30.5	30.5	N/A	N/A	29.0	30.5	30.5	N/A	N/A
ANT 1	GSM 1900 GMSK 2 Slot(s)	1.3	-1.3	28.2	29.5	29.5	0.146	0.198	28.2	29.5	29.5	0.146	0.198	1.5	-1.5	27.3	28.8	29.5	0.837	1.190	26.5	28.0	29.5	0.696	0.990
ANT 1	GSM 1900 8PSK 1 Slot	1.3	-1.3	24.2	25.5	25.5	N/A	N/A	24.2	25.5	25.5	N/A	N/A	1.5	-1.5	24.0	25.5	25.5	N/A	N/A	24.0	25.5	25.5	N/A	N/A
ANT 1	GSM 1900 8PSK 2 Slot(s)	1.3	-1.3	23.2	24.5	24.5	N/A	N/A	23.2	24.5	24.5	N/A	N/A	1.5	-1.5	23.0	24.5	24.5	N/A	N/A	23.0	24.5	24.5	N/A	N/A
ANT 1	W-CDMA B2 Rel. 99	0.6	-0.6	24.6	25.2	25.2	0.268	0.309	24.6	25.2	25.2	0.268	0.309	0.8	-0.8	21.4	22.2	25.2	0.983	1.190	20.6	21.4	25.2	0.818	0.990
ANT 1	W-CDMA B2 HSDPA	0.6	-0.6	24.6	25.2	25.2	N/A	N/A	24.6	25.2	25.2	N/A	N/A	0.8	-0.8	21.4	22.2	25.2	N/A	N/A	20.6	21.4	25.2	N/A	N/A
ANT 1	W-CDMA B2 HSUPA	0.6	-0.6	24.6	25.2	25.2	N/A	N/A	24.6	25.2	25.2	N/A	N/A	0.8	-0.8	21.4	22.2	25.2	N/A	N/A	20.6	21.4	25.2	N/A	N/A
ANT 1	W-CDMA B2 HSPA+	0.6	-0.6	24.6	25.2	25.2	N/A	N/A	24.6	25.2	25.2	N/A	N/A	0.8	-0.8	21.4	22.2	25.2	N/A	N/A	20.6	21.4	25.2	N/A	N/A
ANT 1	W-CDMA B4 Rel. 99	1.0	-1.0	24.7	25.7	25.7	0.303	0.378	24.7	25.7	25.7	0.303	0.378	1.1	-1.1	20.7	21.8	25.7	0.926	1.190	19.9	21.0	25.7	0.770	0.990
ANT 1	W-CDMA B4 HSDPA	1.0	-1.0	24.7	25.7	25.7	N/A	N/A	24.7	25.7	25.7	N/A	N/A	1.1	-1.1	20.7	21.8	25.7	N/A	N/A	19.9	21.0	25.7	N/A	N/A
ANT 1	W-CDMA B4 HSUPA	1.0	-1.0	24.7	25.7	25.7	N/A	N/A	24.7	25.7	25.7	N/A	N/A	1.1	-1.1	20.7	21.8	25.7	N/A	N/A	19.9	21.0	25.7	N/A	N/A
ANT 1	W-CDMA B4 HSPA+	1.0	-1.0	24.7	25.7	25.7	N/A	N/A	24.7	25.7	25.7	N/A	N/A	1.1	-1.1	20.7	21.8	25.7	N/A	N/A	19.9	21.0	25.7	N/A	N/A
ANT 1	LTE B2 PC3	0.7	-0.7	24.5	25.2	25.2	N/A	N/A	24.5	25.2	25.2	N/A	N/A	1.0	-1.0	20.9	21.9	25.2	N/A	N/A	20.1	21.1	25.2	N/A	N/A
ANT 1	LTE B4 PC3	1.0	-1.0	24.7	25.7	25.7	N/A	N/A	24.7	25.7	25.7	N/A	N/A	1.1	-1.1	21.6	22.7	25.7	N/A	N/A	20.8	21.9	25.7	N/A	N/A
ANT 1	LTE B5 PC3	1.1	-1.1	24.6	25.7	25.7	0.172	0.222	24.6	25.7	25.7	0.172	0.222	0.8	-0.8	24.9	25.7	25.7	0.311	0.375	24.9	25.7	25.7	0.311	0.375
ANT 1	LTE B7 PC3	1.1	-1.1	23.6	24.7	24.7	0.239	0.306	23.6	24.7	24.7	0.239	0.306	1.3	-1.3	21.6	22.9	24.7	0.882	1.190	20.8	22.1	24.7	0.734	0.990
ANT 1	LTE B12 PC3	1.5	-1.5	24.3	25.7	25.7	0.112	0.156	24.3	25.7	25.7	0.112	0.156	1.0	-1.0	24.7	25.7	25.7	0.340	0.431	24.7	25.7	25.7	0.340	0.431
ANT 1	LTE B13 PC3	0.9	-0.9	24.8	25.7	25.7	0.106	0.130	24.8	25.7	25.7	0.106	0.130	1.0	-1.0	24.7	25.7	25.7	0.403	0.504	24.7	25.7	25.7	0.403	0.504
ANT 1	LTE B14 PC3	0.9	-0.9	24.8	25.7	25.7	0.123	0.150	24.8	25.7	25.7	0.123	0.150	0.9	-0.9	24.8	25.7	25.7	0.433	0.533	24.8	25.7	25.7	0.433	0.533
ANT 1	LTE B17 PC3	1.5	-1.5	24.3	25.7	25.7	N/A	N/A	24.3	25.7	25.7	N/A	N/A	1.0	-1.0	24.7	25.7	25.7	N/A	N/A	24.7	25.7	25.7	N/A	N/A
ANT 1	LTE B25 PC3	0.7	-0.7	24.5	25.2	25.2	0.166	0.196	24.5	25.2	25.2	0.166	0.196	1.0	-1.0	20.9	21.9	25.2	0.939	1.190	20.1	21.1	25.2	0.781	0.990
ANT 1	LTE B26 PC3	1.1	-1.1	24.6	25.7	25.7	0.142	0.183	24.6	25.7	25.7	0.142	0.183	0.8	-0.8	24.9	25.7	25.7	0.345	0.416	24.9	25.7	25.7	0.345	0.416
ANT 1	LTE B30 PC3	1.1	-1.1	23.6	24.7	24.7	0.267	0.345	23.6	24.7	24.7	0.267	0.345	1.4	-1.4	22.5	23.9	24.7	0.858	1.190	21.7	23.1	24.7	0.714	0.990
ANT 1	LTE B41 PC3	1.3	-1.3	24.4	25.7	25.7	0.211	0.285	24.4	25.7	25.7	0.211	0.285	1.4	-1.4	24.0	25.4	25.7	0.866	1.190	23.2	24.6	25.7	0.721	0.990
ANT 1	LTE B41 PC2	1.3	-1.3	27.4	28.7	28.7	N/A	N/A	27.4	28.7	28.7	N/A	N/A	1.4	-1.4	26.0	27.4	28.7	N/A	N/A	25.2	26.6	28.7	N/A	N/A
ANT 1	LTE B66 PC3	1.0	-1.0	24.7	25.7	25.7	0.242	0.302	24.7	25.7	25.7	0.242	0.302	1.1	-1.1	21.6	22.7	25.7	0.926	1.190	20.8	21.9	25.7	0.770	0.990
ANT 1	LTE B71 PC3	1.0	-1.0	24.7	25.7	25.7	0.084	0.106	24.7	25.7	25.7	0.084	0.106	1.0	-1.0	24.7	25.7	25.7	0.345	0.434	24.7	25.7	25.7	0.345	0.434
ANT 1	LTE ULCA B5 PC3	1.1	-1.1	24.6	25.7	25.7	N/A	N/A	24.6	25.7	25.7	N/A	N/A	0.8	-0.8	24.9	25.7	25.7	N/A	N/A	24.9	25.7	25.7	N/A	N/A
ANT 1	LTE ULCA B7 PC3	1.1	-1.1	23.6	24.7	24.7	N/A	N/A	23.6	24.7	24.7	N/A	N/A	1.3	-1.3	21.6	22.9	24.7	N/A	N/A	20.8	22.1	24.7	N/A	N/A
ANT 1	LTE ULCA B41 PC3	1.3	-1.3	24.4	25.7	25.7	N/A	N/A	24.4	25.7	25.7	N/A	N/A	1.4	-1.4	24.0	25.4	25.7	N/A	N/A	23.2	24.6	25.7	N/A	N/A
ANT 1	LTE ULCA B41 PC2	1.3	-1.3	27.4	28.7	28.7	N/A	N/A	27.4	28.7	28.7	N/A	N/A	1.4	-1.4	24.0	25.4	28.7	N/A	N/A	23.2	24.6	28.7	N/A	N/A
ANT 1	FR1 n2 PC3	0.9	-0.9	24.3	25.2	25.2	N/A	N/A	24.3	25.2	25.2	N/A	N/A	1.0	-1.0	20.9	21.9	25.2	N/A	N/A	20.1	21.1	25.2	N/A	N/A
ANT 1	FR1 n5 PC3	1.2	-1.2	24.5	25.7	25.7	0.159	0.210	24.5	25.7	25.7	0.159	0.210	1.4	-1.4	24.3	25.7	25.7	0.390	0.542	24.3	25.7	25.7	0.390	0.542
ANT 1	FR1 n7 PC3	0.8	-0.8	23.9	24.7	24.7	0.158	0.192	23.9	24.7	24.7	0.158	0.192	1.4	-1.4	23.1	24.5	24.7	0.868	1.190	22.3	23.7	24.7	0.722	0.990
ANT 1	FR1 n12 PC3	1.5	-1.5	24.2	25.7	25.7	0.069	0.097	24.2	25.7	25.7	0.069	0.097	1.3	-1.3	24.4	25.7	25.7	0.421	0.564	24.4	25.7	25.7	0.421	0.564
ANT 1	FR1 n14 PC3	0.9	-0.9	24.8	25.7	25.7	0.150	0.186	24.8	25.7	25.7	0.150	0.186	1.0	-1.0	24.7	25.7	25.7	0.578	0.731	24.7	25.7	25.7	0.578	0.731
ANT 1	FR1 n25 PC3	0.9	-0.9	24.3	25.2	25.2	0.236	0.292	24.3	25.2	25.2	0.236	0.292	1.0	-1.0	20.9	21.9	25.2	0.947	1.190	20.1	21.1	25.2	0.788	0.990
ANT 1	FR1 n26 PC3	1.2	-1.2	24.5	25.7	25.7	0.185	0.244	24.5	25.7	25.7	0.185	0.244	1.4	-1.4	24.3	25.7	25.7	0.309	0.429	24.3	25.7	25.7	0.309	0.429
ANT 1	FR1 n30 PC3	1.2	-1.2	23.5	24.7	24.7	0.190	0.249	23.5	24.7	24.7	0.190	0.249	1.5	-1.5	22.9	24.4	24.7	0.835	1.190	22.1	23.6	24.7	0.694	0.990
ANT 1	FR1 n41 PC3	1.8	-1.8	24.0	25.7	25.7	0.196	0.293	24.0	25.7	25.7	0.196	0.293	1.9	-1.9	21.8	23.7	25.7	0.767	1.190	21.0	22.9	25.7	0.638	0.990
ANT 1	FR1 n41 PC2	1.8	-1.8	27.0	28.7	28.7	N/A	N/A	27.0	28.7	28.7	N/A	N/A	1.9	-1.9	21.8	23.7	28.7	N/A	N/A	21.0	22.9	28.7	N/A	N/A
ANT 1	FR1 n66 PC3	1.0	-1.0	24.7	25.7	25.7	0.146	0.185	24.7	25.7	25.7	0.146	0.185	1.2	-1.2	21.2	22.4	25.7	0.899	1.190	20.4	21.6	25.7	0.748	0.990
ANT 1	FR1 n70 PC3	0.8	-0.8	24.9	25.7	25.7	0.198	0.236	24.9	25.7	25.7	0.198	0.236	1.1	-1.1	21.2	22.3	25.7	0.928	1.190	20.4	21.5	25.7	0.772	0.990
ANT 1	FR1 n71 PC3	1.5	-1.5	24.3	25.7	25.7	0.150	0.209	24.3	25.7	25.7	0.150	0.209	1.4	-1.4	24.3	25.7	25.7	0.361	0.496	24.3	25.7	25.7	0.361	0.496
ANT 1	MSS (L-Band)	1.0	-1.0	23.5	24.5	27.7	N/A	N/A	22.7	23.7	27.7	N/A	N/A	1.0	-1.0	23.5	24.5	27.7	N/A	N/A	22.7	23.7	27.7	N/A	N/A
ANT 2	GSM 850 GMSK 1 Slot	2.0	-2.0	31.5	33.5	33.5	N/A	N/A	31.5	33.5	33.5	N/A	N/A	1.8	-1.8	31.7	33.5	33.5	N/A	N/A	31.7	33.5	33.5	N/A	N/A
ANT 2	GSM 850 GMSK 2 Slot(s)	2.0	-2.0	30.2	32.2	32.5	0.744	1.190	29.4	31.4	32.5	0.619	0.990	1.8	-1.8	30.4	32.2	32.5	0.794	1.190	29.6	31.4	32.5	0.660	0.990
ANT 2	GSM 850 8PSK 1 Slot	2.0	-2.0	26.0	28.0	28.0	N/A	N/A	26.0	28.0	28.0	N/A	N/A	1.8	-1.8	26.2	28.0	28.0	N/A	N/A	26.2	28.0	28.0	N/A	N/A
ANT 2	GSM 850 8PSK 2 Slot(s)	2.0	-2.0	25.0	27.0	27.0	N/A	N/A	25.0	27.0	27.0	N/A	N/A	1.8	-1.8	25.2	27.0	27.0	N/A	N/A	25.2	27.0	27.0	N/A	N/A
ANT 2	GSM 1900 GMSK 1 Slot	2.0	-2.0	29.5	31.5	32.0	N/A	N/A	28.7	30.7	32.0	N/A	N/A	2.2	-2.2	29.8	32.0	32.0	N/A	N/A	29.8	32.0	32.0	N/A	N/A
ANT 2	GSM 1900 GMSK 2 Slot(s)	2.0	-2.0	26.5	28.5	31.0	0.751	1.190	25.7	27.7	31.0	0.625	0.990	2.2	-2.2	28.5	30.7	31.0	0.715	1.190	27.7	29.9	31.0	0.595	0.990
ANT 2	GSM 1900 8PSK 1 Slot	2.0	-2.0	25.0	27.0	27.0	N/A	N/A	25.0	27.0	27.0	N/A	N/A	2.2	-2.2	24.8	27.0	27.0	N/A	N/A	24.8	27.0	27.0	N/A	N/A
ANT 2	GSM 1900 8PSK 2 Slot(s)	2.0	-2.0	24.0	26.0	26.0	N/A	N/A	24.0	26.0	26.0	N/A	N/A	2.2	-2.2	23.8	26.0	26.0	N/A	N/A	23.8	26.0	26.0	N/A	N/A
ANT 2	W-CDMA B2 Rel. 99	1.2	-1.2	20.2	21.4	25.7	0.903	1.190	19.4	20.6	25.7	0.751	0.990	1.3	-1.3	22.1	23.4	25.7	0.880	1.190	21.3	22.6	25.7	0.732	0.990
ANT 2	W-CDMA B2 HSDPA	1.2	-1.2	20.2	21.4	25.7	N/A	N/A	19.4	20.6	25.7	N/A	N/A	1.3	-1.3	22.1	23.4	25.7	N/A	N/A	21.3	22.6	25.7	N/A	N/A
ANT 2	W-CDMA B2 HSUPA	1.2	-1.2	20.2	21.4	25.7	N/A	N/A	19.4	20.6	25.7	N/A	N/A	1.3	-1.3	22.1	23.4	25.7	N/A	N/A	21.3	22.6	25.7	N/A	N/A
ANT 2	W-CDMA B2 HSPA+	1.2	-1.2	20.2	21.4	25.7	N/A	N/A	19.4	20.6	25.7	N/A	N/A	1.3	-1.3	22.1	23.4	25.7	N/A	N/A	21.3	22.6	25.7	N/A	N/A
ANT 2	W-CDMA B4 Rel. 99	1.1	-1.1	20.9	21.9	25.7	0.934	1.190	20.1	21.1	25.7	0.777	0.990	1.1	-1.1	23.3	24.4	25.7	0.926	1.190	22.5	23.6	25.7	0.770	0.990
ANT 2	W-CDMA B4 HSDPA	1.1	-1.1	20.9	21.9	25.7	N/A	N/A	20.1	21.1	25.7	N/A	N/A	1.1	-1.1	23.3	24.4	25.7	N/A	N/A	22.5	23.6	25.7	N/A	N/A
ANT 2	W-CDMA B4 HSUPA	1.1	-1.1	20.9	21.9	25.7	N/A	N/A	20.1	21.1	25.7	N/A	N/A	1.1	-1.1	23.3	24.4	25.7	N/A	N/A	22.5	23.6	25.7	N/A	N/A
ANT 2	W-CDMA B4 HSPA+	1.1	-1.1	20.9	21.9	25.7	N/A	N/A	20.1	21.1	25.7	N/A	N/A	1.1	-1.1	23.3	24.4	25.7	N/A	N/A	22.5	23.6	25.7	N/A	N/A
ANT 2	W-CDMA B5 Rel. 99	0.9	-0.9	24.8	25.7	25.7	0.822	1.021	24.1	25.0	25.7	0.797	0.990	0.7	-0.7	25.0	25.7	25.7	0.473	0.551	25.0	25.7	25.7	0.473	0.551
ANT 2	W-CDMA B5 HSDPA	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.1	25.0	25.7	N/A	N/A	0.7	-0.7	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A
ANT 2	W-CDMA B5 HSUPA	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.1	25.0	25.7	N/A	N/A	0.7	-0.7	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A
ANT 2	W-CDMA B5 HSPA+	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.1	25.0	25.7	N/A	N/A	0.7	-0.7	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A
ANT 2	LTE B2 PC3	1.2	-1.2	19.1	20.3	25.7	N/A	N/A	18.3	19.5	25.7	N/A	N/A	1.3	-1.3	22.5	23.8	25.7	N/A	N/A	21.7	23.0	25.7	N/A	N/A
ANT 2	LTE B4 PC3	1.1	-1.1	20.5	21.5	25.7	N/A	N/A	19.7	20.7	25.7	N/A	N/A	1.1	-1.1	23.8	24.9	25.7	N/A	N/A	23.0	24.1	25.7	N/A	N/A
ANT 2	LTE B5 PC3	0.9	-0.9	24.1	25.0	25.7	0.958	1.190	23.3	24.2	25.7	0.797	0.990	0.7	-0.7	25.0	25.7	25.7	0.699	0.814	25.0	25.7	25.7	0.699	0.814
ANT 2	LTE B7 PC3	1.0	-1.0	18.2	19.2	25.7	0.941	1.190	17.4	18.4	25.7	0.783	0.990	1.2	-1.2	20.9	22.1	25.7	0.899	1.190	20.1	21.3	25.7	0.748	0.990
ANT 2	LTE B12 PC3	0.9	-0.9	24.8	25.7	25.7	0.759	0.936	24.3	25.2	25.7	0.803	0.990	0.6	-0.6	25.1	25.7	25.7	0.437	0.505	25.1	25.7	25.7	0.437	0.505
ANT 2	LTE B13 PC3	1.0	-1.0	24.1	25.1	25.7	0.943	1.190	23.3	24.3	25.7	0.785	0.990	0.7	-0.7	25.0	25.7	25.7	0.671	0.794	25.0	25.7	25.7	0.671	0.794
ANT 2	LTE B14 PC3	1.0	-1.0	24.7	25.7	25.7	0.839	1.066	23.9	24.9	25.7	0.779	0.990	0.8	-0.8	24.9	25.7	25.7	0.634	0.762	24.9	25.7	25.7	0.634	0.762
ANT 2	LTE B17 PC3	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A	0.6	-0.6	25.1	25.7	25.7	N/A	N/A	25.1	25.7	25.7	N/A	N/A
ANT 2	LTE B25 PC3	1.2	-1.2	19.1	20.3	25.7	0.903	1.190	18.3	19.5	25.7	0.751	0.990	1.3	-1.3	22.5	23.8	25.7	0.880	1.190	21.7	23.0	25.7	0.732	0.990
ANT 2	LTE B26 PC3	0.9	-0.9	24.1	25.0	25.7	0.958	1.190	23.3	24.2	25.7	0.797	0.990	0.7	-0.7	25.0	25.7	25.7	0.548	0.638	25.0	25.7	25.7	0.548	0.638
ANT 2	LTE B30 PC3	0.8	-0.8	19.3	20.1	24.2	0.997	1.190	18.5	19.3	24.2	0.829	0.990	0.9	-0.9	21.1	22.0	24.2	0.958	1.190	20.3	21.2	24.2	0.797	0.990
ANT 2	LTE B41 PC3	1.0	-1.0	20.8	21.8	25.7	0.952	1.190	20.0	21.0	25.7	0.792	0.990	1.3	-1.3	22.1	23.4	25.7	0.882	1.190	21.3	22.6	25.7	0.734	0.990
ANT 2	LTE B41 PC2	1.0	-1.0	22.8	23.8	28.7	N/A	N/A	22.0	23.0	28.7	N/A	N/A	1.3	-1.3	24.1	25.4	28.7	N/A	N/A	23.3	24.6	28.7	N/A	N/A
ANT 2	LTE B66 PC3	1.1	-1.1	20.5	21.5	25.7	0.934	1.190	19.7	20.7	25.7	0.777	0.990	1.1	-1.1	23.8	24.9	25.7	0.926	1.190	23.0	24.1	25.7	0.770	0.990
ANT 2	LTE B71 PC3	1.0	-1.0	24.8	25.7	25.7	0.652	0.811	24.8	25.7	25.7	0.652	0.811	0.9	-0.9	24.9	25.7	25.7	0.405	0.493	24.9	25.7	25.7	0.405	0.493
ANT 2	LTE ULCA B5 PC3	0.9	-0.9	24.7	25.6	25.7	N/A	N/A	23.9	24.8	25.7	N/A	N/A	0.7	-0.7	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A
ANT 2	LTE ULCA B7 PC3	1.0	-1.0	18.2	19.2	25.7	N/A	N/A	17.4	18.4	25.7	N/A	N/A	1.2	-1.2	20.9	22.1	25.7	N/A	N/A	20.1	21.3	25.7	N/A	N/A
ANT 2	LTE ULCA B41 PC3	1.0	-1.0	20.8	21.8	25.7	N/A	N/A	20.0	21.0	25.7	N/A	N/A	1.3	-1.3	22.1	23.4	25.7	N/A	N/A	21.3	22.6	25.7	N/A	N/A
ANT 2	LTE ULCA B41 PC2	1.0	-1.0	20.8	21.8	28.7	N/A	N/A	20.0	21.0	28.7	N/A	N/A	1.3	-1.3	22.1	23.4	28.7	N/A	N/A	21.3	22.6	28.7	N/A	N/A

Transmitter	Technology	1-g Averaging Volume																							
		Mode A (Head)												Mode B (Body)											
		Uncert. (+)	Uncert. (-)	Cell PS1 + Connectivity PS5/6					Cell PS2 + Connectivity PS3/4					Uncert. (+)	Uncert. (-)	Cell PS1 + Connectivity PS5/6					Cell PS2 + Connectivity PS3/4				
				$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)	$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)			$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)	$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)
ANT 2	FR1 n2 PC3	1.2	-1.2	19.4	20.6	25.7	N/A	N/A	18.6	19.8	25.7	N/A	N/A	1.5	-1.5	22.8	24.3	25.7	N/A	N/A	22.0	23.5	25.7	N/A	N/A
ANT 2	FR1 n5 PC3	1.2	-1.2	24.3	25.5	25.7	0.909	1.190	23.5	24.7	25.7	0.756	0.990	0.9	-0.9	24.8	25.7	25.7	0.442	0.549	24.8	25.7	25.7	0.442	0.549
ANT 2	FR1 n7 PC3	1.1	-1.1	18.6	19.7	25.7	0.919	1.190	17.8	18.9	25.7	0.765	0.990	1.3	-1.3	20.6	21.9	25.7	0.878	1.190	19.8	21.1	25.7	0.731	0.990
ANT 2	FR1 n12 PC3	0.9	-0.9	24.8	25.7	25.7	0.606	0.744	24.8	25.7	25.7	0.606	0.744	0.8	-0.8	24.9	25.7	25.7	0.427	0.509	24.9	25.7	25.7	0.427	0.509
ANT 2	FR1 n14 PC3	1.1	-1.1	24.7	25.7	25.7	0.756	0.963	24.3	25.3	25.7	0.777	0.990	0.9	-0.9	24.8	25.7	25.7	0.506	0.618	24.8	25.7	25.7	0.506	0.618
ANT 2	FR1 n25 PC3	1.2	-1.2	19.4	20.6	25.7	0.903	1.190	18.6	19.8	25.7	0.751	0.990	1.5	-1.5	22.8	24.3	25.7	0.839	1.190	22.0	23.5	25.7	0.698	0.990
ANT 2	FR1 n26 PC3	1.2	-1.2	24.3	25.5	25.7	0.909	1.190	23.5	24.7	25.7	0.756	0.990	0.9	-0.9	24.8	25.7	25.7	0.434	0.539	24.8	25.7	25.7	0.434	0.539
ANT 2	FR1 n30 PC3	0.7	-0.7	19.5	20.2	24.2	1.013	1.190	18.7	19.4	24.2	0.843	0.990	1.1	-1.1	21.0	22.1	24.2	0.928	1.190	20.2	21.3	24.2	0.772	0.990
ANT 2	FR1 n41 PC3	1.7	-1.7	17.7	19.4	25.7	0.806	1.190	16.9	18.6	25.7	0.671	0.990	1.8	-1.8	20.2	21.9	25.7	0.795	1.190	19.4	21.1	25.7	0.662	0.990
ANT 2	FR1 n41 PC2	1.7	-1.7	17.7	19.4	28.7	N/A	N/A	16.9	18.6	28.7	N/A	N/A	1.8	-1.8	20.2	21.9	28.7	N/A	N/A	19.4	21.1	28.7	N/A	N/A
ANT 2	FR1 n66 PC3	1.1	-1.1	20.7	21.8	25.7	0.915	1.190	19.9	21.0	25.7	0.761	0.990	1.1	-1.1	23.4	24.5	25.7	0.922	1.190	22.6	23.7	25.7	0.767	0.990
ANT 2	FR1 n70 PC3	0.9	-0.9	21.3	22.2	25.7	0.963	1.190	20.5	21.4	25.7	0.801	0.990	1.0	-1.0	23.7	24.7	25.7	0.941	1.190	22.9	23.9	25.7	0.783	0.990
ANT 2	FR1 n71 PC3	0.9	-0.9	24.8	25.7	25.7	0.594	0.736	24.8	25.7	25.7	0.594	0.736	0.8	-0.8	24.9	25.7	25.7	0.312	0.378	24.9	25.7	25.7	0.312	0.378
ANT 2	MSS (L-Band)	1.0	-1.0	25.0	26.0	27.7	N/A	N/A	N/A	25.2	27.7	N/A	N/A	1.0	-1.0	25.0	26.0	27.7	N/A	N/A	24.2	25.2	27.7	N/A	N/A
ANT 3	GSM 850 GMSK 1 Slot	1.1	-1.1	32.4	33.5	33.5	N/A	N/A	32.4	33.5	33.5	N/A	N/A	1.5	-1.5	32.0	33.5	33.5	N/A	N/A	32.0	33.5	33.5	N/A	N/A
ANT 3	GSM 850 GMSK 2 Slot(s)	1.1	-1.1	31.4	32.5	32.5	0.113	0.146	31.4	32.5	32.5	0.113	0.146	1.5	-1.5	30.7	32.2	32.5	0.839	1.190	29.9	31.4	32.5	0.698	0.990
ANT 3	GSM 850 8PSK 1 Slot	1.1	-1.1	26.9	28.0	28.0	N/A	N/A	26.9	28.0	28.0	N/A	N/A	1.5	-1.5	26.5	28.0	28.0	N/A	N/A	26.5	28.0	28.0	N/A	N/A
ANT 3	GSM 850 8PSK 2 Slot(s)	1.1	-1.1	25.9	27.0	27.0	N/A	N/A	25.9	27.0	27.0	N/A	N/A	1.5	-1.5	25.5	27.0	27.0	N/A	N/A	25.5	27.0	27.0	N/A	N/A
ANT 3	GSM 1900 GMSK 1 Slot	1.9	-1.9	30.2	32.0	32.0	N/A	N/A	30.2	32.0	32.0	N/A	N/A	1.9	-1.9	30.1	32.0	32.0	N/A	N/A	30.1	32.0	32.0	N/A	N/A
ANT 3	GSM 1900 GMSK 2 Slot(s)	1.9	-1.9	29.2	31.0	31.0	0.229	0.351	29.2	31.0	31.0	0.229	0.351	1.9	-1.9	27.8	29.7	31.0	0.768	1.190	27.0	28.9	31.0	0.639	0.990
ANT 3	GSM 1900 8PSK 1 Slot	1.9	-1.9	25.2	27.0	27.0	N/A	N/A	25.2	27.0	27.0	N/A	N/A	1.9	-1.9	25.1	27.0	27.0	N/A	N/A	25.1	27.0	27.0	N/A	N/A
ANT 3	GSM 1900 8PSK 2 Slot(s)	1.9	-1.9	24.2	26.0	26.0	N/A	N/A	24.2	26.0	26.0	N/A	N/A	1.9	-1.9	24.1	26.0	26.0	N/A	N/A	24.1	26.0	26.0	N/A	N/A
ANT 3	W-CDMA B2 Rel. 99	1.0	-1.0	24.8	25.7	25.7	0.283	0.352	24.8	25.7	25.7	0.283	0.352	1.2	-1.2	22.1	23.3	25.7	0.903	1.190	21.3	22.5	25.7	0.751	0.990
ANT 3	W-CDMA B2 HSDPA	1.0	-1.0	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A	1.2	-1.2	22.1	23.3	25.7	N/A	N/A	21.3	22.5	25.7	N/A	N/A
ANT 3	W-CDMA B2 HSUPA	1.0	-1.0	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A	1.2	-1.2	22.1	23.3	25.7	N/A	N/A	21.3	22.5	25.7	N/A	N/A
ANT 3	W-CDMA B2 HSPA+	1.0	-1.0	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A	1.2	-1.2	22.1	23.3	25.7	N/A	N/A	21.3	22.5	25.7	N/A	N/A
ANT 3	W-CDMA B4 Rel. 99	0.8	-0.8	25.0	25.7	25.7	0.217	0.258	25.0	25.7	25.7	0.217	0.258	1.0	-1.0	22.9	23.9	25.7	0.941	1.190	22.1	23.1	25.7	0.783	0.990
ANT 3	W-CDMA B4 HSDPA	0.8	-0.8	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A	1.0	-1.0	22.9	23.9	25.7	N/A	N/A	22.1	23.1	25.7	N/A	N/A
ANT 3	W-CDMA B4 HSUPA	0.8	-0.8	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A	1.0	-1.0	22.9	23.9	25.7	N/A	N/A	22.1	23.1	25.7	N/A	N/A
ANT 3	W-CDMA B4 HSPA+	0.8	-0.8	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A	1.0	-1.0	22.9	23.9	25.7	N/A	N/A	22.1	23.1	25.7	N/A	N/A
ANT 3	W-CDMA B5 Rel. 99	1.1	-1.1	24.6	25.7	25.7	0.097	0.125	24.6	25.7	25.7	0.097	0.125	0.9	-0.9	24.8	25.7	25.7	0.302	0.373	24.8	25.7	25.7	0.302	0.373
ANT 3	W-CDMA B5 HSDPA	1.1	-1.1	24.6	25.7	25.7	N/A	N/A	24.6	25.7	25.7	N/A	N/A	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A
ANT 3	W-CDMA B5 HSUPA	1.1	-1.1	24.6	25.7	25.7	N/A	N/A	24.6	25.7	25.7	N/A	N/A	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A
ANT 3	W-CDMA B5 HSPA+	1.1	-1.1	24.6	25.7	25.7	N/A	N/A	24.6	25.7	25.7	N/A	N/A	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A
ANT 3	LTE B2 PC3	1.0	-1.0	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A	1.2	-1.2	22.5	23.7	25.7	N/A	N/A	21.7	22.9	25.7	N/A	N/A
ANT 3	LTE B4 PC3	0.8	-0.8	25.0	25.7	25.7	N/A	N/A	25.0	25.7	25.7	N/A	N/A	1.0	-1.0	21.8	22.8	25.7	N/A	N/A	21.0	22.0	25.7	N/A	N/A
ANT 3	LTE B5 PC3	1.1	-1.1	24.6	25.7	25.7	0.148	0.191	24.6	25.7	25.7	0.148	0.191	0.9	-0.9	24.8	25.7	25.7	0.386	0.477	24.8	25.7	25.7	0.386	0.477
ANT 3	LTE B7 PC3	1.1	-1.1	24.6	25.7	25.7	0.365	0.467	24.6	25.7	25.7	0.365	0.467	1.5	-1.5	21.8	23.2	25.7	0.852	1.190	21.0	22.4	25.7	0.709	0.990
ANT 3	LTE B12 PC3	0.9	-0.9	24.9	25.7	25.7	0.109	0.133	24.9	25.7	25.7	0.109	0.133	0.9	-0.9	24.8	25.7	25.7	0.375	0.460	24.8	25.7	25.7	0.375	0.460
ANT 3	LTE B13 PC3	0.9	-0.9	24.8	25.7	25.7	0.143	0.176	24.8	25.7	25.7	0.143	0.176	1.4	-1.4	24.4	25.7	25.7	0.469	0.640	24.4	25.7	25.7	0.469	0.640
ANT 3	LTE B14 PC3	0.8	-0.8	24.9	25.7	25.7	0.124	0.148	24.9	25.7	25.7	0.124	0.148	0.9	-0.9	24.8	25.7	25.7	0.312	0.382	24.8	25.7	25.7	0.312	0.382
ANT 3	LTE B17 PC3	0.9	-0.9	24.9	25.7	25.7	N/A	N/A	24.9	25.7	25.7	N/A	N/A	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A
ANT 3	LTE B25 PC3	1.0	-1.0	24.8	25.7	25.7	0.371	0.462	24.8	25.7	25.7	0.371	0.462	1.2	-1.2	22.5	23.7	25.7	0.903	1.190	21.7	22.9	25.7	0.751	0.990
ANT 3	LTE B26 PC3	1.2	-1.2	24.5	25.7	25.7	0.133	0.177	24.5	25.7	25.7	0.133	0.177	1.0	-1.0	24.7	25.7	25.7	0.351	0.439	24.7	25.7	25.7	0.351	0.439
ANT 3	LTE B30 PC3	0.8	-0.8	24.9	25.7	25.7	0.433	0.522	24.9	25.7	25.7	0.433	0.522	0.8	-0.8	21.4	22.2	25.7	0.988	1.190	20.6	21.4	25.7	0.822	0.990
ANT 3	LTE B41 PC3	1.1	-1.1	24.7	25.7	25.7	0.275	0.350	24.7	25.7	25.7	0.275	0.350	1.6	-1.6	22.7	24.3	25.7	0.829	1.190	21.9	23.5	25.7	0.690	0.990
ANT 3	LTE B41 PC2	1.1	-1.1	27.7	28.7	28.7	N/A	N/A	27.7	28.7	28.7	N/A	N/A	1.6	-1.6	24.7	26.3	28.7	N/A	N/A	23.9	25.5	28.7	N/A	N/A
ANT 3	LTE B53 PC3	0.9	-0.9	19.8	20.7	20.7	0.200	0.248	19.8	20.7	20.7	0.200	0.248	1.3	-1.3	19.4	20.7	20.7	0.409	0.548	19.4	20.7	20.7	0.409	0.548
ANT 3	LTE B66 PC3	0.8	-0.8	25.0	25.7	25.7	0.283	0.336	25.0	25.7	25.7	0.283	0.336	1.0	-1.0	21.8	22.8	25.7	0.941	1.190	21.0	22.0	25.7	0.783	0.990
ANT 3	LTE B71 PC3	1.6	-1.6	24.2	25.7	25.7	0.115	0.164	24.2	25.7	25.7	0.115	0.164	1.3	-1.3	24.4	25.7	25.7	0.344	0.461	24.4	25.7	25.7	0.344	0.461
ANT 3	LTE ULCA B5 PC3	1.1	-1.1	24.6	25.7	25.7	N/A	N/A	24.6	25.7	25.7	N/A	N/A	0.9	-0.9	24.8	25.7	25.7	N/A	N/A	24.8	25.7	25.7	N/A	N/A
ANT 3	LTE ULCA B7 PC3	1.1	-1.1	24.6	25.7	25.7	N/A	N/A	24.6	25.7	25.7	N/A	N/A	1.5	-1.5	21.8	23.2	25.7	N/A	N/A	21.0	22.4	25.7	N/A	N/A
ANT 3	LTE ULCA B41 PC3	1.1	-1.1	24.7	25.7	25.7	N/A	N/A	24.7	25.7	25.7	N/A	N/A	1.6	-1.6	22.7	24.3	25.7	N/A	N/A	21.9	23.5	25.7	N/A	N/A
ANT 3	LTE ULCA B41 PC2	1.1	-1.1	27.7	28.7	28.7	N/A	N/A	27.7	28.7	28.7	N/A	N/A	1.6	-1.6	22.7	24.3	28.7	N/A	N/A	21.9	23.5	28.7	N/A	N/A
ANT 3	FR1 n2 PC3	1.0	-1.0	24.7	25.7	25.7	N/A	N/A	24.7	25.7	25.7	N/A	N/A	0.9	-0.9	23.0	23.9	25.7	N/A	N/A	22.2	23.1	25.7	N/A	N/A
ANT 3	FR1 n5 PC3	1.3	-1.3	24.4	25.7	25.7	0.097	0.130	24.4	25.7	25.7	0.097	0.130	1.2	-1.2	24.5	25.7	25.7	0.329	0.433	24.5	25.7	25.7	0.329	0.433
ANT 3	FR1 n7 PC3	1.1	-1.1	24.6	25.7	25.7	0.256	0.329	24.6	25.7	25.7	0.256	0.329	1.4	-1.4	21.8	23.2	25.7	0.856	1.190	21.0	22.4	25.7	0.712	0.990
ANT 3	FR1 n12 PC3	1.2	-1.2	24.5	25.7	25.7	0.066	0.086	24.5	25.7	25.7	0.066	0.086	1.1	-1.1	24.6	25.7	25.7	0.289	0.375	24.6	25.7	25.7	0.289	0.375
ANT 3	FR1 n14 PC3	0.8	-0.8	24.9	25.7	25.7	0.150	0.182	24.9	25.7	25.7	0.150	0.182	0.9	-0.9	24.8	25.7	25.7	0.421	0.522	24.8	25.7	25.7	0.421	0.522
ANT 3	FR1 n25 PC3	1.0	-1.0	24.7	25.7	25.7	0.157	0.197	24.7	25.7	25.7	0.157	0.197	0.9	-0.9	23.0	23.9	25.7	0.965	1.190	22.2	23.1	25.7	0.803	0.990
ANT 3	FR1 n26 PC3	1.3	-1.3	24.4	25.7	25.7	0.064	0.086	24.4	25.7	25.7	0.064	0.086	1.2	-1.2	24.5	25.7	25.7	0.255	0.337	24.5	25.7	25.7	0.255	0.337
ANT 3	FR1 n30 PC3	0.8	-0.8	24.9	25.7	25.7	0.251	0.300	24.9	25.7	25.7	0.251	0.300	0.9	-0.9	21.3	22.1	25.7	0.978	1.190	20.5	21.3	25.7	0.814	0.990
ANT 3	FR1 n41 PC3	1.8	-1.8	23.9	25.7	25.7	0.217	0.325	23.9	25.7	25.7	0.217	0.325	2.0	-2.0	21.0	23.0	25.7	0.744	1.190	20.2	22.2	25.7	0.619	0.990
ANT 3	FR1 n41 PC2	1.8	-1.8	26.9	28.7	28.7	N/A	N/A	26.9	28.7	28.7	N/A	N/A	2.0	-2.0	21.0	23.0	28.7	N/A	N/A	20.2	22.2	28.7	N/A	N/A
ANT 3	FR1 n53 PC3	1.1	-1.1	19.6	20.7	20.7	0.303	0.389	19.6	20.7	20.7	0.303	0.389	1.5	-1.5	19.2	20.7	20.7	0.484	0.679	19.2	20.7	20.7	0.484	0.679
ANT 3	FR1 n66 PC3	0.8	-0.8	24.9	25.7	25.7	0.115	0.138	24.9	25.7	25.7	0.115	0.138	1.1	-1.1	22.2	23.3	25.7	0.922	1.190	21.4	22.5	25.7	0.767	0.990
ANT 3	FR1 n70 PC3	0.8	-0.8	24.9	25.7	25.7	0.115	0.140	24.9	25.7	25.7	0.115	0.140	1.5	-1.5	22.9	24.4	25.7	0.850	1.190	22.1	23.6	25.7	0.707	0.990
ANT 3	FR1 n71 PC3	1.4	-1.4	24.4	25.7	25.7	0.097	0.132	24.4	25.7	25.7	0.097	0.132	1.2	-1.2	24.6	25.7	25.7	0.365	0.476	24.6	25.7	25.7	0.365	0.476
ANT 4	GSM 1900 GMSK 1 Slot	2.0	-2.0	27.8	29.7	30.5	N/A	N/A	27.0	28.9	30.5	N/A	N/A	2.5	-2.5	28.0	30.5	30.5	N/A	N/A	28.0	30.5	30.5	N/A	N/A
ANT 4	GSM 1900 GMSK 2 Slot(s)	2.0	-2.0	24.8	26.7	29.5	0.760	1.190	24.0	25.9	29.5	0.632	0.990	2.5	-2.5	26.6	29.1	29.5	0.669	1.190	25.8	28.3	29.5	0.557	0.990
ANT 4	GSM 1900 8PSK 1 Slot	2.0	-2.0	23.6	25.5	25.5	N/A	N/A	23.6	25.5	25.5	N/A	N/A	2.5	-2.5	23.0	25.5	25.5	N/A	N/A	23.0	25.5	25.5	N/A	N/A
ANT 4	GSM 1900 8PSK 2 Slot(s)	2.0	-2.0	22.6	24.5	24.5	N/A	N/A	22.6	24.5	24.5	N/A	N/A	2.5	-2.5	22.0	24.5	24.5	N/A	N/A	22.0	24.5	24.5	N/A	N/A
ANT 4	W-CDMA B2 Rel. 99	1.3	-1.3	19.2	20.4	25.2	0.892	1.190	18.4	19.6	25.2	0.742	0.990	1.5	-1.5	20.5	22.0	25.2	0.842	1.190	19.7	21.2	25.2	0.701	0.990
ANT 4	W-CDMA B2 HSDPA	1.3	-1.3	19.2	20.4	25.2	N/A	N/A	18.4	19.6	25.2	N/A	N/A	1.5	-1.5	20.5	22.0	25.2	N/A	N/A	19.7	21.2	25.2	N/A	N/A
ANT 4	W-CDMA B2 HSUPA	1.3	-1.3	19.2	20.4	25.2	N/A	N/A	18.4	19.6	25.2	N/A	N/A	1.5	-1.5	20.5	22.0	25.2	N/A	N/A	19.7	21.2	25.2	N/A	N/A
ANT 4	W-CDMA B2 HSPA+	1.3	-1.3	19.2	20.4	25.2	N/A	N/A	18.4	19.6	25.2	N/A	N/A	1.5	-1.5	20.5	22.0	25.2	N/A	N/A	19.7	21.2	25.2	N/A	N/A
ANT 4	W-CDMA B4 Rel. 99	1.1	-1.1	19.1	20.2	25.7	0.932	1.190	18.3	19.4	25.7	0.776	0.990	0.9	-0.9	21.2	22.0	25.7	0.978	1.190	20.4	21.2	25.7	0.814	0.990
ANT 4	W-CDMA B4 HSDPA	1.1	-1.1	19.1	20.2	25.7	N/A	N/A	18.3	19.4	25.7	N/A	N/A	0.9	-0.9	21.2	22.0	25.7	N/A	N/A	20.4	21.2	25.7	N/A	N/A
ANT 4	W-CDMA B4 HSUPA	1.1	-1.1	19.1	20.2	25.7	N/A	N/A	18.3	19.4	25.7	N/A	N/A	0.9	-0.9	21.2	22.0	25.7	N/A	N/A	20.4	21.2	25.7	N/A	N/A
ANT 4	W-CDMA B4 HSPA+	1.1	-1.1	19.1	20.2	25.7	N/A	N/A	18.3	19.4	25.7	N/A	N/A	0.9	-0.9	21.2	22.0	25.7	N/A	N/A	20.4	21.2	25.7	N/A	N/A
ANT 4	LTE B2 PC3	1.3	-1.3	19.3	20.5	25.2	N/A	N/A	18.5	19.7	25.2	N/A	N/A	1.5	-1.5	20.8	22.3	25.2	N/A	N/A	20.0	21.5	25.2	N/A	N/A
ANT 4	LTE B4 PC3	1.1	-1.1	18.8	19.9	25.7	N/A	N/A	18.0	19.1	25.7	N/A	N/A	0.9	-0.9	21.4	22.2	25.7	N/A	N/A	20.6	21.4	25.7	N/A	N/A
ANT 4	LTE B7 PC3	0.9	-0.9	17.5	18.4	24.7	0.963	1.190	16.7	17.6	24.7	0.801	0.990	1.4	-1.4	18.3	19.6	24.7	0.872	1.190	17.5	18.8	24.7	0.725	0.990
ANT 4	LTE B25 PC3	1.3	-1.3	19.3	20.5	25.2	0.892	1.190	18.5	19.7	25.2	0.742	0.990	1.5	-1.5	20.8	22.3	25.2	0.842	1.190	20.0	21.5	25.2	0.701	0.990
ANT 4	LTE B30 PC3	0.8	-0.8	20.1	20.9	24.7	0.994	1.190	19.3	20.1	24.7	0.827	0.990	1.5	-1.5	20.8	22.3	24.7	0.842	1.190	20.0	21.5	24.7	0.701	0.990
ANT 4	LTE B41 PC3	1.1	-1.1	19.6	20.7	25.7	0.919	1.190	18.8	19.9	25.7	0.765	0.990	1.4	-1.4	20.1	21.5	25.7	0.856	1.190	19.3	20.7	25.7	0.712	0.990
ANT 4	LTE B41 PC2	1.1	-1.1	19.6	20.7	28.7	N/A	N/A	18.8	19.9	28.7	N/A	N/A	1.4	-1.4	20.1	21.5	28.7	N/A	N/A	19.3	20.7	28.7	N/A	N/A
ANT 4	LTE B48 PC3	1.2	-1.2	19.9	21.1	24.4	0.903	1.190	19.1	20.3	24.4	0.751	0.990	1.8	-1.8	20.7	22.5	24.4	0.790	1.190	19.9	21.7	24.4	0.657	0.990
ANT 4	LTE B53 PC3	0.8	-0.8	19.9	20.7	20.7	0.579	0.698	19.9	20.7	20.7	0.579	0.698	1.6	-1.6	19.2	20.7	20.7	0.476	0.680	19.2	20.7	20.7	0.476	0.680
ANT 4	LTE B66 PC3	1.1	-1.1	18.8	19.9	25.7	0.932	1.190	18.0	19.1	25.7	0.776	0.990	0.9	-0.9	21.4	22.2	25.7	0.978	1.190	20.6	21.4	25.7	0.814	0.990

Transmitter	Technology	1-g Averaging Volume																							
		Mode A (Head)												Mode B (Body)											
		Uncert. (+)	Uncert. (-)	Cell PS1 + Connectivity PS5/6					Cell PS2 + Connectivity PS3/4					Uncert. (+)	Uncert. (-)	Cell PS1 + Connectivity PS5/6					Cell PS2 + Connectivity PS3/4				
				$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)	$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)			$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)	$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)
ANT 4	LTE ULCA B7 PC3	0.9	-0.9	17.5	18.4	24.7	N/A	N/A	16.7	17.6	24.7	N/A	N/A	1.4	-1.4	18.3	19.6	24.7	N/A	N/A	17.5	18.8	24.7	N/A	N/A
ANT 4	LTE ULCA B41 PC3	1.1	-1.1	19.6	20.7	25.7	N/A	N/A	18.8	19.9	25.7	N/A	N/A	1.4	-1.4	20.1	21.5	25.7	N/A	N/A	19.3	20.7	25.7	N/A	N/A
ANT 4	LTE ULCA B41 PC2	1.1	-1.1	19.6	20.7	28.7	N/A	N/A	18.8	19.9	28.7	N/A	N/A	1.4	-1.4	20.1	21.5	28.7	N/A	N/A	19.3	20.7	28.7	N/A	N/A
ANT 4	LTE ULCA B48 PC3	1.2	-1.2	19.9	21.1	24.4	N/A	N/A	19.1	20.3	24.4	N/A	N/A	1.8	-1.8	20.7	22.5	24.4	N/A	N/A	19.9	21.7	24.4	N/A	N/A
ANT 4	FR1 n2 PC3	1.3	-1.3	19.3	20.6	25.2	N/A	N/A	18.5	19.8	25.2	N/A	N/A	1.4	-1.4	20.6	22.0	25.2	N/A	N/A	19.8	21.2	25.2	N/A	N/A
ANT 4	FR1 n7 PC3	0.9	-0.9	17.3	18.2	24.7	0.972	1.190	16.5	17.4	24.7	0.808	0.990	1.3	-1.3	18.3	19.6	24.7	0.886	1.190	17.5	18.8	24.7	0.737	0.990
ANT 4	FR1 n25 PC3	1.3	-1.3	19.3	20.6	25.2	0.882	1.190	18.5	19.8	25.2	0.734	0.990	1.4	-1.4	20.6	22.0	25.2	0.854	1.190	19.8	21.2	25.2	0.711	0.990
ANT 4	FR1 n30 PC3	0.7	-0.7	20.5	21.2	24.7	1.004	1.190	19.7	20.4	24.7	0.835	0.990	1.3	-1.3	20.7	22.0	24.7	0.878	1.190	19.9	21.2	24.7	0.731	0.990
ANT 4	FR1 n41 PC3	1.7	-1.7	16.8	18.5	25.7	0.808	1.190	16.0	17.7	25.7	0.672	0.990	1.8	-1.8	17.7	19.5	25.7	0.786	1.190	16.9	18.7	25.7	0.654	0.990
ANT 4	FR1 n41 PC2	1.7	-1.7	16.8	18.5	28.7	N/A	N/A	16.0	17.7	28.7	N/A	N/A	1.8	-1.8	17.7	19.5	28.7	N/A	N/A	16.9	18.7	28.7	N/A	N/A
ANT 4	FR1 n48 PC3	1.1	-1.1	19.7	20.8	24.4	0.922	1.190	18.9	20.0	24.4	0.767	0.990	1.5	-1.5	19.2	20.7	24.4	0.839	1.190	18.4	19.9	24.4	0.698	0.990
ANT 4	FR1 n53 PC3	0.9	-0.9	18.9	19.8	20.7	0.967	1.190	18.1	19.0	20.7	0.805	0.990	1.4	-1.4	19.3	20.7	20.7	0.716	0.991	18.8	20.2	20.7	0.716	0.990
ANT 4	FR1 n66 PC3	1.1	-1.1	19.9	21.0	25.7	0.917	1.190	19.1	20.2	25.7	0.763	0.990	0.9	-0.9	21.9	22.8	25.7	0.963	1.190	21.1	22.0	25.7	0.801	0.990
ANT 4	FR1 n70 PC3	1.0	-1.0	20.8	21.8	25.7	0.939	1.190	20.0	21.0	25.7	0.781	0.990	1.1	-1.1	22.6	23.7	25.7	0.924	1.190	21.8	22.9	25.7	0.768	0.990
ANT 4	FR1 n77 (Block A) PC3	1.2	-1.2	16.6	17.8	26.0	0.909	1.190	15.8	17.0	26.0	0.756	0.990	1.5	-1.5	18.1	19.6	26.0	0.848	1.190	17.3	18.8	26.0	0.706	0.990
ANT 4	FR1 n77 (Block A) PC2	1.2	-1.2	16.6	17.8	26.0	N/A	N/A	15.8	17.0	26.0	N/A	N/A	1.5	-1.5	18.1	19.6	26.0	N/A	N/A	17.3	18.8	26.0	N/A	N/A
ANT 4	FR1 n77 (Block C) PC3	1.3	-1.3	20.2	21.5	26.0	0.876	1.190	19.4	20.7	26.0	0.729	0.990	1.6	-1.6	19.8	21.4	26.0	0.821	1.190	19.0	20.6	26.0	0.683	0.990
ANT 4	FR1 n77 (Block C) PC2	1.3	-1.3	20.2	21.5	26.0	N/A	N/A	19.4	20.7	26.0	N/A	N/A	1.6	-1.6	19.8	21.4	26.0	N/A	N/A	19.0	20.6	26.0	N/A	N/A
ANT 7	LTE B48 PC3	1.4	-1.4	24.6	26.0	26.0	0.125	0.172	24.6	26.0	26.0	0.125	0.172	2.3	-2.3	20.9	23.2	26.0	0.702	1.190	20.1	22.4	26.0	0.584	0.990
ANT 7	LTE ULCA B48 PC3	1.4	-1.4	23.6	25.0	25.0	N/A	N/A	23.6	25.0	25.0	N/A	N/A	2.3	-2.3	20.9	23.2	25.0	N/A	N/A	20.1	22.4	25.0	N/A	N/A
ANT 7	FR1 n48 PC3	1.7	-1.7	24.3	26.0	26.0	0.453	0.668	24.3	26.0	26.0	0.453	0.668	2.3	-2.3	19.3	21.6	26.0	0.701	1.190	18.5	20.8	26.0	0.583	0.990
ANT 7	FR1 n77 (Block A) PC3	1.4	-1.4	24.6	26.0	26.0	0.400	0.550	24.6	26.0	26.0	0.400	0.550	2.1	-2.1	17.4	19.4	26.0	0.742	1.190	16.6	18.6	26.0	0.617	0.990
ANT 7	FR1 n77 (Block A) PC2	1.4	-1.4	25.6	27.0	27.0	N/A	N/A	25.6	27.0	27.0	N/A	N/A	2.1	-2.1	17.4	19.4	27.0	N/A	N/A	16.6	18.6	27.0	N/A	N/A
ANT 7	FR1 n77 (Block C) PC3	1.2	-1.2	24.8	26.0	26.0	0.108	0.143	24.8	26.0	26.0	0.108	0.143	1.8	-1.8	21.6	23.4	26.0	0.790	1.190	20.8	22.6	26.0	0.657	0.990
ANT 7	FR1 n77 (Block C) PC2	1.2	-1.2	25.8	27.0	27.0	N/A	N/A	25.8	27.0	27.0	N/A	N/A	1.8	-1.8	21.6	23.4	27.0	N/A	N/A	20.8	22.6	27.0	N/A	N/A
ANT 8	LTE B48 PC3	1.2	-1.2	21.6	22.8	23.1	0.894	1.190	21.3	22.5	23.1	0.744	0.990	1.6	-1.6	18.9	20.5	23.1	0.825	1.190	18.1	19.7	23.1	0.686	0.990
ANT 8	LTE ULCA B48 PC3	1.2	-1.2	21.6	22.8	23.1	N/A	N/A	21.3	22.5	23.1	N/A	N/A	1.6	-1.6	18.9	20.5	23.1	N/A	N/A	18.1	19.7	23.1	N/A	N/A
ANT 8	FR1 n48 PC3	1.5	-1.5	17.3	18.8	23.1	0.835	1.190	16.5	18.0	23.1	0.694	0.990	1.8	-1.8	17.8	19.6	23.1	0.783	1.190	17.0	18.8	23.1	0.651	0.990
ANT 8	FR1 n77 (Block A) PC3	1.1	-1.1	18.3	19.4	26.0	0.917	1.190	17.5	18.6	26.0	0.763	0.990	1.9	-1.9	20.6	22.5	26.0	0.768	1.190	19.8	21.7	26.0	0.639	0.990
ANT 8	FR1 n77 (Block A) PC2	1.1	-1.1	18.3	19.4	28.7	N/A	N/A	17.5	18.6	28.7	N/A	N/A	1.9	-1.9	20.6	22.5	28.7	N/A	N/A	19.8	21.7	28.7	N/A	N/A
ANT 8	FR1 n77 (Block C) PC3	1.5	-1.5	18.7	20.2	26.0	0.842	1.190	17.9	19.4	26.0	0.701	0.990	1.8	-1.8	18.2	20.0	26.0	0.792	1.190	17.4	19.2	26.0	0.659	0.990
ANT 8	FR1 n77 (Block C) PC2	1.5	-1.5	18.7	20.2	28.7	N/A	N/A	17.9	19.4	28.7	N/A	N/A	1.8	-1.8	18.2	20.0	28.7	N/A	N/A	17.4	19.2	28.7	N/A	N/A
ANT 9	LTE B48 PC3	2.0	-2.0	24.0	26.0	26.0	0.097	0.154	24.0	26.0	26.0	0.097	0.154	1.7	-1.7	23.1	24.7	26.0	0.814	1.190	22.3	23.9	26.0	0.677	0.990
ANT 9	LTE ULCA B48 PC3	2.0	-2.0	23.0	25.0	25.0	N/A	N/A	23.0	25.0	25.0	N/A	N/A	1.7	-1.7	23.1	24.7	25.0	N/A	N/A	22.3	23.9	25.0	N/A	N/A
ANT 9	FR1 n48 PC3	1.9	-1.9	24.1	26.0	26.0	0.185	0.287	24.1	26.0	26.0	0.185	0.287	1.8	-1.8	21.4	23.2	26.0	0.790	1.190	20.6	22.4	26.0	0.657	0.990
ANT 9	FR1 n77 (Block A) PC3	1.7	-1.7	24.3	26.0	26.0	0.187	0.275	24.3	26.0	26.0	0.187	0.275	1.7	-1.7	21.2	22.9	26.0	0.801	1.190	20.4	22.1	26.0	0.666	0.990
ANT 9	FR1 n77 (Block A) PC2	1.7	-1.7	27.0	28.7	28.7	N/A	N/A	27.0	28.7	28.7	N/A	N/A	1.7	-1.7	21.2	22.9	28.7	N/A	N/A	20.4	22.1	28.7	N/A	N/A
ANT 9	FR1 n77 (Block C) PC3	1.7	-1.7	24.3	26.0	26.0	0.175	0.258	24.3	26.0	26.0	0.175	0.258	1.6	-1.6	20.7	22.2	26.0	0.833	1.190	19.9	21.4	26.0	0.693	0.990
ANT 9	FR1 n77 (Block C) PC2	1.7	-1.7	27.0	28.7	28.7	N/A	N/A	27.0	28.7	28.7	N/A	N/A	1.6	-1.6	20.7	22.2	28.7	N/A	N/A	19.9	21.4	28.7	N/A	N/A

Transmitter	Technology	10-g Averaging Volume											
		Body (Extremity)											
		Uncert. (+)	Uncert. (-)	Cell PS1 + Connectivity PS5/6					Cell PS2 + Connectivity PS3/4				
				$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)	$P_{Limit, nom}$ (dBm)	P_{Limit} (dBm)	P_{Max} (dBm)	$SAR_{Design Target}$ (W/kg)	$SAR_{Design Limit}$ (W/kg)
ANT 1	MSS (L-Band)	1.0	-1.0	23.5	24.5	27.7	2.363	2.975	22.7	23.7	27.7	1.966	2.475
ANT 2	MSS (L-Band)	1.0	-1.0	25.0	26.0	27.7	2.363	2.975	24.2	25.2	27.7	1.966	2.475

4. Linearity Validation

To validate linearity, point SAR measurements are performed with TAS operation turned off. Per antenna, the mode with the largest difference between P_{Limit} and P_{Max} will be selected for measurement (highlighted in green within the characterization tables in §3). When possible, different frequency bands will be assessed per antenna.

Point SAR measurements are performed in 2 dB steps from P_{Max} to P_{Limit} minus 4 dB.

Linearity is sufficiently validated when the SAR versus requested power is within the defined device uncertainties.

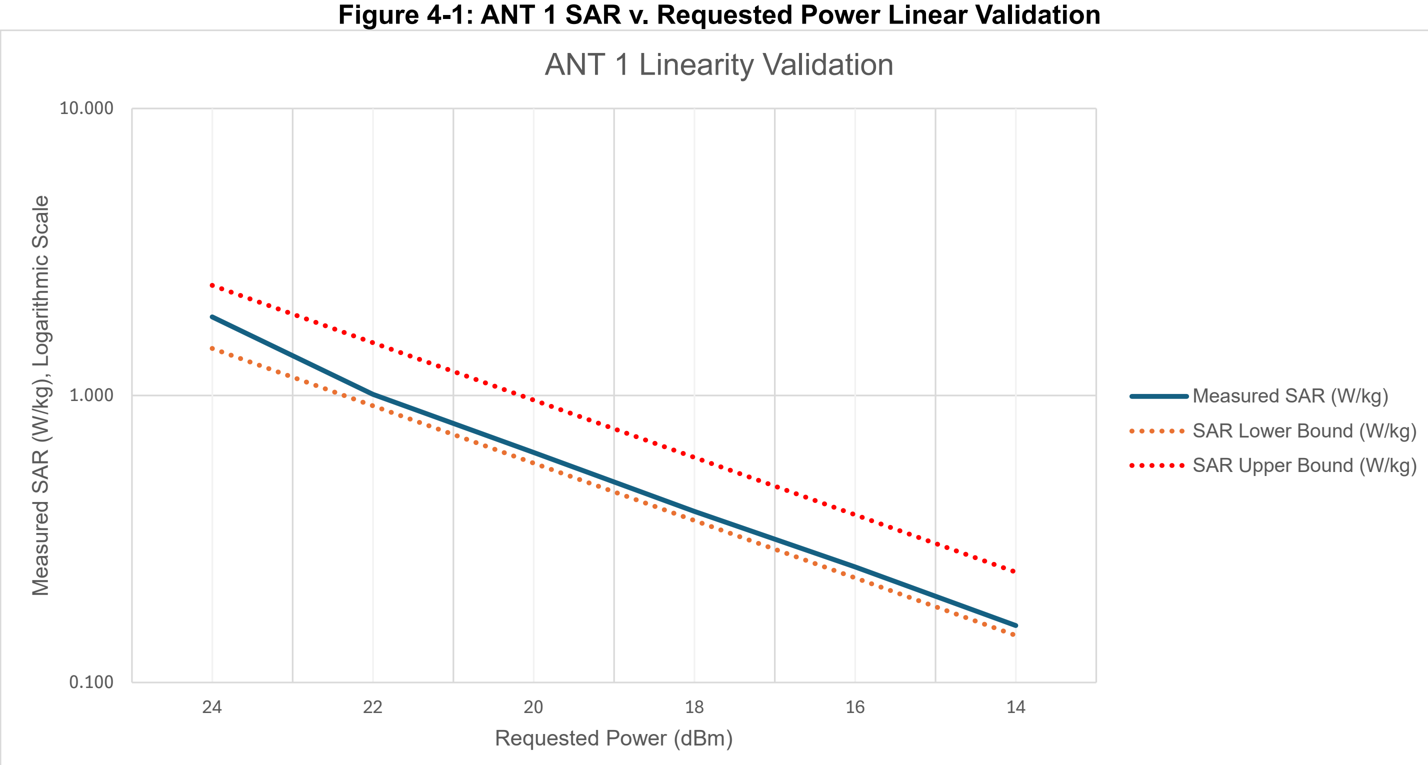
4.1. ANT 1

The table and figure below demonstrate that the linearity is sufficiently validated as the SAR versus requested power is within the expected uncertainties.

Table 4-1: ANT 1 SAR v. Requested Power

Transmitter	Technology	Uncert. (+)	Uncert. (-)	P_{Max}	P_{Limit}	Req. Power (dBm)	Req. Power (mW)	Meas. SAR (W/kg)	SAR Lower Bound	SAR Upper Bound
ANT 1	W-CDMA B4 Rel. 99	1.1	-1.1	25.7	21.8	24	251.2	1.880	1.459	2.422
						22	158.5	1.010	0.921	1.528
						20	100.0	0.633	0.581	0.964
						18	63.1	0.395	0.367	0.608
						16	39.8	0.253	0.231	0.384
						14	25.1	0.158	0.146	0.242

Figure 4-1: ANT 1 SAR v. Requested Power Linear Validation



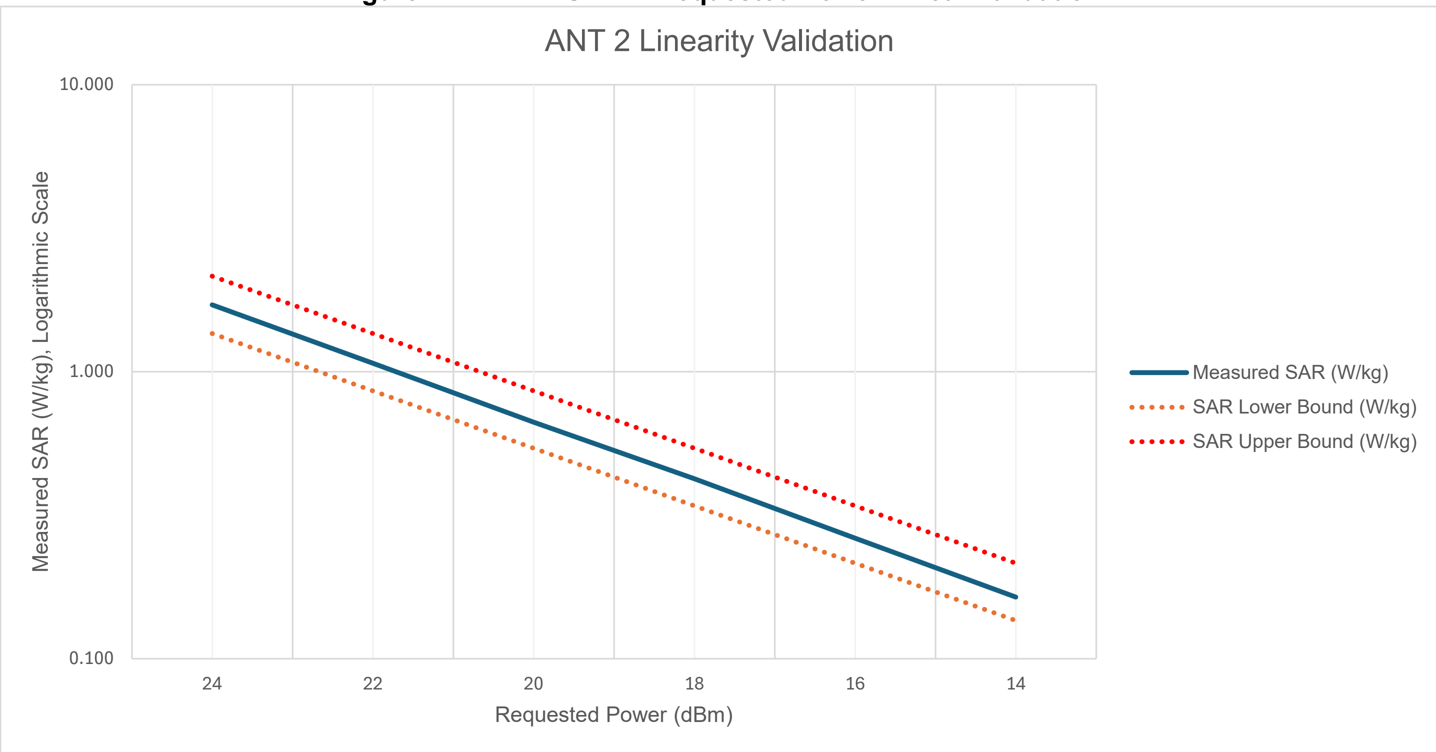
4.2. ANT 2

The table and figure below demonstrate that the linearity is sufficiently validated as the SAR versus requested power is within the expected uncertainties.

Table 4-2: ANT 2 SAR v. Requested Power

Transmitter	Technology	Uncert. (+)	Uncert. (-)	P_{Max}	P_{Limit}	Req. Power (dBm)	Req. Power (mW)	Meas. SAR (W/kg)	SAR Lower Bound	SAR Upper Bound
ANT 2	LTE B7 PC3	1.0	-1.0	25.7	19.2	24	251.2	1.710	1.358	2.153
						22	158.5	1.070	0.857	1.358
						20	100.0	0.667	0.541	0.857
						18	63.1	0.424	0.341	0.541
						16	39.8	0.263	0.215	0.341
						14	25.1	0.164	0.136	0.215

Figure 4-2: ANT 2 SAR v. Requested Power Linear Validation



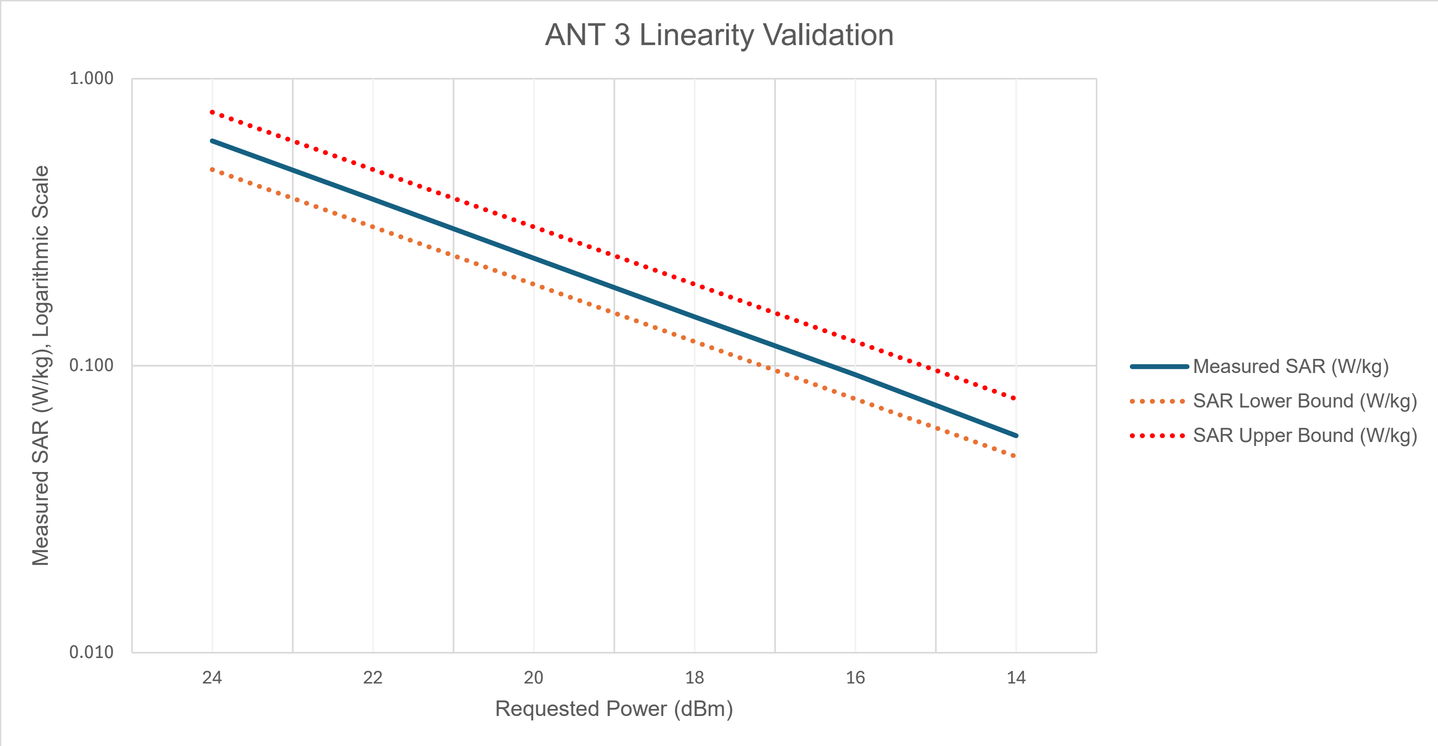
4.3. ANT 3

The table and figure below demonstrate that the linearity is sufficiently validated as the SAR versus requested power is within the expected uncertainties.

Table 4-3: ANT 3 SAR v. Requested Power

Transmitter	Technology	Uncert. (+)	Uncert. (-)	P_{Max}	P_{Limit}	Req. Power (dBm)	Req. Power (mW)	Meas. SAR (W/kg)	SAR Lower Bound	SAR Upper Bound
ANT 3	LTE B66 PC3	1	-1	25.7	22.8	24	251.2	0.608	0.483	0.765
						22	158.5	0.380	0.305	0.483
						20	100.0	0.237	0.192	0.305
						18	63.1	0.148	0.121	0.192
						16	39.8	0.093	0.077	0.121
						14	25.1	0.057	0.048	0.077

Figure 4-3: ANT 3 SAR v. Requested Power Linear Validation



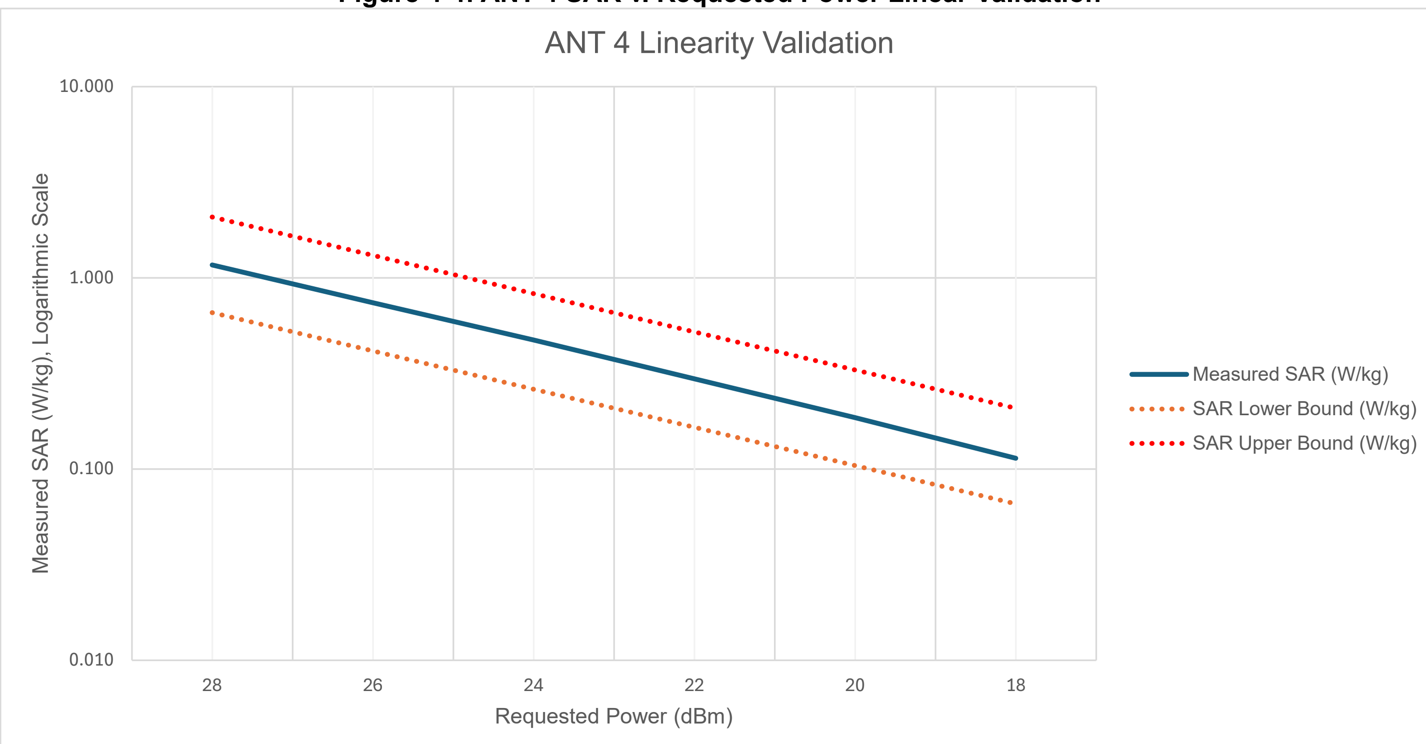
4.4. ANT 4

The table and figure below demonstrate that the linearity is sufficiently validated as the SAR versus requested power is within the expected uncertainties.

Table 4-4: ANT 4 SAR v. Requested Power

Transmitter	Technology	Uncert. (+)	Uncert. (-)	P_{Max}	P_{Limit}	Req. Power (dBm)	Req. Power (mW)	Meas. SAR (W/kg)	SAR Lower Bound	SAR Upper Bound
ANT 4	GSM 1900 GMSK 2 Slot(s)	2.5	-2.5	29.5	29.1	28	631.0	1.170	0.658	2.081
						26	398.1	0.741	0.415	1.313
						24	251.2	0.473	0.262	0.828
						22	158.5	0.297	0.165	0.523
						20	100.0	0.186	0.104	0.330
						18	63.1	0.114	0.066	0.208

Figure 4-4: ANT 4 SAR v. Requested Power Linear Validation



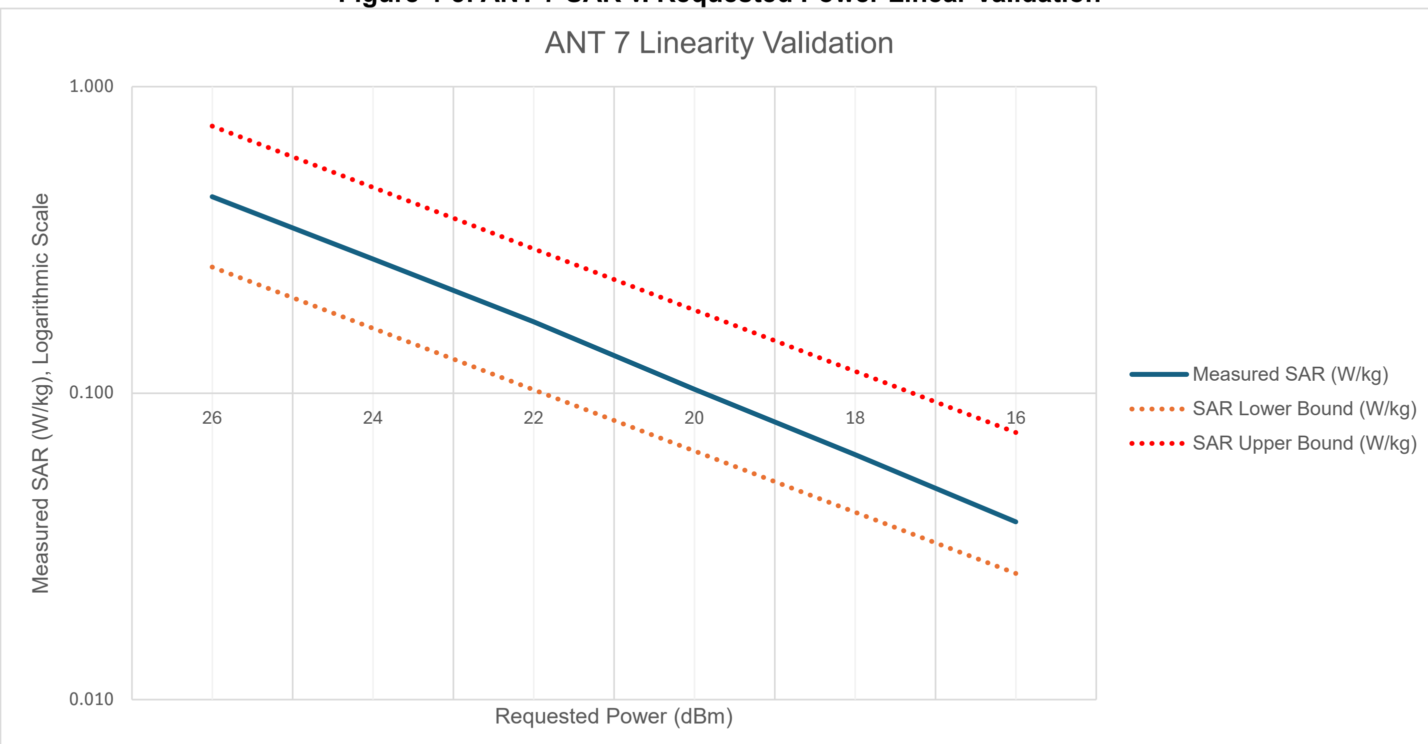
4.5. ANT 7

The table and figure below demonstrate that the linearity is sufficiently validated as the SAR versus requested power is within the expected uncertainties.

Table 4-5: ANT 7 SAR v. Requested Power

Transmitter	Technology	Uncert. (+)	Uncert. (-)	P_{Max}	P_{Limit}	Req. Power (dBm)	Req. Power (mW)	Meas. SAR (W/kg)	SAR Lower Bound	SAR Upper Bound
ANT 7	LTE B48 PC3	2.3	-2.3	26	23.2	26	398.1	0.438	0.258	0.744
						24	251.2	0.274	0.163	0.469
						22	158.5	0.171	0.103	0.296
						20	100.0	0.103	0.065	0.187
						18	63.1	0.063	0.041	0.118
						16	39.8	0.038	0.026	0.074

Figure 4-5: ANT 7 SAR v. Requested Power Linear Validation



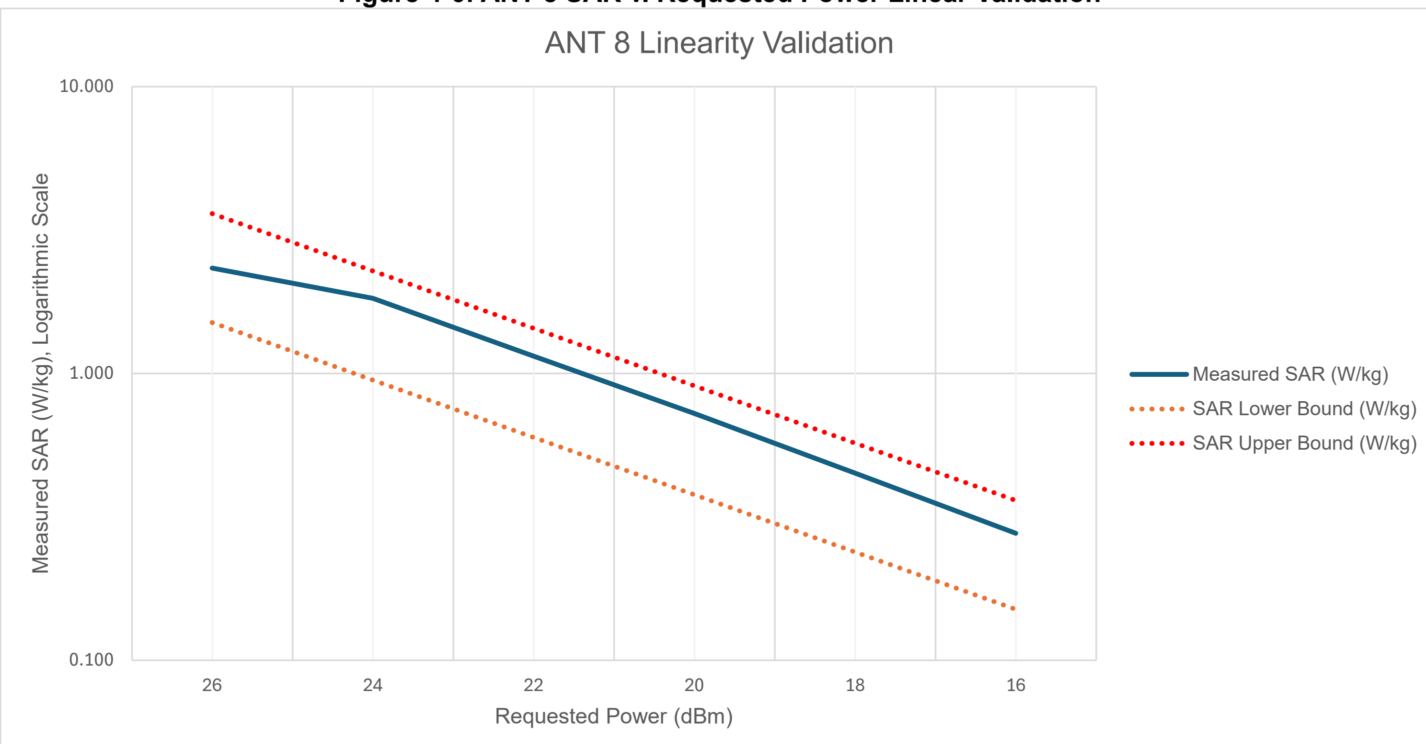
4.6. ANT 8

The table and figure below demonstrate that the linearity is sufficiently validated as the SAR versus requested power is within the expected uncertainties.

Table 4-6: ANT 8 SAR v. Requested Power

Transmitter	Technology	Uncert. (+)	Uncert. (-)	P_{Max}	P_{Limit}	Req. Power (dBm)	Req. Power (mW)	Meas. SAR (W/kg)	SAR Lower Bound	SAR Upper Bound
ANT 8	FR1 n77 (Block A) PC3	1.9	-1.9	26	22.5	26	398.1	2.330	1.504	3.609
						24	251.2	1.830	0.949	2.277
						22	158.5	1.150	0.599	1.437
						20	100.0	0.725	0.378	0.906
						18	63.1	0.449	0.238	0.572
						16	39.8	0.277	0.150	0.361

Figure 4-6: ANT 8 SAR v. Requested Power Linear Validation



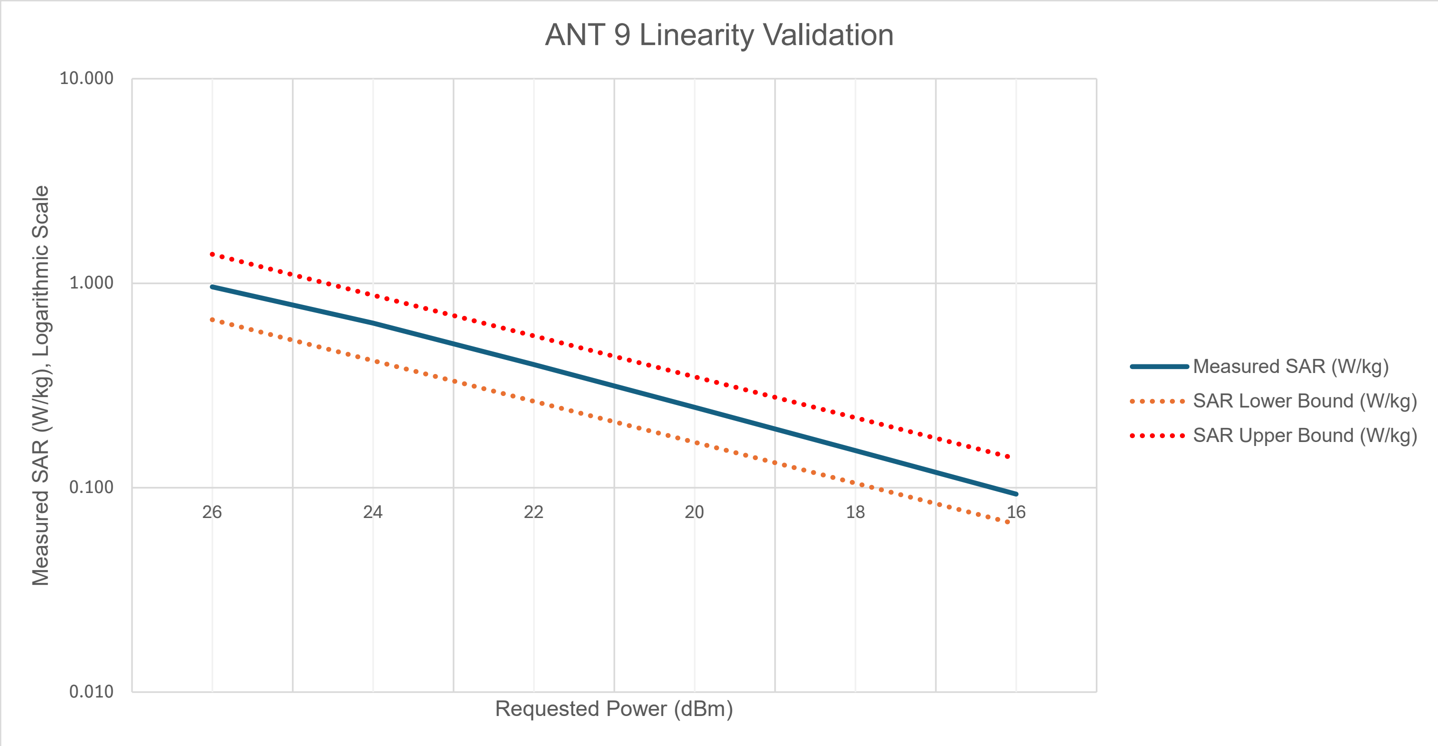
4.7. ANT 9

The table and figure below demonstrate that the linearity is sufficiently validated as the SAR versus requested power is within the expected uncertainties.

Table 4-7: ANT 9 SAR v. Requested Power

Transmitter	Technology	Uncert. (+)	Uncert. (-)	P_{Max}	P_{Limit}	Req. Power (dBm)	Req. Power (mW)	Meas. SAR (W/kg)	SAR Lower Bound	SAR Upper Bound
ANT 9	FR1 n77 (Block C) PC3	1.6	-1.6	26	22.2	26	398.1	0.959	0.663	1.386
						24	251.2	0.638	0.419	0.875
						22	158.5	0.400	0.264	0.552
						20	100.0	0.247	0.167	0.348
						18	63.1	0.152	0.105	0.220
						16	39.8	0.093	0.066	0.139

Figure 4-7: ANT 9 SAR v. Requested Power Linear Validation



5. TAS Validation

5.1. Conducted

5.1.1. Test Sequences

The TAS algorithm shall be validated when the base station requests different power levels to manage the link budget.

Requested power measurements shall be performed for at least one band per technology. The P_{Limit} value associated with the chosen band should be several dB lower than the corresponding value of P_{Max}, i.e. 2 to 4 dB lower. Whenever possible, the same band should not be repeated for different technologies. Frequency-division duplexing (FDD) and time-division duplexing (TDD) configurations shall be treated as separate technologies.

5.1.1.1. Start-up Test Sequences

5.1.1.1.1. Test Sequence A (1a)

Upon start-up, request a power level of $P_{Max,\ nom}$ for a period of at least 400 seconds, followed by $0.5 \cdot P_{Limit,\ nom}$ for a period of at least 400 seconds. The following figure demonstrates Test Sequence A (1a) with P[n] per region's timing window:

5.1.1.1.2. Test Sequence B (1b)

Upon start-up, request a power level of 1 mW (0 dBm) for a period of at least 400 seconds, followed by $P_{Max,\ nom}$ for a period of at least 400 seconds. The following figure demonstrates Test Sequence B (1b) with P[n] per region's timing window.

5.1.1.2. Pseudo-random Test Sequence

A pseudo-random sequence of power requests shall be applied to validate the dynamic behavior of the TAS algorithm. Each test shall be performed with a unique sequence of 150 independent power requests. These power levels are calculated as follows (Equation 1):

Equation 1: Power Level Equation

$$P_{req} = P_{Max,nom}\left(\frac{P_{Limit,nom}}{P_{Max,nom}}\right)^{x}$$

where P_{req} is the requested power in watts and x is a random value drawn from the Weibull distribution with shape and scale parameters of 2.0 and 0.8 respectively. These values were chosen to ensure that P_{req} exceeds $P_{Limit,nom}$ on average, while maintaining a reasonable likelihood that some P_{req} values will sometimes fall well below $P_{Limit,nom}$.

The corresponding request durations are given by (Equation 2):

Equation 2: P_{req} Durations

$$T_{req} = 2(1 + 2y)$$

where T_{req} is the duration of the power request in seconds and y is a uniformly distributed random value between 0 and 1.

5.1.1.3. Antenna and Duplex Switch

Requested power measurements shall be performed to validate the TAS algorithm in antenna- and duplex-switching scenarios. Maximum power shall be requested from the EUT throughout the test. The switch between antennas and duplexes shall occur once the TAS algorithm has reached steady state for the first antenna and duplex, and the test shall conclude once the algorithm has reached steady state for the second antenna and duplex.

When different P_{Limit} and P_{Max} values are associated with each transmitting antenna and duplex, consideration shall be given to the combinations of antennas/duplexes and operating state(s) for which the P_{Limit} values are several dB below the corresponding P_{Max} values, i.e., 2 to 4 dB lower. Of these combinations, the performance of the TAS algorithm shall be validated when the EUT switches from the antenna and duplex with the highest P_{Limit} value to that with the lowest.

5.1.1.4. Change in Device State

Requested power measurements shall be performed to validate the TAS algorithm when the EUT changes between operating states with different P_{Limit} values, e.g., when sensors or other mechanisms are used to change operating states. Maximum power shall be requested from the DUT throughout the test. The change in operating state shall occur once the TAS algorithm has reached steady state for the first operating state, and the test shall conclude once the algorithm has reached steady state for the second operating state.

The TAS algorithm shall be validated for the following changes in operating state:

- Among the operating states for which the P_{Limit} values are several dB below the corresponding P_{Max} values, i.e., 2 to 4 dB lower, changing from one operating state to another with a lower P_{Limit} value.

5.1.1.5. Change in Technology and Band

Requested power measurements shall be performed to validate the TAS algorithm when the DUT switches between frequency bands and technologies with different P_{Limit} values. Maximum power shall be requested from the DUT throughout the test. The change in frequency band and technology shall occur once the TAS algorithm has reached steady state for the first band/technology, and the test shall conclude once the algorithm has reached steady state for the second band/technology.

The TAS algorithm shall be validated for the following changes in frequency band and technology:

- Among the frequency band and technology, configurations for which the P_{Limit} values are several dB below the corresponding P_{Max} values, i.e., 2 to 4 dB lower, changing from one frequency band and technology to another with a lower P_{Limit} value.

5.1.1.6. Call Drop

Requested power measurements shall be performed to validate the TAS algorithm during dropped connections to ensure the algorithm is able to account for previous connection states. Only one test is required with one of the configurations for which P_{Limit} is 2 to 4 dB below P_{Max}. Maximum power shall be requested from the DUT throughout the test. The dropped connection shall occur once the TAS algorithm has reached steady state, and the test shall conclude once steady state has been regained after the dropped connection.

5.1.1.7. MSS

A continuity test sequence validates the transition of MSS to Cellular to MSS, where a single configuration is selected for MSS and Cellular. Maximum power is requested from the DUT throughout the test.

5.1.1.8. EN-DC

EN-DC operation is validated by performing a single test sequence. A transition is initiated from cellular operation at all down bits/lowest power configuration + FR1 requesting P_{Max} to cellular requesting P_{Max} + FR1 requesting P_{Max} to cellular requesting P_{Max} + FR1 at all down bits/lowest power configuration.

5.1.1.9. ULCA

ULCA operation is validated by performing a single test sequence. A transition is initiated from PCC at 0 dBm + SCC at P_{Max} to PCC at P_{Max} + SCC at 0 dBm to PCC at P_{Max} + SCC at P_{Max}.

5.1.2. Test Case Validation

Validation plots are included for the applicable test cases for this DUT. These plots serve to validate the operation of this cellular TAS algorithm by ensuring that the measured power averaged over the applicable regulatory limit (P[n]) is always maintained below the defined P_{Limit}.

Requested power measurements (P_{Meas}) are used to validate all TAS test cases. In test cases where P_{Limit} remains constant, the equation, *Equation 3*, below is used to calculate the rolling time-averaged power for the nth time step (P[n]).

Equation 3: Rolling Time-averaged Power (Constant P_{Limit})

$$P[n] = \frac{1}{M}\sum_{m=0}^{M-1} P_{Meas}[n-m]$$

Where *M* is the total number of reporting periods per time-averaging window and *m* is the index of the time-averaging window. The TAS algorithm is validated when P[n] is maintained less than or equal to P_{Limit}.

In test cases where P_{Limit} is not constant, the equation, *Equation 4*, below is used to calculate the normalized rolling time-averaged power (p[n]).

Equation 4: Rolling Time-averaged Power (P_{Limit} not Constant)

$$p[n] = \frac{1}{M}\sum_{m=0}^{M-1} \frac{P_{Meas}[n-m]}{P_{Limit}[n-m]}$$

Where *M* is the total number of reporting periods per time-averaging window and *m* is the index of the time-averaging window. The TAS algorithm is validated when p[n] is maintained less than or equal to 1.

The test cases are summarized in the table below.

Table 5-1: Applicable Test Cases for FCC TAS Validation

Test Case	Test Group	Tech	Band	Antenna	Modulation	Exposure	Details	P_{Max}	P_{Limit}	$P_{Limit,meas}$	$SAR_{Limit,meas}$	SAR_{Limit}
1a	Time-varying Tx Power: Sequence A	LTE FDD	B7 PC3	ANT 2	QPSK	Head	Right Cheek | Ch.21350 | RB 100-0	25.7	19.2	17.9	0.874	1.179
1b	Time-varying Tx Power: Sequence B	GSM	1900	ANT 4	GMSK	Head	Left Cheek | Ch.661 | 2 Slot(s)	29.5	26.7	26.4	0.942	1.009
		W-CDMA	B4	ANT 1	QPSK	Body	Back (Offset) | Ch.1513	25.7	21.8	21.3	1.020	1.144
		LTE FDD	B7 PC3	ANT 2	QPSK	Head	Right Cheek | Ch.21350 | RB 100-0	25.7	19.2	17.9	0.874	1.179
		LTE TDD	B41 PC3	ANT 4	QPSK	Head	Left Cheek | Ch.41055 | RB 100-0	25.7	20.7	19.0	0.774	1.145
		FR1 FDD	n7 PC3	ANT 4	π/2 BPSK	Body	Edge Right | Ch.507000 | RB 1-1	24.7	19.6	18.1	0.803	1.134
		FR1 TDD	n77 (Block C) PC3	ANT 8	π/2 BPSK	Body	Edge Left | Ch.657200 | RB 1-1	26.0	20.0	19.1	0.785	0.966
1c	Time-varying Tx Power: Pseudo-Random Sequence	LTE FDD	B7 PC3	ANT 2	QPSK	Head	Right Cheek | Ch.21350 | RB 100-0	25.7	19.2	17.9	0.874	1.179
2	Antenna/Duplex Switch	LTE FDD	B7 PC3	ANT 2	QPSK	Head	Right Cheek | Ch.21350 | RB 100-0	25.7	19.2	17.9	0.874	1.179
		LTE TDD	B48 PC3	ANT 4	QPSK	Head	Left Cheek | Ch.55340 | RB 1-49	24.4	21.1	19.5	0.814	1.177
3	Change in Device State	LTE FDD	B7 PC3	ANT 2	QPSK	Head	Right Cheek | Ch.21350 | RB 100-0	25.7	19.2	17.9	0.874	1.179
		LTE FDD	B7 PC3	ANT 2	QPSK	Body	Edge Left | Ch.21100 | RB 100-0	25.7	22.1	20.2	0.710	1.100
4	Change in Technology/Band	W-CDMA	B2	ANT 4	QPSK	Head	Left Cheek | Ch.9262	25.2	20.4	19.7	0.976	1.147
		LTE FDD	B7 PC3	ANT 4	QPSK	Head	Left Cheek | Ch.21100 | RB 100-0	24.7	18.4	17.0	0.764	1.055
5	Call Drop	LTE FDD	B7 PC3	ANT 2	QPSK	Head	Right Cheek | Ch.21350 | RB 100-0	25.7	19.2	17.9	0.874	1.179
MSS	Time-varying Tx Power	MSS	(L-Band)	ANT 2	BPSK	Body	Edge Left | Ch.Mid	27.7	26.0	25.2	0.564	0.678
		LTE FDD	B66 PC3	ANT 3	QPSK	Body	Back | Ch.132072 | RB 1-49	25.7	22.8	22.4	0.900	0.987
EN-DC		LTE FDD	66A	ANT 1	QPSK	Head	Right Cheek | Ch.132322 | RB 1-49	25.7	25.7	24.5	0.242	0.319
		FR1 FDD	n25A	ANT 3	π/2 BPSK	Head	Left Cheek | Ch.376500 | RB 1-1	25.7	25.7	24.2	0.157	0.222
ULCA		LTE FDD	5A	ANT 3	QPSK	Head	Left Cheek | Ch.20525 | RB 1-25	25.7	25.7	24.0	0.148	0.219
		LTE FDD	66A	ANT 2	QPSK	Head	Right Cheek | Ch.132322 | RB 100-0	25.7	21.5	20.9	0.993	1.140

The following figures outline the test setup for the applicable test cases:

Figure 5-1: Time-varying, Call Drop, and OBD/OPS Switch

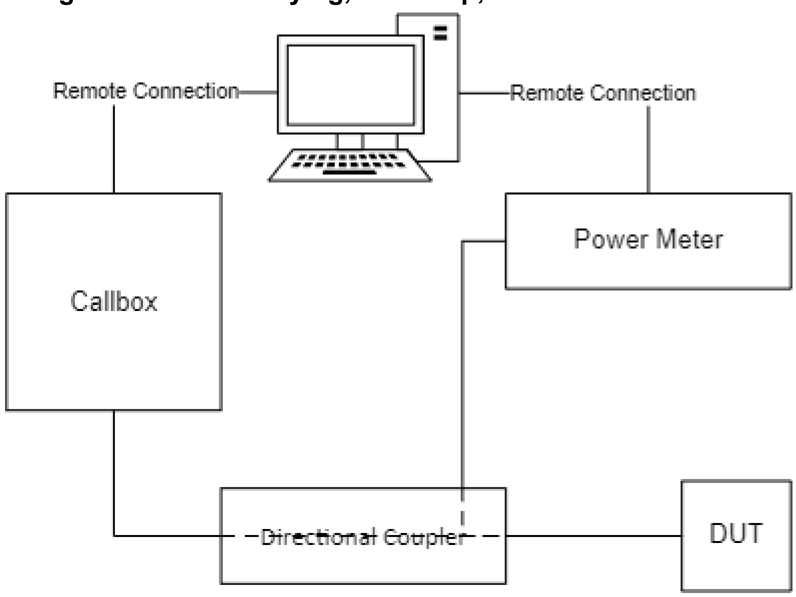


Figure 5-2: Antenna and Technology/Band Switching

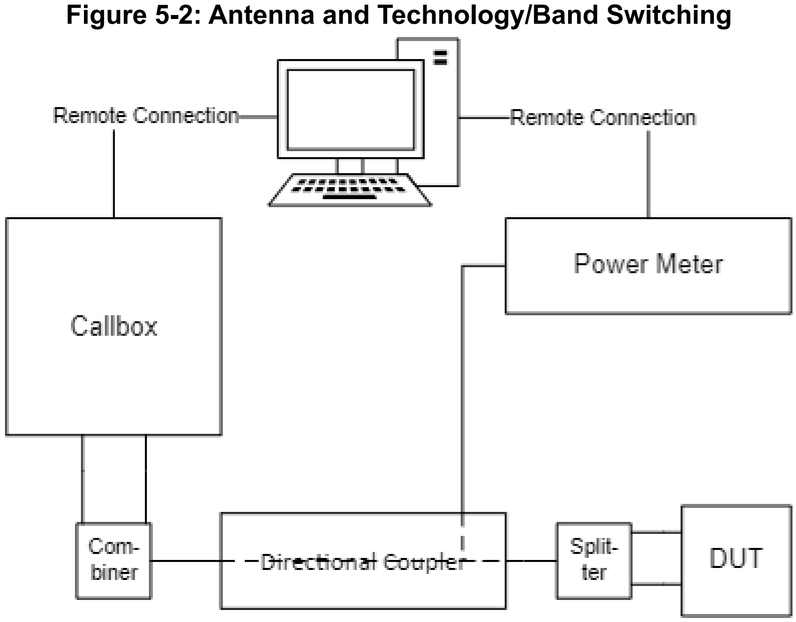
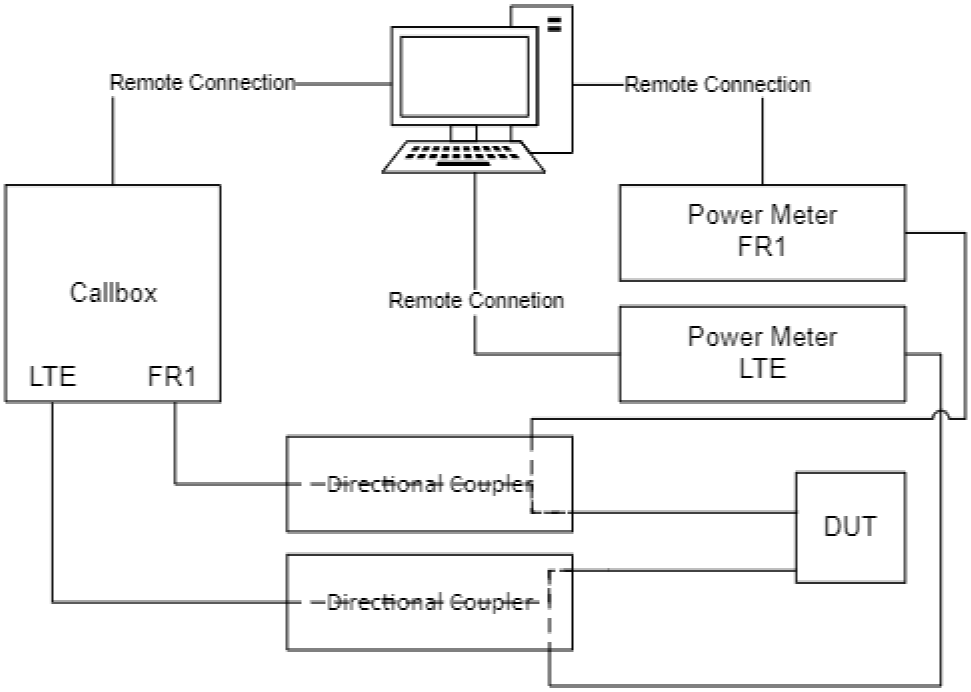


Figure 5-3: EN-DC and ULCA



5.1.2.1. Test Case 1a

5.1.2.1.1. LTE FDD

Figure 5-4: LTE FDD Start-up Sequence 1a

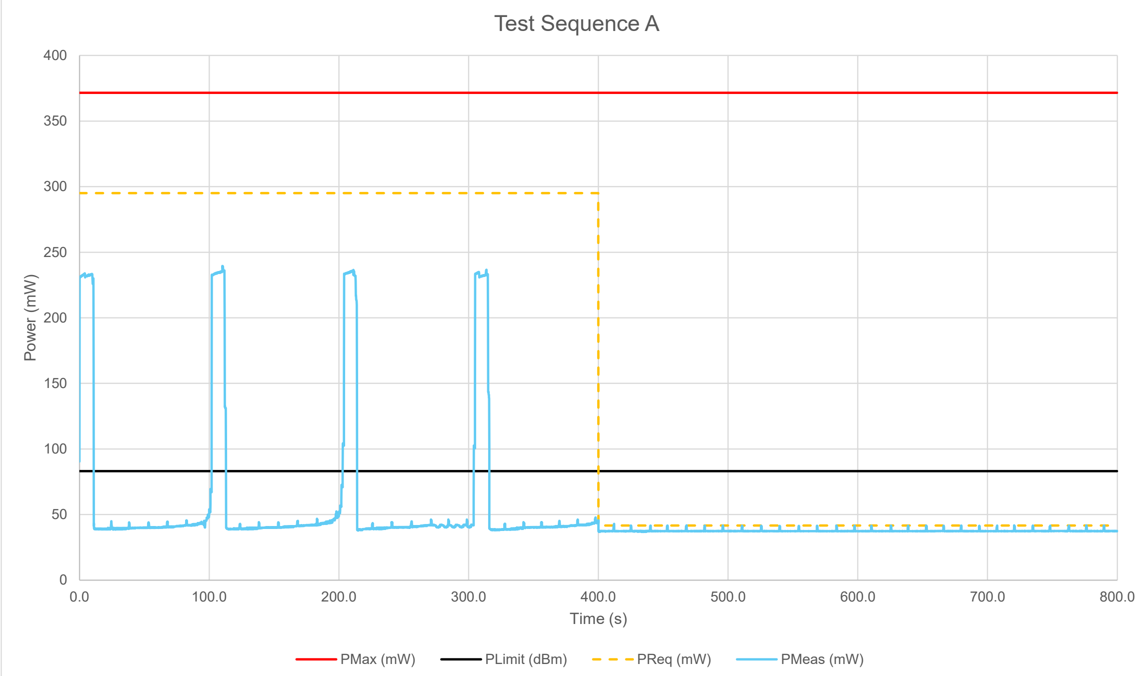
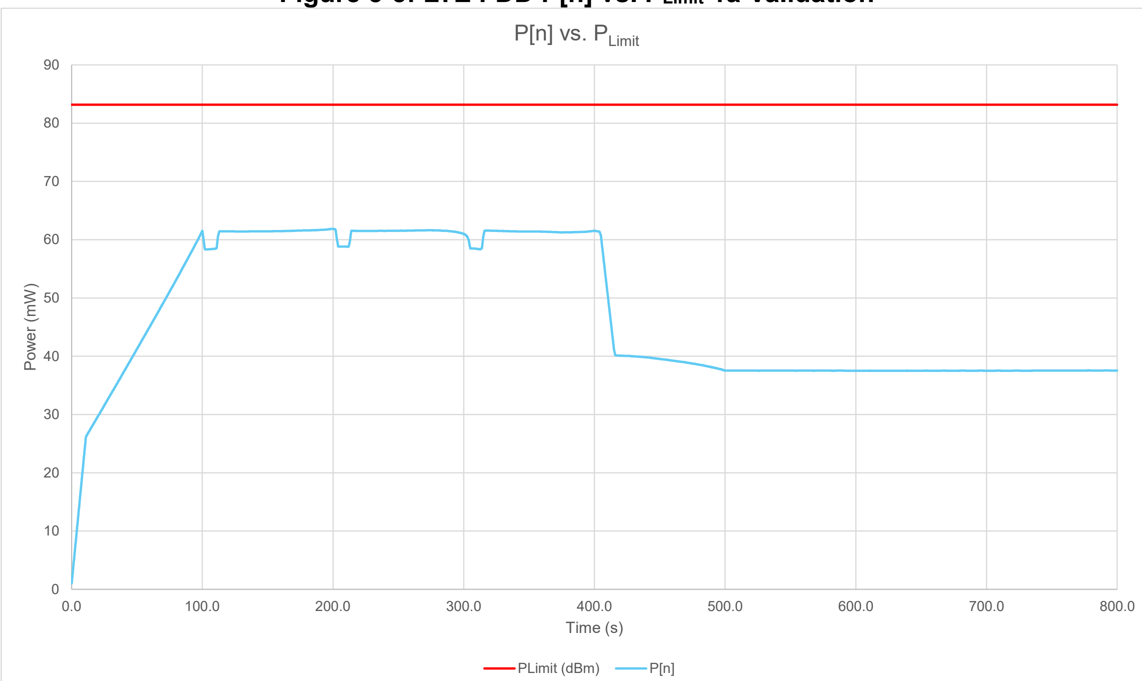


Figure 5-5: LTE FDD P[n] vs. P_{Limit} 1a Validation



	Validation
$P[n] \leq P_{Limit}$	$61.8 \leq 83.2$

P[n] was calculated using the 100 second time-averaging duration.

5.1.2.2. Test Case 1b

5.1.2.2.1. GSM

Figure 5-6: GSM Start-up Sequence 1b

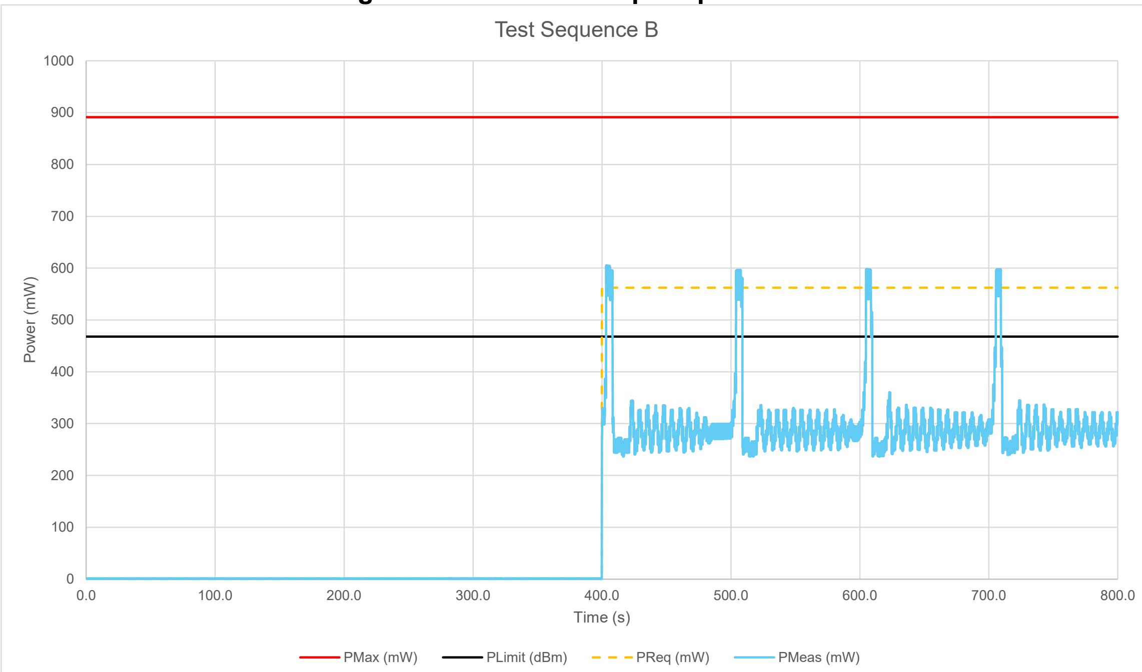
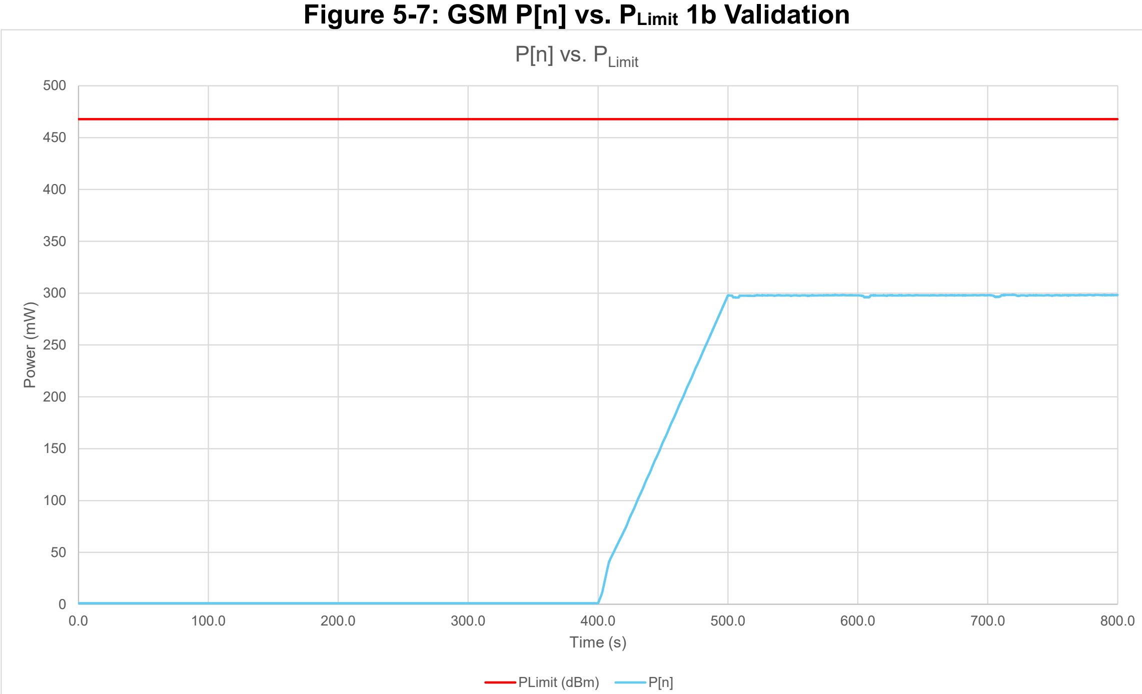


Figure 5-7: GSM P[n] vs. P_{Limit} 1b Validation



	Validation
$P[n] \le P_{Limit}$	$298.4 \le 467.7$

P[n] was calculated using the 100 second time-averaging duration.

5.1.2.2.2. W-CDMA

Figure 5-8: W-CDMA Start-up Sequence 1b

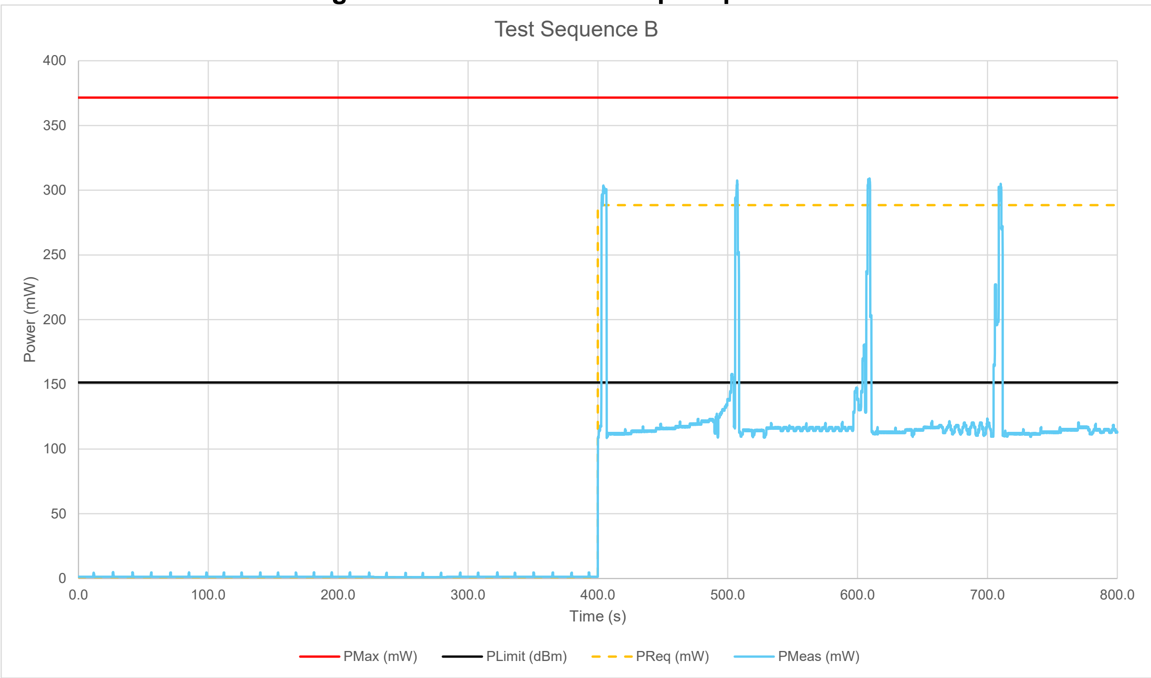
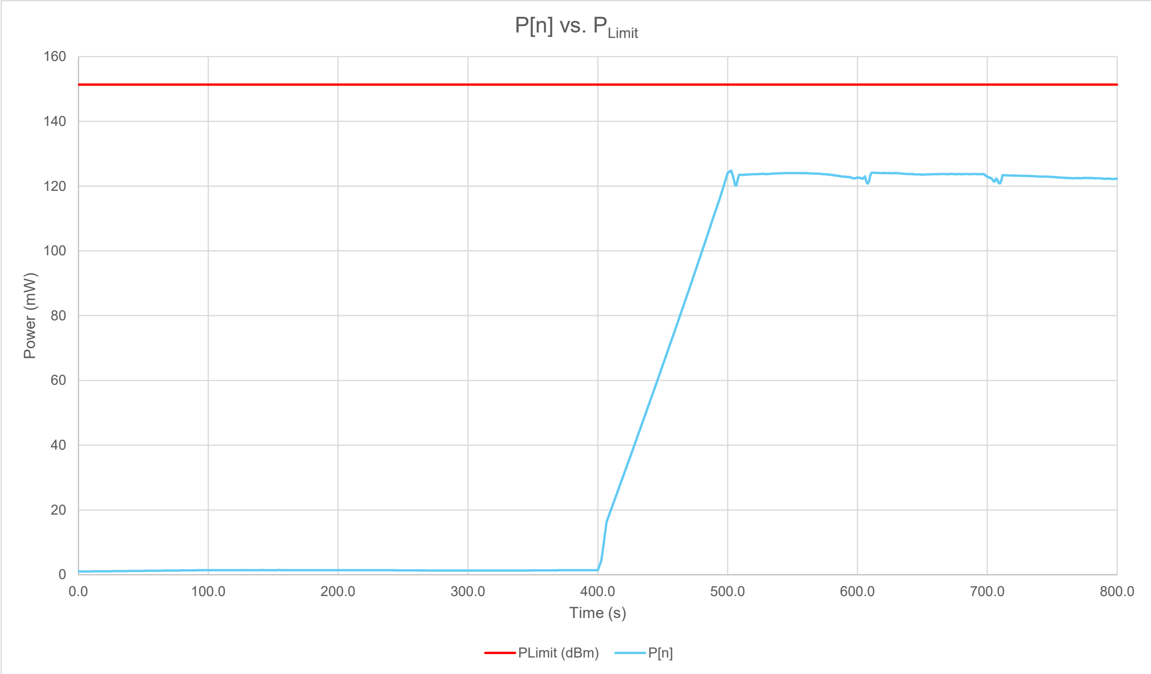


Figure 5-9: W-CDMA P[n] vs. P_{Limit} 1b Validation



	Validation
$P[n] \leq P_{Limit}$	$124.8 \leq 151.4$

P[n] was calculated using the 100 second time-averaging duration.

5.1.2.2.3. LTE FDD

Figure 5-10: LTE FDD Start-up Sequence 1b

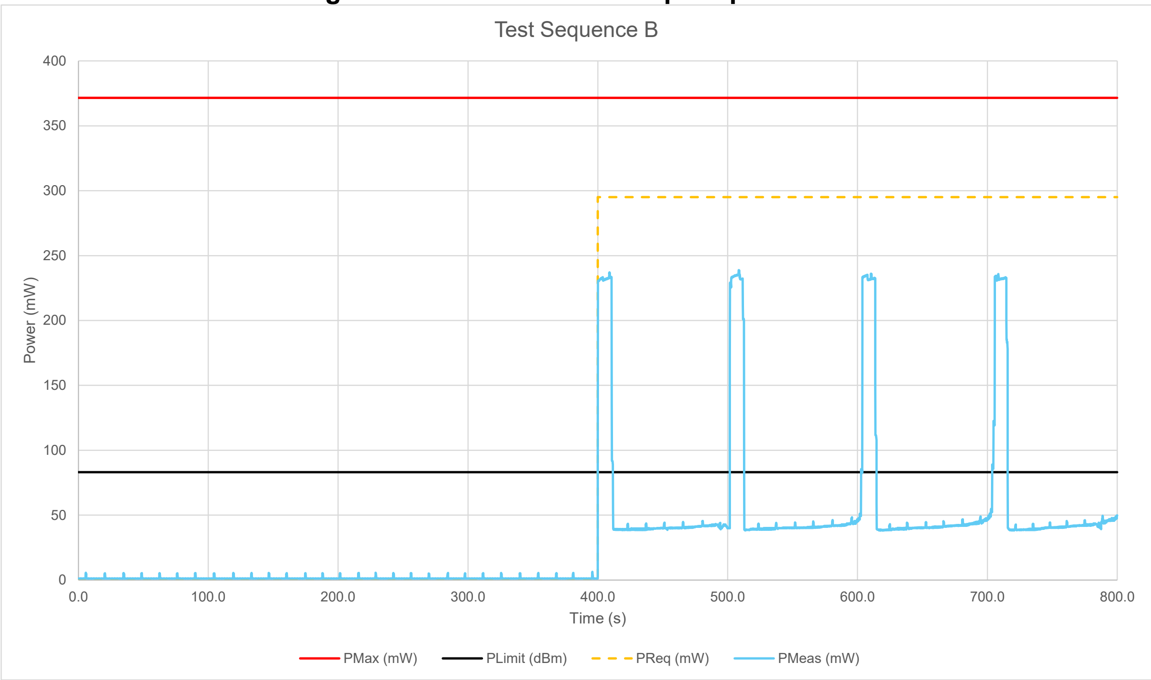
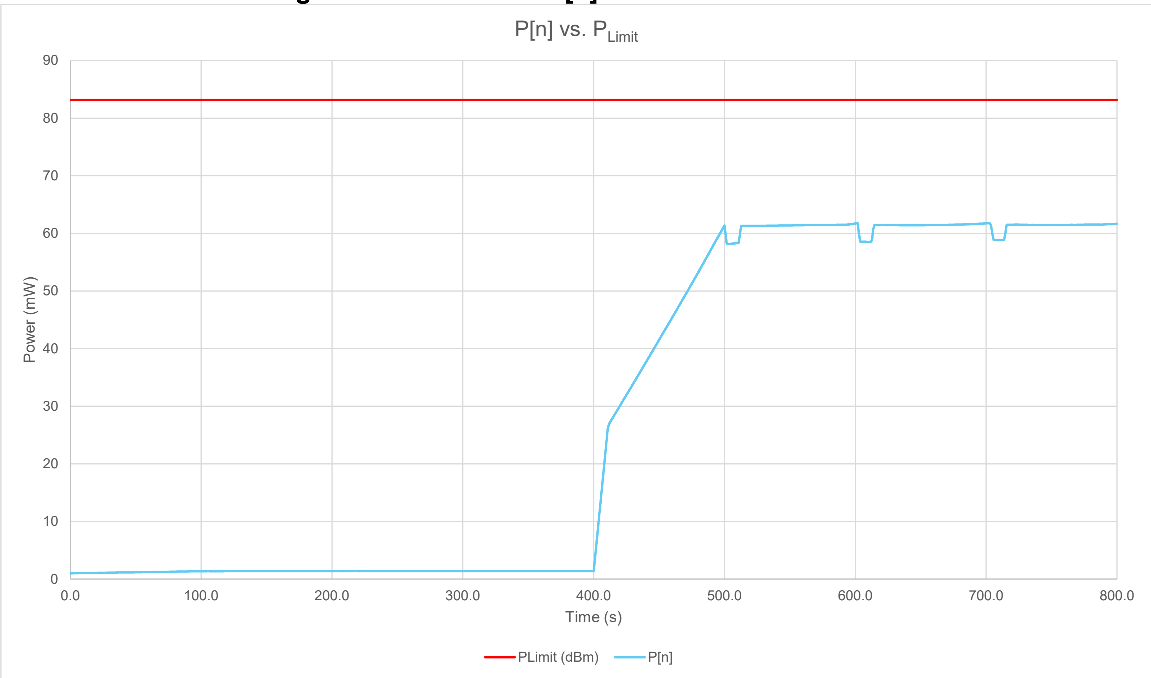


Figure 5-11: LTE FDD P[n] vs. P_{Limit} 1b Validation



	Validation
$P[n] \le P_{Limit}$	$61.8 \le 83.2$

P[n] was calculated using the 100 second time-averaging duration.

5.1.2.2.4. LTE TDD

Figure 5-12: LTE TDD Start-up Sequence 1b

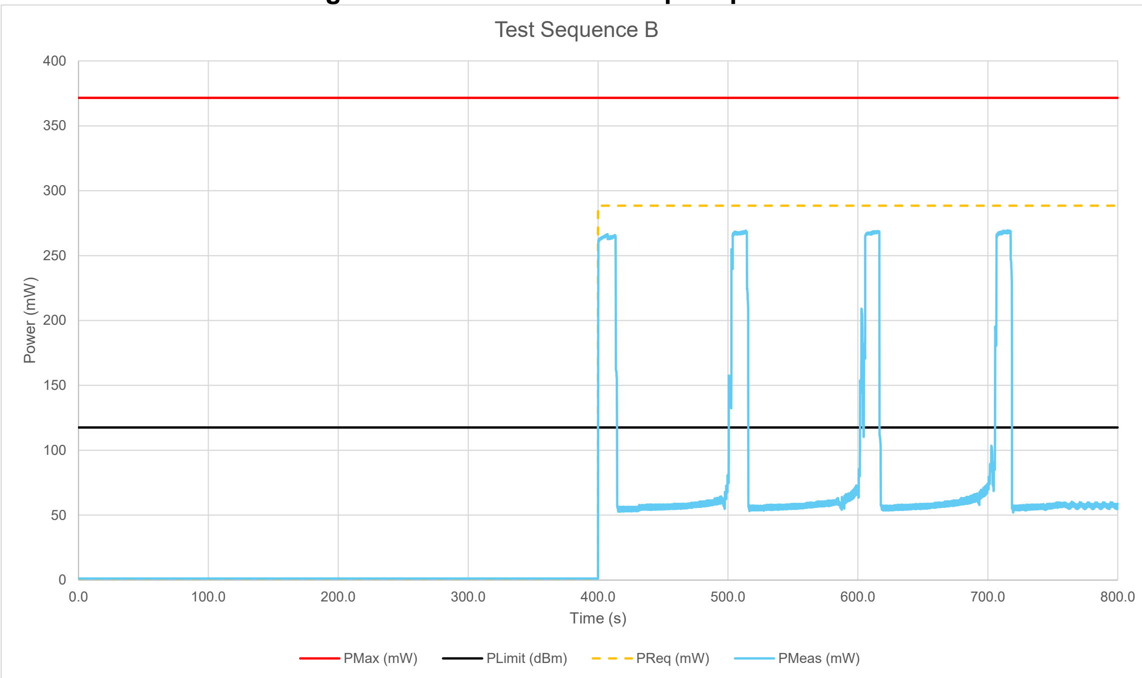
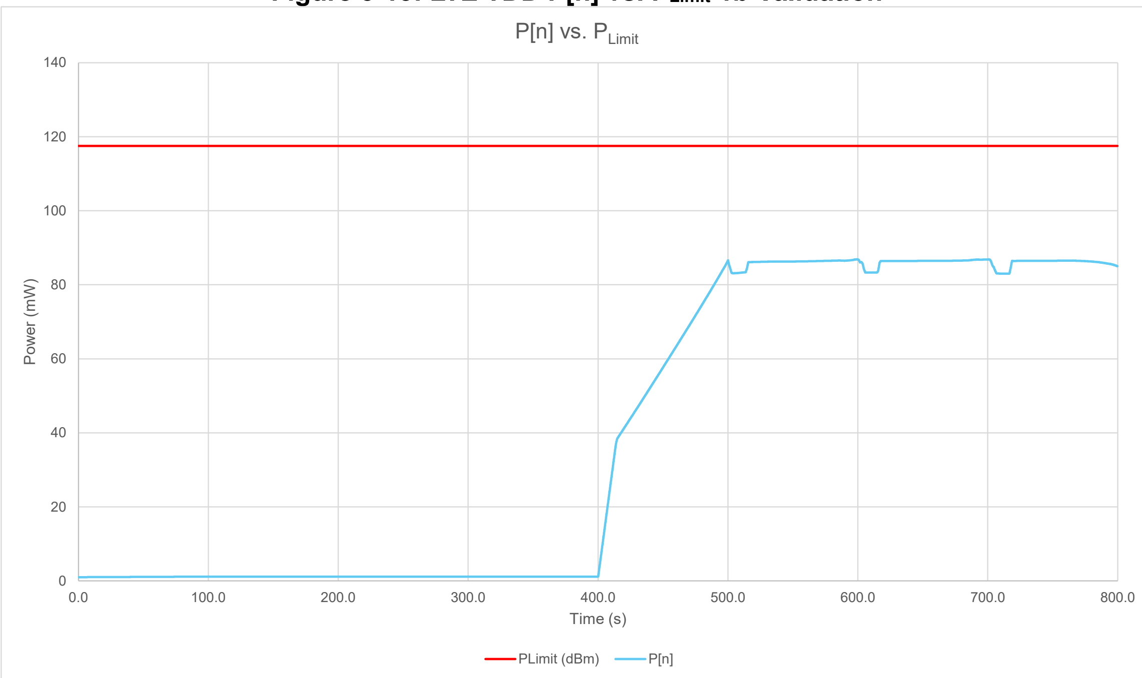


Figure 5-13: LTE TDD P[n] vs. P_{Limit} 1b Validation



	Validation
P[n] ≤ P_{Limit}	86.9 ≤ 117.5

P[n] was calculated using the 100 second time-averaging duration.

5.1.2.2.5. FR1 FDD

Figure 5-14: FR1 FDD Start-up Sequence 1b

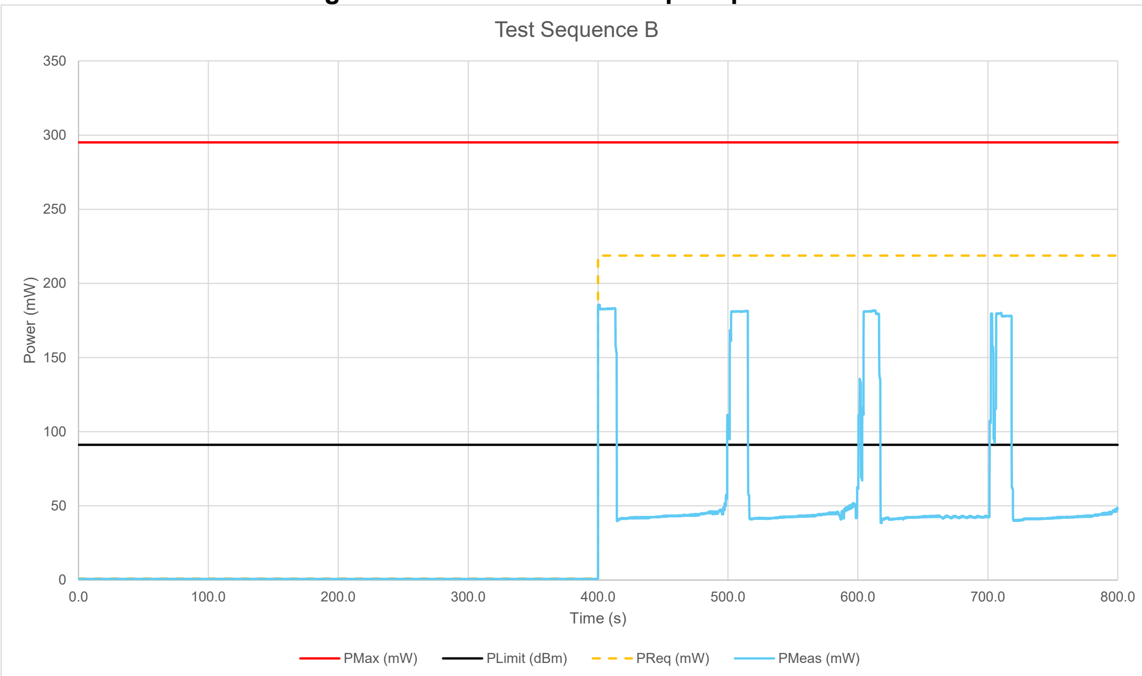
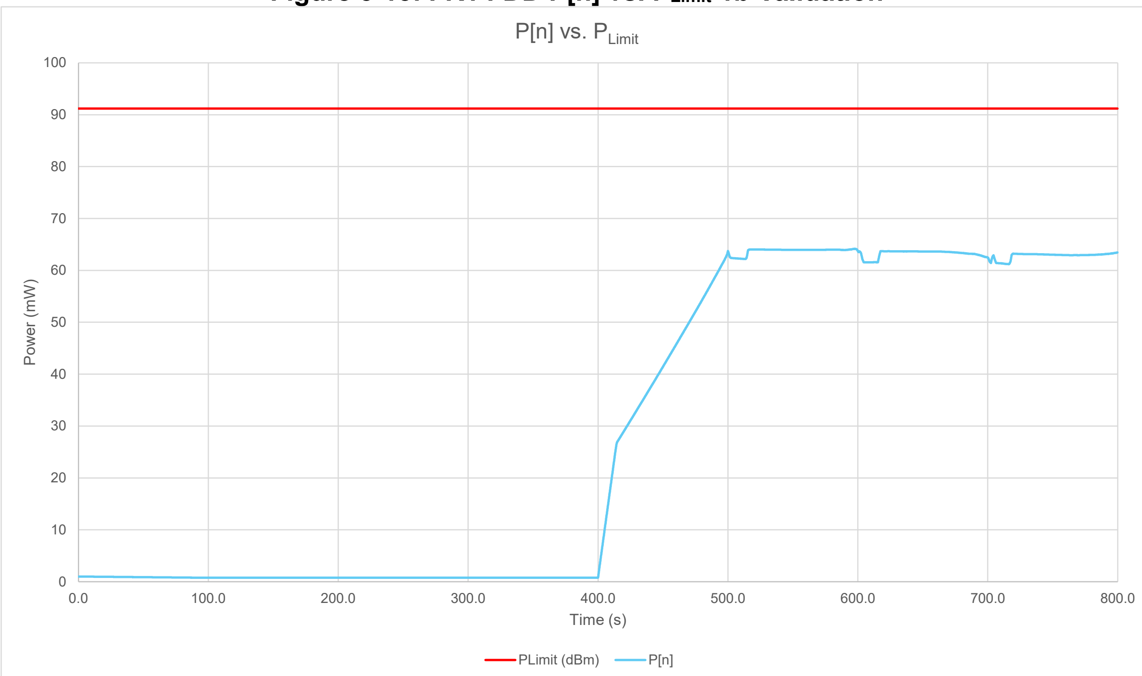


Figure 5-15: FR1 FDD P[n] vs. P_{Limit} 1b Validation



	Validation
$P[n] \leq P_{Limit}$	64.2 ≤ 91.2

P[n] was calculated using the 100 second time-averaging duration.

5.1.2.2.6. FR1 TDD

Figure 5-16: FR1 TDD Start-up Sequence 1b

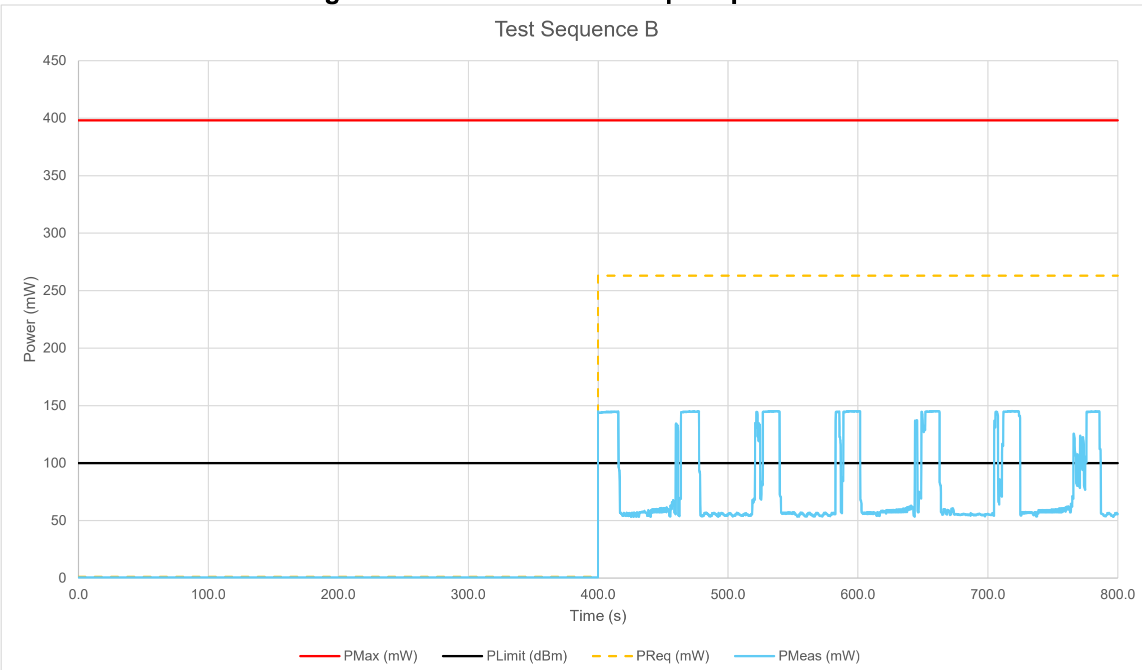
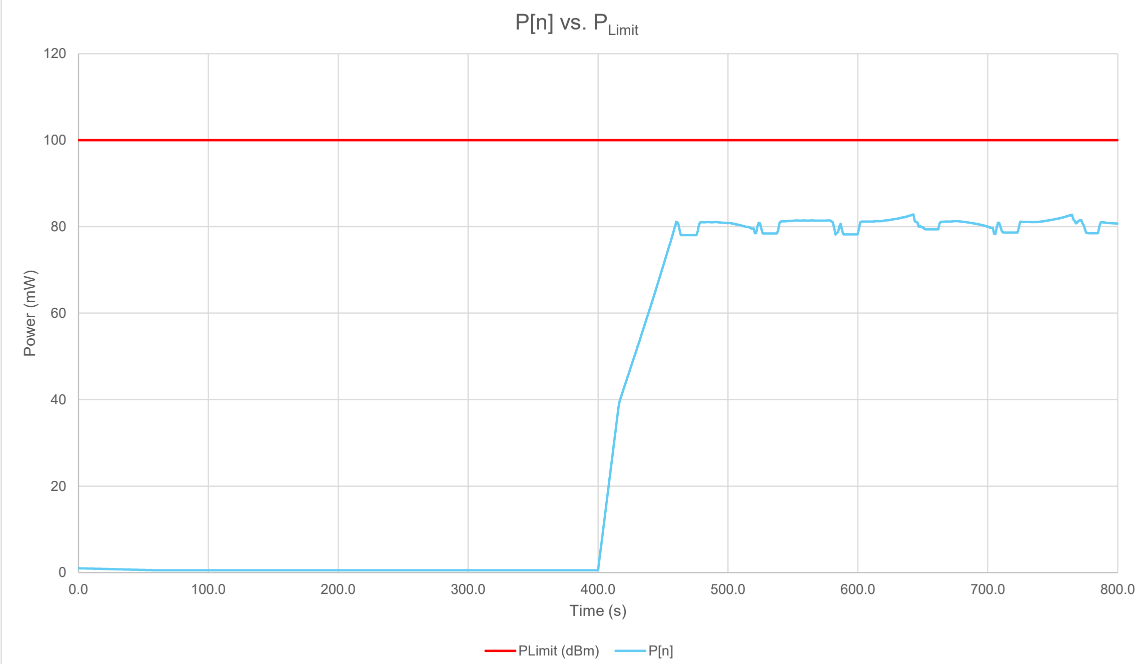


Figure 5-17: FR1 TDD P[n] vs. P_{Limit} 1b Validation



	Validation
$P[n] \leq P_{Limit}$	$82.8 \leq 100$

P[n] was calculated using the 60 second time-averaging duration.

5.1.2.3. Test Case 1c

5.1.2.3.1. LTE FDD

Figure 5-18: LTE FDD Pseudo-random Sequence 1c

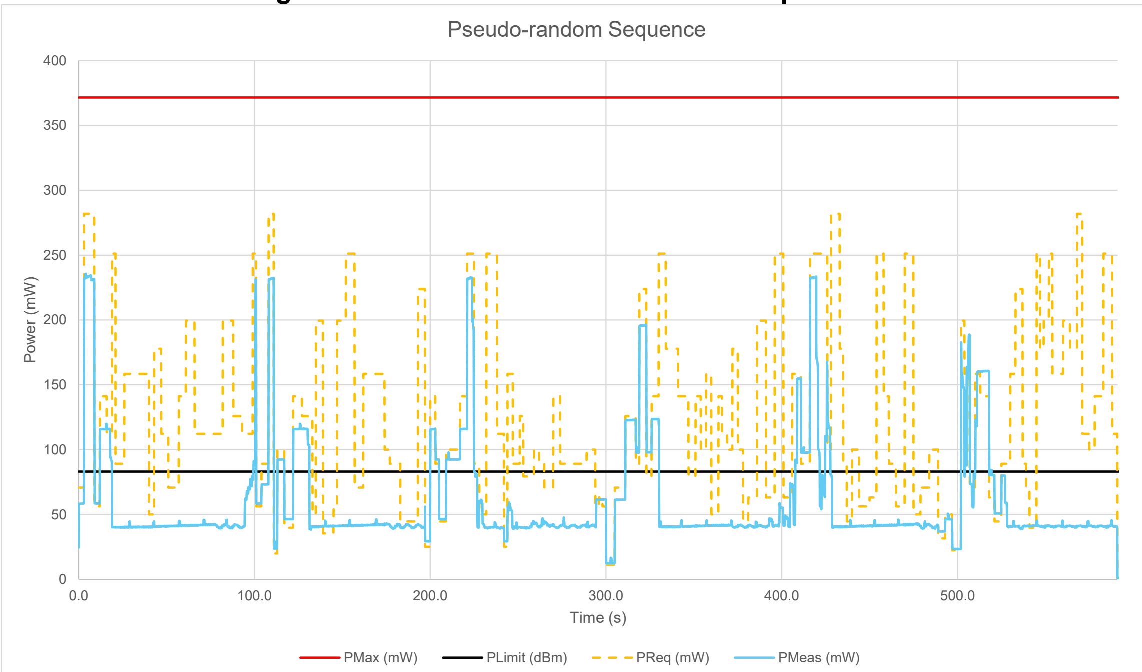
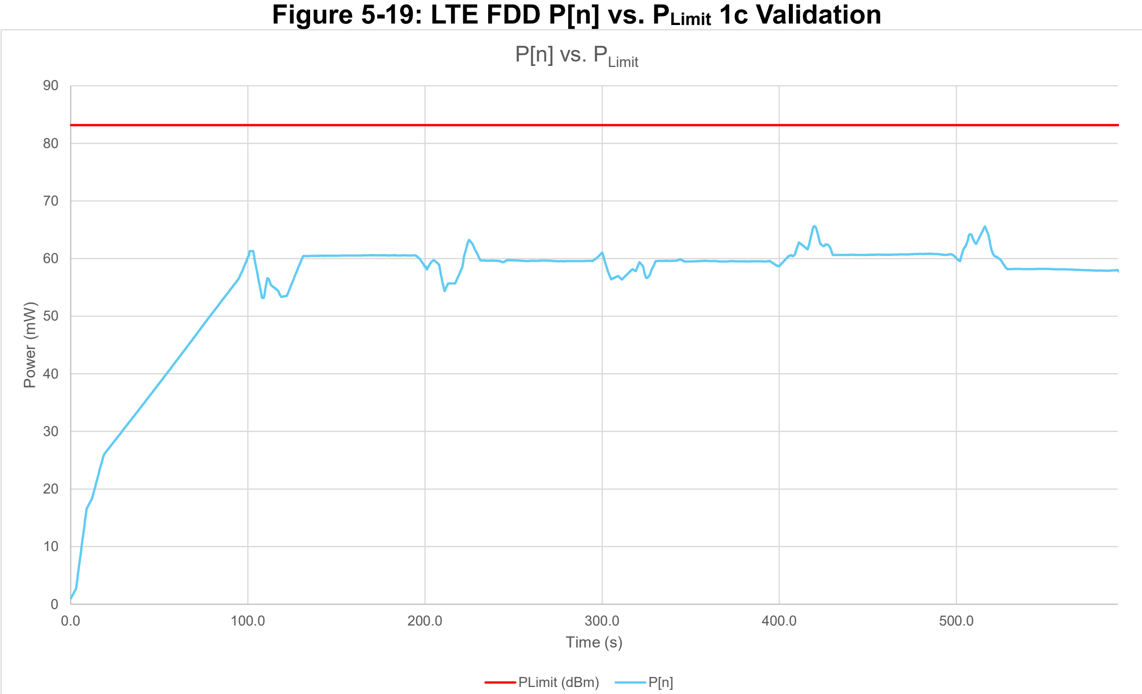


Figure 5-19: LTE FDD P[n] vs. P_{Limit} 1c Validation



	Validation
P[n] ≤ P_{Limit}	65.6 ≤ 83.2

P[n] was calculated using the 100 second time-averaging duration.

Table 5-2: LTE FDD T_{Req} vs. P_{Req}

Index	T_{Req}	P_{Req}	Index	T_{Req}	P_{Req}	Index	T_{Req}	P_{Req}
0	3	70.8	50	4	100	100	5	63.1
1	6	281.8	51	4	100	101	5	158.5
2	3	56.2	52	4	141.3	102	5	89.1
3	4	141.3	53	4	251.2	103	4	251.2
4	3	112.2	54	3	89.1	104	6	251.2
5	2	251.2	55	4	50.1	105	2	100
6	5	89.1	56	6	251.2	106	5	281.8
7	5	158.5	57	4	112.2	107	2	177.8
8	5	158.5	58	2	25.1	108	2	89.1
9	4	158.5	59	3	158.5	109	3	44.7
10	3	50.1	60	4	89.1	110	4	100
11	4	177.8	61	2	125.9	111	6	56.2
12	4	112.2	62	6	79.4	112	4	63.1
13	6	70.8	63	3	100	113	4	251.2
14	4	141.3	64	3	89.1	114	3	141.3
15	5	199.5	65	5	70.8	115	4	89.1
16	4	112.2	66	4	141.3	116	5	56.2
17	6	112.2	67	6	89.1	117	5	251.2
18	3	112.2	68	5	89.1	118	4	50.1
19	3	112.2	69	4	89.1	119	5	70.8
20	6	199.5	70	5	100	120	5	100
21	5	125.9	71	2	56.2	121	4	31.6
22	6	112.2	72	2	63.1	122	4	50.1
23	2	251.2	73	2	56.2	123	5	22.4
24	3	56.2	74	5	11.2	124	2	199.5
25	4	89.1	75	6	70.8	125	3	158.5
26	3	281.8	76	6	125.9	126	3	70.8
27	2	20	77	2	89.1	127	3	158.5
28	4	100	78	4	223.9	128	5	141.3
29	5	39.8	79	3	79.4	129	3	63.1
30	5	141.3	80	4	141.3	130	4	44.7
31	6	125.9	81	4	251.2	131	5	89.1
32	2	50.1	82	5	177.8	132	3	158.5
33	4	199.5	83	2	177.8	133	4	223.9
34	6	35.5	84	6	141.3	134	2	89.1
35	2	56.2	85	4	79.4	135	2	70.8
36	5	199.5	86	3	141.3	136	4	39.8
37	5	251.2	87	3	100	137	2	251.2
38	5	70.8	88	3	158.5	138	2	177.8
39	6	158.5	89	4	50.1	139	3	199.5
40	6	158.5	90	2	141.3	140	2	251.2
41	3	100	91	3	112.2	141	6	158.5
42	6	89.1	92	3	100	142	4	199.5
43	5	44.7	93	3	177.8	143	4	177.8
44	5	44.7	94	3	100	144	3	281.8
45	4	223.9	95	3	44.7	145	4	112.2
46	3	25.1	96	5	63.1	146	3	100
47	3	141.3	97	5	199.5	147	5	141.3
48	2	89.1	98	5	63.1	148	5	251.2
49	4	44.7	99	5	251.2	149	3	112.2

5.1.2.4. Test Case 2: Antenna and Duplex Switching

Figure 5-20: Antenna and Duplex Switch Plot

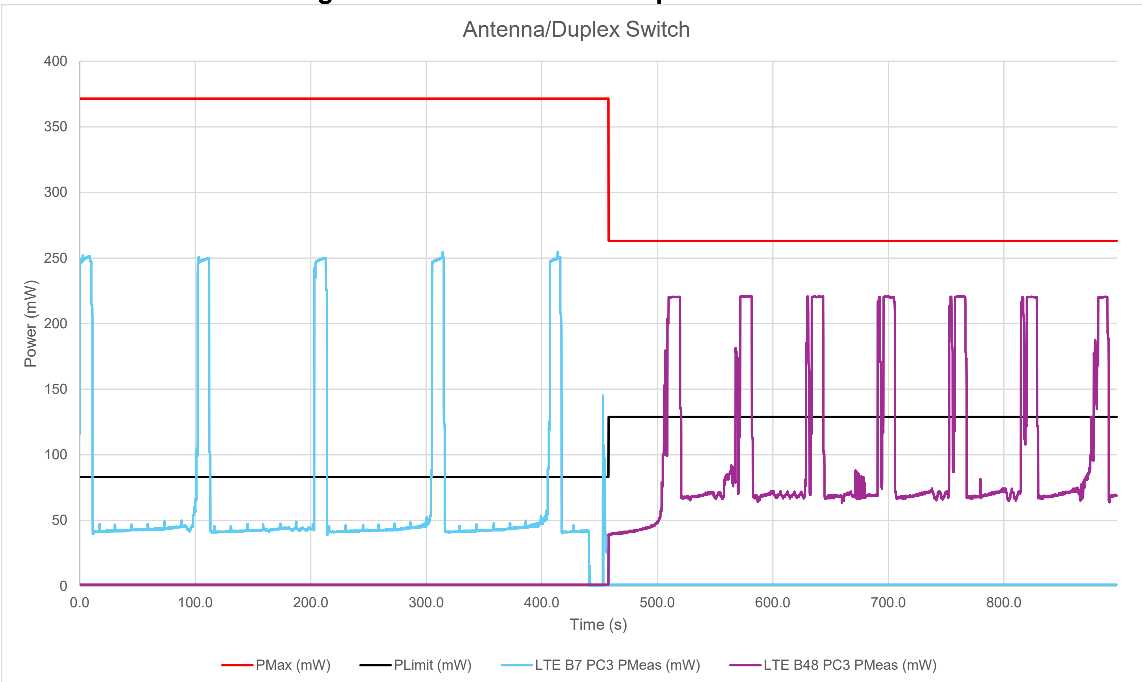
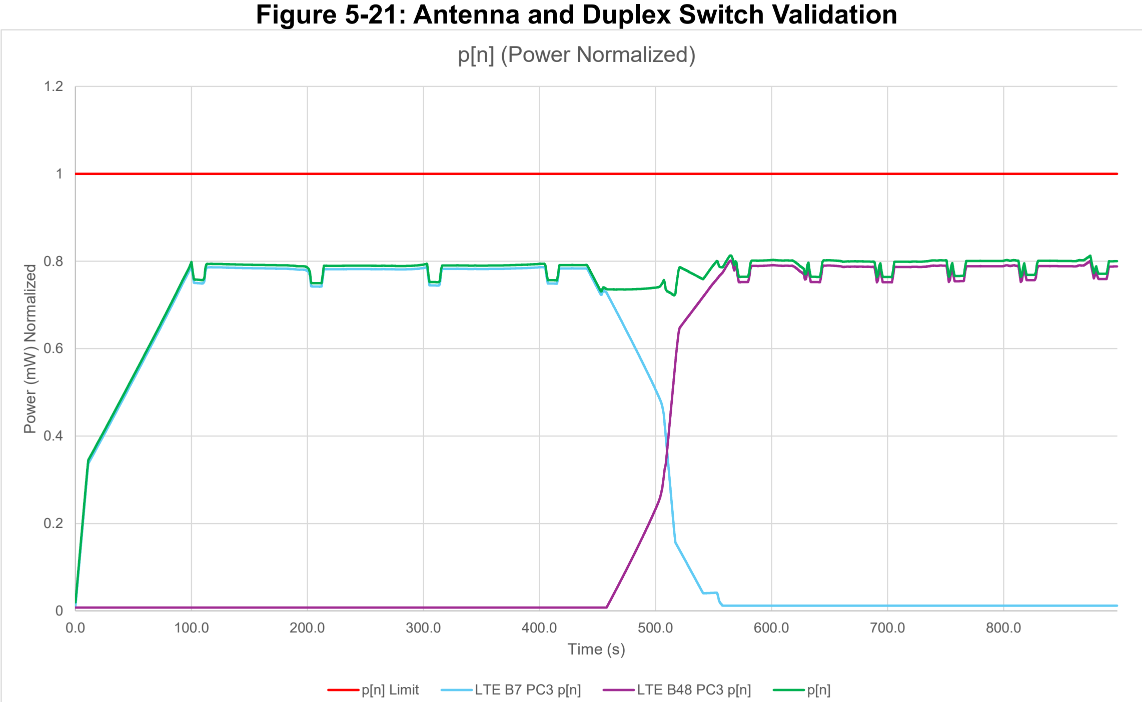


Figure 5-21: Antenna and Duplex Switch Validation



	Validation
p[n] Total Normalized ≤ 1	0.813 ≤ 1

p[n] was calculated using the sum of LTE B7’s 100 second time-averaging duration and LTE B48’s 60 second time-averaging duration.

5.1.2.5. Test Case 3: Change in Device State

Figure 5-22: Change in Device State Plot

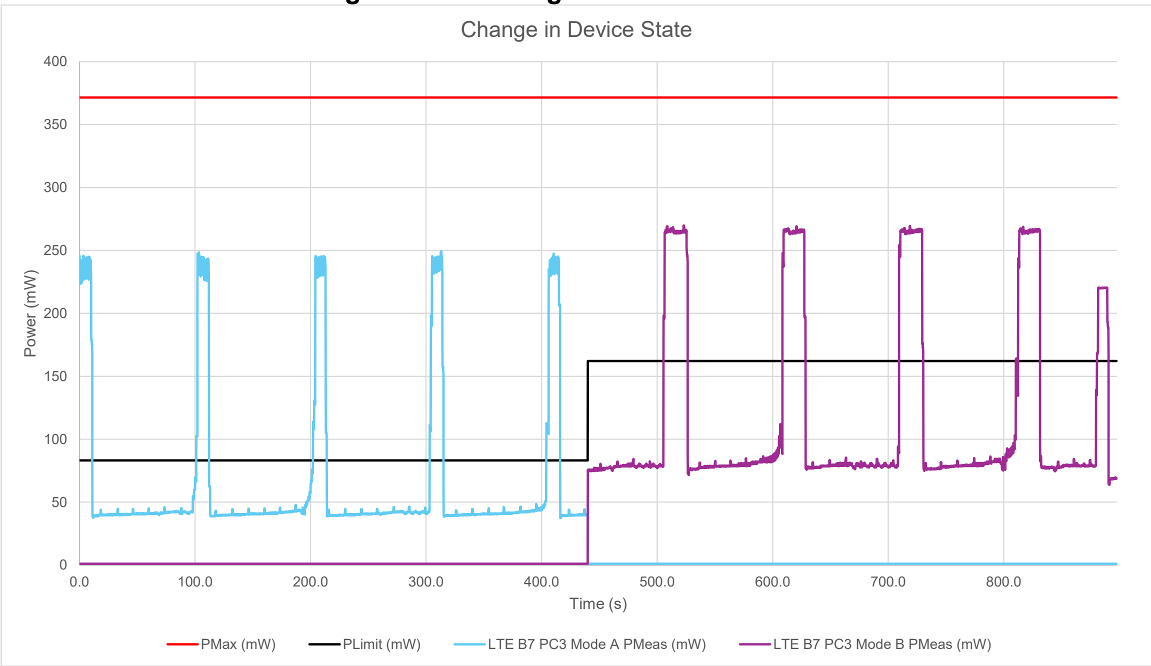
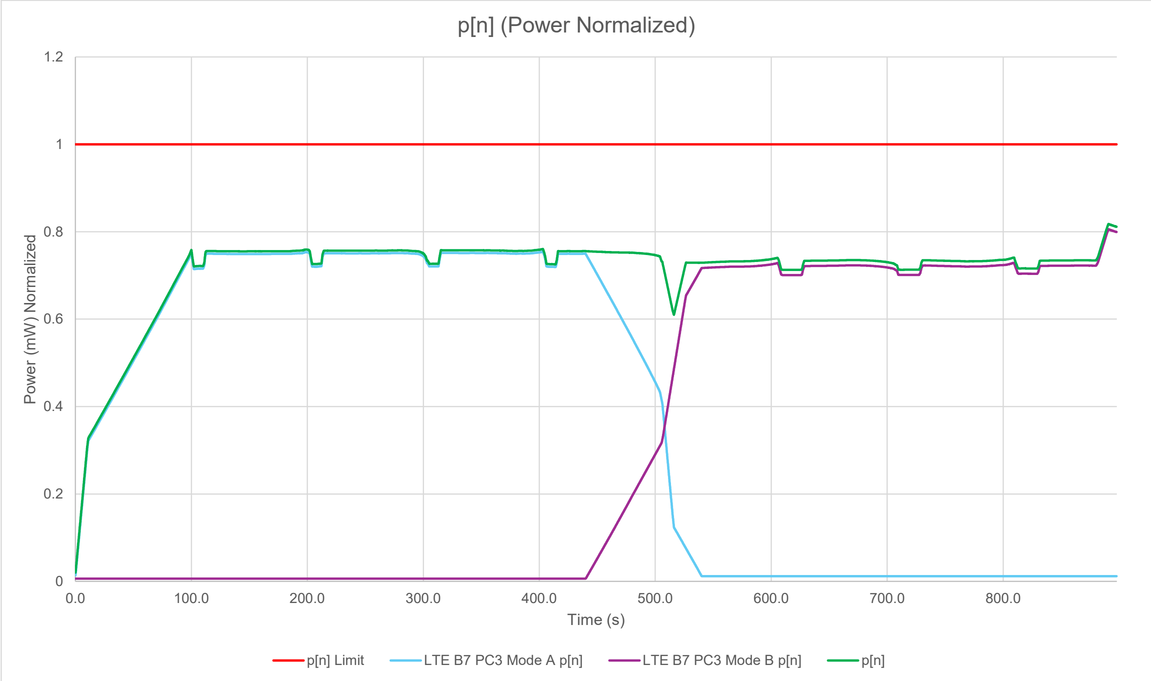


Figure 5-23: Change in Device State Validation



	Validation
p[n] Total Normalized ≤ 1	0.818 ≤ 1

p[n] was calculated using the sum of LTE's 100 second time-averaging duration.

5.1.2.6. Test Case 4: Change in Technology and Band

Figure 5-24: Change in Technology and Band Plot

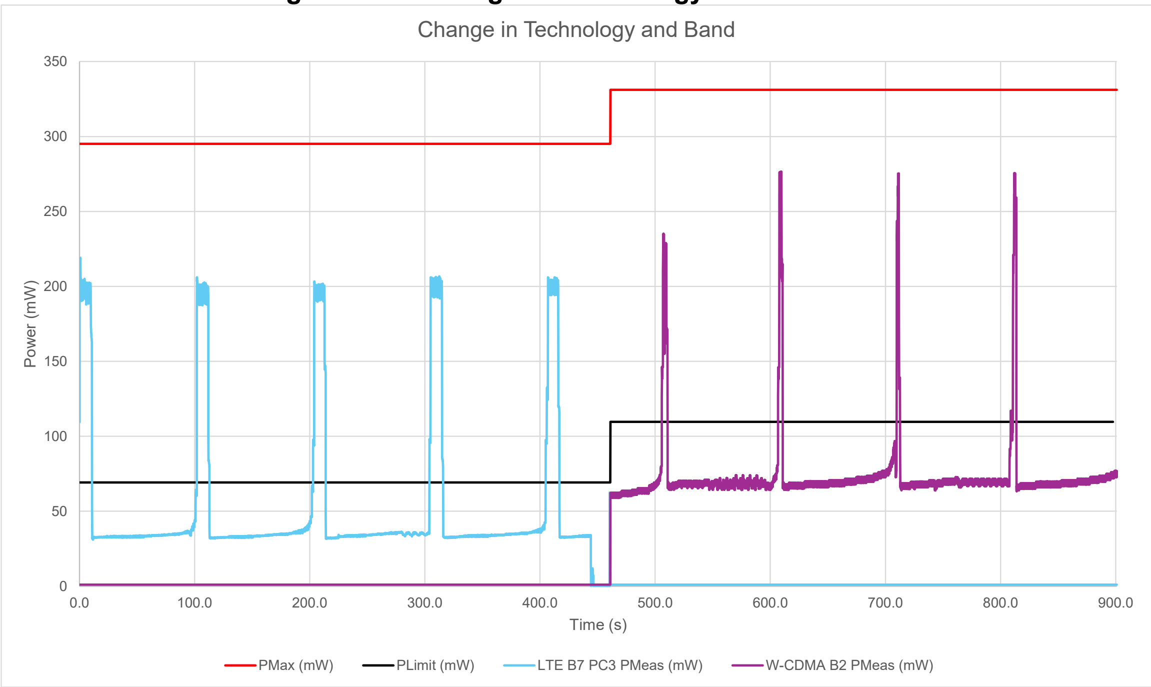
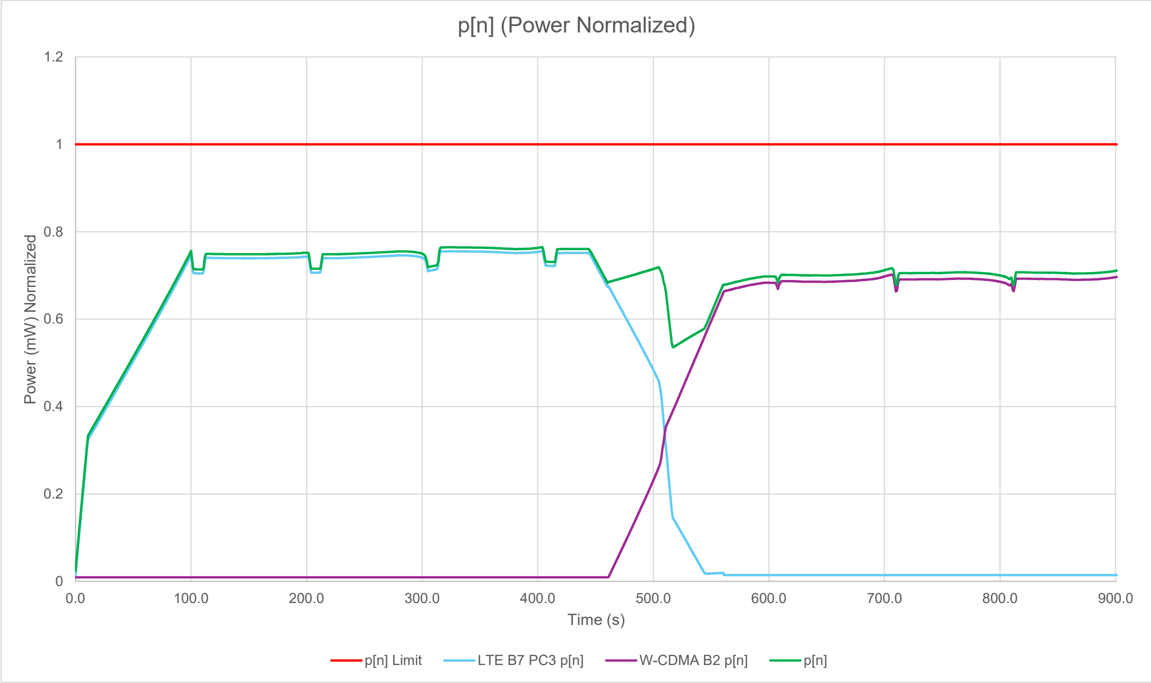


Figure 5-25: Change in Technology and Band Validation



	Validation
p[n] Total Normalized ≤ 1	0.765 ≤ 1

p[n] was calculated using the sum of LTE's and W-CDMA's 100 second time-averaging duration.

5.1.2.7. Test Case 5: Call Drop

Figure 5-26: Call Drop Plot

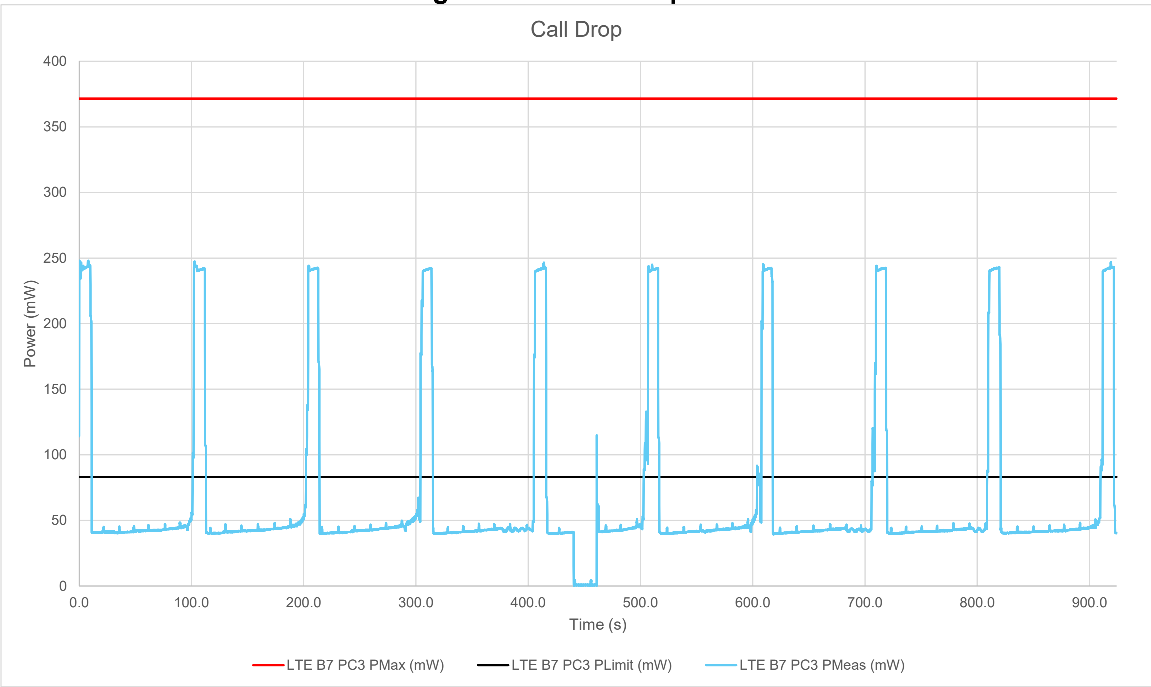
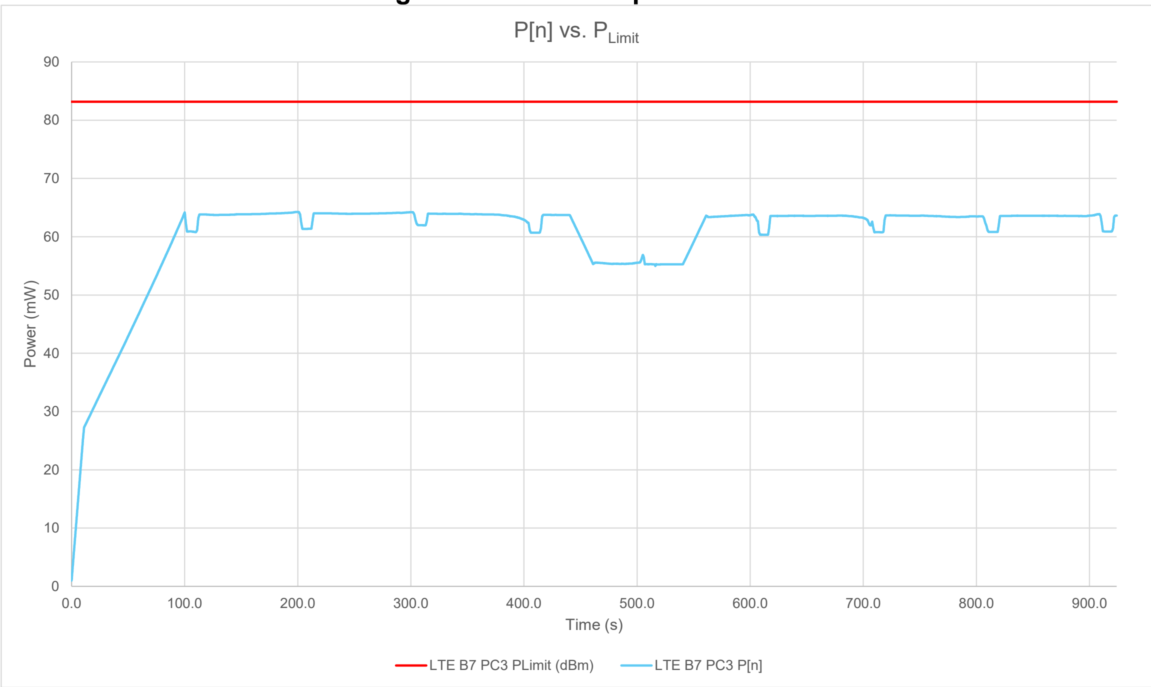


Figure 5-27: Call Drop Validation



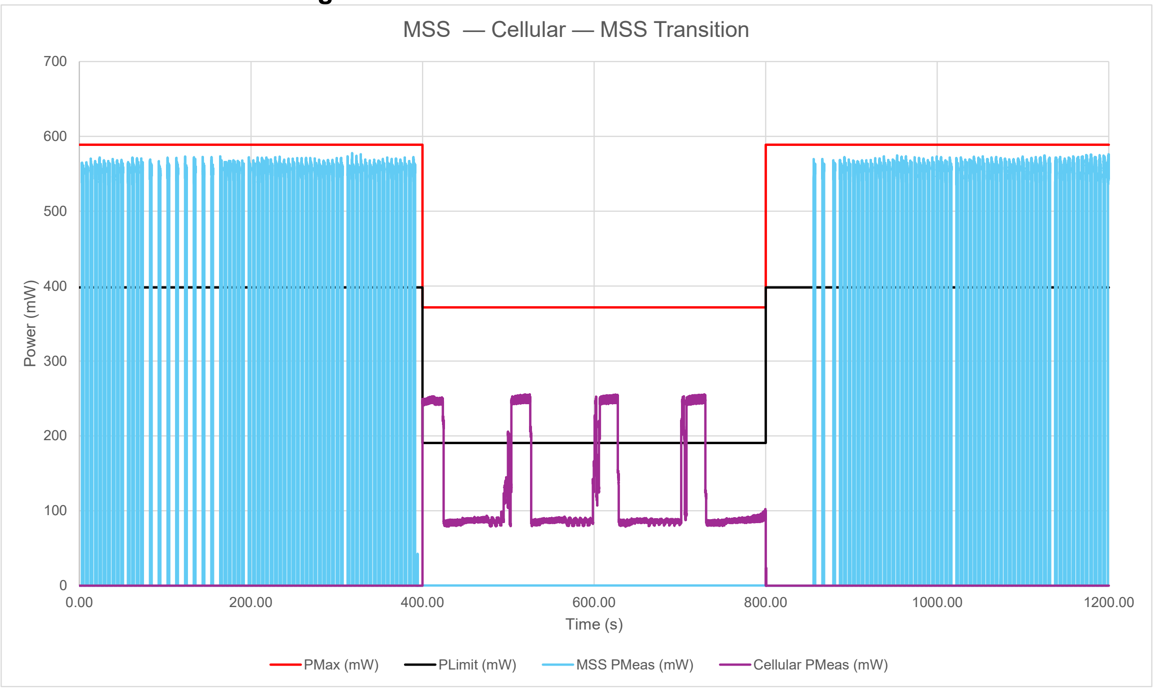
	Validation
P[n] ≤ P_{Limit}	0.772 ≤ 1

P[n] was calculated using the 100 second time-averaging duration.

5.1.2.8. MSS[3]

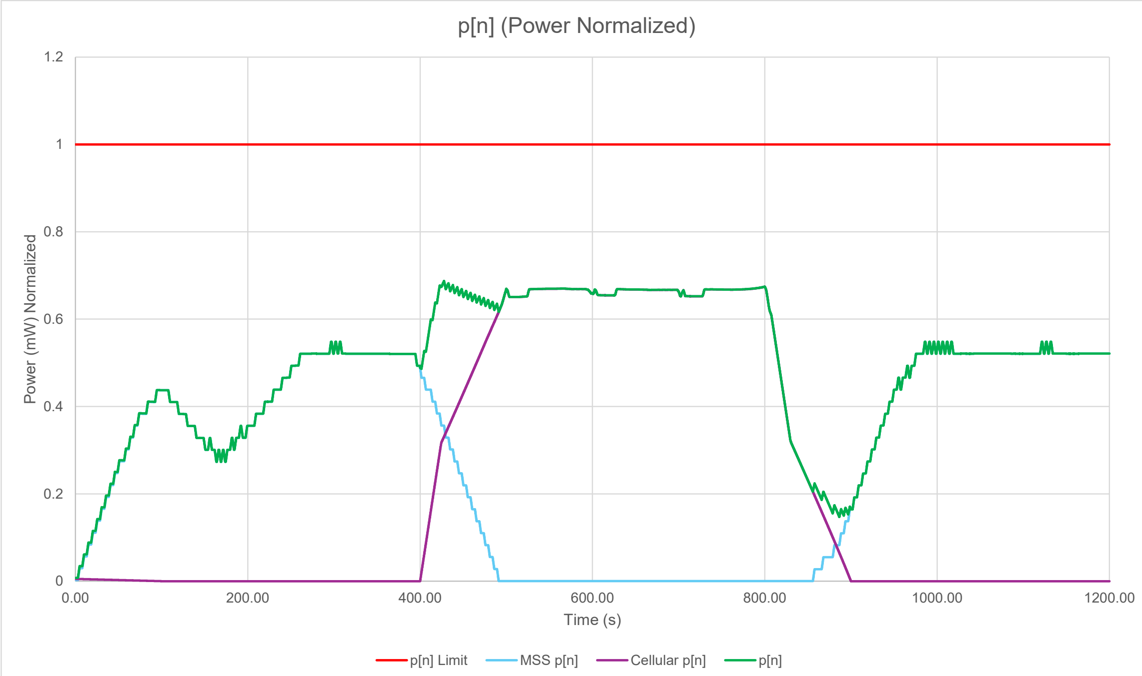
5.1.2.8.1. Transition Assessment

Figure 5-28: MSS – Cellular – MSS Transition



[3] Data in this section was collected and provided by the OEM; the test lab did not conduct any of these measurements within this section.

Figure 5-29: MSS – Cellular – MSS Transition Normalized Validation

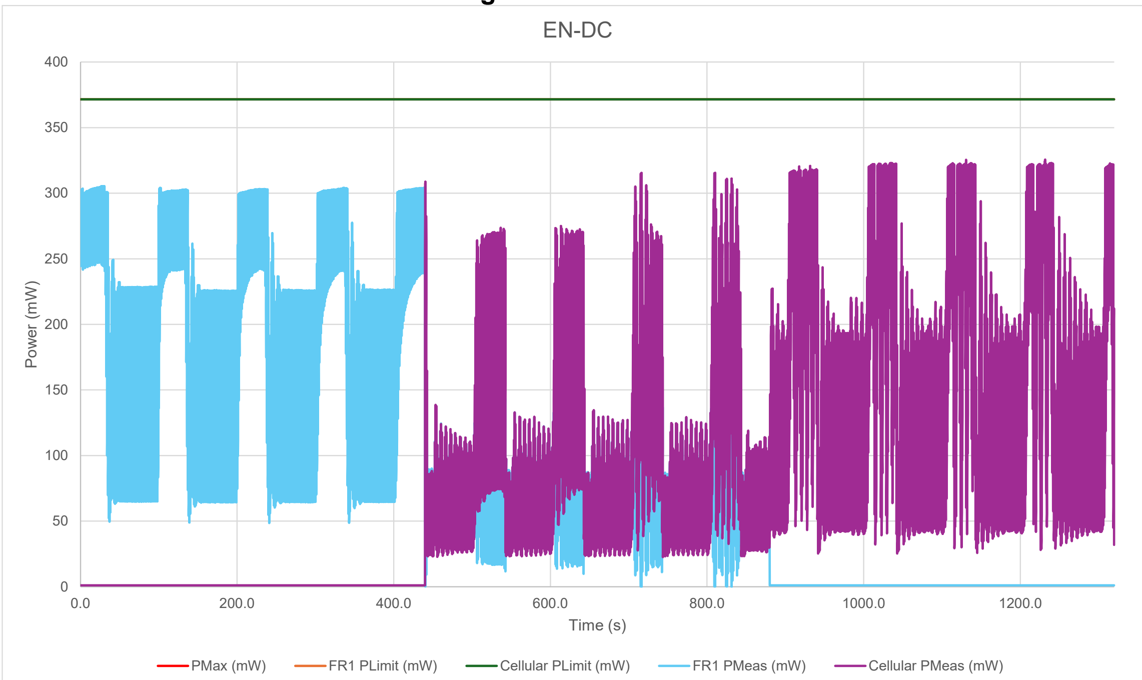


	Validation
p[n] Total Normalized ≤ 1	0.687 ≤ 1

p[n] was calculated using the sum of MSS's 99.84 second time-averaging duration and Cellular's 100 second time-averaging duration.

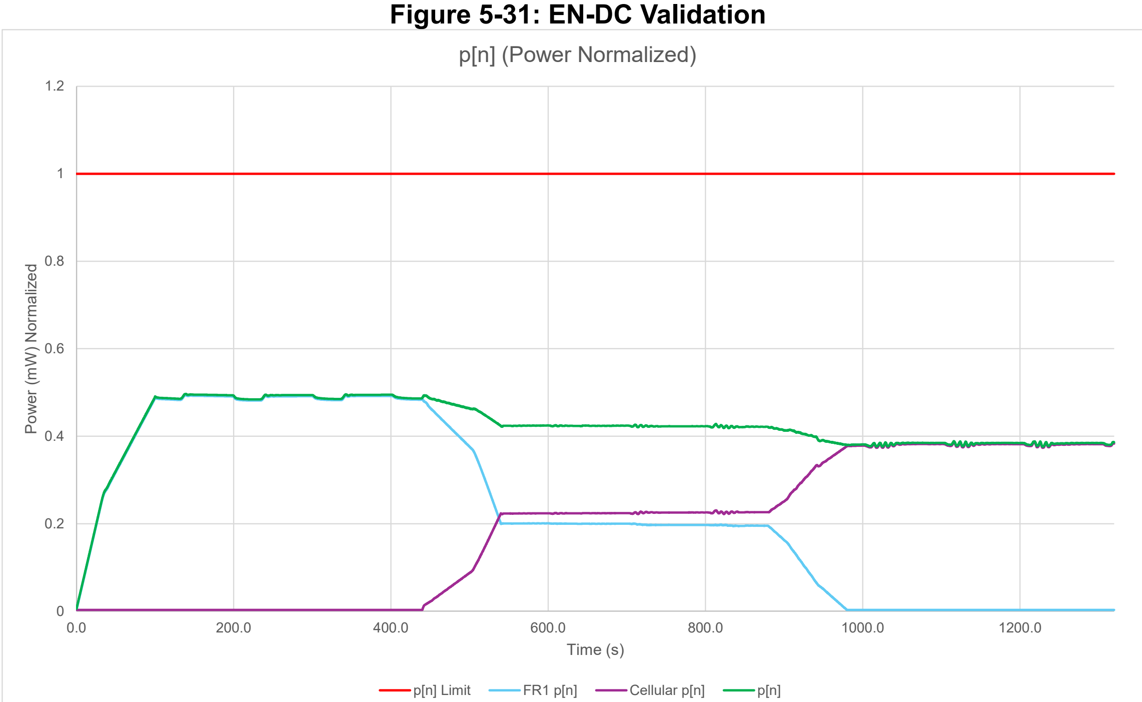
5.1.2.9. EN-DC

Figure 5-30: EN-DC



Note: P_{Max} and P_{Limit} are the same for both FR1 and Cellular.

Figure 5-31: EN-DC Validation

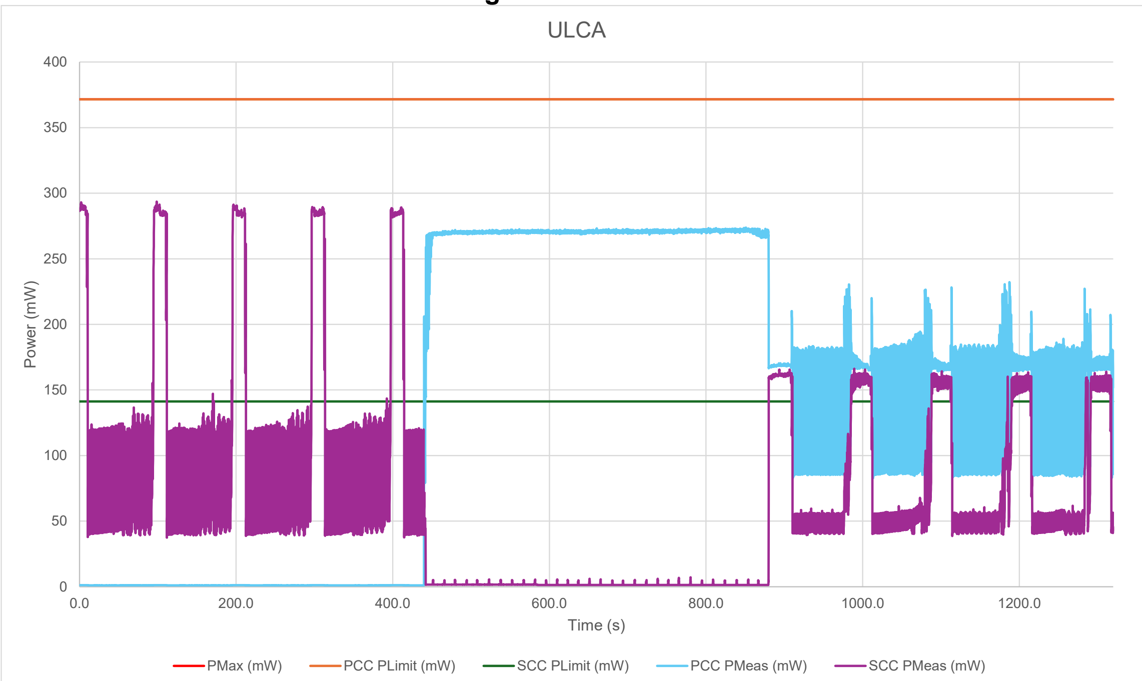


	Validation
p[n] Total Normalized ≤ 1	0.497 ≤ 1

p[n] was calculated using the sum of LTE's and FR1's 100 second time-averaging duration.

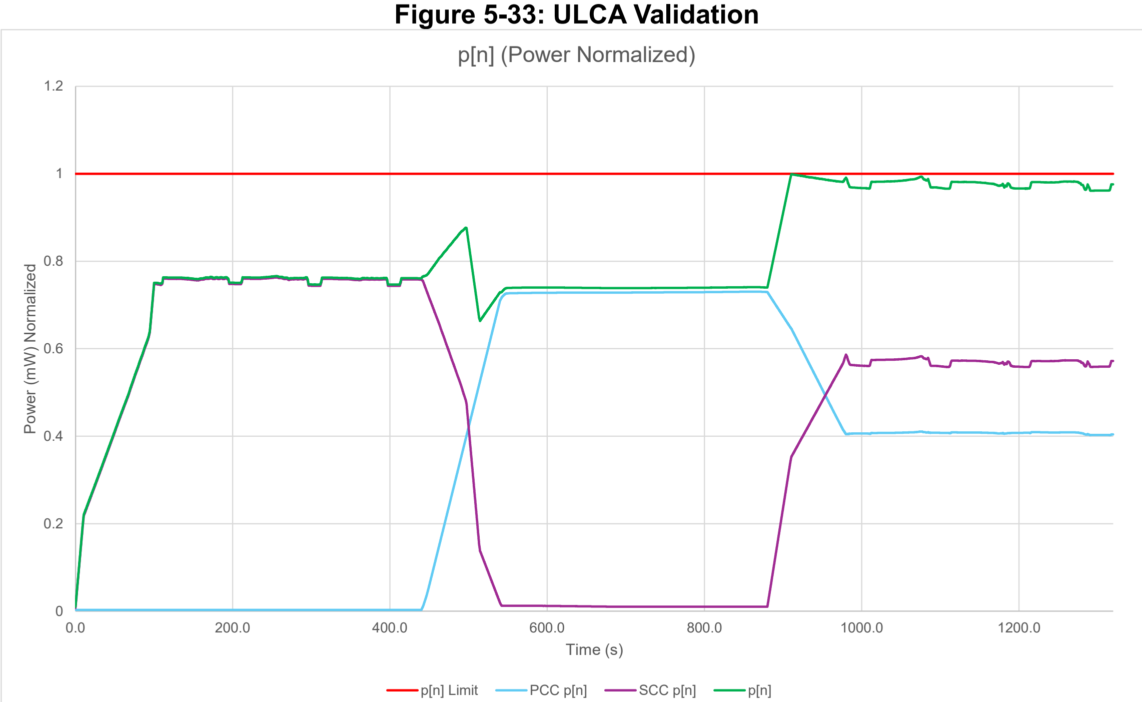
5.1.2.10. ULCA

Figure 5-32: ULCA



Note: PCC's P_{Max} and P_{Limit} are the same.

Figure 5-33: ULCA Validation



	Validation
p[n] Total Normalized ≤ 1	0.999 ≤ 1

p[n] was calculated using the sum of LTE SCC's and LTE PCC's 100 second time-averaging duration.

6. Dynamic Budget Validation[4]

This DUT supports dynamic budget sharing for Cellular and MSS technologies. Other supported technologies operate using a static budget allocation. The SAR budget for Cellular and MSS technologies is allocated dynamically over time considering usage statistics and consumed SAR from all active radios. The device total exposure ratio (TER) is always maintained less than 1.

To validate the dynamic budgeting algorithm, the following configurations will be assessed:

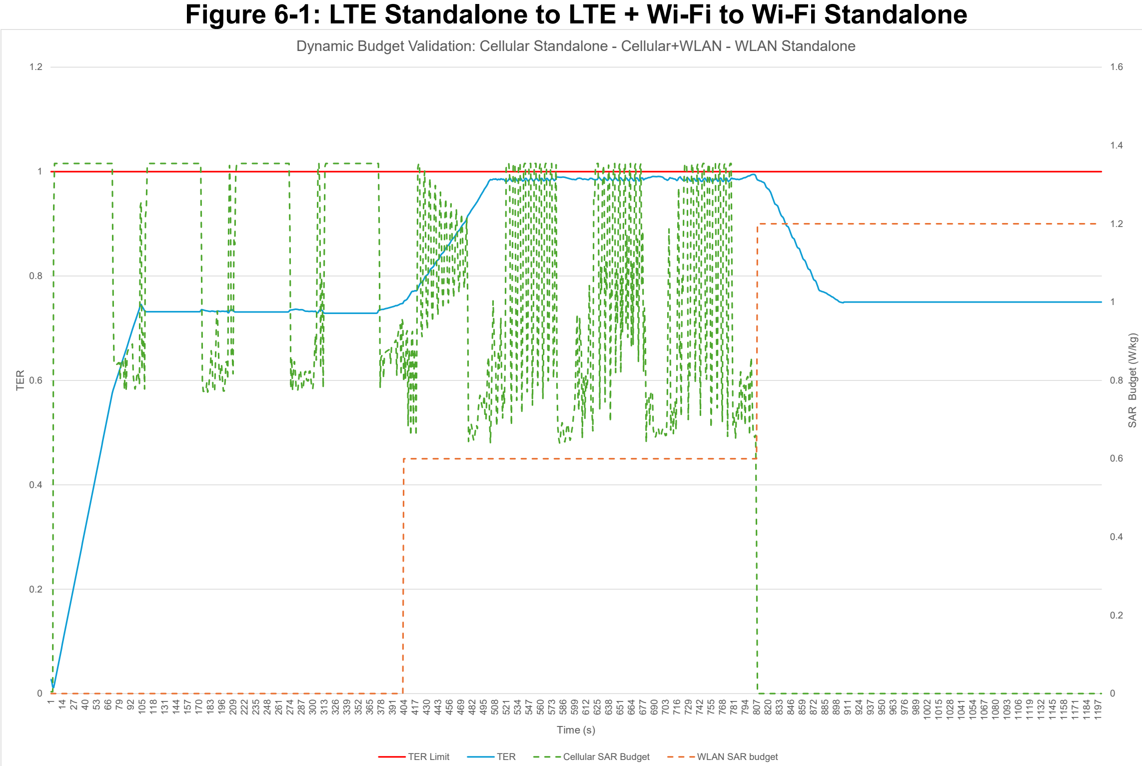
1. Cellular standalone to Cellular + WLAN to WLAN standalone
   a. P_{Max} is requested for this test scenario in all operating conditions. The test time for each connection will be sufficient to allow a steady state to be achieved.
   b. This test case validates the transition between a mode that supports dynamic budgeting to a mode that uses fixed budgeting.

6.1. Cellular Standalone to Cellular + WLAN to WLAN Standalone

This sections illustrates the transition from a dynamic budget mode (Cellular) to a static budget mode (WLAN).

6.1.1. LTE

Figure 6-1: LTE Standalone to LTE + Wi-Fi to Wi-Fi Standalone



	Validation
TER ≤ 1	0.995 ≤ 1.000

7. Conclusion

The data collected herein is sufficient in displaying the validation of this Cellular TAS algorithm. As demonstrated, the power limiting enforcement is effective and the total normalized time-averaged requested power/RF exposure does not exceed 1 nor does P[n] and TAS[n] exceed P_{Limit} and psSAR[reported], respectively.

[4] Data in this section was provided and post-processed by the OEM.

Appendices

Appendix A: Test Setup Photos

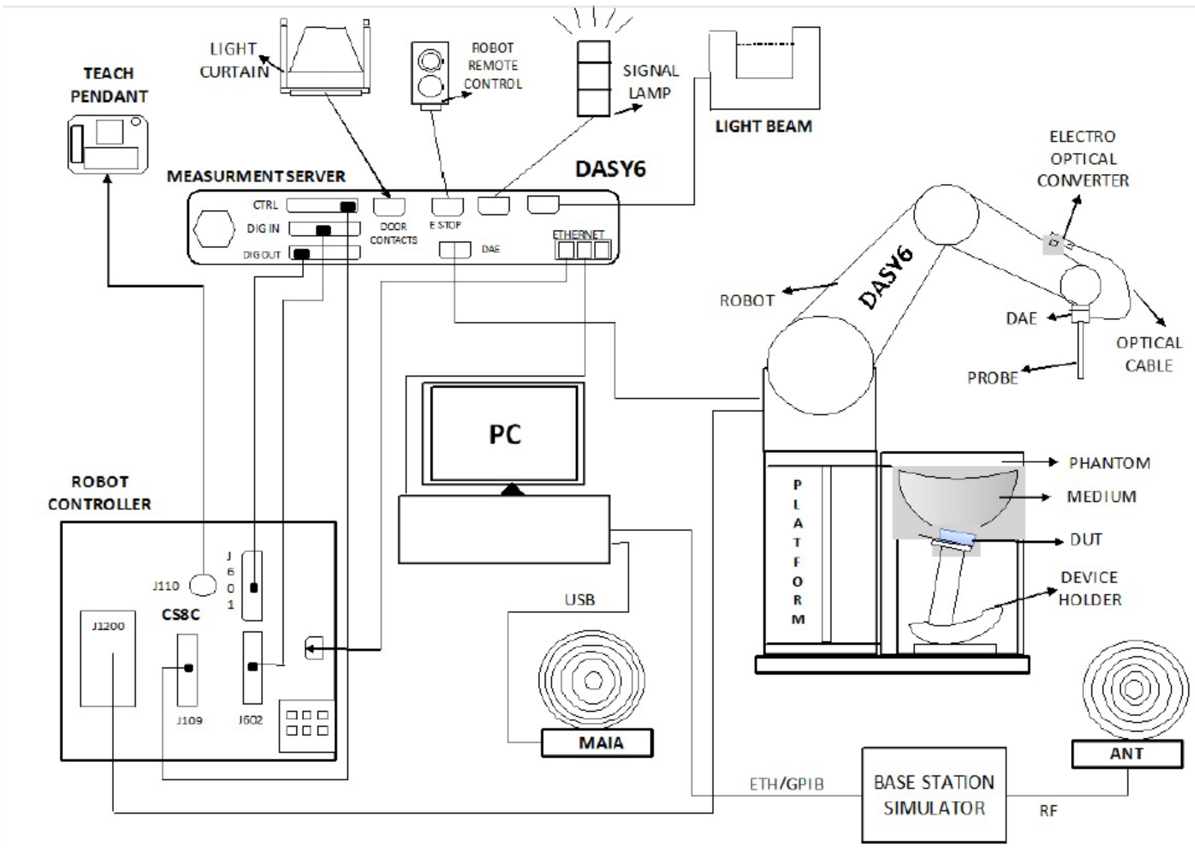
Appendix B: Probe Calibration Certificates

Appendix C: Dipole Certification Certificates

Appendix D: SAR Measurement System & Test Equipment

D.1. SAR Measurement System

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win11 and the DASY6/8 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder, and other accessories according to the targeted measurement.

D.2. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations and is traceable to recognized national standards.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
S-Parameter Netw ork Analyzer	Rohde & Schw arz	ZNLE6	1323.0012K56-101274-mn	2/28/2026
Dielectric Probe kit	SPEAG	DAK-3.5	1082	4/14/2026
Shorting Block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	4/14/2026
Thermometer	Fisher Scientific	Traceable	240029257	1/31/2026

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator	R & S	SMB100A	168412	1/31/2026
Wideband Pow er Sensor	Agilent	N1921A	80119	1/31/2026
Pow er Sensor	R & S	NRP18A	171443	2/28/2026
Pow er Meter	HP	437B	82600	1/31/2026
Directional coupler	Mini-circuits	ZUDC10-183+	PRE0181620	N/A
Pow er Source	SPEAG	POWERSOURCE1	4348	12/11/2025

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab 13)	SPEAG	EX3DV4	7657	5/9/2026
Data Acquisition Electronics (SAR Lab 13)	SPEAG	DAE4	1784	4/9/2026
System Validation Dipole	SPEAG	D1750V2	1053	10/13/2025
System Validation Dipole	SPEAG	D1900V2	5d140	4/14/2026
System Validation Dipole	SPEAG	D2450V2	706	1/20/2026
System Validation Dipole	SPEAG	D2600V2	1006	10/13/2025
System Validation Dipole	SPEAG	D3500V2	1060	2/7/2026

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	168607-xb	3/31/2026
Base Station Simulator	R & S	CMW500	147543-Bg	2/28/2026
Base Station Simulator	R & S	CMW500	135384-pJ	2/28/2026
Base Station Simulator	Keysight	E7515B	MY58460103	1/312026
Pow er Meter	R&S	NRP8S	108347-tb	5/5/2027
Pow er Meter	R&S	NRP8S	110667-vC	2/28/2026
Pow er Sensor*	R&S	NRP18Sn	102264	7/15/2026
Pow er Sensor*	R&S	NRP18Sn	102263	7/15/2026

Note(s):

*: Equipment used by OEM to measure and record data

Appendix E: Liquid and System Checks

E.1. Liquid Checks

Liquid Check										
SAR Lab	Date	Tissue Type	Band (MHz)	Freq. (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta	Measured	Target	Delta
SAR 13	7/9/2025	Head	1750	1750	41.60	40.08	3.78%	1.34	1.37	-1.97%
				1695	41.74	40.17	3.91%	1.31	1.34	-2.09%
				1780	41.67	40.04	4.07%	1.36	1.39	-1.87%
SAR 13	7/9/2025	Head	1900	1900	41.46	40.00	3.65%	1.44	1.40	2.64%
				1850	41.51	40.00	3.78%	1.40	1.40	0.29%
				1920	41.38	40.00	3.45%	1.45	1.40	3.36%
SAR 13	7/9/2025	Head	2450	2450	40.83	39.20	4.16%	1.81	1.80	0.72%
				2400	40.76	39.30	3.72%	1.78	1.75	1.79%
				2500	40.62	39.14	3.79%	1.85	1.85	-0.06%
SAR 13	7/9/2025	Head	2600	2600	40.50	39.01	3.82%	1.93	1.96	-1.44%
				2495	40.62	39.14	3.77%	1.85	1.85	-0.04%
				2690	40.34	38.90	3.71%	2.01	2.06	-2.55%
SAR 13	7/9/2025	Head	3500	3500	39.01	37.93	2.85%	2.71	2.91	-6.82%
				3400	39.16	38.04	2.93%	2.63	2.81	-6.35%
				3600	38.89	37.82	2.84%	2.80	3.01	-7.03%

E.2. System Checks

System Check													
Date	Dipole Type & Serial Number	Dipole Cal. Due Date	Input Power (dBm)	Measured results for 1-g SAR				Measured results for 10-g SAR				Plot No.
				Meas. Zoom Scan	Normalize to 1 W	Target (Ref. Value)	Delta ±10%	Meas. Zoom Scan	Normalize to 1 W	Target (Ref. Value)	Delta ±10%	
7/9/2025	D1750V2 SN: 1053	10/13/2025	17.0	1.820	36.314	36.600	-0.78%	0.977	19.494	19.300	1.00%	1
7/9/2025	D1900V2 SN: 5d140	4/14/2026	17.0	2.030	40.504	39.400	2.80%	1.060	21.150	20.600	2.67%	2
7/9/2025	D2450V2 SN: 706	1/20/2026	14.0	1.270	50.560	52.300	-3.33%	0.593	23.608	24.500	-3.64%	3
7/9/2025	D2600V2 SN: 1006	10/13/2025	17.0	2.770	55.269	56.100	-1.48%	1.250	24.941	25.400	-1.81%	4
7/9/2025	D3500V2 SN: 1060	2/7/2026	17.0	3.340	66.642	65.700	1.43%	1.280	25.539	24.900	2.57%	5

Appendix F: Measurement Uncertainty

F.1. SAR

300 MHz to 3 GHz

Measurement uncertainty for 300 MHz to 3 GHz

Uncertainty component	Uncertainty Value (±%)	Prob. Dist.	Div.	*ci* (1 g)	*ci* (10 g)	Std. Unc. 1 g (± %)	Std. Unc. 10 g (± %)
Measurement System							
Probe Calibration	12.00	Normal	2	1	1	6.00	6.00
Probe Calibration Drift	1.70	Rectangular	1.732	1	1	1.0	1.0
Probe Linearity	4.70	Rectangular	1.732	1	1	2.7	2.7
Boradband Signal	3.00	Rectangular	1.732	1	1	1.7	1.7
Probe Isotropy	7.60	Rectangular	1.732	1	1	4.4	4.4
Other Probe+Electronic	0.70	Normal	1	1	1	0.7	0.7
RF Ambient	1.80	Normal	1	1	1	1.8	1.8
Probe Positioning	0.60	Normal	1	0.14	0.14	0.1	0.1
Data Processing	1.20	Normal	1	1	1	1.2	1.2
Phantom and Device Errors							
Conductivity (meas.)[DAK]	2.50	Normal	1	0.78	0.71	2.0	1.8
Conductivity (temp.)[BB]	3.30	Rectangular	1.732	0.78	0.71	1.5	1.4
Phantom Permittivity	14.00	Rectangular	1.732	0	0	0.0	0.0
Distance DUT - TSL	2.00	Normal	1	2	2	4.0	4.0
Device Positioning	1.00	Normal	1	1	1	1.0	1.0
Device Holder	3.60	Normal	1	1	1	3.6	3.6
DUT Modulation[m]	2.40	Rectangular	1.732	1	1	1.4	1.4
Time-average SAR	1.70	Rectangular	1.732	1	1	1.0	1.0
DUT Drift	2.50	Normal	1	1	1	2.5	2.5
Val Antenna Unc.[val]	0.00	Normal	1	1	1	0.0	0.0
Unc. Input Power[val]	0.00	Normal	1	1	1	0.0	0.0
Correction to the SAR results							
Uncertainty in SAR Correction for Deviations in Permittivity and Conductivity	1.90	Normal	1	1	0.84	1.9	1.6
SAR scaling[p]	0.00	Rectangular	1.732	1	1	0.0	0.0
Liquid Conductivity - measurement	**3.36**	Normal	1	0.78	0.71	2.6	2.4
Combined Standard Uncertainty Uc(y) =		RSS				11.3	11.1
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =						22.6	22.3

3 GHz to 6 GHz

Measurement uncertainty for 3 GHz to 6 GHz

Uncertainty component	Uncertainty Value (±%)	Prob. Dist.	Div.	*ci* (1 g)	*ci* (10 g)	Std. Unc. 1 g (± %)	Std. Unc. 10 g (± %)
Measurement System							
Probe Calibration	13.10	Normal	2	1	1	6.55	6.55
Probe Calibration Drift	1.70	Rectangular	1.732	1	1	1.0	1.0
Probe Linearity	4.70	Rectangular	1.732	1	1	2.7	2.7
Boradband Signal	2.60	Rectangular	1.732	1	1	1.5	1.5
Probe Isotropy	7.60	Rectangular	1.732	1	1	4.4	4.4
Other Probe+Electronic	1.20	Normal	1	1	1	1.2	1.2
RF Ambient	1.80	Normal	1	1	1	1.8	1.8
Probe Positioning	0.50	Normal	1	0.29	0.29	0.15	0.15
Data Processing	2.30	Normal	1	1	1	2.3	2.3
Phantom and Device Errors							
Conductivity (meas.)[DAK]	2.50	Normal	1	0.78	0.71	2.0	1.8
Conductivity (temp.)[BB]	3.40	Rectangular	1.732	0.78	0.71	1.5	1.4
Phantom Permittivity	14.00	Rectangular	1.732	0.25	0.25	2.0	2.0
Distance DUT - TSL	2.00	Normal	1	2	2	4.0	4.0
Device Positioning	1.00	Normal	1	1	1	1.0	1.0
Device Holder	3.60	Normal	1	1	1	3.6	3.6
DUT Modulation[m]	2.40	Rectangular	1.732	1	1	1.4	1.4
Time-average SAR	1.70	Rectangular	1.732	1	1	1.0	1.0
DUT Drift	2.50	Normal	1	1	1	2.5	2.5
Val Antenna Unc.[val]	0.00	Normal	1	1	1	0.0	0.0
Unc. Input Pow er[val]	0.00	Normal	1	1	1	0.0	0.0
Correction to the SAR results							
Uncertainty in SAR Correction for Deviations in Permittivity and Conductivity	1.90	Normal	1	1	0.84	1.9	1.6
SAR scaling[p]	0.00	Rectangular	1.732	1	1	0.0	0.0
Liquid Conductivity - measurement	**-7.03**	Normal	1	0.78	0.71	-5.5	-5.0
Combined Standard Uncertainty Uc(y) =		RSS				12.9	12.6
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =						25.8	25.2

F.2. Conducted

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
RF Power Measurement Direct Method Using Power Meter	1.300 dB Peak 0.450 dB Avg

Uncertainty figures are valid to a confidence level of 95%.

END OF REPORT