

FCC Connectivity TAS Evaluation Report

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Revision History

Rev.	Date	Revisions	Revised By
V1	2025/7/18	Initial Issue	--
V2	2025/7/24	Removed watermark Fixed Table of Contents Changed “cellular” to “unlicensed” in Section 4.1.5 Updated formatting and note for Table 4-1	Kanaad Sovani
V3	2025/7/24	Fixed DUT Time Averaging Window in Plots	Kanaad Sovani
V4	2025/8/1	§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:

5440 Patrick Henry Drive
SAR/Conducted Labs PHD

2. Introduction

This DUT supports time-averaged SAR (TAS) technology for the connectivity transmitters (i.e. WLAN, BT, 802.15.4, NB UNII). A central manager, referenced as the RF Exposure manager, is responsible for maintaining the rolling time-averaged RF exposure over the applicable regulatory compliance window. This manager allocates a total RF exposure budget and specifies the RF exposure compliance limit to the connectivity radios. The radio controllers manage their transmissions to always maintain their consumption below the regulatory RF exposure limit. They report their consumed RF exposure back to the RF exposure manager. The RF exposure manager uses this feedback to allocate updated budget information throughout the regulatory averaging window. This implementation uses a 30-second time-averaging window.

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
0	Head
1	Body/Extremity

3.2. Wi-Fi Power State Descriptions

Table 3-2: Power States and Descriptions

Power State*	Description
1	Cell Off 802.15.4ab Off
2	Cell Off 802.15.4ab On
3	Cell On (Power State 2) 802.15.4ab Off
4	Cell On (Power State 2) 802.15.4ab On
5	Cell On (Power State 1) 802.15.4ab Off
6	Cell On (Power State 1) 802.15.4ab On

*: Power State will be abbreviated to PS in this report

3.3. TAS Parameter Definitions

P_{Max} :	The maximum possible instantaneous power
P_{Limit} :	The maximum possible time-averaged power
$SAR_{Design\ Limit}$:	The maximum spatial peak averaged SAR value inclusive of the total device uncertainty
$P_{avg}(n)$:	The normalized time-averaged conducted power, which should be less than 1 for a passing scenario.

P_{Limit} and P_{Max} values are defined for all antennas, technologies, bands, and OBD/OPS combinations supporting TAS on the DUT. Instantaneous power for the specified antenna/technology/band/OBD/OPS combinations is capped at P_{Max} .

Transmitter	Technology	Protocol	Bandwidth (MHz)	1-g Averaging Volume																	
				Cell Off + Connectivity PS 1			Cell Off + Connectivity PS 2 + 802.15.4ab			Cell On PS 2 + Connectivity PS 3			Cell On PS 3 + Connectivity PS 4 + 802.15.4ab			Cell On PS 1 + Connectivity PS 5			Cell On PS 1 + Connectivity PS 6 + 802.15.4ab		
				P _{Limit} (dBm)	P _{Max} (dBm)	SAR _{Design Limit} (W/kg)	P _{Limit} (dBm)	P _{Max} (dBm)	SAR _{Design Limit} (W/kg)	P _{Limit} (dBm)	P _{Max} (dBm)	SAR _{Design Limit} (W/kg)	P _{Limit} (dBm)	P _{Max} (dBm)	SAR _{Design Limit} (W/kg)	P _{Limit} (dBm)	P _{Max} (dBm)	SAR _{Design Limit} (W/kg)	P _{Limit} (dBm)	P _{Max} (dBm)	SAR _{Design Limit} (W/kg)
ANT 1	Wi-Fi 2.4 GHz	802.11b	20	21.8	21.2	1.190	21.3	21.2	1.190	18.8	21.2	0.600	18.0	21.2	0.500	17.0	21.2	0.400	15.8	21.2	0.300
ANT 1	Bluetooth 2.4 GHz	BDR	1	22.3	20.0	1.190	22.3	20.0	1.190	19.3	20.0	0.600	18.5	20.0	0.500	17.5	20.0	0.400	16.3	20.0	0.300
ANT 1	Bluetooth 2.4 GHz	EDR2	1	22.3	16.5	1.190	22.3	16.5	1.190	19.3	16.5	0.600	18.5	16.5	0.500	17.5	16.5	0.400	16.3	16.5	0.300
ANT 1	Bluetooth 2.4 GHz	EDR3	1	22.3	16.5	1.190	22.3	16.5	1.190	19.3	16.5	0.600	18.5	16.5	0.500	17.5	16.5	0.400	16.3	16.5	0.300
ANT 1	Bluetooth 2.4 GHz	LE Adv	1	22.3	20.8	1.190	22.3	20.8	1.190	19.3	20.8	0.600	18.5	20.8	0.500	17.5	20.8	0.400	16.3	20.8	0.300
ANT 1	Bluetooth 2.4 GHz	LE 1M	1	22.3	20.8	1.190	22.3	20.8	1.190	19.3	20.8	0.600	18.5	20.8	0.500	17.5	20.8	0.400	16.3	20.8	0.300
ANT 1	Bluetooth 2.4 GHz	LE 2M	2	22.3	20.8	1.190	22.3	20.8	1.190	19.3	20.8	0.600	18.5	20.8	0.500	17.5	20.8	0.400	16.3	20.8	0.300
ANT 1	Bluetooth 2.4 GHz	LELR 2	1	22.3	12.8	1.190	22.3	12.8	1.190	19.3	12.8	0.600	18.5	12.8	0.500	17.5	12.8	0.400	16.3	12.8	0.300
ANT 1	Bluetooth 2.4 GHz	LELR 8	1	22.3	12.8	1.190	22.3	12.8	1.190	19.3	12.8	0.600	18.5	12.8	0.500	17.5	12.8	0.400	16.3	12.8	0.300
ANT 1	Bluetooth 2.4 GHz	HDR 4	2	22.3	13.8	1.190	22.3	13.8	1.190	19.3	13.8	0.600	18.5	13.8	0.500	17.5	13.8	0.400	16.3	13.8	0.300
ANT 1	Bluetooth 2.4 GHz	HDR 8	2	22.3	13.8	1.190	22.3	13.8	1.190	19.3	13.8	0.600	18.5	13.8	0.500	17.5	13.8	0.400	16.3	13.8	0.300
ANT 1	Bluetooth 2.4 GHz	HDRPS 2	2	22.3	13.8	1.190	22.3	13.8	1.190	19.3	13.8	0.600	18.5	13.8	0.500	17.5	13.8	0.400	16.3	13.8	0.300
ANT 1	Bluetooth 2.4 GHz	HDRPM 4	4	22.3	13.8	1.190	22.3	13.8	1.190	19.3	13.8	0.600	18.5	13.8	0.500	17.5	13.8	0.400	16.3	13.8	0.300
ANT 1	Bluetooth 2.4 GHz	HDRPM 6	4	22.3	13.8	1.190	22.3	13.8	1.190	19.3	13.8	0.600	18.5	13.8	0.500	17.5	13.8	0.400	16.3	13.8	0.300
ANT 1	Bluetooth 2.4 GHz	HDRPM 8	4	22.3	13.8	1.190	22.3	13.8	1.190	19.3	13.8	0.600	18.5	13.8	0.500	17.5	13.8	0.400	16.3	13.8	0.300
ANT 1	Bluetooth 2.4 GHz	HDRPM 12	4	22.3	12.8	1.190	22.3	12.8	1.190	19.3	12.8	0.600	18.5	12.8	0.500						

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ANT 6	Wi-Fi 5 GHz	802.11a	20	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11n HT20	40	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11n HT40	40	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11ac VHT80	80	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11ac VHT160	160	14.8	16.5	1.190	14.3	16.5	1.190	11.8	16.5	0.600	11.0	16.5	0.500	10.0	16.5	0.400	8.8	16.5	0.300
ANT 6	Wi-Fi 5 GHz	802.11ax HE20	20	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11ax HE40	40	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11ax HE80	80	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11ax HE160	160	14.8	18.9	1.190	14.3	18.9	1.190	11.8	18.9	0.600	11.0	18.9	0.500	10.0	18.9	0.400	8.8	18.9	0.300
ANT 6	Wi-Fi 5 GHz	802.11be EHT40	40	14.8	18.9	1.190	14.3	18.9	1.190	11.8	18.9	0.600	11.0	18.9	0.500	10.0	18.9	0.400	8.8	18.9	0.300
ANT 6	Wi-Fi 5 GHz	802.11be EHT80	80	14.8	20.0	1.190	14.3	20.0	1.190	11.8	20.0	0.600	11.0	20.0	0.500	10.0	20.0	0.400	8.8	20.0	0.300
ANT 6	Wi-Fi 5 GHz	802.11be EHT160	160	14.8	14.5	1.190	14.3	14.5	1.190	11.8	14.5	0.600	11.0	14.5	0.500	10.0	14.5	0.400	8.8	14.5	0.300
ANT 6	Wi-Fi 6 GHz	802.11a	20	9.8	19.0	1.190	9.3	19.0	1.190	6.8	19.0	0.600	6.0	19.0	0.500	5.0	19.0	0.400	3.8	19.0	0.300
ANT 6	Wi-Fi 6 GHz	802.11ax HE20	20	9.8	19.0	1.190	9.3	19.0	1.190	6.8	19.0	0.600	6.0	19.0	0.500	5.0	19.0	0.400	3.8	19.0	0.300
ANT 6	Wi-Fi 6 GHz	802.11ax HE40	40	9.8	19.0	1.190	9.3	19.0	1.190	6.8	19.0	0.600	6.0	19.0	0.500	5.0	19.0	0.400	3.8	19.0	0.300
ANT 6	Wi-Fi 6 GHz	802.11ax HE80	80	9.8	19.0	1.190	9.3	19.0	1.190	6.8	19.0	0.600	6.0	19.0	0.500	5.0	19.0	0.400	3.8	19.0	0.300
ANT 6	Wi-Fi 6 GHz	802.11ax HE160	160	9.8	18.5	1.190	9.3	18.5	1.190	6.8	18.5	0.600	6.0	18.5	0.500	5.0	18.5	0.400	3.8	18.5	0.300
ANT 6	Wi-Fi 6 GHz	802.11be EHT20	20	9.8	19.0	1.190	9.3	19.0	1.190	6.8	19.0	0.600	6.0	19.0	0.500	5.0	19.0	0.400	3.8	19.0	0.300
ANT 6	Wi-Fi 6 GHz	802.11be EHT40	40	9.8	19.0	1.190	9.3	19.0	1.190	6.8	19.0	0.600	6.0	19.0	0.500	5.0	19.0	0.400	3.8	19.0	0.300
ANT 6	Wi-Fi 6 GHz	802.11be EHT80	80	9.8	19.0	1.190	9.3	19.0	1.190	6.8	19.0	0.600	6.0	19.0	0.500	5.0	19.0	0.400	3.8	19.0	0.300
ANT 6	Wi-Fi 6 GHz	802.11be EHT160	160	9.8	18.5	1.190	9.3	18.5	1.190	6.8	18.5	0.600	6.0	18.5	0.500	5.0	18.5	0.400	3.8	18.5	0.300
ANT 6	Bluetooth NB-U-NII 1	BD	1	16.0	10.3	1.190	16.0	10.3	1.190	13.0	10.3	0.600	12.2	10.3	0.500	11.3	10.3	0.400	10.0	10.3	0.300
ANT 6	Bluetooth NB-U-NII 1	LE Adv	1	16.0	10.3	1.190	16.0	10.3	1.190	13.0	10.3	0.600	12.2	10.3	0.500	11.3	10.3	0.400	10.0	10.3	0.300
ANT 6	Bluetooth NB-U-NII 1	LE 1M	1	16.0	10.3	1.190	16.0	10.3	1.190	13.0	10.3	0.600	12.2	10.3	0.500	11.3	10.3	0.400	10.0	10.3	0.300
ANT 6	Bluetooth NB-U-NII 1	LE 2M	2	16.0	11.0	1.190	16.0	11.0	1.190	13.0	11.0	0.600	12.2	11.0	0.500	11.3	11.0	0.400	10.0	11.0	0.300
ANT 6	Bluetooth NB-U-NII 1	HDR 4	2	16.0	12.3	1.190	16.0	12.3	1.190	13.0	12.3	0.600	12.2	12.3	0.500	11.3	12.3	0.400	10.0	12.3	0.300
ANT 6	Bluetooth NB-U-NII 1	HDR 8	4	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPS 2	2	16.0	12.3	1.190	16.0	12.3	1.190	13.0	12.3	0.600	12.2	12.3	0.500	11.3	12.3	0.400	10.0	12.3	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPM 4	4	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPM 6	4	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPM 8	4	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPM 12	4	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPM 16	4	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPL 8	8	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPL 12	8	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPL 16	8	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPL 24	8	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPL 32	8	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPL 48	8	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDRPL 24	8	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPS 2	2	16.0	12.3	1.190	16.0	12.3	1.190	13.0	12.3	0.600	12.2	12.3	0.500	11.3	12.3	0.400	10.0	12.3	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPM 4	4	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPM 6	4	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPM 8	4	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPM 12	4	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPM 16	4	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPL 8	8	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPL 12	8	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPL 16	8	16.0	14.5	1.190	16.0	14.5	1.190	13.0	14.5	0.600	12.2	14.5	0.500	11.3	14.5	0.400	10.0	14.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPL 24	8	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	XHDRPL 32	8	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDT 2	2	16.0	12.5	1.190	16.0	12.5	1.190	13.0	12.5	0.600	12.2	12.5	0.500	11.3	12.5	0.400	10.0	12.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDT 3	2	16.0	12.5	1.190	16.0	12.5	1.190	13.0	12.5	0.600	12.2	12.5	0.500	11.3	12.5	0.400	10.0	12.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDT 4	2	16.0	12.5	1.190	16.0	12.5	1.190	13.0	12.5	0.600	12.2	12.5	0.500	11.3	12.5	0.400	10.0	12.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDT 6	2	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	HDT 7.5/8	2	16.0	11.5	1.190	16.0	11.5	1.190	13.0	11.5	0.600	12.2	11.5	0.500	11.3	11.5	0.400	10.0	11.5	0.300
ANT 6	Bluetooth NB-U-NII 1	BD	1	16.0	19.3	1.190	16.0	19.3	1.190	13.0	19.3	0.600	12.2	19.3	0.500	11.3	19.3	0.400	10.0	19.3	0.300
ANT 6	Bluetooth NB-U-NII 3	LE Adv	1	16.0	19.3	1.190	16.0	19.3	1.190	13.0	19.3	0.600	12.2	19.3	0.500	11.3	19.3	0.400	10.0	19.3	0.300
ANT 6	Bluetooth NB-U-NII 3	LE 1M	1	16.0	19.3	1.190	16.0	19.3	1.190	13.0	19.3	0.600	12.2	19.3	0.500	11.3	19.3	0.400	10.0	19.3	0.300
ANT 6	Bluetooth NB-U-NII 3	LE 2M	2	16.0	19.3	1.190	16.0	19.3	1.190	13.0	19.3	0.6									

ANT 6	Bluetooth NB U-NII 5	BDR	1	8.5	-10.3	1.190	8.5	-10.3	1.190	5.5	-10.3	0.600	4.7	-10.3	0.500	3.8	-10.3	0.400	2.5	-10.3	0.300
ANT 6	Bluetooth NB U-NII 5	LE Adv	1	8.5	-9.8	1.190	8.5	-9.8	1.190	5.5	-9.8	0.600	4.7	-9.8	0.500	3.8	-9.8	0.400	2.5	-9.8	0.300
ANT 6	Bluetooth NB U-NII 5	LE 1M	1	8.5	-9.8	1.190	8.5	-9.8	1.190	5.5	-9.8	0.600	4.7	-9.8	0.500	3.8	-9.8	0.400	2.5	-9.8	0.300
ANT 6	Bluetooth NB U-NII 5	LE 2M	2	8.5	-9.0	1.190	8.5	-9.0	1.190	5.5	-9.0	0.600	4.7	-9.0	0.500	3.8	-9.0	0.400	2.5	-9.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDR 4	2	8.5	-8.0	1.190	8.5	-8.0	1.190	5.5	-8.0	0.600	4.7	-8.0	0.500	3.8	-8.0	0.400	2.5	-8.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDR 8	4	8.5	-8.0	1.190	8.5	-8.0	1.190	5.5	-8.0	0.600	4.7	-8.0	0.500	3.8	-8.0	0.400	2.5	-8.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPS 2	2	8.5	-8.0	1.190	8.5	-8.0	1.190	5.5	-8.0	0.600	4.7	-8.0	0.500	3.8	-8.0	0.400	2.5	-8.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPM 4	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPM 6	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPM 8	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPM 12	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPM 16	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPL 8	8	8.5	-2.0	1.190	8.5	-2.0	1.190	5.5	-2.0	0.600	4.7	-2.0	0.500	3.8	-2.0	0.400	2.5	-2.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPL 12	8	8.5	-2.0	1.190	8.5	-2.0	1.190	5.5	-2.0	0.600	4.7	-2.0	0.500	3.8	-2.0	0.400	2.5	-2.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPL 16	8	8.5	-2.0	1.190	8.5	-2.0	1.190	5.5	-2.0	0.600	4.7	-2.0	0.500	3.8	-2.0	0.400	2.5	-2.0	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPL 24	8	8.5	-2.3	1.190	8.5	-2.3	1.190	5.5	-2.3	0.600	4.7	-2.3	0.500	3.8	-2.3	0.400	2.5	-2.3	0.300
ANT 6	Bluetooth NB U-NII 5	HDRPL 32	8	8.5	-2.3	1.190	8.5	-2.3	1.190	5.5	-2.3	0.600	4.7	-2.3	0.500	3.8	-2.3	0.400	2.5	-2.3	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPS 2	2	8.5	-8.0	1.190	8.5	-8.0	1.190	5.5	-8.0	0.600	4.7	-8.0	0.500	3.8	-8.0	0.400	2.5	-8.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPM 4	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPM 6	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPM 8	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPM 12	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPM 16	4	8.5	-5.0	1.190	8.5	-5.0	1.190	5.5	-5.0	0.600	4.7	-5.0	0.500	3.8	-5.0	0.400	2.5	-5.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPL 8	8	8.5	-2.0	1.190	8.5	-2.0	1.190	5.5	-2.0	0.600	4.7	-2.0	0.500	3.8	-2.0	0.400	2.5	-2.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPL 12	8	8.5	-2.0	1.190	8.5	-2.0	1.190	5.5	-2.0	0.600	4.7	-2.0	0.500	3.8	-2.0	0.400	2.5	-2.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPL 16	8	8.5	-2.0	1.190	8.5	-2.0	1.190	5.5	-2.0	0.600	4.7	-2.0	0.500	3.8	-2.0	0.400	2.5	-2.0	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPL 24	8	8.5	-2.3	1.190	8.5	-2.3	1.190	5.5	-2.3	0.600	4.7	-2.3	0.500	3.8	-2.3	0.400	2.5	-2.3	0.300
ANT 6	Bluetooth NB U-NII 5	XHDRPL 32	8	8.5	-2.3	1.190	8.5	-2.3	1.190	5.5	-2.3	0.600	4.7	-2.3	0.500	3.8	-2.3	0.400	2.5	-2.3	0.300
ANT 6	Bluetooth NB U-NII 5	HDT 2	2	8.5	-7.5	1.190	8.5	-7.5	1.190	5.5	-7.5	0.600	4.7	-7.5	0.500	3.8	-7.5	0.400	2.5	-7.5	0.300
ANT 6	Bluetooth NB U-NII 5	HDT 3	2	8.5	-7.5	1.190	8.5	-7.5	1.190	5.5	-7.5	0.600	4.7	-7.5	0.500	3.8	-7.5	0.400	2.5	-7.5	0.300
ANT 6	Bluetooth NB U-NII 5	HDT 4	2	8.5	-7.5	1.190	8.5	-7.5	1.190	5.5	-7.5	0.600	4.7	-7.5	0.500	3.8	-7.5	0.400	2.5	-7.5	0.300
ANT 6	Bluetooth NB U-NII 5	HDT 6	2	8.5	-7.5	1.190	8.5	-7.5	1.190	5.5	-7.5	0.600	4.7	-7.5	0.500	3.8	-7.5	0.400	2.5	-7.5	0.300
ANT 6	Bluetooth NB U-NII 5	HDT 7.5/8	2	8.5	-7.5	1.190	8.5	-7.5	1.190	5.5	-7.5	0.600	4.7	-7.5	0.500	3.8	-7.5	0.400	2.5	-7.5	0.300
ANT 6	802.15.4ab	N/A	2.5	14.8	19.0	0.100	14.8	19.0	0.100	14.8	19.0	0.100	14.8	19.0	0.100	14.8	19.0	0.100	14.8	19.0	0.100

4. TAS Validation

4.1. Conducted

4.1.1. Test Sequences

The TAS algorithm shall be validated with different expected power levels to manage the link budget.

Conducted power measurements will be used to validate the test cases. Configurations where P_{Limit} is 2-4dB below P_{Max} will be selected for assessment. Configurations where P_{Limit} is greater than P_{Max} will be excluded from testing as there will be no TAS activity in this condition.

4.1.2. Technology Switch

Requested power measurements shall be performed to validate the TAS algorithm when the DUT switches between technologies with different P_{Limit} values. Maximum power for the specific technology shall be requested from the DUT throughout the test. The change in technology shall occur once the TAS algorithm has reached steady state for the first band/technology, then the test transitions to transmitting on both technologies simultaneously once the TAS algorithm has reached steady state for the second technology. This test may be referenced for validation of simultaneous compliance.

4.1.3. Change in Device State

Requested power measurements shall be performed to validate the TAS algorithm when the DUT 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.

4.1.4. Change in Antenna / Band

Requested power measurements shall be performed to validate the TAS algorithm when the DUT switches between different antennas and/or bands with differing P_{Limit} values, e.g., when sensors, DUT commands, and other mechanisms are used to switch between the DUT's different transmitting antennas or bands. Maximum power shall be requested from the device from the DUT throughout the test. The DUT's change in antenna or band shall take place once the TAS algorithm has reached a steady state under the first transmitting antenna/band; then, after the switch, the test will conclude once the TAS algorithm has reached a steady state under the second transmitting antenna/band.

4.1.5. Test Case Validation

Validation plots are included for the applicable test cases for this DUT. These plots serve to validate the operation of this unlicensed TAS algorithm by ensuring that the measured power averaged over the applicable regulatory limit, $P_{avg}(n)$, 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 1*, below is used to calculate the rolling time-averaged power for the n^{th} time step, $P_{avg}(n)$.

Equation 1: Rolling Time-averaged Power (Constant P_{Limit})

$$P_{avg}(n) = \frac{1}{M} \sum_{m=0}^{M-1} P_{meas}[n - m]$$

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 $P_{avg}(n)$ is maintained less than or equal to P_{Limit} .

In test cases where P_{Limit} is not constant, the equation, *Equation 2*, below is used to calculate the normalized rolling time-averaged power, $P_{avg}(n)$.

Equation 2: Rolling Time-averaged Power (P_{Limit} not Constant)

$$P_{avg}(n) = \frac{1}{M} \sum_{m=0}^{M-1} \frac{P_{meas}[n - m]}{P_{limit}[n - m]}$$

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 $P_{avg}(n)$ is maintained less than or equal to 1.

The test cases are summarized in the table below.

Table 4-1: Applicable Test Cases for FCC TAS Validation

Test Case	Sequence	Tech	Band	Antenna	OBD/OPS	Details
1 – Technology Switch	Cell Off Wi-Fi PS1 -> Cell Off BT PS1 -> Cell Off Wi-Fi PS1	Wi-Fi	5GHz	6	1 - Body	802.11a PRV
		BT	2.4GHz	2	1 - Body	HDR4
2 – Change in Device State	Power State 3 -> Power State 1	Wi-Fi	5GHz	6	1 - Body	802.11a
	Power State 3 -> Power State 4	Wi-Fi	2.4GHz	2	1 - Body	802.11b PRV
	Power State 5 -> Power State 6	BT	2.4GHz	2	1 - Body	HDR4 PRV
3 – Change in Antenna / Band	Wi-Fi 2.4GHz -> Wi-Fi 6GHz	Wi-Fi	2.4GHz	2	1 - Body	802.11b
			6GHz	6	1 - Body	802.11ax
	Wi-Fi 2.4GHz -> Wi-Fi 2.4GHz + 5 GHz	Wi-Fi	2.4GHz	2	1 - Body	802.11b
			5GHz	6	1 - Body	802.11a

NOTE: Testing was performed using a Preliminary Power Table to demonstrate TAS functionality

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

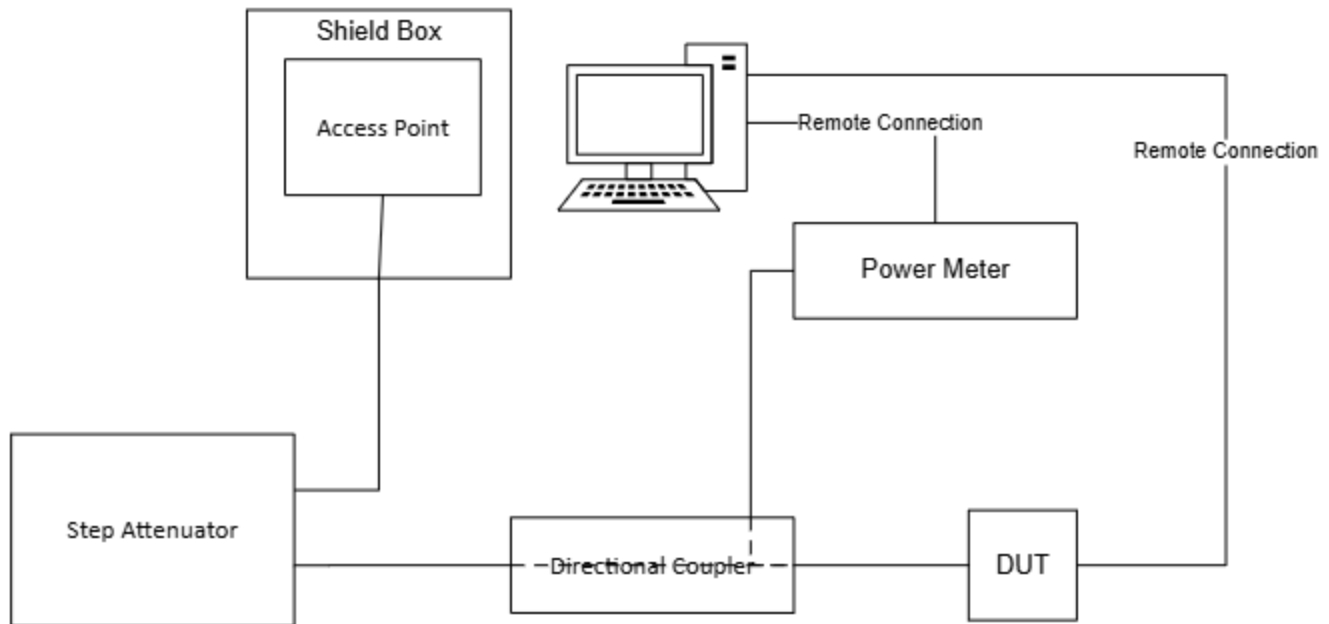


Figure 4-1: Mode Switch

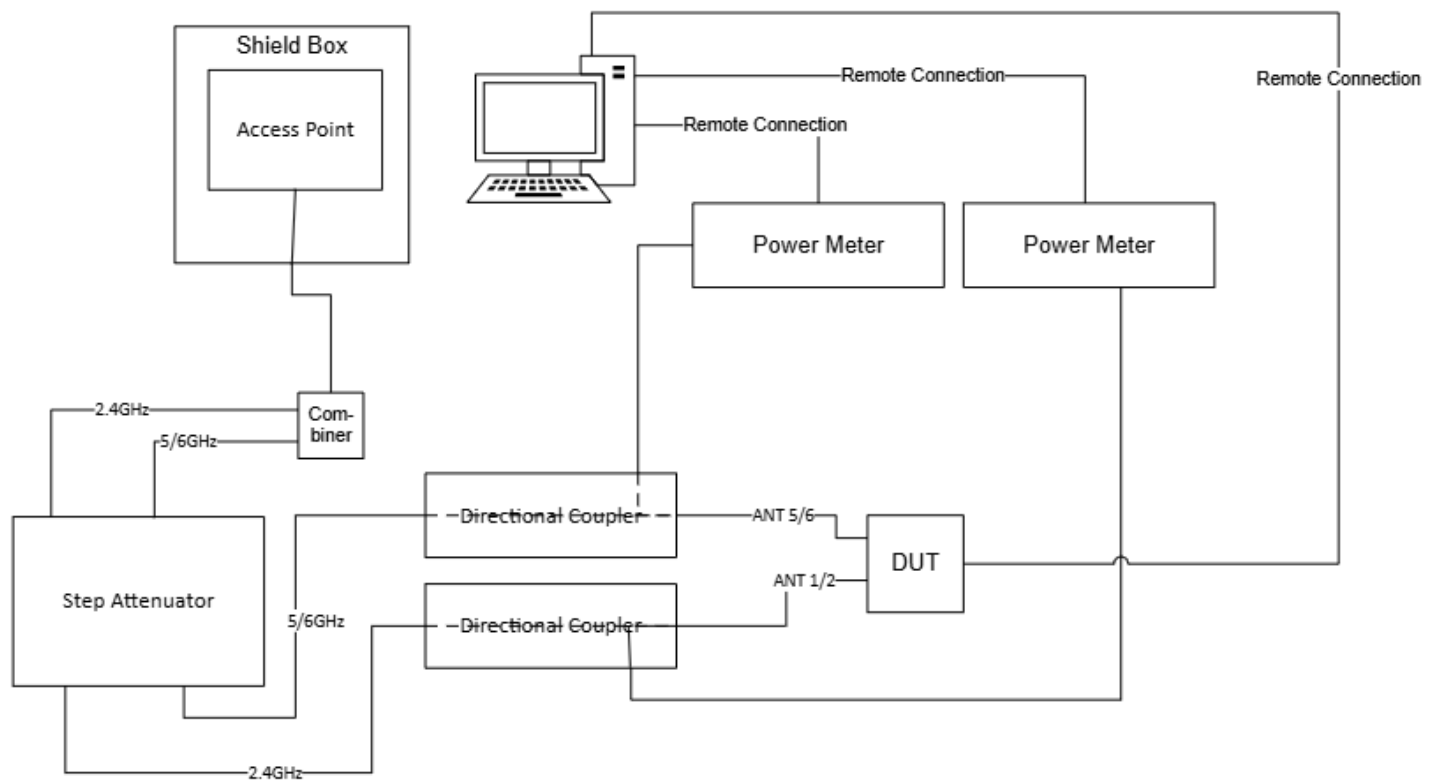


Figure 4-2: Antenna and Band Switching

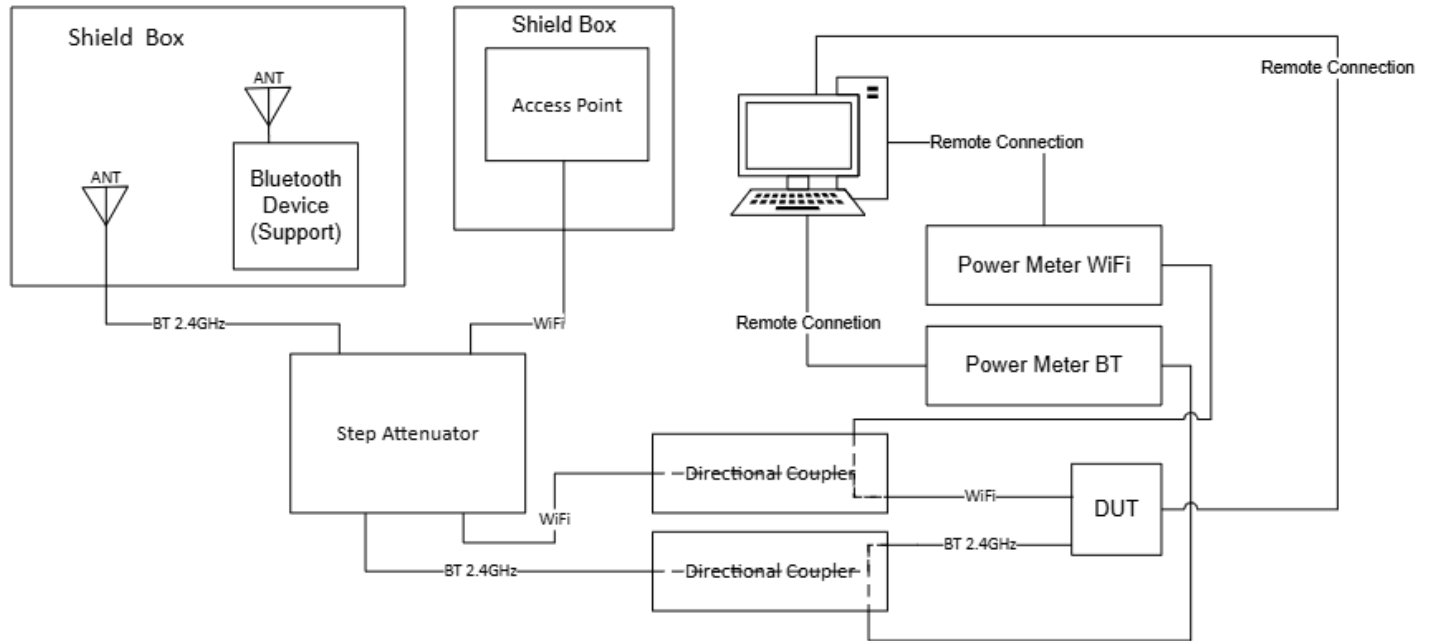


Figure 4-3: Tech Switch

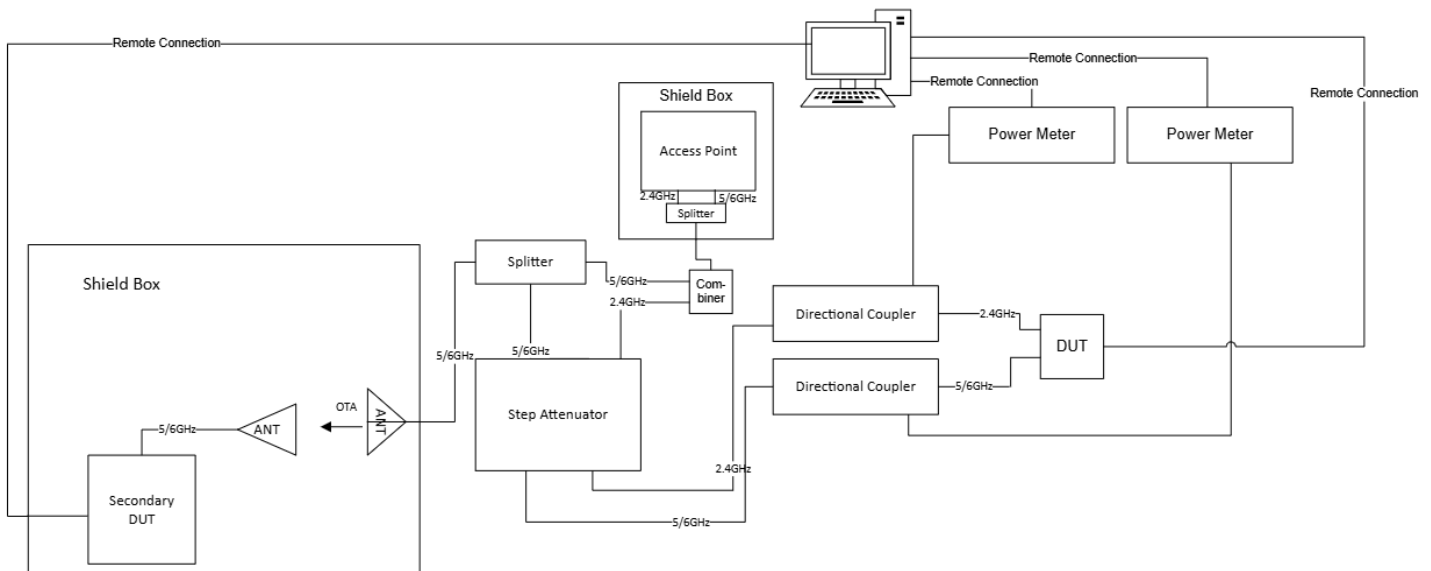


Figure 4-4: SDB Switch

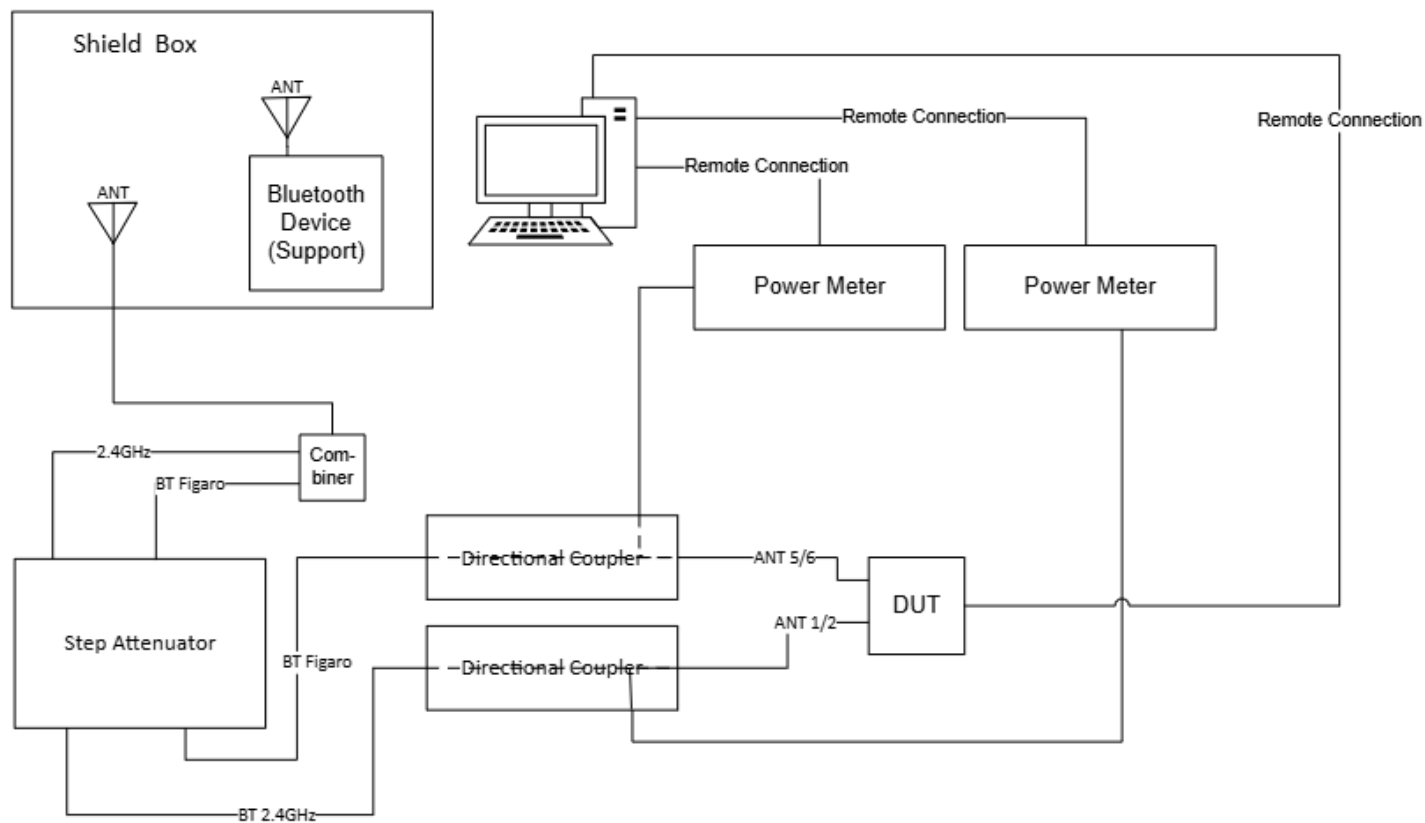
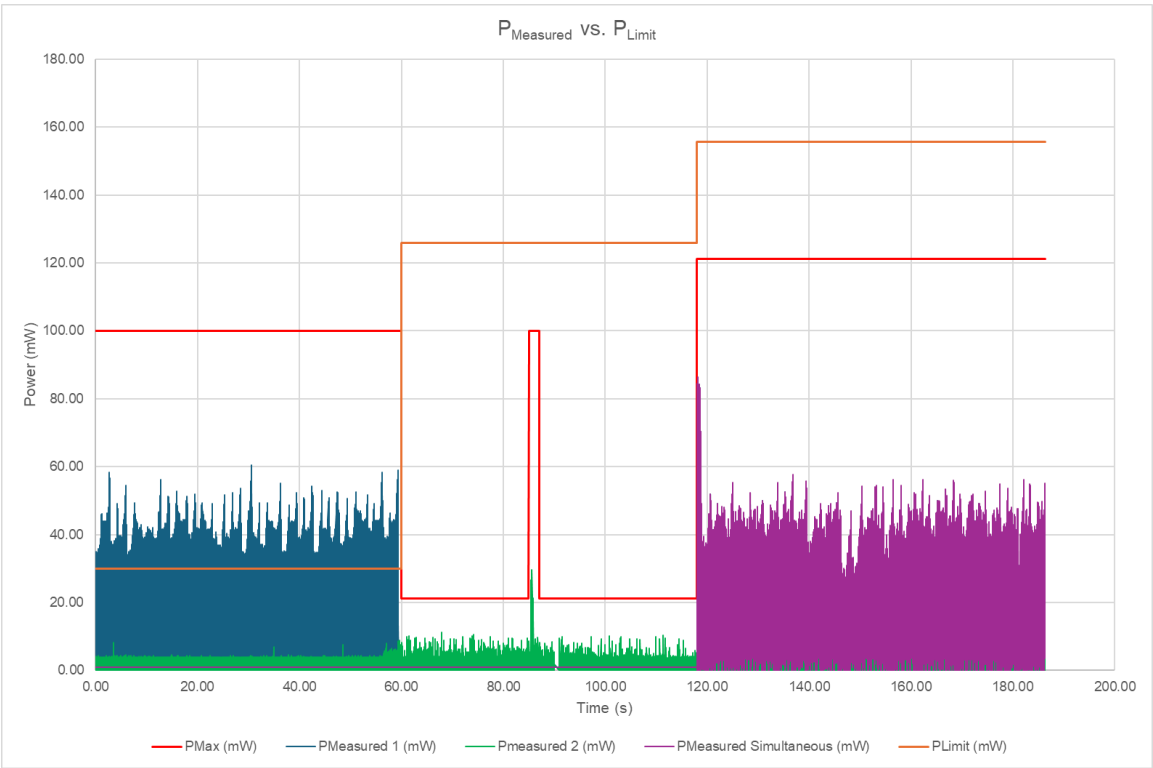


Figure 4-5: Change in BT Antenna and Band

4.1.6. Technology Switch



*: Between 85s and 90s there is a change in P_{Max} due to a brief period of an acknowledgement packet via different modulation than what the test was performed on

Figure 4-6: Change in Technology and Band Plot

	dBm	mW
Frequency: Wi-Fi 5.6GHz Ch120 Antenna: TxChain1 PLim ₁	14.75	29.85
Frequency: 5.6GHz Ch120 Antenna: TxChain1 Pmax ₁	20	100
Frequency: BT 2.4GHz Antenna: TxChain1 Plim ₂	21	125.89
Frequency: 6.1GHz Ch33 Antenna: TxChain1 Pmax ₂	13.25 Intermittently 20	21.13 Intermittently 100
Simultaneous Plim ₃	21.92	155.74
Simultaneous Pmax ₃	20.83	121.13

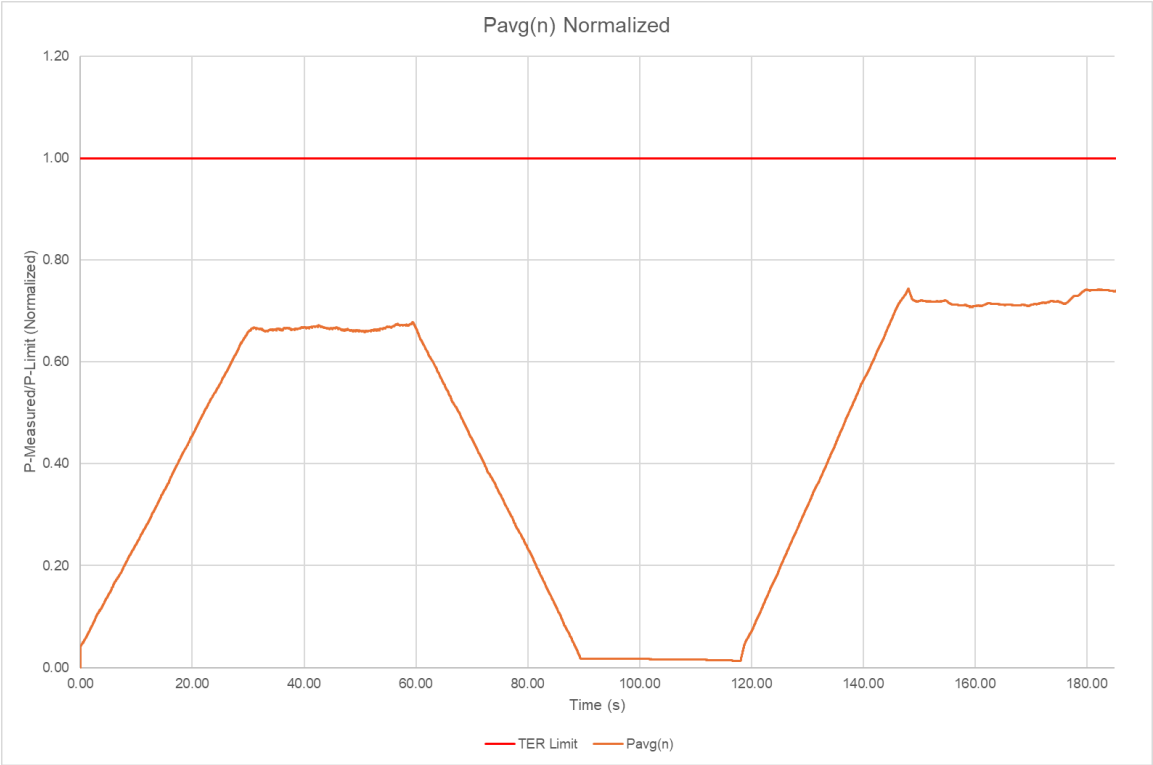


Figure 4-7: Change in Technology and Band Validation

	Validation
$p[n] \leq 1$	$0.75 \leq 1$

Pavg(n) was calculated using the 30 second time-averaging duration.

4.1.7. Change In Device State

4.1.7.1. Power State 3 to Power State 1

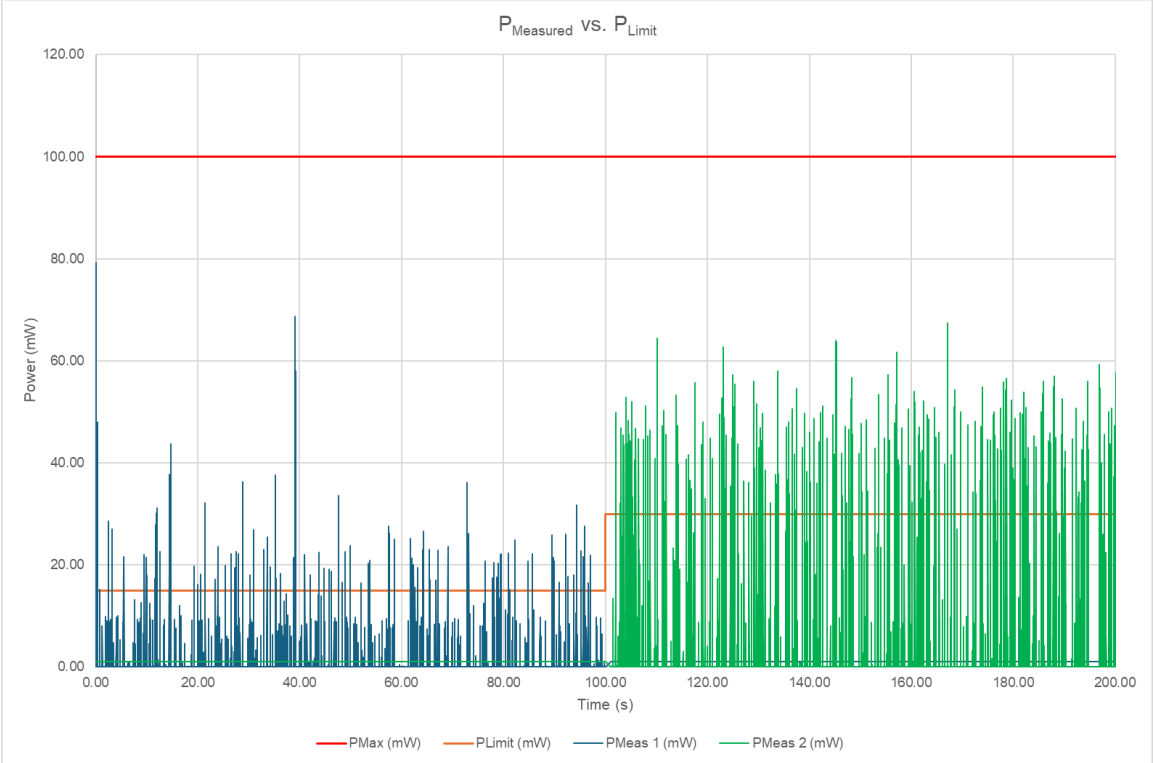


Figure 4-8: Power State 3 to Power State 1 Sequence

Frequency: 5.6GHz TxChain1	dBm	mW
Power State 3 Plim ₁	11.74	14.93
Power State 1 Plim ₂	14.75	29.85
Pmax	20	100

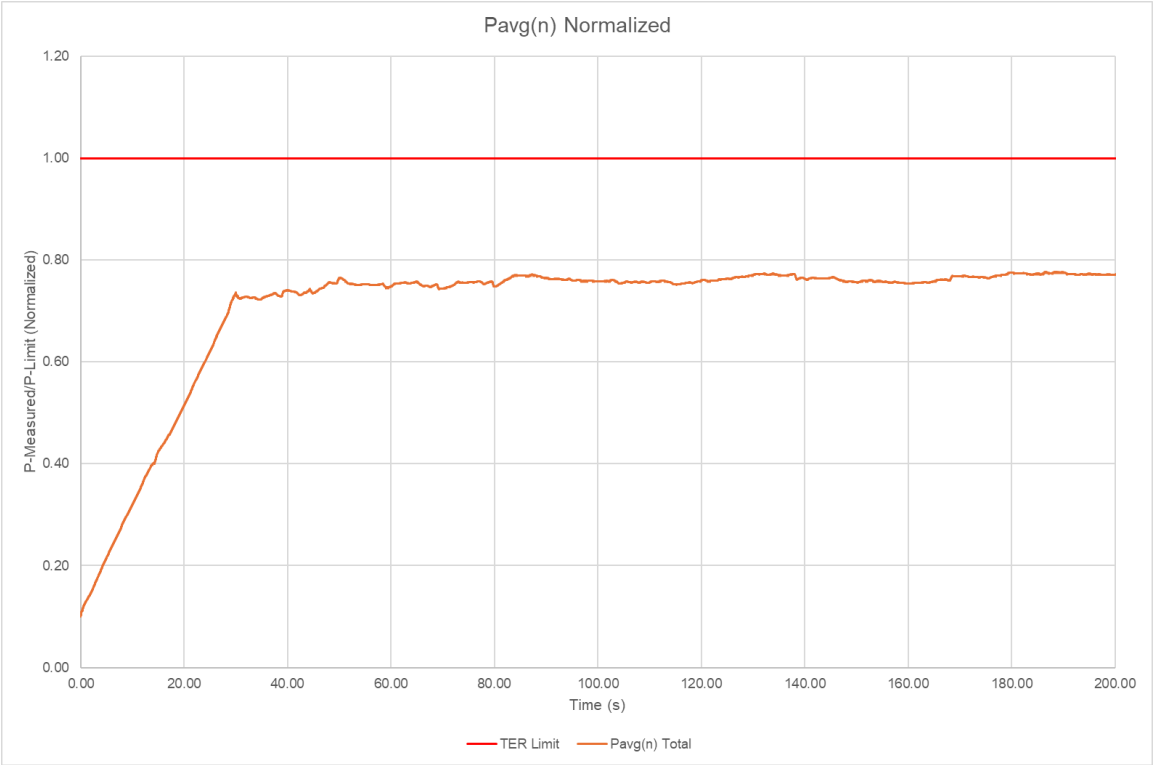


Figure 4-9: Wi-Fi Power State 3 to Power State 1 Validation

	Validation
$P_{avg}(n) \leq 1$	$0.78 \leq 1$

Pavg(n) was calculated using the 30 second time-averaging duration.

4.1.7.2. Power State 3 to Power State 4

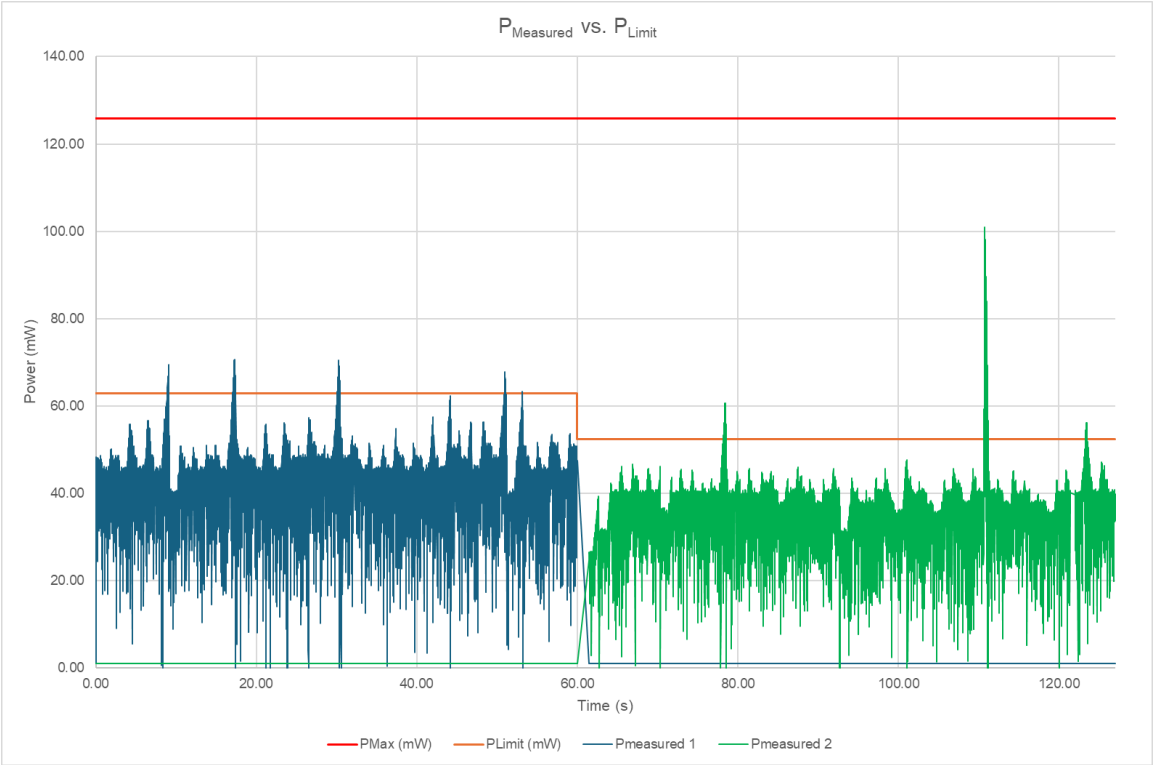


Figure 4-10: Wi-Fi Power State 3 to Power State 4 Plot

Frequency: 2.4GHz Ch6 Antenna: TxChain1	dBm	mW	Budget (mJ/kg) Max:1.2 mJ/kg
Power State 3 Plim ₁	17.98	62.95	0.6
Power State 4 Plim ₂	17.20	52.45	0.5
Pmax	21	125.89	N/A

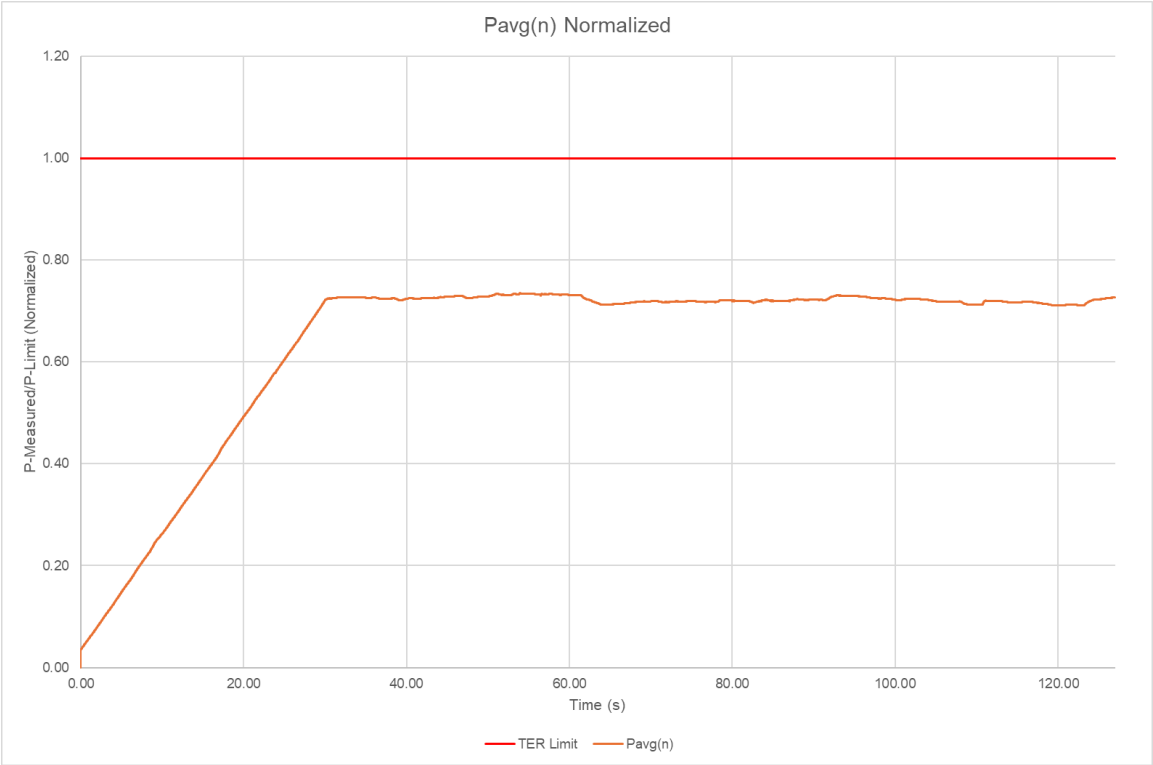


Figure 4-11: Wi-Fi Power State 3 to Power State 4 Validation

	Validation
$P_{avg}(n) \leq 1$	$0.73 \leq 1$

Pavg(n) was calculated using the 30 second time-averaging duration.

4.1.7.3. Power State 5 to Power State 6

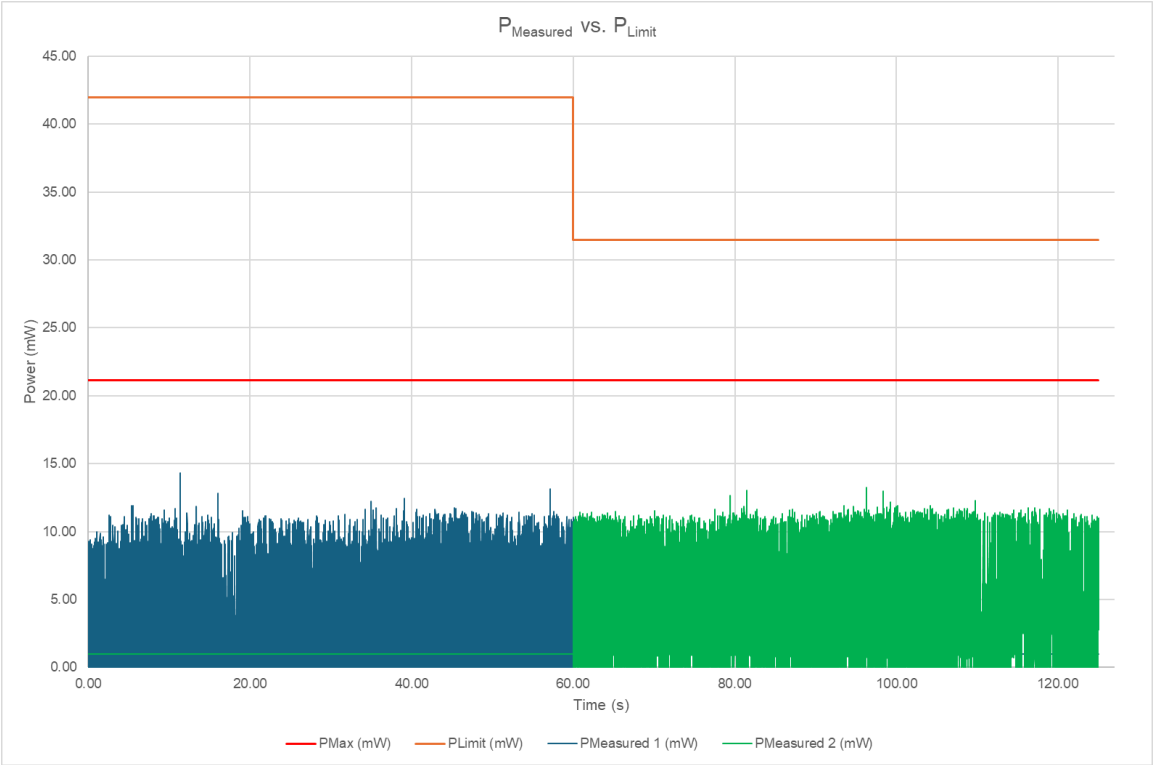


Figure 4-12: BT Power State 5 to Power State 6 Plot

Frequency: BT 2.4GHz HDR Antenna: TxChain1	dBm	mW	Budget (mJ/kg) Max:1.2 mJ/kg
Power State 5 Plim ₁	16.23	41.96	0.4
Power State 6 Plim ₂	14.97	31.47	0.3
Pmax	13.25	21.13	N/A

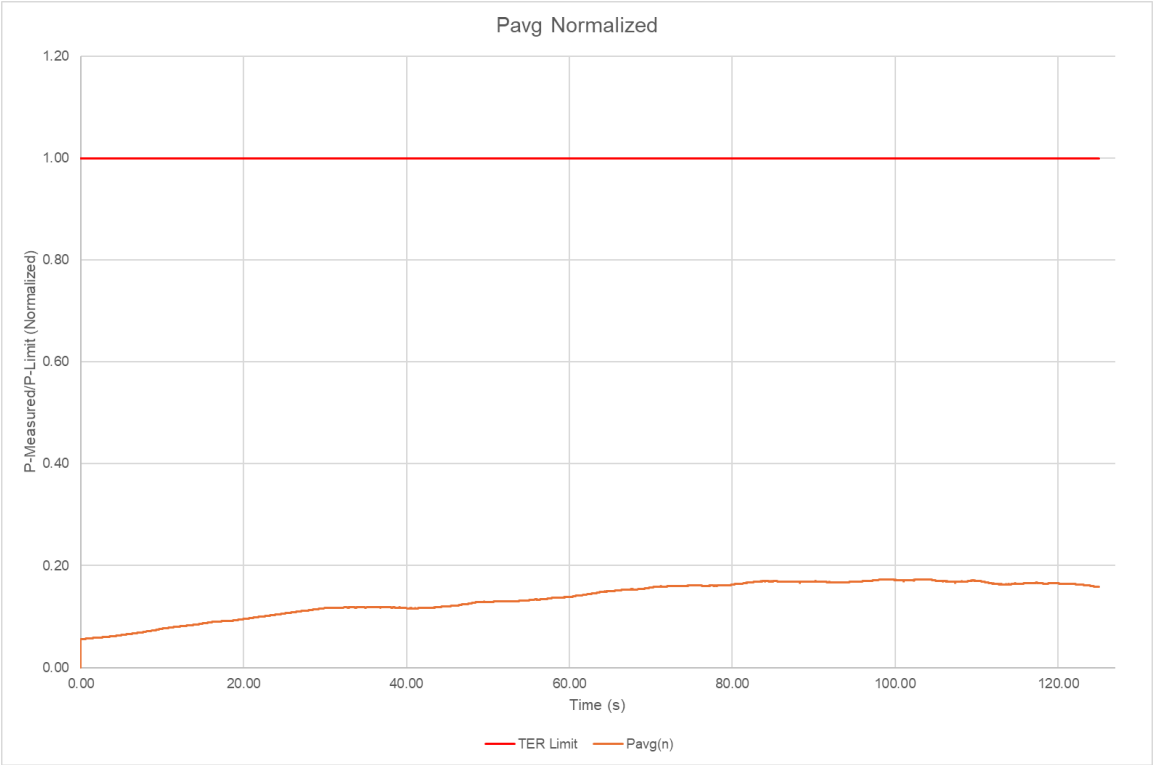
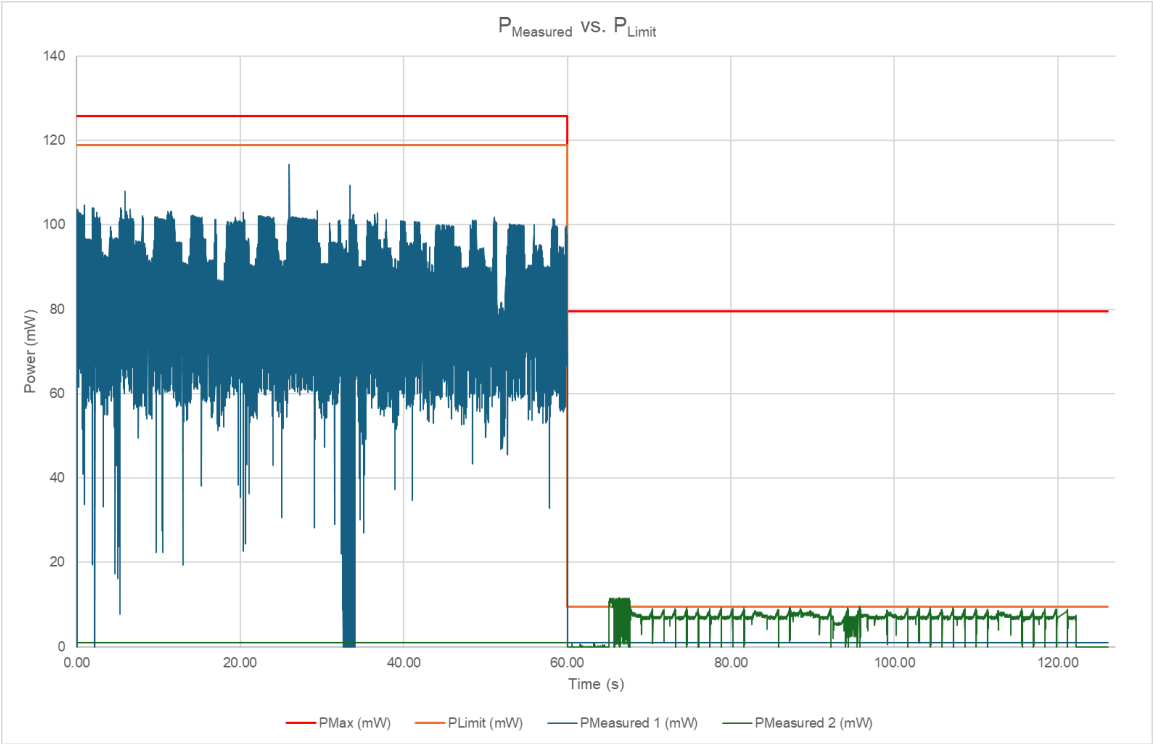


Figure 4-13: BT Power State 5 to Power State 6 Validation

	Validation
$P_{\text{avg}}(n) \leq 1$	$0.17 \leq 1$

Pavg(n) was calculated using the 30 second time-averaging duration.

4.1.8. Change in Antenna/Band
4.1.8.1. Wi-Fi 2.4 GHz to Wi-Fi 6 GHz



	dBm	mW
Frequency: 2.4GHz Ch6 Antenna: TxChain1 Plim ₁	20.75	118.85
Frequency: 2.4GHz Ch6 Antenna: TxChain1 Pmax ₁	21	125.89
Frequency: 6.1GHz Ch33 Antenna: TxChain1 Plim ₂	9.75	9.44
Frequency: 6.1GHz Ch33 Antenna: TxChain1 Pmax ₂	19	79.43

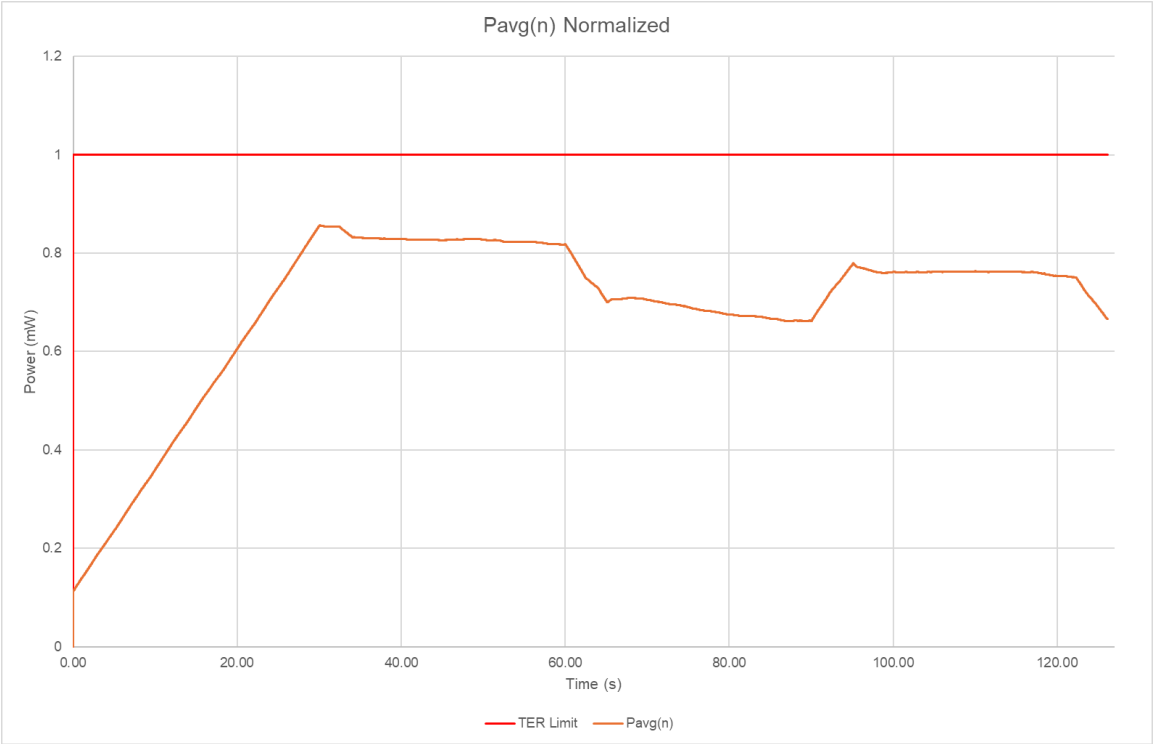
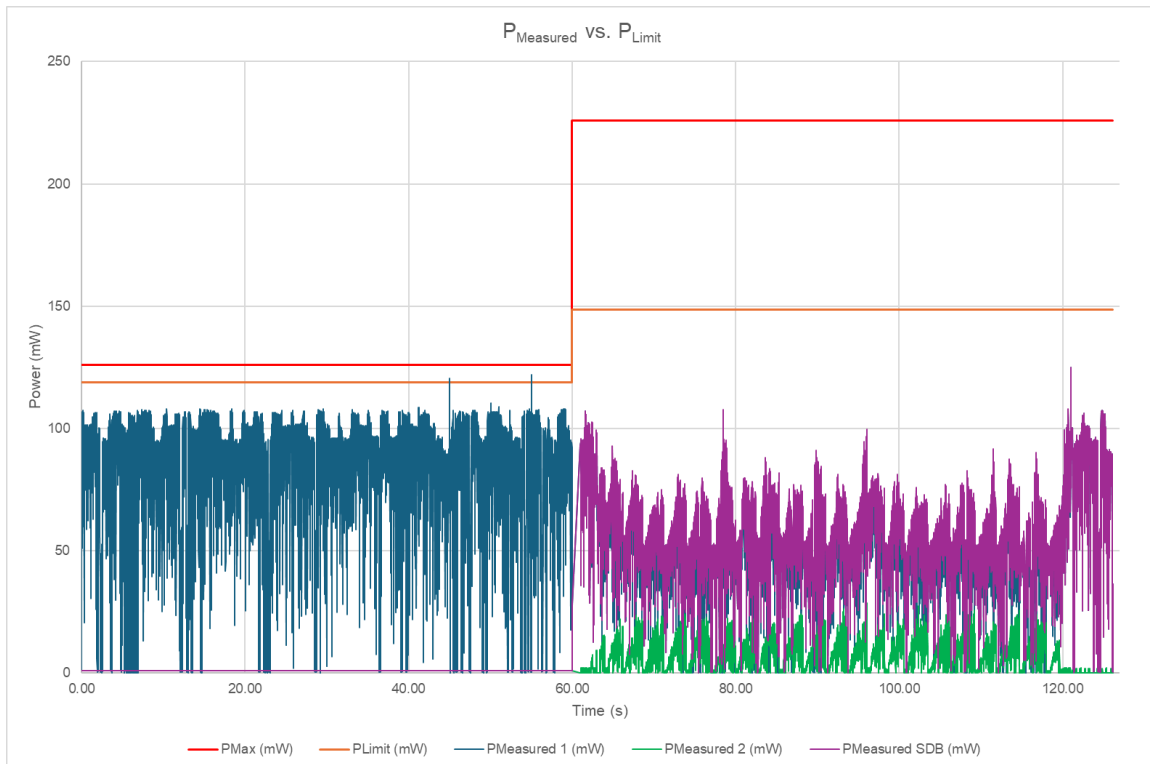


Figure 4-15: Band Switch Validation

	Validation
$P_{avg}(n) \leq 1$	$0.86 \leq 1$

$P_{avg}(n)$ was calculated using the 30 second time-averaging duration.

4.1.8.2. Wi-Fi 2.4GHz to Wi-Fi 2.4GHz + 5 GHz**Figure 4-16: Wi-Fi Standalone to Wi-Fi SDB Plot**

	dBm	mW
Frequency: 2.4GHz Ch6 Antenna: TxChain1 Plim ₁	20.75	118.85
Frequency: 2.4GHz Ch6 Antenna: TxChain1 Pmax ₁	21	125.89
Frequency: 5.6GHz Ch120 Antenna: TxChain1 Plim	14.75	29.85
Frequency: 5.6GHz Ch120 Antenna: TxChain1 Pmax	20	100
SDB Plim ₂	21.72	148.7
SDB Pmax ₂	23.54	225.89

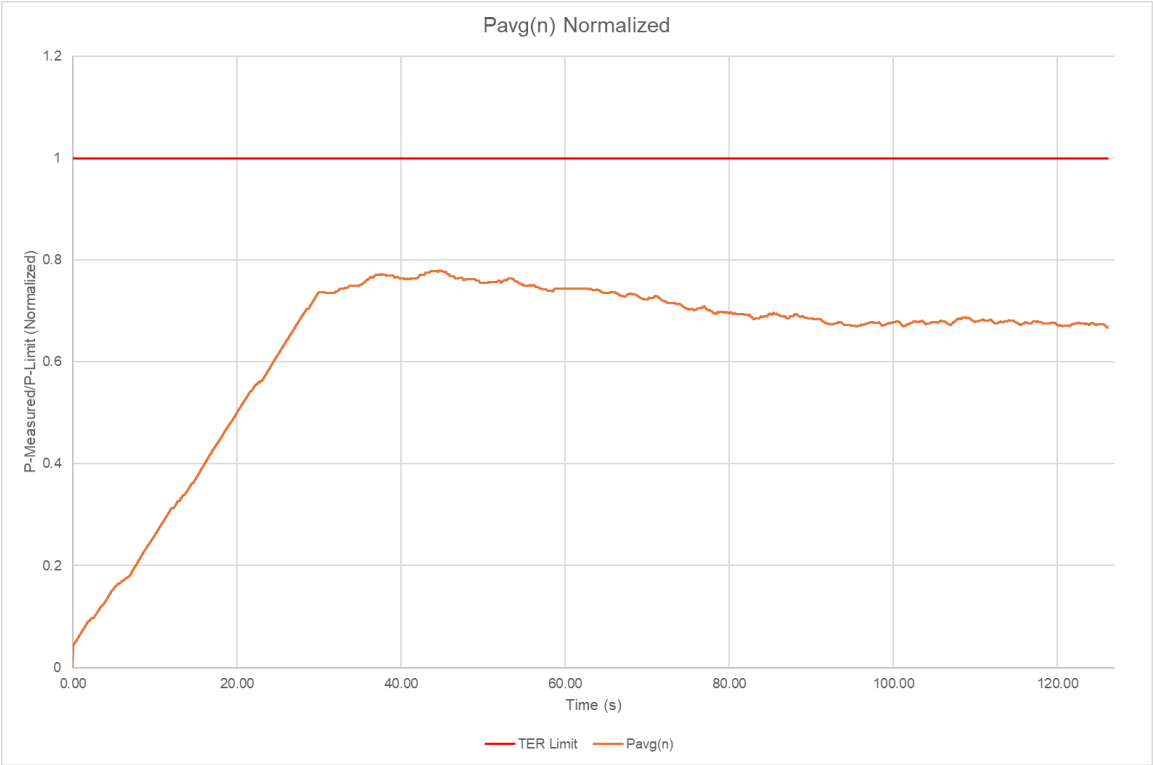


Figure 4-17: Wi-Fi Standalone to Wi-Fi SDB Validation

	Validation
$p[n] \leq 1$	$0.78 \leq 1$

$P_{avg}(n)$ was calculated using the 30 second time-averaging duration.

5. Conclusion

The data presented in this report serves to validate this TAS algorithm for the connectivity transmitters. As demonstrated, the power limiting enforcement is effective and the total normalized time-averaged requested power/RF exposure does not exceed 1 nor does $P_{avg}(n)$ exceed P_{Limit} .

Appendices

Appendix A: Test Setup Photos

Appendix B: SAR Measurement System & Test Equipment

B.1. 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.

Test Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Sensor	R&S	NRP8S	107587	5/5/2027
Power Sensor	R&S	NRP8S	108121	5/5/2027
Power Sensor	R&S	NRP8S	109115	2/28/2026
Power Sensor	R&S	NRP8S	105244	5/5/2027
Vector Network Analyzer	R&S	ZNLE6	171920	2/28/2026
OSM Calibration Kit	R&S	ZN-Z151	101507	2/21/2026
Bi-Directional Coupler	Mini-Circuits	ZUDC10-83-S+	N/A	N/A
Bi-Directional Coupler	Mini-Circuits	ZUDC10-83-S+	N/A	N/A
Programmable Step Attenuator	API Technologies - Weinschel	8321 Series	11548001	N/A
Power Splitter	Mini-Circuits	ZFSC-2-10G	SF191300443	N/A
Power Splitter	Mini-Circuits	ZN2PD-9G-S	SF689400614	N/A
Access Point – Wi-Fi Router	TP-Link	Archer BE800	Y24B045000598	N/A

END OF REPORT