The following test report is submitted to supplement the spot check test report S-4792232027-E3 for variant model FCC ID: A3LSMX840.
It contains test data from FCC ID: A3LSMX848U as referenced in the variant model spot check report.
Compliance of variant model A3LSMX840 is based on the combination of reports in accordance with FCC KDB 484596.

IAS
ACCREDITED
Testing Laboratory
TL-637

CERTIFICATION TEST REPORT

Report Number. : S- 4792232010-E7V3

Applicant : SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Model : SM-X848U

FCC ID : A3LSMX848U

EUT Description : BT/BLE Tablet + DTS/UNII a/b/g/n/ac/ax/be and digitizer

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
2026-07-09

Prepared by:
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Revision History

Rev.	Issue Date	Revisions	Presented By
V1	2026-06-22	Initial issue	Myeongjun Kwon
V2	2026-06-29	Updated to address TCB's question	Myeongjun Kwon
V3	2026-07-09	Update the cover apge	Myeongjun Kwon

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: WCDMA/LTE/5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and digitizer

MODEL NUMBER: SM-X848U

SERIAL NUMBER: R3GL40GJ5JD, R3GL40GJ4PN, R3GL40GJ3GX (CONDUCTED); R3GL40GJ5MZ, R3GL40GJ4NY (RADIATED);

DATE TESTED: 2026-04-30 – 2026-06-29

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
47 CFR Part 15 Subpart C	Complies

UL KOREA LTD. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL KOREA LTD. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL KOREA LTD. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL KOREA LTD. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL KOREA LTD. By:

Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Tested By:

Myeongjun Kwon
Suwon Lab Engineer
UL KOREA LTD.

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2. TEST METHODOLOGY

1. FCC 47 CFR Part 2.
2. FCC 47 CFR Part 15.
3. KDB 558074 D01 15.247 Meas Guidance v05r02.
4. KDB 662911 D01 v02r01
5. ANSI C63.10-2020.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1(3m semi-anechoic chamber)
☒ Chamber 2(3m semi-anechoic chamber)
☒ Chamber 3(3m semi-anechoic chamber)
☐ Chamber 4(3m Full-anechoic chamber)
☐ Chamber 5(3m Full-anechoic chamber)

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

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4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
28.9 dBuV/m = 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB

AC Corrected Reading (dBuV) = Measured Voltage (dBuV) + Extension Cord Loss (dB) + Cable Loss (dB)
44.72 dBuV = 34.72 dBuV + 9.9 dB + 0.1 dB

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
RF Output Power	0.70 dB
Power Spectral Density	1.99 dB
Occupied Bandwidth	0.04 %
Conducted Spurious Emissions	2.00 dB
Conducted Disturbance, 0.15 to 30 MHz	1.84 dB
Radiated Disturbance, 9 kHz to 30 MHz	2.41 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.78 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.25 dB
Radiated Disturbance, Above 18 GHz	5.07 dB

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

4.4. DECISION RULES

Decision rule for statement(s) of conformity is based on Clause 4.4.3 in IEC Guide 115:2023.

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is WCDMA/LTE/5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and digitizer. This test report addresses the DTS (BLE) operational mode.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak and average conducted output power as follows:

Antenna1

Frequency Range[MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2 402 ~ 2 480	500 kbps (255 pkt)	Peak	13.86	24.32
		Average	13.73	23.62
2 404 ~ 2 478	2 Mbps (255 pkt)	Peak	13.70	23.44
		Average	13.39	21.84

Antenna2

Frequency Range[MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2 402 ~ 2 480	500 kbps (255 pkt)	Peak	14.02	25.24
		Average	13.73	23.59
2 404 ~ 2 478	2 Mbps (255 pkt)	Peak	13.94	24.77
		Average	13.55	22.65

Antenna Dual mode

Frequency Range[MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2 402 ~ 2 480	1 Mbps (255 pkt)	Peak	11.82	15.20
		Average	11.48	14.05
2 404 ~ 2 478	2 Mbps (255 pkt)	Peak	11.75	14.95
		Average	11.25	13.32

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The internal antenna was Permanently attached.
Therefore this E.U.T Complies with the requirement of §15.203.

The radio utilizes a internal antenna, with a maximum gain of:

Frequency Band[MHz]	ANT1 Gain [dBi]	ANT2 Gain [dBi]	Correlated Chains Directional Gain[dBi]
DTS 2400 – 2483.5	-5.70	-5.90	-2.79

Directional gain for the MIMO operations is determined using KDB 662911 D01 Multiple Transmitter Output section F (2)(d)(1) for *Unequal antenna gains, with equal transmit powers*. The gain is calculated using the formula for correlated transmissions across the two transmit antennas.

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]$ dBi.
Sample calculation for this device with $N_{ANT} = 2$
Directional gain = $10 \log[(10^{-5.70/20} + 10^{-5.90/20})^2 / 2] = -2.79$ dBi

“WIFI0” and “WIFI1” as indicated in antenna specification are written as ANT1 and ANT2 in this report.

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5.4. WORST-CASE CONFIGURATION AND MODE

Both Bluetooth LE Diversity mode and DUAL mode have been investigated and confirmed.

The radiated tests of the EUT were investigated in three orthogonal orientations X, Y and Z.
It was determined that below table's orientation was the worst-case orientation.

ANT	BE	RSE
	EUT axis	EUT axis
ANT1	X	Y
ANT2	X	Y
Dual	X	Y

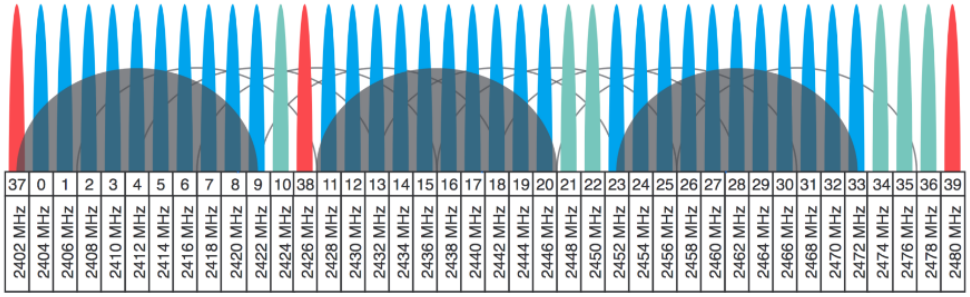
For conducted power test, both Diversity and DUAL mode were tested and reported.
Only Conducted power was reported for Dual mode because no noticeable emissions were detected in other test items.

Radiated and power line conducted tests were performed with EUT connected to AC power adapter as the worst-case configuration. Radiated harmonics spurious 1~18 GHz Low/Mid/High channels,18-26GHz were performed with the EUT set at the Diversity and DUAL mode. Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

For Radiated band-edge and spurious test, tests were performed on Diversity and DUAL mode.

Due to modulation characteristics, BLE coded data was worse than 1Mbps in the RBW 3kHz PSD results. However, based on the RBW (1MHz) when measuring radiated spurious, the PSD of 1Mbps is higher, so 1Mbps was selected as the worst case to suit the radiation test environment.
All radiated and power line conducted tests were performed attached with travel adapter for the worst-case condition mode.

The EUT does not supported Primary PHY channels (2402[37] / 2426[38] / 2480[39] MHz) at the BLE 2Mbps data-rate. BLE Channels that used for testing are follows in below.



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Power verification

The output power of all data rates was investigated. The 1 Mbps, 500 kbps, 2 Mbps modes represent the worst case in terms of symbol rate. All tests were performed in these three modes.

Symbol Rate [Ms/s]	Mode	Freq. [MHz]	Conducted Burst Avg [dBm]	Symbol Rate [Ms/s]	Mode	Freq. [MHz]	Conducted Burst Avg [dBm]
1	1 Mbps 37 pkt ANT1	2 402	12.672	2	2 Mbps 37 pkt ANT1	2 404	12.368
		2 440	13.559			2 440	13.398
		2 480	13.124			2 478	13.038
	1 Mbps 37 pkt ANT2	2 402	12.577		2 Mbps 37 pkt ANT2	2 404	12.399
		2 440	12.642			2 440	12.479
		2 480	12.312			2 478	11.981
	1 Mbps 255 pkt ANT1	2 402	13.689		**2 Mbps 255 pkt ANT1**	2 404	13.393
		2 440	13.549			2 440	13.387
		2 480	13.104			2 478	13.023
	1 Mbps 255 pkt ANT2	2 402	13.553		**2 Mbps 255 pkt ANT2**	2 404	13.434
		2 440	13.716			2 440	13.550
		2 480	12.342			2 478	11.972
1 Coded S=8	125 kbps 37 pkt ANT1	2 402	12.670	1 Coded S=2	500 kbps 37 pkt ANT1	2 402	12.669
		2 440	13.559			2 440	13.553
		2 480	13.128			2 480	13.134
	125 kbps 37 pkt ANT2	2 402	12.541		500 kbps 37 pkt ANT2	2 402	12.562
		2 440	12.667			2 440	12.687
		2 480	12.345			2 480	12.365
	125 kbps 255 pkt ANT1	2 402	13.711		**500 kbps 255 pkt ANT1**	2 402	13.733
		2 440	13.578			2 440	13.580
		2 480	13.144			2 480	13.146
	125 kbps 255 pkt ANT2	2 402	13.537		**500 kbps 255 pkt ANT2**	2 402	13.569
		2 440	13.688			2 440	13.728
		2 480	12.318			2 480	12.357

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-T2510	N/A	N/A
Data Cable	SAMSUNG	EP-DN980	N/A	N/A

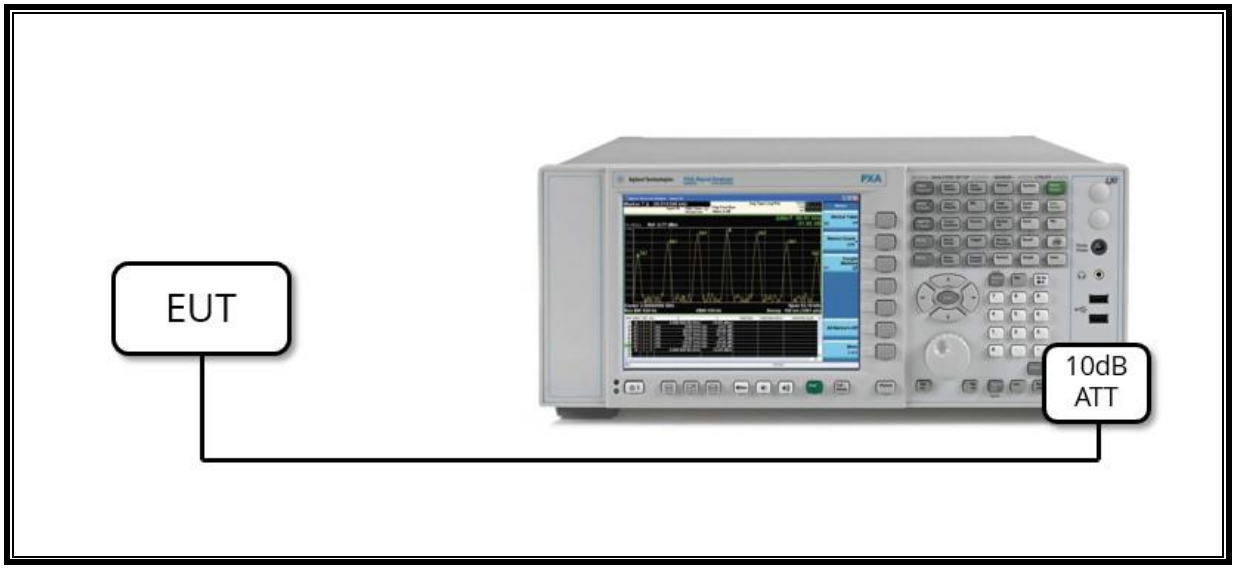
I/O CABLE

I/O Cable List						
Cable No.	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	C Type	Shielded	1.0 m	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software in hidden menu exercised the EUT to enable BLE mode.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



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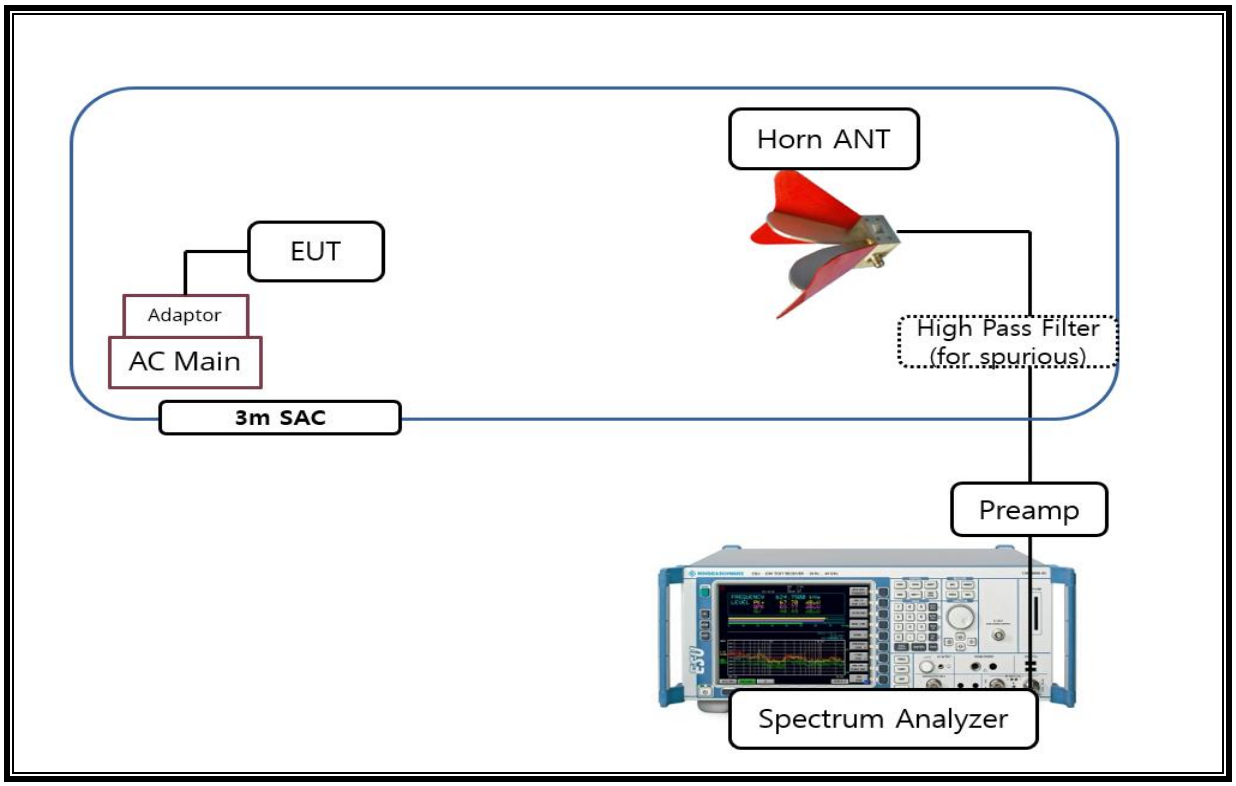
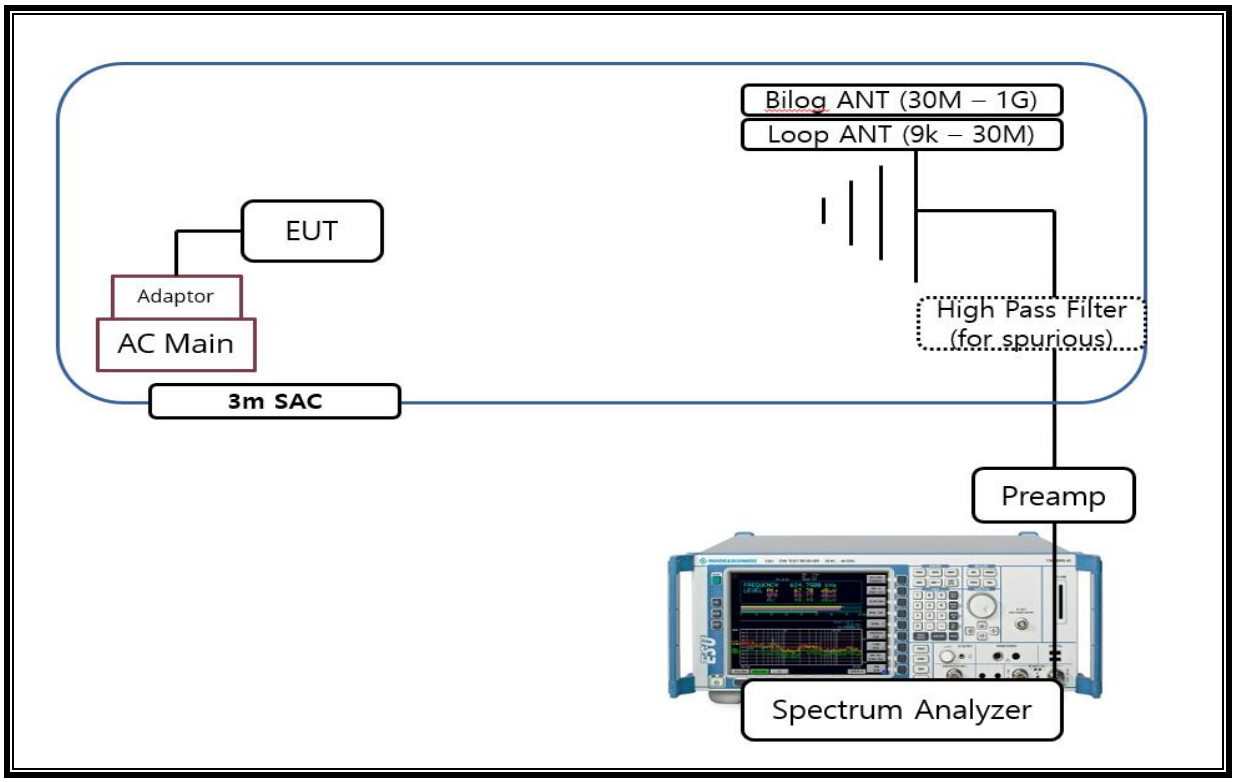
SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP) Below 1GHz



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6. MEASUREMENT METHOD

6 dB BW : ANSI C63.10-2020, Section 11.8.2 Option 2

OUTPUT POWER: ANSI C63.10-2020, Section 11.9.1.1 RBW ≥ DTS bandwidth

POWER SPECTRAL DENSITY: ANSI C63.10-2020, Section 11.10.2 Method PKPSD (peak PSD)

Out-of-band Emissions (Conducted): ANSI C63.10-2020, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Non-restricted Bands: ANSI C63.10-2020, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Restricted Bands: ANSI C63.10-2020, Section 11.12 Emissions in restricted frequency bands

AC Power Line Conducted Emission: ANSI C63.10-2020, Section 6.2

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7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB 9163	750	2026-07-30
Antenna, Horn, 18 GHz	ETS	3117	00168717	2026-07-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2026-07-23
Preamplifier	ETS	3116C-PA	00168841	2026-07-28
Preamplifier, 1000 MHz	Sonoma	310N	341282	2026-07-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2026-07-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2026-07-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2026-12-29
RF Switching Unit	TA Engineering	TA-018S-16	SW-1	N/A
Average Power Sensor	Agilent / HP	U2000A	MY54270007	2026-07-22
Average Power Sensor	Agilent / HP	U2000A	MY54260010	2026-07-22
Attenuator	PASTERNACK	PE7087-10	A001	2026-07-22
Attenuator	PASTERNACK	PE7087-10	A008	2026-07-22
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2026-07-21
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2026-07-21
EMI Test Receive	R&S	ESW 8	101227	2026-07-17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2026-07-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2026-07-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	21	2026-07-21
LISN	R&S	ENV216	101837	2026-07-22
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2E	100900	2027-07-24

UL Software			
Description	**Manufacturer**	**Model**	**Version**
Radiated software	UL	UL EMC	Ver 9.5
AC Line Conducted software	UL	UL EMC	Ver 9.5

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8. TEST RESULTS SUMMARY

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	Occupied Bandwidth(6dB)	> 500kHz	Conducted	Complies
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-20 dBc		Complies
15.247 (b)(3)	TX conducted output power	< 30 dBm		Complies
15.247(e)	PSD	< 8 dBm/3kHz		Complies
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	Complies
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	Complies

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9. ANTENNA PORT TEST RESULTS

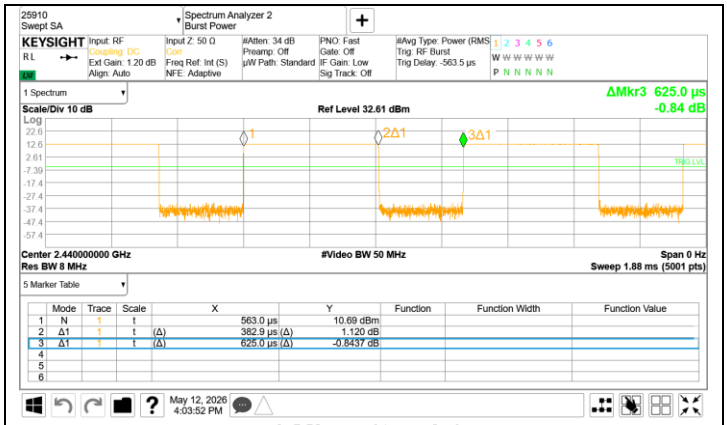
9.1. ON TIME AND DUTY CYCLE

LIMITS

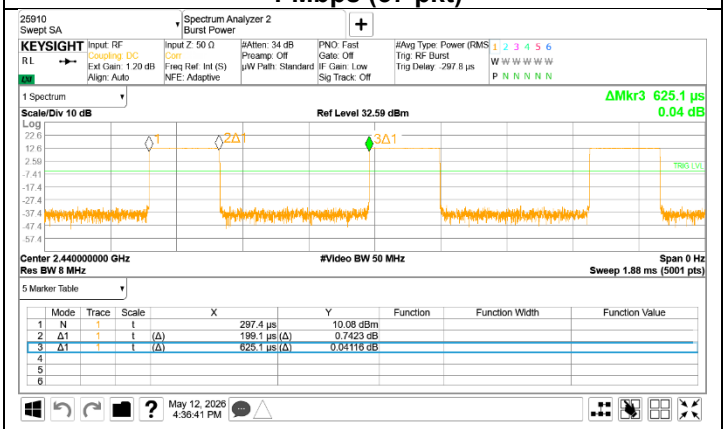
None; for reporting purposes only.

Mode	On time [msec]	Period [msec]	Duty cycle x [Linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2 400 ~ 2 483.5 MHz Bands						
500 kbps [37pkt]	1.056	1.875	0.5632	56.32	2.49	0.95
500 kbps [255pkt]	4.528	5.002	0.9052	90.52	0.43	0.22
1 Mbps [37pkt]	0.383	0.625	0.6126	61.26	2.13	2.61
1 Mbps [255pkt]	2.119	2.499	0.8479	84.79	0.72	0.47
2 Mbps [37pkt]	0.199	0.625	0.3185	31.85	4.97	5.02
2 Mbps [255pkt]	1.065	1.875	0.5680	56.80	2.46	0.94

Note: Due to All diversity and Dual mode have the same duty cycle, the duty cycle of ANT1 is reported as a representative in the table above.



1 Mbps (37 pkt)



2 Mbps (37 pkt)

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9.2. 6 dB & 99% BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

9.2.1. Test data

Mode	Antenna	Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minimum Limit [kHz]	99% Bandwidth [kHz]
500 kbps (255pkt)	ANT1	37	2 402	663.4	500.0	1 026.0
		17	2 440	664.8		1 026.3
		39	2 480	672.1		1 025.9
	ANT2	37	2 402	679.8		1 025.9
		17	2 440	656.3		1 026.4
		39	2 480	659.3		1 025.4
2 Mbps (255pkt)	ANT1	0	2 404	1 172.0		2 059.8
		17	2 440	1 227.0		2 061.6
		36	2 478	1 174.0		2 059.3
	ANT2	0	2 404	1 160.0		2 060.0
		17	2 440	1 156.0		2 061.6
		36	2 478	1 223.0		2 061.6
Worst				**656.3**		**2 061.6**

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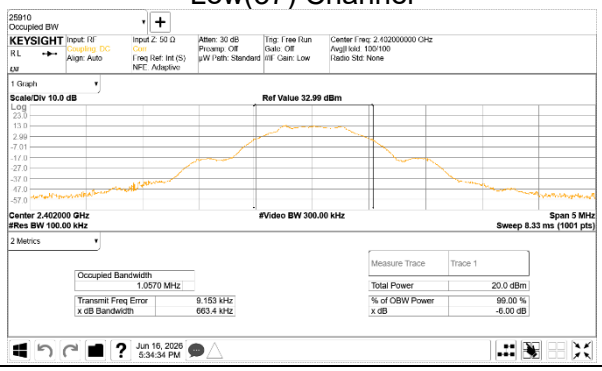
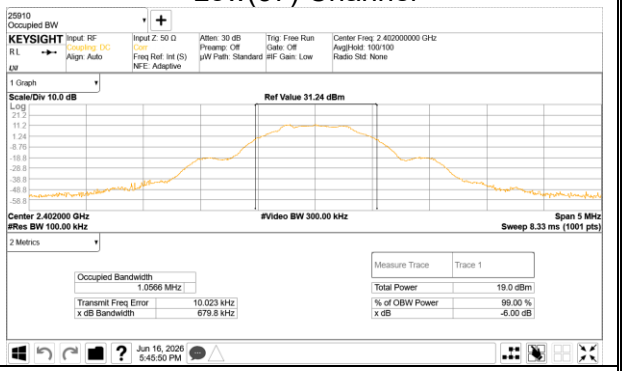
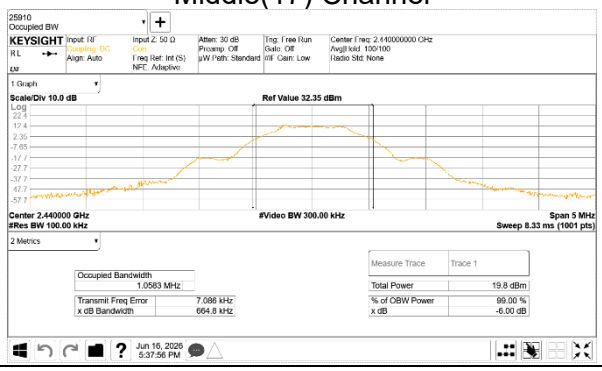
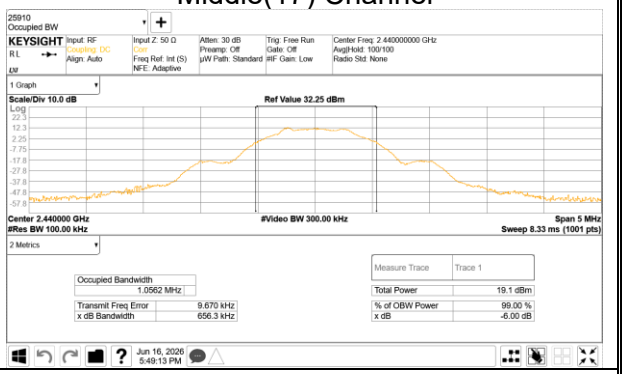
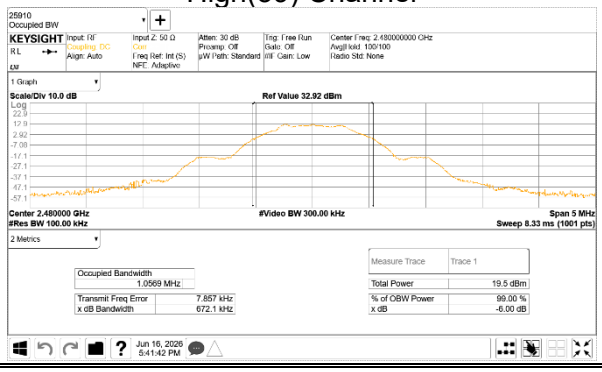
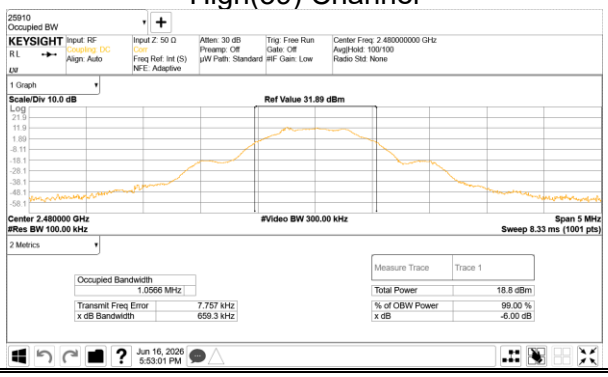
9.2.2. 6 dB BANDWIDTH PLOTS

500 kbps ANT1	500 kbps ANT2
Low(37) Channel	Low(37) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(39) Channel	High(39) Channel
	

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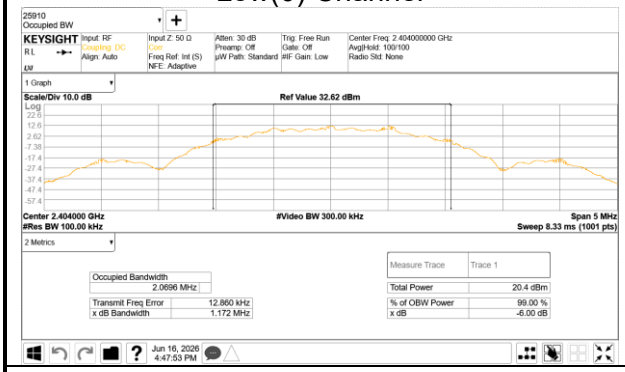
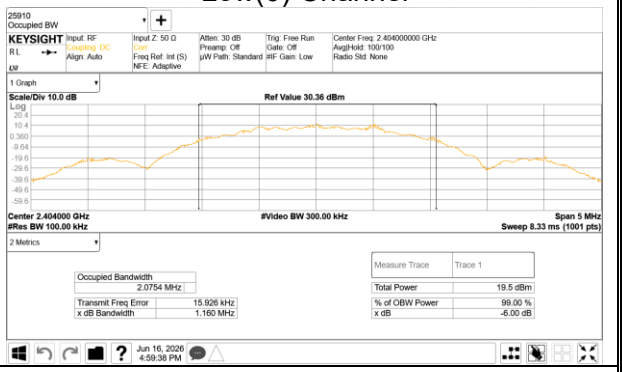
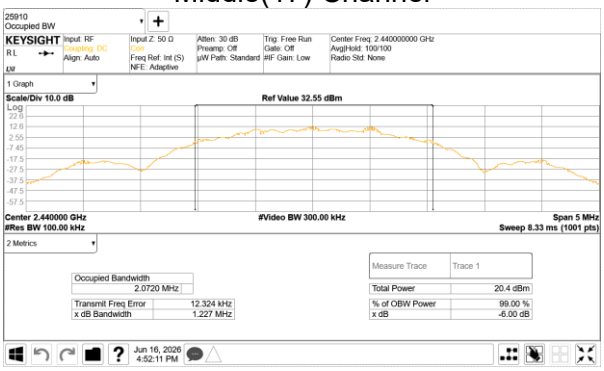
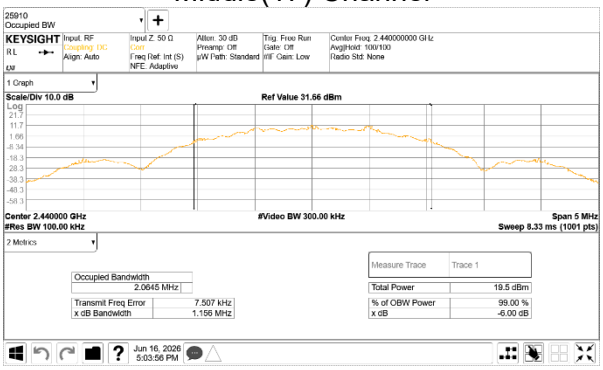
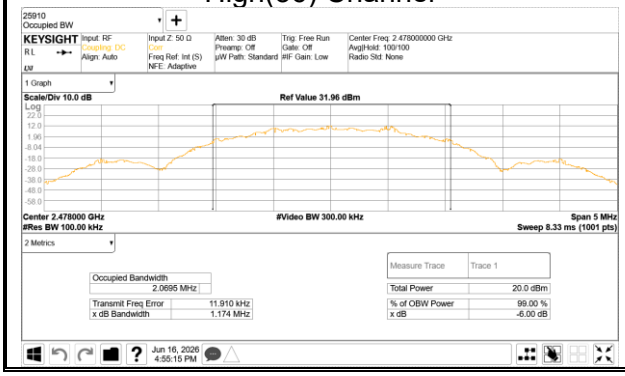
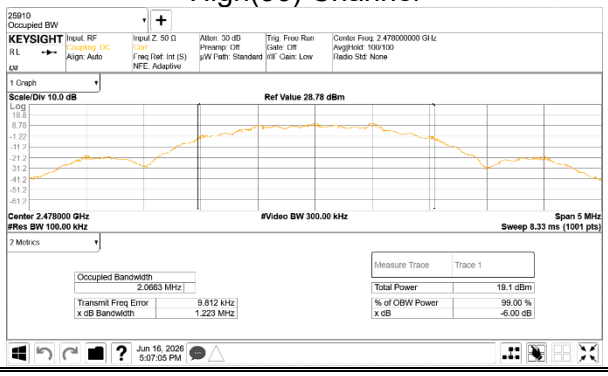
2 Mbps ANT1	2 Mbps ANT2
Low(0) Channel	Low(0) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(36) Channel	High(36) Channel
	

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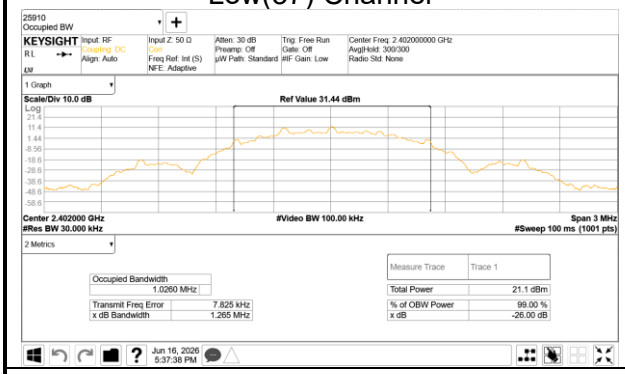
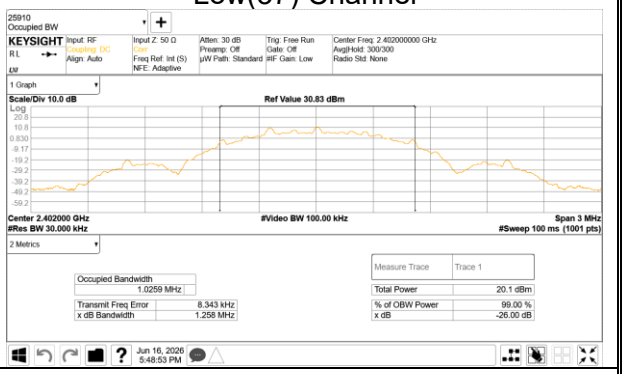
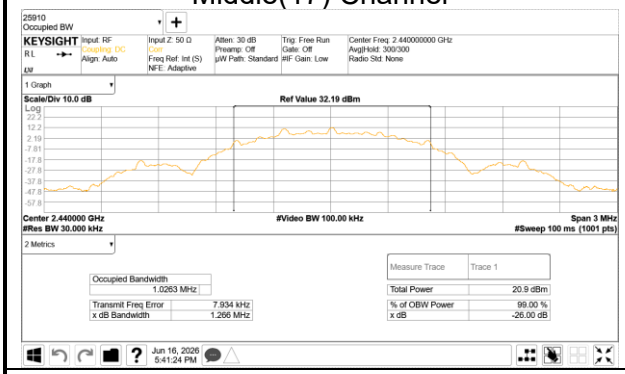
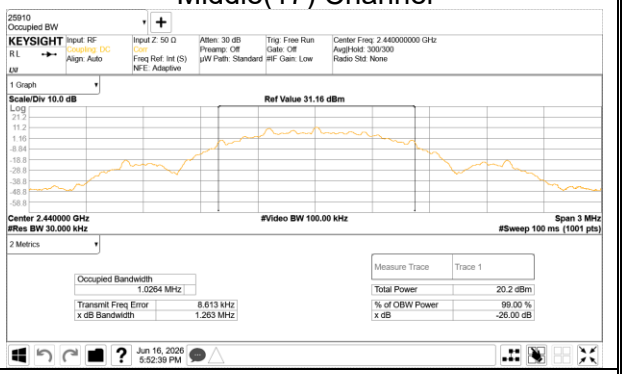
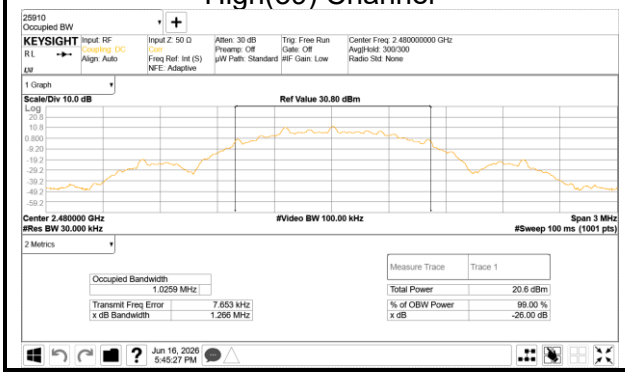
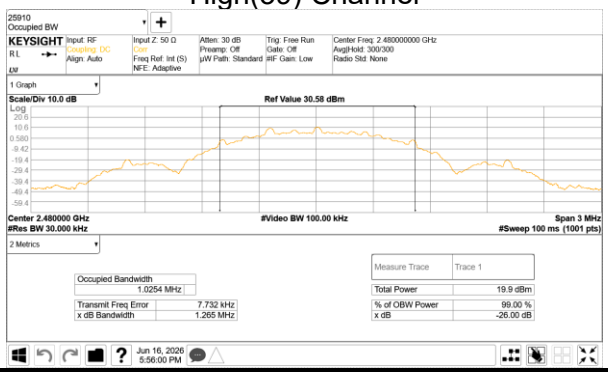
9.2.3. 99% BANDWIDTH PLOTS

500 kbps ANT1	500 kbps ANT2
Low(37) Channel	Low(37) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(39) Channel	High(39) Channel
	

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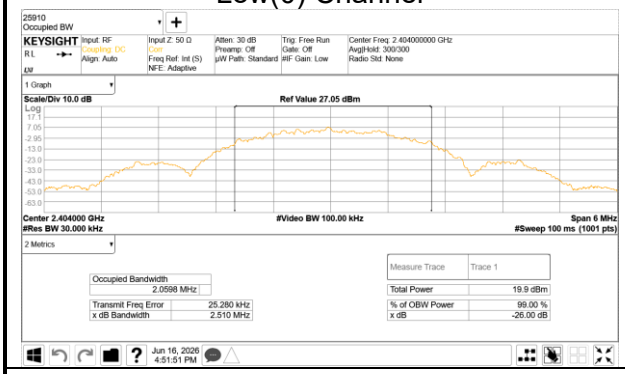
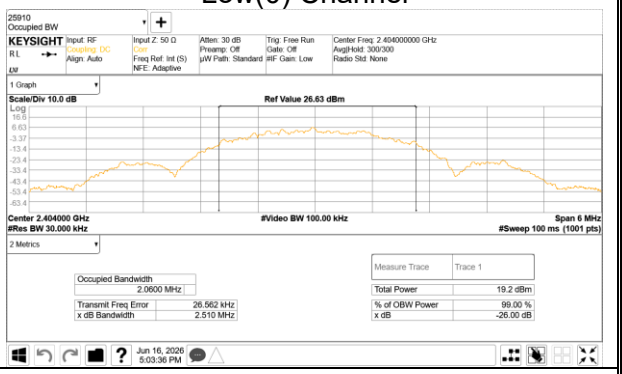
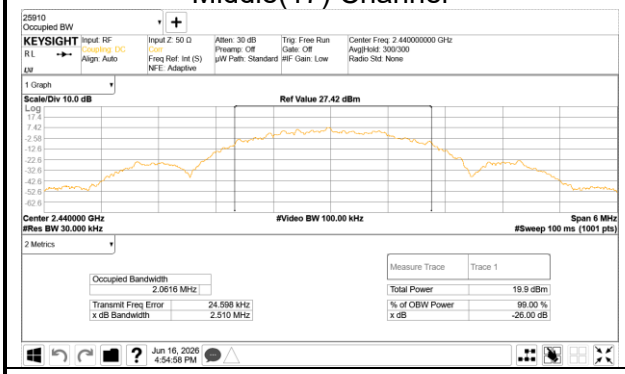
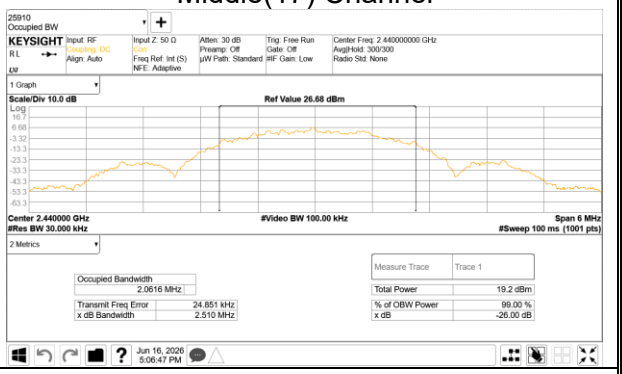
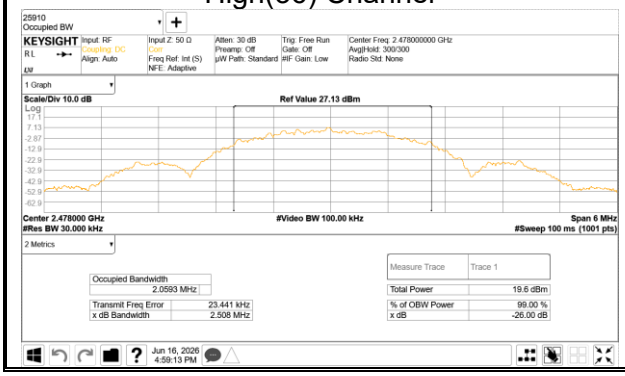
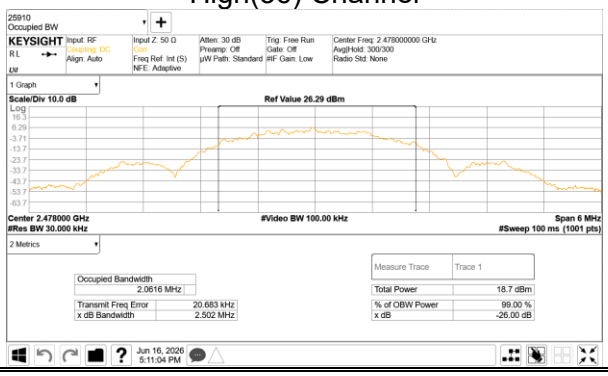
2 Mbps ANT1	2 Mbps ANT2
Low(0) Channel	Low(0) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(36) Channel	High(36) Channel
	

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9.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using ANSI C63.10(2020) under section 11.9.1.1 utilizing spectrum analyzer(RBW ≧ DTS bandwidth).

RESULTS

9.3.1. DIVERSITY MODE TEST DATA

Mode	Antenna	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
500 kbps (255 pkt)	ANT1	37	2 402	13.86	30.00	-16.14
		17	2 440	13.71		-16.29
		39	2 480	13.30		-16.70
	ANT2	37	2 402	13.00		-17.00
		17	2 440	14.02		-15.98
		39	2 480	12.57		-17.43
2 Mbps (255 pkt)	ANT1	0	2 404	13.69		-16.31
		17	2 440	13.70		-16.30
		36	2 478	13.32		-16.68
	ANT2	0	2 404	13.84		-16.16
		17	2 440	13.94		-16.06
		36	2 478	12.40		-17.60
Worst				**14.02**		**-15.98**

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9.3.2. DUAL MODE TEST DATA

Mode	Antenna	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
1 Mbps (255 pkt)	DUAL ANT1	37	2 402	8.21	30.00	
		17	2 440	8.52		
		39	2 480	7.96		
	DUAL ANT2	37	2 402	8.35		
		17	2 440	9.08		
		39	2 480	7.01		
	DUAL ANT1+2	37	2 402	11.29		-18.71
		17	2 440	11.82		-18.18
		39	2 480	10.52		-19.48
2 Mbps (255 pkt)	DUAL ANT1	0	2 404	8.27		
		17	2 440	8.53		
		36	2 478	8.01		
	DUAL ANT2	0	2 404	8.49		
		17	2 440	8.93		
		36	2 478	7.45		
	DUAL ANT1+2	0	2 404	11.39		-18.61
		17	2 440	11.74		-18.26
		36	2 478	10.75		-19.25
Worst				**11.74**		**-18.26**

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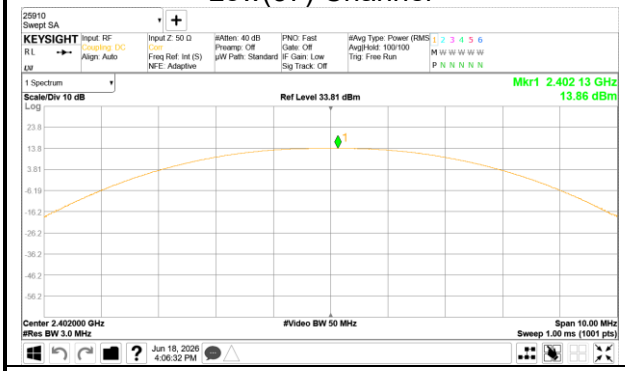
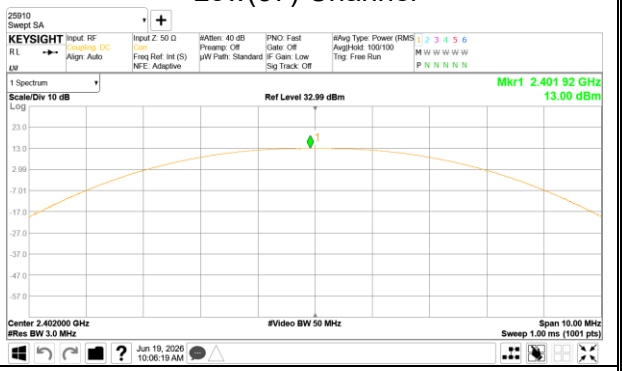
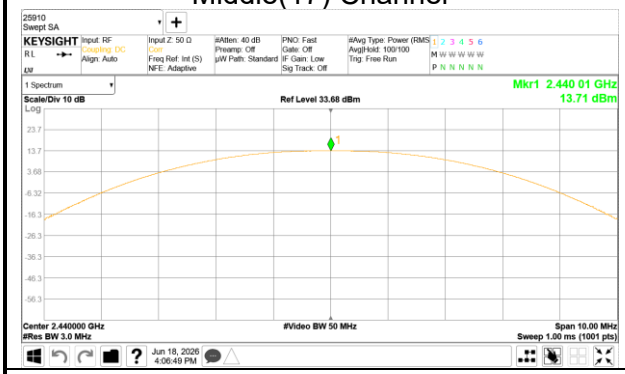
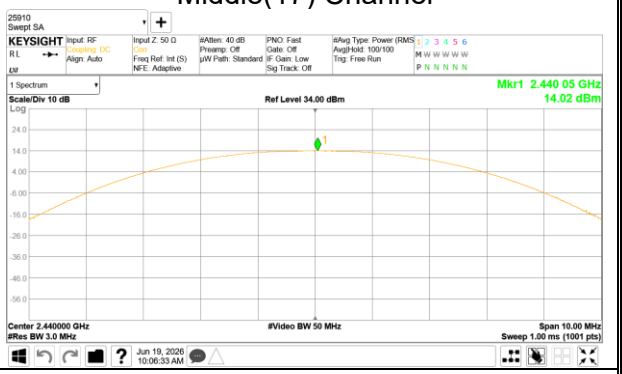
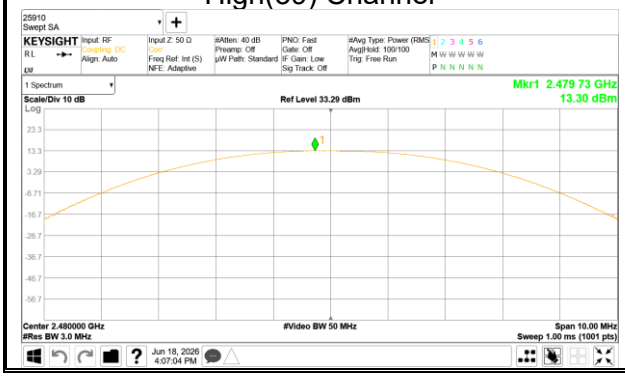
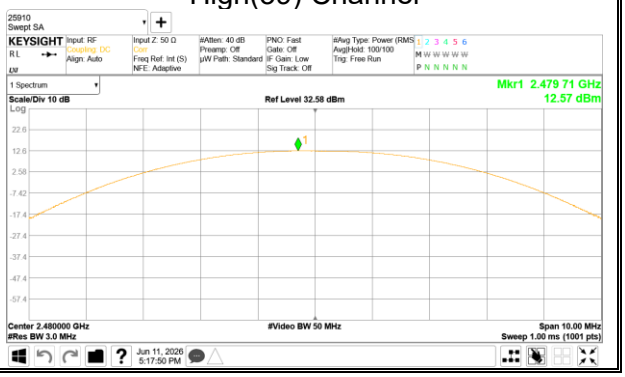
9.3.3. PEAK POWER PLOTS

500 kbps DIVERSITY MODE ANT1	500 kbps DIVERSITY MODE ANT2
Low(37) Channel	Low(37) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(39) Channel	High(39) Channel
	

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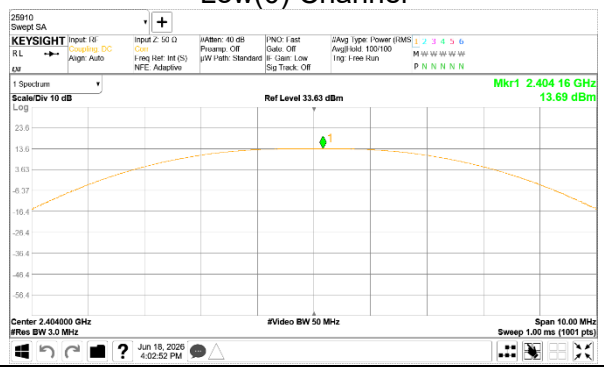
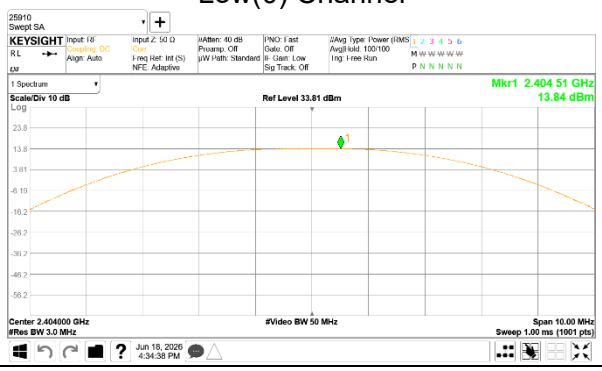
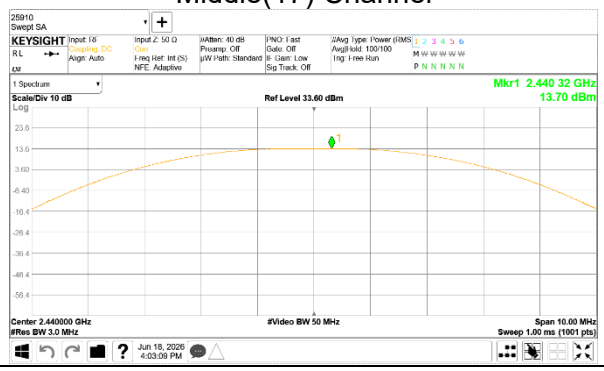
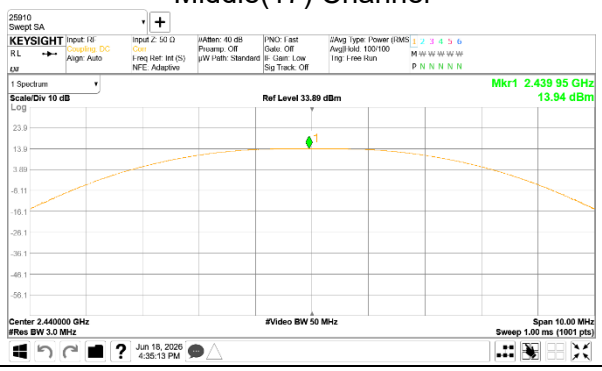
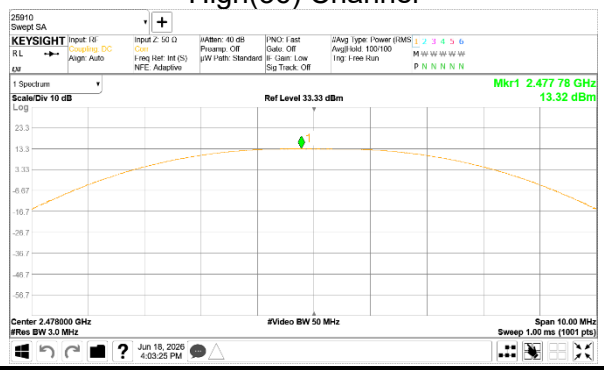
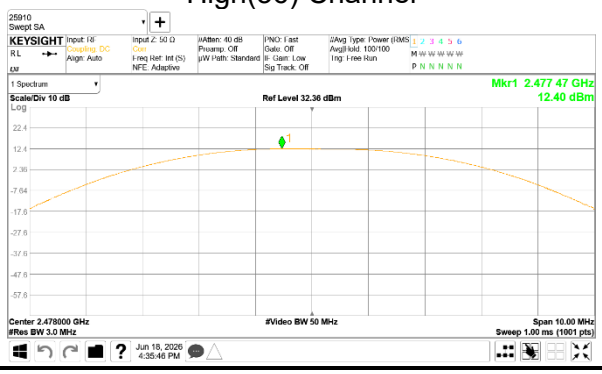
2 Mbps DIVERSITY MODE ANT1	2 Mbps DIVERSITY MODE ANT2
Low(0) Channel	Low(0) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(36) Channel	High(36) Channel
	

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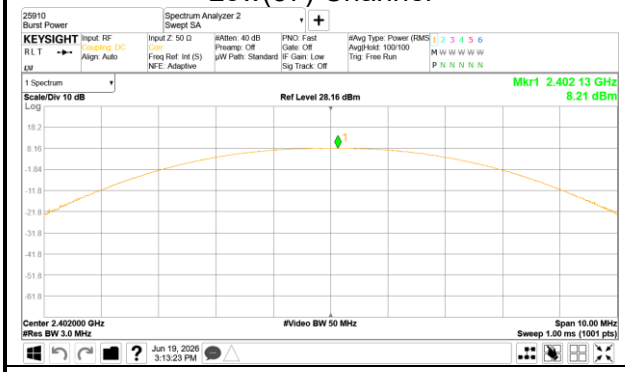
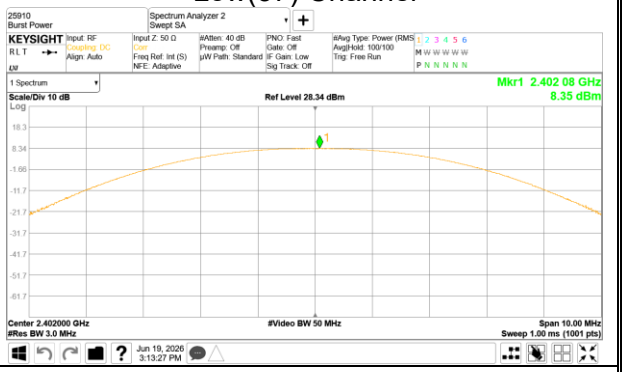
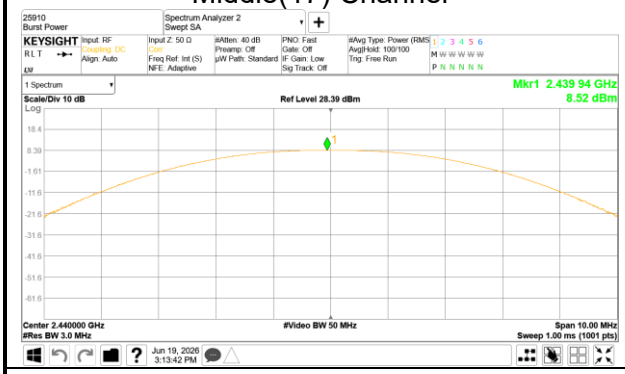
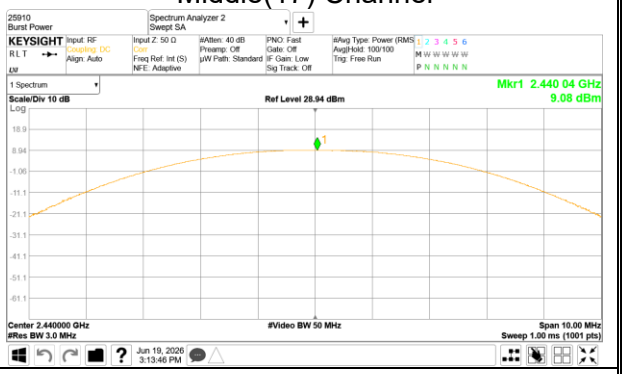
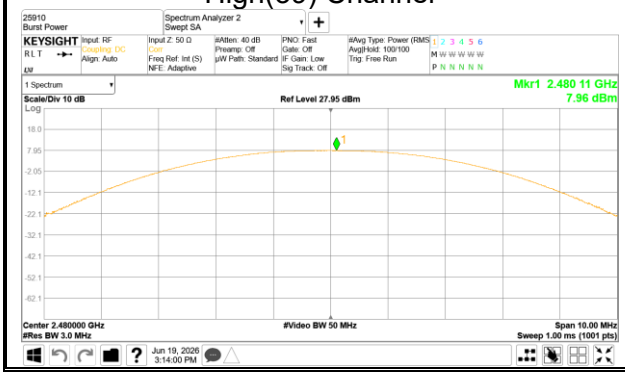
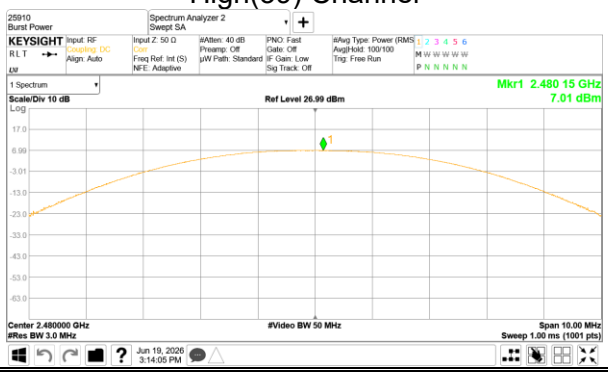
1 Mbps DUAL MODE ANT1	1 Mbps DUAL MODE ANT2
Low(37) Channel	Low(37) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(39) Channel	High(39) Channel
	

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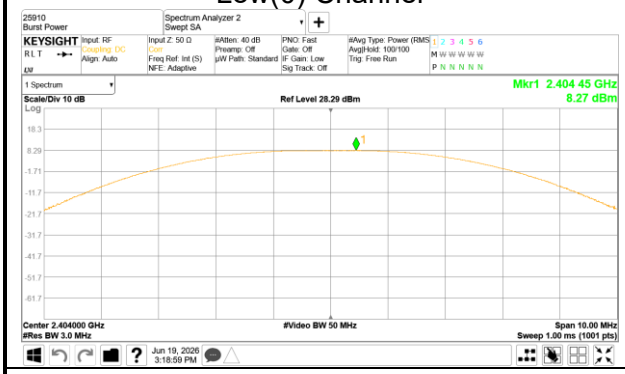
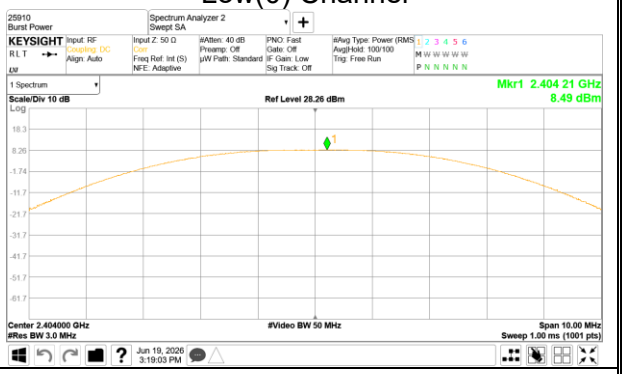
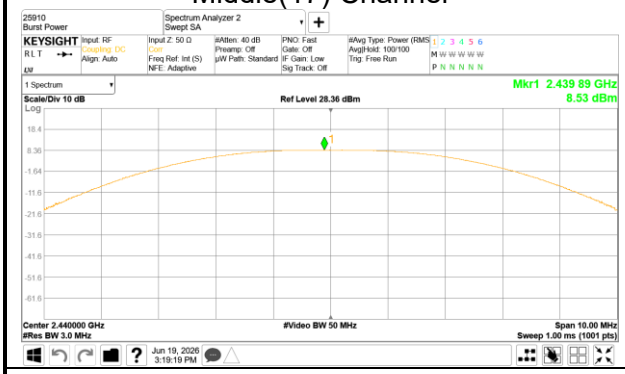
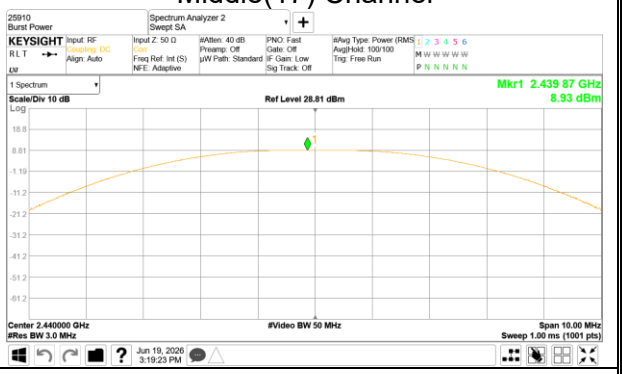
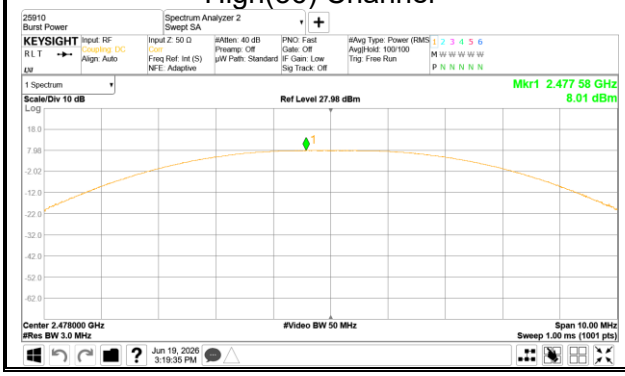
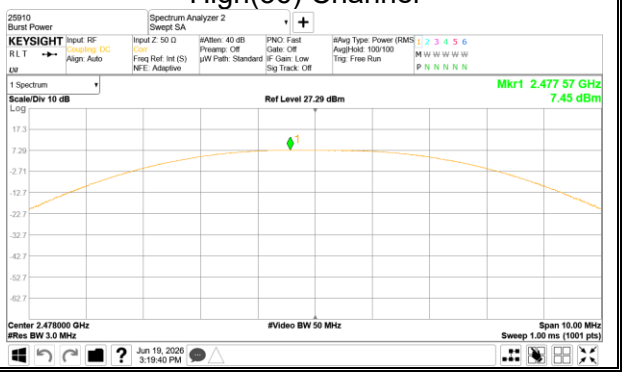
2 Mbps DUAL MODE ANT1	2 Mbps DUAL MODE ANT2
Low(0) Channel	Low(0) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(36) Channel	High(36) Channel
	

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9.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband RF frame average power sensor.
The cable assembly insertion loss and duty cycle correction factor were entered as an offset in the power meter to allow for direct reading of power.

RESULTS

9.4.1. DIVERSITY MODE TEST DATA

Mode	Antenna	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
500 kbps (255 pkt)	ANT1	37	2 402	13.733	23.621
		17	2 440	13.580	22.803
		39	2 480	13.146	20.635
	ANT2	37	2 402	12.788	19.002
		17	2 440	13.728	23.594
		39	2 480	12.357	17.207
2 Mbps (255 pkt)	ANT1	0	2 404	13.393	21.842
		17	2 440	13.387	21.812
		36	2 478	13.023	20.059
	ANT2	0	2 404	13.434	22.050
		17	2 440	13.550	22.646
		36	2 478	11.972	15.747

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9.4.2. DUAL MODE TEST DATA

Mode	Antenna	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
1 Mbps (255 pkt)	DUAL ANT1	37	2 402	8.001	
		17	2 440	8.184	
		39	2 480	7.644	
	DUAL ANT2	37	2 402	8.240	
		17	2 440	8.731	
		39	2 480	6.661	
	DUAL ANT1+2	37	2 402	11.132	12.979
		17	2 440	11.476	14.049
		39	2 480	10.191	10.449
2 Mbps (255 pkt)	DUAL ANT1	0	2 404	7.849	
		17	2 440	7.932	
		36	2 478	7.561	
	DUAL ANT2	0	2 404	8.054	
		17	2 440	8.519	
		36	2 478	6.985	
	DUAL ANT1+2	0	2 404	10.963	12.482
		17	2 440	11.246	13.322
		36	2 478	10.293	10.697

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9.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

ANSI C63.10-2020, Section 11.10.2 Method PKPSD (peak PSD)

RESULTS

9.5.1. TEST DATA

Mode	Antenna	Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
1 Mbps (255 pkt)	ANT1	37	2 402	-3.22	8.00	-11.23
		17	2 440	-3.24		-11.24
		39	2 480	-3.63		-11.63
	ANT2	37	2 402	-4.2		-12.20
		17	2 440	-4.19		-12.19
		39	2 480	-4.31		-12.31
125 kbps (255 pkt)	ANT1	37	2 402	7.59		-0.41
		17	2 440	7.41		-0.59
		39	2 480	7.01		-0.99
	ANT2	37	2 402	6.51		-1.49
		17	2 440	6.72		-1.28
		39	2 480	6.26		-1.74
500 kbps (255 pkt)	ANT1	37	2 402	7.30		-0.70
		17	2 440	7.10		-0.90
		39	2 480	6.83		-1.17
	ANT2	37	2 402	6.31		-1.69
		17	2 440	6.44		-1.56
		39	2 480	6.08		-1.92
2 Mbps (255 pkt)	ANT1	0	2 404	-5.32		-13.32
		17	2 440	-5.24		-13.24
		36	2 478	-5.59		-13.59
	ANT2	0	2 404	-6.01		-14.01
		17	2 440	-6.29		-14.29
		36	2 478	-6.45		-14.45
Worst				**7.59**		**-0.41**

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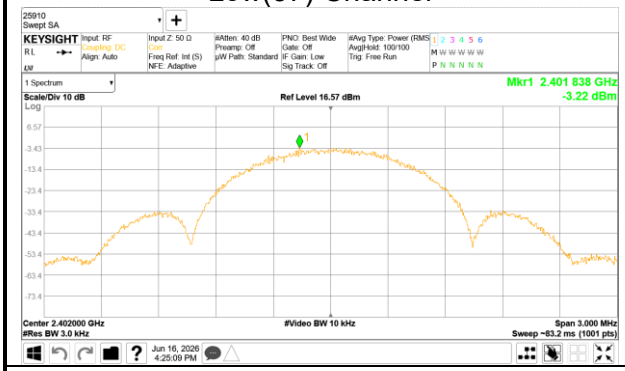
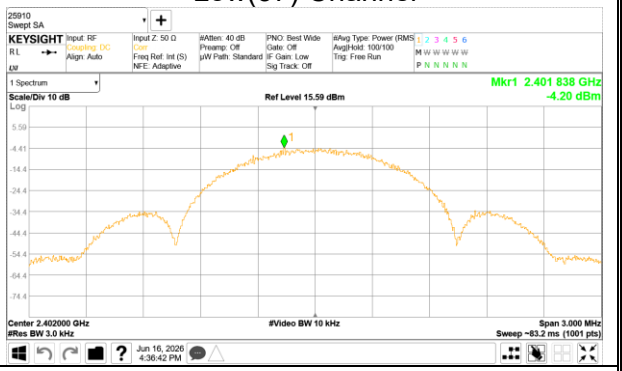
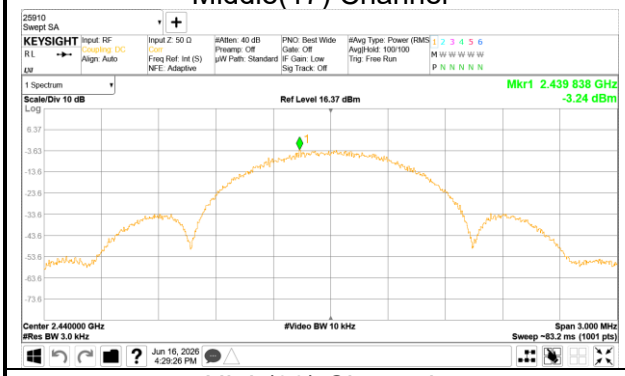
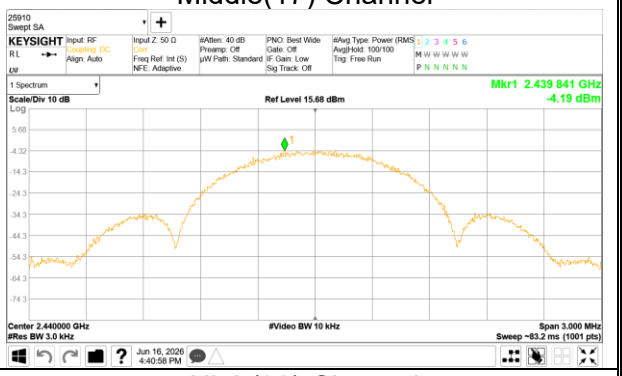
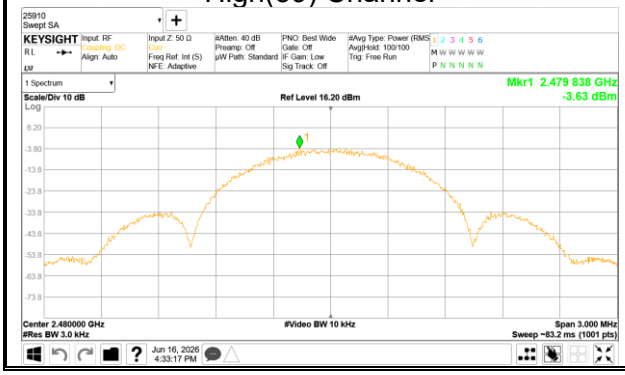
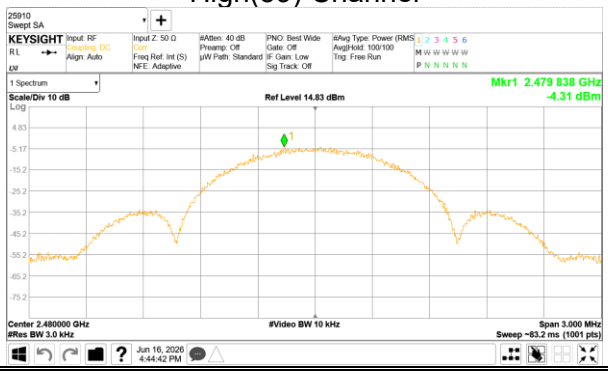
9.5.2. PSD TEST PLOTS

1 Mbps ANT1	1 Mbps ANT2
Low(37) Channel	Low(37) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(39) Channel	High(39) Channel
	

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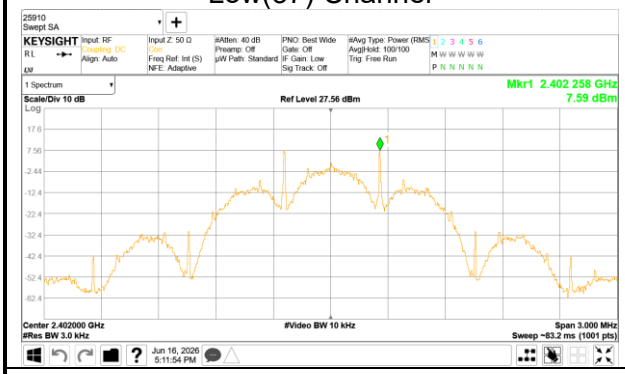
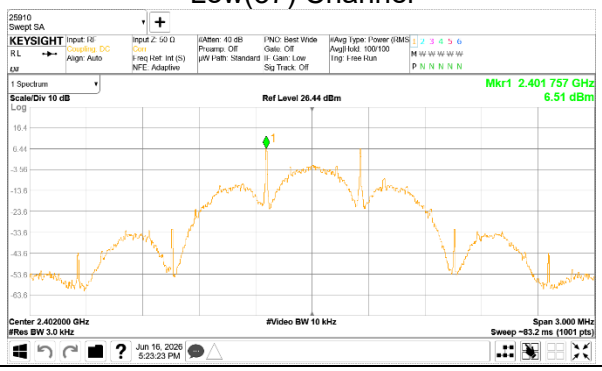
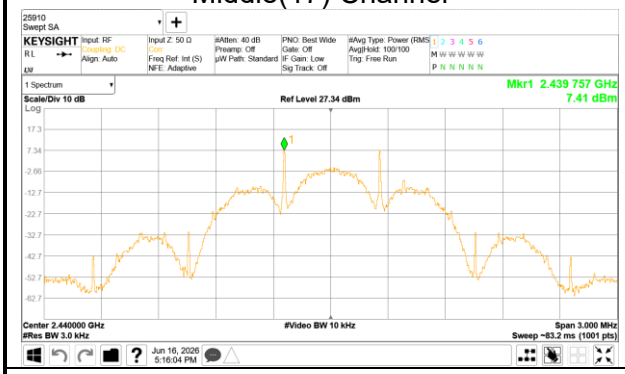
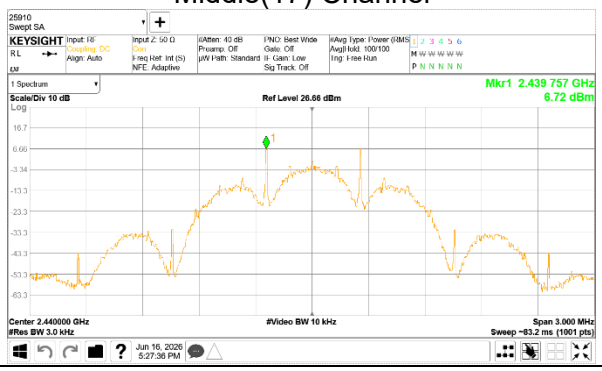
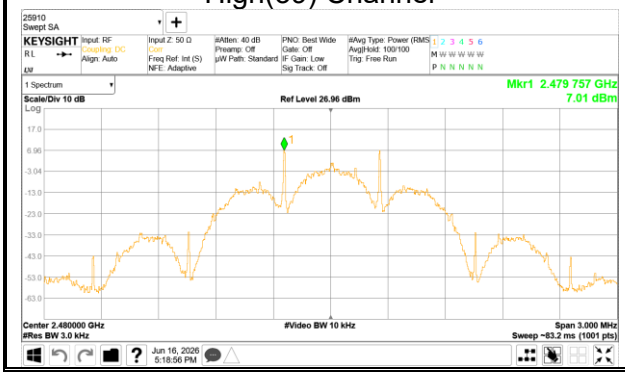
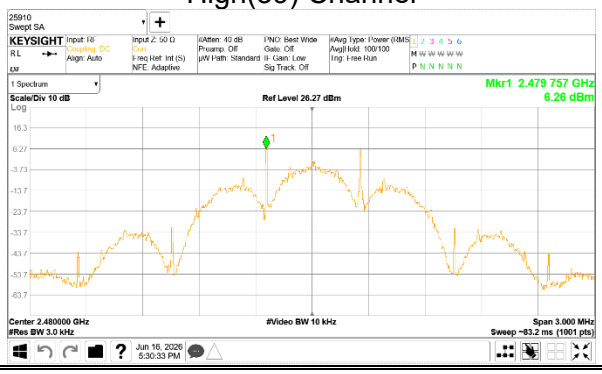
125 kbps ANT1	125 kbps ANT2
Low(37) Channel	Low(37) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(39) Channel	High(39) Channel
	

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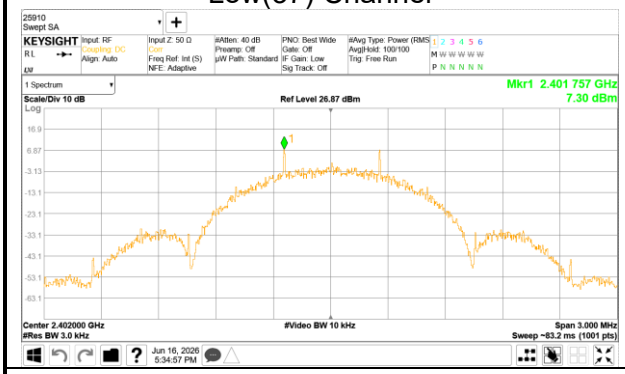
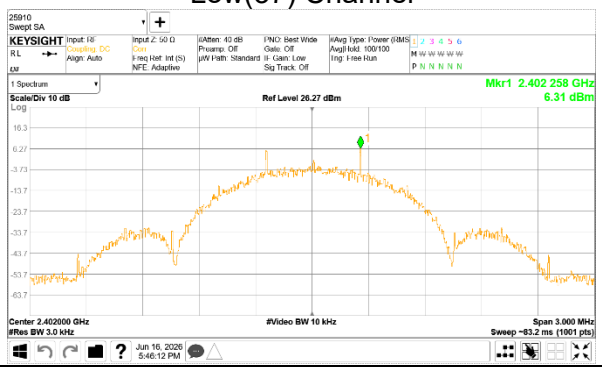
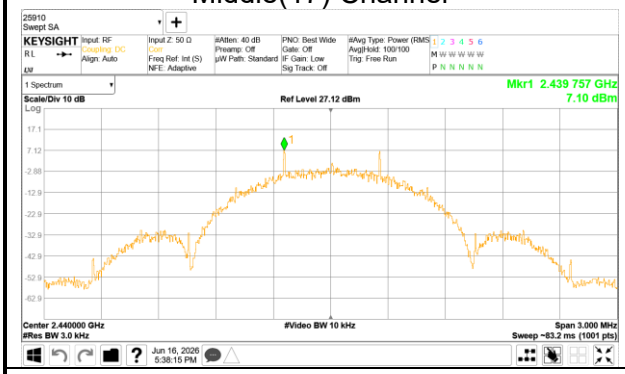
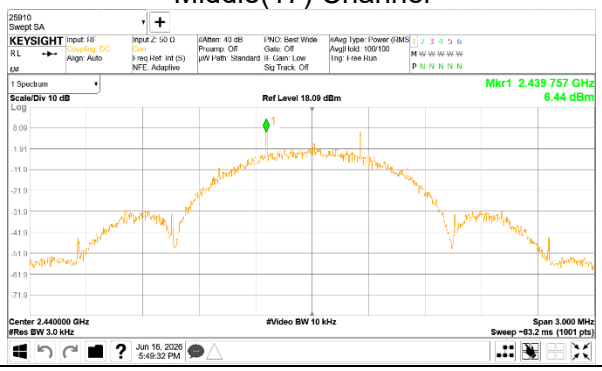
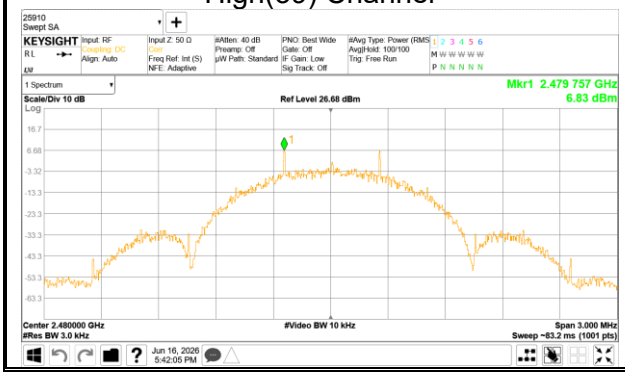
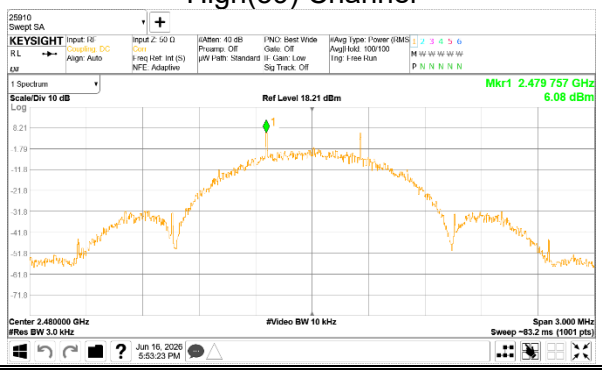
500 kbps ANT1	500 kbps ANT2
Low(37) Channel	Low(37) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(39) Channel	High(39) Channel
	

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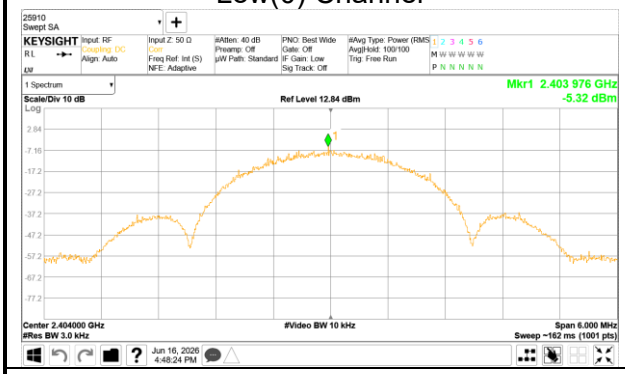
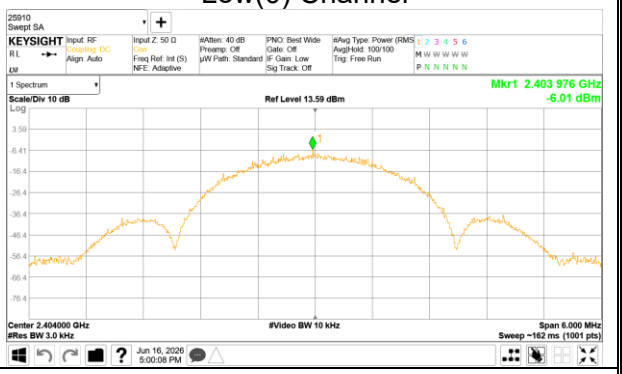
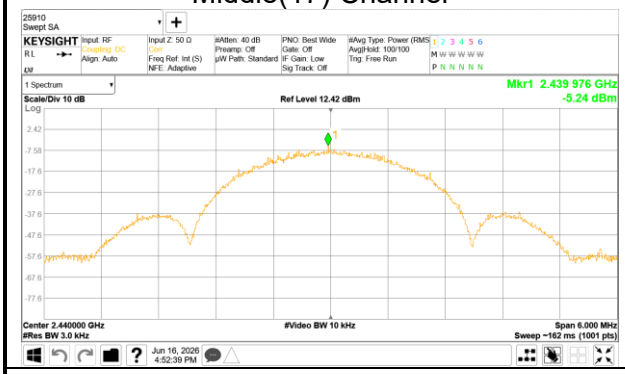
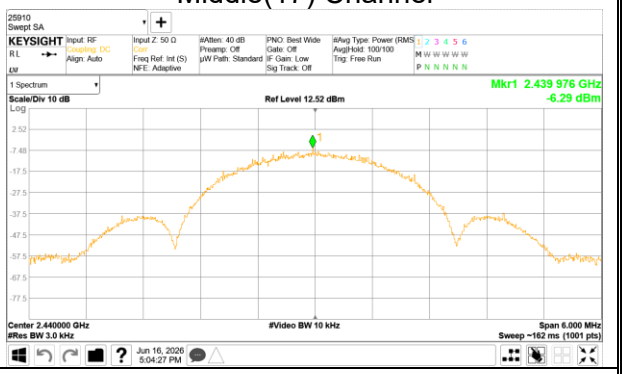
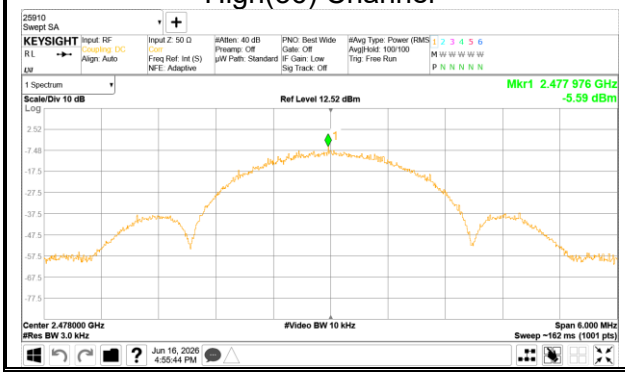
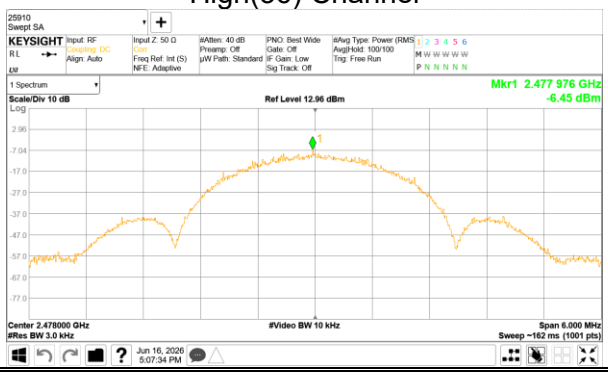
2 Mbps ANT1	2 Mbps ANT2
Low(0) Channel	Low(0) Channel
	
Middle(17) Channel	Middle(17) Channel
	
High(36) Channel	High(36) Channel
	

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9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Output power was measured based on the use of a peak measurement.
Therefore, spurious emissions are required to be 20 dBc.

RESULTS

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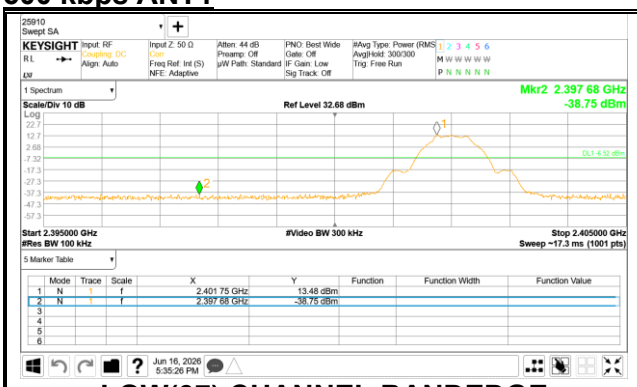
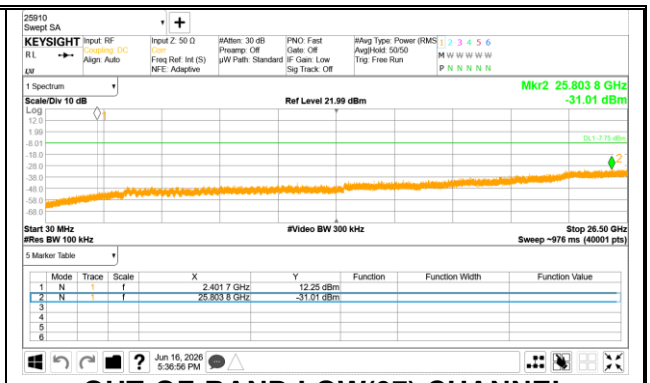
9.6.1. Test plot

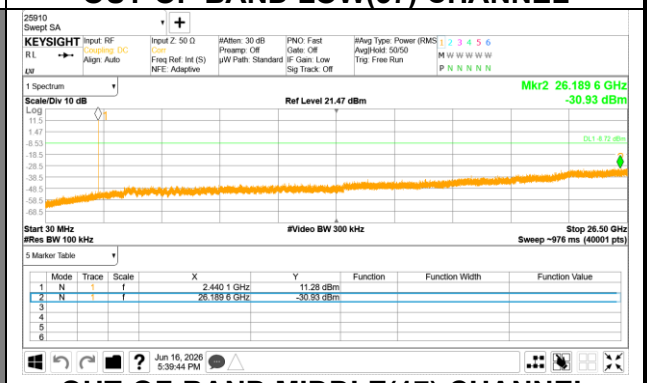
500 kbps ANT1



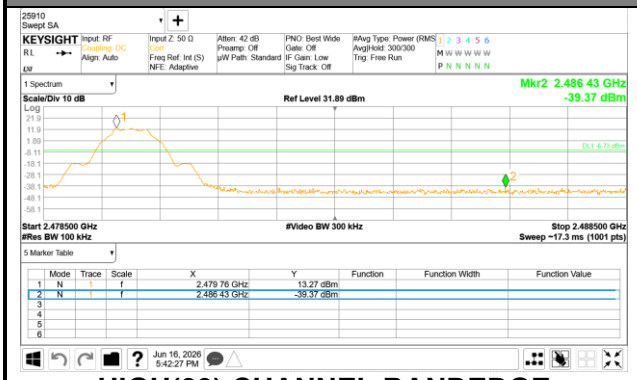
LOW(37) CHANNEL BANDEDGE



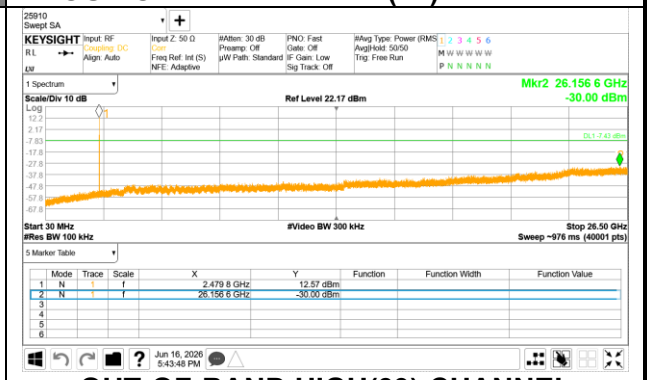
OUT-OF-BAND LOW(37) CHANNEL



OUT-OF-BAND MIDDLE(17) CHANNEL



HIGH(39) CHANNEL BANDEDGE



OUT-OF-BAND HIGH(39) CHANNEL

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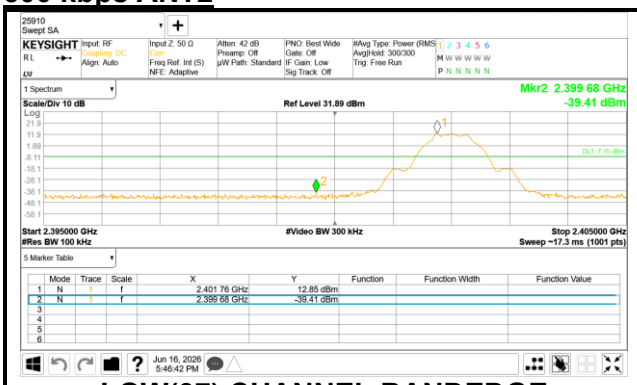
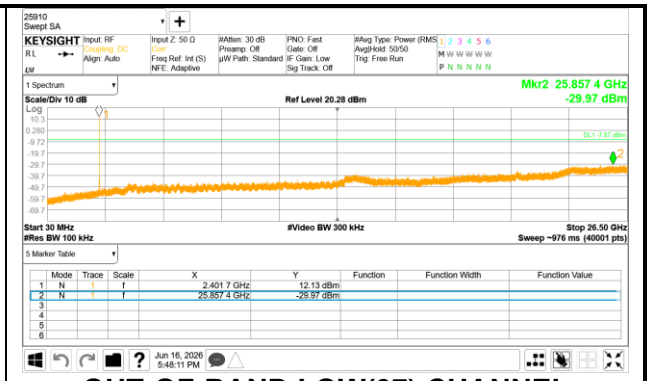
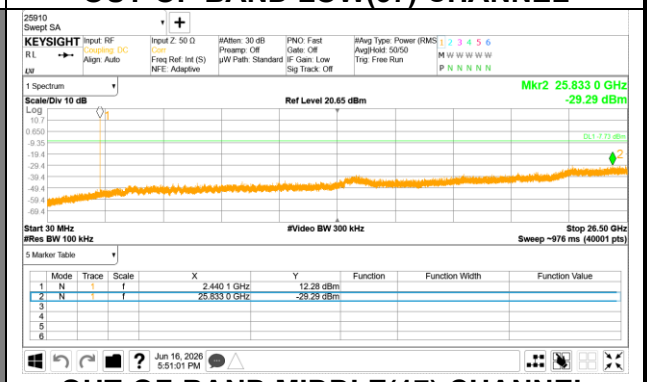
500 kbps ANT2



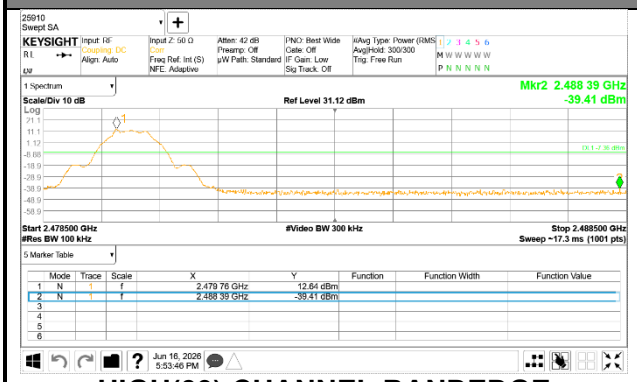
LOW(37) CHANNEL BANDEDGE



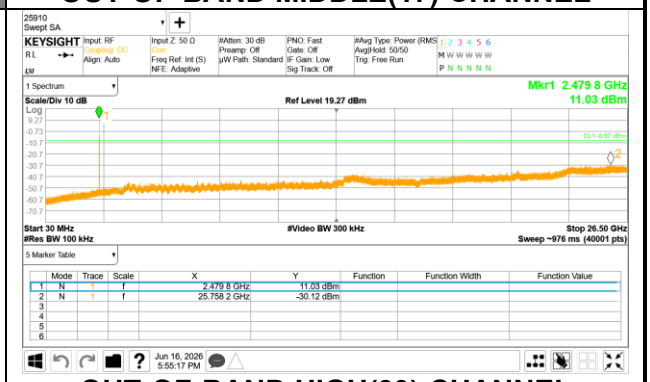
OUT-OF-BAND LOW(37) CHANNEL



OUT-OF-BAND MIDDLE(17) CHANNEL



HIGH(39) CHANNEL BANDEDGE



OUT-OF-BAND HIGH(39) CHANNEL

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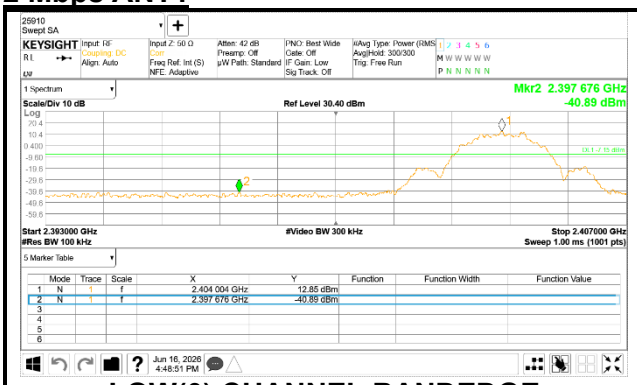
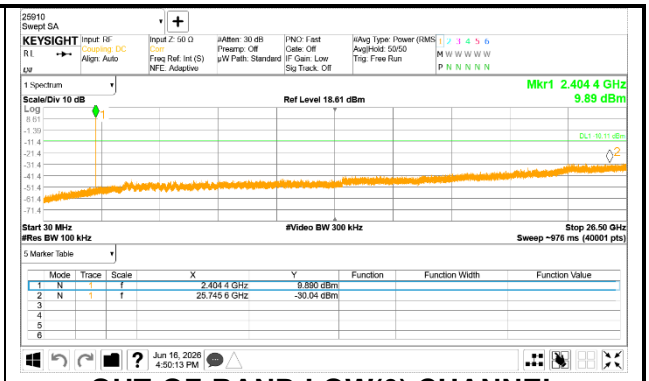
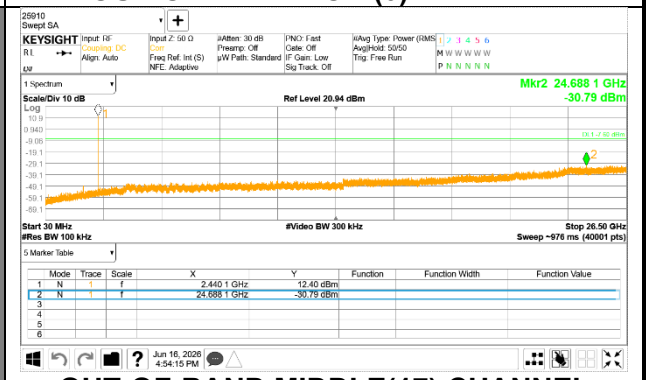
2 Mbps ANT1



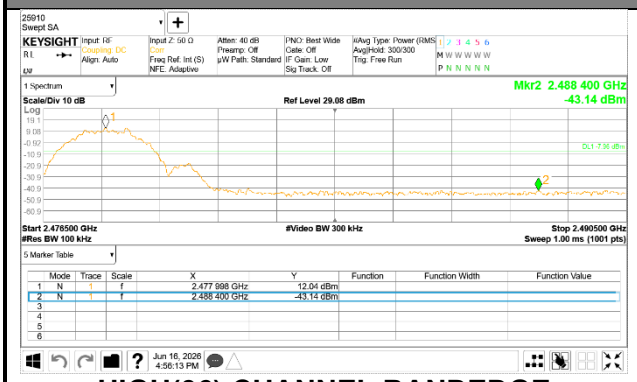
LOW(0) CHANNEL BANDEDGE



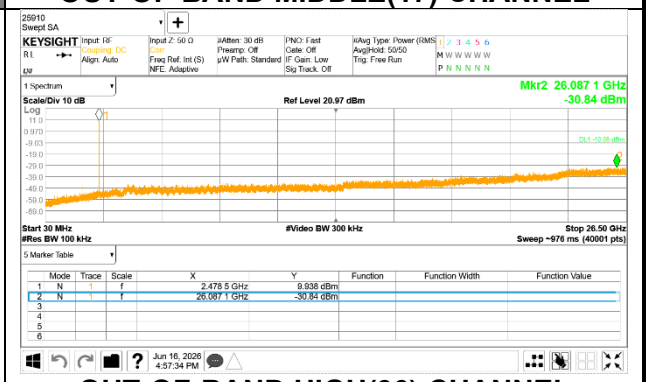
OUT-OF-BAND LOW(0) CHANNEL



OUT-OF-BAND MIDDLE(17) CHANNEL



HIGH(36) CHANNEL BANDEDGE



OUT-OF-BAND HIGH(36) CHANNEL

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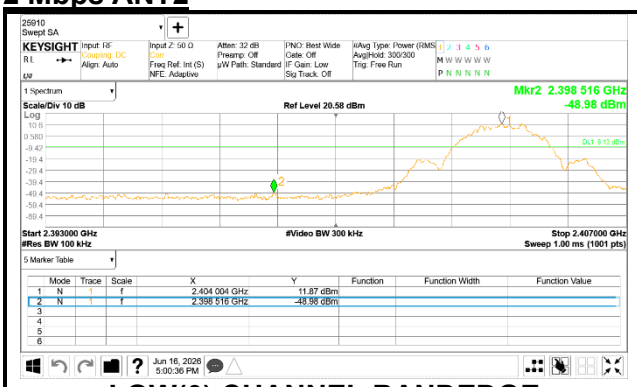
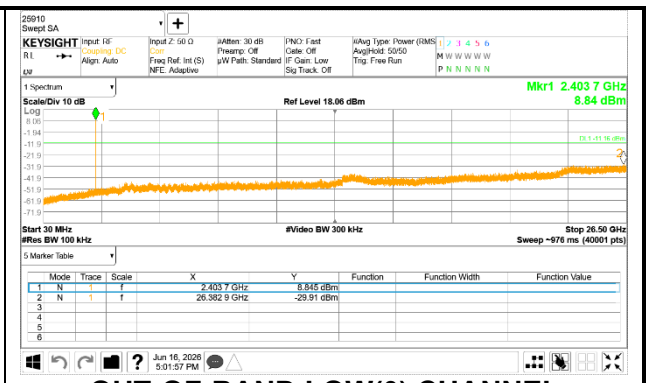
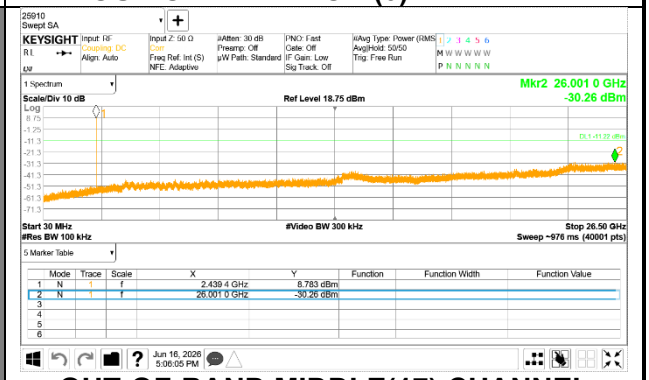
2 Mbps ANT2



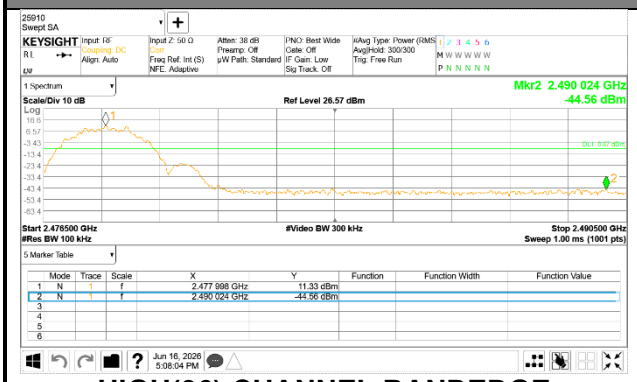
LOW(0) CHANNEL BANDEDGE



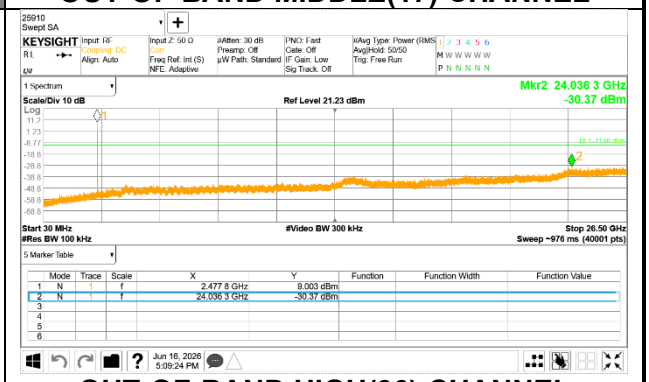
OUT-OF-BAND LOW(0) CHANNEL



OUT-OF-BAND MIDDLE(17) CHANNEL



HIGH(36) CHANNEL BANDEDGE



OUT-OF-BAND HIGH(36) CHANNEL

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10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

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TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. (Restricted band-edge, Final detection of spurious harmonic emissions)
Duty cycle factor = 10 log (1/x). For this sample:

Mode	Duty cycle x [Linear]	Duty Cycle Correction Factor [dB]	Antenna
500 kbps [255pkt]	0.9052	0.4324	Antenna 1, 2 and Dual mode
1 Mbps [255pkt]	0.8479	0.7164	Antenna 1, 2 and Dual mode
2 Mbps [255pkt]	0.5680	2.4565	Antenna 1, 2 and Dual mode

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1 GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

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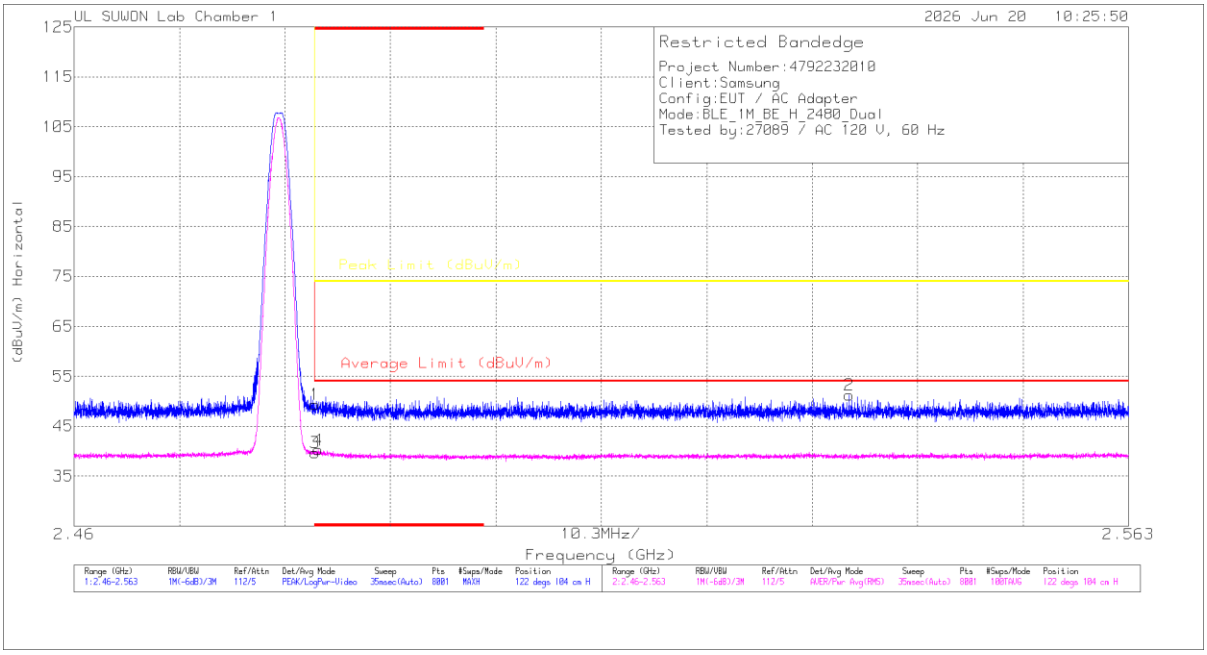
10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. TX ABOVE 1 GHz BLUETOOTH LE 500Kbps, 1 Mbps

BANDEDGE (WORST CASE: 1Mbps, 2480 MHz, DUAL)

HORIZONTAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_Factor (dB/m)	10dB_Path Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	43.52	Pk	32	-26.2	0	49.32	-	-	74	-24.68	122	104	H
2	2.53569	45.32	Pk	32	-26.1	0	51.22	-	-	74	-22.78	122	104	H
3	* 2.48351	33.21	RMS	32	-26.2	.72	39.73	54	-14.27	-	-	122	104	H
4	* 2.48386	33.73	RMS	32	-26.2	.72	40.25	54	-13.75	-	-	122	104	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

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BANDEDGE TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 2.39	39.80	Pk	32.10	-24.90	0.00	47.00	-	-	74.00	-27.00	153	126	H
		* 2.32566	42.00	Pk	31.90	-24.90	0.00	49.00	-	-	74.00	-25.00	153	126	H
		* 2.39	29.61	RMS	32.10	-24.90	0.43	37.24	54.00	-16.76	-	-	153	126	H
		* 2.38123	30.85	RMS	32.10	-25.10	0.43	38.28	54.00	-15.72	-	-	153	126	H
		* 2.39	39.12	Pk	32.10	-24.90	0.00	46.32	-	-	74.00	-27.68	192	312	V
		* 2.32319	42.35	Pk	31.90	-24.90	0.00	49.35	-	-	74.00	-24.65	192	312	V
		* 2.39	29.62	RMS	32.10	-24.90	0.43	37.25	54.00	-16.75	-	-	192	312	V
		* 2.31881	30.78	RMS	31.90	-25.00	0.43	38.11	54.00	-15.89	-	-	192	312	V
2480	ANT1	* 2.4835	39.89	Pk	32.40	-24.90	0.00	47.39	-	-	74.00	-26.61	155	100	H
		2.555	41.94	Pk	32.40	-24.80	0.00	49.54	-	-	74.00	-24.46	155	100	H
		* 2.4835	30.43	RMS	32.40	-24.90	0.43	38.36	54.00	-15.64	-	-	155	100	H
		* 2.48505	30.94	RMS	32.40	-24.90	0.43	38.87	54.00	-15.13	-	-	155	100	H
		* 2.4835	40.06	Pk	32.40	-24.90	0.00	47.56	-	-	74.00	-26.44	201	296	V
		* 2.48467	42.90	Pk	32.40	-24.90	0.00	50.40	-	-	74.00	-23.60	201	296	V
		* 2.4835	30.28	RMS	32.40	-24.90	0.43	38.21	54.00	-15.79	-	-	201	296	V
		* 2.48359	31.39	RMS	32.40	-24.90	0.43	39.32	54.00	-14.68	-	-	201	296	V
2402	ANT2	* 2.39	40.04	Pk	32.10	-24.90	0.00	47.24	-	-	74.00	-26.76	205	114	H
		* 2.34204	42.25	Pk	32.00	-25.00	0.00	49.25	-	-	74.00	-24.75	205	114	H
		* 2.39	29.38	RMS	32.10	-24.90	0.43	37.01	54.00	-16.99	-	-	205	114	H
		* 2.32822	30.78	RMS	31.90	-25.00	0.43	38.11	54.00	-15.89	-	-	205	114	H
		* 2.39	39.60	Pk	32.10	-24.90	0.00	46.80	-	-	74.00	-27.20	166	285	V
		* 2.36936	42.36	Pk	32.00	-25.00	0.00	49.36	-	-	74.00	-24.64	166	285	V
		* 2.39	30.07	RMS	32.10	-24.90	0.43	37.70	54.00	-16.30	-	-	166	285	V
		* 2.35875	30.78	RMS	32.00	-25.00	0.43	38.21	54.00	-15.79	-	-	166	285	V
2480	ANT2	* 2.4835	40.91	Pk	32.40	-24.90	0.00	48.41	-	-	74.00	-25.59	207	121	H
		2.547	42.15	Pk	32.40	-24.70	0.00	49.85	-	-	74.00	-24.15	207	121	H
		* 2.4835	30.67	RMS	32.40	-24.90	0.43	38.60	54.00	-15.40	-	-	207	121	H
		* 2.48381	31.35	RMS	32.40	-24.90	0.43	39.28	54.00	-14.72	-	-	207	121	H
		* 2.4835	40.44	Pk	32.40	-24.90	0.00	47.94	-	-	74.00	-26.06	168	301	V
		* 2.48381	42.63	Pk	32.40	-24.90	0.00	50.13	-	-	74.00	-23.87	168	301	V
		* 2.4835	30.37	RMS	32.40	-24.90	0.43	38.30	54.00	-15.70	-	-	168	301	V
		* 2.48386	31.51	RMS	32.40	-24.90	0.43	39.44	54.00	-14.56	-	-	168	301	V
2402	DUAL	* 2.39	43.30	Pk	31.70	-26.20	0.00	48.80	-	-	74.00	-25.20	59	106	H
		* 2.35684	44.71	Pk	31.70	-26.20	0.00	50.21	-	-	74.00	-23.79	59	106	H
		* 2.39	32.46	RMS	31.70	-26.20	0.72	38.68	54.00	-15.32	-	-	59	106	H
		* 2.38645	33.09	RMS	31.70	-26.10	0.72	39.41	54.00	-14.59	-	-	59	106	H
		* 2.39	42.05	Pk	31.70	-26.20	0.00	47.55	-	-	74.00	-26.45	171	318	V
		* 2.38286	45.77	Pk	31.70	-26.20	0.00	51.27	-	-	74.00	**-22.73**	171	318	V
		* 2.39	32.19	RMS	31.70	-26.20	0.72	38.41	54.00	-15.59	-	-	171	318	V
		* 2.38593	33.03	RMS	31.70	-26.10	0.72	39.35	54.00	-14.65	-	-	171	318	V
2480	DUAL	* 2.48351	43.52	Pk	32.00	-26.20	0.00	49.32	-	-	74.00	-24.68	122	104	H
		2.536	45.32	Pk	32.00	-26.10	0.00	51.22	-	-	74.00	-22.78	122	104	H
		* 2.48351	33.21	RMS	32.00	-26.20	0.72	39.73	54.00	-14.27	-	-	122	104	H
		* 2.48386	33.73	RMS	32.00	-26.20	0.72	40.25	54.00	**-13.75**	-	-	122	104	H
		* 2.48351	41.55	Pk	32.00	-26.20	0.00	47.35	-	-	74.00	-26.65	171	299	V
		2.545	44.85	Pk	32.10	-26.10	0.00	50.85	-	-	74.00	-23.15	171	299	V
		* 2.48351	33.18	RMS	32.00	-26.20	0.72	39.70	54.00	-14.30	-	-	171	299	V
		* 2.48427	33.63	RMS	32.00	-26.20	0.72	40.15	54.00	-13.85	-	-	171	299	V

Note1. Pk - Peak detector, RMS - RMS detectior
Note2. * - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

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