

CERTIFICATION TEST REPORT

Report Number. : S-4791953314-E6V1

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

Model : SC-52G, SCG38

FCC ID : A3LSMS947JPN

EUT Description : GSM/WCDMA/LTE/5G NR Phone + BT/BLE,
DTS/UNII a/b/g/n/ac/ax/be, NFC, WPT and UWB

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

Date Of Issue:

2025-12-22

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Revision History

Rev.	Issue Date	Revisions	Presented By
V1	2025-12-22	Initial issue	Jaejin Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax/be, NFC, WPT and UWB

MODEL NUMBER: SC-52G, SCG38

SERIAL NUMBER: R3CY90EPCDF, R3CY90EPDPN (CONDUCTED);
R3CY90EPFAN, R3CY90EPGSX (RADIATED)

DATE TESTED: 2025-11-26 ~ 2025-12-22

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:



Jaejin Lee
Suwon Lab Engineer
UL KOREA LTD.

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>.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 28.9 \text{ dBuV/m} &= 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} \end{aligned}$$

$$\begin{aligned} \text{AC Corrected Reading (dBuV)} &= \text{Measured Voltage (dBuV)} + \text{Extension Cord} \\ &\text{Loss (dB)} + \text{Cable Loss (dB)} \\ 44.72 \text{ dBuV} &= 34.72 \text{ dBuV} + 9.9 \text{ dB} + 0.1 \text{ dB} \end{aligned}$$

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	0.69 dB
Power Spectral Density	1.4 dB
Occupied Bandwidth	0.04 %
Conducted Spurious Emissions	1.4 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	3.69 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.18 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.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

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

Representative model	Comparison Criteria	Derivative model
		SCG38
SC-52G	Hardware	Identical
	Software	UI modified according to Service Provider specifications

The SC-52G model was used as the representative model for final testing. All test results in this report apply to both the representative model and its derivative variants.

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	1 Mbps (37 pkt)	Peak	9.45	8.81
		Average	9.22	8.35
2 404 ~ 2 478	2Mbps (37 pkt)	Peak	9.46	8.83
		Average	9.07	8.08
2 404 ~ 2 478	CS_SYNC_1M	Peak	9.20	8.32
		Average	8.67	7.36

Antenna2

Frequency Range[MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2 402 ~ 2 480	1 Mbps (37 pkt)	Peak	9.52	8.95
		Average	9.19	8.29
2 404 ~ 2 478	2Mbps (37 pkt)	Peak	9.62	9.16
		Average	9.23	8.38
2 404 ~ 2 478	CS_SYNC_1M	Peak	9.42	8.75
		Average	9.05	8.04

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]
DTS 2400 – 2483.5	-4.06	-5.91

“SUB4” and “SUB6” as indicated in antenna specification are written as ANT1 and ANT2 in this report.

5.4. WORST-CASE CONFIGURATION AND MODE

Both Bluetooth LE Diversity modes have been investigated and confirmed. The fundamentals 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.

Worst-case		ANT1	ANT2
Axis	Band-Edge	X	Z
	Spurious	X	Z

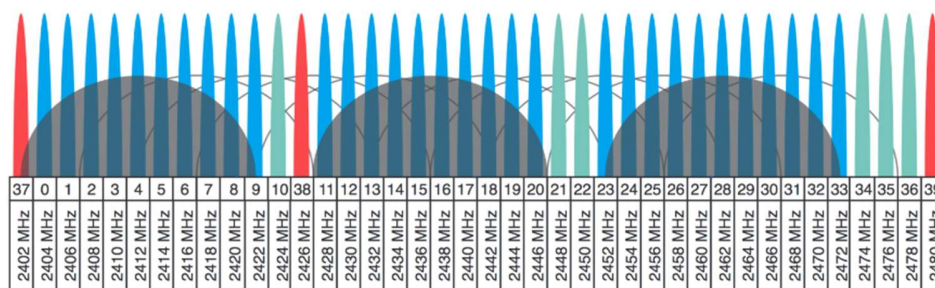
Radiated and power line conducted tests were performed with EUT connected to AC power adapter as the worst-case configuration. Radiated harmonics spurious 1~18 GHz Low/Mid/High channels, 18-26GHz were performed with the EUT set at the Diversity. Radiated emission below 1GHz and power line conducted emission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

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.



Bluetooth LE Channel Sounding supports CS_SYNC_1M and CS_TONE_ASK.

For CS_SYNC_1M, the output power is lower than the existing 1 Mbps, and since the duty cycle in actual use is very short, the measurement data of the existing 1 Mbps was used to represent CS_SYNC_1M.

Power verification

The output power of all data rates was investigated. The 1 Mbps, 2 Mbps, and CS_TONE_ASK 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	9.076	2	2 Mbps 37 pkt ANT1	2 404	8.759
		2 440	9.120			2 440	8.955
		2 480	9.218			2 478	9.073
	1 Mbps 37 pkt ANT2	2 402	7.886		2 Mbps 37 pkt ANT2	2 404	8.265
		2 440	8.287			2 440	8.135
		2 480	9.185			2 478	9.231
	1 Mbps 255 pkt ANT1	2 402	9.036		2 Mbps 255 pkt ANT1	2 404	8.734
		2 440	9.086			2 440	8.932
		2 480	9.160			2 478	9.014
	1 Mbps 255 pkt ANT2	2 402	7.897		2 Mbps 255 pkt ANT2	2 404	8.255
		2 440	8.289			2 440	8.114
		2 480	9.163			2 478	9.207
1 Coded S=8	125 kbps 37 pkt ANT1	2 402	9.048	1 Coded S=2	500 kbps 37 pkt ANT1	2 402	9.069
		2 440	9.094			2 440	9.109
		2 480	9.188			2 480	9.207
	125 kbps 37 pkt ANT2	2 402	7.908		500 kbps 37 pkt ANT2	2 402	7.895
		2 440	8.306			2 440	8.292
		2 480	9.168			2 480	9.183
	125 kbps 255 pkt ANT1	2 402	9.028		500 kbps 255 pkt ANT1	2 402	9.051
		2 440	9.075			2 440	9.100
		2 480	9.142			2 480	9.174
	125 kbps 255 pkt ANT2	2 402	7.886		500 kbps 255 pkt ANT2	2 402	7.898
		2 440	8.282			2 440	8.296
		2 480	9.163			2 480	9.175
1	CS_SYNC_1M ANT1	2 404	8.419				
		2 440	8.667				
		2 478	8.649				
	CS_SYNC_1M ANT2	2 404	7.844				
		2 440	7.652				
		2 478	9.052				

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

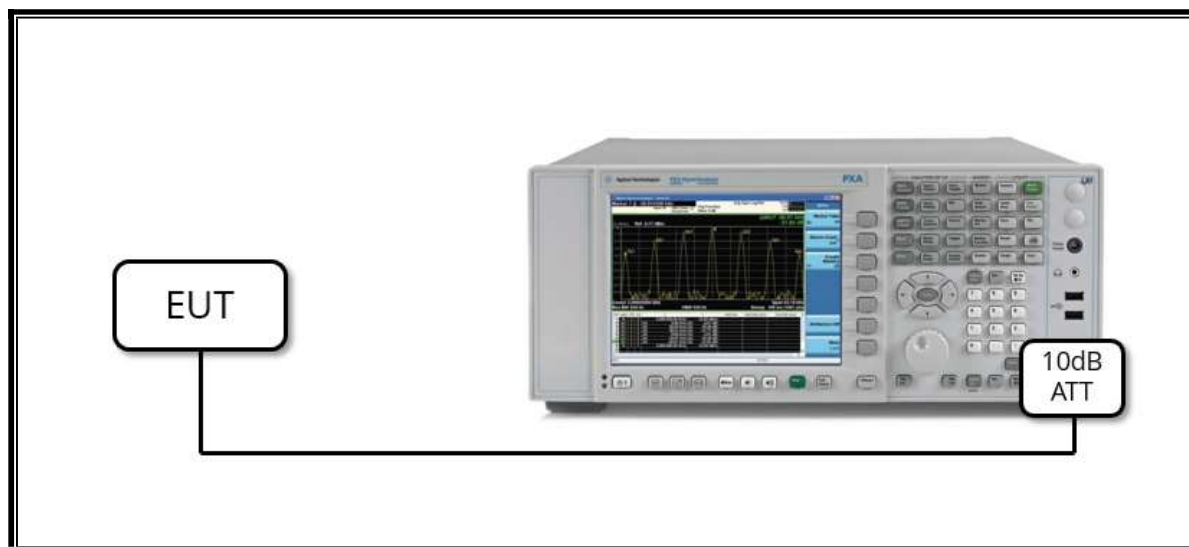
I/O CABLE

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

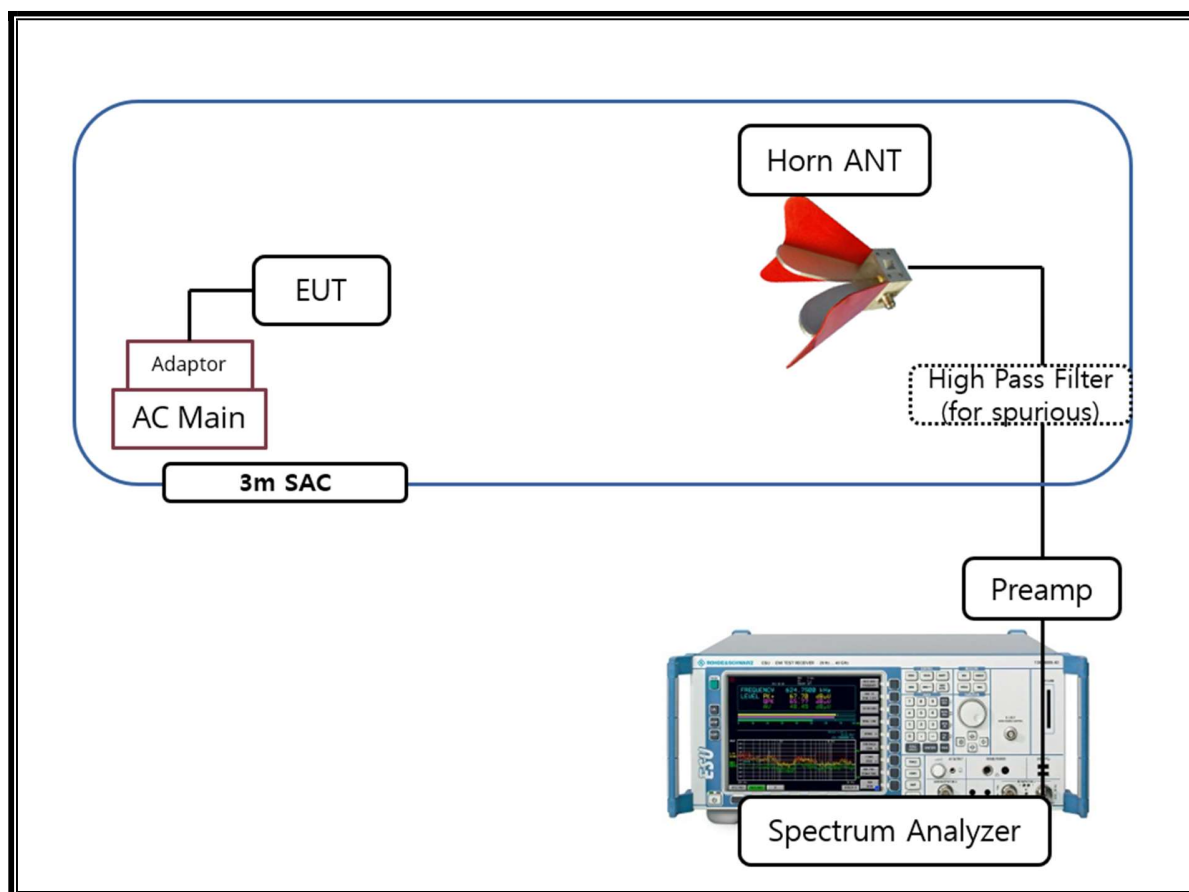
TEST SETUP

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

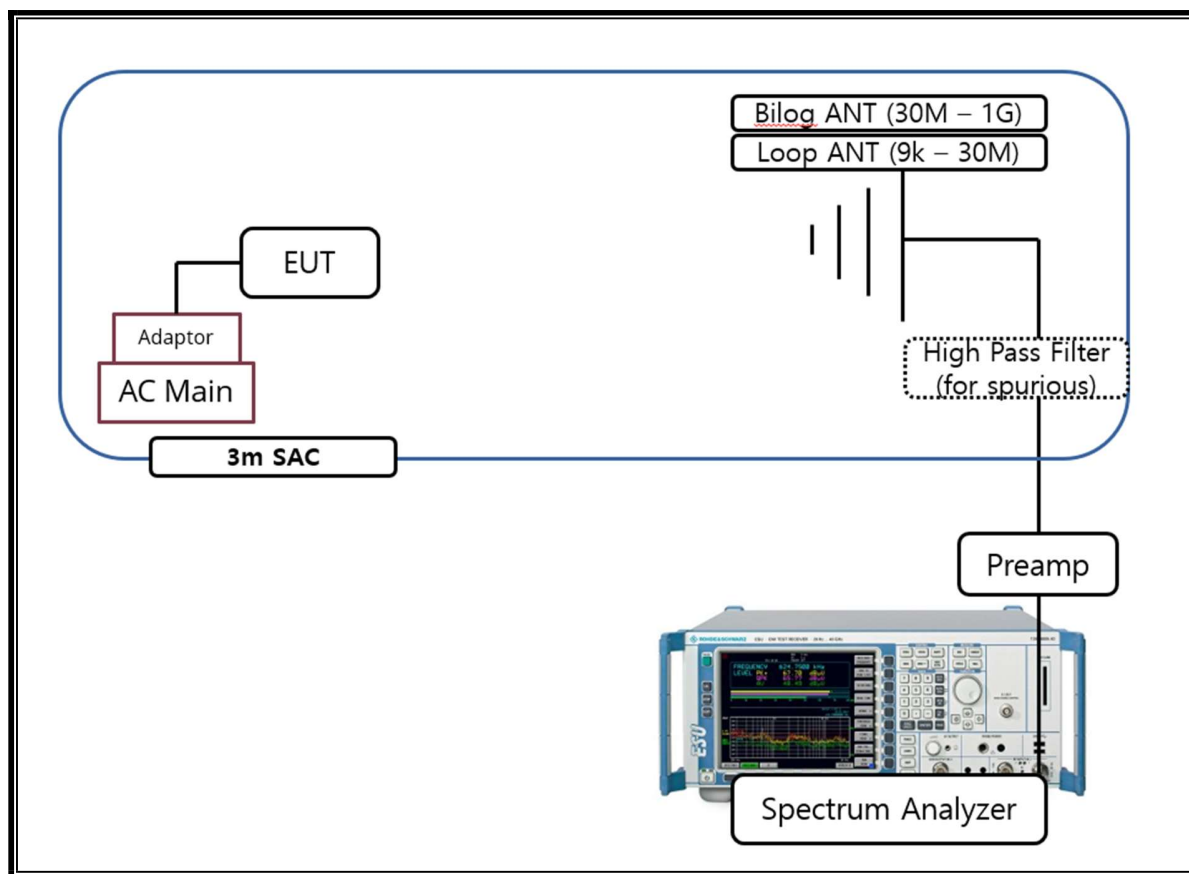
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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



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 $RBW \geq$ 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

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	KEYSIGHT	N9030B	MY60070693	2026-01-02
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	PASTERNAK	PE7087-10	A001	2026-07-22
Attenuator	PASTERNAK	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	

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

9. ANTENNA PORT TEST RESULTS

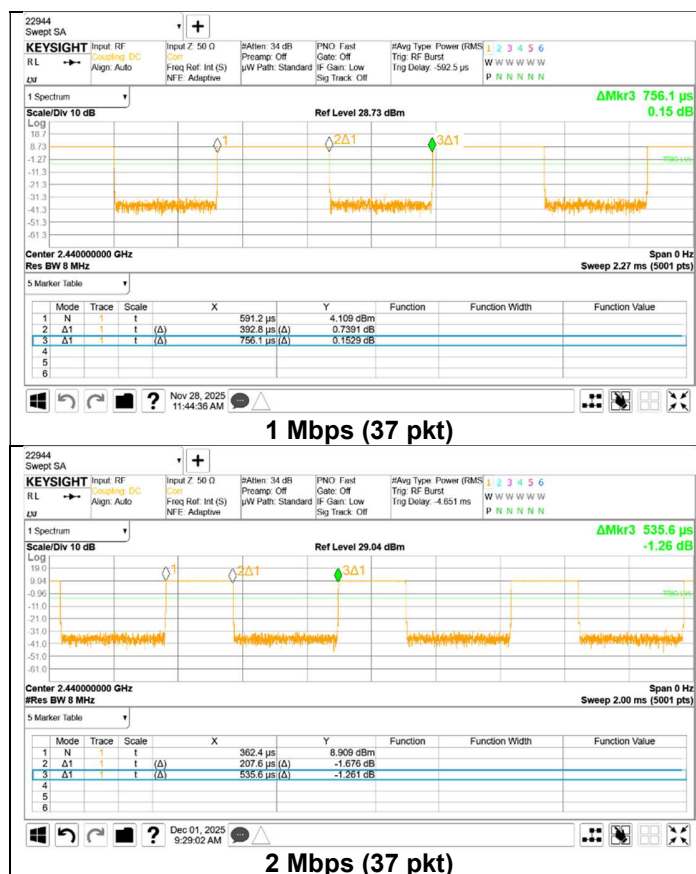
9.1. ON TIME AND DUTY CYCLE

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						
1 Mbps [37pkt]	0.393	0.756	0.5195	51.95	2.84	2.55
1 Mbps [255pkt]	2.136	2.499	0.8547	85.47	0.68	0.47
2 Mbps [37pkt]	0.208	0.536	0.3876	38.76	4.12	4.82
2 Mbps [255pkt]	1.079	1.407	0.7669	76.69	1.15	0.93

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



9.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

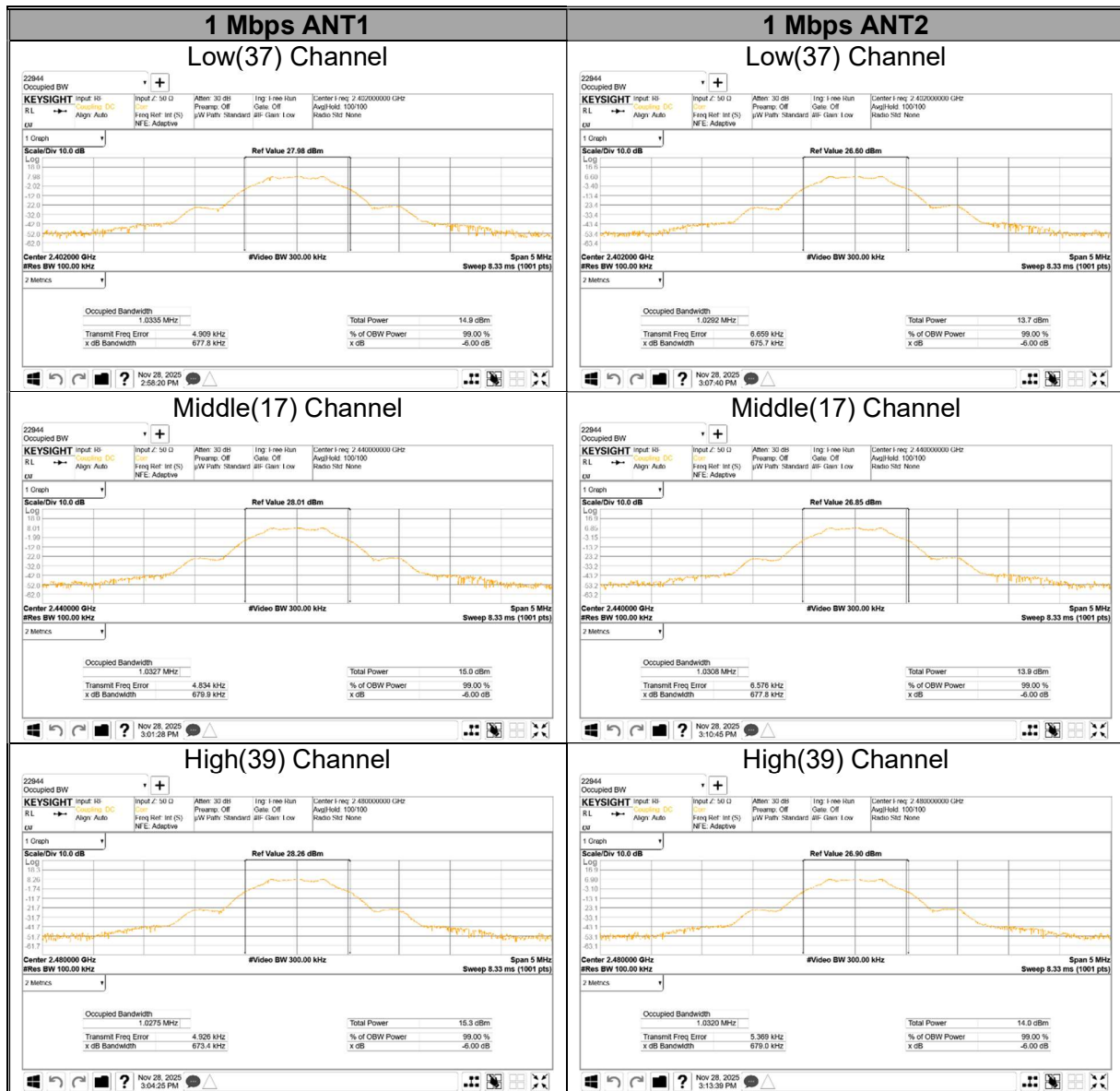
The minimum 6 dB bandwidth shall be at least 500 kHz.

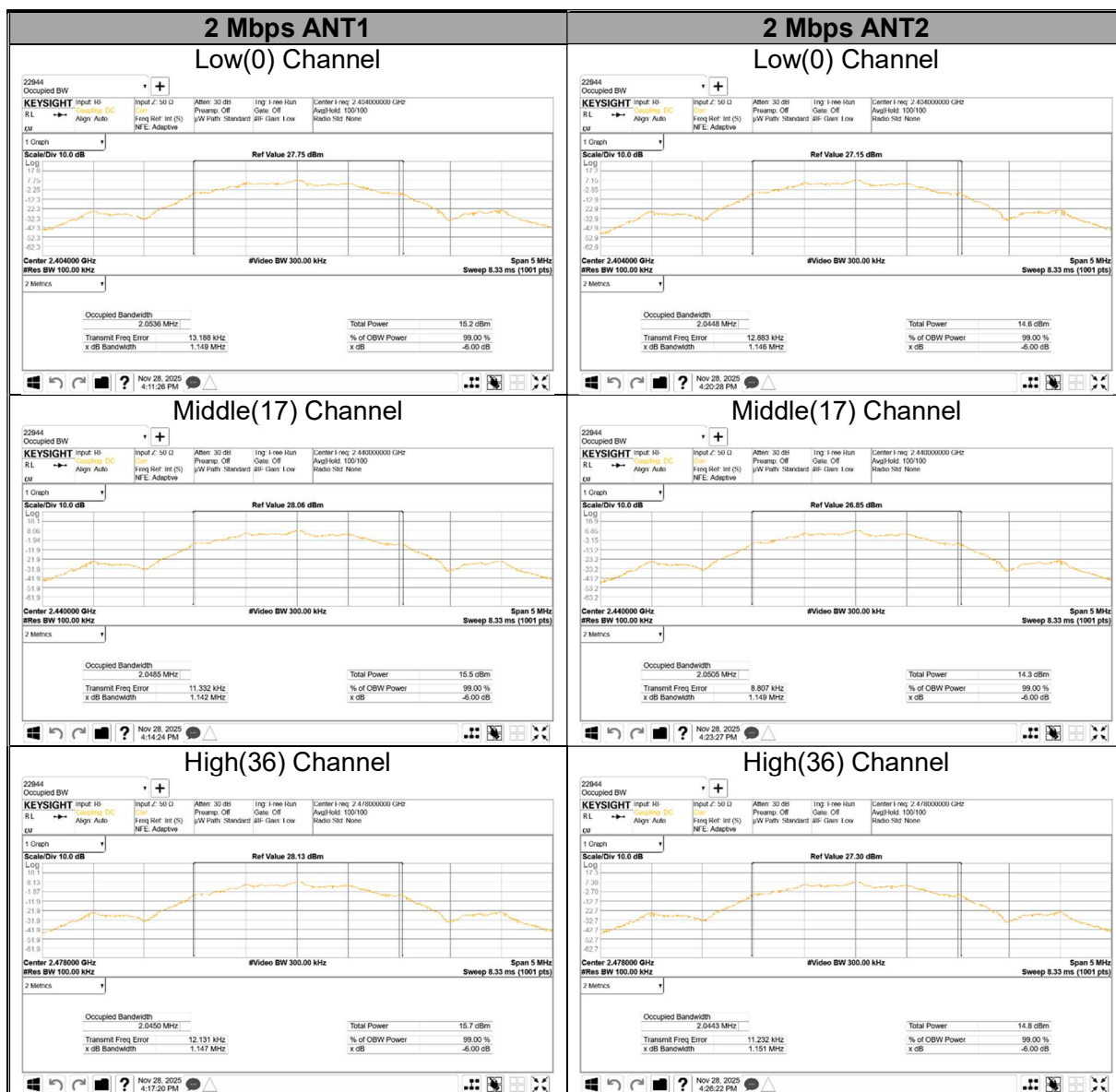
RESULTS

9.2.1. Test data

Mode	Antenna	Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minimum Limit [kHz]
1 Mbps (37pkt)	ANT1	37	2 402	677.8	500.0
		17	2 440	679.9	
		39	2 480	673.4	
1 Mbps (37pkt)	ANT2	37	2 402	675.7	
		17	2 440	677.8	
		39	2 480	679.0	
2 Mbps (37pkt)	ANT1	0	2 404	1149.0	
		17	2 440	1142.0	
		36	2 478	1147.0	
2 Mbps (37pkt)	ANT2	0	2 404	1146.0	
		17	2 440	1149.0	
		36	2 478	1151.0	
Worst				673.4	500.0

9.2.2. 6 dB BANDWIDTH PLOTS





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

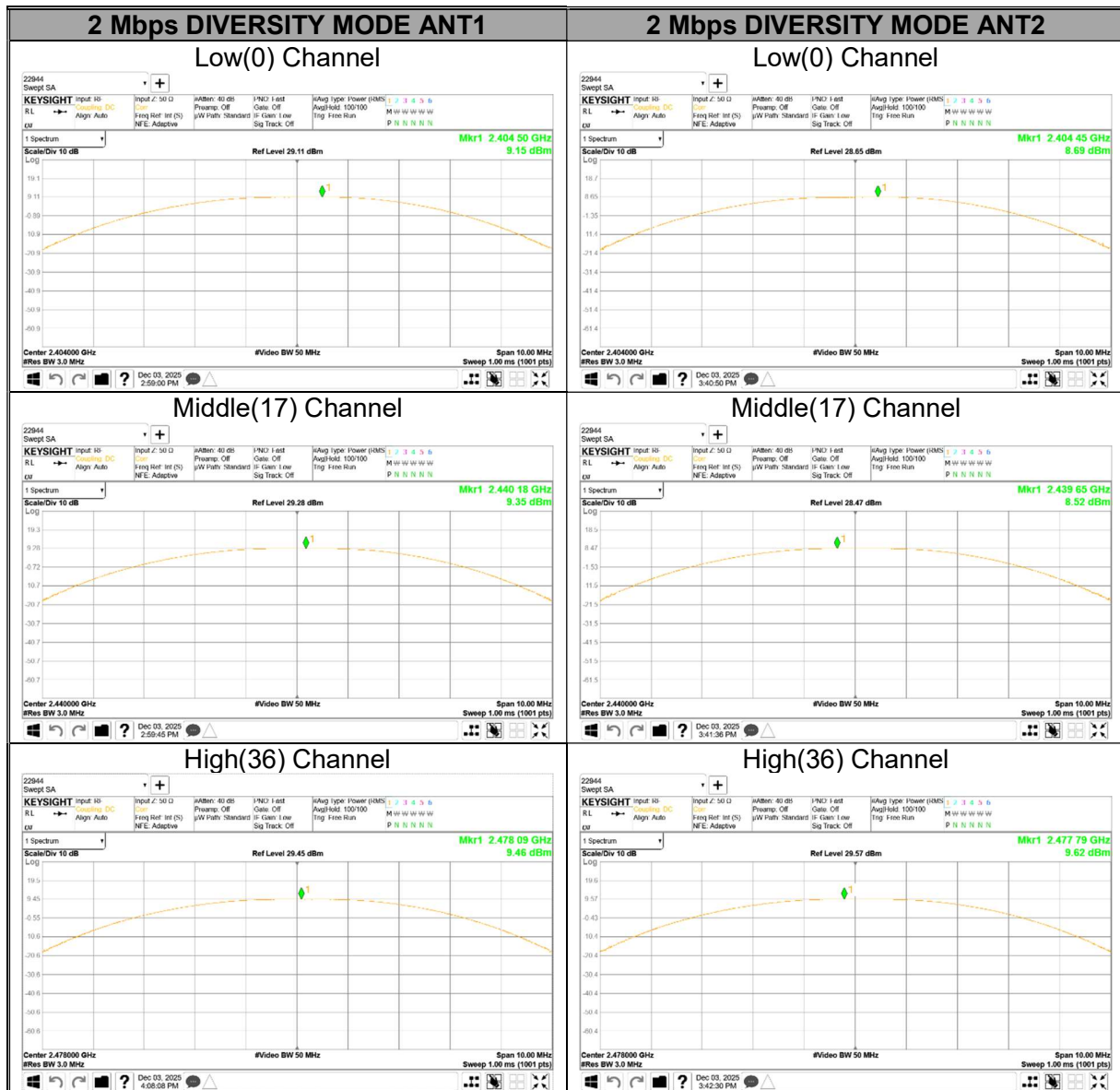
Peak power is measured using ANSI C63.10(2020) under section 11.9.1.1 utilizing spectrum analyzer(RBW $\geq$ DTS bandwidth).

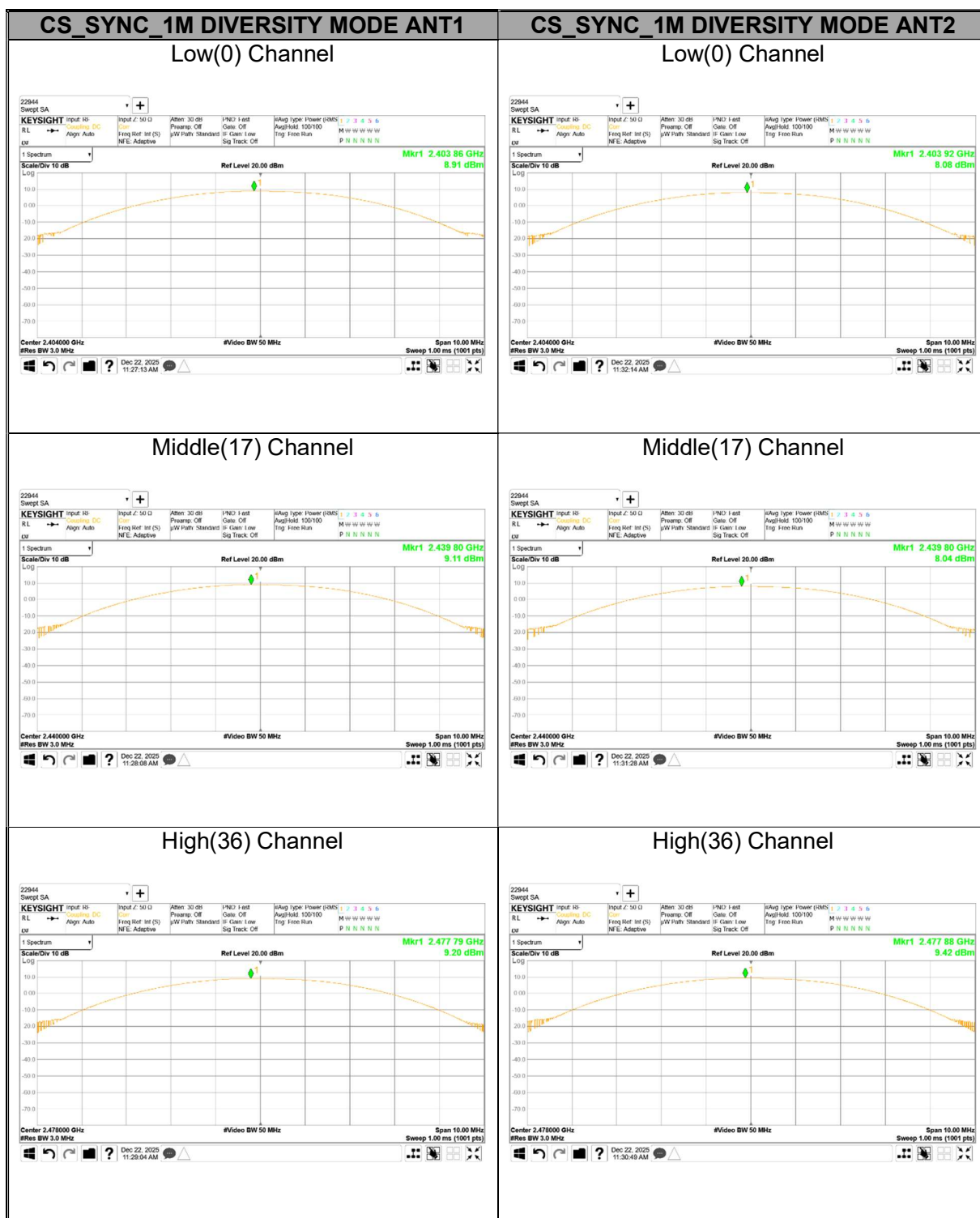
RESULTS

9.3.1. DIVERSITY MODE TEST DATA

Mode	Antenna	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
1 Mbps (37 pkt)	ANT1	37	2 402	9.30	30.000	-20.70
		17	2 440	9.33		-20.67
		39	2 480	9.45		-20.55
1 Mbps (37 pkt)	ANT2	37	2 402	8.13		-21.87
		17	2 440	8.51		-21.49
		39	2 480	9.52		-20.48
2 Mbps (37 pkt)	ANT1	0	2 404	9.15		-20.85
		17	2 440	9.35		-20.65
		36	2 478	9.46		-20.54
2 Mbps (37 pkt)	ANT2	0	2 404	8.69		-21.31
		17	2 440	8.52		-21.48
		36	2 478	9.62		-20.38
CS SYNC 1 M	ANT1	0	2 404	8.91		-21.09
		17	2 440	9.11		-20.89
		36	2 478	9.20		-20.80
	ANT2	0	2 404	8.08		-21.92
		17	2 440	8.04		-21.96
		36	2 478	9.42		-20.58
Worst				9.62		-20.38

[illegible]





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]
1 Mbps (37 pkt)	ANT1	37	2 402	9.076	8.084
		17	2 440	9.120	8.166
		39	2 480	9.218	8.352
1 Mbps (37 pkt)	ANT2	37	2 402	7.886	6.146
		17	2 440	8.287	6.741
		39	2 480	9.185	8.289
2 Mbps (37 pkt)	ANT1	0	2 404	8.759	7.514
		17	2 440	8.955	7.862
		36	2 478	9.073	8.078
2 Mbps (37 pkt)	ANT2	0	2 404	8.265	6.707
		17	2 440	8.135	6.509
		36	2 478	9.231	8.377
CS SYNC 1M	ANT1	0	2 404	8.419	6.948
		17	2 440	8.667	7.357
		36	2 478	8.649	7.326
	ANT2	0	2 404	7.844	6.087
		17	2 440	7.652	5.824
		36	2 478	9.052	8.039

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

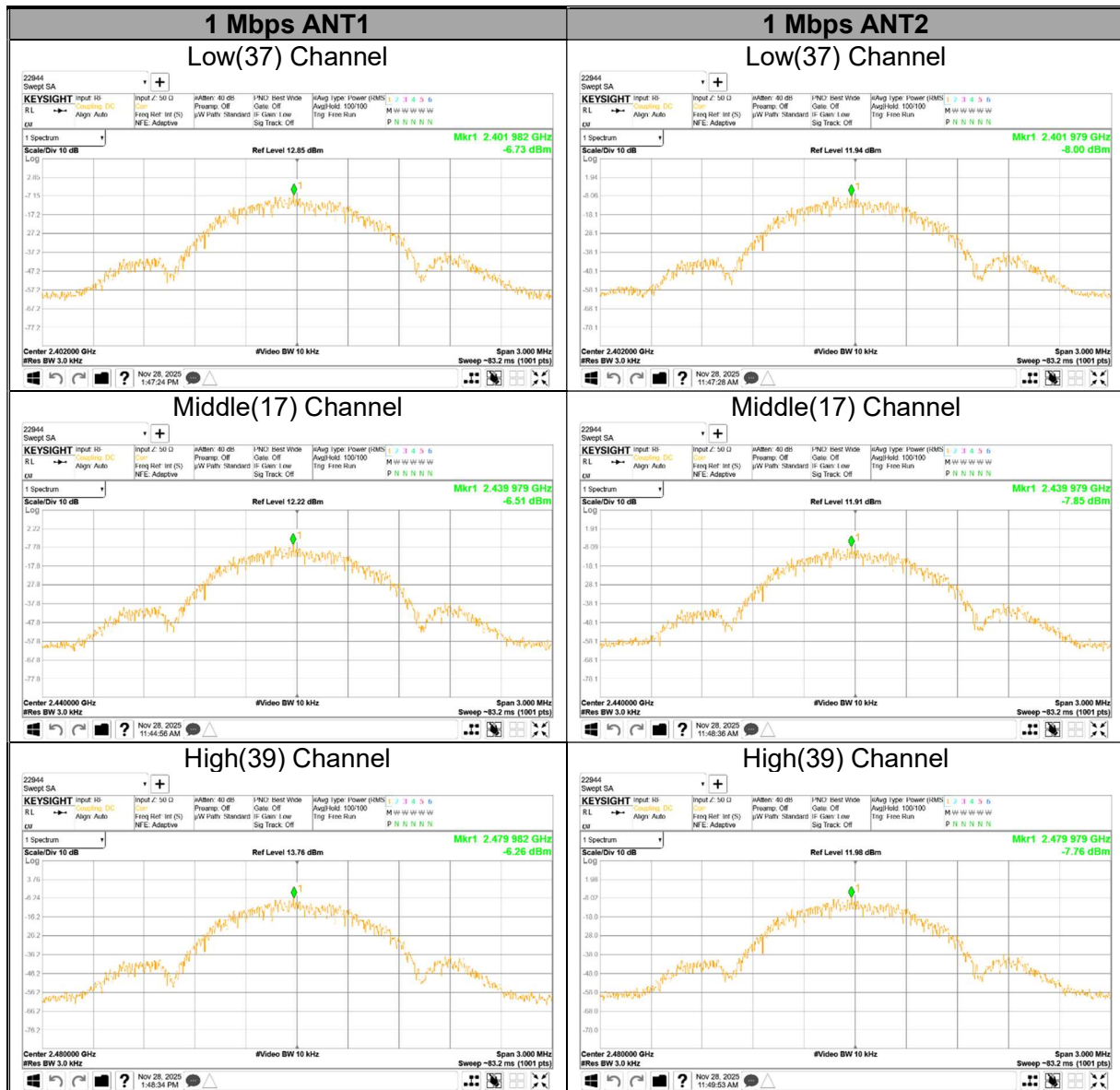
ANSI C63.10-2020, Section 11.10.2 Method PKPSD (peak PSD)

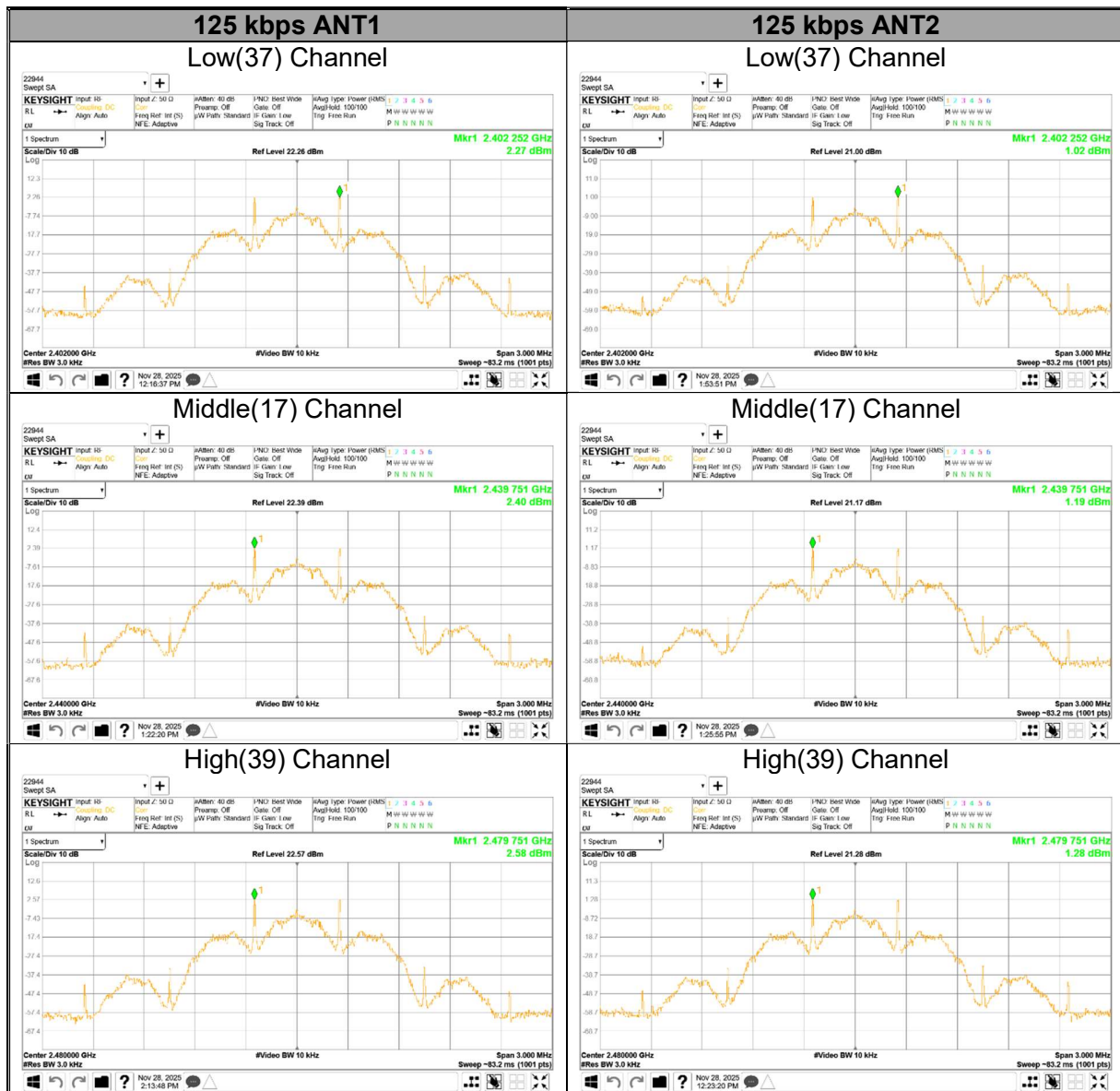
RESULTS

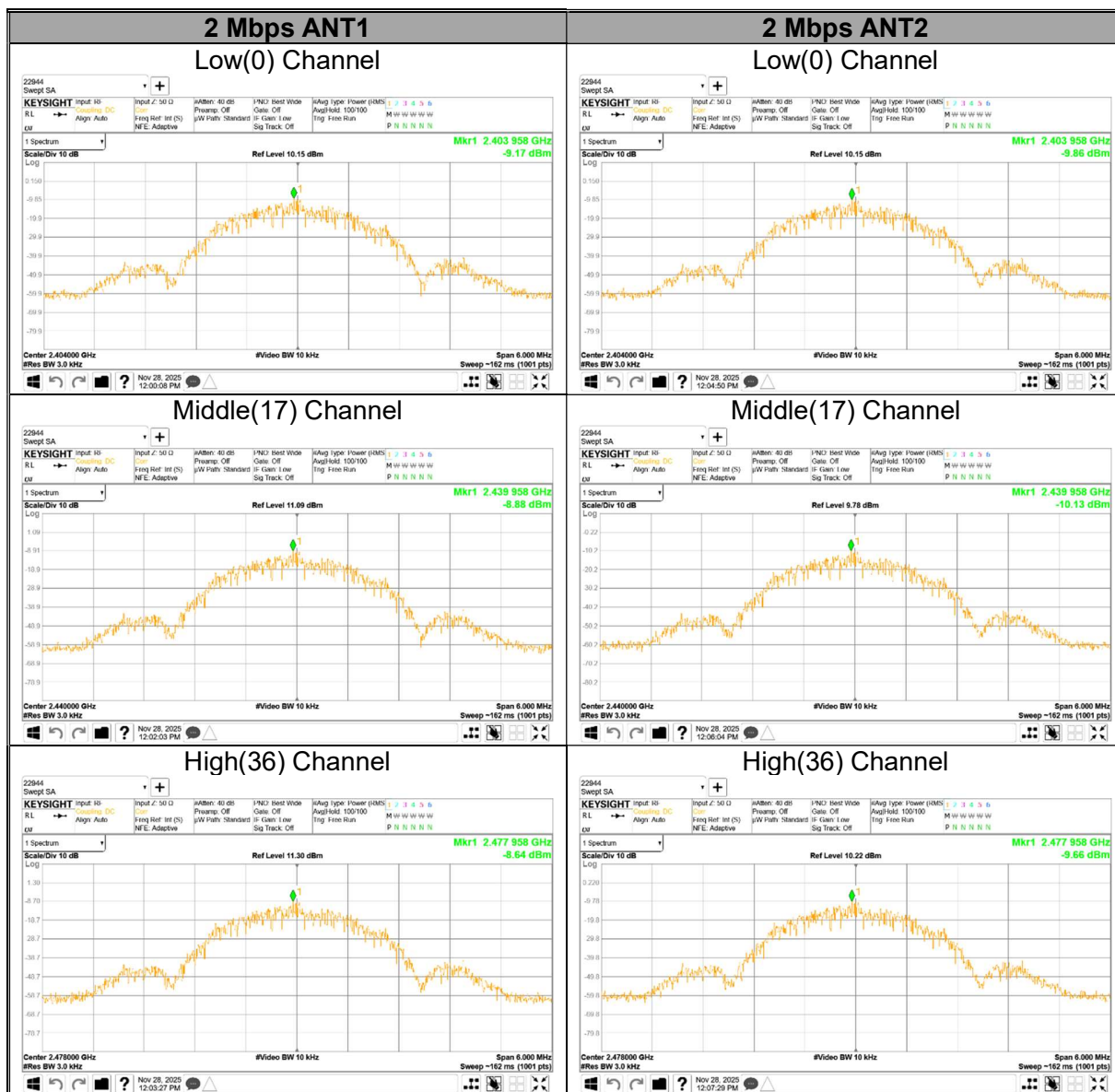
9.5.1. TEST DATA

Mode	Antenna	Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
1 Mbps (37pkt)	ANT1	37	2 402	-6.73	8.00	-14.73
		17	2 440	-6.51		-14.51
		39	2 480	-6.26		-14.26
1 Mbps (37pkt)	ANT2	37	2 402	-8.00		-16.00
		17	2 440	-7.85		-15.85
		39	2 480	-7.76		-15.76
125 kbps (37pkt)	ANT1	37	2 402	2.27		-5.73
		17	2 440	2.40		-5.60
		39	2 480	2.58		-5.42
125 kbps (37pkt)	ANT2	37	2 402	1.02		-6.98
		17	2 440	1.19		-6.81
		39	2 480	1.28		-6.72
500 kbps (37 pkt)	ANT1	37	2 402	2.07		-5.93
		17	2 440	2.23		-5.77
		39	2 480	2.48		-5.52
500 kbps (37 pkt)	ANT2	37	2 402	0.84		-7.16
		17	2 440	1.04		-6.96
		39	2 480	1.12		-6.88
2 Mbps (37 pkt)	ANT1	0	2 404	-9.17		-17.17
		17	2 440	-8.88		-16.88
		36	2 478	-8.64		-16.64
2 Mbps (37 pkt)	ANT 2	0	2 404	-9.86		-17.86
		17	2 440	-10.13		-18.13
		36	2 478	-9.66		-17.66
Worst				2.58		-5.42

9.5.2. PSD TEST PLOTS







9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

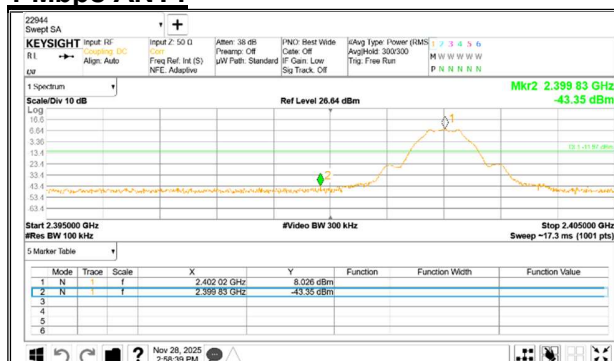
FCC §15.247 (d)

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

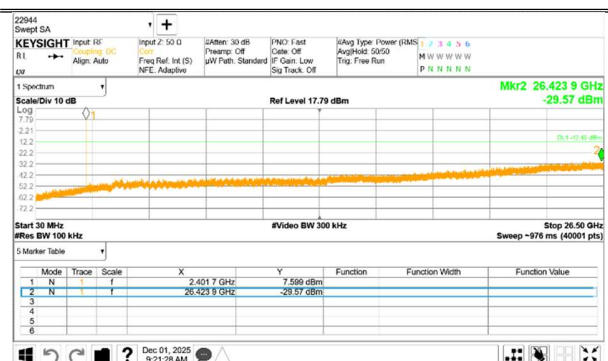
RESULTS

9.6.1. Test plot

1 Mbps ANT1



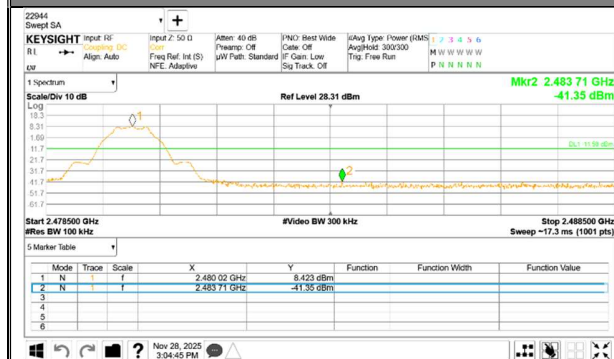
LOW(37) CHANNEL BANDEDGE



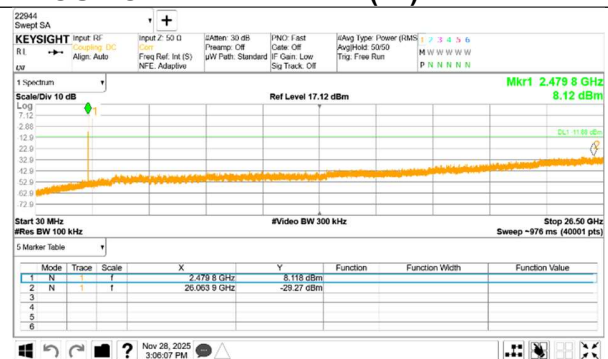
OUT-OF-BAND LOW(37) CHANNEL



OUT-OF-BAND MIDDLE(17) CHANNEL

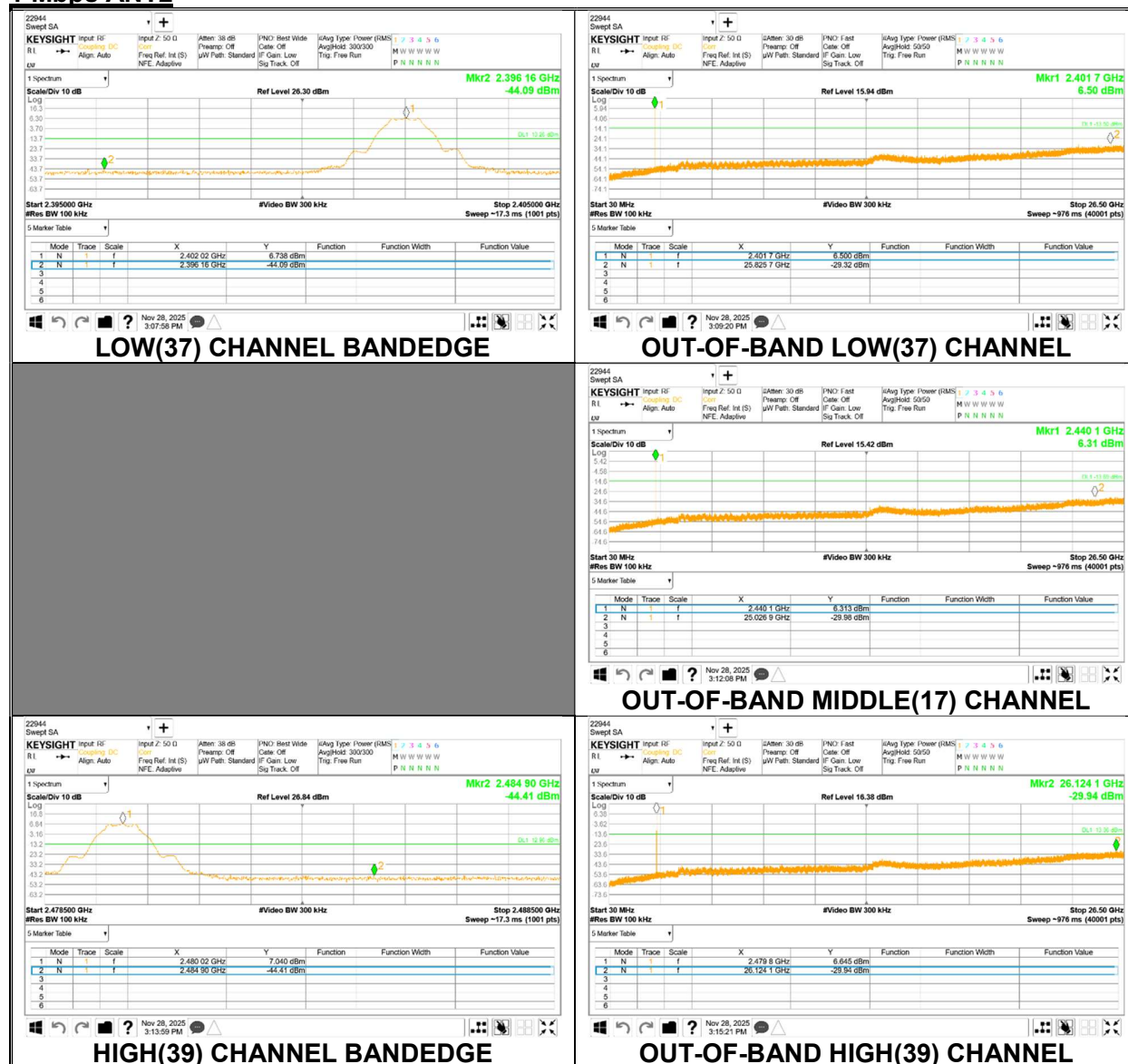


HIGH(39) CHANNEL BANDEDGE

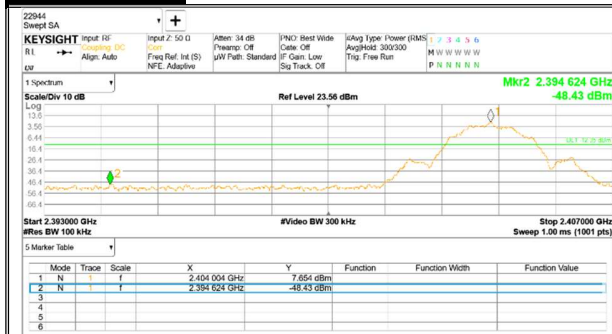


OUT-OF-BAND HIGH(39) CHANNEL

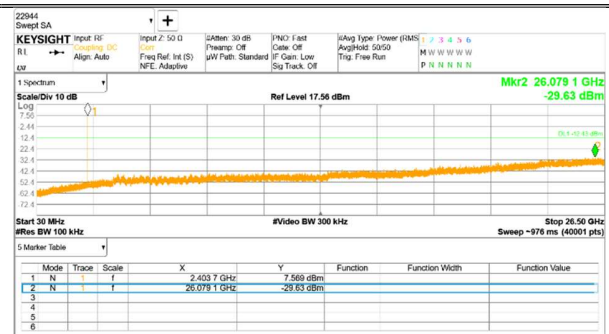
1 Mbps ANT2



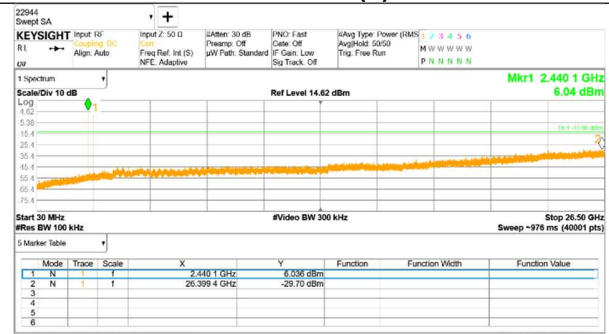
2 Mbps ANT1



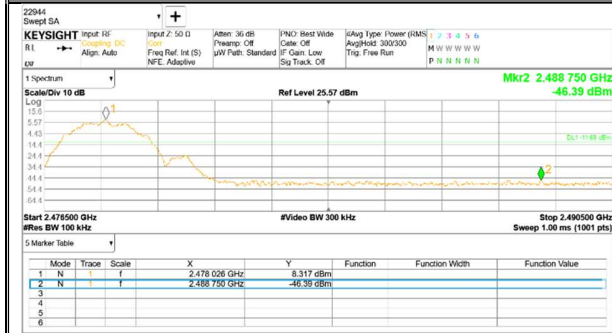
LOW(0) CHANNEL BANDEDGE



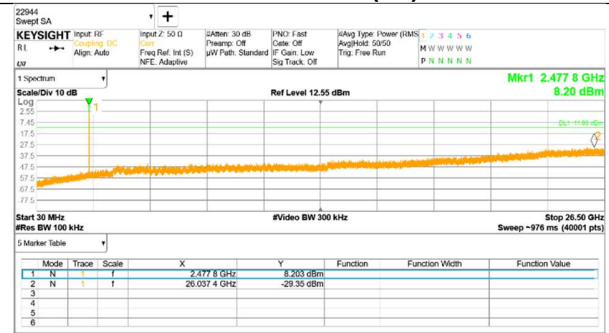
OUT-OF-BAND LOW(0) CHANNEL



OUT-OF-BAND MIDDLE(17) CHANNEL

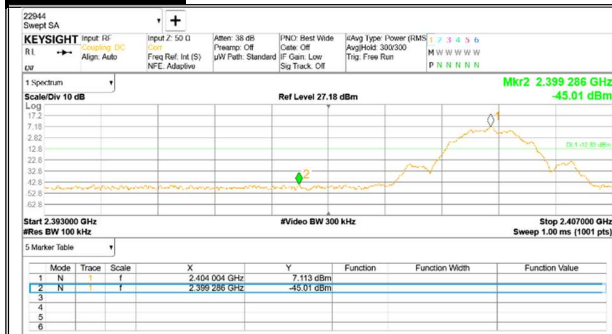


HIGH(36) CHANNEL BANDEDGE

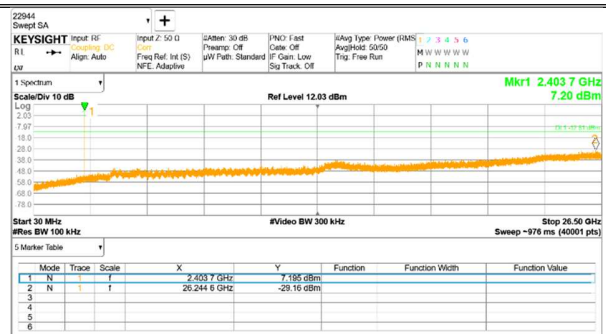


OUT-OF-BAND HIGH(36) CHANNEL

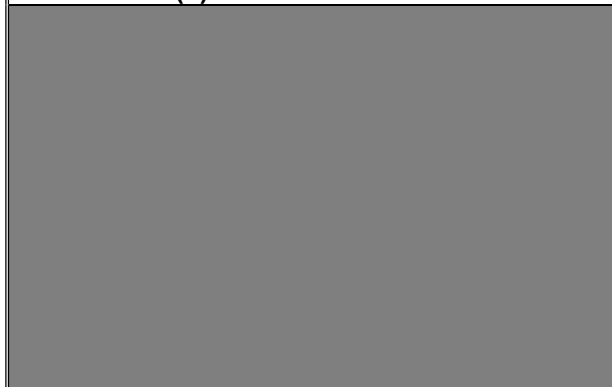
2 Mbps ANT2



LOW(0) CHANNEL BANDEDGE



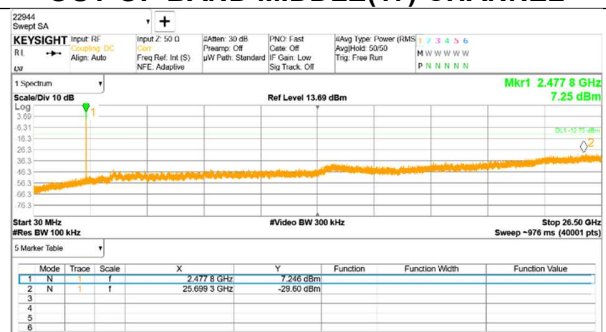
OUT-OF-BAND LOW(0) CHANNEL



OUT-OF-BAND MIDDLE(17) CHANNEL



HIGH(36) CHANNEL BANDEDGE



OUT-OF-BAND HIGH(36) CHANNEL

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.

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
1 Mbps [37pkt]	0.5195	2.84	Antenna 1 and 2
2 Mbps [37pkt]	0.3876	4.12	Antenna 1 and 2

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.

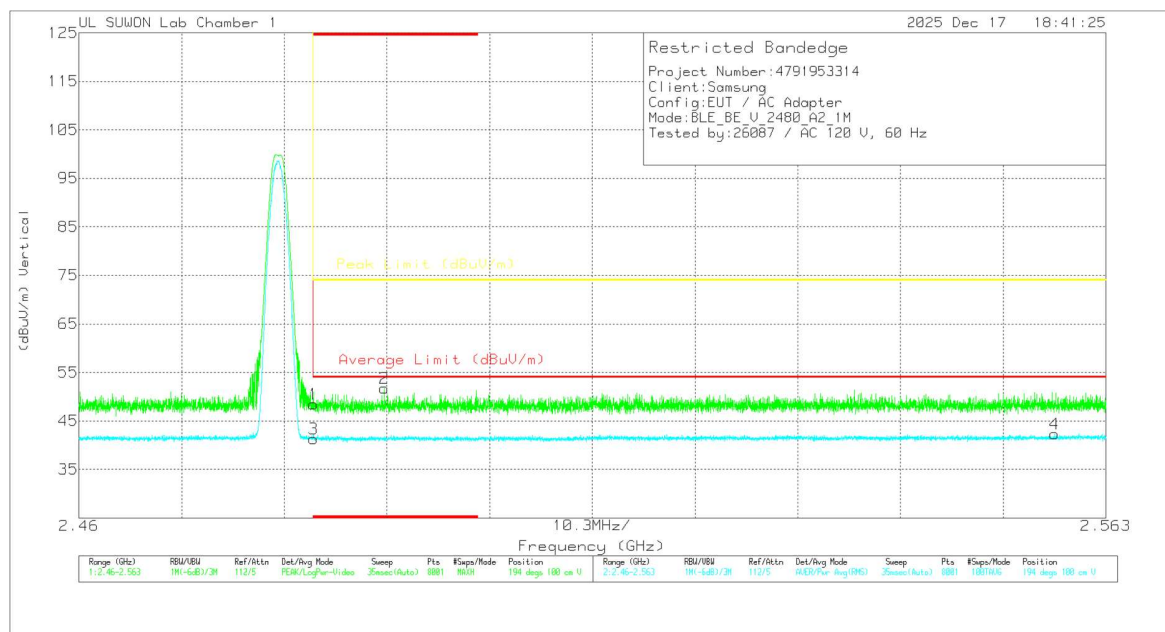
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field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

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. TX ABOVE 1 GHz BLUETOOTH LE 1 Mbps

BANDEDGE (WORST CASE: 2480 MHz, ANT2)

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuU/m)	Det	Antenna_Factor (dBm)	10dB_Path Loss (dB)	DC Corr (dB)	Corrected Reading (dBuU/m)	Average Limit (dBuU/m)	Margin (dB)	Peak Limit (dBuU/m)	PK Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	* 2.48351	42.06	Pk	32	-26.2	0	48.46	-	-	74	-25.54	194	100	V
2	* 2.49064	45.86	PK	32	-26.1	0	51.76	-	-	74	-22.24	194	100	V
3	* 2.48351	32.71	RMS	32	-26.2	2.84	41.35	54	-12.85	-	-	194	100	V
4	2.55788	33.44	RMS	32.1	-26.1	2.84	42.28	54	-11.72	-	-	194	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

BANDEDGE TEST DATA

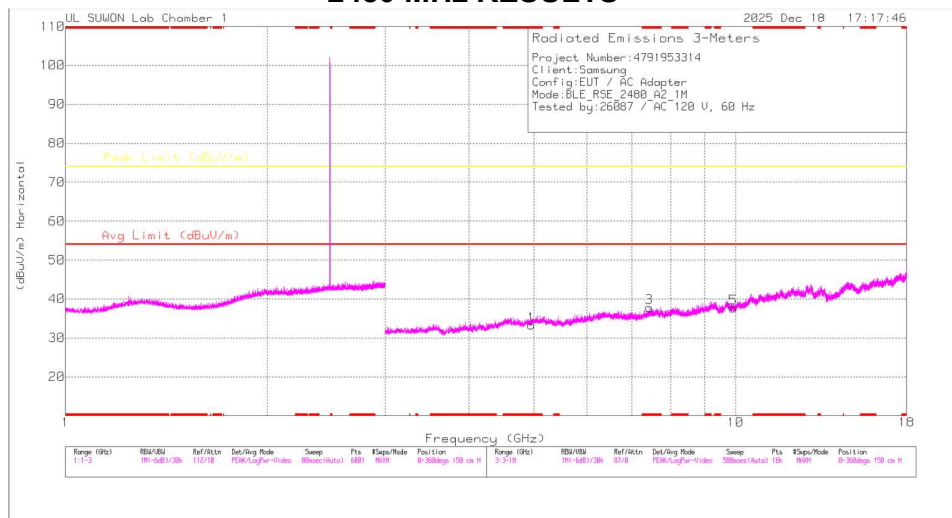
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 2.39	42.69	Pk	31.70	-26.20	0.00	48.19	-	-	74.00	-25.81	127	146	H
		* 2.3197	46.46	Pk	31.60	-26.30	0.00	51.76	-	-	74.00	-22.24	127	146	H
		* 2.39	32.70	RMS	31.70	-26.20	2.84	41.04	54.00	-12.96	-	-	127	146	H
		* 2.338	33.51	RMS	31.60	-26.20	2.84	41.75	54.00	-12.25	-	-	127	146	H
		* 2.39	41.15	Pk	31.70	-26.20	0.00	46.65	-	-	74.00	-27.35	97	110	V
		* 2.36207	46.47	Pk	31.70	-26.20	0.00	51.97	-	-	74.00	-22.03	97	110	V
		* 2.39	32.78	RMS	31.70	-26.20	2.84	41.12	54.00	-12.88	-	-	97	110	V
		* 2.38174	33.27	RMS	31.70	-26.20	2.84	41.61	54.00	-12.39	-	-	97	110	V
2480	ANT1	* 2.48351	42.42	Pk	32.00	-26.20	0.00	48.22	-	-	74.00	-25.78	160	100	H
		2.516	45.96	Pk	32.00	-26.10	0.00	51.86	-	-	74.00	-22.14	160	100	H
		* 2.48351	33.13	RMS	32.00	-26.20	2.84	41.77	54.00	-12.23	-	-	160	100	H
		2.544	33.23	RMS	32.10	-26.00	2.84	42.17	54.00	-11.83	-	-	160	100	H
		* 2.48351	42.23	Pk	32.00	-26.20	0.00	48.03	-	-	74.00	-25.97	96	106	V
		2.524	45.12	Pk	32.00	-26.10	0.00	51.02	-	-	74.00	-22.98	96	106	V
		* 2.48351	32.97	RMS	32.00	-26.20	2.84	41.61	54.00	-12.39	-	-	96	106	V
		2.521	33.49	RMS	32.00	-26.10	2.84	42.23	54.00	-11.77	-	-	96	106	V
2402	ANT2	* 2.39	42.16	Pk	31.70	-26.20	0.00	47.66	-	-	74.00	-26.34	30	141	H
		* 2.3318	45.52	Pk	31.60	-26.30	0.00	50.82	-	-	74.00	-23.18	30	141	H
		* 2.39	32.56	RMS	31.70	-26.20	2.84	40.90	54.00	-13.10	-	-	30	141	H
		* 2.37803	33.17	RMS	31.70	-26.10	2.84	41.61	54.00	-12.39	-	-	30	141	H
		* 2.39	41.98	Pk	31.70	-26.20	0.00	47.48	-	-	74.00	-26.52	197	124	V
		* 2.35661	45.30	Pk	31.70	-26.20	0.00	50.80	-	-	74.00	-23.20	197	124	V
		* 2.39	32.77	RMS	31.70	-26.20	2.84	41.11	54.00	-12.89	-	-	197	124	V
		* 2.33801	33.42	RMS	31.60	-26.20	2.84	41.66	54.00	-12.34	-	-	197	124	V
2480	ANT2	* 2.48351	43.04	Pk	32.00	-26.20	0.00	48.84	-	-	74.00	-25.16	147	112	H
		2.539	45.80	Pk	32.00	-26.00	0.00	51.80	-	-	74.00	-22.20	147	112	H
		* 2.48351	32.68	RMS	32.00	-26.20	2.84	41.32	54.00	-12.68	-	-	147	112	H
		2.523	33.45	RMS	32.00	-26.10	2.84	42.19	54.00	-11.81	-	-	147	112	H
		* 2.48351	42.66	Pk	32.00	-26.20	0.00	48.46	-	-	74.00	-25.54	194	100	V
		* 2.49064	45.86	Pk	32.00	-26.10	0.00	51.76	-	-	74.00	-22.24	194	100	V
		* 2.48351	32.71	RMS	32.00	-26.20	2.84	41.35	54.00	-12.65	-	-	194	100	V
		2.558	33.44	RMS	32.10	-26.10	2.84	42.28	54.00	-11.72	-	-	194	100	V

Note1. Pk - Peak detector, RMS - RMS detector

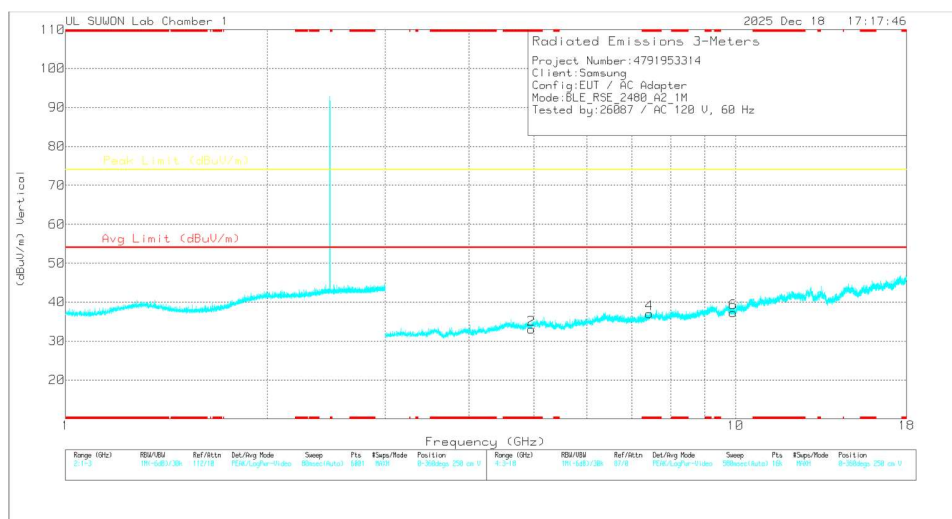
Note2. * - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 2480 MHz, ANT2)

2480 MHz RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna Factor (dB/m)	3GHz_HP_Pat h Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.95971	42.35	PK2	34.2	-32.9	0	43.65	-	-	74	-30.35	0	100	H
* 4.95984	42.37	PK2	34.2	-32.9	0	43.67	-	-	74	-30.33	0	100	V
* 7.43917	41.28	PK2	35.6	-30.4	0	46.48	-	-	74	-27.52	215	226	H
* 7.4395	30.21	MAV1	35.6	-30.4	2.84	38.25	54	-15.75	-	-	215	226	H
* 7.43966	41.86	PK2	35.6	-30.4	0	47.06	-	-	74	-26.94	186	118	V
* 7.43944	30.13	MAV1	35.6	-30.4	2.84	38.17	54	-15.83	-	-	186	118	V
9.9183	37.27	PK2	37.4	-27.1	0	47.57	-	-	74	-26.43	0	100	H
9.91818	37.03	PK2	37.4	-27.1	0	47.33	-	-	74	-26.67	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS 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	* 4.80414	41.97	PK2	34.20	-33.00	0.00	43.17	-	-	74.00	-30.83	217	111	H
		* 4.80081	30.25	MAv1	34.20	-33.00	2.84	34.29	54.00	-19.71	-	-	217	111	H
		* 4.80442	42.26	PK2	34.20	-33.00	0.00	43.46	-	-	74.00	-30.54	64	312	V
		* 4.80111	30.21	MAv1	34.20	-33.00	2.84	34.25	54.00	-19.75	-	-	64	312	V
		7.206	40.77	PK2	35.50	-31.00	0.00	45.27	-	-	74.00	-28.73	100	101	H
		7.208	41.22	PK2	35.50	-31.00	0.00	45.72	-	-	74.00	-28.28	136	101	V
		9.608	37.87	PK2	37.00	-27.10	0.00	47.77	-	-	74.00	-26.23	0	100	H
		9.609	37.31	PK2	37.00	-27.10	0.00	47.21	-	-	74.00	-26.79	0	100	V
2440	ANT1	* 4.88047	42.15	PK2	34.20	-33.00	0.00	43.35	-	-	74.00	-30.65	320	382	H
		* 4.88244	30.00	MAv1	34.20	-33.00	2.84	34.04	54.00	-19.96	-	-	320	382	H
		* 4.87732	42.78	PK2	34.20	-33.00	0.00	43.98	-	-	74.00	-30.02	62	162	V
		* 4.87954	30.19	MAv1	34.20	-33.00	2.84	34.23	54.00	-19.77	-	-	62	162	V
		* 7.31899	40.91	PK2	35.50	-30.80	0.00	45.61	-	-	74.00	-28.39	91	116	H
		* 7.32173	28.36	MAv1	35.50	-30.70	2.84	36.00	54.00	-18.00	-	-	91	116	H
		* 7.31887	40.57	PK2	35.50	-30.80	0.00	45.27	-	-	74.00	-28.73	137	102	V
		* 7.31942	28.52	MAv1	35.50	-30.80	2.84	36.06	54.00	-17.94	-	-	137	102	V
		9.760	37.41	PK2	37.20	-26.40	0.00	48.21	-	-	74.00	-25.79	0	100	H
		9.762	37.26	PK2	37.20	-26.40	0.00	48.06	-	-	74.00	-25.94	0	100	V
2480	ANT1	* 4.95995	42.14	PK2	34.20	-32.90	0.00	43.44	-	-	74.00	-30.56	172	122	H
		* 4.95974	30.23	MAv1	34.20	-32.90	2.84	34.37	54.00	-19.63	-	-	172	122	H
		* 4.9595	41.99	PK2	34.20	-32.90	0.00	43.29	-	-	74.00	-30.71	327	205	V
		* 4.96016	30.24	MAv1	34.20	-32.90	2.84	34.38	54.00	-19.62	-	-	327	205	V
		* 7.43936	40.77	PK2	35.60	-30.40	0.00	45.97	-	-	74.00	-28.03	0	100	H
		* 7.43823	40.65	PK2	35.60	-30.30	0.00	45.95	-	-	74.00	-28.05	360	100	V
		9.922	38.02	PK2	37.40	-27.10	0.00	48.32	-	-	74.00	-25.68	0	100	H
		9.919	37.29	PK2	37.40	-27.10	0.00	47.59	-	-	74.00	-26.41	0	100	V
2402	ANT2	* 4.8052	42.85	PK2	34.20	-32.90	0.00	44.15	-	-	74.00	-29.85	0	100	H
		* 4.80167	42.41	PK2	34.20	-33.00	0.00	43.61	-	-	74.00	-30.39	0	100	V
		7.208	40.69	PK2	35.50	-31.00	0.00	45.19	-	-	74.00	-28.81	116	392	H
		7.207	40.92	PK2	35.50	-31.00	0.00	45.42	-	-	74.00	-28.58	197	112	V
		9.610	37.50	PK2	37.00	-27.10	0.00	47.40	-	-	74.00	-26.60	0	100	H
		9.608	36.87	PK2	37.00	-27.10	0.00	46.77	-	-	74.00	-27.23	0	100	V
2440	ANT2	* 4.87821	42.27	PK2	34.20	-33.00	0.00	43.47	-	-	74.00	-30.53	360	100	H
		* 4.88066	42.61	PK2	34.20	-33.00	0.00	43.81	-	-	74.00	-30.19	0	100	V
		* 7.32225	41.17	PK2	35.50	-30.70	0.00	45.97	-	-	74.00	-28.03	139	102	H
		* 7.31938	29.05	MAv1	35.50	-30.80	2.84	36.59	54.00	-17.41	-	-	139	102	H
		* 7.31922	41.30	PK2	35.50	-30.80	0.00	46.00	-	-	74.00	-28.00	196	137	V
		* 7.32059	29.32	MAv1	35.50	-30.80	2.84	36.86	54.00	-17.14	-	-	196	137	V
		9.761	37.07	PK2	37.20	-26.40	0.00	47.87	-	-	74.00	-26.13	360	100	H
		9.759	36.96	PK2	37.20	-26.40	0.00	47.76	-	-	74.00	-26.24	0	100	V
2480	ANT2	* 4.95971	42.35	PK2	34.20	-32.90	0.00	43.65	-	-	74.00	-30.35	0	100	H
		* 4.95984	42.37	PK2	34.20	-32.90	0.00	43.67	-	-	74.00	-30.33	0	100	V
		* 7.43917	41.28	PK2	35.60	-30.40	0.00	46.48	-	-	74.00	-27.52	215	226	H
		* 7.4395	30.21	MAv1	35.60	-30.40	2.84	38.25	54.00	-15.75	-	-	215	226	H
		* 7.43966	41.86	PK2	35.60	-30.40	0.00	47.06	-	-	74.00	-26.94	186	118	V
		* 7.43944	30.13	MAv1	35.60	-30.40	2.84	38.17	54.00	-15.83	-	-	186	118	V
		9.918	37.27	PK2	37.40	-27.10	0.00	47.57	-	-	74.00	-26.43	0	100	H
		9.918	37.03	PK2	37.40	-27.10	0.00	47.33	-	-	74.00	-26.67	0	100	V

Note1. PK2 - KDB558074 Method: Maximum Peak / MAv1 - KDB558074 Option 1 Maximum RMS Average

Note2. * - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band