TEST REPORT

Report Number : 14523772-E16V1

Applicant	:	APPLE INC 1 APPLE PARK WAY CUPERTINO, CA 95104, U.S.A.
Model	:	A3105 (Parent Model) A3106, A3108 (Variant Models)
Brand	:	APPLE
FCC ID	:	BCG-E8440A (Parent Model) BCG-E8441A, BCG-E8442A (Variant Models)
IC	:	579C-E8440A (Parent model) 579C-E8441A, 579C-E8442A (Variant Models)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC CFR 47 PART 15 SUBPART F §15.519 ISED RSS-220 ISSUE 1 AMENDMENT 1

Date Of Issue:
AUGUST 05, 2023

Prepared by:
UL VERIFICATION SERVICES INC.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

ACCREDITED
CERT #0751.05

Her emaRevision History

Rev.	Issue Date	Revisions	Revised By
V1	08/05/2023	Initial Issue	---

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TABLE OF CONTENTS

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1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE INC 1 APPLE PARK WAY CUPERTINO, CA 95104, U.S.A.
Model	A3105 (Parent Model, Full Test) A3106, A3108 (Variant Models)
Brand	APPLE
FCC ID	BCG-E8440A (Parent Model) BCG-E8441A, BCG-E8442A (Variant Models)
IC	579C-E8440A (Parent model) 579C-E8441A, 579C-E8442A (Variant Models)
EUT Description	SMARTPHONE
Serial Number	N2YYXMXHWQ
Sample Receipt Date	June 16, 2023
Date Tested	FEBRUARY 09, 2023 to JULY 17, 2023
Applicable Standards	FCC CFR 47 PART 15 SUBPART F §15.519 ISED RSS-220 ISSUE 1 AMENDMENT 1
Test Results	COMPLIES

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released By:	Prepared & Reviewed By:
	
Thu Chan Staff Engineer UL Verification Services Inc.	Benjamin Dobbins Senior Test Engineer UL Verification Services Inc.

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2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.4
15.503 & 15.519 (b)	RSS-220 Sect. 2	-10 dB BW	Complies	ANSI C63.10 Section 10.1
15.519 (c) & (e)	RSS-220 Sect. 4 (c) & 5.3.1 (d)	Pk Power & Max Avg Emissions	Complies	ANSI C63.10 Section 10.3
15.519 (a)(1)	RSS-220 Sect. 5.3.1 (b)	Cessation Time	Complies	None
15.519 (c) & 15.209 (a)	RSS-220 Sect. 3.4	Emissions Below 960 MHz	Complies	ANSI C63.10 Section 10.2
15.519 (c) & (d)	RSS-220 Sect. 5.3.1 (d) & (e)	Emissions Above 960 MHz	Complies	ANSI C63.10 Section 10.3
15.207 (a)	RSS-Gen 8.8	AC Power Line Conducted Emissions	Complies	ANSI C63.10 Section 6.2

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3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:

- CFR Title 47 Part 15 Subpart F
- KDB 393764 D01 UWB FAQ v02r01
- ANSI C63.10-2013
- ISED RSS-220 Issue 1 Amendment 1
- ISED RSS GEN Issue 5 Amendment 2

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☐	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
☒	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

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5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U_{LAB}
Conducted Antenna Port Emission Measurement	1.940 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 %
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

EIRP (dBm) = Meter Reading (dBm) + Antenna Factor (dB/m) + Pre-Amp Gain/Cbl Loss (dB)
+ dBm-to-dBm Unit Conversion Factor @ 3m
= -60 dBm + 28 dB/m + (-27) dB + 11.8
= -47.2 dBm

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

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Final Voltage (dBuV) = Measured Voltage (dBuV) + LISN Insertion Loss (dB) + Cable Loss (dB) + Limiter Factor (dB)
= 38.32 dBuV + 0.1 dB + 0 dB + 9.4 (dB)
= 47.82 dBuV

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6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, UMTS, LTE, 5GNR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth (BT), Ultra-Wideband (UWB), GPS, NFC, NB UNII, 802.15.4, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

The EUT has a UWB transceiver with two integral antennas (ANT1 = UWB1, ANT2 = ANT6/UWB0). ANT1 only operates on 8 GHz (Channel 9). ANT2 operates on 6.5 GHz (Channel 5) and 8 GHz (Channel 9). The antennas are not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

Parent Model: A3105, FCC ID: BCG-E8440A, IC: 579C-E8440A

Variant Models: A3106, FCC ID: BCG-E8441A, IC: 579C-E8441A
A3108, FCC ID: BCG-E8442A, IC: 579C-E8442A

6.2. MAXIMUM OUTPUT POWER

Highest Average Powers based on ANT/CH for the parent model are listed as follow:

Parent Model (A3105)			
ANT	**CH**	**CONFIG**	**Average Power (dBm EIRP)**
1	9	202	-42.32
2	5	809	-42.30
2	9	601	-42.34

6.3. MODULATION

The UWB signal is BPSK pulsed modulated signal.

6.4. SOFTWARE AND FIRMWARE

The Software and Firmware version used at test is FT: 210.1868000000100002.9.

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7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

SUPPORT EQUIPMENT LIST			
Description	**Manufacturer**	**Model**	**Serial Number**
Laptop + Adapter	Apple	MacBook Pro	FVF1CBUHV29
Brisket – USB Adapter	Apple	Brisket UART Cable Pigtail	F2010M00004786
USB-C Power Adapter	Apple	A2305	C4H9516000APF4F4P
USB-C Ethernet Adapter	Ugreen	CM475	60600
USB-A to USB-C adapter	Anker	A8731	X002NCP6GR
USB-A Cable with Repeater	Ugreen	10321	X000TT2OLL

I/O CABLES

I/O CABLES					
Port	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
AC	1	AC	Un-shielded	2	N/A
USB	1	USB	Un-shielded	1	N/A

TEST SETUP

The EUT was examined at pre-scan test using a fundamental frequency in the portrait (z), landscape (y), and flatbed (x) position and the worst-case orientation of individual ANT/CH/CONFIG setting was determined for final spurious emission measurement. All selected configs are used for the Ant/Ch settings that were tested at default power (0 dBm), and Config 9 Payload 125 was chose for uwanted emission test with CH9 on Ant 1 and both CH5 and CH9 on Ant 2 on the parent model by setting at maximum output power higher than 0 dBm.

Measurements of spurious average emissions were made with the device operating at a higher power than production power to ensure compliance. Measurements of the in-band signal (peak and average emissions, 10 dBc bandwidth, 99% bandwidth) were all made at the production power settings.

EUT was connected to AC power adapter in all test cases except 0.96-6GHz, 1164-1240MHz, and 1559-1610MHz due to noise unrelated to the UWB signal from the device.

For simultaneous transmission on the same antenna of multiple channels in the UWB and WiFi, no noticeable new emission was found.

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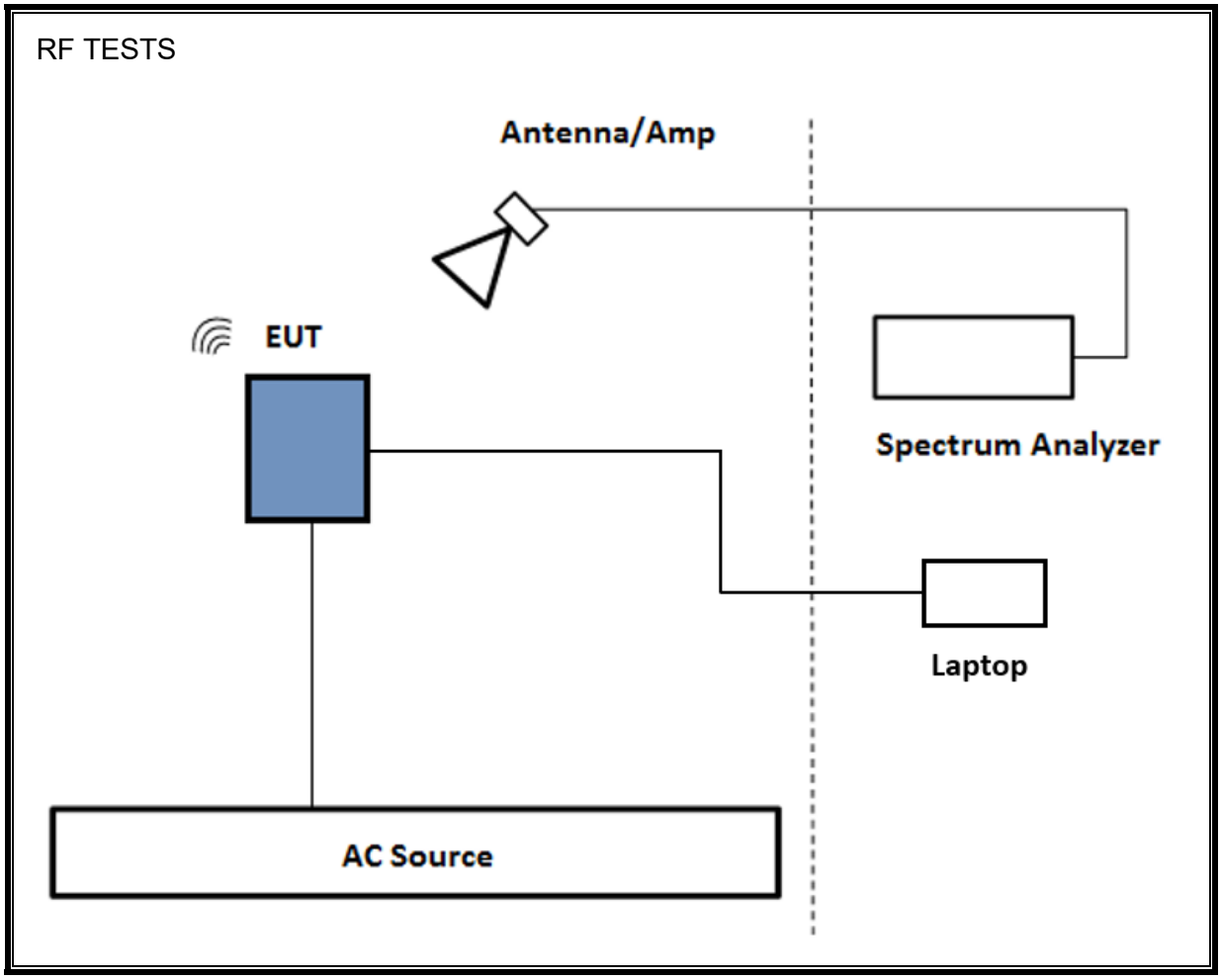
SETUP DIAGRAM FOR Above 1 GHz TESTS



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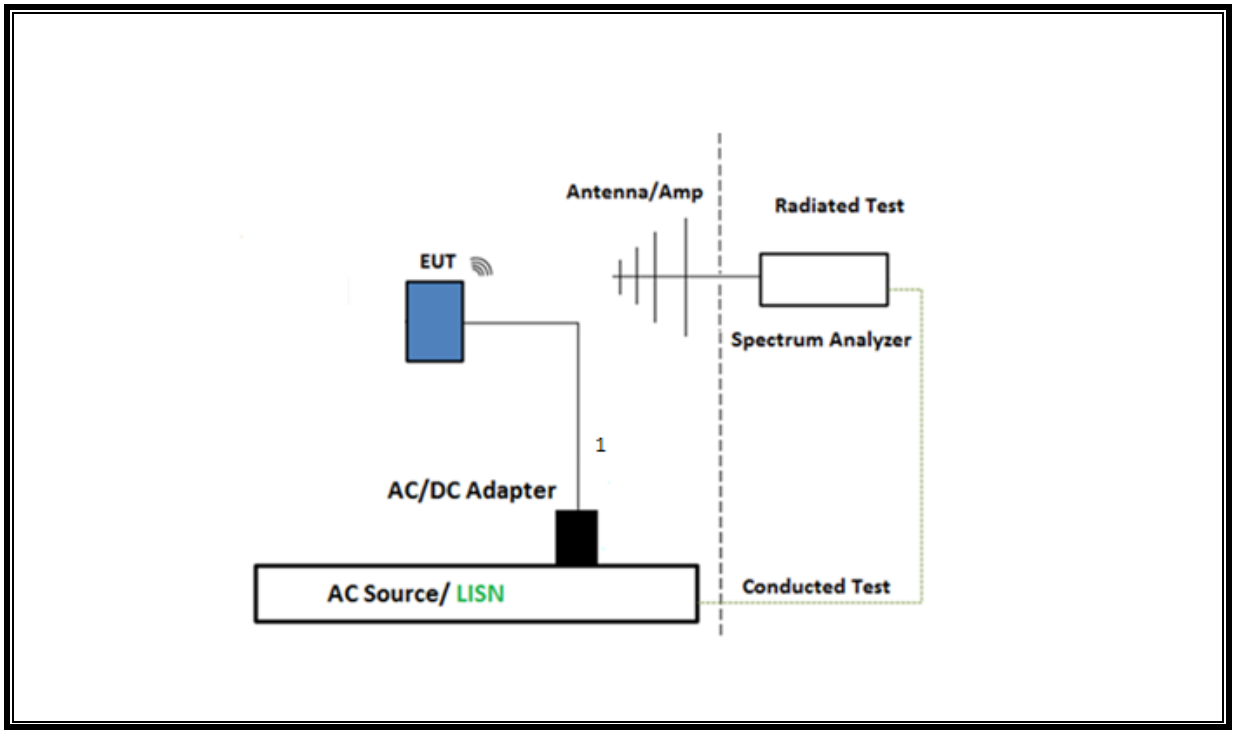
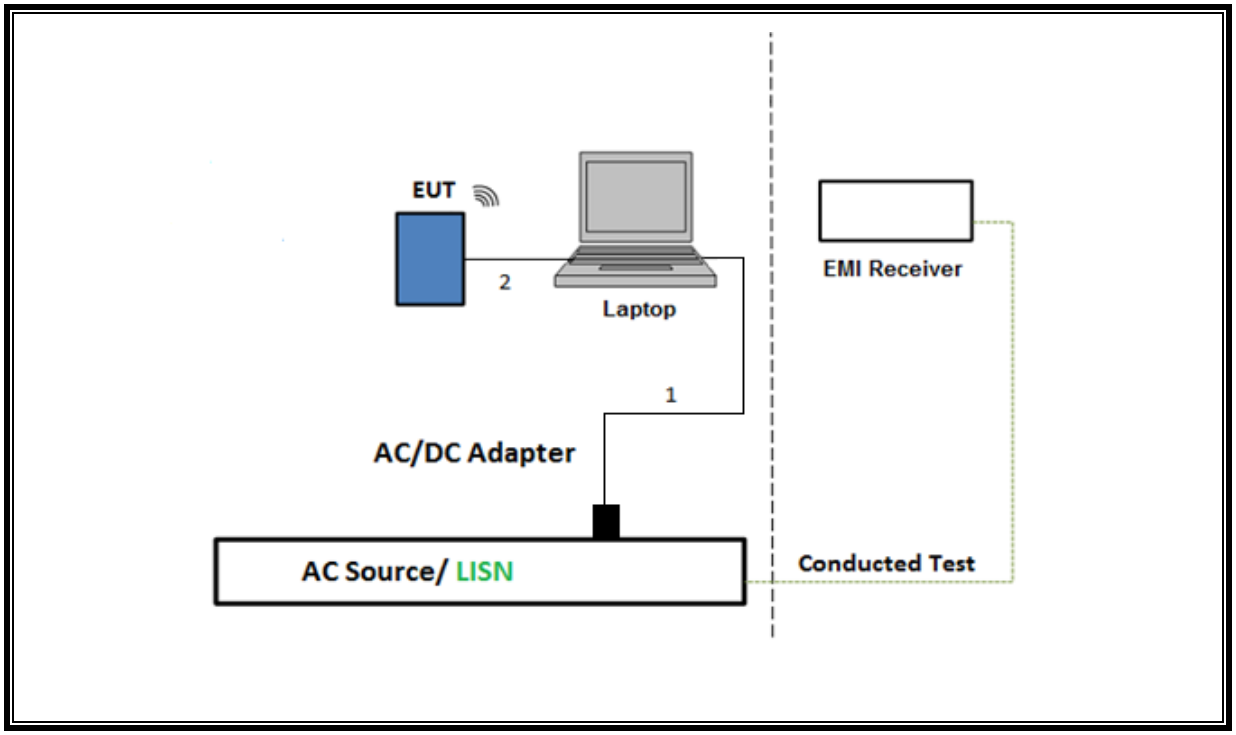
SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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8. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment					
Description	Manufacturer	Model	Local ID	Cal Date	Cal Due
EMI Test Reciever	Rohde & Schwarz	ESW44	223460	2/18/2023	2/29/2024
Horn Antenna, 1-18GHz	ETS-Lindgren	3117	206805	7/5/2022	7/5/2023
Horn Antenna, 1-18GHz	ETS-Lindgren	3117	80403	6/22/2023	6/30/2024
RF Filter Box, 1-18GHz	UL-FR1 (CTECH)	N/A	224478	10/26/2022	10/26/2023
EMI Test Reciever	Rohde & Schwarz	ESW44	223459	9/9/2022	9/9/2023
Horn Antenna, 1-18GHz	ETS-Lindgren	3117	80707	4/28/2022	4/28/2023
RF Filter Box, 1-18GHz	UL-FR1 (CTECH)	N/A	225079	10/31/2022	10/31/2023
EMI Test Reciever	Rohde & Schwarz	ESW44	169937	2/16/2023	2/29/2024
Horn Antenna, 1-18GHz	ETS-Lindgren	3117	200896	2/14/2023	2/28/2024
EMI Test Reciever	Rohde & Schwarz	ESW44	226078	2/22/2023	2/29/2024
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	172354	10/21/2022	10/21/2023
RF Amplifier 18-26.5GHz	Amplical	AMP18G26.5-60	221832	2/13/2023	2/13/2024
Antenna, Horn 26.5-40GHz	ARA	MWH-2640/B	172369	10/21/2022	10/21/2023
RF Amplifier 26.5-40GHz	Amplical	AMP26G40-60	221834	2/13/2023	2/13/2024
EMI Test Reciever	Rohde & Schwarz	ESW44	169935	2/19/2022	3/1/2023
EMI Test Reciever	Rohde & Schwarz	ESW44	235266	3/30/2023	3/31/2024
Horn Antenna, 1-18GHz	ETS-Lindgren	3117	206808	2/18/2022	3/1/2023
Horn Antenna, 1-18GHz	ETS-Lindgren	3117	206808	3/7/2023	3/31/2024
RF Filter Box, 1-18GHz	UL-FR1 (CTECH)	N/A	173233	3/28/2022	3/28/2023
Antenna, Broadband Hybrid, 30 MHz to 3GHz	Sunol Sciences Corp	JB3	230634	1/23/2023	1/31/2024
Amplifier, 9kHz to 1 GHz, 32dB	Sonoma Instrumnet	310N	79584	12/12/2022	12/12/2023
Antenna, Passive Loop 100kHz - 30MHz	Electro-Metrics	EM-6872	170015	7/28/2022	7/28/2023
Antenna, Passive Loop 30Hz - 1MHz	Electro-Metrics	EM-6871	170013	7/28/2022	7/28/2023
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	81139	7/11/2022	7/11/2023
RF Amplifier 18-26.5GHz	Amplical	AMP18G26.5-60	220194	7/13/2022	7/13/2023
Antenna, Horn 26.5-40GHz	ARA	MWH-2640/B	81105	7/11/2022	7/11/2023
RF Amplifier 26.5-40GHz	Amplical	AMP26G40-60	220193	7/15/2022	7/15/2023
Filter, LPF 0-5400MHz Ch5/9 5.4G LPF	Wainwright Instruments Gmbh	WLKX12-5400-5913-18000-60ST	204843	11/10/2022	11/10/2023
Filter, HPF, 9-18GHz	RF-Lambda	RHPF23G09G18	206078	11/10/2022	11/10/2023
Filter, HPF 11.2GHz, Ch9 11.5G HPF	Wainwright Instruments Gmbh	WHW2-8165-11500-21000-40CD	176234	12/28/2022	12/28/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2/20/2023	2/20/2024
Cable, RG223 Coax, double shield, BNC	Pasternack Enterprises	RG233/U	202322	7/15/2022	7/31/2023
Cable, RG223 Coax, double shield, BNC	Pasternack Enterprises	RG233/U	202326	7/15/2022	7/31/2023
Transient Limiter	TE	TBFL1	207996	7/15/2022	7/15/2023
LISN for Conducted Emissions CISPR-16	Fischer Custom Communications, Ince	FCC-LISN-50/250/-25-2-01-480V	175765	1/27/2023	1/27/2024
Radiated Software	UL	UL EMC	Version 9.5 May 1, 2023		
AC Line Conducted Software	UL	UL EMC	Version 9.5 March 3, 2023		

Tests were performed prior to the calibration date to ensure accurate measurements were recorded.

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9. APPLICABLE LIMITS AND TEST RESULTS

9.1. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

ANSI C63.10 Section 6.9.3

The transmitter output is connected to a spectrum analyzer. The RBW is in the range of 1% to 5% of the OBW bandwidth. The VBW is set to ≥ 3*RBW. The sweep time is coupled.

Tabulated data provides the test results of all available test configurations for the parent model. The plots for the parent model of Ant 1, CONFIG 0, Payload 25 on CH5 and Ant 1, CONFIG 0, Payload 125 on CH9 bandwidth measurement on are presented and same measurement settings apply to the rest of the test configurations.

RESULTS

Parent Model
Employee IDs: 32305, 32479, 32550, 32188, 24943
Location: Chamber 5A
Test Date: 6/23/23 – 7/8/23

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ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	99% BW (MHz)
1	9	0	25	Portrait	H	607.20
1	9	1	45	Portrait	H	606.75
1	9	9	125	Portrait	H	625.55
1	9	10	25	Portrait	H	606.37
1	9	11	25	Portrait	H	607.58
1	9	11	65	Portrait	H	606.96
1	9	101	25	Portrait	H	606.73
1	9	101	65	Portrait	H	606.88
1	9	102	25	Portrait	H	606.77
1	9	102	65	Portrait	H	609.04
1	9	103	25	Portrait	H	608.47
1	9	103	125	Portrait	H	613.98
1	9	202	625	Portrait	H	810.44
1	9	402	445	Portrait	H	730.16
1	9	501	0	Portrait	H	609.46
1	9	503	0	Portrait	H	609.43
1	9	601	0	Portrait	H	635.14
1	9	605	0	Portrait	H	635.14
1	9	607	0	Portrait	H	636.35
1	9	701	0	Portrait	H	640.57
1	9	702	0	Portrait	H	634.70
1	9	703	0	Portrait	H	641.74
1	9	704	0	Portrait	H	640.23
1	9	705	0	Portrait	H	627.27
1	9	706	0	Portrait	H	627.72
1	9	405	4093	Portrait	H	839.16
1	9	407	4093	Portrait	H	810.84
1	9	801	0	Portrait	H	635.30
1	9	802	0	Portrait	H	623.46
1	9	803	0	Portrait	H	624.56
1	9	804	0	Portrait	H	629.44
1	9	805	0	Portrait	H	627.19
1	9	806	0	Portrait	H	625.30
1	9	807	0	Portrait	H	626.86
1	9	808	0	Portrait	H	633.58
1	9	809	0	Portrait	H	633.29
1	9	80A	0	Portrait	H	630.49
1	9	80B	0	Portrait	H	632.04
1	9	80C	0	Portrait	H	634.04

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ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	99% BW (MHz)
2	5	0	25	Landscape	H	595.66
2	5	1	45	Landscape	H	594.21
2	5	9	125	Landscape	H	617.20
2	5	10	25	Landscape	H	597.16
2	5	11	25	Landscape	H	596.39
2	5	11	65	Landscape	H	583.30
2	5	101	25	Landscape	H	580.34
2	5	101	65	Landscape	H	583.55
2	5	102	25	Landscape	H	581.33
2	5	102	65	Landscape	H	583.69
2	5	103	25	Landscape	H	583.99
2	5	103	125	Landscape	H	590.47
2	5	202	625	Landscape	H	854.82
2	5	402	445	Landscape	H	914.14
2	5	501	0	Landscape	H	587.40
2	5	503	0	Landscape	H	586.23
2	5	601	0	Landscape	H	596.13
2	5	605	0	Landscape	H	592.16
2	5	607	0	Landscape	H	592.13
2	5	701	0	Landscape	H	638.01
2	5	702	0	Landscape	H	597.62
2	5	703	0	Landscape	H	610.84
2	5	704	0	Landscape	H	613.40
2	5	705	0	Landscape	H	591.37
2	5	706	0	Landscape	H	594.76
2	5	405	4093	Landscape	H	819.66
2	5	407	4093	Landscape	H	791.81
2	5	801	0	Landscape	H	590.74
2	5	802	0	Landscape	H	591.95
2	5	803	0	Landscape	H	581.16
2	5	804	0	Landscape	H	609.61
2	5	805	0	Landscape	H	601.77
2	5	806	0	Landscape	H	592.86
2	5	807	0	Landscape	H	582.44
2	5	808	0	Landscape	H	580.57
2	5	809	0	Landscape	H	579.40
2	5	80A	0	Landscape	H	595.40
2	5	80B	0	Landscape	H	583.71
2	5	80C	0	Landscape	H	583.40

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ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	99% BW (MHz)
2	9	0	25	Flatbed	H	606.28
2	9	1	45	Flatbed	H	606.23
2	9	9	125	Flatbed	H	623.79
2	9	10	25	Flatbed	H	610.20
2	9	11	25	Flatbed	H	610.23
2	9	11	65	Flatbed	H	610.25
2	9	101	25	Flatbed	H	609.81
2	9	101	65	Flatbed	H	610.46
2	9	102	25	Flatbed	H	609.78
2	9	102	65	Flatbed	H	609.19
2	9	103	25	Flatbed	H	609.19
2	9	103	125	Flatbed	H	614.22
2	9	202	625	Flatbed	H	800.41
2	9	402	445	Flatbed	H	715.28
2	9	501	0	Flatbed	H	603.47
2	9	503	0	Flatbed	H	604.27
2	9	601	0	Flatbed	H	617.17
2	9	605	0	Flatbed	H	616.07
2	9	607	0	Flatbed	H	616.60
2	9	701	0	Flatbed	H	622.32
2	9	702	0	Flatbed	H	622.79
2	9	703	0	Flatbed	H	626.63
2	9	704	0	Flatbed	H	635.72
2	9	705	0	Flatbed	H	624.28
2	9	706	0	Flatbed	H	626.20
2	9	405	4093	Flatbed	H	743.12
2	9	407	4093	Flatbed	H	711.70
2	9	801	0	Flatbed	H	619.06
2	9	802	0	Flatbed	H	618.08
2	9	803	0	Flatbed	H	616.77
2	9	804	0	Flatbed	H	627.11
2	9	805	0	Flatbed	H	626.09
2	9	806	0	Flatbed	H	623.23
2	9	807	0	Flatbed	H	620.50
2	9	808	0	Flatbed	H	618.69
2	9	809	0	Flatbed	H	619.38
2	9	80A	0	Flatbed	H	629.03
2	9	80B	0	Flatbed	H	623.04
2	9	80C	0	Flatbed	H	624.37

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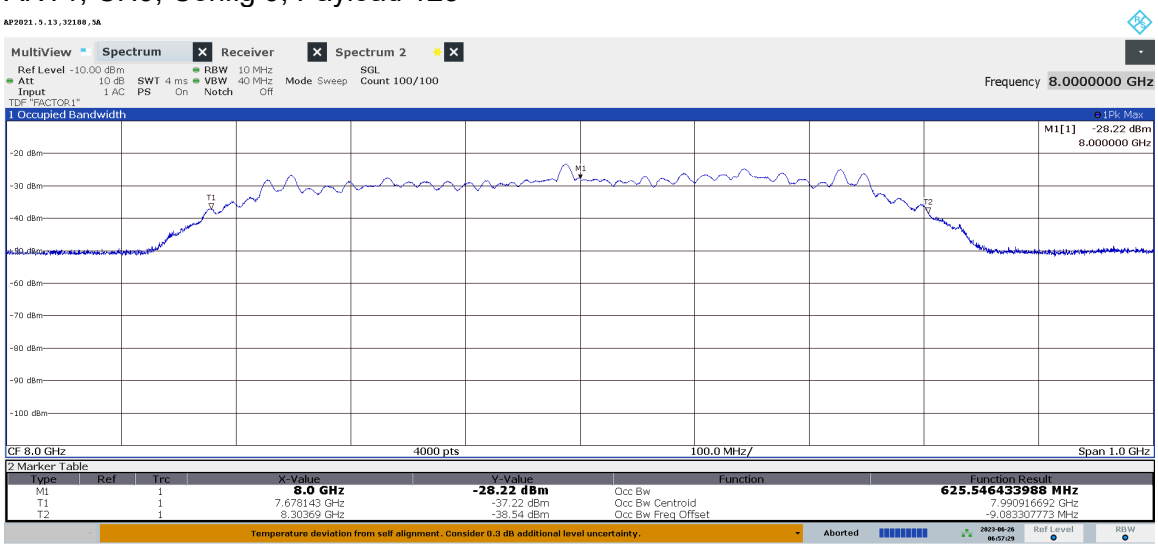
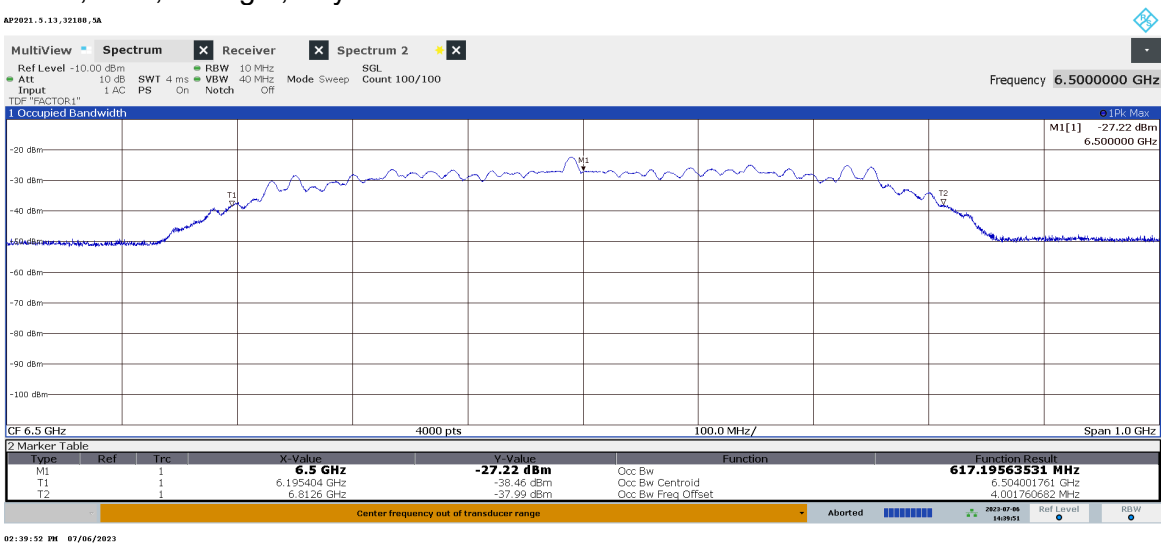
99% BW

Parent Model

ANT1, CH9, Config 9, Payload 125



ANT2, CH5, Config 9, Payload 125



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ANT2, CH9, Config 9, Payload 125

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9.2. OPERATING BANDWIDTH

LIMITS

FCC

§15.503 (a)*UWB bandwidth.* For the purpose of this subpart, the UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The upper boundary is designated fH and the lower boundary is designated fL. The frequency at which the highest radiated emission occurs is designated fM.

§15.503 (b)*Center frequency.* The center frequency, FC, equals (FH + FL)/2.

§15.503 (c)*Fractional bandwidth.* The fractional bandwidth equals 2(FH−FL)/ (FH+ FL).

§15.503 (d)*Ultra-wideband (UWB) transmitter.* An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

§15.519 (b) The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

RSS-220

Section 2 A *UWB device* is an intentional radiator that has either a *-10 dB bandwidth* of at least 500 MHz or a *-10 dB fractional bandwidth* greater than 0.2.

Section 5.1 (a) The -10 dB bandwidth of the device shall be totally contained in the band 3.1-10.6 GHz.

"-10 dB bandwidth B_{-10}" and "-10 dB fractional bandwidth μ_{-10}" are defined as follows:

$$B_{-10} = f_H - f_L$$
$$\mu_{-10} = B_{-10}/f_C$$

where:

f_M is the frequency of maximum UWB transmission;
f_H is the highest frequency at which the power spectral density of the UWB transmission is -10 dB relative to f_M;
f_L is the lowest frequency at which the power spectral density of the UWB transmission is -10 dB relative to f_M; and
$f_C = (f_H + f_L)/2$ is the centre frequency of the -10 dB bandwidth.

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TEST PROCEDURE

ANSI C63.10 Clause 10.1

RSS-220 Section 2 of the Annex

Tabulated data provides the test results of all available test configurations. The plots for ANT1, CONFIG 9, Payload 125 on CH9 and ANT2, CONFIG 9, Payload 125 on CH5 and CH9 bandwidth measurement on are presented and same measurement settings apply to the rest of the test configurations.

RESULTS

Parent Model
Employee IDs: 32305, 32479, 32550, 32188, 24943
Location: Chamber 5A
Test Date: 6/23/23 – 7/8/23

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ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	FM (GHz)	FL (GHz)	FH (GHz)	FC (GHz)	OBW (MHz)	Min. OBW (MHz)	OBW Margin (MHz)	OBW Pass/Fail
1	9	0	25	Portrait	H	8.22675	7.72419	8.2503	7.987245	526.11	500	26.11	P
1	9	1	45	Portrait	H	8.22625	7.72418	8.25031	7.987245	526.13	500	26.13	P
1	9	9	125	Portrait	H	8.2263	7.7257	8.24881	7.987245	523.13	500	23.13	P
1	9	10	25	Portrait	H	8.2268	7.7242	8.25031	7.987275	526.07	500	26.07	P
1	9	11	25	Portrait	H	8.2263	7.7242	8.25031	7.987245	526.13	500	26.13	P
1	9	11	65	Portrait	H	8.2268	7.7242	8.25032	7.987245	526.15	500	26.15	P
1	9	101	25	Portrait	H	8.2268	7.7242	8.25032	7.98725	526.14	500	26.14	P
1	9	101	65	Portrait	H	8.2268	7.7247	8.25082	7.98775	526.14	500	26.14	P
1	9	102	25	Portrait	H	8.2268	7.7242	8.25031	7.98726	526.10	500	26.1	P
1	9	102	65	Portrait	H	8.2268	7.7242	8.25032	7.987255	526.13	500	26.13	P
1	9	103	25	Portrait	H	8.2268	7.7242	8.25032	7.98725	526.14	500	26.14	P
1	9	103	125	Portrait	H	8.2263	7.7242	8.25029	7.98724	526.10	500	26.1	P
1	9	202	625	Portrait	H	8.2268	7.7242	8.25032	7.987245	526.15	500	26.15	P
1	9	402	445	Portrait	H	8.2268	7.7242	8.25033	7.98725	526.16	500	26.16	P
1	9	501	0	Portrait	H	8.2263	7.7242	8.25032	7.987245	526.15	500	26.15	P
1	9	503	0	Portrait	H	8.2263	7.7242	8.25032	7.98725	526.14	500	26.14	P
1	9	601	0	Portrait	H	8.2268	7.7247	8.250312	7.9874965	525.63	500	25.631	P
1	9	605	0	Portrait	H	8.2268	7.7247	8.250312	7.9874965	525.63	500	25.631	P
1	9	607	0	Portrait	H	8.2268	7.7247	8.250312	7.9874965	525.63	500	25.631	P
1	9	701	0	Portrait	H	8.2258	7.7232	8.251313	7.987247	528.13	500	28.132	P
1	9	702	0	Portrait	H	8.2258	7.7232	8.25131	7.9872455	528.13	500	28.129	P
1	9	703	0	Portrait	H	8.2263	7.7232	8.25131	7.9872455	528.13	500	28.129	P
1	9	704	0	Portrait	H	8.2263	7.7222	8.25132	7.98675	529.14	500	29.14	P
1	9	705	0	Portrait	H	8.2263	7.7197	8.25131	7.985495	531.63	500	31.63	P
1	9	706	0	Portrait	H	8.2263	7.7232	8.25132	7.98725	528.14	500	28.14	P
1	9	405	4093	Portrait	H	8.2268	7.7237	8.25032	7.987	526.64	500	26.64	P
1	9	407	4093	Portrait	H	8.2268	7.7227	8.25182	7.98725	529.14	500	29.14	P
1	9	801	0	Portrait	H	8.2263	7.7222	8.25582	7.989	533.64	500	33.64	P
1	9	802	0	Portrait	H	8.2263	7.7232	8.25732	7.99025	534.14	500	34.14	P
1	9	803	0	Portrait	H	8.2263	7.7232	8.25732	7.99025	534.14	500	34.14	P
1	9	804	0	Portrait	H	8.2276	7.7227	8.25832	7.9905	535.64	500	35.64	P
1	9	805	0	Portrait	H	8.2263	7.7222	8.26182	7.992	539.64	500	39.64	P
1	9	806	0	Portrait	H	8.2263	7.7222	8.26082	7.9915	538.64	500	38.64	P
1	9	807	0	Portrait	H	8.2258	7.7227	8.25132	7.987	528.64	500	28.64	P
1	9	808	0	Portrait	H	8.2263	7.7232	8.25195	7.9875655	528.77	500	28.769	P
1	9	809	0	Portrait	H	8.2263	7.7231	8.25195	7.98754	528.82	500	28.82	P
1	9	80A	0	Portrait	H	8.2263	7.7229	8.25145	7.98717	528.56	500	28.56	P
1	9	80B	0	Portrait	H	8.2263	7.7231	8.25207	7.9876	528.94	500	28.94	P
1	9	80C	0	Portrait	H	8.22625	7.72338	8.25295	7.988165	529.57	500	29.57	P

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ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	FM (GHz)	FL (GHz)	FH (GHz)	FC (GHz)	OBW (MHz)	Min. OBW (MHz)	OBW Margin (MHz)	OBW Pass/Fail
2	5	0	25	Landscape	H	6.7288	6.2267	6.75281	6.489745	526.13	500	26.13	P
2	5	1	45	Landscape	H	6.7293	6.2267	6.75281	6.489745	526.13	500	26.13	P
2	5	9	125	Landscape	H	6.7288	6.2282	6.75131	6.489745	523.13	500	23.13	P
2	5	10	25	Landscape	H	6.7288	6.2267	6.75281	6.489745	526.13	500	26.13	P
2	5	11	25	Landscape	H	6.7288	6.2269	6.75275	6.48982	525.86	500	25.86	P
2	5	11	65	Landscape	H	6.7288	6.2277	6.75281	6.490245	525.13	500	25.13	P
2	5	101	25	Landscape	H	6.7288	6.2277	6.75281	6.490245	525.13	500	25.13	P
2	5	101	65	Landscape	H	6.7288	6.2277	6.752813	6.4902475	525.13	500	25.131	P
2	5	102	25	Landscape	H	6.7293	6.2282	6.752813	6.4904975	524.63	500	24.631	P
2	5	102	65	Landscape	H	6.7293	6.2277	6.752813	6.4902475	525.13	500	25.131	P
2	5	103	25	Landscape	H	6.7288	6.2277	6.752813	6.4902475	525.13	500	25.131	P
2	5	103	125	Landscape	H	6.7288	6.2277	6.752813	6.4902475	525.13	500	25.131	P
2	5	202	625	Landscape	H	6.7293	6.2277	6.752813	6.4902475	525.13	500	25.131	P
2	5	402	445	Landscape	H	6.7293	6.2272	6.752831	6.4900155	525.63	500	25.631	P
2	5	501	0	Landscape	H	6.7288	6.2272	6.75283	6.490015	525.63	500	25.63	P
2	5	503	0	Landscape	H	6.7288	6.2272	6.75283	6.490015	525.63	500	25.63	P
2	5	601	0	Landscape	H	6.7288	6.2272	6.75283	6.490015	525.63	500	25.63	P
2	5	605	0	Landscape	H	6.7288	6.2272	6.75283	6.490015	525.63	500	25.63	P
2	5	607	0	Landscape	H	6.7288	6.2272	6.75283	6.490015	525.63	500	25.63	P
2	5	701	0	Landscape	H	6.7288	6.2262	6.75383	6.490015	527.63	500	27.63	P
2	5	702	0	Landscape	H	6.7283	6.2267	6.753814	6.490248	527.13	500	27.132	P
2	5	703	0	Landscape	H	6.7283	6.2267	6.765317	6.4959995	538.64	500	38.635	P
2	5	704	0	Landscape	H	6.7288	6.2267	6.7542	6.49044	527.52	500	27.52	P
2	5	705	0	Landscape	H	6.7288	6.2267	6.7537	6.49019	527.02	500	27.02	P
2	5	706	0	Landscape	H	6.7288	6.2267	6.75383	6.490255	527.15	500	27.15	P
2	5	405	4093	Landscape	H	6.7293	6.2277	6.7522	6.48994	524.52	500	24.52	P
2	5	407	4093	Landscape	H	6.7293	6.2277	6.7527	6.49019	525.02	500	25.02	P
2	5	801	0	Landscape	H	6.7283	6.2267	6.75383	6.490255	527.15	500	27.15	P
2	5	802	0	Landscape	H	6.7288	6.2267	6.75383	6.490255	527.15	500	27.15	P
2	5	803	0	Landscape	H	6.5518	6.2267	6.76332	6.495	536.64	500	36.64	P
2	5	804	0	Landscape	H	6.5523	6.2270	6.76925	6.49813	542.24	500	42.24	P
2	5	805	0	Landscape	H	6.5518	6.2267	6.773318	6.499999	546.64	500	46.638	P
2	5	806	0	Landscape	H	6.5523	6.2267	6.77132	6.499	544.64	500	44.64	P
2	5	807	0	Landscape	H	6.5693	6.2273	6.762316	6.494793	535.05	500	35.046	P
2	5	808	0	Landscape	H	6.5523	6.2267	6.771818	6.49925	545.14	500	45.136	P
2	5	809	0	Landscape	H	6.5523	6.2272	6.768817	6.4979995	541.64	500	41.635	P
2	5	80A	0	Landscape	H	6.6143	6.2272	6.765317	6.4962495	538.14	500	38.135	P
2	5	80B	0	Landscape	H	6.5523	6.2272	6.768817	6.4979995	541.64	500	41.635	P
2	5	80C	0	Landscape	H	6.55175	6.22718	6.769318	6.49825	542.136	500	42.136	P

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2	9	0	25	Flatbed	H	8.2268	7.7240	8.2442	7.984105	520.19	500	20.19	P
2	9	1	45	Flatbed	H	8.2263	7.7243	8.24432	7.98429	520.06	500	20.06	P
2	9	9	125	Flatbed	H	8.2263	7.7258	8.2457	7.98573	519.94	500	19.94	P
2	9	10	25	Flatbed	H	8.2268	7.7242	8.25031	7.987245	526.13	500	26.13	P
2	9	11	25	Flatbed	H	8.2268	7.7243	8.25031	7.987285	526.05	500	26.05	P
2	9	11	65	Flatbed	H	8.2268	7.7242	8.25032	7.98725	526.14	500	26.14	P
2	9	101	25	Flatbed	H	8.2268	7.7243	8.25008	7.98717	525.82	500	25.82	P
2	9	101	65	Flatbed	H	8.2268	7.7243	8.25045	7.987355	526.19	500	26.19	P
2	9	102	25	Flatbed	H	8.2268	7.7241	8.25031	7.98722	526.18	500	26.18	P
2	9	102	65	Flatbed	H	8.2268	7.7241	8.25031	7.98722	526.18	500	26.18	P
2	9	103	25	Flatbed	H	8.2263	7.7242	8.25045	7.987315	526.27	500	26.27	P
2	9	103	125	Flatbed	H	8.2268	7.7247	8.25032	7.9875	525.64	500	25.64	P
2	9	202	625	Flatbed	H	8.2263	7.7242	8.2502	7.987185	526.03	500	26.03	P
2	9	402	445	Flatbed	H	8.2268	7.7242	8.25032	7.987245	526.15	500	26.15	P
2	9	501	0	Flatbed	H	8.2268	7.7244	8.25081	7.987595	526.43	500	26.43	P
2	9	503	0	Flatbed	H	8.2268	7.7242	8.25031	7.987245	526.13	500	26.13	P
2	9	601	0	Flatbed	H	8.2268	7.7242	8.25032	7.98725	526.14	500	26.14	P
2	9	605	0	Flatbed	H	8.2268	7.7241	8.2503	7.987215	526.17	500	26.17	P
2	9	607	0	Flatbed	H	7.7483	7.7244	8.25045	7.98742	526.06	500	26.06	P
2	9	701	0	Flatbed	H	7.7488	7.7223	8.2512	7.986725	528.95	500	28.95	P
2	9	702	0	Flatbed	H	7.7488	7.7223	8.25145	7.986855	529.19	500	29.19	P
2	9	703	0	Flatbed	H	7.7488	7.7177	8.25131	7.984495	533.63	500	33.63	P
2	9	704	0	Flatbed	H	7.7483	7.7218	8.25195	7.986855	530.19	500	30.19	P
2	9	705	0	Flatbed	H	7.7433	7.7229	8.25145	7.98717	528.56	500	28.56	P
2	9	706	0	Flatbed	H	7.7483	7.7211	8.25107	7.9861	529.94	500	29.94	P
2	9	405	4093	Flatbed	H	7.7483	7.7234	8.24995	7.98667	526.56	500	26.56	P
2	9	407	4093	Flatbed	H	8.2268	7.7236	8.25045	7.98704	526.82	500	26.82	P
2	9	801	0	Flatbed	H	7.7483	7.7197	8.25181	7.98575	532.12	500	32.12	P
2	9	802	0	Flatbed	H	7.7488	7.7227	8.25131	7.986995	528.63	500	28.63	P
2	9	803	0	Flatbed	H	7.7488	7.7227	8.25131	7.986995	528.63	500	28.63	P
2	9	804	0	Flatbed	H	7.7488	7.7221	8.2512	7.98666	529.08	500	29.08	P
2	9	805	0	Flatbed	H	7.7488	7.7122	8.25132	7.98175	539.14	500	39.14	P
2	9	806	0	Flatbed	H	7.7483	7.7122	8.25131	7.98175	539.12	500	39.12	P
2	9	807	0	Flatbed	H	7.7483	7.7122	8.2513	7.98174	539.12	500	39.12	P
2	9	808	0	Flatbed	H	7.7488	7.7182	8.25182	7.985	533.64	500	33.64	P
2	9	809	0	Flatbed	H	7.7488	7.7102	8.25381	7.98199	543.64	500	43.64	P
2	9	80A	0	Flatbed	H	7.7488	7.7072	8.25232	7.97975	545.14	500	45.14	P
2	9	80B	0	Flatbed	H	7.7488	7.7062	8.25631	7.981255	550.11	500	50.11	P
2	9	80C	0	Flatbed	H	7.74825	7.70786	8.25675	7.982305	548.89	500	48.89	P

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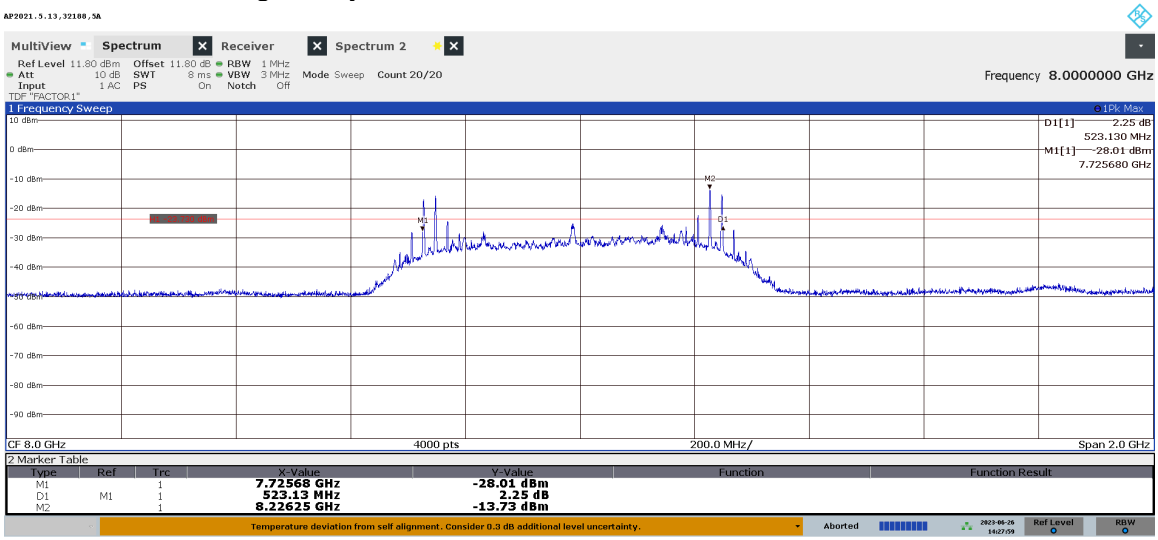
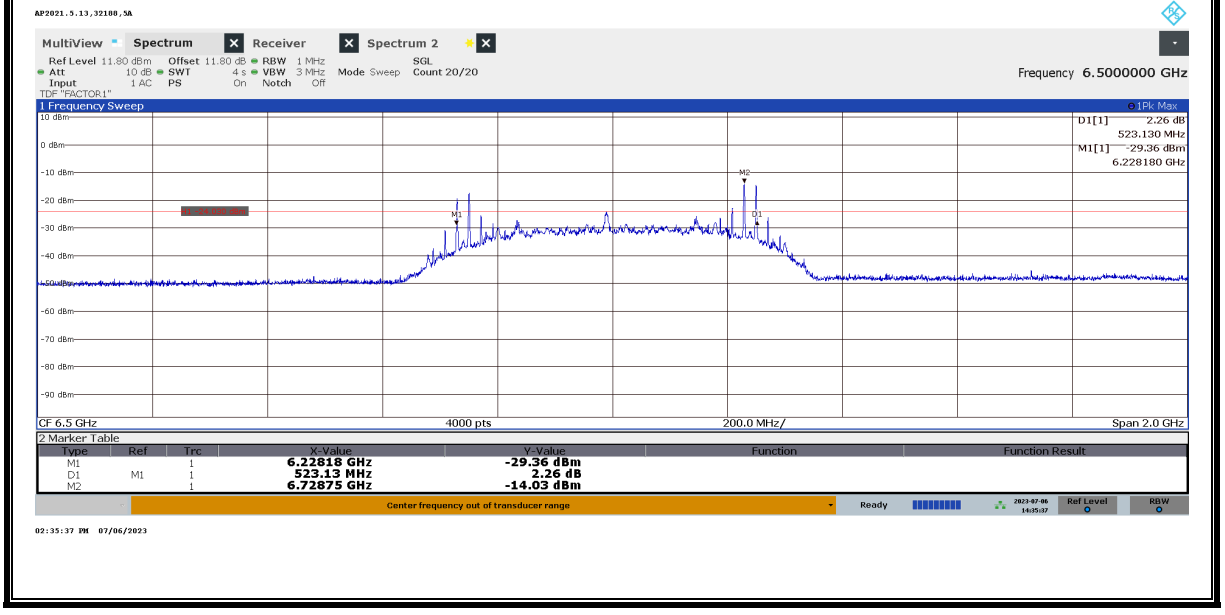
OPERATING BANDWIDTH

Parent Model

ANT 1, CH 9, Config 9, Payload 125



ANT2, CH 5, Config 9, Payload 125



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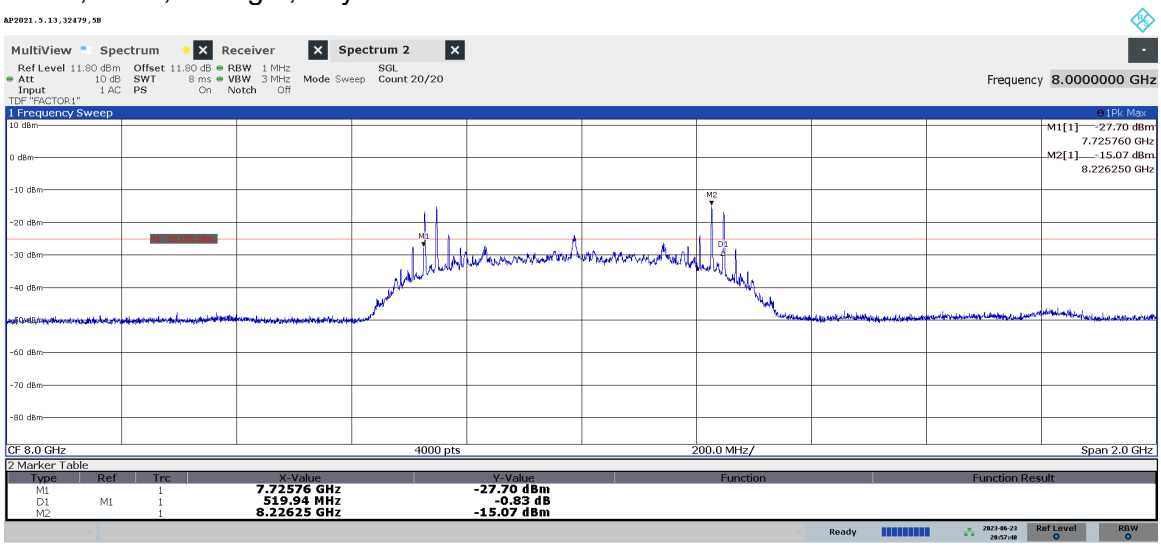
ANT2, CH 9, Config 9, Payload 125



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9.3. PEAK POWER AND MAXIMUM AVERAGE EMISSIONS

LIMITS

FCC

15.519 (e) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, f_M. That limit is 0 dBm EIRP.

15.519 (c) The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
3100 - 10600	-41.3

RSS-220

Annex, Section 4 (c) Peak measurements shall be made in addition to average measurements. Transmissions shall not exceed 0 dBm e.i.r.p. in any 50 MHz bandwidth when the average limit is -41.3 dBm/MHz.

Section 5.3.1 (d) Radiated emissions above 960 MHz from a device shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz.

Frequency	E.I.R.P. in a Resolution Bandwidth of 1 MHz
4.75 – 10.6 GHz	−41.3 dBm

TEST PROCEDURE

ANSI C63.10 Clause 10.3

RSS-220 Annex

Peak EIPR power is measured using RBW of 50 MHz.

The radiated emissions of 6 - 9 GHz frequency band are performed at 3-meter test distance.

Tabulated data provides the test results of all available test configurations for the parent model. Plots for the parent model of Ant 1, CONFIG 9, Payload 125 on CH9 and Ant 2, CONFIG 9, Payload 125 on CH5 and CH9 peak and maximum average power measurements are presented and same measurement settings apply to the rest of test configurations.

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RESULTS

Parent Model

Employee IDs: 32305, 32479, 32550, 32188, 24943
Location: Chamber 5A
Test Date: 6/23/23 – 7/8/23

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						Peak EIRP Power				Average EIRP Power			
ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	FM (GHz)	Adj Pk	Pk Limit	Margin (dB)	FM (GHz)	Adj Av	Avg Limit	Margin (dB)
1	9	0	25	Portrait	H	8.2335	-1.38	0	-1.38	8.1275	-43.125	-41.3	-1.83
1	9	1	45	Portrait	H	8.2355	-1.18	0	-1.18	8.1275	-43.35	-41.3	-2.05
1	9	9	125	Portrait	H	8.2335	-7.56	0	-7.56	8.1505	-42.46	-41.3	-1.16
1	9	10	25	Portrait	H	8.2335	-1.37	0	-1.37	8.1275	-42.60	-41.3	-1.30
1	9	11	25	Portrait	H	8.2355	-1.31	0	-1.31	8.1275	-44.20	-41.3	-2.90
1	9	11	65	Portrait	H	8.2345	-1.35	0	-1.35	8.1275	-42.48	-41.3	-1.18
1	9	101	25	Portrait	H	8.2335	-1.22	0	-1.22	8.1275	-44.30	-41.3	-3.00
1	9	101	65	Portrait	H	8.2335	-1.33	0	-1.33	8.1275	-42.83	-41.3	-1.53
1	9	102	25	Portrait	H	8.2275	-1.45	0	-1.45	8.0805	-44.89	-41.3	-3.59
1	9	102	65	Portrait	H	8.2345	-1.30	0	-1.30	8.0805	-42.75	-41.3	-1.45
1	9	103	25	Portrait	H	8.2345	-1.31	0	-1.31	8.1275	-42.70	-41.3	-1.40
1	9	103	125	Portrait	H	8.2325	-3.98	0	-3.98	8.0965	-42.69	-41.3	-1.39
1	9	202	625	Portrait	H	8.2345	-9.70	0	-9.70	8.1475	-42.32	-41.3	-1.02
1	9	402	445	Portrait	H	8.2335	-8.36	0	-8.36	8.1445	-42.73	-41.3	-1.43
1	9	501	0	Portrait	H	8.2265	-1.43	0	-1.43	8.2265	-46.04	-41.3	-4.74
1	9	503	0	Portrait	H	8.2265	-1.47	0	-1.47	8.2265	-46.13	-41.3	-4.83
1	9	601	0	Portrait	H	8.2255	-1.42	0	-1.42	8.0945	-43.67	-41.3	-2.37
1	9	605	0	Portrait	H	8.2265	-1.33	0	-1.33	8.2265	-48.19	-41.3	-6.89
1	9	607	0	Portrait	H	8.2255	-1.07	0	-1.07	8.2265	-48.14	-41.3	-6.84
1	9	701	0	Portrait	H	8.2255	-1.31	0	-1.31	8.1055	-43.66	-41.3	-2.36
1	9	702	0	Portrait	H	8.2255	-1.15	0	-1.15	8.0855	-43.28	-41.3	-1.98
1	9	703	0	Portrait	H	8.2255	-1.48	0	-1.48	8.1085	-43.88	-41.3	-2.58
1	9	704	0	Portrait	H	8.2265	-2.63	0	-2.63	8.0835	-42.59	-41.3	-1.29
1	9	705	0	Portrait	H	8.2255	-1.50	0	-1.50	8.0835	-43.96	-41.3	-2.66
1	9	706	0	Portrait	H	8.2245	-1.40	0	-1.40	8.0845	-43.07	-41.3	-1.77
1	9	405	4093	Portrait	H	8.2245	-8.85	0	-8.85	8.0825	-42.37	-41.3	-1.07
1	9	407	4093	Portrait	H	8.2245	-8.08	0	-8.08	8.0855	-42.43	-41.3	-1.13
1	9	801	0	Portrait	H	8.2255	-1.31	0	-1.31	8.1115	-45.61	-41.3	-4.31
1	9	802	0	Portrait	H	8.2255	-1.20	0	-1.20	8.0905	-45.23	-41.3	-3.93
1	9	803	0	Portrait	H	8.2245	-1.35	0	-1.35	8.0905	-46.53	-41.3	-5.23
1	9	804	0	Portrait	H	8.2245	-1.09	0	-1.09	8.1115	-42.39	-41.3	-1.09
1	9	805	0	Portrait	H	8.2255	-1.39	0	-1.39	8.0905	-42.83	-41.3	-1.53
1	9	806	0	Portrait	H	8.2255	-1.17	0	-1.17	8.0905	-44.00	-41.3	-2.70
1	9	807	0	Portrait	H	8.2255	-1.44	0	-1.44	8.1125	-46.27	-41.3	-4.97
1	9	808	0	Portrait	H	8.2245	-1.34	0	-1.34	8.0825	-46.76	-41.3	-5.46
1	9	809	0	Portrait	H	8.2255	-1.34	0	-1.34	8.0825	-46.40	-41.3	-5.10
1	9	80A	0	Portrait	H	8.2245	-1.14	0	-1.14	8.1115	-42.37	-41.3	-1.07
1	9	80B	0	Portrait	H	8.2255	-1.28	0	-1.28	8.1025	-44.43	-41.3	-3.13
1	9	80C	0	Portrait	H	8.2245	-1.31	0	-1.31	8.1485	-44.15	-41.3	-2.85

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						Peak EIRP Power				Average EIRP Power			
ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	FM (GHz)	Adj Pk	Pk Limit	Margin (dB)	FM (GHz)	Adj Av	Avg Limit	Margin (dB)
2	5	0	25	Landscape	H	6.5015	-2.18	0	-2.18	6.5985	-42.48	-41.3	-1.18
2	5	1	45	Landscape	H	6.5015	-1.65	0	-1.65	6.5995	-42.37	-41.3	-1.07
2	5	9	125	Landscape	H	6.4905	-7.19	0	-7.19	6.7285	-42.34	-41.3	-1.04
2	5	10	25	Landscape	H	6.5015	-1.99	0	-1.99	6.5985	-42.36	-41.3	-1.06
2	5	11	25	Landscape	H	6.5045	-1.09	0	-1.09	6.5995	-43.36	-41.3	-2.06
2	5	11	65	Landscape	H	6.5025	-2.67	0	-2.67	6.5985	-42.52	-41.3	-1.22
2	5	101	25	Landscape	H	6.5015	-1.20	0	-1.20	6.5675	-42.88	-41.3	-1.58
2	5	101	65	Landscape	H	6.5035	-2.62	0	-2.62	6.5985	-42.67	-41.3	-1.37
2	5	102	25	Landscape	H	6.5025	-1.31	0	-1.31	6.6125	-42.71	-41.3	-1.41
2	5	102	65	Landscape	H	6.5015	-2.72	0	-2.72	6.5985	-42.57	-41.3	-1.27
2	5	103	25	Landscape	H	6.5005	-2.74	0	-2.74	6.6095	-42.59	-41.3	-1.29
2	5	103	125	Landscape	H	6.4945	-5.01	0	-5.01	6.5985	-42.66	-41.3	-1.36
2	5	202	625	Landscape	H	6.7365	-11.58	0	-11.58	6.6145	-42.67	-41.3	-1.37
2	5	402	445	Landscape	H	6.7365	-12.50	0	-12.50	6.6065	-42.77	-41.3	-1.47
2	5	501	0	Landscape	H	6.7365	-1.70	0	-1.70	6.5995	-42.75	-41.3	-1.45
2	5	503	0	Landscape	H	6.7365	-1.40	0	-1.40	6.6055	-42.58	-41.3	-1.28
2	5	601	0	Landscape	H	6.7345	-4.54	0	-4.54	6.6005	-42.77	-41.3	-1.47
2	5	605	0	Landscape	H	6.7375	-1.45	0	-1.45	6.5975	-42.38	-41.3	-1.08
2	5	607	0	Landscape	H	6.7355	-1.45	0	-1.45	6.5975	-42.36	-41.3	-1.06
2	5	701	0	Landscape	H	6.7365	-6.63	0	-6.63	6.5515	-42.69	-41.3	-1.39
2	5	702	0	Landscape	H	6.7375	-6.64	0	-6.64	6.5885	-42.65	-41.3	-1.35
2	5	703	0	Landscape	H	6.7345	-6.83	0	-6.83	6.6015	-42.61	-41.3	-1.31
2	5	704	0	Landscape	H	6.6145	-8.31	0	-8.31	6.5865	-42.58	-41.3	-1.28
2	5	705	0	Landscape	H	6.6155	-3.45	0	-3.45	6.5985	-42.57	-41.3	-1.27
2	5	706	0	Landscape	H	6.6135	-4.63	0	-4.63	6.5975	-42.54	-41.3	-1.24
2	5	405	4093	Landscape	H	6.7425	-14.97	0	-14.97	6.5965	-42.52	-41.3	-1.22
2	5	407	4093	Landscape	H	6.7325	-14.43	0	-14.43	6.5985	-42.67	-41.3	-1.37
2	5	801	0	Landscape	H	6.7395	-4.33	0	-4.33	6.6145	-42.50	-41.3	-1.20
2	5	802	0	Landscape	H	6.7385	-4.31	0	-4.31	6.5935	-42.59	-41.3	-1.29
2	5	803	0	Landscape	H	6.7385	-4.17	0	-4.17	6.5935	-42.41	-41.3	-1.11
2	5	804	0	Landscape	H	6.7355	-8.47	0	-8.47	6.5725	-42.78	-41.3	-1.48
2	5	805	0	Landscape	H	6.7385	-8.63	0	-8.63	6.5935	-42.44	-41.3	-1.14
2	5	806	0	Landscape	H	6.7345	-7.44	0	-7.44	6.5935	-42.71	-41.3	-1.41
2	5	807	0	Landscape	H	6.7375	-5.44	0	-5.44	6.6145	-42.70	-41.3	-1.40
2	5	808	0	Landscape	H	6.7385	-5.17	0	-5.17	6.5845	-42.74	-41.3	-1.44
2	5	809	0	Landscape	H	6.7355	-4.96	0	-4.96	6.5855	-42.30	-41.3	-1.00
2	5	80A	0	Landscape	H	6.7355	-8.66	0	-8.66	6.6145	-42.41	-41.3	-1.11
2	5	80B	0	Landscape	H	6.7365	-7.23	0	-7.23	6.5775	-42.53	-41.3	-1.23
2	5	80C	0	Landscape	H	6.7375	-7.363	0	-7.363	6.6045	-42.481	-41.3	-1.181

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						Peak EIRP Power				Average EIRP Power			
ANT	CH	CF	PL	EUT Orientation	Ant. Polarity	FM (GHz)	Adj Pk	Pk Limit	Margin (dB)	FM (GHz)	Adj Av	Avg Limit	Margin (dB)
2	9	0	25	Flatbed	H	7.9865	-1.32	0	-1.32	8.0655	-42.50	-41.3	-1.20
2	9	1	45	Flatbed	H	7.9885	-1.09	0	-1.09	8.0645	-43.08	-41.3	-1.78
2	9	9	125	Flatbed	H	7.9855	-6.35	0	-6.35	7.9885	-42.53	-41.3	-1.23
2	9	10	25	Flatbed	H	7.9885	-1.43	0	-1.43	8.0655	-42.60	-41.3	-1.30
2	9	11	25	Flatbed	H	7.9875	-1.39	0	-1.39	8.0645	-44.28	-41.3	-2.98
2	9	11	65	Flatbed	H	7.9885	-1.52	0	-1.52	7.9555	-42.65	-41.3	-1.35
2	9	101	25	Flatbed	H	7.9875	-1.34	0	-1.34	8.0615	-44.27	-41.3	-2.97
2	9	101	65	Flatbed	H	7.9855	-1.54	0	-1.54	7.9555	-42.69	-41.3	-1.39
2	9	102	25	Flatbed	H	7.9875	-1.38	0	-1.38	8.0625	-44.12	-41.3	-2.82
2	9	102	65	Flatbed	H	7.9855	-2.03	0	-2.03	8.0805	-42.79	-41.3	-1.49
2	9	103	25	Flatbed	H	7.9875	-1.87	0	-1.87	8.0765	-42.75	-41.3	-1.45
2	9	103	125	Flatbed	H	7.9885	-4.26	0	-4.26	8.0805	-42.62	-41.3	-1.32
2	9	202	625	Flatbed	H	8.2335	-11.12	0	-11.12	7.9875	-42.47	-41.3	-1.17
2	9	402	445	Flatbed	H	8.2345	-9.33	0	-9.33	7.9905	-42.43	-41.3	-1.13
2	9	501	0	Flatbed	H	8.2365	-1.21	0	-1.21	8.0695	-44.89	-41.3	-3.59
2	9	503	0	Flatbed	H	8.2345	-1.19	0	-1.19	8.0695	-44.86	-41.3	-3.56
2	9	601	0	Flatbed	H	8.2355	-1.48	0	-1.48	8.0725	-42.34	-41.3	-1.04
2	9	605	0	Flatbed	H	8.2365	-1.33	0	-1.33	8.0805	-44.65	-41.3	-3.35
2	9	607	0	Flatbed	H	8.2255	-1.33	0	-1.33	7.9705	-44.66	-41.3	-3.36
2	9	701	0	Flatbed	H	8.2255	-4.48	0	-4.48	7.9945	-42.56	-41.3	-1.26
2	9	702	0	Flatbed	H	8.2255	-4.08	0	-4.08	7.9605	-42.68	-41.3	-1.38
2	9	703	0	Flatbed	H	8.2265	-4.12	0	-4.12	7.9995	-42.54	-41.3	-1.24
2	9	704	0	Flatbed	H	8.2325	-6.78	0	-6.78	7.9875	-42.63	-41.3	-1.33
2	9	705	0	Flatbed	H	8.1075	-2.76	0	-2.76	7.9865	-42.65	-41.3	-1.35
2	9	706	0	Flatbed	H	8.1055	-3.71	0	-3.71	7.9875	-42.55	-41.3	-1.25
2	9	405	4093	Flatbed	H	8.2365	-12.99	0	-12.99	7.9915	-42.53	-41.3	-1.23
2	9	407	4093	Flatbed	H	8.2345	-12.39	0	-12.39	7.9995	-42.52	-41.3	-1.22
2	9	801	0	Flatbed	H	8.2345	-2.50	0	-2.50	7.9875	-42.50	-41.3	-1.20
2	9	802	0	Flatbed	H	8.2355	-2.32	0	-2.32	8.0085	-42.34	-41.3	-1.04
2	9	803	0	Flatbed	H	8.2335	-1.25	0	-1.25	8.0085	-42.40	-41.3	-1.10
2	9	804	0	Flatbed	H	8.2335	-5.43	0	-5.43	7.9875	-42.47	-41.3	-1.17
2	9	805	0	Flatbed	H	8.2325	-4.97	0	-4.97	8.0805	-42.42	-41.3	-1.12
2	9	806	0	Flatbed	H	8.2325	-4.07	0	-4.07	8.0805	-42.49	-41.3	-1.19
2	9	807	0	Flatbed	H	8.2345	-2.51	0	-2.51	7.9875	-42.45	-41.3	-1.15
2	9	808	0	Flatbed	H	8.2335	-1.75	0	-1.75	8.0465	-42.48	-41.3	-1.18
2	9	809	0	Flatbed	H	8.2325	-2.00	0	-2.00	8.0825	-42.47	-41.3	-1.17
2	9	80A	0	Flatbed	H	8.2325	-5.71	0	-5.71	7.9875	-42.67	-41.3	-1.37
2	9	80B	0	Flatbed	H	8.2265	-3.94	0	-3.94	8.0745	-42.54	-41.3	-1.24
2	9	80C	0	Flatbed	H	8.2265	-4.168	0	-4.168	8.0145	-42.551	-41.3	-1.251

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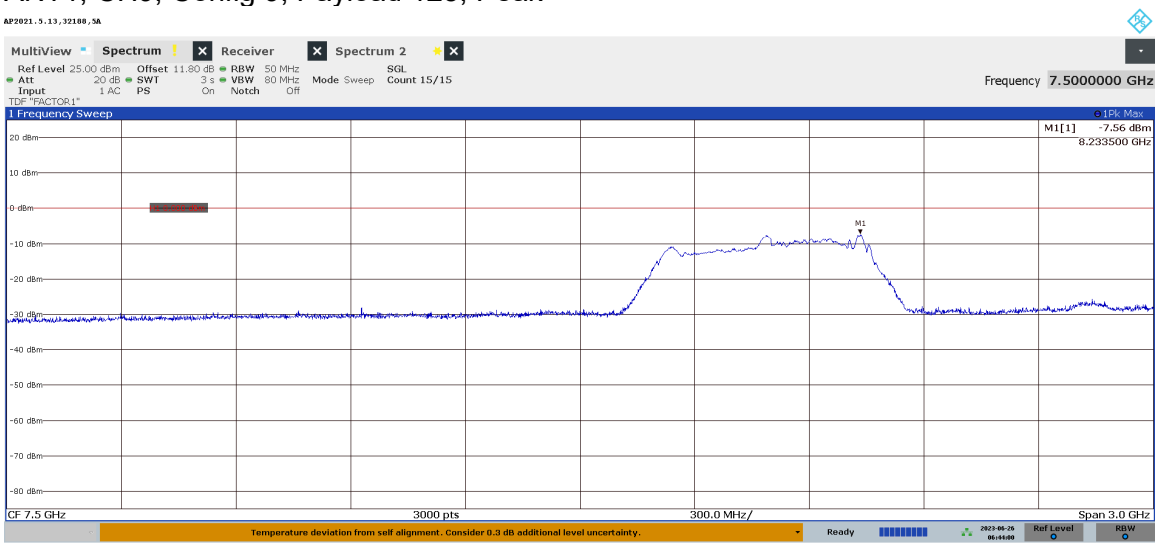
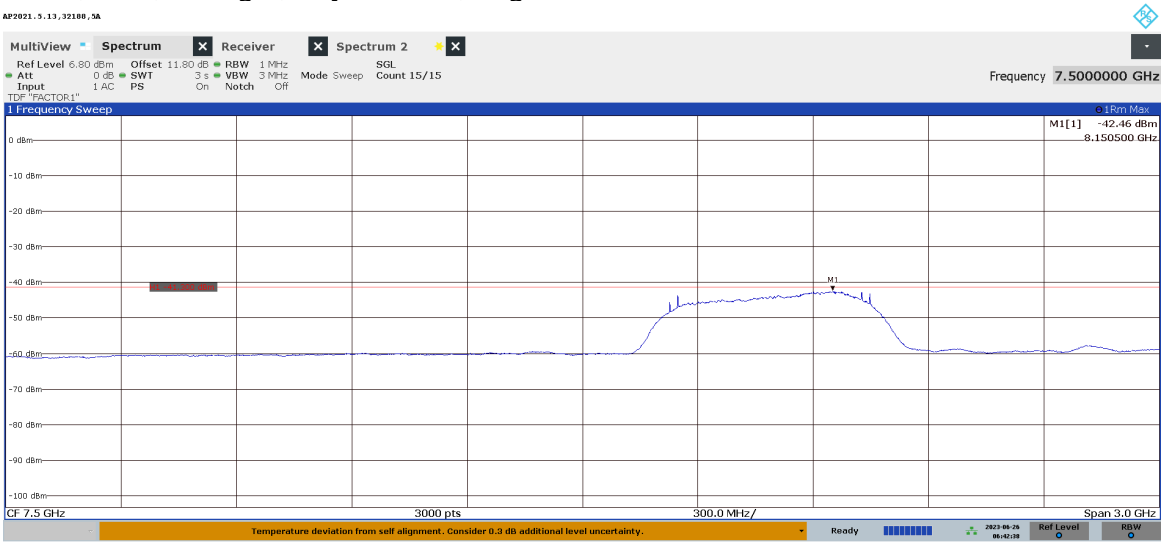
PEAK POWER AND MAXIMUM AVERAGE EMISSIONS

Parent Model

ANT1, CH9, Config 9, Payload 125, Peak



ANT1, CH9, Config 9, Payload 125, Avg.



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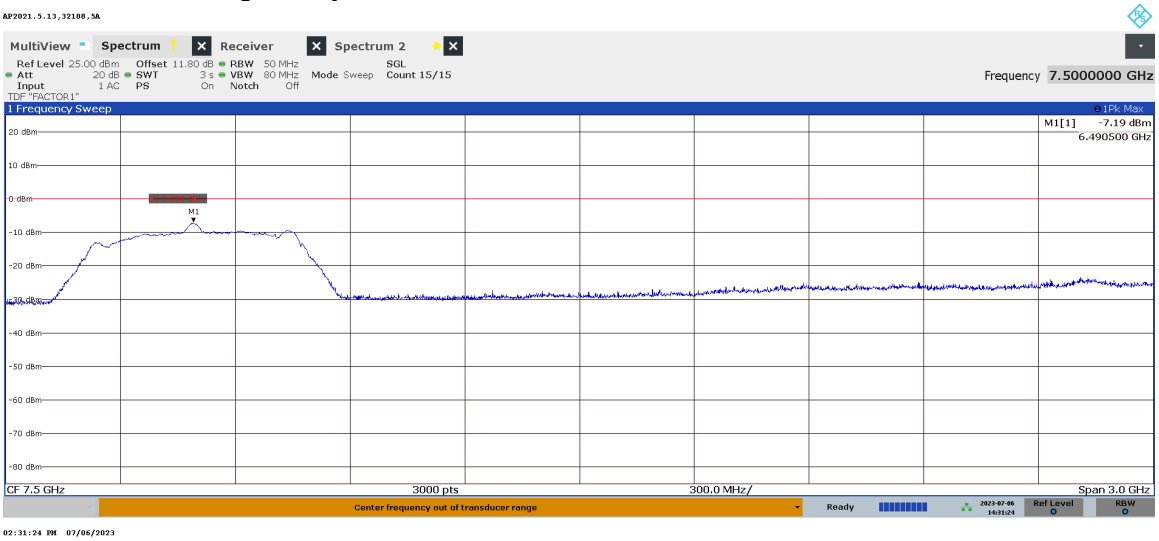
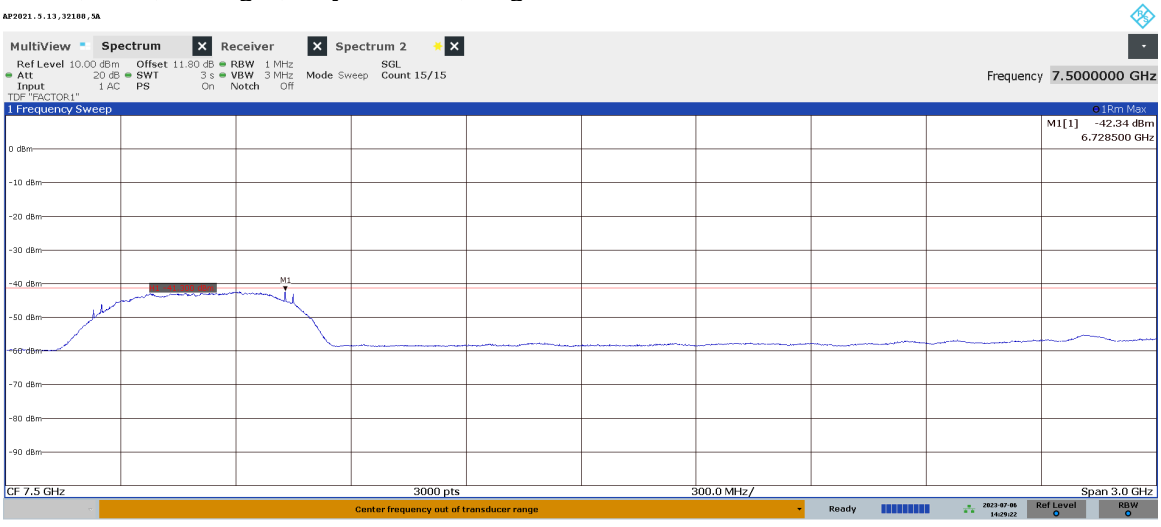
ANT2, CH5, Config 9, Payload 125, Peak



ANT2, CH5, Config 9, Payload 125, Avg.



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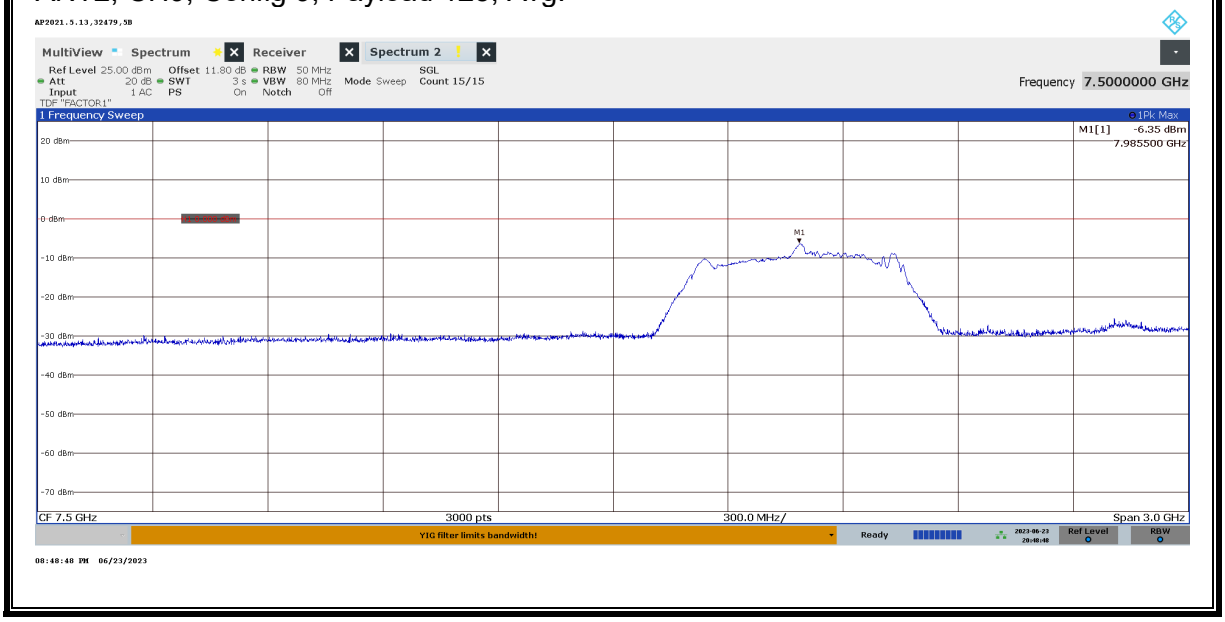
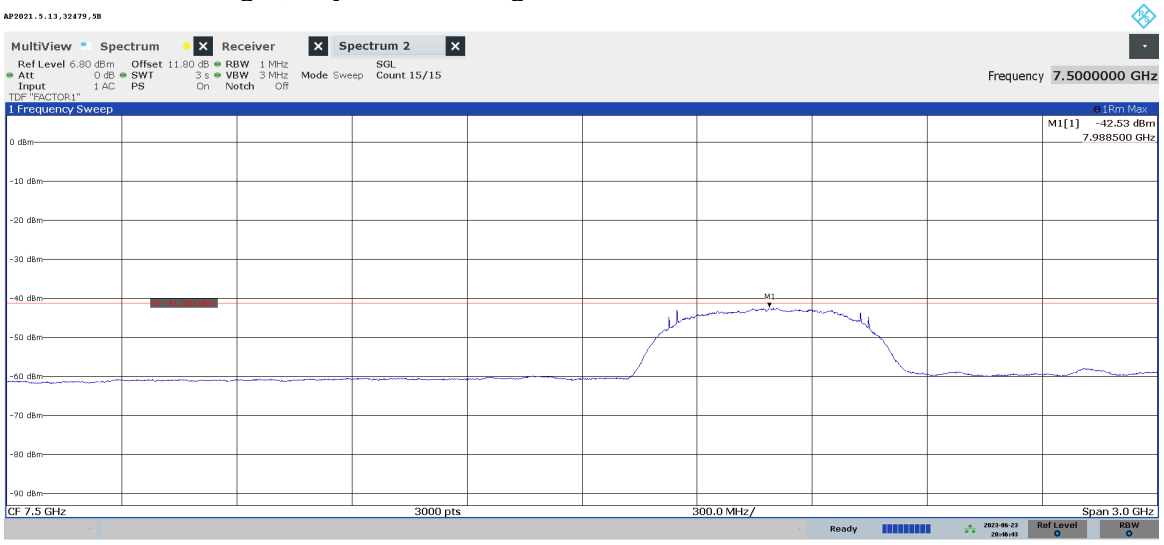
ANT2, CH9, Config 9, Payload 125, Avg.



ANT2, CH9, Config 9, Payload 125, Avg.



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9.4. CESSATION TIME

LIMITS

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§15.519(a)(1) A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

RSS-220

Section 5.3.1 (b) The device is to transmit only when it is sending information to an associated receiver. The device shall cease transmission of information within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB device at least every 10 seconds or the UWB device shall cease transmitting any information other than periodic signals used for the establishment or re-establishment of a communication link with an associated receiver.

TEST PROCEDURES

* Initiator = EUT
* Responder = associated receiver

Transmissions are monitored for two cases:

1. The Initiator ends the UWB link.
2. The Responder ends the UWB link.

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RESULTS

Results for both the parent and variant A models are shown below.

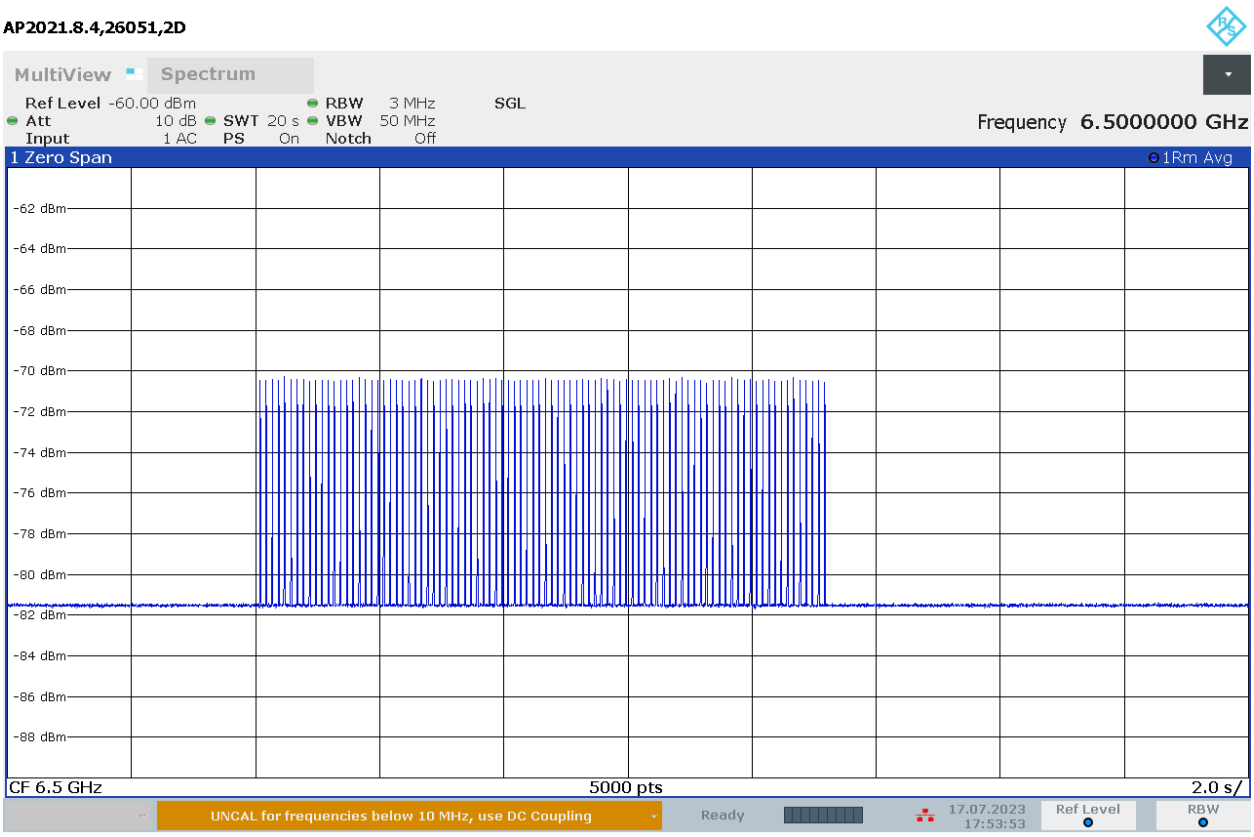
Parent Model
Employee ID: 26051
Location: Chamber D
Test Date: 07/17/23

Signal Levels on all Plots

- Initiator is Low Amplitude
- Responder is High Amplitude

Case 1: Initiator ends the UWB link

Parent Model



RESULT

- All devices, including the Responder, cease transmissions

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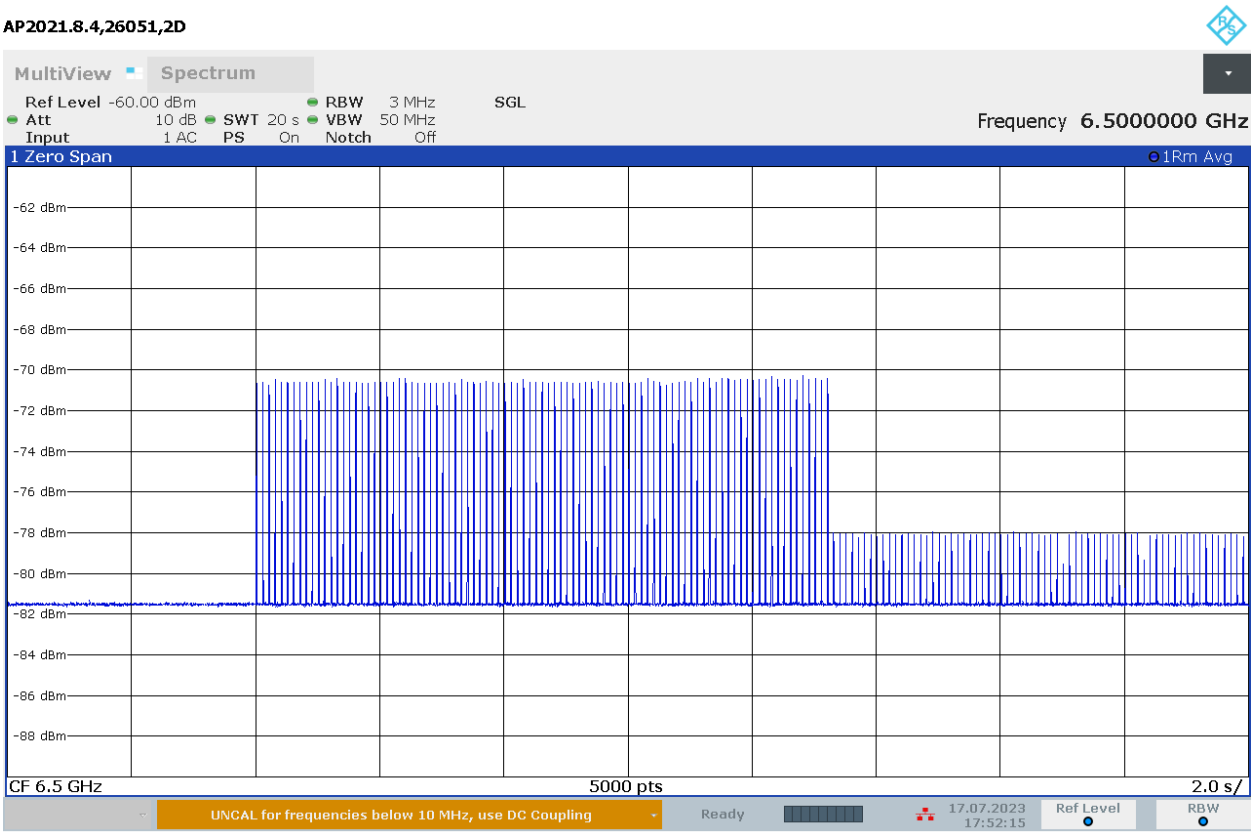
Case 2: Responder ends the UWB link

Parent Model



RESULT

- Responder ends the link; Initiator stops Acknowledgements but continues Polling.
    - Responder ceases transmissions, does not respond to Polling Signals.

Zoom-in Plot during On-Off Transition

Parent Model

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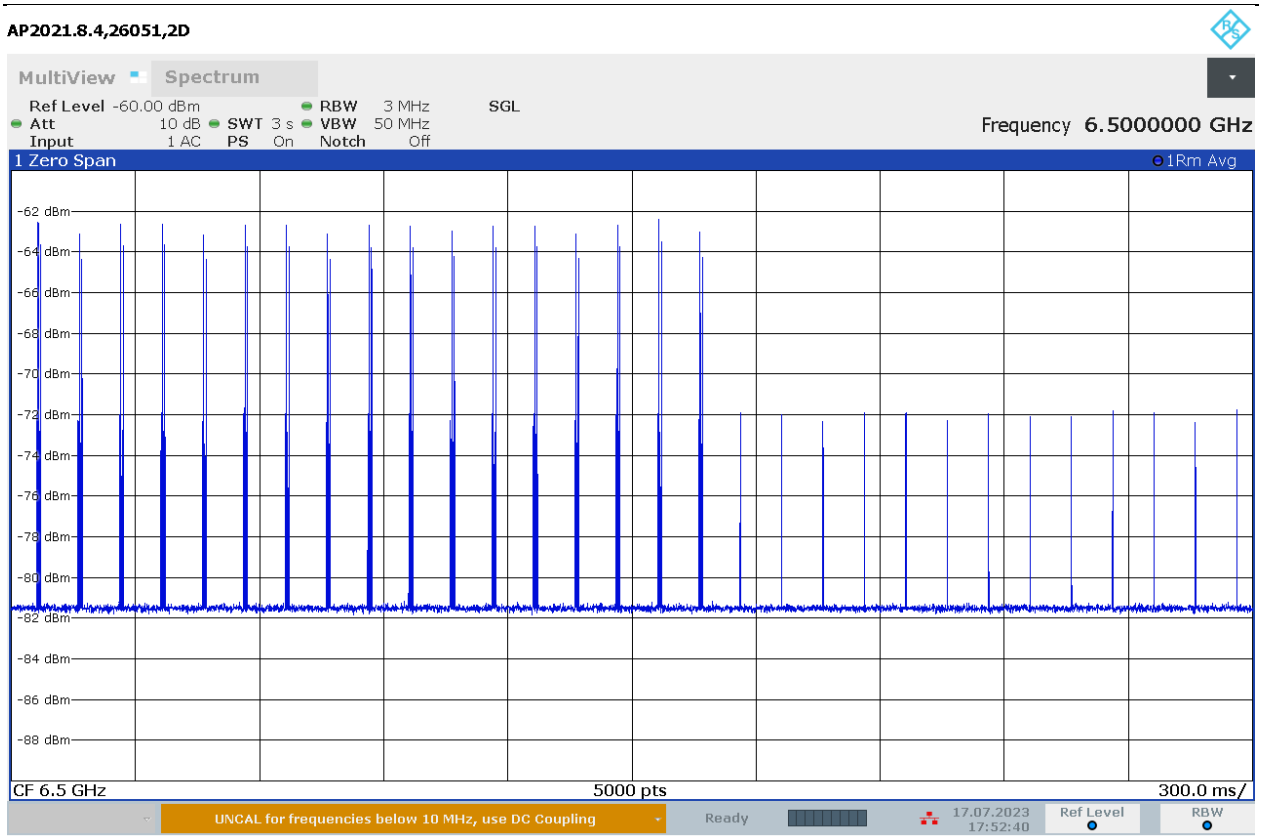

RESULT

- Shows Link Traffic, Acknowledgements and Polling Signals while Link is established
- Shows Polling Signals after Link has ended

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9.5. EMISSIONS BELOW 960 MHz

LIMITS

FCC

§15.519 (c) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

15.209 (a)

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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

RSS-220

Section 3.4 Radiated emissions at or below 960 MHz for all subclasses of UWB device shall not exceed the following limits. Measurements of radiated emissions at and below 960 MHz are to be made using a CISPR quasi-peak detector. CISPR measurement bandwidth specifications are to be used.

Frequency (MHz)	Field Strength (Microvolts/m)	Measurement Distance (Metres)	E.i.r.p. (dBmW)
0.009-0.490	2,400/F (F in kHz)	300	10 log (17.28 / F^2) (F in kHz)
0.490-1.705	24,000/F (F in kHz)	30	10 log (17.28 / F^2) (F in kHz)
1.705-30	30	30	-45.7
30-88	100	3	-55.2
88-216	150	3	-51.7
216-960	200	3	-49.2

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average emissions detector.

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TEST PROCEDURE

ANSI C63.10 Clause 10.2

RSS-220 Annex

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 3m from the EUT.

For below 30 MHz testing, investigation was done on three antenna orientations: RX antenna Face-on, Face-off and horizontal (parallel to ground). The worst-case configurations were determined on RX antenna Face-on and Face-off; therefore, all final tests were performed using these two orientations.

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

A final test is made at any frequencies at which emissions are found. During this final scan, the antenna is kept no further from the EUT than the maximum distance calculated for each band that yields a minimum system noise floor.

RESULTS

Emissions Summary

Parent Model
Employee IDs: 20737, 32440, 24943, 26051, 32067
Location: Chamber 2D, 2F
Test Date: 2/13/23 – 3/1/23

					Frequency Range	
Ant	CH	Config	Payload	Power Setting	9 kHz - 30 MHz	30 - 960 MHz
1	9	9	125	Max	PASS	PASS
2	5	9	125	Max	PASS	PASS
2	9	9	125	Max	PASS	PASS

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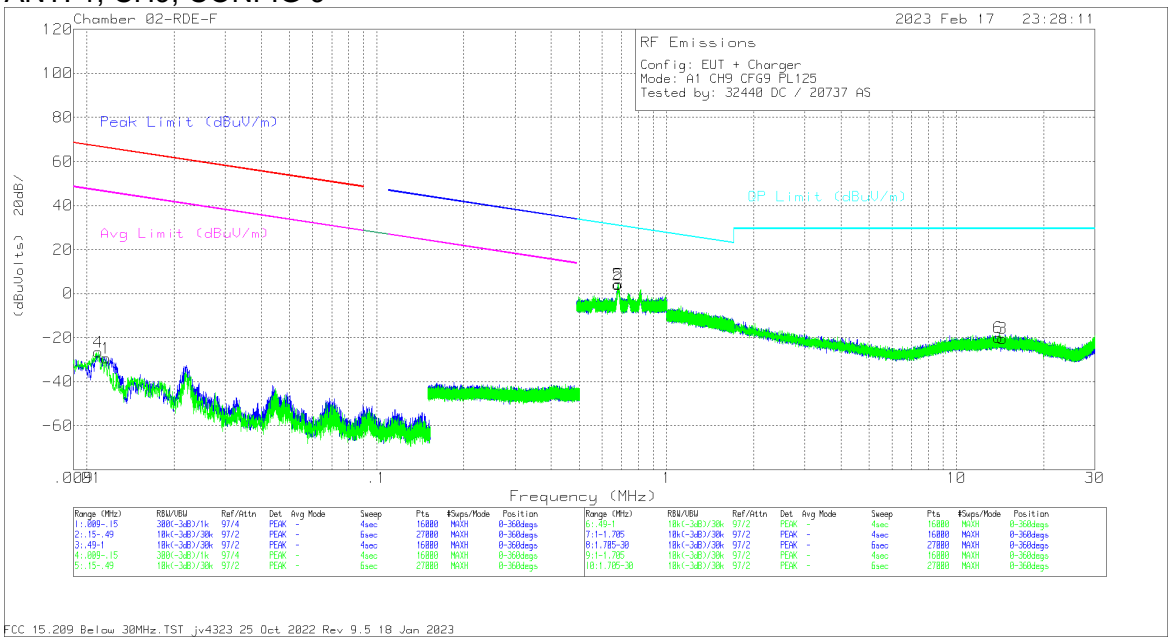
9.5.1. EMISSIONS, 9 kHz – 30 MHz

ANT. 1, CH9, CONFIG 9



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Chamber F port 0 loss	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.0117	21.21	Pk	60.2	-30.7	-80	-29.29	66.25	-95.54	46.25	-75.54	0-360	On
4	.011	23.69	Pk	60.3	-30.4	-80	-26.41	66.79	-93.2	46.79	-73.2	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Chamber F port 0 loss	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
2	.6788	20.06	Pk	56.4	-32.5	-40	3.96	30.98	-27.02	0-360	On
3	14.411	17.77	Pk	34.1	-32.2	-40	-20.33	29.5	-49.83	0-360	On
5	.6825	20.33	Pk	56.4	-32.5	-40	4.23	30.93	-26.7	0-360	Off
6	13.9142	18.13	Pk	34.2	-32.2	-40	-19.87	29.5	-49.37	0-360	Off

Pk - Peak detector

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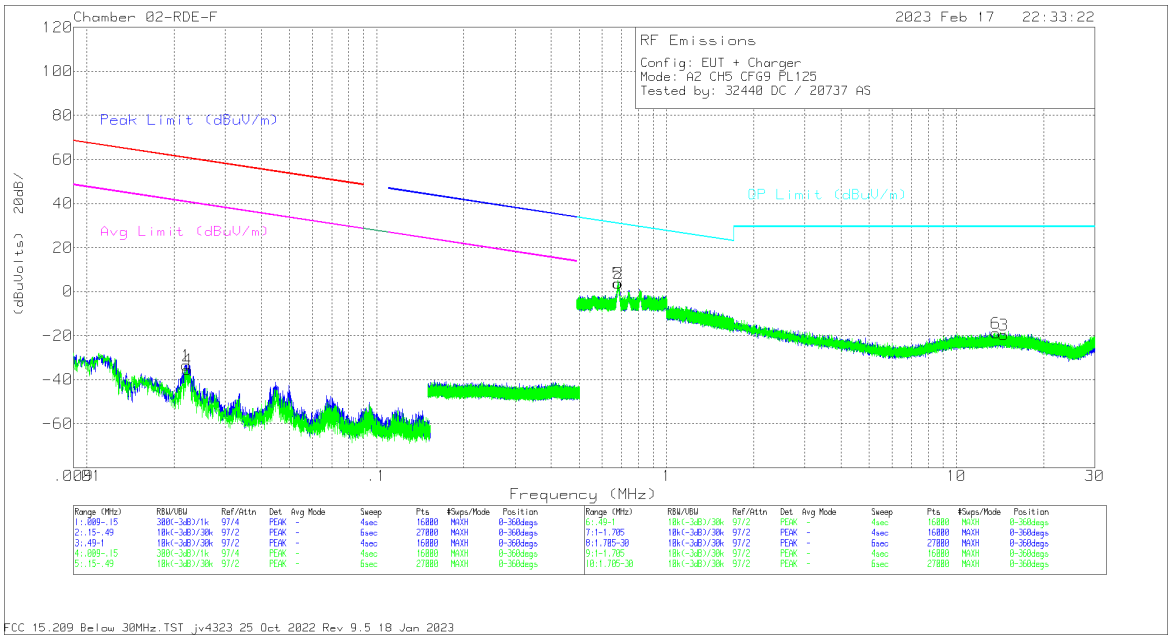
ANT. 2, CH5, Config 9



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Chamber F port 0 loss	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.0221	19.57	Pk	58.9	-31.8	-80	-33.33	60.7	-94.03	40.7	-74.03	0-360	On
4	.0222	17.55	Pk	58.9	-31.8	-80	-35.35	60.65	-96	40.65	-76	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Chamber F port 0 loss	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
2	.6822	19.82	Pk	56.4	-32.5	-40	3.72	30.93	-27.21	0-360	On
3	14.5608	18.44	Pk	34.1	-32.2	-40	-19.66	29.5	-49.16	0-360	On
5	.6784	19.91	Pk	56.4	-32.5	-40	3.81	30.98	-27.17	0-360	Off
6	13.6973	19.11	Pk	34.2	-32.2	-40	-18.89	29.5	-48.39	0-360	Off

Pk - Peak detector

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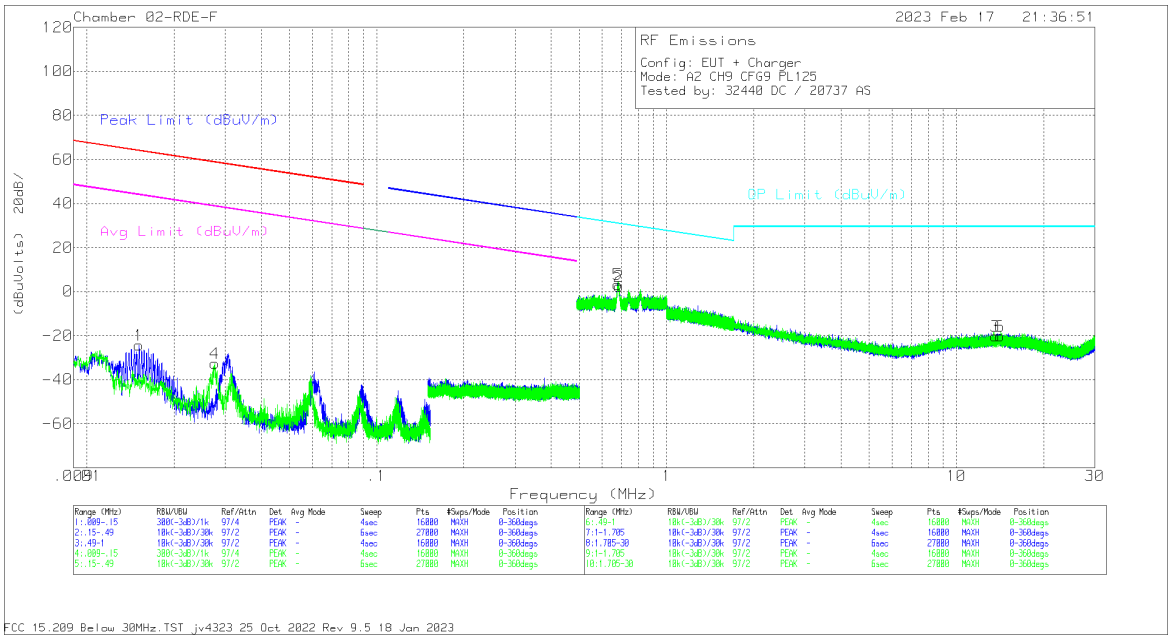
ANT. 2, CH9, Config 9



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Chamber F port 0 loss	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.0152	27.09	Pk	59.7	-31.2	-80	-24.41	63.97	-88.38	43.97	-68.38	0-360	On
4	.0276	21.09	Pk	58.3	-32.1	-80	-32.71	58.76	-91.47	38.76	-71.47	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Chamber F port 0 loss	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
2	.6853	18.48	Pk	56.4	-32.5	-40	2.38	30.89	-28.51	0-360	On
3	13.6082	17.91	Pk	34.2	-32.2	-40	-20.09	29.5	-49.59	0-360	On
5	.6793	19.32	Pk	56.4	-32.5	-40	3.22	30.97	-27.75	0-360	Off
6	14.1343	17.74	Pk	34.2	-32.1	-40	-20.16	29.5	-49.66	0-360	Off

Pk - Peak detector

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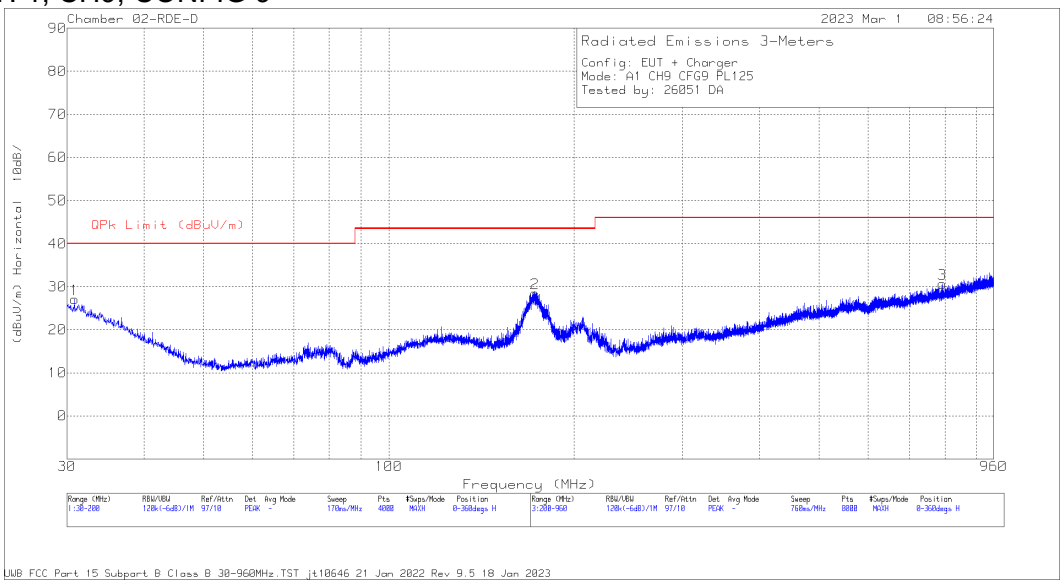
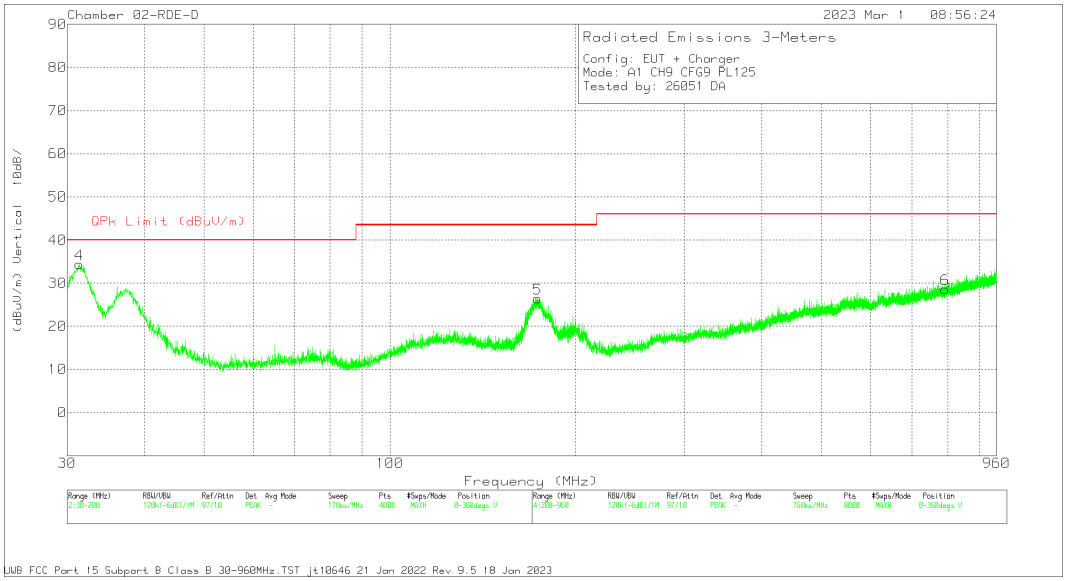
9.5.2. EMISSIONS, 30 - 960 MHz

ANT. 1, CH9, CONFIG 9





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80508 ACF (dB)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.8502	31.1	Pk	26.4	-30.4	27.1	40	-12.9	0-360	199	H
4	31.3604	38.76	Pk	26	-30.4	34.36	40	-5.64	0-360	100	V
2	172.709	40.77	Pk	17.6	-29.9	28.47	43.52	-15.05	0-360	199	H
5	173.22	38.92	Pk	17.5	-30	26.42	43.52	-17.1	0-360	100	V
3	792.59	30.33	Pk	27.3	-27	30.63	46.02	-15.39	0-360	299	H
6	792.875	28.35	Pk	27.3	-27	28.65	46.02	-17.37	0-360	98	V

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	80508 ACF (dB)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
31.4663	34.28	Qp	25.9	-30.4	29.78	40	-10.22	259	113	V

Pk - Peak detector

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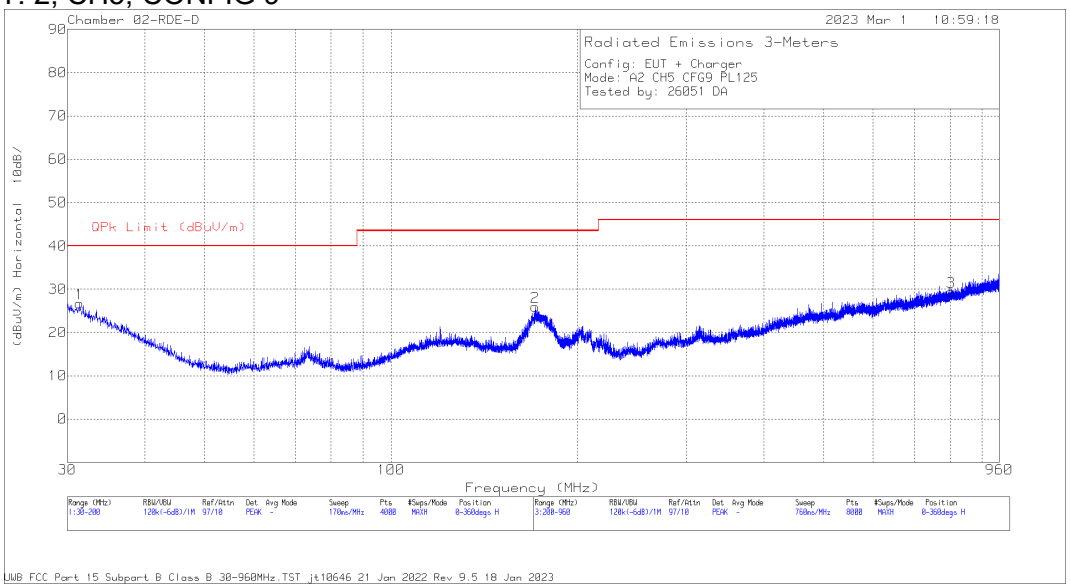
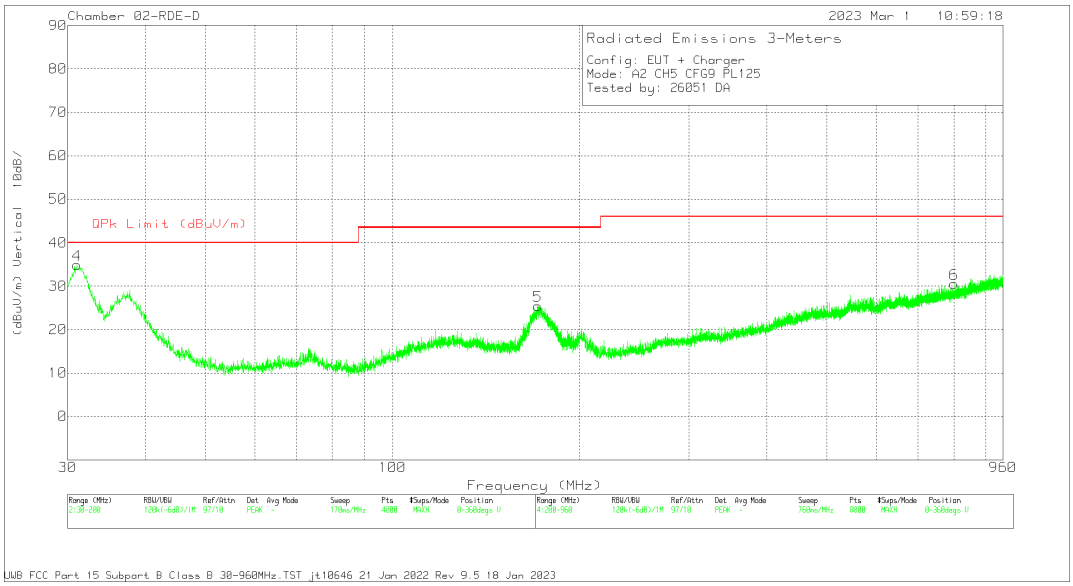
ANT. 2, CH5, CONFIG 9





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80508 ACF (dB)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.0628	39.1	Pk	26.2	-30.4	34.9	40	-5.1	0-360	100	V
1	31.4029	31.06	Pk	26	-30.4	26.66	40	-13.34	0-360	199	H
2	171.009	38.17	Pk	17.7	-29.9	25.97	43.52	-17.55	0-360	199	H
5	171.307	37.66	Pk	17.7	-29.9	25.46	43.52	-18.06	0-360	100	V
6	800.856	29.98	Pk	27.6	-27	30.58	46.02	-15.44	0-360	299	V
3	802.376	28.73	Pk	27.6	-26.9	29.43	46.02	-16.59	0-360	101	H

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	80508 ACF (dB)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
31.4498	34.56	Qp	25.9	-30.4	30.06	40	-9.94	337	108	V

Pk - Peak detector

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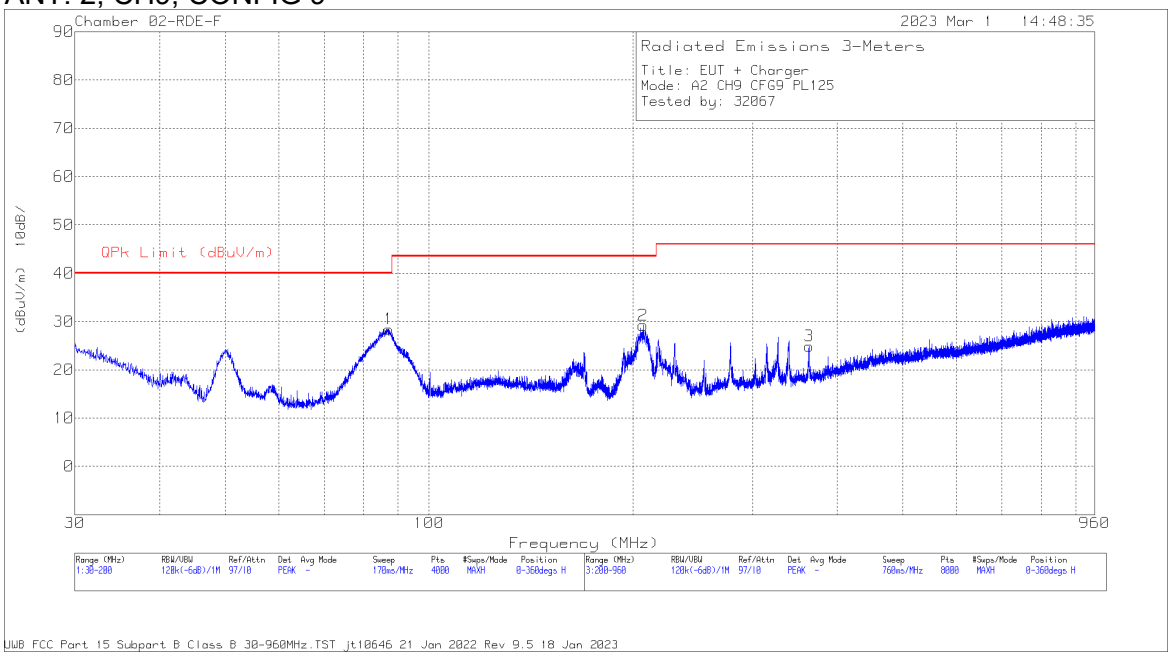
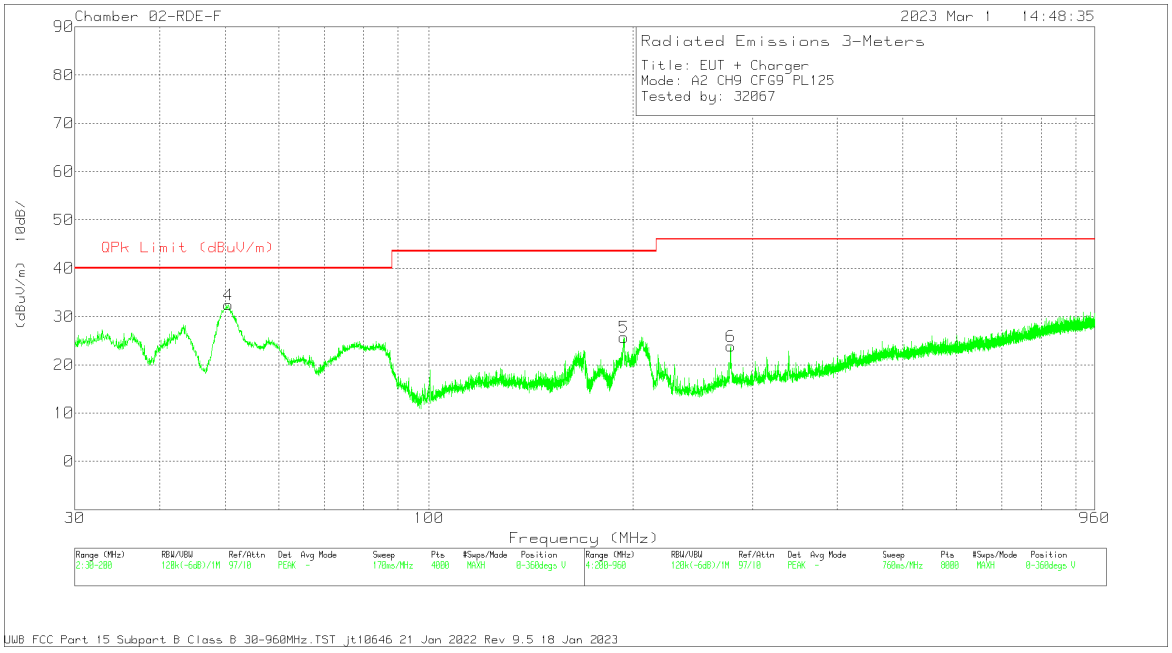
ANT. 2, CH9, CONFIG 9





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	230634 ACF (dB) 10m H	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	87.1773	46.15	Pk	13.3	-31	28.45	40	-11.55	0-360	199	H
2	206.841	43.12	Pk	16.5	-30.4	29.22	43.52	-14.3	0-360	100	H
3	363.611	34.42	Pk	20.4	-29.9	24.92	46.02	-21.1	0-360	100	H
4	50.5753	49.92	Pk	13.7	-31.2	32.42	40	-7.58	0-360	100	V
5	193.922	38.7	Pk	17.5	-30.5	25.7	43.52	-17.82	0-360	100	V
6	278.765	35.04	Pk	19	-30.2	23.84	46.02	-22.18	0-360	99	V

Pk - Peak detector

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9.6. AVERAGE EMISSIONS ABOVE 960 MHz

LIMITS

FCC

15.519 (c)

Frequency in MHz	EIRP in dBm
960-1610	−75.3
1610-1990	−63.3
1990-3100	−61.3
3100-10600	−41.3
Above 10600	−61.3

§15.519 (d) In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency in MHz	EIRP in dBm
1164-1240	−85.3
1559-1610	−85.3

RSS-220

Section 5.3.1 (d) Radiated emissions above 960 MHz from a device shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz.

Hand-held (Outdoor) Communication, Measurement, Location Sensing, and Tracking Devices	
Frequency	E.i.r.p. in a Resolution Bandwidth of 1 MHz
960-1 610 MHz	-75.3 dBm
1.61-4.75 GHz	-70.0 dBm
4.75-10.6 GHz	-41.3 dBm
Above 10.6 GHz	-61.3 dBm

Section 5.3.1 (e) In addition to the limits specified in paragraph (d) of this section, radiated emissions shall not exceed the following average limits when measured using a resolution bandwidth greater than or equal to 1 kHz. The measurements shall demonstrate compliance with the stated limits at whatever resolution bandwidth is used.

Frequency	E.i.r.p. in a Resolution Bandwidth of no less than 1 kHz
1 164-1 240 MHz	-85.3 dBm
1 559-1 610 MHz	-85.3 dBm

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TEST PROCEDURE

ANSI C63.10 Clause 10.3.

RSS-220 Annex

Exploratory measurements for all frequency ranges are performed with the measurement antenna at close distances to the EUT as described in ANSI C63.10 6.6.4.2. Where emissions are observed the measurement antenna is then positioned at a height of 1.5m and a distance of 1m from the EUT and final measurements are made at the frequencies observed in the exploratory scans using the alternative measurement procedures detailed in ANSI C63.10 section 6.6.5. If no emissions are observed, a plot is made at a test distance of 1m from the EUT to show the measurement system noise floor.

PROCEDURE FOR 0.96 TO 6 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

A low pass filter with a cut off frequency of 5.4 GHz is used to suppress the fundamental and perform measurement for 0.96 - 6 GHz.

Distance Correction Factor from 3m to 0.5m = 20*log(0.5m/3m) = -15.56 dB

RESULTS FOR 6 GHz TO 9 GHz

The 6 - 9 GHz frequency band is covered in Section 9.3.

PROCEDURE FOR 9 GHz TO 18 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

A high pass filter with pass band frequency beyond 9 GHz is used to suppress the fundamental and perform measurement for 9 - 18 GHz.

Distance Correction Factor from 3m to 0.5m = 20*log(0.5m/3m) = -15.56 dB

PROCEDURE FOR 1.164 TO 1.240 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

RBW = 120 kHz & VBW = 360 kHz were used at pre-scan.

A low pass filter with a cut off frequency of 6 GHz is used to suppress the fundamental and perform measurement for 1.164 – 1.240 GHz.

Distance Correction Factor from 3m to 0.5m = 20*log(0.5m/3m) = -15.56 dB

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PROCEDURE FOR 1.559 TO 1.610 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

RBW = 120 kHz & VBW = 500 kHz were used at pre-scan.

A low pass filter with a cut off frequency of 6 GHz is used to suppress the fundamental and perform measurement for 1.559 – 1.610 GHz.

Distance Correction Factor from 3m to 0.5m = 20*log(0.5m/3m) = -15.56 dB

PROCEDURE FOR 18 GHz TO 40 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 1m from the EUT.

A final test is made at any frequencies at which emissions are found. During this final scan, the antenna is kept no further from the EUT than the maximum distance calculated for each band that yields a minimum system noise floor.

Distance Correction Factor from 3m to 1m = 20*log(1m/3m) = -9.54 dB

RESULTS

Average Emissions Summary

Parent Model
Employee IDs: 20737, 32440, 24943, 26051, 32067
Location: Chamber 2D, 2F, 5E
Test Date: 2/13/23 – 3/1/23, 6/17/23, 7/17/23

					Frequency Ranges				
Ant	CH	Config	Payload	Power Setting	1164 - 1240 MHz	1559 - 1610 MHz	0.96 - 18 GHz	18 - 26.5 GHz	26.5 - 40 GHz
1	9	9	125	Max	PASS	PASS	PASS	PASS	PASS
2	5	9	125	Max	PASS	PASS	PASS	PASS	PASS
2	9	9	125	Max	PASS	PASS	PASS	PASS	PASS

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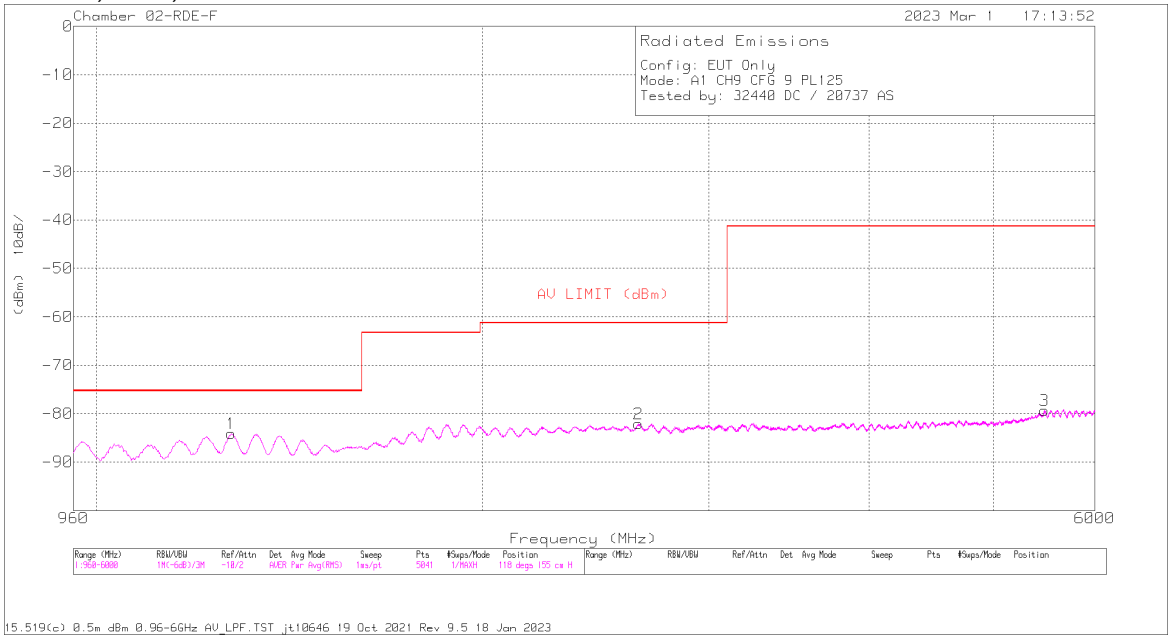
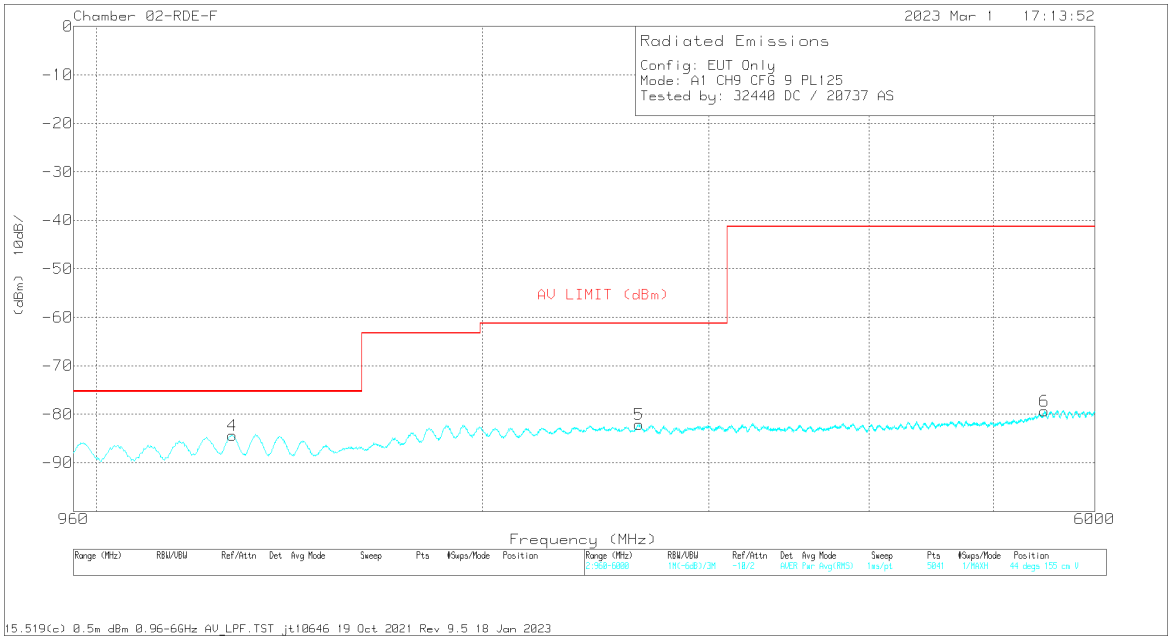
9.6.1. AVERAGE EMISSIONS, 0.96 – 6 GHz

FCC15.519 (C)

Parent

ANT. 1, CH9, CONFIG 9





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	81887 ACF (dB)	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	AV LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1274	-61.26	RMS	29.6	-48.9	-15.6	11.8	.2	-84.16	-75.3	-8.86	96	155	H
2	2646	-63.11	RMS	33.1	-48.6	-15.6	11.8	.3	-82.11	-61.3	-20.81	140	155	H
3	5484	-65.39	RMS	35.1	-47.3	-15.6	11.8	2	-79.39	-41.3	-38.09	338	155	H
4	1277	-61.44	RMS	29.6	-48.9	-15.6	11.8	.2	-84.34	-75.3	-9.04	154	155	V
5	2647	-63.02	RMS	33	-48.6	-15.6	11.8	.3	-82.12	-61.3	-20.82	66	155	V
6	5484	-65.3	RMS	35.1	-47.3	-15.6	11.8	2	-79.3	-41.3	-38	0	155	V

RMS - RMS detection

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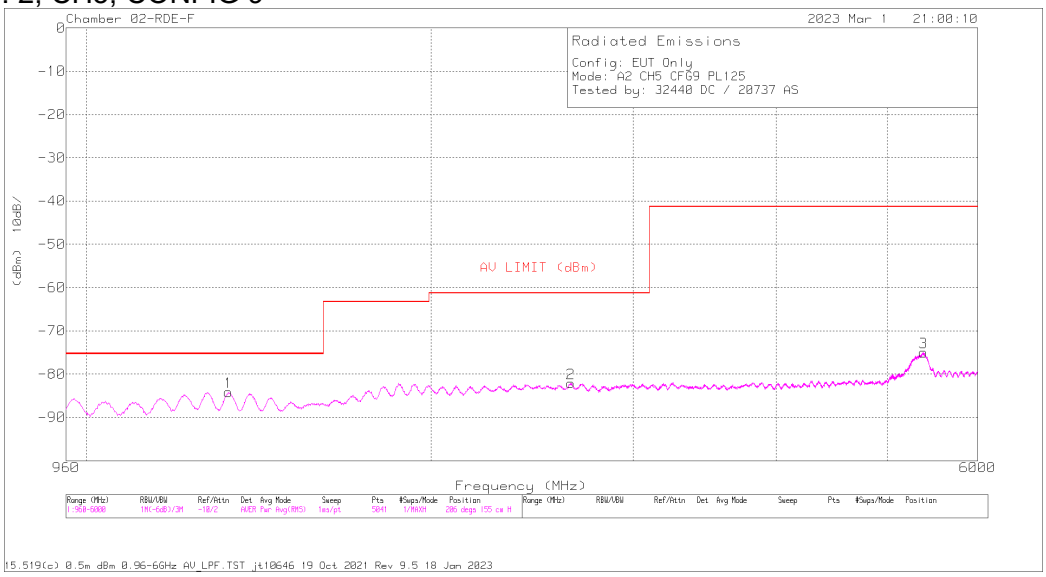
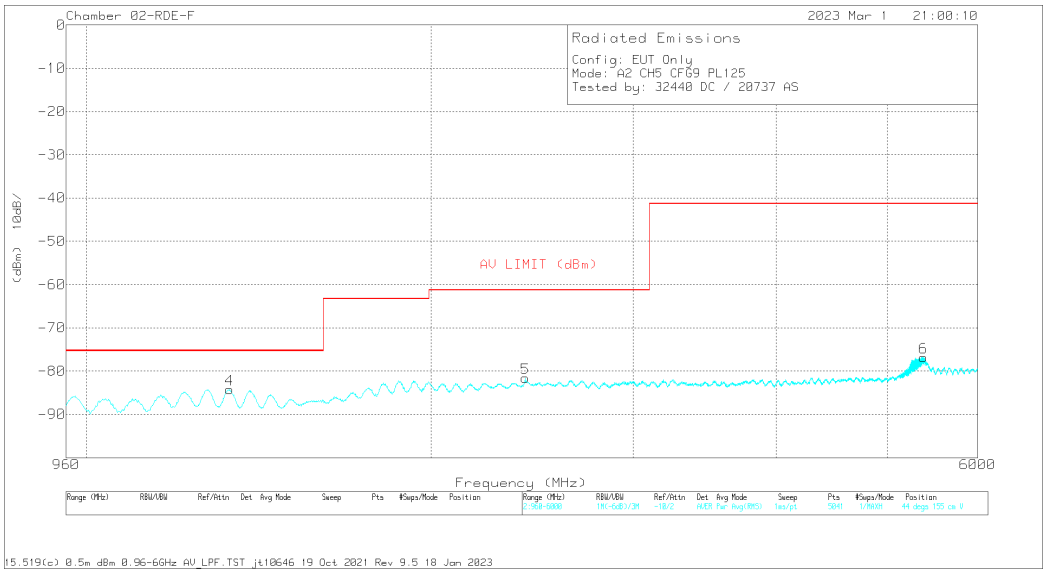
ANT. 2, CH5, CONFIG 9





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	81887 ACF (dB)	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	AV LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1331	-61.17	RMS	29.4	-48.8	-15.6	11.8	.2	-84.17	-75.3	-8.87	273	155	H
2	2647	-63.01	RMS	33	-48.6	-15.6	11.8	.3	-82.11	-61.3	-20.81	162	155	H
3	5379	-60.2	RMS	35	-47.5	-15.6	11.8	1.5	-75	-41.3	-33.7	317	155	H
4	1334	-61.23	RMS	29.4	-48.8	-15.6	11.8	.2	-84.23	-75.3	-8.93	154	155	V
5	2416	-61.12	RMS	32.6	-49.5	-15.6	11.8	.2	-81.62	-61.3	-20.32	154	155	V
6	5380	-62.01	RMS	35	-47.5	-15.6	11.8	1.5	-76.81	-41.3	-35.51	66	155	V

RMS - RMS detection

Radiated Emissions

Frequency (MHz)	Meter Reading (dBm)	Det	81887 ACF (dB)	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	AV LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5368.1	-59.49	RMS	35	-47.5	-15.6	11.8	1.5	-74.29	-41.3	-32.99	305	155	H
5365.1	-61.14	RMS	35	-47.5	-15.6	11.8	1.5	-75.94	-41.3	-34.64	56	155	V
2413	-60.42	RMS	32.6	-49.5	-15.6	11.8	.2	-80.92	-61.3	-19.62	130	155	V

RMS - RMS detection

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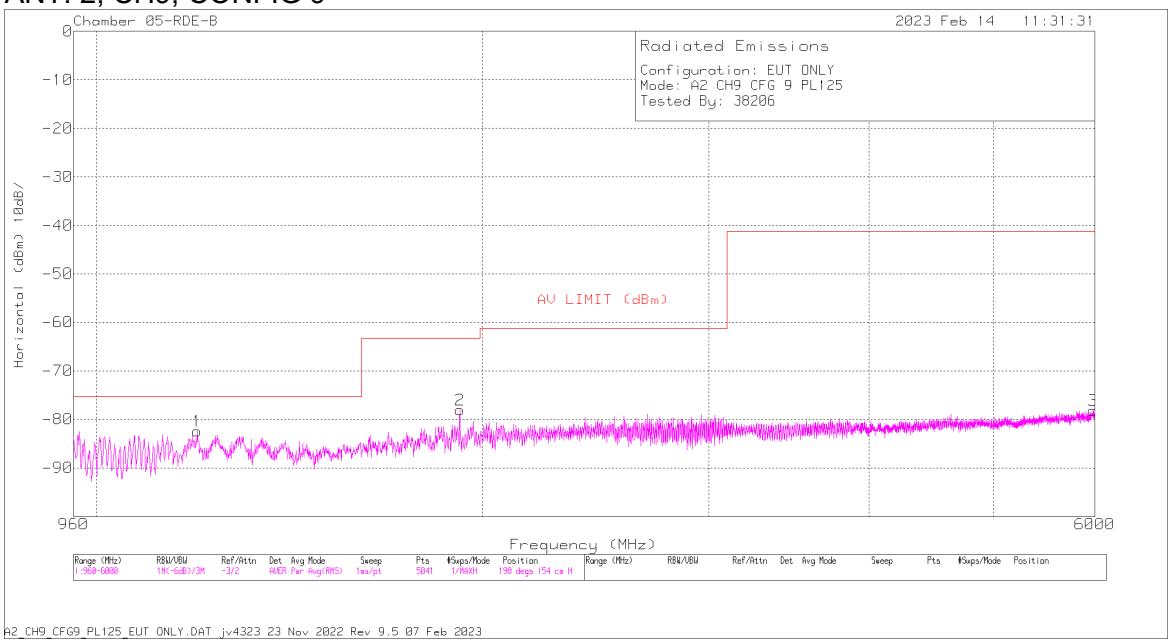
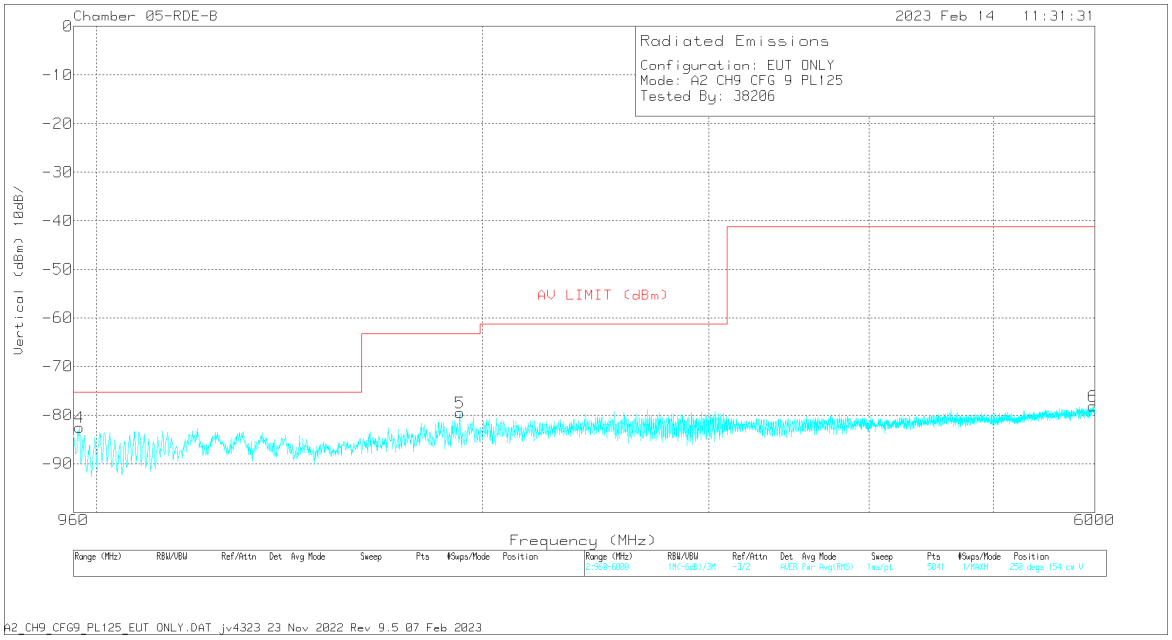
ANT. 2, CH9, CONFIG 9





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Horn Antenna ACF(dB)	Dist. Corr. (dB)	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading (dBm)	AV LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	970	-61.88	RMS	28	-15.6	11.8	-44.82	-82.5	-75.3	-7.2	118	154	V
1	1199	-59.8	RMS	29	-15.6	11.8	-47.78	-82.38	-75.3	-7.08	198	154	H
2	1920	-56.95	RMS	31.3	-15.6	11.8	-48.59	-78.04	-63.3	-14.74	198	154	H
5	1920	-58.39	RMS	31.3	-15.6	11.8	-48.59	-79.48	-63.3	-16.18	206	154	V
3	5981	-65.82	RMS	35.8	-15.6	11.8	-44.37	-78.19	-41.3	-36.89	242	154	H
6	5983	-65.72	RMS	35.8	-15.6	11.8	-44.4	-78.12	-41.3	-36.82	316	154	V

RMS - RMS detection

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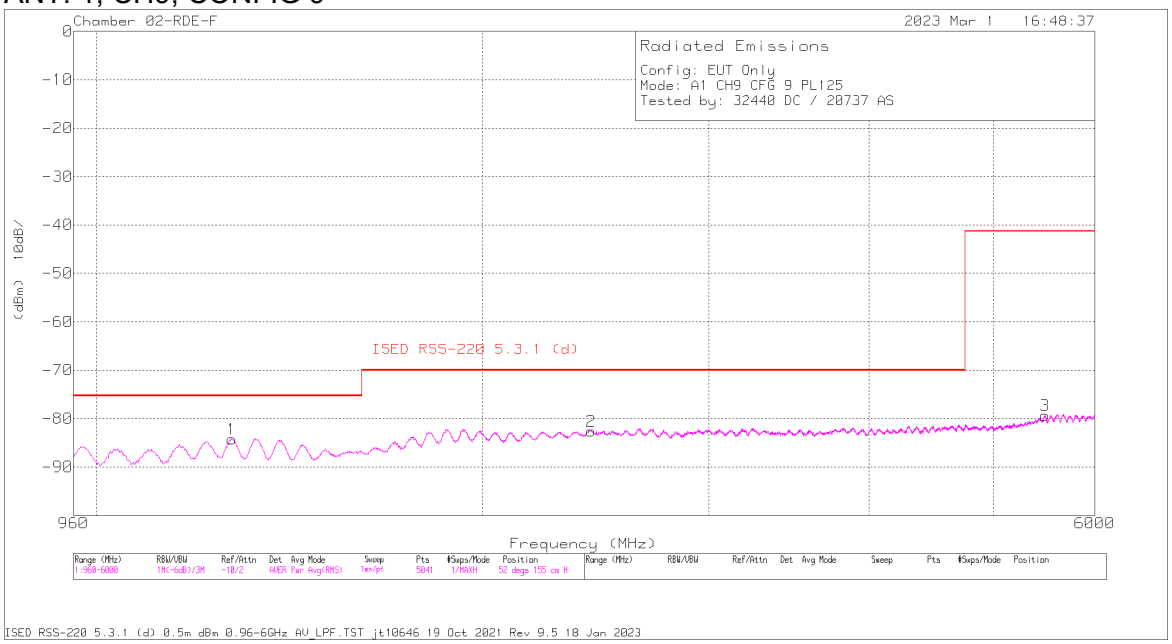
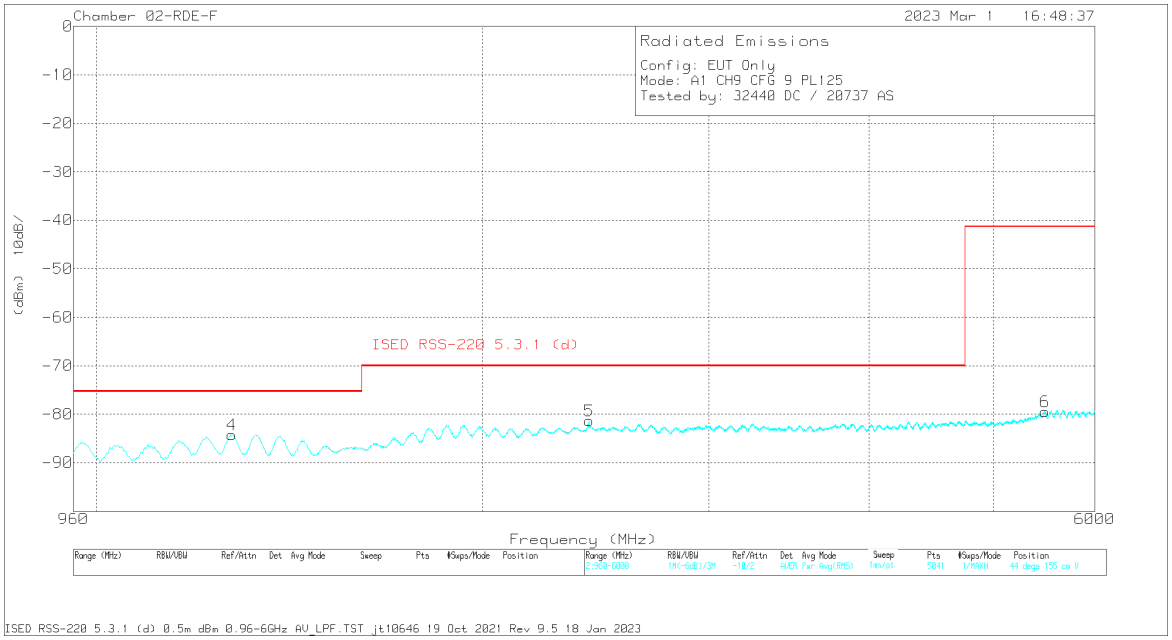
RSS-220 5.3.1 (d)

ANT. 1, CH9, CONFIG 9





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	81887 ACF (dB)	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1275	-61.32	RMS	29.6	-48.9	-15.6	11.8	.2	-84.22	-75.3	-8.92	338	155	H
2	2431	-62.55	RMS	32.7	-49.1	-15.6	11.8	.2	-82.55	-70	-12.55	184	155	H
3	5485	-65.29	RMS	35.1	-47.3	-15.6	11.8	2	-79.29	-41.3	-37.99	294	155	H
4	1275	-61.28	RMS	29.6	-48.9	-15.6	11.8	.2	-84.18	-75.3	-8.88	88	155	V
5	2421	-60.92	RMS	32.6	-49.4	-15.6	11.8	.2	-81.32	-70	-11.32	242	155	V
6	5485	-65.45	RMS	35.1	-47.3	-15.6	11.8	2	-79.45	-41.3	-38.15	88	155	V

RMS - RMS detection

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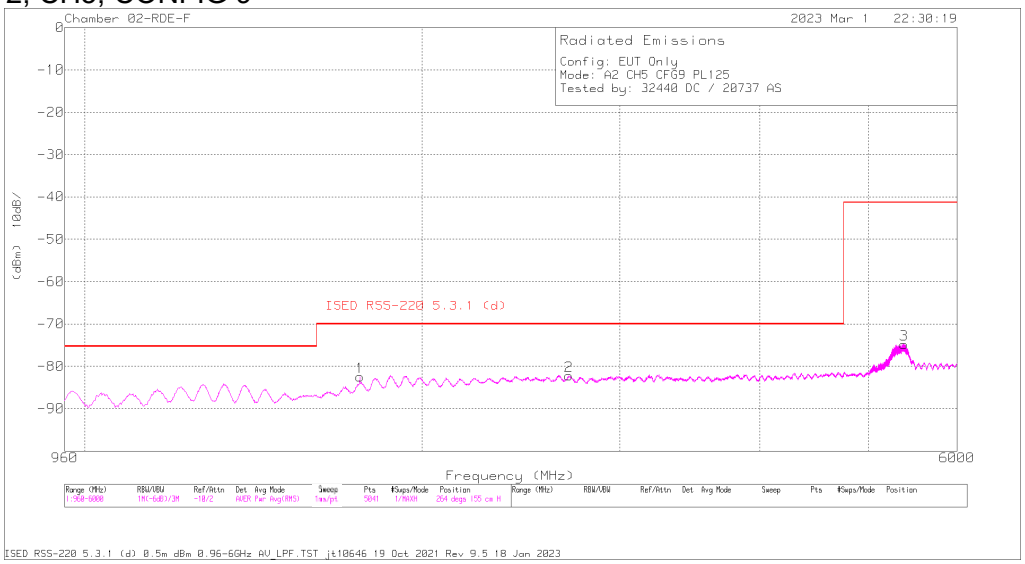

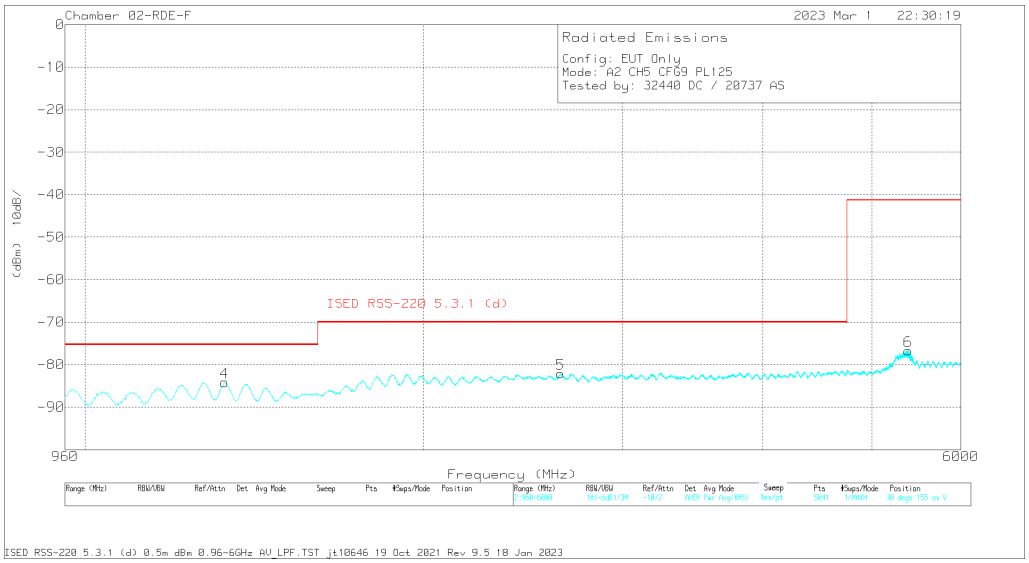

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	81887 ACF (dB)	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1760	-60.68	RMS	30.7	-49	-15.6	11.8	.3	-82.48	-70	-12.48	330	155	H
2	2703	-63.31	RMS	32.9	-48.3	-15.6	11.8	.3	-82.21	-70	-12.21	88	155	H
3	5380	-60.06	RMS	35	-47.5	-15.6	11.8	1.5	-74.86	-41.3	-33.56	308	155	H
4	1331	-61.17	RMS	29.4	-48.8	-15.6	11.8	.2	-84.17	-75.3	-8.87	294	155	V
5	2646	-63.15	RMS	33.1	-48.6	-15.6	11.8	.3	-82.15	-70	-12.15	52	155	V
6	5384	-62.07	RMS	35	-47.3	-15.6	11.8	1.5	-76.67	-41.3	-35.37	52	155	V

RMS - RMS detection

Radiated Emissions

Frequency (MHz)	Meter Reading (dBm)	Det	81887 ACF (dB)	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1816.4	-61.45	RMS	31.5	-49	-15.6	11.8	.2	-82.55	-70	-12.55	345	155	H
5367.1	-59.53	RMS	35	-47.6	-15.6	11.8	1.5	-74.43	-41.3	-33.13	306	155	H
5357.2	-61.15	RMS	35	-47.5	-15.6	11.8	1.5	-75.95	-41.3	-34.65	55	155	V

RMS - RMS detection

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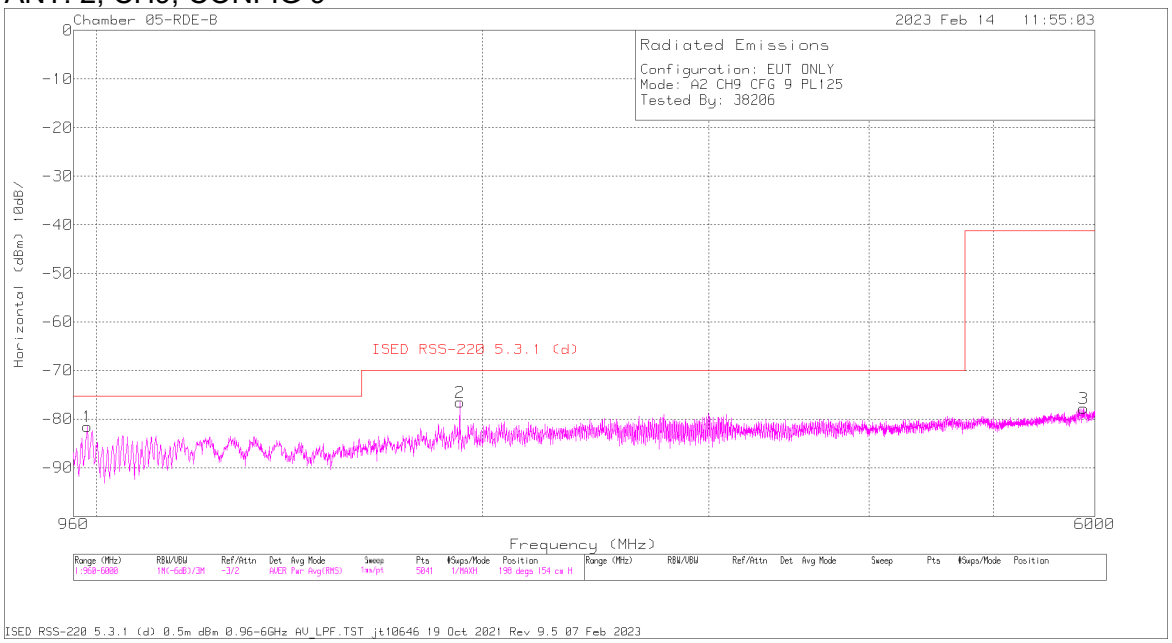

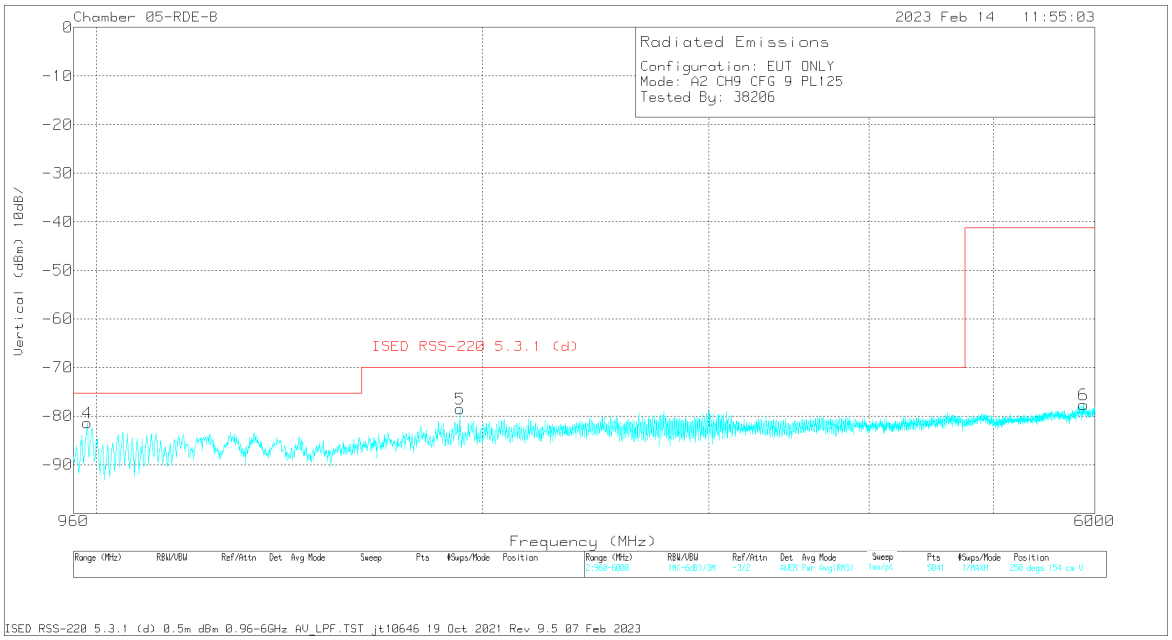

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Horn Antenna ACF(dB)	Dist. Corr. (dB)	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	984	-61.22	RMS	28	-15.6	11.8	-44.5	-81.52	-75.3	-6.22	264	154	H
4	984	-61.07	RMS	28	-15.6	11.8	-44.5	-81.37	-75.3	-6.07	360	154	V
2	1920	-56.45	RMS	31.3	-15.6	11.8	-47.53	-76.48	-70	-6.48	198	154	H
5	1920	-58.47	RMS	31.3	-15.6	11.8	-47.53	-78.5	-70	-8.5	206	154	V
3	5880	-65.75	RMS	35.5	-15.6	11.8	-43.68	-77.73	-41.3	-36.43	66	154	H
6	5880	-65.63	RMS	35.5	-15.6	11.8	-43.68	-77.61	-41.3	-36.31	272	154	V

RMS - RMS detection

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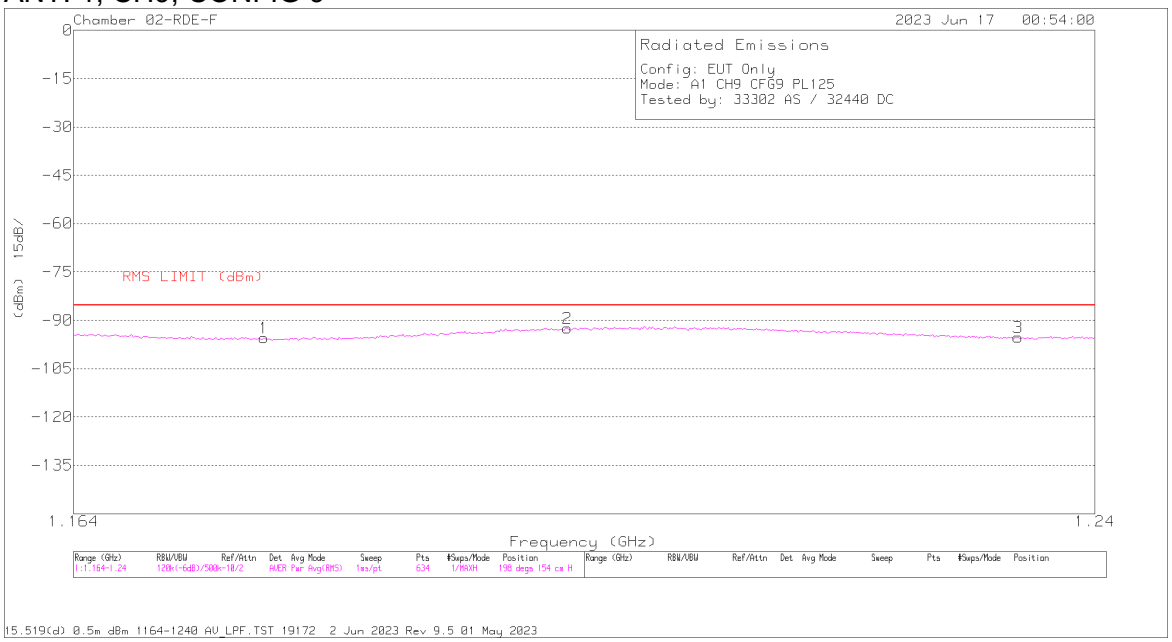
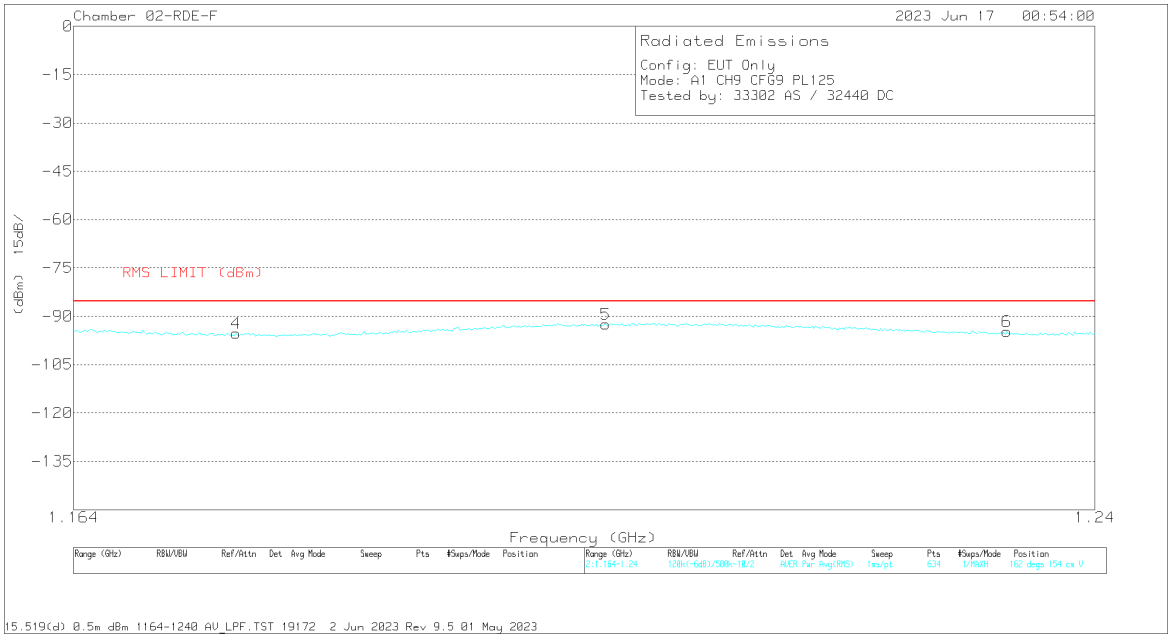
9.6.2. AVERAGE EMISSIONS, 1.164 – 1.240 GHz

ANT. 1, CH9, CONFIG 9





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206808 ACF (dB) 3mH	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.177807	-73.01	RMS	28.2	-47.1	-15.6	11.8	.2	-95.51	-85.3	-10.21	242	154	H
2	1.200139	-70.17	RMS	28.4	-47	-15.6	11.8	.2	-92.37	-85.3	-7.07	308	154	H
3	1.234117	-73.54	RMS	28.6	-46.8	-15.6	11.8	.2	-95.34	-85.3	-10.04	110	154	H
4	1.175766	-72.83	RMS	28.2	-47	-15.6	11.8	.2	-95.23	-85.3	-9.93	294	154	V
5	1.20302	-70.27	RMS	28.4	-46.9	-15.6	11.8	.2	-92.37	-85.3	-7.07	184	154	V
6	1.233276	-72.98	RMS	28.6	-46.8	-15.6	11.8	.2	-94.78	-85.3	-9.48	294	154	V

RMS - RMS detection

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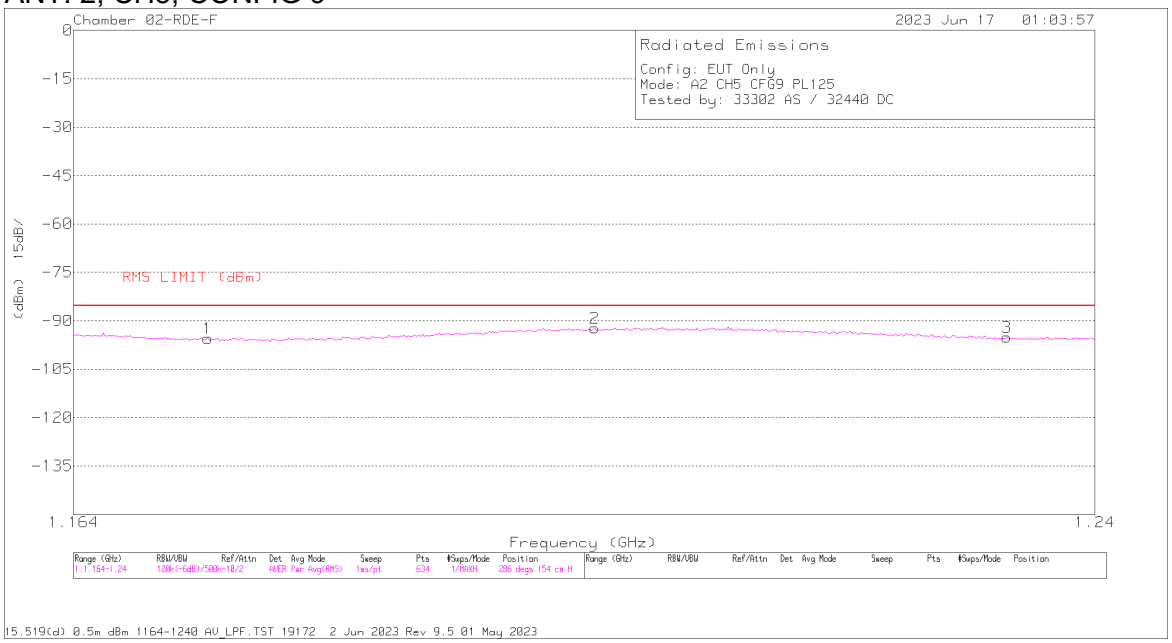

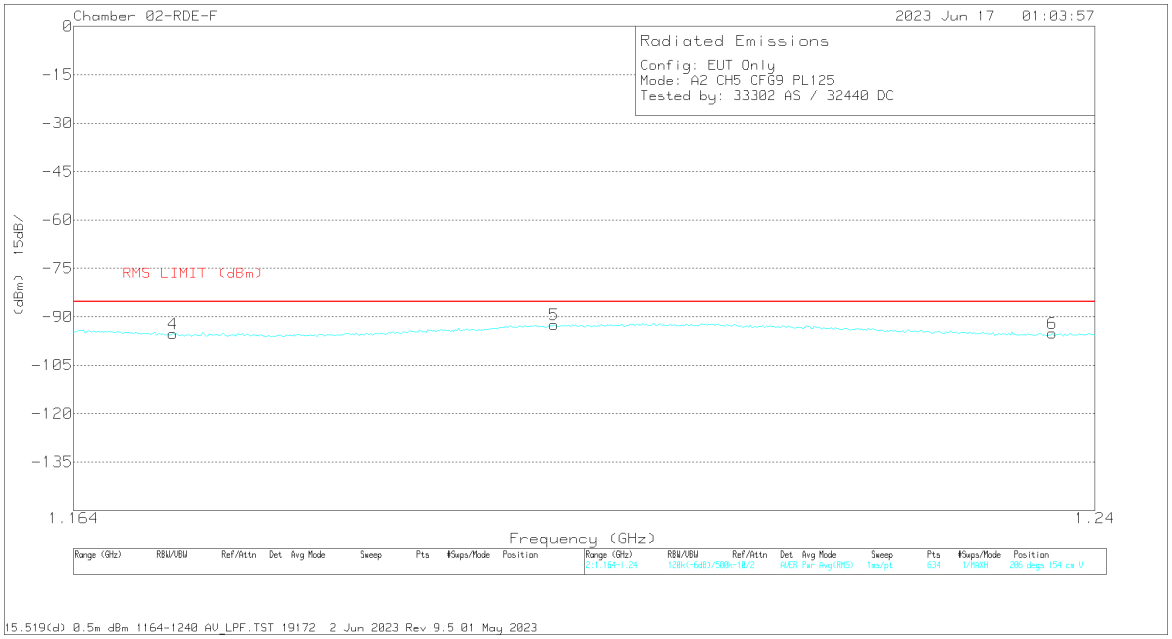

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206808 ACF (dB) 3mH	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.173725	-73.03	RMS	28.1	-46.9	-15.6	11.8	.2	-95.43	-85.3	-10.13	132	154	H
2	1.20218	-70.14	RMS	28.4	-47	-15.6	11.8	.2	-92.34	-85.3	-7.04	132	154	H
3	1.233276	-73.22	RMS	28.6	-46.8	-15.6	11.8	.2	-95.02	-85.3	-9.72	44	154	H
4	1.171204	-72.7	RMS	28.1	-47.1	-15.6	11.8	.2	-95.3	-85.3	-10	272	154	V
5	1.199178	-70.24	RMS	28.4	-47	-15.6	11.8	.2	-92.44	-85.3	-7.14	360	154	V
6	1.236758	-73.34	RMS	28.6	-46.8	-15.6	11.8	.2	-95.14	-85.3	-9.84	140	154	V

RMS - RMS detection

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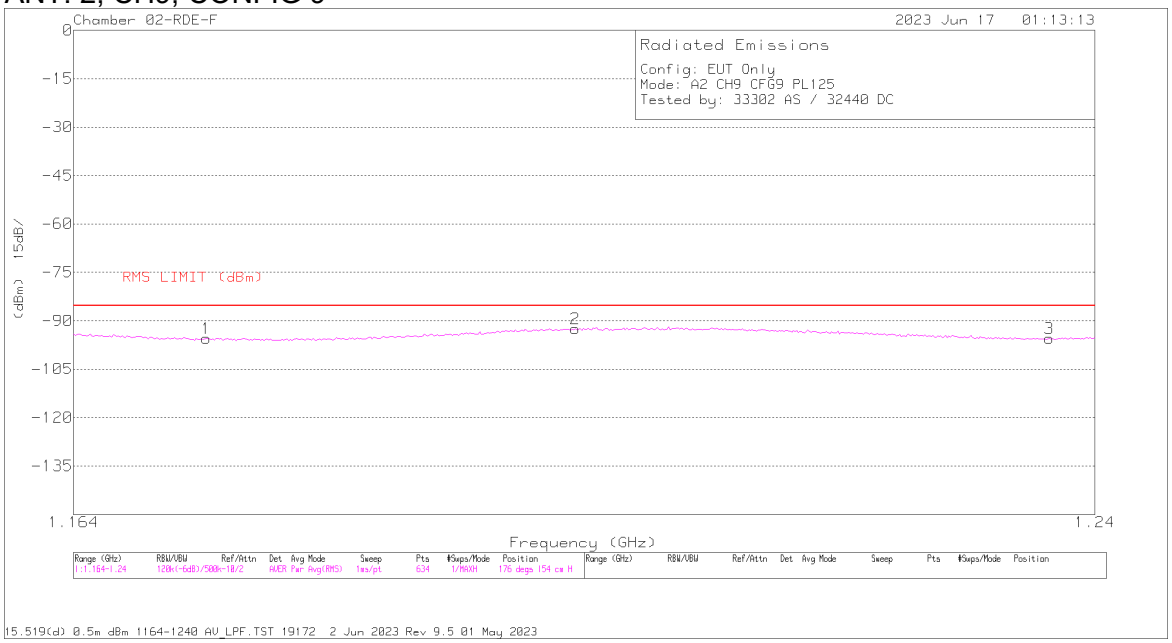

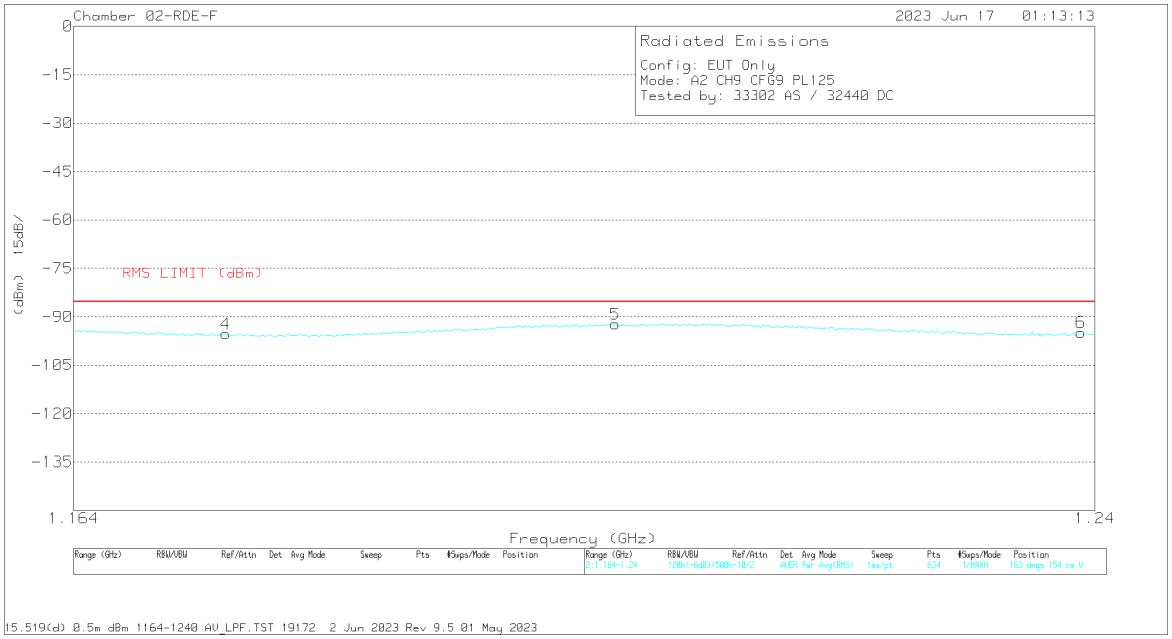

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206808 ACF (dB) 3mH	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.173605	-73.01	RMS	28.1	-46.9	-15.6	11.8	.2	-95.41	-85.3	-10.11	132	154	H
2	1.200739	-70.16	RMS	28.4	-47	-15.6	11.8	.2	-92.36	-85.3	-7.06	0	154	H
3	1.236518	-73.64	RMS	28.6	-46.8	-15.6	11.8	.2	-95.44	-85.3	-10.14	286	154	H
4	1.175046	-72.8	RMS	28.1	-47	-15.6	11.8	.2	-95.3	-85.3	-10	52	154	V
5	1.203741	-70.1	RMS	28.4	-46.9	-15.6	11.8	.2	-92.2	-85.3	-6.9	316	154	V
6	1.238919	-73.1	RMS	28.7	-46.8	-15.6	11.8	.2	-94.8	-85.3	-9.5	360	154	V

RMS - RMS detection

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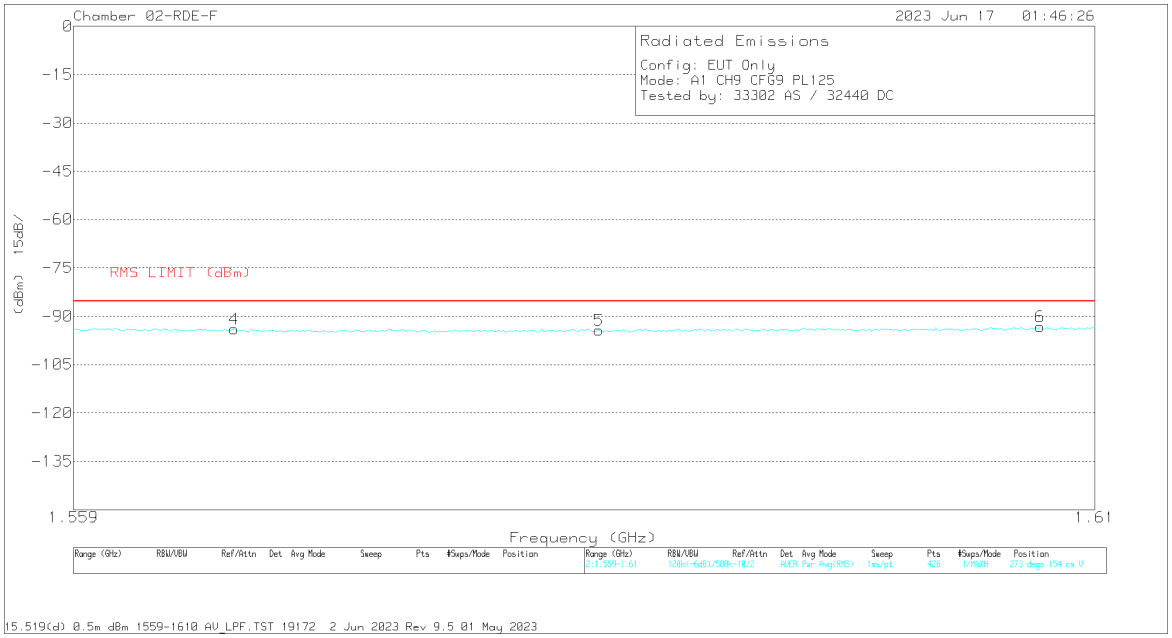
9.6.3. AVERAGE EMISSIONS, 1.559 – 1.610 GHz

ANT. 1, CH9, CONFIG 9



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206808 ACF (dB) 3mH	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.56548	-71.35	RMS	27.8	-46.9	-15.6	11.8	.2	-94.05	-85.3	-8.75	176	154	H
2	1.58288	-71.92	RMS	27.9	-46.7	-15.6	11.8	.2	-94.32	-85.3	-9.02	44	154	H
3	1.6094	-71.24	RMS	28.2	-46.8	-15.6	11.8	.1	-93.54	-85.3	-8.24	220	154	H
4	1.56692	-71.24	RMS	27.8	-46.9	-15.6	11.8	.2	-93.94	-85.3	-8.64	316	154	V
5	1.58504	-72.03	RMS	28	-46.7	-15.6	11.8	.2	-94.33	-85.3	-9.03	250	154	V
6	1.60724	-71.02	RMS	28.2	-46.8	-15.6	11.8	.2	-93.22	-85.3	-7.92	206	154	V

RMS - RMS detection

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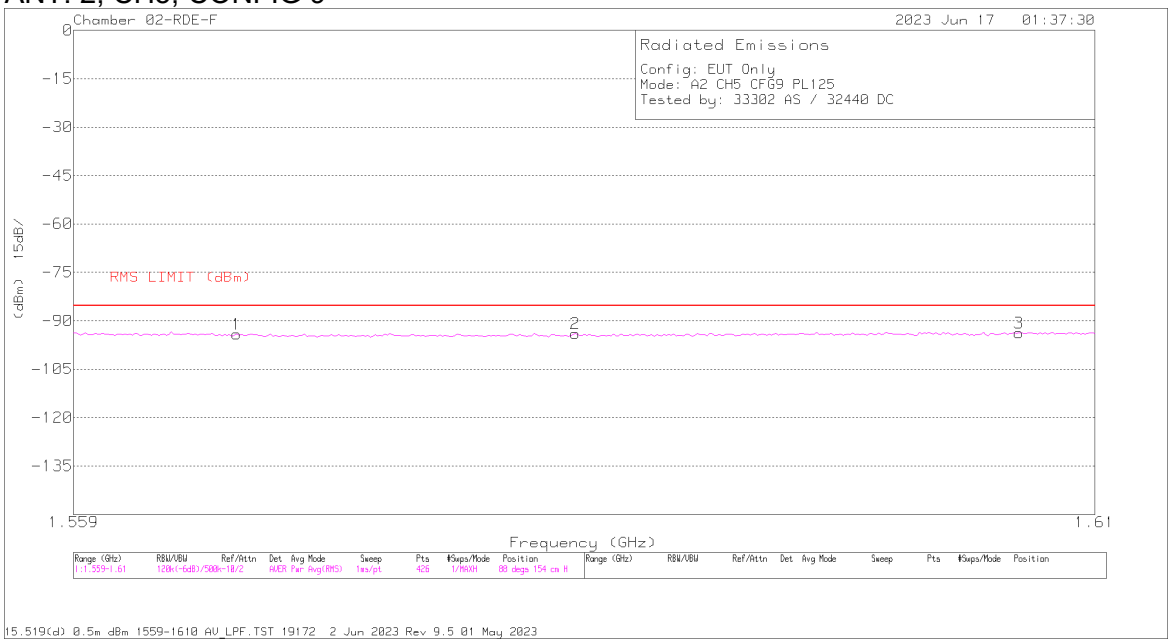
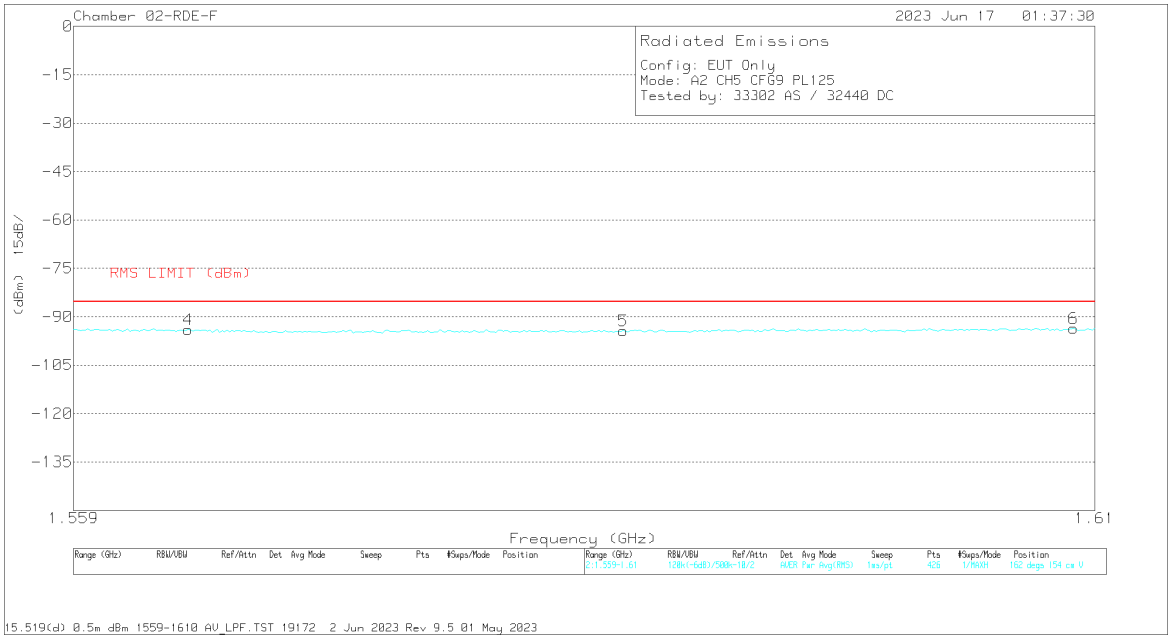
ANT. 2, CH5, CONFIG 9





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206808 ACF (dB) 3mH	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.56704	-71.49	RMS	27.8	-46.9	-15.6	11.8	.2	-94.19	-85.3	-8.89	88	154	H
2	1.58384	-71.68	RMS	28	-46.7	-15.6	11.8	.2	-93.98	-85.3	-8.68	88	154	H
3	1.60616	-71.48	RMS	28.2	-46.8	-15.6	11.8	.2	-93.68	-85.3	-8.38	286	154	H
4	1.56464	-71.3	RMS	27.8	-46.9	-15.6	11.8	.2	-94	-85.3	-8.7	206	154	V
5	1.58624	-71.98	RMS	28	-46.7	-15.6	11.8	.2	-94.28	-85.3	-8.98	360	154	V
6	1.60892	-71.45	RMS	28.2	-46.8	-15.6	11.8	.2	-93.65	-85.3	-8.35	316	154	V

RMS - RMS detection

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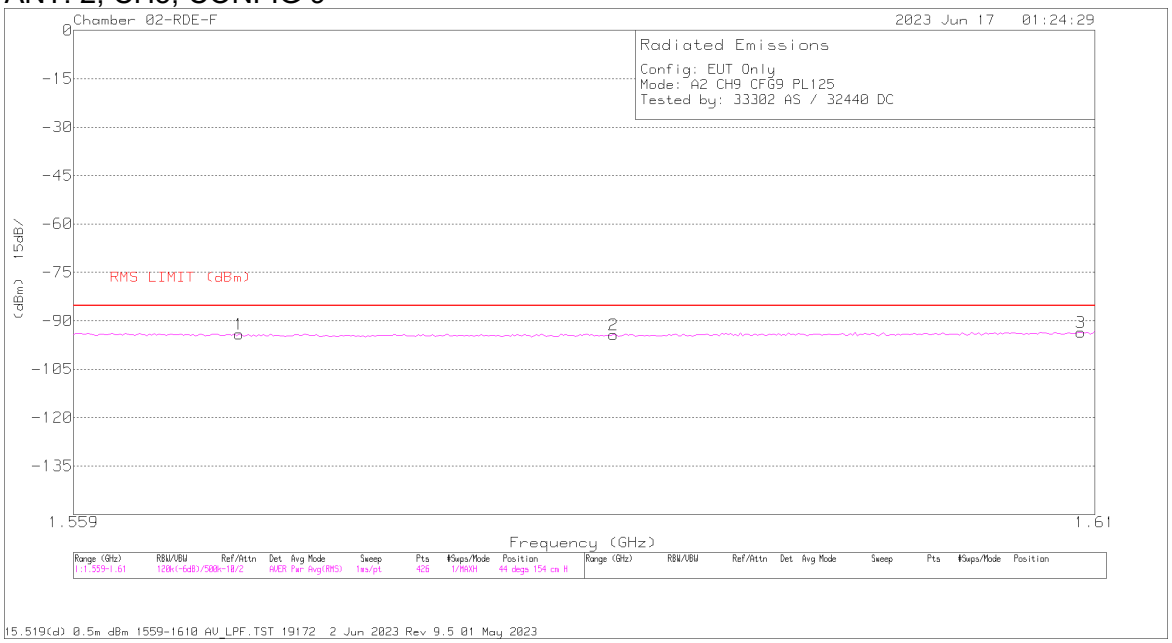

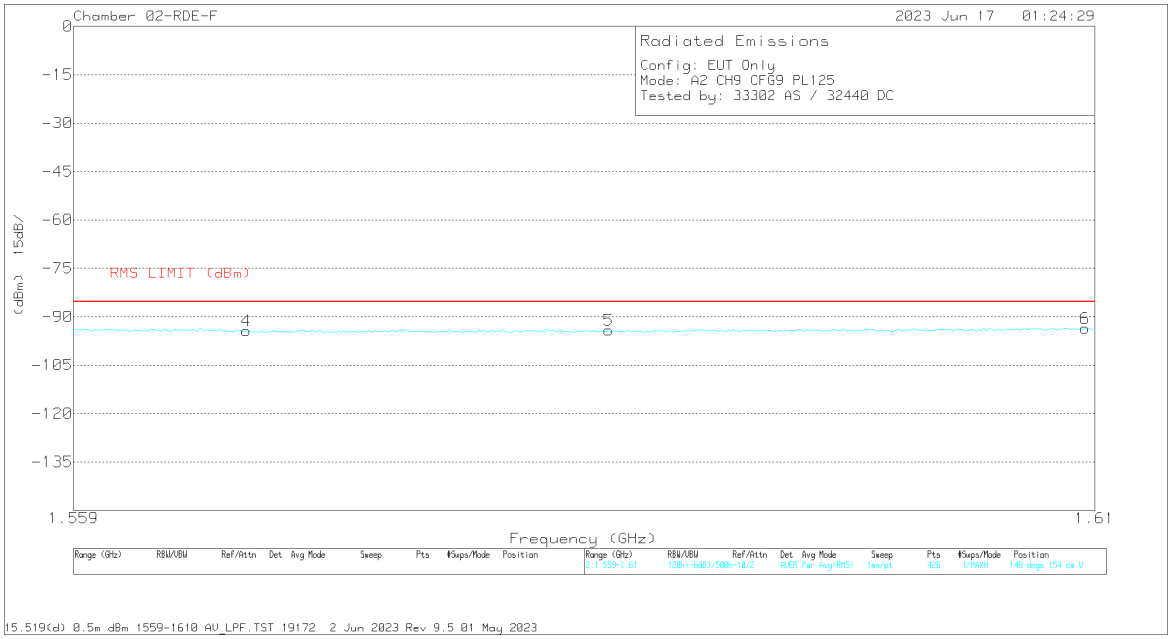

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206808 ACF (dB) 3mH	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	204843 LPF (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.56716	-71.36	RMS	27.8	-46.9	-15.6	11.8	.2	-94.06	-85.3	-8.76	220	154	H
2	1.58576	-72.01	RMS	28	-46.7	-15.6	11.8	.2	-94.31	-85.3	-9.01	88	154	H
3	1.60928	-71.3	RMS	28.2	-46.8	-15.6	11.8	.1	-93.6	-85.3	-8.3	154	154	H
4	1.56752	-71.55	RMS	27.8	-46.9	-15.6	11.8	.2	-94.25	-85.3	-8.95	228	154	V
5	1.58552	-71.91	RMS	28	-46.7	-15.6	11.8	.2	-94.21	-85.3	-8.91	228	154	V
6	1.60952	-71.28	RMS	28.2	-46.8	-15.6	11.8	.1	-93.58	-85.3	-8.28	228	154	V

RMS - RMS detection

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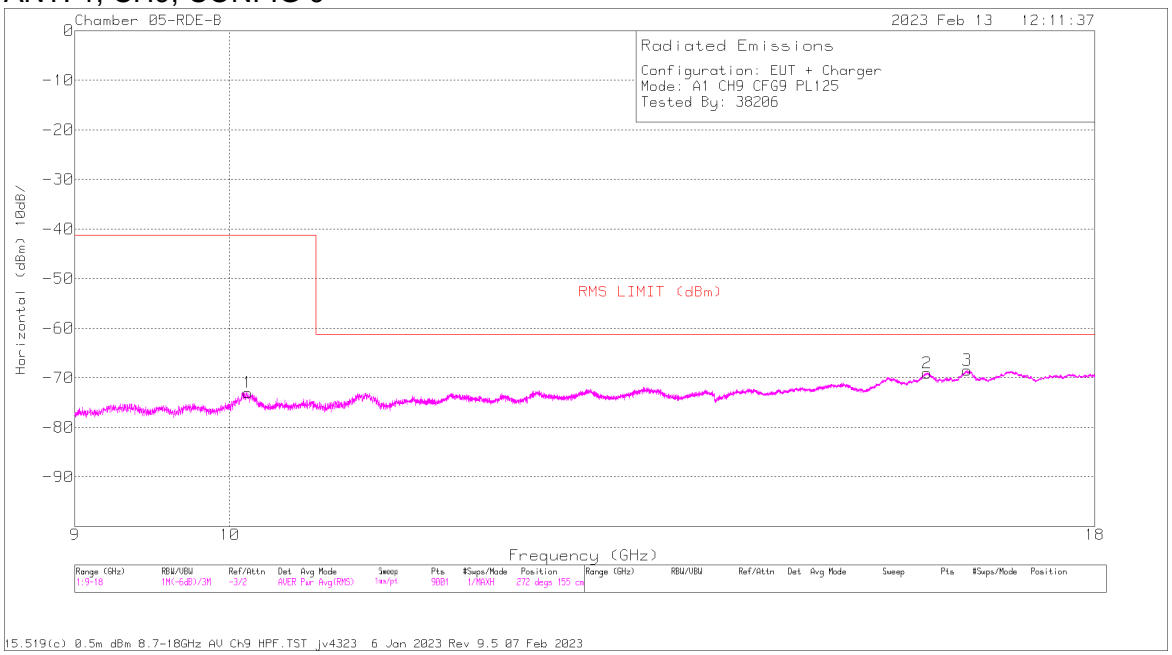
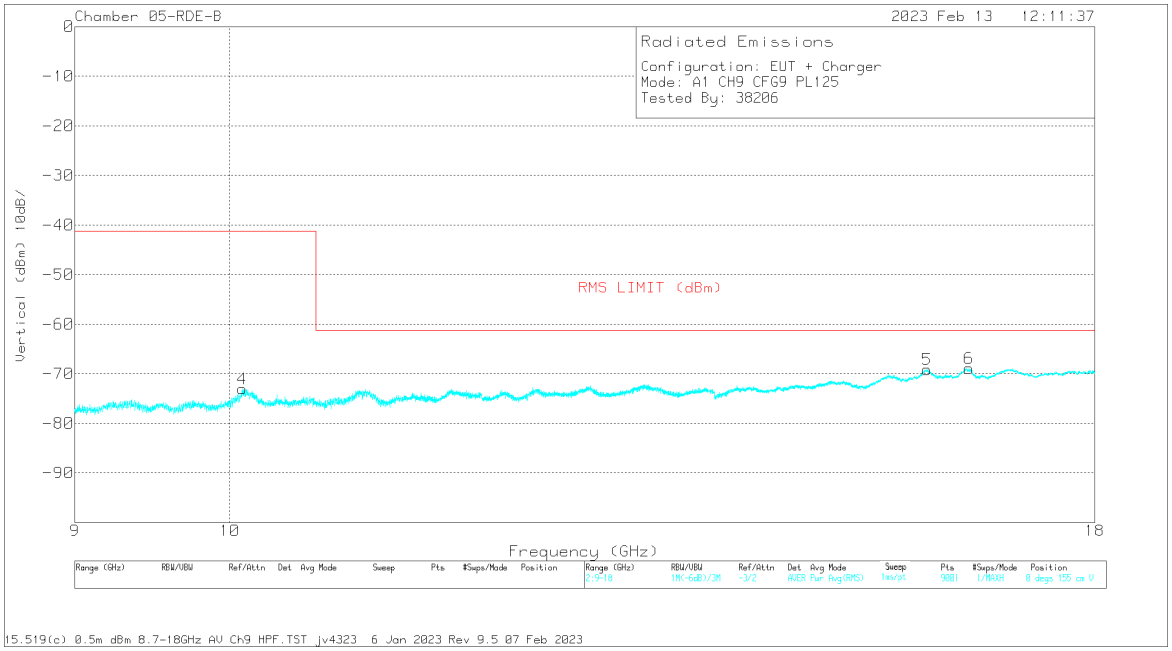
9.6.4. AVERAGE EMISSIONS, 9 – 18 GHz

ANT. 1, CH9, CONFIG 9





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Horn Antenna ACF(dB)	Dist. Corr. (dB)	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	10.084	-64.64	RMS	37.6	-15.6	11.8	-42.22	-73.06	-41.3	-31.76	110	155	V
1	10.123	-64.52	RMS	37.6	-15.6	11.8	-42.25	-72.97	-41.3	-31.67	228	155	H
2	16.061	-64.39	RMS	41.5	-15.6	11.8	-42.34	-69.03	-61.3	-7.73	294	155	H
5	16.061	-64.52	RMS	41.5	-15.6	11.8	-42.34	-69.16	-61.3	-7.86	22	155	V
3	16.502	-64.03	RMS	41.9	-15.6	11.8	-42.53	-68.46	-61.3	-7.16	228	155	H
6	16.527	-64.61	RMS	42	-15.6	11.8	-42.5	-68.91	-61.3	-7.61	66	155	V

RMS - RMS detection

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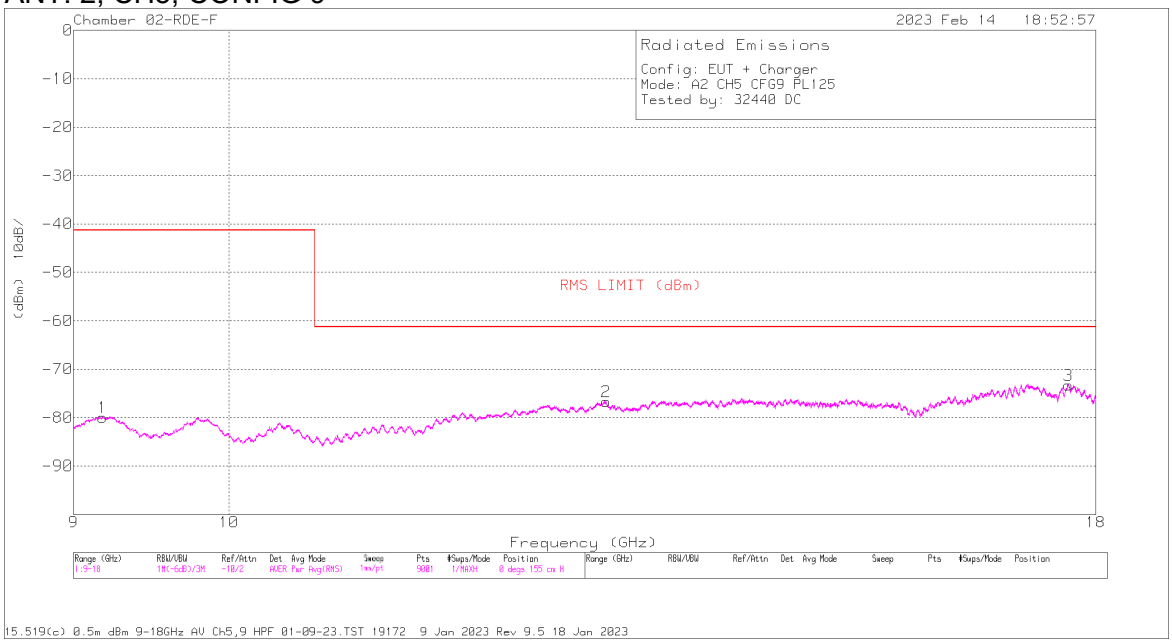

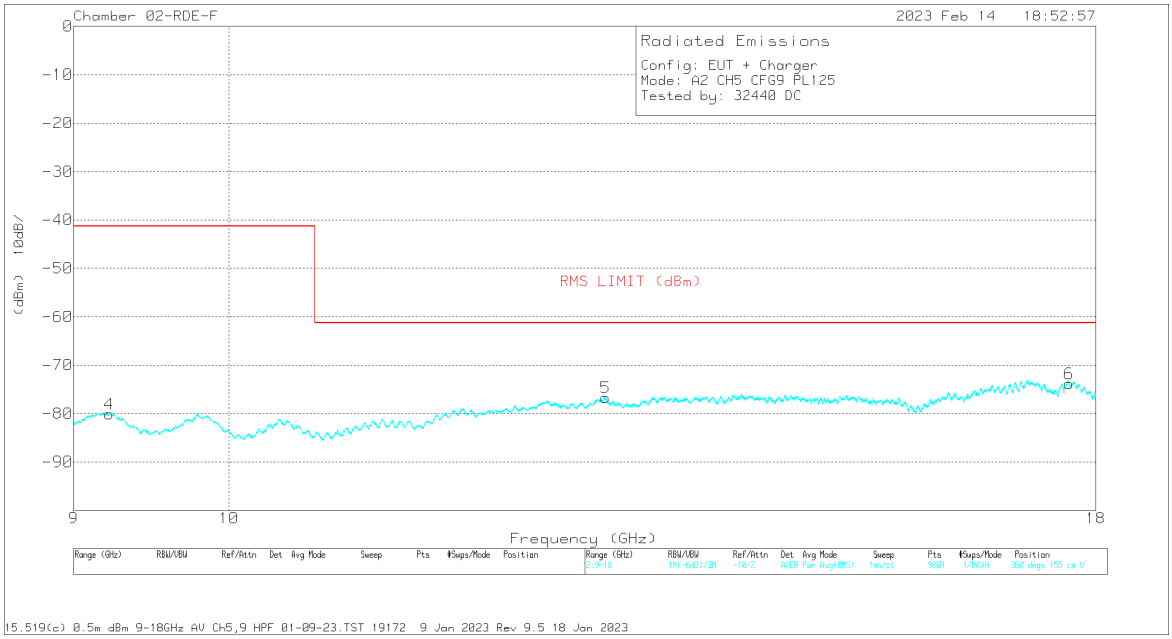

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	81887 ACF (dB)	Amp/Cbl (dB)	Dist. Corr. (dB)	Conv. Fact. (dB)	High Pass Filter (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	9.181	-67.62	RMS	36.5	-45.5	-15.6	11.8	.5	-79.92	-41.3	-38.62	176	155	H
2	12.914	-67.08	RMS	38.7	-44.8	-15.6	11.8	.3	-76.68	-61.3	-15.38	286	155	H
3	17.672	-66.63	RMS	41.5	-44.7	-15.6	11.8	.3	-73.33	-61.3	-12.03	44	155	H
4	9.221	-67.69	RMS	36.6	-45.6	-15.6	11.8	.4	-80.09	-41.3	-38.79	162	155	V
5	12.911	-67.1	RMS	38.7	-44.8	-15.6	11.8	.3	-76.7	-61.3	-15.4	207	155	V
6	17.679	-66.87	RMS	41.5	-44.9	-15.6	11.8	.3	-73.77	-61.3	-12.47	96	155	V

RMS - RMS detection

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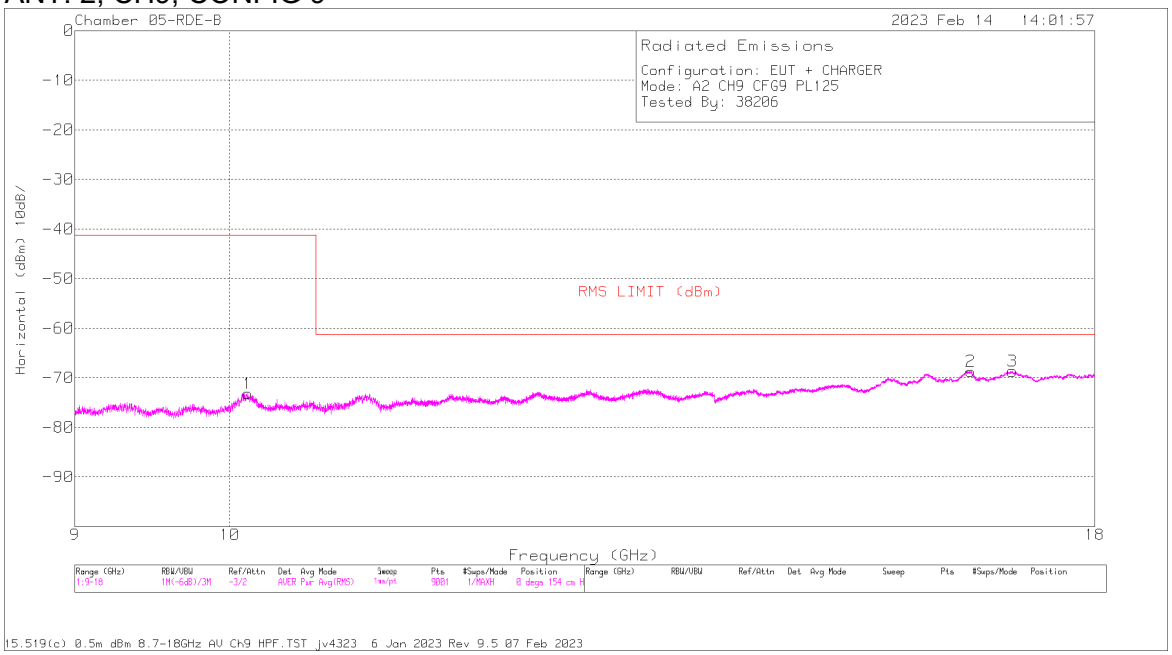

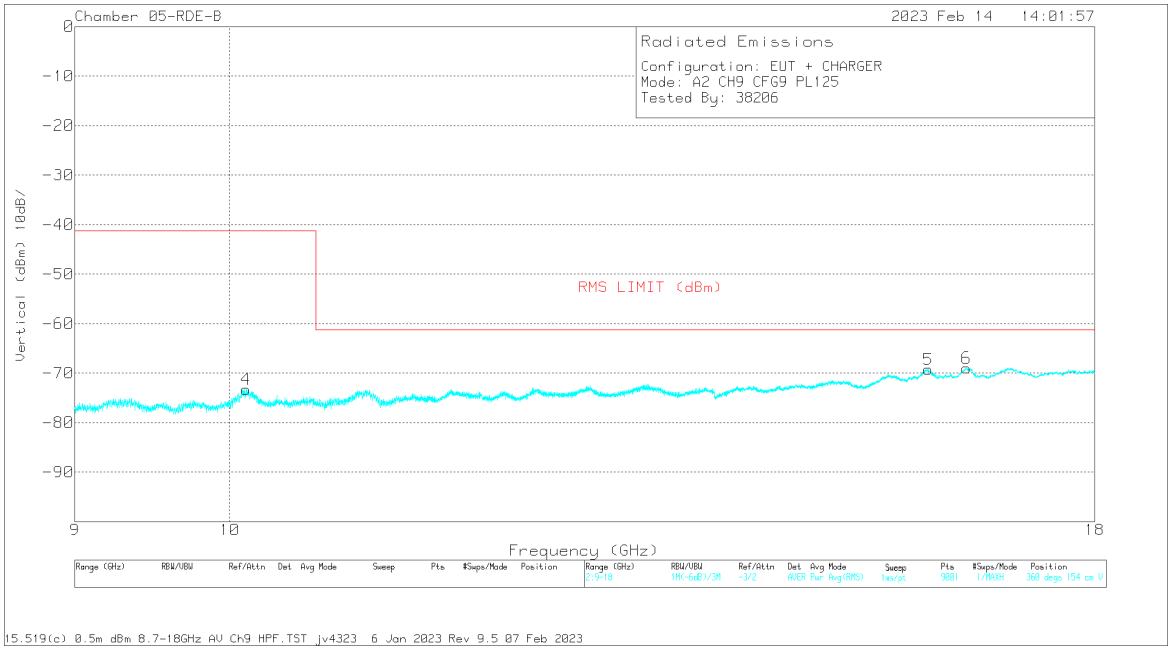

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Horn Antenna ACF(dB)	Dist. Corr. (dB)	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading (dBm)	RMS LIMIT (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	10.112	-64.82	RMS	37.6	-15.6	11.8	-42.22	-73.24	-41.3	-31.94	294	154	V
1	10.123	-64.71	RMS	37.6	-15.6	11.8	-42.25	-73.16	-41.3	-31.86	176	154	H
5	16.074	-64.62	RMS	41.5	-15.6	11.8	-42.32	-69.24	-61.3	-7.94	74	154	V
6	16.5	-64.59	RMS	41.9	-15.6	11.8	-42.47	-68.96	-61.3	-7.66	140	154	V
2	16.544	-64.28	RMS	42	-15.6	11.8	-42.62	-68.7	-61.3	-7.4	66	154	H
3	17.02	-63.68	RMS	42.1	-15.6	11.8	-43.28	-68.66	-61.3	-7.36	66	154	H

RMS - RMS detection

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9.6.5. AVERAGE EMISSIONS, 18 – 26.5 GHz

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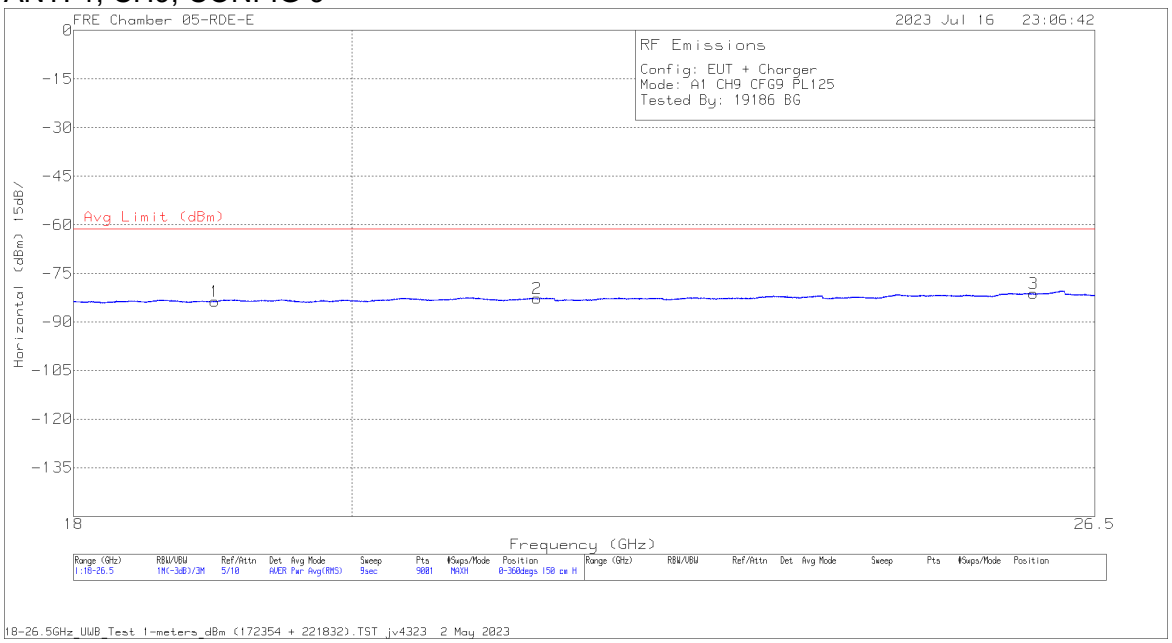

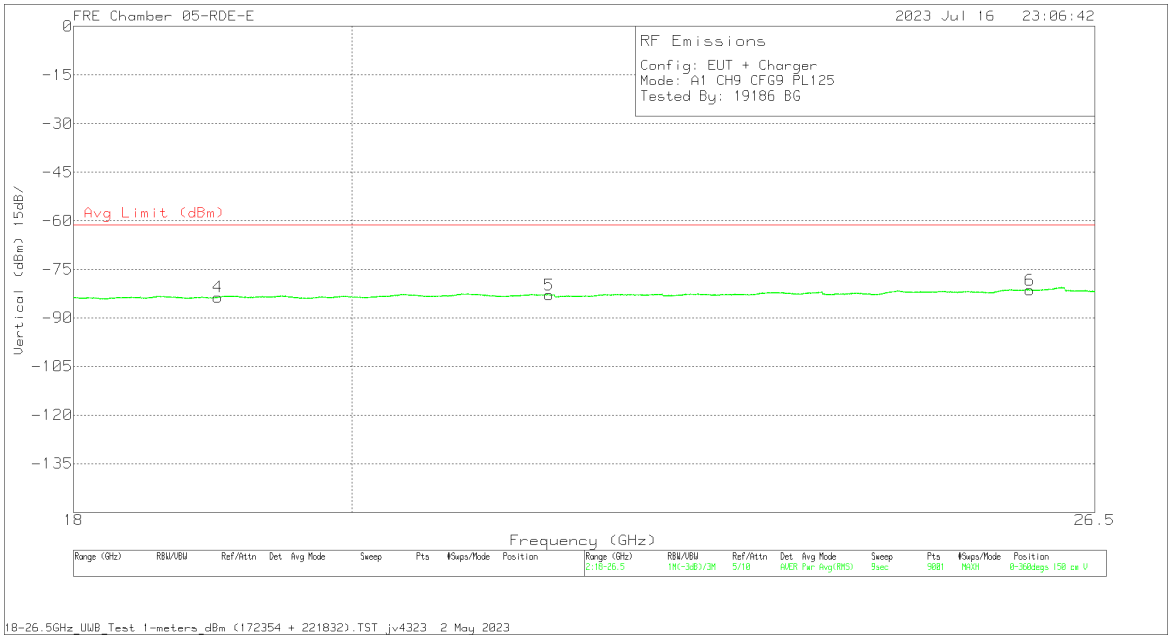

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	172354 1m AF (dB/m)	18-26GHz Amp	CBL/SWITCH	Dist Corr (dB)	Conv. Fact. (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	18.990722	-62.76	RMS	32.7	-62.9	13.2	-15.6	11.8	-83.56	-61.3	-22.26	0-360	150	H
4	19.012444	-62.75	RMS	32.7	-62.9	13.2	-15.6	11.8	-83.55	-61.3	-22.25	0-360	150	V
2	21.452887	-64.69	RMS	33.3	-61.6	14	-15.6	11.8	-82.79	-61.3	-21.49	0-360	150	H
5	21.552054	-64.73	RMS	33.4	-61.7	14	-15.6	11.8	-82.83	-61.3	-21.53	0-360	150	V
6	25.855885	-66.36	RMS	34.7	-61.3	15.4	-15.6	11.8	-81.36	-61.3	-20.06	0-360	150	V
3	25.891774	-66.29	RMS	34.7	-61.3	15.4	-15.6	11.8	-81.29	-61.3	-19.99	0-360	150	H

RMS - RMS detection

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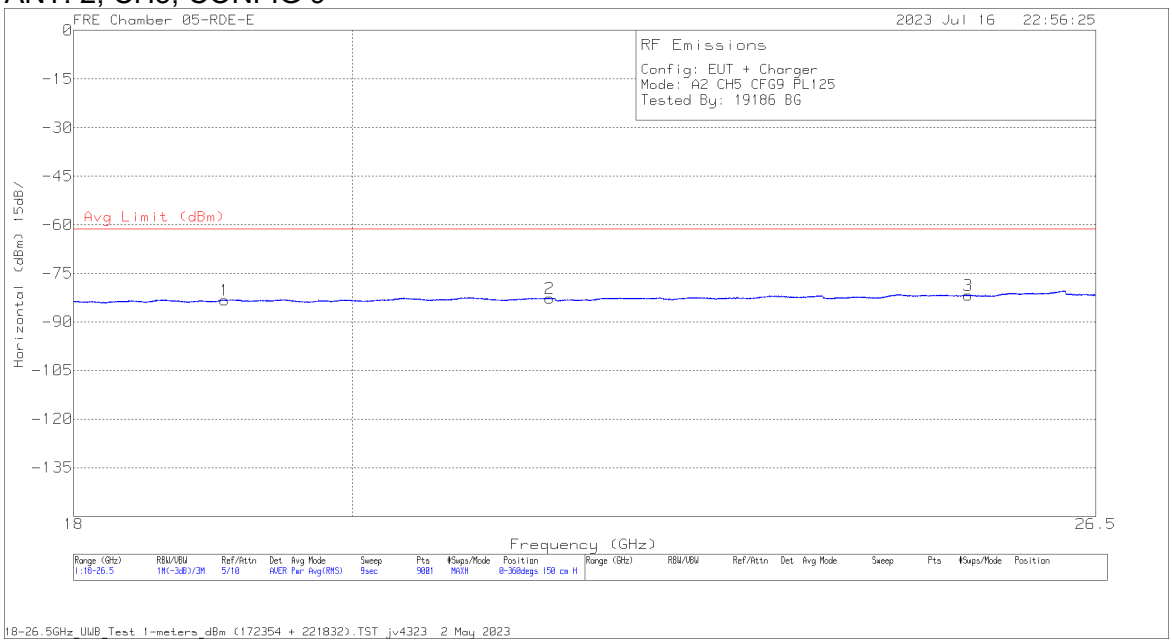

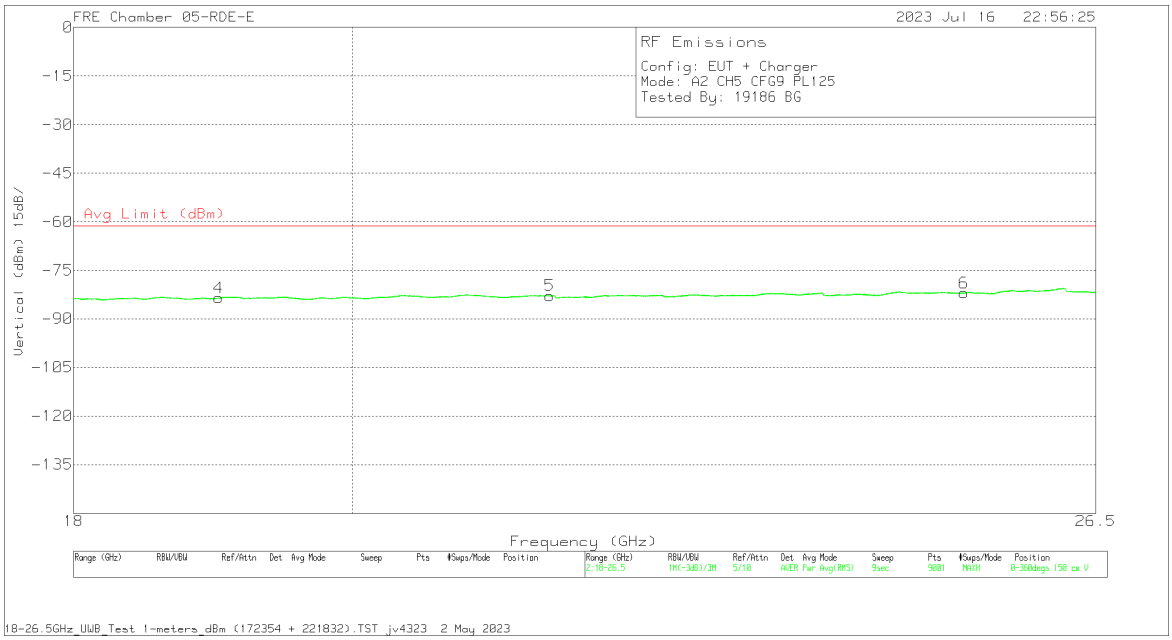

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	172354 1m AF (dB/m)	18-26GHz Amp	CBL/SWITCH	Dist Corr (dB)	Conv. Fact. (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	19.016222	-62.73	RMS	32.7	-62.9	13.2	-15.6	11.8	-83.53	-61.3	-22.23	0-360	150	V
1	19.059666	-62.68	RMS	32.8	-62.8	13.2	-15.6	11.8	-83.28	-61.3	-21.98	0-360	150	H
2	21.552054	-64.57	RMS	33.4	-61.7	14	-15.6	11.8	-82.67	-61.3	-21.37	0-360	150	H
5	21.552054	-64.7	RMS	33.4	-61.7	14	-15.6	11.8	-82.8	-61.3	-21.5	0-360	150	V
6	25.207997	-66.04	RMS	34.5	-61.8	15.2	-15.6	11.8	-81.94	-61.3	-20.64	0-360	150	V
3	25.249552	-65.8	RMS	34.5	-61.8	15.2	-15.6	11.8	-81.7	-61.3	-20.4	0-360	150	H

RMS - RMS detection

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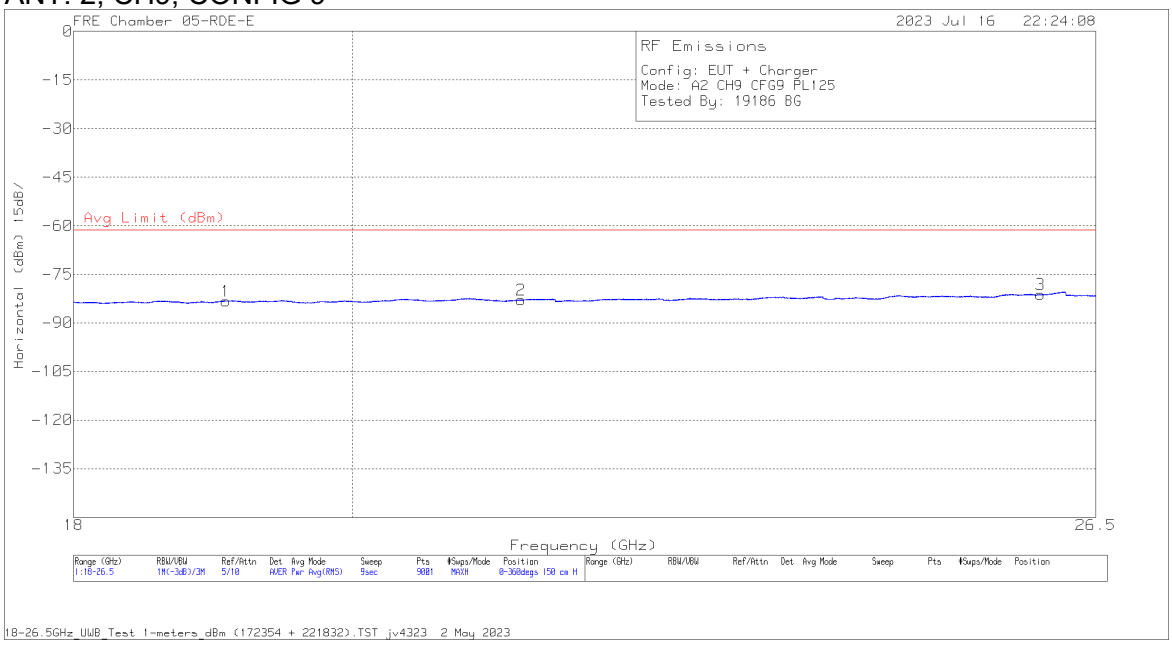

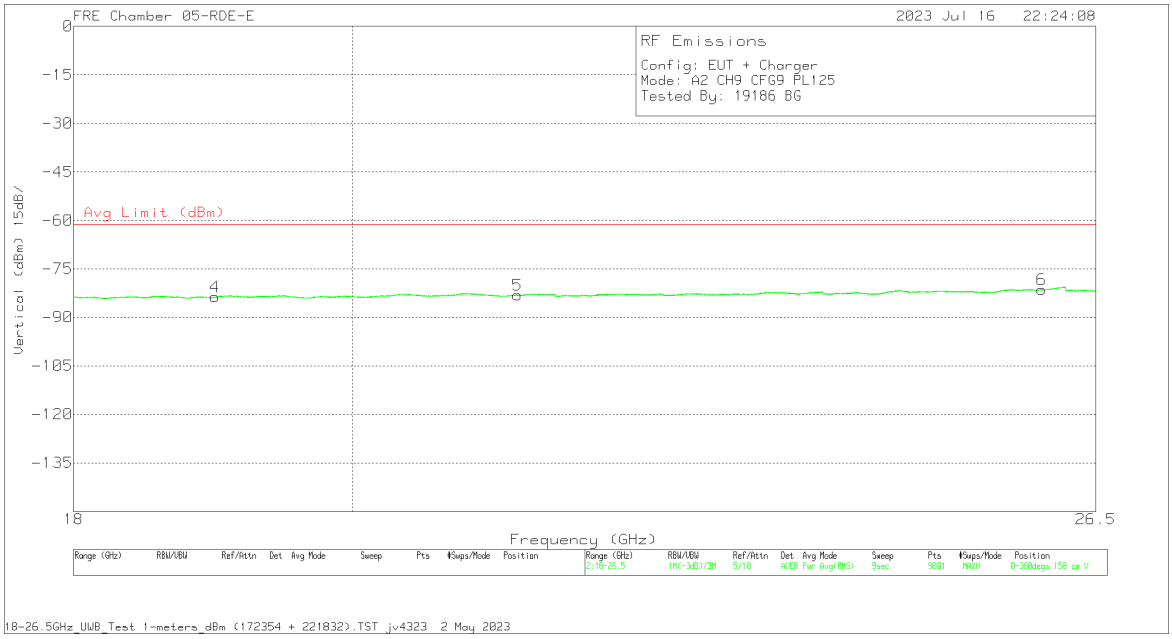

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	172354 1m AF (dB/m)	18-26GHz Amp	CBL/SWITCH	Dist Corr (dB)	Conv. Fact. (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	18.988833	-62.85	RMS	32.7	-62.9	13.2	-15.6	11.8	-83.65	-61.3	-22.35	0-360	150	V
1	19.069111	-62.61	RMS	32.8	-62.8	13.2	-15.6	11.8	-83.21	-61.3	-21.91	0-360	150	H
5	21.293276	-64.78	RMS	33.1	-61.5	13.9	-15.6	11.8	-83.08	-61.3	-21.78	0-360	150	V
2	21.32161	-64.74	RMS	33.2	-61.5	13.9	-15.6	11.8	-82.94	-61.3	-21.64	0-360	150	H
3	25.953163	-66.57	RMS	34.8	-61.2	15.5	-15.6	11.8	-81.27	-61.3	-19.97	0-360	150	H
6	25.965441	-66.71	RMS	34.8	-61.2	15.5	-15.6	11.8	-81.41	-61.3	-20.11	0-360	150	V

RMS - RMS detection

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9.6.6. AVERAGE EMISSIONS, 26.5 – 40 GHz

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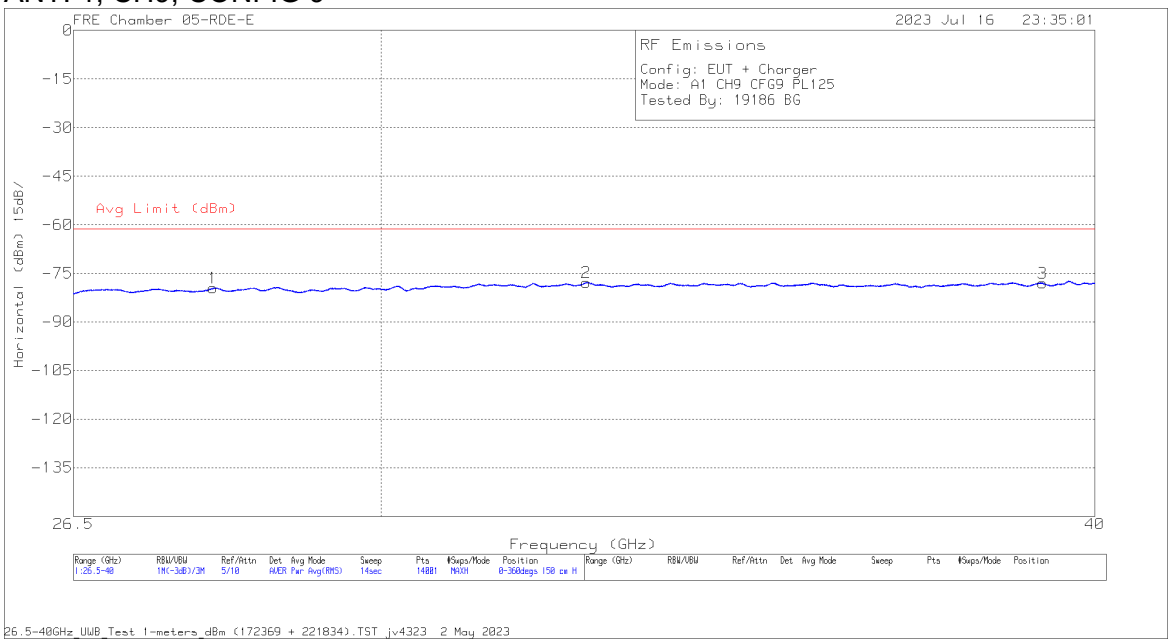

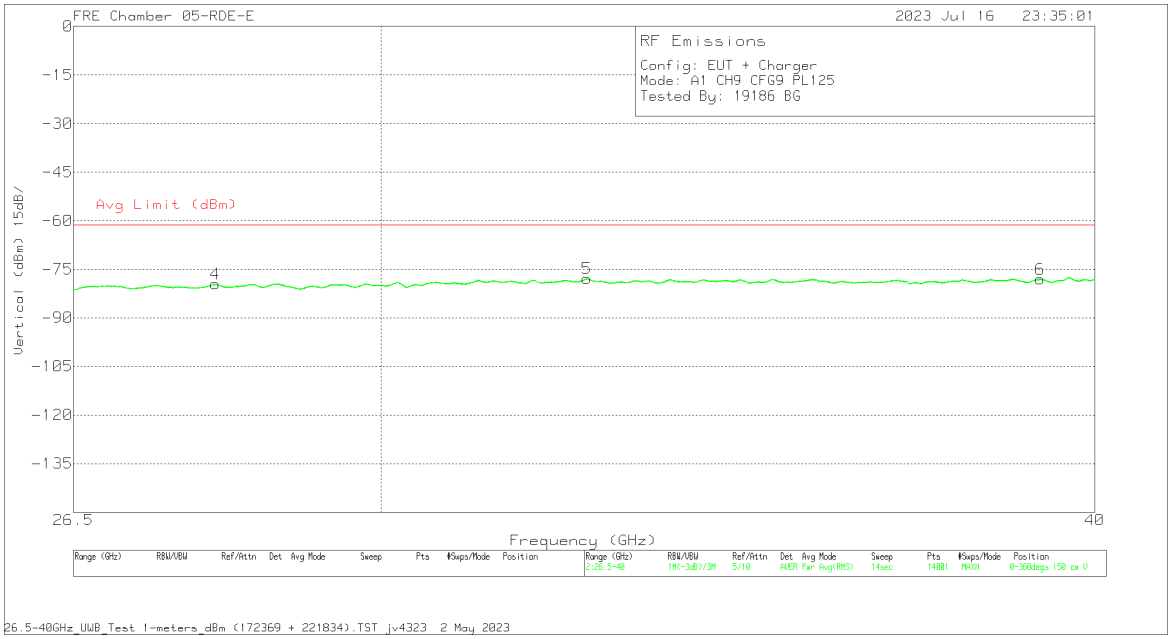

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	172369 1m AF (dB/m)	221834 amp/cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	CBL/SWITCH	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	28.031286	-65.76	RMS	36.2	-62.4	-15.6	11.8	16.2	-79.56	-61.3	-18.26	0-360	150	H
4	28.063108	-65.99	RMS	36.3	-62.4	-15.6	11.8	16.3	-79.59	-61.3	-18.29	0-360	150	V
2	32.586573	-67.31	RMS	37.3	-61.6	-15.6	11.8	17.6	-77.81	-61.3	-16.51	0-360	150	H
5	32.594288	-67.49	RMS	37.3	-61.5	-15.6	11.8	17.6	-77.89	-61.3	-16.59	0-360	150	V
6	39.132147	-65.97	RMS	39.1	-67.1	-15.6	11.8	19.7	-78.07	-61.3	-16.77	0-360	150	V
3	39.167825	-65.97	RMS	39.1	-67.1	-15.6	11.8	19.7	-78.07	-61.3	-16.77	0-360	150	H

RMS - RMS detection

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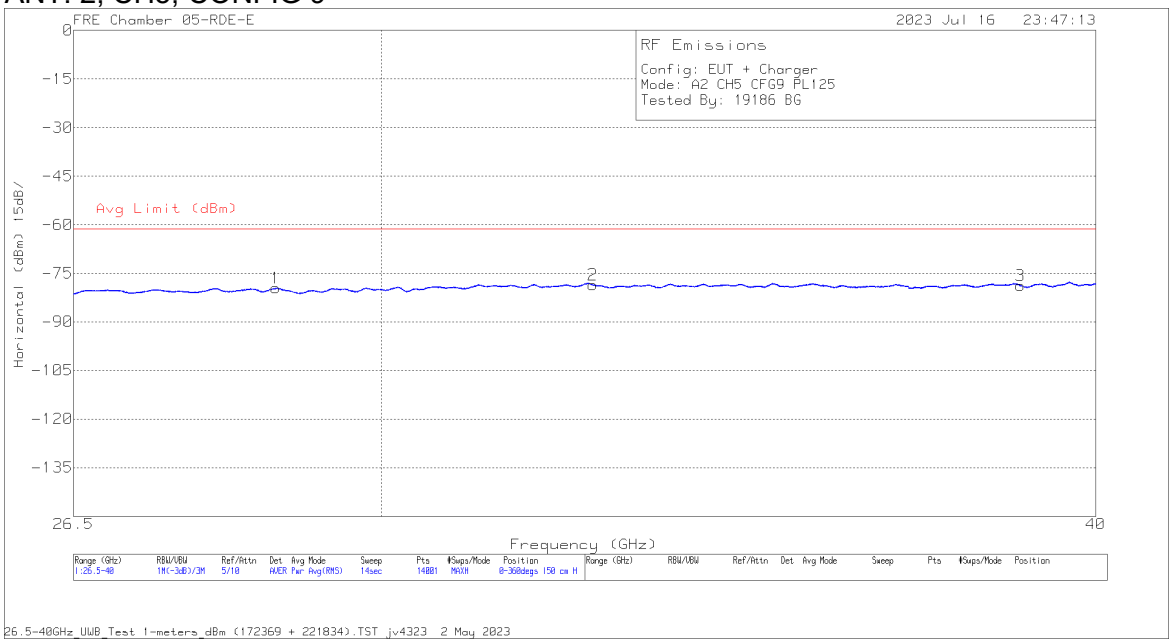

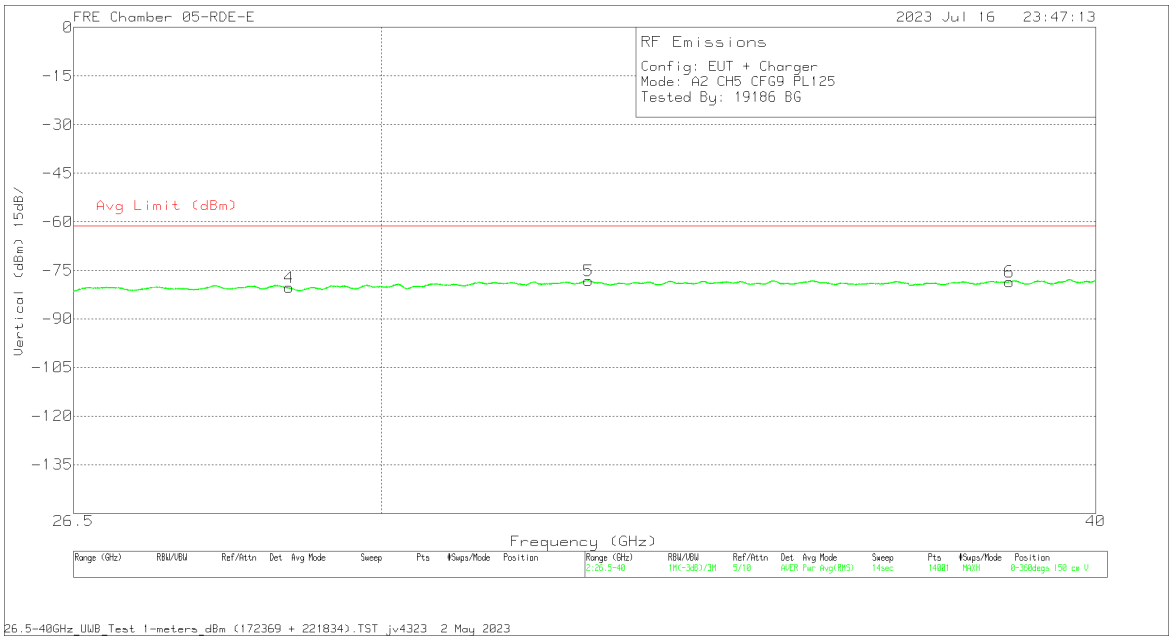

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	172369 1m AF (dB/m)	221834 amp/cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	CBL/SWITCH	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	28.749679	-66.52	RMS	36.3	-62.1	-15.6	11.8	16.6	-79.52	-61.3	-18.22	0-360	150	H
4	28.903965	-67.14	RMS	36.2	-62.2	-15.6	11.8	16.6	-80.34	-61.3	-19.04	0-360	150	V
5	32.608752	-67.62	RMS	37.3	-61.6	-15.6	11.8	17.6	-78.12	-61.3	-16.82	0-360	150	V
2	32.666609	-67.59	RMS	37.3	-61.9	-15.6	11.8	17.5	-78.49	-61.3	-17.19	0-360	150	H
6	38.636504	-66.29	RMS	39	-67	-15.6	11.8	19.6	-78.49	-61.3	-17.19	0-360	150	V
3	38.804289	-66.39	RMS	39	-67.1	-15.6	11.8	19.6	-78.69	-61.3	-17.39	0-360	150	H

RMS - RMS detection

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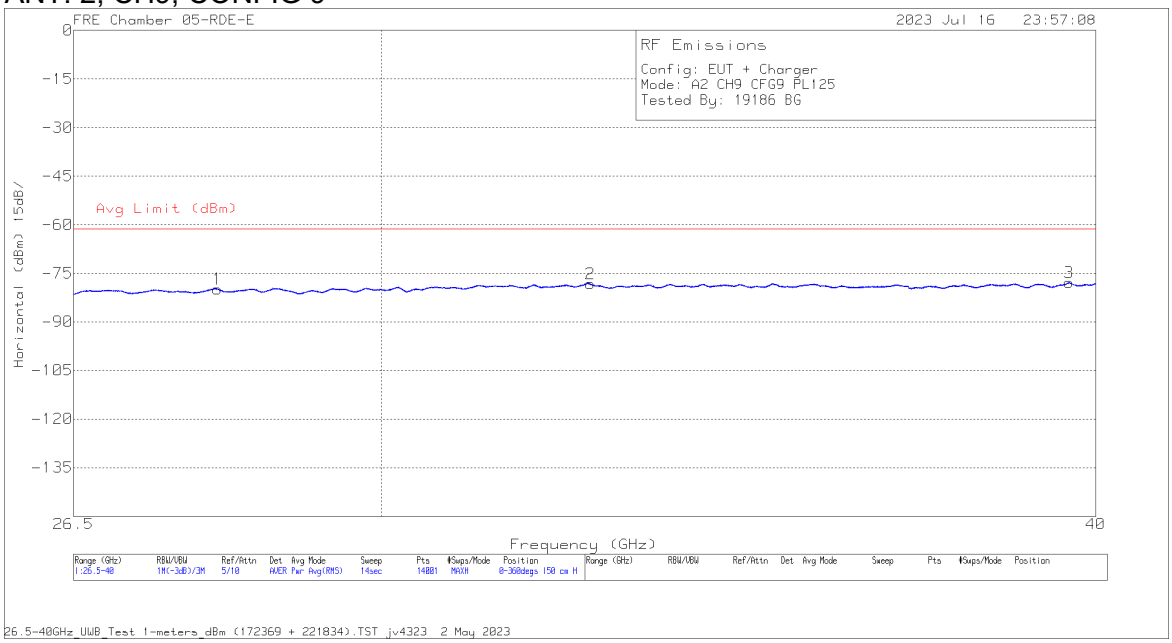

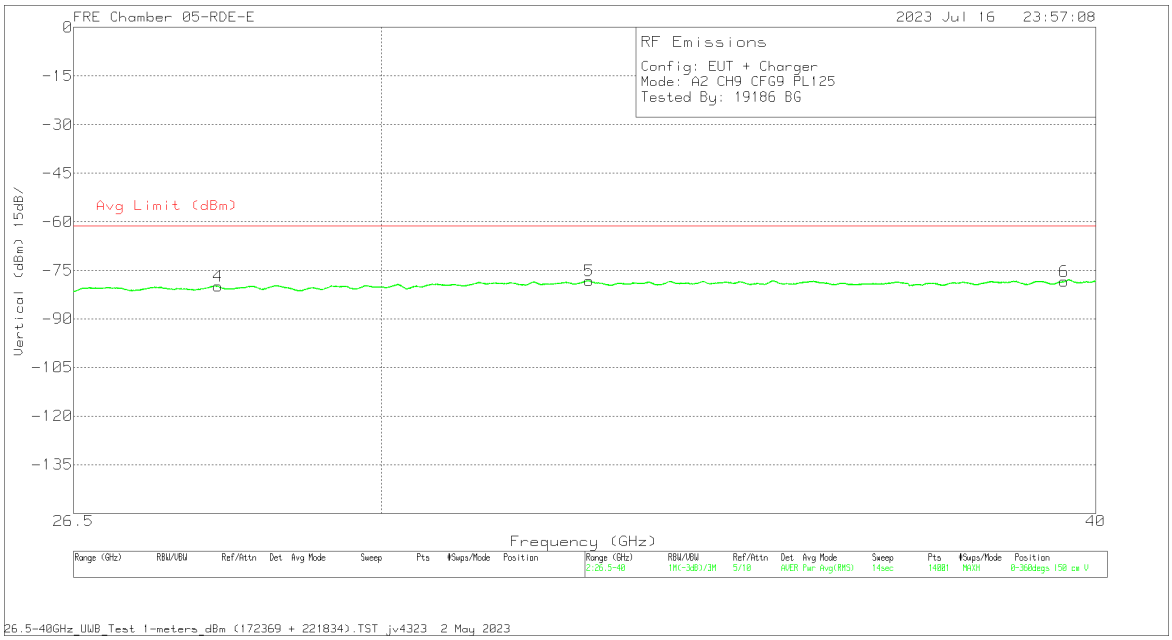

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	172369 1m AF (dB/m)	221834 amp/cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	CBL/SWITCH	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	28.0795	-66.2	RMS	36.3	-62.4	-15.6	11.8	16.3	-79.8	-61.3	-18.5	0-360	150	H
4	28.091072	-66.46	RMS	36.3	-62.3	-15.6	11.8	16.3	-79.96	-61.3	-18.66	0-360	150	V
5	32.61743	-67.71	RMS	37.3	-61.6	-15.6	11.8	17.6	-78.21	-61.3	-16.91	0-360	150	V
2	32.631895	-67.63	RMS	37.3	-61.7	-15.6	11.8	17.6	-78.23	-61.3	-16.93	0-360	150	H
6	39.49279	-66.23	RMS	39.1	-67.3	-15.6	11.8	19.8	-78.43	-61.3	-17.13	0-360	150	V
3	39.572825	-65.82	RMS	39.1	-67.1	-15.6	11.8	19.8	-77.82	-61.3	-16.52	0-360	150	H

RMS - RMS detection

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9.7. AC POWER-LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a) & RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.10 Section 6.2

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

Parent Model
Employee IDs: 25196, 24943
Location: Immunity Test Lab
Test Date: 7/11/23-7/12/23

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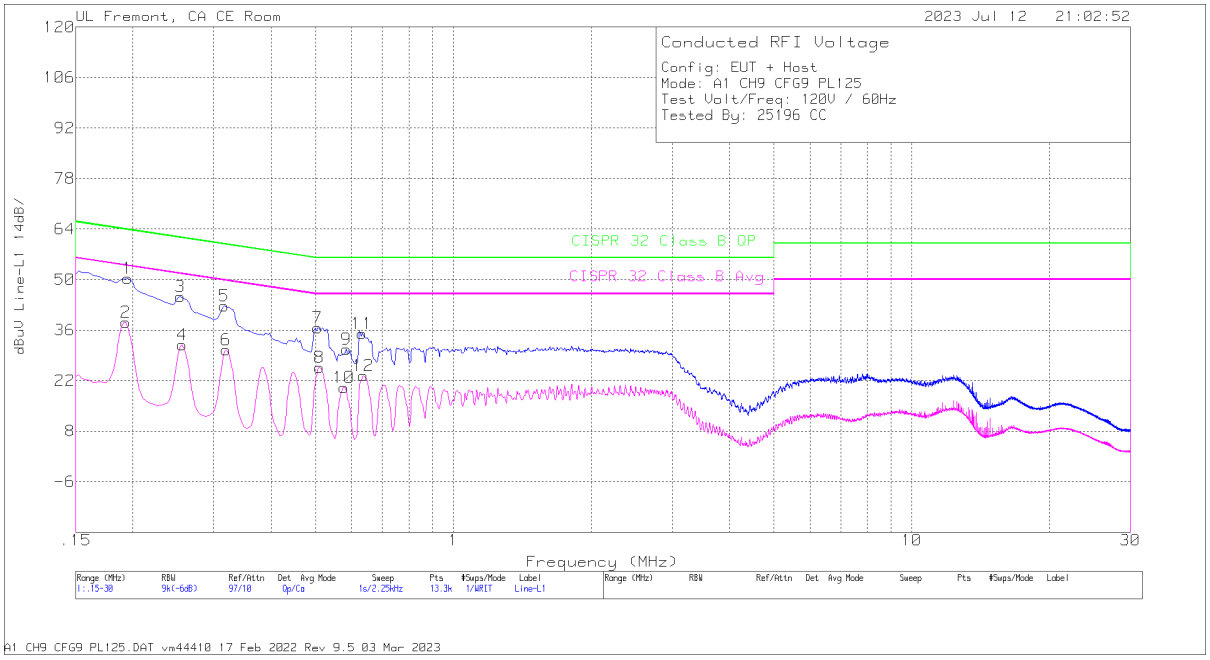
9.7.1. AC Power Line with Laptop

Parent

LINE 1 RESULTS



Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv (dB)	C1&C3 cable path loss (dB)	207996 Limiter with short cable (dB)	Corrected Reading (dBuV)	FCC Part 15 Class B QP (dBuV)	QP Margin (dB)	FCC Part 15 Class B Avg (dBuV)	Av(CISPR) Margin (dB)
2	.1928	28.73	Ca	0	0	9.4	38.13	-	-	53.92	-15.79
4	.2558	22.65	Ca	0	0	9.3	31.95	-	-	51.57	-19.62
6	.3188	21.28	Ca	0	0	9.3	30.58	-	-	49.74	-19.16
8	.51	16.25	Ca	0	.1	9.3	25.65	-	-	46	-20.35
10	.5775	10.72	Ca	0	.1	9.3	20.12	-	-	46	-25.88
12	.636	13.95	Ca	0	.1	9.3	23.35	-	-	46	-22.65
1	.195	40.97	Qp	0	0	9.4	50.37	63.82	-13.45	-	-
3	.2535	35.98	Qp	0	0	9.3	45.28	61.64	-16.36	-	-
5	.3165	33.43	Qp	0	0	9.3	42.73	59.8	-17.07	-	-
7	.5055	27.29	Qp	0	.1	9.3	36.69	56	-19.31	-	-
9	.5843	21.32	Qp	0	.1	9.3	30.72	56	-25.28	-	-
11	.6315	25.7	Qp	0	.1	9.3	35.1	56	-20.9	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

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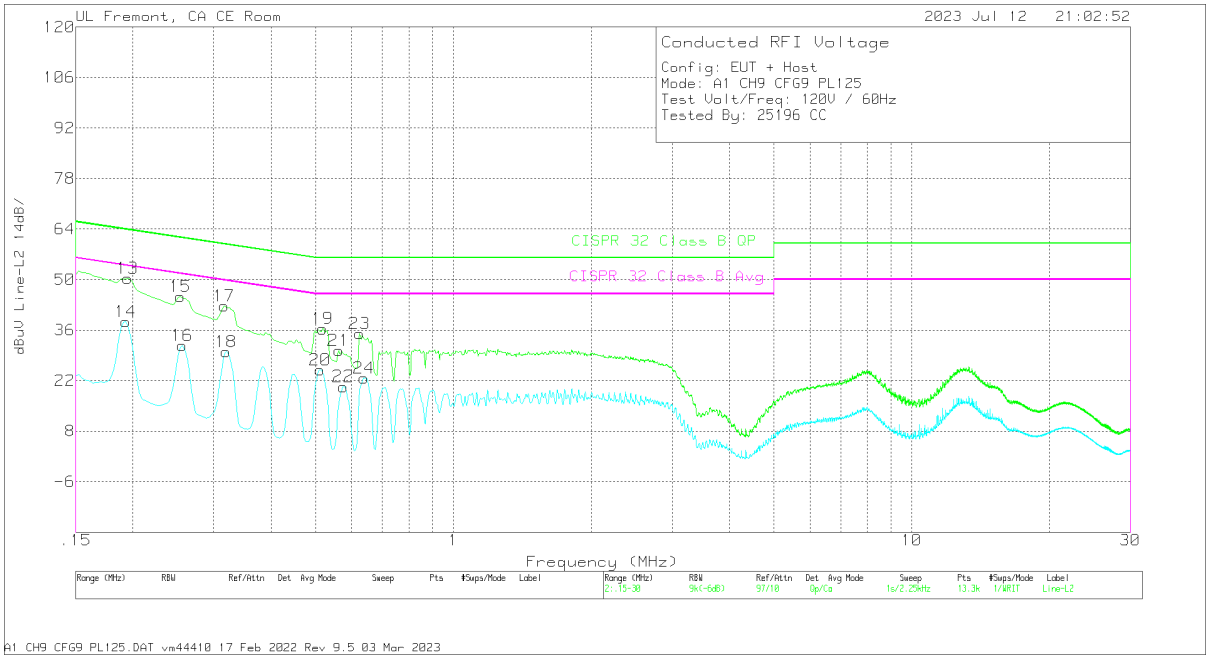
LINE 2 RESULTS



Trace Markers

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv (dB)	C1&C3 cable path loss (dB)	207996 Limiter with short cable (dB)	Corrected Reading (dBuV)	FCC Part 15 Class B QP (dBuV)	QP Margin (dB)	FCC Part 15 Class B Avg (dBuV)	Av(CISPR) Margin (dB)
14	.1928	29.03	Ca	0	0	9.4	38.43	-	-	53.92	-15.49
16	.2558	22.5	Ca	0	0	9.3	31.8	-	-	51.57	-19.77
18	.3188	20.76	Ca	0	0	9.3	30.06	-	-	49.74	-19.68
20	.5123	15.55	Ca	0	.1	9.3	24.95	-	-	46	-21.05
22	.5753	10.96	Ca	0	.1	9.3	20.36	-	-	46	-25.64
24	.6383	13.34	Ca	0	.1	9.3	22.74	-	-	46	-23.26
13	.195	40.94	Qp	0	0	9.4	50.34	63.82	-13.48	-	-
15	.2535	36.03	Qp	0	0	9.3	45.33	61.64	-16.31	-	-
17	.3165	33.37	Qp	0	0	9.3	42.67	59.8	-17.13	-	-
19	.519	26.96	Qp	0	.1	9.3	36.36	56	-19.64	-	-
21	.5618	20.9	Qp	0	.1	9.3	30.3	56	-25.7	-	-
23	.6248	25.69	Qp	0	.1	9.3	35.09	56	-20.91	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

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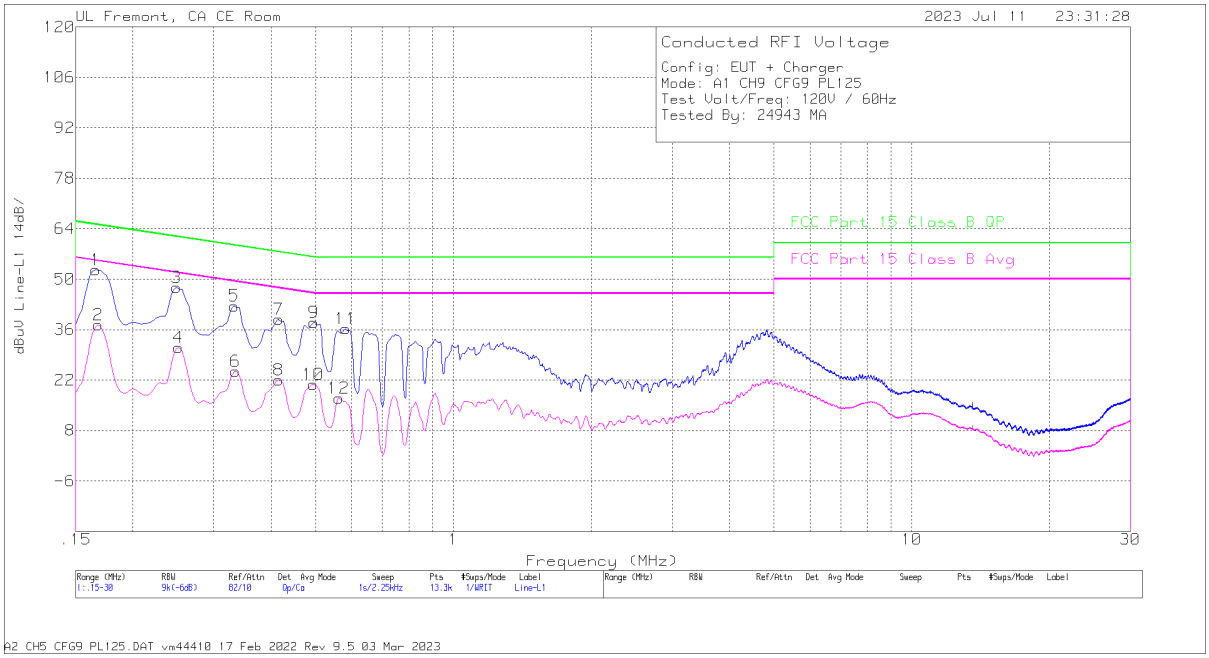
9.7.2. AC Power Line with AC/DC Adapter

Parent

LINE 1 RESULTS



Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv (dB)	C1&C3 cable path loss (dB)	207996 Limiter with short cable (dB)	Corrected Reading (dBuV)	FCC Part 15 Class B QP (dBuV)	QP Margin (dB)	FCC Part 15 Class B Avg (dBuV)	Av(CISPR) Margin (dB)
2	.168	27.94	Ca	0	0	9.4	37.34	-	-	55.06	-17.72
4	.2513	21.7	Ca	0	0	9.3	31	-	-	51.72	-20.72
6	.3345	15.12	Ca	0	0	9.3	24.42	-	-	49.34	-24.92
8	.4155	12.54	Ca	0	.1	9.3	21.94	-	-	47.54	-25.6
10	.4943	11.46	Ca	0	.1	9.3	20.86	-	-	46.1	-25.24
12	.5618	7.64	Ca	0	.1	9.3	17.04	-	-	46	-28.96
1	.1658	43.18	Qp	0	0	9.4	52.58	65.17	-12.59	-	-
3	.249	38.41	Qp	0	0	9.3	47.71	61.79	-14.08	-	-
5	.3323	33.31	Qp	0	0	9.3	42.61	59.39	-16.78	-	-
7	.4155	29.46	Qp	0	.1	9.3	38.86	57.54	-18.68	-	-
9	.4965	28.6	Qp	0	.1	9.3	38	56.06	-18.06	-	-
11	.582	26.82	Qp	0	.1	9.3	36.22	56	-19.78	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

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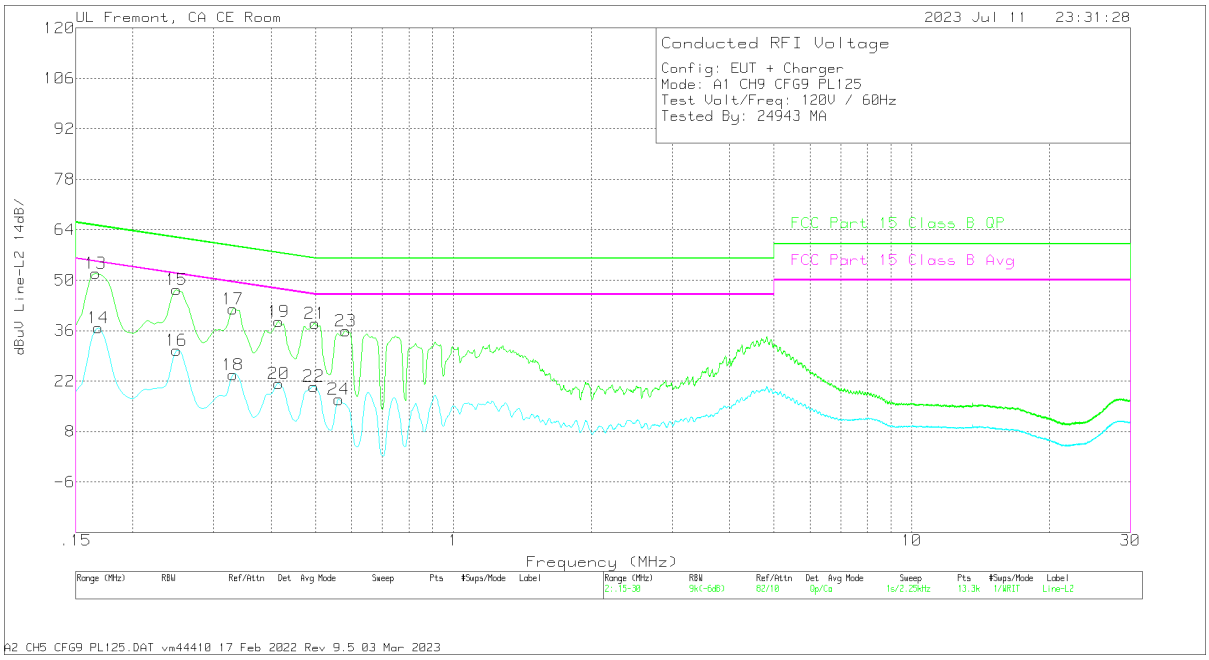
LINE 2 RESULTS



Trace Markers

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv (dB)	C1&C3 cable path loss (dB)	207996 Limiter with short cable (dB)	Corrected Reading (dBuV)	FCC Part 15 Class B QP (dBuV)	QP Margin (dB)	FCC Part 15 Class B Avg (dBuV)	Av(CISPR) Margin (dB)
14	.168	27.4	Ca	0	0	9.4	36.8	-	-	55.06	-18.26
16	.249	21.18	Ca	0	0	9.3	30.48	-	-	51.79	-21.31
18	.33	14.47	Ca	0	0	9.3	23.77	-	-	49.45	-25.68
20	.4155	11.95	Ca	0	.1	9.3	21.35	-	-	47.54	-26.19
22	.4965	11.13	Ca	0	.1	9.3	20.53	-	-	46.06	-25.53
24	.5618	7.49	Ca	0	.1	9.3	16.89	-	-	46	-29.11
13	.1658	42.49	Qp	0	0	9.4	51.89	65.17	-13.28	-	-
15	.249	38.04	Qp	0	0	9.3	47.34	61.79	-14.45	-	-
17	.33	32.65	Qp	0	0	9.3	41.95	59.45	-17.5	-	-
19	.4155	29.05	Qp	0	.1	9.3	38.45	57.54	-19.09	-	-
21	.4988	28.58	Qp	0	.1	9.3	37.98	56.02	-18.04	-	-
23	.582	26.56	Qp	0	.1	9.3	35.96	56	-20.04	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

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10. SETUP PHOTOS

Please refer to 14523772-EP1V1 for setup photos.

END OF REPORT

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