Microtest
微 测 检 测

Test Report

Report No.: MTi230609007-04E1

Date of issue: 2023-06-29

Applicant: Shenzhen Lingdu Auto Electronics Co.,Ltd.

Product: Dashcam

Model(s): M550 Pro, M550, M570, M571, M572, M560, C34

FCC ID: 2ASWV-M550PRO

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com

Instructions

1. This test report shall not be partially reproduced without the written consent of the laboratory.

2. The test results in this test report are only responsible for the samples submitted

3. This test report is invalid without the seal and signature of the laboratory.

4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.

5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Table of contents

Test Result Certification	
Applicant:	Shenzhen Lingdu Auto Electronics Co.,Ltd.
Address:	1807-1808 JinHua Building, No.468 Minzhi Avenue, Longhua District,
Manufacturer:	Dongguan Lingdu Electronics Technology Co., Ltd.
Address:	No.1, Longcheng Road, Xiekeng Village Committee, Qingxi Town, Dongguan, Guangdong, China.
Product description	
Product name:	Dashcam
Trade mark:	N/A
Model name:	M550 Pro
Series Model:	M550,M570,M571,M572,M560,C34
Standards:	47 CFR Part 15.247
Test method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02
Date of Test	
Date of test:	2023-06-20 to 2023-06-25
Test result:	Pass

Test Engineer	:	Letter. Lan.
		(Letter)
Reviewed By	:	Leon chen
		(Leon)
Approved By	:	Tom Xue
		(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	Dashcam
Model name:	M550 Pro
Series Model:	M550,M570,M571,M572,M560,C34
Model difference:	All the models are the same circuit and module, except the model name and appearance, antenna position.
Accessories:	Cable: 1.Car charger cable(3.5m) 2. Video cable(6m) Car charger manufacturer: XINHUICHEN, OUTPUT 5V 2.5A, Input 12V-24V
Electrical rating:	Input: 5V2.5A
Hardware version:	V1.0
Software version:	2023-4-17_1.0.0
Test sample(s) number:	MTi230609007-04S1001
RF specification	
Operating frequency range:	802.11b/g/n(HT20): 2412MHz to 2462MHz; 802.11n(HT40): 2422MHz to 2452MHz
Channel number:	802.11b/g/n(HT20): 11 Channels; 802.11n(HT40): 7 Channels
Modulation type:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n(HT20 and HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna(s) type:	FPC antenna
Antenna(s) gain:	2 dBi

1.2 Description of test modes

All the test modes were carried out with the EUT in normal operation, the final test mode of the EUT was the worst test mode for emission test, which was shown in this report and defined as:

No.	Emission test modes
Mode1	802.11b mode
Mode2	802.11g mode
Mode3	802.11n(HT20) mode
Mode4	802.11n(HT40) mode

1.3 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	/	

Note: The test software has been used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Test Software:	FCC ASSIST 1.1.5		
802.11b		**802.11g**	
Channel	Power setting	Channel	Power setting
1	32	1	32
6	32	6	32
11	32	11	32
802.11n (HT20)		**802.11n (HT40)**	
Channel	Power setting	Channel	Power setting
1	32	1	32
6	32	6	32
11	32	11	32

1.4 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

1.5 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list			
Description	Model	Serial No.	Manufacturer
Accumulator	6-QW-45(370)-L	/	Camel Group Co., Ltd.
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.6 Measurement uncertainty

Parameter	Measurement uncertainty
AC power line conducted emission (9 kHz~30 MHz)	±2.5 dB
Occupied Bandwidth	±3 %
Conducted RF output power	±0.16 dB
Conducted spurious emissions	±0.21 dB
Radiated emission (9 kHz ~ 30 MHz)	±4.0 dB
Radiated emission (30 MHz~1 GHz)	±4.2 dB
Radiated emission (above 1 GHz)	±4.3 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2 Summary of Test Result

No.	FCC reference	Description of test	Result
1	§ 15.203	Antenna requirement	Pass
2	§ 15.207	AC power line conducted emissions	N/A
3	§ 15.247(d)	Radiated spurious emissions	Pass
4	15.247(a)(2)	DTS bandwidth	Pass
5	15.247(b)(3)	Maximum conducted output power	Pass
6	15.247(e)	Power Spectral Density	Pass
7	15.247(d)	Band edge (Conducted)	Pass
8	15.247(d)	Conducted spurious emissions	Pass
9	/	Duty Cycle	Pass

Notes:

N/A means not applicable.
Note: The device is a DC power supply and does not apply to conducted emissions.

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Occupied Bandwidth						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Maximum Conducted Output Power						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Power Spectral Density						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Unwanted emission						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Band edge emissions (Radiated)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-05-26	2024-05-25
3	Amplifier	Agilent	8449B	3008A01120	2023-05-26	2024-05-25
4	Multi-device Controller	TuoPu	TPMDC	/	/	/
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-05-05	2024-05-04
Emissions in frequency bands (below 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-26	2024-04-25
4	Multi-device Controller	TuoPu	TPMDC	/	/	/
5	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2021/05/30	2024/05/29
Emissions in frequency bands (above 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-05-26	2024-05-25
3	Amplifier	Agilent	8449B	3008A01120	2023-05-26	2024-05-25
4	Multi-device Controller	TuoPu	TPMDC	/	/	/
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-05-05	2024-05-04

5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.
Description of the antenna of EUT:	The antenna of the EUT is permanently attached.
Conclusion:	The EUT complies with the requirement of FCC PART 15.203.

6 Radio Spectrum Matter Test Results (RF)

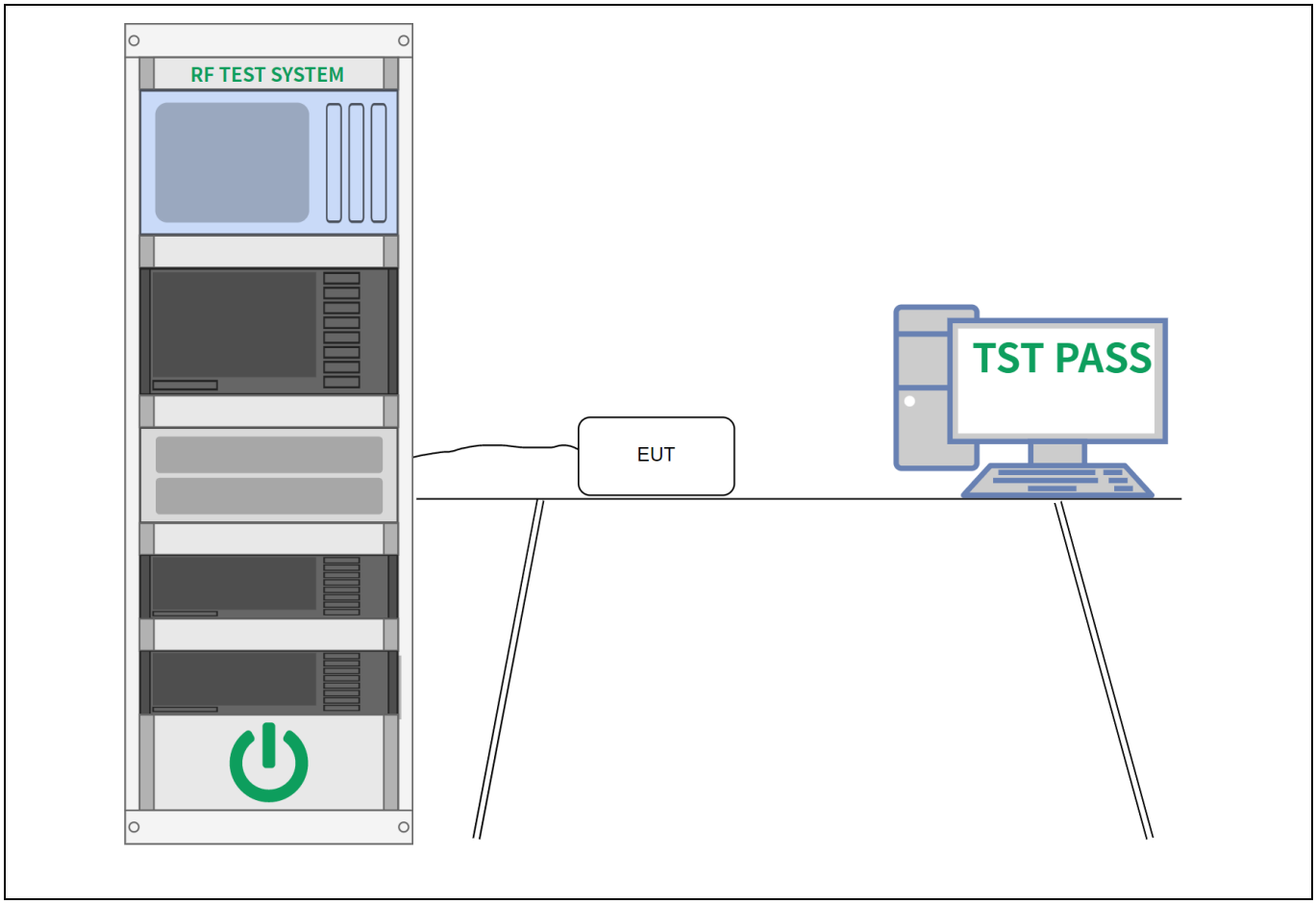
6.1 Occupied Bandwidth

Test Requirement:	Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Limit:	Section (a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	DTS bandwidth
Procedure:	a) Set RBW = 100 kHz. b) Set the VBW >= [3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	58 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

Please Refer to Appendix for Details.

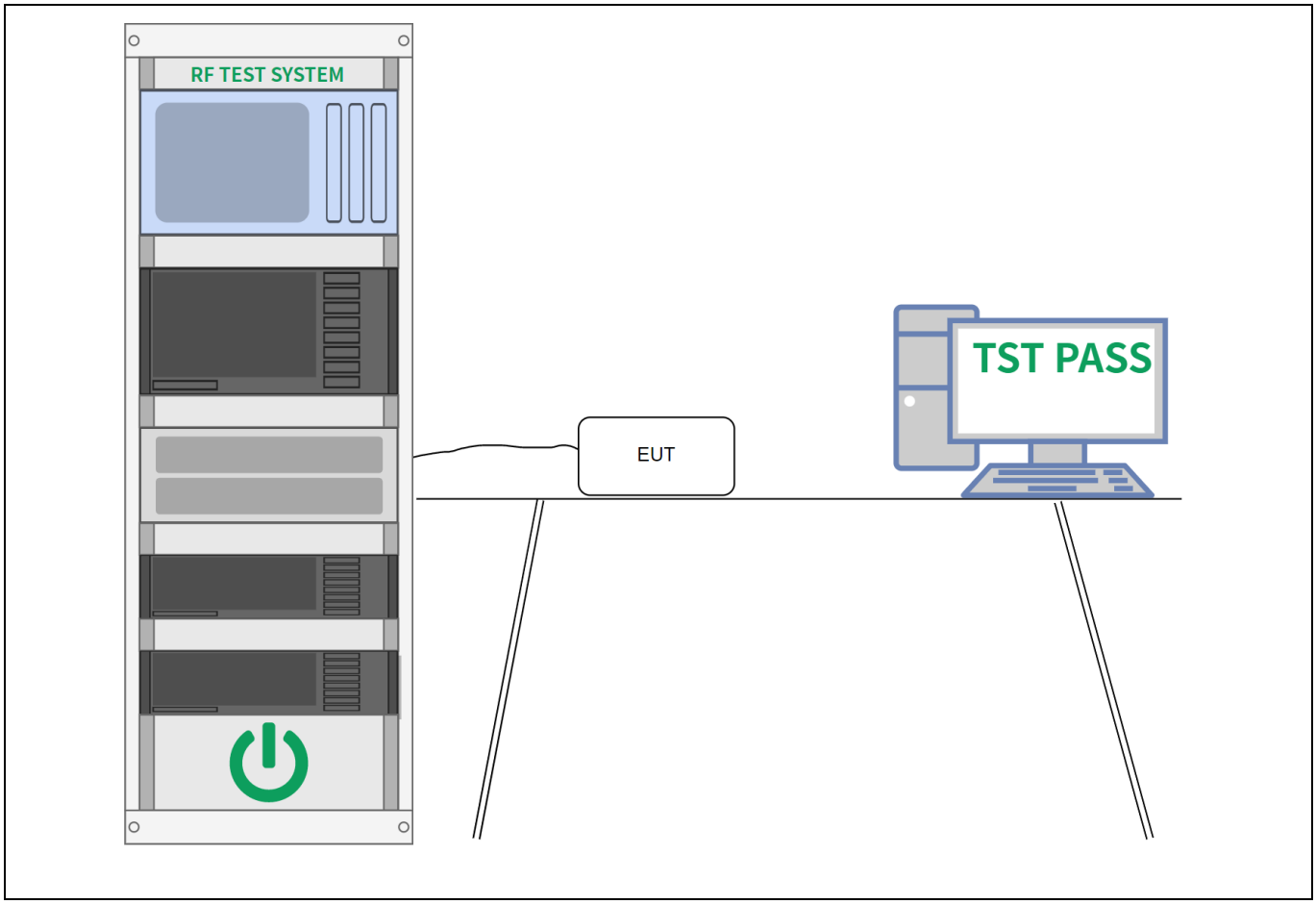
6.2 Maximum Conducted Output Power

Test Requirement:	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test Limit:	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test Method:	Maximum peak conducted output power
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power

6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	58 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

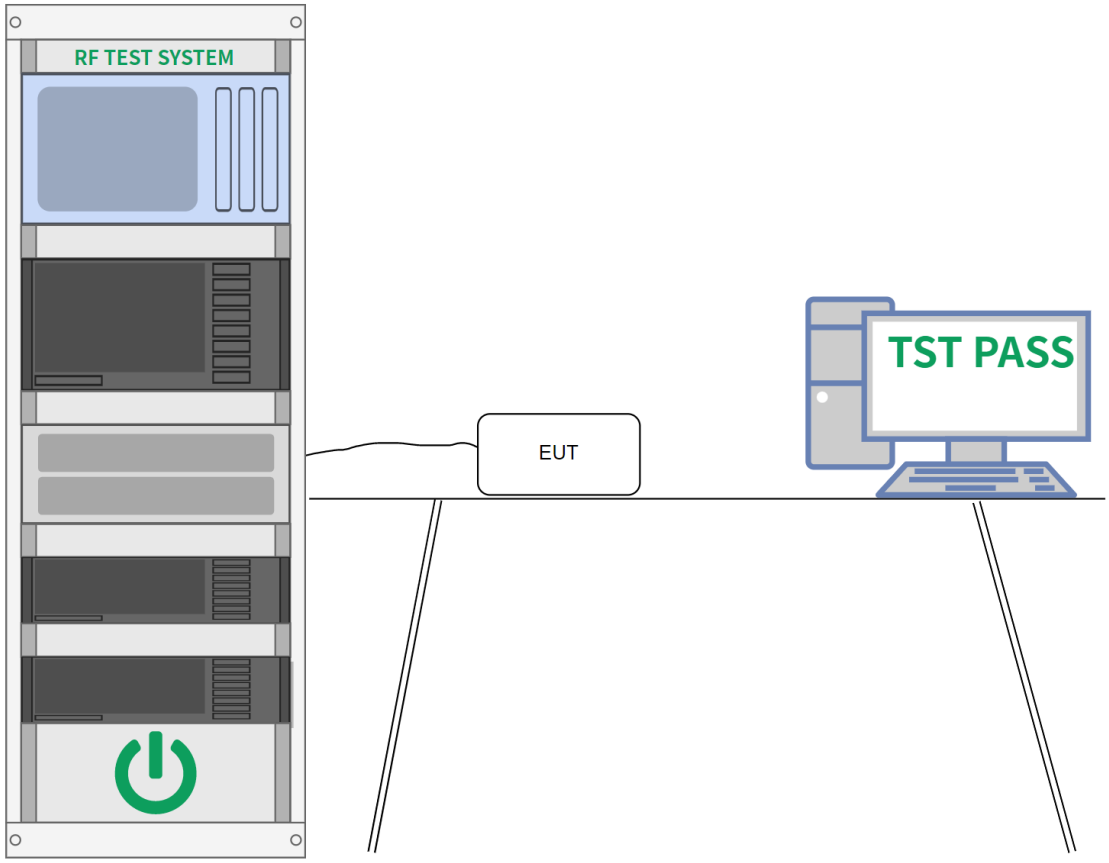
6.3 Power Spectral Density

Test Requirement:	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Limit:	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Method:	Maximum power spectral density level in the fundamental emission

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	58 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

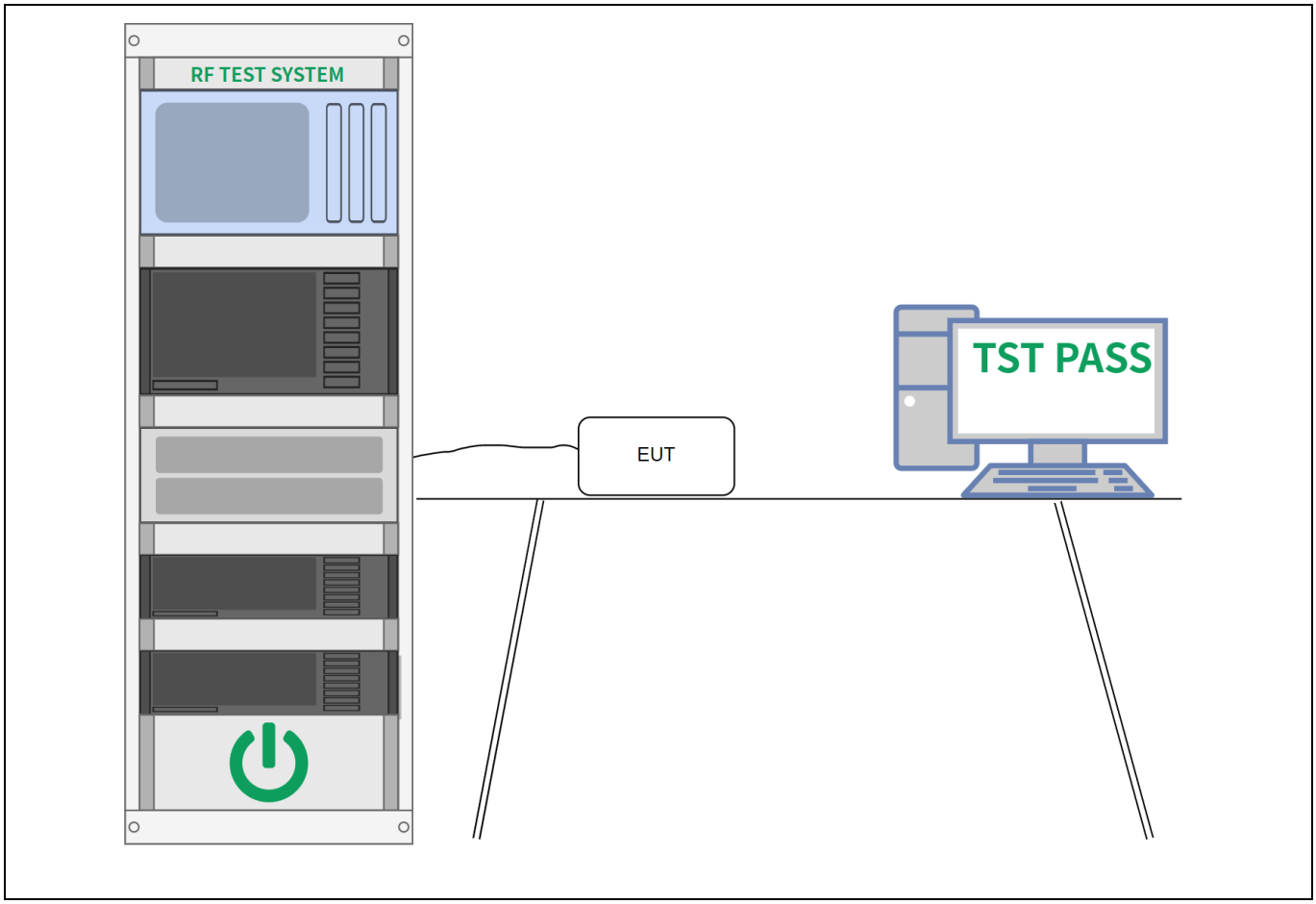
6.4 RF conducted spurious emissions and band edge measurement

Test Requirement:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required.
Test Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required.
Test Method:	Emissions in frequency bands
Procedure:	ANSI C63.10-2013 Section 11.11.1, Section 11.11.2, Section 11.11.3

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	58 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

6.5 Band edge emissions (Radiated)

<table>
<tr><td>Test Requirement:</td><td>In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`</td></tr>
<tr><td>Test Limit:</td><td>
<table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g.,
§§ 15.231 and 15.241.
</td></tr>
<tr><td>Test Method:</td><td>Radiated emissions tests</td></tr>
<tr><td>Procedure:</td><td>ANSI C63.10-2013 section 6.10</td></tr>
</table>

6.5.1 E.U.T. Operation:

<table>
<tr><td colspan="6">Operating Environment:</td></tr>
<tr><td>Temperature:</td><td>27 °C</td><td>Humidity:</td><td>51 %</td><td>Atmospheric Pressure:</td><td>101 kPa</td></tr>
<tr><td colspan="2">Pre test mode:</td><td colspan="4">Mode1, Mode2, Mode3, Mode4</td></tr>
<tr><td colspan="2">Final test mode:</td><td colspan="4">Mode1, Mode2, Mode3, Mode4</td></tr>
<tr><td colspan="6">Note: All other emissions are attenuated 20dB below the limit, so does not recorded</td></tr>
</table>

6.5.2 Test Data:

M550 Pro:

Mode4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	45.36	-8.08	37.28	74.00	-36.72	peak
2		2310.000	35.25	-8.08	27.17	54.00	-26.83	AVG
3		2390.000	59.67	-7.71	51.96	74.00	-22.04	peak
4	*	2390.000	40.74	-7.71	33.03	54.00	-20.97	AVG

Mode4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	43.94	-8.08	35.86	74.00	-38.14	peak
2		2310.000	33.35	-8.08	25.27	54.00	-28.73	AVG
3		2390.000	54.74	-7.71	47.03	74.00	-26.97	peak
4	*	2390.000	37.04	-7.71	29.33	54.00	-24.67	AVG

Mode4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	57.97	-7.24	50.73	74.00	-23.27	peak
2	*	2483.500	41.62	-7.24	34.38	54.00	-19.62	AVG
3		2500.000	49.22	-7.17	42.05	74.00	-31.95	peak
4		2500.000	38.91	-7.17	31.74	54.00	-22.26	AVG

Mode4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	63.16	-7.24	55.92	74.00	-18.08	peak
2	*	2483.500	45.13	-7.24	37.89	54.00	-16.11	AVG
3		2500.000	52.40	-7.17	45.23	74.00	-28.77	peak
4		2500.000	40.27	-7.17	33.10	54.00	-20.90	AVG

C34:

Mode4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	51.61	-8.08	43.53	74.00	-30.47	peak
2		2310.000	40.34	-8.08	32.26	54.00	-21.74	AVG
3		2390.000	53.57	-7.71	45.86	74.00	-28.14	peak
4	*	2390.000	43.93	-7.71	36.22	54.00	-17.78	AVG

Mode4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	50.30	-8.08	42.22	74.00	-31.78	peak
2		2310.000	40.51	-8.08	32.43	54.00	-21.57	AVG
3		2390.000	60.76	-7.71	53.05	74.00	-20.95	peak
4	*	2390.000	46.95	-7.71	39.24	54.00	-14.76	AVG

Mode4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	53.52	-7.24	46.28	74.00	-27.72	peak
2	*	2483.500	45.24	-7.24	38.00	54.00	-16.00	AVG
3		2500.000	52.29	-7.17	45.12	74.00	-28.88	peak
4		2500.000	43.42	-7.17	36.25	54.00	-17.75	AVG

Mode4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	60.63	-7.24	53.39	74.00	-20.61	peak
2	*	2483.500	46.85	-7.24	39.61	54.00	-14.39	AVG
3		2500.000	52.18	-7.17	45.01	74.00	-28.99	peak
4		2500.000	41.72	-7.17	34.55	54.00	-19.45	AVG

6.6 Unwanted emission (below 1GHz)

Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`
Test Limit:	<table><tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr><tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr><tr><td>1.705-30.0</td><td>30</td><td>30</td></tr><tr><td>30-88</td><td>100 **</td><td>3</td></tr><tr><td>88-216</td><td>150 **</td><td>3</td></tr><tr><td>216-960</td><td>200 **</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>3</td></tr></table> ** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
Test Method:	Radiated emissions tests
Procedure:	ANSI C63.10-2013 section 6.6.4

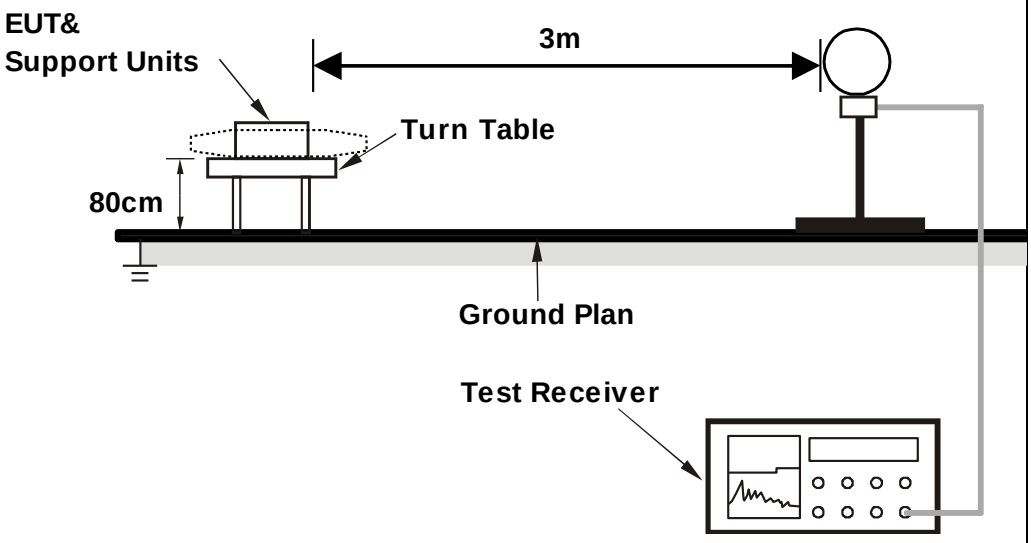
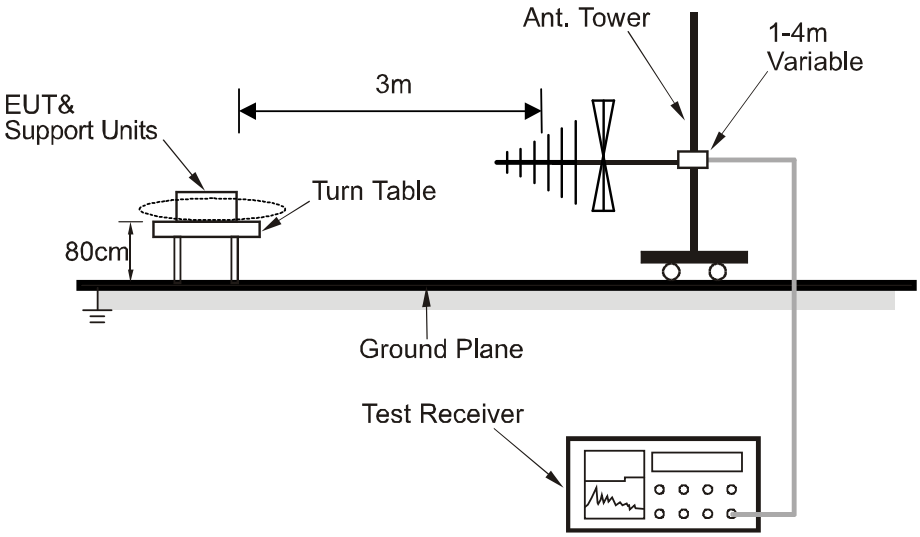
6.6.1 E.U.T. Operation:

Operating Environment:					
Temperature:	27 °C	Humidity:	49 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1				

Note:

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

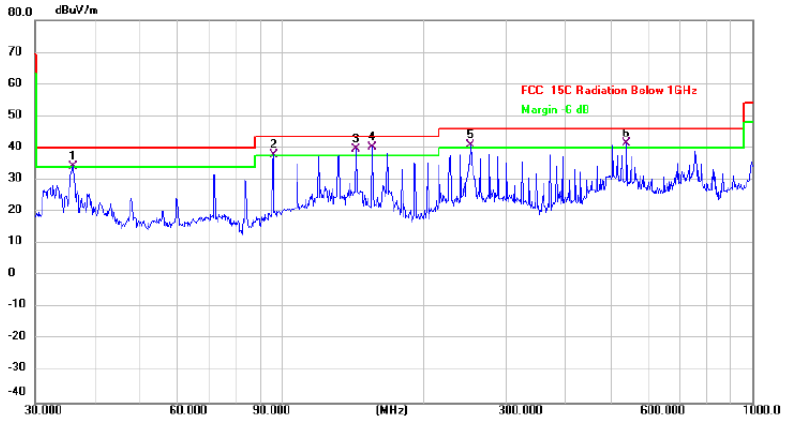
All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.

Test setup:	Below 30MHz  30MHz~1GHz  For the actual test configuration, please refer to the related item – Photographs of the test setup.

6.6.2 Test Data:

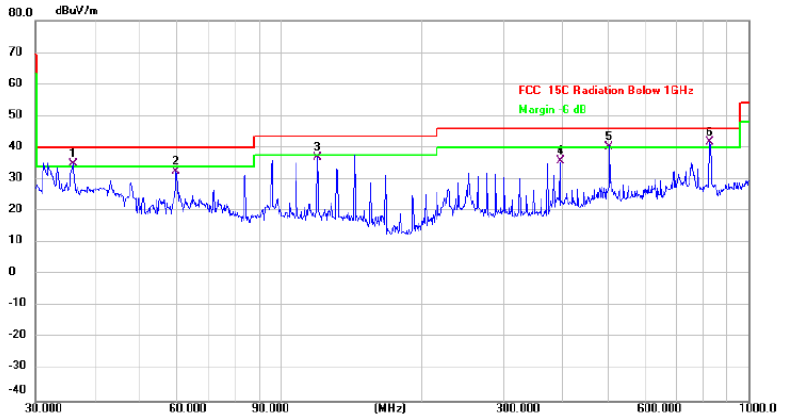
M550 Pro:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	!	36.0007	41.90	-7.60	34.30	40.00	-5.70	QP	
2	!	96.0986	46.08	-8.13	37.95	43.50	-5.55	QP	
3	!	143.8295	50.83	-11.28	39.55	43.50	-3.95	QP	
4	*	155.9101	51.01	-10.83	40.18	43.50	-3.32	QP	
5	!	252.0627	48.64	-7.88	40.76	46.00	-5.24	QP	
6	!	541.3725	46.61	-5.14	41.47	46.00	-4.53	QP	

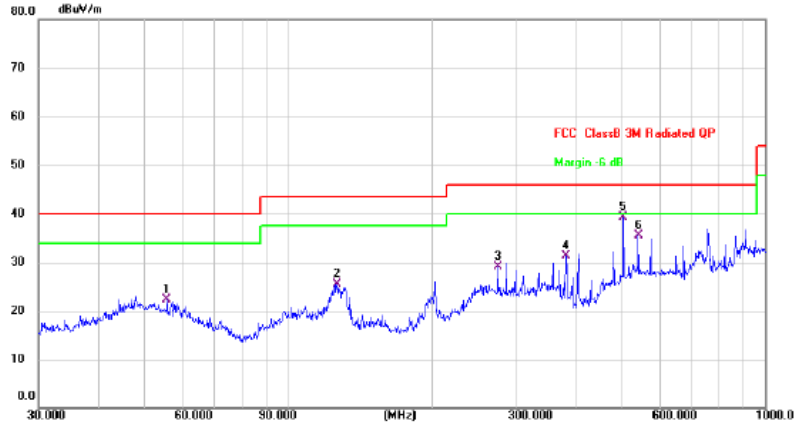
Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	!	36.0007	42.32	-7.60	34.72	40.00	-5.28	QP	
2		59.8588	39.17	-6.73	32.44	40.00	-7.56	QP	
3		119.8556	47.01	-10.20	36.81	43.50	-6.69	QP	
4		396.2415	39.84	-4.24	35.60	46.00	-10.40	QP	
5	!	504.7062	43.61	-3.21	40.40	46.00	-5.60	QP	
6	*	827.4934	39.15	2.48	41.63	46.00	-4.37	QP	

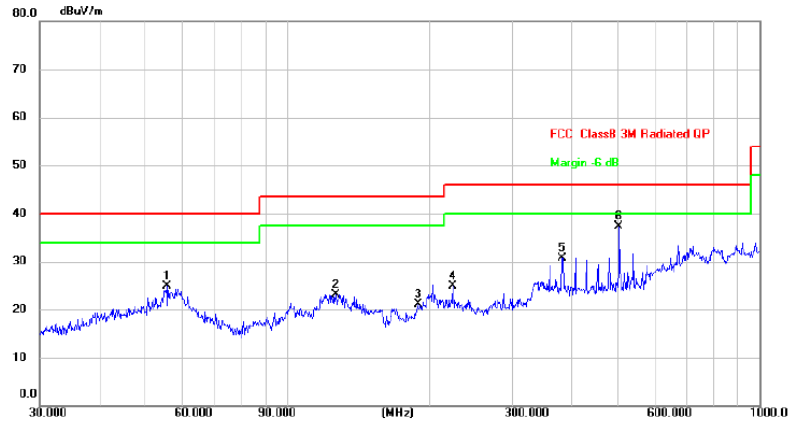
C34:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L



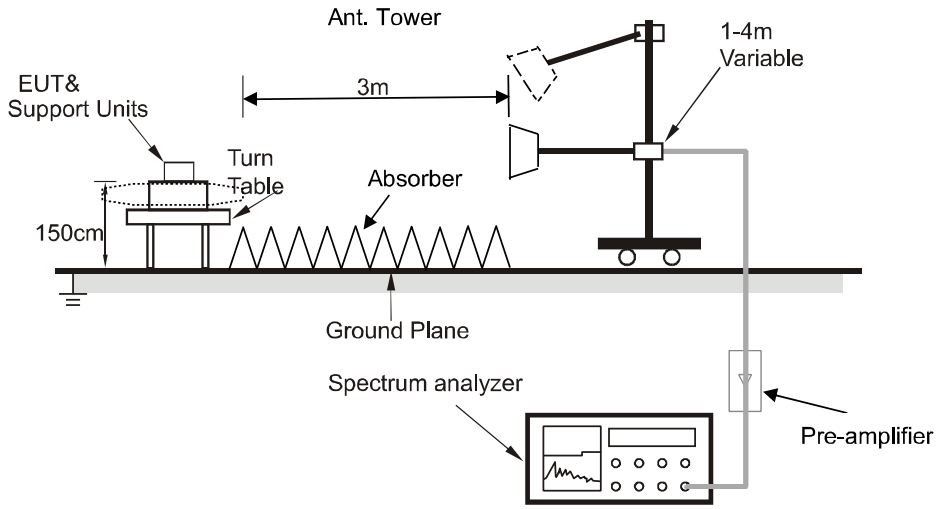
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		55.8046	29.15	-6.84	22.31	40.00	-17.69	QP	
2		126.7723	35.23	-9.64	25.59	43.50	-17.91	QP	
3		275.1569	33.90	-4.77	29.13	46.00	-16.87	QP	
4		382.5878	33.67	-2.43	31.24	46.00	-14.76	QP	
5	*	504.7062	39.14	0.19	39.33	46.00	-6.67	QP	
6		541.3723	34.25	1.21	35.46	46.00	-10.54	QP	

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		55.6092	31.65	-6.81	24.84	40.00	-15.16	QP	
2		126.7723	32.73	-9.64	23.09	43.50	-20.41	QP	
3		189.0741	28.90	-7.70	21.20	43.50	-22.30	QP	
4		224.5192	30.88	-5.88	25.00	46.00	-21.00	QP	
5		382.5878	33.21	-2.43	30.78	46.00	-15.22	QP	
6	*	504.7062	37.06	0.19	37.25	46.00	-8.75	QP	

6.7 Unwanted emission (above 1GHz)

Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`
Test Limit:	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 Above 960 / 500 / 3 ** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
Test Method:	Radiated emissions tests
Procedure:	ANSI C63.10-2013 section 6.6.4
Test setup:	Above 1GHz  For the actual test configuration, please refer to the related item – Photographs of the test setup.

6.7.1 E.U.T. Operation:

Operating Environment:					
Temperature:	27 °C	Humidity:	50 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

Note: Test frequency are from 1GHz to 25GHz, the amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.
All modes of operation of the EUT were investigated, and only the worst-case results are reported.

6.7.2 Test Data:

M550 Pro:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4824.000	42.08	0.82	42.90	74.00	-31.10	peak
2		4824.000	35.75	0.82	36.57	54.00	-17.43	AVG
3		7236.000	40.02	6.00	46.02	74.00	-27.98	peak
4		7236.000	33.82	6.00	39.82	54.00	-14.18	AVG
5		9648.000	41.21	6.17	47.38	74.00	-26.62	peak
6	*	9648.000	34.92	6.17	41.09	54.00	-12.91	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4824.000	42.03	0.82	42.85	74.00	-31.15	peak
2		4824.000	35.51	0.82	36.33	54.00	-17.67	AVG
3		7236.000	39.89	6.00	45.89	74.00	-28.11	peak
4		7236.000	33.62	6.00	39.62	54.00	-14.38	AVG
5		9648.000	41.69	6.17	47.86	74.00	-26.14	peak
6	*	9648.000	35.40	6.17	41.57	54.00	-12.43	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4874.000	41.29	1.01	42.30	74.00	-31.70	peak
2		4874.000	35.22	1.01	36.23	54.00	-17.77	AVG
3		7311.000	39.84	5.94	45.78	74.00	-28.22	peak
4		7311.000	33.20	5.94	39.14	54.00	-14.86	AVG
5		9748.000	40.37	6.54	46.91	74.00	-27.09	peak
6	*	9748.000	33.52	6.54	40.06	54.00	-13.94	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4874.000	41.28	1.01	42.29	74.00	-31.71	peak
2		4874.000	35.02	1.01	36.03	54.00	-17.97	AVG
3		7311.000	39.93	5.94	45.87	74.00	-28.13	peak
4		7311.000	33.80	5.94	39.74	54.00	-14.26	AVG
5		9748.000	41.23	6.54	47.77	74.00	-26.23	peak
6	*	9748.000	34.51	6.54	41.05	54.00	-12.95	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4924.000	41.97	1.27	43.24	74.00	-30.76	peak
2		4924.000	35.27	1.27	36.54	54.00	-17.46	AVG
3		7386.000	40.69	5.86	46.55	74.00	-27.45	peak
4		7386.000	34.66	5.86	40.52	54.00	-13.48	AVG
5		9848.000	42.18	6.31	48.49	74.00	-25.51	peak
6	*	9848.000	35.84	6.31	42.15	54.00	-11.85	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4924.000	41.83	1.27	43.10	74.00	-30.90	peak
2		4924.000	34.75	1.27	36.02	54.00	-17.98	AVG
3		7386.000	41.02	5.86	46.88	74.00	-27.12	peak
4		7386.000	34.79	5.86	40.65	54.00	-13.35	AVG
5		9848.000	41.36	6.31	47.67	74.00	-26.33	peak
6	*	9848.000	35.06	6.31	41.37	54.00	-12.63	AVG

M550 Pro:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4824.000	39.69	0.82	40.51	74.00	-33.49	peak
2		4824.000	33.43	0.82	34.25	54.00	-19.75	AVG
3		7236.000	40.31	6.00	46.31	74.00	-27.69	peak
4		7236.000	34.13	6.00	40.13	54.00	-13.87	AVG
5		9648.000	41.33	6.17	47.50	74.00	-26.50	peak
6	*	9648.000	35.05	6.17	41.22	54.00	-12.78	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4824.000	42.09	0.82	42.91	74.00	-31.09	peak
2		4824.000	35.63	0.82	36.45	54.00	-17.55	AVG
3		7236.000	40.23	6.00	46.23	74.00	-27.77	peak
4		7236.000	34.12	6.00	40.12	54.00	-13.88	AVG
5		9648.000	41.34	6.17	47.51	74.00	-26.49	peak
6	*	9648.000	35.12	6.17	41.29	54.00	-12.71	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4874.000	43.01	1.01	44.02	74.00	-29.98	peak
2		4874.000	37.09	1.01	38.10	54.00	-15.90	AVG
3		7311.000	40.19	5.94	46.13	74.00	-27.87	peak
4		7311.000	34.11	5.94	40.05	54.00	-13.95	AVG
5		9748.000	40.62	6.54	47.16	74.00	-26.84	peak
6	*	9748.000	34.57	6.54	41.11	54.00	-12.89	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4874.000	42.65	1.01	43.66	74.00	-30.34	peak
2		4874.000	36.31	1.01	37.32	54.00	-16.68	AVG
3		7311.000	40.91	5.94	46.85	74.00	-27.15	peak
4		7311.000	34.53	5.94	40.47	54.00	-13.53	AVG
5		9748.000	40.68	6.54	47.22	74.00	-26.78	peak
6	*	9748.000	34.61	6.54	41.15	54.00	-12.85	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4924.000	42.18	1.27	43.45	74.00	-30.55	peak
2		4924.000	36.02	1.27	37.29	54.00	-16.71	AVG
3		7386.000	40.37	5.86	46.23	74.00	-27.77	peak
4		7386.000	34.28	5.86	40.14	54.00	-13.86	AVG
5		9848.000	41.41	6.31	47.72	74.00	-26.28	peak
6	*	9848.000	34.98	6.31	41.29	54.00	-12.71	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4924.000	43.40	1.27	44.67	74.00	-29.33	peak
2		4924.000	37.07	1.27	38.34	54.00	-15.66	AVG
3		7386.000	40.81	5.86	46.67	74.00	-27.33	peak
4		7386.000	34.55	5.86	40.41	54.00	-13.59	AVG
5		9848.000	41.27	6.31	47.58	74.00	-26.42	peak
6	*	9848.000	34.92	6.31	41.23	54.00	-12.77	AVG

Appendix

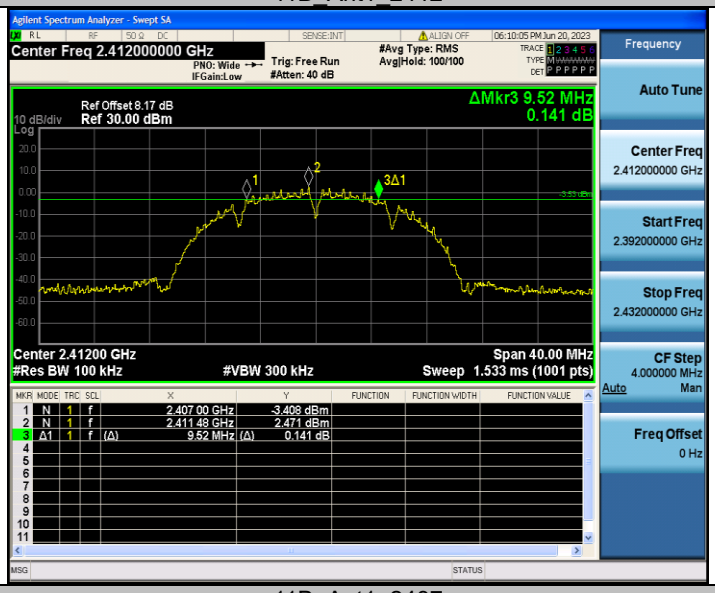
Appendix A: DTS Bandwidth

Test Result

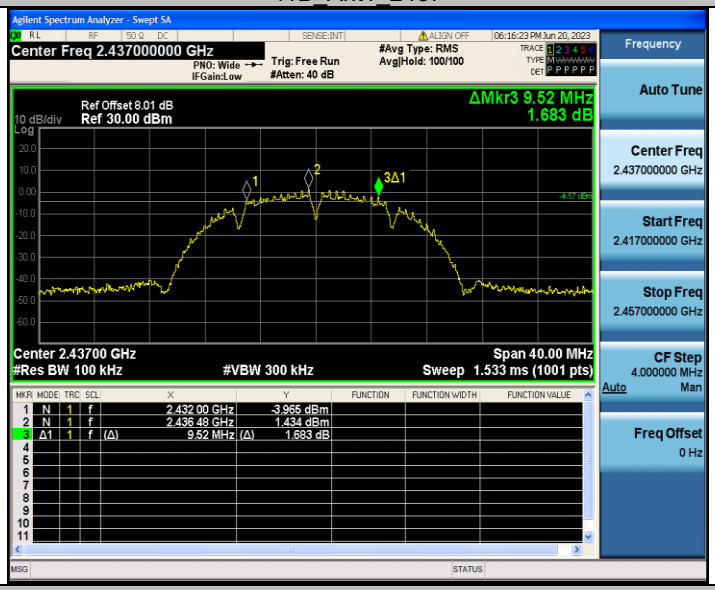
Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	9.520	0.5	PASS
		2437	9.520	0.5	PASS
		2462	9.760	0.5	PASS
11G	Ant1	2412	16.320	0.5	PASS
		2437	16.320	0.5	PASS
		2462	16.400	0.5	PASS
11N20SISO	Ant1	2412	16.920	0.5	PASS
		2437	17.560	0.5	PASS
		2462	16.680	0.5	PASS
11N40SISO	Ant1	2422	35.040	0.5	PASS
		2437	36.320	0.5	PASS
		2452	35.920	0.5	PASS

Test Graphs

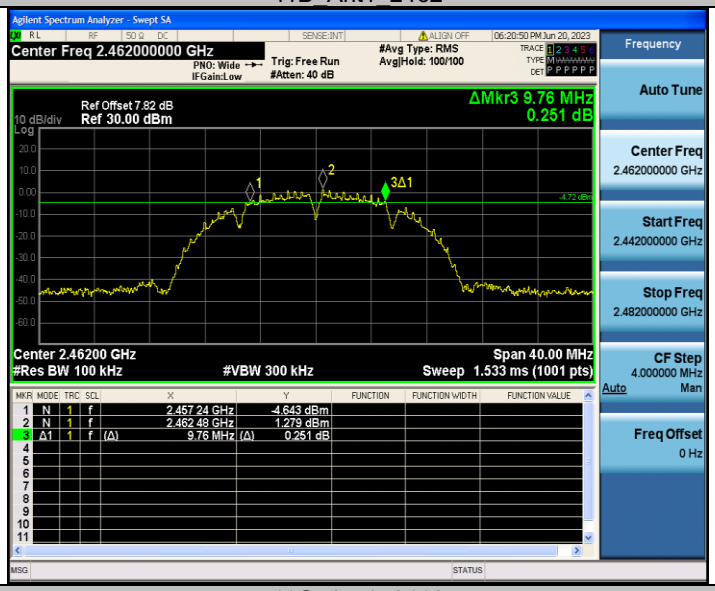
11B_Ant1_2412



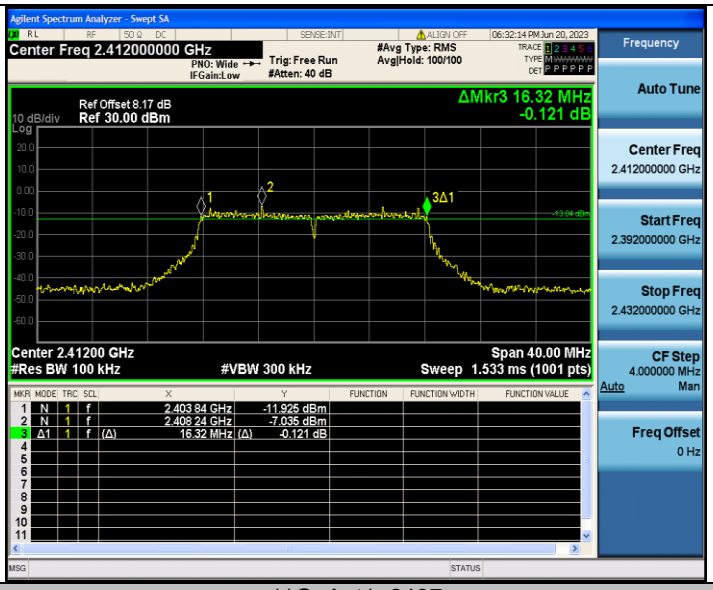
11B_Ant1_2437



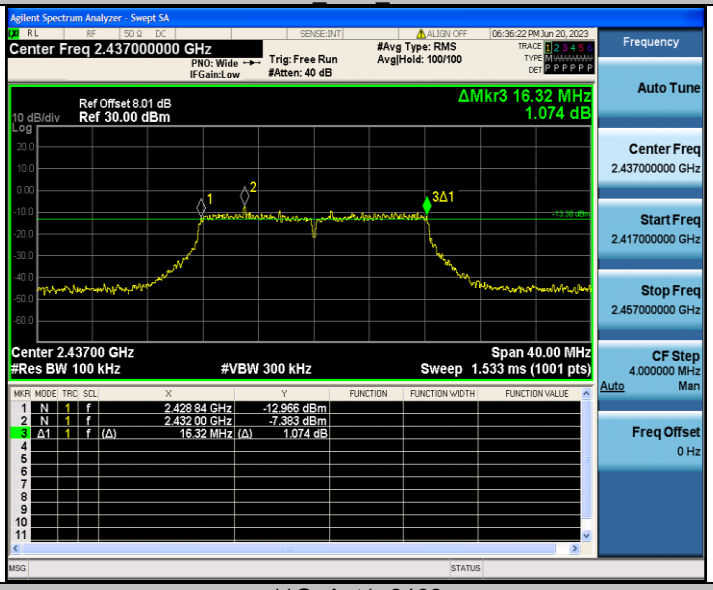
11B_Ant1_2462



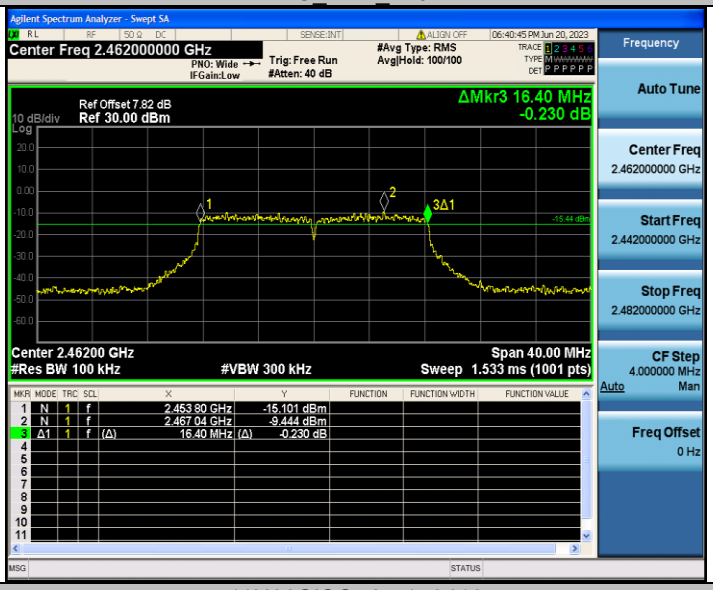
11G_Ant1_2412



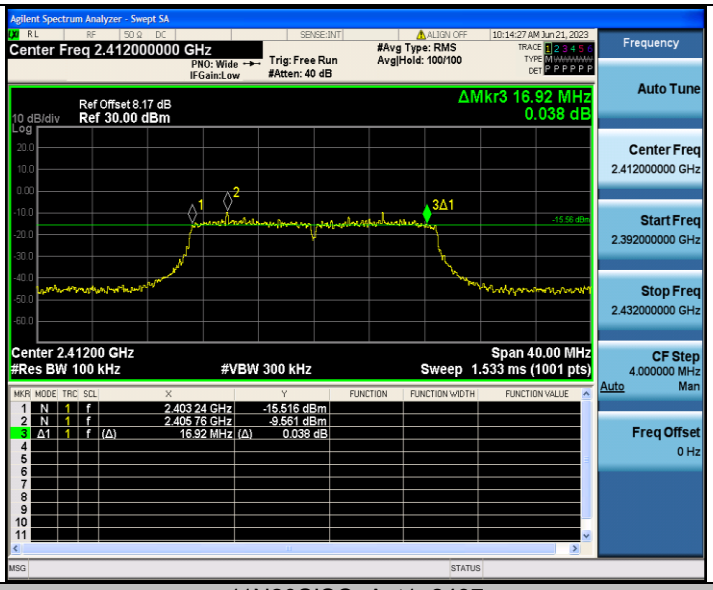
11G_Ant1_2437



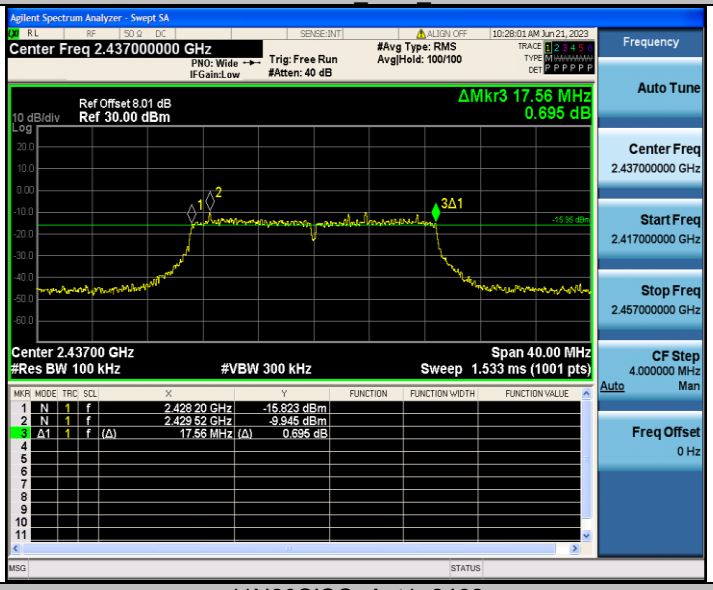
11G_Ant1_2462



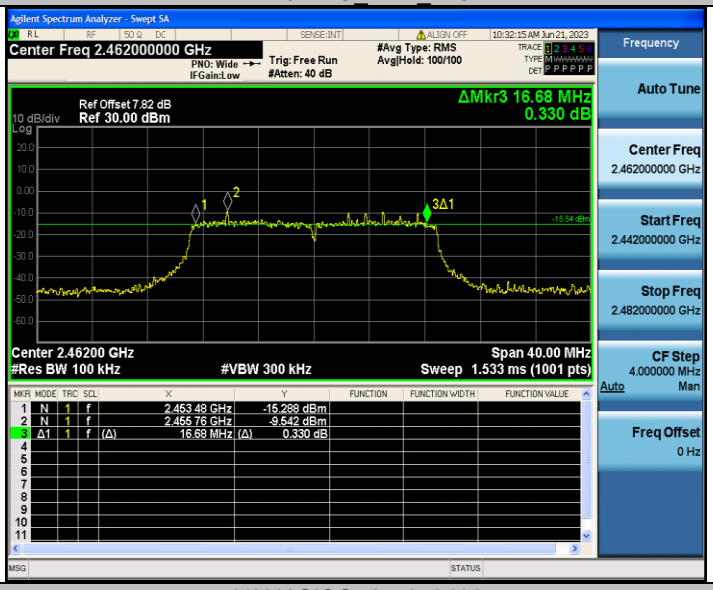
11N20SISO_Ant1_2412



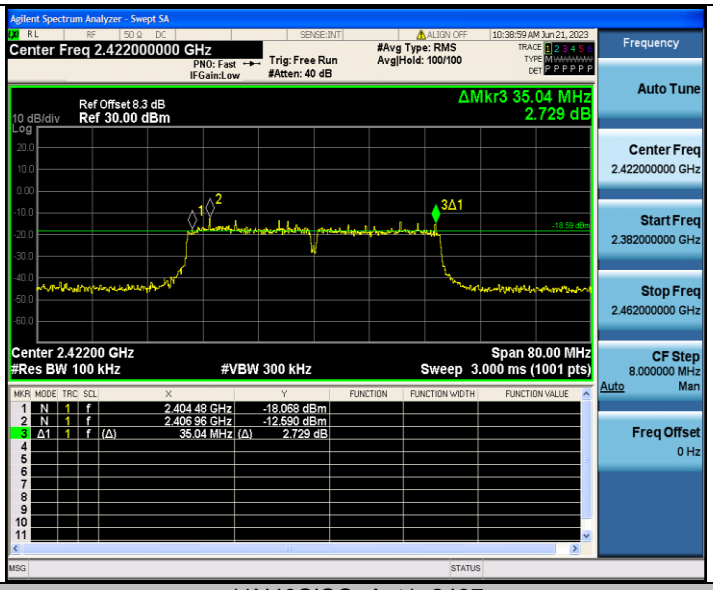
11N20SISO_Ant1_2437



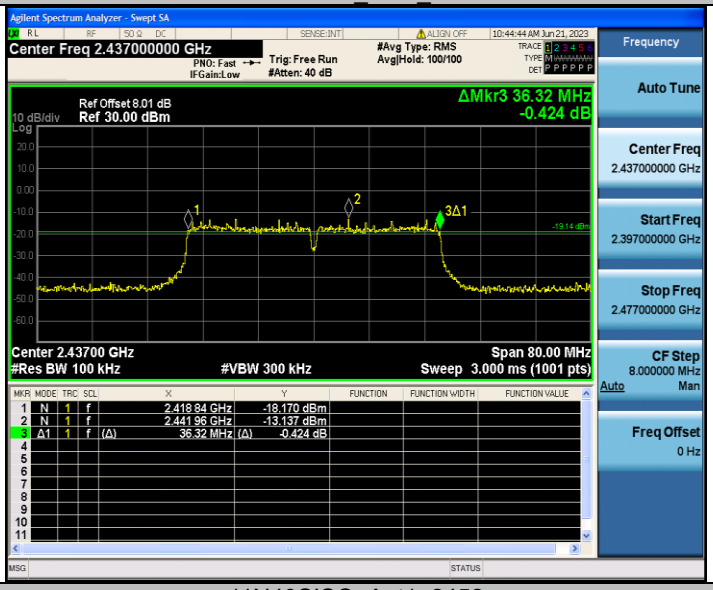
11N20SISO_Ant1_2462



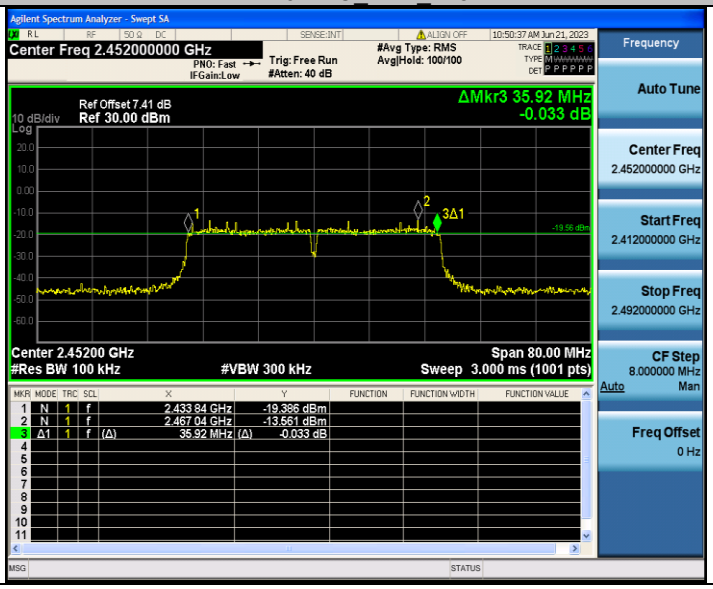
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



Appendix B: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Frequency [MHz]	Peak Power [dBm]	Conducted Limit [dBm]	Verdict
11B	Ant1	2412	13.93	≤30.00	PASS
		2437	13.04	≤30.00	PASS
		2462	13.58	≤30.00	PASS
11G	Ant1	2412	11.87	≤30.00	PASS
		2437	10.80	≤30.00	PASS
		2462	10.71	≤30.00	PASS
11N20SISO	Ant1	2412	8.52	≤30.00	PASS
		2437	8.72	≤30.00	PASS
		2462	8.28	≤30.00	PASS
11N40SISO	Ant1	2422	7.97	≤30.00	PASS
		2437	8.75	≤30.00	PASS
		2452	7.91	≤30.00	PASS

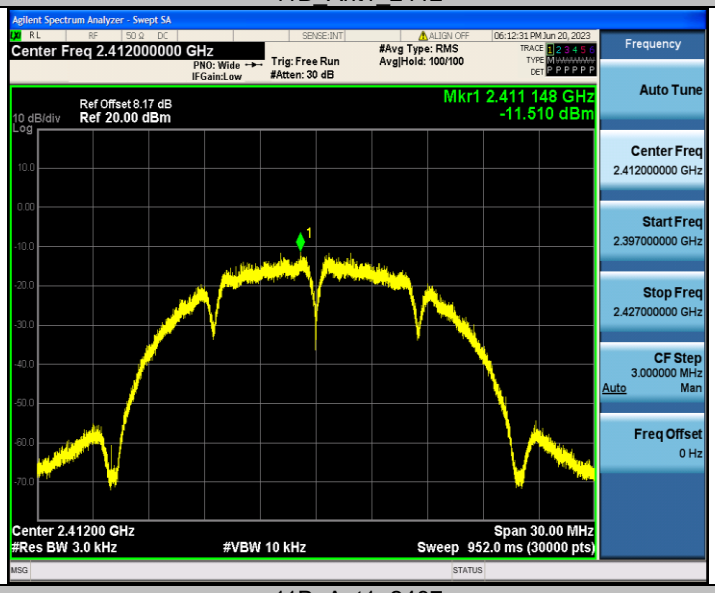
Appendix C: Maximum power spectral density

Test Result

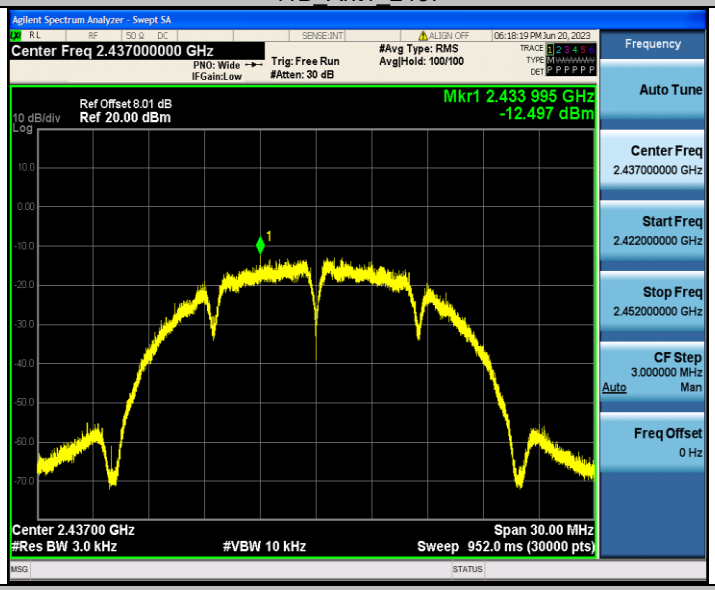
Test Mode	Antenna	Frequency [MHz]	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-11.51	≤8.00	PASS
		2437	-12.5	≤8.00	PASS
		2462	-12.07	≤8.00	PASS
11G	Ant1	2412	-20.02	≤8.00	PASS
		2437	-21.23	≤8.00	PASS
		2462	-21.98	≤8.00	PASS
11N20SISO	Ant1	2412	-23.72	≤8.00	PASS
		2437	-24.09	≤8.00	PASS
		2462	-23.87	≤8.00	PASS
11N40SISO	Ant1	2422	-27.66	≤8.00	PASS
		2437	-27.25	≤8.00	PASS
		2452	-27.24	≤8.00	PASS

Test Graphs

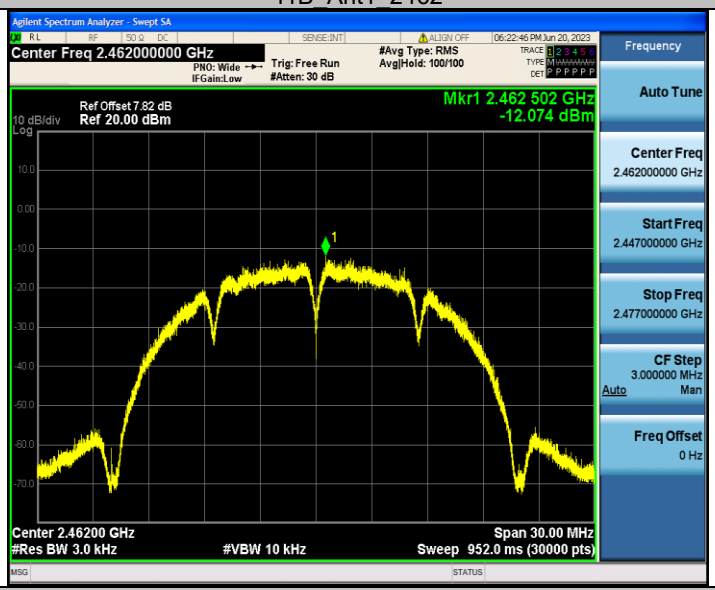
11B_Ant1_2412



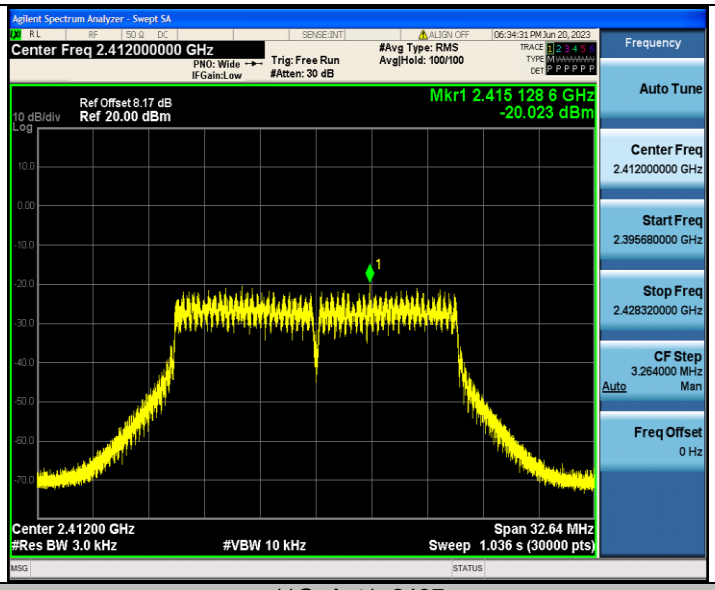
11B_Ant1_2437



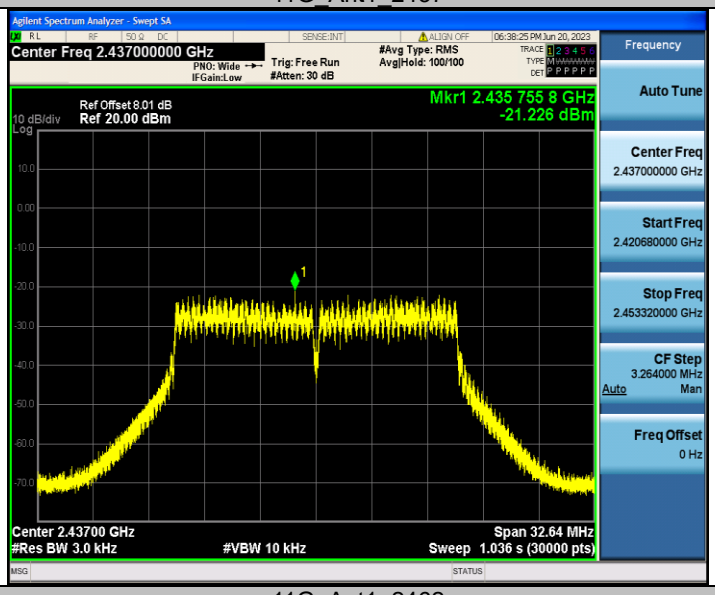
11B_Ant1_2462



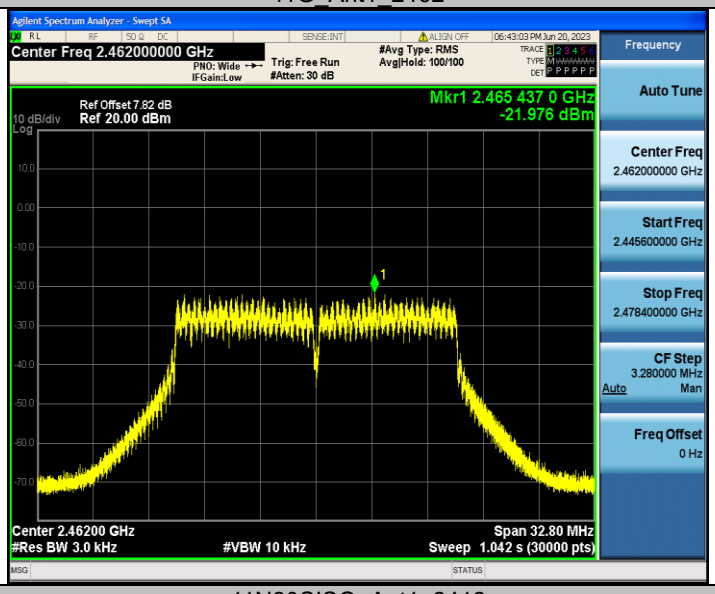
11G_Ant1_2412



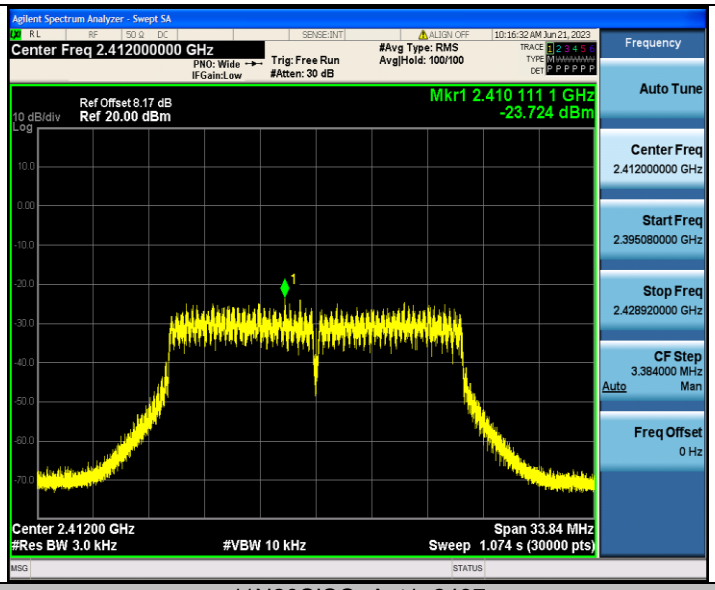
11G_Ant1_2437



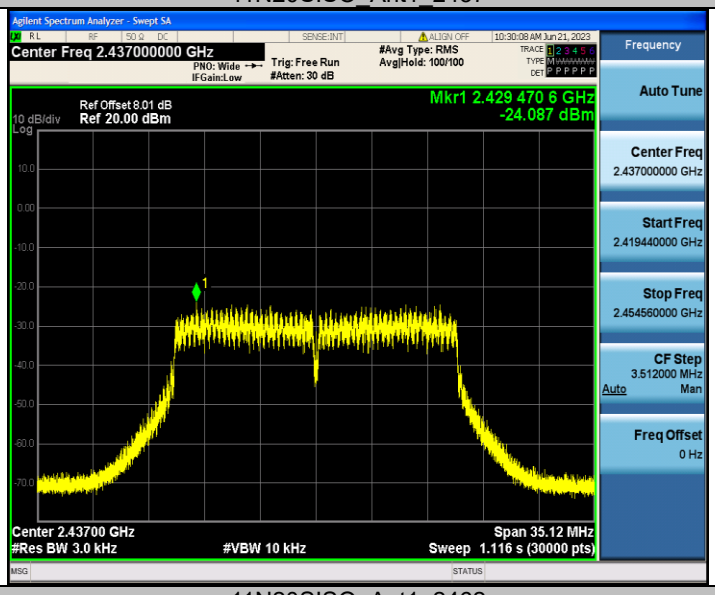
11G_Ant1_2462



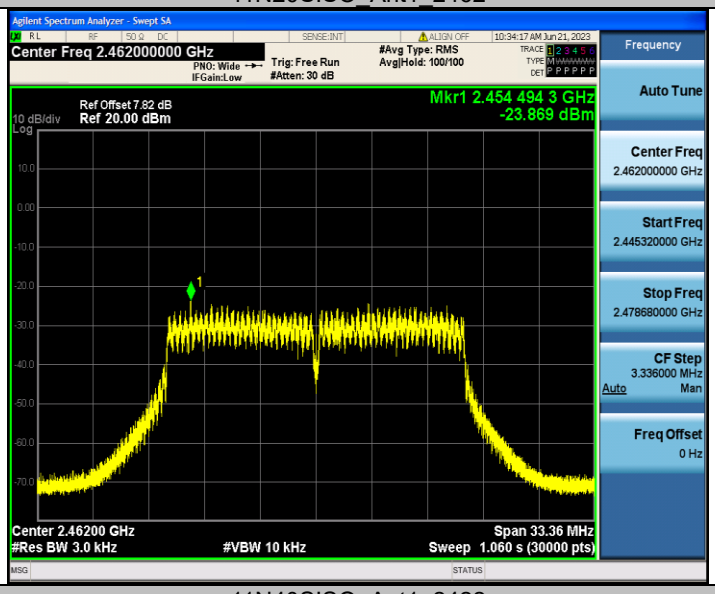
11N20SISO_Ant1_2412



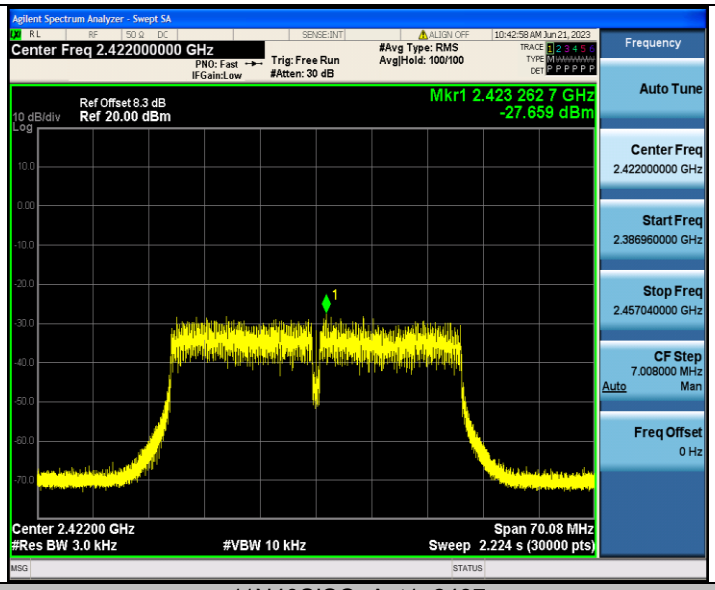
11N20SISO_Ant1_2437



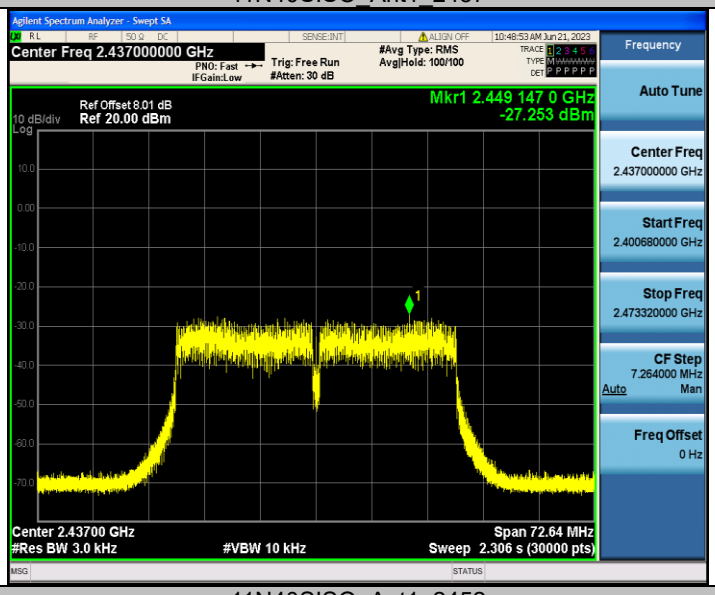
11N20SISO_Ant1_2462



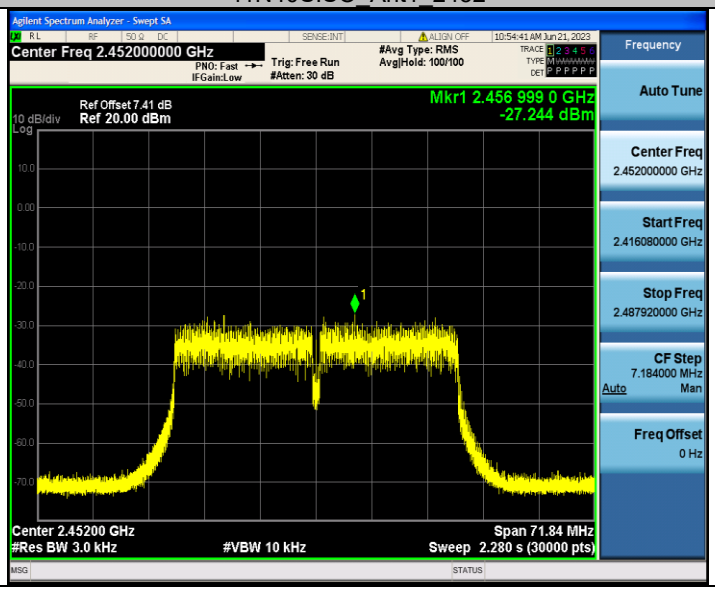
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437

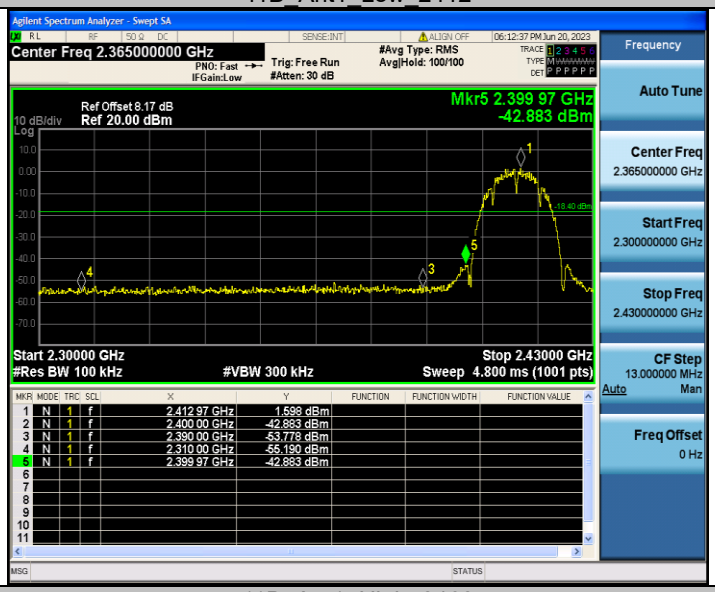


11N40SISO_Ant1_2452

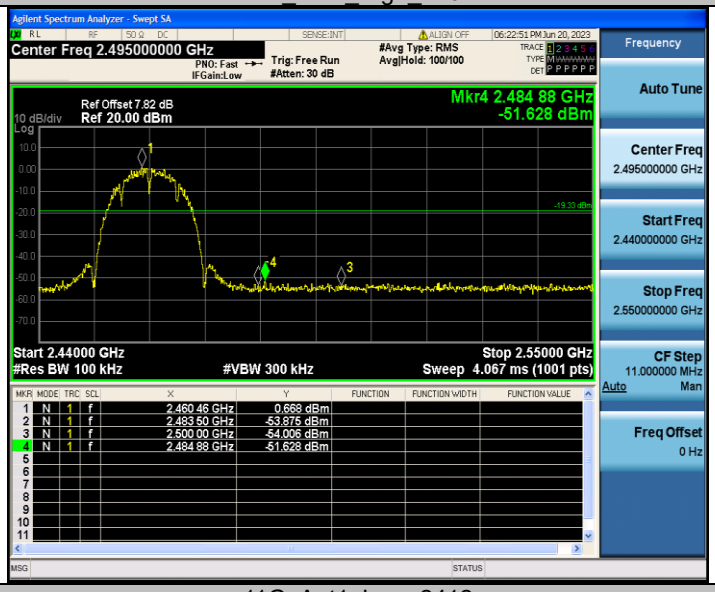


Appendix D: Band edge measurements

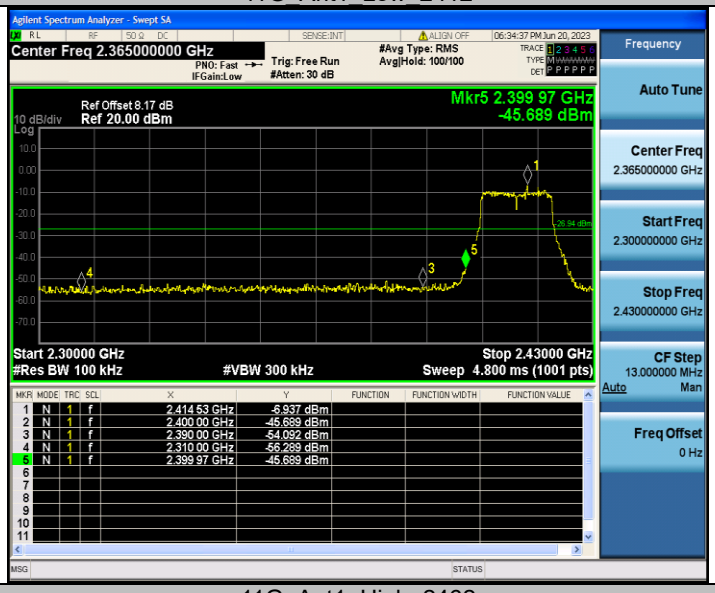
11B_Ant1_Low_2412



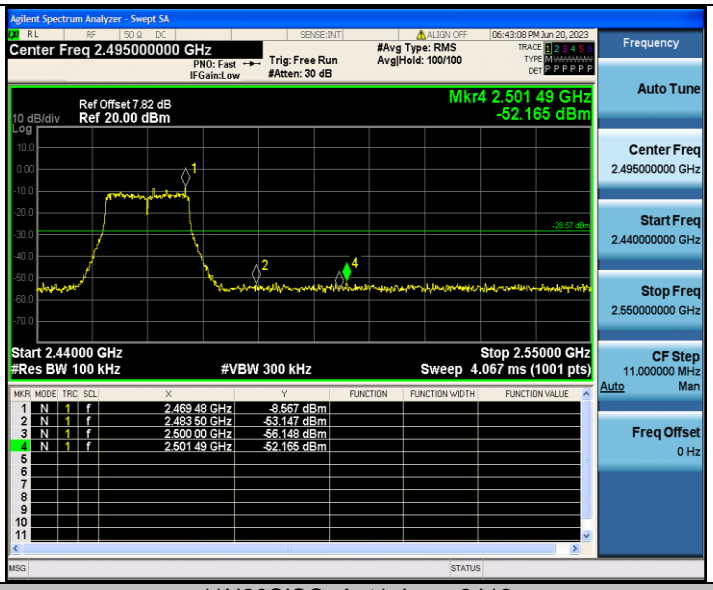
11B_Ant1_High_2462



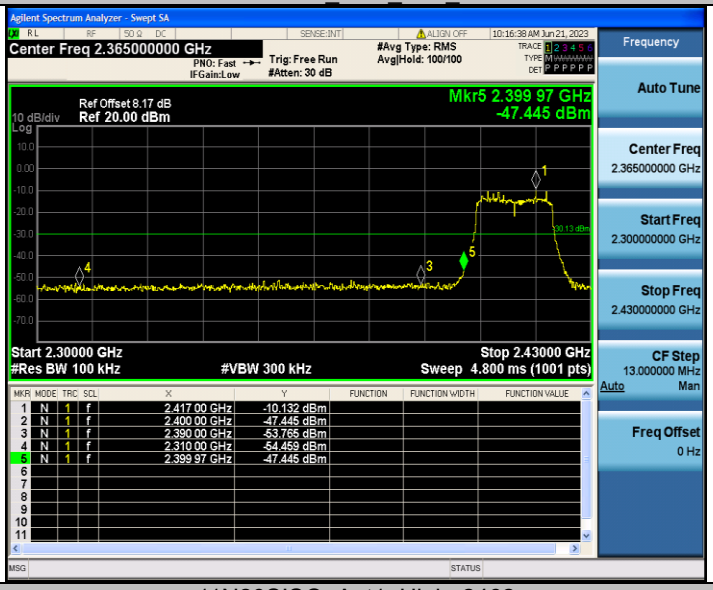
11G_Ant1_Low_2412



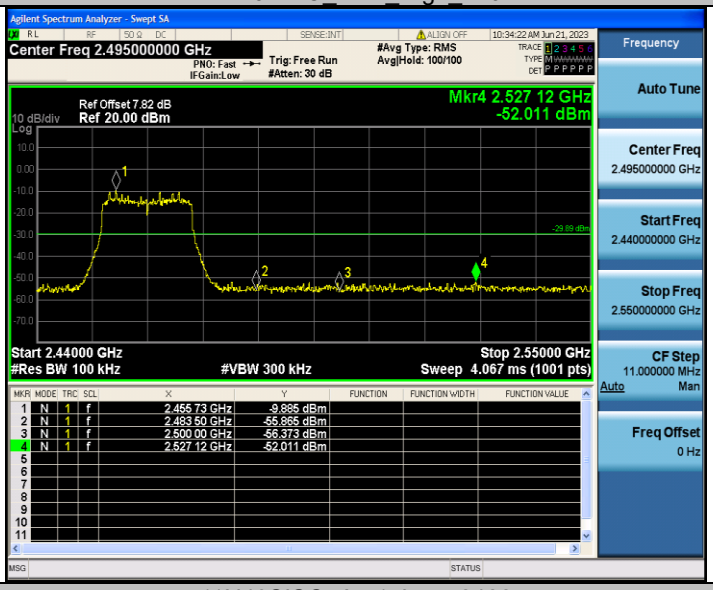
11G_Ant1_High_2462



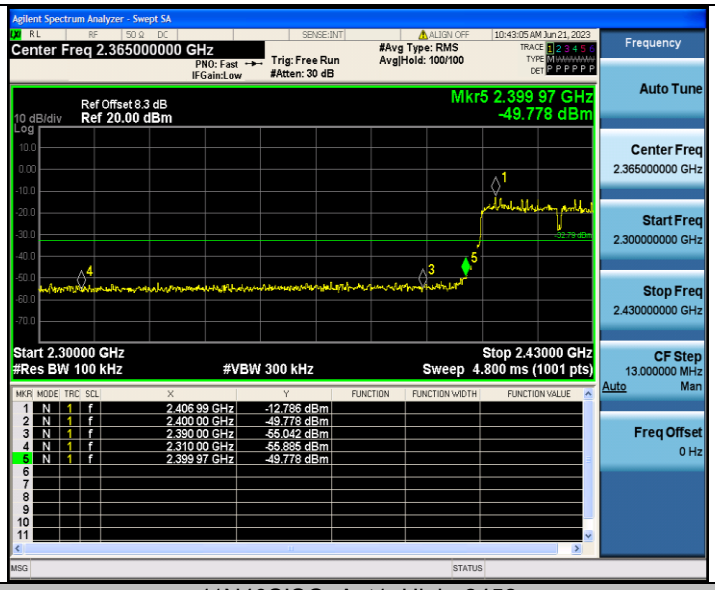
11N20SISO_Ant1_Low_2412



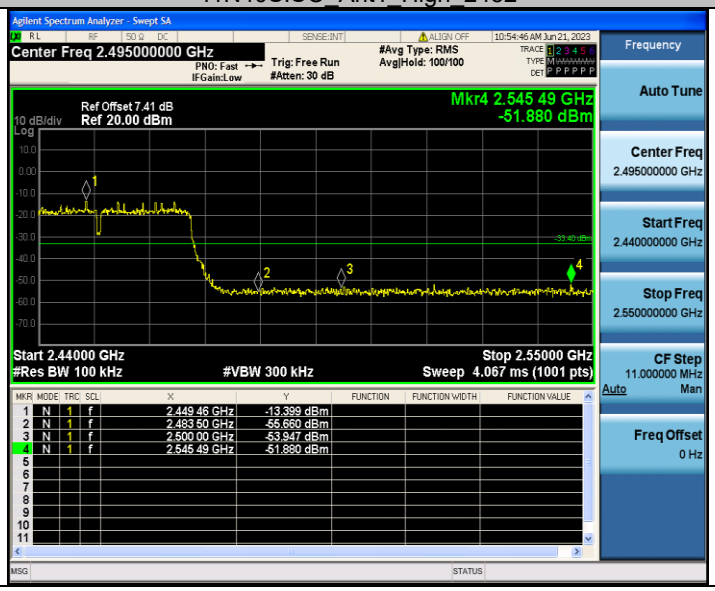
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



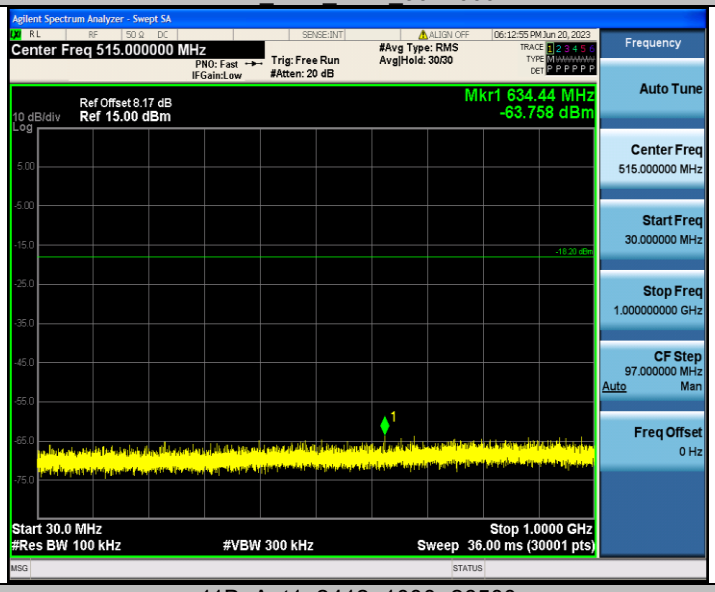
11N40SISO_Ant1_High_2452



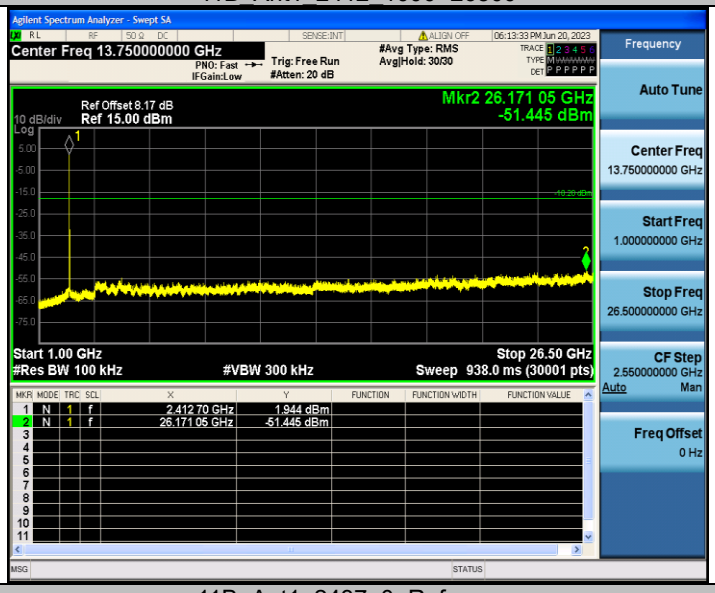
Appendix E: Conducted Spurious Emission

11B_Ant1_2412_0~Reference

11B_Ant1_2412_30~1000



11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference