

# Test Report

**Report No.:** MTi230717017-01E1

**Date of issue:** 2023-10-23

**Applicant:** ALOGIC Corporation Pty Ltd.

**Product:** Loc8 Card

**Model(s):** JSTCBK, JSTCXX (XX represents color, BK is black, WH is white.)

**FCC ID:** 2ATCA-JSTC

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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<b>Test Result Certification</b>	
<b>Applicant:</b>	ALOGIC Corporation Pty Ltd.
Address:	Level 40, 140 Williams Street, Melbourne, Victoria 3000, Australia
<b>Manufacturer:</b>	ALOGIC Corporation Pty Ltd.
Address:	Level 40, 140 Williams Street, Melbourne, Victoria 3000, Australia
<b>Product description</b>	
Product name:	Loc8 Card
Trade mark:	JOURNEY, JR-NY
Model name:	JSTCBK
Series Model:	JSTCXX (XX represents color, BK is black, WH is white.)
Standards:	47 CFR Part 15.247
Test Method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02
<b>Date of Test</b>	
Date of test:	2023-08-18 to 2023-08-28
Test result:	Pass

<b>Test Engineer</b>	:	<i>Yanice Xie</i>
		(Yanice.Xie)
<b>Reviewed By</b>	:	<i>Leon Chen</i>
		(Leon Chen)
<b>Approved By</b>	:	<i>Tom Xue</i>
		(Tom Xue)

## 1 General Description

### 1.1 Description of the EUT

Product name:	Loc8 Card
Model name:	JSTCBK
Series Model:	JSTCXX (XX reprints color,BK is black,WH is white.)
Model difference:	All the models are the same circuit and module, except the model name and color.
Electrical rating:	Input:DC 3V Battery:3V 400mAh
Accessories:	N/A
Hardware version:	1.0.0
Software version:	1.4.8
Test sample(s) number:	MTi230717017-01S1001
<b>RF specification</b>	
Bluetooth version:	V5.2
Operating frequency range:	2402MHz to 2480MHz
Channel number:	40
Modulation type:	GFSK
Antenna type:	PCB Antenna
Antenna gain:	-0.679 dBi

### 1.2 Description of test modes

No.	Emission test modes
Mode1	TX-GFSK-1Mbps(CH00/CH19/CH39)
Mode2	TX-GFSK-2Mbps(CH00/CH19/CH39)

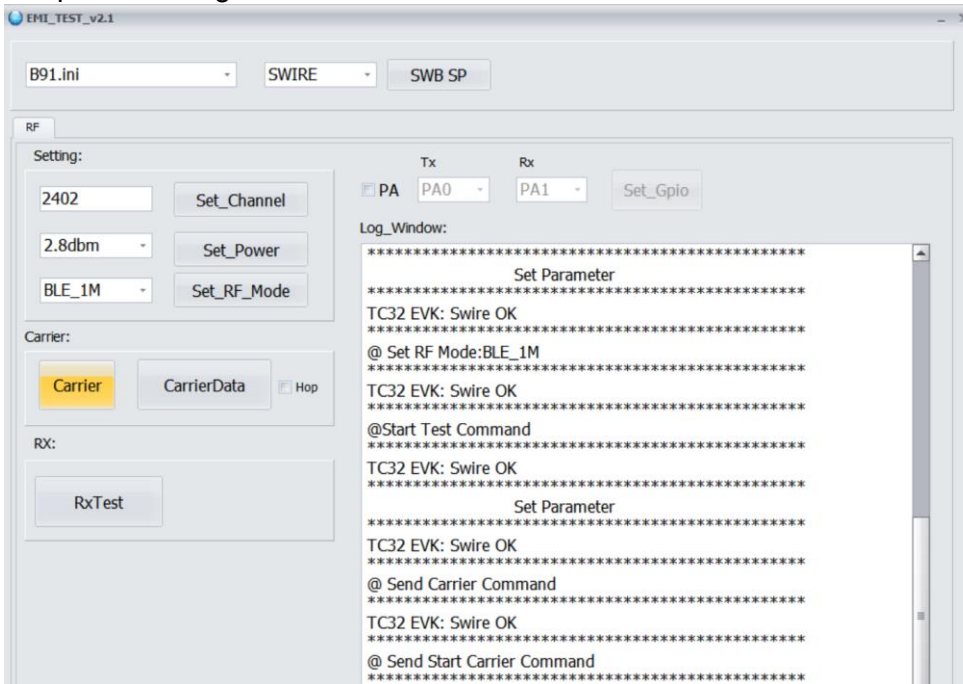
#### 1.2.1 Operation channel list

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

Mode	Test Software	EMI_TEST_V2.1		
	Channel	2402MHz	2440MHz	2480MHz
BLE-1M	Power setting	2.8	2.8	2.8
BLE-2M		2.8	2.8	2.8

**Test Software:**

For power setting, refer to below table.



### 1.3 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

### 1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
/	/	/	/

Support cable list			
Description	Length (m)	From	To
/	/	/	/

### 1.5 Measurement uncertainty

Measurement	Uncertainty
AC power line conducted emission (9 kHz~30 MHz)	±2.5 dB
Time	±1 %
Occupied channel bandwidth	±3 %
RF output power, conducted	±1 dB
Power Spectral Density, conducted	±1 dB
Unwanted Emissions, conducted	±1 dB
Radiated spurious emissions (above 1GHz)	±5.3dB
Radiated spurious emissions (9kHz~30MHz)	±4.3dB
Radiated spurious emissions (30MHz~1GHz)	±4.7dB
Temperature	±1 °C
Humidity	± 5 %

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.	Item	Standard	Requirement	Result
1	Antenna requirement	47 CFR Part 15.247	47 CFR 15.203	Pass
2	Occupied Bandwidth	47 CFR Part 15.247	47 CFR 15.247(a)(2)	Pass
3	Maximum Conducted Output Power	47 CFR Part 15.247	47 CFR 15.247(b)(3)	Pass
4	Power Spectral Density	47 CFR Part 15.247	47 CFR 15.247(e)	Pass
5	Emissions in non-restricted frequency bands	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
6	Band edge emissions (Radiated)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
7	Radiated emissions (below 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
8	Radiated emissions (above 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
9	Conducted Emission at AC power line	47 CFR Part 15.247	47 CFR 15.207(a)	N/A

### Notes:

N/A means not applicable.

Since the EUT power by DC supply, therefore AC power line conducted emissions test is not required.



### 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
IC Registration No.:	21760
CABID:	CN0093

#### 4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Duty Cycle						
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
Emission 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
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

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
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
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Emissions in frequency bands						
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
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	2023-06-11	2025-06-10
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)

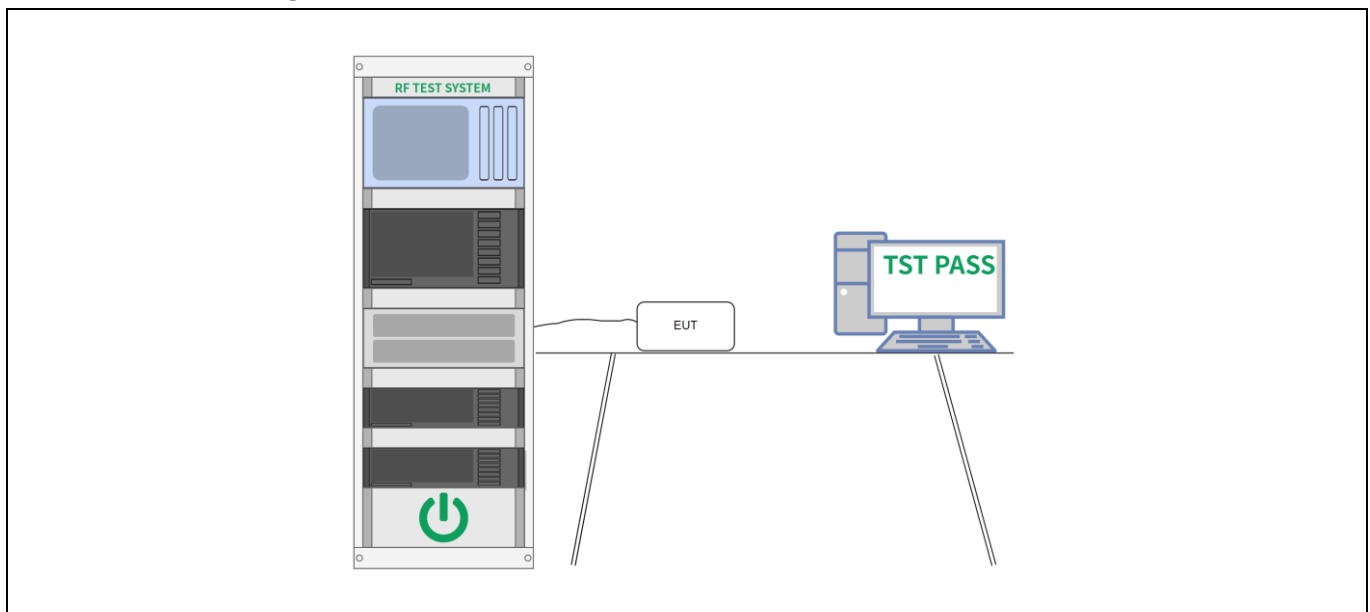
### 6.1 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Limit:	Refer to 47 CFR 15.247(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:	ANSI C63.10-2013, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	a) Set RBW = 100 kHz. b) Set the VBW $\geq$ [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:	24 °C	Humidity:	59 %
Atmospheric Pressure:		101 kPa	
Test mode:	Mode1, Mode2		

#### 6.1.2 Test Setup Diagram:



**6.1.3 Test Data:**

Please Refer to Appendix for Details.

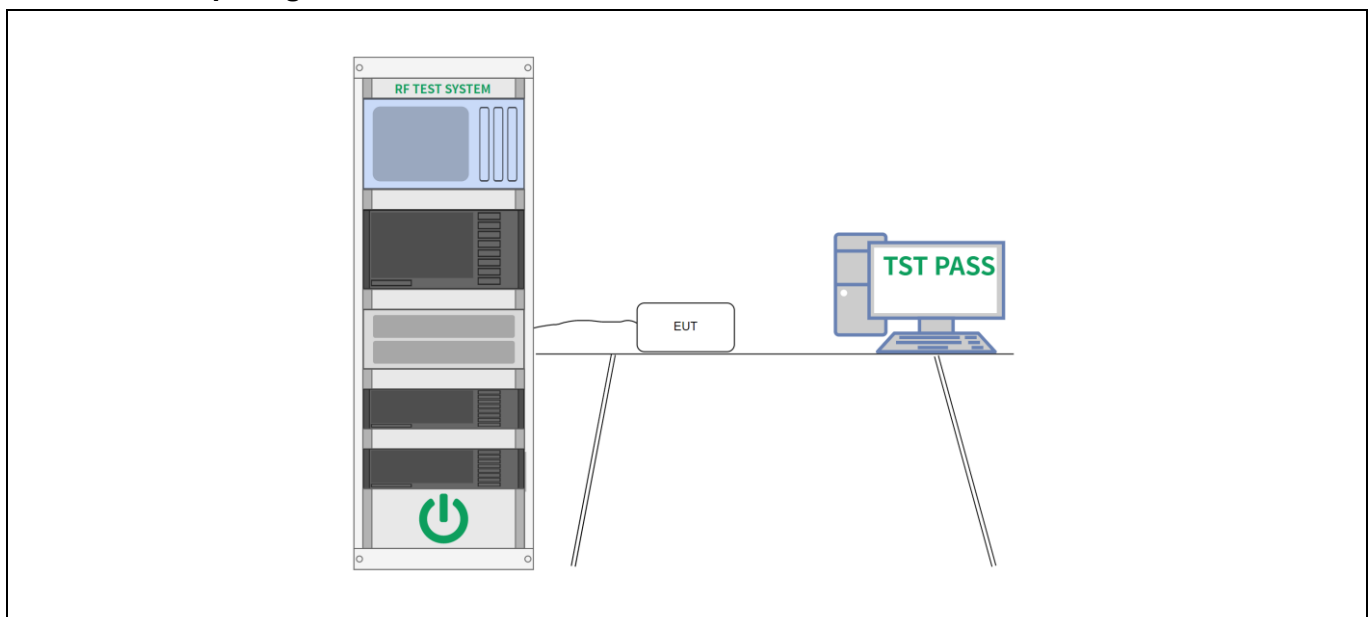
## 6.2 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 15.247(b)(3), 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:	ANSI C63.10-2013, section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power

### 6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	24 °C	Humidity:	59 %	Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2				

### 6.2.2 Test Setup Diagram:



### 6.2.3 Test Data:

Please Refer to Appendix for Details.

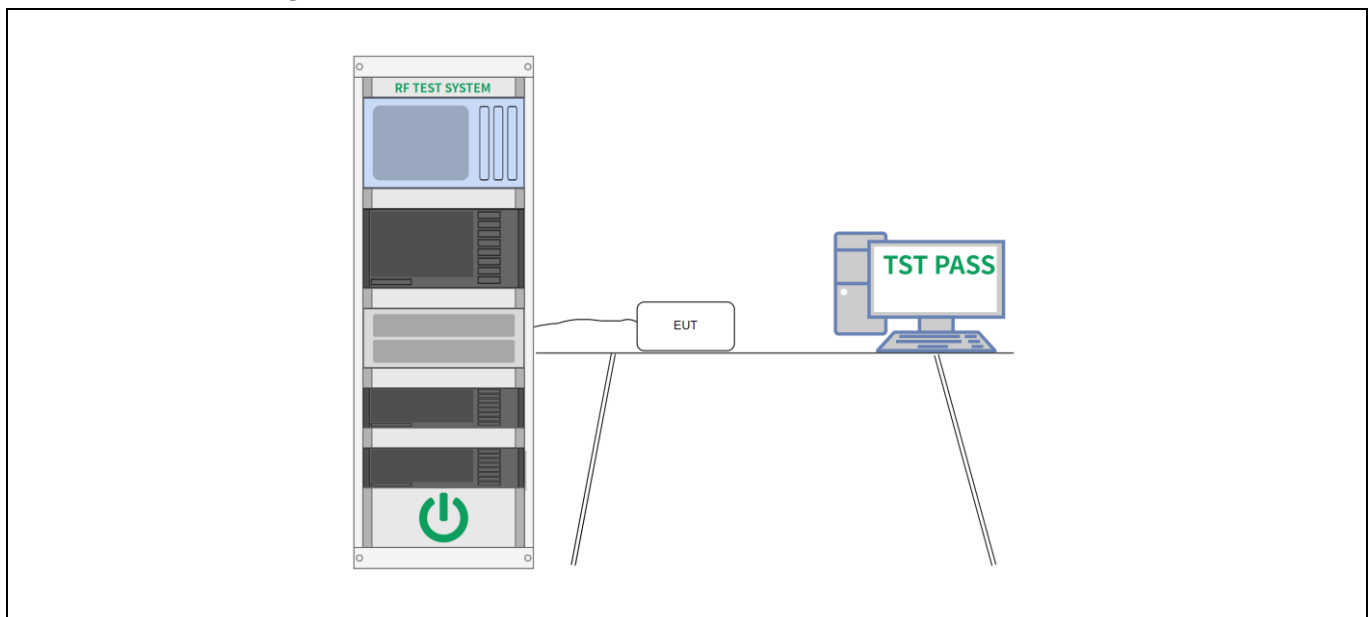
### 6.3 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 15.247(e), 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:	ANSI C63.10-2013, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.10, Maximum power spectral density level in the fundamental emission

#### 6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	24 °C	Humidity:	59 %	Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2				

#### 6.3.2 Test Setup Diagram:



#### 6.3.3 Test Data:

Please Refer to Appendix for Details.



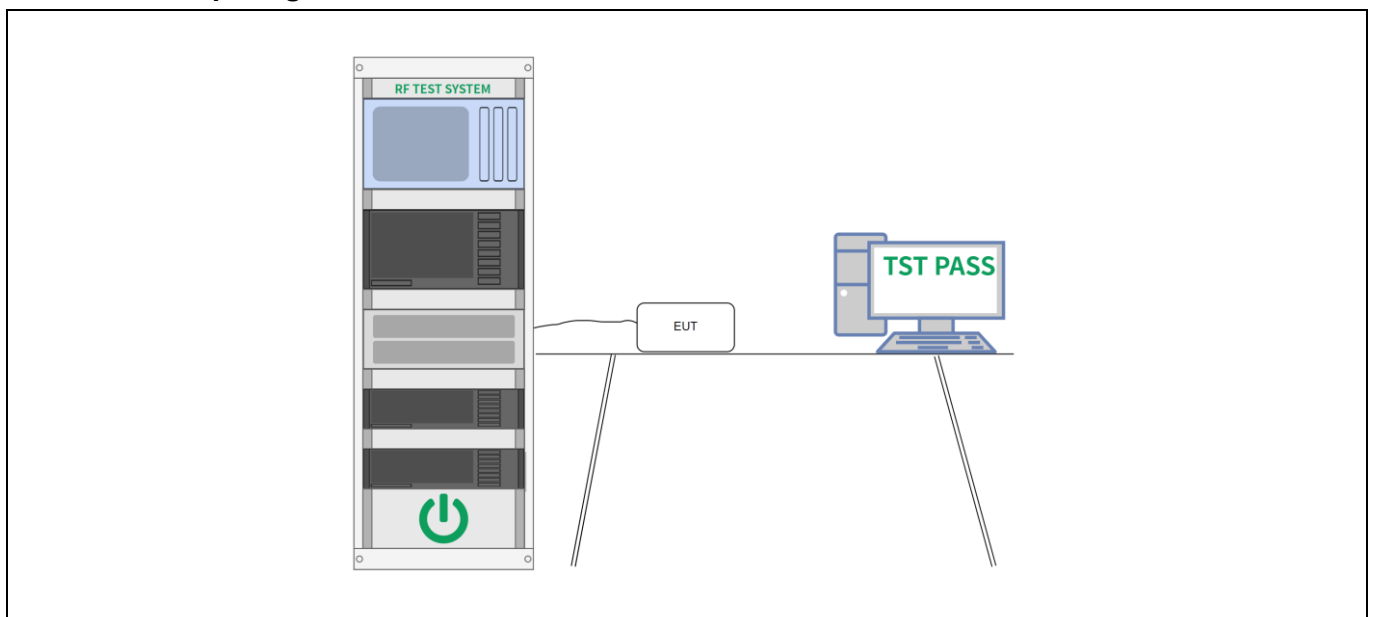
#### 6.4 Emissions in frequency bands

Test Requirement:	47 CFR 15.247(d)
Test Limit:	Refer to 47 CFR 15.247(d), 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:	ANSI C63.10-2013 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02
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:	24 °C	Humidity:	59 %
		Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2		

##### 6.4.2 Test Setup Diagram:



##### 6.4.3 Test Data:

Please Refer to Appendix for Details.

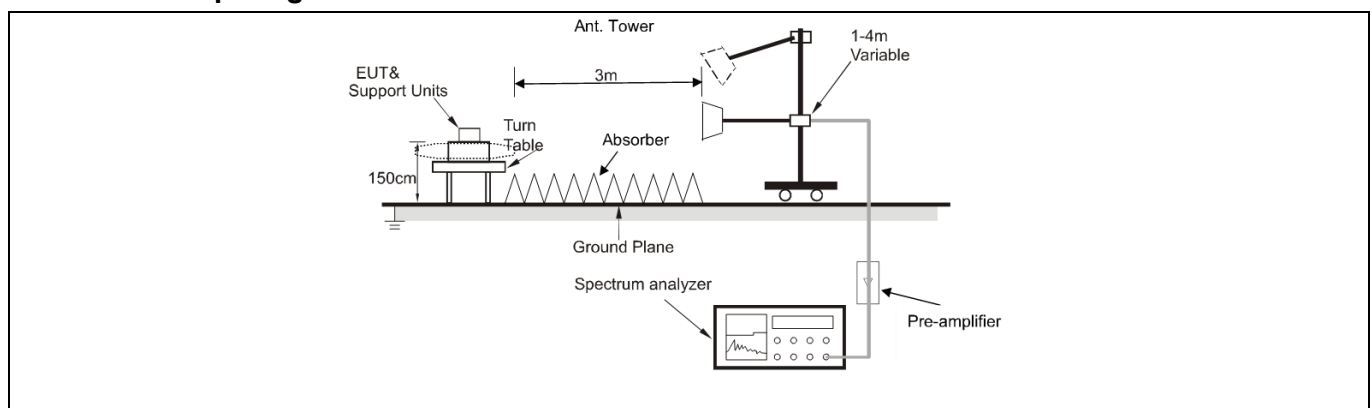
### 6.5 Band edge emissions (Radiated)

Test Requirement:	Refer to 47 CFR 15.247(d), 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:	ANSI C63.10-2013 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2013 section 6.10.5.2		

#### 6.5.1 E.U.T. Operation:

Operating Environment:			
Temperature:	26 °C	Humidity:	54 %
		Atmospheric Pressure:	98 kPa
Test mode:	Mode1, Mode2		
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report		
Note:	The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.		

#### 6.5.2 Test Setup Diagram:



**6.5.3 Test Data:**

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 2 / CH00

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2310.000	45.35	-2.66	42.69	74.00	-31.31	peak
2		2310.000	37.04	-2.66	34.38	54.00	-19.62	AVG
3		2390.000	46.95	-2.03	44.92	74.00	-29.08	peak
4	*	2390.000	37.44	-2.03	35.41	54.00	-18.59	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 2 / CH00

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2310.000	47.03	-2.66	44.37	74.00	-29.63	peak
2		2310.000	37.15	-2.66	34.49	54.00	-19.51	AVG
3		2390.000	47.72	-2.03	45.69	74.00	-28.31	peak
4	*	2390.000	37.28	-2.03	35.25	54.00	-18.75	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 2 / CH39

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2483.500	47.36	-1.91	45.45	74.00	-28.55	peak
2	*	2483.500	37.71	-1.91	35.80	54.00	-18.20	AVG
3		2500.000	49.05	-1.80	47.25	74.00	-26.75	peak
4		2500.000	37.53	-1.80	35.73	54.00	-18.27	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 2 / CH39

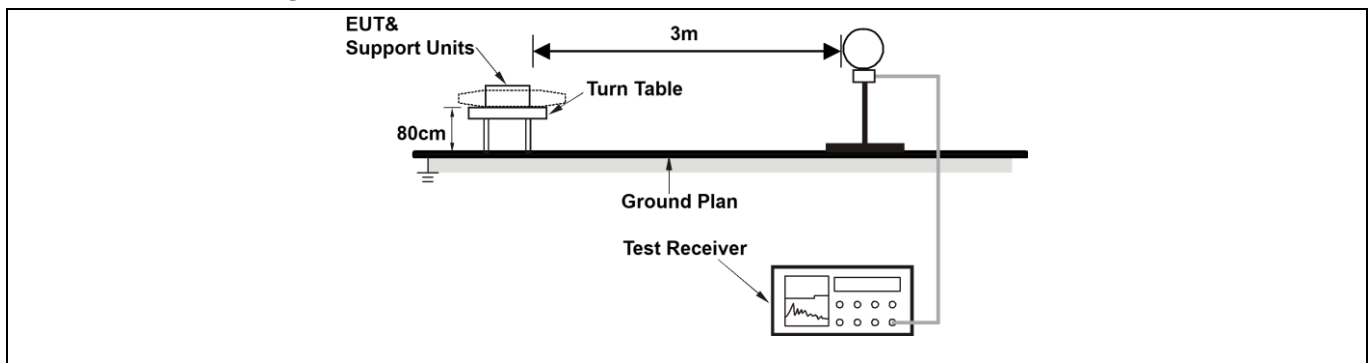
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2483.500	46.17	-1.91	44.26	74.00	-29.74	peak
2		2483.500	37.64	-1.91	35.73	54.00	-18.27	AVG
3		2500.000	47.25	-1.80	45.45	74.00	-28.55	peak
4	*	2500.000	37.75	-1.80	35.95	54.00	-18.05	AVG

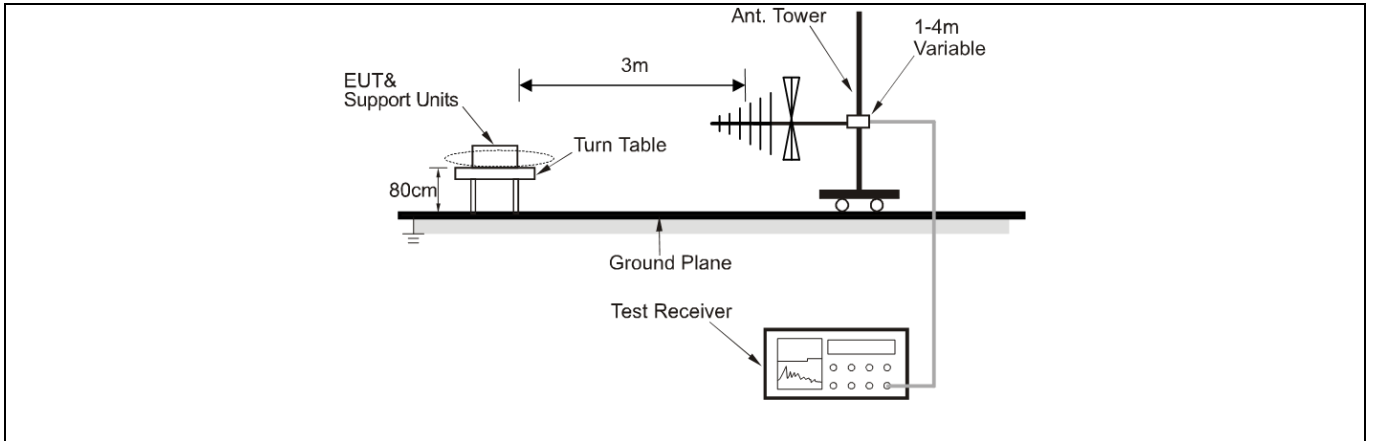
**6.6 Radiated emissions (below 1GHz)**

Test Requirement:	Refer to 47 CFR 15.247(d), 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:	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2013 section 6.6.4		

**6.6.1 E.U.T. Operation:**

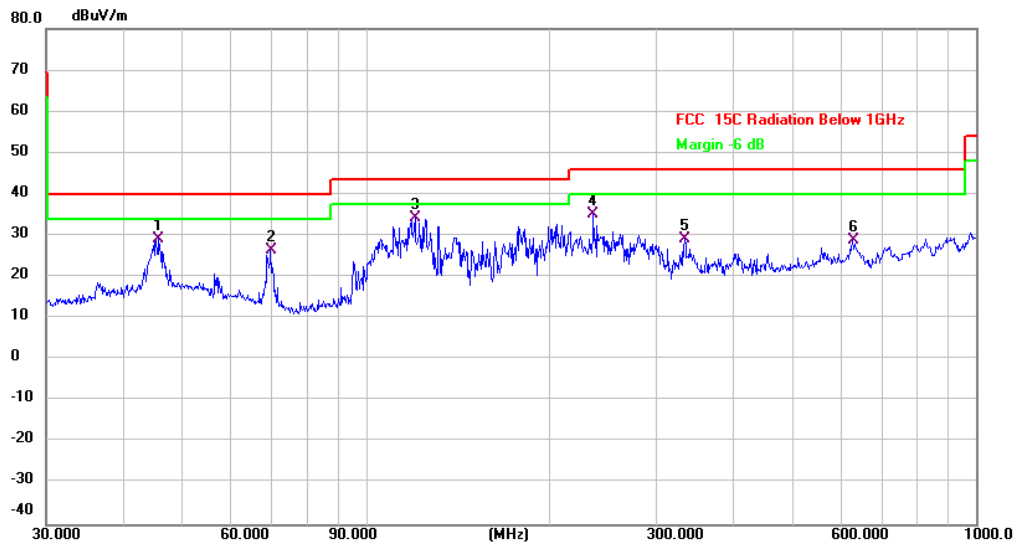
Operating Environment:			
Temperature:	26 °C	Humidity:	54 %
		Atmospheric Pressure:	98 kPa
Test mode:	Mode1, Mode2		
Note:	The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported. All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.		

**6.6.2 Test Setup Diagram:**




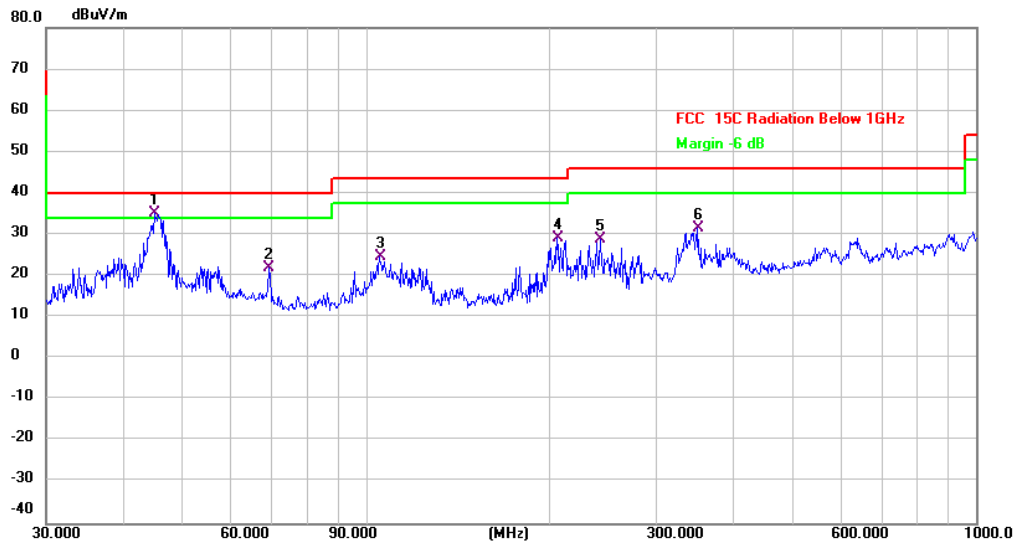
**6.6.3 Test Data:**

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 2 / CH39



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		45.8553	36.28	-7.26	29.02	40.00	-10.98	QP	
2		69.8450	37.63	-11.12	26.51	40.00	-13.49	QP	
3	*	120.2766	43.97	-9.75	34.22	43.50	-9.28	QP	
4		236.6447	42.12	-7.03	35.09	46.00	-10.91	QP	
5		333.6867	33.52	-4.49	29.03	46.00	-16.97	QP	
6		627.2738	28.54	0.17	28.71	46.00	-17.29	QP	

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 2 / CH39



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	45.0583	42.69	-7.42	35.27	40.00	-4.73	QP	
2		69.3568	33.09	-11.02	22.07	40.00	-17.93	QP	
3		105.2718	31.87	-7.26	24.61	43.50	-18.89	QP	
4		206.3976	37.35	-8.09	29.26	43.50	-14.24	QP	
5		242.5253	36.24	-7.32	28.92	46.00	-17.08	QP	
6		350.4768	36.49	-4.85	31.64	46.00	-14.36	QP	



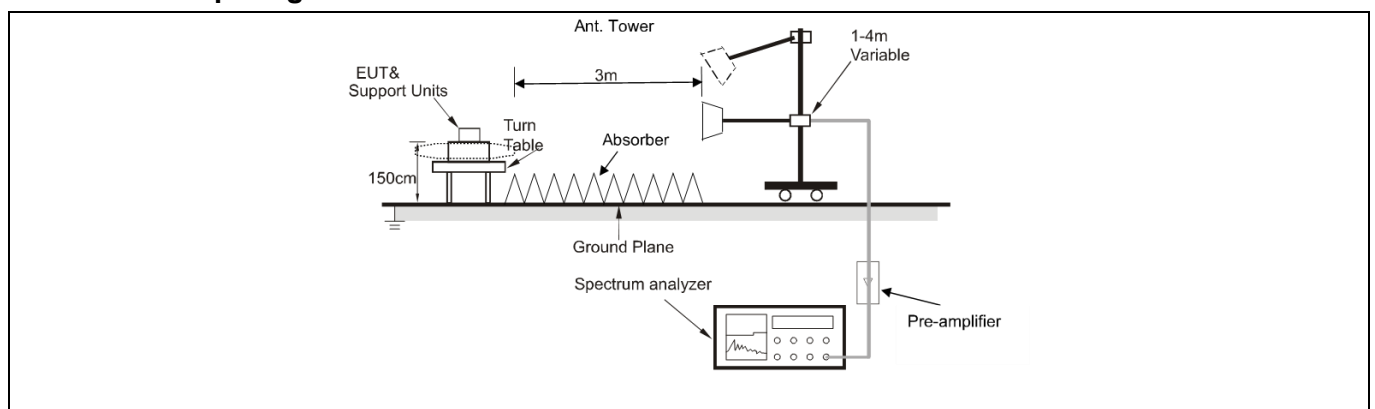
### 6.7 Radiated emissions (above 1GHz)

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:	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2013 section 6.6.4		

#### 6.7.1 E.U.T. Operation:

Operating Environment:			
Temperature:	26 °C	Humidity:	54 %
		Atmospheric Pressure:	98 kPa
Test mode:	Mode1, Mode2		
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 Setup Diagram:



**6.7.3 Test Data:**

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 2 / CH00

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4804.000	47.26	2.74	50.00	74.00	-24.00	peak
2		4804.000	42.11	2.74	44.85	54.00	-9.15	AVG
3		7206.000	40.00	9.34	49.34	74.00	-24.66	peak
4		7206.000	34.24	9.34	43.58	54.00	-10.42	AVG
5		9608.000	42.07	10.49	52.56	74.00	-21.44	peak
6	*	9608.000	36.36	10.49	46.85	54.00	-7.15	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 2 / CH00

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4804.000	42.00	2.74	44.74	74.00	-29.26	peak
2		4804.000	35.85	2.74	38.59	54.00	-15.41	AVG
3		7206.000	40.68	9.34	50.02	74.00	-23.98	peak
4		7206.000	35.37	9.34	44.71	54.00	-9.29	AVG
5		9608.000	41.59	10.49	52.08	74.00	-21.92	peak
6	*	9608.000	36.46	10.49	46.95	54.00	-7.05	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 2 / CH19

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4880.000	48.97	3.05	52.02	74.00	-21.98	peak
2	*	4880.000	44.20	3.05	47.25	54.00	-6.75	AVG
3		7320.000	41.74	9.02	50.76	74.00	-23.24	peak
4		7320.000	35.23	9.02	44.25	54.00	-9.75	AVG
5		9760.000	40.45	12.01	52.46	74.00	-21.54	peak
6		9760.000	34.84	12.01	46.85	54.00	-7.15	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 2 / CH19

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4880.000	43.21	3.05	46.26	74.00	-27.74	peak
2		4880.000	38.28	3.05	41.33	54.00	-12.67	AVG
3		7320.000	41.82	9.02	50.84	74.00	-23.16	peak
4		7320.000	36.23	9.02	45.25	54.00	-8.75	AVG
5		9760.000	41.35	12.01	53.36	74.00	-20.64	peak
6	*	9760.000	35.01	12.01	47.02	54.00	-6.98	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 2 / CH39

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4960.000	50.07	3.52	53.59	74.00	-20.41	peak
2	*	4960.000	44.73	3.52	48.25	54.00	-5.75	AVG
3		7440.000	41.56	9.16	50.72	74.00	-23.28	peak
4		7440.000	37.69	9.16	46.85	54.00	-7.15	AVG
5		9920.000	41.13	11.74	52.87	74.00	-21.13	peak
6		9920.000	35.65	11.74	47.39	54.00	-6.61	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 2 / CH39

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4960.000	43.56	3.52	47.08	74.00	-26.92	peak
2		4960.000	37.73	3.52	41.25	54.00	-12.75	AVG
3		7440.000	41.28	9.16	50.44	74.00	-23.56	peak
4		7440.000	36.09	9.16	45.25	54.00	-8.75	AVG
5		9920.000	41.73	11.74	53.47	74.00	-20.53	peak
6	*	9920.000	35.97	11.74	47.71	54.00	-6.29	AVG

## Photographs of the test setup

Refer to Appendix – Test setup photos

## Photographs of the EUT

Refer to Appendix - EUT Photos

# Appendix

## Appendix A: DTS Bandwidth

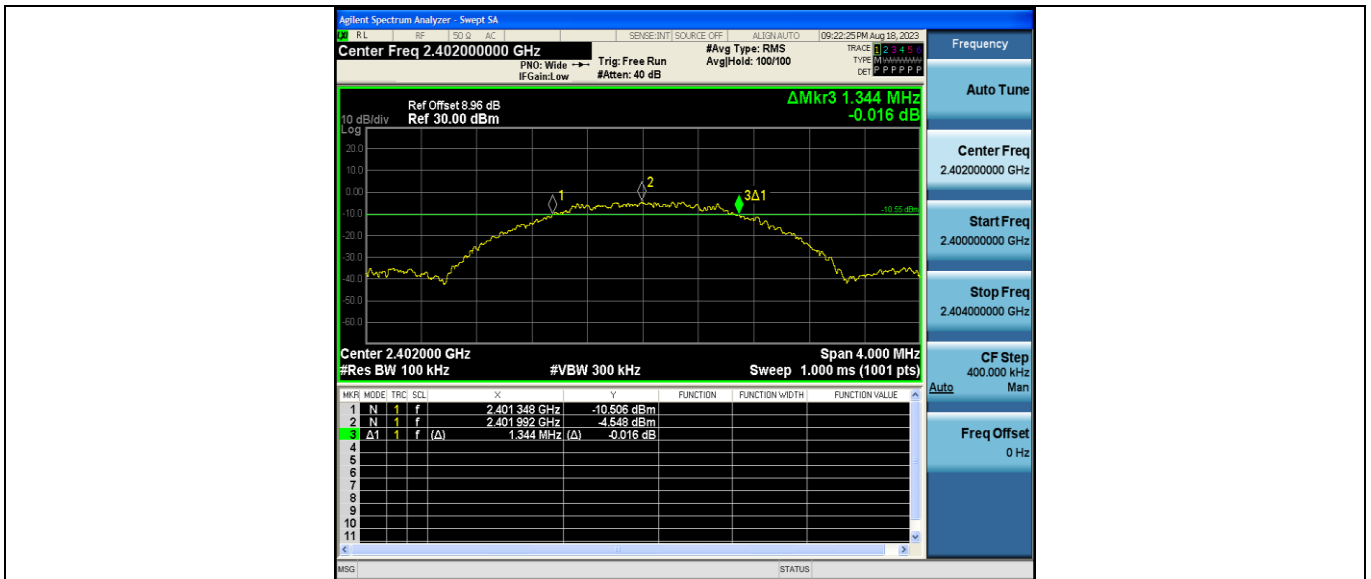
### Test Result

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	0.648	0.5	PASS
		2440	0.648	0.5	PASS
		2480	0.656	0.5	PASS
BLE_2M	Ant1	2402	1.344	0.5	PASS
		2440	1.380	0.5	PASS
		2480	1.460	0.5	PASS

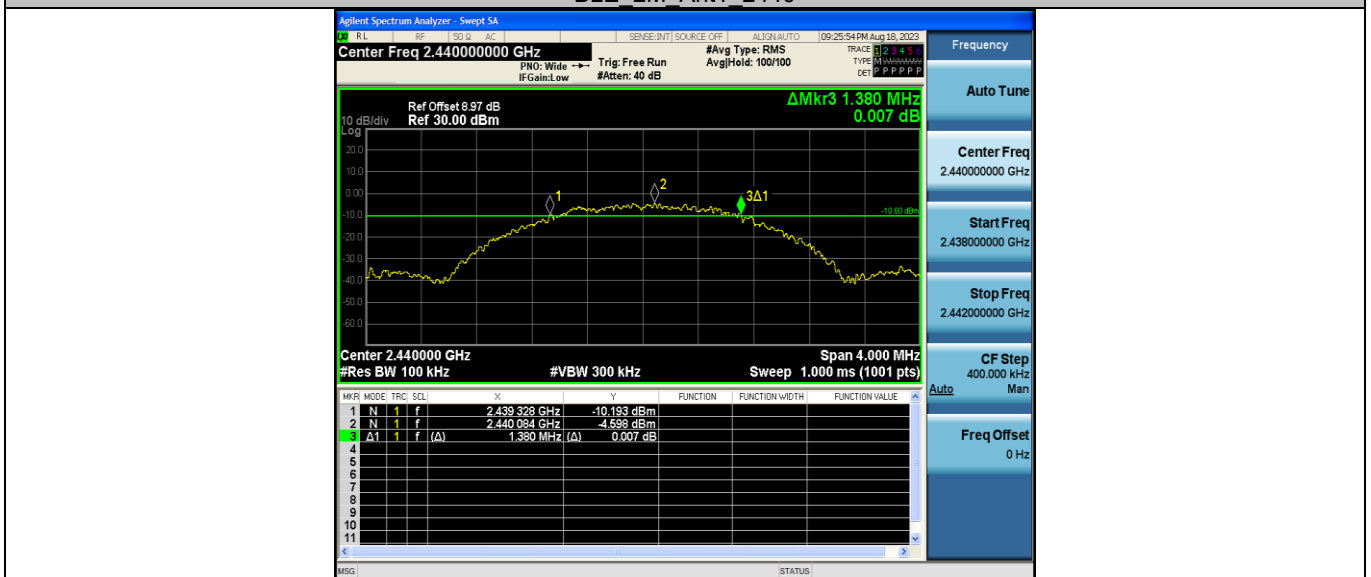


## Test Graphs

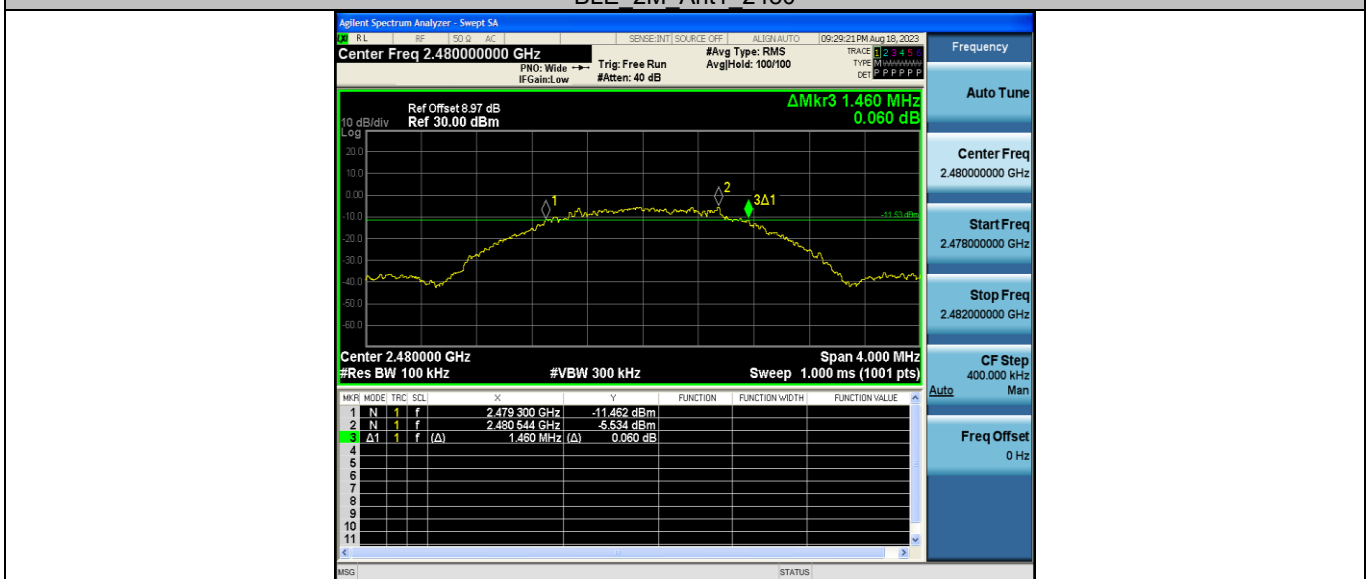




BLE 2M Ant1 2440



BLE 2M Ant1 2480

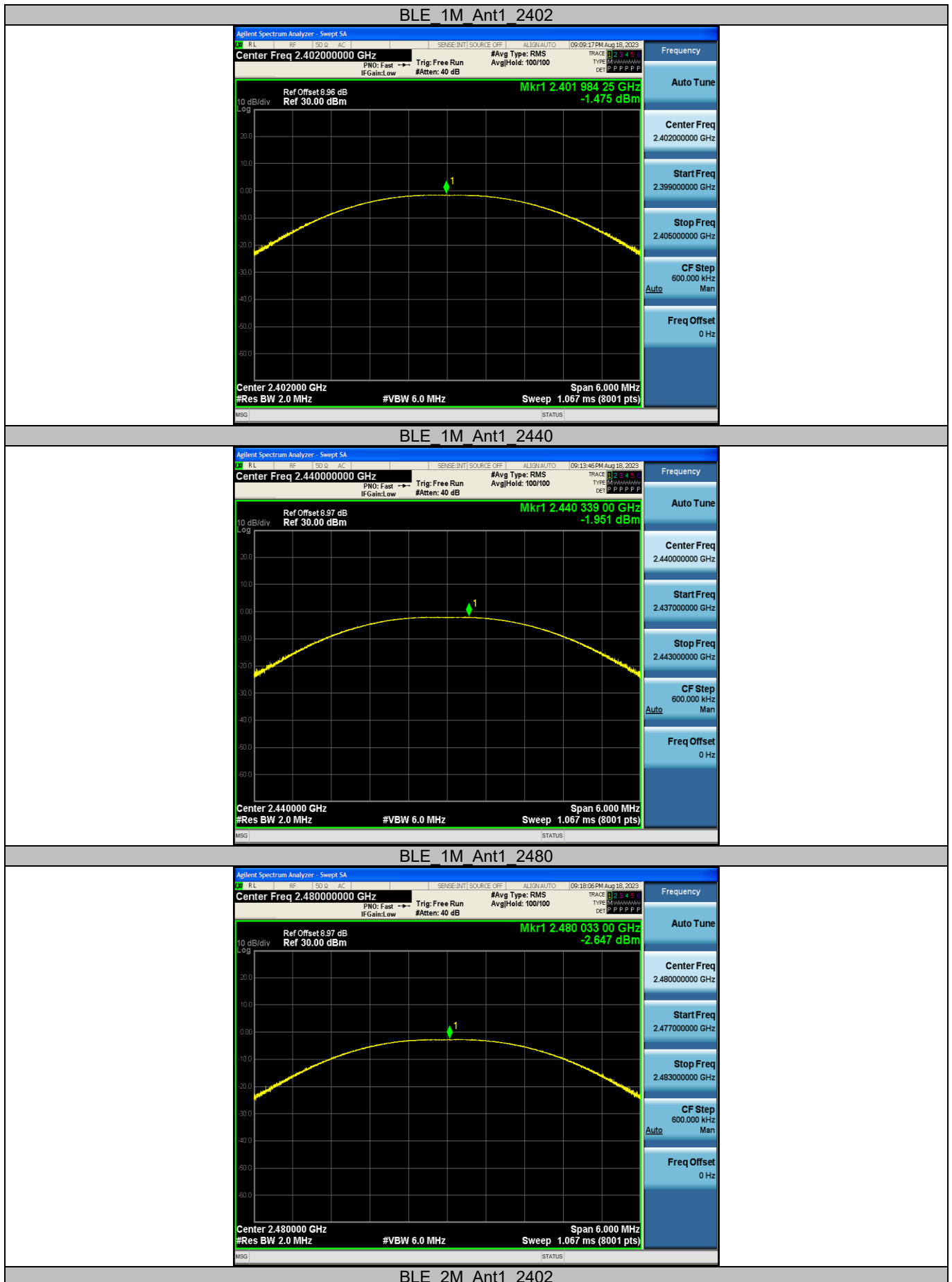


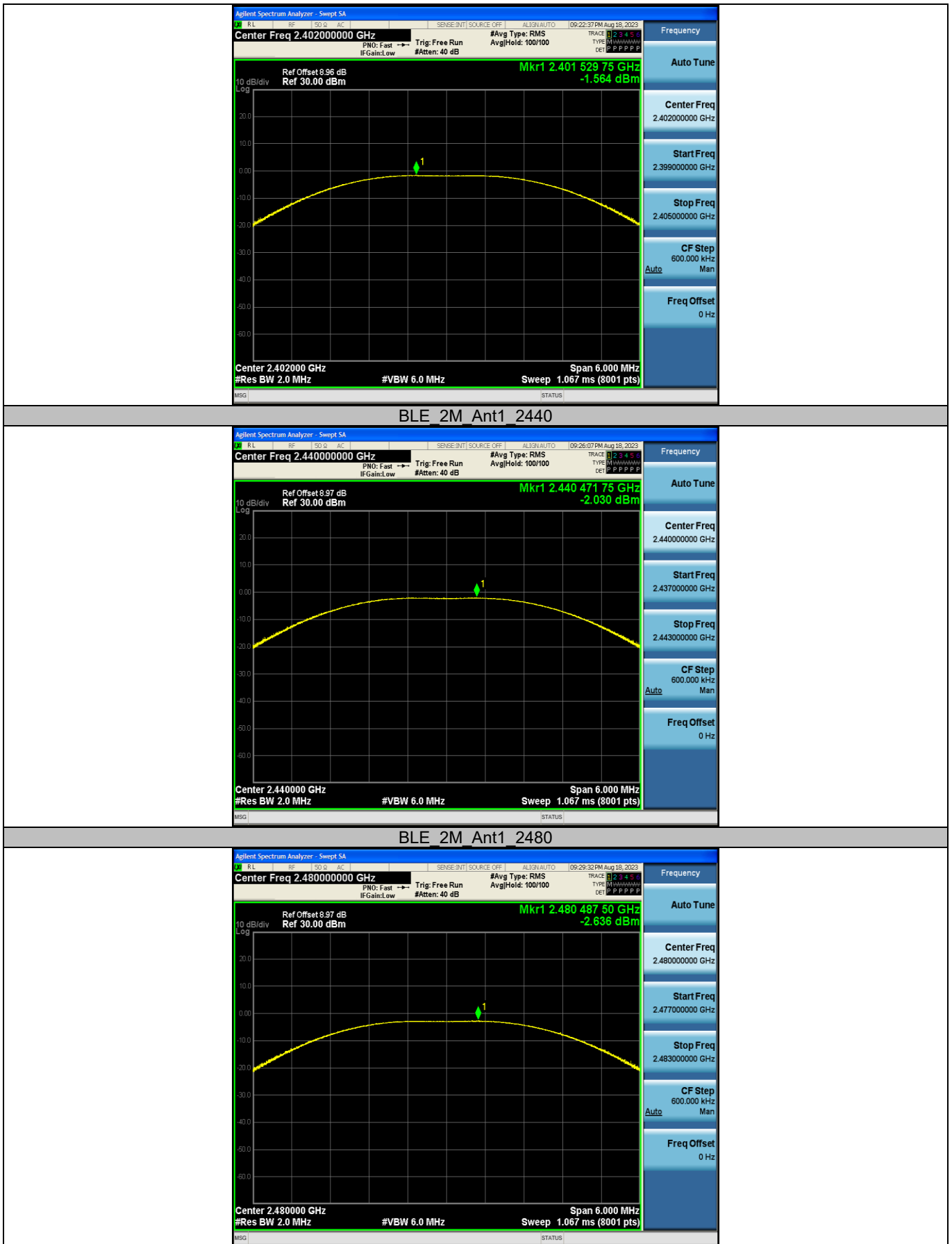
## Appendix B: Maximum conducted output power

### Test Result-Peak

Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	2402	-1.48	≤30	PASS
		2440	-1.95	≤30	PASS
		2480	-2.65	≤30	PASS
BLE_2M	Ant1	2402	-1.56	≤30	PASS
		2440	-2.03	≤30	PASS
		2480	-2.64	≤30	PASS

## Test Graphs



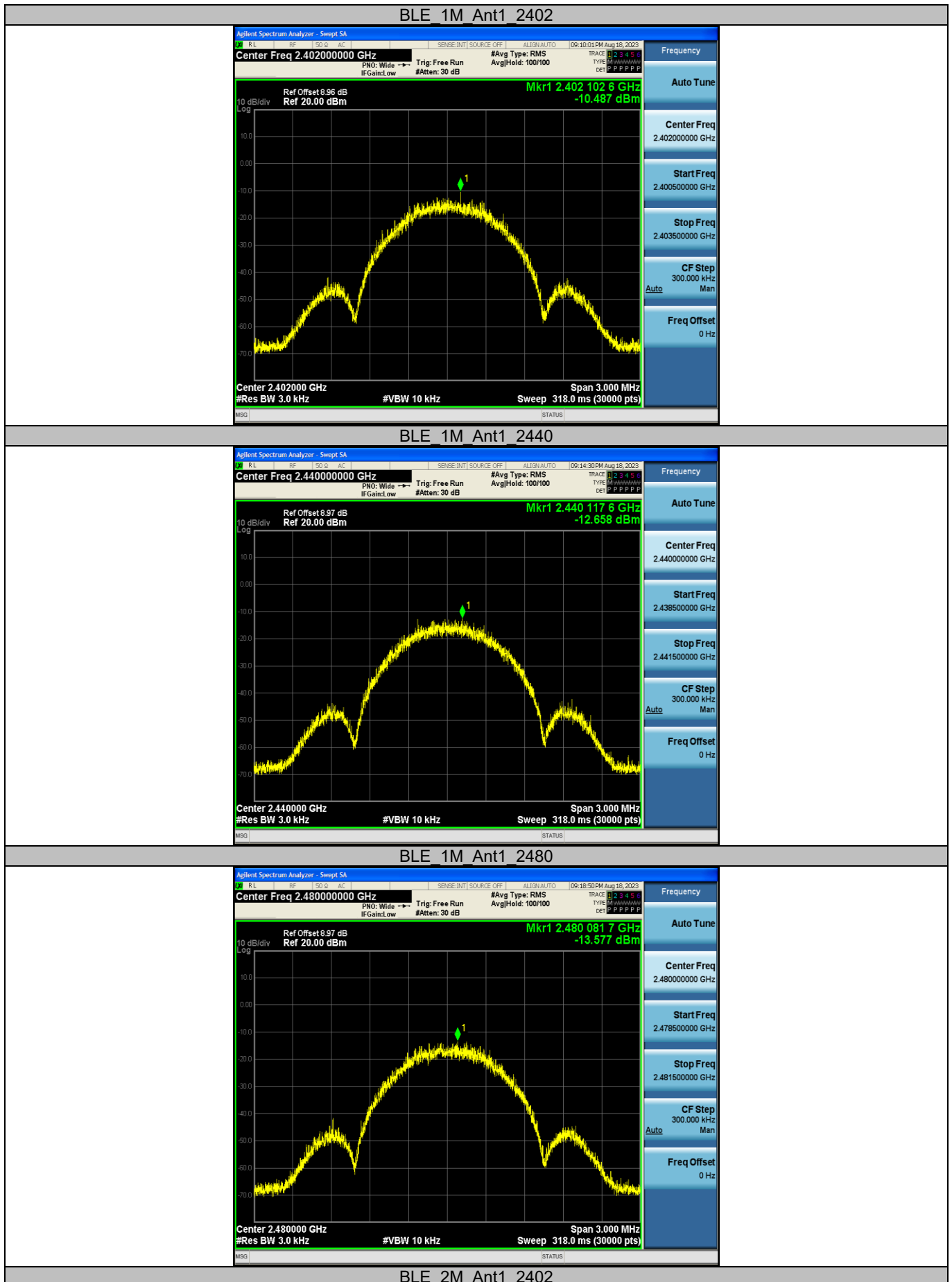


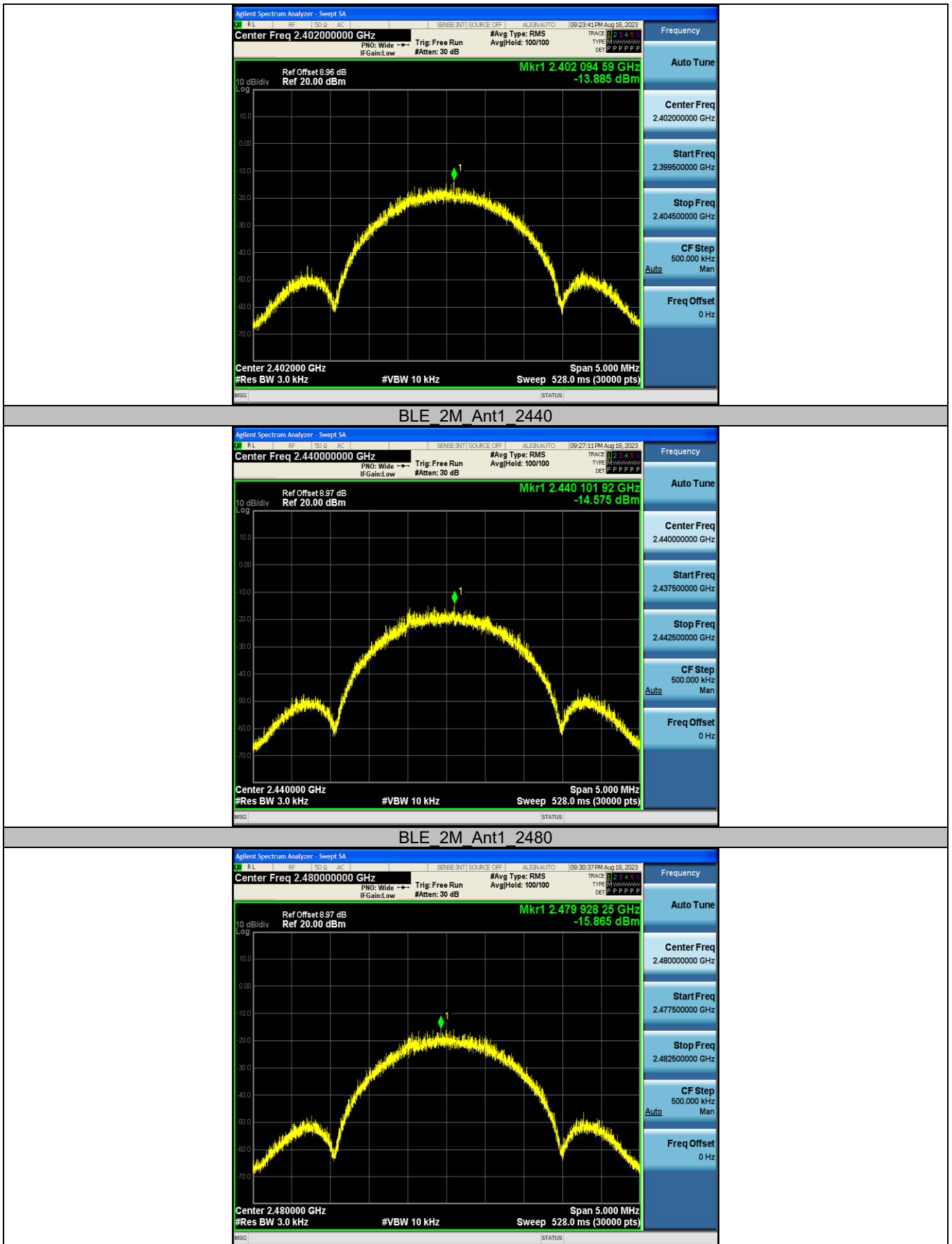
## Appendix C: Maximum power spectral density

### Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-10.49	≤8.00	PASS
		2440	-12.66	≤8.00	PASS
		2480	-13.58	≤8.00	PASS
BLE_2M	Ant1	2402	-13.89	≤8.00	PASS
		2440	-14.58	≤8.00	PASS
		2480	-15.87	≤8.00	PASS

## Test Graphs

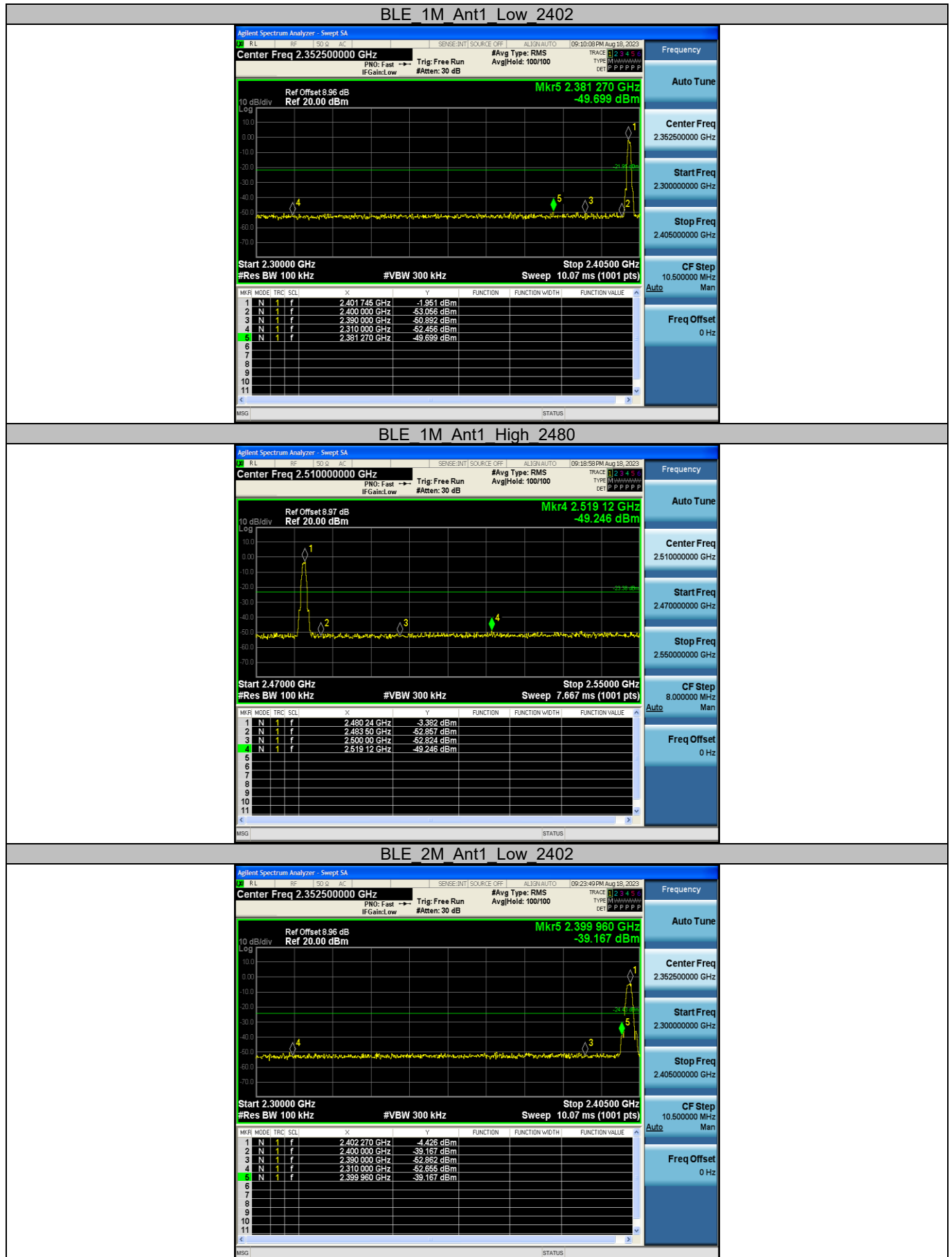


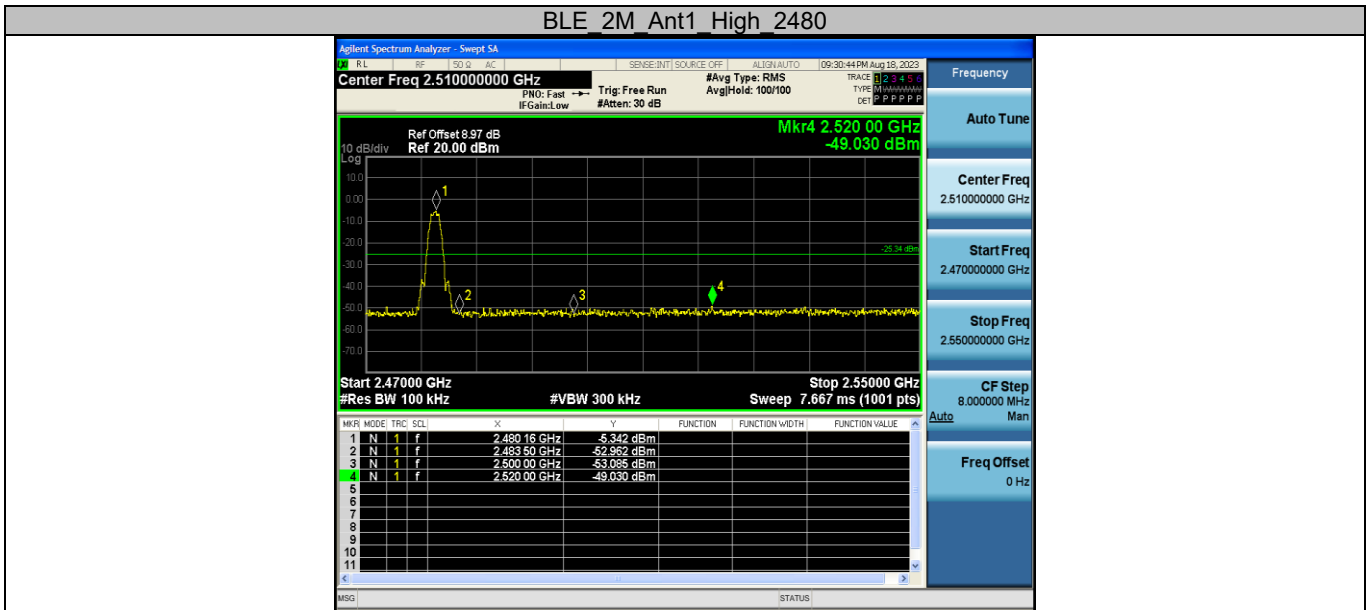




## Appendix D: Band edge measurements

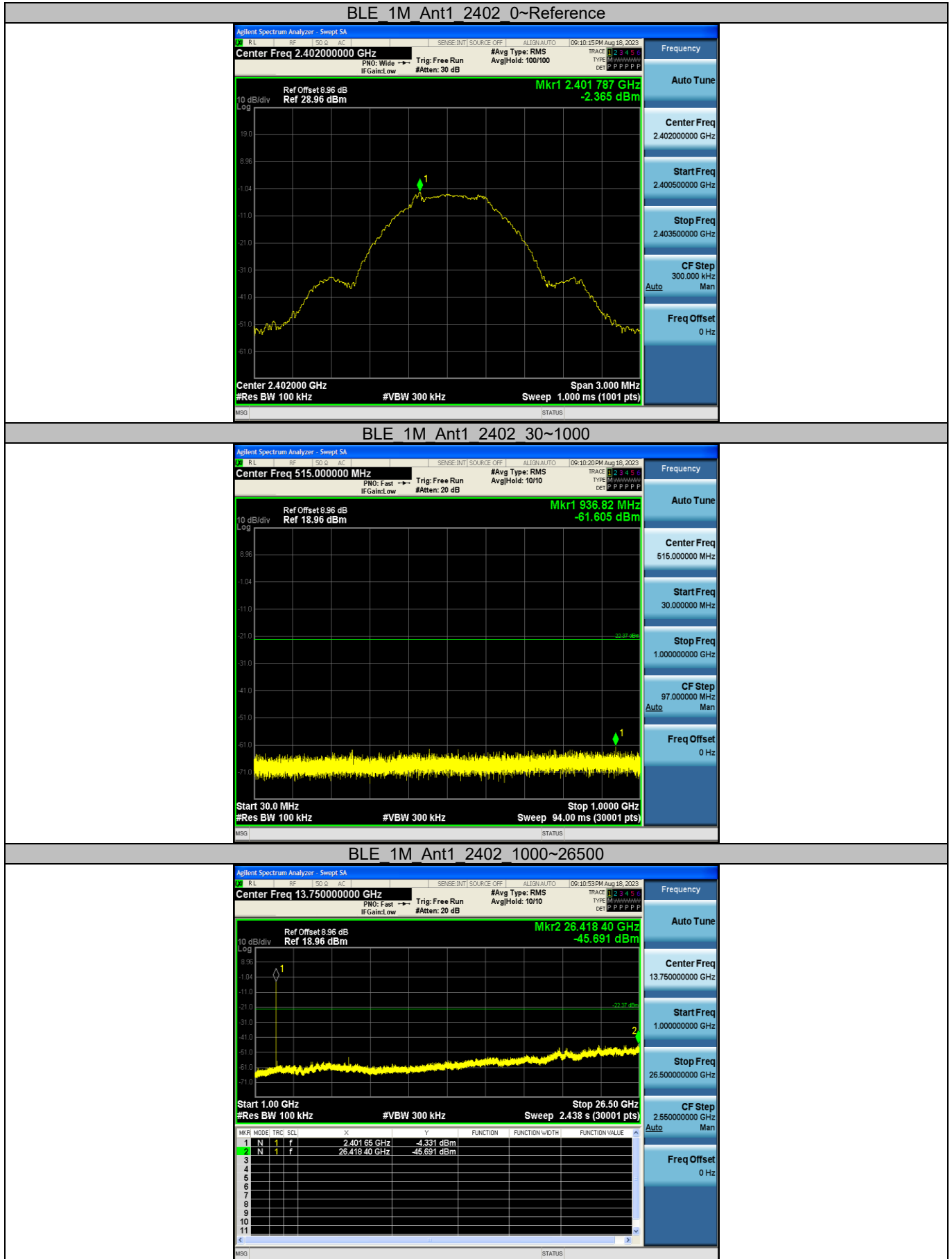
### Test Graphs

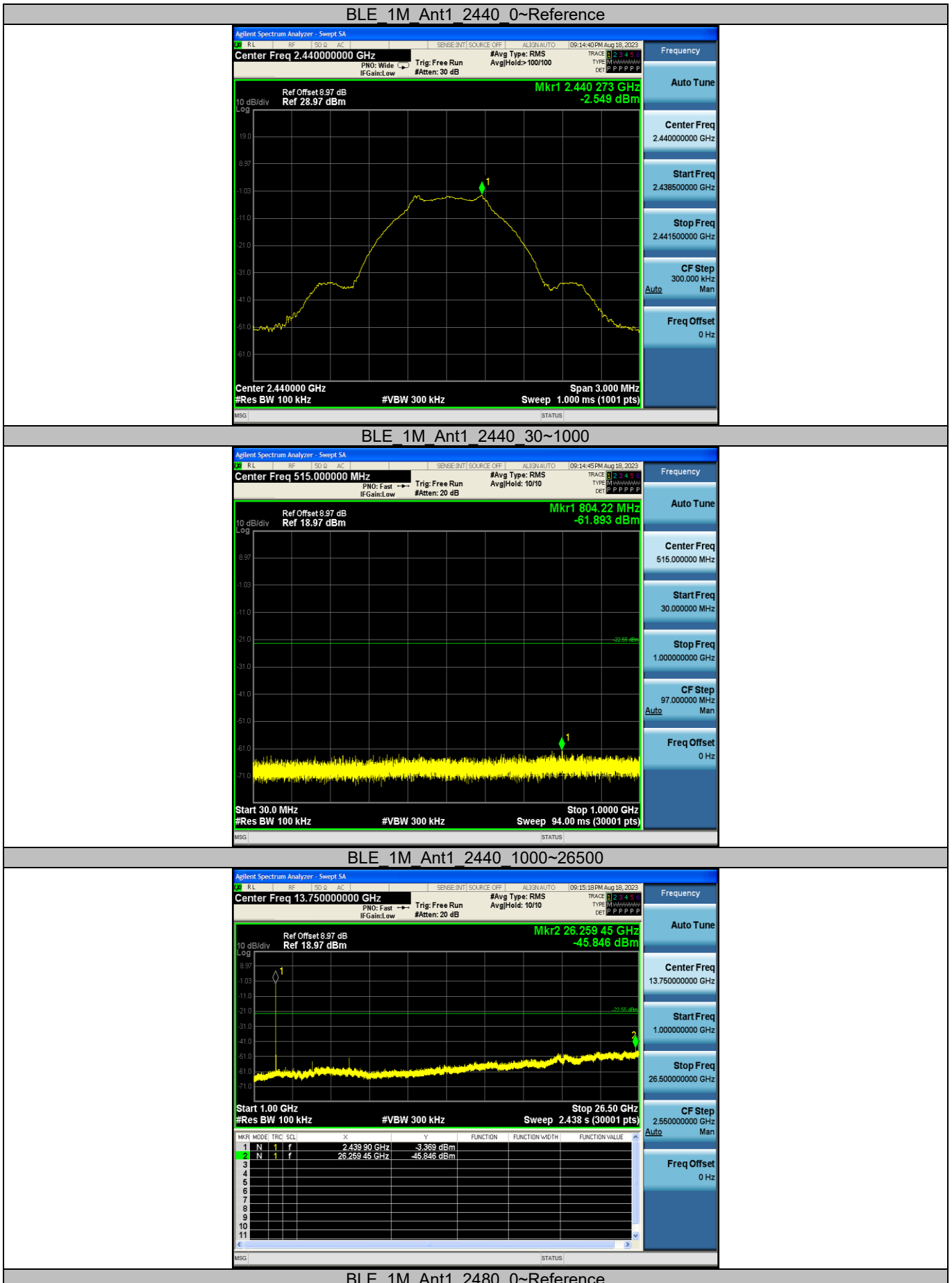


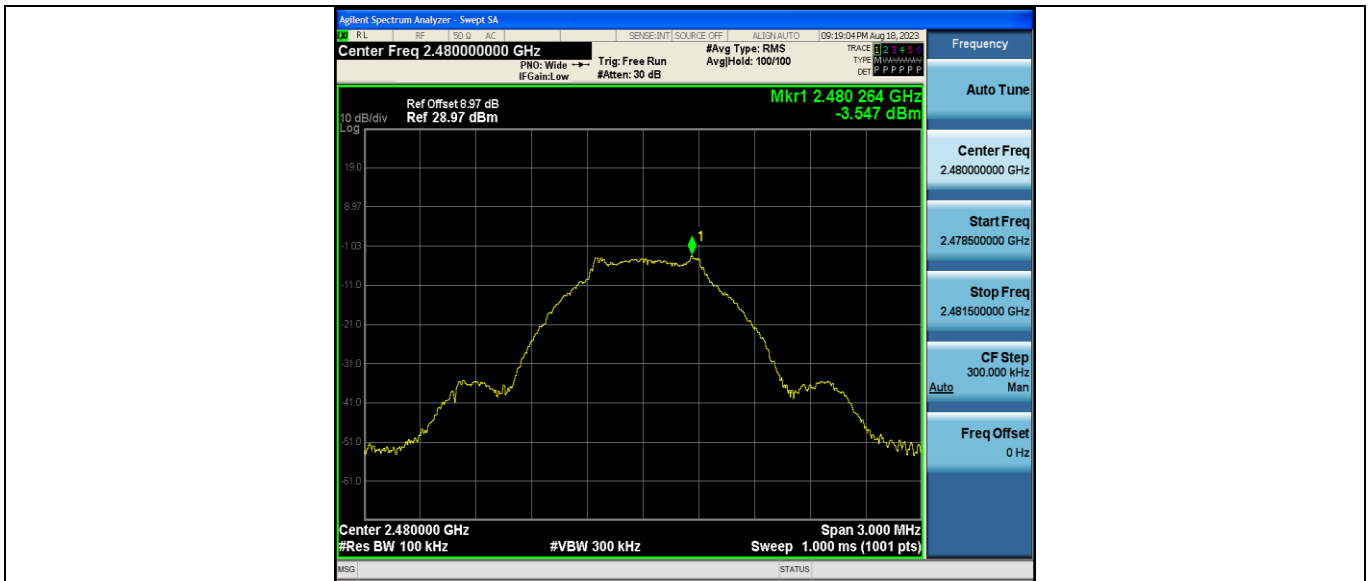


## Appendix E: Conducted Spurious Emission

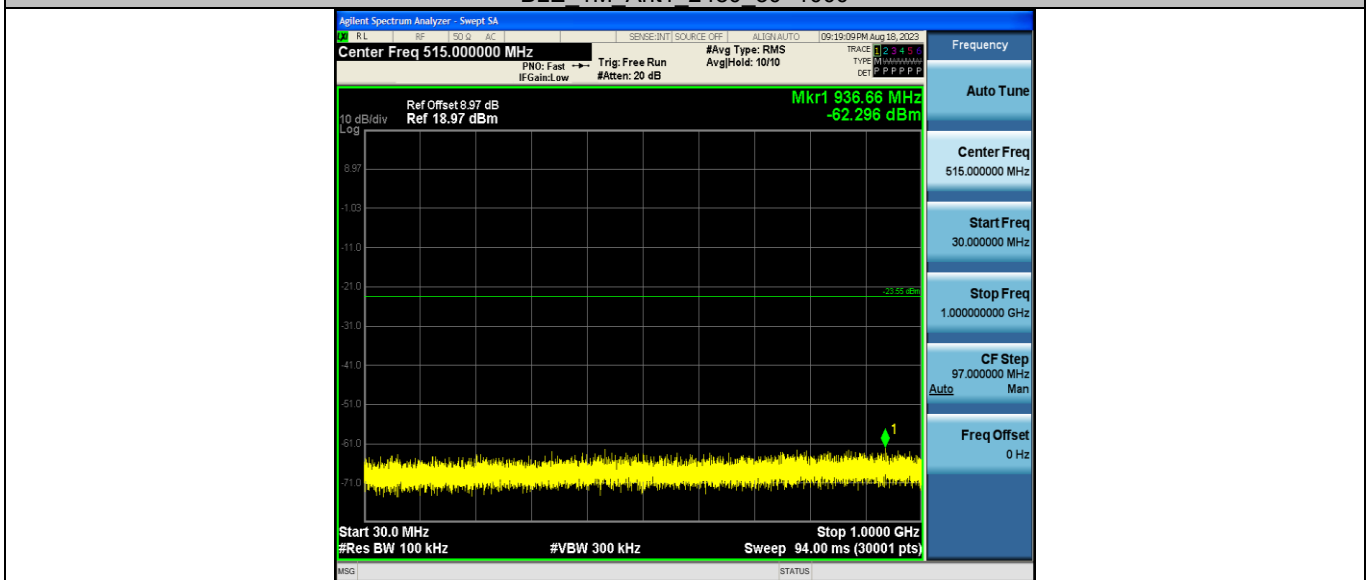
### Test Graphs



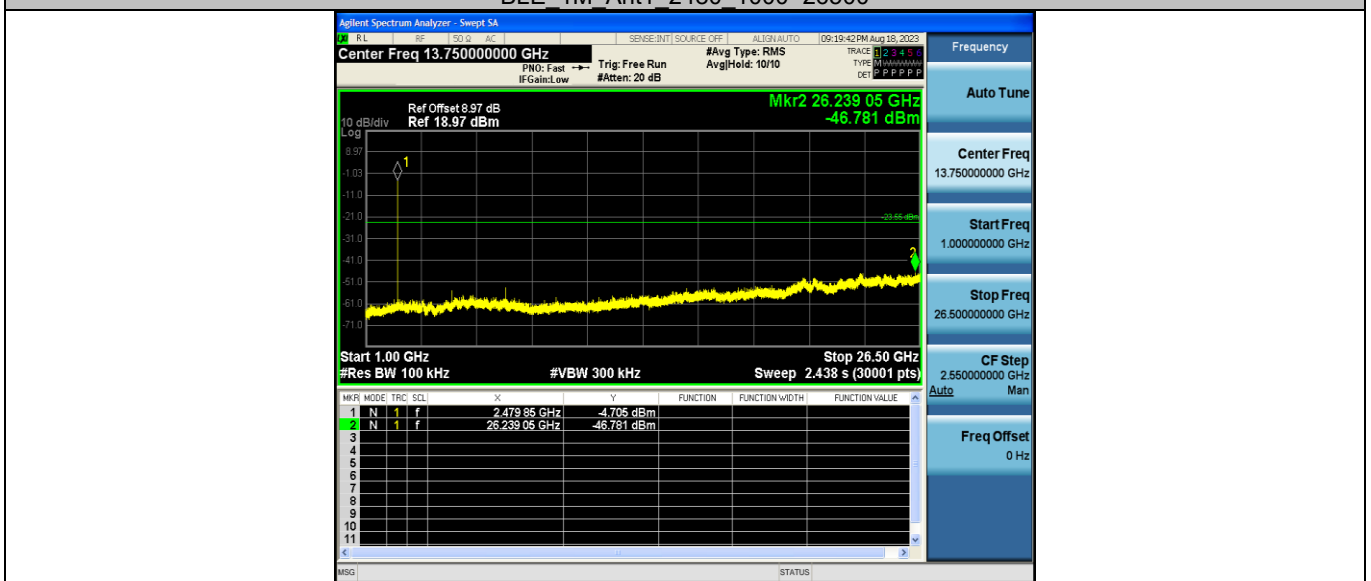




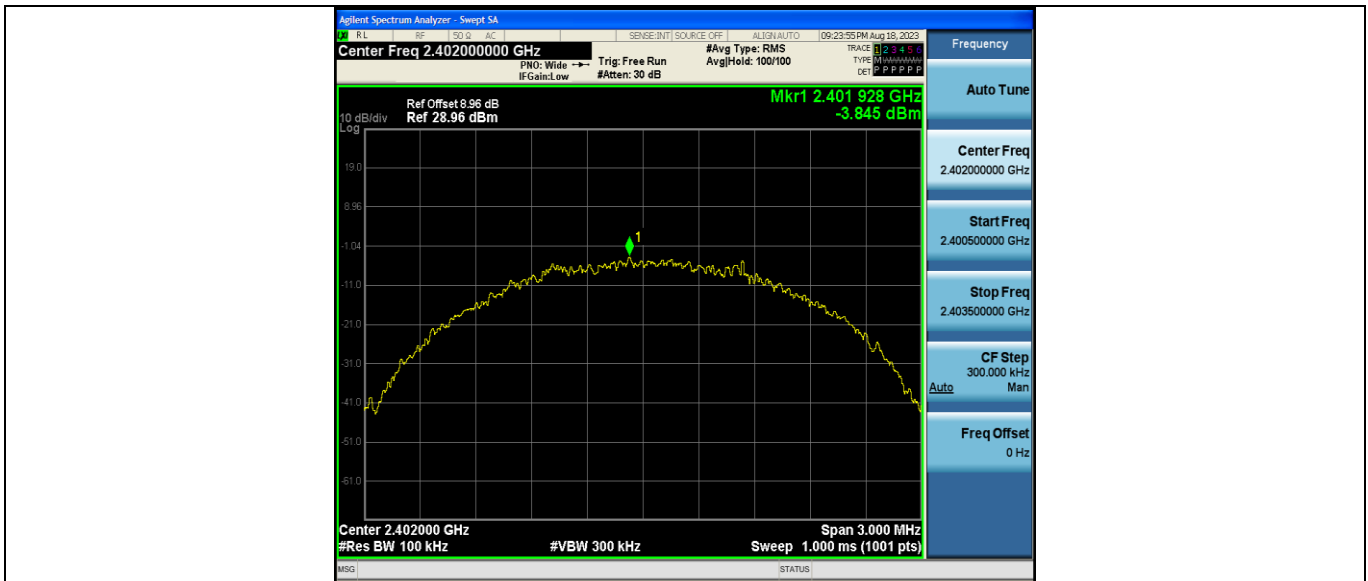
BLE 1M Ant1 2480 30~1000



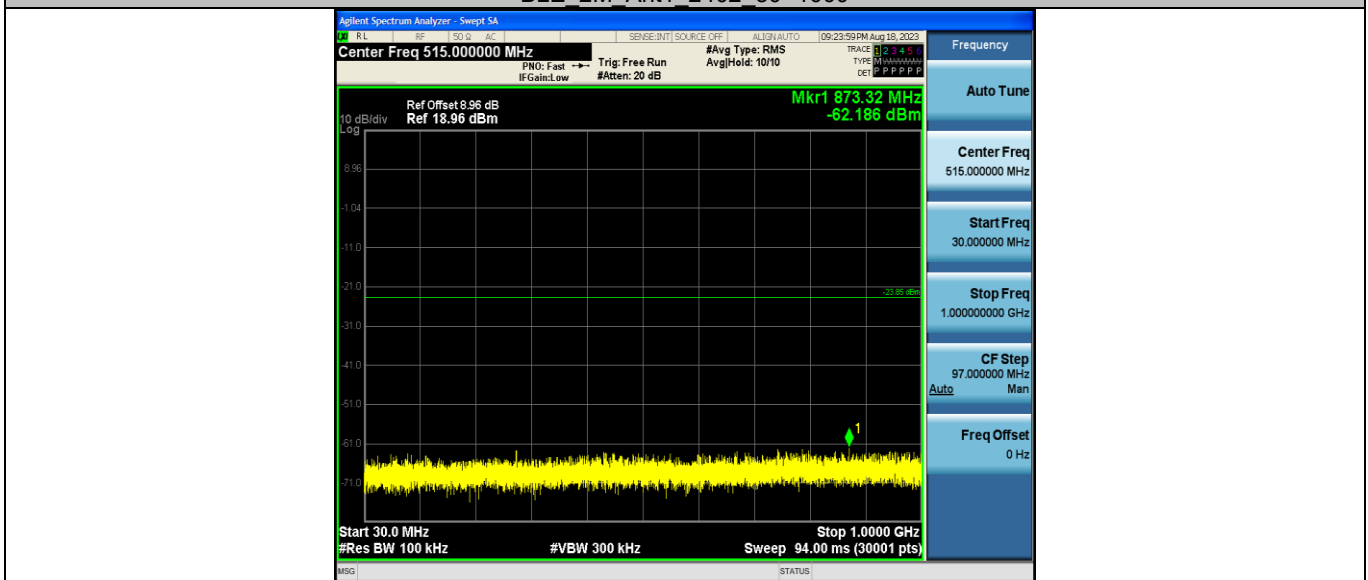
BLE 1M Ant1 2480 1000~26500



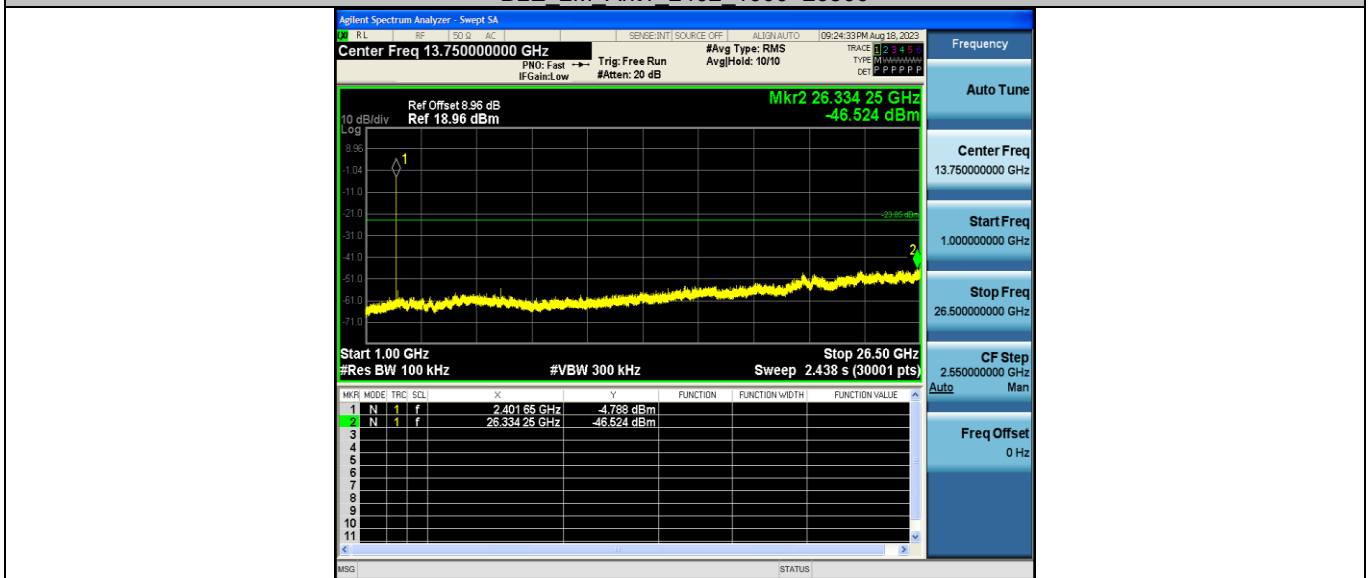
BLE 2M Ant1 2402 0~Reference



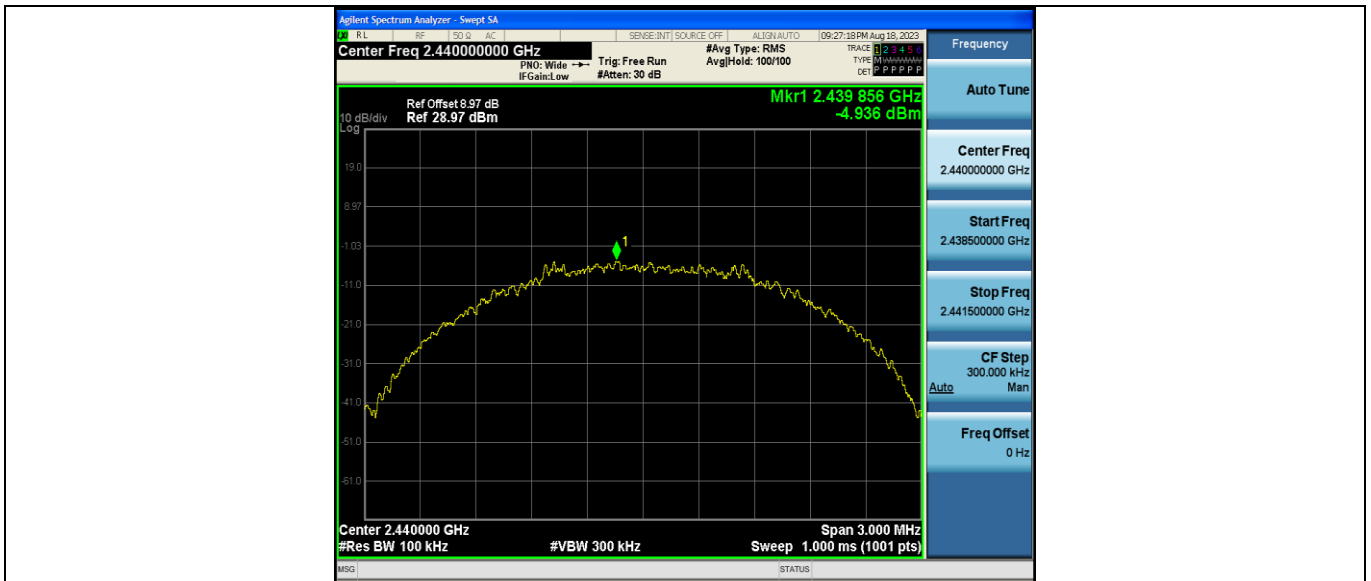
BLE 2M Ant1 2402 30~1000



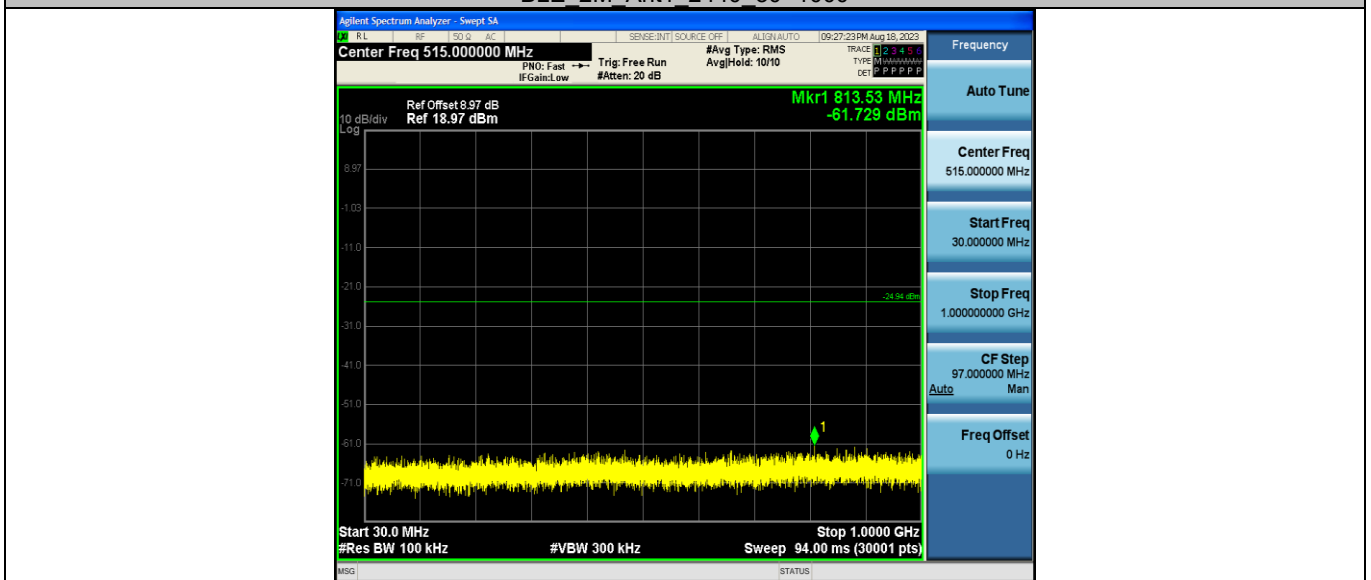
BLE 2M Ant1 2402 1000~26500



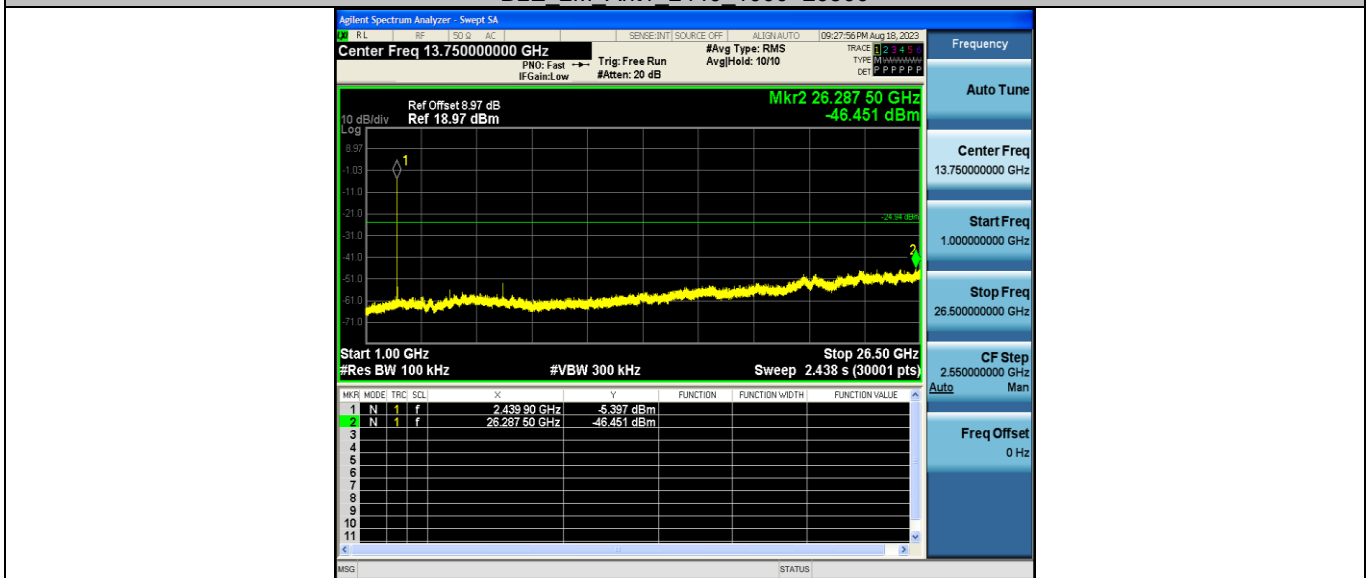
BLE 2M Ant1 2440 0~Reference



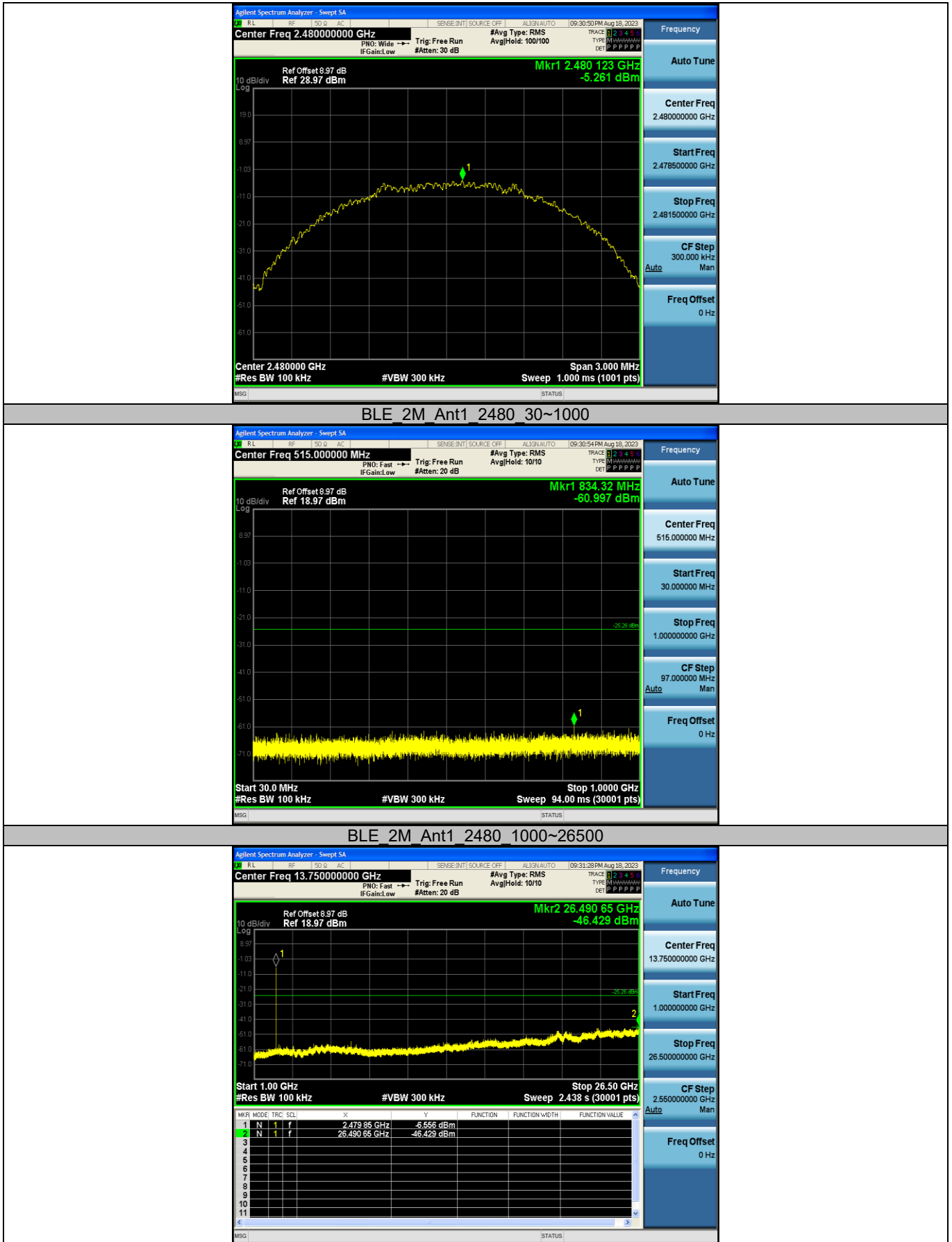
BLE 2M Ant1 2440 30~1000



BLE 2M Ant1 2440 1000~26500



BLE 2M Ant1 2480 0~Reference





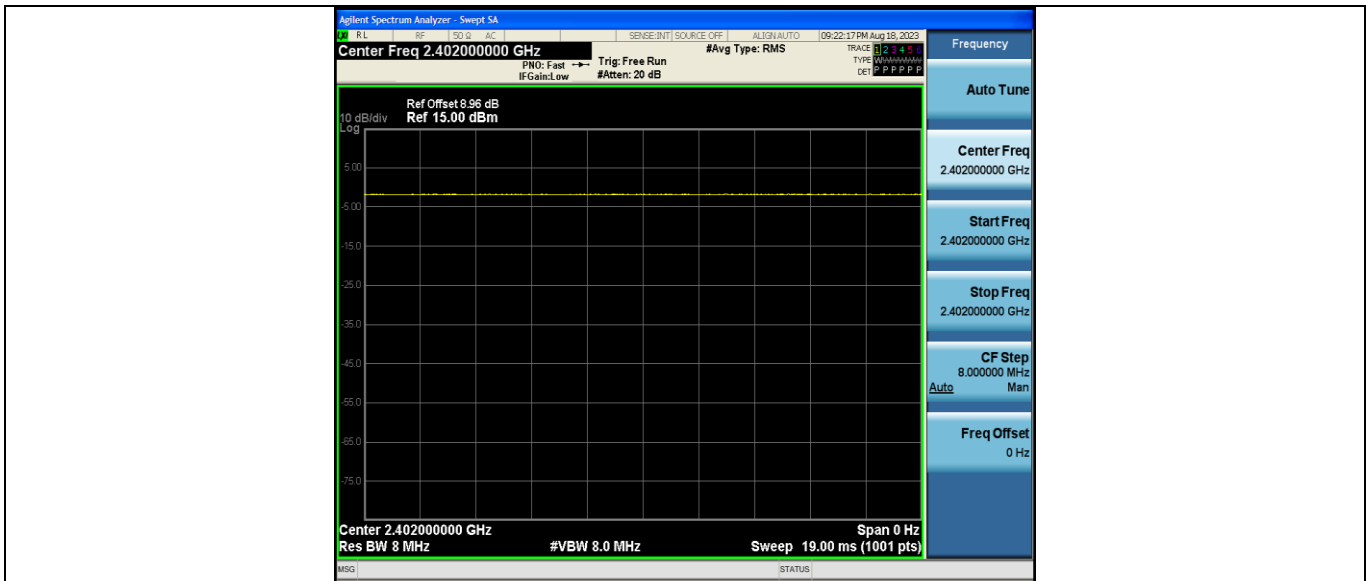
## Appendix F: Duty Cycle

### Test Result

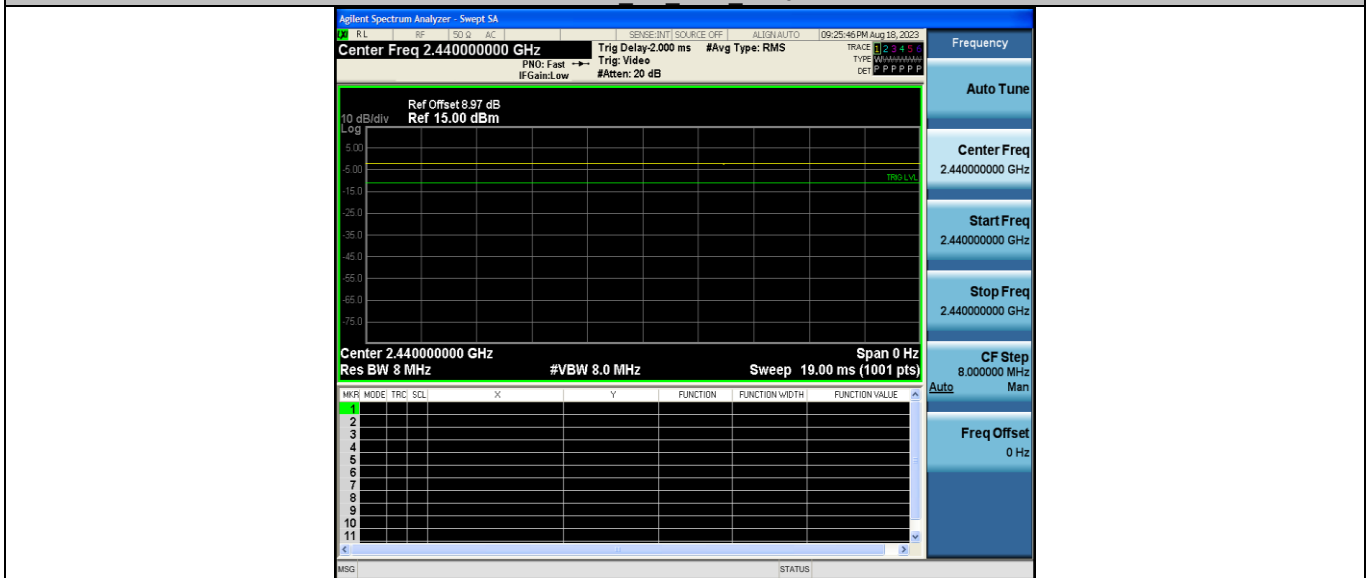
Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	Ant1	2402	19.00	19.00	100	0.00
		2440	19.00	19.00	100	0.00
		2480	19.00	19.00	100	0.00
BLE_2M	Ant1	2402	19.00	19.00	100	0.00
		2440	19.00	19.00	100	0.00
		2480	19.00	19.00	100	0.00

## Test Graphs

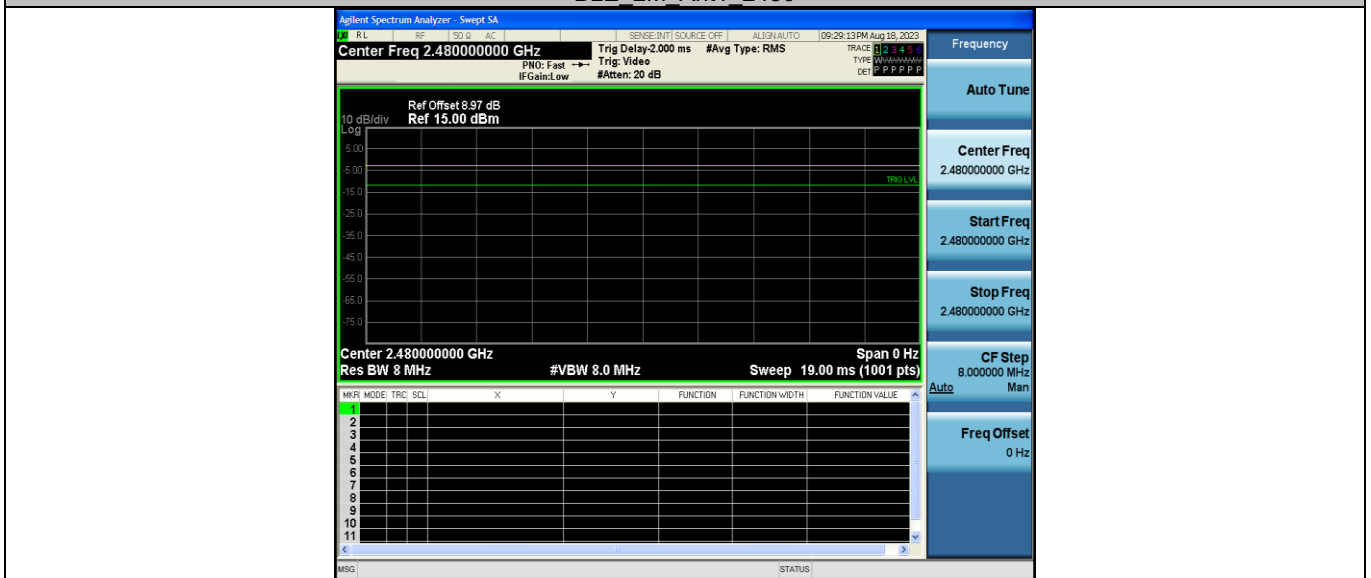




BLE 2M Ant1 2440



BLE 2M Ant1 2480



---End of Report---