

## RF Test Report

Applicant : Mobile Action Technology Inc.

Product Type : Bluetooth GPS Logger

Trade Name : Mobile Action

Model Number : GT-120B

Applicable Standard : Notification No.88 of MIC, 2004, Annex 43  
2.4 GHz band wide-band low-power data communication system  
(Item 19 of Article 2 Paragraph 1)

Received Date : Oct. 08, 2021

Test Period : Oct. 18 ~ Nov. 05, 2021

Issued Date : Nov. 17, 2021

### Issued by

A Test Lab Techno Corp.  
No. 140-1, Changan Street, Bade District,  
Taoyuan City 33465, Taiwan (R.O.C)  
Tel : +886-3-2710188 / Fax : +886-3-2710190

### Note:

- 1.The test results are valid only for samples provided by customers and under the test conditions described in this report.
- 2.This report shall not be reproduced except in full, without the written approval of A Test Lab Technology Corporation.
- 3.The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.

Revision History

Rev.	Issued Date	Revisions	Revised By
00	Nov. 17, 2021	Initial Issue	Emma Chao

## Verification of Compliance

Applicant : Mobile Action Technology Inc.

Product Type : Bluetooth GPS Logger

Trade Name : Mobile Action

Model Number : GT-120B

EUT Rated Voltage : DC 5 V, 200 mA

Test Voltage : DC 3.3 V / DC 3.7 V / DC 4.07 V

Applicable Standard : Notification No.88 of MIC, 2004, Annex 43  
2.4 GHz band wide-band low-power data communication system  
(Item 19 of Article 2 Paragraph 1)

Test Result : Complied

Performed Lab. : A Test Lab Techno Corp.  
No. 140-1, Changan Street, Bade District,  
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The above equipment has been tested by A Test Lab Techno Corp., and found compliance with the requirements set forth in the 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2 Paragraph 1) and technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By :

\_\_\_\_\_  
( Fly Lu )

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### Appendix A. Test Setup Photographs



# 1 General Information

## 1.1. EUT Description

Applicant	Mobile Action Technology Inc. 12F, NO.661, Bannan Rd., Zhonghe Dist. New Taipei City, Taiwan (R.O.C.) 235030		
Manufacturer	VALTEC Technology Co., Ltd. 5F, No.5, Alley 8, Lane 45, Pao Hsin Rd. Hsin-Tien Dist. New Taipei City 23145, Taiwan R.O.C.		
Product Type	Bluetooth GPS Logger		
Trade Name	Mobile Action		
Model Number	GT-120B		
Hardware Version	Version 1.1		
Software Version	Version 1.0		
Antenna Information	Trade Name: Invax Model Number: IVX-CA2400-321605 Antenna Type: Chip Antenna Max. Gain: 2.5 dBi		
Radio Equipment	2.4 GHz Band Wide-Band Low-Power Data Communication System		
Classification of Specified Radio Equipment	Article 2 Clause 1 Item 19		
Frequency Band	Bluetooth LE : 1 Mbps Bluetooth 2LE : 2 Mbps		
Frequency Range	2402-2480 MHz		
Channel Number	40		
Channel Separated	2 MHz		
Modulation Type	GFSK		
Type of Emissions	F1D		
Declared Rated Power	Bluetooth LE	1.574 mW	1.970 dBm
	Bluetooth 2LE	1.567 mW	1.951 dBm
E.I.R.P.	Bluetooth LE	4.470 dBm	
	Bluetooth 2LE	4.451 dBm	
Tested Circuit Insertion Loss	0.6 dB		
Operate Temp. Range	-10 ~ +50 ℃		

## 1.2. Summary of Test Result

Item	Result	Remark
Frequency Error	PASS	-----
Occupied Bandwidth	PASS	-----
Antenna Power (Conducted)	PASS	-----
Unwanted Emission Strength	PASS	-----
Secondarily Emitted Radio Wave Strength	PASS	-----
Radio Interference Prevention Capability Measurement	PASS	-----

### Decision Rule

- ☒ Uncertainty is not included.
- ☐ Uncertainty is included.

## 2 Test Methodology

### 2.1. Mode of Operation

#### Test Category

2.4 GHz Band Wideband Low-Power Data Communication System

Test Mode
Mode 1: LE Continuous TX mode
Mode 2: 2LE Continuous TX mode

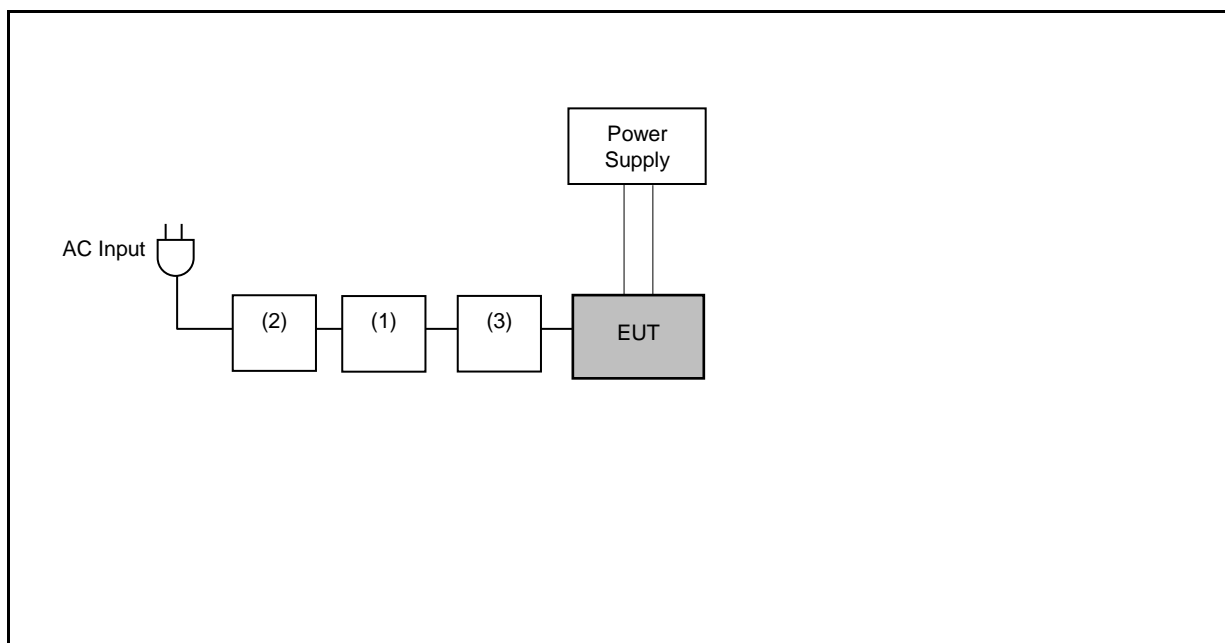
#### Comprehensive operation test

Three voltage settings are respectively adopted during the test. They are Normal Voltage, Normal Voltage + 10 % and Normal Voltage - 10 %

### 2.2. EUT Test Step

1.	Setup the EUT shown on "Configuration of Test System Details".
2.	Turn on Bluetooth function.
3.	EUT run test program.

### 2.3. Configuration of Test System Details



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
(1)	Notebook	ASUS	P2430U	GANXCV04H86940A	---
(2)	AC Adapter	ASUS	ADP-65GD D	---	Non-Shielded, 0.8 m
(3)	Fixture	Mobile Action	USB-UART	---	---

## 2.4. Test Instruments

Test Period: Oct. 18 ~ Nov. 05, 2021

Testing Engineer: Andy Lu, Peter Shui

Use	Equipment	Manufacturer	Model Number	Serial Number	Calibration Authority	Cal. Date	Cal. Period	Cal. Method
<input type="checkbox"/>	Power Sensor	Anritsu	MA2411B	1126022	ETC	09/03/2021	1 year	(c)
<input type="checkbox"/>	Power Meter	Anritsu	ML2495A	1135009	ETC	09/03/2021	1 year	(c)
<input checked="" type="checkbox"/>	Power Sensor	Agilent	N1921A	MY45241957	ETC	12/09/2020	1 year	(c)
<input checked="" type="checkbox"/>	Power Meter	Agilent	N1911A	MY45101619	ETC	12/09/2020	1 year	(c)
<input type="checkbox"/>	Spectrum Analyzer (10 Hz~26.5 GHz)	Keysight	N9010B	MY59071418	ETC	03/17/2021	1 year	(c)
<input type="checkbox"/>	Spectrum Analyzer (9 kHz~26.5 GHz)	Agilent	N9010A	MY48030518	ETC	07/23/2021	1 year	(c)
<input checked="" type="checkbox"/>	Spectrum Analyzer (20 Hz~26.5 GHz)	Agilent	N9020A	US47520902	ETC	09/09/2021	1 year	(c)
<input type="checkbox"/>	Spectrum Analyzer (3 Hz~50 GHz)	Agilent	N9030A	MY53120541	ETC	01/08/2021	1 year	(c)
<input type="checkbox"/>	Signal Generator	Keysight	N5182B	MY53052569	ETC	04/20/2021	1 year	(c)
<input type="checkbox"/>	Signal Generator	Keysight	N5182BX07	MY59360221	ETC	04/20/2021	1 year	(c)
<input type="checkbox"/>	Bluetooth Tester	R&S	CBT	100350	ETC	03/17/2021	2 years	(c)
<input type="checkbox"/>	Wireless Connectivity Tester	R&S	CMW270	102208	R&S	06/02/2021	1 year	(c)
<input checked="" type="checkbox"/>	Power Supply	KEITHLEY	2303	4045290	OCL	02/01/2021	1 year	(c)

Remark :

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).
- (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c)

From JRL Article 24-2, paragraph 4, Item 2

## 2.5. Uncertainty of Measured Value

Test Item	Uncertainty
Frequency Error	1.3 x 10 <sup>-7</sup>
Occupied Bandwidth	4.5 %
Spread Bandwidth	4.5 %
Antenna Power Error	1.1 dB
Unwanted Emission Strength	1.1 dB
Secondarily Emitted Radio Wave Strength	1.1 dB

## 2.6. Test Site Environment

Items	Test Item	Required	Actual
Temperature (°C)	Conducted	5-35	20-30
Humidity (%RH)		45-85	45-75

Site Name: A Test Lab Techno Corp.  
 Site Address: No. 140-1, Changan Street, Bade District,  
 Taoyuan City 33465, Taiwan (R.O.C)  
 TEL : 886-3-271-0188 / FAX : 886-3-271-0190  
<http://www.atl-lab.com.tw/e-index.htm>

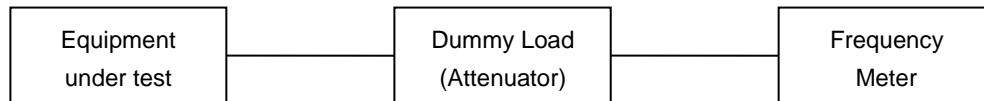
### 3 Measurement Procedure

#### 3.1. Frequency Error Measurement

##### ■ Limit

Frequency Tolerances  $\leq 50$  ppm.

##### ■ Test Setup



##### ■ Measuring Equipment Conditions

- (1) Use a frequency counter that has sensitivity of -20 dBm or better or a spectrum analyzer that has synthesized local oscillator.
- (2) Accuracy of the frequency counter shall be one tenth of the tolerance specified for EUT or less (e.g.  $5 \times 10^{-6}$  or less)
- (3) Attenuation of the attenuator shall be adjusted to give the optimum operation input level to the frequency meter in order to avoid the effect from the amplitude fluctuation of measurement wave.
- (4) When measuring burst waves, use the pulse measuring function of the counter and set the gate open time to a value that enables the measurement though entire period of burst as long as possible.

##### ■ Conditions of Equipment under Test

- (1) Set the EUT to the test frequency and transmit RF signal.
- (2) The modulation state is "continuous wave without modulation" by stopping spread spectrum in principle. But, if it is not possible, it shall be "continuous burst wave without modulation".

##### ■ Measuring Operation Procedures

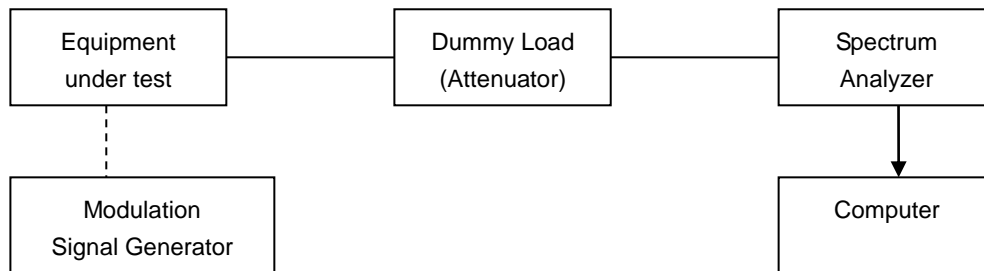
In case of burst waves, the measurement shall be done for enough time (e.g. covering 20 or more of burst waves) in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.

### 3.2. Occupied Bandwidth Measurement

#### ■ Limit

Max. Occupied Bandwidth: 26 MHz.

#### ■ Test Setup



#### ■ Measuring Equipment Conditions

Spectrum Analyzer Setting

SPAN : 200 MHz

RBW : 300 kHz

VBW : 300 kHz

Sweep Time : AUTO (Minimum time to ensure measurement accuracy.)

Data Points : 401 points or more

Indication mode : Max hold

Detection Mode : Positive Peak

Storage Mode : Normal

Y-axis Scale : 10 dB/Div.

Reference Level : Enough level for maximum dynamic range

#### ■ Conditions of Equipment under Test

Set to testing frequency and modulate using standard encoding test signals.

#### ■ Measuring Operation Procedures

- (1) Configure the setting of the spectrum analyzer to 3.3(1).
- (2) After repeating sweeps until no display changes are found, import the values of all the data points as array variables of the computer.
- (3) Convert the dB value into the antilog of the power dimension (i.e. mW) for all the data.
- (4) Find the total power of the all the data and record as "Total Power" in mW.
- (5) Add power to the minimum frequency data in order and find the value of the limiting data point that is 0.5 % of the "Total Power". Convert the limiting point into a frequency and record as the "lower limit" frequency.
- (6) Add power to the maximum frequency data in order and find the value of the limiting data point that is 0.5 % of the "Total Power". Convert the limiting point into a frequency and record as the "upper limit" frequency.



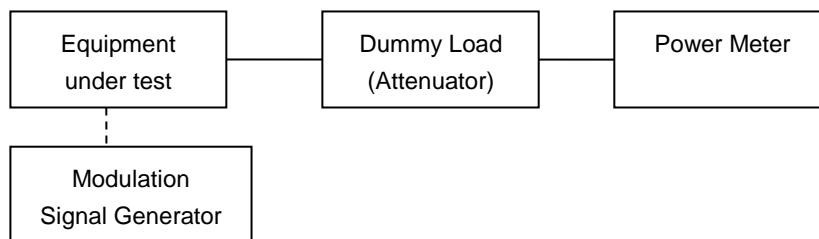
### 3.3. Antenna Power (Conducted) Measurement

#### ■ Limit

RF Output Power  $\leq 10$  mW.

RF Output Power Tolerance  $\leq -80\% \sim +20\%$ .

#### ■ Test Setup



#### ■ Measuring Equipment Conditions

a. Use power meter to measure burst power.

#### ■ Conditions of Equipment under Test

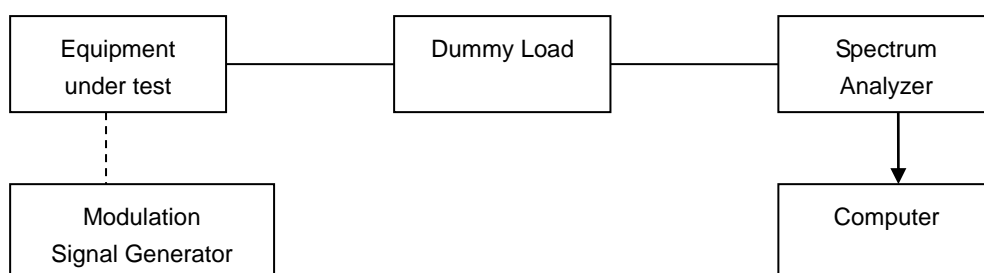
a. Connect the high frequency power meter to the output of the attenuator and measure the total power (without bandwidth limitation)

### 3.4. Unwanted Emission Strength Measurement

#### ■ Limit

Frequency (MHz)	Limit (μW/MHz)
Under 2387 MHz	≤ 2.5
2387-2400 MHz	≤ 25
2483.5-2496.5 MHz	≤ 25
2496.5 - 12.5 GHz	≤ 2.5

#### ■ Test Setup



Note 1: The computer is used for calculating the mean value of amplitude levels.

#### ■ Measuring Equipment Conditions

(1) The setting of the spectrum analyzer during spurious searches are as follow:

Sweep Bandwidth:	Starts spurious searches form the smallest possible frequencies to more then 5 times the carrier frequencies..
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Y-axis scale:	10 dB/Div.
Input level:	Maximum dynamic range value
Sweep time:	Minimum amount of time to ensure measurement accuracy.
Sweep mode:	Continuous mode
Data Points:	Over 400 points
Detection mode:	Positive peak
Display mode:	Maximum hold

(2) The setting of spectrum analyzer while conducting spurious amplitude measurement are as follows:

Center Frequency:	Acquired spurious frequency in (1)
Frequency sweep width:	0 MHz
Resolution bandwidth:	1 MHz
Video bandwidth:	Same as Resolution bandwidth
	Note: take into account that the requirement limits the power in a bandwidth of 1 MHz. If the measurement is carried out with a bandwidth of 100 kHz (for frequencies below 1 GHz), the limit shall be reduced with 10 dB
Y-axis scale:	10 dB/Div
Input level:	Choose input level within the linear range of the SA mixer (so that no additional spurious are generated by the mixer).
Sweep mode:	Minimum amount of time to ensure measurement accuracy.
Data Points:	Over 400 points
Sweep mode:	Single sweep
Detection mode:	Sample (BIN-Width $\ll$ RBW, so that all spurious emissions are captured). [BIN-width is the frequency difference between 2 adjacent sample points on the display.]

#### ■ Conditions of Equipment under Test

Set the testing frequency and testing spread codes and modulate using standard encoding test signals. Choose a frequency / channel according to specified range (Low, Middle and High).

Note: If the spurious limit is specified with the EIRP value, the effective (maximum) antenna gain shall be taken into account.

#### ■ Measuring Operation Procedures

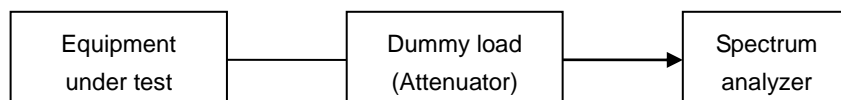
- (1) Configure the settings of the spectrum analyzer to 8.3(1) and search for spurious frequencies by sweeping. Do not conduct the measurements in 8.3(2) if the amplitude value of the acquired spurious frequencies meets the standard value.
- (2) If the acquired spurious amplitude value exceeds the standard value, narrow the sweep Bandwidth, in the order of 100 MHz, 10 MHz, and 1 MHz, to increase the frequency accuracy of the spectrum analyzer and accurately find the spurious frequency. Configure the spectrum analyzer to the settings in 8.3(2), find the average of the spurious amplitude values (in the case of burst waves, the average values are within the respective burst and set this as the measured value. Averaging can be done by summing up the power (display must give the linear power in uW) according to 8.3(2) and dividing by the amount of points. Correction on the equivalent noise bandwidth shall be necessary (if not realized automatically).

### 3.5. Secondly Emitted Radio Wave Strength Measurement

#### ■ Limit

Frequency (MHz)	Limit (nW)
Under 1 GHz	$\leq 4$
1 - 12.5 GHz	$\leq 20$

#### ■ Test Setup



#### ■ Measuring Equipment Conditions

- (1) Set the attenuation of the attenuator to under 20 dB because the subject for measurement is of low level.
- (2) Set the spectrum analyzer as follow:
 

Frequency sweep width:	See 7.5 Measuring Operation Procedures
Resolution bandwidth:	A value determined by the specified dynamic range and the sweep time. (e.g. 30 kHz for 8 GHz sweep width and 30 second sweep time.).
Video bandwidth:	Approximately the same bandwidth as resolution bandwidth.
Y-axis scale:	10 dB/Div
Input level:	0 dB, if possible.
Sweep mode:	Single sweep
Detection mode:	Positive peak

#### ■ Conditions of Equipment under Test

Set the EUT to receiver the test frequency with forced continuous receiving control.

#### ■ Measuring Operation Procedures

Sweep the spectrum analyzer from a low frequency to a frequency of 3 times if the carrier or over (e.g. 10 MHz to about 8 GHz) and measure the collateral radio emissions.

### 3.6. Radio Interference Prevention Capability Measurement

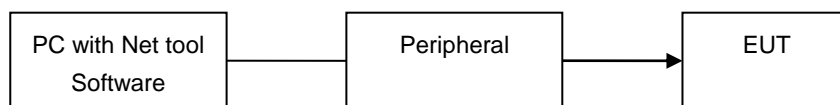
■ **Limit**

Identification code  $\geq$  48 bits

■ **Measuring Id Code Software**

MAC IP List: MAC Scan

■ **Test Setup**



■ **Measuring Operation Procedures**

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

### 3.7. Construction Protection Confirmation Method

■ **Limit**

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

## 4 Test Results

Mode 1: LE Continuous TX mode

### **TEST RESULTS DATA FOR JAPANESE CERTIFICATION**

Peak Antenna Gain	2.500	dBi
Declaration Output Power	1.574	mW
Declaration Output Power	1.970	dBm
EIRP	4.470	dBm
Input Power Voltage	3.7	Vdc

Tested Circuit Insertion Loss		0.6	dB
Burst	ON TIME	-Not applicable-	sec
	OFF TIME	-Not applicable-	sec
	Ratio	-Not applicable-	%
Packet Type (Mode)		-Not applicable-	mode

Frequency equal to the transmission rate  
of the modulation signal

0 MHz

Test Category ; 2.4GHz Band Wideband Low-Power Data Communication System

Comprehensive operation test

: In order to receive constant voltage from DC power supply, power supply voltage examines only by usual state voltage.

## 2.1 TEST Results (Normal Voltage)

Measurement Frequency			MHz	2402	2440	2480	Result	Limit
Channel Number			Ch.	0	19	39	-----	-----
Reading Frequency			MHz	2402.0459	2440.0465	2480.0471	-----	-----
Frequency Tolerance			ppm	19.11	19.06	18.99	<b>PASS</b>	-50≤x≤+50
Occupied Bandwidth			MHz	1.2567	1.2611	1.2586	<b>PASS</b>	≤26 MHz
RF Output Power			mW	1.355	1.574	1.352	<b>PASS</b>	≤10 mW
RF Output Power Tolerance			%	-13.914	0.000	-14.104	<b>PASS</b>	-80≤x≤+20
EIRP			dBm	3.820	4.470	3.810	-----	-----
Unwanted Emission Strength (TX1)	Under 2387MHz	μW/MHz	0.009	0.008	0.015	<b>PASS</b>	≤2.5uW/MHz	
		MHz	2210.200	2247.900	2288.000	-----	-----	
	2387-2400MHz	μW/MHz	3.606	0.010	0.002	<b>PASS</b>	≤25uW/MHz	
		MHz	2399.987	2394.449	2399.532	-----	-----	
	2483.5-2496.5MHz	μW/MHz	0.003	0.008	0.221	<b>PASS</b>	≤25uW/MHz	
		MHz	2484.709	2485.021	2483.591	-----	-----	
	2496.5 - 12.5GHz	μW/MHz	0.096	0.064	0.059	<b>PASS</b>	≤2.5uW/MHz	
		MHz	4807.000	4877.000	4957.000	-----	-----	
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.001	0.001	0.001	<b>PASS</b>	≤4 nW	
		MHz	166.770	903.970	956.350	-----	-----	
	1 - 12.5GHz	nW	0.021	0.020	0.015	<b>PASS</b>	≤20 nW	
		MHz	2656.000	5876.000	5405.000	-----	-----	
Interference Prevention Function			-----	good			<b>PASS</b>	-----

## 2.2 TEST Results (High Voltage)

Measurement Frequency		MHz	2402	2440	2480	Result	Limit
Channel Number		Ch.	0	19	39	-----	-----
Reading Frequency		MHz	2402.0459	2440.0462	2480.0477	-----	-----
Frequency Tolerance		ppm	19.11	18.93	19.23	<b>PASS</b>	-50≤x≤+50
Occupied Bandwidth		MHz	1.2593	1.2559	1.2602	<b>PASS</b>	≤26 MHz
RF Output Power		mW	1.358	1.570	1.349	<b>PASS</b>	≤10 mW
RF Output Power Tolerance		%	-13.703	-0.231	-14.297	<b>PASS</b>	-80≤x≤+20
EIRP		dBm	3.830	4.460	3.800	-----	-----
Unwanted Emission Strength (TX1)	Under 2387MHz	μW/MHz	0.009	0.009	0.012	<b>PASS</b>	≤2.5uW/MHz
		MHz	2210.200	2247.900	2288.000	-----	-----
	2387-2400MHz	μW/MHz	3.223	0.009	0.002	<b>PASS</b>	≤25uW/MHz
		MHz	2399.897	2395.606	2396.789	-----	-----
	2483.5-2496.5MHz	μW/MHz	0.002	0.008	0.217	<b>PASS</b>	≤25uW/MHz
		MHz	2487.751	2485.424	2483.500	-----	-----
	2496.5 - 12.5GHz	μW/MHz	0.089	0.064	0.058	<b>PASS</b>	≤2.5uW/MHz
		MHz	4807.000	12200.000	4957.000	-----	-----
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.001	0.001	0.001	<b>PASS</b>	≤4 nW
		MHz	2679.000	2668.000	5899.000	-----	-----
	1 - 12.5GHz	nW	0.019	0.016	0.020	<b>PASS</b>	≤20 nW
		MHz	797.270	811.820	534.400	-----	-----
Interference Prevention Function		-----	good			<b>PASS</b>	-----



### **2.3 TEST Results (Low Voltage)**

Measurement Frequency		MHz	2402	2440	2480	Result	Limit
Channel Number		Ch.	0	19	39	----	----
Reading Frequency		MHz	2402.0456	2440.0465	2480.0474	----	----
Frequency Tolerance		ppm	18.98	19.06	19.11	<b>PASS</b>	-50≤x≤+50
Occupied Bandwidth		MHz	1.2552	1.2588	1.2610	<b>PASS</b>	≤26 MHz
RF Output Power		mW	1.355	1.570	1.349	<b>PASS</b>	≤10 mW
RF Output Power Tolerance		%	-13.902	-0.231	-14.297	<b>PASS</b>	-80≤x≤+20
EIRP		dBm	3.820	4.460	3.800	----	----
Unwanted Emission Strength (TX1)	Under 2387MHz	μW/MHz	0.011	0.011	0.011	<b>PASS</b>	≤2.5uW/MHz
		MHz	2210.200	2247.900	2288.000	----	----
	2387-2400MHz	μW/MHz	3.882	0.011	0.003	<b>PASS</b>	≤25uW/MHz
		MHz	2400.000	2394.956	2396.373	----	----
	2483.5-2496.5MHz	μW/MHz	0.002	0.007	0.224	<b>PASS</b>	≤25uW/MHz
		MHz	2485.073	2484.930	2483.721	----	----
	2496.5 - 12.5GHz	μW/MHz	0.091	0.065	0.057	<b>PASS</b>	≤2.5uW/MHz
		MHz	4807.000	4877.000	4957.000	----	----
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.001	0.001	0.001	<b>PASS</b>	≤4 nW
		MHz	768.170	900.090	957.320	----	----
	1 - 12.5GHz	nW	0.017	0.019	0.018	<b>PASS</b>	≤20 nW
		MHz	2679.000	3162.000	2748.000	----	----
Interference Prevention Function		----	good			<b>PASS</b>	----

Mode 2: 2LE Continuous TX mode

## **2. TEST RESULTS DATA FOR JAPANESE CERTIFICATION**

Peak Antenna Gain	2.500	dBi
Declaration Output Power	1.567	mW
Declaration Output Power	1.951	dBm
EIRP	4.451	dBm
Input Power Voltage	3.7	Vdc

Tested Circuit Insertion Loss		0.6	dB
Burst	ON TIME	-Not applicable-	sec
	OFF TIME	-Not applicable-	sec
	Ratio	-Not applicable-	%
Packet Type (Mode)		-Not applicable-	mode

Frequency equal to the transmission rate  
of the modulation signal

0 MHz

Test Category ; 2.4GHz Band Wideband Low-Power Data Communication System

Comprehensive operation test

: In order to receive constant voltage from DC power supply, power supply voltage examines only by usual state voltage.

## 2.1 TEST Results (Normal Voltage)

Measurement Frequency		MHz	2402	2440	2480	Result	Limit
Channel Number		Ch.	0	19	39	-----	-----
Reading Frequency		MHz	2402.0462	2440.0471	2480.0477	-----	-----
Frequency Tolerance		ppm	19.23	19.30	19.23	<b>PASS</b>	-50≤x≤+50
Occupied Bandwidth		MHz	2.1280	2.1302	2.1327	<b>PASS</b>	≤26 MHz
RF Output Power		mW	1.330	1.567	1.346	<b>PASS</b>	≤10 mW
RF Output Power Tolerance		%	-15.124	0.000	-14.103	<b>PASS</b>	-80≤x≤+20
EIRP		dBm	3.740	4.450	3.790	-----	-----
Unwanted Emission Strength (TX1)	Under 2387MHz	μW/MHz	0.009	0.010	0.011	<b>PASS</b>	≤2.5uW/MHz
		MHz	2210.200	2247.900	2288.000	-----	-----
	2387-2400MHz	μW/MHz	0.005	0.008	0.001	<b>PASS</b>	≤25uW/MHz
		MHz	2400.000	2395.281	2396.711	-----	-----
	2483.5-2496.5MHz	μW/MHz	0.001	0.006	0.196	<b>PASS</b>	≤25uW/MHz
		MHz	2485.424	2484.423	2484.267	-----	-----
	2496.5 - 12.5GHz	μW/MHz	0.091	0.064	0.054	<b>PASS</b>	≤2.5uW/MHz
		MHz	4807.000	12200.000	4957.000	-----	-----
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.001	0.001	0.001	<b>PASS</b>	≤4 nW
		MHz	496.570	918.520	200.720	-----	-----
	1 - 12.5GHz	nW	0.017	0.017	0.018	<b>PASS</b>	≤20 nW
		MHz	2737.000	5589.000	5025.000	-----	-----
Interference Prevention Function		-----	good			<b>PASS</b>	-----

## 2.2 TEST Results (High Voltage)

Measurement Frequency			MHz	2402	2440	2480	Result	Limit
Channel Number			Ch.	0	19	39	-----	-----
Reading Frequency			MHz	2402.0465	2440.0468	2480.0474	-----	-----
Frequency Tolerance			ppm	19.36	19.18	19.11	<b>PASS</b>	-50≤x≤+50
Occupied Bandwidth			MHz	2.1281	2.1303	2.1331	<b>PASS</b>	≤ 26 MHz
RF Output Power			mW	1.327	1.552	1.340	<b>PASS</b>	≤ 10 mW
RF Output Power Tolerance			%	-15.291	-0.933	-14.507	<b>PASS</b>	-80≤x≤+20
EIRP			dBm	3.730	4.410	3.770	-----	-----
Unwanted Emission Strength (TX1)	Under 2387MHz	μW/MHz	0.009	0.010	0.012	<b>PASS</b>	≤ 2.5uW/MHz	
		MHz	2210.200	2247.900	2288.000	-----	-----	
	2387-2400MHz	μW/MHz	0.007	0.007	0.001	<b>PASS</b>	≤ 25uW/MHz	
		MHz	2400.000	2395.112	2397.764	-----	-----	
	2483.5-2496.5MHz	μW/MHz	0.001	0.006	0.249	<b>PASS</b>	≤ 25uW/MHz	
		MHz	2485.532	2485.073	2483.799	-----	-----	
	2496.5 - 12.5GHz	μW/MHz	0.086	0.061	0.053	<b>PASS</b>	≤ 2.5uW/MHz	
		MHz	4807.000	4877.000	4957.000	-----	-----	
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.001	0.001	0.001	<b>PASS</b>	≤ 4 nW	
		MHz	806.970	846.740	994.180	-----	-----	
	1 - 12.5GHz	nW	0.017	0.019	0.021	<b>PASS</b>	≤ 20 nW	
		MHz	5738.000	12397.000	5853.000	-----	-----	
Interference Prevention Function			-----	good			<b>PASS</b>	-----

### **2.3 TEST Results (Low Voltage)**

Measurement Frequency			MHz	2402	2440	2480	Result	Limit
Channel Number			Ch.	0	19	39	----	----
Reading Frequency			MHz	2402.0462	2440.0468	2480.0474	----	----
Frequency Tolerance			ppm	19.23	19.18	19.11	PASS	-50≤x≤+50
Occupied Bandwidth			MHz	2.1270	2.1323	2.1316	PASS	≤ 26 MHz
RF Output Power			mW	1.324	1.545	1.337	PASS	≤ 10 mW
RF Output Power Tolerance			%	-15.486	-1.388	-14.704	PASS	-80≤x≤+20
EIRP			dBm	3.720	4.390	3.760	----	----
Unwanted Emission Strength (TX1)	Under 2387MHz	μW/MHz	0.010	0.009	0.015	PASS	≤ 2.5uW/MHz	
		MHz	2210.200	2377.600	2288.000	----	----	
	2387-2400MHz	μW/MHz	0.007	0.008	0.001	PASS	≤ 25uW/MHz	
		MHz	2400.000	2395.000	2397.647	----	----	
	2483.5-2496.5MHz	μW/MHz	0.001	0.006	0.241	PASS	≤ 25uW/MHz	
		MHz	2485.554	2485.541	2483.825	----	----	
	2496.5 - 12.5GHz	μW/MHz	0.086	0.060	0.052	PASS	≤ 2.5uW/MHz	
		MHz	4807.000	12200.000	4957.000	----	----	
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.001	0.001	0.001	PASS	≤ 4 nW	
		MHz	949.560	909.790	190.050	----	----	
	1 - 12.5GHz	nW	0.018	0.019	0.019	PASS	≤ 20 nW	
		MHz	2679.000	4899.000	2668.000	----	----	
Interference Prevention Function			----	good			PASS	----

### ■ Antenna List

Antenna			Gain Specification			Notes ( Cable or Others )
No	Type	Model Name	Max Gain (dBi)	Attenuation (dB)	Net Gain (dBi)	
1	Chip Antenna	IVX-CA2400-321605	2.5	0	0	Horizontal + Vertical

### ■ Construction Protection Confirmation Method

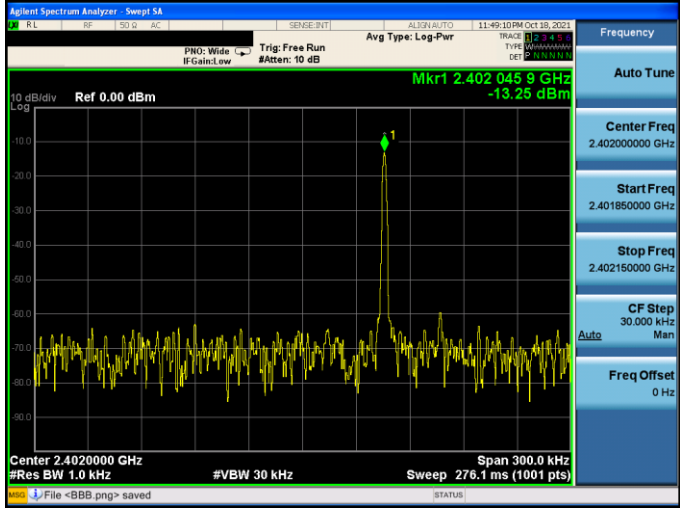
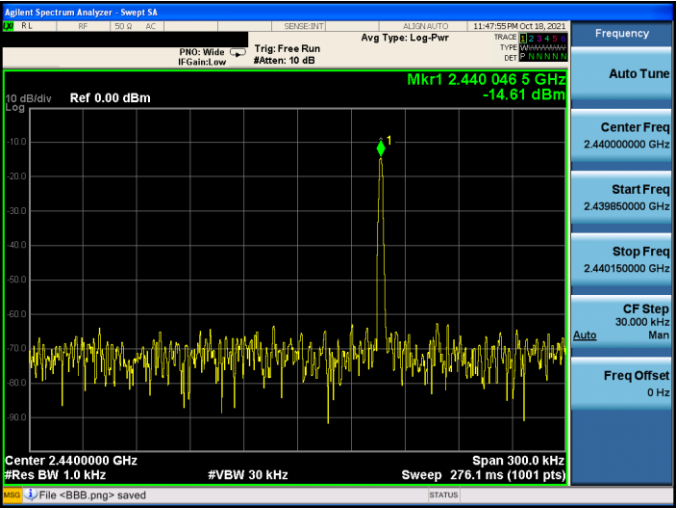
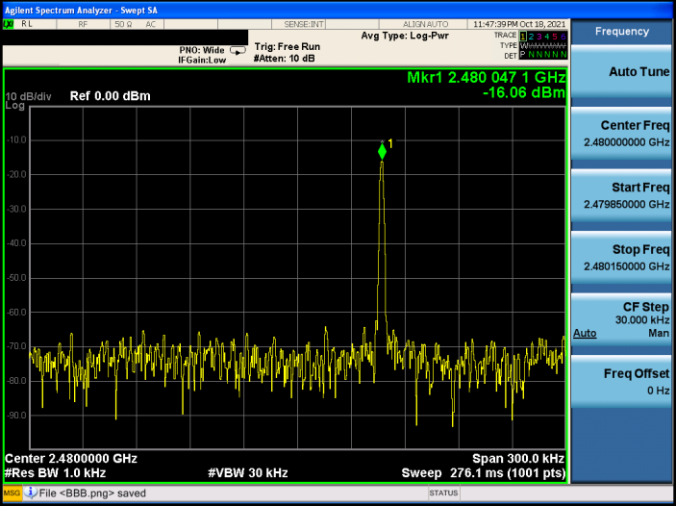
#### Confirmation Method

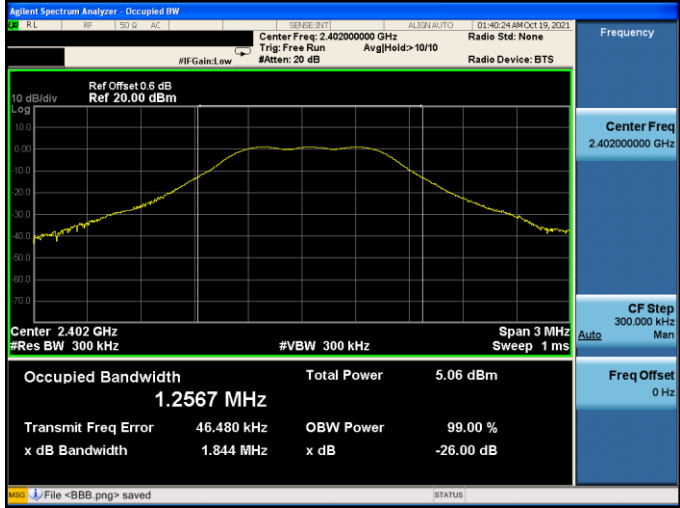


<input type="checkbox"/>	1. Sealed with special screws (indicate the special screws used in Exterior View Drawings, and also attach its technical drawings of such screws).
<input type="checkbox"/>	2. Plastic chassis is being welded using ultrasonic waves.
<input checked="" type="checkbox"/>	3. Chassis is glued using a special adhesive.
<input type="checkbox"/>	4. Metal covers are spot-fused (indicate the fused points in Exterior View Drawings).
<input type="checkbox"/>	5. Cover is specially interlocked (indicate the interlocked part in Exterior View Drawings).
<input type="checkbox"/>	6. Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
<input type="checkbox"/>	7. Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
<input type="checkbox"/>	8. Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
<input type="checkbox"/>	9. Other ( )

Photo



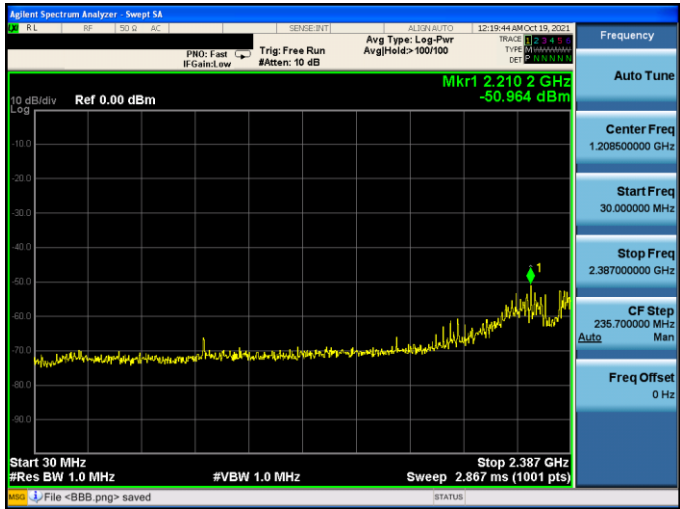
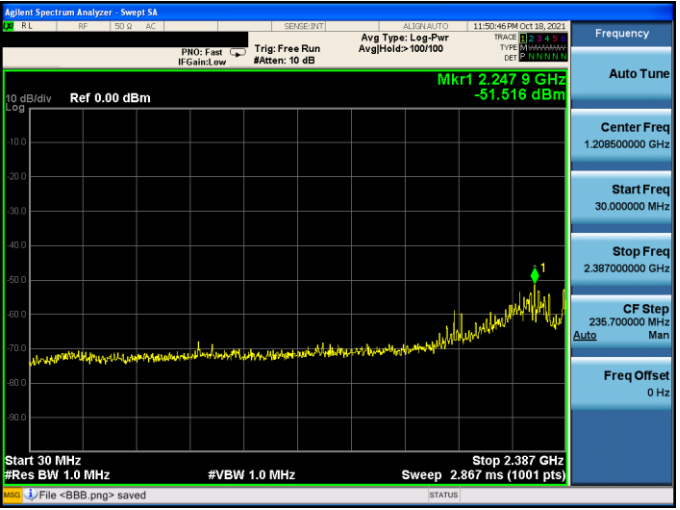
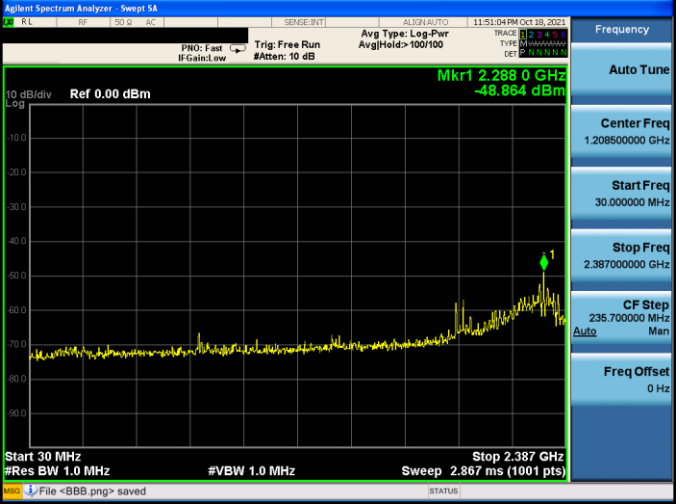
## ■ Test Graphs



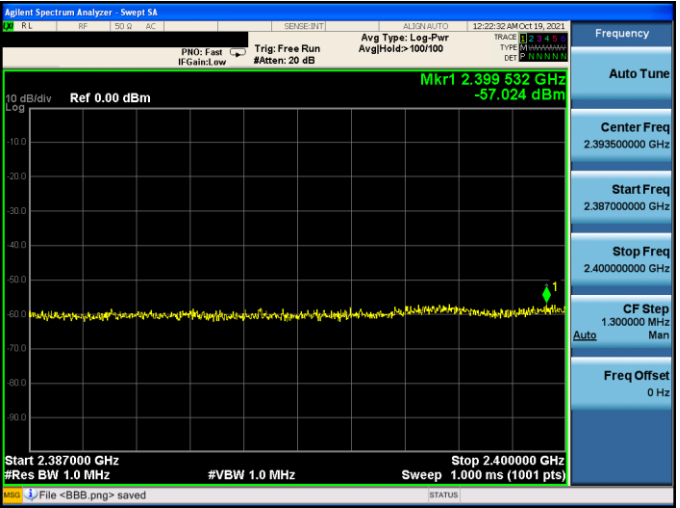
Mode 1	
Frequency Error Measurement	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

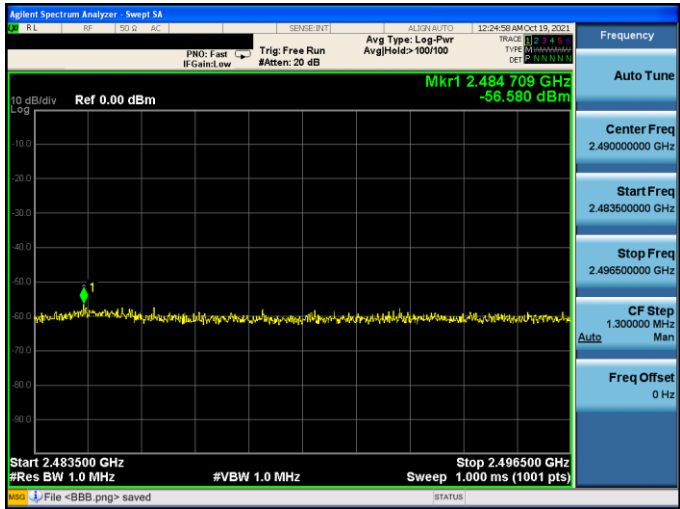

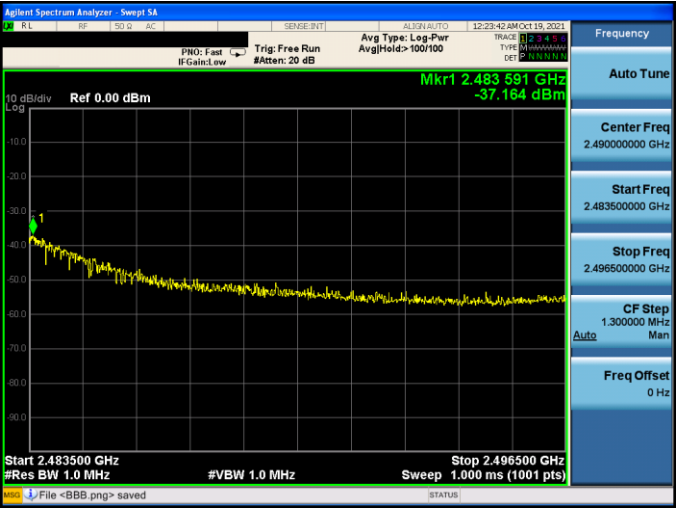
Mode 1	
Occupied Bandwidth Measurement	
Normal Voltage  Low CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.40200000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.402 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2567 MHz Total Power: 5.06 dBm</p> <p>Transmit Freq Error: 46.480 kHz OBW Power: 99.00 % x dB Bandwidth: 1.844 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>
Normal Voltage  Middle CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.44000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.44 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2611 MHz Total Power: 5.83 dBm</p> <p>Transmit Freq Error: 47.881 kHz OBW Power: 99.00 % x dB Bandwidth: 1.844 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>
Normal Voltage  High CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.48000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.48 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2586 MHz Total Power: 5.23 dBm</p> <p>Transmit Freq Error: 48.297 kHz OBW Power: 99.00 % x dB Bandwidth: 1.836 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>

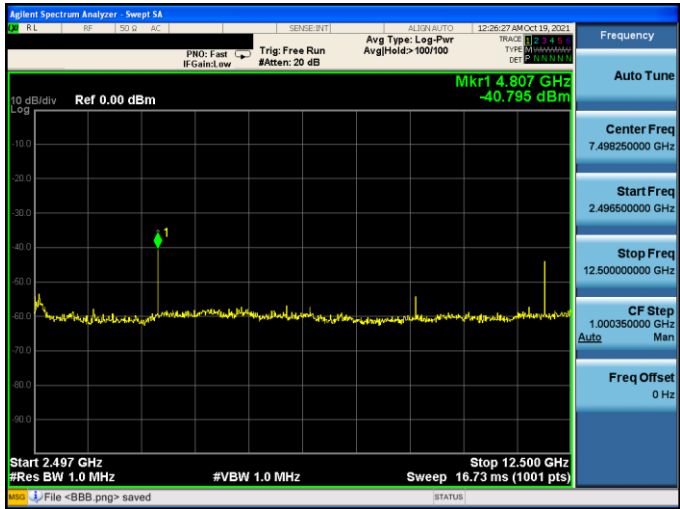
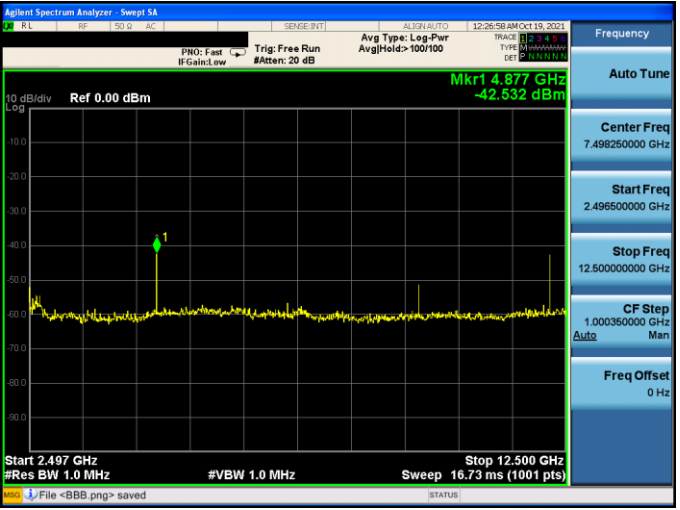
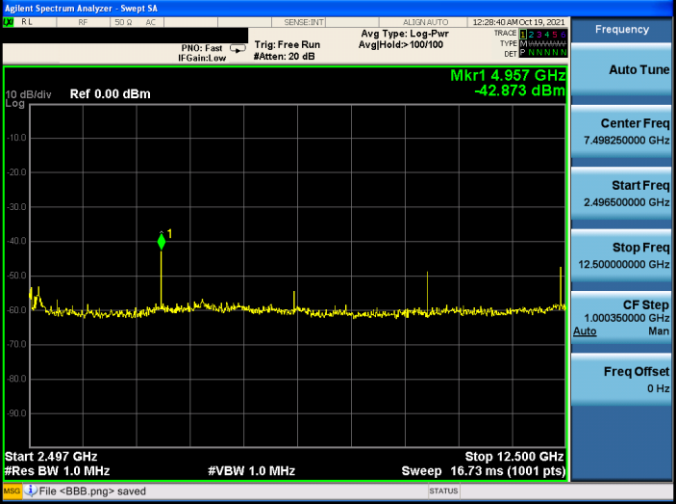


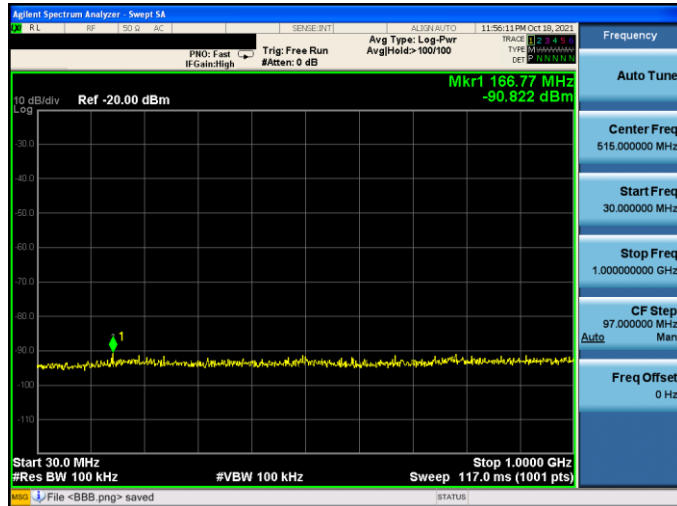
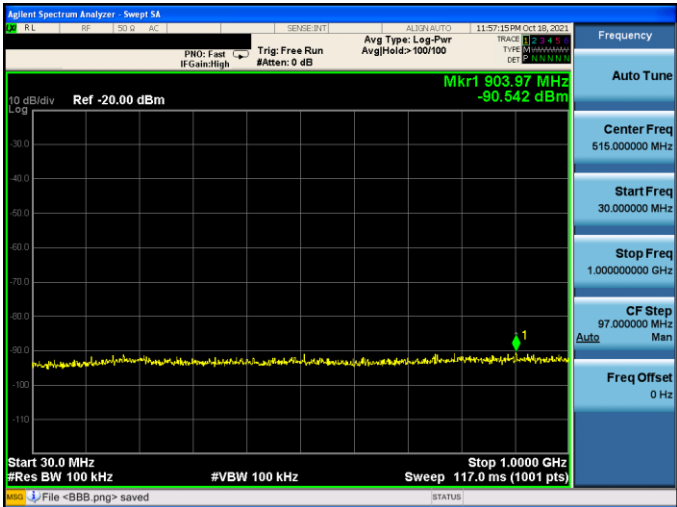
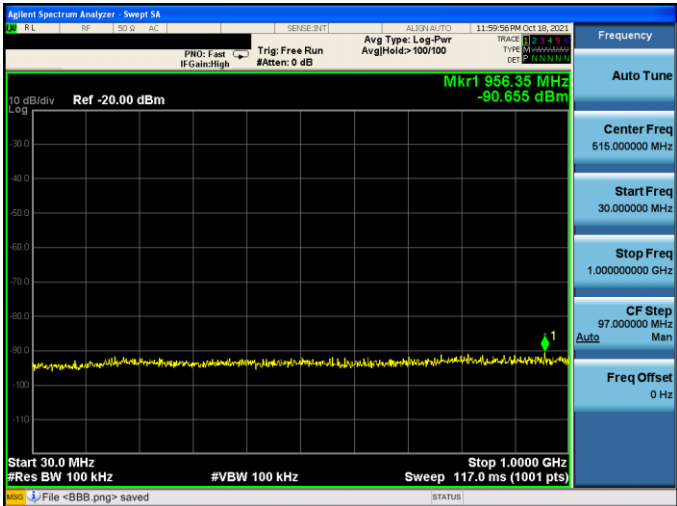
Mode 1	
Antenna Power (Conducted) Measurement	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

Mode 1	
Unwanted Emission Strength Measurement	
30 MHz – 2387 MHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

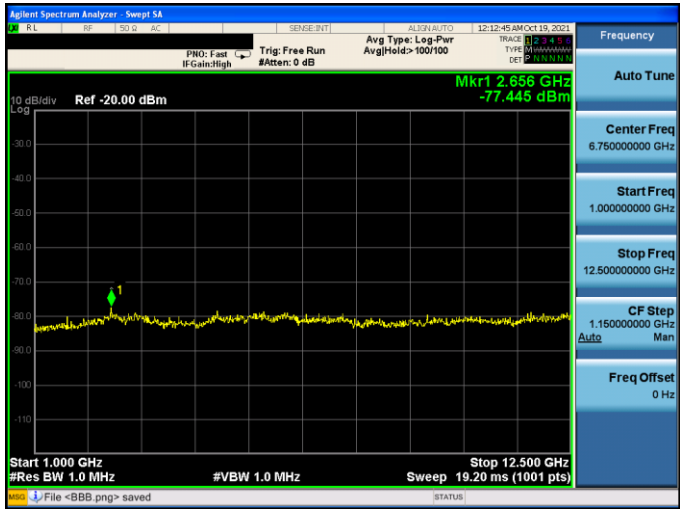

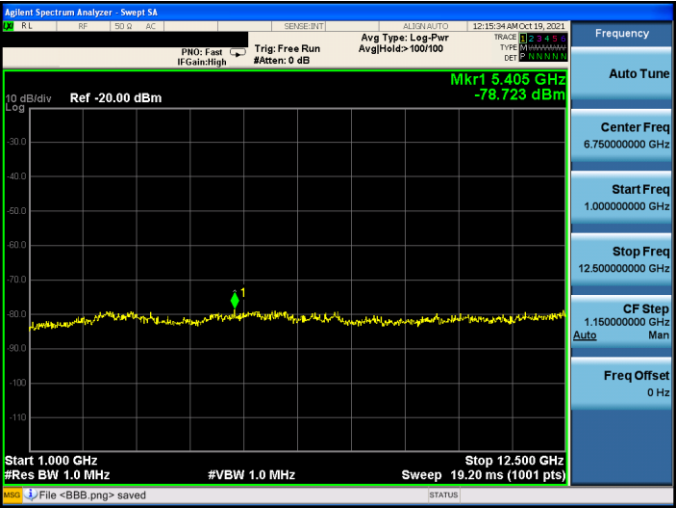
Mode 1	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

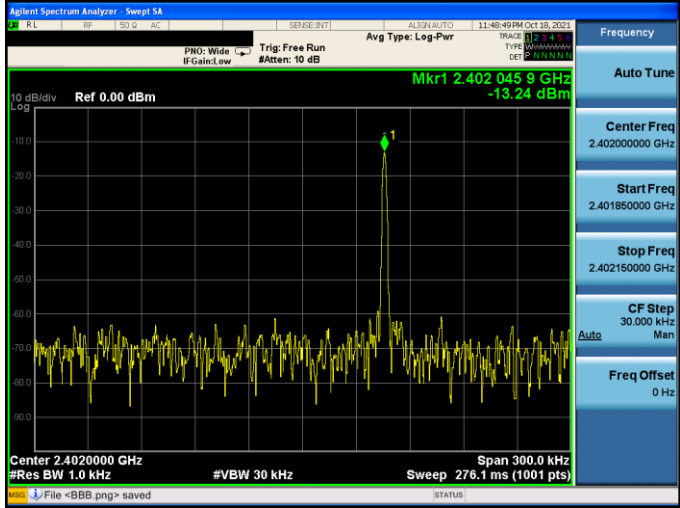
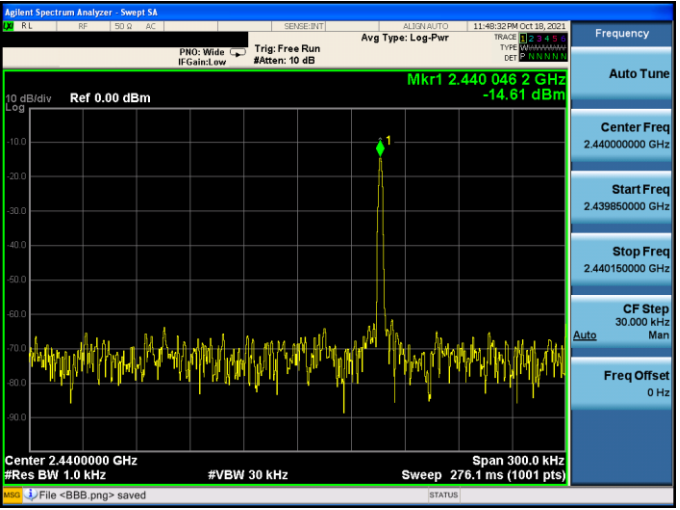
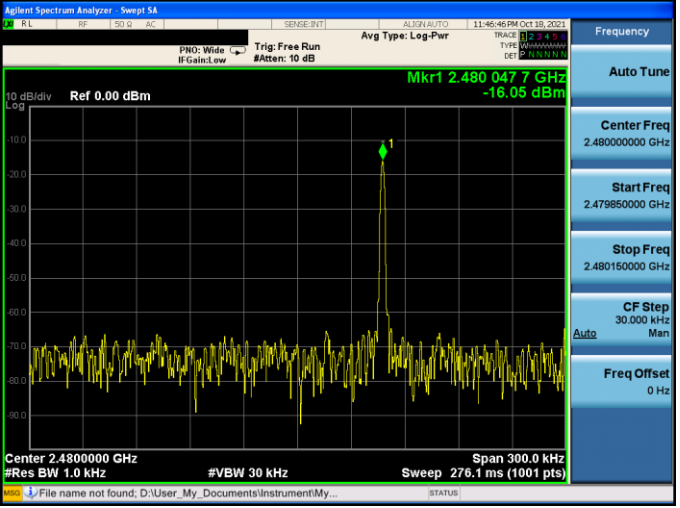
Mode 1	
Unwanted Emission Strength Measurement	
2483.5 MHz – 2496.5 MHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

Mode 1	
Unwanted Emission Strength Measurement	
2496.5 MHz – 12.5 GHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

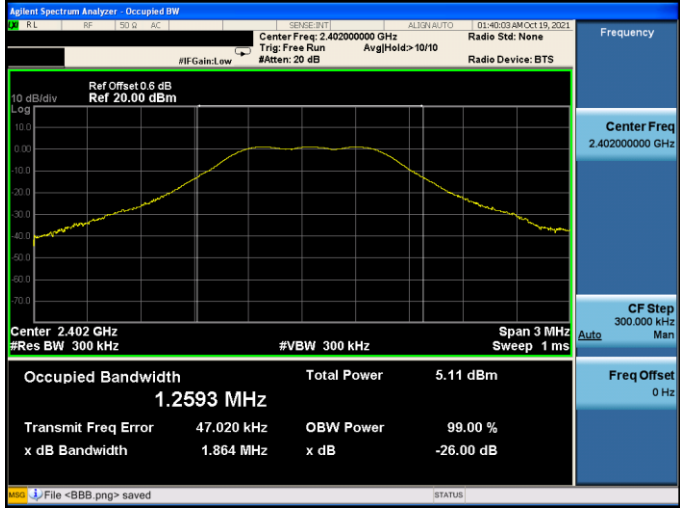


Mode 1	
Secondarily Emitted Radio Wave Strength Measurement	
30 MHz – 1 GHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	






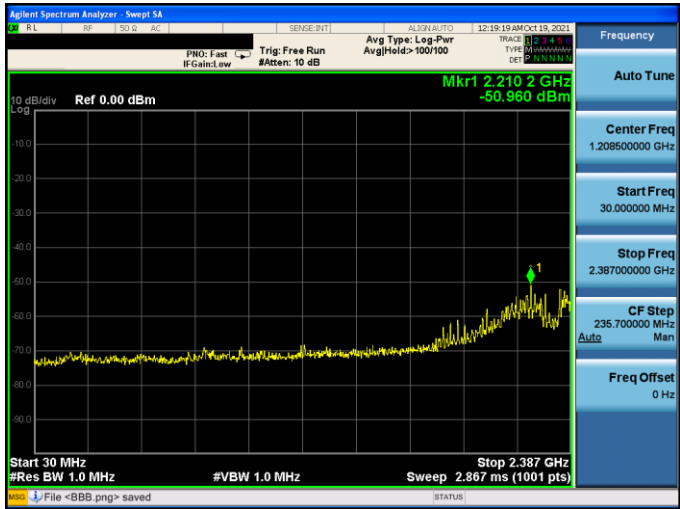
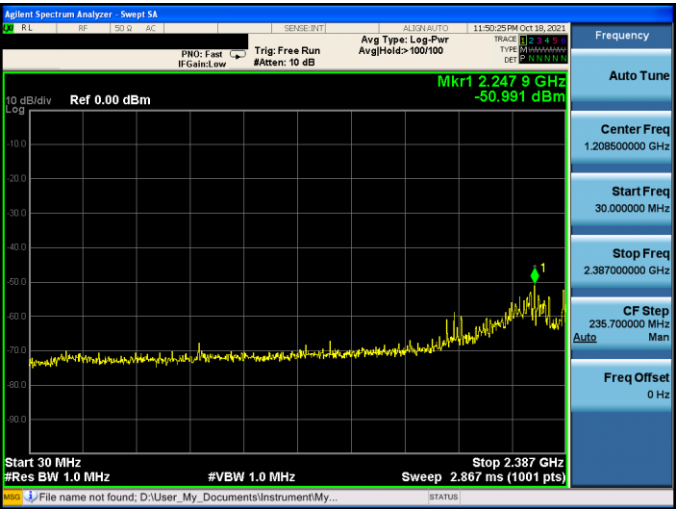

Mode 1	
Secondarily Emitted Radio Wave Strength Measurement	
1 GHz – 12.5 GHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

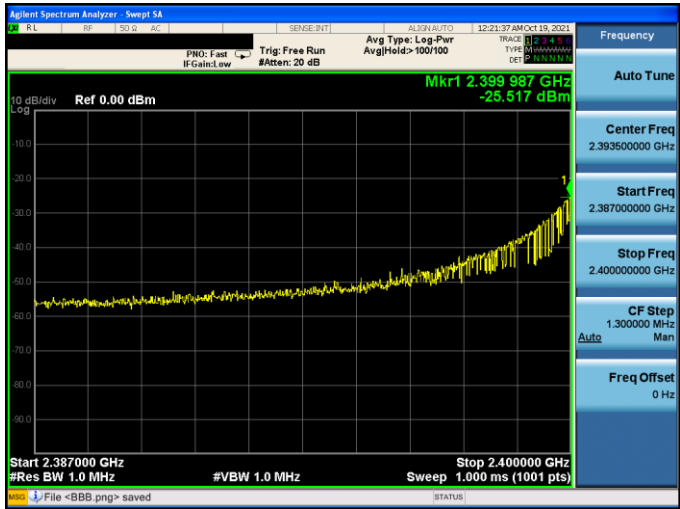

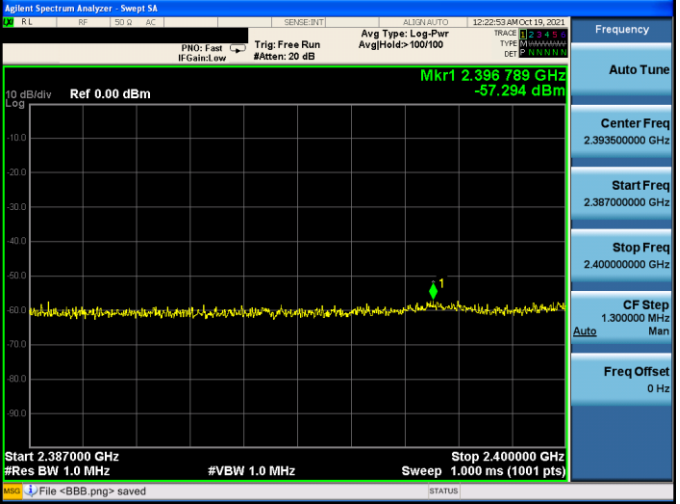
Mode 1	
Frequency Error Measurement	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

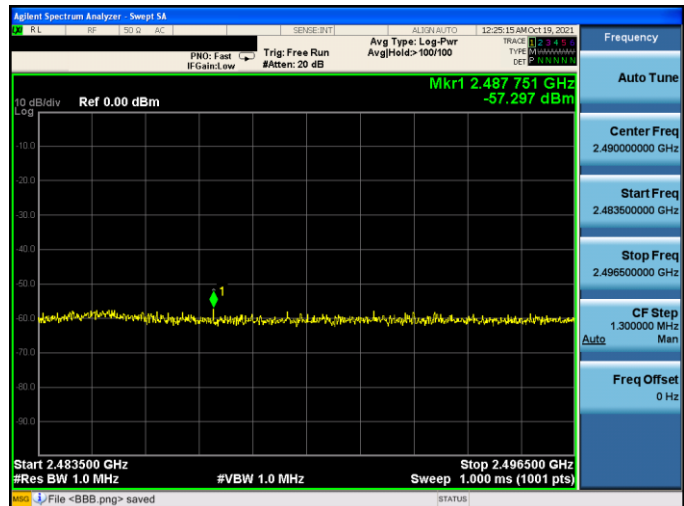

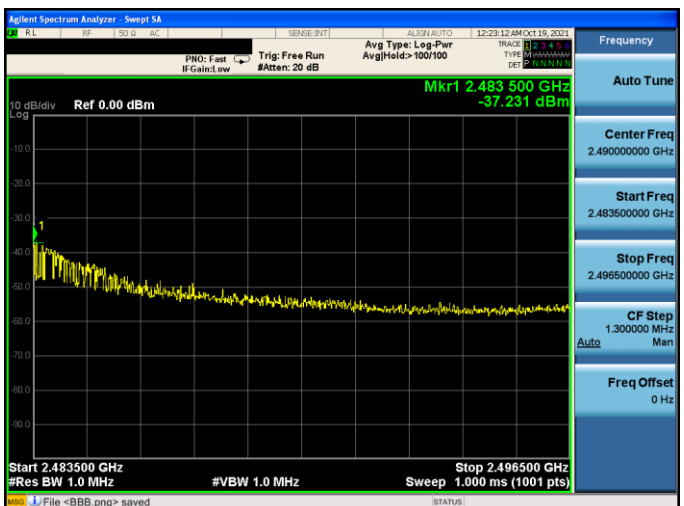


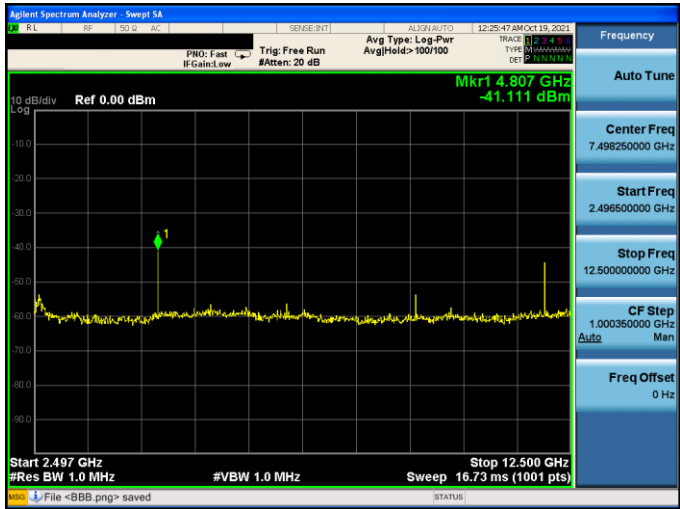
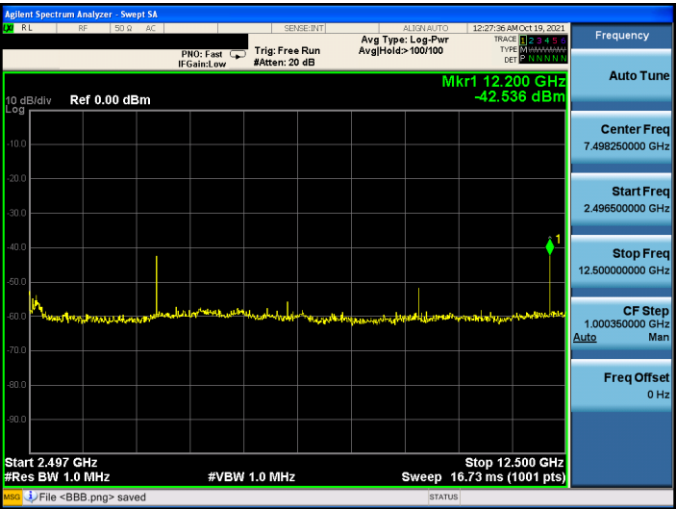
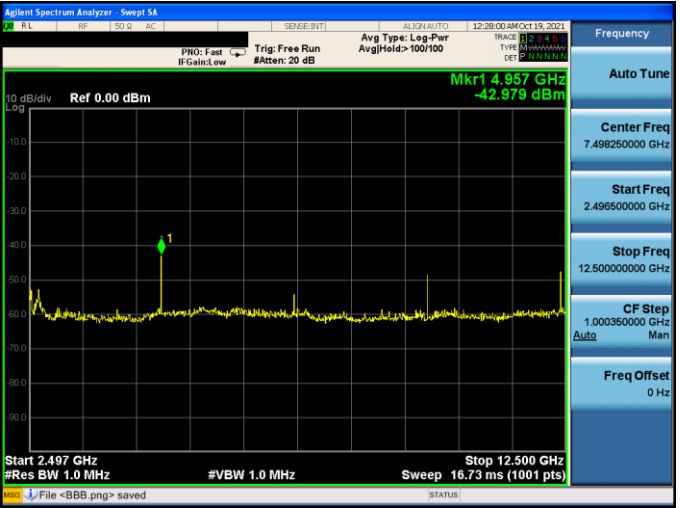
Mode 1	
Occupied Bandwidth Measurement	
High Voltage  Low CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.40200000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.402 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2593 MHz Total Power: 5.11 dBm Transmit Freq Error: 47.020 kHz OBW Power: 99.00 % x dB Bandwidth: 1.864 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>
High Voltage  Middle CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.44000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.44 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2559 MHz Total Power: 5.86 dBm Transmit Freq Error: 48.409 kHz OBW Power: 99.00 % x dB Bandwidth: 1.854 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>
High Voltage  High CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.48000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.48 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2602 MHz Total Power: 5.24 dBm Transmit Freq Error: 48.144 kHz OBW Power: 99.00 % x dB Bandwidth: 1.855 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>

Mode 1	
Antenna Power (Conducted) Measurement	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

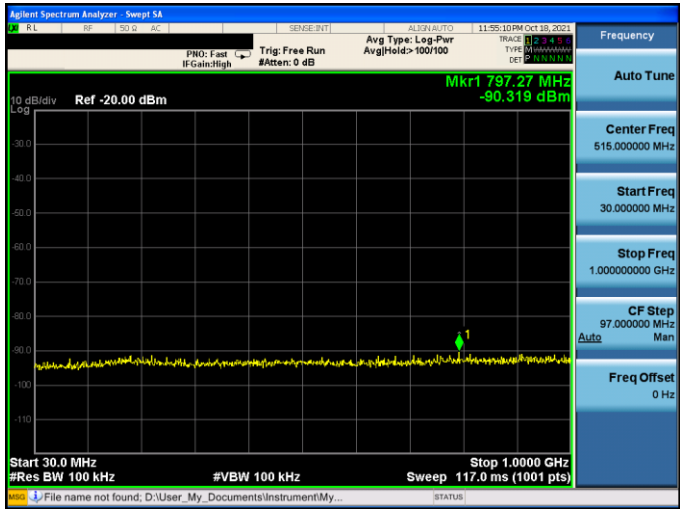
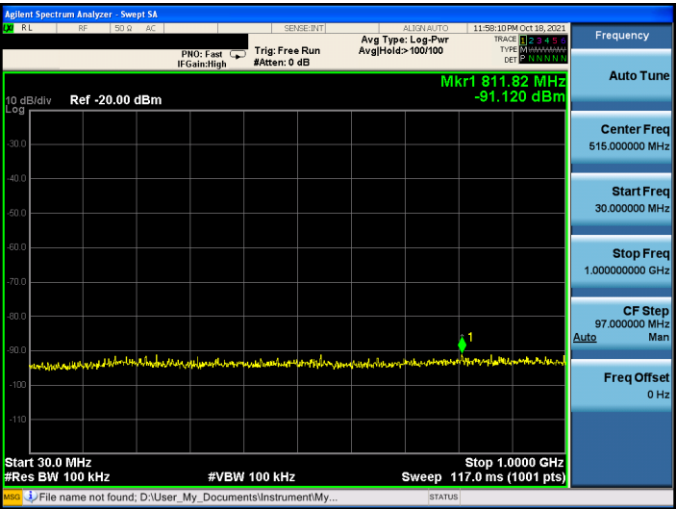
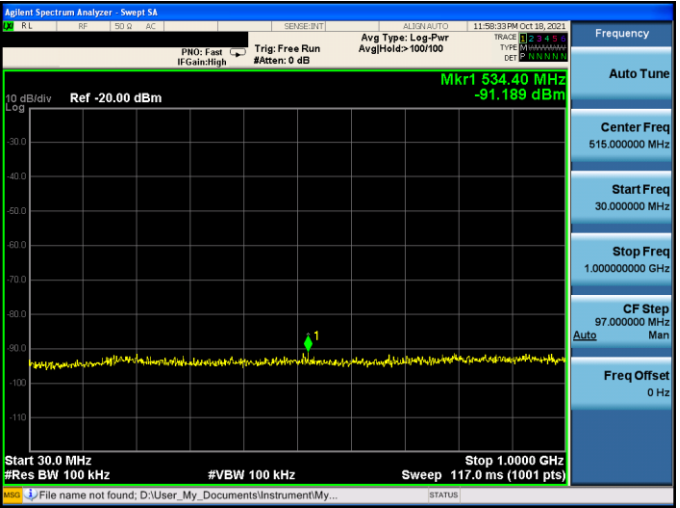
Mode 1	
Unwanted Emission Strength Measurement	
30 MHz – 2387 MHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	



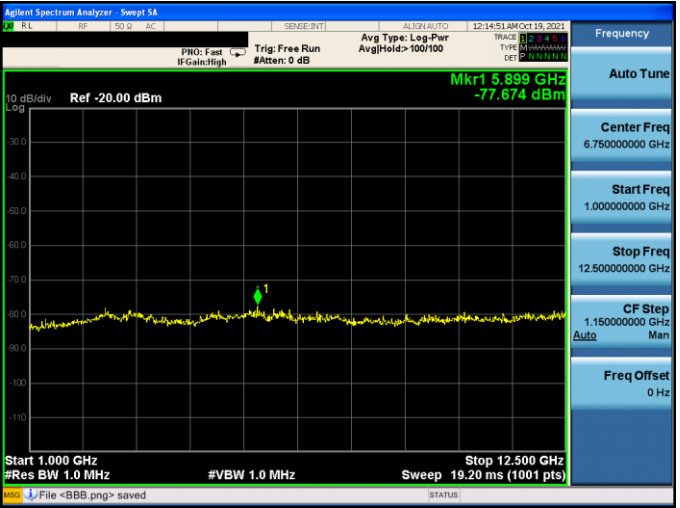
Mode 1	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

Mode 1	
Unwanted Emission Strength Measurement	
2483.5 MHz – 2496.5 MHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

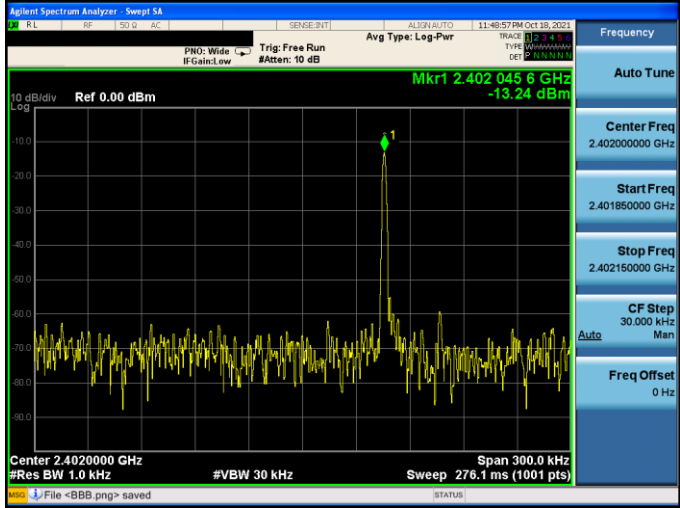
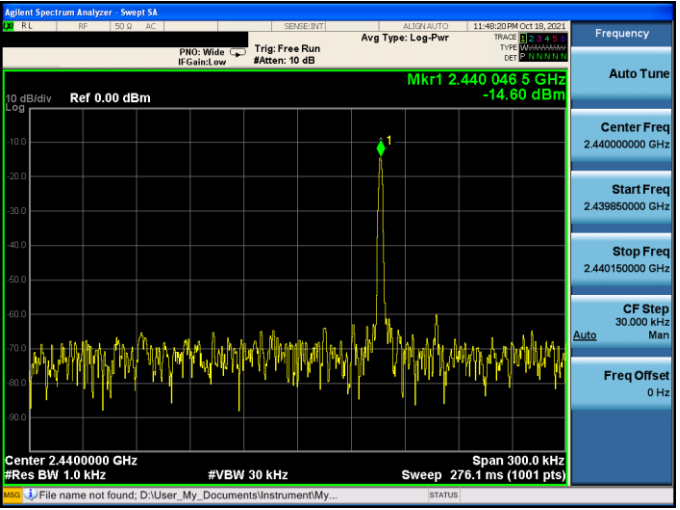
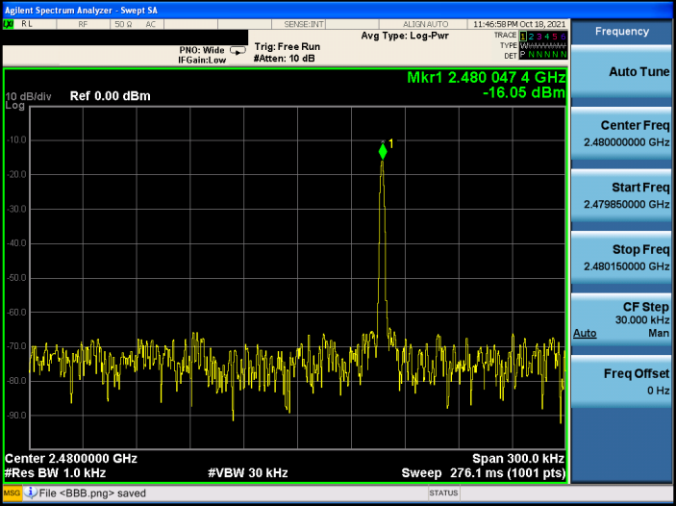
Mode 1	
Unwanted Emission Strength Measurement	
2496.5 MHz – 12.5 GHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

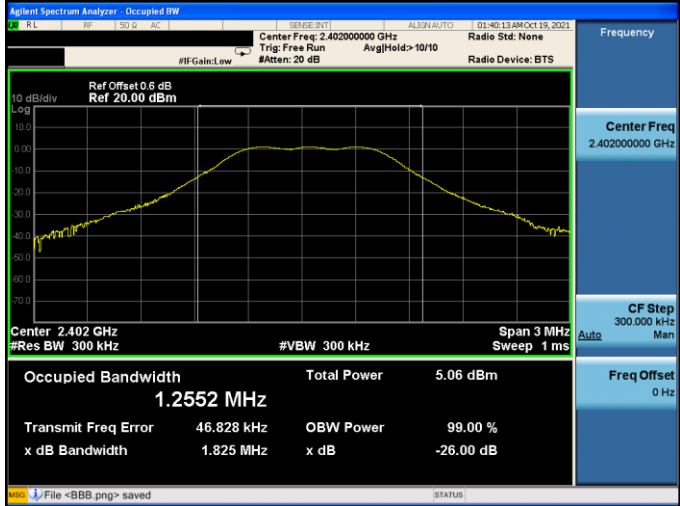




Mode 1	
Secondarily Emitted Radio Wave Strength Measurement	
30 MHz – 1 GHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

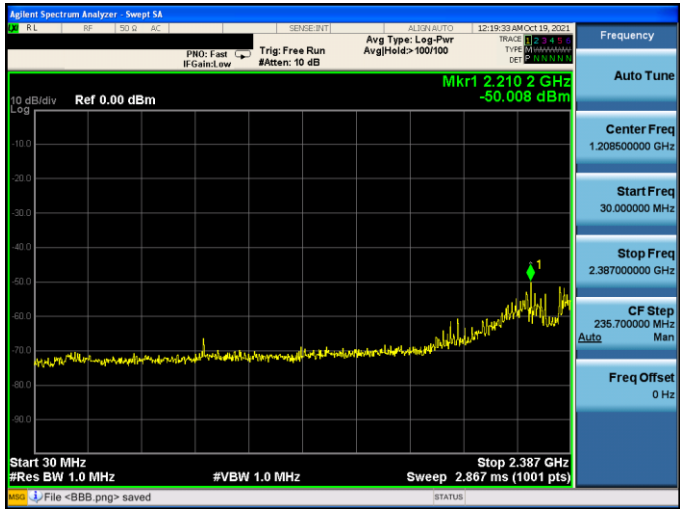

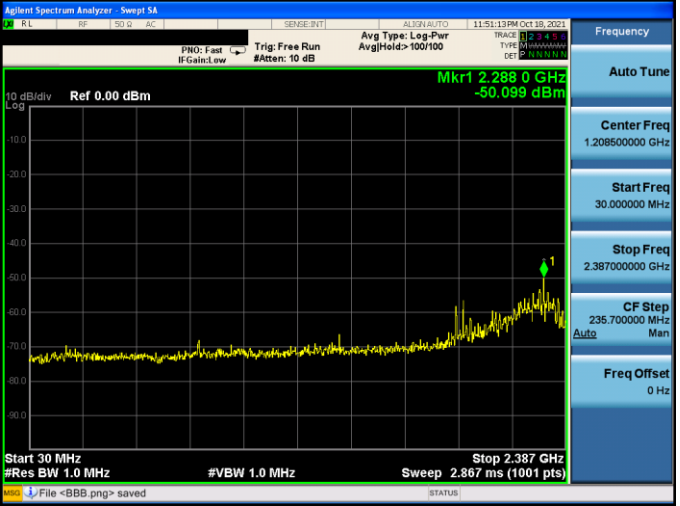
Mode 1	
Secondarily Emitted Radio Wave Strength Measurement	
1 GHz – 12.5 GHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	



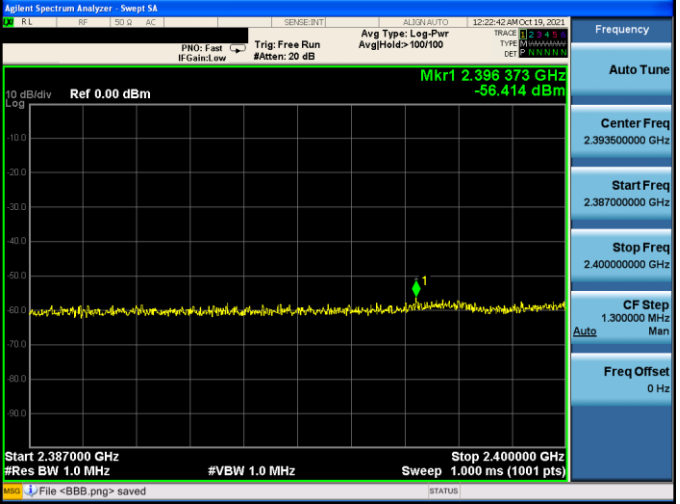


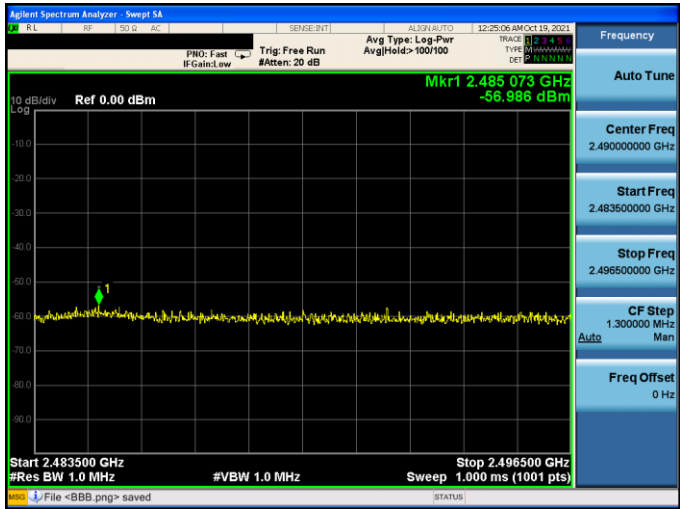

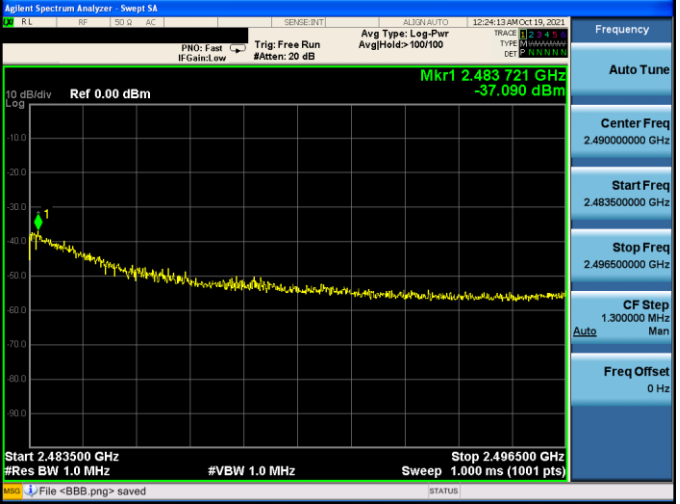
Mode 1	
Frequency Error Measurement	
<p>Low Voltage</p> <p>Low CH</p>	
<p>Low Voltage</p> <p>Middle CH</p>	
<p>Low Voltage</p> <p>High CH</p>	

Mode 1	
Occupied Bandwidth Measurement	
Low Voltage  Low CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.40200000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.402 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2552 MHz Total Power: 5.06 dBm Transmit Freq Error: 46.828 kHz OBW Power: 99.00 % x dB Bandwidth: 1.825 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>
Low Voltage  Middle CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.44000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.44 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2588 MHz Total Power: 5.86 dBm Transmit Freq Error: 47.604 kHz OBW Power: 99.00 % x dB Bandwidth: 1.857 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>
Low Voltage  High CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.48000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.48 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 1.2610 MHz Total Power: 5.22 dBm Transmit Freq Error: 48.537 kHz OBW Power: 99.00 % x dB Bandwidth: 1.843 MHz x dB: -26.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>

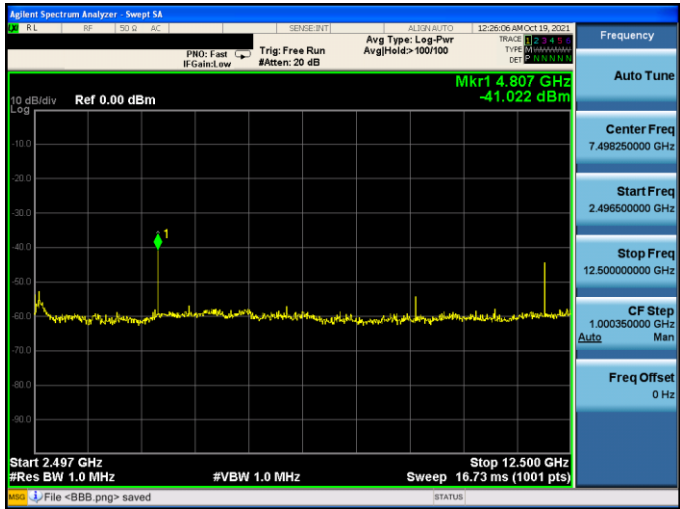
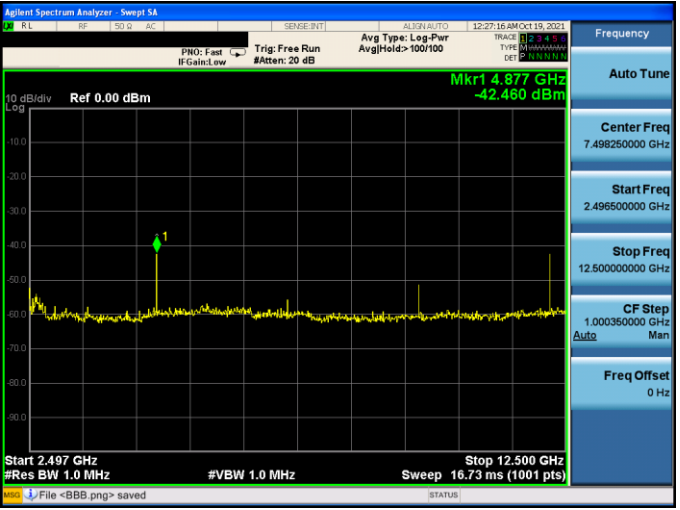
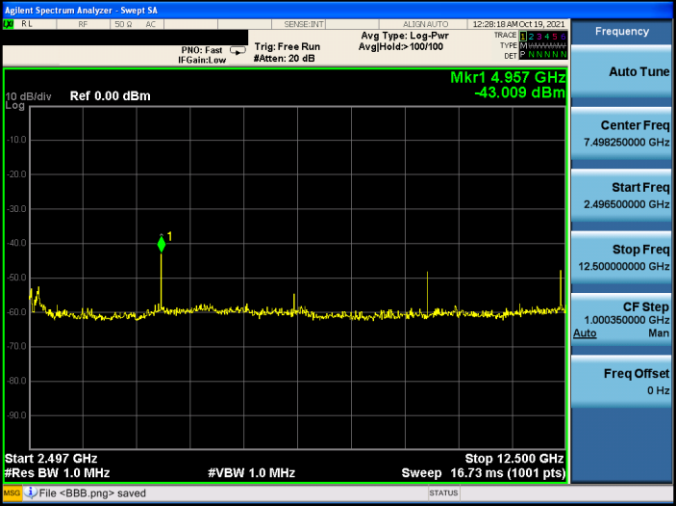
Mode 1	
Antenna Power (Conducted) Measurement	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

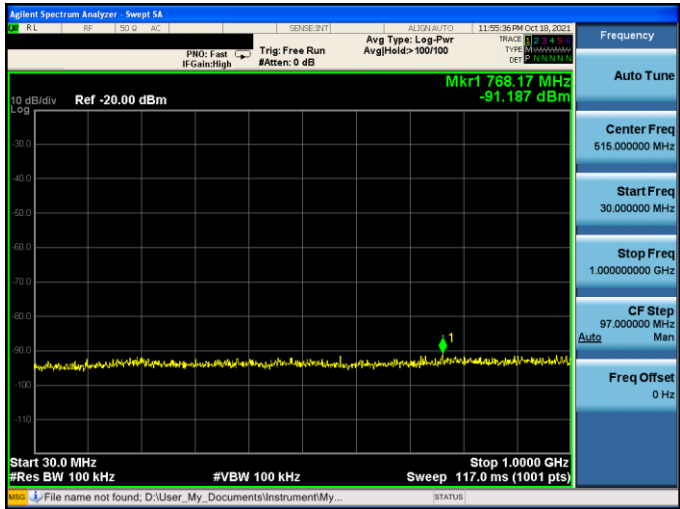

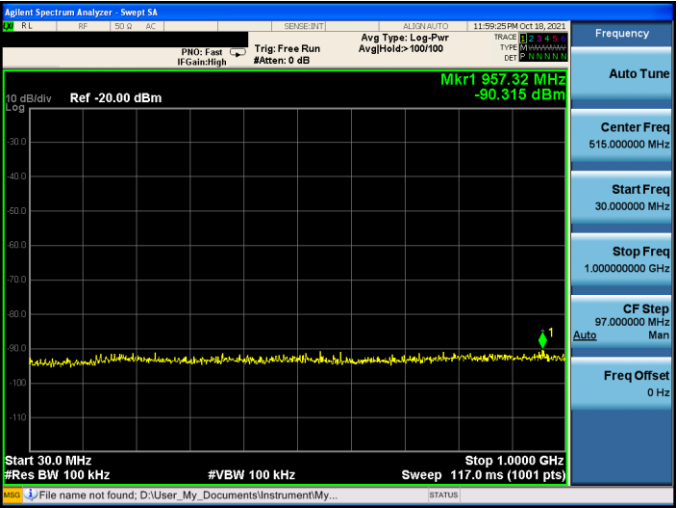
Mode 1	
Unwanted Emission Strength Measurement	
30 MHz – 2387 MHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

Mode 1	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
Low Voltage  Low CH	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref 0.00 dBm</p> <p>Mkr1 2.400 000 GHz -24.710 dBm</p> <p>Start 2.387000 GHz #Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 ms (1001 pts)</p> <p>File &lt;BBB.png&gt; saved</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.393500000 GHz</p> <p>Start Freq 2.387000000 GHz</p> <p>Stop Freq 2.400000000 GHz</p> <p>CF Step 1.300000 MHz Man</p> <p>Freq Offset 0 Hz</p>
Low Voltage  Middle CH	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref 0.00 dBm</p> <p>Mkr1 2.394 956 GHz -50.371 dBm</p> <p>Start 2.387000 GHz #Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 ms (1001 pts)</p> <p>File &lt;BBB.png&gt; saved</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.393500000 GHz</p> <p>Start Freq 2.387000000 GHz</p> <p>Stop Freq 2.400000000 GHz</p> <p>CF Step 1.300000 MHz Man</p> <p>Freq Offset 0 Hz</p>
Low Voltage  High CH	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref 0.00 dBm</p> <p>Mkr1 2.396 373 GHz -56.414 dBm</p> <p>Start 2.387000 GHz #Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 ms (1001 pts)</p> <p>File &lt;BBB.png&gt; saved</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.393500000 GHz</p> <p>Start Freq 2.387000000 GHz</p> <p>Stop Freq 2.400000000 GHz</p> <p>CF Step 1.300000 MHz Man</p> <p>Freq Offset 0 Hz</p>



Mode 1	
Unwanted Emission Strength Measurement	
2483.5 MHz – 2496.5 MHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

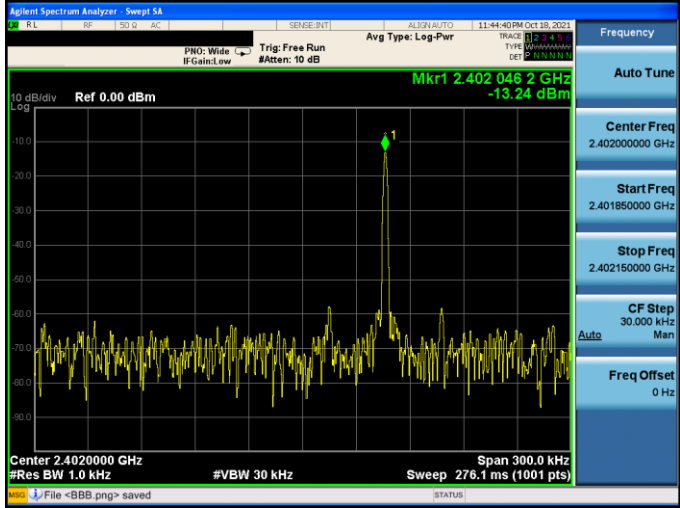
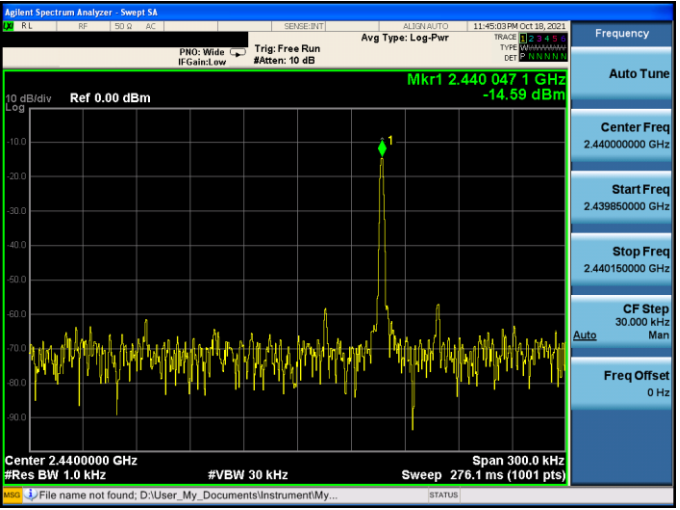
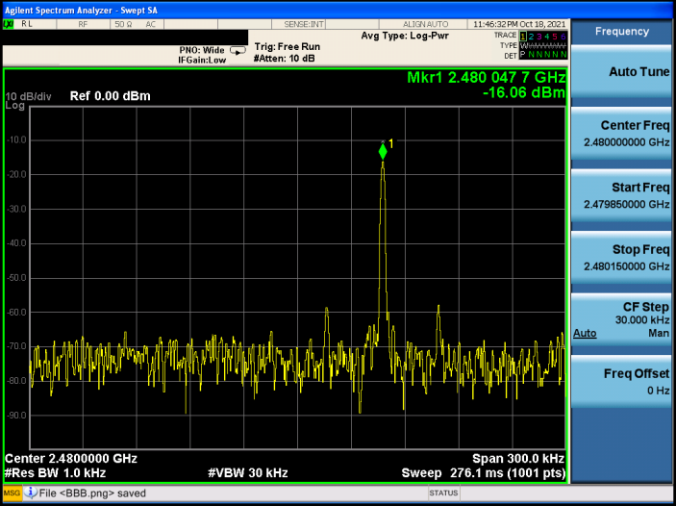


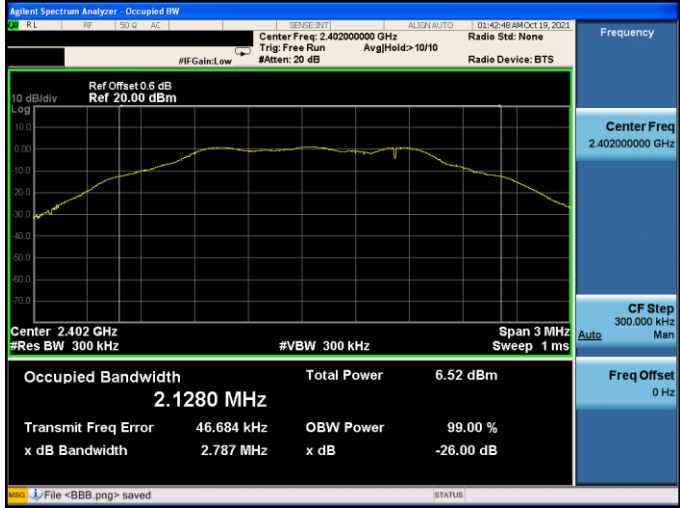


Mode 1	
Unwanted Emission Strength Measurement	
2496.5 MHz – 12.5 GHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

Mode 1	
Secondarily Emitted Radio Wave Strength Measurement	
30 MHz – 1 GHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

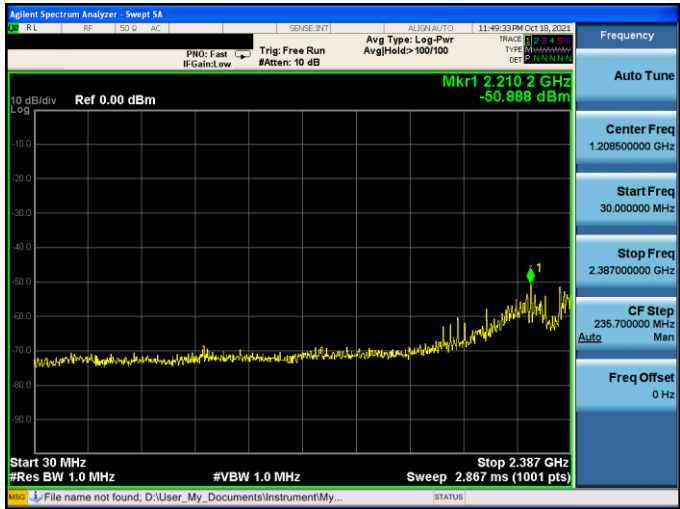

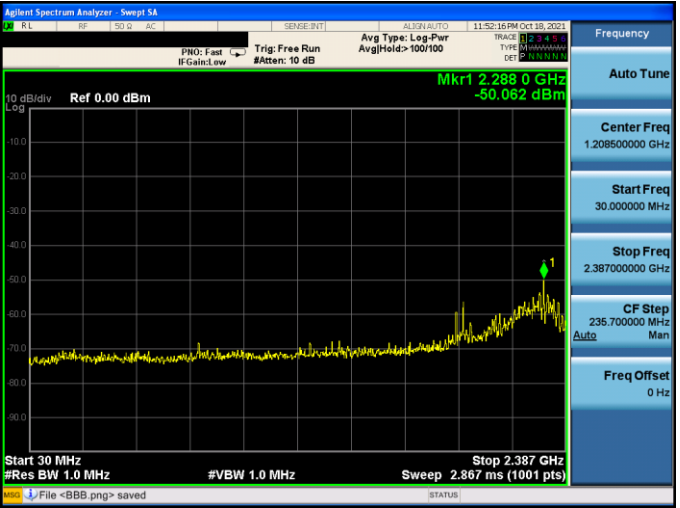


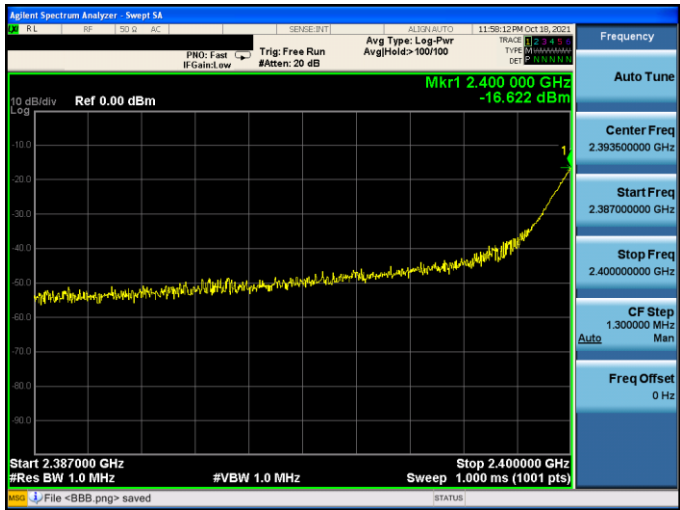

Mode 1	
Secondarily Emitted Radio Wave Strength Measurement	
1 GHz – 12.5 GHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

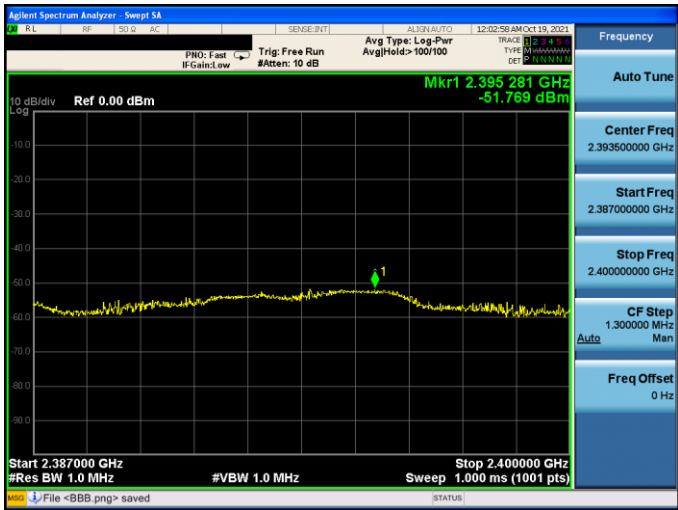
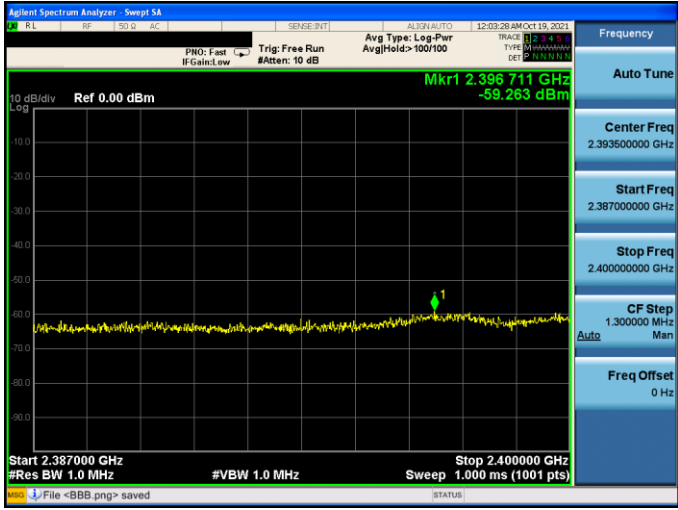
Mode 2	
Frequency Error Measurement	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

Mode 2	
Occupied Bandwidth Measurement	
Normal Voltage  Low CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.40200000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.402 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1280 MHz Total Power: 6.52 dBm</p> <p>Transmit Freq Error: 46.684 kHz OBW Power: 99.00 % x dB Bandwidth: 2.787 MHz x dB: -26.00 dB</p> <p>Frequency: 2.40200000 GHz CF Step: 300.000 kHz Freq Offset: 0 Hz</p>
Normal Voltage  Middle CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.44000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.44 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1302 MHz Total Power: 7.32 dBm</p> <p>Transmit Freq Error: 47.143 kHz OBW Power: 99.00 % x dB Bandwidth: 2.784 MHz x dB: -26.00 dB</p> <p>Frequency: 2.44000000 GHz CF Step: 300.000 kHz Freq Offset: 0 Hz</p>
Normal Voltage  High CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.48000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.48 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1327 MHz Total Power: 6.72 dBm</p> <p>Transmit Freq Error: 49.029 kHz OBW Power: 99.00 % x dB Bandwidth: 2.787 MHz x dB: -26.00 dB</p> <p>Frequency: 2.48000000 GHz CF Step: 300.000 kHz Freq Offset: 0 Hz</p>

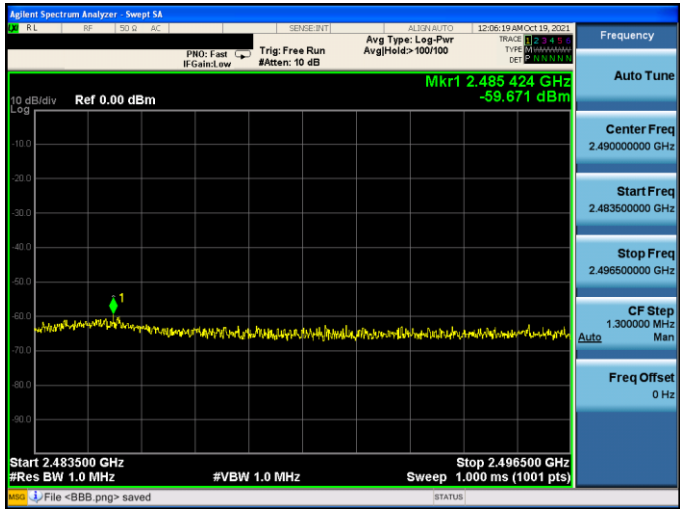

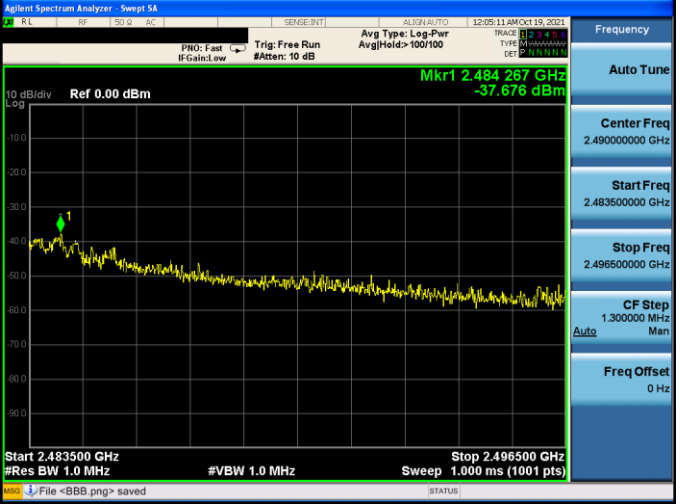
Mode 2	
Antenna Power (Conducted) Measurement	
Normal Voltage  Low CH	 <p>The image shows the Agilent N1911A P-Series Power Meter display. The screen displays 'LCL' at the top left, 'A1 Avg' and '2.5GHz' in the top left area, and a large '0.64 dBm' in the center. Below the main reading, it shows 'A1 Avg' and '0.64 dBm'. The bottom of the screen has a scale from -70.000 dBm to 20.000 dBm. On the right side, there are buttons for 'Trigger', 'Settings', 'Acqn Cont Trig', and 'Statistical Settings'. At the bottom of the screen, there are buttons for 'System', 'Channel', 'Trig/Acq', 'Meas', and 'Disp'.</p>
Normal Voltage  Middle CH	 <p>The image shows the Agilent N1911A P-Series Power Meter display. The screen displays 'LCL' at the top left, 'A1 Avg' and '2.5GHz' in the top left area, and a large '1.35 dBm' in the center. Below the main reading, it shows 'A1 Avg' and '1.35 dBm'. The bottom of the screen has a scale from -70.000 dBm to 20.000 dBm. On the right side, there are buttons for 'Trigger', 'Settings', 'Acqn Cont Trig', and 'Statistical Settings'. At the bottom of the screen, there are buttons for 'System', 'Channel', 'Trig/Acq', 'Meas', and 'Disp'.</p>
Normal Voltage  High CH	 <p>The image shows the Agilent N1911A P-Series Power Meter display. The screen displays 'LCL' at the top left, 'A1 Avg' and '2.5GHz' in the top left area, and a large '0.69 dBm' in the center. Below the main reading, it shows 'A1 Avg' and '0.69 dBm'. The bottom of the screen has a scale from -70.000 dBm to 20.000 dBm. On the right side, there are buttons for 'Trigger', 'Settings', 'Acqn Cont Trig', and 'Statistical Settings'. At the bottom of the screen, there are buttons for 'System', 'Channel', 'Trig/Acq', 'Meas', and 'Disp'.</p>

Mode 2	
Unwanted Emission Strength Measurement	
30 MHz – 2387 MHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

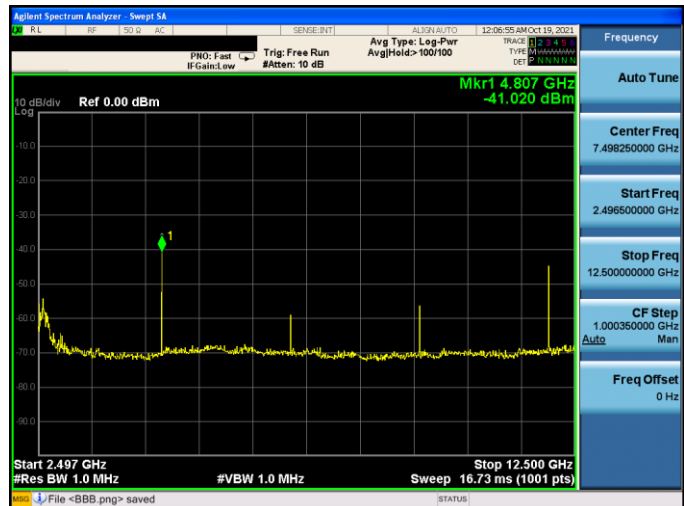
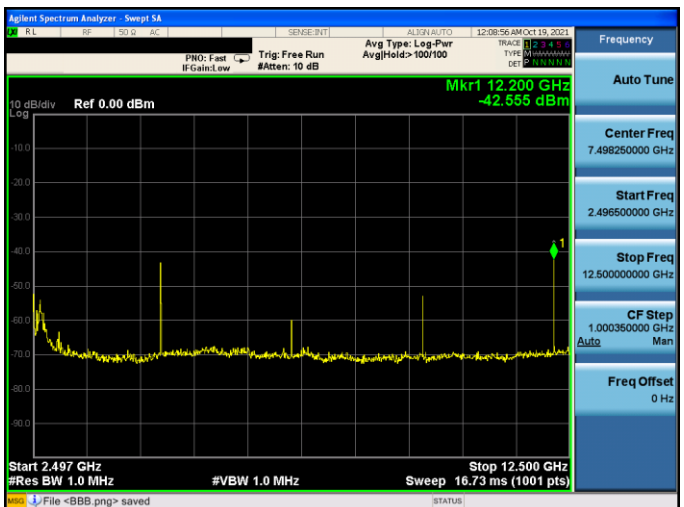
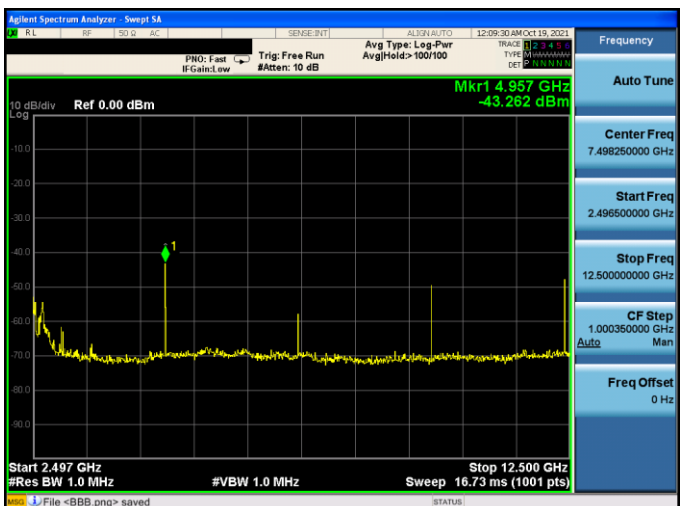
Mode 2	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
<p>Normal Voltage</p> <p>Low CH</p>	
	

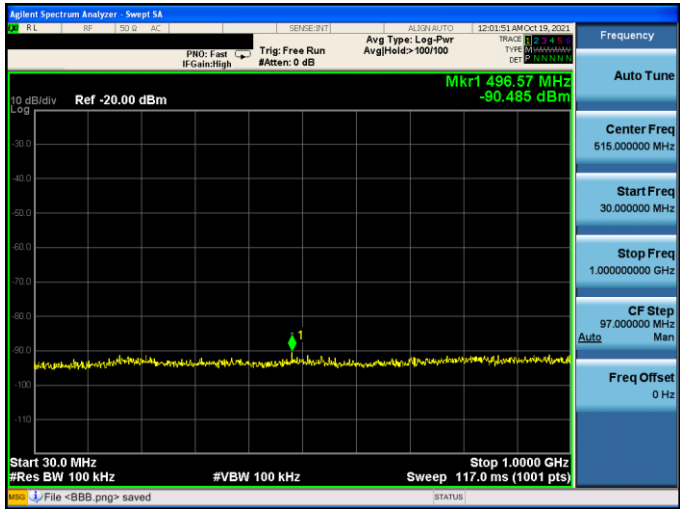
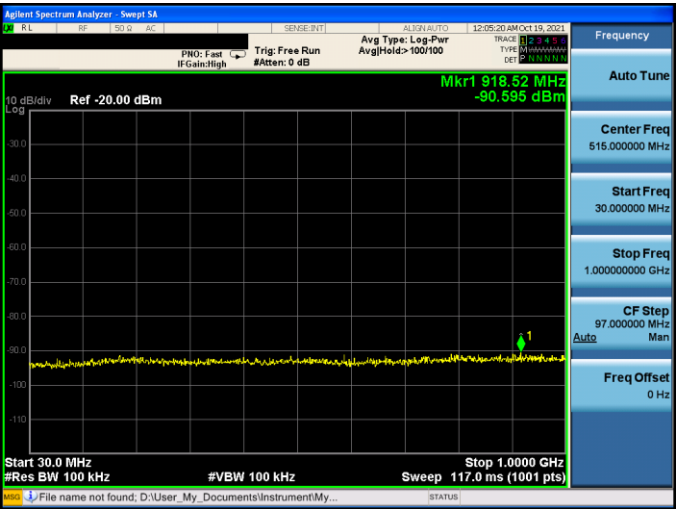
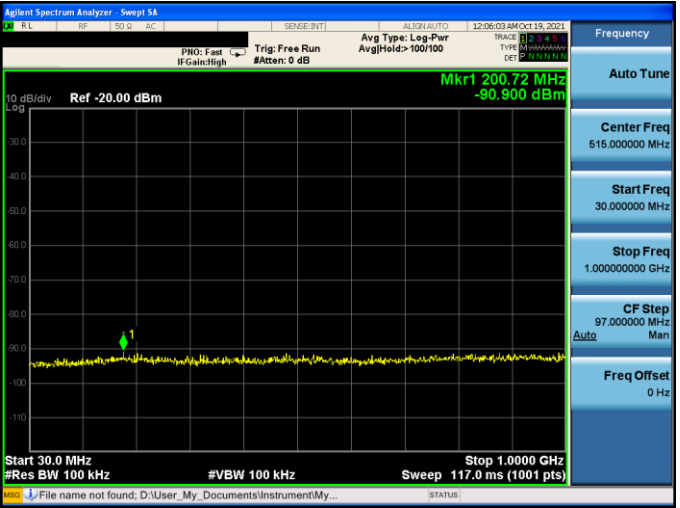
Mode 2	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

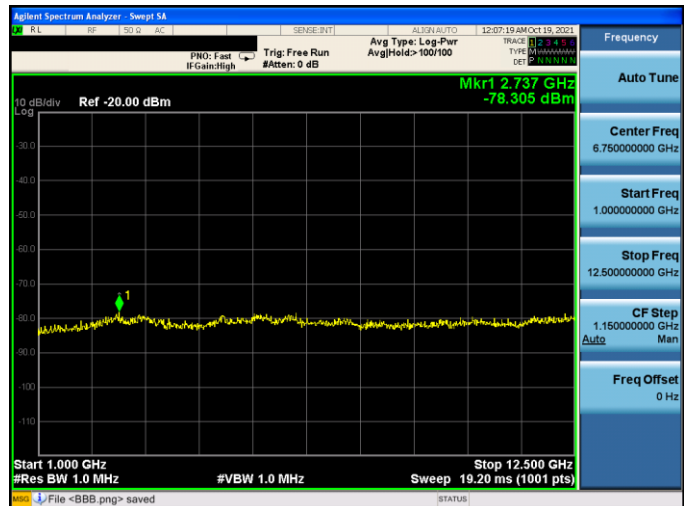

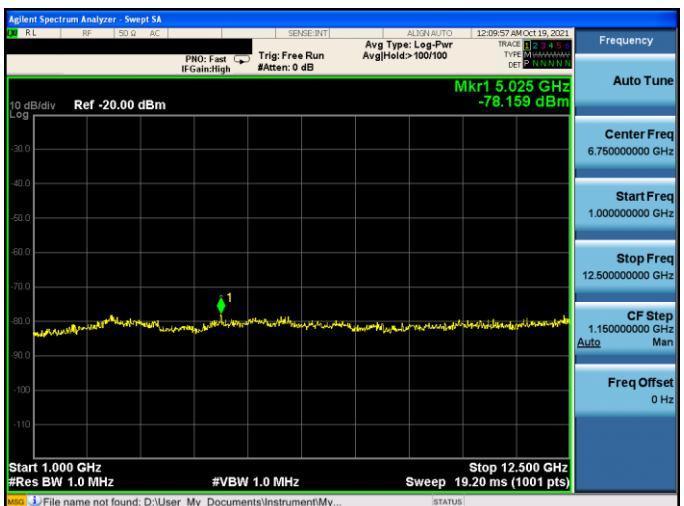


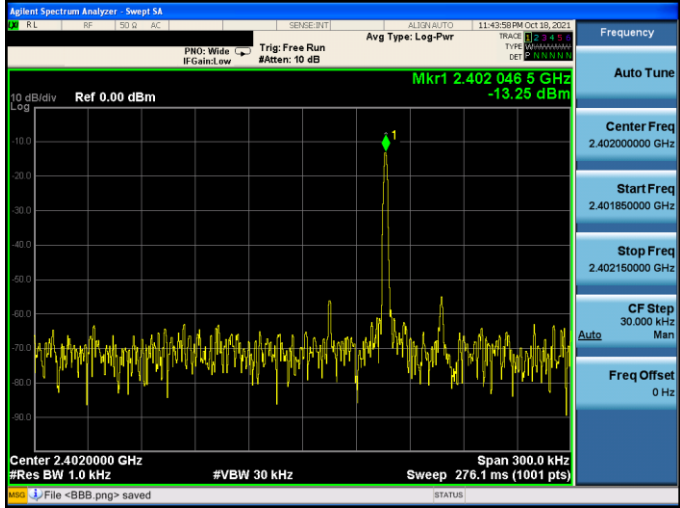
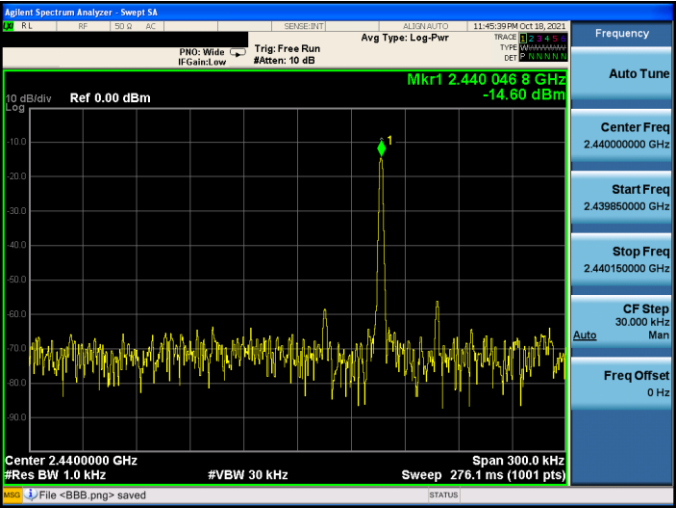
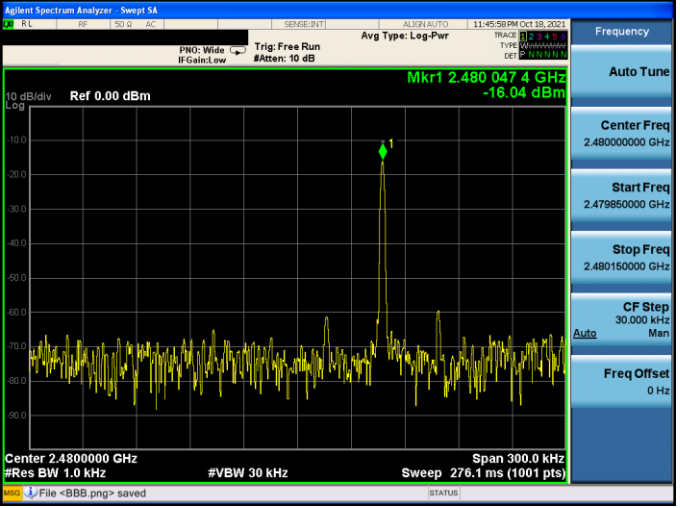
Mode 2	
Unwanted Emission Strength Measurement	
2483.5 MHz – 2496.5 MHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

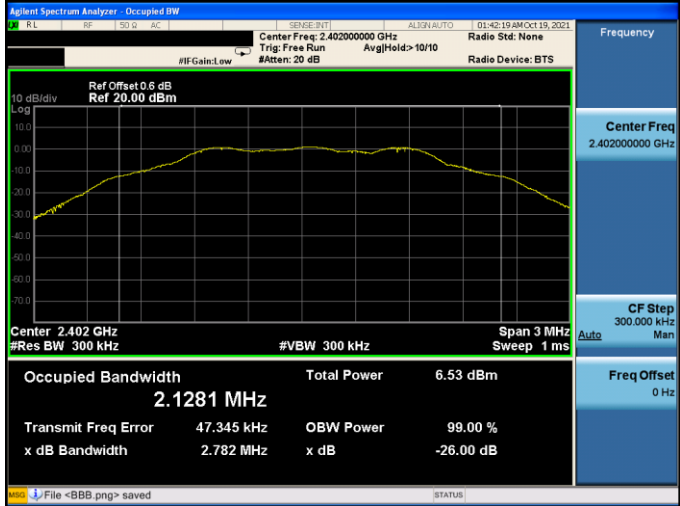
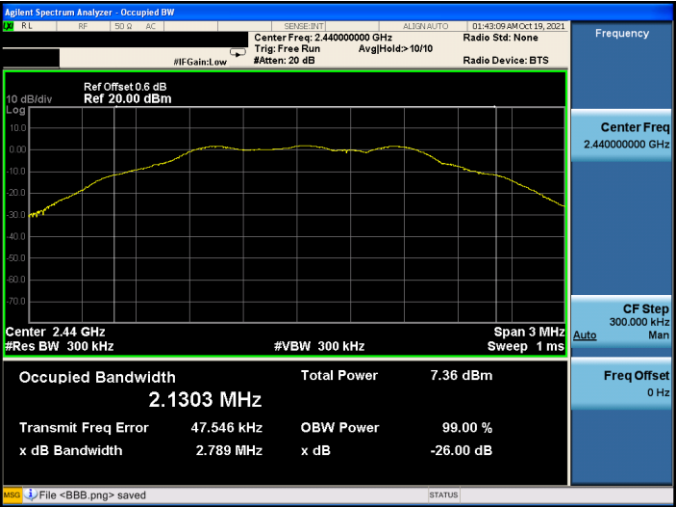
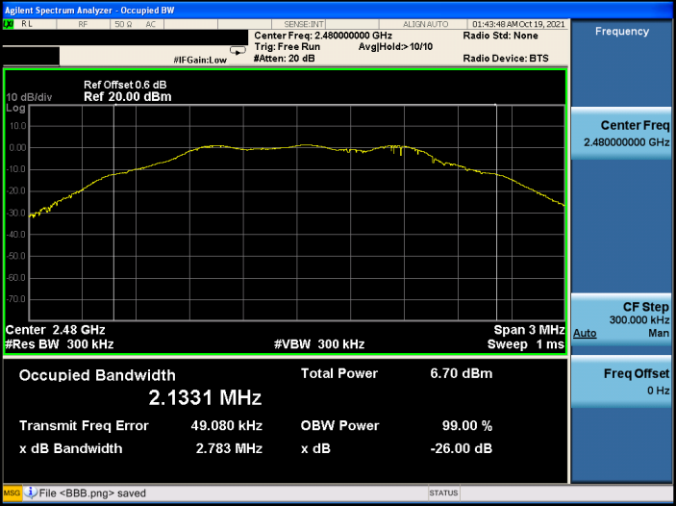





Mode 2	
Unwanted Emission Strength Measurement	
2496.5 MHz – 12.5 GHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

Mode 2	
Secondarily Emitted Radio Wave Strength Measurement	
30 MHz – 1 GHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

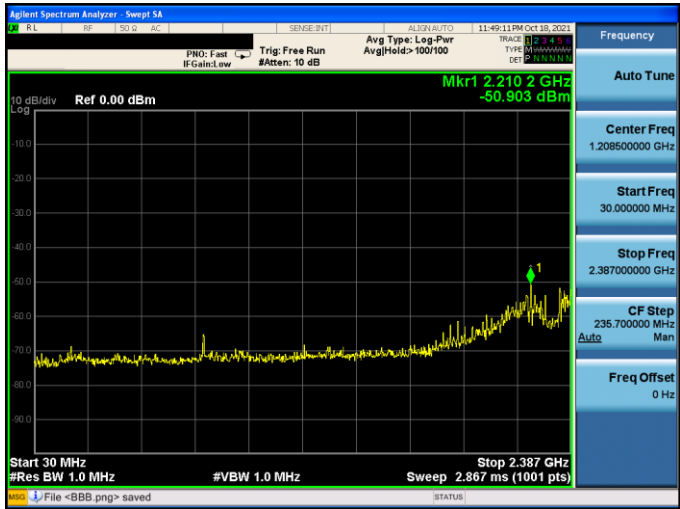
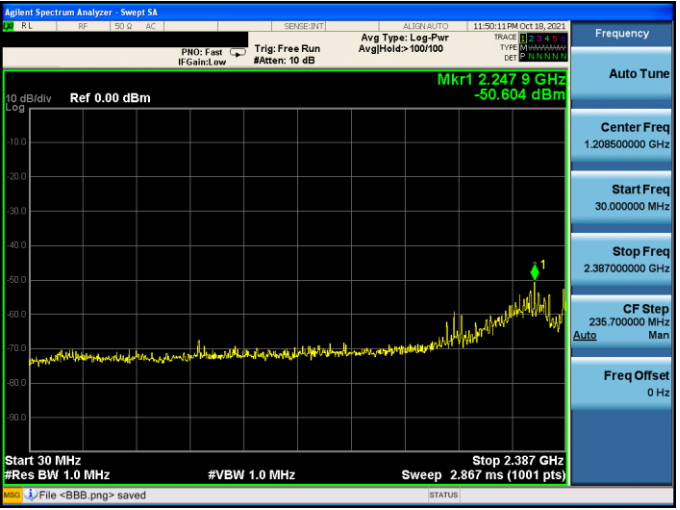
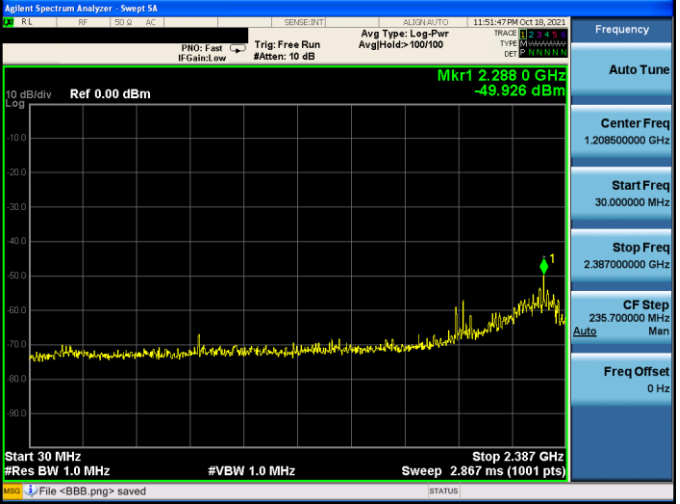
Mode 2	
Secondarily Emitted Radio Wave Strength Measurement	
1 GHz – 12.5 GHz	
Normal Voltage  Low CH	
Normal Voltage  Middle CH	
Normal Voltage  High CH	

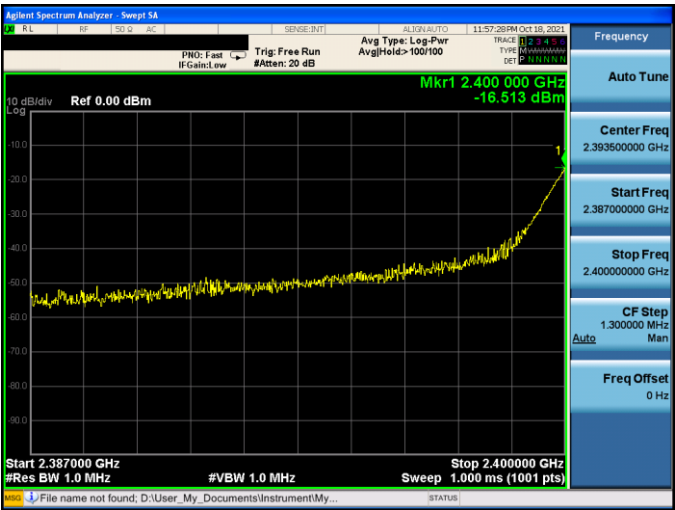

Mode 2	
Frequency Error Measurement	
<p>High Voltage</p> <p>Low CH</p>	
<p>High Voltage</p> <p>Middle CH</p>	
<p>High Voltage</p> <p>High CH</p>	

Mode 2	
Occupied Bandwidth Measurement	
High Voltage  Low CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.40200000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.402 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1281 MHz Total Power: 6.53 dBm</p> <p>Transmit Freq Error: 47.345 kHz OBW Power: 99.00 % x dB Bandwidth: 2.782 MHz x dB: -26.00 dB</p> <p>Frequency: 2.40200000 GHz CF Step: 300.000 kHz Freq Offset: 0 Hz</p>
High Voltage  Middle CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.44000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.44 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1303 MHz Total Power: 7.36 dBm</p> <p>Transmit Freq Error: 47.546 kHz OBW Power: 99.00 % x dB Bandwidth: 2.789 MHz x dB: -26.00 dB</p> <p>Frequency: 2.44000000 GHz CF Step: 300.000 kHz Freq Offset: 0 Hz</p>
High Voltage  High CH	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.48000000 GHz Trig: Free Run Ave/Hold: 10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset: 0.6 dB Ref: 20.00 dBm</p> <p>Center: 2.48 GHz #Res BW: 300 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1331 MHz Total Power: 6.70 dBm</p> <p>Transmit Freq Error: 49.080 kHz OBW Power: 99.00 % x dB Bandwidth: 2.783 MHz x dB: -26.00 dB</p> <p>Frequency: 2.48000000 GHz CF Step: 300.000 kHz Freq Offset: 0 Hz</p>

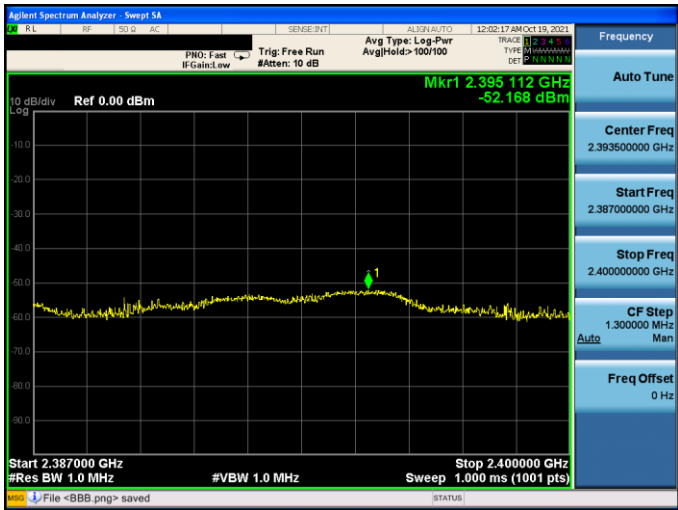
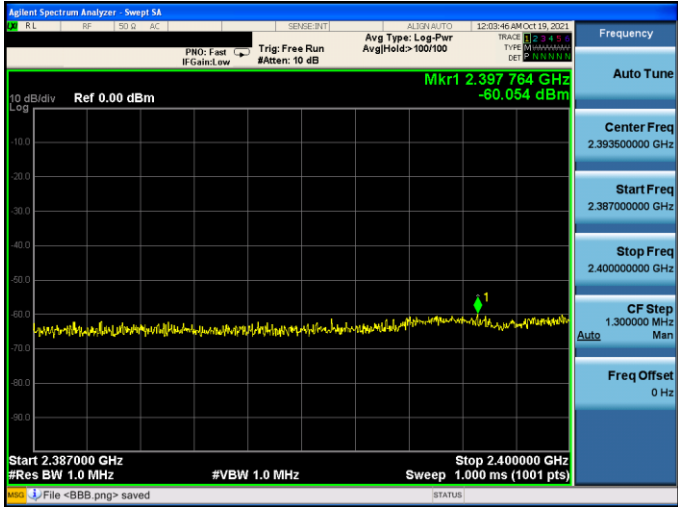
Mode 2	
Antenna Power (Conducted) Measurement	
High Voltage  Low CH	 The image shows the Agilent N1911A P-Series Power Meter. The screen displays 'LCL' at the top left, 'A1 2.5GHz' and 'Avg' below it. The main display shows '0.63 dBm' with a large upward arrow. Below this, it shows 'A1 Avg' and '0.63 dBm'. At the bottom of the screen is a scale from -70.000 dBm to 20.000 dBm. On the right side of the screen, there are buttons for 'Trigger', 'Settings', 'Acqn Cont Trig', and 'Statistical Settings'. Below the screen are buttons for 'System', 'Channel', 'Trig/Acq', 'Meas', and 'Disp'.
High Voltage  Middle CH	 The image shows the Agilent N1911A P-Series Power Meter. The screen displays 'LCL' at the top left, 'A1 2.5GHz' and 'Avg' below it. The main display shows '1.31 dBm' with a large upward arrow. Below this, it shows 'A1 Avg' and '1.31 dBm'. At the bottom of the screen is a scale from -70.000 dBm to 20.000 dBm. On the right side of the screen, there are buttons for 'Trigger', 'Settings', 'Acqn Cont Trig', and 'Statistical Settings'. Below the screen are buttons for 'System', 'Channel', 'Trig/Acq', 'Meas', and 'Disp'.
High Voltage  High CH	 The image shows the Agilent N1911A P-Series Power Meter. The screen displays 'LCL' at the top left, 'A1 2.5GHz' and 'Avg' below it. The main display shows '0.67 dBm' with a large upward arrow. Below this, it shows 'A1 Avg' and '0.67 dBm'. At the bottom of the screen is a scale from -70.000 dBm to 20.000 dBm. On the right side of the screen, there are buttons for 'Trigger', 'Settings', 'Acqn Cont Trig', and 'Statistical Settings'. Below the screen are buttons for 'System', 'Channel', 'Trig/Acq', 'Meas', and 'Disp'.

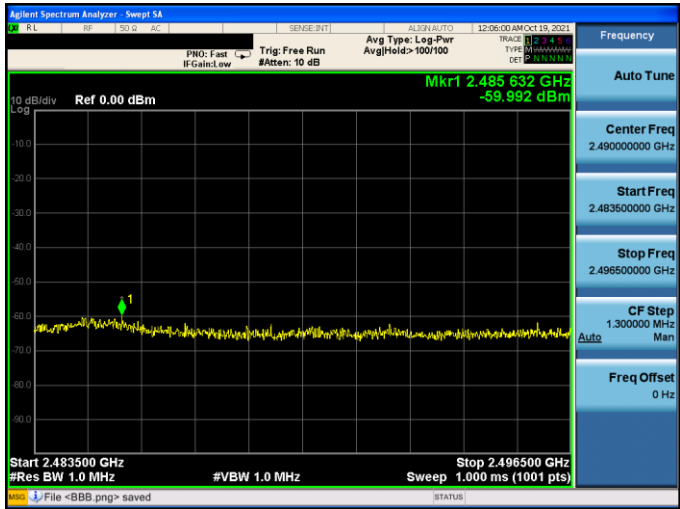

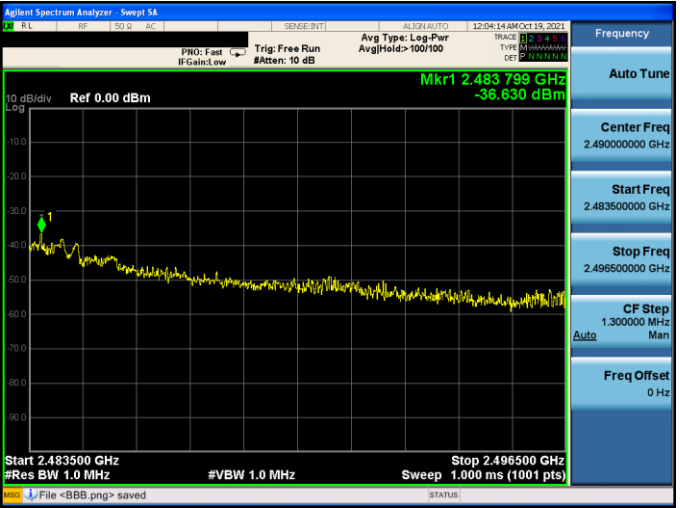


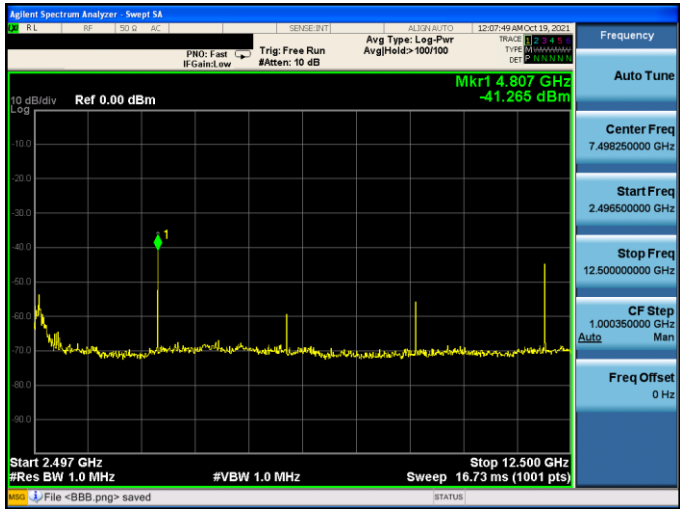
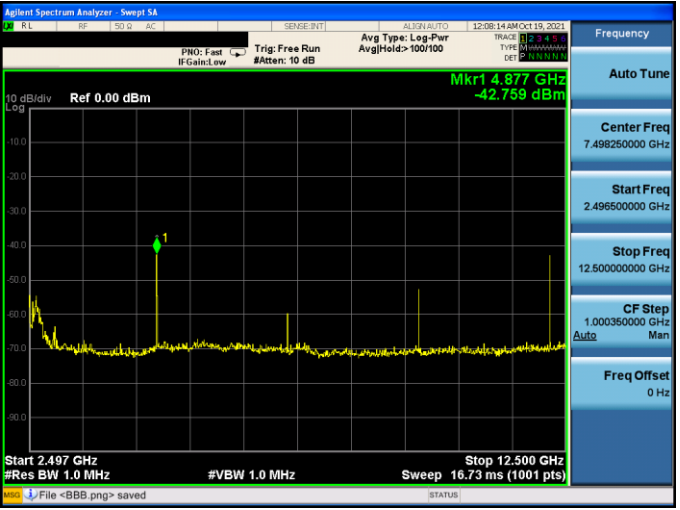
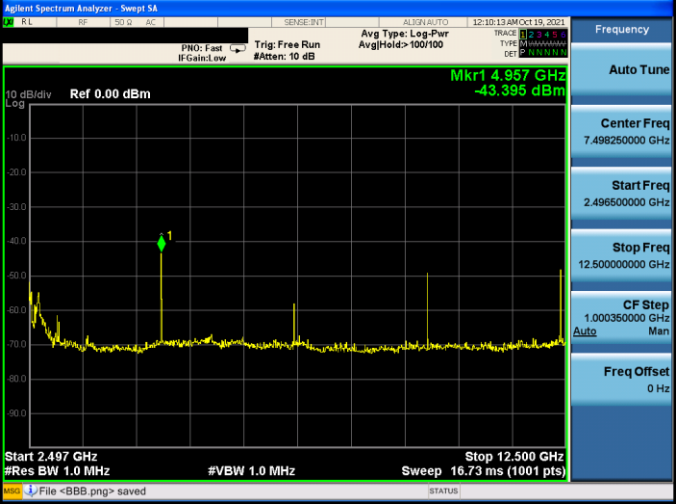
Mode 2	
Unwanted Emission Strength Measurement	
30 MHz – 2387 MHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

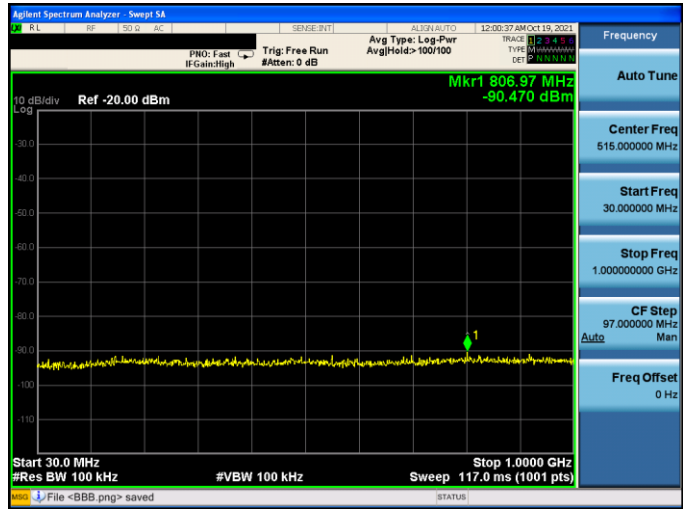
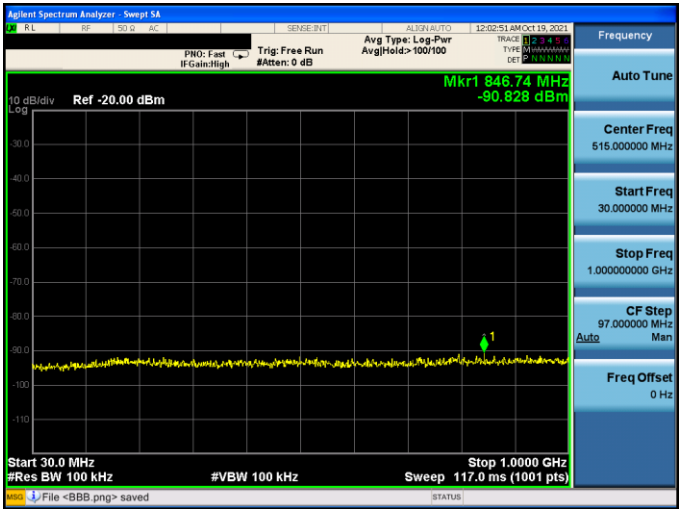
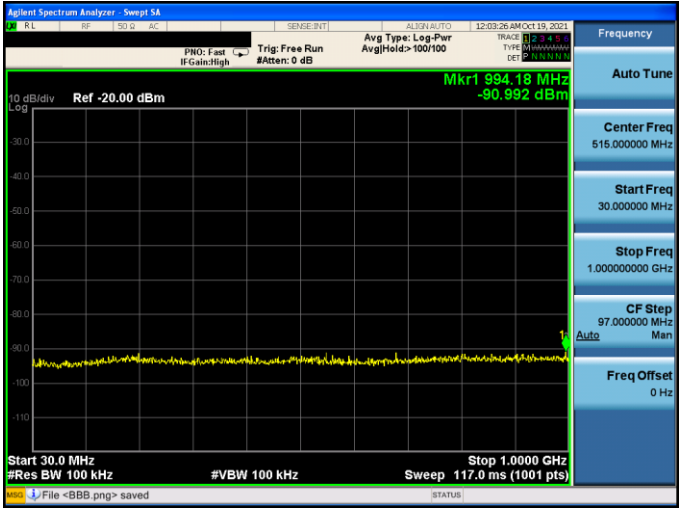
Mode 2	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
High Voltage  Low CH	 <p>The screenshot shows the Agilent Spectrum Analyzer interface. The main display shows a spectrum plot with a rising signal at 2400 MHz. The y-axis is labeled '10 dB/div Log' and ranges from -90.0 to 10.0. The x-axis is labeled 'Start 2.387000 GHz' and 'Stop 2.400000 GHz'. A marker 'Mkr1 2.400 000 GHz -16.513 dBm' is visible. The right panel shows frequency settings: Center Freq 2.393500000 GHz, Start Freq 2.387000000 GHz, Stop Freq 2.400000000 GHz, CF Step 1.300000 MHz, and Freq Offset 0 Hz.</p>
	 <p>The screenshot shows the Agilent Spectrum Analyzer interface. The main display shows a flat spectrum plot at 2400 MHz. The y-axis is labeled '10 dB/div Log' and ranges from -90.0 to 10.0. The x-axis is labeled 'Center 2.400000000 GHz' and 'Span 0 Hz'. A marker 'Mkr1 588.0 μs -52.060 dBm' is visible. The right panel shows frequency settings: Center Freq 2.400000000 GHz, Start Freq 2.400000000 GHz, Stop Freq 2.400000000 GHz, CF Step 1.000000 MHz, and Freq Offset 0 Hz.</p>

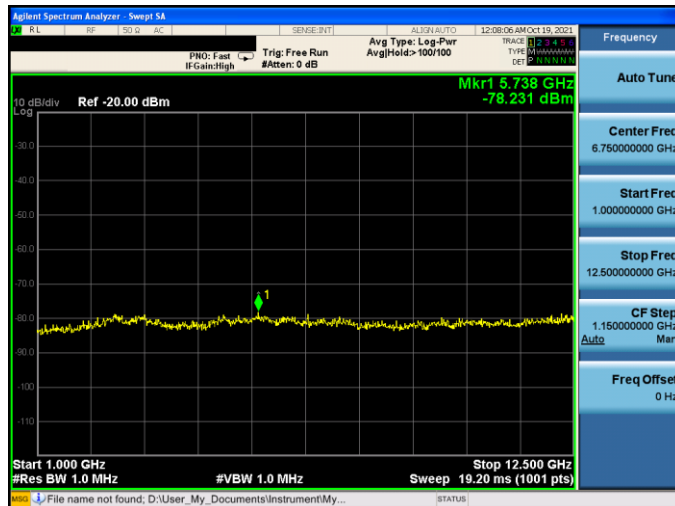
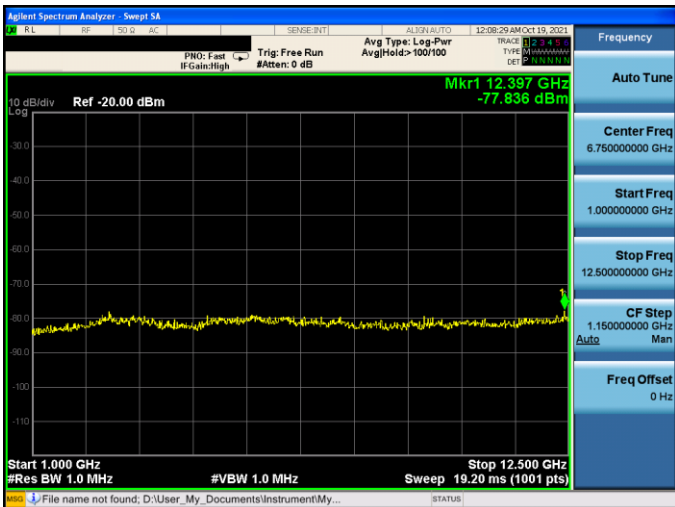
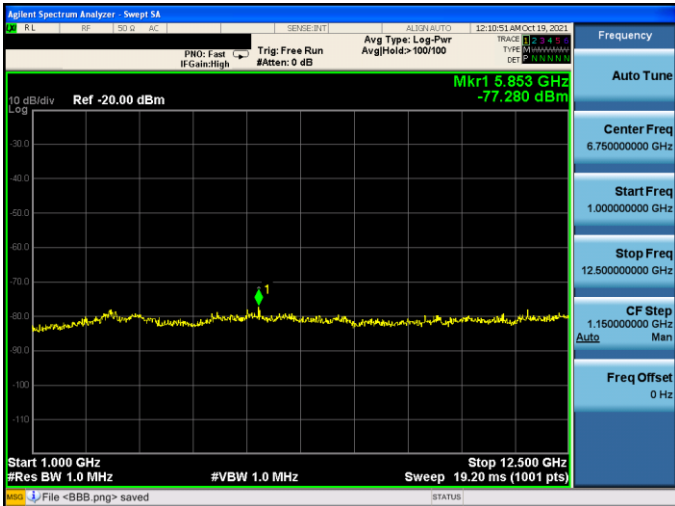


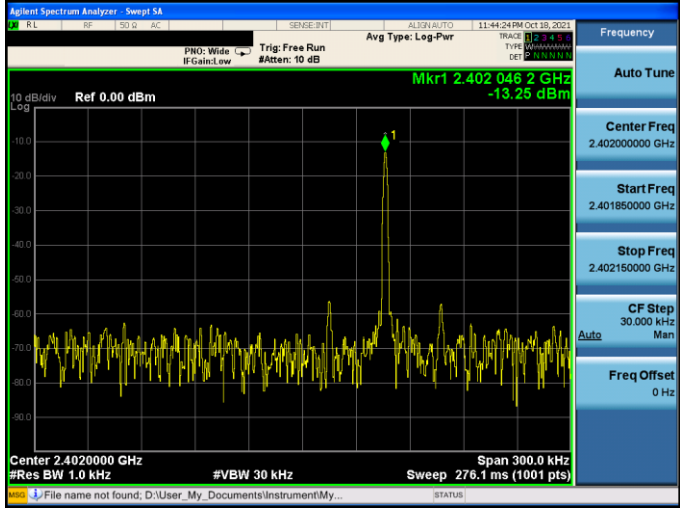
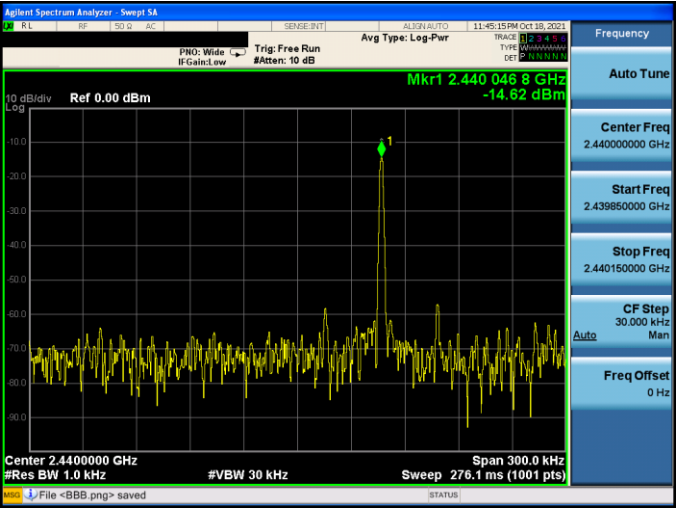
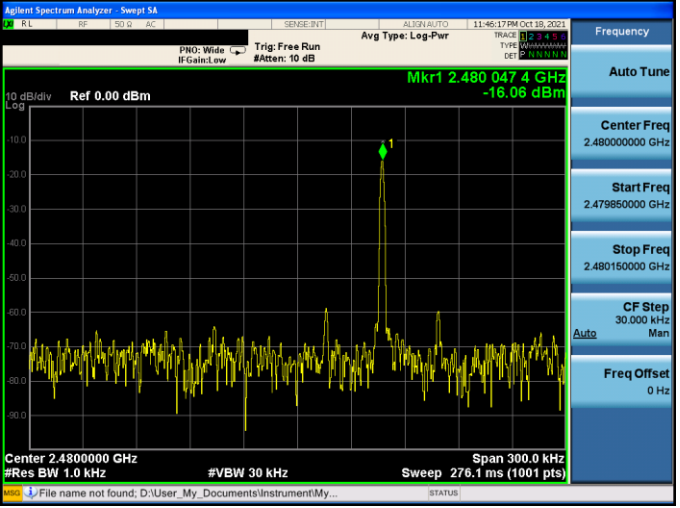
Mode 2	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
<p>High Voltage</p> <p>Middle CH</p>	
<p>High Voltage</p> <p>High CH</p>	

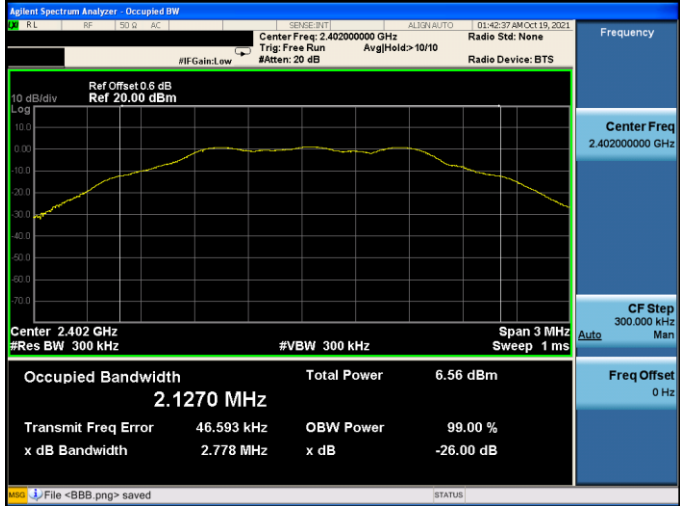
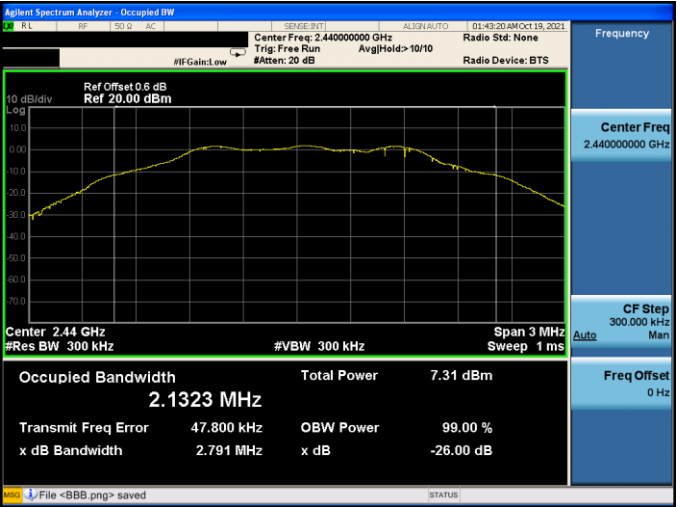
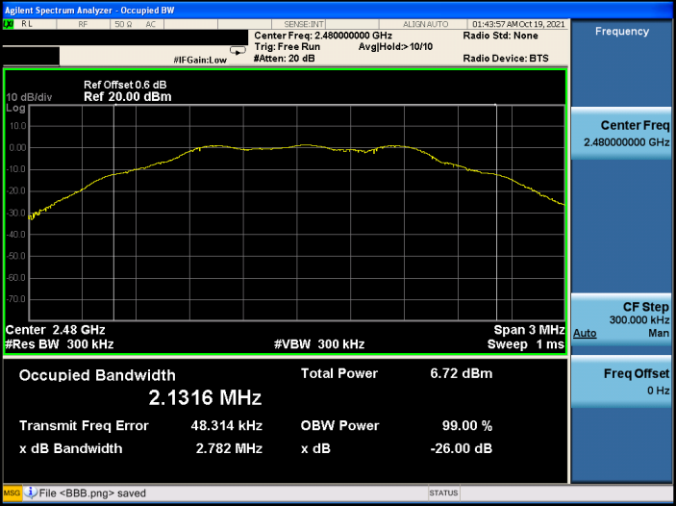
Mode 2	
Unwanted Emission Strength Measurement	
2483.5 MHz – 2496.5 MHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

Mode 2	
Unwanted Emission Strength Measurement	
2496.5 MHz – 12.5 GHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	




Mode 2	
Secondarily Emitted Radio Wave Strength Measurement	
30 MHz – 1 GHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

Mode 2	
Secondarily Emitted Radio Wave Strength Measurement	
1 GHz – 12.5 GHz	
High Voltage  Low CH	
High Voltage  Middle CH	
High Voltage  High CH	

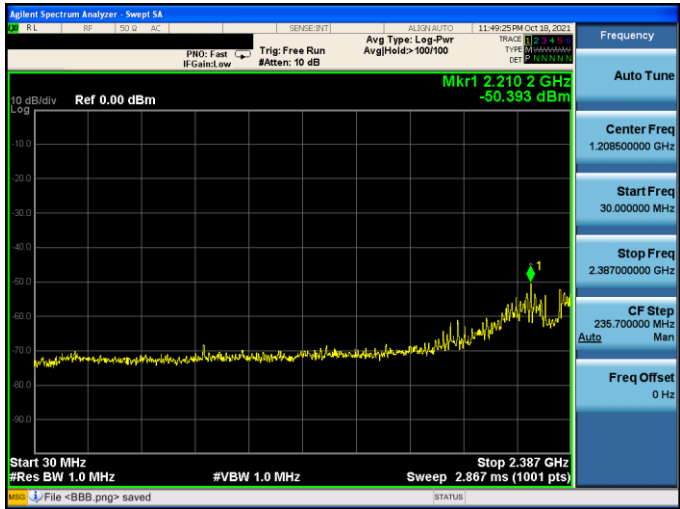
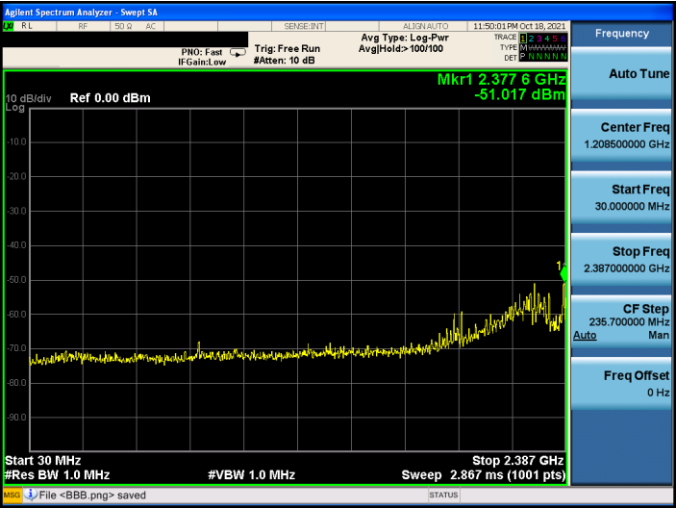
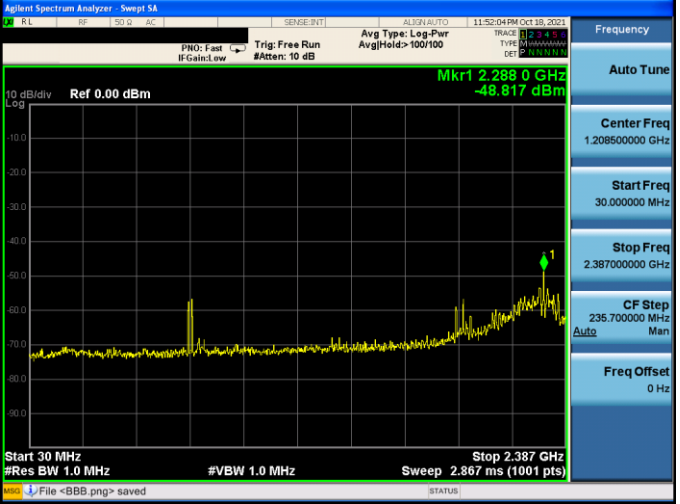
Mode 2	
Frequency Error Measurement	
<p>Low Voltage</p> <p>Low CH</p>	
<p>Low Voltage</p> <p>Middle CH</p>	
<p>Low Voltage</p> <p>High CH</p>	

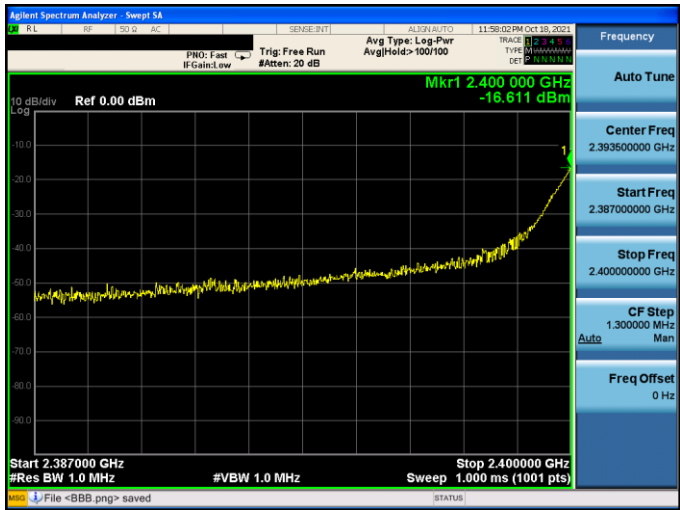

Mode 2	
Occupied Bandwidth Measurement	
<p>Low Voltage</p> <p>Low CH</p>	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.40200000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: 10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset: 0.6 dB</p> <p>Ref: 20.00 dBm</p> <p>Center: 2.402 GHz</p> <p>#Res BW: 300 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 3 MHz</p> <p>Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1270 MHz</p> <p>Total Power: 6.56 dBm</p> <p>Transmit Freq Error: 46.593 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 2.778 MHz</p> <p>x dB: -26.00 dB</p> <p>Frequency: 2.40200000 GHz</p> <p>Center Freq: 2.40200000 GHz</p> <p>CF Step: 300.000 kHz</p> <p>Man</p> <p>Freq Offset: 0 Hz</p> <p>File &lt;BBB.png&gt; saved</p> <p>STATUS</p>
<p>Low Voltage</p> <p>Middle CH</p>	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.44000000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: 10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset: 0.6 dB</p> <p>Ref: 20.00 dBm</p> <p>Center: 2.44 GHz</p> <p>#Res BW: 300 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 3 MHz</p> <p>Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1323 MHz</p> <p>Total Power: 7.31 dBm</p> <p>Transmit Freq Error: 47.800 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 2.791 MHz</p> <p>x dB: -26.00 dB</p> <p>Frequency: 2.44000000 GHz</p> <p>Center Freq: 2.44000000 GHz</p> <p>CF Step: 300.000 kHz</p> <p>Man</p> <p>Freq Offset: 0 Hz</p> <p>File &lt;BBB.png&gt; saved</p> <p>STATUS</p>
<p>Low Voltage</p> <p>High CH</p>	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.48000000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: 10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset: 0.6 dB</p> <p>Ref: 20.00 dBm</p> <p>Center: 2.48 GHz</p> <p>#Res BW: 300 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 3 MHz</p> <p>Sweep: 1 ms</p> <p>Occupied Bandwidth: 2.1316 MHz</p> <p>Total Power: 6.72 dBm</p> <p>Transmit Freq Error: 48.314 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 2.782 MHz</p> <p>x dB: -26.00 dB</p> <p>Frequency: 2.48000000 GHz</p> <p>Center Freq: 2.48000000 GHz</p> <p>CF Step: 300.000 kHz</p> <p>Man</p> <p>Freq Offset: 0 Hz</p> <p>File &lt;BBB.png&gt; saved</p> <p>STATUS</p>



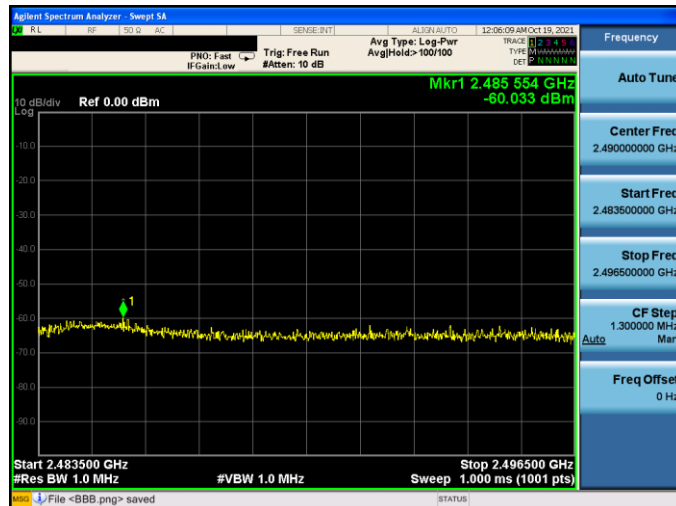

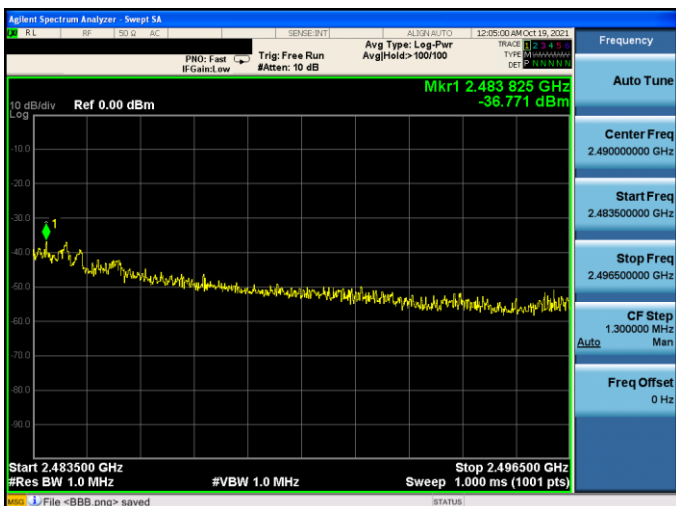
Mode 2	
Antenna Power (Conducted) Measurement	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

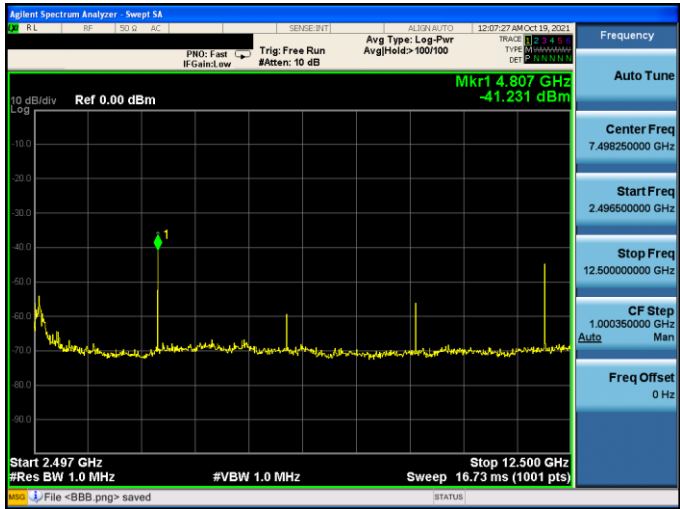
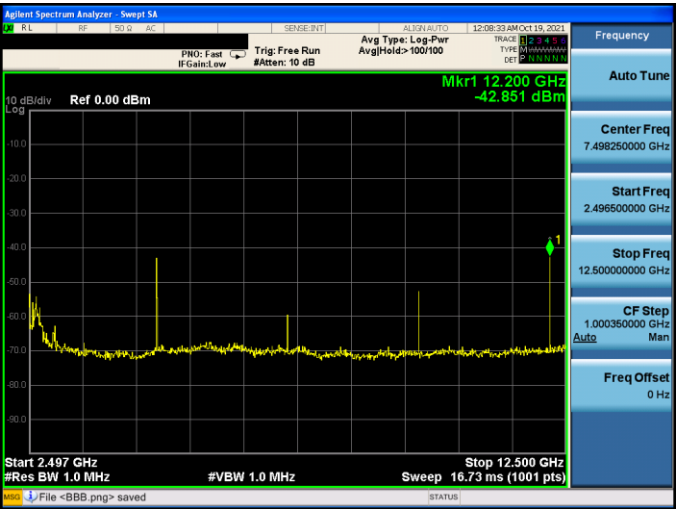
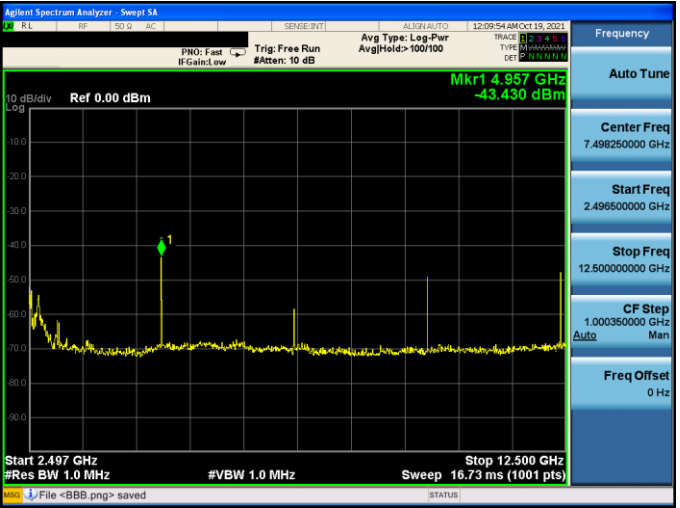


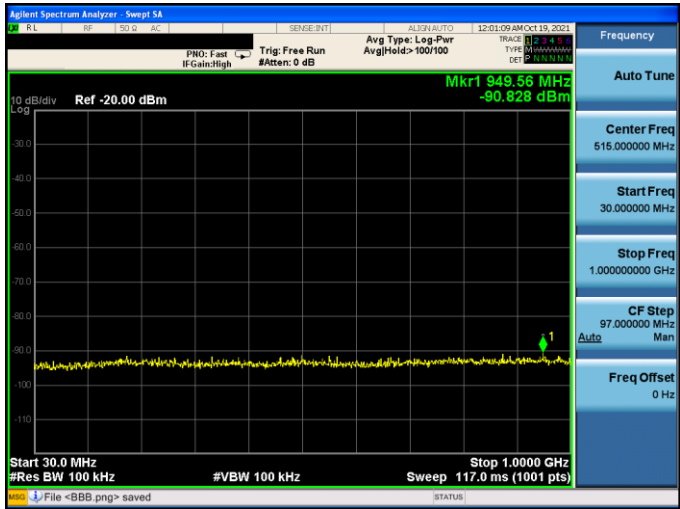
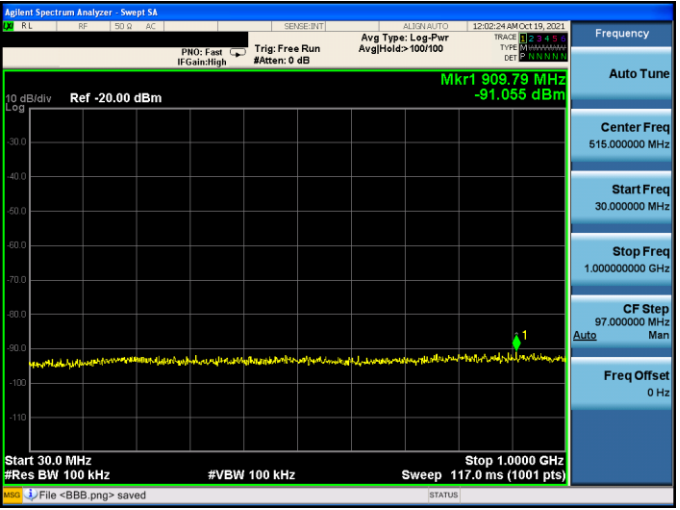
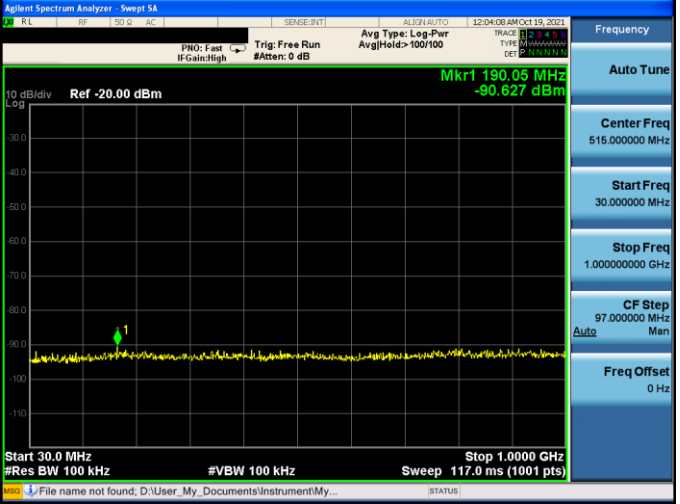
Mode 2	
Unwanted Emission Strength Measurement	
30 MHz – 2387 MHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	


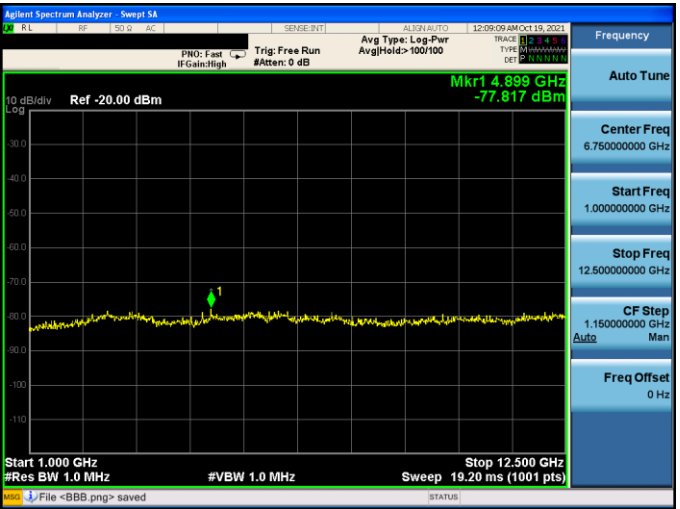

Mode 2	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
Low Voltage  Low CH	
	

Mode 2	
Unwanted Emission Strength Measurement	
2387 MHz – 2400 MHz	
<p>Low Voltage</p> <p>Middle CH</p>	
<p>Low Voltage</p> <p>High CH</p>	

Mode 2	
Unwanted Emission Strength Measurement	
2483.5 MHz – 2496.5 MHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

Mode 2	
Unwanted Emission Strength Measurement	
2496.5 MHz – 12.5 GHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

Mode 2	
Secondarily Emitted Radio Wave Strength Measurement	
30 MHz – 1 GHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

Mode 2	
Secondarily Emitted Radio Wave Strength Measurement	
1 GHz – 12.5 GHz	
Low Voltage  Low CH	
Low Voltage  Middle CH	
Low Voltage  High CH	

---END---