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Test Report No.: W7L-220518W001RF01



# FCC TEST REPORT (Part 15, Subpart C)

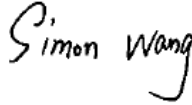

Applicant:	Wyze Labs, Inc.
Address:	5808 Lake Washington Blvd NE Ste 300 Kirkland WA 98033

Manufacturer or Supplier:	Wyze Labs, Inc.
Address:	5808 Lake Washington Blvd NE Ste 300 Kirkland WA 98033
Product:	Wyze Cam Pan v3
Brand Name:	WYZE
Model Name:	WYZECPAN3
FCC ID:	2AUUIWYZECPAN3
Date of tests:	May. 19, 2022 ~ Jul. 12, 2022

The tests have been carried out according to the requirements of the following standard:

- FCC Part 15, Subpart C, Section 15.247**
- ANSI C63.10-2013**

**CONCLUSION: The submitted sample was found to COMPLY with the test requirement**

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: Jul. 12, 2022	 Date: Jul. 12, 2022

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-220518W001RF01	Original release	Jul. 12, 2022



# 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)		
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
15.207	AC Power Conducted Emission	Compliance
15.205 15.209	Radiated Emissions	Compliance
15.247(d)	Out of band Emission Measurement	Compliance
15.247(a)(2)	6dB bandwidth	Compliance
15.247(b)	Conducted Output power	Compliance
15.247(e)	Power Spectral Density	Compliance
15.203	Antenna Requirement	Compliance

## 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	±2.70dB
Radiated emissions (30MHz~1GMHz)	±4.98dB
Radiated emissions (1GMHz ~6GMHz)	±4.70dB
Radiated emissions (6GMHz ~18GMHz)	±4.60dB
Radiated emissions (18GMHz ~40GMHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±4 3.58KHz
Conducted Output power	±2.06dB
Power Spectral Density	±0.85 dB

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



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Wyze Cam Pan v3
<b>BRAND NAME</b>	WYZE
<b>MODEL NAME</b>	WYZECPAN3
<b>NOMINAL VOLTAGE</b>	5Vdc (adapter)
<b>MODULATION</b>	DSSS, OFDM
<b>TRANSMISSION RATE</b>	802.11b: 11/ 5.5/ 2.0 / 1.0 Mbps 802.11g: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps 802.11n20: up to 65 Mbps
<b>OPERATING FREQUENCY</b>	2412-2462MHz for 11b/g/n(HT20)
<b>MAX. CONDUCTED POWER</b>	WLAN: 366.44mW (Maximum)
<b>ANTENNA TYPE</b>	omnidirectional built-in stamping Antenna with 2.5 dBi gain
<b>HW VERSION</b>	V1.3/V1.4
<b>SW VERSION</b>	V4.50.0.36
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	N/A

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function. Physically, the EUT provides one transmitter and one receiver.

MODULATION MODE	TX/RX FUNCTION
802.11b	1TX /1RX
802.11g	1TX /1RX
802.11n (20MHz)	1TX /1RX

- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

**List of Accessory:**

ACCESSORIES	BRAND	MODEL	SPECIFICATION
AC Adapter 1	WYZE	KA12C-0502000US	I/P: 100-240Vac, 0.35A, O/P:5Vdc, 2.0A,1.8 meter
AC Adapter 2	WYZE	AS1207A-0502000 USU	I/P: 100-240Vac, 0.35A, O/P:5Vdc, 2.0A,1.8 meter



**Sample Information :**

<b>Sample</b>	<b>SPECIFICATION</b>
1	WYZECPAN3 (V1.3)(Mainly tested by this version)
2	WYZECPAN3(V1.4)

Note: According to the difference letter of declaration by the manufacturer, the difference between HW:V1.3 and HW: 1.4 does not have any impact on the approved radio parameter such as power, frequency range, RF circuit etc, the report only shown the worst case data of the all verified data.

**2.2 DESCRIPTION OF TEST MODES**

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

<b>CHANNEL</b>	<b>FREQUENCY</b>	<b>CHANNEL</b>	<b>FREQUENCY</b>
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		





### 2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

### 2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Y axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G**: Radiated Emission below 1GHz      **RE≥1G**: Radiated Emission above 1GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement

**NOTE:** No need to concern of Conducted Emission due to the EUT is powered by battery.

### RADIATED EMISSION TEST (BELOW 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11n HT20	1 to 11	11	OFDM	MCS0



**RADIATED EMISSION TEST (ABOVE 1GHz):**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0

**POWER LINE CONDUCTED EMISSION TEST**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11n HT20	1 to 11	11	OFDM	MCS0

**BANDEDGE MEASUREMENT:**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	DSSS	1.0
802.11g	1 to 11	1, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 11	OFDM	MCS0



**ANTENNA PORT CONDUCTED MEASUREMENT:**

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	23deg. C, 70%RH	DC 5V	Carl Xie
RE≥1G	23deg. C, 70%RH	DC 5V	Carl Xie
PLC	25deg. C, 52%RH	DC 5V	Lily Zhao
APCM	25deg. C, 60%RH	DC 5V	Lily Zhao



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## **2.3 Duty Cycle of Test Signal**

Please Refer to Appendix 1 of this test report.



## 2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C, Section 15.247**

**KDB 558074 D01 DTS Meas Guidance v05r02**

**ANSI C63.10-2013**

Note :

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

## 2.5 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Desktop	Lenovo	M73 SFF	PC04GRQV	N/A
2	Desktop	Lenovo	M73 SFF	PC06CS27	N/A
3	Laptop	Lenovo	Thnikpad T450	PC-049PT1	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 1.5m
2	AC Line: Unshielded, Detachable 1.5m
3	AC Line: Unshielded, Detachable 1.5m



### 3 TEST TYPES AND RESULTS

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:**
- 1.The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

##### 3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 15,22	Feb. 14,23
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Mar. 04,22	Mar. 03,23

- NOTE:**
1. The test was performed in CE shielded room.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



### 3.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

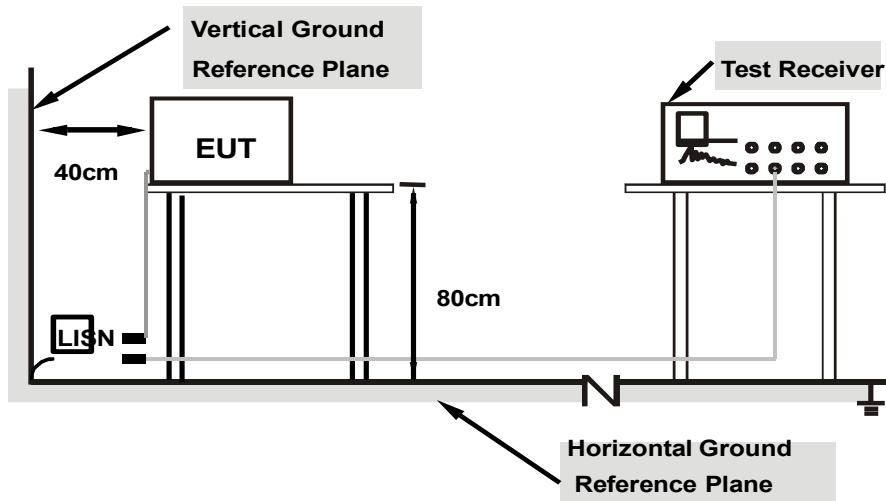
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 3.1.4 DEVIATION FROM TEST STANDARD

No deviation.



### 3.1.5 TEST SETUP



- Note:**
- 1.Support units were connected to second LISN.
  - 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 3.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.





### 3.1.7 TEST RESULTS

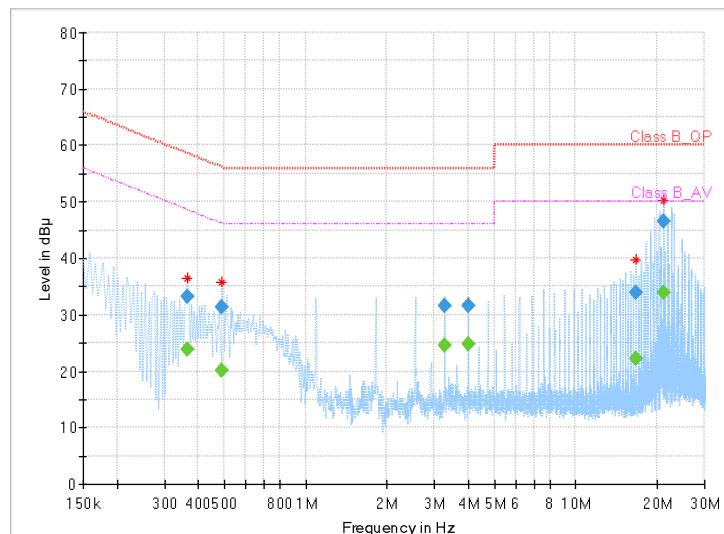
#### CONDUCTED WORST-CASE DATA:

<b>Frequency Range</b>	150KHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	25deg. C, 55%RH
<b>Tested By</b>	Carl Xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.364000	---	23.84	48.64	24.80	L1	ON	9.7
0.364000	33.17	---	58.64	25.47	L1	ON	9.7
0.488000	---	20.20	46.20	26.00	L1	ON	9.7
0.488000	31.37	---	56.20	24.83	L1	ON	9.7
3.276000	---	24.59	46.00	21.41	L1	ON	9.7
3.276000	31.48	---	56.00	24.52	L1	ON	9.7
4.008000	---	24.74	46.00	21.26	L1	ON	9.7
4.008000	31.65	---	56.00	24.35	L1	ON	9.7
16.768000	---	22.17	50.00	27.83	L1	ON	9.8
16.768000	33.91	---	60.00	26.09	L1	ON	9.8
21.140000	---	33.99	50.00	16.01	L1	ON	9.8
21.140000	46.65	---	60.00	13.35	L1	ON	9.8

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Limit value - Emission level
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.

Full Spectrum





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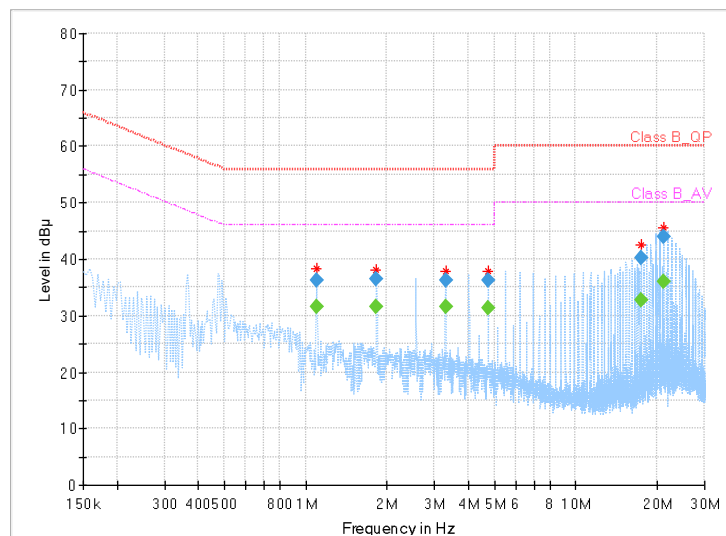
**Test Report No.: W7L-220518W001RF01**

<b>Frequency Range</b>	150KHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	25deg. C, 55%RH
<b>Tested By</b>	Carl Xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
1.096000	---	31.60	46.00	14.40	N	ON	9.8
1.096000	36.30	---	56.00	19.70	N	ON	9.8
1.828000	---	31.64	46.00	14.36	N	ON	9.8
1.828000	36.39	---	56.00	19.61	N	ON	9.8
3.292000	---	31.51	46.00	14.49	N	ON	9.8
3.292000	36.23	---	56.00	19.77	N	ON	9.8
4.756000	---	31.33	46.00	14.68	N	ON	9.8
4.756000	36.28	---	56.00	19.72	N	ON	9.8
17.568000	---	32.81	50.00	17.19	N	ON	9.9
17.568000	40.18	---	60.00	19.82	N	ON	9.9
21.232000	---	35.96	50.00	14.04	N	ON	9.9
21.232000	43.90	---	60.00	16.10	N	ON	9.9

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Limit value - Emission level
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.

Full Spectrum





### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

FREQUENCIES (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

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

**3.2.2 TEST INSTRUMENTS**

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	May. 19,20	May. 18,23
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 06,22	Mar. 05,23
Horn Antenna	ETS-LINDGREN	3117	00168692	Mar. 06,22	Mar. 05,23
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Aug. 25, 21	Aug. 24, 22
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	JS1120-3	3.2.06	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jun. 03,21	Jun. 02,22
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jun. 03,22	Jun. 02,23
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 18,22	Feb. 17,23
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 21,22	Feb.20,23
DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 25,21	Aug. 24,22
Power Meter	Anritsu	ML2495A	1506002	Feb. 22,22	Feb. 21,23
Power Sensor	Anritsu	MA2411B	1339352	May. 07,22	May. 06,23
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.05,21	Sep.04,22

- NOTE:**
1. The calibration interval of the above test instruments is 12 months or 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
  2. The test was performed in 3m Chamber.
  3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.



### 3.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

#### **Note:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ( $10 \log(1/\text{duty cycle})$ ).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

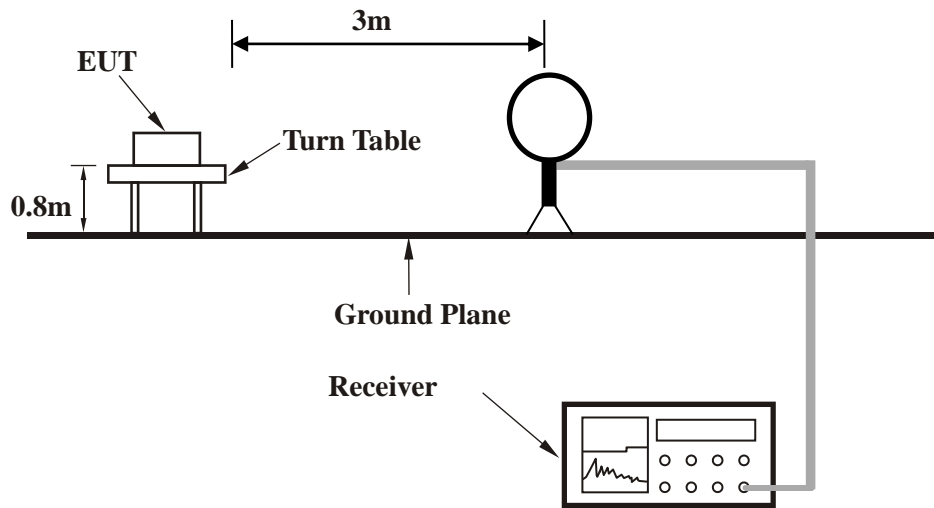
### 3.2.4 DEVIATION FROM TEST STANDARD

No deviation

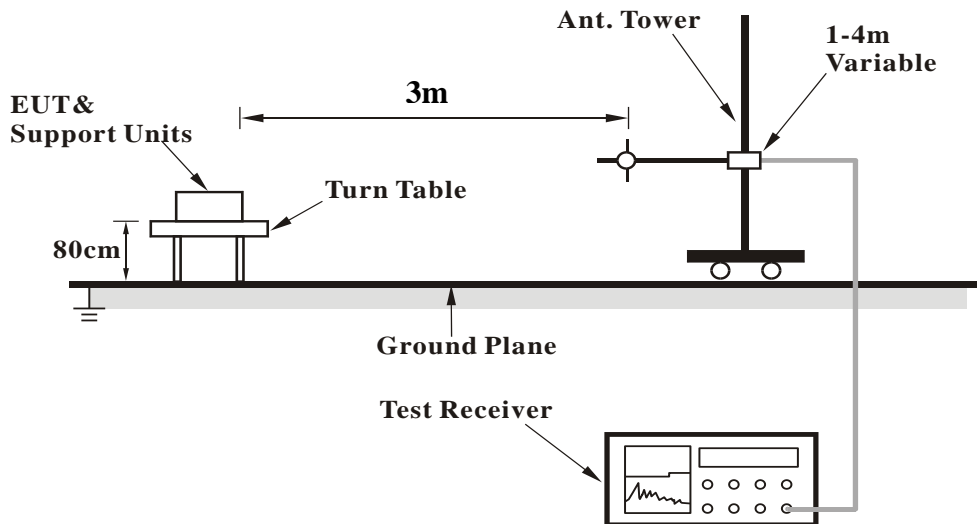


### 3.2.5 TEST SETUP

#### <Frequency Range 9KHz~30MHz >

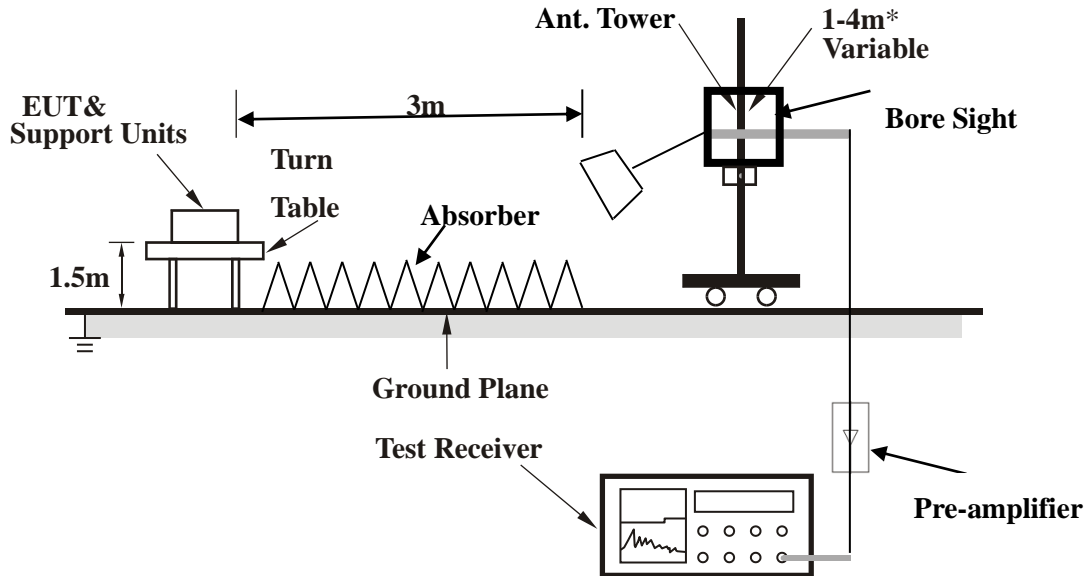


#### < Frequency Range 30MHz~1GHz >





**<Frequency Range above 1GHz>**



**Note:** Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

**3.2.6 EUT OPERATING CONDITIONS**

- a. Set the EUT under full load condition and placed them on a testing table.
- b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.



### 3.2.7 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA:

**Note:** For frequency below 30MHz, the emission was tested 20db below the limit so the data not recorded in the sheet.

**30 MHz – 1GHz data:**

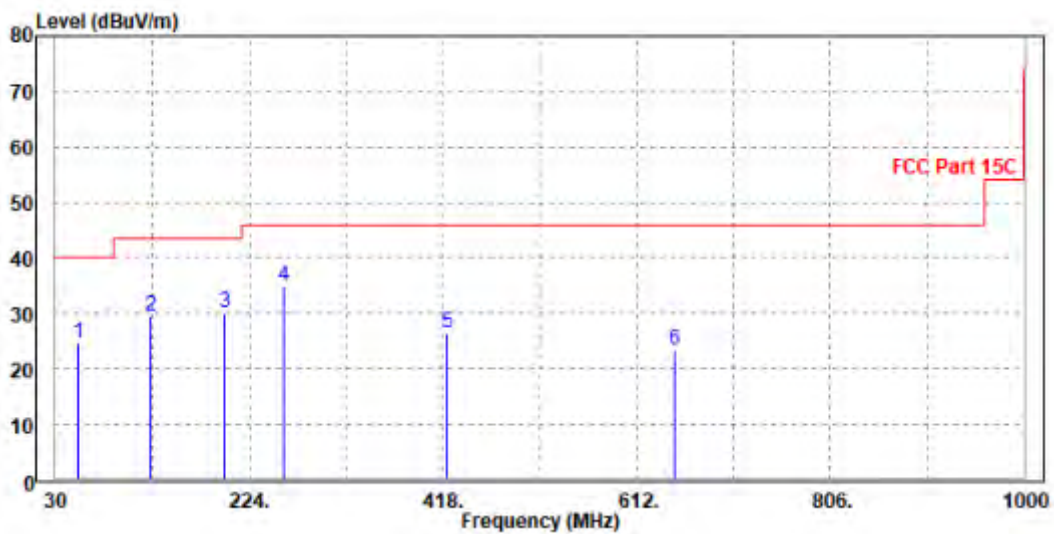
**802.11n (20MHz)**

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
52.31	24.49	51.10	40.00	-15.51	9.97	0.41	36.99	120	94	QP
126.03	29.53	56.70	43.50	-13.97	8.92	0.60	36.69	124	172	QP
199.75	29.97	54.23	43.50	-13.53	11.30	0.73	36.29	123	4	QP
258.92	34.83	56.66	46.00	-11.17	13.59	0.85	36.27	153	166	QP
422.85	26.45	45.18	46.00	-19.55	16.63	1.11	36.47	143	17	QP
649.83	23.28	38.24	46.00	-22.72	20.65	1.42	37.03	186	237	QP

#### REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Emission level – Limit value.







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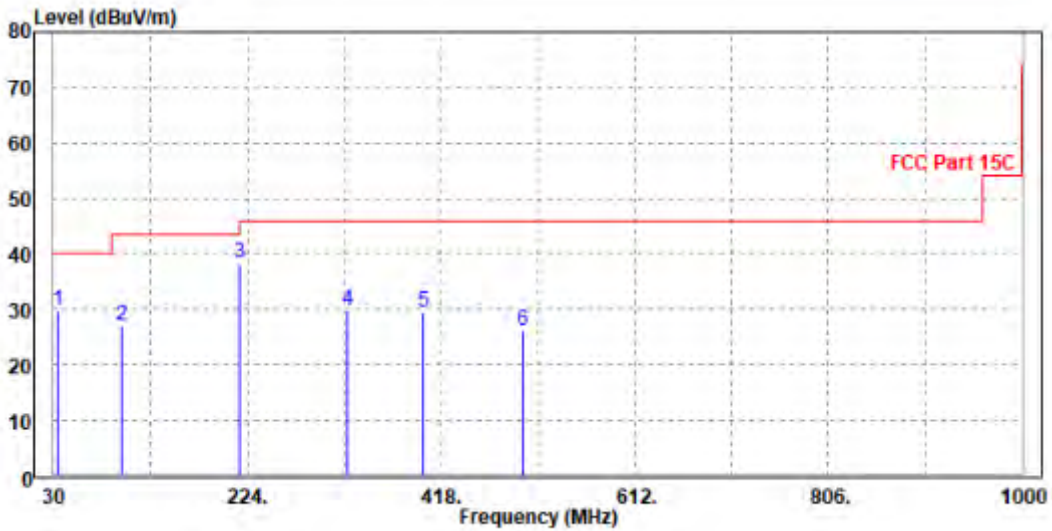
**Test Report No.: W7L-220518W001RF01**

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
34.85	29.73	48.87	40.00	-10.27	17.88	0.33	37.35	175	115	QP
97.90	27.22	54.54	43.50	-16.28	9.00	0.53	36.85	177	191	QP
216.24	38.47	62.13	46.00	-7.53	11.86	0.77	36.29	120	280	QP
324.88	29.71	50.49	46.00	-16.29	14.57	0.95	36.30	159	67	QP
399.57	29.63	48.69	46.00	-16.37	16.29	1.07	36.42	101	30	QP
500.45	26.30	44.09	46.00	-19.70	17.61	1.22	36.62	133	133	QP

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Emission level – Limit value.





**ABOVE 1GHz WORST-CASE DATA:**

**Note:** For higher frequency, the emission is too low to be detected.

**802.11b:**

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.52	61.56	74	-20.48	31.75	6.18	45.97	110	330	Peak
2390	44.74	52.78	54	-9.26	31.75	6.18	45.97	110	330	Average
2412	98.18	106.11	-	-	31.82	6.21	45.96	110	330	Peak
2412	95.63	103.56	-	-	31.82	6.21	45.96	110	330	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.73	61.38	74	-20.27	32.14	6.18	45.97	100	330	Peak
2390	44.8	52.45	54	-9.2	32.14	6.18	45.97	100	330	Average
2412	99.23	106.79	-	-	32.19	6.21	45.96	100	330	Peak
2412	96.2	103.76	-	-	32.19	6.21	45.96	100	330	Average

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2412MHz: Fundamental frequency.



<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
4874	43.62	46.79	74	-30.38	34.2	9.03	46.4	200	0	Peak
4874	34.89	38.06	54	-19.11	34.2	9.03	46.4	200	0	Average
7307	45.33	43.25	74	-28.67	35.84	11.97	45.73	200	0	Peak
7307	39.56	37.48	54	-14.44	35.84	11.97	45.73	200	0	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
4876	43.39	46.36	74	-30.61	34.4	9.03	46.4	100	0	Peak
4876	35.28	38.25	54	-18.72	34.4	9.03	46.4	100	0	Average
7307	46.82	44.66	74	-27.18	35.92	11.97	45.73	100	0	Peak
7307	39.96	37.8	54	-14.04	35.92	11.97	45.73	100	0	Average

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2437MHz: Fundamental frequency.



<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2462	99.55	107.23	-	-	31.98	6.28	45.94	100	330	Peak
2462	96.95	104.63	-	-	31.98	6.28	45.94	100	330	Average
2483.5	52.94	60.51	74	-21.06	32.05	6.31	45.93	100	330	Peak
2483.5	45.70	53.27	54	-8.30	32.05	6.31	45.93	100	330	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2462	98.02	105.37	-	-	32.31	6.28	45.94	100	330	Peak
2462	95.81	103.16	-	-	32.31	6.28	45.94	100	330	Average
2483.5	53.02	60.28	74	-20.98	32.36	6.31	45.93	100	330	Peak
2483.5	45.55	52.81	54	-8.45	32.36	6.31	45.93	100	330	Average

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2462MHz: Fundamental frequency.



**802.11g**

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.90	61.94	74	-20.10	31.75	6.18	45.97	110	330	Peak
2390	45.42	53.46	54	-8.58	31.75	6.18	45.97	110	330	Average
2412	99.77	107.7	-	-	31.82	6.21	45.96	110	330	Peak
2412	92.31	100.24	-	-	31.82	6.21	45.96	110	330	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.02	59.67	74	-21.98	32.14	6.18	45.97	100	310	Peak
2390	45.21	52.86	54	-8.79	32.14	6.18	45.97	100	310	Average
2412	99.74	107.3	-	-	32.19	6.21	45.96	100	310	Peak
2412	92.07	99.63	-	-	32.19	6.21	45.96	100	310	Average

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2412MHz: Fundamental frequency.



<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
4876	43.26	46.43	74	-30.74	34.20	9.03	46.40	200	360	Peak
4876	35.49	38.66	54	-18.51	34.20	9.03	46.40	200	360	Average
7311	45.40	43.32	74	-28.6	35.84	11.97	45.73	200	360	Peak
7311	39.45	37.37	54	-14.55	35.84	11.97	45.73	200	360	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
4874	42.86	45.83	74	-31.14	34.4	9.03	46.40	100	0	Peak
4874	35.94	38.91	54	-18.06	34.4	9.03	46.40	100	0	Average
7307	45.47	43.31	74	-28.53	35.92	11.97	45.73	100	0	Peak
7307	39.46	37.30	54	-14.54	35.92	11.97	45.73	100	0	Average

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2437MHz: Fundamental frequency.



<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV/m)</b>	<b>READ LEVEL (dBuV)</b>	<b>LIMIT (dBuV/m)</b>	<b>MARGIN (dB)</b>	<b>ANTENNA FACTOR (dB /m)</b>	<b>CABLE LOSS (dB)</b>	<b>PREAMP FACTOR (dB)</b>	<b>ANTENNA HEIGHT (cm)</b>	<b>TABLE ANGLE (Degree)</b>	<b>REMARK</b>
2462	99.61	107.29	-	-	31.98	6.28	45.94	110	330	Peak
2462	92.26	99.94	-	-	31.98	6.28	45.94	110	330	Average
2483.5	54.17	61.74	74	-19.83	32.05	6.31	45.93	110	330	Peak
2483.5	46.16	53.73	54	-7.84	32.05	6.31	45.93	110	330	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV/m)</b>	<b>READ LEVEL (dBuV)</b>	<b>LIMIT (dBuV/m)</b>	<b>MARGIN (dB)</b>	<b>ANTENNA FACTOR (dB /m)</b>	<b>CABLE LOSS (dB)</b>	<b>PREAMP FACTOR (dB)</b>	<b>ANTENNA HEIGHT (cm)</b>	<b>TABLE ANGLE (Degree)</b>	<b>REMARK</b>
2462	99.31	106.66	-	-	32.31	6.28	45.94	100	310	Peak
2462	91.73	99.08	-	-	32.31	6.28	45.94	100	310	Average
2483.5	53.67	60.93	74	-20.33	32.36	6.31	45.93	100	310	Peak
2483.5	45.59	52.85	54	-8.41	32.36	6.31	45.93	100	310	Average

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.



**802.11n (20MHz)**

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.65	60.69	74	-21.35	31.75	6.18	45.97	110	330	Peak
2390	46.41	54.45	54	-7.59	31.75	6.18	45.97	110	330	Average
2412	100.12	108.05	-	-	31.82	6.21	45.96	110	330	Peak
2412	92.05	99.98	-	-	31.82	6.21	45.96	110	330	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.81	60.46	74	-21.19	32.14	6.18	45.97	100	310	Peak
2390	45.25	52.9	54	-8.75	32.14	6.18	45.97	100	310	Average
2412	99.64	107.2	-	-	32.19	6.21	45.96	100	310	Peak
2412	92.09	99.65	-	-	32.19	6.21	45.96	100	310	Average

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2412MHz: Fundamental frequency.





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**Test Report No.: W7L-220518W001RF01**

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
4874	43.53	46.70	74	-30.47	34.20	9.03	46.40	200	0	Peak
4874	35.44	38.61	54	-18.56	34.20	9.03	46.40	200	0	Average
7307	45.82	43.74	74	-28.18	35.84	11.97	45.73	200	0	Peak
7307	39.26	37.18	54	-14.74	35.84	11.97	45.73	200	0	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
4876	42.05	45.02	74	-31.95	34.40	9.03	46.40	100	360	Peak
4876	36.37	39.34	54	-17.63	34.40	9.03	46.40	100	360	Average
7311	44.97	42.82	74	-29.03	35.91	11.97	45.73	100	360	Peak
7311	39.34	37.19	54	-14.66	35.91	11.97	45.73	100	360	Average

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2437MHz: Fundamental frequency.



<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV/m)</b>	<b>READ LEVEL (dBuV)</b>	<b>LIMIT (dBuV/m)</b>	<b>MARGIN (dB)</b>	<b>ANTENNA FACTOR (dB /m)</b>	<b>CABLE LOSS (dB)</b>	<b>PREAMP FACTOR (dB)</b>	<b>ANTENNA HEIGHT (cm)</b>	<b>TABLE ANGLE (Degree)</b>	<b>REMARK</b>
2462	100.5	108.18	-	-	31.98	6.28	45.94	100	330	Peak
2462	92.79	100.47	-	-	31.98	6.28	45.94	100	330	Average
2483.5	55.86	63.43	74	-18.14	32.05	6.31	45.93	100	330	Peak
2483.5	47.12	54.69	54	-6.88	32.05	6.31	45.93	100	330	Average
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV/m)</b>	<b>READ LEVEL (dBuV)</b>	<b>LIMIT (dBuV/m)</b>	<b>MARGIN (dB)</b>	<b>ANTENNA FACTOR (dB /m)</b>	<b>CABLE LOSS (dB)</b>	<b>PREAMP FACTOR (dB)</b>	<b>ANTENNA HEIGHT (cm)</b>	<b>TABLE ANGLE (Degree)</b>	<b>REMARK</b>
2462	98.83	106.18	-	-	32.31	6.28	45.94	100	310	Peak
2462	91.44	98.79	-	-	32.31	6.28	45.94	100	310	Average
2483.5	53.59	60.85	74	-20.41	32.36	6.31	45.93	100	310	Peak
2483.5	45.67	52.93	54	-8.33	32.36	6.31	45.93	100	310	Average

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.



### 3.3 6 dB BANDWIDTH MEASUREMENT

#### 3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 22,22	Feb. 21,23
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 18,22	Feb. 17,23
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.15,22	May.14,23
Power Sensor	ANRITSU	MA2411B	1339352	May. 06,22	May. 05,23

#### NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

#### 3.3.3 TEST PROCEDURE

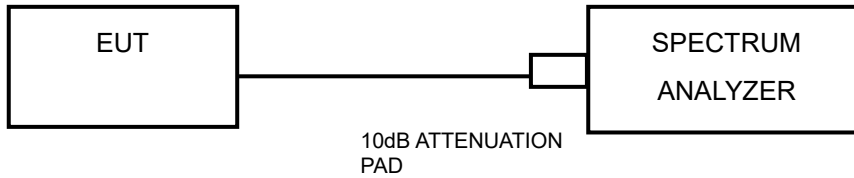
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



### 3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

### 3.3.5 TEST SETUP



### 3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



### 3.3.7 TEST RESULTS

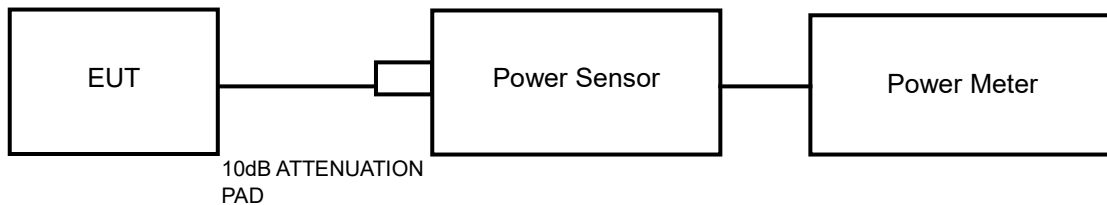
Please Refer to Appendix 1 of this test report.

## 3.4 CONDUCTED OUTPUT POWER

### 3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

### 3.4.2 TEST SETUP



### 3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

### 3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

### 3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



### 3.4.7 TEST RESULTS

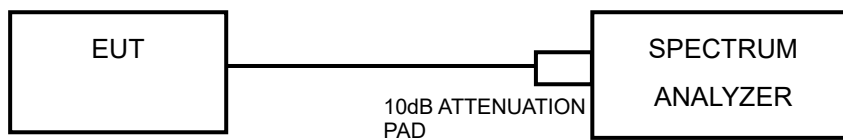
Please Refer to Appendix 1 of this test report.

## 3.5 POWER SPECTRAL DENSITY MEASUREMENT

### 3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

### 3.5.2 TEST SETUP



### 3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

### 3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW  $\geq$  3 x RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

### 3.5.5 DEVIATION FROM TEST STANDARD

No deviation.



### 3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 3.5.7 TEST RESULTS

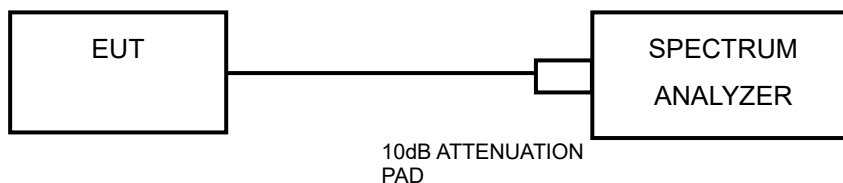
Please Refer to Appendix 1 of this test report.

## 3.6 OUT OF BAND EMISSION MEASUREMENT

### 3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 3.6.2 TEST SETUP



### 3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

### 3.6.4 TEST PROCEDURE

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



## MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

### 3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix 1 of this test report.





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## 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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## **5 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.



## 6 Appendix 1: DTS BANDWIDTH TEST RESULT

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.000	2407.000	2417.000	0.5	PASS
		2437	9.600	2432.440	2442.040	0.5	PASS
		2462	10.000	2457.000	2467.000	0.5	PASS
11G	Ant1	2412	16.360	2403.800	2420.160	0.5	PASS
		2437	16.360	2428.800	2445.160	0.5	PASS
		2462	16.360	2453.800	2470.160	0.5	PASS
11N20SISO	Ant1	2412	17.160	2403.360	2420.520	0.5	PASS
		2437	17.040	2428.440	2445.480	0.5	PASS
		2462	17.080	2453.480	2470.560	0.5	PASS



**TEST GRAPHS**



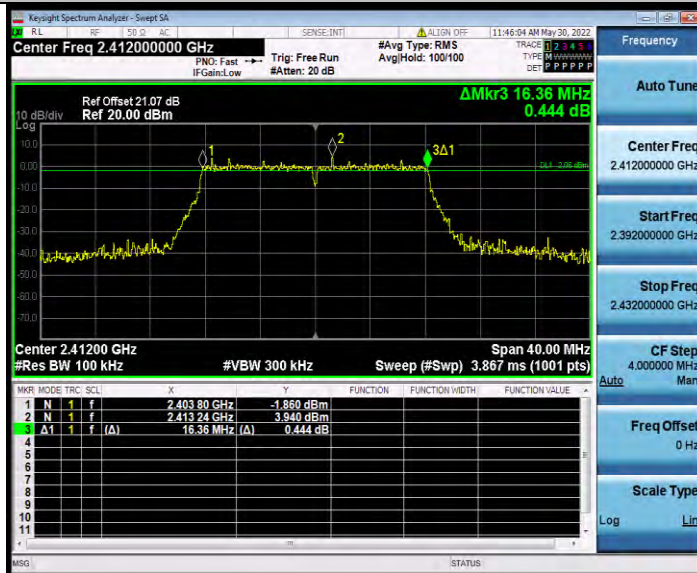


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11G\_Ant1\_2412

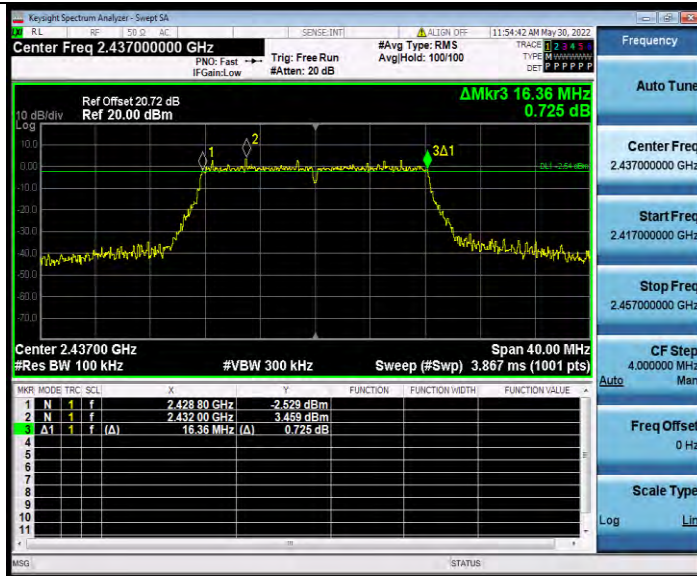


11G\_Ant1\_2437

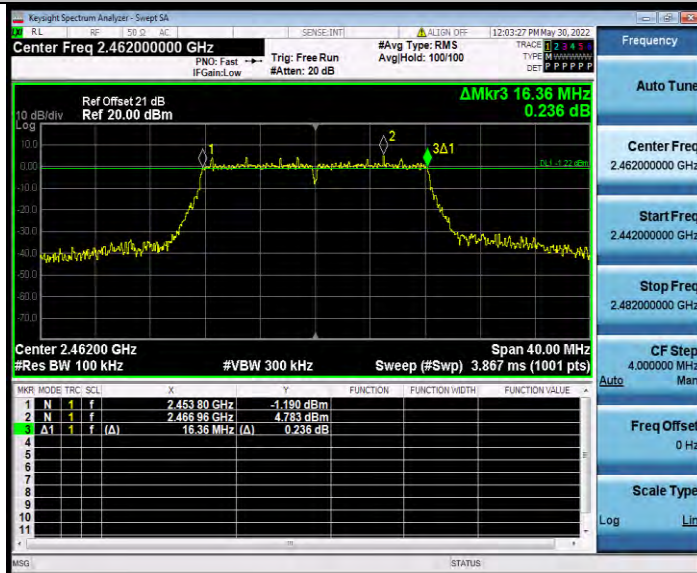


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11G\_Ant1\_2462



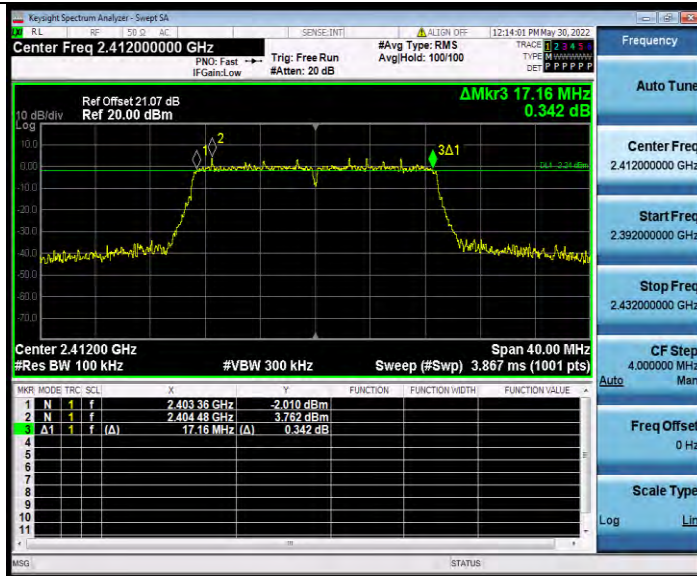
11N20SISO\_Ant1\_2412



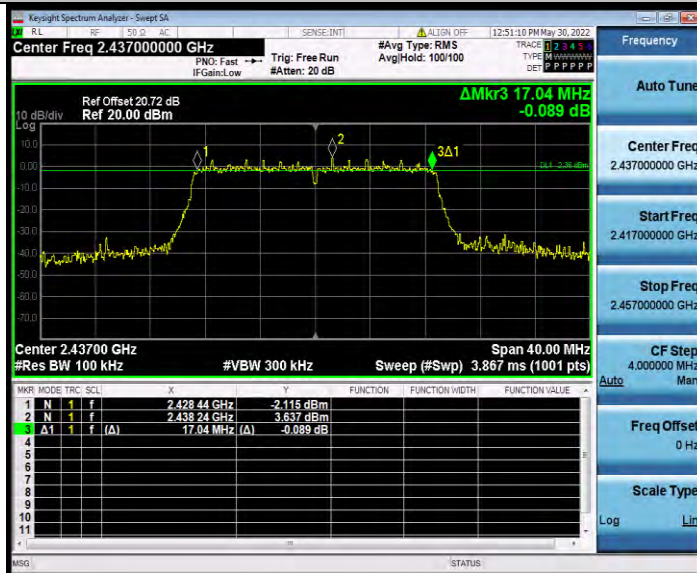


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11N20SISO\_Ant1\_2437

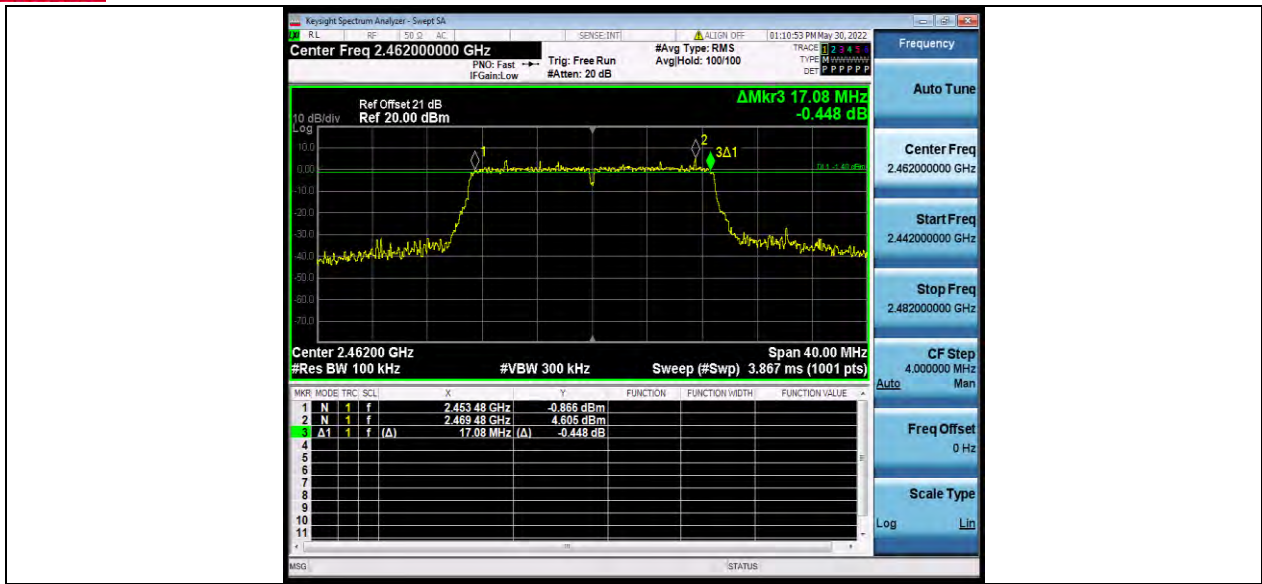


11N20SISO\_Ant1\_2462



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## OCCUPIED CHANNEL BANDWIDTH TEST RESULT

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.095	2405.446	2418.541	---	---
		2437	13.101	2430.445	2443.546	---	---
		2462	13.108	2455.472	2468.580	---	---
11G	Ant1	2412	16.613	2403.673	2420.286	---	---
		2437	16.583	2428.720	2445.303	---	---
		2462	16.575	2453.679	2470.254	---	---
11N20SISO	Ant1	2412	17.619	2403.207	2420.826	---	---
		2437	17.595	2428.196	2445.791	---	---
		2462	17.629	2453.201	2470.830	---	---



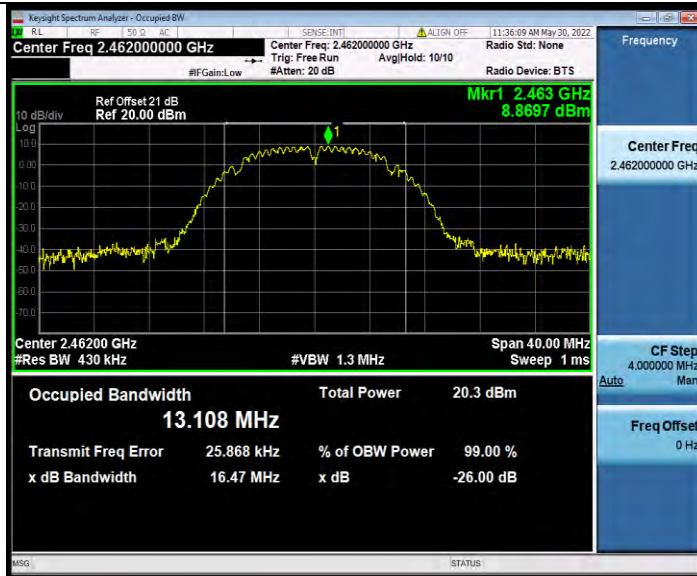
### TEST GRAPHS



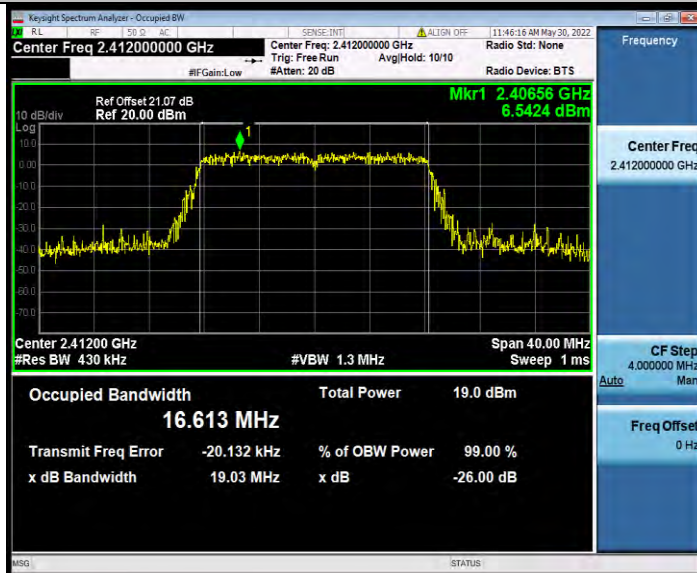


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11G\_Ant1\_2412

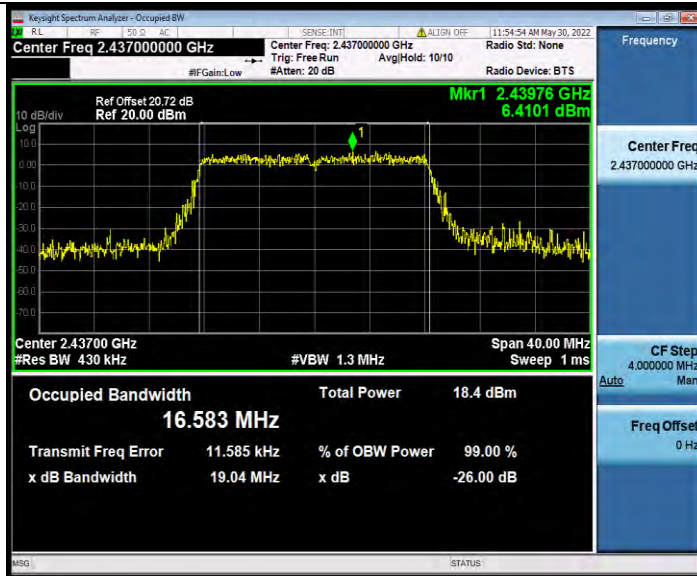


11G\_Ant1\_2437

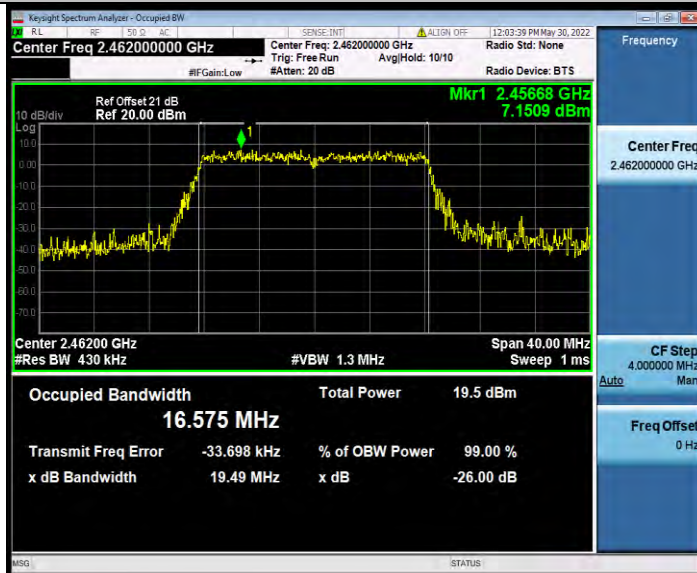


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11G\_Ant1\_2462

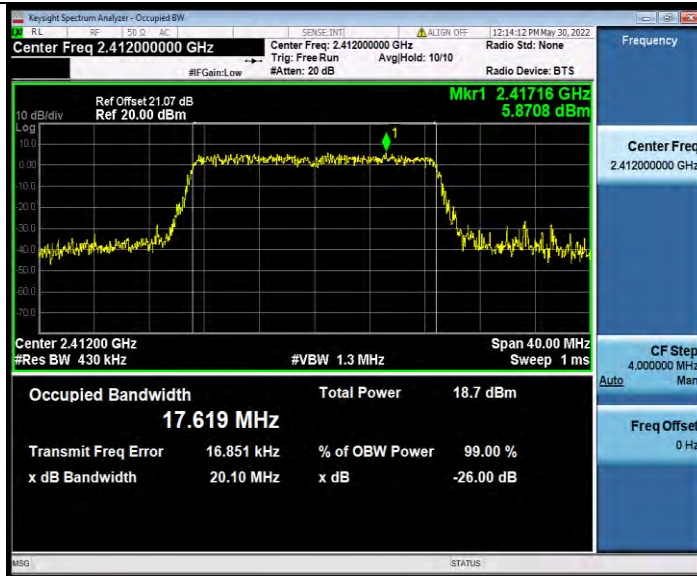


11N20SISO\_Ant1\_2412

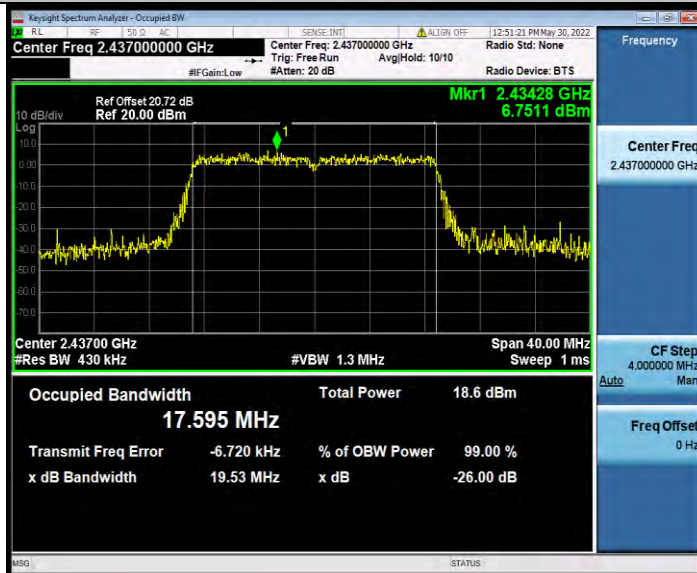


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11N20SISO\_Ant1\_2437



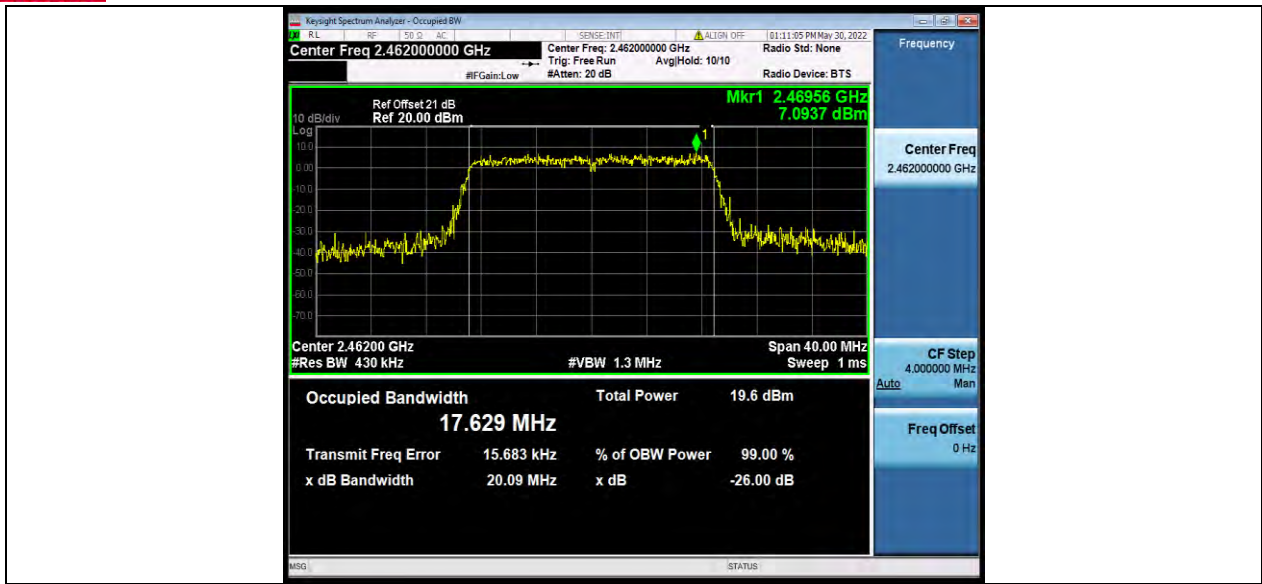
11N20SISO\_Ant1\_2462





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### MAXIMUM CONDUCTED OUTPUT POWER

#### TEST RESULT PEAK

Test Mode	Freq. (MHz)	Peak Power [dBm]	Peak Power [mw]	Conducted Limit [dBm]	EIRP [dBm]	EIRP [mw]	EIRP Limit [dBm]	Verdict	Power Setting
11B	2412	20.21	104.95	≤30.00	22.71	186.64	≤36.00	PASS	Default
	2437	20.79	119.95	≤30.00	23.29	213.30	≤36.00	PASS	Default
	2462	21.52	141.91	≤30.00	24.02	252.35	≤36.00	PASS	Default
11G	2412	25.07	321.37	≤30.00	27.57	571.48	≤36.00	PASS	Default
	2437	25.25	334.97	≤30.00	27.75	595.66	≤36.00	PASS	Default
	2462	25.62	364.75	≤30.00	28.12	648.63	≤36.00	PASS	Default
11N20 SISO	2412	25.15	327.34	≤30.00	27.65	582.10	≤36.00	PASS	Default
	2437	25.32	340.41	≤30.00	27.82	605.34	≤36.00	PASS	Default
	2462	25.64	<b>366.44</b>	≤30.00	28.14	<b>651.63</b>	≤36.00	PASS	Default

#### TEST RESULT AVERAGE

Test Mode	Freq. (MHz)	Average power [dBm]	Verdict	Power Setting
11B	2412	17.44	PASS	Default
	2437	18.02	PASS	Default
	2462	18.73	PASS	Default
11G	2412	16.00	PASS	Default
	2437	16.11	PASS	Default
	2462	16.82	PASS	Default
11N20SISO	2412	15.95	PASS	Default
	2437	16.07	PASS	Default
	2462	16.75	PASS	Default



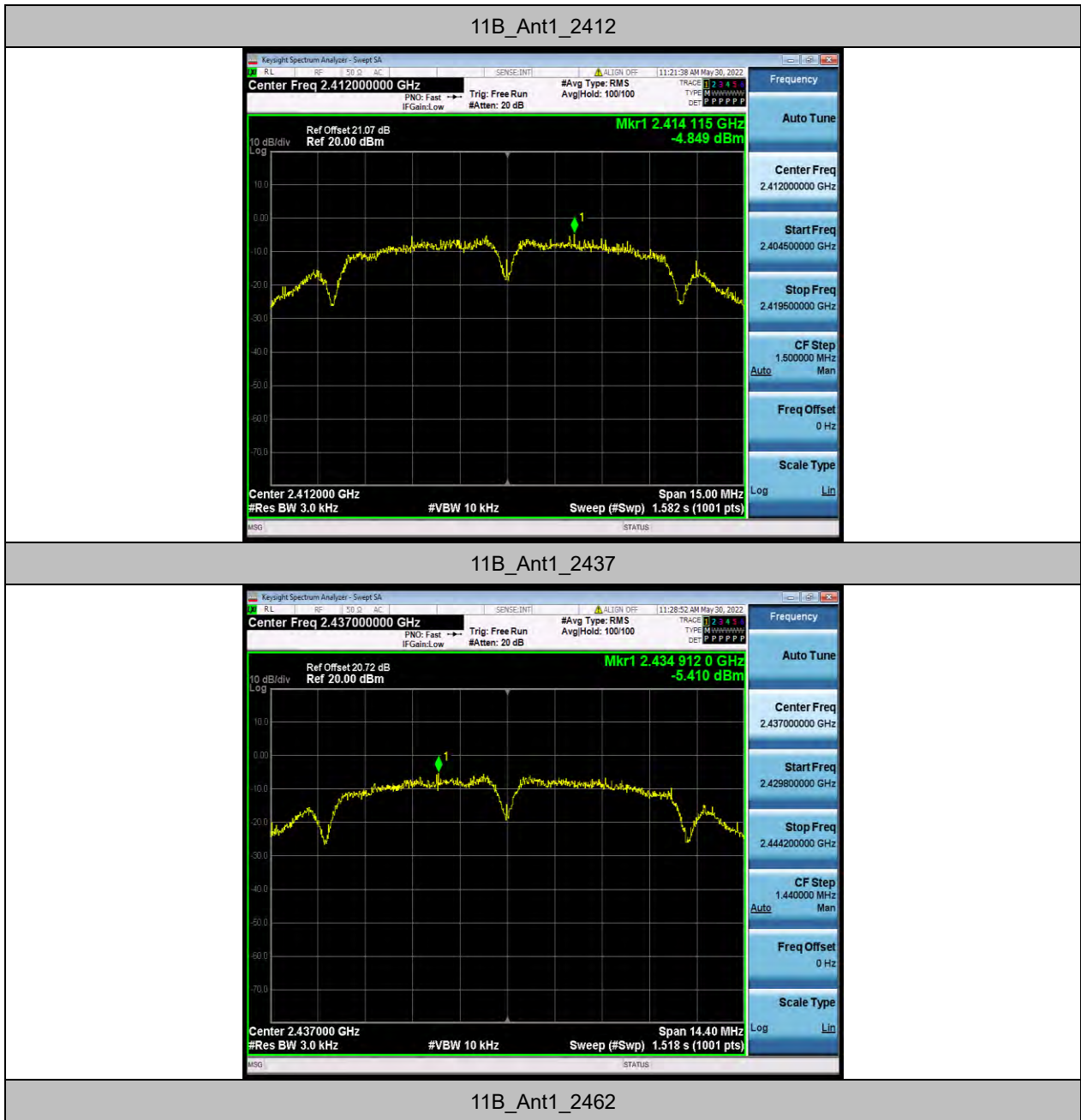
## MAXIMUM POWER SPECTRAL DENSITY TEST RESULT

TestMode	Antenna	Freq(MHz)	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-4.85	≤8.00	PASS
		2437	-5.41	≤8.00	PASS
		2462	-2.71	≤8.00	PASS
11G	Ant1	2412	-8.66	≤8.00	PASS
		2437	-9.34	≤8.00	PASS
		2462	-7.73	≤8.00	PASS
11N20SISO	Ant1	2412	-9.06	≤8.00	PASS
		2437	-9.63	≤8.00	PASS
		2462	-8.21	≤8.00	PASS





### TEST GRAPHS



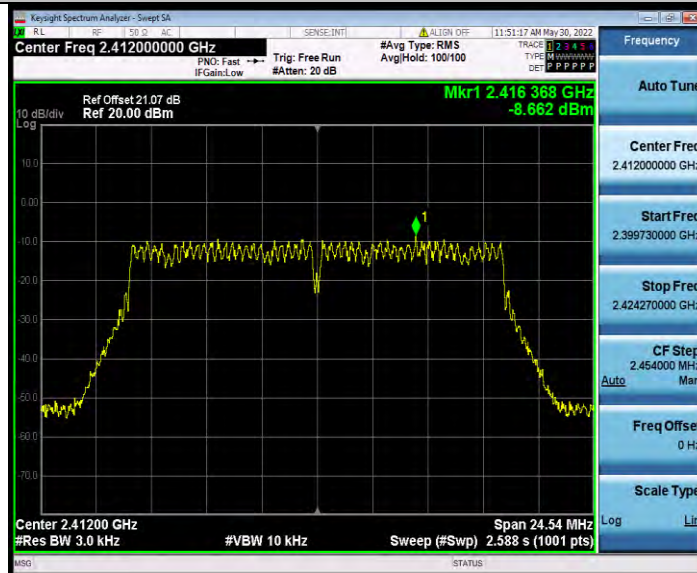


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11G\_Ant1\_2412

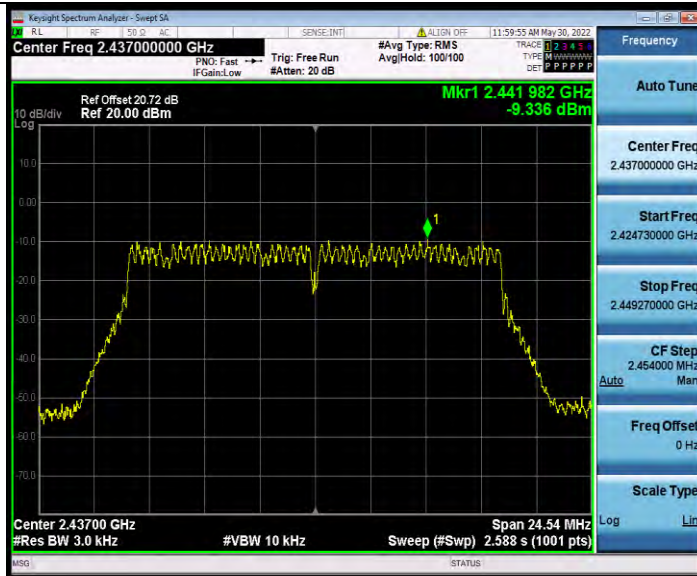


11G\_Ant1\_2437



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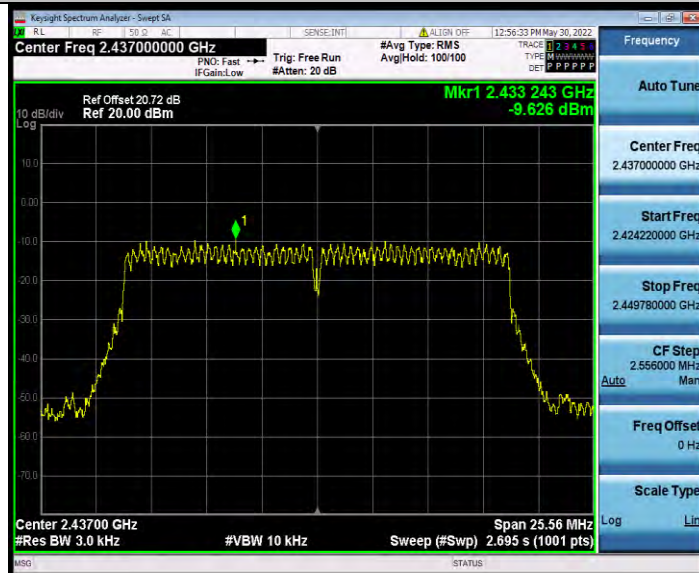
11G\_Ant1\_2462



11N20SISO\_Ant1\_2412



11N20SISO\_Ant1\_2437

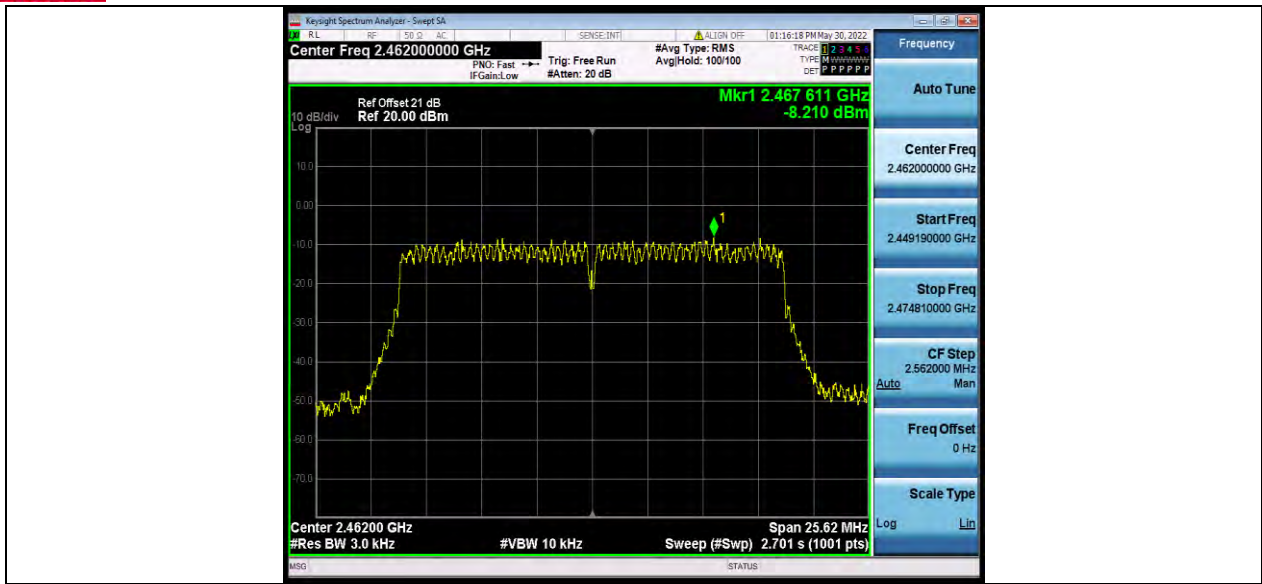


11N20SISO\_Ant1\_2462



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## REFERENCE LEVEL MEASUREMENT

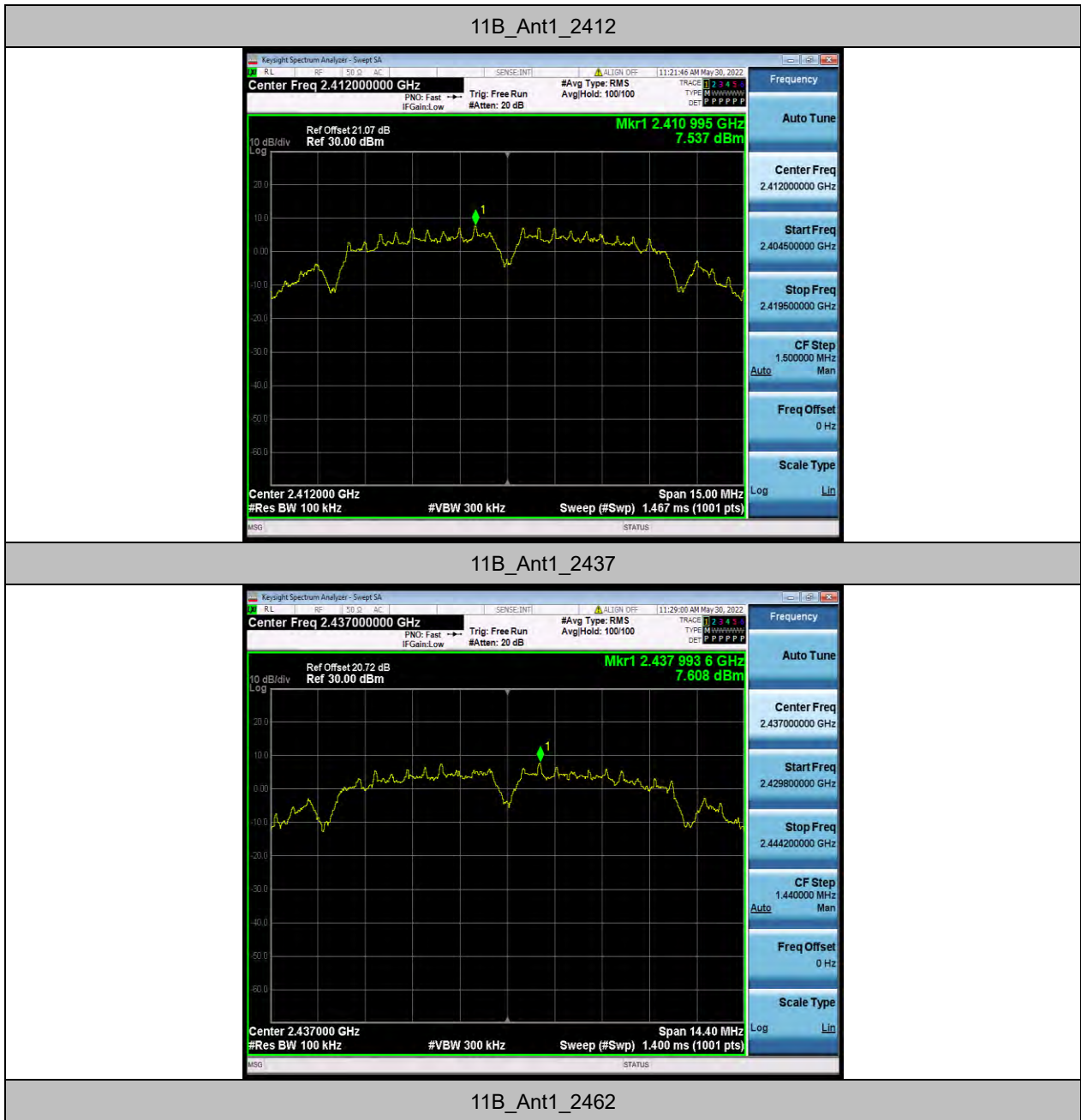
### TEST RESULT

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
11B	Ant1	2412	2411.00	7.54
		2437	2437.99	7.61
		2462	2459.99	8.20
11G	Ant1	2412	2406.99	3.87
		2437	2431.99	3.35
		2462	2467.01	4.67
11N20SISO	Ant1	2412	2407.01	3.83
		2437	2429.51	3.32
		2462	2463.28	4.82





### TEST GRAPHS





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11G\_Ant1\_2412



11G\_Ant1\_2437

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11G\_Ant1\_2462



11N20SISO\_Ant1\_2412

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11N20SISO\_Ant1\_2437

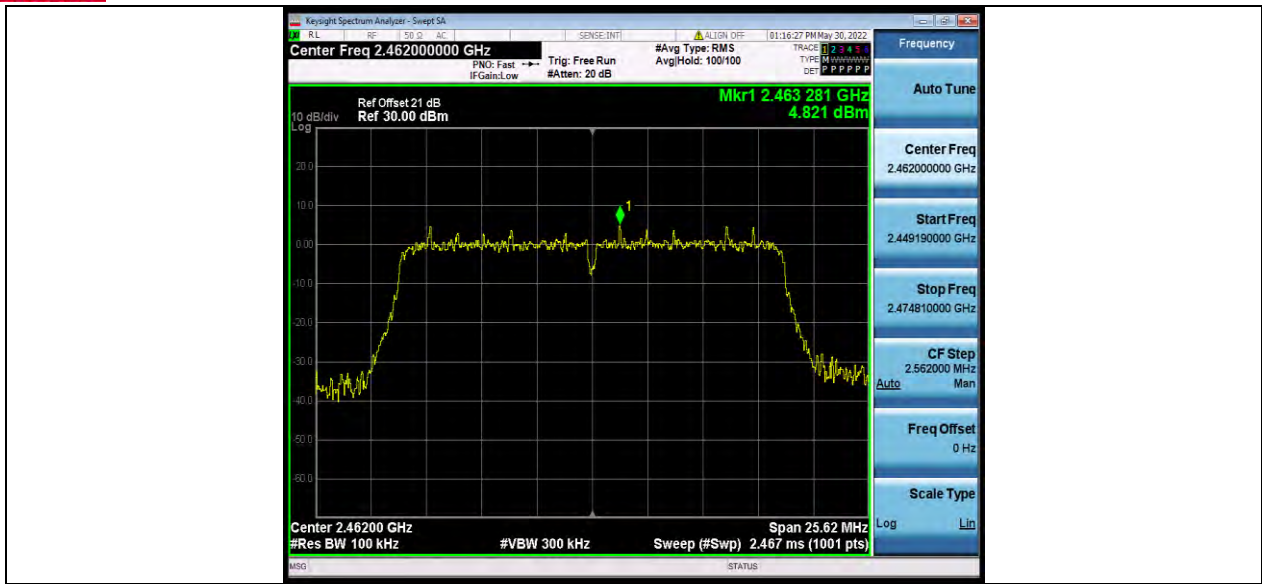


11N20SISO\_Ant1\_2462



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## **BAND EDGE MEASUREMENTS**

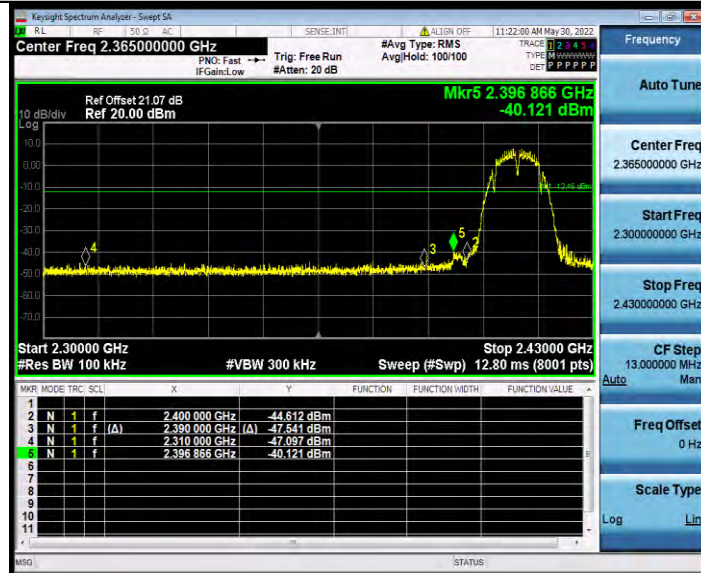
### **TEST RESULT**

TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	7.54	-40.12	≤-12.46	PASS
		High	2462	8.20	-42.87	≤-11.8	PASS
11G	Ant1	Low	2412	3.87	-36.1	≤-16.13	PASS
		High	2462	4.67	-39.34	≤-15.33	PASS
11N20SISO	Ant1	Low	2412	3.83	-35.34	≤-16.17	PASS
		High	2462	4.82	-39.31	≤-15.18	PASS

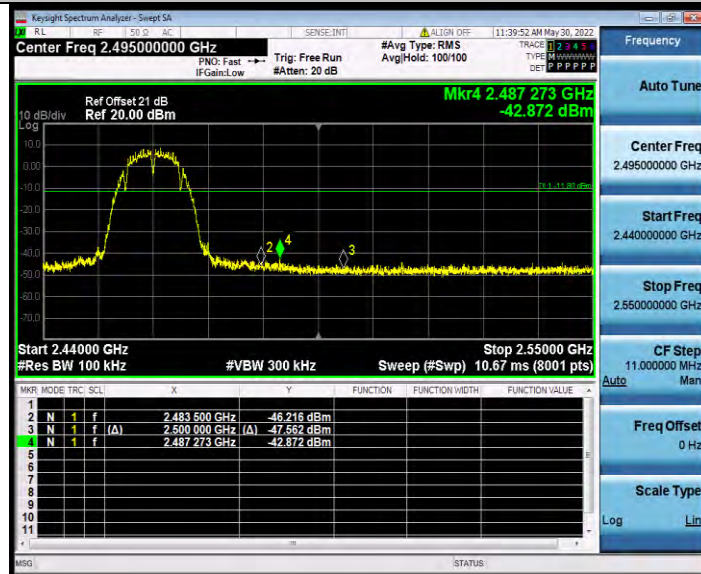


### TEST GRAPHS

11B\_Ant1\_Low\_2412



11B\_Ant1\_High\_2462



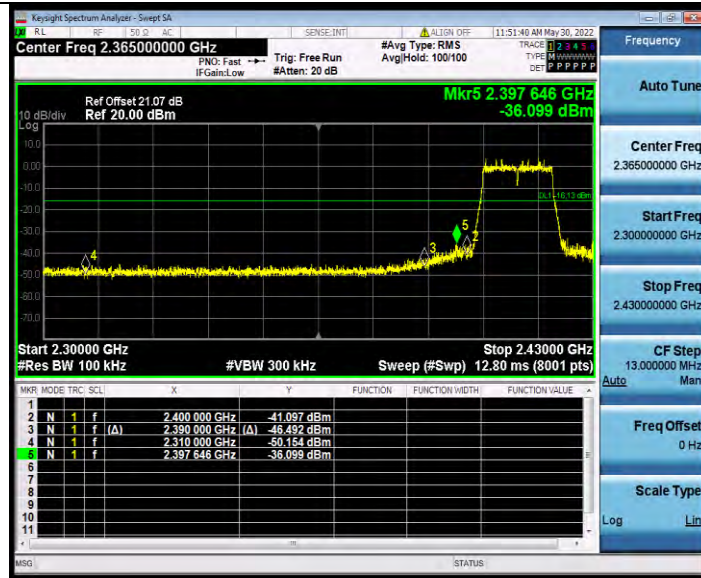
11G\_Ant1\_Low\_2412



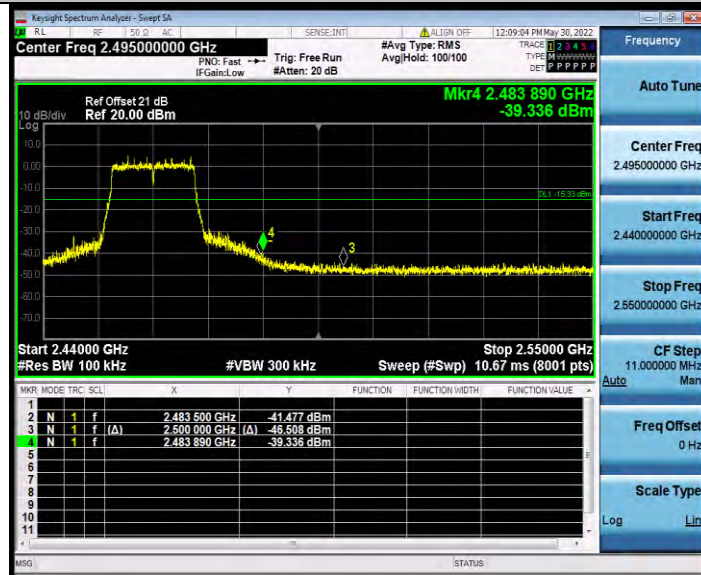


BUREAU VERITAS

Test Report No.: W7L-220518W001RF01



11G\_Ant1\_High\_2462



11N20SISO\_Ant1\_Low\_2412

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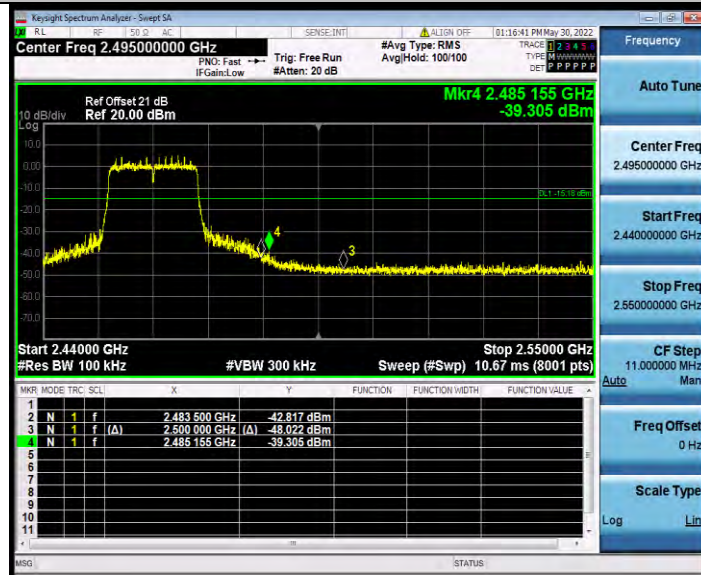


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**Test Report No.: W7L-220518W001RF01**



11N20SISO\_Ant1\_High\_2462



BV 7Layers Communications Technology  
(Shenzhen) Co., Ltd

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### CONDUCTED SPURIOUS EMISSION

### TEST RESULT

TestMode	Antenna	Freq(MHz)	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	30~1000	7.54	-43.1	≤-12.46	PASS
			1000~26500	7.54	-27.54	≤-12.46	PASS
		2437	30~1000	7.61	-44.37	≤-12.39	PASS
			1000~26500	7.61	-27.33	≤-12.39	PASS
		2462	30~1000	8.20	-44.39	≤-11.8	PASS
			1000~26500	8.20	-25.04	≤-11.8	PASS
11G	Ant1	2412	30~1000	3.87	-43.79	≤-16.13	PASS
			1000~26500	3.87	-27.7	≤-16.13	PASS
		2437	30~1000	3.35	-44.49	≤-16.65	PASS
			1000~26500	3.35	-28.22	≤-16.65	PASS
		2462	30~1000	4.67	-44.11	≤-15.33	PASS
			1000~26500	4.67	-28.14	≤-15.33	PASS
11N20SISO	Ant1	2412	30~1000	3.83	-43.68	≤-16.17	PASS
			1000~26500	3.83	-28.25	≤-16.17	PASS
		2437	30~1000	3.32	-44.02	≤-16.68	PASS
			1000~26500	3.32	-27.82	≤-16.68	PASS
		2462	30~1000	4.82	-43.97	≤-15.18	PASS
			1000~26500	4.82	-28.06	≤-15.18	PASS





### TEST GRAPHS

11B\_Ant1\_2412\_30~1000



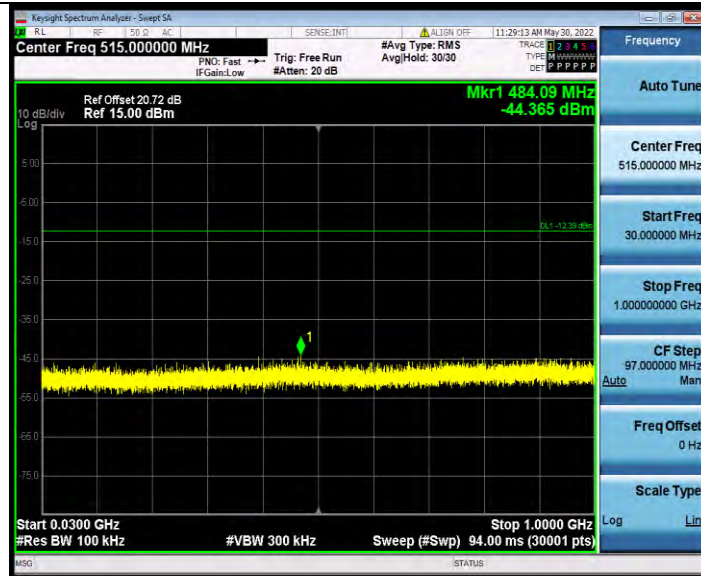
11B\_Ant1\_2412\_1000~26500



11B\_Ant1\_2437\_30~1000



**BUREAU VERITAS** Test Report No.: W7L-220518W001RF01



11B\_Ant1\_2437\_1000~26500

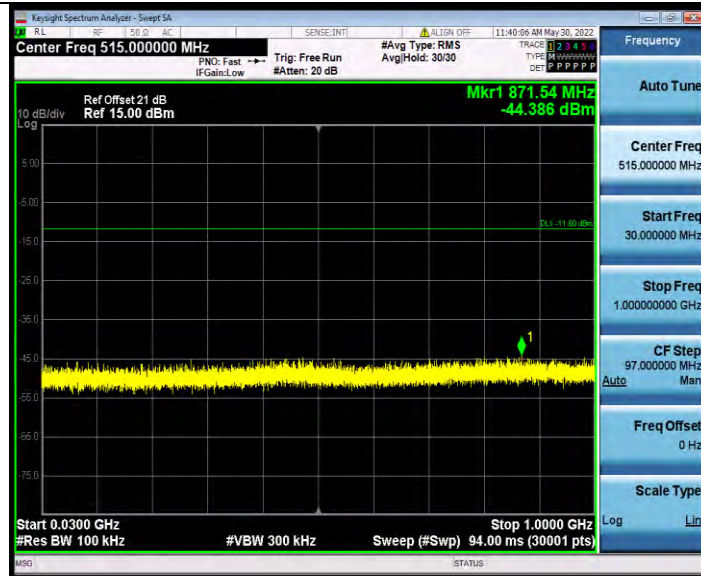


11B\_Ant1\_2462\_30~1000



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**Test Report No.: W7L-220518W001RF01**



11B\_Ant1\_2462\_1000~26500



11G\_Ant1\_2412\_30~1000

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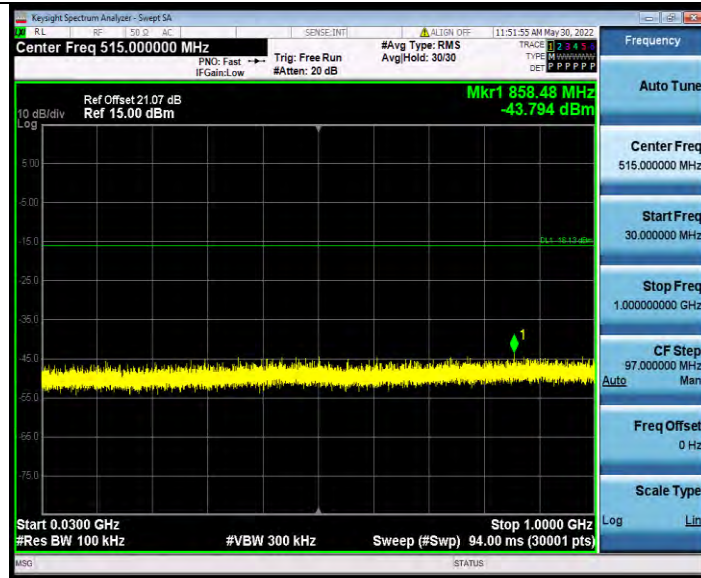
No.B102, Dazu Chuangxin Mansion, North of Beihuan  
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11G\_Ant1\_2412\_1000~26500



11G\_Ant1\_2437\_30~1000

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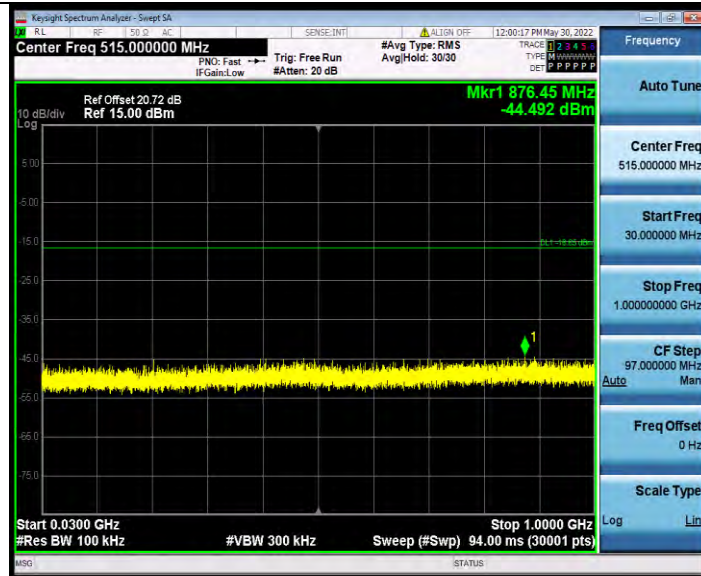
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11G\_Ant1\_2437\_1000~26500



11G\_Ant1\_2462\_30~1000

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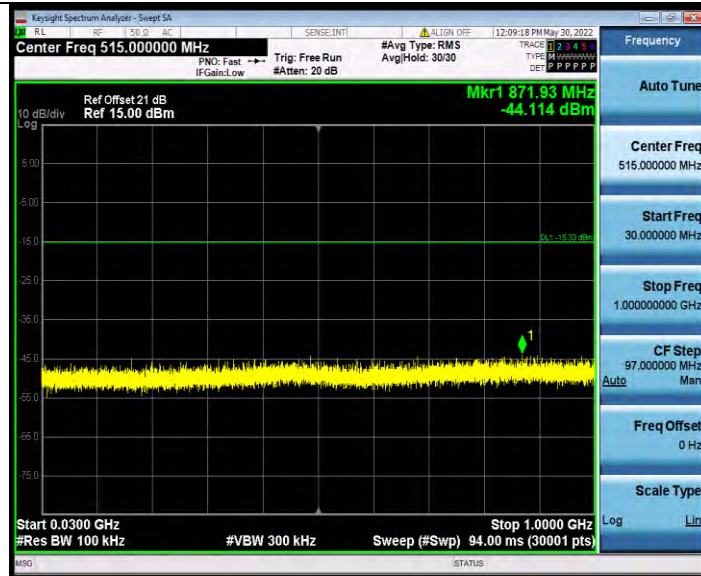
No.B102, Dazu Chuangxin Mansion, North of Beihuan  
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11G\_Ant1\_2462\_1000~26500



11N20SISO\_Ant1\_2412\_30~1000

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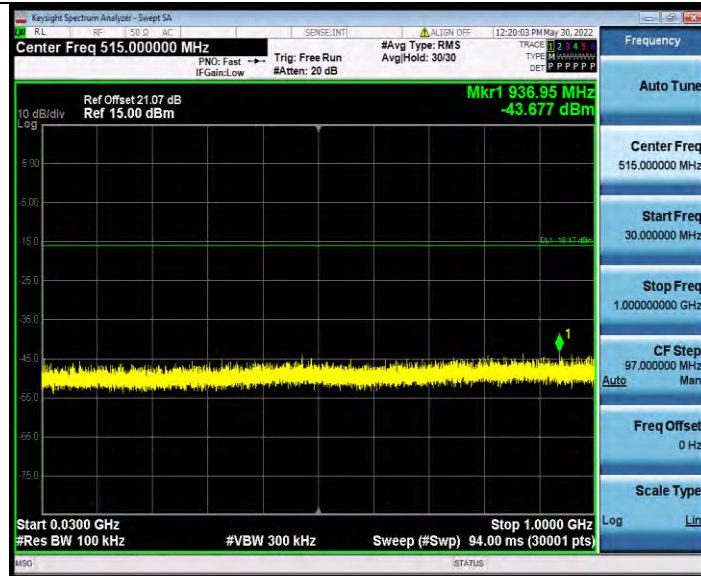
No.B102, Dazu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China

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11N20SISO\_Ant1\_2412\_1000~26500



11N20SISO\_Ant1\_2437\_30~1000

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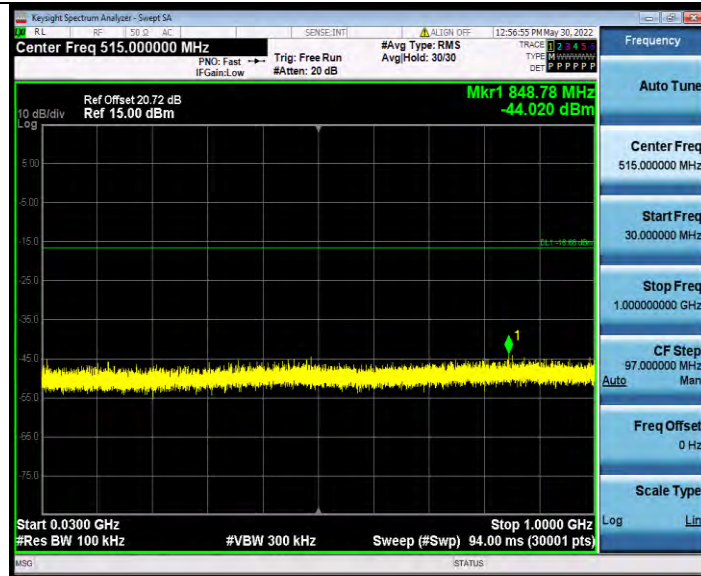
No.B102, Dazu Chuangxin Mansion, North of Beihuan  
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11N20SISO\_Ant1\_2437\_1000~26500



11N20SISO\_Ant1\_2462\_30~1000

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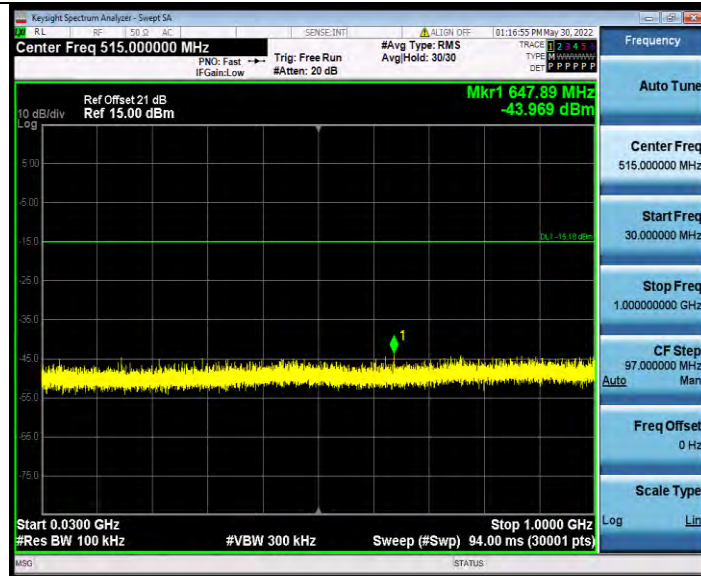
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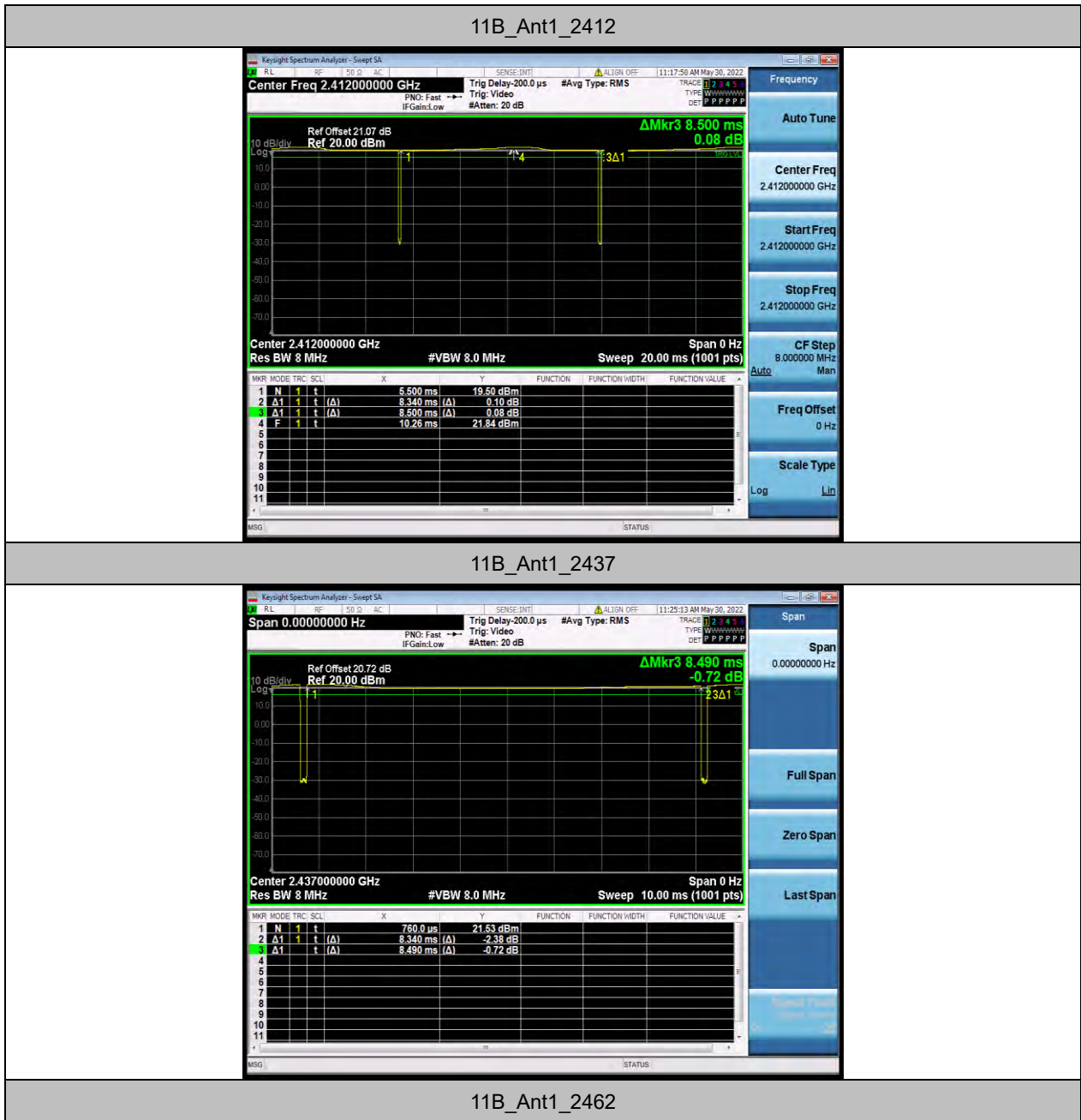


## DUTY CYCLE TEST RESULT

TestMode	Antenna	Freq(MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Verdict
11B	Ant1	2412	8.34	8.50	98.12	---
		2437	8.34	8.49	98.23	---
		2462	8.34	8.49	98.23	---
11G	Ant1	2412	1.38	1.42	97.18	---
		2437	1.37	1.41	97.16	---
		2462	1.37	1.41	97.16	---
11N20SISO	Ant1	2412	1.29	1.33	96.99	---
		2437	1.29	1.33	96.99	---
		2462	1.28	1.32	96.97	---



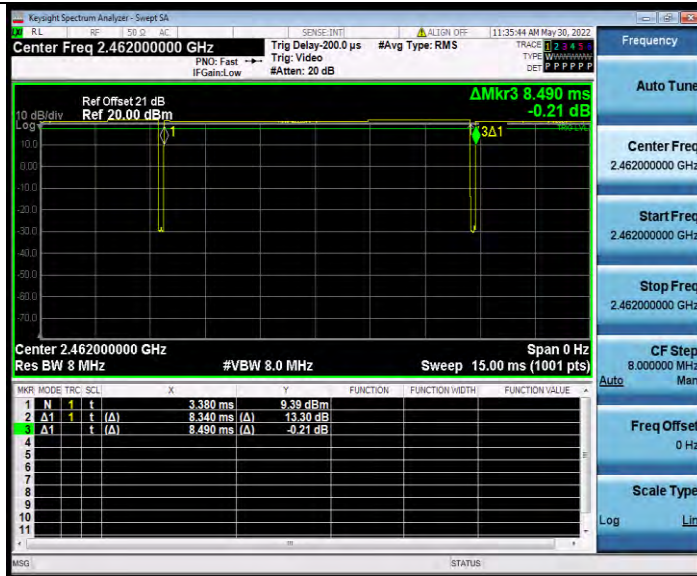
### TEST GRAPHS



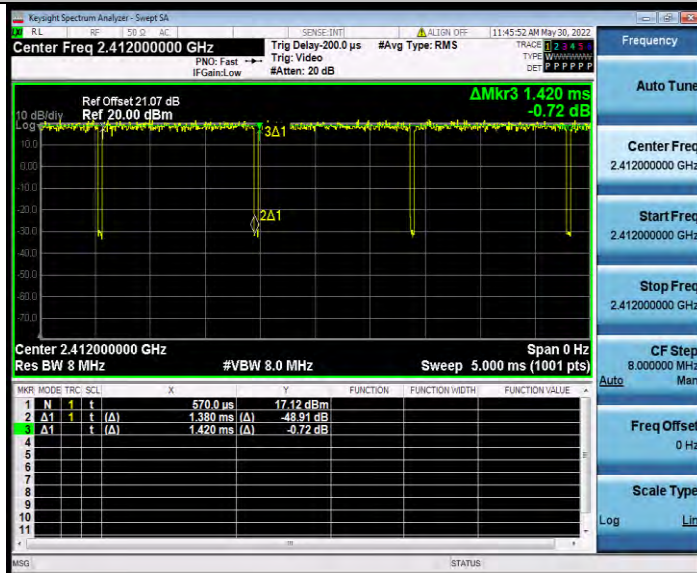


BUREAU VERITAS

Test Report No.: W7L-220518W001RF01



11G\_Ant1\_2412

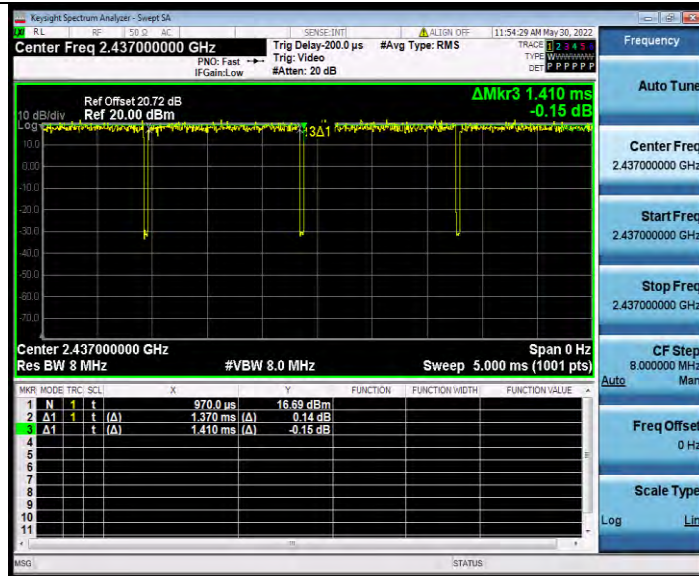


11G\_Ant1\_2437

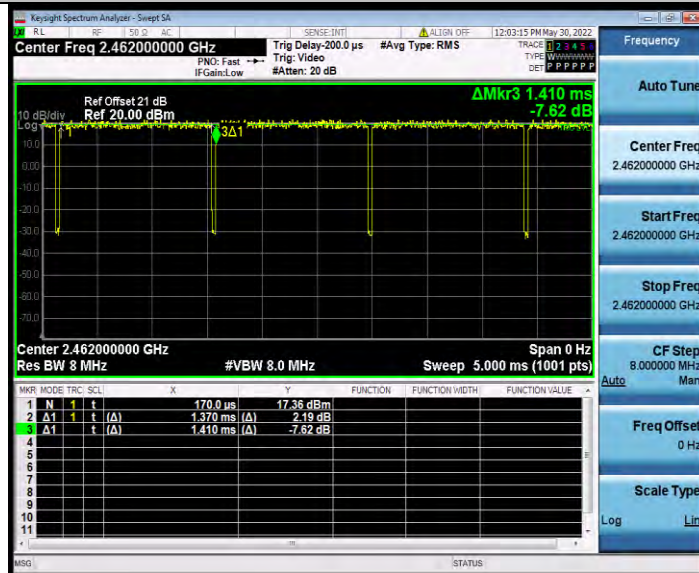


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VERITAS**

Test Report No.: W7L-220518W001RF01



11G\_Ant1\_2462



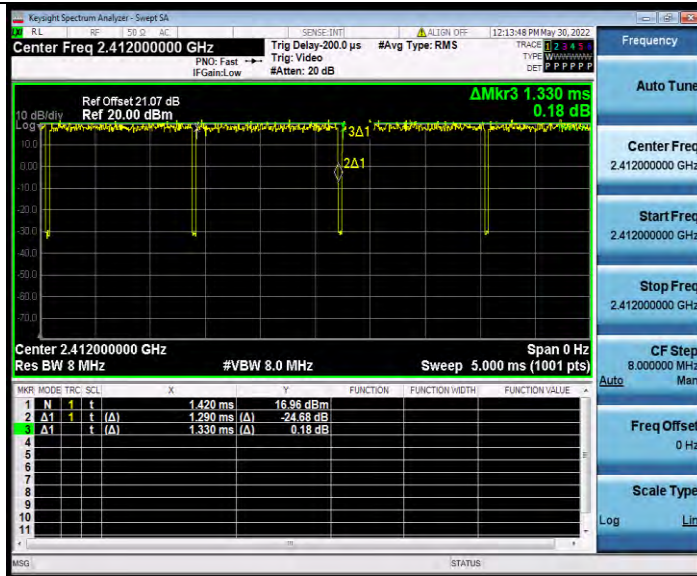
11N20SISO\_Ant1\_2412



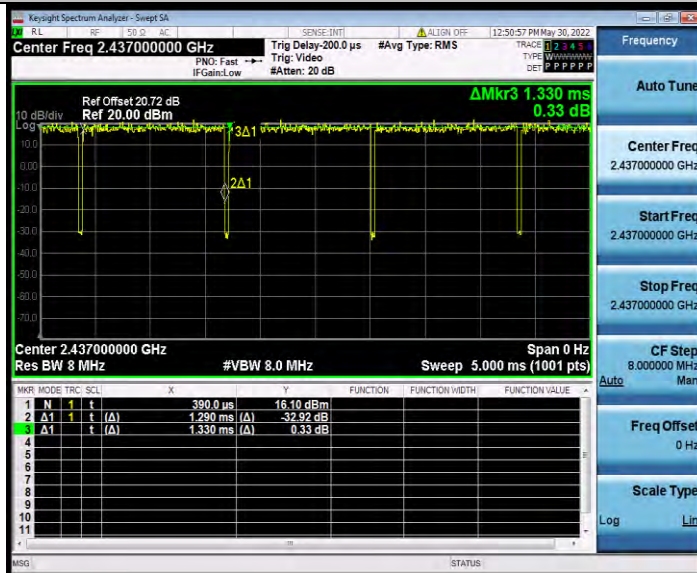


BUREAU VERITAS

Test Report No.: W7L-220518W001RF01



11N20SISO\_Ant1\_2437

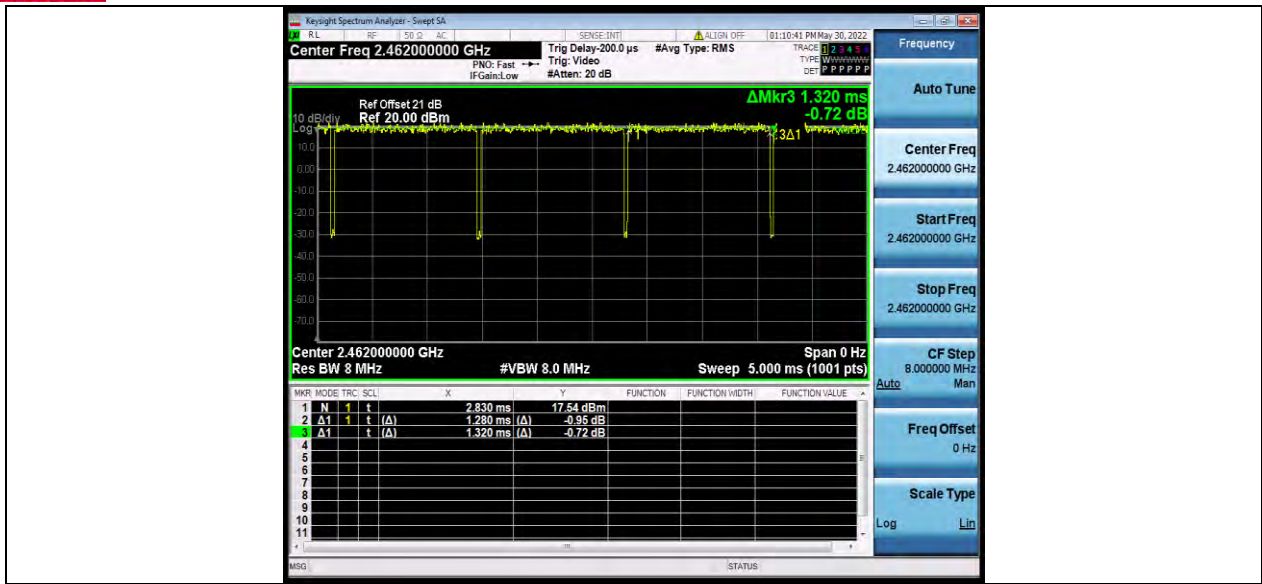


11N20SISO\_Ant1\_2462



BUREAU VERITAS

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