

FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	HMD Global Oy
Address:	Bertel Jungin aukio 9,02600 Espoo,Finland

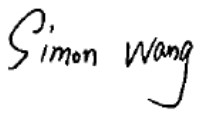
Manufacturer or Supplier:	HMD Global Oy
Address:	Bertel Jungin aukio 9,02600 Espoo,Finland
Product:	Smart Phone
Brand Name:	NOKIA
Model Name:	TA-1508
FCC ID:	2AJOTTA-1508
Date of tests:	Sep. 26, 2022 ~ Nov. 18, 2022

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: Nov. 18, 2022	 Date: Nov. 18, 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.

TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1 SUMMARY OF TEST RESULTS.....	5
1.1 MEASUREMENT UNCERTAINTY	6
2 GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	9
2.2.1 CONFIGURATION OF SYSTEM UNDER TEST	10
2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	10
2.3 DUTY CYCLE OF TEST SIGNAL	14
2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	15
2.5 DESCRIPTION OF SUPPORT UNITS	15
3 TEST TYPES AND RESULTS.....	16
3.1 CONDUCTED EMISSION MEASUREMENT	16
3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	16
3.1.2 TEST INSTRUMENTS.....	16
3.1.3 TEST PROCEDURES	17
3.1.4 DEVIATION FROM TEST STANDARD	17
3.1.5 TEST SETUP	18
3.1.6 EUT OPERATING CONDITIONS	18
3.1.7 TEST RESULTS	19
3.2 RADIATED EMISSION MEASUREMENT	21
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	21
3.2.2 TEST INSTRUMENTS.....	22
3.2.3 TEST PROCEDURES	23
3.2.4 DEVIATION FROM TEST STANDARD	23
3.2.5 TEST SETUP	24
3.2.6 EUT OPERATING CONDITIONS	25
3.2.7 TEST RESULTS	26
3.3 6 DB BANDWIDTH MEASUREMENT	70
3.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT	70
3.3.2 TEST INSTRUMENTS.....	70
3.3.3 TEST PROCEDURE.....	70
3.3.4 DEVIATION FROM TEST STANDARD	71



3.3.5	TEST SETUP	71
3.3.6	EUT OPERATING CONDITIONS	71
3.3.7	TEST RESULTS	72
3.4	CONDUCTED OUTPUT POWER.....	73
3.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	73
3.4.2	TEST SETUP	73
3.4.3	TEST INSTRUMENTS	73
3.4.4	TEST PROCEDURES	73
3.4.5	DEVIATION FROM TEST STANDARD	73
3.4.6	EUT OPERATING CONDITIONS	73
3.4.7	TEST RESULTS	74
3.4.7.1	MAXIMUM PEAK OUTPUT POWER	74
3.4.7.2	AVERAGE OUTPUT POWER (FOR REFERENCE).....	75
3.5	POWER SPECTRAL DENSITY MEASUREMENT	76
3.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	76
3.5.2	TEST SETUP	76
3.5.3	TEST INSTRUMENTS	76
3.5.4	TEST PROCEDURE.....	76
3.5.5	DEVIATION FROM TEST STANDARD	76
3.5.6	EUT OPERATING CONDITION	76
3.5.7	TEST RESULTS	77
3.6	OUT OF BAND EMISSION MEASUREMENT	78
3.6.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT	78
3.6.2	TEST SETUP	78
3.6.3	TEST INSTRUMENTS	78
3.6.4	TEST PROCEDURE.....	78
3.6.5	DEVIATION FROM TEST STANDARD	79
3.6.6	EUT OPERATING CONDITION	79
3.6.7	TEST RESULTS	79
4	PHOTOGRAPHS OF THE TEST CONFIGURATION	80
5	MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB81	
6	APPENDIX 1 WLAN 2.4G.....	82
7	APPENDIX 2 BLE	132



Test Report No.: W7L-P22090023RF02

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P22090023RF02	Original release	Nov. 18, 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

Note : 1.Except RSE , other data please refer to Appendix 1 (for WIFI-2.4G) and Appendix 2 (for BLE)
2. Only the worse data were report



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 (9KHz-30MHz)	±2.16 dB
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	±43.58KHz
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

PRODUCT	Smart Phone
BRAND NAME	NOKIA
MODEL NAME	TA-1508
NOMINAL VOLTAGE	5.0Vdc(adapter or host equipment) 3.8Vdc (Li-ion, battery)
MODULATION	DSSS, OFDM, GFSK
TRANSMISSION RATE	802.11b: 11/ 5.5/ 2.0 / 1.0 Mbps 802.11g: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps 802.11n20: up to 72.2 Mbps BT_LE: 1 Mbps
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20) 2402-2480MHz for BT-LE(GFSK)
MAX. OUTPUT POWER	WLAN: 104.47mW (Maximum) BT-LE: 1.32mW (Maximum)
ANTENNA TYPE	PIFA Antenna with 2.51dBi gain
HW VERSION	V01
SW VERSION	00WW_0_010
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB cable: non-shielded cable, with w/o ferrite core, 1 meter Earphone: non-shielded cable, with w/o ferrite core, 1.2 meter



**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. 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
BT_LE(1MHz)	1TX /1RX

3. 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	MANUFACTURER	MODEL	SPECIFICATION
Battery	NOKIA	Shenzhen Aerospace Electronic Co., Ltd	BL-29CI	Capacity: 3.8Vdc, 3000mAh
AC Adapter	NOKIA	Dongguan Aohai Technology Co., Ltd.	A18A-050100U-U S2	I/P: 100-240Vac, 0.2A, O/P: 5.0Vdc, 1.0A
AC Adapter	NOKIA	Shenzhen Baijunda Electronic Co.,Ltd	AD-005U	I/P: 100-240Vac, 0.2A, O/P: 5.0Vdc, 1.0A
Earphone	N/A	Hui Zhou JuWei Electronic Co., Ltd	JWEP1199-M01H	Signal Line, 1.2meter
USB Cable	N/A	Hui Zhou JuWei Electronic Co., Ltd	JWUB1480-M01H	Signal Line, 1.0meter



2.2 DESCRIPTION OF TEST MODES

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
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		

40 channels are provided for BT-LE (GFSK):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480



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	6	OFDM	MCS0
BT-LE	0 to 39	19	GFSK	1.0



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
BT-LE	0 to 39	0,19, 39	GFSK	1

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	6	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, 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
BT-LE	0 to 39	0,19, 39	GFSK	1

**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
BT-LE	0 to 39	0,19, 39	GFSK	1

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	23deg. C, 70%RH	DC 5V By Adapter	Carl Xie
RE≥1G	23deg. C, 70%RH	DC 5V By Adapter	Carl Xie
PLC	25deg. C, 52%RH	DC 5V By Adapter	Lily Zhao
APCM	25deg. C, 60%RH	DC 3.8V By Battery	Lily Zhao



2.3 Duty Cycle of Test Signal

Please Refer to Appendix1/2 Of this test report.

WORST-CASE DATA:

Measured Duty Cycle		
Mode		Duty Cycle [%]
		ANT0
WIFI 2.4GHz	11B	100.00
	11G	97.40
	11N20	96.10
BT LE	BT4.0	86.90

Note:

Duty cycle of test signal is < 98%, duty factor shall be considered.



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 (dB μ V)	
	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.

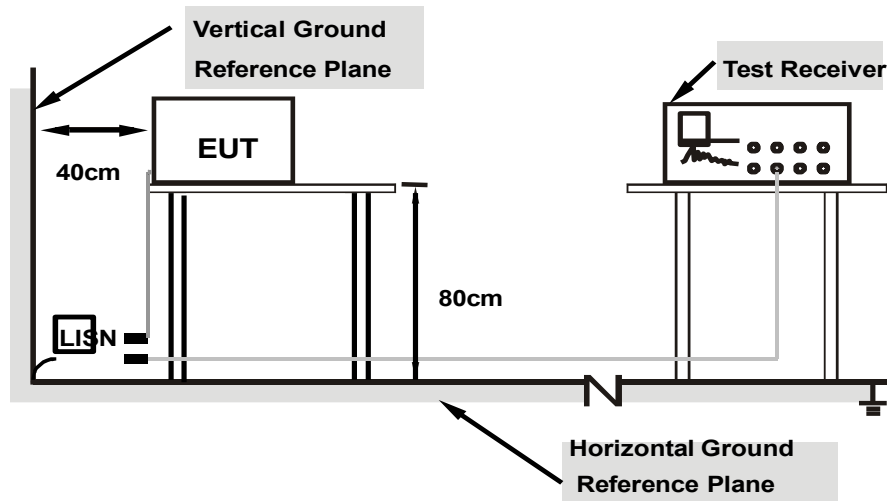
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

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:

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 51%RH
Tested By	Carl Xie		

Rd	Frequency [MHz]	QPK Level [dBuV]	QPK Limit [dBuV]	QPK Margin [dB]	CAV Level [dBuV]	CAV: AVG Limit [dBuV]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]
1.	0.204.	46.80.	63.45.	16.65.	36.98.	53.45.	16.47.	9.87.	L1.	9.000.
1.	0.474.	44.55.	56.44.	11.89.	39.67.	46.44.	6.77.	10.06.	L1.	9.000.
1.	0.596.	41.71.	56.00.	14.29.	33.03.	46.00.	12.97.	10.03.	L1.	9.000.
1.	1.073.	41.40.	56.00.	14.60.	31.11.	46.00.	14.89.	9.85.	L1.	9.000.
1.	5.433.	36.89.	60.00.	23.11.	28.83.	50.00.	21.17.	9.83.	L1.	9.000.
1.	13.722.	29.54.	60.00.	30.46.	22.63.	50.00.	27.37.	10.04.	L1.	9.000.

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

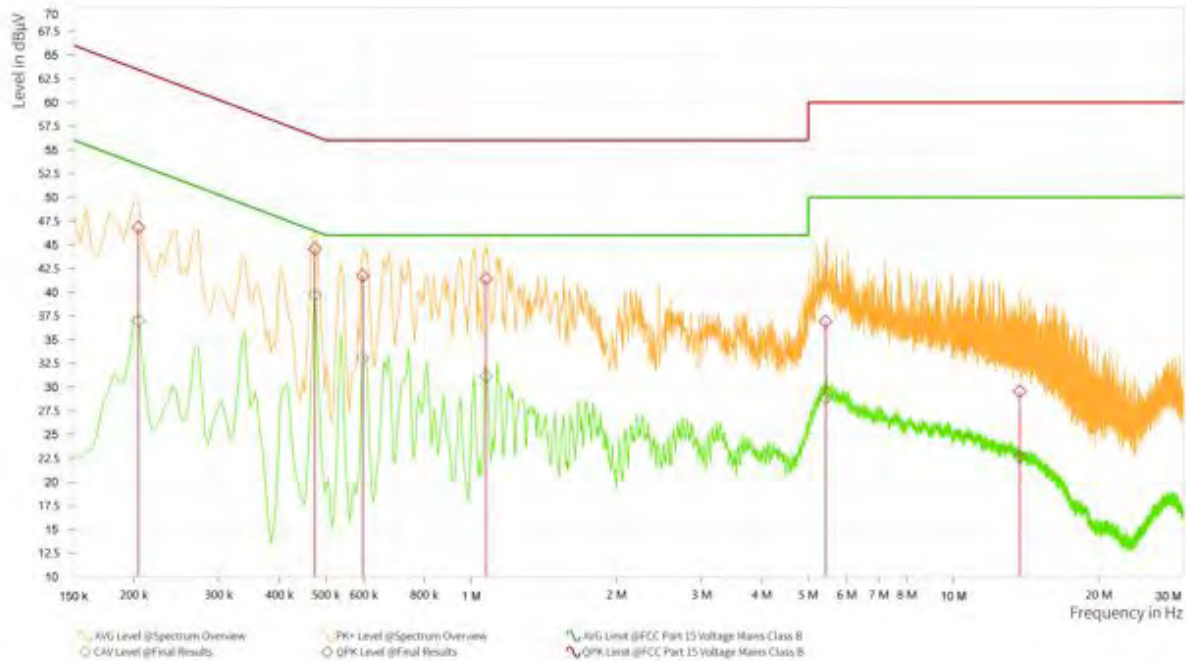
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

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.





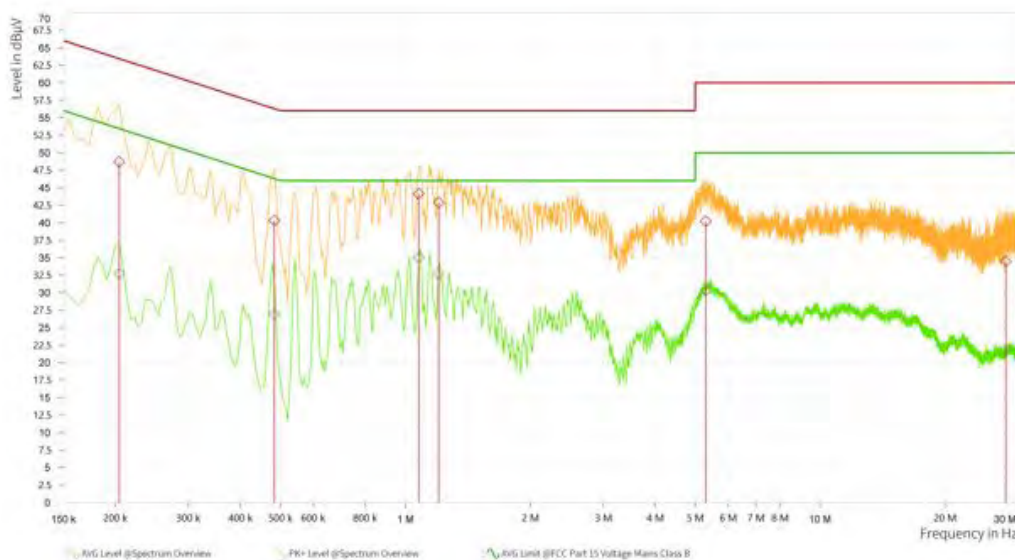
**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 51%RH
Tested By	Carl Xie		

	Frequency [MHz]	QPK Level [dBuV]	QPK Limit [dBuV]	QPK Margin [dB]	CAV Level [dBuV]	CAV: AVG Limit [dBuV]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]
1.	0.204	48.68	63.45	14.77	32.71	53.45	20.74	9.88	N.	9.000
1.	0.483	40.32	56.29	15.97	26.88	46.29	19.41	10.06	N.	9.000
1.	1.077	44.14	56.00	11.86	35.08	46.00	10.92	9.86	N.	9.000
1.	1.203	42.90	56.00	13.10	32.78	46.00	13.22	9.83	N.	9.000
1.	5.303	40.19	60.00	19.81	30.33	50.00	19.67	9.83	N.	9.000
1.	28.068	34.48	60.00	25.52	21.82	50.00	28.18	10.31	N.	9.000

- 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.





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. 27, 22	Aug. 26, 23
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. 02,22	Jun. 01,23
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 21,22	Feb. 20,23
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
DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 24,22	Aug. 23,23
Power Meter	Anritsu	ML2495A	1506002	Feb. 22,22	Feb. 21,23
Power Sensor	Anritsu	MA2411B	1339352	May. 14,22	May. 13,23
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep. 04,22	Sep. 03,23

- 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

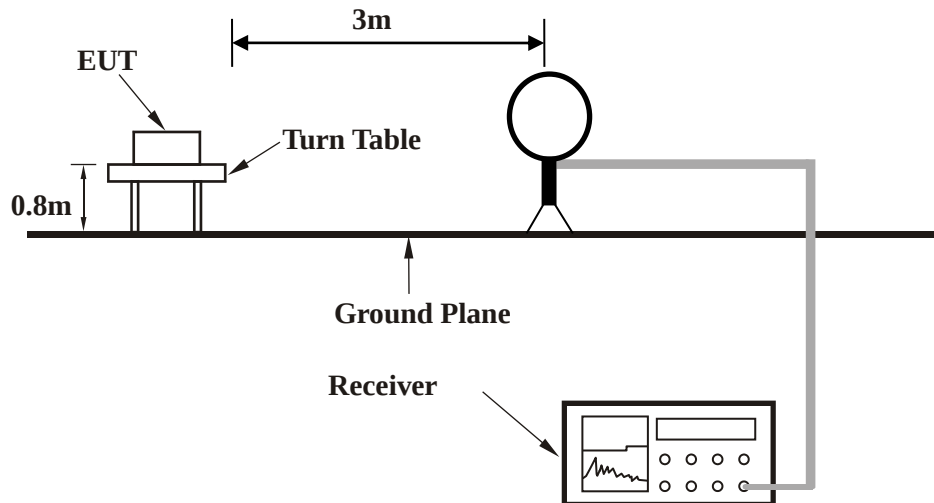


BUREAU
VERITAS

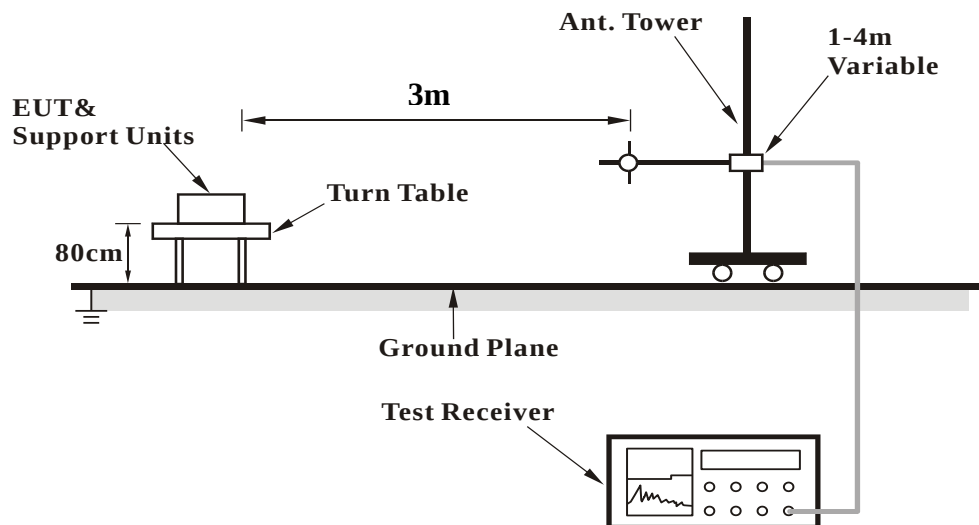
Test Report No.: W7L-P22090023RF02

3.2.5 TEST SETUP

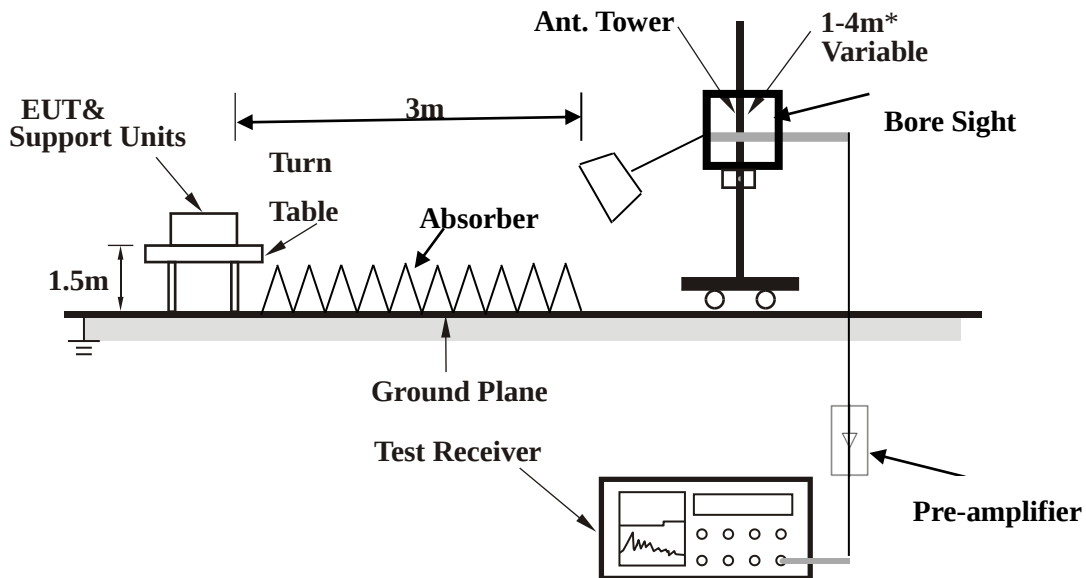
<Frequency Range 9KHz~30MHz >



< 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

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



**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

3.2.7 TEST RESULTS

NOTE : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

BELOW 1GHz WORST-CASE DATA:

30 MHz – 1GHz data:

802.11n (20MHz):

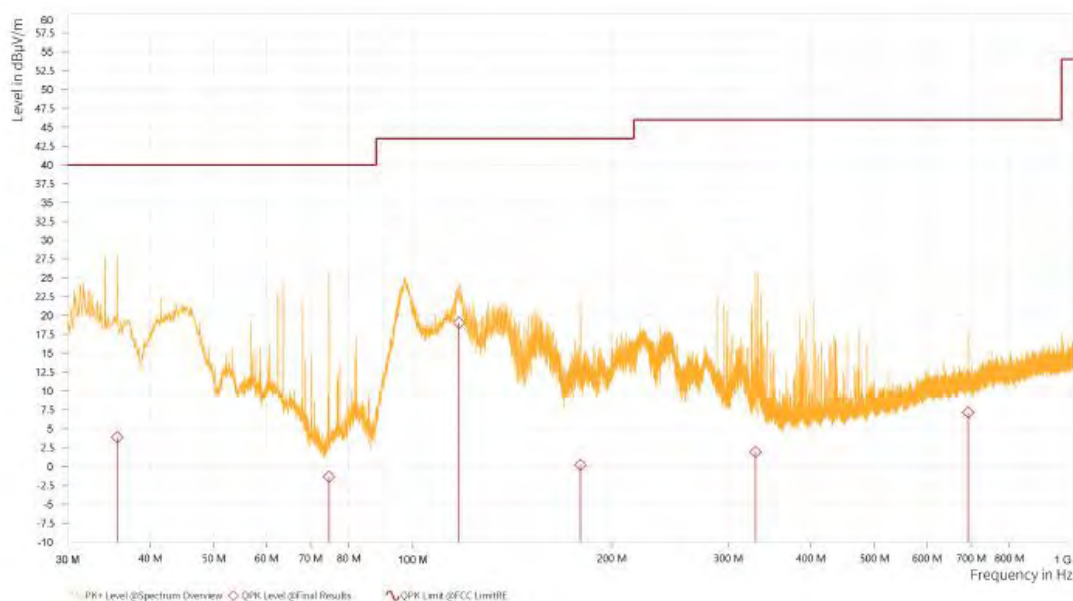
CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	35.675	3.87	40.00	36.13	-19.97	H	231.4	2	120.000
1	74.669	-1.36	40.00	41.36	-25.20	H	129.7	1	120.000
1	117.494	19.00	43.50	24.50	-22.92	H	97.5	2	120.000
1	179.477	0.19	43.50	43.31	-25.75	H	355.5	2	120.000
1	330.264	1.91	46.00	44.09	-21.06	H	5	1	120.000
1	693.432	7.15	46.00	38.85	-15.22	H	231.4	2	120.000

REMARKS:

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





**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

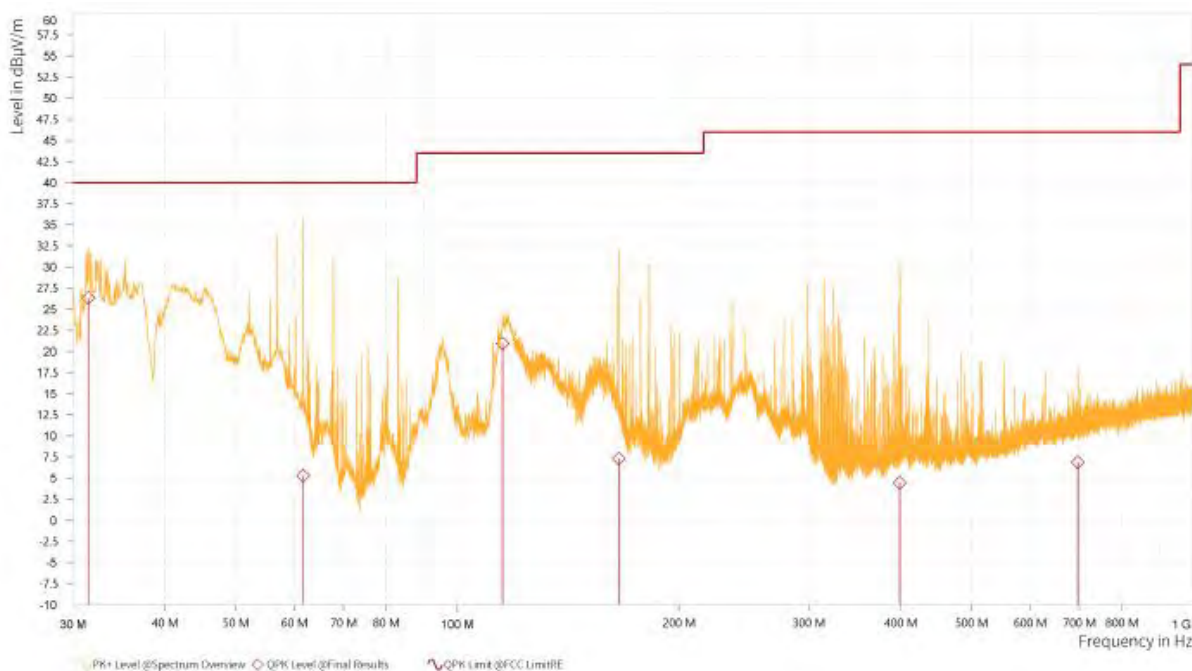
CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	31.504	26.35	40.00	13.65	-19.39	V	359.1	1	120.000
1	61.719	5.26	40.00	34.74	-19.68	V	259.9	1	120.000
1	115.215	20.92	43.50	22.58	-22.54	V	3.8	1	120.000
1	165.655	7.29	43.50	36.21	-25.76	V	126	1	120.000
1	399.134	4.44	46.00	41.56	-20.27	V	3.8	1	120.000
1	696.778	6.85	46.00	39.15	-15.47	V	231.5	2	120.000

REMARKS:

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





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

ABOVE 1GHz WORST-CASE DATA:

Note: 1. For radiated emissions testing , the full testing range of different modes have been scanned , only the worst case harmonic data is reported in the sheet.

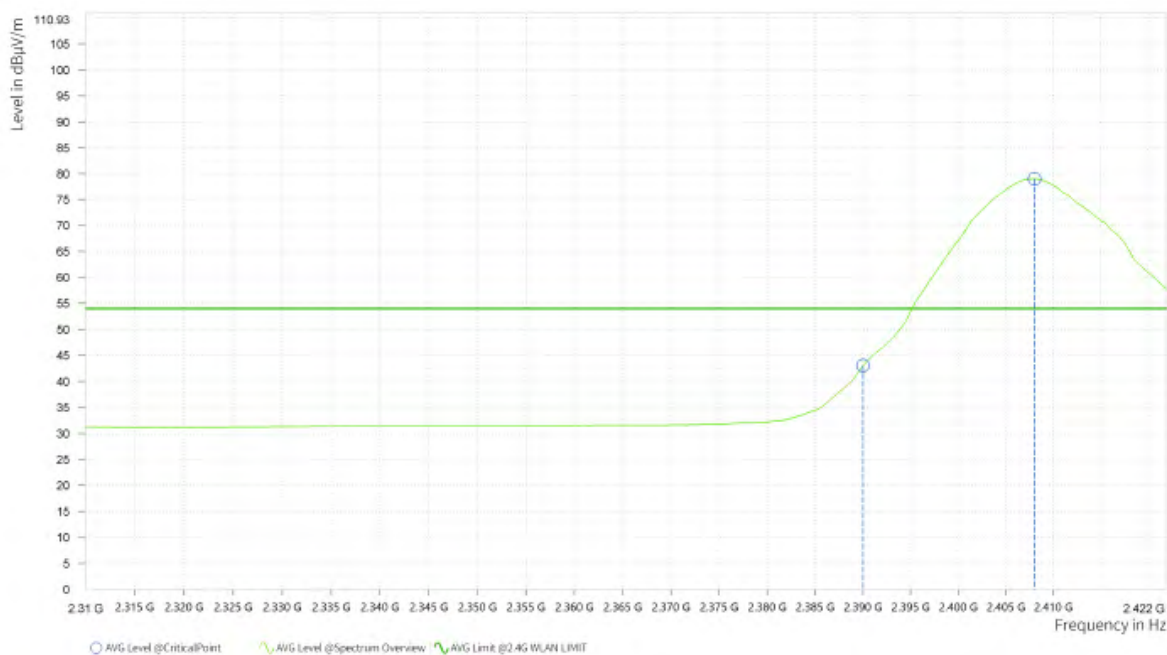
2. All other emissions that more than 20dB below the limit were not recorded

802.11b:

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	43.05	54.00	10.95	9.84	H	165.7	1
1	2,408.000	79.05			9.86	H	165.7	1





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	41.83	74.00	32.17	9.84	H	50.2	3
1	2,410.500	95.42			9.86	H	171.1	1





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	42.02	74.00	31.98	9.84	V	121	3
1	2,410.500	94.67			9.86	V	85.9	3

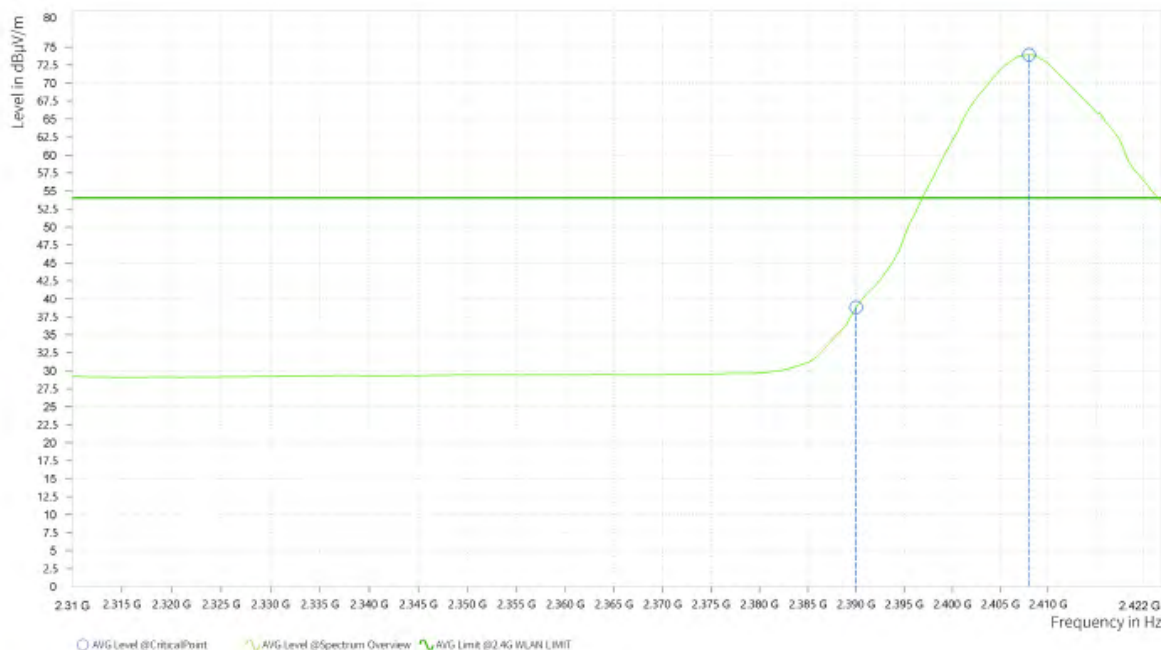




BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	38.82	54.00	15.18	9.84	V	184.6	2
1	2,408.000	73.91			9.86	V	184.6	2



REMARKS:

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



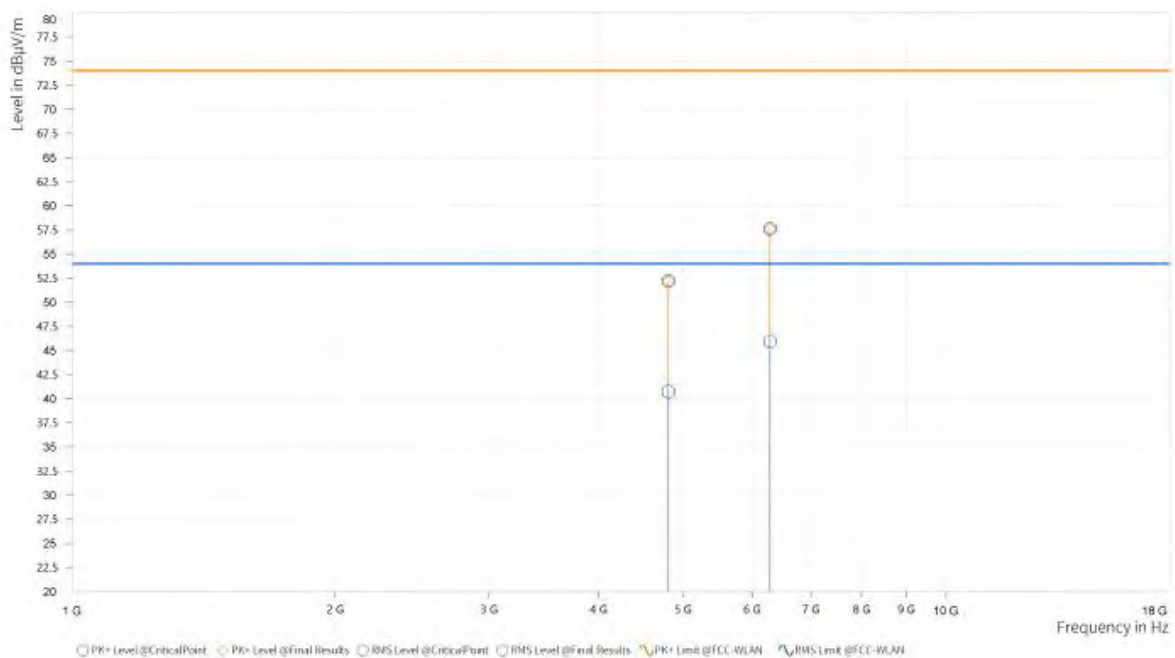
BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	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

Rg	Frequency [MHz]	RMS Level [dBuV/m]	RMS Limit [dBuV/m]	RMS Margin [dB]	PK+ Level [dBuV/m]	PK+ Limit [dBuV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,811.603	40.73	54.00	13.27	52.17	74.00	21.83	15.70	H	187.9	2
3	6,289.324	45.94	54.00	8.06	57.59	74.00	16.41	21.07	H	359	2



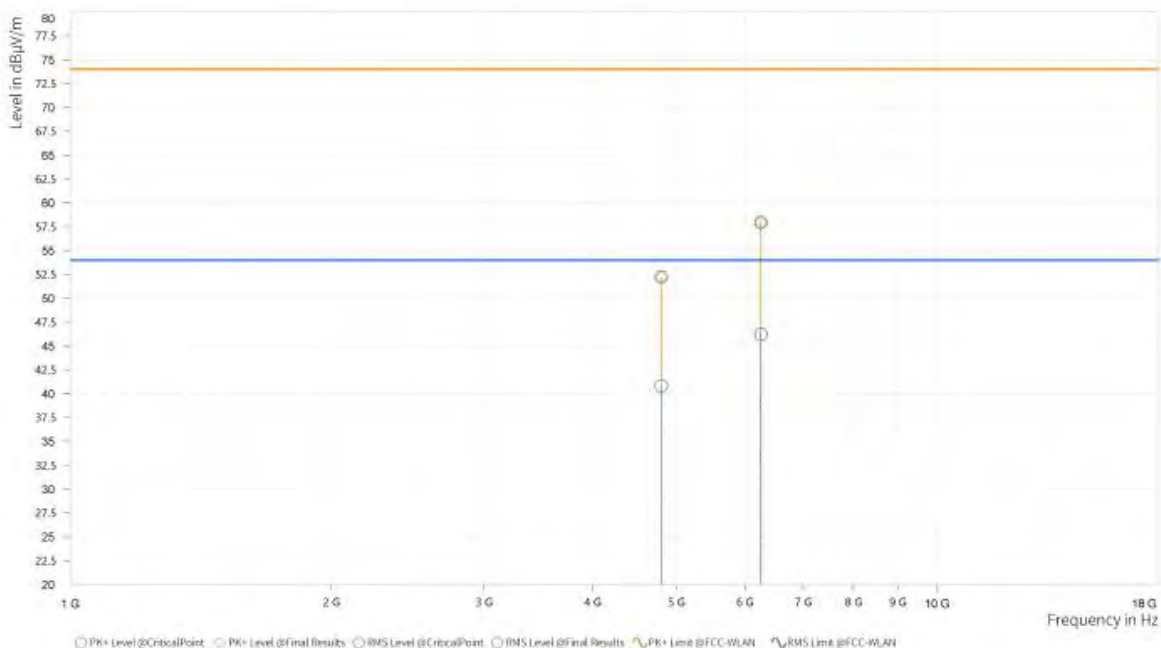


**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	RMS Level [dBμV/m]	RMS Limit [dBμV/m]	RMS Margin [dB]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,802.382	40.81	54.00	13.19	52.26	74.00	21.74	15.60	V	188.9	2
3	6,257.779	46.20	54.00	7.80	57.95	74.00	16.05	21.17	V	171.1	1



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Limit value – Emission level.
2. 2437MHz: Fundamental frequency.
3. For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.



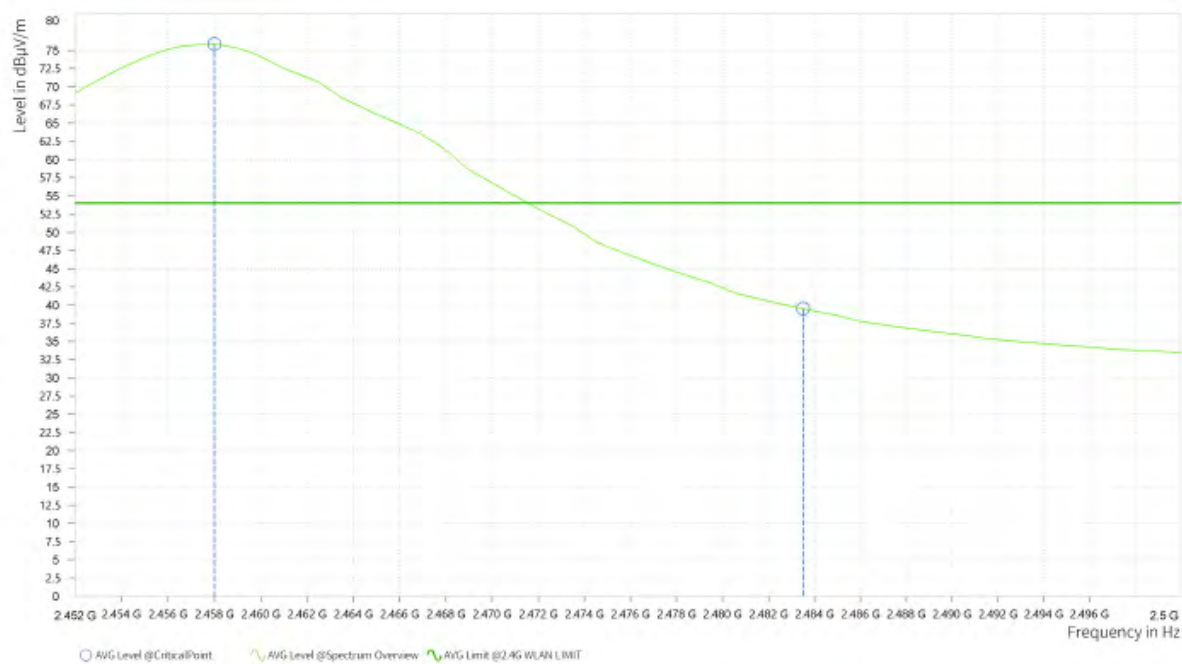
BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	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

Rg	Frequency [MHz]	AVG Level [dBuV/m]	AVG Limit [dBuV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,458.000	75.87			9.97	H	214.6	2
1	2,483.500	39.50	54.00	14.50	9.88	H	214.6	2





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,460.500	96.58			9.97	H	171.1	3
1	2,483.500	45.90	74.00	28.10	9.88	H	206.7	2





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

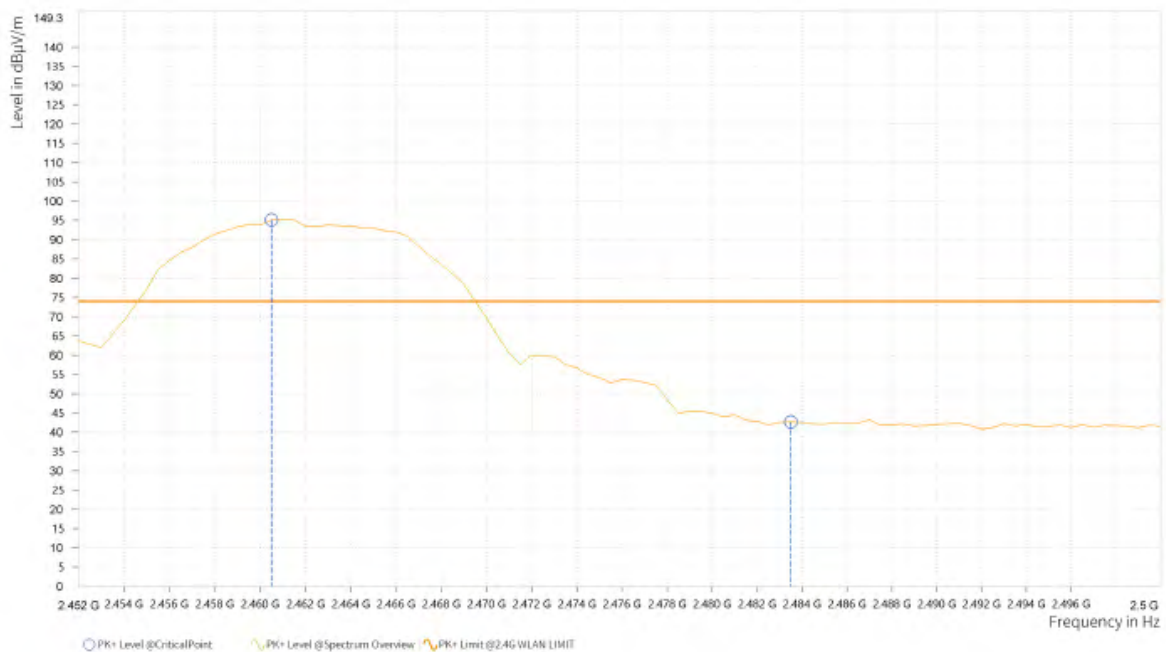
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,458.000	74.87			9.97	V	175.1	2
1	2,483.500	37.79	54.00	16.21	9.88	V	175.1	2





Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,460.500	95.12			9.97	V	85.9	3
1	2,483.500	42.68	74.00	31.32	9.88	V	172.9	3



REMARKS:

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



BUREAU
VERITAS

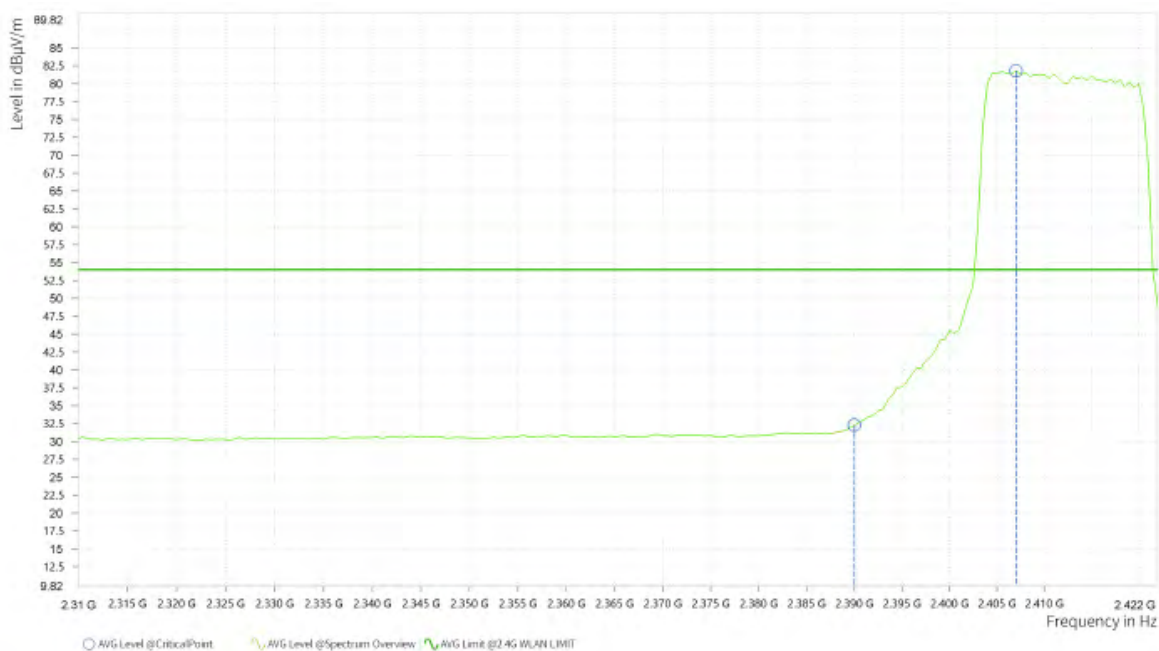
Test Report No.: W7L-P22090023RF02

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	32.29	54.00	21.71	9.84	H	95.1	1
1	2,407.000	81.80			9.86	H	154.9	1

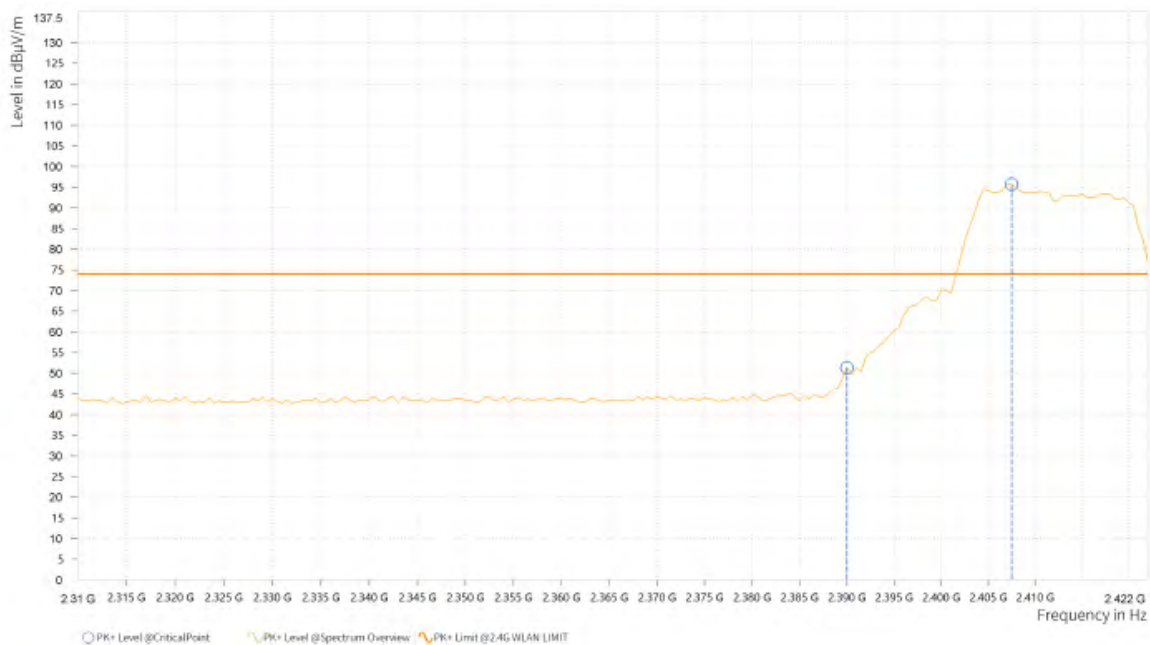




BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	51.34	74.00	22.66	9.84	H	212.1	2
1	2,407.500	95.72			9.86	H	169.3	1



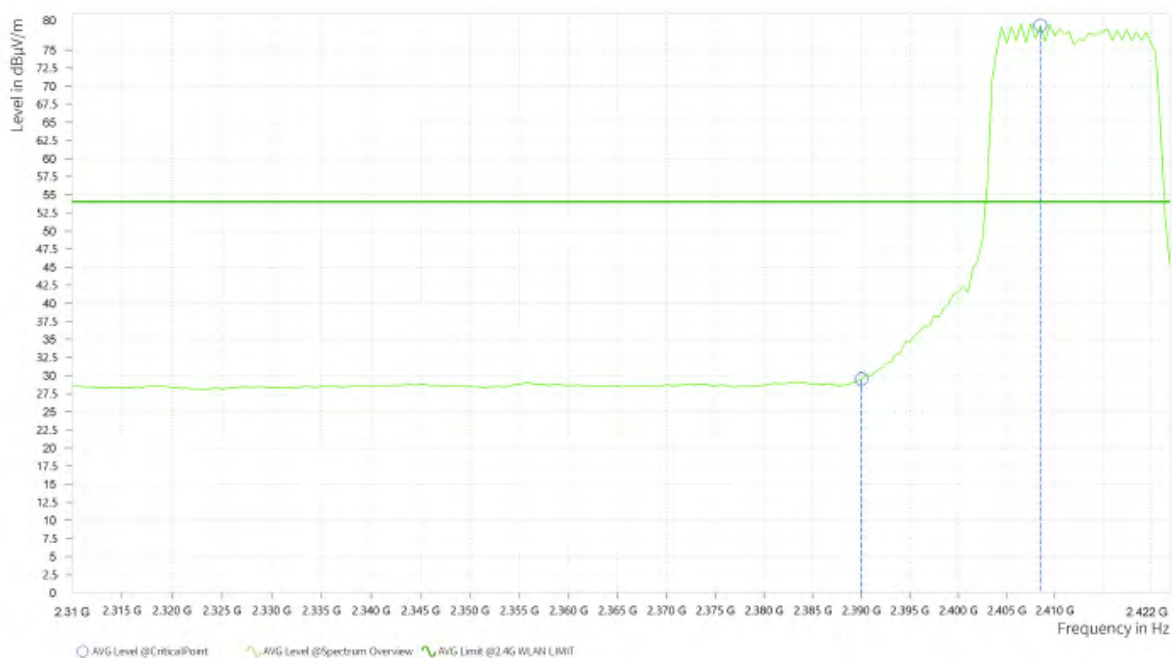


BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	29.52	54.00	24.48	9.84	V	309.1	1
1	2,408.500	78.38			9.86	V	177.5	2

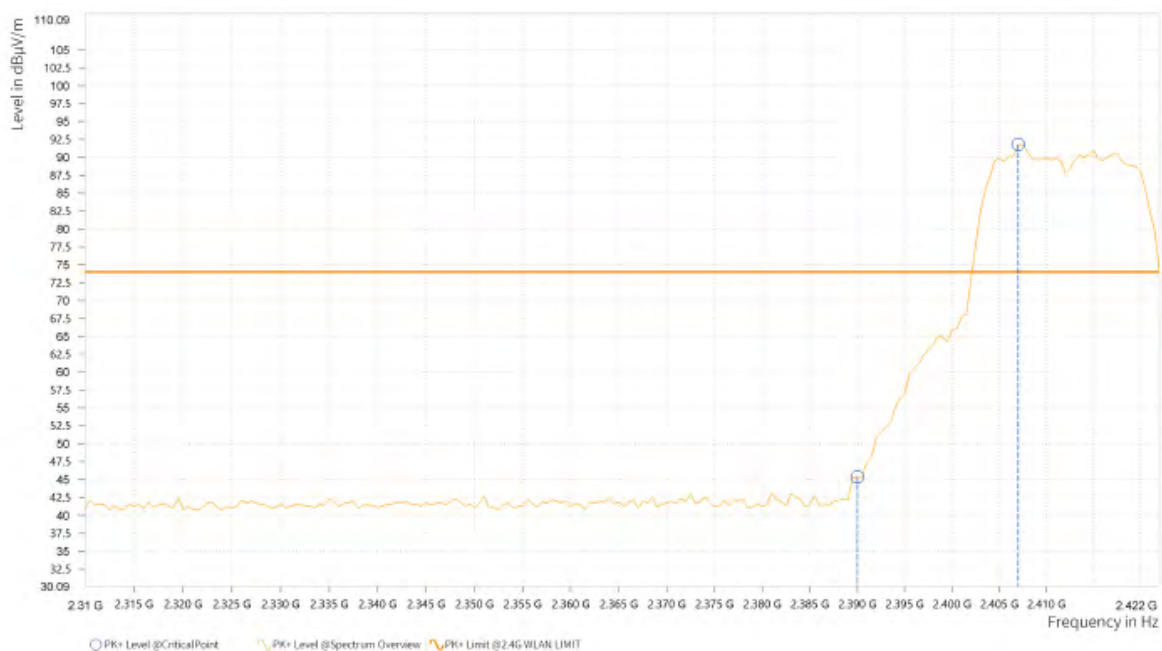




**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	45.38	74.00	28.62	9.84	V	120.1	3
1	2,407.000	91.79			9.86	V	85	3



REMARKS:

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



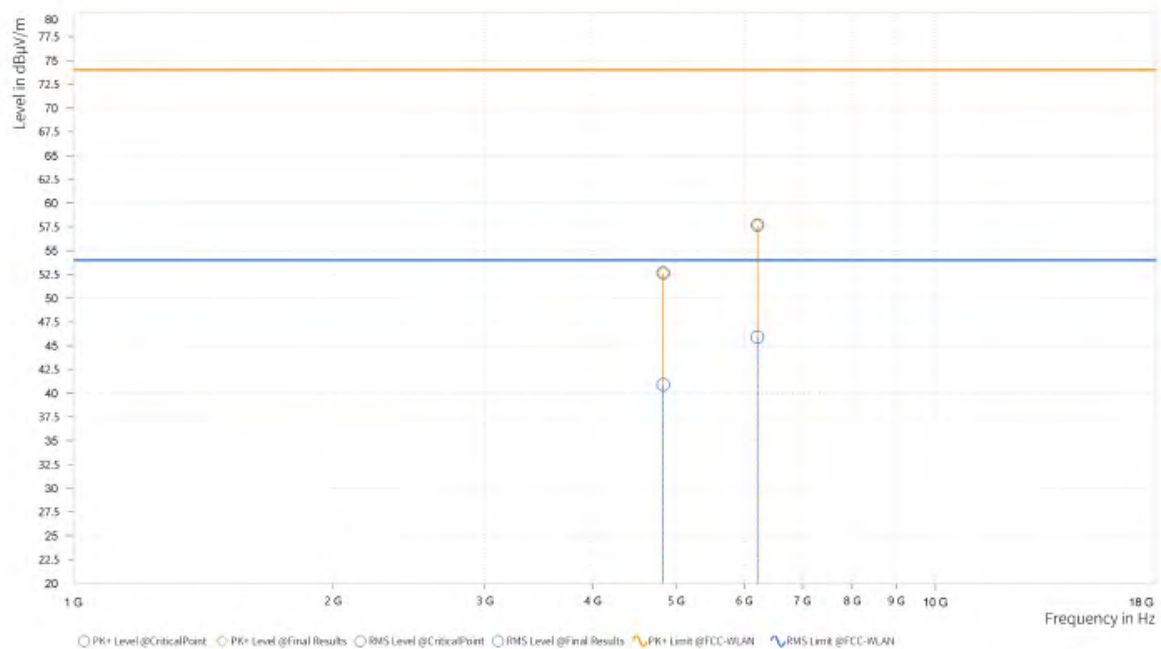
BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	RMS Level [dBμV/m]	RMS Limit [dBμV/m]	RMS Margin [dB]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,831.985	40.89	54.00	13.11	52.67	74.00	21.33	15.88	H	172	1
3	6,214.103	45.91	54.00	8.09	57.70	74.00	16.30	20.97	H	1	2



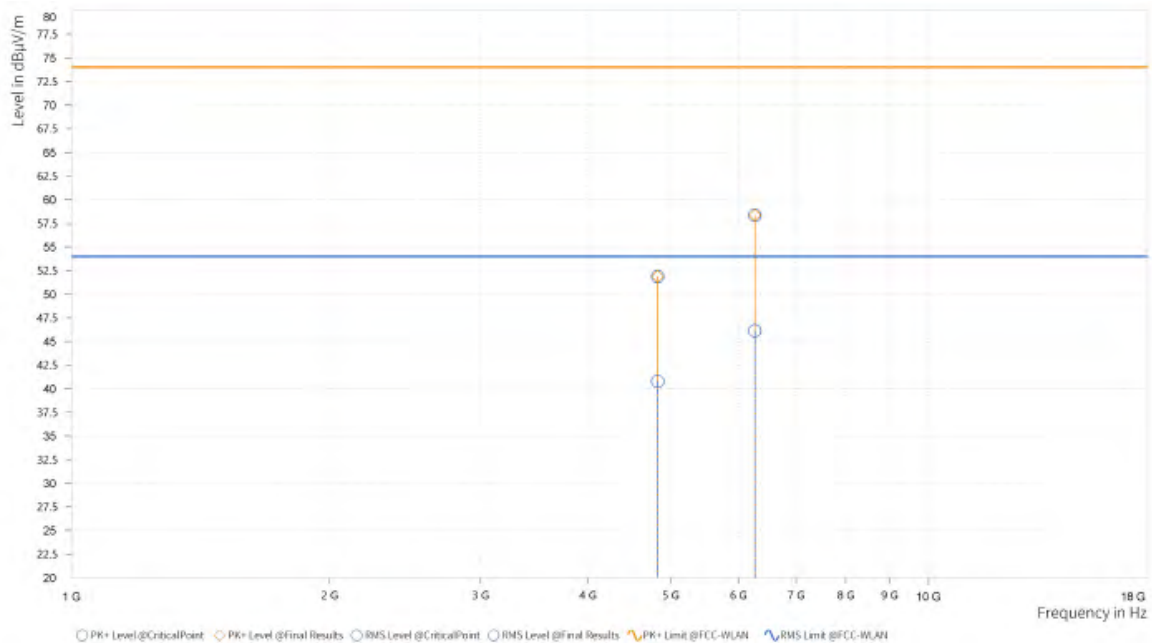


**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

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

Rg	Frequency [MHz]	RMS Level [dBuV/m]	RMS Limit [dBuV/m]	RMS Margin [dB]	PK+ Level [dBuV/m]	PK+ Limit [dBuV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,827.132	40.78	54.00	13.22	51.89	74.00	22.11	15.86	V	1	2
3	6,267.000	46.13	54.00	7.87	58.35	74.00	15.65	21.14	V	1	2



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 2437MHz: Fundamental frequency.
3. For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,455.500	85.18			9.97	H	172.9	1
1	2,483.500	38.66	54.00	15.34	9.88	H	221.7	2

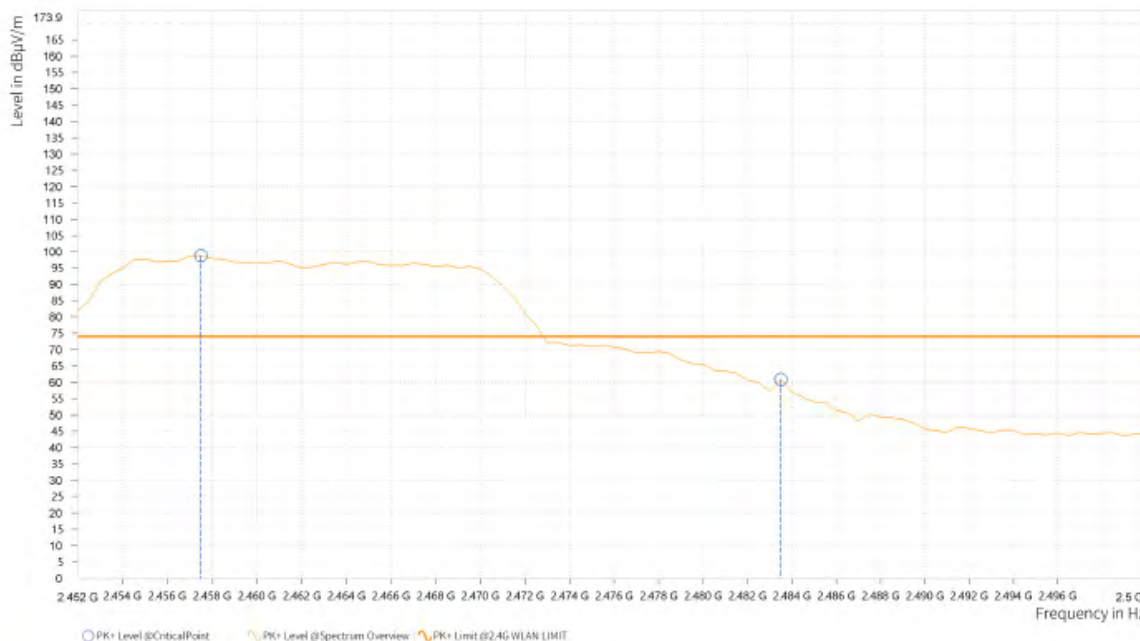




BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,457.500	98.78			9.97	H	172	1
1	2,483.500	60.86	74.00	13.14	9.88	H	33.2	3





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,459.500	82.29			9.97	V	177.5	2
1	2,483.500	37.33	54.00	16.67	9.88	V	177.5	2

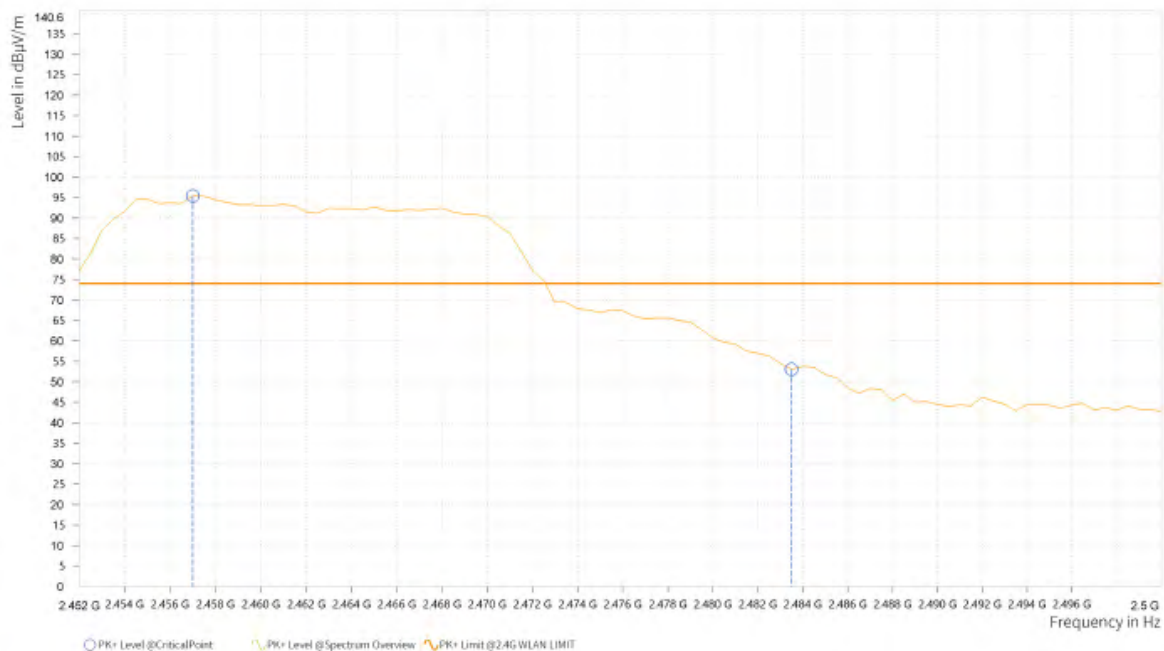




BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,457.000	95.39			9.97	V	147.9	3
1	2,483.500	53.06	74.00	20.94	9.88	V	165.8	3



REMARKS:

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



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	32.89	54.00	21.11	9.84	H	160.8	1
1	2,410.000	82.33			9.86	H	160.8	1





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	50.29	74.00	23.71	9.84	H	358.7	1
1	2,406.000	94.71			9.86	H	173.8	1





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	29.46	54.00	24.54	9.84	V	184.6	2
1	2,410.000	77.37			9.86	V	184.6	2





Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	47.50	74.00	26.50	9.84	V	139.8	3
1	2,407.500	89.28			9.86	V	86.9	3

Spectrum Overview



REMARKS:

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



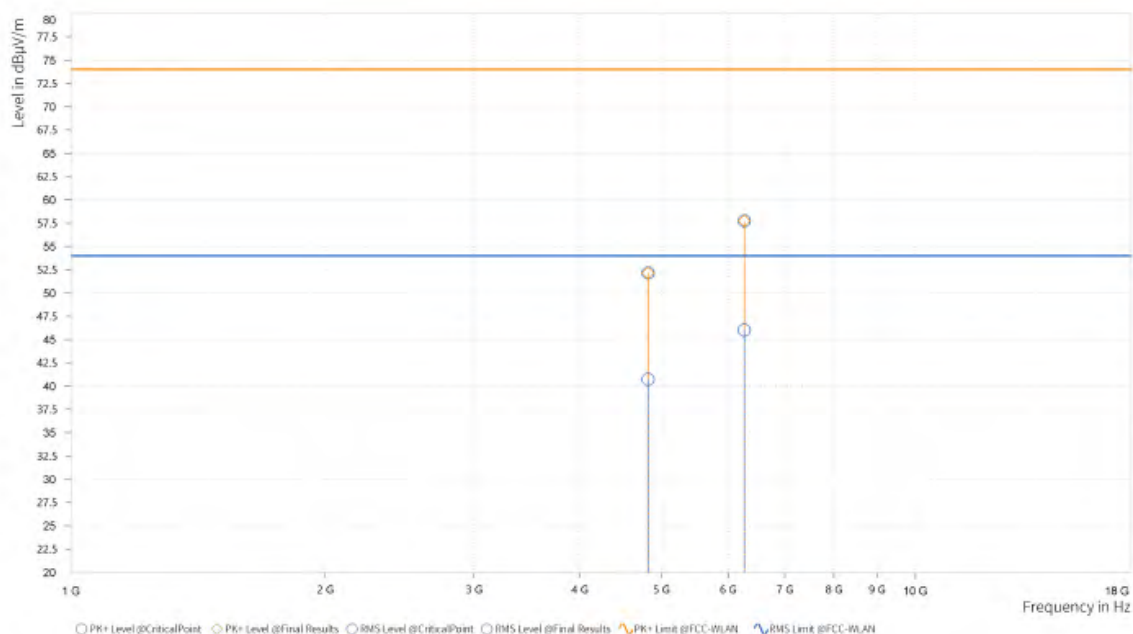
BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	RMS Level [dBμV/m]	RMS Limit [dBμV/m]	RMS Margin [dB]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,823.250	40.73	54.00	13.27	52.17	74.00	21.83	15.82	H	1	2
3	6,267.485	46.00	54.00	8.00	57.74	74.00	16.26	21.14	H	187.8	2



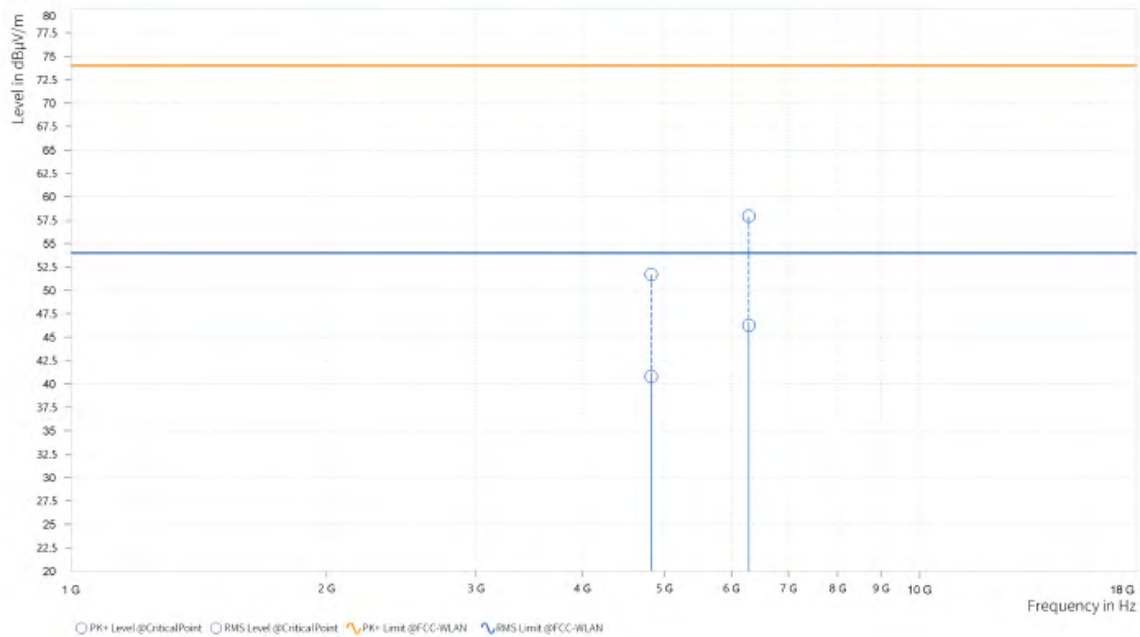


**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	RMS Level [dBμV/m]	RMS Limit [dBμV/m]	RMS Margin [dB]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,824.221	40.78	54.00	13.22	51.71	74.00	22.29	15.83	V	170.2	1
3	6,290.779	46.25	54.00	7.75	57.92	74.00	16.08	21.06	V	1	1



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Limit value – Emission level.
2. 2437MHz: Fundamental frequency.
3. For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.



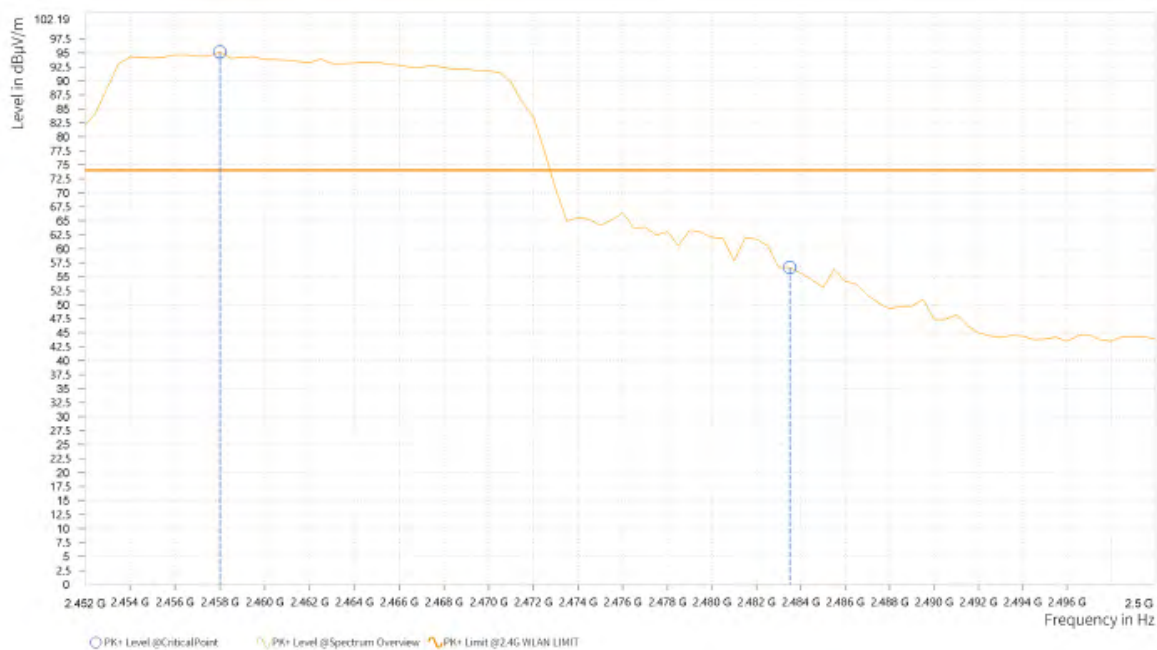
BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,458.000	95.14			9.97	H	174.7	1
1	2,483.500	56.63	74.00	17.37	9.88	H	174.7	1





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,454.000	83.41			9.97	H	172.9	1
1	2,483.500	37.01	54.00	16.99	9.88	H	172.9	1



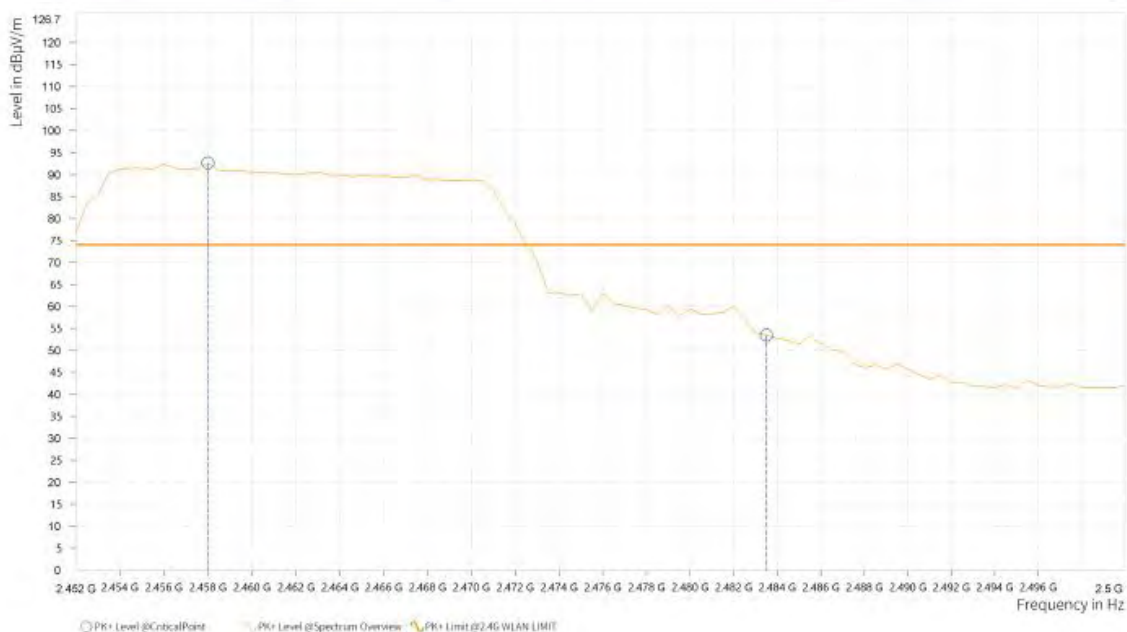


BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,458.000	92.62			9.97	V	86	3
1	2,483.500	53.44	74.00	20.56	9.88	V	139	3





**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,455.500	76.56			9.97	V	240.8	2
1	2,483.500	32.87	54.00	21.13	9.88	V	169	2



REMARKS:

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



**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

BELOW 1GHz WORST-CASE DATA:

30 MHz – 1GHz data:

BT-LE _1M

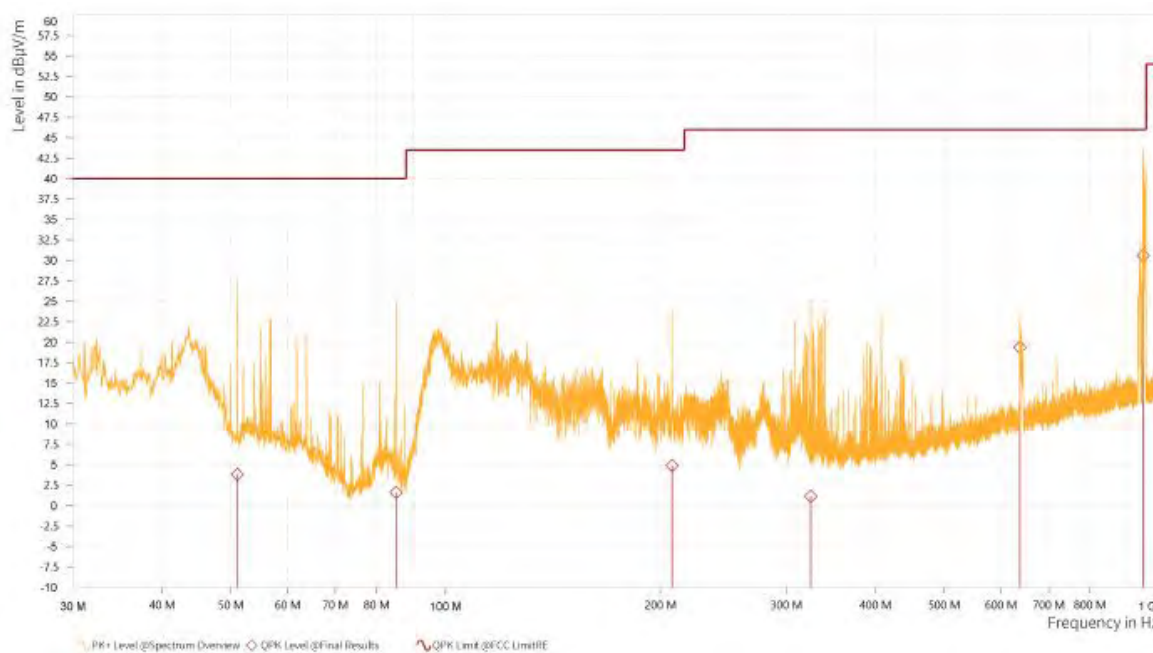
CHANNEL	TX Channel 19	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	51.049	3.81	40.00	36.19	-18.32	H	354.9	2	120.000
1	85.242	1.62	40.00	38.38	-24.26	H	354.9	2	120.000
1	207.656	4.91	43.50	38.59	-23.34	H	263.6	1	120.000
1	325.026	1.12	46.00	44.88	-21.92	H	5.8	1	120.000
1	638.578	19.34	46.00	26.66	-15.86	H	359	1	120.000
1	951.161	30.55	46.00	15.45	-12.58	H	5.8	1	120.000

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission level.



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

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

Tel: +86 755 8869 6566
Fax: +86 755 8869 6577
Email: customerservice.sw@bureauveritas.com



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

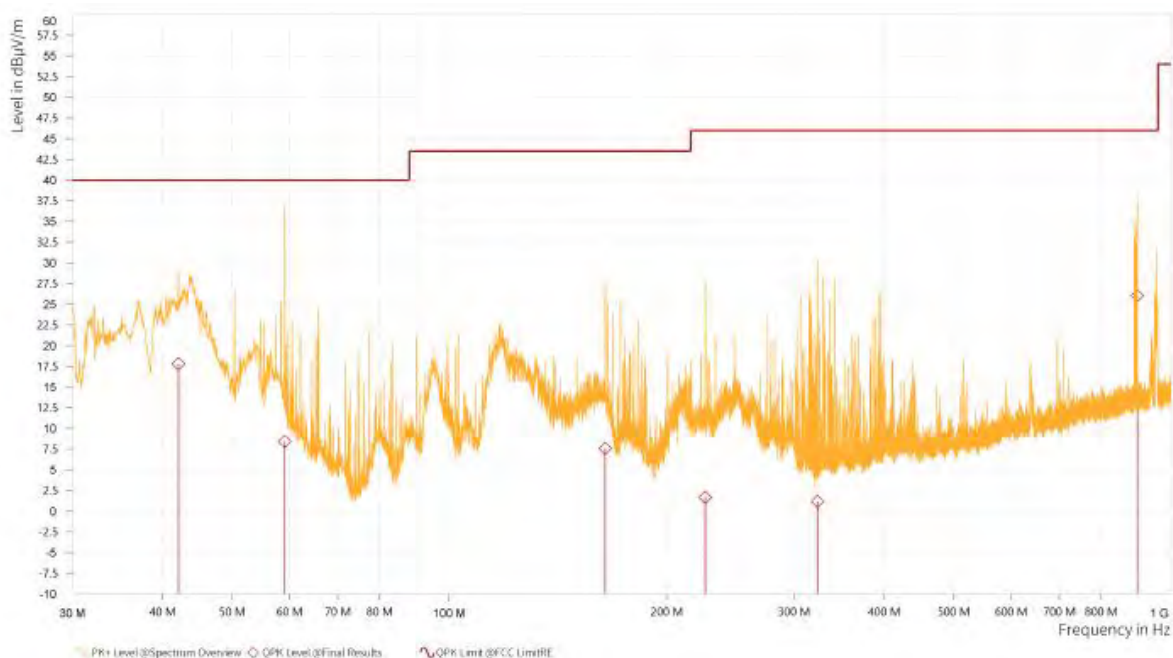
CHANNEL	TX Channel 19	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	42.125	17.78	40.00	22.22	-17.22	V	263.6	1	120.000
1	59.149	8.43	40.00	31.57	-19.63	V	129.7	1	120.000
1	164.442	7.59	43.50	35.91	-26.06	V	129.7	1	120.000
1	226.425	1.66	46.00	44.34	-23.08	V	129.7	1	120.000
1	323.813	1.17	46.00	44.83	-21.97	V	5	1	120.000
1	898.393	26.05	46.00	19.95	-12.70	V	359	2	120.000

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission level.





ABOVE 1GHz TEST DATA

- Note:** 1. For radiated emissions testing , the full testing range of different modes have been scanned , only the worst case harmonic data is reported in the sheet.
2. All other emissions were greater than 20dB below the limit was not recorded

BT-LE _1M

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	29.17	54.00	24.83	9.84	H	199.8	1
1	2,402.000	80.26			9.85	H	125.5	3





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	41.68	74.00	32.32	9.84	H	359.9	2
1	2,402.000	84.37			9.85	H	324.4	1





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

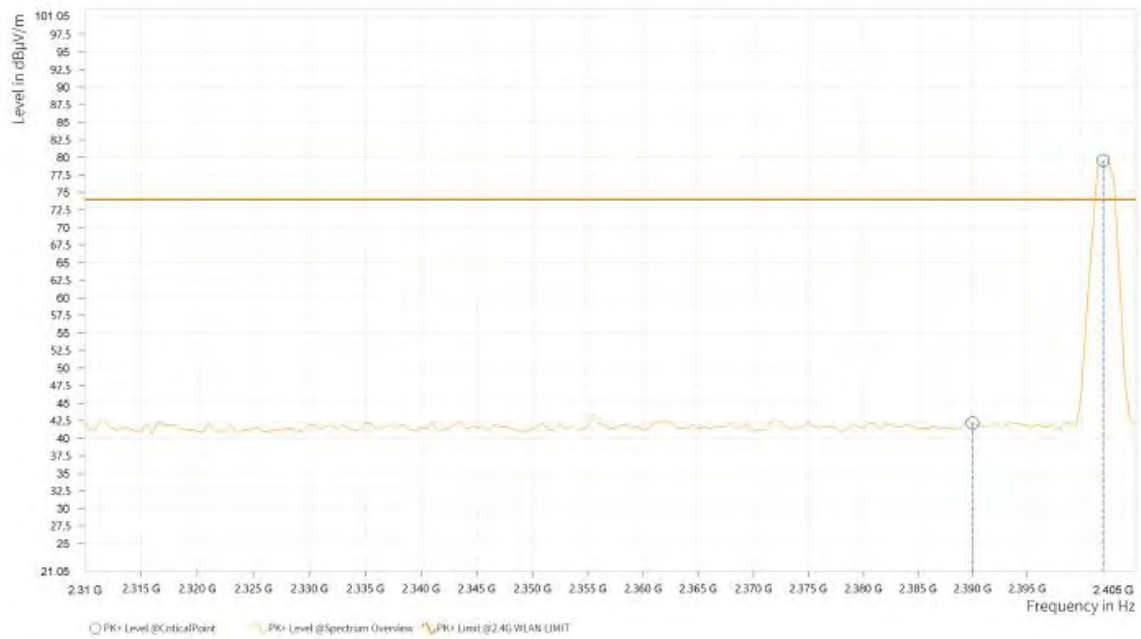
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	29.15	54.00	24,85	9.84	V	52.9	3
1	2,402.000	76.95			9.85	V	232	1





Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,390.000	42.17	74.00	31.83	9.84	V	88.6	1
1	2,402.000	79.54			9.85	V	287.7	3



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Limit value – Emission level.
2. 2402MHz: Fundamental frequency.



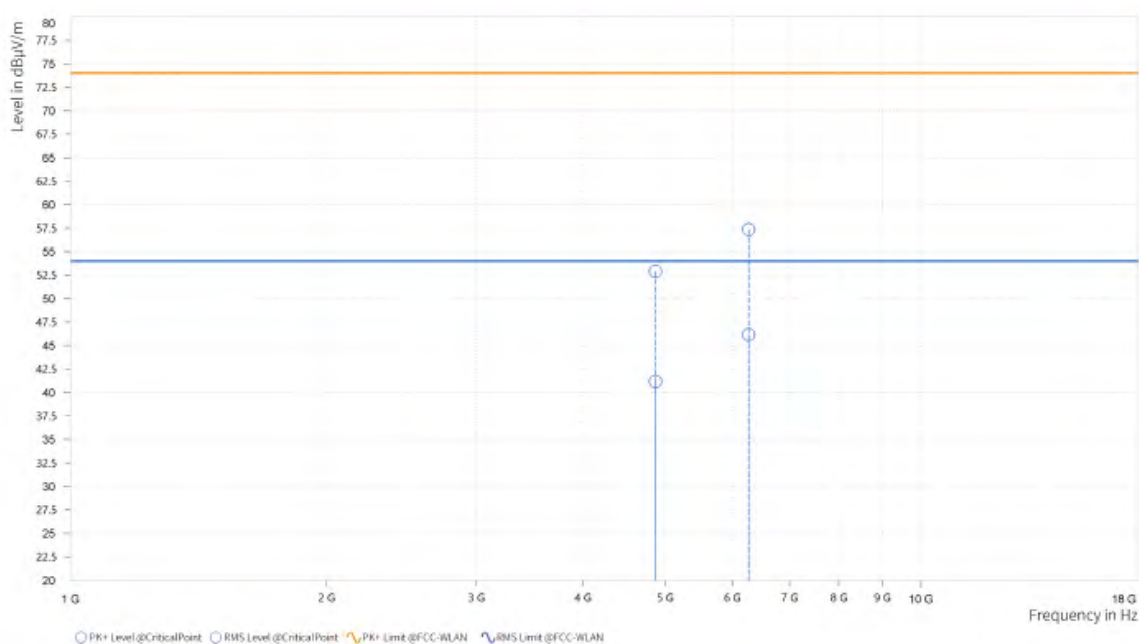
BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	RMS Level [dBμV/m]	RMS Limit [dBμV/m]	RMS Margin [dB]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,871.779	41.17	54.00	12.83	52.90	74.00	21.10	15.94	H	359	2
3	6,270.882	46.16	54.00	7.84	57.38	74.00	16.62	21.13	H	1	2



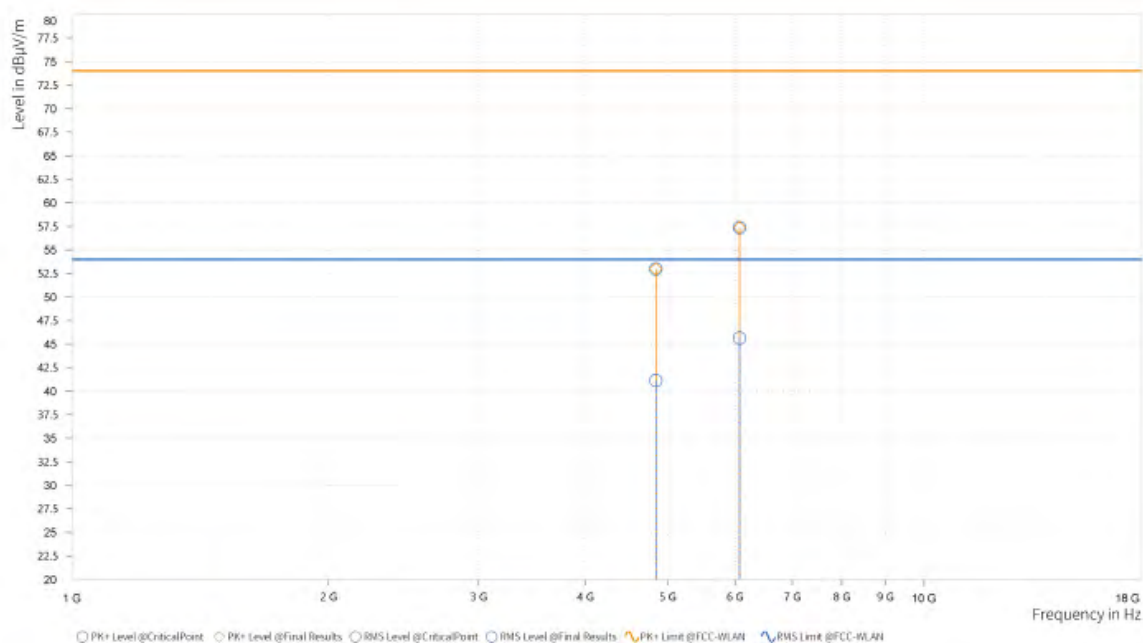


**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	RMS Level [dBμV/m]	RMS Limit [dBμV/m]	RMS Margin [dB]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,843.147	41.12	54.00	12.88	52.98	74.00	21.02	15.90	V	359.1	1
3	6,073.853	45.62	54.00	8.38	57.36	74.00	16.64	20.59	V	359.1	1



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Limit value – Emission level.
2. 2440MHz: Fundamental frequency.
3. For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,480.000	86.17			9.89	H	327.9	1
1	2,483.500	29.65	54.00	24.35	9.88	H	327.9	1

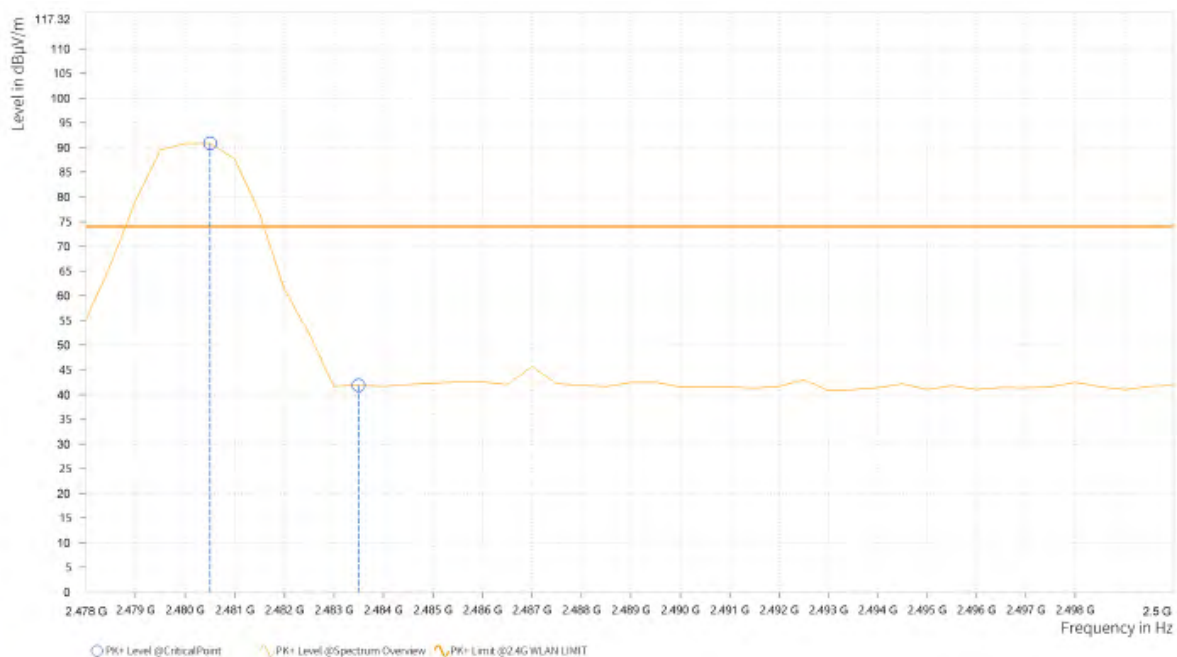




BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,480.500	90.85			9.89	H	325.2	1
1	2,483.500	41.86	74.00	32.14	9.88	H	108.4	1





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,480.500	84.78			9.89	V	223.1	1
1	2,483.500	29.19	54.00	24.81	9.88	V	359.3	3

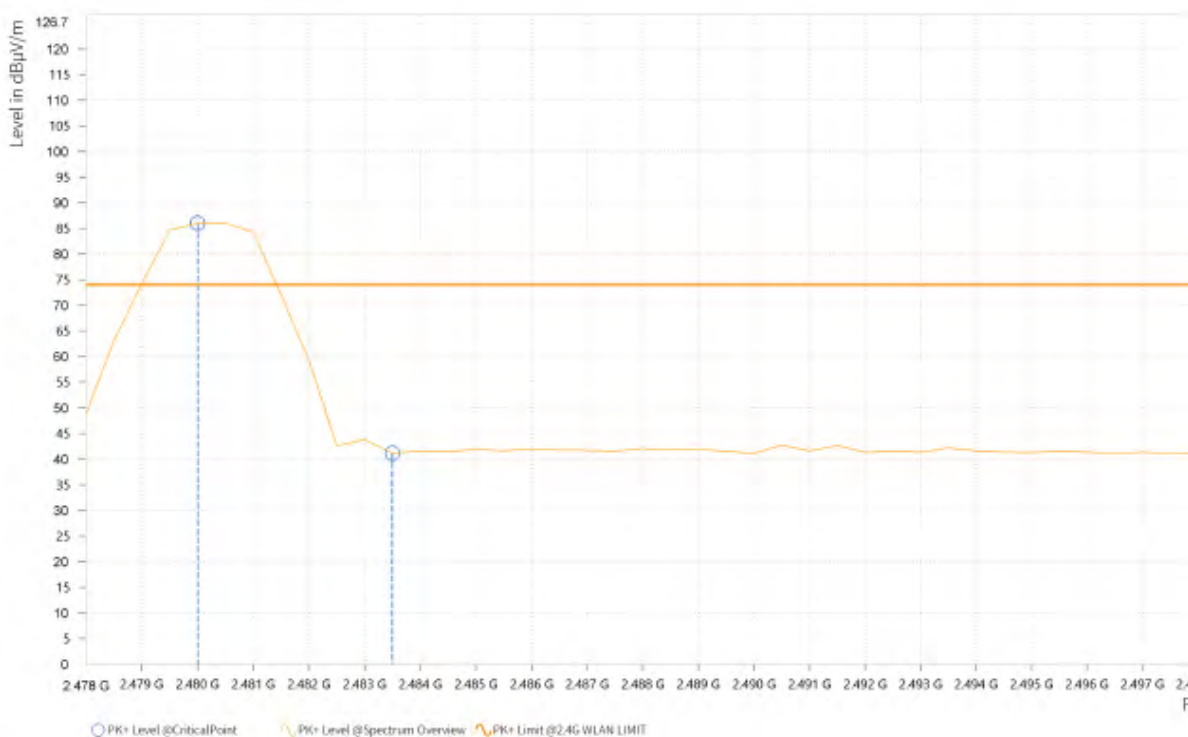




BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,480.000	86.03			9.89	V	126.4	1
1	2,483.500	41.16	74.00	32.84	9.88	V	126.4	1



REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Limit value – Emission level.
- 2480MHz: 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

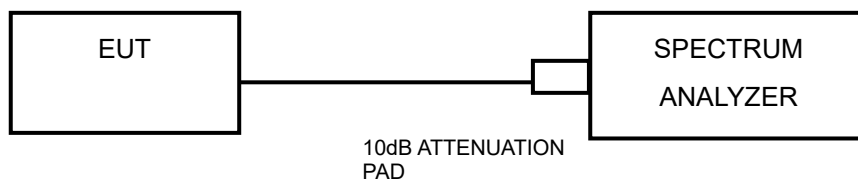
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (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.



Test Report No.: W7L-P22090023RF02

3.3.7 TEST RESULTS

Please Refer to Appendix1/2 Of this test report.

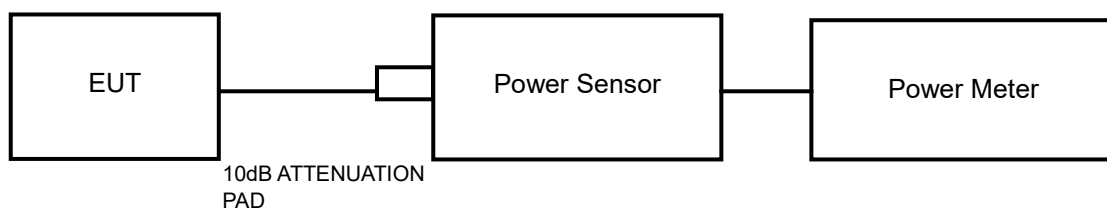


3.4 CONDUCTED OUTPUT POWER

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.



Test Report No.: W7L-P22090023RF02

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix1/2 Of this test report.



Test Report No.: W7L-P22090023RF02

3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

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

Please Refer to Appendix1/2 Of this test report.

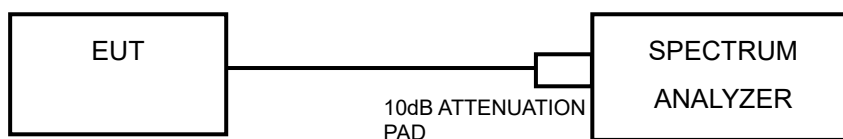


3.5 POWER SPECTRAL DENSITY MEASUREMENT

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 $\geq 3 \times$ 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.



Test Report No.: W7L-P22090023RF02

3.5.7 TEST RESULTS

Please Refer to Appendix1/2 Of this test report.

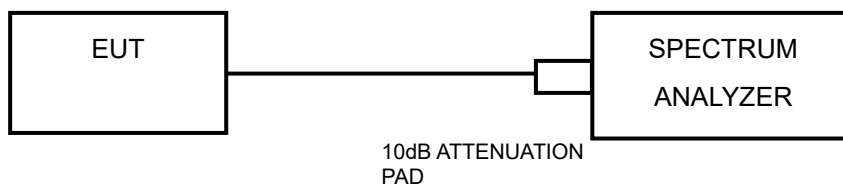


3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB 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 Appendix1/2 Of this test report.



Test Report No.: W7L-P22090023RF02

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



Test Report No.: W7L-P22090023RF02

5 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 WLAN 2.4G

DTS BANDWIDTH

TEST RESULT

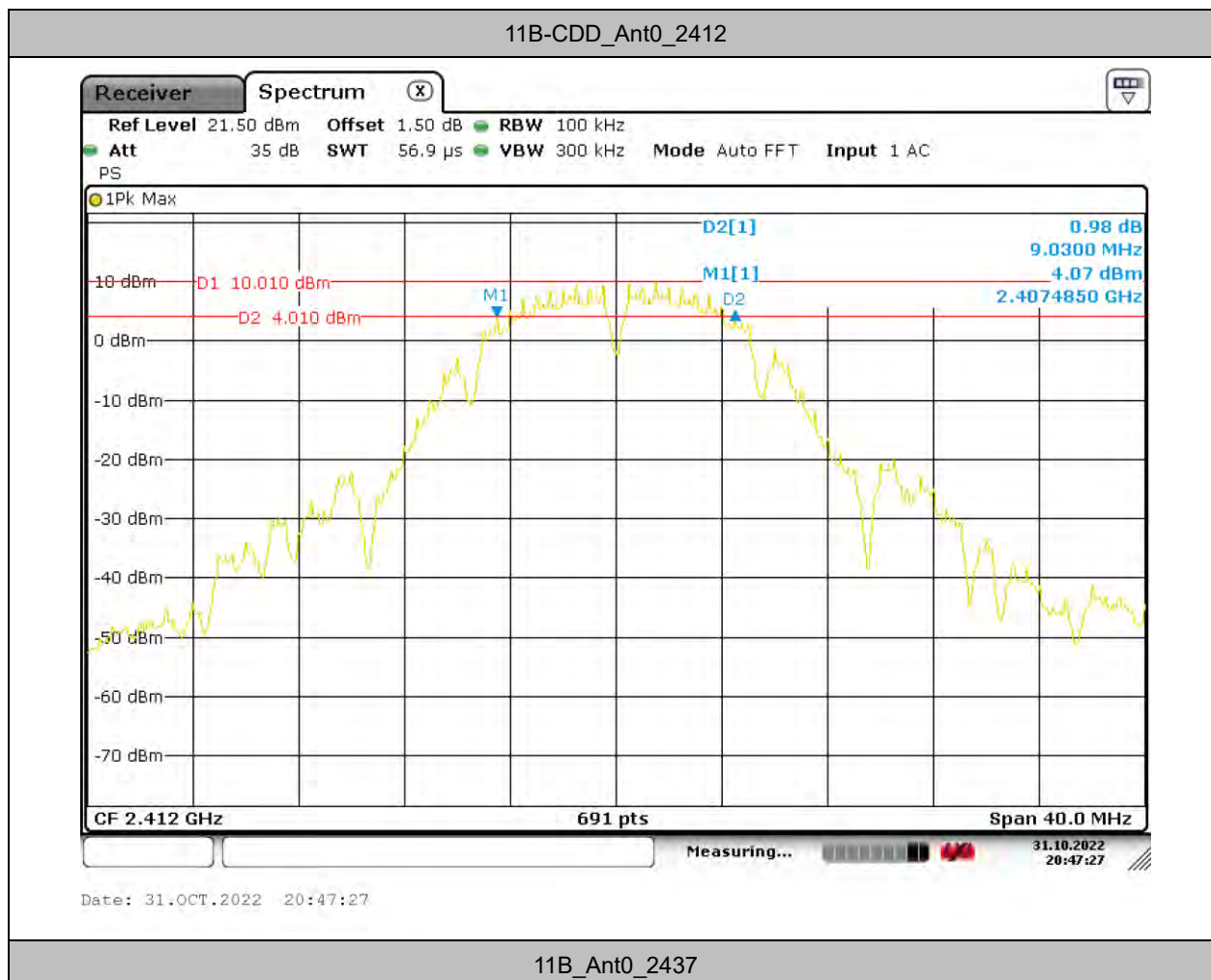
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant0	2412	9.0300	2408.440	2416.040	0.5	PASS
	Ant0	2437	9.0880	2433.440	2440.560	0.5	PASS
	Ant0	2462	9.0300	2458.000	2466.040	0.5	PASS
11G	Ant0	2412	16.035	2403.840	2403.840	0.5	PASS
	Ant0	2437	16.324	2428.840	2445.160	0.5	PASS
	Ant0	2462	16.324	2453.840	2470.160	0.5	PASS
11N20	Ant0	2412	16.729	2403.840	2403.840	0.5	PASS
	Ant0	2437	17.315	2428.840	2445.160	0.5	PASS
	Ant0	2462	17.25	2453.840	2470.160	0.5	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

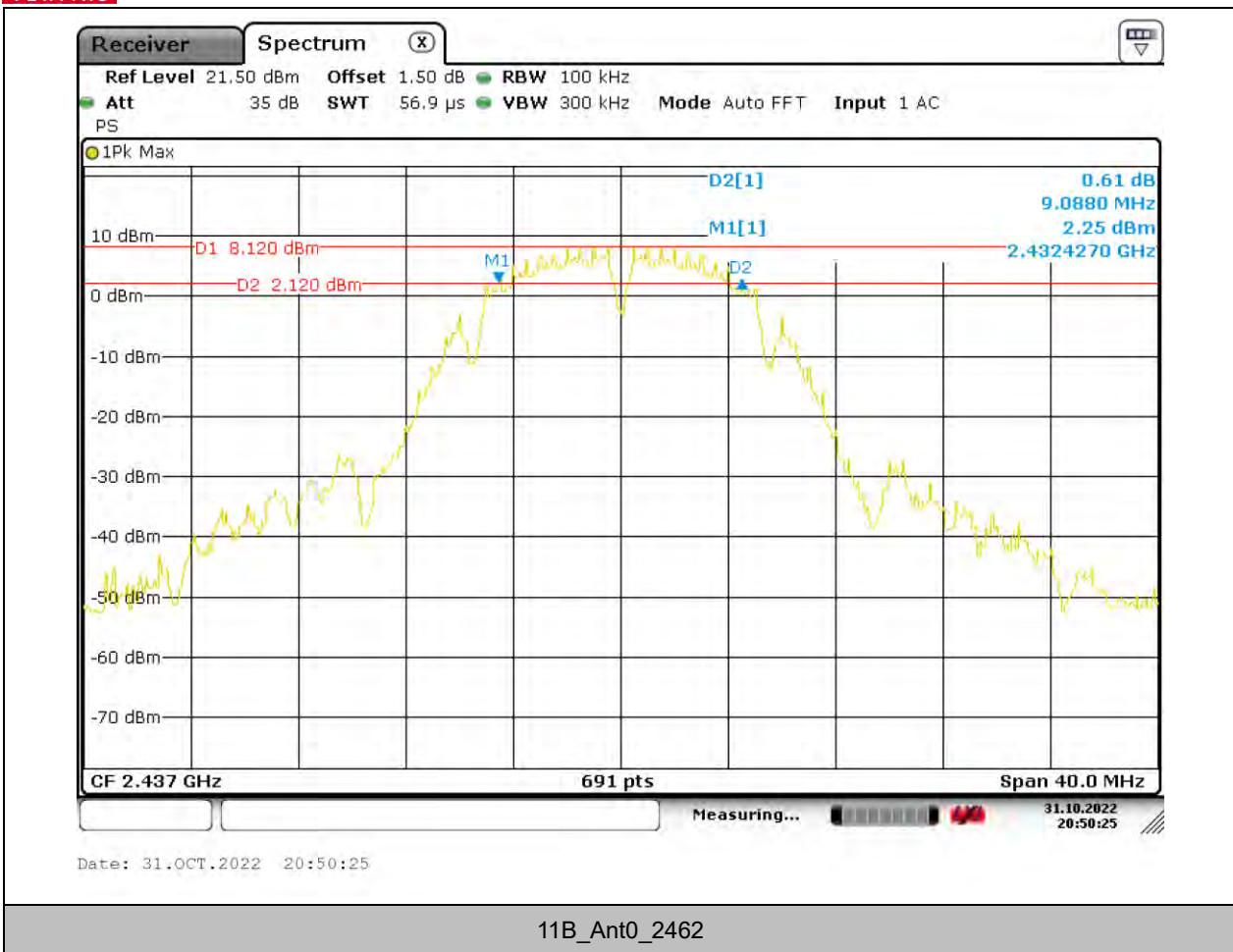
TEST GRAPHS





BUREAU
VERITAS

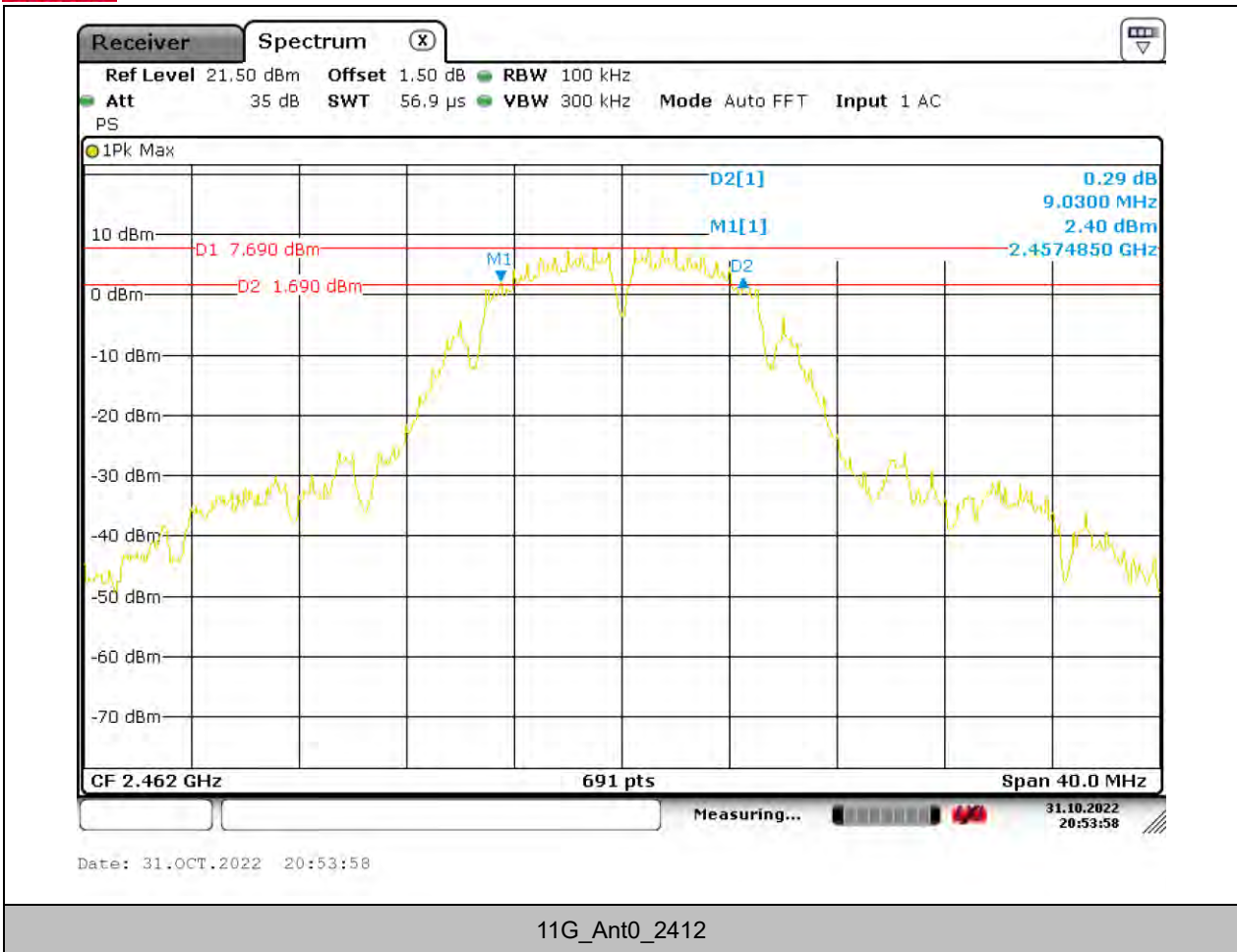
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

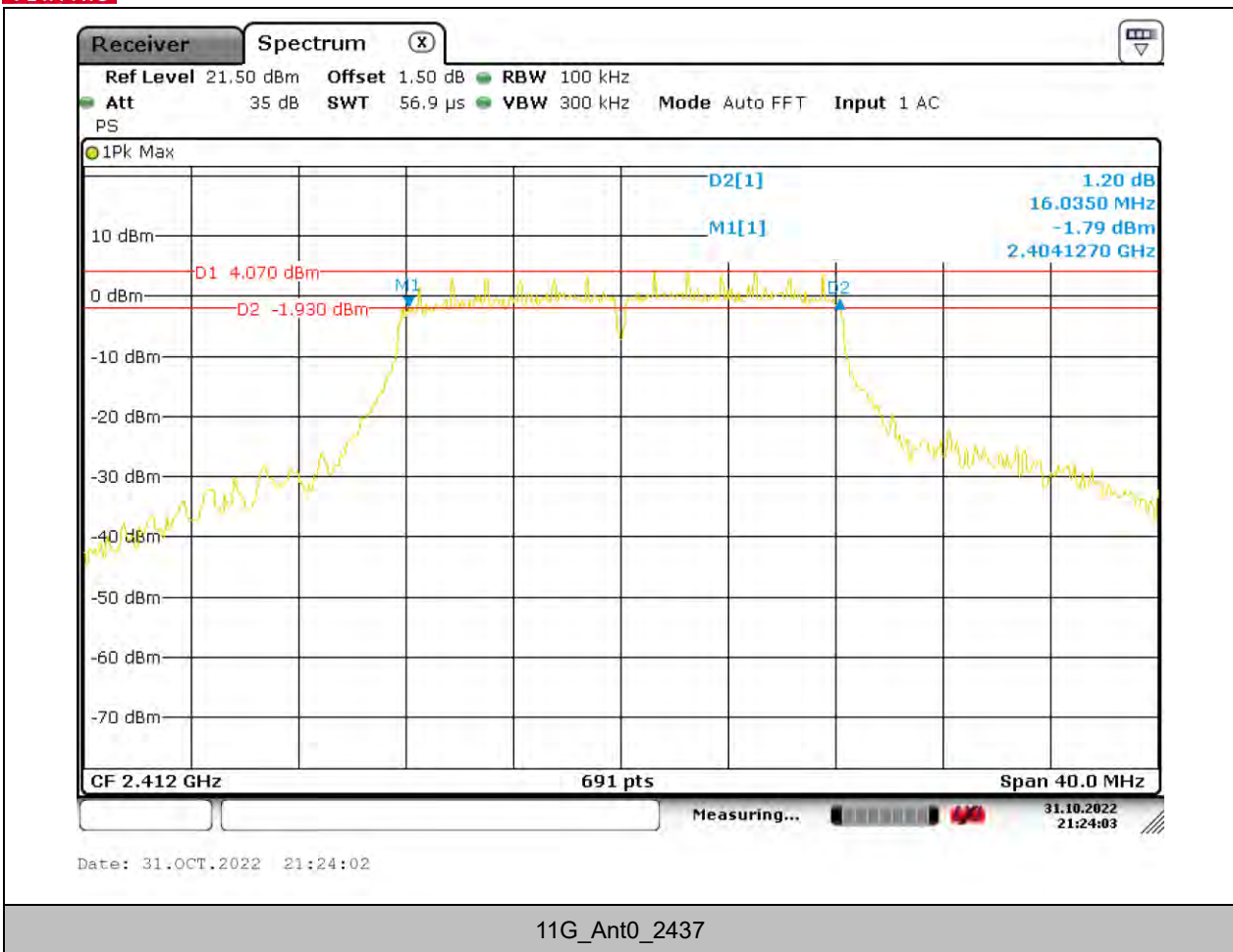
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

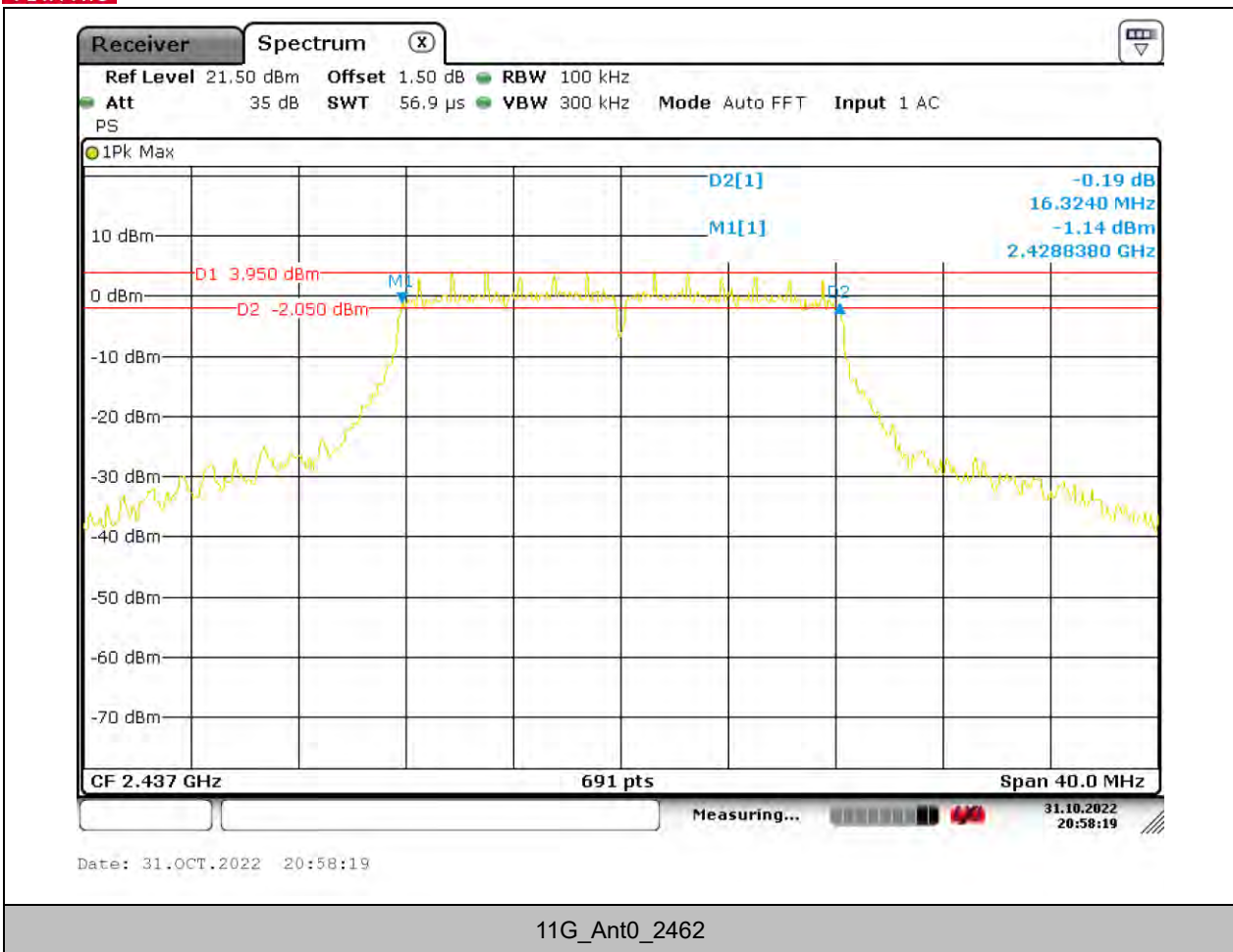
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

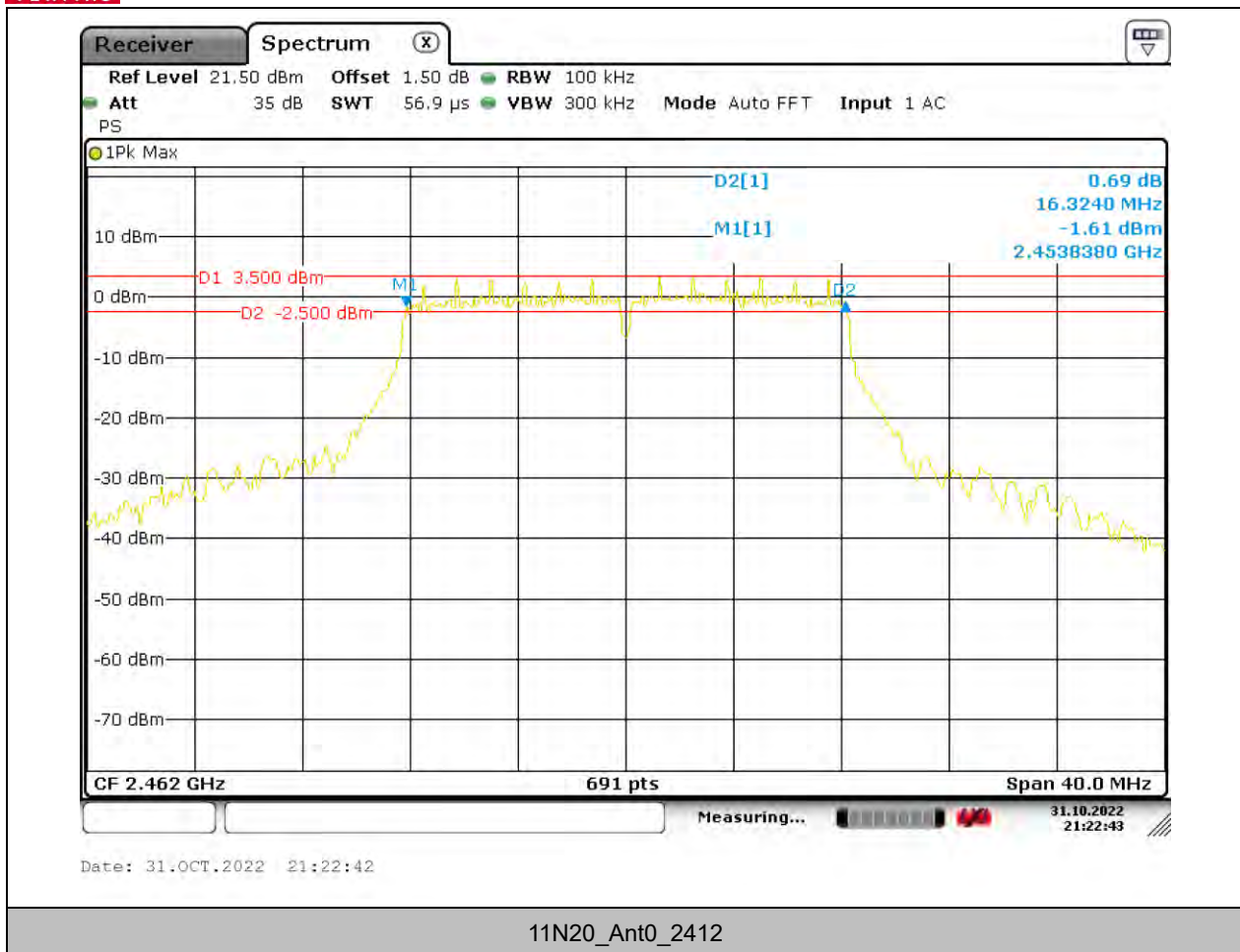
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

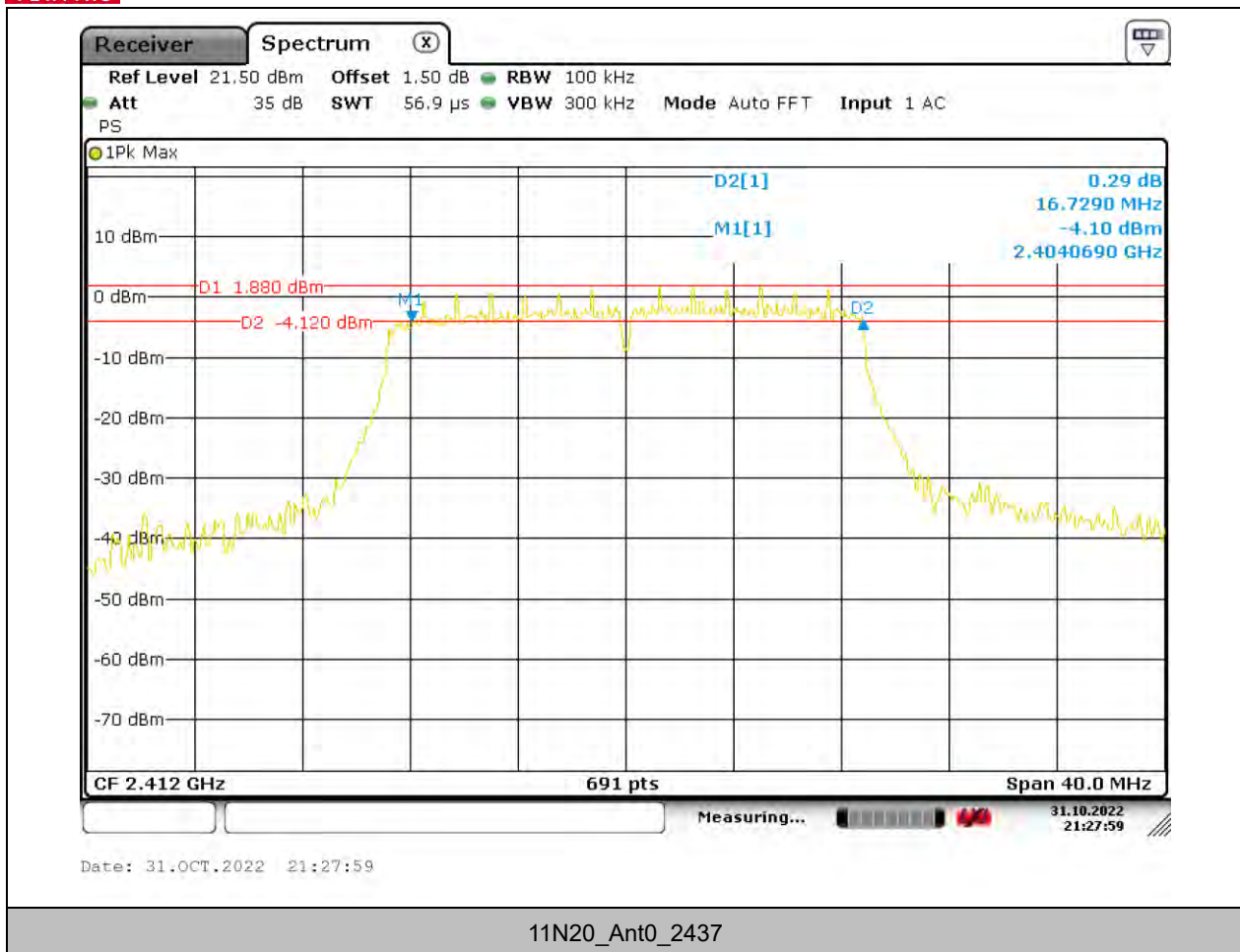
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

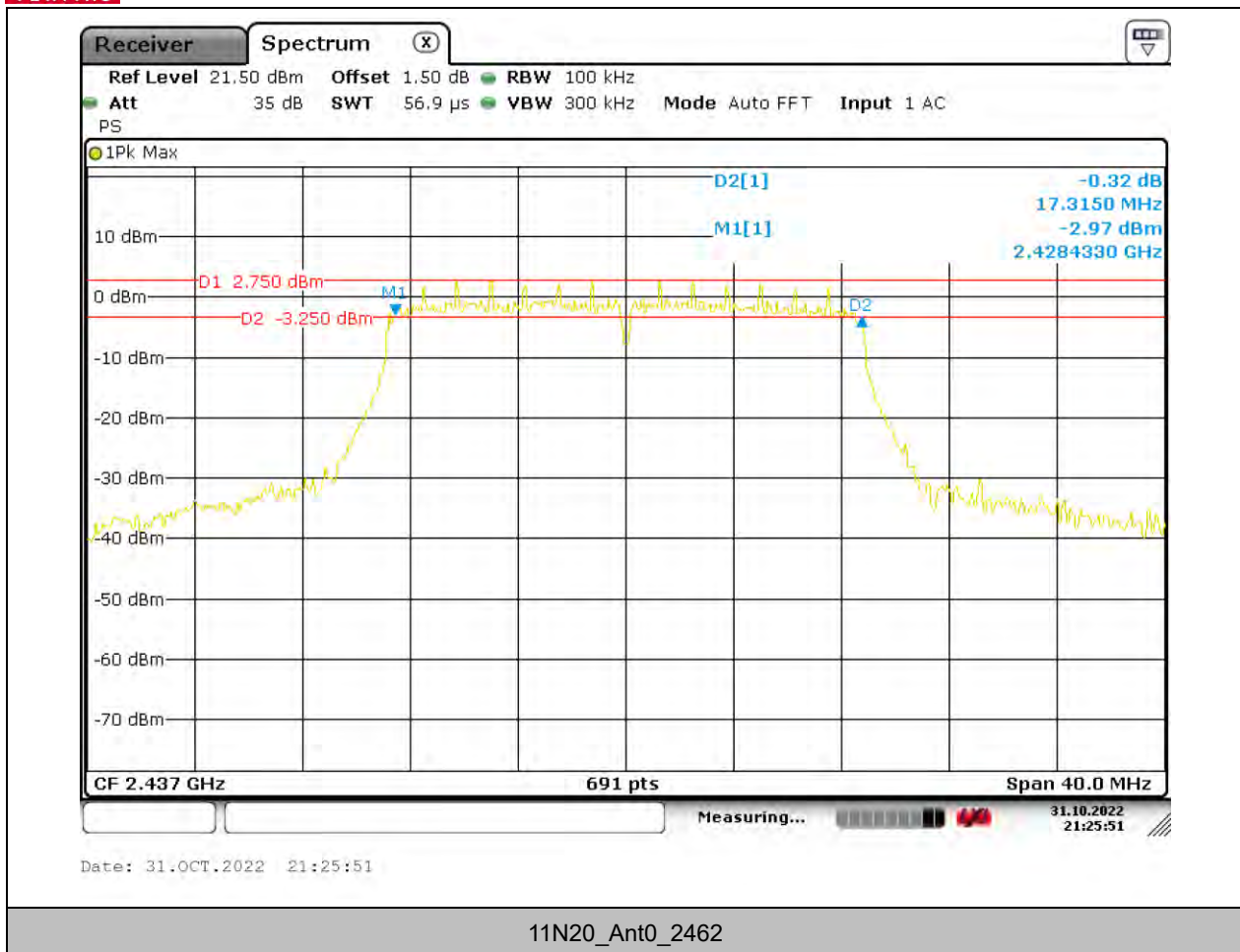
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

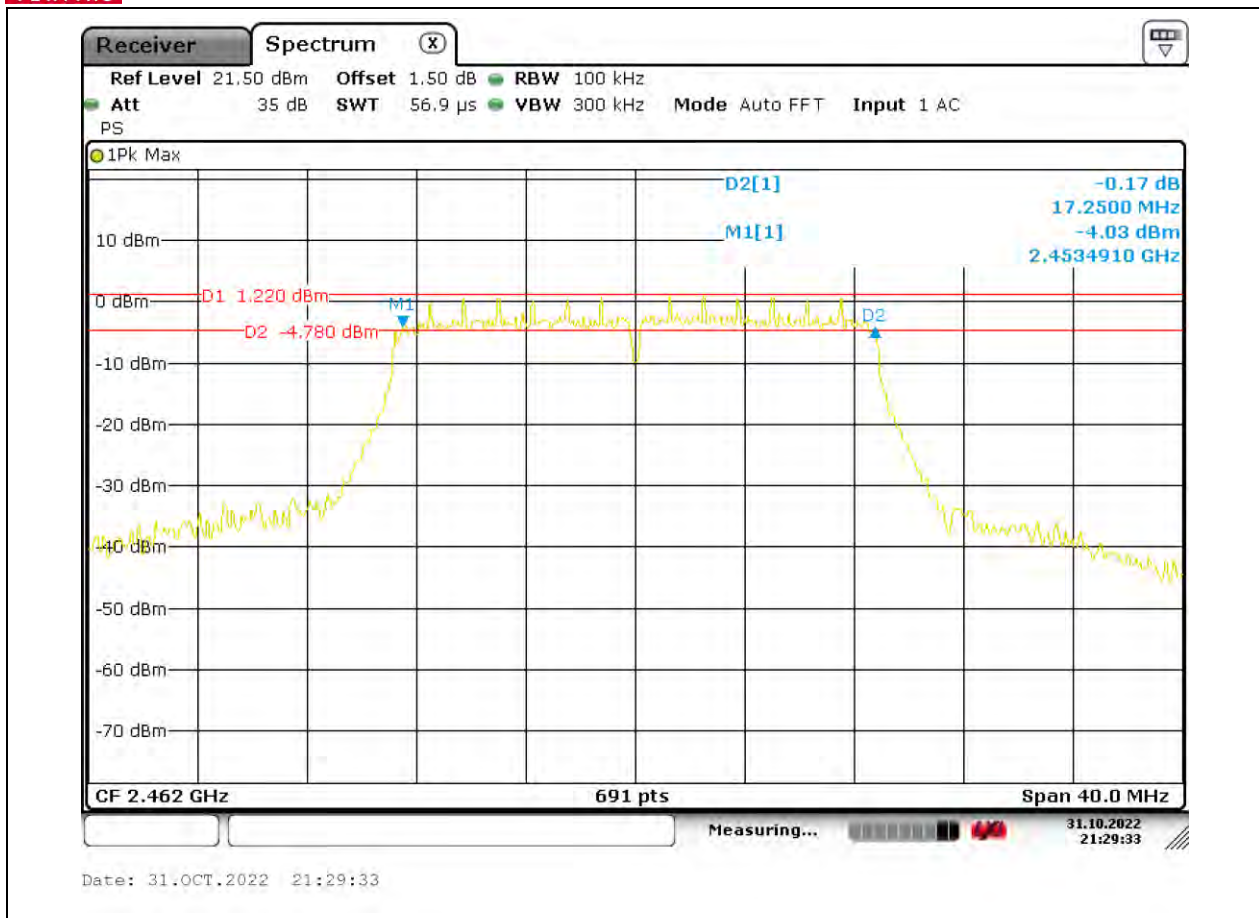
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



**MAXIMUM CONDUCTED OUTPUT POWER****TEST RESULT PEAK**

TestMode	Antenna	Frequency [MHz]	Peak power [dBm]	Peak power [mw]	Limit [dBm]	Verdict	Power Setting
11B	Ant0	2412	20.19	104.47	≤30.00	PASS	16
	Ant0	2437	20.12	102.80	≤30.00	PASS	16
	Ant0	2462	19.63	91.83	≤30.00	PASS	16
11G	Ant0	2412	19.45	88.10	≤30.00	PASS	14
	Ant0	2437	19.67	92.68	≤30.00	PASS	14
	Ant0	2462	19.33	85.70	≤30.00	PASS	14
11N20-	Ant0	2412	18.49	70.63	≤30.00	PASS	14
	Ant0	2437	18.95	78.52	≤30.00	PASS	14
	Ant0	2462	17.91	61.80	≤30.00	PASS	14

TEST RESULT AVERAGE

Test Mode	Antenna	Frequency [MHz]	Average power [dBm]	Limit [dBm]	Verdict	Power Setting
11B -SISO	Ant0	2412	16.34	/	PASS	16
	Ant0	2437	16.26	/	PASS	16
	Ant0	2462	15.75	/	PASS	16
11G -SISO	Ant0	2412	13.79	/	PASS	14
	Ant0	2437	13.80	/	PASS	14
	Ant0	2462	13.28	/	PASS	14
11N20 -SISO	Ant0	2412	11.66	/	PASS	14
	Ant0	2437	12.48	/	PASS	14
	Ant0	2462	11.16	/	PASS	14



MAXIMUM POWER SPECTRAL DENSITY TEST RESULT

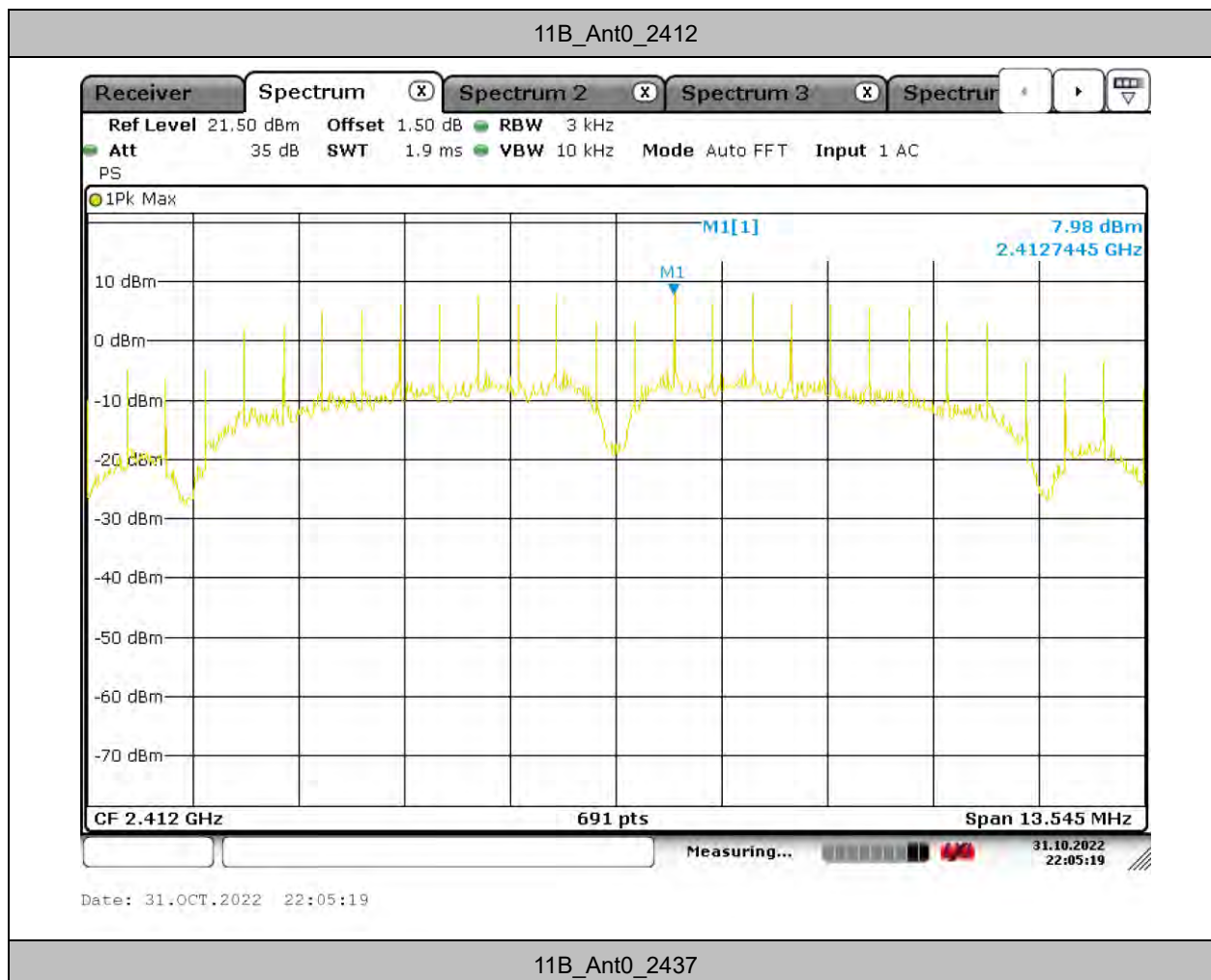
TestMode	Antenna	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant0	2412	7.98	≤8.00	PASS
	Ant0	2437	7.36	≤8.00	PASS
	Ant0	2462	6.63	≤8.00	PASS
11G	Ant0	2412	-10.42	≤8.00	PASS
	Ant0	2437	-10.86	≤8.00	PASS
	Ant0	2462	-11.32	≤8.00	PASS
11N20	Ant0	2412	-12.54	≤8.00	PASS
	Ant0	2437	-11.38	≤8.00	PASS
	Ant0	2462	-13.25	≤8.00	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

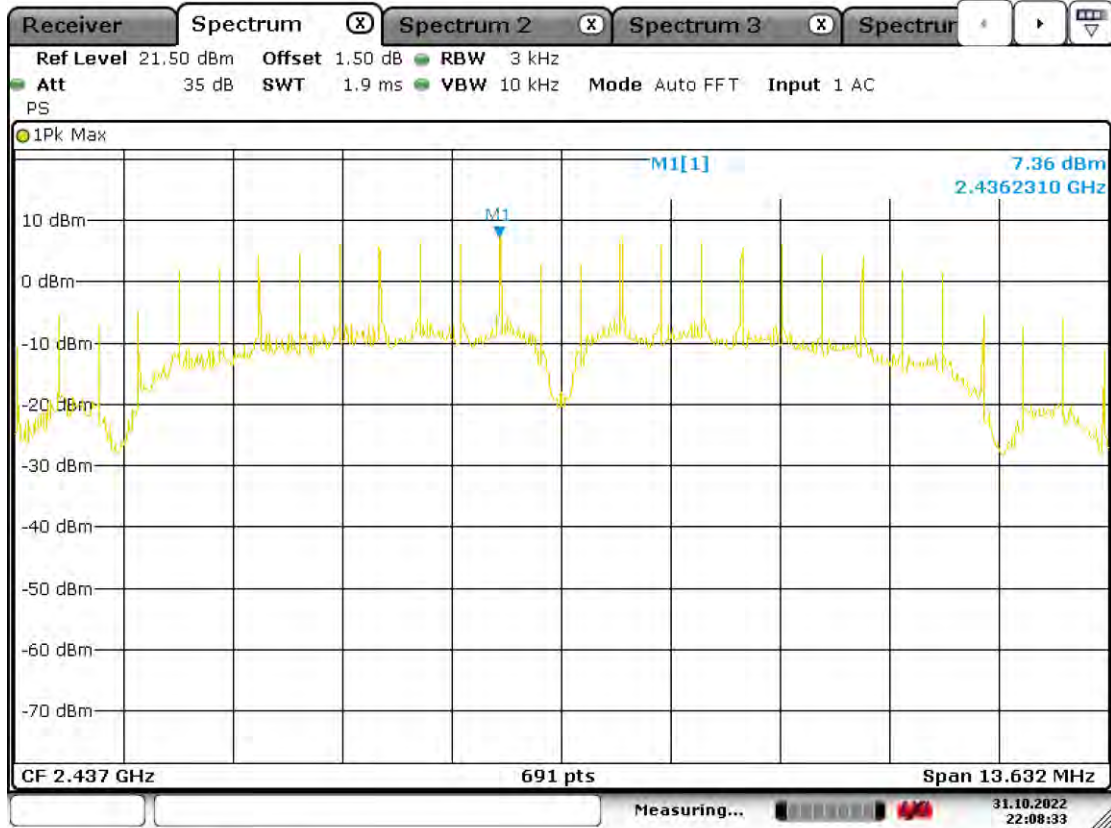
TEST GRAPHS





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



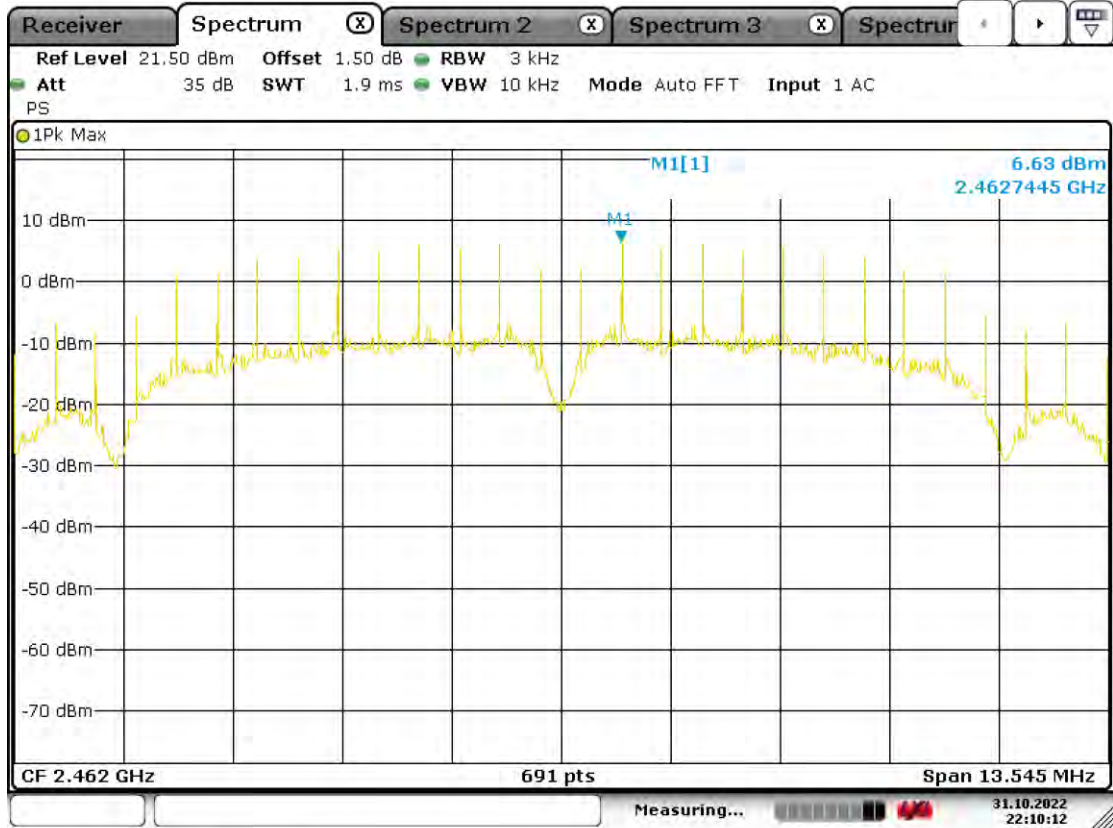
Date: 31.OCT.2022 22:08:32

11B_Ant0_2462



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



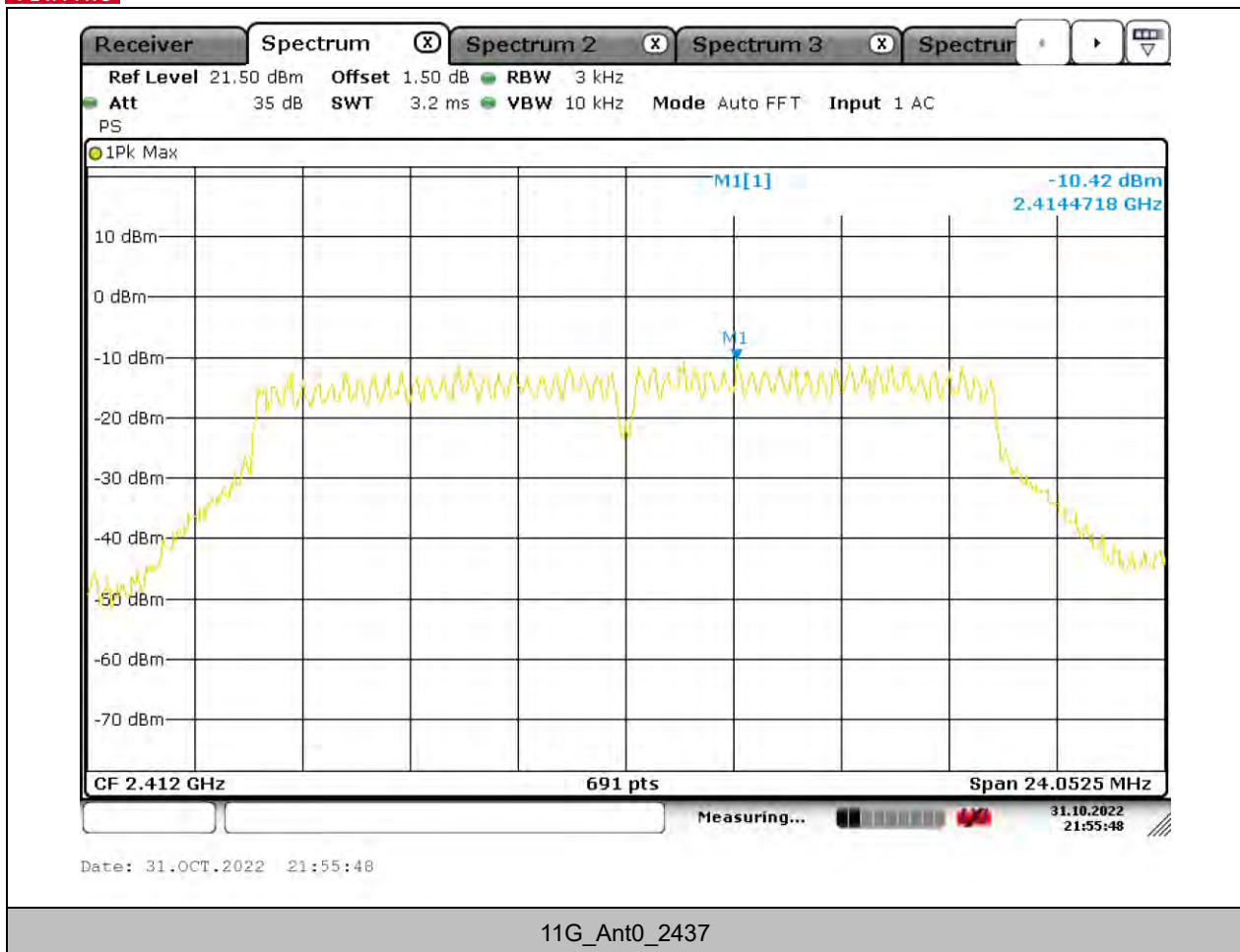
Date: 31.OCT.2022 22:10:12

11G_Ant0_2412



BUREAU
VERITAS

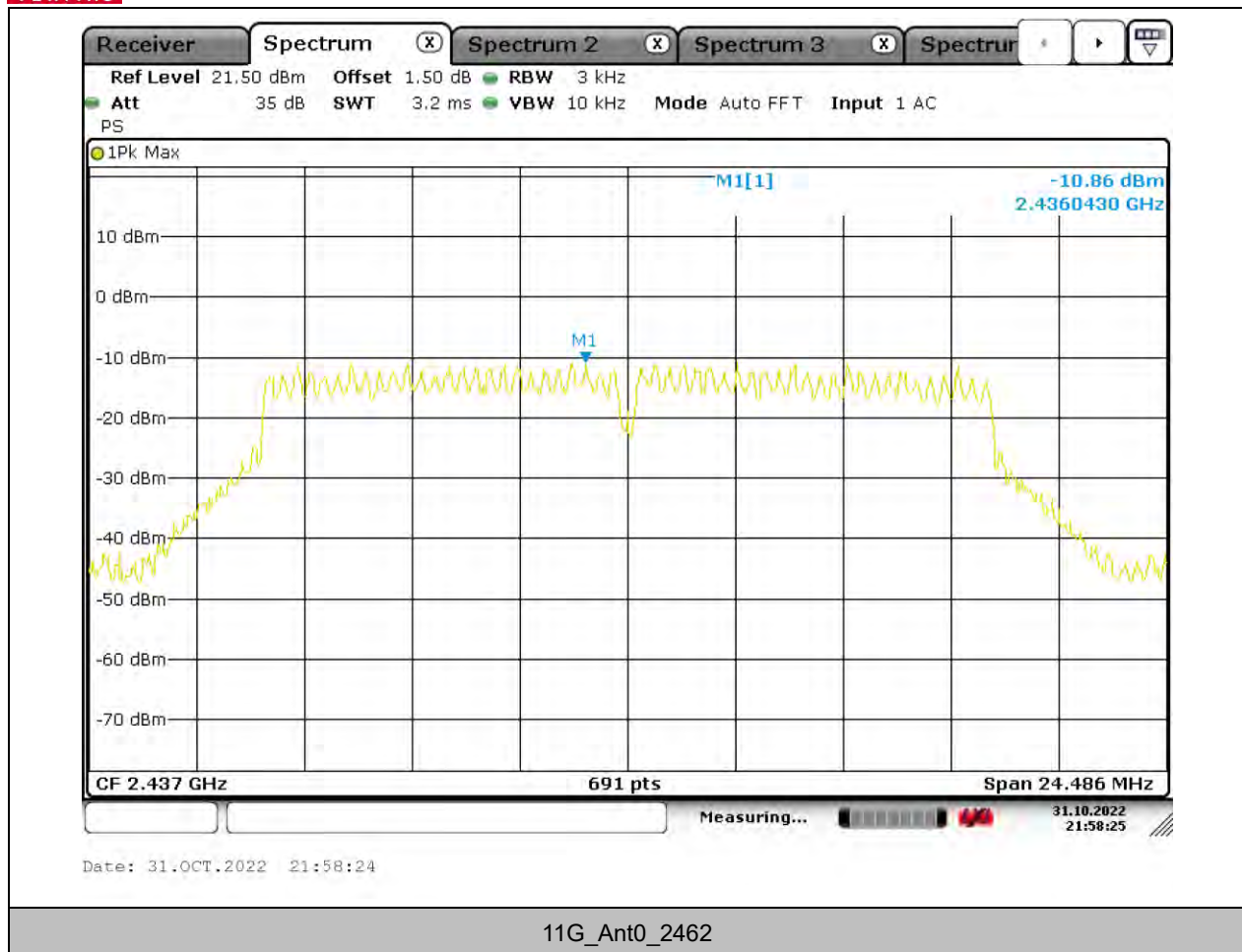
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

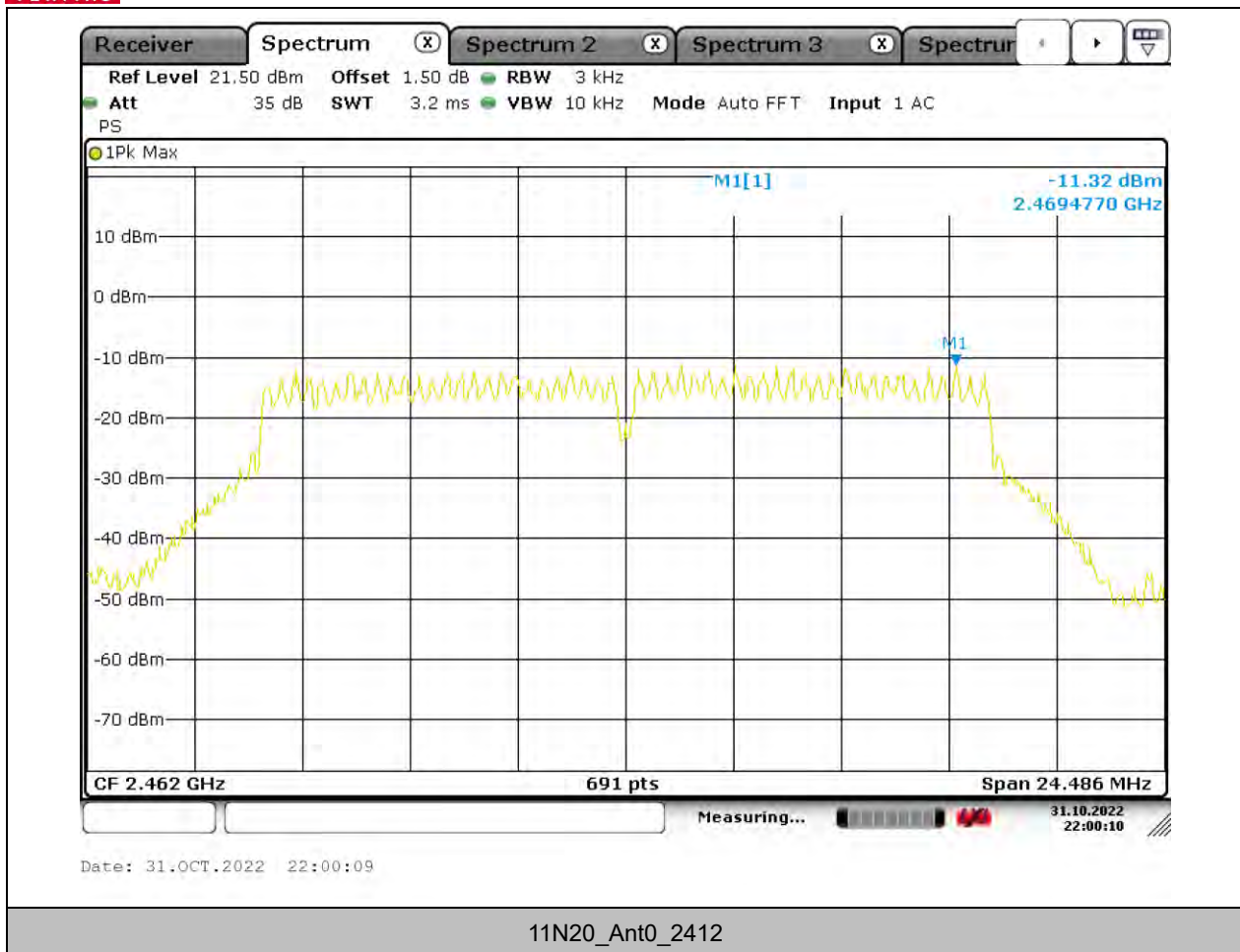
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

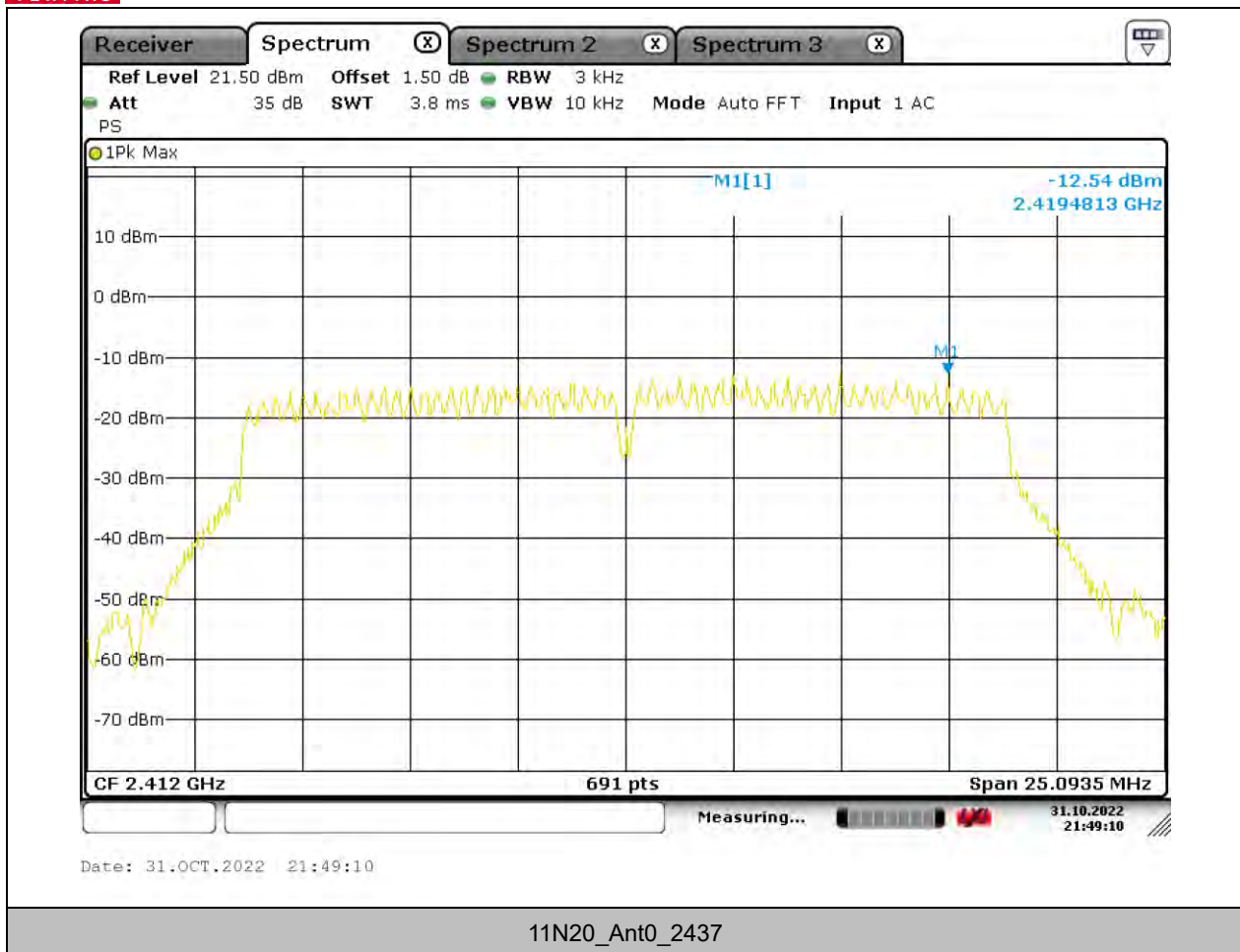
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

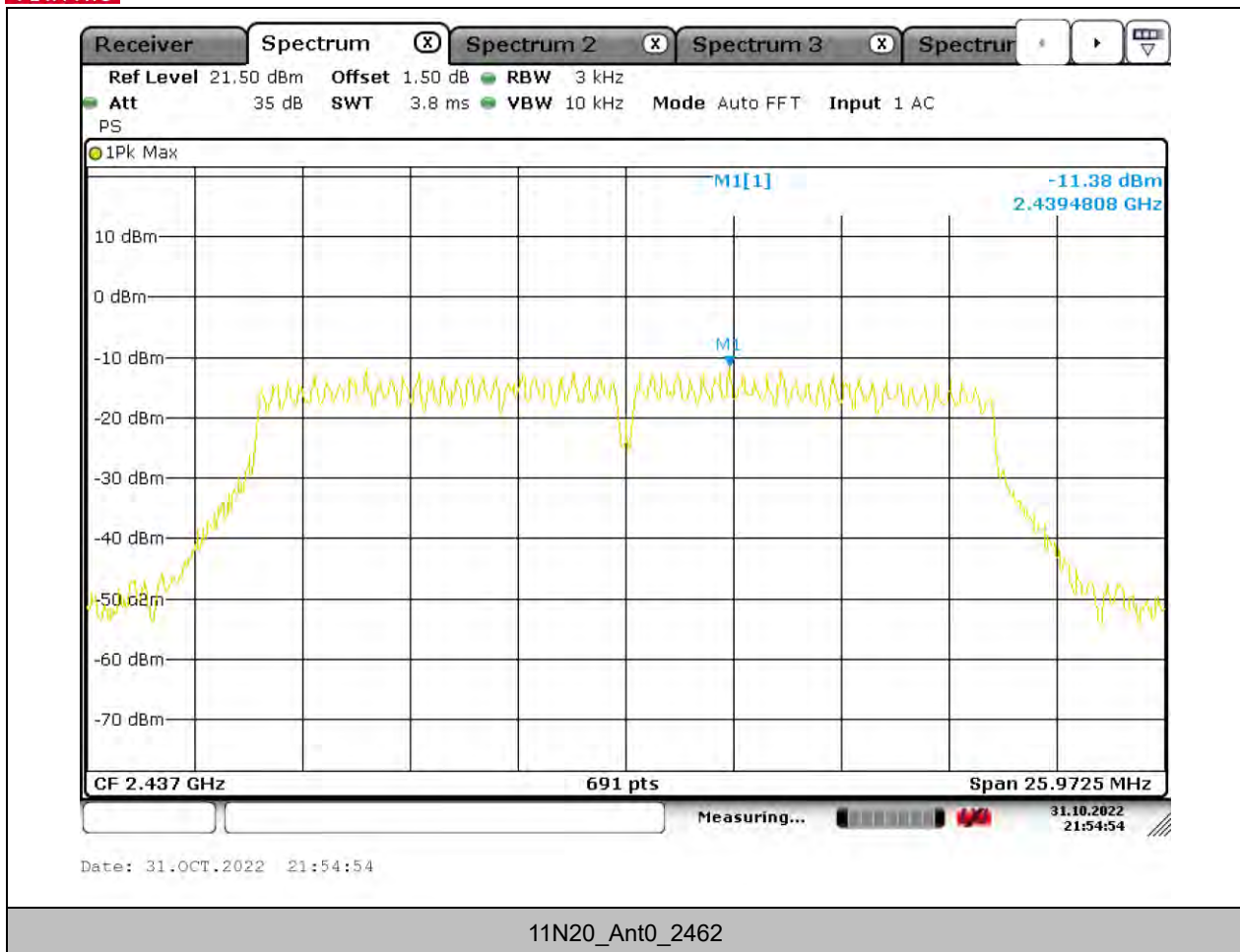
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

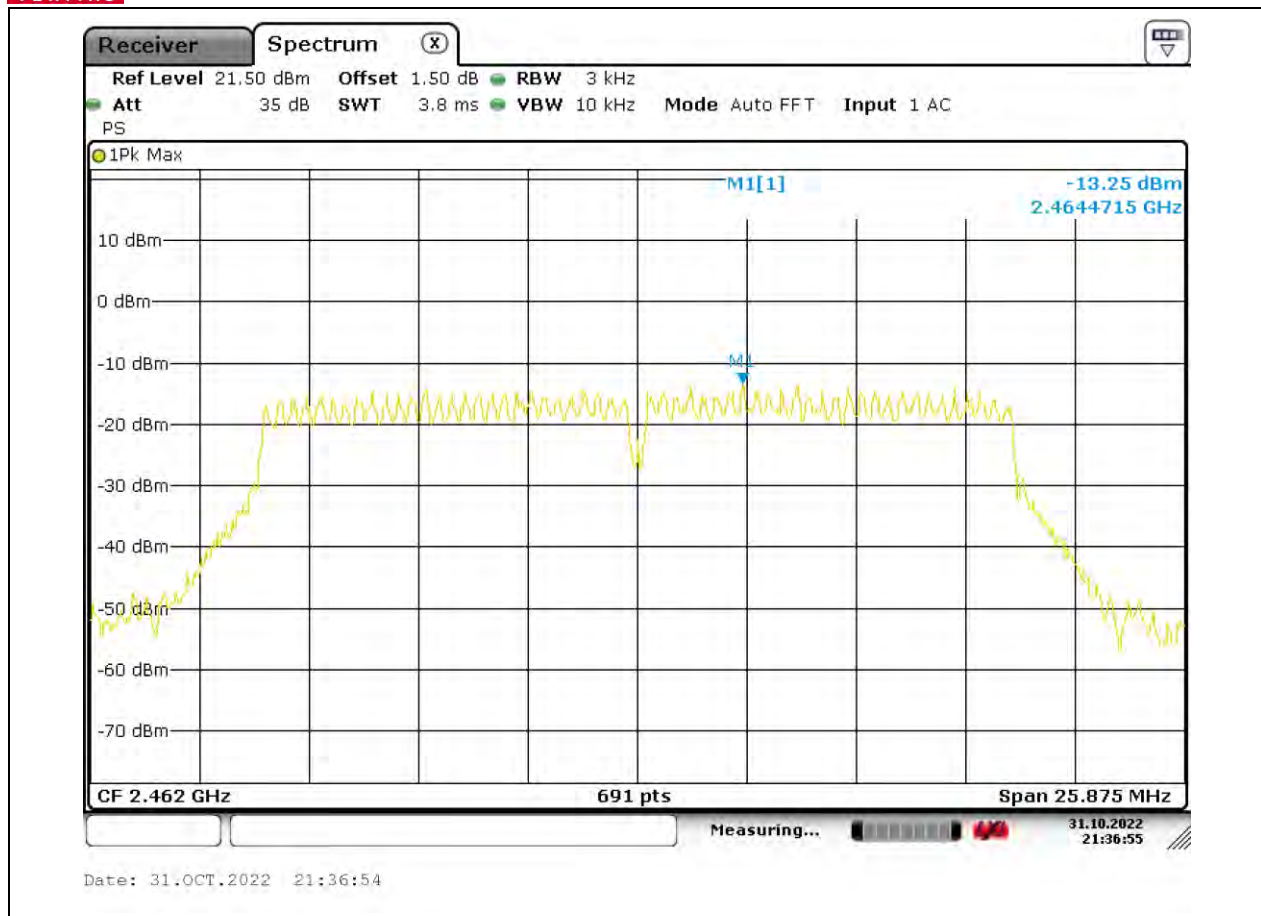
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02





**BUREAU
VERITAS**

Test Report No.: W7L-P22090023RF02

BAND EDGE MEASUREMENTS

TEST RESULT

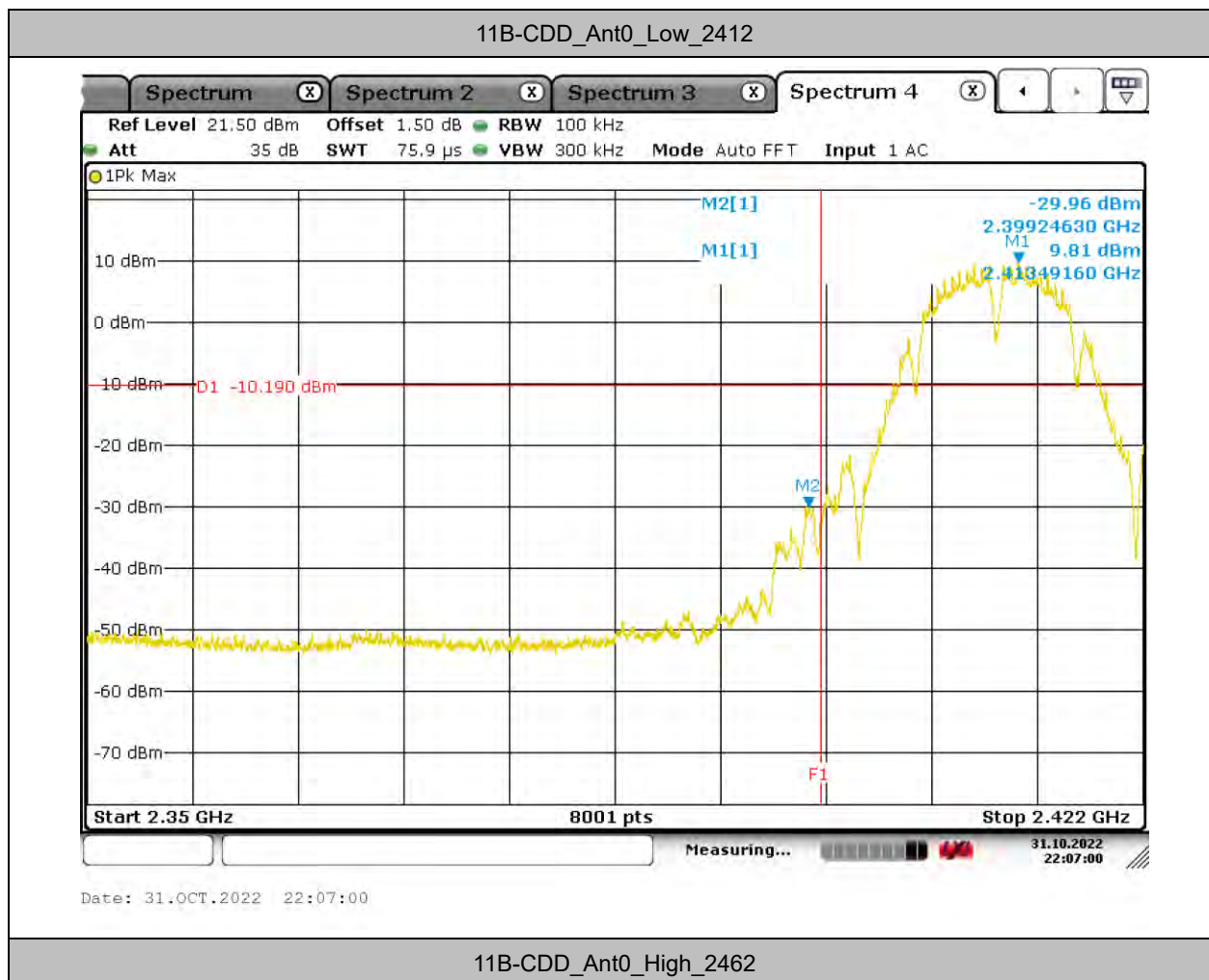
TestMode	Antenna	ChName	Frequency [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant0	Low	2412	9.81	-29.96	≤-10.19	PASS
	Ant0	High	2462	8.76	-49.02	≤-11.24	PASS
11G	Ant0	Low	2412	4.49	-28.02	≤-15.51	PASS
	Ant0	High	2462	3.52	-43.19	≤-16.48	PASS
11N20	Ant0	Low	2412	2.23	-37.08	≤-17.77	PASS
	Ant0	High	2462	1.16	-44.93	≤-18.84	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

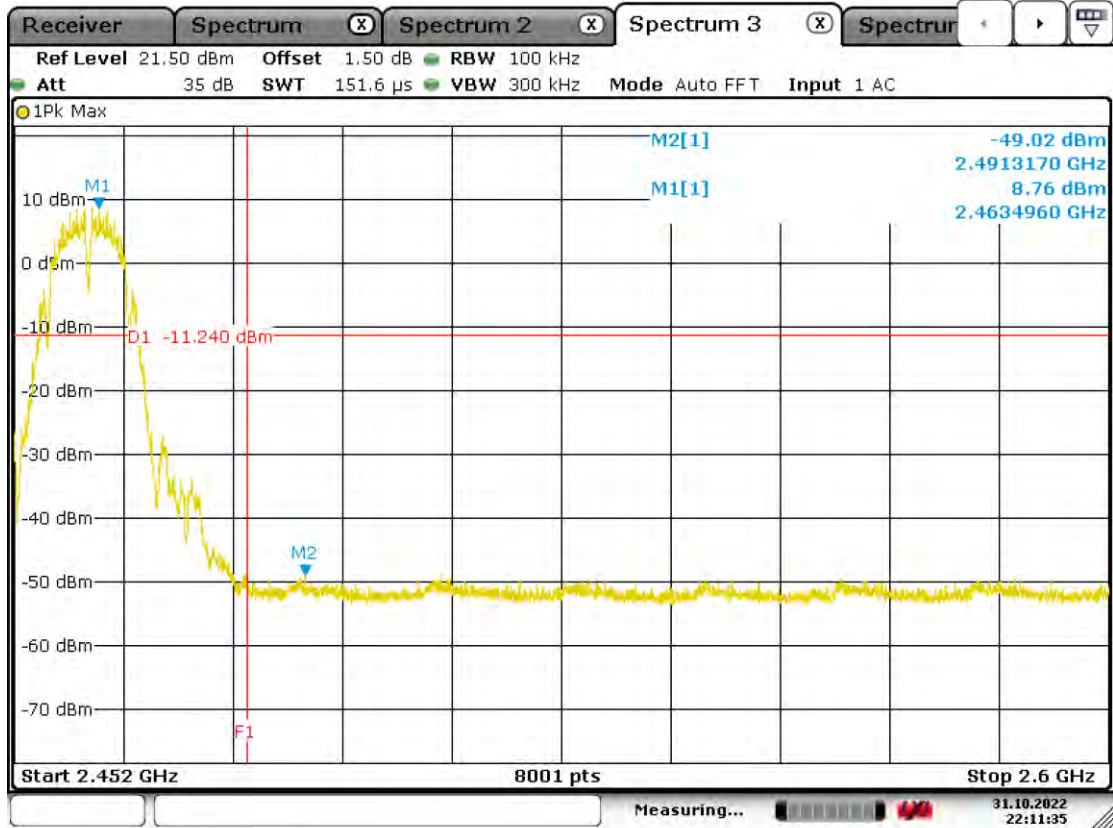
TEST GRAPHS





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



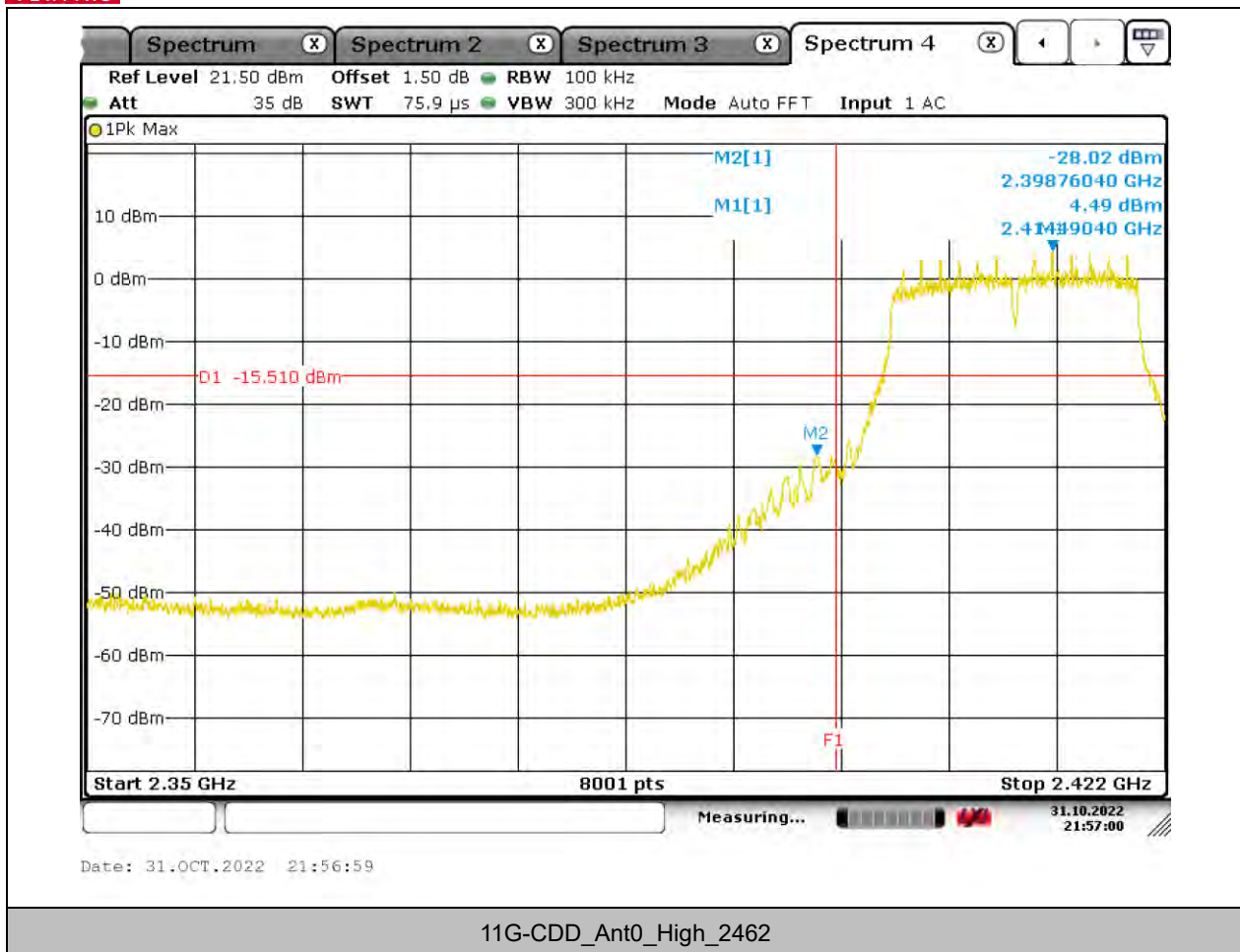
Date: 31.OCT.2022 22:11:34

11G-CDD_Ant0_Low_2412



BUREAU
VERITAS

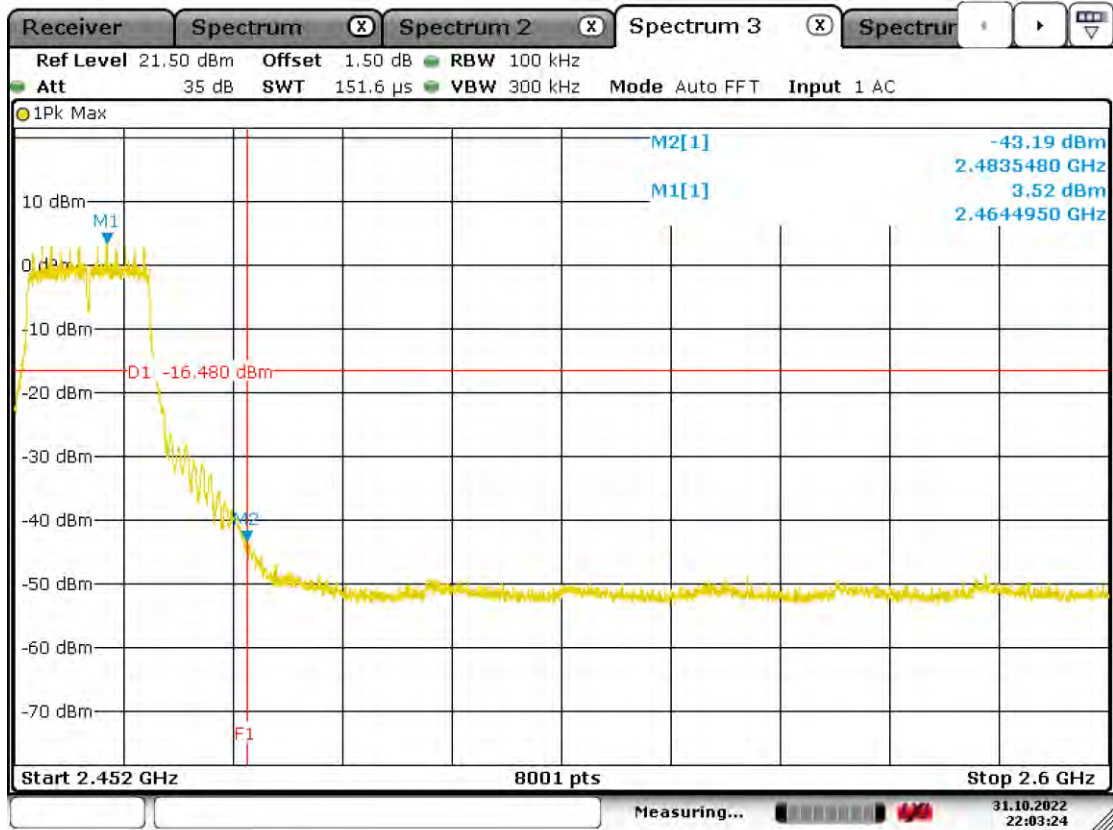
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



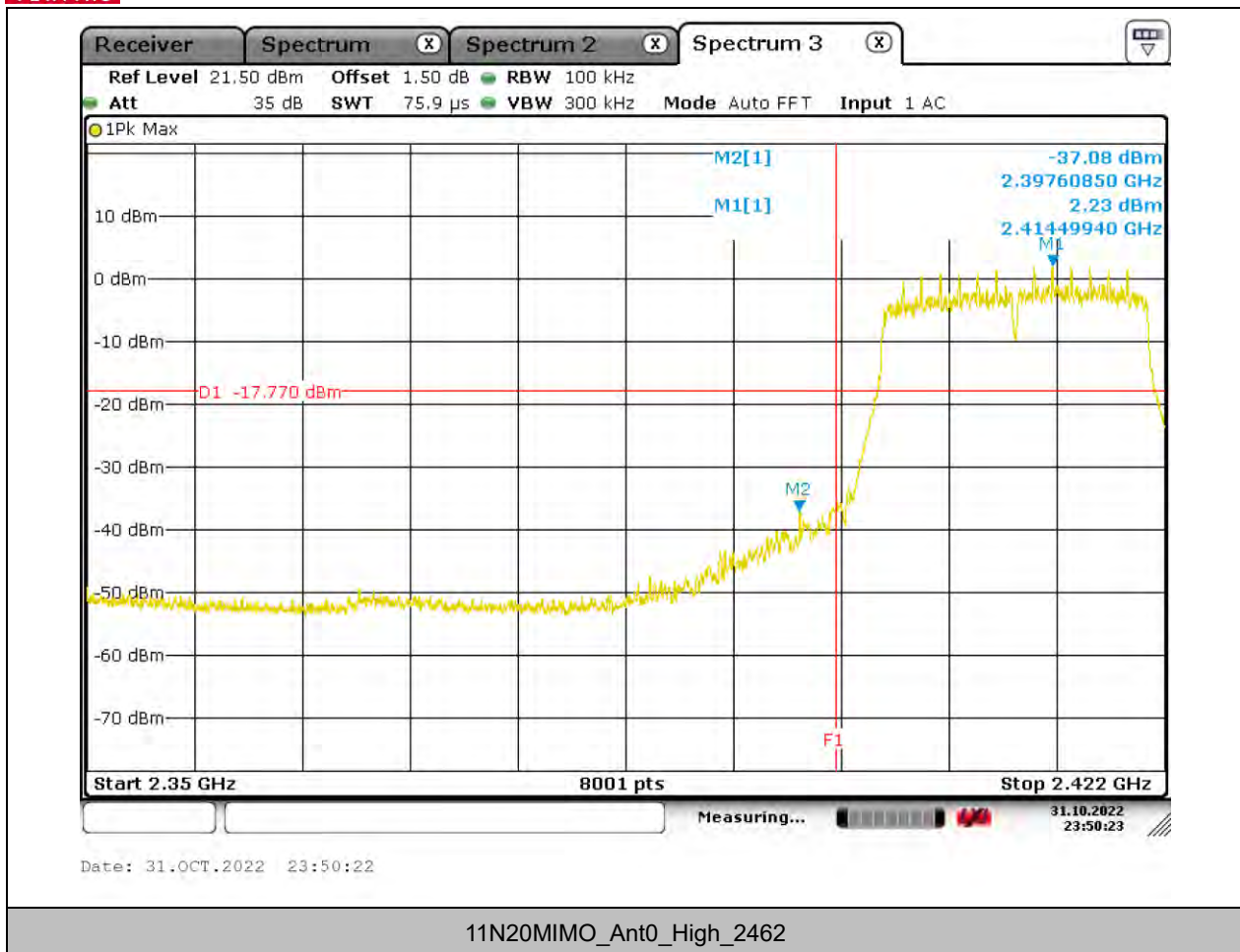
Date: 31.OCT.2022 22:03:24

11N20MIMO_Ant0_Low_2412



BUREAU
VERITAS

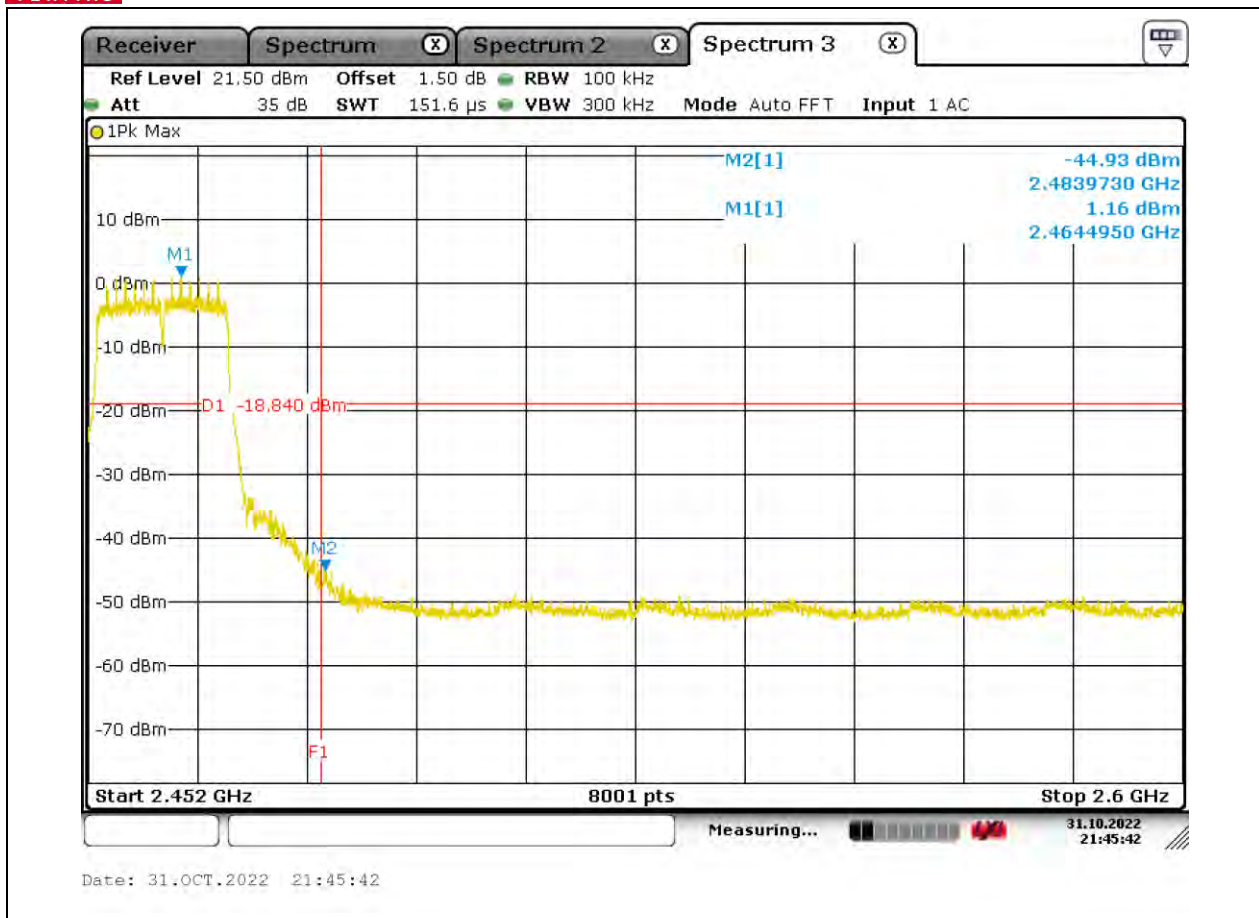
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



CONDUCTED SPURIOUS EMISSION TEST RESULT

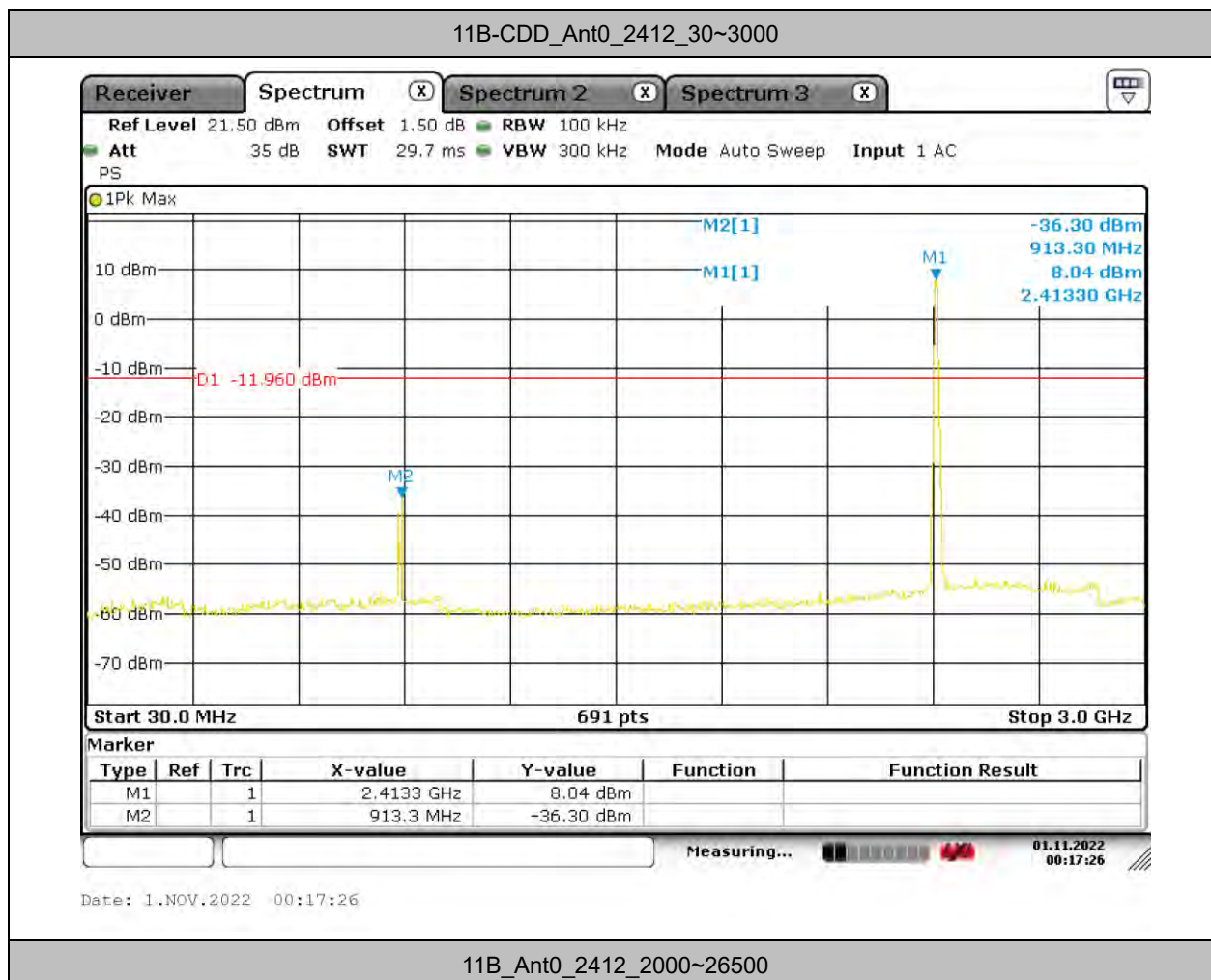
TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant0	2412	30~3000	8.04	-36.30	≤-11.96	PASS
			2000~26500	8.38	-42.36	≤-11.62	PASS
	Ant0	2437	30~3000	8.17	-34.79	≤-11.83	PASS
			2000~26500	8.62	-42.49	≤-11.38	PASS
	Ant0	2462	30~3000	7.46	-37.74	≤-12.54	PASS
			2000~26500	7.34	-41.77	≤-12.66	PASS
11G	Ant0	2412	30~3000	3.81	-30.59	≤-16.19	PASS
			2000~26500	3.60	-42.55	≤-16.40	PASS
	Ant0	2437	30~3000	4.45	-33.05	≤-15.55	PASS
			2000~26500	4.57	-42.37	≤-15.43	PASS
	Ant0	2462	30~3000	2.96	-36.07	≤-17.04	PASS
			2000~26500	3.22	-41.67	≤-16.78	PASS
11N20	Ant0	2412	30~3000	1.17	-55.17	≤-18.83	PASS
			2000~26500	1.58	-41.90	≤-18.42	PASS
	Ant0	2437	30~3000	2.82	-38.70	≤-17.18	PASS
			2000~26500	3.10	-42.57	≤-16.90	PASS
	Ant0	2462	30~3000	0.82	-31.64	≤-19.18	PASS
			2000~26500	1.18	-41.71	≤-18.82	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

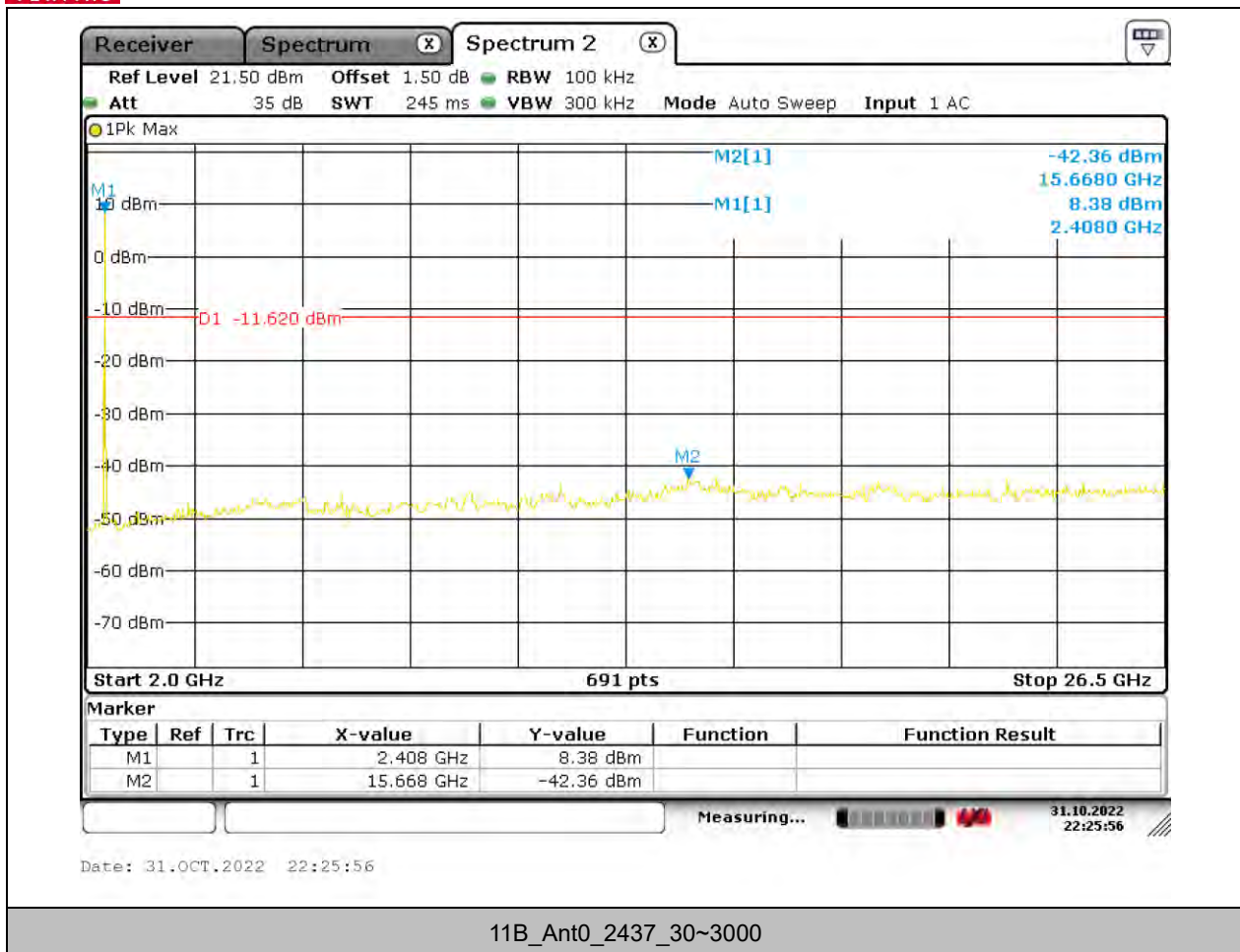
TEST GRAPHS





BUREAU
VERITAS

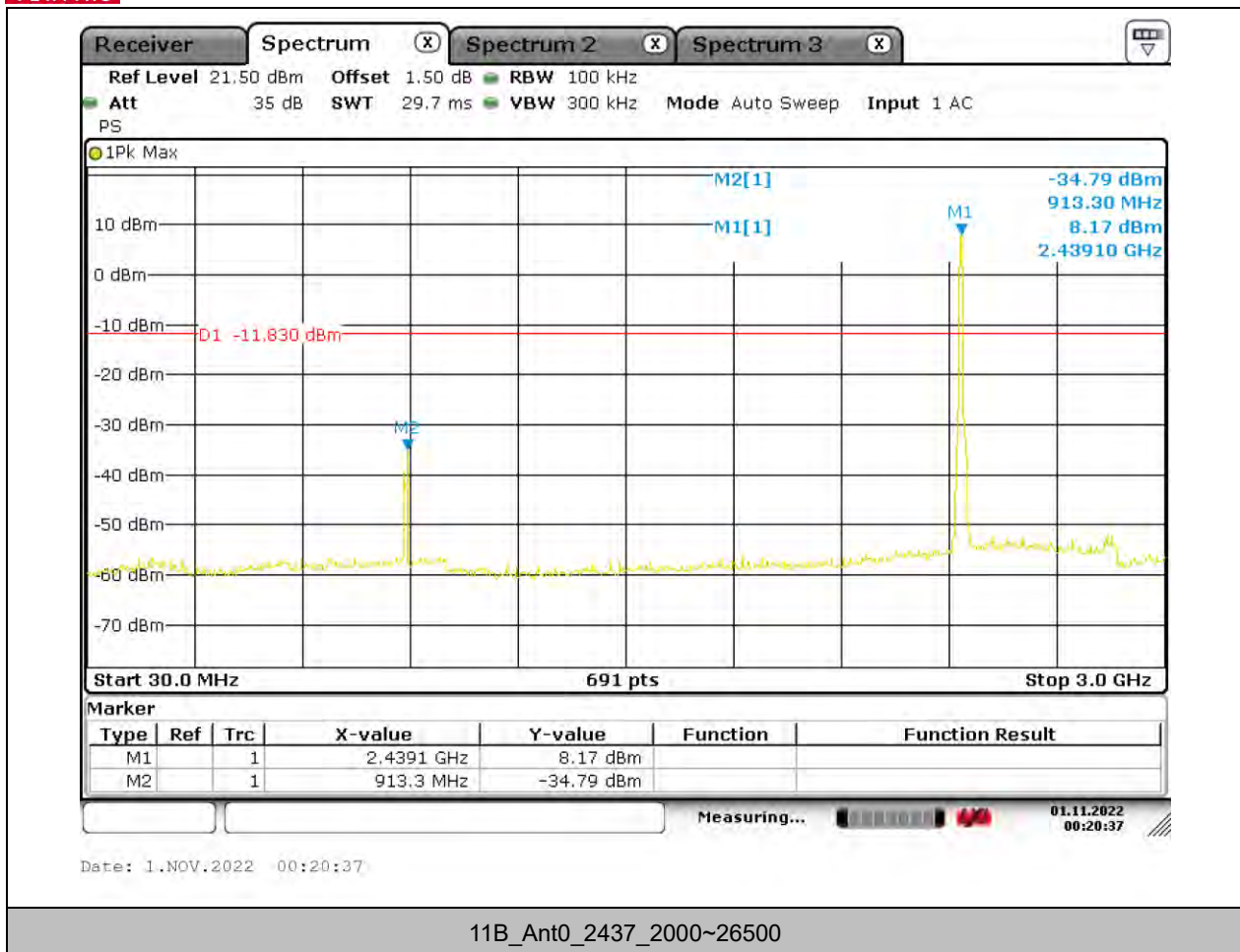
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

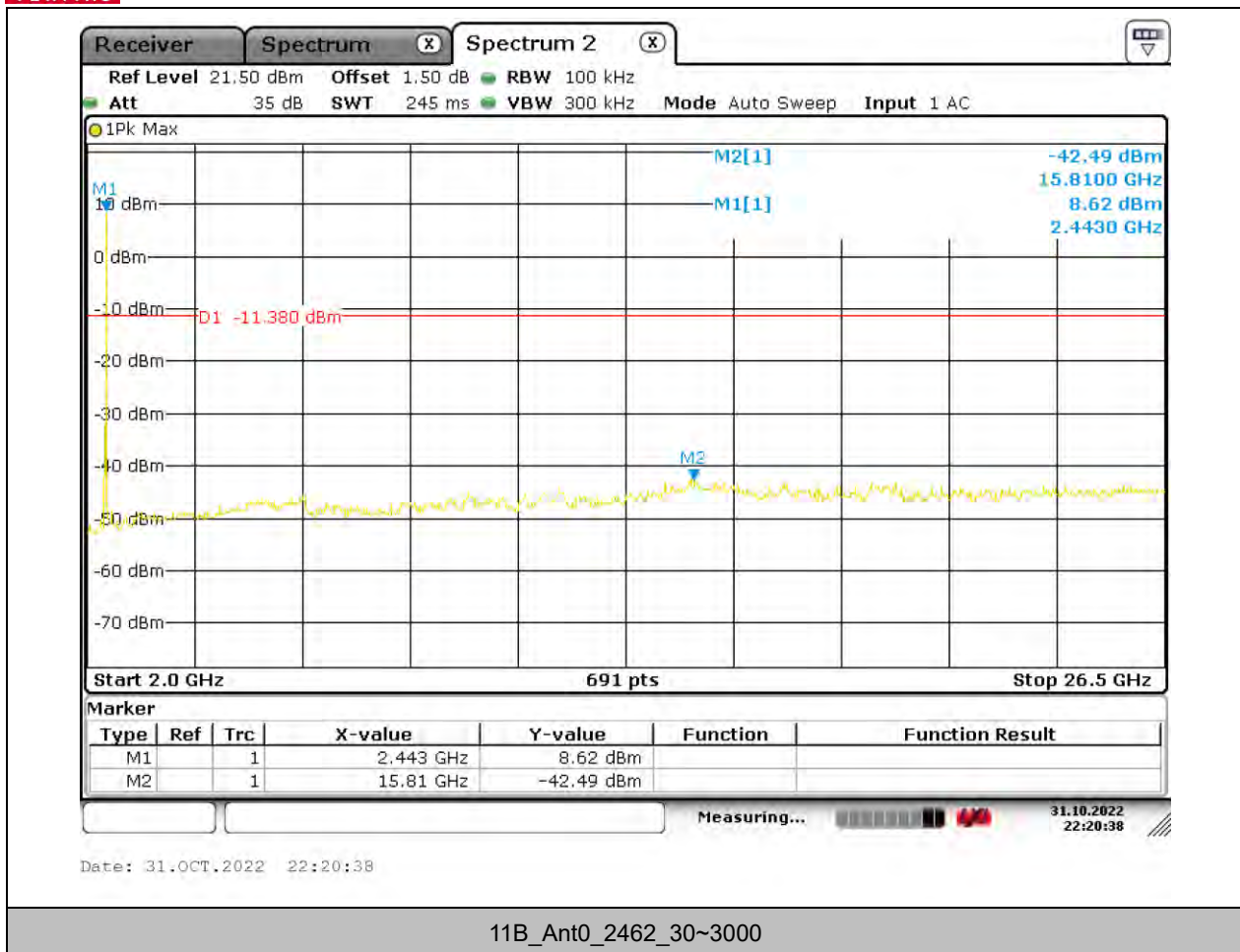
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

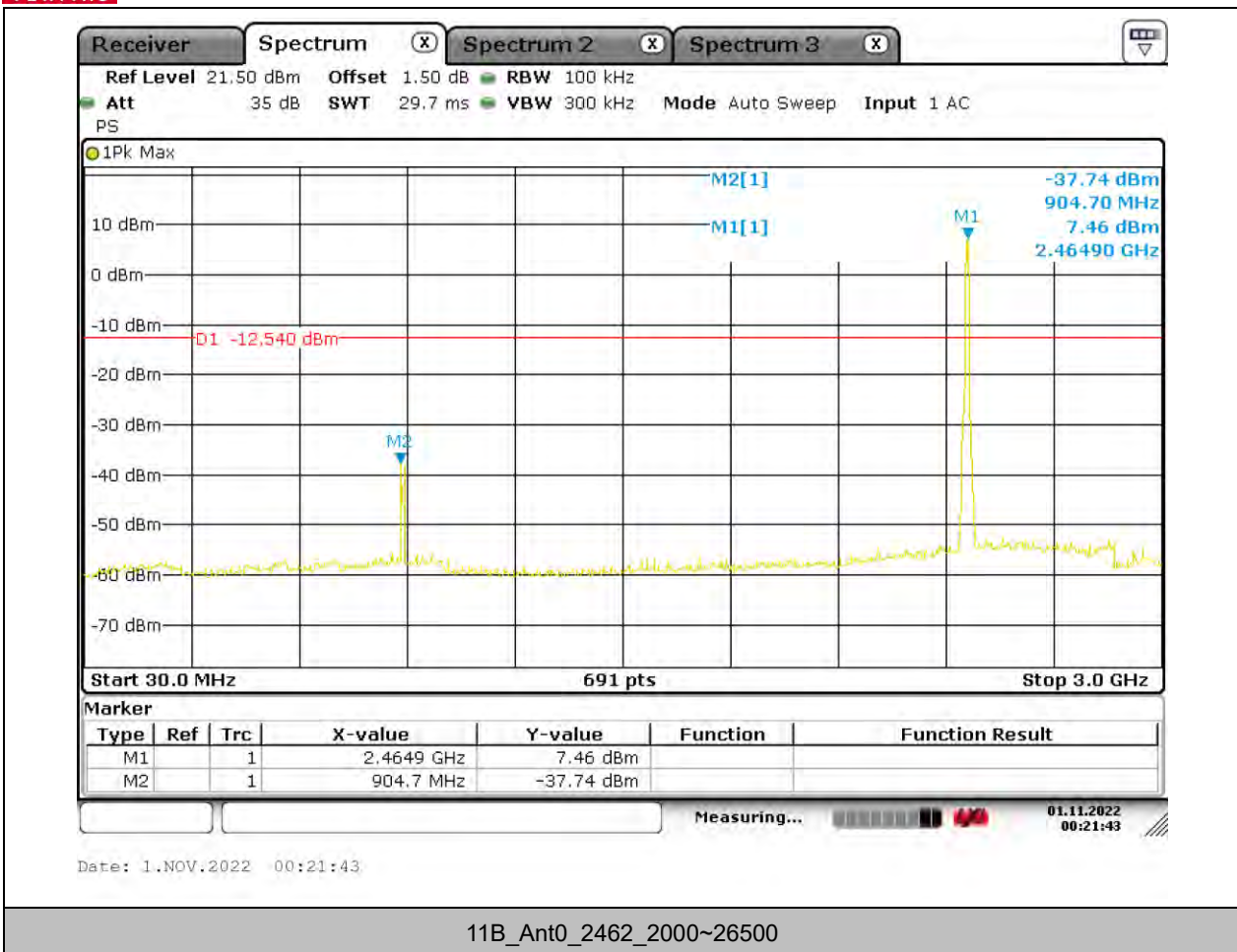
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

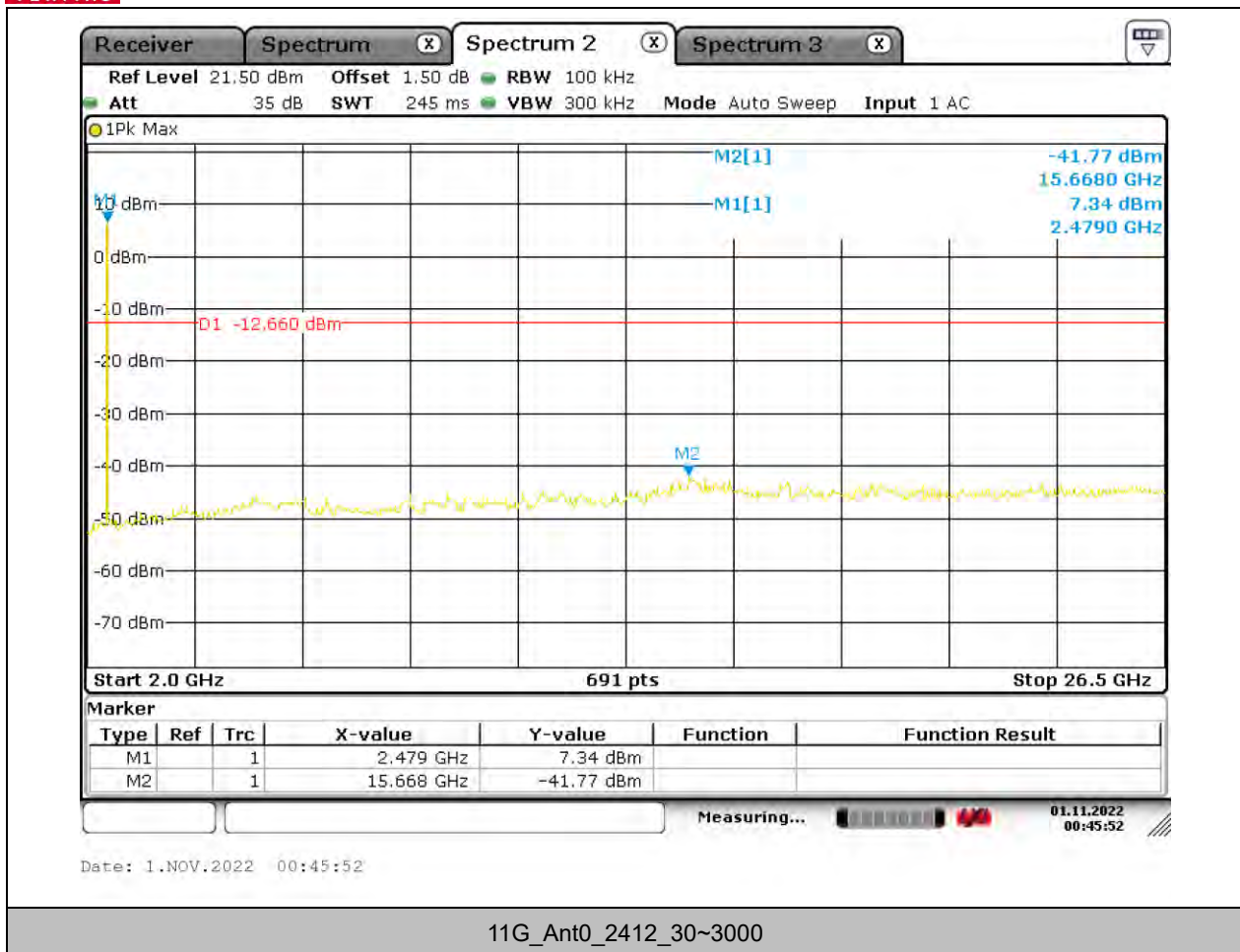
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

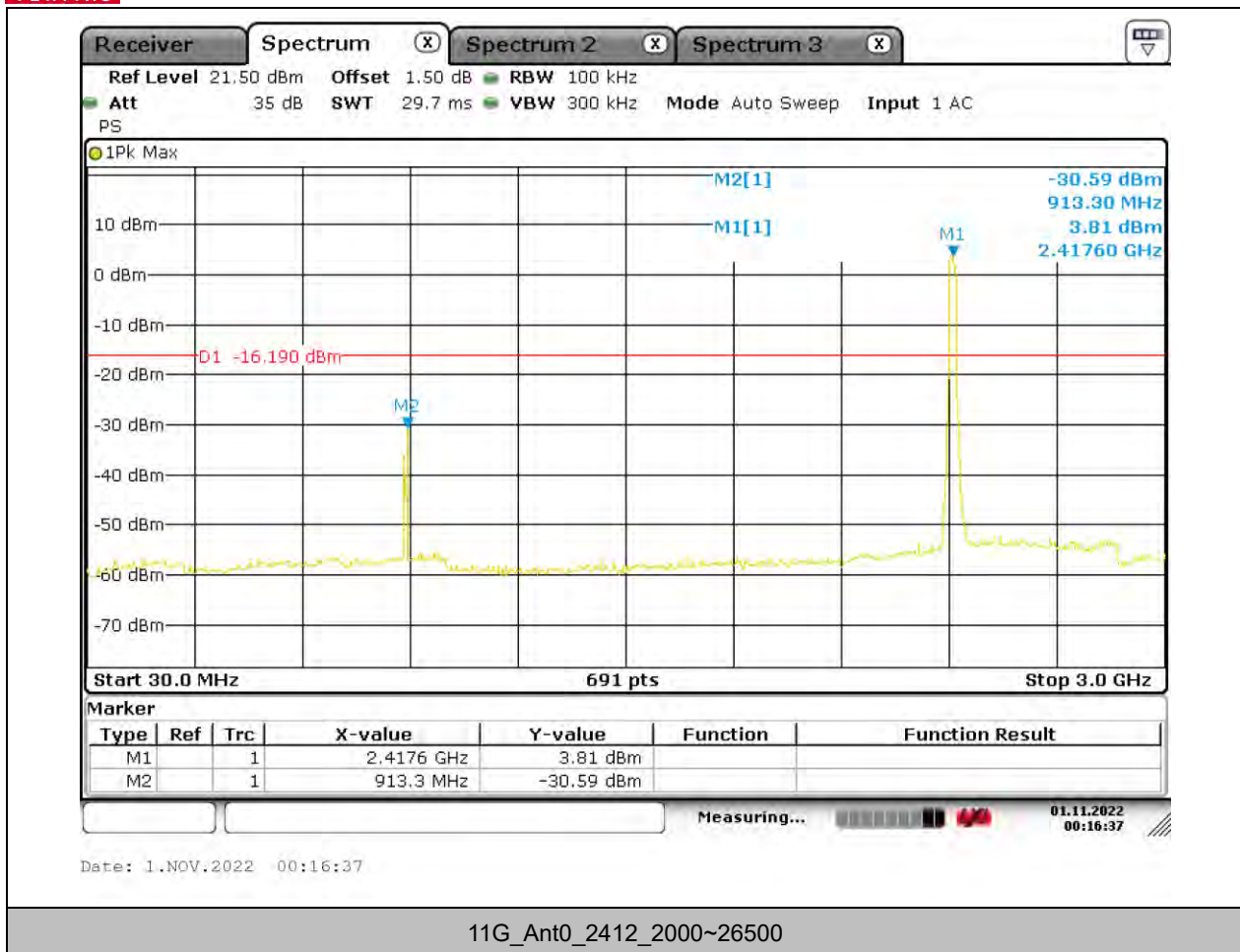
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

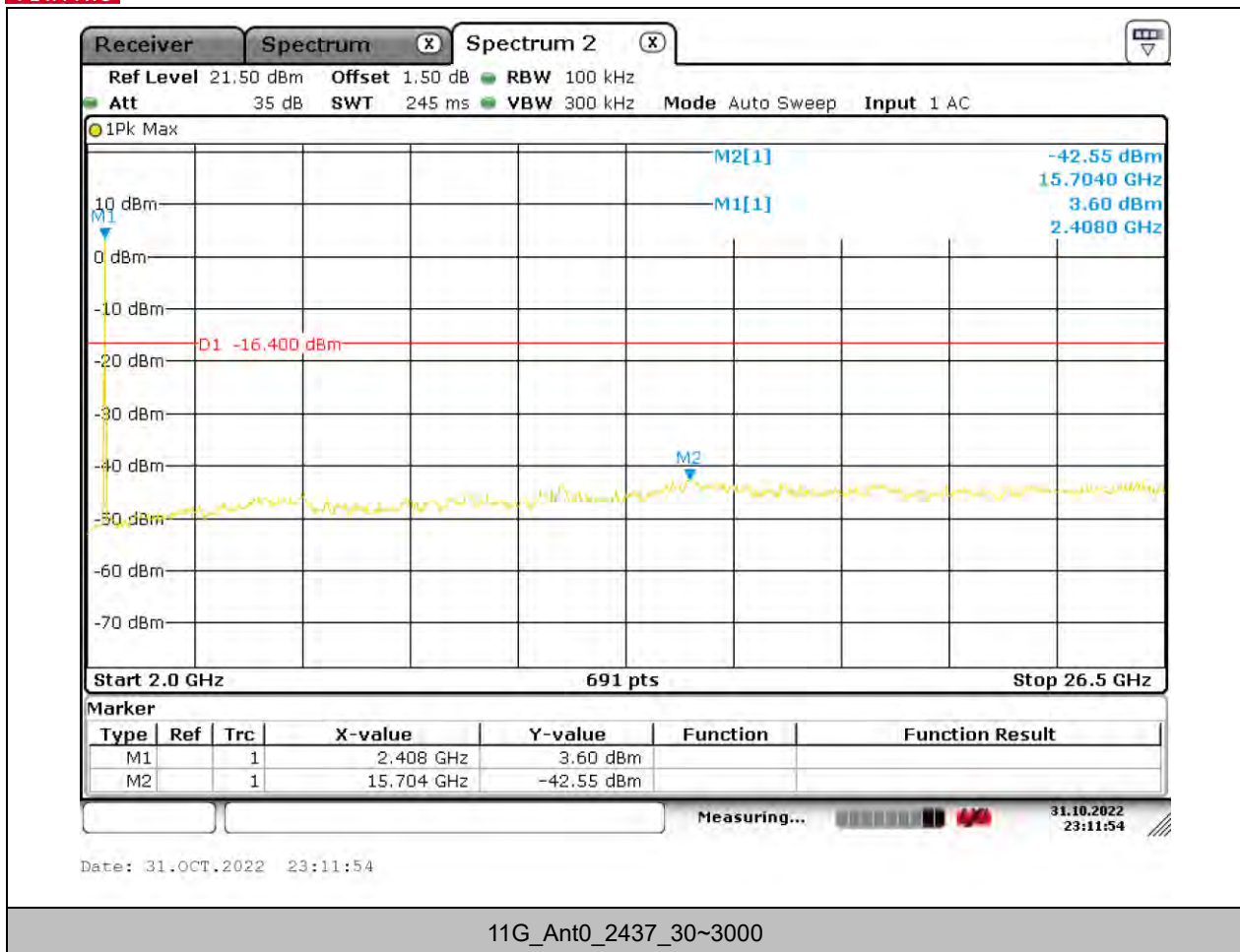
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

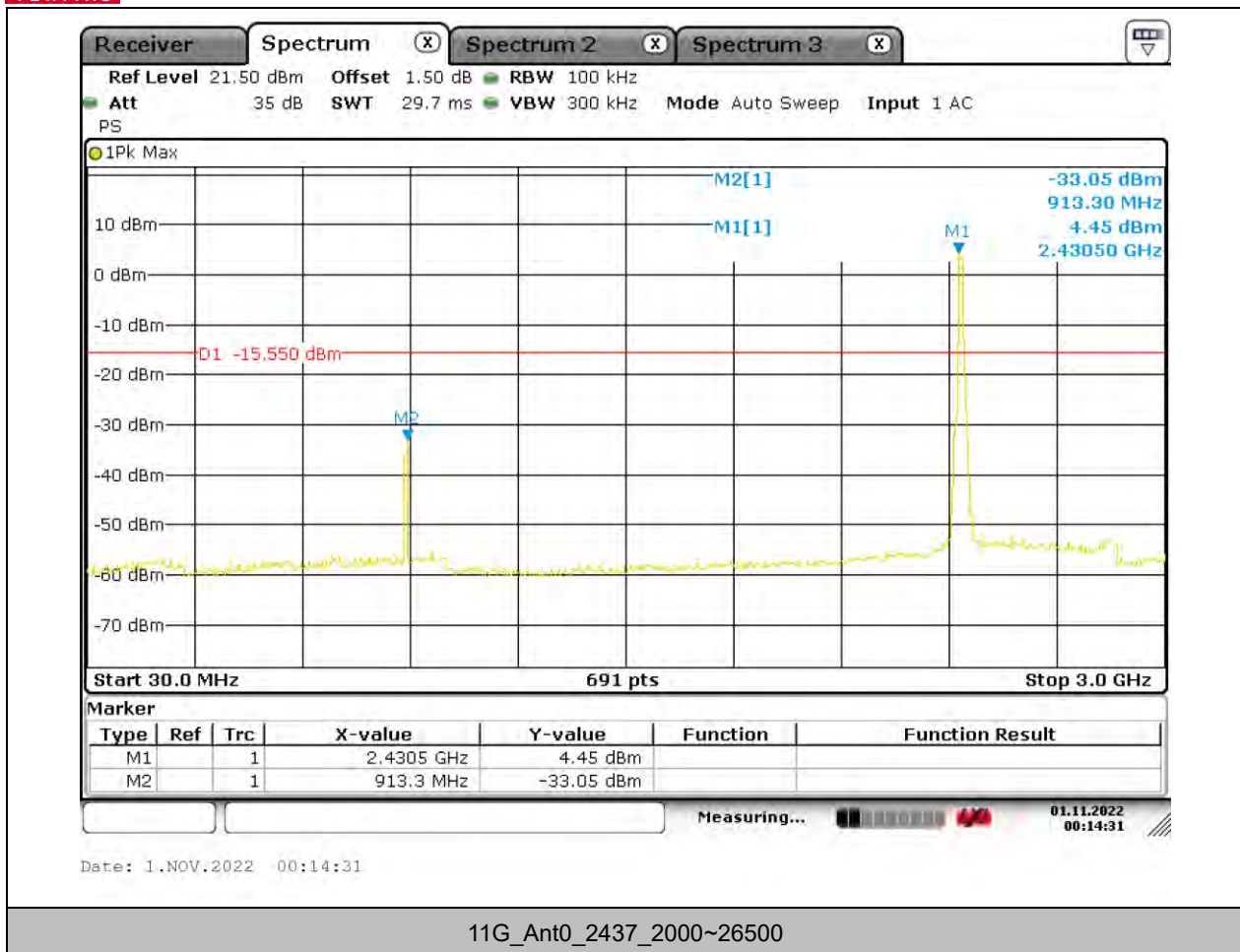
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

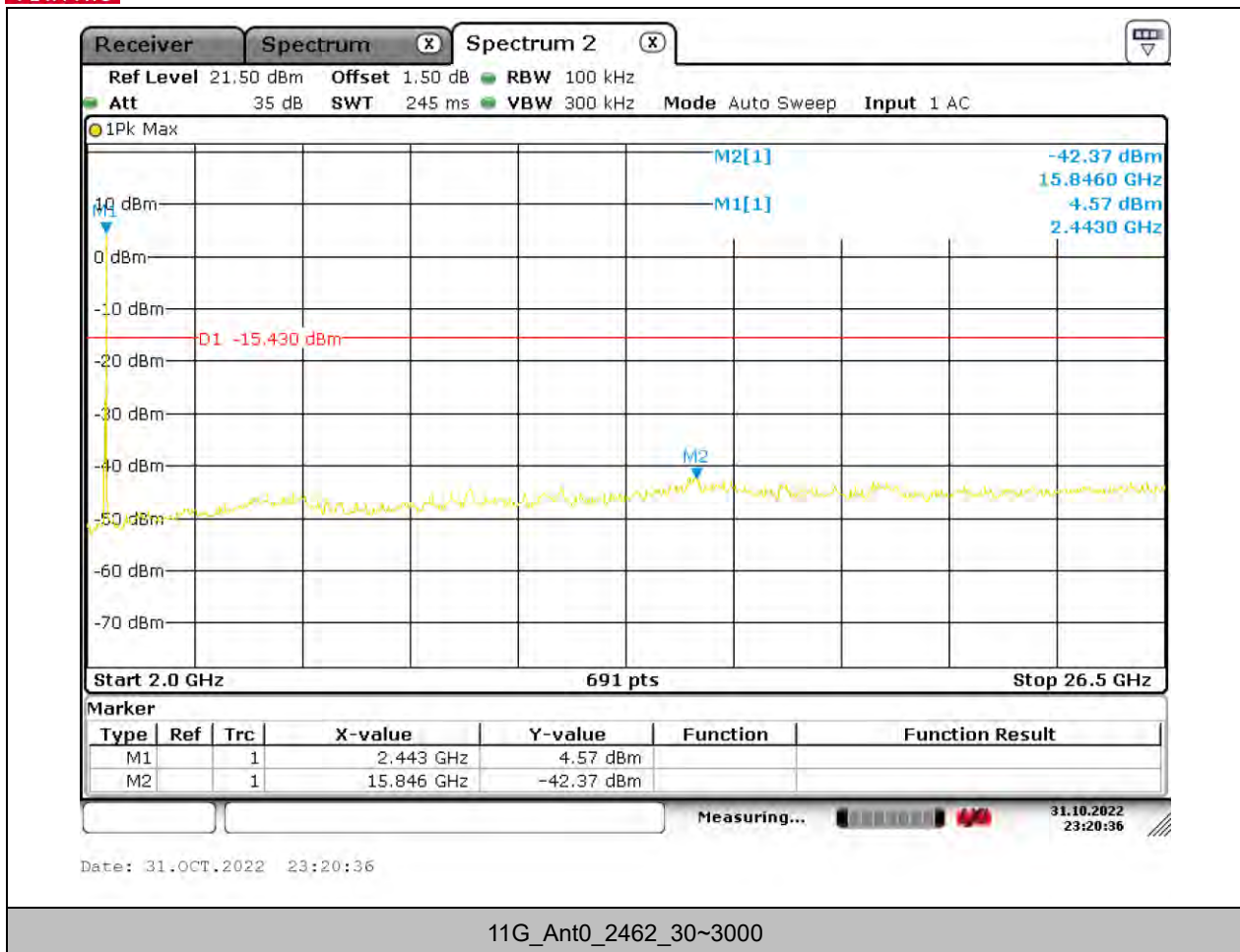
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

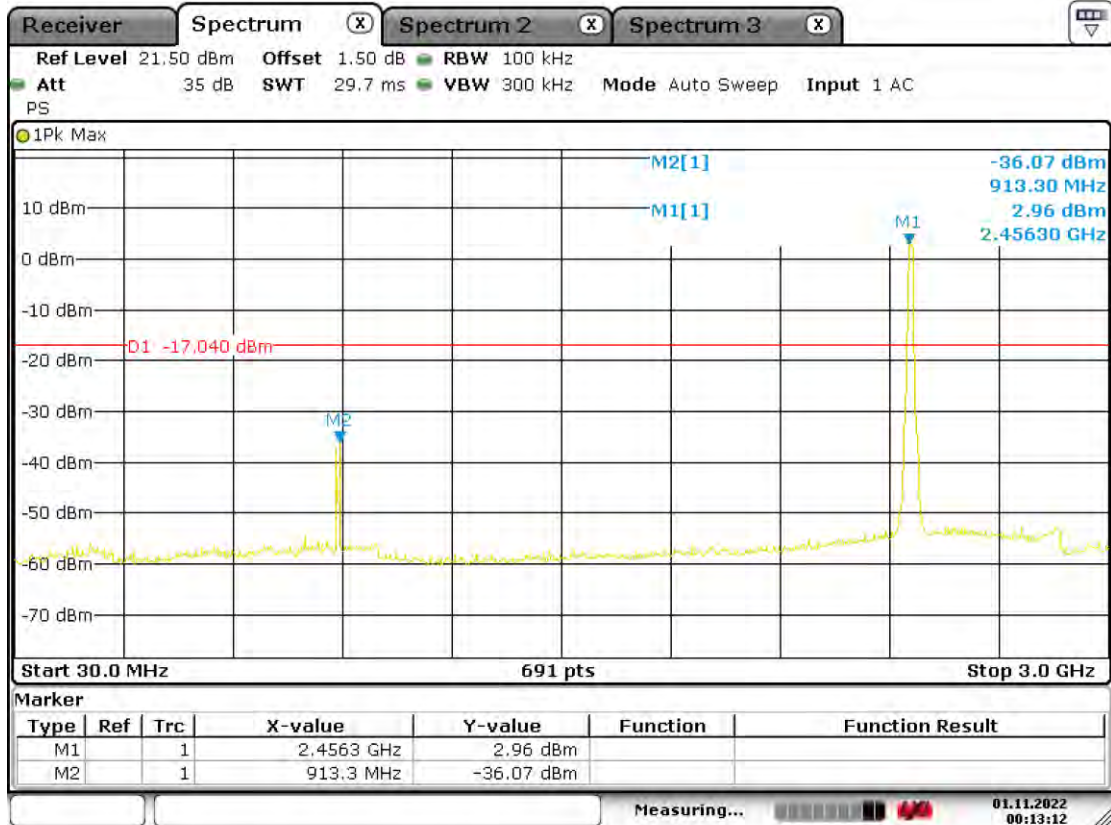
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



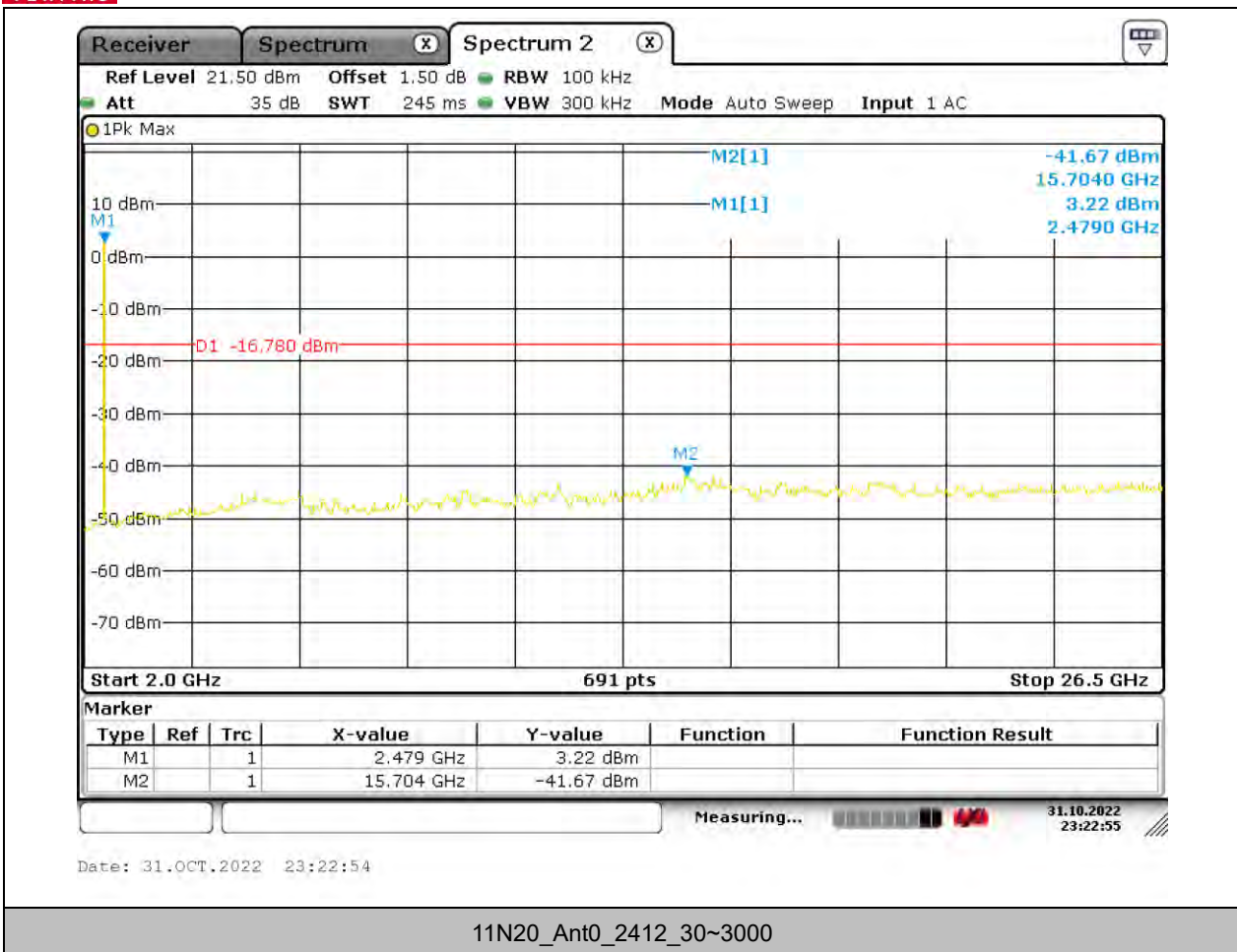
Date: 1.NOV.2022 00:13:12

11G_Ant0_2462_2000~26500



BUREAU
VERITAS

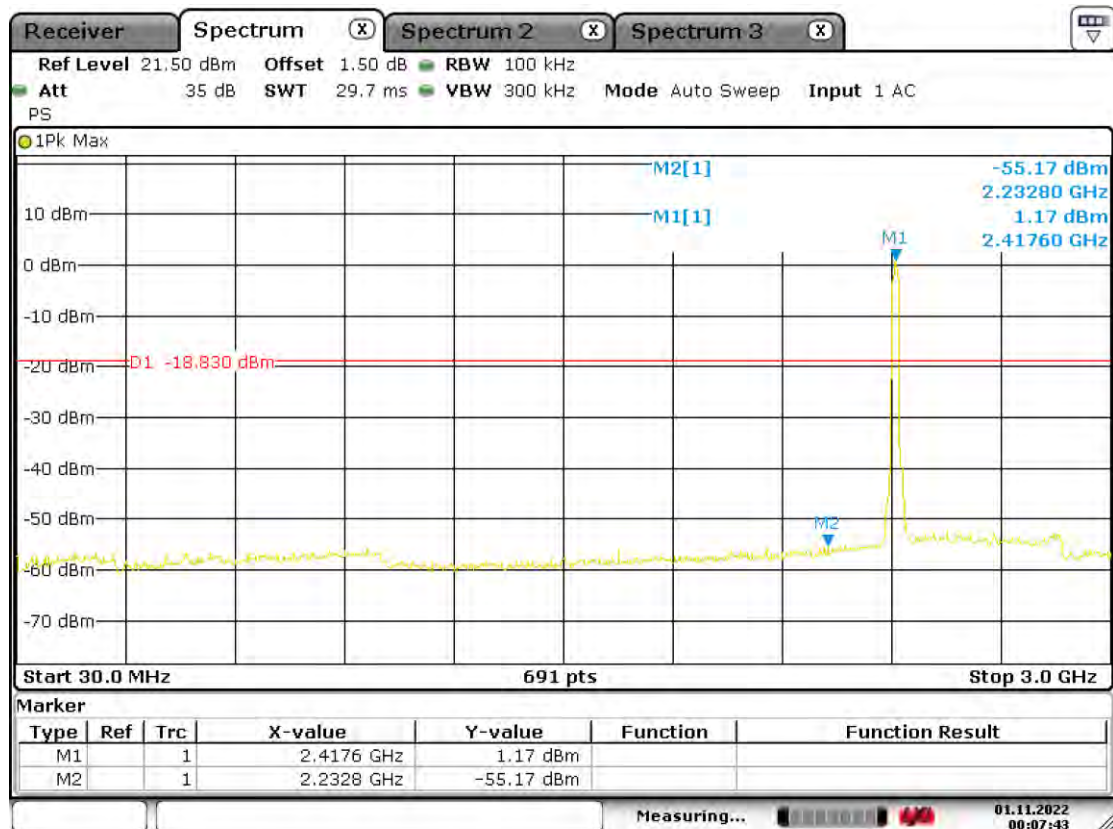
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



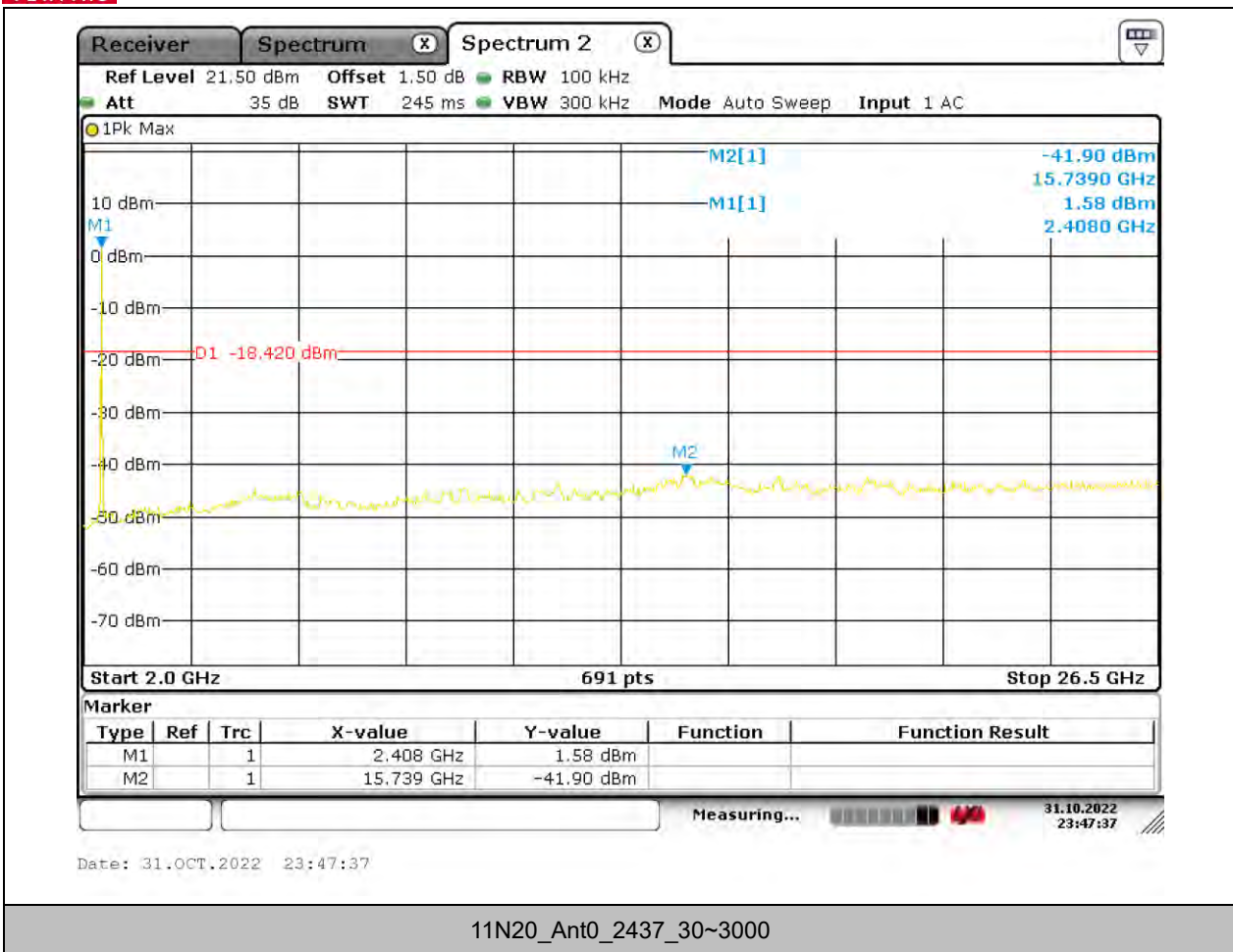
Date: 1.NOV.2022 00:07:43

11N20_Ant0_2412_2000~26500



BUREAU
VERITAS

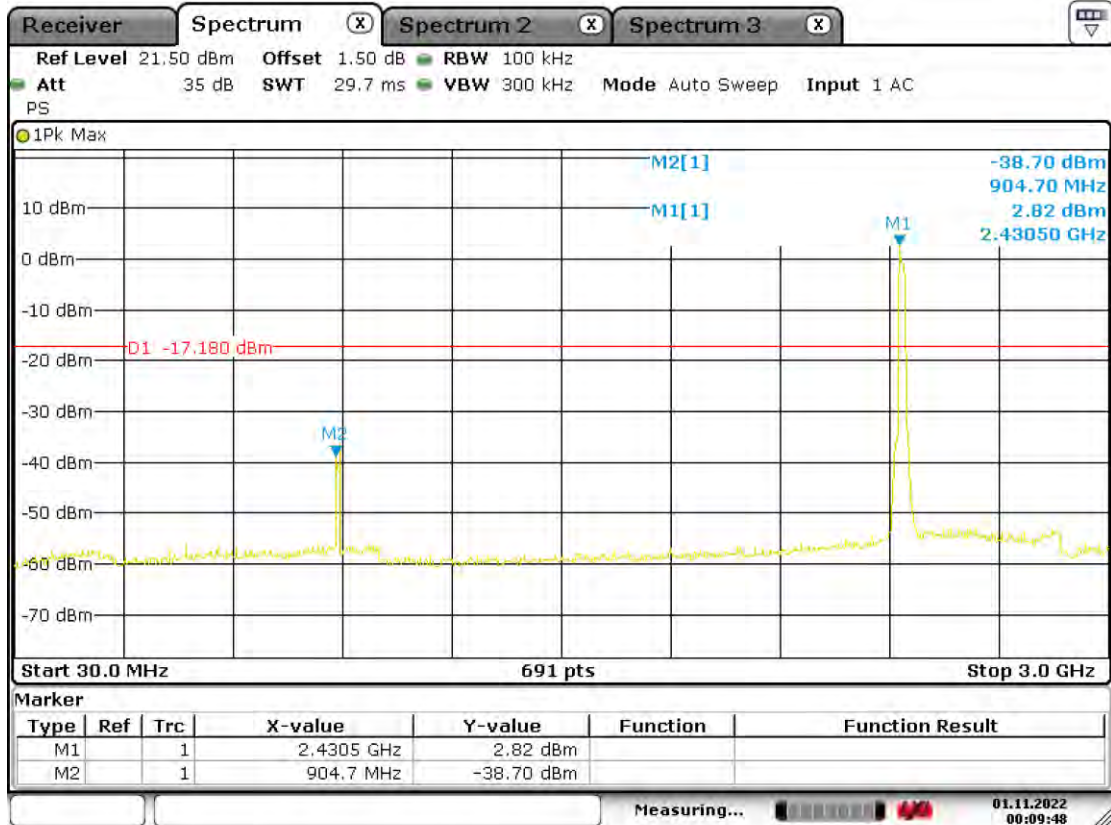
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



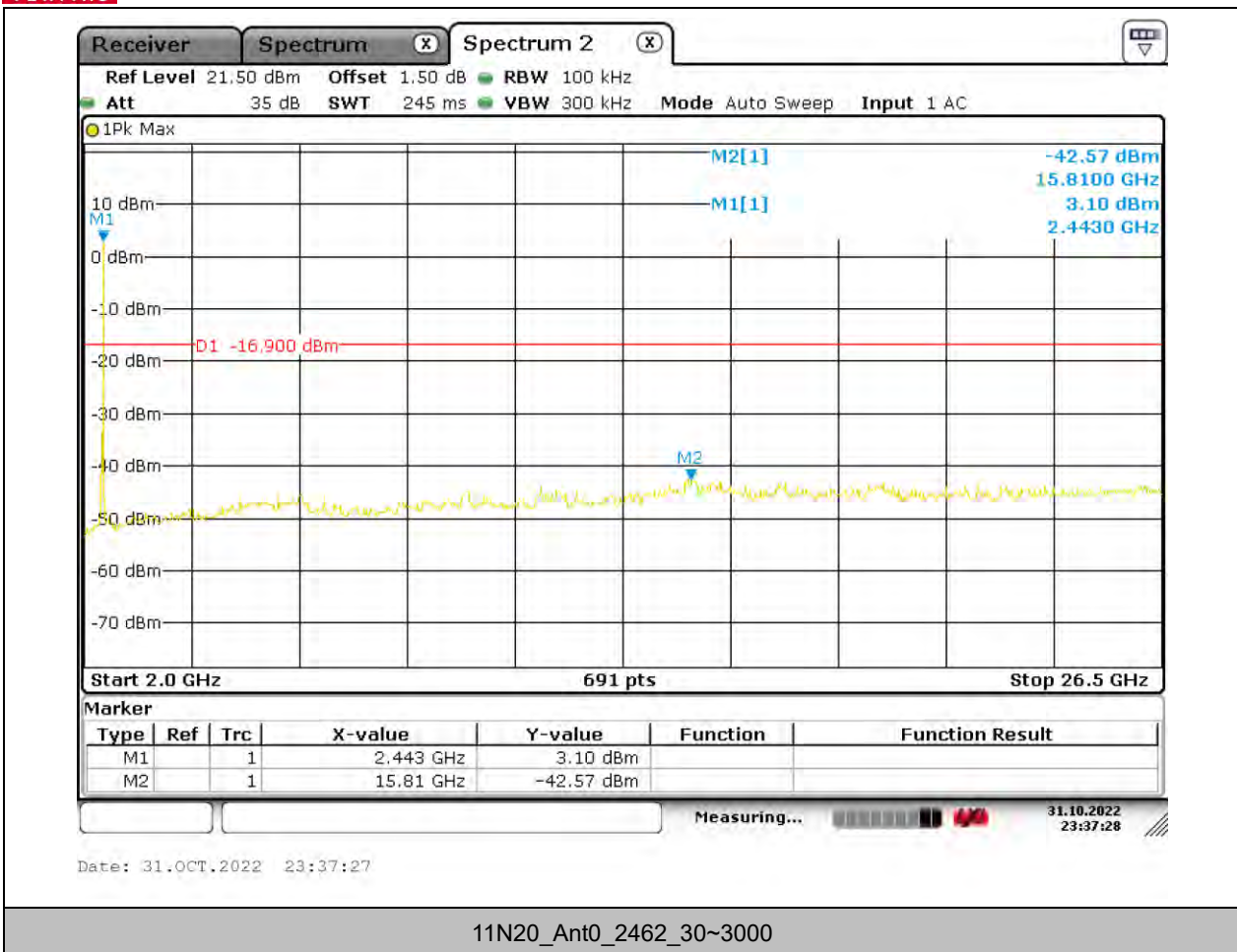
Date: 1.NOV.2022 00:09:48

11N20_Ant0_2437_2000~26500



BUREAU
VERITAS

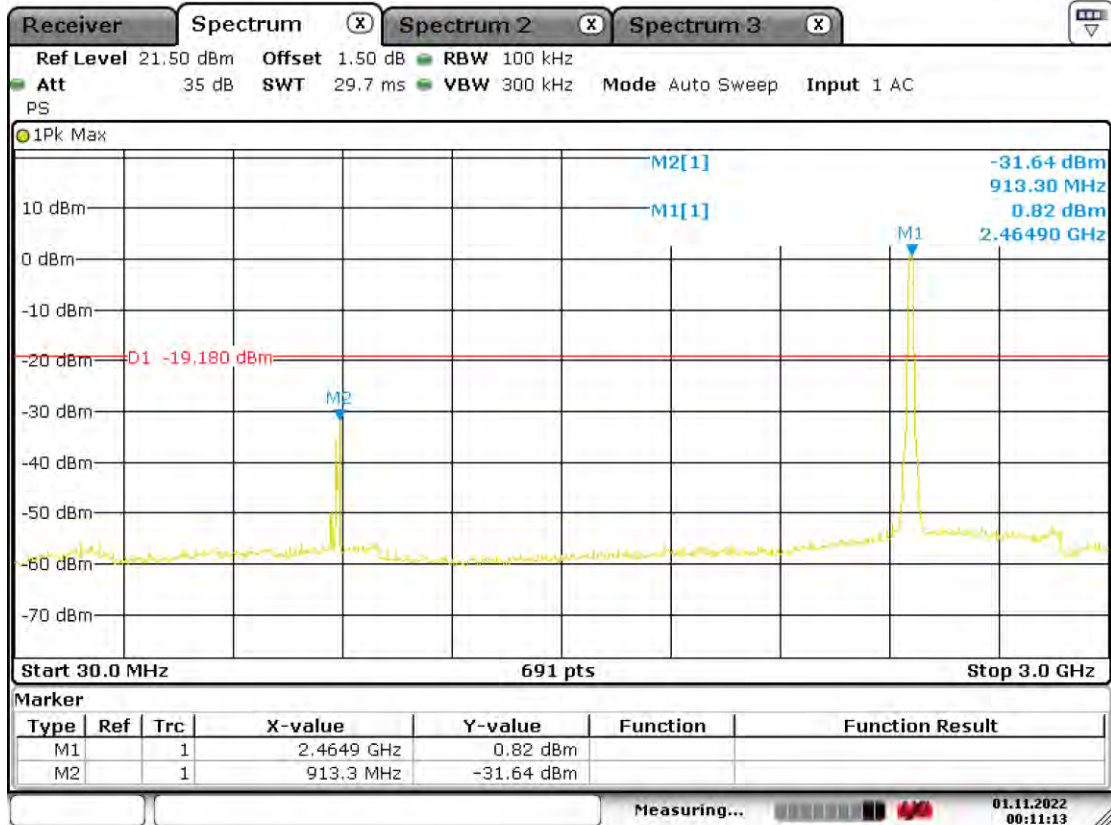
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



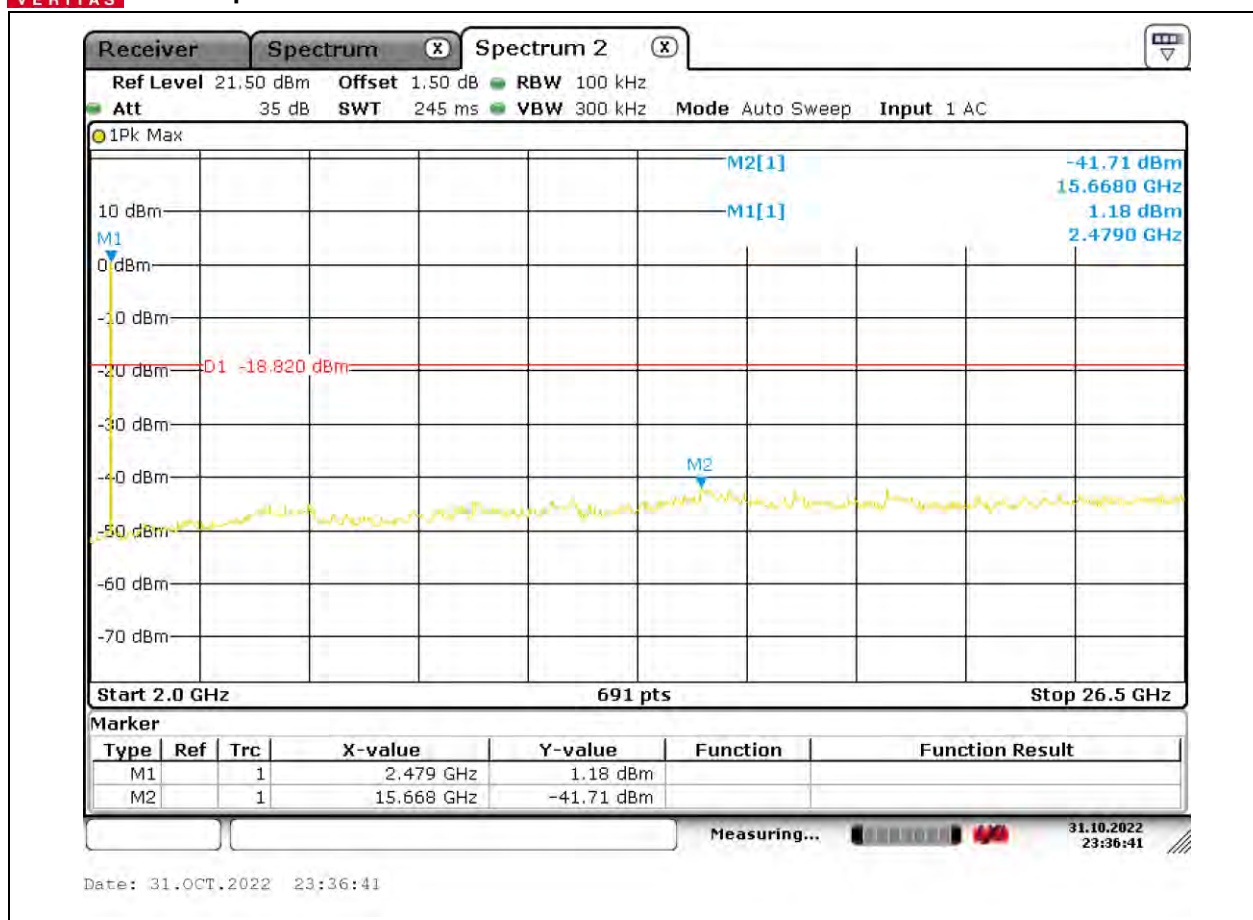
Date: 1.NOV.2022 00:11:12

11N20_Ant0_2462_2000~26500



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02





Test Report No.: W7L-P22090023RF02

DUTY CYCLE

TEST RESULT

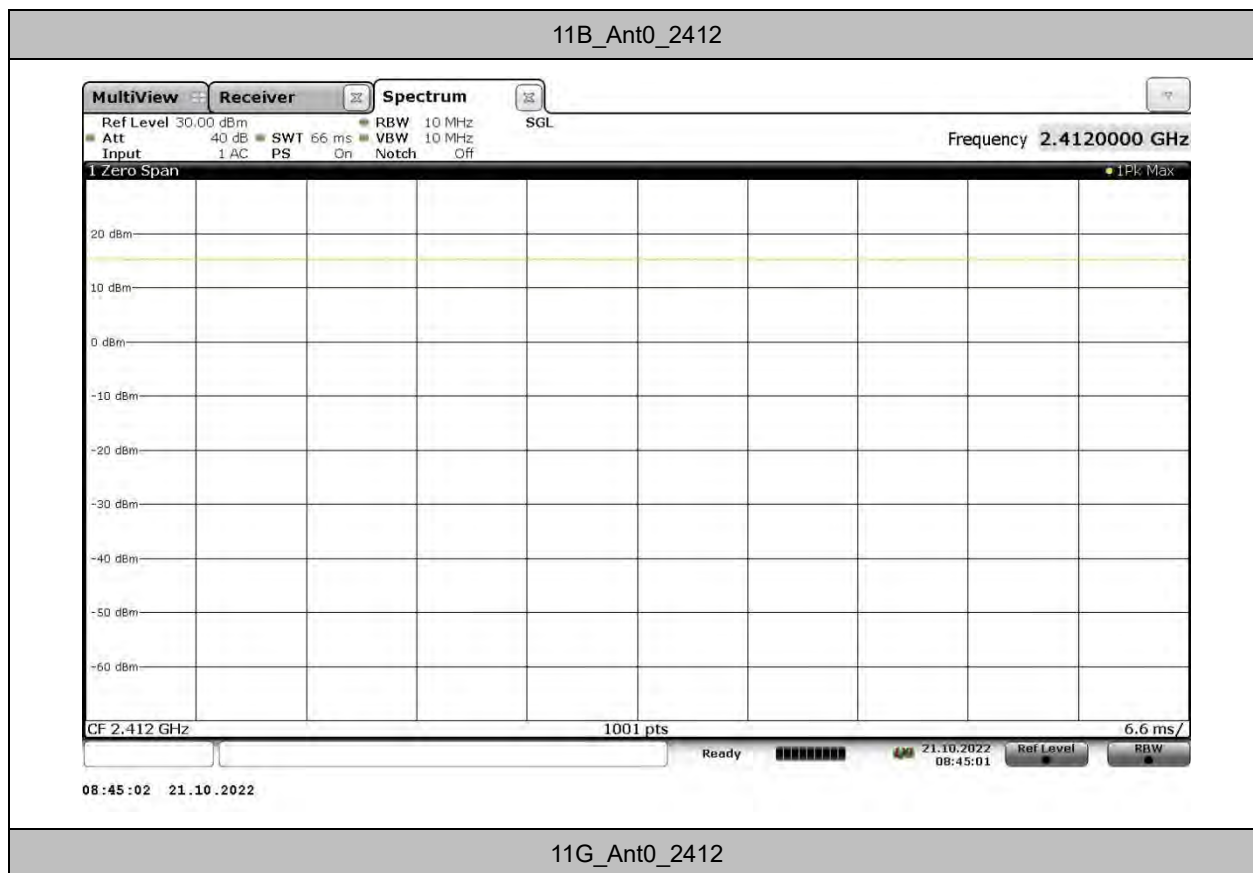
TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant0	2412	100.00	100.00	100
11G	Ant0	2412	1.362	1.398	97.40
11N20	Ant0	2412	1.275	1.326	96.10



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

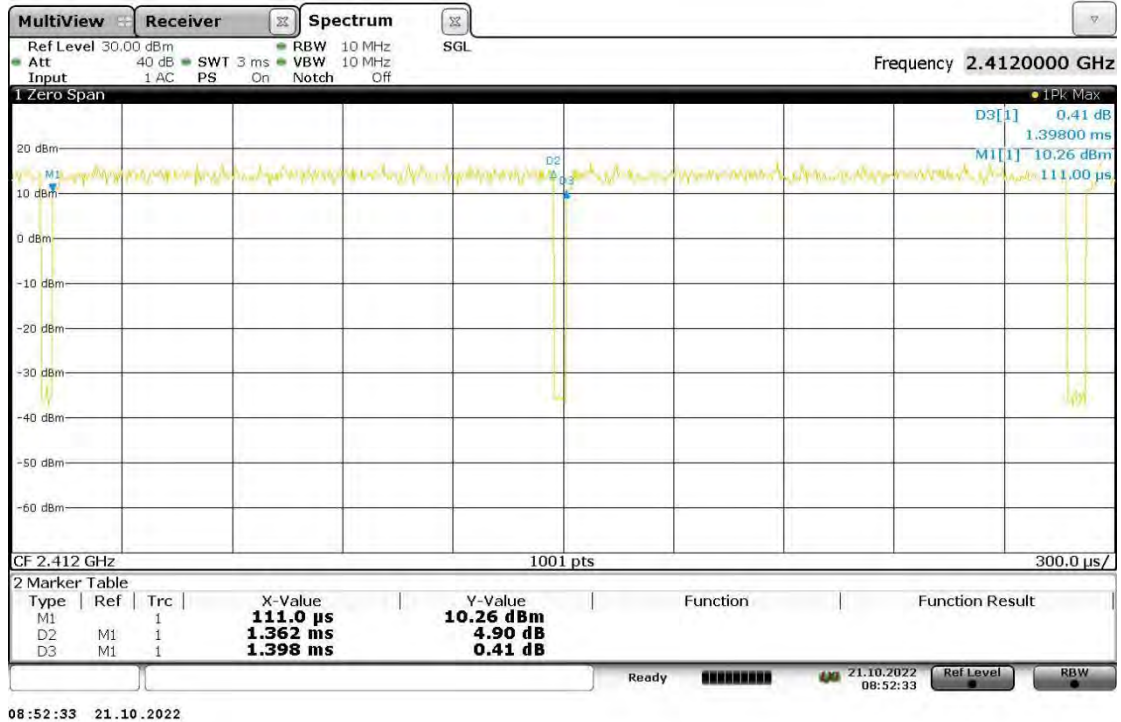
TEST GRAPHS



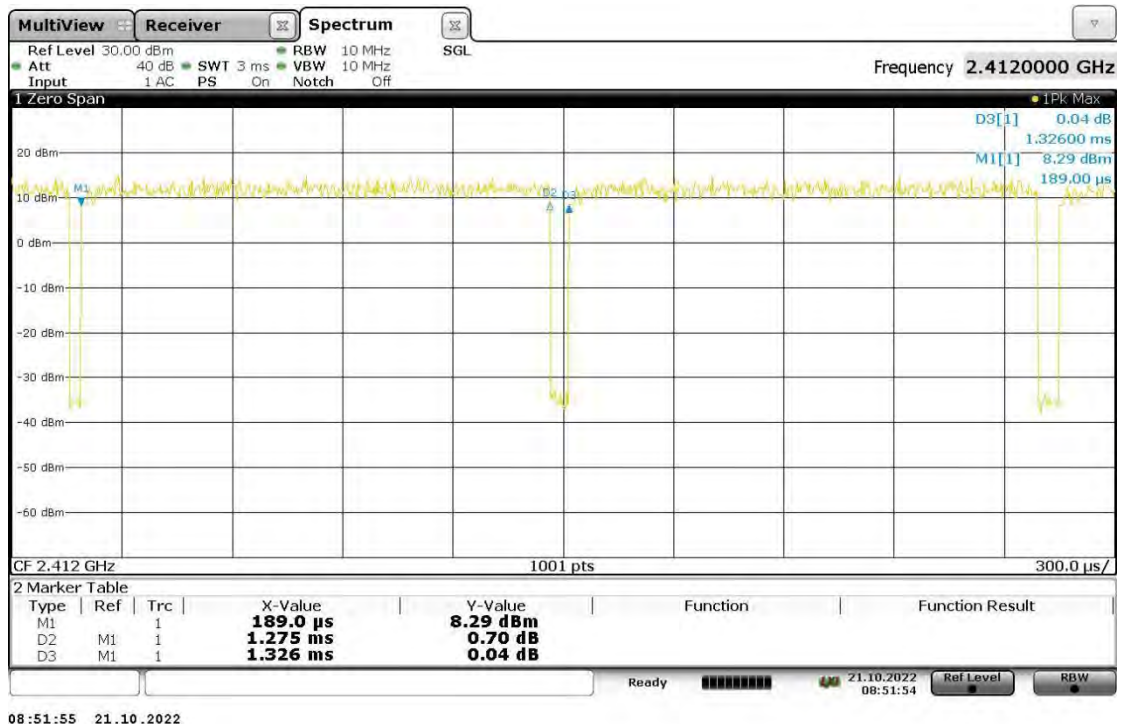


BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



11N20_Ant0_2412





7 Appendix 2 BLE

DTS BANDWIDTH

TEST RESULT

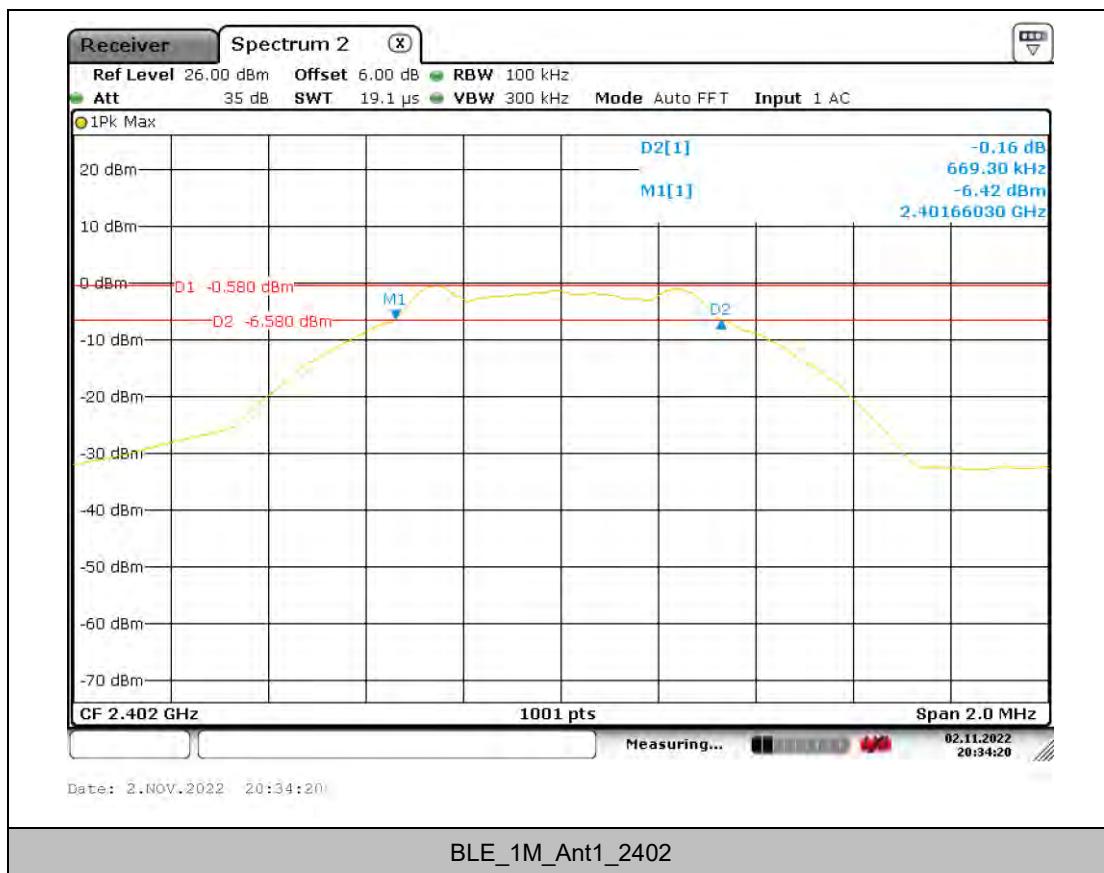
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.669	2401.664	2402.324	0.5	PASS
		2440	0.663	2439.668	2440.332	0.5	PASS
		2480	0.661	2479.680	2480.316	0.5	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

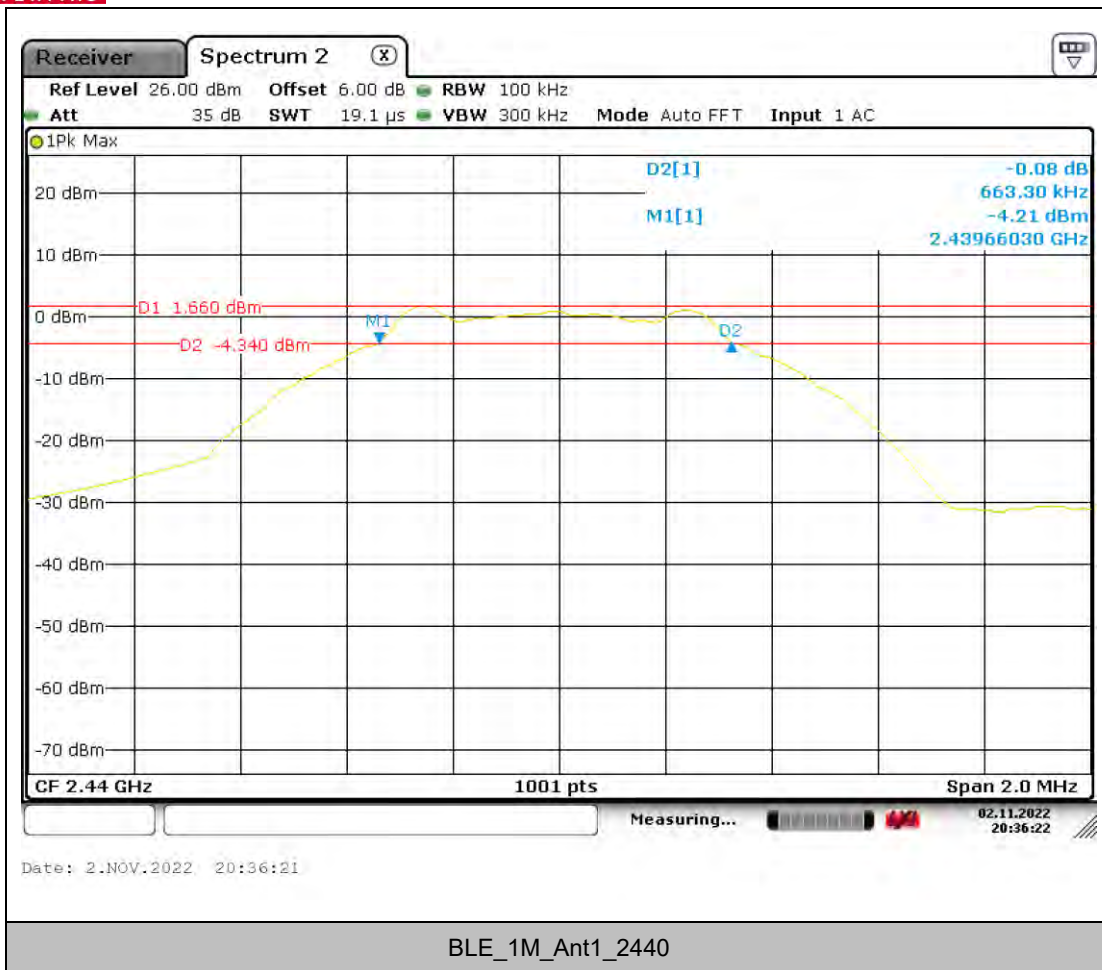
TEST GRAPHS





BUREAU
VERITAS

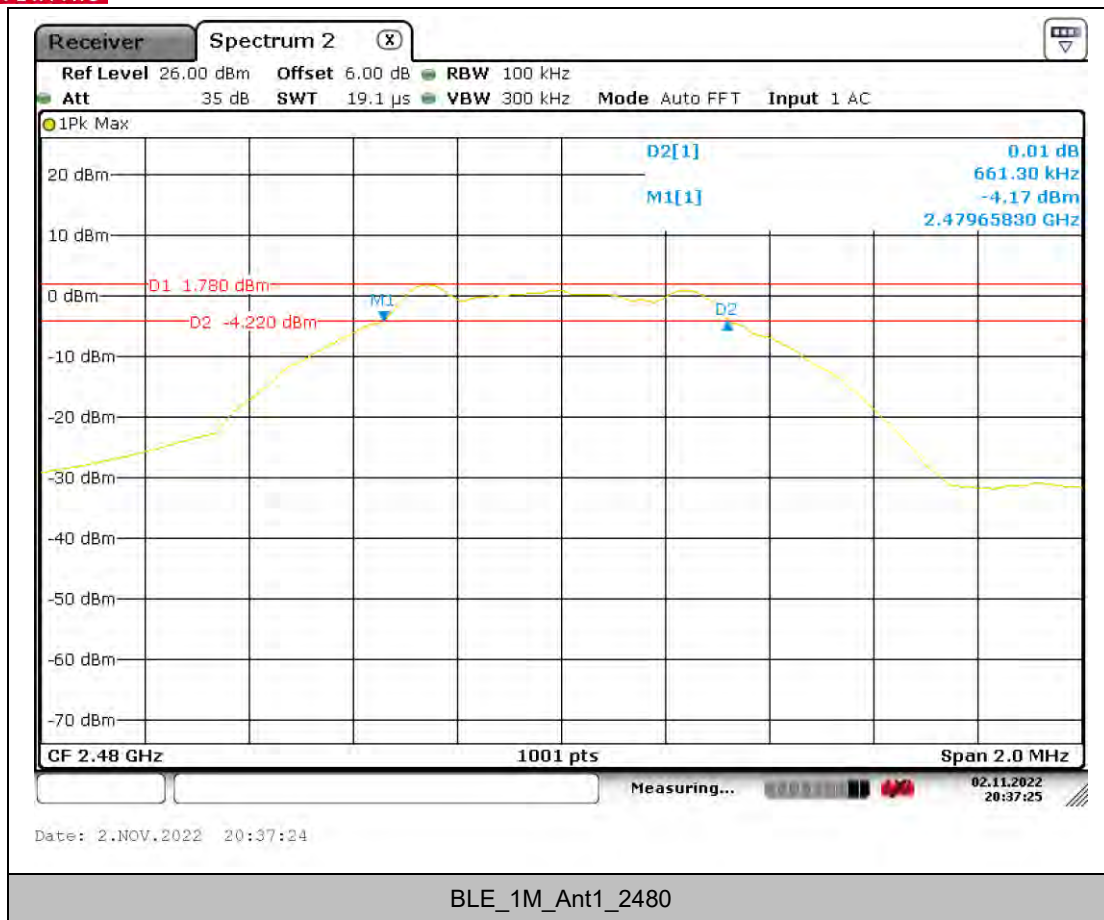
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02





Test Report No.: W7L-P22090023RF02

OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

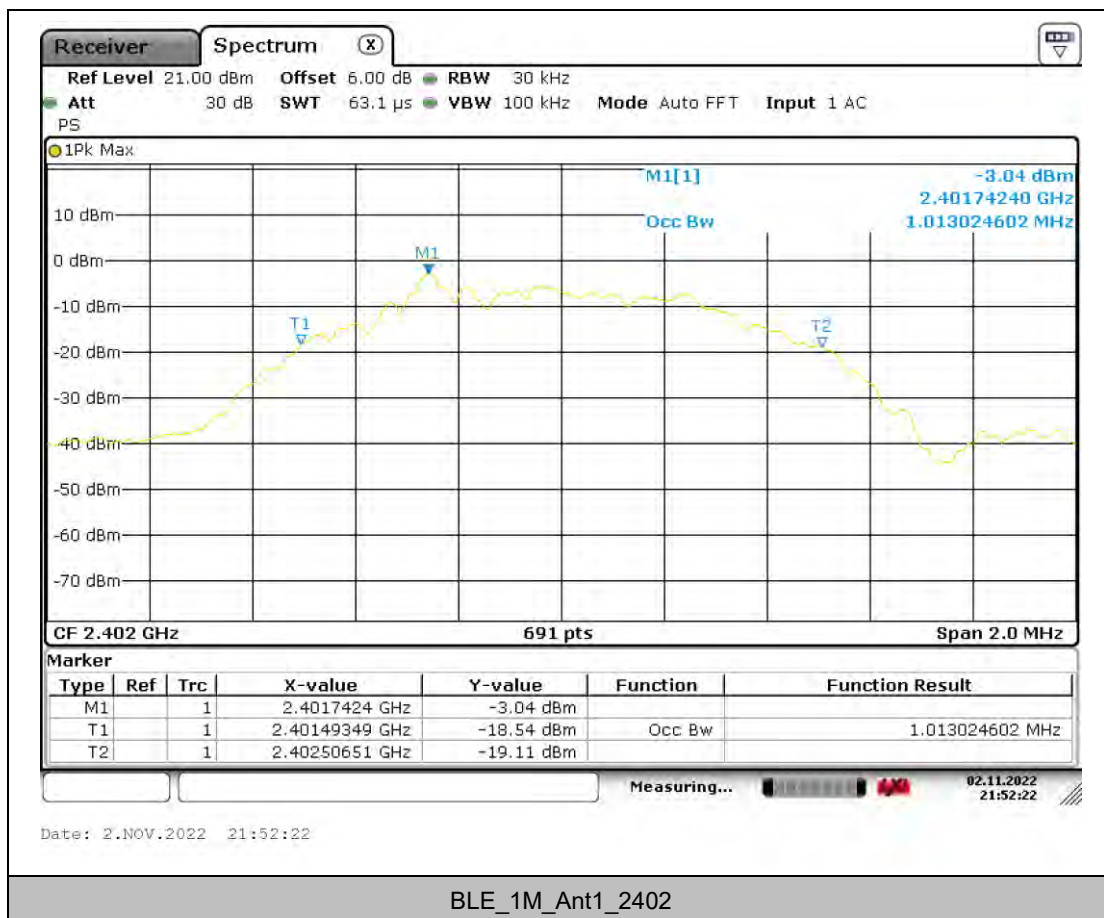
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0130	2401.492	2402.525	---	PASS
		2440	1.0159	2439.489	2440.517	---	PASS
		2480	1.0159	2479.488	2480.517	---	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

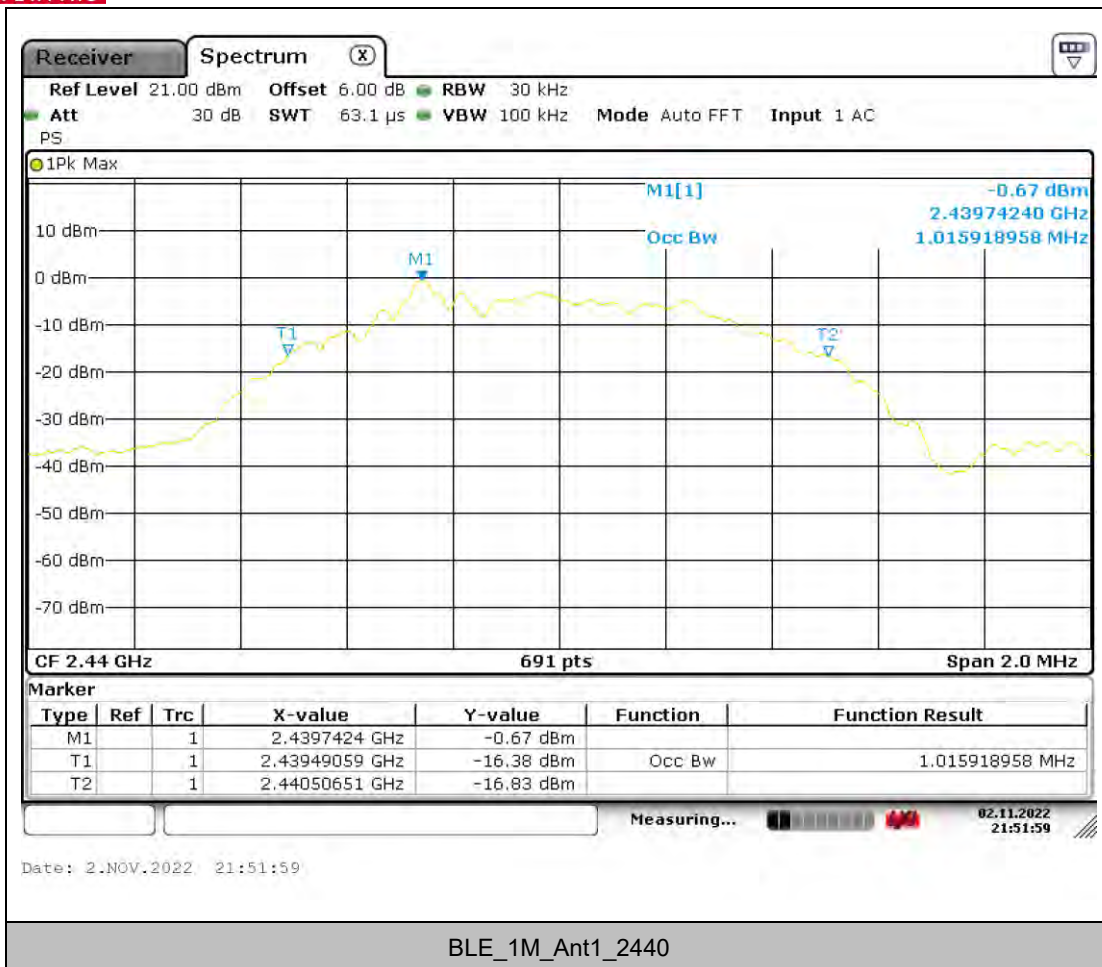
TEST GRAPHS





BUREAU
VERITAS

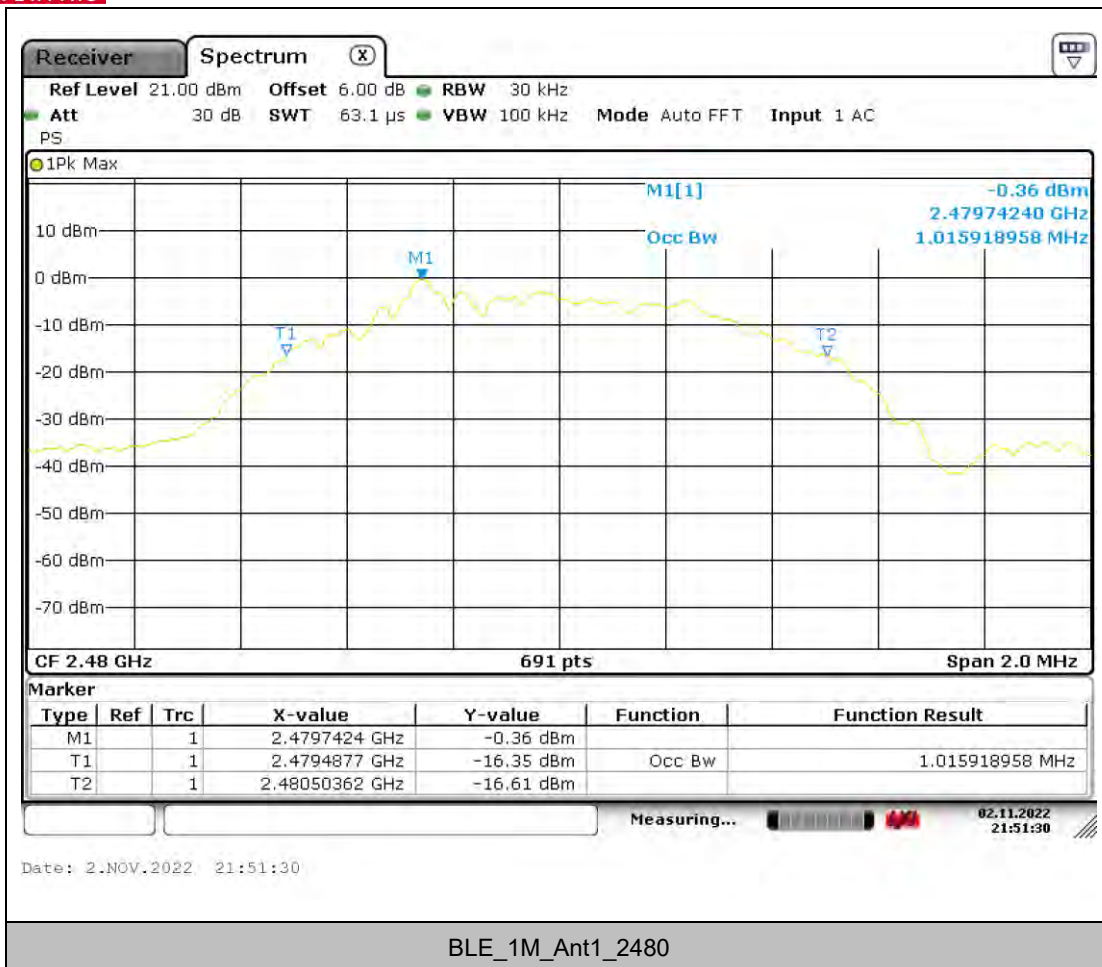
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02





Test Report No.: W7L-P22090023RF02

MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT PEAK

TestMode	Antenna	Channel	Peak Power[dBm]	Peak Power[mw]	Conducted Limit[dBm]	Verdict	Power setting
1M	Ant1	2402	-1.19	0.76	≤30	PASS	Default
		2440	1.21	1.32	≤30	PASS	Default
		2480	1.14	1.3	≤30	PASS	Default

TEST RESULT AVERAGE

TestMode	Antenna	Channel	Average Power	Conducted Limit[dBm]	Verdict	Power setting
1M	Ant1	2402	-1.79	/	PASS	Default
		2440	0.57	/	PASS	Default
		2480	0.53	/	PASS	Default



Test Report No.: W7L-P22090023RF02

MAXIMUM POWER SPECTRAL DENSITY

TEST RESULT

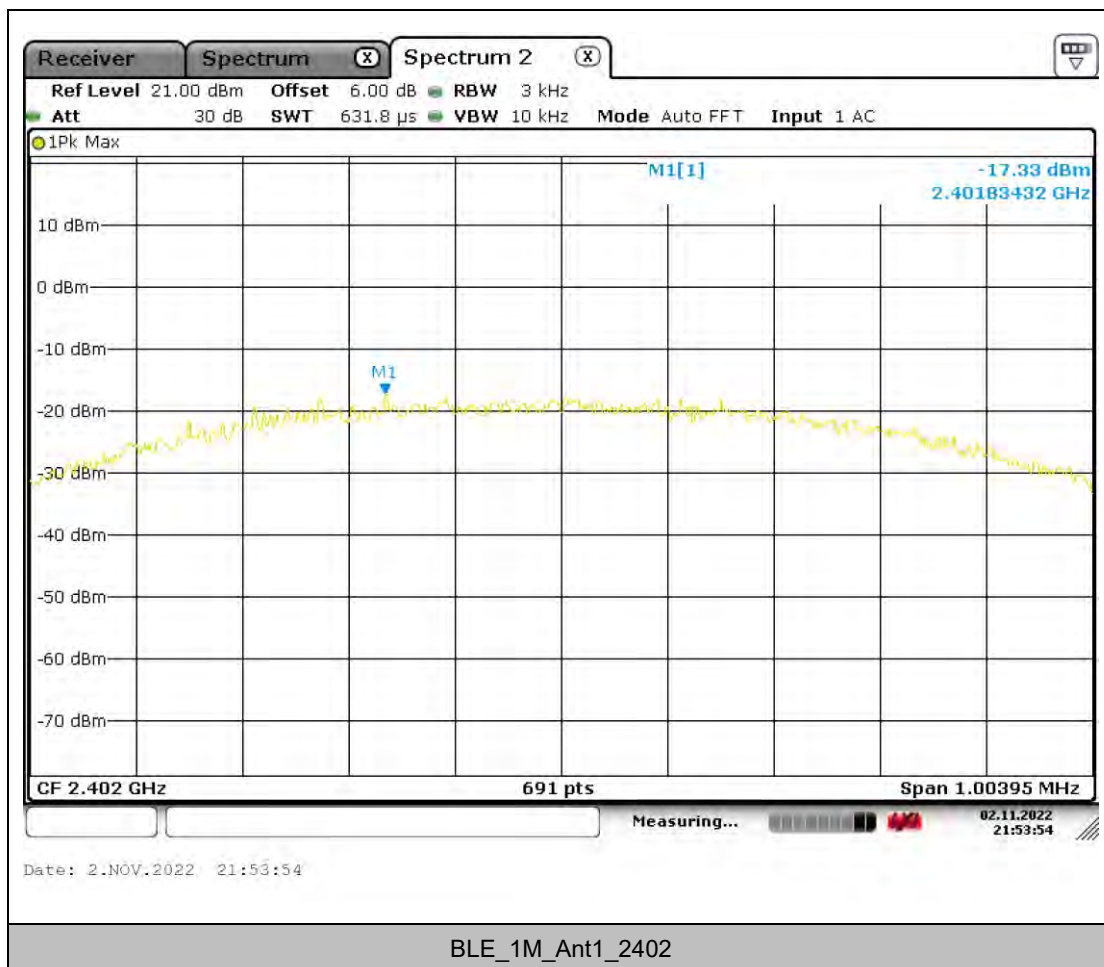
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-17.33	≤8	PASS
		2440	-14.94	≤8	PASS
		2480	-14.76	≤8	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

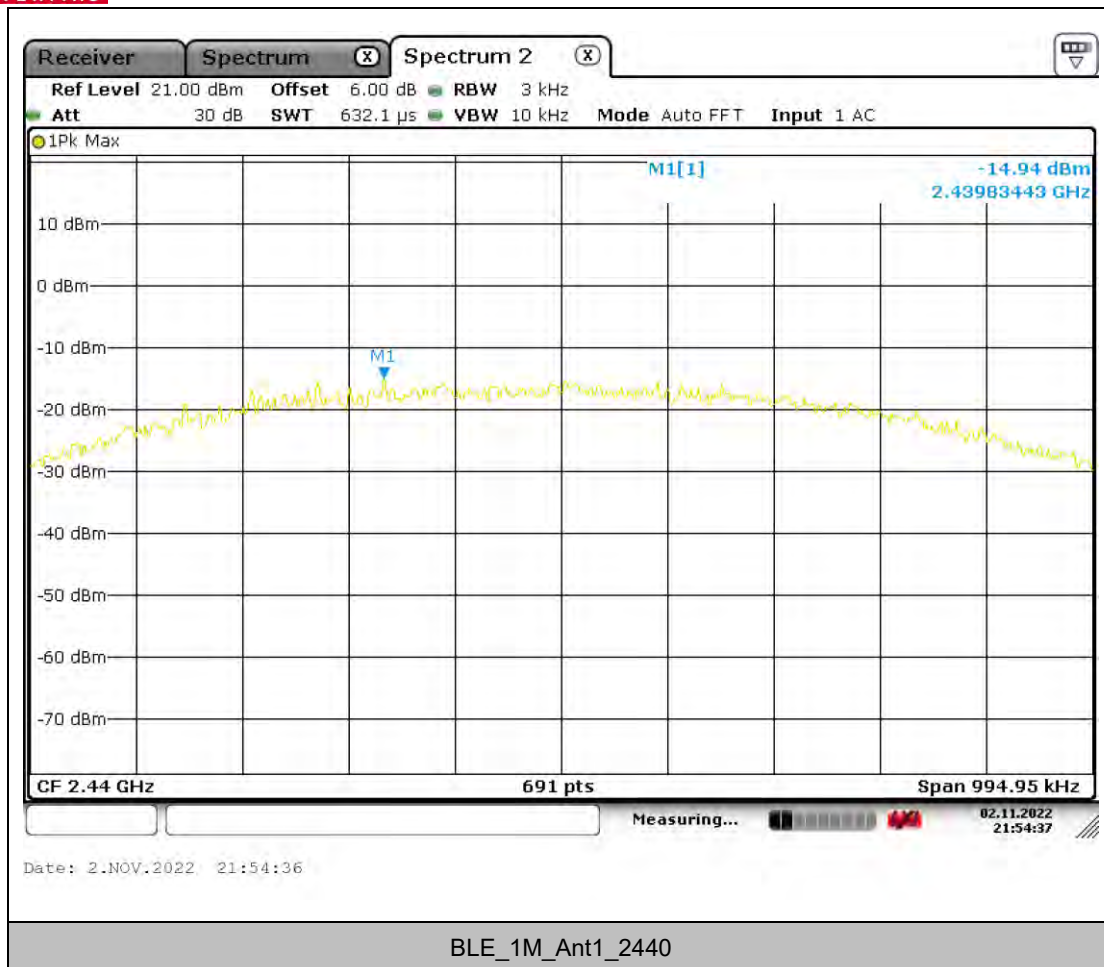
TEST GRAPHS





BUREAU
VERITAS

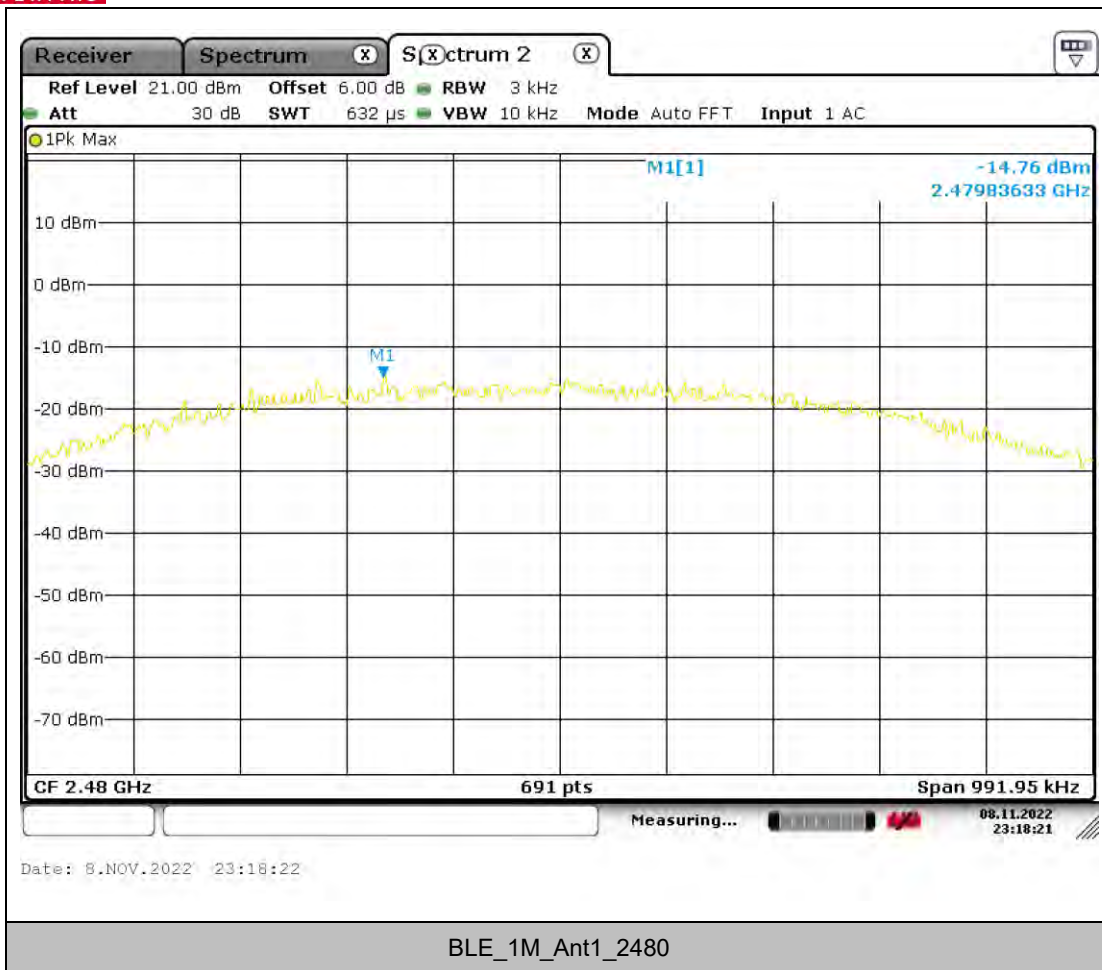
Test Report No.: W7L-P22090023RF02





BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02





Test Report No.: W7L-P22090023RF02

BAND EDGE MEASUREMENTS

TEST RESULT

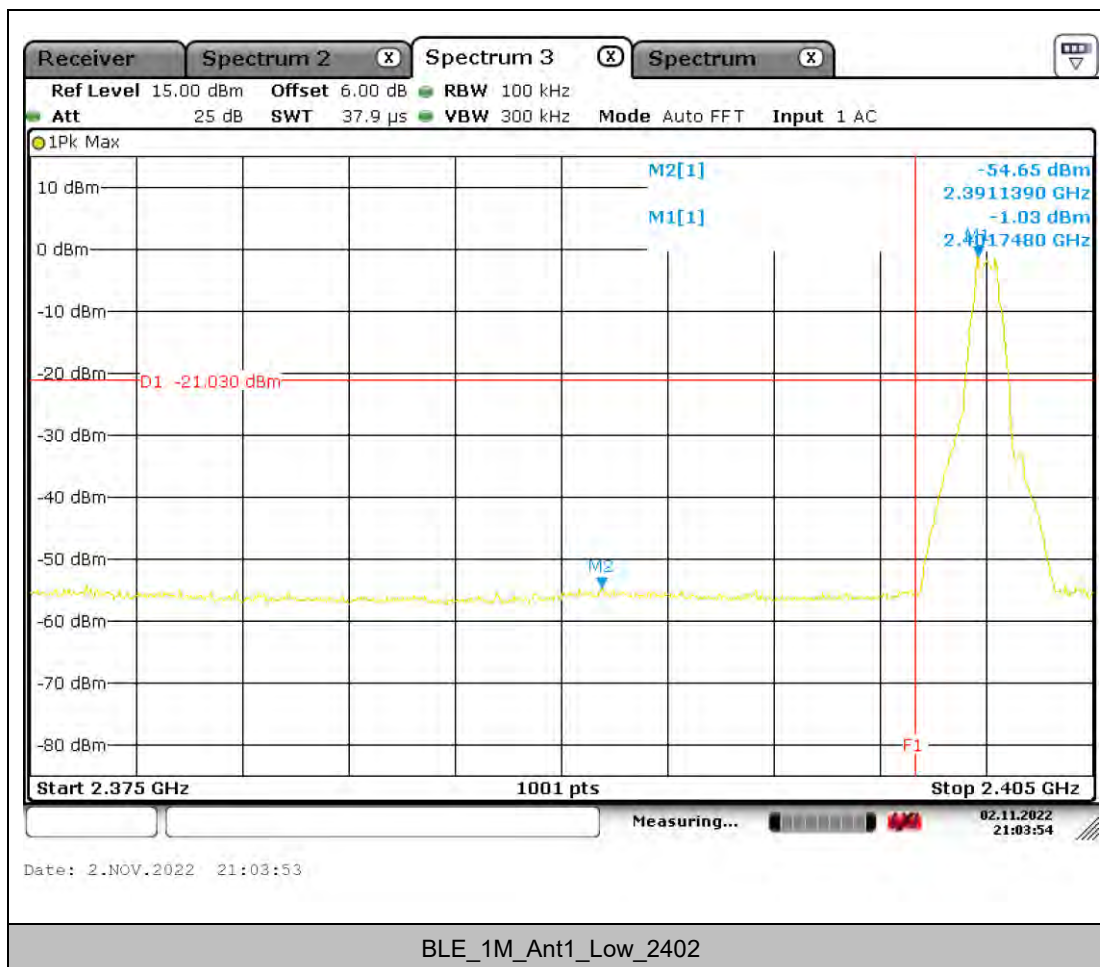
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-1.03	-54.65	≤ -21.03	PASS
		High	2480	1.56	-54.20	≤ -18.44	PASS



BUREAU
VERITAS

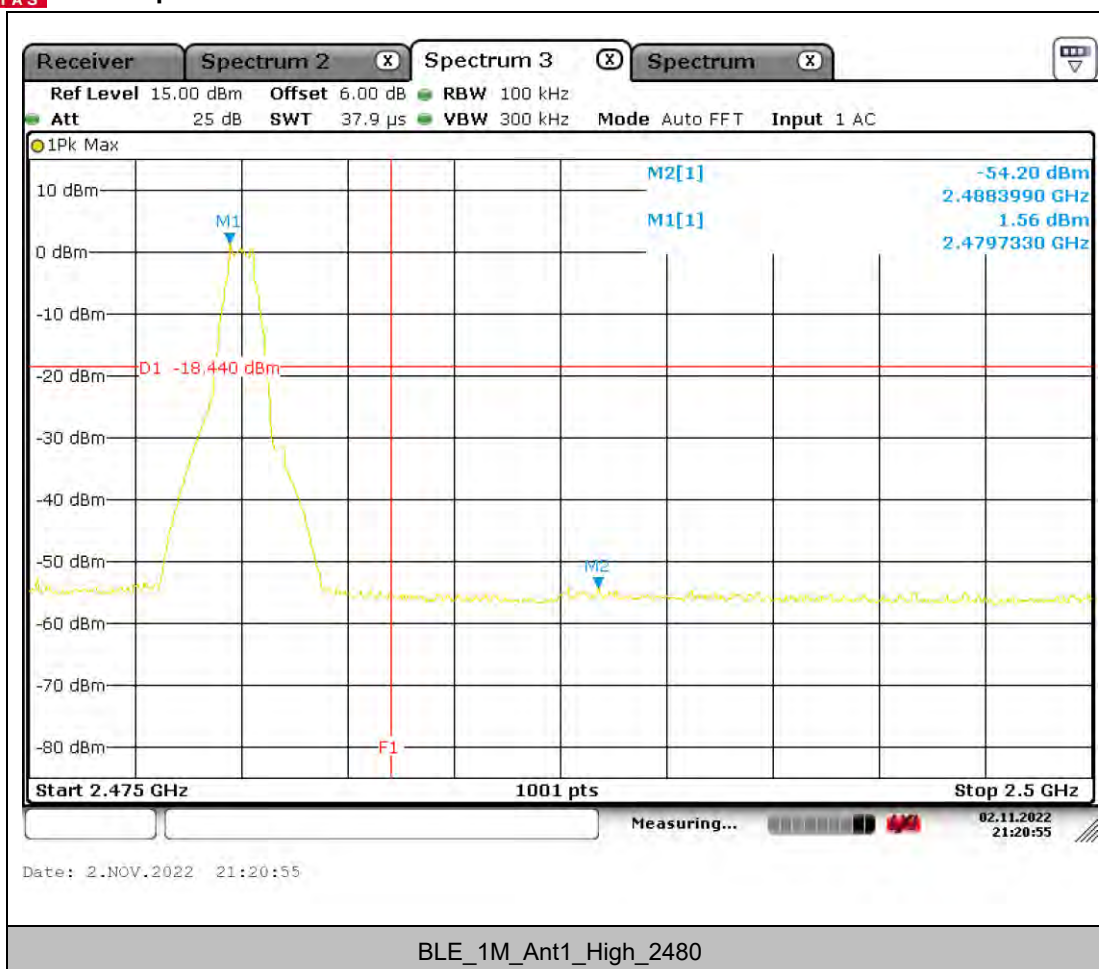
Test Report No.: W7L-P22090023RF02

TEST GRAPHS





Test Report No.: W7L-P22090023RF02





CONDUCTED SPURIOUS EMISSION TEST RESULT

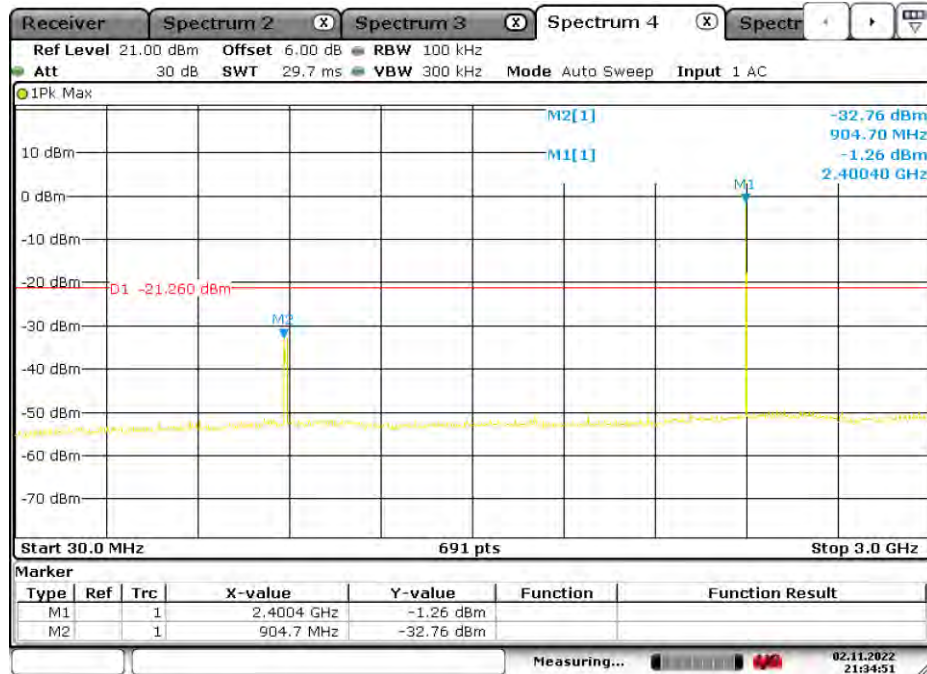
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	30~3000	-1.26	-32.76	≤-21.26	PASS
			2000~26500	-1.57	-42.57	≤-21.57	PASS
		2440	30~3000	1.31	-50.17	≤-18.69	PASS
			2000~26500	1.54	-42.27	≤-18.64	PASS
		2480	30~3000	1.36	-50.29	≤-18.64	PASS
			2000~26500	1.51	-41.98	≤-18.49	PASS



BUREAU
VERITAS

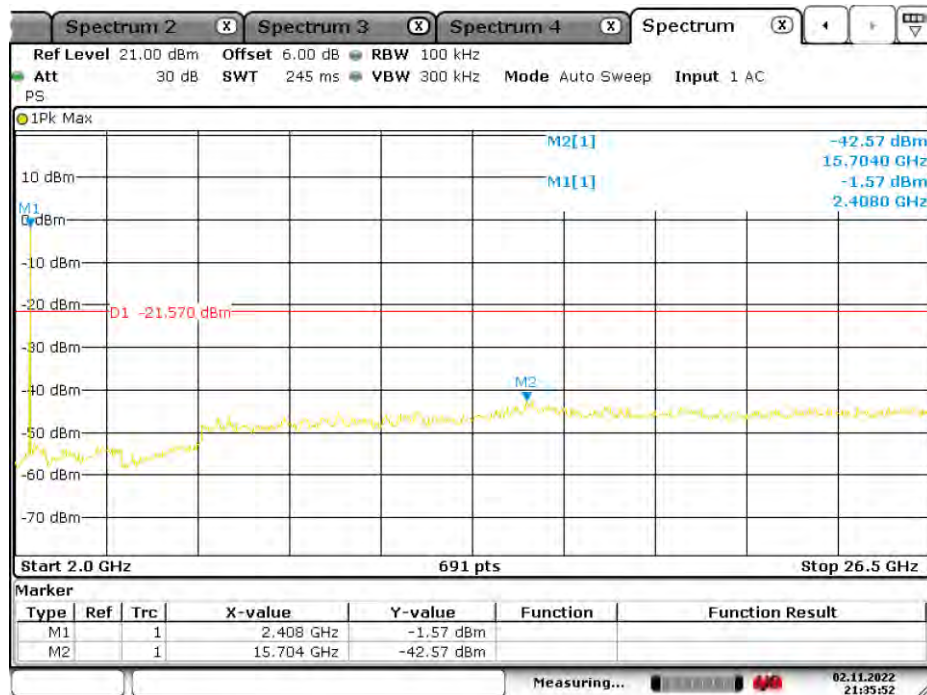
Test Report No.: W7L-P22090023RF02

TEST GRAPHS



Date: 2.NOV.2022 21:34:51

BLE_1M_Ant1_2402_30~3000

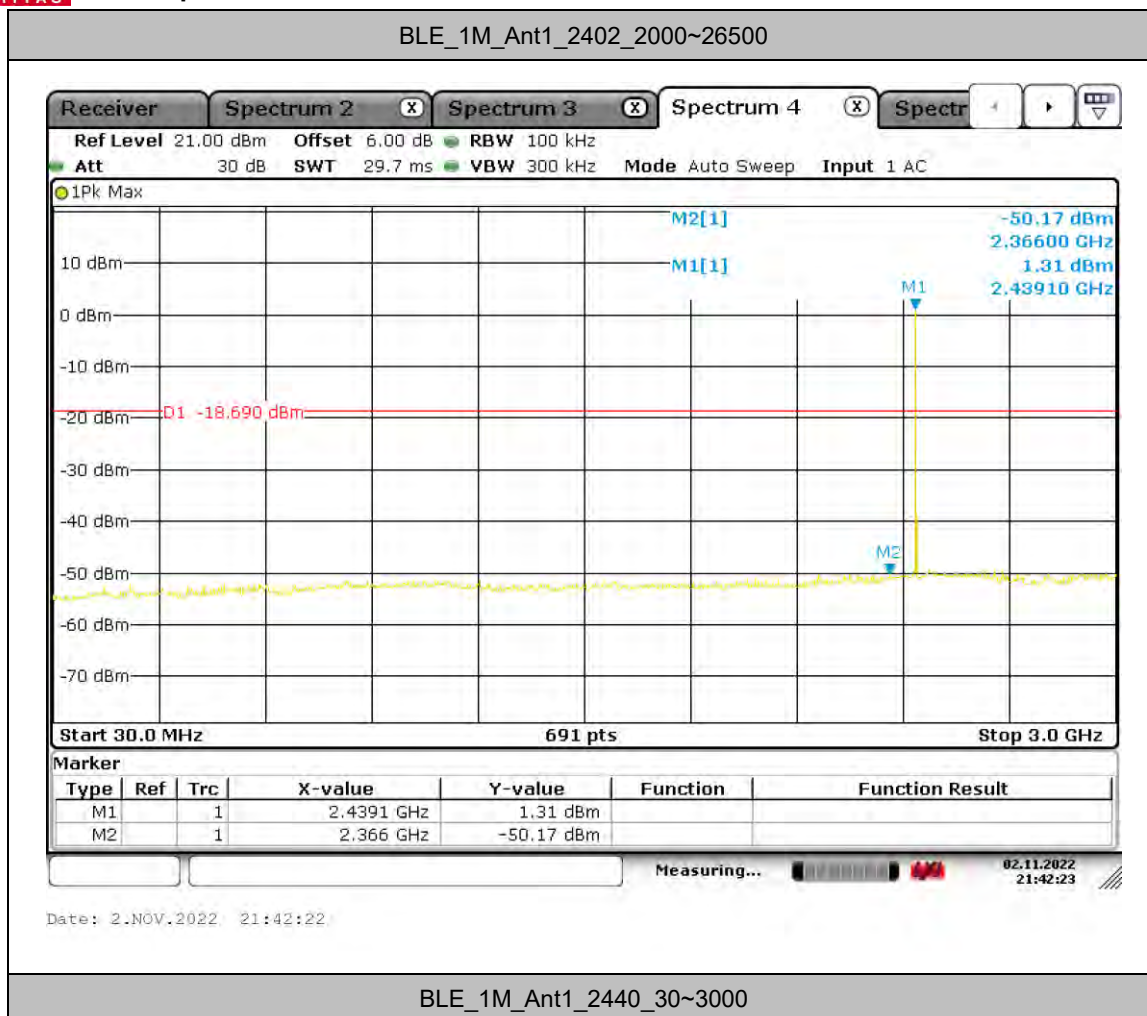


Date: 2.NOV.2022 21:35:52



BUREAU
VERITAS

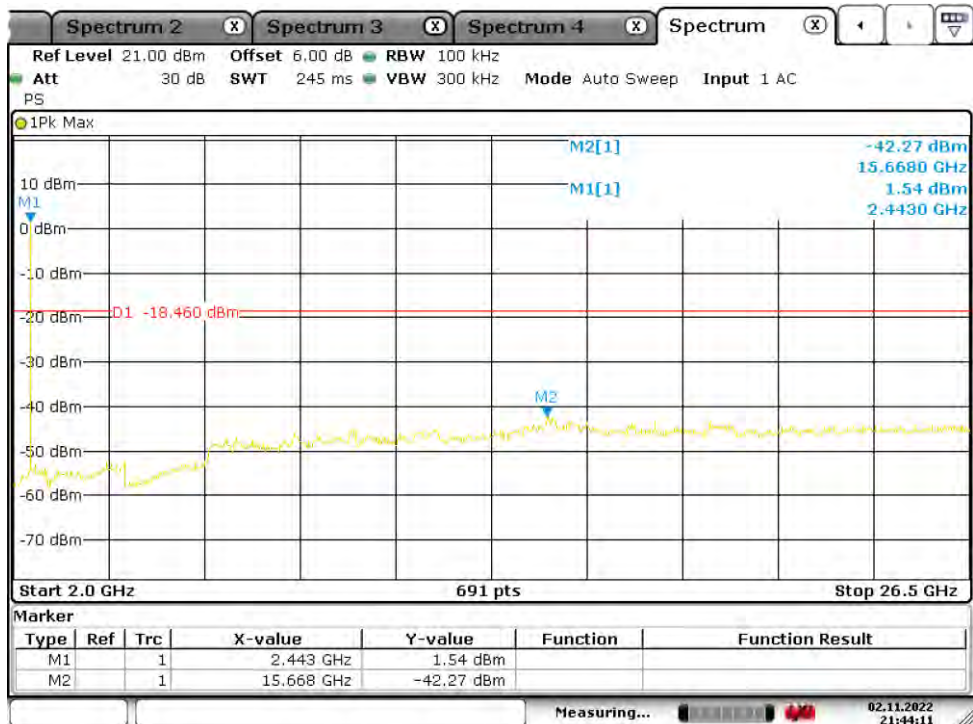
Test Report No.: W7L-P22090023RF02





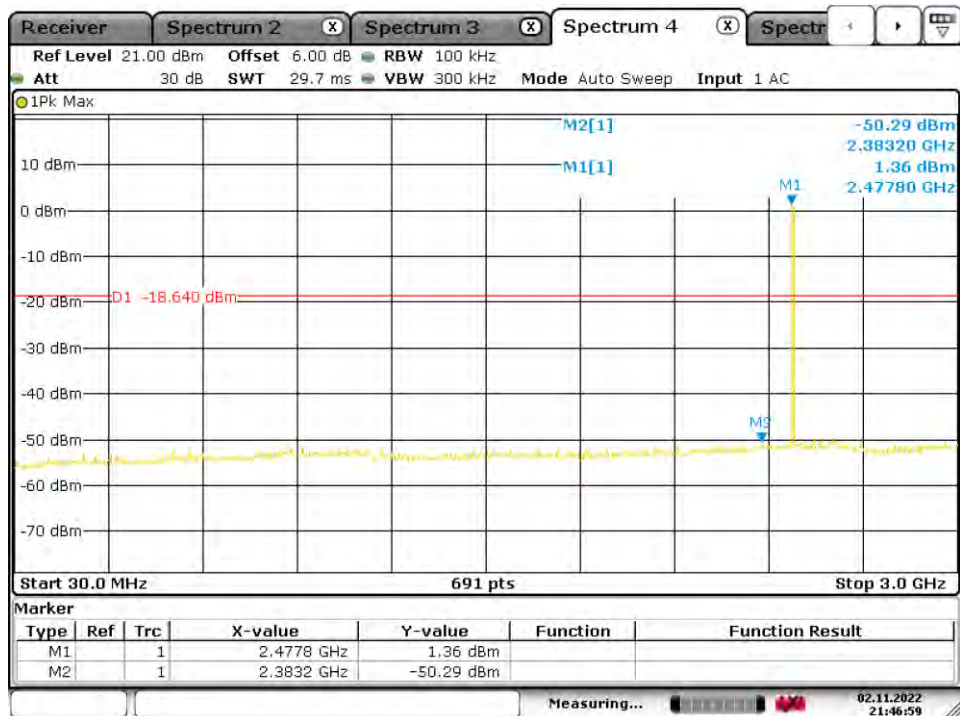
BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02



Date: 2.NOV.2022 21:44:10

BLE_1M_Ant1_2440_2000~26500

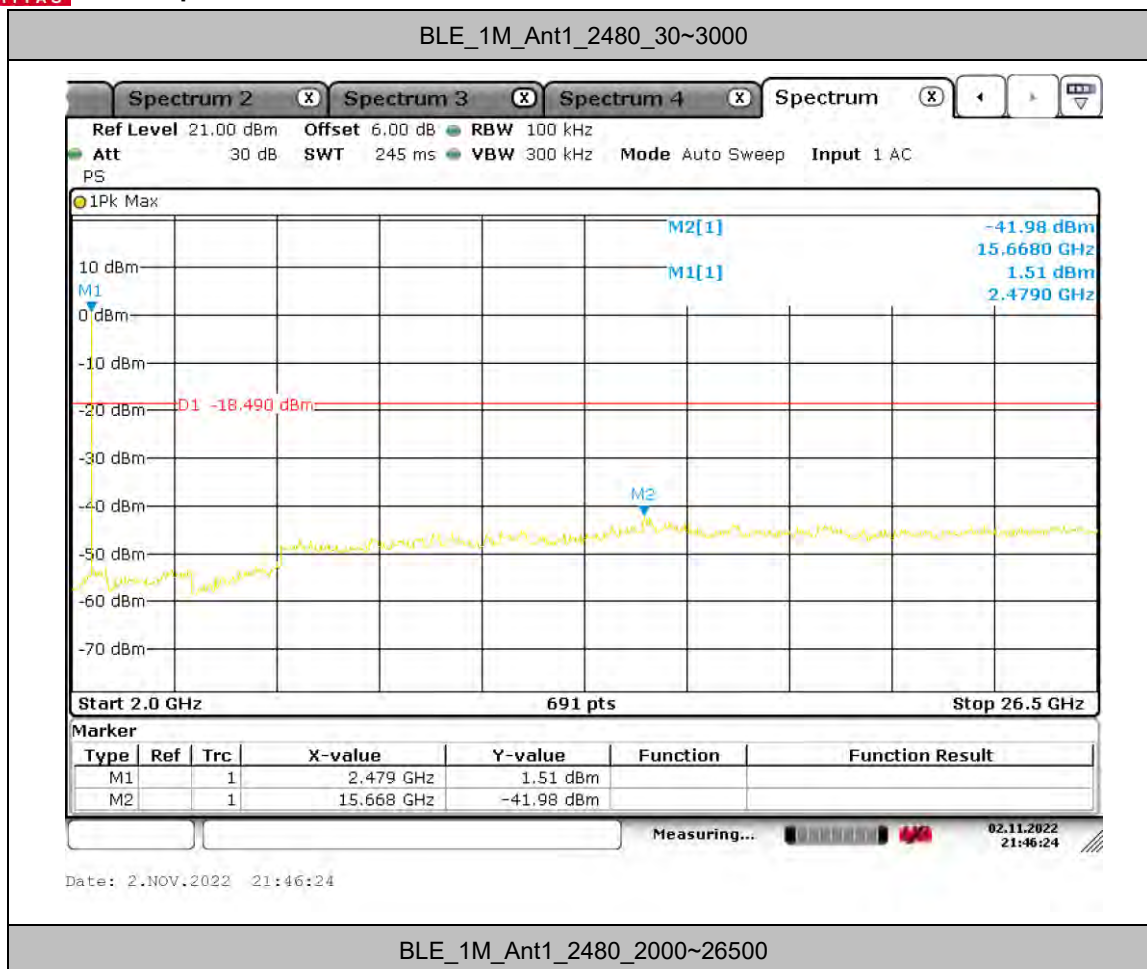


Date: 2.NOV.2022 21:46:59



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02





Test Report No.: W7L-P22090023RF02

DUTY CYCLE

TEST RESULT

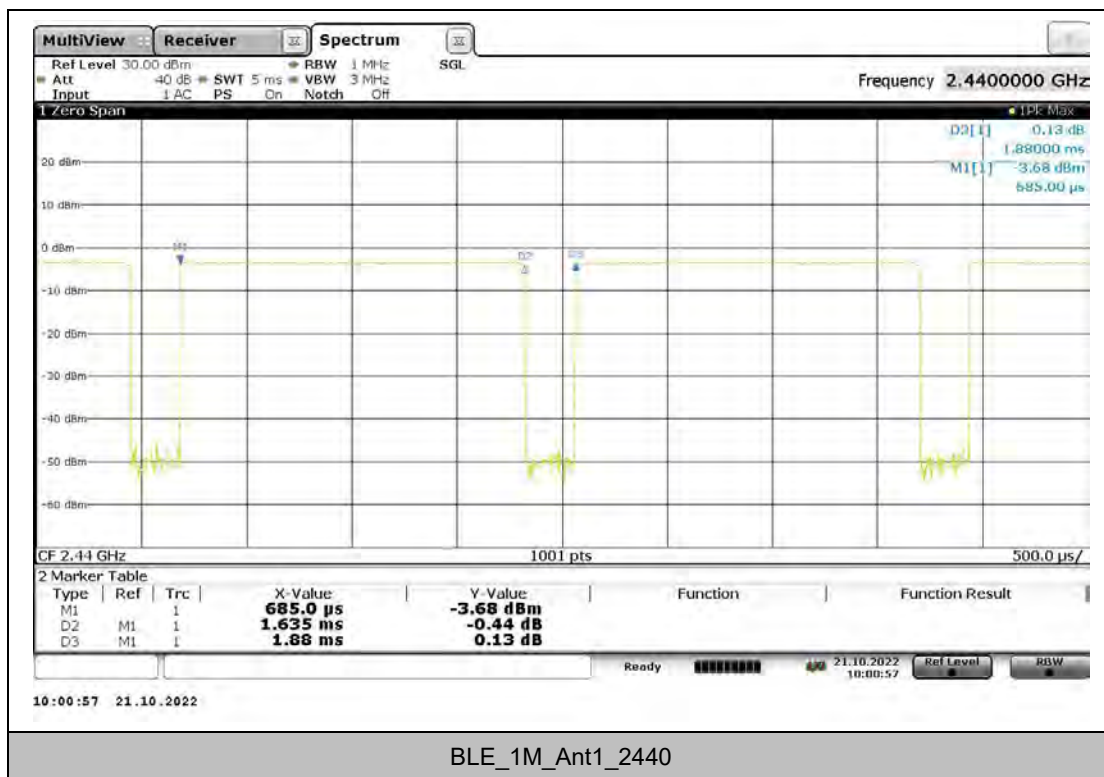
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2440	1.635	1.88	0.8696	86.90	0.61	---	PASS



BUREAU
VERITAS

Test Report No.: W7L-P22090023RF02

TEST GRAPHS



--- END ---