ACCREDITED
CERTIFICATE #5473.01

Test Report No.:
FCC2022-0016-RF

RF Test Report

EUT	:	**Robot Mop**
MODEL	:	**M20, M20-2, M20-3, M20-4**
BRAND NAME	:	**+360,Botslab**
CLIENT	:	**Botslab,Inc.**
Classification of Test	:	**N/A**

CVC Testing Technology Co., Ltd.

Client	**Name : Botslab,Inc.** **Address : 919 North Market Street, Suite 950, Wilmington, New Castle, Delaware, USA**
Manufacturer	**Name : Botslab,Inc.** **Address : 919 North Market Street, Suite 950, Wilmington, New Castle, Delaware, USA**
Equipment Under Test	**Name : Robot Mop** **Model/Type: M20, M20-2, M20-3, M20-4** **Trade mark : +360,Botslab** **Serial NO.:N/A** **Sampe NO.:3-1**

Date of Receipt.	**2022.3.15**	Date of Testing	**2022.03.15～2021.04.15**

Test Specification	**Test Result**
FCC Part 15, Subpart C, Section 15.247 **Canada RSS-Gen Issue 5 + A1 + A2** **Canada RSS-247 Issue 2**	PASS

Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. **Issue Date: 2021.04.15**

Tested by:	Reviewed by:	Approved by:
Xu ZhenFei	**Liu YongHai**	**Chen HuaWen**
Name Signature	Name Signature	Name Signature

Other Aspects: NONE.

Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2022-0016-RF	Original release	2022.04.15

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

PPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
15.207 RSS-Gen 8.8	AC Power Conducted Emission	PASS	Meet the requirement of limit.
RSS-Gen 6.7	Occupied Bandwidth Measurement	PASS	Meet the requirement of limit
15.247(d) 15.209 8.10 Table 7 8.9 Table 5	Radiated Emissions	PASS	Meet the requirement of limit.
15.247(d) 5.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2) 5.2(a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b) 5.4(d)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e) 5.2(b)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Meet the requirement of limit.

1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
WIFI & Bluetooth Test System 1					/
Communication Shielded Room 1	4m*3m*3m	CRTDSWKSR44301	VGDS-0699	CRT	2024/04/24
Spectrum Analyzer	FSV30	104337	DZ-000235	R&S	2022/11/03
Comprehensive Test Instrument	CMW500	137779	DZ-000220	R&S	2022/06/30
Comprehensive Test Instrument	CMW500	169888	DZ-000342	R&S	2022/12/01
LTE Comprehensive Test Instrument	E7515A	MY58010639	DZ-000173	KEYSIGHT	2022/04/14
Analog Signal Generator	SMA100B	103663	DZ-000239-2	R&S	2022/06/30
Vector Signal Generator	SMBV100B	101757	DZ-000239-1	R&S	2022/06/30
Programmable DC Power Supply	E3642A	MY59108106	DZ-000242-2	KEYSIGHT	2022/08/05
Radiation SpuriousTest System					/
3m Semi-Anechoic Chamber	FACT-4	ST08035	WKNA-0024	ETS	2024/12/12
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2023/03/02
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2023/03/02
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWARZBECK	2022/06/26
Waveguide Horn Antenna	HF906	360306/008	WKNA-0024-8	R&S	2023/03/04
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWARZBECK	2022/08/27
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	2022/06/30
5G Bandstop Filters	WRCJV12-4900-5100-5900-6100-50EE	1	DZ-000186	WI	2022/12/20
Comprehensive tester	CMW500	159000	DZ-000240-2	R&S	2022/12/20
Conducted emission					/
EMI Test Receiver	ESCI	100857	WKNB-0081	R&S	2022-12-08
EMI Test Receiver	ESR3	102394	VGDY-0705	R&S	2023-03-04
LISN	NSLK 8127	8127644	VGDY-0150	SCHWARZBECK	2022-09-01
DC LISN	PVDC8301-017	PVDC8301#17	VGDY-0692	SCHWARZBECK	2022-06-07
LISN	NSLK 8129	8129-268	EM-000388	SCHWARZBECK	2023-03-03
Plus Limiter（#1）	VTSD 9561 F-N	00515	VGDY-0808	SCHWARZBECK	2023-03-04
Impedance Stabilization Network	ISN T800	27095	WKNE-0195	TESEQ	2022-09-01
Impedance Stabilization Network	NTFM8158	8158-0092	VGDY-0356	SCHWARZBECK	2022-06-07
ImpedanceStabilizationNetwork	NTFM8131	#184	EM-000498	SCHWARZBECK	2022-06-05
Voltage Probe	TK9420	9420-499	VGDY-0128	SCHWARZBECK	2023-03-04
Power Divider	4901.17.B	22643830	DB-0016	HUBER+SUHNER	2023-09-01
Video Signal Generator	GV-798+	151064920001	VGDS-0215	PROMAX	2022-06-07
AudioSignalGenerator	GAG-810	EK871591	EM-000309	GW	2022-12-08
Shielding Room(#1)	GP1A	001	WKNF-0001	LEINING	2024-08-08

1.2 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:

No.	ITEM	FREQUENCY	UNCERTAINTY
1	Conducted emissions	9kHz~30MHz	±2.66dB
2	Radiated emissions	9KHz ~ 30MHz	±0.769dB
		30MHz ~ 1GMHz	±0.877dB
		1GHz ~ 18GHz	±0.777dB
		18GHz ~ 40GHz	±1.315dB

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

1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology Co., Ltd.

Address: No.3,TiantaiyiRoad,KaitaiAvenue,ScienceCity,Guangzhou,China
Post Code：510663 Tel：020-32293888
FAX：020-32293889 E-mail：office@cvc.org.cn

2 GENERAL INFORMATION

2.1 GENERAL PRODUCT INFORMATION

PRODUCT	Robot Mop
BRAND	+360,Botslab
MODEL	M20
ADDITIONAL MODEL	M20-2, M20-3, M20-4
FCC ID	2A22Z-M20
IC ID	27673-M20
POWER SUPPLY	DC 24V From Self-cleaning base or DC 14.4V From Li-ion battery
MODULATIONTECHNOLOGY	DSSS, OFDM
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
OPERATING FREQUENCY	2412MHz ~ 2462MHz for 11b/g/n(HT20) 2422MHz ~ 2452MHz for 11n(HT40)
NUMBER OF CHANNEL	802.11b/g/n (HT20): 11 802.11n (HT40): 7
PEAK OUTPUT POWER	WLAN: 25.39dBm (Maximum)
ANTENNA TYPE	WLAN: PCB Antenna, 2dBi Gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

Remark:

1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document for detailed product photo. (Report NO.: FCC2022-0016-E)
4. Additional model M20-2, M20-3, M20-4 is identical with the test model M20 except the color of the appearance and model name for trading purpose
5. The EUT have SISO function, provides 1 completed transmitter and 1 receiver.

MODULATION MODE	TX FUNCTION
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n (HT20)	1TX/1RX
802.11n (HT40)	1TX/1RX

2.2 Description of Accessories

Self-cleaning base	
BRAND	+360,Botslab
Model No.:	M20s, M20-2s, M20-3s, M20-4s
Input:	Input :100V-240VOutput :24V/2A
Output:	24.0 V ⎓ 2 A
AC Cable:	1.0 Meter, Unshielded without ferrite
DC Cable:	N/A

2.3 OTHER INFORMATION

Operating frequency of each channel

2.4G WIFI					
802.11b/g/n (HT20)					
CHANNEL	**FREQ. (MHz)**	**CHANNEL**	**FREQ. (MHz)**	**CHANNEL**	**FREQ. (MHz)**
1	**2412**	5	2432	9	2452
2	2417	**6**	**2437**	10	2457
3	2422	7	2442	**11**	**2462**
4	2427	8	2447		
802.11/n (HT40)					
CHANNEL	**FREQ. (MHz)**	**CHANNEL**	**FREQ. (MHz)**	**CHANNEL**	**FREQ. (MHz)**
3	**2422**	**6**	**2437**	**9**	**2452**
4	2427	7	2442		
5	2432	8	2447		

Note: The channels which were indicated in bold type of the above channel list were selected as representative test channel. Therefore only the data of the test channels were recorded in this report.

2.4 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

EUT CONFIGURE MODE	APPLICABLE TEST ITEMS				DESCRIPTION
	RE<1G	RE≥1G	PLC	APCM	
A	√	√	√	√	2.4G WIFI Function

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

RADIATED EMISSION TEST (BELOW 1 GHz):

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

☒ The worst case was found when positioned on x axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	6	DSSS	DBPSK	6.0

For the test results, only the worst case was shown in test report.

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

☒ The worst case was found when positioned on x axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n(HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n(HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

POWER LINE CONDUCTED EMISSION TEST:

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

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

EUT CONFIGURE MODE	TESTED CONDITION
-	WIFI (2.4G) Link

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, antenna ports (if EUT with antenna diversity architecture), and packet types.

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n(HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n(HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE<1G	24deg. C, 55%RH	DC 14.4V From battery	Liu ShiWei
RE≥1G	24deg. C, 55%RH	DC 14.4V From battery	Liu ShiWei
PLC	24deg. C, 55%RH	DC 14.4V From battery	Liu ShiWei
APCM	25deg. C, 58%RH	DC 14.4V From battery	Liu ShiWei

2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC PART 15, Subpart C. Section 15.247
KDB 558074 D01 15.247 Meas Guidance v05r02
ANSI C63.10-2020
Canada RSS-Gen Issue 5 + A1 + A2
Canada RSS-247 Issue 2

All test items have been performed and recorded as per the above standards

2.6 DESCRIPTION OF SUPPORT UNITS

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

Support Equipment					
NO	Description	Brand	Model No.	Serial Number	Supplied by
N/A	N/A	N/A	N/A	N/A	N/A

Support Cable							
NO	Description	Quantity (Number)	Length (cm)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 Limit

Frequency (MHz)	Conducted Limits(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. NOTE: 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

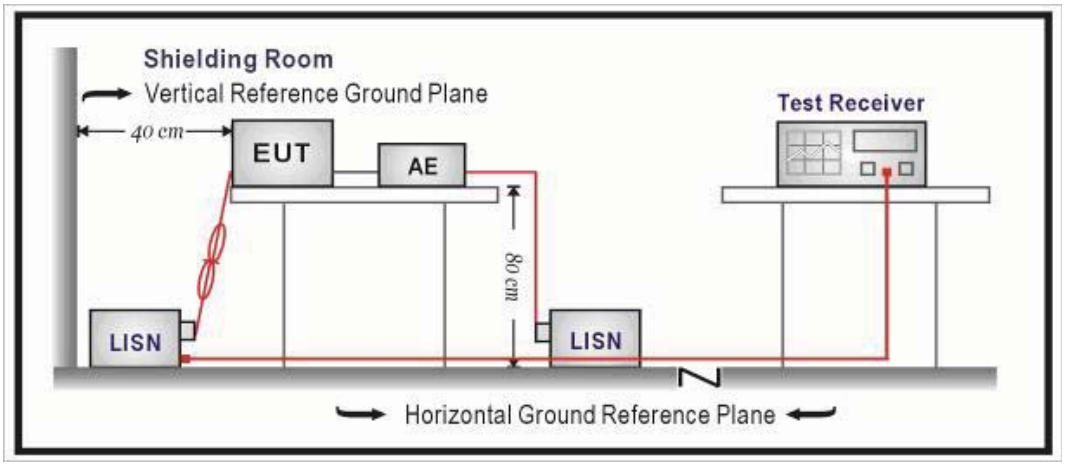
3.1.2 Measurement procedure

a. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the Test photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.The equipment under test shall be placed on a support of non-metallic material, the height of which shall be1.5m above the ground,

b. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

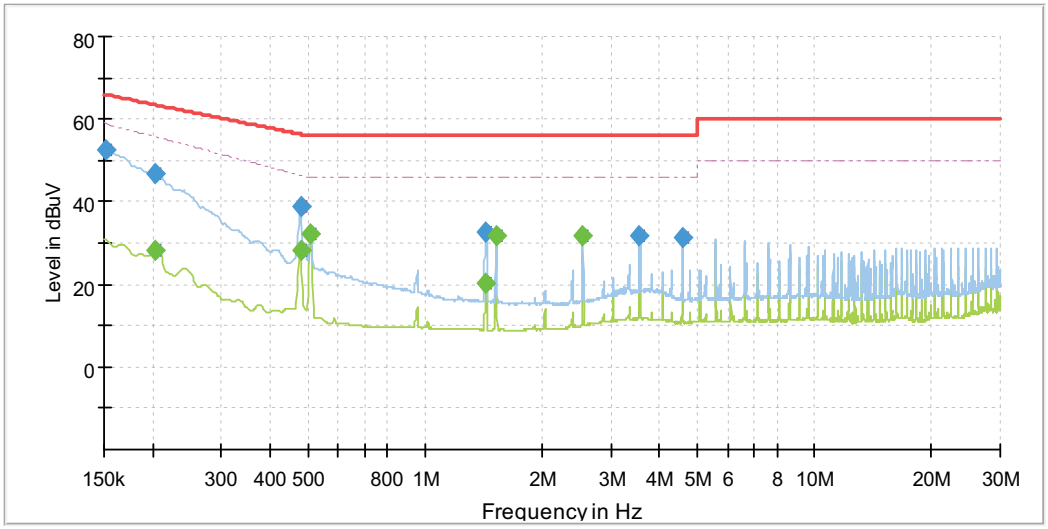
c. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.1.3 Test setup



3.1.4 Test results

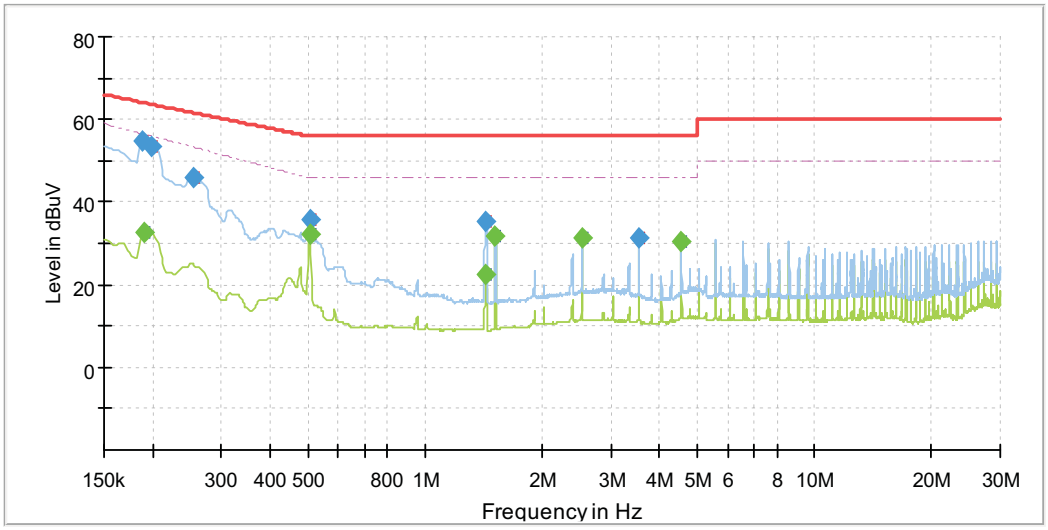
Test Mode	Charging+ WIFI (2.4G) Link		
Frequency Range	150KHz ~ 30MHz	PHASE	Line (L)



NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.152	52.5	---	65.9	13.4	L1	19.5
2	0.204	46.8	---	63.4	16.6	L1	19.5
3	0.204	---	28.4	55.7	27.3	L1	19.5
4	0.479	---	28.4	46.5	18.1	L1	19.5
5	0.479	38.8	---	56.4	17.6	L1	19.5
6	0.508	---	32.2	46.0	13.8	L1	19.5
7	1.435	---	20.3	46.0	25.7	L1	19.6
8	1.437	32.8	---	56.0	23.2	L1	19.6
9	1.525	---	31.9	46.0	14.1	L1	19.6
10	2.542	---	31.6	46.0	14.4	L1	19.6
11	3.559	31.8	---	56.0	24.2	L1	19.6
12	4.576	31.3	---	56.0	24.7	L1	19.6

Remark: The emission levels of other frequencies were very low against the limit.

Test Mode	Charging+ WIFI (2.4G) Link		
Frequency Range	150KHz ~ 30MHz	**PHASE**	Line (N)



NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.188	54.8	---	64.1	9.3	N	19.5
2	0.191	---	32.7	56.4	23.7	N	19.5
3	0.200	53.6	---	63.6	10.0	N	19.5
4	0.256	45.9	---	61.6	15.7	N	19.6
5	0.506	---	32.0	46.0	14.0	N	19.6
6	0.506	35.7	---	56.0	20.4	N	19.6
7	1.435	---	22.3	46.0	23.7	N	19.6
8	1.437	35.1	---	56.0	20.9	N	19.6
9	1.518	---	31.7	46.0	14.3	N	19.6
10	2.531	---	31.4	46.0	14.6	N	19.6
11	3.543	31.5	---	56.0	24.5	N	19.6
12	4.556	---	30.3	46.0	15.7	N	19.7

Remark: The emission levels of other frequencies were very low against the limit.

3.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

3.2.1 Limit(FCC)

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.
NOTE: 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
NOTE: 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 Limit(IC)

Radiated emissions which fall in the restricted bands, as defined in RSS-Gen Section 8.10, must also comply with the radiated emission limits specified in RSS-Gen Section 8.9. as following:

Table 5 – General field strength limits at frequencies above 30 MHz		
FREQUENCIES (MHz)	**FIELD STRENGTH (microvolts/meter)**	**MEASUREMENT DISTANCE (meters)**
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Table 6 – General field strength limits at frequencies below 30 MHz		
FREQUENCIES (MHz)	**Magnetic field strength (H-Field) (μA/m)**	**MEASUREMENT DISTANCE (meters)**
9 - 490 kHz	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

NOTE:

1. The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.
2. The lower limit shall apply at the transition frequencies.
3. Emission level (dBuV/m) = 20 log Emission level (uV/m).
4. dBuV/m=dBuA/m+51.5

3.2.3 Measurement procedure

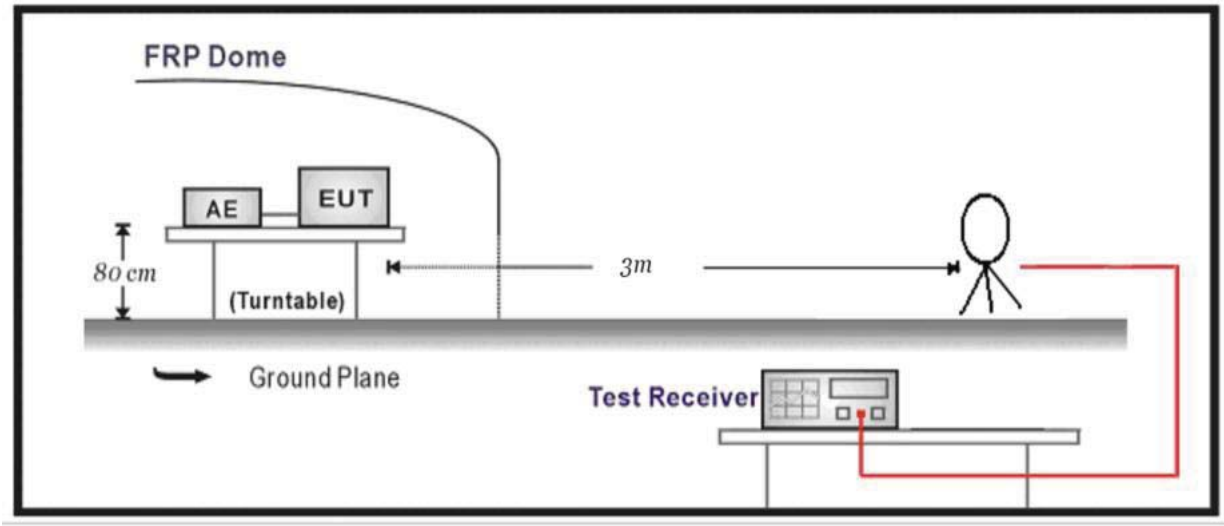
a. The EUT was placed on the top of a rotating table 1.5 meters(above 1GHz) and 0.8 meters(below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. For below 1GHz was used bilog antenna, and above 1GHz was used horn 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. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
g. 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:

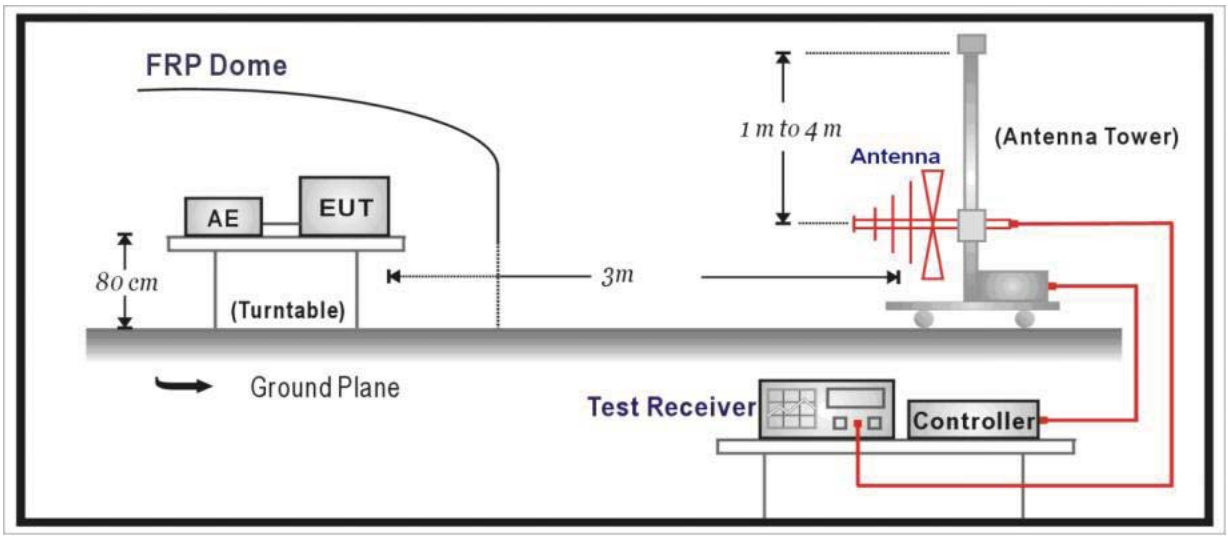
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geqslant$ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

3.2.4 Test setup

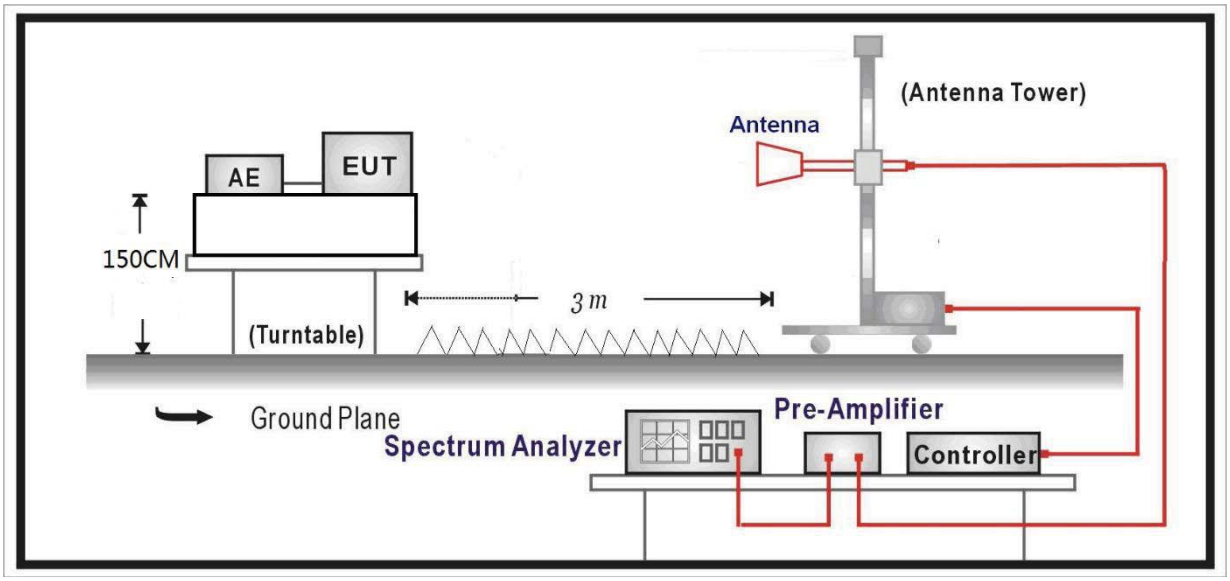
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:

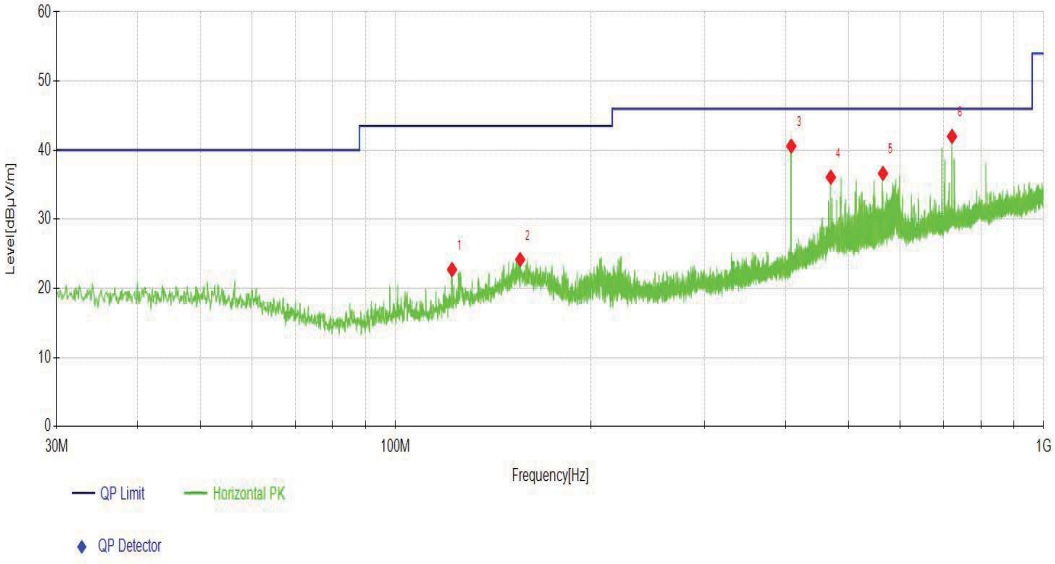

(Antenna Tower)
Antenna
AE
EUT
150CM
3 m
(Turntable)
Ground Plane
Pre-Amplifier
Spectrum Analyzer
Controller

3.2.5 Test results

BELOW 1GHz WORST-CASE DATA:

Worst Test Mode	802.11b	Channel	CH 1
Frequency Range	9KHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Horizontal

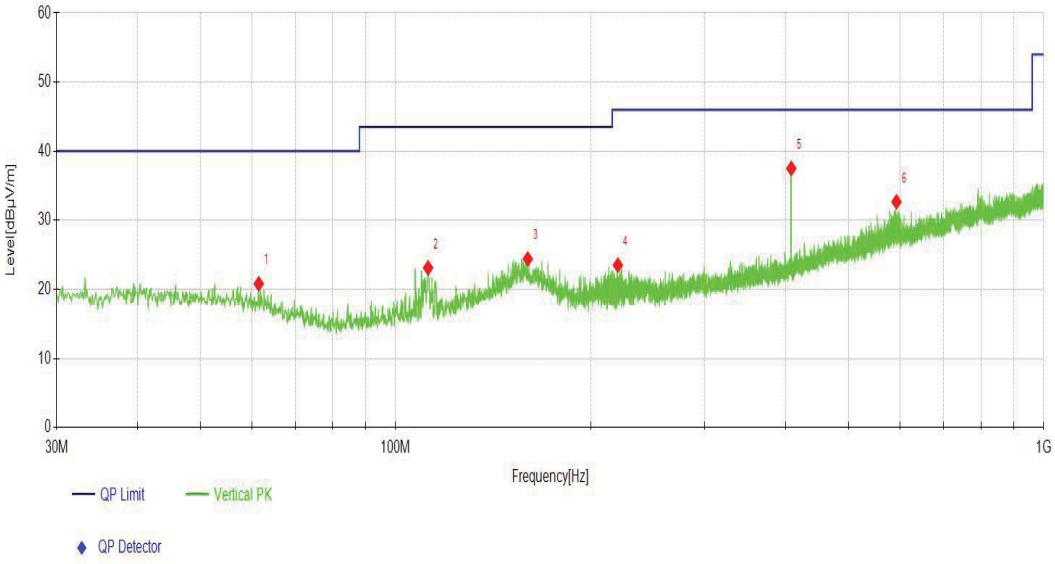


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]
1	122.2562	4.85	22.71	17.86	43.50	20.79	200	144
2	155.7246	3.45	24.17	20.72	43.50	19.33	200	161
3	407.9498	18.28	40.58	22.30	46.00	5.42	100	186
4	469.4539	12.38	36.08	23.70	46.00	9.92	100	159
5	565.0085	11.31	36.64	25.33	46.00	9.36	200	83
6	722.1642	13.78	42.00	28.22	46.00	4.00	200	6

Remark: 1. 9KHz~30MHz have been test and test data more than 20dB margin.
2. The emission levels of other frequencies were greater than 20dB margin.
3. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
4. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
5. Margin(dB) = Limit[dBµV/m] - Level [dBµV/m]

Worst Test Mode	802.11b	Channel	CH 1
Frequency Range	9KHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Vertical



NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]
1	61.5282	2.09	20.79	18.70	40.00	19.21	200	106
2	112.2642	6.09	23.11	17.02	43.50	20.39	200	276
3	159.9930	3.49	24.40	20.91	43.50	19.10	100	55
4	220.3330	6.02	23.50	17.48	46.00	22.50	100	271
5	407.9498	15.20	37.50	22.30	46.00	8.50	200	254
6	592.8503	6.76	32.67	25.91	46.00	13.33	100	283

Remark: 1. 9KHz~30MHz have been test and test data more than 20dB margin.
2. The emission levels of other frequencies were greater than 20dB margin.
3. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
4. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
5. Margin(dB) = Limit[dBµV/m] - Level [dBµV/m]

ABOVE 1GHz DATA

Channel	**802.11b CH 1**	**Frequency**	2412MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2390	46.16	-0.15	46.01	74.00	27.99	197	359	PK
2	2390	38.30	-0.15	38.15	54.00	15.85	197	359	AV
3	2412	94.83	0.15	94.98			197	2	PK
4	2412	92.44	0.17	92.61			197	2	AV
5	4824	34.59	9.68	44.27	54.00	9.73	130	211	AV
6	4824	43.09	9.68	52.77	74.00	21.23	130	288	PK
7	7236	21.21	12.39	33.60	54.00	20.40	130	240	AV
8	7236	27.61	12.39	40.00	74.00	34.00	130	347	PK
9	9648	34.84	13.14	47.98	74.00	26.02	130	186	PK
10	9648	30.50	13.14	43.64	54.00	10.36	130	186	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	45.33	-0.15	45.18	74.00	28.82	202	252	PK
2	2390	37.59	-0.15	37.44	54.00	16.56	202	132	AV
3	2412	93.73	0.16	93.89			202	259	PK
4	2412	91.51	0.17	91.68			202	252	AV
5	4824	42.15	9.68	51.83	74.00	22.17	190	146	PK
6	4824	34.71	9.68	44.39	54.00	9.61	190	1	AV
7	7236	28.30	12.39	40.69	74.00	33.31	190	46	PK
8	7236	20.80	12.39	33.19	54.00	20.81	190	73	AV
9	9648	30.56	13.14	43.70	54.00	10.30	190	173	AV
10	9648	33.58	13.14	46.72	74.00	27.28	190	173	PK

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11b CH 6	Frequency	2437MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4874	39.76	9.70	49.46	54.00	4.54	156	38	AV
2	4874	48.07	9.70	57.77	74.00	16.23	156	53	PK
3	7311	28.93	11.03	39.96	74.00	34.04	156	49	PK
4	7311	22.31	11.03	33.34	54.00	20.66	156	49	AV
5	9748	24.26	13.23	37.49	54.00	16.51	156	175	AV
6	9748	30.43	13.23	43.66	74.00	30.34	156	175	PK

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4874	40.35	9.70	50.05	54.00	3.95	183	148	AV
2	4874	48.28	9.70	57.98	74.00	16.02	183	175	PK
3	7311	35.25	9.75	45.00	74.00	29.00	183	152	PK
4	7311	26.32	9.75	36.07	54.00	17.93	183	145	AV
5	9748	24.19	13.23	37.42	54.00	16.58	183	65	AV
6	9748	29.58	13.23	42.81	74.00	31.19	183	65	PK

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	**802.11b CH 11**	**Frequency**	2462MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2462	86.29	0.79	87.08			104	134	AV
2	2462	88.94	0.75	89.69			104	155	PK
3	2483.5	37.21	0.46	37.67	54.00	16.33	104	359	AV
4	2483.5	48.60	0.46	49.06	74.00	24.94	104	34	PK
5	4924	42.67	10.07	52.74	74.00	21.26	143	178	PK
6	4924	39.78	10.23	50.01	54.00	3.99	143	52	AV
7	7386	21.88	9.80	31.68	54.00	22.32	143	200	AV
8	7386	28.93	9.80	38.73	74.00	35.27	143	341	PK
9	9848	26.50	13.40	39.90	54.00	14.10	143	112	AV
10	9848	32.32	13.40	45.72	74.00	28.28	143	112	PK

Vertical

NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2462	85.20	0.79	85.99			252	153	AV
2	2462	87.71	0.74	88.45			252	126	PK
3	2483.5	37.19	0.46	37.65	54.00	16.35	252	93	AV
4	2483.5	44.35	0.46	44.81	74.00	29.19	252	93	PK
5	4924	45.51	9.99	55.50	74.00	18.50	221	72	PK
6	4924	40.09	10.21	50.30	54.00	3.70	221	145	AV
7	7386	22.70	11.70	34.40	54.00	19.60	221	179	AV
8	7386	32.27	9.77	42.04	74.00	31.96	221	46	PK
9	9848	27.62	13.24	40.86	74.00	33.14	221	73	PK
10	9848	20.97	13.24	34.21	54.00	19.79	221	73	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBµV/m] - Level [dBµV/m]

Channel	802.11g CH 1	Frequency	2412MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2390	41.99	-0.15	41.84	54.00	12.16	287	257	AV
2	2390	51.70	-0.15	51.55	74.00	22.45	287	73	PK
3	2412	96.59	0.14	96.73			287	250	PK
4	2412	89.45	0.14	89.59			287	250	AV
5	4824	50.26	9.68	59.94	74.00	14.06	241	231	PK
6	4824	41.10	9.68	50.78	54.00	3.22	241	218	AV
7	7236	24.24	12.39	36.63	54.00	17.37	241	330	AV
8	7236	30.47	12.39	42.86	74.00	31.14	241	316	PK
9	9648	27.82	13.13	40.95	74.00	33.05	241	330	PK
10	9648	21.16	13.13	34.29	54.00	19.71	241	161	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	46.25	-0.15	46.10	74.00	27.90	136	109	PK
2	2390	38.45	-0.15	38.30	54.00	15.70	136	340	AV
3	2412	82.62	0.14	82.76			136	273	AV
4	2412	89.81	0.14	89.95			136	273	PK
5	4824	47.56	9.68	57.24	74.00	16.76	123	256	PK
6	4824	39.33	9.68	49.01	54.00	4.99	123	256	AV
7	7236	36.39	12.52	48.91	74.00	25.09	123	225	PK
8	7236	28.99	12.42	41.41	54.00	12.59	123	225	AV
9	9648	29.33	13.33	42.66	74.00	31.34	123	246	PK
10	9648	23.98	13.14	37.12	54.00	16.88	123	259	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	**802.11g CH 6**	**Frequency**	2437MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4874	50.81	9.67	60.48	74.00	13.52	115	225	PK
2	4874	40.78	9.72	50.50	54.00	3.50	115	225	AV
3	7311	32.28	11.24	43.52	74.00	30.48	115	318	PK
4	7311	25.59	11.14	36.73	54.00	17.27	115	324	AV
5	9748	29.56	13.16	42.72	74.00	31.28	115	264	PK
6	9748	23.18	13.23	36.41	54.00	17.59	115	182	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4874	45.87	9.70	55.57	74.00	18.43	243	257	PK
2	4874	38.35	9.70	48.05	54.00	5.95	243	40	AV
3	7311	26.24	11.03	37.27	54.00	16.73	243	232	AV
4	7311	33.28	11.03	44.31	74.00	29.69	243	232	PK
5	9748	28.53	13.23	41.76	74.00	32.24	243	184	PK
6	9748	22.61	13.23	35.84	54.00	18.16	243	136	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11g CH 11	Frequency	2462MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2462	87.05	0.60	87.65			264	67	AV
2	2462	94.09	0.59	94.68			264	60	PK
3	2483.5	50.49	0.46	50.95	54.00	3.05	264	80	AV
4	2483.5	64.97	0.46	65.43	74.00	8.57	264	46	PK
5	4924	41.65	10.23	51.88	54.00	2.12	146	225	AV
6	4924	49.44	9.93	59.37	74.00	14.63	146	225	PK
7	7386	28.38	9.80	38.18	74.00	35.82	146	305	PK
8	7386	21.79	9.80	31.59	54.00	22.41	146	108	AV
9	9848	26.45	13.24	39.69	74.00	34.31	146	1	PK
10	9848	20.19	13.24	33.43	54.00	20.57	146	1	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2462	81.68	0.59	82.27			105	340	AV
2	2462	89.01	0.53	89.54			105	340	PK
3	2483.5	45.84	0.46	46.30	54.00	7.70	105	122	AV
4	2483.5	59.31	0.46	59.77	74.00	14.23	105	122	PK
5	4924	43.12	10.07	53.19	74.00	20.81	227	346	PK
6	4924	34.24	10.07	44.31	54.00	9.69	227	346	AV
7	7386	21.78	9.80	31.58	54.00	22.42	227	89	AV
8	7386	28.69	9.80	38.49	74.00	35.51	227	1	PK
9	9848	27.54	13.24	40.78	74.00	33.22	227	272	PK
10	9848	20.00	13.24	33.24	54.00	20.76	227	143	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11n20 CH 1	Frequency	2412MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2390	46.02	-0.15	45.87	54.00	8.13	121	249	AV
2	2390	57.84	-0.15	57.69	74.00	16.31	121	80	PK
3	2412	95.99	0.13	96.12			121	80	PK
4	2412	89.13	0.14	89.27			121	249	AV
5	4824	48.89	9.68	58.57	74.00	15.43	291	219	PK
6	4824	40.59	9.68	50.27	54.00	3.73	291	225	AV
7	7236	24.45	12.39	36.84	54.00	17.16	291	1	AV
8	7236	30.28	12.39	42.67	74.00	31.33	291	7	PK
9	9648	27.62	13.13	40.75	74.00	33.25	291	271	PK
10	9648	20.99	13.13	34.12	54.00	19.88	291	142	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	39.83	-0.15	39.68	54.00	14.32	153	334	AV
2	2390	48.72	-0.15	48.57	74.00	25.43	153	117	PK
3	2412	82.60	0.14	82.74			153	266	AV
4	2412	89.28	0.14	89.42			153	266	PK
5	4824	47.48	9.68	57.16	74.00	16.84	132	223	PK
6	4824	38.62	9.68	48.30	54.00	5.70	132	216	AV
7	7236	27.73	12.39	40.12	54.00	13.88	132	232	AV
8	7236	35.61	12.39	48.00	74.00	26.00	132	225	PK
9	9648	28.43	13.13	41.56	74.00	32.44	132	177	PK
10	9648	21.02	13.13	34.15	54.00	19.85	132	123	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11n20 CH 6	Frequency	2437MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4874	41.75	9.70	51.45	54.00	2.55	103	225	AV
2	4874	47.89	9.70	57.59	74.00	16.41	103	225	PK
3	7311	29.51	11.03	40.54	74.00	33.46	103	325	PK
4	7311	23.42	11.03	34.45	54.00	19.55	103	305	AV
5	9748	23.00	13.23	36.23	54.00	17.77	103	217	AV
6	9748	29.60	13.23	42.83	74.00	31.17	103	217	PK

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4874	45.69	9.70	55.39	74.00	18.61	280	224	PK
2	4874	37.36	9.70	47.06	54.00	6.94	280	258	AV
3	7311	26.57	11.03	37.60	54.00	16.40	280	224	AV
4	7311	32.34	11.03	43.37	74.00	30.63	280	224	PK
5	9748	29.23	13.23	42.46	74.00	31.54	280	128	PK
6	9748	23.15	13.23	36.38	54.00	17.62	280	210	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11n20 CH 11	Frequency	2462MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2462	87.11	0.61	87.72			182	73	AV
2	2462	93.65	0.60	94.25			182	73	PK
3	2483.5	50.36	0.46	50.82	54.00	3.18	182	66	AV
4	2483.5	63.21	0.46	63.67	74.00	10.33	182	73	PK
5	4924	42.92	10.07	52.99	74.00	21.01	286	8	PK
6	4924	34.57	10.07	44.64	54.00	9.36	286	8	AV
7	7386	22.38	9.80	32.18	54.00	21.82	286	73	AV
8	7386	30.14	9.80	39.94	74.00	34.06	286	358	PK
9	9848	28.09	13.24	41.33	74.00	32.67	286	291	PK
10	9848	21.18	13.24	34.42	54.00	19.58	286	291	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2462	81.52	0.59	82.11			182	347	AV
2	2462	88.46	0.56	89.02			182	340	PK
3	2483.5	57.87	0.46	58.33	74.00	15.67	182	353	PK
4	2483.5	46.83	0.46	47.29	54.00	6.71	182	340	AV
5	4924	41.74	10.07	51.81	74.00	22.19	296	129	PK
6	4924	34.15	10.07	44.22	54.00	9.78	296	47	AV
7	7386	21.77	9.80	31.57	54.00	22.43	296	82	AV
8	7386	28.58	9.80	38.38	74.00	35.62	296	356	PK
9	9848	26.89	13.24	40.13	74.00	33.87	296	157	PK
10	9848	20.81	13.24	34.05	54.00	19.95	296	157	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11n40 CH 3	Frequency	2422MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2390	43.86	-0.15	43.71	54.00	10.29	267	74	AV
2	2390	51.52	-0.15	51.37	74.00	22.63	267	269	PK
3	2422	91.62	0.13	91.75			267	249	PK
4	2422	85.15	0.14	85.29			267	80	AV
5	4844	44.56	9.94	54.50	74.00	19.50	100	193	PK
6	4844	38.09	9.94	48.03	54.00	5.97	100	220	AV
7	7266	21.74	11.99	33.73	54.00	20.27	100	167	AV
8	7266	28.88	11.99	40.87	74.00	33.13	100	316	PK
9	9688	27.91	13.15	41.06	74.00	32.94	100	256	PK
10	9688	21.09	13.15	34.24	54.00	19.76	100	208	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	39.40	-0.15	39.25	54.00	14.75	184	334	AV
2	2390	47.94	-0.15	47.79	74.00	26.21	184	205	PK
3	2422	78.40	0.38	78.78			184	259	AV
4	2422	85.84	0.38	86.22			184	259	PK
5	4844	43.96	9.94	53.90	74.00	20.10	281	222	PK
6	4844	36.78	9.94	46.72	54.00	7.28	281	222	AV
7	7266	23.10	11.99	35.09	54.00	18.91	281	253	AV
8	7266	29.34	11.99	41.33	74.00	32.67	281	266	PK
9	9688	27.90	13.15	41.05	74.00	32.95	281	132	PK
10	9688	21.66	13.15	34.81	54.00	19.19	281	260	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11n40 CH 6	Frequency	2437MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4874	46.23	9.70	55.93	74.00	18.07	186	218	PK
2	4874	37.47	9.70	47.17	54.00	6.83	186	218	AV
3	7311	22.81	11.03	33.84	54.00	20.16	186	271	AV
4	7311	29.05	11.03	40.08	74.00	33.92	186	6	PK
5	9748	28.25	13.23	41.48	74.00	32.52	186	34	PK
6	9748	23.39	13.23	36.62	54.00	17.38	186	224	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4874	43.25	9.70	52.95	74.00	21.05	292	87	PK
2	4874	35.56	9.70	45.26	54.00	8.74	292	54	AV
3	7311	23.05	11.03	34.08	54.00	19.92	292	170	AV
4	7311	28.17	11.03	39.20	74.00	34.80	292	314	PK
5	9748	28.74	13.23	41.97	74.00	32.03	292	205	PK
6	9748	22.79	13.23	36.02	54.00	17.98	292	90	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

Channel	802.11n40 CH 9	Frequency	2452MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2452	90.35	0.63	90.98			171	74	PK
2	2452	83.22	0.60	83.82			171	74	AV
3	2483.5	47.92	0.46	48.38	54.00	5.62	171	80	AV
4	2483.5	58.53	0.46	58.99	74.00	15.01	171	74	PK
5	4904	48.59	10.16	58.75	74.00	15.25	229	225	PK
6	4904	38.74	10.14	48.88	54.00	5.12	229	225	AV
7	7356	23.45	11.01	34.46	54.00	19.54	229	318	AV
8	7356	28.47	10.31	38.78	74.00	35.22	229	356	PK
9	9808	26.24	13.20	39.44	74.00	34.56	229	74	PK
10	9808	23.89	13.23	37.12	54.00	16.88	229	190	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2452	78.92	0.57	79.49			212	258	AV
2	2452	85.63	0.57	86.20			212	265	PK
3	2483.5	43.60	0.46	44.06	54.00	9.94	212	340	AV
4	2483.5	53.09	0.46	53.55	74.00	20.45	212	56	PK
5	4904	42.67	10.10	52.77	74.00	21.23	292	141	PK
6	4904	35.12	10.10	45.22	54.00	8.78	292	230	AV
7	7356	21.59	10.31	31.90	54.00	22.10	292	35	AV
8	7356	28.45	10.31	38.76	74.00	35.24	292	151	PK
9	9808	27.34	13.20	40.54	74.00	33.46	292	42	PK
10	9808	24.97	13.23	38.20	54.00	15.80	292	253	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

3.3 6dB BANDWIDTH MEASUREMENT

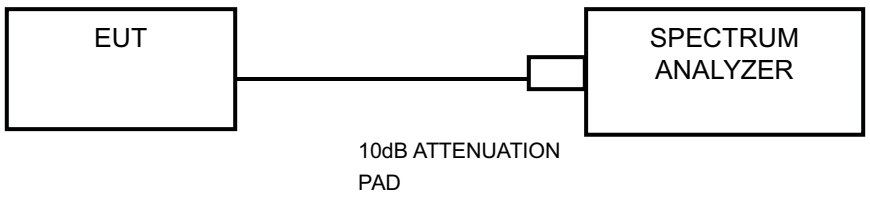
3.3.1 Limits

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 Measurement procedure

a. Set resolution bandwidth (RBW) = 100KHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associatedwith the two amplitude points (upper and lower) that are attenuated by 6 dB relative to themaximum level measured in the fundamental emission.

3.3.3 Test setup



3.3.4 Test result

Please refer Annex A

3.4 CONDUCTED OUTPUT POWER

3.4.1 Limits(FCC)

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

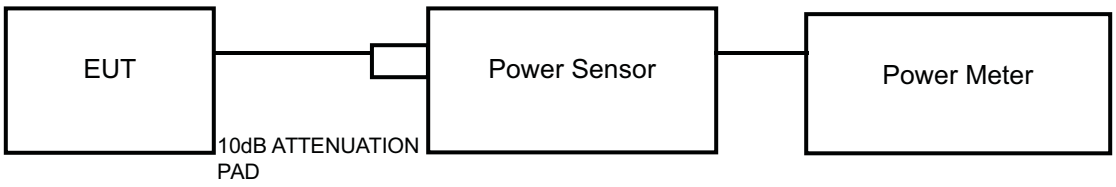
3.4.2 Limits(IC)

For DTSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W(30dBm). The e.i.r.p. shall not exceed 4 W(36dBm)

3.4.3 Measurement procedure

a. 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 and set the detector to PEAK. Record the power level.
b. Anaverage power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power senso and set the detector to AVERAGE. Record the power level.

3.4.4 Test setup



3.4.5 Test result

Please refer Annex A.

3.5 POWER SPECTRAL DENSITY MEASUREMENT

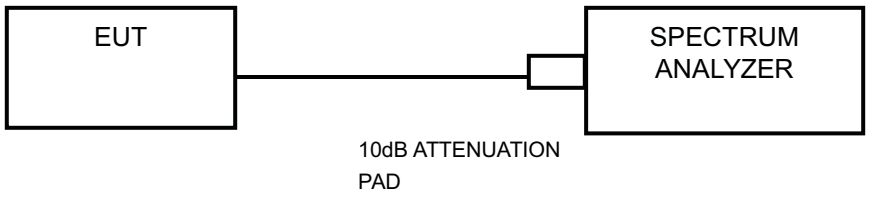
3.5.1 Limits

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

3.5.2 Measurement procedure

a. Set instrument center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set RBW to: 3KHz
d. Set VBW ≥3 x RBW.
e. Detector = peak
f. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g. Sweep time = auto couple.
h. Use the peak marker function to determine the maximum amplitude level.

3.5.3 Test setup



3.5.4 Test result

Please refer Annex A.

3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 Limits

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 Measurement procedure

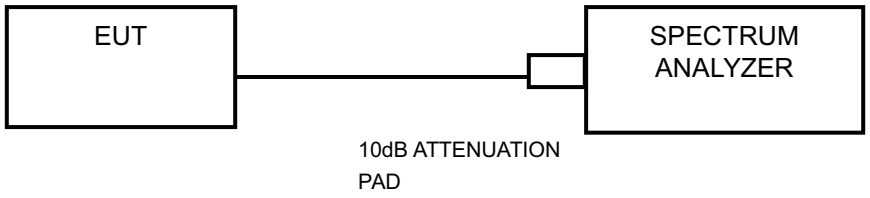
Measurement Procedure -Reference Level

a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHzband segment within the fundamental EBW.

Measurement Procedure –Unwanted Emission Level

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Set span to encompass the spectrum to be examined
d. Detector = peak.
e. Trace Mode = max hold.
f. Sweep = auto couple.

3.6.3 Test setup



3.6.4 Test result

Please refer Annex A.

3.7 OCCUPIED BANDWIDTH MEASUREMENT

3.7.1 Measurement procedure

The transmitter antenna output was connected to the spectrum analyzer through an attenuator. The resolution bandwidth shall be set to the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth.
below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.7.2 TEST SETUP

3.7.3 Test result

Please refer Annex A.

4 PHOTOGRAPHS OF TEST SETUP

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

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5 Appendix A

Please refer to the following pages for test results.

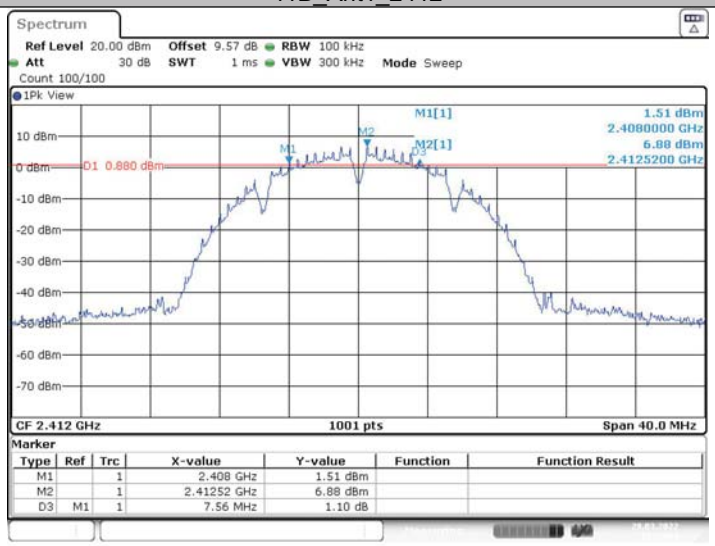
5.1 6DB BANDWIDTH MEASUREMENT

5.1.1 Test Result

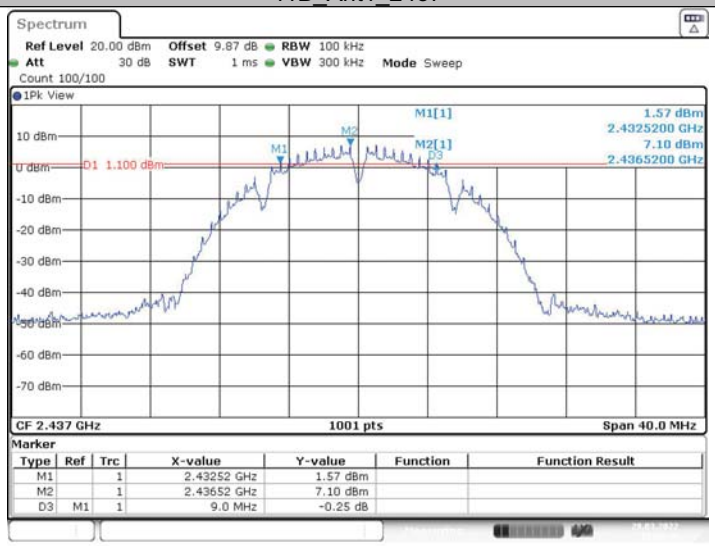
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	7.56	2408.00	2415.56	0.5	PASS
		2437	9.00	2432.52	2441.52	0.5	PASS
		2462	8.52	2458.00	2466.52	0.5	PASS
11G	Ant1	2412	16.32	2403.88	2420.20	0.5	PASS
		2437	16.32	2428.84	2445.16	0.5	PASS
		2462	16.36	2453.84	2470.20	0.5	PASS
11N20SISO	Ant1	2412	17.56	2403.24	2420.80	0.5	PASS
		2437	17.16	2428.24	2445.40	0.5	PASS
		2462	17.52	2453.28	2470.80	0.5	PASS
11N40SISO	Ant1	2422	35.44	2404.16	2439.60	0.5	PASS
		2437	35.36	2419.24	2454.60	0.5	PASS
		2452	36.24	2433.92	2470.16	0.5	PASS

5.1.2 Test Graphs

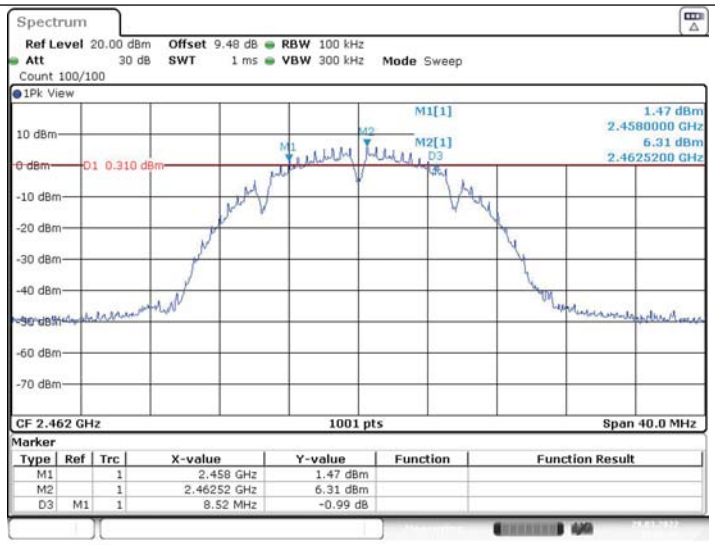
11B_Ant1_2412



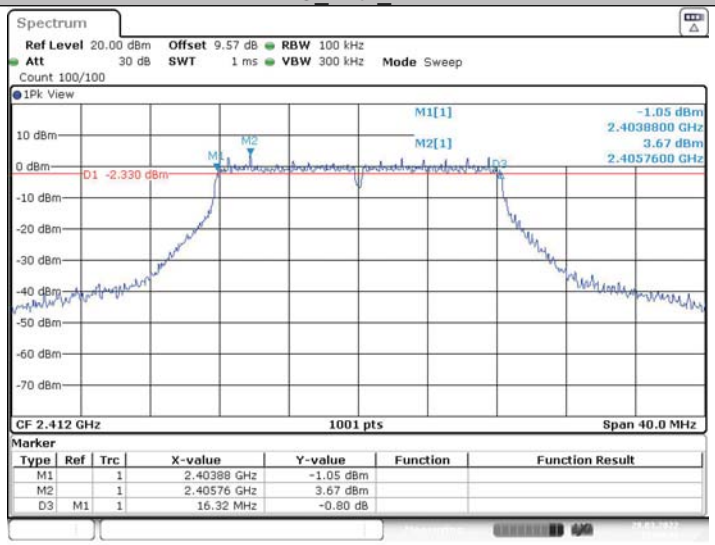
11B_Ant1_2437



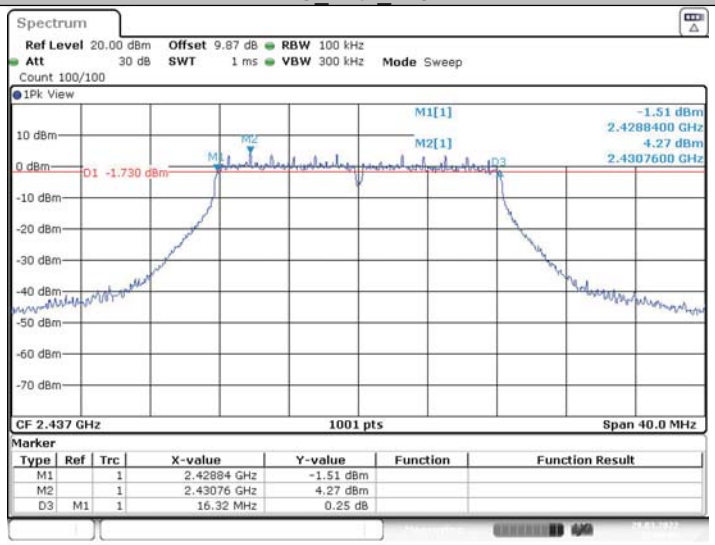
11B_Ant1_2462



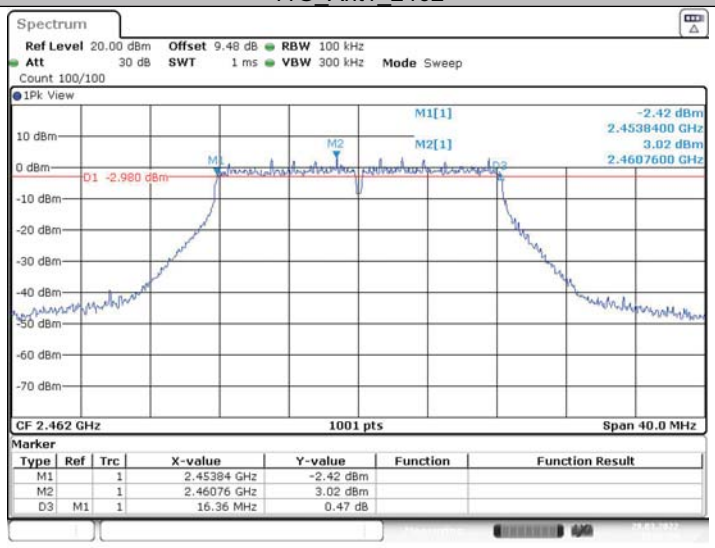
11G_Ant1_2412



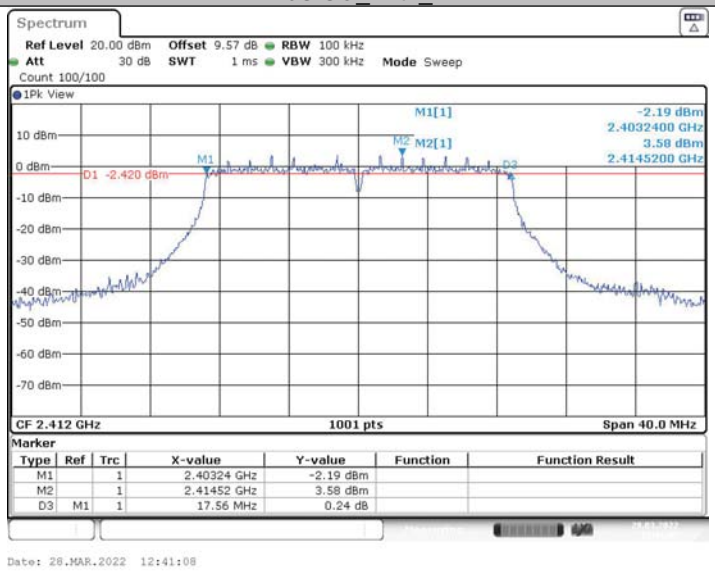
11G_Ant1_2437



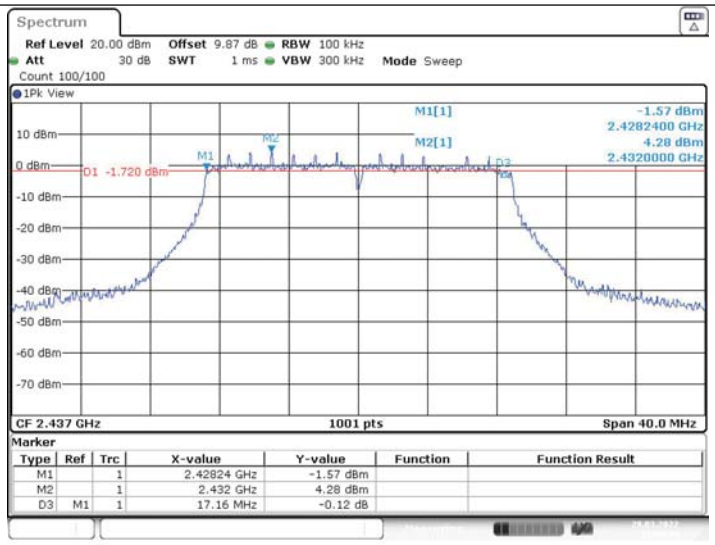
11G_Ant1_2462



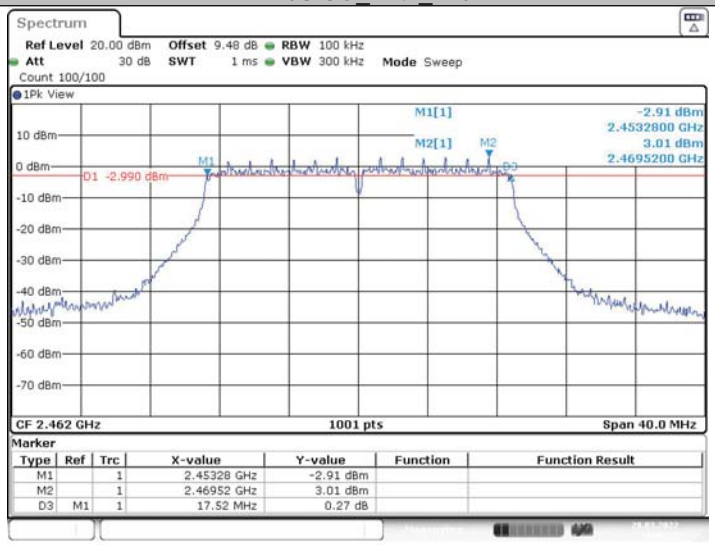
11N20SISO_Ant1_2412



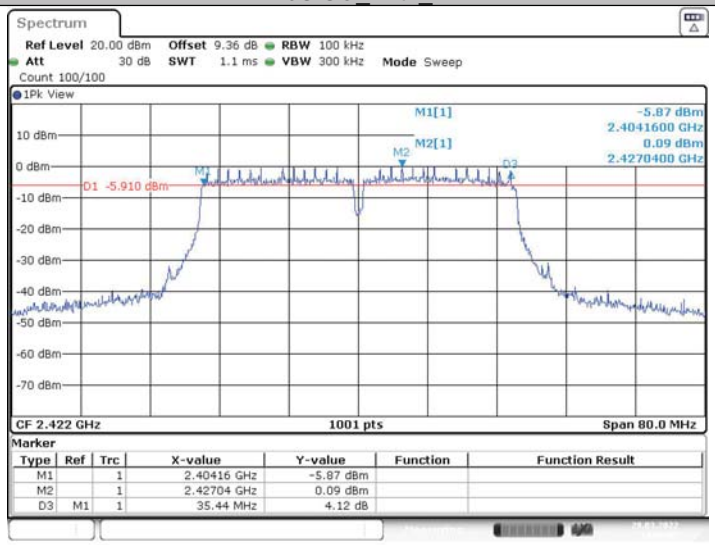
11N20SISO_Ant1_2437



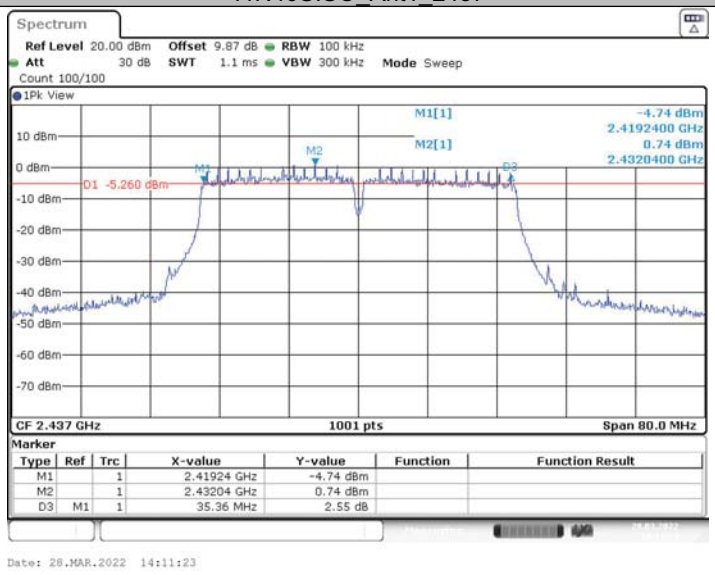
11N20SISO_Ant1_2462



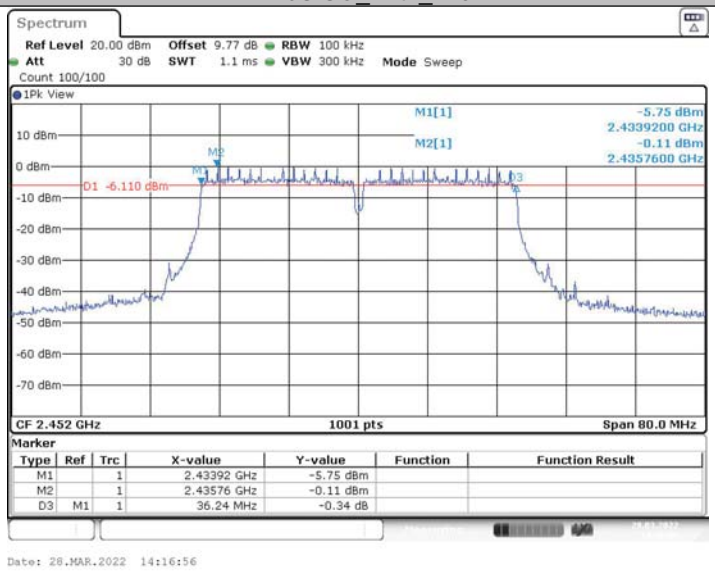
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



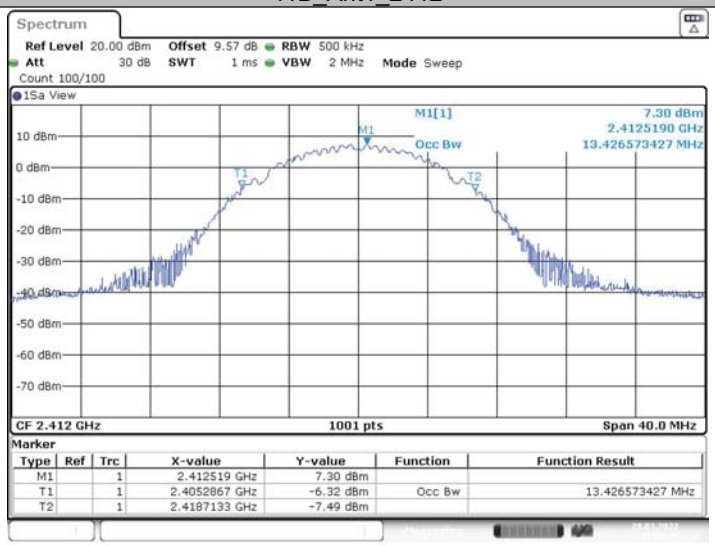
5.2 Occupied Channel Bandwidth

5.2.1 Test Result

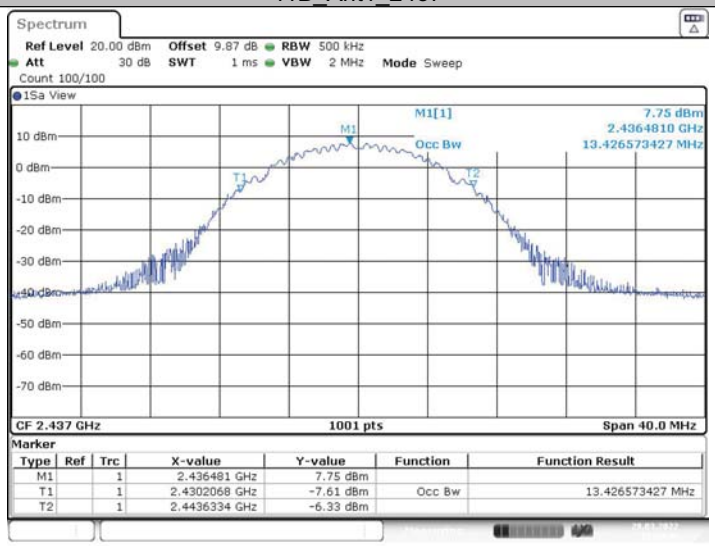
TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.427	2405.287	2418.713	---	---
		2437	13.427	2430.207	2443.633	---	---
		2462	13.427	2455.327	2468.753	---	---
11G	Ant1	2412	17.383	2403.409	2420.791	---	---
		2437	17.383	2428.209	2445.591	---	---
		2462	17.463	2453.329	2470.791	---	---
11N20SISO	Ant1	2412	18.262	2402.889	2421.151	---	---
		2437	18.342	2427.849	2446.191	---	---
		2462	18.302	2452.849	2471.151	---	---
11N40SISO	Ant1	2422	36.603	2403.698	2440.302	---	---
		2437	36.683	2418.778	2455.462	---	---
		2452	36.523	2433.778	2470.302	---	---

5.2.2 Test Graphs

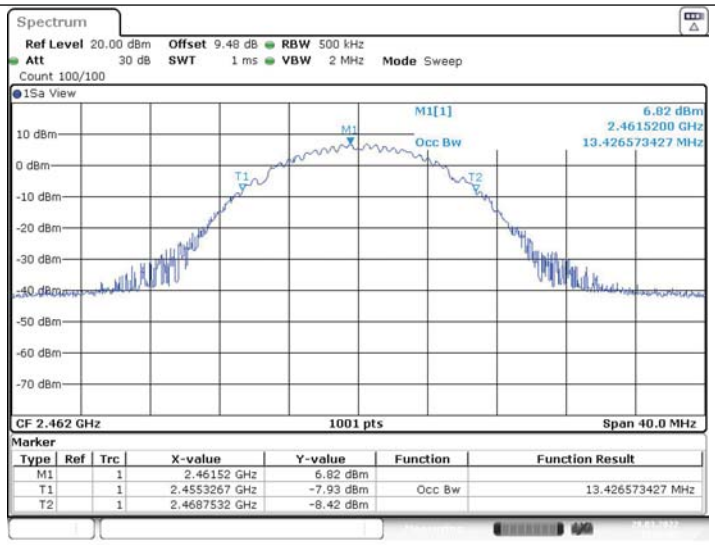
11B_Ant1_2412



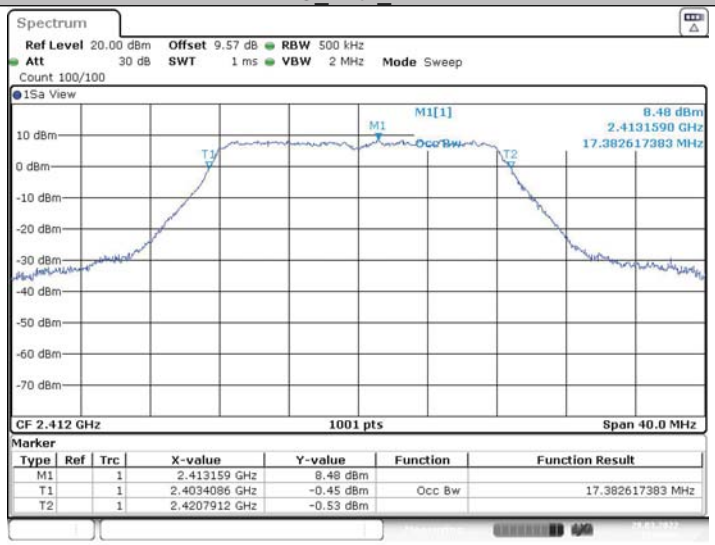
11B_Ant1_2437



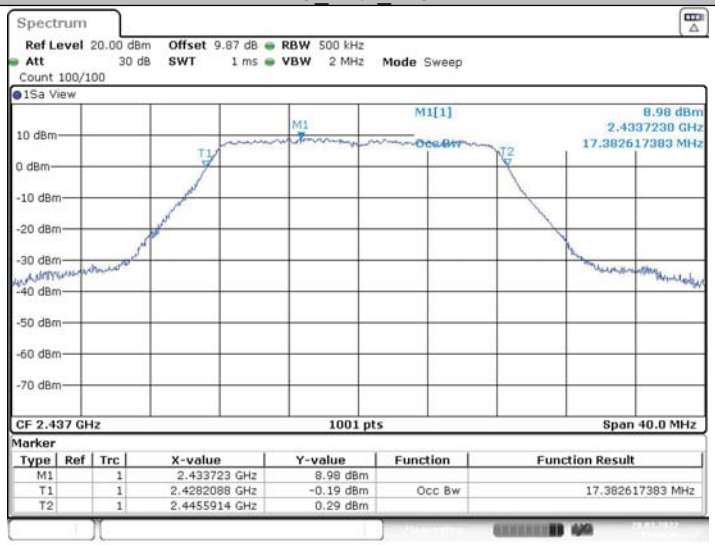
11B_Ant1_2462



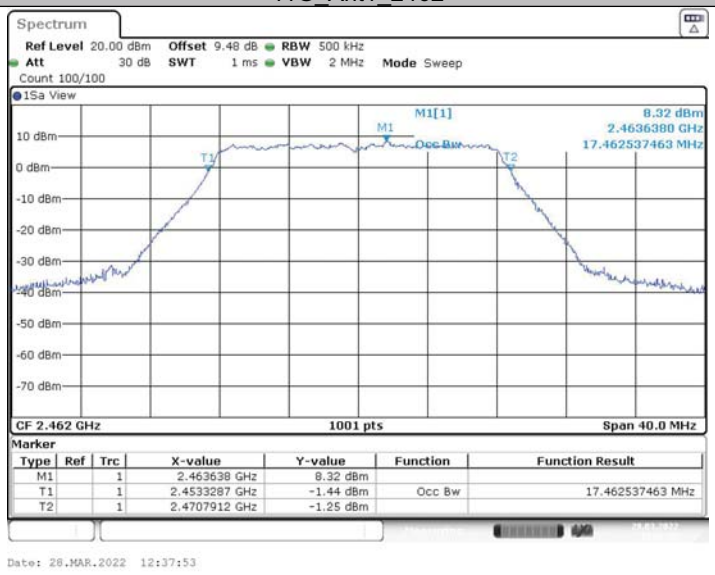
11G_Ant1_2412



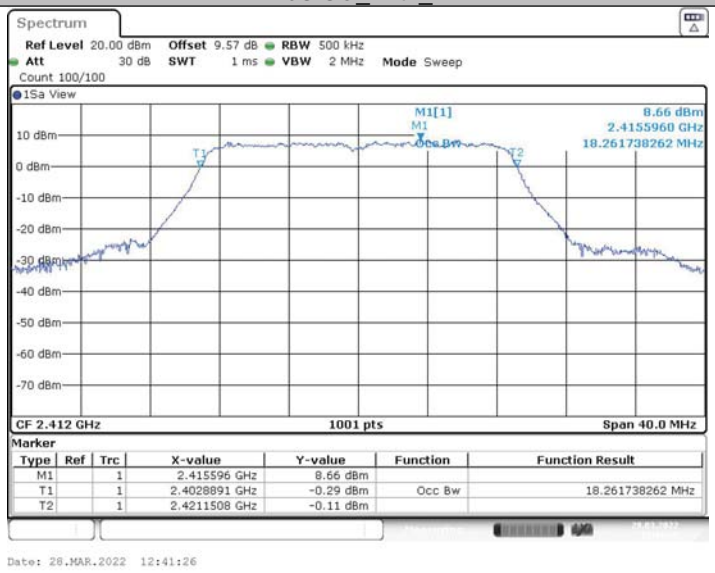
11G_Ant1_2437



11G_Ant1_2462



11N20SISO_Ant1_2412



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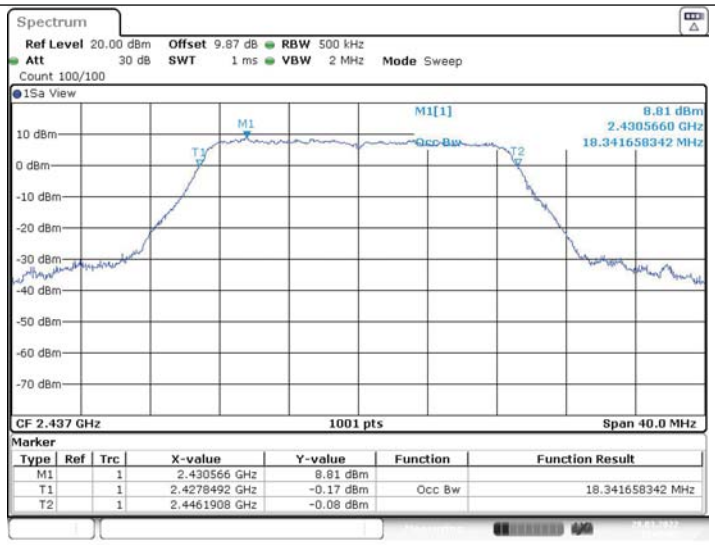

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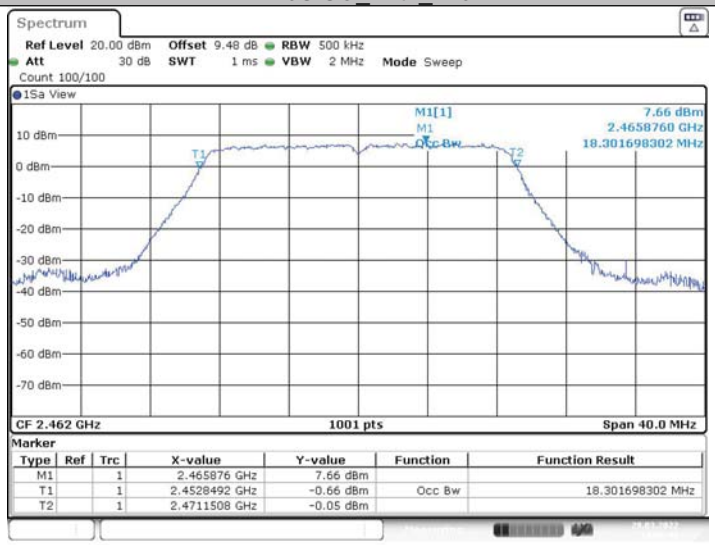

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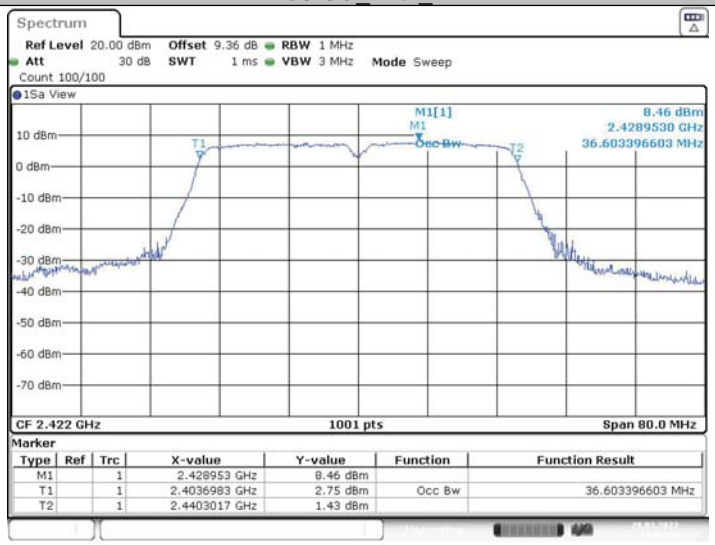

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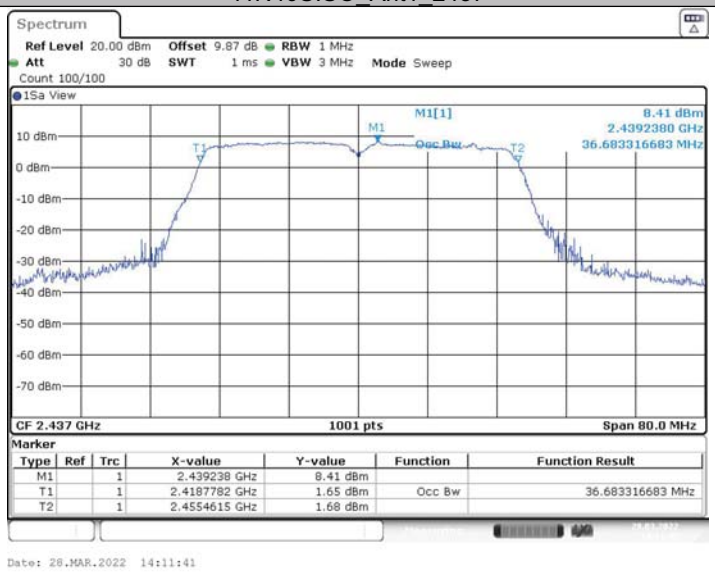
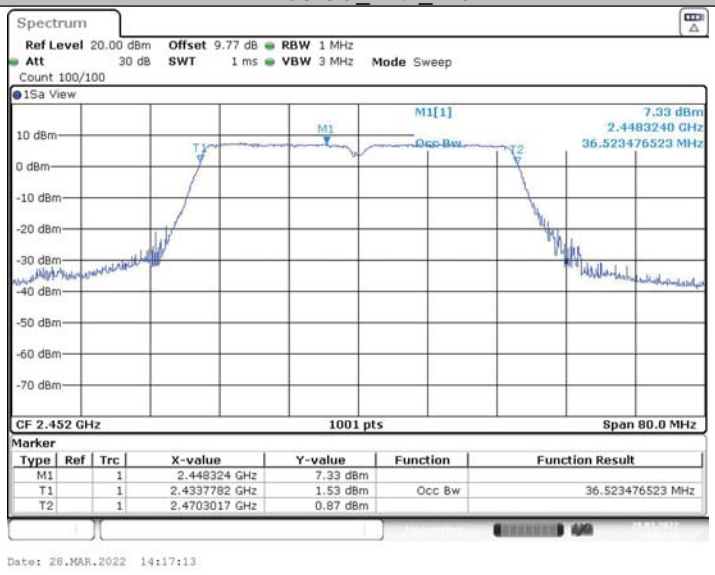
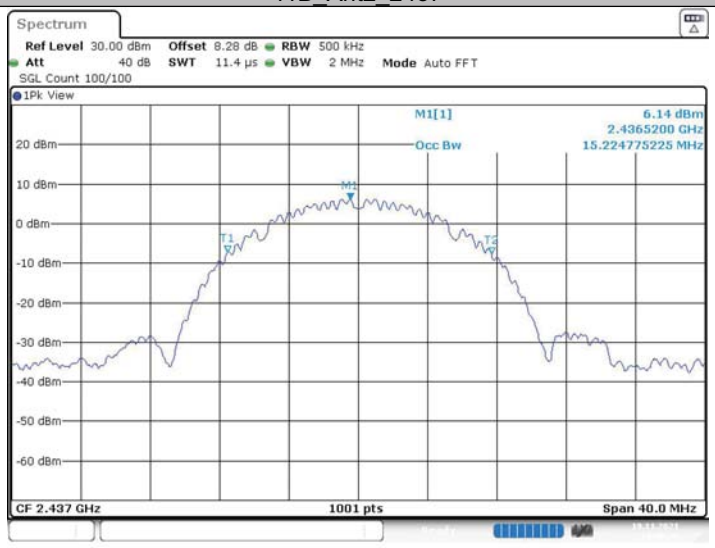
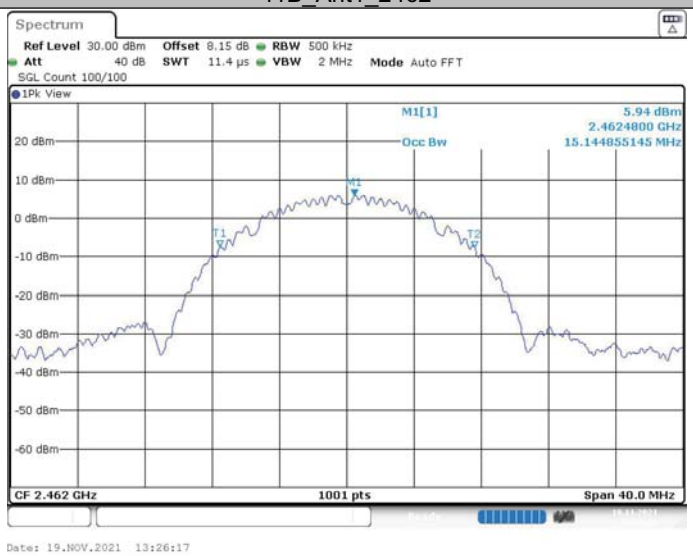


11N40SISO_Ant1_2452


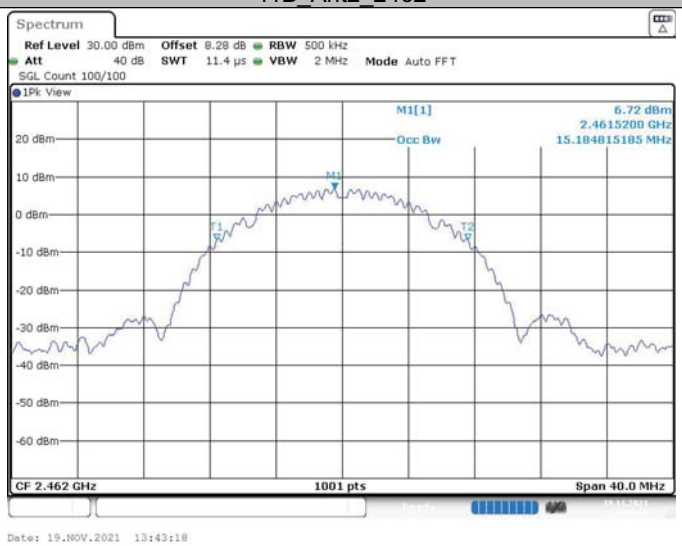
11B_Ant2_2437



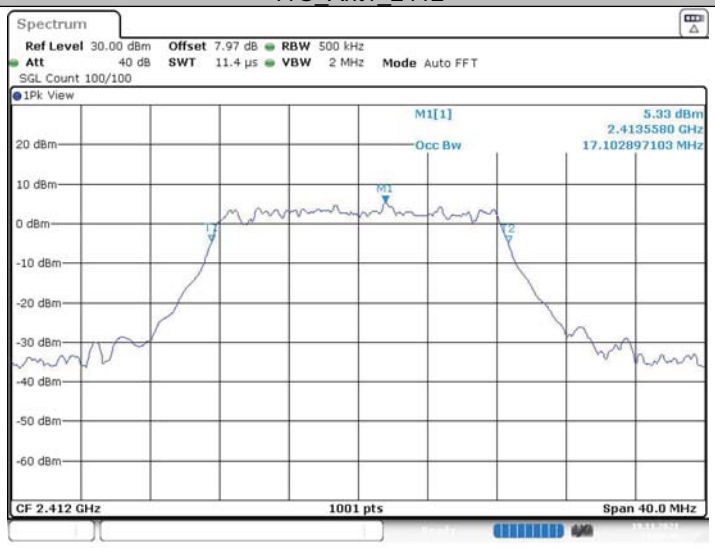
11B_Ant1_2462



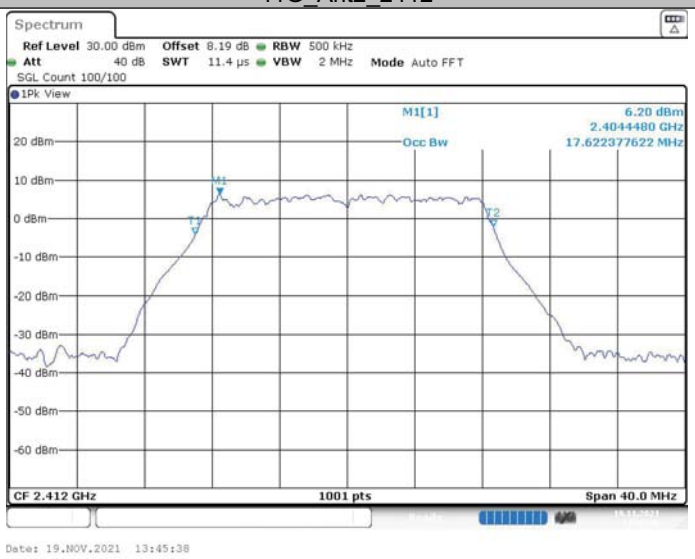
11B_Ant2_2462



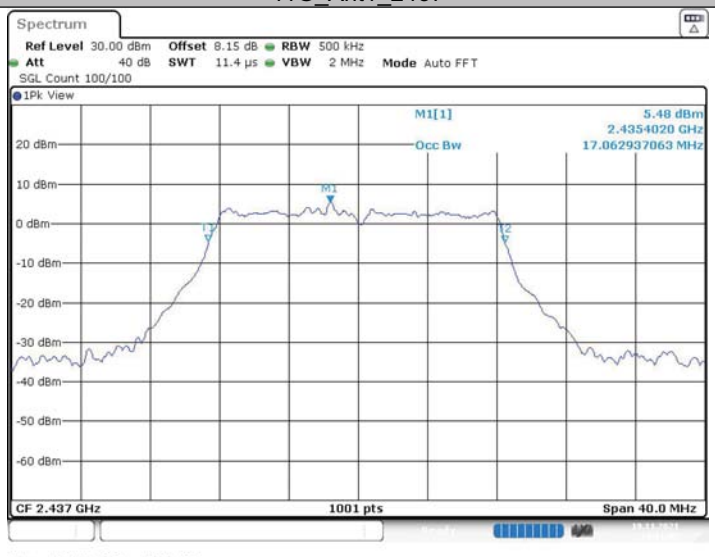
11G_Ant1_2412



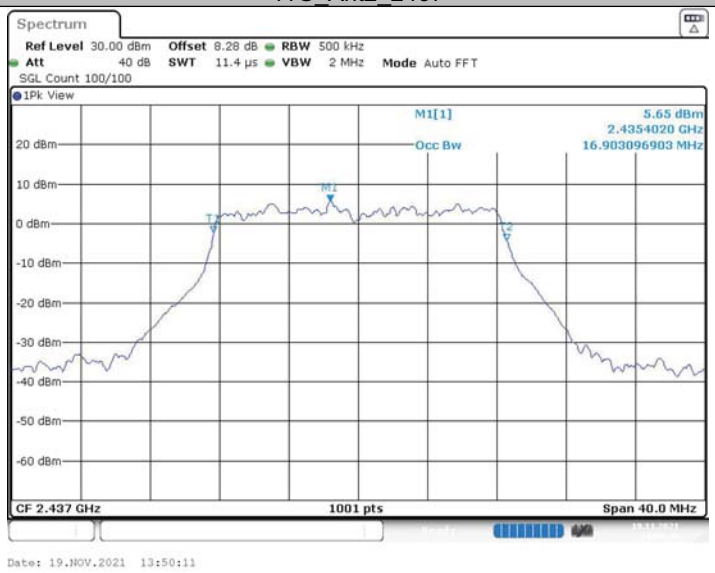
11G_Ant2_2412



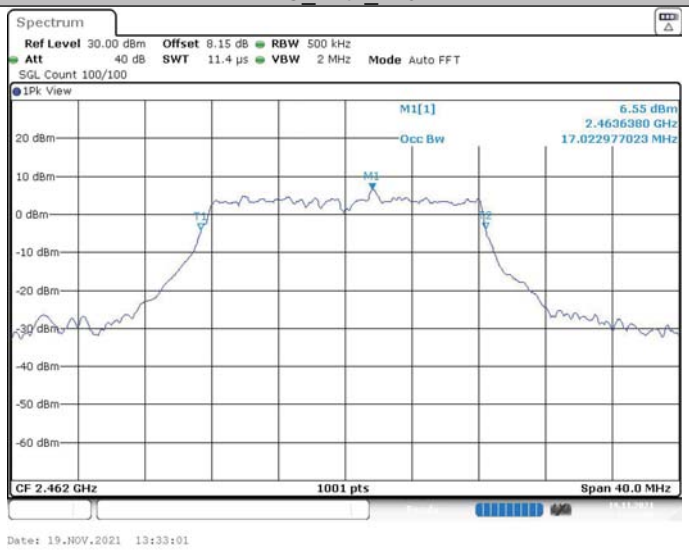
11G_Ant1_2437



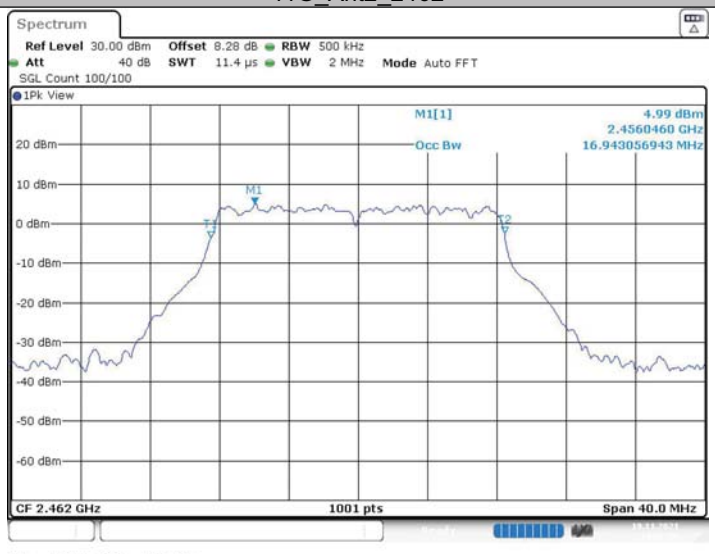
11G_Ant2_2437



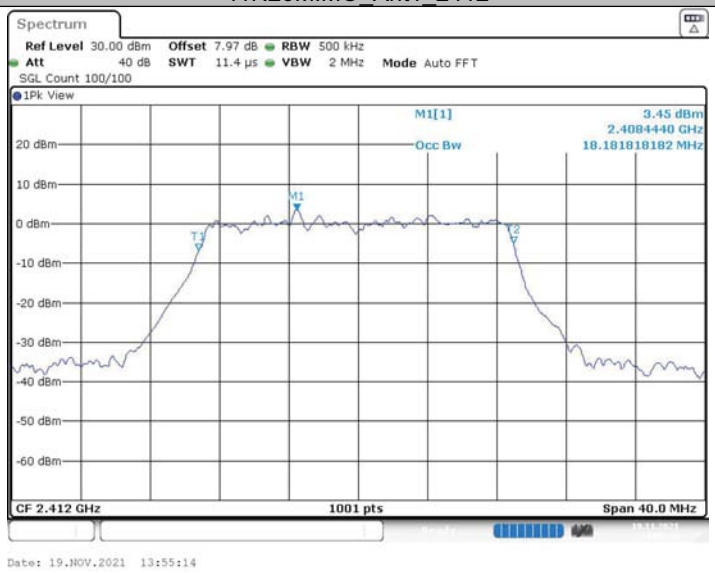
11G_Ant1_2462



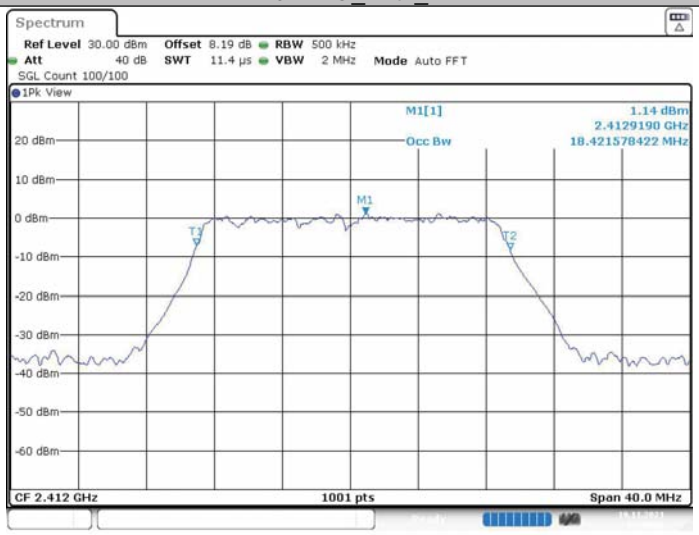
11G_Ant2_2462



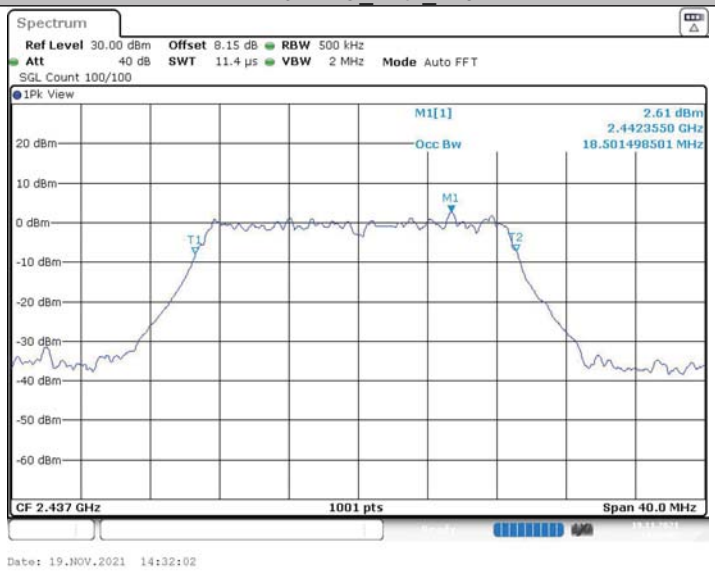
11N20MIMO_Ant1_2412



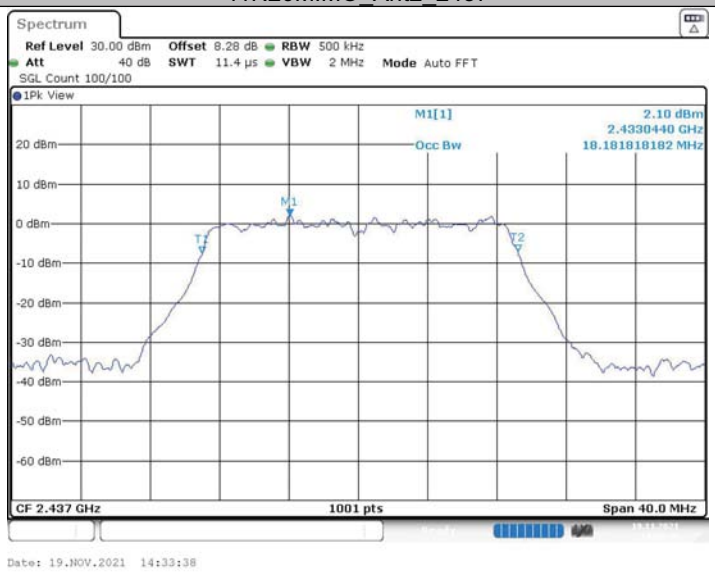
11N20MIMO_Ant2_2412



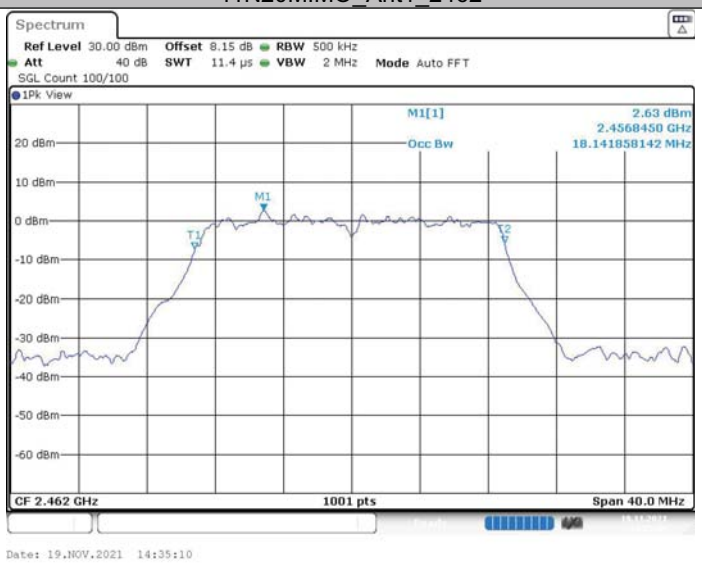
11N20MIMO_Ant1_2437



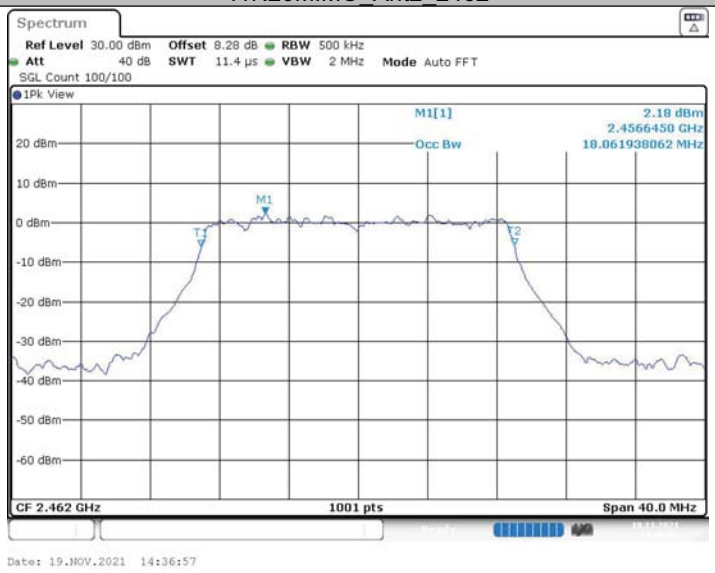
11N20MIMO_Ant2_2437



11N20MIMO_Ant1_2462



11N20MIMO_Ant2_2462



5.3 CONDUCTED OUTPUT POWER

5.3.1 Test Result

PK：

TestMode	Antenna	Frequency[MHz]	Peak Powert[dBm]	Conducted Limit[dBm]	EIRP [dBm]	EIRP Limit[dBm]	Verdict
11B	Ant1	2412	12.49	≤30.00	14.49	≤36.00	PASS
		2437	13.27	≤30.00	15.27	≤36.00	PASS
		2462	12.26	≤30.00	14.26	≤36.00	PASS
11G	Ant1	2412	22.88	≤30.00	24.88	≤36.00	PASS
		2437	23.29	≤30.00	25.29	≤36.00	PASS
		2462	22.40	≤30.00	24.40	≤36.00	PASS
11N20SISO	Ant1	2412	22.85	≤30.00	24.85	≤36.00	PASS
		2437	23.20	≤30.00	25.20	≤36.00	PASS
		2462	22.27	≤30.00	24.27	≤36.00	PASS
11N40SISO	Ant1	2422	22.04	≤30.00	24.04	≤36.00	PASS
		2437	22.31	≤30.00	24.31	≤36.00	PASS
		2452	21.96	≤30.00	23.96	≤36.00	PASS

AVG：

Test Mode	Antenna	Frequency[MHz]	Set Power	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11B	Ant1	2412	---	9.13	≤30.00	2.00	11.13	≤36.00	PASS
		2437	---	9.27	≤30.00	2.00	11.27	≤36.00	PASS
		2462	---	8.68	≤30.00	2.00	10.68	≤36.00	PASS
11G	Ant1	2412	---	14.04	≤30.00	2.00	16.04	≤36.00	PASS
		2437	---	14.33	≤30.00	2.00	16.33	≤36.00	PASS
		2462	---	13.59	≤30.00	2.00	15.59	≤36.00	PASS
11N20SISO	Ant1	2412	---	14.07	≤30.00	2.00	16.07	≤36.00	PASS
		2437	---	14.02	≤30.00	2.00	16.02	≤36.00	PASS
		2462	---	13.46	≤30.00	2.00	15.46	≤36.00	PASS
11N40SISO	Ant1	2422	---	13.28	≤30.00	2.00	15.28	≤36.00	PASS
		2437	---	13.55	≤30.00	2.00	15.55	≤36.00	PASS
		2452	---	13.07	≤30.00	2.00	15.07	≤36.00	PASS

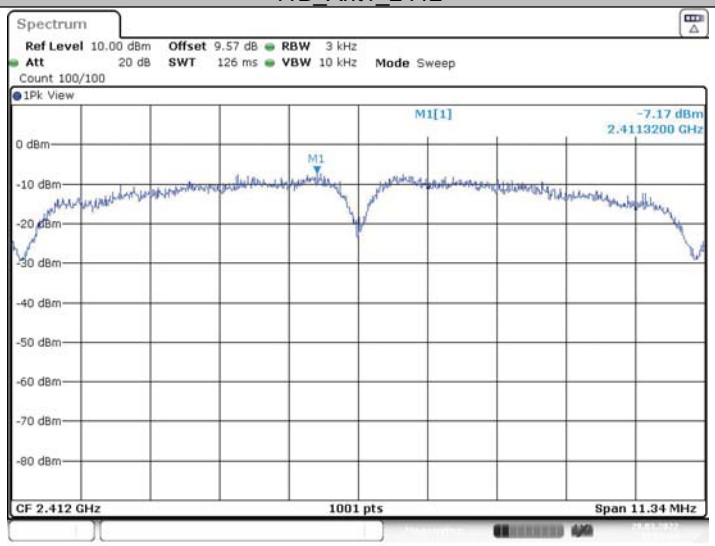
5.4 POWER SPECTRAL DENSITY MEASUREMENT

5.4.1 Test Result

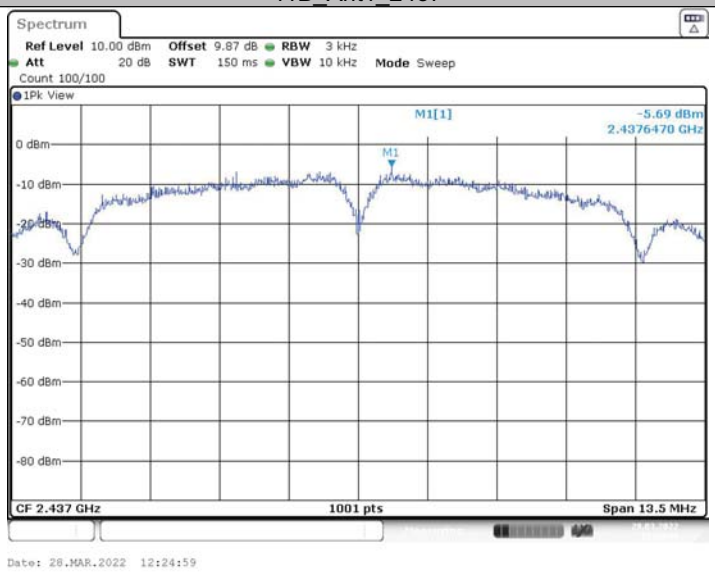
TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-7.17	≤8.00	PASS
		2437	-5.69	≤8.00	PASS
		2462	-7.2	≤8.00	PASS
11G	Ant1	2412	-9.44	≤8.00	PASS
		2437	-9.33	≤8.00	PASS
		2462	-10.26	≤8.00	PASS
11N20SISO	Ant1	2412	-10.36	≤8.00	PASS
		2437	-9.97	≤8.00	PASS
		2462	-10.17	≤8.00	PASS
11N40SISO	Ant1	2422	-12.26	≤8.00	PASS
		2437	-13.34	≤8.00	PASS
		2452	-14.75	≤8.00	PASS

5.4.2 Test Graphs

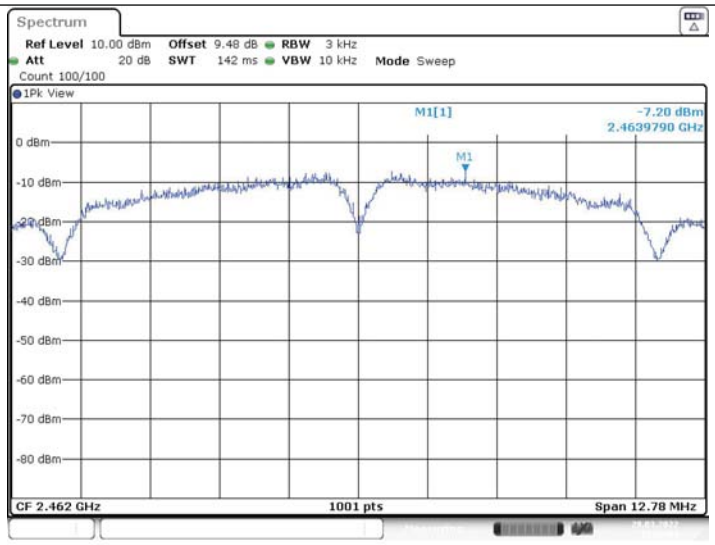
11B_Ant1_2412



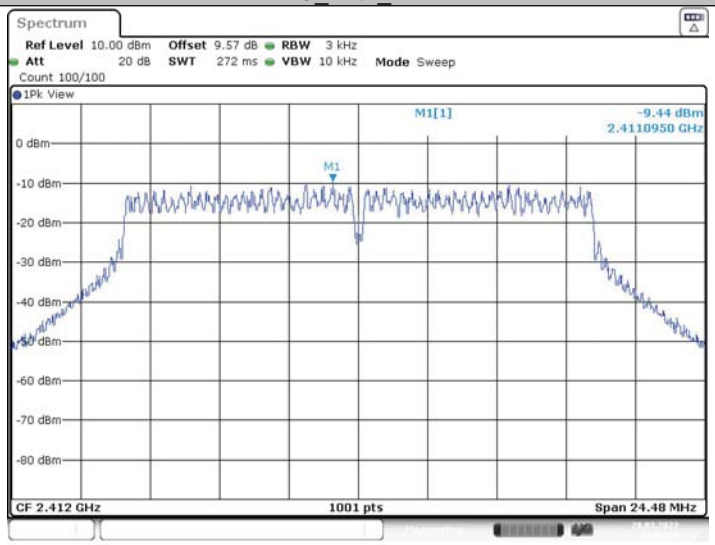
11B_Ant1_2437



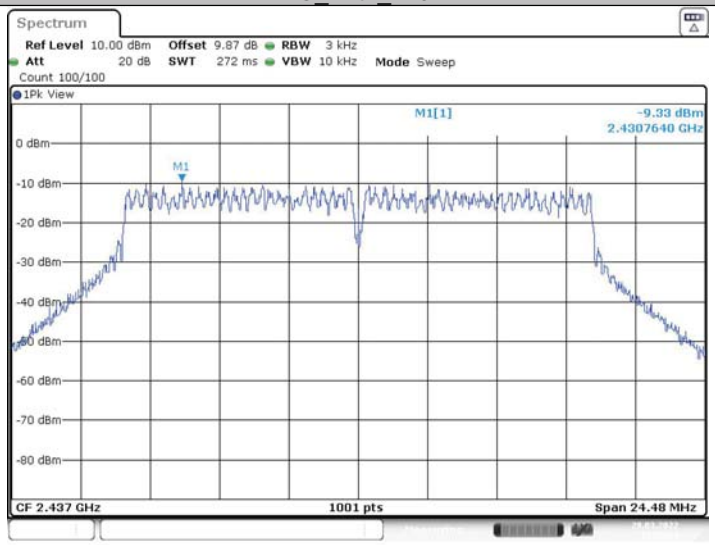
11B_Ant1_2462

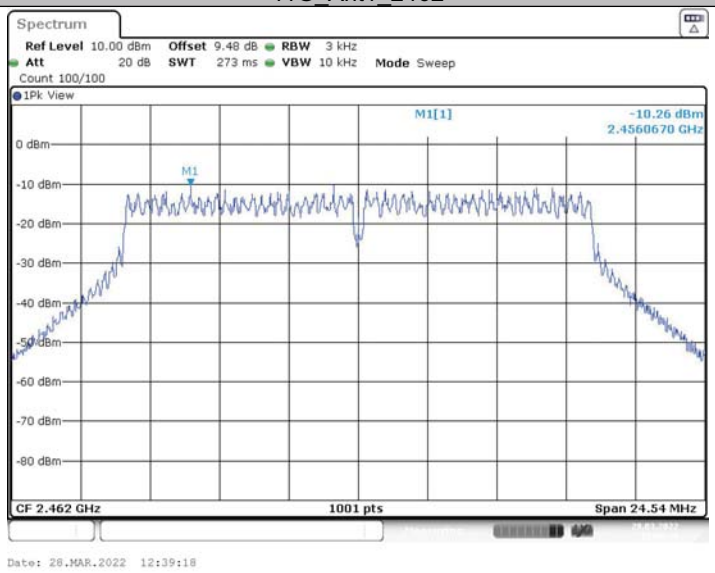


11G_Ant1_2412



11G_Ant1_2437



11G_Ant1_2462

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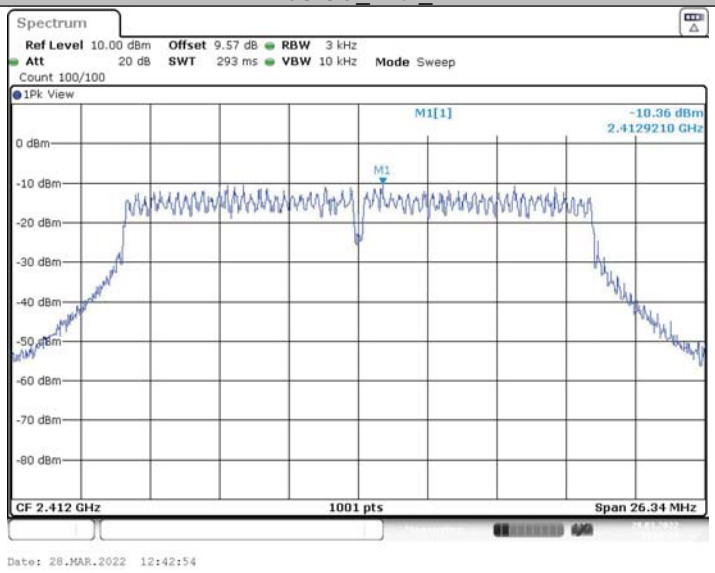
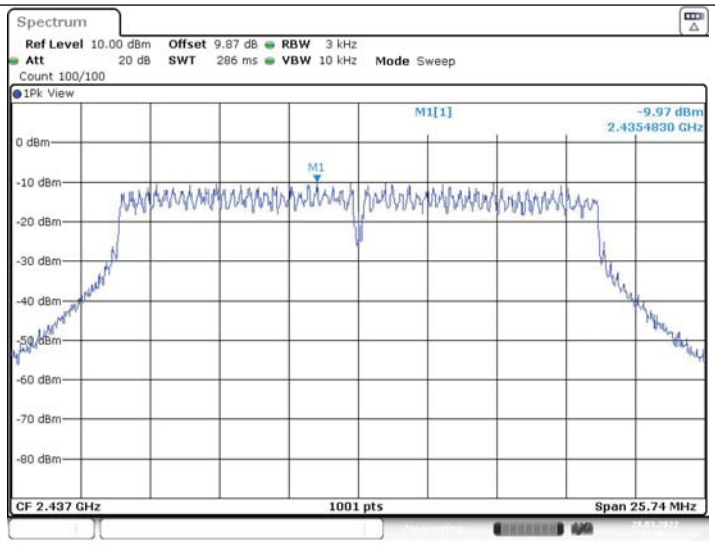
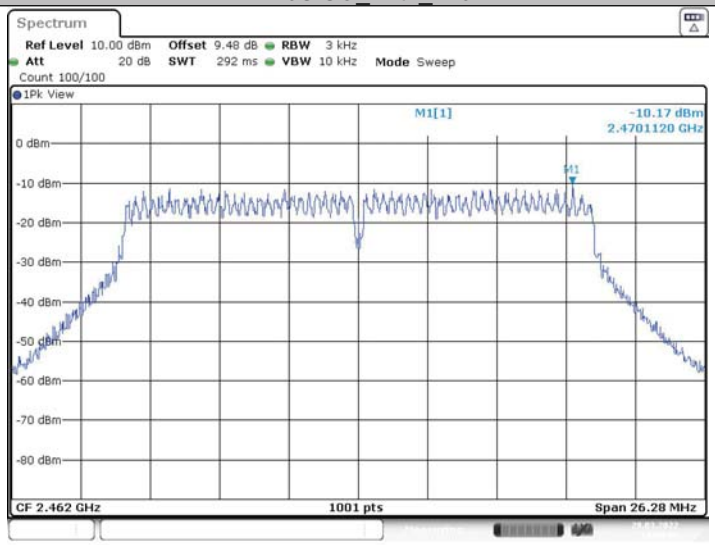
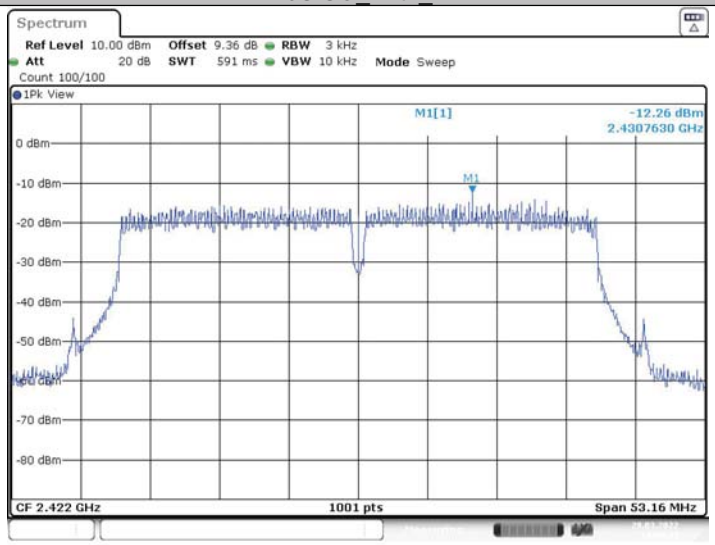

11N20SISO_Ant1_2437

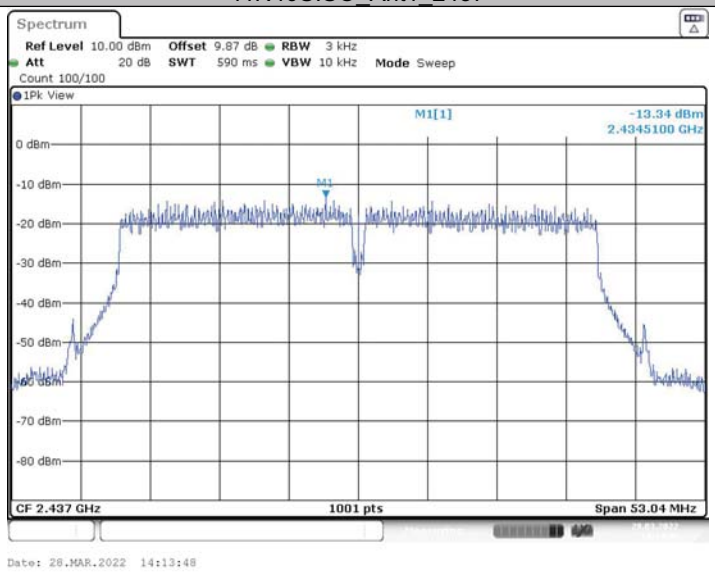


11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



11N40SISO_Ant1_2437

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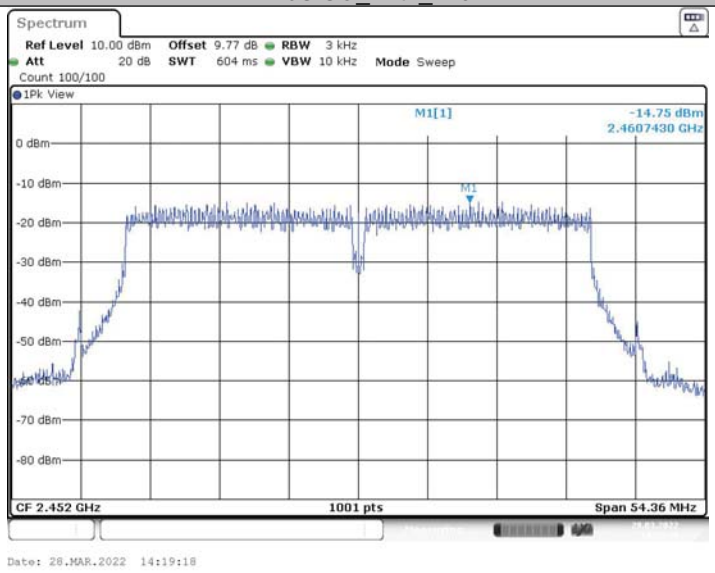
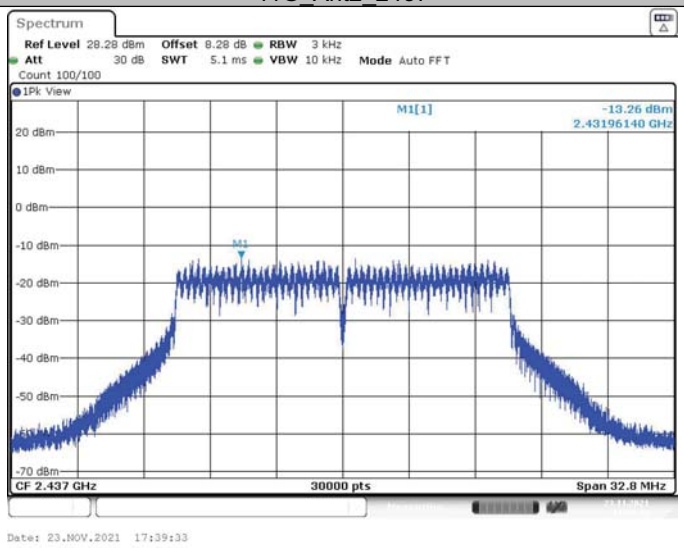
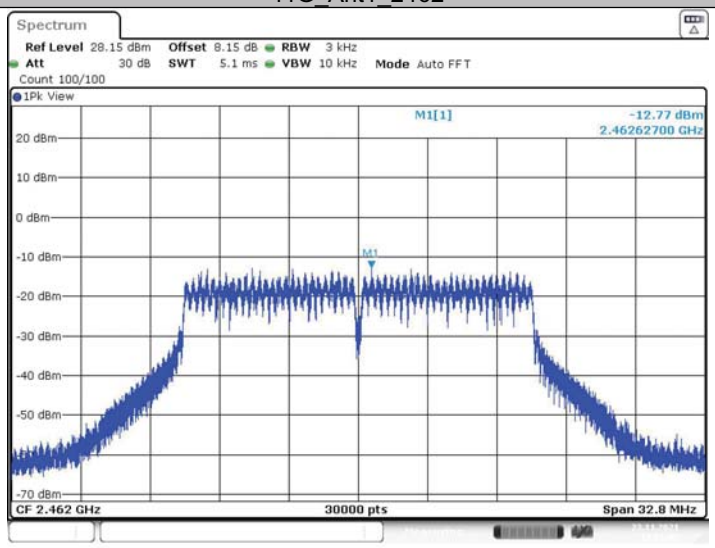


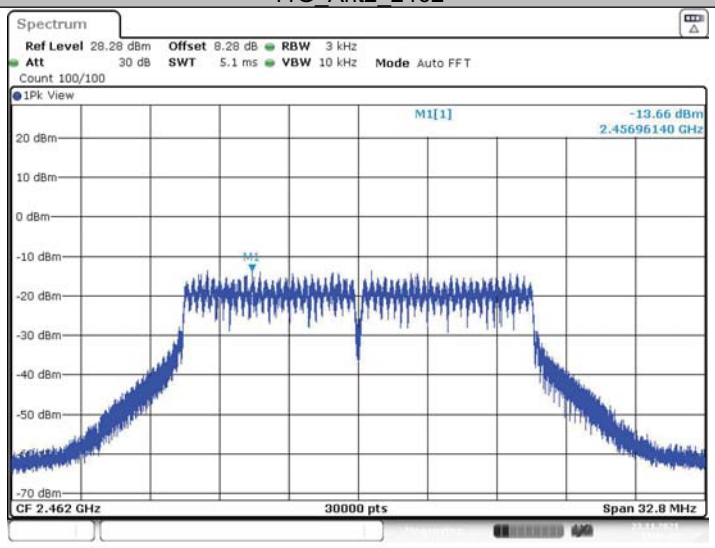
11G_Ant2_2437



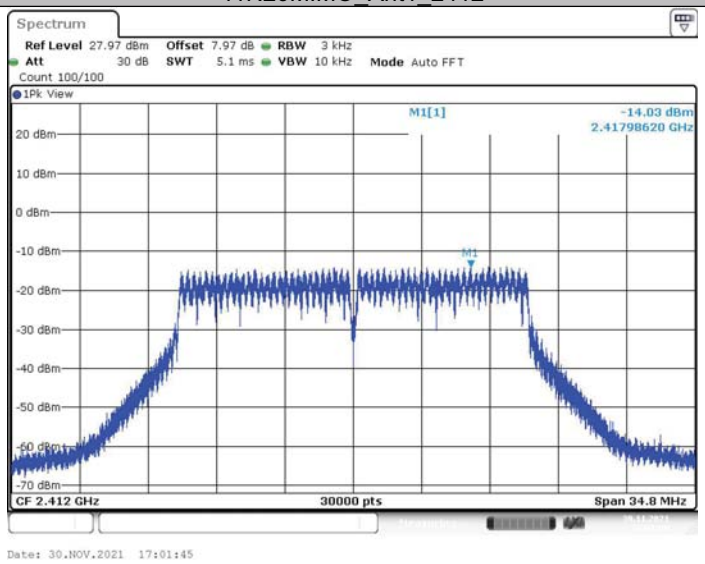
11G_Ant1_2462



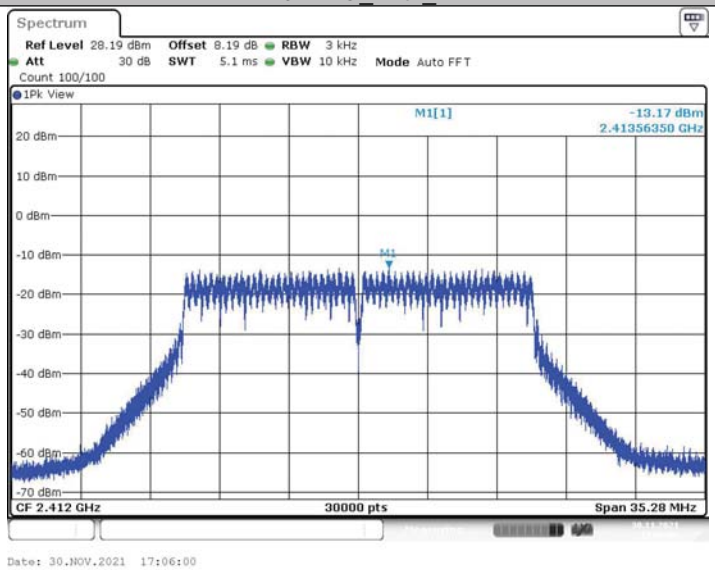
11G_Ant2_2462



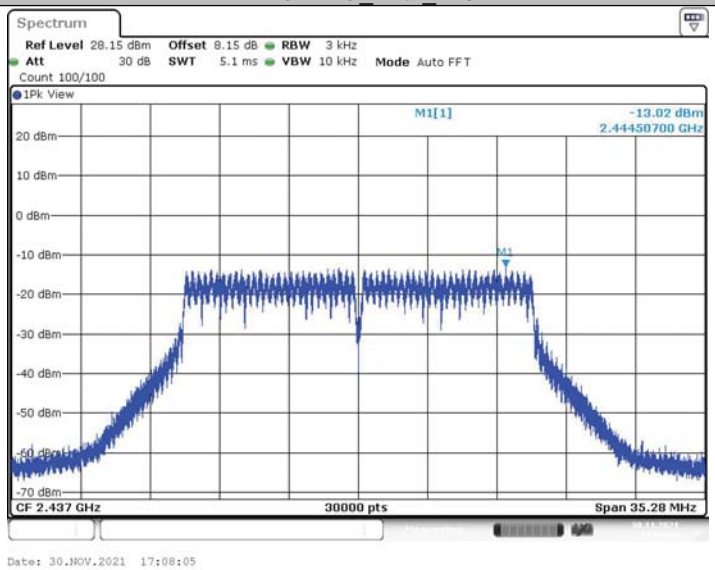
11N20MIMO_Ant1_2412



11N20MIMO_Ant2_2412



11N20MIMO_Ant1_2437



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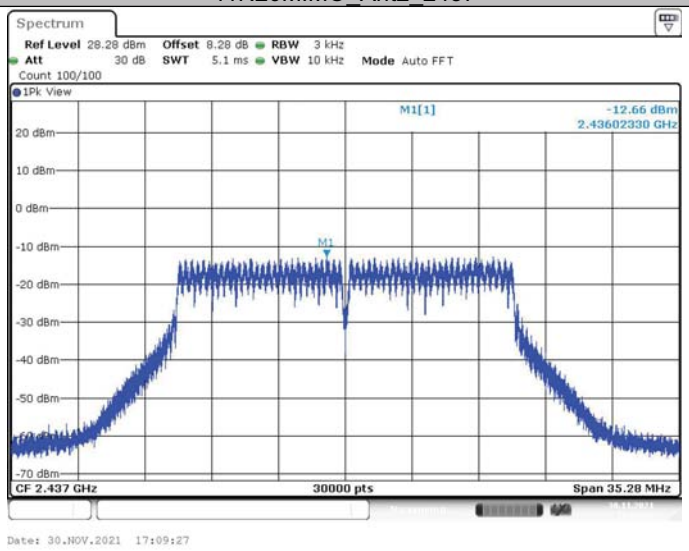
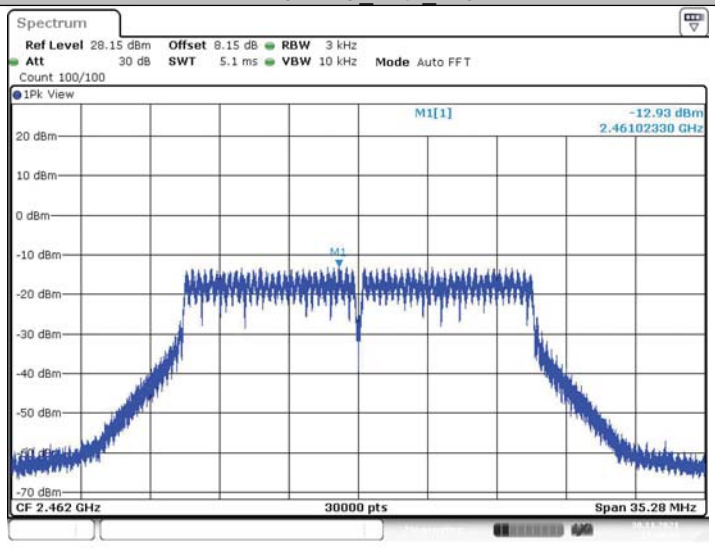


11N20MIMO_Ant1_2462



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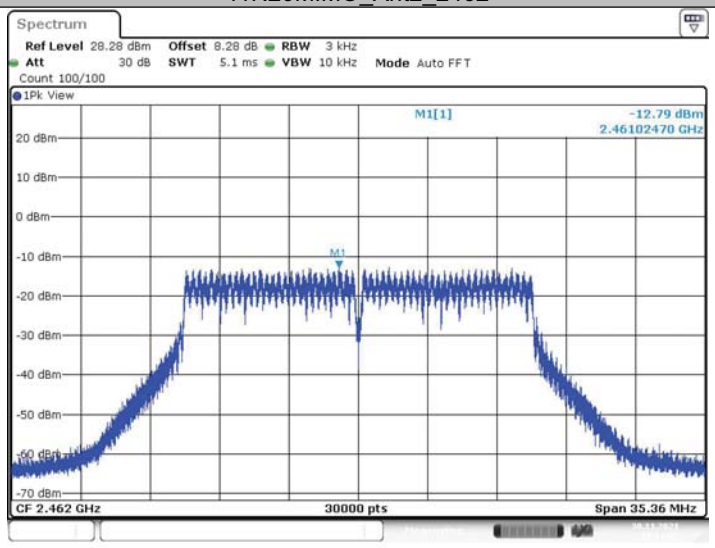


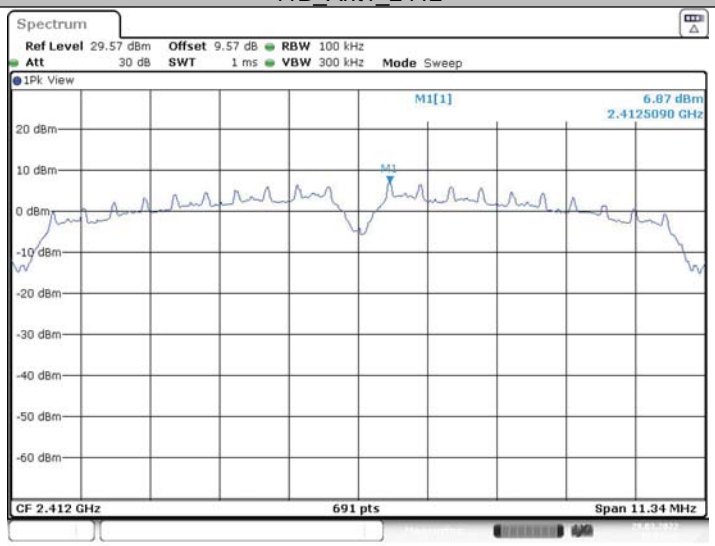
5.5 Reference level measurement

5.5.1 Test Result

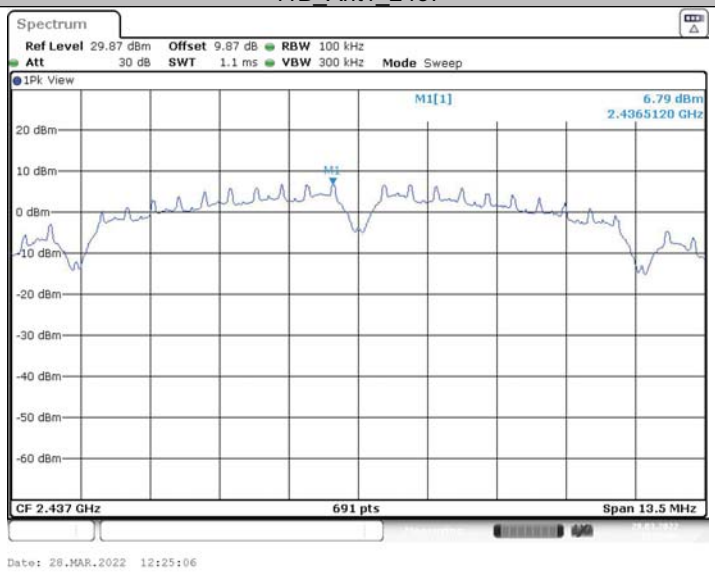
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
11B	Ant1	2412	2412.51	6.87
		2437	2436.51	6.79
		2462	2462.50	6.26
11G	Ant1	2412	2405.77	3.65
		2437	2430.77	4.41
		2462	2460.76	2.94
11N20SISO	Ant1	2412	2407.01	3.48
		2437	2432.01	4.18
		2462	2464.55	2.56
11N40SISO	Ant1	2422	2427.00	0.07
		2437	2432.01	0.70
		2452	2435.79	-0.22

5.5.2 Test Graphs

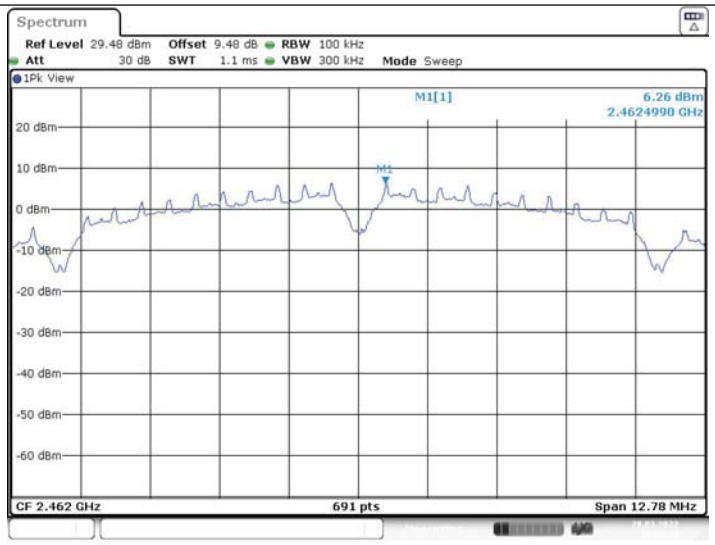
11B_Ant1_2412



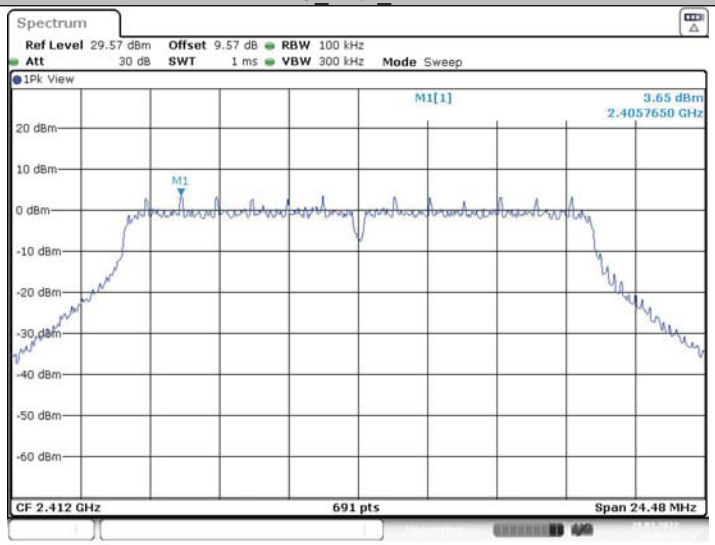
11B_Ant1_2437



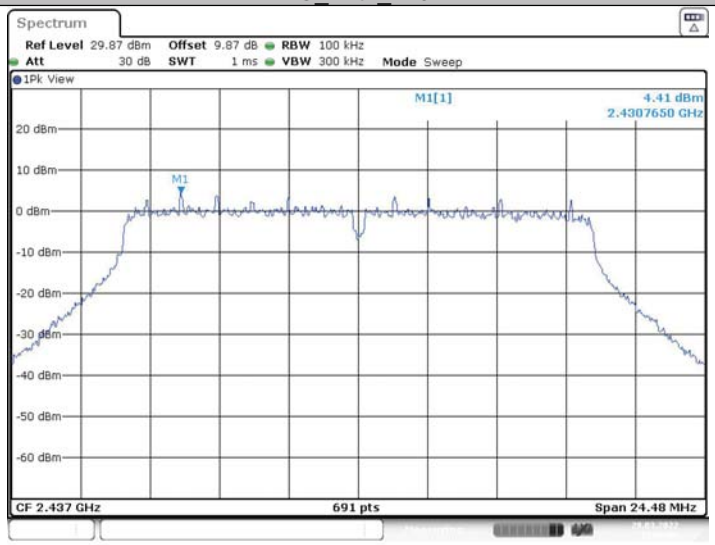
11B_Ant1_2462



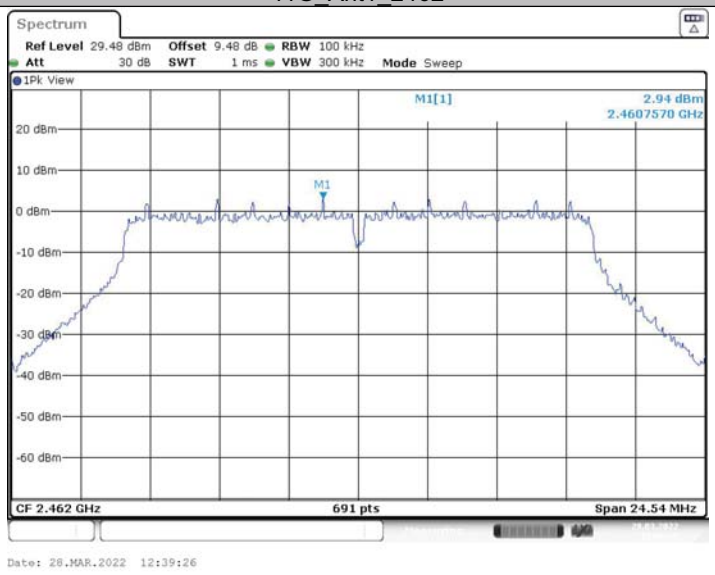
11G_Ant1_2412



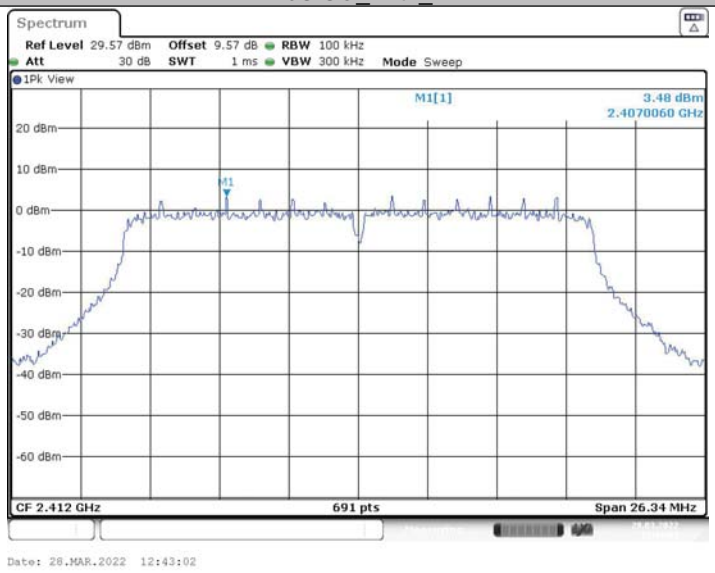
11G_Ant1_2437



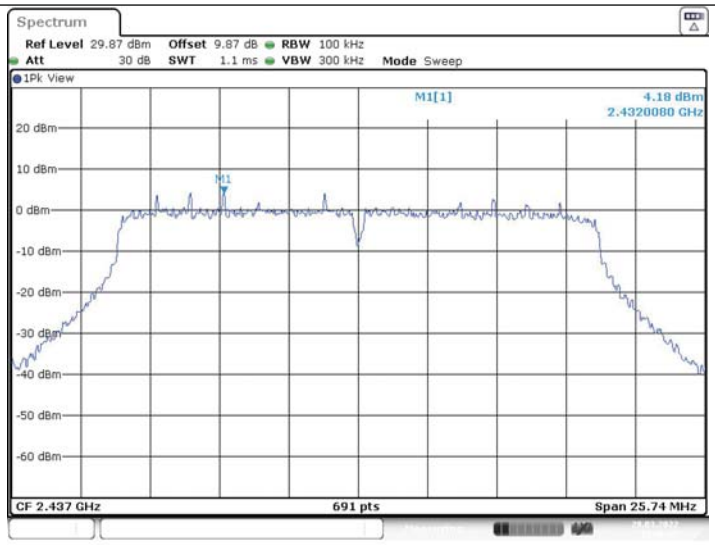
11G_Ant1_2462



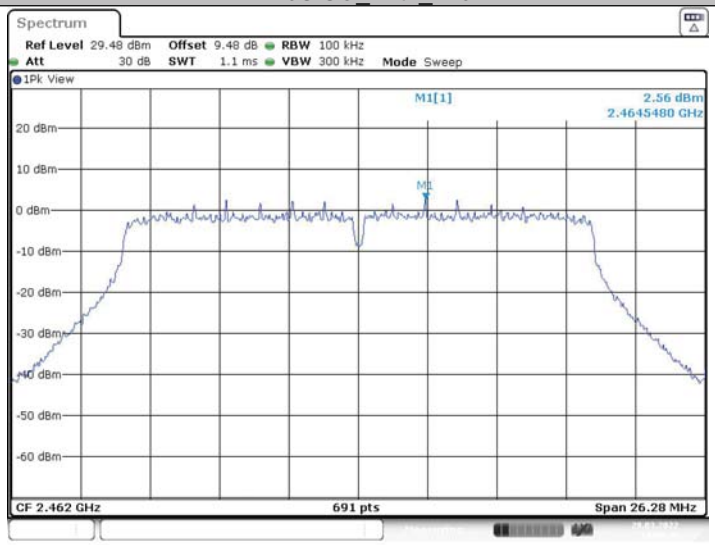
11N20SISO_Ant1_2412



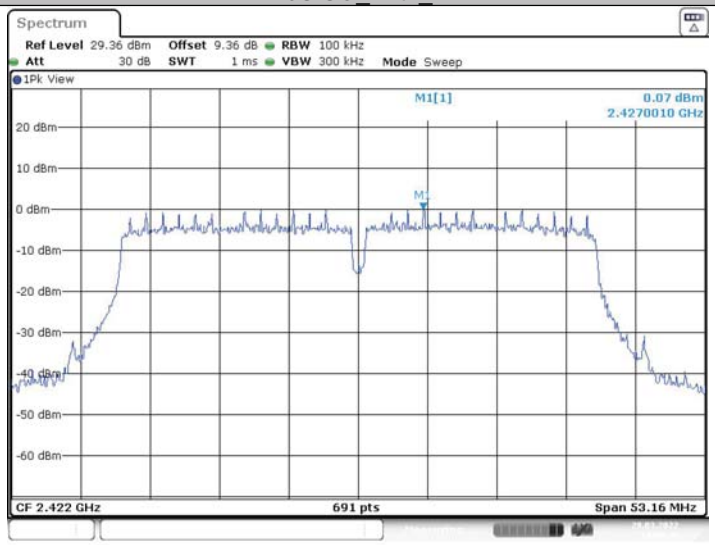
11N20SISO_Ant1_2437

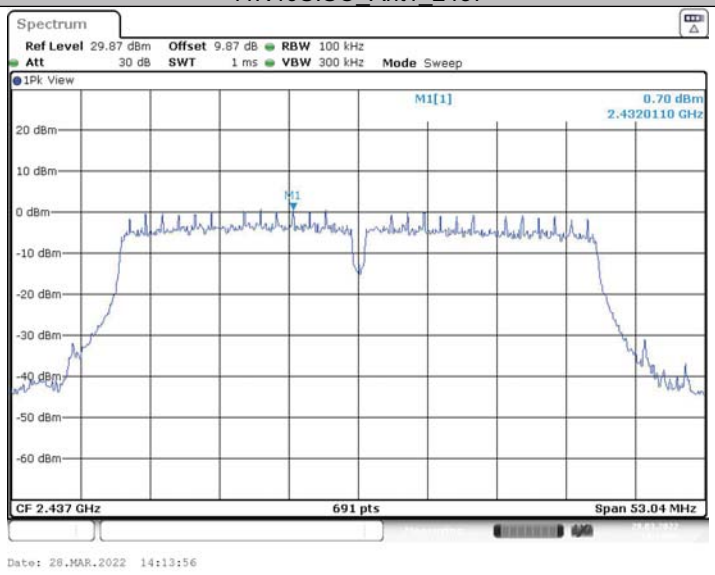
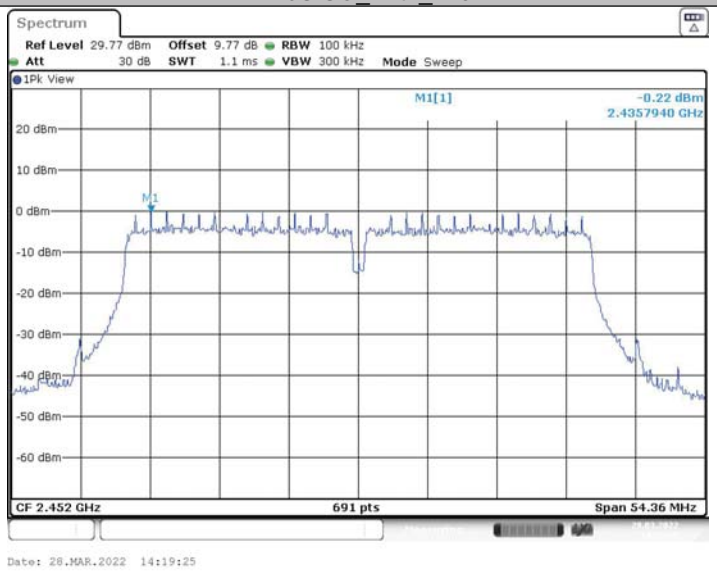


11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



11N40SISO_Ant1_2437

11N40SISO_Ant1_2452


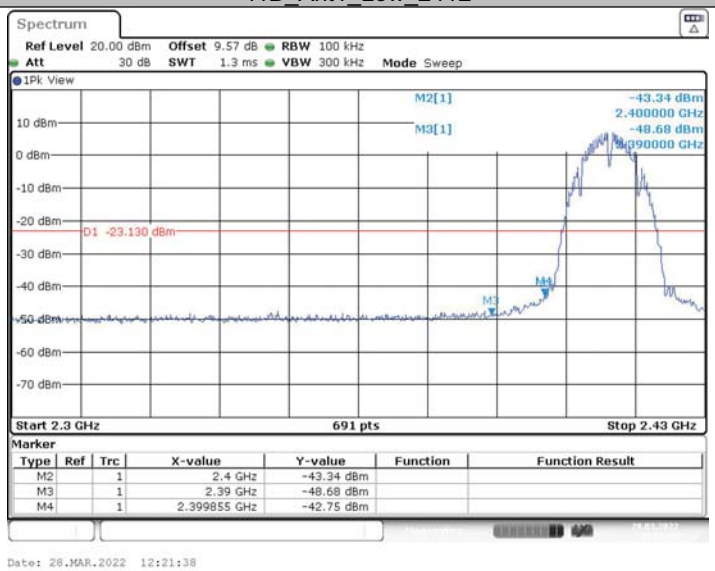
5.6 Band edge measurements

5.6.1 Test Result

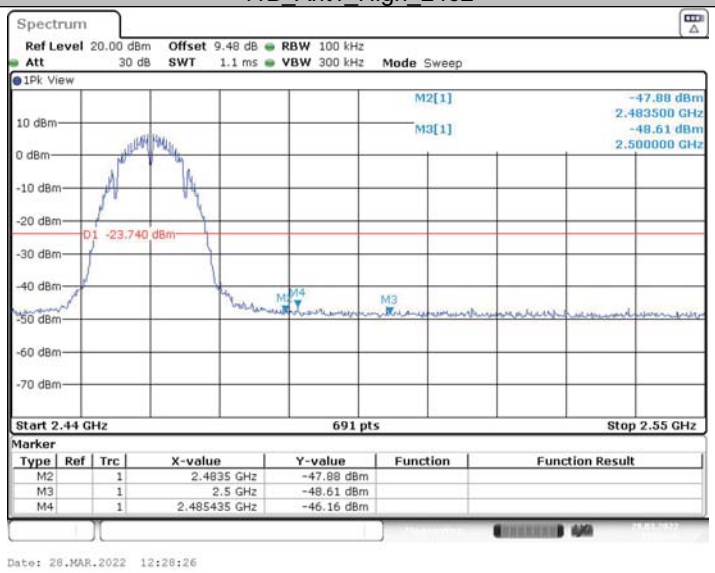
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	6.87	-42.75	≤-23.13	PASS
		High	2462	6.26	-46.16	≤-23.74	PASS
11G	Ant1	Low	2412	3.65	-34.46	≤-26.35	PASS
		High	2462	2.94	-46.49	≤-27.06	PASS
11N20SISO	Ant1	Low	2412	3.48	-33.87	≤-26.52	PASS
		High	2462	2.56	-45.85	≤-27.44	PASS
11N40SISO	Ant1	Low	2422	0.07	-36.77	≤-29.93	PASS
		High	2452	-0.22	-43.76	≤-30.22	PASS

5.6.2 Test Graphs

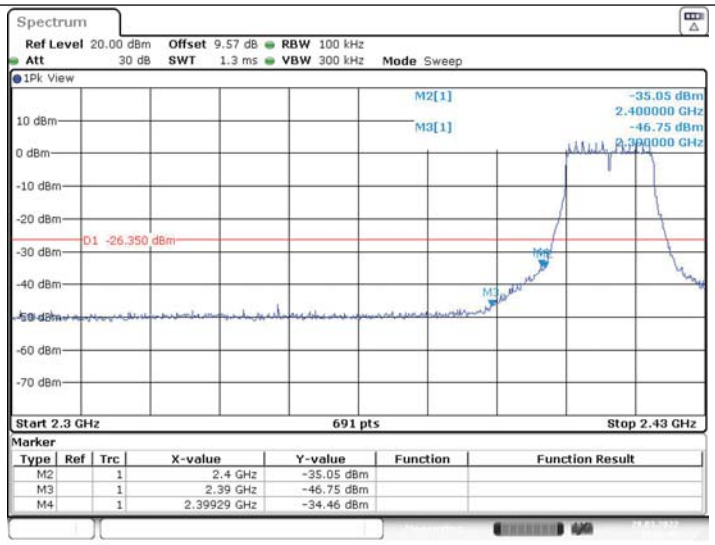
11B_Ant1_Low_2412



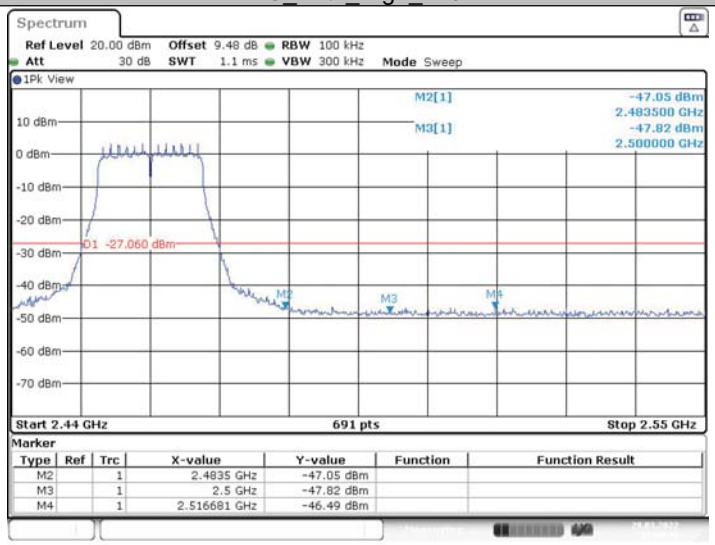
11B_Ant1_High_2462



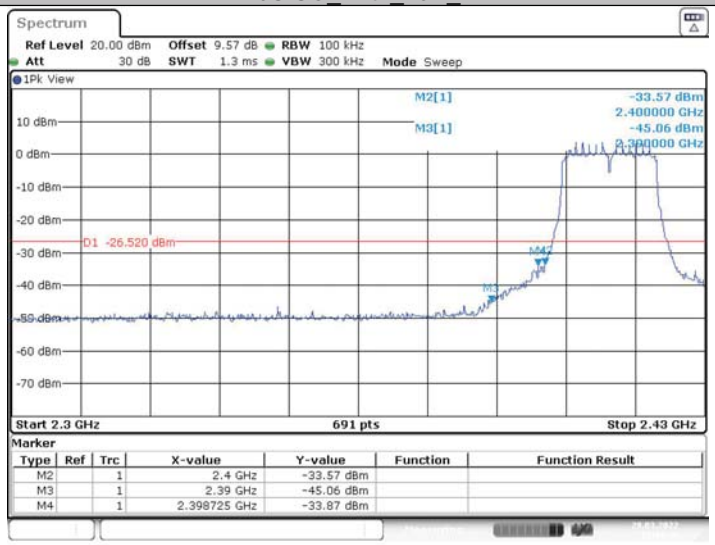
11G_Ant1_Low_2412



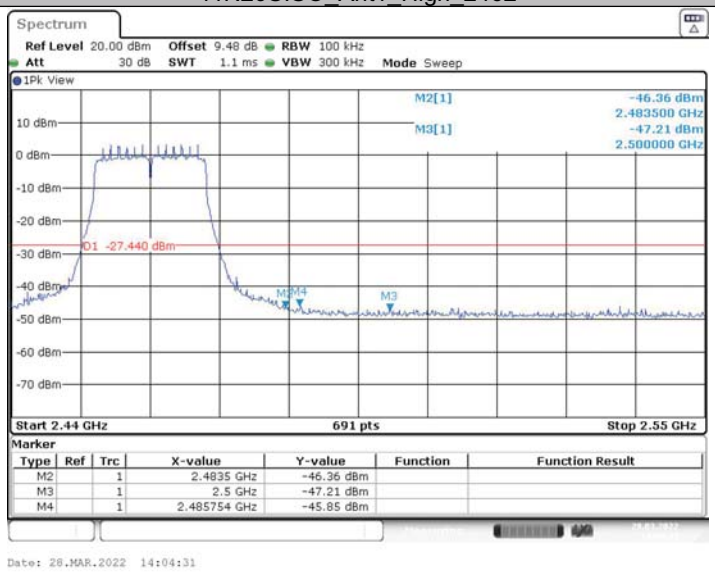
11G_Ant1_High_2462



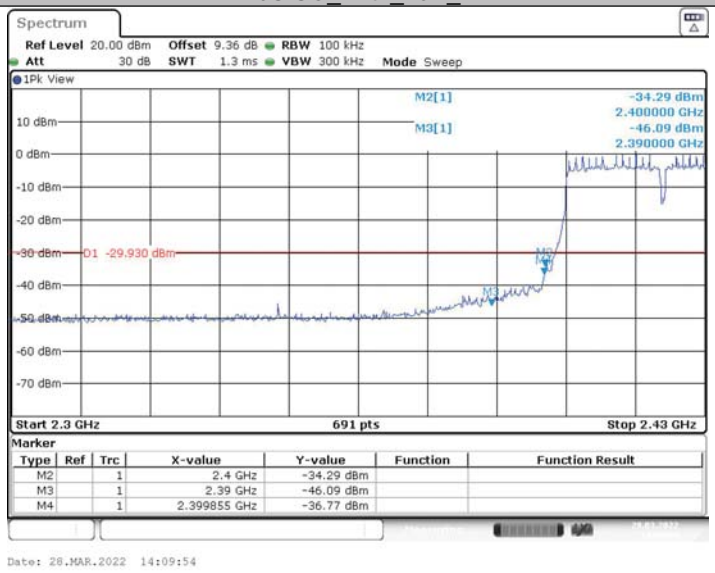
11N20SISO_Ant1_Low_2412



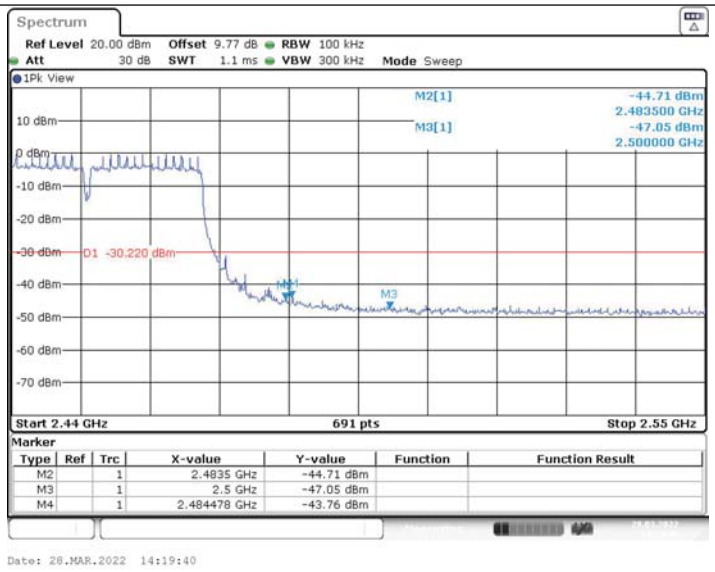
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452


Spectrum
Ref Level 20.00 dBm Offset 9.77 dB RBW 100 kHz
Att 30 dB SWT 1.1 ms VBW 300 kHz Mode Sweep
1Pk View
M2[1] -44.71 dBm
2.483500 GHz
M3[1] -47.05 dBm
2.500000 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
D1 -30.220 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.44 GHz
691 pts
Stop 2.55 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M2 1 2.4835 GHz -44.71 dBm
M3 1 2.5 GHz -47.05 dBm
M4 1 2.484478 GHz -43.76 dBm
Date: 28.MAR.2022 14:19:40

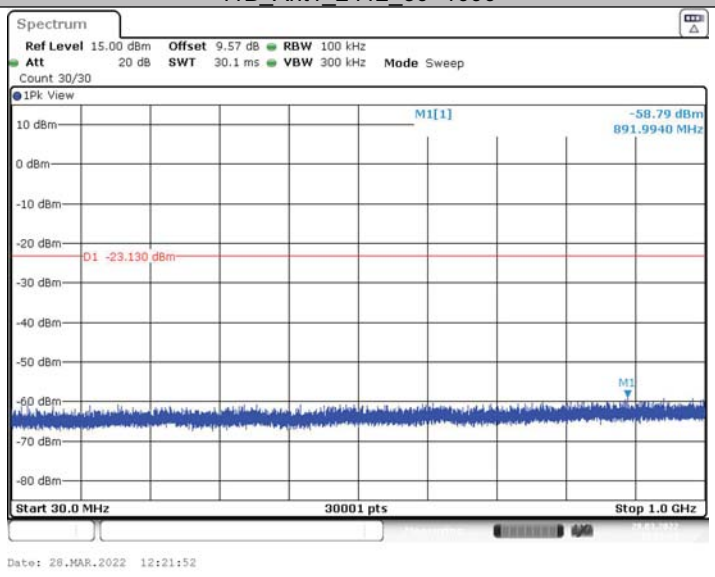
5.7 OUT OF BAND EMISSION MEASUREMENT

5.7.1 Test Result

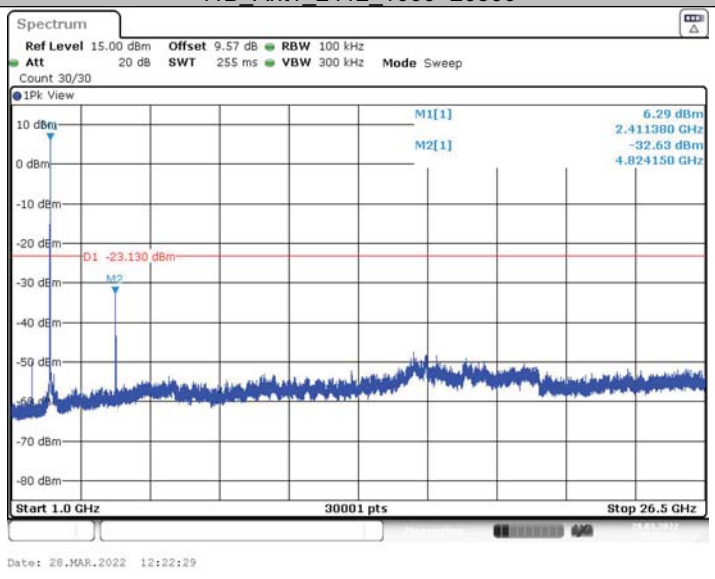
TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	30~1000	6.87	-58.79	≤-23.13	PASS
			1000~26500	6.87	-32.63	≤-23.13	PASS
		2437	30~1000	6.79	-58.46	≤-23.21	PASS
			1000~26500	6.79	-34.47	≤-23.21	PASS
		2462	30~1000	6.26	-58.98	≤-23.74	PASS
			1000~26500	6.26	-37.35	≤-23.74	PASS
11G	Ant1	2412	30~1000	3.65	-59.14	≤-26.35	PASS
			1000~26500	3.65	-42.02	≤-26.35	PASS
		2437	30~1000	4.41	-58.5	≤-25.59	PASS
			1000~26500	4.41	-42.54	≤-25.59	PASS
		2462	30~1000	2.94	-59.08	≤-27.06	PASS
			1000~26500	2.94	-47.82	≤-27.06	PASS
11N20SISO	Ant1	2412	30~1000	3.48	-59.03	≤-26.52	PASS
			1000~26500	3.48	-41.14	≤-26.52	PASS
		2437	30~1000	4.18	-58.73	≤-25.82	PASS
			1000~26500	4.18	-44.4	≤-25.82	PASS
		2462	30~1000	2.56	-59.26	≤-27.44	PASS
			1000~26500	2.56	-47.07	≤-27.44	PASS
11N40SISO	Ant1	2422	30~1000	0.07	-59.16	≤-29.93	PASS
			1000~26500	0.07	-44.78	≤-29.93	PASS
		2437	30~1000	0.70	-58.74	≤-29.3	PASS
			1000~26500	0.70	-47.57	≤-29.3	PASS
		2452	30~1000	-0.22	-58.82	≤-30.22	PASS
			1000~26500	-0.22	-44.63	≤-30.22	PASS

5.7.2 Test Graphs

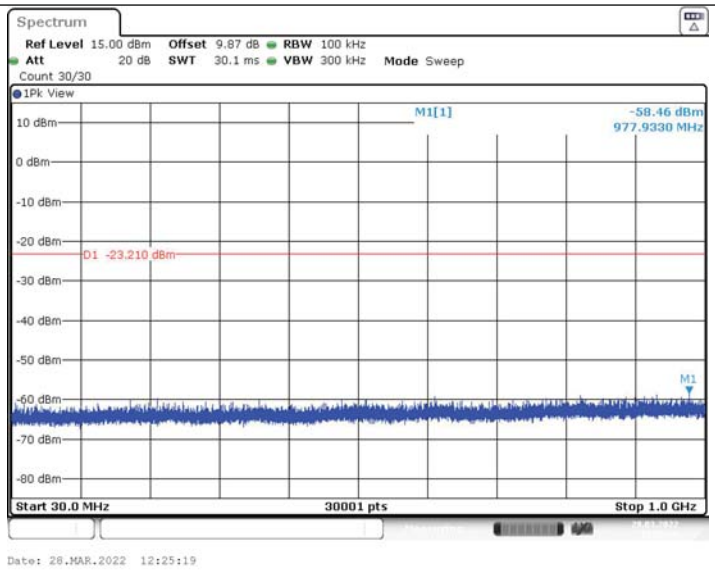
11B_Ant1_2412_30~1000



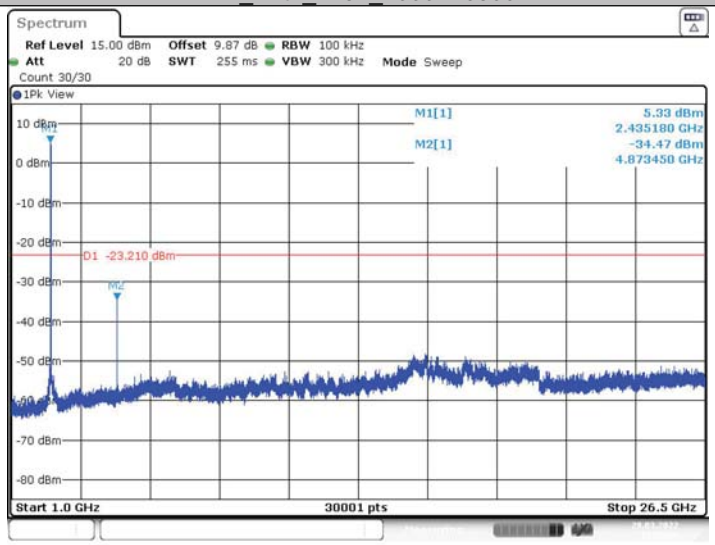
11B_Ant1_2412_1000~26500



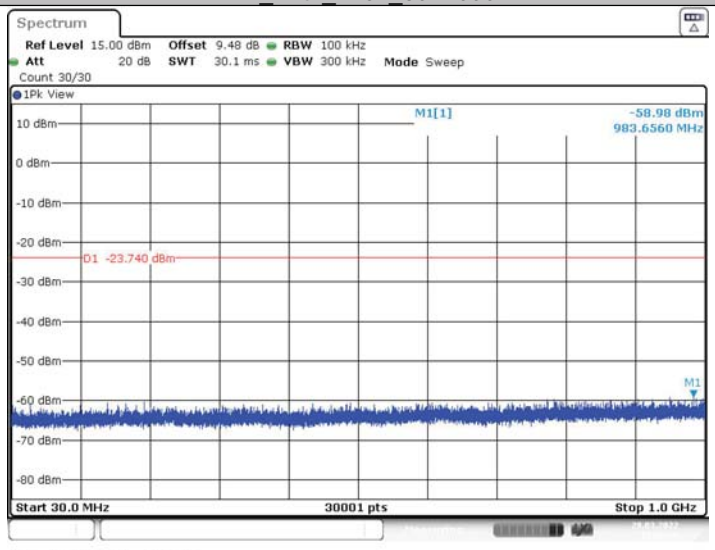
11B_Ant1_2437_30~1000



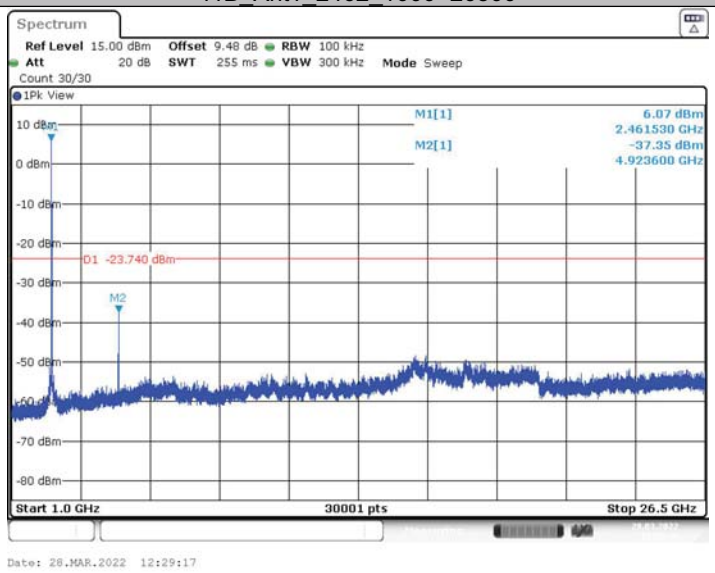
11B_Ant1_2437_1000~26500



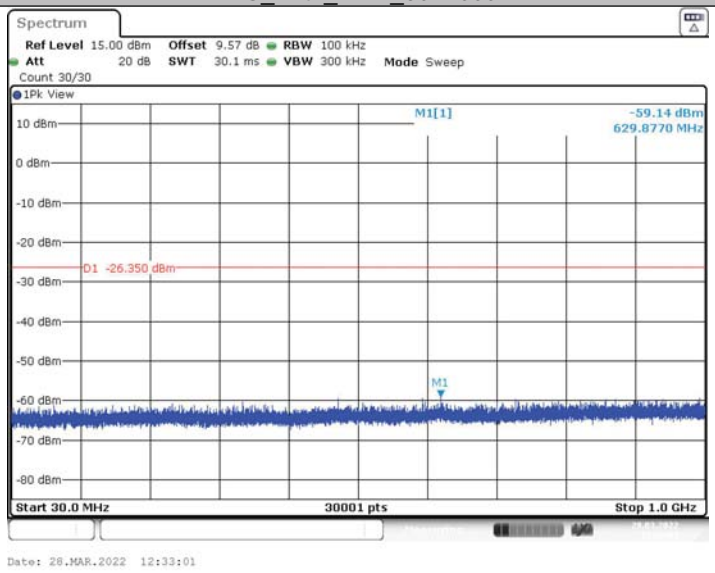
11B_Ant1_2462_30~1000



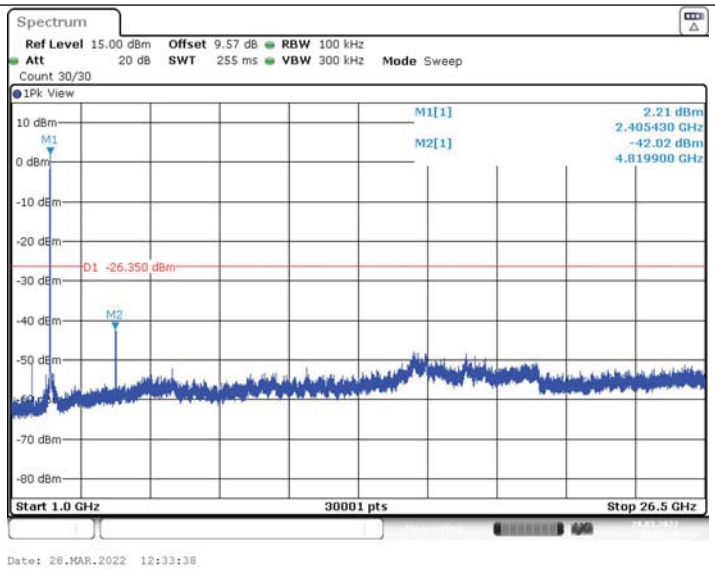
11B_Ant1_2462_1000~26500



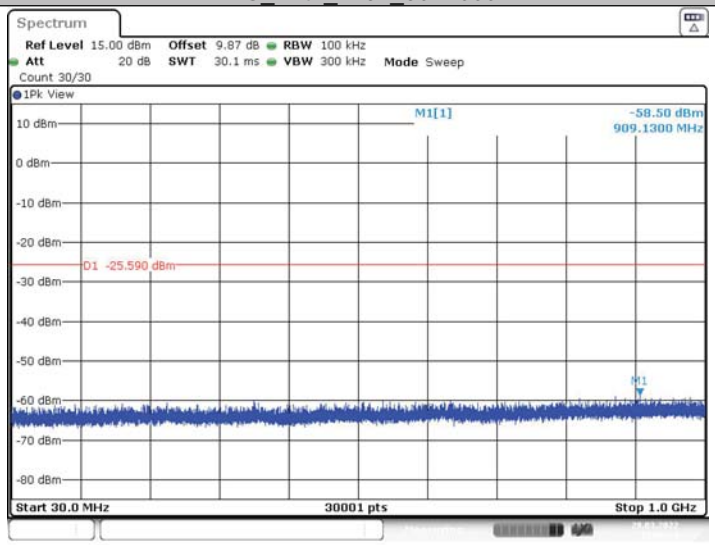
11G_Ant1_2412_30~1000



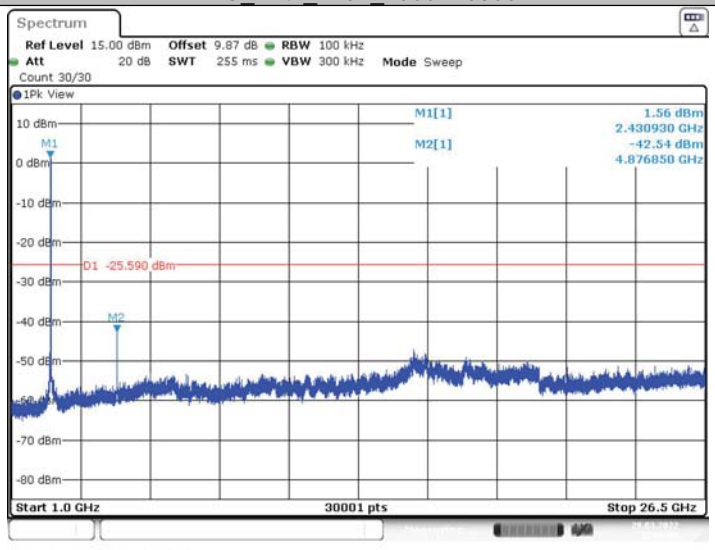
11G_Ant1_2412_1000~26500



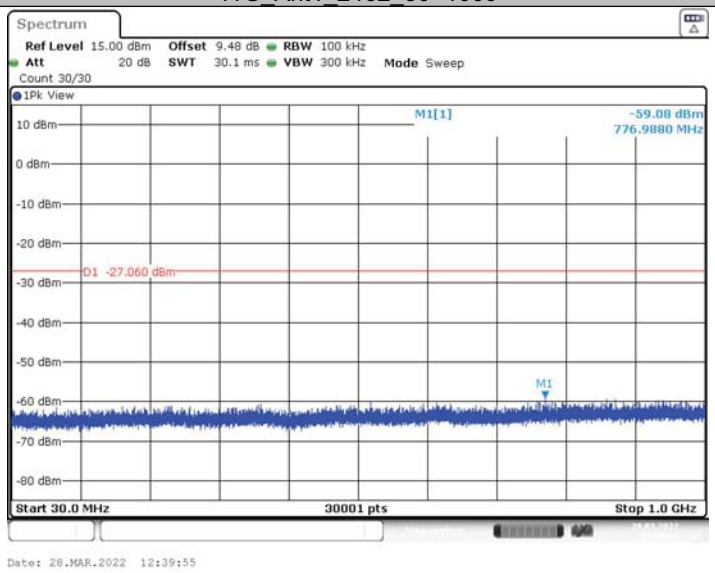
11G_Ant1_2437_30~1000



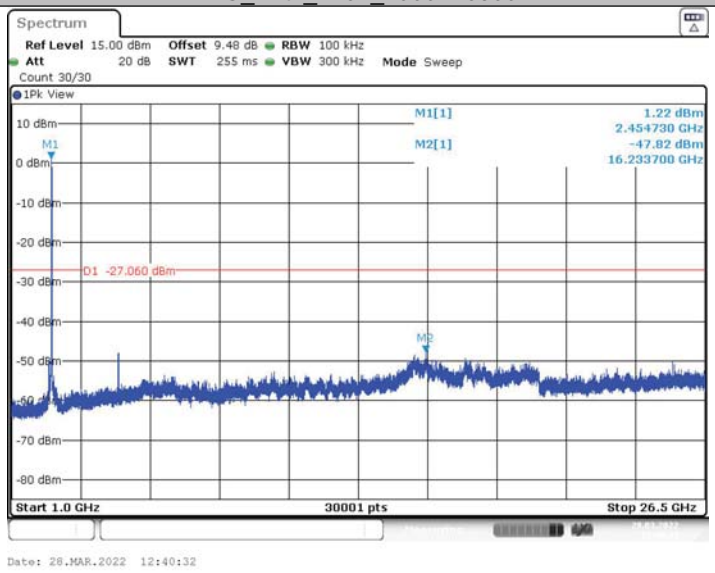
11G_Ant1_2437_1000~26500



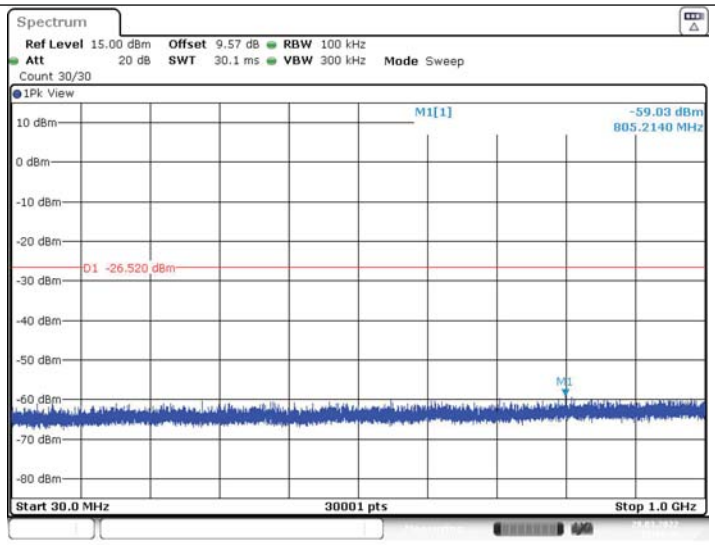
11G_Ant1_2462_30~1000



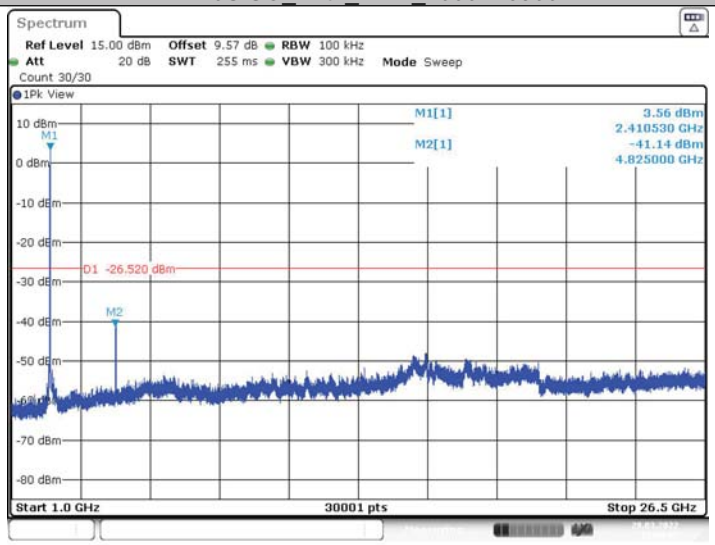
11G_Ant1_2462_1000~26500



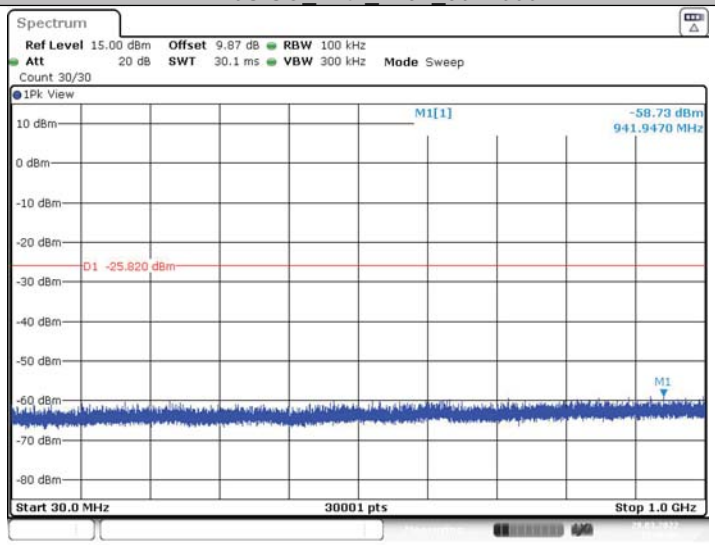
11N20SISO_Ant1_2412_30~1000



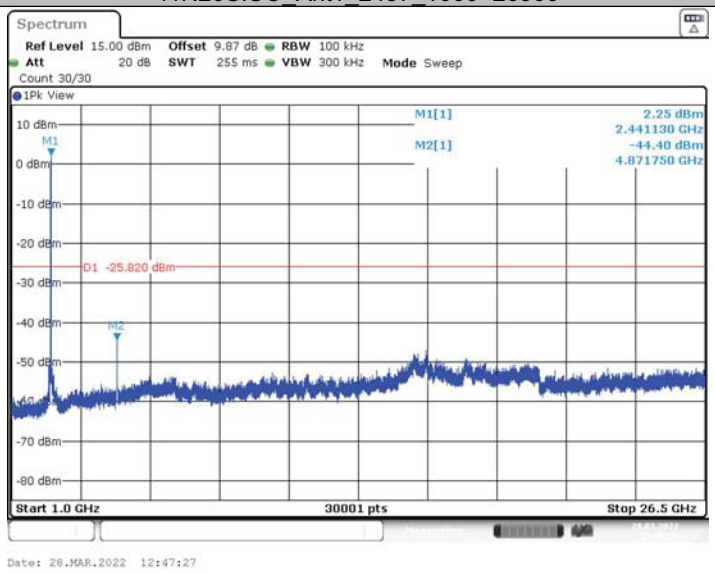
11N20SISO_Ant1_2412_1000~26500



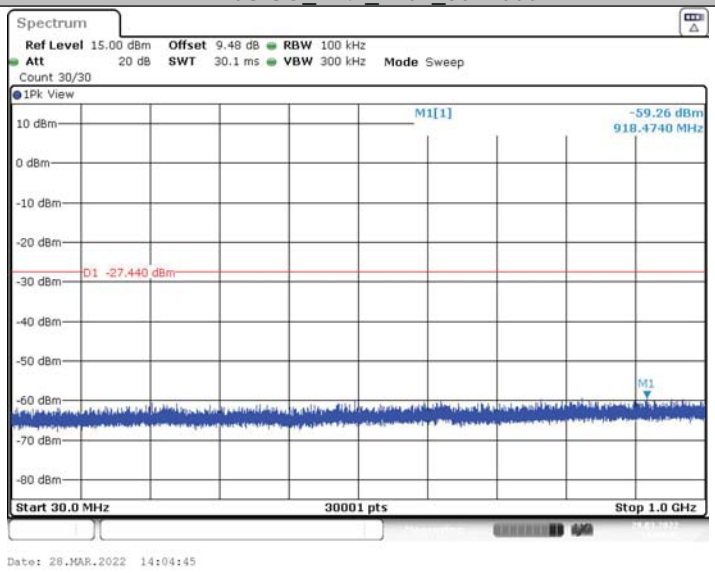
11N20SISO_Ant1_2437_30~1000



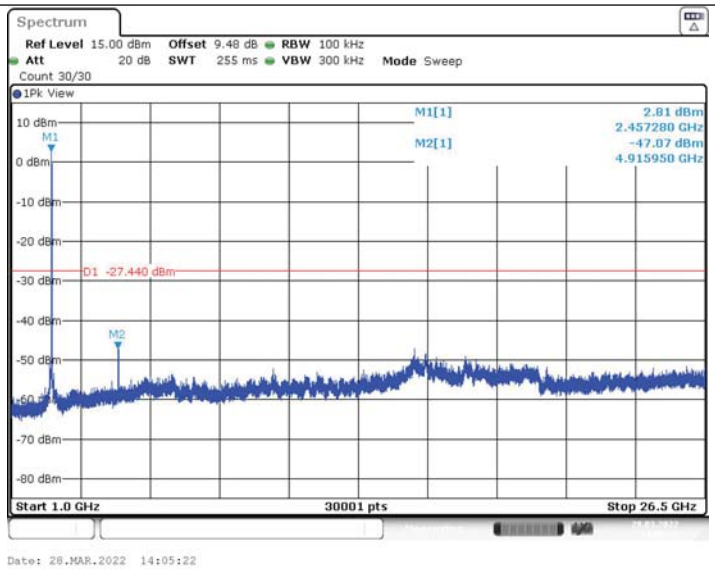
11N20SISO_Ant1_2437_1000~26500



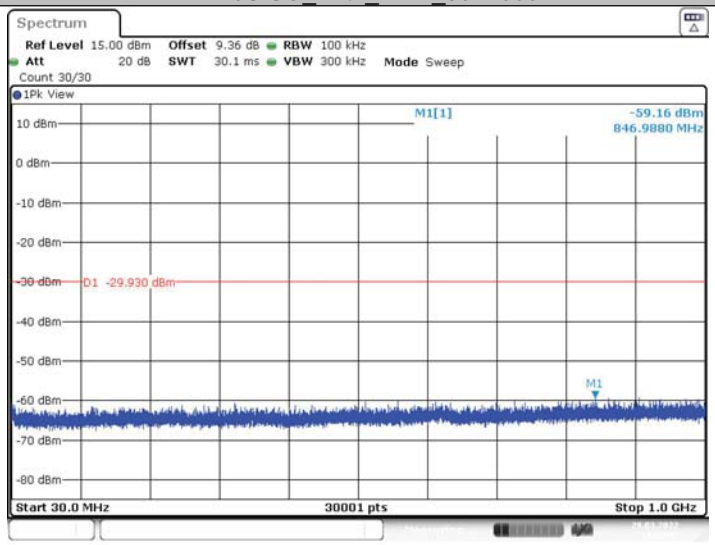
11N20SISO_Ant1_2462_30~1000



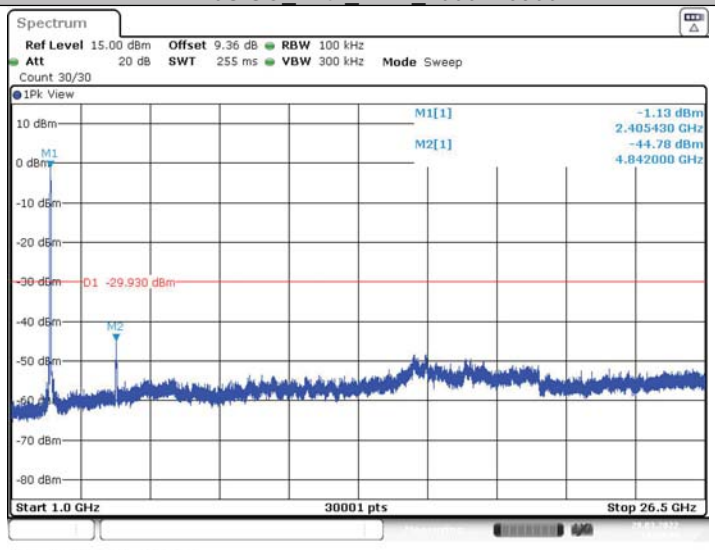
11N20SISO_Ant1_2462_1000~26500



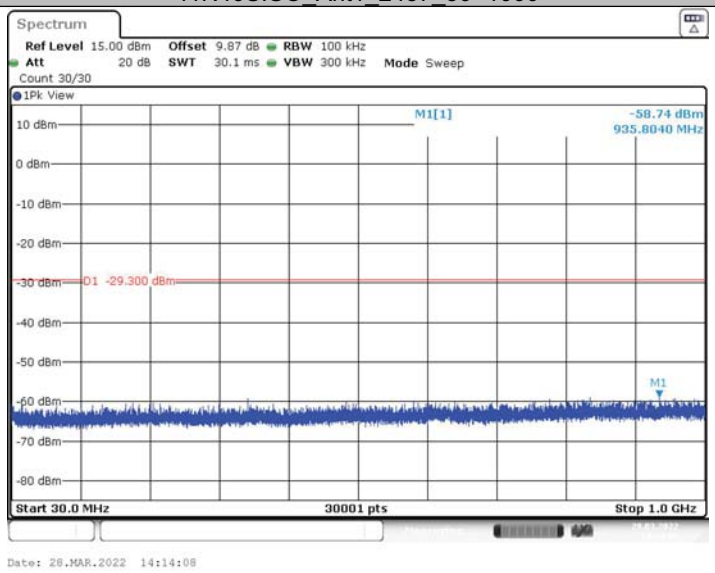
11N40SISO_Ant1_2422_30~1000



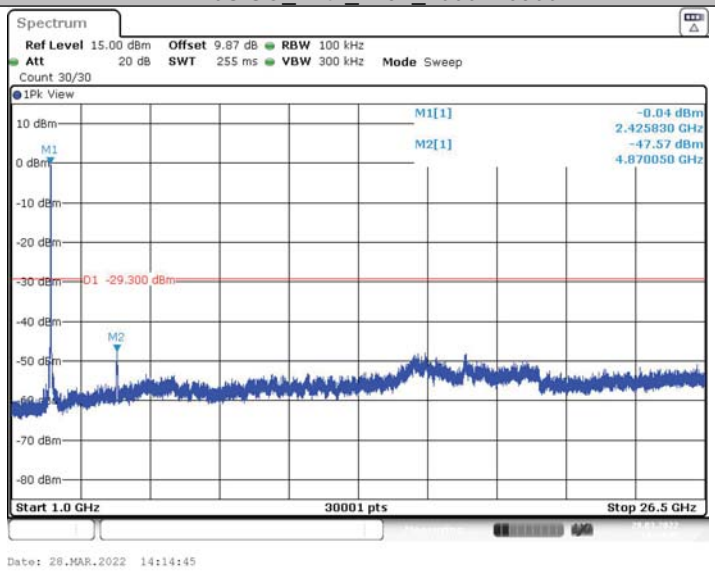
11N40SISO_Ant1_2422_1000~26500



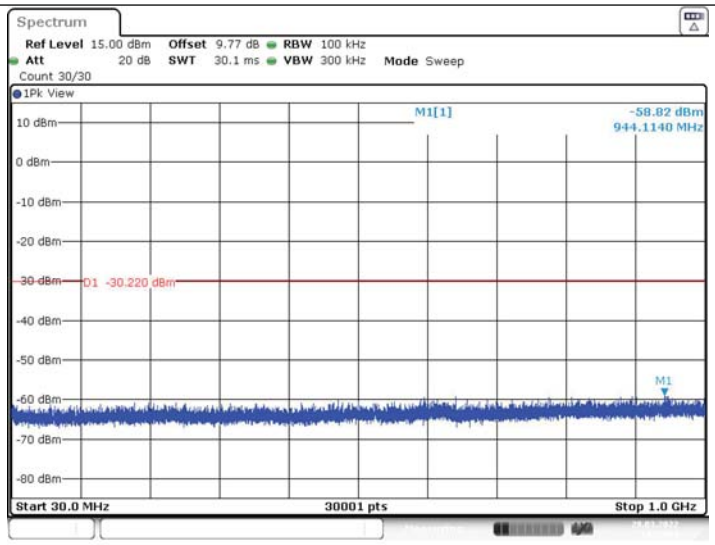
11N40SISO_Ant1_2437_30~1000



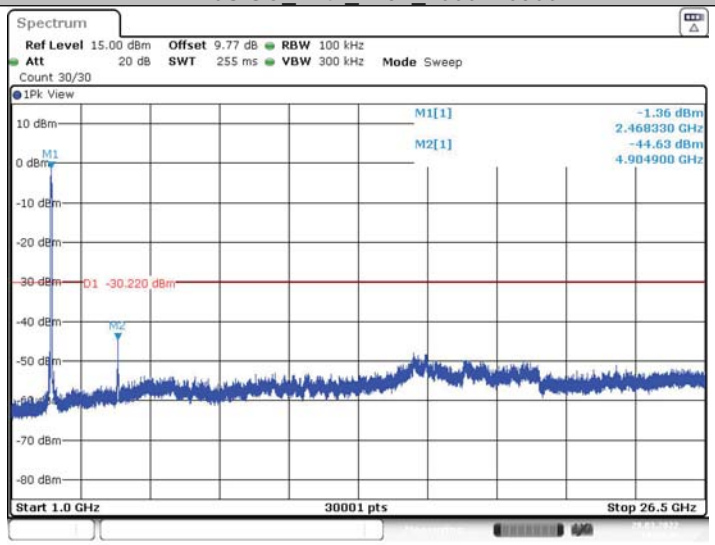
11N40SISO_Ant1_2437_1000~26500



11N40SISO_Ant1_2452_30~1000



11N40SISO_Ant1_2452_1000~26500



Important

(1) The test report is valid with the official seal of the laboratory and the signatures of Test engineer, Author and Reviewer simultaneously.

(2) The test report is invalid if altered.

(3) Any photocopies or part photocopies in the test report are forbidden without the written permission from the laboratory.

(4) Objections to the test report must be submitted to the laboratory within 15 days.

(5) Generally, commission test is responsible for the tested samples only.

Address of the laboratory:
CVC Testing Technology Co., Ltd.
Address: No.3,TiantaiyiRoad,KaitaiAvenue,ScienceCity,Guangzhou,China
Post Code：510663 Tel：020-32293888
FAX：020-32293889 E-mail：office@cvc.org.cn