

FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	PAX Technology Limited
Address:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Hong Kong, China

Manufacturer or Supplier:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address:	4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.
Product:	Smart Mobile Payment Terminal
Brand Name:	PAX
Model Name:	A920Pro
FCC ID:	V5PA920PRO
Date of tests:	Mar. 25, 2020 ~ May. 07, 2020

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 Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: May. 09, 2020	 Date: May. 09, 2020

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Test Report No.: RF200324W001-1

TABLE OF CONTENTS

RELEASE CONTROL RECORD	5
1 SUMMARY OF TEST RESULTS.....	6
1.1 MEASUREMENT UNCERTAINTY	7
2 GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF EUT	8
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 GENERAL DESCRIPTION OF APPLIED STANDARDS	13
2.4 DESCRIPTION OF SUPPORT UNITS.....	13
3 TEST TYPES AND RESULTS.....	14
3.1 CONDUCTED EMISSION MEASUREMENT.....	14
3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	14
3.1.2 TEST INSTRUMENTS	14
3.1.3 TEST PROCEDURES	14
3.1.4 DEVIATION FROM TEST STANDARD	15
3.1.5 TEST SETUP	15
3.1.6 EUT OPERATING CONDITIONS	15
3.1.7 TEST RESULTS.....	16
3.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
3.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
3.2.2 TEST INSTRUMENTS	19
3.2.3 TEST PROCEDURES	22
3.2.4 DEVIATION FROM TEST STANDARD	22
3.2.5 TEST SETUP	23
3.2.6 EUT OPERATING CONDITIONS	24
3.2.7 TEST RESULTS.....	25
3.3 NUMBER OF HOPPING FREQUENCY USED	35
3.3.1 LIMIT OF HOPPING FREQUENCY USED	35
3.3.2 TEST SETUP	35
3.3.3 TEST INSTRUMENTS	35
3.3.4 TEST PROCEDURES	36
3.3.5 DEVIATION FROM TEST STANDARD	36
3.3.6 TEST RESULTS.....	36
3.4 DWELL TIME ON EACH CHANNEL	40



Test Report No.: RF200324W001-1

3.4.1	LIMIT OF DWELL TIME USED	40
3.4.2	TEST SETUP	40
3.4.3	TEST INSTRUMENTS	40
3.4.4	TEST PROCEDURES	40
3.4.5	DEVIATION FROM TEST STANDARD	41
3.4.6	TEST RESULTS.....	41
3.5	CHANNEL BANDWIDTH.....	47
3.5.1	LIMITS OF CHANNEL BANDWIDTH	47
3.5.2	TEST SETUP	47
3.5.3	TEST INSTRUMENTS	47
3.5.4	TEST PROCEDURE	47
3.5.5	DEVIATION FROM TEST STANDARD	47
3.5.6	EUT OPERATING CONDITION.....	48
3.5.7	TEST RESULTS.....	48
3.6	HOPPING CHANNEL SEPARATION	54
3.6.1	LIMIT OF HOPPING CHANNEL SEPARATION	54
3.6.2	TEST SETUP	54
3.6.3	TEST INSTRUMENTS	54
3.6.4	TEST PROCEDURES	54
3.6.5	DEVIATION FROM TEST STANDARD	54
3.6.6	TEST RESULTS.....	55
3.7	MAXIMUM OUTPUT POWER.....	61
3.7.1	LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT	61
3.7.2	TEST SETUP	61
3.7.3	TEST INSTRUMENTS	61
3.7.4	TEST PROCEDURES	61
3.7.5	DEVIATION FROM TEST STANDARD	61
3.7.6	EUT OPERATING CONDITION.....	61
3.7.7	TEST RESULTS.....	62
3.7.7.1	MAXIMUM PEAK OUTPUT POWER	62
3.7.7.2	AVERAGE OUTPUT POWER (FOR REFERENCE).....	63
3.8	OUT OF BAND MEASUREMENT	64
3.8.1	LIMITS OF OUT OF BAND MEASUREMENT	64
3.8.2	TEST INSTRUMENTS	64
3.8.3	TEST PROCEDURE	64
3.8.4	DEVIATION FROM TEST STANDARD	64



Test Report No.: RF200324W001-1

3.8.5	EUT OPERATING CONDITION.....	64
3.8.6	TEST RESULTS.....	64
4	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	71
5	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	72



Test Report No.: RF200324W001-1

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF200324W001-1	Original release	May. 09, 2020



Test Report No.: RF200324W001-1

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD	TEST TYPE AND LIMIT	RESULT	TEST LAB*
15.207	AC Power Conducted Emission	Compliance	A
15.247(a)(1)(iii)	Number of Hopping Frequency Used	Compliance	A
15.247(a)(1)(iii)	Dwell Time on Each Channel	Compliance	A
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	Compliance	A
15.247(b)	Maximum Peak Output Power	Compliance	A
15.247(d)&15.209	Transmitter Radiated Emissions	Compliance	B
15.247(d)	Out of band Measurement	Compliance	A
15.203	Antenna Requirement	Compliance	A

NOTE: If the Frequency Hopping System operating in 2400-2483.5MHz band and the output power less than 125mW. The hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.

*Test Lab Information Reference

Lab A:

BV 7Layers Communications Technology (Shenzhen) Co. Ltd

Lab Address:

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

The FCC Site Registration No. is 525120; The Designation No. is CN1171.

Lab B:

Bureau Veritas (Shenzhen) Consumer Products Service

Lab Address:

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park
South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108

The FCC Site Registration No. is 535293.

1.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	±2.70dB
Radiated emissions (30MHz~1GMHz)	±4.98dB
Radiated emissions (1GMHz ~6GMHz)	±4.70dB
Radiated emissions (6GMHz ~18GMHz)	±4.60dB
Radiated emissions (18GMHz ~40GMHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±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 Mobile Payment Terminal
BRAND NAME	PAX
MODEL NAME	A920Pro
NOMINAL VOLTAGE	DC 3.7V
MODULATION TECHNOLOGY	FHSS
MODULATION TYPE	GFSK, 8DPSK, $\pi/4$ DQPSK
OPERATING FREQUENCY	2402MHz~2480MHz
NUMBER OF CHANNEL	79
MAX. OUTPUT POWER	5.01mW (Max. Measured)
ANTENNA TYPE	FPC Antenna with 0.8dBi gain
HW VERSION	N/A
SW VERSION	N/A
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3. List of Accessory:

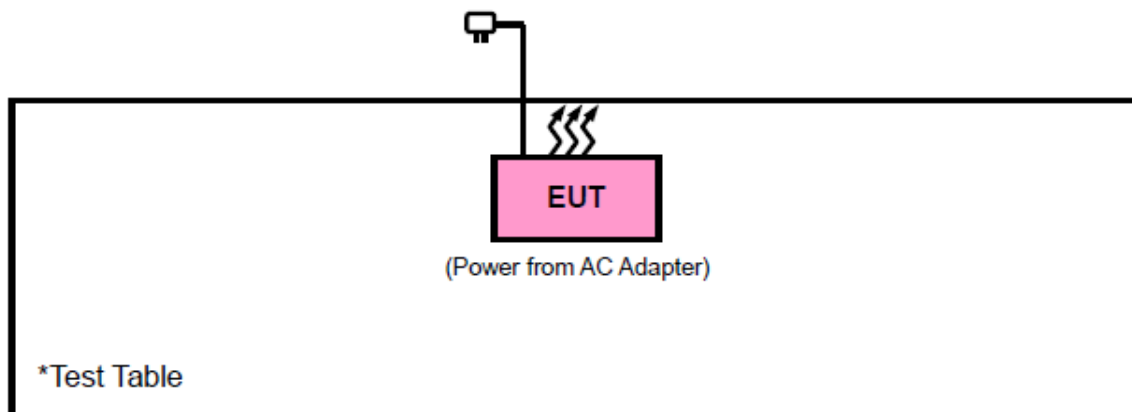
ACCESSORIES	BRAND	MODEL	MANUFACTURER	SPECIFICATION
AC Adapter	N/A	GLH50D2000HW	/	Input: 100-240V~50/60Hz 0.40A Output: 5.0V $\overline{\text{---}}$ 2000mA
Battery	VEKEN	YW-008	NingBo Veken Battery Co., Ltd.	Rating : 3.7V $\overline{\text{---}}$ 5150mAh 19.05Wh, Rechargeable Li-ion Battery

2.2 DESCRIPTION OF TEST MODES

79 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

2.2.1 CONFIGURATION OF SYSTEM UNDER TEST



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 X axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

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

Where **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz
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.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	78	FHSS	8DPSK	3DH5

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	78	FHSS	GFSK	DH5

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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 39, 78	FHSS	GFSK	DH1/DH3/DH5
0 to 78	0, 39, 78	FHSS	$\pi/4$ DQPSK	2DH1/2DH3/2DH5
0 to 78	0, 39, 78	FHSS	8DPSK	3DH1/3DH3/3DH5



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Test Report No.: RF200324W001-1

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE<1G	23deg. C, 70%RH	DC 3.7V	Aaron Liang
RE≥1G	23deg. C, 70%RH	DC 3.7V	Aaron Liang
PLC	25deg. C, 52%RH	DC 3.7V	Chase Zhou
APCM	25deg. C, 60%RH	DC 3.7V	Harris Wang



Test Report No.: RF200324W001-1

2.3 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

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 (Sdoc). The test report has been issued separately.

2.4 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	N/A	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A



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Test Report No.: RF200324W001-1

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. 28,20	Feb. 27,21
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 28,20	Feb. 27,21

- 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

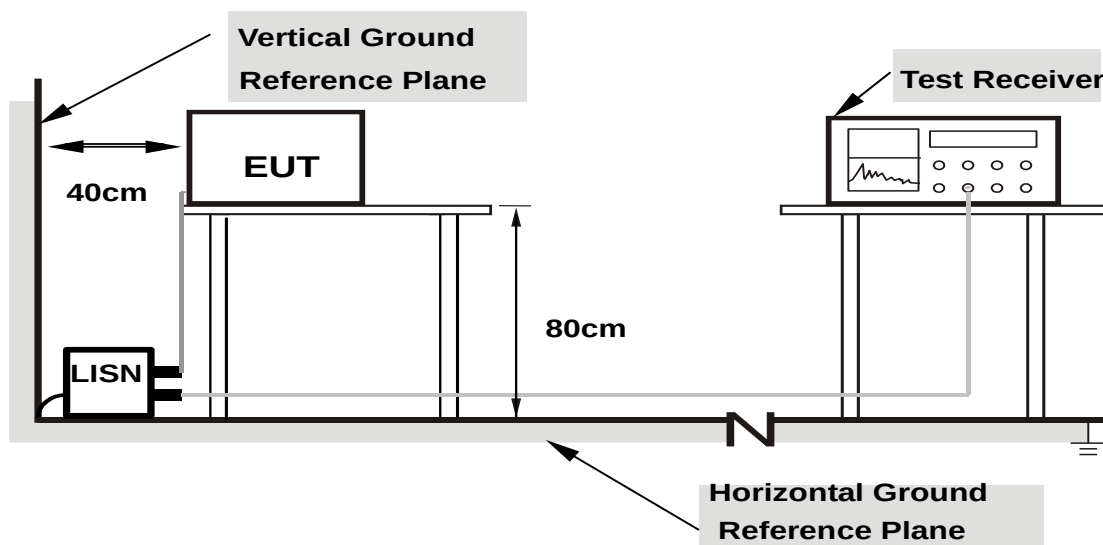
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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

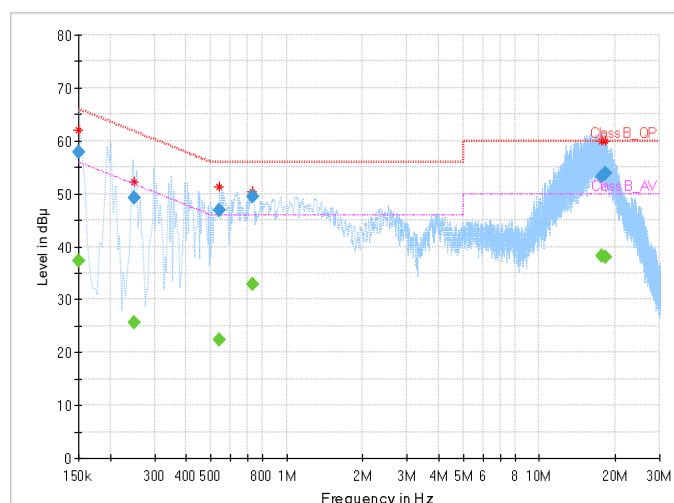
CONDUCTED WORST-CASE DATA:

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	23deg. C, 55RH
Tested By	Chase Zhou		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	37.40	56.00	-18.60	L1	ON	9.7
0.150000	57.91	---	66.00	-8.09	L1	ON	9.7
0.248000	---	25.60	51.82	-26.22	L1	ON	9.7
0.248000	49.25	---	61.82	-12.58	L1	ON	9.7
0.540000	---	22.42	46.00	-23.58	L1	ON	9.7
0.540000	46.82	---	56.00	-9.18	L1	ON	9.7
0.736000	---	32.92	46.00	-13.08	L1	ON	9.7
0.736000	49.40	---	56.00	-6.60	L1	ON	9.7
17.596000	---	38.14	50.00	-11.86	L1	ON	10.0
17.596000	53.20	---	60.00	-6.80	L1	ON	10.0
18.188000	---	37.91	50.00	-12.09	L1	ON	10.0
18.188000	53.84	---	60.00	-6.16	L1	ON	10.0

- 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 = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

Full Spectrum

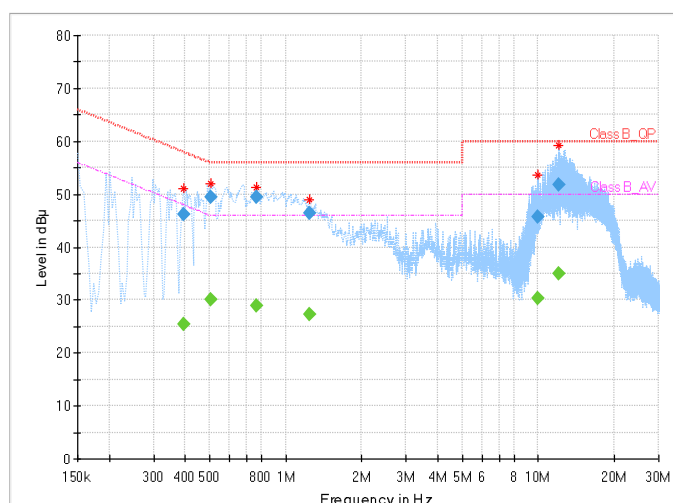


Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	23deg. C, 55RH
Tested By	Chase Zhou		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.396000	---	25.37	47.94	-22.57	N	ON	9.8
0.396000	46.18	---	57.94	-11.76	N	ON	9.8
0.508000	---	30.00	46.00	-16.00	N	ON	9.8
0.508000	49.49	---	56.00	-6.51	N	ON	9.8
0.768000	---	28.99	46.00	-17.01	N	ON	9.8
0.768000	49.39	---	56.00	-6.61	N	ON	9.8
1.244000	---	27.37	46.00	-18.63	N	ON	9.8
1.244000	46.43	---	56.00	-9.57	N	ON	9.8
9.964000	---	30.38	50.00	-19.62	N	ON	10.0
9.964000	45.65	---	60.00	-14.35	N	ON	10.0
12.084000	---	34.89	50.00	-15.11	N	ON	10.0
12.084000	51.75	---	60.00	-8.25	N	ON	10.0

- 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 = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

Full Spectrum



3.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE 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). Other emissions shall be at least 20dB below the highest level of the desired power.

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

FREQUENCY RANGE BELOW 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESL6	1300.5001K06-100262-e Q	Mar. 24,20	Mar. 24,21
Bilog Antenna	Sunol Sciences	JB6	A110712	Apr. 08, 20	Apr. 07,21
Active Antenna	CMO-POWER	AL-130	121031	Mar. 27, 20	Mar. 26, 21
Signal Amplifier	HP	8447E	443008	Mar. 24, 20	Mar. 24, 21
3m Semi-anechoic Chamber	SAEMC	9m*6m*6 m	N/A	Oct. 18,18	Oct. 17,21
Test Software	EZ-EMC	ICP-03A1	N/A	N/A	N/A
Universal Radio Communication	ROHDE&SCHWARZ	CMU200	112012	Mar. 24,20	Mar. 24,21
Wireless Communication Test Set	ROHDE&SCHWARZ	CMW500	1201.0002K500-155842- Gd	Nov. 1, 19	Oct. 31, 20

FREQUENCY RANGE ABOVE 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXA signal analyzer	Agilent	N9020A	MY49100060	Mar. 24, 20	Mar. 24, 21
Horn Antenna	COM-POWER	HAH-118	71259	Apr. 17, 20	Apr. 17, 21
Horn Antenna	COM-POWER	HAH-118	71283	Mar. 20, 20	Mar. 19, 21
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170147	Jun. 30, 20	Jun. 29, 21
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170242	Jun. 30, 20	Jun. 29, 21
AMPLIFIER	EM Electornic Corporation	EM01G26 G	60613	Mar. 24, 20	Mar. 24, 21
3m Semi-anechoic Chamber	SAEMC	9m*6m*6m	N/A	Oct. 18, 18	Oct. 17, 21
Test Software	EZ-EMC	ICP-03A1	N/A	N/A	N/A
Universal Radio Communication	ROHDE&SCHWARZ	CMU200	112012	Mar. 24, 20	Mar. 24, 21
Wireless Communication Test Set	ROHDE&SCHWARZ	CMW500	1201.0002K500-155842-G d	Nov. 1, 19	Oct. 31, 20



Test Report No.: RF200324W001-1

NOTE:

1. The calibration interval of the above test instruments is 12 months (except 3m Semi-anechoic Chamber). And the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 535293.

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:

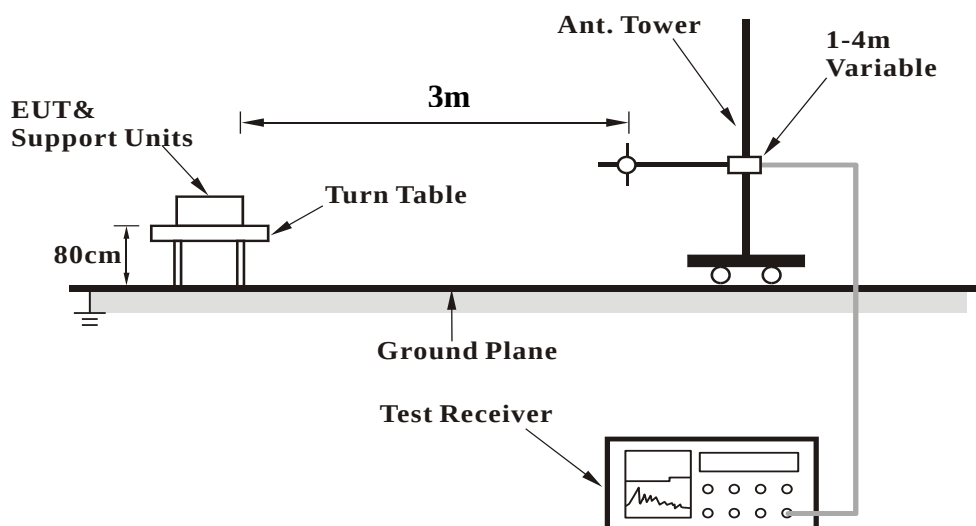
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit.
5. All modes of operation were investigated and the worst-case emissions are reported.

3.2.4 DEVIATION FROM TEST STANDARD

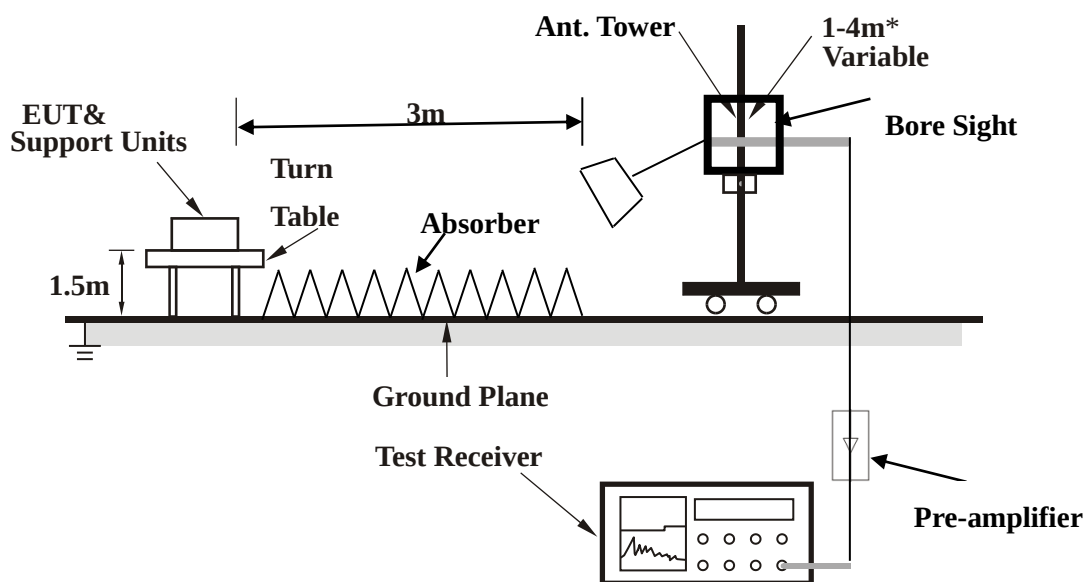
No deviation.

3.2.5 TEST SETUP

< Frequency Range 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).



Test Report No.: RF200324W001-1

3.2.6 EUT OPERATING CONDITIONS

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



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Test Report No.: RF200324W001-1

3.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

30 MHz – 1GHz data:

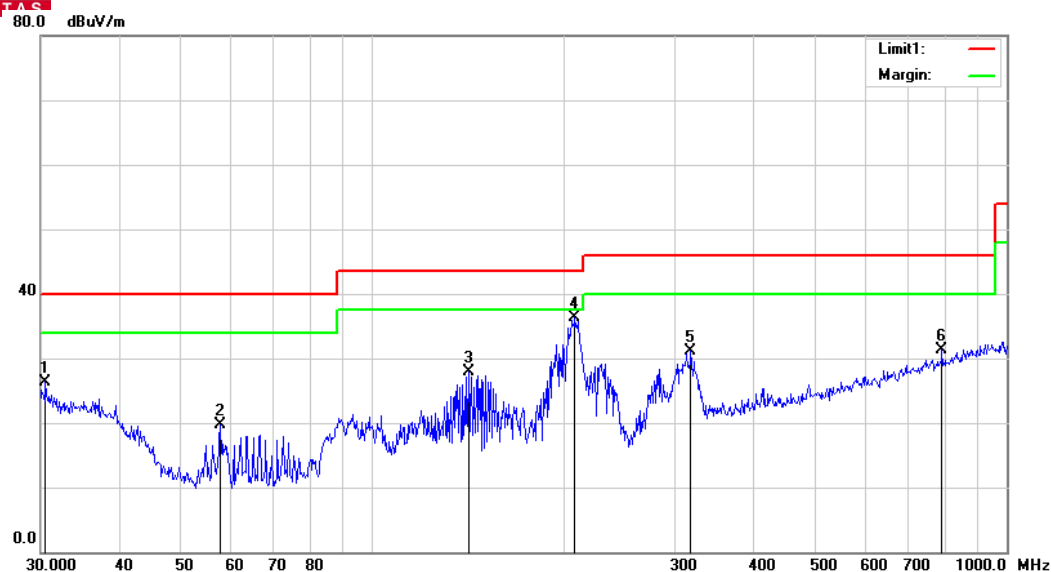
8DPSK 3DH5

CHANNEL	Channel 78	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
(MHz)	(dBμV/m)		(dBm)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(cm)	()
30.530 6	27.51	peak	20.9 9	22.2 8	0.13	26.35	40.00	-13.6 5	200	348
57.593 9	34.29	peak	7.56	22.4 0	0.26	19.71	40.00	-20.2 9	200	256
141.82 62	36.40	peak	12.6 0	22.4 0	1.22	27.82	43.50	-15.6 8	100	357
208.58 03	45.18	peak	11.9 8	22.3 6	1.56	36.36	43.50	-7.14	100	306
317.70 11	37.52	peak	13.9 7	22.2 4	1.77	31.02	46.00	-14.9 8	100	123
790.61 88	28.69	peak	21.2 9	21.1 7	2.54	31.35	46.00	-14.6 5	300	83

REMARKS:

1. Emission Level(dBuV/m) = Read Level(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 = Emission Level – Limit value

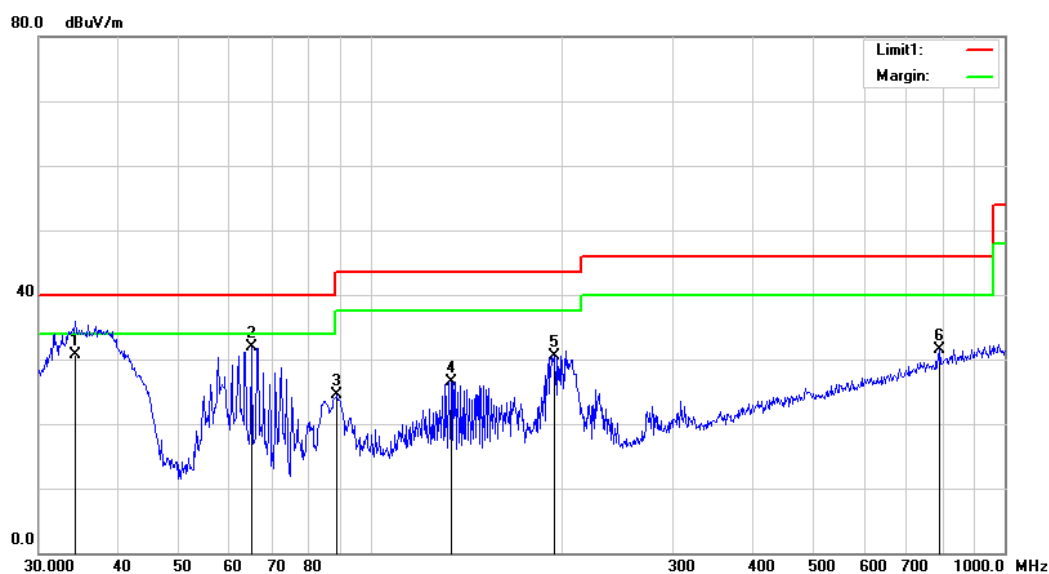


CHANNEL	Channel 78	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

Frequency (MHz)	Reading (dBuV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree ()
34.276 0	34.77	QP	18.1 1	22.2 5	0.15	30.78	40.00	-9.22	100	21
64.886 5	46.40	peak	7.54	22.4 0	0.30	31.84	40.00	-8.16	300	350
88.652 5	38.30	peak	7.95	22.3 3	0.62	24.54	43.50	-18.9 6	300	136
134.08 82	34.81	peak	12.9 8	22.4 0	1.13	26.52	43.50	-16.9 8	300	126
195.13 65	39.58	peak	11.8 3	22.3 5	1.53	30.59	43.50	-12.9 1	300	178
790.61 88	28.77	peak	21.2 9	21.1 7	2.54	31.43	46.00	-14.5 7	100	71

REMARKS:

1. Emission Level(dBuV/m) = Read Level(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 = Emission Level – Limit value





Test Report No.: RF200324W001-1



Test Report No.: RF200324W001-1

ABOVE 1GHz WORST-CASE DATA:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORREC TION FACTOR (dB/m)
2390	46.75	PK	74	-27.25	110	149	58.13	-11.38
2390	33.48	AV	54	-20.52	110	149	44.86	-11.38
2402	96.22	PK			170	195	107.6	-11.38
2402	95.67	AV			170	195	107.05	-11.38
4804	46.51	PK	74	-27.49	394	143	52.58	-6.07
4804	35.16	AV	54	-18.84	394	143	41.23	-6.07
7206	47.67	PK	74	-26.33	277	14	47.38	0.29
7206	36.2	AV	54	-17.8	277	14	35.91	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORREC TION FACTOR (dB/m)
2388	52.63	PK	74	-21.37	125	29	64.01	-11.38
2388	34.23	AV	54	-19.77	125	29	45.61	-11.38
2402	103.24	PK			219	62	114.62	-11.38
2402	100.98	AV			219	62	112.36	-11.38
4804	44.49	PK	74	-29.51	117	347	50.56	-6.07
4804	32.87	AV	54	-21.13	117	347	38.94	-6.07
7206	47.81	PK	74	-26.19	101	306	47.52	0.29
7206	36.75	AV	54	-17.25	101	306	36.46	0.29

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORREC TION FACTOR (dB/m)
2441	96.68	PK			314	319	108.06	-11.38
2441	95.21	AV			314	319	106.59	-11.38
4882	44.19	PK	74	-29.81	324	247	50.26	-6.07
4882	33.8	AV	54	-20.2	324	247	39.87	-6.07
7323	45.36	PK	74	-28.64	190	251	45.07	0.29
7323	34.94	AV	54	-19.06	190	251	34.65	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORREC TION FACTOR (dB/m)
2441	103.74	PK			145	302	115.12	-11.38
2441	101.22	AV			145	302	112.6	-11.38
4882	47.2	PK	74	-26.8	329	184	53.27	-6.07
4882	35.47	AV	54	-18.53	329	184	41.54	-6.07
7323	45.81	PK	74	-28.19	166	237	45.52	0.29
7323	34.35	AV	54	-19.65	166	237	34.06	0.29

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 2441MHz: Fundamental frequency.

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2483.5	47.04	PK	74	-26.96	328	268	58.42	-11.38
2483.5	33.51	AV	54	-20.49	328	268	44.89	-11.38
2480	98.53	PK			193	128	109.91	-11.38
2480	96.11	AV			193	128	107.49	-11.38
4960	46.9	PK	74	-27.1	344	319	52.97	-6.07
4960	36	AV	54	-18	344	319	42.07	-6.07
7440	45.56	PK	74	-28.44	326	44	45.27	0.29
7440	34.63	AV	54	-19.37	326	44	34.34	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2483.5	49.42	PK	74	-24.58	210	270	60.8	-11.38
2483.5	34.96	AV	54	-19.04	210	270	46.34	-11.38
2480	101.36	PK			257	60	112.74	-11.38
2480	97.69	AV			257	60	109.07	-11.38
4960	44.75	PK	74	-29.25	385	129	50.82	-6.07
4960	32.84	AV	54	-21.16	385	129	38.91	-6.07
7440	47.05	PK	74	-26.95	114	10	46.76	0.29
7440	35.76	AV	54	-18.24	114	10	35.47	0.29

REMARKS:

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



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Test Report No.: RF200324W001-1

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2390	46.04	PK	74	-27.96	342	195	57.42	-11.38
2390	35.59	AV	54	-18.41	342	195	46.97	-11.38
2402	98.15	PK			243	145	109.53	-11.38
2402	95.69	AV			243	145	107.07	-11.38
4804	47.2	PK	74	-26.8	235	263	53.27	-6.07
4804	37.21	AV	54	-16.79	235	263	43.28	-6.07
7206	48.41	PK	74	-25.59	328	315	48.12	0.29
7206	39.38	AV	54	-14.62	328	315	39.09	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2390	46.61	PK	74	-27.39	122	135	57.99	-11.38
2390	35.94	AV	54	-18.06	122	135	47.32	-11.38
2402	105.01	PK			290	287	116.39	-11.38
2402	102.66	AV			290	287	114.04	-11.38
4804	44.45	PK	74	-29.55	211	44	50.52	-6.07
4804	33.67	AV	54	-20.33	211	44	39.74	-6.07
7206	45.81	PK	74	-28.19	120	70	45.52	0.29
7206	34.14	AV	54	-19.86	120	70	33.85	0.29

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2441	100.76	PK			229	286	112.14	-11.38
2441	97.21	AV			229	286	108.59	-11.38
4882	44.97	PK	74	-29.03	251	304	51.04	-6.07
4882	35.83	AV	54	-18.17	251	304	41.9	-6.07
7323	45.87	PK	74	-28.13	335	258	45.58	0.29
7323	34.27	AV	54	-19.73	335	258	33.98	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2441	106.84	PK			266	96	118.22	-11.38
2441	103.42	AV			266	96	114.8	-11.38
4882	44.74	PK	74	-29.26	163	162	50.81	-6.07
4882	34.41	AV	54	-19.59	163	162	40.48	-6.07
7323	45.57	PK	74	-28.43	210	92	45.28	0.29
7323	34.28	AV	54	-19.72	210	92	33.99	0.29

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 2441MHz: Fundamental frequency.

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2483.5	48.55	PK	74	-25.45	185	74	59.93	-11.38
2483.5	35.69	AV	54	-18.31	185	74	47.07	-11.38
2480	100.28	PK			175	206	111.66	-11.38
2480	97.51	AV			175	206	108.89	-11.38
4960	46.24	PK	74	-27.76	159	310	52.31	-6.07
4960	35.89	AV	54	-18.11	159	310	41.96	-6.07
7440	47.15	PK	74	-26.85	212	77	46.86	0.29
7440	36.8	AV	54	-17.2	212	77	36.51	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
2483.5	50.41	PK	74	-23.59	238	190	61.79	-11.38
2483.5	39.91	AV	54	-14.09	238	190	51.29	-11.38
2480	102.56	PK			103	104	113.94	-11.38
2480	99.43	AV			103	104	110.81	-11.38
4960	46.23	PK	74	-27.77	230	142	52.3	-6.07
4960	36.46	AV	54	-17.54	230	142	42.53	-6.07
7440	47.26	PK	74	-26.74	189	310	46.97	0.29
7440	37.15	AV	54	-16.85	189	310	36.86	0.29

REMARKS:

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

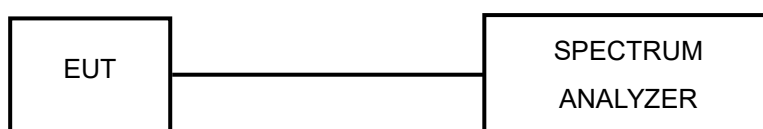
Note: Radiated Emission AND BANDEDGE Measurement Test was performed by **Lab B**.

3.3 NUMBER OF HOPPING FREQUENCY USED

3.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 channels frequencies, and should be equally spaced.

3.3.2 TEST SETUP



3.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 28,20	Feb. 27,21
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 28,20	Feb. 27,21
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	Feb. 28,20	Feb. 27,21
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 28,20	Feb. 27,21
CBT32 BLUETOOTH TESTER 4HU	Rohde&Schwarz	CBT32	101176	Feb. 28,20	Feb. 27,21

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.



Test Report No.: RF200324W001-1

3.3.4 TEST PROCEDURES

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- d. Set the SA on View mode and then plot the result on SA screen.
- e. Repeat above procedures until all frequencies measured were completed.

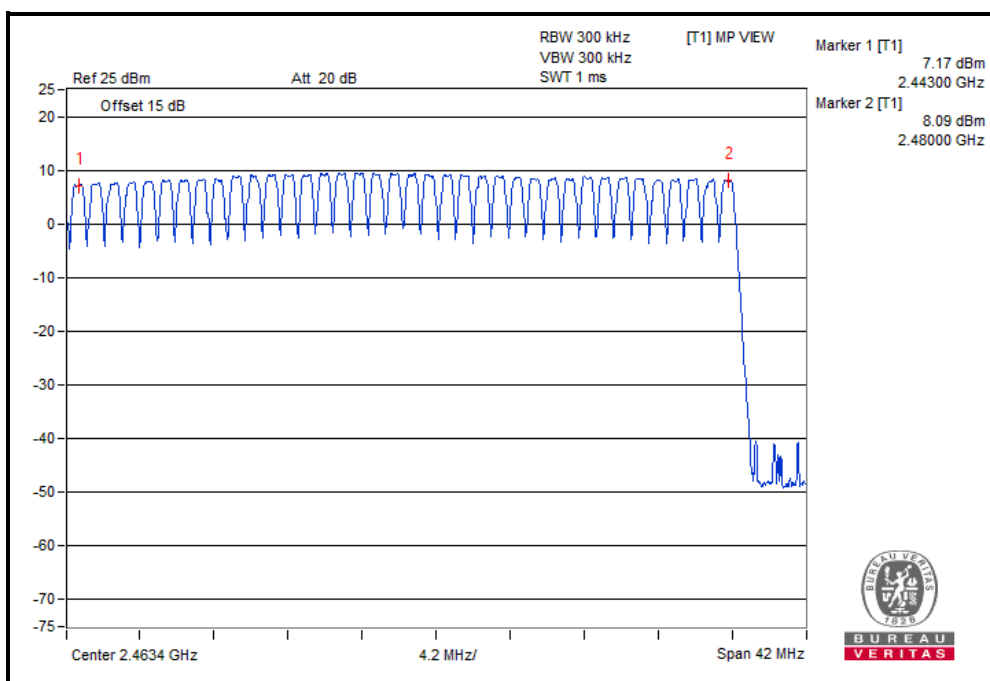
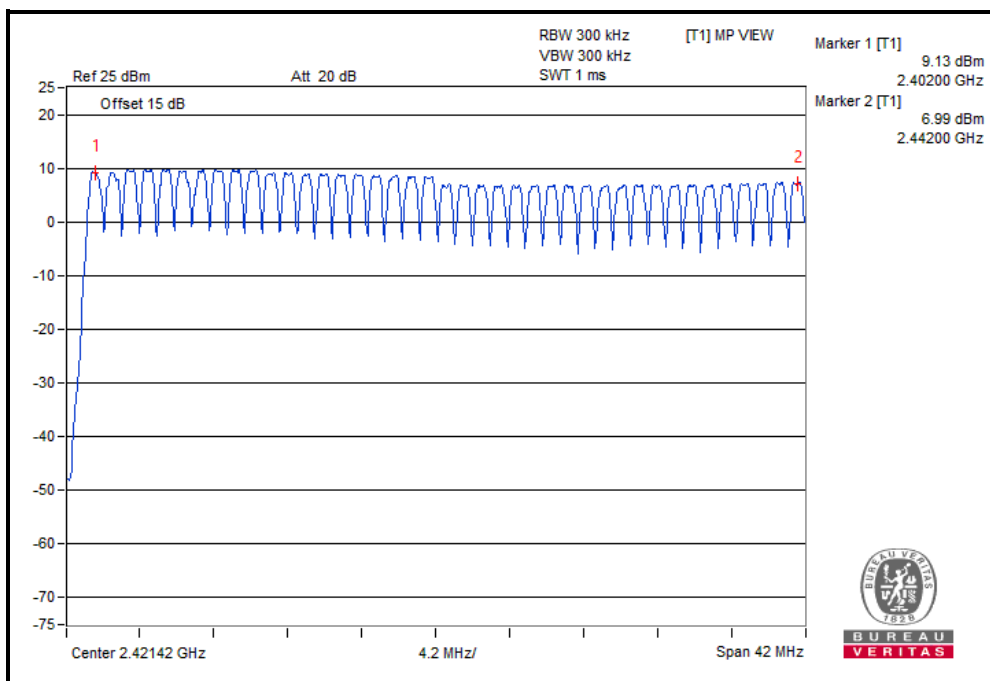
3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

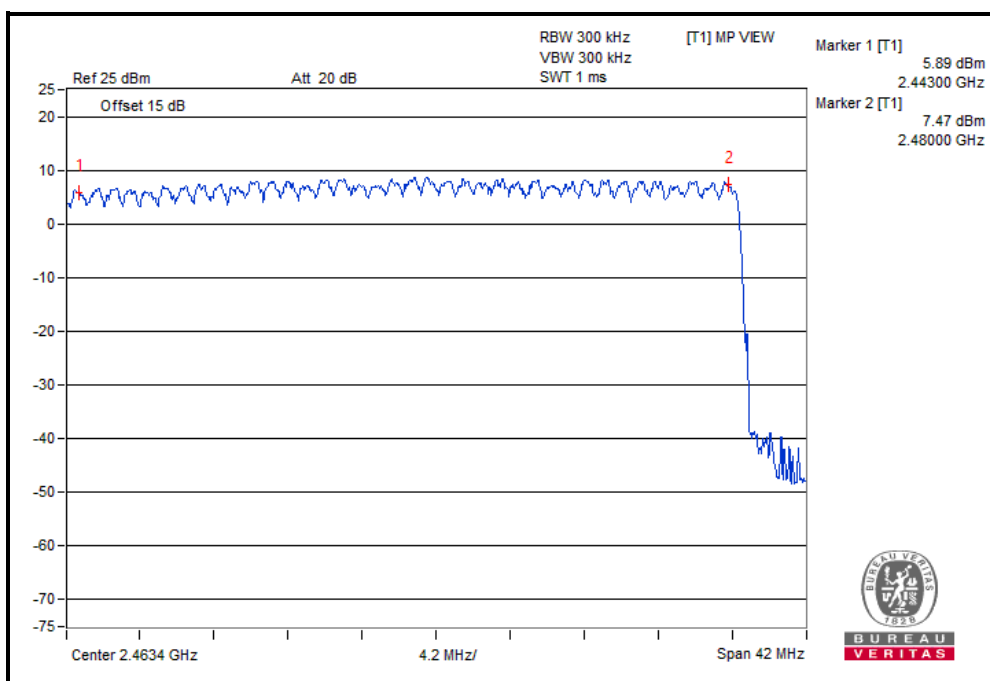
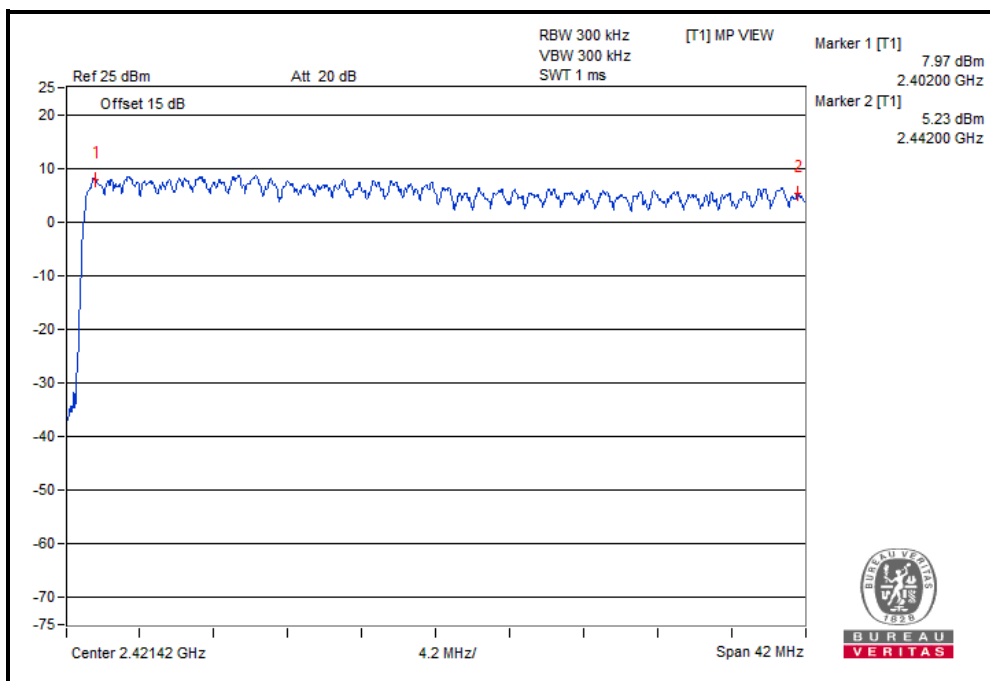
3.3.6 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

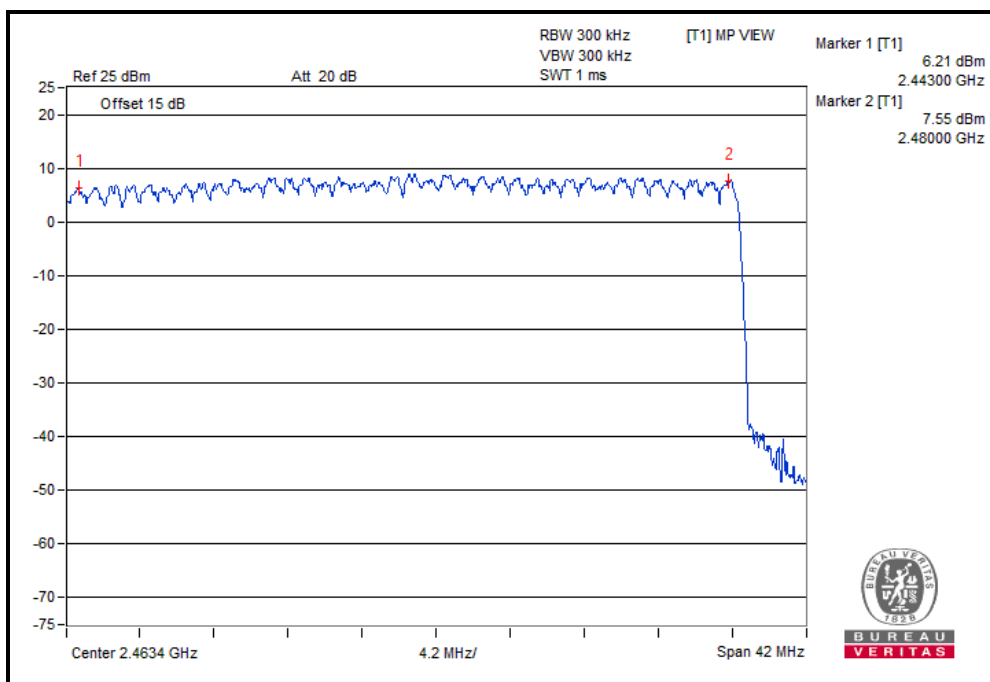
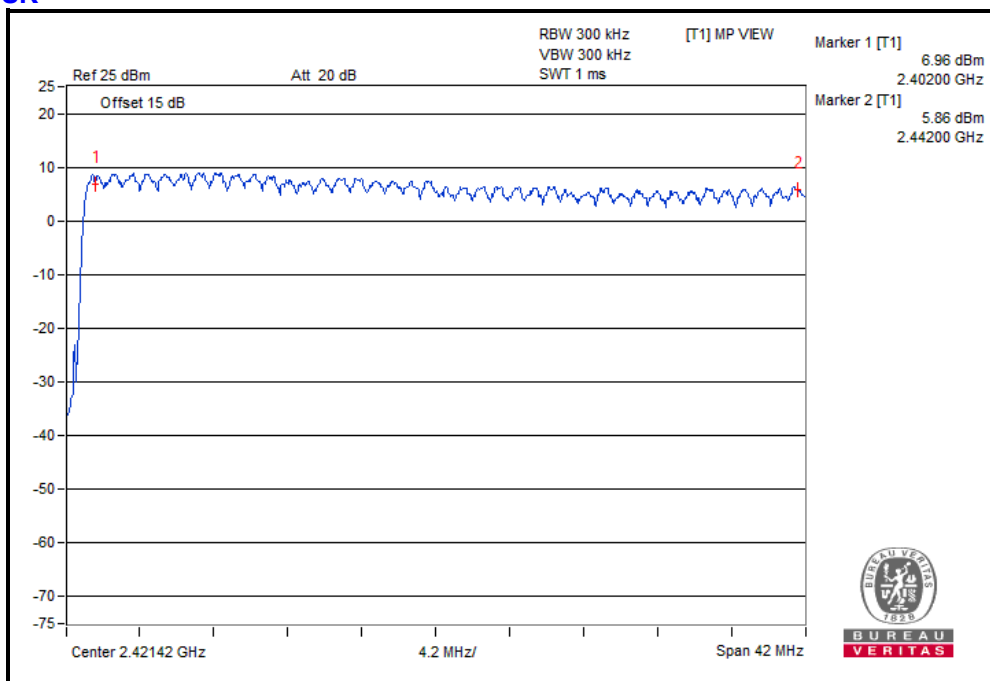
GFSK



8DPSK



$\pi/4$ DQPSK

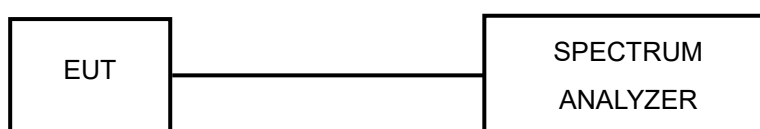


3.4 DWELL TIME ON EACH CHANNEL

3.4.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.4.4 TEST PROCEDURES

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- e. Repeat above procedures until all different time-slot modes have been completed.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 TEST RESULTS

GFSK

Mode	Number of Hopping Channel	Number of transmission in a period(channel number*0.4 sec)				Length of transmission time (msec)	Result (msec)	Limit (msec)	PASS / FAIL
		period (sec)	sweep time (sec)	times in a sweep	times in a period				
DH1	79	31.6	5	48	303.36	0.459	139.24	400	PASS
DH3	79	31.6	5	17	107.44	1.705	183.19	400	PASS
DH5	79	31.6	5	8	50.56	2.965	149.91	400	PASS

NOTE: Test plots of the transmitting time slot are shown on next page.

GFSK





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Test Report No.: RF200324W001-1

8DPSK

Mode	Number of Hopping Channel	Number of transmission in a period(channel number*0.4 sec)				Length of transmission time (msec)	Result (msec)	Limit (msec)	PASS / FAIL
		period (sec)	sweep time (sec)	times in a sweep	times in a period				
3DH1	79	31.6	5	51	322.32	0.441	142.14	400	PASS
3DH3	79	31.6	5	15	94.8	1.72	163.06	400	PASS
3DH5	79	31.6	5	13	82.16	2.94	241.55	400	PASS

NOTE: Test plots of the transmitting time slot are shown on next page.



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Test Report No.: RF200324W001-1

8DPSK





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π/4DQPSK

Test Report No.: RF200324W001-1

Mode	Number of Hopping Channel	Number of transmission in a period(channel number*0.4 sec)				Length of transmission time (msec)	Result (msec)	Limit (msec)	PASS / FAIL
		period (sec)	sweep time (sec)	times in a sweep	times in a period				
2DH1	79	31.6	5	49	309.68	0.453	140.29	400	PASS
2DH3	79	31.6	5	14	88.48	1.695	149.97	400	PASS
2DH5	79	31.6	5	6	37.92	2.945	111.67	400	PASS



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Test Report No.: RF200324W001-1

$\pi/4$ DQPSK

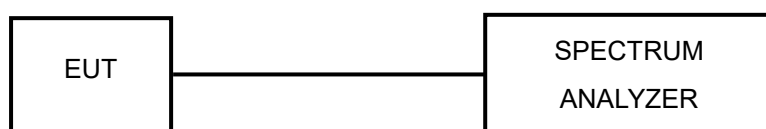


3.5 CHANNEL BANDWIDTH

3.5.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dB bandwidth of hopping channel shall be a minimum limit for the hopping channel separation.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.5.4 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

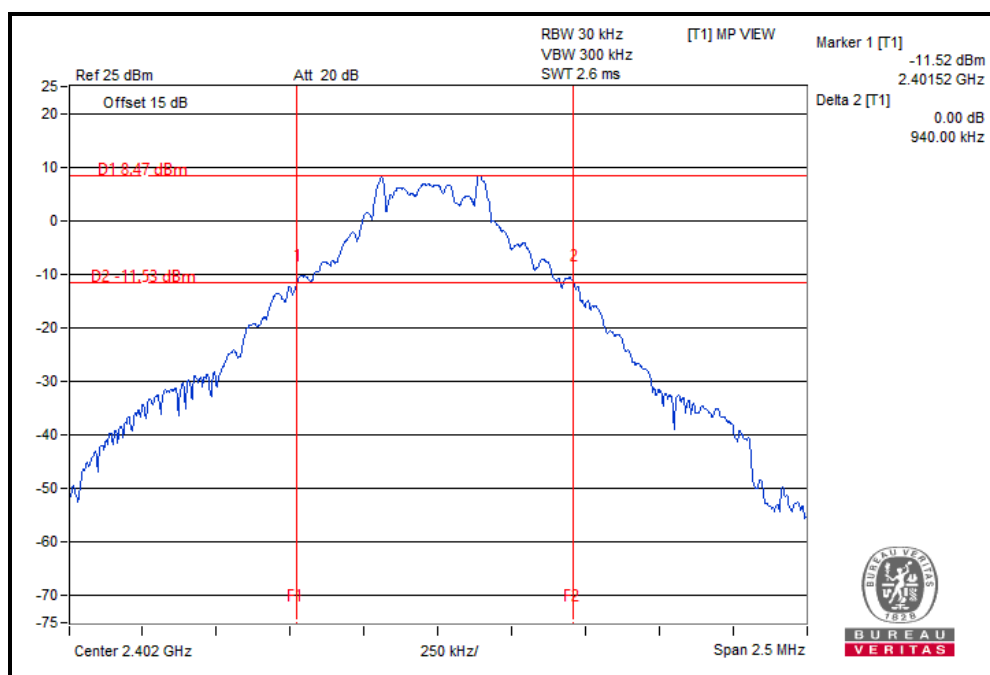
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

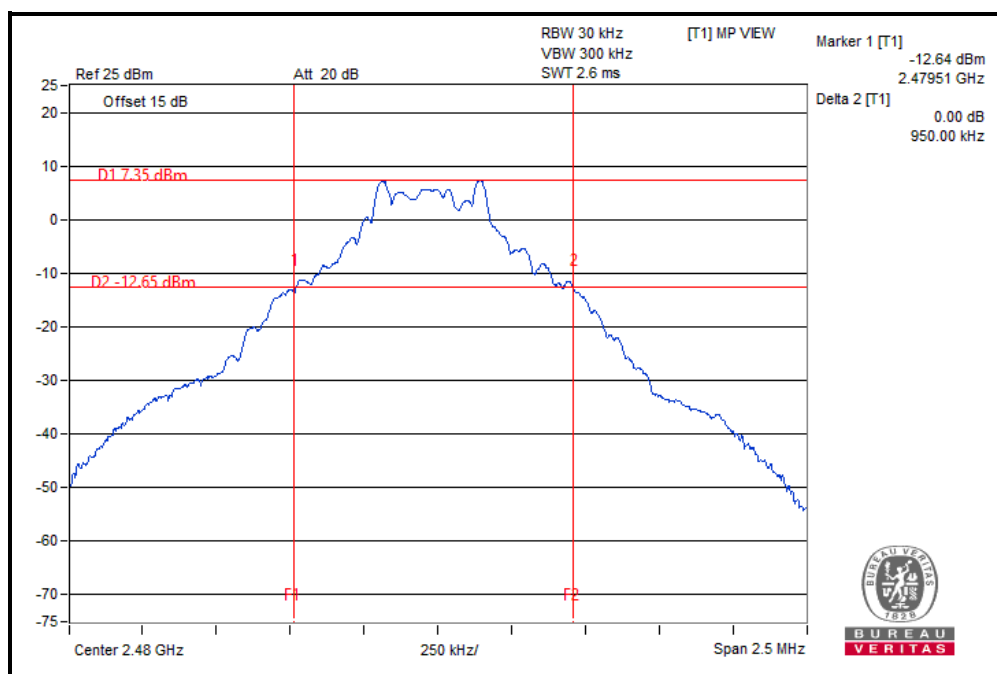
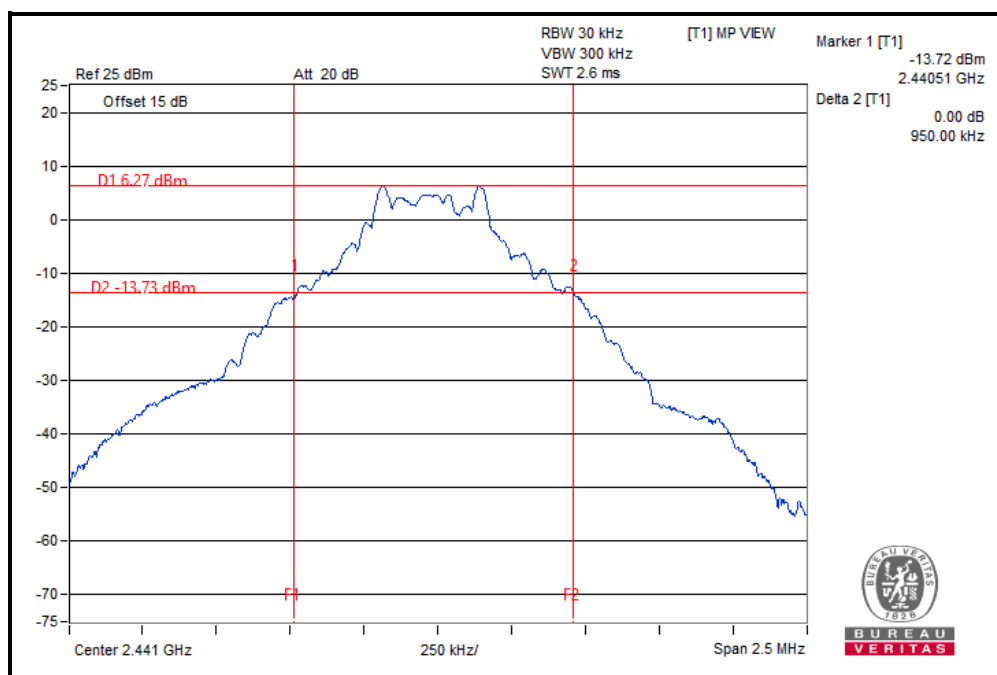
3.5.7 TEST RESULTS

GFSK

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	0.94
39	2441	0.95
78	2480	0.95

CH 0







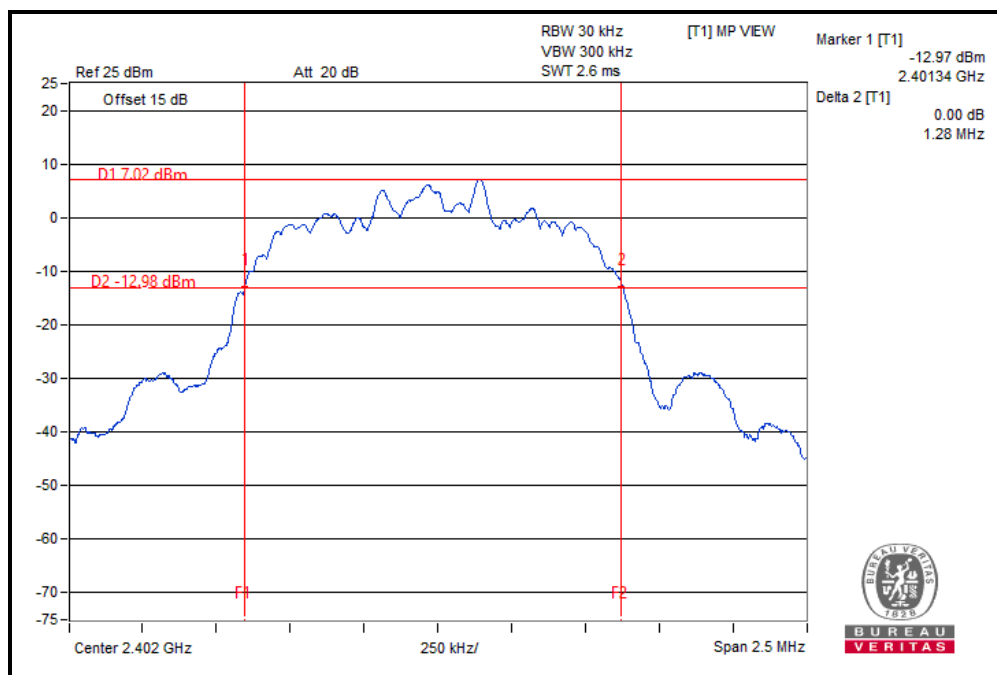
BUREAU
VERITAS

Test Report No.: RF200324W001-1

$\pi/4$ DQPSK

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	1.28
39	2441	1.28
78	2480	1.28

CH 0

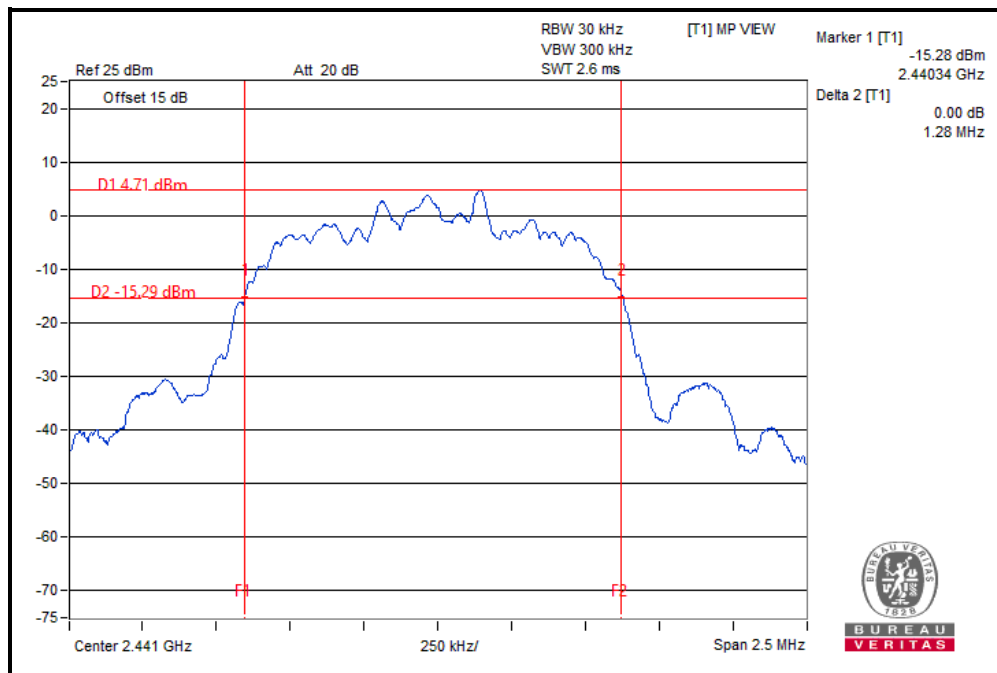




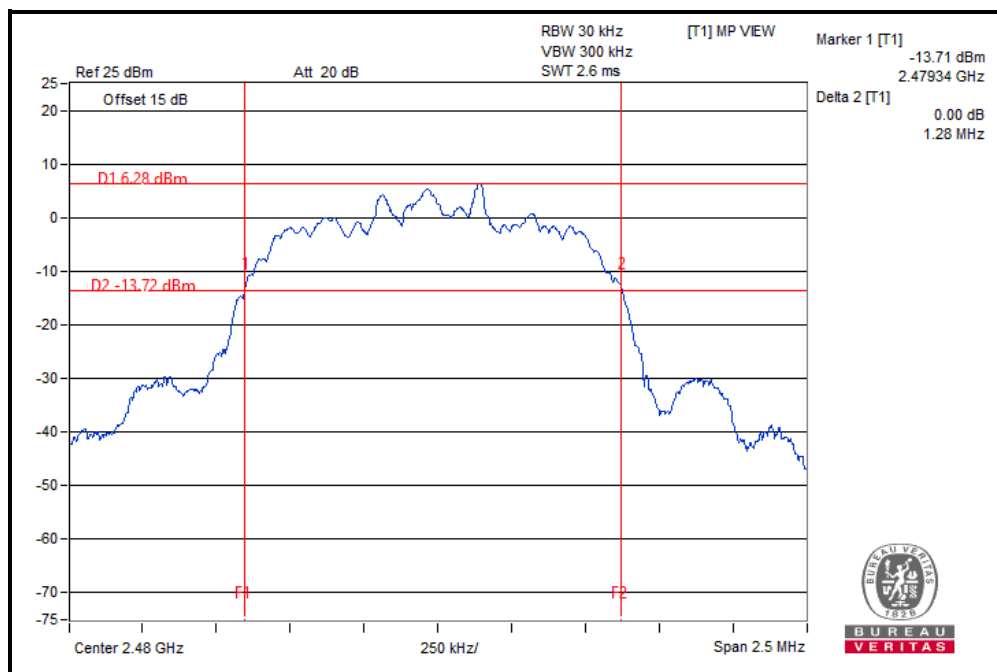
BUREAU
VERITAS

Test Report No.: RF200324W001-1

CH 39



CH 78





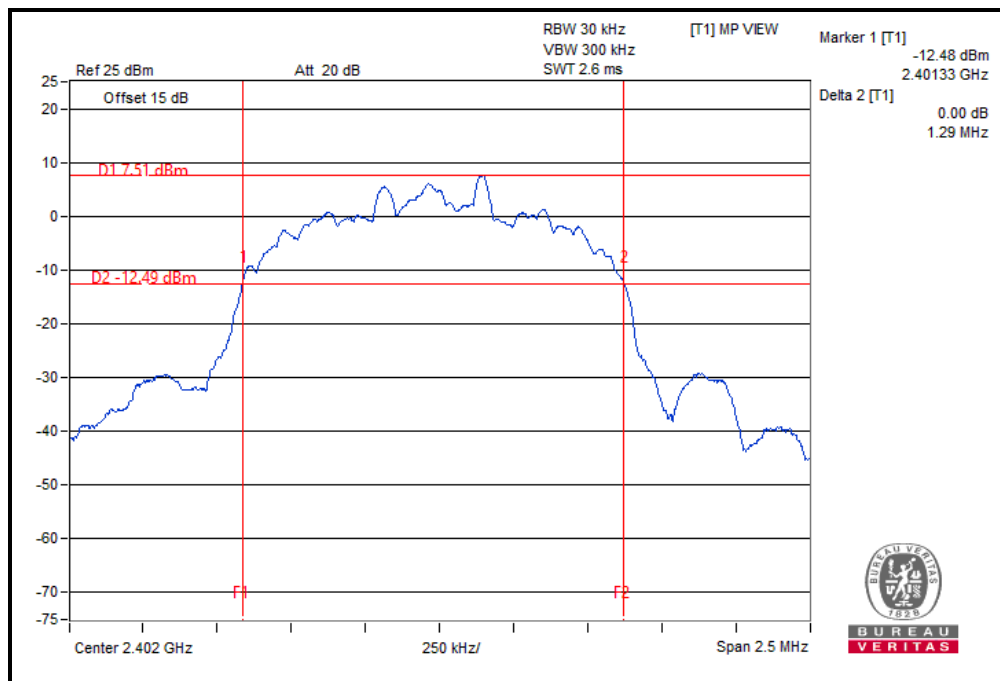
BUREAU
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Test Report No.: RF200324W001-1

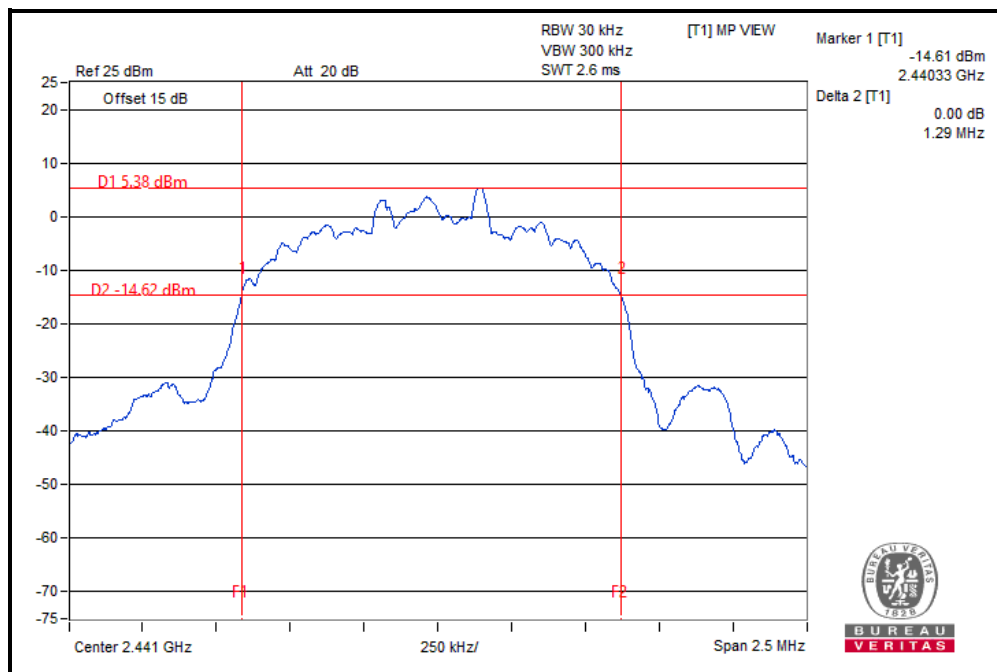
8DPSK

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	1.29
39	2441	1.29
78	2480	1.29

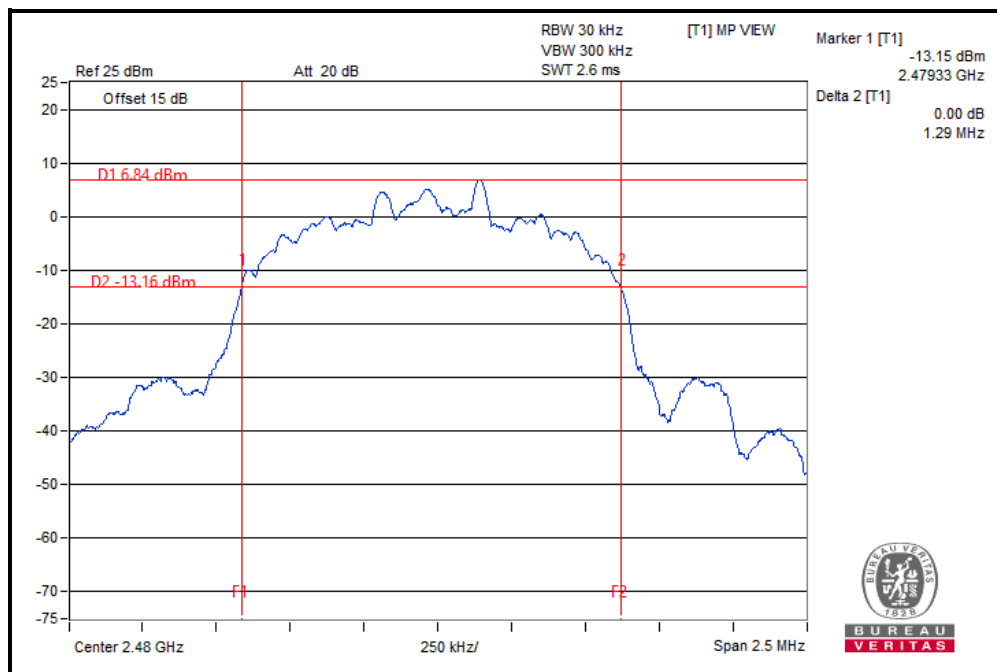
CH 0



CH 39



CH 78

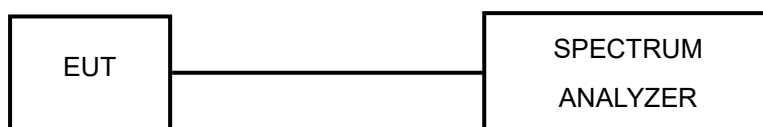


3.6 HOPPING CHANNEL SEPARATION

3.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.6.4 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.



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Test Report No.: RF200324W001-1

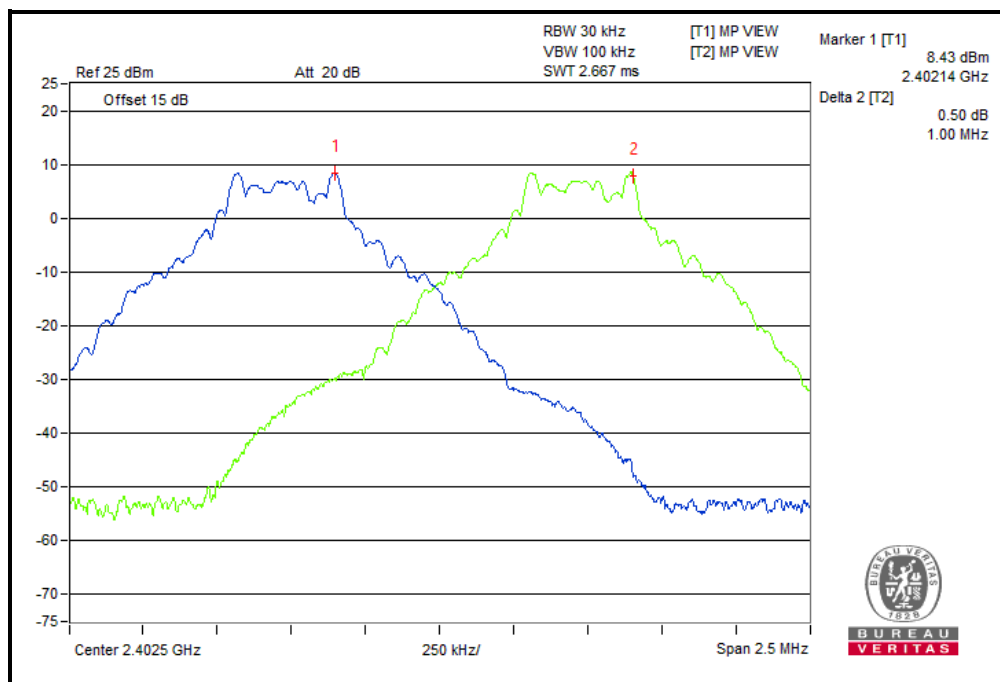
3.6.6 TEST RESULTS

GFSK

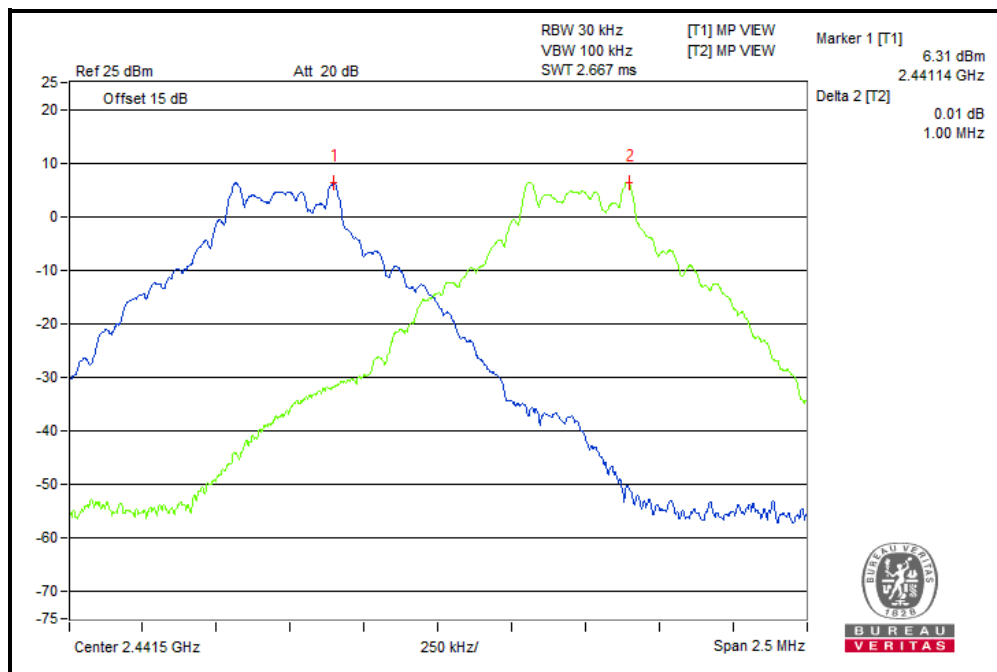
CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.00	0.94	0.63	PASS
39	2441	1.00	0.95	0.63	PASS
78	2480	1.00	0.95	0.63	PASS

NOTE: The minimum limit is two-third 20dB bandwidth.

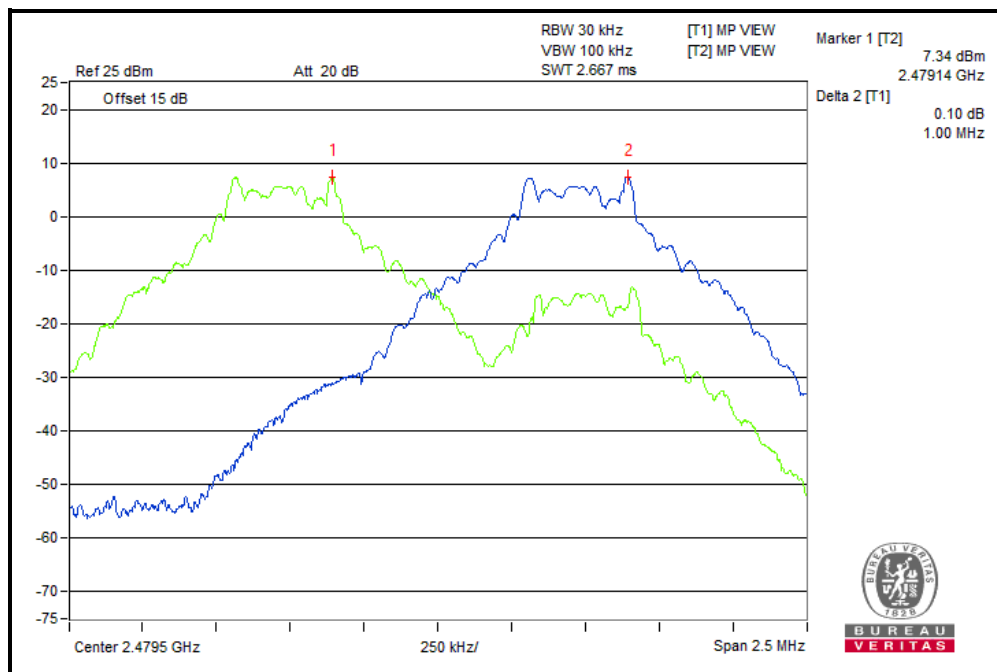
CH 0



CH 39



CH 78

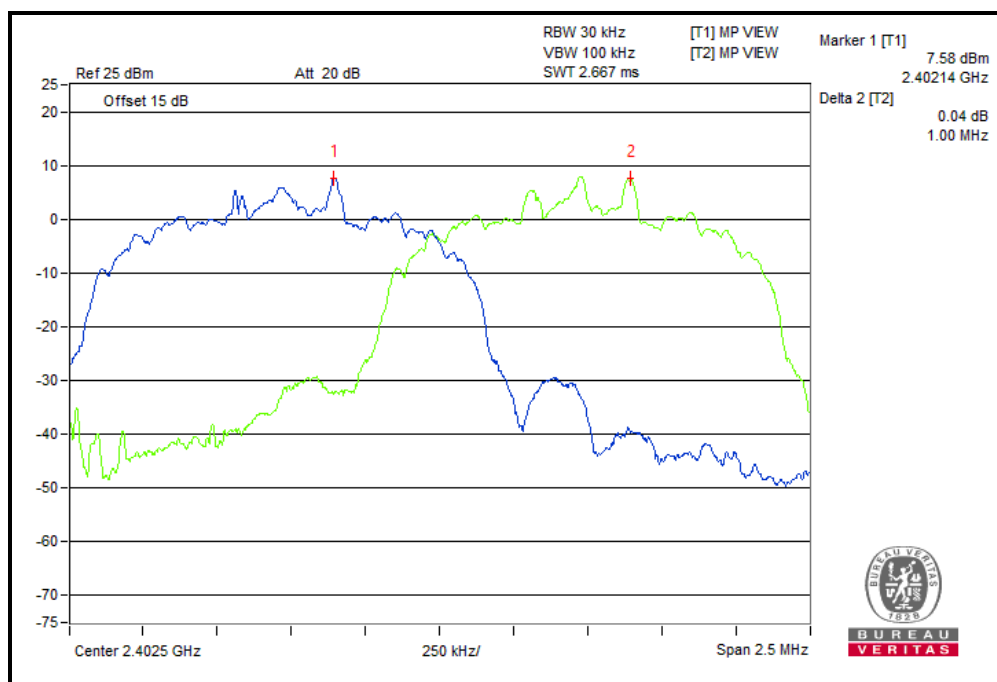


8DPSK

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.00	1.29	0.86	PASS
39	2441	1.00	1.29	0.86	PASS
78	2480	1.00	1.29	0.86	PASS

NOTE: The minimum limit is two-third 20dB bandwidth.

CH 0

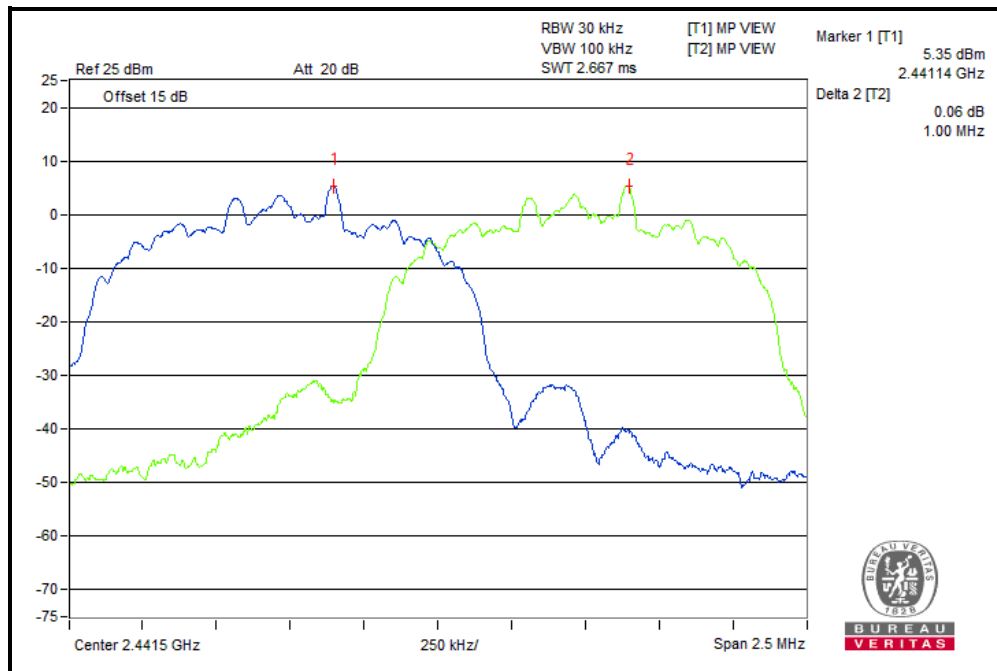




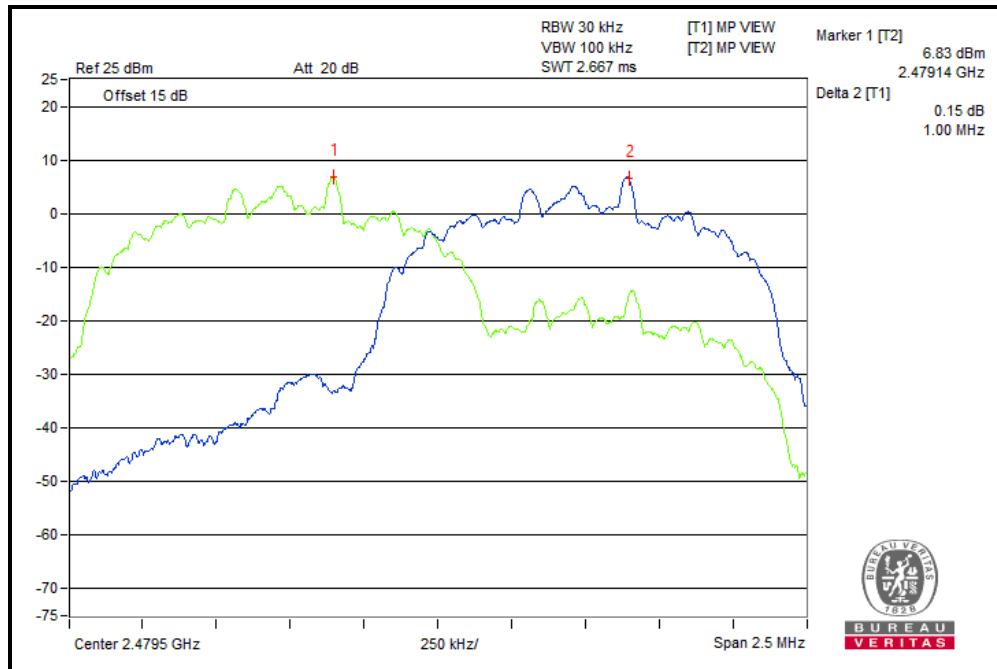
BUREAU
VERITAS

Test Report No.: RF200324W001-1

CH 39



CH 78





BUREAU
VERITAS

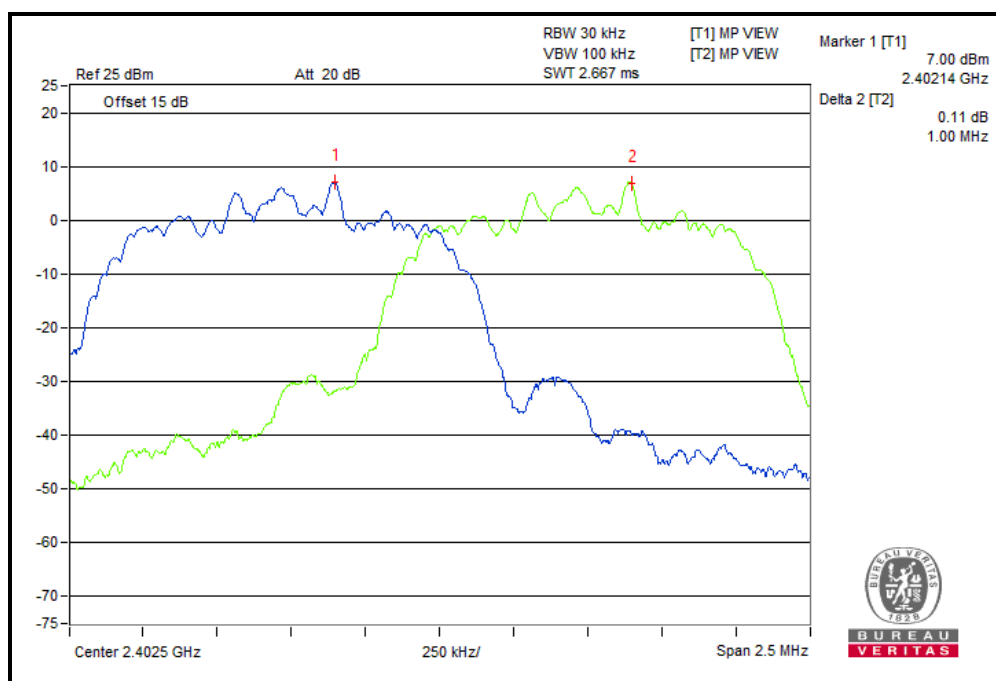
$\pi/4$ QPSK

Test Report No.: RF200324W001-1

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.00	1.28	0.85	PASS
39	2441	1.00	1.28	0.85	PASS
78	2480	1.00	1.28	0.85	PASS

NOTE: The minimum limit is two-third 20dB bandwidth.

CH 0

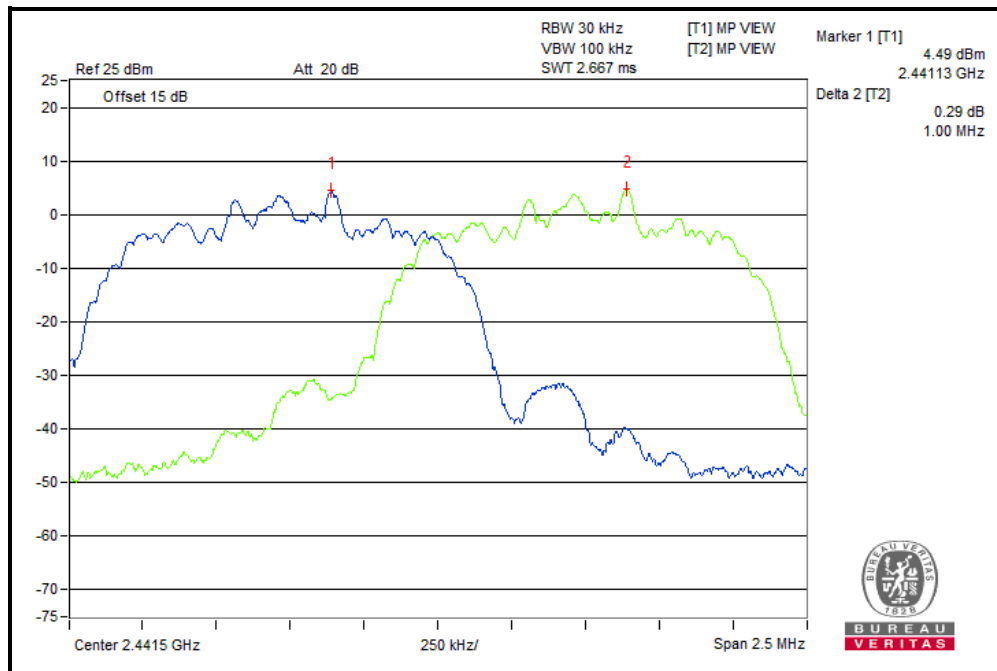




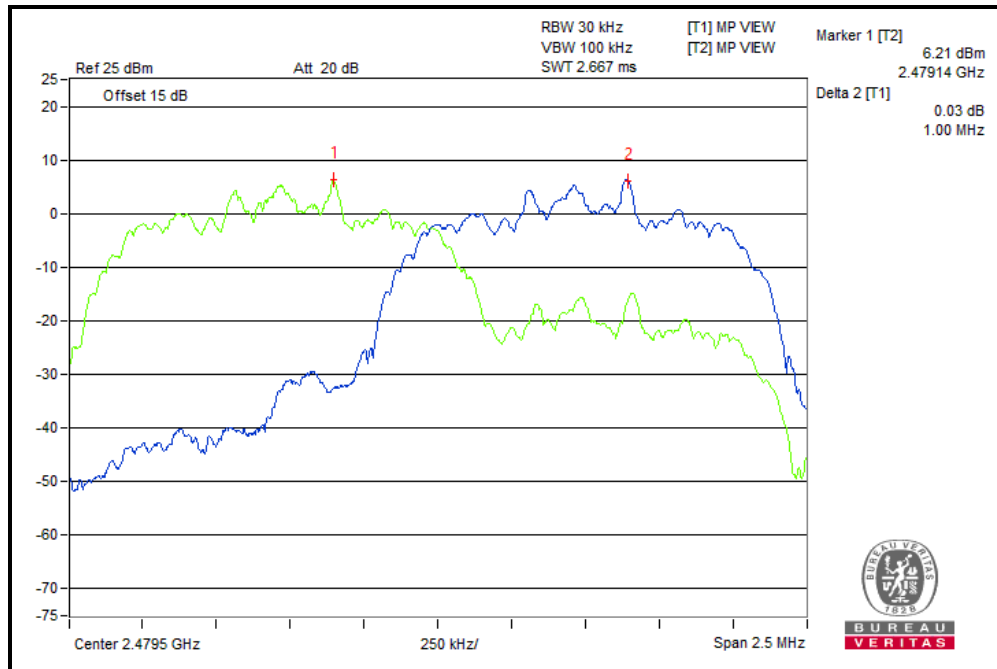
BUREAU
VERITAS

Test Report No.: RF200324W001-1

CH 39



CH 78

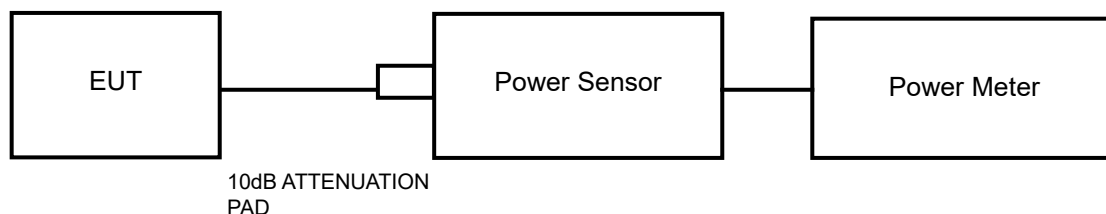


3.7 MAXIMUM OUTPUT POWER

3.7.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 125mW.

3.7.2 TEST SETUP



3.7.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.7.4 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.

3.7.5 DEVIATION FROM TEST STANDARD

No deviation.

3.7.6 EUT OPERATING CONDITION

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



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Test Report No.: RF200324W001-1

3.7.7 TEST RESULTS

3.7.7.1 MAXIMUM PEAK OUTPUT POWER

GFSK

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (dBm)	POWER OUTPUT (mW)	POWER LIMIT (mW)	PASS/FAIL
0	2402	5.10	3.24	125	PASS
39	2441	4.76	2.99	125	PASS
78	2480	4.91	3.10	125	PASS

$\pi/4$ DQPSK

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (dBm)	POWER OUTPUT (mW)	POWER LIMIT (mW)	PASS/FAIL
0	2402	6.65	4.62	125	PASS
39	2441	6.27	4.24	125	PASS
78	2480	6.30	4.27	125	PASS

8DPSK

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (dBm)	POWER OUTPUT (mW)	POWER LIMIT (mW)	PASS/FAIL
0	2402	7.00	5.01	125	PASS
39	2441	6.48	4.45	125	PASS
78	2480	6.49	4.46	125	PASS

3.7.7.2 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.

GFSK

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
0	2402	4.68	N/A
39	2441	4.33	N/A
78	2480	4.58	N/A

$\pi/4$ DQPSK

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
0	2402	6.07	N/A
39	2441	5.68	N/A
78	2480	5.75	N/A

8DPSK

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
0	2402	6.32	N/A
39	2441	5.84	N/A
78	2480	5.87	N/A

3.8 OUT OF BAND MEASUREMENT

3.8.1 LIMITS OF OUT OF BAND MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz RBW).

3.8.2 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Spectrum Analyzer was set RBW to 100 kHz and VBW to 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. Detector = PEAK and Trace mode = Max Hold. The band edges was measured and recorded.

3.8.4 DEVIATION FROM TEST STANDARD

No deviation.

3.8.5 EUT OPERATING CONDITION

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

3.8.6 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.

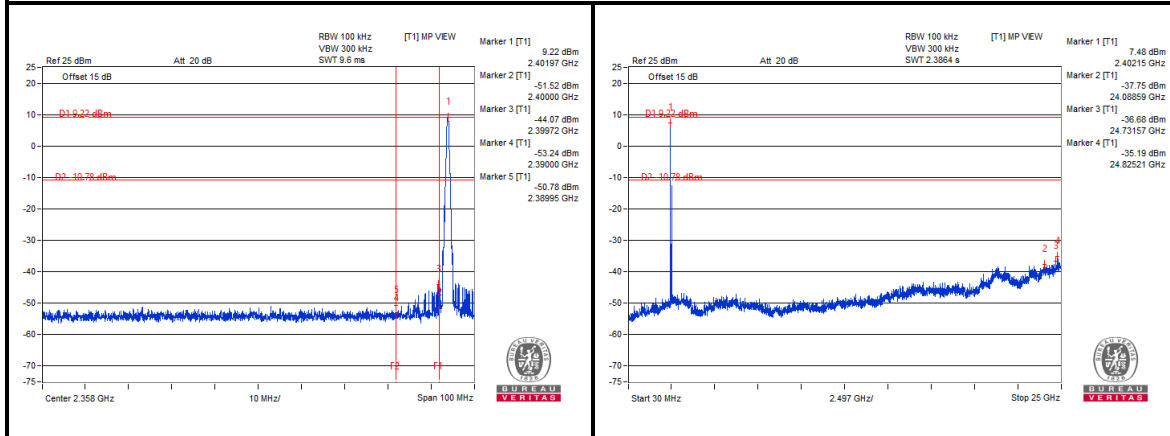


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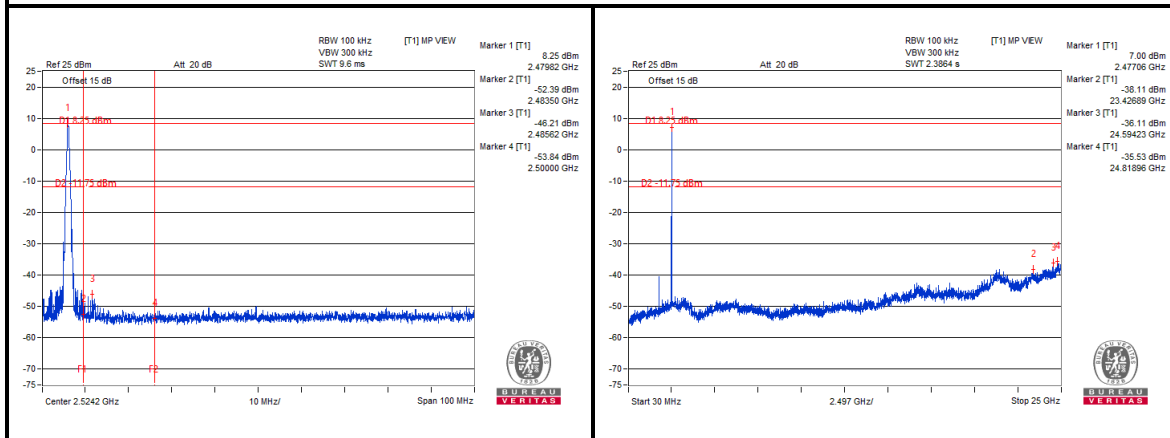
Test Report No.: RF200324W001-1

GFSK

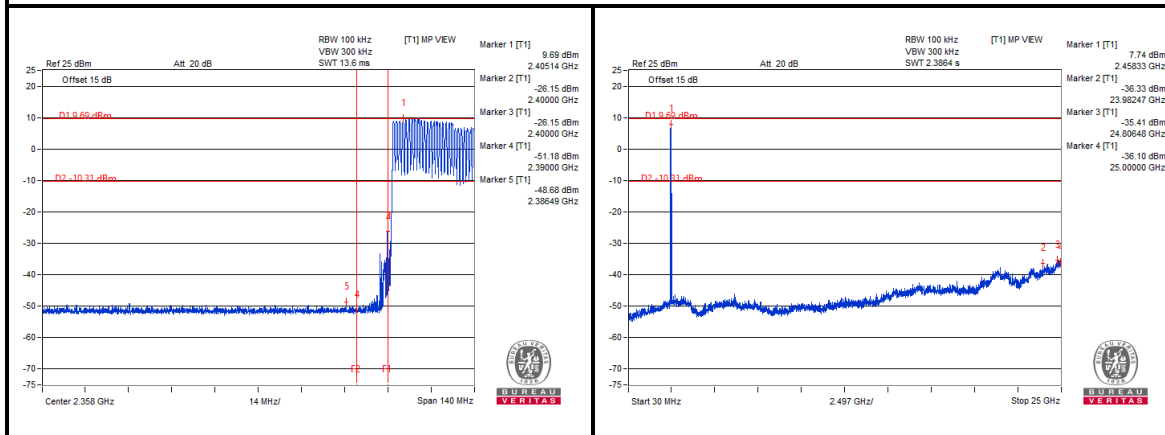
Hopping disabled Low Channel



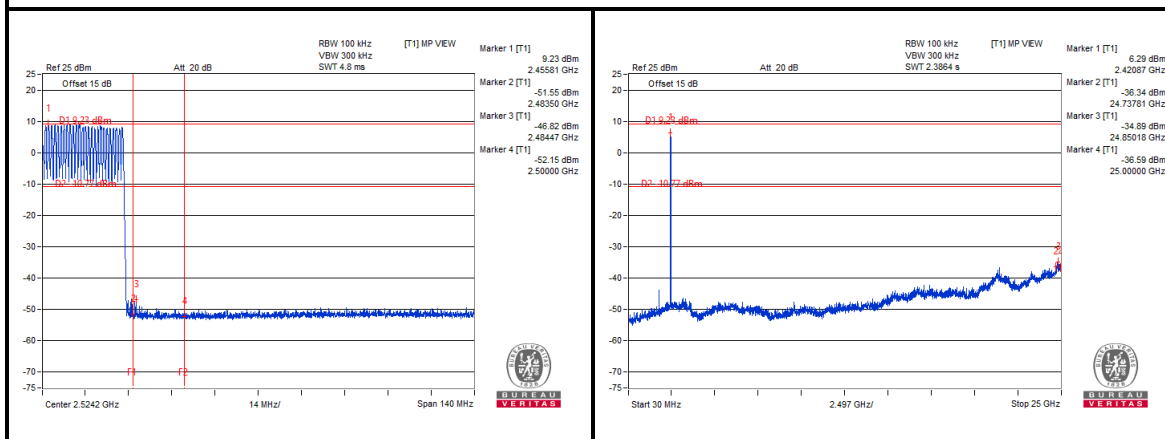
Hopping disabled_High Channel



Hopping enabled Low Channel

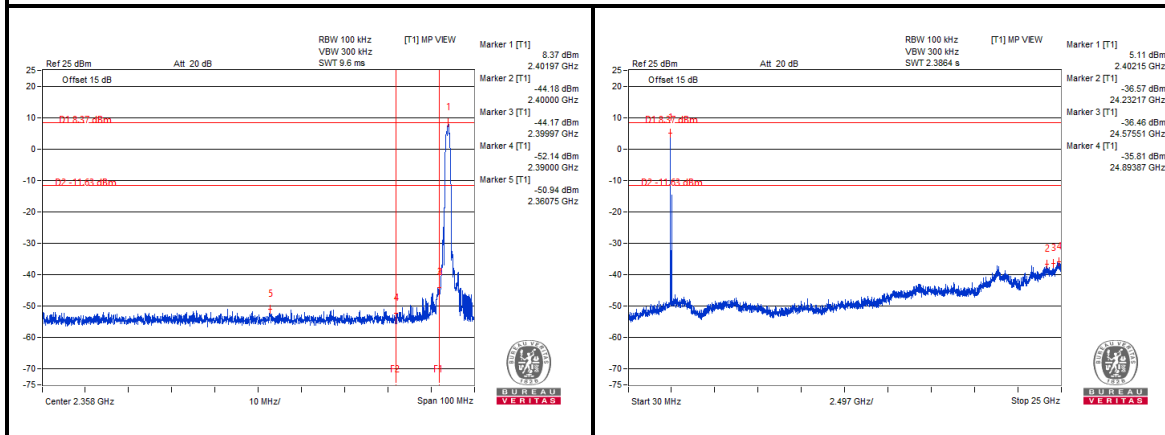


Hopping enabled_High Channel

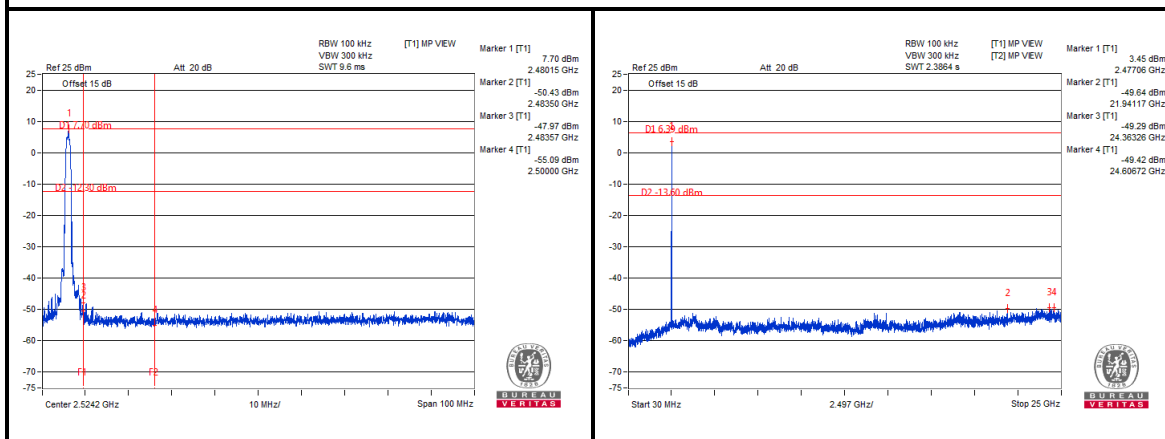


8DPSK

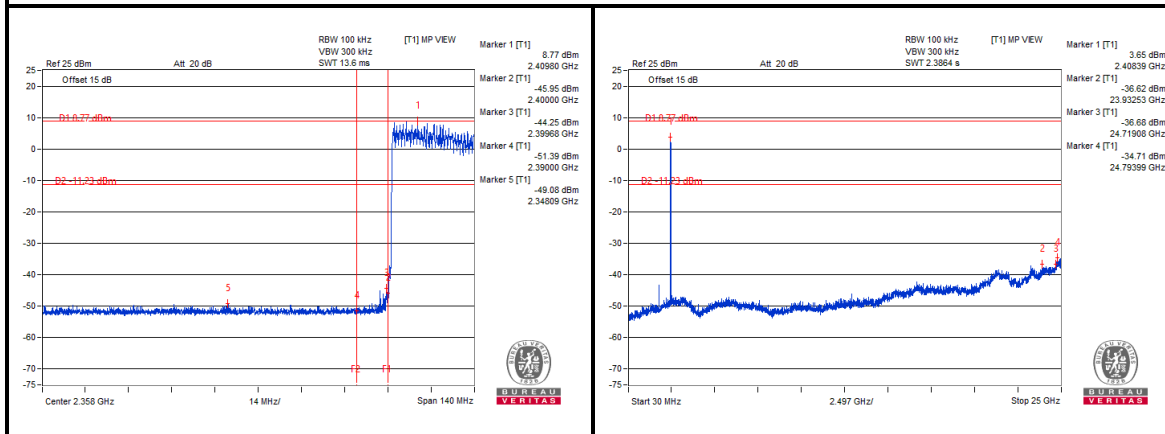
Hopping disabled Low Channel



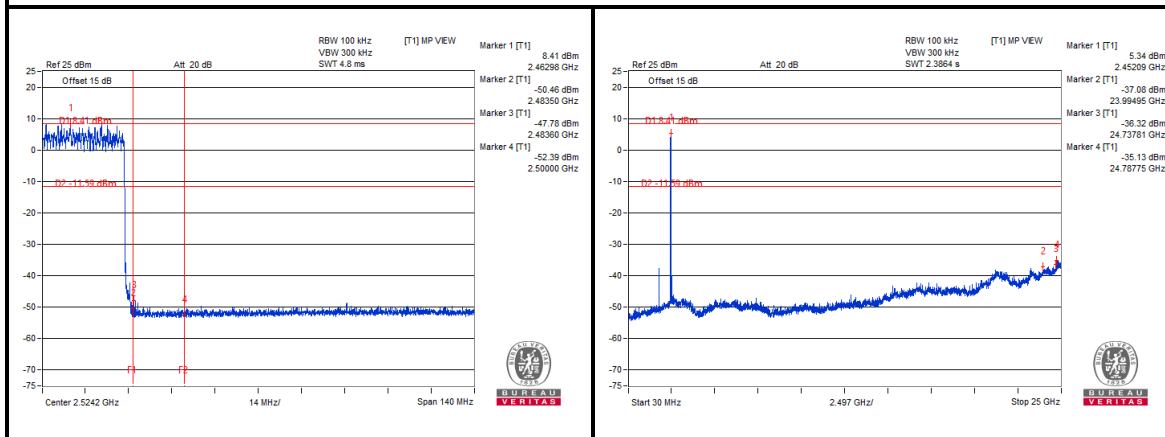
Hopping disabled_High Channel



Hopping enabled Low Channel



Hopping enabled_High Channel



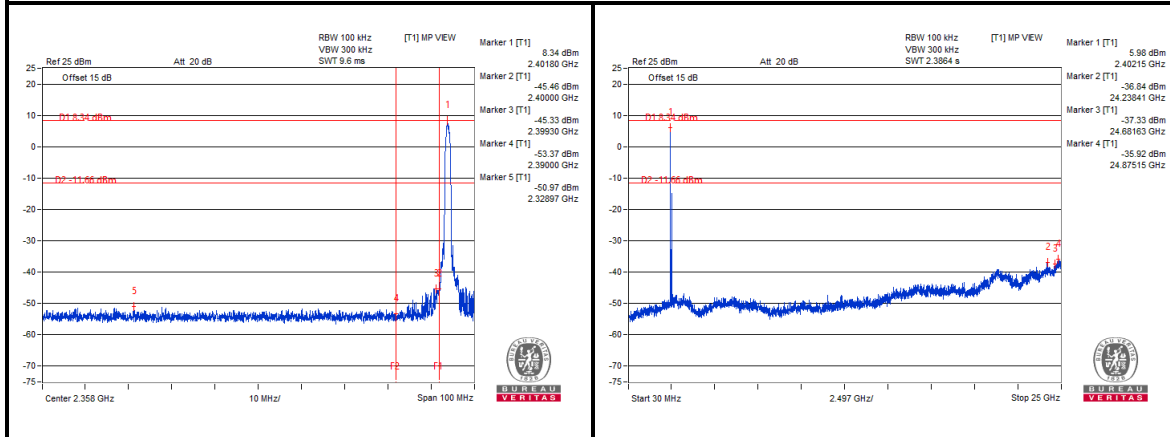


BUREAU
VERITAS

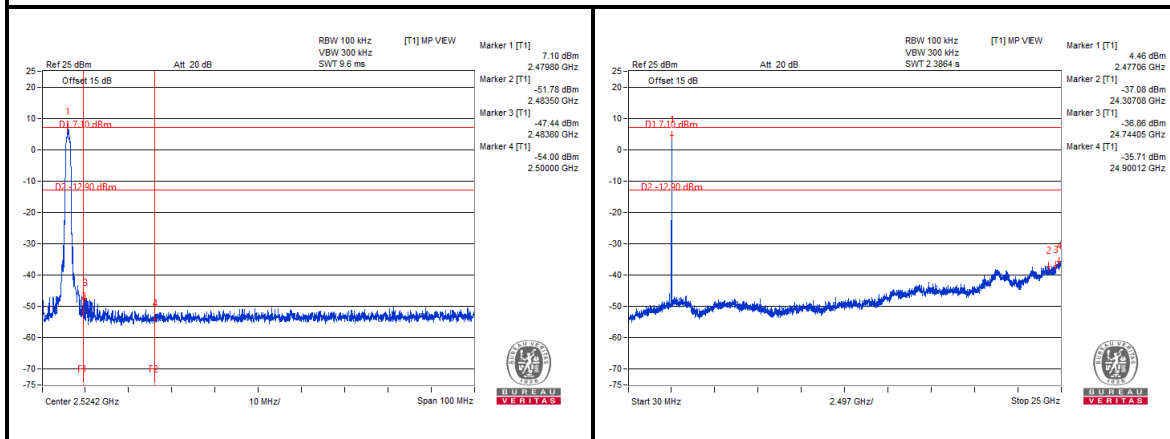
Test Report No.: RF200324W001-1

$\pi/4$ DQPSK

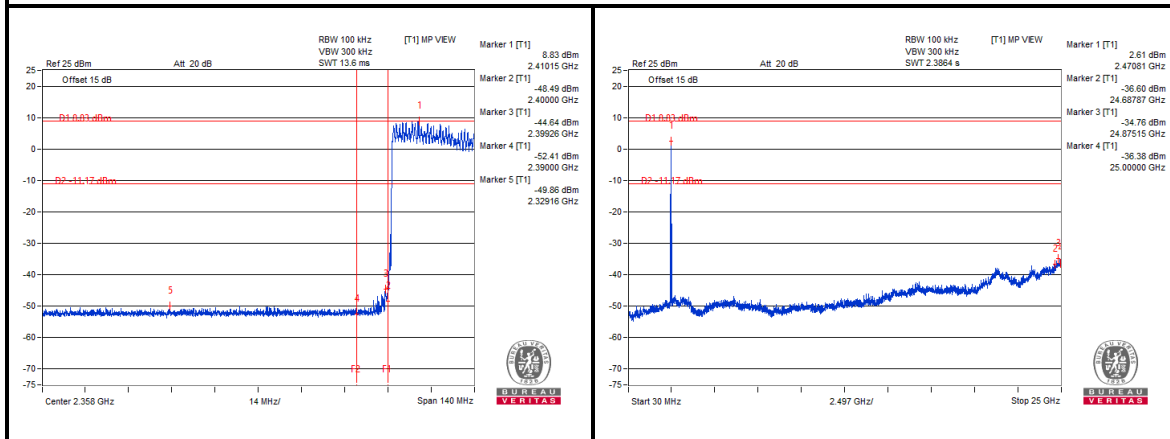
Hopping disabled Low Channel



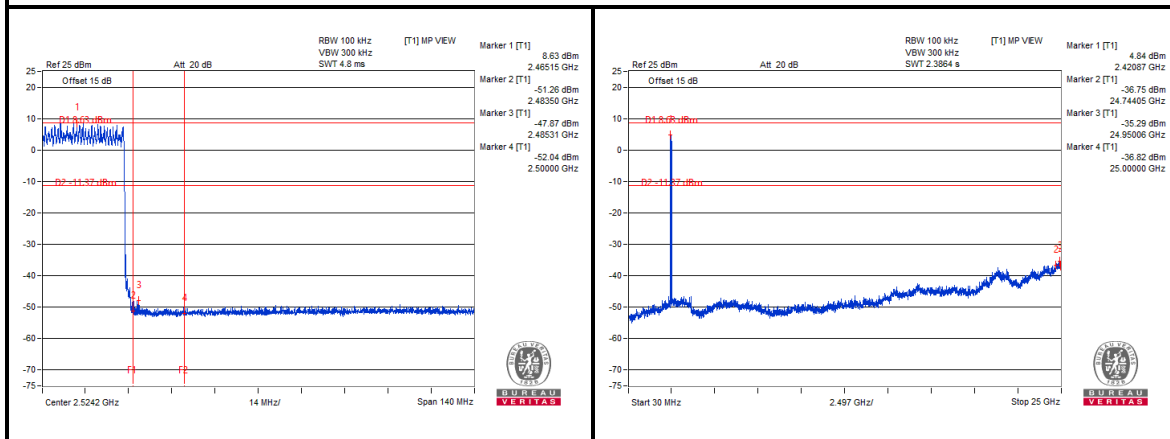
Hopping disabled_High Channel



Hopping enabled Low Channel



Hopping enabled_High Channel





Test Report No.: RF200324W001-1

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



Test Report No.: RF200324W001-1

5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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

---END---