

MIC public notice 88

TEST REPORT

Client Name : Shenzhen Yunke Acoustics Technology Co.,Ltd

Address : Room 205, Building 2, Zhonglian Zhan New Energy Vehicle City,
No. 23 Hongmian Road, Yuanshan Subdistrict, Longgang District,
Shenzhen

Product Name : MUSE300

Test Model No. : MUSE300

Report No. : CCTI-2026012605-2E

Issued Date : May 25, 2026

Prepared By : Shenzhen CCTI Technology Co., Ltd.

Address : A1-1, Building B1&B2, No.45 Gangtou Road, Bogang District,
Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Contact Info : Service Tel : 0086-400-188-9662

CCTI E-mail : ccti@ccti-lab.com

CCTI Web : www.ccti-lab.com



Scan code for report

TEST REPORT VERIFICATION

Applicant : Shenzhen Yunke Acoustics Technology Co.,Ltd
Address : Room 205, Building 2, Zhonglian Zhan New Energy Vehicle City, No. 23 Hongmian Road, Yuanshan Subdistrict, Longgang District, Shenzhen
Manufacturer : Shenzhen Yunke Acoustics Technology Co.,Ltd
Address : Room 205, Building 2, Zhonglian Zhan New Energy Vehicle City, No. 23 Hongmian Road, Yuanshan Subdistrict, Longgang District, Shenzhen
Product Name : MUSE300
Test Model No. : MUSE300
Series No. : N/A

Trade Mark : 

Power Supply : Input: 12V $\equiv$ 3A
(Supplier by AC Adapter: Model: YHY-12003000)
Input: 100V-240V, 50/60Hz, 1.5A, Output: 12V $\equiv$ 3A

Test Date : May 06, 2026 to May 25, 2026

Test Standard(s) :

MIC public notice 88:2004, annex 43 and annex 1, Article 2, Paragraph 1, Item 19

Test Result : **PASS**

The device described above is tested by CCTI to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the MIC public notice 88:2004, annex 43 and annex 1 limits both conducted and radiated emissions. The results shown in this test report refer only to the sample(s) tested unless other wise stated and the sample(s) are retained for 30 days only.

The document is issued by CCTI, may be altered or revised by CCTI, personal only, and shall be noted in the revision of the document. this document cannot be reproduced except in full with our prior written permission.

Producer By : 
(Betty Liang / Engineer)

Date : May 25, 2026

Authorized Signer : 
(Corey Mao / Manager)

Date : May 25, 2026



TABLE OF CONTENTS

1. TEST SUMMARY	6
1.1. Test Facility	7
1.2. Test Uncertainty	7
2. GENERAL INFORMATION	8
2.1. General Description of EUT	8
2.2. Test Mode	9
2.3. Test Conditions	9
2.4. Test Voltage	9
2.5. Description of Test Setup	9
2.6. Description Test Peripheral and EUT Peripheral	9
2.7. Description of Test Equipment	11
3. Antenna Power	12
3.1. Applied Procedures / Limit	12
3.2. Test Setup	12
3.3. Test Procedure	12
3.4. Test Result	13
4. Frequency Tolerance	14
4.1. Applied Procedures / Limit	14
4.2. Test Setup	14
4.3. Test Procedure	14
4.4. Test Result	14
5. Occupied Frequency Bandwidth	16
5.1. Applied Procedures / Limit	16
5.2. Test Setup	16
5.3. Test Procedure	16
5.4. Test Result	16
6. Spread Bandwidth	17
6.1. Applied Procedures / Limit	19
6.2. Test Setup	19
6.3. Test Procedure	19
6.4. Test Result	19
7. Dwell Time	22
7.1. Applied Procedures / Limit	22
7.2. Test Setup	22
7.3. Test Procedure	22
7.4. Test Result	23
8. Transmitter Spurious Emissions (Conducted)	23
8.1. Applied Procedures / Limit	27
8.2. Test Setup	27
8.3. Test Procedure	27
8.4. Test Result	28
9. Interference Prevention Function	29

9.1. Applied Procedures / Limit	35
9.2. Measuring ID Code Software	35
9.3. Test Setup	35
9.4. Test Procedure	35
9.5. Test Result	35
10. Carrier Sensing Function	36
10.1. Applied Procedures / Limit	36
10.2. Test Setup	36
10.3. Test Procedure	36
10.4. Test Result	36
11. Secondary Radiated Emissions	37
11.1. Applied Procedures / Limit	37
11.2. Test Setup	37
11.3. Test Procedure	37
11.4. Test Result	38
12. Equivalent Isotropic Radiated Power	39
12.1. Applied Procedures / Limit	45
12.2. Test Setup	45
12.3. Test Procedure	45
12.4. Test Result	46
13. 3dB Beam Bandwidth	47
13.1. Test Setup	47
13.2. Test Procedure	47
13.3. Test Result	48
APPENDIX I -- EUT TEST PHOTOGRAPHS	49
APPENDIX II -- EUT PHOTOGRAPHS	50
APPENDIX III -- STATEMENT.....	51

Revision History

Revision	Description	Issued Data	Remark
V0	Initial Test Report Release	Apr. 01, 2025	Corey Mao

1. TEST SUMMARY

Test procedures according to the technical standards:

MIC Notice No.88 Appendix No. 43

Second-Generation Low-Power Data Communication System/Wireless LAN System.

Clause	Test Item	Result
Transmitter Parameters		
3.2 (2)	Antenna Power	P
3.2 (3)	Tolerances for Antenna Power	P
3.2 (4)	Frequency Tolerance	P
3.2 (7)	Occupied Frequency Bandwidth	P
3.2 (8)	Spread Bandwidth	P
3.2 (10)	Number of Carriers	P
3.2 (11)	Dwell Time	P
3.2 (6)	Spurious Emissions	P
/	Interference prevention function	P
/	Carrier Sensing function	N/A(3)
/	Equivalent Isotropic Radiated Power	P
/	3dB Beam Bandwidth	N/A(4)
Receiver Parameters		
3.2 (1)	Secondary Radiated Emissions	P

NOTE:

- (1) P is an abbreviation for Pass, F is an abbreviation for Fail, N/A is an abbreviation for Not Applicable.
- (2) Decision rules for the conclusion of this test report: decision by actual test data without considering measurement uncertainty.
- (3) (3)Application to transmitting devices which EIRP is less than[2.14dBi antenna power limit] and the shortage of EIRP is compensated by the antenna power. Not applicable to this product.Application to transmitting devices with OFDM modulation and the occupied bandwidth greater than 26MHz.
- (4) The EIRP less than 12.14dBm/MHz.

1.1. Test Facility

Shenzhen CCTI Technology Co., Ltd.

A1-1, Building B1&B2, No.45 Gangtuo Road, Bogang District, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

1.2. Test Uncertainty

Item	MU	Remark
Bandwidth	± 0.20 ppm	/
Antenna Power	± 0.33 dB	/
Transmit time (Dwell time)	$\pm 2\%$	/
Frequency Tolerance	± 5.02 ppm	/
Conducted spurious emission	± 0.13 dB	/
Spurious emissions, radiated(>1 G)	± 2.83 dB	/
Spurious emissions, radiated(<1 G)	± 3.01 dB	/
(95% Confidence Levels, $k=2$)		

2. GENERAL INFORMATION

2.1. General Description of EUT

EUT : MUSE300

Trademark : 

Model Number : MUSE300

Serial Model : N/A

Model Difference : N/A

Power Supply : Input: 12V $\equiv$ 3A
(Supplier by AC Adapter: Model: YHY-12003000)
Input: 100V-240V, 50/60Hz, 1.5A, Output: 12V $\equiv$ 3A

Radio Technology : Bluetooth EDR

Operation frequency : 2402-2480MHz

Channel No. : 79 Channels

Channel Separation : 1MHz

Data rate : 1Mbps, 2Mbps, 3Mbps

Modulation : GFSK, $\pi/4$ DQPSK, 8DPSK

Antenna Gain (Peak) : Maximum Gain is 0.8dBi

Antenna Type : Rubber antenna

Hardware Version : V1.0

Software Version : V1.0

Intend use environment : Residential, commercial and light industrial environment

Remark:

(1) MUSE300 was selected as the test model and the datas have been recorded in this report.

(2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2. Test Mode

The test software is used to control the operation of the EUT in the continuous transmission mode, and select the test channel and wireless mode:

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
Carrier Tx Mode	CH0	2402
	CH19	2440
	CH39	2480
GFSK / Pi/4-DQPSK/8-DPSK hopping on Tx Mode	CH0 to CH78	2402 to 2480
GFSK / Pi/4-DQPSK/8-DPSK hopping off Tx Mode	CH0	2402
	CH39	2441
	CH78	2480
GFSK / Pi/4-DQPSK/8-DPSK Rx Mode	CH0	2402
	CH39	2441
	CH78	2480

2.3. Test Conditions

Temperature range	5-35°C
Humidity range	45-85%
Pressure range	86-106kPa

2.4. Test Voltage

Voltage mode	Input Voltage	Radio Unit Voltage
AC	AC 99V	DC 12V
	AC 110V	DC 12V
	AC 121V	DC 12V

Note:

- (1) The radio unit Voltage with the IC.
- (2) The radio unit less than 1%, so the test only rated voltage (Normal voltage AC 110V).

2.5. Description of Test Setup



2.6. Description Test Peripheral and EUT Peripheral

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.

Item	Equipment	Trade Mark	Model/Type No.	Series No.	Note
1	PC Computer	HP	14s	/	/

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.7. Description of Test Equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	966 Chamber	Yiheng	9*6*6	ZJE-001	2025.07.12	2027.07.11
2	Spectrum Analyzer	Agilent	N9020A	ZJE-024	2025.07.12	2026.07.11
3	EMI Test Receiver	R&S	ESCI7	ZJE-003	2025.07.12	2026.07.11
4	Broadband antenna	Schwarzbeck	VULB 9163	ZJE-004	2025.07.12	2026.07.11
5	Horn antenna	Schwarzbeck	BBHA 9120D	ZJE-005	2025.07.12	2026.07.11
6	Loop antenna	Schwarzbeck	FMZB 1519 B	ZJE-015	2025.07.12	2026.07.11
7	Synthesizer	R&S	CMW500	ZJE-036	2025.07.12	2026.07.11
8	Vector Signal Generator	Agilent	N5182A	ZJE-037	2025.07.12	2026.07.11
9	Analog signal generator	Agilent	N5181A	ZJE-038	2025.07.12	2026.07.11
10	Power Supply	Agilent	E3632A	ZJE-039	2025.07.12	2026.07.11
11	Power meter	KEYSIGHT	E4419B	ZJE-028	2025.07.12	2026.07.11
12	Attenuator6dB	Weinschel Associates	WA1-6-34	ZJE-040	2025.07.12	2026.07.11
13	RF Automatic Test System	TST	TSTRF562	ZJE-042	/	/
14	RSE Test Software	Frad	EZ-RE	ZJE-008	/	/

(a) Calibration conducted by the National institute of information and Communications Technology (NiCT) in Japan (hereinafter referred to as "NiCT") or a designated Calibration agency under Article 102-18 paragraph (1) in JRL.

(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act(Act No.51 of 1992).

(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NiCT or a designated calibration agency under Article102-18 paragraph (1).

(d) Calibration, etc, conducted by using measuring instruments and other equipment listed in the right column of appended table No.3, which shall have been given any type of calibration, etc. listed above from (a)1o (c).

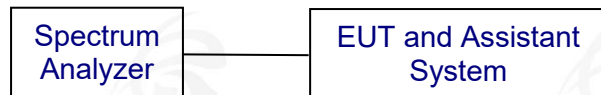
We used the (c) method for equipment calibration.

3. Antenna Power

3.1. Applied Procedures / Limit

Limit	3mW/MHz
Tolerance	20%

3.2. Test Setup



3.3. Test Procedure

For FHSS

1. Measure the total power by the Power Meter in a state of hopping mode.
2. Calculate the mean power per 1MHz by dividing the reading level by spread bandwidth.

Output power Density (Mw/MHz) = Total Power (mW) / Spread Bandwidth(MHz)

3.4. Test Result

3.4.1 Total Power

ENV	Mode	Frequency (MHz)	Packet Type	ANT	Total Power (mW)
					Measured
NTNV	GFSK	HOPP	DH5	1	84.14
	Pi/4DQPSK	HOPP	2DH5	1	63.97
	8DPSK	HOPP	3DH5	1	40.36

3.4.2 Spread Bandwidth

ENV	Mode	TX Type	Frequency (MHz)	Packet Type	Spread Bandwidth (MHz)	
					ANT1	Limit
NTNV	GFSK	SISO	HOPP	DH5	67.243	/
	Pi/4DQPSK	SISO	HOPP	2DH5	69.541	/
	8DPSK	SISO	HOPP	3DH5	68.336	/

Note: Data sources clause 6.4

3.4.3 Output power Density

ENV	Mode	Frequency (MHz)	Packet Type	ANT	Antenna Power (mW/MHz)		Nominal Power (mW/MHz)	Tolerance (%)		Verdict
					Measured	Limit		Measured	Limit	
NTNV	GFSK	HOPP	DH5	1	1.25	<=3.00	1.25	0.00	<=20	Pass
	Pi/4DQPSK	HOPP	2DH5	1	0.92	<=3.00	1.25	-26.4	<=20	Pass
	8DPSK	HOPP	3DH5	1	0.59	<=3.00	1.25	-52.8	<=20	Pass

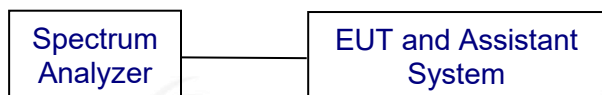
Note: Antenna Power = Total Power (mW) / Spread Bandwidth(MHz)

4. Frequency Tolerance

4.1. Applied Procedures / Limit

$\pm 50 \times 10^{-6}$ or less(50ppm)

4.2. Test Setup



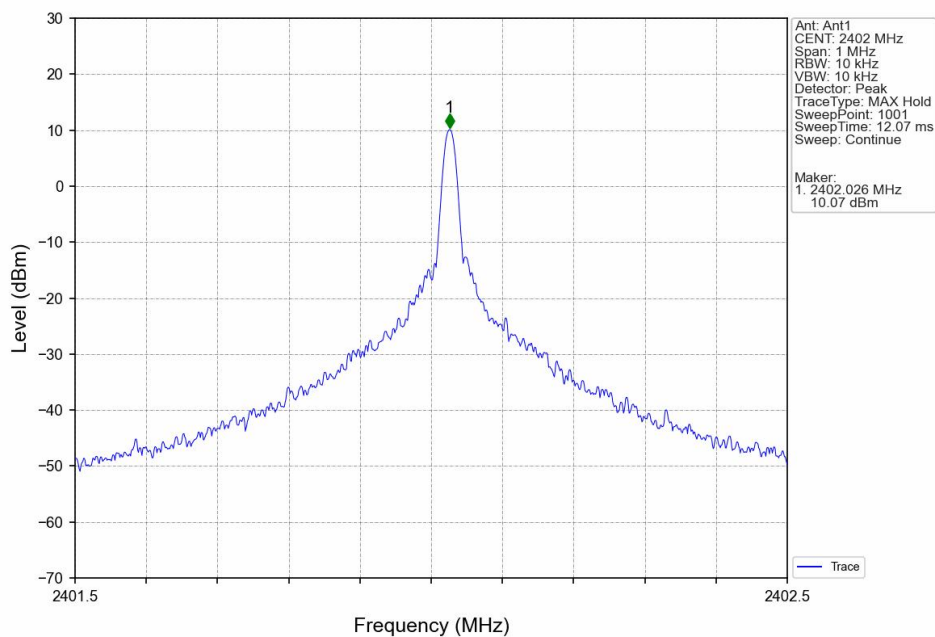
4.3. Test Procedure

- (1) Configure EUT and assistant system according clause 2.3 and 4.3;
- (2) Set EUT work in carrier Tx mode as described in clause 2.4;
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 Centre Frequency: The centre frequency of the channel under test.
 Resolution BW: 10 KHz.
 Video BW: 10 KHz.
 Span: 1MHz.
 Detector: Peak.
 Trace Mode: Max Hold.
- (4) When the trace is complete, find the peak value of the power envelope and record the frequency.

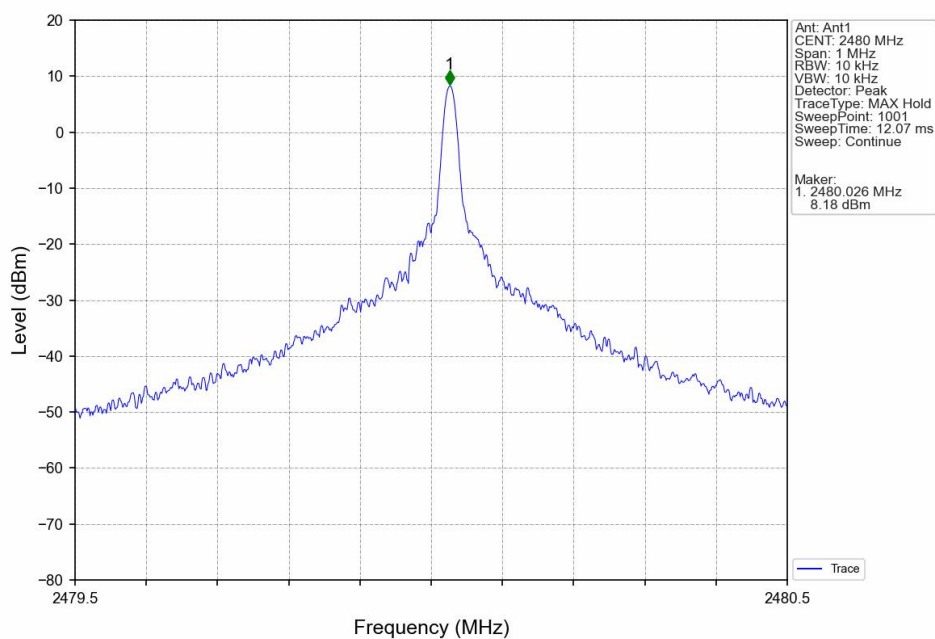
4.4. Test Result

Mode	CH	Result			Limit
		Measured (MHz)	Tolerance (MHz)	Tolerance (ppm)	ppm
Carrier TX Mode	CH0:2402MHz	2402.000	2402.026	10.82	± 50
	CH78:2480MHz	2480.000	2480.026	10.48	± 50

Frequency Error NTN_V Carrier Wave_2402MHz_Ant1 NTN_V



Frequency Error NTN_V Carrier Wave_2480MHz_Ant1 NTN_V

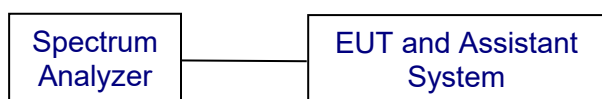


5. Occupied Frequency Bandwidth

5.1. Applied Procedures / Limit

Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a system other than any of the above shall be 26 MHz or less.

5.2. Test Setup



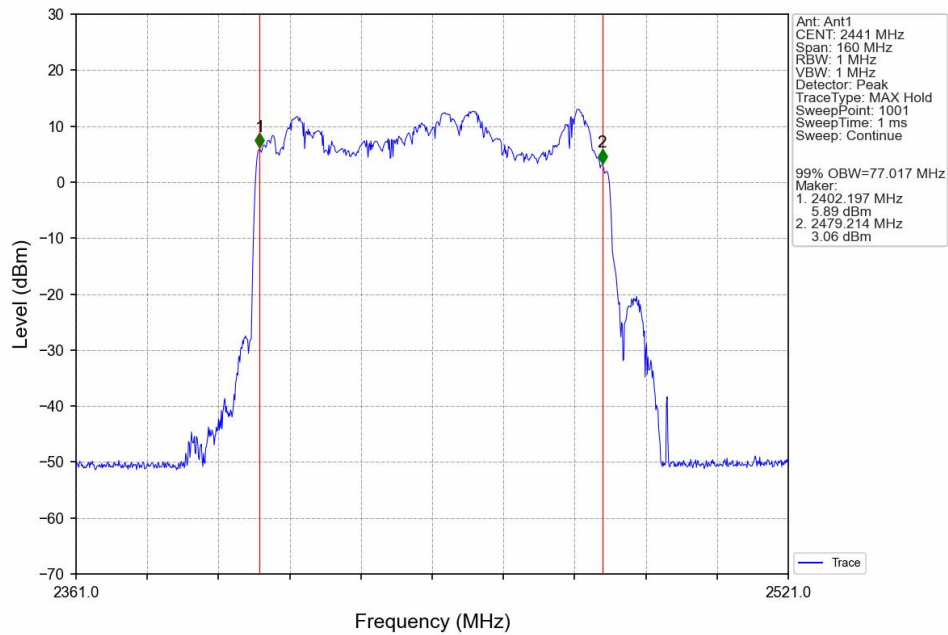
5.3. Test Procedure

- (1) Configure EUT and assistant system according clause 2.3 and 5.3;
- (2) Set EUT work in test mode as described in clause 2.4;
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 Centre Frequency: The centre frequency of the channel under test.
 Resolution BW: 1 MHz
 Video BW: 1 MHz
 Span: Wide enough to cover the complete power envelope of the signal of the EUT.
 Detector: Peak.
 Trace Mode: Max Hold.
- (4) When the trace is complete, measure the occupied bandwidth (99% bandwidth) with spectrum analyzer's bandwidth measure function.

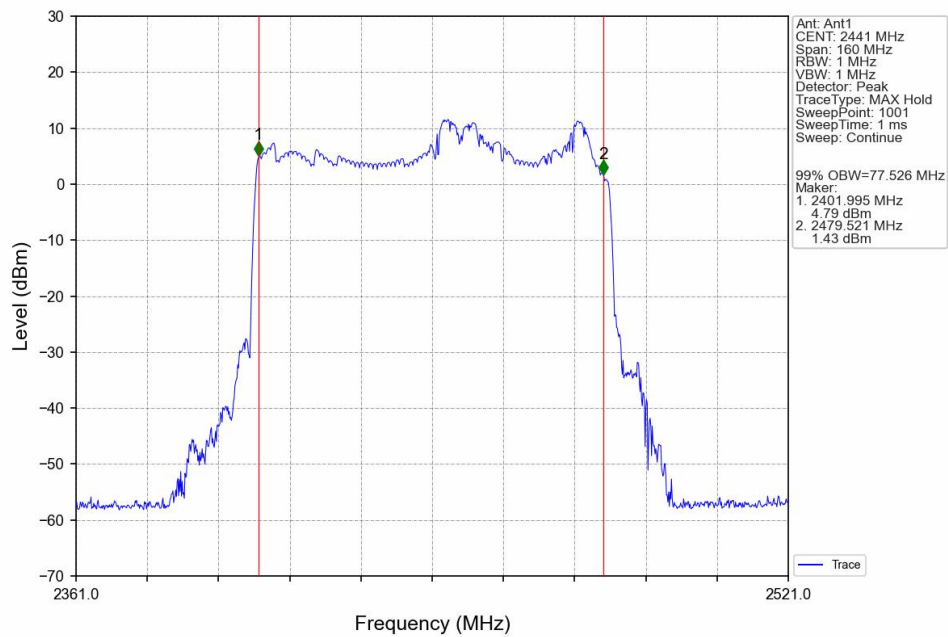
5.4. Test Result

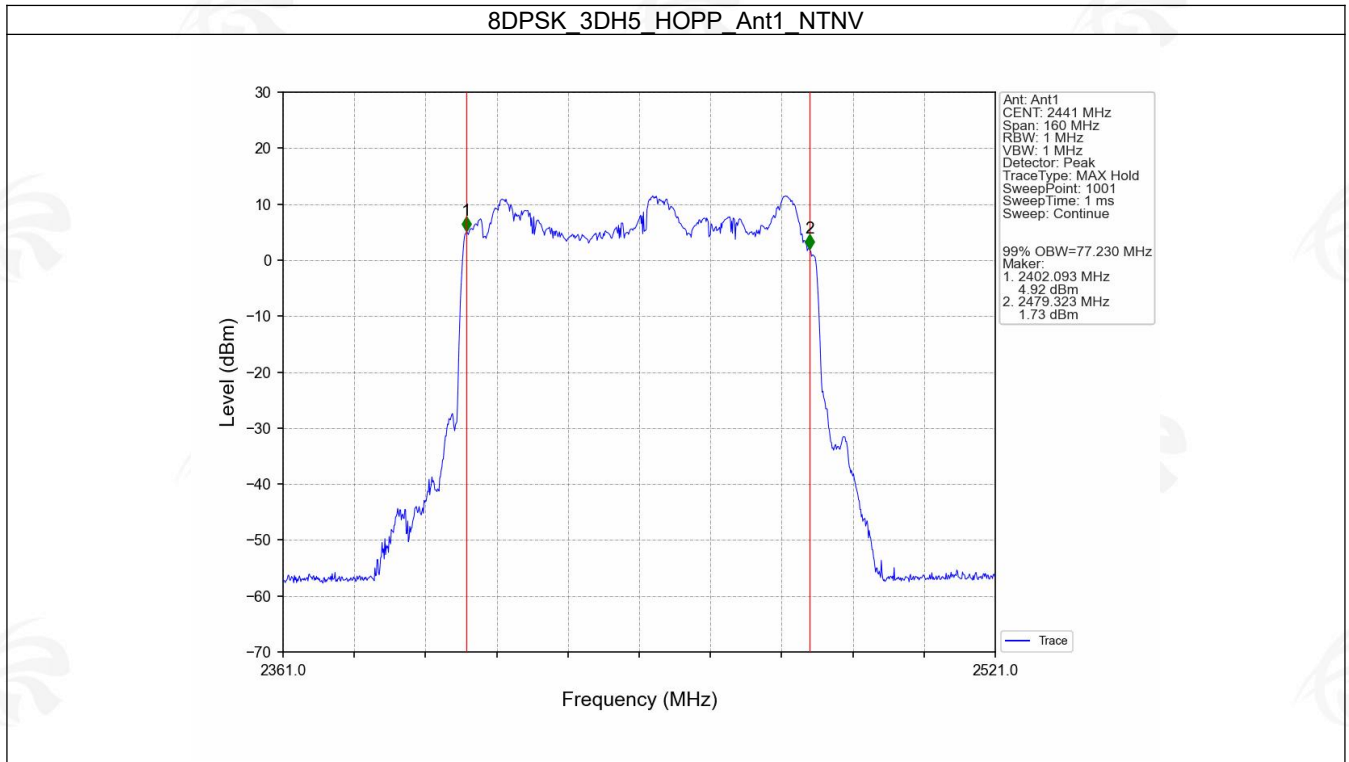
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	99% Occupied Bandwidth (MHz)		Verdict
					ANT1	Limit	
NTNV	GFSK	SISO	HOPP	DH5	77.017	<=83.5	Pass
	Pi/4DQPSK	SISO	HOPP	2DH5	77.526	<=83.5	Pass
	8DPSK	SISO	HOPP	3DH5	77.230	<=83.5	Pass

GFSK DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV





6. Spread Bandwidth

6.1. Applied Procedures / Limit

In spread spectrum systems, spread bandwidth (which refers to a frequency bandwidth with an upper limit and lower limit such that each of the mean powers radiated above the upper frequency limit and below the lower frequency limit is equal to 5 % of the total mean power radiated; this also applies hereafter) shall be 500 kHz or more.

6.2. Test Setup



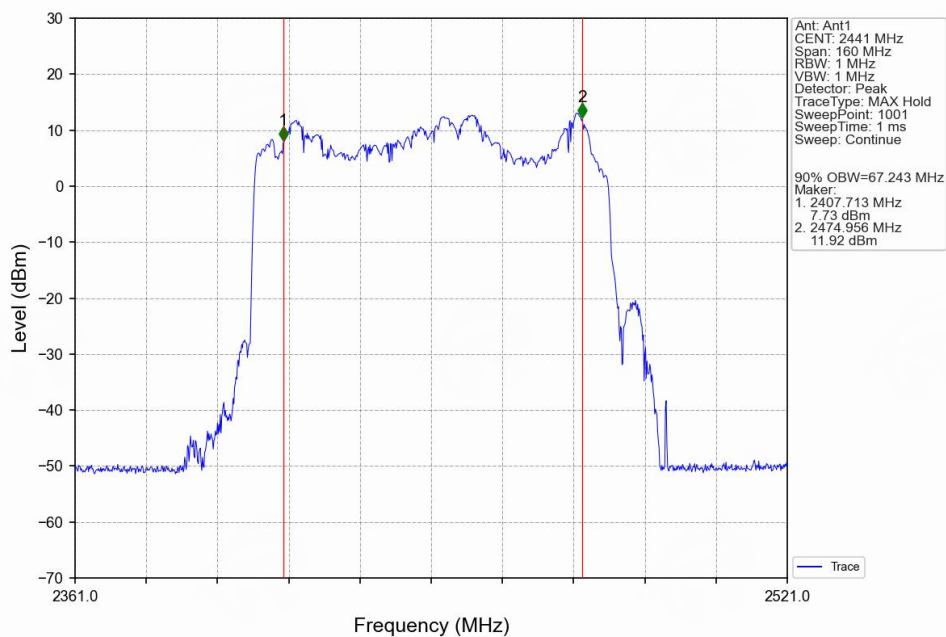
6.3. Test Procedure

- (1) Configure EUT and assistant system according clause 2.4 and 6.3;
- (2) Set EUT work in test mode as described in clause 2.4;
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 Resolution BW: 1MHz.
 Video BW: 1MHz.
 Span: Wide enough to cover the complete power envelope of the signal of the EUT.
 Detector: Peak.
 Trace Mode: Max Hold.
- (4) When the trace is complete, measure the spread bandwidth (90% bandwidth) with spectrum analyzer's bandwidth measure function.

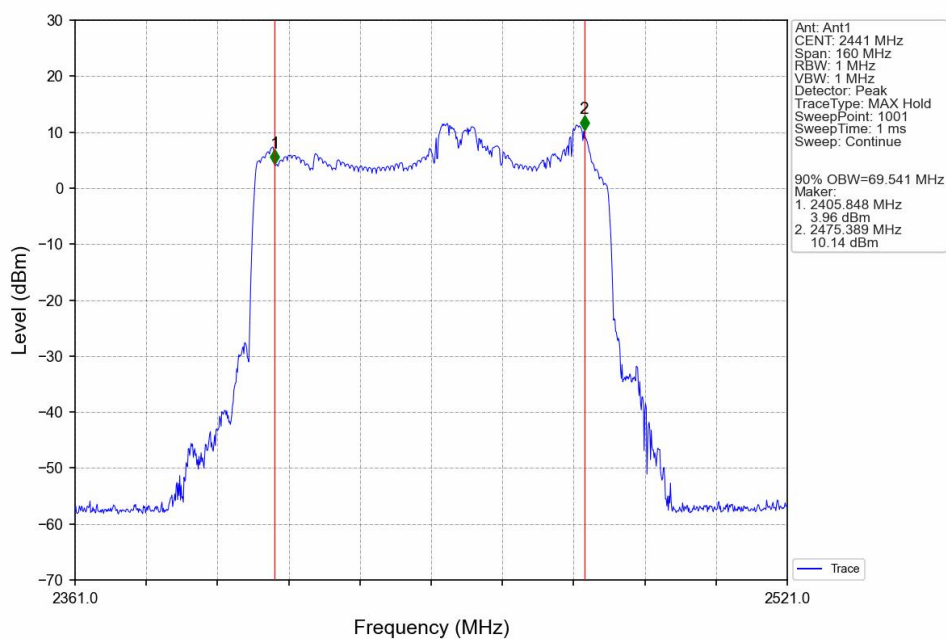
6.4. Test Result

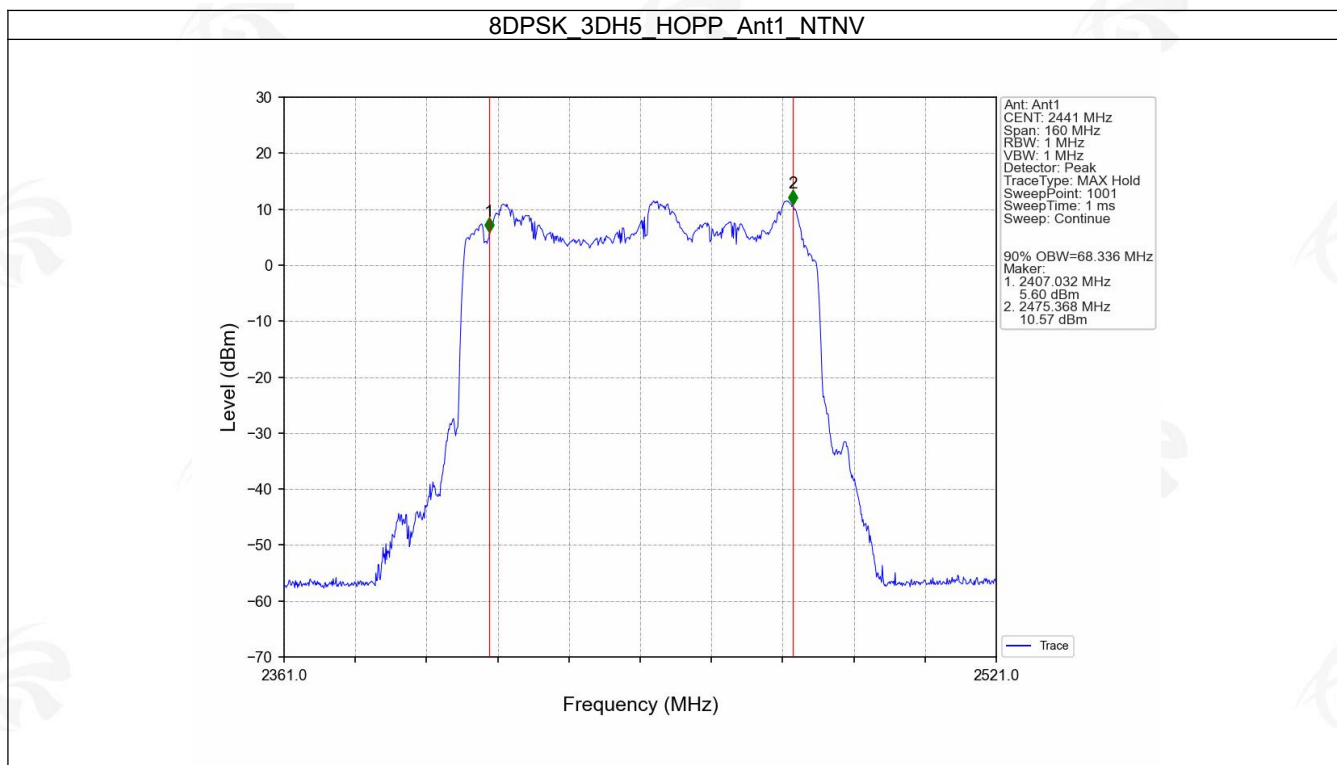
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	Spread Bandwidth (MHz)		Verdict
					ANT1	Limit	
NTNV	GFSK	SISO	HOPP	DH5	67.243	/	Only For Report
	Pi/4DQPSK	SISO	HOPP	2DH5	69.541	/	Only For Report
	8DPSK	SISO	HOPP	3DH5	68.336	/	Only For Report

GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV





7. Dwell Time

7.1. Applied Procedures / Limit

Frequency dwell time (time during which radio waves continue to be emitted at a specified frequency) of a transmitting equipment using the FH system shall be 0.4 seconds or less.

7.2. Test Setup

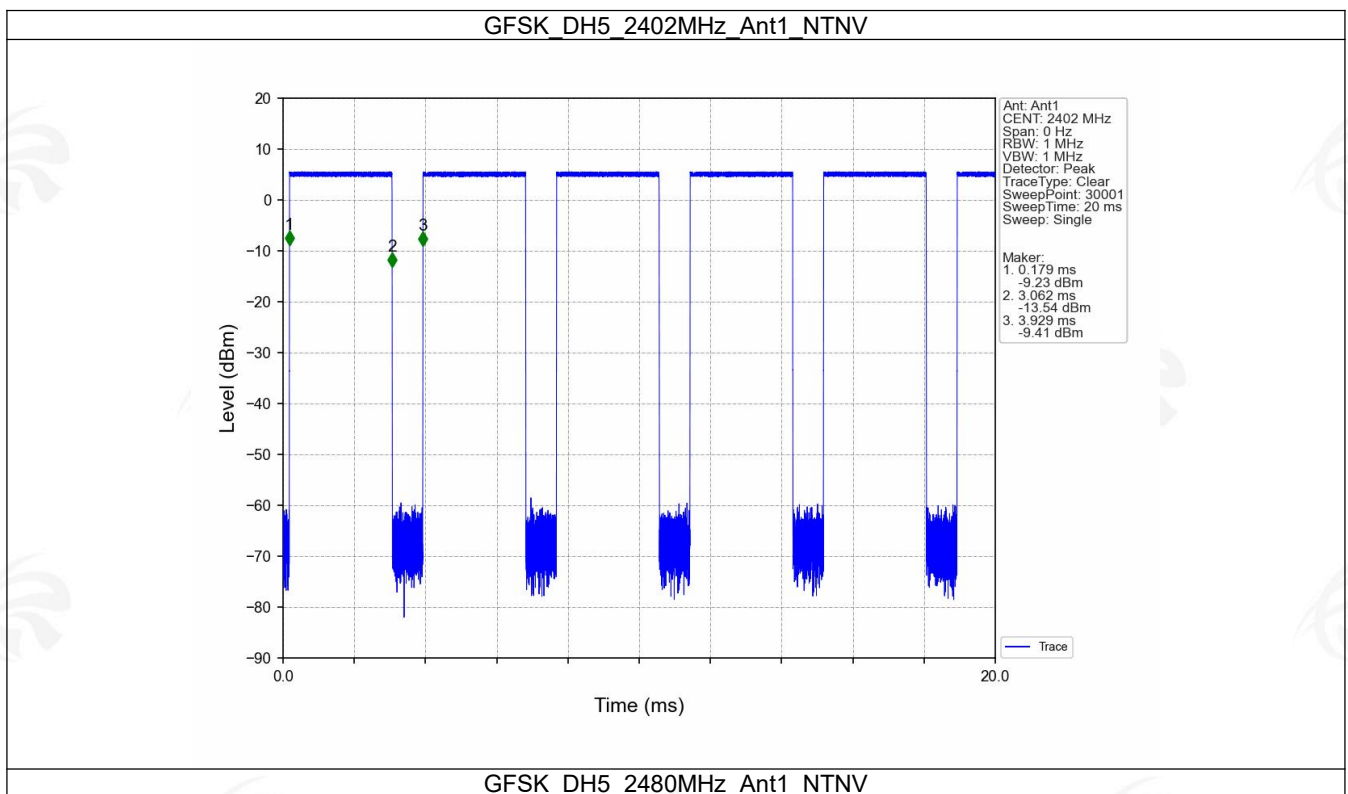


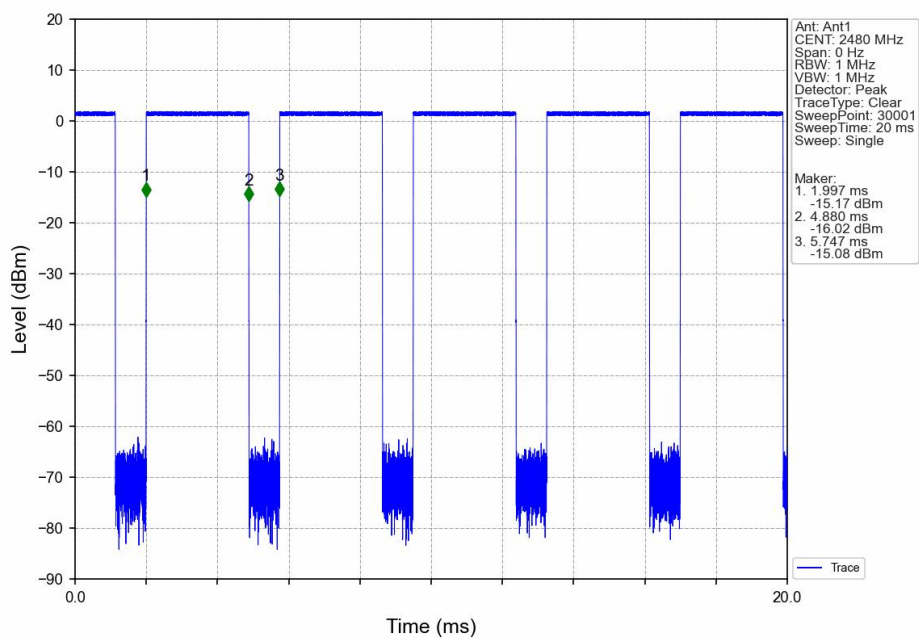
7.3. Test Procedure

- (1) Configure EUT and assistant system according clause 2.4 and 7.3;
- (2) Set EUT work in test mode as described in clause 2.4;
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 - Centre Frequency: The centre frequency of the middle hopping channel.
 - Resolution BW: 1MHz.
 - Video BW: 1MHz.
 - Span: Zero span.
 - Detector: Peak.
 - Trace Mode: Max Hold.
 - Sweep: Video Trigger
- (4) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 Burst cycle.
- (5) Calculate dwell time follow below formula:
 - Dwell time $= (0.4(s) \times \text{spreading rate} \times \text{sending time of 1 burst(s)}) / (\text{Burst cycle(s)} \times \text{No. of hopping channel})$
 - Spreading rate = Spread bandwidth (actual measurement value)/Transmission rate.

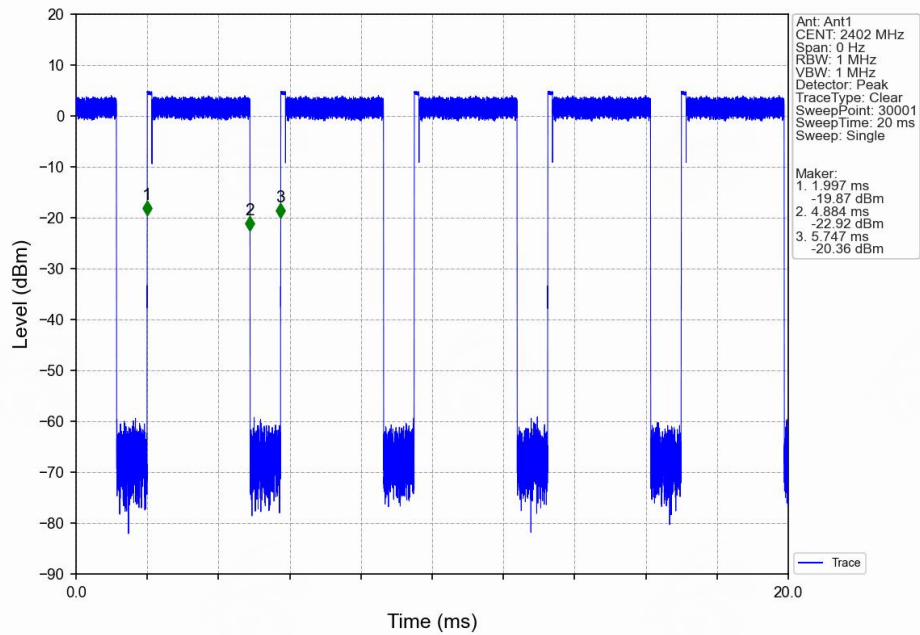
7.4. Test Result

Ant1											
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	Spreading Rate	T_on (ms)	Period (ms)	Hopp Number	Dwell Time (ms)		Verdict
									Result	Limit	
NTNV	GFSK	SISO	2402	DH5	67.243	2.883	3.750	79	261.754	<=400	Pass
			2480	DH5	67.243	2.883	3.750	79	261.754	<=400	Pass
	Pi/4DQPSK	SISO	2402	2DH5	69.541	2.887	3.750	79	271.075	<=400	Pass
			2480	2DH5	69.541	2.888	3.751	79	271.097	<=400	Pass
	8DPSK	SISO	2402	3DH5	68.336	2.889	3.750	79	266.562	<=400	Pass
			2480	3DH5	68.336	2.888	3.750	79	266.470	<=400	Pass

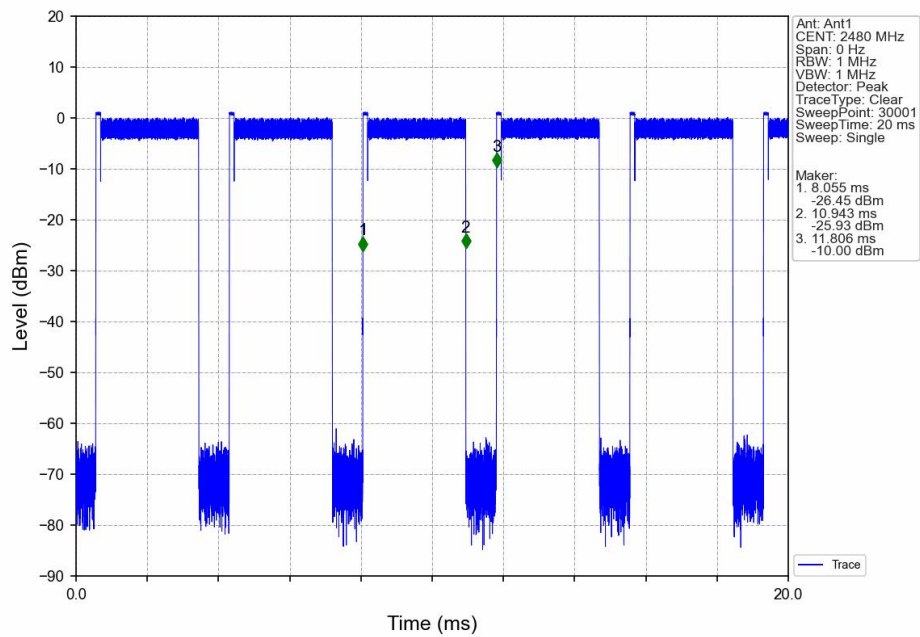




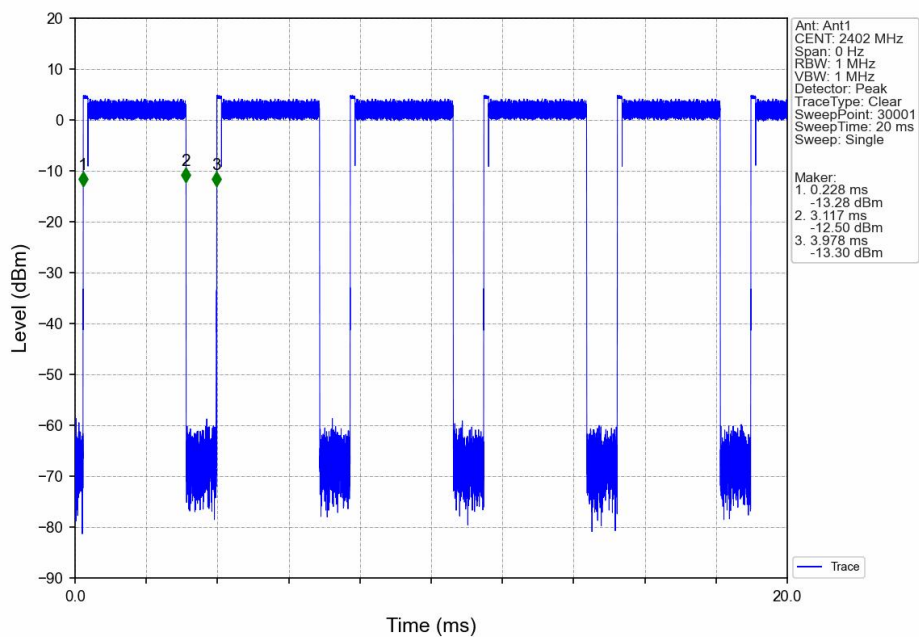
Pi/4DQPSK_2DH5_2402MHz_Ant1_NTNV



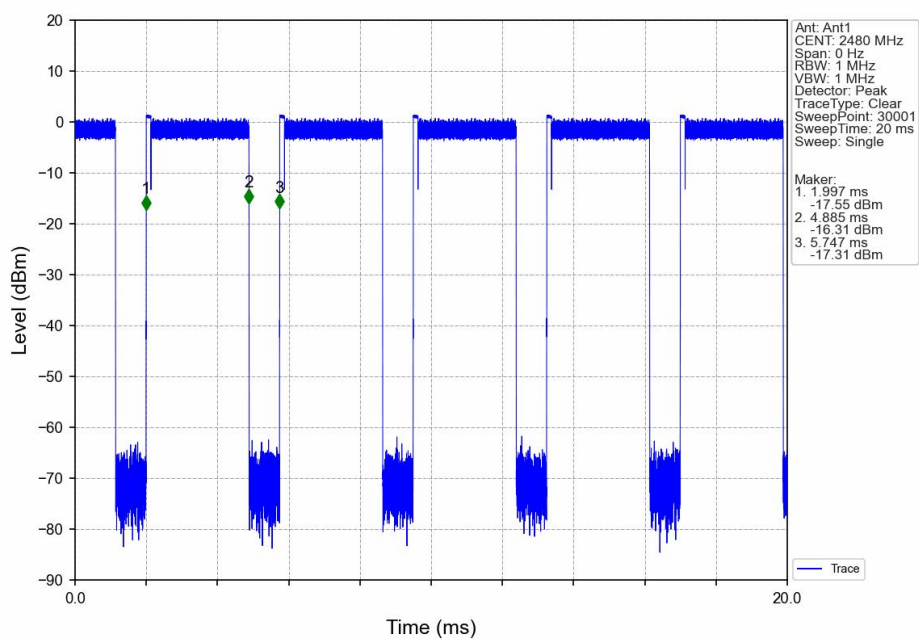
Pi/4DQPSK_2DH5_2480MHz_Ant1_NTNV



8DPSK_3DH5_2402MHz_Ant1_NTNV



8DPSK_3DH5_2480MHz_Ant1_NTNV



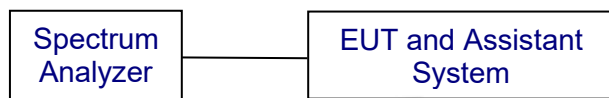
7.5. Transmitter Spurious Emissions (Conducted)

7.6. Applied Procedures / Limit

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

- a. $2,387\text{MHz} \leq f \leq 2,400\text{MHz}$ and $2,483.5\text{MHz} < f \leq 2,496.5\text{MHz}$ 25 $\mu\text{W}/\text{MHz}$ or less
- b. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ 2.5 $\mu\text{W}/\text{MHz}$ or less

7.7. Test Setup



7.8. Test Procedure

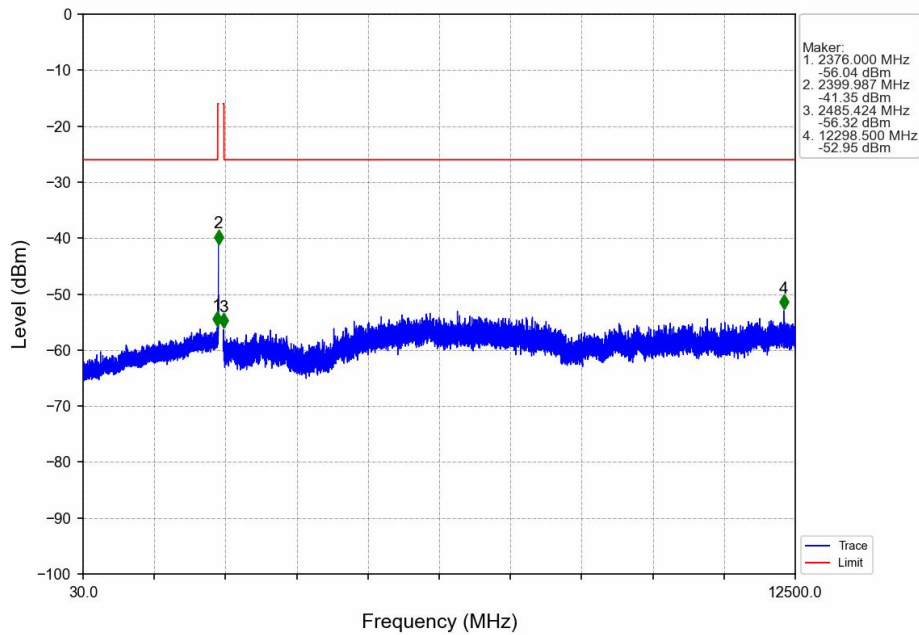
- (1) Configure EUT and assistant system according clause 2.4 and 8.3
- (2) Set EUT work in test mode as described in clause 2.4
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Below 1GHz	Above 1GHz
Resolution BW: 1MHz	Resolution BW: 1MHz
Video BW: 1MHz	Video BW: 1MHz
- (4) All the emissions from 30MHz to 13GHz were measured and record.

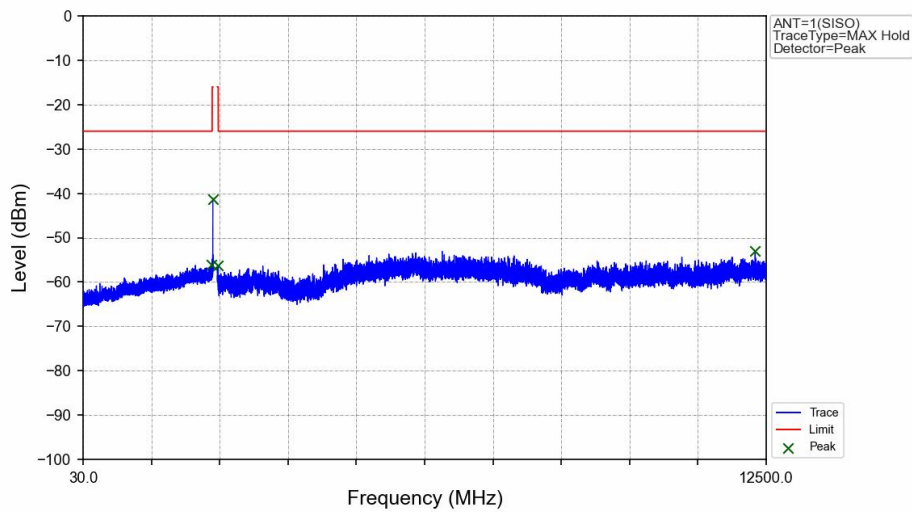
7.9. Test Result

NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
GFSK	SISO	2402	1	30	2387	2376	-56.04	0.002	/	/	2.5	Pass
				2387	2400	2399.987	-41.35	0.073	/	/	25	Pass
				2483.5	2496.5	2485.424	-56.32	0.002	/	/	25	Pass
				2496.5	12500	12298.5	-52.95	0.005	/	/	2.5	Pass
		2480	1	30	2387	2379	-59.63	0.001	/	/	2.5	Pass
				2387	2400	2391.758	-59.65	0.001	/	/	25	Pass
				2483.5	2496.5	2486.737	-56.14	0.002	/	/	25	Pass
				2496.5	12500	5578.5	-57.07	0.002	/	/	2.5	Pass
Pi/4DQPSK	SISO	2402	1	30	2387	2364.5	-56.44	0.002	/	/	2.5	Pass
				2387	2400	2399.987	-29.62	1.091	/	/	25	Pass
				2483.5	2496.5	2487.452	-56.10	0.002	/	/	25	Pass
				2496.5	12500	6982	-52.46	0.006	/	/	2.5	Pass
		2480	1	30	2387	2203.5	-59.42	0.001	/	/	2.5	Pass
				2387	2400	2390.874	-59.41	0.001	/	/	25	Pass
				2483.5	2496.5	2489.285	-56.37	0.002	/	/	25	Pass
				2496.5	12500	5750.5	-51.75	0.007	/	/	2.5	Pass
8DPSK	SISO	2402	1	30	2387	2386.5	-50.60	0.009	/	/	2.5	Pass
				2387	2400	2399.987	-29.30	1.175	/	/	25	Pass
				2483.5	2496.5	2488.141	-56.11	0.002	/	/	25	Pass
				2496.5	12500	5785	-51.13	0.008	/	/	2.5	Pass
		2480	1	30	2387	2167.5	-59.41	0.001	/	/	2.5	Pass
				2387	2400	2396.217	-60.06	0.001	/	/	25	Pass
				2483.5	2496.5	2484.033	-57.39	0.002	/	/	25	Pass
				2496.5	12500	7376	-57.19	0.002	/	/	2.5	Pass

GFSK DH5_2402MHz_Ant1_NTNV

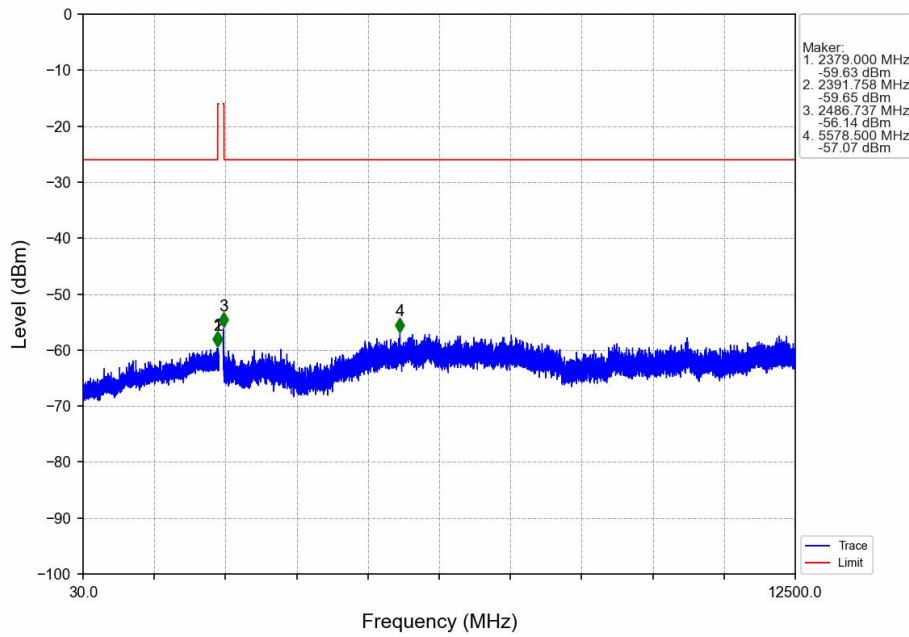


GFSK DH5_2402MHz_Ant1_NTNV

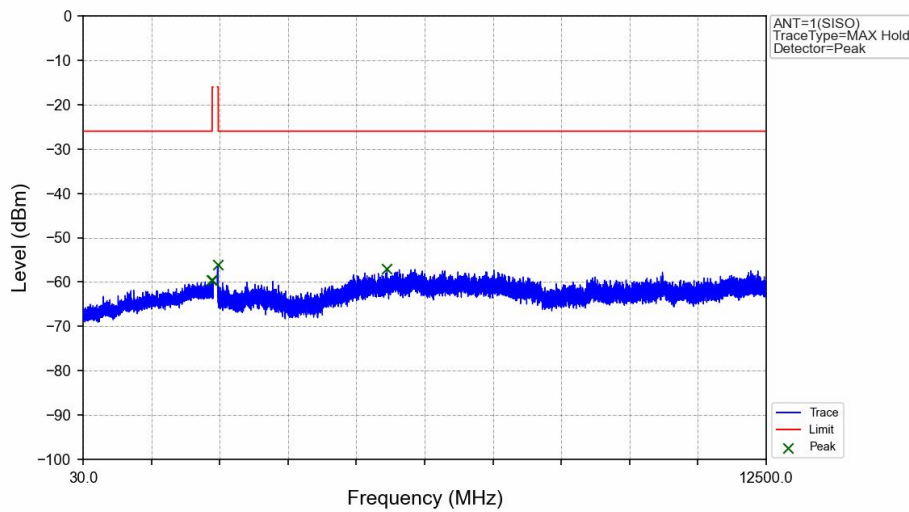


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2376.000	-56.04	/	-26	Pass
2387	2400	1	1	2399.987	-41.35	/	-16	Pass
2483.5	2496.5	1	1	2485.424	-56.32	/	-16	Pass
2496.5	12500	1	1	12298.500	-52.95	/	-26	Pass

GFSK DH5_2480MHz_Ant1_NTNV

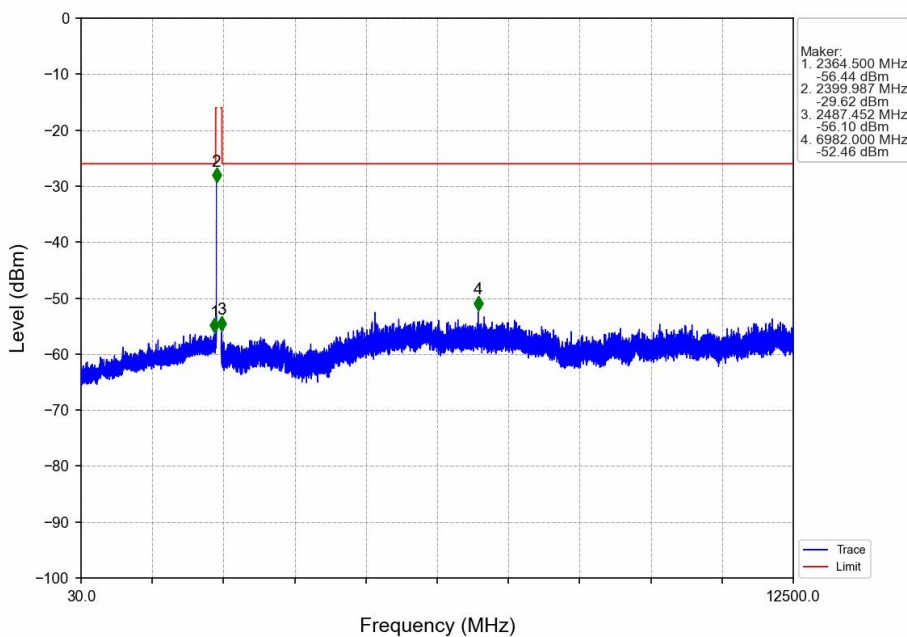


GFSK DH5_2480MHz_Ant1_NTNV

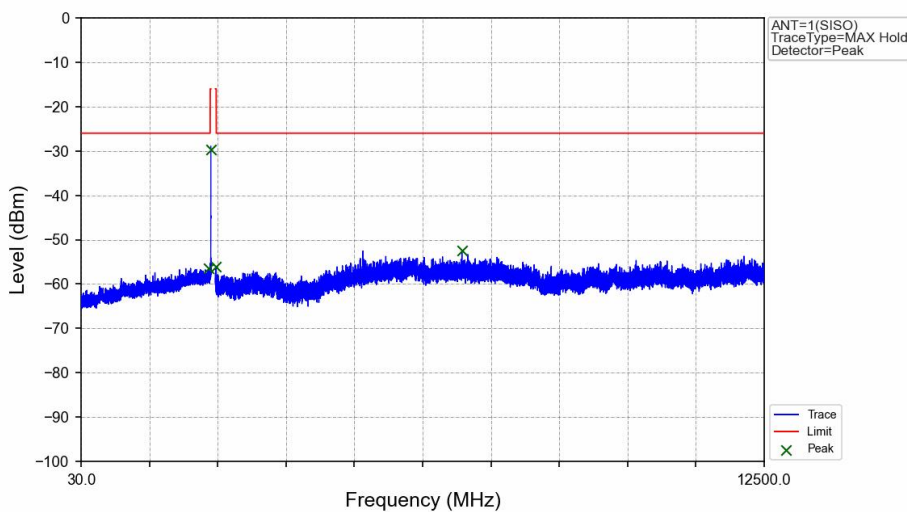


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2379.000	-59.63	/	-26	Pass
2387	2400	1	1	2391.758	-59.65	/	-16	Pass
2483.5	2496.5	1	1	2486.737	-56.14	/	-16	Pass
2496.5	12500	1	1	5578.500	-57.07	/	-26	Pass

Pi/4DQPSK_2DH5_2402MHz_Ant1_NTNV

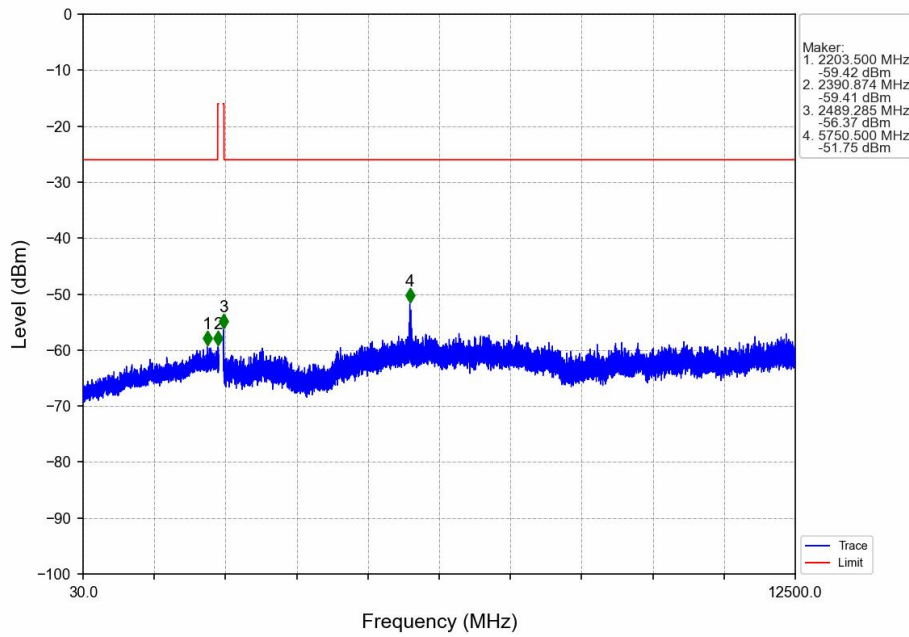


Pi/4DQPSK_2DH5_2402MHz_Ant1_NTNV

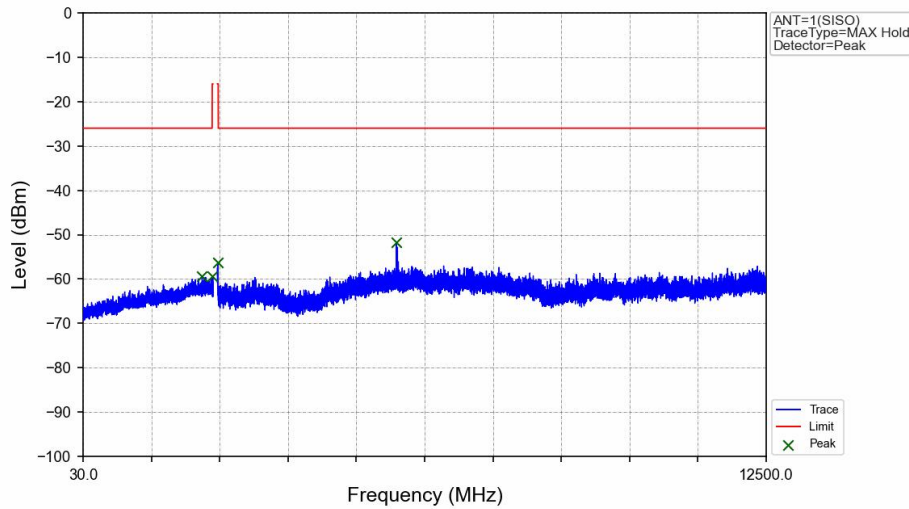


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2364.500	-56.44	/	-26	Pass
2387	2400	1	1	2399.987	-29.62	/	-16	Pass
2483.5	2496.5	1	1	2487.452	-56.10	/	-16	Pass
2496.5	12500	1	1	6982.000	-52.46	/	-26	Pass

Pi/4DQPSK_2DH5_2480MHz_Ant1_NTNV

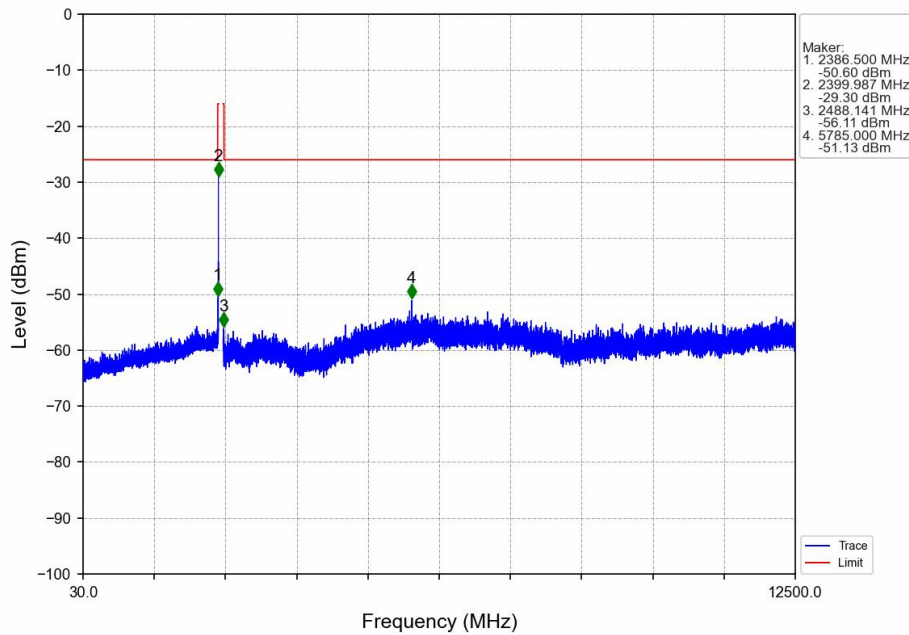


Pi/4DQPSK_2DH5_2480MHz_Ant1_NTNV

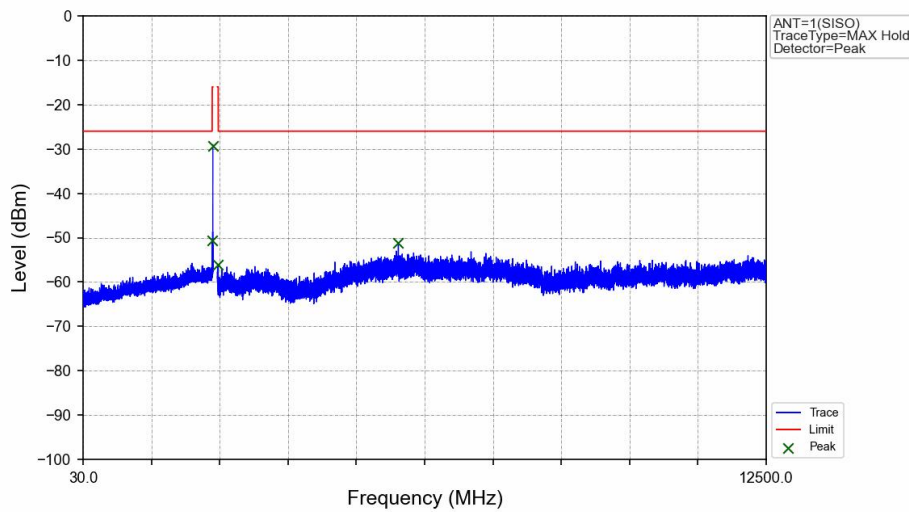


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2203.500	-59.42	/	-26	Pass
2387	2400	1	1	2390.874	-59.41	/	-16	Pass
2483.5	2496.5	1	1	2489.285	-56.37	/	-16	Pass
2496.5	12500	1	1	5750.500	-51.75	/	-26	Pass

8DPSK_3DH5_2402MHz_Ant1_NTNV

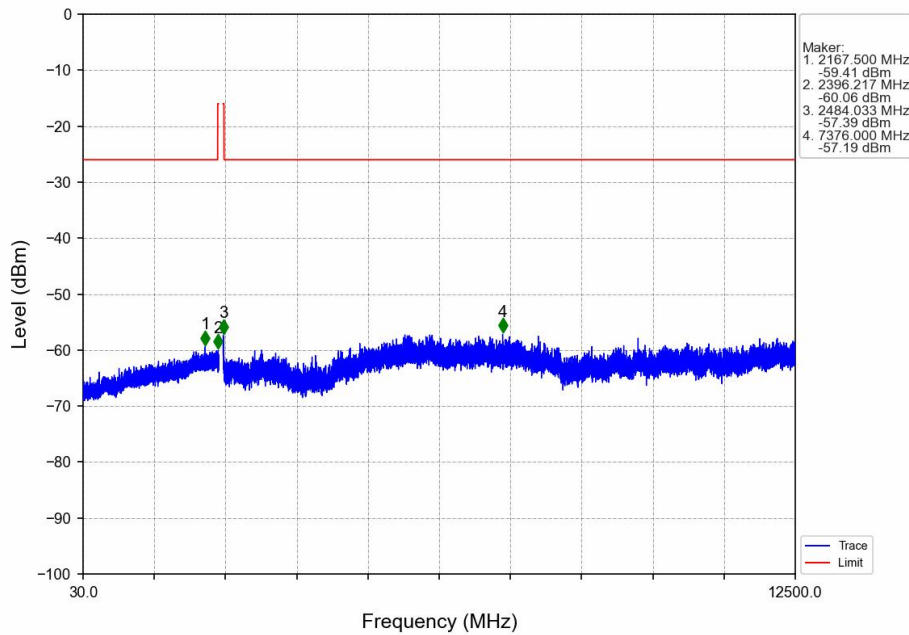


8DPSK_3DH5_2402MHz_Ant1_NTNV

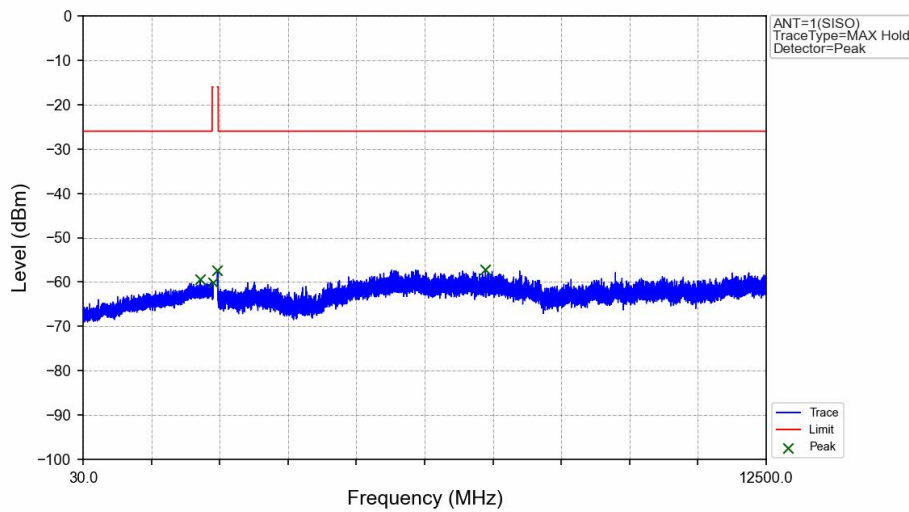


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2386.500	-50.60	/	-26	Pass
2387	2400	1	1	2399.987	-29.30	/	-16	Pass
2483.5	2496.5	1	1	2488.141	-56.11	/	-16	Pass
2496.5	12500	1	1	5785.000	-51.13	/	-26	Pass

8DPSK_3DH5_2480MHz_Ant1_NTNV



8DPSK_3DH5_2480MHz_Ant1_NTNV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2167.500	-59.41	/	-26	Pass
2387	2400	1	1	2396.217	-60.06	/	-16	Pass
2483.5	2496.5	1	1	2484.033	-57.39	/	-16	Pass
2496.5	12500	1	1	7376.000	-57.19	/	-26	Pass

8. Interference Prevention Function

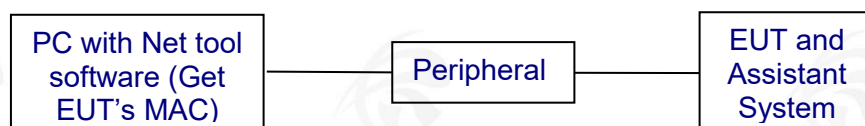
8.1. Applied Procedures / Limit

Item	Limits
Identification	≥48 bits

8.2. Measuring ID Code Software

Item	Limits
MAC IP List	MAC Scan

8.3. Test Setup



8.4. Test Procedure

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

8.5. Test Result

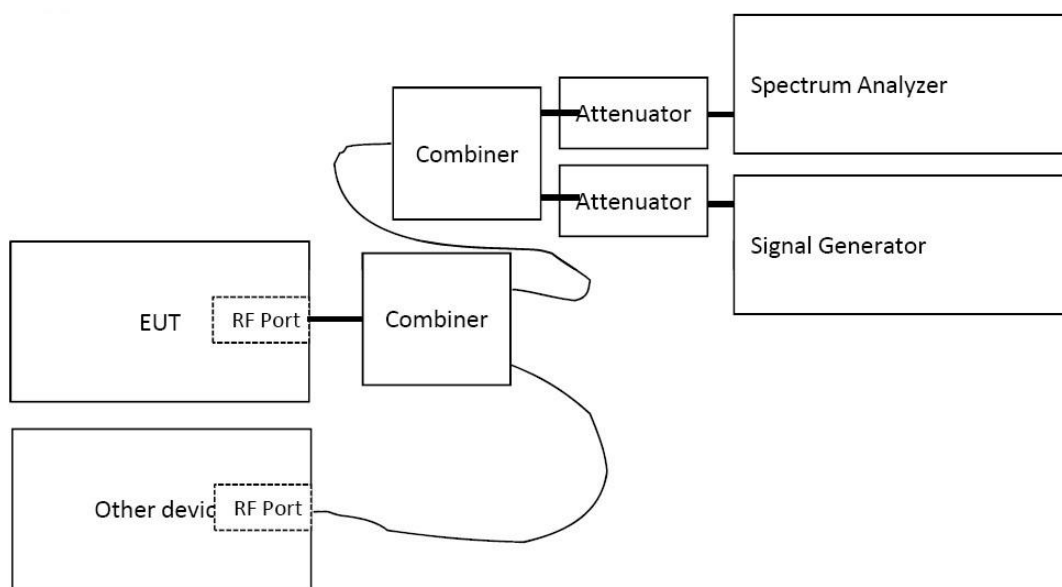
EUT:	MUSE300	Tested by:	Leo Wang
Temperature:	24℃	Humidity:	56%RH
Mac address:	52:45:48:46:B6:5B		
Test result:	PASS		

9. Carrier Sensing Function

9.1. Applied Procedures / Limit

The device shall not transmit radio wave when receiving 100Mw/m.

9.2. Test Setup



9.3. Test Procedure

The device is configured to communicate with another device as shown below. Once the communications link is established the signal generator is configured to produce a CW signal at the center frequency of the operating channel. The level of the signal generator is increased from a level approximately 30dB lower then the required carrier sense detection threshold (calculated based on the lowest antenna gain to be used with the device) until the device stops transmitting. This level is recorded as the carrier sense detection threshold.

9.4. Test Result

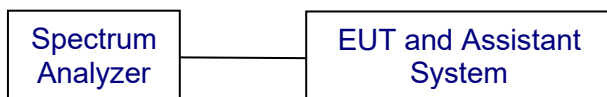
EUT:	MUSE300	Tested by:	Leo Wang
Temperature:	24°C	Humidity:	56%RH
Test result:	N/A		

10. Secondary Radiated Emissions

10.1. Applied Procedures / Limit

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4 nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

10.2. Test Setup



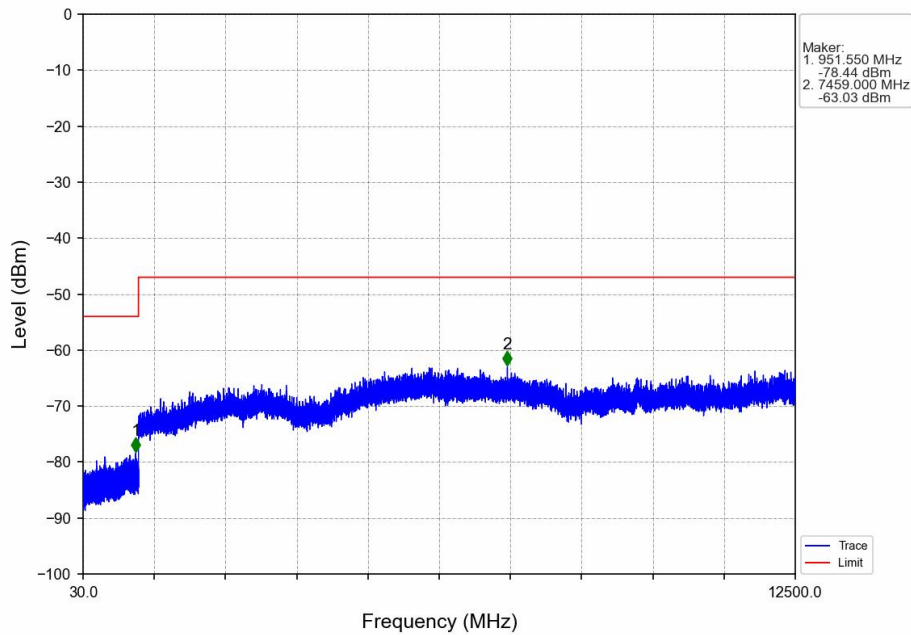
10.3. Test Procedure

- (1) Configure EUT and assistant system according clause 2.4 and 9.3
- (2) Set EUT work in test mode as described in clause 2.4
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 - Resolution BW: 100 KHz for frequency below 1GHz and 1MHz for frequency above 1GHz
 - Video BW: 100 KHz for frequency below 1GHz and 1MHz for frequency above 1GHz
 - Detector: Peak.
 - Trace Mode: Max Hold.
- (4) All the emissions from 30MHz to 13GHz were measured and record.

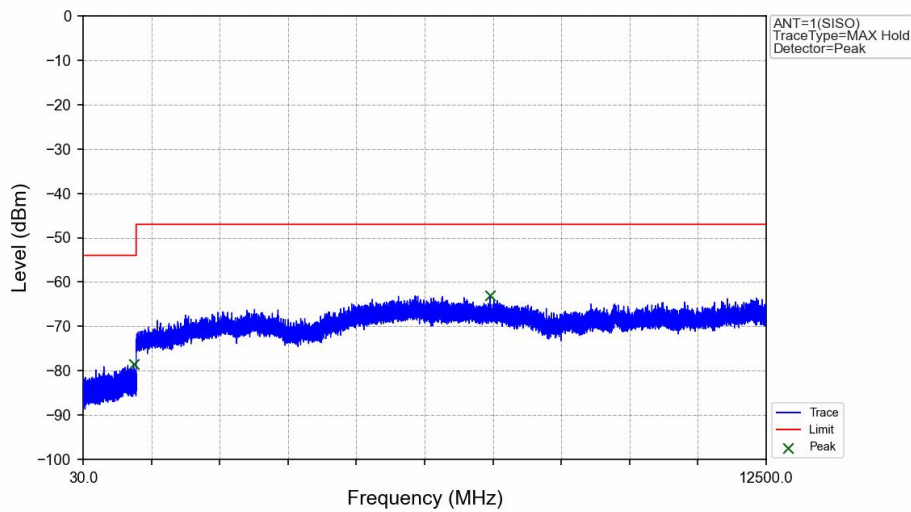
10.4. Test Result

NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
GFSK	SISO	2402	1	30	1000	951.55	-78.44	0.014	/	/	4	Pass
				1000	12500	7459	-63.03	0.498	/	/	20	Pass
		2480	1	30	1000	764.95	-78.64	0.014	/	/	4	Pass
				1000	12500	7723.5	-62.86	0.518	/	/	20	Pass
Pi/4DQPSK	SISO	2402	1	30	1000	806.55	-78.50	0.014	/	/	4	Pass
				1000	12500	6081	-62.06	0.622	/	/	20	Pass
		2480	1	30	1000	925.9	-78.81	0.013	/	/	4	Pass
				1000	12500	5589	-62.80	0.525	/	/	20	Pass
8DPSK	SISO	2402	1	30	1000	972	-78.39	0.014	/	/	4	Pass
				1000	12500	6811	-62.28	0.592	/	/	20	Pass
		2480	1	30	1000	830.9	-78.72	0.013	/	/	4	Pass
				1000	12500	6114.5	-62.94	0.508	/	/	20	Pass

GFSK DH5_2402MHz_Ant1_NTNV

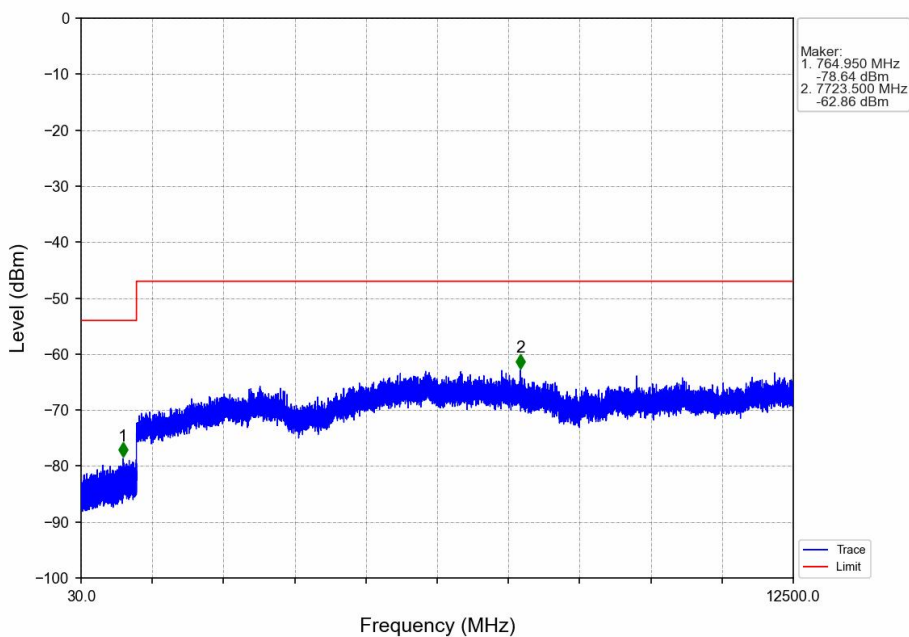


GFSK DH5_2402MHz_Ant1_NTNV

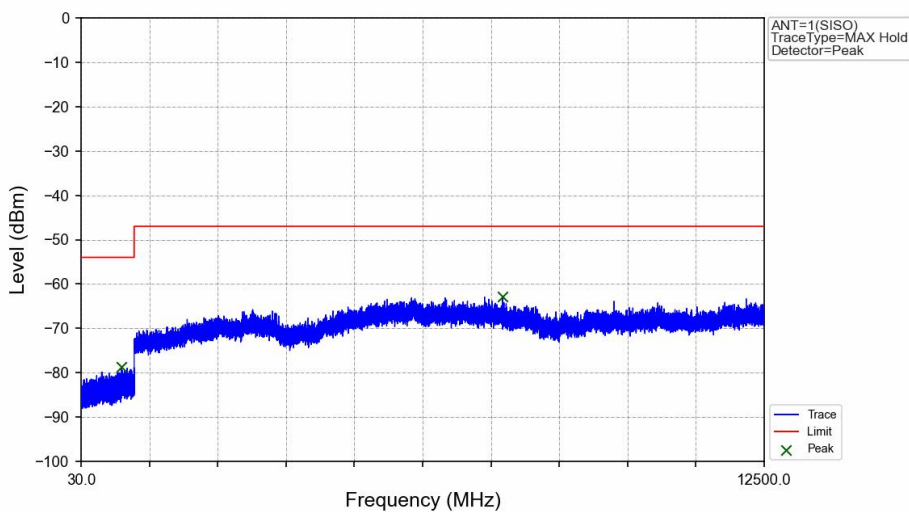


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	951.550	-78.44	/	-54	Pass
1000	12500	1	1	7459.000	-63.03	/	-47	Pass

GFSK DH5_2480MHz_Ant1_NTNV

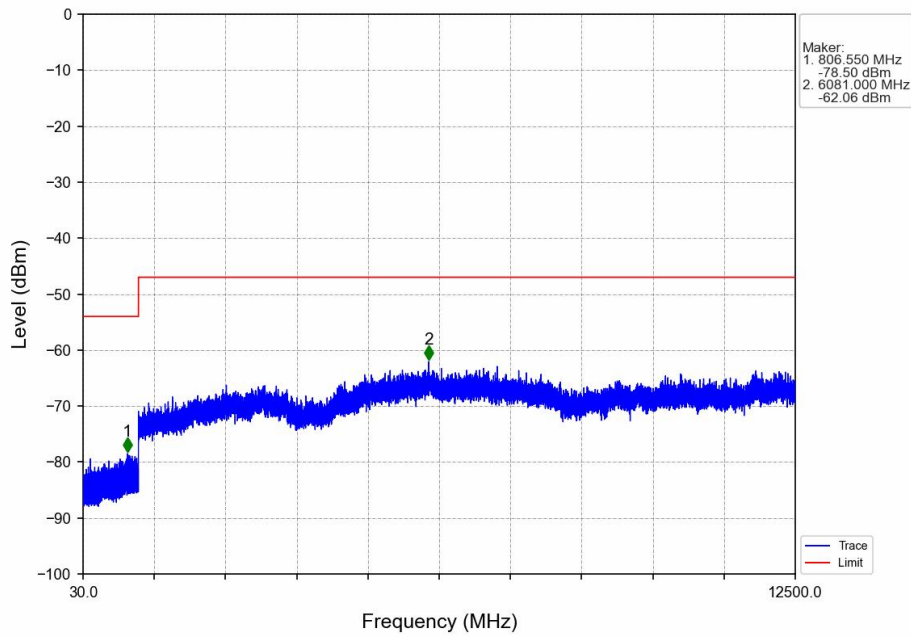


GFSK DH5_2480MHz_Ant1_NTNV

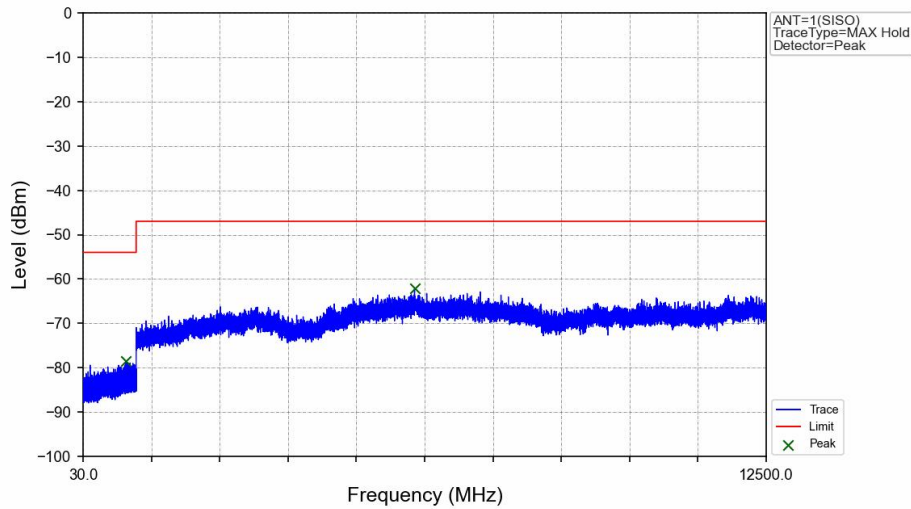


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	764.950	-78.64	/	-54	Pass
1000	12500	1	1	7723.500	-62.86	/	-47	Pass

Pi/4DQPSK_2DH5_2402MHz_Ant1_NTNV

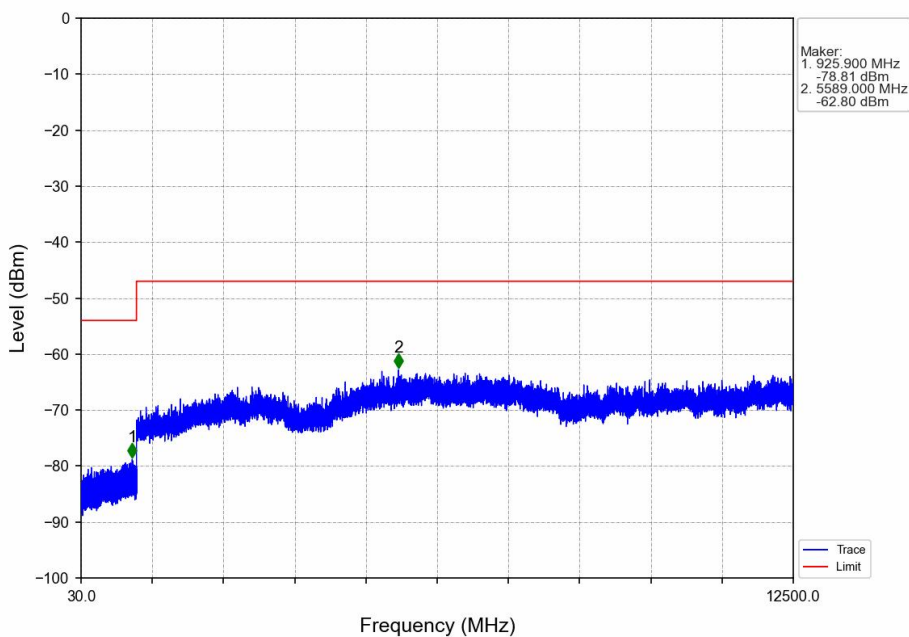


Pi/4DQPSK_2DH5_2402MHz_Ant1_NTNV

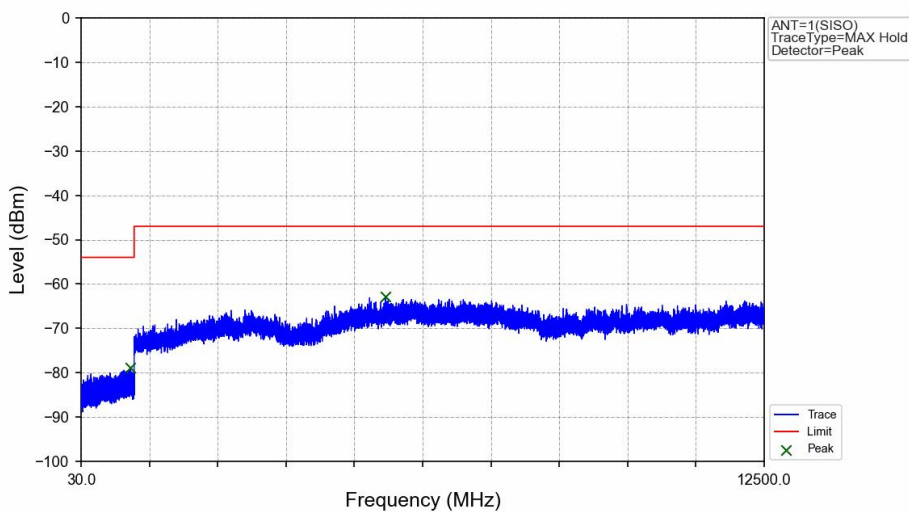


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	806.550	-78.50	/	-54	Pass
1000	12500	1	1	6081.000	-62.06	/	-47	Pass

Pi/4DQPSK_2DH5_2480MHz_Ant1_NTNV

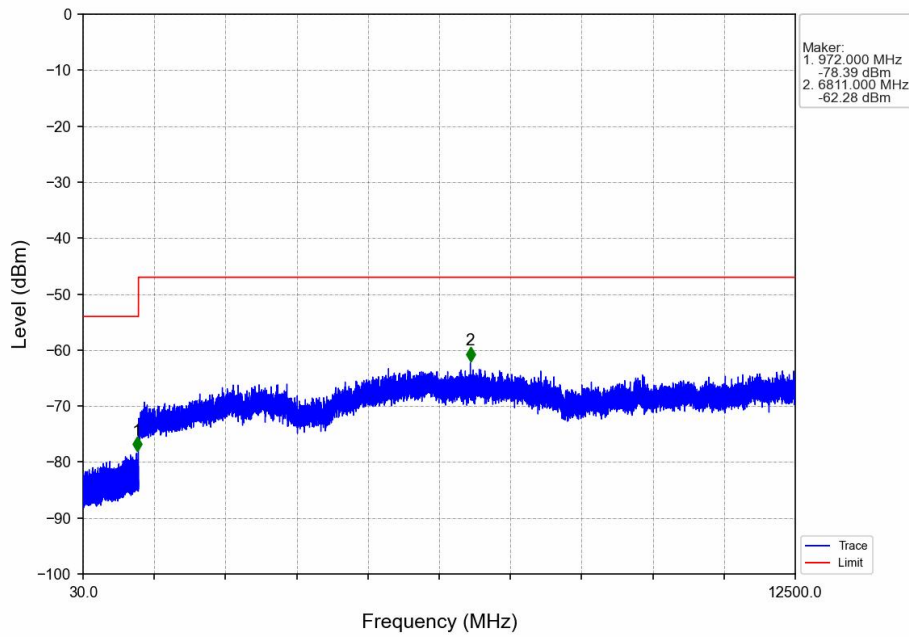


Pi/4DQPSK_2DH5_2480MHz_Ant1_NTNV

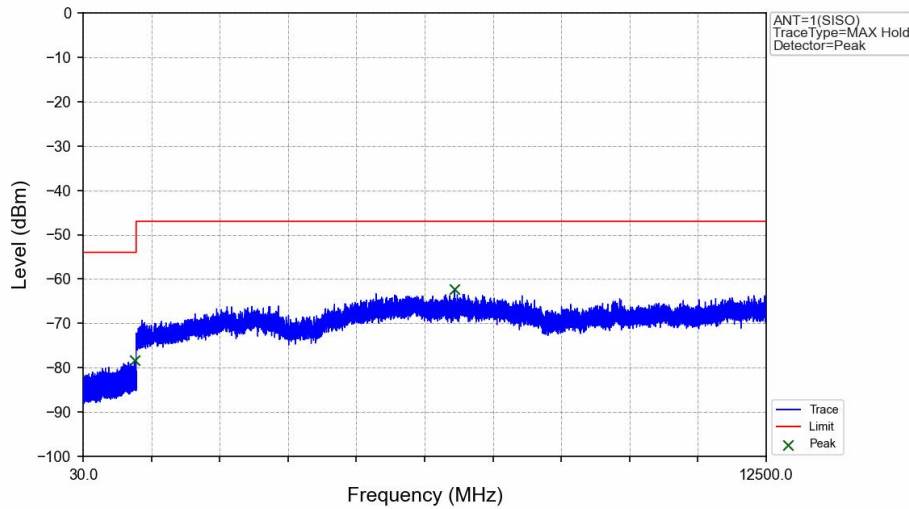


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	925.900	-78.81	/	-54	Pass
1000	12500	1	1	5589.000	-62.80	/	-47	Pass

8DPSK_3DH5_2402MHz_Ant1_NTNV

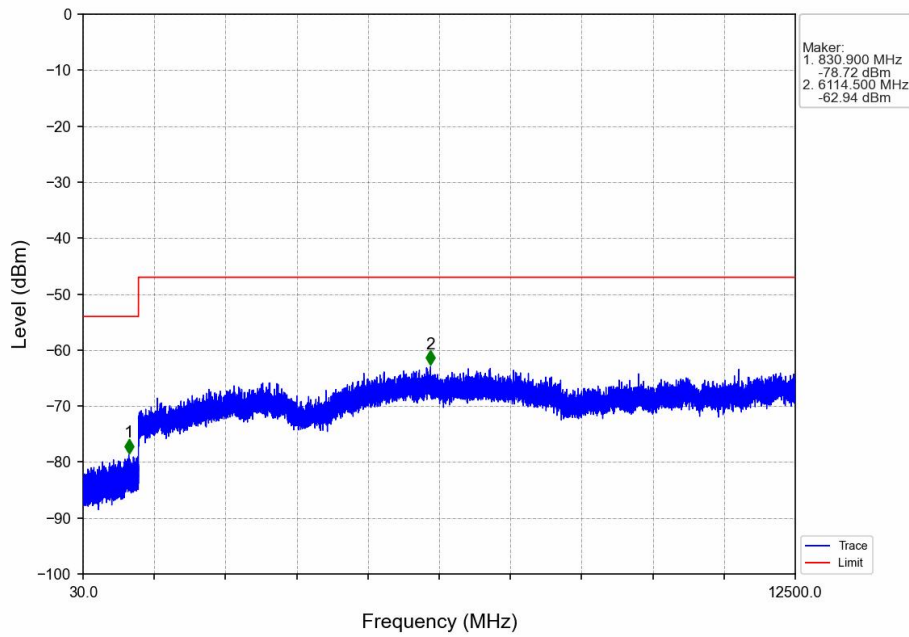


8DPSK_3DH5_2402MHz_Ant1_NTNV

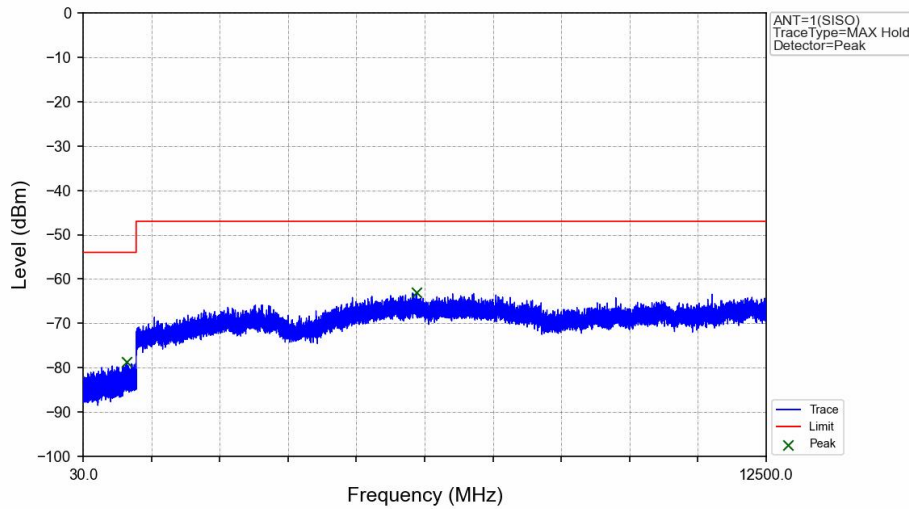


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	972.000	-78.39	/	-54	Pass
1000	12500	1	1	6811.000	-62.28	/	-47	Pass

8DPSK_3DH5_2480MHz_Ant1_NTNV



8DPSK_3DH5_2480MHz_Ant1_NTNV



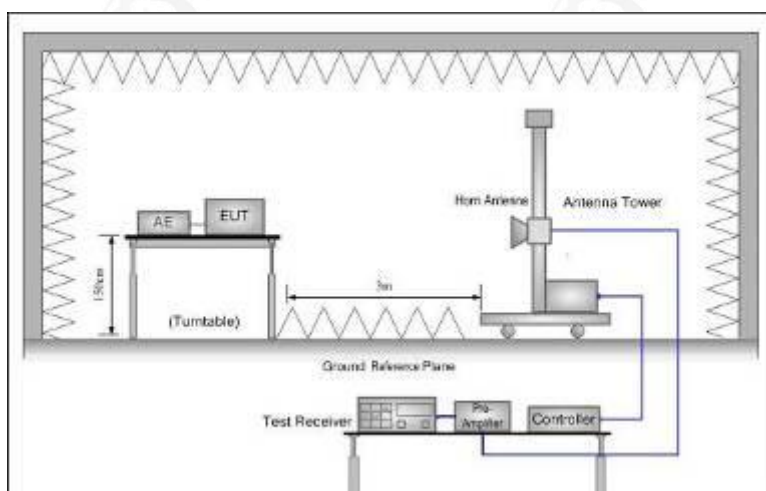
Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	830.900	-78.72	/	-54	Pass
1000	12500	1	1	6114.500	-62.94	/	-47	Pass

11. Equivalent Isotropic Radiated Power

11.1. Applied Procedures / Limit

Modulation system	Frequency band used	Antenna power(max.)	EIRP	
			Omnidirectional case	Directional case
DS	2400~2483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz

11.2. Test Setup



11.3. Test Procedure

Step 1

Set the test equipment at test frequency, and in continuous transmitting mode or intermittent burst mode (constant frequency and constant burst time). Stop the spread.

Step 2

Set the height and direction of test equipment and measurement antenna approximately facing each other.

Step 3

In the frequency derived in D), change the height of the measurement antenna from the ground by $\pm 50\text{cm}$ with a central focus on the antenna of test equipment. Search the location that the power is maximum by adjusting the direction of measurement antenna. Set the indicator of spectrum analyzer at this point as "E".

Step 4

Remove the test equipment from the turntable, set the opening of substitution antenna at the same location as the opening of the test equipment, and receive by outputting radio wave of the same frequency from the standard signal generator for substitution.

Step 5

Adjust at the maximum power point, turning the substitution antenna.

Step 6

Change the height of the measurement antenna from the ground by $\pm 50\text{cm}$ with a central focus on the substitution antenna, and adjust the direction of measurement antenna to the location that the received power is maximum.

Step 7

Adjust output of standard signal generator and record the power P_s that is equal to "E". Or record P_s by counting backward from the difference with "E" as the close value to "E" (within $\pm 1\text{dB}$).

Step 8

EIRP is derived from the following calculating formula:

$$\text{EIRP} = G_s - L_f + P_s$$

G_s ; Absolute gain of substitution antenna (dBi).

L_f ; Loss of electric supply line between standard signal generator and substitution antenna (dB).

P_s ; Output of standard signal generator (dBm).

Step 9

Spectrum Analyzer as below:

Centre Frequency: The center frequency of the channel under test.

Frequency Span: 0Hz

Resolution BW: 1MHz

Video BW: 3MHz

Detector: Peak.

Sweep mode: Continuous sweep.

11.4. Test Result

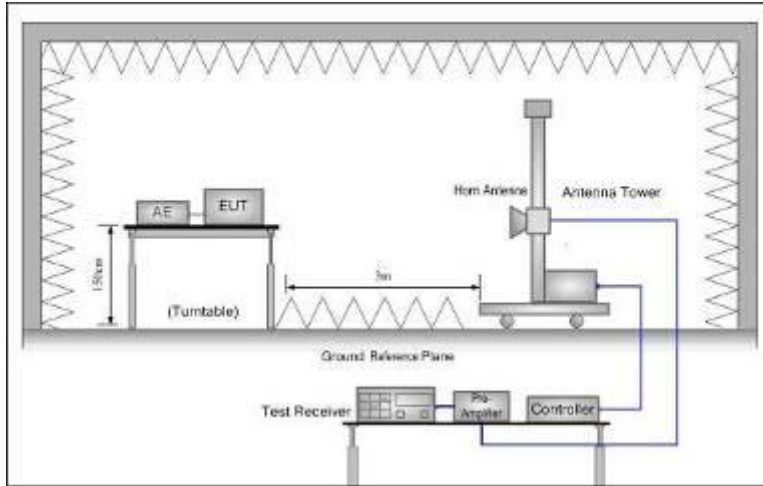
Pass

ENV	Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Gain (dBi)	EIRP (dBm/MHz)	
							Result	Limit
NTNV	GFSK	SISO	HOPP	DH5	1	0.8	-9.65	≤ 6.91
	Pi/4DQPSK	SISO	HOPP	2DH5	1	0.8	-14.47	≤ 6.91
	8DPSK	SISO	HOPP	3DH5	1	0.8	-13.09	≤ 6.91

EIRP=Conduct power+ant (dBi)

12. 3dB Beam Bandwidth

12.1. Test Setup



12.2. Test Procedure

Step 1

Set the test equipment at test frequency, and transmit.

Step 2

Stop the modulation, and make it “continuous transmission of unmodulated wave” in principle. If it is impossible, make it “intermittent burst transmission of unmodulated wave”

Step 3

Polarized wave side of measurement antenna is the same using mode as test equipment.

Step 4

Set the height and direction of test equipment and measurement antenna approximately facing each other.

Step 5

Set the spectrum analyzer according to “Spectrum set” and set as reference level and receive.

Step 6

Adjust at the maximum received power point, turning the test equipment horizontally and vertically.

Step 7

Change the height of the measurement antenna from the ground by $\pm 50\text{cm}$ with a central focus on the antenna of test equipment, and search the location that the power is maximum by adjusting the direction of measurement antenna. Set the indicator of spectrum analyzer at this point as “E”.

Step 8

By using EIRP (P_E) that is measured at 9, calculate allowed main beam angle (θ_0) between the horizontal plane and vertical plane of the test equipment as follows.

Allowed main beam angle (θ_0) = $360/A$

θ_0 : Allowed transmitter antenna beamwidth angle in degree of test equipment

P_E : EIRP of test equipment (dBm)

A: A is defined as EIRP divides by the summation of antenna gain 2.14dBi transmitter antenna and average power 10mW (In case of using OFDM, or DS, or FHSS, or DS and complex with FHSS, or OFDM and complex with FHSS, 10mW/MHz. However, in FHSS or DS and complex with FHSS, or OFDM and complex with FHSS, when using the frequency from 2,427MHz to 2,470.75MHz, 3mW/MHz) antenna power. In case the value is lower than 1, set A as 1.

Step 9

Turn the test equipment in horizontal direction, from main beam direction with the beam angle except main beam angle (θ_0) calculated by (step 8), over all surroundings as much as possible. Confirm that received power is decreased more than 3dB from the maximum point value of received power(E).

Step 10

Return the test equipment to position (step 6), incline the test equipment in vertical direction, from main beam direction with the beam angle except main beam angle (θ_0) calculated by (step 8), widely as much as possible (over 90 degrees. However, it is able to according to “6. other condition”, too.) Confirm that received power is 3dB lower than the maximum point value of received power (E).

Step 9

Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Frequency Span: 0Hz

Resolution BW: 1MHz

Video BW: 1KHz

Y-Axis: 5dB/Div

Detector: Peak.

Sweep mode: Continuous sweep

Input level: the amplitude of transmission signal is set around max. line area of mixer.

12.3. Test Result

Not applicable(the EIRP less than 12.14dBm)

APPENDIX I -- EUT TEST PHOTOGRAPHS

Please see the attachment for details

APPENDIX II -- EUT PHOTOGRAPHS

Please see the attachment for details

APPENDIX III -- STATEMENT

1. The equipment lists are traceable to the national reference standards.
2. The test report can not be partially copied unless prior written approval is issued from our lab.
3. The test report is invalid without the "special seal for inspection and testing".
4. The test report is invalid without the signature of the approver.
5. The test process and test result is only related to the Unit Under Test.
6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
7. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

******* END OF REPORT *******

