FCC - TEST REPORT

Report Number	:	**68.950.24.0443.01**	Date of Issue:	**2024-11-26**
Model	:	**EAV-RC50**		
Product Type	:	Remote Controller		
Applicant	:	SUZHOU EAVISION ROBOTIC TECHNOLOGIES CO., LTD		
Address	:	Unit 1-A, No.3 Workshop, 28 Xiasheng Road, SIP Suzhou, Jiangsu China 215000		
Manufacturer	:	SUZHOU EAVISION ROBOTIC TECHNOLOGIES CO., LTD		
Address	:	Unit 1-A, No.3 Workshop, 28 Xiasheng Road, SIP Suzhou, Jiangsu China 215000		
Factory	:	SUZHOU EAVISION ROBOTIC TECHNOLOGIES CO., LTD		
Address	:	Unit 1-A, No.3 Workshop, 28 Xiasheng Road, SIP Suzhou, Jiangsu China 215000		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**62**		

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation, chapter A-3.4.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

1 Table of Contents

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District Shenzhen 518052 P.R. China
Telephone:	+86 755 8828 6998
Fax:	+86 755 828 5299
FCC Registration No.:	514049
FCC Designation Number:	CN5009

3 Description of the Equipment Under Test

Product:	Remote Controller
Model No.:	EAV-RC50
Brand name:	EAVISION
FCC ID:	2AXLB-EAV-RC50
Rating:	Input: DC20V⎓3.25A Battery Capacity:7.6V, 13100mAh
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	79
Modulation:	GFSK, π/4-DQPSK, 8DPSK
Antenna Type:	FPC Antenna
Antenna	Gain: -3.3dBi
Description of the EUT:	EUT is a Remote Controller which support 2.4G (BR, Slot), Bluetooth (BR+EDR+BLE), Wi-Fi operated at 2.4GHz and 5GHz, GSM, WCDMA and LTE. Only Bluetooth (BR+EDR) included in this report.

NOTE 1: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2023 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05r02 Measurement Guidance and ANSI C63.10-2020.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart C			
Test Condition		Test Site	Test Result
§15.207	Conducted emission AC power port	N/A	N/A
§15.247(b)(1)	Conducted peak output power	Site 1	Pass
§15.247(a)(1)	20dB bandwidth	Site 1	Pass
§15.247(a)(1)	Carrier channel frequency separation	Site 1	Pass
§15.247(a)(1)(iii)	Number of hopping frequencies	Site 1	Pass
§15.247(a)(1)(iii)	Dwell Time - Average Time of Occupancy	Site 1	Pass
§15.247(d)	Spurious RF conducted emissions	Site 1	Pass
§15.247(d)	Band edge	Site 1	Pass
§15.247(d) & §15.209 &§15.205	Spurious radiated emissions for transmitter	Site 1	Pass
§15.203	Antenna requirement	See note 2	Pass

Note 1: N/A=Not Applicable.
Note 2: The EUT uses a FPC antenna, which gain is -3.3dBi. In accordance to §15.203, it is considered sufficiently to comply with the provisions of this section.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AXLB-EAV-RC50, complies with Section 15.209, 15.247 of the FCC Part 15, Subpart C rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date:	2024-03-01
Testing Start Date:	2024-03-01
Testing End Date:	2024-11-21

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch -

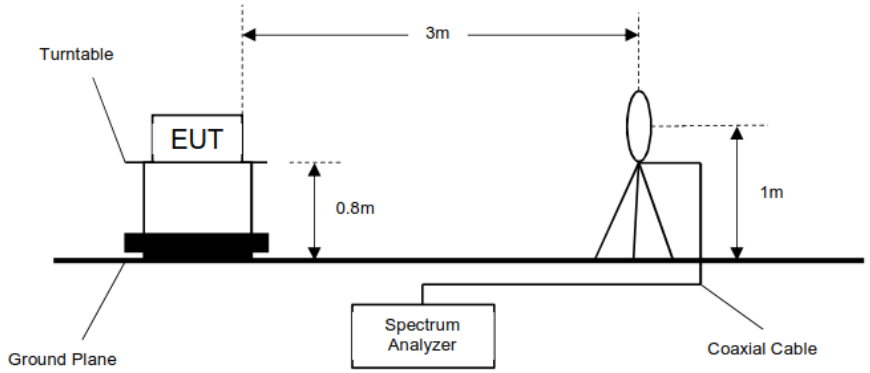
Reviewed by:	Prepared by:	Tested by:
John Zhi	Hayden Hu	Carry Cai
Section Manager	Project Engineer	Test Engineer

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

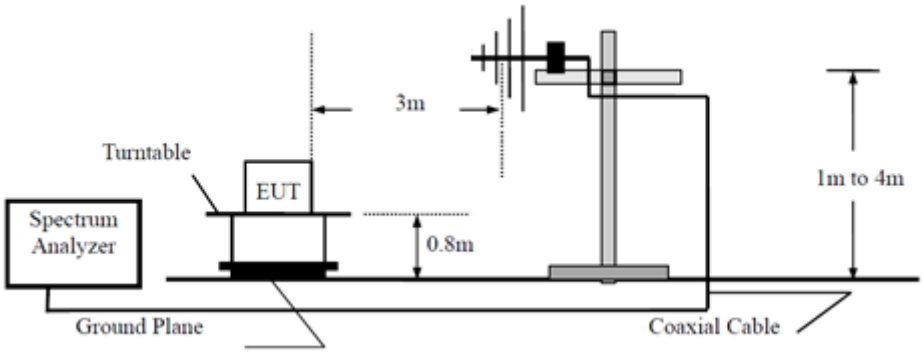
7 Test Setups

7.1 Radiated test setups

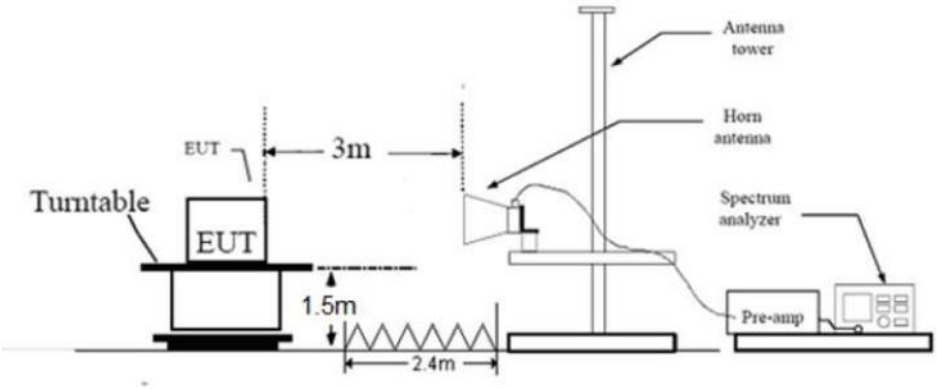
9KHz - 30MHz



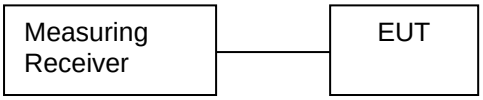
30MHz - 1GHz



Above 1GHz

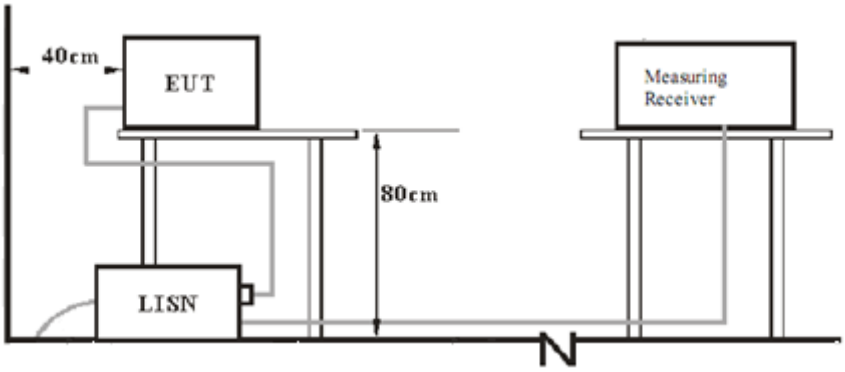


7.3 Conducted RF test setups



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

7.4 AC Power Line Conducted Emission test setups



8 Systems Test Configuration

Auxiliary Equipment Used during Test:

Description	Manufacturer	Model NO.	S/N
Notebook	LENOVO	X220	---

Cables Used During Test:

Cable	Length	Shielded/unshielded	With / without ferrite
---	---	---	---

Test software information:

Test Software Version	BlueSuiteCda_3_3_11_1269	
Modulation	Setting TX Power	Packet Type
GFSK	6	PRBS9
π/4-DQPSK	6	PRBS9
8DPSK	6	PRBS9

The system was configured to hopping mode and non-hopping mode.

Hopping mode: typical working mode (normal hopping status)

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. Both sides of AC line were checked for maximum conducted interference.
6. The frequency range from 150 kHz to 30 MHz was searched.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

Limit

According to §15.207, conducted emissions limit as below:

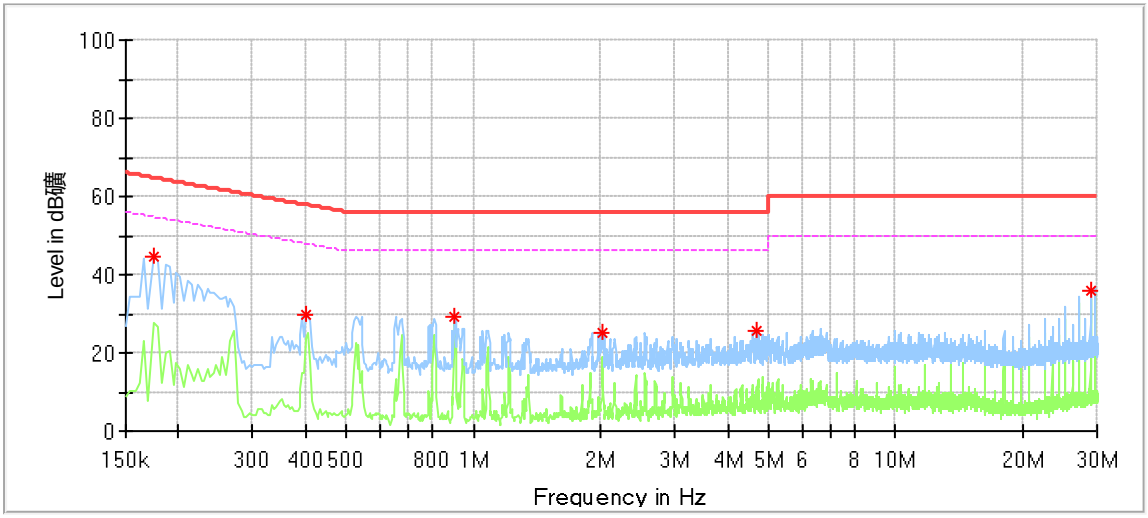
Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

*Decreasing linearly with logarithm of the frequency

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Conducted Emission

Product Type	:	Remote Controller
M/N	:	EAV-RC50
Operating Condition	:	Normal Working
Test Specification	:	Line
Comment	:	AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174000	44.46	---	64.77	20.31	L1	9.54
0.402000	29.87	---	57.81	27.94	L1	9.58
0.902000	29.44	---	56.00	26.56	L1	9.60
2.026000	25.08	---	56.00	30.92	L1	9.62
4.698000	25.62	---	56.00	30.38	L1	9.73
28.886000	35.86	---	60.00	24.14	L1	10.03

Final_Result

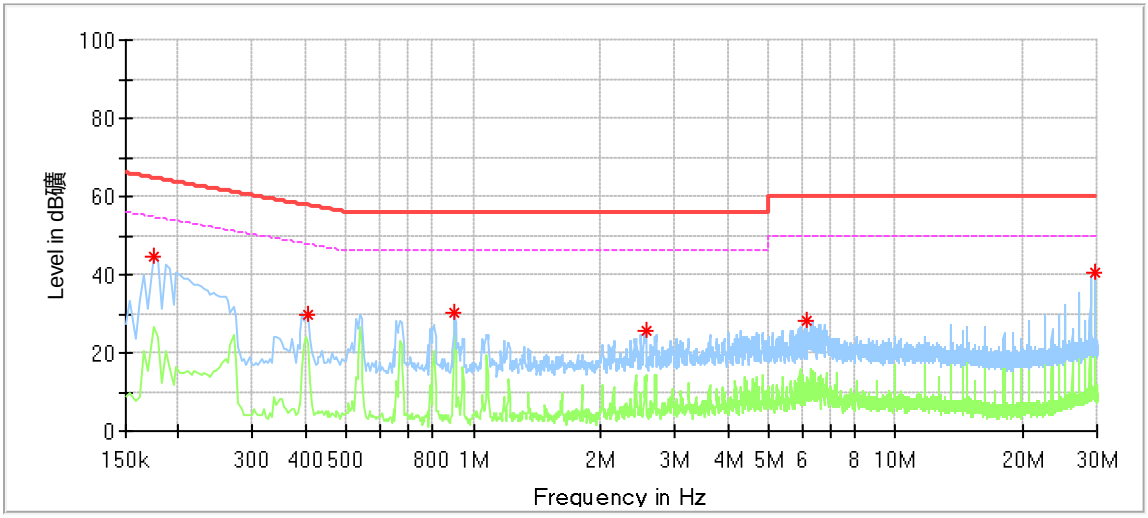
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---		---

Remark:
Max Peak= Read level + Corrector factor
Correct factor=cable loss + LISN factor
EUT has more than one typical operation, only the worst test mode will be recorded in this report.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Conducted Emission

Product Type : Remote Controller
M/N : EAV-RC50
Operating Condition : WIFI transmission
Test Specification : Power Line, Neutral
Comment : AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174000	44.66	---	64.77	20.11	N	9.57
0.406000	29.90	---	57.73	27.83	N	9.61
0.902000	30.17	---	56.00	25.83	N	9.63
2.558000	25.83	---	56.00	30.17	N	9.67
6.146000	28.28	---	60.00	31.72	N	9.83
29.786000	40.43	---	60.00	19.57	N	9.88

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---		---

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.2 Conducted Peak Output Power

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following test receiver settings:
   Span = approximately 5 times the 20dB bandwidth, centered on a hopping channel
   RBW > the 20dB bandwidth of the emission being measured, VBW≥RBW,
   Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power and record the results in the test report.
5. Repeat above procedures until all frequencies measured were complete.

Limits

According to §15.247 (b) (1), conducted peak output power limit as below:

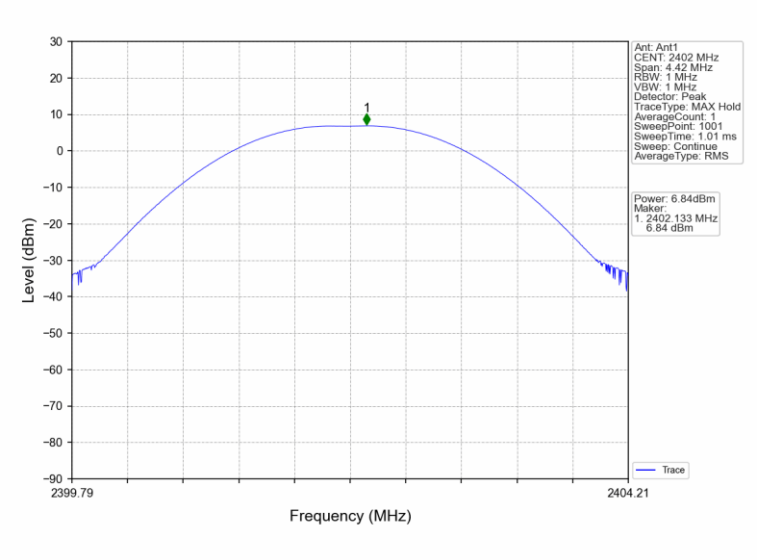
Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

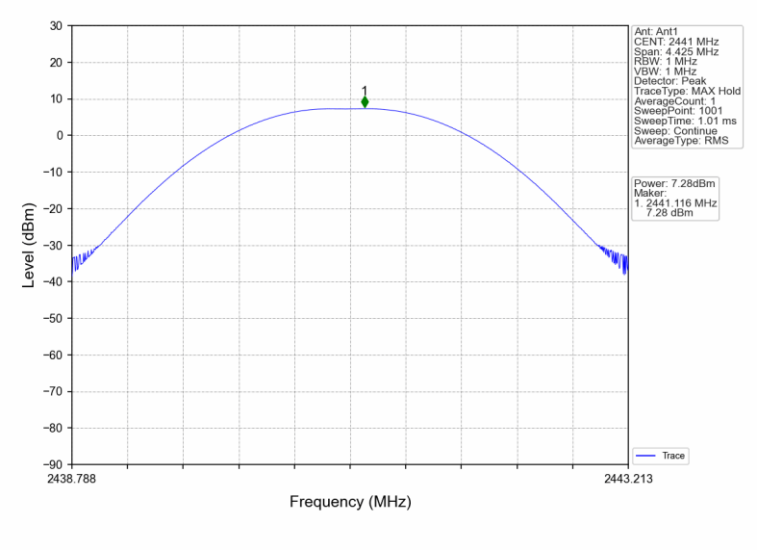
Conducted Peak Output Power

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	6.84	<=30	Pass
		2441	DH5	7.28	<=30	Pass
		2480	DH5	5.93	<=30	Pass
Pi/4DQPSK	SISO	2402	2DH5	6.31	<=30	Pass
		2441	2DH5	6.76	<=30	Pass
		2480	2DH5	5.48	<=30	Pass
8DPSK	SISO	2402	3DH5	6.61	<=30	Pass
		2441	3DH5	7.10	<=30	Pass
		2480	3DH5	5.76	<=30	Pass

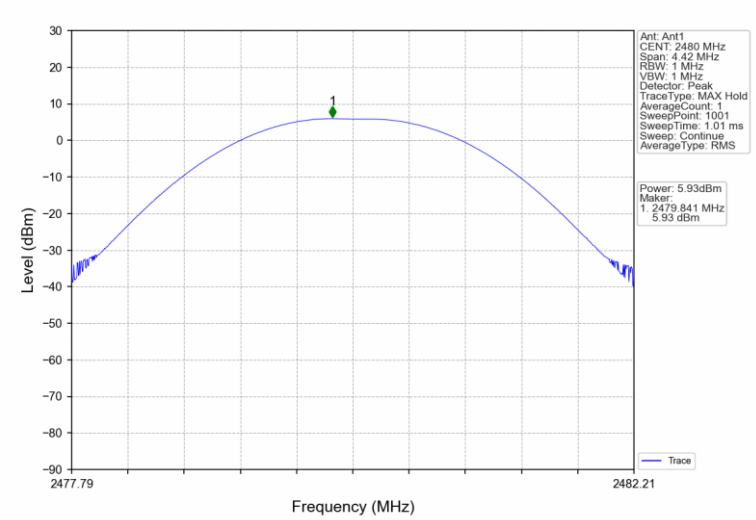
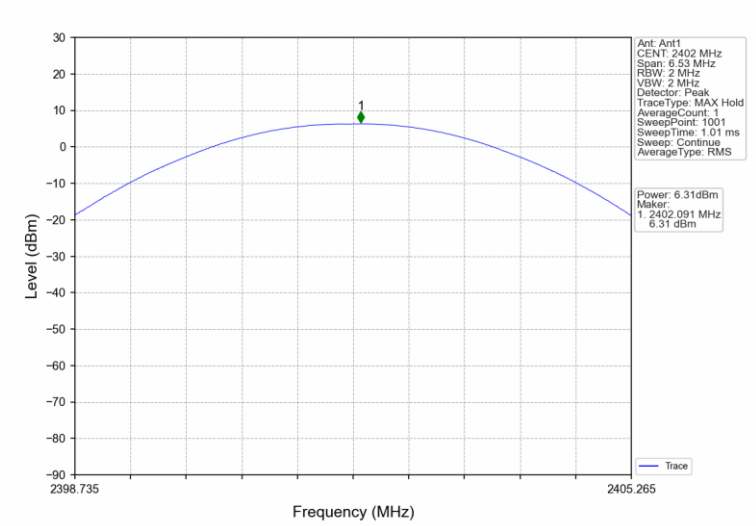
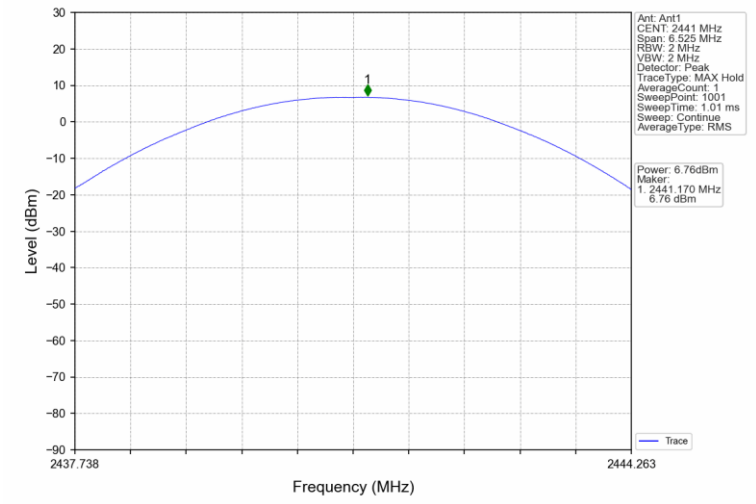
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



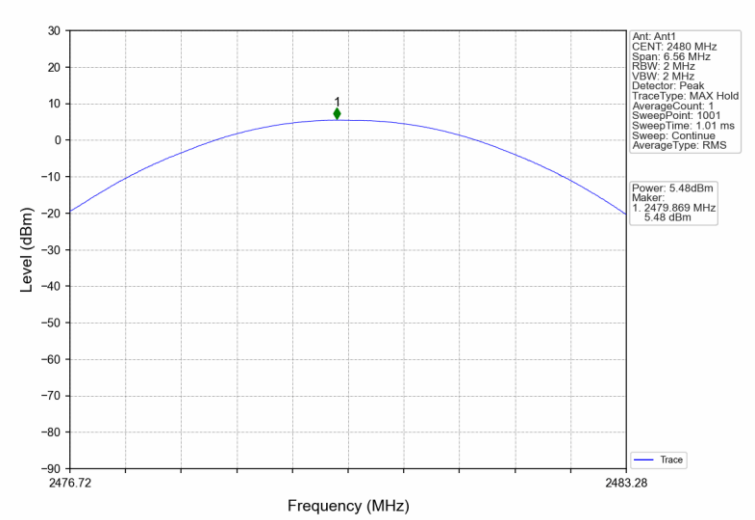
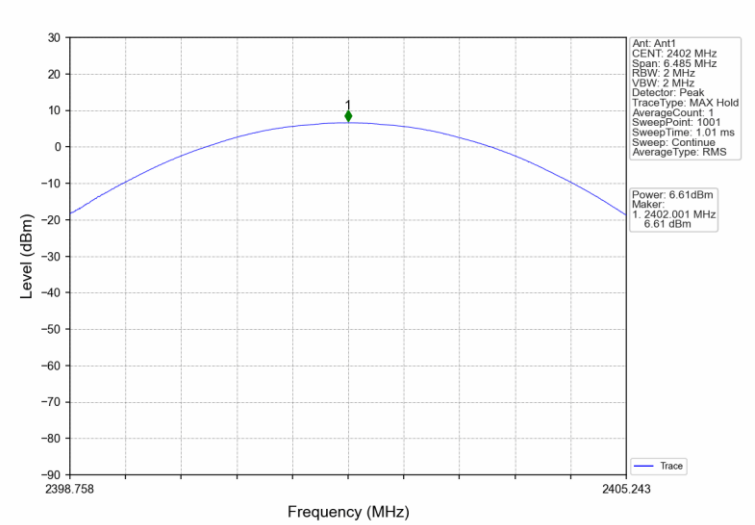
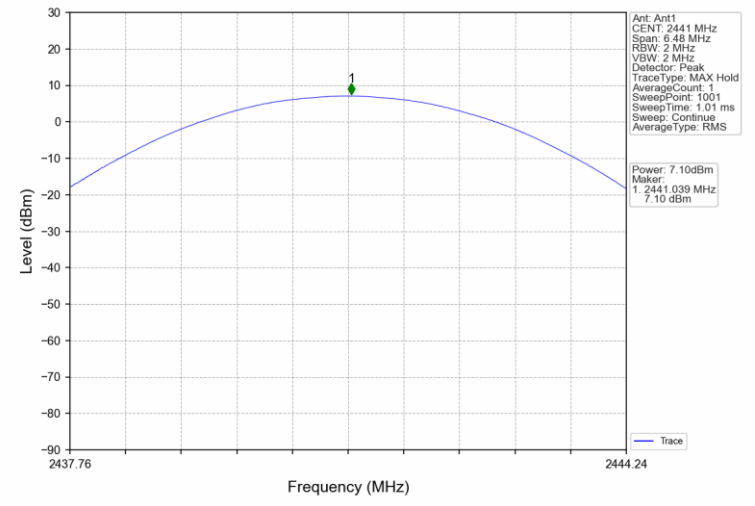
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



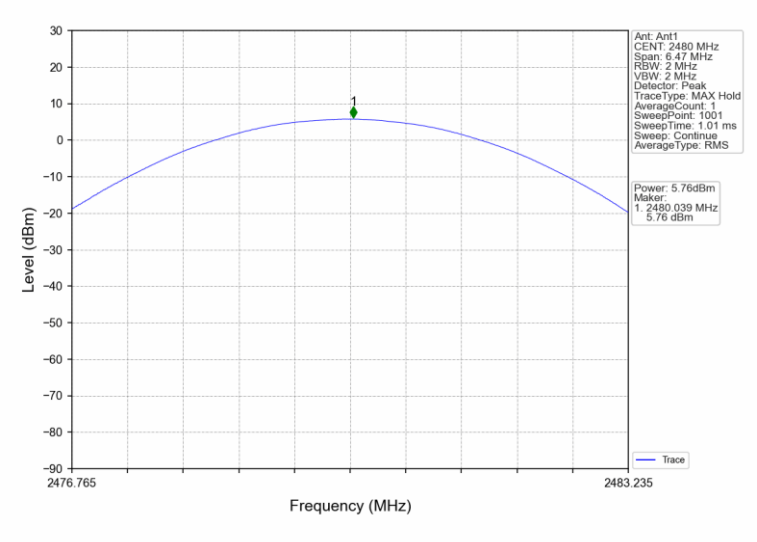
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

GFSK_DH5_HCH_2480MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.3 20 dB Bandwidth

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following test receiver settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
   RBW ≥ 1% to 5% of the 20 dB bandwidth/99% OBW, VBW≥3RBW,
   Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth. Record the results.
5. Repeat above procedures until all frequencies measured were complete.

Limit

According to §15.247(a)(1), 20 dB Bandwidth limit as below:

Limit [kHz]
N/A

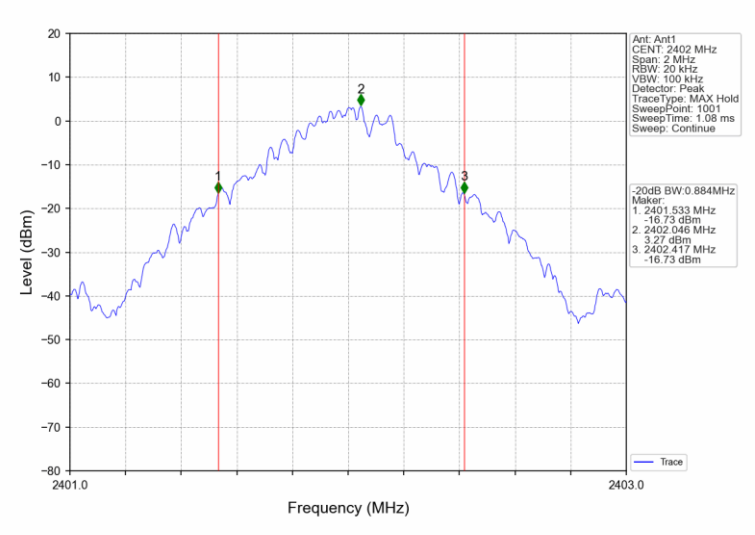
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

20 dB bandwidth

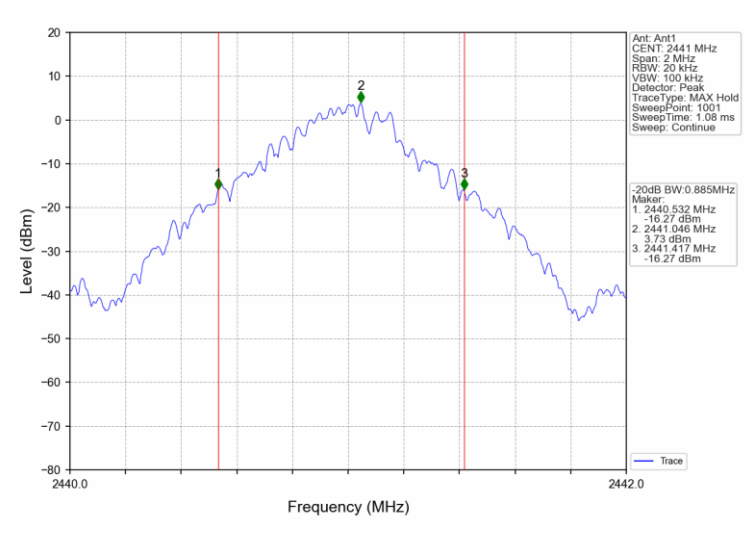
Test result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.884	/	Pass
		2441	DH5	1	0.885	/	Pass
		2480	DH5	1	0.884	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.306	/	Pass
		2441	2DH5	1	1.305	/	Pass
		2480	2DH5	1	1.312	/	Pass
8DPSK	SISO	2402	3DH5	1	1.297	/	Pass
		2441	3DH5	1	1.296	/	Pass
		2480	3DH5	1	1.294	/	Pass

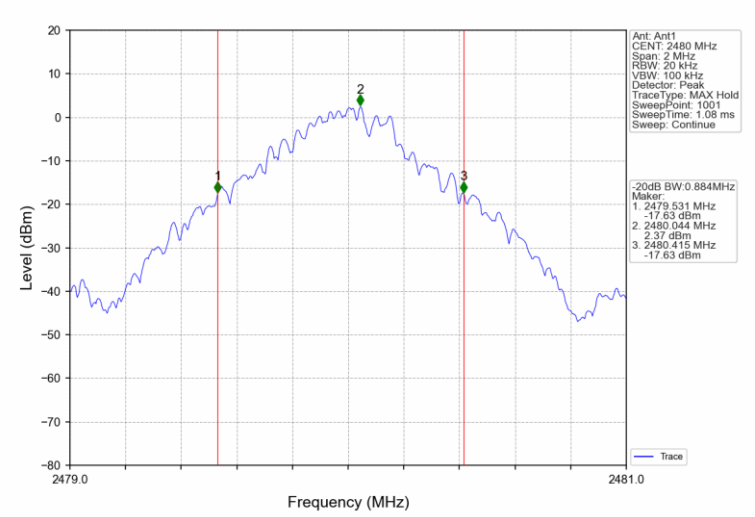
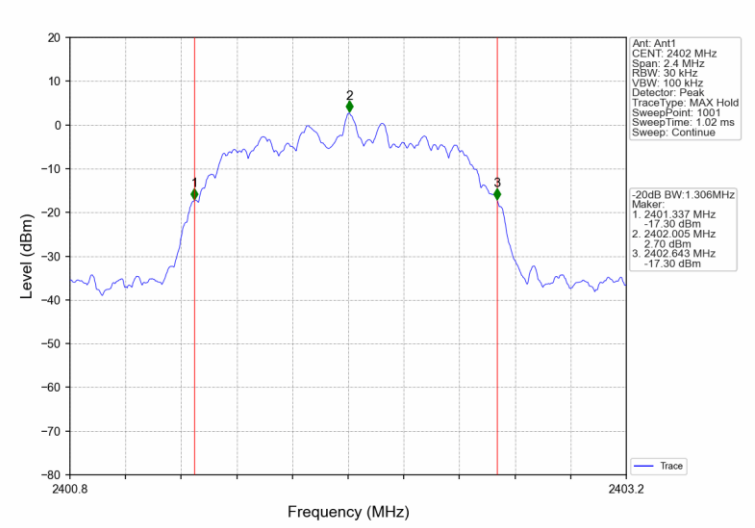
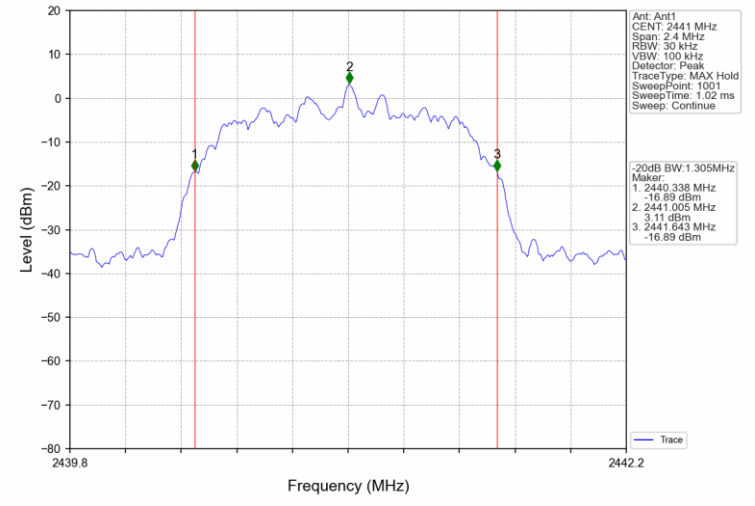
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



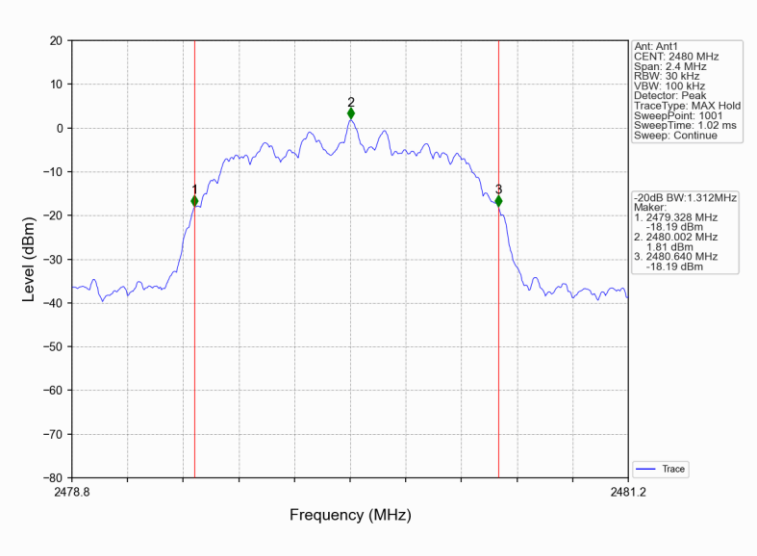
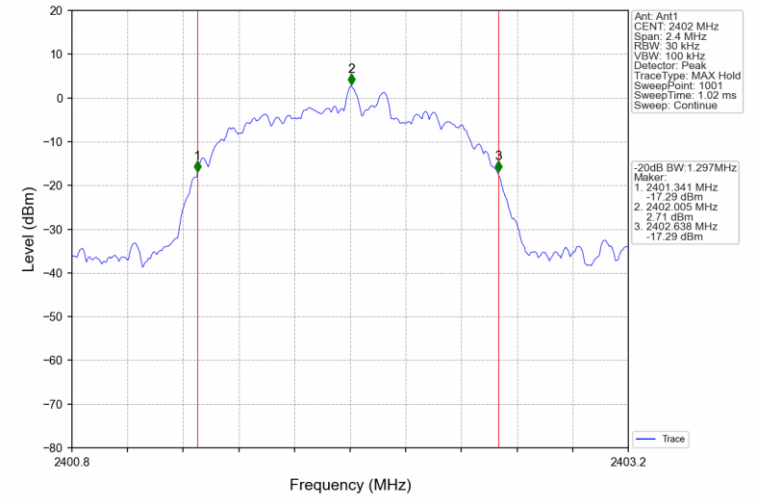
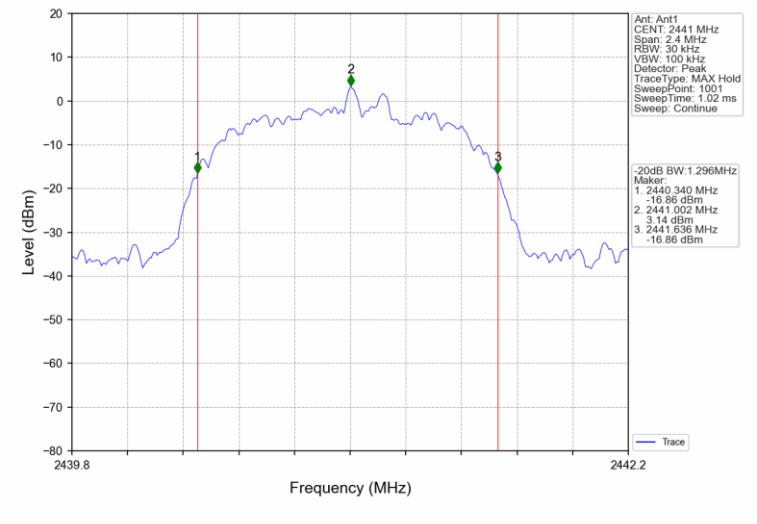
GFSK_DH5_MCH_2441MHz_Ant1_NTNV

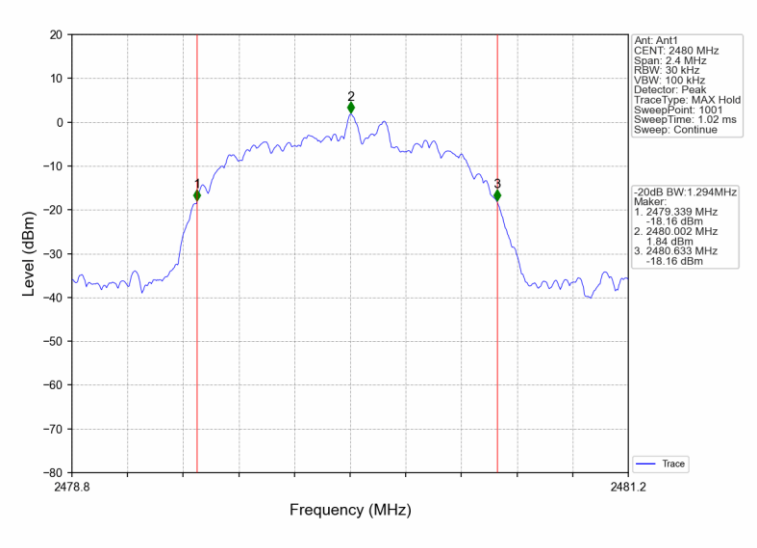


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

GFSK_DH5_HCH_2480MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV


8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.4 Carrier Frequency Separation

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit to hopping mode.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels, RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel. VBW ≥RBW, Sweep = auto, Detector function = peak.
4. By using the Max-Hold function record the separation of two adjacent channels.
5. Measure the frequency difference of these two adjacent channels by spectrum analyzer marker function. Record the results.
6. Repeat above procedures until all frequencies measured were complete.

Limit

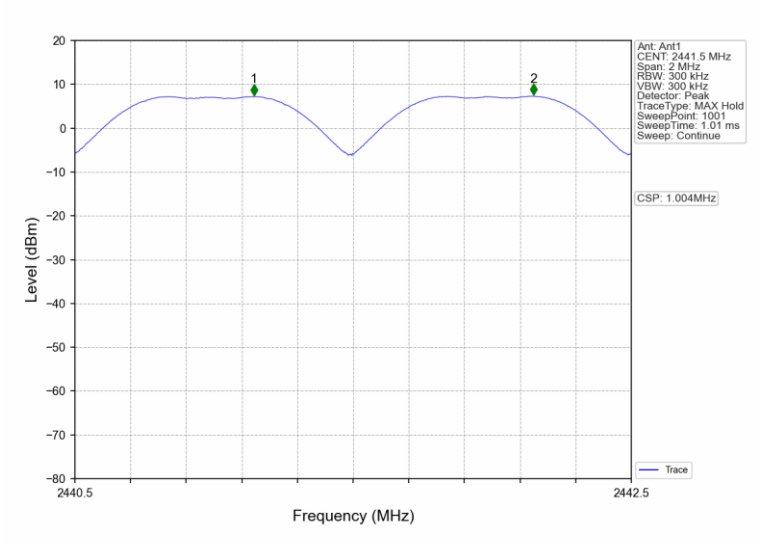
According to §15.247(a)(1), Carrier Frequency Separation limit as below:

Limit
kHz
⩾25kHz or 2/3 of the 20 dB bandwidth which is greater

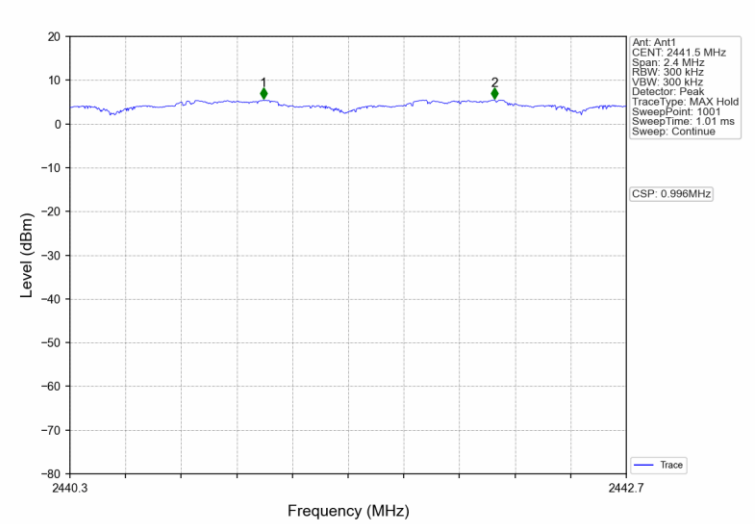
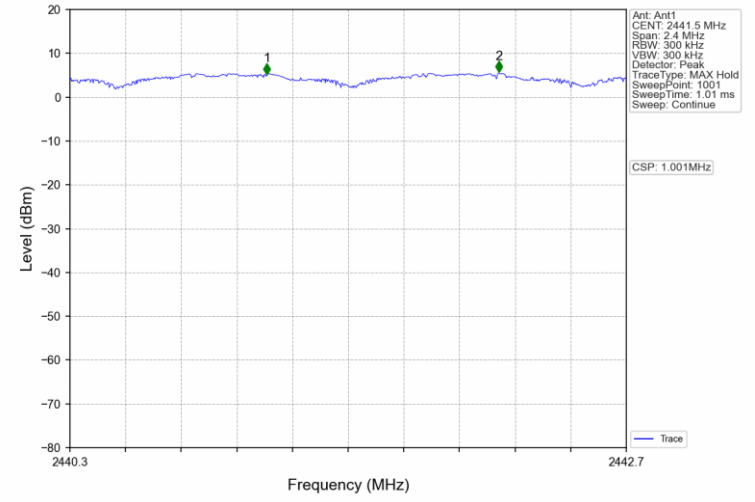
Test result: The measurement was performed with the typical configuration (normal hopping status).

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.004	0.885	>=0.885	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	0.996	1.312	>=0.875	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.297	>=0.865	Pass

GFSK_DH5_HOPP_Ant1_NTNV



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

8DPSK_3DH5_HOPP_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.5 Number of Hopping Frequencies

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit to hopping mode.
3. Use the following spectrum analyzer settings:
   Span = the frequency band of operation, RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller, VBW ≥RBW, Sweep = auto, Detector function = peak, Trace=Max hold.
4. Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

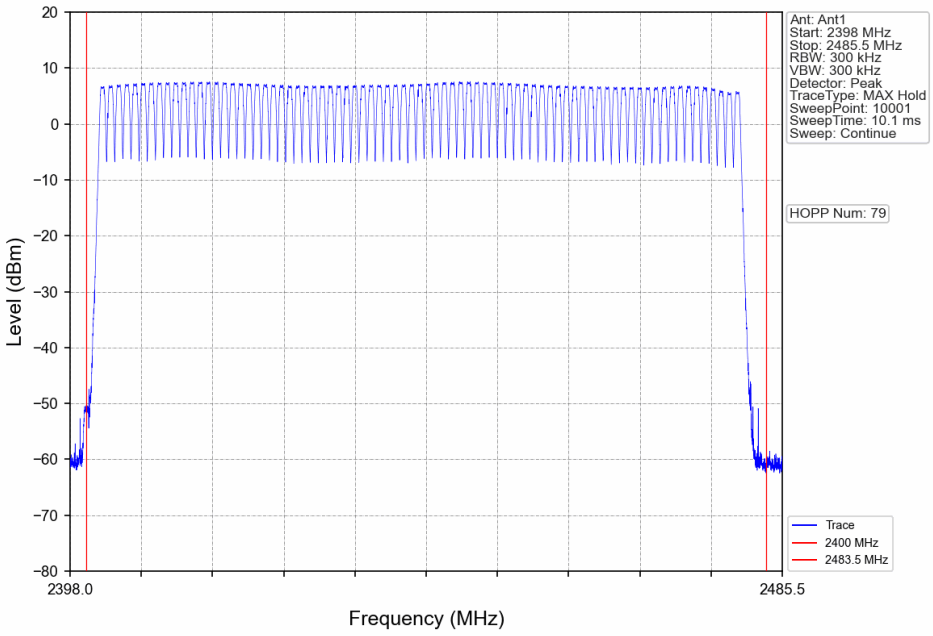
Limit

According to §15.247(a)(1)(iii), Number of Hopping Frequencies limit as below:

Limit
number
⩾ 15

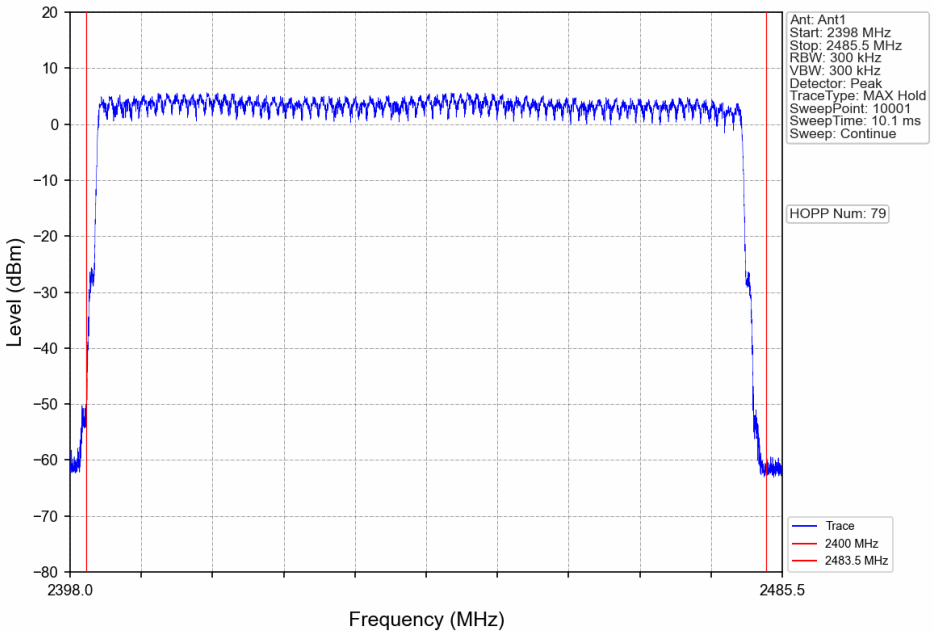
Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies		Verdict
				ANT1	Limit	
GFSK	SISO	HOPP	DH5	79	>=15	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	79	>=15	Pass
8DPSK	SISO	HOPP	3DH5	79	>=15	Pass

GFSK_DH5_HOPP_Ant1_NTNV

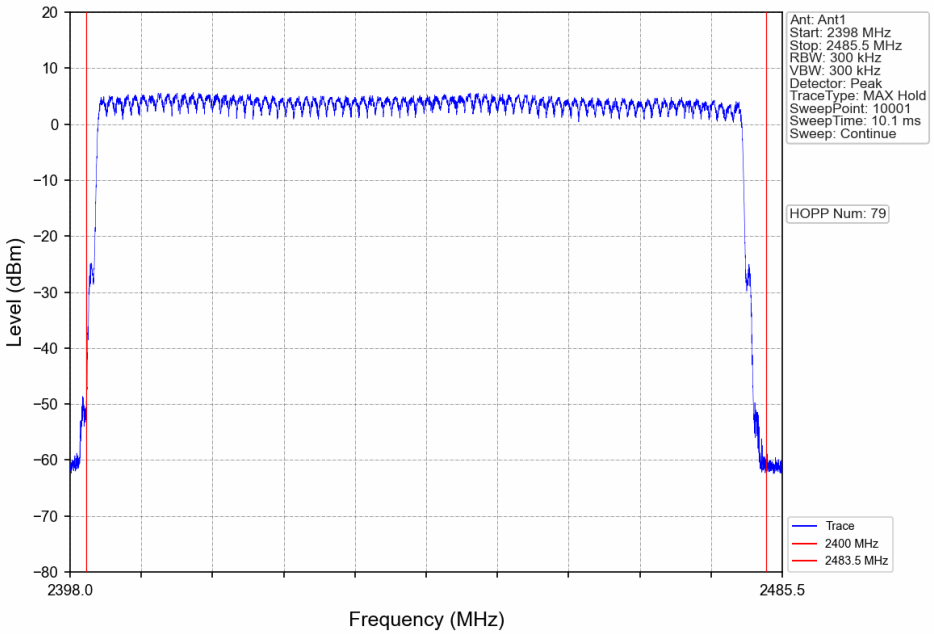


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.6 Dwell Time

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit to hopping mode.
3. Span: Zero span, centered on a hopping channel.
4. RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
5. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
6. Detector function: Peak.
7. Trace: Max hold. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

Limit

According to §15.247(a)(1)(iii), Dwell Time limit as below:

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

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

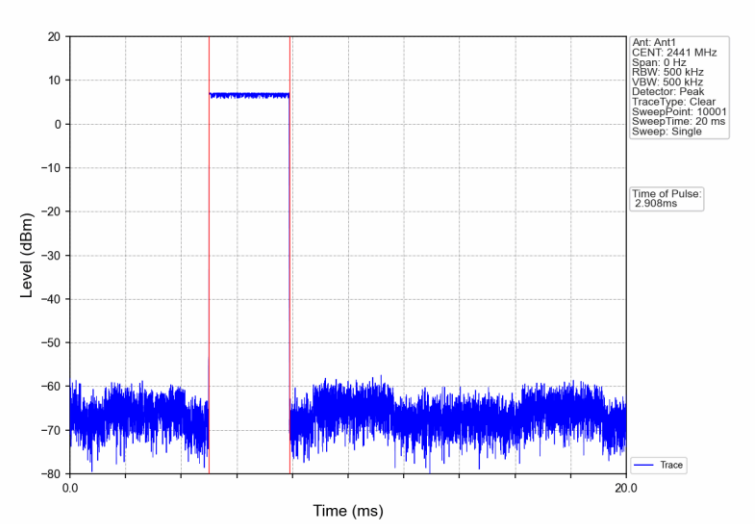
Dwell Time

Dwell time

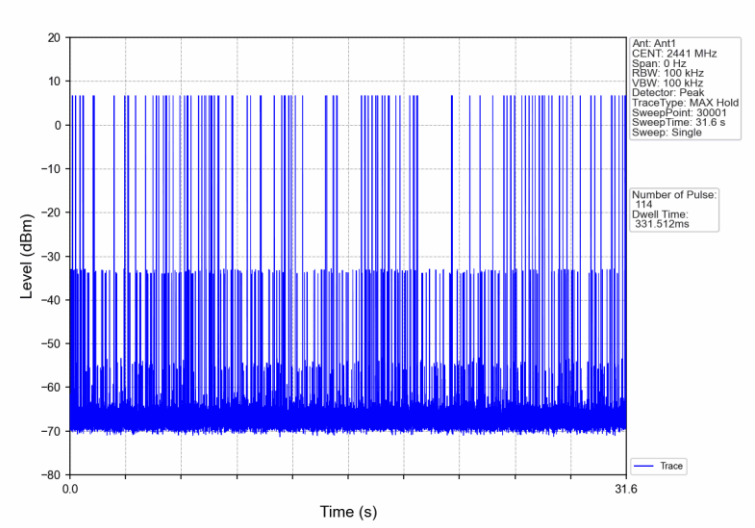
The maximum dwell time shall be 0.4 s.
According to the Bluetooth Core Specification,
The duration for dwell time calculation: 0.4 [s] * hopping number = 0.4 [s] * 79 [ch] = 31.6 [s]
The Dwell Time = Burst Width * Total Hops.

Ant1									
Mode	TX Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH5	2.908	31.600	114	331.512	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	2.898	31.600	102	295.596	<=400	Pass
8DPSK	SISO	HOPP	3DH5	2.900	31.600	107	310.300	<=400	Pass

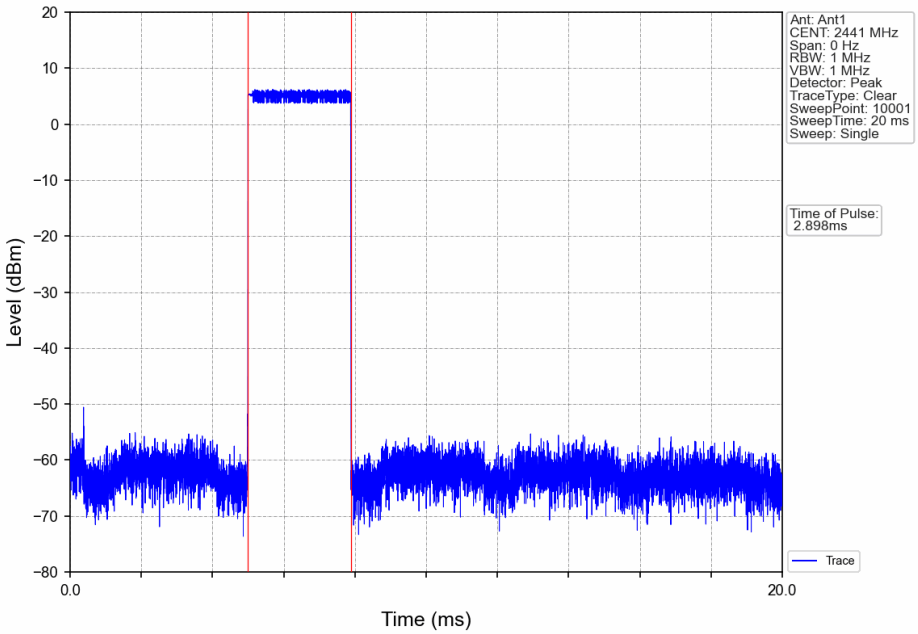
GFSK_DH5_HOPP_Ant1_NTNV

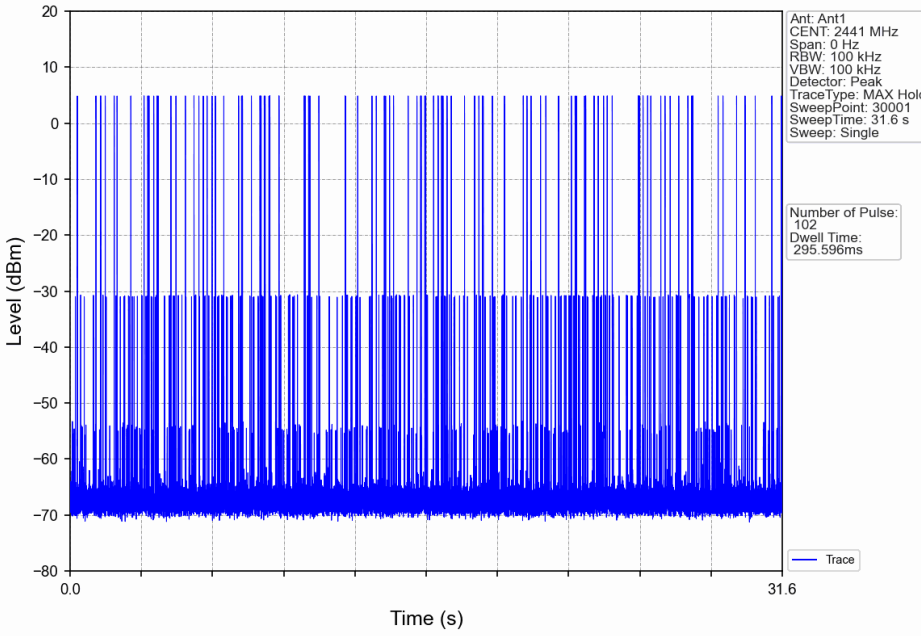


GFSK_DH5_HOPP_Ant1_NTNV

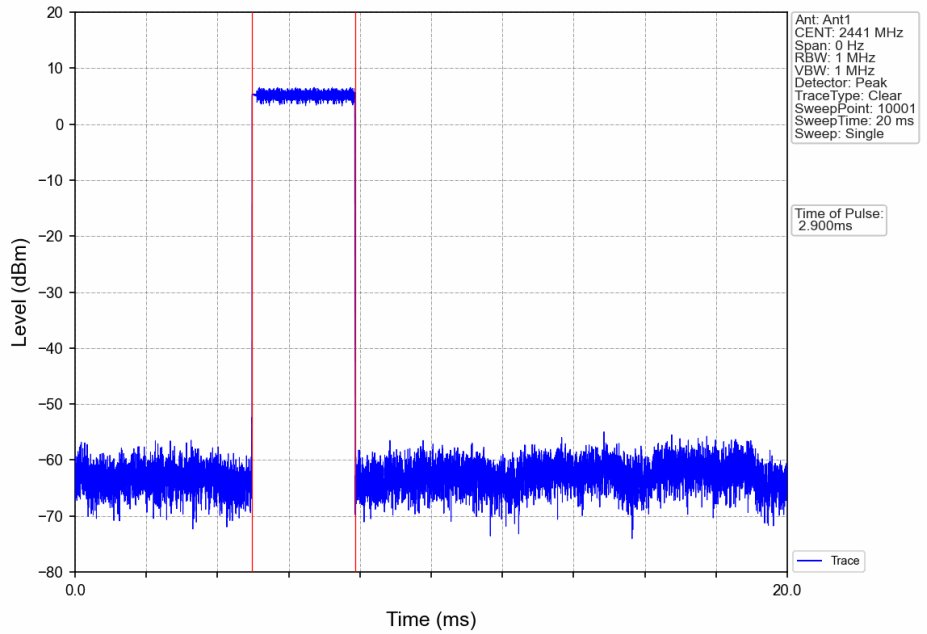


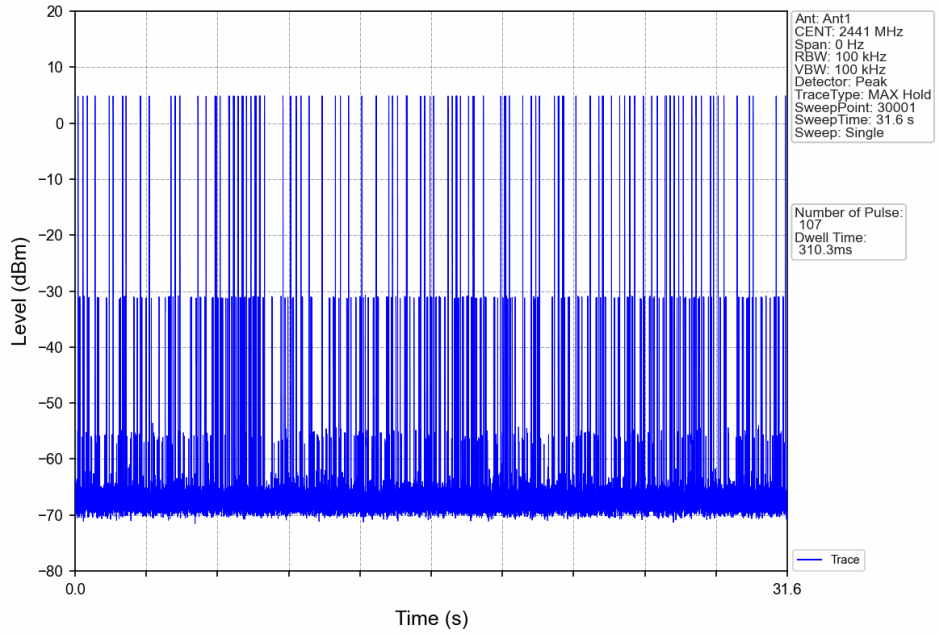
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV


Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

8DPSK_3DH5_HOPP_Ant1_NTNV


8DPSK_3DH5_HOPP_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.7 Spurious RF Conducted Emissions

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector, Sweep = auto, Span = wide enough to capture the peak level of the in-band emission and all spurious emissions, Trace = max hold. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.
4. Measure and record the results in the test report.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency.

Limit

According to §15.247(d), Spurious RF Conducted Emissions limit as below:

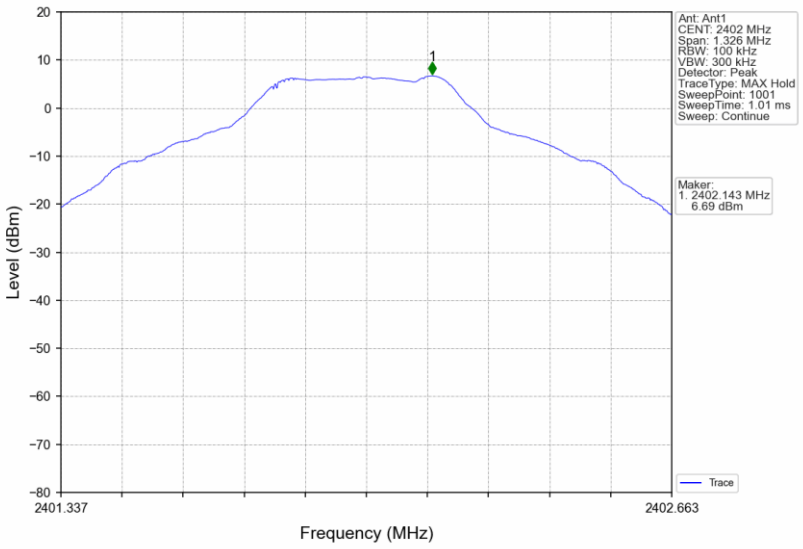
Frequency Range MHz	Limit (dBc)
30-25000	-20

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

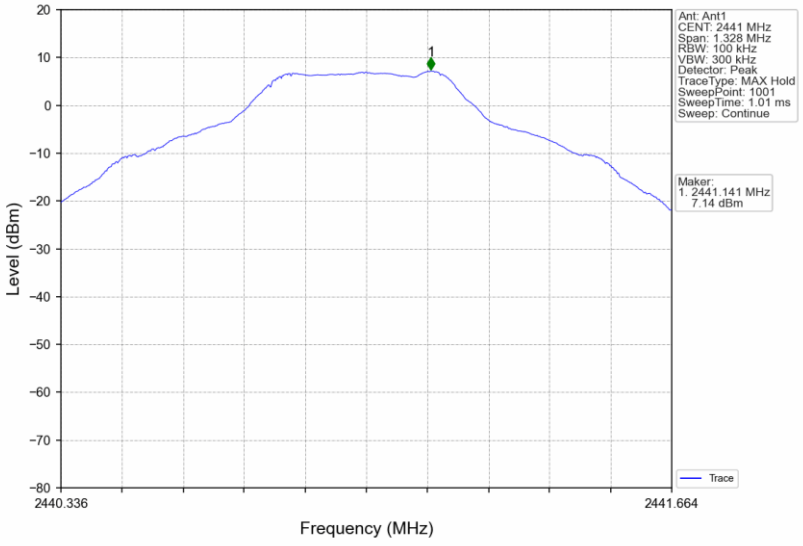
Spurious RF Conducted Emissions

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	6.69	-13.31	Pass
		2441	DH5	1	7.14	-12.86	Pass
		2480	DH5	1	5.69	-14.31	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	4.72	-15.28	Pass
		2441	2DH5	1	5.15	-14.85	Pass
		2480	2DH5	1	3.91	-16.09	Pass
8DPSK	SISO	2402	3DH5	1	4.84	-15.16	Pass
		2441	3DH5	1	5.24	-14.76	Pass
		2480	3DH5	1	3.89	-16.11	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.							

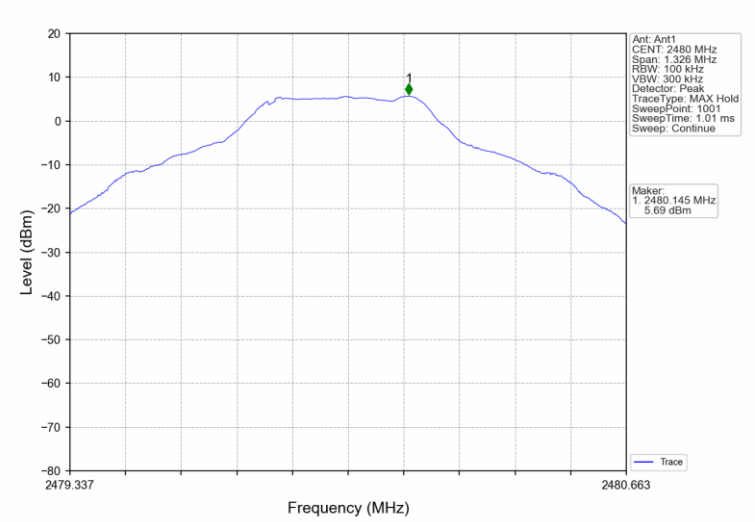
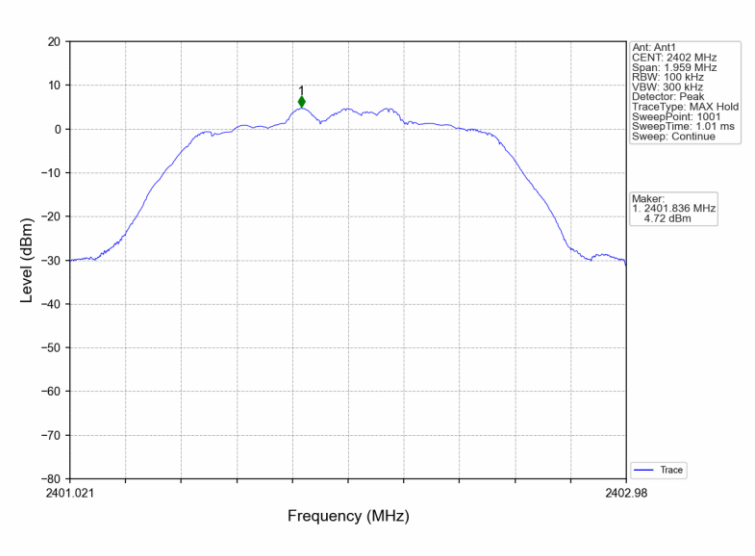
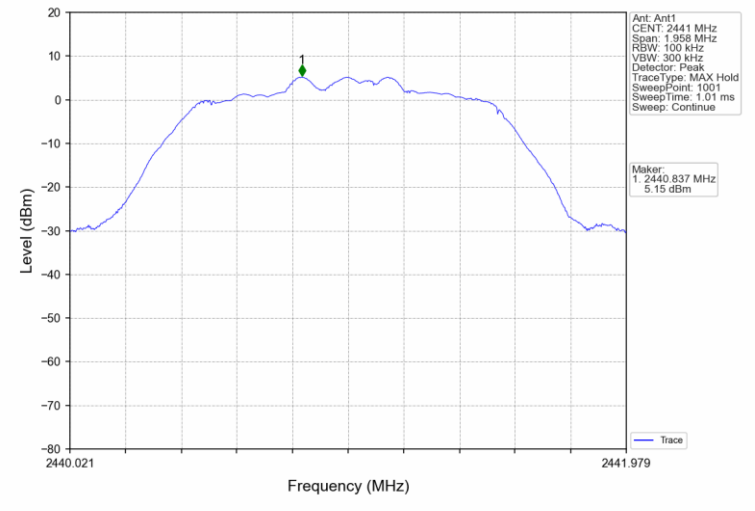
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



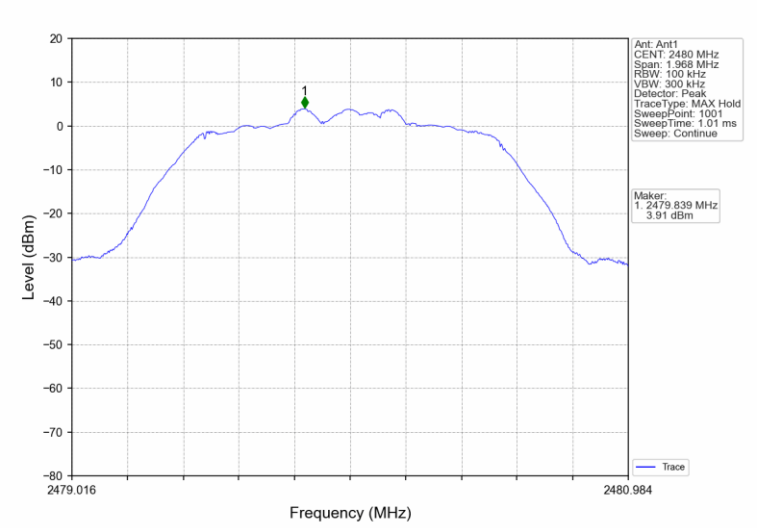
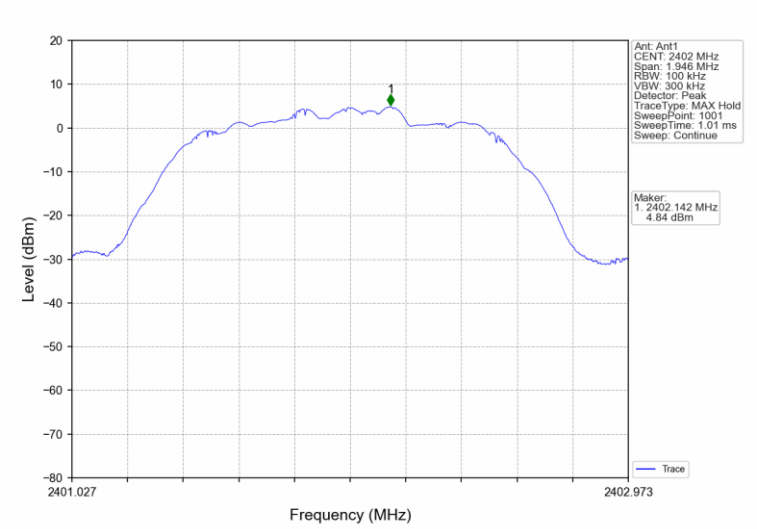
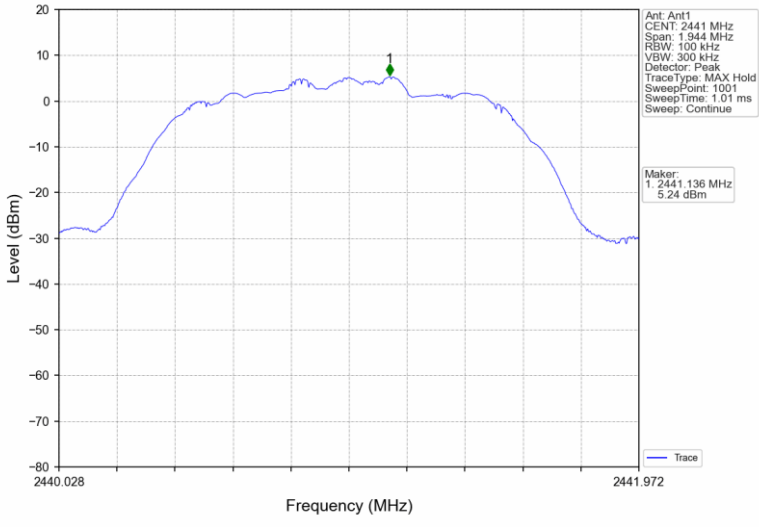
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



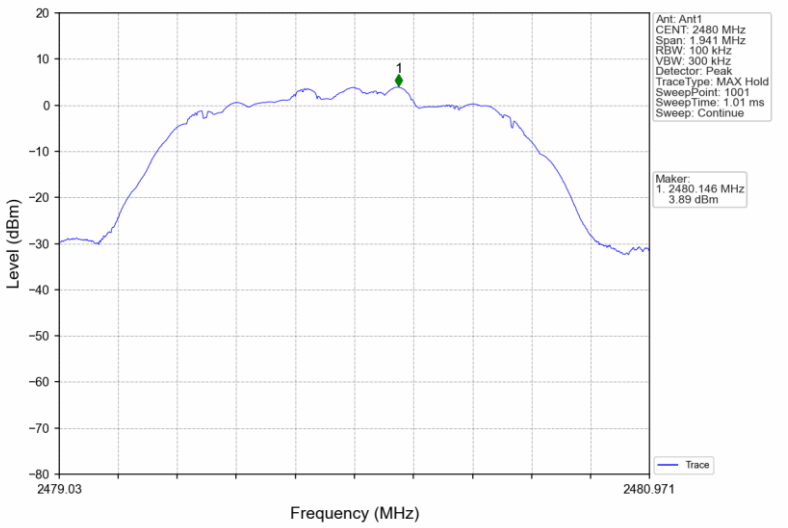
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

GFSK_DH5_HCH_2480MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV


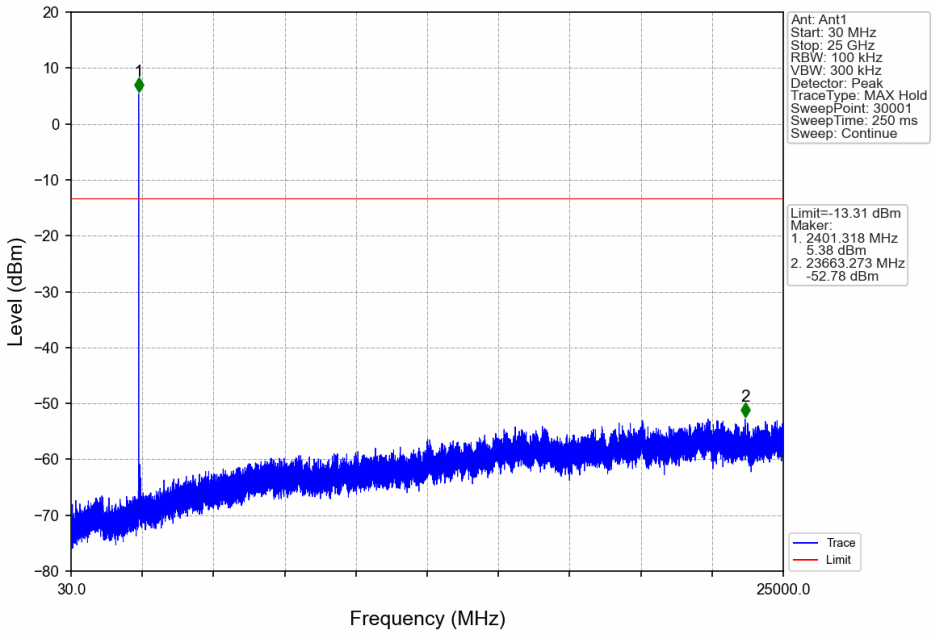
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV


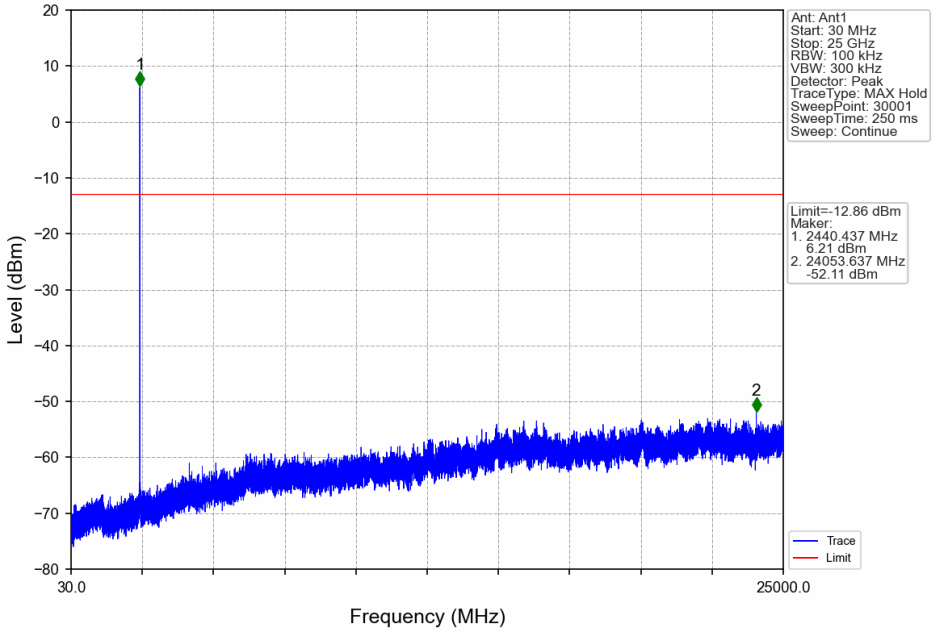
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

CSE：

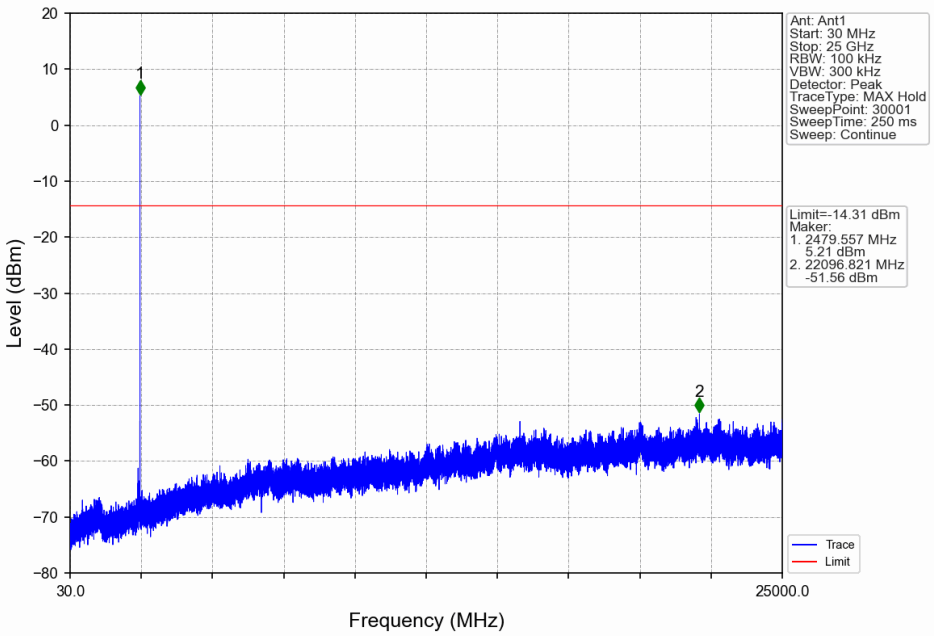
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



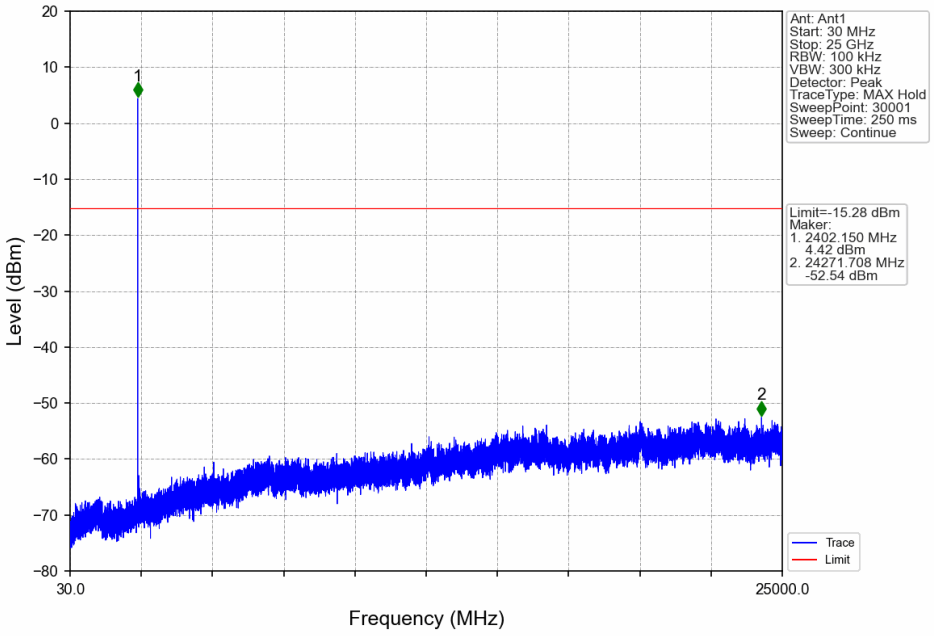
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



GFSK_DH5_HCH_2480MHz_Ant1_NTNV

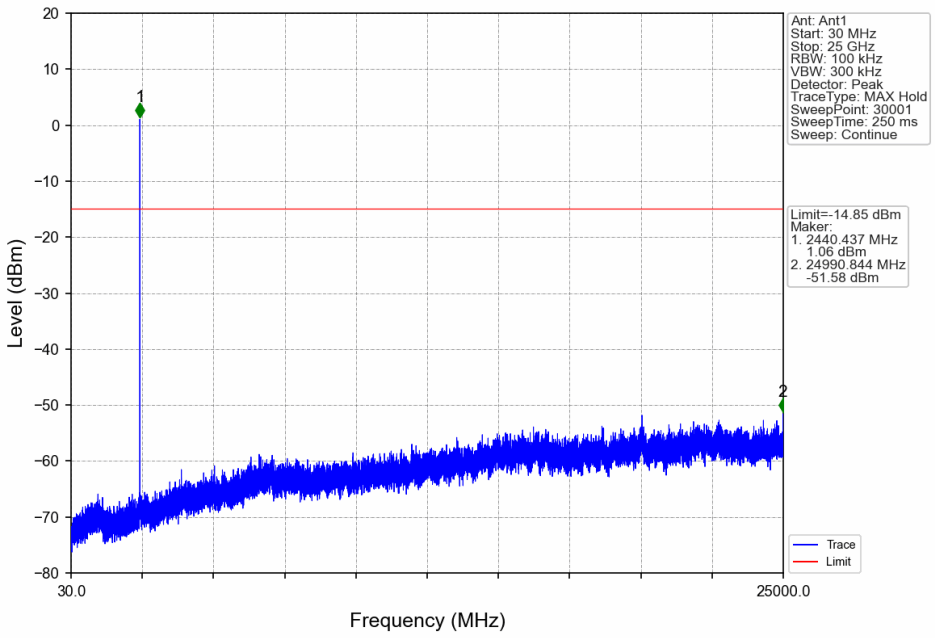


Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

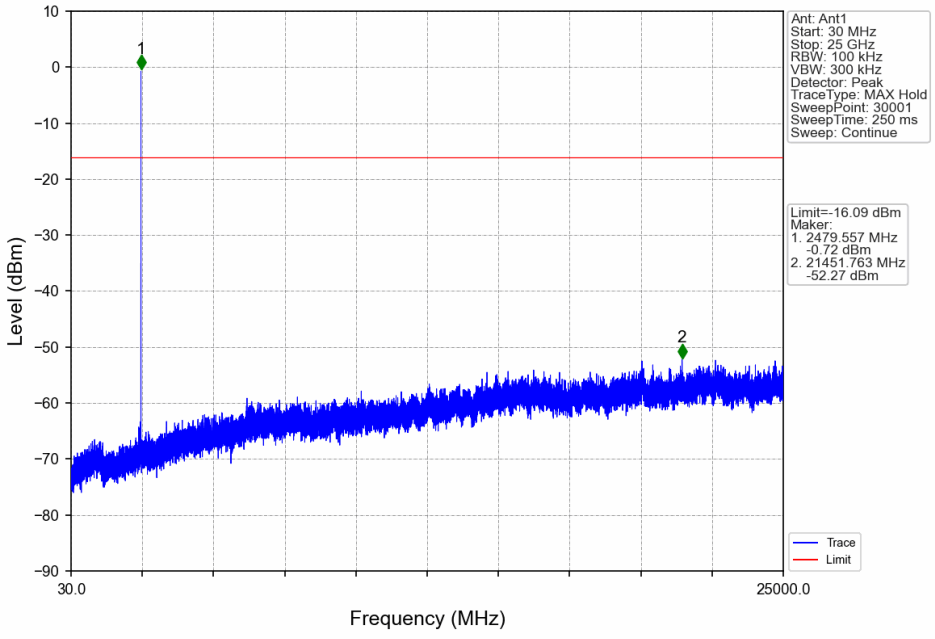


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

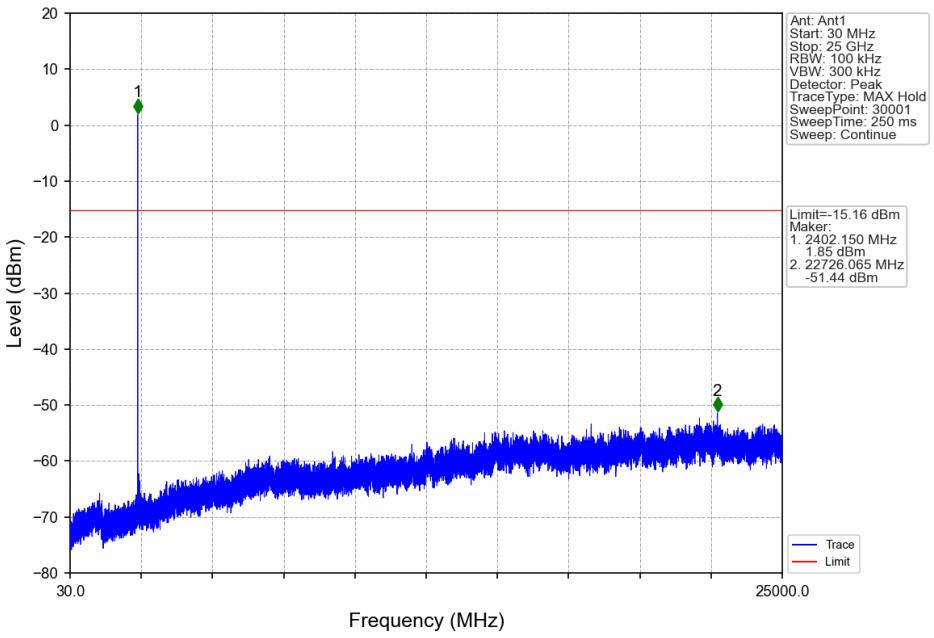
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



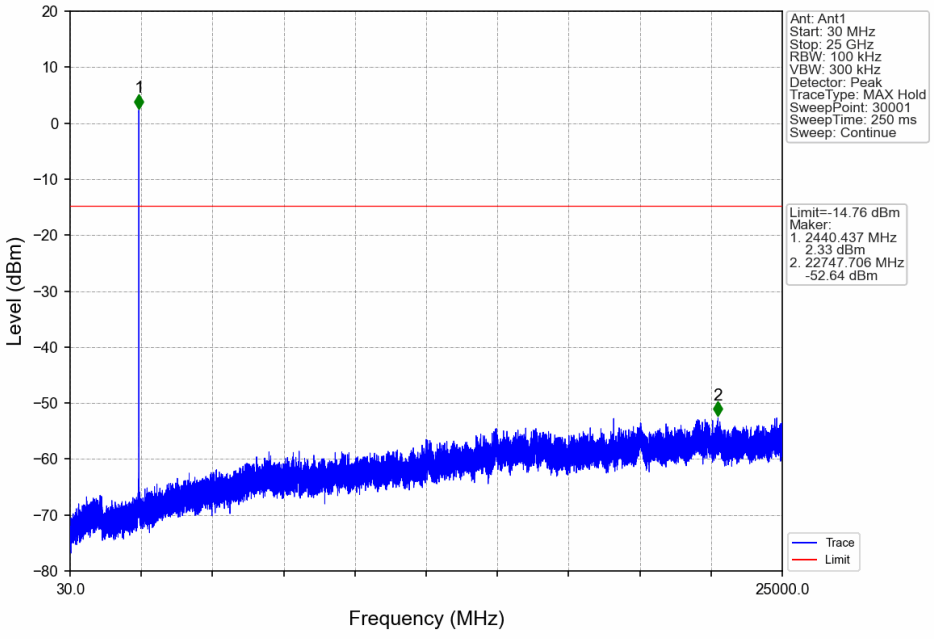
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

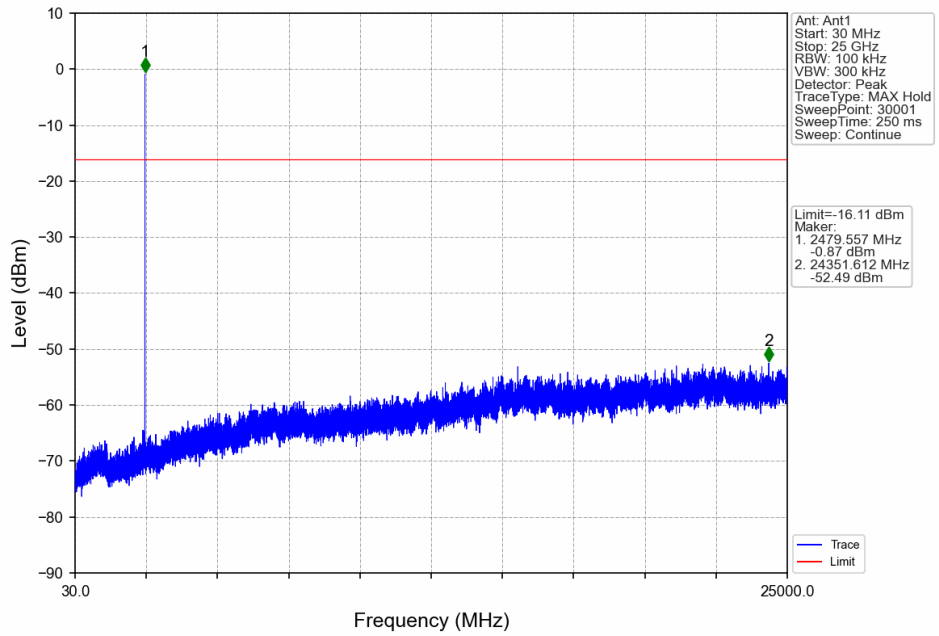


8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.8 Band Edge Testing

Test Method

1. The RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously. Set the EUT to the lowest frequency channel.
3. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector, Trace: Max hold, Sweep time: Coupled, Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation. Allow the trace to stabilize.
4. Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, and then use the marker-to-peak function to move the marker to the peak of the in-band emission.
5. Set the EUT to the highest frequency channel and repeat step 2) to 4)
6. Enable the EUT hopping mode, repeat the test.

Limit:
According to §15.247(d), Band Edge limit as below:

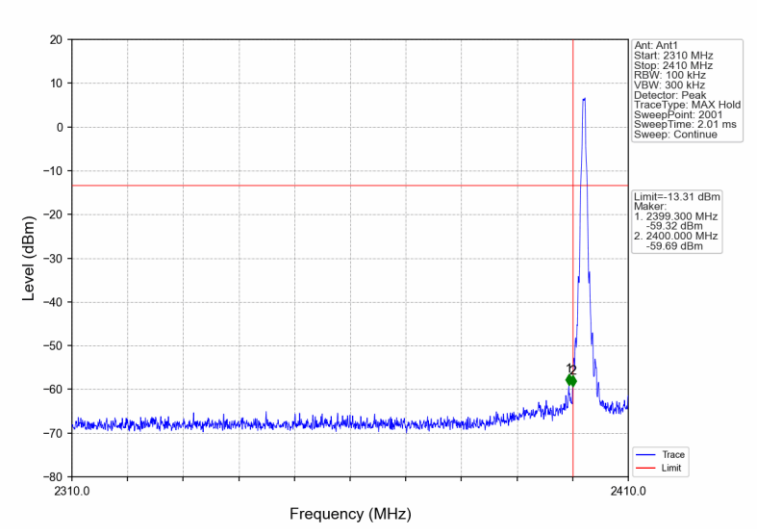
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

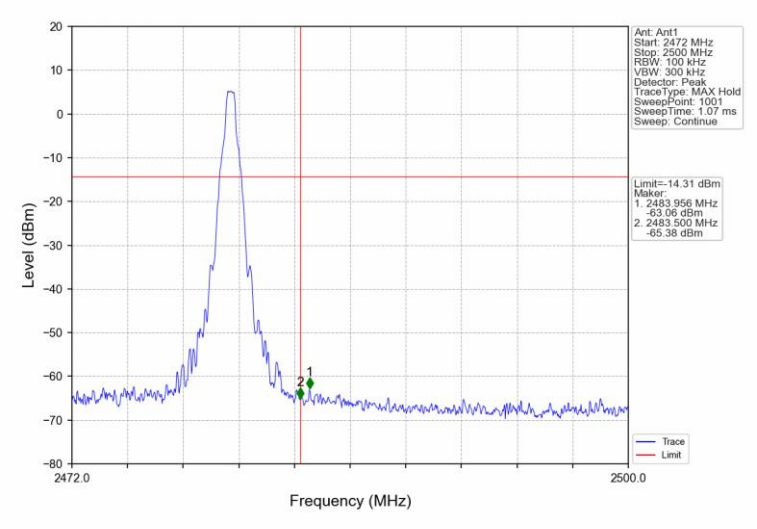
Band Edge

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	6.69	-13.31	Pass
		2441	DH5	1	7.14	-12.86	Pass
		2480	DH5	1	5.69	-14.31	Pass
		HOPP	DH5	1	7.09	-12.91	Pass
					7.09	-12.91	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	4.72	-15.28	Pass
		2441	2DH5	1	5.15	-14.85	Pass
		2480	2DH5	1	3.91	-16.09	Pass
		HOPP	2DH5	1	5.39	-14.61	Pass
					5.39	-14.61	Pass
8DPSK	SISO	2402	3DH5	1	4.84	-15.16	Pass
		2441	3DH5	1	5.24	-14.76	Pass
		2480	3DH5	1	3.89	-16.11	Pass
		HOPP	3DH5	1	5.53	-14.47	Pass
					5.53	-14.47	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.							

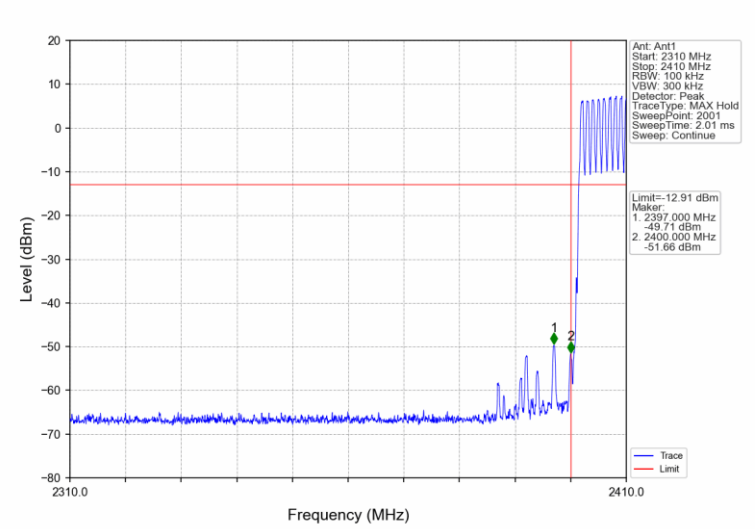
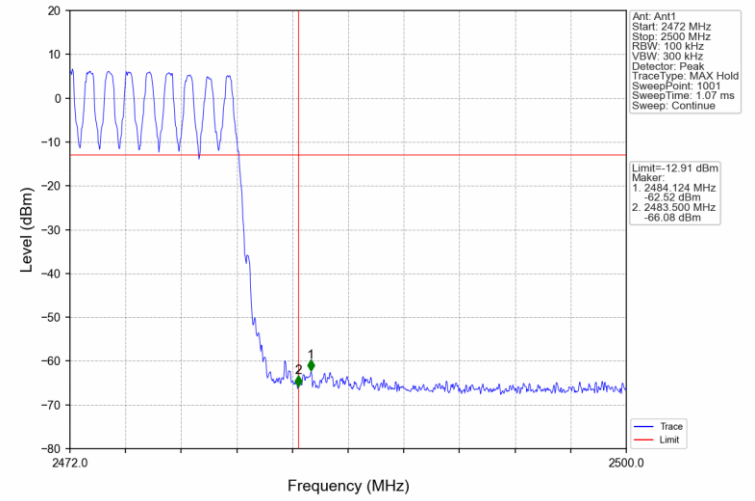
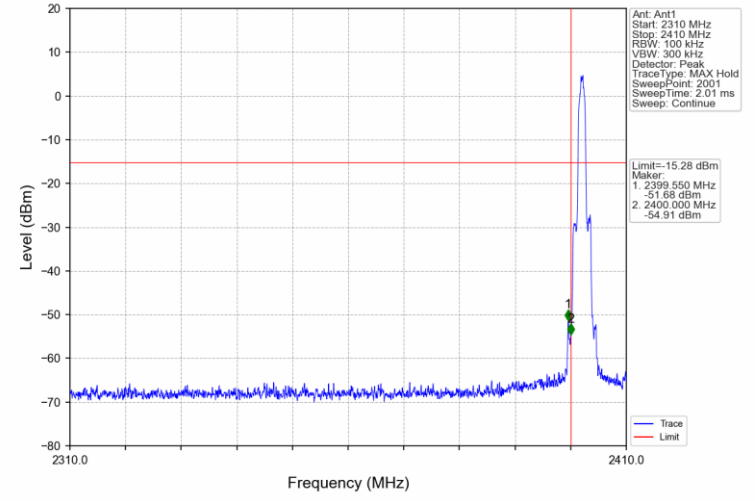
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



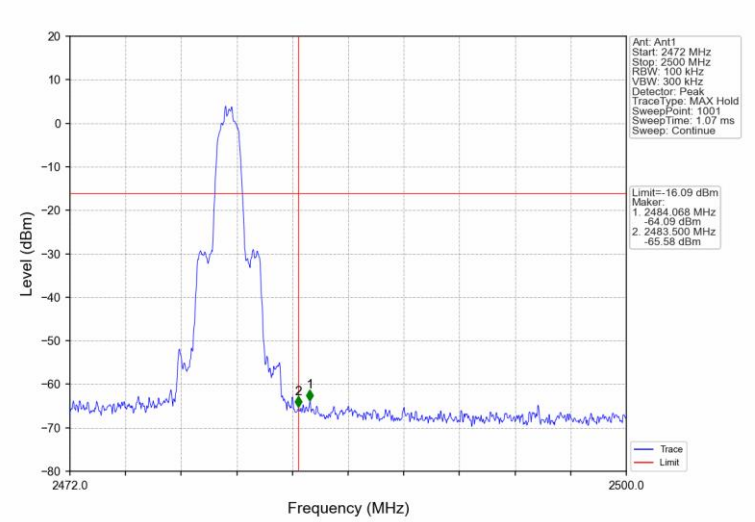
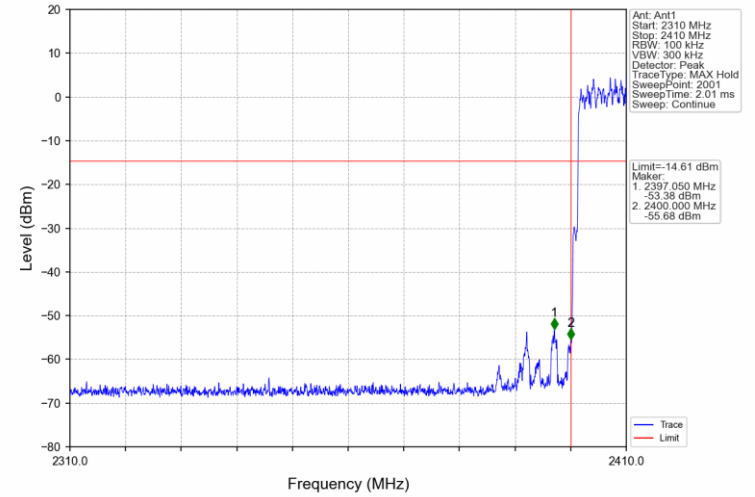
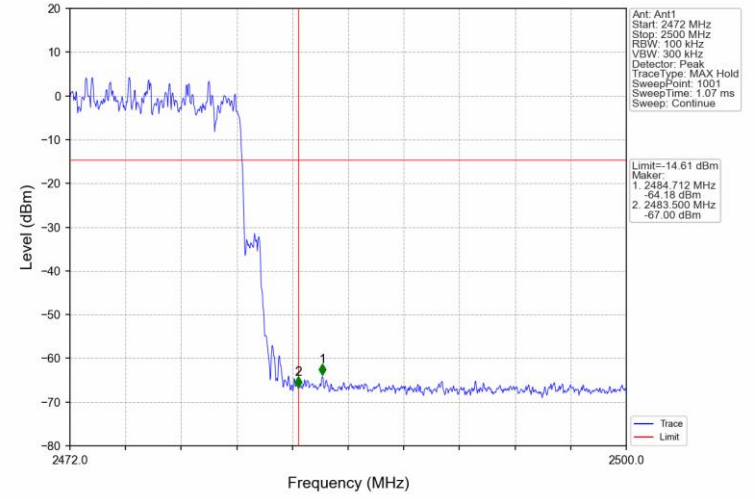
GFSK_DH5_HCH_2480MHz_Ant1_NTNV

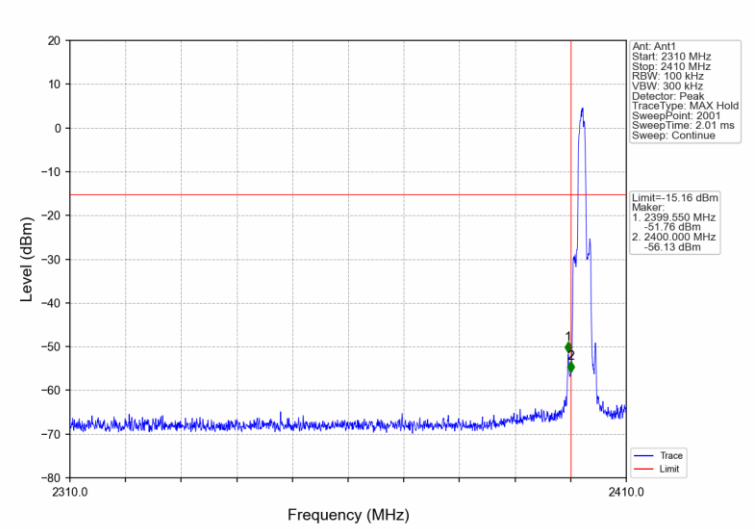
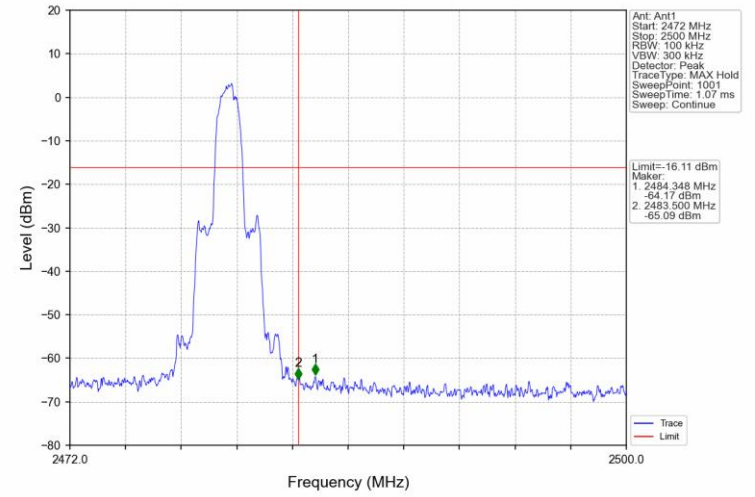
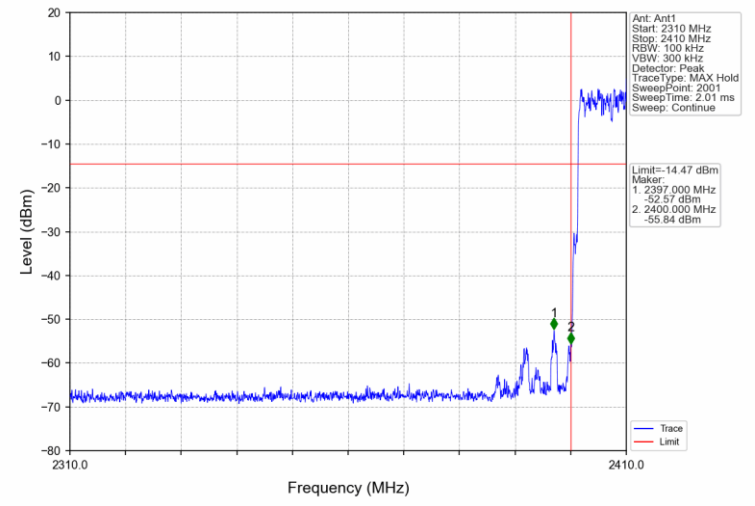


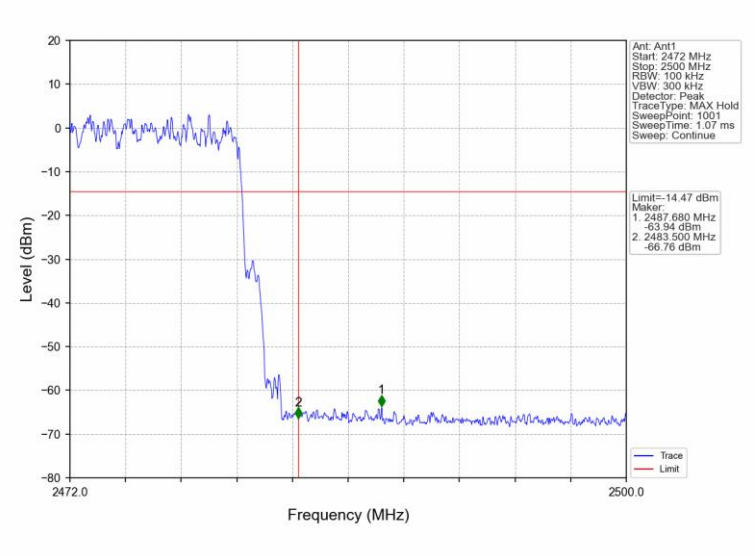
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

GFSK_DH5_HOPP_Ant1_NTNV

GFSK_DH5_HOPP_Ant1_NTNV

Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV


8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV

8DPSK_3DH5_HOPP_Ant1_NTNV


8DPSK_3DH5_HOPP_Ant1_NTNV


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

9.9 Spurious Radiated Emissions for Transmitter

Test Method

1. The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
4. The height of antenna 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.
5. 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.
6. Use the following test receiver settings According to C63.10:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz to 120KHz for f < 1 GHz; VBW≥ RBW; Sweep = auto; Detector function = QP; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥1 GHz for peak measurement.
   For average measurement:
   The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
   The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
7. Repeat above procedures until all frequencies measured were complete.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Spurious Radiated Emissions for Transmitter

Limit

The radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength μV/m	Field Strength dBμV/m	Detector	Measurement distance meters
0.009-0.490	2400/F(kHz)	48.5-13.8	AV	300
0.490-1.705	24000/F(kHz)	33.8-23.0	QP	30
1.705-30	30	29.5	QP	30
30-88	100	40	QP	3
88-216	150	43.5	QP	3
216-960	200	46	QP	3
960-1000	500	54	QP	3
Above 1000	500	54	AV	3
Above 1000	5000	74	PK	3

Note 1: Limit 3m(dBμV/m)=Limit 300m(dBμV/m)+40Log(300m/3m) (Below 30MHz)
Note 2: Limit 3m(dBμV/m)=Limit 30m(dBμV/m)+40Log(30m/3m) (Below 30MHz)

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

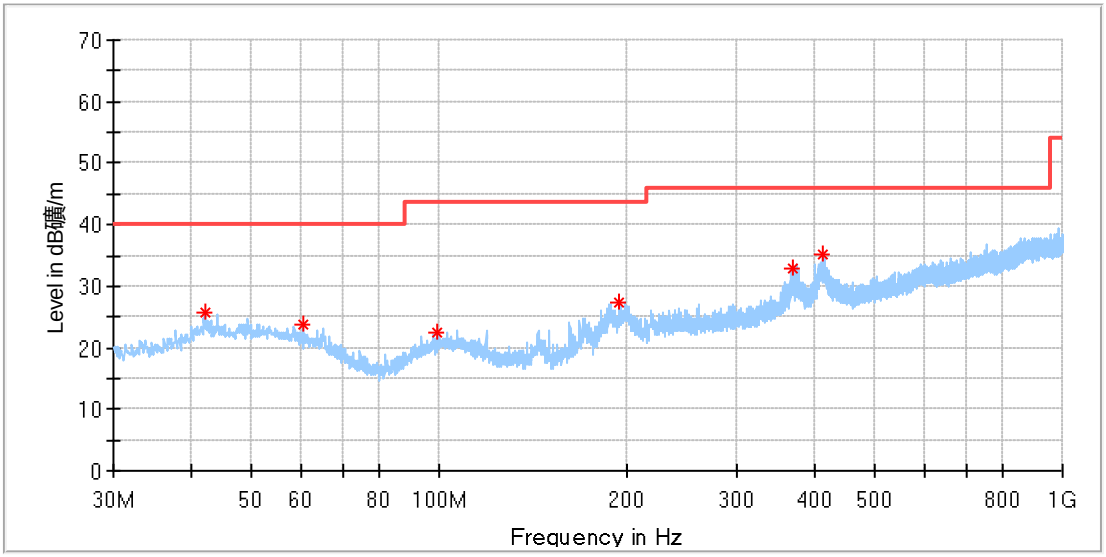
Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worse case (which is subject to the maximum EIRP, 8DPSK mode) test result is listed in the report.

Transmitting spurious emission test result as below:

Test data_30MHz to 1000MHz



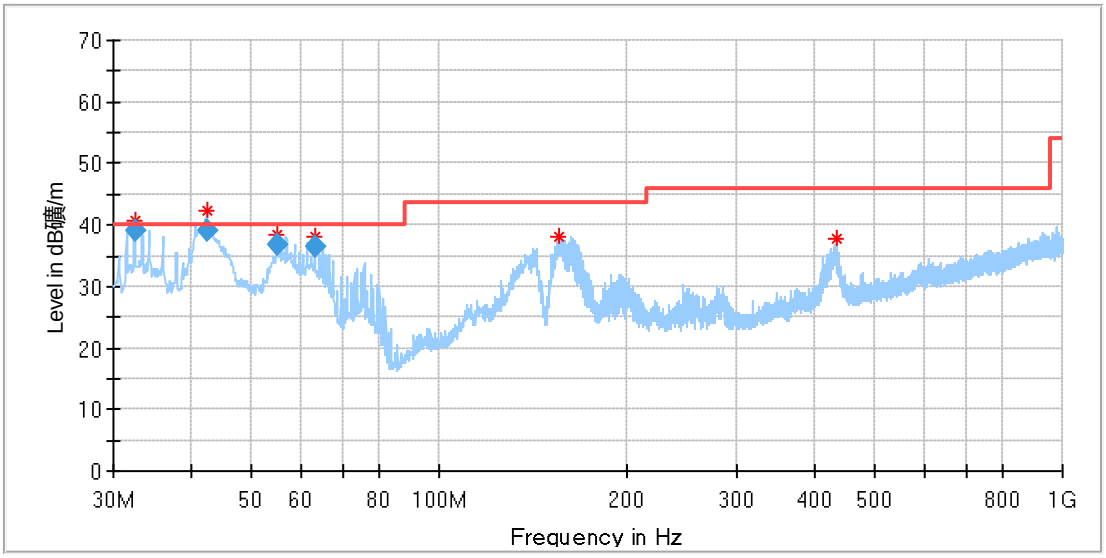
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
42.003750	25.62	40.00	14.38	100.0	H	0.0	19.81
60.312500	23.82	40.00	16.18	200.0	H	208.0	19.60
99.536875	22.45	43.50	21.05	200.0	H	302.0	18.85
194.718125	27.29	43.50	16.21	100.0	H	9.0	19.02
370.045625	33.03	46.00	12.97	100.0	H	195.0	22.99
411.573750	35.22	46.00	10.78	200.0	H	0.0	24.30

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299



Critical_Freqs

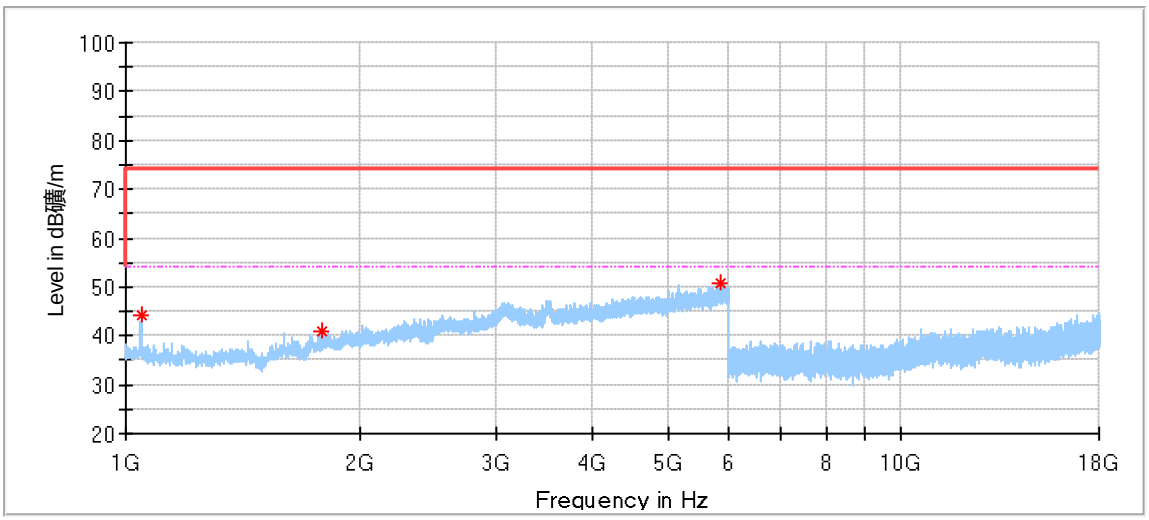
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.485625	40.61	40.00	-0.61	100.0	V	244.0	16.68
42.428125	42.24	40.00	-2.24	100.0	V	47.0	19.90
55.038125	38.28	40.00	1.72	100.0	V	175.0	20.51
63.101250	38.21	40.00	1.79	100.0	V	209.0	18.87
155.190625	38.21	43.50	5.29	100.0	V	244.0	15.59
433.459375	37.65	46.00	8.35	100.0	V	315.0	24.80

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.485625	39.00	40.00	1.00	100.0	V	244.0	16.68
42.428125	39.20	40.00	0.80	100.0	V	47.0	19.90
55.038125	36.70	40.00	3.30	100.0	V	175.0	20.51
63.101250	36.40	40.00	3.60	100.0	V	209.0	18.87

Test data 1GHz to 18GHz:

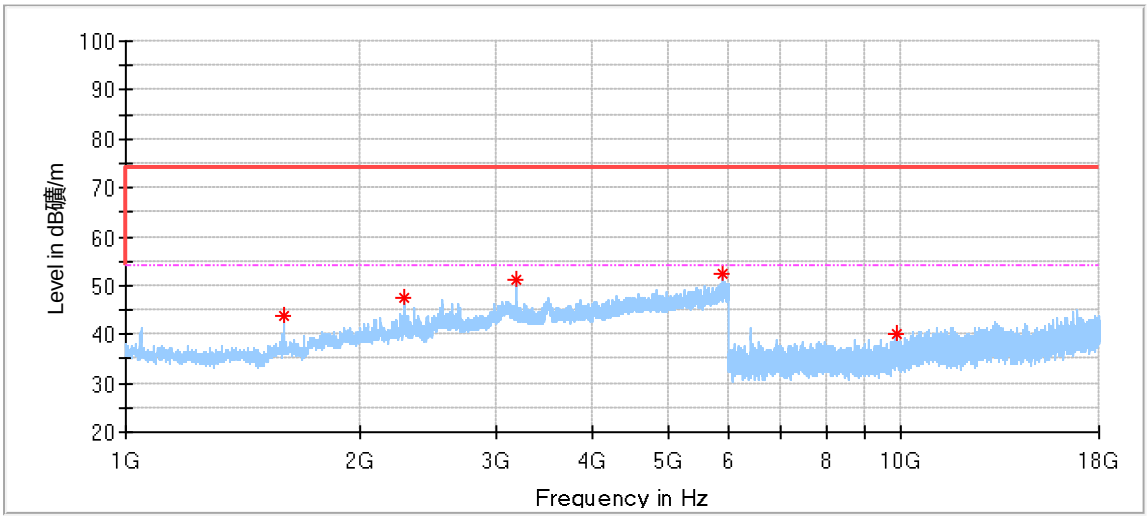
DH5_2402MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1047.500000	44.05	74.00	29.95	150.0	H	228.0	-8.58
1789.000000	40.95	74.00	33.05	150.0	H	312.0	-5.44
5855.000000	50.58	74.00	23.42	150.0	H	240.0	6.70

DH5_2402MHz - Vertical:

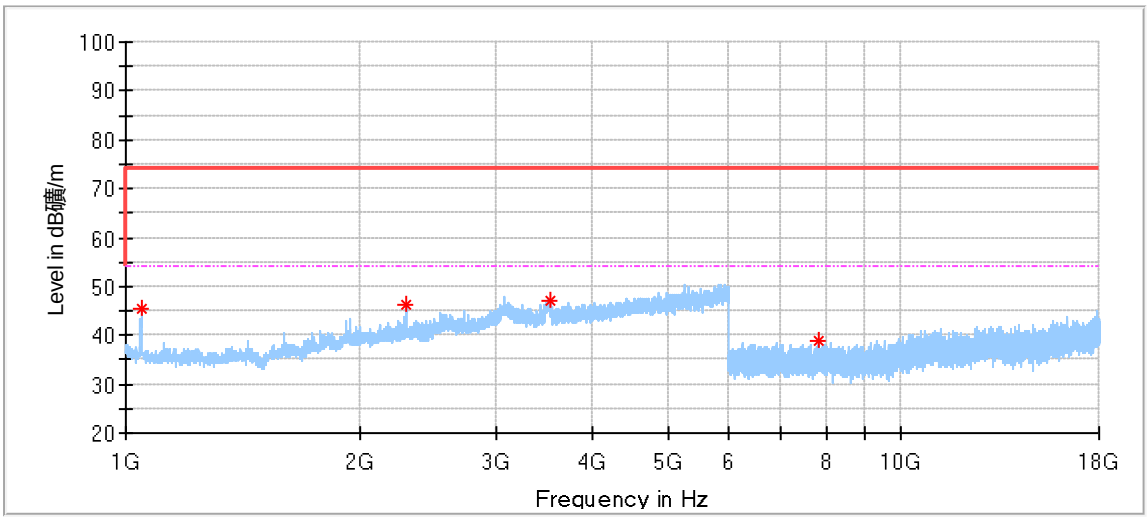


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1597.000000	43.66	74.00	30.34	150.0	V	177.0	-7.24
2290.000000	47.30	74.00	26.70	150.0	V	165.0	-3.57
3191.500000	51.14	74.00	22.86	150.0	V	225.0	0.41
5869.500000	52.33	74.00	21.67	150.0	V	201.0	6.79
9883.000000	40.14	74.00	33.86	150.0	V	328.0	8.38

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

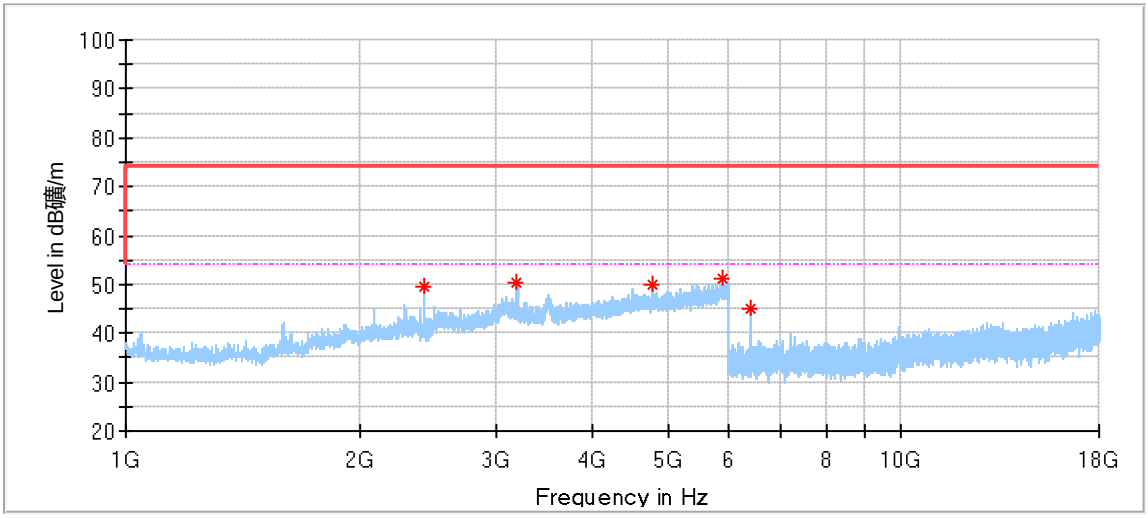
DH5_2441MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1047.500000	45.27	74.00	28.73	150.0	H	237.0	-8.58
2296.000000	46.22	74.00	27.78	150.0	H	177.0	-3.55
3520.000000	47.02	74.00	26.98	150.0	H	273.0	2.62
7835.500000	38.77	74.00	35.23	150.0	H	327.0	6.37

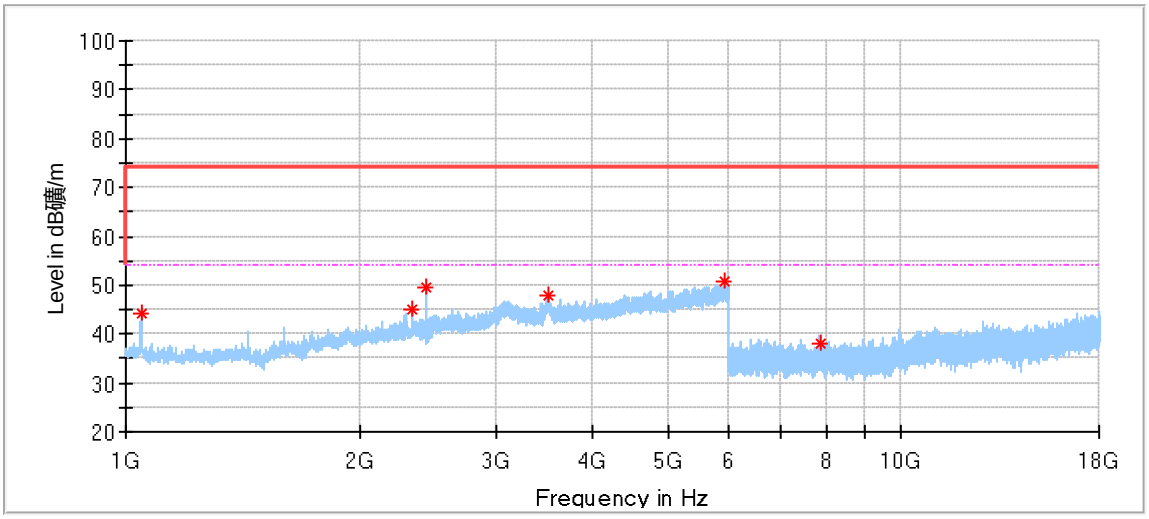
DH5_2441MHz - Vertical:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2425.500000	49.55	74.00	24.45	150.0	V	177.0	-2.38
3192.500000	50.49	74.00	23.51	150.0	V	225.0	0.41
4786.500000	49.95	74.00	24.05	150.0	V	201.0	3.96
5869.000000	51.26	74.00	22.74	150.0	V	34.0	6.78
6396.000000	44.96	74.00	29.04	150.0	V	180.0	5.34

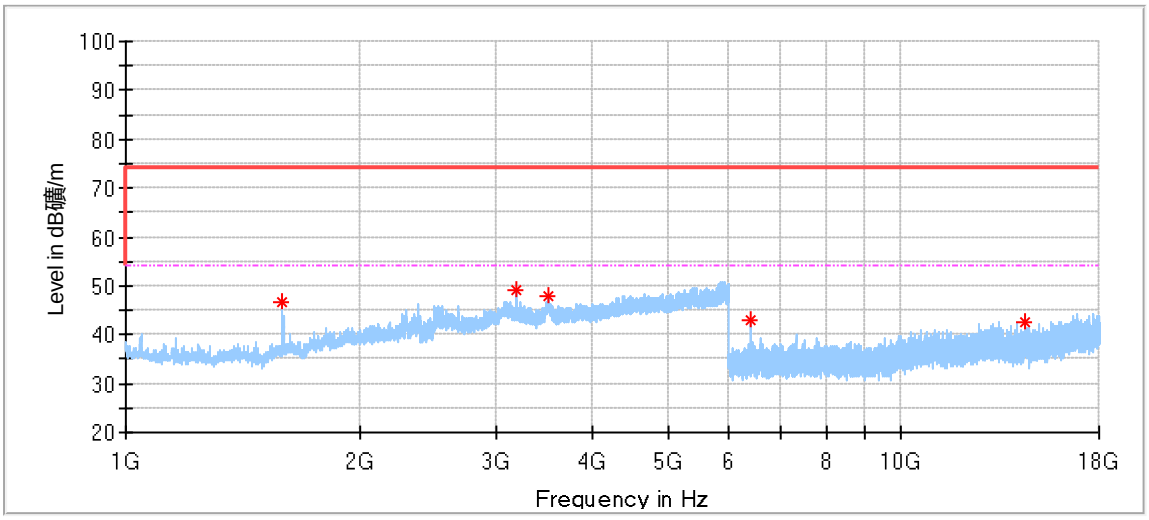
DH5_2480MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1048.500000	44.13	74.00	29.87	150.0	H	228.0	-8.59
2338.000000	45.03	74.00	28.97	150.0	H	168.0	-3.29
2438.000000	49.70	74.00	24.30	150.0	H	216.0	-2.25
3501.000000	47.78	74.00	26.22	150.0	H	168.0	3.71
5915.000000	50.95	74.00	23.05	150.0	H	168.0	6.87
7856.000000	37.88	74.00	36.12	150.0	H	81.0	6.37

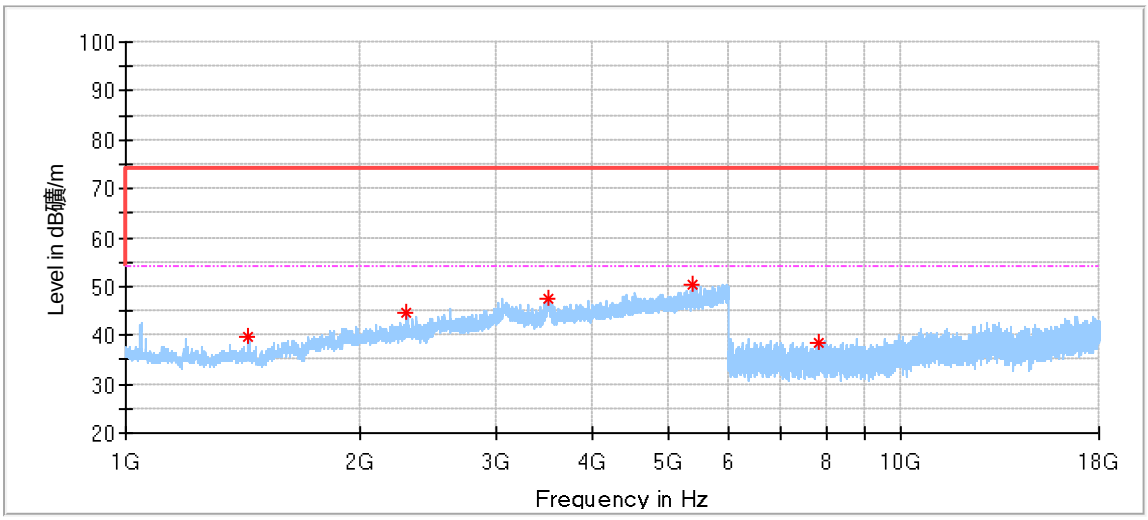
DH5_2480MHz - Vertical:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1593.000000	46.75	74.00	27.25	150.0	V	189.0	-7.30
3196.500000	48.93	74.00	25.07	150.0	V	225.0	0.39
3498.500000	48.07	74.00	25.93	150.0	V	46.0	3.65
6378.000000	43.05	74.00	30.95	150.0	V	202.0	5.33
14477.000000	42.39	74.00	31.61	150.0	V	128.0	11.98

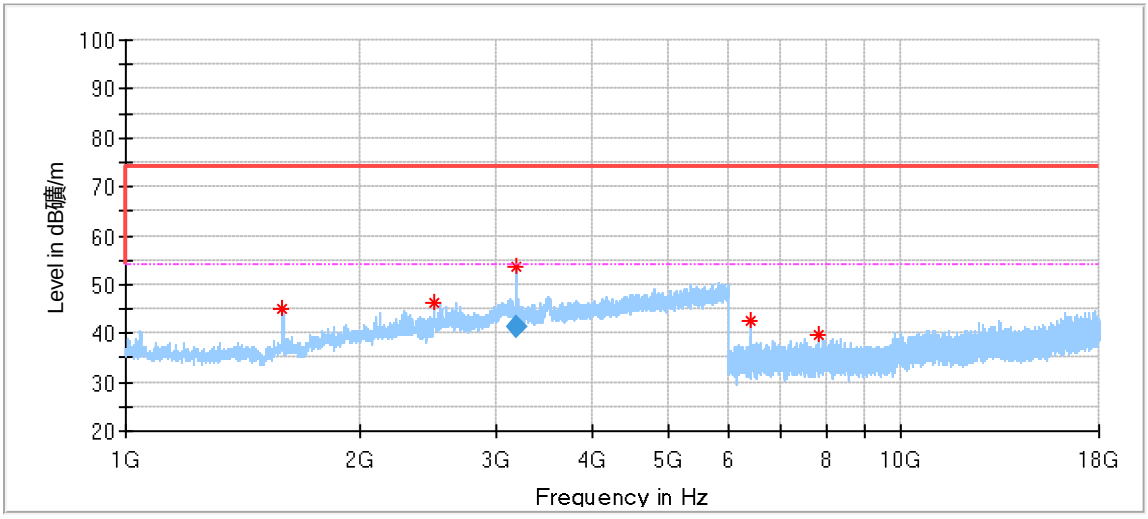
3DH5_2402MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1439.500000	39.88	74.00	34.12	150.0	H	192.0	-8.85
2301.000000	44.63	74.00	29.37	150.0	H	180.0	-3.53
3511.000000	47.60	74.00	26.40	150.0	H	156.0	3.14
5393.500000	50.50	74.00	23.50	150.0	H	84.0	5.44
7833.000000	38.41	74.00	35.59	150.0	H	327.0	6.36

3DH5_2402MHz - Vertical:



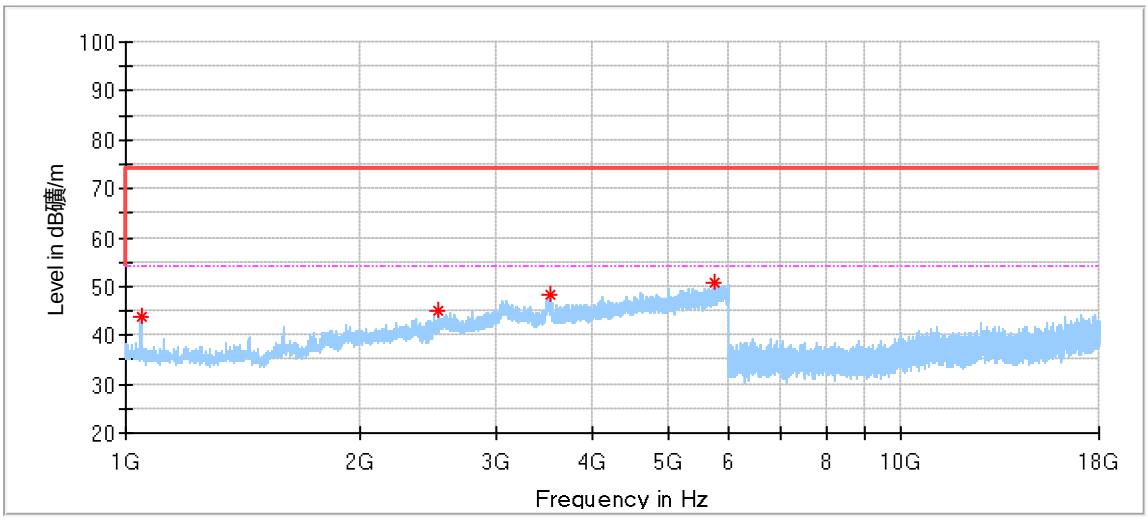
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1594.500000	45.23	74.00	28.77	150.0	V	192.0	-7.28
2497.500000	46.17	74.00	27.83	150.0	V	180.0	-2.09
3190.000000	53.59	74.00	20.41	150.0	V	156.0	0.42
6400.000000	42.73	74.00	31.27	150.0	V	107.0	5.34
7848.000000	39.78	74.00	34.22	150.0	V	350.0	6.37

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3190.000000	41.26	54.00	12.74	150.0	V	156.0	0.42

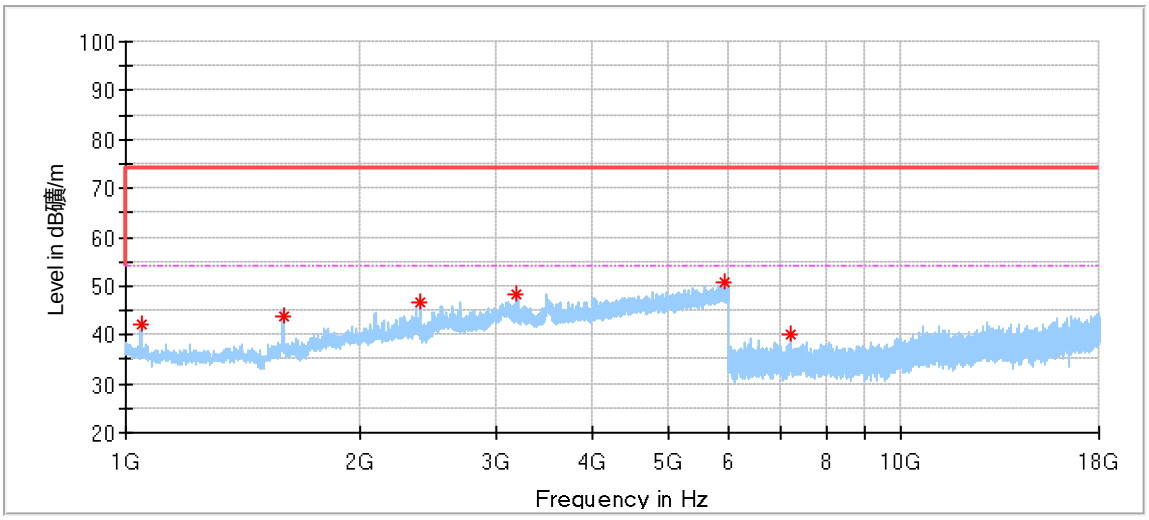
3DH5_2441MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1047.000000	43.61	74.00	30.39	150.0	H	228.0	-8.58
2530.500000	45.15	74.00	28.85	150.0	H	192.0	-1.81
3528.500000	48.40	74.00	25.60	150.0	H	347.0	2.12
5748.000000	50.82	74.00	23.18	150.0	H	0.0	5.94

3DH5_2441MHz - Vertical:

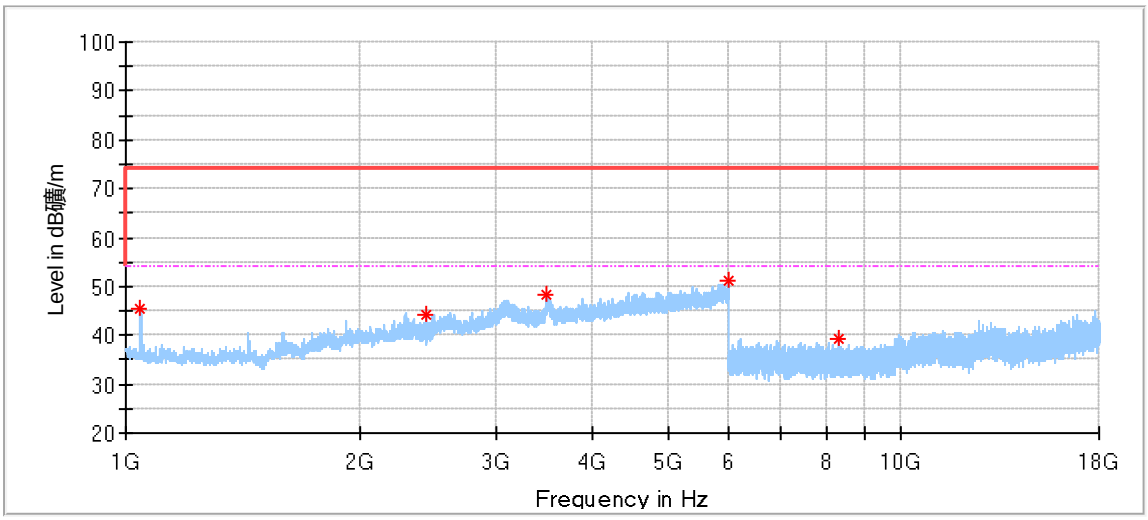


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1049.500000	41.95	74.00	32.05	150.0	V	216.0	-8.60
1595.000000	43.63	74.00	30.37	150.0	V	228.0	-7.28
2390.500000	46.64	74.00	27.36	150.0	V	228.0	-2.80
3186.000000	48.40	74.00	25.60	150.0	V	216.0	0.44
5924.500000	50.78	74.00	23.22	150.0	V	276.0	6.87
7197.500000	40.17	74.00	33.83	150.0	V	206.0	5.67

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

3DH5_2480MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1045.500000	45.33	74.00	28.67	150.0	H	228.0	-8.56
2445.500000	44.07	74.00	29.93	150.0	H	216.0	-2.17
3481.000000	48.28	74.00	25.72	150.0	H	204.0	2.40
5980.500000	51.04	74.00	22.96	150.0	H	144.0	6.90
8291.000000	39.35	74.00	34.65	150.0	H	0.0	6.58

3DH5_2480MHz - Vertical:

Remark:

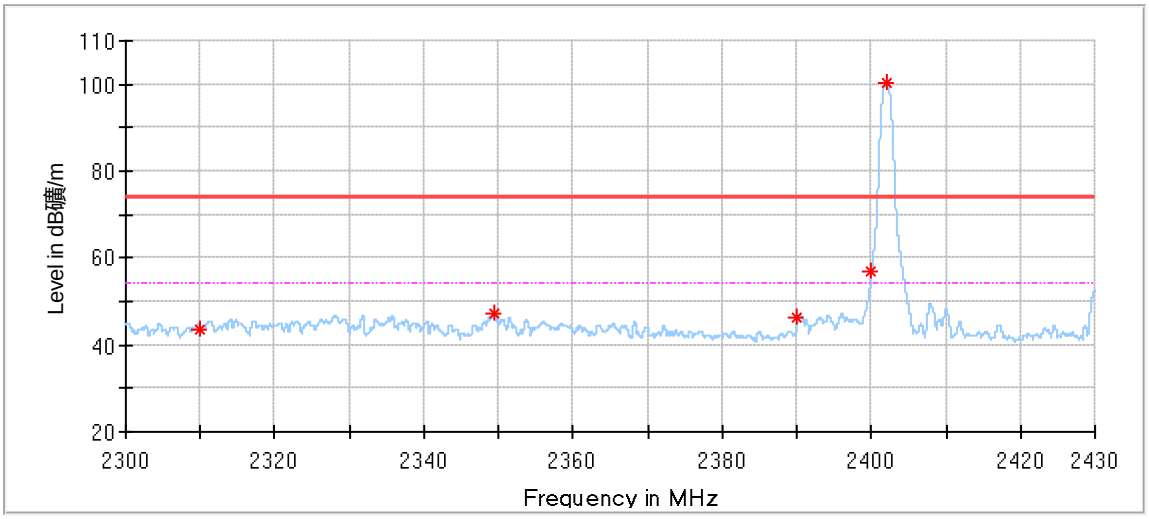
(1) Data of measurement within frequency range 9kHz-30MHz are the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured, so test data does not present in this report.

(2) Corrected Amplitude = Read level + Corrector factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Emissions at Restricted Band:

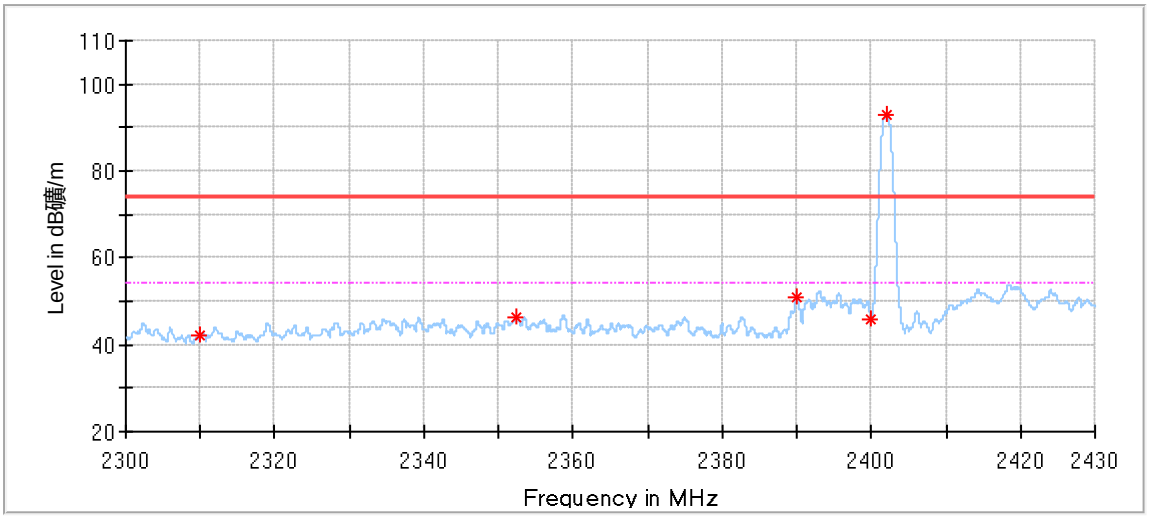
DH5_2402MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2310.000000	43.46	74.00	30.54	150.0	H	2.0	-4.05
2349.328000	47.18	74.00	26.82	150.0	H	7.0	-3.82
2390.000000	46.36	74.00	27.64	150.0	H	2.0	-3.35
2400.000000	56.90	74.00	17.10	150.0	H	56.0	-3.32
2402.144000	100.20	74.00	-26.20	150.0	H	56.0	-3.30

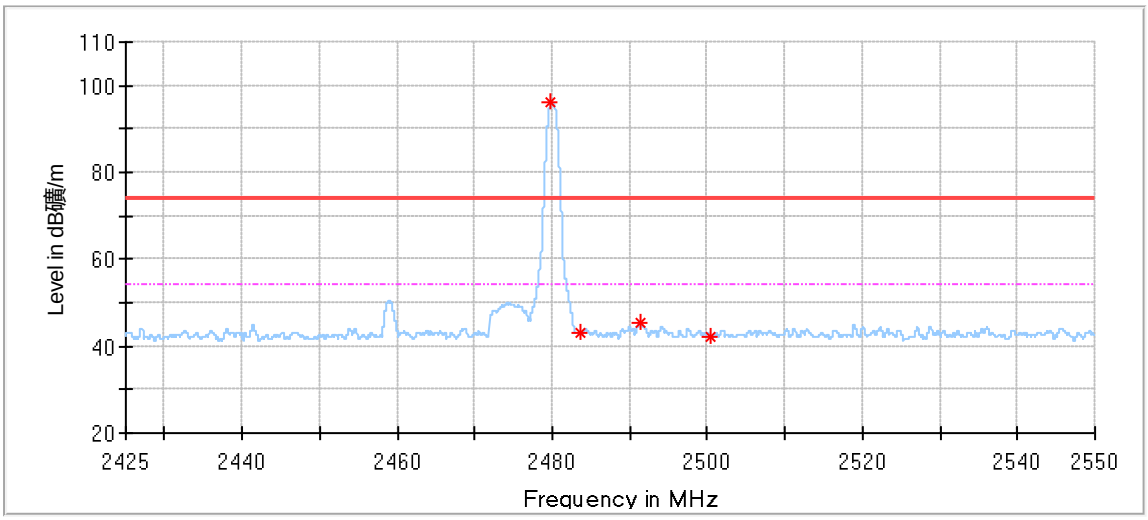
DH5_2402MHz - Vertical:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2310.000000	42.11	74.00	31.89	150.0	V	38.0	-4.05
2352.304000	46.20	74.00	27.80	150.0	V	38.0	-3.78
2390.000000	50.88	74.00	23.12	150.0	V	49.0	-3.36
2400.000000	45.73	74.00	28.27	150.0	V	285.0	-3.32
2402.144000	93.00	74.00	-19.00	150.0	V	285.0	-3.30

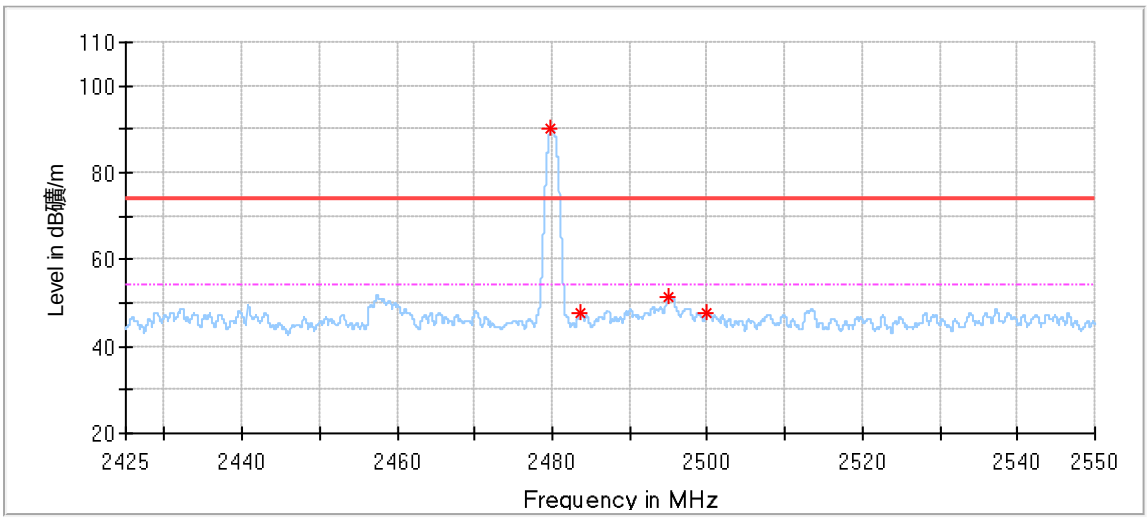
DH5_2480MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2479.837500	96.09	74.00	-22.09	150.0	H	22.0	-2.69
2483.537500	42.85	74.00	31.15	150.0	H	0.0	-2.68
2491.412500	45.19	74.00	28.81	150.0	H	0.0	-2.66
2500.337500	42.22	74.00	31.78	150.0	H	212.0	-2.64

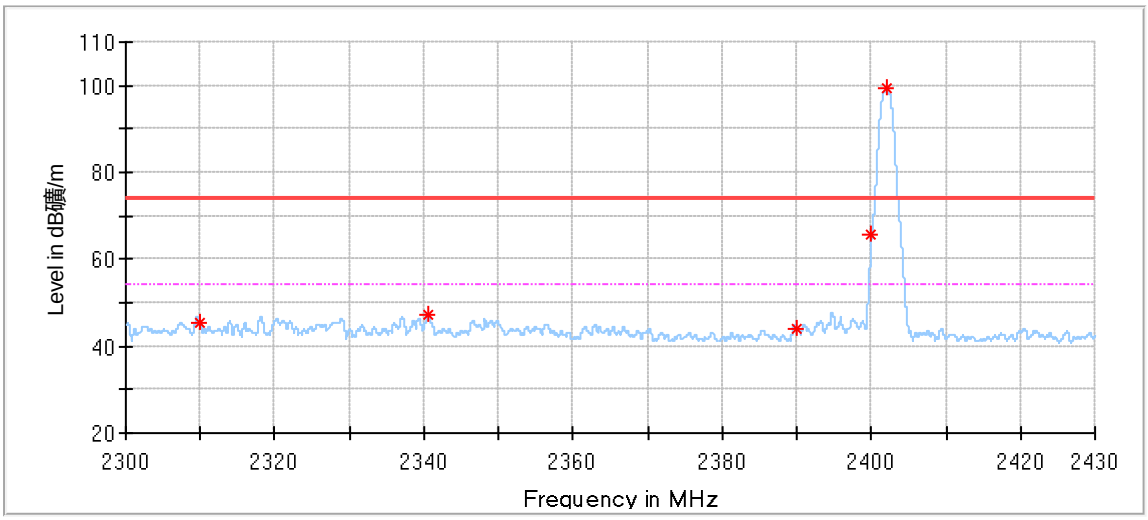
DH5_2480MHz - Vertical:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2479.850000	90.08	74.00	-16.08	150.0	V	285.0	-2.69
2483.500000	47.57	74.00	26.43	150.0	V	348.0	-2.68
2495.112500	51.57	74.00	22.43	150.0	V	0.0	-2.65
2500.000000	47.56	74.00	26.44	150.0	V	1.0	-2.64

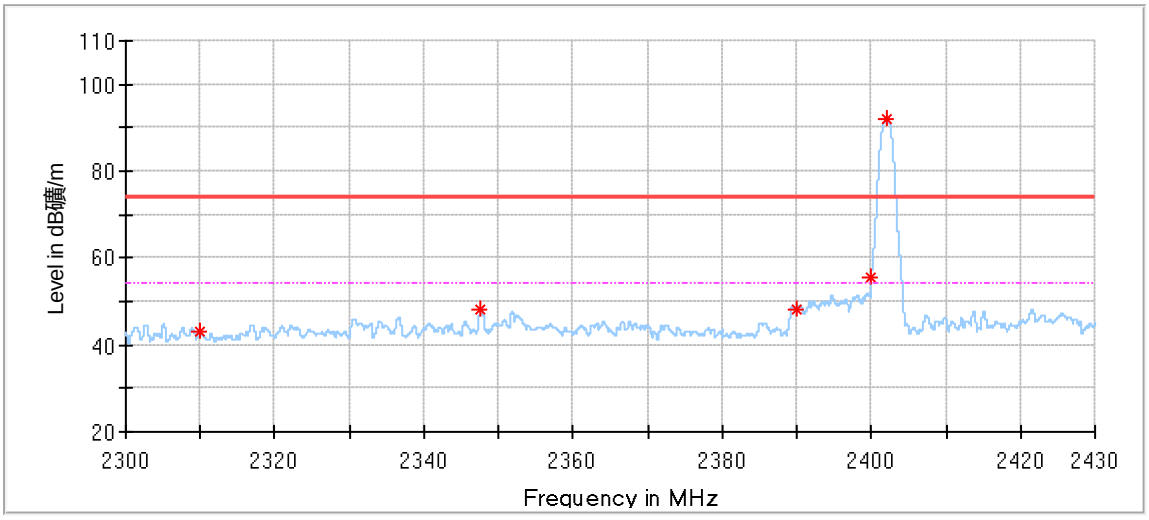
3DH5_2402MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2310.000000	45.48	74.00	28.52	150.0	H	0.0	-4.05
2340.560000	47.24	74.00	26.76	150.0	H	0.0	-3.89
2390.000000	44.00	74.00	30.00	150.0	H	87.0	-3.36
2400.000000	65.64	74.00	8.36	150.0	H	49.0	-3.32
2402.016000	99.28	74.00	-25.28	150.0	H	49.0	-3.30

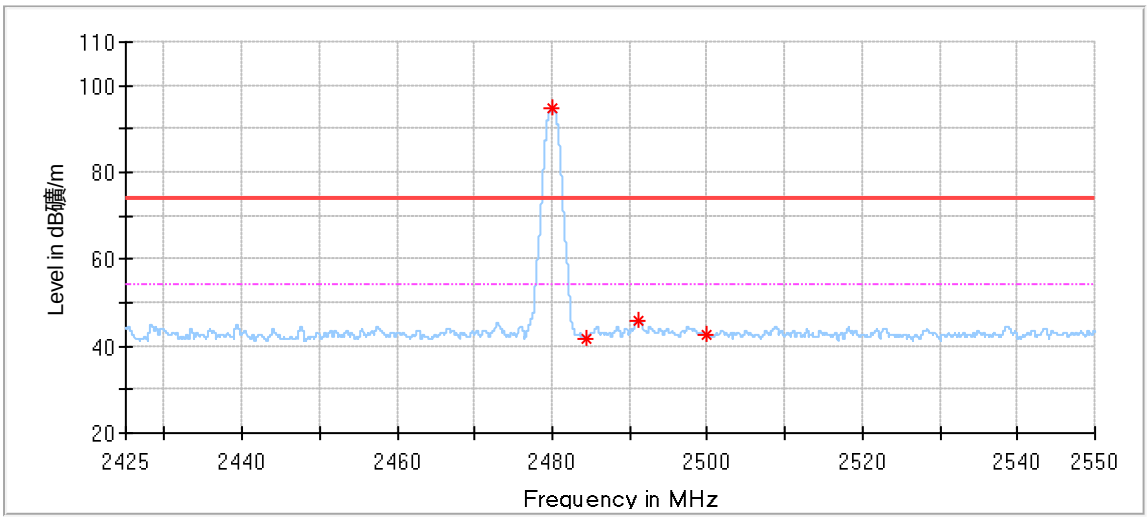
3DH5_2402MHz - Vertical:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2309.000000	43.04	74.00	30.96	150.0	V	309.0	-4.05
2347.664000	48.16	74.00	25.84	150.0	V	40.0	-3.83
2390.000000	48.12	74.00	25.88	150.0	V	0.0	-3.36
2400.000000	55.68	74.00	18.32	150.0	V	61.0	-3.32
2402.000000	91.86	74.00	-17.86	150.0	V	61.0	-3.30

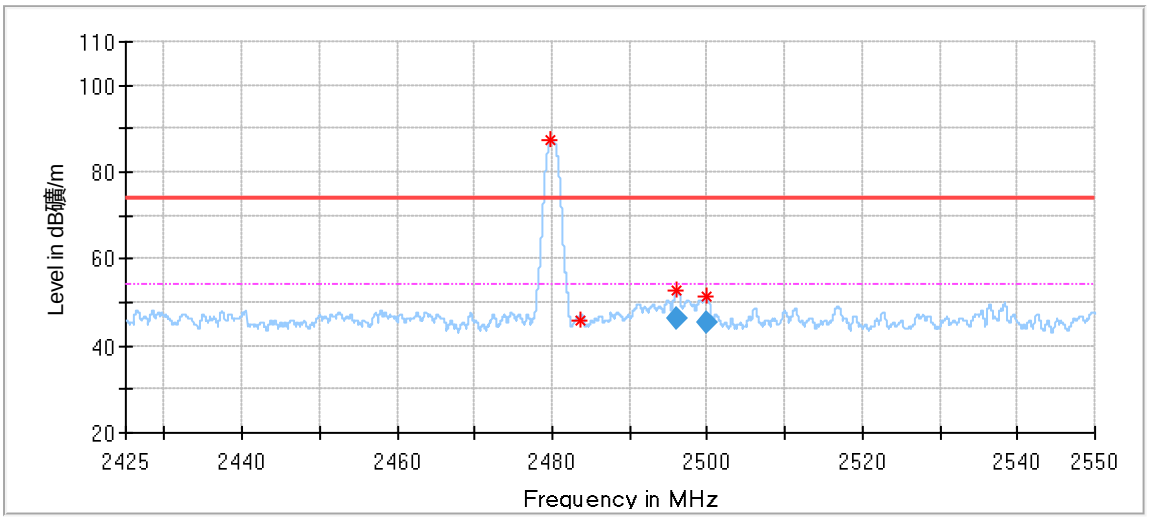
3DH5_2480MHz - Horizontal:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2480.000000	94.81	74.00	-20.81	150.0	H	31.0	-2.69
2484.500000	41.89	74.00	32.11	150.0	H	201.0	-2.68
2491.200000	45.90	74.00	28.10	150.0	H	74.0	-2.66
2500.000000	42.69	74.00	31.31	150.0	H	285.0	-2.64

3DH5_2480MHz - Vertical:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2479.837500	87.27	74.00	-13.27	150.0	V	288.0	-2.69
2483.500000	45.85	74.00	28.15	150.0	V	350.0	-2.68
2496.137500	52.78	74.00	21.22	150.0	V	0.0	-2.65
2500.000000	51.20	74.00	22.80	150.0	V	0.0	-2.64

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2496.137500	46.53	54.00	7.47	150.0	V	0.0	-2.65
2500.000000	45.39	54.00	8.61	150.0	V	0.0	-2.64

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

10 Test Equipment List

Radiated Emission Test, SAC-3 #1

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 7	68-4-74-19-001	102176	1	2025-5-13
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	68-4-80-14-002	707	1	2025-7-2
Horn Antenna	Rohde & Schwarz	HF907	68-4-80-14-005	102294	1	2025-5-27
Loop Antenna	Rohde & Schwarz	HFH2-Z2	68-4-80-14-006	100398	1	2025-7-24
Pre-amplifier	Rohde & Schwarz	SCU 18	68-4-29-14-001	102230	1	2025-5-11
Attenuator	Mini-circuits	UNAT-6+	68-4-81-21-001	15542	1	2025-5-11
Cable	HUBER-SUHNER	RG214	68-4-90-14-001-A20	----	----	----
Cable	HUBER-SUHNER	RG214	68-4-90-14-001-A21	----	----	----
Cable	JUNFLON	MWX221	68-4-90-14-001-A22	----	----	----
3m Semi-anechoic chamber	TDK	SAC-3 #1	68-4-90-14-001	----	3	2026-10-25
Test software	Rohde & Schwarz	EMC32	68-4-90-14-001-A10	Version10.35.02	N/A	N/A

RF Conducted Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	68-4-48-14-001	108272	1	2025-5-11
Vector Signal Generator	Rohde & Schwarz	SMBV100A	68-4-48-18-001	262825	1	2025-5-11
Signal Analyzer	Rohde & Schwarz	FSV40	68-4-74-14-004	101030	1	2025-5-11
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157W	68-4-93-14-003	101226/100929	1	2025-5-11
Power Splitter	Weinschel	1580	68-4-85-14-001	SC319	1	2025-5-11
10dB Attenuator	Weinschel	4M-10	68-4-81-14-003	43152	1	2025-5-11
RF Meas. and Switch Matrix Unit	TST PASS	TSCB3023R2	68-4-93-23-001	2811685c	1	2025-5-11
Frequency Extender	TST PASS	TSTCMWEXT7	68-4-93-23-001-A01	WEX230017C	1	2025-5-12
Frequency Extender	TST PASS	TSTSGEXT7	68-4-93-23-001-A02	EX2300BA	1	2025-5-12
Cable	JUNFLON	J12J103539	68-4-90-19-003-A20	----	----	----
Test software	TST PASS	System for BT/WIFI	68-4-93-23-001-A03	Version 2.0	N/A	N/A
Shielding Room	TDK	TS8997	68-4-90-19-003	----	3	2025-10-15

Conducted Emission Test 1# Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	68-4-74-14-001	101782	1	2025-5-13
LISN	Rohde & Schwarz	ENV4200	68-4-87-14-001	100249	1	2025-5-13
High Voltage Probe	Schwarzbeck	TK9420(VT9420)	68-4-27-14-001	9420-584	1	2025-5-12
RF Current Probe	Rohde & Schwarz	EZ-17	68-4-27-14-002	100816	1	2025-5-13
Attenuator	Shanghai Huaxiang	TS2-26-3	68-4-81-16-003	080928189	1	2025-5-11
Cable	OUQIAO	RG142	68-4-90-19-004-A20	----	----	----
Test software	Rohde & Schwarz	EMC32	68-4-90-14-003-A10	Version9.15.00	N/A	N/A
Shielding Room	TDK	CSR #1	68-4-90-19-004	----	3	2025-10-15

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission 9kHz-30MHz	4.69dB
Uncertainty for Radiated Emission 30MHz-1000MHz	Horizontal: 4.78dB Vertical: 5.85dB
Uncertainty for Radiated Spurious Emission 1000MHz-18000MHz	5.11dB
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	5.10dB
Uncertainty for Conducted RF test	RF Power Conducted: 1.31dB Frequency test involved: 0.6×10^{-8} or 1%

Measurement Uncertainty Decision Rule:
Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2023, clause 4.4.3 and 4.5.1.

---END OF REPORT---

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong, China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299