FCC - TEST REPORT

Report Number	:	**68.950.23.0016.01**	Date of Issue:	**2023-04-24**
Model	:	**DXR-8 PRO, DXR8PPZ-B, DXR8PPZ-BBU**		
Product Type	:	Wireless Digital Video Monitoring System		
Applicant	:	STANDARD MERIT INDUSTRIAL LIMITED		
Address	:	604 Kalok Building, 720 Nathan Road, Kowloon, Hong Kong		
Manufacturer	:	STANDARD MERIT INDUSTRIAL LIMITED		
Address	:	604 Kalok Building, 720 Nathan Road, Kowloon, Hong Kong		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**49**		

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.

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Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District,
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1 Table of Contents

1 Table of Contents 2
2 Details about the Test Laboratory 3
3 Description of the Equipment Under Test 4
4 Summary of Test Standards 5
5 Summary of Test Results 6
6 General Remarks 7
7 Test Setups 8
8 Systems Test Configuration 10
9 Technical Requirement 11
9.1 Conducted Emission 11
9.2 Conducted Peak Output Power 16
9.3 20 dB Bandwidth and 99% Occupied Bandwidth 19
9.4 Carrier Frequency Separation 24
9.5 Number of Hopping Frequencies 26
9.6 Dwell Time 28
9.7 Spurious RF Conducted Emissions 30
9.8 Band Edge Testing 36
9.9 Spurious Radiated Emissions for Transmitter 41
10 Test Equipment List 48
11 System Measurement Uncertainty 49

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2 Details about the Test Laboratory

Details about the Test Laboratory

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, Guangdong, 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:	Wireless Digital Video Monitoring System
Model no.:	DXR-8 PRO, DXR8PPZ-B, DXR8PPZ-BBU
FCC ID:	2AAAM-DXR8PPZ-BBU
Rating:	5.9VDC, 1A (powered by adapter)
Adapter	Adapter 1 Model: BLJ05K059100P-U Input: 100-240VAC 50/60Hz, 0.2A, Output: 5.9VDC,1000mA Manufacturer: Zhongshan Baolijin Electronic Co., Ltd. Adapter 2 Model: HP07Z-0591000-CU Input: 100-240VAC 50/60Hz, 0.3A, Output: 5.9VDC,1000mA Manufacturer: DONGGUAN HP-POWER TECHNOLOGY., LIMITED
RF Transmission Frequency:	2410.00MHz-2473.00MHz
No. of Operated Channel:	19
Modulation:	GFSK
Antenna Type:	Integrated antenna
Antenna Gain:	2.37 dBi
Remark:	Only the model DXR-8 PRO was tested, DXR-8 PRO is the system model of the product that of which consist of one camera unit and one monitor unit with the model DXRBPPZ-B. The model DXR-8 PRO is represented the coverage of one Camera unit and one Monitor with the Model DXR8PPZ-B. For DXR8PPZ-B is the model represent the individual Camera/Monitor unit only. For DXR8PPZ-BBU is the model represent the individual Camera unit only.

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2410.00	6	2427.50	11	2445.00	16	2462.50
2	2413.50	7	2431.00	12	2448.50	17	2466.00
3	2417.00	8	2434.50	13	2452.00	18	2469.50
4	2420.50	9	2438.00	14	2455.50	19	2473.00
5	2424.00	10	2441.50	15	2459.00		

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

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2021 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 (2013).

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5 Summary of Test Results

Technical Requirements		
FCC Part 15 Subpart C		
Test Condition		Test Result
§15.207	Conducted emission AC power port	Pass
§15.247(b)(1)	Conducted peak output power	Pass
§15.247(e)	Power spectral density	N/A
§15.247(a)(2)	6dB bandwidth and 99% Occupied Bandwidth	N/A
§15.247(a)(1)	20dB bandwidth and 99% Occupied Bandwidth	Pass
§15.247(a)(1)	Min. of Hopping Channel Carrier Frequency Separation	Pass
§15.247(a)(1)(iii)	Min number of hopping frequencies	Pass
§15.247(a)(1)(iii)	Dwell Time - Average Time of Occupancy	Pass
§15.247(d)	Spurious RF conducted emissions	Pass
§15.247(d)	Band edge	Pass
§15.247(d) & §15.209 &	Spurious radiated emissions for transmitter	Pass
§15.203	Antenna requirement	Pass See note 2

Note 1: N/A=Not Applicable.
Note 2: The EUT uses an Integrated antenna, which gain is 2.37 dBi. In accordance to §15.203, it is considered sufficiently to comply with the provisions of this section.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AAAM-DXR8PPZ-BBU, complies with Section 15.207, 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.

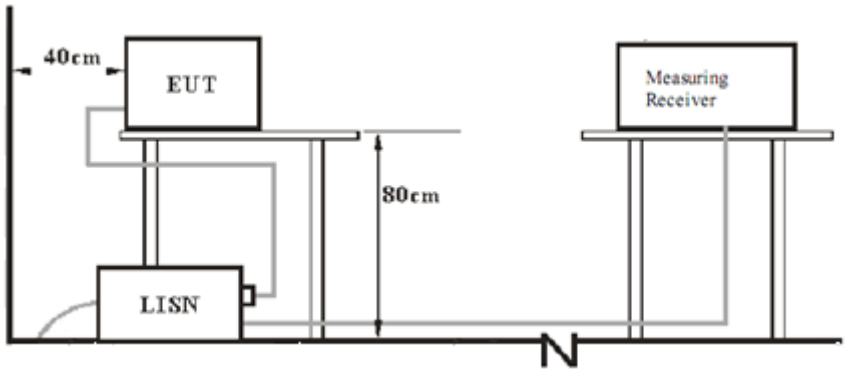
Sample Received Date:	2022-10-20
Testing Start Date:	2022-10-20
Testing End Date:	2023-04-24

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

Reviewed by:	Prepared by:	Tested by:
John Zhi	Joe Gu	Carry Cai
Section Manager	Project Engineer	Test Engineer

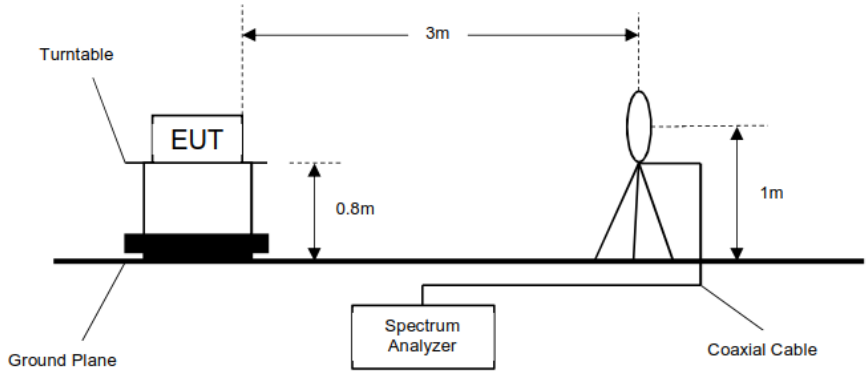
7 Test Setups

7.1 AC Power Line Conducted Emission test setups

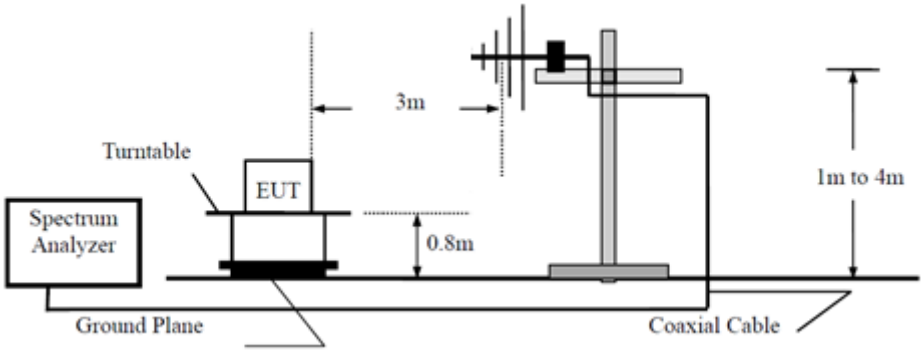


7.2 Radiated test setups

9KHz - 30MHz



Below 1GHz



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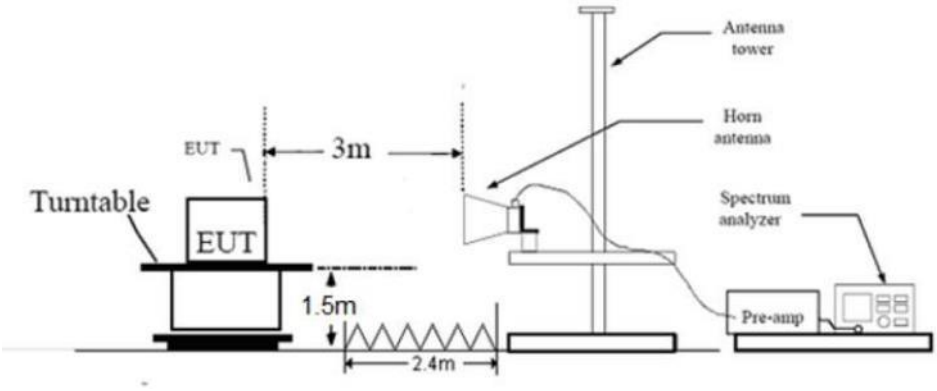
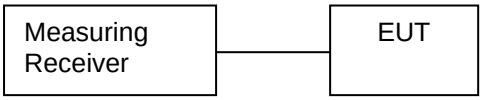
Above 1GHz



7.3 Conducted RF test setups



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8 Systems Test Configuration

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

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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

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

*Decreases with the logarithm of the frequency.

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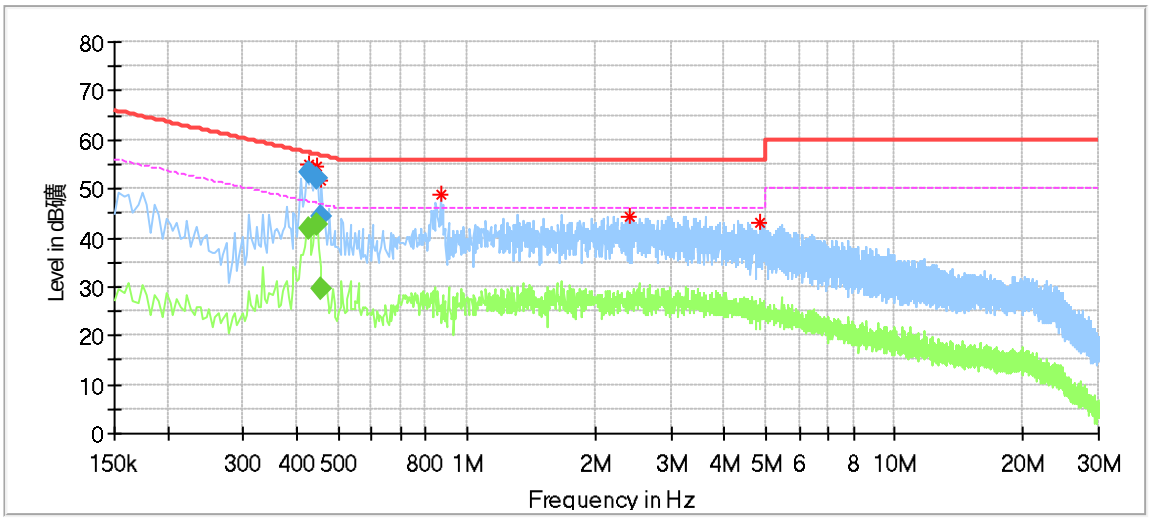
Conducted Emission

Product Type	:	Wireless Digital Video Monitoring System
M/N	:	DXR-8 PRO
Operating Condition	:	Transmit
Test Specification	:	Line
Comment	:	AC 120V/60Hz (External adapter)
Adapter	:	BLJ05K059100P-U



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Corr. (dB)
0.429500	54.85	---	57.25	2.40	L1	9.62	---
0.446000	54.49	---	56.95	2.46	L1	9.62	---
0.457500	51.66	---	56.73	5.07	L1	9.62	---
0.870000	49.00	---	56.00	7.00	L1	9.64	---
2.398000	44.46	---	56.00	11.54	L1	9.67	---
4.830000	42.95	---	56.00	13.05	L1	9.77	---

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Corr. (dB)
0.429500	53.23	---	57.26	4.03	L1	9.62	---
0.429500	---	41.90	47.26	5.36	L1	9.62	---
0.446000	52.02	---	56.88	4.86	L1	9.62	---
0.446000	---	42.52	46.88	4.36	L1	9.62	---
0.457500	---	29.59	46.74	17.15	L1	9.62	---
0.457500	44.27	---	56.74	12.47	L1	9.62	---

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)

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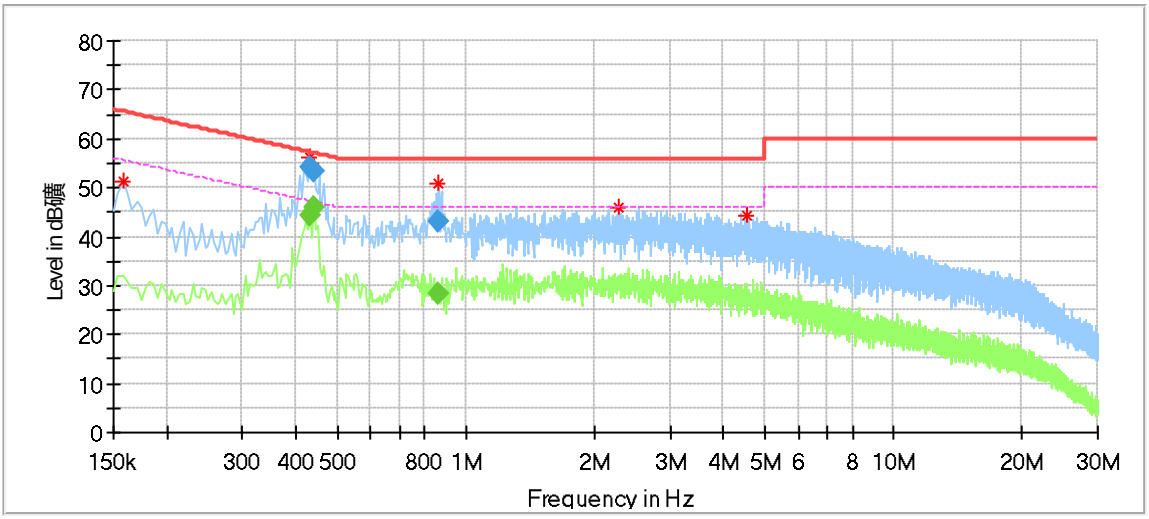
Conducted Emission

Product Type	:	Wireless Digital Video Monitoring System
M/N	:	DXR-8 PRO
Operating Condition	:	Transmit
Test Specification	:	Neutral
Comment	:	AC 120V/60Hz (External adapter)
Adapter	:	BLJ05K059100P-U



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.158000	51.08	---	65.57	14.48	N	9.57
0.430000	56.27	---	57.25	0.98	N	9.62
0.442000	54.20	---	57.02	2.82	N	9.62
0.865500	50.74	---	56.00	5.26	N	9.64
2.278000	45.81	---	56.00	10.19	N	9.67
4.522000	44.35	---	56.00	11.65	N	9.75

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.430000	---	44.49	47.34	2.85	N	9.62
0.430000	54.02	---	57.34	3.32	N	9.62
0.442000	---	45.92	46.96	2.06	N	9.62
0.442000	53.22	---	56.96	4.36	N	9.62
0.865500	---	28.48	46.00	17.52	N	9.64
0.865500	43.25	---	56.00	12.75	N	9.64

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)

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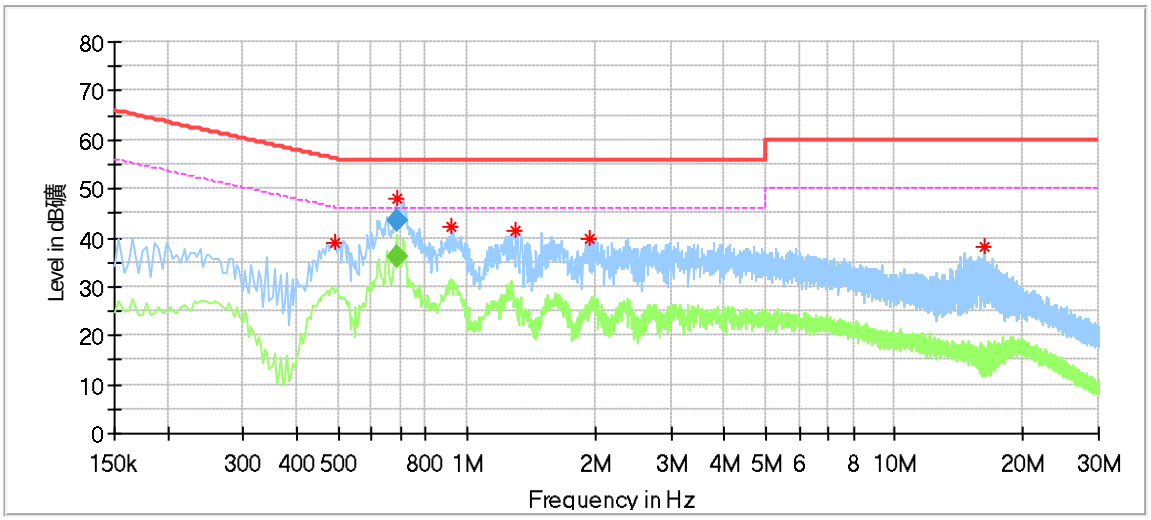
Conducted Emission

Product Type	:	Wireless Digital Video Monitoring System
M/N	:	DXR-8 PRO
Operating Condition	:	Transmit
Test Specification	:	Line
Comment	:	AC 120V/60Hz (External adapter)
Adapter	:	HP07Z-0591000-CU



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.490000	39.13	---	56.17	17.03	L1	9.63
0.689500	48.17	---	56.00	7.83	L1	9.63
0.922000	42.17	---	56.00	13.83	L1	9.64
1.302000	41.26	---	56.00	14.74	L1	9.65
1.934000	39.81	---	56.00	16.19	L1	9.65
16.158000	38.29	---	60.00	21.71	L1	9.98

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.689500	---	36.05	46.00	9.95	L1	9.63
0.689500	43.39	---	56.00	12.61	L1	9.63

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)

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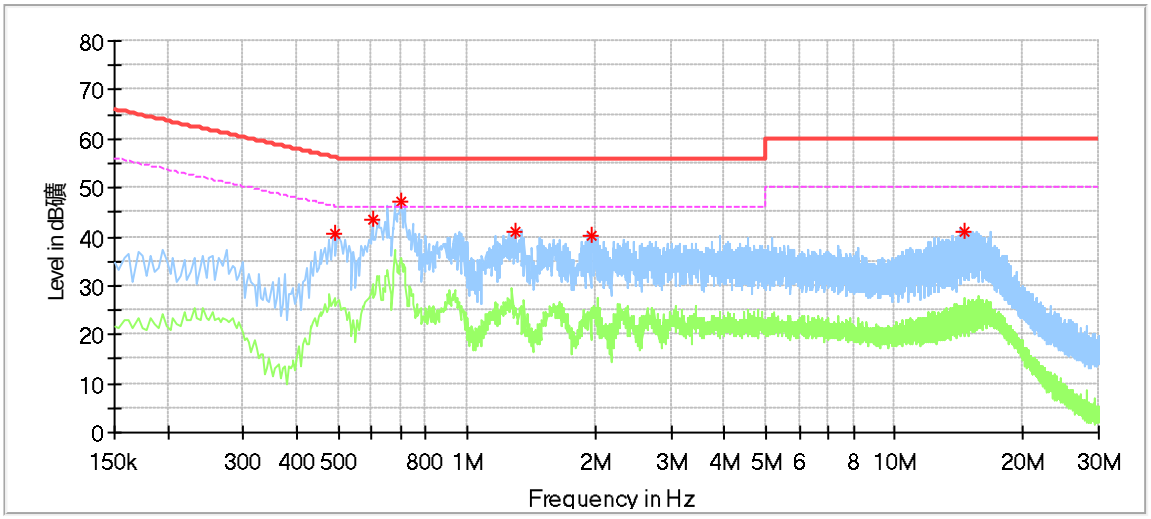
Conducted Emission

Product Type	:	Wireless Digital Video Monitoring System
M/N	:	DXR-8 PRO
Operating Condition	:	Transmit
Test Specification	:	Neutral
Comment	:	AC 120V/60Hz (External adapter)
Adapter	:	HP07Z-0591000-CU



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.490000	40.67	---	56.17	15.50	N	9.63
0.602000	43.48	---	56.00	12.52	N	9.63
0.702000	47.03	---	56.00	8.97	N	9.64
1.298000	41.11	---	56.00	14.89	N	9.65
1.958000	40.11	---	56.00	15.89	N	9.65
14.610000	40.98	---	60.00	19.02	N	9.96

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)

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9.2 Conducted Peak Output Power

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
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

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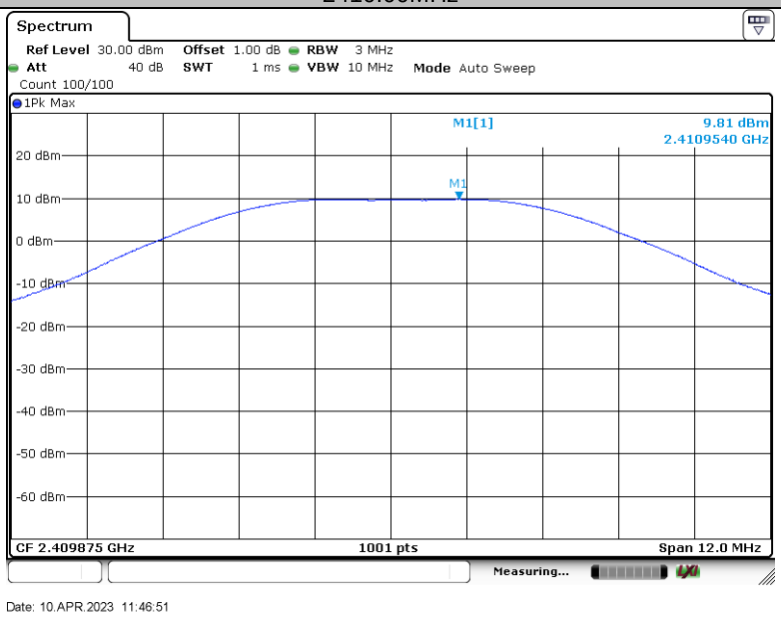
Conducted Peak Output Power

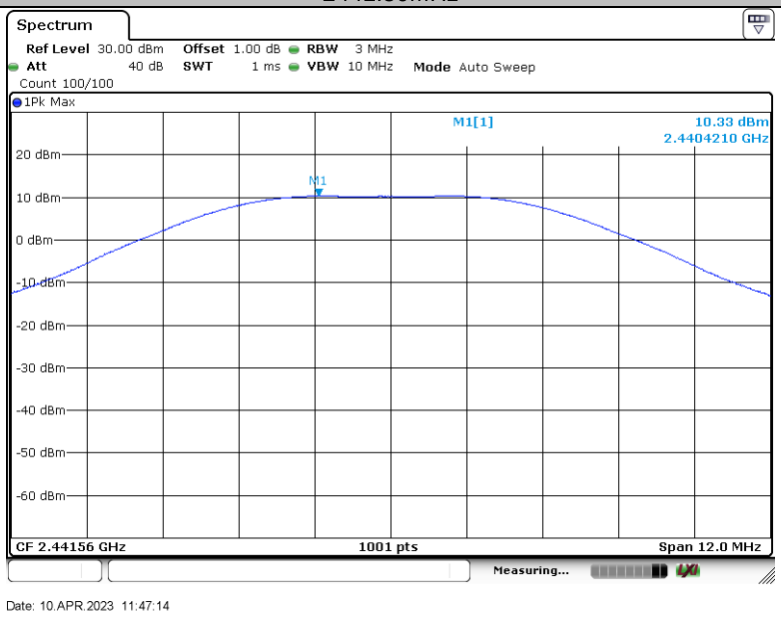
Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2410.00MHz	9.81	Pass
Middle channel 2441.50MHz	10.33	Pass
High channel 2473.00MHz	9.94	Pass

2410.00MHz



2441.50MHz



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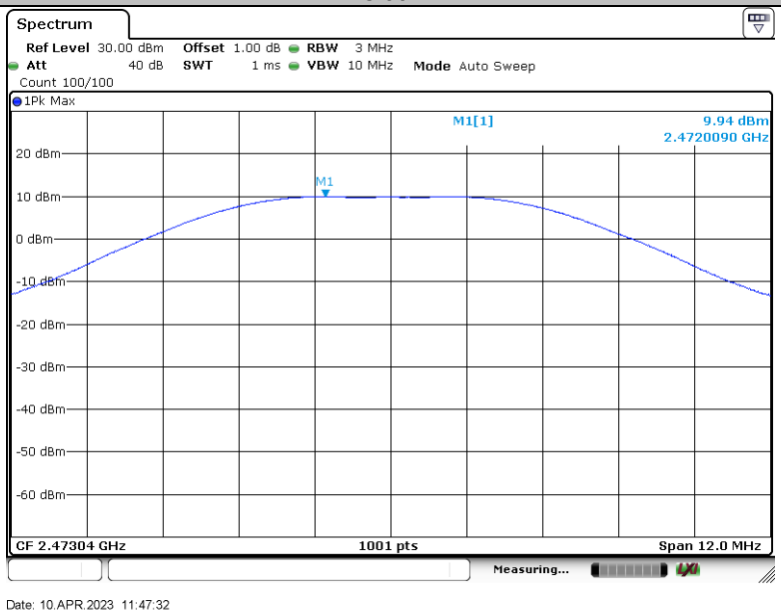
2473.00MHz


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9.3 20 dB Bandwidth and 99% Occupied Bandwidth

Test Method

20dB bandwidth test:

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.
3. Use the following test receiver settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
   RBW ≥ 1% of the 20 dB bandwidth, 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.

Occupied Bandwidth test:

1. Connect EUT test port to test receiver.
2. Use the following spectrum analyzer settings:
   RBW=1% to 5% of the actual occupied, VBW≥3RBW, Sweep = auto,
   Detector function = peak, Trace = max hold
3. Use the occupied bandwidth measurement capability of test receiver.
4. Allow the trace to stabilize, record the occupied bandwidth value.

Limit

Limit [kHz]
N/A

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20 dB bandwidth and 99% Occupied Bandwidth

Test result

Frequency	20 dB Bandwidth	99% Bandwidth	Limit	Result
MHz	MHz	MHz	MHz	
2410.00MHz	4.710	4.565	--	Pass
2441.50MHz	4.630	4.535	--	Pass
2473.00MHz	4.710	4.595	--	Pass

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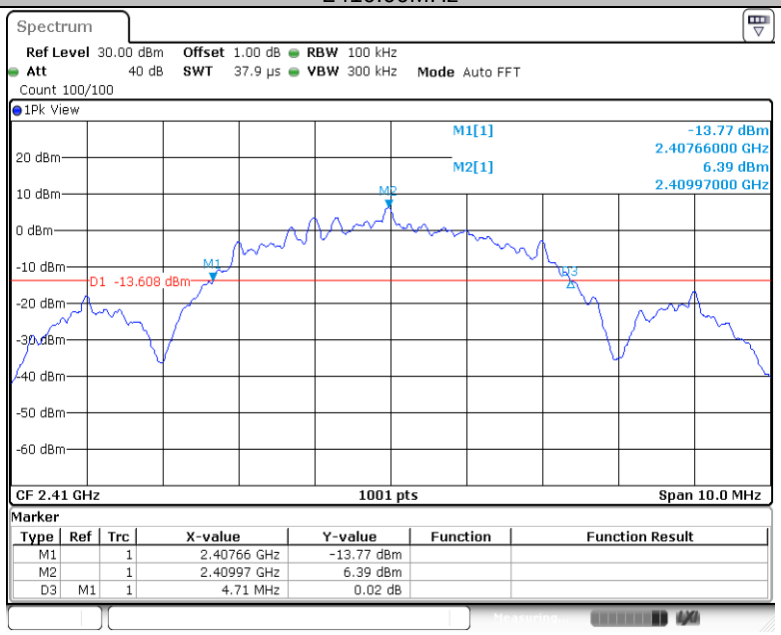
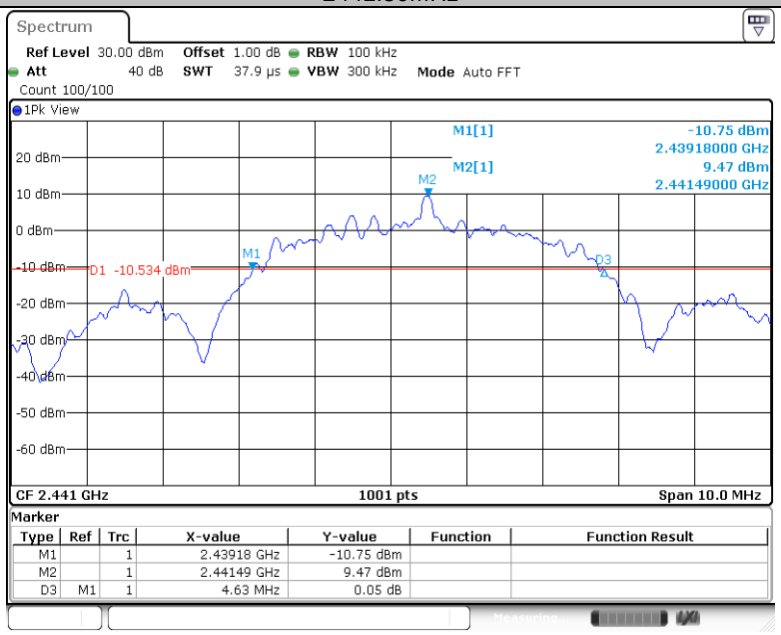
20 dB Bandwidth

2410.00MHz



Date: 24.APR.2023 12:40:33

2441.50MHz



Date: 24.APR.2023 12:43:26

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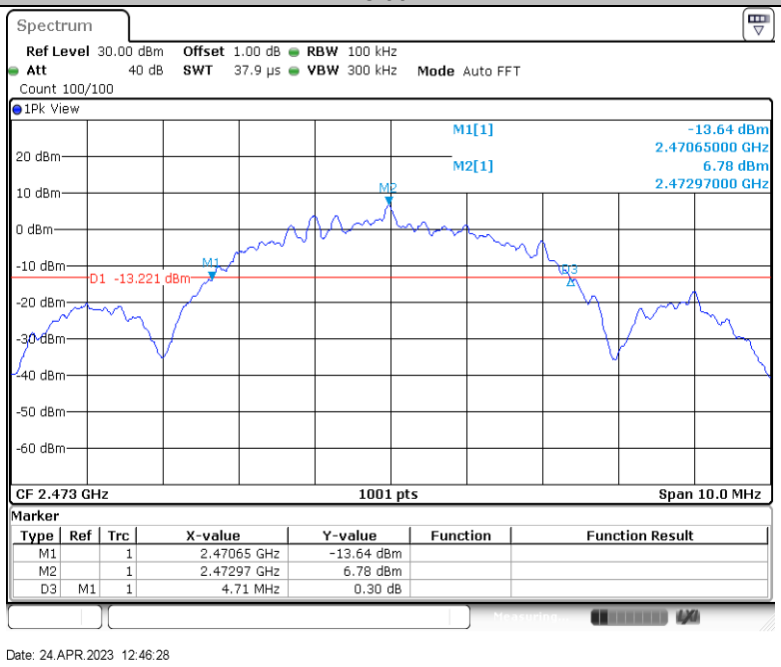
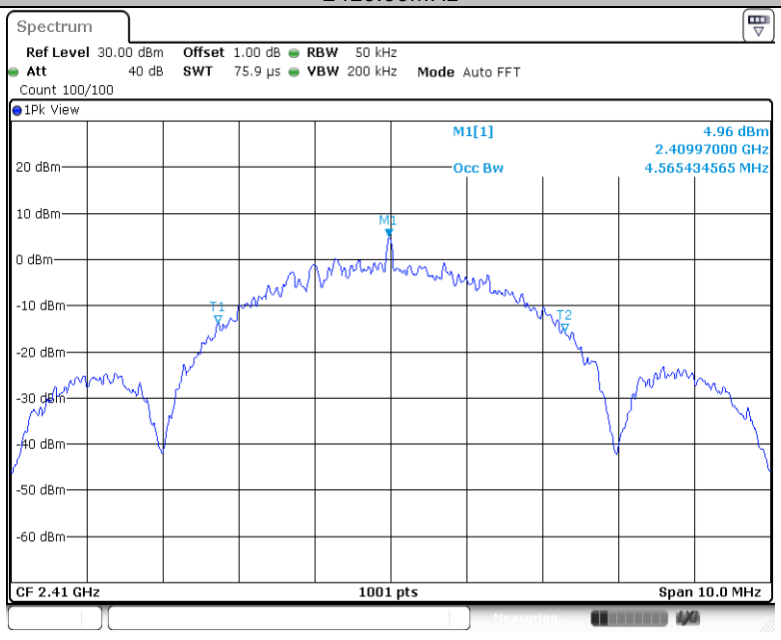
2473.00MHz



Date: 24.APR.2023 12:46:28

99% Occupied Bandwidth

2410.00MHz



Date: 24.APR.2023 12:40:44

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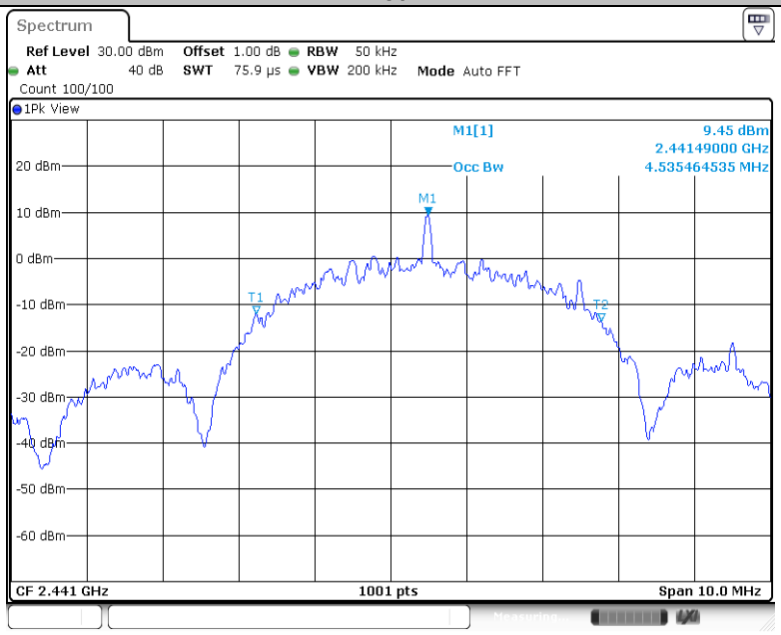
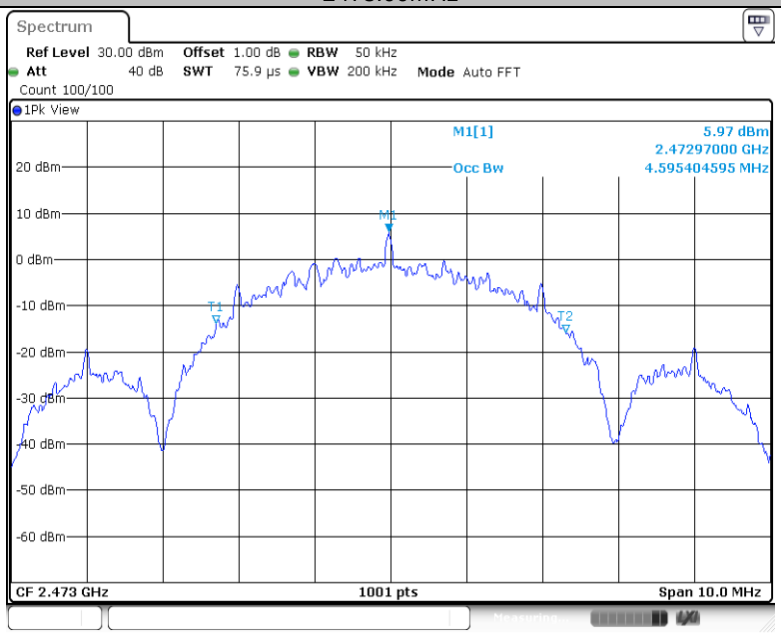
2441.50MHz



Date: 24.APR.2023 12:43:37

2473.00MHz



Date: 24.APR.2023 12:46:39

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9.4 Carrier Frequency Separation

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 to hopping mode.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels, RBW ≥ 1% of the span, 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

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

Limit

Frequency MHz	2/3 of 20 dB Bandwidth kHz
2441.50MHz	3087

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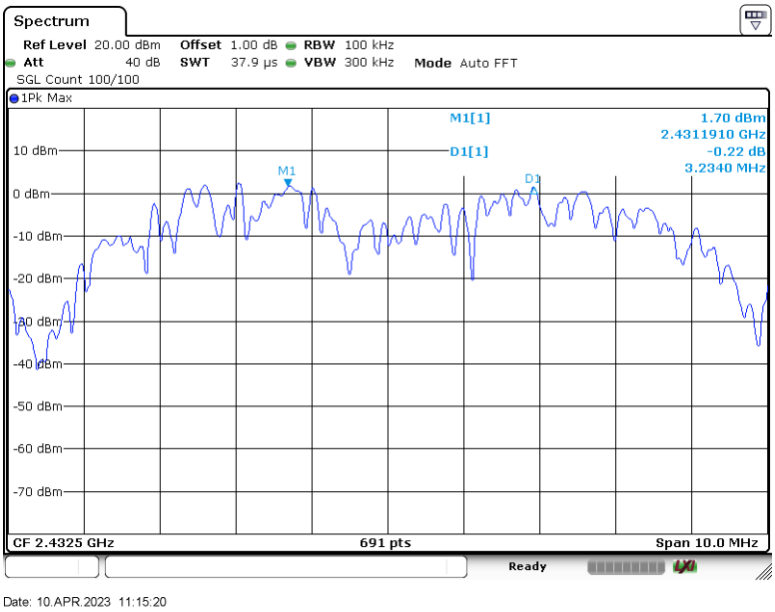
Carrier Frequency Separation

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

Frequency MHz	Carrier Frequency Separation MHz	Result
2441.50MHz	3.234	Pass



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9.5 Number of Hopping Frequencies

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 to hopping mode.
3. Use the following spectrum analyzer settings:
   Span = the frequency band of operation, RBW ≥ 1% of the span, VBW ≥RBW,
   Sweep = auto, Detector function = peak
4. Set the spectrum analyzer on Trace = max hold
5. 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

Limit number
⩾ 15

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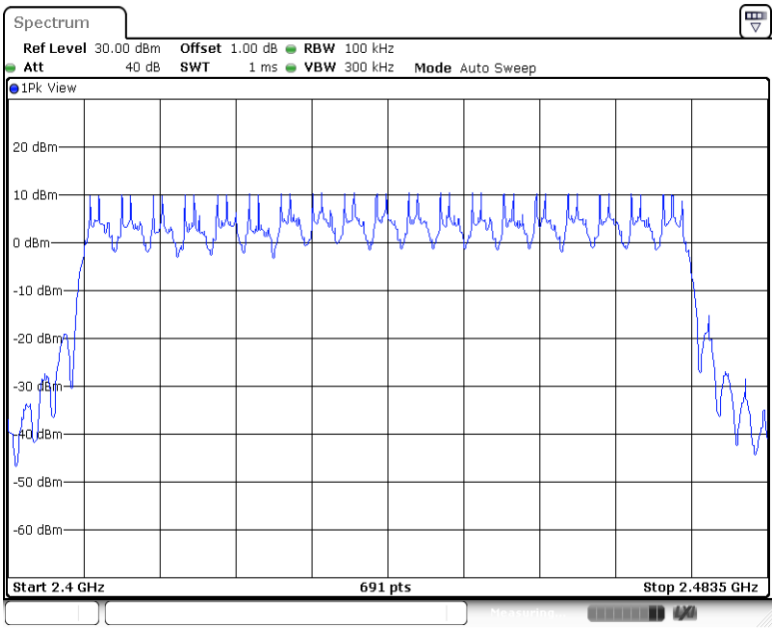
Number of Hopping Frequencies

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

Number of hopping frequencies	Result
19	Pass



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9.6 Dwell Time

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 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

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.

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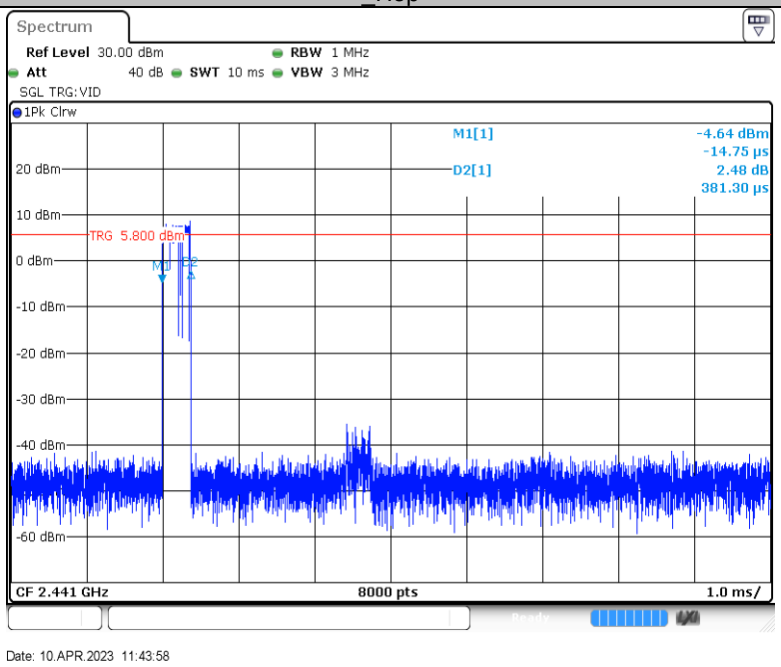
Dwell Time

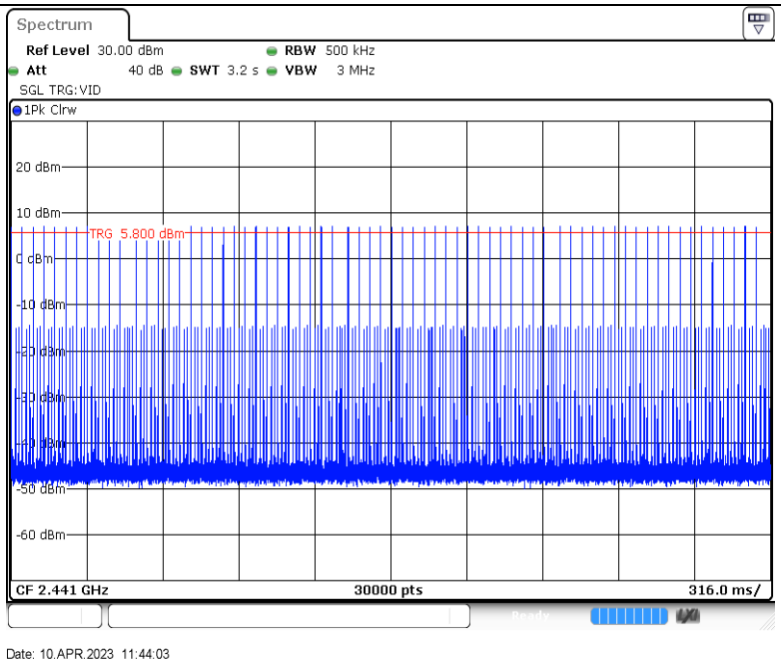
The maximum dwell time shall be 0.4 s.

The Dwell Time = Burst Width * Total Hops.
The burst width, which is directly measured, refers to the duration on one channel hop.

Channel	Burst Width (ms)	Total Hops	Result (s)	Limit (s)	Verdict
Hop	0.38	680	0.259	<=0.4	PASS

_Hop





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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. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
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

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

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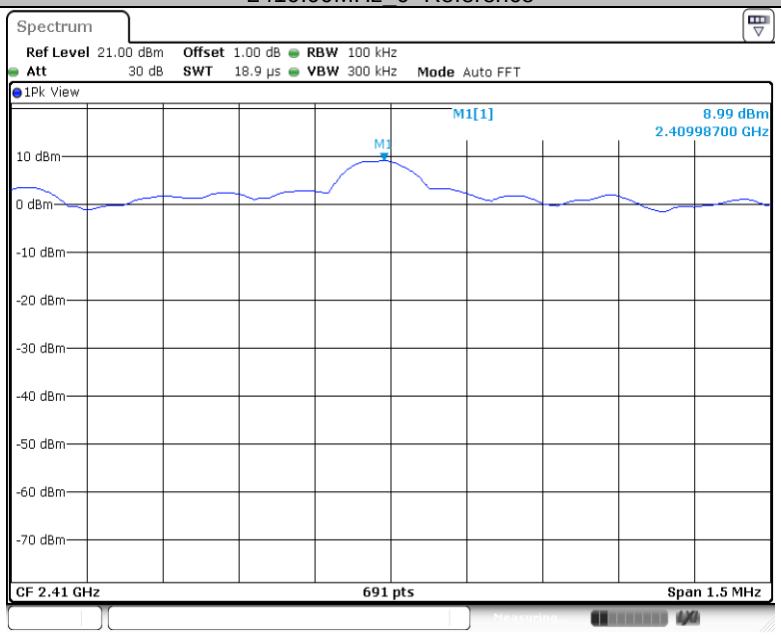
Spurious RF Conducted Emissions

2410.00MHz_0~Reference



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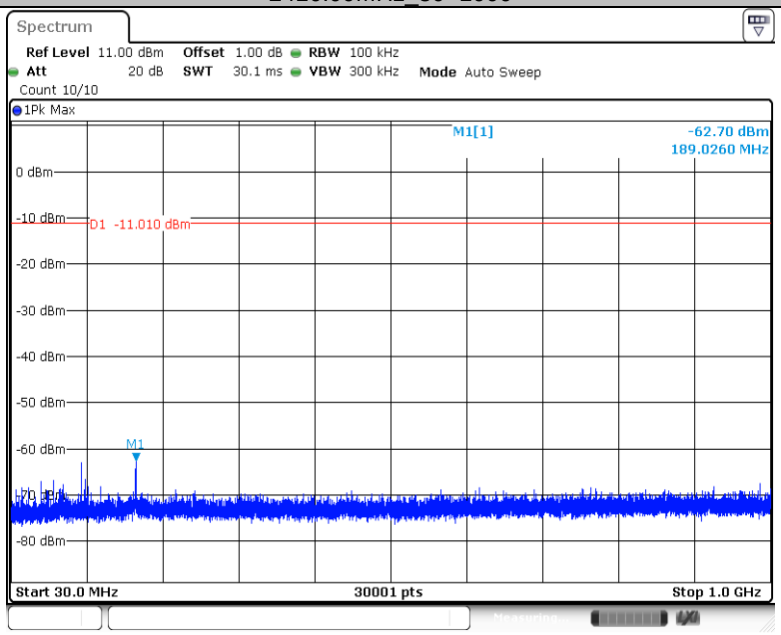
2410.00MHz_30~1000



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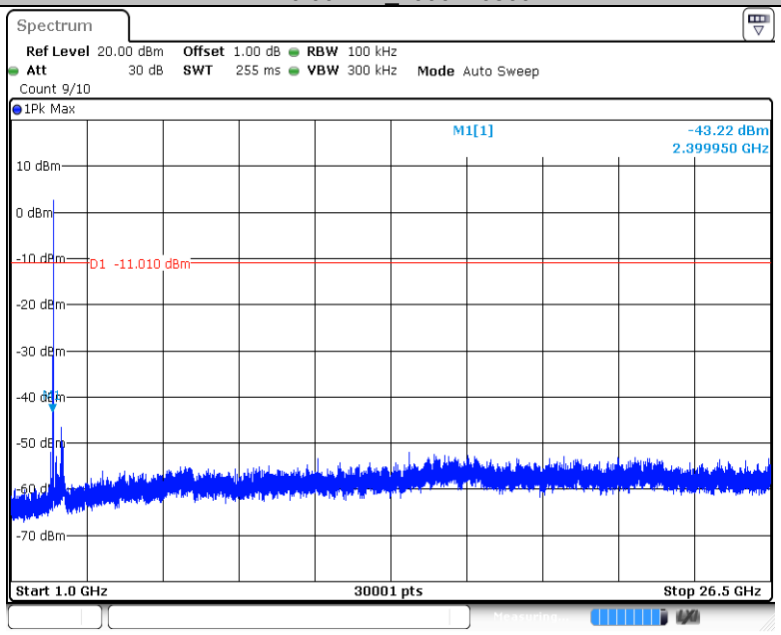
2410.00MHz_1000~26500



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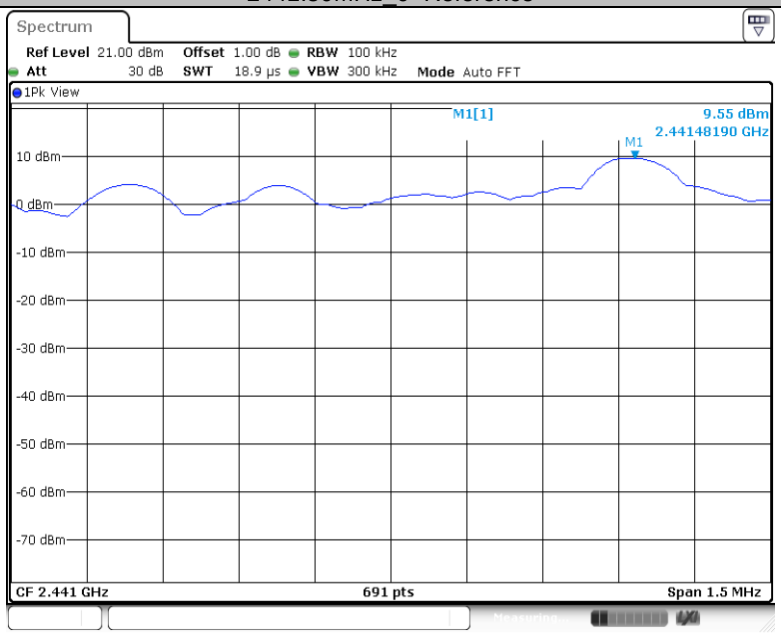
2441.50MHz_0~Reference



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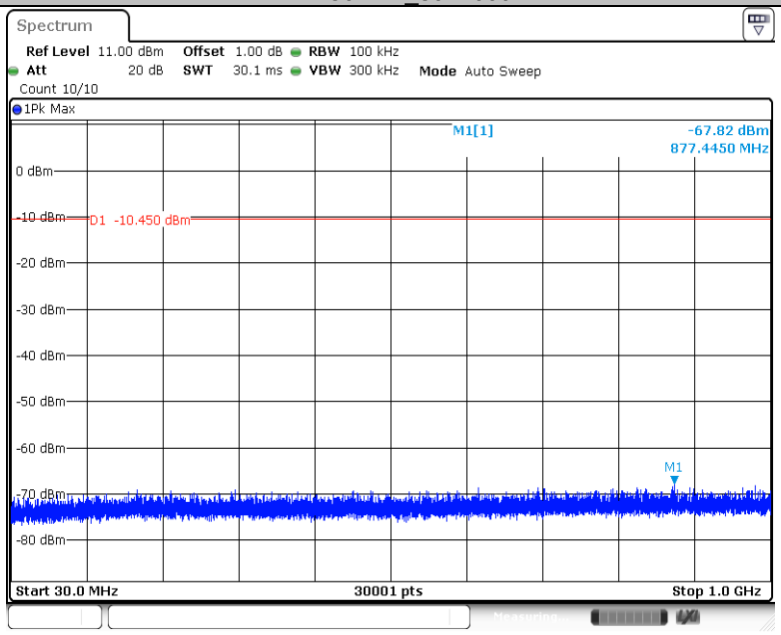
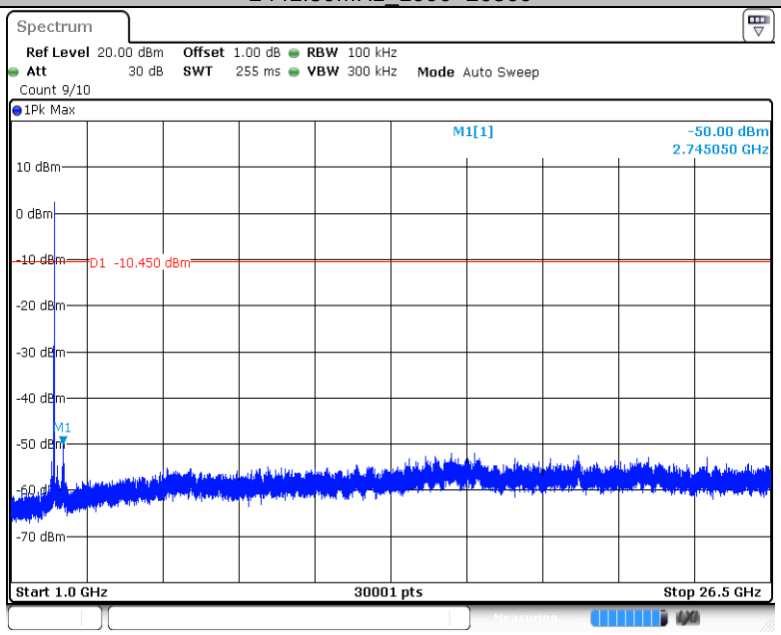
2441.50MHz_30~1000



Date: 24.APR.2023 12:43:49

2441.50MHz_1000~26500



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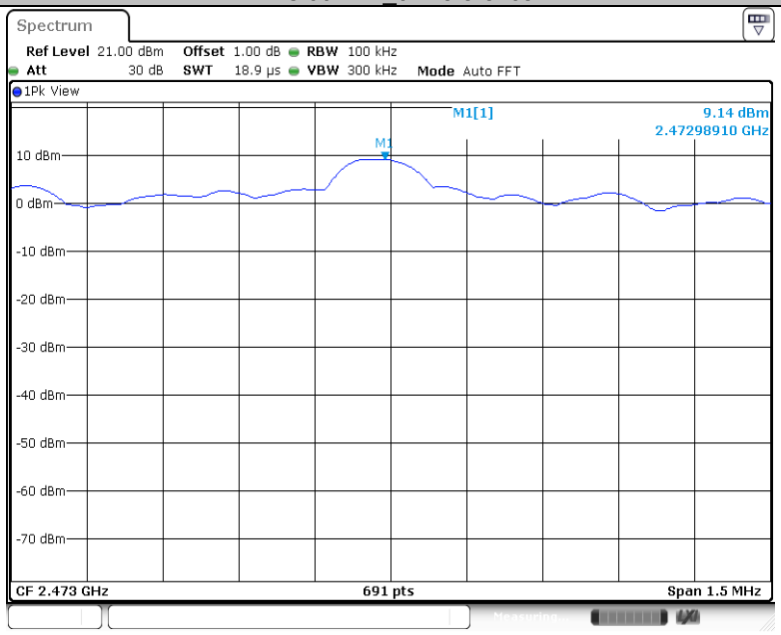
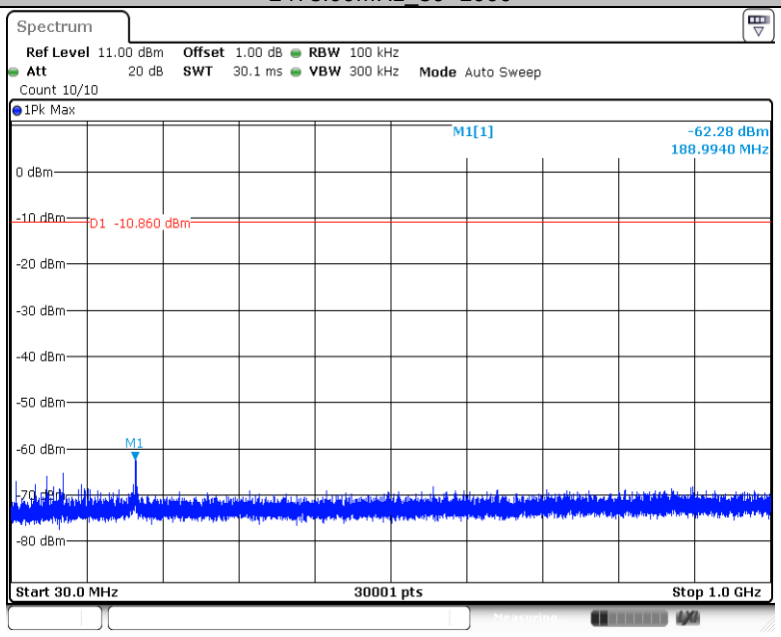
2473.00MHz_0~Reference

2473.00MHz_30~1000


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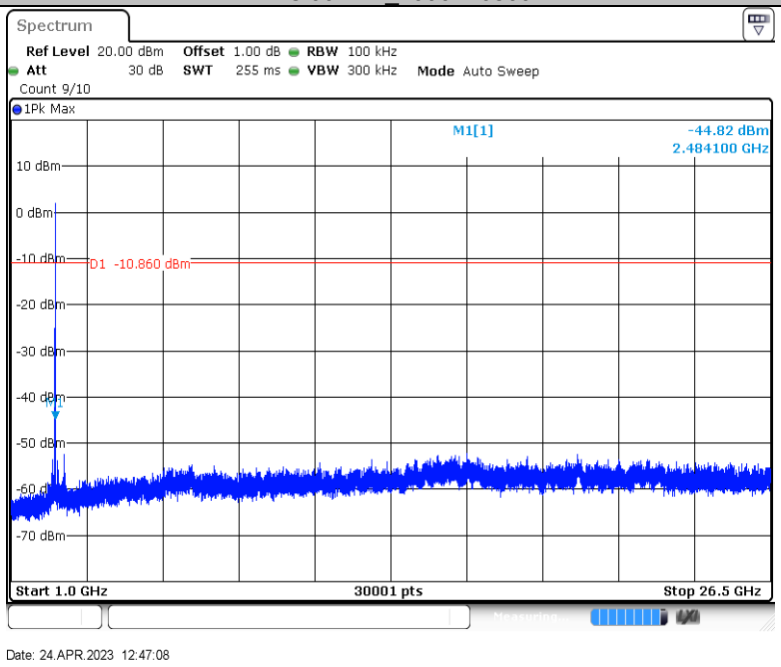
2473.00MHz_1000~26500



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9.8 Band Edge Testing

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. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
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
6. Set to the maximum power setting and enable the EUT hopping mode, repeat the test.

Limit:

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.

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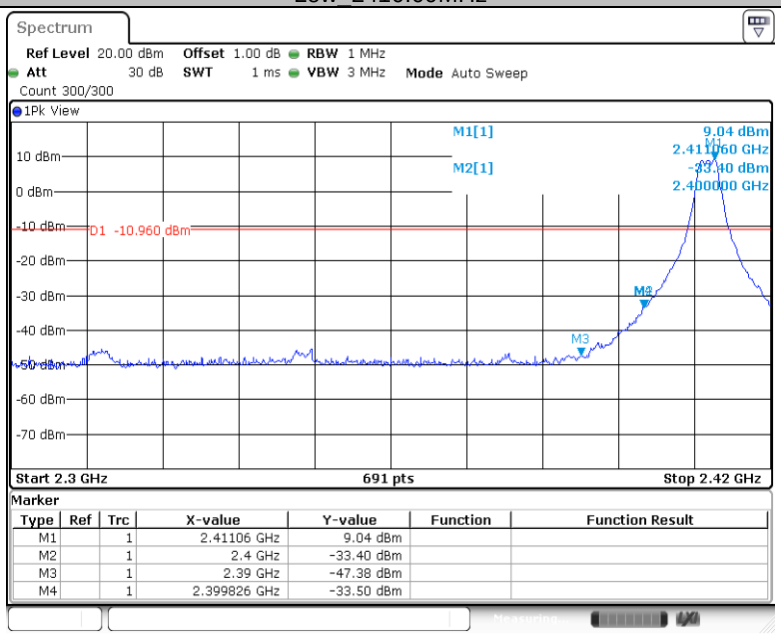
Band Edge

Low_2410.00MHz



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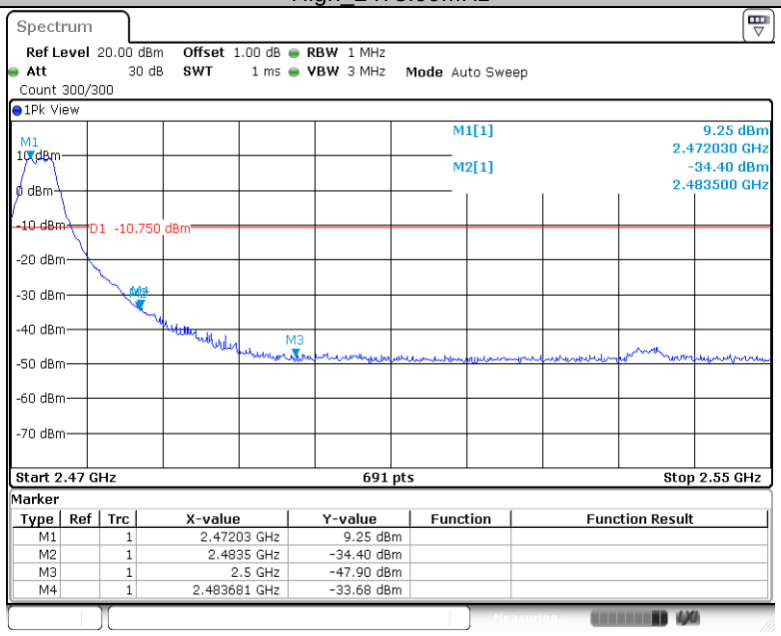
High_2473.00MHz



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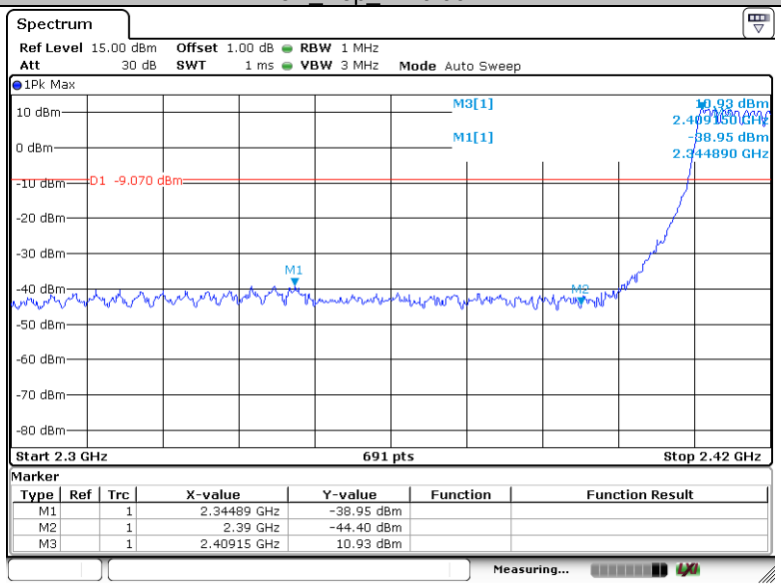
Low_Hop_2410.00MHz



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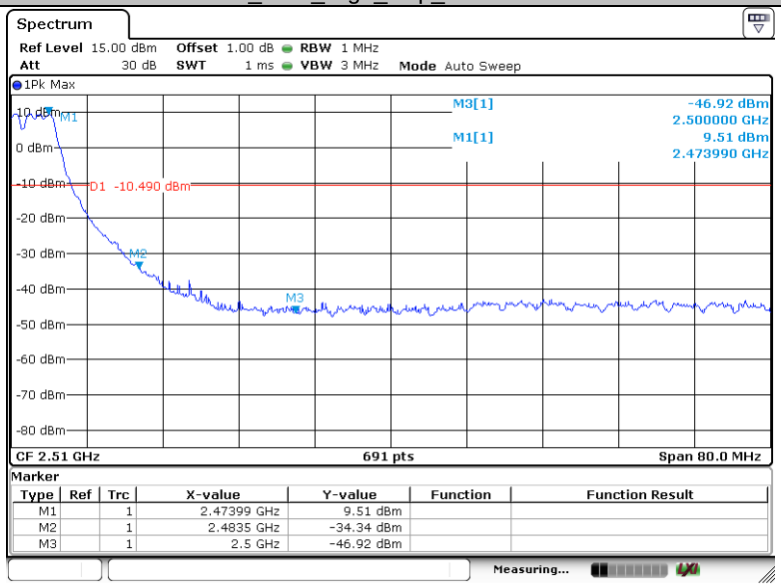
DH5_Ant1_High_Hop_2473.00MHz



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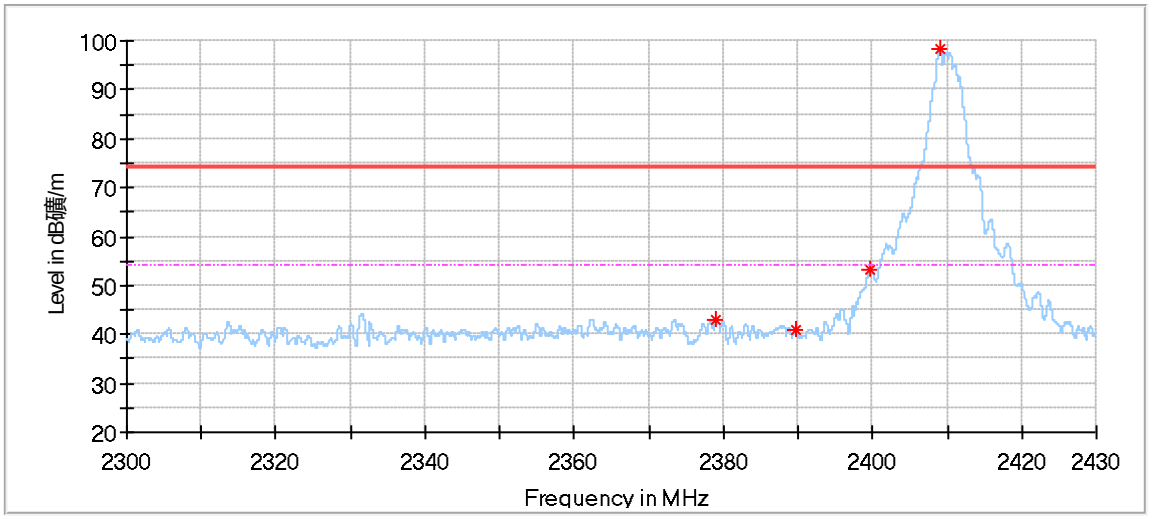
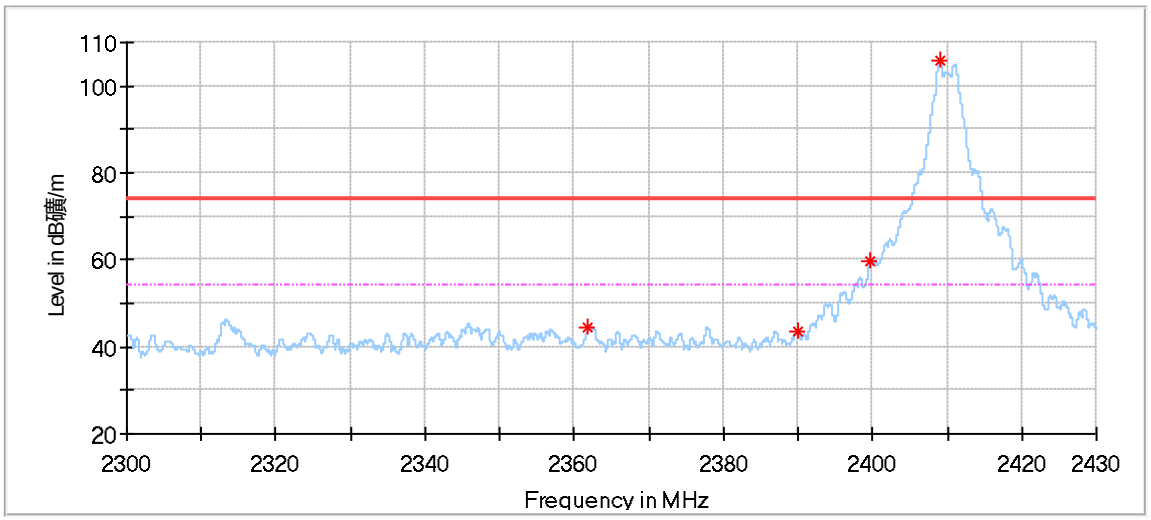
Radiated Emissions Band Edge:
2410.00MHz:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2378.949000	42.98	74.00	31.02	150.0	H	156.0	-3.04
2389.687000	41.10	74.00	32.90	150.0	H	284.0	-2.95
2399.723000	53.13	74.00	20.87	150.0	H	238.0	-2.86
2408.992000	98.28	74.00	-24.28	150.0	H	247.0	-2.75



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2361.880000	44.60	74.00	29.40	150.0	V	351.0	-3.09
2389.895000	43.66	74.00	30.34	150.0	V	13.0	-2.94
2399.723000	59.74	74.00	14.26	150.0	V	8.0	-2.86
2408.979000	105.74	74.00	-31.74	150.0	V	300.0	-2.76

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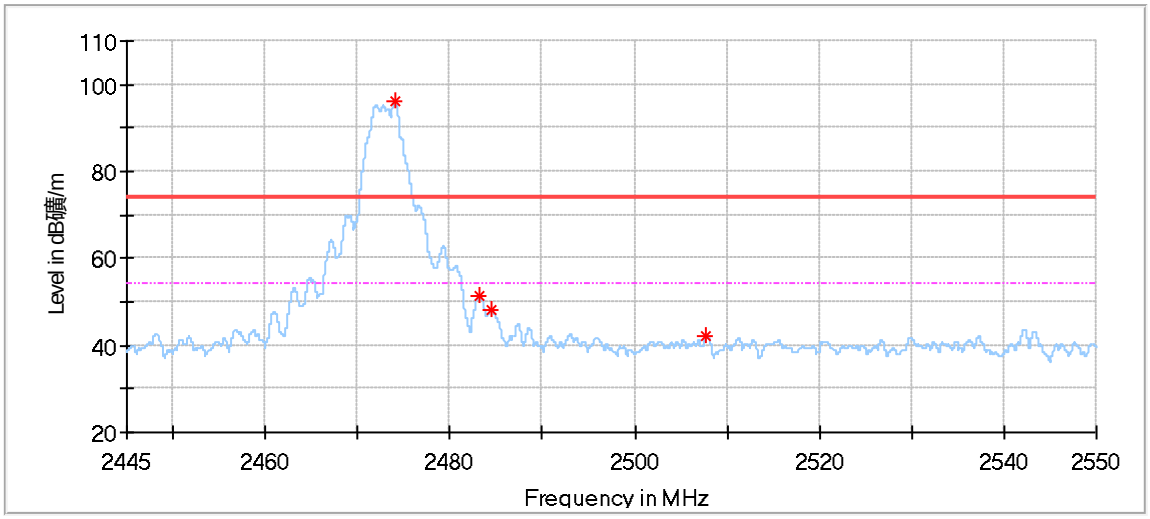
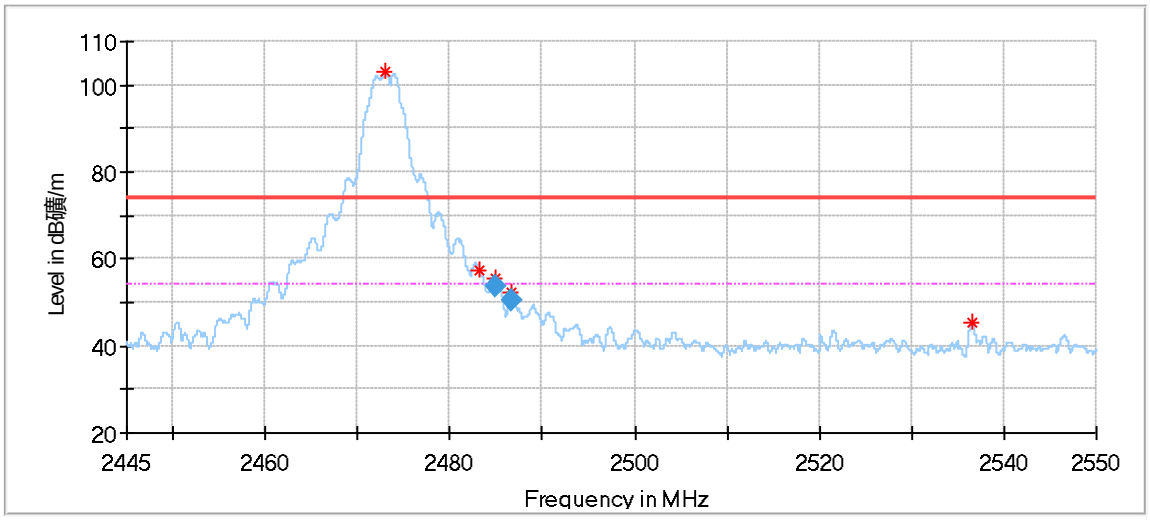
2473.00MHz:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2474.001000	96.01	74.00	-22.01	150.0	H	193.0	-2.24
2483.094000	51.16	74.00	22.84	150.0	H	128.0	-2.20
2484.564000	48.23	74.00	25.77	150.0	H	224.0	-2.20
2507.748000	42.13	74.00	31.87	150.0	H	312.0	-2.15



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2472.940500	102.92	74.00	-28.92	150.0	V	306.0	-2.24
2483.272500	57.17	74.00	16.83	150.0	V	301.0	-2.20
2484.994500	55.52	74.00	18.48	150.0	V	326.0	-2.20
2486.716500	52.18	74.00	21.82	150.0	V	75.0	-2.19
2536.507500	45.19	74.00	28.81	150.0	V	306.0	-2.26
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2484.994500	53.60	54.00	0.40	150.0	V	326.0	-2.20
2486.716500	50.27	54.00	3.73	150.0	V	75.0	-2.19

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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 spectrum analyzer 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.

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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 dBµV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

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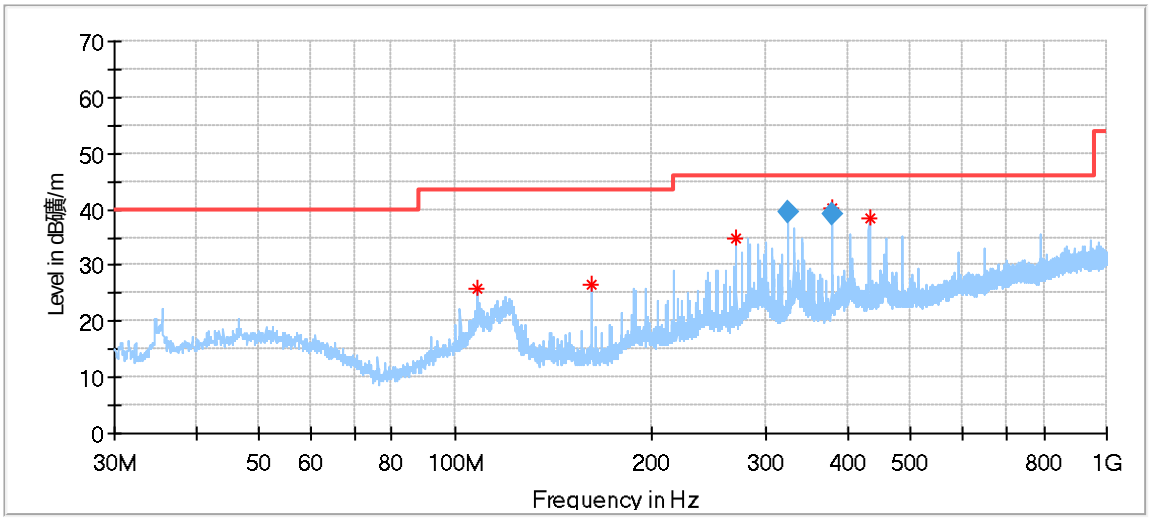
Spurious radiated emissions for transmitter

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.

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)
108.085000*	25.91	43.50	17.59	200.0	H	152.0	15.76
161.973889	26.44	43.50	17.06	200.0	H	66.0	13.36
269.967222*	34.70	46.00	11.30	100.0	H	215.0	17.99
323.963889*	40.01	46.00	5.99	100.0	H	223.0	19.48
378.014444	40.04	46.00	5.96	200.0	H	145.0	20.85
431.957222	38.26	46.00	7.74	100.0	H	146.0	22.09

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
323.963889*	39.48	46.00	6.52	100.0	H	223.0	19.48
378.014444	39.20	46.00	6.80	200.0	H	145.0	20.85

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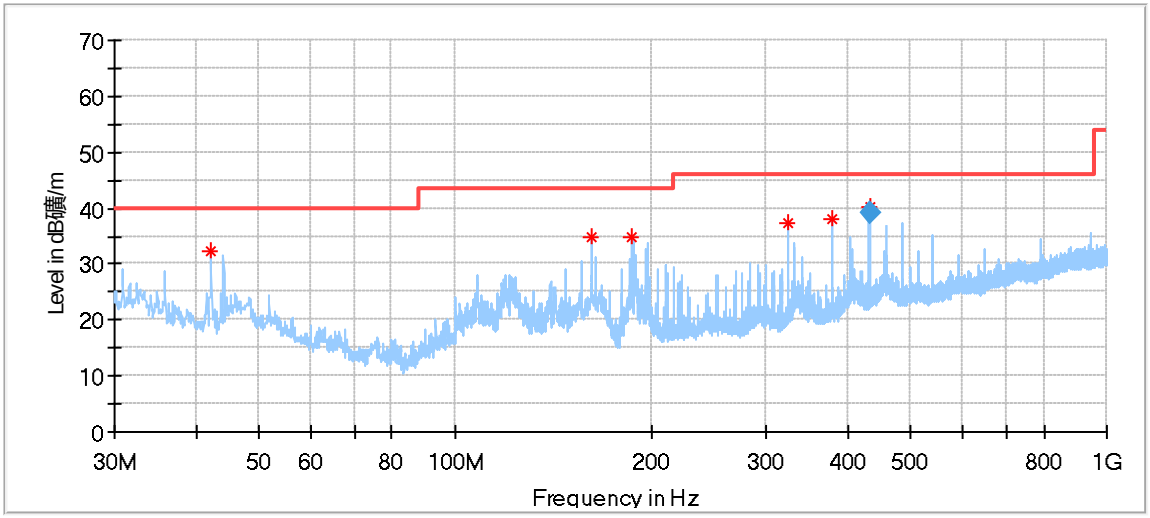

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
42.178889	32.34	40.00	7.66	100.0	V	252.0	17.49
161.973889	34.93	43.50	8.57	100.0	V	214.0	13.36
186.170000	34.81	43.50	8.69	100.0	V	44.0	15.01
323.963889	37.18	46.00	8.82	200.0	V	319.0	19.48
377.960556	37.94	46.00	8.06	100.0	V	163.0	20.85
431.957222	40.15	46.00	5.85	100.0	V	334.0	22.09

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
431.957222	39.30	46.00	6.70	100.0	V	334.0	22.09

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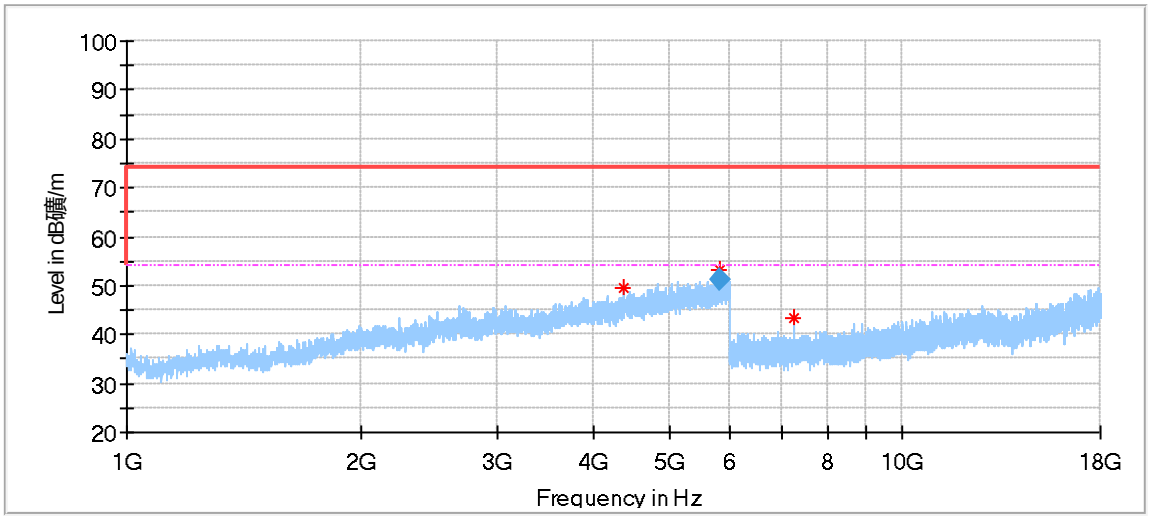
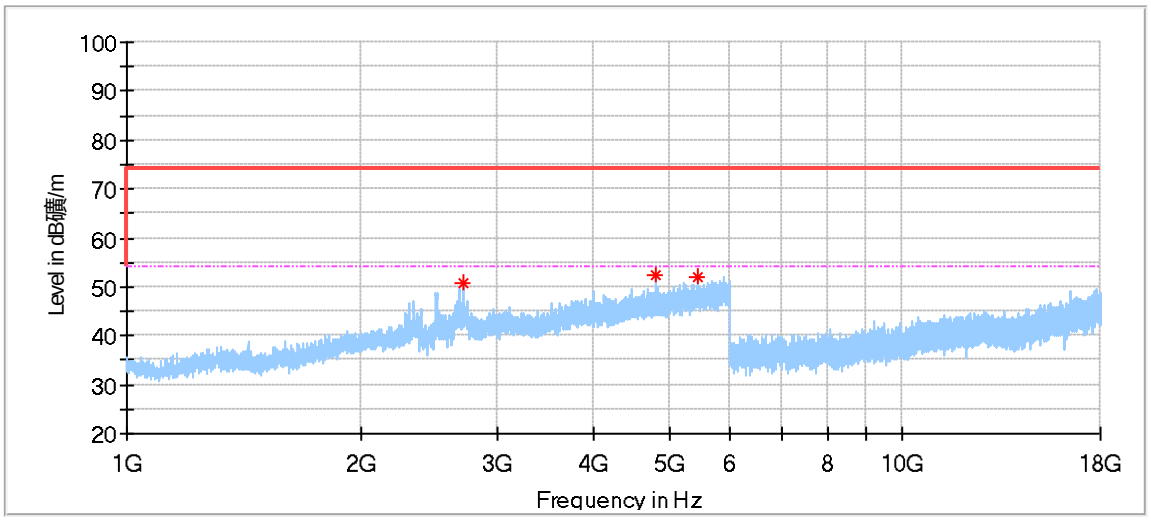
Test data 1GHz to 18GHz:
Low Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4367.500000*	49.37	74.00	24.63	150.0	H	97.0	4.08
5821.000000	53.14	74.00	20.87	150.0	H	151.0	8.46
7233.000000*	43.36	74.00	30.64	150.0	H	213.0	8.69
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
5821.000000	51.24	54.00	2.76	150.0	H	151.0	8.46



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2714.500000*	50.82	74.00	23.18	150.0	V	356.0	-0.87
4818.500000*	52.24	74.00	21.76	150.0	V	251.0	5.78
5447.000000*	52.07	74.00	21.93	150.0	V	42.0	7.96

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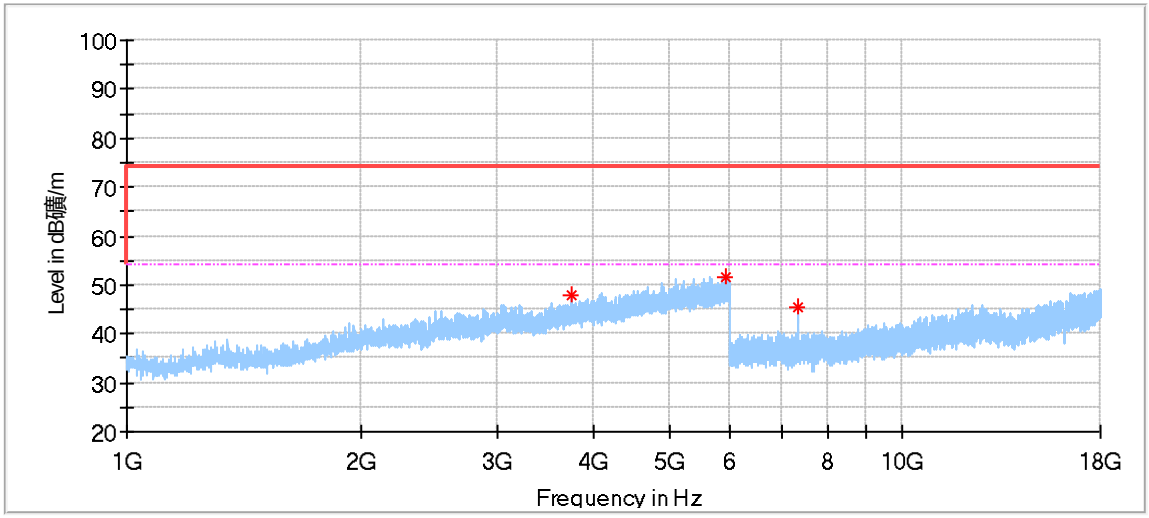
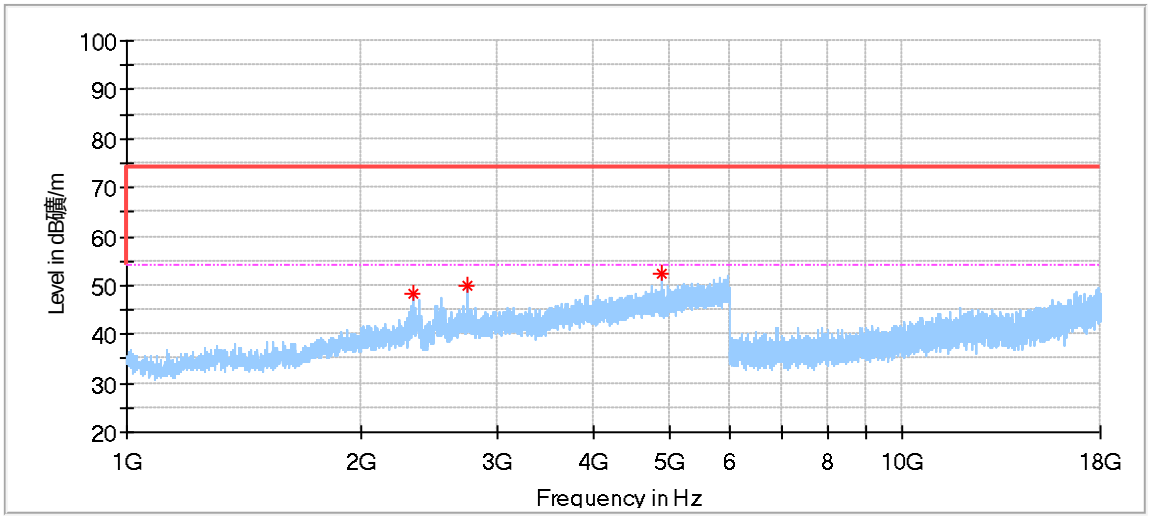
Middle Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3751.000000*	47.75	74.00	26.25	150.0	H	191.0	2.96
5923.000000	51.75	74.00	22.25	150.0	H	332.0	8.72
7327.500000*	45.55	74.00	28.45	150.0	H	194.0	8.68



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2344.500000*	48.12	74.00	25.88	150.0	V	77.0	-2.14
2746.000000*	49.99	74.00	24.01	150.0	V	30.0	-0.90
4881.000000*	52.61	74.00	21.39	150.0	V	249.0	6.01

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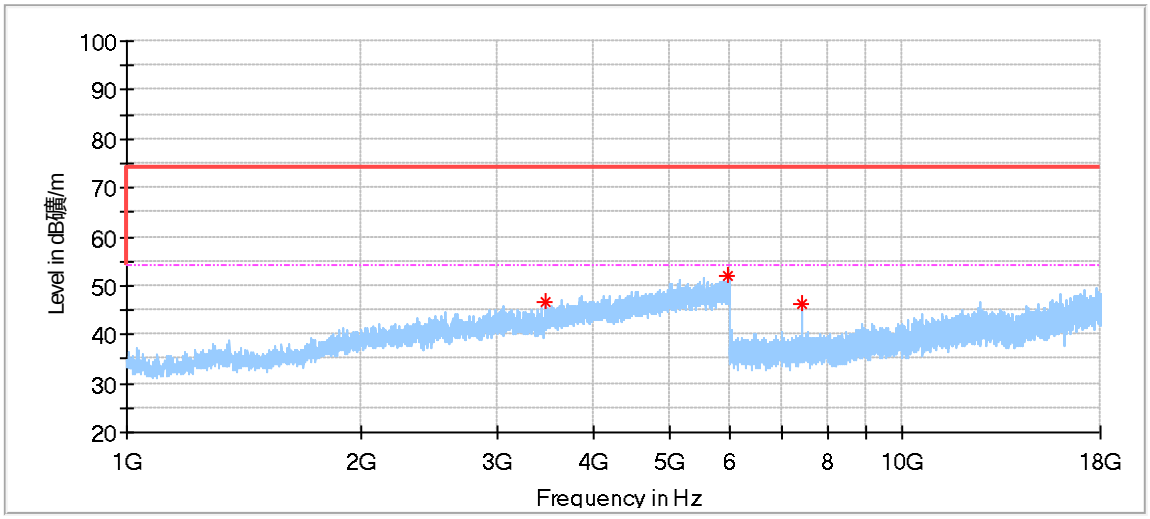
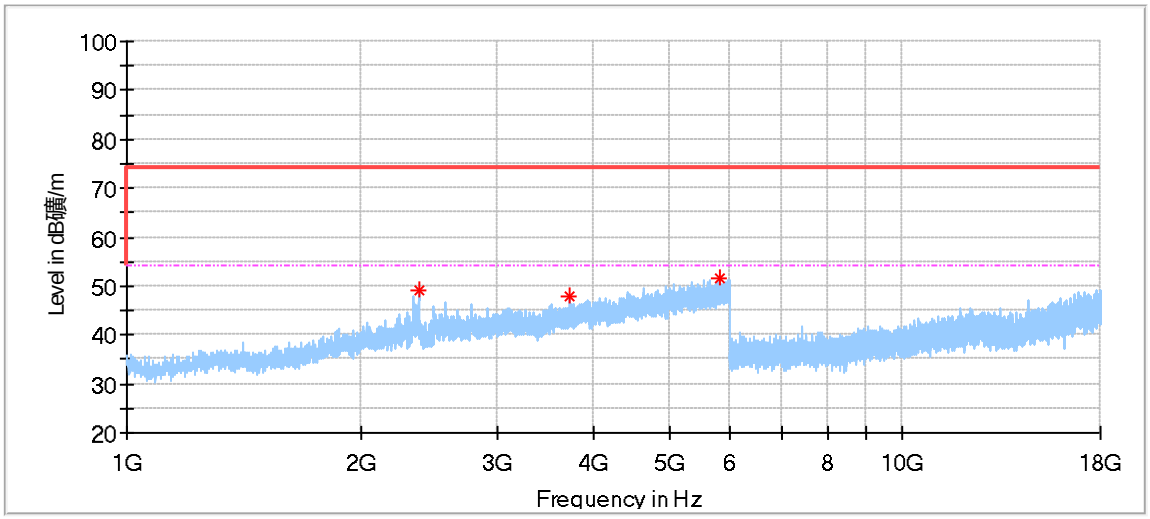
Highest Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3473.000000	46.72	74.00	27.28	150.0	H	29.0	1.07
5971.500000*	51.99	74.00	22.01	150.0	H	91.0	8.79
7416.000000	46.40	74.00	27.60	150.0	H	232.0	8.72



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2377.500000*	48.99	74.00	25.01	150.0	V	283.0	-1.89
3725.500000*	47.78	74.00	26.22	150.0	V	220.0	2.73
5816.500000	51.50	74.00	22.50	150.0	V	72.0	8.44

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within frequency range 9kHz-30MHz, 18-26GHz 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.

(3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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

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10 Test Equipment List

List of Test Instruments

Radiated Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	68-4-74-14-002	101269	1	2023-5-28
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9162	68-4-80-19-003	284	1	2023-7-12
Wave Guide Antenna	ETS	3117	68-4-80-19-001	00218954	1	2023-5-9
Pre-amplifier	Rohde & Schwarz	SCU 18F	68-4-29-19-001	100745	1	2023-5-28
Pre-amplifier	Rohde & Schwarz	SCU 18F	68-4-29-19-002	100746	1	2023-5-28
Sideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	68-4-80-14-008	12827	1	2023-7-12
Loop Antenna	Rohde & Schwarz	HFH2-Z2	68-4-80-14-006	100398	1	2023-8-17
Pre-amplifier	Rohde & Schwarz	SCU 40A	68-4-29-14-002	100432	1	2023-7-27
Attenuator	Mini-circuits	UNAT-6+	68-4-81-21-002	15542	1	2023-5-27
3m Semi-anechoic chamber	TDK	SAC-3 #2	68-4-90-19-006	----	2	2023-5-28
Test software	Rohde & Schwarz	EMC32	68-4-90-19-006-A01	Version10.35.02	N/A	N/A

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	68-4-74-19-002	102590	1	2023-5-27
LISN	Rohde & Schwarz	ENV216	68-4-87-19-001	102472	1	2023-5-27
Attenuator	Shanghai Huaxiang	TS2-26-3	68-4-81-16-003	080928189	1	2023-5-27
Test software	Rohde & Schwarz	EMC32	68-4-90-19-005-A01	Version10.35.02	N/A	N/A
Shielding Room	TDK	CSR #2	68-4-90-19-005	----	3	2025-10-15

Conducted RF Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	68-4-74-14-004	101030	1	2023-5-27
Test software	Tonscend	System for BT/WIFI	68-4-74-14-006-A13	Version 2.6.77.0518	N/A	N/A
Shielding Room	TDK	TS8997	68-4-90-19-003	----	3	2025-10-15

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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 Conducted Emission 150kHz-30MHz (for test using AMN ENV432 or ENV4200)	3.57dB
Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 9kHz-30MHz	4.70dB
Uncertainty for Radiated Emission in new 3m chamber (68-4-90-19-006) 30MHz-1000MHz	Horizontal: 4.59dB; Vertical: 4.75dB
Uncertainty for Radiated Emission in new 3m chamber (68-4-90-19-006) 1000MHz-18000MHz	Horizontal: 5.08dB; Vertical: 5.09dB;
Uncertainty for Radiated Emission 18000MHz-40000MHz	Horizontal: 4.52dB; Vertical: 4.51dB
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: 2021, clause 4.4.3 and 4.5.1.

THE END

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