FCC - TEST REPORT

Report Number	:	**68.910.22.0032.01**	Date of Issue:	**2022-06-21**
Model	:	**CM-07**		
Product Type	:	Tubular Motor		
Applicant	:	Coulisse B.V.		
Address	:	Vonderweg 48, Enter, 7468 DC, Netherlands		
Manufacturer	:	Ningbo Dooya Mechanic & Electronic Technology Co., Ltd.		
Address	:	No.168 Shengguang Road, Luotuo, Zhenhai, 315202 Ningbo, Zhejiang province, PEOPLE'S REPUBLIC OF CHINA		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**38**		

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1 Table of Contents

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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 China
FCC Designation Number:	CN5009
FCC Registration No.:	514049
Telephone:	86 755 8828 6998
Fax:	86 755 8828 5299

3 Description of the Equipment under Test

Product:	Tubular Motor
Model no.:	CM-07
FCC ID:	ZY4CM07B
Rating:	12V ⎓; 1A, 12W
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	40
Modulation:	GFSK
Antenna Type:	Monopole Antenna
Antenna Gain:	0dBi max for 2.4GHz BLE
Description of the EUT:	The Equipment Under Test (EUT) is a Tubular Motor supports 2.4GHz BLE/433.925MHz SRD functions.

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2020 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB558074 D01 v05r02 DTS 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	Test Site
§15.207	Conducted emission AC power port	Pass	Site 1
§15.247 (b) (3)	Conducted output power	Pass	Site 1
RSS-247 5.4(d)	Equivalent Isotropic Radiated Power	Pass	Site 1
§15.247(e)	Power spectral density	Pass	Site 1
§15.247(a)(2)	6dB bandwidth	Pass	Site 1
§15.247(a)(1)	20dB Occupied bandwidth	N/A	--
§15.247(a)(1)	Carrier frequency separation	N/A	--
§15.247(a)(1)(iii)	Number of hopping frequencies	N/A	--
§15.247(a)(1)(iii)	Dwell Time	N/A	--
§15.247(d)	Spurious RF conducted emissions	Pass	Site 1
§15.247(d)	Band edge	Pass	Site 1
§15.247(d) & §15.209 & §15.205	Spurious radiated emissions for transmitter	Pass	Site 1
§15.203	Antenna requirement	Pass See note 1	--

Remark 1: N/A – Not Applicable.
Note 1: The EUT uses a Monopole Antenna, which gain is 0dBi. 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: ZY4CM07B, complies with Section 15.207, 15.209, 15.205, 15.247 of the FCC Part 15, Subpart C.

This report is for the Bluetooth Low Energy part.

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: 2022-05-10

Testing Start Date: 2022-05-12

Testing End Date: 2022-05-30

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

Reviewed by:	Prepared by:	Tested by:
Jessie He	Myron Yu	Carry Cai
Project Manager	Project Engineer	Test Engineer

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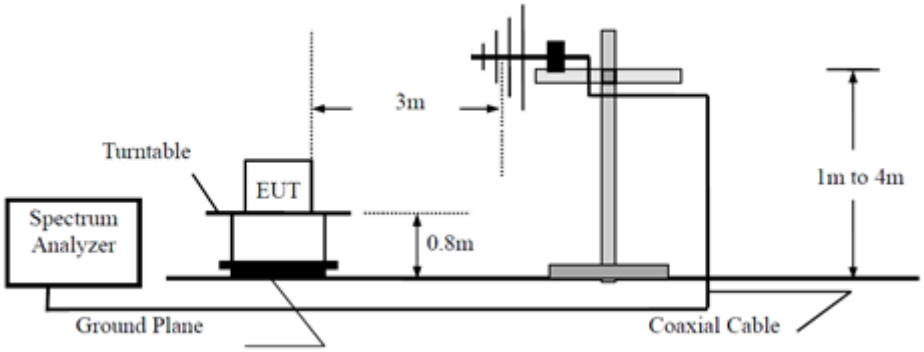
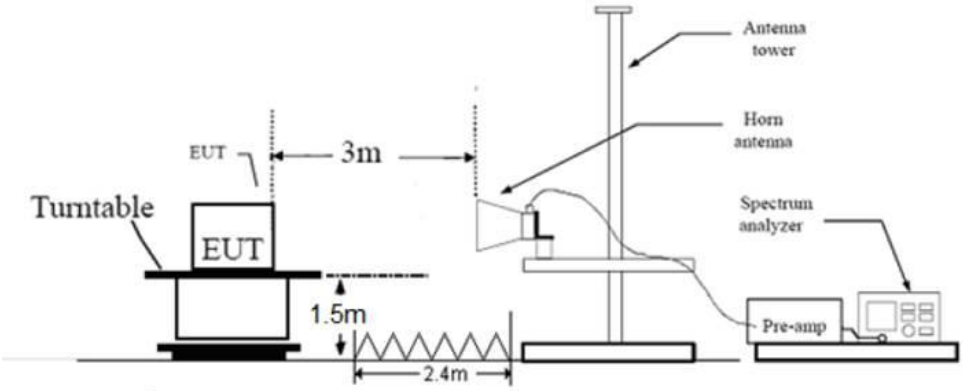
7 Test Setups

7.1 Radiated test setups

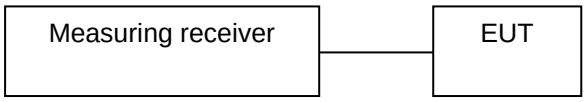
Below 1GHz



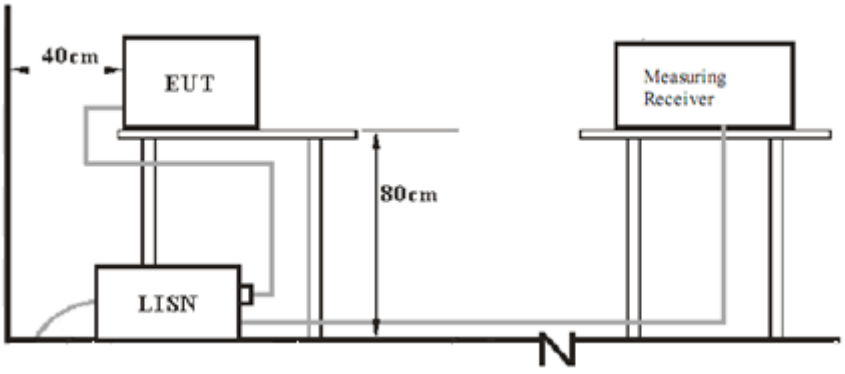
Above 1GHz



7.2 Conducted RF test setups



7.3 AC Power Line Conducted Emission test setups



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8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	REMARK
LAPTOP	THINKPAD	X220	429044C
DC POWER SOURCE	NANJING SHENGBAO ELECTRONICS CO., LTD.	ROSE-122000	INPUT: 100-240VAC, 50/60HZ, 1A MAX OUTPUT:12VDC, 2A

The system was configured to channel 0, 19, and 39 for the test.

Test Software Information:

Test Software Version	BlueNRG GUI-4.0.0.0	
Modulation	Setting TX Power	Packet Type
GFSK	3	/

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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

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

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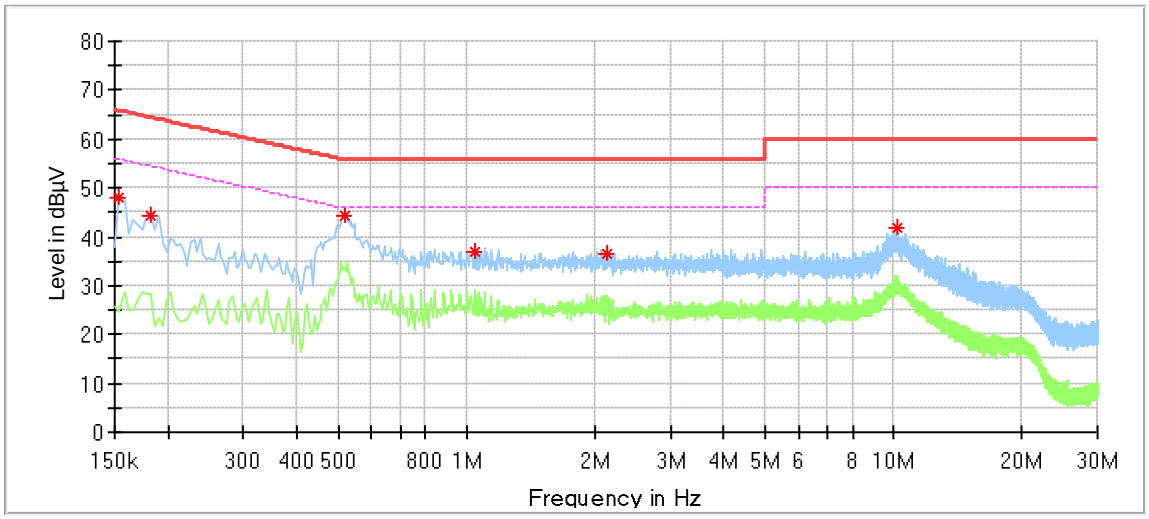
Conducted Emission

Product Type	:	Tubular Motor
M/N	:	CM-07
Operating Condition	:	ON + BLE
Test Specification	:	Power Line, Live
Comment	:	120VAC, 60Hz (External DC power source)



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	48.20	---	65.78	17.58	L1	9.25
0.182000	44.39	---	64.39	20.00	L1	9.25
0.518000	44.30	---	56.00	11.70	L1	9.20
1.042000	36.98	---	56.00	19.02	L1	9.20
2.126000	36.69	---	56.00	19.31	L1	9.23
10.194000	41.68	---	60.00	18.32	L1	9.39

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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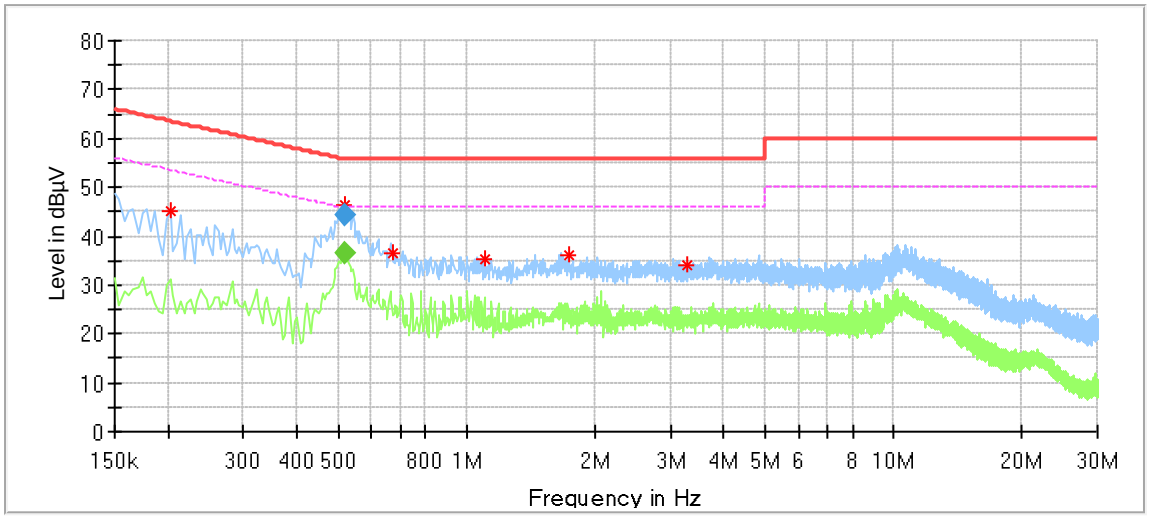
Conducted Emission

Product Type	:	Tubular Motor
M/N	:	CM-07
Operating Condition	:	ON + BLE
Test Specification	:	Power Line, Neutral
Comment	:	120VAC, 60Hz (External DC power source)



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.202000	45.14	---	63.53	18.39	N	9.39
0.518500	46.16	---	56.00	9.84	N	9.40
0.670000	36.37	---	56.00	19.63	N	9.39
1.106000	35.42	---	56.00	20.58	N	9.40
1.730000	35.91	---	56.00	20.09	N	9.41
3.270000	34.00	---	56.00	22.00	N	9.45

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.518500	44.14	---	56.00	11.86	N	9.40
0.518500	---	36.65	46.00	9.35	N	9.40

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 output power

Test Method

1. The EUT was placed on 0.8m height table, 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. Use the following spectrum analyzer settings:
   RBW > the 6dB bandwidth of the emission being measured, VBW≥3RBW, Span≥3RBW
   Sweep = auto, Detector function = peak, Trace = max hold.
3. 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.

Limits

According to §15.247 (b) (3), conducted output power limit as below:

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

Test Results

Data rate	Frequency (MHz)	Conducted Output Power (dBm)	Result
1 Mbps	Low channel 2402MHz	2.71	Pass
	Middle channel 2440MHz	2.54	Pass
	High channel 2480MHz	2.30	Pass

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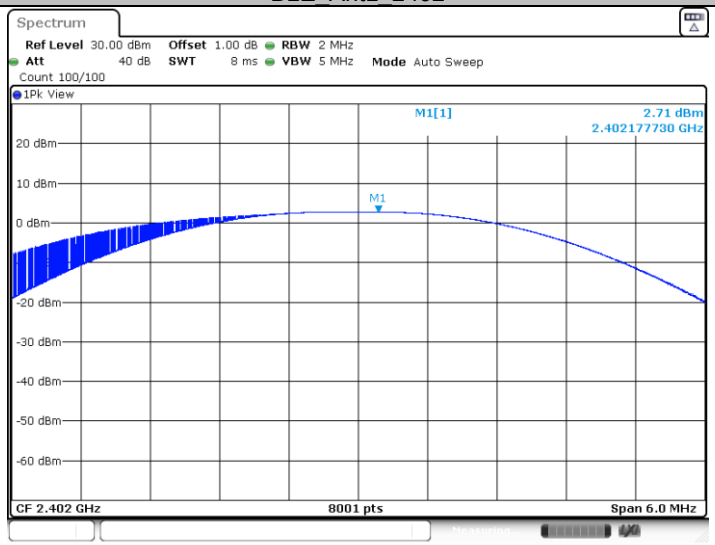
Test Graphs

BLE_Ant1_2402



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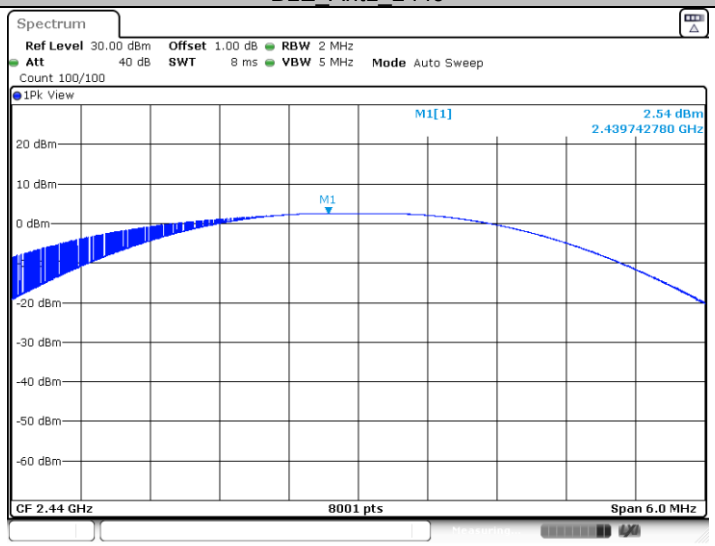

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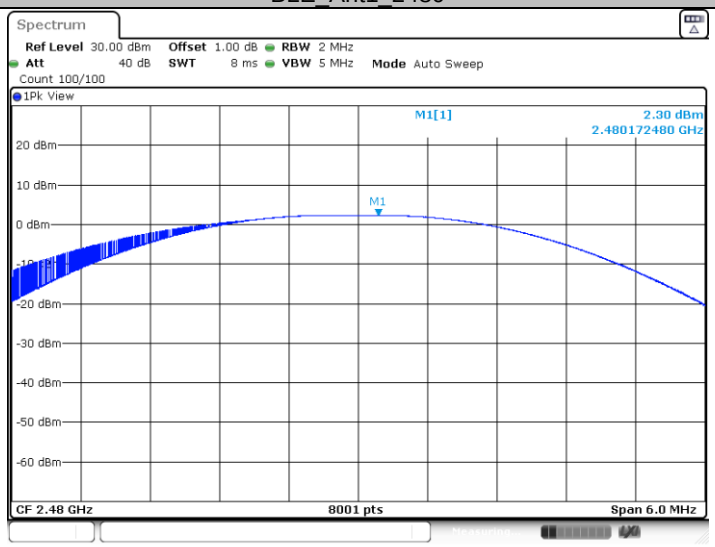
BLE_Ant1_2480



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9.3 6dB bandwidth

Test Method

1. Connect EUT test port to spectrum analyzer.
2. Use the following spectrum analyzer settings:
   RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
3. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
4. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]
≥500

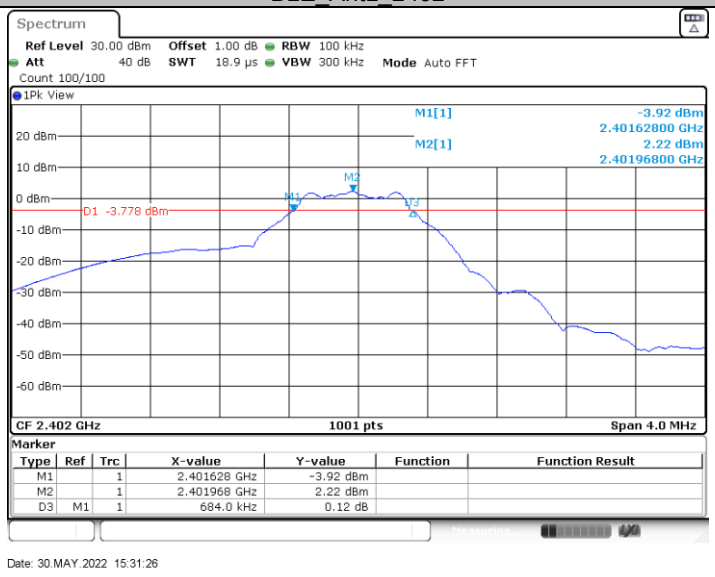
Test Results

Data rate	Channel (MHz)	Result (MHz)	Limit (MHz)	Verdict
1 Mbps	2402	0.684	0.5	PASS
	2440	0.676	0.5	PASS
	2480	0.672	0.5	PASS

Test Graphs

1 Mbps:

BLE_Ant1_2402



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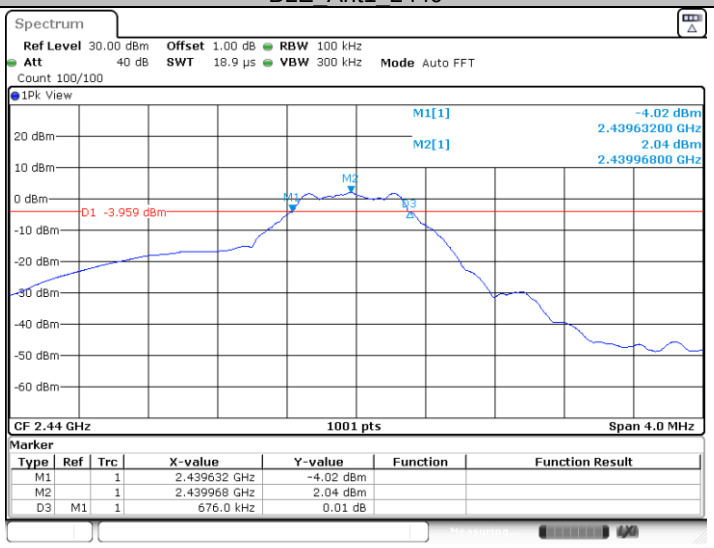
BLE_Ant1_2440



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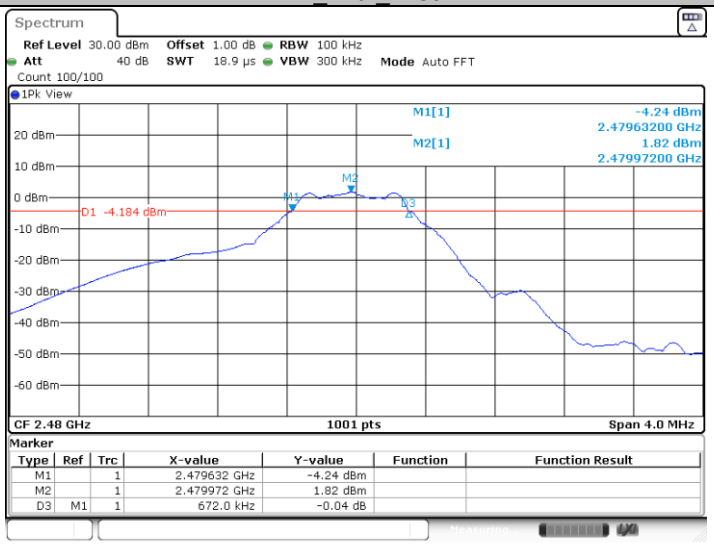
BLE_Ant1_2480



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9.4 99% bandwidth

Test Method

1. Connect EUT test port to spectrum analyzer.
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 automatic bandwidth measurement capability of an instrument, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
4. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]
--

Test Results

Data rate	Channel (MHz)	Result (MHz)	Limit (MHz)	Verdict
1 Mbps	2402	1.483	---	PASS
	2440	1.443	---	PASS
	2480	1.207	---	PASS

Test Graphs

1 Mbps:

BLE_Ant1_2402

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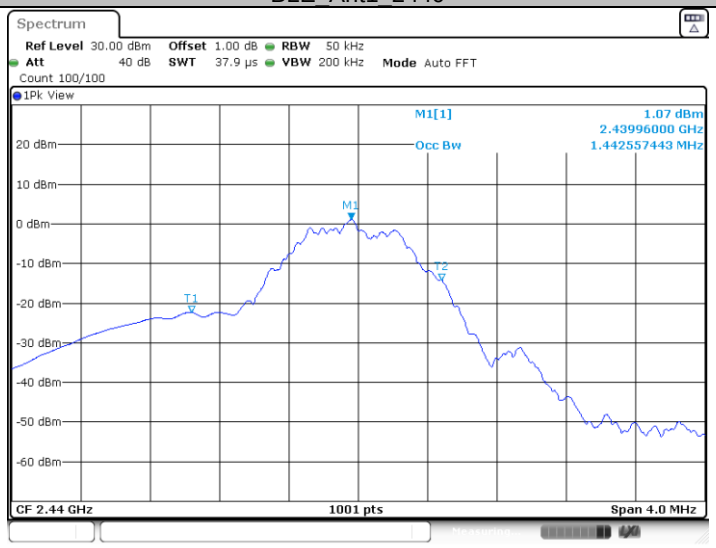
BLE_Ant1_2440
 Date: 30.MAY.2022 15:34:20
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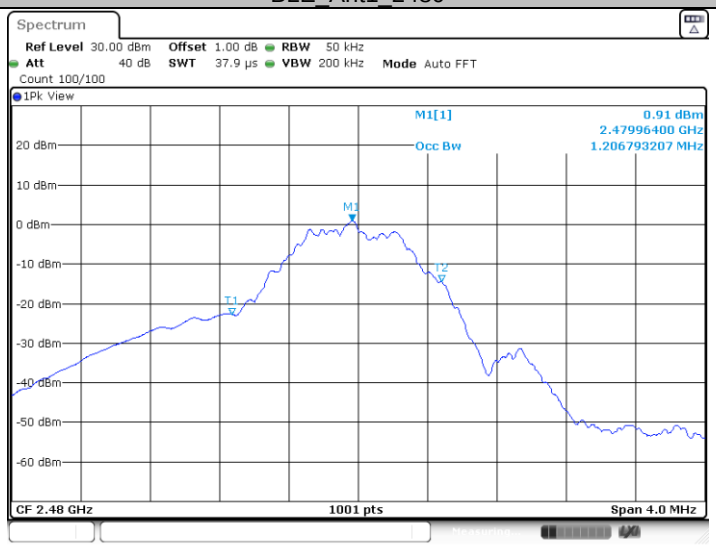 Date: 30.MAY.2022 15:36:50

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9.5 Power spectral density

Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

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 analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW≥3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto,
   Trace= max hold.
3. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
4. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm/3KHz]
≤8

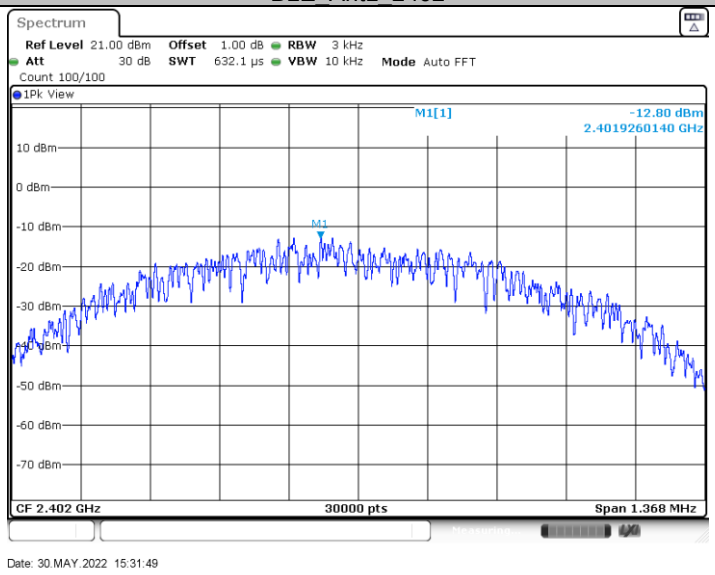
Test Results

Data rate	Channel (MHz)	Result (dBm/3KHz)	Limit(dBm/3KHz)	Verdict
1 Mbps	2402	-12.8	8	PASS
	2440	-13.05	8	PASS
	2480	-12.84	8	PASS

Test Graphs

1 Mbps:

BLE_Ant1_2402



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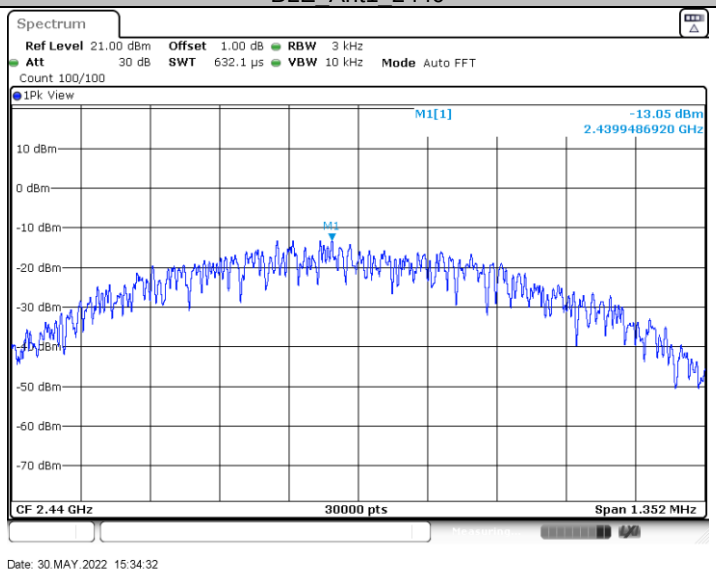
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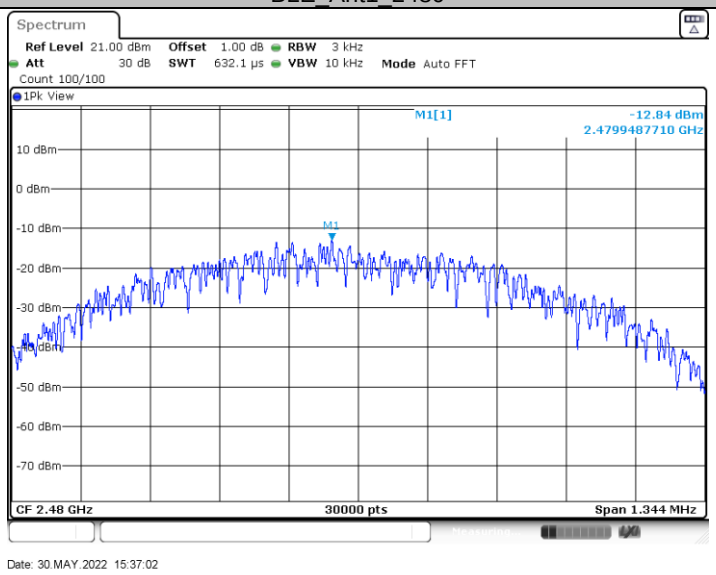

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9.6 Spurious RF conducted emissions

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. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
3. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
4. The level displayed must comply with the limit specified in this Section. Submit these plots.
5. Repeat above procedures until all frequencies measured were complete.

Limit

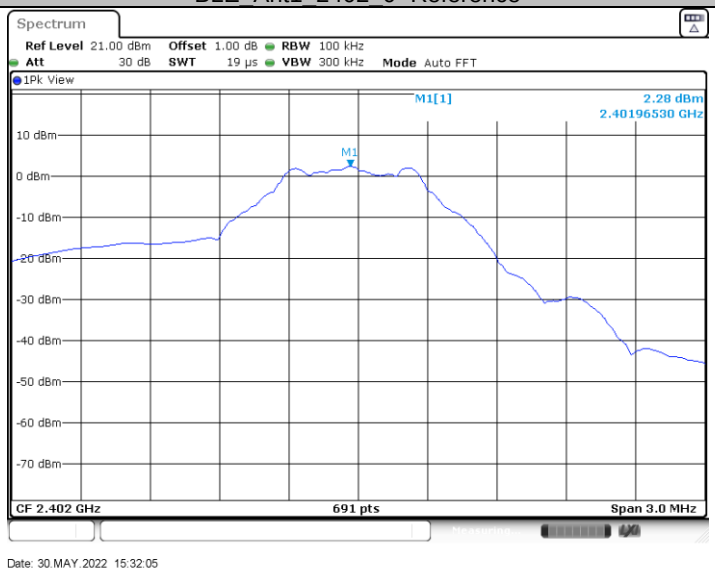
Frequency Range MHz	Limit (dBc)
30-25000	-20

Test Results

Data rate	Channel (MHz)	Freq Range (MHz)	Ref Level (dBm)	Result (dBm)	Limit (dBm)	Verdict
1 Mbps	2402	Reference	2.28	2.28	---	PASS
		30~1000	---	-65.32	<=-17.72	PASS
		1000~26500	---	-46.56	<=-17.72	PASS
	2440	Reference	1.98	1.98	---	PASS
		30~1000	---	-64.46	<=-18.02	PASS
		1000~26500	---	-44.49	<=-18.02	PASS
	2480	Reference	1.80	1.80	---	PASS
		30~1000	---	-64.14	<=-18.2	PASS
		1000~26500	---	-38.91	<=-18.2	PASS

1 Mbps:

BLE_Ant1_2402_0~Reference



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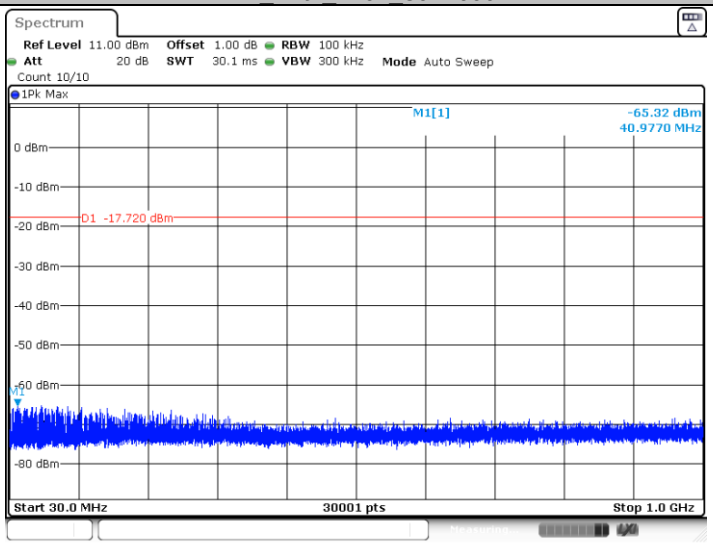
BLE_Ant1_2402_30~1000



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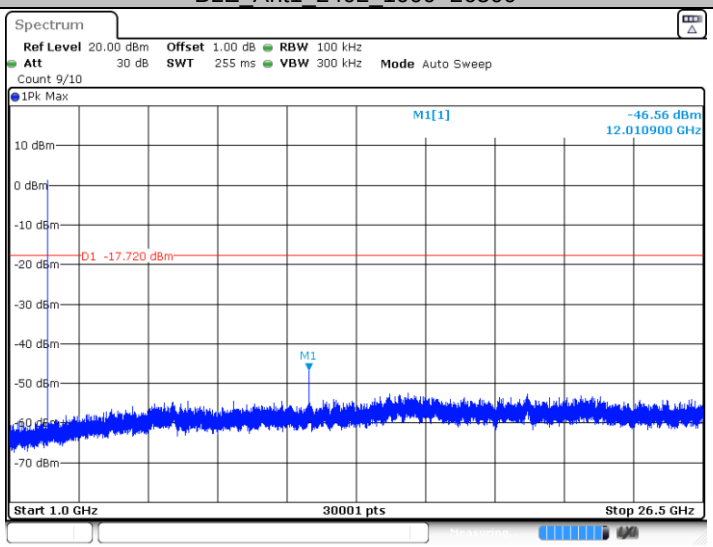
BLE_Ant1_2402_1000~26500



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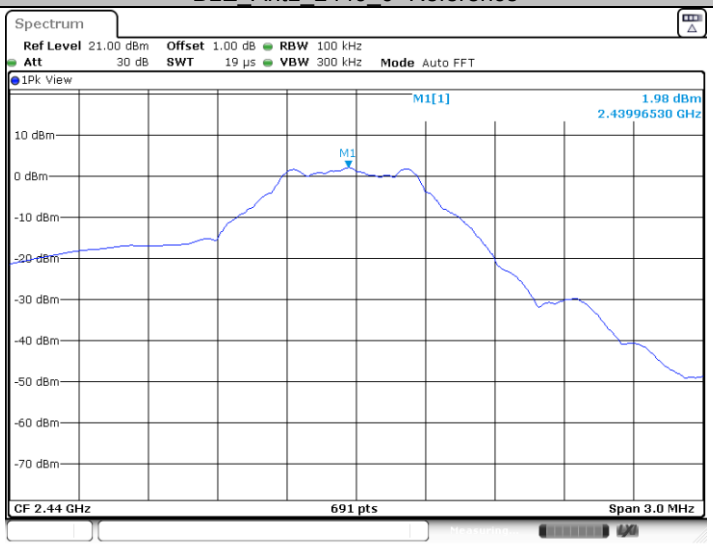

Date: 30.MAY.2022 15:34:38

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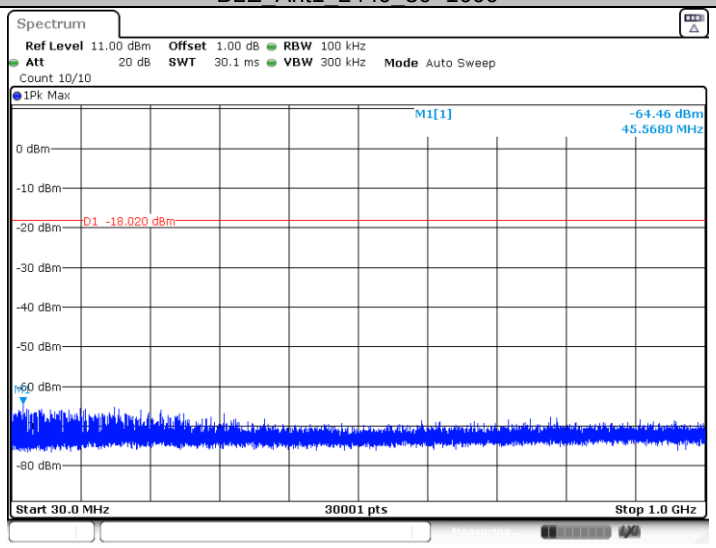
BLE_Ant1_2440_30~1000



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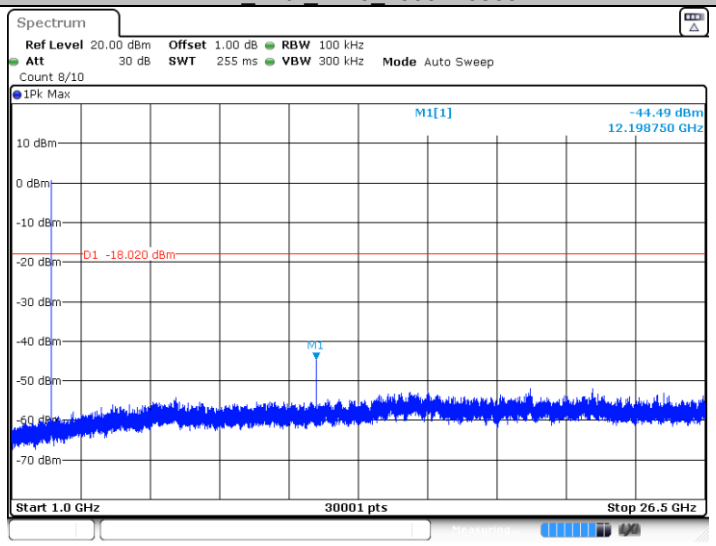
BLE_Ant1_2440_1000~26500



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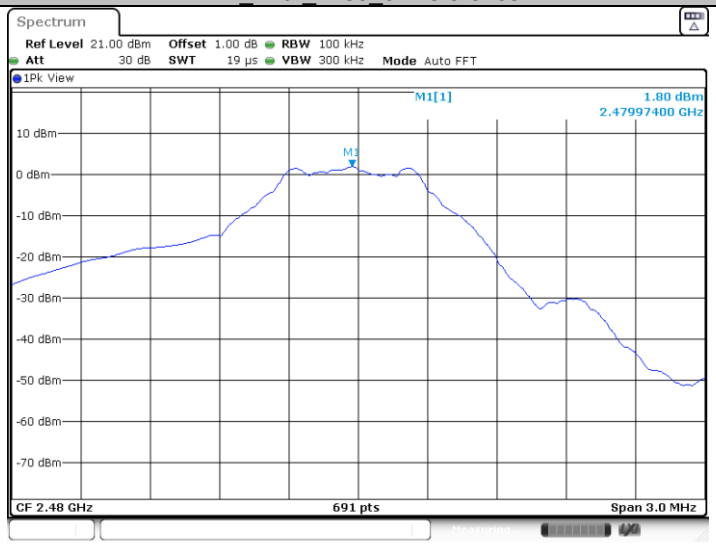
BLE_Ant1_2480_0~Reference



Date: 30.MAY.2022 15:37:17

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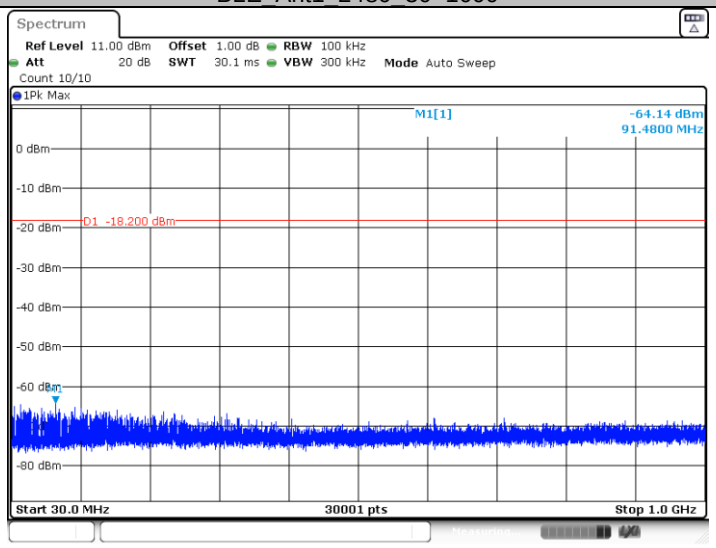
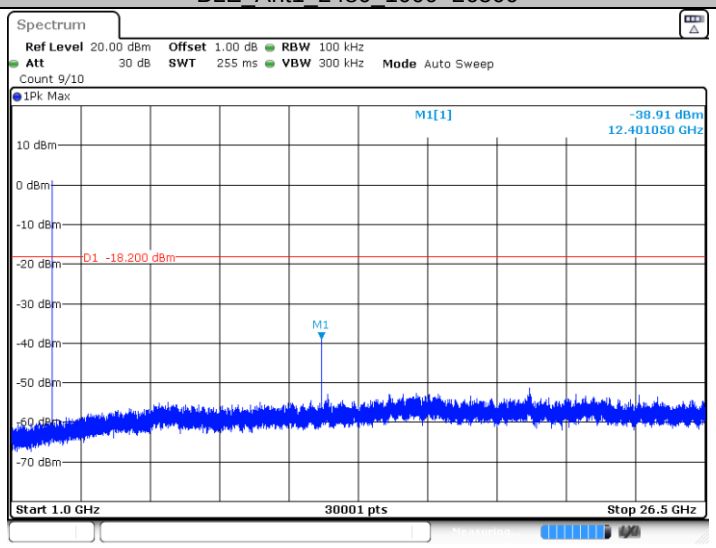
BLE_Ant1_2480_30~1000



Date: 30.MAY.2022 15:37:23

BLE_Ant1_2480_1000~26500



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9.7 Band edge

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. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
3. Allow the trace to stabilize, use the peak and delta measurement to record the result.
4. The level displayed must comply with the limit specified in this Section.
5. Repeat the test at the hopping off and hopping on mode, submit all the plots.

Limit:

According to §15.247(d) and RSS-247 5.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator 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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) and RSS-Gen 8.10, must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)) and RSS-Gen.

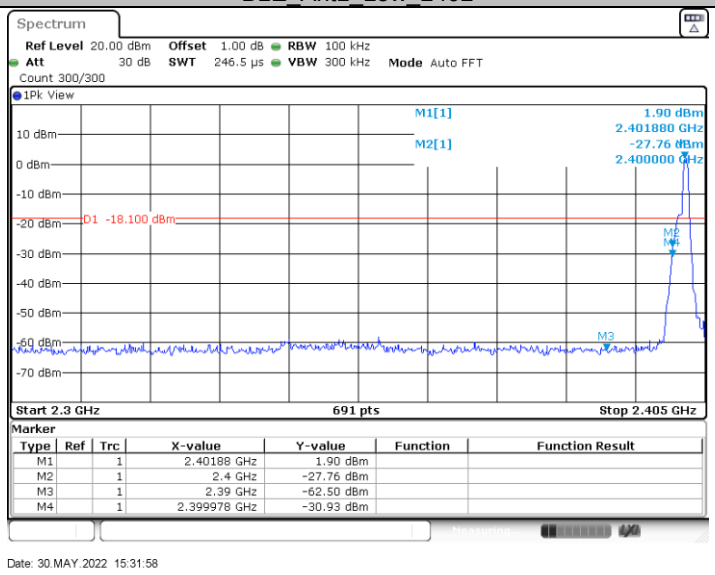
Frequency Range MHz	Limit (dBc)
30-25000	-20

Test Results

Data rate	Ch Name	Channel (MHz)	Ref Level (dBm)	Result (dBm)	Limit (dBm)	Verdict
1 Mbps	Low	2402	1.90	-30.93	<=-18.1	PASS
	High	2480	1.78	-56.21	<=-18.22	PASS

1 Mbps:

BLE_Ant1_Low_2402



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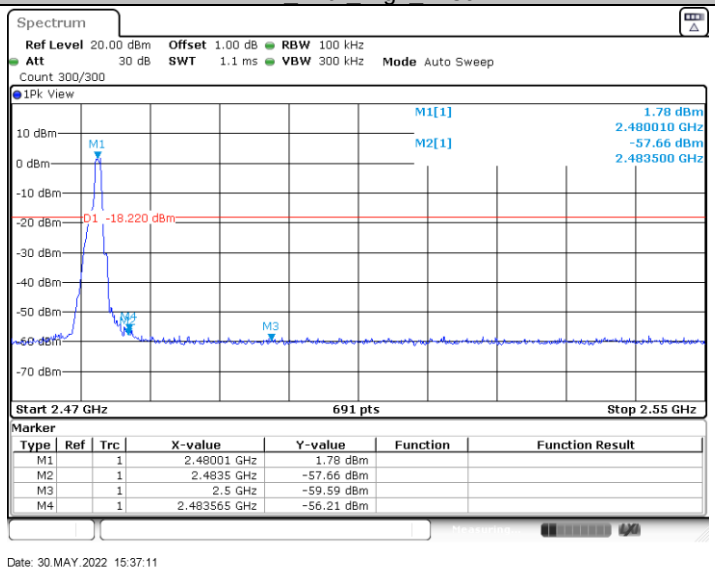
BLE_Ant1_High_2480



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9.8 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 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3: 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.
4: 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.
5: Use the following spectrum analyzer settings According to C63.10:
For Below 1GHz
Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz to 120KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Peak unwanted emissions Above 1GHz:

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Procedures for average unwanted emissions measurements above 1000 MHz

a) RBW = 1MHz.
b) VBW \ [3 × RBW].
c) Detector = RMS (power averaging), if [span / (# of points in sweep)] \ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
e) Sweep time = auto.
f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)
g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

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 uV/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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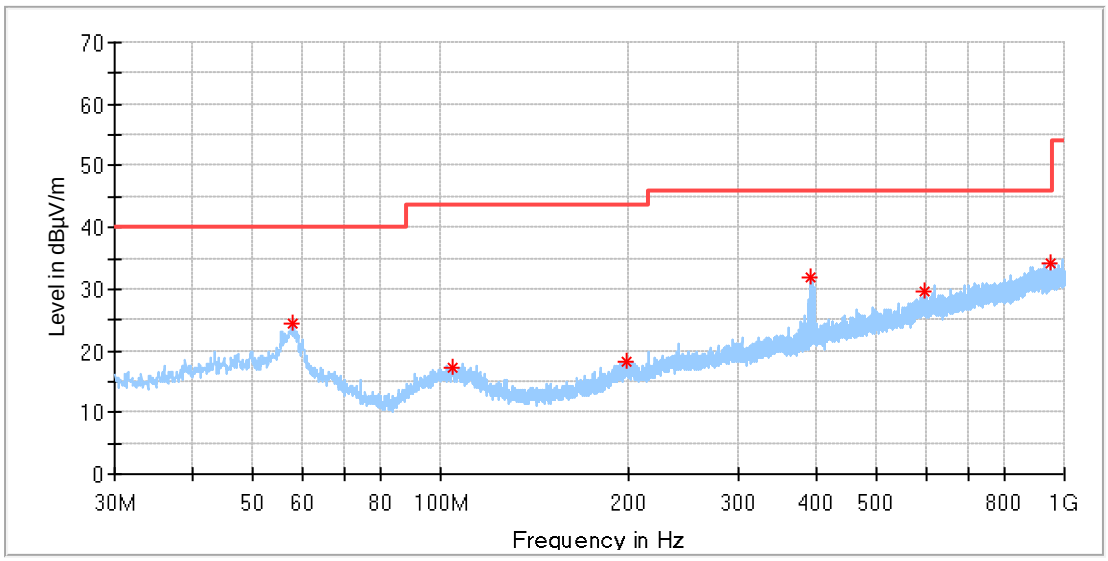
Spurious radiated emissions for transmitter

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:

Below 1G:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
57.826875	24.47	40.00	15.53	100.0	H	293.0	20.38
104.629375	17.35	43.50	26.15	200.0	H	56.0	19.29
198.234375	18.21	43.50	25.29	100.0	H	312.0	19.61
392.840625	32.05	46.00	13.95	100.0	H	116.0	23.99
596.237500	29.68	46.00	16.32	200.0	H	1.0	28.51
948.590000	34.32	46.00	11.68	200.0	H	0.0	32.69

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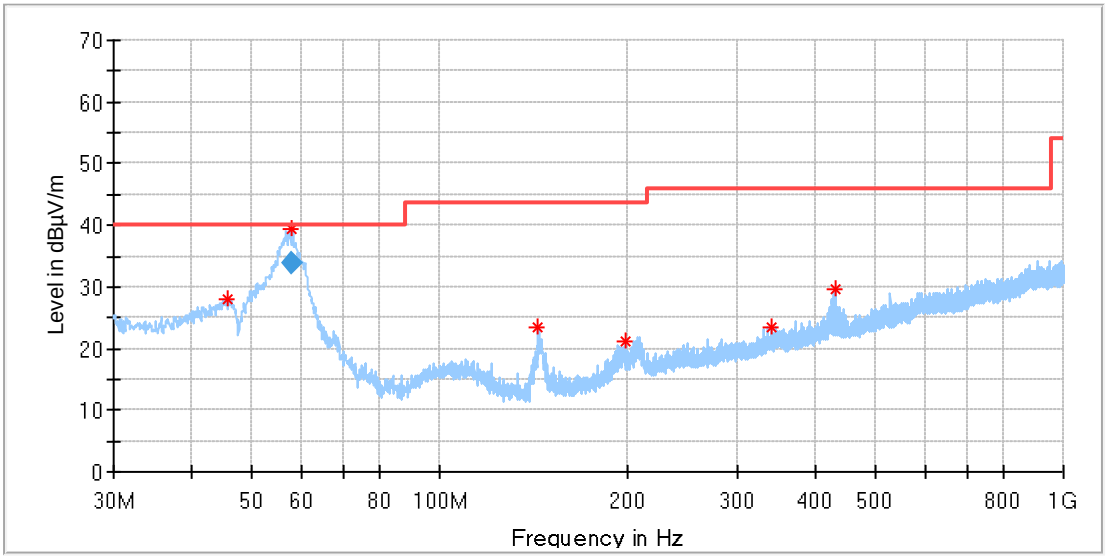

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.823125	28.09	40.00	11.91	100.0	V	267.0	20.84
57.962500	39.51	40.00	0.49	100.0	V	-177.0	20.38
143.975000	23.47	43.50	20.03	100.0	V	0.0	15.47
198.719375	21.29	43.50	22.21	100.0	V	0.0	19.56
341.248750	23.31	46.00	22.69	200.0	V	0.0	23.13
432.004375	29.47	46.00	16.53	100.0	V	258.0	24.92

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
57.962500	33.77	40.00	6.23	100.0	V	-177.0	20.37

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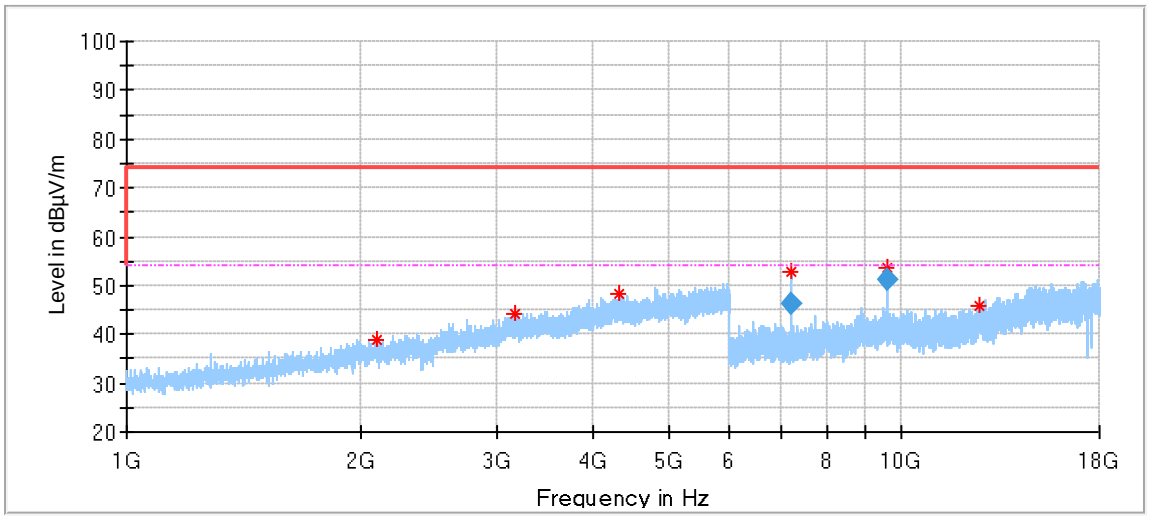
Low channel 2402MHz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2104.000000	38.99	74.00	35.01	150.0	H	178.0	-6.53
3178.500000	44.28	74.00	29.72	150.0	H	0.0	-0.73
4329.500000*	48.27	74.00	25.73	150.0	H	0.0	3.35
7205.000000	52.91	74.00	21.09	150.0	H	80.0	8.83
9607.000000	53.67	74.00	20.33	150.0	H	161.0	12.87
12578.500000*	45.94	74.00	28.06	150.0	H	106.0	14.80

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7205.000000	46.18	54.00	7.82	150.0	H	80.0	8.83
9607.000000	51.19	54.00	2.81	150.0	H	161.0	12.87

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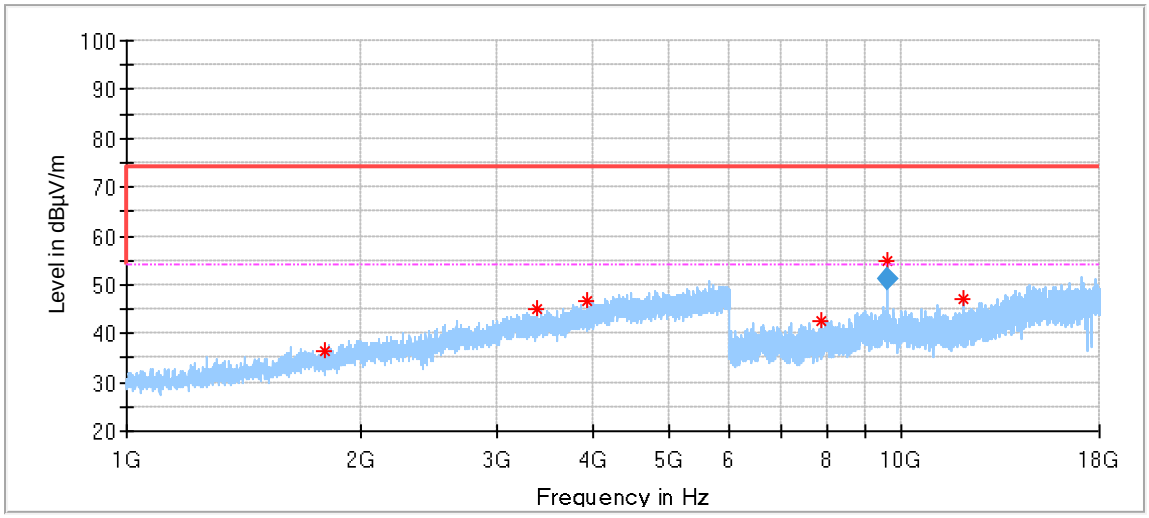

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1801.000000	36.44	74.00	37.56	150.0	V	59.0	-8.45
3393.000000	44.96	74.00	29.04	150.0	V	194.0	-0.62
3917.500000*	46.86	74.00	27.14	150.0	V	345.0	1.23
7870.000000	42.69	74.00	31.31	150.0	V	354.0	10.00
9608.000000	54.98	74.00	19.02	150.0	V	116.0	12.88
12009.500000*	47.03	74.00	26.97	150.0	V	199.0	13.82

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9608.000000	51.00	54.00	3.00	150.0	V	116.0	12.88

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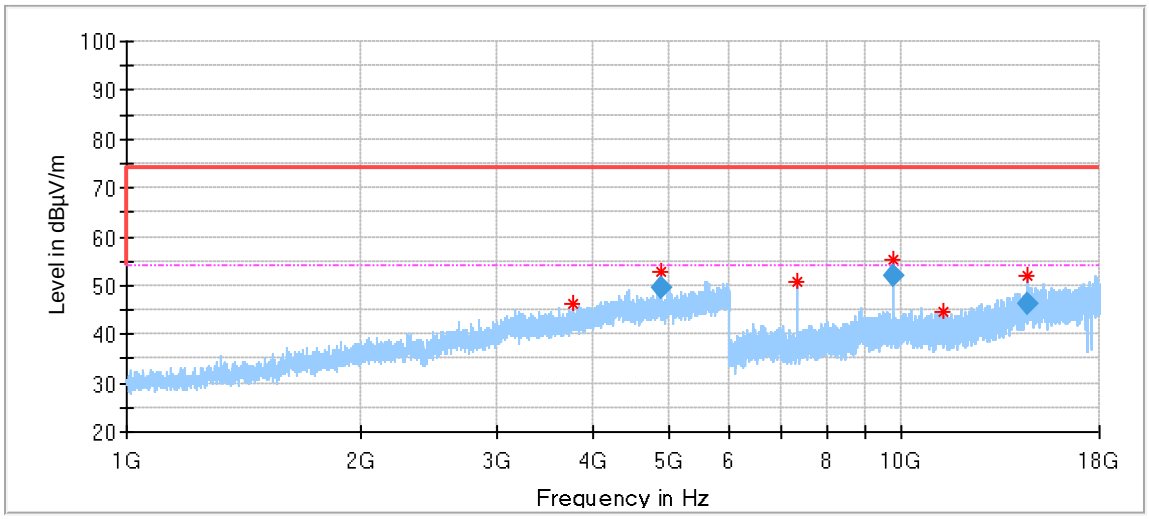
Middle channel 2440MHz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3767.500000*	46.29	74.00	27.71	150.0	H	204.0	0.81
4880.000000*	52.67	74.00	21.33	150.0	H	85.0	4.49
7319.000000*	50.96	74.00	23.04	150.0	H	82.0	9.07
9759.000000	55.39	74.00	18.61	150.0	H	134.0	13.14
11285.500000*	44.70	74.00	29.30	150.0	H	24.0	12.91
14512.000000	51.94	74.00	22.06	150.0	H	108.0	18.25

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4880.000000*	49.37	54.00	4.63	150.0	H	85.0	4.49
9759.000000	52.00	54.00	2.00	150.0	H	134.0	13.14
14512.000000	46.20	54.00	7.80	150.0	H	108.0	18.25

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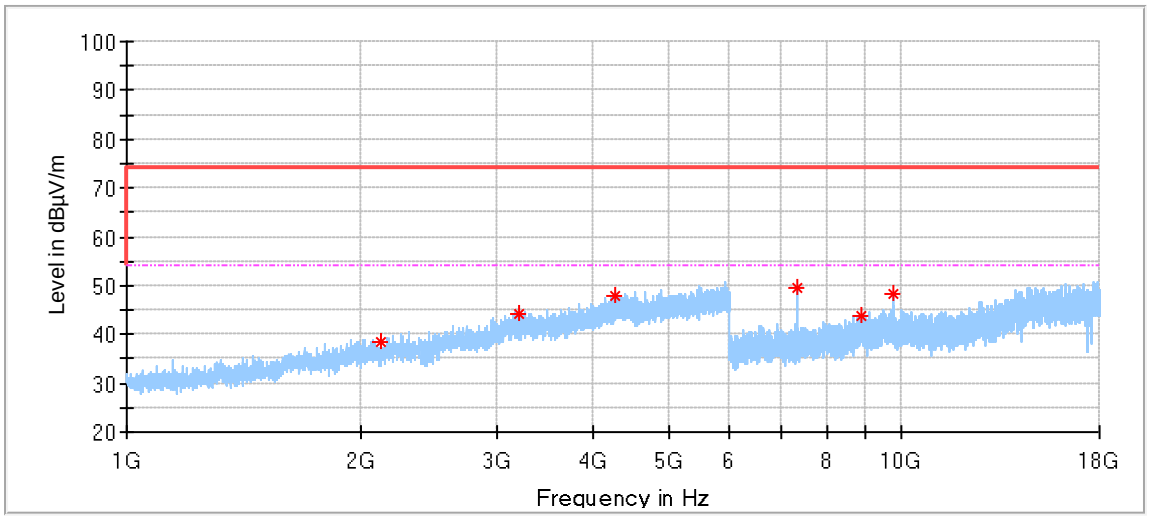

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2123.500000	38.55	74.00	35.45	150.0	V	329.0	-6.51
3214.500000	44.11	74.00	29.89	150.0	V	71.0	-0.93
4278.500000*	47.85	74.00	26.15	150.0	V	133.0	3.32
7319.500000*	49.46	74.00	24.54	150.0	V	161.0	9.07
8878.500000	43.68	74.00	30.32	150.0	V	47.0	13.10
9761.000000	48.31	74.00	25.69	150.0	V	47.0	13.15

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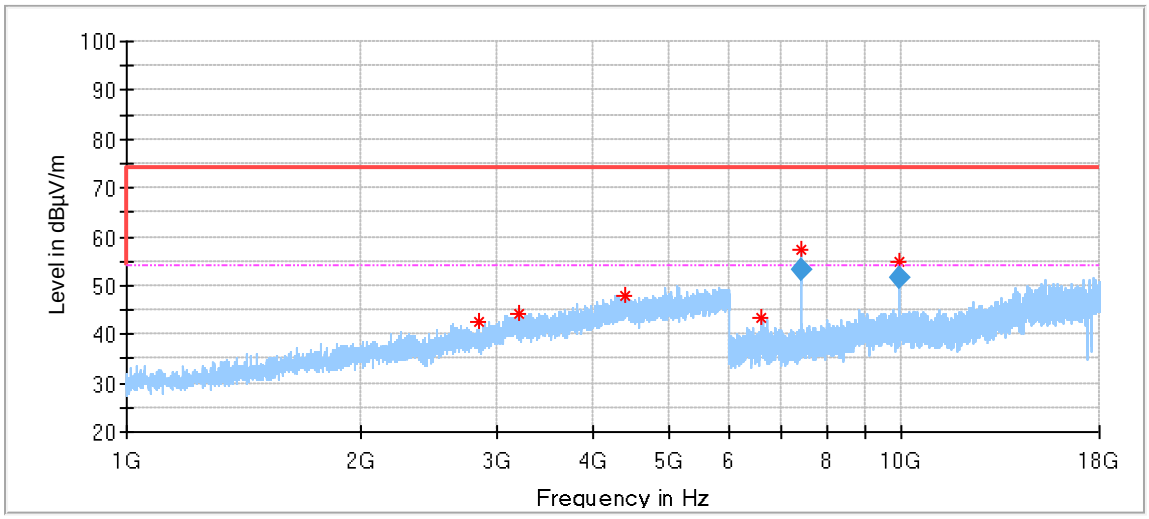
High channel 2480MHz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2853.500000*	42.63	74.00	31.37	150.0	H	316.0	-3.45
3205.500000	44.24	74.00	29.76	150.0	H	31.0	-0.92
4386.000000*	47.95	74.00	26.05	150.0	H	245.0	3.42
6572.500000	43.41	74.00	30.59	150.0	H	30.0	8.92
7439.000000*	57.14	74.00	16.86	150.0	H	116.0	9.21
9919.000000	54.70	74.00	19.30	150.0	H	116.0	12.71

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.000000*	53.08	54.00	0.92	150.0	H	116.0	9.21
9919.000000	51.62	54.00	2.38	150.0	H	116.0	12.71

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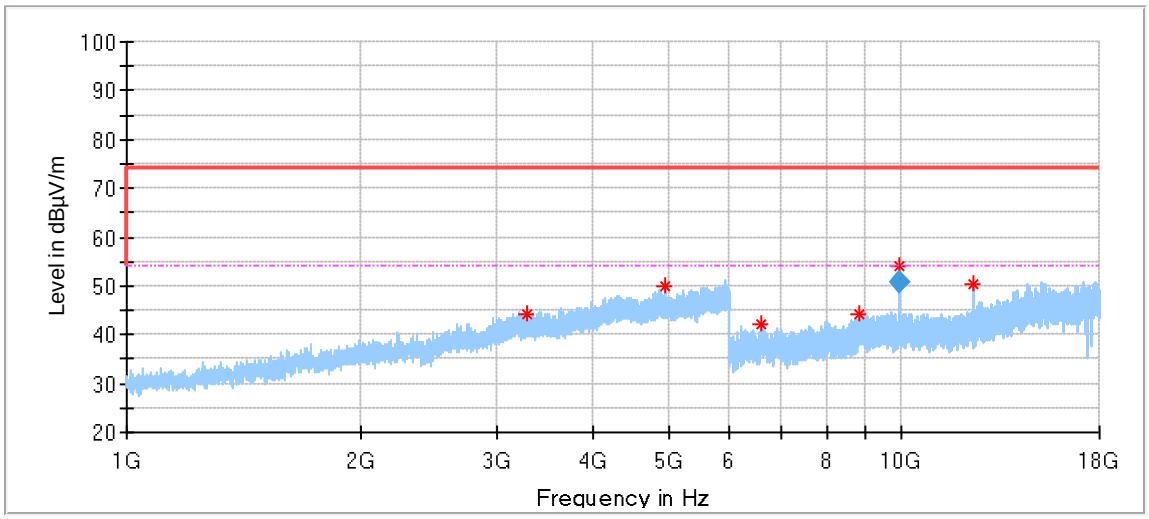

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3289.000000	44.09	74.00	29.91	150.0	V	337.0	-0.74
4960.000000*	49.91	74.00	24.09	150.0	V	43.0	4.63
6600.000000	42.18	74.00	31.82	150.0	V	280.0	9.28
8798.500000	44.08	74.00	29.92	150.0	V	144.0	12.76
9920.000000	54.07	74.00	19.93	150.0	V	4.0	12.71
12399.500000*	50.30	74.00	23.70	150.0	V	60.0	13.96

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9920.000000	50.82	54.00	3.18	150.0	V	4.0	12.71

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 range18-26GHz 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) Level= Reading Level + Correction Factor

(4) Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

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10 Test Equipment List

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	Version 10.35.02	N/A	N/A
Shielding Room	TDK	CSR #2	68-4-90-19-005	----	1	2022-11-07

Radiated Emission Test 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	2023-5-27
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	68-4-80-14-002	707	1	2022-7-23
Pre-amplifier	Rohde & Schwarz	SCU 18	68-4-29-14-001	102230	1	2023-5-28
Attenuator	Mini-circuits	UNAT-6+	68-4-81-21-001	15542	1	2023-5-27
3m Semi-anechoic chamber	TDK	SAC-3 #1	68-4-90-14-001	----	2	2023-5-28
Test software	Rohde & Schwarz	EMC32	68-4-90-14-001-A10	Version 10.35.02	N/A	N/A

Radiated Emission Test 2#

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
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	2022-7-21
Pre-amplifier	Rohde & Schwarz	SCU 40A	68-4-29-14-002	100432	1	2022-7-27
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	Version 10.35.02	N/A	N/A

RF Conducted Test

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

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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 (0.15MHz-30MHz)	3.31dB
Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001)30MHz-1000MHz	Horizontal: 4.68dB; Vertical: 4.65dB;
Uncertainty for Radiated Emission in new 3m chamber (68-4-90-19-006) 1000MHz-18000MHz	Horizontal: 4.76dB; Vertical: 4.75dB;
Uncertainty for Radiated Emission 18000MHz-40000MHz	Horizontal: 4.51dB; Vertical: 4.50dB
Uncertainty for Conducted RF test with TS 8997	RF Power Conducted: 1.27dB Frequency test involved: 0.6×10^{-7} 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 OF REPORT---

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