

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22BXOF(P15C-BLE) 001	Auftrags-Nr.: <i>Order no.:</i>	238542281	Seite 1 von 23 Page 1 of 23
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-04-14	
Auftraggeber: <i>Client:</i>	Microchip Technology Inc. 2355 West Chandler Blvd. Chandler, Arizona 85224-6199, United States.			
Prüfgegenstand: <i>Test item:</i>	IEEE 802.11 b/g/n Link Controller Module With Integrated Bluetooth			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	ATWILC3000-MR110UA			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C Test report (BLE)			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.247			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-05-20			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003264661-001			
Prüfzeitraum: <i>Testing period:</i>	2022-05-27 - 2022-07-15			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Taipei Testing Site			
Prüflaboratorium: <i>Testing laboratory:</i>	Taipei Testing Laboratories			
Prüfergebnis*: <i>Test result*:</i>	Pass			
zusammengestellt von: <i>compiled by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	2022-07-19		Ausstellungsdatum: <i>Issue date:</i>	
Stellung / Position:	Project Manager		2022-07-19	
	Jack Wang		Senior Project Manager	
Sonstiges / Other:	This is an updated reprot for 2 nd source crystal and 2 nd source RF inductors change, so we only evaluate and verify the output power and RSE tests. The other test results are all referred to the original report no. 50141822 001.			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.247(b) & 15.203	Antenna Requirement	Pass
5.1.2	15.247(b)(3)	Peak Output Power	Pass
-	15.247(a)(2)	6 dB Bandwidth	Refer to report no. 50141822 001
-	2.1049	99% Occupied Bandwidth	
-	15.247(e)	Power Spectral Density	
-	15.247(d)	Conducted Spurious Emissions and Band Edges	
5.1.3	15.247(d) & 15.205 & 15.209	Radiated Spurious Emissions and Band Edges	Pass
-	15.207	Mains Conducted Emission	Refer to report no. 50141822 001

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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APPENDIX B - TEST RESULT OF RADIATED Emissions for Ant No. 6

APPENDIX C - TEST RESULT OF RADIATED Emissions for Ant No. 9

APPENDIX SP - Photographs of Test Setup

APPENDIX EP - Photographs of EUT

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HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
CN22BXOF(P15C-BLE) 001	Original Release	2022-07-19

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A - Test Result of Radiated Emissions for Ant No. 4

Appendix B - Test Result of Radiated Emissions for Ant No. 6

Appendix C - Test Result of Radiated Emissions for Ant No. 9

Appendix SP - Photographs of Test Setup

Appendix EP - Photographs of EUT

Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.247
FCC 47CFR Part 2: Subpart J Section 2.1049
ANSI C63.10:2013
KDB 558074 D01 15.247 Meas Guidance v05r02

1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,
New Taipei City 244
Taiwan (R.O.C.)
FCC Registration No.: 226631
ISED Registration No.: 25563

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95% level of confidence.

Emission Measurement Uncertainty

Parameter	Uncertainty
Radiated Emission (9 kHz ~ 30 MHz)	± 1.15 dB
Radiated Emission (30 MHz ~ 200 MHz)	± 1.30 dB
Radiated Emission (200 MHz ~ 1 GHz)	± 1.30 dB
Radiated Emission (1 GHz ~ 18 GHz)	± 1.54 dB
Radiated Emission (18 GHz ~ 40 GHz)	± 2.52 dB
Mains Conducted Emission	± 1.65 dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT is an IEEE 802.11 b/g/n Link Controller Module With Integrated Bluetooth . It contains a Bluetooth compatible module enabling the user to communicate data through a Wireless interface. For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	IEEE 802.11 b/g/n Link Controller Module With Integrated Bluetooth
Type Identification	ATWILC3000-MR110UA
FCC ID	2ADHKWILC3000U

Technical Specification of EUT

Item	EUT information
Operating Frequency	2402 MHz ~ 2480 MHz
Channel Spacing	2 MHz
Channel Number	40
Data Rate	1Mbps
Operation Voltage	2.5Vdc to 4.2Vdc (Typical = 3.3Vdc)
Modulation	GFSK
Maximum Output Power (mW)	4.38
Antenna Information	Refer to Note 1
Accessory Device	Refer to 4.4

Note 1: External Antenna List

Antennas no. 4, 6 and 9 selected for testing as worst case antennas

Antenna No.	P/N	Vendor	Antenna Gain @ 2.4GHz Band	Antenna type	Remarks
1	W3525B039	Pulse Electronics Corporation	2 dBi	PCB	Cable length 100mm
2	RN-SMA-4	Microchip	2.2 dBi	Dipole	
3	RFDP A870920IMLB 301	WALSIN	1.84 dBi	Dipole-DB	Dual Band
4	RFMTA331215IMAB 701	WALSIN	3.8 dBi	Metal Stamp	Cable length 150mm
5	RFMTA331240IMAB 701	WALSIN	3.0 dBi	Metal Stamp	Antenna same as SIno.4, cable length 400 mm
6	RFPCA381013IMAB 701	WALSIN	4.50 dBi	PCB	Cable length 130mm
7	RFPCA381035IMAB 701	WALSIN	2.7 dBi	PCB	Antenna same as SIno.6, cable length 350mm
8	RFA-02-3-C5H1	Aristotle	3 dBi	Dipole	
9	RFA-02-5-C7H1	Aristotle	5 dBi	Dipole-Long	
10	RFA-02-P33	Aristotle	2 dBi	PCB	Cable length 150mm
11	1461530100	Molex	3 dBi	PCB/Flexi	Cable length 100mm Dual Band
12	RN-SMA-S	Microchip	0.56 dBi	Dipole-short	
13	RN-SMA-7	Microchip	5 dBi	Dipole-Long	
14	RFA-02-5-F7H1	Aristotle	5 dBi	Dipole-Long	
15	RFA-02-D3	Aristotle	2 dBi	Dipole-no encl.	
16	RFA-02-G03	Aristotle	2 dBi	Metal Stamp	Cable length 150mm
17	RFA-02-L2H1	Aristotle	2 dBi	Dipole	
18	RFA-02-P05	Aristotle	2 dBi	PCB	Cable length 150mm
19	RFA-02-C2M2	Aristotle	2 dBi	Dipole	

3.3 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.4 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The test modes were adapted accordingly in reference to the instructions for use. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output expected by the customer and is going to be fixed on the firmware of the final end product.

Table for Parameters of Test Software Setting

Frequency (MHz)	Power Setting
2402	6,12,-10.5
2440	6,12,-10
2480	6,12,9.5

4.2 Carrier Frequency and Channel

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

4.3 Test Operation and Test Software

Setup for testing: Test samples are provided with an I2C to USB Adaptor and UART Interface which makes it possible to control them through the test software installed on a notebook computer. This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed as below.

Test Software	ATWILC3000_ChcGUI.exe
---------------	-----------------------

The samples were used as follows:

A003264661-001

Full test was applied on all test modes, but only worst case was shown.

EUT Configure Mode	Applicable To				Description
	Antenna Port Conducted Measurement	Radiated Spurious Emissions above 1 GHz	Radiated Spurious Emissions below 1 GHz	Mains Conducted Emission	
Ant No. 4	-	√	√	-	-
Ant No. 6	-	√	√	-	-
Ant No. 9	√	√	√	-	-
Ant No. 12	√	-	-	-	-

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on Z-plane.
2. "-" means no effect.

Antenna Port Conducted Measurement

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)	Date Rate (Mbps)
Ant No. 9, 12	2402 to 2480	2402, 2440, 2480	1

Radiated Spurious Emissions (Above 1 GHz)

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)	Date Rate (Mbps)
Ant No. 4, 6	2402 to 2480	2402, 2440, 2480	1

Radiated Spurious Emissions (Below 1 GHz)

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)	Date Rate (Mbps)
Ant No. 4, 6	2402 to 2480	2402	1

Test Condition

Test Item		Ambient Temperature	Relative Humidity	Tested by
Conducted Measurement		18-23 °C	58-67 %	Nick Hsu
Radiated Spurious Emissions above 1 GHz	Ant No. 4	24.3-25.6 °C	54-57 %	Ivan Chiang
	Ant No. 6	23.6-25 °C	53-56 %	
	Ant No. 9	23.6-25 °C	53-56 %	
Radiated Spurious Emissions below 1 GHz	Ant No. 4	24.3-25.6 °C	54-57 %	Ivan Chiang
	Ant No. 6	23.6-25 °C	53-56 %	
	Ant No. 9	23.6-25 °C	53-56 %	

4.4 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Accessory of EUT

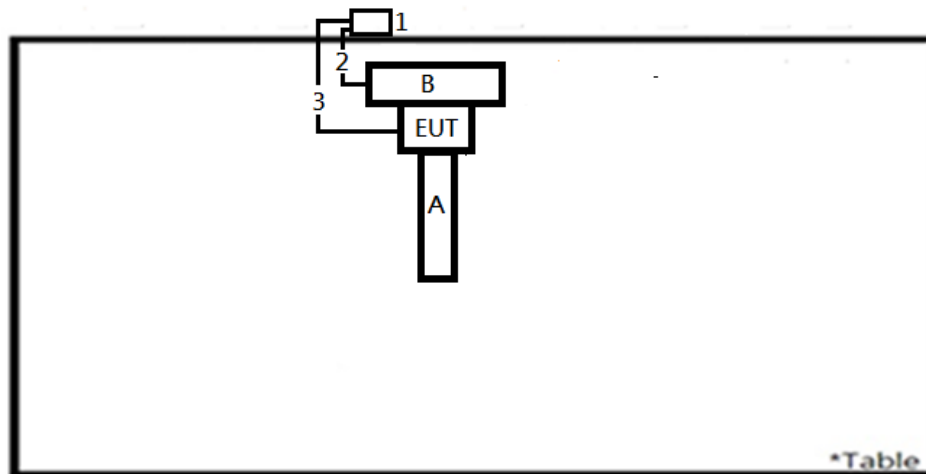
None.

Support Unit

No.	Description	Brand	Model	S/N	Remark
Radiated Test					
1	Notebook	HP	15-da1OTX	CND9111RJB	-
2	USB Cable	TUV	TUV-001	-	200 cm non-shielded cable w/o core
3	USB Cable	TUV	TUV-002	-	300 cm non-shielded cable w/o core
A	Antenna	Microchip	Refer to Antenna list no. 4, 6, 9	-	-
B	Fixture 3000	Microchip	-	-	-
Conducted Test					
-	Notebook	LENOVO	TP00094A	PF-1GT015	-

4.5 Test Setup Diagram

<Radiated Spurious Emissions mode>



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

Requirement Use of approved antennas only

According to the manufacturer declaration, the EUT has an antenna with Max directional gain of 5dBi (refer to External Antenna List). The antenna is connected through a proprietary connector with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Antenna No.	P/N	Vendor	Antenna Gain @ 2.4GHz Band	Antenna type	Remarks
1	W3525B039	Pulse Electronics Corporation	2 dBi	PCB	Cable length 100mm
2	RN-SMA-4	Microchip	2.2 dBi	Dipole	--
3	RFDP A870920IMLB301	WALSIN	1.84 dBi	Dipole-DB	Dual Band
4	RFMTA331215IMAB701	WALSIN	3.8 dBi	Metal Stamp	Cable length 150mm
5	RFMTA331240IMAB701	WALSIN	3.0 dBi	Metal Stamp	Antenna same as SIno.4, cable length 400 mm
6	RFPCA381013IMAB701	WALSIN	4.50 dBi	PCB	Cable length 130mm
7	RFPCA381035IMAB701	WALSIN	2.7 dBi	PCB	Antenna same as SIno.6, cable length 350mm
8	RFA-02-3-C5H1	Aristotle	3 dBi	Dipole	--
9	RFA-02-5-C7H1	Aristotle	5 dBi	Dipole-Long	--
10	RFA-02-P33	Aristotle	2 dBi	PCB	Cable length 150mm
11	1461530100	Molex	3 dBi	PCB/Flexi	Cable length 100mm Dual Band
12	RN-SMA-S	Microchip	0.56 dBi	Dipole-short	--
13	RN-SMA-7	Microchip	5 dBi	Dipole-Long	--
14	RFA-02-5-F7H1	Aristotle	5 dBi	Dipole-Long	--
15	RFA-02-D3	Aristotle	2 dBi	Dipole-no encl.	--
16	RFA-02-G03	Aristotle	2 dBi	Metal Stamp	Cable length 150mm
17	RFA-02-L2H1	Aristotle	2 dBi	Dipole	--
18	RFA-02-P05	Aristotle	2 dBi	PCB	Cable length 150mm
19	RFA-02-C2M2	Aristotle	2 dBi	Dipole	--

5.1.2 Peak Output Power

Limit 1 watt (30 dBm)

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Power Meter	Anritsu	ML2495A	1901008	2022/3/15	2023/3/14	2022/5/27	2022/5/27
Power Sensor	Anritsu	MA2411B	1725269	2022/3/15	2023/3/14	2022/5/27	2022/5/27

Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

Test Result**Peak Output Power**

<1Mbps>

Channel	Channel Frequency	Peak Output Power		Limit (dBm)
	(MHz)	(dBm)	(mW)	
Low Channel	2402	6.11	4.08	30
Middle Channel	2440	6.41	4.38	30
High Channel	2480	6.41	4.38	30

Average Power

<1Mbps>

Channel	Channel Frequency	Average Power	
	(MHz)	(dBm)	(mW)
Low Channel	2402	5.73	3.74
Middle Channel	2440	6.01	3.99
High Channel	2480	6.00	3.98

5.1.3 Radiated Spurious Emissions and Band Edges

Limit

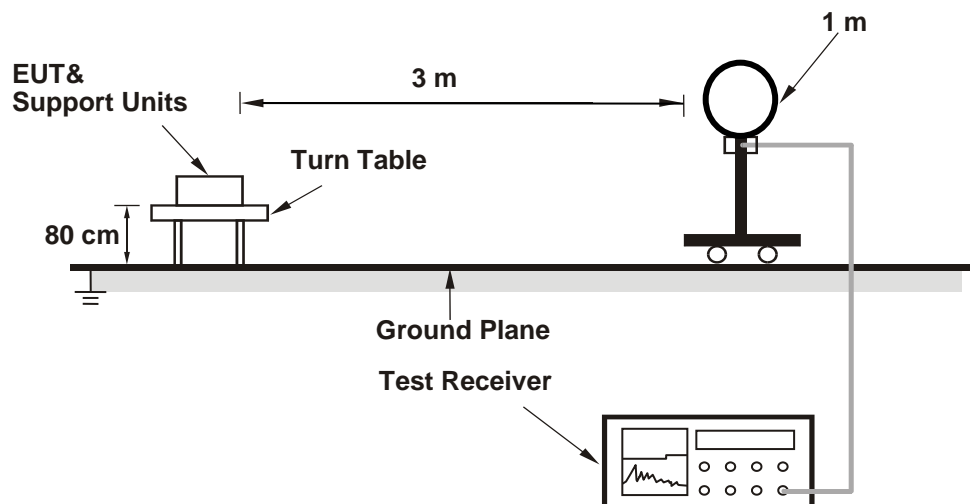
Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Emissions radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in §15.247(d).

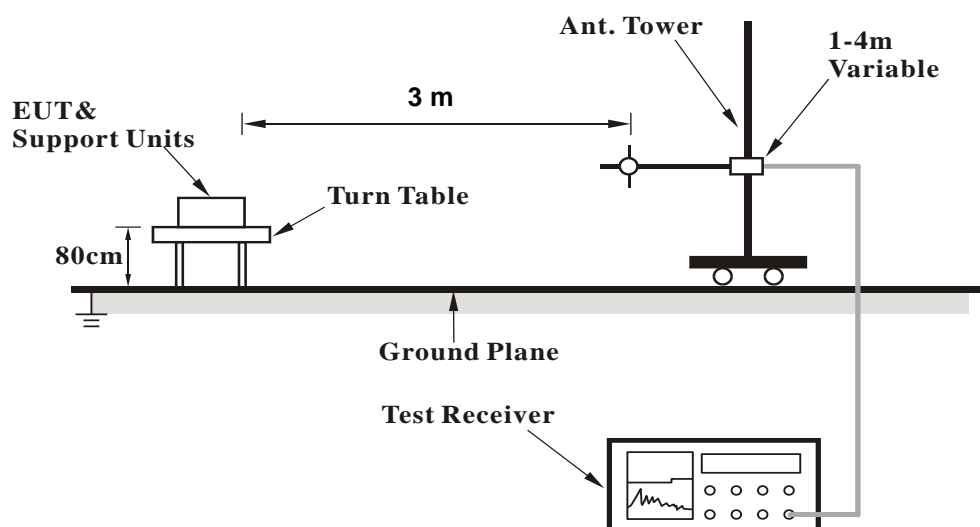
Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

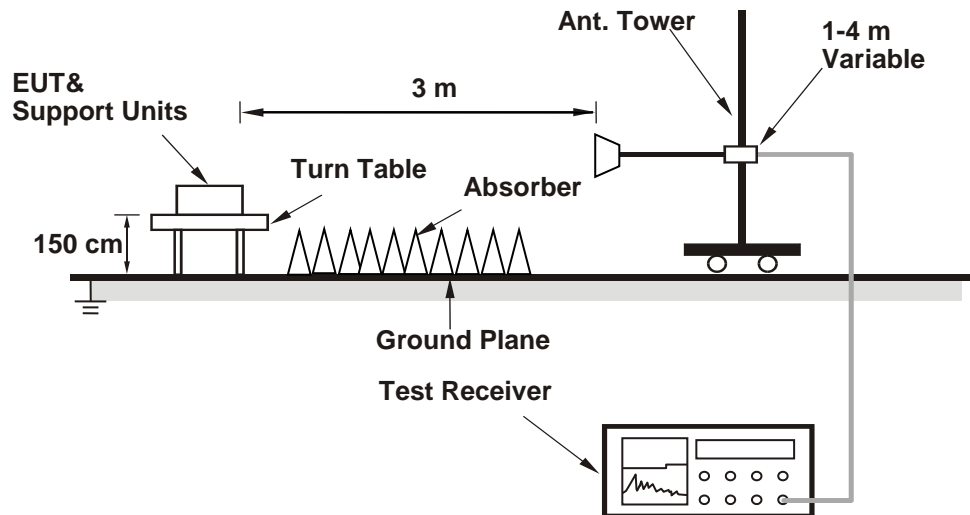
<Radiated Emissions below 30 MHz>



<Radiated Emissions 30 MHz to 1 GHz>



<Radiated Emissions above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Test Instruments

Ant No. 4 (Test Date: 2022/7/11~2022/7/12)

Ant No. 6 (Test Date: 2022/7/14~2022/7/15)

Ant No. 9 (Test Date: 2022/7/14~2022/7/15)

Below 30MHz					
Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Receiver	R&S	ESR7	102108	2022/4/28	2023/4/27
Microwave Cable	SUCOFLEX 104EA	800056/4EA	804680/4	2022/3/22	2023/3/21
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2021/12/8	2022/12/7
30MHz-1GHz					
Receiver	R&S	ESR7	102108	2022/4/28	2023/4/27
Bilog Antenna	SCHWARZBECK	VULB-9168	00951	2022/4/6	2023/4/5
LF-AMP	Agilent	8447D	2944A107722	2022/3/22	2023/3/21
Above 1GHz					
Signal Analyzer	R&S	FSV40	101508	2022/4/13	2023/4/12
Horn Antenna	ETS-Lindgren	3117	00218930	2021/12/20	2022/12/19
HF-AMP + AC source	EMCI	EMC051845SE	980633	2022/2/16	2023/2/15
HF-AMP + AC source	EMCI	EMC184045SE	980657	2022/2/16	2023/2/15
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2022/3/29	2023/3/28

Test Procedures**For Radiated Emissions below 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel (OPEN), perpendicular (CLOSE), and ground-parallel (GROUND) orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated Emissions above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The Radiated Emissions testing was performed in the X(E1), Y(H) and Z(E2) axis orientation. The worst-case Axis orientation is recorded in this test report.

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Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Please refer to Appendix A for Ant 4, Appendix B for Ant 6 and Appendix C for Ant 9.

Appendix A:

Test Results of Radiated Spurious Emissions for Antenna no. 4
Band Edges, 2.31GHz ~ 2.9GHz

BLE_1M																																																																																																																									
Low Channel (Horizontal) Peak	Low Channel (Vertical) Peak																																																																																																																								
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Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note																																																																																																														
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg																																																																																																																	
1	2379.62	53.52	15.99	37.53	74.00	-20.48	400	202	Peak	Horizontal																																																																																																															
2 *	2402.00	95.40	57.77	37.63	74.00	21.40	400	202	Peak	Horizontal																																																																																																															
3	2612.00	54.61	16.63	37.98	74.00	-19.39	400	202	Peak	Horizontal																																																																																																															
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1	2373.37	53.69	16.20	37.49	74.00	-20.31	283	336	Peak	Vertical																																																																																																															
2 *	2402.00	89.88	52.25	37.63	74.00	15.88	283	336	Peak	Vertical																																																																																																															
3	2813.27	55.47	17.28	38.19	74.00	-18.53	283	336	Peak	Vertical																																																																																																															

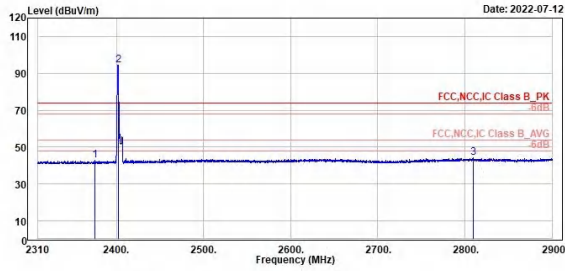
BLE_1M

Low Channel (Horizontal) Average

Low Channel (Vertical) Average



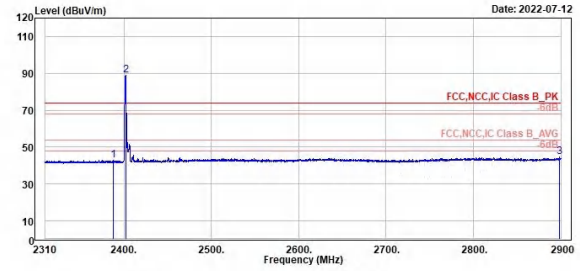
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1	2	3	Read Level	Read Level Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
2375.73	42.73	5.23	37.50	54.00	-11.27	400	202	Average	Horizontal		
2402.00	94.34	56.71	37.63	54.00	40.34	400	202	Average	Horizontal		
2809.61	44.27	6.07	38.20	54.00	-9.73	400	202	Average	Horizontal		



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1	2	3	Read Level	Read Level Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
2388.12	43.08	5.51	37.57	74.00	-30.92	283	336	Peak	Vertical		
2402.00	88.82	51.19	37.63	74.00	14.82	283	336	Peak	Vertical		
2898.47	44.63	6.22	38.41	74.00	-29.37	283	336	Peak	Vertical		

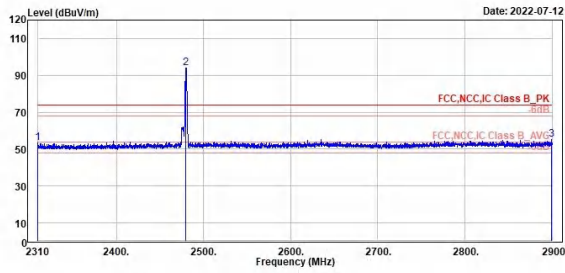
BLE_1M

High Channel (Horizontal) Peak

High Channel (Vertical) Peak



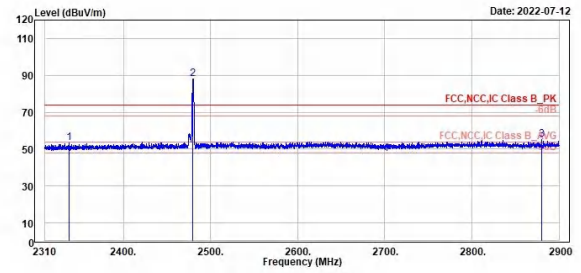
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Peak	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2310.12	53.33	16.08	37.25	74.00	-20.67	300	20	Peak	Horizontal	
2 *	2488.00	93.89	56.10	37.79	74.00	19.89	300	20	Peak	Horizontal	
3	2899.17	55.24	16.82	38.42	74.00	-18.76	300	20	Peak	Horizontal	



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Peak	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2338.20	53.22	15.88	37.34	74.00	-20.78	377	328	Peak	Vertical	
2 *	2488.00	88.03	50.24	37.79	74.00	14.03	377	328	Peak	Vertical	
3	2880.29	55.00	16.68	38.32	74.00	-19.00	377	328	Peak	Vertical	

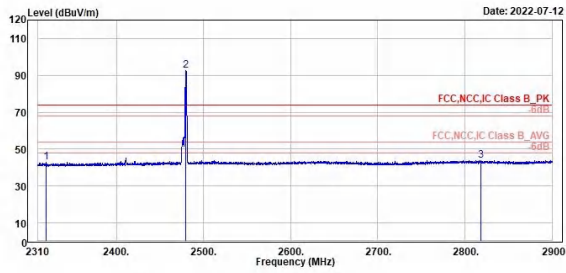
BLE_1M

High Channel (Horizontal) Average

High Channel (Vertical) Average



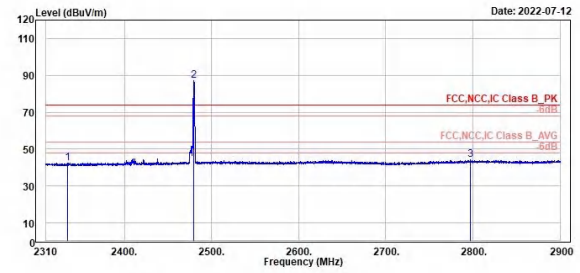
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1	2	3
2319.09	2488.00	2818.70
42.72	92.85	43.90
5.44	55.06	5.71
37.28	37.79	38.19
54.00	54.00	54.00
-11.28	38.85	-10.10
300	300	300
20	20	20
Average	Average	Average
Horizontal	Horizontal	Horizontal



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1	2	3
2335.13	2488.00	2796.87
42.62	86.97	44.16
5.29	49.18	5.96
37.33	37.79	38.20
54.00	54.00	54.00
-11.38	32.97	-9.84
377	377	377
328	328	328
Average	Average	Average
Vertical	Vertical	Vertical

Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

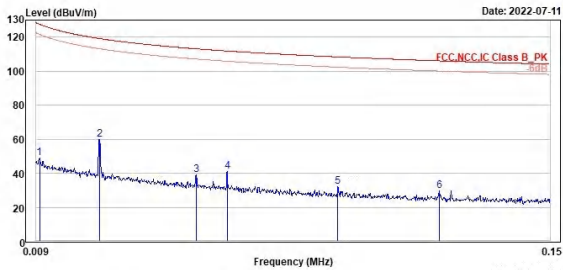
BLE_1M

Low Channel (Open) 9kHz~150kHz

Low Channel (Open) 150kHz~30MHz



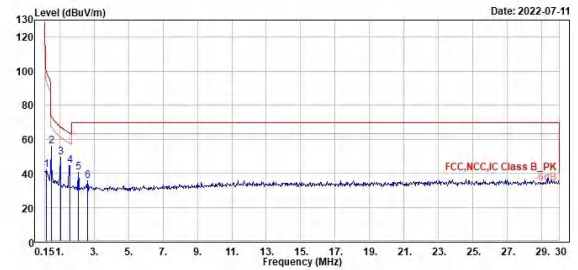
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Peak	Freq (MHz)	Level (dBuV/m)	Read Level (dBuV)	Level Factor (dB/m)	Limit Line (dBuV/m)	Over Limit (dB)	APos (cm)	TPos (deg)	Remark	Pol/Phase	Note
1	0.01	49.05	31.34	17.71	127.60	-78.55	100	7	QP	Open	
2	0.03	59.92	40.73	19.19	119.13	-59.21	100	101	QP	Open	
3	0.05	38.86	19.62	19.24	113.11	-74.25	100	63	QP	Open	
4	0.06	41.14	22.08	19.06	111.82	-70.68	100	352	QP	Open	
5	0.09	32.19	13.80	18.39	108.34	-76.15	100	199	QP	Open	
6	0.12	29.70	11.41	18.29	106.05	-76.35	100	168	QP	Open	



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Peak	Freq (MHz)	Level (dBuV/m)	Read Level (dBuV)	Level Factor (dB/m)	Limit Line (dBuV/m)	Over Limit (dB)	APos (cm)	TPos (deg)	Remark	Pol/Phase	Note
1	0.24	41.87	23.15	18.72	100.01	-58.14	100	106	QP	Open	
2	0.51	56.09	37.14	18.95	73.48	-17.39	100	182	QP	Open	
3	1.05	49.57	30.30	19.27	67.22	-17.65	100	173	QP	Open	
4	1.58	44.48	25.13	19.35	63.62	-19.14	100	179	QP	Open	
5	2.09	40.44	21.02	19.42	69.50	-29.06	100	193	QP	Open	
6	2.63	35.48	16.00	19.48	69.50	-34.02	100	164	QP	Open	

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

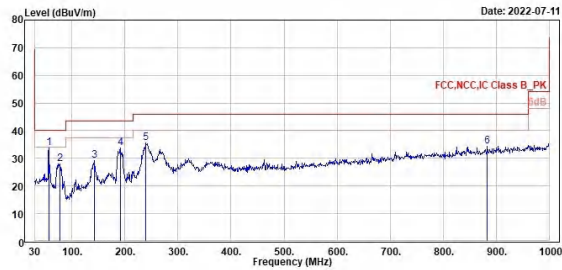
BLE_1M

Low Channel (Horizontal)

Low Channel (Vertical)



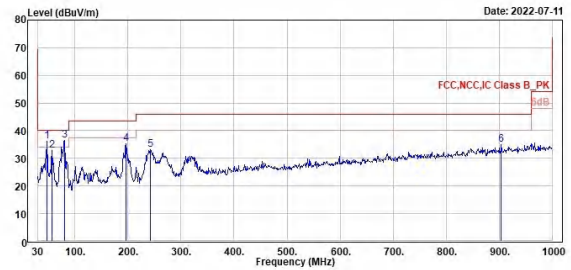
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	56.19	33.80	40.48	-6.68	40.00	-6.20	100	88 QP	Horizontal
2	76.56	28.13	37.91	-9.78	40.00	-11.87	200	267 QP	Horizontal
3	142.52	29.23	35.48	-6.25	43.50	-14.27	200	109 QP	Horizontal
4	191.02	33.69	42.19	-8.50	43.50	-9.81	400	320 QP	Horizontal
5	239.52	35.68	42.42	-6.74	46.00	-10.32	100	271 QP	Horizontal
6	883.60	34.51	30.18	4.33	46.00	-11.49	400	168 QP	Horizontal



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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	46.49	36.24	42.11	-5.87	40.00	-3.76	100	13 QP	Vertical
2	56.19	32.83	39.51	-6.68	40.00	-7.17	100	179 QP	Vertical
3	80.44	36.38	46.05	-10.47	40.00	-3.62	100	157 QP	Vertical
4	196.84	35.43	44.01	-8.58	43.50	-8.07	100	336 QP	Vertical
5	241.46	33.24	39.96	-6.72	46.00	-12.76	100	21 QP	Vertical
6	903.97	34.92	30.19	4.73	46.00	-11.08	100	236 QP	Vertical

Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

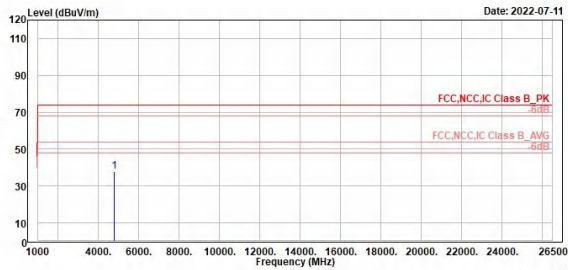
BLE_1M

Low Channel (Horizontal)

Low Channel (Vertical)



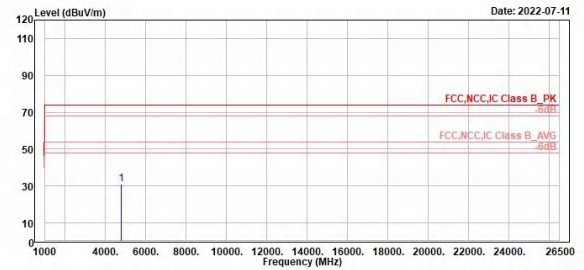
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1	4804.00	37.84	47.71	-9.87	74.00	-36.16	200	22	Peak	Horizontal
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1	4804.00	30.84	40.71	-9.87	74.00	-43.16	400	360	Peak	Vertical
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BLE_1M

Middle Channel (Horizontal)

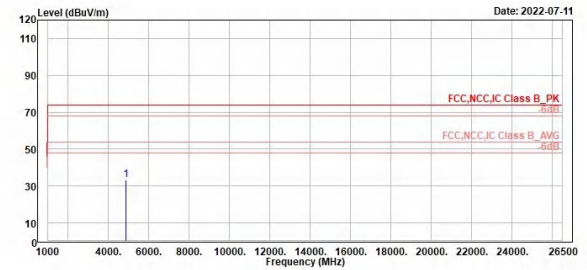
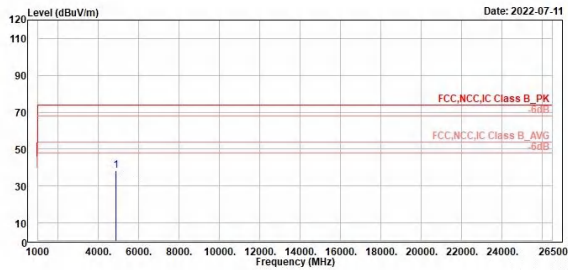
Middle Channel (Vertical)



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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4888.00	36.19	47.98	-9.79	74.00	-35.81	227	69 Peak	Horizontal	

Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4888.00	33.33	43.12	-9.79	74.00	-40.67	287	133 Peak	Vertical	

BLE_1M

High Channel (Horizontal)

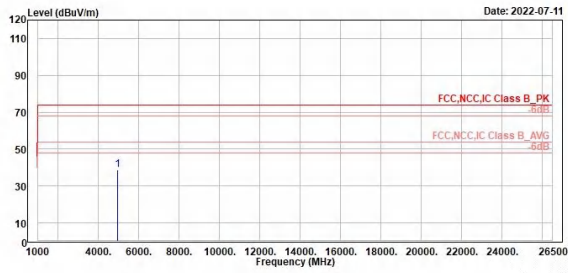
High Channel (Vertical)



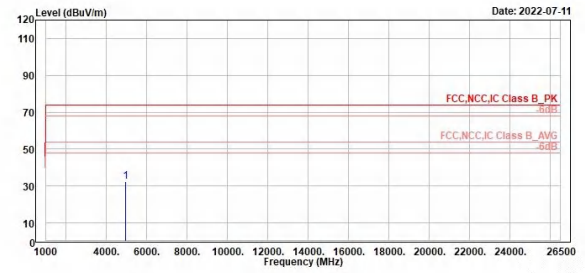
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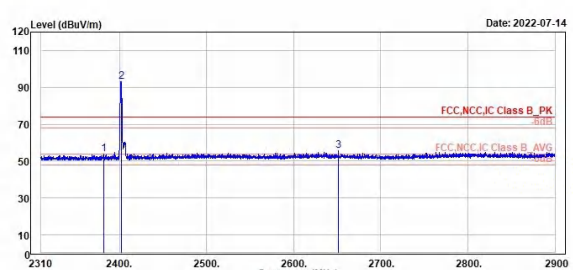
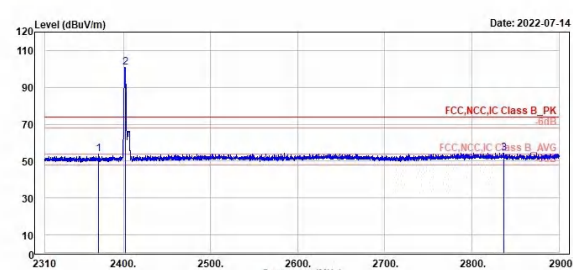
Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4960.00	36.71	48.25	-9.54	74.00	-35.29	200	170 Peak	Horizontal



Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4960.00	32.42	41.96	-9.54	74.00	-41.58	154	360 Peak	Vertical

Appendix B:

Test Results of Radiated Spurious Emissions for Antenna no. 6
Band Edges, 2.31GHz ~ 2.9GHz

BLE_1M																																																																																																																									
Low Channel (Horizontal) Peak	Low Channel (Vertical) Peak																																																																																																																								
 <p>Level (dBuV/m) vs Frequency (MHz) plot. Date: 2022-07-14. FCC, NCC, IC Class B PK and AVG limits are shown.</p> <table border="1"> <thead> <tr> <th>Freq</th> <th>Level</th> <th>Read</th> <th>Level</th> <th>Factor</th> <th>Limit</th> <th>Over</th> <th>APos</th> <th>TPos</th> <th>Remark</th> <th>Pol/Phase</th> <th>Note</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV</th> <th>dB/m</th> <th>dBuV/m</th> <th>dB</th> <th>dB</th> <th>cm</th> <th>deg</th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2381.74</td> <td>53.93</td> <td>16.39</td> <td>37.54</td> <td>74.00</td> <td>-20.07</td> <td>165</td> <td>35</td> <td>Peak</td> <td>Horizontal</td> <td></td> </tr> <tr> <td>2 *</td> <td>2402.00</td> <td>93.14</td> <td>55.51</td> <td>37.63</td> <td>74.00</td> <td>19.14</td> <td>165</td> <td>35</td> <td>Peak</td> <td>Horizontal</td> <td></td> </tr> <tr> <td>3</td> <td>2651.49</td> <td>55.62</td> <td>17.60</td> <td>38.02</td> <td>74.00</td> <td>-18.38</td> <td>165</td> <td>35</td> <td>Peak</td> <td>Horizontal</td> <td></td> </tr> </tbody> </table>	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg				1	2381.74	53.93	16.39	37.54	74.00	-20.07	165	35	Peak	Horizontal		2 *	2402.00	93.14	55.51	37.63	74.00	19.14	165	35	Peak	Horizontal		3	2651.49	55.62	17.60	38.02	74.00	-18.38	165	35	Peak	Horizontal		 <p>Level (dBuV/m) vs Frequency (MHz) plot. Date: 2022-07-14. FCC, NCC, IC Class B PK and AVG limits are shown.</p> <table border="1"> <thead> <tr> <th>Freq</th> <th>Level</th> <th>Read</th> <th>Level</th> <th>Factor</th> <th>Limit</th> <th>Over</th> <th>APos</th> <th>TPos</th> <th>Remark</th> <th>Pol/Phase</th> <th>Note</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV</th> <th>dB/m</th> <th>dBuV/m</th> <th>dB</th> <th>dB</th> <th>cm</th> <th>deg</th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2371.83</td> <td>53.71</td> <td>16.22</td> <td>37.49</td> <td>74.00</td> <td>-20.29</td> <td>350</td> <td>180</td> <td>Peak</td> <td>Vertical</td> <td></td> </tr> <tr> <td>2 *</td> <td>2402.00</td> <td>101.06</td> <td>63.43</td> <td>37.63</td> <td>74.00</td> <td>27.06</td> <td>350</td> <td>180</td> <td>Peak</td> <td>Vertical</td> <td></td> </tr> <tr> <td>3</td> <td>2836.16</td> <td>54.41</td> <td>16.23</td> <td>38.18</td> <td>74.00</td> <td>-19.59</td> <td>350</td> <td>180</td> <td>Peak</td> <td>Vertical</td> <td></td> </tr> </tbody> </table>	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg				1	2371.83	53.71	16.22	37.49	74.00	-20.29	350	180	Peak	Vertical		2 *	2402.00	101.06	63.43	37.63	74.00	27.06	350	180	Peak	Vertical		3	2836.16	54.41	16.23	38.18	74.00	-19.59	350	180	Peak	Vertical	
Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note																																																																																																														
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg																																																																																																																	
1	2381.74	53.93	16.39	37.54	74.00	-20.07	165	35	Peak	Horizontal																																																																																																															
2 *	2402.00	93.14	55.51	37.63	74.00	19.14	165	35	Peak	Horizontal																																																																																																															
3	2651.49	55.62	17.60	38.02	74.00	-18.38	165	35	Peak	Horizontal																																																																																																															
Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note																																																																																																														
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg																																																																																																																	
1	2371.83	53.71	16.22	37.49	74.00	-20.29	350	180	Peak	Vertical																																																																																																															
2 *	2402.00	101.06	63.43	37.63	74.00	27.06	350	180	Peak	Vertical																																																																																																															
3	2836.16	54.41	16.23	38.18	74.00	-19.59	350	180	Peak	Vertical																																																																																																															

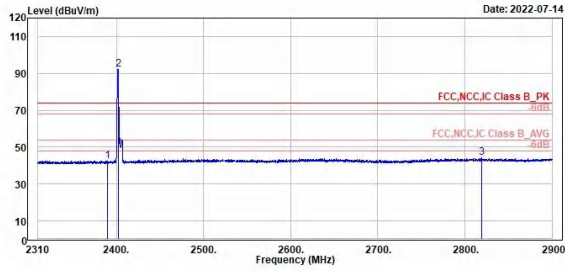
BLE_1M

Low Channel (Horizontal) Average

Low Channel (Vertical) Average



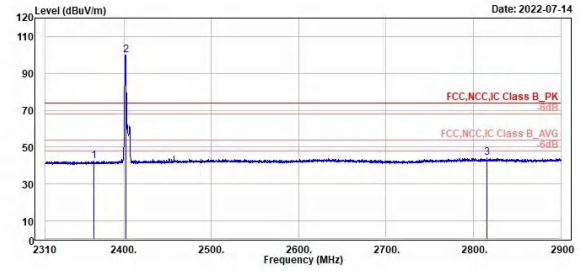
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1	2	3	Read Level	Read Level Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
1	2	3	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	2389.53	42.50	4.92	37.58	54.00	-11.50	165	35	Average	Horizontal	
2 *	2402.00	92.08	54.45	37.63	54.00	38.08	165	35	Average	Horizontal	
3	2818.82	44.05	5.86	38.19	54.00	-9.95	165	35	Average	Horizontal	



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1	2	3	Read Level	Read Level Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
1	2	3	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	2365.58	42.26	4.81	37.45	54.00	-11.74	350	180	Average	Vertical	
2 *	2402.00	99.92	62.29	37.63	54.00	45.92	350	180	Average	Vertical	
3	2815.28	44.26	6.07	38.19	54.00	-9.74	350	180	Average	Vertical	

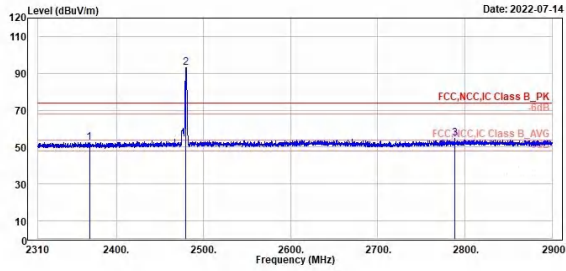
BLE_1M

High Channel (Horizontal) Peak

High Channel (Vertical) Peak



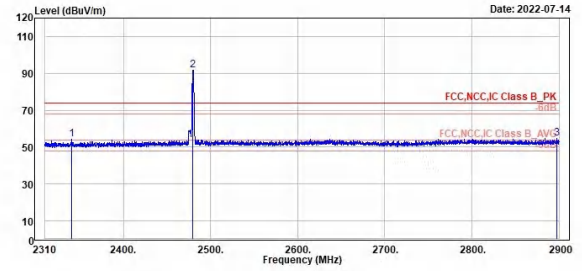
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Peak	Freq (MHz)	Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Over Limit (dB)	APos (cm)	TPos (deg)	Remark	Pol/Phase	Note
1	2369.12	52.63	15.15	37.48	74.00	-21.37	298	18	Peak	Horizontal	
2 *	2488.00	93.12	55.33	37.79	74.00	19.12	298	18	Peak	Horizontal	
3	2788.49	54.58	16.39	38.19	74.00	-19.42	298	18	Peak	Horizontal	



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Peak	Freq (MHz)	Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Over Limit (dB)	APos (cm)	TPos (deg)	Remark	Pol/Phase	Note
1	2340.92	54.23	16.89	37.34	74.00	-19.77	332	177	Peak	Vertical	
2 *	2488.00	91.77	53.98	37.79	74.00	17.77	332	177	Peak	Vertical	
3	2897.29	54.97	16.56	38.41	74.00	-19.03	332	177	Peak	Vertical	

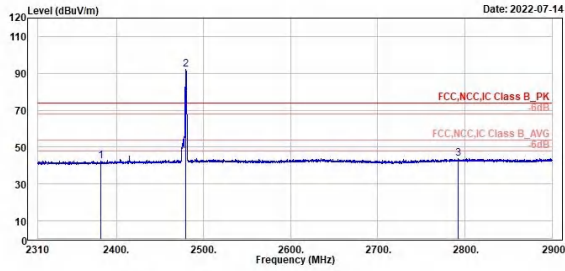
BLE_1M

High Channel (Horizontal) Average

High Channel (Vertical) Average



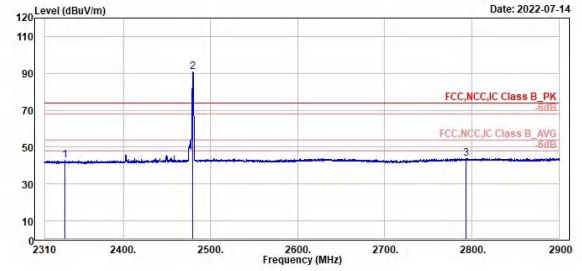
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Peak	Freq	Level	Read Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2382.45	42.54	5.00	37.54	74.00	-31.46	298	18	Peak	Horizontal	
2 *	2488.00	92.04	54.25	37.79	74.00	18.04	298	18	Peak	Horizontal	
3	2792.27	43.76	5.57	38.19	74.00	-30.24	298	18	Peak	Horizontal	



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Peak	Freq	Level	Read Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2333.36	42.85	5.53	37.32	54.00	-11.15	332	177	Average	Vertical	
2 *	2488.00	90.76	52.97	37.79	54.00	36.76	332	177	Average	Vertical	
3	2793.33	44.02	5.82	38.20	54.00	-9.98	332	177	Average	Vertical	

Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

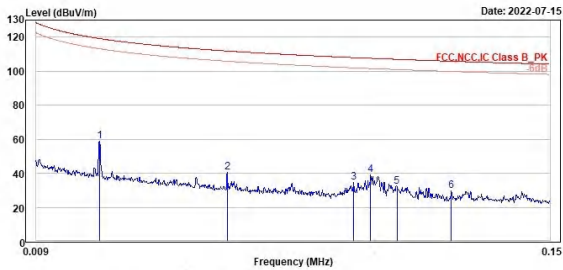
BLE_1M

Low Channel (Open) 9kHz~150kHz

Low Channel (Open) 150kHz~30MHz



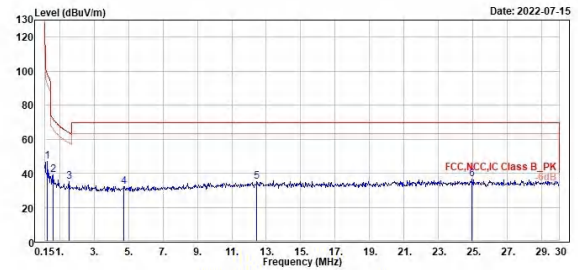
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.03	58.61	39.42	19.19	119.13	-60.52	100	286	QP	Open
2	0.06	40.76	21.70	19.06	111.82	-71.06	100	122	QP	Open
3	0.10	34.38	16.08	18.30	107.94	-73.56	100	250	QP	Open
4	0.10	38.91	20.69	18.22	107.53	-68.62	100	127	QP	Open
5	0.11	32.28	14.03	18.25	106.93	-74.65	100	226	QP	Open
6	0.12	29.44	11.14	18.30	105.80	-76.36	100	96	QP	Open



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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.30	46.80	27.86	18.94	98.08	-51.28	100	127	QP	Open
2	0.63	38.95	19.92	19.03	71.65	-32.70	100	127	QP	Open
3	1.55	35.23	15.88	19.35	63.78	-28.55	100	127	QP	Open
4	4.75	32.21	12.82	19.39	69.50	-37.29	100	360	QP	Open
5	12.45	34.90	13.23	21.67	69.50	-34.60	100	214	QP	Open
6	24.96	36.53	14.11	22.42	69.50	-32.97	100	233	QP	Open

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

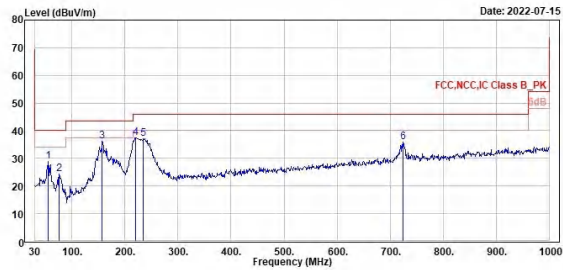
BLE_1M

Low Channel (Horizontal)

Low Channel (Vertical)



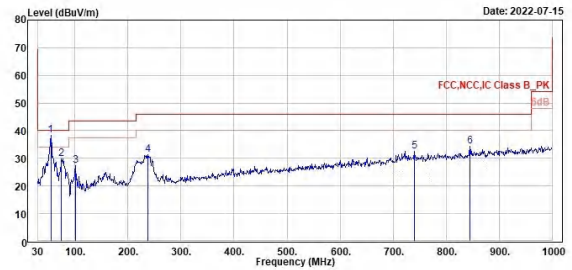
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	55.22	29.00	35.52	-6.52	40.00	-11.00	300	158	QP	Horizontal
2	75.59	24.42	34.00	-9.58	40.00	-15.58	284	126	QP	Horizontal
3	157.07	36.19	42.18	-5.99	43.50	-7.31	200	293	QP	Horizontal
4	228.12	37.53	45.55	-8.02	46.00	-8.47	100	263	QP	Horizontal
5	234.67	37.02	43.90	-6.88	46.00	-8.98	100	266	QP	Horizontal
6	724.52	35.84	34.07	1.77	46.00	-10.16	100	174	QP	Horizontal



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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	54.25	38.24	44.64	-6.40	40.00	-1.76	100	88	QP	Vertical
2	74.62	29.76	39.26	-9.50	40.00	-10.24	300	148	QP	Vertical
3	100.81	27.41	38.58	-11.17	43.50	-16.09	118	360	QP	Vertical
4	237.58	31.40	38.19	-6.79	46.00	-14.60	201	78	QP	Vertical
5	740.04	32.66	30.24	2.42	46.00	-13.34	100	264	QP	Vertical
6	844.80	34.34	30.61	3.73	46.00	-11.66	200	120	QP	Vertical

Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

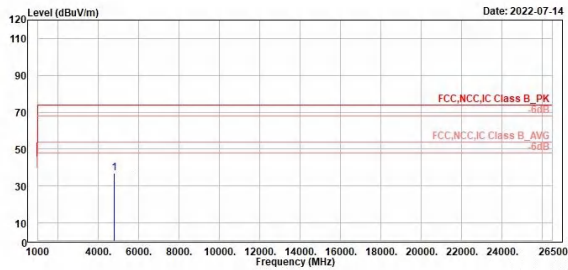
BLE_1M

Low Channel (Horizontal)

Low Channel (Vertical)



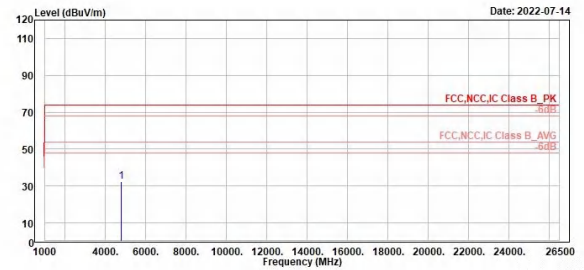
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1	4804.00	36.86	46.73	-9.87	74.00	-37.14	200	208	Peak	Horizontal
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1	4804.00	32.46	42.33	-9.87	74.00	-41.54	400	307	Peak	Vertical
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BLE_1M

Middle Channel (Horizontal)

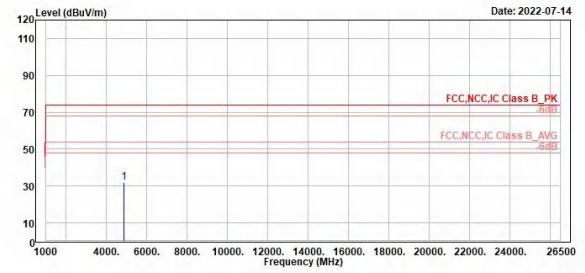
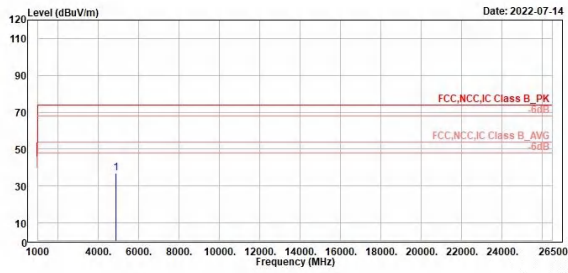
Middle Channel (Vertical)



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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4888.00	36.94	46.73	-9.79	74.00	-37.06	100	284 Peak	Horizontal	

Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4888.00	32.06	41.85	-9.79	74.00	-41.94	200	325 Peak	Vertical	

BLE_1M

High Channel (Horizontal)

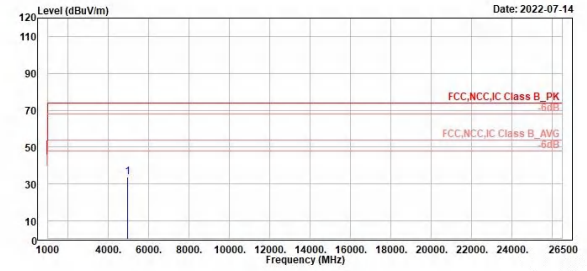
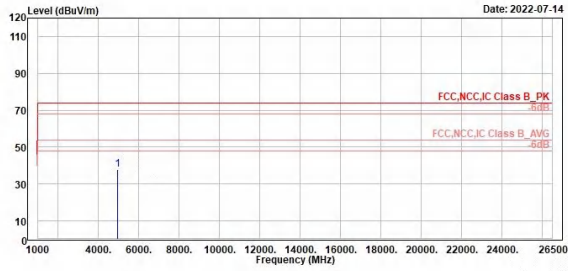
High Channel (Vertical)



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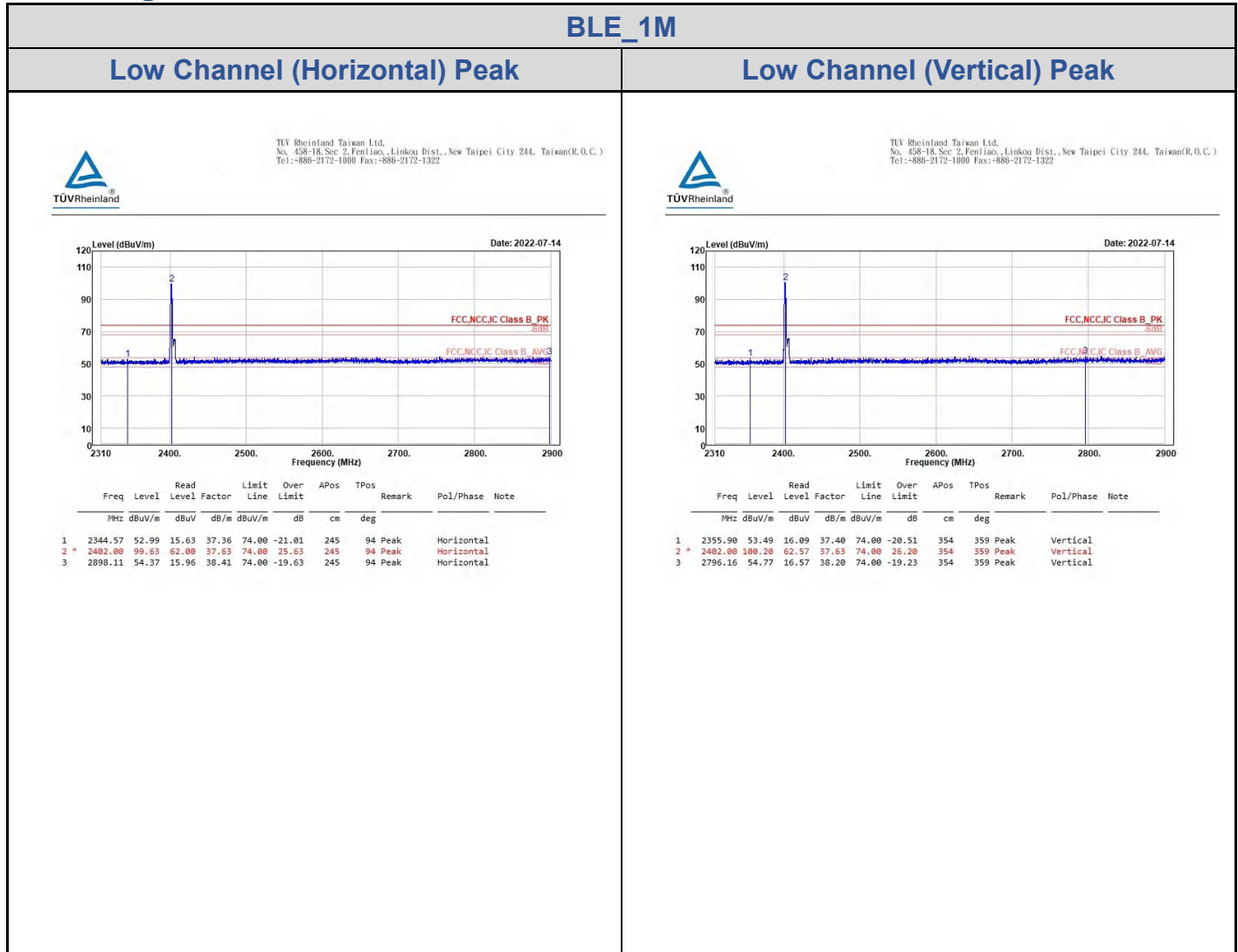
Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4968.00	37.65	47.19	-9.54	74.00	-36.35	400	183 Peak	Horizontal

Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4968.00	33.75	43.29	-9.54	74.00	-40.25	400	280 Peak	Vertical

Appendix C:

Test Results of Radiated Spurious Emissions for Ant No.9

Band Edges, 2.31GHz ~ 2.9GHz



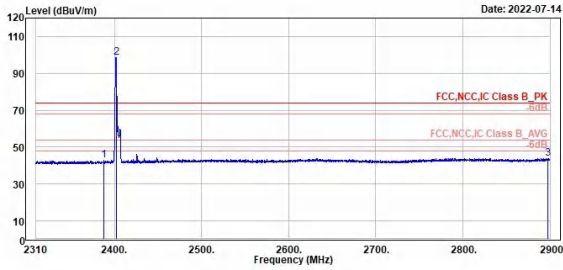
BLE_1M

Low Channel (Horizontal) Average

Low Channel (Vertical) Average



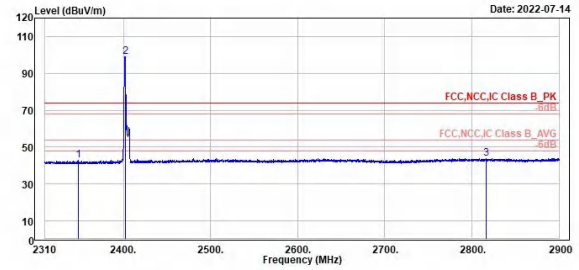
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1	2	3								
Level	Level	Level								
Factor	Factor	Factor								
Line	Line	Line								
Limit	Limit	Limit								
Over	Over	Over								
Limit	Limit	Limit								
APos	APos	APos								
TPos	TPos	TPos								
Remark	Remark	Remark								
Pol/Phase	Pol/Phase	Pol/Phase								
Note	Note	Note								
MHz	dBuV/m	dBuV/m								
dBuV	dB/m	dBuV/m								
dB	cm	deg								
2387.64	42.68	5.11	37.57	54.00	-11.32	245	94	Average	Horizontal	
2402.00	98.56	60.93	37.63	54.00	44.56	245	94	Average	Horizontal	*
2897.52	43.97	5.56	38.41	54.00	-10.03	245	94	Average	Horizontal	



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1	2	3								
Level	Level	Level								
Factor	Factor	Factor								
Line	Line	Line								
Limit	Limit	Limit								
Over	Over	Over								
Limit	Limit	Limit								
APos	APos	APos								
TPos	TPos	TPos								
Remark	Remark	Remark								
Pol/Phase	Pol/Phase	Pol/Phase								
Note	Note	Note								
MHz	dBuV/m	dBuV/m								
dBuV	dB/m	dBuV/m								
dB	cm	deg								
2348.35	42.84	5.47	37.37	54.00	-11.16	354	359	Average	Vertical	
2402.00	99.14	61.51	37.63	54.00	45.14	354	359	Average	Vertical	*
2815.98	44.03	5.84	38.19	54.00	-9.97	354	359	Average	Vertical	

BLE_1M

High Channel (Horizontal) Peak

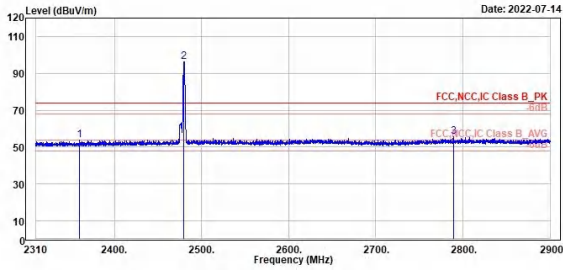
High Channel (Vertical) Peak



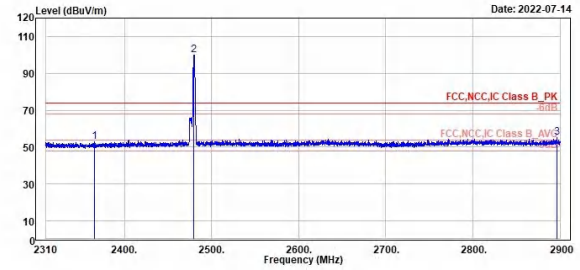
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No. 438-18, Sec 2, Fenhiao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel: +886-2172-1000 Fax: +886-2172-1322



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Tel: +886-2172-1000 Fax: +886-2172-1322



1	2	3	Read Level	Level Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
2368.39	53.86	16.43	37.43	74.00	-20.14	259	101	Peak	Horizontal		
2488.00	96.23	58.44	37.79	74.00	22.23	259	101	Peak	Horizontal		
2788.96	55.50	17.31	38.19	74.00	-18.50	259	101	Peak	Horizontal		



1	2	3	Read Level	Level Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
2365.93	52.86	15.41	37.45	74.00	-21.14	331	180	Peak	Vertical		
2488.00	100.13	62.34	37.79	74.00	26.13	331	180	Peak	Vertical		
2895.99	55.21	16.81	38.40	74.00	-18.79	331	180	Peak	Vertical		

BLE_1M

High Channel (Horizontal) Average

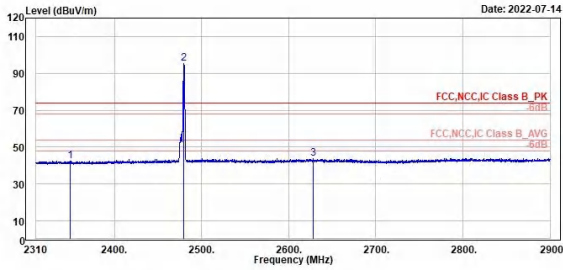
High Channel (Vertical) Average



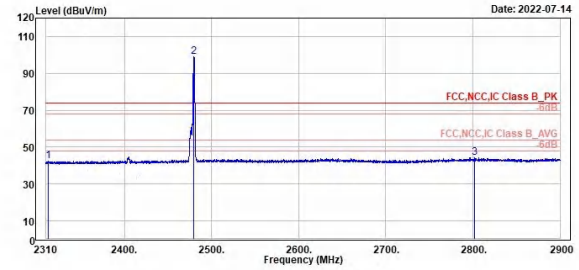
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Tel: +886-2172-1000 Fax: +886-2172-1322



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1	2	3
2349.06	2488.00	2628.48
42.44	95.22	44.01
5.07	57.43	6.01
37.37	37.79	38.00
54.00	54.00	54.00
-11.56	41.22	-9.99
259	259	259
101	101	101
Average	Average	Average
Horizontal	Horizontal	Horizontal



1	2	3
2313.07	2488.00	2801.94
42.46	99.08	44.28
5.20	61.29	6.07
37.26	37.79	38.21
54.00	54.00	54.00
-11.54	45.08	-9.72
331	331	331
180	180	180
Average	Average	Average
Vertical	Vertical	Vertical

Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

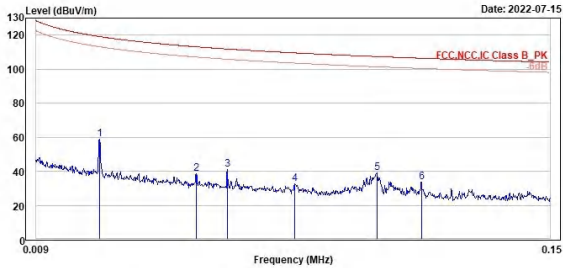
BLE_1M

Low Channel (Open) 9kHz~150kHz

Low Channel (Open) 150kHz~30MHz



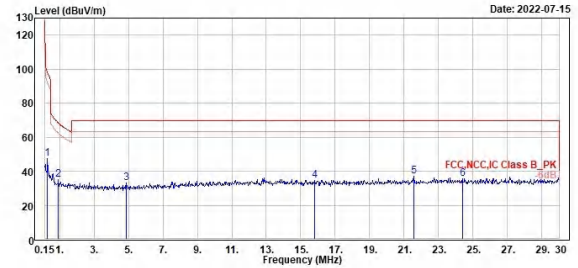
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Tel: +886-2172-1000 Fax: +886-2172-1322



Peak	Freq (MHz)	Level (dBuV/m)	Read Level (dBuV)	Level Factor (dB/m)	Limit (dBuV/m)	Over Limit (dB)	APos (cm)	TPos (deg)	Remark	Pol/Phase	Note
1	0.03	58.68	39.49	19.19	119.13	-60.45	100	279	QP	Open	
2	0.05	38.47	19.23	19.24	113.11	-74.64	100	78	QP	Open	
3	0.06	41.10	22.04	19.06	111.82	-70.72	100	80	QP	Open	
4	0.08	32.43	13.78	18.65	109.53	-77.10	100	125	QP	Open	
5	0.10	38.91	20.68	18.23	107.37	-68.46	100	121	QP	Open	
6	0.11	33.84	15.57	18.27	106.40	-72.56	100	121	QP	Open	



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Peak	Freq (MHz)	Level (dBuV/m)	Read Level (dBuV)	Level Factor (dB/m)	Limit (dBuV/m)	Over Limit (dB)	APos (cm)	TPos (deg)	Remark	Pol/Phase	Note
1	0.30	47.24	28.30	18.94	98.08	-50.84	100	228	QP	Open	
2	0.93	35.10	15.87	19.23	68.27	-33.17	100	209	QP	Open	
3	4.87	33.13	13.76	19.37	69.50	-36.37	100	4	QP	Open	
4	15.82	34.70	12.79	21.91	69.50	-34.80	100	59	QP	Open	
5	21.55	37.28	15.81	22.27	69.50	-32.22	100	204	QP	Open	
6	24.39	35.63	13.23	22.40	69.50	-33.87	100	300	QP	Open	

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

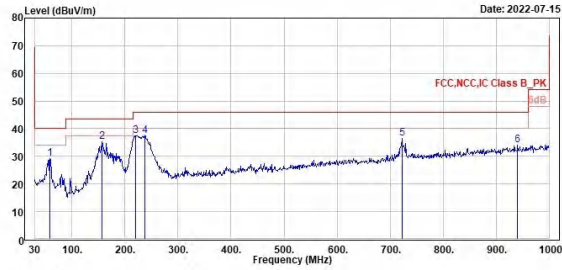
BLE_1M

Low Channel (Horizontal)

Low Channel (Vertical)



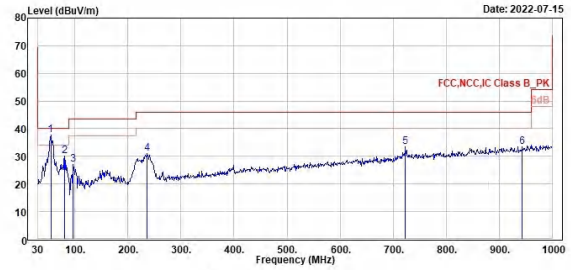
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Tel: +886-2172-1000 Fax: +886-2172-1322



Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	58.13	29.32	36.20	-6.88	40.00	-10.68	100	323 QP	Horizontal
2	157.07	35.41	41.40	-5.99	43.50	-8.09	200	290 QP	Horizontal
3	220.12	37.41	45.43	-8.02	46.00	-8.59	100	260 QP	Horizontal
4	237.58	37.34	44.13	-6.79	46.00	-8.66	100	251 QP	Horizontal
5	722.58	36.61	34.85	1.76	46.00	-9.39	100	160 QP	Horizontal
6	948.83	34.18	28.93	5.25	46.00	-11.82	400	154 QP	Horizontal



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Tel: +886-2172-1000 Fax: +886-2172-1322



Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	54.25	37.83	44.23	-6.40	40.00	-2.17	100	18 QP	Vertical
2	80.44	30.23	40.70	-10.47	40.00	-9.77	100	8 QP	Vertical
3	96.93	27.10	39.10	-12.00	43.50	-16.40	300	360 QP	Vertical
4	236.61	31.10	37.91	-6.81	46.00	-14.90	200	191 QP	Vertical
5	723.55	33.35	31.58	1.77	46.00	-12.65	100	93 QP	Vertical
6	943.74	33.54	28.27	5.27	46.00	-12.46	300	360 QP	Vertical

Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

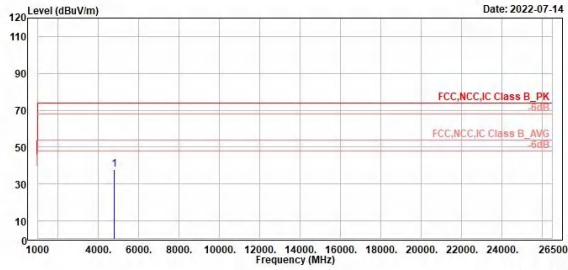
BLE_1M

Low Channel (Horizontal)

Low Channel (Vertical)



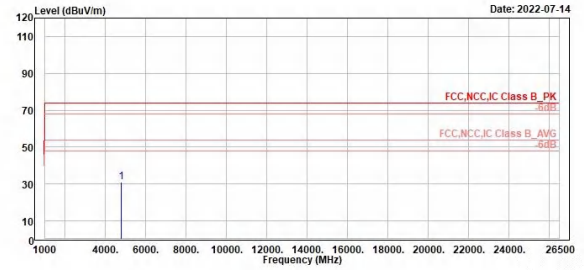
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Tel: +886-2172-1000 Fax: +886-2172-1322



Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4884.00	37.80	47.67	-9.87	74.00	-36.20	400	125	Peak	Horizontal



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Tel: +886-2172-1000 Fax: +886-2172-1322



Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4884.00	31.04	40.91	-9.87	74.00	-42.96	369	360	Peak	Vertical

BLE_1M

Middle Channel (Horizontal)

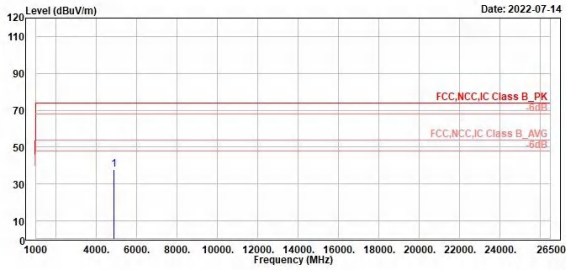
Middle Channel (Vertical)



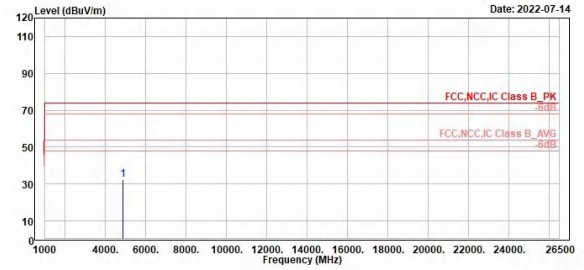
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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4888.00	37.87	47.66	-9.79	74.00	-36.13	400	85 Peak	Horizontal	



Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4888.00	32.50	42.29	-9.79	74.00	-41.50	300	132 Peak	Vertical	

BLE_1M

High Channel (Horizontal)

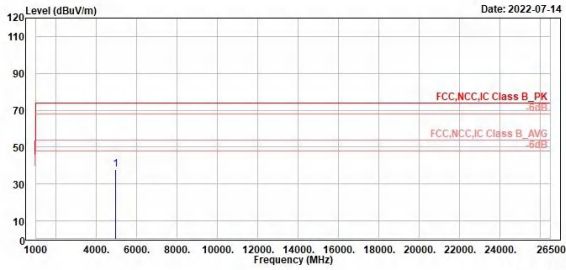
High Channel (Vertical)



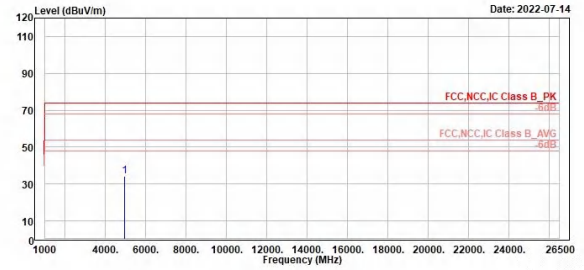
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4968.00	37.68	47.22	-9.54	74.00	-36.32	300	305 Peak	Horizontal



Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4968.00	34.28	43.82	-9.54	74.00	-39.72	200	73 Peak	Vertical