Prüfbericht-Nr.: *Test report no.:*	50041194 003	**Auftrags-Nr.:** *Order no.*:	238543987	Seite 1 von 24 *Page 1 of 24*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2022-05-26	
Auftraggeber: *Client:*	Microchip Technology Inc., 2355 West Chandler Blvd. Chandler, Arizona 85224-6199, United States			
Prüfgegenstand: *Test item:*	Bluetooth Module			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	BM64SPKS1MC1			
Auftrags-Inhalt: *Order content*:	FCC Part 15C / ISED RSS-247 Test report (BLE)			
Prüfgrundlage: *Test specification:*	FCC 47CFR Part 15: Subpart C Section 15.247 ISED RSS-247 Issue 2 March 2017			
Wareneingangsdatum: *Date of sample receipt:*	2022-01-12			
Prüfmuster-Nr.: *Test sample no:*	A003199127-005 A003199127-004			
Prüfzeitraum: *Testing period:*	2022-10-07 - 2022-10-19			
Ort der Prüfung: *Place of testing:*	EMC/RF Taipei Testing Site			
Prüflaboratorium: *Testing laboratory:*	Taipei Testing Laboratories			
Prüfergebnis*: *Test result*:*	Pass			

zusammengestellt von: *compiled by:*		**genehmigt von:** authorized by:	
Datum: *Date:* 2022-11-02		**Ausstellungsdatum:** *Issue date:* 2022-11-02	
Stellung / *Position:*	Ryan Chen Senior Project Manager	**Stellung** / *Position:*	Brenda Chen Senior Project Manager

Sonstiges / *Other:* This report (C2PC) is to cover the 2nd source crystal change. Only the conducted power, RSE and Mains Conducted Emission tests were evaluated. The other test results are referred to the original report no.: 50041194 002.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

TEST SUMMARY

Report Section	FCC Clause	ISED Clause	Test Item	Result
5.1.1	15.247(b) & 15.203	RSS-Gen	Antenna Requirement	Pass
5.1.2	15.247(b)(3)	RSS-247 5.4(d)	Peak Output Power	Pass
5.1.3	15.247(d) & 15.205 & 15.209	RSS-247 5.5	Radiated Spurious Emissions and Band Edges	Pass
5.2.1	15.207	RSS-Gen	Mains Conducted Emission	

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

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APPENDIX A - TEST RESULT OF RADIATED EMISSIONS & MAINS CONDUCTED EMISSION

APPENDIX SP - PHOTOGRAPHS OF TEST SETUP

APPENDIX EP - PHOTOGRAPHS OF EUT

HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
50041194 003	Original Release	2022-11-02

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 & Mains Conducted Emission
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
ISED RSS-247 Issue 2 March 2017
ISED RSS-247 Issue 5, Amendment 1 + Amendment 2, February 2021
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.: 180491
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 basics 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 a Bluetooth Module. 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	Bluetooth Module
Type Identification	BM64SPKS1MC1
FCC ID	A8TBM64S1
IC	12246A-BM64S1
HVIN	BM64SPKS1MC1

Technical Specification of EUT

Item	EUT information
Operating Frequency	2402 MHz ~ 2480 MHz
Channel Number	40
Data Rate	1Mbps
Operation Voltage	3.2Vdc ~ 4.2Vdc (Tested at 3.3Vdc)
Modulation	GFSK
Antenna Information	Refer to 5.1.1
Accessory Device	Refer to 4.4

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	Max-5
2440	Max-5
2480	Max-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 data interface which makes it possible to control them through a 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	ISRT_V2.1.32.5667

The samples were used as follows:
A003199127-005
A003199127-004
Full test was applied on all test modes, but only worst case was shown.

EUT Configure Mode	Applicable To				Description
	Output Power	Radiated Spurious Emissions above 1 GHz	Radiated Spurious Emissions below 1 GHz	Mains Conducted Emission	
-	√	√	√	√	-

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.

Output Power

☒ 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)
-	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)
-	2402 to 2480	2402, 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)
-	2402 to 2480	2402	1

Mains Conducted Emission

☒ 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)
-	2402 to 2480	2402	1

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Output Power	18-23 °C	58-69 %	Nick Hsu
Radiated Spurious Emissions above 1 GHz	23.7-24.5 °C	55-56 %	Ivan Chiang
Radiated Spurious Emissions below 1 GHz	23.7-24.5 °C	55-56 %	Ivan Chiang
Mains Conducted Emission	21.9 °C	59 %	Ray Huang

4.4 Special Accessories and Auxiliary Equipment

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

Accessory of EUT

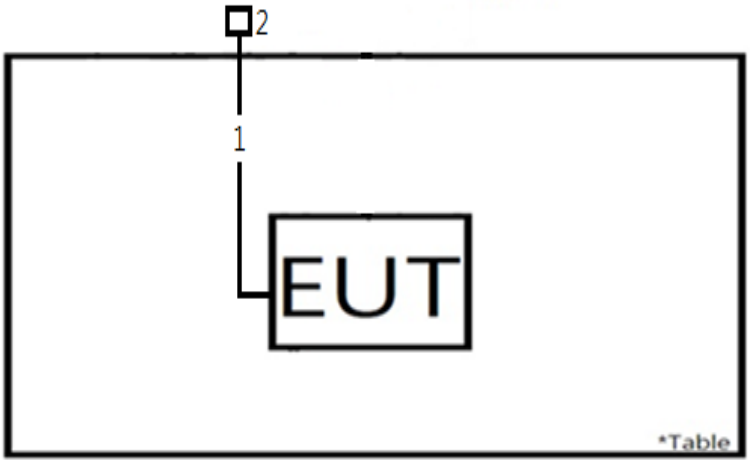
None

Support Unit

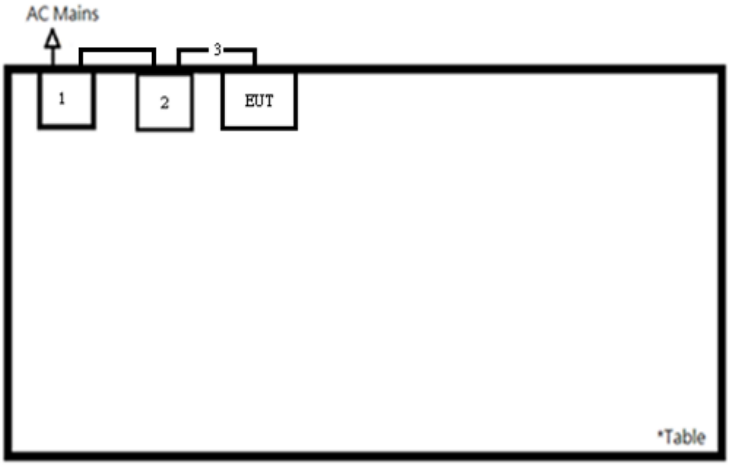
Support Unit								
No	Description	Brand	Model	S/N	Shielded	Ferrite Core (Qty)	Length (cm)	Remark
1	LAN Cable	TUV	TUV-001	NO	YES	NO	300	Radiated
2	Notebook	HP	15s-du0007TX	CND93662WV	-	-	-	
1	Adapter	HP	PPP009D	N/A	YES	NO	179	Mains Conducted
2	Notebook	Lenovo	81BL	MP1DCD6Y	-	-	-	
3	USB to Mirco	TUV	TUV-001	N/A	-	-	-	

4.5 Test Setup Diagram

<Radiated Spurious Emissions mode>



<Mains Conducted Emission 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 a directional gain of 1.927 dBi. The antenna is a PCB antenna with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.
Refer to EUT photo for details.

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	2022/10/7	2022/10/7
Power Sensor	Anritsu	MA2411B	1725269	2022/3/15	2023/3/14	2022/10/7	2022/10/7

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	17.41	55.08	30
Middle Channel	2440	16.99	50.00	30
High Channel	2480	16.44	44.06	30

Average Power (For Reference)

<1Mbps>

Channel	Channel Frequency	Average Power	
	(MHz)	(dBm)	(mW)
Low Channel	2402	17.08	51.05
Middle Channel	2440	16.70	46.77
High Channel	2480	16.14	41.11

5.1.3 Radiated Spurious Emissions and Band Edges

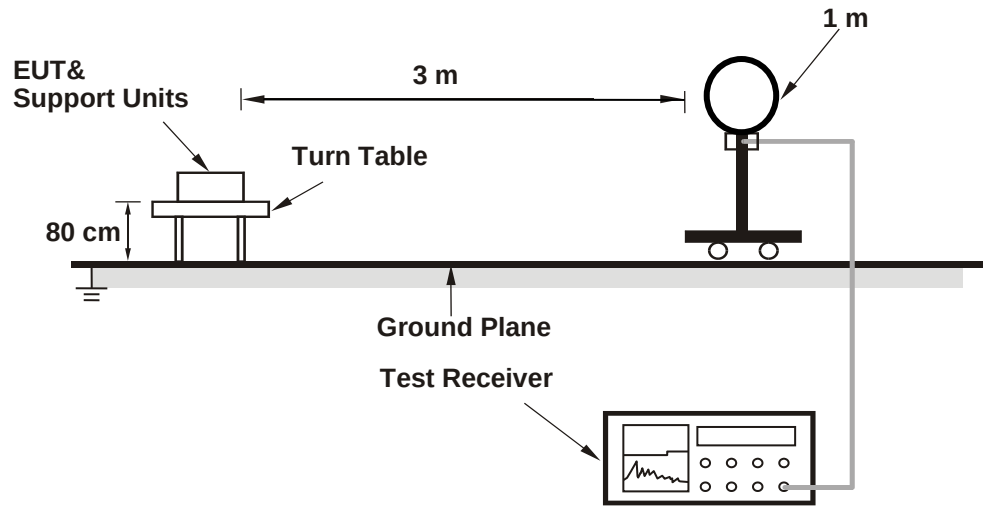
Limit

Radiated emissions which fall in the restricted bands, as defined in §15.205(a) and RSS-Gen i5, 8.10 (Table 7), must comply with the radiated emission limits specified in §15.209(a) and RSS-Gen i5, 8.9 (Table 5 and 6).
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) and RSS-247 i2, 5.5.

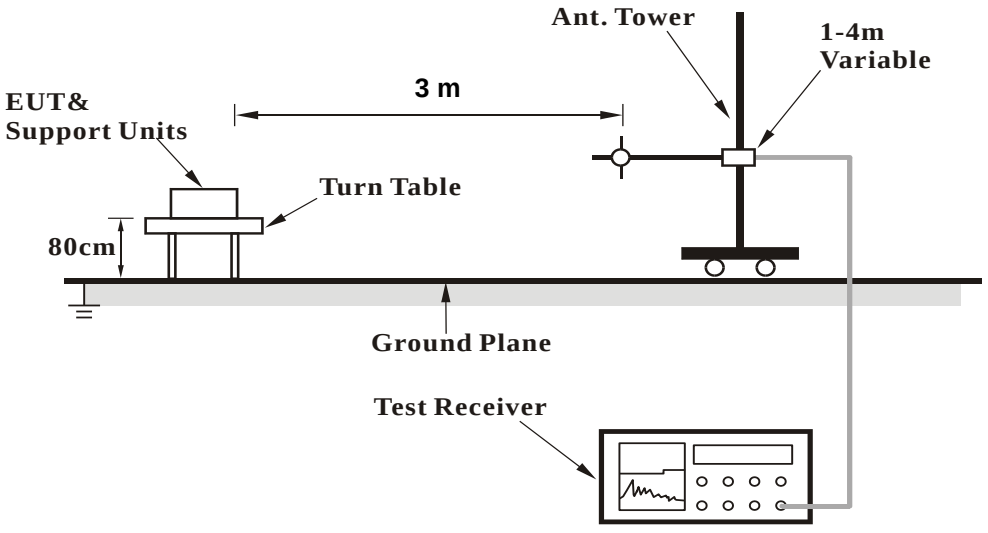
Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

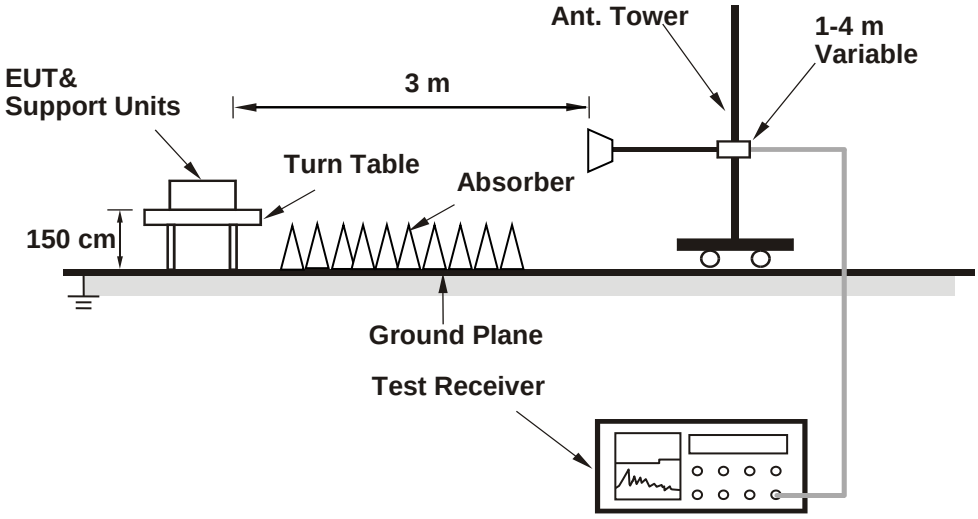
<Radiated Emissions below 30 MHz>



<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

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Above 1 GHz					
Signal Analyzer	R&S	FSV40	101508	2022/4/13	2023/4/12
Horn Antenna	ETS-Lindgren	3117	00218929	2021/11/25	2022/11/24
HF-AMP + AC source	EMCI	EMC051845SE	980635	2022/1/20	2023/1/19
HF-AMP + AC source	EMCI	EMC184045SE	980656	2022/1/20	2023/1/19
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2022/3/29	2023/3/28
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A
30 MHz ~ 1 GHz					
Receiver	R&S	ESR7	102108	2022/4/28	2023/4/27
Bilog Antenna	SCHWARZBECK	VULB-9168	00950	2022/4/6	2023/4/5
LF-AMP	Agilent	8447D	2944A107722	2022/3/22	2023/3/21
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A
Below 30 MHz					
Receiver	R&S	ESR7	102108	2022/4/28	2023/4/27
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2021/12/8	2022/12/7
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A

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 ≥ 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.

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.

5.2 Mains Emission

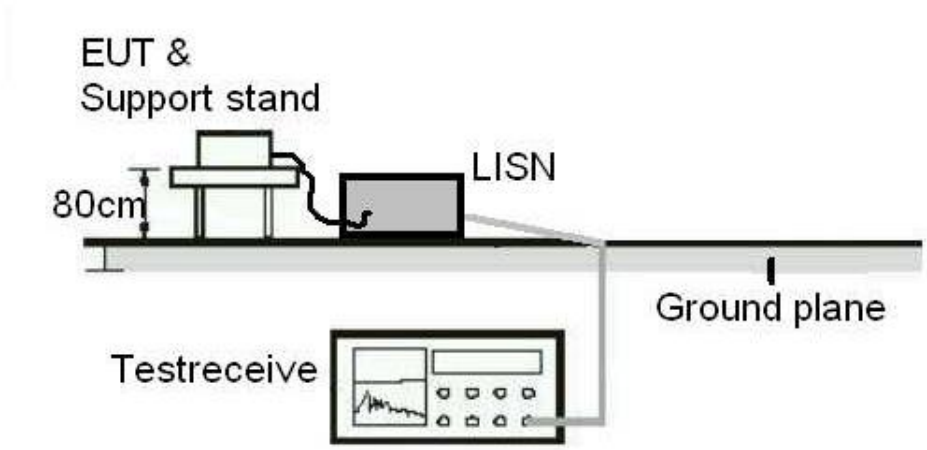
5.2.1 Mains Conducted Emission

Limit

Mains Conducted Emission as defined in §15.207 and RSS-Gen 8.8 must comply with the mains conducted emission limits.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Two-Line V-Network	Rohde & Schwarz	ENV216	101938	2022/9/22	2023/9/21
EMI Test Receiver	R&S	ESCI	1816063	2021/11/15	2022/11/14

Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

Test Results

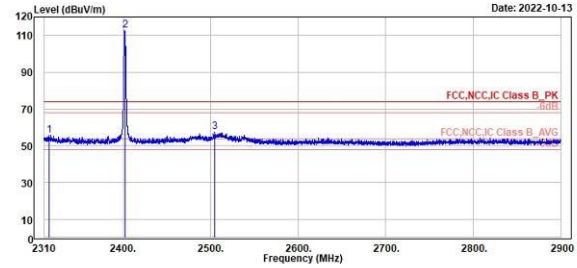
Please refer to Appendix A.

Appendix A: Test Results of Radiated Spurious Emissions & Mains Conducted Emission Tests

Band Edges, 2.31GHz ~ 2.9GHz

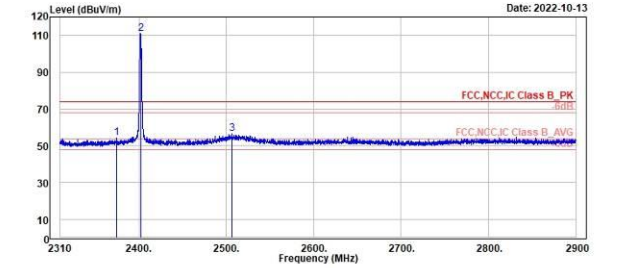
BLE_1M	
Low Channel (Horizontal) Peak	**Low Channel (Vertical) Peak**

TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	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	2315.43	55.80	18.54	37.26	74.00	-18.20	100	118	Peak	Horizontal	
2 *	2402.00	112.53	74.90	37.63	74.00	38.53	100	118	Peak	Horizontal	
3	2504.35	57.36	19.50	37.86	74.00	-16.64	100	118	Peak	Horizontal	

TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322

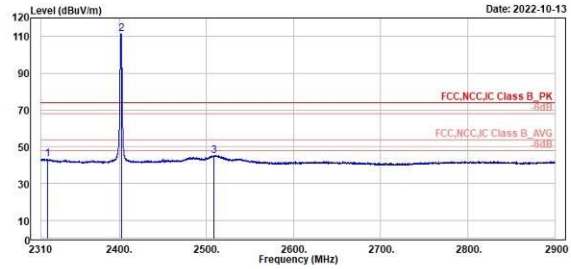


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2374.55	54.44	16.94	37.50	74.00	-19.56	348	149	Peak	Vertical	
2 *	2402.00	110.91	73.28	37.63	74.00	36.91	348	149	Peak	Vertical	
3	2506.71	56.76	18.90	37.86	74.00	-17.24	348	149	Peak	Vertical	

BLE_1M

Low Channel (Horizontal) Average

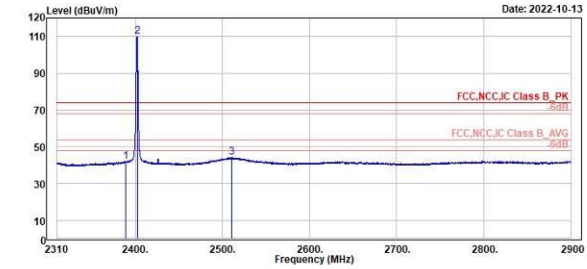
TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	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	2317.91	43.42	6.14	37.28	54.00	-10.58	100	118	Average	Horizontal	
2 *	2402.00	111.34	73.71	37.63	54.00	57.34	100	118	Average	Horizontal	
3	2508.59	45.35	7.49	37.86	54.00	-8.65	100	118	Average	Horizontal	

Low Channel (Vertical) Average

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	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	2389.30	41.99	4.41	37.58	54.00	-12.01	348	149	Average	Vertical	
2 *	2402.00	109.75	72.12	37.63	54.00	55.75	348	149	Average	Vertical	
3	2510.36	44.27	6.41	37.86	54.00	-9.73	348	149	Average	Vertical	

BLE_1M

High Channel (Horizontal) Peak

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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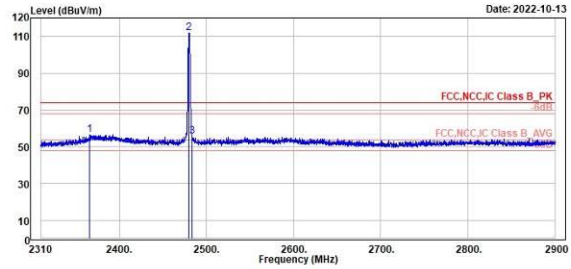

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2366.17	56.50	19.05	37.45	74.00	-17.50	100	122	Peak	Horizontal	
2 *	2480.00	111.67	73.88	37.79	74.00	37.67	100	122	Peak	Horizontal	
3	2483.58	55.52	17.72	37.80	74.00	-18.48	100	122	Peak	Horizontal	

High Channel (Vertical) Peak

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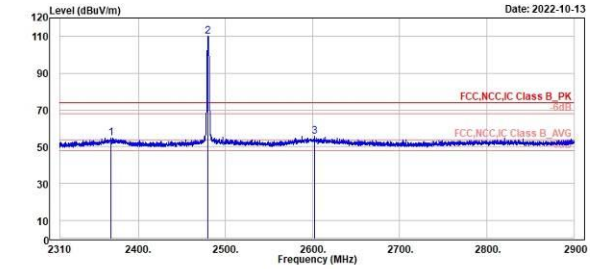

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2368.29	54.67	17.21	37.46	74.00	-19.33	364	162	Peak	Vertical	
2 *	2480.00	110.05	72.26	37.79	74.00	36.05	364	162	Peak	Vertical	
3	2602.40	55.73	17.76	37.97	74.00	-18.27	364	162	Peak	Vertical	

BLE_1M

High Channel (Horizontal) Average

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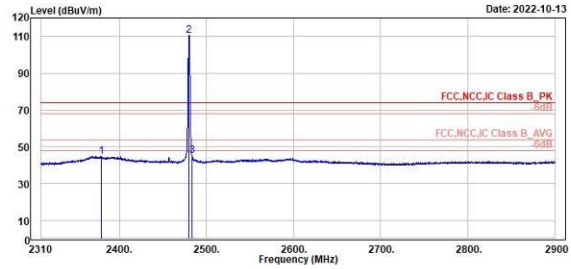

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2379.15	44.79	7.26	37.53	54.00	-9.21	100	122	Average	Horizontal	
2 *	2480.00	110.60	72.81	37.79	54.00	56.60	100	122	Average	Horizontal	
3	2483.46	45.24	7.44	37.80	54.00	-8.76	100	122	Average	Horizontal	

High Channel (Vertical) Average

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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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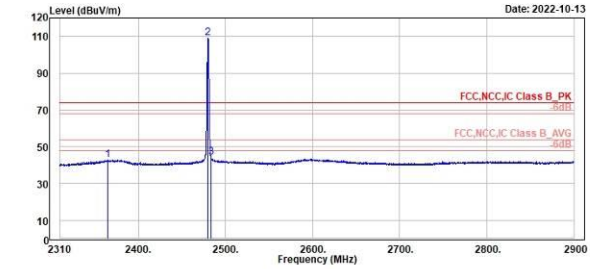

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2365.22	42.83	5.38	37.45	54.00	-11.17	364	162	Average	Vertical	
2 *	2480.00	108.98	71.19	37.79	54.00	54.98	364	162	Average	Vertical	
3	2483.46	44.19	6.39	37.80	54.00	-9.81	364	162	Average	Vertical	

Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

BLE_1M

Low Channel (Open) 9kHz~150kHz

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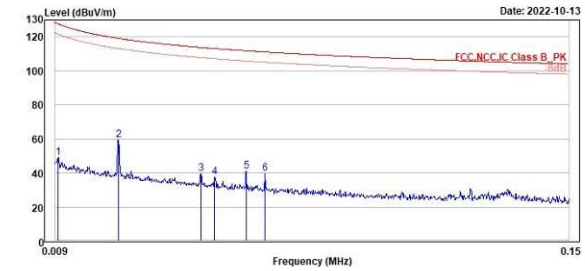

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.01	48.81	31.05	17.76	127.72	-78.91	100	200	QP	Open	
2	0.03	59.42	40.23	19.19	119.13	-59.71	100	60	QP	Open	
3	0.05	39.36	20.04	19.32	113.78	-74.42	100	221	QP	Open	
4	0.05	37.33	18.08	19.25	113.13	-75.80	100	96	QP	Open	
5	0.06	41.27	22.21	19.06	111.82	-70.55	100	272	QP	Open	
6	0.07	39.39	20.45	18.94	111.12	-71.73	100	191	QP	Open	

Low Channel (Open) 150kHz~30MHz

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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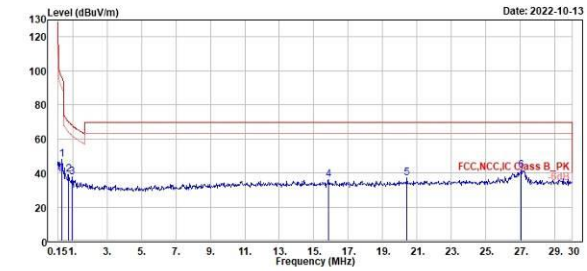

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.39	48.15	29.20	18.95	95.81	-47.66	100	195	QP	Open	
2	0.78	39.11	19.98	19.13	69.80	-30.69	100	195	QP	Open	
3	0.99	37.66	18.40	19.26	67.73	-30.07	100	46	QP	Open	
4	15.85	36.06	14.15	21.91	69.50	-33.44	100	58	QP	Open	
5	20.42	36.91	14.69	22.22	69.50	-32.59	100	178	QP	Open	
6	27.04	41.37	18.85	22.52	69.50	-28.13	100	255	QP	Open	

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

BLE_1M

Low Channel (Horizontal)

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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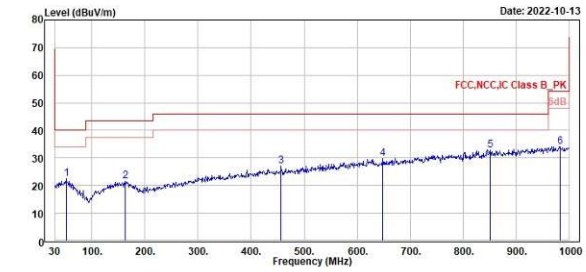

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	51.34	22.52	28.70	-6.18	40.00	-17.48	200	317	QP	Horizontal	
2	162.89	21.52	27.46	-5.94	43.50	-21.98	200	34	QP	Horizontal	
3	456.80	27.14	29.22	-2.08	46.00	-18.86	100	208	QP	Horizontal	
4	648.86	29.66	28.99	0.67	46.00	-16.34	200	264	QP	Horizontal	
5	850.62	32.86	29.10	3.76	46.00	-13.14	300	94	QP	Horizontal	
6	982.54	34.20	28.25	5.95	54.00	-19.80	300	314	QP	Horizontal	

Low Channel (Vertical)

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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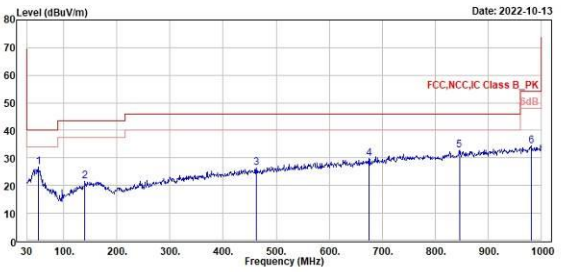

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	51.34	26.65	32.83	-6.18	40.00	-13.35	100	217	QP	Vertical	
2	139.61	21.49	27.85	-6.36	43.50	-22.01	300	325	QP	Vertical	
3	462.62	26.48	28.46	-1.98	46.00	-19.52	400	107	QP	Vertical	
4	675.05	29.91	28.96	0.95	46.00	-16.09	400	328	QP	Vertical	
5	845.77	32.80	29.07	3.73	46.00	-13.20	100	329	QP	Vertical	
6	981.57	34.51	28.58	5.93	54.00	-19.49	400	15	QP	Vertical	

Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

BLE_1M

Low Channel (Horizontal)

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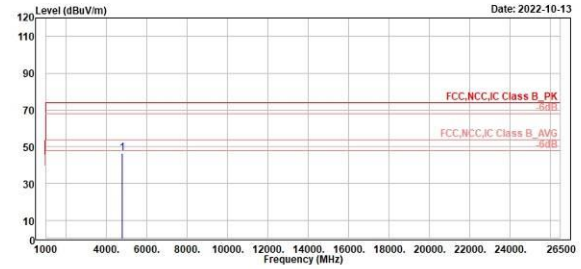
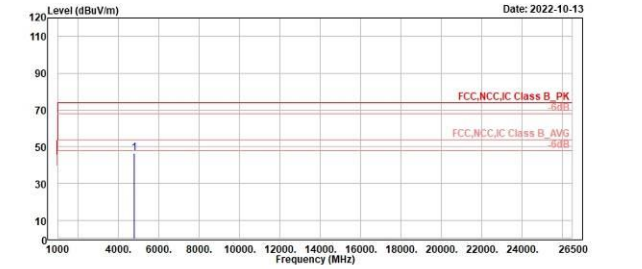


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4804.00	46.67	56.54	-9.87	74.00	-27.33	300	16	Peak	Horizontal	

Low Channel (Vertical)

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	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	4804.00	46.37	56.24	-9.87	74.00	-27.63	400	227	Peak	Vertical	

BLE_1M

Middle Channel (Horizontal)

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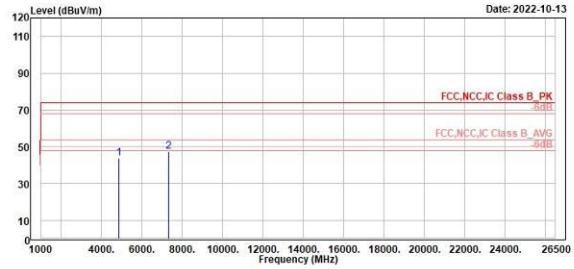

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4880.00	43.94	53.73	-9.79	74.00	-30.06	263	56	Peak	Horizontal	
2	7320.00	47.40	54.89	-7.49	74.00	-26.60	100	360	Peak	Horizontal	

Middle Channel (Vertical)

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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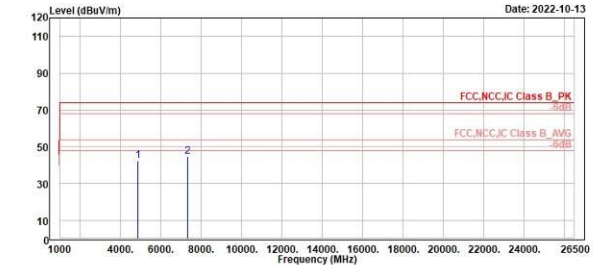

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4880.00	42.55	52.34	-9.79	74.00	-31.45	300	240	Peak	Vertical	
2	7320.00	44.59	52.08	-7.49	74.00	-29.41	400	104	Peak	Vertical	

BLE_1M

High Channel (Horizontal)

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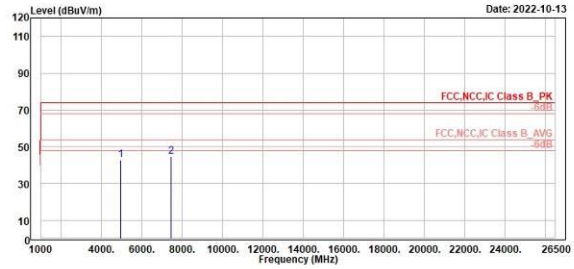

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4960.00	42.80	52.34	-9.54	74.00	-31.20	300	25	Peak	Horizontal	
2	7440.00	44.57	51.92	-7.35	74.00	-29.43	400	360	Peak	Horizontal	

High Channel (Vertical)

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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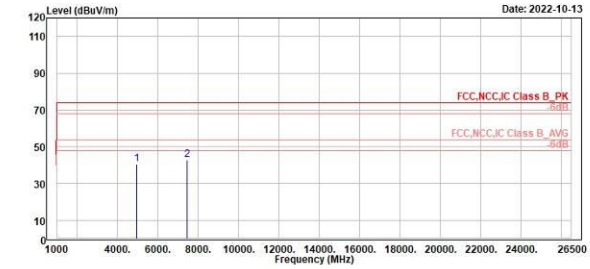

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4960.00	40.58	50.12	-9.54	74.00	-33.42	200	309	Peak	Vertical	
2	7440.00	43.03	50.38	-7.35	74.00	-30.97	400	252	Peak	Vertical	

Mains Conducted Emission, Tx Mode, 150kHz ~ 30MHz

Worst Band

(Line)

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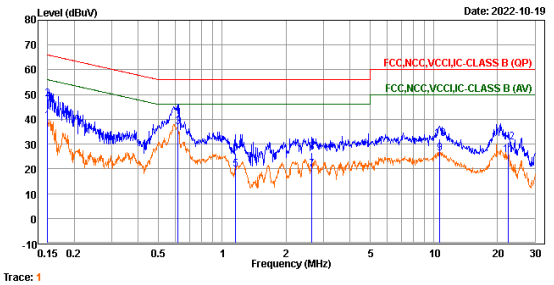

Trace: 1

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark	Pol/Phase	Note
	MHz	dBuV	dBuV	dB	dBuV	dB			
1	0.15	39.23	29.62	9.61	56.00	-16.77	Average	line1	
2	0.15	48.07	38.46	9.61	66.00	-17.93	QP	line1	
3	0.61	36.74	27.12	9.62	46.00	-9.26	Average	line1	
4	0.61	41.55	31.93	9.62	56.00	-14.45	QP	line1	
5	1.15	19.63	10.00	9.63	46.00	-26.37	Average	line1	
6	1.15	26.16	16.53	9.63	56.00	-29.84	QP	line1	
7	2.65	19.67	10.02	9.65	46.00	-26.33	Average	line1	
8	2.65	26.73	17.08	9.65	56.00	-29.27	QP	line1	
9	10.64	26.21	16.48	9.73	50.00	-23.79	Average	line1	
10	10.64	32.02	22.29	9.73	60.00	-27.98	QP	line1	
11	22.47	25.63	15.94	9.69	50.00	-24.37	Average	line1	
12	22.47	30.70	21.01	9.69	60.00	-29.30	QP	line1	

(Neutral)

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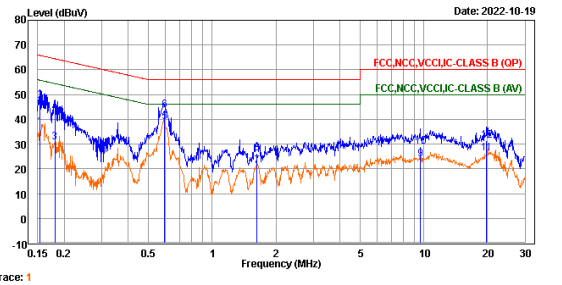

Trace: 1

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark	Pol/Phase	Note
	MHz	dBuV	dBuV	dB	dBuV	dB			
1	0.15	36.98	27.39	9.59	55.83	-18.85	Average	neutral	
2	0.15	47.48	37.89	9.59	65.83	-18.35	QP	neutral	
3	0.18	30.74	21.15	9.59	54.47	-23.73	Average	neutral	
4	0.18	42.76	33.17	9.59	64.47	-21.71	QP	neutral	
5	0.59	38.80	29.20	9.60	46.00	-7.20	Average	neutral	
6	0.59	43.61	34.01	9.60	56.00	-12.39	QP	neutral	
7	1.62	21.25	11.63	9.62	46.00	-24.75	Average	neutral	
8	1.62	26.13	16.51	9.62	56.00	-29.87	QP	neutral	
9	9.58	23.99	14.25	9.74	50.00	-26.01	Average	neutral	
10	9.58	29.10	19.36	9.74	60.00	-30.90	QP	neutral	
11	19.74	26.25	16.45	9.80	50.00	-23.75	Average	neutral	
12	19.74	31.49	21.69	9.80	60.00	-28.51	QP	neutral	