



<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	CN21BSRI(P15C-BLE) 001	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	238494761	Seite 1 von 24 Page 1 of 24
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>	N/A	<b>Auftragsdatum:</b> <i>Order date:</i>	2020-12-02	
<b>Auftraggeber:</b> <i>Client:</i>	Fuji Electric Co., Ltd. 5520, Minami Tamagaki-cho Suzuka-city Mie Japan			
<b>Prüfgegenstand:</b> <i>Test item:</i>	Multi-function Keypad			
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type no.:</i>	TP-A2SW			
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	FCC Part 15C Test report (BLE)			
<b>Prüfgrundlage:</b> <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.247			
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	2020-12-22			
<b>Prüfmuster-Nr.:</b> <i>Test sample no.:</i>	A002965109-002			
<b>Prüfzeitraum:</b> <i>Testing period:</i>	2020-12-23 - 2020-12-30			
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	EMC/RF Taipei Testing Site			
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	Taipei Testing Laboratories			
<b>Prüfergebnis*:</b> <i>Test result*:</i>	Pass			
<b>überprüft von:</b> <i>reviewed by:</i>			<b>genehmigt von:</b> <i>authorized by:</i>	
<b>Datum:</b> <i>Date:</i>	2021-01-08		<b>Ausstellungsdatum:</b> <i>Issue date:</i>	2021-01-08
<b>Stellung / Position:</b>	Senior Project Engineer		<b>Stellung / Position:</b>	Senior Project Manager
<b>Sonstiges / Other:</b>	This product refer to Bluetooth module certification, so we only evaluate and verify the tests of Peak Output Power, Spurious Emission and Mains Conducted Emission.			
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
<b>* Legende:</b>	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar
<b>* Legend:</b>	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable
<b>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.</b> <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	Not Applicable
-	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
5.2.1	15.207	Mains Conducted Emission	Pass

**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**

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## HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
CN21BSRI(P15C-BLE) 001	Original Release	2021-01-08

## 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
KDB 996369 D04 Module Integration Guide v01
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)	$\pm 1.15$ dB
Radiated Emission (30 MHz ~ 200 MHz)	$\pm 1.30$ dB
Radiated Emission (200 MHz ~ 1 GHz)	$\pm 1.30$ dB
Radiated Emission (1 GHz ~ 18 GHz)	$\pm 1.54$ dB
Radiated Emission (18 GHz ~ 40 GHz)	$\pm 2.52$ dB
Mains Conducted Emission	$\pm 1.65$ dB



### 3. General Product Information

#### 3.1 Product Function and Intended Use

The EUT is a Multi-function Keypad . 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	Multi-function Keypad
Type Identification	TP-A2SW
FCC ID	2AYOMBGM13P

##### 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	5Vdc
Modulation	GFSK
Maximum Output Power (mW)	4.21
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	Default
2440	Default
2480	Default

### 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: TP-A2SW is power up with DC5V power supply. Connect DC5V to the power input cable (red: + pole, black: GND) prior to operating. Once started, the LCD screen shown below appears.

Test Software	EFR Connect
---------------	-------------

The samples were used as follows:

A002965109-002 for radiated and conduction

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	
-	√	√	√	√	-

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)
-	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, 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)
-	2402 to 2480	2480	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	2480	1

**Test Condition**

Test Item	Ambient Temperature	Relative Humidity	Tested by
Conducted Measurement	22 °C	66 %	Stanislas Charles
Radiated Spurious Emissions above 1 GHz	21.4~22 °C	55.4~58.4 %	Temo Chen
Radiated Spurious Emissions below 1 GHz	21.4~22 °C	55.4~58.4 %	Temo Chen
Mains Conducted Emission	26 °C	65 %	Temo Chen

## 4.4 Special Accessories and Auxiliary Equipment

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

**Accessory of EUT**

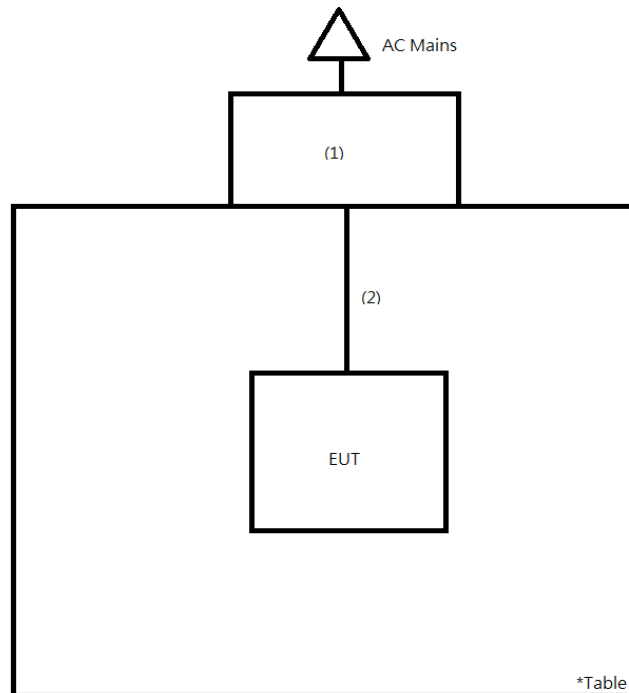
None.

**Support Unit**

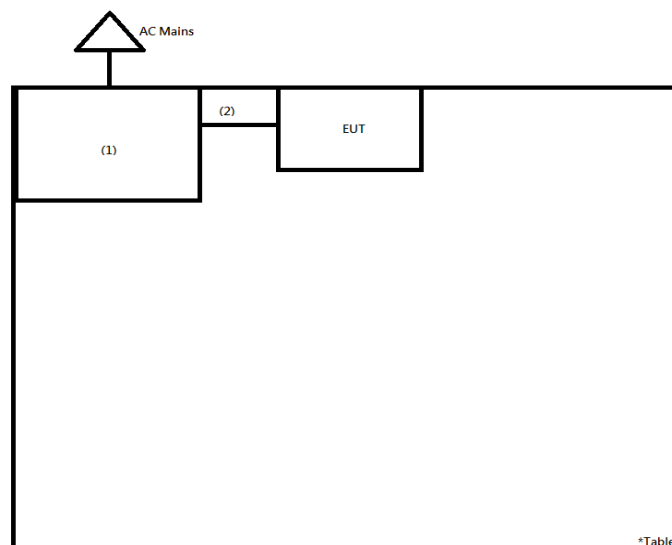
Radiated Test					
No.	Description	Brand	Model	S/N	Remark
1	DC Power Supply	PeakTech	2250	-	-
2	Power Cable	-	-	-	250cm non-shielded cable w/o core
Mains Conducted Test					
1	DC Power Supply	GWINSTEK	GPS-3303	GEU915620	-
2	DC Power Cable	-	-	-	30cm non-shielded cable w/o core

## 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

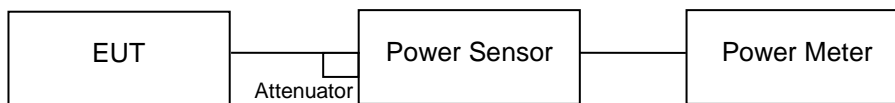
According to the manufacturer declaration, the EUT has an antenna with a directional gain of 1 dBi. The antenna is a Chip Antenna soldered to the PCB with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision. Refer to 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	2020/4/6	2021/4/5	2020/12/23	2020/12/23
Power Sensor	Anritsu	MA2411B	1725269	2020/4/7	2021/4/6	2020/12/23	2020/12/23

### 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**

&lt;1Mbps&gt;

Channel	Channel Frequency	Peak Output Power		Limit (dBm)
	(MHz)	(dBm)	(mW)	
Low Channel	2402	6.24	4.21	30
Middle Channel	2440	5.42	3.48	30
High Channel	2480	4.63	2.90	30

**Average Power**

&lt;1Mbps&gt;

Channel	Channel Frequency	Average Power	
	(MHz)	(dBm)	(mW)
Low Channel	2402	6.20	4.17
Middle Channel	2440	5.38	3.45
High Channel	2480	4.59	2.88

### 5.1.3 Radiated Spurious Emissions and Band Edges

#### Limit

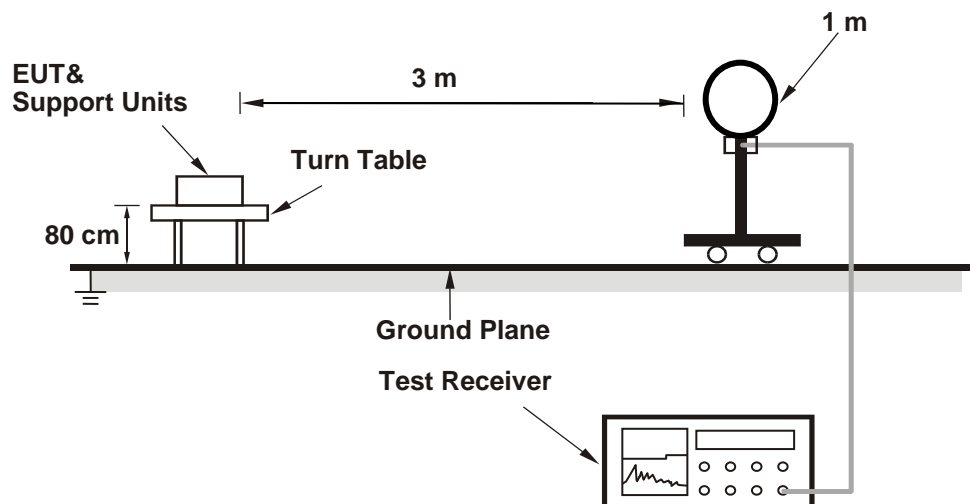
Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

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).

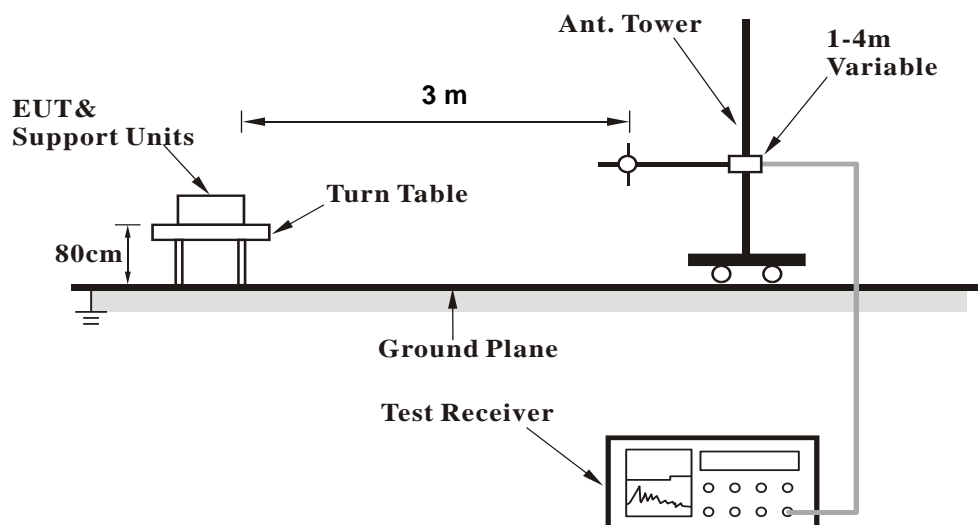
**Kind of Test Site** 3m Semi-Anechoic Chamber

#### Test Setup

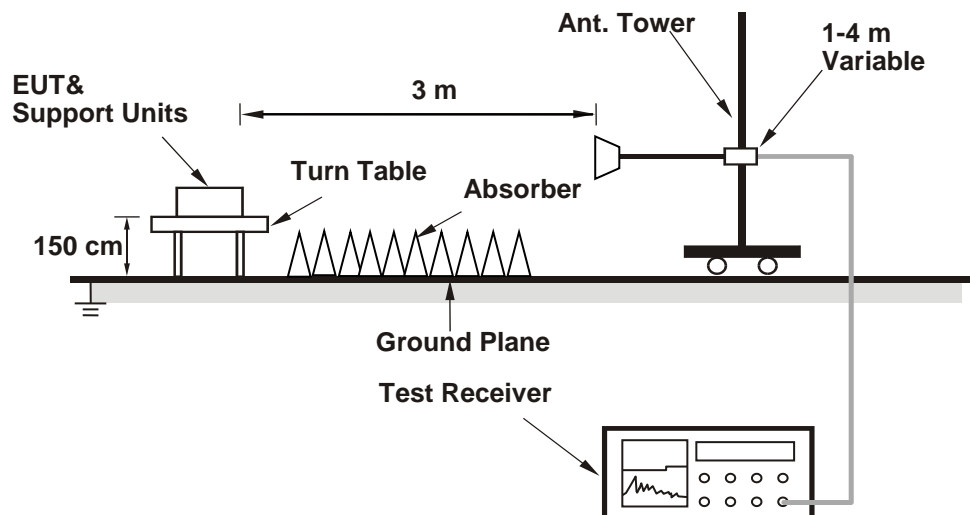
##### <Radiated Emissions below 30 MHz>



##### <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**

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV40	101508	2020/3/16	2021/3/15
Receiver	R&S	ESR7	102108	2020/4/22	2021/4/21
Bilog Antenna	SCHWARZBECK	VULB-9168	00951	2020/2/14	2021/2/12
Horn Antenna	ETS-Lindgren	3117	00218930	2020/12/1	2021/11/30
LF-AMP	Agilent	8447D	2944A10772	2020/2/11	2021/2/9
HF-AMP + AC source	EMCI	EMC051845SE	980633	2020/2/17	2021/2/15
HF-AMP + AC source	EMCI	EMC184045SE	980657	2020/2/17	2021/2/15
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2020/4/10	2021/4/9
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	804680/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	MY37202/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800898/2EA	2020/4/22	2021/4/21
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800901/2EA	2020/4/22	2021/4/21
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	801027/2EA	2020/4/22	2021/4/21
Loop Antenna	Chance Most	EMCILPA600 +calibration	287	2020/1/9	2021/1/7

**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  $\geq 98$  %) 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, Y and Z 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.

## 5.2 Mains Emission

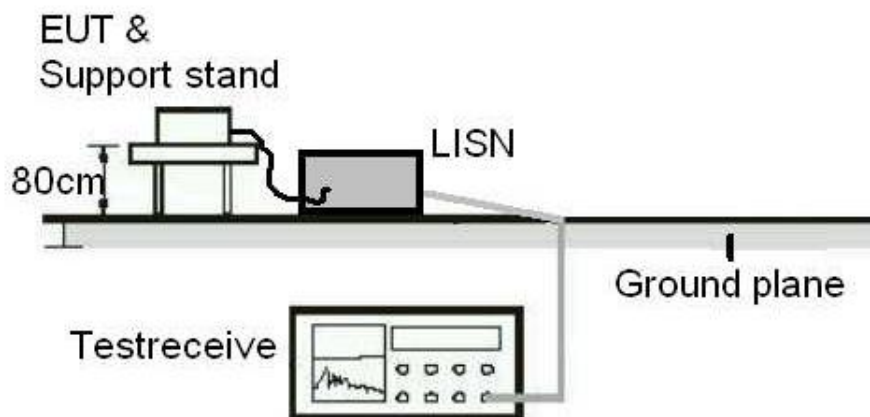
### 5.2.1 Mains Conducted Emission

#### Limit

Mains Conducted Emission as defined in §15.207 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 (for EUT)	Rohde & Schwarz	ENV216	101262	2020/08/04	2021/08/04
EMI Test Receiver	R&S	ESR7	102108	2020/4/22	2021/4/21
10dB attenuation	SCHWARZBECK	VTSD 9561 F-N	660	2020/2/24	2021/2/23
Measurement Software	EZ	EZ EMC (Version NB-03A)	N/A	N/A	N/A

#### 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 Emissions & Mains Conducted Emission Test

## Band Edges, 2.31GHz ~ 2.9GHz

BLE\_1M

Low Channel (Horizontal) 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

Date: 2020-12-30

Level (dBuV/m)

Frequency (MHz)

FCC Class B PK

FCC Class B AVG

	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	2388.59	52.26	14.93	37.33	74.00	-21.74	268	246	Peak	Horizontal		
2 *	2402.00	104.61	67.24	37.37	74.00	30.61	268	246	Peak	Horizontal		
3	2825.66	54.30	16.31	37.99	74.00	-19.70	268	246	Peak	Horizontal		

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

Date: 2020-12-30

Level (dBuV/m)

Frequency (MHz)

FCC Class B PK

FCC Class B AVG

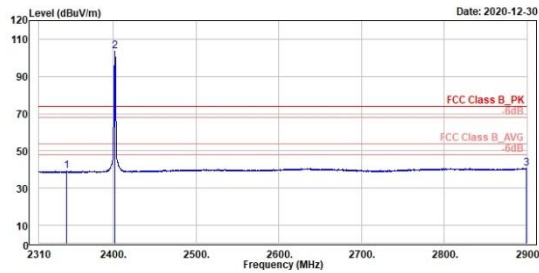
	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	2389.53	52.34	15.01	37.33	74.00	-21.66	393	139	Peak	Vertical		
2 *	2402.00	103.85	66.48	37.37	74.00	29.85	393	139	Peak	Vertical		
3	2811.85	53.37	15.43	37.94	74.00	-20.63	393	139	Peak	Vertical		

**BLE\_1M**

**Low Channel (Horizontal) Average**



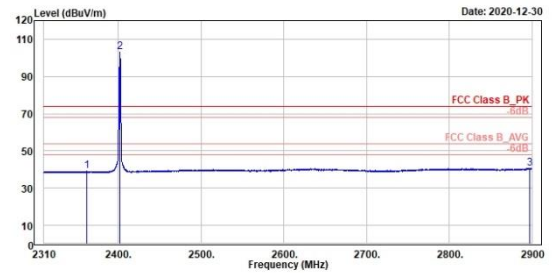
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Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	2343.04	39.14	1.95	37.19	54.00	-14.86	268	246	Average	Horizontal	
2 *	2402.00	105.72	66.35	37.37	54.00	49.72	268	246	Average	Horizontal	
3	2899.29	40.53	2.21	38.32	54.00	-13.47	268	246	Average	Horizontal	



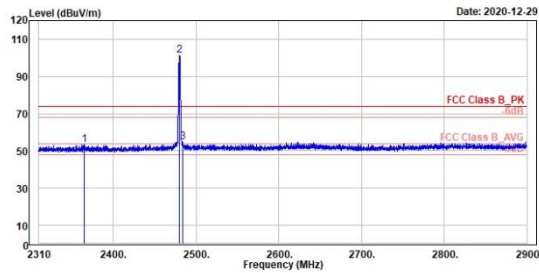
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Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	2362.27	39.20	1.96	37.24	54.00	-14.80	393	139	Average	Vertical	
2 *	2402.00	102.91	65.54	37.37	54.00	48.91	393	139	Average	Vertical	
3	2897.05	40.58	2.27	38.31	54.00	-13.42	393	139	Average	Vertical	

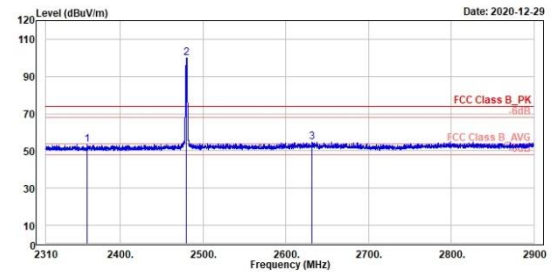
**BLE\_1M**

**High Channel (Horizontal) Peak**



Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	cm	deg			
1	2365.34	53.68	16.35	37.25	74.00	-20.40	255	242	Peak	Horizontal	
2 *	2480.00	101.10	63.54	37.56	74.00	27.10	255	242	Peak	Horizontal	
3	2483.58	54.94	17.38	37.56	74.00	-19.06	255	242	Peak	Horizontal	

**High Channel (Vertical) Peak**



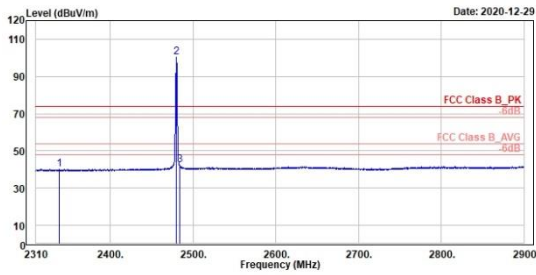
Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	cm	deg			
1	2359.91	53.55	16.31	37.24	74.00	-20.45	364	146	Peak	Vertical	
2 *	2480.00	99.96	62.40	37.56	74.00	25.96	364	146	Peak	Vertical	
3	2631.90	54.89	16.99	37.90	74.00	-19.11	364	146	Peak	Vertical	

**BLE\_1M**

**High Channel (Horizontal) Average**



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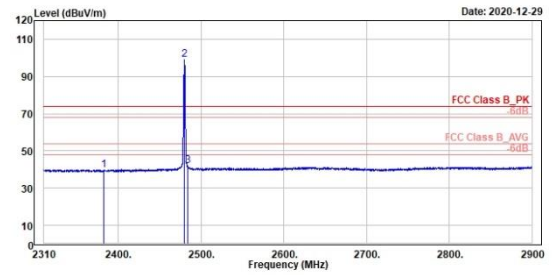


Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	2337.97	40.22	3.05	37.17	54.00	-13.78	255	242	Average	Horizontal	
2 *	2480.00	100.21	62.65	37.56	54.00	46.21	255	242	Average	Horizontal	
3	2483.50	42.36	4.80	37.56	54.00	-11.64	255	242	Average	Horizontal	

**High Channel (Vertical) Average**



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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	cm	deg				
1	2382.22	39.92	2.62	37.30	54.00	-14.08	364	146	Average	Vertical	
2 *	2480.00	99.03	61.47	37.56	54.00	45.03	364	146	Average	Vertical	
3	2483.50	41.97	4.41	37.56	54.00	-12.03	364	146	Average	Vertical	

**Spurious Emissions, Tx Mode, 9kHz ~ 30MHz**

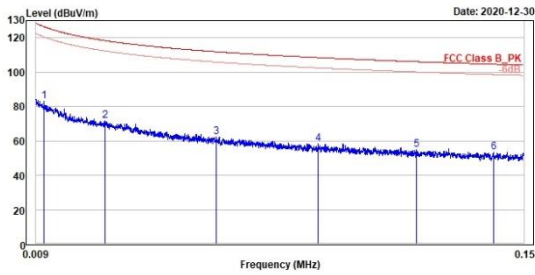
**BLE\_1M**

**High Channel (Open) 9kHz~150kHz**

**High Channel (Open) 150kHz~30MHz**



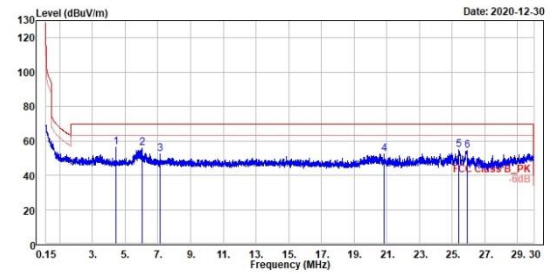
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1	2	3	4	5	6
Freq	Level	Read	Limit	Over	APos
MHz	dBuV/m	Level	Line	Limit	cm
Factor		dB/m	dBuV/m	dB	
TPos	Remark	Pol/Phase	Note		
deg					
137	QP	Open			
76	QP	Open			
181	QP	Open			
64	QP	Open			
66	QP	Open			
57	QP	Open			



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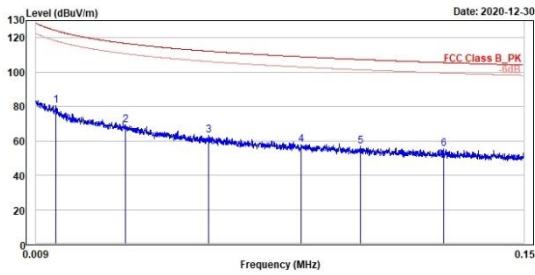
1	2	3	4	5	6
Freq	Level	Read	Limit	Over	APos
MHz	dBuV/m	Level	Line	Limit	cm
Factor		dB/m	dBuV/m	dB	
TPos	Remark	Pol/Phase	Note		
deg					
57	QP	Open			
99	QP	Open			
28	QP	Open			
26	QP	Open			
234	QP	Open			
5	QP	Open			

**BLE\_1M**

**High Channel (Close) 9kHz~150kHz**



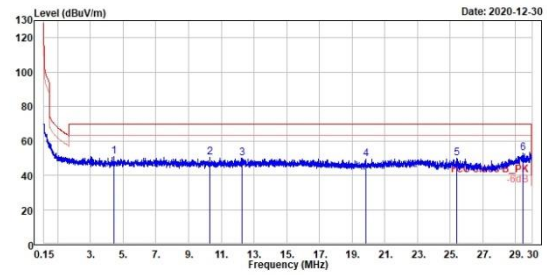
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Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	0.01	80.43	4.55	75.88	124.24	-43.81	100	246 QP	Close		
2	0.03	69.13	-0.03	69.16	116.72	-47.59	100	71 QP	Close		
3	0.06	63.40	-0.39	63.79	112.18	-48.78	100	24 QP	Close		
4	0.09	58.08	-2.72	60.80	108.94	-50.86	100	174 QP	Close		
5	0.10	56.61	-2.48	59.09	107.36	-50.75	100	348 QP	Close		
6	0.13	55.38	-2.31	57.69	105.53	-50.15	100	20 QP	Close		



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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	cm	deg				
1	4.44	51.10	12.77	38.33	69.50	-18.40	100	248 QP	Close		
2	10.31	50.29	12.82	37.47	69.50	-19.21	100	284 QP	Close		
3	12.25	50.01	12.68	37.33	69.50	-19.49	100	0 QP	Close		
4	19.83	49.58	13.29	36.29	69.50	-19.92	100	189 QP	Close		
5	25.40	49.85	15.74	34.11	69.50	-19.65	100	360 QP	Close		
6	29.45	53.08	14.70	38.38	69.50	-16.42	100	141 QP	Close		

## Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

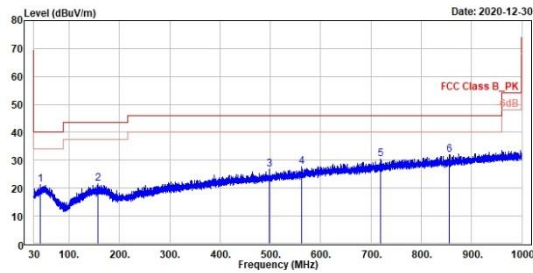
### BLE\_1M/

#### High Channel (Horizontal)

#### High Channel (Vertical)



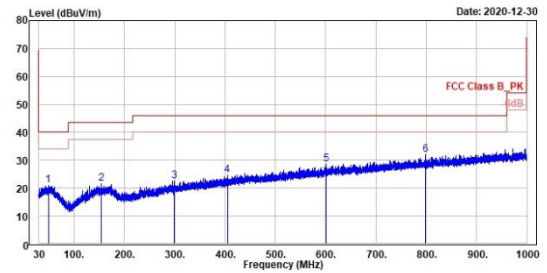
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Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	43.39	21.29	28.96	-7.67	40.00	-18.71	200	215	QP	horizontal	
2	156.97	21.71	29.28	-7.57	43.50	-21.79	200	350	QP	horizontal	
3	497.73	26.82	30.05	-3.23	46.00	-19.18	200	184	QP	horizontal	
4	562.63	27.63	29.67	-2.04	46.00	-18.37	400	92	QP	horizontal	
5	719.48	30.29	29.80	0.49	46.00	-15.71	400	272	QP	horizontal	
6	856.44	32.07	29.63	2.44	46.00	-13.93	300	201	QP	horizontal	



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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	cm	deg				
1	48.62	21.00	28.49	-7.49	40.00	-19.00	301	360	QP	vertical	
2	154.55	21.54	29.16	-7.62	43.50	-21.96	400	165	QP	vertical	
3	299.27	22.47	28.91	-6.44	46.00	-23.53	100	194	QP	vertical	
4	404.52	24.60	29.20	-4.60	46.00	-21.40	100	44	QP	vertical	
5	601.52	28.71	30.00	-1.29	46.00	-17.29	100	334	QP	vertical	
6	798.63	31.85	30.17	1.68	46.00	-14.15	400	303	QP	vertical	

## Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

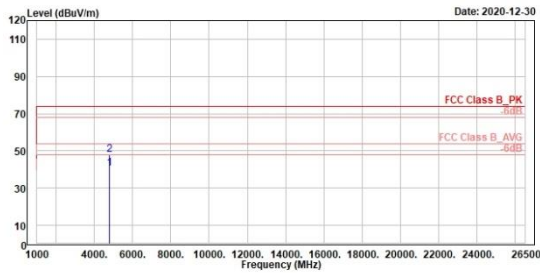
### BLE\_1M

#### Low Channel (Horizontal)

#### Low Channel (Vertical)



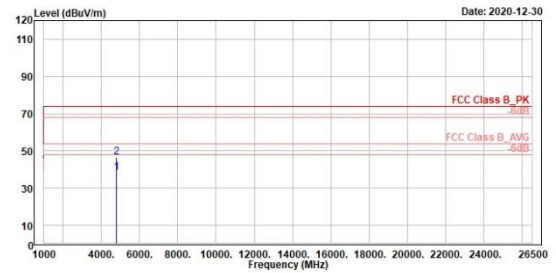
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	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	cm	deg			
1	4804.00	48.66	58.86	-10.20	54.00	-13.34	112	270	Average	horizontal		
2	4804.00	47.85	58.05	-10.20	74.00	-26.15	112	270	Peak	horizontal		



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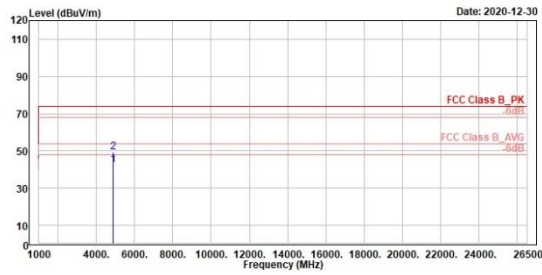


	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	cm	deg			
1	4804.00	38.23	48.43	-10.20	54.00	-15.77	116	325	Average	vertical		
2	4804.00	46.51	56.71	-10.20	74.00	-27.49	116	325	Peak	vertical		



**BLE\_1M**
**Middle Channel (Horizontal)**

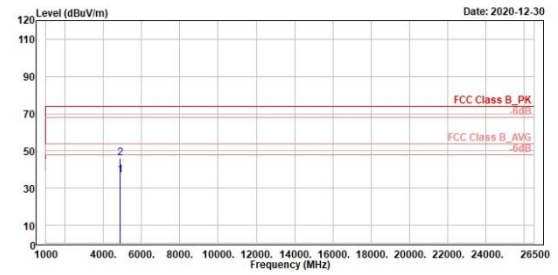

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	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	cm	deg			
1	4880.00	42.51	52.57	-10.06	54.00	-11.49	337	269	Average	horizontal		
2	4880.00	49.40	59.46	-10.06	74.00	-24.60	337	269	Peak	horizontal		



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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	cm	cm	deg			
1	4880.00	37.00	47.06	-10.06	54.00	-17.00	100	300	Average	vertical		
2	4880.00	46.30	56.36	-10.06	74.00	-27.70	100	300	Peak	vertical		

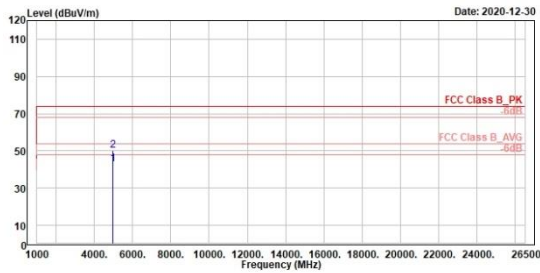
**BLE\_1M**

**High Channel (Horizontal)**

**High Channel (Vertical)**



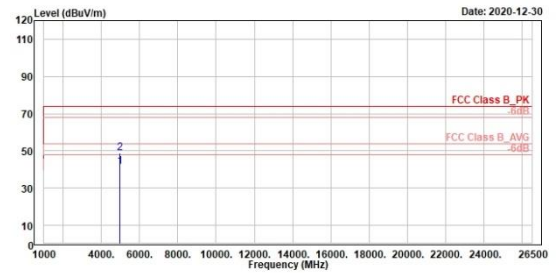
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	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	4960.00	43.11	52.87	-9.76	54.00	-10.89	323	294	Average	horizontal		
2	4960.00	49.99	59.75	-9.76	74.00	-24.01	323	294	Peak	horizontal		



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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	4960.00	41.74	51.50	-9.76	54.00	-12.26	353	295	Average	vertical		
2	4960.00	48.95	58.71	-9.76	74.00	-25.05	353	295	Peak	vertical		

## Mains Conducted Emission, 150kHz ~ 30MHz

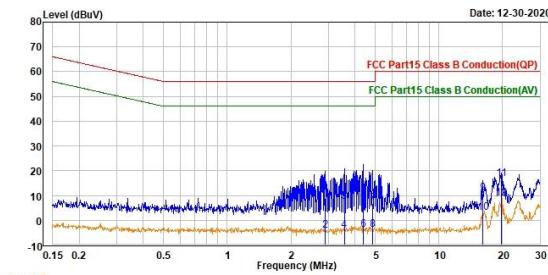
### Worst Band

#### (Line)

#### (Neutral)



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