



FCC PART 15 SUBPART C FCC PART 15.249 TEST REPORT

FCC ID:2BYJQ-EPM01020304

Report No: CTSL2620930241E02

Product Name: Power meter

Main Test Model: EPM01020304

Series Models: -

Applicant: Hangzhou leoseek sports technology Co.,Ltd.

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with
FCC PART 15C, FCC PART 15 SUBPART C (15.249).

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CTSL Testing (Dongguan) Co., Ltd.

Main company address: Building 1, Houjie Road, Houjie Town, Guangdong Province
Dongguan City, China

Test Report

FCC ID:2BYJQ-EPM01020304

Applicant Name	Hangzhou leoseek sports technology Co.,Ltd.				
Applicant Address	Unit 5208, Building 5, No.4 Fengdu Road, Pingyao Town, Yuhang District, Hangzhou City, Zhejiang Province, China				
Manufacturer Name	Hangzhou leoseek sports technology Co.,Ltd.				
Manufacturer Address	Unit 5208, Building 5, No.4 Fengdu Road, Pingyao Town, Yuhang District, Hangzhou City, Zhejiang Province, China				
Trade Mark	LEOSEEK				
Product name	Power meter				
Main Test Model	EPM01020304				
Series Models	-				
Standard	FCC Part 15 Subpart C (15.249) ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024				
Test Location	ISO/IEC 17025 by ILAC-MRA is A2LA 7556.01 CTSL Testing (Dongguan) Co., Ltd. 1/F, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China				
Receipt Date	2026.09.10	Test period	2026.09.10-2026.09.30	Issue Date	2026.10.09
Conclusion	The equipment under test was found to be compliance with the requirements of the standards applied.				
Performs Testing:	Ethan Zhao	Ethan Zhao			
Test Report Reviewer:	Steve Qin	Steve Qin			
Test Report Authorizer:	Alan Li	Alan Li			

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1. GENERAL INFORMATION

1.1. General Description of EUT (Equipment Under Test)

Product Information	
Product Name	: Power meter
Main Test Model	: EPM01020304
Series Models	: -
Model differences	: -
Power supply	: DC 3.7V from Rechargeable Li-ion battery Charging Input: DC 5V, 100mA
Battery	: Rechargeable Li-ion battery*2 JUR 601035G 200mAh 3.7V 0.74Wh 2509
Software Version	: V026
Hardware Version	: V005
Equipment Under Test	
Testing sample ID	: CTSL2620930241-S1 (Engineer sample) CTSL2620930241-S2 (Normal sample)
Test supplied	: ☐ supplied by the manufacturer ☒ supplied by the lab (Auxiliary test equipment supplied by test Lab, Details reference Section 2.6.)
Power supply information	: Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz
Wireless Specification	
Supported Type	: 2.4G Wireless SRD
Modulation Type	: GFSK
Operation frequency	: 2457MHz
Number of channels	: 1 Channels
Bandwidth	: -
Max Field Strength@3m (Fundamental)	: 90.39dB μ V/m (Peak)
Antenna Gain& type	: Refer to Section 1.2 of the report.
Sample Type	: Prototype production
Type of Device	: ☒ Portable Device; ☐ Mobile Device; ☐ Modular Device

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Band	Model Name	Antenna Type	Connector	Gain (dBi)
1	2400- 2500MHz	CA-C03	SMD Antenna	/	4.3
Note: 1. The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain. 2. The test results of this report only apply to the sample as received.					

1.3. Information of RF Cable

Cable Loss(dB)	Provided by
1.0	Hangzhou leoseek sports technology Co.,Ltd.
Note: 1. The customer declared the loss value of the RF Cable. and the test results of this report only apply to the sample as received. 2. The laboratory is not responsible for the accuracy of the cable loss.	

2. SUMMARY OF TEST

2.1. Test Standards

FCC Rules Part 15.249: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz.

ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024: American National Standard for Testing Unlicensed Wireless Devices

2.2. Summary of test result

No.	Description of Test Item	FCC Standard Section	Results
1	Field Strength of Fundamental	§15.249(a)	PASS
2	Radiated Spurious Emissions and Band Edge	§15.205 §15.209 §15.249(a)(c)(d)(e) §15.35(b)	PASS
3	20dB Bandwidth	§15.215(c)	PASS
4	AC Power Line Conducted Emissions	§15.207	PASS
5	Antenna Requirement	§15.203	PASS

Note: "N/A" denotes test is not applicable in this test report.

2.3. Test Facilities

EMC Lab :

A2LA Certificate Number: 7556.01;
CTSL Testing (Dongguan) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

FCC Designation Number: CN1425;
Test Firm Registration Number:750639;
CTSL Testing (Dongguan) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

Industry Canada Registration Number. Is: 34801;
CAB identifier: CN0192;
CTSL Testing (Dongguan) Co., Ltd. The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

Name of Firm : CTSL Testing (Dongguan) Co.,Ltd.

Main company address:

Building 1, Houjie Road, Houjie Town, Guangdong Province Dongguan City, China

EMC test location/satellite location:

1/F, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China

2.4. Measurement uncertainty

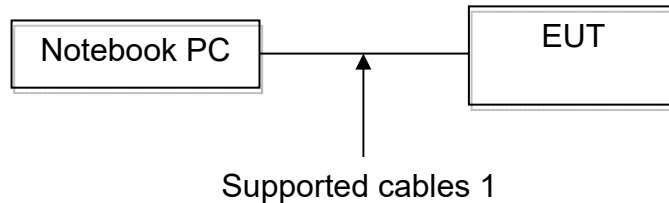
Item	Uncertainty
Uncertainty for Conduction emission test	3.72dB (9kHz-150kHz) 3.24dB (150kHz-30MHz)
Uncertainty for spurious emissions test	3.18dB (Below 30MHz) 4.90dB (30-1000MHz) 5.61dB (Above 1GHz)
Uncertainty for radio frequency	1.0 ppm
Uncertainty for conducted RF Power	0.7dB
Uncertainty for Power density test	0.6dB
Uncertainty of bandwidth test	0.34 dB
Uncertainty for Temperature	0.5°C
Uncertainty for Relative Humidity	1.8%RH
Uncertainty for Atmospheric Pressure	0.16 kPa

Note: This uncertainty represents an expanded uncertainty expressed at approximately The 95% confidence level using a coverage factor of k=2.

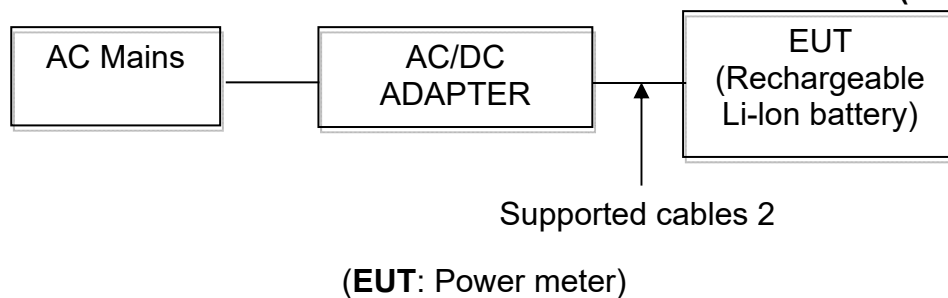
2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into Bluetooth test mode by software before test.

Connect EUT Antenna Terminal, Radiated Spurious Emissions& Band Edge Test



AC Power Line Conducted Emissions Test& Radiated Emission Test (30-1000MHz):



2.6. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
1	Notebook PC	-	Inspiron 14R-5421 (Manufacturer: Dell)	-	25TZHW1
2	AC/DC ADAPTER (supplied by the Lab.)	Oppo	VCB7CACH	-	C622503PB1 009774

Supported cables				
Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.5m	USB Extension Cable (supplied by the Lab.)
2	NO	NO	1.0m	USB-C Charge Cable (supplied by the Lab.)

2.7. Test mode

Combining all the rates, modulations, and packet types, the Pre-scans had been carried out. The worst-case test mode was selected for the final test as listed below.

Test Item	Modulation Type	Operating Mode	Test Channel
Field Strength of Fundamental	GFSK	Continuous TX	CH00 2457MHz
Radiated Emissions 30-1000MHz	Only Worst case is reported.		
Radiated Emissions Above 1GHz	GFSK	Continuous TX	CH00 2457MHz
Radiated Band Edge	GFSK	Continuous TX	CH00 2457MHz
20dB Bandwidth	GFSK	Continuous TX	CH00 2457MHz
AC Power Line Conducted Emissions	Only Worst case is reported.		

Note: In radiated measurement, the EUT had been pre-scan on the positioned of each 3 axis (X, Y, Z), the worst case was found when positioned on **X-plane**.

2.8. Channel List

2.4G Wireless SRD-GFSK	
Channel No.	Frequency (MHz)
00	2457

2.9. Power Setting of Test Software

Software Name	nrfconnect-setup-5.2.0
Frequency (MHz)	2457
GFSK Setting	7

Note: This information is provided by the applicant.

2.10. Test Equipment

For Conducted Emission Test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI 3	AT005	GUANGZHOU NEM	May 28,26	May 27,27
LISN	Rohde & Schwarz	ENV216	AT006	GUANGZHOU NEM	May 28,26	May 27,27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	AT007	GUANGZHOU NEM	May 28,26	May 27,27
CE Cable	Times Microwave	LMR195UF-N MNM-1.50M	AT041	GUANGZHOU NEM	May 28,26	May 27,27
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A

For Radiated Emission Test (9kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI TestReceiver	Rohde& Schwarz	ESCI 7	AT001	GUANGZHOU NEM	May 28,26	May 27,27
Active Loop Antenna	HCT	6505	AT064	GRG METROLOGY	Mar 22,26	Mar 21,27
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	Times Microwave	LMR195UF-N MNM-9M	AT045	GUANGZHOU NEM	May 28,26	May 27,27

For Radiated Emissions Test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde& Schwarz	ESCI 7	AT001	GUANGZHOU NEM	May 28,26	May 27,27
Trilog-Broadband Antenna (Includes 6db attenuator)	SCHWARZBECK	VULB 9168	AT002	LISAI	May 30,26	May 29,27
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
30-1000MHz Cable	Times Microwave Systems	LMR195UF-N MRNMR-3.00M+ LMR400UF-N MNM-3.00M+ LMR400UF-N MNM-3.00M	AT042+AT043+AT044	GUANGZHOU NEM	May 28,26	May 27,27

For Radiated Emission test (Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna 1-18G	SCHWARZBEC K	BBHA 9120 D	AT003	LISAI	May 30,26	May 29,27
Horn Antenna 18-40GHz	XIBAO	XB-WDB18-40K	AT064	LISAI	May 30,26	May 29,27
Broadband Preamplifier	SCHWARZBEC K	BBV 9718 D	AT004	GUANGZHOU NEM	May 28,26	May 27,27
Low Noise Amplifier	MWRFTest	DLA8-18-40G-2078	AT065	GUANGZHOU NEM	May 28,26	May 27,27
Spectrum Analyzer 40G	Keysight	N9020B	AT066	GUANGZHOU NEM	May 28,26	May 27,27
Spectrum Analyzer 26.5G	Keysight	N9020A	AT050	GUANGZHOU NEM	May 28,26	May 27,27
Radio switching unit	TiGroup	SU319	AT055	N/A	N/A	N/A
Filtering unit	TiGroup	SU319F	AT056	N/A	N/A	N/A
Test Software	BL	BL410-E V25.5 en	N/A	N/A	N/A	N/A
Above 1GHz Cable	Times Microwave Systems	SFT205-NMN M-7.0M+ SFT205-NMN M-2.0M	AT057+ AT058	GUANGZHOU NEM	May 28,26	May 27,27

For Connect EUT Antenna Terminal Test (RF Test system)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Spectrum analyzer	Keysight	N9020A	AT050	GUANGZHOU NEM	May 28,26	May 27,27
Power probe unit	Ti Group	SU319P	AT053	GUANGZHOU NEM	May 28,26	May 27,27
Switch unit	Ti Group	SU319S	AT054	N/A	N/A	N/A
Test Software	BL	BL410R 3.5.2.621	N/A	N/A	N/A	N/A

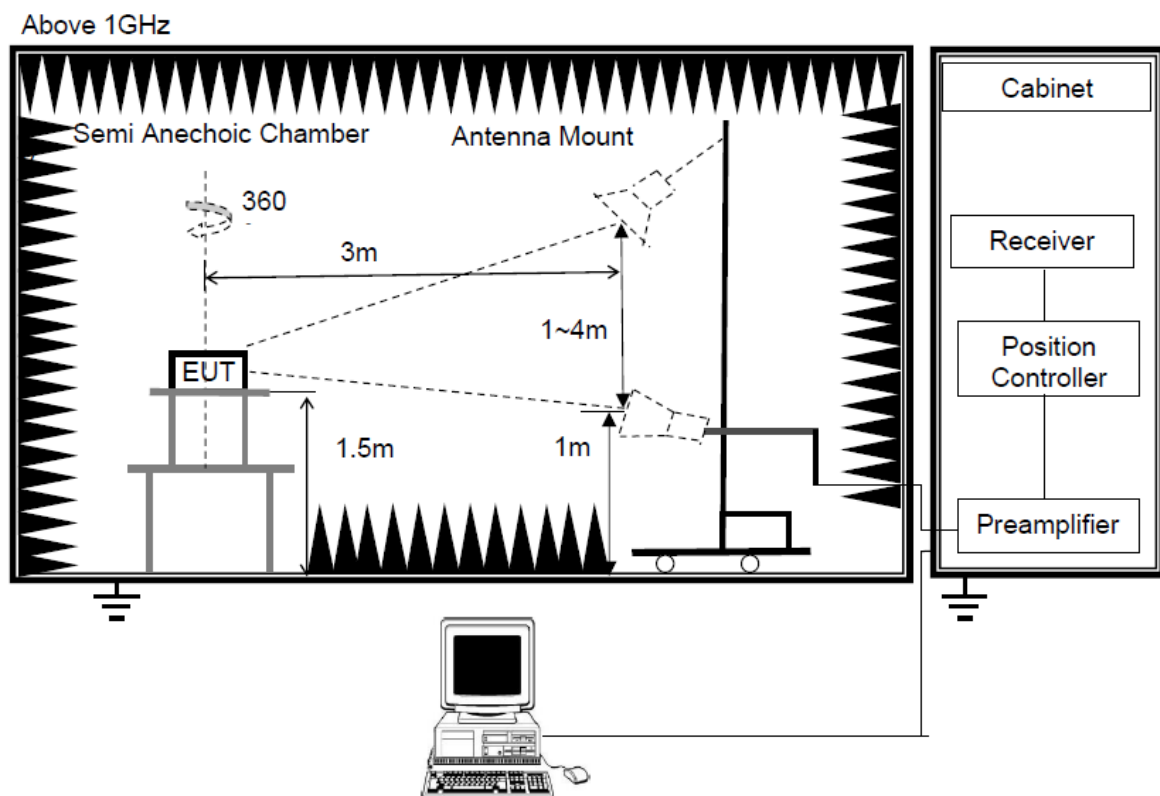
3. FIELD STRENGTH OF FUNDAMENTAL

3.1. Limit

§ 15.249(a) Fundamental Field Strength Limits (at 3 m)			
Frequency band (MHz)	Fundamental limit (mV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
2400-2483.5MHz	50	94	114
Note: 1. Average Limit (dBμV/m)=20×log[1000×Field Strength (mV/m)]. 2. Peak Limit (dBμV/m) = Average Limit (dBμV/m) +20dB, per §15.35(b).			

3.2. Test Setup

(A) Radiated Emission Test Set-Up, Frequency above 1GHz



3.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	≥OBW (Suggested 1MHz)
VBW	3×RBW (Suggested 3MHz)
Start frequency	2400MHz
Stop frequency	2483.5MHz
Sweep Time	Auto
Detector	Peak / Average
Trace Mode	Max Hold

3.4. Test Procedure

- EUT was placed on a turn table, which is 1.5 meter high above the ground.
- EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower.
- Spectrum analyzer setting parameters in accordance with section 3.3.
- Set the EUT transmit continuously with maximum output power.
- The turn table can rotate 360 degrees to determine the position of the maximum emission level.
- The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test, record the average and peak value.
- Repeat above procedures until all channels were measured.
- Record the results in the test report.
- recorded in this report.

3.5. Test Conditions

EUT:	Power meter	Main Test Model:	EPM01020304
Test Voltage:	DC 3.7V from Rechargeable Li-ion battery		
Temperature:	24.6°C	Humidity:	43 % RH
Atmosphere Pressure:	100.9kPa		

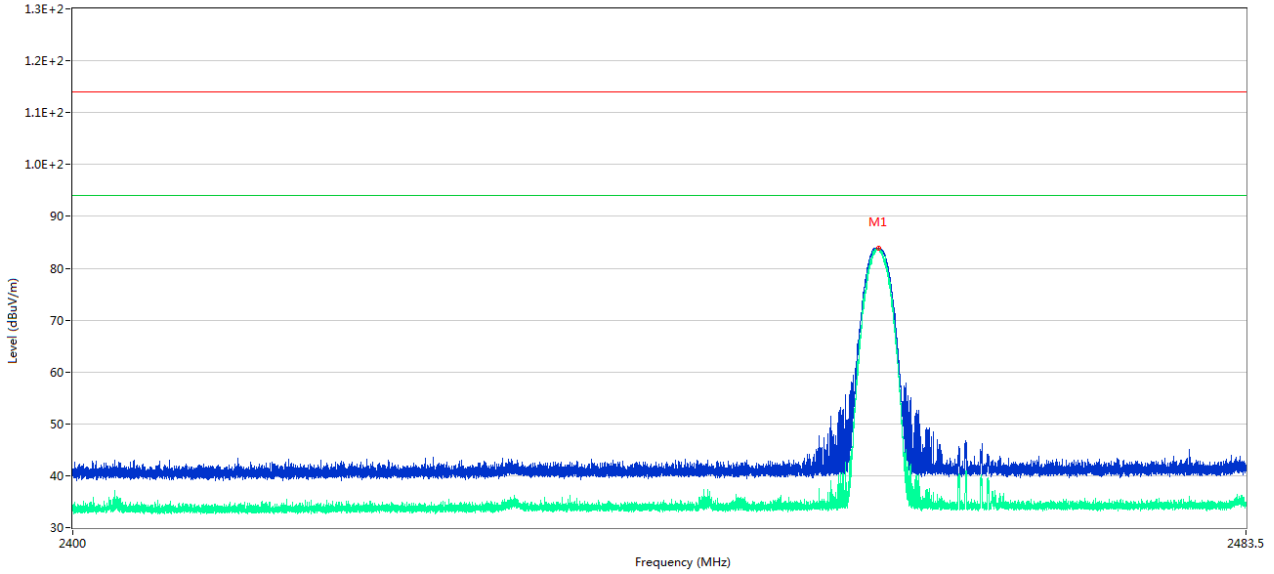
3.6. Test Result

Field Strength of Fundamental@3m						
Frequency MHz	Field strength of fundamental level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization	Result
2457	83.95	114.00	30.05	Peak	Vertical	Pass
	83.56	94.00	10.44	Average		
	90.39	114.00	23.61	Peak	Horizontal	Pass
	89.98	94.00	4.02	Average		

3.7.Original Test record

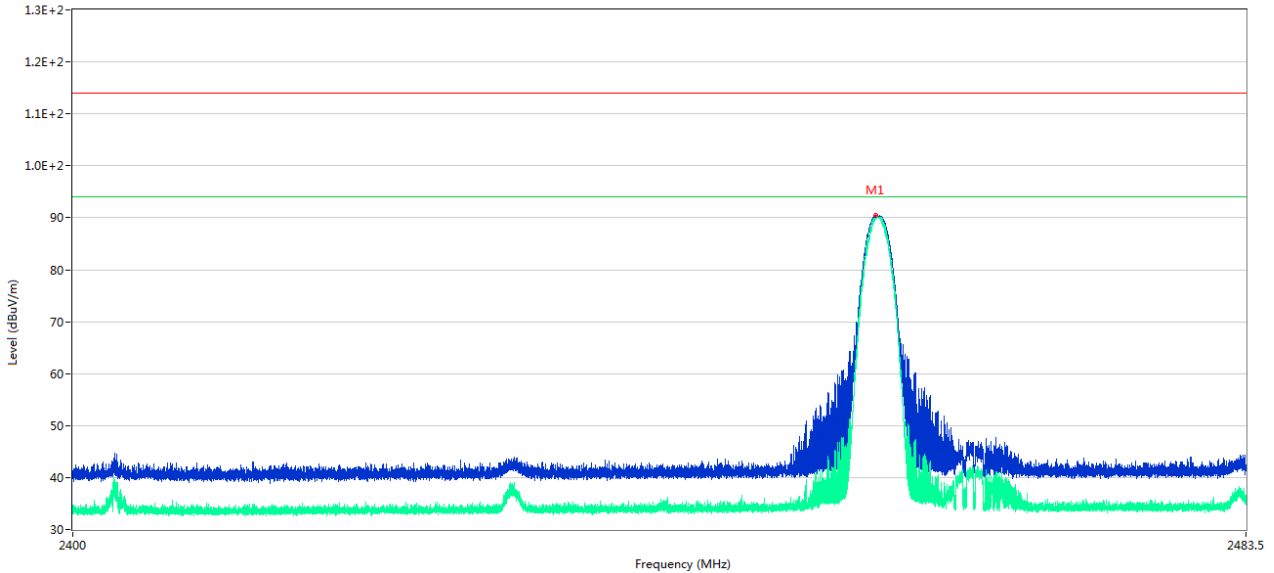
Field Strength of Fundamental@3m (GFSK- CH00 2457MHz)

RF_FCC RE_FCC ID 2.4G wireless SRD_FCC 15.249(2.4G SRD)Power_2.4GHz-2.483GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2457.047	83.95	-19.48	114.0	30.05	Peak	84.50	150	Vertical	Pass
1**	2457.047	83.56	-19.48	94.0	10.44	AV	84.50	150	Vertical	Pass

RF_FCC RE_FCC ID 2.4G wireless SRD_FCC 15.249(2.4G SRD)Power_2.4GHz-2.483GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2456.872	90.39	-19.48	114.0	23.61	Peak	72.40	150	Horizontal	Pass
1**	2456.872	89.98	-19.48	94.0	4.02	AV	72.40	150	Horizontal	Pass

4. RADIATED SPURIOUS EMISSIONS AND BAND EDGE

4.1. Limit

15.205 Restricted frequency band			
MHZ	MHz	MHZ	GHZ
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)

For harmonics and other spurious emissions:

Harmonics: 500 $\mu\text{V/m}$ = 54 dB $\mu\text{V/m}$ (at 3 m)

Other spurious emissions outside the band: comply with general limits in §15.209 (see table below)

§ 15.209 Radiated emission general limits			
Frequency (MHz)	Field Strength($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Distance(m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

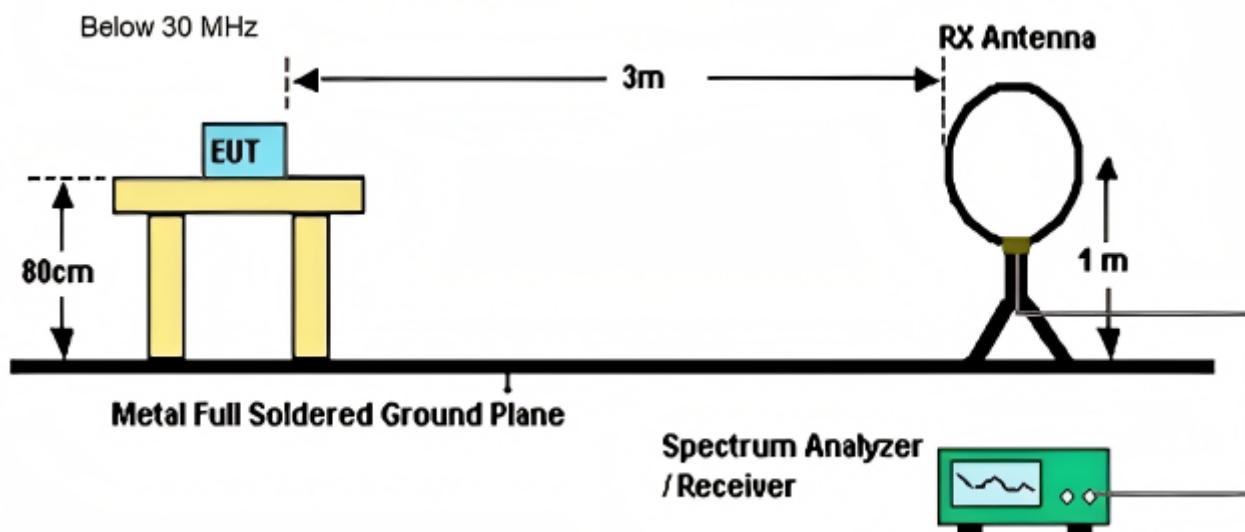
Note: Peak measurement may exceed average limit by up to 20 dB per §15.35(b). Restricted bands per §15.205 apply; emissions falling within these bands must meet the §15.209 limits.

Note:

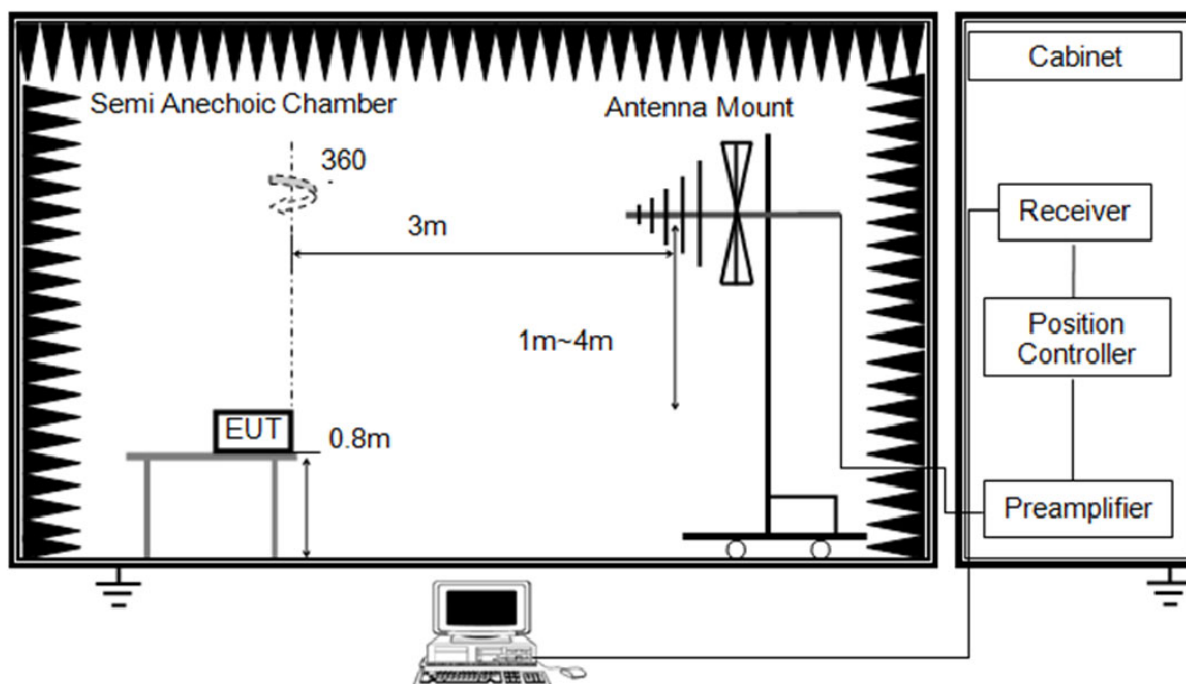
- (1) Emission level dB μV = 20 log Emission level $\mu\text{V/m}$.
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4.2. Test Setup

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz

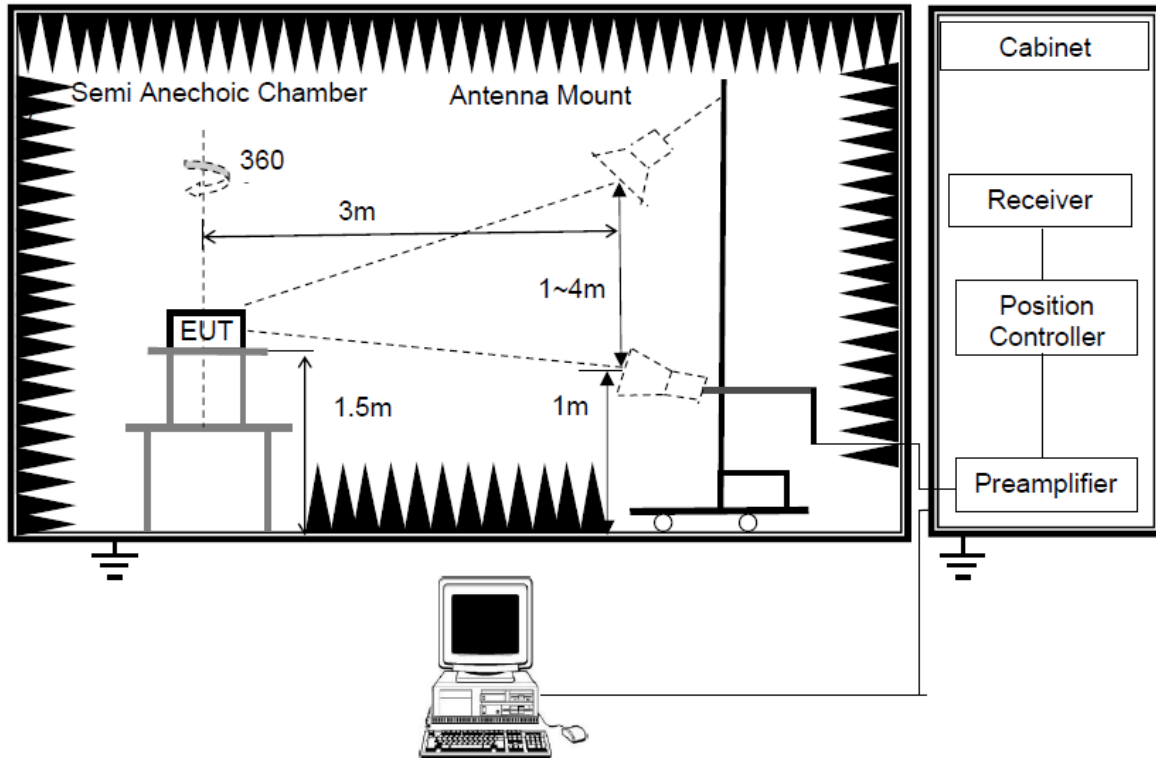


(B) Radiated Emission Test Set-Up, Frequency below 1000MHz Below 1 GHz and above 30 MHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz

Above 1GHz



4.3. Spectrum Analyzer Setting

For 9KHz-150KHz	
Spectrum Parameters	Setting
RBW	200Hz
VBW	600Hz
Start frequency	9KHz
Stop frequency	150KHz
Sweep Time	Auto
Detector	PEAK/QP/AVG
Trace Mode	Max Hold

Note: For 9KHz-90KHz&110KHz-150KHz,the detector is average,other frequency is CISPR QP detector.

For 150KHz-30MHz	
Spectrum Parameters	Setting
RBW	9KHz
VBW	30KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

Note : For 150KHz-490KHz,the detector is average,other frequency is CISPR QP detector.

For 30MHz-1GHz	
Spectrum Parameters	Setting
RBW	120KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	1GHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For Above 1GHz		
Spectrum Parameters	Setting	
RBW	1MHz	
VBW	Peak Measurement: 3MHz	Average Measurement: 10Hz (using Peak detector)
Start frequency	1GHz	
Stop frequency	40GHz	
Sweep Time	Auto	
Detector	Peak	Peak with 10Hz VBW (for Average measurement)
Trace Mode	Max Hold	

4.4. Test Procedure

- Reference: ANSI C63.10, Sections 6.3, 6.6
- Place the EUT on a non-metallic turntable at 0.8 m (below 1 GHz) or 1.5 m (above 1 GHz) height.
- Set the EUT to transmit continuously at maximum power.
- Rotate the turntable 360° and vary antenna height 1–4 m (below 1 GHz) to maximise emissions.
- For above 1 GHz, antenna height is typically 1.5 m, but can be varied if required.
- Measure emissions from 9 kHz up to the 10th harmonic of the fundamental (up to 25 GHz).
- Use Peak and Average detectors (or QP for below 1 GHz) as per section 4.3
- For band edge measurements, focus on 2310–2390 MHz (low) and 2483.5–2500 MHz (high).
- Record the highest emissions for each frequency range.

Note:

- For emissions above 1GHz, if peak level complies with average limit, then the average level is deemed to comply with average limit.
- The frequency 2457MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.
- For 30-1000MHz Radiation emissions, GFSK mode all have been tested, only worse case: GFSK mode with CH00 2457MHz is reported.
- Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9KHz to 30MHz and not recorded in this report.
- The amplitude of 18GHz to 25GHz spurious emissions that are attenuated by more than 20dB below the permissible limit have no need to be reported.
- Radiated emission test from 25GHz to 40GHz of fundamental was verified, and no emission found except system noise floor in 25GHz to 40GHz and not recorded in this report.

4.5. Test Conditions

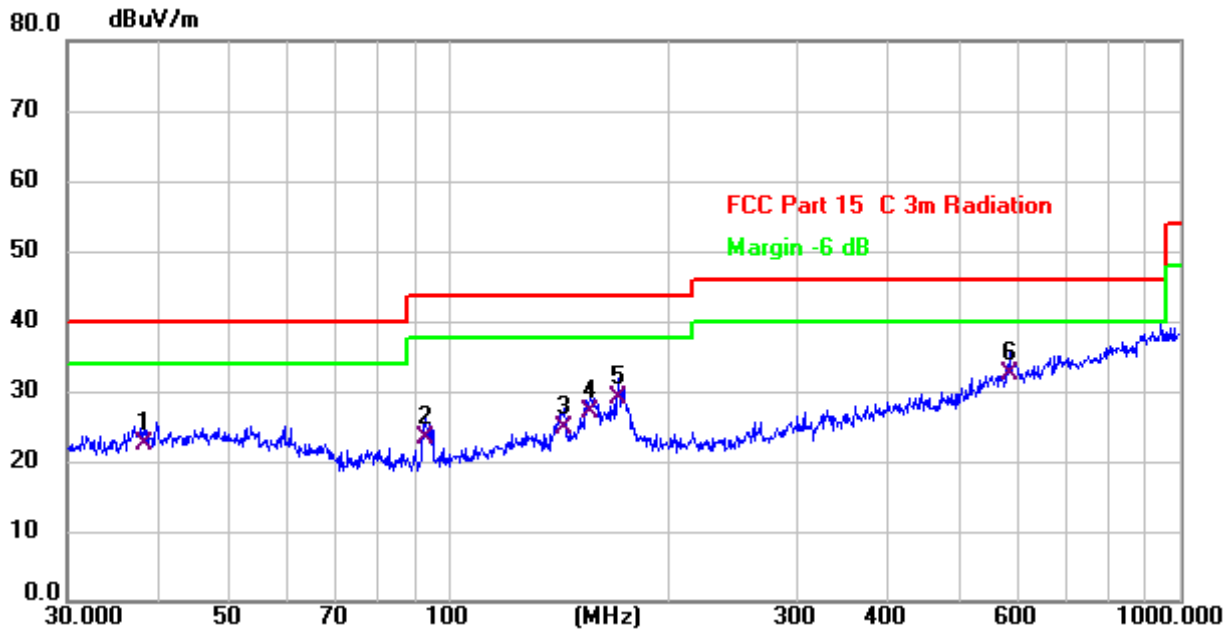
Radiated Emissions 30-1000MHz			
EUT:	Power meter	Main Test Model:	EPM01020304
Test Voltage:	Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz		
Temperature:	24.6°C	Humidity:	43 % RH
Atmosphere Pressure:	100.9kPa		

Radiated Emissions Above 1GHz & Radiated Band Edge			
EUT:	Power meter	Main Test Model:	EPM01020304
Test Voltage:	Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz		
Temperature:	24.6°C	Humidity:	43 % RH
Atmosphere Pressure:	100.9kPa		

4.6. Test Result

Radiated Emissions 30-1000MHz

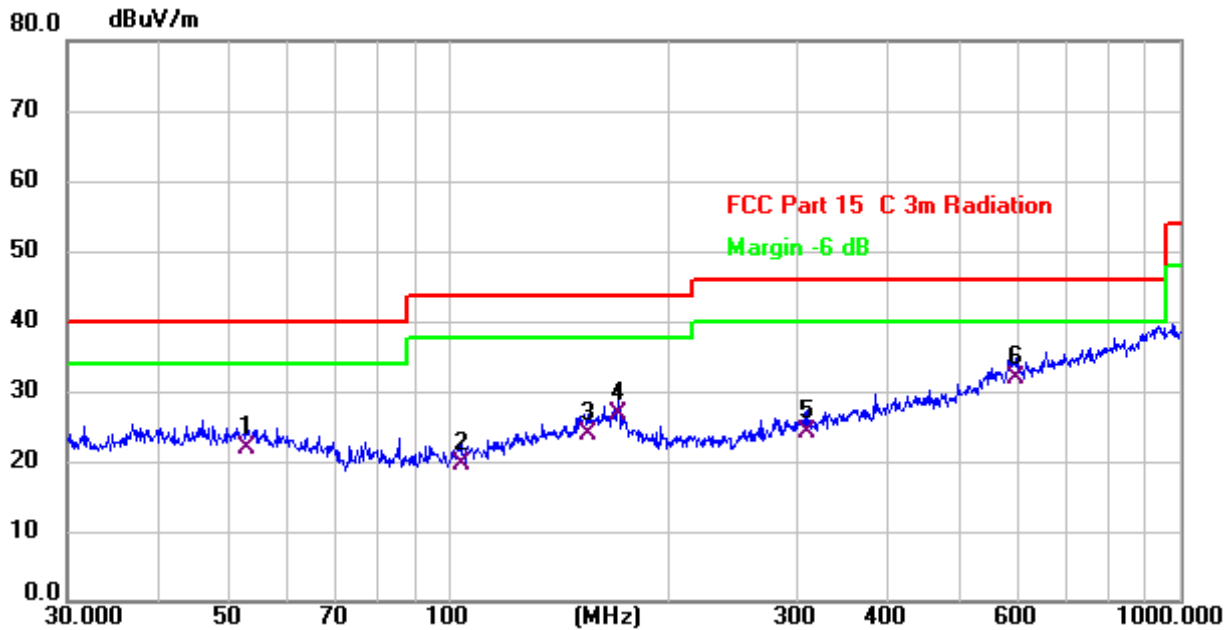
EUT: Power meter
 Main Test Model: EPM01020304
 Test Voltage: Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz
 Ant. Pol.: Vertical
 Test Mode: TX Mode
 Note: only worse case: GFSK mode with CH00 2457MHz is reported
 Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	38.346	2.72	19.84	22.56	40.00	-17.44	QP
2	92.787	7.54	15.83	23.37	43.50	-20.13	QP
3	143.829	4.36	20.28	24.64	43.50	-18.86	QP
4	156.458	6.67	20.32	26.99	43.50	-16.51	QP
5	170.195	9.52	19.44	28.96	43.50	-14.54	QP
6 *	584.789	5.91	26.55	32.46	46.00	-13.54	QP

Remarks: 1). Level (dBuV/m) = Reading (dBuV/m) + Factor (dB/m)
 2). Factor(dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-amplifier Gain (dB) (if applicable)
 3). Margin(dB) = Limit (dBuV/m) - Level (dBuV/m)
 4). No pre-amplifier was used for the 30 MHz – 1 GHz measurement.

EUT: Power meter
 Main Test Model: EPM01020304
 Test Voltage: Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz
 Ant. Pol.: Horizontal
 Test Mode: TX Mode
 Note: only worse case: GFSK mode with CH00 2457MHz is reported
 Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	52.945	2.24	19.70	21.94	40.00	-18.06	QP
2	103.805	2.72	16.94	19.66	43.50	-23.84	QP
3	155.364	3.43	20.31	23.74	43.50	-19.76	QP
4	170.793	7.48	19.20	26.68	43.50	-16.82	QP
5	309.998	3.75	20.53	24.28	46.00	-21.72	QP
6 *	595.133	4.85	26.87	31.72	46.00	-14.28	QP

Remarks: 1). Level (dBuV/m) = Reading (dBuV/m) + Factor (dB/m)
 2). Factor(dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-amplifier Gain (dB) (if applicable)
 3). Margin(dB) = Limit (dBuV/m) - Level (dBuV/m)
 4). No pre-amplifier was used for the 30 MHz – 1 GHz measurement.

Radiated Emissions Above 1GHz -GFSK

GFSK-CH00 2457MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2319.359	40.56	-19.60	74.0	33.44	Peak	180.00	150	Horizontal	Pass
1**	2319.359	31.72	-19.60	54.0	22.28	AV	180.00	150	Horizontal	Pass
2	4776.250	48.64	-10.50	74.0	25.36	Peak	216.00	150	Horizontal	Pass
2**	4776.250	40.50	-10.50	54.0	13.50	AV	216.00	150	Horizontal	Pass
3	4882.000	45.26	-10.72	74.0	28.74	Peak	288.00	150	Horizontal	Pass
3**	4882.000	38.59	-10.72	54.0	15.41	AV	288.00	150	Horizontal	Pass
4	7323.000	49.47	-6.78	74.0	24.53	Peak	216.00	150	Horizontal	Pass
4**	7323.000	42.47	-6.78	54.0	11.53	AV	216.00	150	Horizontal	Pass
5	7829.250	53.54	-6.12	74.0	20.46	Peak	360.00	150	Horizontal	Pass
5**	7829.250	43.22	-6.12	54.0	10.78	AV	360.00	150	Horizontal	Pass
6	17487.000	52.98	1.20	74.0	21.02	Peak	36.00	150	Horizontal	Pass
6**	17487.000	43.68	1.20	54.0	10.32	AV	36.00	150	Horizontal	Pass

GFSK-CH00 2457MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2389.594	40.43	-19.27	74.0	33.57	Peak	216.00	150	Vertical	Pass
1**	2389.594	31.24	-19.27	54.0	22.76	AV	216.00	150	Vertical	Pass
2	4765.750	49.48	-10.55	74.0	24.52	Peak	324.00	150	Vertical	Pass
2**	4765.750	39.41	-10.55	54.0	14.59	AV	324.00	150	Vertical	Pass
3	4882.000	45.47	-10.72	74.0	28.53	Peak	144.00	150	Vertical	Pass
3**	4882.000	39.22	-10.72	54.0	14.78	AV	144.00	150	Vertical	Pass
4	7323.000	48.04	-6.78	74.0	25.96	Peak	288.00	150	Vertical	Pass
4**	7323.000	41.92	-6.78	54.0	12.08	AV	288.00	150	Vertical	Pass
5	7881.250	52.14	-6.02	74.0	21.86	Peak	180.00	150	Vertical	Pass
5**	7881.250	42.95	-6.02	54.0	11.05	AV	180.00	150	Vertical	Pass
6	17944.001	53.09	1.36	74.0	20.91	Peak	360.00	150	Vertical	Pass
6**	17944.001	44.33	1.36	54.0	9.67	AV	360.00	150	Vertical	Pass

Note:

1. Results (dBuV/m) =Raw Value (dBuV) + Factor (dB/m)
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Pre-amplifier
3. Margin value = Limit - Results.

Radiated Band Edge - GFSK

GFSK-CH00 2457MHz-Low Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2314.725	41.74	-19.41	74.0	32.26	Peak	218.10	150	Vertical	Pass
1**	2314.725	30.24	-19.41	54.0	23.76	AV	218.10	150	Vertical	Pass
2	2389.950	39.32	-19.56	74.0	34.68	Peak	245.00	150	Vertical	Pass
2**	2389.950	29.66	-19.56	54.0	24.34	AV	245.00	150	Vertical	Pass
3	2399.925	39.71	-19.64	74.0	34.29	Peak	298.50	150	Vertical	Pass
3**	2399.925	29.61	-19.64	54.0	24.39	AV	298.50	150	Vertical	Pass

GFSK-CH00 2457MHz-Low Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2356.500	41.54	-19.69	74.0	32.46	Peak	0.80	150	Horizontal	Pass
1**	2356.500	30.16	-19.69	54.0	23.84	AV	0.80	150	Horizontal	Pass
2	2389.950	39.49	-19.56	74.0	34.51	Peak	123.40	150	Horizontal	Pass
2**	2389.950	29.86	-19.56	54.0	24.14	AV	123.40	150	Horizontal	Pass
3	2399.925	39.34	-19.64	74.0	34.66	Peak	318.80	150	Horizontal	Pass
3**	2399.925	29.55	-19.64	54.0	24.45	AV	318.80	150	Horizontal	Pass

GFSK-CH00 2457MHz-High Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.475	42.07	-19.50	74.0	31.93	Peak	269.30	150	Horizontal	Pass
1**	2483.475	33.77	-19.50	54.0	20.23	AV	269.30	150	Horizontal	Pass
2	2489.350	42.44	-19.51	74.0	31.56	Peak	0.00	150	Horizontal	Pass
2**	2489.350	30.70	-19.51	54.0	23.30	AV	0.00	150	Horizontal	Pass
3	2496.650	42.94	-19.48	74.0	31.06	Peak	36.30	150	Horizontal	Pass
3**	2496.650	30.57	-19.48	54.0	23.43	AV	36.30	150	Horizontal	Pass

GFSK-CH00 2457MHz-High Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.475	40.68	-19.50	74.0	33.32	Peak	64.20	150	Vertical	Pass
1**	2483.475	31.46	-19.50	54.0	22.54	AV	64.20	150	Vertical	Pass
2	2486.475	41.61	-19.50	74.0	32.39	Peak	174.00	150	Vertical	Pass
2**	2486.475	30.62	-19.50	54.0	23.38	AV	174.00	150	Vertical	Pass
3	2497.225	41.78	-19.48	74.0	32.22	Peak	2.20	150	Vertical	Pass
3**	2497.225	30.55	-19.48	54.0	23.45	AV	2.20	150	Vertical	Pass

Note:

- Results (dBuV/m) = Raw Value (dBuV) + Factor (dB/m)
- Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Pre-amplifier
- Margin value = Limit - Results.

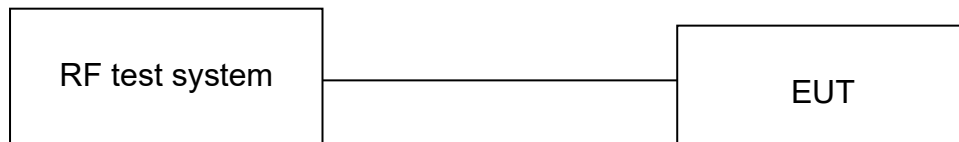
5. 20DB BANDWIDTH

5.1. Limit

According to FCC §15.215(c), for devices operating under the provisions of this section, the 20 dB bandwidth of the emission shall be contained within the frequency band designated in the rule section under which the equipment is operated. No specific minimum bandwidth is required.

If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band (i.e., 2400-2483.5 MHz) in order to minimize the possibility of out-of-band operation.

5.2. Test Setup



5.3. Spectrum Analyzer Setting

20dB Bandwidth	
Spectrum Parameters	Setting
RBW	30KHz
VBW	100KHz
Span	3MHz (or sufficient to display the emission)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

5.4. Test Procedure

- The test according to ANSI C63.10 clause Section 6.9.
- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 5.3.
- Set the EUT to transmit continuously at maximum power on the selected channel.
- Allow the trace to stabilize, use the “ndB down” function (set to 20 dB) to measure the 20 dB bandwidth.
- Repeat above procedures until all channels and test modes were measured.
- Record the results in the test report.

5.5. Test Conditions

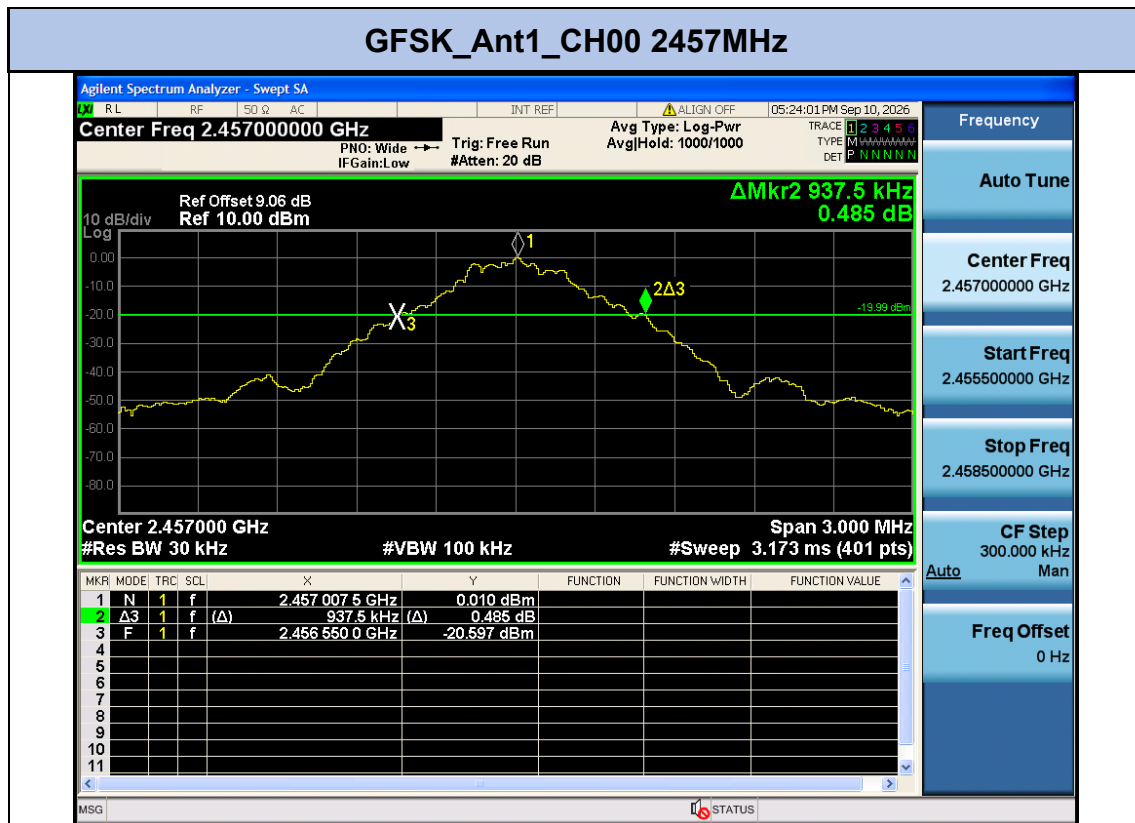
EUT:	Power meter	Main Test Model:	EPM01020304
Test Voltage:	DC 3.7V from Rechargeable Li-ion battery		
Temperature:	23.1°C	Humidity:	53 % RH
Atmosphere Pressure:	100.9kPa		

5.6. Test Result

Test Mode	Antenna	Channel & Frequency	20dB Bandwidth	Result
		MHz	MHz	
GFSK	Ant1	CH00 2457	0.938	PASS

Note: The measured bandwidth is fully contained within the 2400-2483.5 MHz band.

5.7. Original Test record



6. AC POWER LINE CONDUCTED EMISSIONS

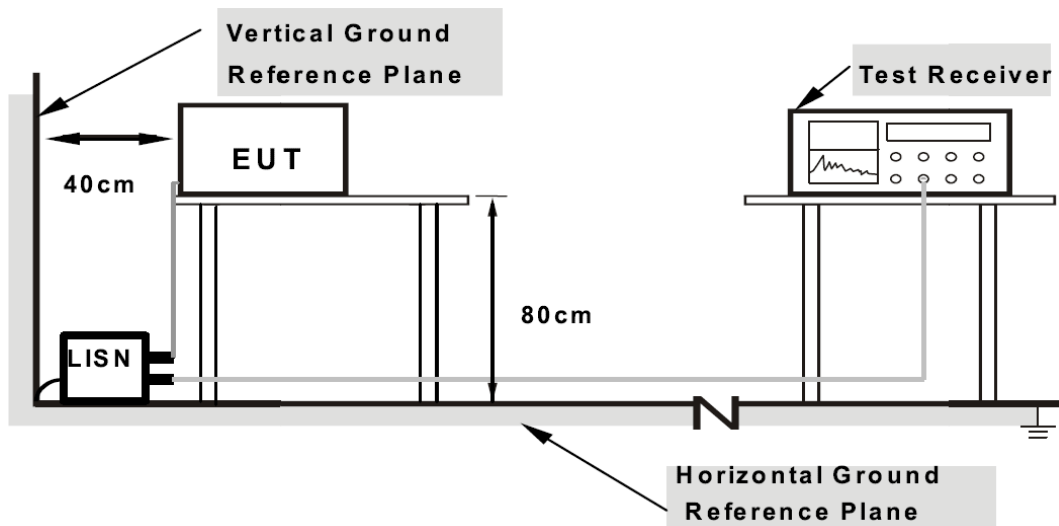
6.1. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note:

1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.2. Test Setup



6.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	9KHz
VBW	30KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP/AVG
Trace Mode	Max Hold

6.4. Test Procedure

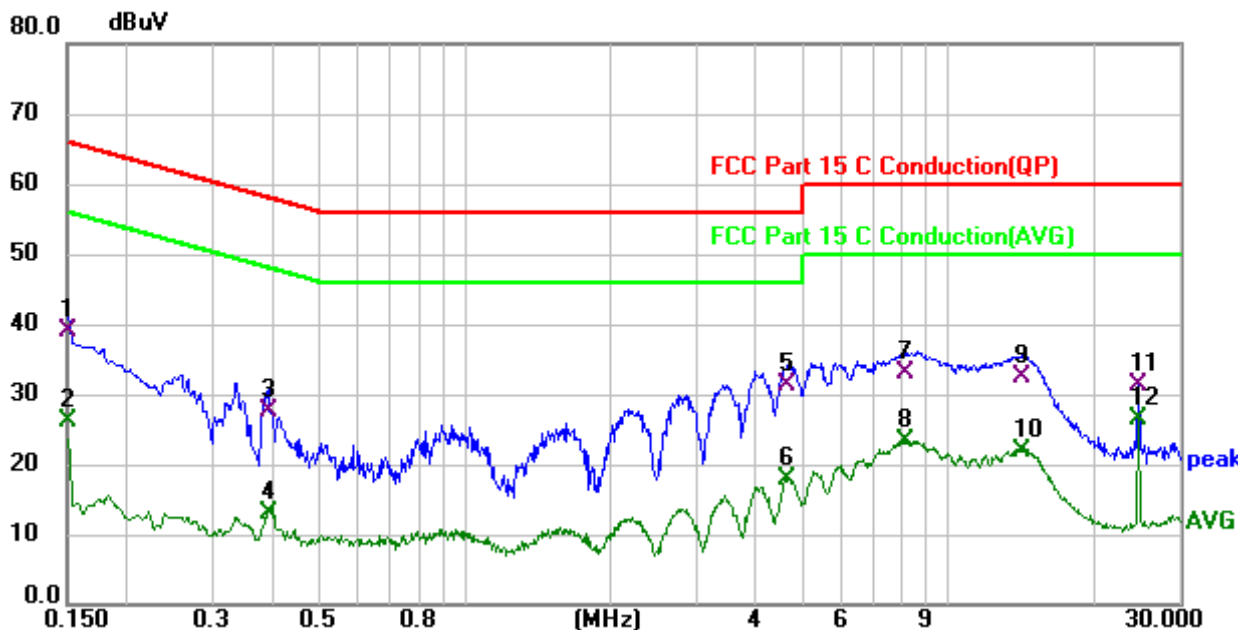
- Reference: ANSI C63.10, Section 6.2.
- The EUT was placed on a non-metallic table, 80cm above the ground plane.
- The EUT Power connected to the power mains through a line impedance stabilization network.
- Provides a 50ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
- Set the EUT transmit continuously with maximum output power.
- Spectrum analyzer setting parameters in accordance with section 6.3.
- The AC line is checked to find out the maximum conducted emission. To find the maximum emission levels, the relative positions of equipment and all the interface cables shall be changed according to ANSI C63.10 on Conducted Emission Test.

6.5. Test Conditions

AC POWER LINE CONDUCTED EMISSIONS			
EUT:	Power meter	Main Test Model:	EPM01020304
Test Voltage:	Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz		
Temperature:	24.6°C	Humidity:	47 % RH
Atmosphere Pressure:	100.9kPa		

6.6. Test Result

EUT: Power meter
 Main Test Model: EPM01020304
 Test Voltage: Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz
 Phase: Live
 Test Mode: TX Mode
 Note: only worse case: GFSK mode with CH00 2457MHz is reported
 Detailed results are shown below



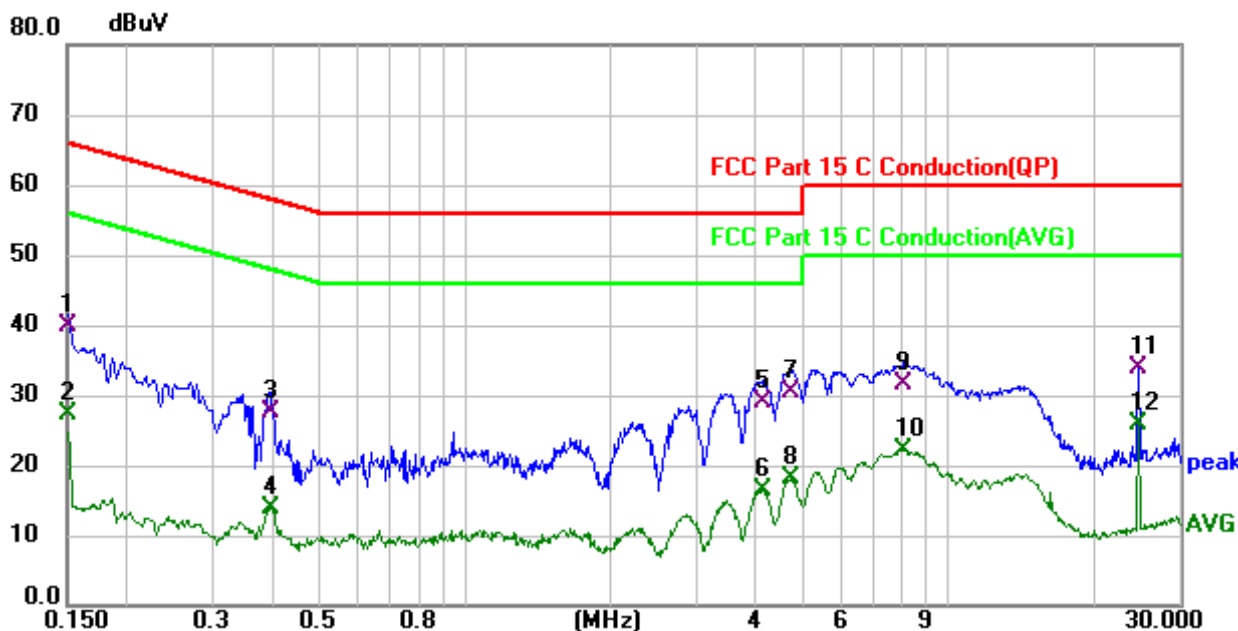
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.150	18.21	20.72	38.93	66.00	-27.07	QP	P
2	0.150	5.38	20.72	26.10	56.00	-29.90	AVG	P
3	0.390	6.96	20.73	27.69	58.07	-30.38	QP	P
4	0.390	-7.63	20.73	13.10	48.07	-34.97	AVG	P
5	4.654	10.13	21.08	31.21	56.00	-24.79	QP	P
6	4.654	-3.22	21.08	17.86	46.00	-28.14	AVG	P
7	8.146	11.49	21.48	32.97	60.00	-27.03	QP	P
8	8.146	1.75	21.48	23.23	50.00	-26.77	AVG	P
9	14.178	9.59	22.92	32.51	60.00	-27.49	QP	P
10	14.178	-1.08	22.92	21.84	50.00	-28.16	AVG	P
11	24.702	7.04	24.24	31.28	60.00	-28.72	QP	P
12 *	24.702	2.16	24.24	26.40	50.00	-23.60	AVG	P

Remark: The test Result=Reading+ Lisn+ Cab L.

If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EUT: Power meter
 Main Test Model: EPM01020304
 Test Voltage: Charging Input: DC 5V via AC/DC ADAPTER, AC/DC ADAPTER Input: AC 120V/60Hz
 Phase: Neutral
 Test Mode: TX Mode
 Note: only worse case: GFSK mode with CH00 2457MHz is reported

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.150	19.23	20.55	39.78	66.00	-26.22	QP	P
2	0.150	6.82	20.55	27.37	56.00	-28.63	AVG	P
3	0.394	6.93	20.57	27.50	57.98	-30.48	QP	P
4	0.394	-6.72	20.57	13.85	47.98	-34.13	AVG	P
5	4.130	8.15	20.92	29.07	56.00	-26.93	QP	P
6	4.130	-4.56	20.92	16.36	46.00	-29.64	AVG	P
7	4.698	9.57	20.99	30.56	56.00	-25.44	QP	P
8	4.698	-2.92	20.99	18.07	46.00	-27.93	AVG	P
9	8.082	10.20	21.40	31.60	60.00	-28.40	QP	P
10	8.082	0.86	21.40	22.26	50.00	-27.74	AVG	P
11	24.706	9.48	24.28	33.76	60.00	-26.24	QP	P
12 *	24.706	1.64	24.28	25.92	50.00	-24.08	AVG	P

Remark: The test Result=Reading+ Lisn+ Cab L.

If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

7. ANTENNA REQUIREMENTS

7.1. Limit

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

7.2. Test Result

The antennas used for this product is SMD Antenna (Internal antenna), so compliance with antenna requirements. (Please refer to the **Annex B. EUT Internal Photos** for details)



8. APPENDIX

"EUT of External Photos, EUT Internal Photos & Test Setup Photos" Please refer to the Annex A, Annex B& Annex C document.

CTSL2620930241E Annex A. EUT External Photos

CTSL2620930241E Annex B. EUT Internal Photos

CTSL2620930241E Annex C. Test Setup Photos

-----*End of Test Report*-----

