



FCC 47 CFR PART 15 SUBPART C
CERTIFICATION TEST REPORT

For

Self balancing scooter
MODEL NUMBER: K5

FCC ID: 2AJ4RJOMOK5

REPORT NUMBER: 4787639344.1-2

ISSUE DATE: November 15, 2016

Prepared for

Dongguan Jomo Electronics Co., Ltd.
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Prepared by

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	11/15/2016	Initial Issue	

Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6db DTS Bandwidth	FCC 15.247 (a) (2)	Complied
2	Peak Conducted Power	FCC 15.247 (b) (3)	Complied
3	Power Spectral Density	FCC 15.247 (e)	Complied
4	Conducted Band edge And Spurious emission	FCC 15.247 (d)	Complied
5	Radiated Band edges and Spurious emission	FCC 15.247 (d) FCC 15.209 FCC 15.205	Complied
6	Conducted Emission Test For AC Power Port	FCC 15.207	Complied
7	Antenna Requirement	FCC 15.203	Complied

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Dongguan Jomo Electronics Co., Ltd.
Address: Block 1, No.1 ChiTian East Road, BaiShigang Village,
ChangPing Town, Dongguan, GuangDong

Manufacturer Information

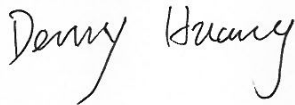
Company Name: Dongguan Jomo Electronics Co., Ltd.
Address: Block 1, No.1 ChiTian East Road, BaiShigang Village,
ChangPing Town, Dongguan, GuangDong

EUT Description

Product Name Self balancing scooter
Brand Name N/A
Model Name K5
FCC ID 2AJ4RJOMOK5
Date Tested October 31, 2016 ~ November 01, 2016

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	PASS

Tested By:



Denny Huang
Engineer Project Associate

Check By:



Shawn Wen
Laboratory Leader

Approved By:



Stephen Guo
Laboratory Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

Test Location	Dongguan Dongdian Testing Service Co., Ltd
Address	No. 17, Zongbu Road 2, Songshan Lake Sci&Tech Park, Dongguan City, Guangdong Province, 523808, China
Accreditation Certificate	<p>Dongguan Dongdian Testing Service Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until January 31, 2018.</p> <p>Dongguan Dongdian Testing Service Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 270092, Renewal date March 11, 2015, valid time is until March 11, 2018.</p> <p>The 3m Alternate Test Site of Dongguan Dongdian Testing Service Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 10288A on April 23, 2015, valid time is until April 23, 2018.</p>

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	3.32dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	4.10dB(1-6GHz)
	4.40dB (6GHz-18Gz)
	3.54dB (18GHz-26Gz)
Bandwidth	1.1%
Stop Transmitting Time Test	0.6%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment	Self balancing scooter		
Model Name	K5		
Product Description	Operation Frequency	2402 MHz ~ 2480 MHz	
	Modulation Type	Data Rate	
	GFSK	1Mbps	
Battery	36V, 4300mAh		
Bluetooth Version	BT 4.0		
Adapter	Input: AC 100~240V, 50/60Hz, 1.7A Output: DC 42V, 2000mA		

5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Number of Transmit Chains (NTX)	Bluetooth Mode	Frequency (MHz)	Channel Number	Max PK Conducted Power (dBm)
2400-2483.5	1	BLE	2402-2480	0-39[40]	-0.32

5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	11	2424	22	2446	33	2468
01	2404	12	2426	23	2448	34	2470
02	2406	13	2428	24	2450	35	2472
03	2408	14	2430	25	2452	36	2474
04	2410	15	2432	26	2454	37	2476
05	2412	16	2434	27	2456	38	2478
06	2414	17	2436	28	2458	39	2480
07	2416	18	2438	29	2460		
08	2418	19	2440	30	2462		
09	2420	20	2442	31	2464		
10	2422	21	2444	32	2466		

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
GFSK	CH 00, CH 19, CH 39	2402MHz, 2440MHz, 2480MHz

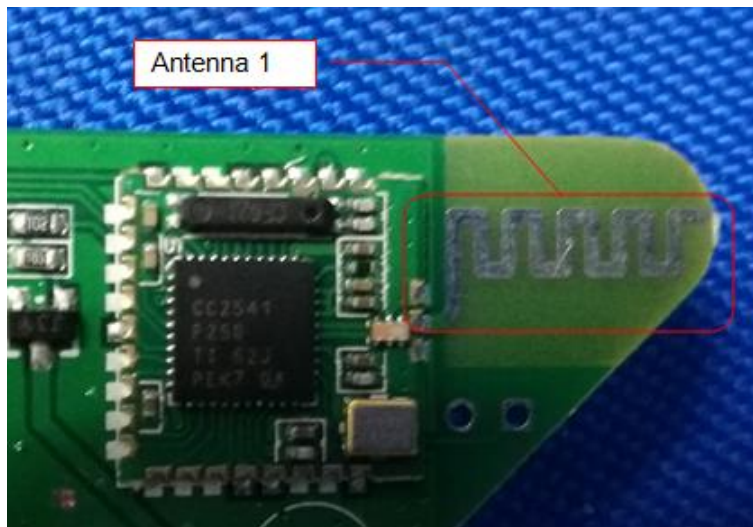
5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
Test Software Version		Setup_SmartRF_Studio_7-2.2.1		
Modulation Type	Transmit Antenna Number	Test Channel		
		CH 00	CH 19	CH 39
GFSK	1	N/A	N/A	N/A

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2402-2480	PCB Antenna	3.0

Test Mode	Transmit and Receive Mode	Description
GFSK	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.



5.7. WORST-CASE CONFIGURATIONS

Bluetooth Mode	Modulation Technology	Modulation Type	Data Rate (Mbps)
BLE	DTS	GFSK	1Mbit/s

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	Latitude D610	N/A

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	DC In	DC	Unshielded	1.0	DC 42V, 2000mA

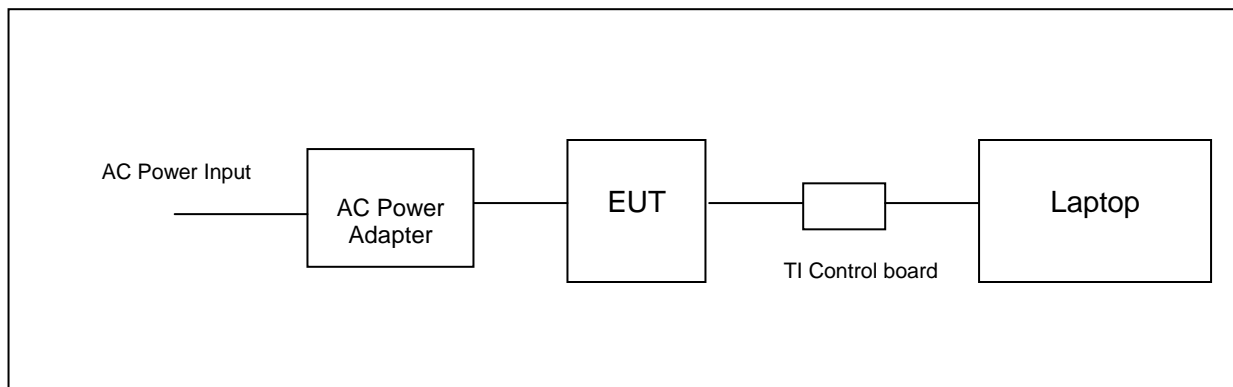
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Power Adapter	N/A	AOI-08420200DD1	Input: AC 100~240V, 50/60Hz, 1.7A Output: DC 42V, 2000mA

TEST SETUP

The EUT can work in an engineer mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



5.9. MEASURING INSTRUMENT AND SOFTWARE USED

Instrument (Conducted for RF Port)						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Spectrum Analyzer	R&S	FSU26	1166.1660.26	2016/10/16	1 Year
Instrument (Radiated Tests)						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Expired date
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESU8	100316	2016/10/16	1 Year
<input checked="" type="checkbox"/>	Spectrum analyzer	R&S	FSU26	1166.1660.26	2016/10/16	1 Year
<input checked="" type="checkbox"/>	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2016/10/27	1 Year
<input checked="" type="checkbox"/>	Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	2016/10/27	1 Year
<input checked="" type="checkbox"/>	Double Ridged Horn Antenna	R&S	HF907	100276	2016/10/12	1 Year
<input checked="" type="checkbox"/>	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	697	2016/01/06	1 Year
<input checked="" type="checkbox"/>	Pre-amplifier	A.H.	PAM-0118	360	2016/12/20	1 Year
<input checked="" type="checkbox"/>	Pre-amplifier	TDK	PA-02-2	TRS-307-0002	2016/12/20	1 Year
<input checked="" type="checkbox"/>	RF Cable	HUBSER	CP-X2	W11.03	2016/10/16	1 Year
<input checked="" type="checkbox"/>	RF Cable	HUBSER	CP-X1	W12.02	2016/10/16	1 Year
<input checked="" type="checkbox"/>	MI Cable	HUBSER	C10-01-01-1M	1091629	2016/10/16	1 Year
<input checked="" type="checkbox"/>	Test software	Audix	E3	V 6.11111b	N/A	N/A
Instrument (Line Conducted Emission (AC Main))						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Expired date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESU8	100316	2016/10/16	1 Year
<input checked="" type="checkbox"/>	LISN 1	R&S	ENV216	101109	2016/10/16	1 Year
<input checked="" type="checkbox"/>	LISN 2	R&S	ESH2-Z5	100309	2016/10/16	1 Year
<input checked="" type="checkbox"/>	Pulse Limiter	R&S	ESH3-Z2	101242	2016/10/16	1 Year
<input checked="" type="checkbox"/>	CE Cable 1	HUBSER	ESU8/RF2	W10.01	2016/10/16	1 Year
<input checked="" type="checkbox"/>	Test software	Audix	E3	V 6.11111b	N/A	N/A

6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6 dB Bandwidth	KDB 558074 D01 v03r05	8.1
2	Peak Output Power	KDB 558074 D01 v03r05	9.1.1
3	Power Spectral Density	KDB 558074 D01 v03r05	10.2
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 v03r05	11.0
5	Out-of-band emissions in restricted bands	KDB 558074 D01 v03r05	12.1
6	Band-edge	KDB 558074 D01 v03r05	13.3.2
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	7.3

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (KHz)
BLE	1.00	1.00	1.00	100.00	0.00	0.01

7.2. 6 dB DTS BANDWIDTH & 99% DTS BANDWIDTH

LIMITS

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2)	Bandwidth	>= 500KHz	2400-2483.5

TEST PROCEDURE

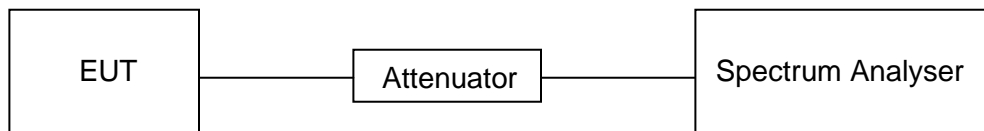
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100K
VBW	$\geq 3 \times \text{RBW}$
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Use the 99% bandwidth function in the spectrum analyser and allow the trace to stabilize, then recorded the measurement data.

TEST SETUP

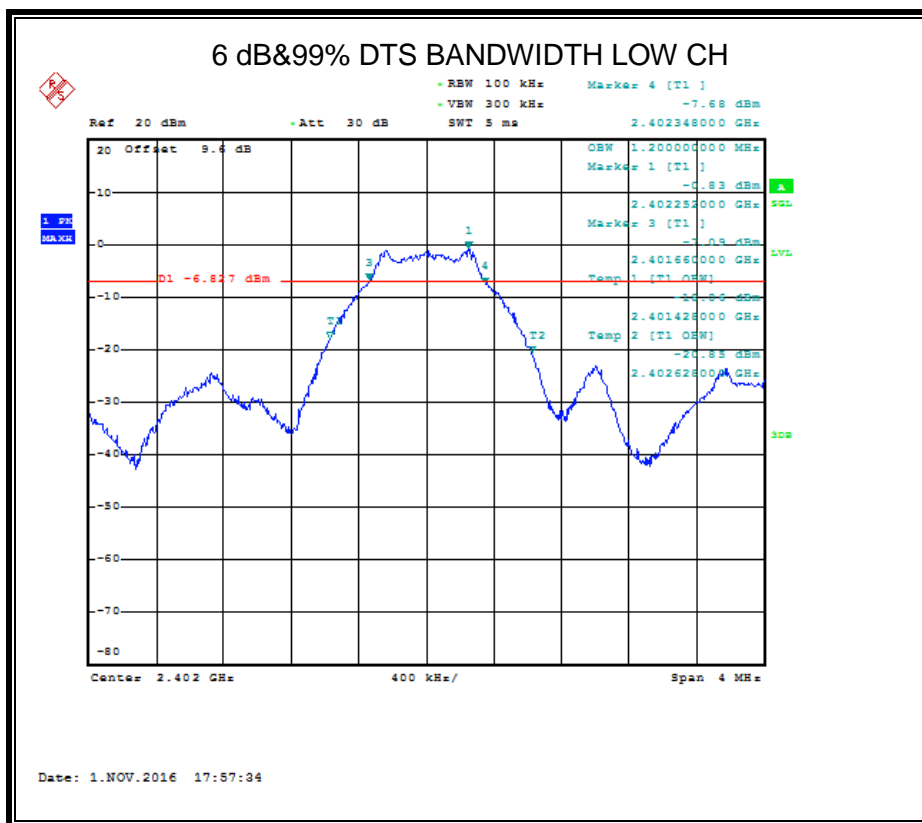


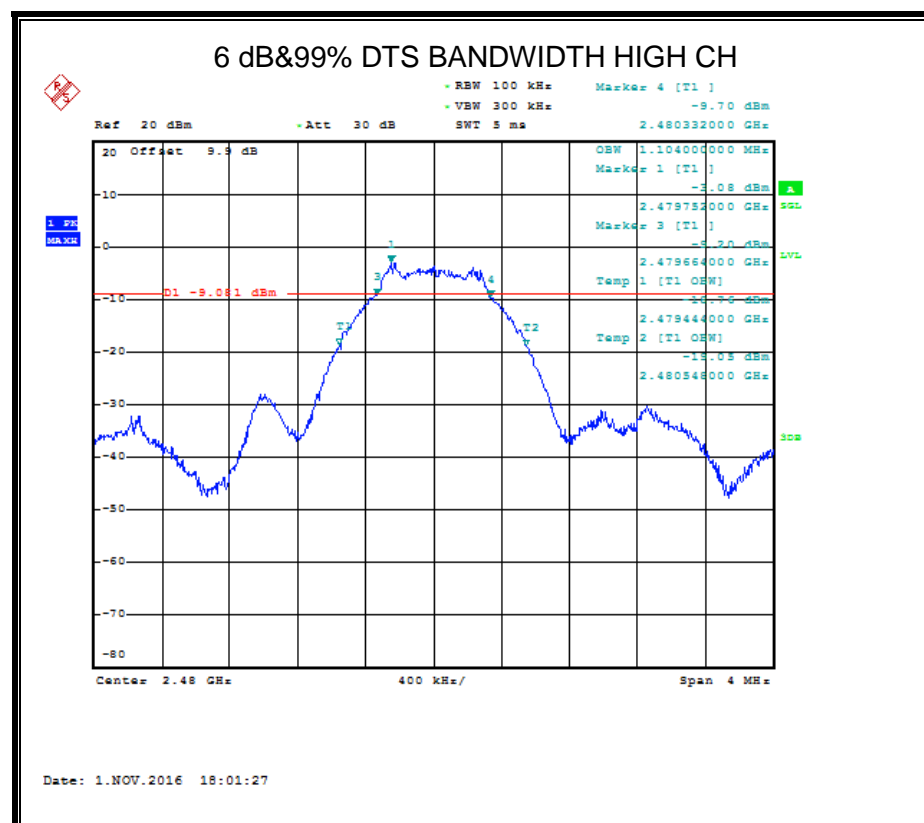
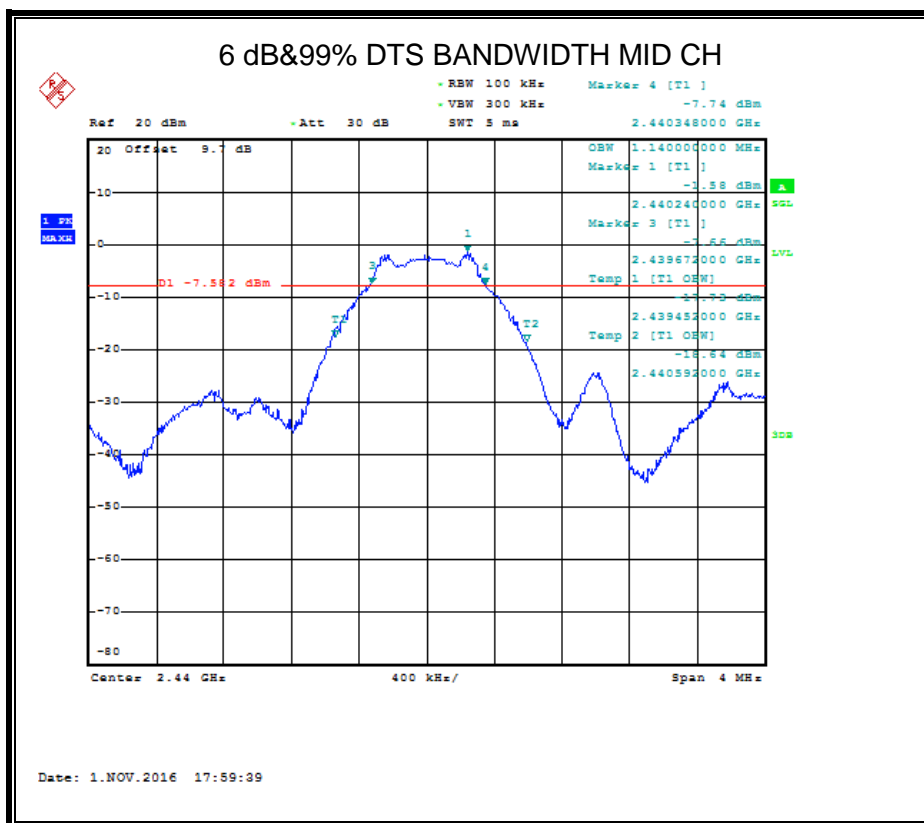
TEST CONDITIONS

Temperature: 24.0°C
 Relative Humidity: 58%
 Test Voltage: AC 120V/60Hz

RESULTS

Channel	Frequency (MHz)	6dB bandwidth (kHz)	99% Bandwidth (MHz)	Limit (kHz)	Result
Low	2402	0.688	1.200	500	Pass
Middle	2440	0.676	1.140	500	Pass
High	2480	0.668	1.104	500	Pass





7.3. PEAK CONDUCTED OUTPUT POWER

LIMITS

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5

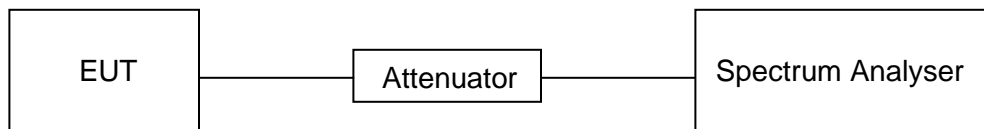
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	\geq DTS bandwidth(e.g. 1 MHz for BLE)
VBW	$\geq 3 \times$ RBW
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use peak marker function to determine the peak amplitude level.

TEST SETUP

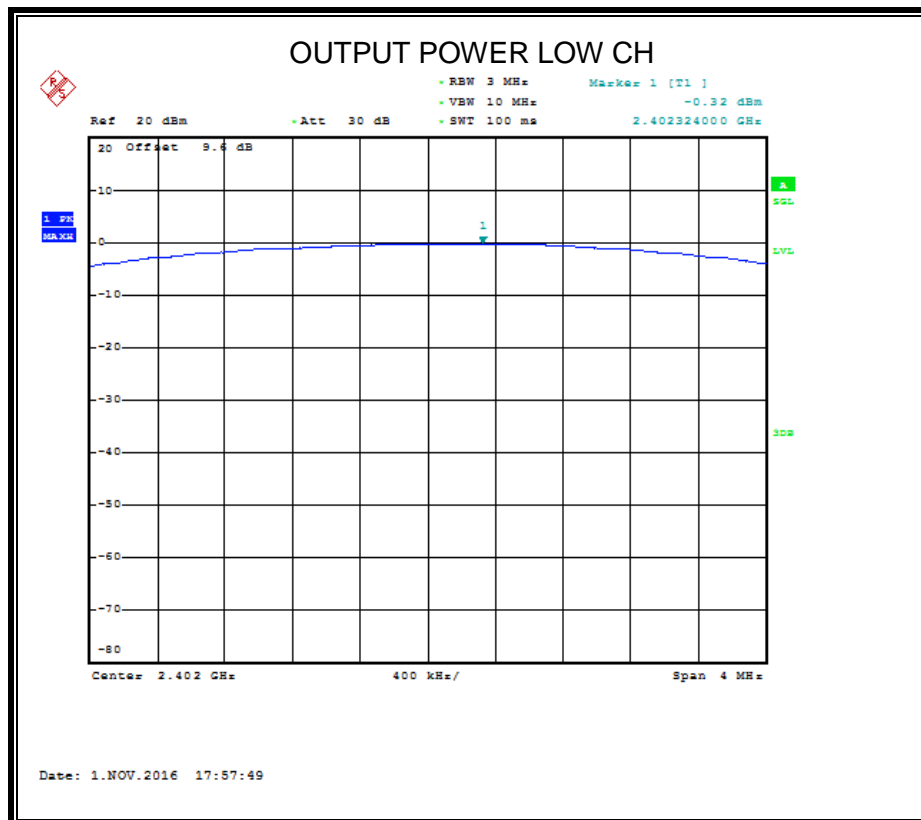


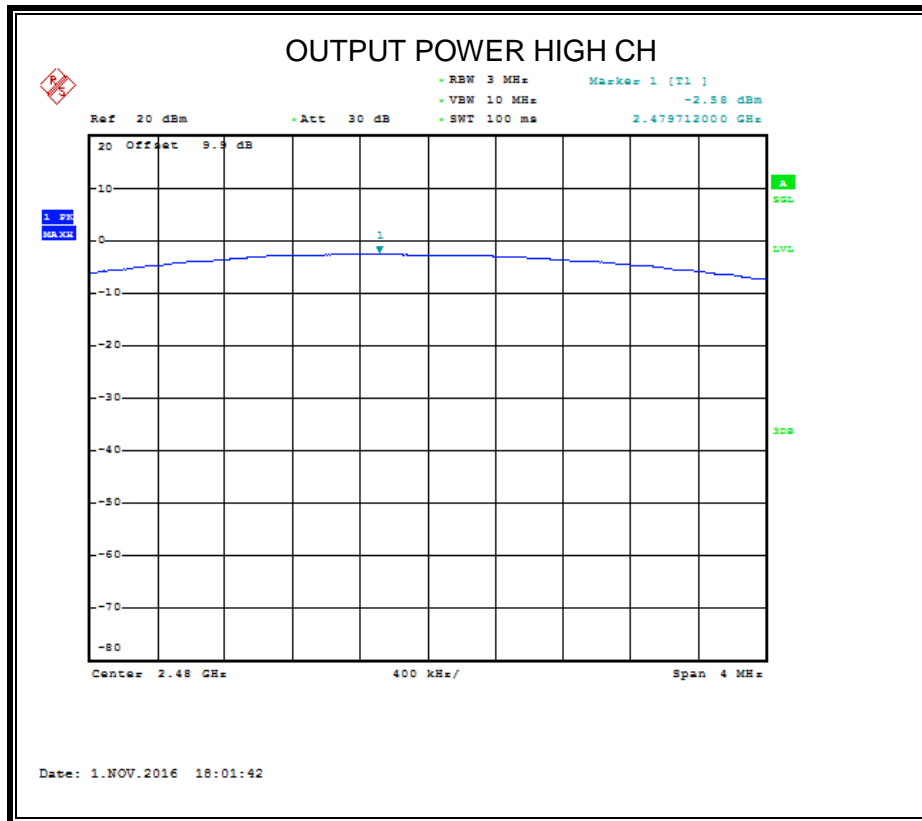
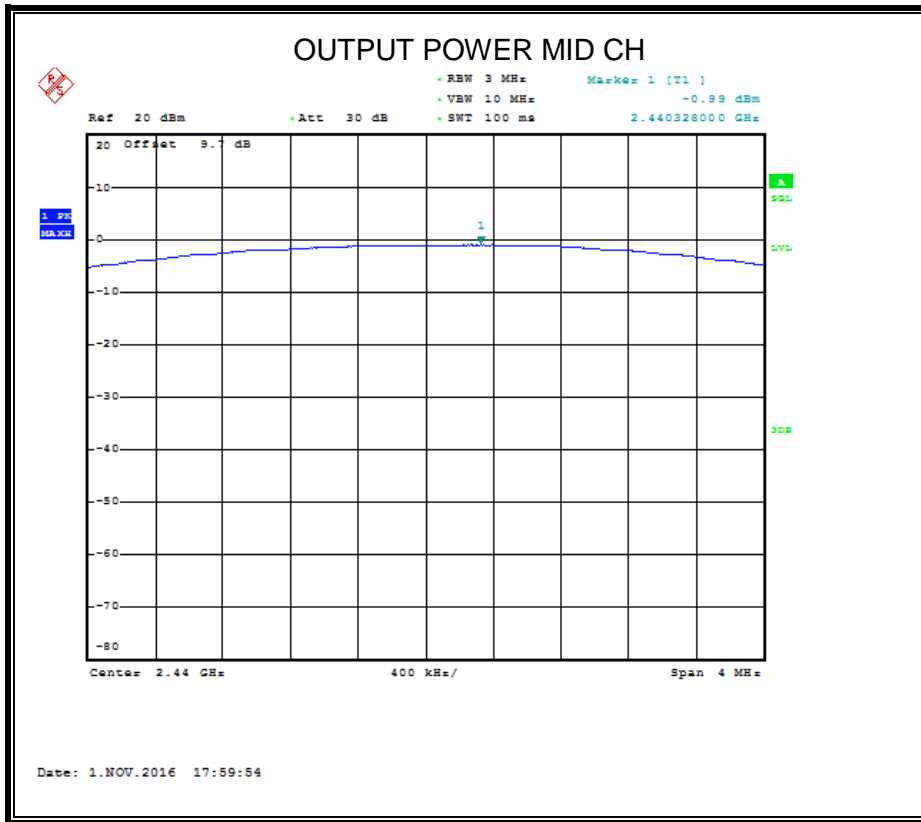
TEST CONDITIONS

Temperature: 24.0°C
 Relative Humidity: 58%
 Test Voltage: AC 120V/60Hz

RESULTS

Test Channel	Frequency	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	dBm
CH00	2402	-0.320	30
CH19	2440	-0.990	30
CH39	2480	-2.580	30





7.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

TEST PROCEDURE

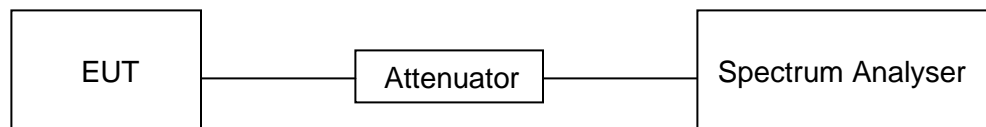
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP

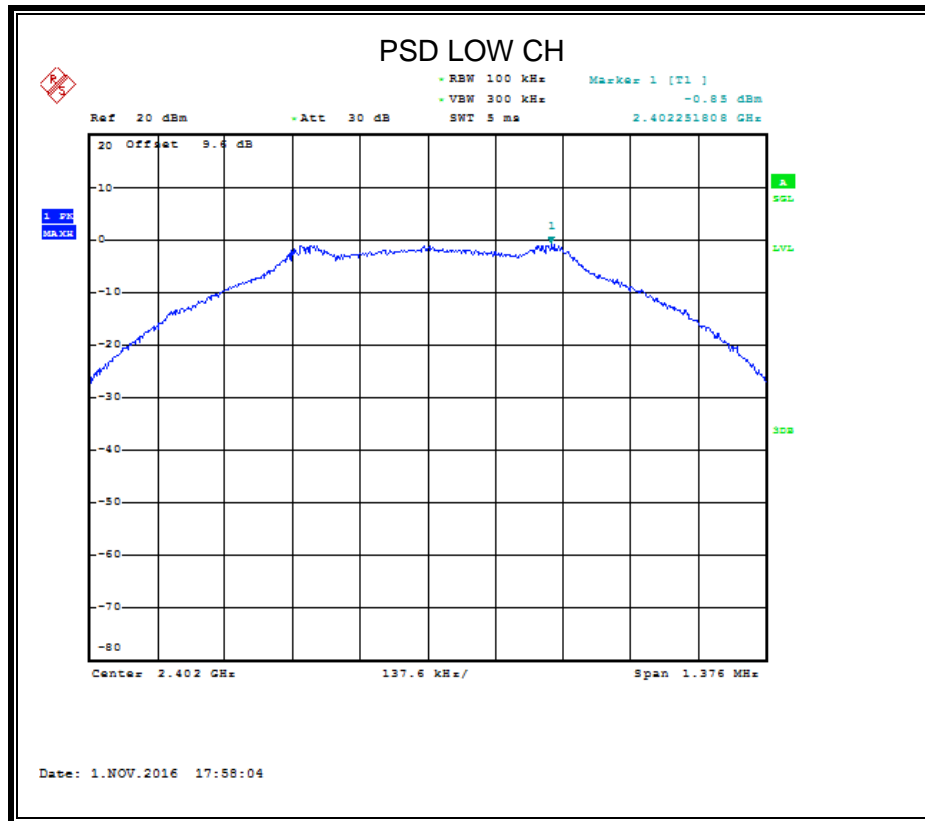


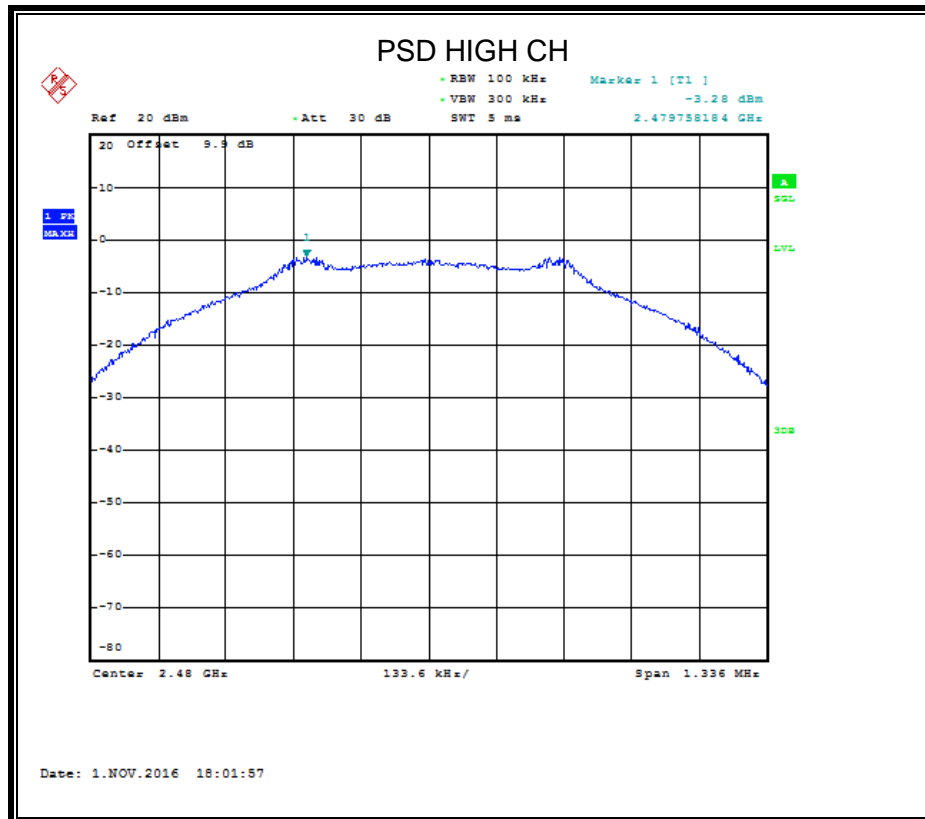
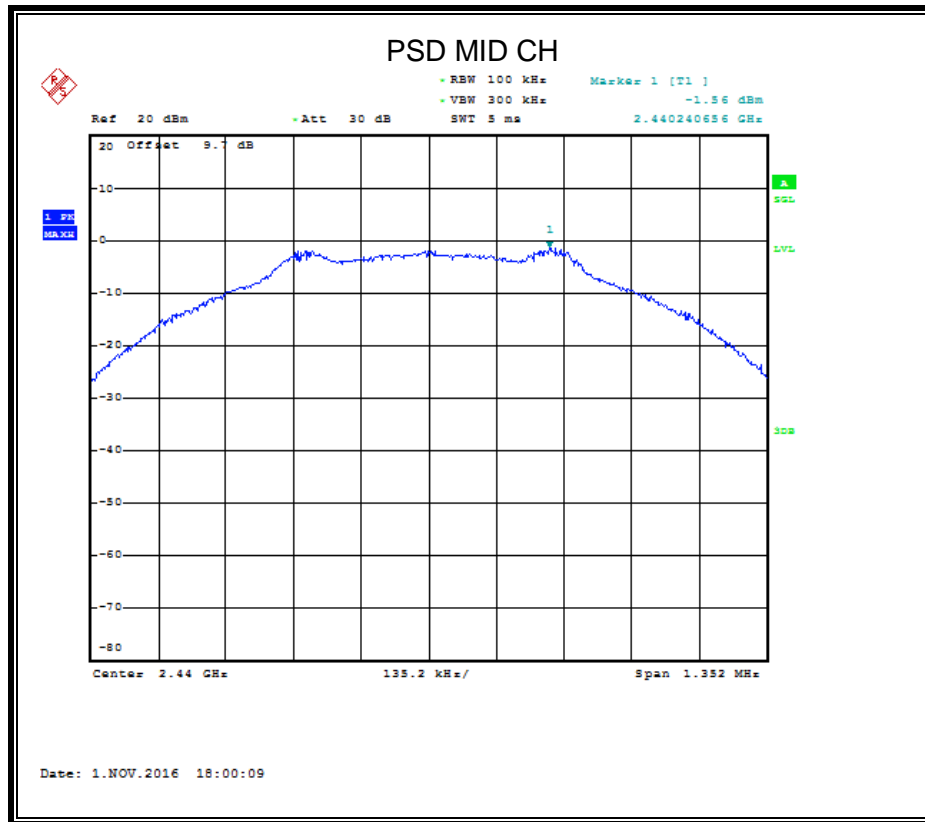
TEST CONDITIONS

Temperature: 24.0°C
 Relative Humidity: 58%
 Test Voltage: AC 120V/60Hz

RESULTS

Frequency	Power Spectral Density (dBm)	Limit (dBm)	Result
2402 MHz	-0.850	8	PASS
2440 MHz	-1.560	8	PASS
2480 MHz	-3.280	8	PASS





7.5. CONDUCTED BANDEGE AND SPURIOUS EMISSIONS

LIMITS

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Limit
FCC §15.247 (d)	Conducted Bandedge	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

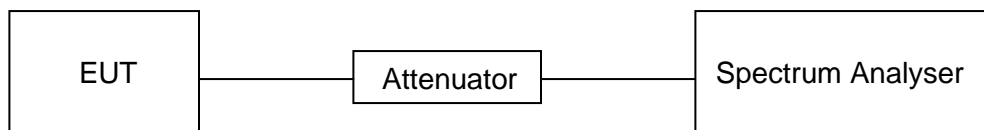
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level.

TEST SETUP

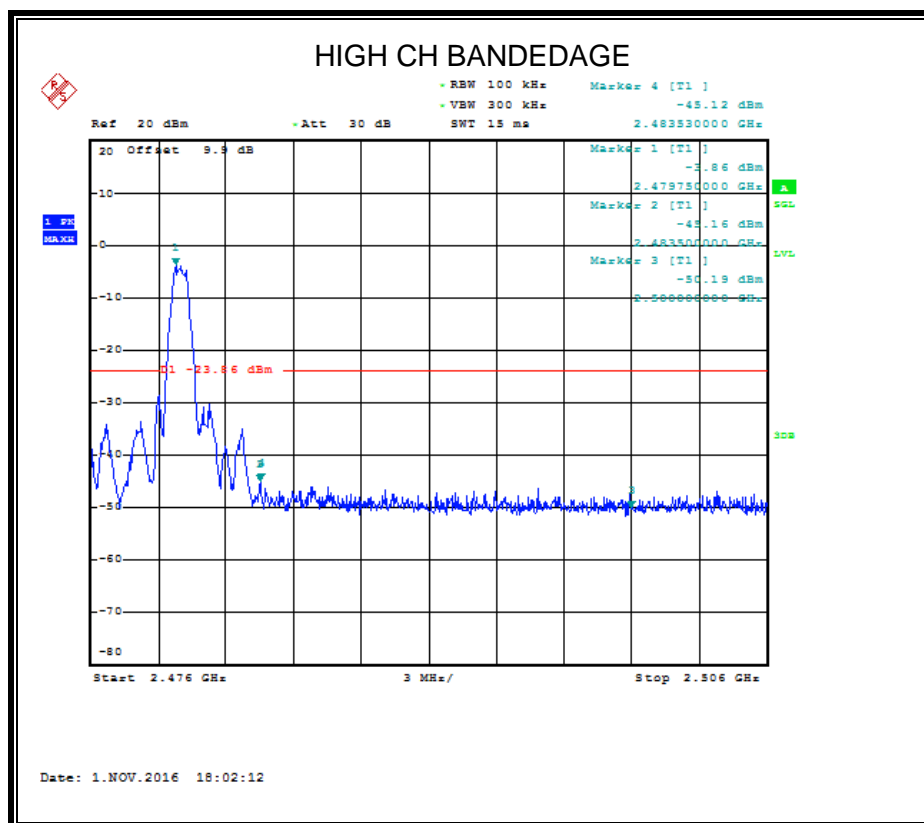
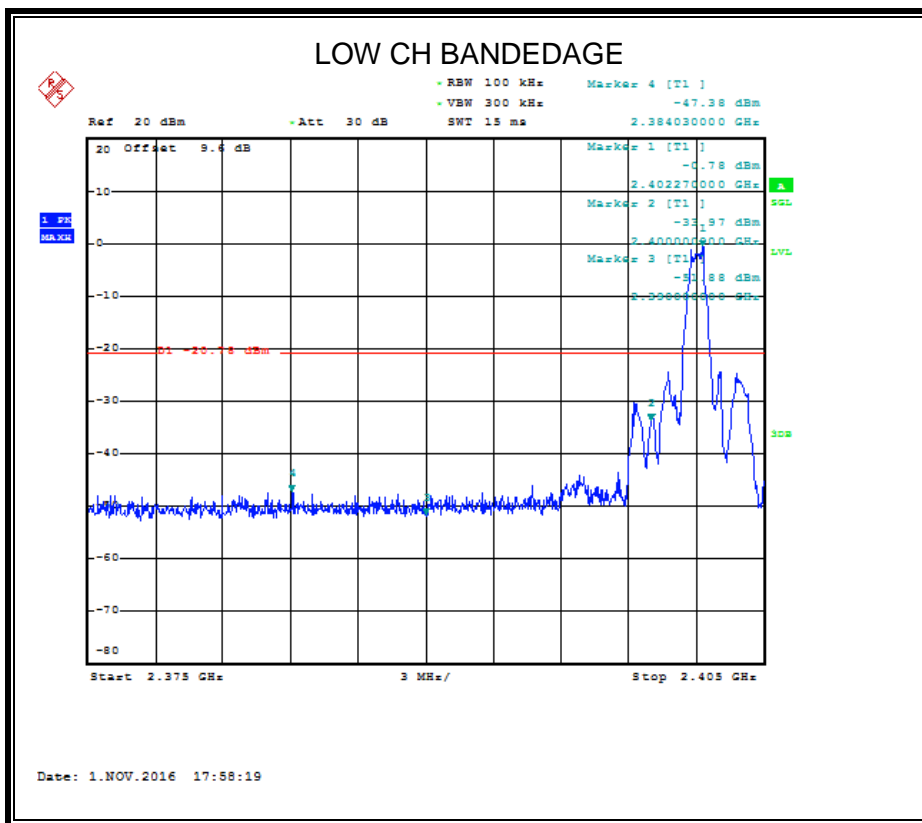


TEST CONDITIONS

Temperature: 24.0°C
 Relative Humidity: 58%
 Test Voltage: AC 120V/60Hz

RESULTS

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Result
BLE	LCH	-0.780	-33.97	-20.78	PASS
BLE	HCH	-3.860	-45.16	-23.86	PASS



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

Please refer to FCC §15.205 and §15.209

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

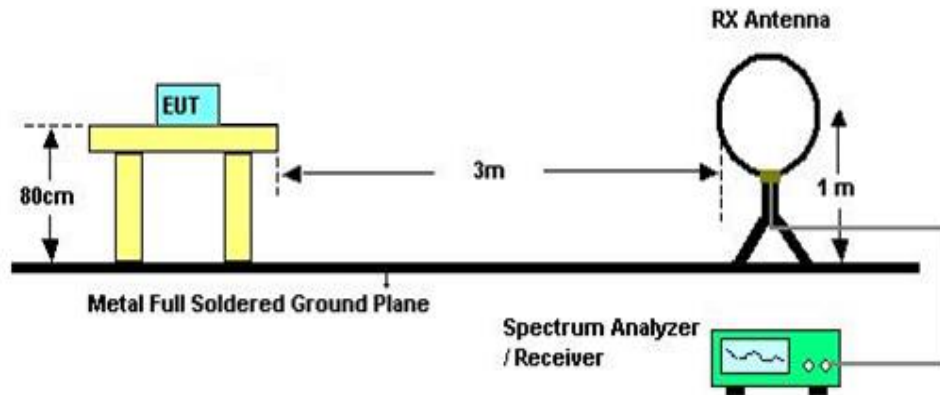
Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 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)
13.36-13.41			

Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6

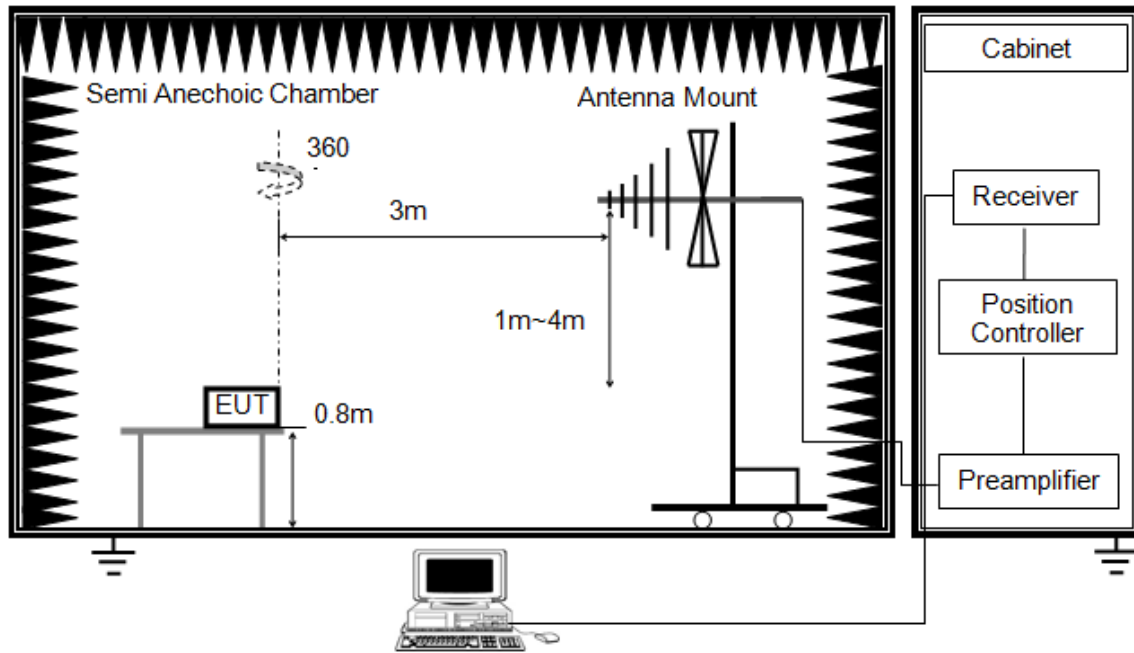
Below 30MHz



The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

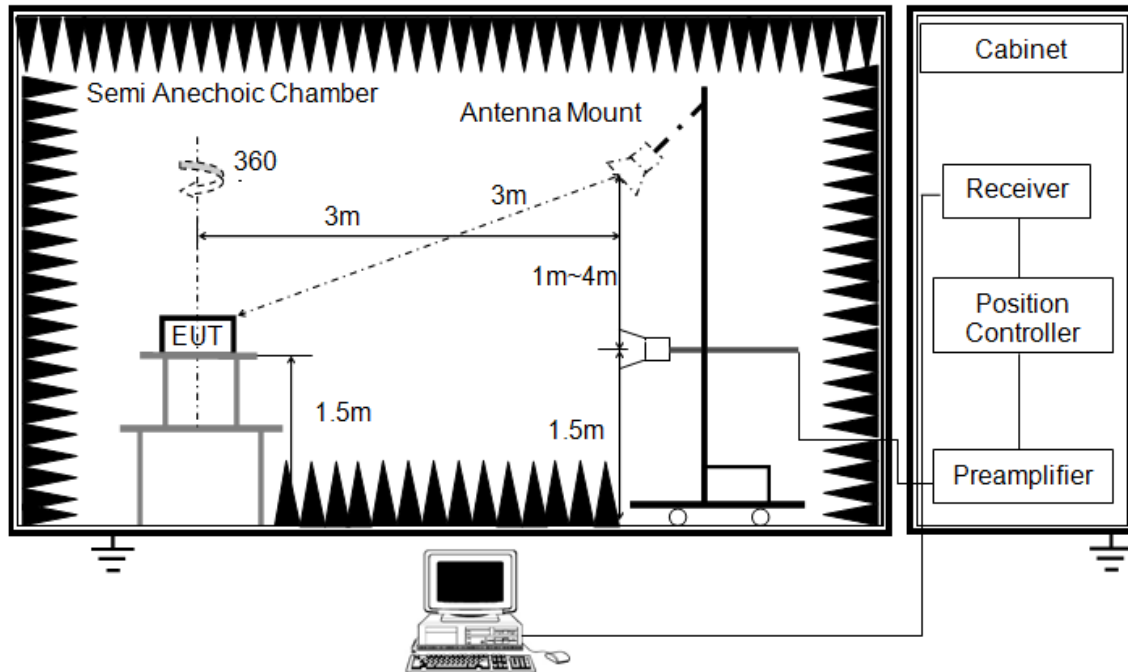
1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: $\text{Antenna Factor} + \text{Cable Loss} + \text{Read Level} - \text{Preamp Factor} = \text{Level}$
6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)



The setting of the spectrum analyser

RBW	120K
VBW	300K
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: $\text{Antenna Factor} + \text{Cable Loss} + \text{Read Level} - \text{Preamp Factor} = \text{Level}$
6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)



The setting of the spectrum analyser

RBW	1M
VBW	3M
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: $\text{Antenna Factor} + \text{Cable Loss} + \text{Read Level} - \text{Preamp Factor} = \text{Level}$
6. For measurement above 1GHz, the emission measurement will be measured by the peak detecto.
7. For average power measurement, set the VBW to 1/T (10 Hz), while maintaining all of the other instrument settings.
8. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

TEST CONDITIONS

Temperature: 24.5°C

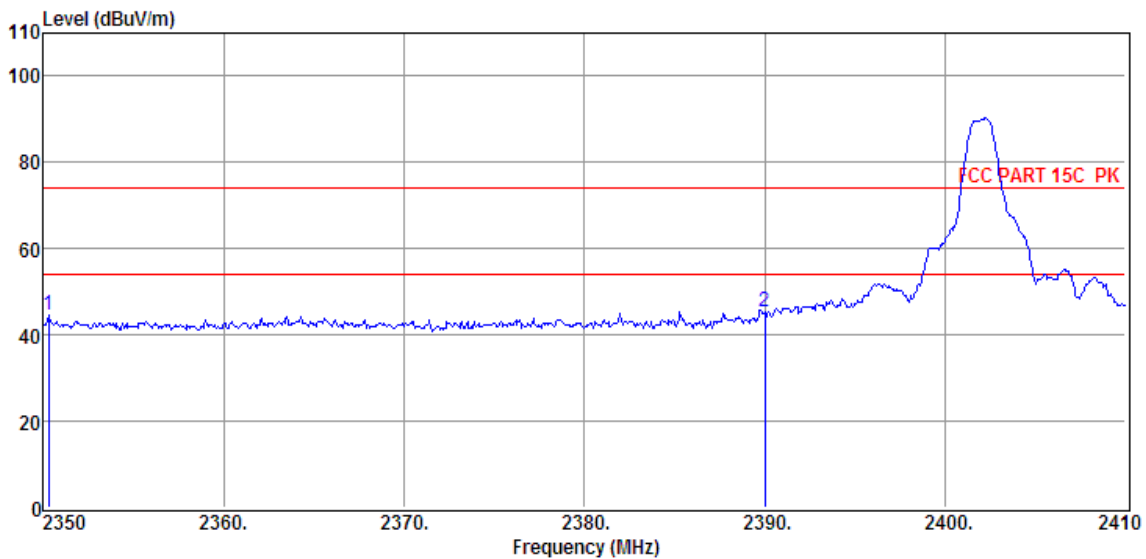
Relative Humidity: 55%

Test Voltage: AC 120V/60Hz

8.2. RESTRICTED BANDEDGE

8.2.1. GFSK MODE

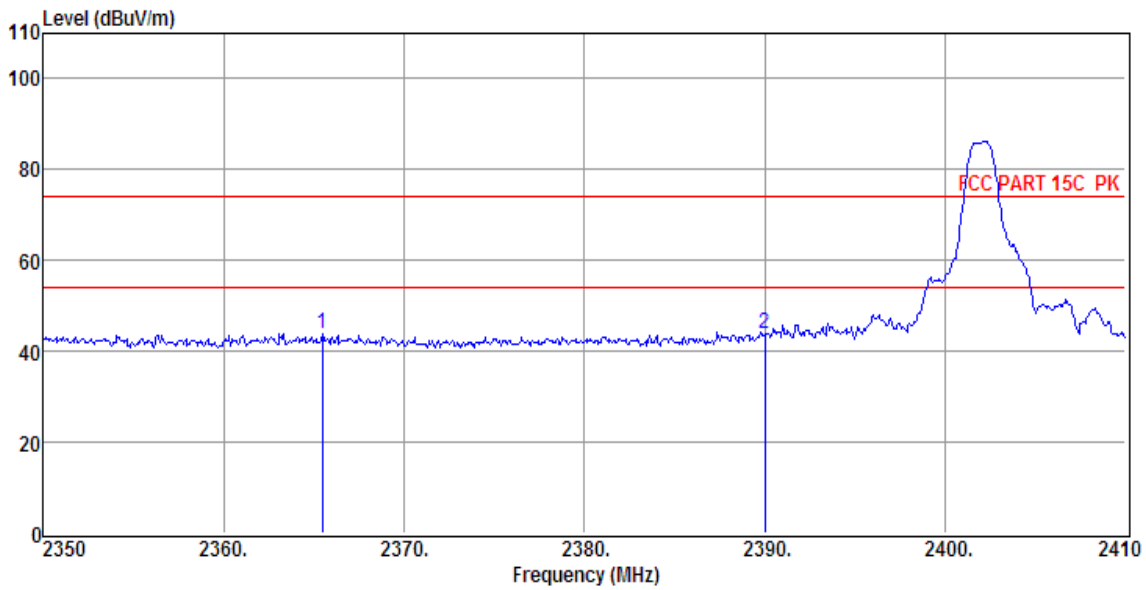
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	2350.30	38.41	29.62	29.34	5.96	44.65	74.00	-29.35	Peak
2	2390.00	38.87	29.78	29.41	6.01	45.25	74.00	-28.75	Peak

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

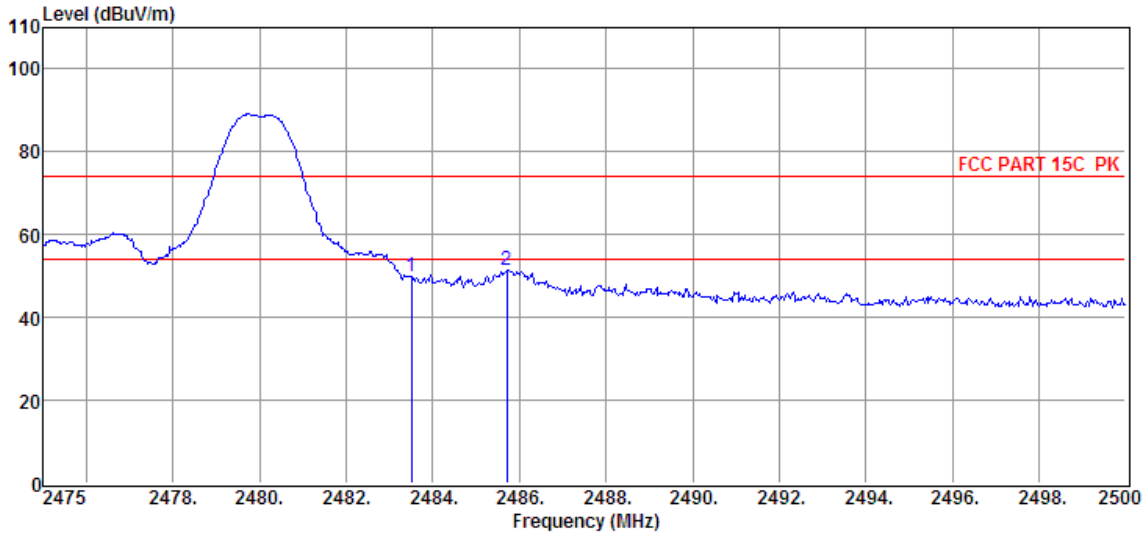
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	2365.48	37.52	29.68	29.37	5.98	43.81	74.00	-30.19	Peak
2	2390.00	37.40	29.78	29.41	6.01	43.78	74.00	-30.22	Peak

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

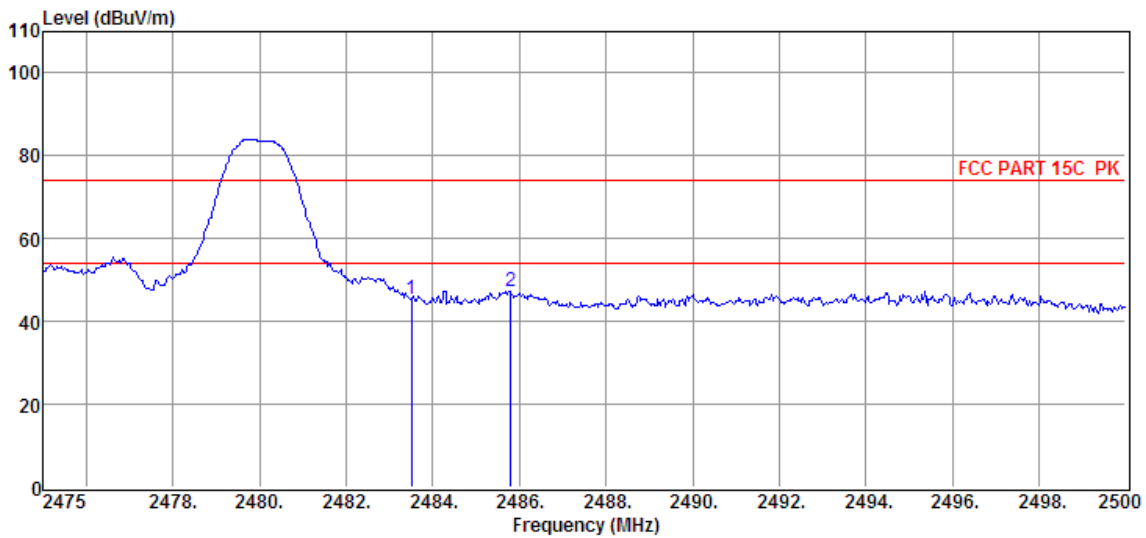
RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	2483.50	43.23	30.14	29.71	6.15	49.81	74.00	-24.19	Peak
2	2485.70	44.81	30.15	29.71	6.15	51.40	74.00	-22.60	Peak

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	2483.50	38.76	30.14	29.71	6.15	45.34	74.00	-28.66	Peak
2	2485.80	40.54	30.15	29.71	6.15	47.13	74.00	-26.87	Peak

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

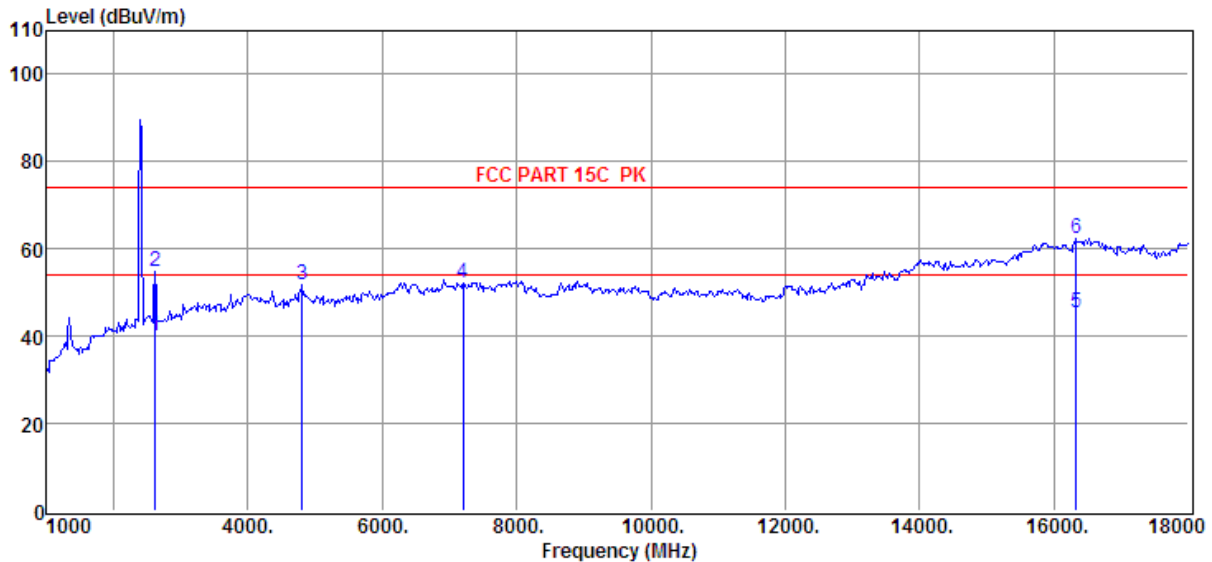
Note: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

8.3. SPURIOUS EMISSIONS (1~25GHz)

8.3.1. GFSK MODE

HARMONICS AND SPURIOUS EMISSIONS

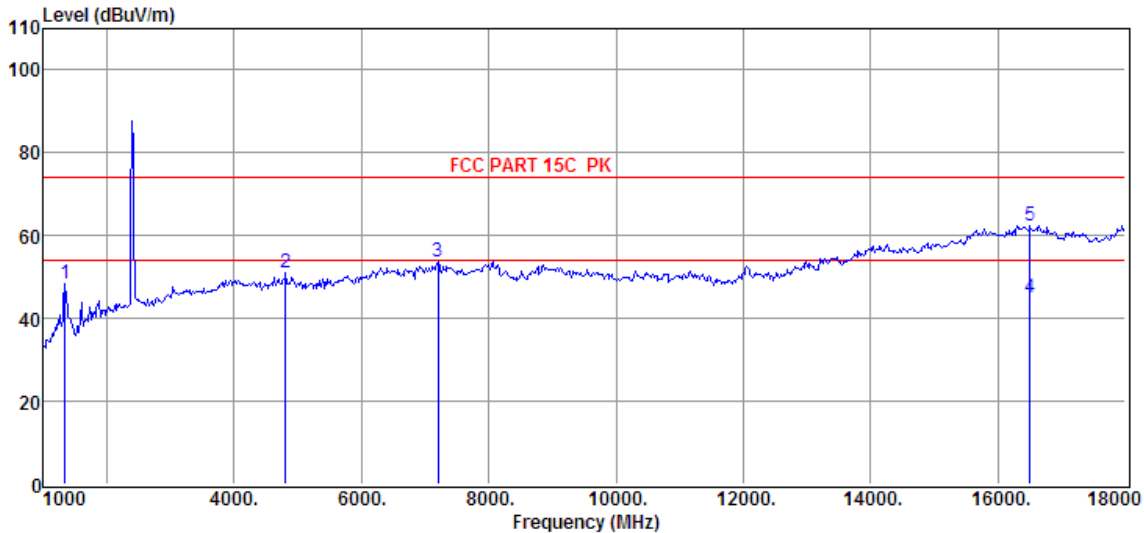
EUT:		Model Name:	
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Low Chanel	Polarization :	Horizontal



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	2615.00	32.97	30.57	29.94	6.31	39.91	54.00	-14.09	Average
2	2615.00	47.87	30.57	29.94	6.31	54.81	74.00	-19.19	Peak
3	4804.00	38.97	33.74	29.32	8.48	51.87	74.00	-22.13	Peak
4	7206.00	35.59	36.37	30.49	10.60	52.07	74.00	-21.93	Peak
5	16334.00	19.51	44.44	35.80	17.35	45.50	54.00	-8.50	Average
6	16334.00	36.44	44.44	35.80	17.35	62.43	74.00	-11.57	Peak

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. For average power measurement, set the VBW to 1/T (10 Hz), while maintaining all of the other instrument settings.
 5. For 1/T, please refer to clause 7.1 ON TIME AND DUTY CYCLE
 6. The higher frequency, which started from 18GHz to 25GHz, was pre-scanned and the result which was 20dB lower than the limit line and was not reported.

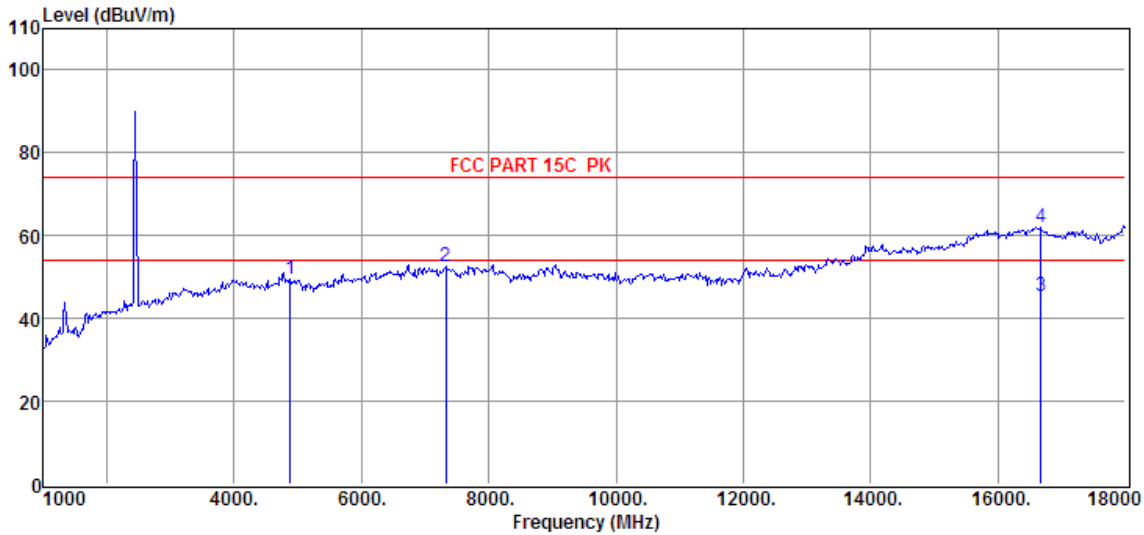
EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Low Chanel	Polarization :	Vertical



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	1340.00	48.53	24.79	29.36	4.53	48.49	74.00	-25.51	Peak
2	4804.00	38.03	33.74	29.32	8.48	50.93	74.00	-23.07	Peak
3	7206.00	37.05	36.37	30.49	10.60	53.53	74.00	-20.47	Peak
4	16504.00	18.85	44.69	36.06	17.51	44.99	54.00	-9.01	Average
5	16504.00	36.23	44.69	36.06	17.51	62.37	74.00	-11.63	Peak

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. For average power measurement, set the VBW to 1/T (10 Hz), while maintaining all of the other instrument settings.
 5. For 1/T, please refer to clause 7.1 ON TIME AND DUTY CYCLE
 6. The higher frequency, which started from 18GHz to 25GHz, was pre-scanned and the result which was 20dB lower than the limit line and was not reported.

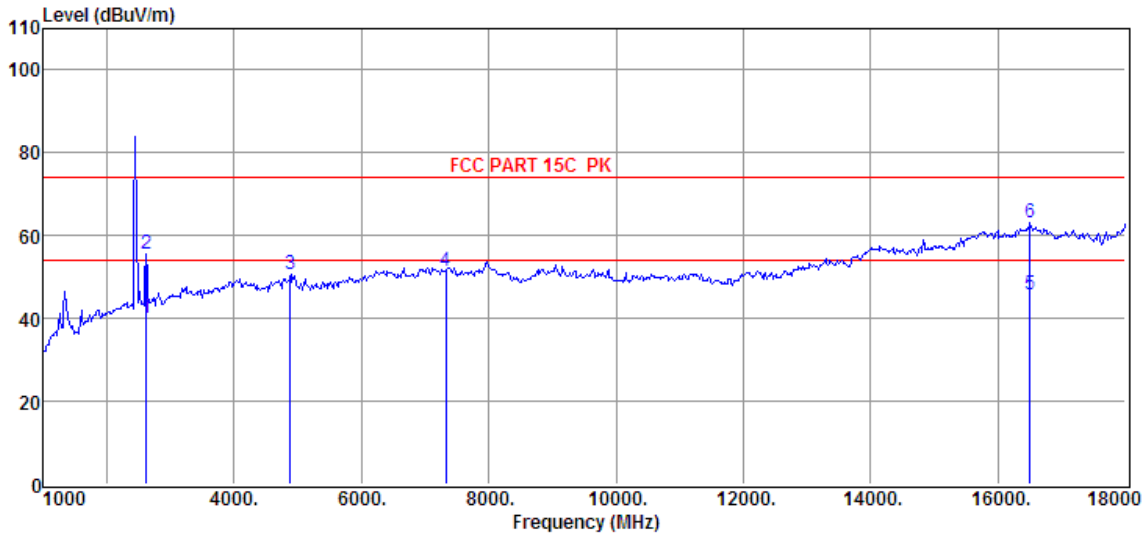
EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Middle Channel	Polarization :	Horizontal



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	4880.00	36.60	33.72	29.33	8.56	49.55	74.00	-24.45	Peak
2	7320.00	35.97	36.46	30.59	10.71	52.55	74.00	-21.45	Peak
3	16674.00	19.35	44.42	36.34	17.81	45.24	54.00	-8.76	Average
4	16674.00	36.16	44.42	36.34	17.81	62.05	74.00	-11.95	Peak

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. For average power measurement, set the VBW to 1/T (10 Hz), while maintaining all of the other instrument settings.
 5. For 1/T, please refer to clause 7.1 ON TIME AND DUTY CYCLE
 6. The higher frequency, which started from 18GHz to 25GHz, was pre-scanned and the result which was 20dB lower than the limit line and was not reported.

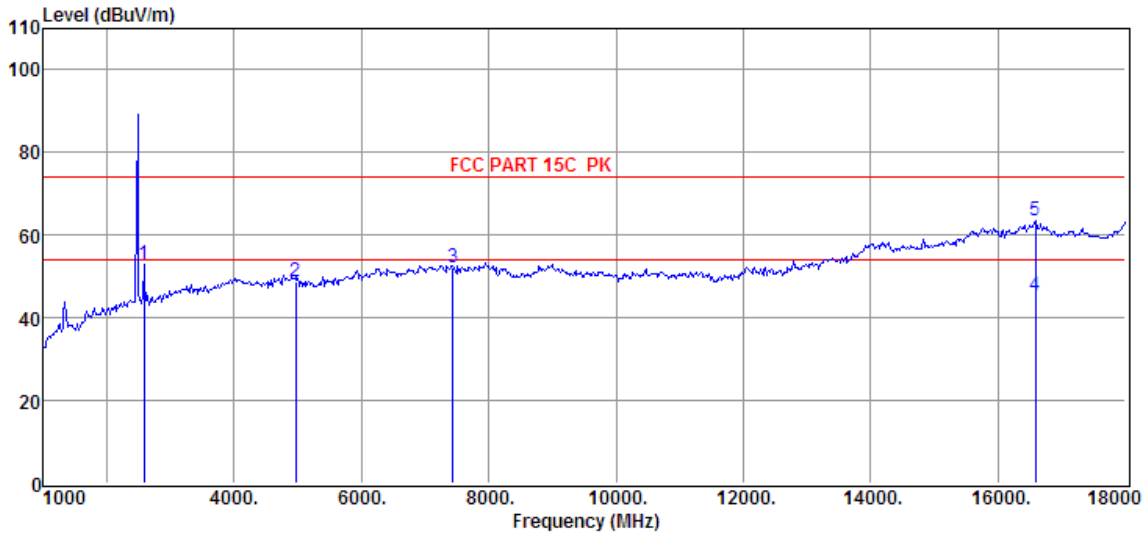
EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Middle Channel	Polarization :	Vertical



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	2615.00	32.97	30.57	29.94	6.31	39.91	54.00	-14.09	Average
2	2615.00	48.78	30.57	29.94	6.31	55.72	74.00	-18.28	Peak
3	4880.00	37.70	33.72	29.33	8.56	50.65	74.00	-23.35	Peak
4	7320.00	34.95	36.46	30.59	10.71	51.53	74.00	-22.47	Peak
5	16504.00	19.41	44.69	36.06	17.51	45.55	54.00	-8.45	Average

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. For average power measurement, set the VBW to 1/T (10 Hz), while maintaining all of the other instrument settings.
 5. For 1/T, please refer to clause 7.1 ON TIME AND DUTY CYCLE
 6. The higher frequency, which started from 18GHz to 25GHz, was pre-scanned and the result which was 20dB lower than the limit line and was not reported.

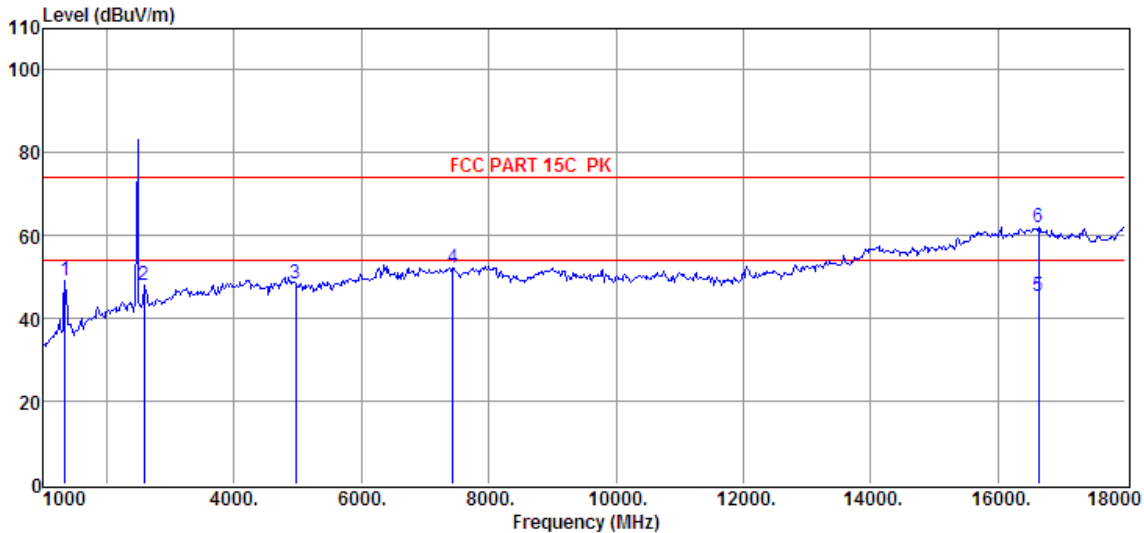
EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode High Channel	Polarization :	Horizontal



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	2581.00	46.00	30.46	29.89	6.26	52.83	74.00	-21.17	Peak
2	4960.00	35.71	33.71	29.34	8.63	48.71	74.00	-25.29	Peak
3	7440.00	35.50	36.55	30.70	10.80	52.15	74.00	-21.85	Peak
4	16589.00	19.20	44.56	36.21	17.64	45.19	54.00	-8.81	Average
5	16589.00	37.41	44.56	36.21	17.64	63.40	74.00	-10.60	Peak

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. For average power measurement, set the VBW to 1/T (10 Hz), while maintaining all of the other instrument settings.
 5. For 1/T, please refer to clause 7.1 ON TIME AND DUTY CYCLE
 6. The higher frequency, which started from 18GHz to 25GHz, was pre-scanned and the result which was 20dB lower than the limit line and was not reported.

EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode High Channel	Polarization :	Vertical



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector
1	1340.00	49.12	24.79	29.36	4.53	49.08	74.00	-24.92	Peak
2	2581.00	41.33	30.46	29.89	6.26	48.16	74.00	-25.84	Peak
3	4960.00	35.49	33.71	29.34	8.63	48.49	74.00	-25.51	Peak
4	7440.00	35.37	36.55	30.70	10.80	52.02	74.00	-21.98	Peak
5	16640.00	19.41	44.47	36.28	17.74	45.34	54.00	-8.66	Average
6	16640.00	36.15	44.47	36.28	17.74	62.08	74.00	-11.92	Peak

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. For average power measurement, set the VBW to 1/T (10 Hz), while maintaining all of the other instrument settings.
 5. For 1/T, please refer to clause 7.1 ON TIME AND DUTY CYCLE
 6. The higher frequency, which started from 18GHz to 25GHz, was pre-scanned and the result which was 20dB lower than the limit line and was not reported.

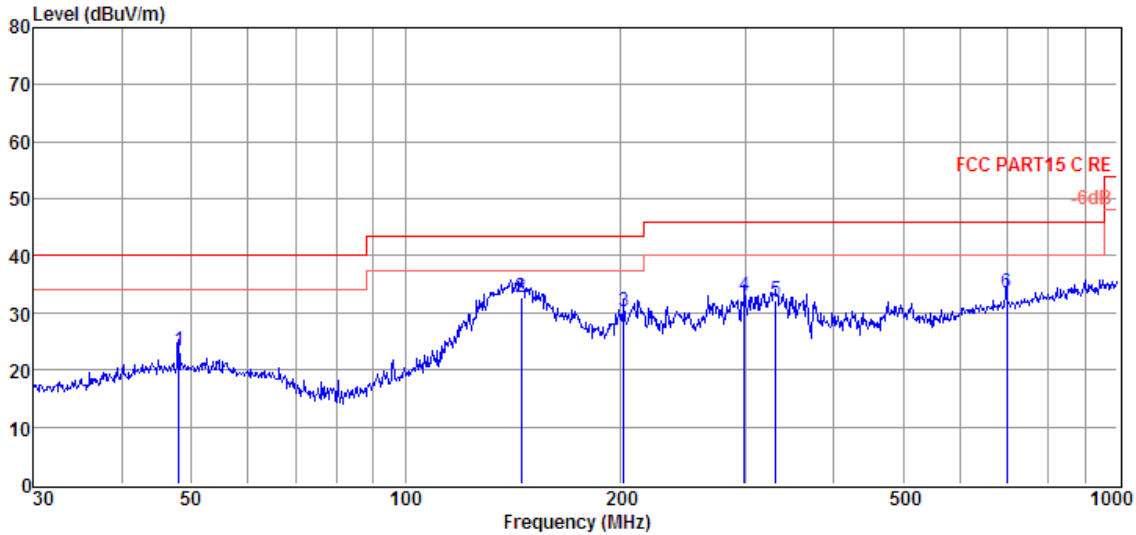
Note: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

8.4. SPURIOUS EMISSIONS 30M ~ 1 GHz

8.4.1. GFSK MODE

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

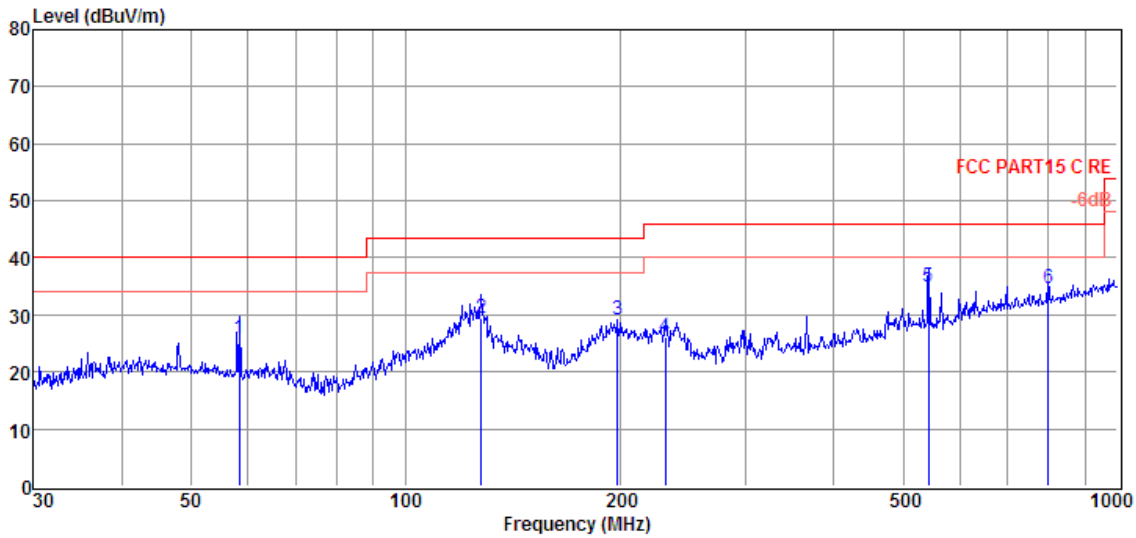
EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Low Channel	Polarization :	Horizontal



Item	Freq.	Read Level	Antenna Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	(dBμV/m)	(dBμV/m)	(dB)	
1	47.99	6.23	13.28	3.87	23.38	40.00	-16.62	QP
2	145.35	20.92	7.18	4.57	32.67	43.50	-10.83	QP
3	202.81	14.49	10.80	4.91	30.20	43.50	-13.30	QP
4	299.32	14.45	13.17	5.38	33.00	46.00	-13.00	QP
5	331.36	12.58	14.06	5.51	32.15	46.00	-13.85	QP
6	699.31	7.03	19.78	6.83	33.64	46.00	-12.36	QP

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Low Channel	Polarization :	Vertical



Item	Freq.	Read Level	Antenna Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	(dBμV/m)	(dBμV/m)	(dB)	
1	58.41	9.95	11.87	3.96	25.78	40.00	-14.22	QP
2	127.67	17.07	7.87	4.47	29.41	43.50	-14.09	QP
3	198.59	13.50	10.81	4.89	29.20	43.50	-14.30	QP
4	231.72	9.43	11.66	5.05	26.14	46.00	-19.86	QP
5	543.27	10.84	17.71	6.32	34.87	46.00	-11.13	QP
6	798.98	6.51	20.92	7.12	34.55	46.00	-11.45	QP

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Note 1: All the channels had been tested, but only the worst data recorded in the report.

Note 2: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

8.5. SPURIOUS EMISSIONS BELOW 30M

Note 1: The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Note 2: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

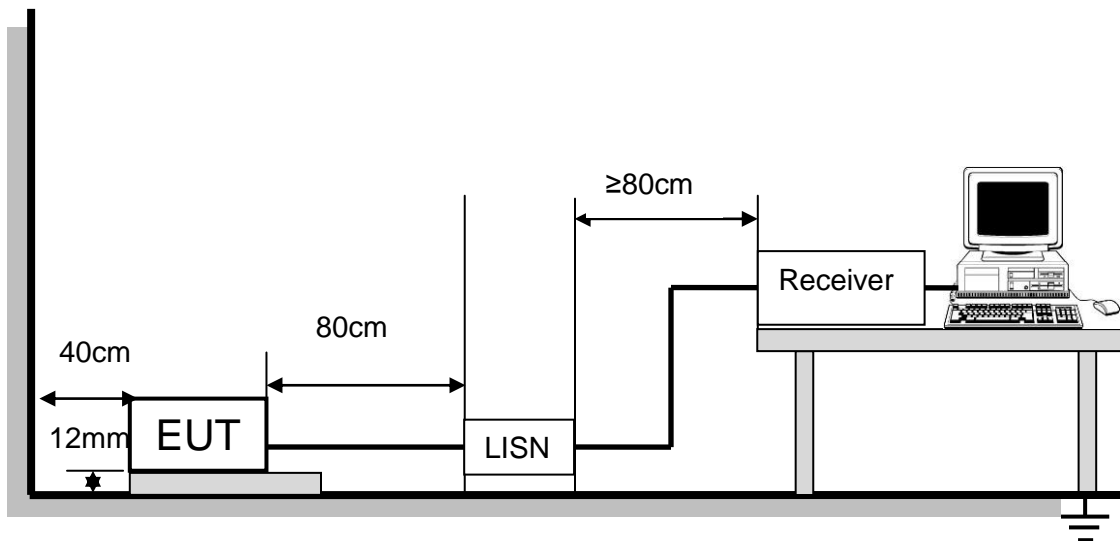
9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

Please refer to FCC §15.207 (a)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

TEST SETUP AND PROCEDURE

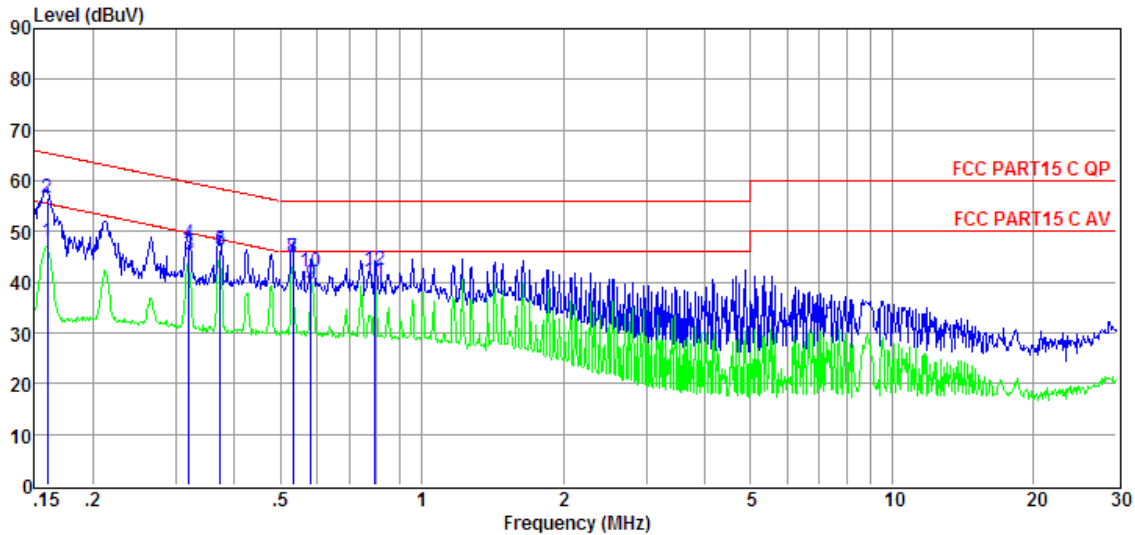


The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2014. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST RESULTS

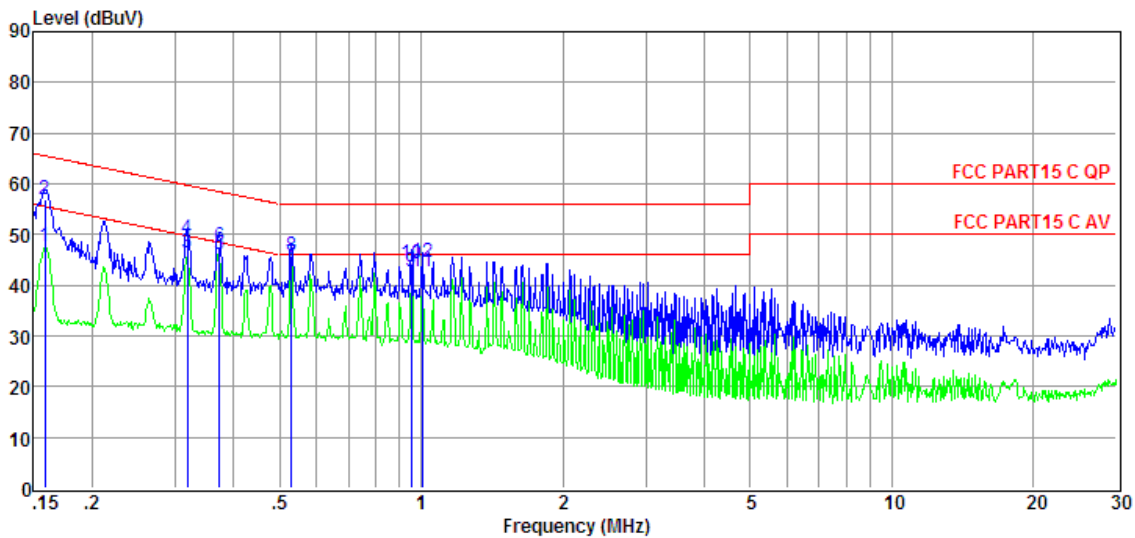
EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Low Channel	Phase :	L1



Item	Freq	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.160	28.30	9.61	0.02	9.86	47.79	55.47	-7.68	Average
2	0.160	37.22	9.61	0.02	9.86	56.71	65.47	-8.76	QP
3	0.320	25.84	9.61	0.02	9.86	45.33	49.71	-4.38	Average
4	0.320	28.01	9.61	0.02	9.86	47.50	59.71	-12.21	QP
5	0.373	27.03	9.61	0.02	9.86	46.52	48.43	-1.91	Average
6	0.373	26.57	9.61	0.02	9.86	46.06	58.43	-12.37	QP
7	0.532	25.37	9.61	0.03	9.86	44.87	46.00	-1.13	Average
8	0.532	25.23	9.61	0.03	9.86	44.73	56.00	-11.27	QP
9	0.582	20.17	9.61	0.03	9.86	39.67	46.00	-6.33	Average
10	0.582	22.54	9.61	0.03	9.86	42.04	56.00	-13.96	QP
11	0.796	20.86	9.61	0.03	9.86	40.36	46.00	-5.64	Average
12	0.796	22.94	9.61	0.03	9.86	42.44	56.00	-13.56	QP

- Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

EUT:	Self balancing scooter	Model Name:	K5
Temperature:	24.5°C	Relative Humidity:	55%
Pressure:	100.1kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	GFSK Mode Low Channel	Phase :	N



Item	Freq	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.159	28.13	9.61	0.02	9.86	47.62	55.52	-7.90	Average
2	0.159	37.55	9.61	0.02	9.86	57.04	65.52	-8.48	QP
3	0.318	26.97	9.61	0.02	9.86	46.46	49.75	-3.29	Average
4	0.318	29.81	9.61	0.02	9.86	49.30	59.75	-10.45	QP
5	0.373	26.68	9.61	0.02	9.86	46.17	48.43	-2.26	Average
6	0.373	28.00	9.61	0.02	9.86	47.49	58.43	-10.94	QP
7	0.529	24.75	9.61	0.03	9.86	44.25	46.00	-1.75	Average
8	0.529	26.28	9.61	0.03	9.86	45.78	56.00	-10.22	QP
9	0.953	23.33	9.61	0.03	9.86	42.83	46.00	-3.17	Average
10	0.953	24.80	9.61	0.03	9.86	44.30	56.00	-11.70	QP
11	1.005	23.16	9.61	0.03	9.86	42.66	46.00	-3.34	Average
12	1.005	25.10	9.61	0.03	9.86	44.60	56.00	-11.40	QP

- Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

Note: All the channels had been tested, but only the worst data recorded in the report.

10. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC rule.

ANTENNA CONNECTOR

EUT has a PCB antenna without antenna connector.

ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi.

END OF REPORT

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