TEST REPORT

Report No.	:	AY0051453(7)	Date :	Sep 16, 2019
Application No.	:	LY021855(0)		
Applicant	:	Bell Sports Inc. 5550 SCOTTS VALLEY DRIVE, SCOTTS VALLEY, CA 95066		
Sample Description	:	One(1) item of submitted sample stated to be Turn signal light Radio Frequency : 2403 – 2478MHz Rating : 3.7V rechargeable battery No. of submitted sample : One (1) set Sample registration No. : RY047193-001		
Date Received	:	09 Jul 2019		
Test Period	:	09 Jul 2019 to 09 Aug 2019		
Test Requested	:	FCC 47CFR Part 15 Certification		
Test Method	:	47 CFR Part 15 (10-1-18 Edition) ANSI C63.10 – 2013 ANSI C63.4 – 2014		
Test Result	:	See attached sheet(s) from page 2 to 21.		
Conclusion	:	The submitted sample was found to comply with requirement of FCC 47CFR Part 15 Subpart C, section 15.249.		

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Mr. WONG Lap-pong, Andrew
Manager

FCC ID: QH67115952L

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

Table of Contents

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

1 General Information

1.1 General Description

The 4.897MHz crystal oscillator drives the base of IC final amplifier. The modulation provided by IC u1. The output of U1 has the matching network consisting C2, L1, L2 that limit the harmonic content and affect the proper coupling of the antenna to the output stage.

Antenna, Ground and Power Source:
The antenna consists of PCB antenna with 0.0dBi gain. The ground is only that of the printed circuit board. Electric current is supplied by 3.7V rechargeable battery.

Operation Descriptions:
The Equipment Under Test (EUT) is a portable 2.4GHz transmitter, The transmitter is light control system. The transmission signal is frequency hopping with channel frequency range 2403.0.-2478.0MHz during normal use. The EUT was set to fixed frequency test mode by application. The EUT is powered by 3.7V rechargeable. After switching on the EUT, the light can be controlled by remote.

The EUT is need to pair with a transmitter and received the transmitted signal for corresponding response.

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

1.2 Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2014. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2014. A shielded room is located at :

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

FCC Accredited Lab (Designation Number: HK0004)
Conformity Assessment Body Identifier (CABID: HK0002)

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date	Calibration Period
EMI Test Receiver	Rohde & Schwarz	ESCI	100152	31 Mar 2020	1Year
Spectrum Analyzer	R&S	FSV40	100964	10 Sep 2020	1Year
Broadband Antenna	Schaffner	CBL6112B	2692	27 Mar 2021	2Years
Loop Antenna	EMCO	6502	00056620	25 Jan 2020	2Years
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-531	21 Dec 2020	2Years
Broadband Pre-Amplifier	Schwarzbeck	BBV 9718	9718-119	21 Dec 2020	2Years
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170442	01 Aug 2020	2Years
Broadband Pre-Amplifier	Schwarzbeck	BBV 9719	9719-010	01 Aug 2020	2Years
Coaxial Cable	Schaffner	RG 213/U	N/A	16 May 2020	1Year
Coaxial Cable	Suhner	RG 214/U	N/A	16 May 2020	1Year
Coaxial Cable	Suhner	Sucoflex_104	N/A	21 Dec 2019	1Year
LISN	Rohde & Schwarz	ENV216	101323	22 Jan 2020	1Year
Coaxial Cable	Tyco Electronics	RG 58C/U	N/A	23 Oct 2019	1Year

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

1.4 Measurement Uncertainty

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Radiated emissions

Frequency	Uncertainty (U_{lab})
30MHz ~ 200MHz (Horizontal)	4.59dB
30MHz ~ 200MHz (Vertical)	4.49dB
200MHz ~1000MHz (Horizontal)	4.94dB
200MHz ~1000MHz (Vertical)	4.97dB
1GHz ~ 6GHz	4.52dB
6GHz – 18GHz	4.58dB
18GHz – 40GHz	4.80dB

1.5 Test Summary

TEST ITEM	FCC REFERANCE	RESULT
Fundamental and harmonic emission	15.249(a)	Comply
Out-band emission	15.249(d)	Comply
Peak Limit	15.249(e)	Comply
Bandwidth	15.215(c)	Comply

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

2 Description of the radiated emission test

2.1 Test Procedure

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

A non-conductive turntable with dimensions of 1.5m x 0.4m x 0.8m (L x W x H) placed above the reference ground plane. The equipment under test (EUT) was placed at 0.8m height for below 1GHz measurement and 1.5m height for above 1GHz measurement. The test distance is 3m between EUT and receiving antenna. A broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated. Additional absorbing material will be placed between the EUT and receiving antenna for above 1GHz measurement.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

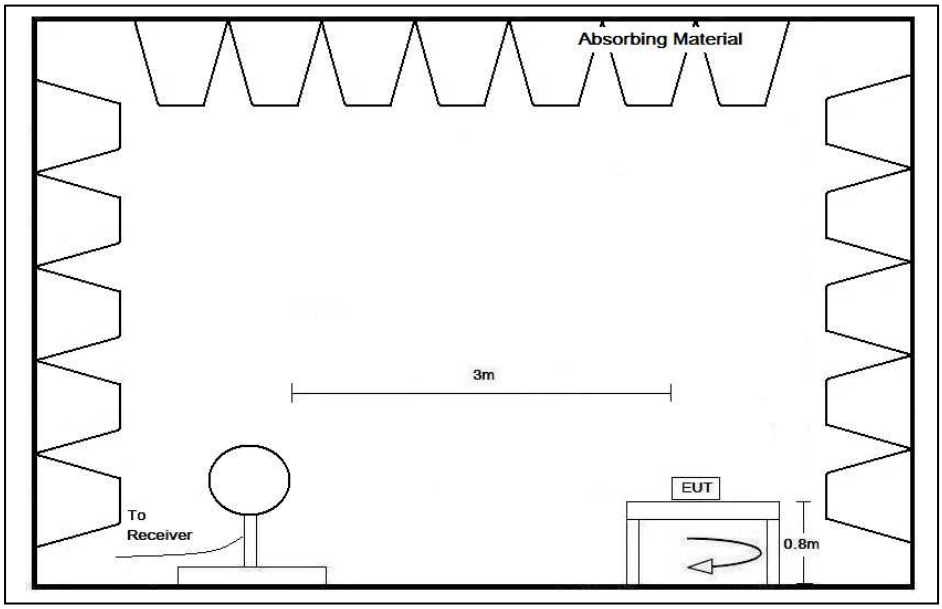
The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

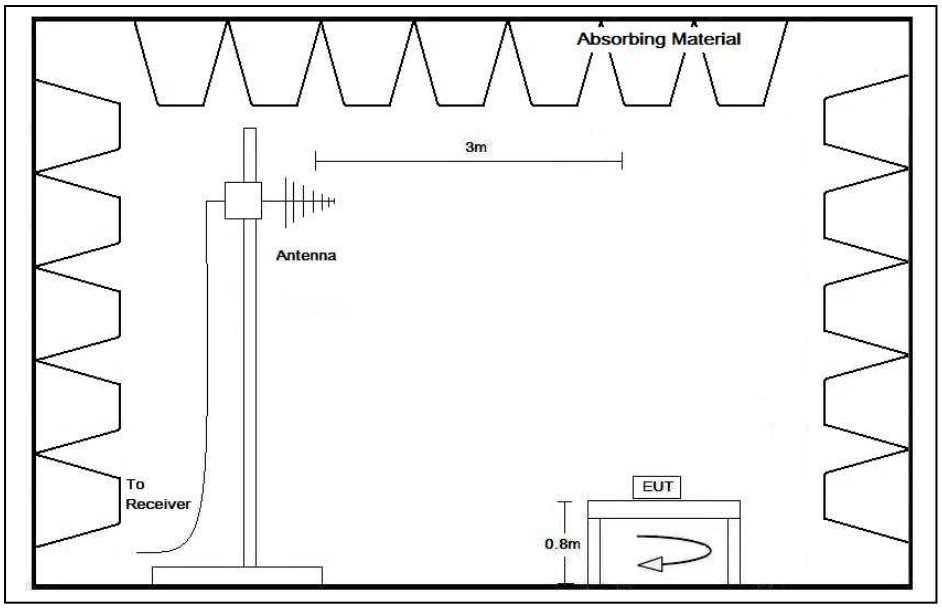
TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

2.2 Test Setup



Below 30MHz



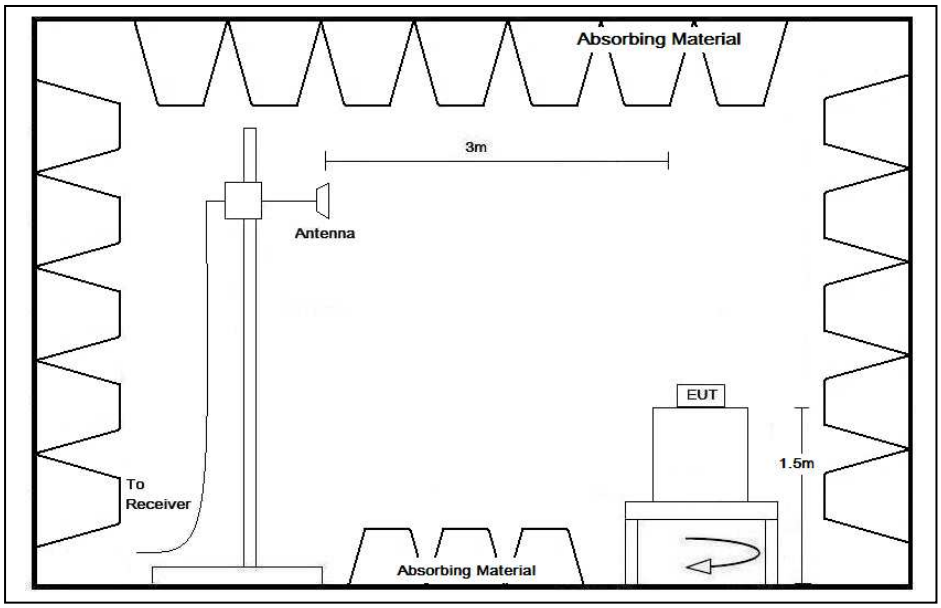
30MHz – 1GHz

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

2.2 Test Setup



Above 1GHz

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

2.3 Test Result

Peak Detector data was measured unless otherwise stated.

The radiated emissions are measured from 9kHz to 26GHz (the tenth harmonics)

The worst case configuration is shown on the worst case configuration of test setup photo.

The frequencies from fundamental up to tenth harmonics were investigated, and emissions more 20dB below limit were not reported. Thus, those highest emissions were presented in next pages.

The EUT has been tested in Transmission mode.

It was found that the EUT meet the FCC requirement.

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

2.4 Radiated Emission Measurement Data

Radiated emission

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	27.8	° C
Relative humidity:	49.5	%

Channel: 2403 MHz

Polarization	Frequency (MHz)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)	Detector Type
H	2402.848[1]	85.3	-4.6	80.7	94.0	-13.3	Peak
V	2402.874[1]	85.0	-4.6	80.4	94.0	-13.6	Peak
H	2400.000	60.4	-4.6	55.8	74.0	-18.2	Peak
H	2400.000	27.4	-4.6	22.8	54.0	-31.2	Average
V	2400.000	60.0	-4.6	55.4	74.0	-18.6	Peak
V	2400.000	26.7	-4.6	22.1	54.0	-31.9	Average
H	4806.389	57.4	2.9	60.3	74.0	-13.7	Peak
H	4806.289	33.1	2.9	36.0	54.0	-18.0	Average
V	4806.272	52.4	2.9	55.3	74.0	-18.7	Peak
V	4806.288	28.7	2.9	31.6	54.0	-22.4	Average
H	7209.086[1]	33.7	9.7	43.4	54.0	-10.6	Peak
V	7208.452[1]	33.8	9.7	43.5	54.0	-10.5	Peak

Remark: 1) The peak value of emissions at fundamental and above 7GHz are below the average limit, so no average measurement is performed.

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

Channel: 2440 MHz

Polarization	Frequency (MHz)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)	Detector Type
H	2440.127	86.4	-4.6	81.8	94.0	-12.2	Peak
V	2440.113	85.2	-4.6	80.6	94.0	-13.4	Peak
H	4880.162	56.6	2.5	59.1	74.0	-14.9	Peak
H	4880.297	32.4	2.5	34.9	54.0	-19.1	Average
V	4880.391	54.0	2.5	56.5	74.0	-17.5	Peak
V	4880.309	30.2	2.5	32.7	54.0	-21.3	Average
H	7320.059	34.6	9.7	44.3	54.0	-9.7	Peak
V	7320.341	35.6	9.7	45.3	54.0	-8.7	Peak

Remark: 1) The peak value of emissions at fundamental and above 7GHz are below the average limit, so no average measurement is performed.

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

Channel: 2478 MHz

Polarization	Frequency (MHz)	Reading at 3m (dBµV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)	Detector Type
H	2478.107	85.3	-4.6	80.7	94.0	-13.3	Peak
V	2478.139	83.3	-4.6	78.7	94.0	-15.3	Peak
H	2483.500	54.3	-4.6	49.7	74.0	-24.3	Peak
V	2483.500	53.3	-4.6	48.7	74.0	-25.3	Peak
H	4956.408	53.4	2.9	56.3	74.0	-17.7	Peak
H	4956.355	29.9	2.9	32.8	54.0	-21.2	Average
V	4956.319	54.6	2.9	57.5	74.0	-16.5	Peak
V	4956.342	30.3	2.9	33.2	54.0	-20.8	Average
H	7434.147	35.1	9.7	44.8	54.0	-9.2	Peak
V	7434.505	35.0	9.7	44.7	54.0	-9.3	Peak

Remark: 1) The peak value of emissions at fundamental and above 7GHz are below the average limit, so no average measurement is performed.

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

Mode: Light on with charging

Polarization	Frequency (MHz)	Reading at 3m (dBµV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)	Detector Type
H	54.949	7.3	10.8	18.1	40.0	-21.9	QP
V	89.216	10.4	10.0	20.4	43.5	-23.1	QP
H	125.785	11.1	12.9	24.0	43.5	-19.5	QP
V	174.325	7.4	14.7	22.1	43.5	-21.4	QP
H	217.524	7.7	14.5	22.2	46.0	-23.8	QP
H	248.699	11.4	14.5	25.9	46.0	-20.1	QP
V	289.579	12.7	14.5	27.2	46.0	-18.8	QP

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

3 Description of the Line-conducted Test

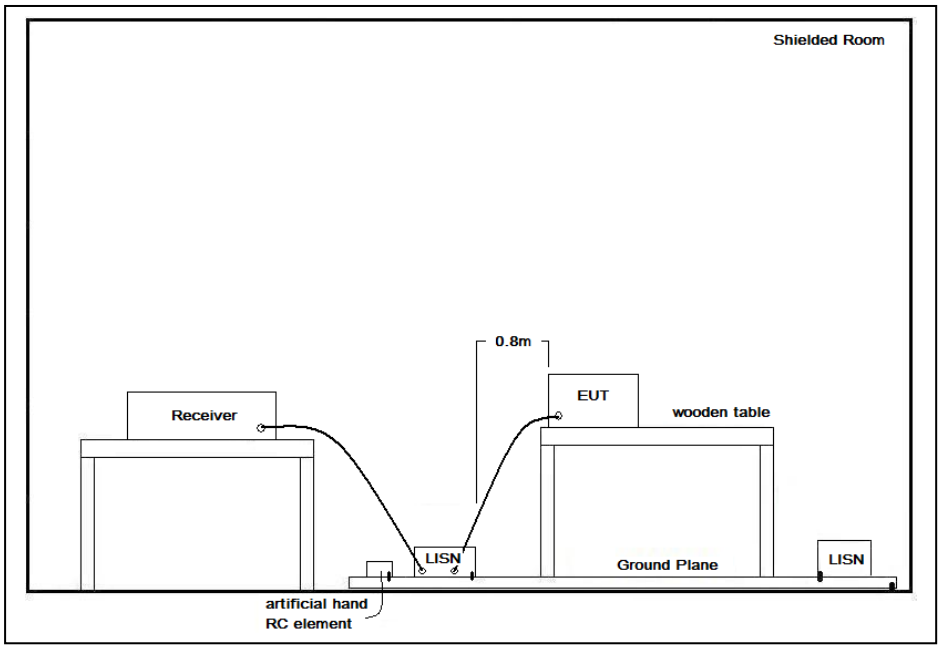
3.1 Test Procedure

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.10 – 2013. The EUT was setup as described in the procedures, and both lines were measured.

3.2 Test Result

The result showed that the EUT meet the FCC requirement.

3.3 Test Setup



3.4 Graph and Table of Conducted Emission Measurement Data

FCC ID: QH67115952L

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

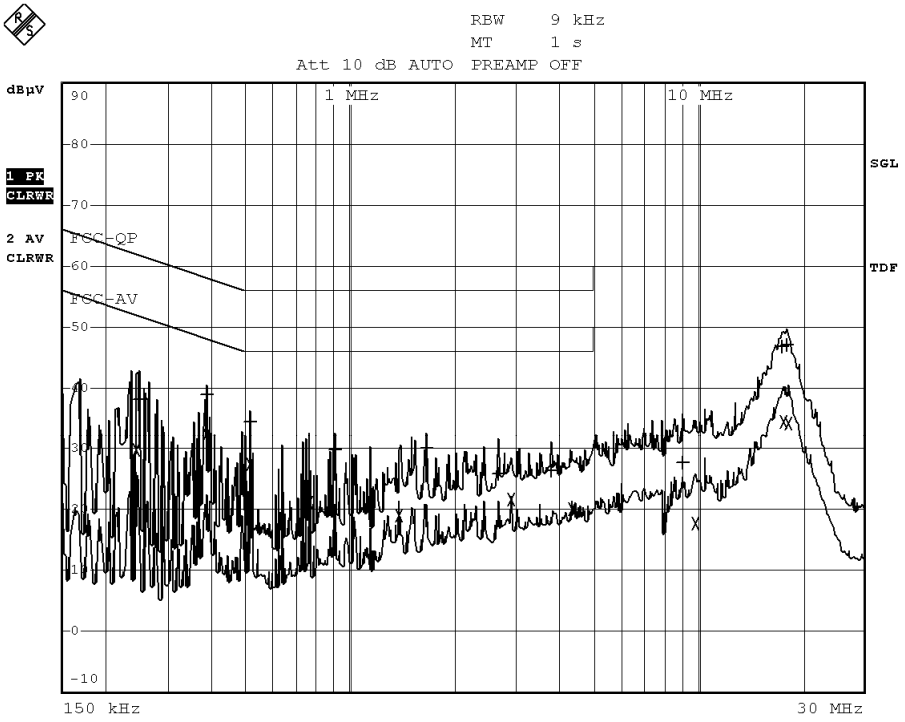
Measurement Data (Graph)

Conducted emission

pursuant to

the requirement of FCC Part 15

Mode: Bluetooth connection with Charging



FCC ID: QH67115952L

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

Measurement Data (Data)

Conducted emission

pursuant to

the requirement of FCC Part 15

Mode: Bluetooth connection with Charging

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC-QP		
Trace2:	FCC-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	244.5 kHz	29.84 N gnd	-22.09
1 Quasi Peak	249 kHz	38.18 N gnd	-23.60
1 Quasi Peak	388.5 kHz	38.92 N gnd	-19.17
2 Average	388.5 kHz	32.46 N gnd	-15.63
1 Quasi Peak	513.5 kHz	34.48 L1 gnd	-21.51
2 Average	513.5 kHz	27.27 N gnd	-18.72
2 Average	761 kHz	20.98 N gnd	-25.02
1 Quasi Peak	905 kHz	29.78 N gnd	-26.21
2 Average	1.3865 MHz	18.97 N gnd	-27.03
1 Quasi Peak	1.6655 MHz	30.14 N gnd	-25.85
1 Quasi Peak	2.6645 MHz	25.80 N gnd	-30.19
2 Average	2.9255 MHz	21.51 N gnd	-24.48
1 Quasi Peak	3.7895 MHz	26.22 N gnd	-29.77
2 Average	4.334 MHz	20.06 N gnd	-25.93
1 Quasi Peak	9.0635 MHz	27.56 N gnd	-32.43
2 Average	9.8195 MHz	17.67 L1 gnd	-32.32
1 Quasi Peak	17.456 MHz	46.91 N gnd	-13.08
2 Average	17.645 MHz	34.55 N gnd	-15.44
1 Quasi Peak	18.0005 MHz	47.06 N gnd	-12.93
2 Average	18.212 MHz	34.17 N gnd	-15.82

FCC ID: QH67115952L

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

4 Supplementary document

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

Document	Filename
ID Label/Location	Label Artwork and Location.pdf
Block Diagram	Block Diagram.pdf
Schematic Diagram	Schematic.pdf
Users Manual	User Manual.pdf
Operational Description	Operation Description.pdf

4.1 Bandwidth

Appendix A1 show the fundamental emission is confined in the specified band. 20dB bandwidth is 1.208MHz. 20dB bandwidth falls in the band of 2400 – 2483.5MHz. It also shows that the EUT met the requirement of FCC Part 15.215(c).

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

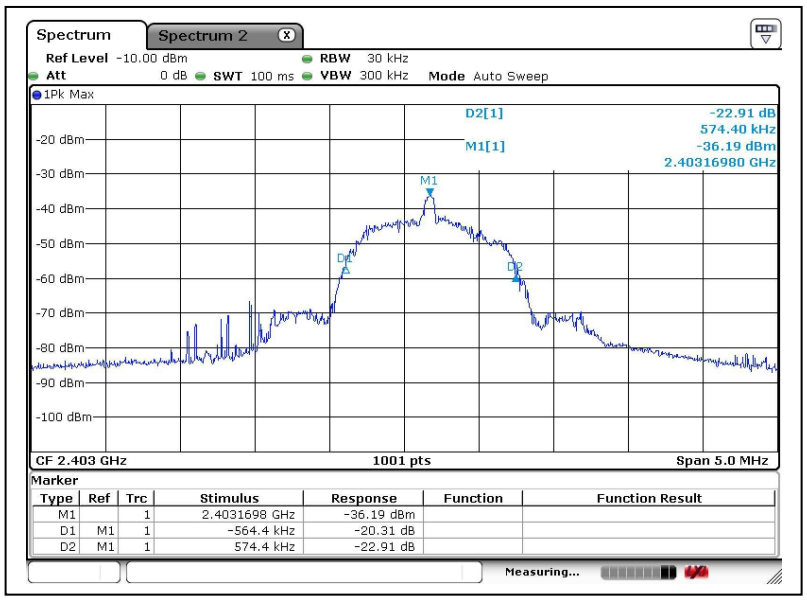
5 Appendices

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

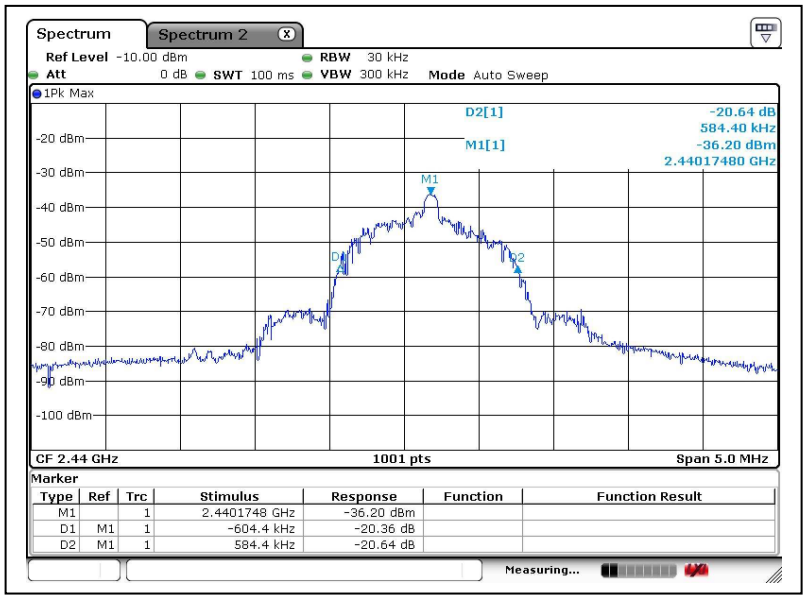
TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019

A1. 20dB Bandwidth Plot



Channel: 2403MHz



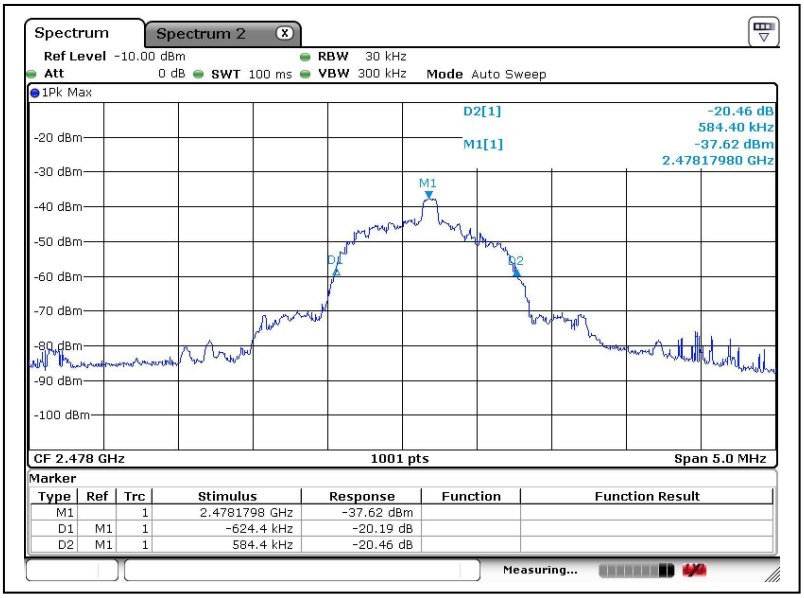
Channel: 2440MHz

FCC ID: QH67115952L

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org

TEST REPORT

Report No. : AY0051453(7) Date : Sep 16, 2019



Channel: 2478MHz

***** End of Report *****

FCC ID: QH67115952L

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel : (852) 2698 8198 Fax : (852) 2695 4177 E-mail : info@cmatesting.org Web Site : http://www.cmatesting.org