



CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AU0052161(4) Date : 02 Sep 2016

Application No. : LU030653(6)

Applicant : Camino International Limited
Flat A, 3rd Floor, International Industrial Building
501-503 Castle Peak Road, Cheung Sha Wan, Kowloon, Hong Kong

Sample Description : One(1) item of submitted sample stated to :

Sample description	Model number
WAR MACHINE MARK III LIFE-SIZE FIGURATIVE DECORATIVE BLUETOOTH WIRELESS SPEAKER	761504
MARK XLVI IRON MAN LIFE-SIZE FIGURATIVE DECORATIVE BLUETOOTH WIRELESS SPEAKER	761505
IRON MAN MARK XLIII LIFE-SIZE BUST FIGURATIVE DECORATIVE BLUETOOTH HI-FI SYSTEM SPEAKER SET	761401, 761486
DEATH TROOPER HELMET BLUETOOTH WIRELESS SPEAKER	761508

Sample registration No. : RU015708-001

Radio Frequency : 2402MHz – 2480 MHz Transceiver

Rating : AC 100-240V to DC 15V

No. of submitted sample : Four (4) set (s)

Date Received : 09 Aug 2016

Test Period : 11 Aug 2016 to 19 Aug 2016.

Test Requested : FCC Permissive Change

Test Method : 47 CFR Part 15 (10-1-15 Edition), ANSI C63.4 – 2014, ANSI C63.10 – 2013
FCC Public Notice DA 00-705

Test Engineer : Mr. LEUNG Shu-kan, Ken

Test Result : See attached sheet(s) from page 2 to 91.


Conclusion : The submitted sample was found to comply with requirement of FCC Part 15
Subpart B and C.

Remark : All Five models are the same in circuitry and components and construction, and
therefore model 761505 was chosen to be the representative of the test sample.
The difference(s) between the tested model and the declared model(s) is/are
outlook.

For and on behalf of

CMA Industrial Development Foundation Limited

Authorized Signature : _____


Mr. WONG Lap-pong, Andrew
Manager
Electrical Division

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FCC ID: ZZX761074



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1 General Information

1.1 General Description

The equipment under test (EUT) is a Bluetooth wireless speaker. The EUT is power by AC 120-240V to DC 15V adaptor. The EUT receives digital audio signal from other wireless device and playback the audio signal.

For the Bluetooth mode, it supports standard Bluetooth V2.1+EDR or below revision protocol for data synchronization. After paring with other standard Bluetooth device, it can play the music.

A non standardized Bluetooth protocol or other Gaussian frequency-shift keying (GFSK) digital modulation signal was unable to synchronize the Bluetooth speaker.

A Bluetooth trademark was printed on the speaker enclosure to indicate it communicate with Bluetooth protocol only.

Pseudorandom frequency hopping sequence

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF Channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The nominal hop rate is 1600 hops/s.

Example of a 79 hopping sequence in data mode: 40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54...

Equal Hopping Frequency Use

All Bluetooth units participating in the piconet are time and hop-synchronized to the channel.

System Receiver Input Bandwidth

The input bandwidth of the receiver is 1 MHz. In every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g. single multisport (packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings. Repeating of a packet has no influence on the hopping sequence.. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.



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Equipment Description

15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply With all of The regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.

15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate it channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

The brief circuit description is listed as follows:

- M1 and its associated circuit act as RF module
- U1 and its associated circuit act as MCU
- U7, U8 and its associated circuit act as audio amplifier

Antenna type : PCB Antenna
Antenna gain : -5dBi
Modulation technique : GFSK
Number of channel : 79 channels



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1.2 Location of the test site

FCC Registered Test Site Number: 552221

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013. 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 C63.10 – 2013. A shielded room is located at :

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
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1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date	Calibration Period
EMI Test Receiver	R&S	ESCI	100152	27 Sep 2016	1 Year
Spectrum Analyzer	R&S	FSV40	100628	09 Feb 2017	1 Year
Broadband Antenna	Schaffner	CBL6112B	2718	15 Mar 2017	2 Years
Loop Antenna	EMCO	6502	00056620	25 Jan 2018	2 Years
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-531	24 Nov 2016	2 Years
Broadband Pre-Amplifier	Schwarzbeck	BBV 9718	9718-119	24 Nov 2016	2 Years
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170442	02 Aug 2017	2 Years
Broadband Pre-Amplifier	Schwarzbeck	BBV 9719	9719-010	02 Aug 2017	2 Years
Coaxial Cable	Schaffner	RG 213/U	N/A	18 May 2017	1 Year
Coaxial Cable	Suhner	RG 214/U	N/A	18 May 2017	1 Year
Coaxial Cable	Suhner	Sucoflex_104	N/A	13 Dec 2016	1 Year
LISN	R&S	ENV216	101323	21 Oct 2016	1 Year
Coaxial Cable	Tyco Electronics	RG 58C/U	N/A	01 Nov 2016	1 Year
TS8997 Testing System					
Spectrum Analyzer	R&S	FSV 40	101190	12 May 2017	1 Year
Vector Generator	R&S	SMBV100A	262024	04 May 2017	1 Year
Generator	R&S	SMB100A	103230	24 May 2017	1 Year
OSP	R&S	OSP	OSP120 V02	06 Jun 2017	1 Year



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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)	4.83dB
30MHz ~ 200MHz (Vertical)	4.84dB
200MHz ~ 1000MHz (Horizontal)	4.87dB
200MHz ~ 1000MHz (Vertical)	5.94dB
1GHz ~ 6GHz	4.41dB
6GHz ~ 18GHz	4.64dB

Conducted emissions

Frequency	Uncertainty (U_{lab})
150kHz~30MHz	2.64dB



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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.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground for below 1GHz measurement and 1.5m high above the ground for above 1GHz measurement. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then 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.

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.

For 30MHz to 1GHz, broadband antenna with its vertical and horizontal plane is placed 3m from the EUT and rotated about its vertical and horizontal axis for maximum response at each azimuth about the EUT. And the reference point of antenna shall be 1 m above the ground.

For above 1GHz, horn antenna with its vertical and horizontal plane is placed 3m from the EUT and rotated about its vertical and horizontal axis for maximum response at each azimuth about the EUT. Preamplifier and High Pass filter was used for measurements. The reference point of antenna shall be 1 m above the ground.

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

The EUT will connect to TS 8997 testing system for direct conducted measurement.



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2.2 Test Result

Summary

Test	Frequency (MHz)	Nominal Power (dBm)	Nominal Bandwidth (MHz)	Result
Hopping Frequencies	--- (hopping)	0.0	1.000000	PASS
Band Edge low	--- (hopping)	0.0	1.000000	PASS
Band Edge high	--- (hopping)	0.0	1.000000	PASS
Tx Spurious Emission	--- (hopping)	0.0	1.000000	PASS
Rx Spurious Emission	--- (hopping)	0.0	1.000000	PASS
Carrier Frequency Separation	2402.000 (hopping)	0.0	1.000000	PASS
Carrier Frequency Separation	2441.000 (hopping)	0.0	1.000000	PASS
Carrier Frequency Separation	2479.000 (hopping)	0.0	1.000000	PASS
Time of Channel Occupancy	2402.000 (hopping)	0.0	1.000000	PASS
Time of Channel Occupancy	2441.000 (hopping)	0.0	1.000000	PASS
Time of Channel Occupancy	2480.000 (hopping)	0.0	1.000000	PASS
RF output power	2402.000 (single)	0.0	1.000000	PASS
Emission Bandwidth 20 dB	2402.000 (single)	0.0	1.000000	PASS
Band Edge low	2402.000 (single)	0.0	1.000000	PASS
RF output power	2441.000 (single)	0.0	1.000000	PASS
Emission Bandwidth 20 dB	2441.000 (single)	0.0	1.000000	PASS
RF output power	2480.000 (single)	0.0	1.000000	PASS
Emission Bandwidth 20 dB	2480.000 (single)	0.0	1.000000	PASS
Band Edge high	2480.000 (single)	0.0	1.000000	PASS



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Frequencies

BT CH 1 (2402 MHz)	BT CH 2 (2403 MHz)	BT CH 3 (2404 MHz)
BT CH 4 (2405 MHz)	BT CH 5 (2406 MHz)	BT CH 6 (2407 MHz)
BT CH 7 (2408 MHz)	BT CH 8 (2409 MHz)	BT CH 9 (2410 MHz)
BT CH 10 (2411 MHz)	BT CH 11 (2412 MHz)	BT CH 12 (2413 MHz)
BT CH 13 (2414 MHz)	BT CH 14 (2415 MHz)	BT CH 15 (2416 MHz)
BT CH 16 (2417 MHz)	BT CH 17 (2418 MHz)	BT CH 18 (2419 MHz)
BT CH 19 (2420 MHz)	BT CH 20 (2421 MHz)	BT CH 21 (2422 MHz)
BT CH 22 (2423 MHz)	BT CH 23 (2424 MHz)	BT CH 24 (2425 MHz)
BT CH 25 (2426 MHz)	BT CH 26 (2427 MHz)	BT CH 27 (2428 MHz)
BT CH 28 (2429 MHz)	BT CH 29 (2430 MHz)	BT CH 30 (2431 MHz)
BT CH 31 (2432 MHz)	BT CH 32 (2433 MHz)	BT CH 33 (2434 MHz)
BT CH 34 (2435 MHz)	BT CH 35 (2436 MHz)	BT CH 36 (2437 MHz)
BT CH 37 (2438 MHz)	BT CH 38 (2439 MHz)	BT CH 39 (2440 MHz)
BT CH 40 (2441 MHz)	BT CH 41 (2442 MHz)	BT CH 42 (2443 MHz)
BT CH 43 (2444 MHz)	BT CH 44 (2445 MHz)	BT CH 45 (2446 MHz)
BT CH 46 (2447 MHz)	BT CH 47 (2448 MHz)	BT CH 48 (2449 MHz)
BT CH 49 (2450 MHz)	BT CH 50 (2451 MHz)	BT CH 51 (2452 MHz)
BT CH 52 (2453 MHz)	BT CH 53 (2454 MHz)	BT CH 54 (2455 MHz)
BT CH 55 (2456 MHz)	BT CH 56 (2457 MHz)	BT CH 57 (2458 MHz)
BT CH 58 (2459 MHz)	BT CH 59 (2460 MHz)	BT CH 60 (2461 MHz)
BT CH 61 (2462 MHz)	BT CH 62 (2463 MHz)	BT CH 63 (2464 MHz)
BT CH 64 (2465 MHz)	BT CH 65 (2466 MHz)	BT CH 66 (2467 MHz)
BT CH 67 (2468 MHz)	BT CH 68 (2469 MHz)	BT CH 69 (2470 MHz)
BT CH 70 (2471 MHz)	BT CH 71 (2472 MHz)	BT CH 72 (2473 MHz)
BT CH 73 (2474 MHz)	BT CH 74 (2475 MHz)	BT CH 75 (2476 MHz)
BT CH 76 (2477 MHz)	BT CH 77 (2478 MHz)	BT CH 78 (2479 MHz)



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2.3 Conducted Emission Measurement Data

Environmental conditions:

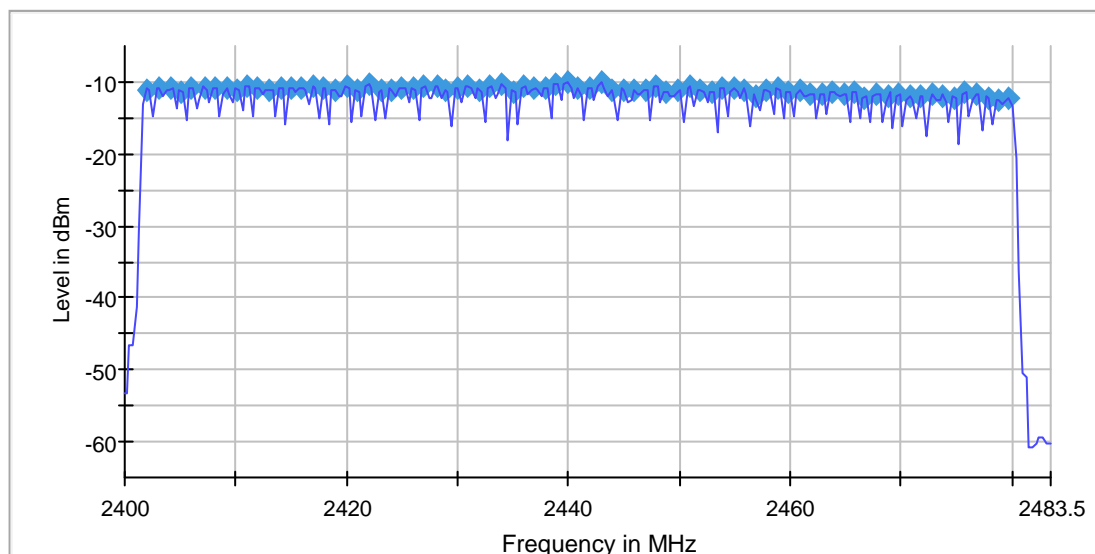
Parameter	Recorded value	
Ambient temperature:	26	° C
Relative humidity:	66	%

Hopping Frequencies (frequency independent)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Channels

Channels	Limit Min	Limit Max	Result
79	15	---	PASS





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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	300.000 kHz	<= 300.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	278	~ 278
SweepTime	1.000 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50	0.50
Run	147 / max. 150	max. 150
Stable	3 / 3	3



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Band Edge low (frequency independent)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Result
hopping	PASS

Inband Peak

Frequency (MHz)	Level (dBm)
2419.063585	-23.1

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2397.576346	-72.6	29.5	-43.1	PASS
2399.675180	-73.7	30.6	-43.1	PASS
2398.525819	-74.1	31.0	-43.1	PASS
2399.575236	-74.5	31.4	-43.1	PASS
2398.026097	-74.8	31.7	-43.1	PASS
2399.425319	-75.5	32.4	-43.1	PASS
2396.626874	-76.3	33.2	-43.1	PASS
2395.077735	-76.4	33.3	-43.1	PASS
2395.627429	-76.6	33.5	-43.1	PASS
2397.176569	-76.6	33.5	-43.1	PASS
2396.476957	-76.8	33.7	-43.1	PASS
2397.726268	-76.8	33.7	-43.1	PASS
2398.725703	-76.9	33.8	-43.1	PASS
2395.227651	-77.0	33.9	-43.1	PASS
2398.176013	-77.0	33.9	-43.1	PASS



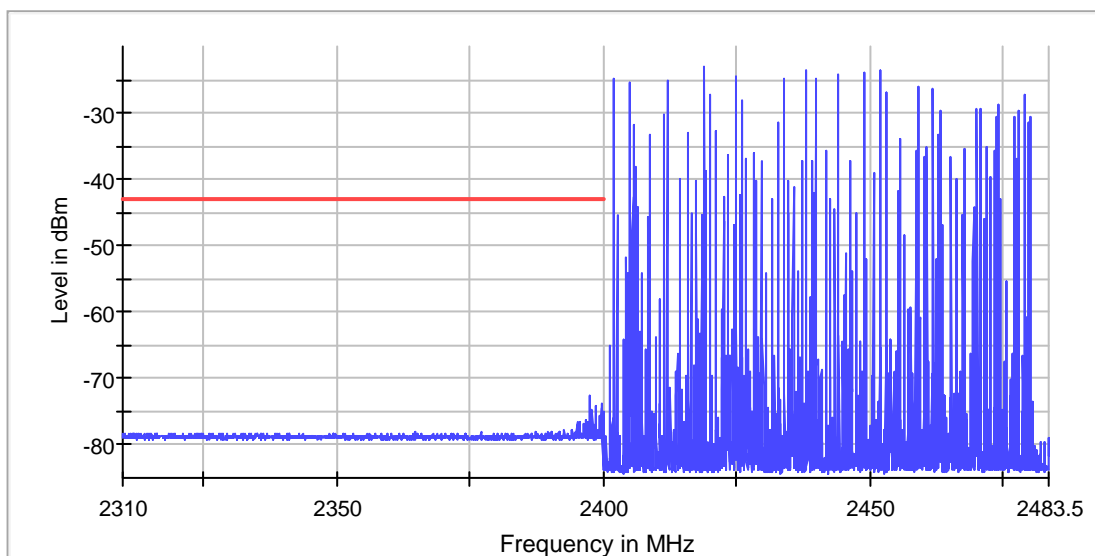
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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	1.670 s	1.670 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
SweepTime	1.800 s	1.800 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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Band Edge high (frequency independent)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Result
hopping	PASS

Inband Peak

Frequency (MHz)	Level (dBm)
2438.002244	-23.2

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2484.372356	-75.7	32.5	-43.2	PASS
2485.369335	-76.3	33.1	-43.2	PASS
2484.920695	-76.5	33.3	-43.2	PASS
2484.322508	-76.6	33.3	-43.2	PASS
2490.254532	-77.1	33.8	-43.2	PASS
2485.917674	-77.1	33.9	-43.2	PASS
2485.319486	-77.2	34.0	-43.2	PASS
2486.266616	-77.3	34.1	-43.2	PASS
2492.746979	-77.6	34.4	-43.2	PASS
2485.967523	-77.7	34.4	-43.2	PASS
2485.120091	-77.7	34.5	-43.2	PASS
2484.621601	-77.8	34.5	-43.2	PASS
2489.357251	-77.8	34.6	-43.2	PASS
2488.260574	-77.8	34.6	-43.2	PASS
2486.117069	-77.9	34.7	-43.2	PASS



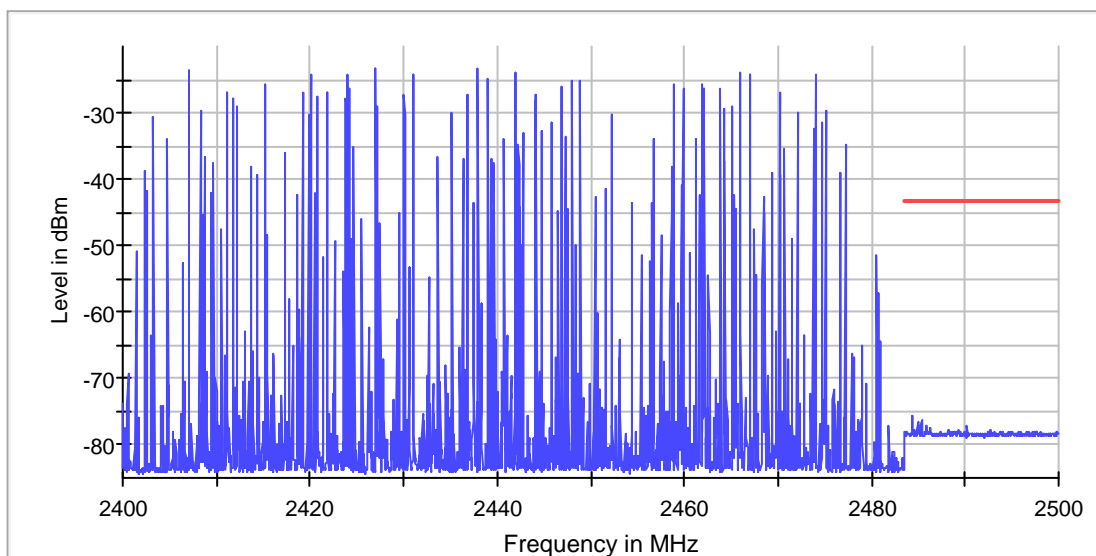
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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	≤ 100.000 kHz
VBW	300.000 kHz	≥ 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	1.670 s	1.670 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	330	~ 330
SweepTime	330.000 ms	330.000 ms
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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Tx Spurious Emission (frequency independent)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Result
hopping	PASS

Final measurements

Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
2488.249474	-46.7	-79.7	-41.2	38.5	PASS

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.249474	-46.7	5.5	-41.2
2488.749419	-47.2	6.0	-41.2
2487.249585	-49.6	8.4	-41.2
2483.749972	-50.3	9.1	-41.2
2487.749530	-51.4	10.2	-41.2
2486.749640	-52.1	10.9	-41.2
2486.249696	-52.5	11.3	-41.2
2485.249806	-54.2	12.9	-41.2
2485.749751	-54.7	13.5	-41.2
2484.749862	-58.2	16.9	-41.2
2384.755444	-58.5	17.2	-41.2
2484.249917	-58.5	17.3	-41.2
2378.257765	-59.1	17.8	-41.2
2379.257408	-59.7	18.5	-41.2
2385.755087	-60.0	18.8	-41.2

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	1000.000000	1	1
1000.000000	2400.000000	2	2
2400.000000	2483.500000	2	2
2483.500000	7000.000000	2	2
7000.000000	26000.000000	2	2



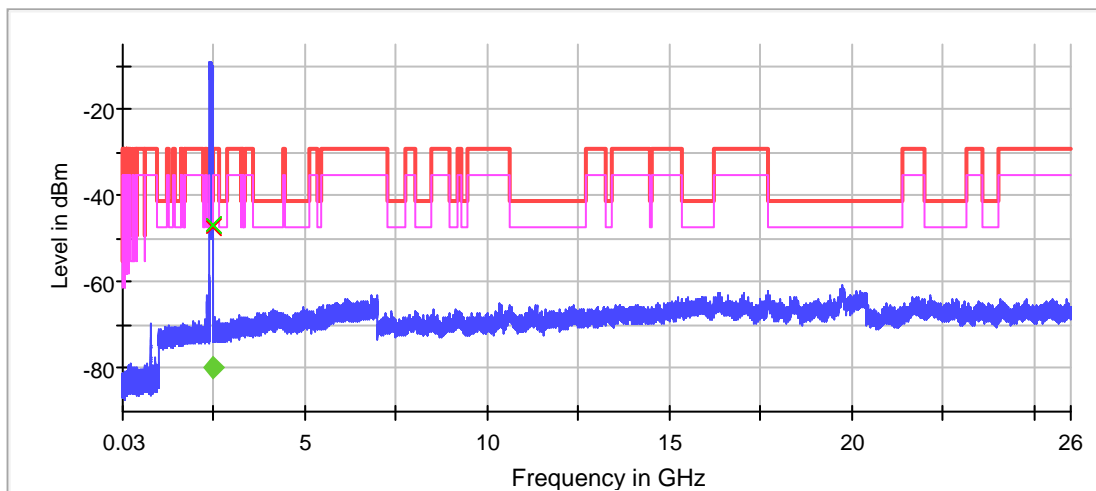
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✗ Limit [limit.Result:1] ✗ Sum Level [trace.Result:1]
◆ Threshold [limit.2.Result:1] ◆ Critical [Over Limit.Result:1]

Pre Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	19400	~ 19400
SweepTime	19.400 ms	AUTO
Reference Level	-30.000 dBm	-30.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 150	max. 150
Stable	3 / 3	3



CMA Testing and Certification Laboratories

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Date : 02 Sep 2016

Pre Measurement 2

Setting	Instrument Value	Target Value
RBW	1.000 MHz	≤ 1.000 MHz
VBW	3.000 MHz	≥ 3.000 MHz
SweepPoints	2800	~ 2800
SweepTime	2.800 ms	AUTO
Reference Level	-30.000 dBm	-30.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 150	max. 150
Stable	3 / 3	3

Final Measurement 2

Setting	Instrument Value	Target Value
Span	ZeroSpan	ZeroSpan
RBW	1.000 MHz	~ 1.000 MHz
VBW	3.000 MHz	~ 3.000 MHz
SweepPoints	10001	~ 10001
SweepTime	1.000 s	1.000 s
Reference Level	-30.000 dBm	-30.000 dBm
Attenuation	0.000 dB	0.000 dB
Detector	RMS	RMS
SweepCount	1	1
Filter	3 dB	3 dB
Trace Mode	Clear Write	Clear Write
SweepType	Sweep	AUTO
Preamp	off	off



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

Rx Spurious Emission (frequency independent)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Result
hopping	PASS

Final measurements

Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
---	---	---	---	---	---

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19758.828483	-60.2	19.0	-41.2
19703.831377	-60.5	19.3	-41.2
19723.830325	-60.6	19.4	-41.2
19716.830693	-60.7	19.5	-41.2
19734.829746	-60.8	19.6	-41.2
19767.828009	-60.9	19.7	-41.2
19766.828062	-60.9	19.7	-41.2
20230.803642	-60.9	19.7	-41.2
19762.828272	-61.0	19.7	-41.2
19727.830114	-61.0	19.8	-41.2
19778.827430	-61.1	19.8	-41.2
19704.831325	-61.1	19.9	-41.2
19777.827483	-61.1	19.9	-41.2
19712.830904	-61.2	19.9	-41.2
19717.830640	-61.2	19.9	-41.2

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	1000.000000	1	1
1000.000000	7000.000000	2	2
7000.000000	26000.000000	2	2



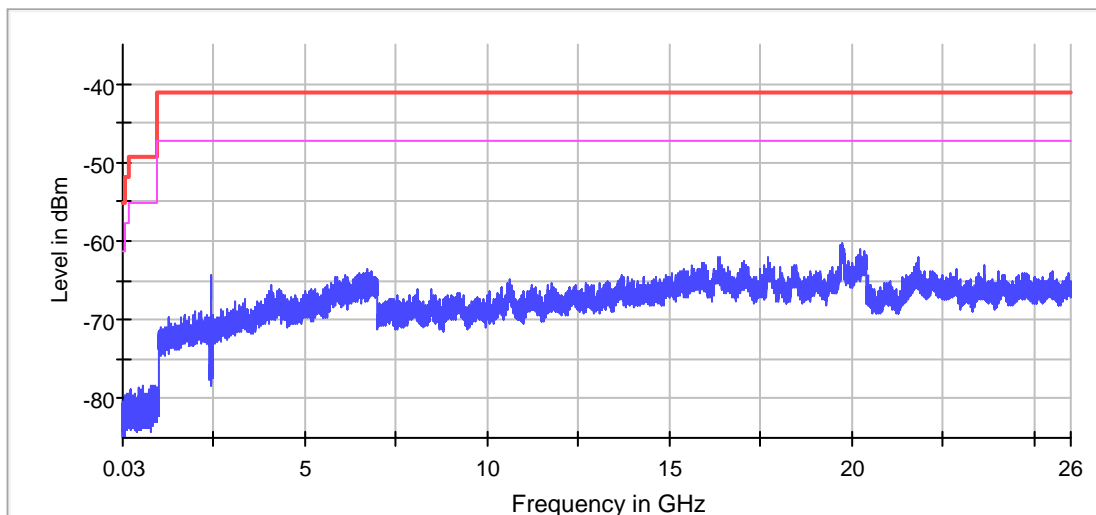
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TEST REPORT

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— Limit [limit.Result:1] X Threshold [limit.2.Result:1]

Pre Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	9700	~ 9700
SweepTime	9.700 ms	AUTO
Reference Level	-67.000 dBm	-67.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 150	max. 150
Stable	3 / 3	3



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Pre Measurement 2

Setting	Instrument Value	Target Value
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	6000	~ 6000
SweepTime	6.000 ms	AUTO
Reference Level	-67.000 dBm	-67.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 150	max. 150
Stable	3 / 3	3



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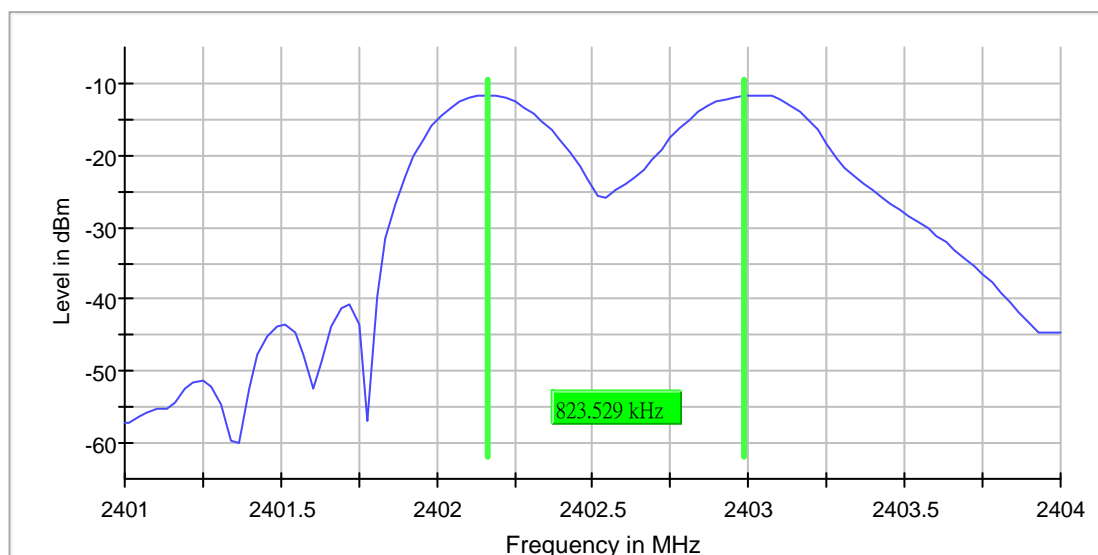
Date : 02 Sep 2016

Carrier Frequency Separation (2402 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Frequency Separation (MHz)	Limit Min (MHz)	Limit Max (MHz)	Center Frequency low Channel (MHz)	Center Frequency high Channel (MHz)	Result
2402.000000	0.823529	0.666667	---	2402.161765	2402.985294	PASS





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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40400 GHz	2.40400 GHz
Span	3.000 MHz	3.000 MHz
RBW	300.000 kHz	<= 300.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	101	~ 10
SweepTime	6.313 μ s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	16 / max. 150	max. 150
Stable	10 / 10	10



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TEST REPORT

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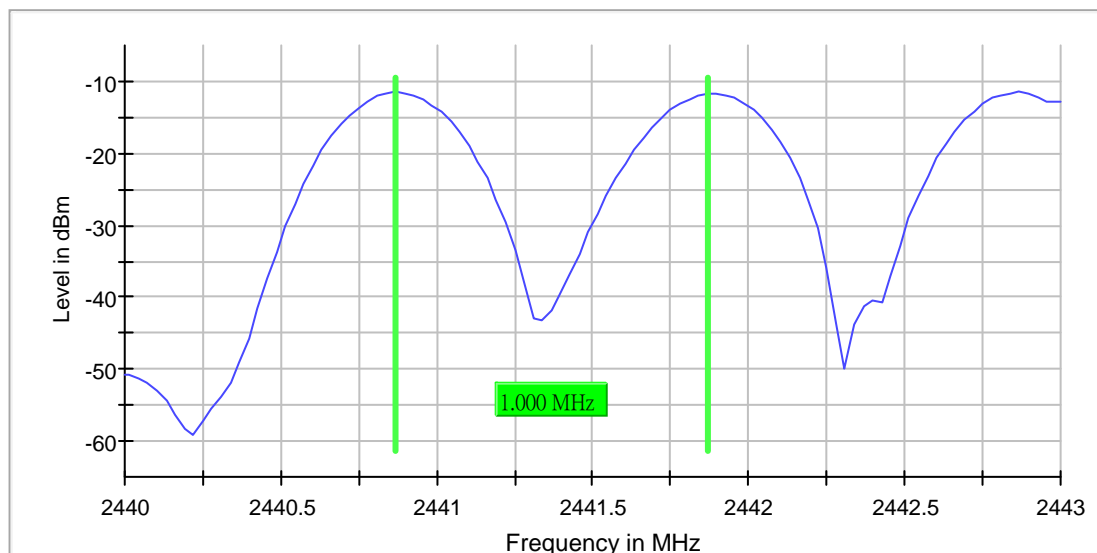
Date : 02 Sep 2016

Carrier Frequency Separation (2441 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Frequency Separation (MHz)	Limit Min (MHz)	Limit Max (MHz)	Center Frequency low Channel (MHz)	Center Frequency high Channel (MHz)	Result
2441.000000	1.000000	0.666667	---	2440.867647	2441.867647	PASS





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Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44000 GHz	2.44000 GHz
Stop Frequency	2.44300 GHz	2.44300 GHz
Span	3.000 MHz	3.000 MHz
RBW	300.000 kHz	<= 300.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	101	~ 10
SweepTime	6.313 μ s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	14 / max. 150	max. 150
Stable	10 / 10	10



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TEST REPORT

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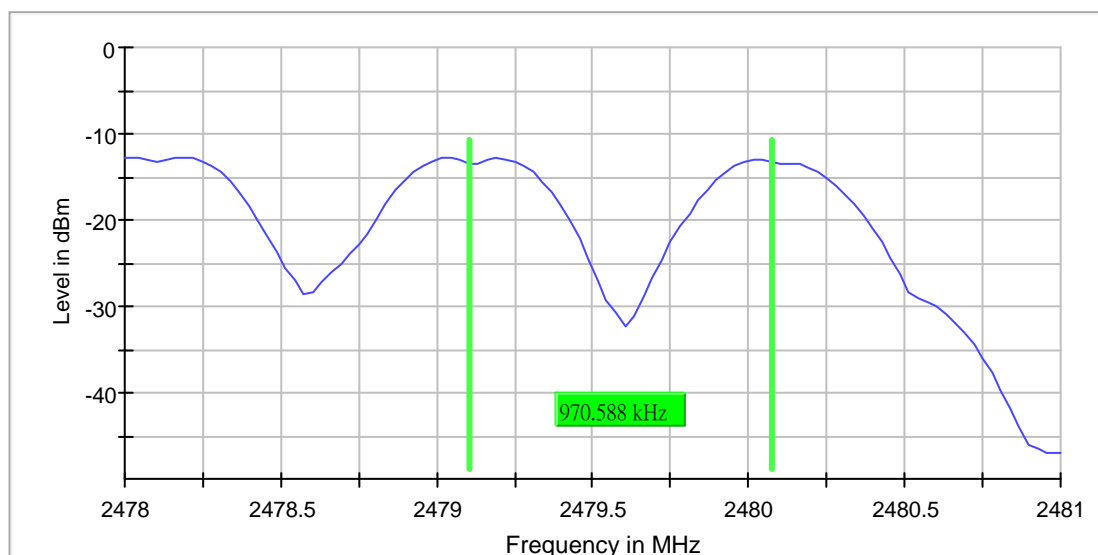
Date : 02 Sep 2016

Carrier Frequency Separation (2479 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Frequency Separation (MHz)	Limit Min (MHz)	Limit Max (MHz)	Center Frequency low Channel (MHz)	Center Frequency high Channel (MHz)	Result
2479.000000	0.970588	0.666667	---	2479.102941	2480.073529	PASS





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TEST REPORT

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Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	3.000 MHz	3.000 MHz
RBW	300.000 kHz	<= 300.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	101	~ 10
SweepTime	6.313 μ s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	52 / max. 150	max. 150
Stable	10 / 10	10



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TEST REPORT

Report No. : AU0052161(4)

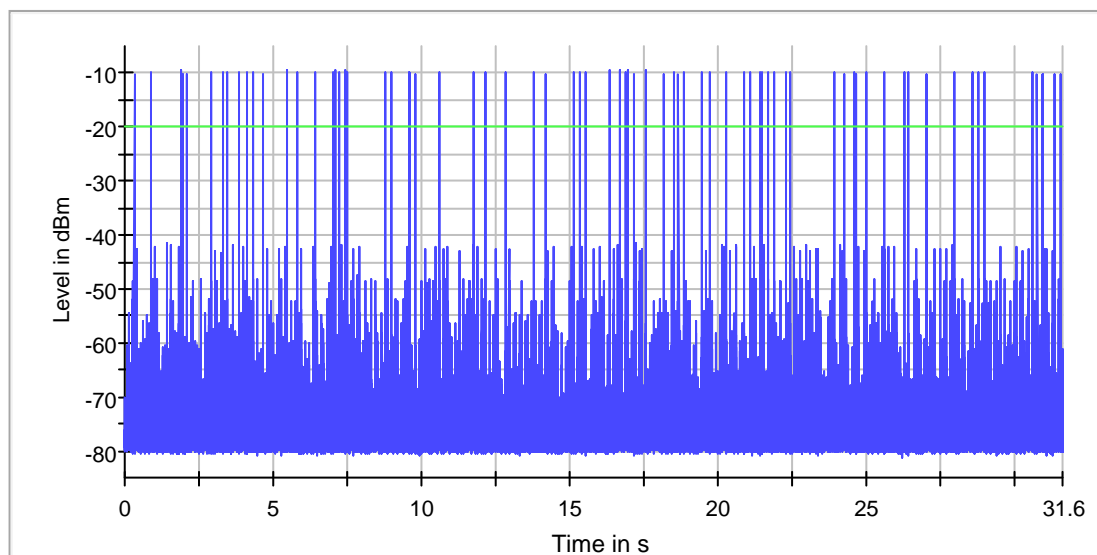
Date : 02 Sep 2016

Time of Channel Occupancy (2402 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Time (ms)	Limit Max (ms)	Limit Min (ms)	Threshold (dBm)	Result
2402.000000	12.030	---	0.000	-20.0	PASS





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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Center Frequency	2.40200 GHz	2.40200 GHz
Span	ZeroSpan	ZeroSpan
RBW	500.000 kHz	~ 500.000 kHz
VBW	1.000 MHz	~ 1.500 MHz
SweepPoints	30001	~ 30001
SweepTime	31.600 s	31.600 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	0.000 dB	0.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Clear Write	Clear Write
SweepType	Sweep	AUTO
Preamp	off	off
Trigger	Extern	Extern
Trigger Offset	0.000 ms	0.000 ms



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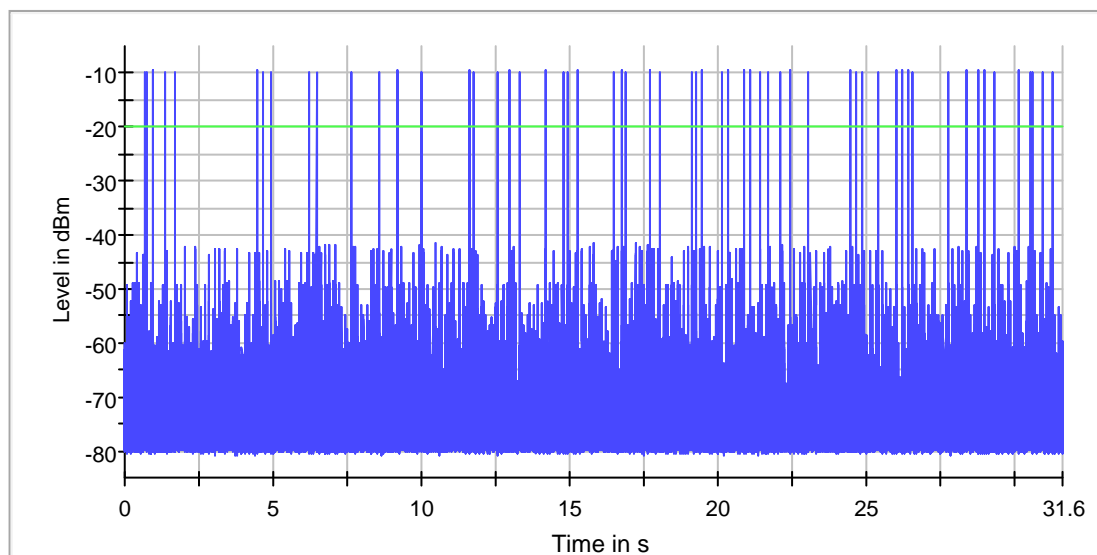
Date : 02 Sep 2016

Time of Channel Occupancy (2441 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Time (ms)	Limit Max (ms)	Limit Min (ms)	Threshold (dBm)	Result
2441.000000	9.880	---	0.000	-20.0	PASS





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TEST REPORT

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Measurement

Setting	Instrument Value	Target Value
Center Frequency	2.44100 GHz	2.44100 GHz
Span	ZeroSpan	ZeroSpan
RBW	500.000 kHz	~ 500.000 kHz
VBW	1.000 MHz	~ 1.500 MHz
SweepPoints	30001	~ 30001
SweepTime	31.600 s	31.600 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	0.000 dB	0.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Clear Write	Clear Write
SweepType	Sweep	AUTO
Preamp	off	off
Trigger	Extern	Extern
Trigger Offset	0.000 ms	0.000 ms



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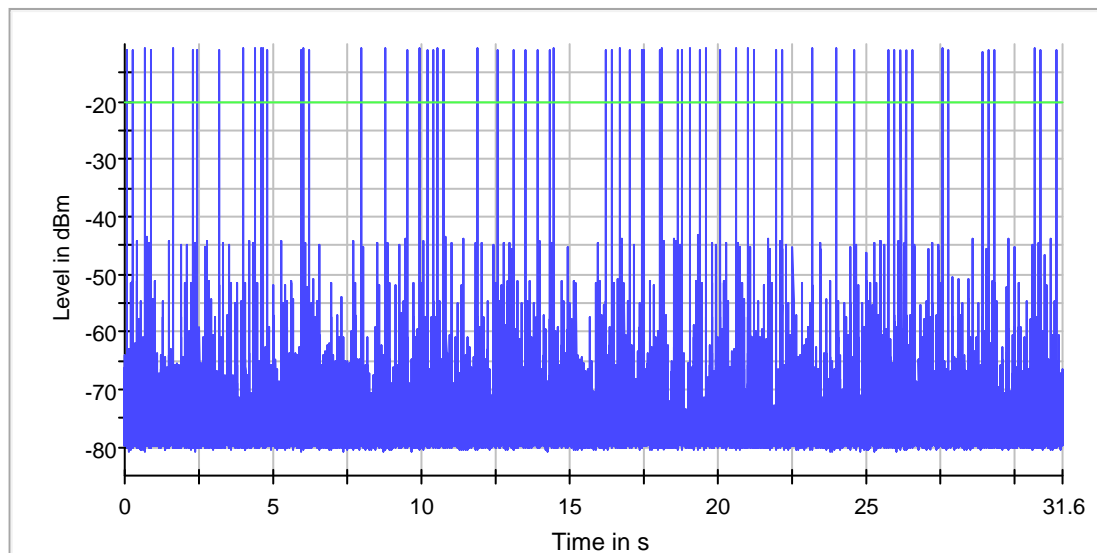
Date : 02 Sep 2016

Time of Channel Occupancy (2480 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Time (ms)	Limit Max (ms)	Limit Min (ms)	Threshold (dBm)	Result
2480.000000	10.780	---	0.000	-20.0	PASS





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Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Center Frequency	2.48000 GHz	2.48000 GHz
Span	ZeroSpan	ZeroSpan
RBW	500.000 kHz	~ 500.000 kHz
VBW	1.000 MHz	~ 1.500 MHz
SweepPoints	30001	~ 30001
SweepTime	31.600 s	31.600 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	0.000 dB	0.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Clear Write	Clear Write
SweepType	Sweep	AUTO
Preamp	off	off
Trigger	Extern	Extern
Trigger Offset	0.000 ms	0.000 ms



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Report No. : AU0052161(4)

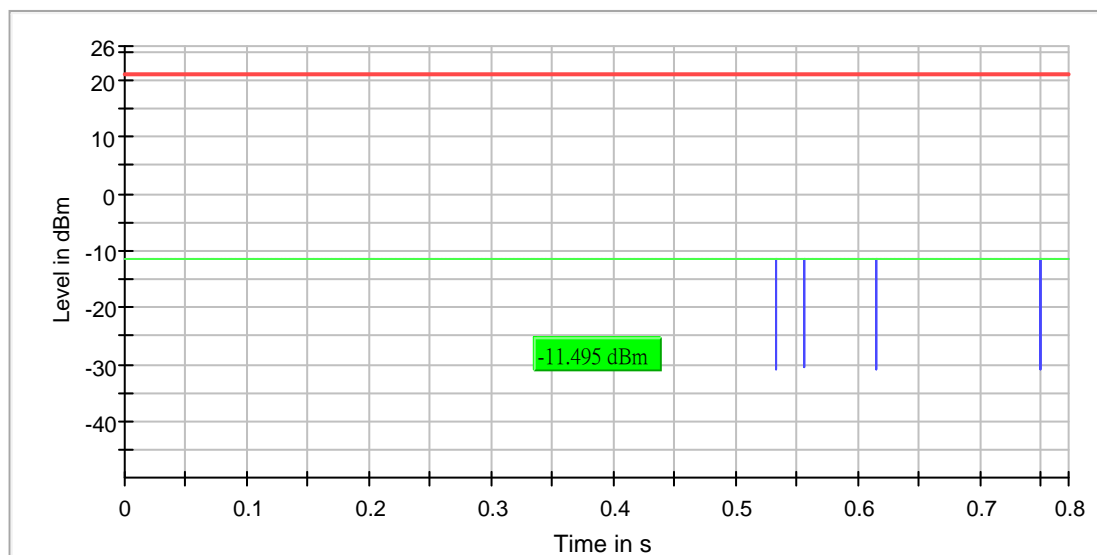
Date : 02 Sep 2016

RF output power (2402 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Gated EIRP (dBm)	Limit Max (dBm)	Duty Cycle (%)	Result
2402.000000	-11.5	21.0	77.783	PASS





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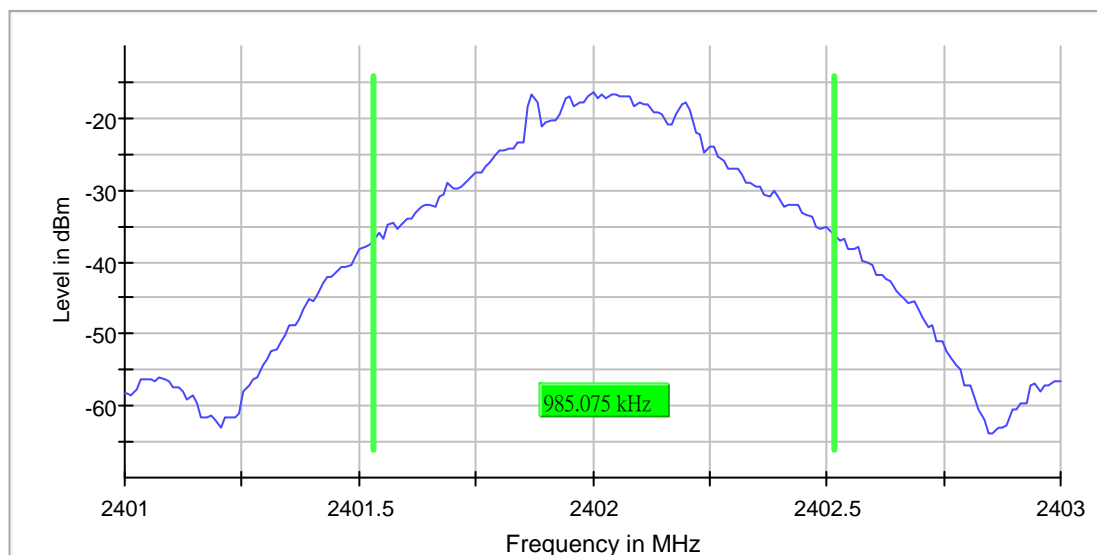
Date : 02 Sep 2016

Emission Bandwidth 20 dB (2402 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2402.000000	0.985075	---	---	2401.532338	2402.517413	-16.3	PASS





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TEST REPORT

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Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	~ 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	200	~ 200
SweepTime	189.620 μ s	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	41 / max. 150	max. 150
Stable	5 / 5	5



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Band Edge low (2402 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Result
2402.000000	PASS

Inband Peak

Frequency (MHz)	Level (dBm)
2402.023788	-15.5

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.525264	-70.7	35.2	-35.5	PASS
2399.925042	-71.3	35.7	-35.5	PASS
2399.575236	-71.5	36.0	-35.5	PASS
2399.475292	-71.6	36.1	-35.5	PASS
2399.625208	-72.3	36.8	-35.5	PASS
2399.025541	-72.7	37.2	-35.5	PASS
2399.875069	-72.8	37.2	-35.5	PASS
2398.575791	-72.8	37.2	-35.5	PASS
2399.075514	-72.8	37.3	-35.5	PASS
2399.825097	-73.3	37.7	-35.5	PASS
2399.775125	-73.5	37.9	-35.5	PASS
2399.125486	-73.6	38.1	-35.5	PASS
2399.675180	-73.6	38.1	-35.5	PASS
2399.725153	-73.7	38.1	-35.5	PASS
2399.425319	-74.0	38.5	-35.5	PASS



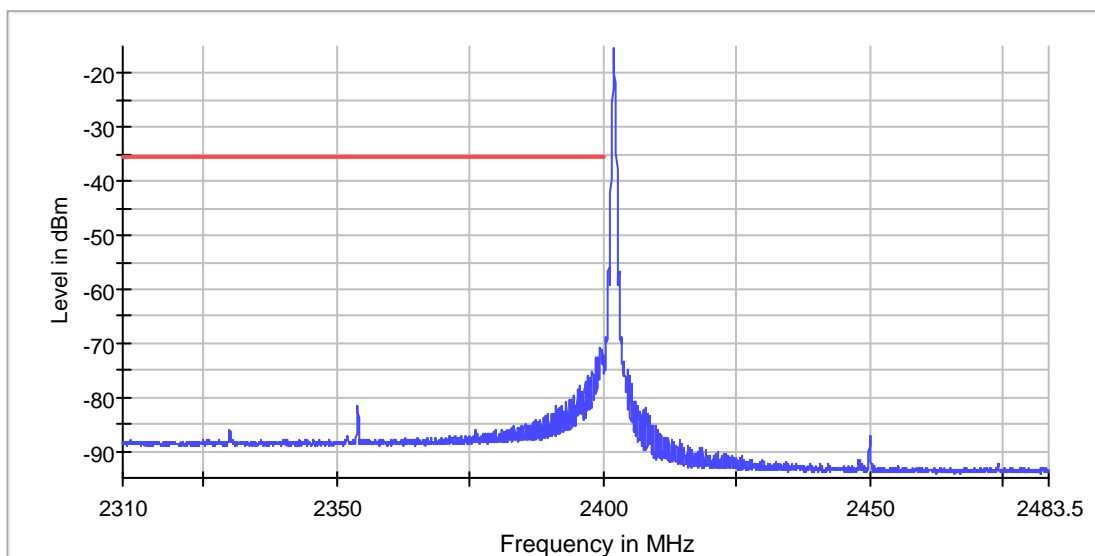
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Date : 02 Sep 2016



Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	1.670 s	1.670 s
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
SweepTime	1.800 s	1.800 s
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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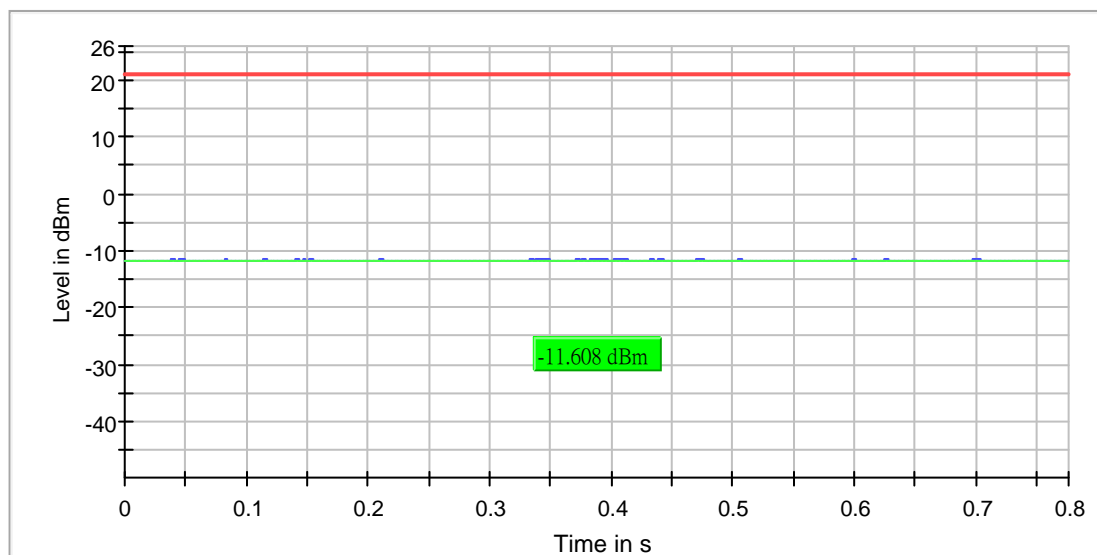
Date : 02 Sep 2016

RF output power (2441 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Gated EIRP (dBm)	Limit Max (dBm)	Duty Cycle (%)	Result
2441.000000	-11.6	21.0	77.838	PASS





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TEST REPORT

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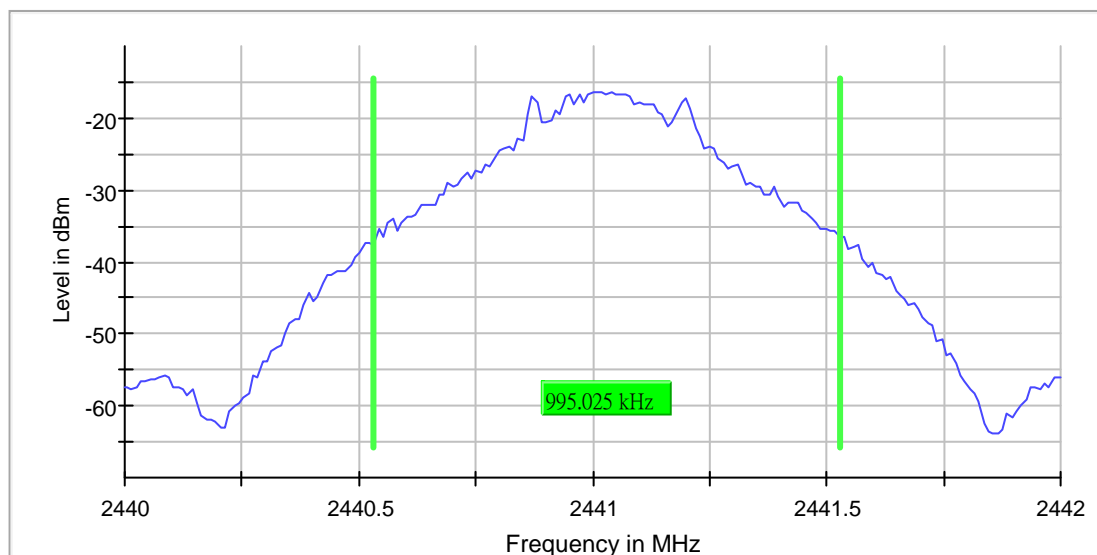
Date : 02 Sep 2016

Emission Bandwidth 20 dB (2441 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2441.000000	0.995025	---	---	2440.532338	2441.527363	-16.3	PASS





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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44000 GHz	2.44000 GHz
Stop Frequency	2.44200 GHz	2.44200 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	~ 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	200	~ 200
SweepTime	189.620 μ s	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	39 / max. 150	max. 150
Stable	5 / 5	5



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TEST REPORT

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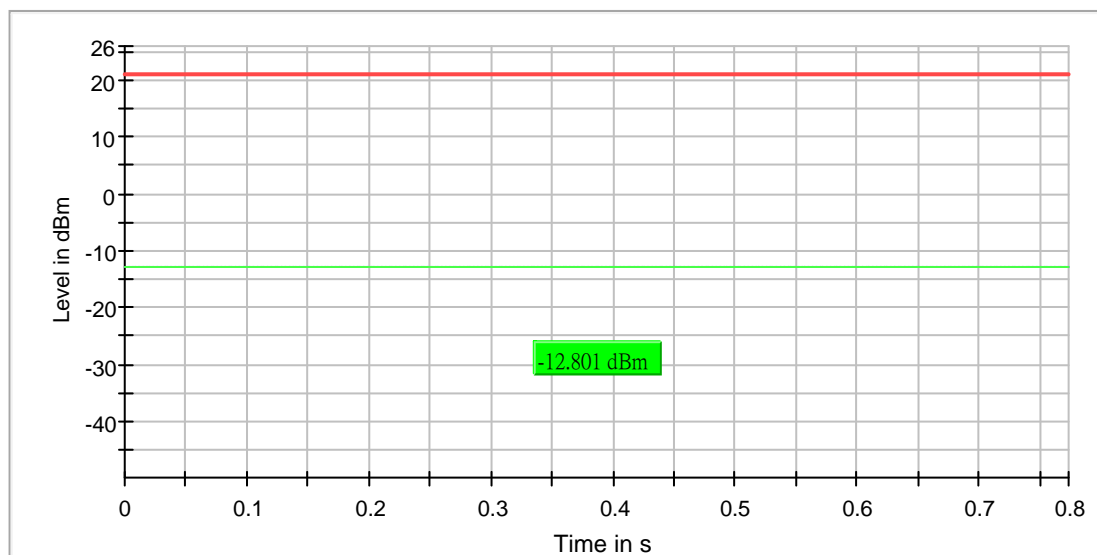
Date : 02 Sep 2016

RF output power (2480 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Gated EIRP (dBm)	Limit Max (dBm)	Duty Cycle (%)	Result
2480.000000	-12.8	21.0	77.842	PASS





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TEST REPORT

Report No. : AU0052161(4)

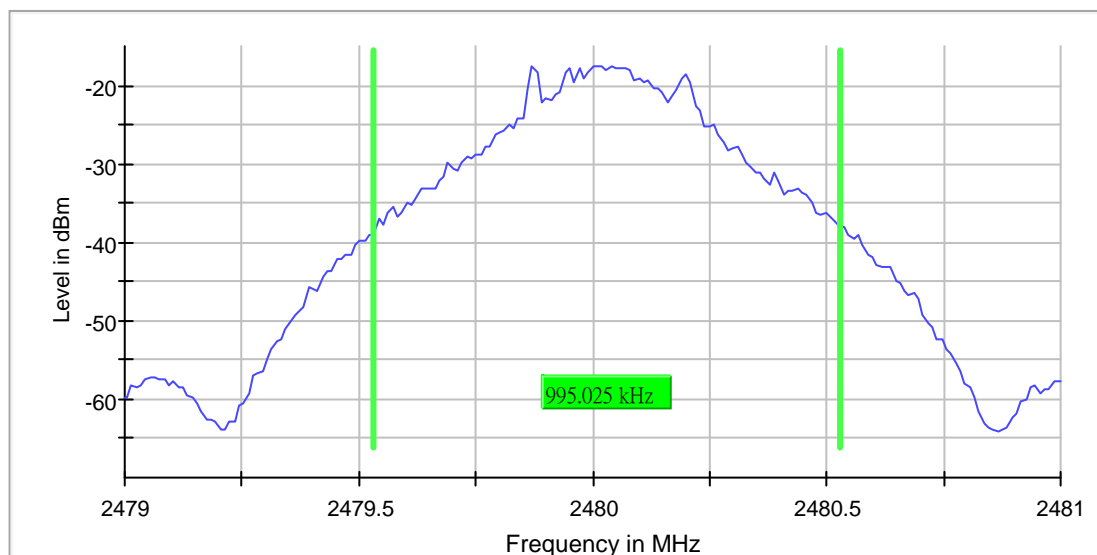
Date : 02 Sep 2016

Emission Bandwidth 20 dB (2480 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2480.000000	0.995025	---	---	2479.532338	2480.527363	-17.5	PASS





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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47900 GHz	2.47900 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	~ 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	200	~ 200
SweepTime	189.620 μ s	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	37 / max. 150	max. 150
Stable	5 / 5	5



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

Band Edge high (2480 MHz)

Test according to FCC title 47 part 15 §15.247(a), FCC Public Notice DA 00-705 and ANSI 63.10-2013

Result

DUT Frequency (MHz)	Result
2480.000000	PASS

Inband Peak

Frequency (MHz)	Level (dBm)
2479.977110	-16.6

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.973565	-74.7	38.1	-36.6	PASS
2483.923716	-75.7	39.2	-36.6	PASS
2484.422205	-76.4	39.9	-36.6	PASS
2484.472054	-76.6	40.1	-36.6	PASS
2483.524924	-76.9	40.3	-36.6	PASS
2484.023414	-77.2	40.6	-36.6	PASS
2485.419184	-77.5	40.9	-36.6	PASS
2484.970544	-77.8	41.2	-36.6	PASS
2484.521903	-78.7	42.1	-36.6	PASS
2484.920695	-79.3	42.7	-36.6	PASS
2484.870846	-79.4	42.8	-36.6	PASS
2483.873867	-79.7	43.1	-36.6	PASS
2485.020393	-79.8	43.2	-36.6	PASS
2483.574773	-79.9	43.3	-36.6	PASS
2485.469033	-80.0	43.5	-36.6	PASS



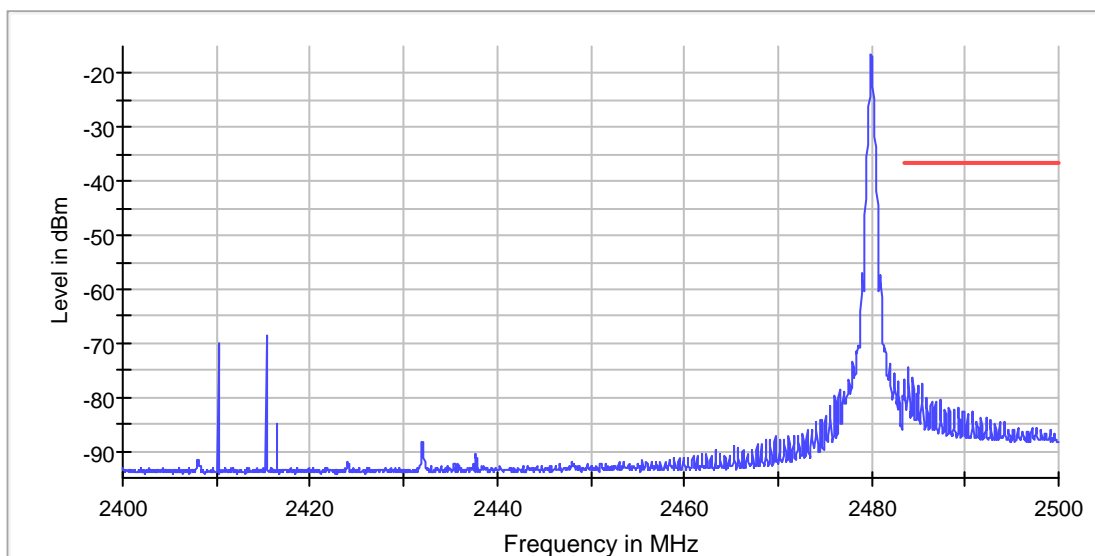
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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016



Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	1.670 s	1.670 s
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	330	~ 330
SweepTime	330.000 ms	330.000 ms
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30	0.30
Run	3 / max. 15	max. 15
Stable	3 / 3	3



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	26	° C
Relative humidity:	66	%

Testing frequency range: 9kHz to 26GHz Mode: Transmission

Measurement: Quasi-peak (9kHz – 1GHz), Peak (above 1GHz)

RBW: 9kHz (below 30MHz), 120KHz (30MHz – 1GHz), 1MHz (above 1GHz)

VBW: 30kHz (below 30MHz), 300kHz (30MHz – 1GHz), 3MHz (above 1GHz)

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
2402.030	H	87.0	- 4.2	82.8	114.0	- 31.2
2402.014	V	89.0	- 4.2	84.8	114.0	- 29.2
2441.032	H	91.1	- 4.2	86.9	114.0	- 27.1
2441.039	V	89.1	- 4.2	84.9	114.0	- 29.1
2480.032	H	89.3	- 4.3	85.0	114.0	- 29.0
2480.040	V	88.9	- 4.3	84.6	114.0	- 29.4

Remark: Other emissions more than 20dB below the limit are not reported.

Peak measurement values are lower than average limit, therefore average measurement is not necessary.



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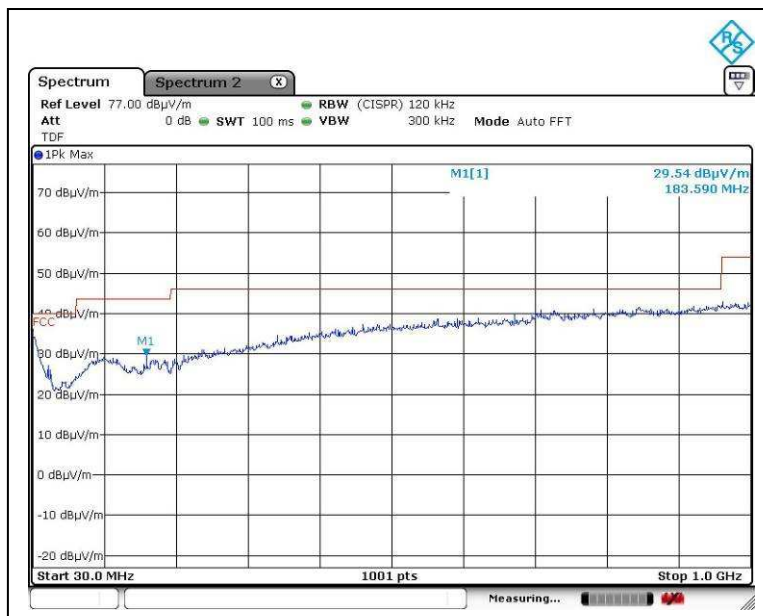
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TEST REPORT

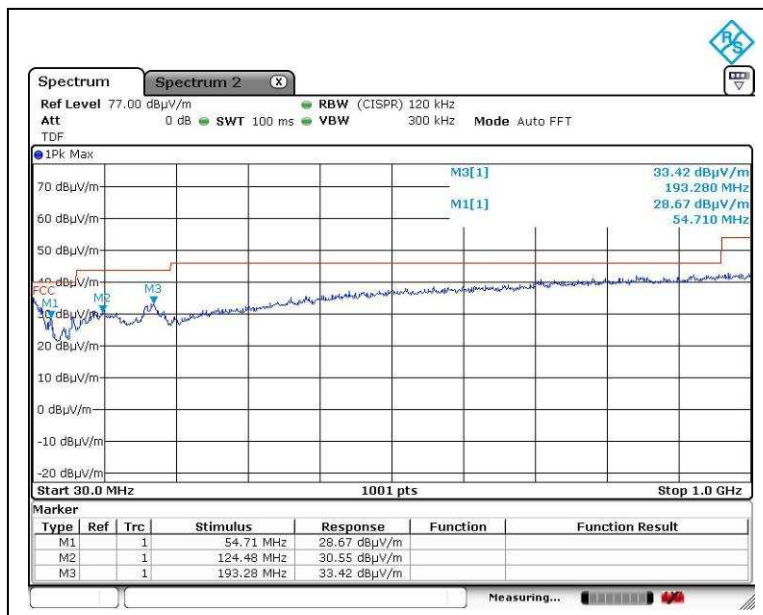
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Transmission mode, 30MHz – 1GHz, Horizontal



Transmission mode, 30MHz – 1GHz, Vertical

FCC ID: ZZX761074

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CMA Testing and Certification Laboratories

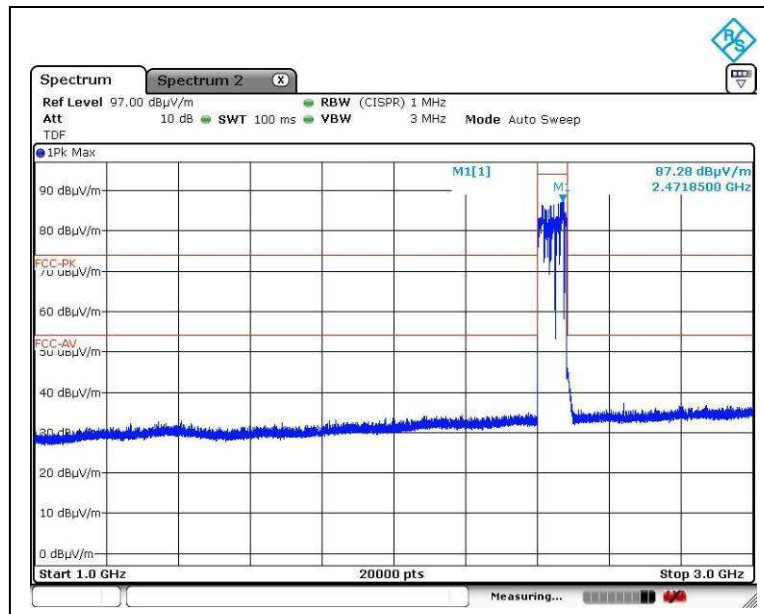
廠商會檢定中心

TEST REPORT

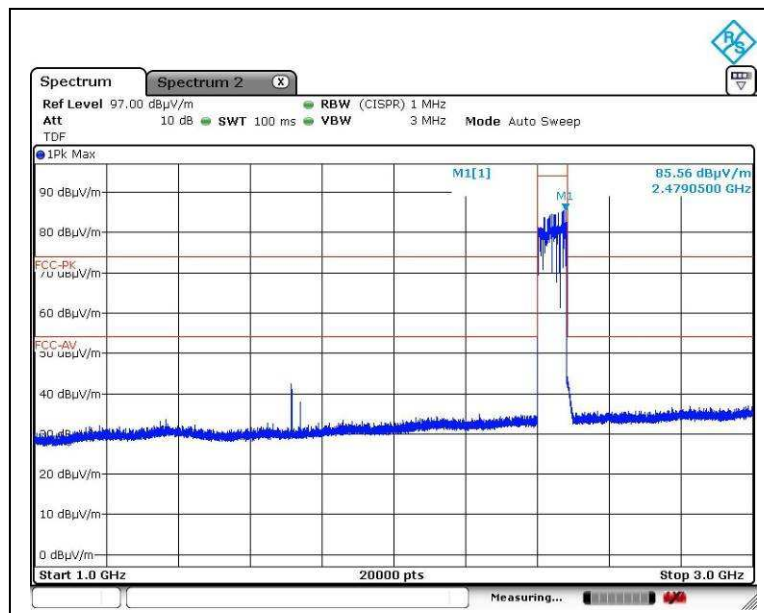
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Transmission mode, 1GHz – 3GHz, Horizontal



Transmission mode, 1GHz – 3GHz, Vertical

FCC ID: ZZX761074



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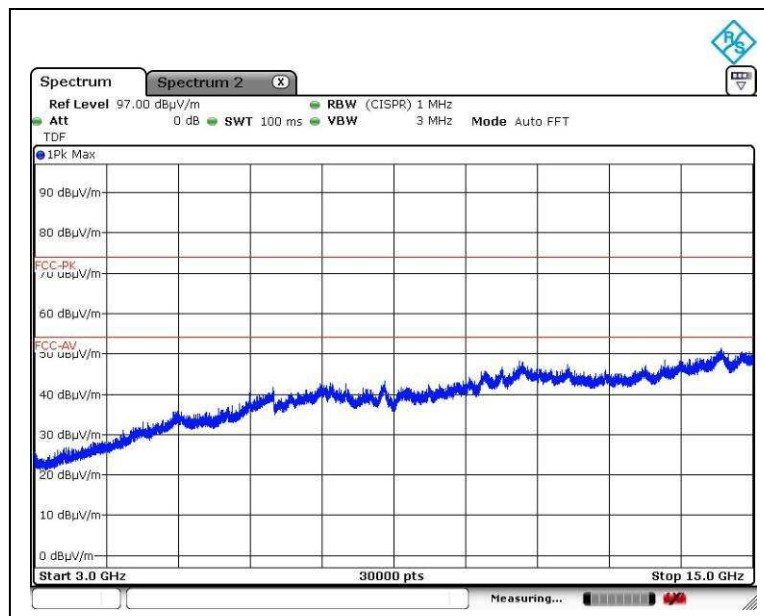
廠商會檢定中心

TEST REPORT

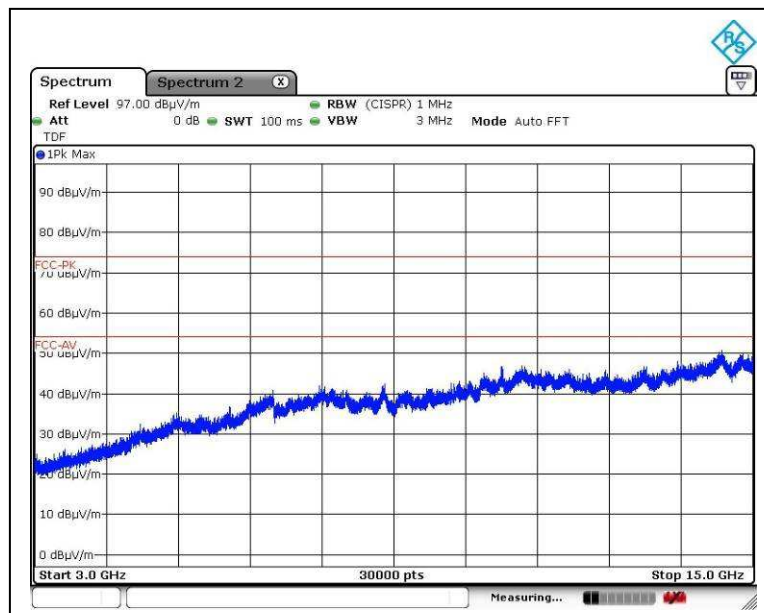
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Transmission mode, 3GHz – 15GHz, Horizontal



Transmission mode, 3GHz – 15GHz, Vertical

FCC ID: ZZX761074

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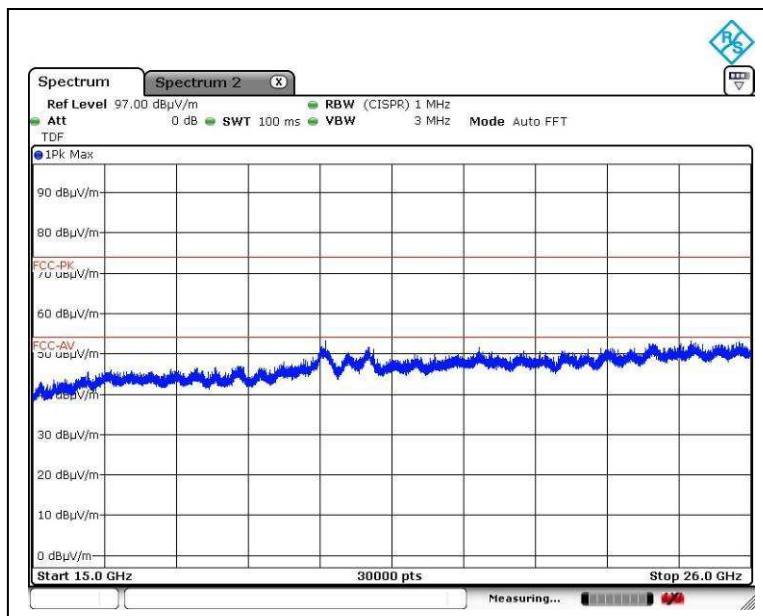
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TEST REPORT

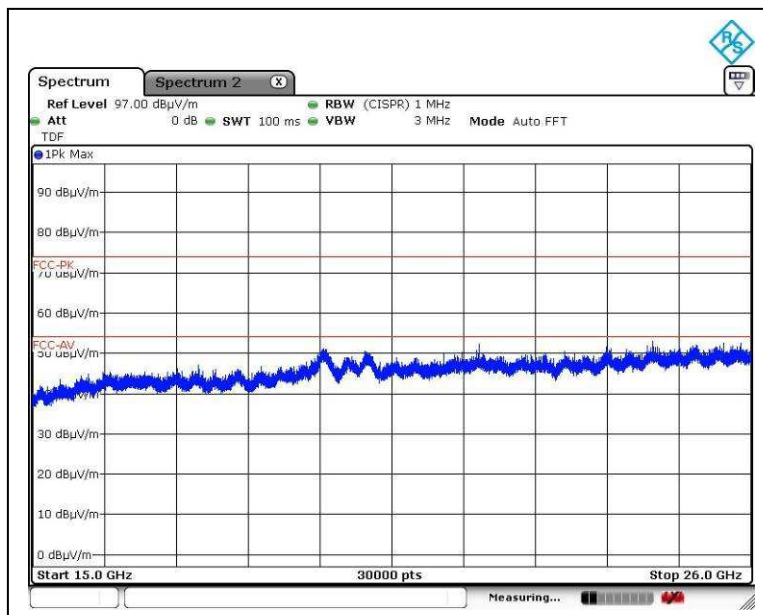
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Transmission mode, 15GHz – 26GHz, Horizontal



Transmission mode, 15GHz – 26GHz, Vertical

FCC ID: ZZX761074

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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	26	° C
Relative humidity:	66	%

Testing frequency range: 9kHz to 26GHz Mode: Receiving

Measurement: Quasi-peak (9kHz – 1GHz), Peak (above 1GHz)

RBW: 9kHz (below 30MHz), 120KHz (30MHz – 1GHz), 1MHz (above 1GHz)

VBW: 30kHz (below 30MHz), 300kHz (30MHz – 1GHz), 3MHz (above 1GHz)

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)

Remark: No specified emission found



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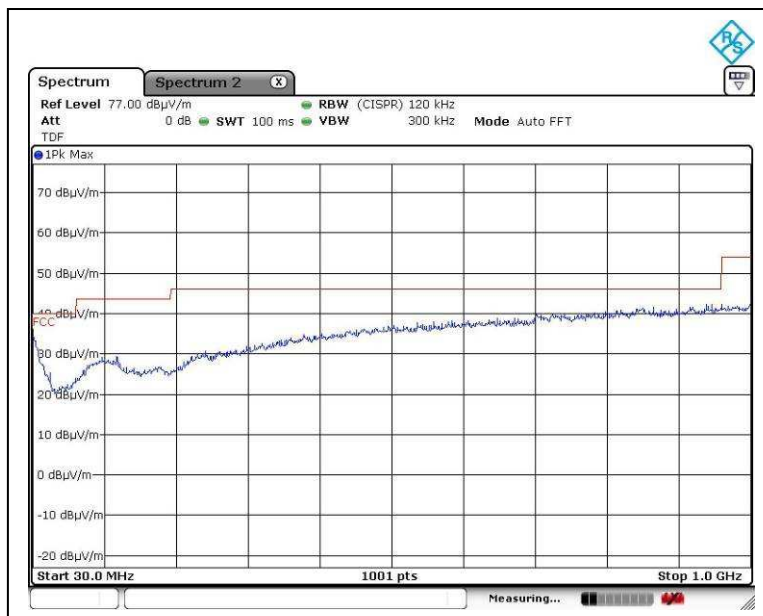
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TEST REPORT

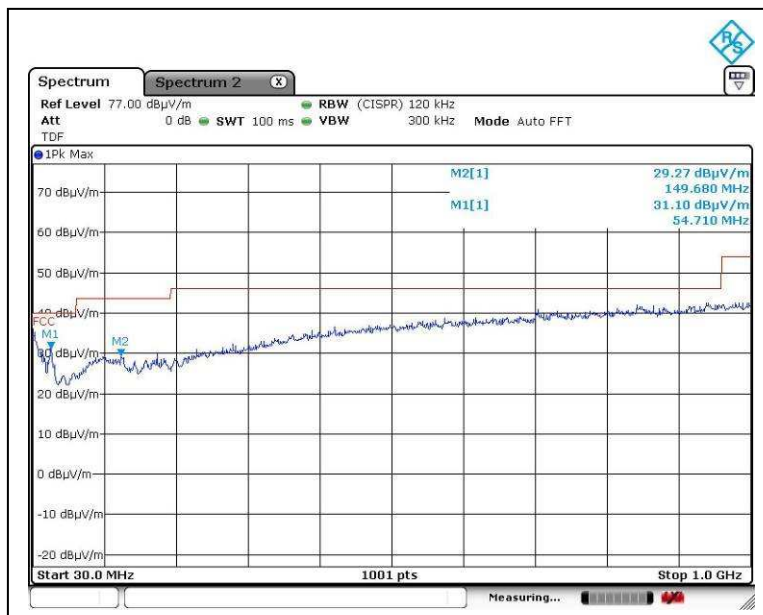
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Receiving mode, 30MHz – 1GHz, Horizontal



Receiving mode, 30MHz – 1GHz, Vertical

FCC ID: ZZX761074

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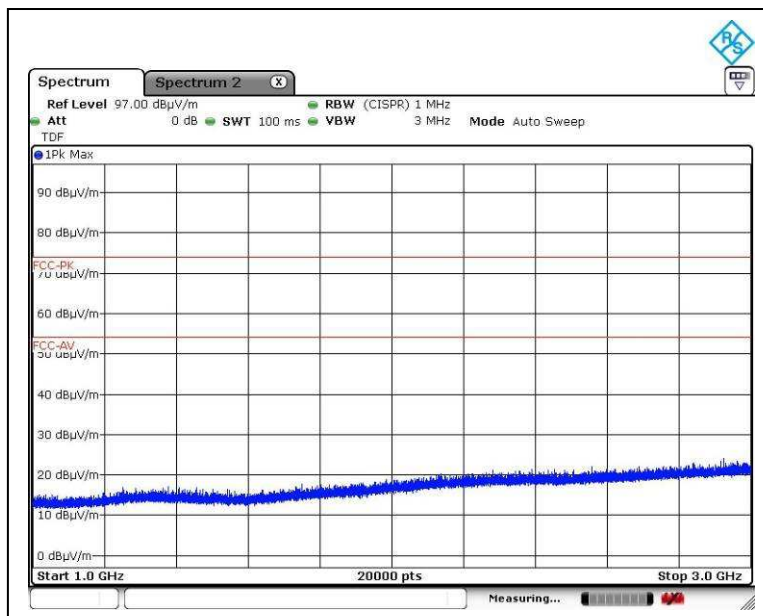
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TEST REPORT

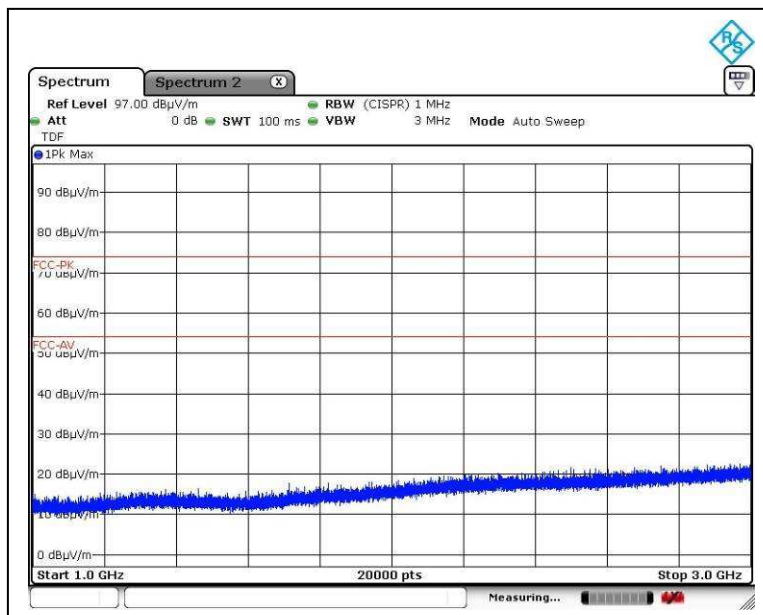
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Receiving mode, 1GHz – 3GHz, Horizontal



Receiving mode, 1GHz – 3GHz, Vertical

FCC ID: ZZX761074

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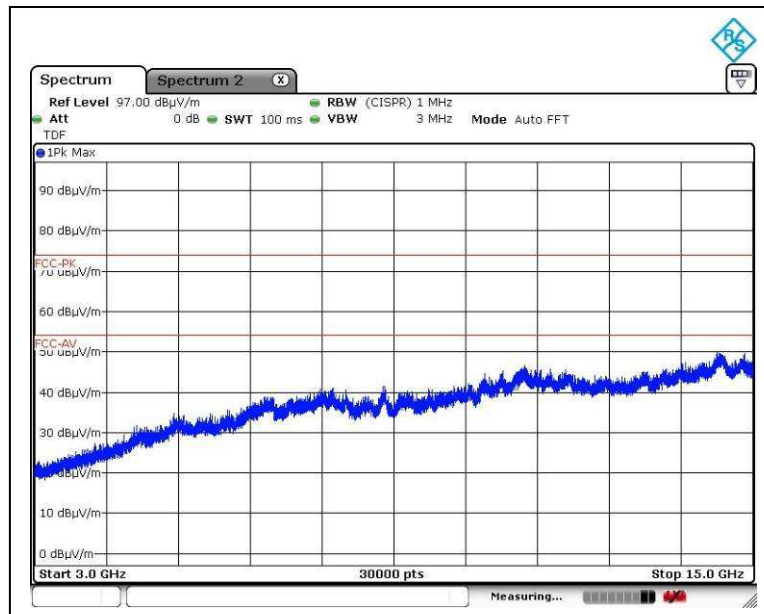
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TEST REPORT

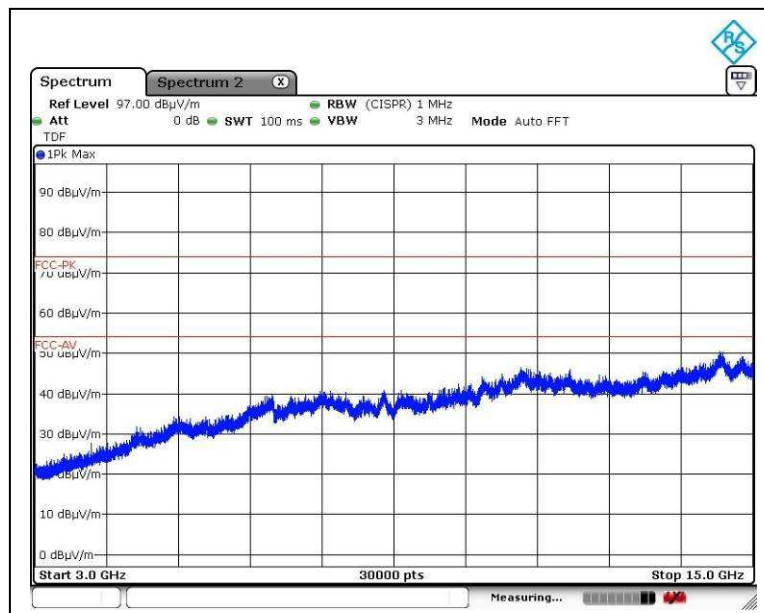
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Receiving mode, 3GHz – 15GHz, Horizontal



Receiving mode, 3GHz – 15GHz, Vertical

FCC ID: ZZX761074

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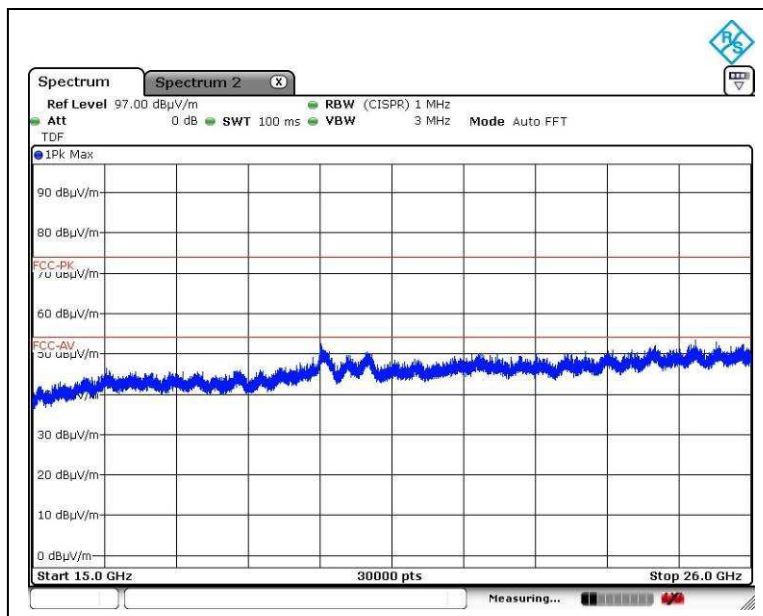
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TEST REPORT

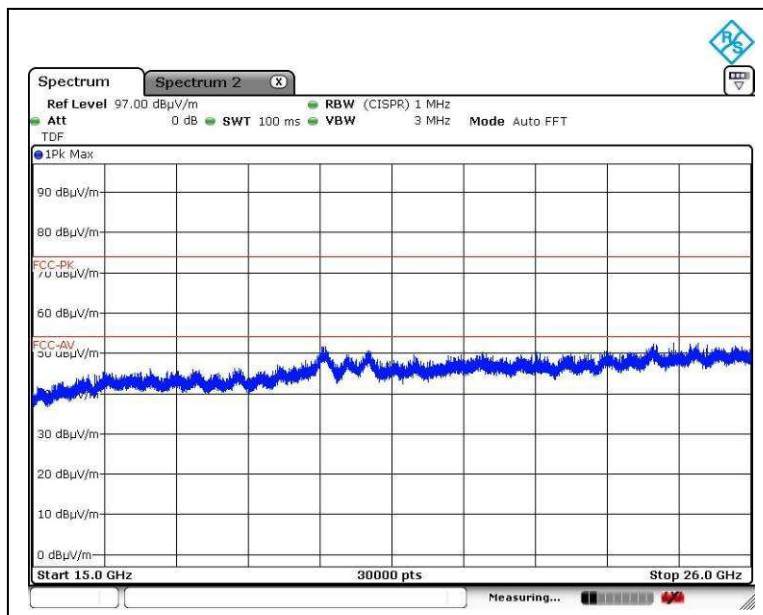
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Receiving mode, 15GHz – 26GHz, Horizontal



Receiving mode, 15GHz – 26GHz, Vertical

FCC ID: ZZX761074

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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	26	° C
Relative humidity:	66	%

Testing frequency range: 9kHz to 26GHz Mode: Aux-in + Charging

Measurement: Quasi-peak (9kHz – 1GHz), Peak (above 1GHz)

RBW: 9kHz (below 30MHz), 120kHz (30MHz – 1GHz), 1MHz (above 1GHz)

VBW: 30kHz (below 30MHz), 300kHz (30MHz – 1GHz), 3MHz (above 1GHz)

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
70.561	V	11.3	8.0	19.3	40.0	- 20.7
82.021	V	10.1	8.5	18.6	40.0	- 21.4
82.303	H	9.0	8.5	17.5	40.0	- 22.5
109.810	V	11.3	12.2	23.5	43.5	- 20.0
133.632	H	8.3	14.4	22.7	43.5	- 20.8
192.861	V	11.6	11.2	22.8	43.5	- 20.7
204.534	H	8.5	12.0	20.5	43.0	- 22.5

Remark: Other emissions more than 20dB below the limit are not reported.



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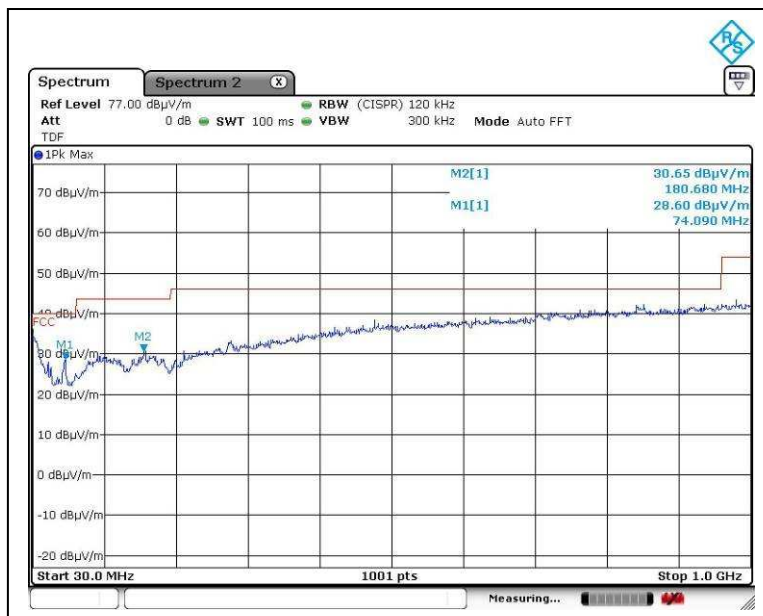
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TEST REPORT

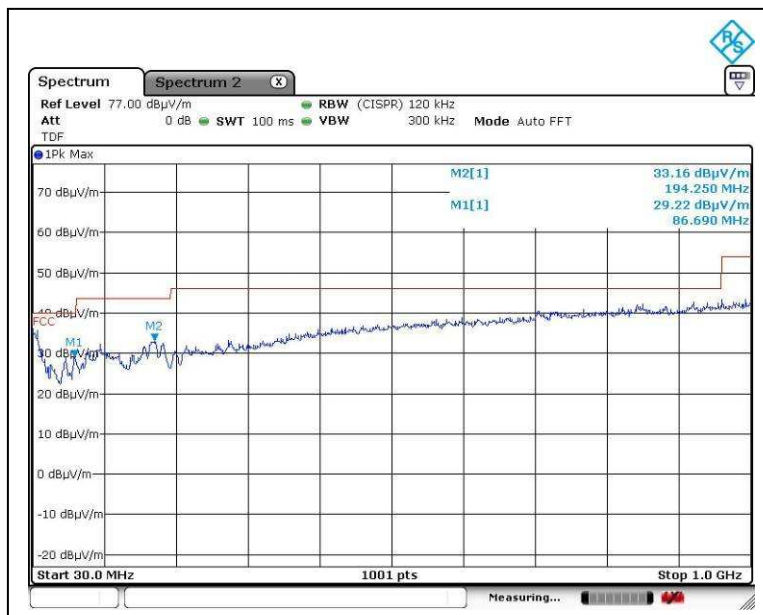
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



Aux-in and charging mode, 30MHz – 1GHz, Horizontal



Aux-in and charging mode, 30MHz – 1GHz, Vertical

FCC ID: ZZX761074

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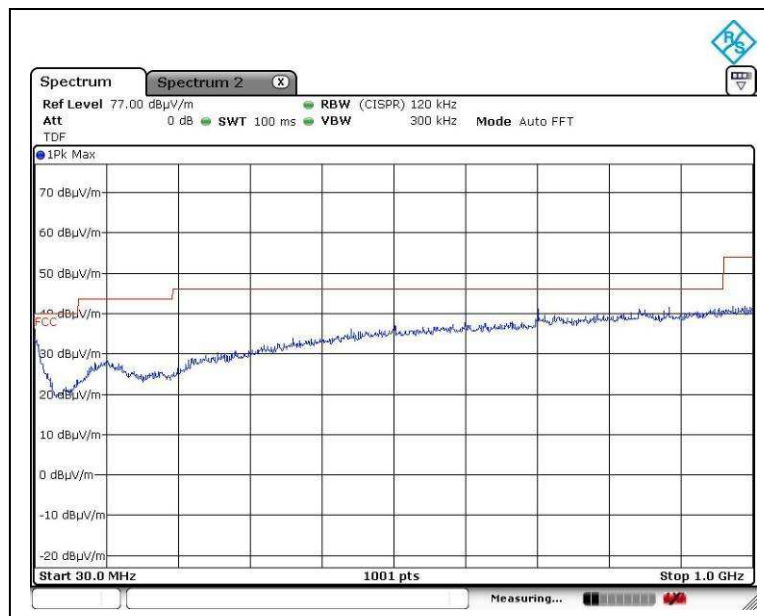
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TEST REPORT

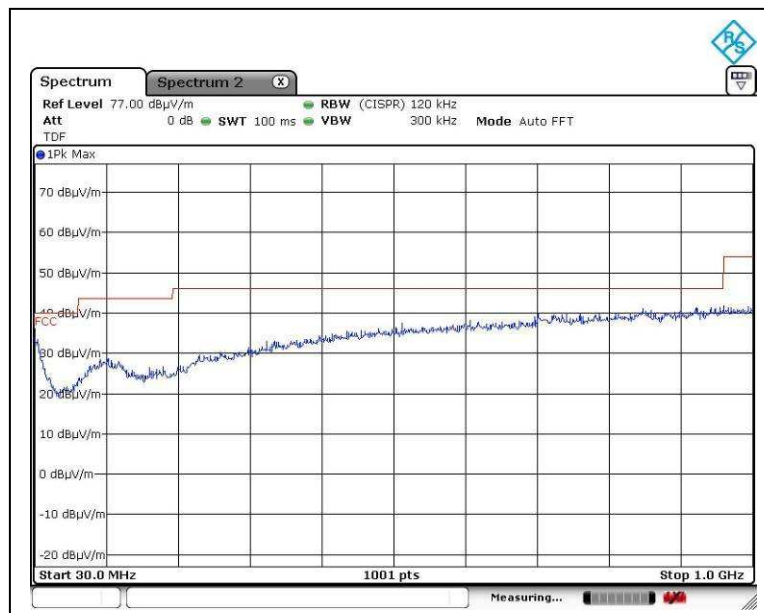
Report No. : AU0052161(4)

Date : 02 Sep 2016

2.4 Radiated Emission Measurement Data (Con't)



LED on, 30MHz – 1GHz, Horizontal



LED on, 30MHz – 1GHz, Vertical

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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

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 EUT connected to an adaptor for operating



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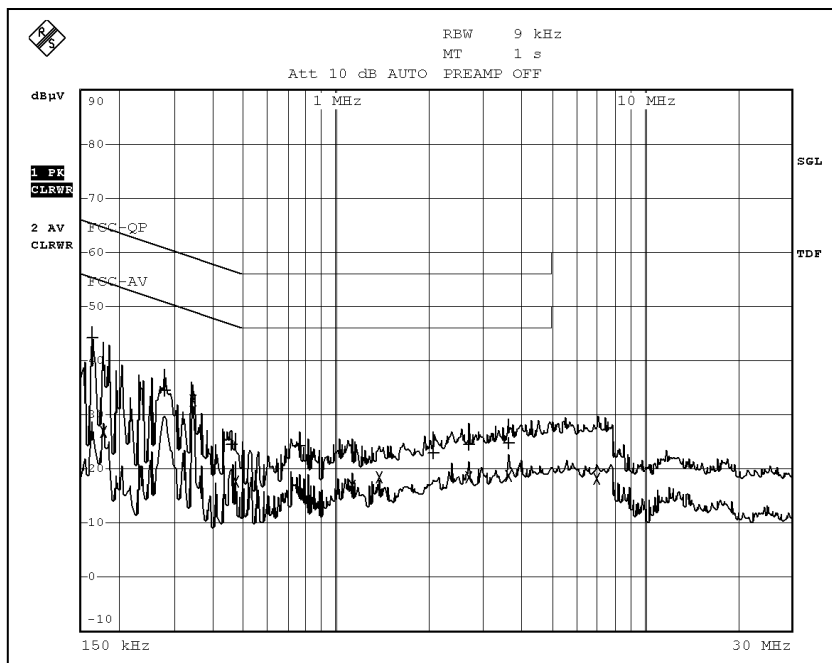
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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

3.3 Graph and Table of Conducted Emission Measurement Data



EDIT PEAK LIST (Final Measurement Results)				
Trace1:	FCC-QP			
Trace2:	FCC-AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	163.5 kHz	44.17	N gnd	-21.10
2 Average	177 kHz	26.89	N gnd	-27.73
1 Quasi Peak	280.5 kHz	34.59	N gnd	-26.20
2 Average	348 kHz	32.55	N gnd	-16.45
1 Quasi Peak	460.5 kHz	24.57	L1 gnd	-32.11
2 Average	478.5 kHz	17.81	L1 gnd	-28.55
1 Quasi Peak	765.5 kHz	24.25	L1 gnd	-31.74
2 Average	1.13 MHz	16.94	N gnd	-29.05
2 Average	1.391 MHz	18.35	N gnd	-27.64
1 Quasi Peak	2.066 MHz	23.00	L1 gnd	-32.99
1 Quasi Peak	2.714 MHz	24.44	L1 gnd	-31.55
2 Average	2.714 MHz	18.47	L1 gnd	-27.52
1 Quasi Peak	3.632 MHz	24.76	L1 gnd	-31.23
2 Average	3.632 MHz	18.82	L1 gnd	-27.17
2 Average	7.052 MHz	18.19	L1 gnd	-31.80



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

4 Photograph

4.1 Photographs of the Test Setup for Radiated Emission and Conducted Emission

For electronic filing, the photos are saved with filename ZZX761074 TSup.pdf.

4.2 Photographs of the External and Internal Configurations of the EUT

For electronic filing, the photos are saved with filename ZZX761074 ExPho.pdf and ZZX761074 InPho.pdf.

4.3 Antenna requirement

Appendices A4 shows the antenna is permanently attached and cannot be changed. Therefore it fulfils the section 15.203 requirement



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

5 Appendices

A1	Photos of the set-up of Radiated Emissions	5	pages
A2	Photos of the set-up of Conducted Emissions	1	page
A3	Photos of the set-up of Line-conducted Emissions	1	page
A4	Photos of External Configurations	11	pages
A5	Photos of Internal Configurations	4	pages
A6	ID Label/Location	1	page



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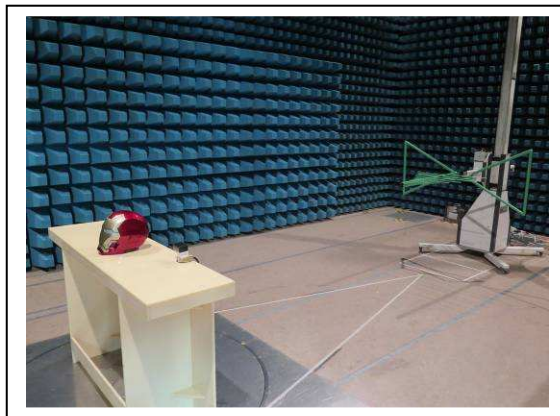
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TEST REPORT

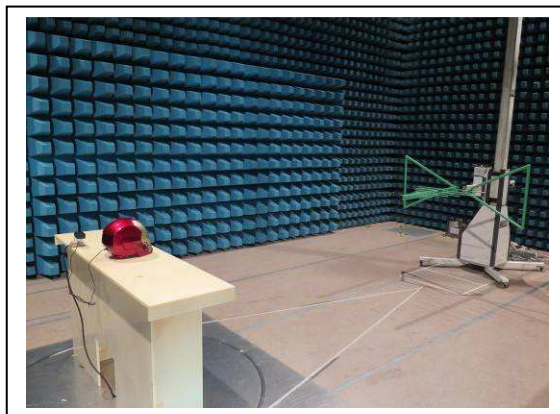
Report No. : AU0052161(4)

Date : 02 Sep 2016

A1. Photos of the set-up of Radiated Emissions



Front view, 30MHz – 1GHz



Rear view, 30MHz – 1GHz

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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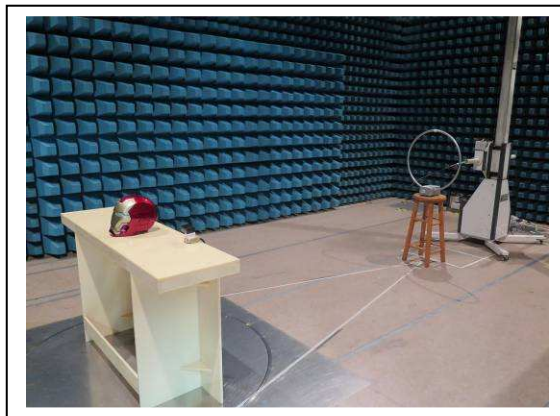
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TEST REPORT

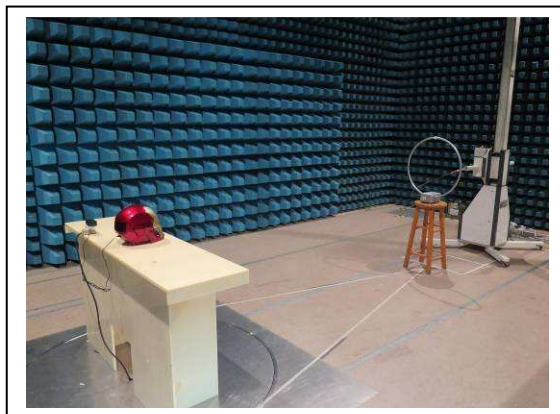
Report No. : AU0052161(4)

Date : 02 Sep 2016

A1. Photos of the set-up of Radiated Emissions



Front view, 9kHz – 30MHz



Rear view, 9kHz – 30MHz

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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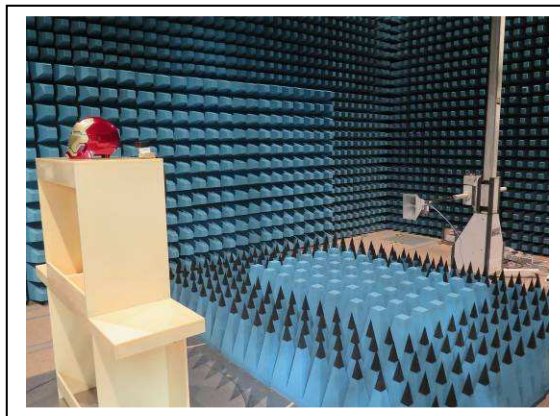
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TEST REPORT

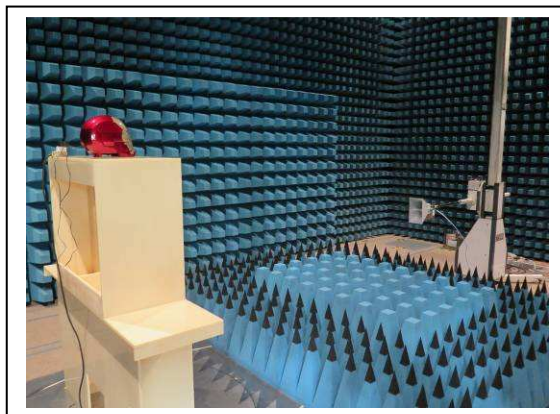
Report No. : AU0052161(4)

Date : 02 Sep 2016

A1. Photos of the set-up of Radiated Emissions



Front view, 1GHz – 25GHz



Rear view, 1GHz – 25GHz

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew

FCC ID: ZZX761074

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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@cmatcl.com Web Site: <http://www.cmatcl.com>



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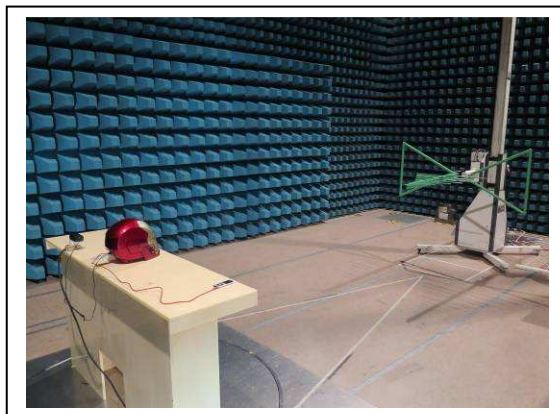
Report No. : AU0052161(4)

Date : 02 Sep 2016

A1. Photos of the set-up of Radiated Emissions



Front view, Aux-in + Charging



Rear view, Aux-in + Charging

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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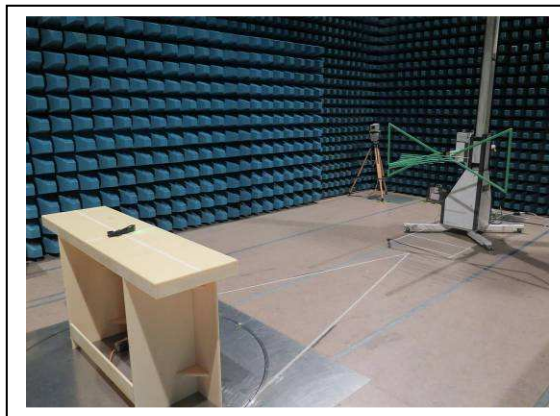
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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

A1. Photos of the set-up of Radiated Emissions



LED on

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

A2. Photos of the set-up of Conducted Emissions



Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew

FCC ID: ZZX761074

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Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: <http://www.cmatcl.com>



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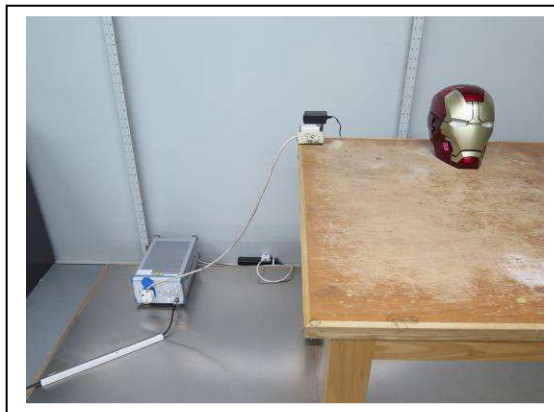
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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

A3. Photos of the set-up of Line-conducted Emissions



Front view



Side view

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew

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廠商會檢定中心

TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

A4 Photos of External Configurations



External Configuration 1



External Configuration 2

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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廠商會檢定中心

TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

A4 Photos of External Configurations



External Configuration 3



External Configuration 4

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

A4 Photos of External Configurations



External Configuration 5



External Configuration 6

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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TEST REPORT

Report No. : AU0052161(4)

Date : 02 Sep 2016

A4 Photos of External Configurations



External Configuration 7



External Configuration 8

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew

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TEST REPORT

Report No. : AU0052161(4)

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A4 Photos of External Configurations



External Configuration 9



External Configuration 10

Tested by:

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Reviewed by:

Mr. WONG Lap-pong, Andrew



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Report No. : AU0052161(4)

Date : 02 Sep 2016

A4 Photos of External Configurations



External Configuration 11



External Configuration 12

Tested by:

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Reviewed by:

Mr. WONG Lap-pong, Andrew

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Report No. : AU0052161(4)

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A4 Photos of External Configurations



External Configuration 13



External Configuration 14

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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Report No. : AU0052161(4)

Date : 02 Sep 2016

A4 Photos of External Configurations



External Configuration 15



External Configuration 16 (with LED)

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Reviewed by:

Mr. WONG Lap-pong, Andrew

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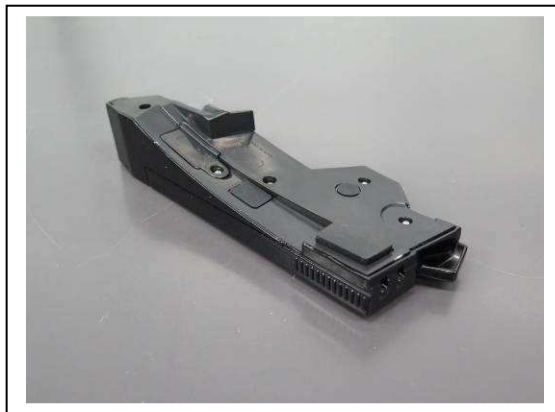
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Report No. : AU0052161(4)

Date : 02 Sep 2016

A4 Photos of External Configurations



External Configuration 17 (LED for 761508)



External Configuration 18 (LED for 761508)

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Reviewed by:

Mr. WONG Lap-pong, Andrew

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A4 Photos of External Configurations



External Configuration 19



External Configuration 20

Tested by:

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Reviewed by:

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A4 Photos of External Configurations



External Configuration 21

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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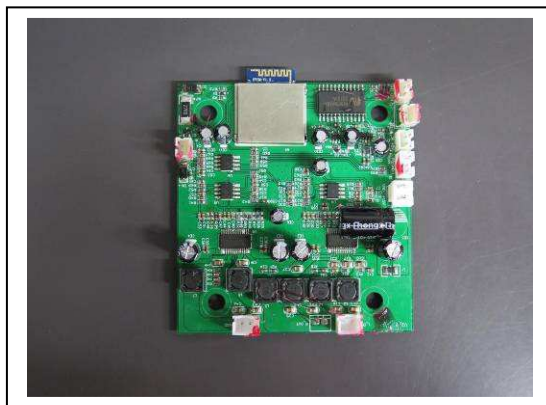
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TEST REPORT

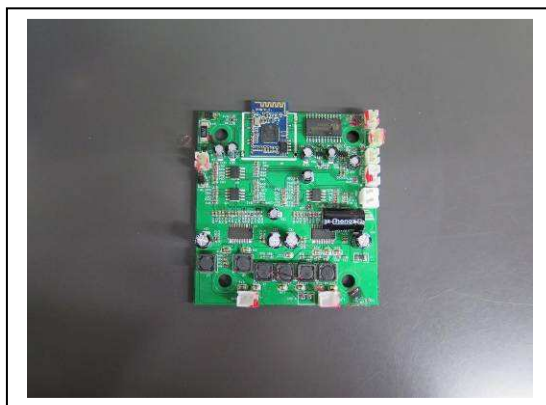
Report No. : AU0052161(4)

Date : 02 Sep 2016

A5 Photos of Internal Configurations



Internal Configuration 1



Internal Configuration 2

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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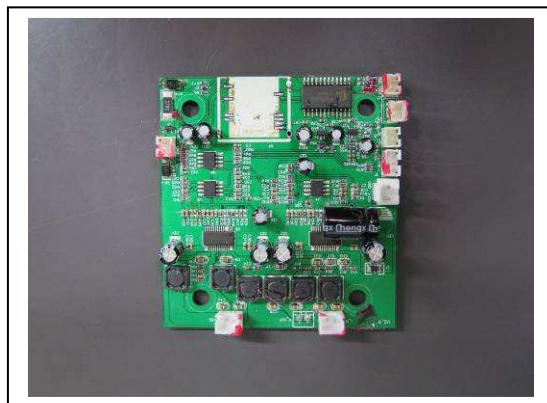
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TEST REPORT

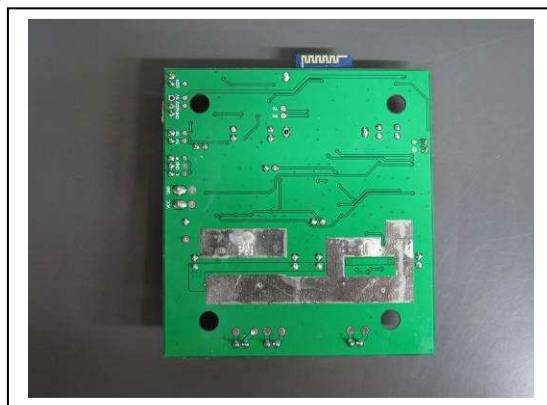
Report No. : AU0052161(4)

Date : 02 Sep 2016

A5 Photos of Internal Configurations



Internal Configuration 3



Internal Configuration 4

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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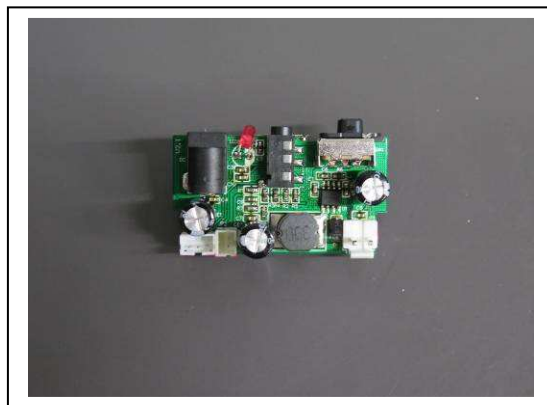
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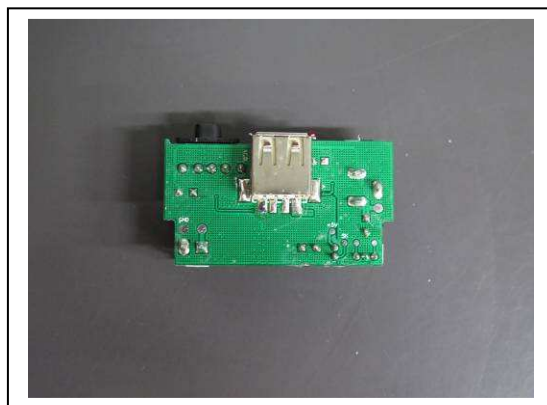
Report No. : AU0052161(4)

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A5 Photos of Internal Configurations



Internal Configuration 5



Internal Configuration 6

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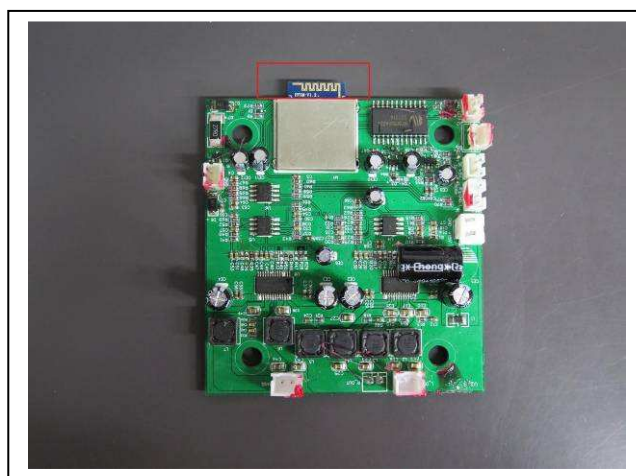
Report No. : AU0052161(4)

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A5 Photos of Internal Configurations



Internal Configuration 7



EUT antenna

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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Report No. : AU0052161(4)

Date : 02 Sep 2016

A6 ID Label / Location



ID Label 1



ID Label 2

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

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