# FCC REPORT (BLE)

Applicant: Shenzhen Fortuneship Technology Co., LTD

Room 501, the 5th Floor, Block B, Digital Building, Garden City,

Address of Applicant: No. 1079 Nanhai Road, Nanshan District, Shenzhen

Guangdong, P.R. China

**Equipment Under Test (EUT)** 

Product Name: Polar V650

Model No.: 0U

FCC ID: 2ABXI-0U

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 17 Jan., 2014

**Date of Test:** 18 Jan., to 14 Feb., 2014

Date of report issued: 18 Feb., 2014

Test Result: PASS \*

\* In the configuration tested, the EUT complied with the standards specified above.

#### Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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### Version

Version No.	Date	Description
00	18 Feb., 2014	Original

Shirtey Li
Report Clerk Prepared by: Date: 18 Feb., 2014

Reviewed by: Date: 18 Feb., 2014

**Project Engineer** 



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# 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

Pass: The EUT complies with the essential requirements in the standard.

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# 5 General Information

### 5.1 Client Information

Applicant:	Shenzhen Fortuneship Technology Co., LTD	
Address of Applicant:	Room 501, the 5th Floor, Block B, Digital Building, Garden City, No. 1079 Nanhai Road, Nanshan District, Shenzhenm Guangdong, P.R. China	
Manufacturer/Factory:	Shenzhen Fortuneship Technology Co., LTD	
Address of Manufacturer/ Factory:	Room 501, the 5th Floor, Block B, Digital Building, Garden City, No. 1079 Nanhai Road, Nanshan District, Shenzhenm Guangdong, P.R. China	

# 5.2 General Description of E.U.T.

Product Name:	Polar V650
Model No.:	OU
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	Internal Antenna
Antenna gain:	1.7dBi
Power supply:	Rechargeable Li-ion Battery DC3.8V 1900mAh

Shenzhen Zhongjian Nanfang Testing Co., Ltd. No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China

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Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

#### Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2442MHz
The Highest channel	2480MHz

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### 5.3 Test environment and mode

Operating Environment:				
Temperature:	24.0 °C			
Humidity: 54 % RH				
Atmospheric Pressure:	1010 mbar			
Test mode:				
Operation mode Keep the EUT in continuous transmitting with modulation				

The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.

### 5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
Lenovo	Laptop	SL510	LR-7Y97D	DoC

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# 5.5 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

### ● FCC - Registration No.: 817957

Shenzhen Zhongjian Nanfang Testing 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 out files. Registration 817957, February 27, 2012.

### ● IC - Registration No.: 10106A-1

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

#### ● CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

### 5.6 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China

Tel: 0755-23118282 Fax: 0755-23116366

Shenzhen Zhongjian Nanfang Testing Co., Ltd. No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China

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### 5.7 Test Instruments list

Radia	Radiated Emission:					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	June 09 2013	June 08 2014
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	May 25 2013	May 24 2014
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	May 25 2013	May 24 2014
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Coaxial Cable	CCIS	N/A	CCIS0016	Apr. 01 2013	Mar. 31 2014
6	Coaxial Cable	CCIS	N/A	CCIS0017	Apr. 01 2013	Mar. 31 2014
7	Coaxial cable	CCIS	N/A	CCIS0018	Apr. 01 2013	Mar. 31 2014
8	Coaxial Cable	CCIS	N/A	CCIS0019	Apr. 01 2013	Mar. 31 2014
9	Coaxial Cable	CCIS	N/A	CCIS0087	Apr. 01 2013	Mar. 31 2014
10	Amplifier(10kHz- 1.3GHz)	HP	8447D	CCIS0003	Apr. 01 2013	Mar. 31 2014
11	Amplifier(1GHz- 18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	June 09 2013	June 08 2014
12	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Apr. 01 2013	Mar. 31 2014
13	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2013	Mar. 29 2014
14	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
15	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
16	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	May. 25 2013	May. 24 2014
17	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	Apr 01 2013	Mar. 31 2014
18	Loop antenna	Laplace instrument	RF300	EMC0701	Aug. 12 2013	Aug. 11 2014
19	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	May. 25 2013	May. 24 2014
20	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	May. 25 2013	May. 24 2014

Cond	Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	June 09 2013	June 08 2014	
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	May 25 2013	May 24 2014	
3	LISN	CHASE	MN2050D	CCIS0074	Apr 01 2013	Mar. 31 2014	
4	Coaxial Cable	CCIS	N/A	CCIS0086	Apr. 01 2013	Mar. 31 2014	
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A	

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### 6 Test results and Measurement Data

### 6.1 Antenna requirement:

Standard requirement: FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

#### **E.U.T Antenna:**

The antenna is an internal antenna which cannot replace by end-user, the best case gain of the antenna is 1.7 dBi.



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### 6.2 Conducted Emission

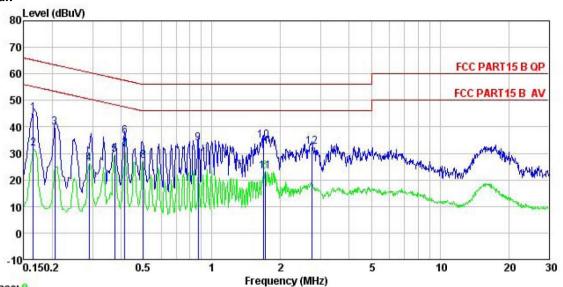
<b>U.</b> _	2 0011440104 21111001011				
	Test Requirement:	FCC Part15 C Section 15.207			
	Test Method:	ANSI C63.4: 2003			
	Test Frequency Range:	150 kHz to 30 MHz			
	Class / Severity:	Class B			
	Receiver setup:	RBW=9kHz, VBW=30kHz			
	Limit:	Limit (dRu\/)			
		Frequency range (MHz)  Quasi-peak  Average			
		0.15-0.5 66 to 56* 56 to 46*			
		0.5-5 56 46			
		5-30 60 50			
		* Decreases with the logarithm of the frequency.			
	Test procedure	The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment.			
		<ol> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> </ol>			
		<ol> <li>Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.</li> </ol>			
	Test setup:	Reference Plane			
		LISN 40cm 80cm Filter AC power Equipment E.U.T EMI Receiver			
		LISN: Line Impedence Stabilization Network Test table height=0.8m			
	Test Instruments:	Refer to section 5.7 for details			
	Test mode:	Refer to section 5.3 for details			
	Test results:	Passed			

#### **Measurement Data**



Project No.: CCIS140100035RF

#### Neutral:



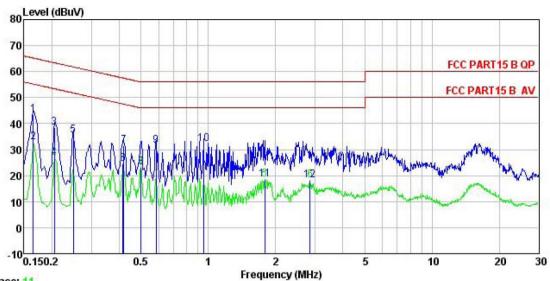
Trace: 9 Site : CCIS Conducted test Site
Condition : FCC PART15 B QP LISN NEUTRAL
Test Mode : BLE Mode
Power Rating : AC120V/60Hz
Environment : Temp: 23 °C Huni:56% Atmos:101KPa
Test Engineer: Garen
Remark

Freq	Read Level	LISN Factor			Limit Line	Over Limit	Remark
MHz	dBu∜	₫B	₫B	dBu∜	dBu∜	₫B	
0.165	34.05	0.25	10.77	45.07	65.21	-20.14	QP
0.165	20.88	0.25	10.77	31.90	55.21	-23.31	Average
0.205	28.95	0.25	10.76	39.96	63.40	-23.44	QP
0.289	15.33	0.26	10.74	26.33	50.54	-24.21	Average
0.375	18.64	0.25	10.72	29.61	48.39	-18.78	Average
0.415	25.40	0.26	10.73	36.39	57.55	-21.16	QP
0.415	20.62	0.26	10.73	31.61	47.55	-15.94	Average
0.499	16.09	0.29	10.76	27.14	46.01	-18.87	Average
0.871	22.88	0.20	10.83	33.91	56.00	-22.09	QP
1.689	23.69	0.27	10.94	34.90	56.00	-21.10	QP
1.707	12.09	0.27	10.94	23.30	46.00	-22.70	Average
2.736	21.24	0.29	10.93	32.46	56.00	-23.54	QP
	MHz  0.165 0.165 0.205 0.289 0.375 0.415 0.415 0.499 0.871 1.689 1.707	MHz dBuV  0.165 34.05 0.165 20.88 0.205 28.95 0.289 15.33 0.375 18.64 0.415 25.40 0.415 20.62 0.499 16.09 0.871 22.88 1.689 23.69 1.707 12.09	Freq Level Factor  MHz dBuV dB  0.165 34.05 0.25 0.165 20.88 0.25 0.205 28.95 0.25 0.289 15.33 0.26 0.375 18.64 0.25 0.415 25.40 0.26 0.415 20.62 0.26 0.499 16.09 0.29 0.871 22.88 0.20 1.689 23.69 0.27	MHz         dBuV         dB         dB           0.165         34.05         0.25         10.77           0.165         20.88         0.25         10.77           0.205         28.95         0.25         10.76           0.289         15.33         0.26         10.74           0.375         18.64         0.25         10.72           0.415         25.40         0.26         10.73           0.499         16.09         0.29         10.76           0.871         22.88         0.20         10.83           1.689         23.69         0.27         10.94           1.707         12.09         0.27         10.94	MHz         dBuV         dB         dB         dB uV           0.165         34.05         0.25         10.77         45.07           0.165         20.88         0.25         10.77         31.90           0.205         28.95         0.25         10.76         39.96           0.289         15.33         0.26         10.74         26.33           0.375         18.64         0.25         10.72         29.61           0.415         25.40         0.26         10.73         36.39           0.499         16.09         0.29         10.76         27.14           0.871         22.88         0.20         10.83         33.91           1.689         23.69         0.27         10.94         34.90           1.707         12.09         0.27         10.94         23.30	MHz         dBuV         dB         dB         dBuV         dBuV           0.165         34.05         0.25         10.77         45.07         65.21           0.165         20.88         0.25         10.77         31.90         55.21           0.205         28.95         0.25         10.76         39.96         63.40           0.289         15.33         0.26         10.74         26.33         50.54           0.375         18.64         0.25         10.72         29.61         48.39           0.415         25.40         0.26         10.73         36.39         57.55           0.499         16.09         0.29         10.76         27.14         46.01           0.871         22.88         0.20         10.83         33.91         56.00           1.689         23.69         0.27         10.94         34.90         56.00           1.707         12.09         0.27         10.94         23.30         46.00	MHz         dBuV         dB         dB         dBuV         dBuV         dB           0.165         34.05         0.25         10.77         45.07         65.21         -20.14           0.165         20.88         0.25         10.77         31.90         55.21         -23.31           0.205         28.95         0.25         10.76         39.96         63.40         -23.44           0.289         15.33         0.26         10.74         26.33         50.54         -24.21           0.375         18.64         0.25         10.72         29.61         48.39         -18.78           0.415         25.40         0.26         10.73         36.39         57.55         -21.16           0.499         16.09         0.26         10.73         31.61         47.55         -15.94           0.499         16.09         0.29         10.76         27.14         46.01         -18.87           0.871         22.88         0.20         10.83         33.91         56.00         -22.09           1.689         23.69         0.27         10.94         34.90         56.00         -21.10           1.707         12.09         0.27

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#### Line:



Over

Limit

Trace: 11 Site : CCIS Conducted test Site : FCC PART15 B QP LISN LINE Condition

Read

Test Mode : BLE mode

Power Rating: AC120V/60Hz Environment: Temp: 23 °C Huni:56% Atmos:101KPa

LISN Cable

Test Engineer: Garen Remark

Level Factor Level Line Limit Remark Freq Loss MHz dB ďΒ dBuV dBuV 43.34 32.76 65.21 -21.87 QP 55.21 -22.45 Average 0.165 32.30 0.27 10.77 2 0.165 21.72 0.27 10.77 3 0.205 27.60 0.28 10.76 38.64 63.40 -24.76 QP 4 0.205 15.90 0.28 10.76 26.94 53.40 -26.46 Average 61.78 -26.33 QP 5 0.249 24.43 0.27 35.45 10.75 0.415 13.56 0.28 10.73 24.57 47.55 -22.98 Average

67 0.419 20.38 0.28 10.73 31.39 57.46 -26.07 QP 46.01 -22.82 Average 56.00 -24.59 QP 8 0.499 12.14 0.29 10.76 23.19 31.41 32.17 20.38 0.585 0.26 10.77 10 0.953 21.06 0.25 10.86 56.00 -23.83 QP 11 1.790 7.40 0.26 10.95 18.61 46.00 -27.39 Average 0.27 46.00 -27.69 Average 18.31

#### Notes:

- 1. An initial pre-scan was performed on the live and neutral lines with peak detector.
- 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3. Final Level = Receiver Read level + LISN Factor + Cable Loss



# **6.3 Conducted Output Power**

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)			
Test Method:	ANSI C63.4:2003 and KDB558074			
Limit:	30dBm			
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane			
Test Instruments:	Refer to section 5.7 for details			
Test mode:	Refer to section 5.3 for details			
Test results:	Passed			
Remark:	Test method refer to KDB558074 v03r01 (DTS Measure Guidance) section 9.2.2.2			

### Measurement Data

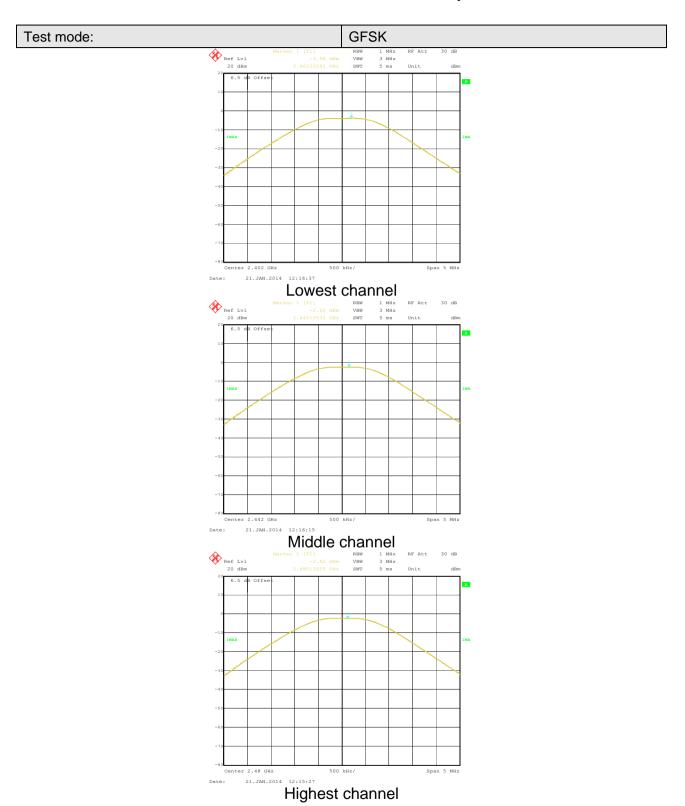
Test CH	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
Lowest	-3.98		
Middle	-2.62	30.00	Pass
Highest	-2.62		

Test plot as follows:

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# 6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	>500kHz
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

#### Measurement Data

Test CH	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
Lowest	0.75		
Middle	0.75	>500	Pass
Highest	0.74		

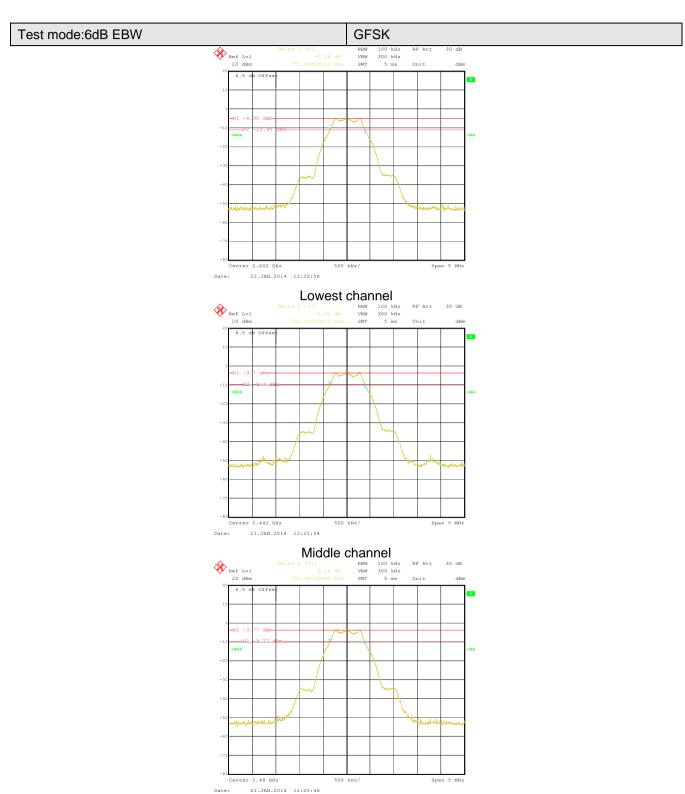
Test CH	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
Lowest	1.04		
Middle	1.05	N/A	N/A
Highest	1.04		

Test plot as follows:

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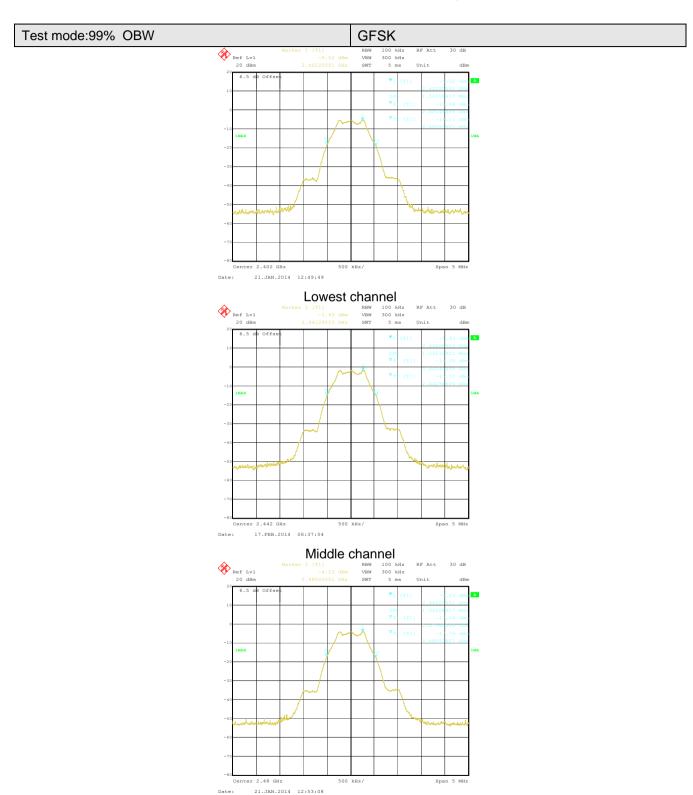




Highest channel

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Highest channel



# 6.5 Power Spectral Density

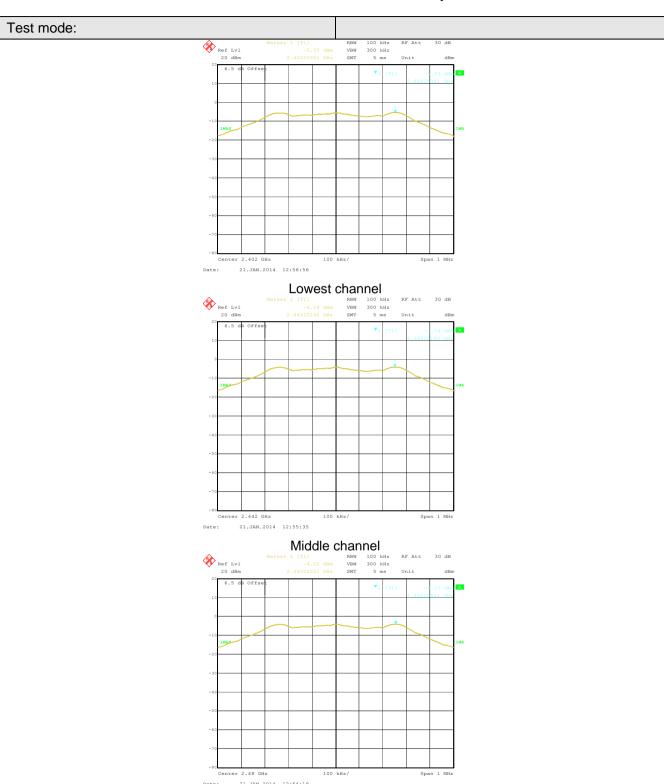
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	8 dBm
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

#### Measurement Data

Test CH	Power Spectral Density (dBm)	Limit(dBm)	Result
Lowest	-5.55		
Middle	-4.24	8.00	Pass
Highest	-4.22		

Test plots as follow:





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# 6.6 Band Edge

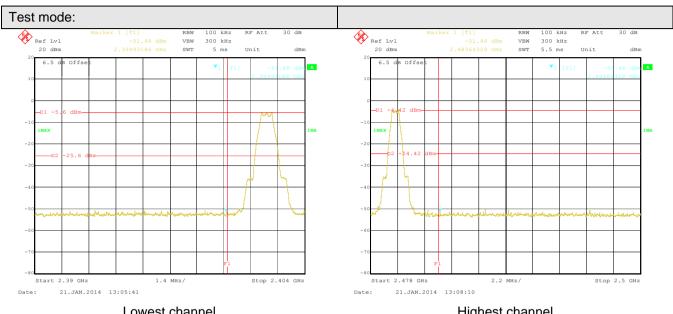
### 6.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)				
Test Method:	ANSI C63.4:2003 and KDB558074				
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.				
Test setup:	Snagtrum Analyzar				
	Spectrum Analyzer  E.U.T  Non-Conducted Table				
	TVOII-Conducted Table				
	Ground Reference Plane				
Test Instruments:	Refer to section 5.7 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Passed				

Test plots as follow:

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Lowest channel Highest channel

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### 6.6.2 Radiated Emission Method

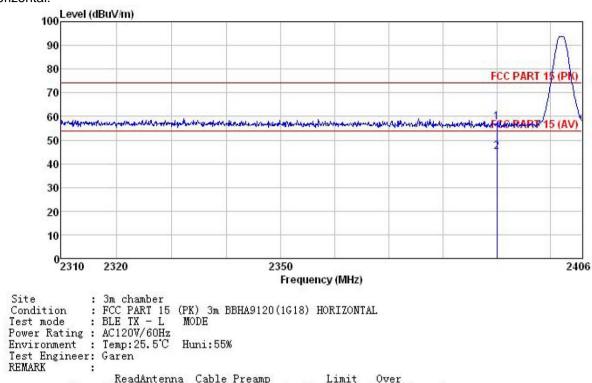
Test Requirement:	FCC Part15 C Section 15.209 and 15.205					
Test Method:	ANSI C63.4: 20	03				
Test Frequency Range:	2.3GHz to 2.5G	Hz				
Test site:	Measurement D	istance: 3m				
Receiver setup:						
·	Frequency	Detector	RBW	VBW	Remark	
	Above 1GHz	Peak	1MHz	3MHz	Peak Value	
Limit		Peak	1MHz	10Hz	Average Value	
Limit:	Freque	encv	Limit (dBuV	/m @3m)	Remark	
	Above 1	-	54.0		Average Value	
			74.0		Peak Value	
Test Procedure:	the ground to determin 2. The EUT wantenna, wantenna, wantenna, wantenna and the ground Both horizon make the number of the ground to find the number of the emission that the limit specified E. If the emission the limit specified number of the did not have peak, quasing the EUT of the limit specified for the limit sp	at a 3 meter cane the position of as set 3 meters which was mount in a height is variet to determine the ontal and vertical and vertical easurement. If the rota table maximum readiceiver system was and width with sion level of the ecified, then testine EUT would be 10 dB margir i-peak or average and width with sion level of the ecified, then testine EUT would be 10 dB margir i-peak or average.	amber. The took the highest is away from the don the took ed from one maximum all polarizations to the EUT in peasiting could be reported.	table was rost radiation.  the interfer op of a variate meter to for a value of the ons of the art to heights from 0 degreeak Detect old Mode.  It was arranged to make the stopped are stopped are otherwise feetested one	rence-receiving able-height antenna our meters above the field strength. Intenna are set to anged to its worst from 1 meter to 4 the ees to 360 degrees.  Function and the peak the emissions that	
Test setup:	in a data sheet.  Antenna Tower  Horn Antenna  Spectrum  Analyzer  Turn  Table  Amplifier					
Test Instruments:	Refer to section					
Test mode:	Refer to section	5.3 for details				
Test results:	Passed					

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Test channel: Lowest

Horizontal:



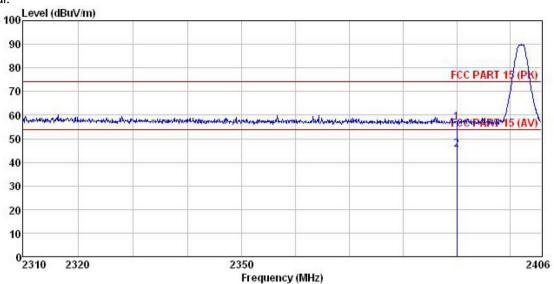
	•	D J	N+	Cabla	D		Timin	0		
	Freq		Antenna Factor						Remark	
-	MHz	dBu∀	dB/m	<u>dB</u>	<u>dB</u>	dBuV/m	dBuV/m	dB		
	2390.000									
/	2390, 000	11. (h	27.58	D. D.	11. 1111	45.111	54.1111	-8.99	Average	

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Test channel: Lowest

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
Test mode : BLE TX - L MODE
Power Rating : AC120V/60Hz
Environment : Temp:25.5°C Huni:55% Site Condition Test mode

Test Engineer: Garen

REMARK

			Antenna				Limit		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Kemark
	MHz	dBu₹	_dB/m	₫B	d₿	dBuV/m	dBuV/m	dB	
2201	000	22 40	27 50	E 67	0.00	EG GE	74 00	17 25	D1-

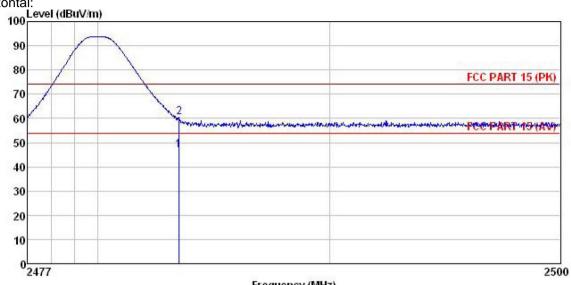
2390.000 23.40 27.58 5.67 2390.000 12.32 27.58 5.67 0.00 56.65 74.00 -17.35 Peak 0.00 45.57 54.00 -8.43 Average

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Test channel: Highest

Horizontal:



Frequency (MHz)

Site Condition

Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
Test mode : BLE TX - H MODE
Power Rating : AC120V/60Hz
Environment : Temp: 25.5°C Huni: 55%

Test Engineer: Garen REMARK :

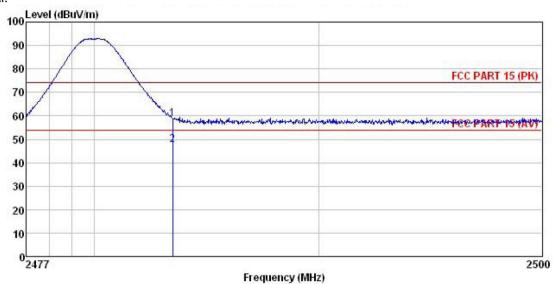
	Freq		Antenna Factor							
	MHz	dBu∇	—dB/m	<u>d</u> B	<u>dB</u>	dBuV/m	dBuV/m	<u>dB</u>		-
	2483.500									
2	2483.510	27.24	27.52	5.70	0.00	60.46	74.00	-13.54	Peak	

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Test channel: Highest

Vertical:



(PK) 3m BBHA9120(1G18) VERTICAL MODE

Site : 3m chamber
Condition : FCC PART 15
Test mode : BLE TX - H
Power Rating : AC120V/60Hz
Environment : Temp:25.5°C
Test Engineer: Garen
REMARK :

Huni:55%

1 2

	1000		Antenna Factor						Remark	
-	MHz	dBu∇	<u>dB</u> /m	<u>d</u> B	<u>dB</u>	dBuV/m	dBuV/m	<u>dB</u>		
	2483.500 2483.500									

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# 6.7 Spurious Emission

### 6.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)							
Test Method:	ANSI C63.4:2003 and KDB558074							
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.							
Test setup:								
	Spectrum Analyzer							
	Non-Conducted Table							
	Ground Reference Plane							
Test Instruments:	Refer to section 5.7 for details							
Test mode:	Refer to section 5.3 for details							
Test results:	Passed							

Test plot as follows:

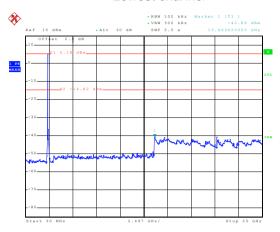
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Test mode:

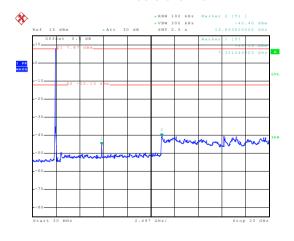
#### Lowest channel



Date: 17.DEC.2013 22:40:41

30MHz~25GHz

#### Middle channel

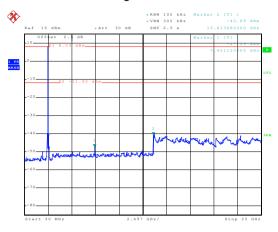


Date: 17.DEC.2013 22:43:27

30MHz~25GHz



### Highest channel



Date: 17.DEC.2013 22:44:38

30MHz~25GHz

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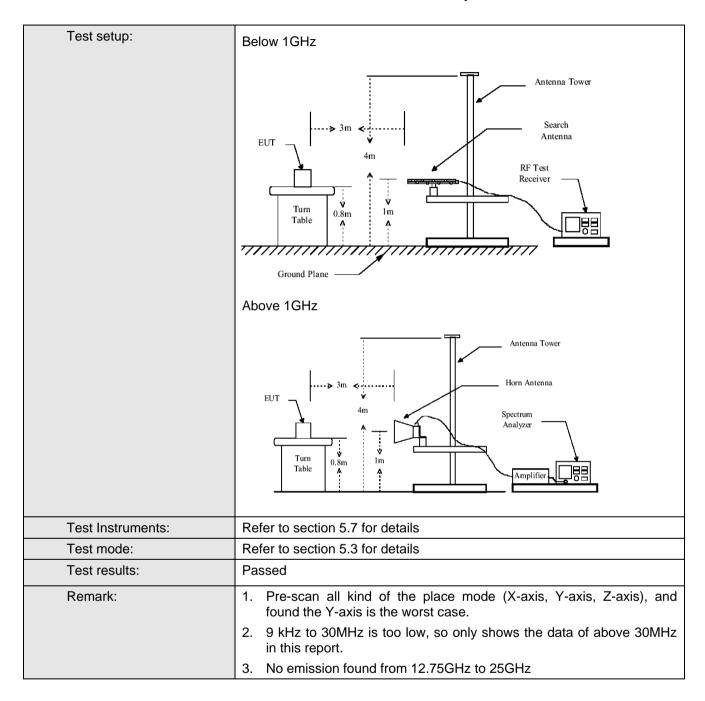


### 6.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205							
Test Method:	ANSI C63.4:200	)3						
Test Frequency Range:	9KHz to 25GHz							
Test site:	Measurement D	istance: 3m						
Receiver setup:								
, , , , , , , , , , , , , , , , , , , ,	Frequency	Detector	RBW	VBW	Remark			
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value			
	Above 1GHz	Peak	1MHz	3MHz	Peak Value			
	7.5000 10112	Peak	1MHz	10Hz	Average Value			
Limit:	-	Ι.		00.				
	Frequency		<u>limit (dBuV/m</u>	@3m)	Remark			
	30MHz-88MHz		10.0 13.5		Quasi-peak Value			
	88MHz-216MHz 216MHz-960MH		16.0		Quasi-peak Value  Quasi-peak Value			
	960MHz-1GHz		54.0		Quasi-peak Value			
			54.0		Average Value			
	Above 1GHz		74.0		Peak Value			
Test Procedure:	the ground to determin 2. The EUT antenna, we tower.  3. The antenna Both horizon make the number of the ground to find the number of the limit so values of the did not ha	at a 3 meter of the position was set 3 methich was mountained and vertine as a surement. Suspected emithen the anten at the rota table maximum reaction level of the pecified, then the EUT would we 10 dB maximum reactions.	camber. The of the highesters away for the highesters away for the maximucal polarizates assion, the Ena was turned ing.  In was set of Maximum Here EUT in perfecting could be reported to gin would be set to the set of t	table was a set radiation. The incomposition of a variance meter to the incomposition of the set of the incomposition of the incomposit	ele 0.8 meters above rotated 360 degrees of terference-receiving table-height antenna of four meters above of the field strength. In antenna are set to the stranged to its worst as from 1 meter to 4 rees to 360 degrees detect Function and as 10 dB lower than oped and the peak of the emissions that do one by one using the dand then reported			

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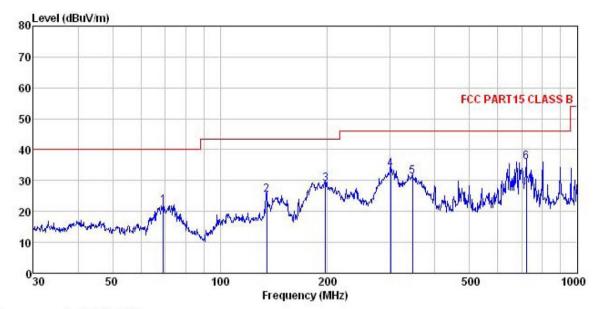
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Project No.: CCIS140100035RF

#### **Below 1GHz**

Horizontal:



: 3m chamber : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL : Cycling computer : 820 Condition

EUT

Model Test mode : BLE MODE Power Rating : AC120V/60Hz Environment : Temp:25.5°C

Huni:55%

Test Engineer: Garen

REMARK

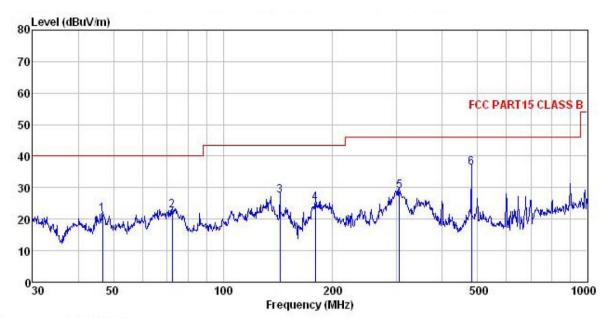
DIED TOTAL									
	Freq		Antenna Factor						Remark
=	MHz	dBu∜	dB/m		<u>ab</u>	$\overline{dBuV/m}$	dBu√/m	<u>dB</u>	
1	69.357	41.44	8.92	1.49	30.09	21.76	40.00	-18.24	QP
2	135.032	44.07	8.56	2.34	29.45	25.52	43.50	-17.98	QP
3	197.200	45.33	10.57	2.85	29.82	28.93	43.50	-14.57	QP
4	300.367	47.00	13.06	2.94	29.44	33.56	46.00	-12.44	QP
5	345.595	43.54	14.20	3.08	29.66	31.16	46.00	-14.84	QP
6	721 726	43 16	19 10	4 26	30.55	35 97	46 00	-10 03	OP

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Vertical:

Report No: CCIS14010003502



Site

: 3m chamber : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL : Cycling computer : 820 Condition EUT

Model Test mode : BLE MODE

Power Rating : AC120V/60Hz Environment : Temp:25.5°C Huni:55%

Test Engineer: Garen REMARK :

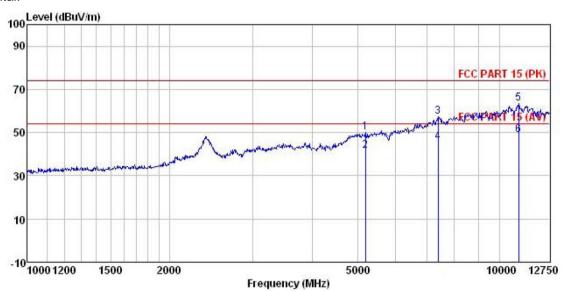
PHEHAT									
	Freq		Antenna Factor						
=	MHz	dBu₹	dB/m	d <u>B</u>	<u>dB</u>	dBuV/m	dBuV/m	<u>dB</u>	
1	46.666	34.70	13.45	1.28	27.97	21.46	40.00	-18.54	QP
1 2 3	72.592	43.22	8.19	1.59	30.14	22.86	40.00	-17.14	QP
3	143.326	46.27	8.22	2.44	29.33	27.60	43.50	-15.90	QP
4	179.386	39.36	9.62	2.73	26.66	25.05	43.50	-18.45	QP
5 6	304.610	42.16	13.13	2.95	29.45	28.79	46.00	-17.21	QP
6	480.528	47.30	16.07	3.46	30.52	36.31	46.00	-9.69	QP



#### **Above 1GHz**

#### The lowest channel:

#### Horizontal:



: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL : BLE-L MODE

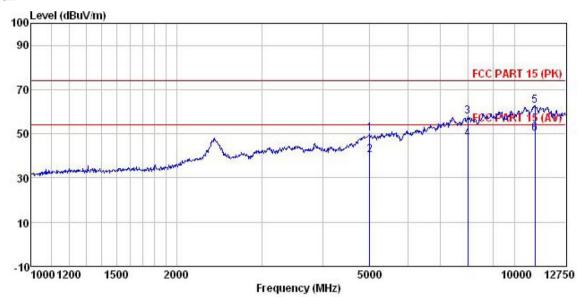
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m B
Test mode : BLE-L MODE
Power Rating : AC120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Garen
REMARK :

	Freq		Antenna Factor				Limit Line	Over Limit	Remark	
	MHz	dBu₹	<u>dB</u> /m	<u>dB</u>	<u>dB</u>	dBuV/m	dBuV/m	<u>dB</u>		-
1	5191.168	49.14	31.96	9.14	40.09	50.15	74.00	-23.85	Peak	
2	5191.168	40.61	31.96	9.14	40.09	41.62	54.00	-12.38	Average	
2	7394.878	51.16	36.54	10.75	41.09	57.36	74.00	-16.64	Peak	
4	7394.878	39.35	36.54	10.75	41.09	45.55	54.00	-8.45	Average	
5	10944.090	49.55	40.33	13.61	40.22	63.27	74.00	-10.73	Peak	
6	10944.090	35.29	40.33	13.61	40.22	49.01	54.00	-4.99	Average	

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#### Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
Test mode : BLE-L MODE
Power Rating : AC120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Garen
REMARK :

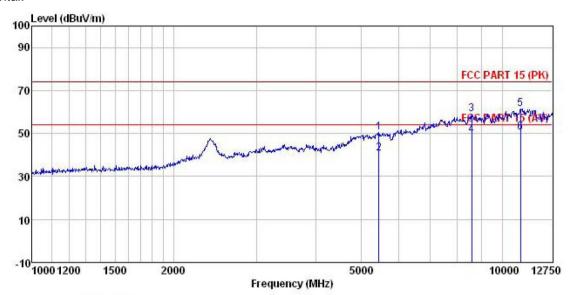
	Freq		ntenna Factor				Limit Line	Limit Over Line Limit	Remark
	MHz	dBu∀	<u>dB</u> /m	<u>dB</u>	<u>dB</u>	dBuV/m	dBuV/m	<u>d</u> B	
1	5009.426	49.15	31.85	9.12	39.99	50.13	74.00	-23.87	Peak
2	5009.426	39.22	31.85	9.12	39.99	40.20	54.00	-13.80	Average
3	7981.717	50.51	37.20	11.01		57.73			
4	7981.717	40.26	37.20	11.01	40.99	47.48	54.00	-6.52	Average
5	10999.950	48.93	40.28	13.58	40.12	62.67	74.00	-11.33	Peak
6	10999.950	36.32	40.28	13.58	40.12	50.06	54.00	-3.94	Average

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The middle channel:'

#### Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
Test mode : BLE-M MODE
Power Rating : AC120V/60Hz
Environment : Temp: 25.5°C Huni: 55%

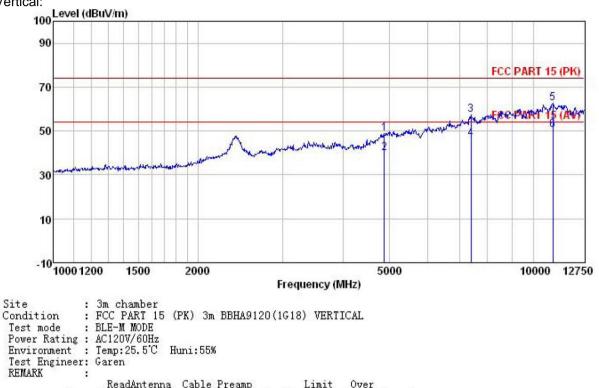
Test Engineer: Garen REMARK :

KEMAK	CK.	:								
	Fre		dAntenna :1 Factor				Limit Line	Over Limit	Remark	
	ME	z dBu	i∇ <u>dB</u> /π	<u>dB</u>	<u>d</u> B	dBuV/m	dBuV/m	<u>dB</u>		-
1	5448.41	0 49.3	31.99	9.16	40.23	50.29	74.00	-23.71	Peak	
2	5448.41	0 39.8	1 31.99	9.16	40.23	40.73	54.00	-13.27	Average	
	8593.22	4 50.3	0 36.83	13.48	41.42	59.19	74.00	-14.81	Peak	
4	8593.22	4 40.2	4 36.83	13.48	41.42	49.13	54.00	-4.87	Average	
5	10916.26	0 47.6	8 40.31	13.64	40.28	61.35	74.00	-12.65	Peak	
6	10916.26	0 36 8	6 40 31	13 64	40 28	50.53	54 00	-3.47	Average	

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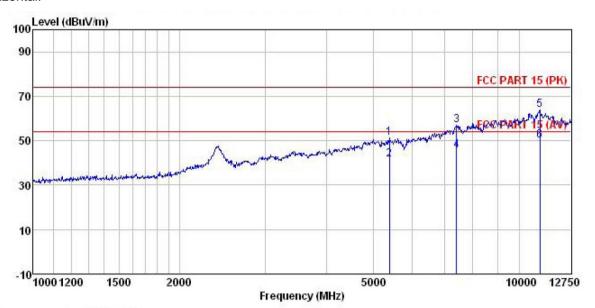
Freq		Antenna		Preamp		Limit	Over	
	PEACT	Factor	Loss	Factor				Remark
MHz	—dBu∇	— <u>dB</u> /m		<u>d</u> B	dBuV/m	dBuV/m	<u>d</u> B	
1883.519	48.48	31.58	8.98	40.15	48.89	74.00	-25.11	Peak
1883.519	39.65	31.58	8.98	40.15	40.06	54.00	-13.94	Average
7394.878	51.04	36.54	10.75	41.09	57.24	74.00	-16.76	Peak
7394.878	40.33	36.54	10.75	41.09	46.53	54.00	-7.47	Average
0944.090	48.96	40.33	13.61	40.22	62.68	74.00	-11.32	Peak
0944.090	36.70	40.33	13.61	40.22	50.42	54.00	-3.58	Average
1	MHz 883. 519 883. 519 394. 878 394. 878 1944. 090	MHz dBuV 883.519 48.48 883.519 39.65 394.878 51.04 394.878 40.33 944.090 48.96	MHz dBuV dB/m 883.519 48.48 31.58 883.519 39.65 31.58 394.878 51.04 36.54 394.878 40.33 36.54 394.878 40.33 36.54 944.090 48.96 40.33	MHz dBuV dB/m dB 883.519 48.48 31.58 8.98 883.519 39.65 31.58 8.98 394.878 51.04 36.54 10.75 394.878 40.33 36.54 10.75 1944.090 48.96 40.33 13.61	MHz dBuV dB/m dB dB  883.519 48.48 31.58 8.98 40.15  883.519 39.65 31.58 8.98 40.15  394.878 51.04 36.54 10.75 41.09  394.878 40.33 36.54 10.75 41.09  944.090 48.96 40.33 13.61 40.22	MHz dBuV dB/m dB dB dBuV/m  883.519 48.48 31.58 8.98 40.15 48.89  883.519 39.65 31.58 8.98 40.15 40.06  394.878 51.04 36.54 10.75 41.09 57.24  394.878 40.33 36.54 10.75 41.09 46.53  1944.090 48.96 40.33 13.61 40.22 62.68	MHz dBuV dB/m dB dB dBuV/m dBuV/m 883.519 48.48 31.58 8.98 40.15 48.89 74.00 883.519 39.65 31.58 8.98 40.15 40.06 54.00 394.878 51.04 36.54 10.75 41.09 57.24 74.00 394.878 40.33 36.54 10.75 41.09 46.53 54.00 944.090 48.96 40.33 13.61 40.22 62.68 74.00	MHz dBuV dB/m dB dB dBuV/m dBuV/m dB 883.519 48.48 31.58 8.98 40.15 48.89 74.00 -25.11 883.519 39.65 31.58 8.98 40.15 40.06 54.00 -13.94 394.878 51.04 36.54 10.75 41.09 57.24 74.00 -16.76 394.878 40.33 36.54 10.75 41.09 46.53 54.00 -7.47 1944.090 48.96 40.33 13.61 40.22 62.68 74.00 -11.32

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### The highest channel:

#### Horizontal:



Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL : BLE-H MODE Condition

Test mode

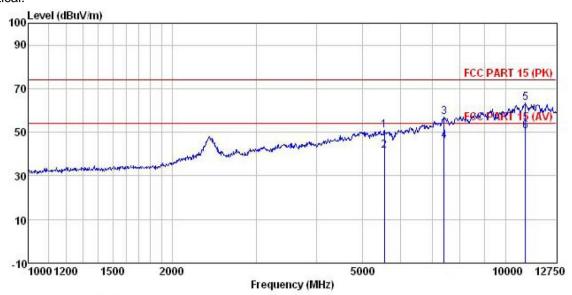
Power Rating: AC120V/60Hz
Environment: Temp:25.5°C Huni:55%
Test Engineer: Garen
REMARK:

KEMAR	<i>TV</i> :									
		Read	Antenna	Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
	MHz	dBu∇	<u>dB</u> /m	dB	<u>dB</u>	$\overline{dBuV/m}$	dBuV/m	dB		
1	5393.215	50.56	31.87	9.15	40.19	51.39	74.00	-22.61	Peak	
2	5393.215	40.74	31.87	9.15	40.19	41.57	54.00	-12.43	Average	
3	7413.726	50.57	36.57	10.77	41.08			-17.17		
4	7413.726	39.52	36.57	10.77	41.08	45.78	54.00	-8.22	Average	
5	10999.950	50.08	40.28	13.58	40.12	63.82	74.00	-10.18	Peak	
6	10999.950	36.39	40.28	13.58	40.12	50.13	54.00	-3.87	Average	



Project No.: CCIS140100035RF

#### Vertical:



Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL : BLE-H MODE Condition Test mode

Power Rating : AC120V/60Hz Environment : Temp:25.5C

Huni:55%

Test Engineer: Garen REMARK

EMAR	v :								
	Freq		Antenna Factor				Limit Line	Over Limit	
	MHz	dBu∀	<u>dB</u> /m		<u>ab</u>	dBu∀/m	dBuV/m	<u>dB</u>	
1	5560.500	49.91	32.09	9.19	40.32	50.87	74.00	-23.13	Peak
2	5560.500	40.67	32.09	9.19	40.32	41.63	54.00	-12.37	Average
3	7413.726	50.64	36.57	10.77	41.08	56.90	74.00	-17.10	Peak
4	7413.726	39.68	36.57	10.77	41.08	45.94	54.00	-8.06	Average
5	10971.980	49.62	40.30	13.59	40.15	63.36	74.00	-10.64	Peak
a	10071 000	36 50	40.30	13 EQ	40 1E	E0 32	E4 00	_3 60	Arrayaga

#### Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.

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