

# Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE160203601

# **FCC REPORT**

# (Bluetooth)

**Applicant:** Shenzhen TongFang Information Technologies CO.,LTD.

Floor3, Building D, TongFang Information Harbour, LangShan

Address of Applicant: Road, High-tech Industrial Park North, NanShan District,

ShenZhen, P.R.China 51805

# **Equipment Under Test (EUT)**

Product Name: MID

Model No.: B9SS3, B9S3

**FCC ID:** 2ABKZ-UC197908

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

Date of sample receipt: 26 Feb., 2016

**Date of Test:** 26 Feb., to 17 Mar., 2016

Date of report issued: 18 Mar., 2016

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.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.





# 2 Version

Version No.	Date	Description
00	18 Mar., 2016	Original

Tested by: 18 Mar., 2016

Test Engineer

Reviewed by: 18 Mar., 2016

Project Engineer





# 3 Contents

1 COVER PAGE 2 VERSION 3 CONTENTS 4 TEST SUMMARY 5 GENERAL INFORMATION 5.1 CLIENT INFORMATION 5.2 GENERAL DESCRIPTION OF E.U.T. 5.3 TEST MODE 5.4 LABORATORY FACILITY 5.5 LABORATORY LOCATION 5.6 TEST INSTRUMENTS LIST. 6 TEST RESULTS AND MEASUREMENT DATA 6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED OUTPUT POWER 6.4 20DB OCCUPY BANDWIDTH 6.5 CARRIER FREQUENCIES SEPARATION 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE 6.9.1 CONDUCTED EMISSION Method 6.9.2 Radiated Emission Method 6.9.2 Radiated Emission Method 6.10.3 SPURIOUS EMISSION 6.10.1 CONDUCTED EMISSION Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method 6.10.1 TONDUCTORY INSTRUCTIONAL DETAILS.			F	⊃age
TEST SUMMARY	1	С	OVER PAGE	1
TEST SUMMARY	2	V	ERSION	2
TEST SUMMARY  GENERAL INFORMATION  5.1 CLIENT INFORMATION  5.2 GENERAL DESCRIPTION OF E.U.T.  5.3 TEST MODE  5.4 LABORATORY FACILITY.  5.5 LABORATORY FACILITY.  5.5 LABORATORY LOCATION  5.6 TEST INSTRUMENTS LIST  6 TEST RESULTS AND MEASUREMENT DATA  6.1 ANTENNA REQUIREMENT  6.2 CONDUCTED EMISSIONS  6.3 CONDUCTED OUTPUT POWER  6.4 20DB OCCUPY BANDWIDTH  6.5 CARRIER FREQUENCIES SEPARATION  6.6 HOPPING CHANNEL NUMBER  6.7 DWELL TIME  6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE  6.9.1 CONDUCTED Emission Method  6.9.2 Radiated Emission Method  6.10.1 Conducted Emission Method  6.10.2 Radiated Emission Method  6.10.2 TEST SETUP PHOTO				
5 GENERAL INFORMATION  5.1 CLIENT INFORMATION  5.2 GENERAL DESCRIPTION OF E.U.T.  5.3 TEST MODE  5.4 LABORATORY FACILITY.  5.5 LABORATORY LOCATION  5.6 TEST INSTRUMENTS LIST.  6 TEST RESULTS AND MEASUREMENT DATA  6.1 ANTENNA REQUIREMENT  6.2 CONDUCTED EMISSIONS  6.3 CONDUCTED OUTPUT POWER  6.4 20DB OCCUPY BANDWIDTH  6.5 CARRIER FREQUENCIES SEPARATION.  6.6 HOPPING CHANNEL NUMBER  6.7 DWELL TIME.  6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE  6.9 BAND EDGE.  6.9.1 CONDUCTED EMISSION Method  6.9.2 Radiated Emission Method  6.10 SPURIOUS EMISSION  6.10.1 CONDUCTED EMISSION Method  6.10.2 Radiated Emission Method  6.10.2 Radiated Emission Method  7 TEST SETUP PHOTO.	၁			
5.1 CLIENT INFORMATION 5.2 GENERAL DESCRIPTION OF E.U.T. 5.3 TEST MODE 5.4 LABORATORY FACILITY 5.5 LABORATORY LOCATION 5.6 TEST INSTRUMENTS LIST. 6 TEST RESULTS AND MEASUREMENT DATA 6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED EMISSIONS 6.4 20DB OCCUPY BANDWIDTH 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME. 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE. 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 SPURIOUS EMISSION 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method	4	T	EST SUMMARY	4
5.2 GENERAL DESCRIPTION OF E.U.T. 5.3 TEST MODE 5.4 LABORATORY FACILITY. 5.5 LABORATORY LOCATION. 5.6 TEST INSTRUMENTS LIST.  6 TEST RESULTS AND MEASUREMENT DATA.  6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS. 6.3 CONDUCTED CUTPUT POWER. 6.4 20DB OCCUPY BANDWIDTH. 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER. 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE. 6.9 BAND EDGE 6.9.1 Conducted Emission Method. 6.9.2 Radiated Emission Method. 6.10 SPURIOUS EMISSION. 6.10.1 CONDUCTED EMISSION Method. 6.10.2 Radiated Emission Method.	5	G	ENERAL INFORMATION	5
5.2 GENERAL DESCRIPTION OF E.U.T. 5.3 TEST MODE 5.4 LABORATORY FACILITY. 5.5 LABORATORY LOCATION. 5.6 TEST INSTRUMENTS LIST.  6 TEST RESULTS AND MEASUREMENT DATA.  6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS. 6.3 CONDUCTED CUTPUT POWER. 6.4 20DB OCCUPY BANDWIDTH. 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER. 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE. 6.9 BAND EDGE 6.9.1 Conducted Emission Method. 6.9.2 Radiated Emission Method. 6.10 SPURIOUS EMISSION. 6.10.1 CONDUCTED EMISSION Method. 6.10.2 Radiated Emission Method.		5 1	CHENT INFORMATION	5
5.3 TEST MODE 5.4 LABORATORY FACILITY 5.5 LABORATORY LOCATION 5.6 TEST INSTRUMENTS LIST.  6 TEST RESULTS AND MEASUREMENT DATA  6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED OUTPUT POWER. 6.4 20DB OCCUPY BANDWIDTH 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME. 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE. 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10.1 Conducted Emission Method 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method				
5.4 LABORATORY FACILITY 5.5 LABORATORY LOCATION 5.6 TEST INSTRUMENTS LIST  6 TEST RESULTS AND MEASUREMENT DATA  6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED OUTPUT POWER 6.4 20DB OCCUPY BANDWIDTH 6.5 CARRIER FREQUENCIES SEPARATION 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10.1 SPURIOUS EMISSION 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 6.10.3 SPURIOUS EMISSION 6.10.4 Conducted Emission Method 6.10.5 Radiated Emission Method 6.10.6 TEST SETUP PHOTO		0		
5.5 LABORATORY LOCATION 5.6 TEST INSTRUMENTS LIST  6 TEST RESULTS AND MEASUREMENT DATA  6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED OUTPUT POWER 6.4 20DB OCCUPY BANDWIDTH 6.5 CARRIER FREQUENCIES SEPARATION 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10.1 Conducted Emission Method 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 6.10.3 FURIOUS EMISSION 6.10.4 Conducted Emission Method 6.10.5 FURIOUS Emission Method 6.10.6 Radiated Emission Method 6.10.7 TEST SETUP PHOTO		5.4		
6 TEST RESULTS AND MEASUREMENT DATA  6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED OUTPUT POWER 6.4 20DB OCCUPY BANDWIDTH 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME. 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE. 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 SPURIOUS EMISSION 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method		5.5		
6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED OUTPUT POWER. 6.4 20DB OCCUPY BANDWIDTH. 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME. 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE. 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 SPURIOUS EMISSION 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method		5.6	TEST INSTRUMENTS LIST	8
6.1 ANTENNA REQUIREMENT 6.2 CONDUCTED EMISSIONS 6.3 CONDUCTED OUTPUT POWER. 6.4 20DB OCCUPY BANDWIDTH. 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME. 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE. 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 SPURIOUS EMISSION 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method	6	T	EST RESULTS AND MEASUREMENT DATA	9
6.2 CONDUCTED EMISSIONS. 6.3 CONDUCTED OUTPUT POWER. 6.4 20DB OCCUPY BANDWIDTH. 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER. 6.7 DWELL TIME. 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE. 6.9.1 Conducted Emission Method. 6.9.2 Radiated Emission Method 6.10 SPURIOUS EMISSION. 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method	•			
6.3 CONDUCTED OUTPUT POWER. 6.4 20DB OCCUPY BANDWIDTH. 6.5 CARRIER FREQUENCIES SEPARATION. 6.6 HOPPING CHANNEL NUMBER. 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE. 6.9 BAND EDGE 6.9.1 Conducted Emission Method. 6.9.2 Radiated Emission Method. 6.10 SPURIOUS EMISSION 6.10.1 Conducted Emission Method. 6.10.2 Radiated Emission Method. 6.10.2 Radiated Emission Method.			·	
6.4 20DB OCCUPY BANDWIDTH 6.5 CARRIER FREQUENCIES SEPARATION 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 Spurious Emission 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 6.10.2 Radiated Emission Method 7 TEST SETUP PHOTO				
6.5 CARRIER FREQUENCIES SEPARATION 6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 SPURIOUS EMISSION 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 7 TEST SETUP PHOTO				
6.6 HOPPING CHANNEL NUMBER 6.7 DWELL TIME				
6.7 DWELL TIME 6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 SPURIOUS EMISSION 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 7 TEST SETUP PHOTO				
6.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE 6.9 BAND EDGE 6.9.1 Conducted Emission Method 6.9.2 Radiated Emission Method 6.10 Spurious Emission 6.10.1 Conducted Emission Method 6.10.2 Radiated Emission Method 7 TEST SETUP PHOTO				
6.9 BAND EDGE		6.8		
6.9.2 Radiated Emission Method  6.10 Spurious Emission  6.10.1 Conducted Emission Method  6.10.2 Radiated Emission Method  7 TEST SETUP PHOTO		6.9		
6.10 Spurious Emission		6.	9.1 Conducted Emission Method	33
6.10.1 Conducted Emission Method		6.		
6.10.2 Radiated Emission Method  7 TEST SETUP PHOTO				
7 TEST SETUP PHOTO				
		6.	10.2 Radiated Emission Method	57
8 FUT CONSTRUCTIONAL DETAILS	7	T	EST SETUP PHOTO	62
	8	E	UT CONSTRUCTIONAL DETAILS	64





4 Test Summary

T 103t Gaillinary		
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)(1)	Pass
20dB Occupied Bandwidth	15.247 (a)(1)	Pass
Carrier Frequencies Separation	15.247 (a)(1)	Pass
Hopping Channel Number	15.247 (a)(1)	Pass
Dwell Time	15.247 (a)(1)	Pass
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	Pass

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



Report No: CCISE160203601

# **5** General Information

# 5.1 Client Information

Applicant:	Shenzhen TongFang Information Technologies CO.,LTD.
Address of Applicant:	Floor3, Building D, TongFang Information Harbour, LangShan Road, High-tech Industrial Park North, NanShan District, ShenZhen, P.R.China 51805
Manufacturer:	Shenzhen TongFang Information Technologies CO.,LTD.
Address of Manufacturer:	Floor3, Building D, TongFang Information Harbour, LangShan Road, High-tech Industrial Park North, NanShan District, ShenZhen, P.R.China 51805

# 5.2 General Description of E.U.T.

	Control Decomption of Electric					
Product Name:	MID					
Model No.:	B9SS3, B9S3					
Operation Frequency:	2402MHz~2480MHz					
Transfer rate:	1/2/3 Mbits/s					
Number of channel:	79					
Modulation type:	GFSK, π/4-DQPSK, 8DPSK					
Modulation technology:	FHSS					
Antenna Type:	Internal Antenna					
Antenna gain:	2 dBi					
Power supply:	Rechargeable Li-ion Battery DC3.7V-2300mAh					
AC adapter:	Model: FEF0500200A1BU					
	Input: AC100-240V 50/60Hz 0.3A					
	Output: DC 5.0V, 2.0A					





Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		



Report No: CCISE160203601

# 5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with worst case data rate.
Remark	GFSK (1 Mbps) is the worst case mode.

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 with a fresh battery, 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.

# 5.4 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.

# 5.5 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: +86-755-23118282 Fax: +86-755-23116366



Report No: CCISE160203601

# 5.6 Test Instruments list

Radiated Emission:									
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)			
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017			
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	03-28-2015	03-28-2016			
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	03-28-2015	03-28-2016			
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2015	03-31-2016			
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	04-01-2015	03-31-2016			
6	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2015	03-31-2016			
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	04-01-2015	03-31-2016			
8	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	03-28-2015	03-28-2016			
9	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	03-28-2015	03-28-2016			
10	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2015	03-31-2016			

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	08-23-2014	08-22-2017				
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	03-28-2015	03-28-2016				
3	LISN	CHASE	MN2050D	CCIS0074	03-28-2015	03-28-2016				
4	Coaxial Cable	CCIS	N/A	CCIS0086	04-01-2015	03-31-2016				
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A				



# 6 Test results and Measurement Data

# 6.1 Antenna requirement

# Standard requirement:

FCC Part 15 C Section 15.203 /247(c)

15.203 requirement:

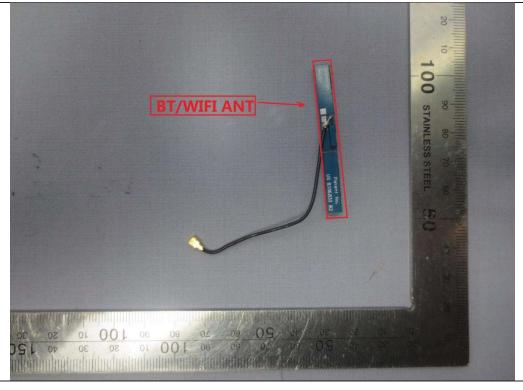
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 Bluetooth antenna is an integral antenna which permanently attached, and the best case gain of the antenna is 2 dBi.







# 6.2 Conducted Emissions

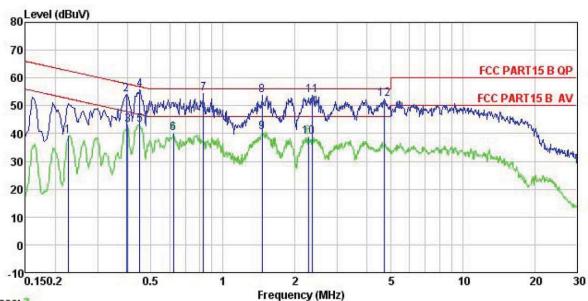
Test Requirement:	FCC Part 15 C Section 15.207					
Test Method:	ANSI C63.4:2009					
Test Frequency Range:	150 kHz to 30 MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9 kHz, VBW=30 kHz, S	weep time=auto				
Limit:		Limit (d	BuV)			
Little	Quasi-peak         Average           0.15-0.5         66 to 56*         56 to 46*					
	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.  Reference Plane					
Test setup:						
	AUX Equipment E.U.T EMI Receiver  Remark: E U.T Equipment Under Test LISN. Line Impedence Stabilization Network Test table height=0.8 m					
Test procedure:	<ol> <li>The E.U.T and simulators a line impedance stabilization 50ohm/50uH coupling impedance.</li> <li>The peripheral devices are LISN that provides a 50ohm termination. (Please refer to photographs).</li> <li>Both sides of A.C. line are interference. In order to find positions of equipment and according to ANSI C63.4: 2</li> </ol>	n network (L.I.S.N.). The edance for the measuring also connected to the m/50uH coupling impeds to the block diagram of the checked for maximum and the maximum emission all of the interface cab	is provides a ng equipment. main power through a lance with 50ohm the test setup and conducted on, the relative les must be changed			
Test Uncertainty:	±3.28 dB					
Test Instruments:	Refer to section 5.7 for details	}				
Test mode:	Bluetooth (Continuous transmitting) mode					
Test results:	Pass					
	1					

## **Measurement Data**





Line:



Trace: 3

Site Condition

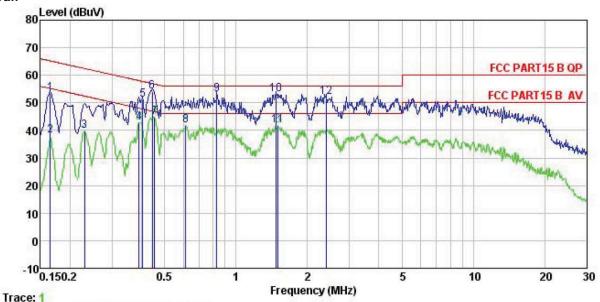
: CCIS Shielding Room : FCC PART15 B QP LISN LINE

EUT : MID Model : B9SS3
Test Mode : BT mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 °C Huni:56% Atmos:101KPa
Test Engineer: Viki

Freq	Read Level	LISN Factor			Limit Line	Over Limit	Remark
MHz	dBu₹	<u>dB</u>	<u>d</u> B	dBu₹	—dBu₹	<u>dB</u>	
0.226	28.08	0.26	10.75	39.09	52.61	-13.52	Average
0.396	43.15	0.26	10.72	54.13	57.95	-3.82	QP
0.400	32.10	0.26	10.72	43.08	47.86	-4.78	Average
0.449	44.90	0.27	10.74	55.91	56.89	-0.98	QP
0.449	32.05	0.27	10.74	43.06	46.89	-3.83	Average
0.621	29.00	0.27	10.77	40.04	46.00	-5.96	Average
0.830	43.27	0.28	10.82	54.37	56.00	-1.63	QP
1.456	42.59	0.30	10.92	53.81	56.00		
1.456	29.25	0.30	10.92	40.47	46.00	-5.53	Average
2.273	27.47	0.33	10.95	38.75	46.00	-7.25	Average
2.358	42.47	0.33	10.94	53.74	56.00	-2.26	QP
4.696	41.17	0.41	10.86	52.44	56.00	-3.56	QP
	MHz 0. 226 0. 396 0. 400 0. 449 0. 469 1. 456 1. 456 2. 273 2. 358	Freq Level  MHz dBuV  0.226 28.08 0.396 43.15 0.400 32.10 0.449 44.90 0.449 32.05 0.621 29.00 0.830 43.27 1.456 42.59 1.456 29.25 2.273 27.47 2.358 42.47	Freq Level Factor  MHz dBuV dB  0.226 28.08 0.26 0.396 43.15 0.26 0.400 32.10 0.26 0.449 44.90 0.27 0.449 32.05 0.27 0.621 29.00 0.27 0.830 43.27 0.28 1.456 42.59 0.30 1.456 29.25 0.30 2.273 27.47 0.33 2.358 42.47 0.33	MHz         dBuV         dB         dB           0.226         28.08         0.26         10.75           0.396         43.15         0.26         10.72           0.400         32.10         0.26         10.72           0.449         44.90         0.27         10.74           0.621         29.05         0.27         10.74           0.621         29.00         0.27         10.77           0.830         43.27         0.28         10.82           1.456         42.59         0.30         10.92           1.456         29.25         0.30         10.92           2.273         27.47         0.33         10.94           2.358         42.47         0.33         10.94	MHz         dBuV         dB         dB         dBuV           0.226         28.08         0.26         10.75         39.09           0.396         43.15         0.26         10.72         54.13           0.400         32.10         0.26         10.72         43.08           0.449         44.90         0.27         10.74         55.91           0.449         32.05         0.27         10.74         43.06           0.621         29.00         0.27         10.77         40.04           0.830         43.27         0.28         10.82         54.37           1.456         42.59         0.30         10.92         53.81           1.456         29.25         0.30         10.92         40.47           2.273         27.47         0.33         10.95         38.75           2.358         42.47         0.33         10.94         53.74	MHz         dBuV         dB         dB         dBuV         dBuV           0.226         28.08         0.26         10.75         39.09         52.61           0.396         43.15         0.26         10.72         54.13         57.95           0.400         32.10         0.26         10.72         43.08         47.86           0.449         44.90         0.27         10.74         55.91         56.89           0.621         29.00         0.27         10.74         43.06         46.89           0.830         43.27         0.28         10.82         54.37         56.00           1.456         42.59         0.30         10.92         53.81         56.00           1.456         29.25         0.30         10.92         40.47         46.00           2.273         27.47         0.33         10.95         38.75         46.00           2.358         42.47         0.33         10.94         53.74         56.00	MHz         dBuV         dB         dB         dBuV         dBuV         dB           0.226         28.08         0.26         10.75         39.09         52.61         -13.52           0.396         43.15         0.26         10.72         54.13         57.95         -3.82           0.400         32.10         0.26         10.72         43.08         47.86         -4.78           0.449         44.90         0.27         10.74         55.91         56.89         -0.98           0.449         32.05         0.27         10.74         43.06         46.89         -3.83           0.621         29.00         0.27         10.77         40.04         46.00         -5.96           0.830         43.27         0.28         10.82         54.37         56.00         -1.63           1.456         42.59         0.30         10.92         53.81         56.00         -2.19           1.456         29.25         0.30         10.92         40.47         46.00         -5.53           2.273         27.47         0.33         10.95         38.75         46.00         -7.25           2.358         42.47         0.33 <t< td=""></t<>



#### Neutral:



: CCIS Shielding Room Site

: FCC PART15 B QP LISN NEUTRAL Condition

EUT : MID Model : B9SS3

Test Mode : BT mode Power Rating : AC 120V/60Hz Environment : Temp: 23 °C Huni:56% Atmos:101KPa

Test Engineer: Viki

Nemark								
		Read	LISN	Cable		Limit	Over	
	Freq	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBu∜	<u>dB</u>	dB	dBu₹	dBu∜	<u>d</u> B	
1	0.165	42.55	0.17	10.77	53.49	65.21	-11.72	QP
1 2 3 4 5 6 7 8 9	0.165	27.17	0.17	10.77	38.11	55.21	-17.10	Average
3	0.230	28.89	0.16	10.75	39.80	52.44	-12.64	Average
4	0.389	32.05	0.16	10.72	42.93	48.08	-5.15	Average
5	0.404	40.24	0.16	10.72	51.12	57.77	-6.65	QP
6	0.444	43.34	0.16	10.74	54.24	56.98	-2.74	QP
7	0.454	34.06	0.16	10.74	44.96	46.80	-1.84	Average
8	0.614	30.71	0.17	10.77	41.65	46.00	-4.35	Average
9	0.830	42.10	0.18	10.82	53.10	56.00	-2.90	QP
10	1.480	42.11	0.19	10.92	53.22	56.00	-2.78	QP
11	1.503	30.57	0.19	10.92	41.68	46.00	-4.32	Average
12	2, 396	41.09	0.21	10.94	52.24	56,00	-3.76	

#### Notes:

- 1. An initial pre-scan was performed on the line 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 Part 15 C Section 15.247 (b)(3)	
Test Method:	ANSI C63.10:2009 and DA00-705	
Receiver setup:	RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz) RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz and < 3MHz)	
Limit:	125 mW(21 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:	Non-hopping mode	
Test results:	Pass	

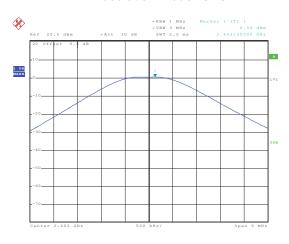
#### **Measurement Data**

	indudui dindiri Butu				
	GFSK mode				
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result		
Lowest	0.56	21.00	Pass		
Middle	2.29	21.00	Pass		
Highest	1.57	21.00	Pass		
	π/4-DQPSK ι	mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result		
Lowest	-0.50	21.00	Pass		
Middle	1.00	21.00	Pass		
Highest	0.27	21.00	Pass		
	8DPSK mode				
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result		
Lowest	-0.41	21.00	Pass		
Middle	1.03	21.00	Pass		
Highest	0.20	21.00	Pass		



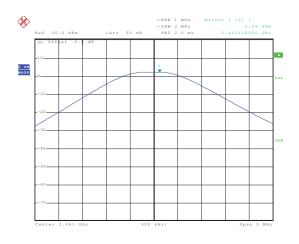
## Test plot as follows:

## Modulation mode: GFSK



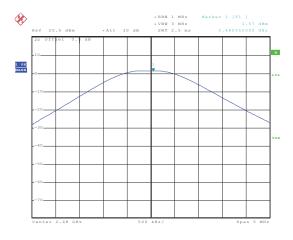
Date: 12.MAR.2016 23:43:48

#### Lowest channel



Date: 12.MAR.2016 23:44:08

## Middle channel

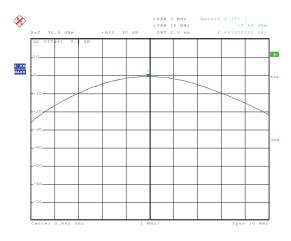


Date: 12.MAR.2016 23:44:24

Highest channel

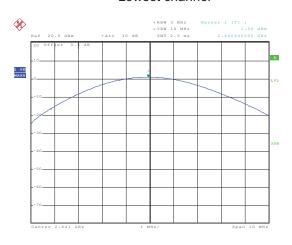


## Modulation mode: π/4-DQPSK



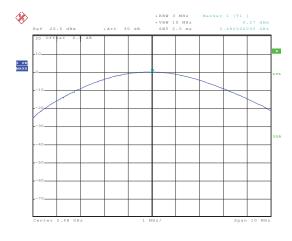
Date: 12.MAR.2016 23:45:47

#### Lowest channel



Date: 12.MAR.2016 23:45:22

#### Middle channel

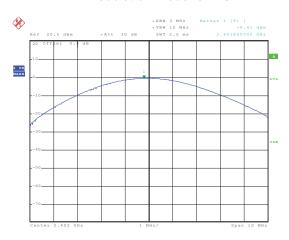


Date: 12.MAR.2016 23:44:57

Highest channel

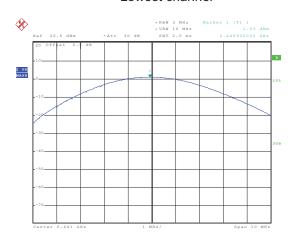


## Modulation mode: 8DPSK



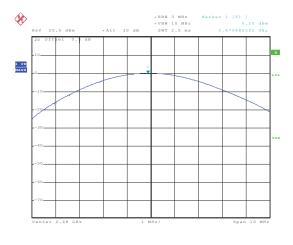
Date: 12.MAR.2016 23:46:24

#### Lowest channel



Date: 12.MAR.2016 23:46:56

## Middle channel



Date: 12.MAR.2016 23:47:23

Highest channel



# 6.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2009 and DA00-705	
Receiver setup:	RBW=30 kHz, VBW=100 kHz, detector=Peak	
Limit:	NA	
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane	
Test Instruments:	Refer to section 5.7 for details	
Test mode:	Non-hopping mode	
Test results:	Pass	

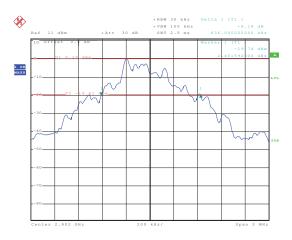
#### **Measurement Data**

Test channel	20dB Occupy Bandwidth (kHz)		
rest channel	GFSK	π/4-DQPSK	8DPSK
Lowest	836	1156	1164
Middle	832	1156	1164
Highest	948	1156	1168

# Test plot as follows:

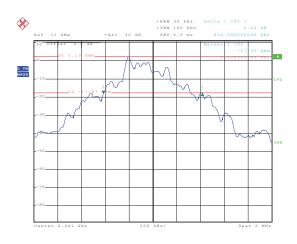


#### Modulation mode: GFSK



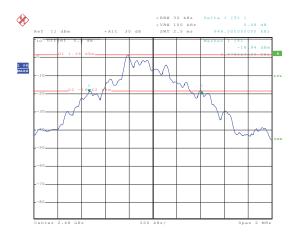
Date: 13.MAR.2016 00:02:33

#### Lowest channel



Date: 12.MAR.2016 23:59:55

#### Middle channel

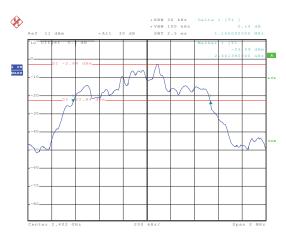


Date: 12.MAR.2016 23:57:57

Highest channel

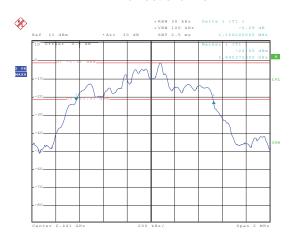


# Modulation mode: π/4-DQPSK



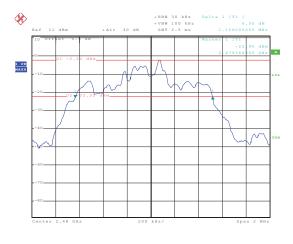
Date: 12.MAR.2016 23:52:42

#### Lowest channel



Date: 12.MAR.2016 23:53:44

#### Middle channel

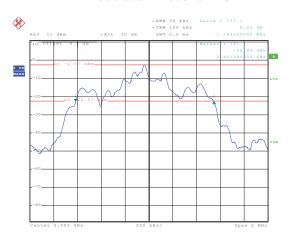


Date: 12.MAR.2016 23:55:14

Highest channel

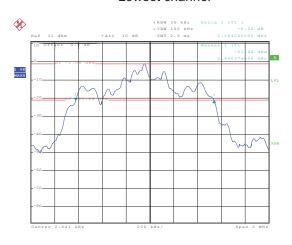


## Modulation mode: 8DPSK



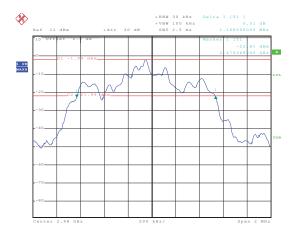
Date: 12.MAR.2016 23:51:20

#### Lowest channel



Date: 12.MAR.2016 23:50:14

#### Middle channel



Date: 12.MAR.2016 23:49:12

Highest channel





# 6.5 Carrier Frequencies Separation

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2009 and DA00-705	
Receiver setup:	RBW=100 kHz, VBW=300 kHz, detector=Peak	
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)	
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane	
Test Instruments:	Refer to section 5.7 for details	
Test mode:	Hopping mode	
Test results:	Pass	

## **Measurement Data**





GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1004	632.00	Pass
Middle	1000	632.00	Pass
Highest	1000	632.00	Pass
	π/4-DQPSK mo	de	
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1000	770.67	Pass
Middle	1000	770.67	Pass
Highest	1004	770.67	Pass
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1000	778.67	Pass
Middle	1000	778.67	Pass
Highest	1000	778.67	Pass

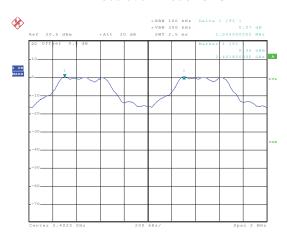
Note: According to section 6.4

Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)	
GFSK	948	632.00	
π/4-DQPSK	1156	770.67	
8DPSK	1168	778.67	

# Test plot as follows:

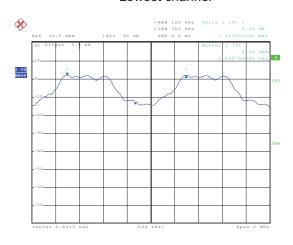


## Modulation mode: GFSK



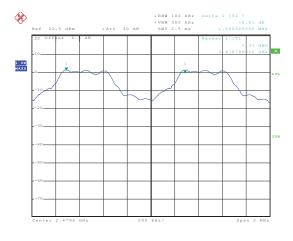
Date: 13.MAR.2016 00:04:37

#### Lowest channel



Date: 13.MAR.2016 00:05:43

#### Middle channel

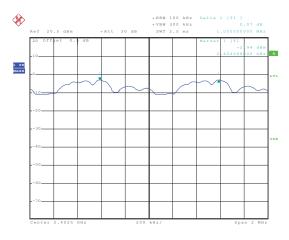


Date: 13.MAR.2016 00:06:34

Highest channel

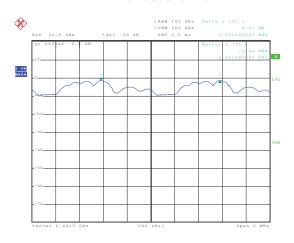


# Modulation mode: π/4-DQPSK



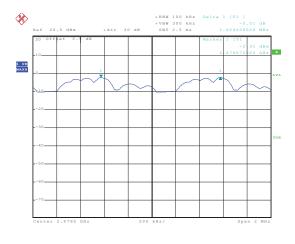
Date: 13.MAR.2016 00:10:07

#### Lowest channel



Date: 13.MAR.2016 00:08:55

#### Middle channel

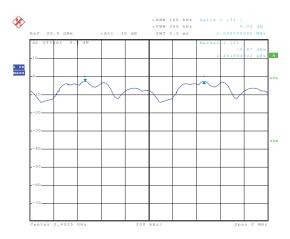


Date: 13.MAR.2016 00:08:00

Highest channel

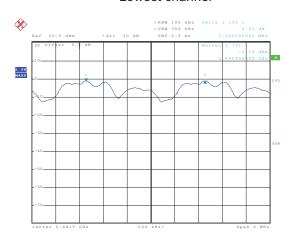


## Modulation mode: 8DPSK



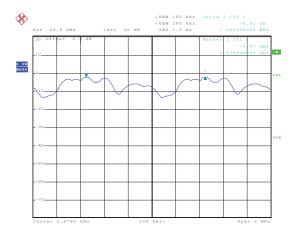
Date: 13.MAR.2016 00:11:53

#### Lowest channel



Date: 13.MAR.2016 00:14:30

#### Middle channel



Date: 13.MAR.2016 00:15:46

Highest channel



# 6.6 Hopping Channel Number

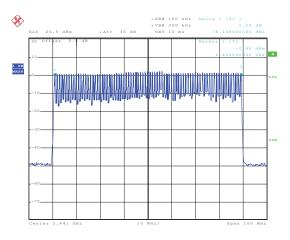
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2009 and DA00-705	
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak	
Limit:	15 channels	
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane	
Test Instruments:	Refer to section 5.7 for details	
Test mode:	Hopping mode	
Test results:	Pass	

## **Measurement Data:**

Mode	Hopping channel numbers	Limit	Result
GFSK, π/4-DQPSK, 8DPSK	79	15	Pass

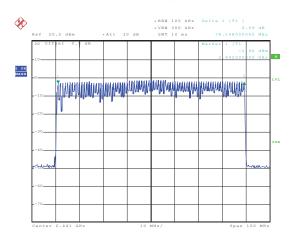


## **GFSK**



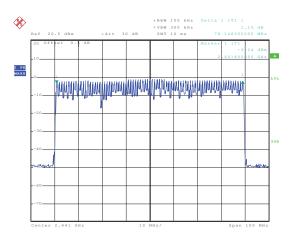
Date: 13.MAR.2016 00:27:43

#### π/4-DQPSK



Date: 13.MAR.2016 00:24:37

## 8DPSK



Date: 13.MAR.2016 00:20:29



## 6.7 Dwell Time

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2009 and KDB DA00-705	
Receiver setup:	RBW=1 MHz, VBW=1 MHz, Span=0 Hz, Detector=Peak	
Limit:	0.4 Second	
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane	
Test Instruments:	Refer to section 5.7 for details	
Test mode:	Hopping mode	
Test results:	Pass	

#### Measurement Data (Worse case)

Mode	Packet	Dwell time (second)	Limit (second)	Result
	DH1	0.13632		
GFSK	DH3	0.27136	0.4	Pass
	DH5	0.31467		
	2-DH1	0.13888		
π/4-DQPSK	2-DH3	0.27232	0.4	Pass
	2-DH5	0.31467		
	3-DH1	0.13760		
8DPSK	3-DH3	0.27232	0.4	Pass
	3-DH5	0.31467		

For GFSK,  $\pi/4$ -DQPSK and 8DPSK:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

DH1 time slot=0.426\*(1600/(2\*79))\*31.6=136.32ms DH3 time slot=1.696\*(1600/(4\*79))\*31.6=271.36ms DH5 time slot=2.950\*(1600/(6\*79))\*31.6=314.67ms

2-DH1 time slot=0.434\*(1600/ (2\*79))\*31.6=138.88ms

2-DH3 time slot=1.702\*(1600/ (4\*79))\*31.6=272.32ms

2-DH5 time slot=2.950\*(1600/ (6\*79))\*31.6=314.67ms

3-DH1 time slot=0.430\*(1600/ (2\*79))\*31.6=137.60ms

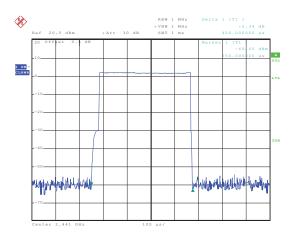
3-DH3 time slot=1.702\*(1600/ (4\*79))\*31.6=272.32ms

3-DH5 time slot=2.950\*(1600/ (6\*79))\*31.6=314.67ms



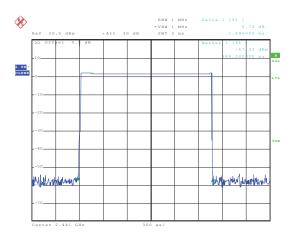
# Test plot as follows:

# Modulation mode: GFSK



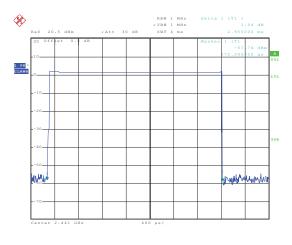
Date: 13.MAR.2016 03:41:37

#### DH1



Date: 13.MAR.2016 03:44:28

#### DH3

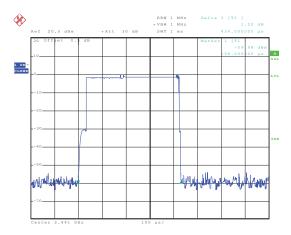


Date: 13.MAR.2016 03:47:21

DH5

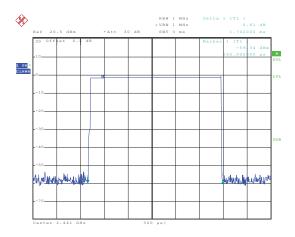


## Modulation mode: π/4-DQPSK



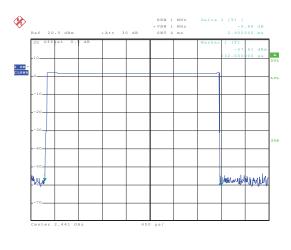
Date: 13.MAR.2016 03:42:32

#### 2-DH1



Date: 13.MAR.2016 03:45:10

#### 2-DH3

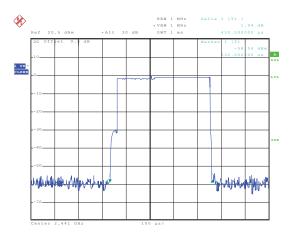


Date: 13.MAR.2016 03:47:49

2-DH5

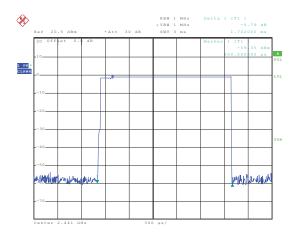


## Modulation mode: 8DPSK



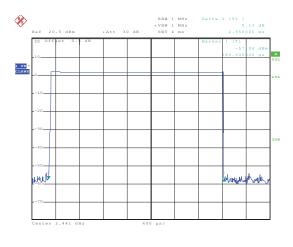
Date: 13.MAR.2016 03:43:04

#### 3-DH1



Date: 13.MAR.2016 03:46:01

#### 3-DH3



Date: 13.MAR.2016 03:48:18

3-DH5

Report No: CCISE160203601

# 6.8 Pseudorandom Frequency Hopping Sequence

# Test Requirement: FCC

FCC Part 15 C Section 15.247 (a)(1) requirement:

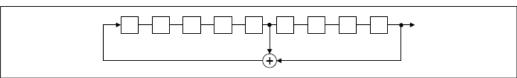
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

## **EUT Pseudorandom Frequency Hopping Sequence**

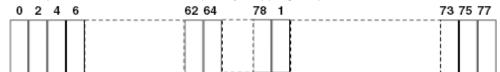
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: 2<sup>9</sup>-1 = 511 bits
- · Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.





# 6.9 Band Edge

# 6.9.1 Conducted Emission Method

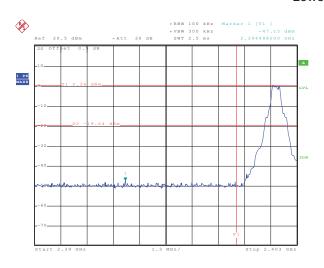
Test Requirement:	FCC Part 15 C Section 15.247 (d)	
Test Method:	ANSI C63.10:2009 and DA00-705	
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector=Peak	
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power 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  E.U.T  Non-Conducted Table  Ground Reference Plane	
Test Instruments:	Refer to section 5.7 for details	
Test mode:	Non-hopping mode and hopping mode	
Test results:	Pass	

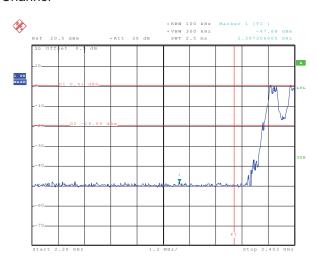
# Test plot as follows:



## **GFSK**

## **Lowest Channel**





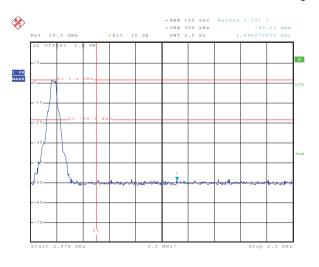
Date: 13.MAR.2016 03:50:28

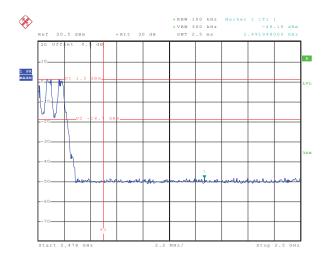
No-hopping mode

Date: 13.MAR.2016 03:57:52

#### Hopping mode

# **Highest Channel**





Date: 13.MAR.2016 04:05:10

No-hopping mode

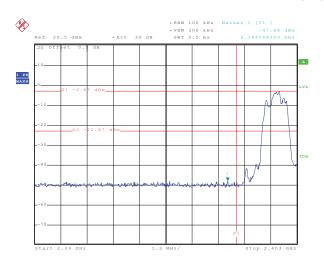
Date: 13.MAR.2016 03:59:21

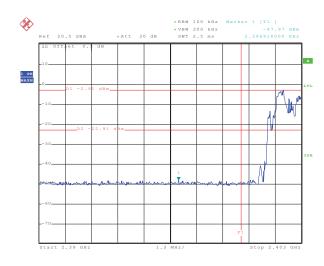
Hopping mode



## $\pi/4$ -DQPSK

#### **Lowest Channel**





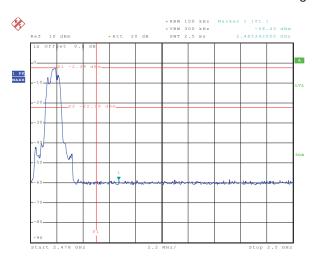
Date: 13.MAR.2016 03:51:25

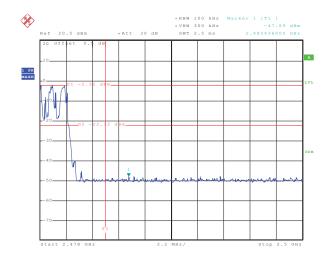
No-hopping mode

Date: 13.MAR.2016 03:56:04

Hopping mode

# **Highest Channel**





Date: 13.MAR.2016 05:05:07

No-hopping mode

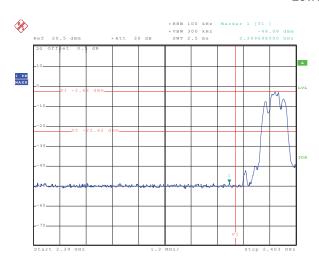
Date: 13.MAR.2016 04:00:53

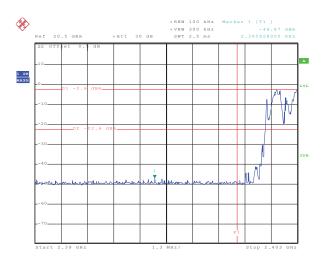
Hopping mode



#### 8DPSK

#### **Lowest Channel**





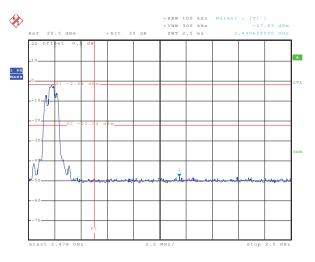
Date: 13.MAR.2016 03:52:17

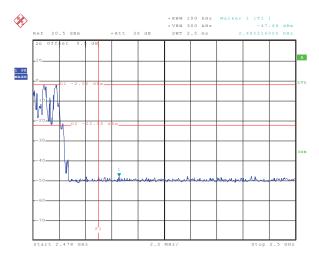
No-hopping mode

Date: 13.MAR.2016 03:54:36

## Hopping mode

# **Highest Channel**





Date: 13.MAR.2016 04:03:36

No-hopping mode

Date: 13.MAR.2016 04:02:34

Hopping mode



## 6.9.2 Radiated Emission Method

Limit: RMS 1MHz  Frequency Limit (dBuV/m  Above 1GHz 54.00	VBW 3MHz 3MHz @3m)	Remark Peak Value Average Value								
Test site:    Measurement Distance: 3m   Frequency   Detector   RBW     Above 1GHz   Peak   1MHz     RMS   1MHz     Limit:   Frequency   Limit (dBuV/m     Above 1GHz   54.00	3MHz 3MHz	Peak Value								
Frequency   Detector   RBW	3MHz 3MHz	Peak Value								
Above 1GHz	3MHz 3MHz	Peak Value								
Limit: RMS 1MHz  Frequency Limit (dBuV/m  Above 1GHz 54.00	3MHz									
Limit: Frequency Limit (dBuV/m  Above 1GHz 54.00		Average Value								
Above 1GHz 54.00	@3m)									
Δρογο 1(ΞΗΖ		Remark Average Value								
/4.00	Above 1GHz  74.00  Peak Value									
Test setup:										
<ol> <li>Test Procedure:         <ol> <li>The EUT was placed on the top of a rotating ground at a 3 meter camber. The table was determine the position of the highest radial 2. The EUT was set 3 meters away from the antenna, which was mounted on the top of tower.</li> <li>The antenna height is varied from one met ground to determine the maximum value on horizontal and vertical polarizations of the measurement.</li> <li>For each suspected emission, the EUT was and then the antenna was tuned to heights and the rotatable was turned from 0 degree maximum reading.</li> <li>The test-receiver system was set to Peak I Specified Bandwidth with Maximum Hold Medical Specified, then testing could be stopped EUT would be reported. Otherwise the emitodB margin would be re-tested one by on average method as specified and then reported.</li> </ol> </li> </ol>	s rotated tion. interferer f a variab ter to found f the field antenna as arranges from 1 rees to 360 Detect Full Mode. Dode was ed and the issions the using p	nce-receiving ple-height antenna  r meters above the d strength. Both are set to make the ed to its worst case meter to 4 meters 0 degrees to find the unction and  10dB lower than the he peak values of the hat did not have peak, quasi-peak or								
Test Instruments: Refer to section 5.7 for details										
Test mode: Non-hopping mode										
Test results: Passed										

### Remark:

- 1. During the test, pre-scan the GFSK,  $\pi/4$ -DQPSK, 8DPSK, and all data were shown in report.
- 2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.

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
Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366

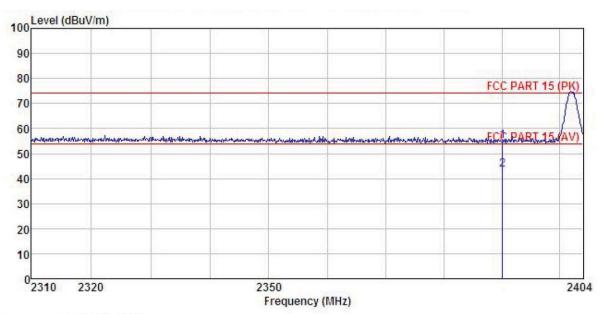




### **GFSK** mode

Test channel: Lowest

Horizontal:



Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL : MID Condition

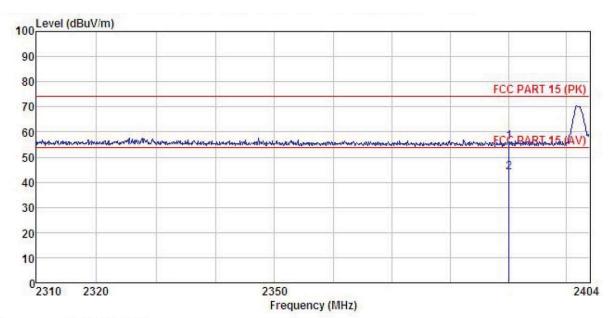
mid

Model : B9SS3
Test mode : DH1-L Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Viki
REMARK :

LMAR.			ReadAntenna Level Factor				Limit Line		Remark
9	MHz	dBu₹	<u>dB</u> /m	<u>ab</u>	<u>d</u> B	dBuV/m	dBuV/m	<u>dB</u>	
1 2	2390.000 2390.000					54.93 43.69			







Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL Condition

: MID EUT : D9SS3

lest mode : DH1-L Mode

Power Rating : AC 120V/60Hz

Environment : Temp:25.5°C Huni:55%

Test Engineer: Viki

REMARK :

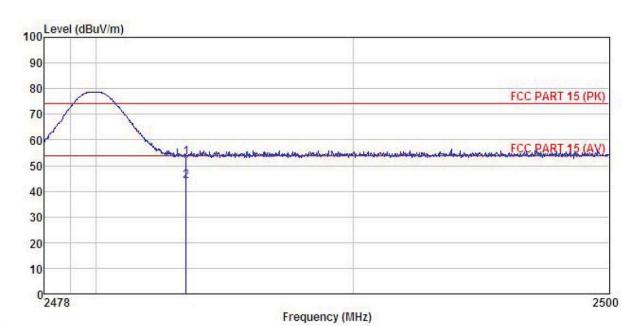
Freq	ReadAntenna Freq Level Factor							
MHz	dBu√	dB/m	<u>d</u> B	<u>d</u> B	$\overline{dBuV/m}$	$\overline{\mathtt{dBuV/m}}$	<u>d</u> B	
2390.000 2390.000								





Test channel: Highest

Horizontal:



Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL Condition

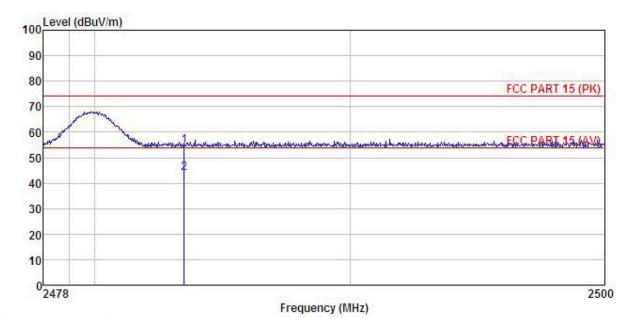
: MID EUT : B9SS3
Test mode : DH1-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Viki
REMARK :

1 2

LAI	rv :								
			Antenna						
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBu₹	dB/m	dB	<u>d</u> B	$\overline{dB} \overline{uV/m}$	dBuV/m	<u>dB</u>	
	2483.500	22.58	23.70	6.85	0.00	53.13	74.00	-20.87	Peak
)	2483.500	13.31	23.70	6.85	0.00	43.86	54.00	-10.14	Average







Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL Condition

EUT : MID : B9SS3
Test mode : DH1-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Viki
REMARK :

1 2

MK.	h :								
			Antenna						
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
-	MHz	—dBu∜		<u>d</u> B	<u>d</u> B	dBuV/m	dBuV/m	<u>dB</u>	
	2483.500 2483.500						74.00 54.00		

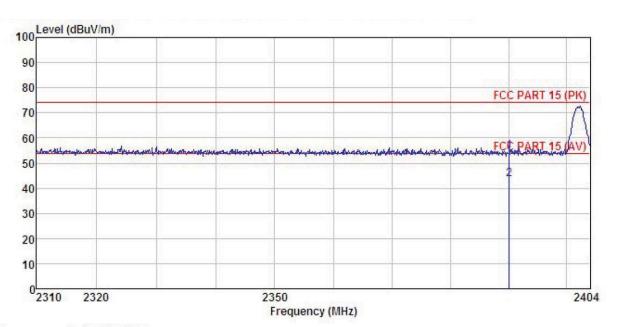




# π/4-DQPSK mode

Test channel: Lowest

Horizontal:



Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL Condition

EUT : MID Model : B9SS3

Test mode : 2DH1-L Mode Power Rating : AC 120V/60Hz

Environment: Temp: 25.5°C Huni: 55%

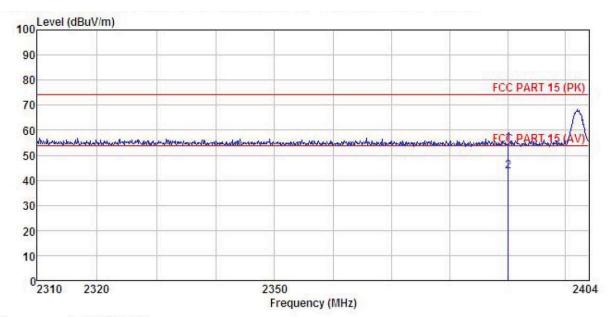
Test Engineer: Viki

REMARK

		Read	Antenna	Cable	Preamp		Limit	Over			
	Freq		Factor								
-	MHz	dBu₹	<u>dB</u> /m	dB	<u>dB</u>	$\overline{dBuV/m}$	dBu√/m	dB			
1	2390.000	24.16	23.68	6.63	0.00	54.47	74.00	-19.53	Peak		
2	2390.000	13.35	23.68	6.63	0.00	43.66	54.00	-10.34	Average		







: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL : MID Site Condition

EUT : B9SS3 Model Test mode : 2DH1-L Mode Power Rating: AC 120V/60Hz
Environment: Temp:25.5°C Huni:55%
Test Engineer: Viki
REMARK:

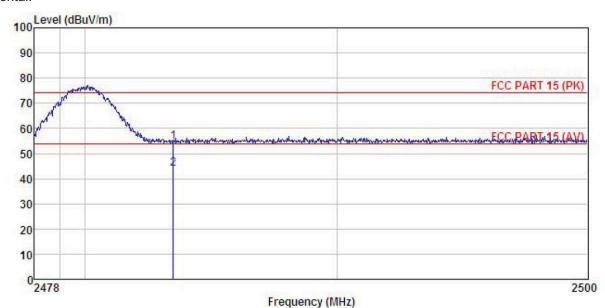
			Ant enna							
	Freq	revel	Factor	LOSS	Factor	Level	Line	Limit	Kemark	
-	MHz	dBu∜	dB/m	dB	−−−dB	$\overline{dBuV/m}$	$\overline{dBuV/m}$	<u>d</u> B		
	2390.000				0.00					
	2390.000				0.00					e





Test channel: Highest

#### Horizontal:



Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL Condition

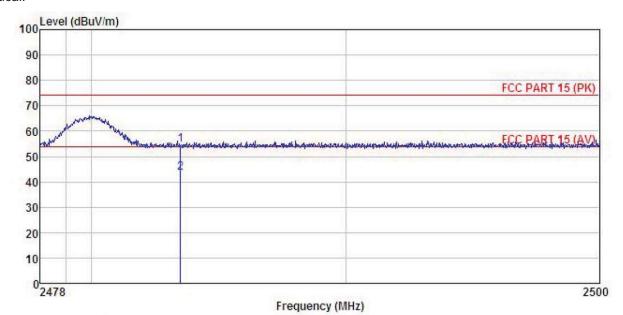
: MID

Model : B9SS3
Test mode : 2DH1-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Viki
REMARK :

Elleri	1000		Antenna Factor				Limit Line		Remark
	MHz	dBu₹	<u>dB</u> /m	<u>d</u> B	dB	$\overline{dBuV/m}$	dBuV/m	<u>d</u> B	
1 2	2483.500 2483.500								







Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL Condition

: MID EUT : D9SS3
rest mode : 2DH1-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Viki
REMARK :

Freq		Antenna Factor						
MHz	dBu∜	dB/m	d <u>B</u>	<u>d</u> B	$\overline{dB} \overline{u} \overline{V} / \overline{m}$	dBuV/m	dB	 -
2483.500 2483.500				0.00 0.00				

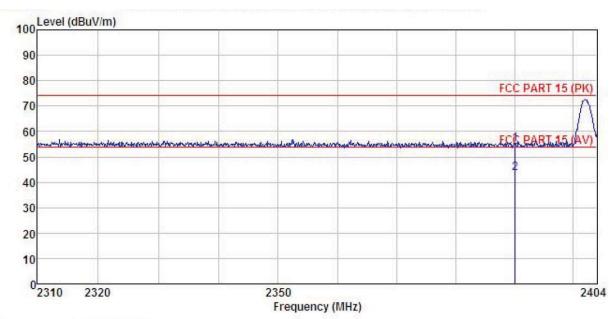




### 8DPSK mode

Test channel: Lowest

Horizontal:



Site Condition

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL

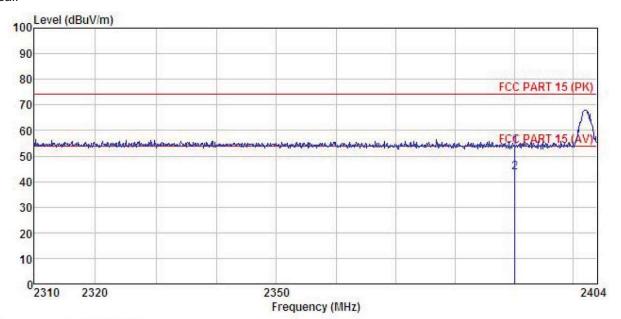
EUT : MID Model : B9SS3 Test mode : 3DH1-L Mode Power Rating : AC 120V/60Hz Environment : Temp:25.5°C Huni:55%

Test Engineer: Viki REMARK :

IIVT)	T.								
		Read	Antenna	Cable	Preamp		Limit	Over	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBu∇		<u>d</u> B	<u>d</u> B	$\overline{\mathtt{dBuV/m}}$	dBuV/m	<u>ab</u>	
1	2390.000	24.80	23.68	6.63	0.00	55.11	74.00	-18.89	Peak
>	2390,000	13.28	23.68	6 63	0.00	43.59	54 00	-10.41	Average







: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL Condition

EUT : MID : B9SS3 Model : 3DH1-L Mode Test mode

Power Rating: AC 120V/60Hz Environment: Temp:25.5°C Huni:55% Test Engineer: Viki REMARK:

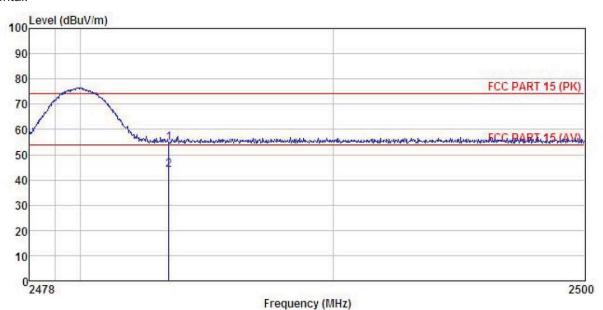
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark	
	MHz	dBu₹	dB/m	dB	<u>dB</u>	$\overline{dBuV/m}$	dBu√/m	<u>dB</u>		-
1 2	2390.000 2390.000				0.00 0.00				Peak Average	





Test channel: Highest

Horizontal:



Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL : MID Condition

: MID

Model : B9SS3

Test mode : 3DHI-H Mode

Power Rating : AC 120V/60Hz

Environment : Temp:25.5°C Huni:55%

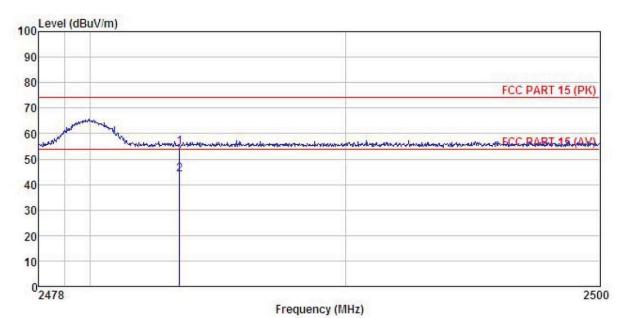
Test Engineer: Viki

REMARK :

	1/45		Antenna Factor				Limit Line		Remark
	MHz	—dBuV	<u>dB</u> /m	d <u>B</u>	<u>dB</u>	$\overline{dBuV/m}$	dBuV/m	<u>dB</u>	
1 2	2483.500 2483.500					54.67 43.78			







Site

: 3m chamber : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL : MID Condition

: MID

Model : B9SS3

Test mode : 3DH1-H Mode

Power Rating : AC 120V/60Hz

Environment : Temp:25.5°C Huni:55%

Test Engineer: Viki

REMARK :

	Freq	ReadAntenna Cable Pre Freq Level Factor Loss Fac					Remark	
8	MHz	dBu₹	<u>dB</u> /m		<u>dB</u>	$\overline{dB}\overline{uV/m}$	$\overline{dBuV/m}$	 
1 2	2483.500 2483.500							



# 6.10 Spurious Emission

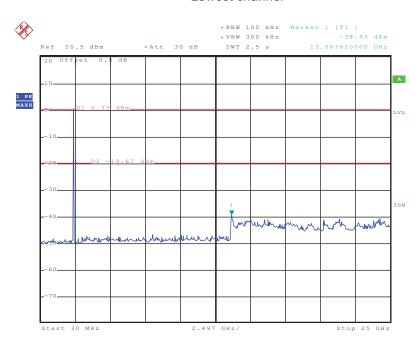
## 6.10.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)					
Test Method:	ANSI C63.10:2009 and DA00-705					
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  E.U.T  Non-Conducted Table  Ground Reference Plane					
Test Instruments:	Refer to section 5.7 for details					
Test mode:	Non-hopping mode					
Test results:	Pass					



#### **GFSK**

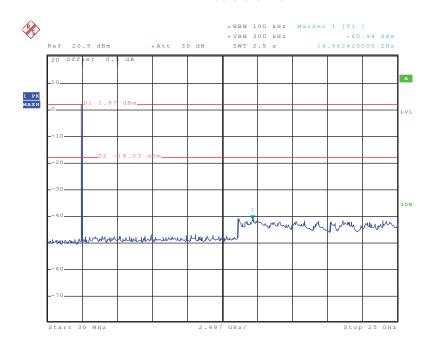
### Lowest channel



Date: 13.MAR.2016 04:08:12

## 30MHz~25GHz

# Middle channel

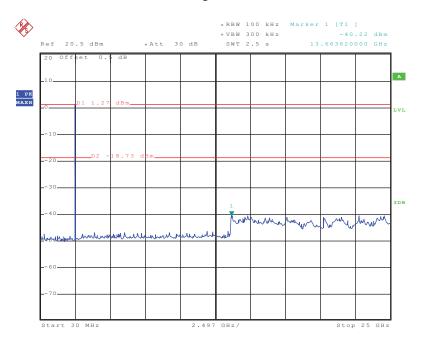


Date: 13.MAR.2016 04:07:13

30MHz~25GHz



## Highest channel



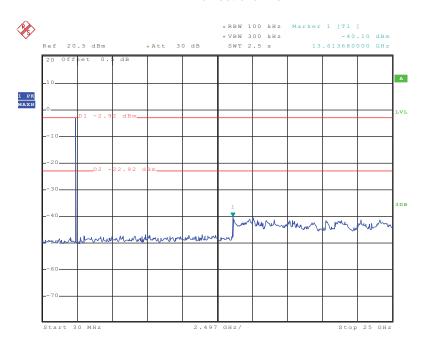
Date: 13.MAR.2016 04:06:35

30MHz~25GHz



### π/4-DQPSK

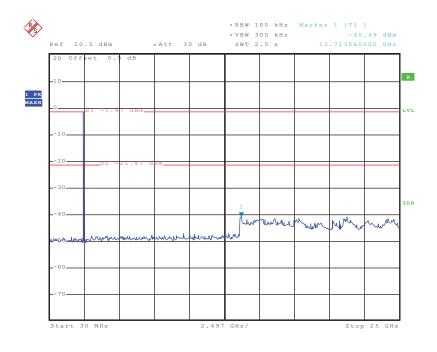
### Lowest channel



Date: 13.MAR.2016 04:09:02

# 30MHz~25GHz

### Middle channel

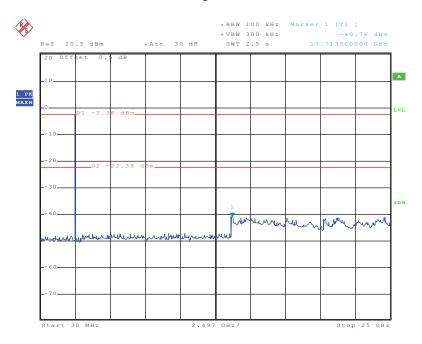


Date: 13.MAR.2016 04:09:39

30MHz~25GHz



## Highest channel



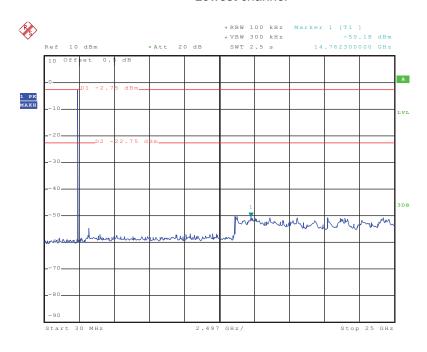
Date: 13.MAR.2016 04:10:49

30MHz~25GHz



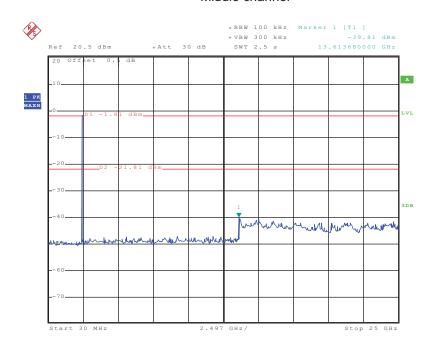
### 8DPSK

### Lowest channel



Date: 13.MAR.2016 05:08:44

# 30MHz~25GHz Middle channel

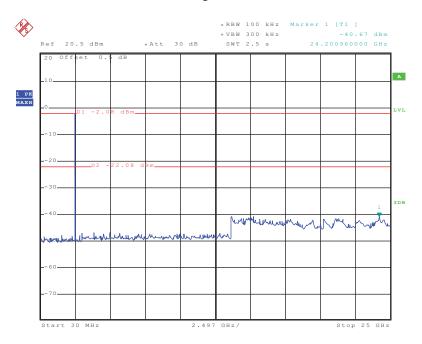


Date: 13.MAR.2016 04:12:06

30MHz~25GHz



## Highest channel



Date: 13.MAR.2016 04:11:33

30MHz~25GHz





## 6.10.2 Radiated Emission Method

6.10.2 Radiated Emission Me	etriou							
Test Requirement:	FCC Part 15 C Se	ection 15.209						
Test Method:	ANSI C63.10: 2009							
Test Frequency Range:	9 kHz to 25 GHz							
Test site:	Measurement Dis	tance: 3m						
Receiver setup:	Frequency	Detector	RBW	VBW	Remark			
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value			
	Above 1GHz	Peak	1MHz	3MHz	Peak Value			
	715070 10112	RMS	1MHz	3MHz	Average Value			
Limit:	Frequen	су	Limit (dBuV	/m @3m)	Remark			
	30MHz-88I	MHz	40.0	)	Quasi-peak Value			
	88MHz-216	MHz	43.5	5	Quasi-peak Value			
	216MHz-960	OMHz	46.0	)	Quasi-peak Value			
	960MHz-1	GHz	54.0	)	Quasi-peak Value			
	Above 1G	iHz –	54.0		Average Value			
	7.5575 13	112	74.0	)	Peak Value			
	Above 1GHz  74.0  Peak Value  Below 1GHz  Antenna Tower  Scarch Antenna  RF T est Receiver  Ground Plane  Above 1GHz  Ground Plane  Above 1GHz							



Test Procedure: 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Test Uncertainty: ±4.88 dB Test Instruments: Refer to section 5.7 for details

Report No: CCISE160203601

#### Remark:

Test mode:

Test results:

- 1. During the test, pre-scan the GFSK,  $\pi/4$ -DQPSK, 8DPSK modulation, and found the GFSK modulation is the worst case.
- 2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.
- 3. 9 kHz to 30 MHz is noise floor, so only shows the data of above 30MHz in this report.

Non-hopping mode

Pass

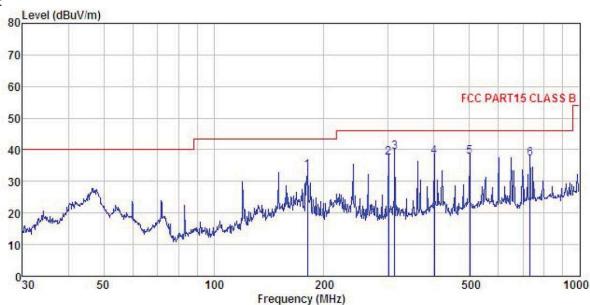




### Measurement data:

#### **Below 1GHz**

Vertical:



Site

: 3m chamber : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL Condition

EUT : MID : B9SS3 Model Test mode : BT Mode Power Rating : AC 120V/60Hz

Environment : Temp: 25.5°C Huni: 55%

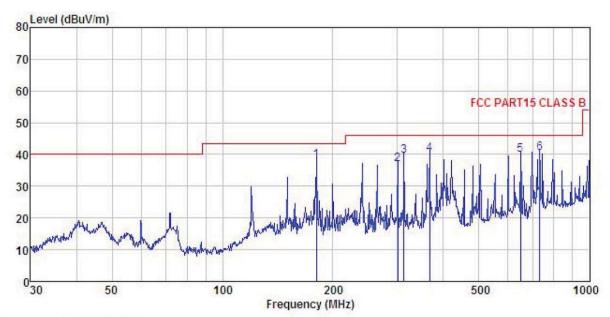
Test Engineer: Viki REMARK :

THEATT									
	Freq		Antenna Factor				Limit Line	Over Limit	Remark
_	MHz	dBu∜	dB/π	<u>dB</u>	<u>dB</u>	$\overline{dBuV/m}$	dBu√/m	<u>dB</u>	
1	180.017	50.53	9.20	2.73	28.97	33.49	43.50	-10.01	QP
2	300.367	50.36	12.70	2.94	28.45	37.55	46.00	-8.45	QP
2	312.179	51.76	13.08	2.98	28.48	39.34	46.00	-6.66	QP
4	400.432	47.53	15.91	3.08	28.78	37.74	46.00	-8.26	QP
5	501.179	46.43	16.80	3.63	28.96	37.90	46.00	-8.10	QP
6	731.920	41.39	20.00	4.29	28.55	37.13	46.00	-8.87	QP





### Horizontal:



Site

: 3m chamber : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL

EUT : MID
Model : B9SS3
Test mode : BT Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Viki
REMARK :

	Freq		Antenna Factor				Limit Line	Over Limit	Remark
_	MHz	dBu∇			dB	$\overline{dBuV/m}$	$\overline{dBuV/m}$	<u>dB</u>	
1	180.017	55.23	9.20	2.73	28.97	38.19	43.50	-5.31	QP
2	300.367	49.78	12.70	2.94	28.45	36.97	46.00	-9.03	QP
2	312.179	52.10	13.08	2.98	28.48	39.68	46.00	-6.32	QP
4	366.823	51.03	14.78	3.09	28.64	40.26	46.00	-5.74	QP
5	649.660	45.91	18.80	3.86	28.78	39.79	46.00	-6.21	QP
6	731.920	44.75	20.00	4.29	28.55	40.49	46.00	-5.51	QP



## Above 1GHz:

	10040 101121										
Te	st channel:		Lowest		Le	vel:	Peak				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
4804.00	44.98	35.99	10.57	40.24	51.30	74.00	-22.70	Vertical			
4804.00	44.72	35.99	10.57	40.24	51.04	74.00	-22.96	Horizontal			
Te	st channel:		Lowest		Level:		Average				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
4804.00	34.81	35.99	10.57	40.24	41.13	54.00	-12.87	Vertical			
4804.00	34.28	35.99	10.57	40.24	40.60	54.00	-13.40	Horizontal			

Te	st channel:		Middle		Le	vel:	Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4882.00	45.02	36.38	10.66	40.15	51.91	74.00	-22.09	Vertical
4882.00	45.33	36.38	10.66	40.15	52.22	74.00	-21.78	Horizontal
Te	st channel:		Middle		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4882.00	35.74	36.38	10.66	40.15	42.63	54.00	-11.37	Vertical
4882.00	35.52	36.38	10.66	40.15	42.41	54.00	-11.59	Horizontal

Te	st channel:		Highest		Le	vel:	Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	45.26	36.71	10.73	40.03	52.67	74.00	-21.33	Vertical
4960.00	45.21	36.71	10.73	40.03	52.62	74.00	-21.38	Horizontal
Te	st channel:		Highest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	35.21	36.71	10.73	40.03	42.62	54.00	-11.38	Vertical
4960.00	35.21	36.71	10.73	40.03	42.62	54.00	-11.38	Horizontal

## Remark:

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