



Page: 1 / 99 Rev.: 00

Report No.: T200915W04-RP1

# RADIO TEST REPORT FCC 47 CFR PART 15 SUBPART C INDUSTRY CANADA RSS-247

Test Standard	FCC Part 15.247 RSS-247 issue 2 and RSS-GEN issue 5
Product name	Communication Module
Brand Name	muRata
Model No.	LBEE5QD1ZM
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Komil Tson

Kevin Tsai Deputy Manager

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.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

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Page: 2 / 99 Rev.: 00

# **Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 11, 2020	Initial Issue	ALL	Mita Wu



Page: 3 / 99 Rev.: 00

# Table of contents

1.	GENERAL INFORMATION
1.1	EUT INFORMATION
1.2	INFORMATION ABOUT THE FHSS CHARACTERISTICS
1.3	EUT CHANNEL INFORMATION 6
1.4	ANTENNA INFORMATION
1.5	MEASUREMENT UNCERTAINTY
1.6	FACILITIES AND TEST LOCATION
1.7	INSTRUMENT CALIBRATION
1.8	SUPPORT AND EUT ACCESSORIES EQUIPMENT
1.9	TEST METHODOLOGY AND APPLIED STANDARDS
2.	TEST SUMMARY 10
3.	DESCRIPTION OF TEST MODES 11
3.1	THE WORST MODE OF OPERATING CONDITION 11
3.2	THE WORST MODE OF MEASUREMENT 12
3.3	EUT DUTY CYCLE
4.	TEST RESULT
4.1	AC POWER LINE CONDUCTED EMISSION
4.2	20DB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)
4.3	OUTPUT POWER MEASUREMENT
4.4	FREQUENCY SEPARATION
4.5	NUMBER OF HOPPING
4.6	CONDUCTED BANDEDGE AND SPURIOUS EMISSION
4.7	TIME OF OCCUPANCY (DWELL TIME)
-	RADIATION BANDEDGE AND SPURIOUS EMISSION



### 1. GENERAL INFORMATION

## **1.1 EUT INFORMATION**

Murata Manufacturing Co., Ltd. 1-10-1, Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan	
Murata Manufacturing Co., Ltd. 1-10-1, Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan	
Communication Module	
LBEE5QD1ZM	
N/A	
muRata	
September 15, 2020	
September 24 ~ October 22, 2020	
Power from power supply.	
1.0	
1.0	
Conducted : NO.1 Radiated : NO.12	

#### Remark:

1. For more details, refer to the User's manual of the EUT.

2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.



Page: 5 / 99 Rev.: 00

## **1.2 INFORMATION ABOUT THE FHSS CHARACTERISTICS**

#### **1.2.1 Pseudorandom Frequency Hopping Sequence**

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The nominal hop rate is 1 600 hops/s.

### 1.2.2 Equal Hopping Frequency Use

The channels of this system will be used equally over the long-term distribution of the hopsets.

#### **1.2.3 Example of a 79 hopping sequence in data mode:**

02, 05, 31, 24, 20, 10, 43, 36, 30, 23, 40, 06, 21, 50, 44, 09, 71, 78, 01, 13, 73, 07, 70, 72, 35, 62, 42, 11, 41, 08, 16, 29, 60, 15, 34, 61, 58, 04, 67, 12, 22, 53, 57, 18, 27, 76, 39, 32, 17, 77, 52, 33, 56, 46, 37, 47, 64, 49, 45, 38, 69, 14, 51, 26, 79, 19, 28, 65, 75, 54, 48, 03, 25, 66, 05, 16, 68, 74, 59, 63, 55

#### **1.2.4 System Receiver Input Bandwidth**

Each channel bandwidth is 1MHz.

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.

#### **1.2.5 Equipment Description**

RSS-247, 5.1 (a): The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. 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.



Page: 6 / 99 Rev.: 00

## **1.3 EUT CHANNEL INFORMATION**

Frequency Range	2402MHz-2480MHz
Modulation Type	<ol> <li>GFSK for BDR-1Mbps</li> <li>π/4-DQPSK for EDR-2Mbps</li> <li>8DPSK for EDR-3Mbps</li> </ol>
Number of channel	79 Channels

#### Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 and RSS-GEN Table 1 for test channels

Number of frequencies to be tested				
Frequency range inNumber ofLocation in frequencywhich device operatesfrequenciesrange of operation				
1 MHz or less	1	Middle		
1 MHz to 10 MHz	2	1 near top and 1 near bottom		
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom		

### **1.4 ANTENNA INFORMATION**

	No	Maker	P/N	Ant. Type	Gain (dBi)
Antenna Specification	1	Molex	146153	dipole	3.2
Antenna opecification	2	Molex	146187	dipole	3.4
	3	Murata	LBEE5QD1ZM-Antenna	Monopole (PCB)	3.6
Antenna Connector	a Connector N/A				



Page: 7 / 99 Rev.: 00

### **1.5 MEASUREMENT UNCERTAINTY**

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

#### Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.



Page: 8 / 99 Rev.: 00

#### **Report No.:** T200915W04-RP1

## **1.6 FACILITIES AND TEST LOCATION**

All measurement facilities used to collect the measurement data are located at No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	-	Not applicable, because EUT doesn't connect to AC Main Source direct.
Radiation	Jerry Chang	-
RF Conducted	Rick Lee	-

**Remark:** The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### **1.7 INSTRUMENT CALIBRATION**

	RF Conducted Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
Coaxial Cable	Woken	WC12	CC003	06/29/2020	06/28/2021	
Signal Analyzer	R&S	FSV 40	101073	09/17/2020	09/16/2021	
EXA Signal Analyzer	KEYSIGHT	N9010B	MY55460167	09/07/2020	09/06/2021	
Power Meter	Anritsu	ML2487A	6K00003260	05/21/2020	05/20/2021	
Power Seneor	Anritsu	MA2490A	032910	05/21/2020	05/20/2021	
Software	N/A					

3M 966 Chamber Test Site						
Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal Due	
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/25/2020	02/24/2021	
Bilog Antenna	Sunol Sciences	JB3	A030105	07/24/2020	07/23/2021	
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/25/2020	02/24/2021	
Coaxial Cable	EMCI	EMC105	190914+25111	09/19/2020	09/19/2021	
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/15/2020	01/14/2021	
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	10/04/2019	10/03/2020	
Loop Ant	COM-POWER	AL-130	121051	03/27/2020	03/26/2021	
Pre-Amplifier	EMEC	EM330	060609	02/25/2020	02/24/2021	
Pre-Amplifier	HP	8449B	3008A00965	02/25/2020	02/24/2021	
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	07/24/2020	07/23/2021	
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R	
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R	
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R	
Software	e3 6.11-20180413					

**Remark:** Each piece of equipment is scheduled for calibration once a year.



Page: 9 / 99 Rev.: 00

## **1.8 SUPPORT AND EUT ACCESSORIES EQUIPMENT**

	EUT Accessories Equipment						
No.	No. Equipment Brand Model Series No. FCC ID						
	N/A						

	Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID	
1	DC Power Source	Agilent	E3640A	N/A	N/A	

## **1.9 TEST METHODOLOGY AND APPLIED STANDARDS**

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, RSS-247 Issue 2 and RSS-GEN Issue 5.



Page: 10 / 99 Rev.: 00

Report No.: T200915W04-RP1

## 2. TEST SUMMARY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
15.203	-	1.3	Antenna Requirement	Pass
15.207(a)	RSS-GEN 8.8	4.1	AC Conducted Emission	N/A
15.247(a)(1)	RSS-247(5.1)(a)	4.2	20 dB Bandwidth	Pass
-	RSS-GEN 6.7	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(1)	RSS-247(5.4)(b)	4.3	Output Power Measurement	Pass
15.247(a)(1)	RSS-247(5.1)(b)	4.4	Frequency Separation	Pass
15.247(a)(1)(iii)	RSS-247(5.1)(d)	4.5	Number of Hopping	Pass
15.247(d)	RSS-247(5.5)	4.6	Conducted Band Edge	Pass
15.247(d)	RSS-247(5.5)	4.6	Conducted Spurious Emission	Pass
15.247(a)(1)(iii)	RSS-247(5.1)(d)	4.7	Time of Occupancy	Pass
15.247(d)	RSS-GEN 8.9, 8.10	4.8	Radiation Band Edge	Pass
15.247(d)	RSS-GEN 8.9, 8.10	4.8	Radiation Spurious Emission	Pass



Page: 11 / 99 Rev.: 00

**Report No.:** T200915W04-RP1

## 3. DESCRIPTION OF TEST MODES

### **3.1 THE WORST MODE OF OPERATING CONDITION**

Operation mode	GFSK for BDR-1Mbps (DH5) 8DPSK for EDR-3Mbps (3DH5)
Test Channel Frequencies	GFSK for BDR-1Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz 8DPSK for EDR-3Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.



Page: 12 / 99 Rev.: 00

**Report No.:** T200915W04-RP1

### **3.2 THE WORST MODE OF MEASUREMENT**

#### PCB Test mode

Radiated Emission Measurement Above 1G			
Test Condition	Radiated Emission Above 1G		
Power supply Mode Mode 1: EUT power by Power supply			
Worst Mode I Mode 1 Mode 2 Mode 3 Mode 4			
Worst Position       Placed in fixed position.         Worst Position       Placed in fixed position at X-Plane (E2-Plane)         Placed in fixed position at Y-Plane (E1-Plane)         Placed in fixed position at Z-Plane (H-Plane)			

Radiated Emission Measurement Below 1G			
Test Condition Radiated Emission Below 1G			
Power supply Mode	Mode 1: EUT power by Power supply		
Worst Mode       Mode 1       Mode 2       Mode 3       Mode 4			

Remark:

1. The worst mode was record in this test report.

2. EUT pre-scanned in two axis ,X,Y and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report

3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

#### Dipole Test mode

Radiated Emission Measurement Above 1G			
Test Condition	Radiated Emission Above 1G		
Power supply Mode Mode 1: EUT power by Power supply			
Worst Mode	☑ Mode 1		
Worst PositionPlaced in fixed position.Worst PositionPlaced in fixed position at X-Plane (E2-Plane)Placed in fixed position at Y-Plane (E1-Plane)Placed in fixed position at Z-Plane (H-Plane)			

Radiated Emission Measurement Below 1G			
Test Condition Radiated Emission Below 1G			
Power supply Mode Mode 1: EUT power by Power supply			
Worst Mode   Mode 1 Mode 2 Mode 3 Mode 4			

Remark:

1. The worst mode was record in this test report.

2. EUT pre-scanned in two axis ,X,Y and two polarity, for radiated measurement. The worst case(Y-Plane) were recorded in this report

3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.



Page: 13 / 99 Rev.: 00

## 3.3 EUT DUTY CYCLE

Temperature:	25°C	Humidity:	50% RH	
Tested by:	Rick Lee			

Duty Cycle				
Configuration	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
BDR-1Mbps	77.20%	1.12	0.35	1.00
EDR-3Mbps	76.80%	1.15	0.35	1.00





Page: 14 / 99 Rev.: 00

### 4. TEST RESULT

## 4.1 AC POWER LINE CONDUCTED EMISSION

### 4.1.1 Test Limit

According to §15.207(a) and RSS-GEN section 8.8,

Frequency Range	Limits(dBµV)		
(MHz)	Quasi-peak	Average	
0.15 to 0.50	66 to 56*	56 to 46*	
0.50 to 5	56	46	
5 to 30	60	50	

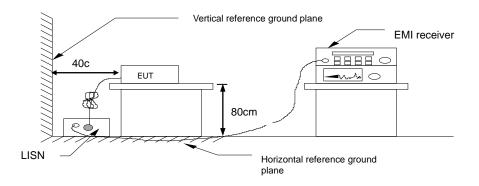
\* Decreases with the logarithm of the frequency.

### 4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

- 1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
- 2. EUT connected to the line impedance stabilization network (LISN)
- 3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. Recorded Line for Neutral and Line.

### 4.1.3 Test Setup



## 4.1.4 Test Result

Not applicable, because EUT doesn't connect to AC Main Source direct.



Page: 15 / 99 Rev.: 00

## 4.220dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

### 4.2.1 Test Limit

According to §15.247(a) (1), RSS-247 section 5.1(a) and RSS-GEN 6.7,

**<u>20 dB Bandwidth</u>** : For reporting purposes only.

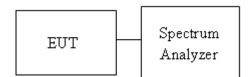
**Occupied Bandwidth(99%)** : For reporting purposes only.

#### 4.2.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 7.8.7,

- 1. The EUT RF output connected to the spectrum analyzer by RF cable.
- 2. Setting maximum power transmit of EUT
- 3. SA set RBW = 30kHz, VBW = 100kHz and Detector = Peak, to measurement 20 dB Bandwidth.
- 4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
- 5. Measure and record the result of 20 dB Bandwidth and 99% Bandwidth. in the test report.

### 4.2.3 Test Setup





Page: 16 / 99 Rev.: 00

#### 4.2.4 Test Result

Temperature:	25°C	Humidity:	50% RH
Tested by:	Rick Lee		

Test mode: GFSK_BDR-1Mbps mode / 2402-2480 MHz					
Channel	Frequency (MHz)	OBW(99%) (MHz)	20dB BW (MHz)		
Low	2402	0.8582	0.9277		
Mid	2441	0.8615	0.9248		
High	2480	0.8613	0.9245		

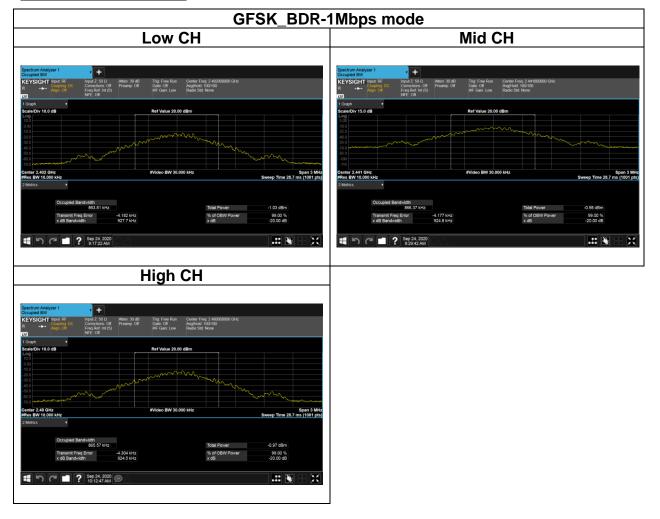
	Test mode: 8DPSK_EDR-3Mbps mode / 2402-2480 MHz				
Channel	Frequency (MHz)	OBW(99%) (MHz)	20dB BW (MHz)		
Low	2402	1.1781	1.2730		
Mid	2441	1.1778	1.2730		
High	2480	1.1830	1.2730		



Page: 17 / 99 Rev.: 00

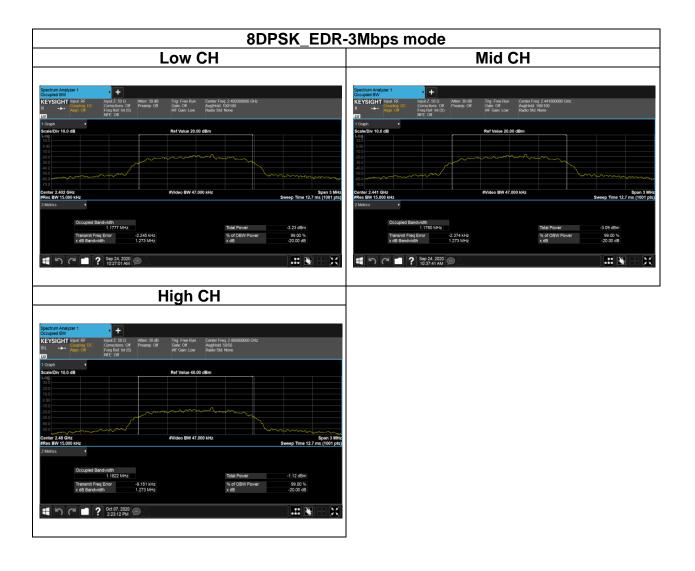
### Test Data

#### 20dB BANDWIDTH





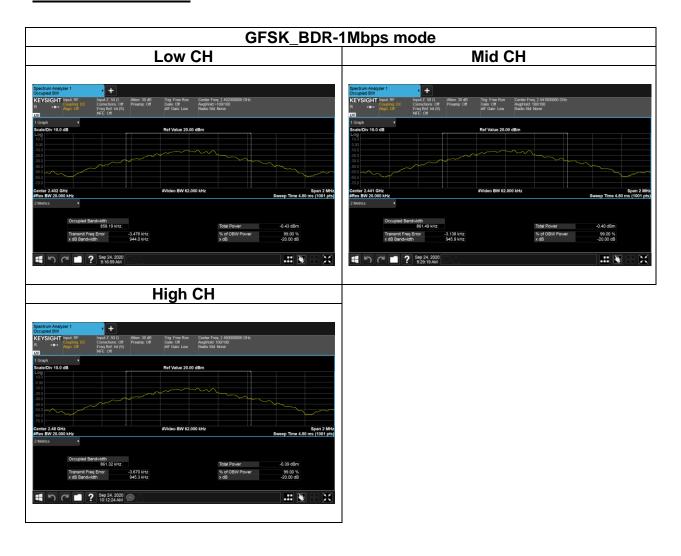
Page: 18 / 99 Rev.: 00





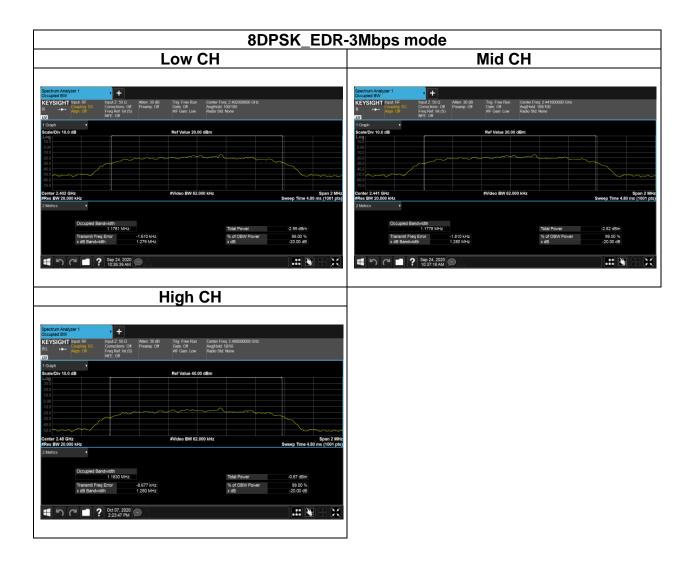
Page: 19 / 99 Rev.: 00

## Test Data BANDWIDTH 99%





Page: 20 / 99 Rev.: 00





Page: 21 / 99 Rev.: 00

Report No.: T200915W04-RP1

### 4.3 OUTPUT POWER MEASUREMENT

### 4.3.1 Test Limit

According to §15.247(a)(1) and RSS-247 section 5.4(b)

#### Peak output power :

#### FCC

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.

#### <u>IC</u>

According to RSS-247 section 5.4(b), For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).



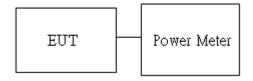
Antenna not exceed 6 dBi : 21dBm
 Antenna with DG greater than 6 dBi : 21dBm [Limit = 30 – (DG – 6)]

Average output power : For reporting purposes only.

#### 4.3.2 Test Procedure

- 1. The EUT RF output connected to the power meter by RF cable.
- 2. Setting maximum power transmit of EUT.
- 3. The path loss was compensated to the results for each measurement.
- 4. Measure and record the result of Peak output power and Average output power. in the test report.

#### 4.3.3 Test Setup





Page: 22 / 99 Rev.: 00

### 4.3.4 Test Result

Temperature:	25°C	Humidity:	50% RH
Tested by:	Rick Lee	Test Date:	October 22, 2020

#### Peak output power :

					ΒT					
Config.	СН	Freq. (MHz)	Power Setting	PK Power (dBm)	PK Power (W)	EIRP PK Power (dBm)	EIRP PK Power (W)	FCC/IC Limit (dBm)	IC EIRP Limit (dBm)	Antenna Gain (dBi)
GFSK	0	2402	5	5.62	0.0036	9.22	0.0084			
BR-1Mbps	39	2441	5	5.76	0.0038	9.36	0.0086			
(DH5)	78	2480	5	5.79	0.0038	9.39	0.0087	21	36	3.6
8DPSK	0	2402	4	5.59	0.0036	9.19	0.0083	21	30	3.0
EDR- 3Mbps	39	2441	4	5.75	0.0038	9.35	0.0086			
(3DH5)	78	2480	4	5.62	0.0036	9.22	0.0084			

#### Average output power :

	BT				
Config.	СН	Freq. (MHz)	AV Power (dBm)		
GFSK	0	2402	5.06		
BR-1Mbps	39	2441	5.13		
(DH5)	78	2480	5.21		
8DPSK	0	2402	2.51		
EDR- 3Mbps	39	2441	2.60		
(3DH5)	78	2480	2.52		



Page: 23 / 99 Rev.: 00

## 4.4 FREQUENCY SEPARATION

### 4.4.1 Test Limit

According to §15.247(a)(1) and RSS-247 section 5.1(b)

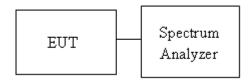
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Limit > two-thirds of the 20 dB bandwidth	
---	--

#### 4.4.2 Test Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. EUT RF output port connected to the SA by RF cable.
- 3. Set the spectrum analyzer as RBW = 100kHz, VBW = 300kHz, Sweep = auto. Max hold, mark 3 peaks of hopping channel and record the 3 peaks frequency

### 4.4.3 Test Setup





Tested by:

Report No.: T200915W04-RP1

Page: 24 / 99 Rev.: 00

### 4.4.4 Test Result

Temperature:	25°C	Humidity:	50% RH
--------------	------	-----------	--------

Rick Lee

	Test mode: GFSK_BDR-1Mbps mode / 2402-2480 MHz			
Channel	Frequency (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)	Result
Low	2402	1.0001	0.618	PASS
Mid	2441	1.0001	0.617	PASS
High	2480	1.0001	0.616	PASS

	Test mode: 8DPSK_EDR-3Mbps mode / 2402-2480 MHz				
Channel	Frequency (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)	Result	
Low	2402	1.0002	0.849	PASS	
Mid	2441	1.0002	0.849	PASS	
High	2480	1.0002	0.849	PASS	



Page: 25 / 99 Rev.: 00

### Test Data



Note: We selected worst case to performed test in middle channel, The results can be meet other channel.



Page: 26 / 99 Rev.: 00

## 4.5 NUMBER OF HOPPING

### 4.5.1 Test Limit

According to §15.247(a)(1)(iii) and RSS-247 section 5.1(d)

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

### 4.5.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 7.8.3

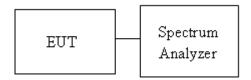
1. Place the EUT on the table and set it in transmitting mode.

2. EUT RF output port connected to the SA by RF cable.

3. Set spectrum analyzer Start Freq. = 2400 MHz, Stop Freq. = 2483.5 MHz, RBW = 100KHz, VBW = 300KHz.

4. Max hold, view and count how many channel in the band.

### 4.5.3 Test Setup





Page: 27 / 99 Rev.: 00

### 4.5.4 Test Result

Temperature:	25°C	Humidity:	50% RH
Tested by:	Rick Lee		

		Number of Hoppir	ng	
Mode	Frequency (MHz)	Hopping Channel Number	Hopping Channel Number Limits	Result
BDR-1Mbps	2402-2480	79	15	Deee
EDR-3Mbps	2402-2480	79	15	Pass

#### Test Data

Numb	per of Hopping
GFSK_BDR-1Mbps mode	8DPSK_EDR-3Mbps mode
Cesciliana Analyzer 1 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	Constitution (Analyzer 1 Constitution)         Image: Constitution (Fig. 1)         Image: Constitution (Fig. 1)         Ph/D Figet (Analyzer 1)         Analyzer 1         2         3         4         5         6           5         6         KEYSIGHT Image: Ref         Image: Constitution (Fig. 1)         Analyzer 1)         Analyzer 1)         Constitution (Fig. 1)         2         3         4         5         6           W         W         Fig. 1)         Fig. 1)         Fig. 1)         Fig. 1)         1         2         3         4         5         6           N         TCI         Market: Constitution (Fig. 1)         Analyzer 1)         Fig. 1)         Fig. 1)         N
1 Spectrum • Mkr1 2.422 2	ScaleDiv to dB         Ref Level 20.00 dBm         Mkr1 2.416 199 0 Gi           3.61 dBm         5ealerDiv to dB         Ref Level 20.00 dBm         -6.35 dB           *         100         *         *         *
000	Vice         0.0           24350 GHz         Start 2.4000 GHz         Stop 2.4850 G           2 (100 pb)         SRes EW 100 Hz         Stop 2.4850 GHz           Start 2.4000 GHz         Stop 2.4850 GHz         Stop 2.4850 GHz           Start 2.4000 GHz         Stop 2.4850 GHz         Stop 2.4850 GHz
MADE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION V NODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION V 1 N I Y 24222110 GFE -3 500 88m 4 5 6	
■ つ C ■ ? 505 28,000 ●	₩ X ■ ? 569 28.2020 ●



Page: 28 / 99 Rev.: 00

## 4.6 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

#### 4.6.1 Test Limit

According to §15.247(d) and RSS-247 section 5.5

Limit	-20 dBc
-------	---------

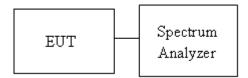
#### 4.6.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

3. The Band Edge at 2.4GHz and 2.4835GHz are investigated with both hopping "ON" and "OFF" modes ".

#### 4.6.3 Test Setup





Report No.: T200	0915W04-RP1		•	29 / 99 00
4.6.4 Test Resul	t			
Temperature:	25°C	Humidity:	50% RH	
Tested by:	Rick Lee			

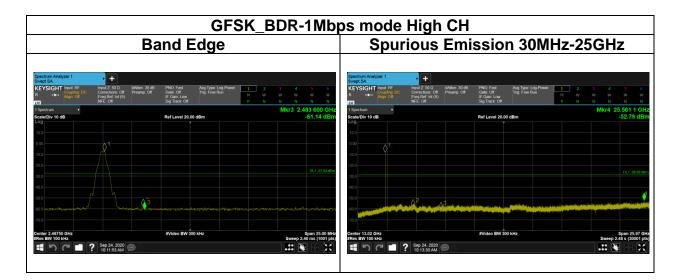
## Test Data

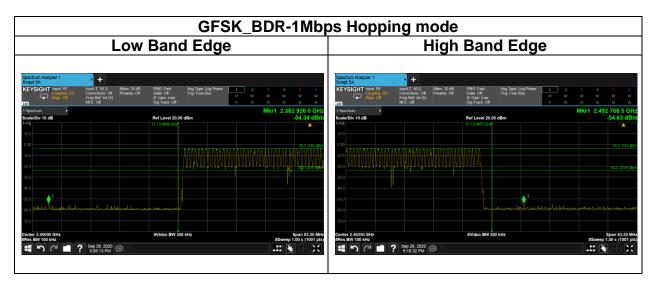
GFSK_BDR-1Mbps mode Low CH															
Band Edge				Spurious Emission 30MHz-25GHz											
Spectrum Analyzer 1 Swept SA KEYSIGHT Input: RF Coupling: DC Aign. Off	Input Z: 50.0 i#Atten 30.dB Corrections: Off Freq Ref Int (S) NFE: Off	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Power Tng: Free Run	1 2 M W	3 4 w w	5 6 W W			Input Z: 50 0 Corrections: off Freq Ref. Int (S) NEE: Off	#Atten: 30 dB Preamp: Off	PNO: Fast Gale: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Pow Trig: Free Run	er <u>1</u> 2 M W	3 4 W W	5 6 W W
1 Spectrum + Scale/Div 10 dB	NPE UT	Ref Level 20.00	l dBm	PN		2.390 00 GHz -59.73 dBm	1 Spectrum Scale/Div 10 dB	•	NFE UT		Ref Level 20.0	00 dBm	PN	Mkr4 2	3.713 8 GH -53.01 dBn
10.0							10.0								
							-10.0								
						DL1 -27.44 dBm	-20.0								
							-40.0								4
50.0 60.0 <del>Millionary (12.000 - 10.000)</del>	antration and the states of the states of	Anteradoria	atul/aposanakanakanondo	autoria and		transmontpilly constaty	-50.0 -60.0		0 0						
70.0		figure Billion	0.111-			6 440.0 Mile	-70.0					00 1415			A N 07.0
Center 2.38500 GHz #Res BW 100 kHz	? Sep 24, 2020 9:16:03 AM	#Video BW 30	U KHZ		Sweep	Span 110.0 MHz 10.5 ms (1001 pts)	Center 13.02 GH #Res BW 100 kH	z	Sep 24, 2020 9:18:06 AM		#Video BW 3	00 KHZ			Span 25.97 GH 48 s (30001 pts

								ops r	nod	e Mid	CH
Spuri	ous I	Emi	ssio	n 30M	Hz-2	5GF	lz	_			
Spectrum Analyzer 1 Swept SA	• +										
R Coupling DC Align: Off		#Atten: 30 dB Preamp: Off	PNO: Fast Gete: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Power Trig: Free Run	1 2 M W P N		w w				
1 Spectrum  Scale/Div 10 dB			Ref Level 20.0	0 dBm		Mkr4	25.662 4 GHz -53.47 dBm				
10.0											
.10.0											
							DL1-28.13 dBm				
							4				
-50.0	¢	along King angelang									
-70.0											
Center 13.02 GHz #Res BW 100 kHz	Sep 24, 2020		#Video BW 30	0 kHz			Span 25.97 GHz p 2.48 s (30001 pts)				
	Sep 24, 2020 9:30:26 AM										

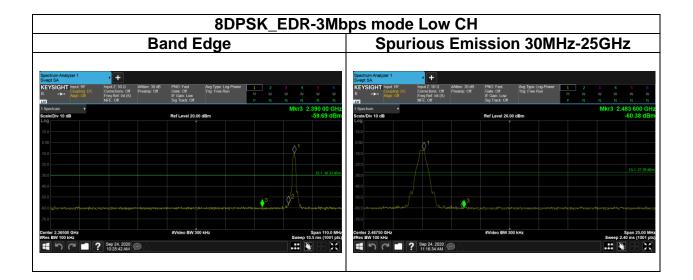


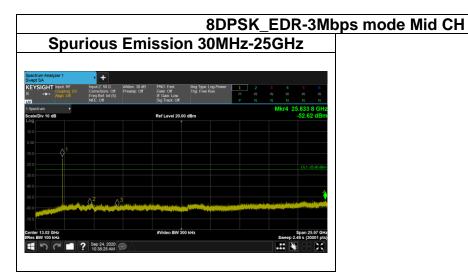
Page: 30 / 99 Rev.: 00





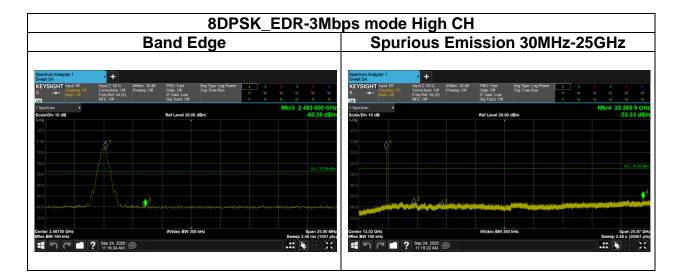


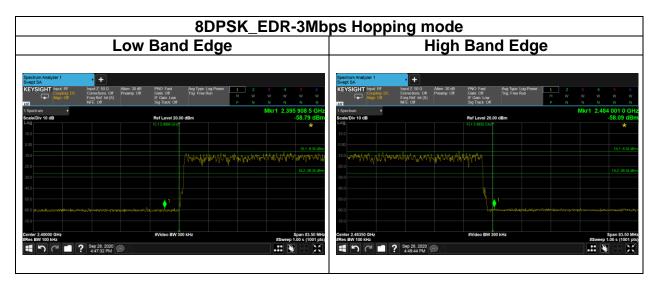






Page: 32 / 99 Rev.: 00







Page: 33 / 99 Rev.: 00

## 4.7 TIME OF OCCUPANCY (DWELL TIME)

### 4.7.1 Test Limit

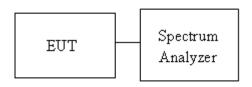
According to §15.247(a)(1)(iii)and RSS-247 section 5.1(d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

#### 4.7.2 Test Procedure

- 1. EUT RF output port connected to the SA by RF cable.
- 2. Set center frequency of spectrum analyzer = operating frequency.
- 3. Set the spectrum analyzer as RBW, VBW=1MHz, Sweep = 1 ms

#### 4.7.3 Test Setup



### 4.7.4 Test Result

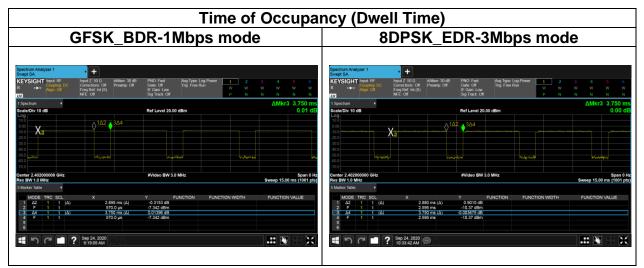
Temperature:	25°C	Humidity:	50% RH
Tested by:	Rick Lee		

Time of Occupancy (Dwell Time)								
Mode	Frequency (MHz)	Pulse Time Per Hopping	Minimum Number of	Number of pulse in	Dwell Time IN		Result	
	()	(ms)	Hopping Freq.	(0.4 * N sec)	(0.4 * N sec)	Limits (s)		
BDR-1Mbps	2441	2.8950	79	106.67	0.3088	0.4	Deee	
EDR-3Mbps	EDR-3Mbps 2441 2.8800 79 106.67 0.3072 0.4 Pass							
	Non-AFH: DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 * 0.4 *79 = 106.6							



Page: 34 / 99 Rev.: 00

### Test Data





Page: 35 / 99 Rev.: 00

## 4.8 RADIATION BANDEDGE AND SPURIOUS EMISSION

#### 4.8.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

#### Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

#### Above 30 MHz

Frequency	Field Stre microvolts/m at 3 metr	
(MHz)	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.



Page: 36 / 99 Rev.: 00

#### IC according to RSS-247 section 5.5, RSS-Gen, Section 8.9 and 8.10

#### <u>RSS-Gen Table 3 and Table 5 – General Field Strength Limits for Transmitters and</u> <u>Receivers at Frequencies Above 30 MHz</u> (Note)

Frequency	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)					
(MHz)	Transmitters	Receivers				
30-88	100 (3 nW)	100 (3 nW)				
88-216	150 (6.8 nW)	150 (6.8 nW)				
216-960	200 (12 nW)	200 (12 nW)				
Above 960	500 (75 nW)	500 (75 nW)				

**Note:** Measurements for compliance with the limits in table 3 may be performed at distances other than 3 metres, in accordance with Section 6.6.

#### <u>RSS-Gen Table 6: General Field Strength Limits for Transmitters at Frequencies</u> <u>Below 30 MHz (Transmit)</u>

Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement Distance (m)		
9-490 kHz <sup>Note</sup>	6.37/F (F in kHz)	300		
490-1,705 kHz	63.7/F (F in kHz)	30		
1.705-30 MHz	0.08	30		

**Note:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.



Page: 37 / 99 Rev.: 00

Report No.: T200915W04-RP1

### 4.8.2 Test Procedure

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 9kHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

Note: No emission found between lowest internal used/generated frequency to 30MHz(9KHz~30MHz)

4. For harmonic, the worst case of output power was BDR-1Mbps. Therefore only BDR-1Mbps record in the report.

- 5. The SA setting following :
  - (1) Below 1G : RBW = 100kHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
  - (2) Above 1G:
    - (2.1) For Peak measurement : RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
    - (2.2) For Average measurement : RBW = 1MHz, VBW

If Duty Cycle  $\geq$  98%, VBW=10Hz.

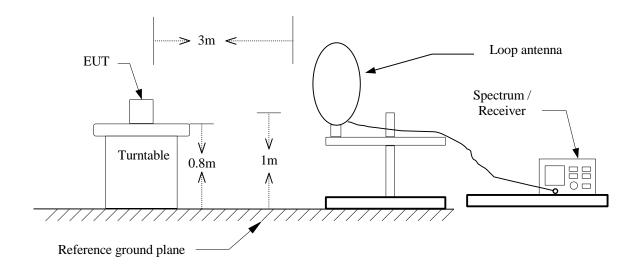
If Duty Cycle < 98%, VBW≥1/T.



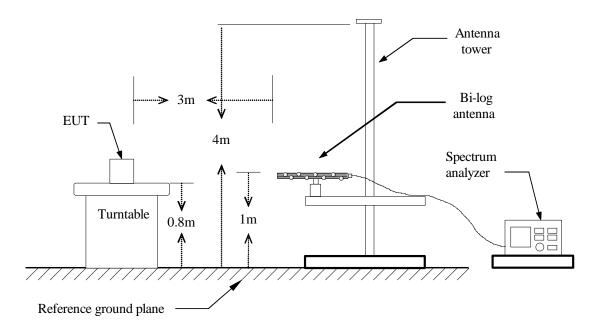
Page: 38 / 99 Rev.: 00

# **Report No.:** T200915W04-RP1 **4.8.3 Test Setup**

### <u>9kHz ~ 30MHz</u>



### <u>30MHz ~ 1GHz</u>

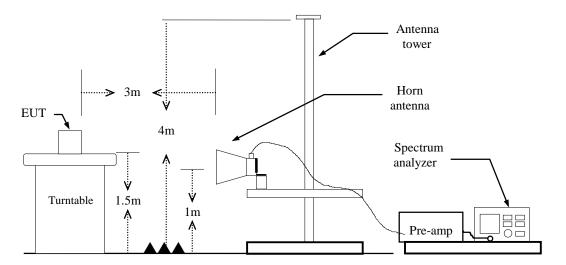




Report No.:	T200915W04-RP1

Page: 39 / 99 Rev.: 00

### Above 1 GHz





### 4.8.4 Test Result

### Type: Dipole Antenna

### Band Edge Test Data

Page: 40 / 99 Rev.: 00

Test M		GFSK_BDR-1M Low CH	bps	Temp/Hum		23.9(°C)/ 52%RF	
Test I		Band Edge		Test Date		per 25, 202	
Polar		Vertical		Test Engineer	Jerry	/ Chang	
Deteo	ctor	Peak / Averag	je				
120 Level (dB	uV/m)						
90							
70							
50					2	· · · · · ·	
30							
10						1 1 1 1 1	
0 <mark></mark> 2310	2330.	2350. Fr	equency (MHz)	2370.	2390.	2410	
_	Detector	Spectrum	Factor	Actual	Limit	Margin	
Freq.				EC	(A)		
·	Mode	Reading Level		FS	@3m		
Freq. MHz	Mode PK/QP/AV	Reading Level dBµV	dB	rs dBμV/m	@3m dBµV/m	dB	
·			<b>dB</b> 1.25	_	-	<b>dB</b> -23.87	



Page: 41 / 99 Rev.: 00

Test M	lode:	GFSK_BDR-1M Low CH	bps	Temp/Hum	23.9(°C	C)/ 52%RH
Test Item		Band Edge		Test Date	Septemb	oer 25, 20
Pola	rize	Horizontal		<b>Test Engineer</b>		/ Chang
Dete	ctor	Peak / Averag	je			
120 Level (dB	BuV/m)					
110					     	 
90						
70						
50						
30						1 1 1 1 1 1 1
10						
0 <mark></mark> 2310	2330.	2350. Fr	equency (MHz	2370. )	2390.	2410
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Peak	49.39	1.25	50.64	74.00	-23.36
	Average	37.94	1.25	39.19	54.00	-14.81
2390.00						



Те	st Mod	e:	GF	High	DR-1Mbp: h CH	Ter	np/Hum	23.9(°C)/	
	est Iter				Edge		st Date	Septembe	
F	Polarize	<b>;</b>		Vertical		Test	Engineer	Jerry (	Chang
D	Detecto	r	P	eak / /	Average				
120 110	Level (dBu)	V/m)							
90									
70									
50					.1				
30									
10									
0	2475	;	2480.	:	2485. F	requency (MHz)	2490.	2495.	2500
Fr	eq.	Dete	ctor	Spe	ectrum	Factor	Actual	Limit	Margin
		Мо	de	Read	ing Level		FS	@3m	
М	Hz	PK/Q	P/AV	c	IBμV	dB	dBµV/m	dBµV/m	dB
248	3.50	Pe	ak	4	8.49	1.62	50.11	74.00	-23.89
248	3.50	Aver	age	3	6.25	1.62	37.87	54.00	-16.13



Test M	lode:	GFSK_BDR-1 High CH	Mbps	Temp/Hum	23.9(°C	C)/ 52%RH
Test	ltem	Band Edg	e	Test Date	Septemb	oer 25, 202
Pola	rize	Horizonta		Test Engineer	Jerry	/ Chang
Dete	ctor	Peak / Avera	ige			
120 Level (dB	uV/m)					
90						
70						
50		2				
30						
10					· · · · · · · · · · · · · · · · · · ·	
0 2475	2480.	2485. Fi	requency (MHz)	2490.	2495.	2500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	50.26	1.62	51.88	74.00	-22.12
	Average	37.06	1.62	38.68	54.00	-15.32



Test N	lode:	GFSK_BDR-1N Low CH Hopp		Temp/Hum	23.9(°C	C)/ 52%RH
Test I	tem	Band Edge		Test Date	Septemb	oer 29, 20
Pola	rize	Vertical		Fest Engineer		y Chang
Dete	ctor	Peak / Avera				
120 Level (dB	3uV/m)					
90						
70						
50			             		2	 
30						
10						
0 <mark></mark> 2310	2330.	2350.		2370.	2390.	2410
		F	requency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Peak	48.33	1.25	49.58	74.00	-24.42
2390.00	Average	37.89	1.25	39.14	54.00	-14.86
	Average	51.09	1.20	59.14	54.00	-14.0



Test Mode:		GFSK_BDR-1M Low CH Hopp		Temp/Hum 23.9(°C		°C)/ 52%RH	
Test	Item	Band Edge		Test Date	Septemb	oer 29, 20	
Pola	rize	Horizontal		Test Engineer		/ Chang	
Dete	ctor	Peak / Averag	ge				
120 Level (dE	3uV/m)						
90						1 1 1 1 1 1	
70							
50					2	           	
30							
10						· · · ·	
0 <mark></mark> 2310	2330.	2350. F	requency (MHz)	2370.	2390.	2410	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
2390.00	Peak	47.27	1.25	48.52	74.00	-25.48	
2390.00	Average	37.17	1.25	38.42	54.00	-15.58	
	1			•			



Test N	підпі Спі порріпід		23.9(°C	C)/ 52%RH		
Test	Test Item Band Edge		e	Test Date	Septemb	per 29, 202
Pola	rize	Vertical	-	Test Engineer	Jerry	/ Chang
Dete	ctor	Peak / Avera	ige			
Loval (dD	u)(/m)					
120 Level (dB	uvilij		1			
110						
90						
70						
70			1			
50		1				
50		2				
30		·····			         	
10		·····				
0 <mark>2475</mark>	2480.	2485.	1	2490.	2495.	2500
		Fr	equency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	47.56	1.62	49.18	74.00	-24.82
		36.65	1.62	38.27	54.00	-15.73



Test N	/lode:	GFSK_BDR-11 High CH Hop		Temp/Hum	23.9(°C	23.9(°C)/ 52%RH	
Test	Item	Band Edge	e	Test Date	Septemb	per 29, 202	
Pola	rize	Horizontal	-	Test Engineer	Jerry	/ Chang	
Dete	ctor	Peak / Avera	ige				
120 Level (dB	uV/m)						
120							
110							
90							
70							
50		2					
30							
10							
0 <mark>2475</mark>	2480.	2485. Fr	equency (MHz)	2490.	2495.	2500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
2483.50	Peak	46.87	1.62	48.49	74.00	-25.51	



Page: 48 / 99 Rev.: 00

Test M	lode:	8DPSK_EDR-3 Low CH		Temp/Hum	23.9(°C)	)/ 52%RH
Test		Band Edge		Test Date	Septemb	
Pola	rize	Vertical		est Engineer	Jerry	Chang
Dete	ctor	Peak / Avera	ige			
120 Level (dB	uV/m)					
90						 
70						
50			               			
30						
10						
0 <mark></mark> 2310	2330.	2350.	Frequency (MHz)	2370.	2390.	2410
<b></b>	Detector		Factor	Actual	Limit	Maraia
Freq.	Detector	Spectrum	Factor			Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	Peak	48.96	1.25	50.21	74.00	-23.79
2390.00						
2390.00 2390.00	Average	36.76	1.25	38.01	54.00	-15.99



Page: 49 / 99 Rev.: 00

est Mode	-					)/ 52%RH
Test Item		Band Edge	-	Test Date	Septemb	er 25, 202
Polarize		Horizontal	Те	st Engineer	Jerry	Chang
Detector	Pe	eak / Average				
120 Level (dBu	V/m)					
110						
90						 
70						
50					2	 
30						
10						
0 <sup>L</sup> 2310	2330.	2350. Fi	requency (MHz)	2370.	2390.	2410
Freq.	Detector	Speatrum	Factor	Actual	Limit	Morain
rieq.		Spectrum	Factor	FS	@3m	Margin
	Mode	Reading Level		_	•	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Peak	49.45	1.25	50.70	74.00	-23.30
2390.00	Average	36.83	1.25	38.08	54.00	-15.92



Test M	lode:	8DPSK_EDR-3I High CH	Mbps .	Temp/Hum		/ 52%RH
Test I		Band Edge		Test Date	Septembe	er 25, 202
Pola	rize	Vertical	T€	est Engineer		Chang
Dete	ctor	Peak / Avera	ge			
120 Level (dB	uV/m)					
110						
90						1 1 1 1 1 1 1
70						
50		2				
30						
10						
0 <sup>_</sup> 2475	2480.	2485. F	requency (MHz)	2490.	2495.	2500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	48.32	1.62	49.94	74.00	-24.06
2483.50	Average	36.73	1.62	38.35	54.00	-15.65



Test M		8DPSK_EDR-3I High CH		ēmp/Hum	23.9(°C)/ 52%RI	
Test I		Band Edge		Test Date	Septembe	
Pola		Horizontal		st Engineer	Jerry	Chang
Dete	ctor	Peak / Averag	ge			
120	uV/m)					:1
110						
90						
70						
50		2				
30						
10						
0 <sup>L</sup> 2475	2480.	2485.	requency (MHz)	2490.	2495.	2500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	52.78	1.62	54.40	74.00	-19.60
2483.50	Average	39.45	1.62	41.07	54.00	-12.93



Test N	lode:	8DPSK_EDR-3 Low CH Hopp		ſemp/Hum	23.9(°C)	)/ 52%RH
Test I		Band Edge		Test Date	Septemb	
Pola	rize	Vertical	Те	st Engineer	Jerry	Chang
Dete	ctor	Peak / Average	ge			
120 Level (dB	uV/m)					
90						
70						
50					2	
30						
10						
0 <mark></mark> 2310	2330.	2350. F	requency (MHz)	2370.	2390.	2410
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Peak	49.38	1.25	50.63	74.00	-23.37
2390.00	Average	37.65	1.25	38.90	54.00	-15.10
	Average	37.00	1.20	30.90	54.00	-15.10



Test M	lode:	8DPSK_EDR-3 Low CH Hopp		emp/Hum	23.9(°C)	)/ 52%RH
Test I		Band Edge		Test Date	Septembe	
Pola	rize	Horizontal	Te	st Engineer	Jerry	Chang
Dete	ctor	Peak / Avera	ge			
120 Level (dB	uV/m)					
90						
70						
50					2	
30						· · · · · · · · · · · · · · · · · · ·
10						   
0 2310	2330.	2350. F	requency (MHz)	2370.	2390.	2410
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Peak	49.10	1.25	50.35	74.00	-23.65
	Average	36.94	1.25	38.19	54.00	-15.81
2390.00	Average	50.54			000	



Test M	lode:	8DPSK_EDR-3 High CH Hopp		ng Temp/Hum		)/ 52%RH
Test I	ltem	Band Edge	Edge Test Date		Septemb	er 29, 202
Pola	rize	Vertical		est Engineer	Jerry	Chang
Dete	ctor	Peak / Avera	ge			
120	uV/m)					
110						
90						
70						
50		1				 
30						           
10						
0 <mark></mark> 2475	2480.	2485.	Frequency (MHz)	2490.	2495.	2500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	5
MHz	PK/QP/AV	-	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	47.00	1.62	48.62	74.00	-25.38
2483.50	Average	36.39	1.62	38.01	54.00	-15.99



Test N	/lode:	8DPSK_EDR-3 High CH Hopp		ſemp/Hum	23.9(°C)	)/ 52%RH
Test	Item	Band Edge		Test Date	Septembe	er 25, 202
Pola	rize	Horizontal		st Engineer		Chang
Dete	ector	Peak / Avera	ge			
120 Level (dE	BuV/m)					
110						
90						
70						
50		2	             			
30						
10						   
0 <mark></mark> 2475	2480.	2485.	Frequency (MHz)	2490.	2495.	2500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
Fieq.	Mode	-	Factor	FS	@3m	Margin
MI.I-		Reading Level			-	-10
MHz	PK/QP/AV	•	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	46.15	1.62	47.77	74.00	-26.23
2483.50	Average	37.19	1.62	38.81	54.00	-15.19



### Below 1G Test Data

Test Mo	de:	BT Mode	Те	mp/Hum	23.9(°C)	/ 52%RH
Test Ite		30MHz-1GHz		est Date	September 26, 202	
Polariz		Vertical	Tes	t Engineer	Jerry	Chang
Detect	or	Peak				
120 Level (dBuV	//m)					
110				i +		
90						
90						
70	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·		 
50	-2					
1	2 <sup>3</sup> 4				5	
10			· · · · · · · · · · · · · · · · · · ·			
0 <mark></mark>	224.	418.		12.	806.	1000
		rie	quency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode PK/QP/AV	Reading Level	JD	FS	@3m	JD
		dBµV	dB	dBµV/m	dBµV/m	<b>dB</b> -6.23
MHz			-15.87	33 77	10.00	
86.26	Peak	49.64	-15.87	33.77	40.00	
86.26 138.64	Peak Peak	49.64 44.57	-9.76	34.81	43.50	-8.69
86.26 138.64 149.31	Peak Peak Peak	49.64 44.57 46.99	-9.76 -10.40	34.81 36.59	43.50 43.50	-8.69 -6.91
86.26 138.64 149.31 162.89	Peak Peak Peak Peak	49.64 44.57 46.99 45.01	-9.76 -10.40 -10.42	34.81 36.59 34.59	43.50 43.50 43.50	-8.69 -6.91 -8.91
86.26 138.64 149.31	Peak Peak Peak	49.64 44.57 46.99	-9.76 -10.40	34.81 36.59	43.50 43.50	-8.69 -6.91



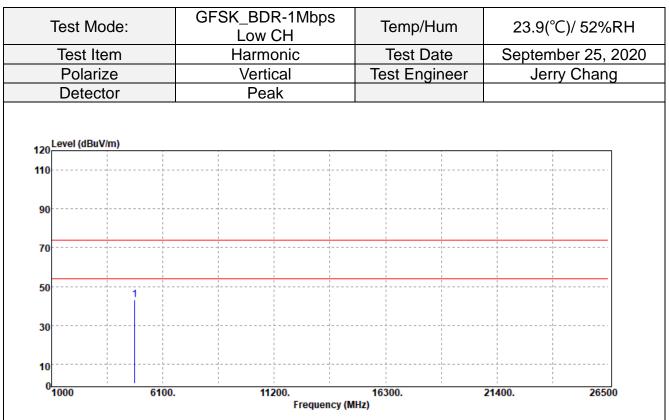
Page: 57 / 99 Rev.: 00

Test Mo		BT Mode		mp/Hum est Date		/ 52%RH
Test Item Polarize		30MHz-1GHz Horizontal		t Engineer	Septembe Jerry	Chang
Detect		Peak			cony	onang
120 Level (dBuV	//m)					
110				*		
90						
70						
50						
	4	5			6	
30					1	
10						
0 <mark></mark>	<u>224.</u>	418.	6	12.	806.	1000
		Fre	quency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
•	Mode	Reading Level		FS	@3m	•
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
95.96	Peak	54.37	-14.22	40.15	43.50	-3.35
		E0.66	-9.76	40.90	43.50	-2.60
138.64	Peak	50.66				
138.64 162.89	Peak Peak	49.25	-10.42	38.83	43.50	-4.67
		-	-10.42 -10.99	38.83 34.03	43.50 43.50	-4.67 -9.47
162.89	Peak	49.25				-9.47
162.89 170.65	Peak Peak	49.25 45.02	-10.99	34.03	43.50	



Page: 58 / 99 Rev.: 00

### Above 1G Test Data



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	36.70	6.33	43.03	74.00	-30.97
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 59 / 99 Rev.: 00

Test Mo	de.	GFSK_BDR-1Mb Low CH	Te	mp/Hum		/ 52%RH
Test Ite		Harmonic		est Date	Septembe	
Polariz		Horizontal	Tes	t Engineer	Jerry	Chang
Detect	or	Peak				
120	//m)					
110						
90						
70						
70						
50					· · · · · · · · · · · · · · · · · · ·	
50	1					
30						
10		i i i i i i i i i i i i i i i i i i i i			· · · · · · · · · · · · · · · · · · ·	
01000	6100.	11200.	40200		24400	20500
1000	6100.		16300 uency (MHz)	J.	21400.	26500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	J
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	37.17	6.33	43.50	74.00	-30.50
N/A						
					1	1

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 60 / 99 Rev.: 00

Test Mo	de:	GFSK_BDR-1Mb Mid CH	Te	mp/Hum		/ 52%RH
Test Ite		Harmonic		est Date	September 25, 202	
Polariz		Vertical	Test	Engineer	Jerry	Chang
Detecto	or	Peak				
120 Level (dBuV/	m)					
110						
90						
70						
50	1					
30				               		
10						
0 <mark></mark> 1000	6100.	11200. Freq	16300 uency (MHz)		21400.	26500
Freq.	Detecto Mode	r Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/A	V dBµV	dB	dBµV/m	dBµV/m	dB
4882.00	Peak	37.52	6.41	43.93	74.00	-30.07
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 61 / 99 Rev.: 00

Test Mo	Test Mode: GFSK		ops Te	emp/Hum	23.9(°C)/ 52%RH	
Test Ite	m	Harmonic		est Date	Septembe	er 25, 202
Polariz	ze	Horizontal	Tes	t Engineer		Chang
Detect	or	Peak				
120	/m)					
110						
00						
90						
70						
10						
50			         	   		
	1					
30						
10	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				
0 <mark></mark>	6100.	11200.	1630	0	21400.	26500
1000	0100.		uency (MHz)		21400.	20300
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4882.00	Peak	36.00	6.41	42.41	74.00	-31.59
N/A						
N/A						
N/A						
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 62 / 99 Rev.: 00

Test Mod	ue.	FSK_BDR-1Mb High CH	le	Temp/Hum		23.9(°C)/ 52%RH	
Test Ite		Harmonic		est Date	Septembe	er 25, 202	
Polariz		Vertical	Test	Engineer	Jerry	Chang	
Detecto	or	Peak					
120 Level (dBuV/	m)						
110							
90				     			
70				   			
50	1			 			
20				1			
30							
10					· · · · · · · · · · · · · · · · · · ·		
0 <mark></mark>	6100.	11200.	16300		21400.	26500	
1000	0100.	Frequ	uency (MHz)		21400.	20300	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
i ioqi	Mode	Reading Level	i dotoi	FS	@3m	ina giri	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4960.00	Peak	36.10	6.80	42.90	74.00	-31.10	
N/A							

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 63 / 99 Rev.: 00

Test Mode	:: GF	SK_BDR-1Mbps High CH	Temp/Hu	ım	23.9(°C)/ 52%F	
Test Item		Harmonic		te S	eptember 2	25, 20
Polarize		Horizontal	Test Engir		Jerry Ch	
Detector		Peak				
120 Level (dBuV/m)	)					
110						
90						
70						
50	1					
30						
10						
0 <mark></mark>	6100.	11200. Frequer	16300. Icy (MHz)	214	100.	26500

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4960.00	Peak	36.17	6.80	42.97	74.00	-31.03
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 64 / 99 Rev.: 00

Test Mode		8DPSK_EDR-3Mbps Low CH	Temp/Hu	ım 23.9	(°C)/ 52%RH
Test Iter	m	Harmonic	Test Da	te Septe	mber 25, 202
Polarize		Vertical	Test Engir	neer Je	erry Chang
Detecto	or	Peak			
120 Level (dBuV/r	n)				
110					
90					
70					
50	1				
30					
10					
0 <mark>1000</mark>	6100.	11200.	16300.	21400.	26500
		Frequency	( (MHz)		

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	36.50	6.33	42.83	74.00	-31.17
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 65 / 99 Rev.: 00

Test Mo	de	3DPSK_EDR-3M Low CH	Te	mp/Hum	23.9(°C)/ 52%RH	
Test Ite		Harmonic		est Date	Septembe	
Polariz		Horizontal	Test	Engineer	Jerry	Chang
Detect	or	Peak				
120 Level (dBuV/	m)					
110						
90						
70						
50	1					
30						
10						
0 <mark></mark> 1000	6100.	11200. 16300. 21400. Frequency (MHz)				
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV		dB	dBµV/m	dBµV/m	dB
4804.00	Peak	36.49	6.33	42.82	74.00	-31.18
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 66 / 99 Rev.: 00

Test Mo	ide	DPSK_EDR-3MI Mid CH	le	mp/Hum		23.9(°C)/ 52%RH	
Test Ite		Harmonic		est Date	Septembe	er 25, 202	
Polariz		Vertical	Test	t Engineer	Jerry	Chang	
Detect	or	Peak					
120 Level (dBuV/	m)						
110							
<mark>90</mark>	 						
70							
50	1				<sup>1</sup>		
30				     			
50							
10				     			
0 <mark>1000</mark>	6100.	11200. Frequ	16300 uency (MHz)	).	21400.	26500	
	-						
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4882.00	Peak	36.49	6.41	42.90	74.00	-31.10	
N/A							
	1			1	1		

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 67 / 99 Rev.: 00

Test Mc	ide	8DPSK_EDR-3MI Mid CH	le	mp/Hum		/ 52%RH
Test Ite		Harmonic		est Date	Septembe	
Polariz	ze	Horizontal	Test	t Engineer	Jerry	Chang
Detect	or	Peak				
120	/m)					
110						
90						
70						
50	1					
30						
10						
0 <mark>.</mark> 1000	6100.	11200. Frequ	16300 iency (MHz)	).	21400.	26500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
•	Mode	Reading Level		FS	@3m	•
	PK/QP/A	/ dBµV	dB	dBµV/m	dBµV/m	dB
MHz					- 1 0 0	
<b>MHz</b> 4882.00	PRIQPIAN	36.46	6.41	42.87	74.00	-31.13
		36.46	6.41	42.87	74.00	-31.13

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 68 / 99 Rev.: 00

Test Mo	ode 8	DPSK_EDR-3M High CH	<sup>bps</sup> Te			23.9(°C)/ 52%RH	
Test Ite		Harmonic	Te	Test Date Septe		er 25, 202	
Polariz	e	Vertical	Test	Engineer	Jerry	Chang	
Detect	or	Peak					
120 Level (dBuV/	(m)		i i	i	i i		
110				 			
90							
70							
50	1		· · · · · · · · · · · · · · · · · · ·				
30				           			
10				       			
0 1000	6100.	11200. Freq	16300 uency (MHz)	).	21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4960.00	Peak	35.22	6.80	42.02	74.00	-31.98	
N/A							

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 69 / 99 Rev.: 00

Test Mo	ue	DPSK_EDR-3M High CH	Te			9(°C)/ 52%RH	
Test Ite		Harmonic		est Date	Septembe	er 25, 2 <mark>0</mark> 2	
Polariz		Horizontal	Test	t Engineer	Jerry	Chang	
Detecto	or	Peak					
120 Level (dBuV/	m)						
110				 			
90							
70							
50	1						
30							
10				·			
0 1000	6100.	11200. Freq	16300 uency (MHz)	<b>).</b>	21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4960.00	Peak	35.66	6.80	42.46	74.00	-31.54	
N/A							
				1		1	

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 70 / 99 Rev.: 00

### Type: Monopole Antenna (PCB)

### Band Edge Test Data

Test M		GFSK_BDR-1M Low CH	-	Temp/Hum		23.9(°C)/ 52%RH	
Test It	tem	Band Edge		Test Date		oer 29, 20	
Polar	ize	Vertical		Test Engineer	Jerry	/ Chang	
Detec	ctor	Peak / Averag	ge				
120 Level (dB	uV/m)						
110						 	
90							
70							
50					2	1 1 1 1 1 1	
30							
10						   	
0 <mark></mark> 2310	2330.	2350. F	requency (MH	2370. iz)	2390.	2410	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
2390.00	Peak	49.42	1.25	50.67	74.00	-23.33	
2390.00	Average	37.11	1.25	38.36	54.00	-15.64	



Page: 71 / 99 Rev.: 00

2390 2390	.00	Peak	49.29 37.34	1.25	50.54 38.59	74.00 54.00	-23.46 -15.41
мн	z	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
Free	q.	Detector	Spectrum	Factor	Actual	Limit	Margin
			· · · · · ·				
0 <mark></mark> 23	10	2330.	2350. F	requenc <mark>y (M</mark> Hz	2370. :)	2390.	2410
10							1 1 1
30	         			       			
50						2	 
10							
70							
90	           			       			
110				         			 
120	vel (dBuV/r	m)		1		1	
	Detecto		Peak / Average		0		J
	Polarize		Horizontal		Test Engineer		/ Chang
т	est Iter	le:	Low CH Band Edge		Temp/Hum Test Date		C)/ 52%RI per 29, 20



Page: 72 / 99 Rev.: 00

Test M	lode:	GFSK_BDF High		Temp/Hum	23.9(°C	C)/ 52%RH
Test I	tem	Band Edge		Test Date	Septemb	per 29, 20
Pola	rize	Vertio		Test Enginee		y Chang
Dete	ctor	Peak / Av	/erage			
120 Level (dB	łuV/m)					
90						
70						
50		2				
30						
10						
0 <mark></mark> 2475	2480.	2	485. Frequency (I	2490. MHz)	2495.	2500
Freq.	Detector	Spectrur	n Facto	or Actual	Limit	Margin
	Mode	Reading Le		FS	@3m	indi gill
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	48.69	1.62	2 50.31	74.00	-23.69
2483.50	Average	36.47	1.62	38.09	54.00	-15.91



Test N	/lode:	GFSK_BDR-1 High CH	Mbps	Temp/Hum	23.9(°C	C)/ 52%RH
Test	Item	Band Edg	e	Test Date Septem		oer 29, 202
Pola	rize	Horizonta		Test Engineer	Jerry	/ Chang
Dete	ctor	Peak / Avera	ige			
120 Level (dB	uV/m)					
90						
70						
50		2				
30						
10						
0 <mark></mark> 2475	2480.	2485. Fi	requency (MHz)	2490.	2495.	2500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	49.19	1.62	50.81	74.00	-23.19
2483.50	Average	37.01	1.62	38.63	54.00	-15.37



Test M	ode:	GFSK_BDR-1M Low CH Hopp		Temp/Hum	23.9(°C	C)/ 52%RH	
Test It	tem	Band Edge		Test Date	Septemb	September 29, 20	
Polar	ize	Vertical		Test Engineer	Jerry	/ Chang	
Detec	ctor	Peak / Averag	ge				
120 Level (dB	uV/m)					- - -	
90							
70					 		
50					,	· · · · · · · · · · · · · · · · · · ·	
30							
10						1 1 1 1 1	
0 2310	2330.	2350. F	requency (MHz)	2370.	2390.	2410	
	Detector	Spectrum	Factor	Actual	Limit	Margin	
Freq.				FS	@3m		
Freq.	Mode	Reading Level					
Freq. MHz	Mode PK/QP/AV	Reading Level dBµV	dB	dBµV/m	dBµV/m	dB	
		-	<b>dB</b> 1.25	<b>dBμV/m</b> 50.31	<b>dBµV/m</b> 74.00	<b>dB</b> -23.69	



Page: 75 / 99 Rev.: 00

Test N	lode:	GFSK_BDR-1Mbps Low CH Hopping Band Edge		Temp/Hum	23.9(°0	23.9(°C)/ 52%RI	
Test I	tem	Band Edge		Test Date	Septemb	per 29, 20	
Pola	rize	Horizontal		Test Engineer	Jerry	/ Chang	
Dete	ctor	Peak / Avera	ge				
120 Level (dE	3uV/m)						
110					· +	1	
90							
70							
50					2		
30							
10						- - - - - - - - - - - - - - - - - - -	
0 <sup>L</sup> 2310	2330.	2350. F	requency (MH	2370. z)	2390.	2410	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
2390.00	Peak	49.37	1.25	50.62	74.00	-23.38	
2390.00	Average	36.85	1.25	38.10	54.00	-15.90	



Test N	/lode:	GFSK_BDR-11 High CH Hop	ping	Temp/Hum		23.9(°C)/ 52%RF	
Test	Item	Band Edge	e	Test Date Septe		per 29, 202	
Pola	rize	Vertical		Test Engineer	Jerry	/ Chang	
Dete	ctor	Peak / Avera	age				
120 Level (dB	uV/m)						
110		· · · · · · · · · · · · · · · · · · ·					
90							
70		 					
50							
30							
10							
0 <sup>L</sup> 2475	2480.	2485.	equency (MHz)	2490.	2495.	2500	
			equency (minz)				
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
2483.50	Peak	48.43	1.62	50.05	74.00	-23.95	
	Average	36.39	1.62	38.01	54.00	-15.99	



Page: 77 / 99 Rev.: 00

Test M		GFSK_BDR-1Mbps High CH Hopping Band Edgo		Temp/Hum		23.9(°C)/ 52%RF	
Test		Band Edge		Test Date	Septemb	oer 29, 202	
Pola		Horizonta		Test Engineer	Jerry	/ Chang	
Dete	ctor	Peak / Avera	age				
120 Level (dB	uV/m)						
110							
90							
70							
50		2	1 1 1 1 1 1				
30							
10							
0 <mark></mark> 2475	2480.	2485. Fi	requency (MHz)	2490.	2495.	2500	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
2483.50	Peak	46.78	1.62	48.40	74.00	-25.60	
	1		1.62	38.53	54.00		



Page: 78 / 99 Rev.: 00

Test Mode	e: 80	LOW CH		23.9(°0	C)/ 52%RH	
Test Item	1 I	Band Edge		Test Date Septem		ber 29, 202
Polarize		Vertical		Test Enginee		y Chang
Detector	-	Peak / Average		¥		<u> </u>
120	uV/m)					
110						
90						
70					·	 
50						 
					2	
30				ii		1
40						
10						
0 <mark></mark> 2310	2330.	2350. Fi	requency (MHz	2370.	2390.	2410
			icquency (initi	-,		
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Peak	49.56	1.25	50.81	74.00	-23.19
		36.84	1.25	38.09	54.00	-15.91
2390.00	Average	30.04	1.20	50.05	01.00	10.01



Page: 79 / 99 Rev.: 00

	8DPSK_EDR-3Mbps Low CH Band Edge		-	23.9(°C)/ 52%RI	
	Band Edge				
	Horizontal	Tes			Chang
Pe	eak / Average				
V/m)					
				1	
2330.	2350. Fr		2370.	2390.	2410
Detector	Spectrum	Factor	Actual	Limit	Margin
Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
	-	Factor			Margin dB
Mode	Reading Level		FS	@3m	-
	V/m)	V/m) 2330. 2350.	V/m)	Low CH     Test Date       Band Edge     Test Date       Horizontal     Test Engineer       Peak / Average	Low CH     Temp/rum     23.9 (C       Band Edge     Test Date     Septemb       Horizontal     Test Engineer     Jerry       Peak / Average     Vm)



Test M	lode:	8DPSK_EDR-3I High CH	Mbps .	Temp/Hum	23.9(°C)/ 52%RH	
Test I		Band Edge		Test Date Septem		er 29, 202
Pola	rize	Vertical	Te	est Engineer		Chang
Dete	ctor	Peak / Avera	ge			
120 Level (dB	uV/m)		i	1 1		
110						
90						
70						
50		2				
30						 
10						   
0 2475	2480.	2485. F	requency (MHz)	2490.	2495.	2500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	49.40	1.62	51.02	74.00	-22.98
2483.50	Average	37.24	1.62	38.86	54.00	-15.14
	•					



Test M	lode:	8DPSK_EDR-3 High CH		ſemp/Hum	23.9(°C)/ 52%RH	
Test		Band Edge		Test Date	Septembe	
Pola		Horizontal		st Engineer	Jerry	Chang
Dete	ctor	Peak / Avera	ge			
120 Level (dB	luV/m)					
90						
70						
50		2				
30						
10						 
0 <mark>2475</mark>	2480.	2485.		2490.	2495.	2500
			Frequency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	52.63	1.62	54.25	74.00	-19.75
2483.50	Average	38.45	1.62	40.07	54.00	-13.93



Test M	lode:	8DPSK_EDR-3I Low CH Hopp		emp/Hum	23.9(°C)	)/ 52%RH
Test I	tem	Band Edge		Test Date	Septembe	er 29, 202
Pola	rize	Vertical		st Engineer		Chang
Deteo	ctor	Peak / Averag	ge			
120 Level (dBr	uV/m)					
90						
70						
50					2	
30						
10						
0 <mark></mark> 2310	2330.	2350. F	requency (MHz)	2370.	2390.	2410
Freq.	Detector	Speatrum	Factor	Actual	Limit	Morgin
	Delector	Spectrum	Factor	FS	@3m	Margin
rieq.	Mode			ГЭ	யலா	
·	Mode	Reading Level	15			10
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
·		-	<b>dB</b> 1.25	<b>dBμV/m</b> 50.75	<b>dBμV/m</b> 74.00	<b>dB</b> -23.25



Test M	lode:	8DPSK_EDR-3 Low CH Hopp		ēmp/Hum	23.9(°C)	/ 52%RH
Test I	tem	Band Edge	•	Test Date	Septembe	er 29, 202
Polai	rize	Horizontal	Te	st Engineer	Jerry	Chang
Deteo	ctor	Peak / Avera	ge			
120 Level (dBi	uV/m)					
90						
70						
50					2	
30						
10						, , , , , , , ,
0 <mark></mark> 2310	2330.	2350. F	requency (MHz)	2370.	2390.	2410
From	Detector	Croatrum	Factor	Actual	Limit	Morgin
Freq.	Detector	Spectrum	Factor			Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Peak	50.50	1.25	51.75	74.00	-22.25
2390.00	Average	36.81	1.25	38.06	54.00	-15.94
2390.00	-					



Test M	lode:	8DPSK_EDR High CH Ho	-3Mbps opping	Temp/Hum	23.9(°C	)/ 52%RH
Test I	Item	Band Ec		Test Date	e September 29, 2	
Pola	rize	Vertica		Test Engineer	Jerry	Chang
Dete	ctor	Peak / Ave	erage			
120	uV/m)					
110						
90						
70						
50		2				
30						             
10						
0 <mark></mark> 2475	2480.	248	35. Frequency (	2490. MHz)	2495.	2500
Freq.	Detector	Spectrum	Facto	or Actual	Limit	Margin
	Mode	Reading Lev		FS	@3m	
MHz	PK/QP/AV	-	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	49.00	1.62		74.00	-23.38
2483.50	Average	37.48	1.62	2 39.10	54.00	-14.90



Test N	/lode:	8DPSK_EDR-3 High CH Hopp				)/ 52%RH
Test	Item	Band Edge		Test Date	Septembe	er 29, 202
Pola	arize	Horizontal		est Engineer		Chang
Dete	ector	Peak / Avera	ge			
120 Level (dl	BuV/m)					
110						
90						
70						
50		2				
30						1 1 1 1 1 1 1
10						   
0 <mark></mark> 2475	2480.		Frequency (MHz)	2490.	2495.	2500
<b>-</b>	Detector	<b>0</b>	<b>F</b> actor			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	•	dB	dBµV/m	dBµV/m	dB
2483.50	Peak	50.60	1.62	52.22	74.00	-21.78
2483.50	Average	38.89	1.62	40.51	54.00	-13.49



## Below 1G Test Data

Test Mo	de:	BT Mode		mp/Hum	23.9(°C)	/ 52%RH
Test Ite		30MHz-1GHz		est Date	September 29, 20	
Polariz Detect		Vertical Peak	Tes	t Engineer	Jerry	Chang
Delect	01	I Cak				
120 Level (dBuV	// <b>m)</b>			i i	i	
110	     					 
90						
70				• • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	
50						
2	3	-				6
30		<u>4</u>			· · · · · · · · · · · · · · · · · · ·	
10						
0 <mark></mark>	224.	418.	6	12.	806.	1000
Freq.	Detector	Spectrum	quency (MHz)	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	J
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
61.04	Peak	51.11	-15.87	35.24	40.00	-4.76
	Peak	44.63	-10.95	33.68	43.50	-9.82
107.60	1 Ball		10.40	34.22	43.50	-9.28
107.60 162.89	Peak	44.64	-10.42			0.20
		44.64 34.56	-7.88	26.68	46.00	-19.32
162.89	Peak			26.68 28.18	46.00 46.00	



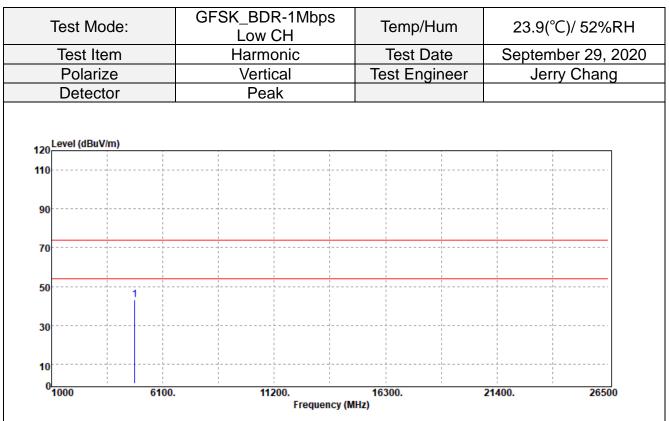
Page: 87 / 99 Rev.: 00

Test Mo		BT Mode		mp/Hum		/ 52%RF	
Test Ite		30MHz-1GHz				September 29, 202	
Polariz Detecto		Horizontal Peak	Ies	t Engineer	Jerry	Chang	
120 Level (dBuV/	m)						
110							
90							
70							
50							
30	2	3 4	5		6	   	
		1 1 1 1 1 1	1	1	1 1		
10							
10 0 30	224.	418. Fre		12.	806.	1000	
	224. Detector Mode		equency (MHz) 6 Factor	12. Actual FS	806. Limit @3m	1000 Margin	
0 <mark></mark>	Detector	Fre	equency (MHz)	Actual	Limit		
o <sub>30</sub> Freq.	Detector Mode	Fre Spectrum Reading Level	equency (MHz) Factor	Actual FS	Limit @3m	Margin	
o <sub>30</sub> Freq. MHz	Detector Mode PK/QP/AV	Fre Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB	
030 Freq. MHz 102.75	Detector Mode PK/QP/AV Peak	Fre Spectrum Reading Level dBµV 53.87	Factor dB -12.09	Actual FS dBµV/m 41.78	Limit @3m dBµV/m 43.50	Margin dB -1.72	
<b>Freq.</b> <b>MHz</b> 102.75 173.56	Detector Mode PK/QP/AV Peak Peak	Fre Spectrum Reading Level dBµV 53.87 45.30	Factor dB -12.09 -11.10	Actual FS dBµV/m 41.78 34.20	Limit @3m dBµV/m 43.50 43.50	Margin dB -1.72 -9.30	
<b>Freq.</b> <b>MHz</b> 102.75 173.56 330.70	Detector Mode PK/QP/AV Peak Peak Peak	Fre Spectrum Reading Level dBµV 53.87 45.30 39.14	Factor dB -12.09 -11.10 -7.81	Actual           FS           dBμV/m           41.78           34.20           31.33	Limit @3m dBµV/m 43.50 43.50 46.00	Margin dB -1.72 -9.30 -14.67	



Page: 88 / 99 Rev.: 00

## Above 1G Test Data



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	37.01	6.33	43.34	74.00	-30.66
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 89 / 99 Rev.: 00

Test Mo	ue.	GFSK_BDR-1Mb Low CH	Te	mp/Hum	. ,	/ 52%RH
Test Ite		Harmonic		est Date	Septembe	
Polariz		Horizontal	Test	t Engineer	Jerry	Chang
Detect	or	Peak				
120 Level (dBuV/	m)					
110						
90						
70						
10						
50						
	1					
30						
10						
0 <mark></mark>	6100.	11200.	16300	1	21400.	26500
1000	0100.		uency (MHz)		21400.	20300
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	37.10	6.33	43.43	74.00	-30.57
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 90 / 99 Rev.: 00

Test Mo	de:	GFSK_BDR-1Mb Mid CH	<sup>ops</sup> Te	mp/Hum	23.9(°C)	/ 52%RH
Test Ite	m	Harmonic	Te	est Date	Septembe	er 29, 202
Polariz	e	Vertical	Test	Engineer	Jerry	Chang
Detect	or	Peak				
120 Level (dBuV/	m)					
110						
90						
70						
50	1					
30						
10						
0 <mark></mark>	<b>6100.</b>	11200.	16300	).	21400.	26500
		Freq	uency (MHz)			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4882.00	Peak	36.88	6.41	43.29	74.00	-30.71
4002.00						
4002.00 N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 91 / 99 Rev.: 00

Test Mod	de: G	FSK_BDR-1Mb Mid CH	ops Te	mp/Hum	23.9(°C)	/ 52%RH
Test Ite	m	Harmonic	Т	est Date	Septembe	er 29, 202
Polariz	e	Horizontal	Tes	t Engineer	Jerry	Chang
Detecto	or	Peak				
120 Level (dBuV/	m)					
110						
90						
90						
70						
10						
50			1 1 1 1 - 1 - 1	   		
	1					
30						
10						
0 <mark></mark>	6100.	11200.	1630	0	21400.	26500
1000	0100.		uency (MHz)		21400.	20500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4882.00	Peak	36.94	6.41	43.35	74.00	-30.65
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 92 / 99 Rev.: 00

Test Mo	de:	GFSK_BDR-1Mb High CH	Te	mp/Hum	23.9(°C)	/ 52%RH
Test Ite		Harmonic		est Date	Septembe	
Polariz		Vertical	Test	Engineer	Jerry	Chang
Detecto	or	Peak				
120 Level (dBuV/	m)					
110						
90			· · · · · · · · · · · · · · · · · · ·			
70	 	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
50	1		·			
30						
10				     		
10						
0 <sup>L</sup> 1000	6100.	11200. Frea	16300 uency (MHz)		21400.	26500
			,			
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4960.00	Peak	36.23	6.80	43.03	74.00	-30.97
N/A						
					1	

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 93 / 99 Rev.: 00

Test Mode:	GFSK_BDR-1Mbp High CH	os Temp/Hum	23.9(°C)/ 52%RF
Test Item	Harmonic	Test Date	September 29, 20
Polarize	Horizontal	Test Engineer	Jerry Chang
Detector	Peak		
120 Level (dBuV/m)	-i i i	- i - i - i i	
110			
90			
70			
50			
30			
10			
0 1000	6100. 11200. Frequ	16300. uency (MHz)	21400. 26500

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4960.00	Peak	36.12	6.80	42.92	74.00	-31.08
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 94 / 99 Rev.: 00

Test Mo	de	8DPSK_EDR-3Mbps Low CH	Temp/H		)(°C)/ 52%RH
Test Iter	m	Harmonic	Test Da	te Septe	mber 29, 202
Polariz	е	Vertical	Test Engi		erry Chang
Detecto	or	Peak			· · ·
120 Level (dBuV/r	n)		:		-:
110	,             				
90					
70					
50	1				
30					
10					         
0 <mark></mark>	6100.	11200.	16300.	21400.	26500
		Frequency	(MHZ)		

Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	37.70	6.33	44.03	74.00	-29.97
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 95 / 99 Rev.: 00

Test Mode		8DPSK_EDR-3Mbps Low CH		mp/Hum	23.9(°C)/ 52%RH	
Test Ite		Harmonic		est Date	September 29, 202	
Polariz		Horizontal	Tes	t Engineer	Jerry	Chang
Detect	or	Peak				
120	/m)					
110	I					
90						
70						
10						
50	I I I I I I I I I I I I I I I I I I I				 	
50	1					
30						
50						
10						
0						
1000	6100.	11200. Freq	1630 uency (MHz)	).	21400.	26500
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	37.29	6.33	43.62	74.00	-30.38
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 96 / 99 Rev.: 00

Test Mode		8DPSK_EDR-3Mbps Mid CH		mp/Hum	23.9(°C)/ 52%RI	
Test Ite		Harmonic		est Date	Septembe	er 29, 2 <mark>0</mark> 2
Polariz		Vertical	Test	Engineer	Jerry	Chang
Detect	or	Peak				
120 Level (dBuV/	m)					
110						
90						
90						
70						
50						
	1					
30						
10						
0 <mark></mark>	6100.	11200.	16300	:	21400.	26500
			uency (MHz)			20000
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
•	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4882.00	Peak	35.26	6.41	41.67	74.00	-32.33
N/A						

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 97 / 99 Rev.: 00

Test Mo	ode 8	3DPSK_EDR-3M Mid CH	bps Tei	mp/Hum	23.9(°C)/ 52%	
Test Ite		Harmonic		est Date	Septembe	er 29, 202
Polariz	ze	Horizontal	Test	Engineer	Jerry Chang	
Detect	or	Peak				
120 <mark>Level (dBuV</mark> /	/m)					
110						
90						
70						
50	1					
30						
10						
0 <mark></mark>	6100.	11200.	16300 uency (MHz)		21400.	26500
		·				
Freg.	Detector	Spectrum	Factor	Actual	Limit	Margin
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
Freq. MHz		-	Factor dB			Margin dB
	Mode	Reading Level		FS	@3m	-
MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 98 / 99 Rev.: 00

Test Mode		DPSK_EDR-3M High CH	<sup>bps</sup> Te	mp/Hum	23.9(°C)	<sup>/</sup> 52%RH	
Test Ite		Harmonic		est Date	September 29, 202		
Polariz		Vertical	Test	Engineer	Jerry	Chang	
Detecto	or	Peak					
120 Level (dBuV/	m)						
110							
90							
70				           			
50							
30							
10							
0 <sup>1</sup> 1000	6100.	11200. Freq	16300 uency (MHz)		21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4960.00	Peak	37.58	6.80	44.38	74.00	-29.62	
N/A							
	1			1		1	

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Page: 99 / 99 Rev.: 00

Test Mode		8DPSK_EDR-3Mbps High CH		mp/Hum	23.9(°C)/ 52%R	
Test Ite		Harmonic		est Date	September 29, 20	
Polarize		Horizontal	Test	Engineer	Jerry	Chang
Detecto	or	Peak				
120 Level (dBuV/	m)					
110						
90						
70						
50	1					
30						
10				       		
0 1000	6100.	11200. 16300. 21400. Frequency (MHz)				26500
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4960.00	Peak	35.77	6.80	42.57	74.00	-31.43
N/A						
		I	i	1	1	1

Remark:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit

- End of Test Report -



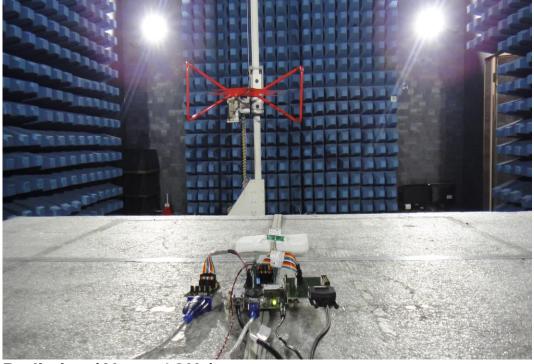
# **APPENDIX-A Test Photo**

# Type: Dipole Antenna

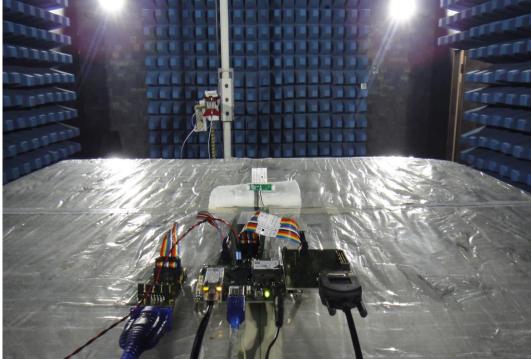
# Radiation (Below 1GHz)

Page: A-1 / A-3

Rev.: 00



# Radiation (Above 1GHz)

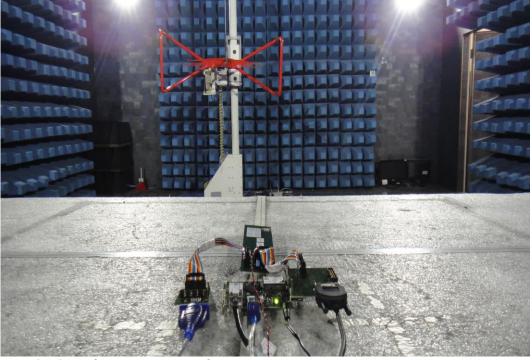




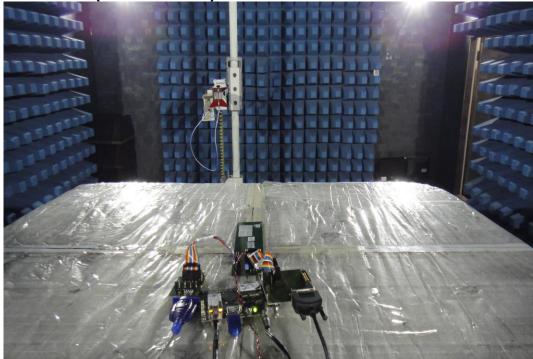
Page: A-2 / A-3 Rev.: 00

# Type: Monopole Antenna (PCB)

# Radiation (Below 1GHz)



# Radiation (Above 1GHz)





Page: A-3 / A-3 Rev.: 00

# **Conducted Emission Set Up Photo**

