Report Number: 60.790.16.716.01



FCC - TEST REPORT

Report Number	: 60.790.16.716.01 Date of Issue: June 2, 2016
Model	: SH002
Product Type	: VerveLoop+
Applicant	: Binatone Electronics International Ltd.
Address	: Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong
	China
Production Facility	: Charter Media (Dongguan) Co., Ltd.
Address	: Dabandi Industrial Zone, Daning District, Humen Town,
	Dongguan City, Guangdong Province 523930, P. R. China
Test Result	: ■ Positive
Total pages including Appendices	49

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

TÜV SÜD Hong Kong Ltd.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin, Hong Kong

Test Site 2 Company name:

mpany name: Hong Kong Productivity Council LG1, HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong

FCC Registration Number: 90656

IC Registration Number: 4780A



3 Description of the Equipment Under Test

Product:	VerveLoop+
Model no.:	SH002
Options and accessories:	Nil
Rating:	DC3.7V Supplied by Li-ion Rechargeable Battery DC5.0V Charged by the mini-USB port
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	79
Modulation:	GFSK, π/4-DQPSK, 8-DPSK
Antenna Type:	Chip antenna
Antenna Gain:	1.6dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Bluetooth headset operated at 2.4GHz



4 Summary of Test Standards

Test Standards					
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES				
10-1-2015 Edition	Subpart C - Intentional Radiators				
RSS-247	Digital Transmission Systems (DTSs), Frequency Hopping Systems				
Issue 1 2015	(FHSS) and License-Exempt Local Area Network (LE-LAN) Devices				

All the test methods were according to Public Notice DA 00-705 -Frequency Hopper Spread Spectrum Test Procedure released by FCC on March 30, 2000 and ANSI C63.10-2013.



5 Summary of Test Results

		Technical Requirements			
FCC Part 15 Sub	part C/RSS-247	Issue 1/RSS-Gen Issue 4			
Test Condition		Pages	Test Result	Test Site	
§15.207	RSS-GEN 8.8	Conducted emission AC power port	10	Pass	Site 2
§15.247(b)(1)	RSS-247 Clause 5.4(2)	Conducted peak output power	13	Pass	Site 2
§15.247(e)	RSS-247 Clause 5.2(2)	Power spectral density*		N/A	
§15.247(a)(2)	RSS-247 Clause 5.2(1)	6dB bandwidth		N/A	
§15.247(a)(1)	RSS-247 Clause 5.1(1)	20dB bandwidth and 99% Occupied Bandwidth	20	Pass	Site 2
§15.247(a)(1)	RSS-247 Clause 5.1(2)	Carrier frequency separation	27	Pass	Site 2
§15.247(a)(1)(iii)	RSS-247 Clause 5.1(4)	Number of hopping frequencies	30	Pass	Site 2
§15.247(a)(1)(iii)	RSS-247 Clause 5.1(4)	Dwell Time	32	Pass	Site 2
§15.247(d)	RSS-247 Clause 5.5	Spurious RF conducted emissions	35	Pass	Site 2
§15.247(d)	RSS-247 Clause 5.5	Band edge	39	Pass	Site 2
§15.247(d) & §15.209 &	RSS-247 Clause 5.5 & RSS-GEN 6.13	Spurious radiated emissions for transmitter and receiver	44	Pass	Site 2
§15.203	RSS-GEN 8.3	Antenna requirement	See note 1	Pass	

Note 1: N/A=Not Applicable.

Note 2: The EUT uses a Chip antenna, which gain is 1.6dBi. In accordance to §15.203, it is considered sufficiently to comply with the provisions of this section.



6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: VLJ-SH002, IC: 4522A-SH002 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C, RSS 247 and RSS-Gen rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed
- □ Not Performed

The Equipment Under Test

- - Fulfills the general approval requirements.
- □ **Does not** fulfill the general approval requirements.

Sample Received Date: May 9, 2016

Testing Start Date: May 9, 2016

Testing End Date: May 28, 2016

- TÜV SÜD HONG KONG LTD. -

Reviewed by:

Fran

Phoebe Hu EMC Project Manager Prepared by:

Felis. Li

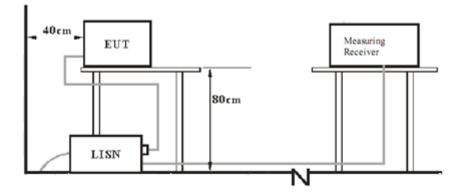
Felix Li Senior EMC Project Engineer

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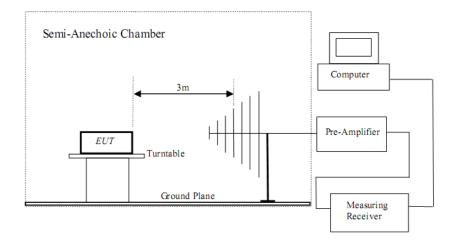


7 Test Setups

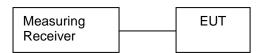
7.1 AC Power Line Conducted Emission test setups



7.2 Radiated test setups



7.3 Conducted RF test setups





8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
PC	lenovo	X220	

Test software: Blue test 3.0, which used to control the EUT in continues transmitting mode

The system was configured to hopping mode and non-hopping mode.

Hopping mode: typical working mode (normal hopping status)

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power



9 Technical Requirement

9.1 Conducted Emission

Test Method

- 1. The EUT was placed on a table, which is 0.8m above ground plane
- 2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
- 3. Maximum procedure was performed to ensure EUT compliance
- 4. A EMI test receiver is used to test the emissions from both sides of AC line

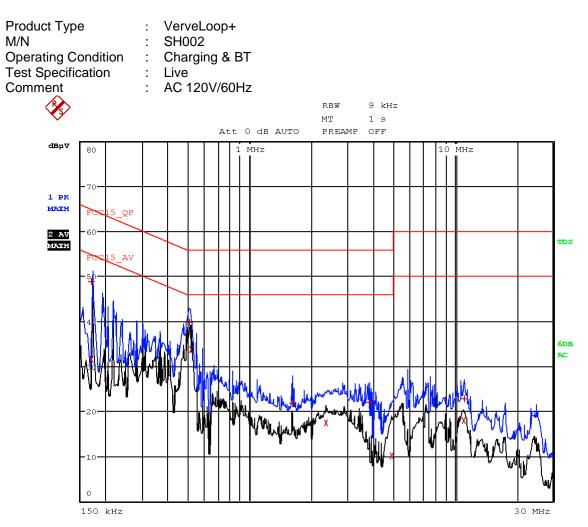
Limit

	Frequency	QP Limit	AV Limit
	MHz	dBµV	dBµV
	0.150-0.500	66-56*	56-46*
	0.500-5	56	46
	5-30	60	50
D۵	oranging linearly with	logarithm of the frequ	uanay

Decreasing linearly with logarithm of the frequency



Conducted Emission

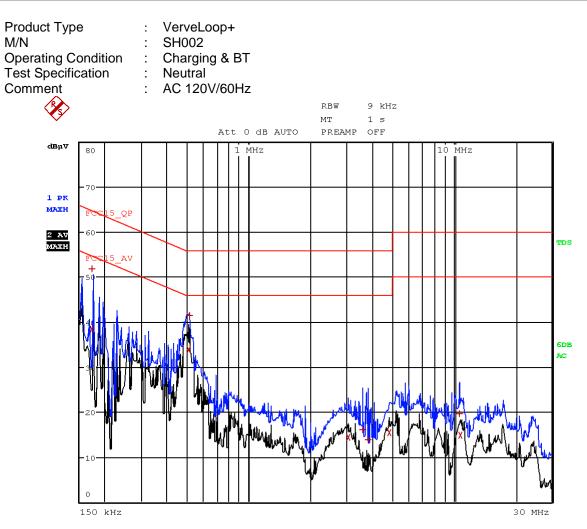


Trace	Frequenc	y	Level (dBµV)	Detector	Delta Limit/dB
1	170.000000000	kHz	48.88	Quasi Peak	-16.08
2	170.00000000	kHz	31.56	Average	-23.40
1	506.00000000	kHz	39.75	Quasi Peak	-16.25
2	514.000000000	kHz	33.75	Average	-12.25
1	1.614000000	MHz	21.73	Quasi Peak	-34.27
2	2.338000000	MHz	17.32	Average	-28.68
1	3.834000000	MHz	21.86	Quasi Peak	-34.14
2	4.914000000	MHz	9.98	Average	-36.02
2	11.050000000	MHz	17.88	Average	-32.12
1	11.070000000	MHz	22.74	Quasi Peak	-37.26

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Conducted Emission



Trace	Frequenc	;y	Level (dBµV)	Detector	Delta Limit/dB
1	174.000000000	kHz	51.77	Quasi Peak	-12.99
2	174.000000000	kHz	38.39	Average	-16.38
2	506.00000000	kHz	33.81	Average	-12.19
1	510.00000000	kHz	41.48	Quasi Peak	-14.52
2	3.042000000	MHz	14.41	Average	-31.59
1	3.598000000	MHz	15.99	Quasi Peak	-40.01
1	3.806000000	MHz	13.83	Quasi Peak	-42.17
2	4.842000000	MHz	15.41	Average	-30.59
1	10.682000000	MHz	19.63	Quasi Peak	-40.37
2	10.738000000	MHz	14.90	Average	-35.10

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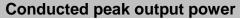
9.2 Conducted peak output power

Test Method

- Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2. Add a correction factor to the display.
- 3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power

Limits

Frequency Range	Limit	Limit
MHz	W	dBm
2400-2483.5	≤1	≤30



Bluetooth Mode GFSK modulation Test Result Conducted Peak Frequency Output Power Result

		-						
	MHz				Bm			
Low ch	annel 2	2402MH	Z	-1.56			Pass	
Middle c	Middle channel 2441MHz		Ηz	3.		Pass		
High ch	annel 2	2480MH	z	3.	.53		Pass	
Ū				el 2402M	ИНz			
Spectrum								
Ref Level 16.00 dBm	Offset 0	.50 dB 👄 RB	W 1 MHz					(~
Att 35 dB	SWT	1 ms 👄 VE	SW 3 MHz	Mode Aut	o Sweep			
1Pk Max					1[1]			-1.56 dBn
10 dBm				M	1[1]		2.402	-1.36 UBA 218810 GH
D dBm				M1				
-10 dBm		1						
-20 dBm								
	ſ						\sim	
-30 dBm								men
hanger that the								
-40 dBm								
-50 dBm								
-30 UBIN								
-60 dBm								
-70 dBm								
00.10								
-80 dBm								
CF 2.402 GHz			691	pts				n 5.0 MHz 12.05.2016
				Mea	suring		1/0	12:24:01

Middle channel 2441MHz

Spectrum Offset 0.50 dB ● RBW 1 MHz SWT 1 ms ● VBW 3 MHz Ref Level 16.00 dBm Att 35 dB Mode Auto Sweep ●1Pk Max 3.35 dBn 2.44084080 GHa M1[1] 10 dBm· M1 0 dBm -10 dBm--20 dBm--30 dBm--40 dBm--50 dBm -60 dBm -70 dBm--80 dBm-Span 5.0 MHz 691 pts CF 2.441 GHz Measuring... 📲 🚺 🚧 12.05.2016 12:23:35

Date: 12.MAY.2016 12:23:36

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High channel 2480MHz Spectrum Ref Level 16.00 dBm Att 35 dB
 Offset
 0.50 dB ●
 RBW
 1 MHz

 SWT
 1 ms ●
 VBW
 3 MHz
 Mode Auto Sweep Att ●1Pk Max M1[1] 3.53 dBm 2.47983360 GHz 10 dBm· M1 0 dBm -10 dBm· -20 dBm -30 dBm--40 dBm· -50 dBm--60 dBm--70 dBm· -80 dBm-691 pts Span 5.0 MHz CF 2.48 GHz 12.05.2016 12:22:48 Measuring...

Date: 12.MAY.2016 12:22:49

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Bluetooth Mode π/4-DQPSK modulation Test Result Conducted Peak

Frequency MHz	Output Power dBm	Result
Low channel 2402MHz	-0.73	Pass
Middle channel 2441MHz	3.27	Pass
High channel 2480MHz	3.57	Pass

		LOW	channe	31 Z40Z	IVIHZ			
Spectrum								
Ref Level 16.00 dBm		0.50 dB 👄 RB						
Att 35 dB	SWT	1 ms 👄 🛛 🛛	W 3 MHz	Mode Au	to Sweep			
●1Pk Max								
10 dBm				N	11[1]		2.402	-0.73 dBm 16640 GHz
0 dBm				M1				
o ubiii								
-10 dBm								
-20 dBm								
-30 dBm								
-40 dBm								mond
-40 UBIII								
-50 dBm								
-60 dBm								
-70 dBm						_		
-80 dBm								
CF 2.402 GHz			691	pts			Spa	n 5.0 MHz
Γ.					asuring			12.05.2016 12:26:04

Low channel 2402MHz

Date: 12.MAY.2016 12:26:04

Middle channel 2441MHz

Spectrum
 Offset
 0.50 dB ●
 RBW
 1 MHz

 SWT
 1 ms ●
 VBW
 3 MHz
 Ref Level 16.00 dBm 35 dB Mode Auto Sweep Att ⊖1Pk Max 3.27 dBm 2.44081190 GHz M1[1] 10 dBm· M1 0 dBm -10 dBm· -20 dBm--30 dBm--40 dBm--50 dBm--60 dBm--70 dBm· -80 dBm-CF 2.441 GHz 691 pts Span 5.0 MHz Measuring... 🚺 🚺 🚧 12.05.2016 12:25:42

Date: 12.MAY.2016 12:25:42

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High channel 2480MHz Spectrum Ref Level 16.00 dBm Att 35 dB
 Offset
 0.50 dB ●
 RBW
 1 MHz

 SWT
 1 ms ●
 VBW
 3 MHz
 Mode Auto Sweep Att ●1Pk Max M1[1] 3.57 dBm 2.47982630 GHz 10 dBm· M1 0 dBm -10 dBm· -20 dBm -30 dBm--40 dBm· -50 dBm--60 dBm--70 dBm· -80 dBm-691 pts Span 5.0 MHz CF 2.48 GHz 12.05.2016 12:25:20 Measuring...

Date: 12.MAY.2016 12:25:20

EMC_SZ_FR_21.00FCC Release 2014-03-20 Page 17 of 49



Bluetooth Mode 8D	PSK modulation Test	t Result
	Conducted Peak	
Frequency	Output Power	Result

	MHz		dBm			
			ubiii			
Low ch	annel 2402MHz	2	-1.11		Pass	
	annel 2441MHz		3.20		Pass	
High ch	nannel 2480MH	7	3.47		Pass	
i ligit oi		- channel 2 [,]			1 400	
	LOW					Ē
Spectrum	off 1 o so lo - pp					
Ref Level 16.00 dBm Att 35 dB	Offset 0.50 dB RB SWT 1 ms VB		de Auto Sweep			
1Pk Max						
			M1[1]			-1.11 dBm
10 dBm					2.402	01450 GHz
0 dBm		M1				
o abiii						
-10 dBm						
-20 dBm					\searrow	
					\sim	
-30 dBm						and the second
MANNE						and the second
-40 dBm						
-50 dBm						
-60 dBm						
-70 dBm						
-80 dBm						
CF 2.402 GHz		691 pts	1	· · · · ·	Spa	n 5.0 MHz
1 I			Measuring		1/0 1	2.05.2016 12:27:59

Date: 12.MAY.2016 12:27:59

Middle channel 2441MHz

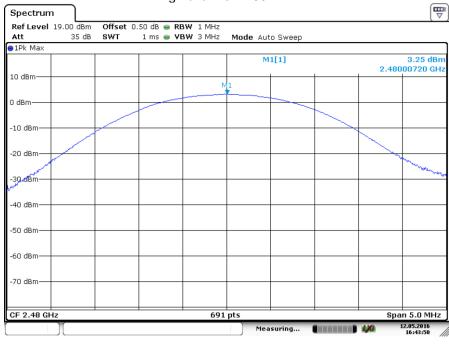
Spectrum Ref Level 16.00 dBm 35 dB Mode Auto Sweep Att ⊖1Pk Max M1[1] 3.20 dBm 2.44098550 GHz 10 dBm· Ν 0 dBm -10 dBm· -20 dBm-30 dBm--40 dBm--50 dBm--60 dBm--70 dBm· -80 dBm-CF 2.441 GHz 691 pts Span 5.0 MHz Measuring... 🚺 🚺 🚧 12.05.2016 12:27:32

Date: 12.MAY.2016 12:27:33

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High channel 2480MHz



Date: 12.MAY.2016 16:43:50

Spectrum							
Ref Level 16.00 dBm Att 35 dB	Offset 0.5 SWT	D dB 👄 RB L ms 👄 VB					
●1Pk Max	501	L ms 🖶 VE	W 3 MHZ	Mode Au	to Sweep		
10 dBm				<u> </u>	11[1]	 2.480	3.47 dBn 00000 GHa
			M	1			
0 dBm							
-10 dBm							
-20 dBm						 - w	
-30 dBm-							- manual
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
-80 dBm							
CF 2.48 GHz			691	pts	1	Spa	n 5.0 MHz
					asuring		12.05.2016 12:27:08

Date: 12.MAY.2016 12:27:08

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9.3 20 dB bandwidth and 99% Occupied Bandwidth

Test Method

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- 3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- 4. Repeat above procedures until all frequencies measured were complete.

Limit

Limit [kHz]

N/A



20 dB bandwidth and 99% Occupied Bandwidth

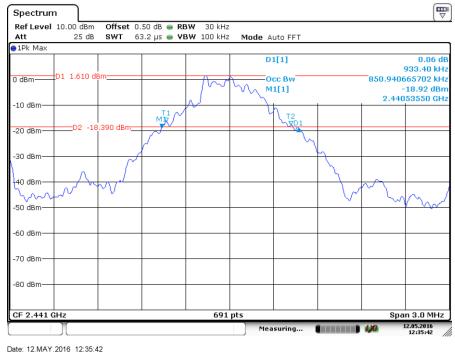
Bluetooth Mode GFSK Modulation test result

requency	20 dB Band	width		ndwidth	Limit		Result
MHz	kHz			Hz 0.94	kHz		Daar
2402	929.10						Pass
2441	933.40			0.94			Pass
2480	924.70			5.40			Pass
			2402N	ИНz			
Spectru							
Ref Leve Att	el 10.00 dBm Offset 25 dB SWT	0.50 dB 👄 R 63.2 µs 👄 V		Mode Auto FFT			
• 1Pk Max		03.2 µ3 🖕 🖡	BW 100 KH2	Mode Adto FFT			
				D1[1]			-0.08 dB 929.10 kHz
0 dBm				Occ Bw		850.9406	i65702 kHz
	D1 -3.690 dBm		In	M1[1]			23.73 dBm 54410 GHz
-10 dBm-				× ~~~			
-20 dBm-				Lh TO			
20 0011	D2 -23.690 dBm	MT1/*		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
-30 dBm-		$- \int_{-}^{-}$					
		1			$\left[\right]$	0	
-40 dBm-						YM	
50 dBm-	A A						
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							
-60 dBm-							
-70 dBm-							
-70 dBm-							
-80 dBm-							
CF 2.402	2 GHz		691 p	ots		Spa	n 3.0 MHz

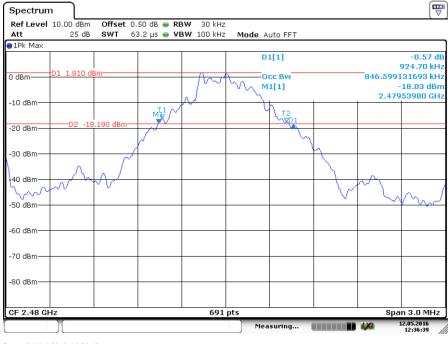
Date: 12.MAY.2016 12:34:53



2441MHz



2480MHz



Date: 12.MAY.2016 12:36:40

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## 20 dB bandwidth and 99% Occupied Bandwidth

Bluetooth Mode  $\pi$ /4-DQPSK Modulation test result

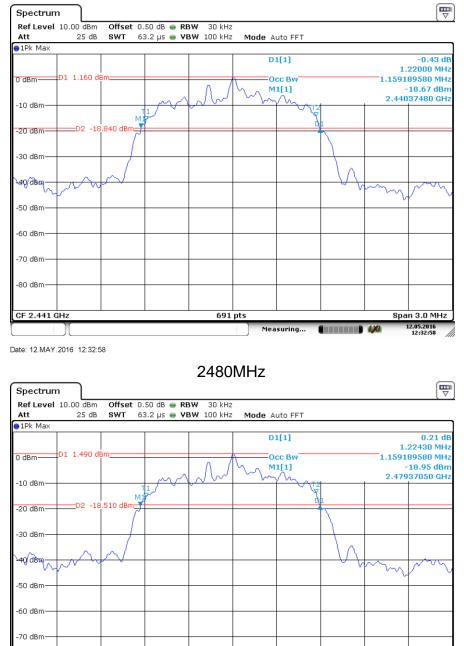
equency MHz	20 dB Bandwidt kHz	h 99% Bandwidth kHz	Limit kHz	Result
2402	1220.0	1163.50		Pass
2441	1220.0	1159.19		Pass
2480	1224.3	1159.19		Pass
		2402MHz		
Spect	rum	210211112		
	vel 10.00 dBm Offset 0.50 dB			( • )
Att		s 👄 VBW 100 kHz 🛛 Mode Auto FFT		
O IPK M	ax	D1[1]		0.06 dB
0 dBm-		Occ Bw	1.16	1.22000 MHz 3531114 MHz
-10 dBn	D1 -3.000 dBm	MI[1]	2.4	-22.82 dBm 10137920 GHz
-20 dBn	n Mar			
-30 dBn	D2 -23.000 dBm			
-40 dBn	n			
-50 dBn	mm -			Mr m
-60 dBn	n			
-70 dBn	n			
-80 dBn	n			
CF 2.4	02 GHz	691 pts	s	pan 3.0 MHz
		Measuring	4,0	12.05.2016 12:33:38

Date: 12.MAY.2016 12:33:38

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2441MHz



Date: 12.MAY.2016 12:32:15

-80 dBm-

CF 2.48 GHz

EMC_SZ_FR_21.00FCC Release 2014-03-20 691 pts

Measuring...

4,20

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Span 3.0 MHz

12:05.2016 12:32:15



## 20 dB bandwidth and 99% Occupied Bandwidth

Bluetooth Mode 8DPSK Modulation test result

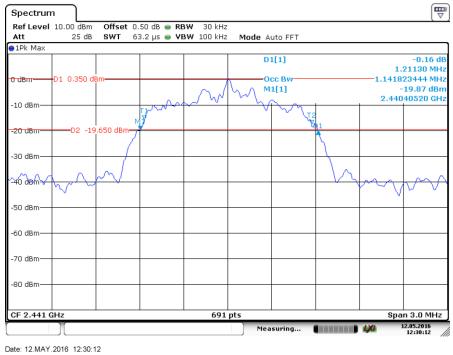
2441 1211.3 1141.82 Pa 2480 1211.3 1146.16 Pa 2402MHz Spectrum Ref Level 10.00 dbm Offset 0.50 dB • RBW 30 kHz Met _ 25 dB _ SWT 63.2 µs • VBW 100 kHz Mode Auto FFT • IPK Max 0 dbm 01 -3.980 dbm 01 -1.150056512 MHz -10 dbm 02 -23,980 dbm 02 -23,980 dbm 02 -24.21 dbm -30 dbm 02 -23,980 dbm 02 -23,980 dbm 02 -23,980 dbm 02 -30	requency MHz	20 dB Bandwi kHz		andwidth Hz	Limit kHz	Result
2480 1211.3 1146.16 Pa 2480 1211.3 1146.16 Pa 2402MHz Pa Spectrum	2402	1211.3	115	0.51		Pass
2480 1211.3 1146.16 Pa	2441	1211.3	114	1.82		Pass
Spectrum         Image: Constraint of the second secon	2480	1211.3	114	6.16		Pass
Spectrum         Image: Constraint of the second secon			2402	MHz		
Ref Level         10.00 dBm         Offset         0.50 dB         RBW         30 kHz           Att         25 dB         SWT         63.2 µs         VBW         100 kHz         Mode         Auto FFT           ● 1Pk Max         D1[1]         -0.39 dB         1.21130 MHz           0 dBm         Occ Bw         1.150506512 MHz           0 dBm         Occ Bw         2.40140960 GHz           -10 dBm         2.40140960 GHz           -20 dBm         D2 -23,980 dBm         M           -30 dBm         O         O           -40 dBm         O         O         O           -70 dBm         O         O         O         O	Spectru	m	-			
• 1Pk Max               D1[1]             • 0.39 dB             1.21130 MHz             1.21130 MHz             • 0cc Bw             1.150506512 MHz             • 24.21 dBm             • 10 dBm             • 10 dBm             • 0cd Bm             • 10 - 24.21 dBm             • 24.21 dBm             • 24.21 dBm             • 10 -						(*)
0 dBm         0cc Bw         1.150506512 MHz           01 -3.980 dBm         M1[1]         -24.21 dBm           -10 dBm         2.40140960 GHz           -20 dBm         0c -23.980 dBm         1           -30 dBm         -02 -23.980 dBm         -1           -30 dBm         -0         -0           -70 dBm         -0         -0		25 08 <b>5WI</b> 63.	2 µs 👅 VBW 100 kH2	MODE AUTO FFT		
D1 -3.980 dBm     M1[1]     -24.21 dBm       -10 dBm     2.40140960 GHz       -20 dBm     1       -20 dBm     1       -30 dBm     1       -40 dBm     -40 dBm       -50 dBm     -50 dBm       -70 dBm     -70 dBm	0 dBm				1.	1.21130 MHz
-10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -40 dBm -40 dBm -60 dBm -70 dBm -70 dBm		D1 -3.980 dBm		M1[1]		-24.21 dBm
-20 dBm D2 -23,980 dBm	-10 dBm—		· ····································	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
-30 dBm -40 dBm -50 dBm -60 dBm -70 dBm	-20 dBm—		pro ·		12	
-40 dBm -50 dBm -60 dBm -70 dBm	20.40-	D2 -23.980 dBm			Ř. –	
-50 dBm -60 dBm -70 dBm	-30 UBIII—					
-60 dBm	-40 dBm-					
-70 dBm	-50 dBm—	man -				ver v
	-60 dBm—					
	-70 dBm—					
	-80 dBm—					
	00 3011					
CF 2.402 GHz 691 pts Span 3.0 MHz	CF 2.402	GHz	691	ots		Span 3.0 MHz

Date: 12.MAY.2016 12:29:18

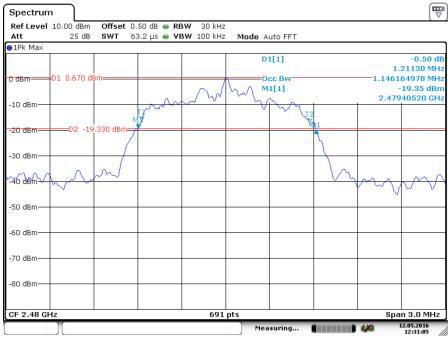
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2441MHz



#### 2480MHz



Date: 12.MAY.2016 12:31:05

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## 9.4 Carrier Frequency Separation

#### **Test Method**

- Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels, RBW ≥ 1% of the span, VBW) ≥RBW, Sweep = auto, Detector function = peak
- 2. By using the Max-Hold function record the separation of two adjacent channels.
- 3. Measure the frequency difference of these two adjacent channels by spectrum analyzer marker function.
- 4. Repeat above procedures until all frequencies measured were complete.

## Limit

Limit kHz

≥25KHz or 2/3 of the 20 dB bandwidth which is greater

## GFSK Modulation Limit

Frequency	2/3 of 20 dB Bandwidth
MHz	kHz
2402	619.40
2441	622.27
2480	616.47





## **Carrier Frequency Separation**

Test result: The measurement was performed with the typical configuration (normal hopping status), here GFSK modulation mode was used to show compliance.

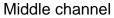
## GFSK Modulation test result

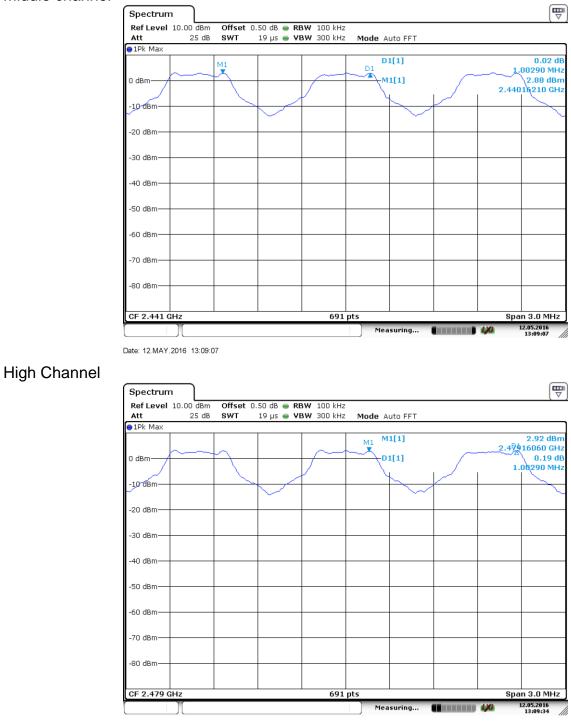
	Frequency MHz	Carrier Frequency Separation kHz	Result
	2402	1000.0	Pass
	2441	1000.0	Pass
	2480	1000.0	Pass
Low Channel			
	Spectrum		
	Ref Level 10.00 dBm Att 25 dB	Offset 0.50 dB ● RBW 100 kHz SWT 19 µs ● VBW 300 kHz Mode Auto FFT	
	Att 25 dB	SWT 19 µs 👄 VBW 300 kHz Mode Auto FFT	]
		D1[1]	2.21 dB 999.30 kHz
	0 dBm	M1 D1 M1[1]	1.85 dBm
	-10 dBm		2.402)7080 GHz
	-10 dBm7		
	-20 dBm		
	-30 dBm		
	-40 dBm		
	-50 dBm		
	-60 dBm		
	-70 dBm		
	-80 dBm		
	CF 2.403 GHz	691 pts	Span 3.0 MHz 12.05.2016
		Measuring	12.05.2016

Date: 12.MAY.2016 13:08:01

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Date: 12.MAY.2016 13:09:34

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## 9.5 Number of hopping frequencies

## **Test Method**

- Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels, RBW ≥ 1% of the span, VBW) ≥RBW, Sweep = auto, Detector function = peak
- 2. Set the spectrum analyzer on Max-Hold Mode, and then keep the EUT in hopping mode.
- 3. Record all the signals from each channel until each one has been recorded.
- 4. Repeat above procedures until all frequencies measured were complete.

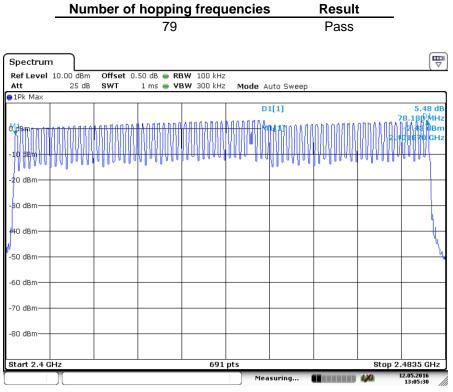
## Limit

Limit number ≥ 15



## Number of hopping frequencies

Test result: The measurement was performed with the typical configuration (normal hopping status), and the total hopping channels is constant for the all modulation mode according with the Bluetooth Core Specification. Here GFSK modulation mode was used to show compliance.



Date: 12.MAY.2016 13:05:30



## 9.6 Dwell Time

## **Test Method**

- 1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable. Equipment mode: Spectrum analyzer
- 2. RBW: 1MHz; VBW: 1MHz; SPAN: Zero Span
- 3. Adjust the center frequency of spectrum analyzer on any frequency be measured.
- 4. Measure the Dwell Time by spectrum analyzer Marker function.
- 5. Repeat above procedures until all frequencies measured were complete.

## Limit

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



### **Dwell Time**

#### Dwell time

The maximum dwell time shall be 0.4 s.

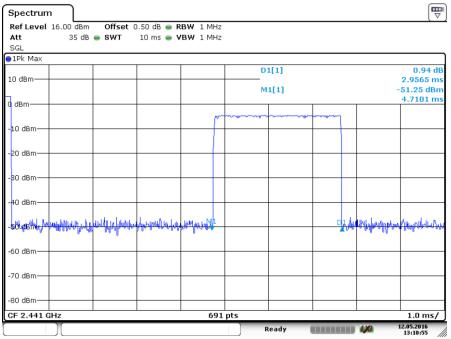
According to the Bluetooth Core Specification, the worse result (DH5 mode) was reported to show compliance.

The Dwell Time = Burst Width * Total Hops. The detailed calculations are showed as follows: The duration for dwell time calculation: 0.4 [s] * hopping number = 0.4 [s] * 79 [ch] = 31.6 [s*ch];The burst width, which is directly measured, refers to the duration on one channel hop. The maximum number of hopping channels in 31.6s for DH5=1600 / 6 / 79 *31.6=106.67

**Test Result** 

#### Modulation **Test Result** Reading Limit **Total Hops** Mode Result (ms) (ms) (ms) GFSK DH5 106.67 2956.5 315.37 < 400 Pass π/4-DQPSK 2DH5 2985.5 106.67 318.46 < 400 Pass 8-DPSK 3DH5 106.67 315.37 2956.5 < 400 Pass

#### **GFSK Modulation**



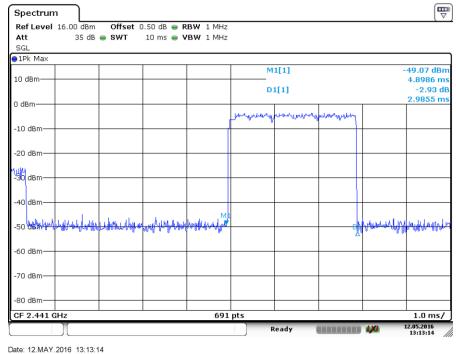
Date: 12.MAY.2016 13:10:56

DH5

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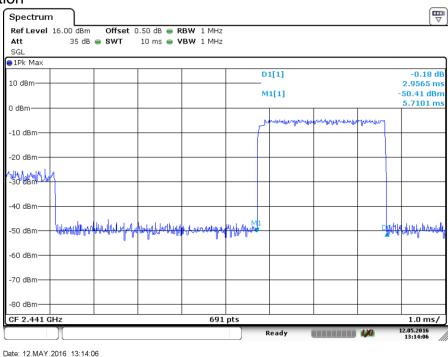


#### π/4-DQPSK Modulation



2DH5

## 8-DPSK Modulation



3DH5

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## 9.7 Spurious RF conducted emissions

## **Test Method**

- 1. Use the following spectrum analyzer settings:
- Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span. RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
- 3. The level displayed must comply with the limit specified in this Section. Submit these plots.
- 4. Repeat above procedures until all frequencies measured were complete.

#### Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20



### **Spurious RF conducted emissions**

Only the worst case (which is subject to the maximum EIRP,  $\pi/4$ -DQPSK mode) test result is listed in the report.

BT3.0 π/4-DQPSK Modulation: 2402MHz

Spectrun	n								( v
	10.00 dBm			• RBW 100 k					
Att 1Pk Max	25 dB	SWT	9.7 ms 🧉	• <b>VBW</b> 300 k	Hz Mode A	uto Sweep			
ar k man					N	11[1]			-61.99 dBn
						1			960.00 MH
) dBm									
10 40									
10 dBm									
20 dBm									
20 00111	D1 -22.560	) dBm							
30 dBm									
40 dBm—									
50 dBm—		+					+		
									M1
60 dBm—								ale di setter	<b>_</b>
way way with	manghare	านแปล	mounder	undelunsteronist	hallowershimmlight	alifuber	ununu	por male with	annar ar
-70 dBm									
80 dBm									
00 0011									
tart 30.0	I MHZ			60	91 pts				op 1.0 GHz
	n	04				asuring		4,40	12:05.2016 12:47:04
Spectrun Ref Level	n 10.00 dBm	Offset		• <b>RBW</b> 100 k	Hz			4,40	12:47:04
Spectrun Ref Level Att	n	Offset			Hz	asuring		490	12:47:04
Spectrun Ref Level Att	n 10.00 dBm	Offset		• <b>RBW</b> 100 k	Hz Hz Mode A				12:47:04
Spectrun Ref Level Att ) 1Pk Max	n 10.00 dBm	Offset		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04
Spectrun Ref Level Att 1Pk Max	n 10.00 dBm	Offset		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 1Pk Max	n 10.00 dBm	Offset		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 1Pk Max	n 10.00 dBm	Offset		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 1Pk Max 0 dBmU 10 dBm	n 10.00 dBm 25 dB	Offset SWT		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 1Pk Max 0 dBmU 10 dBm	n 10.00 dBm	Offset SWT		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 11Pk Max 0 dBMU 10 dBm 20 dBm	n 10.00 dBm 25 dB	Offset SWT		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 11Pk Max 0 dBMU 10 dBm 20 dBm 30 dBm 30 dBm	n 10.00 dBm 25 dB	Offset SWT		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 11Pk Max 0 dBMU 10 dBm 20 dBm 30 dBm 30 dBm	n 10.00 dBm 25 dB	Offset SWT		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 11 Pk Max 10 dBm 10 dBm 20 dBm 30 dBm 40 dBm	n 10.00 dBm 25 dB	Offset SWT		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrun Ref Level Att 11 Pk Max 10 dBm 10 dBm 20 dBm 30 dBm 40 dBm	n 10.00 dBm 25 dB	Offset SWT		• <b>RBW</b> 100 k	Hz Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrum           Ref Level           Att           1Pk Max           0 dBm///           10 dBm///           20 dBm///           30 dBm///           40 dBm///           50 dBm///	n 10.00 dBm 25 dB	Offset SWT		RBW 100 k     VBW 300 k	Hz Mode A	Auto Sweep			12:47:04 √ -2.56 dBn 2.4070 GH:
Spectrun Ref Level Att 11Pk Max 0 dBm 20 dBm 20 dBm 30 dBm 40 dBm 50 dBm	n 10.00 dBm 25 dB	Offset SWT		RBW 100 k     VBW 300 k	Hz Mode A	Auto Sweep			12:47:04 ∠ ⊽ -2.56 dBn
Spectrum Ref Level Att 11Pk Max 0 dBm 20 dBm 20 dBm 30 dBm 40 dBm 50 dBm 50 dBm	n 10.00 dBm 25 dB	Offset SWT	240 ms (	RBW 100 k     VBW 300 k	Hz Mode A	Auto Sweep			12:47:04 √ -2.56 dBn 2.4070 GH:
Spectrun Ref Level Att	n 10.00 dBm 25 dB	Offset SWT	240 ms (	RBW 100 k     VBW 300 k	Hz Mode A	Auto Sweep			12:47:04 √
Spectrum Ref Level Att 11Pk Max 0 dBm 20 dBm 20 dBm 30 dBm 40 dBm 50 dBm 50 dBm	n 10.00 dBm 25 dB	Offset SWT	240 ms (	RBW 100 k     VBW 300 k	Hz Mode A	Auto Sweep			12:47:04 √
Spectrum           Ref Level           Att           1Pk Max           0 dBm///           10 dBm///           20 dBm///           30 dBm///           30 dBm///           50 dBm///           60 dBm///           70 dBm///	n 10.00 dBm 25 dB	Offset SWT	240 ms (	RBW 100 k     VBW 300 k	Hz Mode A	Auto Sweep			12:47:04 √
Spectrum           Ref Level           Att           1Pk Max           0 dBm///           10 dBm///           20 dBm///           30 dBm///           30 dBm///           50 dBm///           60 dBm///           70 dBm///	n 10.00 dBm 25 dB - - - - - - - - - - - - -	Offset SWT	240 ms (	RBW 100 k     VBW 300 k	Hz Mode A	Auto Sweep			12:47:04 √

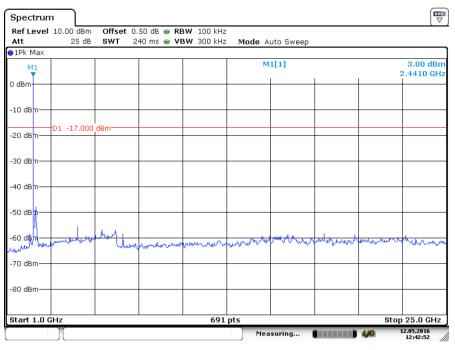
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#### Report Number: 60.790.16.716.01

## 2441MHz

Att	10.00 dBm 25 dB	Offset SWT	0.50 dB 👄 RI 9.7 ms 👄 V			to Sweep			
∋1Pk Max									
					M1	[1]			62.60 dBn 18.50 MH
0 dBm									
-10 dBm—									
-20 dBm—	D1 -17.000	dBm							
-30 dBm—									
-40 dBm—									
-50 dBm—									
-60 dBm—							41		
-70 dBm	adamodelloru	Muruhnhu	whenthere b	murhallow	whenter	njindellandarka	dr.furrateron das	and an world by	hinner
-80 dBm			_						
Start 30.0				691					p 1.0 GHz

Date: 12.MAY.2016 12:43:18



Date: 12.MAY.2016 12:42:52

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### Report Number: 60.790.16.716.01

## 2480MHz

Ref Level	10.00 dBm	Offset	0.50 dB 👄 R						
Att	25 dB	SWT	9.7 ms 👄 <b>V</b>	<b>BW</b> 300 kHz	Mode A	uto Sweep			
∋1Pk Max									
					м	1[1]	1		62.55 dBi 356.10 MH
0 dBm									
-10 dBm—									
-20 dBm	D1 -16.940	dBm							
-30 dBm									
-40 dBm									
-50 dBm									
-60 dBm								M.1	
ակերություն -70 dBm	hubbelling	whitehour	ullinennennen	ander	when merthin	hif-yund haven	montalities	unulihimiti	hunna
-80 dBm—									
Start 30.0	MHz			691	pts			Sto	p 1.0 GHz

Date: 12.MAY.2016 12:41:10

Spectrum				
RefLevel 10.00 dBm Att 25 dB			Auto Sweep	
1Pk Max	341 240 m3 - 4	BW 300 KH2 MOUE	Adto Sweep	
			M1[1]	3.06 dBn 2.4760 GH
10 dBm				
20 dBm	) dBm			
30 dBm				
40 dBm				
50 dBm				
60 dem when here	how when the store when	www.www.du	when when a start of the second secon	wert way all the to be a supported the seather thanks and a seather the seather that the seather that the seather
-70 dBm				
Start 1.0 GHz		691 pts		Stop 25.0 GHz
		par hrz		Stop 25.0 GHz

Date: 12.MAY.2016 12:40:50

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## 9.8 Band edge testing

## **Test Method**

1 Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 100 kHz, VBW  $\ge$  RBW, Sweep = auto, Detector function = peak, Trace = max hold

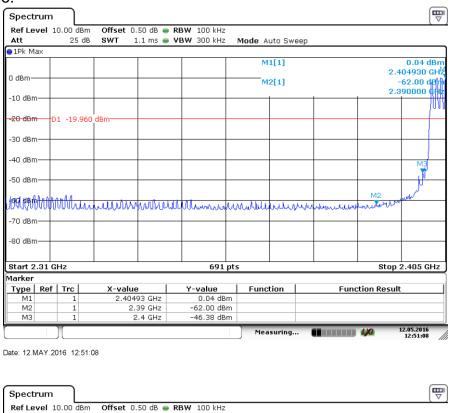
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section. .
- 4 Repeat the test at the hopping off and hopping on mode, submit all the plots.

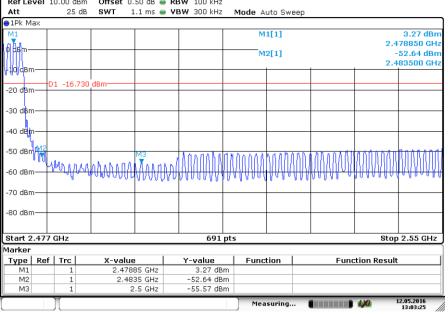
## Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

## **Band edge testing**

## BT3.0 GFSK Modulation Test Result: Hopping on mode:





Date: 12.MAY.2016 13:03:25

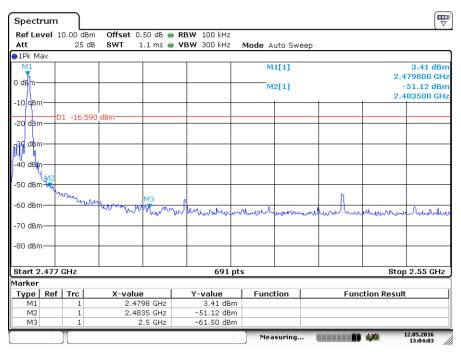




## Hopping off mode:

•	ո լ	In		PPUL KOOLU					
Ref Leve Att		dBm Offse 5dB SWT		RBW 100 kHz VBW 300 kHz	Mode to	ta C			
ALL 1Pk Max	23	5 UB 5WI	1.1 ms 👅	VBW 300 KHZ	Mode Au	to Swee	р		
JIPK Max					M3	C 4 1			-46.38 dB
					Ma	[1]			-40.38 uB 400000 i@t
0 dBm	-				M1	[1]		2.	-2.28 d
								2.	402180 CH
-10 dBm—								1	
00 dp									1 = N
-20 dBm—	D1 -22	.280 dBm							
-30 dBm—									
-30 ubiii-									
-40 dBm—				_					
io abiii									MB
-50 dBm—			_	_			_		<u> </u>
									1.1
-60 dBm—							-	M2	week -
	ounder	wheneverwheeter	manderderments	unertuburrent	withing	knukhnuk	well and the second		
-70 dBm—							_		+
00 10-									
-80 dBm—									
Start 2.3	1 GHz			691 p	ts			Stop	2.405 GH
Marker									
	ef Trc			Y-value	Functi	ion	Fun	ction Resu	it
M1	1	2.	40218 GHz	-2.28 dBm					
M2 M3	1		2.39 GHz 2.4 GHz	-62.57 dBm -46.38 dBm					
1413	1		217 002	40.30 Ubiii					12.05.2016

Date: 12.MAY.2016 12:49:34



Date: 12.MAY.2016 13:04:03



## BT3.0 8-DPSK Modulation Test Result: Hopping on mode:

**T** Spectrum Ref Level 10.00 dBm Offset 0.50 dB 👄 RBW 100 kHz Att 25 dB SWT 1.1 ms 😑 **VBW** 300 kHz Mode Auto Sweep 🔵 1 Pk Max -1.56 dBn 2.403970 GM M1[1] -63.78 dBr 2.390000 GM 0 dBm M2[1] -10 dBm--30 dBm -40 dBm--50 dBm-59 PM With and an area of the way of the second and the second se herroral indu Untrol цц -70 dBm -80 dBm-691 pts Start 2.31 GHz Stop 2.405 GHz Marker X-value 2.40397 GHz 2.39 GHz 2.4 GHz Y-value -1.56 dBm -63.78 dBm -56.70 dBm Function Type Ref Trc Function Result M1 M2 MЗ 12.05.2016 12:57:25 Measuring... 

Date: 12.MAY.2016 12:57:25

Spect	rum													
	evel	10.00 d		Offset (										
Att		25	dB	SWT	1.1 ms 🧉	VB	<b>W</b> 300 kHz	N	1ode A	uto Sw	еер			
⊖1Pk M	lax													
M1									M	1[1]				1.56 dBm
0 dBm-														179800 GHz
11101									M	2[1]				-57.30 dBm
-10 dBr	n_												2.4	183500 GHz
10 0.01	"													
-20 dBr	n—	D1 -18.	440	dBm <del></del>	+									
-30 dBr	n													
-40 dBr	n—													
-50 dBr	M													
-J0 ubi	M2				МЗ		*******	111	UT DA N	106.80	11.01	ከ ለ ለ በ ላ አ	ለለሴስስአ	ከለለሲሲሲ
-60 dBr	<u> </u>	88.080	111	nachalt	1000	المه	NAMAN	ſVЧ	MANA?	የትልለ	100	and Aman	WWW	AAAAAAAAAAA
-00 UBI	"	19000	221	ABAAAA	Angel	144								
-70 dBr														
-70 ubi	"													
-80 dBr	-													
-00 001	"													
Start 2		7 GHz					691	pts					Stop	o 2.55 GHz
Marker														
Туре	Ref			X-valu			Y-value		Func	tion		Fun	ction Result	t
M1		1			798 GHz		1.56 dB							
M2		1			335 GHz		-57.30 dB							
МЗ		1			2.5 GHz		-57.73 dB	m						
[		Л							Mea	suring.	(		L)O	12.05.2016 12:59:11

Date: 12.MAY.2016 12:59:11



# Hopping off mode:

Spectru														
Ref Leve Att						100 kHz 300 kHz		odo A	uto Sw	een				
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-ou abm—	mura	morener	mound	unter	huma	huburre	war	windy	whenthe	unoputer	m	-unitor		
-70 dBm—							<u> </u>							
-80 dBm—														
Start 2.3	1 GHz					691	pts					Stop	0 2.405 (	GHz
Marker														
Type R M1	ef Trc		X-valu	e 18 GHz	Y	-value -2.28 dB	-	Func	tion		Fund	tion Resu	lt	
M1 M2				39 GHz		-2.28 dB -62.57 dB								
M3				2.4 GHz		-46.38 dB								
	][							Mea	suring.			490	12.05.2010	

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Spect	rum											
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M1							м	1[1]			2	1.65 dBm 479800 GHz
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Marker												
Type M1	Ref	Trc 1	X-value	98 GHz	<u>Y-va</u>	alue .65 dBm	Func	tion		Fund	tion Resu	t
M1 M2		1		35 GHZ		.65 dBm .14 dBm						
M3		1		5 GHz		.39 dBm						
		)[					Mea	suring.			4/0	12.05.2016 12:59:59

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## 9.9 Spurious radiated emissions for transmitter

## **Test Method**

1: The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. 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 height of antenna 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5: Use the following spectrum analyzer settings According to C63.10:

## For Above 1GHz

Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 1MHz, VBW ≥ RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.
For Below 1GHz

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 100 KHz, VBW  $\geq$  RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

## Note:

1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.

2: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.

3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).

4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.



## Limit

The radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency	Field Strength	Field Strength	Detector
MHz	uV/m	dBµV/m	
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK



## Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worst case (which is subject to the maximum EIRP,  $\pi$ /4-DQPSK mode) test result is listed in the report.

## Transmitting spurious emission test result as below:

BT3.0 GFSK Modulation	2402MHz Test Result
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Frequency Band	Frequency	Emission Level	Polarization	Limit	Detector	Margin	Result
Danu	MHz	dBuV/m		dBµV/m		dBuV/m	
	*4804	46.88	Н	74	PK	27.12	Pass
1000-			Н	74	PK		Pass
25000MHz	*4804	39.92	V	74	PK	34.08	Pass
			V	74	PK		Pass

## BT3.0 GFSK Modulation 2441MHz Test Result

Frequency Band	Frequency	Emission Level	Polarization	Limit	Detector	Margin	Result
Dallu	MHz	dBuV/m		dBµV/m		dBuV/m	
30-			Н	46	QP		Pass
1000MHz			Н	46	QP		Pass
	*4882	47.62	Н	74	PK	26.38	Pass
1000-			Н	74	PK		Pass
25000MHz	*4882	46.08	V	74	PK	27.92	Pass
			V	74	PK		Pass



## BT3.0 GFSK Modulation 2480MHz Test Result

Frequency Band	Frequency	Emission Level	Polarization	Limit	Detector	Margin	Result
Danu	MHz	dBuV/m		dBµV/m		dBuV/m	
	*4960	44.58	Н	74	PK	29.42	Pass
1000-			Н	74	PK		Pass
25000MHz	*4960	44.23	V	74	PK	29.77	Pass
			V	74	PK		Pass

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.



# **10 Test Equipment List**

## Site 2:

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Test Receiver	R&S	ESU26	100050	12-Feb-2017
Bi-conical Antenna	R&S	HK116	100242	07-Dec-2016
Log Periodic Antenna	R & S	HL223	841516/020	01-Sep-2017
Coaxial cable (50ohm)	Rosenberger	RTK081-05S- 05S-10m	LA2-001-10M / 001	01-Sep-2017
Microwave amplifier (0.5-26.5GHz, 25dB gain)	НР	83017A	3123A00437	10-Jun-2016
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	17-Jul-2016
Horn Antenna	EMCO	3115	9002-3351	28-Oct-2017
Active Loop Antenna	EMCO	6502	9107-2651	26-Aug-2017
RF Voltage Probe	Schwarzbeck	TK9416	None	10-Feb-2017
LISN	R&S	ESH3-Z5	849876/027	15-Jun-2016
Double Shield Cable	Radiall	RG142	Nil	14-Sep-2017
Pulse Limiter	R&S	ESH3-Z2	Nil	04-Jun-2016

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## **11 System Measurement Uncertainty**

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty					
Items	Extended Uncertainty				
Radiated Emissions	Level accuracy 30 to 200 MHz 200 to 1000 MHz 1000 to 25000 MHz	±4.68 dB ±5.73 dB ±5.57 dB			
Conducted Emissions	Level accuracy 9 kHz to 30 MHz	±3.16 dB			
Conducted RF Test	≤ 1 dB				