Spectrun	Γ								
Ref Level Att	10.00 dBm	0.UT 11		VIMHz					
All 1Pk View	30 dB	SW1 11.	4 μs 🥌 VBV	VIMHZ	Mode Auto	FFI			
0 dBm						1[1] 1[1]			-4.04 dB 3.0000 MHz 19.06 dBm 20000 GHz
-10 dBm—									-
	00000000	maaaa		200000000	A A				23
		0.5 11	() <u>(35.</u> 66			A LANDAR	mm	m	m
₇ 30 dBm—									
-40 dBm									
/ <mark>-</mark> 50 dBm——									34.44
-60 dBm									
-70 dBm—									
-80 dBm									
Start 2.4 G	GHz	I	I	1001	pts	l	I	Stop 2.	.4835 GHz
) Measuri	ng 🔳		

7 Average Time of Occupancy

7.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

7.2 Test Arrangement and Procedure



- 1. The transmitter output was connected to a sp ectrum analyzer (through an atten uator, if it's necessary).
- 2. First, measure the number of pulses per 5 second, the RBW is set to 100 kHz and VBW is set to 100 kHz. Sweep is set to 5 sec. Span 0 Hz.
- 3. Second, measure the Pulse width, the RBW is set to 1MHz and VBW is set to 1MHz. Sweep is adjusted to appropriate time to show a complete pulse. Span 0 Hz.

7.3 Limit (§ 15.247(a)(1)(iii))

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.

7.4 Test Result

Compliance.

The final test data are shown on the following page(s).

HongAn TECHNOLOGY CO., LTD.

Bluetooth (1 Mbps) Channel <u>00</u>

DH	Number of Hopping	Number of Pulses	Pulse Width	AV time of	Limit
Packet	channels	per 5 sec	(sec)	Occupancy (sec)	(sec)
DH1	79	50	0.00043188	0.136474	0.4
DH3	79	26	0.0017	0.279344	0.4
DH5	79	17	0.00294638	0.316559	0.4

Bluetooth	Bluetooth (1 Mbps) Channel <u>39</u>									
DH	Number of Hopping	Number of Pulses	Pulse Width	AV time of	Limit					
Packet	channels	per 5 sec	(sec)	Occupancy (sec)	(sec)					
DH1	79	49	0.00043478	0.134642	0.4					
DH3	79	23	0.0017	0.247112	0.4					
DH5	79	19	0.00294348	0.353453	0.4					

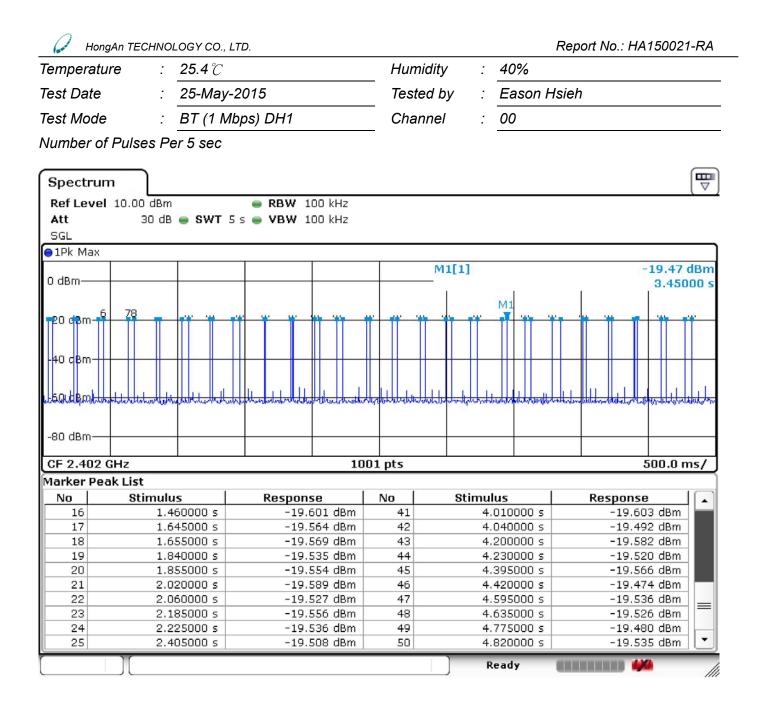
Bluetooth (1 Mbps) Channel <u>78</u>									
DH	Number of Hopping	Number of Pulses	Pulse Width	AV time of	Limit				
Packet	channels	per 5 sec	(sec)	Occupancy (sec)	(sec)				
DH1	79	49	0.00043188	0.133745	0.4				
DH3	79	27	0.00170725	0.291325	0.4				
DH5	79	17	0.00294348	0.316247	0.4				
Remark [.]									

Remark:

AV time of Occupancy (sec) = 79 (number of hopping channels) * 0.4 (sec) * Number of Pulses per 5 sec/

5 * Pulse Width (sec)

Note : 1. The EUT does not support AFH mode.



		2.7								
D2	M1	1	1.25217 ms	1.38 dB						
D1	M1		431.88 µs	-6.95 dB						
M1		1	104.35 µs							
Type	Ref	Trc	Stimulus	Response	Function	Functi	ion Result			
arker				•						
F 2.4	02 GF	lz	I	691 pt	s	I	200.0 µs,			
70 dBm	₀+									
i0 dBm										
i0 dBr	n-+-		- A Lo n Mán o Alti	<u>a a altavili a dvillad</u>	100 00 00 00		a diversion			
U.S. M. I			- MARA AND	manulurani	Milanter Mar	· · · · · · · · · · · · · · · · · · ·	wy www.			
4 Quatern	n			uniterring	NUM	MAD				
30 dBn	n									
20 dB <mark>r</mark>	n									
	"									
dBm—							104.55			
					M1[1]	-42.92 d 104.33				
0 dBm										

D1[1]

🔵 RBW 1 MHz

VBW 1 MHz

Gard	HongAn TECHNOLOGY CO., LTD.
Spec	trum

40 dB 🥃 SWT 2 ms

Ref Level 20.00 dBm

Att

SGL IPk Clrw



Report No.: HA150021-RA

-6.95 dB

🖌 Hor	ngAn TECHNOLOGY CO.,	LTD.			Report No.: HA150021-RA
Test Mode	e : BT (1 M	Ibps) DH3	Chann	el : 00	
Number o	f Pulses Per 5 sec				
Spectru	m				
Ref Leve	l 10.00 dBm	🔵 RBW 100 kHz			
Att	30 dB 🖷 SWT	5 s 👄 VBW 100 kHz			
SGL					
⊖1Pk Max					
0 dBm				M1[1]	-19.48 dBm
0 aBm—					1.74500 s
10 0	E 6	M 12	13	16 17 18	
-20 dBm			-	16 17 18	<u></u>
-40 dBm					
	all all and the second of the second s	mbrahilitetherhalmahilitethereadean	or hall all a second	was marked with the with the set of the set	manumanitation
-80 dBm—					
CF 2.402		10	01 pts		500.0 ms/
Marker Pe		10	or prs		300.0 ms/
		Dechence	No	Otimoulus	Basmansa I
No 4	Stimulus 390.000000 ms	-19.518 dBm	No 17	Stimulus 3.565000 s	-19.543 dBm
5	555.000000 ms	-19.545 dBm	18	3.705000 s	-19.561 dBm
6	970.000000 ms	-19.529 dBm	19	3.905000 s	-19.595 dBm
7	1.145000 s	-19.548 dBm	20	3.965000 s	-19.508 dBm
8	1.170000 s	-19.547 dBm	21	4.105000 s	-19.552 dBm
9	1.555000 s	-19.572 dBm	22	4.130000 s	-19.516 dBm 🗮
10	1.605000 s	-19.540 dBm	23	4.355000 s	-19.520 dBm
11	1.745000 s	-19.484 dBm	24	4.720000 s	-19.588 dBm
12	1.970000 s	-19.542 dBm	25	4.745000 s	-19.501 dBm
13	2.575000 s	-19.517 dBm	26	4.905000 s	-19.533 dBm
				Ready	

Spect	rum										
	vel 2	0.00 dB			W 1 MHz						
Att SGL		40 c	IB 🥌 SWT 5 n	ns VB	W 1 MHz						
oller	rw										
						D	1[1]				-5.35 dB 1.70000 ms
10 dBm·						M	1[1]				-40.26 dBm
0 dBm—										1	853.62 µs
-10 dBm	r	(-			
-20 dBm	<u>ا</u> _ر										
-30 dBm	۱ <u> </u>										
-40 dBm	<u></u>	Ma Marine				a	a land	Re -			
-50 dBm	rwy/w	www	_				1. ANNO				
-60 dBm	<u>ا</u> ــــ										
-70 dBm	-										
CF 2.4	02 GH	lz			691	pts					500.0 µs/
Marker											
Type	Ref		Stimulus		Response -40.26 dB	Func	tion		Fund	tion Resu	lt
M1 D1	M1	1		1.62 μs	-40.26 dE -5.35 i						
D2	M1	1		355 ms	-0.96						

Ready

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	An TECHNOLOGY CO., I			· · · · ·	ort No.: HA150021-RA
est Mode	: BT (1 M	bps) DH5	Chann	el : <u>00</u>	
lumber of	Pulses Per 5 sec				
					Ē
Spectrum	י				
Ref Level	10.00 dBm	🔵 RBW 100 kHz			
Att	30 dB 🥌 SWT 🤱	5 s 👄 VBW 100 kHz			
SGL					
⊖1Pk Max					
				M1[1]	-19.52 dBm
0 dBm					3.63000 9
-10 dBm				M1	
20 dBm -	4 5	6 7 8		9 10 11	14
-30 dBm					
-40 dBm					
-50 dBm					2
69.dBmth	Halpman marken when a hard when a hard when when a hard when a	under man with the plan on the all	addent frament	mautiner marked to marked and the second	and and appel for the of a down in the has
-70 dBm					
-80 dBm					
-00 ubiii					
CF 2.402 G	Hz	100)1 pts		500.0 ms/
Marker Pea	k List				
No	Stimulus	Response	No	Stimulus	Response
1	5.000000 ms	-19.659 dBm	10	3.195000 s	-19.618 dBm
2	60.000000 ms	-19.611 dBm	11	3.370000 s	-19.552 dBm
3	420.000000 ms	-19.579 dBm	12	3.575000 s	-19.623 dBm
4	600.000000 ms 1.010000 s	-19.650 dBm -19.573 dBm	13	3.630000 s 4.405000 s	-19.521 dBm -19.579 dBm
6	1.425000 s	-19.602 dBm	15	4.565000 s	-19.609 dBm
7	1.625000 s	-19.608 dBm	16	4.610000 s	-19.656 dBm
		an an i	17		-10 504 dBm
8	2.420000 s	-19.624 dBm	17	4.970000 s	-19.584 dBm

Spect	um											
Ref Le	vel 2	0.00 d	Bm	😑 RE	3W 1 MHz							
Att		40	dB 🔵 SWT 5	ims VE	BW 1 MHz							
SGL												
●1Pk Cl	W.											
							D	1[1]				-4.24 dB
10 dBm-								1111				2.94638 ms
							M	1[1]				-39.51 dBm 926.09 μs
0 dBm—											1	920.09 µ3
									8			
-10 dBm												
-20 dBm			2									
-30 dBm										-		
			MI									
-40 dBm	Jud	ب الالله	HH .							41	hally	
-50 dBm	Marco	PTW									nandrand	urve.
00 00												
-60 dBm				-								
-70 dBm												
CF 2.40)2 GH	z			691	pts						500.0 µs/
Marker												
Туре	Ref		Stimul		Response		Func	tion		Fund	ction Result	<u> </u>
M1	644	1		26.09 µs	-39.51 di							
D1 D2	M1 M1	1		4638 ms 4493 ms	-4.24							
	INIT	1	3.7	211 5677	-1,00	ub]

Report No.: HA150021-RA

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Ready

B

🖌 HongAn	TECHNOLOGY CO.,	LTD.				Report No.: HA150021	I-RA
Test Mode	: BT(1 N	lbps) DH1	Cha	nnel :	39		
Number of Pu	Ises Per 5 sec						
Spectrum							
Ref Level 10	1.00 dBm	🔵 RBW 100 kHz					(.
Att	30 dB 🥃 SWT	5 s 🔵 VBW 100 kHz					
SGL							
●1Pk Max							
				M1[1]		-20.13 (dBm
0 dBm						25.00) ms
11							
20 = Bm -	89		**	y 4 4	* * *	r whe we we have a	49
-40 dBm				11 . 11	i ii ii		ii.
-80 dBm	na an tha an the second s				ugunaniju zananj		
CF 2.441 GHz		10	001 pts			500.0 m	<u>15/</u>
Marker Peak L		P	1				\sim
No 16	Stimulus 1.630000 s	Response -20.185 dBm	No 41	Stim	4.150000 s	-20.244 dBm	
17	1.785000 s	-20.279 dBm	42		4.205000 s	-20.223 dBm	
18	1.815000 s	-20.173 dBm	43		4.350000 s	-20.263 dBm	
19	1.965000 s	-20.232 dBm	44		4.375000 s	-20.181 dBm	
20	2.040000 s	-20.239 dBm	45		4.530000 s	-20.287 dBm	
21	2.170000 s	-20.152 dBm	46		4.580000 s	-20.145 dBm	
22	2.210000 s	-20.231 dBm	47		4.765000 s	-20.248 dBm	
23	2.385000 s	-20.201 dBm	48		4.795000 s	-20.196 dBm	
24 25	2.430000 s 2.595000 s	-20.227 dBm -20.270 dBm	49		4.950000 s	-20.198 dBm	-
	2.393000 5	-20,270 UBM			_		
					Ready		//

HongAn TECHNOLOGY CO., LTD.

Att 40 dB 🥌 SWT 2 ms VBW 1 MHz SGL ●1Pk Clrw D1[1] -4.21 dB 434.78 µs 10 dBm· M1[1] -42.06 dBm 191.30 µs 0 dBm--10 dBm--20 dBm--30 dBm-DP -40 dBm h. Bolopolus and Araba Araba Araba and Araban hulph Soldem -60 dBm--70 dBm-200.0 µs/ CF 2.441 GHz 691 pts Marker Type | Ref | Trc Stimulus Response Function **Function Result** 191.3 µs Μ1 1 -42.06 dBm D1 Μ1 434.78 µs -4.21 dB 1 1.25507 ms 3.03 dB D2 M1 1 120 Ready **EXTERNET** ///

RBW 1 MHz



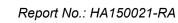
Spectrum

Ref Level 20.00 dBm

🖌 Hon	ngAn TECHNOLOGY CO.,	LTD.				Report No.: HA150021	I-RA
Test Mode	e : BT(1 M	Ibps) DH3	Char	nnel :	39		
Number o	f Pulses Per 5 sec			-			
Spectru	m						₽
-	L 10.00 dBm	🔵 RBW 100 kHz					(*)
Att		5 s 曼 VBW 100 kHz					
SGL							
●1Pk Max							
				M1[1]		-20.26 (dBm
0 dBm				— .		135.00) ms
M1							
- 1 dB		9 12 -	15 16	17 18	21	<u>-22 23</u>	
-40 dBm-							
					10.00		- isl
LOGOLO RID	mandeter and a find the second	Helendon John Martin South	uthe hat went	uter aluma har and	mathicket	with the work from the work of	Anna
-80 dBm—							
CF 2.441	GHz	10)01 pts			500.0 m	
Marker Pe			or pes			0001011	<u> </u>
No	Stimulus	Response	No	Stimulu	5	Response	
3	305.000000 ms	-20.258 dBm	15		85000 s	-20.324 dBm	
4	360.000000 ms	-20.268 dBm	16	2.6	65000 s	-20.326 dBm	
5	530.000000 ms	-20.283 dBm	17	2.8	70000 s	-20.359 dBm	
6	725.000000 ms	-20.345 dBm	18		55000 s	-20.270 dBm	
7	920.000000 ms	-20.308 dBm	19		70000 s	-20.338 dBm	_
8	1.115000 s 1.540000 s	-20.361 dBm -20.387 dBm	20		20000 s 70000 s	-20.304 dBm -20.310 dBm	
10	1.860000 s	-20.387 dBm	21		90000 s	-20.310 dBm	
11	1.910000 s	-20.426 dBm	23		00000 s	-20.350 dBm	
12	2.080000 s	-20.409 dBm					-
	Υ			De	ady		
				Ke	,		11

dBm	🔵 RBW 1 MHz	
10 dB 🥃 SWT 5 r	ms VBW 1 MHz	
		D1[1]
		M1[1]

									D1	[1]							.75 dB 00 ms
10 dBm	+					+			M	[1]						-40.8	2 dBm
0 dBm—																1.933	333 ms
-10 dBm	י - ר						4							_		ſ	
-20 dBm	n											_					
-30 dBm	<u>ا</u> ــــ					4											
-40 dBm	-			No. K.Lu		M						D1			1	£	
-50 dBm	η		սիթ	~v \⊮	Munh	8						4	when	vilmuv	wind.		
-60 dBm	<u> </u>		_			_								_		_	
-70 dBm	2					_								_			
CF 2.4	41 GH	Iz					691	pts								500.	0 µs/
Marker																	
Туре	Ref		Sti	mulus		R	esponse		Funct	ion			Fur	octio	n Resi	ılt	
M1 D1	M1	1			33 ms 1.7 ms		-40.82 dB -4.75 (
D1 D2	M1	1			55 ms		0.51										
)[Ready	,		111		-	



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🖌 Hong	An TECHNOLOGY CO., L	TD.			Repor	t No.: HA150021-RA
Test Mode	: BT (1 Mb	ops) DH5	Channe	el : 39		
Number of	Pulses Per 5 sec					
Spectrum	r)					
Ref Level	10.00 dBm	🔵 RBW 100 kHz				
Att	30 dB 🥃 SWT 5	s 🔵 VBW 100 kHz				
SGL						
⊖1Pk Max						
0 dBm			1	M1[1]		-20.19 dBm 2.56000 s
			M1	1 1		
1-20 dBn34	5 67 8 9	10 11 12	13 14	15	18	19
-40 dBm						
	water all a barrent and a	and and a state with a state of the		mal warden warden	Statute of the second	and the start of the start
-80 dBm						
CF 2.441 G		100	1 pts			500.0 ms/
Marker Pea						
No	Stimulus	Response	No	Stimulus		Response
1	25.000000 ms	-20.258 dBm	11		'0000 s	-20.247 dBm
2	150.000000 ms 350.000000 ms	-20.292 dBm -20.245 dBm	12		25000 s	-20.204 dBm -20.192 dBm
4	400.000000 ms	-20.245 dBm	13		0000 s	-20.192 dBm
5	765.000000 ms	-20.267 dBm	15		5000 s	-20.300 dBm
6	955.000000 ms	-20.267 dBm	16		.0000 s	-20.235 dBm
7	1.015000 s	-20.228 dBm	17		0000 s	-20.219 dBm
8	1.180000 s	-20.278 dBm	18	3.92	25000 s	-20.284 dBm
9	1.370000 s	-20.251 dBm	19	4.57	'5000 s	-20.255 dBm
10	1.575000 s	-20.286 dBm				
				Ready		

Ref Level 20.00 dBm RBW 1 MHz Att 40 dB SWT 5 ms VBW 1 MHz SGL 11 MHz 11 MHz 11 MHz	D1[1] -4.80 dE
SGL	D1[1] -4.90 dg
	D1[1] -4.90 dg
A 1Dk Clew	D1[1] -4.90 dg
	D1[1] _4 90 do
10 dBm	2.94348 ms M1[1] -40.16 dBm
	730.43 µ
0 dBm	
-10 dBm	
-20 dBm	
-30 dBm	
-40 dBm	
NAWAMANAM	Charlen and an and a second a sec
-50 dBm	
-60 dBm	
-70 dBm	
CF 2.441 GHz 691	L pts 500.0 μs/
Marker	
Type Ref Trc Stimulus Response	Function Function Result
M1 1 730.43 µs -40.16 d8	
D1 M1 1 2.94348 ms -4.80 D2 M1 1 3.75217 ms -0.28	

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Ready

🖌 Hong	An TECHNOLOGY CO.,	LTD.				Report No.: HA150021	-RA
Test Mode	: BT (1 N	lbps) DH1	Cha	nnel	: 78		
Number of	Pulses Per 5 sec						
Spectrum							
	10.00 dBm	🔵 RBW 100 kHz					(*)
Att		5 s 🖷 VBW 100 kHz					
SGL							
1Pk Max							
				M1[1]	6	-23.91 (dBm
0 dBm				- Charles		2.575	1.000
				1	1		
1-20 dBm45			M1			10	
	ΤΙΪΪ		T T	li II I	Ϋͳͳ	ז ז חחו ז ו	Ĩ
-40 Bm							
HEALDBORN	abutron the rest of the month of the second	and a superior of the second	Million Mindow	- And Martin Could	m - Haller and an and a star and	any market war	anne
-80 dBm							
-80 UBIII							
CF 2.48 GF	lz	1	001 pts	I	1	500.0 n	ns/
Marker Pea	k List		-				
No	Stimulus	Response	No	St	imulus	Response	
16	1.605000 s	-24.003 dBm	41		4.010000 s	-24.043 dBm	
17	1.635000 s	-24.030 dBm	42		4.160000 s	-24.101 dBm	
18	1.800000 s	-24.077 dBm	43		4.210000 s	-24.077 dBm	
19	1.850000 s	-24.074 dBm	44		4.340000 s	-24.085 dBm	
20	1.970000 s	-24.032 dBm	45		4.385000 s	-24.122 dBm	
21	2.020000 s 2.175000 s	-23.995 dBm -24.052 dBm	46		4.570000 s 4.770000 s	-24.070 dBm -24.087 dBm	
23	2.225000 s	-23.962 dBm	48		4.810000 s	-24.018 dBm	
24	2.400000 s	-24.033 dBm	49		4.960000 s	-24.014 dBm	
25	2.425000 s	-23.993 dBm					-
1	Υ				Deadu		
					Ready		11

Spect	rum														
Ref Le	vel 2	0.00 dBm	1	e R	BW	1 MHz									
Att		40 dB	8 🔵 SWT 2 n	ns VI	BW	1 MHz									
SGL															
⊖1Pk Cl	rw														1
								D	[1]					-13.7	
10 dBm														431.8	
10 abiii								M	1[1]					-37.69	
0 dBm-				1 11 1								X	- Andreas	281.1	.6 µs
												F			
-10 dBm	י	-	-												
-20 dBm	+-י														
-30 dBm		M1													
-40 dBm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	140									Northal	P			
20 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(a) (b) (b) (b) (b) (b) (b) (b) (b) (b) (b			I.	1 Jah	ntun aluppuu	I. N	an Pilal	data di	land	πN	<u></u>			No.
<mark>իկի</mark> //// J-50 dBm	0°W			l	Pol	I A A A A A A A	าบเงข	hable of a	เงิดการ	<u>Illa. N</u>	W				1 IV
C (2)					2				5						
-60 dBm	<u>۱</u>														_
-70 dBm	2							1							
CF 2.4	8 GHz					691	pts							200.0	µs/
Marker															
Туре	Ref	Trc	Stimulus			Response		Func	tion			Funct	ion Res	ult	
M1	21212	1		.16 µs		-37.69 dB									
D1	M1	1		88 µs		-13.71 c									
D2	M1	1	1.252	217 ms		-2.14 c	IR		<u>`</u>			_			
		Л]	Read	У			4/4	//

🖌 Hon	gAn TECHNOLOGY CO.,	LTD.			Report No.: HA150021-	-RA
Test Mode	e : BT(1 M	1bps) DH3	Chan	nel : 78		
Number o	f Pulses Per 5 sec		_			
Spectru	m				(
Ref Leve	10.00 dBm	🔵 RBW 100 kHz			· · · · · · · · · · · · · · · · · · ·	
Att	30 dB 🥃 SWT	5 s 🔵 VBW 100 kHz				
SGL						_
●1Pk Max						
0 dBm				M1[1]	-23.93 d	
о авт——					4.1700)0 s
					DAT.	
1-202dBm3-	6 7 8	9 10 .	13 14	15 18 19	22 23 24	-27
-40 dBm						-+
160 dBm	an and a part of a second	a was we are to			w w in a loss gene ingen i	
with our deriver the second	an and the second second second second	net we have a second second and the second	mountermout	anneal an	and a stand of the stand of the stand of the state of the	William -
-80 dBm—						\neg
CF 2.48 G	iHz	10	01 pts		500.0 m	s/
Marker Pe	ak List					\neg
No	Stimulus	Response	No	Stimulus	Response	
5	605.000000 ms	-23.988 dBm	19	3.545000 s	-23.963 dBm	
6	830.000000 ms	-23.967 dBm	20	3.950000 s	-23.985 dBm	
7	1.035000 s	-23.966 dBm	21	3.970000 s	-24.060 dBm	
8	1.205000 s	-24.015 dBm	22	4.170000 s	-23.928 dBm	
9 10	1.580000 s 2.005000 s	-24.030 dBm -24.043 dBm	23 24	4.330000 s 4.535000 s	-24.049 dBm -24.038 dBm	
10	2.365000 s	-23.966 dBm	24	4.535000 s	-24.038 dBm	
12	2.440000 s	-24.014 dBm	26	4,795000 s	-24.099 dBm	
13	2.620000 s	-23.932 dBm	27	4.935000 s	-24.039 dBm	
14	2.775000 s	-23.955 dBm				-
				Ready		
				Ready		111

Att		40	dB 🥃 SWT 5 n	ns VB	W 1 MHz								
SGL													
●1Pk Cli	rw												
							D1	[1]					-6.75 dB
10 dBm-								1000					70725 ms
							M:	L[1]					8.71 dBm
0 dBm—	_										177. 1 104000	1	41884 ms
		ł –						1					
-10 dBm													
								1					
-20 dBm													
-30 dBm			MI							P	2		
-40 dBm			MI							prot.	Ł		
-40 UBII		the all	with monthly for					Git hour	M. MILL	millional			
-50 dBm		And we	march character a					T The	Ande	william a			
-60 dBm											_		
-70 dBm													
CF 2.48	3 GHz	0			691	ots							i00.0 µs/
Marker													
Type	Ref	Trc	Stimulus	s	Response	1	Funct	ion	1	Eu	nction	Result	
M1		1		- 384 ms	-38.71 dBr	m							
D1	Μ1	1		725 ms	-6.75 d								
D2	M1	1	2.498	355 ms	1.86 d	в							
									Read	v ===		-	
								ļ	Reau	,			11.

Page 59 of 87

est Mode	: BT (1 M	bps) DH5	Channe	el : 78	
	Ilses Per 5 sec				
Spectrum					
Ref Level 10 Att		● RBW 100 kHz s ● VBW 100 kHz			\
SGL					
∋1Pk Max					
0 dBm			r	M1[1]	-23.95 dBm 2.03000 s
-10 dBm			-		
-20 dBm	2 3	45 7 89	+ 1	12 13 14 15	16 IZ
-30 dBm					
-50 dBm					
n6Q.dBman	metricular martine more more	and the second sec	-	the matter and the manufacture of the second states and the second	monocontracture
-70 dBm			+		
-80 dBm					
CF 2.48 GHz		100	1 pts		500.0 ms/
Marker Peak I	ist				
No	Stimulus	Response	No	Stimulus	Response
1	10.000000 ms	-23.996 dBm	10	2.775000 s	-24.001 dBm
2	840.000000 ms	-23.994 dBm	11	2.955000 s	-23.951 dBm
3	1.225000 s	-23.961 dBm	12	3.145000 s	-23.985 dBm
4	1.780000 s	-23.965 dBm	13	3.570000 s	-24.001 dBm
5	1.850000 s	-24.068 dBm	14	3.775000 s	-23.982 dBm
6	2.030000 s	-23.948 dBm	15	3.975000 s	-24.037 dBm
7	2.150000 s	-24.052 dBm	16	4.560000 s	-24.089 dBm
8	2.350000 s 2.405000 s	-23.989 dBm -23.958 dBm	17	4.770000 s	-24.002 dBm
	2 405000 \$	-23,958,08m	() () () () () () () () () ()		

Spect	rum									
	vel 2	0.00 dBm			/ 1 MHz					```````
Att SGL		40 de	5 🥌 SWT 5 ms	S VBW	/ 1 MHz					
●1Pk Cl	rw									
						D	1[1]			-7.01 dB
10 dBm										2.94348 ms
10 0.0.						M	1[1]		1.	39.46 dBm
0 dBm—										773.91 µs
-10 dBm										
-10 000	'									
-20 dBm	∩		+							
										5
-30 dBm	י-ר	MI								
-40, dBm	r	MI			_					R
whether	MUN	441						PAMIN	y Public princip	
-50 dBm		US	+ +						0 0 0	
-60 dBm										
-00 ubii	'T									
-70 dBm	ν 				_					
CF 2.4	B GHz		1 1		691 p	ts				500.0 µs/
Marker										
Туре	Ref		Stimulus		Response	Func	tion	Fu	nction Result	
M1	641	1		91 µs	-39.46 dBm -7.01 dB					
D1 D2	M1 M1	1	2.9434 3.7449		-7.01 dE 1.49 dE					

Report No.: HA150021-RA

///

Ready



Report No.: HA150021-RA

8 Peak Output Power

8.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

8.2 Test Arrangement and Procedure



- 1. The transmitter output was connected to a sp ectrum analyzer (through an atten uator, if it's necessary).
- 2. The RBW is set to 3MHz and VBW is set to 3MHz. Span set to 5MHz.
- 3. Max Hold..

8.3 Limit (§ 15.247(b))

- 15.247(b) The maximum peak conducted output power of the intentional radiator shall not excee d the following:
- 15.247(b)(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. F or all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
- 15.247(b)(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the co nducted output power from the intentional rad iator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is <u>3</u> dBi, therefore, the limit is 30 dBm.

8.4 Test Result

Compliance.

The final test data are shown on the following page(s).



Bluetooth 1 Mbps (DH	5)		
Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)
00	2402	-18.78	30
39	2441	-19.41	30
78	2480	-22.77	30

🖌 HongAn TE	CHNOL	LOGY CO., LTL	D.					Repo	ort No.: HA	150021-RA
Temperature	:	25.4 ℃			Humidity	:	40	%		
Test Date	:	25-May-20	015		Tested by	/ :	Ea	son Hsieh		
Test Mode	:	BT (1Mbp	s) DH5		Channel	:	00			
Spectrum	ſ									
Ref Level 10.00) dBm		RBW	3 MHz						
	30 dB	SWT 1.3	µs 🖷 VBW	3 MHz M	ode Auto Fi	Τ				
⊖1Pk View										
					MJ	[1]				18.78 dBm 00000 GHz
0 dBm									2.402	
-10 dBm										
				M	ī					
-20 dBm					7					
									10000	
-30 dBm										
-40 dBm										
-50 dBm										
-60 dBm										
-70 dBm										
-80 dBm										
CF 2.402 GHz				691	nte					n 5.0 MHz
				091	pts	M			opa	
						mea	asurin	y		· //,

HongAn TEC	HNOLOGY CO., LTD.		Report No.: HA150021-
Test Mode	: BT (1Mbps) DH5	Channel	: 39
Spectrum			(
Ref Level 10.00	dBm 🛛 🖷 RBW 3	MHz	· · · · · · · · · · · · · · · · · · ·
	0 dB SWT 1.3 µs 👄 VBW 3		
●1Pk View	· · · · ·		
		M1[1]	-19.41 d 2.44100000 0
0 dBm			
-10 dBm			
-20 dBm		M1	
-30 dBm			
-40 dBm			
-50 dBm			
-60 dBm			
-70 dBm			
-80 dBm			
CF 2.441 GHz		601 ptc	Span E 0 Mi
GF 2.441 GHZ		691 pts	Span 5.0 Mł
		M	1easuring 🚺 🚺 🚧

Channel : 78

Test Mode :	BT (1 Mbps) DH5
-------------	-----------------

Spectrun	n								
	10.00 dBm		RBW						
Att	30 dB	SWT 1.3	µs 👄 VBW	3 MHz M	lode Auto F	FT			
⊜1Pk View								500	
					M	1[1]			22.77 dBm 00000 GHz
0 dBm								2.400	
-10 dBm									
00 40				N	1				
-20 dBm—			-						
-30 dBm-									
-40 dBm—									
-50 dBm									
-60 dBm									
-70 dBm									
-80 dBm									
CF 2.48 G	 Hz			691	pts			Sna	n 5.0 MHz
				551		Measuri	ng 🔳		
						,			- //

9 100kHz Bandwidth of Band Edges

9.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

9.2 Test Arrangement and Procedure



- 1. Remove the antenna from the transmitter and connected it to a spectrum analyzer through a low loss RF cable (connect an attenuator, if it's necessary).
- 2. The RBW is set to 100 kHz and VBW is set to 100 kHz. Sweep set to Auto. Span set to 100MHz.
- 3. Max Hold. Mark Peak and record max level.
- 4. Keep the same instrument setting, perform the hopping function.
- 5. Max Hold. Mark Peak and record max level.

9.3 Limit (§ 15.247(d))

In any 100 kHz ba ndwidth outside the frequency band in which the spread spectrum or digitally m odulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, r adiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

9.4 Test Result

Compliance.

The final test data are shown on the following page(s).

Since the fix channel mode is the worst case, data of the hopping mode were not recorded in this report.



Bluetooth (1Mbps) Channel: <u>00</u> non-Hopping mode

	Measure					
Lower Channel (MHz)	Max Peak Power	Highest Freq. at Lower Band edge	Max Peak Power at Lower Band edge	Result (dB)	Limit (dB)	
• · · · · · · · · · · · · · · · · · · ·	(dBm)	(MHz)	(dBm)			
2402.06	-18.97	2400	-59.41	40.44	20	

Remark: Result (*dB*) = *Max Peak Power* – *Max Peak power at lower band edge. When Result* > *Limit, it's a pass.*

Bluetooth (1Mbps) Channel: 00 Hopping mode								
	Measure							
	Max Peak	Highest Freq. at	Max Peak Power at	Result	Limit			
	Power	Lower Band edge	Lower Band edge	(dB)	(dB)			
Channel (MHz)	(dBm)	(MHz)	(dBm)					
2408.05	-18.8	2326.13	-56.96	38.16	20			

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.



Bluetooth (1Mbps) Channel: <u>78</u> non-Hopping mode

	Measure	ed Result			
Upper Channel (MHz)	Power		Max Peak Power at Upper Band edge (dBm)	Result (dB)	Limit (dB)
2480	-23.12	2578.6	-58.47	35.35	20

Remark: Result (*dB*) = *Max Peak Power* – *Max Peak power at upper band edge. When Result* > *Limit, it's a pass.*

Bluetooth (1Mbps) Channel: <u>78</u> Hopping mode								
	Measure							
	Max Peak	Highest Freq. at	Max Peak Power at	Result	Limit			
	Power	Upper Band edge	Upper Band edge	(dB)	(dB)			
Channel (MHz)	(dBm)	(MHz)	(dBm)					
2472.09	-22.45	2505.93	-57.01	34.56	20			

Remark: Result (dB) = Max Peak Power – Max Peak power at Upper band edge. When Result > Limit, it's a pass.

🖌 HongAn TECHI	NOL	LOGY CO., LTD.					Rep	ort No.: HA	150021-RA
Temperature	:	25.4 ℃		Humidity	, <u>;</u>	4	40%		
Test Date	:	25-May-2015		Tested b	у:	E	Eason Hsieh	1	
Test Mode	:	BT (1Mbps) non-hopping mode		Channel	:	2	2402		
Spectrum									
		● RBW ● SWT 90 ms ● VBW	100 kHz 300 kHz	Mode Auto) Sweep				
●1Pk View		1 1			1[1]				18.97 dBm
0 dBm					2[1]			2.40	20600 GHz 59.41 dBm 00000 GHz
-10 dBm									141
-20 dBm-D1 -18.9	970	dBm							M1
-30 dBm									
-40 dBm	-38	3.970 dBm							
-50 dBm									
raciolatellination or manhalad	hefer	the second the second second	andaratharitarita	mounduration	all of the second	माम्	www.adutoutoutoutoutoutoutoutoutoutoutoutoutou		a London
-70 dBm									
-80 dBm									
								F	
Start 2.31 GHz			1001	pts					2.41 GHz
					Mea	su	ıring 🚺		

Hong	An TECHNO	LOGY CO., LT	D.					Report No	: HA1500	21-RA
Test Mode	:	BT (1 Mb	os) Hoppin	g mode	Channel	:	2402			
Spectrum	'n									
Ref Level	10.00 dBm		🔵 RBW	' 100 kHz						
Att	30 dB	👄 SWT 10	ms 👄 VBW	/ 300 kHz	Mode Auto	Sweep				-
⊖1Pk View										,
					M	[1]			-18.8	0 dBm
									2.408050	0 GHz
0 dBm					MS	2[1]			-56.9	6 dBm
								r	2.326130	0 GHz
-10 dBm										
10 0.0111										100
	D1 -18.800	dBm								M1
-20 dBm	DI -10.000								111	11111
										JARIN (
-30 dBm	,								10	ЩЩЦ
									14	ԱԱՍՊ
-40 dBm		8.800 dBm <u>—</u>							P***	
-40 uBm	TO OLAN MORE	Contraction Contraction of								
-50 dBm	10.0120						_			
	M2									
h-bendeminit	-	والمربعة والمحاوية المجاجر المعرو العالم	مراوا معربية أسريهم والم	والعسير والمد ومحاوله		-Allower		1.4. Martin and Incold	uterture al	
		1200071280 200-0	1946 - 194 - CESTRONS	1997.A. 252.6900. 897	1. A 1994 (947) A 19		10.000 mar 20.000	and the second second second second second	and the second second	
-70 dBm—										1
-80 dBm										
									F1	
Start 2.31	GHz	1		100:	l pts				Stop 2.41	GHz
						Mea	suring			
L						nea	surniy			11.

HongA	n TECHNO	LOGYCO	., LTD.						Report No.	: HA1	50021	-RA
Toot Mode		BT (1	Mbps)			Channel		2480				
Test Mode	•	non-ho	opping mo	ode		Channel	•					
Spectrum											ſ	₽
					₩ 100 kHz						ļ	
Ref Level 1 Att	10.00 авт 30 dB	SWT	227 5 us (W 300 kHz	Mode Au	to FET					
●1Pk View	00 40	0/11	221.5 μ3			moue Au						
						M	1[1]				23.12 d	Bm
											30000 (100
0 dBm						M:	2[1]				58.47 d	
								T	Ĩ	2.57	78680 (GHZ
-10 dBm												-
-20148m-										—		_
	01 -23,120	dBm										
-30 c <mark>Bm</mark>										\rightarrow		_
-40 dBm										\rightarrow		_
	— D2 -4;	3.120 dBi	m									-
-50 dBm												_
					M2	9						
Jag dBaby	-	mathematic	AM MARAMAN	Allon	thereway	addreathering	Mandante	all when the state	a long barting long	toutport	withing	-
· · · · · · · · · · · · · · · · · · ·						1999 10.00 Percent 100						
-70 dBm												
-80 dBm		ļ										
F1												
Start 2.47 G	Hz				1001	pts					2.69 G	Hz
	Л						Meas	suring		144		

Hong	An TECHNO	LOGY CO., L	TD.				Rep	oort No.: HA	150021-RA
Test Mode	:	BT (1 Mb	ops) Hoppin	g mode	Channel	:	2480		
Spectrun	n								
Ref Level	10.00 dBm		👄 RB	W 100 kHz					
Att	30 dB	SWT 22	7.5 µs 👄 VB	W 300 kHz	Mode Au	ito FFT			
●1Pk View									
					M	1[1]		5	22.45 dBm
								2.4	72090 GHz
0 dBm					M	2[1]			57.01 dBm
							T.	2.5	05930 GHz
-10 dBm									
10 0.011									
11- 1-									
420 dBm	D1 -22.450) dBm							
MARINE -									
1481 (Bm									
-40 dBm									
	D2 -4	4.450 dBm-							
-50 d <mark>8</mark> m	-								
	M2								
-60 d <mark>8 h~ h</mark>	and an intering	hoursen and	Juneaky Lange M	Public and an and	-	ببالديم ويستعال	محبوبيها والمعادلة والموادية	and the state of the state	up marghales
00 00 11	23 253500	1. 1911 (1993)				6 6886 (N	245 (A. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6.	S 526 13	81 (AC14)
-70 dBm—									
-80 dB <mark>m</mark>									
F1									
Start 2.47	GHz		1	1001	pts		I	Stop	2.69 GHz
)(1	Meas	uring		1
						J			- ///

10 Spurious RF Conducted Emissions

10.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

10.2 Test Arrangement and Procedure



1. Remove the antenna from the transmitter and connected it to a spectrum analyzer through a low loss RF cable (connect an attenuator, if it's necessary).

2. 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.

3. Typically, several plots are required to cover this entire span.

4. RBW = 100 kHz ; VBW \geq RBW ; Sweep = auto

- 5. Detector function = peak ; Trace = max hold ; Allow the trace to stabilize.
- 6. Set the marker on the peak of any spurious emission recorded.
- 7. The level displayed must comply with the limit specified in this Section.
- 8. Submit these plots.

10.3 Limit (§ 15.247(d))

In any 100 kHz ba ndwidth outside the frequency band in which the spread spectrum or digitally m odulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a ra diated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, r adiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

10.4 Test Result

Compliance.

The final test data are shown on the following page(s).

Since the fix channel mode is the worst case, data of the hopping mode were not recorded in this report.

Bluetooth (1Mbps) Channel: 00

2.0000000000000000000000000000000000000	56) Ghannon <u>56</u>				
	Measure				
	Max Peak	Highest Freq. at	Max Peak Power at	Result	Limit
(GHz)	Power	spurious emissions	spurious emissions	(dB)	(dB)
	(dBm)	(GHz)	(dBm)		
2.40210	-20.07	2.82640	-57.93	37.86	20
2.4020	-20.41	15.6250	-50.04	29.63	20

Remark: Result (*dB*) = *Max Peak Power* – *Max Peak power at spurious emissions.*

When Result > Limit, it's a pass.

Spectrum Ref Level 1 Att	0.00 dBm 30 dB	SWT 29	● RB 7 ms ● VB	W 100 kHz W 300 kHz	Mode Auto	Sween			
1Pk View	00 00	0HT 25.	7 1113 - 70	N SOO KIL	Mode Aut	5 3466p			
					M1	[1]			-20.07 dB
									.40210 GH
dBm					M2	[1]			-57.93 dB
					1	1		2	.82640 GF
10 dBm				-					
							M	1	
20 dBm D	1 -20.070	dBm						÷	_
30 dBm									
40 dBm	00.40	070 40-							
40 dBm	-D2 -40	.070 dBm-							
50 dBm								-	10000
									M2
60 dBm	البيني ا	A dilly demotion	Alitative deter	kuljoteltrurturaneltik	الماران والمحمد المرام الماريد	tutur matteriture	and the second second	and the dimension	aletter mulo
united the second	malanalinale	An M. M. M. M. A.	- An at low so a.	And a second and have been	-11- 47 all -1				
70 dBm									-
80 dBm									_
					· · · · · · · · · · · · · · · · · · ·				
start 30.0 M	Hz			1001	pts			St	op 3.0 GH
Spectrum	π					Measurir	ig 		•
Spectrum Ref Level 1		8WT 220		V 100 kHz	Made Auto		ıg E		Ģ
Second and the second sec	0.00 dBm 30 dB	SWT 230	● RBV) ms ● VBV		Mode Auto		ıg T		Ę
Ref Level 1 Att		SWT 230				Sweep	g 4		
Ref Level 1 Att		SWT 230					g U		-20.41 dB
Ref Level 1 Att		SWT 230			M1	Sweep	g U		-20.41 dB 2.4020 Gł -50.04 dB
Ref Level 1 Att		SWT 230			M1	Sweep	g 4		-20.41 dB 2.4020 Gł -50.04 dB
Att IPk View dBm		SWT 230			M1	Sweep	g 4		-20.41 dB 2.4020 Gł -50.04 dB
Att 1Pk View 0 dBm 10 dBm		SWT 230			M1	Sweep	g .		-20.41 dB 2.4020 Gł -50.04 dB
Act Level 1 Att 1Pk View dBm 10 dBm	30 dB				M1	Sweep	g .		-20.41 dB 2.4020 GI -50.04 dB
Act Level 1 Att 1Pk View dBm 10 dBm					M1	Sweep	g .		-20.41 dB 2.4020 Gł -50.04 dB
Ref Level 1 Att 1Pk View 10 dBm 10 dBm 10 dBm 10 dBm	30 dB				M1	Sweep	g .		-20.41 dB 2.4020 Gł -50.04 dB
Ref Level 1 Att 1Pk View 10 dBm 10 dBm 10 dBm 10 dBm	30 dB				M1	Sweep	g .		-20.41 dB 2.4020 Gł -50.04 dB
Ref Level 1 Att 1Pk View dBm 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm	30 dB	dBm			M1	Sweep	g .		-20.41 dB 2.4020 Gł -50.04 dB
Ref Level 1 Att 11Pk View 0 dBm 10 dBm	30 dB				M1	Sweep	g .		-20.41 dB 2.4020 Gł -50.04 dB 5.6250 Gł
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 9 dBm	30 dB	dBm			M1	Sweep	g •		-20.41 dB 2.4020 GF -50.04 dB
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 9 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -20.4020 GH -50.04 dB 5.6250 GH
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm	30 dB	dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]			-20.41 dB -2.4020 Gł -50.04 dB 5.6250 Gł
Ref Level 1 Att 1Pk View dBm 10 dBm 10 dBm 30 dBm 40 dBm 50 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -2.4020 Gł -50.04 dB 5.6250 Gł
Ref Level 1 Att 1Pk View 0 dBm 10 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -2.4020 Gł -50.04 dB 5.6250 Gł
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm 50 dBm 50 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -2.4020 Gł -50.04 dB 5.6250 Gł
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -20.4020 GH -50.04 dB 5.6250 GH
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm 50 dBm 50 dBm 70 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -2.4020 Gł -50.04 dB 5.6250 Gł
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm 50 dBm 50 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -20.4020 GH -50.04 dB 5.6250 GH
Ref Level 1 Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm 50 dBm 50 dBm 70 dBm	30 dB	dBm .410 dBm) ms • VBV	V 300 kHz	M1 M2	Sweep [1] [1]		1	-20.41 dB -20.4020 GH -50.04 dB 5.6250 GH
Ref Level 1 Att 1Pk View idBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm 50 dBm 50 dBm 70 dBm	30 dB 1 -20.410 D2 -40	dBm .410 dBm) ms • VBV	V 300 kHz	M1 -M2 M3 M3 M3	Sweep [1] [1]		1 N-bulturturtur	-20.41 dB -20.4020 GH -50.04 dB 5.6250 GH

Bluetooth (1Mbps) Channel: 39

Bidoteotii (iiiib	56) enamen <u>56</u>				
	Measure				
	Max Peak	Highest Freq. at	Max Peak Power at	Result	Limit
(GHz)	Power	spurious emissions	spurious emissions	(dB)	(dB)
	(dBm)	(GHz)	(dBm)		
2.4407	-19.73	2.10250	-57.51	37.78	20
2.4480	-20.24	15.0730	-50.59	30.35	20

Remark: Result (*dB*) = *Max Peak Power* – *Max Peak power at spurious emissions.*

When Result > Limit, it's a pass.

REFLEVE				DDUL 100 LV					Į,
Att	10.00 dBn 30 dB			RBW 100 kHz VBW 300 kHz	Mode Auto	Sween			
1Pk View									
					M1	[1]			19.73 dB
10-						F 11			44070 GH
) dBm					M2	[1]			57.51 dB 10250 GF
					1 1	1	1		
10 dBm-									
							M1		
20 dBm	D1 -19.73	0 dBm					- II		
30 dBm-									
40 dBm		39.730 dBr	n						
50 dBm —	4 9	-							
						MP	1		1.000
60 dBm	La anala	New March 1945	hundernational	at the growth and the second	how and the second	Here and any how way	All and and all a	الطالح مرمد ومشاهد	ulushashaan
and the state of t	Marine Marine								
70 dBm		-		_					
80 dBm									
start 30.0	MHz			100	1 pts			Sto	p 3.0 GH
Spectrum	,					Measuring.			Ę
Ref Level	10.00 dBn			RBW 100 kHz					Ģ
Ref Level Att				RB₩ 100 kHz VB₩ 300 kHz	Mode Auto				ļ
Ref Level Att	10.00 dBn					Sweep			
Ref Level Att	10.00 dBn								20.24 dB
Ref Level Att 1Pk View	10.00 dBn					Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Ref Level Att 1Pk View	10.00 dBn				M1	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Ref Level Att 1Pk View	10.00 dBn				M1	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Att 1Pk View dBm 10 dBm	10.00 dBn				M1	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Att Att 11Pk View 0 dBm 10 dBm 10 dBm	10.00 dBn	B SWT			M1	Sweep		2	20.24 dB 2.4480 Gł 50.59 dB
Att Att 11Pk View 0 dBm 10 dBm 10 dBm	10.00 dBn 30 df	B SWT			M1	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Att Att 11Pk View 0 dBm 10 dBm 10 dBm 11 20 dBm	10.00 dBn 30 df	B SWT			M1	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Att Att 11Pk View 0 dBm 10 dBm 10 dBm 11 20 dBm	10.00 dBn 30 df	B SWT			M1	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Aref Level Att 1Pk View 0 dBm 10 dBm 10 dBm 11 70-dBm	10.00 dBn 30 di 01 -20.24	B SWT	230 ms • 1		M1	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Ref Level Att IPk View 0 dBm 10 dBm 10 dBm 11 30 dBm 30 dBm	10.00 dBn 30 di 01 -20.24	B SWT	230 ms • 1		M1 M2	Sweep		2	20.24 dB 2.4480 GF 50.59 dB
Ref Level Att 1Pk View 0 dBm 10 dBm 10 dBm 30 dBm 40-dBm	10.00 dBn 30 di 01 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]		2	20.24 dB 2.4480 Gi 50.59 dB 5.0730 Gi
Ref Level Att 1Pk View 1Pk View 0 dBm 10 dBm 10 dBm 30 dBm 30 dBm 50 dBm	10.00 dBm 30 di D1 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]	relative the star	2	20.24 dB .4480 Gł 50.59 dB 5.0730 Gł
Ref Level Att 1Pk View 1Pk View 0 dBm 10 dBm 10 dBm 30 dBm 30 dBm 50 dBm	10.00 dBm 30 di D1 -20.24	B SWT	230 ms • 1		M1 	Sweep [1] [1] [1]	rale all for the star	2	20.24 dB .4480 Gł 50.59 dB 5.0730 Gł
Ref Level Att 1Pk View 1Pk View 0 dBm 10 dBm 10 dBm 30 dBm 30 dBm 50 dBm	10.00 dBm 30 di D1 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]	rdeally with sec.	2	20.24 dB .4480 Gł 50.59 dB 5.0730 Gł
Ref Level Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 30 dBm 40 dBm 50 dBm 50 dBm	10.00 dBm 30 di D1 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]	rales at Agentification	2	20.24 dB 2.4480 GF 50.59 dB 5.0730 GF
30 dBm	10.00 dBm 30 di D1 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]		2	20.24 dB .4480 GF 50.59 dB 5.0730 GF
Ref Level Att 1Pk View 0 dBm 10 dBm 10 dBm 10 dBm 30 dBm 40 dBm 50 dBm 50 dBm	10.00 dBm 30 di D1 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]	ente all'hor d'All street	2	20.24 dB .4480 Gł 50.59 dB 5.0730 Gł
Ref Level Att 1Pk View 0 dBm 10 dBm 10 dBm 30 dBm 30 dBm 60 dBm 50 dBm 70 dBm	10.00 dBm 30 di D1 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]	ente all'anti de cale a	2	20.24 dB .4480 GF 50.59 dB 5.0730 GF
Ref Level Att 1Pk View dBm 10 dBm 10 dBm 10 dBm 30 dBm 60 dBm 50 dBm 50 dBm 70 dBm	10.00 den 30 di D1 -20.24	B SWT	230 ms • 1	VBW 300 kHz	M1 	Sweep [1] [1] [1]	ente all'anna de la constante	2 	20.24 dB .4480 Gł 50.59 dB 5.0730 Gł

Bluetooth (1Mbps) Channel: 78

Bidotootii (iiiib	56) Ghannen <u>16</u>				
	Measure				
	Max Peak	Highest Freq. at	Max Peak Power at	Result	Limit
(GHz)	Power	spurious emissions	spurious emissions	(dB)	(dB)
	(dBm)	(GHz)	(dBm)		
2.47930	-24.64	2.85020	-58.43	33.79	20
2.4710	-23.08	15.7290	-50.11	27.03	20

Remark: Result (*dB*) = *Max Peak Power* – *Max Peak power at spurious emissions.*

When Result > Limit, it's a pass.

Spectrum Ref Level Att				RBW 100 kHz VBW 300 kHz	Mode Aut	to Swoon			[,
1Pk View	30 (10 5WI	29.7 ms 🖷	YBW 300 KH2	MODE AU	to Sweep			
					M	1[1]			-24.64 dB
									2.47930 GH
dBm					M	2[1]			-58.43 dB
					8	1	î.	1	2.85020 GH
10 dBm		-			-		1.	-	
20 dBm		_						MI	
	D1 -24.6	40 dBm-			-			Y	
30 dBm									
40 dBm		_							
io abiii	D2	-44.640 dBi	m						
50 dBm									
JO UDITI									140
60 d0									M2
ou asm	ab J How	an har with the second start	berkash guesdy halmon	where the second and the second s	HURLING HIDLEN PHUL	errolly and the second	approximate a provinsion of the second s	A HAMANNA	Man Manufactures and the
	non-render of d					1.4	1.64		
70 dBm					1				
100.000									
80 dBm		-			-			-	
tart 30.0	MHz			100	1 pts				Stop 3.0 GH
Spectrup						Measur	ing .		
Spectrun Ref Level Att	10.00 dB			RBW 100 kHz	Mode Aut	, 			Ę
				RBW 100 kHz VBW 300 kHz	Mode Aut	, 	ing 4		(q
Ref Level Att	10.00 dB					, 			1
Ref Level Att 1Pk View	10.00 dB				м	o Sweep 1[1]			-23.08 dB 2.4710 GI
Ref Level Att	10.00 dB				м	o Sweep			-23.08 dB 2.4710 Gł -50.11 dB
Ref Level Att 1Pk View dBm	10.00 dB				м	o Sweep 1[1]			-23.08 dB 2.4710 GI -50.11 dB
Ref Level Att 1Pk View dBm	10.00 dB				м	o Sweep 1[1]			-23.08 dB 2.4710 GI -50.11 dB
Att 1Pk View dBm 10 dBm	10.00 dB				м	o Sweep 1[1]			-23.08 dB 2.4710 Gł -50.11 dB
Att 1Pk View dBm 10 dBm 20 dBm	10.00 dB 30 (dB SWT			м	o Sweep 1[1]			-23.08 dB 2.4710 GI -50.11 dB
Att IPk View dBm 10 dBm dBm	10.00 dB	dB SWT			м	o Sweep 1[1]			-23.08 dB 2.4710 GI -50.11 dB
Att IPk View dBm 10 dBm dBm	10.00 dB 30 (dB SWT			м	o Sweep 1[1]			-23.08 dB 2.4710 GI -50.11 dB
Att IPk View dBm 10 dBm dBm	10.00 dB 30 (dB SWT			м	o Sweep 1[1]			-23.08 dB 2.4710 GI -50.11 dB
Ref Level Att 1Pk View dBm 10 dBm 20 dBm a0 dBm	10.00 dB 30 d	30 dBm	230 ms		м	o Sweep 1[1]			-23.08 dB 2.4710 Gł -50.11 dB
Ref Level Att 1Pk View dBm 10 dBm 20 dBm a0 dBm	10.00 dB 30 d	dB SWT	230 ms		M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB
Ref Level Att 1Pk View dBm 10 dBm 20 dBm a0 dBm a0 dBm	10.00 dB 30 d	30 dBm	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 GI -50.11 dB 15.7290 GI
Ref Level Att 1Pk View dBm 10 dBm 20 dBm 40 dBm 40 dBm	10.00 dB 30 (D1 -23.0	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł
Ref Level Att 1Pk View dBm 10 dBm 20 dBm 40 dBm 40 dBm	10.00 dB 30 d	48 SWT	230 ms		M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 G -50.11 dB 15.7290 Gł
Ref Level Att 1Pk View dBm 10 dBm 20 dBm 40 dBm 40 dBm	10.00 dB 30 (D1 -23.0	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł
Ref Level Att 1Pk View dBm 10 dBm 20 dBm	10.00 dB 30 (D1 -23.0	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł
Ref Level Att 01Pk View 0 dBm 10 dBm 20 dBm	10.00 dB 30 (D1 -23.0	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł
Ref Level Att 1Pk View dBm 10 dBm 20 dBm	10.00 dB 30 (D1 -23.0	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł
Ref Level Att 1Pk View dBm 10 dBm 20 dBm	10.00 dB 30 (D1 -23.0	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł
Ref Level Att 1Pk View dBm 10 dBm 20 dBm	10.00 dB 30 (D1 -23.0	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł
Ref Level Att 1Pk View dBm 10 dBm 20 dBm	10.00 dB 30 d 20 d 20 d 20 d 20 d 20 d 20 d 20 d 2	48 SWT	230 ms	VBW 300 kHz	M	o Sweep 1[1] 2[1]			-23.08 dB 2.4710 Gł -50.11 dB 15.7290 Gł

11 Antenna requirement

11.1 Limit (§ 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a uniue coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

11.2 Test Result

Compliance.

The EUT applies a PCB antenna.

12 Information about the FHSS characteristics

12.1 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 1600 hops/s.

12.2 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

12.3 Equal Hopping Frequency Use

Due to each the GFSK of modulation of hopping frequency will be transmitted in accordance to the frequency tables described above, there is no any frequency will be able to hop more times than other. Therefore each frequency will be used equally.