

Report No.: TBR-C-202302-0069-51 Page: 74 of 109







2DH5_Low_2402

	30 di	B SWT 94.8 µs	• VBW 300 kHz	Mode Auto F	FT	
3W		22 20				
MI				M1[1]		5.01 dBr 2.480010 GF -51.63 dBr 2.483500 GF
11		2	-			21100000 di
			_			
D1	-14.990) dBm				
\square						
hal	UM2	Astendra Nata and	13 minlight	Margane where	and and the second	maker marked all an
+						
+						
47 GH			691 pts	5		Stop 2.55 GHz
		(Set)				
Ref 1	rc	X-value	Y-value	Function	Funct	ion Result
-	1	2.48001 GHz	5.01 dBm			
	1	2.4835 GHz	-51.63 dBm			
	1	2.5 GHz	-50.36 dBm		1	
	01 47 GHz		M1 M1 D1 -14.990 d8m J1 -14.990 d8m J2 -14.990 d8m	Mi Mi 01 -14.990 d8m	Mile Mile Mile Mile Mile Mile Mile Mile Mile D1 -14.990 dbm Mile Mile Mile Mile	MI MI<

2DH5_High_2480









3DH5_Low_2402

RefL	evel	20.00 dBr	m Offset 12.70 dB	RBW 100 kHz				(V
Att	0.0102	30 di	В SWT 75.8 µs	🕳 VBW 300 kHz	Mode Auto FF	т		
●1Pk Vi	ew							
					M1[1]		2 401956	dBm
10 dBm	-				M2[1]		-47.5	dBm
					(includ		2.400000	GH
U dBm-								
-10 dBn								
10 000	D	1 -13.570	D dBm					-
-20 dBn	n							_
-30 dBn	n-+-							1
10 40-							1	4
-40 dBi					0	100	Ma	
-sh day	jund.	James L	a series and the series	al anno 10	admillion and	WI3 Allow	- in and a second	6
							Constant of Constant	
-60 dBn	n					-		_
-70 dBn	1-			-				
Start 2	.35 G	Hz		691 pt	5		Stop 2.405	GHz
Marker								
Type	Ref	Irc	2 401956 CHr	42 dBm	Function	Func	tion Result	-
641		1	2.4 GHz	-47.54 dBm				-
M1 M2		1	2.39 GHz	-50.46 dBm				
M1 M2 M3								
M1 M2 M3 M4		1	2.3531884 GHz	-46.98 dBm				

2DH5_High_Hop_2480



 Spectrum

 Ref Level 20.00 dBm
 Offset 12.70 dB
 RBW 100 kHz

 Att
 30 dB
 SWT
 75.8 µs
 VBW 300 kHz
 Mode Auto FFT

 M1[1]
 M1[1]
 M1[1]
 M1[1]
 M1[1]



2DH5_Low_Hop_2402

M2[1]

TOBY

Att
 1Pk View

10 dBr

Report No.: TBR-C-202302-0069-51 Page: 75 of 109

3,42 2,4033 Gł

49.



Report No.: TBR-C-202302-0069-51 Page: 76 of 109



3DH5_High_2480



3DH5_Low_Hop_2402



3DH5_High_Hop_2480





8. 99% Occupied and 20dB Bandwidth

- 8.1 Test Standard and Limit
 - 8.1.1 Test Standard
 - RSS-Gen 6.7 & RSS 247 5.1(a)

FCC Part 15.205 & FCC Part 15.247(a)

8.1.2 Test Limit

For an FHSS system operating in the 2400 to 2483.5 MHz band, there are no limits for 20dB bandwidth and 99% occupied bandwidth.

8.2 Test Setup



8.3 Test Procedure

● The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

d) Step a) through step c) might require iteration to adjust within the specified range.e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.





f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the lower frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

 h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled.
 Tabular data may be reported in addition to the plot(s).

8.4 Deviation From Test Standard

No deviation

8.5 EUT Operating Mode

Please refer to the description of test mode.

8.6 Test Data

Please refer to the following pages.



---99% and 20dB Bandwidth Test (Radiation Measurements)

Test Mode	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
0.25	2402	0.896	2401.5624	2402.4585		
DH5	2441	0.896	2440.5624	2441.4585	1	6
20	2480	0.902	2479.5594	2480.4615		 N
2	2402	1.193	2401.4126	2402.6054	5	
2DH5	2441	1.193	2440.4126	2441.6054	(
	2480	1.187	2479.4156	2480.6024		-
	2402	1.205	2401.4036	2402.6084		-
3DH5	2441	1.205	2440.4006	2441.6054		<u></u>
	2480	1.193	2479.4126	2480.6054	C SING	

Test Mode	Antenna	Channel	20db EBW[MHz]	Limit[MHz]	Verdict
2 8		2402	0.96	(+1)2	
DH5	Ant1	2441	0.96		14 H M
and	3	2480	0.96		
1 Ver		2402	1.31	CL 170	
2DH5	Ant1	2441	1.31	5	1102
and s		2480	1.29	<u> </u>	Par-
		2402	1.30		2-2
3DH5	Ant1	2441	1.30	678.0	
0.32		2480	1.30	539	(40)



Report No.: TBR-C-202302-0069-51 Page: 80 of 109















Report No.: TBR-C-202302-0069-51 Page: 81 of 109

















Report No.: TBR-C-202302-0069-51 Page: 82 of 109



3DH5_2402



3DH5_2441







Report No.: TBR-C-202302-0069-51 Page: 83 of 109

















Report No.: TBR-C-202302-0069-51 Page: 84 of 109



2DH5_2402



2DH5_2441







Report No.: TBR-C-202302-0069-51 Page: 85 of 109



3DH5 2402













9. Peak Output Power Test

- 9.1 Test Standard and Limit
 - 9.1.1 Test Standard RSS 247 5.4(2) FCC Part 15.247(b)(1)
 - 9.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
	P _{max-pk} ≤ 1 W	
	$N_{ch} \ge 75$	
	f ≥ MAX { 25 kHz, BW20dB }	
	max. BW20dB not specified	
	$tch \le 0.4 ext{ s for } T = 0.4^*Nch$	
Peak Output Power	<i>P</i> max-pk ≤ 0.125 W	2400~2483.5
	<i>Nch</i> ≥ 15	
	f ≥ [MAX{25 kHz, 0.67*BW20dB}	
	OR MAX{25 kHz, BW20dB}]	
	max. BW20dB not specified	
	$tch \le 0.4 ext{ s for } T = 0.4^* N_{ch}$	
<i>t</i> _{ch} = average time of o	ccupancy; <i>T</i> = period; <i>N</i> _{ch} = # hopping f	requencies; BW = bandwidth; 🗆

f = hopping channel carrier frequency separation

9.2 Test Setup



9.3 Test Procedure

● This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

- a) Use the following spectrum analyzer settings:
 - 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping





channel.

- 2) RBW > 20 dB bandwidth of the emission being measured.
- 3) VBW≥ RBW.
- 4) Sweep: Auto.
- 5) Detector function: Peak.
- 6) Trace: Max hold.
- b) Allow trace to stabilize.
- c) Use the marker-to-peak function to set the marker to the peak of the emission.
- d) The indicated level is the peak output power, after any corrections for external attenuators and cables.

e) A plot of the test results and setup description shall be included in the test report.

NOTE-A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

9.4 Deviation From Test Standard

No deviation

9.5 EUT Operating Mode

Please refer to the description of test mode.

9.6 Test Data

Please refer to the following pages.



---Peak Output Power (Radiation Measurements)

Test Mode	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T [kHz]
No.	2402	2.89	3.73	77.48	0.346
DH5	2441	2.89	3.73	77.48	0.346
	2480	2.89	3.73	77.48	0.346
	2402	2.89	3.74	77.27	0.346
2DH5	2441	2.89	3.73	77.48	0.346
	2480	2.89	3.73	77.48	0.346
120	2402	2.89	3.73	77.48	0.346
3DH5	2441	2.89	3.73	77.48	0.346
	2480	2.89	3.74	77.27	0.346

Test Mode	Channel	EIRP [dBm]	Gain [dBi]	Conducted power [dBm]	Limit[dBm]	Verdict
	2402	2.19	0.85	1.34	≤21	PASS
DH5	2441	2.48	0.85	1.63	≤21	PASS
	2480	2.18	0.85	1.33	≤21	PASS
	2402	4.12	0.85	3.27	≤21	PASS
2DH5	2441	4.38	0.85	3.53	≤21	PASS
	2480	3.48	0.85	2.63	≤21	PASS
	2402	4.27	0.85	3.42	≤21	PASS
3DH5	2441	4.62	0.85	3.77	≤21	PASS
	2480	3.70	0.85	2.85	≤21	PASS
Nata: Canduated	Dower-FIDD Cai					

Note: Conducted Power=EIRP-Gain



Report No.: TBR-C-202302-0069-51 Page: 89 of 109



Date: 15.MAY.2023 12:21:20

DH5_2402

Att SGL Co	unt 1,	20 /1	dB 🖷 SWT TRG: VID	7 ms 🖷	VBW 10 MH	z				
1Pk Cl	rw						M1[1]			2 10 dp
10 dBm	-		MI				IIIII			0.00000000
0 dBm-			00 d0m				D1[1]			
-10 dBm		KG -3.7		_			1			
-20 dBm		_						_		
-30 dBrr	-		when the state of					Denterance	an.	
-40 dBm	-								_	
-50 dBm	-								-	_
-60 dBm	-						10	_	-	_
-70 dBm	-							_	-	_
-80 dBm	-							_	-	_
CF 2.4	41 GH	z	-i		1001 p	ts		-		700.0 µs
larker										
Type	Ref	Trc	X-value	10	Y-value		Function	Fur	iction F	tesult
D1	M1	1	2.89	ms	-32.15 dB	-				
D2	M1	1	3.73	ms	0.01 dB					

Date: 15.MAY.2023 12:29:01

DH5_2441

Ref Level 15.0	dBm Offset 14.54 d	B 📾 RBW 10 MHz			
e Att	20 dB 🖷 SWT 7 m	s 👄 VBW 10 MHz			
SGL Count 1/1	TRG: VID				
Lbk Cli M			M1[1]		0.20 dBm
10 dBm-			and all		0.00000000 s
0 dBm	MI		D1[1]	D2	-30.55 dB
TRG -	5.600 dBm			Î	2.89000 ms
-10 dBm-					
20 dBm					
-20 dbm					
-30 dBm-	ACCONTRACTOR AND	_	미	Martin and and and and and and and and and an	
40 d0m					
-40 UDIN					
-50 dBm-			3		
-60 dBm					
-70 dBm-					
244042224					
-80 dBm-					3 3
CF 2.48 GHz		1001 pt	s		700.0 µs/
Marker					
Type Ref Tro	X-value	Y-value	Function	Function R	tesult
D1 M1	2.89 ms	-30.55 dB			
D2 M1	3.73 ms	-0.01 dB			





Report No.: TBR-C-202302-0069-51 Page: 90 of 109

Ref Le	evel :	15.00 dBn	Offset 14.70 c	B . RBW 10 M	AHZ			
SGL CO	unt 1	20 ut	TRG: VID	IS - YBW 10 1	1112			
1Pk Cl	W	-						
LO dBm-						M1[1]		3.24 dE
					D1	D2		-1.21000 r
) dBm—	TE	G -1.600	dBm		4	_DI[I] &		2 8000 1
40 Jp							1	1
10 anu								
20 dBm	_						_	
which a lather street					. a	Manager and		
30 dBm	-						-	
40 dBm								
40 000								
50 dBm	-						-	
60 dBm								
70 dBm	_							
80 dBm	+						-	
CF 2.40	2 GH	z		100	l pts			700.0 µs
larker								
Туре	Ref	Trc	X-value	Y-value		Function	Fur	nction Result
M1		1	-1.21 ms	3.24 dE	3m			
D1	M1	1	2.89 ms	-0.06	dB dB			

Date: 15.MAY.2023 12:23:05

2DH5_2402



Att	evel	15.00 2	dBm 10 dB		SWT	t 14	7 ms	-	VBW	10 MHZ 10 MHZ								
SGL CO	unt 1	/1			TRG:	VID												
10 dBm						T		T			M	1[1]						-0.73 dB
10 0.011					N	41											0.	.00000000
0 dBm		-	-			-	and the second				D	щ		-1		D2	,	2 89000
-10 dBm	-	₹G -4	.000	dBm-	_			_		_		-				-		
-20 dBm	-			_				-		_								
-30 dBm	-			d										Da	and the second	-		-
-40 dBm	+					-												-
-50 dBm	+					+				22				-		-		-
-60 dBm	-			_		+		-						-		-		-
-70 dBm	+			_		+		-						+-		+		
-80 dBm	+			_		-		-		_				-		-		-
CF 2.4	3 GHz	ų –				-			1	1001 pts				-				700.0 µs
Marker																		
Туре	Ref	Trc		х	-val	ue		1	Y-val	ue	Func	tion			Fur	nction	Resu	t
M1		1	_			().0 s		-0.7	3 dBm			_					
D1	M1	1	_			2.8	9 ms		-29	.55 dB			-					
D2	M1	1				3.7	3 ms		-0	.03 dB								







Report No.: TBR-C-202302-0069-51 Page: 91 of 109

Ref Le	evel	15.00 dBi 20 d	m Offset 14.70 d B 🖷 SWT 7 m	B 🖶 RBW 10 MH is 🖶 VBW 10 MH	z z		
SGL Co	unt 1,	/1	TRG: VID		~~		
10 dbm	W				M1[1]		3.27 dB
10 aBm-		n en exelancia de	and the second states and the second states	D1	Marrie Constraints Acard		-1.94000 n
dam-			adara and a second a	- and the second se	DI[I]	*****	0.08 c
o orbiti	- 11	RG -1.400) dBm			T (1	2.89000 n
10 dBm	-						
-20 dBm					10 000		
30 dBm				Lymennes			law
50 0011					1991 (Sec. 1997)		
-40 dBm	+						
-50 dBm	-						
-60 dBm							
oo abiii							
-70 dBm	+						
-80 dBm	+						
CF 2.40	12 GH	z		1001 p	its		700.0 µs/
larker							
Туре	Ref	Trc	X-value	Y-value	Function	Functio	n Result
M1		1	-1.94 ms	3.27 dBm	-		
D1	M1	1	2.89 ms	-21 54 dB			

Date: 15.MAY.2023 12:24:48





Att SGL Co	unt 1.	20 d /1	B SWT 7 m TRG: VID	s 💩 VBW 10 M	Hz			
01Pk Cl	rw							
10 dBm	-				M	1[1]		0.96 di
- ID	M1	adapter and a		and the second second	R1 D	11192	land and a start a start a start a start a start a start a star	-1.290001
0 dBm-	TF	RG -3.100) dBm		*			2.89000
-10 dBm	1-			-				
-20 dBm								
- and the second se					and Reputered			
-30 dBh								
-40 dBm								
-50 dBm	-					2		
-60 dBm	-			_				
-70 dBm	-+-		-	_				
-80 dBm	-					12		
CF 2.4	B GHz			1001	pts			700.0 µs
Marker								
Туре	Ref	Trc	X-value	Y-value	Func	tion	Function	n Result
D1	M1	1	-1.29 ms	0.96 dB	B			
D2	M1	1	3.74 ms	0.11 d	в			







Report No.: TBR-C-202302-0069-51 Page: 92 of 109



DH5_2480

100

8.0 MH

10 446

Date: 16.MAY.2023 12:53:30





Report No.: TBR-C-202302-0069-51 Page: 93 of 109



2DH5_2402



2DH5_2441







Report No.: TBR-C-202302-0069-51 Page: 94 of 109



3DH5_2402



3DH5_2441







10. Carrier frequency separation

- 10.1 Test Standard and Limit
 - 10.1.1 Test Standard RSS 247 5.1(2)

FOO Dart 45 047(a)

FCC Part 15.247(a)(1)

10.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
	<i>P</i> _{max-pk} ≤ 1 W	
	$N_{ch} \ge 75$	
	f ≥ MAX { 25 kHz, BW20dB }	
	max. BW20dB not specified	
Carrier frequency	$tch \le 0.4 ext{ s for } T = 0.4^*Nch$	
	<i>P</i> max-pk ≤ 0.125 W	2400~2483.5
separation	Nch ≥ 15	
	f ≥ [MAX{25 kHz, 0.67*BW20dB}	
	OR MAX{25 kHz, BW20dB}]	
	max. BW20dB not specified	
	$tch \le 0.4 ext{ s for } T = 0.4 ext{*}N_{ch}$	
tch = average time of o	ccupancy; <i>T</i> = period; <i>N</i> _{ch} = # hopping f	requencies; BW = bandwidth; 🛛

f = hopping channel carrier frequency separation

10.2 Test Setup



10.3 Test Procedure

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

a) Span: Wide enough to capture the peaks of two adjacent channels.

b) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

c) Video (or average) bandwidth (VBW) \geq RBW.





Report No.: TBR-C-202302-0069-51 Page: 96 of 109

d) Sweep: Auto.

e) Detector function: Peak.

f) Trace: Max hold.

g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

Compliance of an EUT with the appropriate regulatory limit shall be determined. A plot of the data shall be included in the test report.

10.4 Deviation From Test Standard

No deviation

10.5 Antenna Connected Construction

Please refer to the description of test mode.

10.6 Test Data

Please refer to the following pages.



---Carrier Frequency Separation (Radiation Measurements)

Test Mode	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Нор	0.997	≥0.960	PASS
2DH5	Нор	1.159	≥0.873	PASS
3DH5	Нор	1.333	≥0.866	PASS

Note: Limit=2/3*20dB BW (when 20dB BW <1MHz, The limit=20dB BW)





Report No.: TBR-C-202302-0069-51 Page: 98 of 109





2DH5_Hop







11. Time of occupancy (dwell time)

- 11.1 Test Standard and Limit
 - 11.1.1 Test Standard RSS 247 5.1(2)

FCC Part 15.247(a)(1)

11.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
	<i>P</i> _{max-pk} ≤ 1 W	
	$N_{ch} \ge 75$	
	f ≥ MAX { 25 kHz, BW20dB }	
	max. BW20dB not specified	
Time of occupancy	t ch ≤ 0.4 s for $T = 0.4$ * N ch	
	<i>P</i> max-pk ≤ 0.125 W	2400~2483.5
(awell time)	<i>Nch</i> ≥ 15	
	f ≥ [MAX{25 kHz, 0.67*BW20dB}	
	OR MAX{25 kHz, BW20dB}]	
	max. BW20dB not specified	
	$tch \le 0.4 ext{ s for } T = 0.4^* N_{ch}$	
tch = average time of o	ccupancy; <i>T</i> = period; <i>N</i> _{ch} = # hopping f	requencies; BW = bandwidth; 🛛

f = hopping channel carrier frequency separation

11.2 Test Setup



11.3 Test Procedure

• The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

a) Span: Zero span, centered on a hopping channel.

b) RBW shall be channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.

c) Sweep: As necessary to capture the entire dwell time per hopping channel; where





possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel. d) Detector function: Peak.

e) Trace: Max hold.

Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) =

(number of hops on spectrum analyzer)x(period specified in the requirements / analyzer sweep time)

The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation.

The measured transmit time and time between hops shall be consistent with the values described in the operational description for the EUT.

11.4 Deviation From Test Standard

No deviation

11.5 Antenna Connected Construction

Please refer to the description of test mode.

11.6 Test Data

Please refer to the following pages.



----Time of Occupancy (Radiation Measurements)

Test Mode	Channel	Burst Width [ms]	Result[s]	Limit[s]	Verdict
DH1	Нор	0.379	0.121	≤0.4	PASS
DH3	Нор	1.626	0.260	≤0.4	PASS
DH5	Нор	2.868	0.306	≤0.4	PASS
2DH1	Нор	0.388	0.124	≤0.4	PASS
2DH3	Нор	1.633	0.261	≤0.4	PASS
2DH5	Нор	2.872	0.306	≤0.4	PASS
3DH1	Нор	0.388	0.124	≤0.4	PASS
3DH3	Нор	1.631	0.261	≤0.4	PASS
3DH5	Нор	2.874	0.307	≤0.4	PASS
DH1&2DH1&3DH1 To DH3&2DH3&3DH3 To DH5&2DH5&3DH5 To	tal of Dwell= Pulse Tim tal of Dwell= Pulse Tim tal of Dwell= Pulse Tim	e*(1600/2)*31.6/79 e*(1600/4)*31.6/79 e*(1600/6)*31.6/79	Dis	a Du	TIM



Report No.: TBR-C-202302-0069-51 Page: 102 of 109



DH1_Hop



DH3_Hop







Report No.: TBR-C-202302-0069-51 Page: 103 of 109



2DH1_Hop



2DH3_Hop

SGL Count	1/1	TRG: VI	D						
UPK CII W				1	M	1[1]			1.91 dB
10 dBm	M								250
0.d0m	TRG 1.270 d	Bm		-	2 D	2[1]			-0.32 87200 r
o ubiii	2015 contail					1	1	1	
-10 dBm									
-20 dBm				-				-	
-30 dBm		-							
-40 dBm									
-50 dBm	1								
Ipan hilly-al	a hy Million				and the design	depart the hast	which had a	haphietel	and the Last
-70 dBm	h ^a nte da nd at				- Mapphethill	www.layt.ja	APP-SPANI	upper period	hilligh
-80 dBm						1.			
				900	0 nte			0	1.0 m





Report No.: TBR-C-202302-0069-51 Page: 104 of 109



3DH1_Hop



3DH3_Hop

SGL Count 1	/1	TRG: V	ID						
			1	1	M	1[1]			2.19 dB
10 dBm	M								250
0 dBm T	RG 1.670 d	Bm		P. C.	2 D:	2[1]		2	0.15 d 2.87400 n
		1							
-10 dBm		1							
-20 dBm									
-30 dBm									
-40 dBm									
-50 dBm									
R. Alabla Hall	heidilde				A substitution	Authorite	althubarabit	www.hull	HALL IN
					n den di konen	din La Maria	n harren	Hillmhi	lblachsti
-so joem						1.	. 1	1	
-80 dBm									
CE 2 441 CH	7			800	0 nts				1.0 ms





12. Number of hopping frequencies

- 12.1 Test Standard and Limit
 - 12.1.1 Test Standard
 - RSS 247 5.1(4)

FCC Part 15.247(b)(1)

12.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
	<i>P</i> _{max-pk} ≤ 1 W	
	<i>N</i> _{ch} ≥ 75	
	f ≥ MAX { 25 kHz, BW20dB }	
	max. BW20dB not specified	
Carrier frequency	$tch \le 0.4 ext{ s for } T = 0.4 ext{*}Nch$	
	<i>P</i> max-pk ≤ 0.125 W	2400~2483.5
separation	<i>Nch</i> ≥ 15	
	f ≥ [MAX{25 kHz, 0.67*BW20dB}	
	OR MAX{25 kHz, BW20dB}]	
	max. BW20dB not specified	
	$tch \le 0.4 ext{ s for } T = 0.4^* N_{ch}$	
<i>t</i> _{ch} = average time of o	ccupancy; <i>T</i> = period; <i>N</i> _{ch} = # hopping f	requencies; BW = bandwidth; 🛛

f = hopping channel carrier frequency separation

12.2 Test Setup



12.3 Test Procedure

• The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

a) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.

b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the





channel spacing or the 20 dB bandwidth, whichever is smaller.

- c) VBW ≥ RBW.
- d) Sweep: Auto.
- e) Detector function: Peak.
- f) Trace: Max hold.
- g) Allow the trace to stabilize.

It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies.

Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A plot of the data shall be included in the test report.

- 12.4 Deviation From Test Standard No deviation
 - No deviation
- 12.5 Antenna Connected Construction

Please refer to the description of test mode.

12.6 Test Data

Please refer to the following pages.





Number of Hopping Frequencies (Radiation Measurements)					
Test Mode	Channel	Result[Num]	Limit[Num]	Verdict	
DH5	Нор	79	≥15	PASS	
2DH5	Нор	79	≥15	PASS	
3DH5	Нор	79	≥15	PASS	



Report No.: TBR-C-202302-0069-51 Page: 108 of 109







Report No.: TBR-C-202302-0069-51 Page: 109 of 109

13. Antenna Requirement

13.1 Test Standard and Limit

11.1.1 Test Standard RSS 247 6.8 FCC Part 15.203

11.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator 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.

13.2 Deviation From Test Standard No deviation

13.3 Antenna Connected Construction

The gains of the antenna used for transmitting is 0.85dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

13.4 Test Data

The EUT antenna is a PCB Antenna. It complies with the standard requirement.

	Antenna Type
⊠Pe	rmanent attached antenna
	ique connector antenna
	ofessional installation antenna

---END OF THE REPORT-----