



FCC RADIO TEST REPORT

FCC ID	:	2ARRN-4275
Equipment	:	Echo Loop
Model Name	:	H9K87E
		H9K87F
		H9K87G
		H9K87H
Applicant	:	Exoseven plus One LLC
		418 North Main Street
		2nd Floor/Suite 200
		Royal Oak, MI 48067
Standard	:	FCC Part 15 Subpart C §15.247

The product was received on Apr. 08, 2019 and testing was started from Aug. 09, 2019 and completed on Sep. 16, 2019. We, Sporton International (USA) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (USA) Inc.,the test report shall not be reproduced except in full.

Ven Chen

Approved by: Ken Chen Sporton International (USA) Inc. 1175 Montague Expressway, Milpitas, CA 95035



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History of this test report

Report No.	Version	Description	Issued Date
FR190805001A	01	Initial issue of report	Sep. 19, 2019



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	15.247(a)(1)	Number of Channels	Pass
3.2	15.247(a)(1)	Hopping Channel Separation	Pass
3.3	15.247(a)(1)	Dwell Time of Each Channel	Pass
3.4	15.247(a)(1)	20dB Bandwidth	Pass
3.4	2.1049	99% Occupied Bandwidth	Reporting only
3.5	15.247(b)(1)	Peak Output Power	Pass
3.6	15.247(d)	Conducted Band Edges	Pass
3.7	15.247(d)	Conducted Spurious Emission	Pass
3.8	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass
3.9	15.207	AC Conducted Emission	Pass
3.10	15.203 & 15.247(b)	Antenna Requirement	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Product Feature of Equipment Under Test

	Product Feature
Equipment	Echo Loop
	H9K87E
Model Name	H9K87F
	H9K87G
	H9K87H
FCC ID	2ARRN-4275
Sample 1 (Size7)	Model Name: H9K87E
Sample 2 (Size10)	Model Name: H9K87F
Sample 3 (Size11)	Model Name: H9K87G
Sample 4 (Size12)	Model Name: H9K87H
EUT supports Radios application	Bluetooth BR/EDR/LE

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification			
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz		
Number of Channels	79		
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78		
	Bluetooth BR(1Mbps) : 11.52 dBm (0.0142 W)		
Maximum Output Power to Antenna	Bluetooth EDR (2Mbps) : 11.22 dBm (0.0132 W)		
	Bluetooth EDR (3Mbps) : 11.58 dBm (0.0144 W)		
	Bluetooth BR(1Mbps) : 0.889MHz		
99% Occupied Bandwidth	Bluetooth EDR (2Mbps) : 1.169MHz		
	Bluetooth EDR (3Mbps) : 1.175MHz		
	PIFA Antenna type with gain 1.1 dBi for Sample 1		
Antenna Type / Gain	PIFA Antenna type with gain 0.0 dBi for Sample 2		
Antenna Type/ Gain	PIFA Antenna type with gain 1.5 dBi for Sample 3		
	PIFA Antenna type with gain 0.4 dBi for Sample 4		
	Bluetooth BR (1Mbps) : GFSK		
Type of Modulation	Bluetooth EDR (2Mbps) : π /4-DQPSK		
	Bluetooth EDR (3Mbps) : 8-DPSK		

1.3 Modification of EUT

No modifications are made to the EUT during all test items.



1.4 Testing Location

Test Site	Sporton International (USA) Inc.			
Test Site Location	1175 Montague Expressway, Milpitas, CA 95035 TEL : 408 9043300			
Test Site No.		Sporton Site No.		
1051 Sile 140.	TH01-CA	CO01-CA	03CH02-CA	

Note: The test site complies with ANSI C63.4 2014 requirement.

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- + FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01
- ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	0	2402	27	2429	54	2456
	1	2403	28	2430	55	2457
	2	2404	29	2431	56	2458
	3	2405	30	2432	57	2459
	4	2406	31	2433	58	2460
	5	2407	32	2434	59	2461
	6	2408	33	2435	60	2462
	7	2409	34	2436	61	2463
	8	2410	35	2437	62	2464
	9	2411	36	2438	63	2465
	10	2412	37	2439	64	2466
	11	2413	38	2440	65	2467
	12	2414	39	2441	66	2468
2400-2483.5 MHz	13	2415	40	2442	67	2469
	14	2416	41	2443	68	2470
	15	2417	42	2444	69	2471
	16	2418	43	2445	70	2472
	17	2419	44	2446	71	2473
	18	2420	45	2447	72	2474
	19	2421	46	2448	73	2475
	20	2422	47	2449	74	2476
	21	2423	48	2450	75	2477
	22	2424	49	2451	76	2478
	23	2425	50	2452	77	2479
	24	2426	51	2453	78	2480
	25	2427	52	2454	-	-
	26	2428	53	2455	-	-



2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report, and the worst mode of radiated spurious emissions is Bluetooth 3Mbps mode, and recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

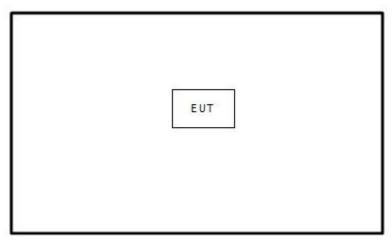
Summary table of Test Cases						
	Data Rate / Modulation					
Test Item	Bluetooth BR 1Mbps	Bluetooth EDR 2Mbps	Bluetooth EDR 3Mbps			
	GFSK	π /4-DQPSK	8-DPSK			
Conducted	Mode 1: CH00_2402 MHz	Mode 4: CH00_2402 MHz	Mode 7: CH00_2402 MHz			
Test Cases	Mode 2: CH39_2441 MHz	Mode 5: CH39_2441 MHz	Mode 8: CH39_2441 MHz			
Test Cases	Mode 3: CH78_2480 MHz	Mode 6: CH78_2480 MHz	Mode 9: CH78_2480 MHz			
	В	luetooth EDR 3Mbps 8-DPS	К			
Radiated	Mode 1: CH00_2402 MHz					
Test Cases	Mode 2: CH39_2441 MHz					
		Mode 3: CH78_2480 MHz				
AC						
Conducted	Mode 1 :Bluetooth TX + Ada	apter 2 Charging				
Emission	Emission					
Remark: For radiated test cases, the worst mode data rate 3Mbps was reported only since the highest						
RF output power in the preliminary tests. The conducted spurious emissions and conducted						
ban	band edge measurement for other data rates were not worse than 3Mbps, and no other					
sign	significantly frequencies found in conducted spurious emission.					

The following summary table is showing all test modes to demonstrate in compliance with the standard.

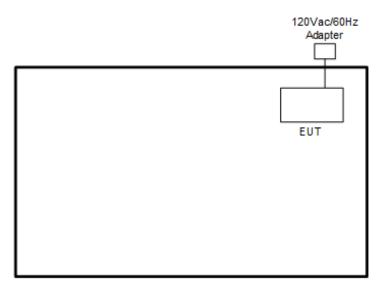


2.3 Connection Diagram of Test System

<Bluetooth Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

ltem	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Adapter 1	N/A	PSC57CP	N/A	N/A	N/A
2.	Adapter 2	N/A	FANA7R	N/A	N/A	N/A



2.5 EUT Operation Test Setup

The RF test items, utility "RTLBTAPP" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)



3 Test Result

3.1 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

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

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedure

- 1. The testing follows ANSI C63.10-2013 clause 7.8.3.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Enable the EUT hopping function.
- Use the following spectrum analyzer settings: Span = the frequency band of operation;
 RBW = 300kHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
- 6. The number of hopping frequency used is defined as the number of total channel.
- 7. Record the measurement data derived from spectrum analyzer.

3.1.4 Test Setup



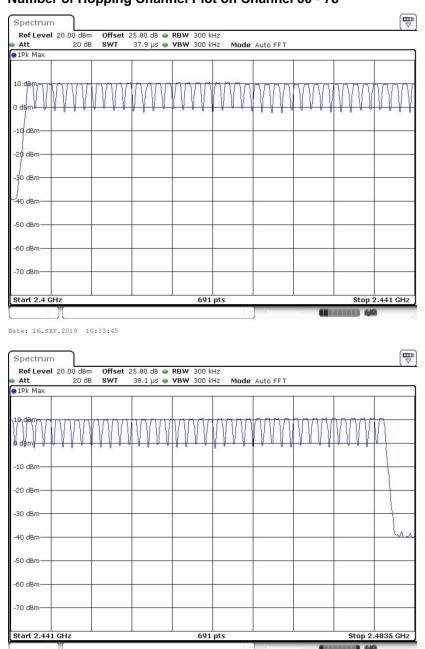
Spectrum Analyzer

EUT



3.1.5 Test Result of Number of Hopping Frequency

Please refer to Appendix A.



Number of Hopping Channel Plot on Channel 00 - 78

Date: 16.SEP.2019 10:34:14

3.2 Hopping Channel Separation Measurement

3.2.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

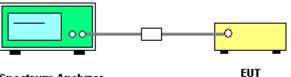
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.2.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Enable the EUT hopping function.
- Use the following spectrum analyzer settings:
 Span = wide enough to capture the peaks of two adjacent channels;
 RBW = 300kHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
- 6. Measure and record the results in the test report.

3.2.4 Test Setup



Spectrum Analyzer

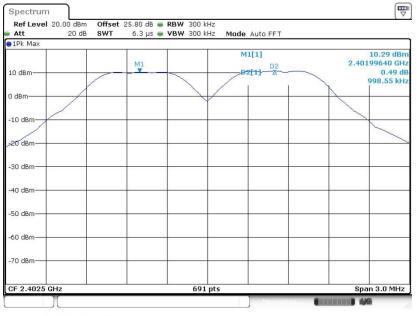
3.2.5 Test Result of Hopping Channel Separation

Please refer to Appendix A.



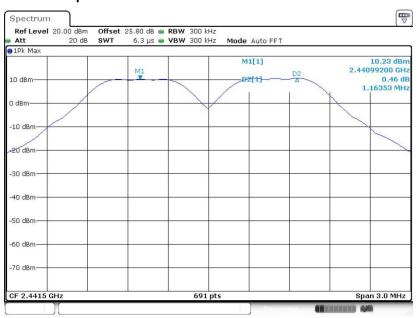
<1Mbps>

Channel Separation Plot on Channel 00 - 01



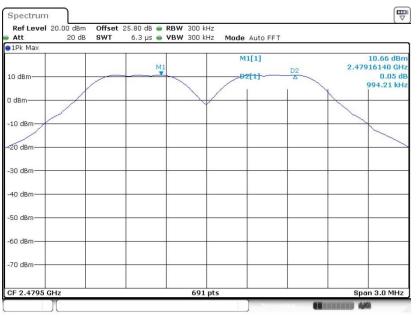
Date: 16.SEP.2019 10:13:53

Channel Separation Plot on Channel 39 - 40



Date: 16.SEP.2019 10:15:40



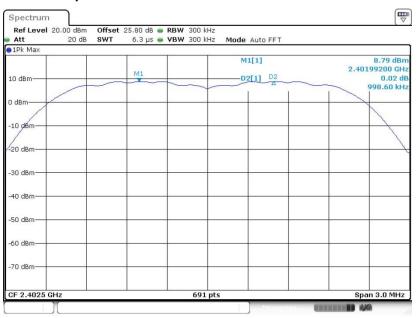


Channel Separation Plot on Channel 77 - 78

Date: 16.SEP.2019 10:18:24

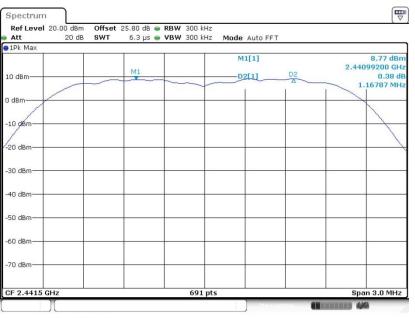
<2Mbps>

Channel Separation Plot on Channel 00 - 01



Date: 16.SEP.2019 13:29:54

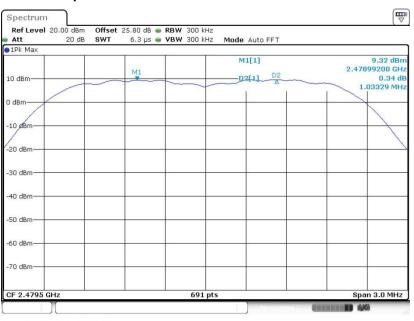




Channel Separation Plot on Channel 39 - 40

Date: 16.SEP.2019 10:21:47

Channel Separation Plot on Channel 77 - 78

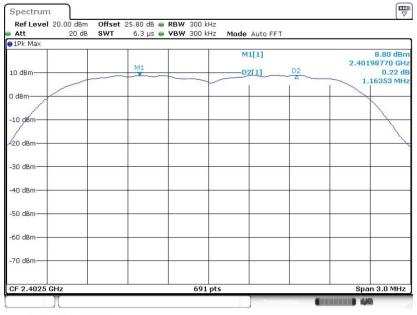


Date: 16.SEP.2019 10:23:04



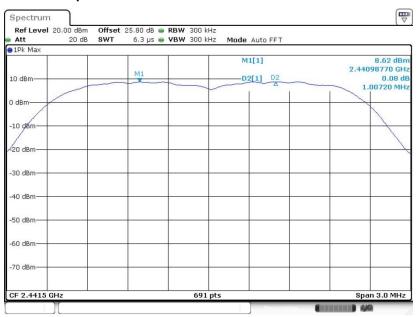
<3Mbps>

Channel Separation Plot on Channel 00 - 01



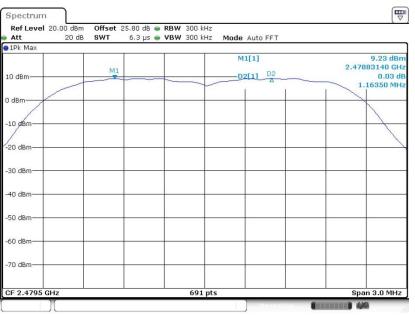
Date: 16.SEP.2019 10:25:38

Channel Separation Plot on Channel 39 - 40



Date: 16.SEP.2019 13:32:48





Channel Separation Plot on Channel 77 - 78

Date: 16.SEP.2019 13:35:15



3.3 Dwell Time Measurement

3.3.1 Limit of Dwell Time

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.

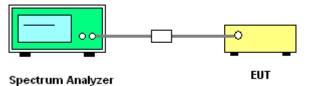
3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.4.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Enable the EUT hopping function.
- Use the following spectrum analyzer settings: Span = zero span, centered on a hopping 5. channel; RBW = 1 MHz; VBW \geq RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
- 6. Measure and record the results in the test report.

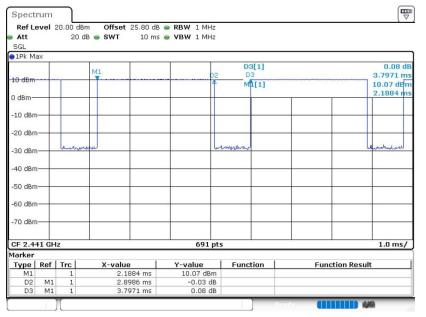
3.3.4 Test Setup



3.3.5 Test Result of Dwell Time

Please refer to Appendix A.





Package Transfer Time Plot

Date: 16.SEP.2019 09:52:17

Remark:

1. In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4×79) (s),Hops Over Occupancy Time comes to $(1600 / 6 / 79) \times (0.4 \times 79) = 106.67$ hops.

2. In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels. With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4×20) (s), Hops Over Occupancy Time comes to $(800 / 6 / 20) \times (0.4 \times 20) = 53.33$ hops.

3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time



3.4 20dB and 99% Bandwidth Measurement

3.4.1 Limit of 20dB and 99% Bandwidth

Reporting only

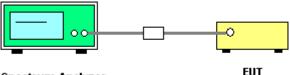
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 6.9.2 and 6.9.3.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- Use the following spectrum analyzer settings for 20dB Bandwidth measurement.
 Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel;
 RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak;
 Trace = max hold.
- Use the following spectrum analyzer settings for 99 % Bandwidth measurement.
 Span = approximately 1.5 to 5 times the 99% bandwidth, centered on a hopping channel;
 RBW ≥ 1-5% of the 99% bandwidth; VBW ≥ 3 * RBW; Sweep = auto; Detector function = peak;
 Trace = max hold.
- 6. Measure and record the results in the test report.

3.4.4 Test Setup



Spectrum Analyzer

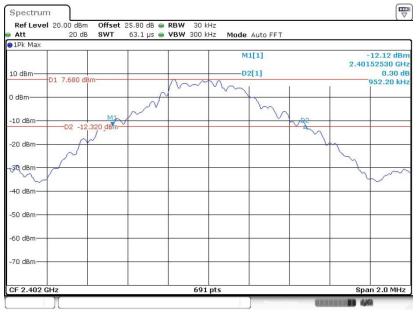
3.4.5 Test Result of 20dB Bandwidth

Please refer to Appendix A.



<1Mbps>

20 dB Bandwidth Plot on Channel 00



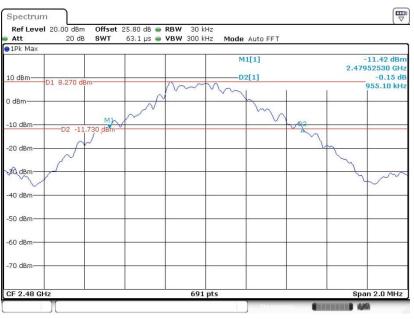
Date: 16.SEP.2019 10:39:13





Date: 16.SEP.2019 10:45:51



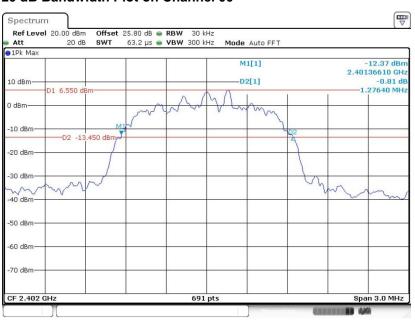


20 dB Bandwidth Plot on Channel 78

Date: 16.SEP.2019 10:48:34

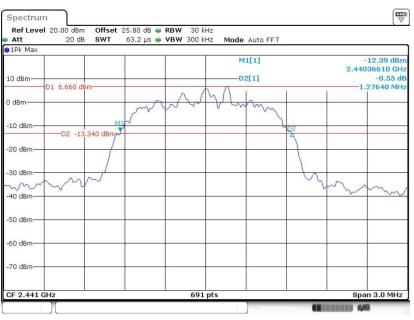
<2Mbps>

20 dB Bandwidth Plot on Channel 00



Date: 16.SEP.2019 10:52:24

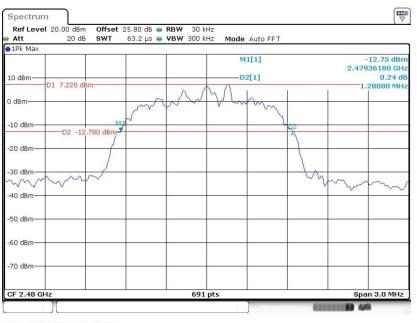




20 dB Bandwidth Plot on Channel 39

Date: 16.SEP.2019 11:01:34

20 dB Bandwidth Plot on Channel 78

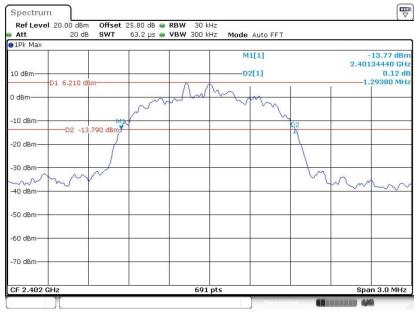


Date: 16.SEP.2019 11:05:22



<3Mbps>

20 dB Bandwidth Plot on Channel 00



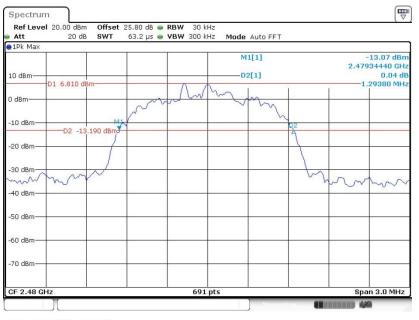
Date: 16.SEP.2019 11:09:22

20 dB Bandwidth Plot on Channel 39



Date: 16.SEP.2019 11:11:39





20 dB Bandwidth Plot on Channel 78

Date: 16.SEP.2019 11:15:46

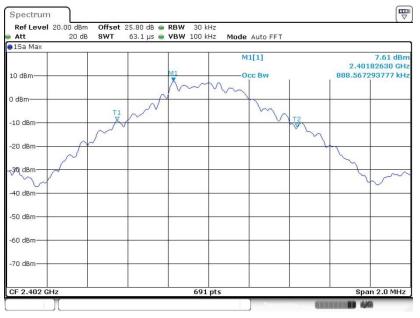


3.4.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

<1Mbps>

99% Occupied Bandwidth Plot on Channel 00



Date: 16.SEP.2019 11:31:22

99% Occupied Bandwidth Plot on Channel 39





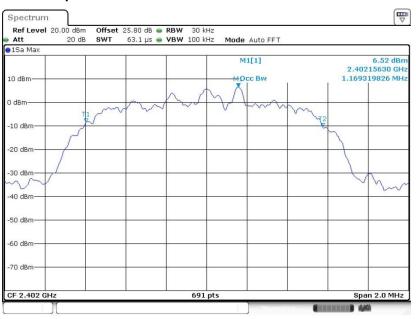


99% Occupied Bandwidth Plot on Channel 78

Date: 16.SEP.2019 11:33:21

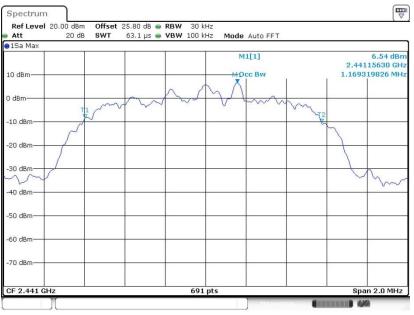
<2Mbps>

99% Occupied Bandwidth Plot on Channel 00



Date: 16.SEP.2019 11:34:33





99% Occupied Bandwidth Plot on Channel 39

Date: 16.SEP.2019 11:35:35



99% Occupied Bandwidth Plot on Channel 78

Date: 16.SEP.2019 11:36:17



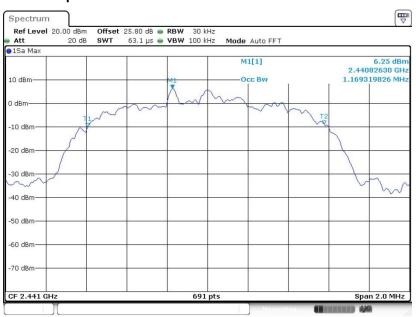
<3Mbps>

Spectrum Offset 25.80 dB ● RBW 30 kHz SWT 63.1 µs ● VBW 100 kHz Ref Level 20.00 dBm Att 20 dB Mode Auto FFT ●1Sa Max 6.26 dBn 2.40182630 GHz 1.172214182 MHz 10 dBm Occ Bw 0 dBm-Т -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.402 GHz 691 pts Span 2.0 MHz

99% Occupied Bandwidth Plot on Channel 00

Date: 16.SEP.2019 11:37:20

99% Occupied Bandwidth Plot on Channel 39



Date: 16.SEP.2019 11:38:38





99% Occupied Bandwidth Plot on Channel 78

Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



3.5 Output Power Measurement

3.5.1 Limit of Output Power

The maximum peak conducted output power of the intentional radiator shall not exceed the following: 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. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts. The power limit for 1Mbps, 2Mbps, 3Mbps and AFH modes are 0.125 watts.

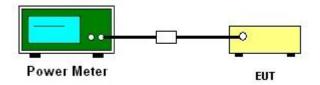
3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.5.
- 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Measure the conducted output power with cable loss and record the results in the test report.
- 5. Measure and record the results in the test report.

3.5.4 Test Setup



3.5.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.5.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.



3.6 Conducted Band Edges Measurement

3.6.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

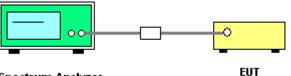
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.6.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- 3. Set RBW = 100kHz, VBW = 300kHz. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
- 4. Enable hopping function of the EUT and then repeat step 2. and 3.
- 5. Measure and record the results in the test report.

3.6.4 Test Setup



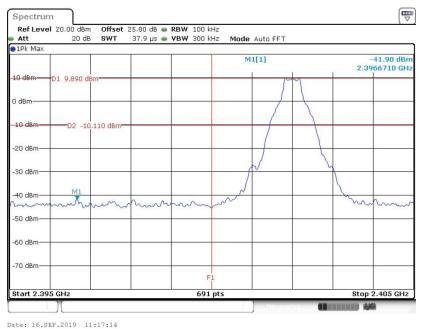
Spectrum Analyzer



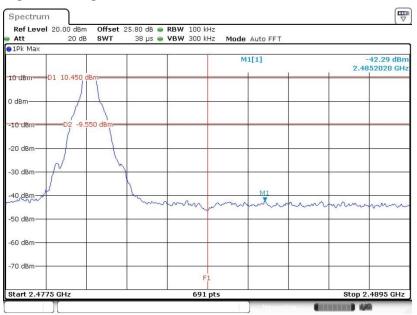
3.6.5 Test Result of Conducted Band Edges

<1Mbps>

Low Band Edge Plot on Channel 00



High Band Edge Plot on Channel 78

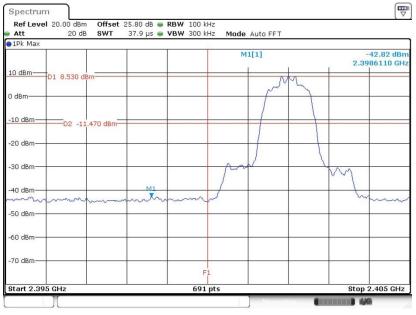


Date: 16.SEP.2019 11:17:53



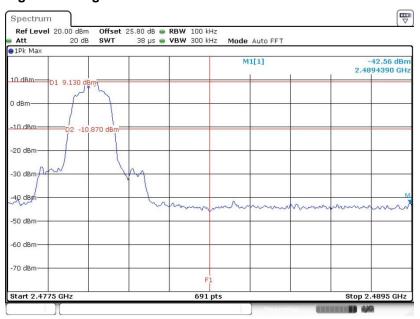
<2Mbps>

Low Band Edge Plot on Channel 00



Date: 16.SEP.2019 11:18:46

High Band Edge Plot on Channel 78

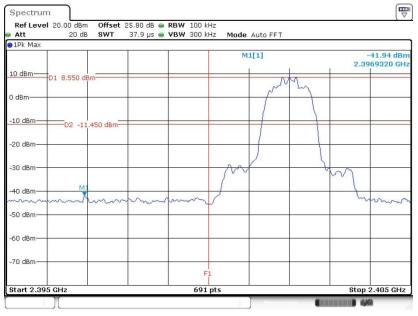


Date: 16.SEP.2019 11:19:18



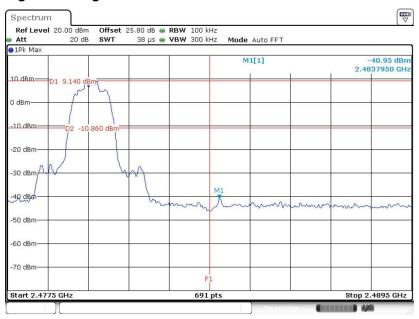
<3Mbps>

Low Band Edge Plot on Channel 00



Date: 16.SEP.2019 11:20:10

High Band Edge Plot on Channel 78

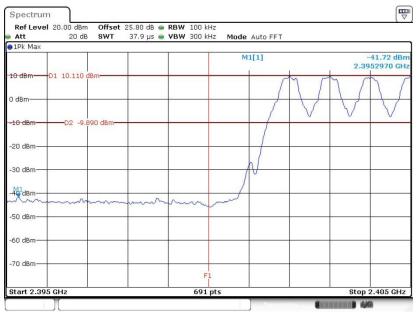


Date: 16.SEP.2019 11:20:45

3.6.6 Test Result of Conducted Hopping Mode Band Edges

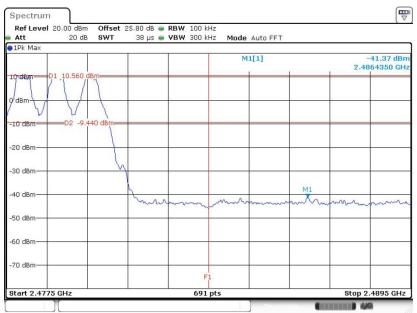
<1Mbps>

Hopping Mode Low Band Edge Plot



Date: 16.SEP.2019 11:23:12

Hopping Mode High Band Edge Plot

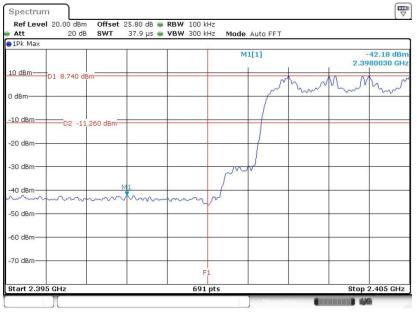


Date: 16.SEP.2019 11:24:29



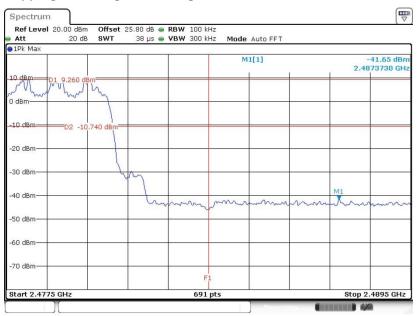
<2Mbps>

Hopping Mode Low Band Edge Plot



Date: 16.SEP.2019 11:25:54

Hopping Mode High Band Edge Plot

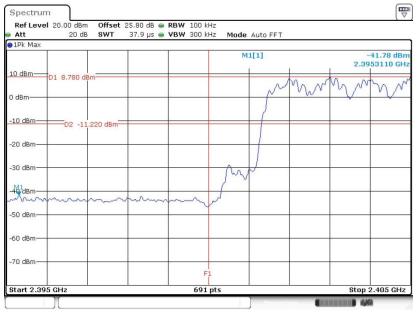


Date: 16.SEP.2019 11:27:07



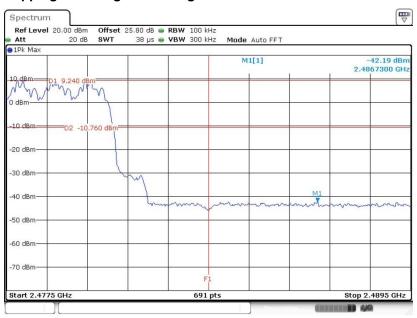
<3Mbps>

Hopping Mode Low Band Edge Plot



Date: 16.SEP.2019 11:29:01

Hopping Mode High Band Edge Plot



Date: 16.SEP.2019 11:30:06

3.7 Conducted Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

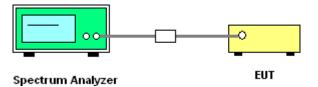
3.7.2 Measuring Instruments

See list of measuring equipment of this test report.

3.7.3 Test Procedure

- 1. The testing follows ANSI C63.10-2013 clause 7.8.8.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
- 5. Measure and record the results in the test report.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.7.4 Test Setup

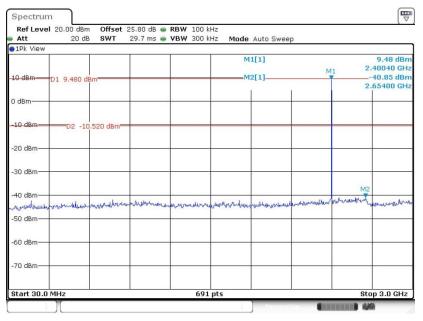


TEL : 408 9043300 Report Template No.: BU5-FR15CWLAC MA Version 2.4

3.7.5 Test Result of Conducted Spurious Emission

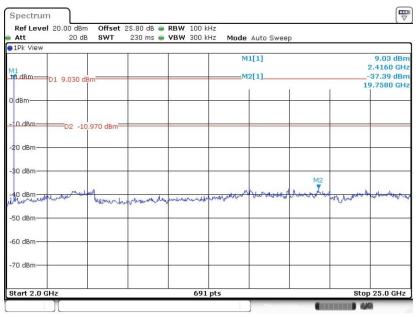
<1Mbps>

CSE Plot on Ch 00 between 30MHz ~ 3 GHz



Date: 16.SEP.2019 11:40:37

CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



Date: 16.SEP.2019 11:41:05



Ref Level 20.00		.80 dB 👄 RBW 10 9.7 ms 👄 VBW 30		ř.	
1Pk View			indue Adde Sheep	,	
10.dBm-D1 9.37	'0 dBm		M1[1] M2[1]	M1	9.37 dBn 2.43910 GH: 40.92 dBn
			1 1	1	2.59810 GH
0 dBm					
-10 dBmD2	-10.630 dBm				
-20 dBm					
-30 dBm	_				
-40 dBm					M2
allevermonumballier	west man burn when	whom the deline when the when the second sec	noughton dubility with when	homospherical	utronymenous
-50 dBm					
-60 dBm					
-70 dBm					

CSE Plot on Ch 39 between 30MHz ~ 3 GHz

Date: 16.SEP.2019 11:41:57

CSE Plot on Ch 39 between 2 GHz ~ 25 GHz

Ref Level 20 Att	20 dB SWT	et 25.80 dB 👄 1 230 ms 👄 1	VBW 300 kHz		Auto Sweer			
1Pk View	20 00 011	200 110	DH OOD KIN	. Houe	Mato Sweet	,		
M1 10 dBm D1	9.380 dBm				1[1] 2[1]			9.38 dBr 2.4490 GH -37.46 dBr 8.0270 GH
) dBm		_						
10 dBm	=D2 -10.620 dBr	n						
20 dBm								
30 dBm		_			M	2		
40 dBm	www.	have added and	wohnterwhole	utument.	"Wordoward	der der some or	America	wwwww
50 dBm								
60 dBm								
70 dBm								
Start 2.0 GHz			691 p	10			Pto	p 25.0 GHz

Date: 16.SEP.2019 11:42:26



Att	20 dB	SWT	29.7 1115	VBW 300	KH2 MOUE	Auto Sweep		
	D1 10.480 d	Bm				12[1]	M	10.48 dBr 1 2.48210 GH -41.03 dBr
) dBm								2.44340 GH
10 dBm—	D2 -9.5	20 dBm—						
20 dBm								
30 dBm								
40 dBm	n-horstaanenen	with	www.	human	wheneve	whenever	M2 where where where a	uter all a land
60 dBm								
70 dBm								

CSE Plot on Ch 78 between 30MHz ~ 3 GHz

Date: 16.SEP.2019 11:44:20

CSE Plot on Ch 78 between 2 GHz ~ 25 GHz

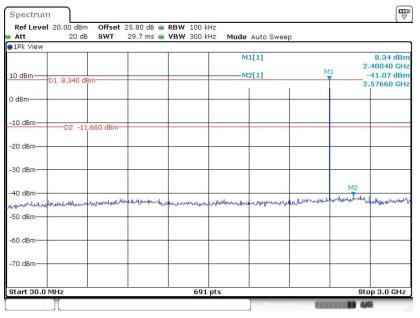
M1 2. 17 dBm D1 9.750 dBm M2[1] -3	
M1 10 dBm 10 dBm 20	
10 dBm D2 -10.250 dBm 20 dBm 30 dBm -30 dBm	9.75 dBr 4830 GH 7.59 dBr 3900 GH
20 dBm 	
30 dBm - N2 40 dBm - N2 50 dBm - S0 dBm	
40 dam	
-50 dBm	
	1400 ml well
-60 dBm-	
-70 dBm	
Start 2.0 GHz 691 pts Stop 2	25.0 GHz

Date: 16.SEP.2019 11:45:45



<2Mbps>

CSE Plot on Ch 00 between 30MHz ~ 3 GHz



Date: 16.SEP.2019 11:58:44

CSE Plot on Ch 00 between 2 GHz ~ 25 GHz

Att	el 20.00 dBm 20 dB		25.80 dB 👄 230 ms 👄	VBW 300		Auto Swee	p		
1Pk View	3. 			217					
10 dBm						1[1] 2[1]			5.80 dBn 2.4160 GH -37.57 dBn
dBm	-D1 5.800 d	3m						1	5.5970 GH:
10 dBm—	D2 _14	.200 dBm-							
20 dBm—		.200 0011							
30 dBm—					Ma				
P dBm	Murrandad	nJurran	uphan way	Maywohahar	huntred	Mary Mary	www.ywww	the market	www.
50 dBm—									
50 dBm—									
70 dBm—									
Start 2.0	CH3			601	pts			Pto	25.0 GHz

Date: 16.SEP.2019 11:59:15



Att	el 20.00 dBm 20 dB		25.80 dB 👄 29.7 ms 👄	VBW 300 k		Auto Swee	p		
1Pk View	r.								
					M	1[1]			8.19 dBn 2.43910 GH
LO dBm—					M	2[1]		M1	-41.02 dBn
	D1 8.190 de	3m-					4		2.46490 GH
) dBm	-		-			-			
-10 dBm—	D2 -11	.810 dBm-							
20 dBm—									
30 dBm—	-					~			
								1/12	
40 dBm-		h. a haltha	my un helder			in the second second	andhandrow	willbeaus	brugen had made
-50 dBm-	non-anim	and the second s		a Amondo ana	- and the second				a la company de la
SO GBII									
60 dBm—									
70 dBm—								-	
Start 30.	0 MHz			691	pts				Stop 3.0 GHz

CSE Plot on Ch 39 between 30MHz ~ 3 GHz

Date: 16.SEP.2019 11:57:21

CSE Plot on Ch 39 between 2 GHz ~ 25 GHz

Att	el 20.00 dBm 20 dB		25.80 dB	VBW 300		Auto Swee	р		
1Pk View					1				
					M	1[1]			5.55 dBr 2.4490 GH
A dBm —			_		M	2[1]			-37.21 dBr
Ť	-D1 5.550 dB	m				1	1	1	15.8970 GH
dBm									-
10 dBm—									
20 dBm-	D2 -14	.450 dBm-							
20 abm—									
30 dBm-									
					N	12			
40 dBm	hundredten	Wq.	Mershinghund	a kindentra hu	hand haven	Bolapolistant	pourspha	Whenwood	Man March
M. Marana		analy	Mannershalow	Articles and Areas				a chora	
50 dBm—			+						
60 dBm—									
70 dBm—									
start 2.0	CH2			601	pts			et.	op 25.0 GHz
start 2.0				09.	. pts	1			5p 20.0 di i2

Date: 16.SEP.2019 11:57:51



Att	20.00 dBm 20 dB	SWT	25.80 dB 👄 29.7 ms 👄	VBW 300 k		Auto Swee	p		
1Pk View									
10 dBm	D1 8.920 dBr	n				1[1] 2[1]		M1	8.92 dBn 2.48210 GH: 40.81 dBn 1.11960 GH:
0 dBm								-	1.11900 GH.
-10 dBm	D2 -11.0)80 dBm—							
-20 dBm									
-30 dBm						-			
-40 dBm	i a farmina sin h	dennikadatus	M2 promobilition	huubudovener	normhalapoul	water	ever Martank	norio	num which which
60 dBm									
70 dBm									
	MHz				pts				Stop 3.0 GHz

CSE Plot on Ch 78 between 30MHz ~ 3 GHz

Date: 16.SEP.2019 11:55:56

CSE Plot on Ch 78 between 2 GHz ~ 25 GHz

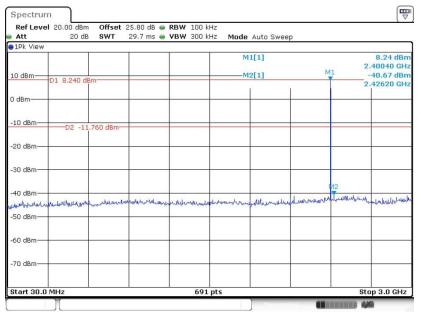
Att	el 20.00 dBm 20 dB		25.80 dB 👄 230 ms 👄	VBW 300		Auto Swee	D		
1Pk View									
0 dBm —						1[1] 2[1]			6.29 dBi 2.4830 GH -37.23 dBi
dBm	-D1 6.290 dt	3m-						-2	3.0860 GF
10 dBm—									-
20 dBm—		.710 dBm—							-
30 dBm—									M2
40 dBm-	Human	all here were a	ununum	whenwohn	without	www.	www	and protocologies	werther derent
50 dBm—									
60 dBm—									
70 dBm—								·	
Start 2.0					pts				p 25.0 GHz

Date: 16.SEP.2019 11:56:24



<3Mbps>

CSE Plot on Ch 00 between 30MHz ~ 3 GHz



Date: 16.SEP.2019 13:03:57

CSE Plot on Ch 00 between 2 GHz ~ 25 GHz

Att 20 dB	SWT 230	ms 👄 VBW 300	kHz Mode Auto Sw	еер	
1Pk View			1		
14 dBm			M1[1] M2[1]		5.34 dBn 2.4160 GH -37.41 dBn 19.7240 GH
D1 5.340 dB	im-				19.7240 GH2
10 dBm	.660 dBm				
20 dBm					
30 dBm				M2	
40 dBm whow when the stand when the	Human	nauthurrarbound	the whole the second	dollar broker by	manydrower
-50 dBm					
-70 dBm					

Date: 16.SEP.2019 13:04:27



Att	20 dB	SWT	29.7 ms 🖷	VBW 300 k	Hz Mode	Auto Sweep	0			
1Pk View			1	1						
					M	1[1]				8.27 dBn 3910 GH
10 dBm					M	2[1]		M1		0.91 dBn
	D1 8.270 de	3m							2.4	2620 GH
D dBm				_						
10 dBm-										
	D2 -11	.730 dBm-								
20 dBm-										
-30 dBm										
-40 dBm								1/12		
unorthun	mesdertumer	rependenter	and the states	an marketer light	needwarde	nouthlypowden	womenter	Mary	wanter war	white
50 dBm										
-60 dBm										
70 dBm										

CSE Plot on Ch 39 between 30MHz ~ 3 GHz

Date: 16.SEP.2019 13:06:19

CSE Plot on Ch 39 between 2 GHz ~ 25 GHz

Ref Leve Att	20.00 dBm 20 dB		25.80 dB	RBW 100 VBW 300		Auto Swee	n		
1Pk View	20 00	UNI	200 110 -	1011 000	Mine Middle	A010 31/66	P		
dBm	D1 8.300 d	300				1[1] 2[1]			8.30 dBn 2.4490 GH -37.13 dBn
) dBm								-	7.9930 GH
10 dBm—	D2 -11	.700 dBm							
20 dBm—									
30 dBm—						м	2		
40 dBm-	milautines	human	lanound	munuluh 1	www.chille	Prod Mathery	Autor	and Wander back	and a start and a start and a start a
50 dBm—									
60 dBm—									
-70 dBm									1
Start 2.0	017			60	1 pts			Sto	p 25.0 GHz

Date: 16.SEP.2019 13:06:49