

Report No.: FR912242A



# **FCC RADIO TEST REPORT**

FCC ID : NM82Q6P100

Equipment : Headset Model Name : 2Q6P100

Applicant : HTC Corporation

No.88, Sec. 3, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Manufacturer : HTC Corporation

No.23, Xinghua Rd., Taoyuan District,

**Taoyuan City, Taiwan 330** 

Standard : FCC Part 15 Subpart C §15.247

The product was received on Jan. 22, 2019 and testing was started from Feb. 06, 2019 and completed on Mar. 09, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, 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 TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Reviewed by: Jones Tsai

TEL: 886-3-327-3456

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

Page Number

: 1 of 59

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# **Table of Contents**

Report No. : FR912242A

His	tory o	f this test reportf	3
Sur	nmary	of Test Result	4
1	Gene	ral Description	5
	1.1	Product Feature of Equipment Under Test	5
	1.2	Modification of EUT	5
	1.3	Testing Location	5
	1.4	Applicable Standards	6
2	Test	Configuration of Equipment Under Test	7
	2.1	Carrier Frequency Channel	7
	2.2	Test Mode	8
	2.3	Connection Diagram of Test System	9
	2.4	Support Unit used in test configuration and system	9
	2.5	EUT Operation Test Setup	10
	2.6	Measurement Results Explanation Example	10
3	Test	Result	11
	3.1	Number of Channel Measurement	11
	3.2	Hopping Channel Separation Measurement	13
	3.3	Dwell Time Measurement	
	3.4	20dB and 99% Bandwidth Measurement	
	3.5	Output Power Measurement	32
	3.6	Conducted Band Edges Measurement	33
	3.7	Conducted Spurious Emission Measurement	40
	3.8	Radiated Band Edges and Spurious Emission Measurement	50
	3.9	AC Conducted Emission Measurement	54
	3.10	Antenna Requirements	56
4	List o	of Measuring Equipment	57
5	Unce	rtainty of Evaluation	59
App	endix	A. Conducted Test Results	
Арр	endix	c B. AC Conducted Emission Test Result	
App	endix	c C. Radiated Spurious Emission	
App	endix	CD. Radiated Spurious Emission Plots	
App	endix	c E. Duty Cycle Plots	

TEL: 886-3-327-3456 Page Number : 2 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# History of this test report

Report No. : FR912242A

Report No. Version		Description	Issued Date
FR912242A	01	Initial issue of report	Mar. 26, 2019

TEL: 886-3-327-3456 Page Number : 3 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# **Summary of Test Result**

Report No.: FR912242A

Report Ref Std. Clause Clause		Test Items	Result (PASS/FAIL)	Remark
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 Pow		Peak Output Power	Pass	-
3.6	15.247(d)	5.247(d) Conducted Band Edges		-
3.7	3.7 15.247(d) Conducted Spurious Emission		Pass	-
3.8 15.247(d)		Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 6.54 dB at 230.790 MHz
3.9	15.207	AC Conducted Emission	Pass	Under limit 15.78 dB at 0.908 MHz
3.10	3.10 15.203 & Antenna Requirement 15.247(b)		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.

Reviewed by: Wii Chang Report Producer: Polly Tsai

TEL: 886-3-327-3456 Page Number : 4 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 1 General Description

# 1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac, Wi-Fi 5GHz 802.11a/n/ac, and 2.4GHz Proprietary Radio

Report No.: FR912242A

Product Specification subjective to this standard					
	WLAN:				
	<ant. 1="">: PCB Antenna</ant.>				
Antenna Type	<ant. 2="">: PCB Antenna</ant.>				
	Bluetooth: PCB Antenna				
	2.4GHz Proprietary Radio: PCB Antenna				

# 1.2 Modification of EUT

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

# 1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC.		
	No.52, Huaya 1st Rd., Guishan Dist.,		
Test Site Location	Taoyuan City, Taiwan (R.O.C.)		
rest Site Location	TEL: +886-3-327-3456		
	FAX: +886-3-328-4978		
Test Site No.	Sporton	Site No.	
rest site NO.	TH05-HY	CO05-HY	

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

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

FCC Designation No.: TW1190 and TW0007

TEL: 886-3-327-3456 Page Number : 5 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 1.4 Applicable Standards

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

Report No.: FR912242A

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r01
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- ANSI C63.10-2013

#### Remark:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

TEL: 886-3-327-3456 Page Number : 6 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 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	-	-

TEL: 886-3-327-3456 FAX: 886-3-328-4978

Report Template No.: BU5-FR15CBT Version 2.4

Page Number : 7 of 59 Issued Date : Mar. 26, 2019

Report No.: FR912242A

Report Version : 01

## 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 (Z plane) were recorded in this report, and the worst mode of radiated spurious emissions is Bluetooth 1Mbps mode, and recorded in this report.

Report No.: FR912242A

b. AC power line Conducted Emission was tested under maximum output power.

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

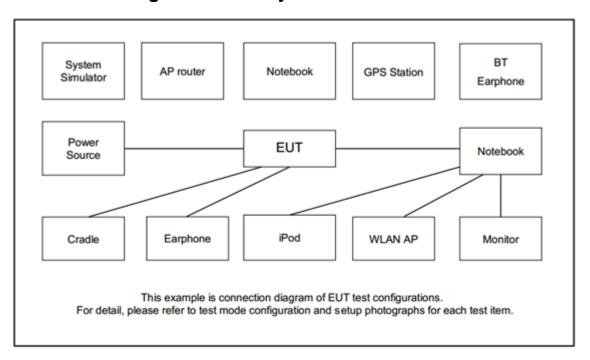
	Summary table of Test Cases						
	Data Rate / Modulation						
Test Item	Bluetooth BR 1Mbps	Bluetooth EDR 2Mbps	Bluetooth EDR 3Mbps				
	GFSK	π/4-DQPSK	8-DPSK				
Conducted	Mode 1: CH00_2402 MHz	Mode 4: CH00_2402 MHz	Mode 7: CH00_2402 MHz				
Conducted	Mode 2: CH39_2441 MHz	Mode 5: CH39_2441 MHz	Mode 8: CH39_2441 MHz				
Test Cases	Mode 3: CH78_2480 MHz	Mode 6: CH78_2480 MHz	Mode 9: CH78_2480 MHz				
		Bluetooth BR 1Mbps GFSK					
Radiated	Mode 1: CH00_2402 MHz						
Test Cases	Mode 2: CH39_2441 MHz						
	Mode 3: CH78_2480 MHz						
AC							
Conducted	Mode 1 : Bluetooth Link + WLAN (2.4GHz) Link + H-Pattern + Controller Power on (2.4GHz RF Link) + USB Cable (Charging from Adapter)						
Emission							

#### Remark:

- For radiated test cases, the worst mode data rate 1Mbps was reported only since the highest RF
  output power in the preliminary tests. The conducted spurious emissions and conducted band edge
  measurement for other data rates were not worse than 1Mbps, and no other significantly
  frequencies found in conducted spurious emission.
- 2. For Radiated Test Cases, the tests were performed with Adapter 1 and USB Cable 1.

TEL: 886-3-327-3456 Page Number : 8 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 2.3 Connection Diagram of Test System



Report No.: FR912242A

# 2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	Notebook	ASUS	P2430U	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Controller	нтс	2Q6M200	N/A	N/A	N/A
6.	Mobile Phone	SONY	N/A	N/A	N/A	N/A

TEL: 886-3-327-3456 Page Number : 9 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 2.5 EUT Operation Test Setup

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

Report No.: FR912242A

# 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)

TEL: 886-3-327-3456 Page Number : 10 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 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.

Report No.: FR912242A

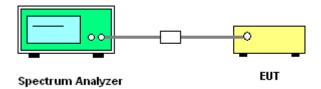
#### 3.1.2 Measuring Instruments

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

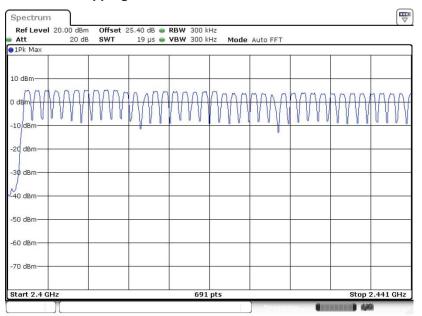


TEL: 886-3-327-3456 Page Number : 11 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 3.1.5 Test Result of Number of Hopping Frequency

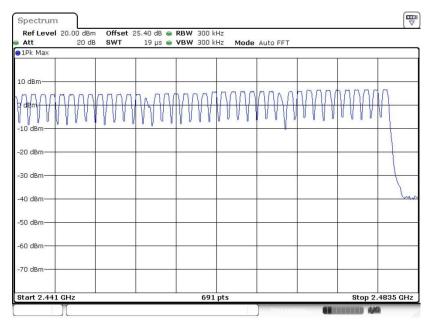
Please refer to Appendix A.

#### Number of Hopping Channel Plot on Channel 00 - 78



Report No.: FR912242A

Date: 23.FEB.2019 16:16:33



Date: 23.FEB.2019 16:17:52

TEL: 886-3-327-3456 Page Number : 12 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 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.

Report No.: FR912242A

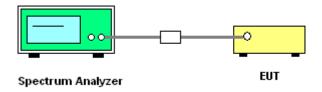
# 3.2.2 Measuring Instruments

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



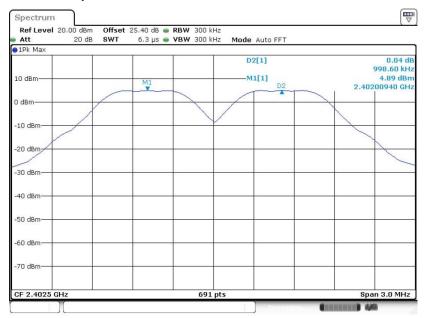
# 3.2.5 Test Result of Hopping Channel Separation

Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 13 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# <1Mbps>

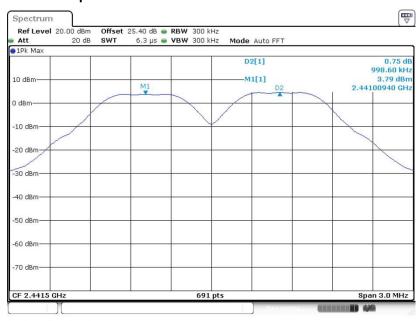
# Channel Separation Plot on Channel 00 - 01



Report No.: FR912242A

Date: 23.FEB.2019 16:09:59

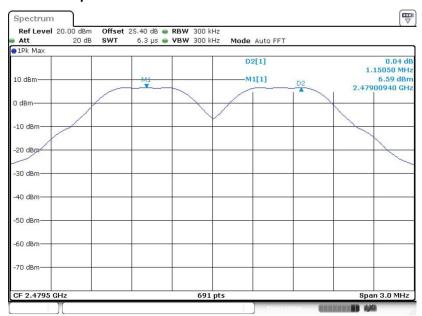
# **Channel Separation Plot on Channel 39 - 40**



Date: 23.FEB.2019 16:21:10

TEL: 886-3-327-3456 Page Number : 14 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# **Channel Separation Plot on Channel 77 - 78**

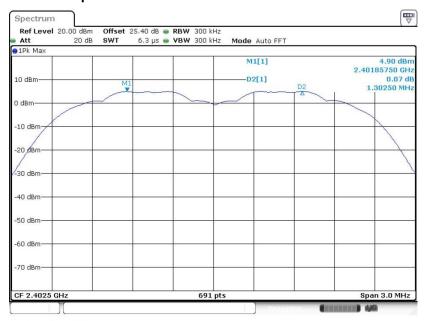


Report No.: FR912242A

Date: 23.FEB.2019 16:26:24

#### <2Mbps>

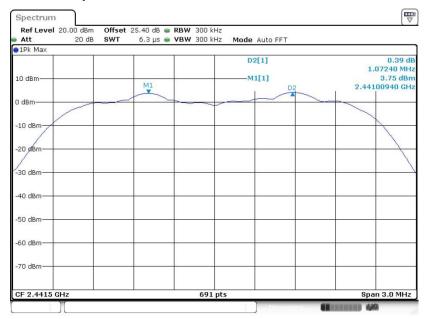
# Channel Separation Plot on Channel 00 - 01



Date: 23.FEB.2019 16:35:34

TEL: 886-3-327-3456 Page Number : 15 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

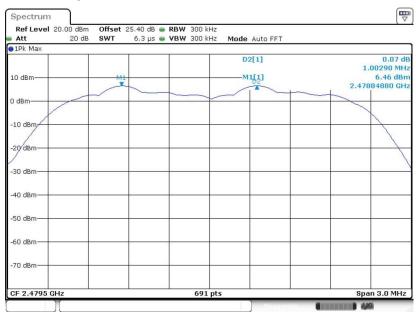
# Channel Separation Plot on Channel 39 - 40



Report No.: FR912242A

Date: 23.FEB.2019 16:43:11

#### **Channel Separation Plot on Channel 77 - 78**

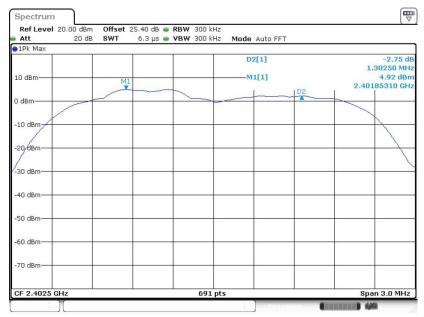


Date: 23.FEB.2019 16:50:50

TEL: 886-3-327-3456 Page Number : 16 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### <3Mbps>

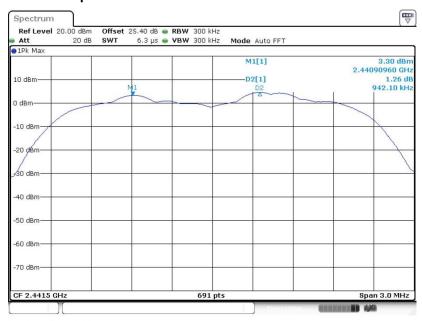
# Channel Separation Plot on Channel 00 - 01



Report No.: FR912242A

Date: 23.FEB.2019 17:07:11

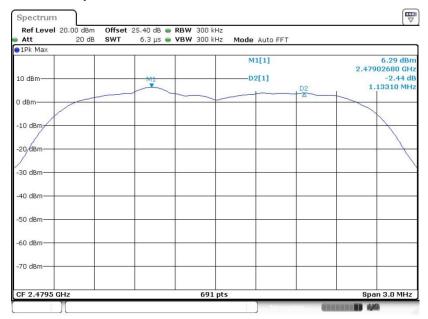
# Channel Separation Plot on Channel 39 - 40



Date: 23.FEB.2019 17:13:55

TEL: 886-3-327-3456 Page Number : 17 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# **Channel Separation Plot on Channel 77 - 78**



Report No.: FR912242A

Date: 23.FEB.2019 17:18:13

TEL: 886-3-327-3456 Page Number : 18 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

## 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.

Report No.: FR912242A

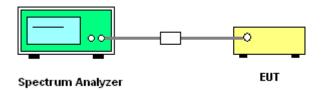
# 3.3.2 Measuring Instruments

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.
- 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.
- 5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ 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



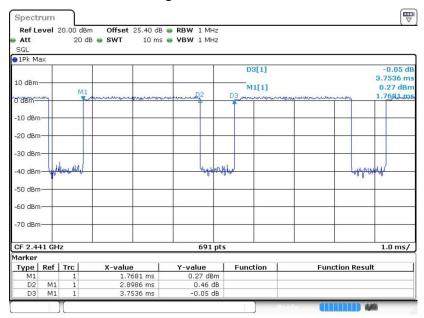
#### 3.3.5 Test Result of Dwell Time

Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 19 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### **Package Transfer Time Plot**

Report No.: FR912242A



Date: 6.FEB.2019 08:24:33

#### 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  $(0.4 \times 79)$  (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  $(0.4 \times 20)$  (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

TEL: 886-3-327-3456 Page Number : 20 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 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.

Report No.: FR912242A

- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. 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 ≥ 1-5% of the OBW; VBW ≥ RBW; Sweep = auto; Detector function = peak;

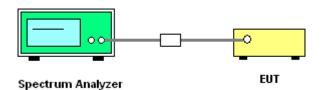
Trace =  $\max$  hold.

- 5. 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



#### 3.4.5 Test Result of 20dB Bandwidth

Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 21 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### <1Mbps>

#### 20 dB Bandwidth Plot on Channel 00



Report No.: FR912242A

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

#### 20 dB Bandwidth Plot on Channel 39



Date: 23.FEB.2019 16:25:10

TEL: 886-3-327-3456 Page Number : 22 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### 20 dB Bandwidth Plot on Channel 78

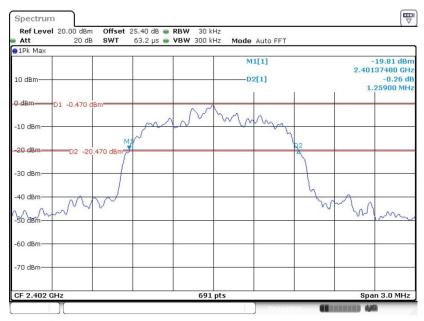


Report No.: FR912242A

Date: 23.FEB.2019 16:30:55

## <2Mbps>

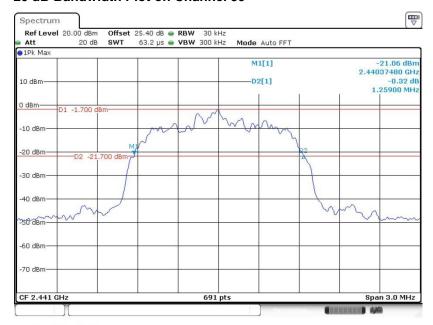
#### 20 dB Bandwidth Plot on Channel 00



Date: 23.FEB.2019 16:41:13

TEL: 886-3-327-3456 Page Number : 23 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### 20 dB Bandwidth Plot on Channel 39



Report No.: FR912242A

Date: 23.FEB.2019 16:45:28

#### 20 dB Bandwidth Plot on Channel 78

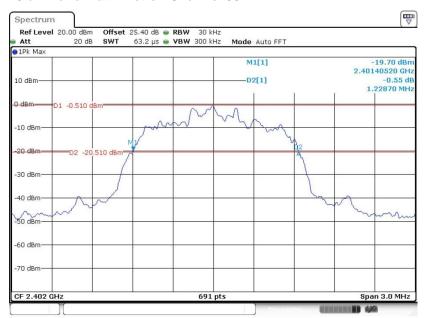


Date: 23.FEB.2019 16:58:34

TEL: 886-3-327-3456 Page Number : 24 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### <3Mbps>

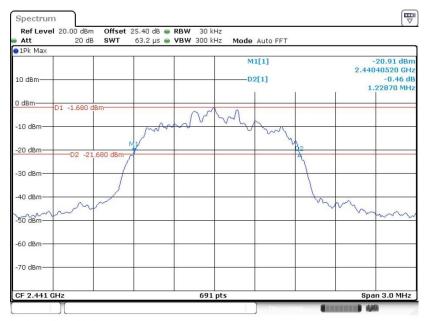
#### 20 dB Bandwidth Plot on Channel 00



Report No.: FR912242A

Date: 23.FEB.2019 17:08:40

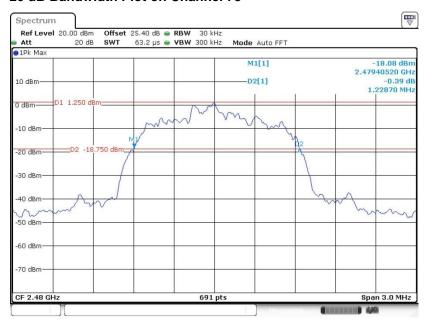
#### 20 dB Bandwidth Plot on Channel 39



Date: 23.FEB.2019 17:15:29

TEL: 886-3-327-3456 Page Number : 25 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 20 dB Bandwidth Plot on Channel 78



Report No.: FR912242A

Date: 23.FEB.2019 17:19:28

TEL: 886-3-327-3456 Page Number : 26 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 3.4.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

#### <1Mbps>

#### 99% Occupied Bandwidth Plot on Channel 00



Report No.: FR912242A

Date: 23.FEB.2019 16:14:37

TEL: 886-3-327-3456 Page Number : 27 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### 99% Occupied Bandwidth Plot on Channel 39



Report No.: FR912242A

Date: 23.FEB.2019 16:22:02

#### 99% Occupied Bandwidth Plot on Channel 78



Date: 23.FEB.2019 16:27:35

TEL: 886-3-327-3456 Page Number : 28 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# <2Mbps>

#### 99% Occupied Bandwidth Plot on Channel 00



Report No.: FR912242A

Date: 23.FEB.2019 16:37:20

# 99% Occupied Bandwidth Plot on Channel 39



Date: 23.FEB.2019 16:47:36

TEL: 886-3-327-3456 Page Number : 29 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### 99% Occupied Bandwidth Plot on Channel 78

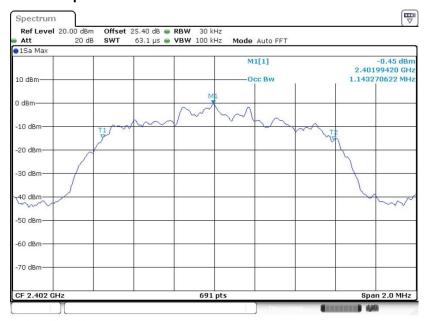


Report No.: FR912242A

Date: 23.FEB.2019 16:52:08

# <3Mbps>

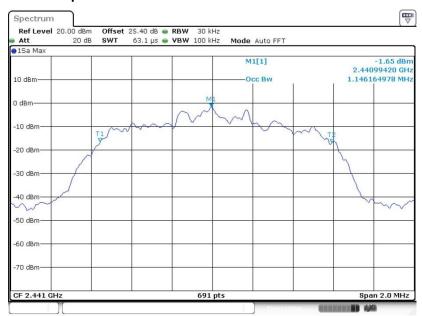
# 99% Occupied Bandwidth Plot on Channel 00



Date: 23.FEB.2019 17:10:40

TEL: 886-3-327-3456 Page Number : 30 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

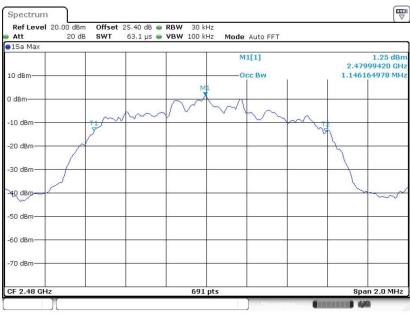
#### 99% Occupied Bandwidth Plot on Channel 39



Report No.: FR912242A

Date: 23.FEB.2019 17:16:07

#### 99% Occupied Bandwidth Plot on Channel 78



Date: 23.FEB.2019 17:20:43

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

TEL: 886-3-327-3456 Page Number : 31 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 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: (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. 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.

Report No.: FR912242A

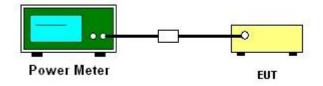
# 3.5.2 Measuring Instruments

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.

TEL: 886-3-327-3456 Page Number: 32 of 59
FAX: 886-3-328-4978 Issued Date: Mar. 26, 2019

# 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.

Report No.: FR912242A

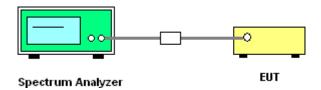
# 3.6.2 Measuring Instruments

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.
- 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

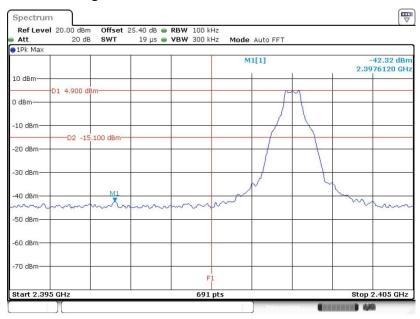


TEL: 886-3-327-3456 Page Number: 33 of 59
FAX: 886-3-328-4978 Issued Date: Mar. 26, 2019

# 3.6.5 Test Result of Conducted Band Edges

### <1Mbps>

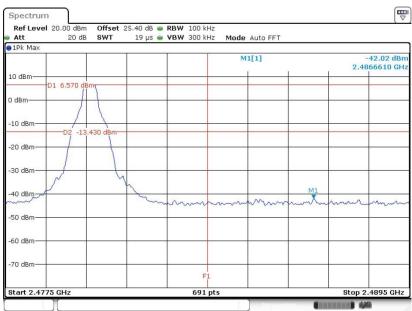
#### Low Band Edge Plot on Channel 00



Report No.: FR912242A

Date: 23.FEB.2019 16:14:00

# **High Band Edge Plot on Channel 78**

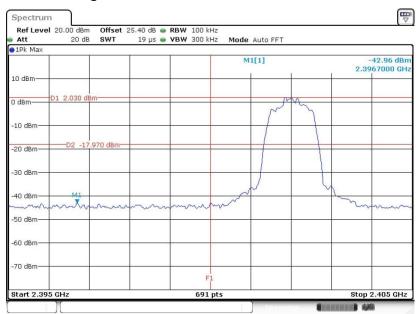


Date: 23.FEB.2019 16:26:58

TEL: 886-3-327-3456 Page Number : 34 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### <2Mbps>

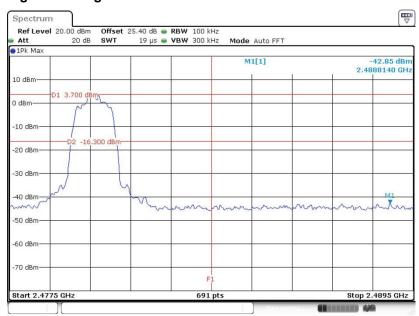
# Low Band Edge Plot on Channel 00



Report No.: FR912242A

Date: 23.FEB.2019 16:36:43

# **High Band Edge Plot on Channel 78**

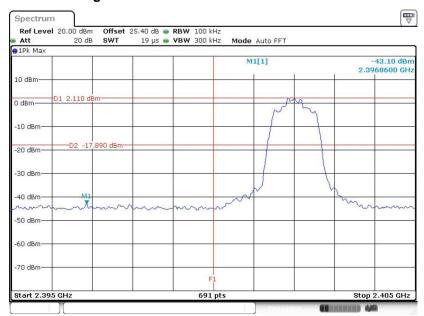


Date: 23.FEB.2019 16:51:28

TEL: 886-3-327-3456 Page Number : 35 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### <3Mbps>

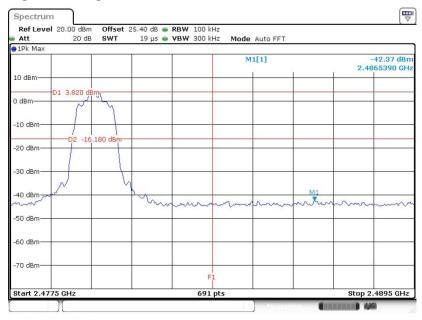
# Low Band Edge Plot on Channel 00



Report No.: FR912242A

Date: 23.FEB.2019 17:09:54

# **High Band Edge Plot on Channel 78**



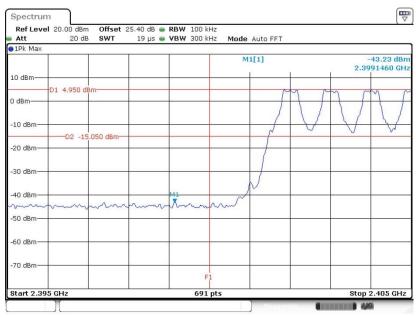
Date: 23.FEB.2019 17:19:48

TEL: 886-3-327-3456 Page Number : 36 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 3.6.6 Test Result of Conducted Hopping Mode Band Edges

#### <1Mbps>

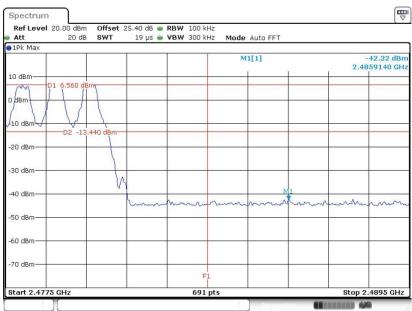
# **Hopping Mode Low Band Edge Plot**



Report No.: FR912242A

Date: 23.FEB.2019 16:18:26

# **Hopping Mode High Band Edge Plot**

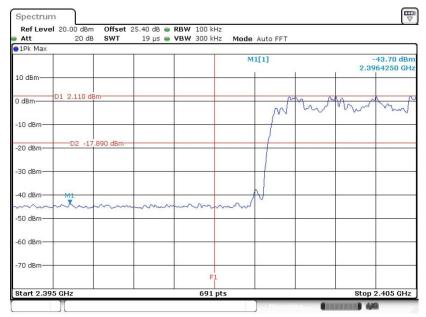


Date: 23.FEB.2019 16:29:05

TEL: 886-3-327-3456 Page Number : 37 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# <2Mbps>

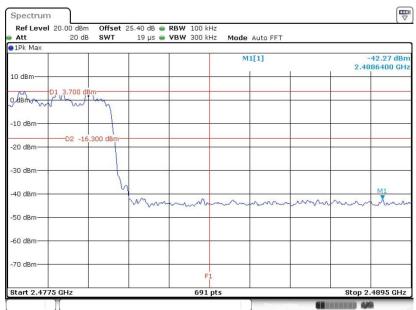
# **Hopping Mode Low Band Edge Plot**



Report No.: FR912242A

Date: 23.FEB.2019 16:39:34

# **Hopping Mode High Band Edge Plot**

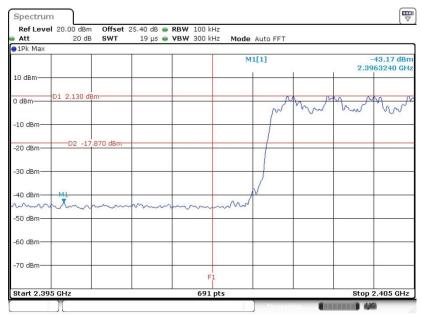


Date: 23.FEB.2019 16:56:43

TEL: 886-3-327-3456 Page Number : 38 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

#### <3Mbps>

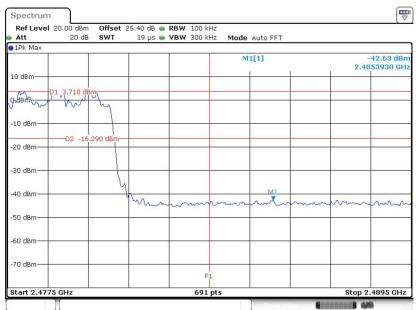
# **Hopping Mode Low Band Edge Plot**



Report No.: FR912242A

Date: 23.FEB.2019 17:12:19

# **Hopping Mode High Band Edge Plot**



Date: 23.FEB.2019 17:22:09

TEL: 886-3-327-3456 Page Number : 39 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

# 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.

Report No.: FR912242A

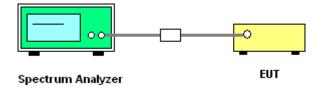
# 3.7.2 Measuring Instruments

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.
- 4. 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

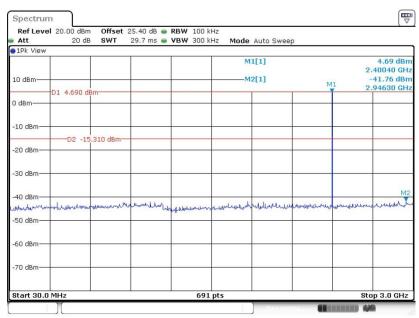


TEL: 886-3-327-3456 Page Number: 40 of 59
FAX: 886-3-328-4978 Issued Date: Mar. 26, 2019

# 3.7.5 Test Result of Conducted Spurious Emission

### <1Mbps>

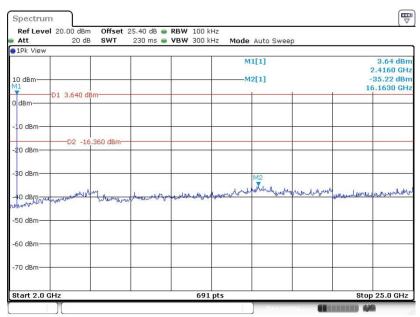
#### CSE Plot on Ch 00 between 30MHz ~ 3 GHz



Report No.: FR912242A

Date: 23.FEB.2019 16:15:18

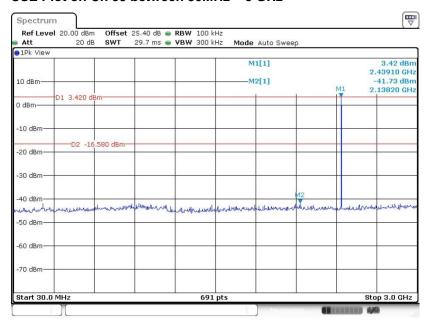
#### CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



Date: 23.FEB.2019 16:15:45

TEL: 886-3-327-3456 Page Number : 41 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019

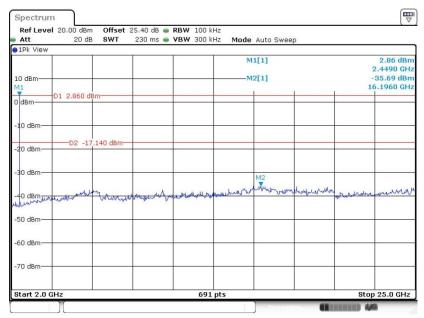
#### CSE Plot on Ch 39 between 30MHz ~ 3 GHz



Report No.: FR912242A

Date: 23.FEB.2019 16:22:36

#### CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



Date: 23.FEB.2019 16:23:48

TEL: 886-3-327-3456 Page Number : 42 of 59
FAX: 886-3-328-4978 Issued Date : Mar. 26, 2019