

# TEST REPORT

**FCC ID: 2ADINN5001TL**

**Product: LTE mobile phone**

**Model No.: N5001L**

**Additional Model No.: N5001TL, A4L, A3L**

**Trade Mark: NUU**

**Report No.: TCT171020E015**

**Issued Date: Oct. 20, 2017**

Issued for:

**Sun Cupid Technology (HK) Ltd.**

**16/F, CEO Tower, 77 Wing Hong St, Cheung Sha Wan, Kowloon, Hong Kong.**

Issued By:

**Shenzhen Tongce Testing Lab.**

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This document may be altered or revised by Shenzhen Tongce Testing Lab. personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

**TABLE OF CONTENTS**

<b>1. Test Certification .....</b>	<b>3</b>
<b>2. Test Result Summary .....</b>	<b>4</b>
<b>3. EUT Description.....</b>	<b>5</b>
<b>4. Genera Information.....</b>	<b>7</b>
4.1. Test environment and mode.....	7
4.2. Description of Support Units.....	8
<b>5. Facilities and Accreditations .....</b>	<b>9</b>
5.1. Facilities .....	9
5.2. Location .....	9
5.3. Measurement Uncertainty.....	9
<b>6. Test Results and Measurement Data .....</b>	<b>10</b>
6.1. Antenna requirement .....	10
6.2. Conducted Emission.....	11
6.3. Conducted Output Power .....	15
6.4. 20dB Occupy Bandwidth .....	20
6.5. Carrier Frequencies Separation .....	25
6.6. Hopping Channel Number .....	30
6.7. Dwell Time.....	32
6.8. Pseudorandom Frequency Hopping Sequence.....	39
6.9. Conducted Band Edge Measurement.....	40
6.10. Conducted Spurious Emission Measurement.....	44
6.11. Radiated Spurious Emission Measurement .....	48
<b>Appendix A: Photographs of Test Setup</b>	
<b>Appendix B: Photographs of EUT</b>	

## 1. Test Certification

<b>Product:</b>	LTE mobile phone
<b>Model No.:</b>	N5001L
<b>Additional Model No.:</b>	N5001TL, A4L, A3L
<b>Trade Mark:</b>	<b>NUU</b>
<b>Applicant:</b>	Sun Cupid Technology (HK) Ltd.
<b>Address:</b>	16/F, CEO Tower, 77 Wing Hong St, Cheung Sha Wan, Kowloon, Hong Kong.
<b>Manufacturer:</b>	SUNCUPID (ShenZhen) Electronic Ltd
<b>Address:</b>	Baolong Industrial City, Longgang District, Shenzhen Hi-Tech Road, Building 1, A 7, China.
<b>Date of Test:</b>	Apr. 24, 2017 – Jun. 13, 2017
<b>Applicable Standards:</b>	FCC CFR Title 47 Part 15 Subpart C Section 15.247

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:



Garen

Date:

Jun. 13, 2017

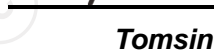
Reviewed By:



Date:

Oct. 20, 2017

Approved By:

  
Tomsin

Date:

Oct. 20, 2017

## 2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(1) §2.1046	PASS
20dB Occupied Bandwidth	§15.247 (a)(1) §2.1049	PASS
Carrier Frequencies Separation	§15.247 (a)(1)	PASS
Hopping Channel Number	§15.247 (a)(1)	PASS
Dwell Time	§15.247 (a)(1)	PASS
Radiated Emission	§15.205/§15.209 §2.1053, §2.1057	PASS
Band Edge	§15.247(d) §2.1051, §2.1057	PASS

**Note:**

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

### 3. EUT Description

<b>Product:</b>	LTE mobile phone
<b>Model No.:</b>	N5001L
<b>Additional Model No.:</b>	N5001TL, A4L, A3L
<b>Trade Mark:</b>	<b>NUU</b>
<b>Hardware Version:</b>	110SFM788P0A2V0
<b>Software Version:</b>	N5001L-AM-01
<b>Bluetooth version :</b>	V4.0(This report is for BDR+EDR)
<b>Operation Frequency:</b>	2402MHz~2480MHz
<b>Transfer Rate:</b>	1/2/3 Mbits/s
<b>Number of Channel:</b>	79
<b>Modulation Type:</b>	GFSK, $\pi/4$ -DQPSK, 8DPSK
<b>Modulation Technology:</b>	FHSS
<b>Antenna Type:</b>	Integral Antenna
<b>Antenna Gain:</b>	1.02dBi
<b>Power Supply:</b>	Rechargeable Li-ion Battery DC3.8V/2000mAh
<b>Adapter:</b>	Adapter: HJ-0501000E1-US Input: AC 100-240V 50/60Hz 0.2A Output: DC 5.0V=1000mA
<b>Remark:</b>	All models above are identical in interior structure, electrical circuits and components, and just model names and color are different for the marketing requirement.

Note: All the test data for this report follows the 2ADINN5001L report

**Operation Frequency each of channel for GFSK,  $\pi/4$ -DQPSK, 8DPSK**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
...	...	...	...	...	...	...	...
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
...	...	...	...	...	...	...	...
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz	-	

Remark: Channel 0, 39 & 78 have been tested for GFSK,  $\pi/4$ -DQPSK, 8DPSK modulation mode.

## 4. Genera Information

### 4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations with Fully-charged battery
<p>The sample was placed 0.8m &amp; 1.5m for the measurement below &amp; above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y &amp; Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.</p>	

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Modulation type	Mode
1Mbps	Mode 1、 Mode 2、 Mode 3、 Mode 4
2Mbps	
3Mbps	

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	Normal Hopping

For Conducted Emission	
Final Test Mode	Description
Mode 4	Normal Hopping

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	Normal Hopping

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The data rate was set in 1Mbps, 2 Mbps, 3 Mbps for radiated emission due to the highest RF output power.
- (3) Record the worst case of each test item in this report.

## 4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 20dB Occupied Bandwidth, Carrier Frequencies Separation, Hopping Channel Number, Dwell Time, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.



## 5. Facilities and Accreditations

### 5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

### 5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

Tel: 86-755-27673339

### 5.3. Measurement Uncertainty

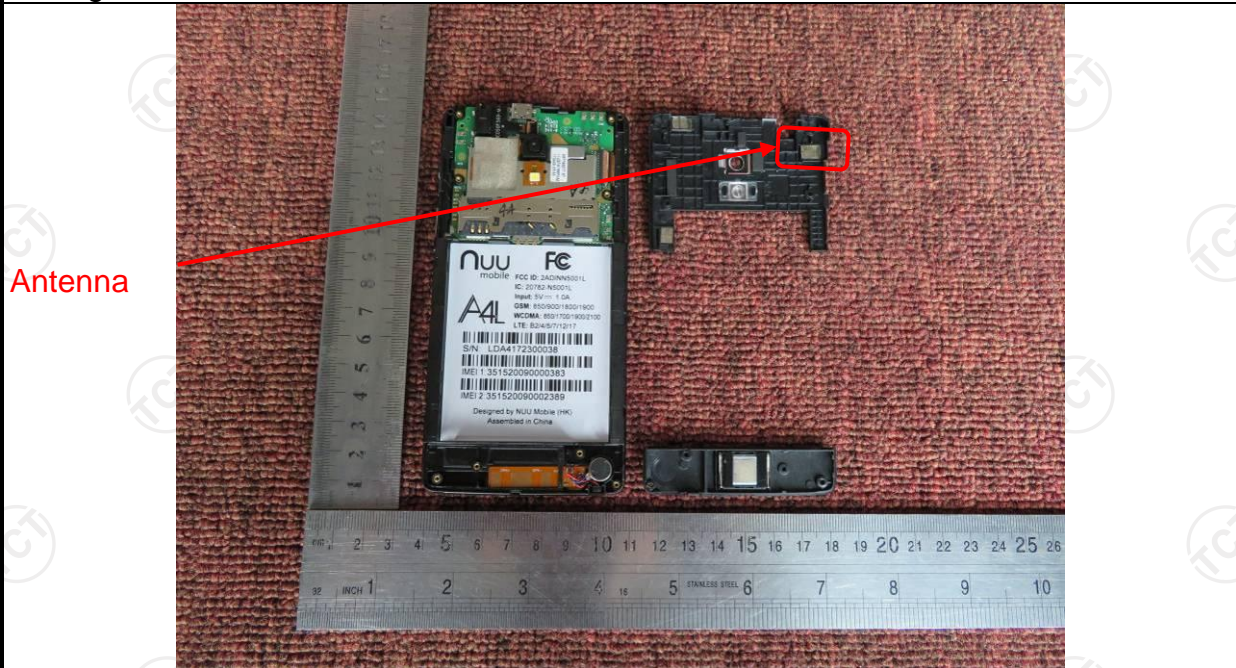
The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$

## 6. Test Results and Measurement Data

### 6.1. Antenna requirement

<b>Standard requirement:</b>	FCC Part15 C Section 15.203 /247(c)
<p>15.203 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, 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.</p> <p>15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.</p>	
<b>E.U.T Antenna:</b>	
<p>The Bluetooth antenna is Integral antenna which permanently attached, and the best case gain of the antenna is 1.02dBi.</p>	



## 6.2. Conducted Emission

### 6.2.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.207														
<b>Test Method:</b>	ANSI C63.10:2013														
<b>Frequency Range:</b>	150 kHz to 30 MHz														
<b>Receiver setup:</b>	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
<b>Limits:</b>	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
<b>Test Setup:</b>	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
<b>Test Mode:</b>	Refer to item 4.1														
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.</li> </ol>														
<b>Test Result:</b>	PASS														

**6.2.2. Test Instruments**

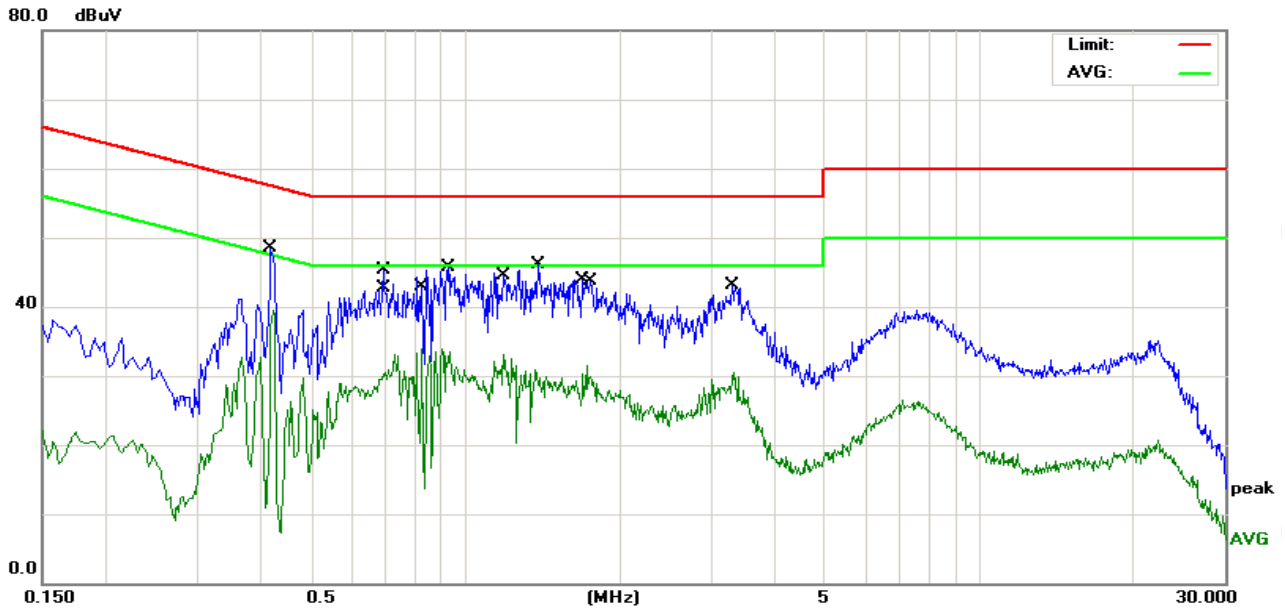
Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	R&S	ESPI	101401	Jun. 12, 2018
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 27, 2018
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 27, 2018
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		1.3860	35.49	10.62	46.11	56.00	-9.89	QP
2		0.9260	35.03	10.66	45.69	56.00	-10.31	QP
3		0.6900	34.60	10.77	45.37	56.00	-10.63	QP
4		0.4180	37.50	10.91	48.41	57.49	-9.08	QP
5		1.6980	33.23	10.59	43.82	56.00	-12.18	QP
6		3.3060	32.51	10.56	43.07	56.00	-12.93	QP
7	*	0.4220	28.69	10.90	39.59	47.41	-7.82	AVG
8		0.7060	20.21	10.77	30.98	46.00	-15.02	AVG
9		0.8220	23.12	10.71	33.83	46.00	-12.17	AVG
10		1.1899	22.47	10.62	33.09	46.00	-12.91	AVG
11		1.7179	20.98	10.59	31.57	46.00	-14.43	AVG
12		3.3220	19.87	10.56	30.43	46.00	-15.57	AVG

**Note:**

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

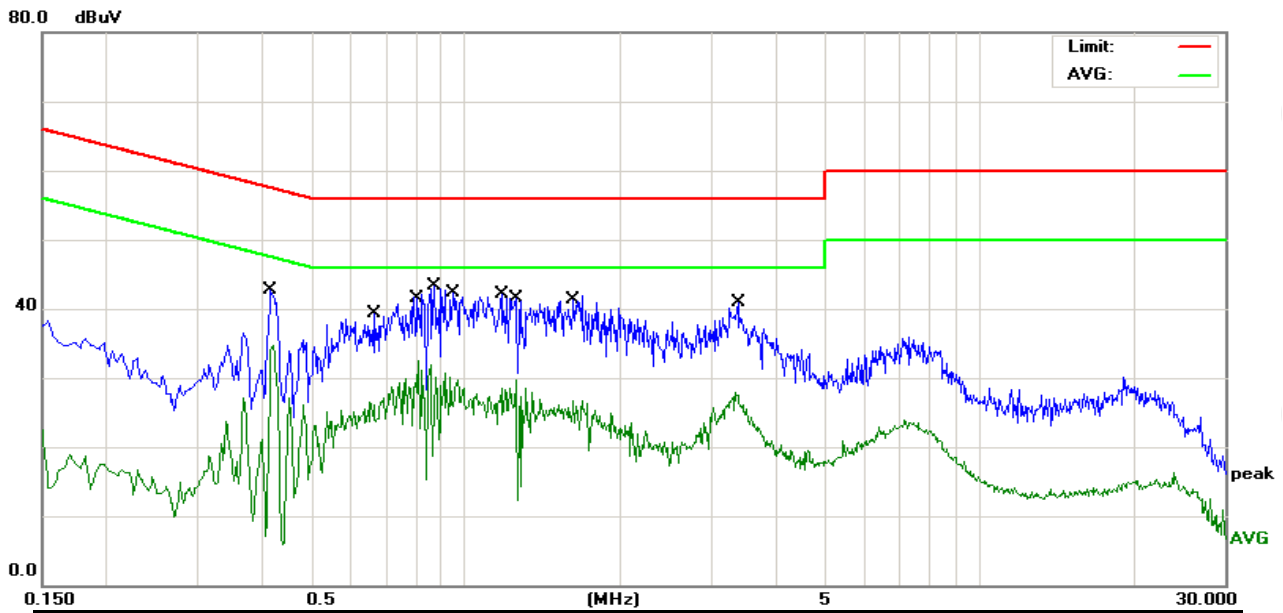
Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak

AVG =average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

## Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.8699	32.58	10.69	43.27	56.00	-12.73	QP
2		0.4180	31.70	10.91	42.61	57.49	-14.88	QP
3		1.1740	31.44	10.62	42.06	56.00	-13.94	QP
4	*	1.6260	30.66	10.60	41.26	46.00	-4.74	AVG
5		3.3860	30.33	10.56	40.89	56.00	-15.11	QP
6		0.6620	28.49	10.78	39.27	56.00	-16.73	QP
7		0.4220	23.76	10.90	34.66	47.41	-12.75	AVG
8		0.8100	21.72	10.71	32.43	46.00	-13.57	AVG
9		1.2500	19.02	10.62	29.64	46.00	-16.36	AVG
10		1.6260	16.12	10.60	26.72	46.00	-19.28	AVG
11		3.3540	17.39	10.56	27.95	46.00	-18.05	AVG
12		0.9340	19.36	10.66	30.02	46.00	-15.98	AVG

### Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) – Limits (dBuV)

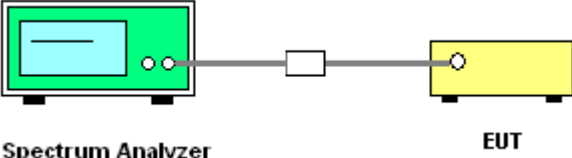
Q.P. =Quasi-Peak

AVG =average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

### 6.3. Conducted Output Power

#### 6.3.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (b)(3)
<b>Test Method:</b>	ANSI C63.10:2013
<b>Limit:</b>	Section 15.247 (b) 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.
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.
<b>Test Result:</b>	PASS

#### 6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.3.3. Test Data**

GFSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	3.50	21.00	PASS
Middle	3.39	21.00	PASS
Highest	2.88	21.00	PASS

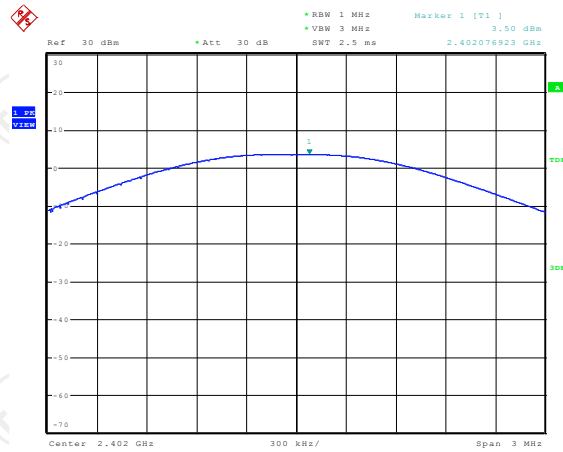
Pi/4DQPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	2.33	21.00	PASS
Middle	2.16	21.00	PASS
Highest	1.76	21.00	PASS

8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	2.34	21.00	PASS
Middle	2.16	21.00	PASS
Highest	1.75	21.00	PASS

Test plots as follows:

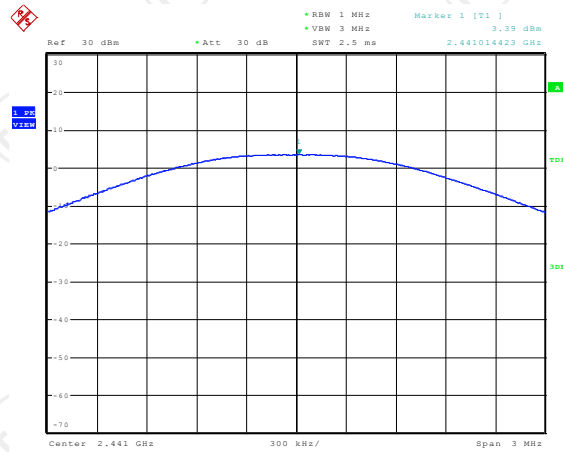


Lowest channel



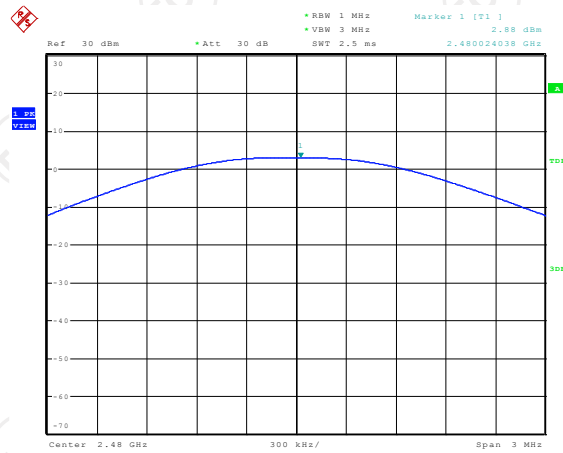
Date: 17.MAY.2017 11:54:57

Middle channel



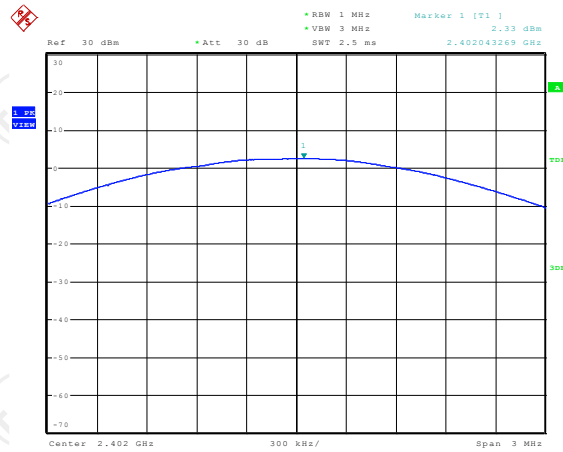
Date: 17.MAY.2017 11:56:32

Highest channel



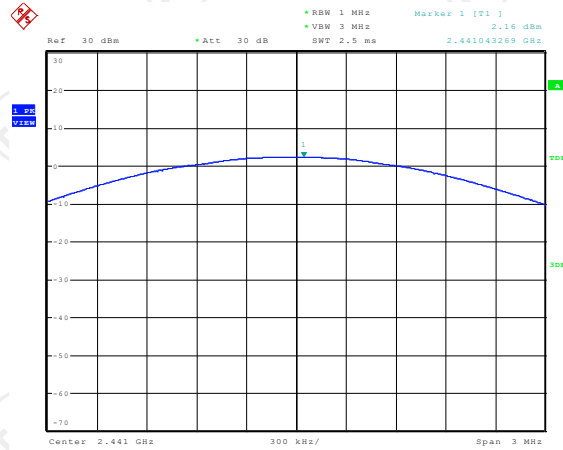
Date: 17.MAY.2017 11:58:21

Lowest channel



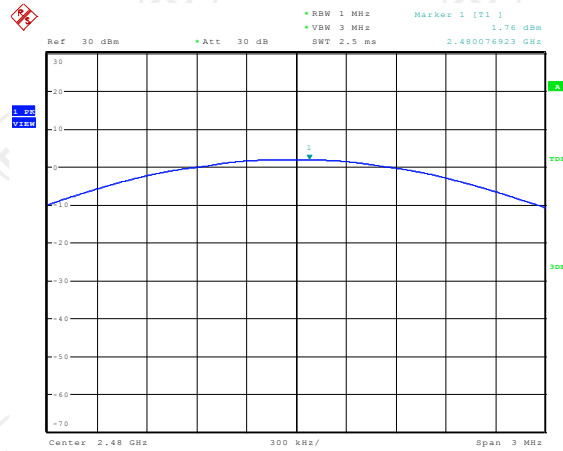
Date: 17.MAY.2017 12:01:26

Middle channel



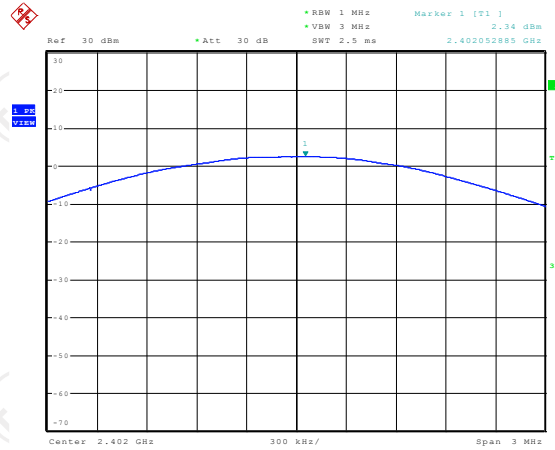
Date: 17.MAY.2017 12:03:03

Highest channel



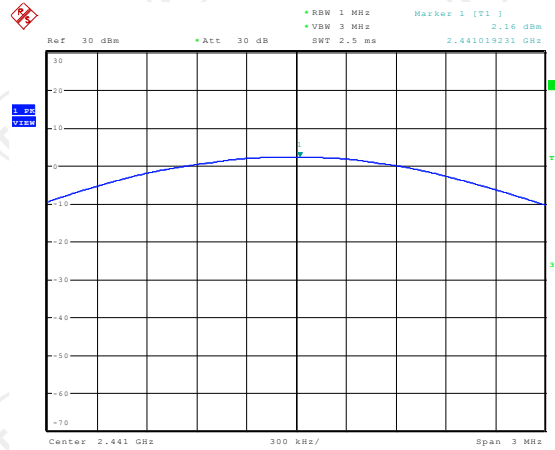
Date: 17.MAY.2017 12:06:48

### Lowest channel



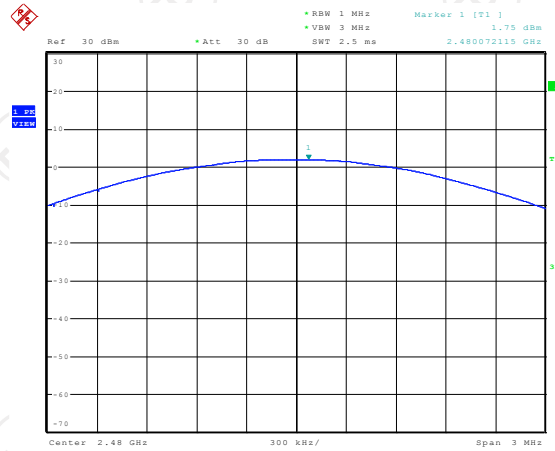
Date: 17.MAY.2017 12:08:51

### Middle channel



Date: 17.MAY.2017 12:10:45

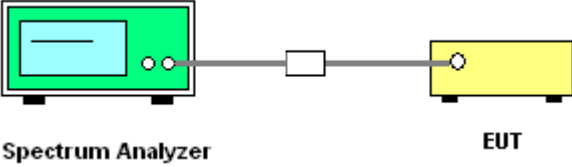
### Highest channel



Date: 17.MAY.2017 12:12:41

## 6.4. 20dB Occupy Bandwidth

### 6.4.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (a)(1)
<b>Test Method:</b>	ANSI C63.10:2013
<b>Limit:</b>	N/A
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows ANSI C63.10:2013 Measurement Guidelines.</li> <li>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.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>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; <math>1\% \leq RBW \leq 5\%</math> of the 20 dB bandwidth; <math>VBW \geq 3RBW</math>; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>5. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	PASS

### 6.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

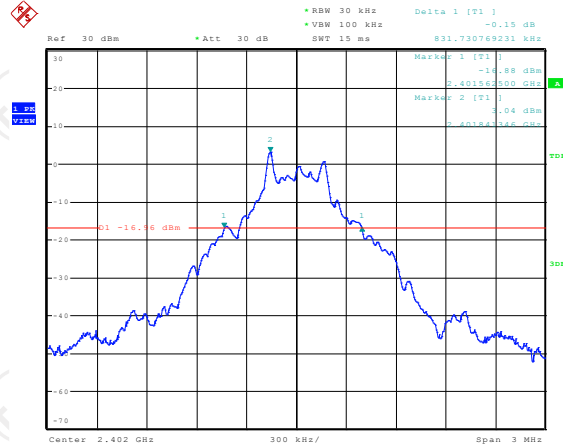
**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.4.3. Test data**

Test channel	20dB Occupy Bandwidth (kHz)			
	GFSK	$\pi/4$ -DQPSK	8DPSK	Conclusion
Lowest	832	1149	1144	PASS
Middle	837	1144	1144	PASS
Highest	837	1144	1135	PASS

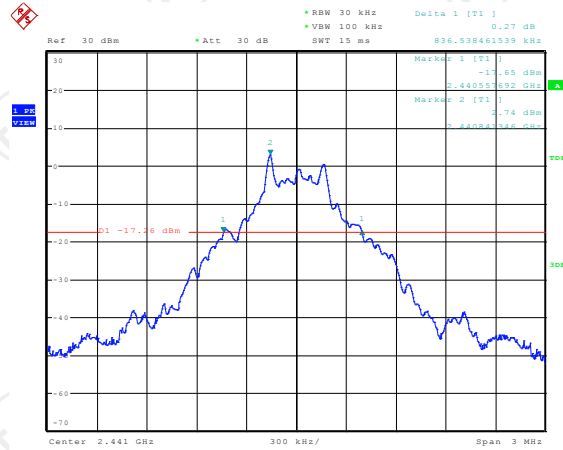
Test plots as follows:

Lowest channel



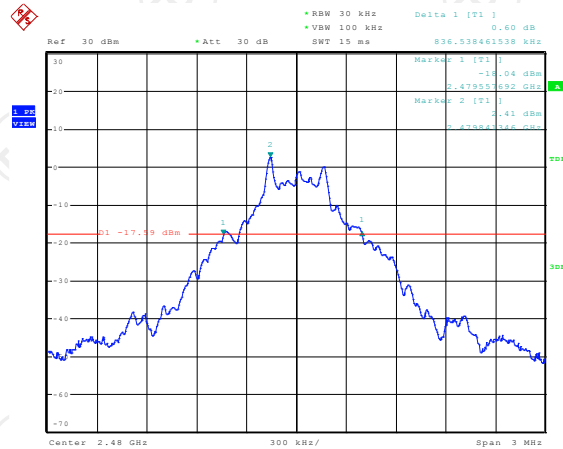
Date: 17.MAY.2017 11:14:54

Middle channel



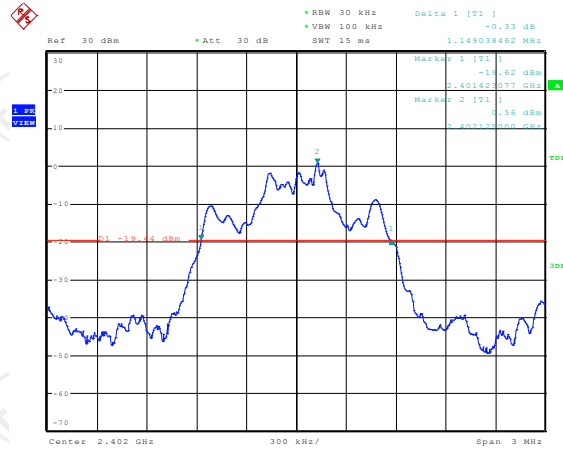
Date: 17.MAY.2017 11:17:00

Highest channel



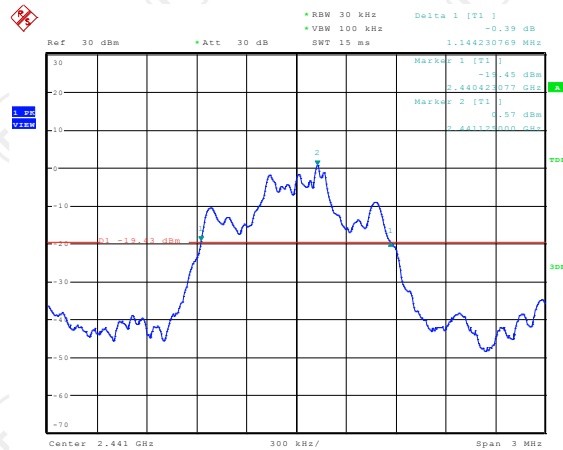
Date: 17.MAY.2017 11:33:32

Lowest channel



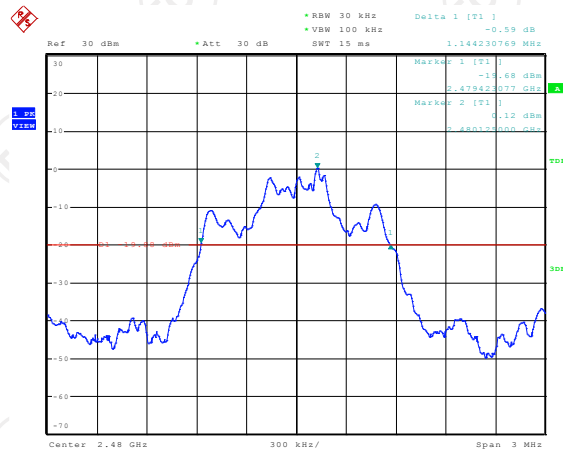
Date: 17.MAY.2017 11:35:23

Middle channel



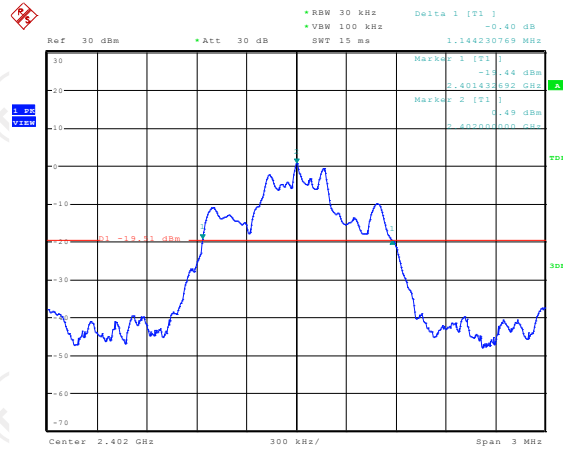
Date: 17.MAY.2017 11:44:13

Highest channel



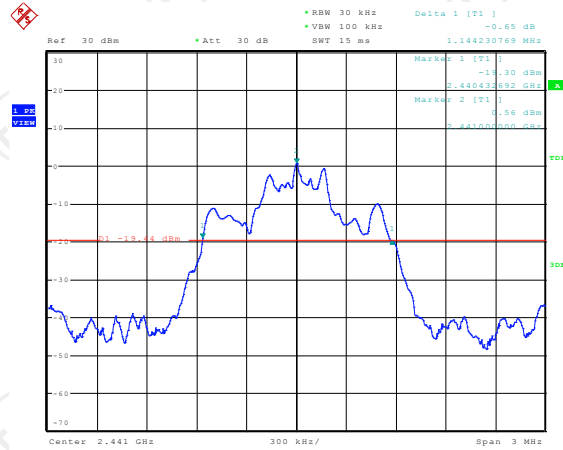
Date: 17.MAY.2017 11:46:49

Lowest channel



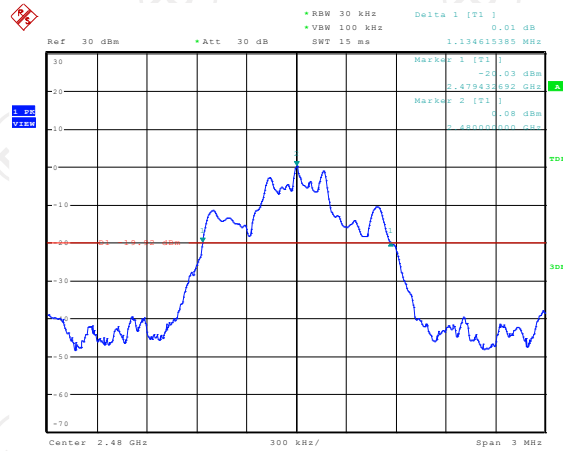
Date: 17.MAY.2017 11:48:53

Middle channel



Date: 17.MAY.2017 11:51:56

Highest channel

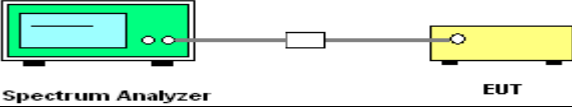


Date: 17.MAY.2017 11:53:28



## 6.5. Carrier Frequencies Separation

### 6.5.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (a)(1)
<b>Test Method:</b>	ANSI C63.10:2013
<b>Limit:</b>	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.
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Hopping mode
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows ANSI C63.10:2013 Measurement Guidelines.</li> <li>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.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>4. Enable the EUT hopping function.</li> <li>5. Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels; RBW is set to approximately 30% of the channel spacing, adjust as necessary to best identify the center of each individual channel; VBW<math>\geq</math>RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>6. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Record the value in report.</li> </ol>
<b>Test Result:</b>	PASS

### 6.5.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.5.3. Test data**

GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1000	558.00	PASS
Middle	1000	558.00	PASS
Highest	1000	558.00	PASS

Pi/4 DQPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1000	766.00	PASS
Middle	1000	766.00	PASS
Highest	1000	766.00	PASS

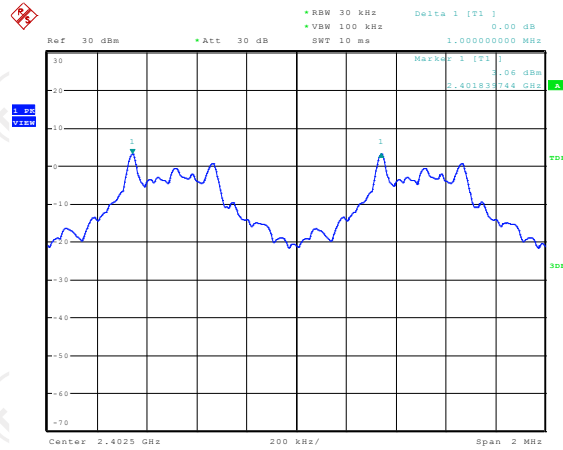
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1000	762.67	PASS
Middle	1000	762.67	PASS
Highest	1000	762.67	PASS

**Note: According to section 6.4**

Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	837	558.00
$\pi/4$ -DQPSK	1149	766.00
8DPSK	1144	762.67

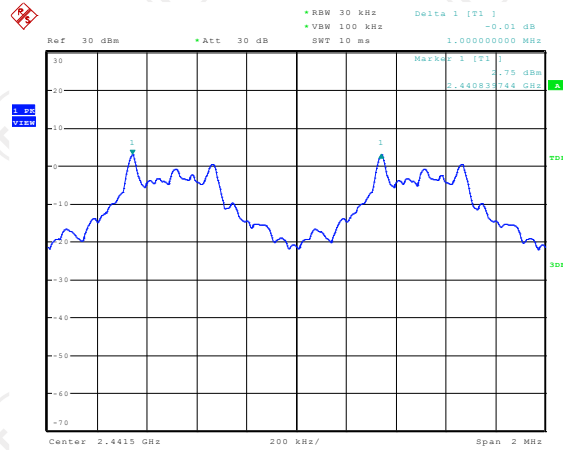
Test plots as follows:

Lowest channel



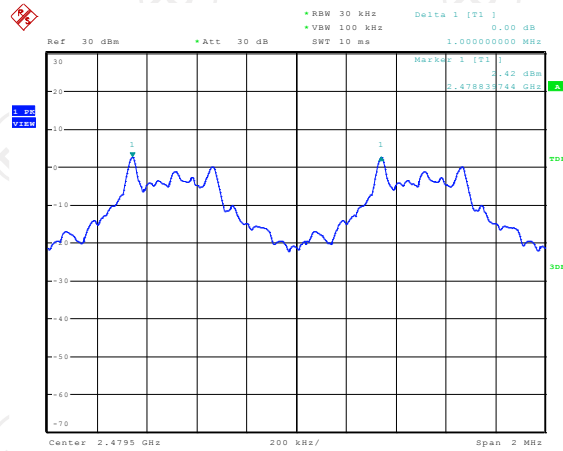
Date: 17.MAY.2017 10:44:15

Middle channel



Date: 17.MAY.2017 10:50:39

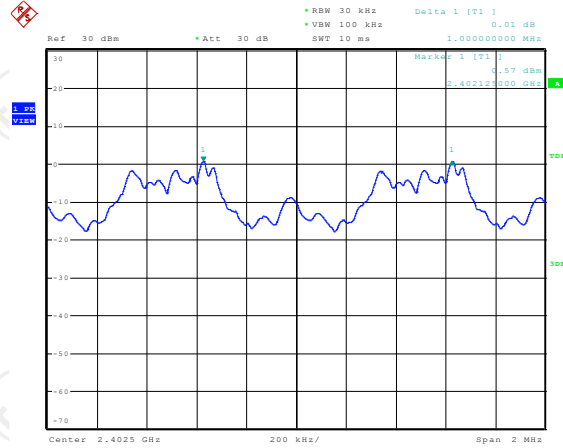
Highest channel



Date: 17.MAY.2017 10:52:48

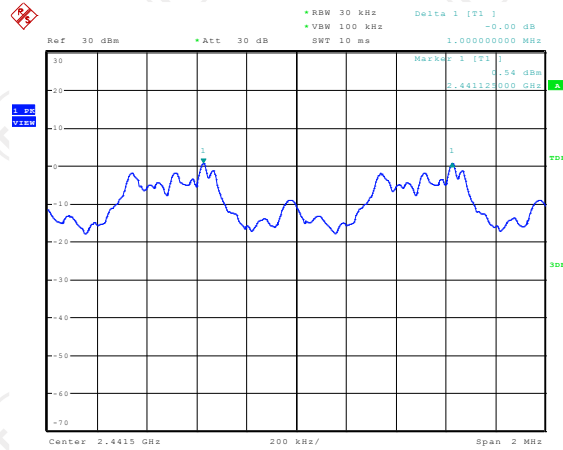
Pi/4DQPSK Modulation

Lowest channel



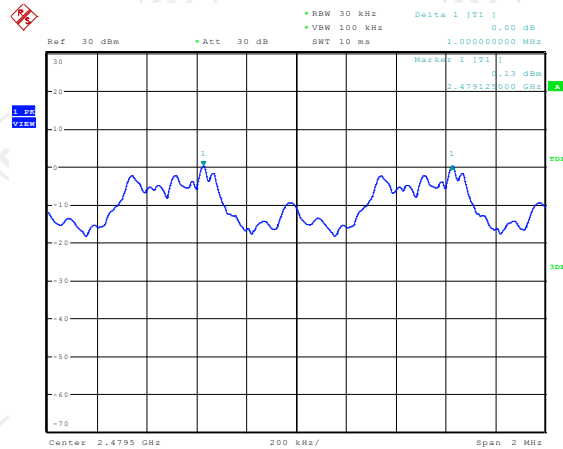
Date: 17.MAY.2017 10:56:28

Middle channel



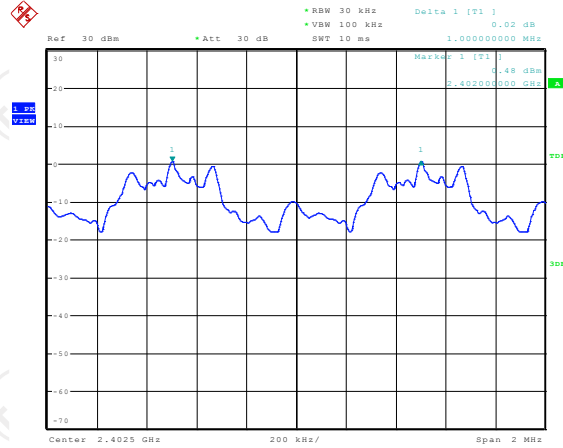
Date: 17.MAY.2017 10:58:09

Highest channel



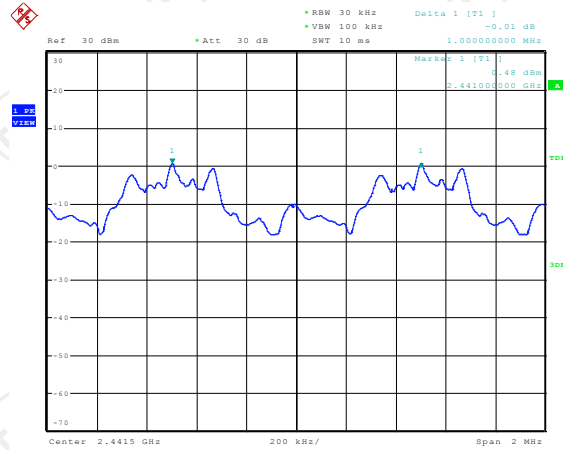
Date: 17.MAY.2017 11:01:30

Lowest channel



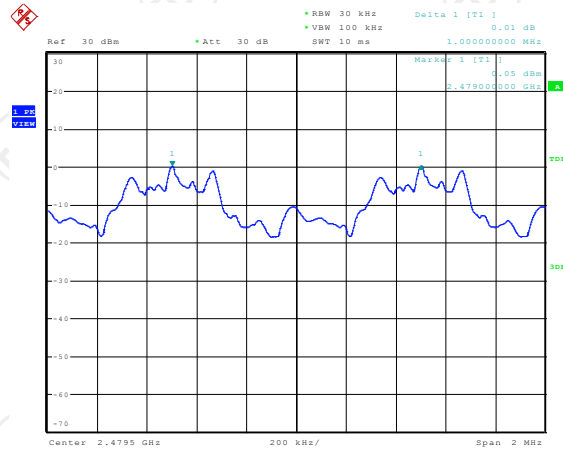
Date: 17.MAY.2017 11:04:28

Middle channel



Date: 17.MAY.2017 11:06:31

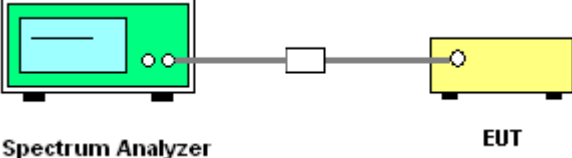
Highest channel



Date: 17.MAY.2017 11:10:10

## 6.6. Hopping Channel Number

### 6.6.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (a)(1)
<b>Test Method:</b>	ANSI C63.10:2013
<b>Limit:</b>	Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Hopping mode
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows ANSI C63.10:2013 Measurement Guidelines.</li> <li>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.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>4. Enable the EUT hopping function.</li> <li>5. Use the following spectrum analyzer settings: Span = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW<math>\geq</math>RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>6. The number of hopping frequency used is defined as the number of total channel.</li> <li>7. Record the measurement data in report.</li> </ol>
<b>Test Result:</b>	PASS

### 6.6.2. Test Instruments

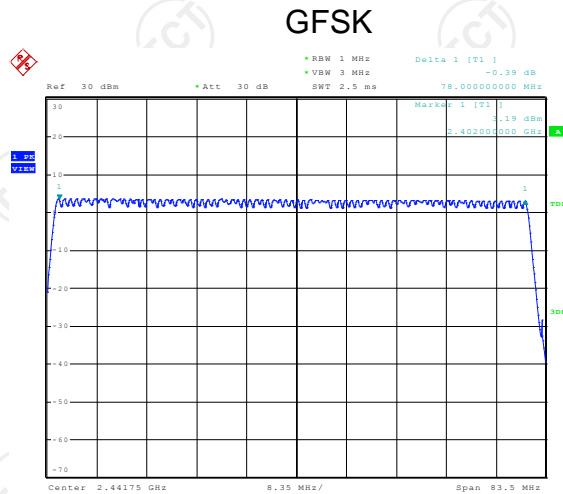
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.6.3. Test data

Mode	Hopping channel numbers	Limit	Result
Hopping	79	15	PASS

Test plots as follows:



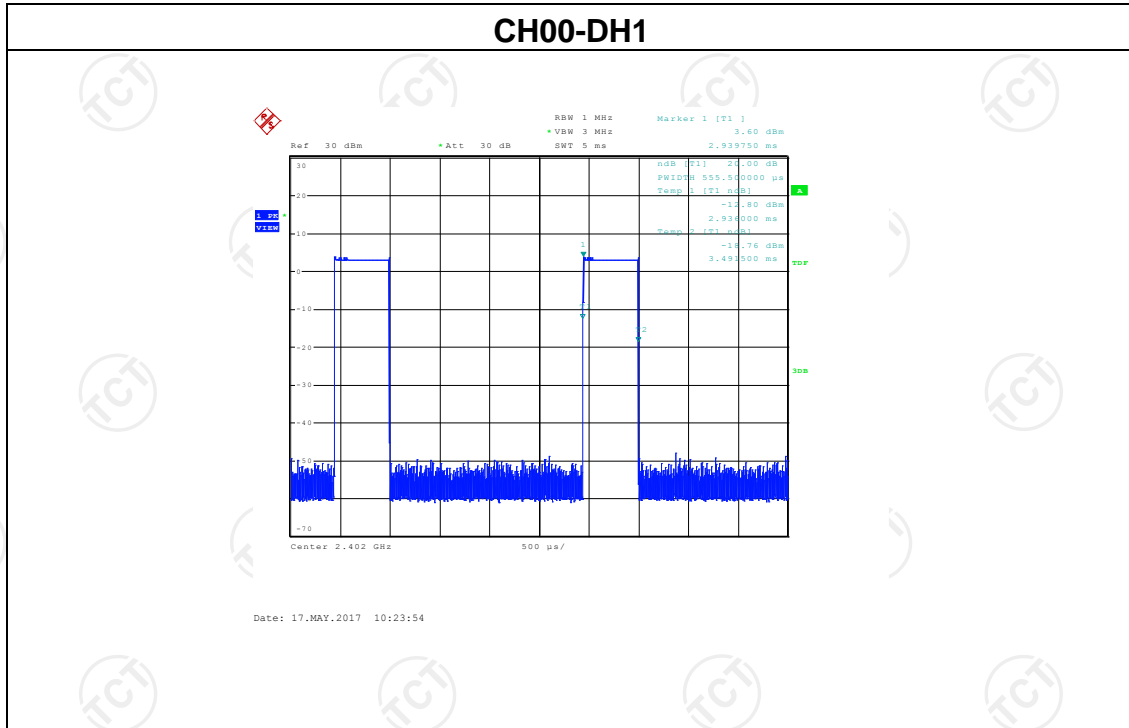
Date: 17.MAY.2017 10:22:05



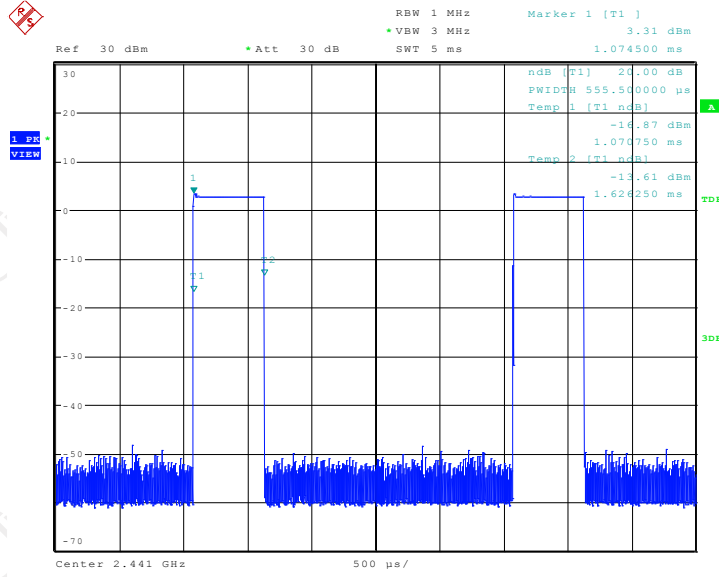


Test Data

Data Packet	Frequency	Pulse time(ms)	Dwell Time(S)	Limits (S)
DH1	2402MHz	0.556	0.178	0.4
DH1	2441MHz	0.556	0.178	0.4
DH1	2480MHz	0.556	0.178	0.4

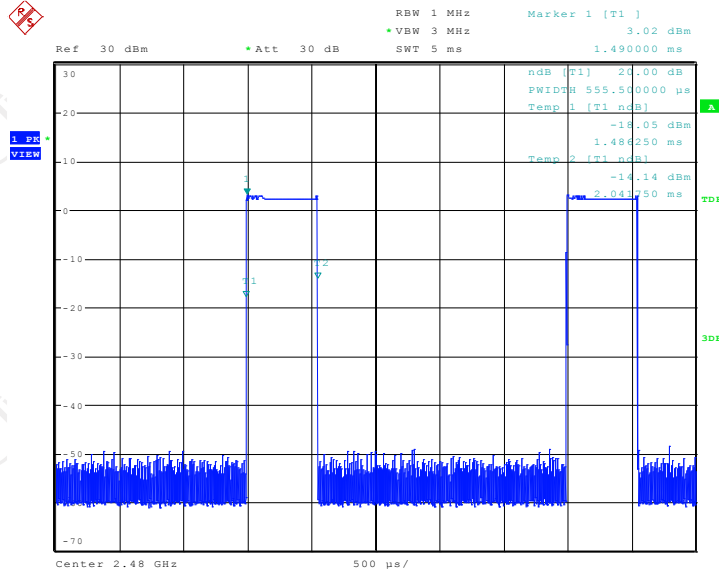


**CH39-DH1**



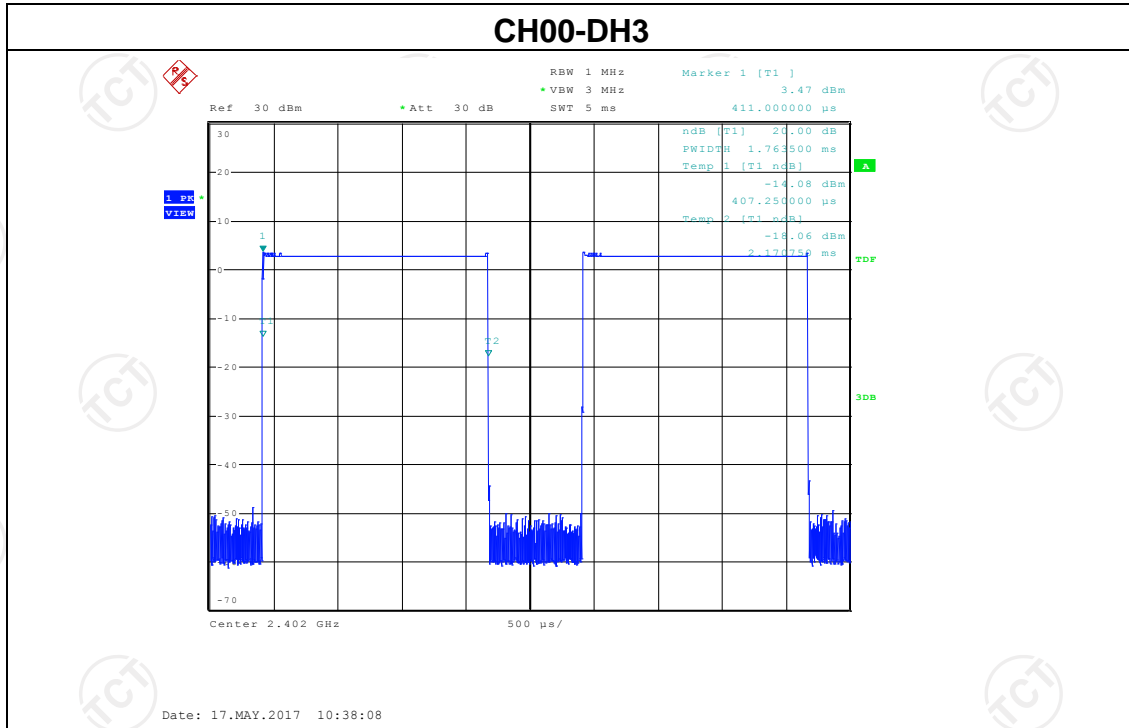
Date: 17.MAY.2017 10:24:36

**CH78-DH1**

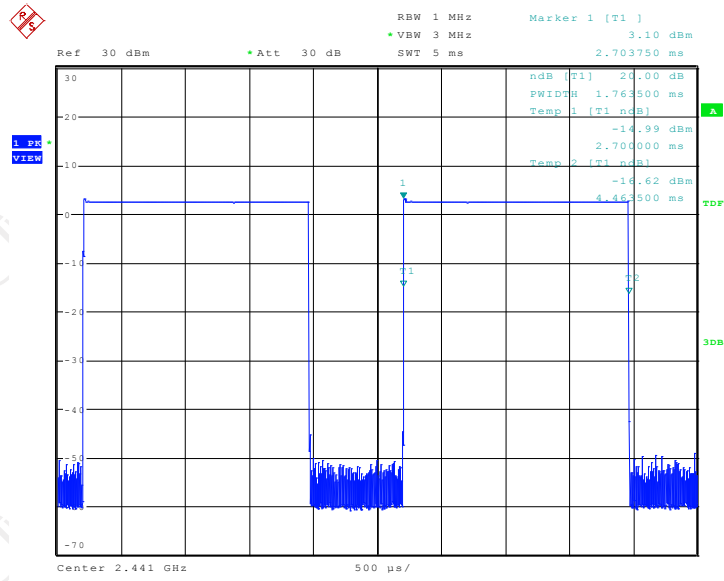


Date: 17.MAY.2017 10:25:01

Data Packet	Frequency	Pulse time(ms)	Dwell Time(S)	Limits (S)
DH3	2402MHz	1.764	0.282	0.4
DH3	2441MHz	1.764	0.282	0.4
DH3	2480MHz	1.764	0.282	0.4

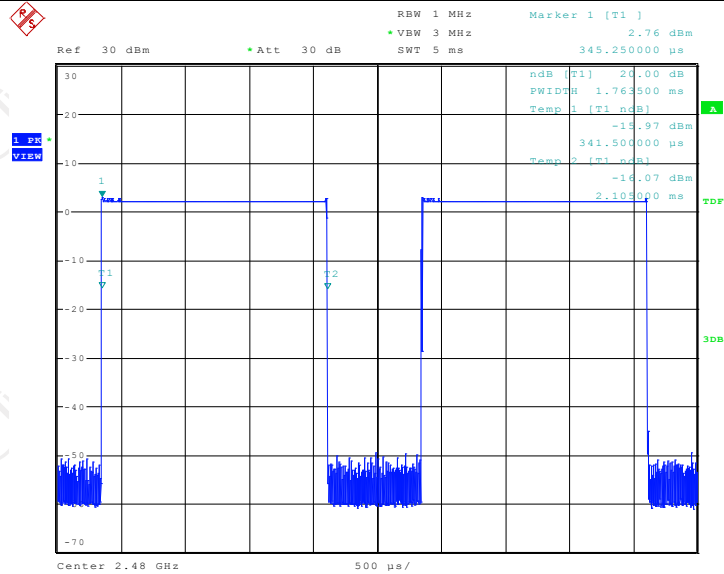


**CH39-DH3**



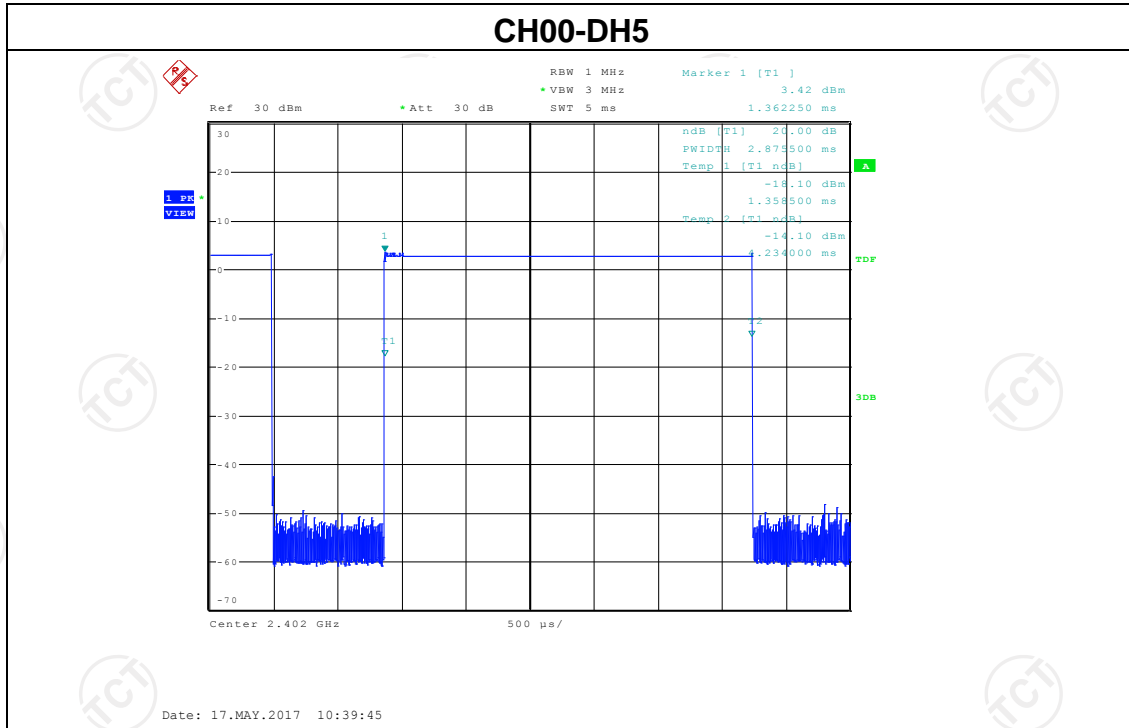
Date: 17.MAY.2017 10:38:40

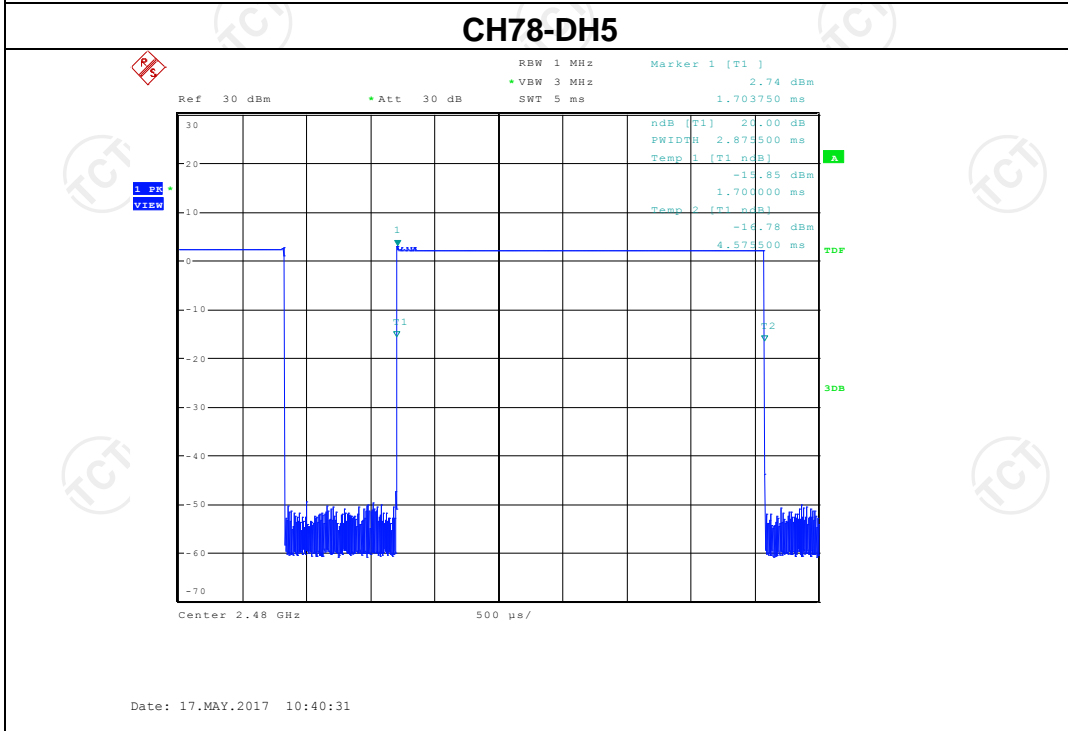
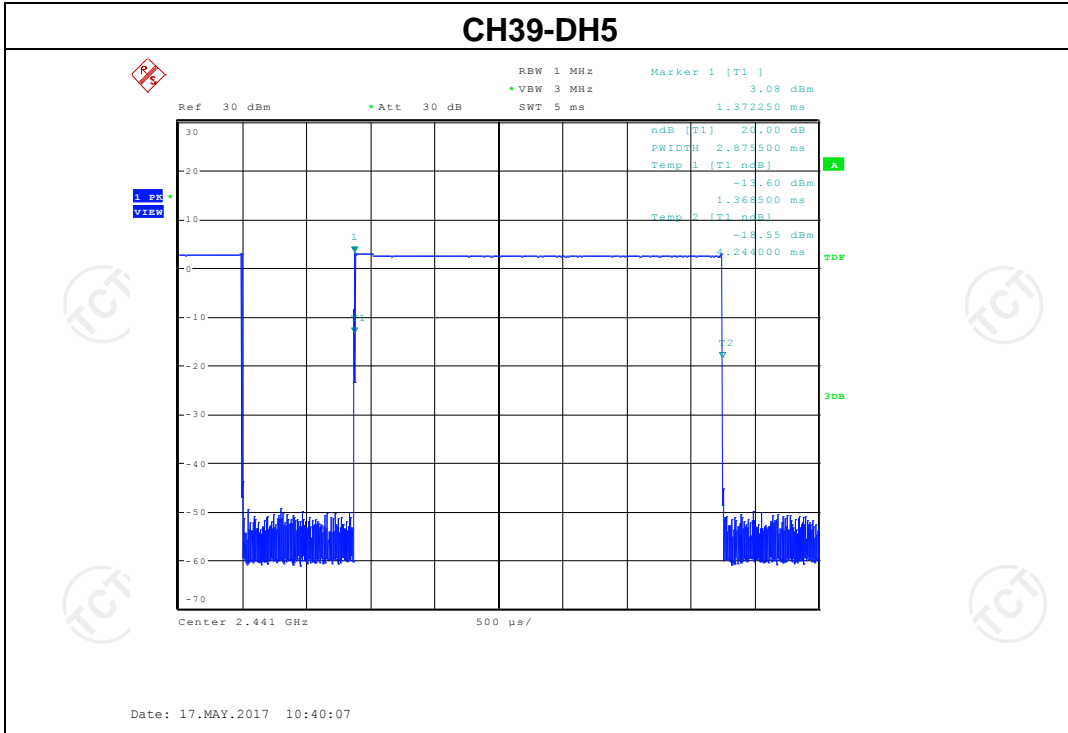
**CH78-DH3**



Date: 17.MAY.2017 10:39:02

Data Packet	Frequency	Pulse time(ms)	Dwell Time(S)	Limits (S)
DH5	2402MHz	2.876	0.307	0.4
DH5	2441MHz	2.876	0.307	0.4
DH5	2480MHz	2.876	0.307	0.4





### 6.8. Pseudorandom Frequency Hopping Sequence

<b>Test Requirement:</b>	<b>FCC Part15 C Section 15.247 (a)(1) requirement:</b>
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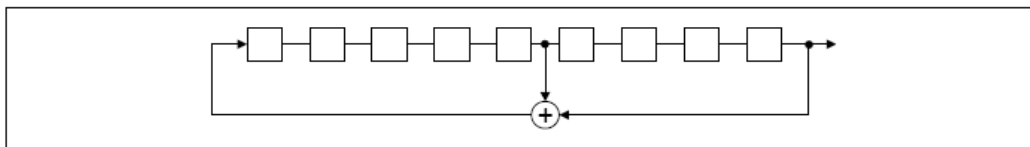
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively. 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, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

#### EUT Pseudorandom Frequency Hopping Sequence

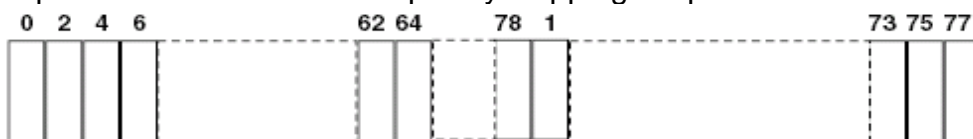
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first one of 9 consecutive ones; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence:  $2^9 - 1 = 511$  bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

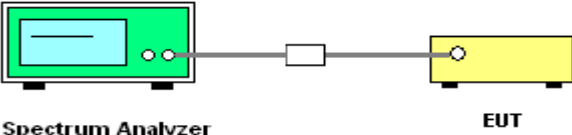
An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter. The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

## 6.9. Conducted Band Edge Measurement

### 6.9.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (d)
<b>Test Method:</b>	ANSI C63.10:2013
<b>Limit:</b>	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.
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows the guidelines in Band-edge Compliance of RF Conducted Emissions of ANSI C63.10:2013 Measurement Guidelines.</li> <li>2. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>3. Set RBW = 100 kHz (<math>\geq 1\%</math> span=10MHz), VBW = 300 kHz (<math>\geq</math>RBW). 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.</li> <li>4. Enable hopping function of the EUT and then repeat step 2 and 3.</li> <li>5. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	PASS

### 6.9.2. Test Instruments

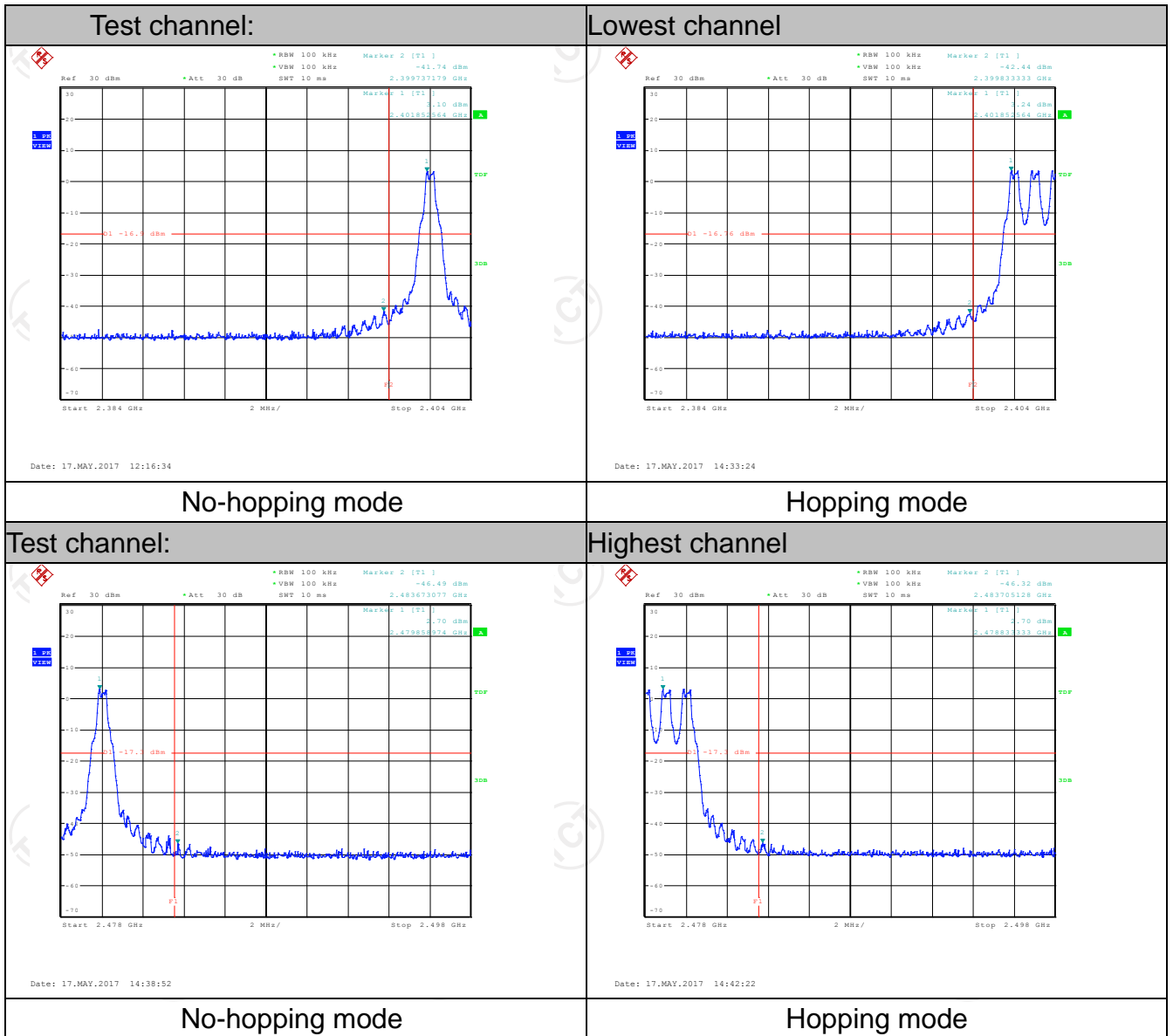
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

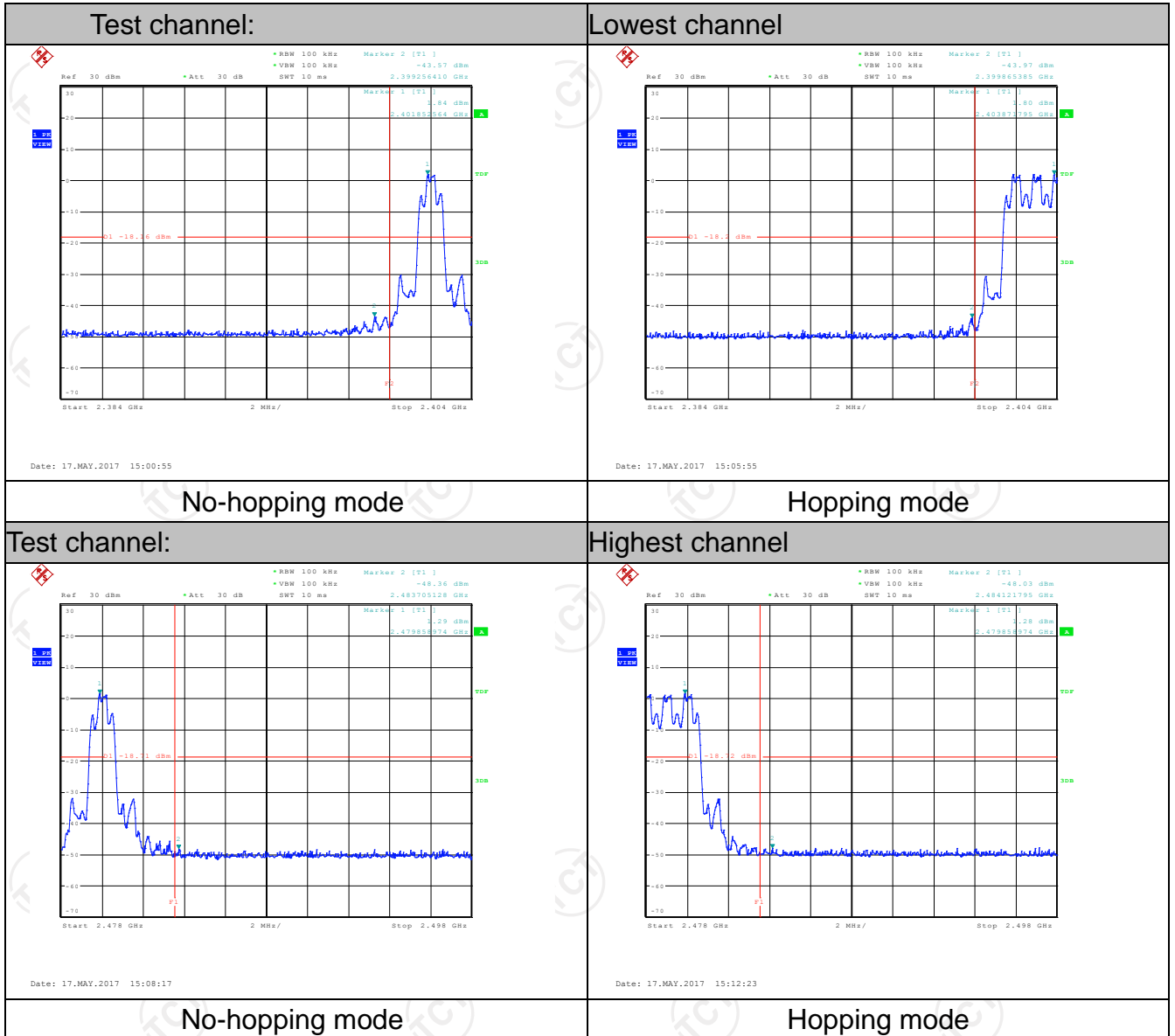


6.9.3. Test Data

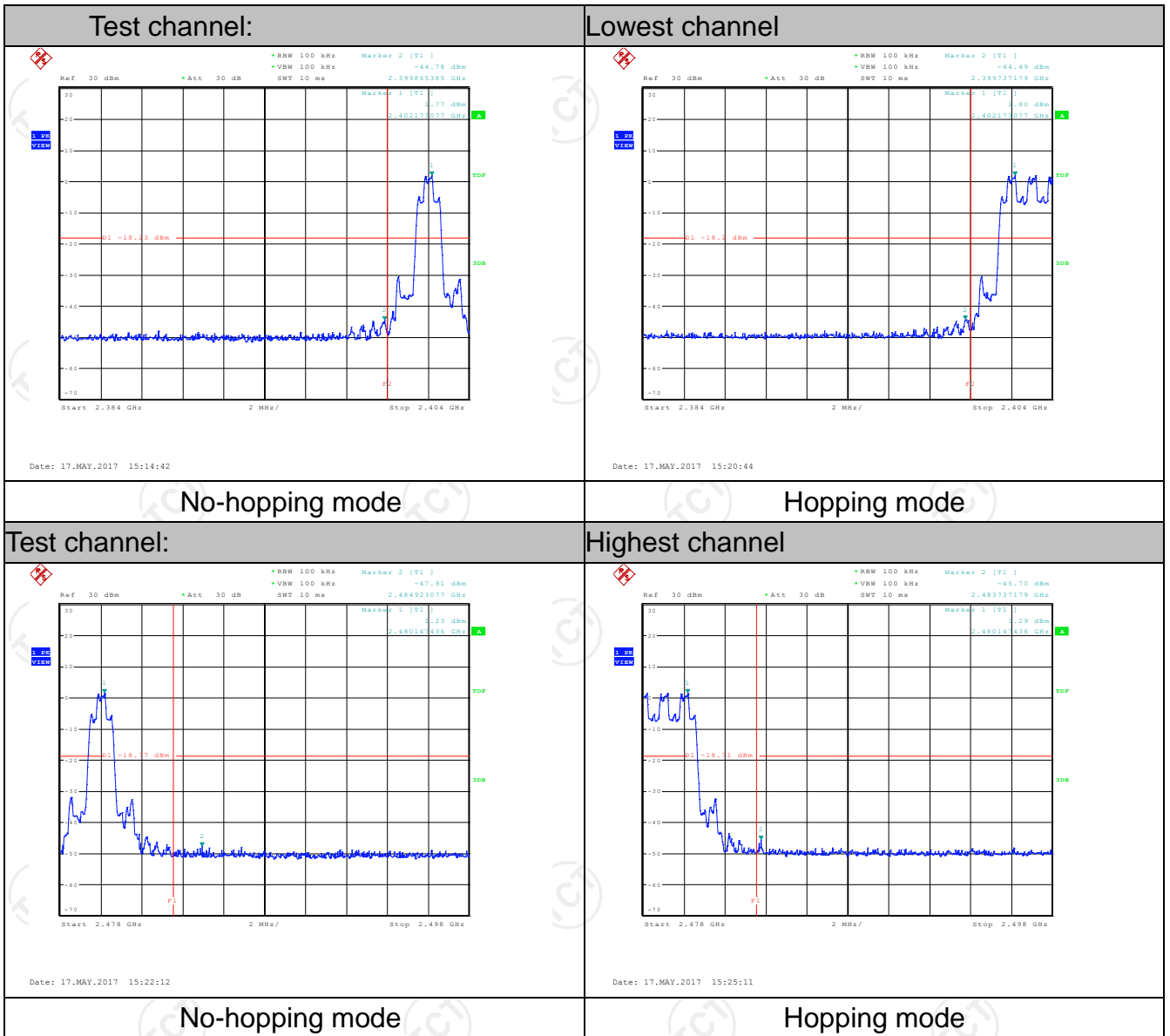
GFSK Modulation



**Pi/4DQPSK Modulation**




**8DPSK Modulation**



## 6.10. Conducted Spurious Emission Measurement

### 6.10.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (d)
<b>Test Method:</b>	ANSI C63.10:2013
<b>Limit:</b>	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.
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows the guidelines in Spurious RF Conducted Emissions of ANSI C63.10:2013 Measurement Guidelines</li> <li>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.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>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.</li> <li>5. Measure and record the results in the test report.</li> <li>6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.</li> </ol>
<b>Test Result:</b>	PASS

### 6.10.2. Test Instruments

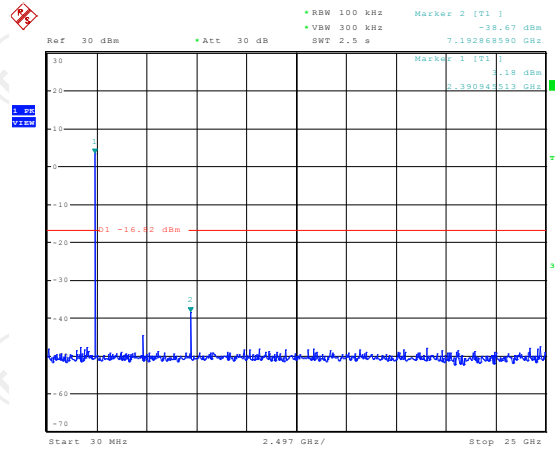
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHWARZ	FSQ	200061	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.10.3. Test Data**

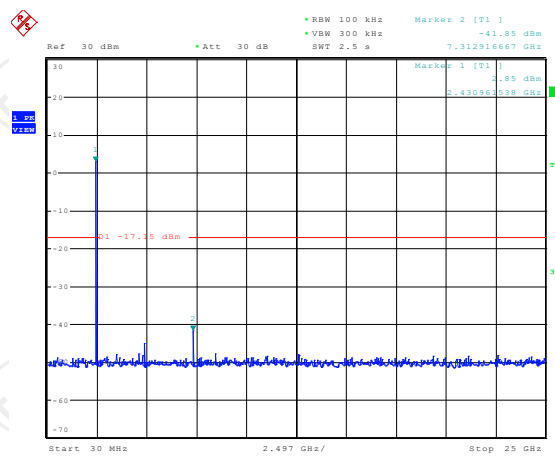
GFSK mode

**Lowest Channel**



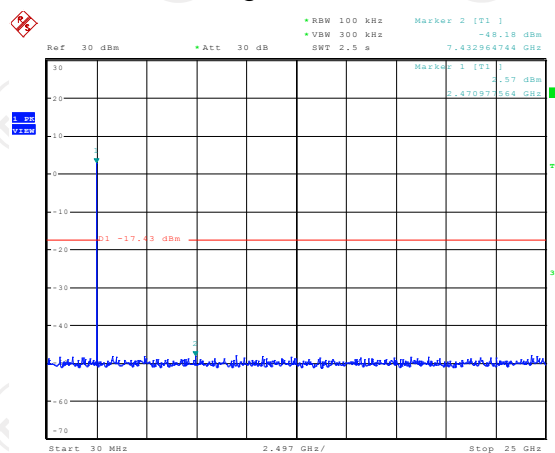
Date: 17.MAY.2017 15:27:43

**Middle Channel**



Date: 17.MAY.2017 15:28:34

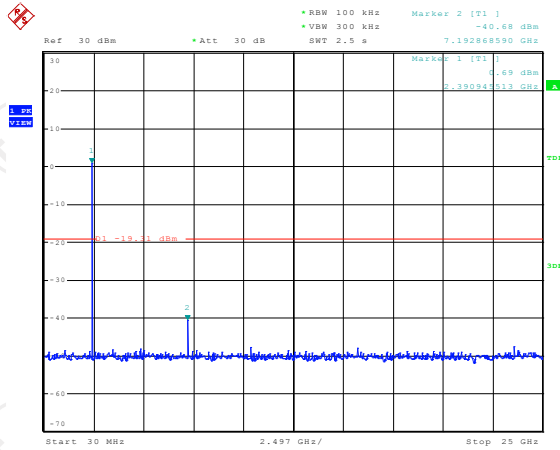
**Highest Channel**



Date: 17.MAY.2017 15:29:54

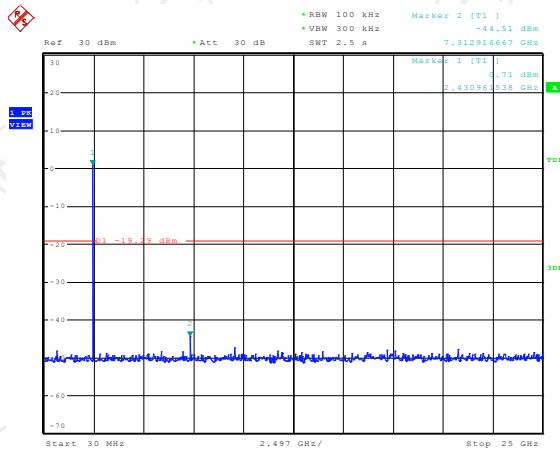
Pi/4DQPSK mode

Lowest Channel



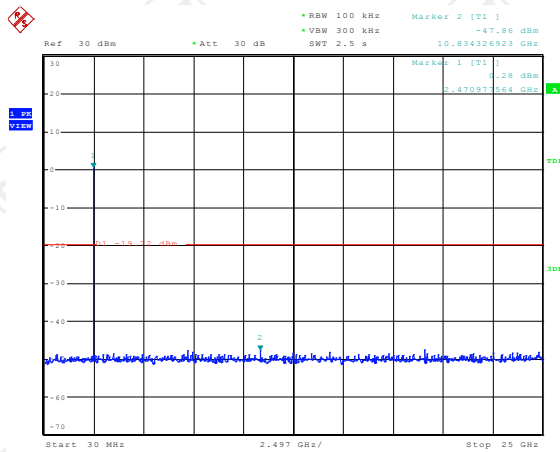
Date: 17.MAY.2017 15:31:01

Middle Channel



Date: 17.MAY.2017 15:31:48

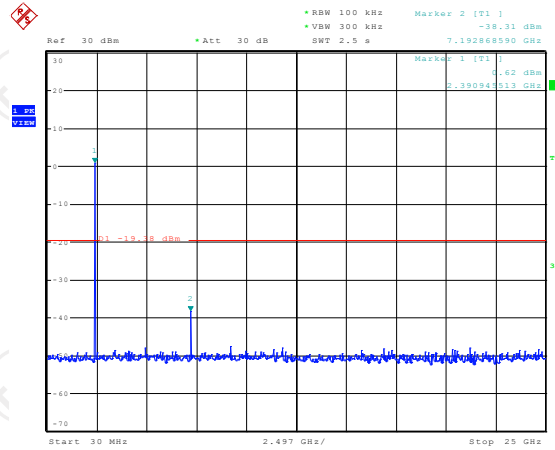
Highest Channel



Date: 17.MAY.2017 15:32:47

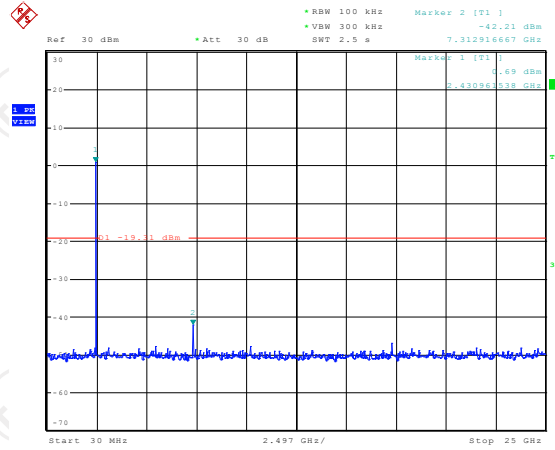
8DPSK mode

Lowest Channel



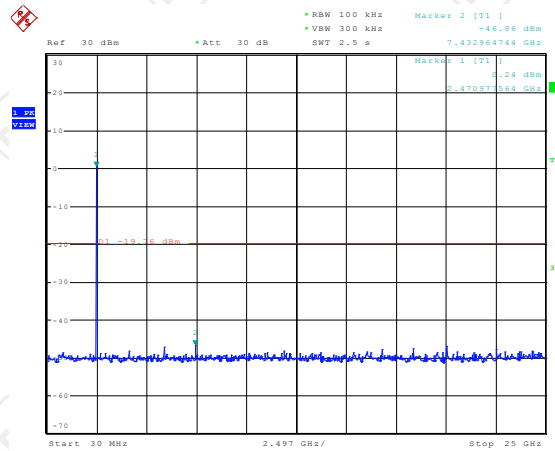
Date: 17.MAY.2017 15:35:28

Middle Channel



Date: 17.MAY.2017 15:36:14

Highest Channel



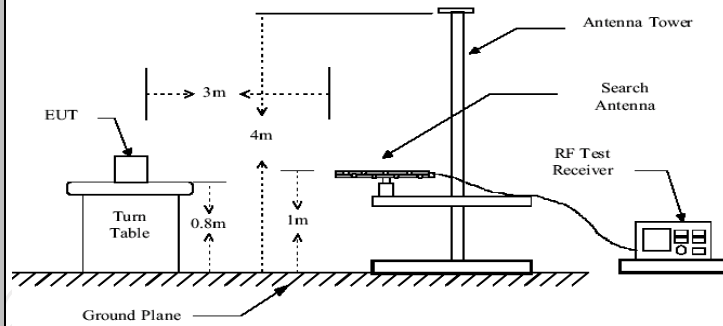
Date: 17.MAY.2017 15:36:58

## 6.11. Radiated Spurious Emission Measurement

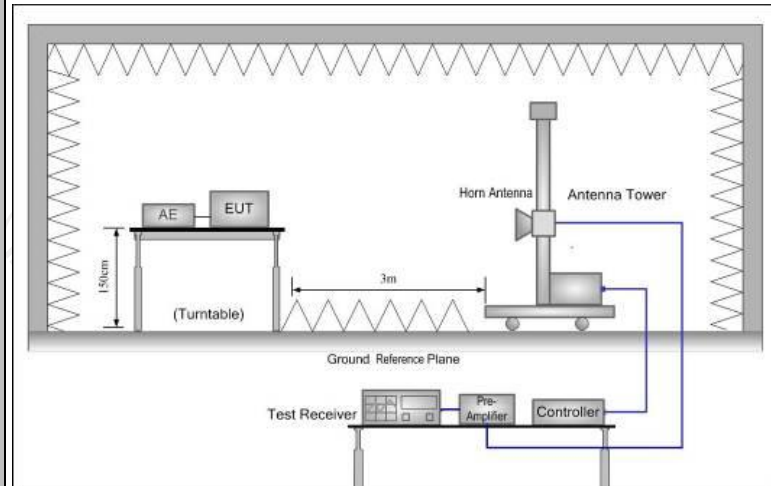
### 6.11.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.209				
<b>Test Method:</b>	ANSI C63.10:2013				
<b>Frequency Range:</b>	9 kHz to 25 GHz				
<b>Measurement Distance:</b>	3 m				
<b>Antenna Polarization:</b>	Horizontal & Vertical				
<b>Receiver Setup:</b>	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
<b>Limit:</b>	Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)		
	0.009-0.490	2400/F(KHz)	300		
	0.490-1.705	24000/F(KHz)	30		
	1.705-30	30	30		
	30-88	100	3		
	88-216	150	3		
	216-960	200	3		
	Above 960	500	3		
	Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector	
	Above 1GHz	500	3	Average	
	5000	3	Peak		
<b>Test setup:</b>	For radiated emissions below 30MHz				
	<p>Distance = 3m</p> <p>EUT</p> <p>Turn table</p> <p>Ground Plane</p> <p>Computer</p> <p>Pre-Amplifier</p> <p>Receiver</p>				
	30MHz to 1GHz				





Above 1GHz



**Test Mode:**

Transmitting mode with modulation

**Test Procedure:**

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10:2013 Measurement Guidelines.

2. For the radiated emission test below 1GHz:

The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.

For the radiated emission test above 1GHz:

Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT,

	<p>depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</p> <p>3. Set to the maximum power setting and enable the EUT transmit continuously.</p> <p>4. Use the following spectrum analyzer settings:</p> <p>(1) Span shall wide enough to fully capture the emission being measured;</p> <p>(2) Set RBW=100 kHz for f &lt; 1 GHz, RBW=1MHz for f&gt;1GHz ; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak</p> <p>(3) For average measurement: use duty cycle correction factor method per 15.35(c). Duty cycle = On time/100 milliseconds On time =N1*L1+N2*L2+...+Nn-1*LNn-1+Nn*Ln Where N1 is number of type 1 pulses, L1 is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + 20*log(Duty cycle)</p> <p>Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p>
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<b>Test results:</b>	PASS
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**6.11.2. Test Instruments**

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ	200061	Sep. 27, 2018
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 27, 2018
Pre-amplifier	HP	8447D	2727A05017	Sep. 27, 2018
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
Coax cable (9KHz-1GHz)	TCT	RE-low-01	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 27, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-03	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Sep. 27, 2018
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

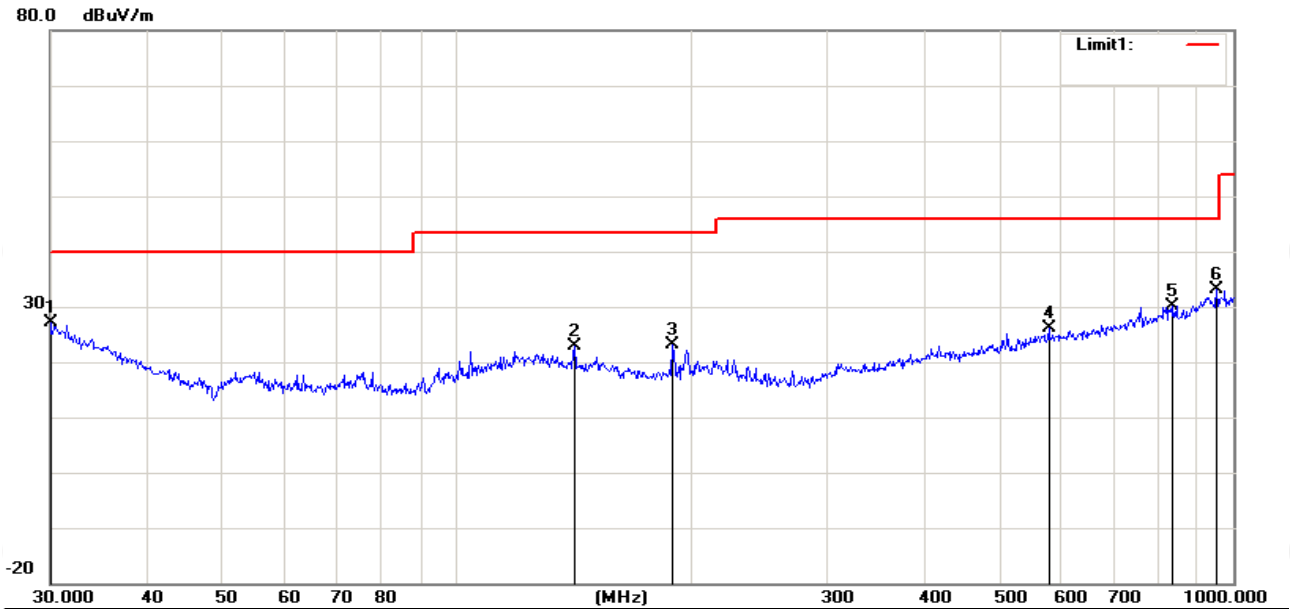
**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.11.3. Test Data

Please refer to following diagram for individual

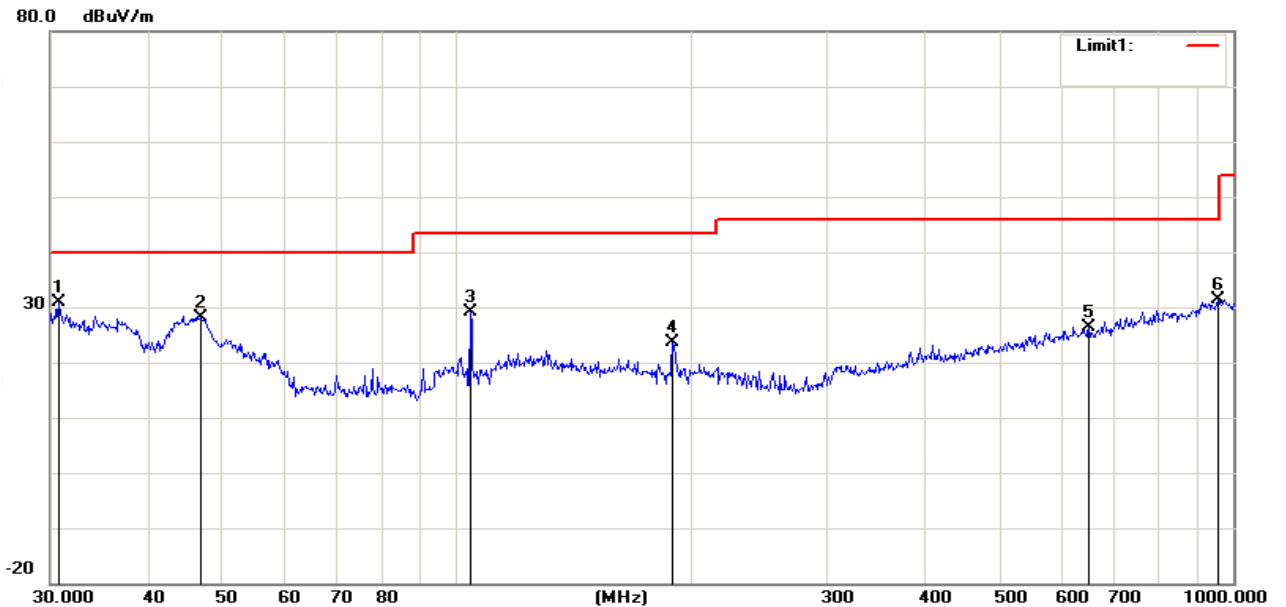
Below 1GHz

Horizontal:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		30.0000	23.67	3.49	27.16	40.00	-12.84	QP
2		141.8262	26.06	-3.19	22.87	43.50	-20.63	QP
3		189.7384	28.51	-5.28	23.23	43.50	-20.27	QP
4		578.6698	25.39	0.68	26.07	46.00	-19.93	QP
5		836.2441	25.10	5.00	30.10	46.00	-15.90	QP
6	*	952.0937	11.01	22.19	33.20	46.00	-12.80	QP

Vertical:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	30.7454	27.78	2.99	30.77	40.00	-9.23	QP
2		46.8303	35.77	-7.56	28.21	40.00	-11.79	QP
3		104.1701	34.36	-5.18	29.18	43.50	-14.32	QP
4		189.7384	28.92	-5.28	23.64	43.50	-19.86	QP
5		651.9415	24.66	1.69	26.35	46.00	-19.65	QP
6		955.4379	8.78	22.49	31.27	46.00	-14.73	QP

**Note:** 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

**Above 1GHz**

Test Mode	Mode 1 TX(1Mbps)	Frequency	2402MHz
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Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4804	V	59.39	39.73	74	54	-14.61	-14.27
7206	V	59.50	39.95	74	54	-14.50	-14.05
4804	H	58.72	40.68	74	54	-15.28	-13.32
7206	H	58.79	39.79	74	54	-15.21	-14.21

Test Mode	Mode 2 TX(2Mbps)	Frequency	2441MHz
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Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4882	V	59.07	41.82	74	54	-14.93	-12.18
7323	V	58.17	39.29	74	54	-15.83	-14.71
4882	H	59.41	40.27	74	54	-14.59	-13.73
7323	H	58.79	39.79	74	54	-15.21	-14.21

Test Mode	Mode 3 TX(3Mbps)	Frequency	2480MHz
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Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4960	V	60.66	39.00	74	54	-13.34	-15.00
7440	V	59.88	39.03	74	54	-14.12	-14.97
4960	H	59.58	39.32	74	54	-14.42	-14.68
7440	H	59.67	40.67	74	54	-14.33	-13.33

**Remark:**

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

All the x/y/z orientation has been investigated, and only worst case is presented in this report.

**Restricted Bands Requirements**  
**Test result for 1Mbps Mode:**

Test Mode	TX /Mode1-1Mbps(CH0)	Polarization	Vertical
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2387	62.82	-8.76	54.06	74	19.94	peak
2387	54.69	-8.76	45.93	54	8.07	AVG
2390	63.18	-8.73	54.45	74	19.55	peak
2390	55.09	-8.73	46.36	54	7.64	AVG

Test Mode	TX /Mode1-1Mbps(CH0)	Polarization	Horizontal
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2384	61.81	-8.76	53.05	74	20.95	peak
2384	55.84	-8.76	47.08	54	6.92	AVG
2390	59.57	-8.73	50.84	74	23.16	peak
2390	56.82	-8.73	48.09	54	5.91	AVG

Test Mode	TX /Mode 3-1Mbps(CH78)	Polarization	Vertical
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	63.40	-8.17	55.23	74	18.77	peak
2483.5	54.20	-8.17	46.03	54	7.97	AVG

Test Mode	TX /Mode 3-1Mbps(CH78)	Polarization	Horizontal
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	62.36	-8.17	54.19	74	19.81	peak
2483.5	54.94	-8.17	46.77	54	7.23	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

All the x/y/z orientation has been investigated, and only worst case is presented in this report.

**Test result for 2Mbps Mode:**

Test Mode	TX /Mode1-2Mbps(CH0)	Polarization	Vertical
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Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2387	62.89	-8.76	54.13	74	19.87	peak
2387	55.49	-8.76	46.73	54	7.27	AVG
2390	59.95	-8.73	51.22	74	22.78	peak
2390	55.12	-8.73	46.39	54	7.61	AVG

Test Mode	TX /Mode1-2Mbps(CH0)	Polarization	Horizontal
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Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2384	61.03	-8.76	52.27	74	21.73	peak
2384	56.56	-8.76	47.80	54	6.20	AVG
2390	61.49	-8.73	52.76	74	21.24	peak
2390	55.17	-8.73	46.44	54	7.56	AVG

Test Mode	TX /Mode3-2Mbps(CH78)	Polarization	Vertical
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Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	61.30	-8.17	53.13	74	20.87	peak
2483.5	54.24	-8.17	46.07	54	7.93	AVG

Test Mode	TX /Mode3-2Mbps(CH78)	Polarization	Horizontal
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Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	64.11	-8.17	55.94	74	18.06	peak
2483.5	53.81	-8.17	45.64	54	8.36	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

All the x/y/z orientation has been investigated, and only worst case is presented in this report.



## Test result for 3Mbps Mode:

Test Mode	TX /Model 1-3Mbps(CH0)	Polarization	Vertical
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2387	61.97	-8.76	53.21	74	20.79	peak
2387	56.03	-8.76	47.27	54	6.73	AVG
2390	62.34	-8.73	53.61	74	20.39	peak
2390	57.95	-8.73	49.22	54	4.78	AVG

Test Mode	TX /Mode 1-3Mbps(CH0)	Polarization	Horizontal
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2384	64.49	-8.76	55.73	74	18.27	peak
2384	56.07	-8.76	47.31	54	6.69	AVG
2390	60.41	-8.73	51.68	74	22.32	peak
2390	56.69	-8.73	47.96	54	6.04	AVG

Test Mode	TX /Model 3-3Mbps(CH78)	Polarization	Vertical
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	61.48	-8.17	53.31	74	20.69	peak
2483.5	53.50	-8.17	45.33	54	8.67	AVG

Test Mode	TX /Model 3-3Mbps(CH78)	Polarization	Horizontal
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	60.21	-8.17	52.04	74	21.96	peak
2483.5	54.11	-8.17	45.94	54	8.06	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

All the x/y/z orientation has been investigated, and only worst case is presented in this report.

**Test result for hopping mode:**

Test Mode	hopping mode-1Mbps	Polarization	Vertical
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2387	60.86	-8.76	52.10	74	21.90	peak
2387	55.14	-8.76	46.38	54	7.62	AVG
2390	60.26	-8.73	51.53	74	22.47	peak
2390	57.64	-8.73	48.91	54	5.09	AVG

Test Mode	Hopping mode-1Mbps	Polarization	Horizontal
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2387	60.08	-8.76	51.32	74	22.68	peak
2387	55.50	-8.76	46.74	54	7.26	AVG
2390	62.96	-8.73	54.23	74	19.77	peak
2390	57.85	-8.73	49.12	54	4.88	AVG

Test Mode	Hopping mode-1Mbps	Polarization	Vertical
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	62.68	-8.17	54.51	74	19.49	peak
2483.5	54.83	-8.17	46.66	54	7.34	AVG

Test Mode	Hopping mode-1Mbps	Polarization	Horizontal
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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	62.43	-8.17	54.26	74	19.74	peak
2483.5	54.36	-8.17	46.19	54	7.81	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

All the x/y/z orientation has been investigated, and only worst case is presented in this report.

## Appendix A: Photographs of Test Setup

Refer to test report TCT171020E013

## Appendix B: Photographs of EUT

Refer to test report TCT171020E013

**\*\*\*\*\*END OF REPORT\*\*\*\*\***