FCC PART 15.247

TEST REPORT

For

SZ DJI TECHNOLOGY CO., LTD

14th floor, West Wing, Skyworth Semiconductor Design Building NO.18 Gaoxin South 4th Ave, Nanshan, Shenzhen, Guangdong, China

FCC ID: SS3-DLG30A1702

Report Type:	Product Name:
Original Report	C1

Test Engineer:	*Lorin Bian*
Report Number:	RDG170308007
Report Date:	2017-04-22
Reviewed By:	Henry Ding EMC Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China Tel: 028-65523123, Fax: 028-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***SZ DJI TECHNOLOGY CO., LTD***'s product, model number: ***DLG30A*** ***(FCC ID: SS3-DLG30A1702)*** (the "EUT") in this report was a ***C1***, which was measured approximately: 18.2 cm (L) x17.2 cm (W) x 7.1 cm(H), rated input voltage: DC7.4V from lithium battery or DC 17.4V from adapter.

Adapter Information:
MODEL: A14-057N1A
UP/N: A057R003L REV: 02
INPUT: 100-240V~1.8A 50-60Hz
OUTPUT:DC17.4V 3.3A

**All measurement and test data in this report was gathered from final production sample, serial number: 170308007 (assigned by the BACL, Chengdu). It may have deviation from any other sample.The EUT supplied by the applicant was received on 2017-03-09, and EUT conformed to test requirement.*

Objective

This report is prepared on behalf of ***SZ DJI TECHNOLOGY CO., LTD*** in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communications Commission's rules

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

Part of system submissions with FCC ID: SS3-DLA30A1702

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Chengdu). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.62dB
Power Spectral Density, conducted	±0.62 dB
Unwanted Emissions, radiated	30M~200MHz: 4.7 dB for Horizontal, 4.7 dB for Vertical 200M~1GHz:6.0 dB for Horizontal, 6.0 for Vertical 1G~6GHz: 5.13 dB, 6G~18GHz: 5.47 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.17 dB (150 kHz to 30 MHz)

Test Facility

The test site used by BACL to collect test data is located in the5040, HuiLongWan Plaza, No. 1, ShaWan Road,JinNiu District, ChengDu, China

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.:560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a testing mode by test software.

The device employed 3 modes as below:

Mode 1,FSK, 250kbps data rate, 46 channels:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2408	24	2442.5
2	2409.5	…	…
…	…	…	…
…	…	…	…
…	…	45	2474
23	2441	46	2475.5

3 channels were tested: 2408MHz, 2442.5MHz and 2475.5MHz

Mode 2,FSK, 500kbps data rate, 46 channels:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2408	24	2442.5
2	2409.5	…	…
…	…	…	…
…	…	…	…
…	…	45	2474
23	2441	46	2475.5

3 channels were tested: 2408MHz, 2442.5MHz and 2475.5MHz

Mode 3,FSK, 1Mbps data rate, 34 channels:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2408	18	2442
2	2410	…	…
…	…	…	…
…	…	…	…
…	…	33	2472
17	2440	34	2474

3 channels were tested: 2408MHz, 2442MHz and 2474MHz

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

The software “wireless_authority-v3.2.10.8-beta11 - special- baudrate256000” was used for testing. The maximum power was configured as below table.

Test Mode	Test Software Version	wireless_authority-v3.2.10.8-beta11 - special-baudrate256000		
Mode 1	Test Frequency	2408MHz	2442.5MHz	2475.5MHz
	Power Level Setting Chain0	45	60	65
Mode 2	Test Frequency	2408MHz	2442.5MHz	2475.5MHz
	Power Level Setting Chain0	45	60	60
Mode 3	Test Frequency	2408MHz	2442MHz	2474MHz
	Power Level Setting Chain0	45	60	60

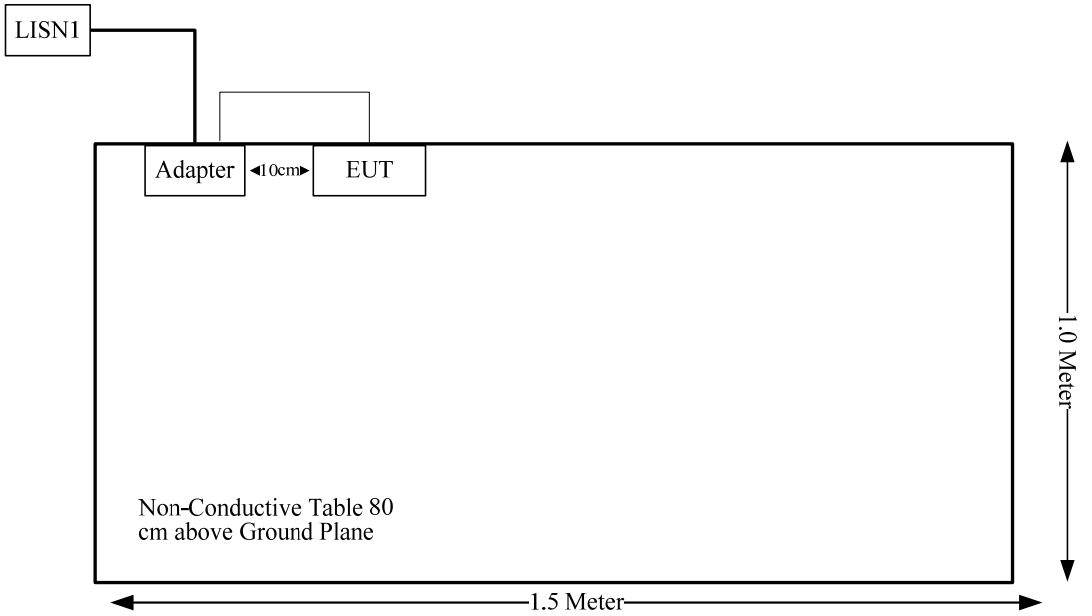
upport Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
DC Cable	NO	Yes	0.8	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(1)	20 dB Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance

Not Applicable: the device was powered by battery.

FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.247(i),§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: RDG170308007-20.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT have two external antennas permanently attached to the unit, only the left antenna was used, the right side antenna was a fake antenna. Both antenna gains are 3.0 dBi, that fulfill the requirement of the item. Please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a)

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

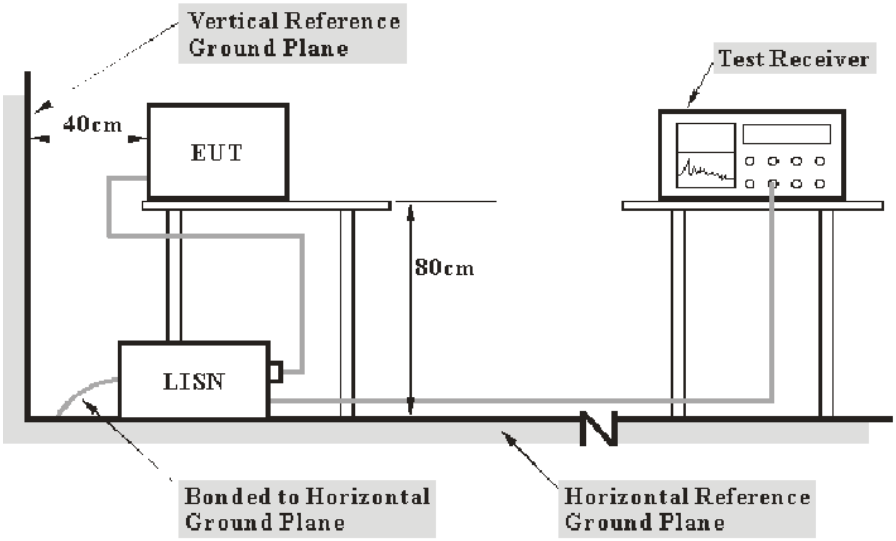
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

Based on CISPR 16-4-2:2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Chengdu) is ±3.17 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 V/60 Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN or ISN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.06	2016-12-02	2017-12-01
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	357.8810.52	2016-10-31	2017-10-30
N/A	Conducted Cable	NO.5	N/A	2016-11-10	2017-11-09
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

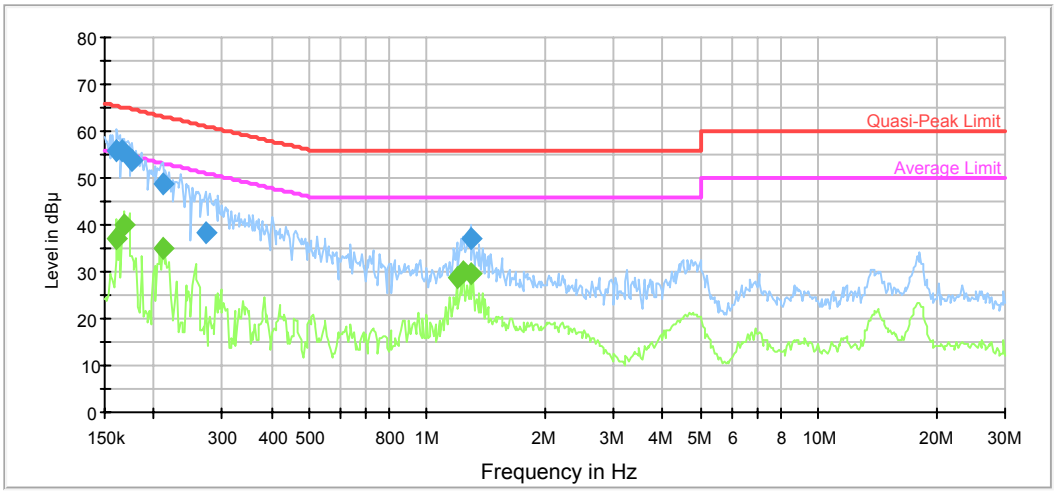
Environmental Conditions

Temperature:	25.6 °C
Relative Humidity:	57 %
ATM Pressure:	98.6 kPa

The testing was performed by Lorin Bian on 2017-03-23.

Test Mode: Transmitting

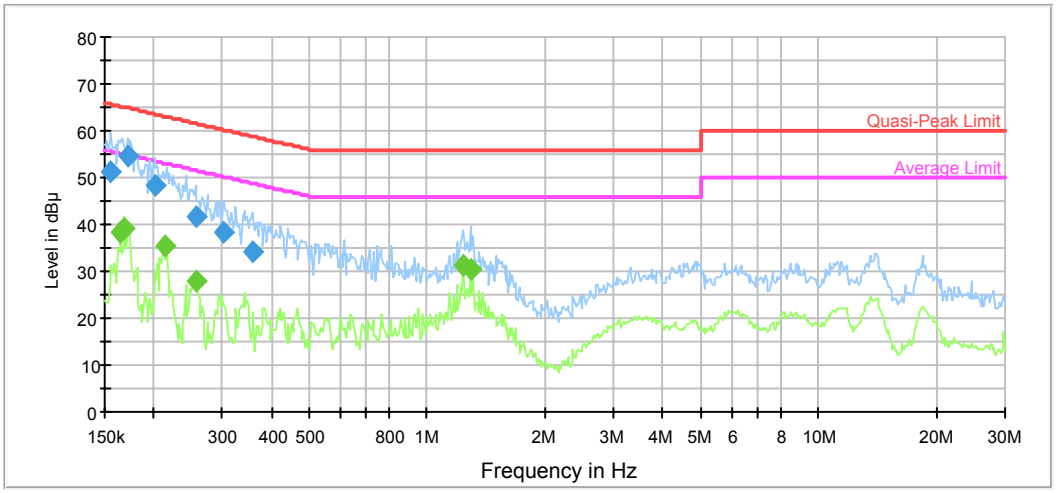
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.161152	55.9	9.000	L1	19.7	9.5	65.4	Compliance
0.166371	55.7	9.000	L1	19.7	9.4	65.1	Compliance
0.175915	53.8	9.000	L1	19.7	10.9	64.7	Compliance
0.211298	48.8	9.000	L1	19.7	14.4	63.2	Compliance
0.272666	38.5	9.000	L1	19.7	22.5	61.0	Compliance
1.289541	37.1	9.000	L1	19.7	18.9	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.161152	37.3	9.000	L1	19.7	18.1	55.4	Compliance
0.167702	39.9	9.000	L1	19.7	15.2	55.1	Compliance
0.211298	35.0	9.000	L1	19.7	18.2	53.2	Compliance
1.190776	28.8	9.000	L1	19.7	17.2	46.0	Compliance
1.239175	30.1	9.000	L1	19.7	15.9	46.0	Compliance
1.289541	29.6	9.000	L1	19.7	16.4	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.156097	51.0	9.000	N	19.7	14.7	65.7	Compliance
0.171759	54.6	9.000	N	19.7	10.3	64.9	Compliance
0.201433	48.2	9.000	N	19.6	15.4	63.6	Compliance
0.255827	41.7	9.000	N	19.6	19.9	61.6	Compliance
0.302425	38.1	9.000	N	19.6	22.1	60.2	Compliance
0.357511	34.1	9.000	N	19.6	24.7	58.8	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.165051	38.4	9.000	N	19.7	16.8	55.2	Compliance
0.169044	39.0	9.000	N	19.7	16.0	55.0	Compliance
0.212988	35.6	9.000	N	19.6	17.5	53.1	Compliance
0.255827	28.0	9.000	N	19.6	23.6	51.6	Compliance
1.239175	31.1	9.000	N	19.6	14.9	46.0	Compliance
1.289541	30.5	9.000	N	19.6	15.5	46.0	Compliance

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 2, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 2, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

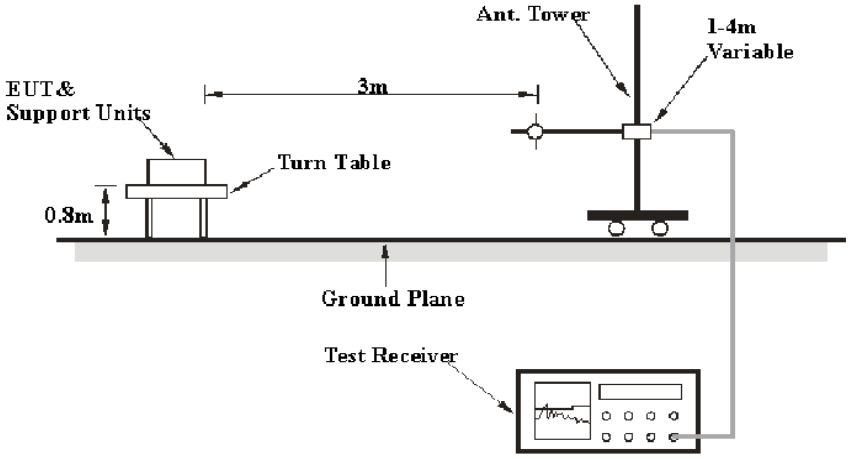
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Chengdu) is:
30M~200MHz: ±4.7 dB;
200M~1GHz: ±6.0 dB;
1G~6GHz: ±5.13dB;
6G~25GHz: ±5.47 dB;

Table 2 – Values of U_{cispr}

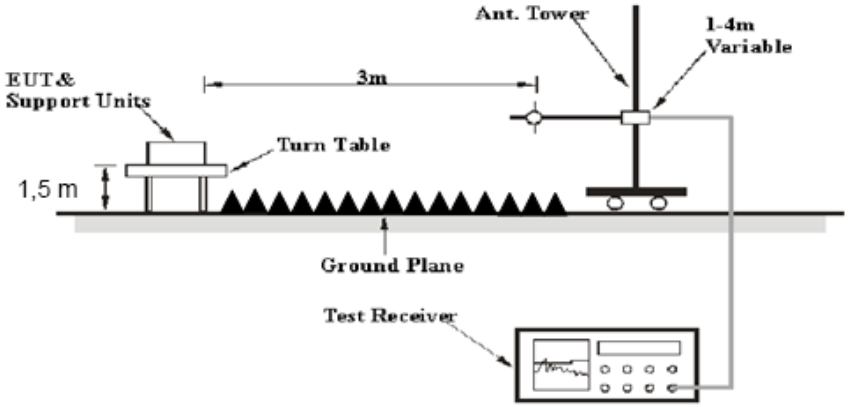
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

30MHz-1000MHz:

Detector	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 25GHz:

Detector	RBW	Video B/W
PK	1MHz	3 MHz
Ave.	1MHz	10 Hz

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113028	2014-06-16	2017-06-15
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2016-5-20	2017-05-19
HP	Amplifier	8449B	3008A00277	2016-12-02	2017-12-01
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2016-11-10	2017-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2016-11-10	2017-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2016-11-10	2017-11-09

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	21°C
Relative Humidity:	58 %
ATM Pressure:	95.3 kPa

The testing was performed by Lorin Bian on 2017-03-15.

Test Result: Compliance, please Refer to the following data

Test Mode: Transmitting **(30MHz-25GHz)**

Test mode 1:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2408 MHz									
2408	81.81	PK	H	23.51	3.00	0.00	108.32	N/A	N/A
2408	79.94	AV	H	23.51	3.00	0.00	106.45	N/A	N/A
2408	93.83	PK	V	23.51	3.00	0.00	120.34	N/A	N/A
2408	92.02	AV	V	23.51	3.00	0.00	118.53	N/A	N/A
2390	32.42	PK	V	23.57	3.00	0.00	58.99	74	15.01
2390	19.41	AV	V	23.57	3.00	0.00	45.98	54	8.02
4816	38.43	PK	V	30.81	5.12	26.87	47.49	74	26.51
4816	25.04	AV	V	30.81	5.12	26.87	34.1	54	19.9
7224	35.84	PK	V	34.75	6.17	26.36	50.4	74	23.6
7224	22.43	AV	V	34.75	6.17	26.36	36.99	54	17.01
9632	38.55	PK	V	37.08	7.80	26.19	57.24	74	16.76
9632	25.82	AV	V	37.08	7.80	26.19	44.51	54	9.49
3258	40.94	PK	V	25.64	3.82	26.50	43.9	74	30.1
3258	26.98	AV	V	25.64	3.82	26.50	29.94	54	24.06
235.64	42.83	QP	H	12.13	1.11	27.56	28.51	46.00	17.49
329.73	37.17	QP	H	14.70	1.18	27.66	25.39	46.00	20.61
Middle Channel: 2442.5 MHz									
2442.5	80.80	PK	H	23.40	3.00	0.00	107.2	N/A	N/A
2442.5	78.93	AV	H	23.40	3.00	0.00	105.33	N/A	N/A
2442.5	91.58	PK	V	23.40	3.00	0.00	117.98	N/A	N/A
2442.5	89.82	AV	V	23.40	3.00	0.00	116.22	N/A	N/A
4885	41.05	PK	V	31.03	5.09	26.87	50.3	74	23.7
4885	27.24	AV	V	31.03	5.09	26.87	36.49	54	17.51
7327.5	35.61	PK	V	34.96	6.22	26.40	50.39	74	23.61
7327.5	22.75	AV	V	34.96	6.22	26.40	37.53	54	16.47
9770	38.20	PK	V	37.16	7.71	26.28	56.79	74	17.21
9770	24.38	AV	V	37.16	7.71	26.28	42.97	54	11.03
3451	39.72	PK	V	26.73	4.11	26.57	43.99	74	30.01
3451	25.98	AV	V	26.73	4.11	26.57	30.25	54	23.75
3182	41.68	PK	V	25.22	3.70	26.48	44.12	74	29.88
3182	27.23	AV	V	25.22	3.70	26.48	29.67	54	24.33
235.64	43.1	QP	H	12.13	1.11	27.56	28.78	46.00	17.22
329.73	37.31	QP	H	14.70	1.18	27.66	25.53	46.00	20.47
High Channel: 2475.5 MHz									
2475.5	82.11	PK	H	23.28	2.99	0.00	108.38	N/A	N/A
2475.5	80.05	AV	H	23.28	2.99	0.00	106.32	N/A	N/A
2475.5	91.88	PK	V	23.28	2.99	0.00	118.15	N/A	N/A
2475.5	90.23	AV	V	23.28	2.99	0.00	116.5	N/A	N/A
2483.5	32.15	PK	V	23.26	2.99	0.00	58.4	74	15.6
2483.5	20.64	AV	V	23.26	2.99	0.00	46.89	54	7.11
4951	38.98	PK	V	31.24	5.05	26.88	48.39	74	25.61
4951	24.91	AV	V	31.24	5.05	26.88	34.32	54	19.68
7426.5	35.98	PK	V	35.15	6.27	26.45	50.95	74	23.05
7426.5	22.94	AV	V	35.15	6.27	26.45	37.91	54	16.09
9902	39.70	PK	V	37.24	7.61	26.36	58.19	74	15.81
9902	26.20	AV	V	37.24	7.61	26.36	44.69	54	9.31
3120	41.24	PK	V	24.87	3.61	26.45	43.27	74	30.73
3120	26.83	AV	V	24.87	3.61	26.45	28.86	54	25.14
235.64	43.94	QP	H	12.13	1.11	27.56	29.62	46.00	16.38
329.73	37.73	QP	H	14.70	1.18	27.66	25.95	46.00	20.05

Test mode 2:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2408 MHz									
2408	80.78	PK	H	23.51	3.00	0.00	107.29	N/A	N/A
2408	76.52	AV	H	23.51	3.00	0.00	103.03	N/A	N/A
2408	87.69	PK	V	23.51	3.00	0.00	114.2	N/A	N/A
2408	83.64	AV	V	23.51	3.00	0.00	110.15	N/A	N/A
2390	29.45	PK	V	23.57	3.00	0.00	56.02	74	17.98
2390	15.83	AV	V	23.57	3.00	0.00	42.4	54	11.6
4816	39.44	PK	V	30.81	5.12	26.87	48.5	74	25.5
4816	25.40	AV	V	30.81	5.12	26.87	34.46	54	19.54
7224	35.28	PK	V	34.75	6.17	26.36	49.84	74	24.16
7224	22.60	AV	V	34.75	6.17	26.36	37.16	54	16.84
9632	38.63	PK	V	37.08	7.80	26.19	57.32	74	16.68
9632	25.81	AV	V	37.08	7.80	26.19	44.5	54	9.5
3146	40.91	PK	V	25.02	3.65	26.46	43.12	74	30.88
3146	26.72	AV	V	25.02	3.65	26.46	28.93	54	25.07
235.64	43.47	QP	H	12.13	1.11	27.56	29.15	46.00	16.85
329.73	38.17	QP	H	14.70	1.18	27.66	26.39	46.00	19.61
Middle Channel: 2442.5 MHz									
2442.5	80.57	PK	H	23.40	3.00	0.00	106.97	N/A	N/A
2442.5	76.82	AV	H	23.40	3.00	0.00	103.22	N/A	N/A
2442.5	88.03	PK	V	23.40	3.00	0.00	114.43	N/A	N/A
2442.5	83.69	AV	V	23.40	3.00	0.00	110.09	N/A	N/A
4885	38.28	PK	V	31.03	5.09	26.87	47.53	74	26.47
4885	24.18	AV	V	31.03	5.09	26.87	33.43	54	20.57
7327.5	36.49	PK	V	34.96	6.22	26.40	51.27	74	22.73
7327.5	22.13	AV	V	34.96	6.22	26.40	36.91	54	17.09
9770	37.80	PK	V	37.16	7.71	26.28	56.39	74	17.61
9770	24.30	AV	V	37.16	7.71	26.28	42.89	54	11.11
2973	39.47	PK	V	24.15	3.41	26.44	40.59	74	33.41
2973	26.71	AV	V	24.15	3.41	26.44	27.83	54	26.17
3462	38.90	PK	V	26.79	4.12	26.58	43.23	74	30.77
3462	24.86	AV	V	26.79	4.12	26.58	29.19	54	24.81
235.64	43	QP	H	12.13	1.11	27.56	28.68	46.00	17.32
329.73	38.61	QP	H	14.70	1.18	27.66	26.83	46.00	19.17
High Channel: 2475.5 MHz									
2475.5	82.21	PK	H	23.28	2.99	0.00	108.48	N/A	N/A
2475.5	77.80	AV	H	23.28	2.99	0.00	104.07	N/A	N/A
2475.5	88.24	PK	V	23.28	2.99	0.00	114.51	N/A	N/A
2475.5	83.83	AV	V	23.28	2.99	0.00	110.1	N/A	N/A
2483.5	32.94	PK	V	23.26	2.99	0.00	59.19	74	14.81
2483.5	19.43	AV	V	23.26	2.99	0.00	45.68	54	8.32
4951	38.00	PK	V	31.24	5.05	26.88	47.41	74	26.59
4951	23.98	AV	V	31.24	5.05	26.88	33.39	54	20.61
7426.5	36.82	PK	V	35.15	6.27	26.45	51.79	74	22.21
7426.5	22.66	AV	V	35.15	6.27	26.45	37.63	54	16.37
9902	39.75	PK	V	37.24	7.61	26.36	58.24	74	15.76
9902	25.48	AV	V	37.24	7.61	26.36	43.97	54	10.03
2945	38.87	PK	V	24.09	3.38	26.46	39.88	74	34.12
2945	25.06	AV	V	24.09	3.38	26.46	26.07	54	27.93
235.64	43.64	QP	H	12.13	1.11	27.56	29.32	46.00	16.68
329.73	38.93	QP	H	14.70	1.18	27.66	27.15	46.00	18.85

Test mode 3:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2408 MHz									
2408	80.05	PK	H	23.51	3.00	0.00	106.56	N/A	N/A
2408	74.39	AV	H	23.51	3.00	0.00	100.9	N/A	N/A
2408	90.40	PK	V	23.51	3.00	0.00	116.91	N/A	N/A
2408	84.88	AV	V	23.51	3.00	0.00	111.39	N/A	N/A
2390	32.42	PK	V	23.57	3.00	0.00	58.99	74	15.01
2390	16.73	AV	V	23.57	3.00	0.00	43.3	54	10.7
4816	38.23	PK	V	30.81	5.12	26.87	47.29	74	26.71
4816	24.35	AV	V	30.81	5.12	26.87	33.41	54	20.59
7224	35.38	PK	V	34.75	6.17	26.36	49.94	74	24.06
7224	22.17	AV	V	34.75	6.17	26.36	36.73	54	17.27
9632	38.53	PK	V	37.08	7.80	26.19	57.22	74	16.78
9632	24.85	AV	V	37.08	7.80	26.19	43.54	54	10.46
3113	40.28	PK	V	24.83	3.60	26.45	42.26	74	31.74
3113	26.50	AV	V	24.83	3.60	26.45	28.48	54	25.52
235.64	43.91	QP	H	12.13	1.11	27.56	29.59	46.00	16.41
329.73	39.07	QP	H	14.70	1.18	27.66	27.29	46.00	18.71
Middle Channel: 2442 MHz									
2442	81.67	PK	H	23.40	3.00	0.00	108.07	N/A	N/A
2442	77.14	AV	H	23.40	3.00	0.00	103.54	N/A	N/A
2442	91.51	PK	V	23.40	3.00	0.00	117.91	N/A	N/A
2442	87.18	AV	V	23.40	3.00	0.00	113.58	N/A	N/A
4884	39.57	PK	V	31.03	5.09	26.87	48.82	74	25.18
4884	25.29	AV	V	31.03	5.09	26.87	34.54	54	19.46
7326	35.80	PK	V	34.95	6.22	26.40	50.57	74	23.43
7326	22.34	AV	V	34.95	6.22	26.40	37.11	54	16.89
9768	38.64	PK	V	37.16	7.71	26.28	57.23	74	16.77
9768	24.44	AV	V	37.16	7.71	26.28	43.03	54	10.97
3195	42.74	PK	V	25.29	3.72	26.48	45.27	74	28.73
3195	29.65	AV	V	25.29	3.72	26.48	32.18	54	21.82
3374	39.81	PK	V	26.29	3.99	26.54	43.55	74	30.45
3374	26.34	AV	V	26.29	3.99	26.54	30.08	54	23.92
235.64	44.75	QP	H	12.13	1.11	27.56	30.43	46.00	15.57
329.73	39.49	QP	H	14.70	1.18	27.66	27.71	46.00	18.29
High Channel: 2474 MHz									
2474	81.14	PK	H	23.29	2.99	0.00	107.42	N/A	N/A
2474	76.22	AV	H	23.29	2.99	0.00	102.5	N/A	N/A
2474	91.50	PK	V	23.29	2.99	0.00	117.78	N/A	N/A
2474	85.97	AV	V	23.29	2.99	0.00	112.25	N/A	N/A
2483.5	38.44	PK	V	23.26	2.99	0.00	64.69	74	9.31
2483.5	23.95	AV	V	23.26	2.99	0.00	50.2	54	3.8
4948	39.60	PK	V	31.23	5.05	26.88	49	74	25
4948	26.08	AV	V	31.23	5.05	26.88	35.48	54	18.52
7422	36.34	PK	V	35.14	6.26	26.45	51.29	74	22.71
7422	23.12	AV	V	35.14	6.26	26.45	38.07	54	15.93
9896	39.68	PK	V	37.24	7.61	26.36	58.17	74	15.83
9896	26.07	AV	V	37.24	7.61	26.36	44.56	54	9.44
3336	40.35	PK	V	26.08	3.93	26.53	43.83	74	30.17
3336	27.02	AV	V	26.08	3.93	26.53	30.5	54	23.5
235.64	44.28	QP	H	12.13	1.11	27.56	29.96	46.00	16.04
329.73	39.93	QP	H	14.70	1.18	27.66	28.15	46.00	17.85

FCC §15.247(a) (1) - CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.50 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

1. Set the EUT in transmitting mode, RBW was set at 30 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another trace.
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	54 %
ATM Pressure:	95.2 kPa

The testing was performed by Lorin Bian on 2017-03-21.

Test Result: Compliance.

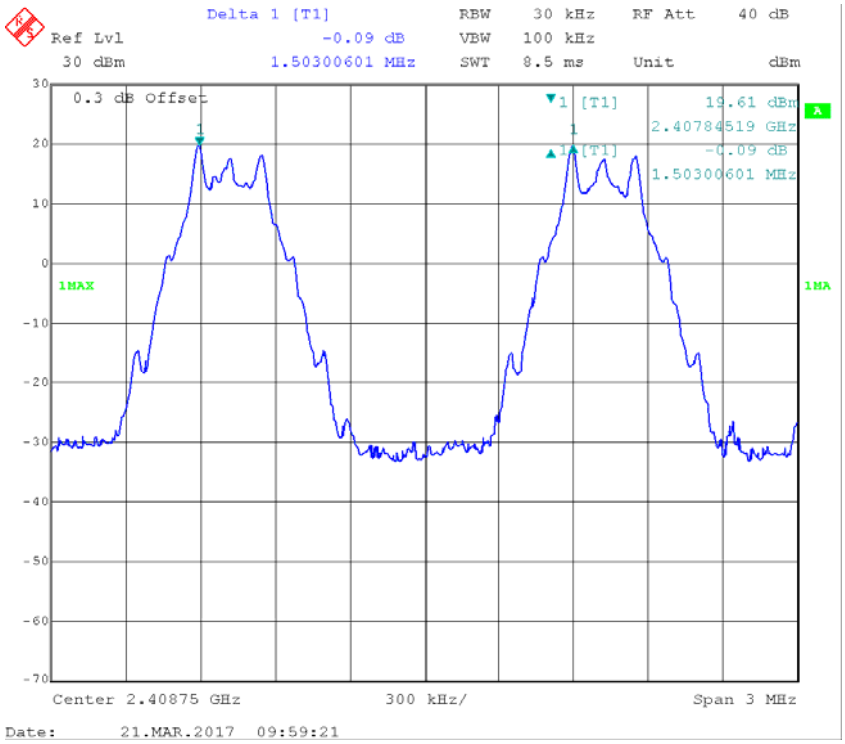
Please refer to following tables and plots

Test Mode: Transmitting(Test performed at left antenna chain)

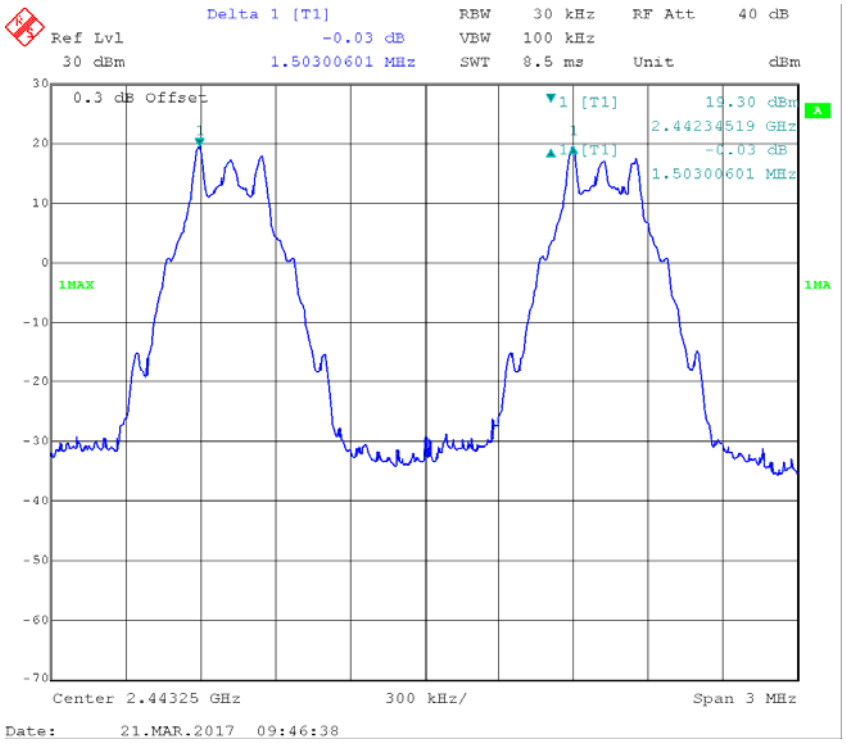
Test Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
Mode 1	Low	2408	1.503	0.341
	Middle	2442.5	1.503	0.339
	High	2475.5	1.503	0.341
Mode 2	Low	2408	1.503	0.341
	Middle	2442.5	1.503	0.339
	High	2475.5	1.503	0.341
Mode 3	Low	2408	2.004	1.37
	Middle	2442	2.004	1.367
	High	2474	2.004	1.367

**Note: Limit= (2/3)× 20 dB bandwidth*

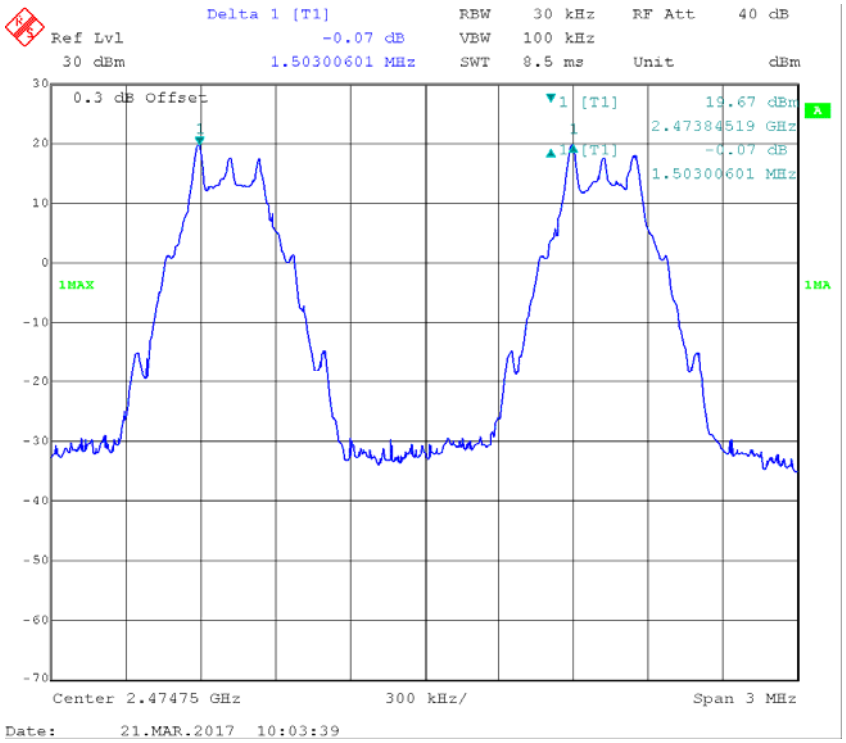
Mode 1- Low Channel



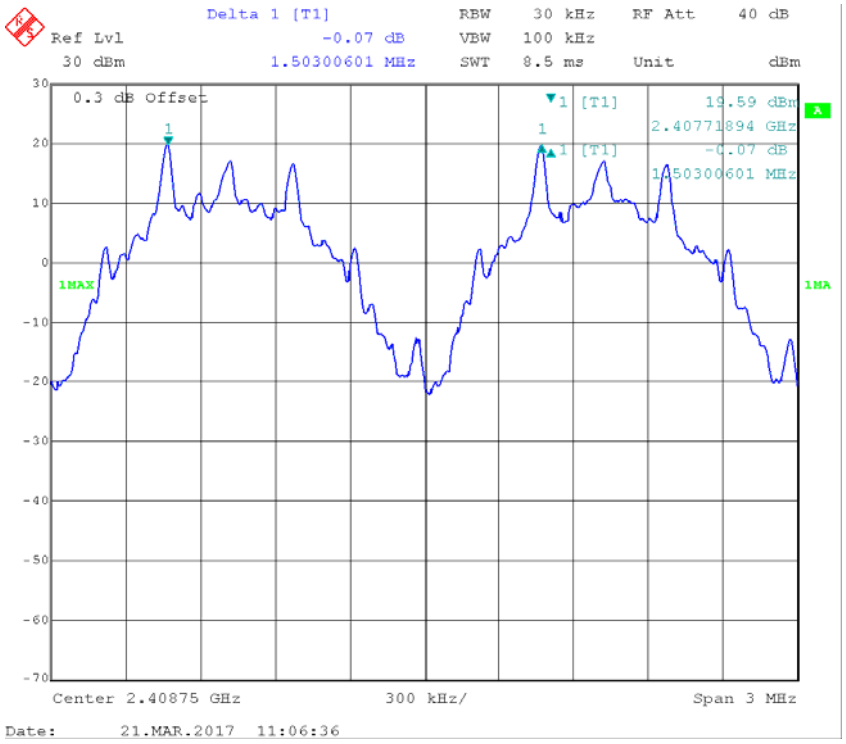
Mode 1- Middle Channel



Mode 1- High Channel



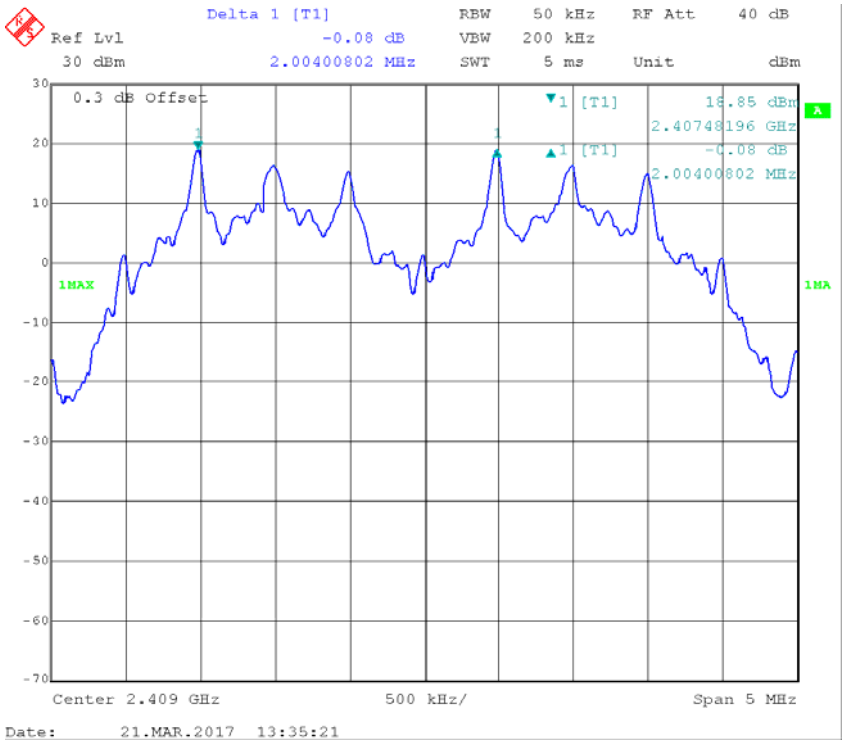
Mode 2- Low Channel



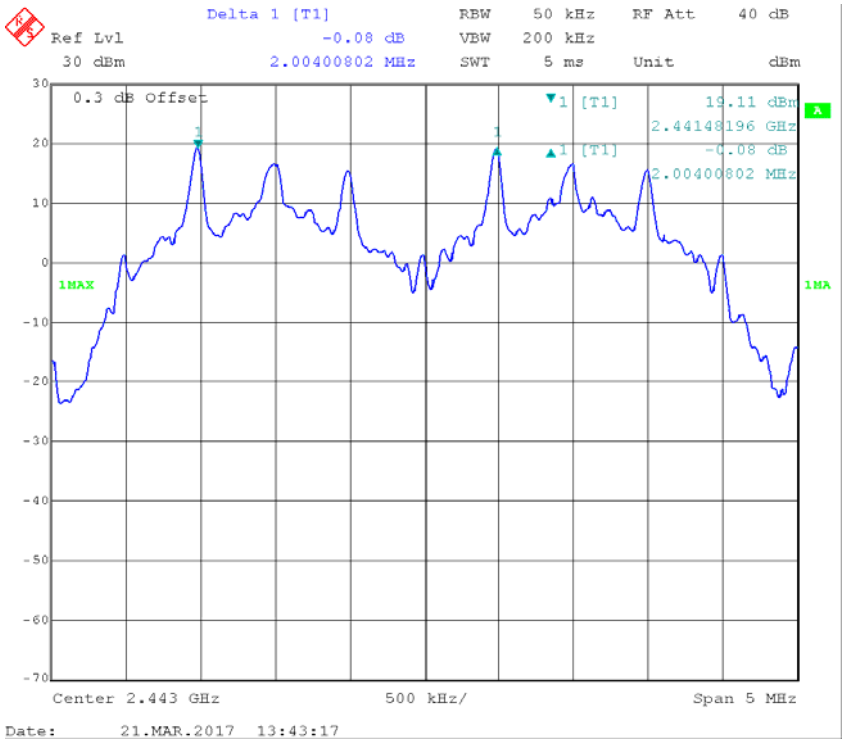
Mode 2- Middle Channel

Mode 2- High Channel

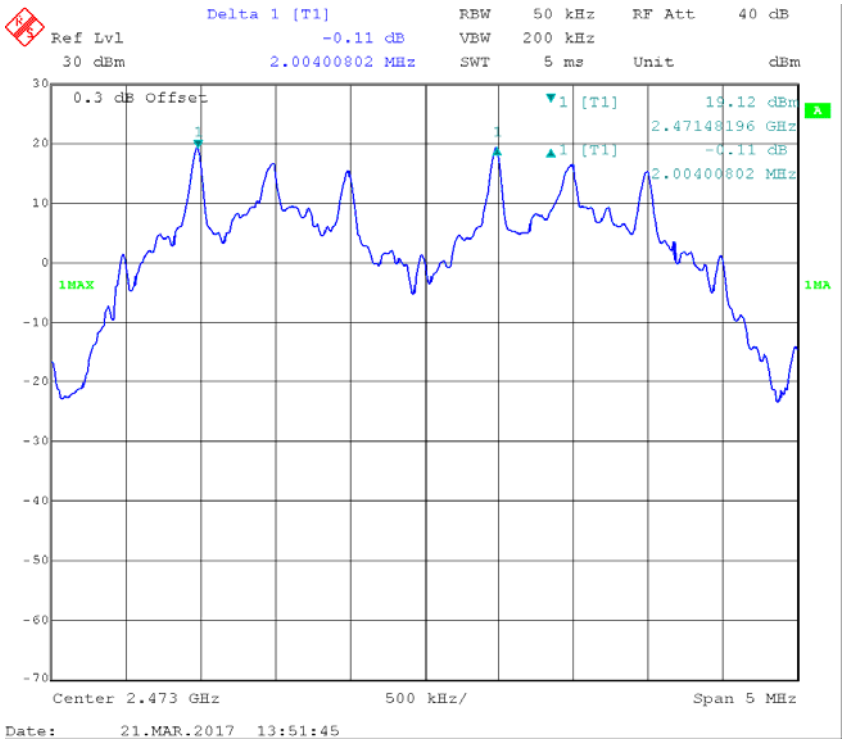
Mode 3- Low Channel



Mode 3- Middle Channel



Mode 3- High Channel



FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING

Applicable Standard

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.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	54 %
ATM Pressure:	95.2 kPa

The testing was performed by Lorin Bian on 2017-03-21.

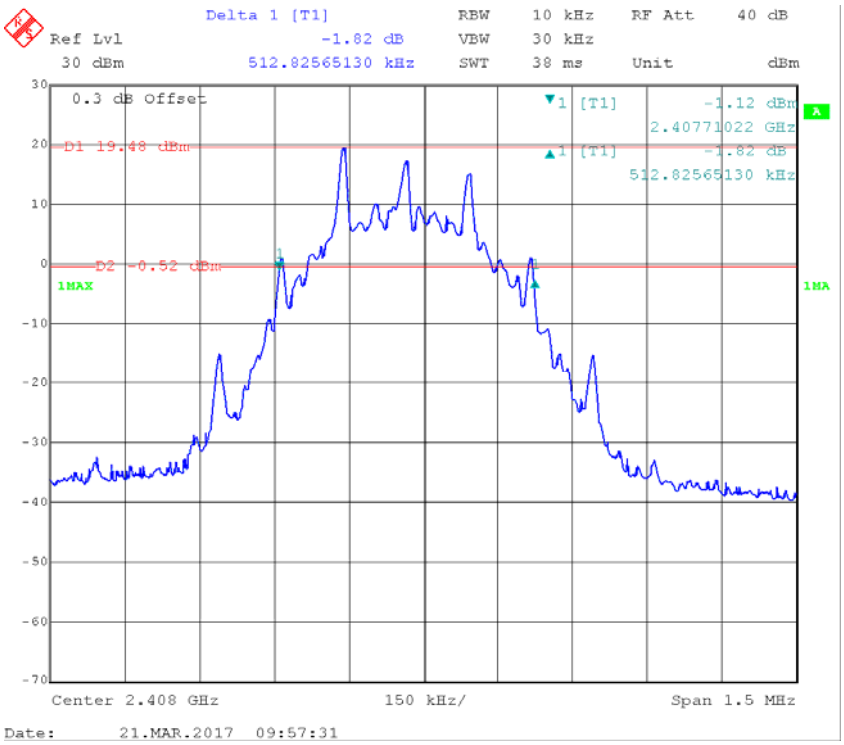
Test Result: Compliance.

Please refer to following tables and plots

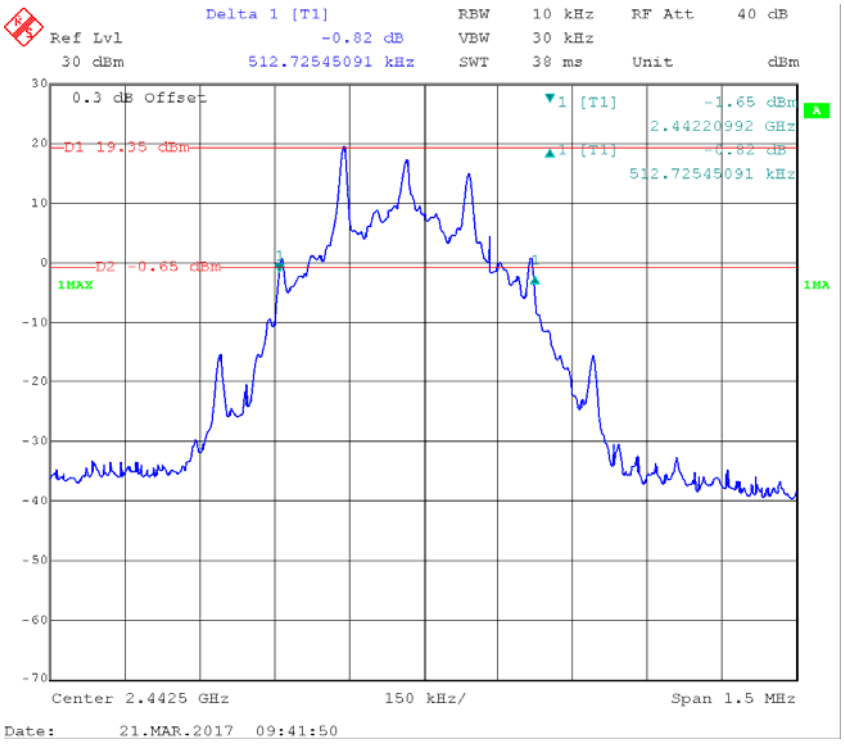
Test Mode: Transmitting

Test Mode	Frequency (MHz)	20 dB Bandwidth (MHz)
Mode 1	2408	0.513
	2442.5	0.513
	2475.5	0.516
Mode 2	2408	1.044
	2442.5	1.038
	2475.5	1.038
Mode 3	2408	2.055
	2442	2.050
	2474	2.050

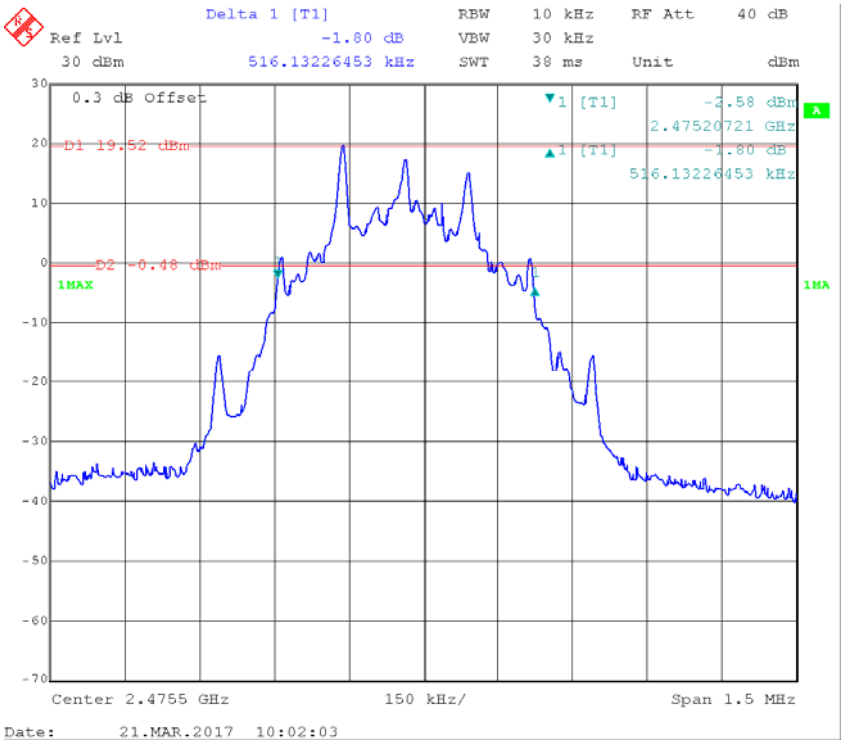
Mode 1-Low Channel



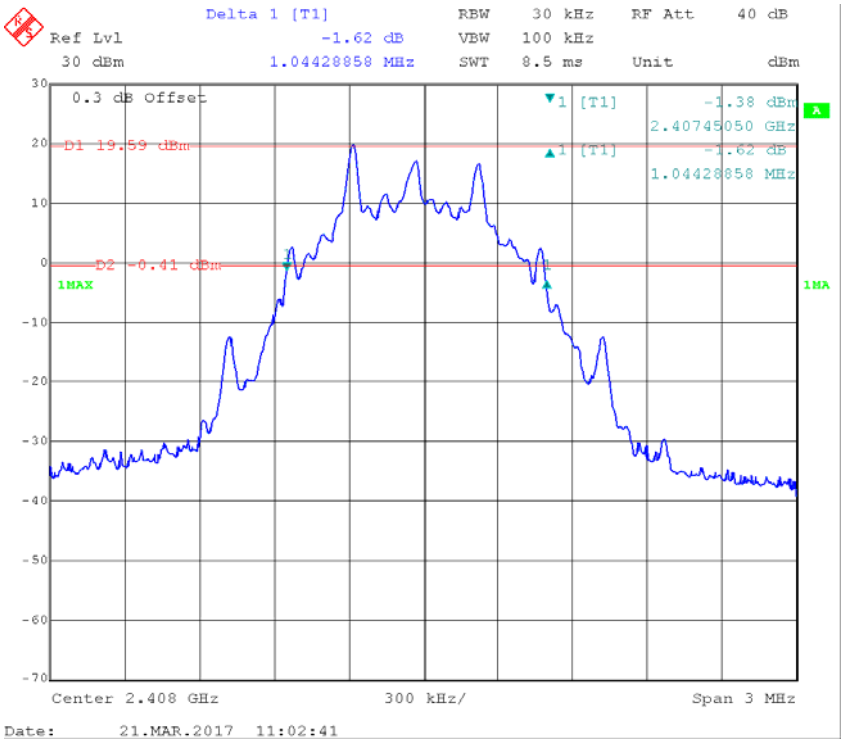
Mode 1-Middle Channel



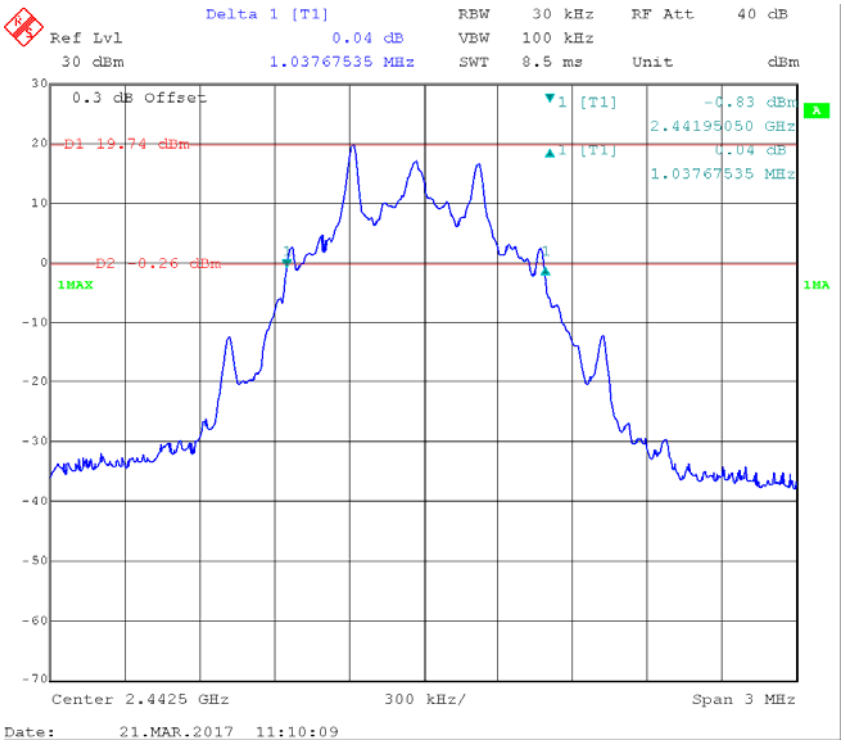
Mode 1-High Channel



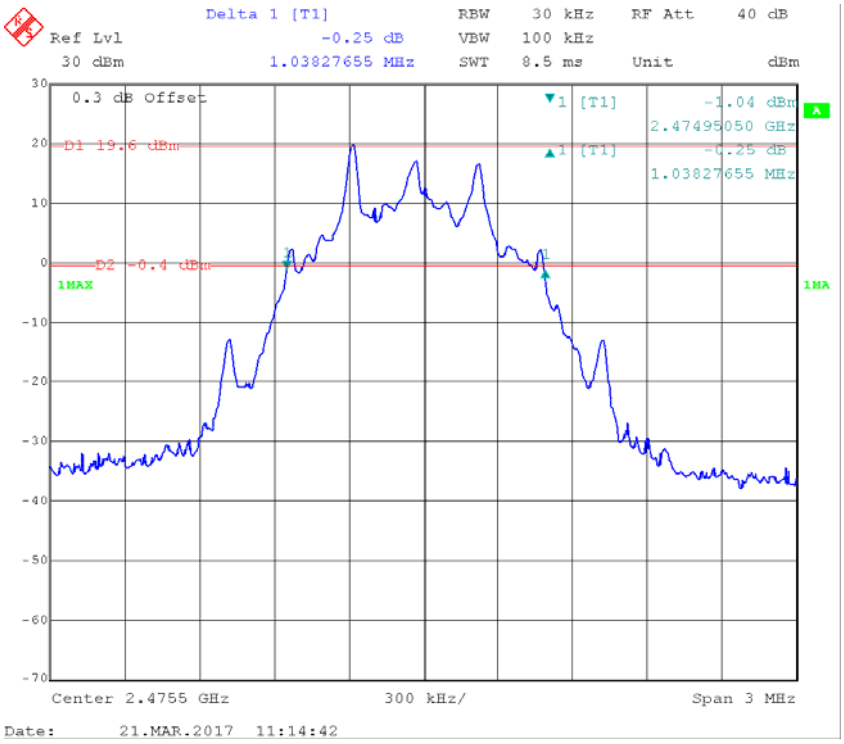
Mode 2-Low Channel



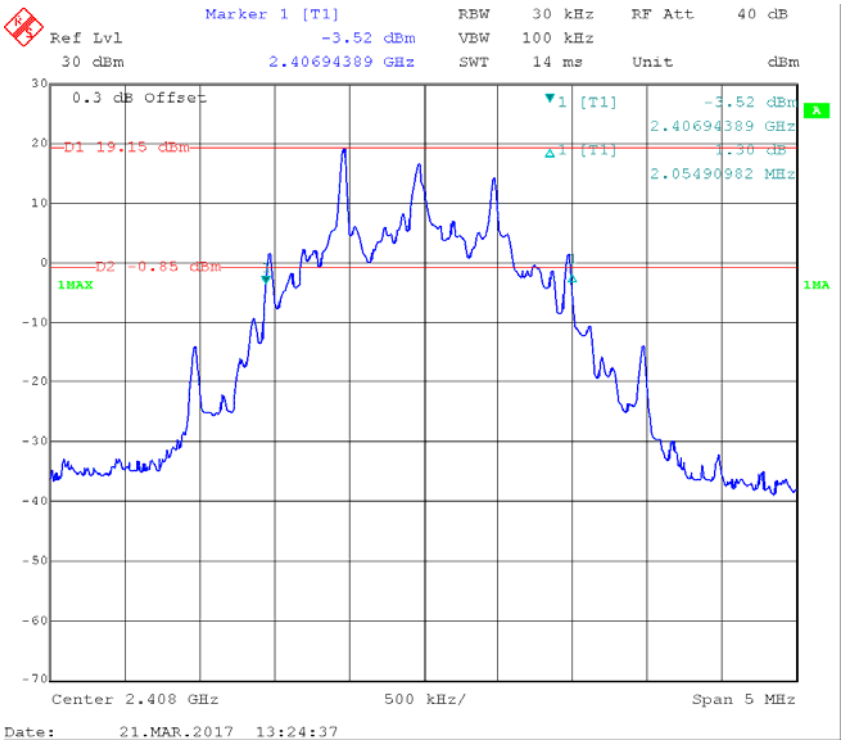
Mode 2-Middle Channel



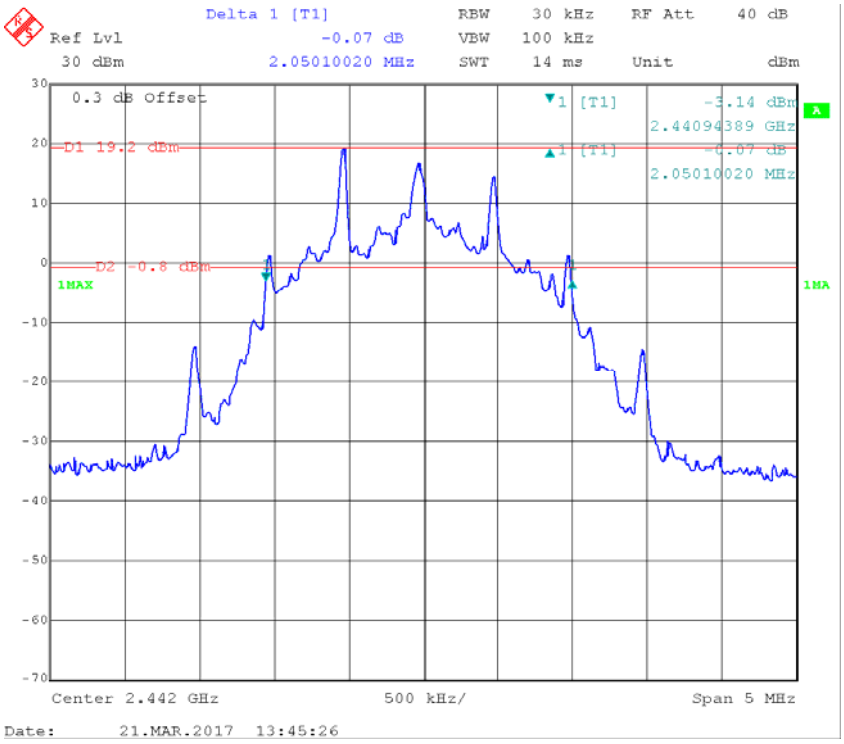
Mode 2-High Channel



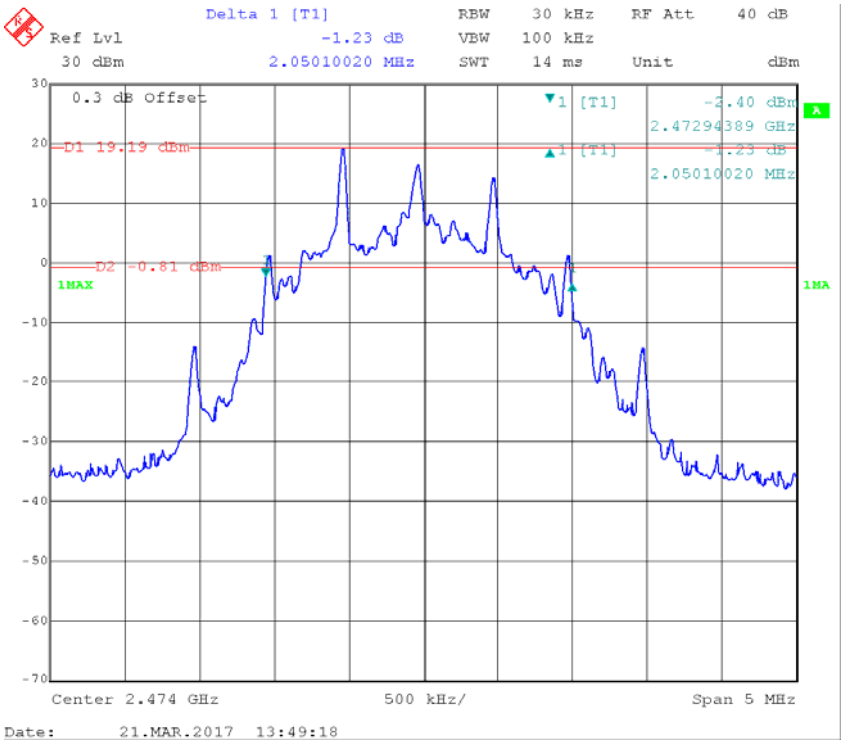
Mode 3-Low Channel



Mode 3-Middle Channel



Mode 3-High Channel



FCC §15.247(a) (1) (iii) - QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	54 %
ATM Pressure:	95.2 kPa

The testing was performed by Lorin Bian on 2017-03-21.

Test Result: Compliance. *(Test performed at antenna chain 0)*

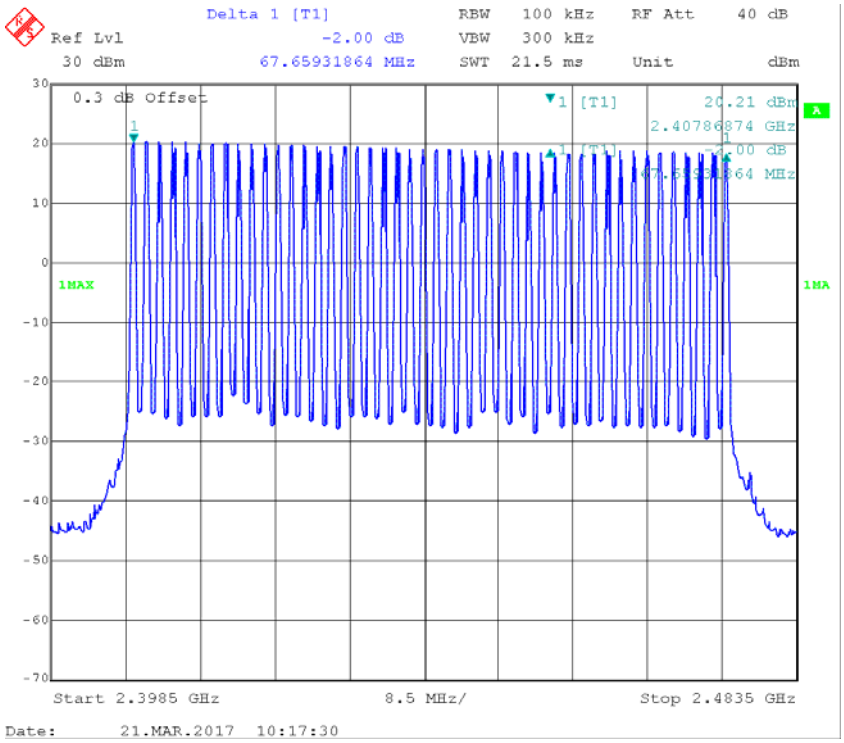
Please refer to following tables and plots

Test Mode: Transmitting

Mode 1:

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	46	≥15

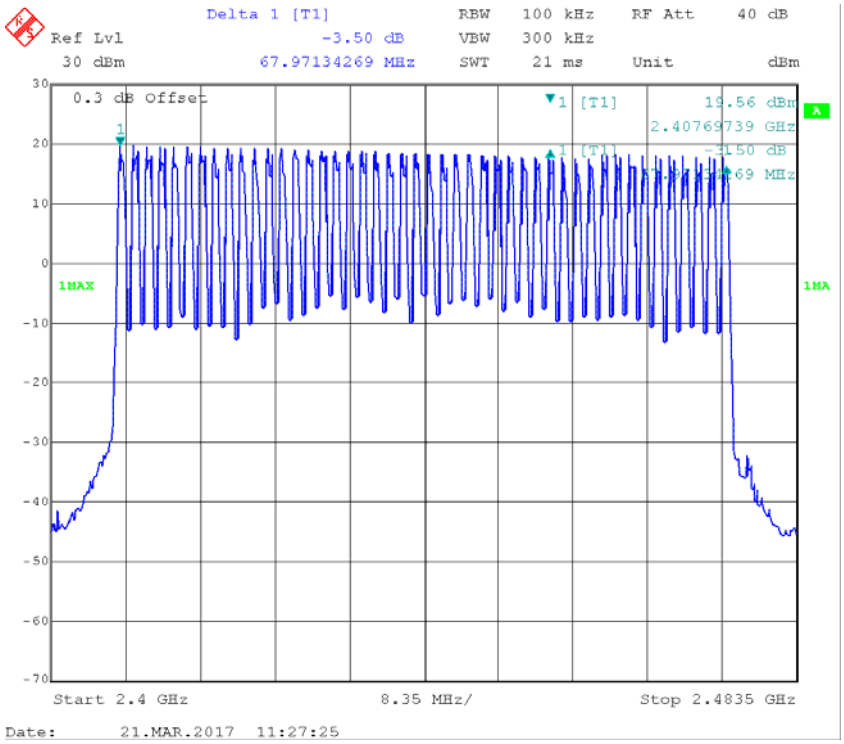
Number of Hopping Channels



Mode 2:

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	46	≥15

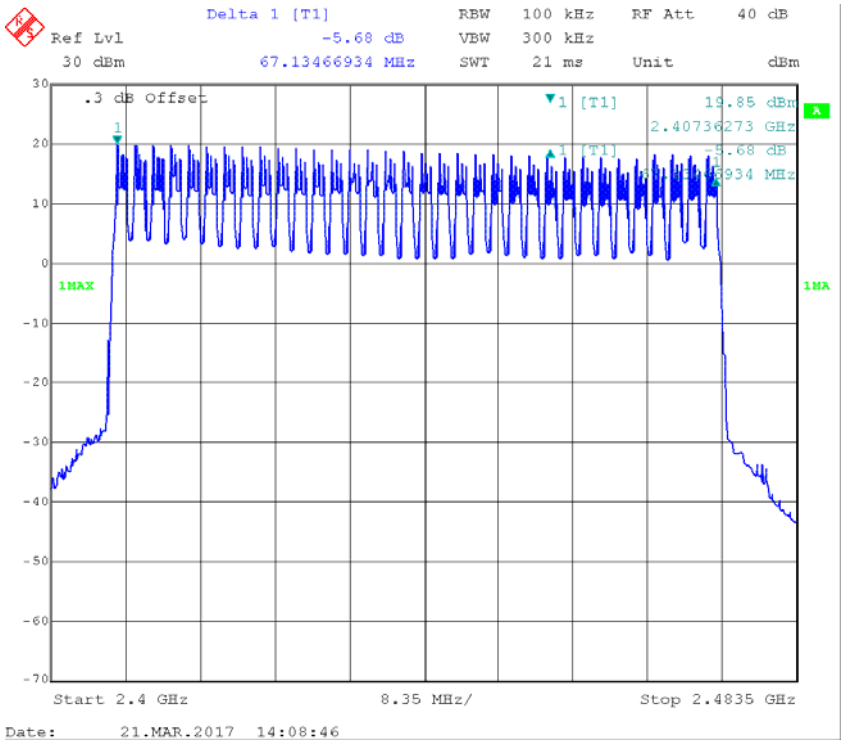
Number of Hopping Channels



Mode 3:

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	34	≥15

Number of Hopping Channels



FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 1s, the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	17~18 °C
Relative Humidity:	53~54 %
ATM Pressure:	95.1~95.2 kPa

The testing was performed by Lorin Bian on 2017-03-21 and 2017-04-15.

Test Result: Compliance

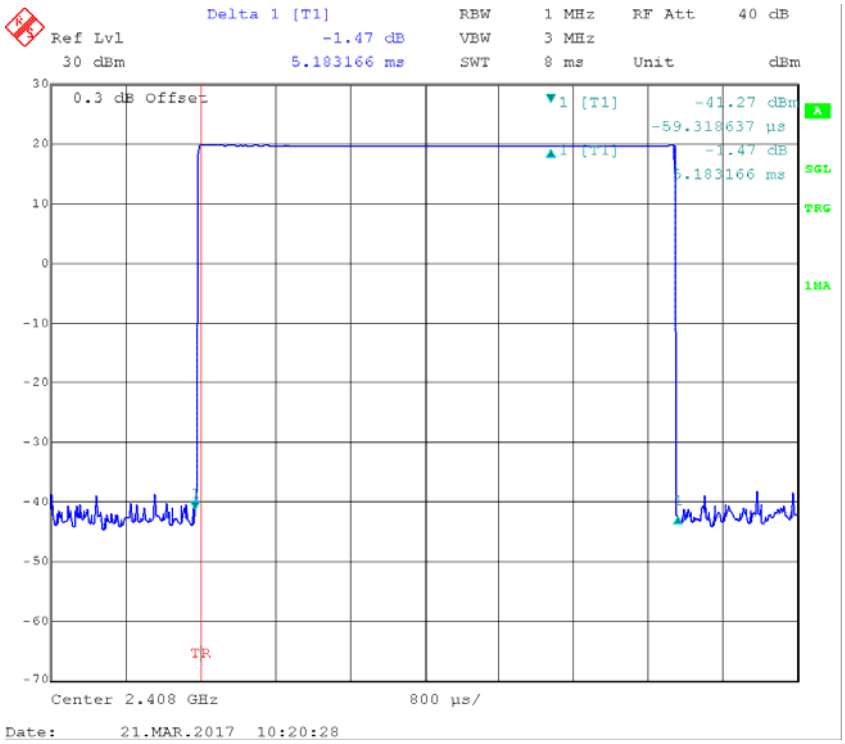
Please refer to following tables and plots

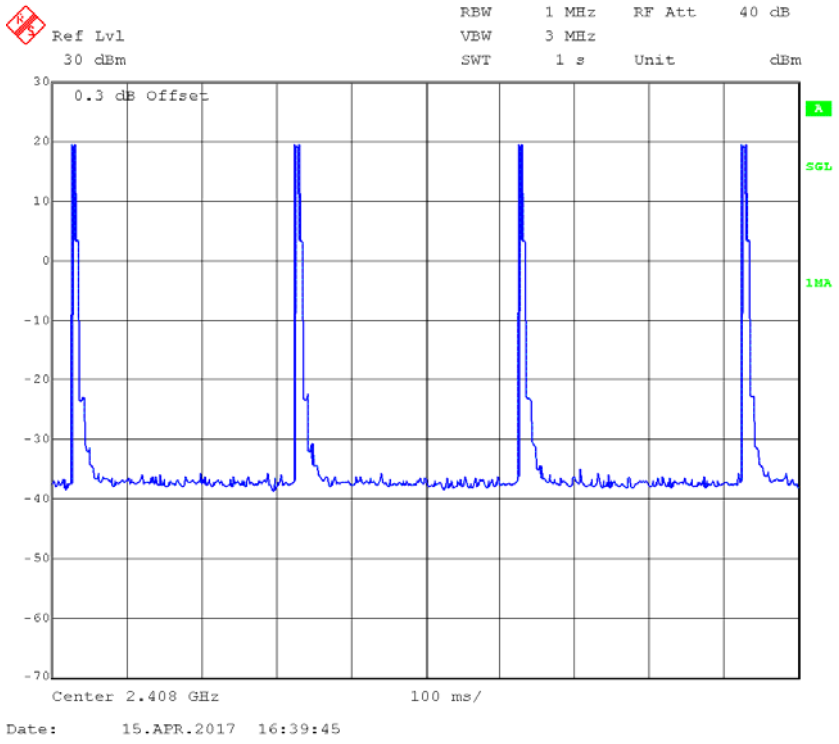
Test Mode: Transmitting

Mode	Channel	Occupancy Time For Single Hop (ms)	Real Observed Period (s)	Hops in Observed Period	Dwell time(s)	Limit (s)	Result
Mode 1	Low	5.183	1	4	0.381	0.4	Compliance
	Middle	5.188	1	4	0.382	0.4	Compliance
	High	5.188	1	4	0.382	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × hopping number per channel in 1s×hopping channels× 0.4						
Mode 2	Low	2.6	1	6	0.287	0.4	Compliance
	Middle	2.602	1	6	0.287	0.4	Compliance
	High	2.602	1	6	0.287	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × hopping number per channel in 1s×hopping channels× 0.4						
Mode 3	Low	1.314	1	12	0.214	0.4	Compliance
	Middle	1.314	1	12	0.214	0.4	Compliance
	High	1.314	1	12	0.214	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × hopping number per channel in 1s×hopping channels× 0.4						

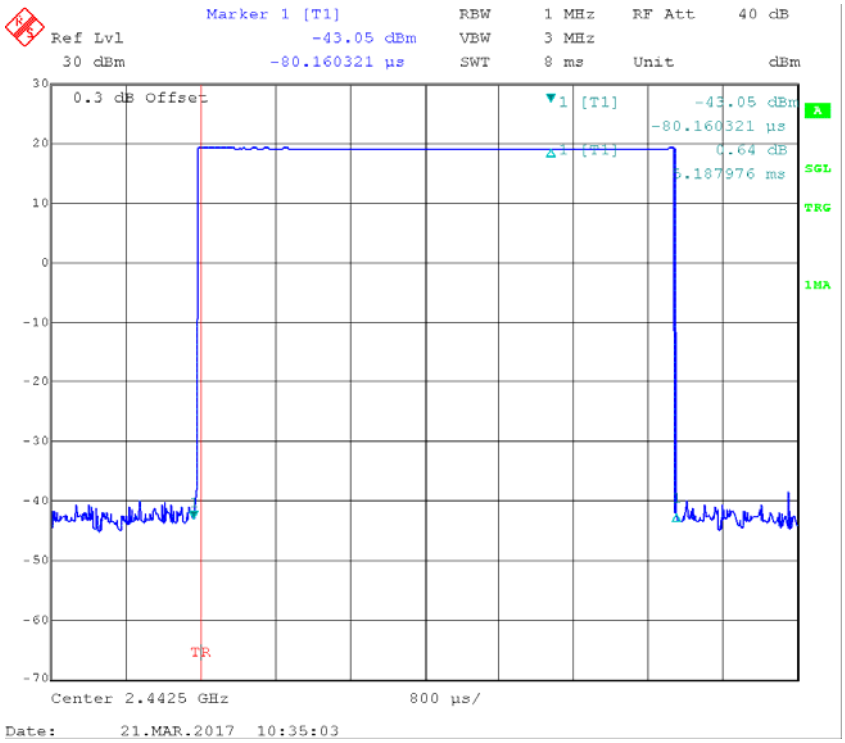
Mode 1:

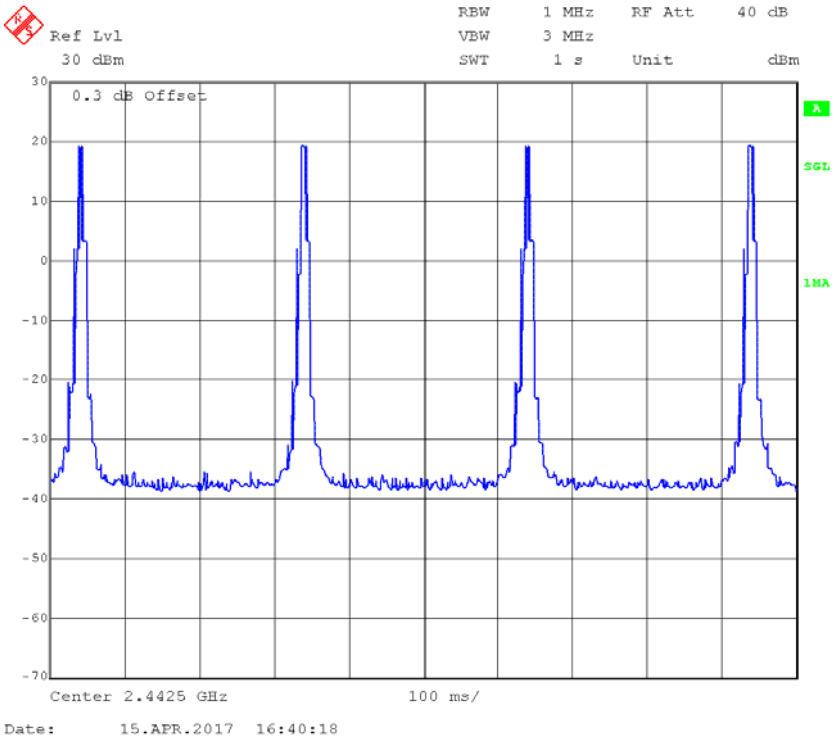
Low Channel



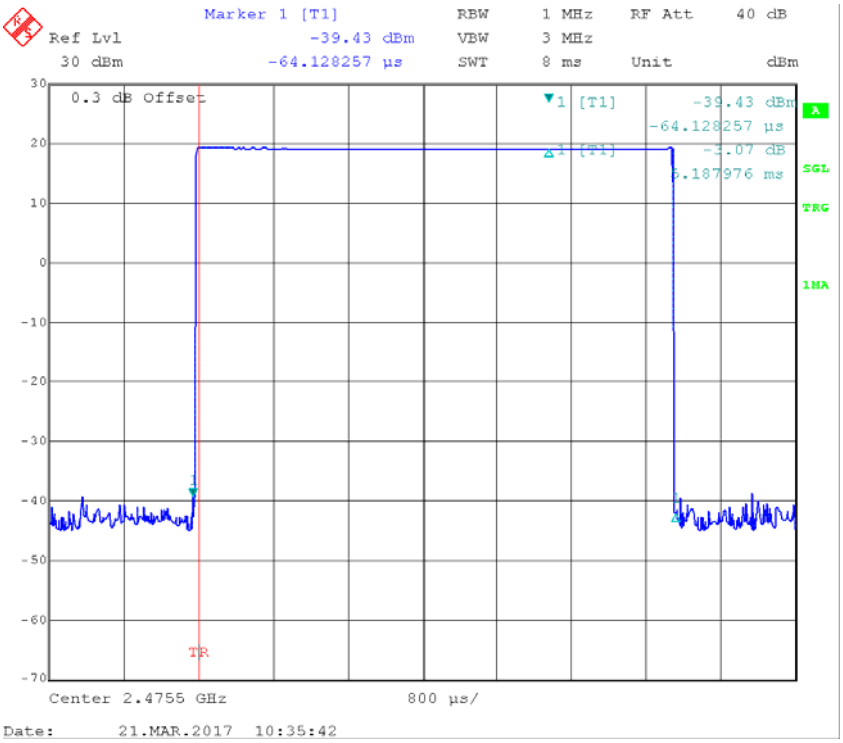


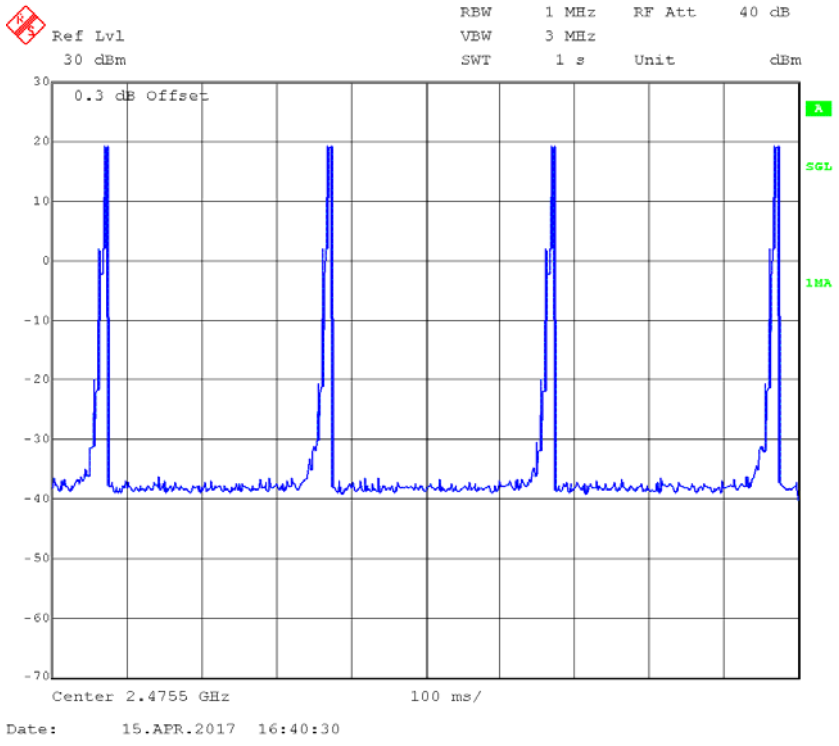
Middle Channel





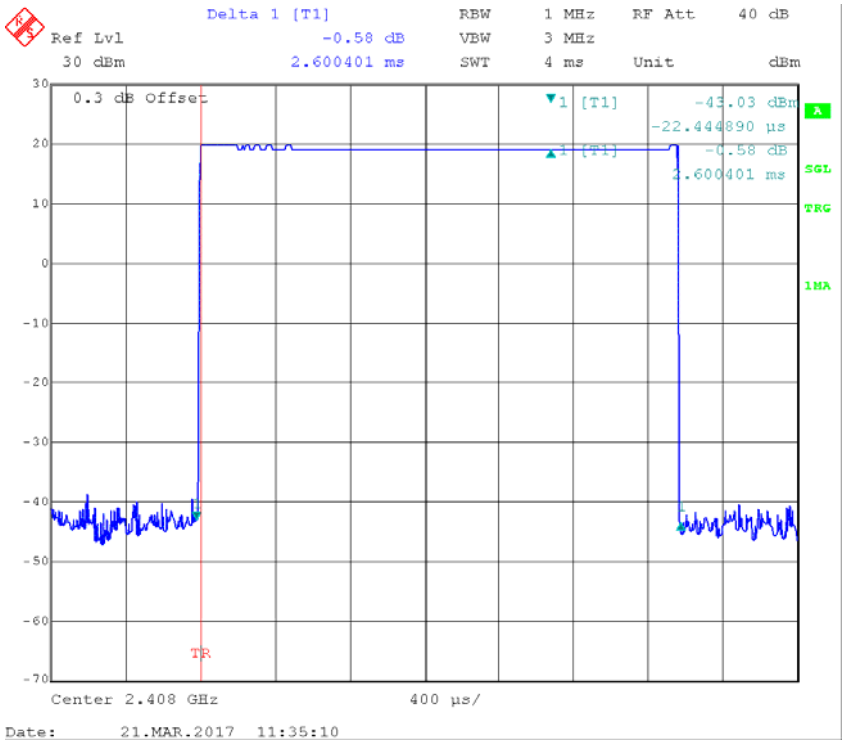
High Channel

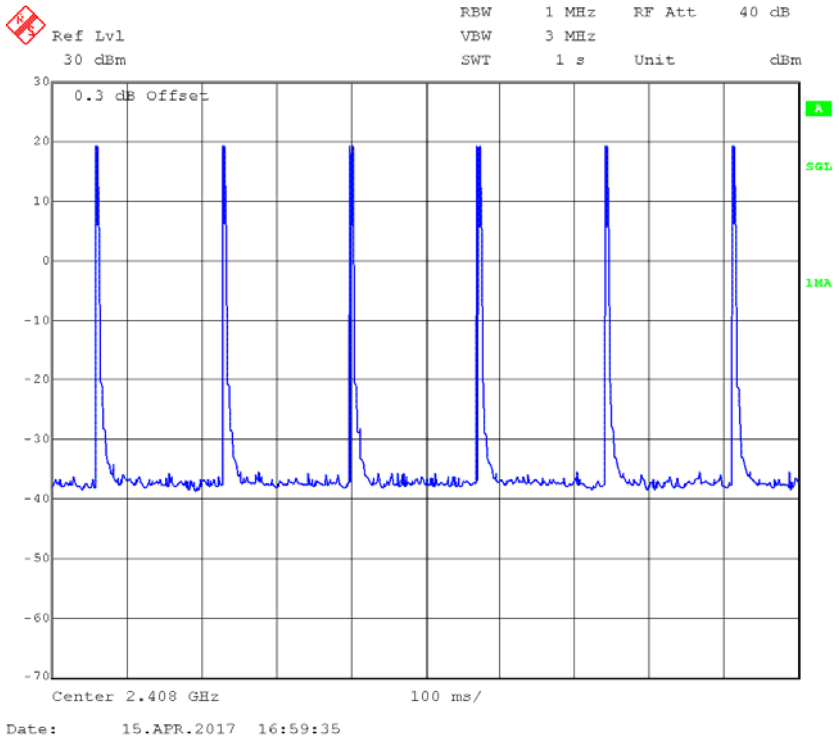




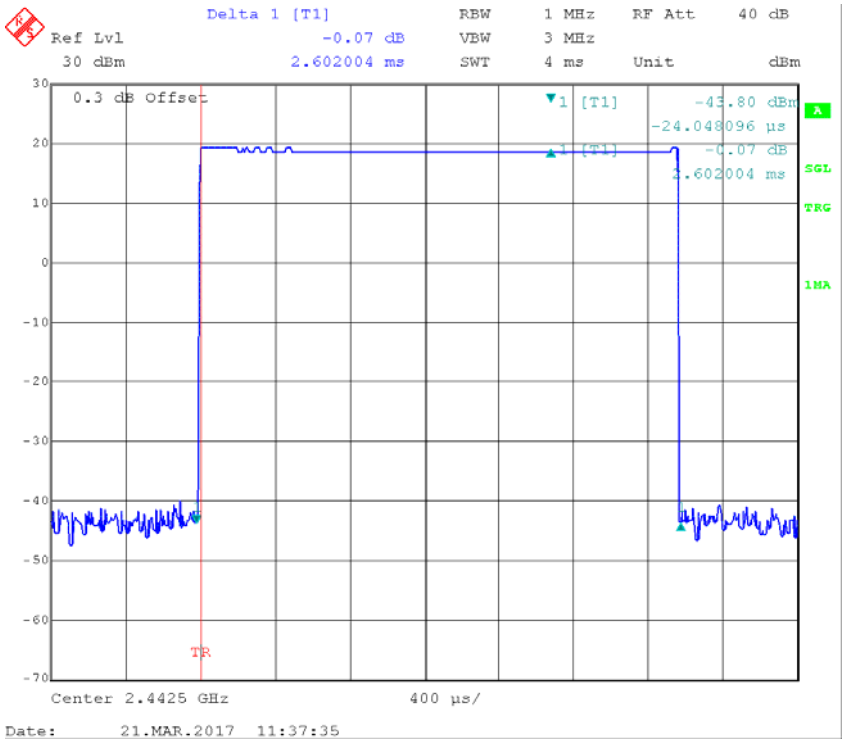
Mode 2:

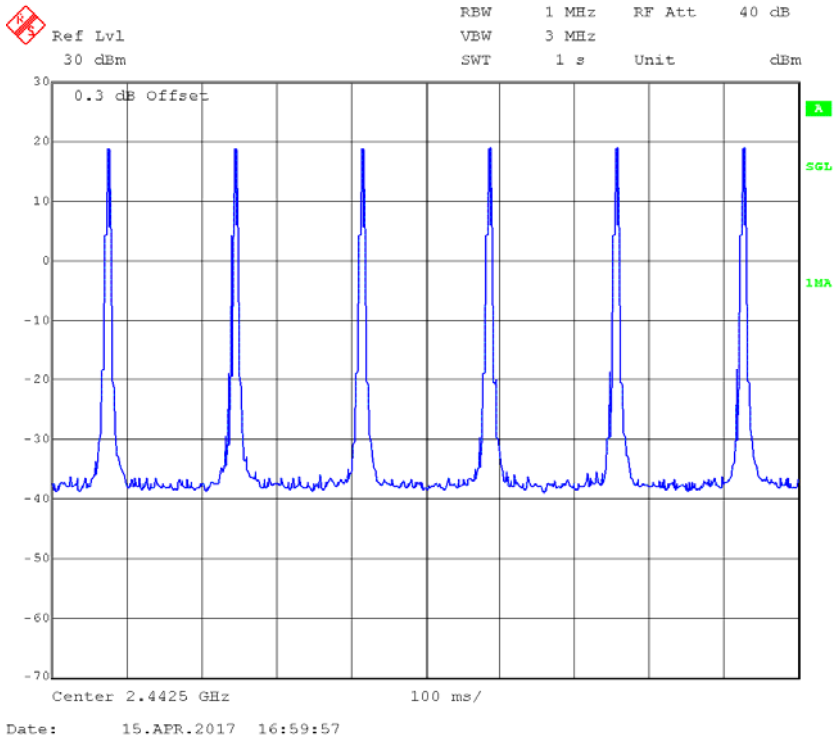
Low Channel



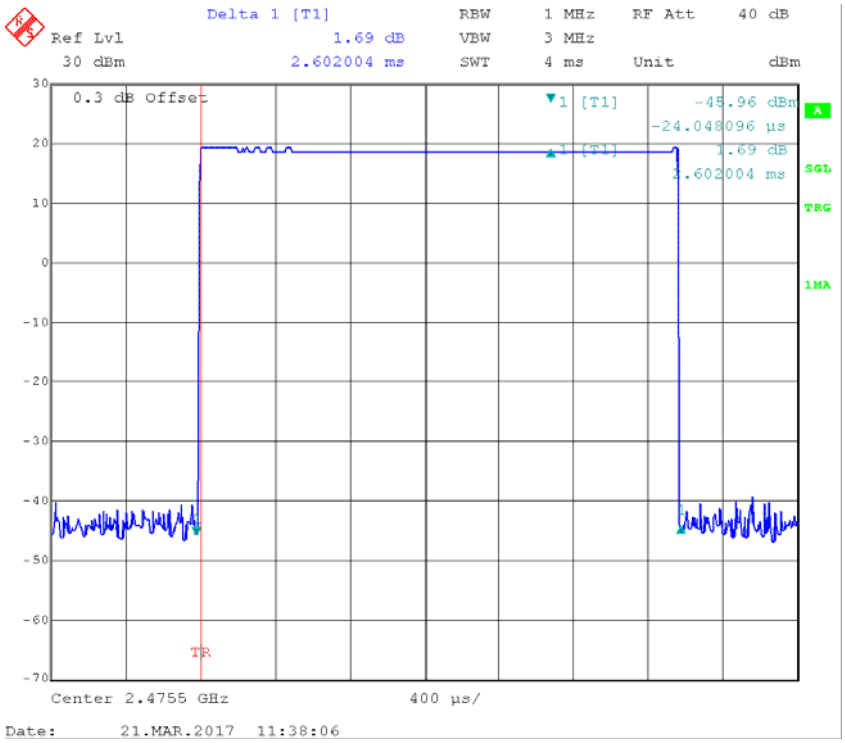


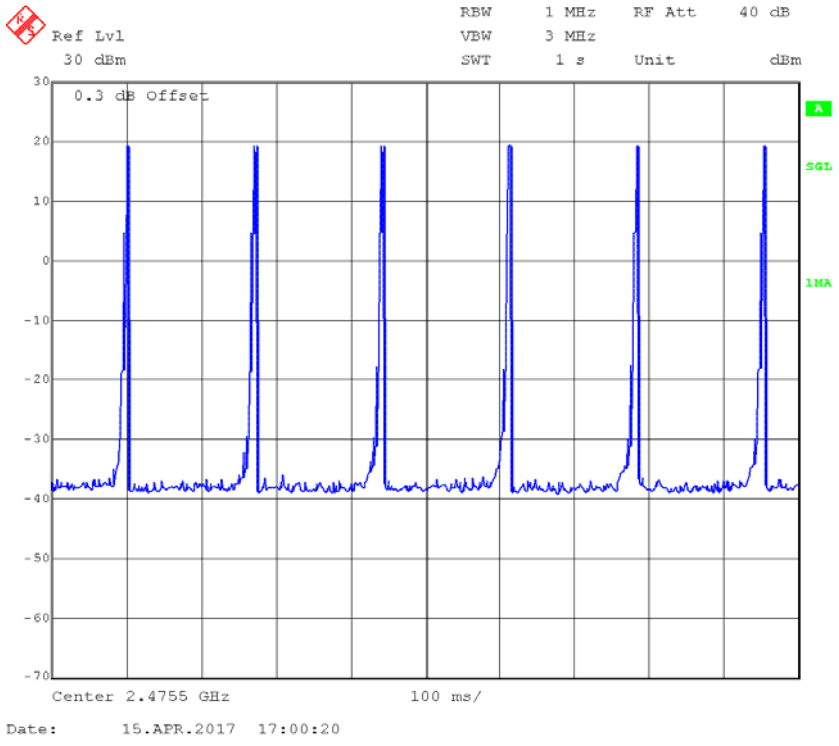
Middle Channel





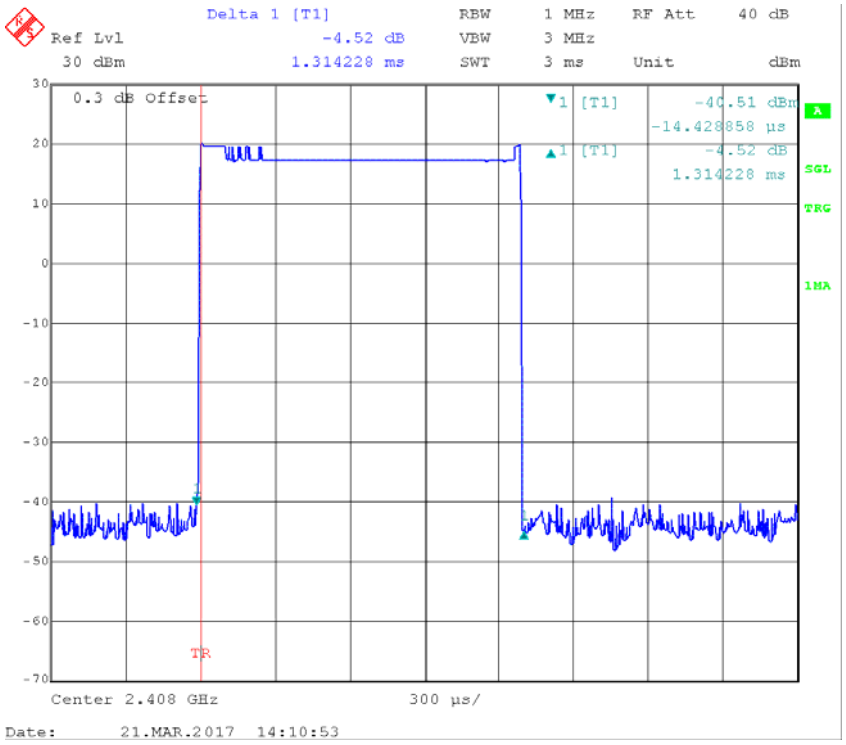
High Channel

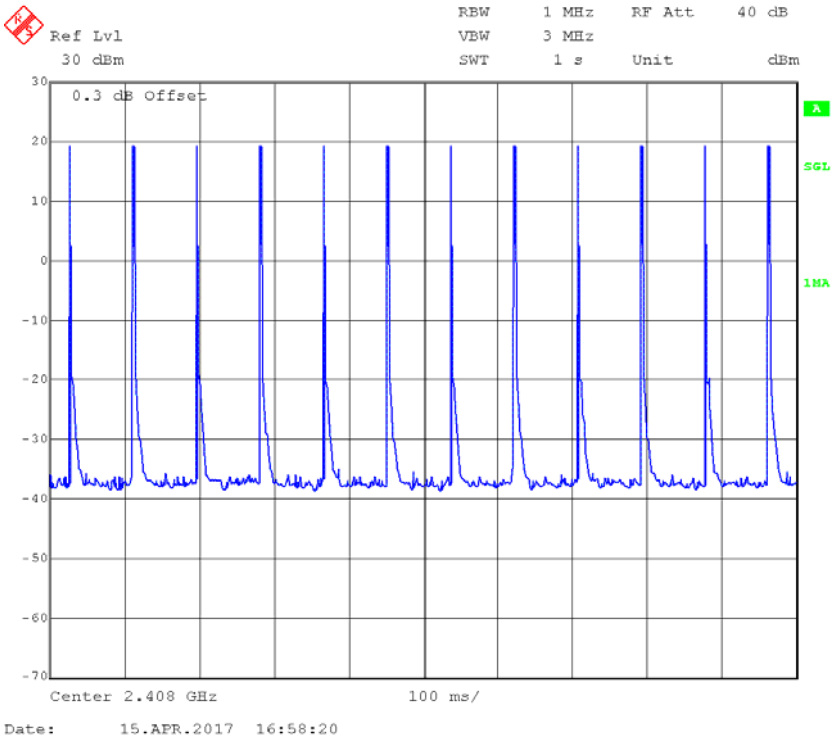




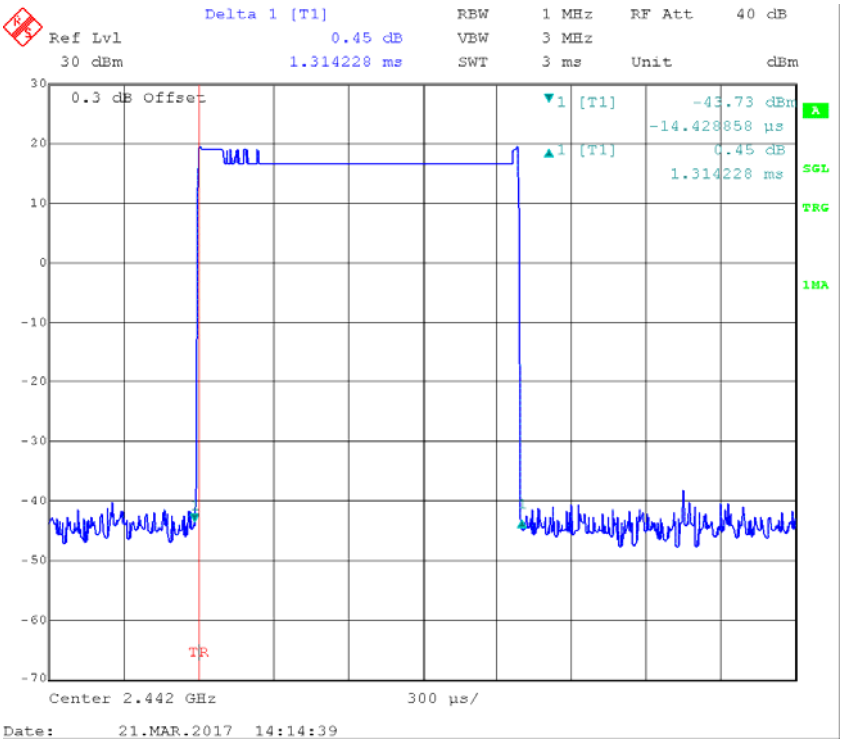
Mode 3:

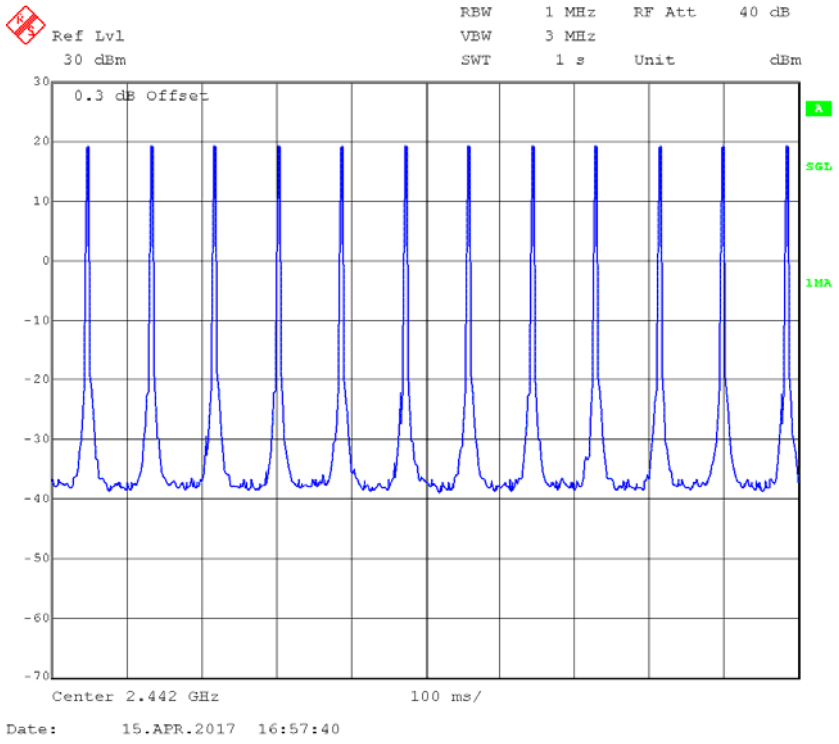
Low Channel



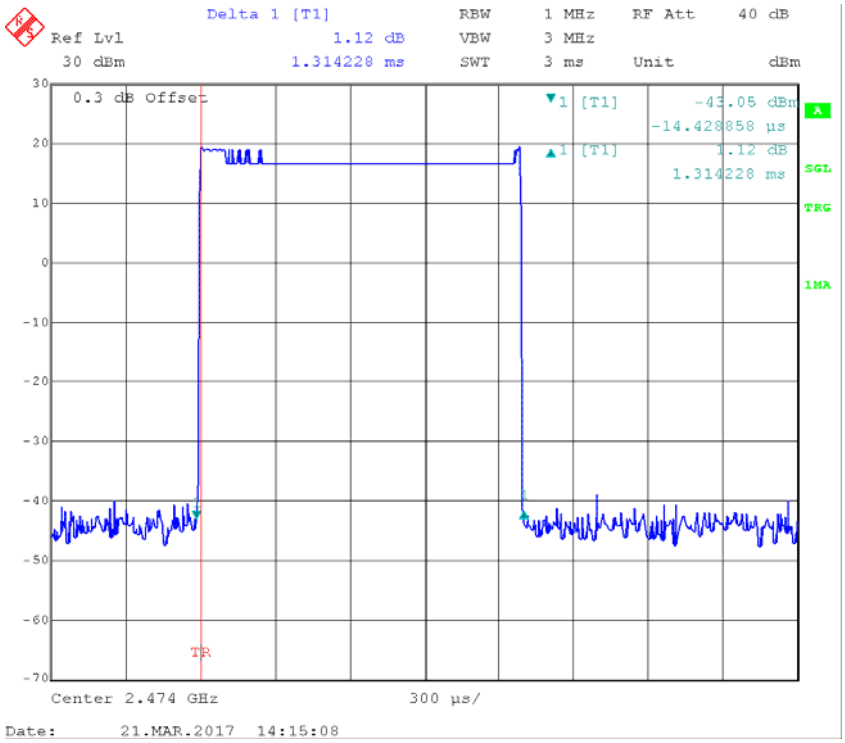


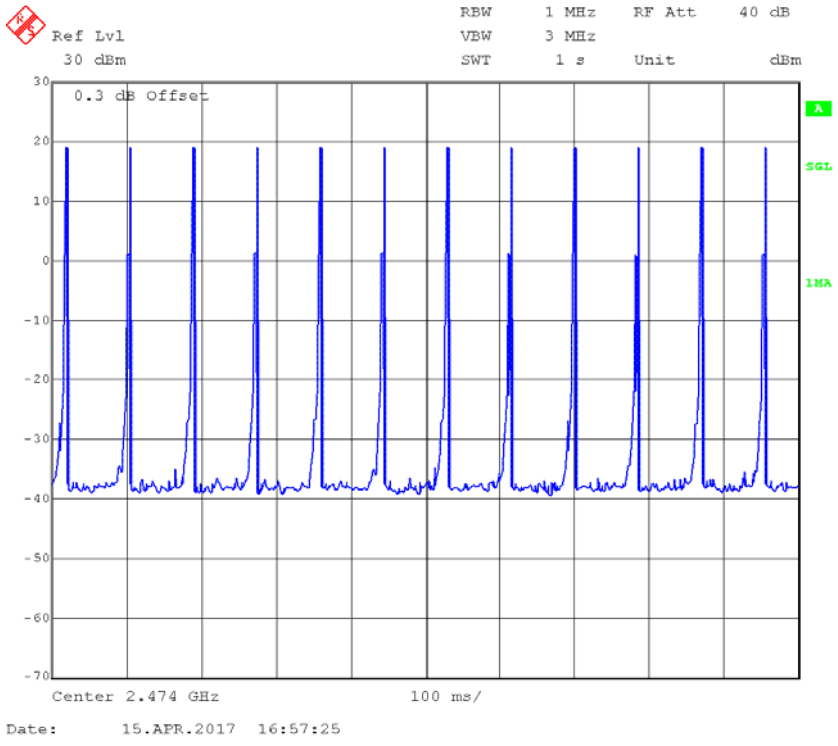
Middle Channel





High Channel




RBW 1 MHz
RF Att 40 dB
VBW 3 MHz
Ref Lvl
30 dBm
SWT 1 s
Unit dBm
0.3 dB Offset
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
A
SGL
1MA
Center 2.474 GHz
100 ms/
Date: 15.APR.2017 16:57:25

FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54170074	2017-01-03	2018-01-02
Agilent	P-Series Power Meter	N1912A	MY5000798	2017-01-03	2018-01-02
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	54 %
ATM Pressure:	95.2 kPa

The testing was performed by Lorin Bian on 2017-03-21.

Test Result: Compliance.

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Conducted Peak Output power (dBm)	Conducted Average Output power (dBm)	Limit (dBm)
Mode 1	Low	2408	19.41	19.37	21
	Middle	2442.5	19.67	19.64	21
	High	2475.5	19.25	19.21	21
Mode 2	Low	2408	19.58	19.54	21
	Middle	2442.5	19.75	19.71	21
	High	2475.5	19.12	19.09	21
Mode 3	Low	2408	19.68	19.64	21
	Middle	2442	19.64	19.6	21
	High	2474	19.31	19.28	21

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

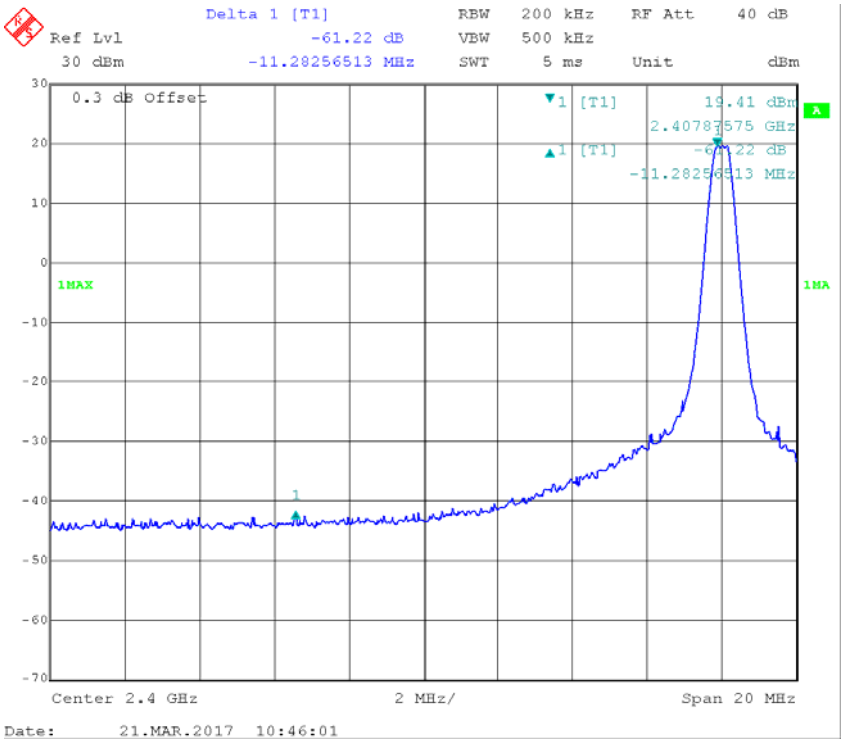
Environmental Conditions

Temperature:	18 °C
Relative Humidity:	54 %
ATM Pressure:	95.2 kPa

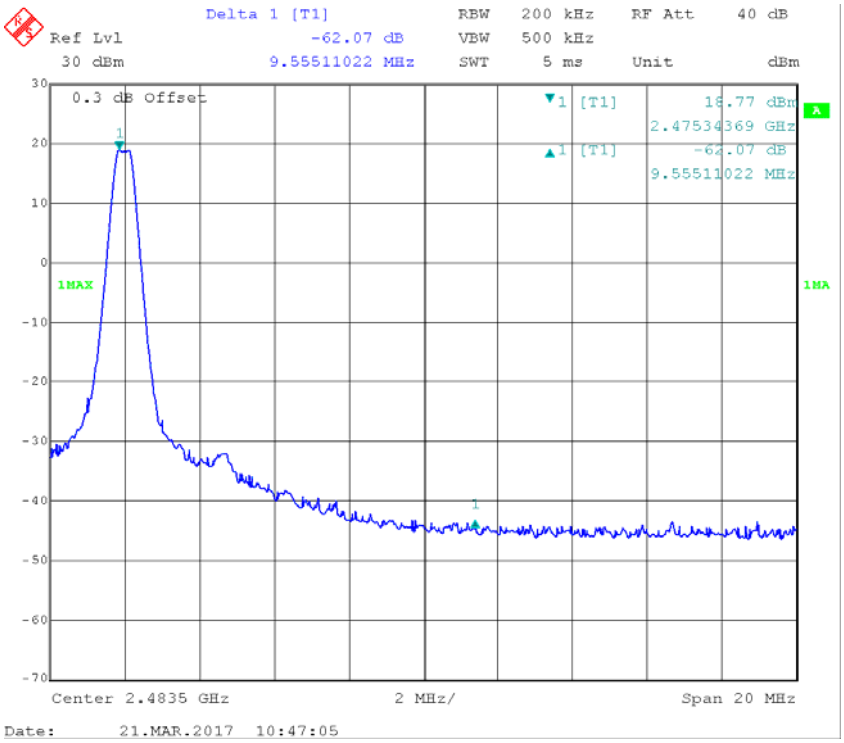
The testing was performed by Lorin Bian on 2017-03-21.

Test Result: Compliance

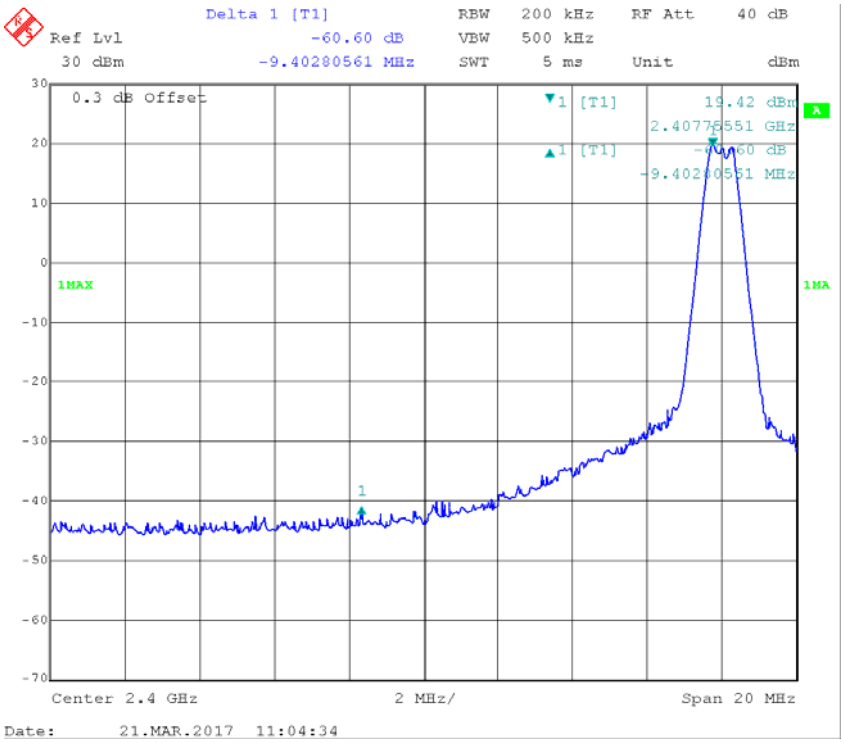
Mode 1 - Band Edge, Left Side



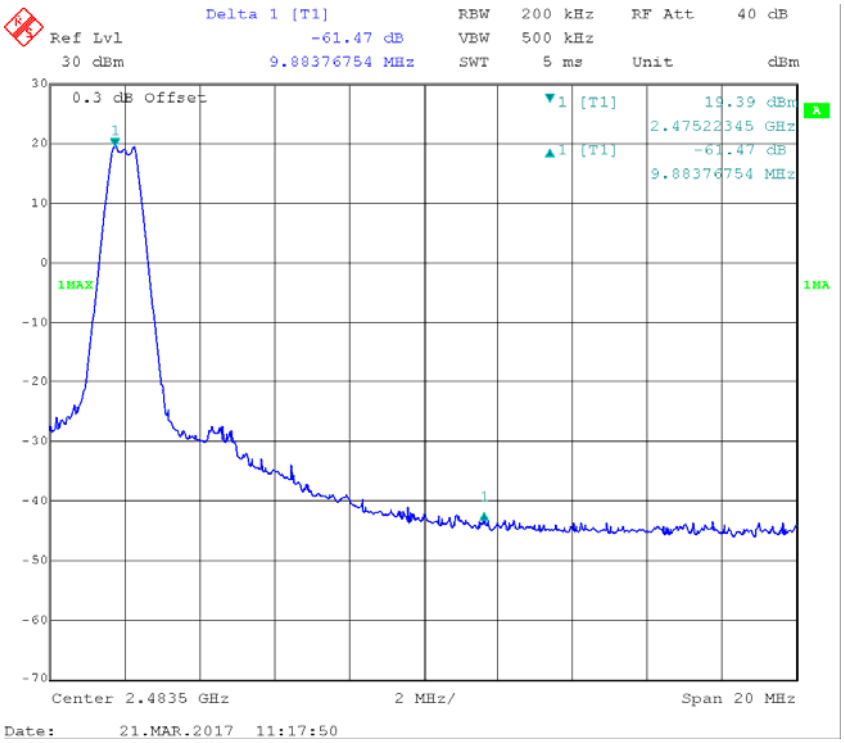
Mode 1 - Band Edge, Right Side



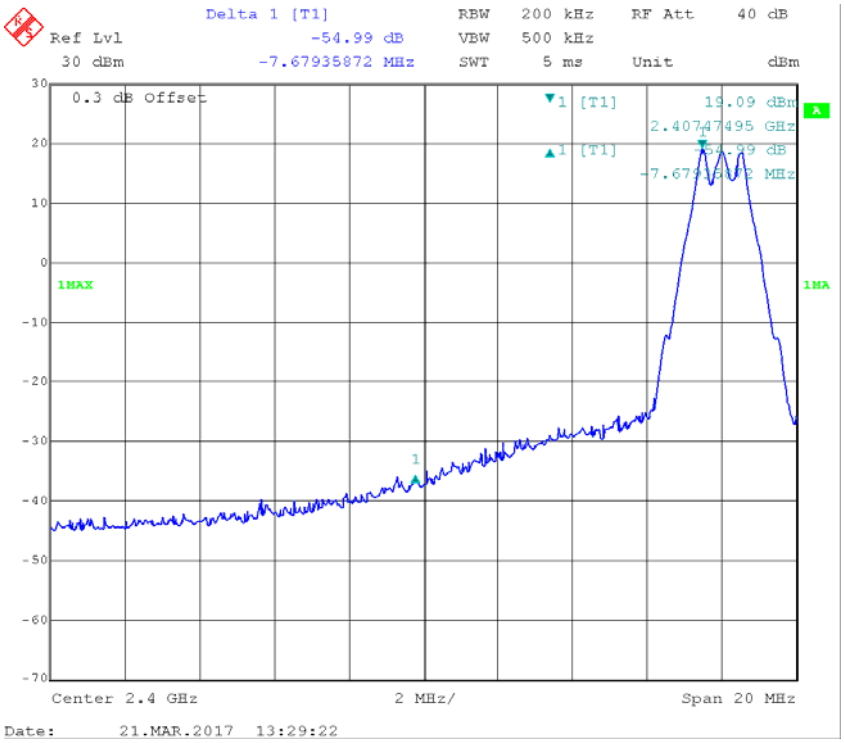
Mode 2 - Band Edge, Left Side



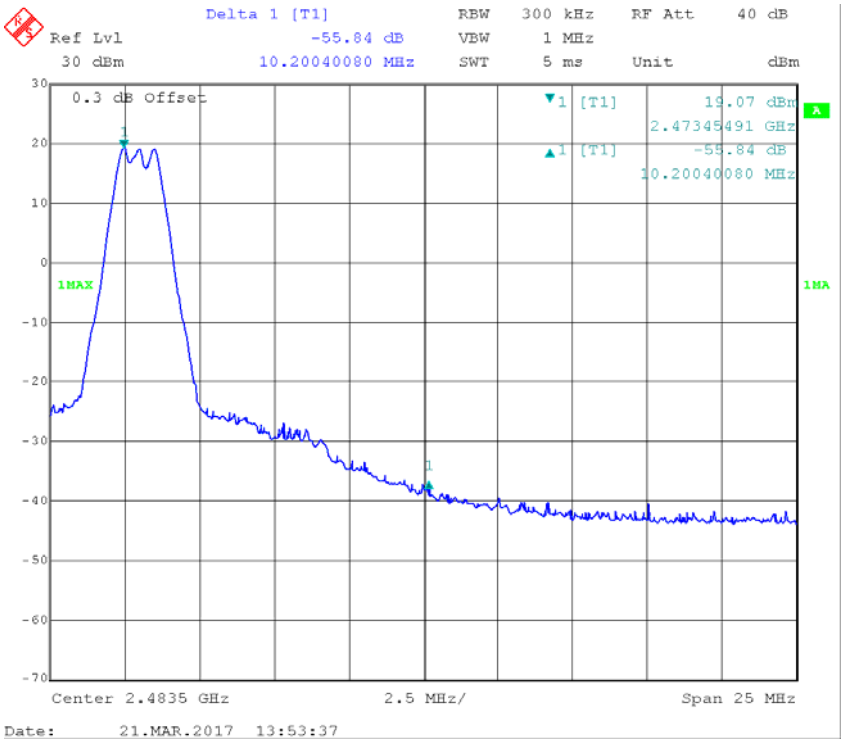
Mode 2 - Band Edge, Right Side



Mode 3 - Band Edge, Left Side



Mode 3 - Band Edge, Right Side



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