

APPLICATION CERTIFICATION FCC Part 15C
On Behalf of

Bulk Unlimited Corp

KidzLane Stage Mic Sing-Off
Model No.: KL-0514

FCC ID: 2AE67-0514

Prepared for : Bulk Unlimited Corp
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Date of Test : August 10-August 23, 2018
Date of Report : August 24, 2018

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Test Report Certification

Applicant : Bulk Unlimited Corp
Manufacturer : Dynamic Scientific Ltd
EUT Description : KidzLane Stage Mic Sing-Off
Model No. : KL-0514
Trade Name : KidzLane

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : August 10-August 23, 2018

Date of Report : August 24, 2018

Prepared by :

Star Yang
(Star Yang, Engineer)

Approved & Authorized Signer :

Sean Liu
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Model Number	:	KL-0514
Bluetooth version	:	V 4.2 This report is for BT classic mode
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	0dBi
Antenna type	:	Integral antenna
Adapter Input Voltage	:	DC 6V (Powered by battery) or DC 5V (Powered by USB port)
Modulation mode	:	GFSK, $\pi/4$ DQPSK, 8DPSK
Applicant	:	Bulk Unlimited Corp
Address	:	199 Lee Ave. Suite 464, Brooklyn, New York, United States 11211
Manufacturer	:	Dynamic Scientific Ltd
Address	:	Room 04&05, 21/F, Canny Industrial Building, 33 San Po Kong, Kowloon, Hong Kong

1.2. Accessory and Auxiliary Equipment

AC/DC Power Adapter (provided by laboratory)	:	Model: TEKA006-0501000UKU
		Input: 100-240V~50/60Hz 0.3A
		Output: DC 5V/1A

1.3. Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.4. Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 06, 2018	Jan. 05, 2019
EMI Test Receiver	Rohde& Schwarz	ESR	101817	Jan. 06, 2018	Jan. 05, 2019
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 06, 2018	Jan. 05, 2019
Pre-Amplifier	Agilent	8447D	294A10619	Jan. 06, 2018	Jan. 05, 2019
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 06, 2018	Jan. 05, 2019
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	Jan. 05, 2019
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	Jan. 05, 2019
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	Jan. 05, 2019
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	Jan. 05, 2019
Open Switch and Control Unit	Rohde&Schwarz	OSP120 + OSP-B157	101244 + 100866	Jan. 06, 2018	Jan. 05, 2019
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	Jan. 05, 2019
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 06, 2018	Jan. 05, 2019
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 06, 2018	Jan. 05, 2019
Conducted Emission Measurement Software: ES-K1 V1.71					
Radiated Emission Measurement Software: EZ_EMV V1.1.4.2					

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode

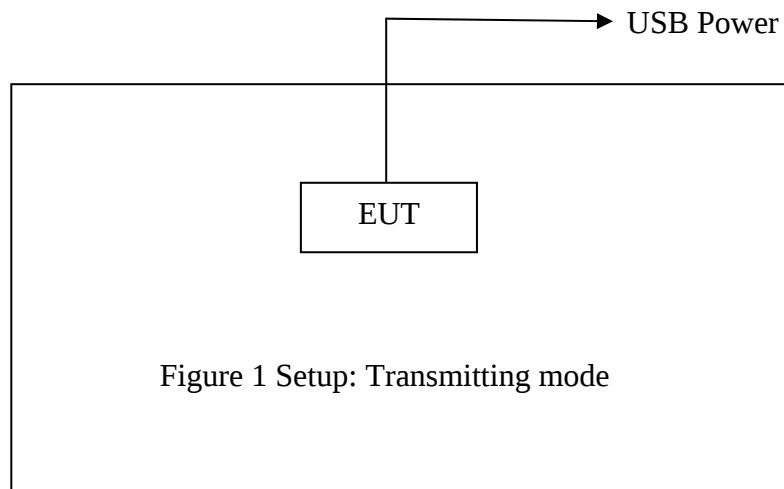
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2.Configuration and peripherals

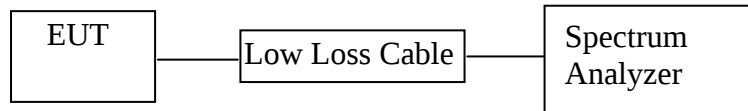


4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.207	AC power-line conducted emissions limits Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): 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.

5.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

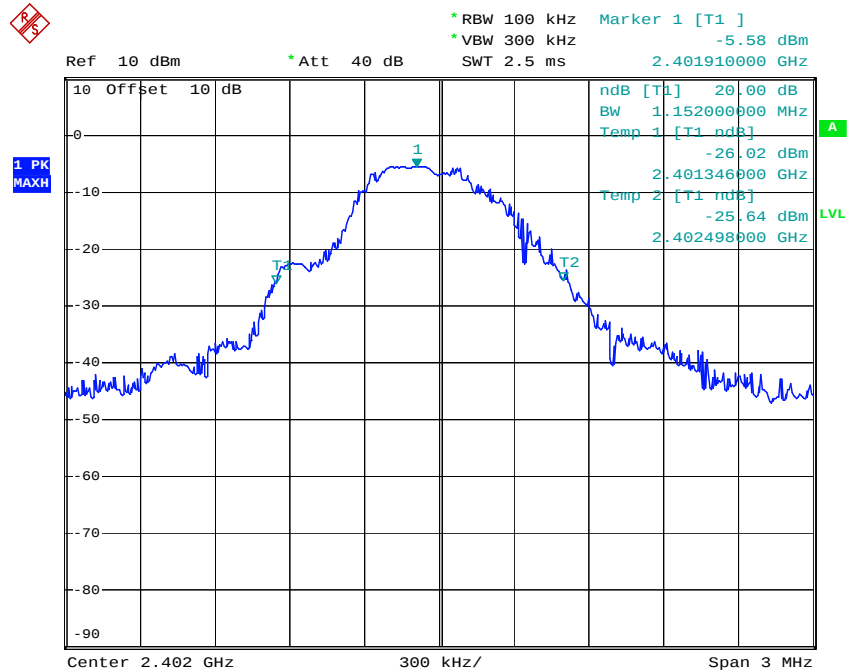
5.6. Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.152	1.290	1.368	Pass
Middle	2441	1.164	1.296	1.356	Pass
High	2480	1.182	1.290	1.386	Pass

The spectrum analyzer plots are attached as below.

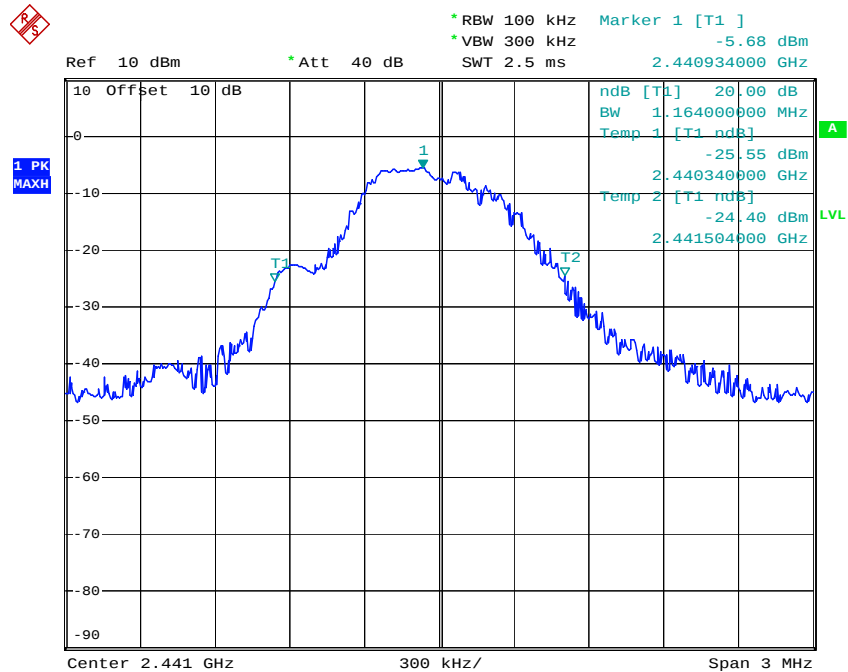
GFSK Mode

Low channel



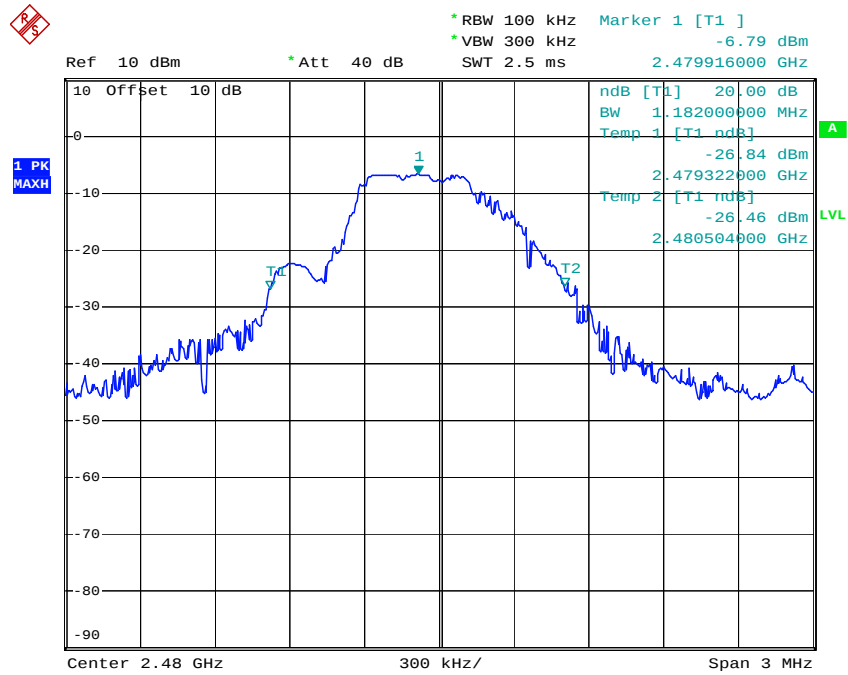
Comment A:
Date: 16.AUG.2018 19:23:38

Middle channel



Comment A:
Date: 16.AUG.2018 19:22:53

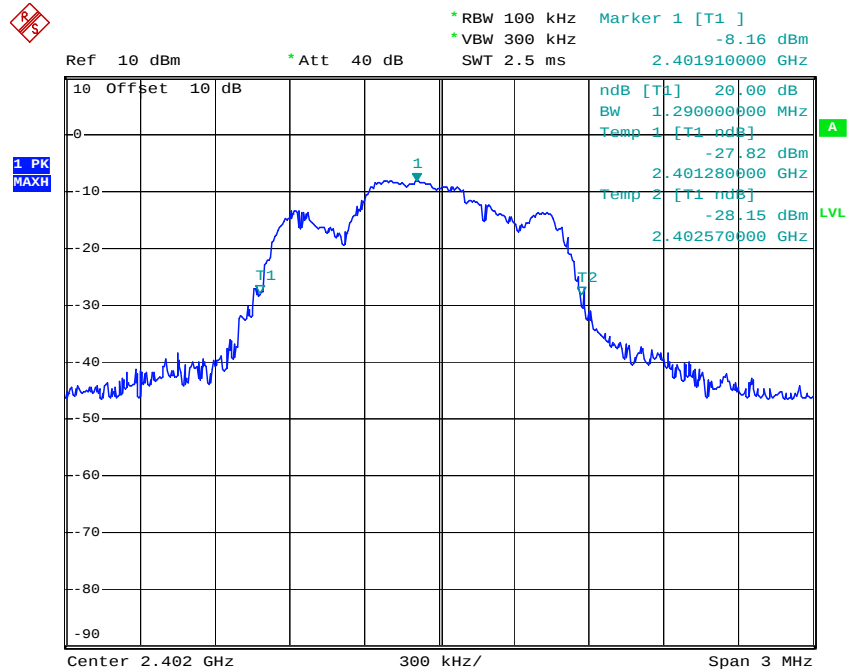
High channel



Comment A:
Date: 16.AUG.2018 19:22:12

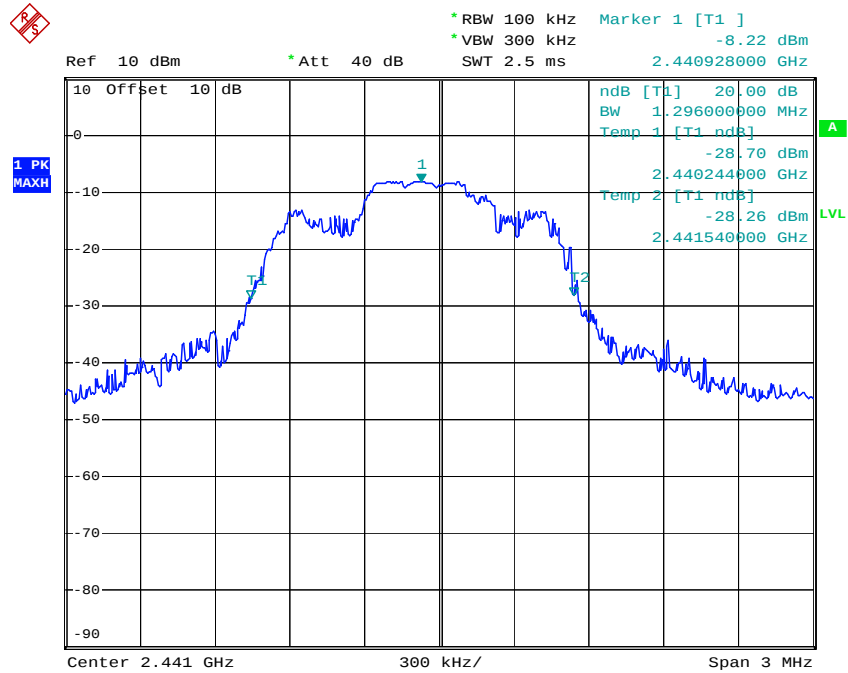
II/4-DQPSK Mode

Low channel



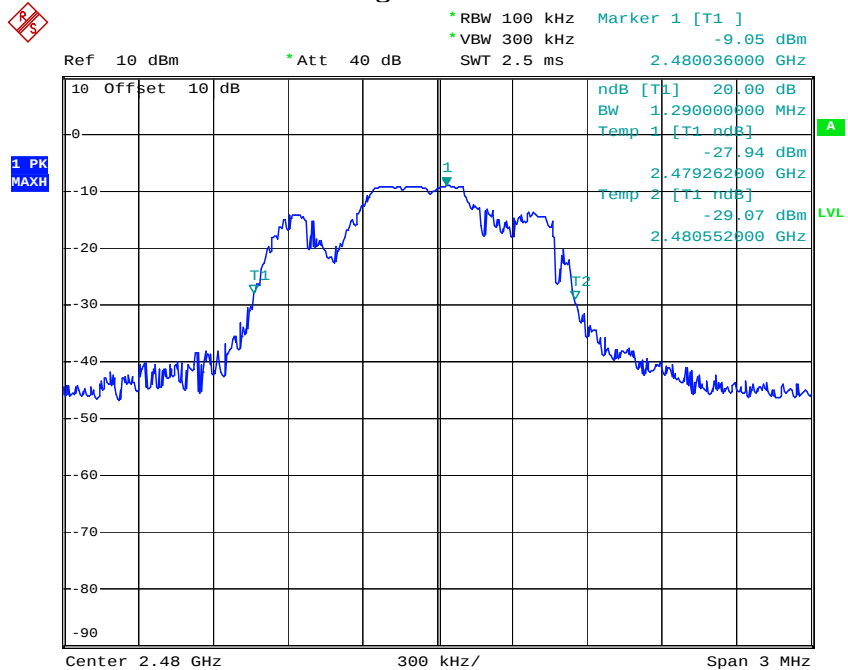
Comment A:
Date: 16.AUG.2018 19:19:39

Middle channel



Comment A:
Date: 16.AUG.2018 19:20:21

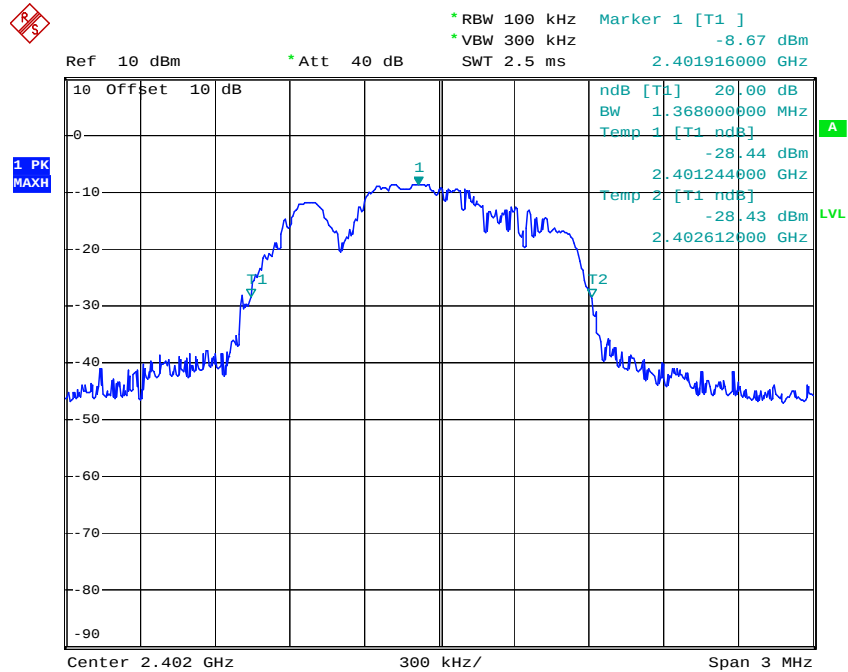
High channel



Comment A:
Date: 16.AUG.2018 19:21:06

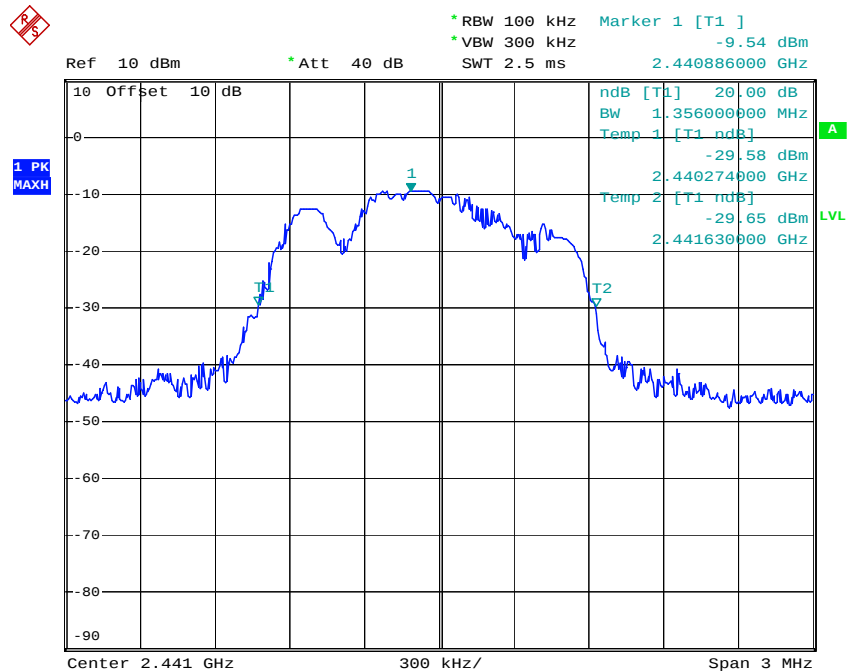
8DPSK Mode

Low channel



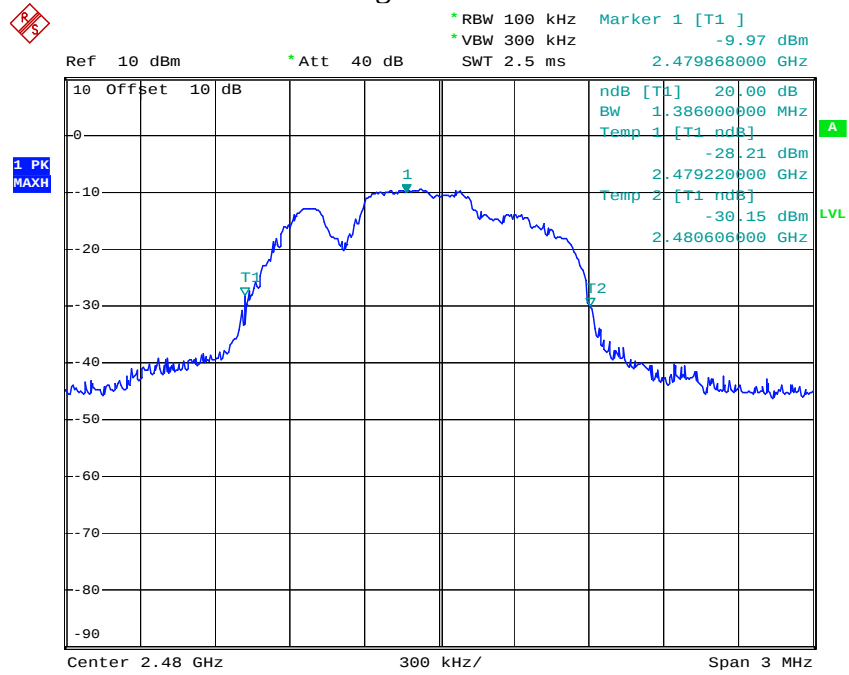
Comment A:
Date: 16.AUG.2018 19:19:01

Middle channel



Comment A:
Date: 16.AUG.2018 19:18:28

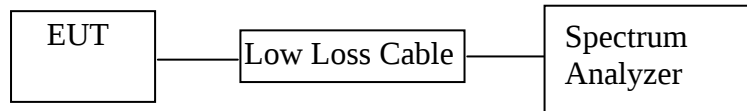
High channel



Comment A:
Date: 16.AUG.2018 19:17:46

6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): 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 pseudo randomly 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.

6.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

6.5. Test Procedure

6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

6.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz. Adjust Span to 2MHz.

6.5.3. Set the adjacent channel of the EUT Maxhold another trace.

6.5.4. Measurement the channel separation

6.6. Test Result

GFSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.008	0.768	Pass
	2403			
Middle	2440	0.996	0.776	Pass
	2441			
High	2479	0.996	0.788	Pass
	2480			

Π/4-DQPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.882	0.860	Pass
	2403			
Middle	2440	0.996	0.864	Pass
	2441			
High	2479	0.996	0.860	Pass
	2480			

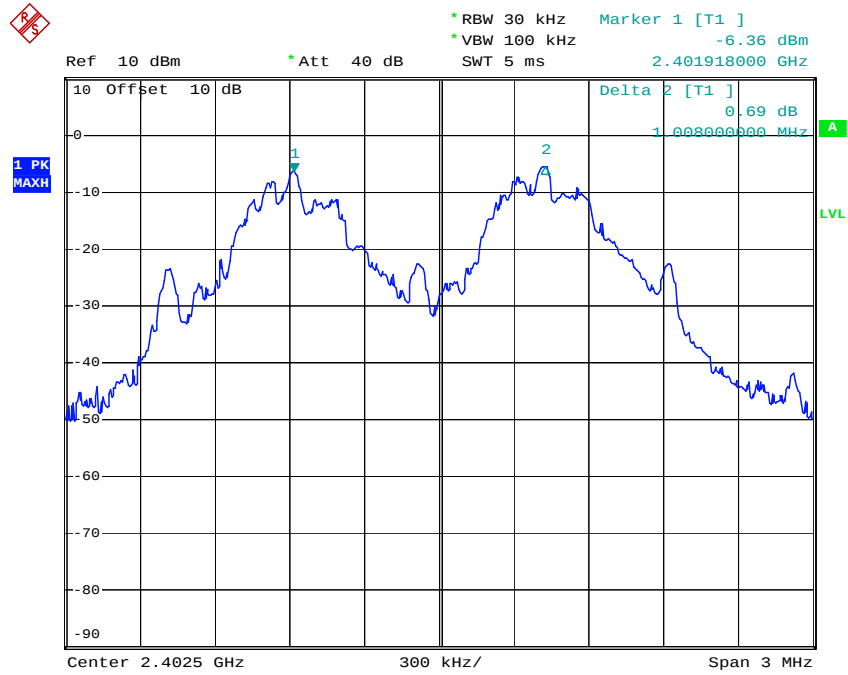
8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.008	0.912	Pass
	2403			
Middle	2440	1.008	0.904	Pass
	2441			
High	2479	0.996	0.912	Pass
	2480			

The spectrum analyzer plots are attached as below.

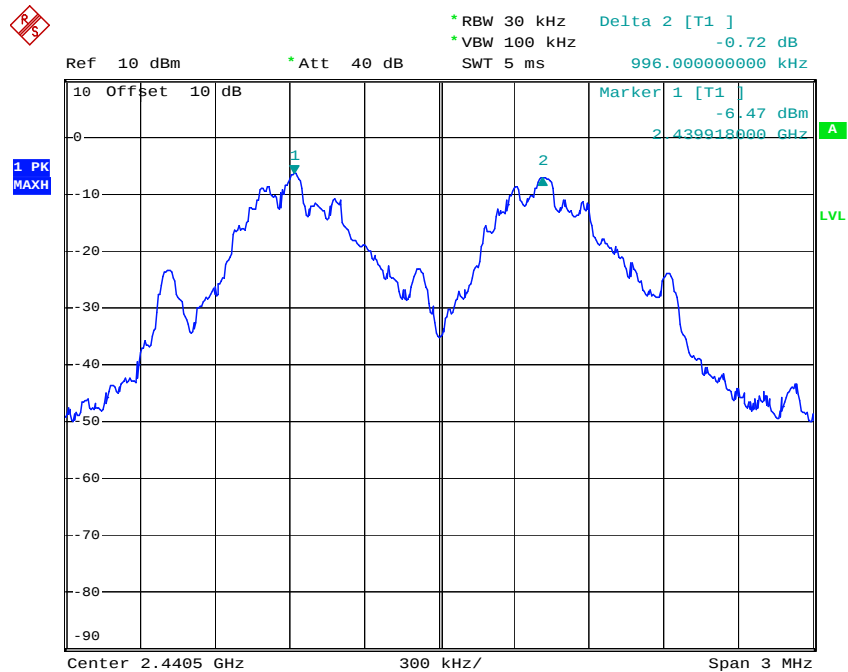
GFSK Mode

Low channel

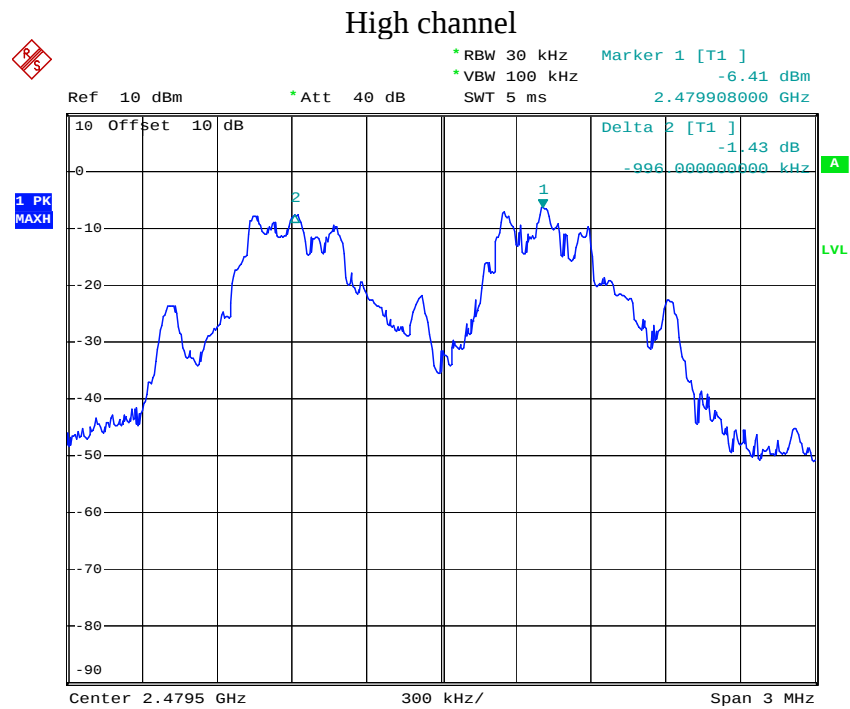


Comment A:
Date: 16.AUG.2018 18:54:11

Middle channel

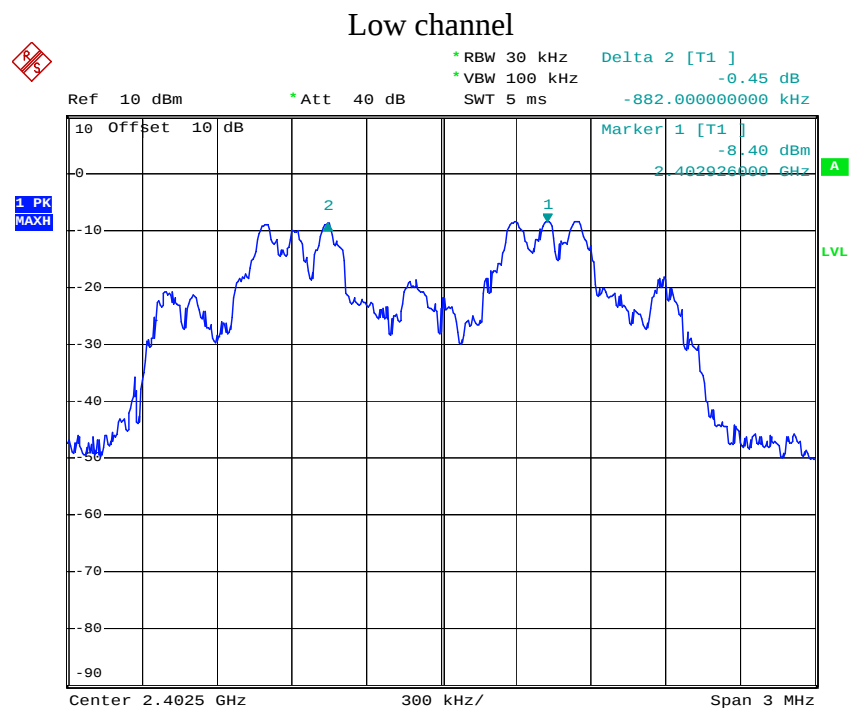


Comment A:
Date: 16.AUG.2018 18:55:43



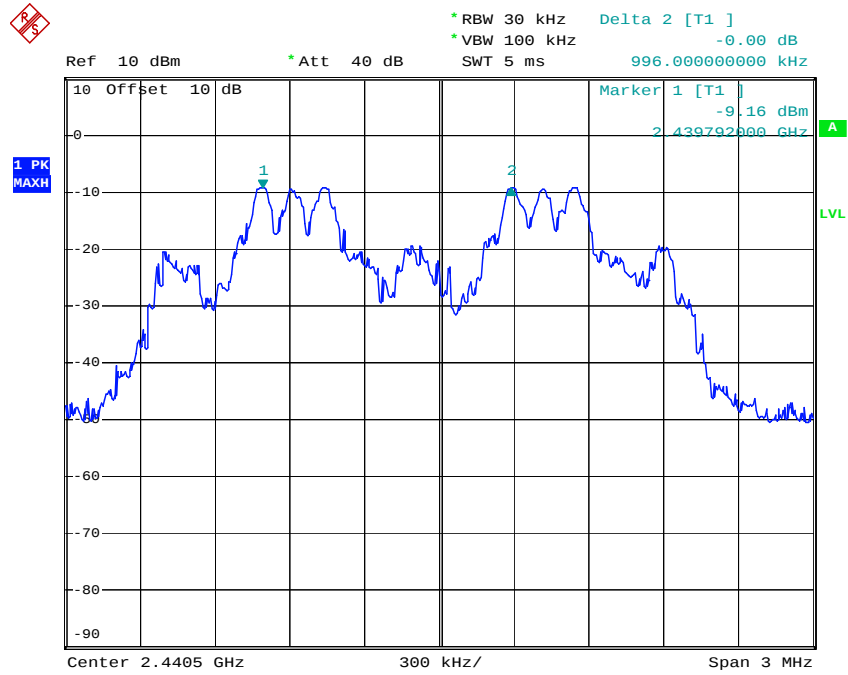
Comment A:
Date: 16.AUG.2018 18:57:40

$\Pi/4$ -DQPSK Mode



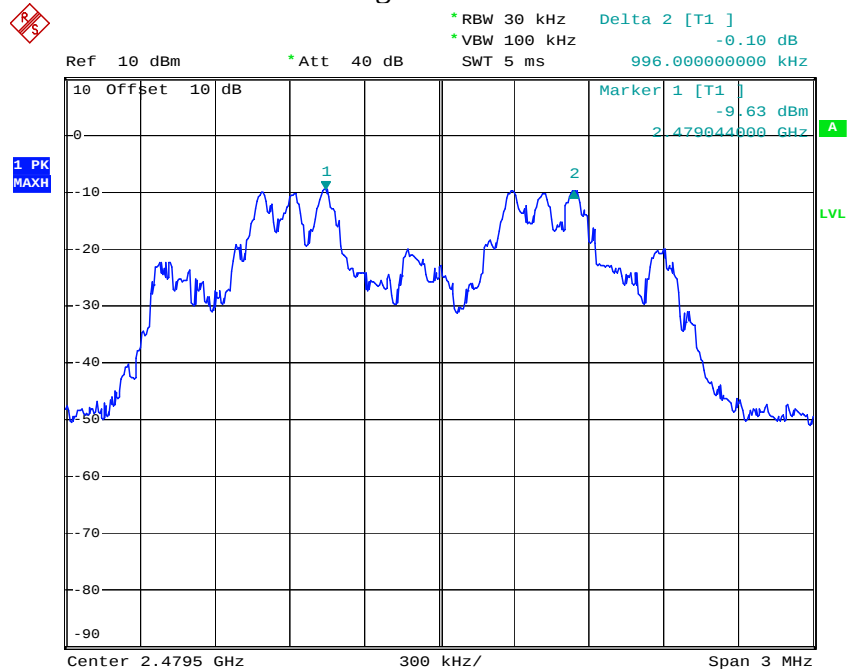
Comment A:
Date: 16.AUG.2018 19:01:26

Middle channel



Comment A:
Date: 16.AUG.2018 18:59:58

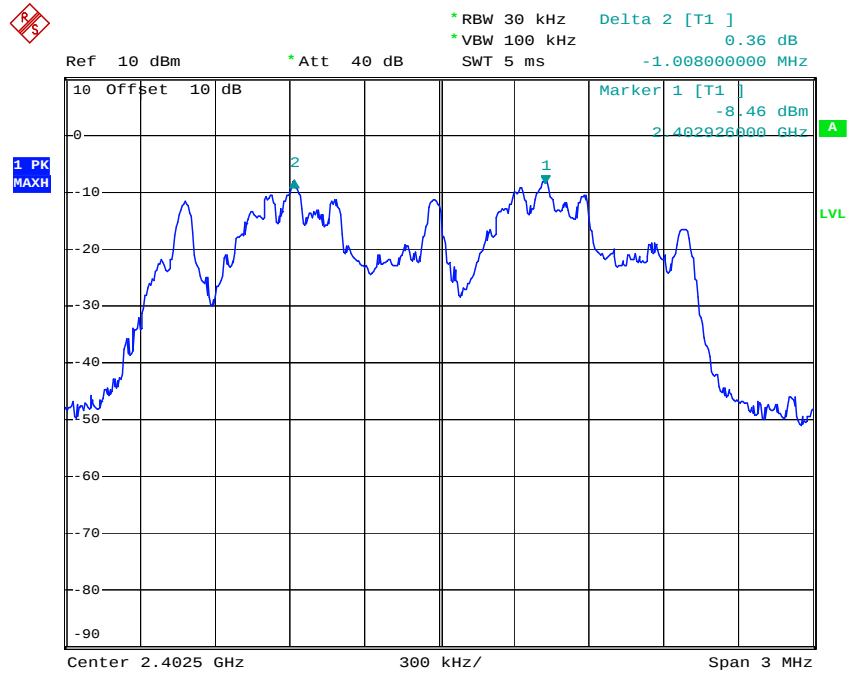
High channel



Comment A:
Date: 16.AUG.2018 18:58:58

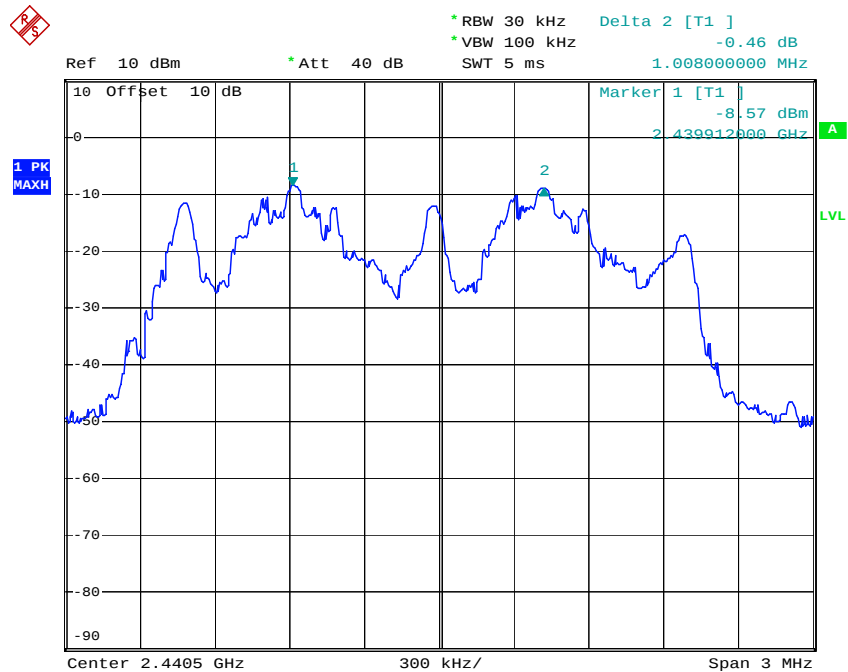
8DPSK Mode

Low channel



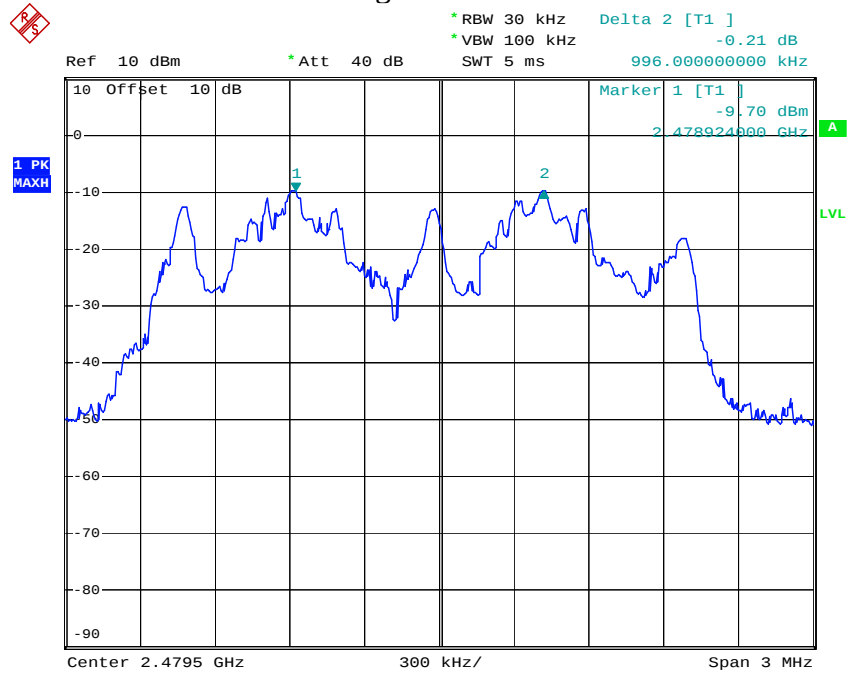
Comment A:
Date: 16.AUG.2018 19:02:24

Middle channel



Comment A:
Date: 16.AUG.2018 19:03:49

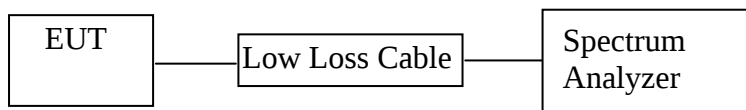
High channel



Comment A:
Date: 16.AUG.2018 19:04:52

7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

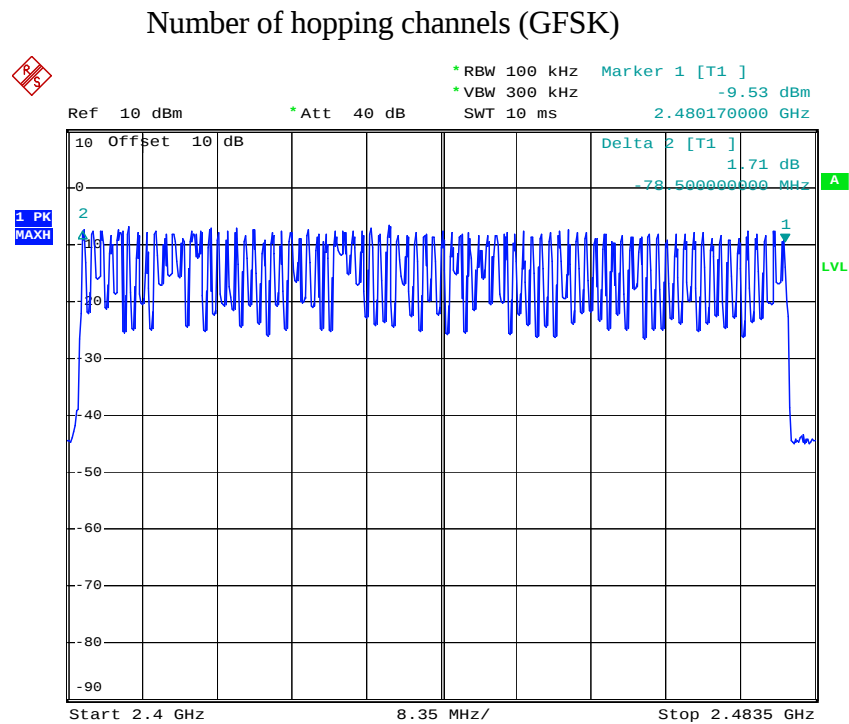
7.5.3. Max hold, view and count how many channel in the band.

7.6.Test Result

Pass.

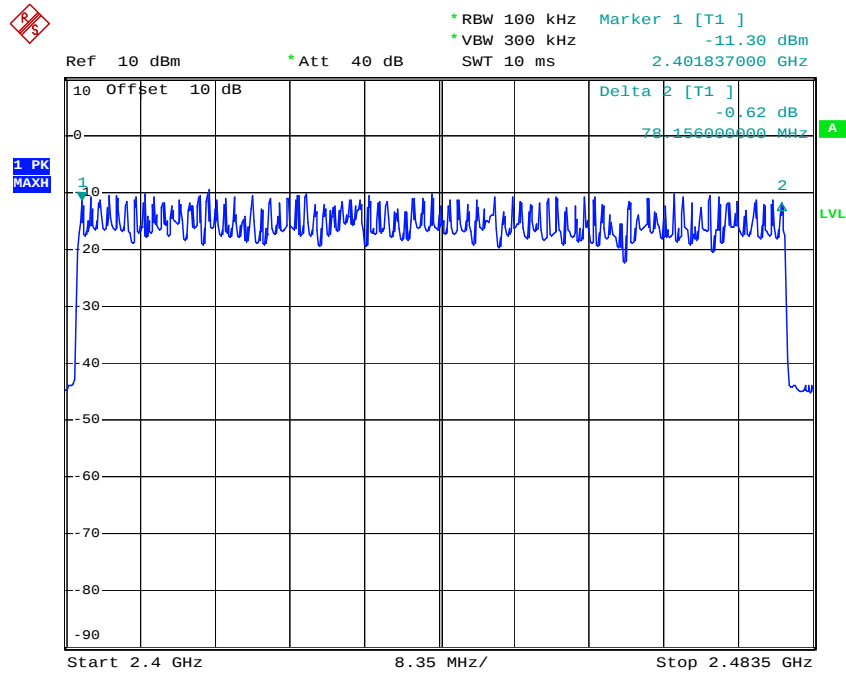
Total number of hopping channel	Measurement result(CH)	Limit(CH)
	79	≥ 15

The spectrum analyzer plots are attached as below.



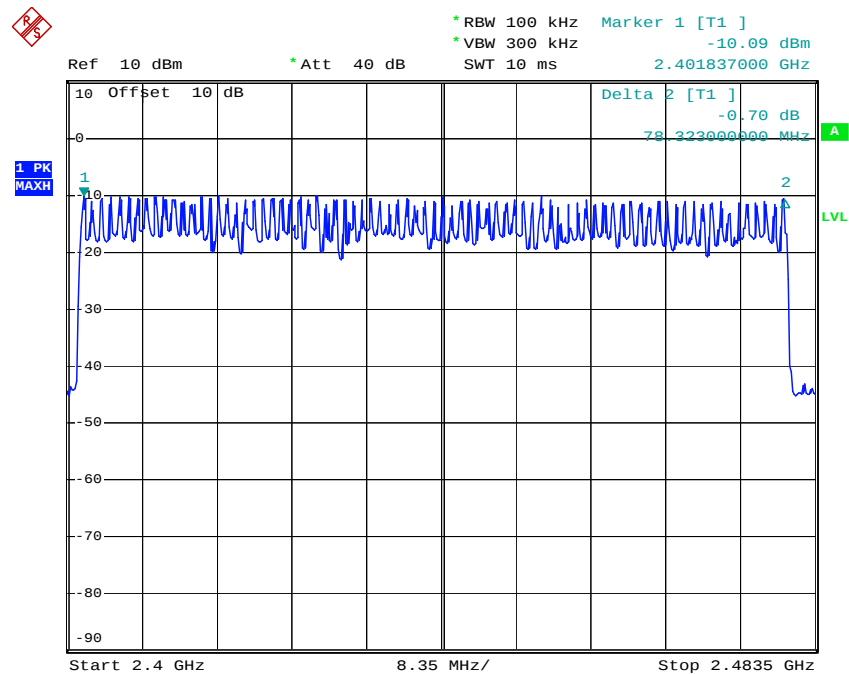
Comment A:
Date: 16.AUG.2018 18:47:25

Number of hopping channels ($\Pi/4$ -DQPSK)



Comment A:
Date: 16.AUG.2018 18:49:17

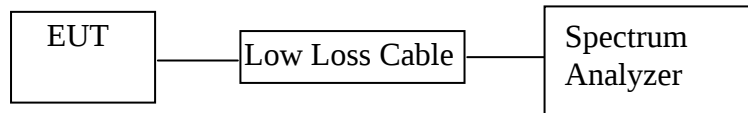
Number of hopping channels (8DPSK)



Comment A:
Date: 16.AUG.2018 18:51:19

8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): 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.

8.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

8.5. Test Procedure

8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2. Set center frequency of spectrum analyzer = operating frequency.

8.5.3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=5ms, 10ms, 15ms. Get the pulse time.

8.5.4. Repeat above procedures until all frequency measured were complete.

8.6. Test Result

Pass.

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.530	169.60	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2441	1.810	289.60	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2441	3.100	330.67	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

Π/4-DQPSK

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
2DH1	2441	0.520	166.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
2DH3	2441	1.800	288.00	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
2DH5	2441	3.060	326.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

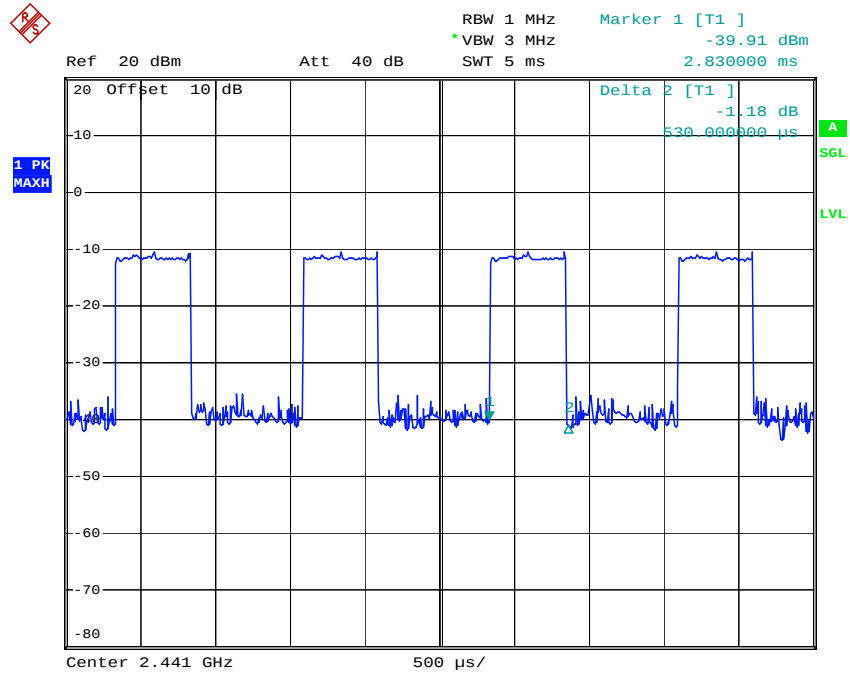
8DPSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
3DH1	2441	0.520	166.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
3DH3	2441	1.800	288.00	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
3DH5	2441	3.060	326.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

The spectrum analyzer plots are attached as below.

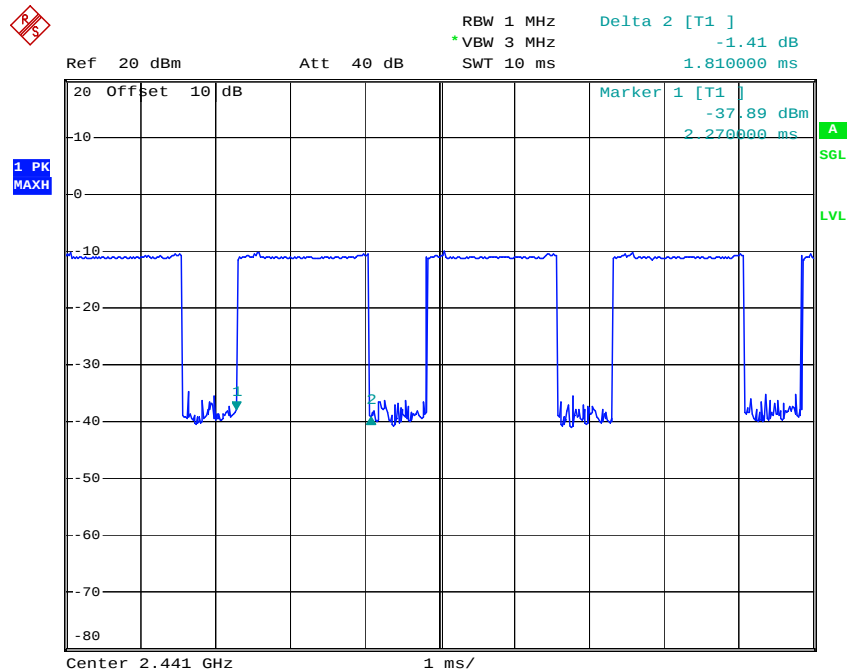
GFSK Mode

DH1 Middle channel



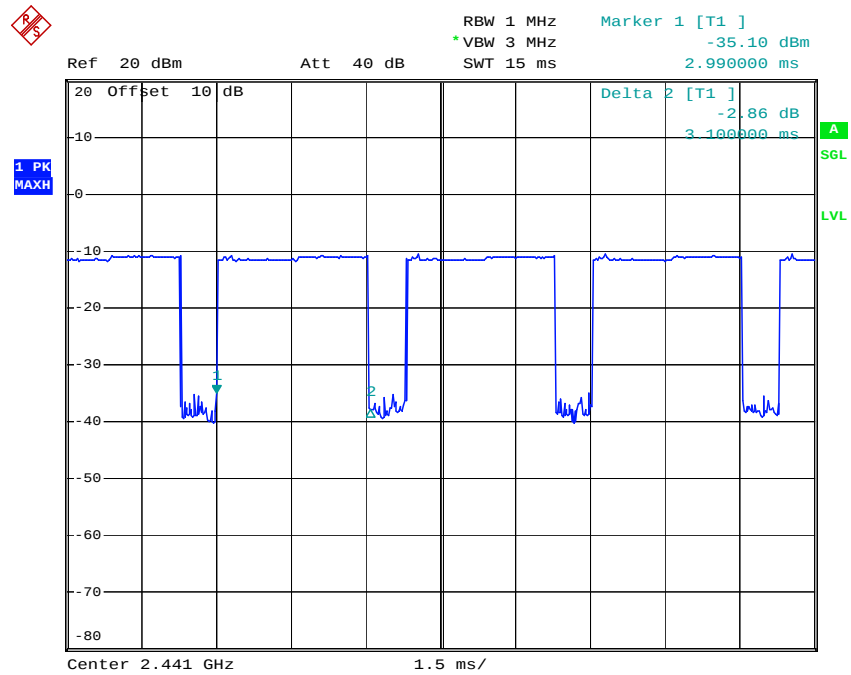
Comment A:
Date: 17.AUG.2018 10:03:48

DH3 Middle channel



Comment A:
Date: 17.AUG.2018 10:04:26

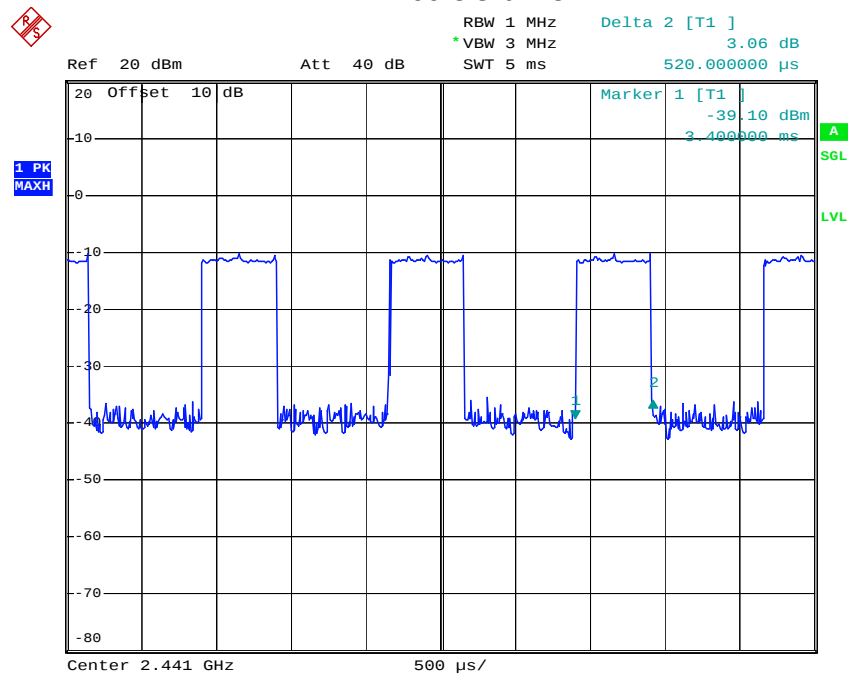
DH5 Middle channel



Comment A:
Date: 17.AUG.2018 10:05:05

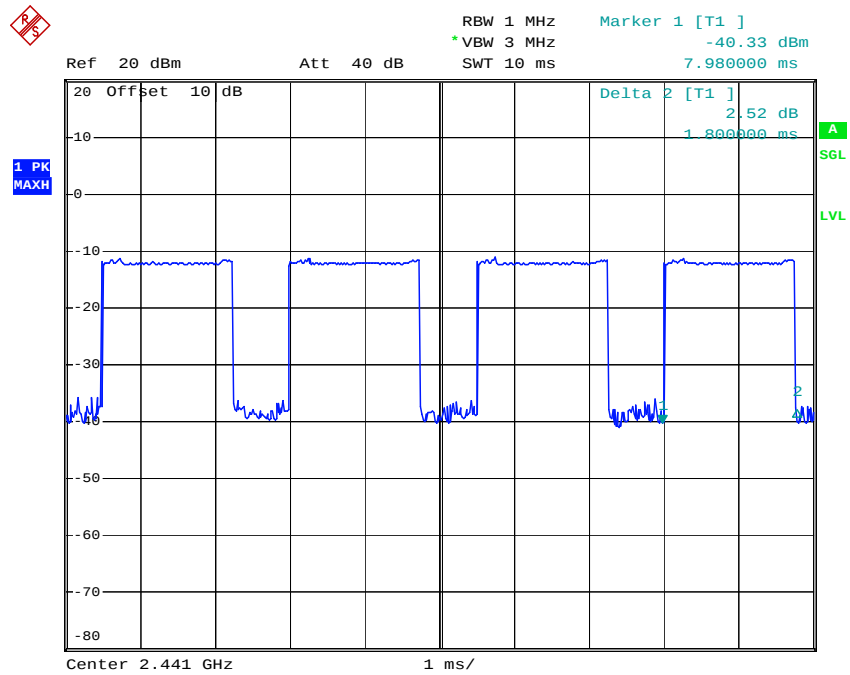
$\Pi/4$ -DQPSK

2DH1 Middle channel



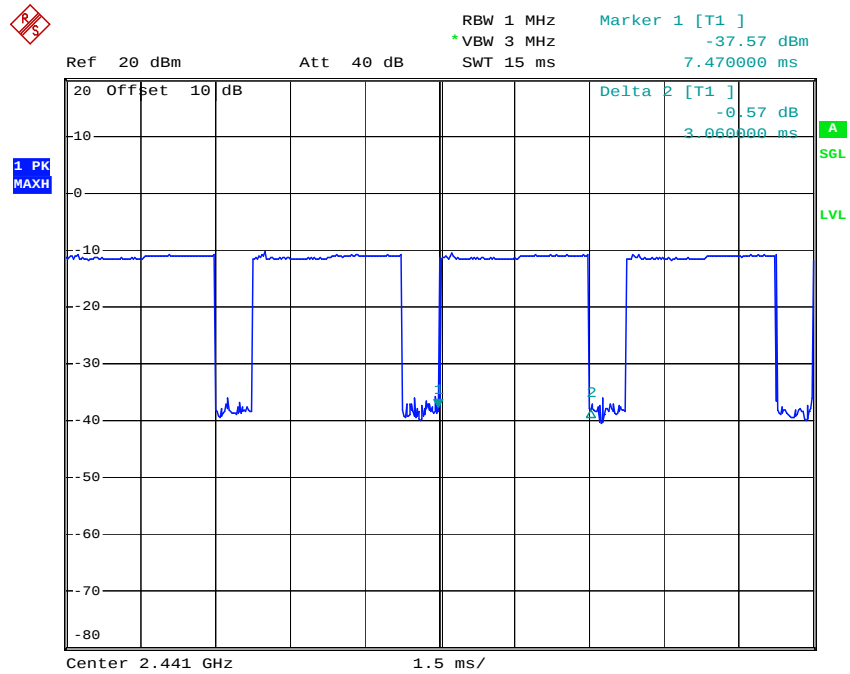
Comment A:
Date: 17.AUG.2018 10:12:30

2DH3 Middle channel



Comment A:
Date: 17.AUG.2018 10:11:19

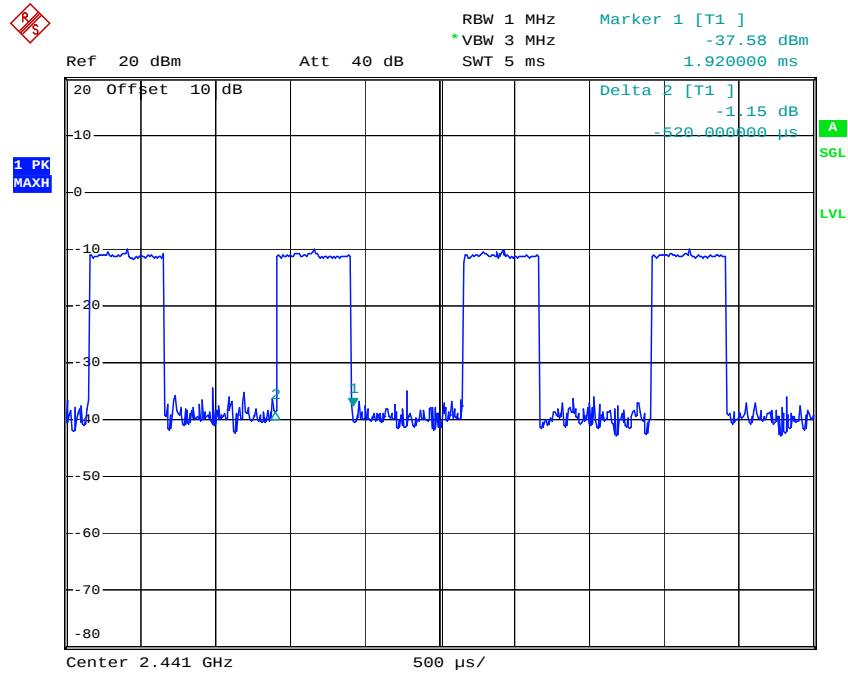
2DH5 Middle channel



Comment A:
Date: 17.AUG.2018 10:11:59

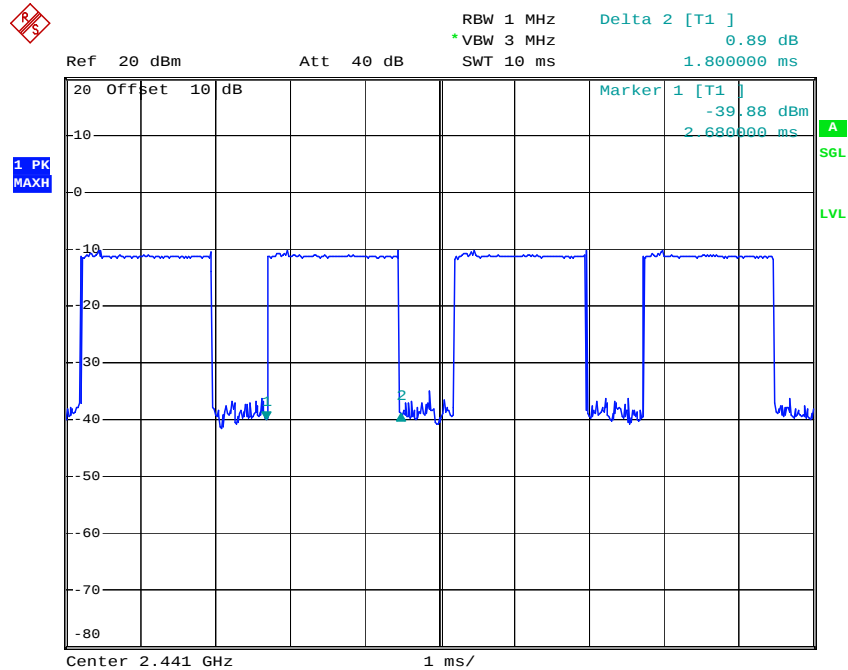
8DPSK Mode

3DH1 Middle channel



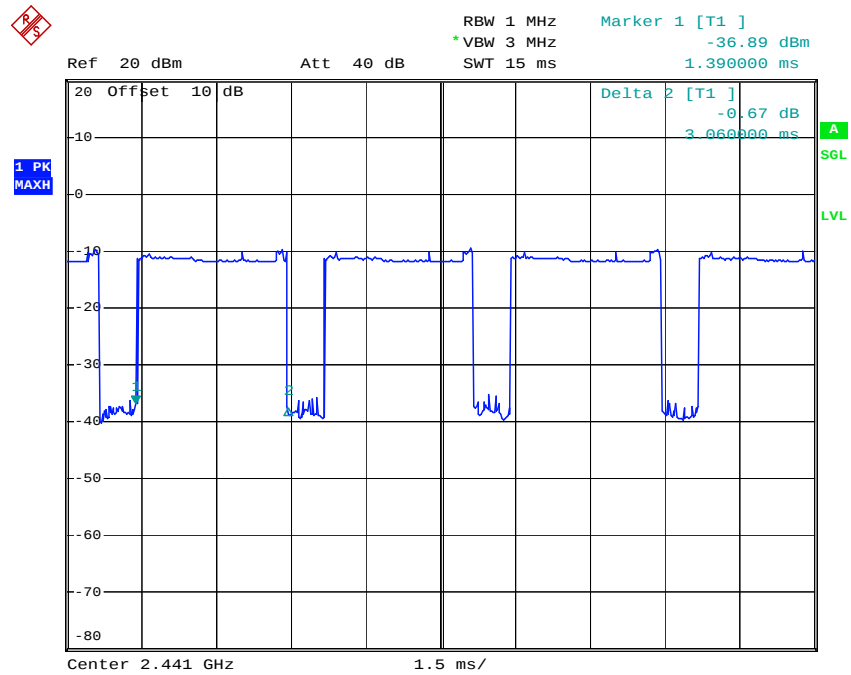
Comment A:
Date: 17.AUG.2018 10:17:22

3DH3 Middle channel



Comment A:
Date: 17.AUG.2018 10:17:52

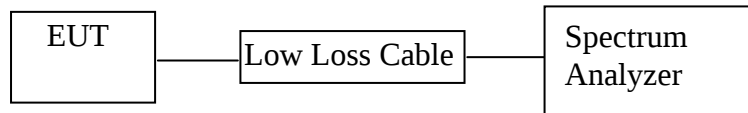
3DH5 Middle channel



Comment A:
Date: 17.AUG.2018 10:18:24

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



9.2. The Requirement For Section 15.247(b)(1)

Section 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.

9.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz.

9.5.3. Measurement the maximum peak output power.

9.6. Test Result

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W	Result
Low	2402	-8.61/0.0001	21 / 0.125	Pass
Middle	2441	-8.11/0.0002	21 / 0.125	Pass
High	2480	-8.06/0.0002	21 / 0.125	Pass

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W	Result
Low	2402	-7.95/0.0002	21 / 0.125	Pass
Middle	2441	-7.49/0.0002	21 / 0.125	Pass
High	2480	-9.00/0.0001	21 / 0.125	Pass

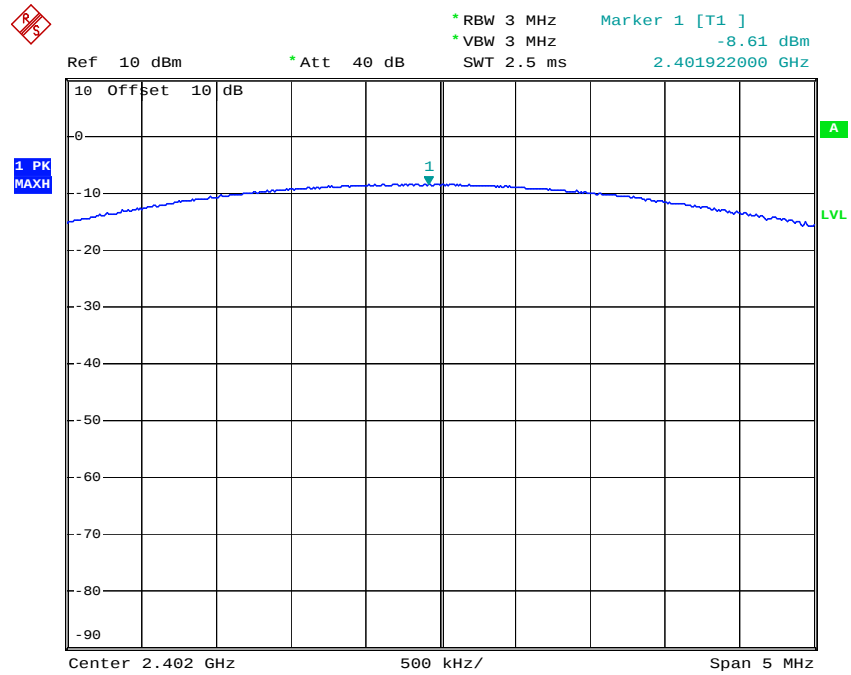
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W	Result
Low	2402	-7.39/0.0002	21 / 0.125	Pass
Middle	2441	-7.94/0.0002	21 / 0.125	Pass
High	2480	-7.87/0.0002	21 / 0.125	Pass

The spectrum analyzer plots are attached as below.

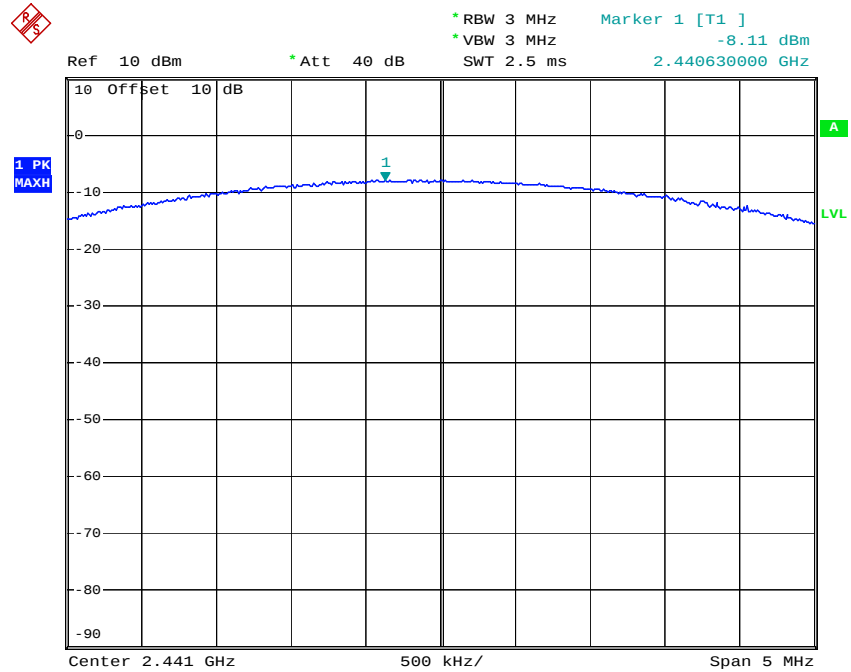
GFSK Mode

Low channel



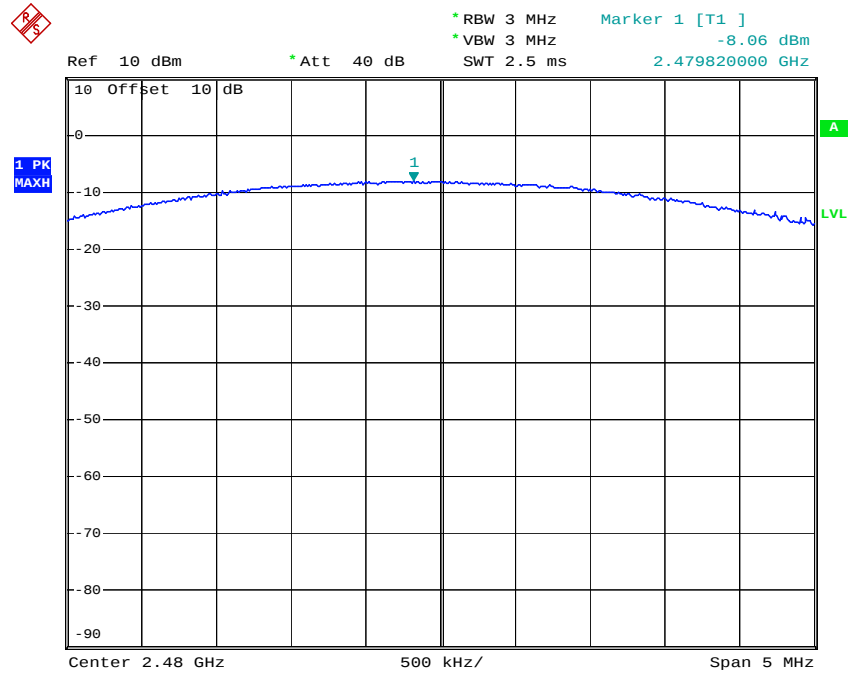
Comment A:
Date: 16.AUG.2018 18:37:07

Middle channel



Comment A:
Date: 16.AUG.2018 18:38:16

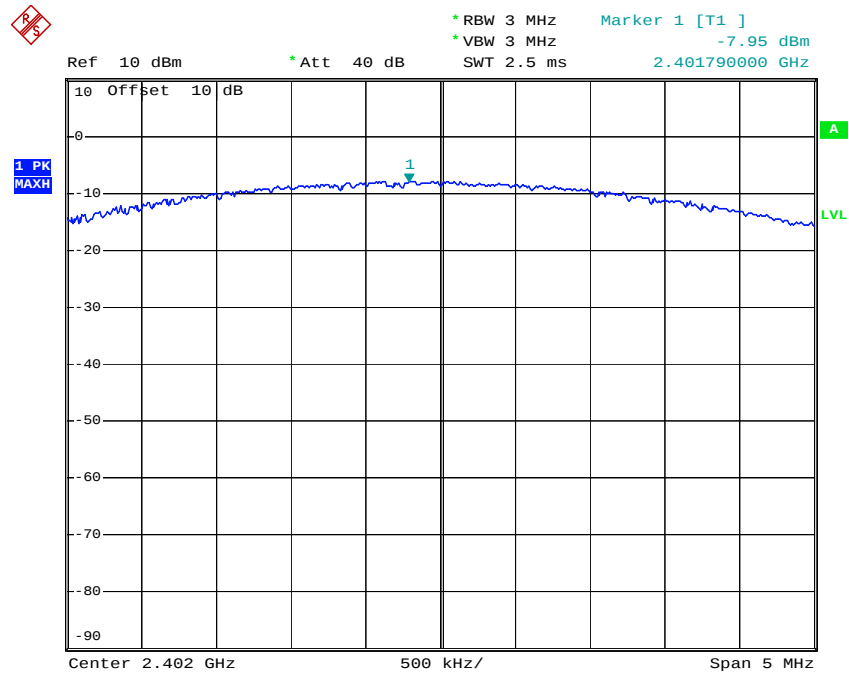
High channel



Comment A:
Date: 16.AUG.2018 18:39:10

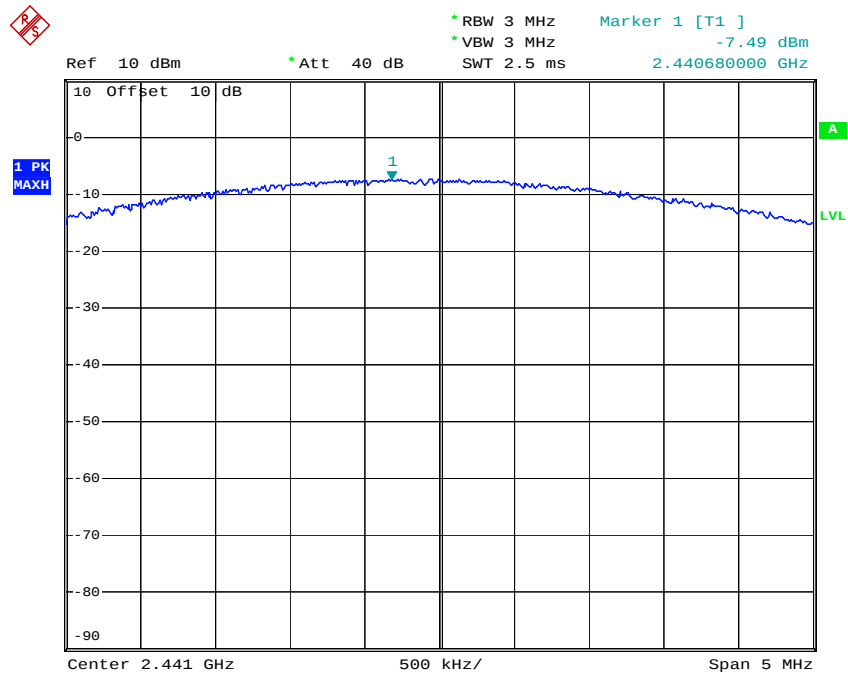
$\Pi/4$ -DQPSK Mode

Low channel



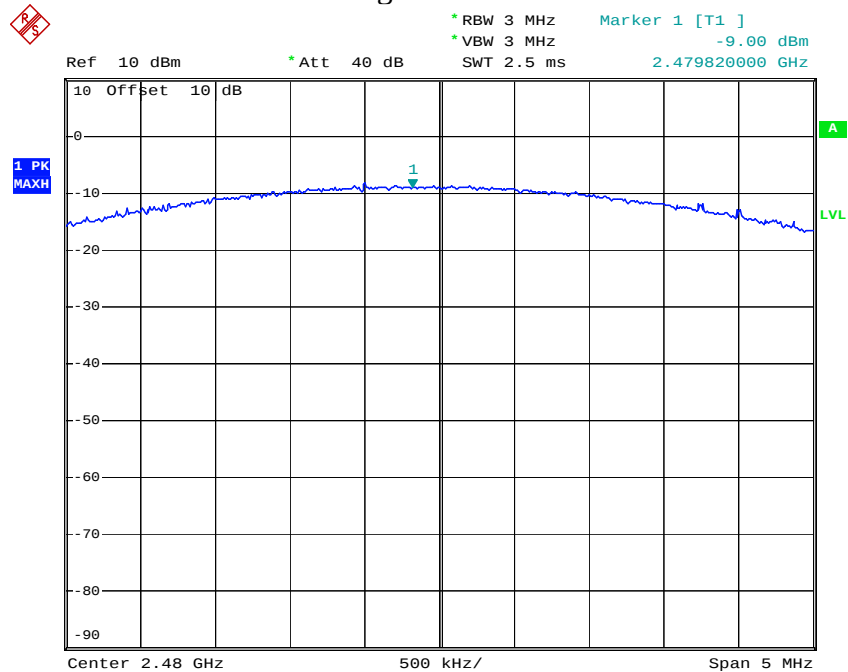
Comment A:
Date: 16.AUG.2018 18:41:52

Middle channel



Comment A:
Date: 16.AUG.2018 18:41:05

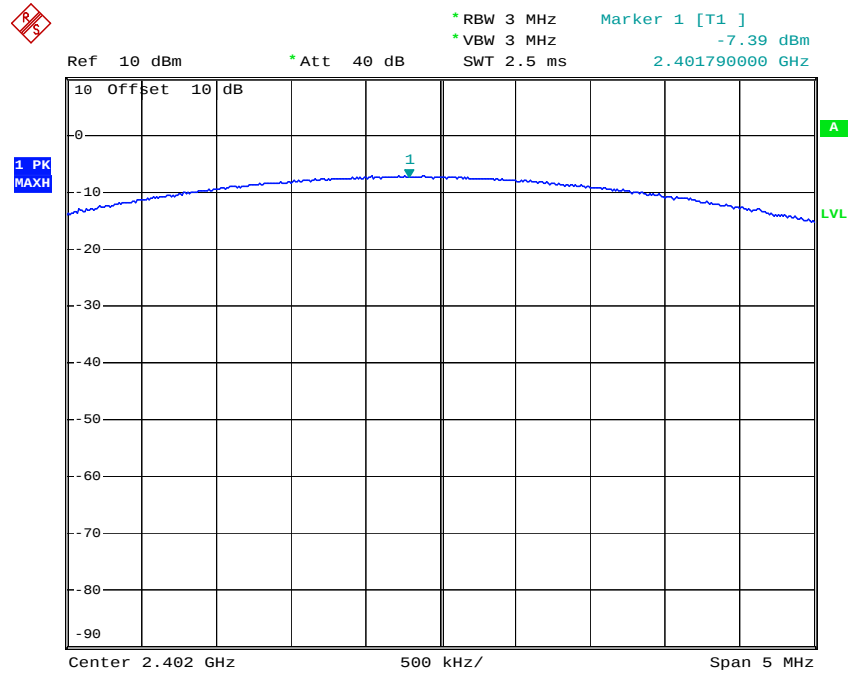
High channel



Comment A:
Date: 16.AUG.2018 18:40:05

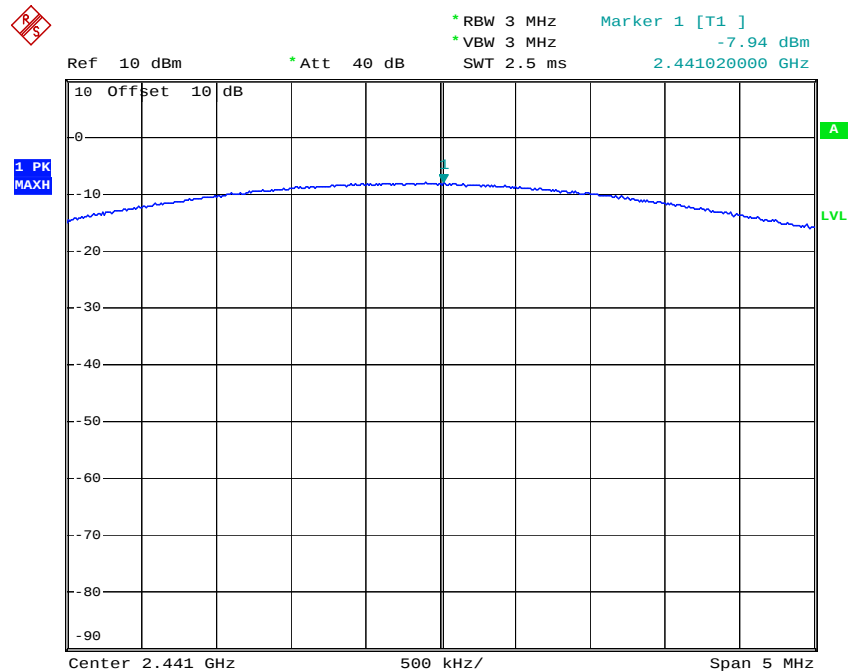
8DPSK Mode

Low channel

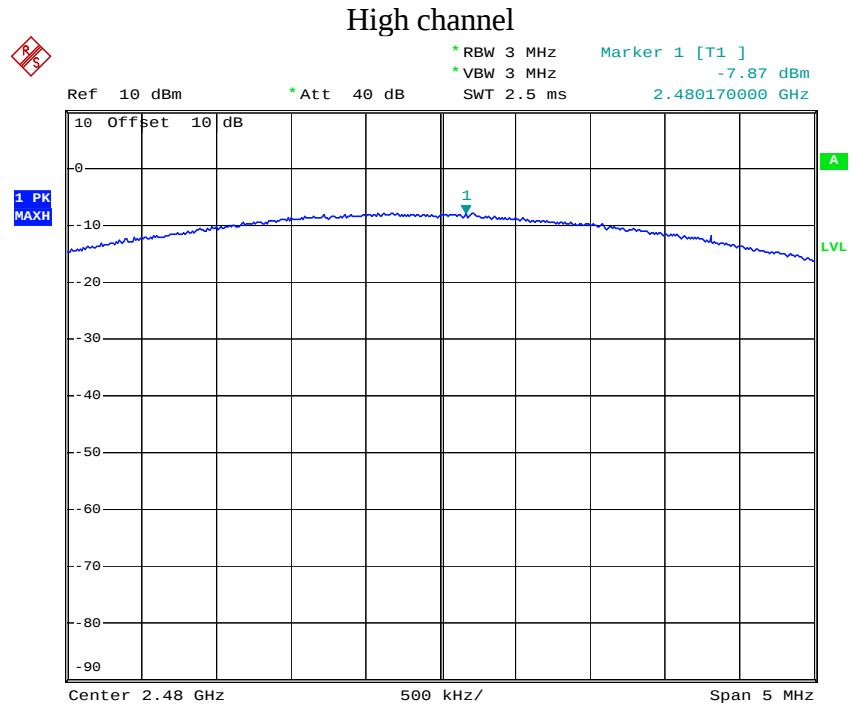


Comment A:
Date: 16.AUG.2018 18:42:27

Middle channel



Comment A:
Date: 16.AUG.2018 18:43:07

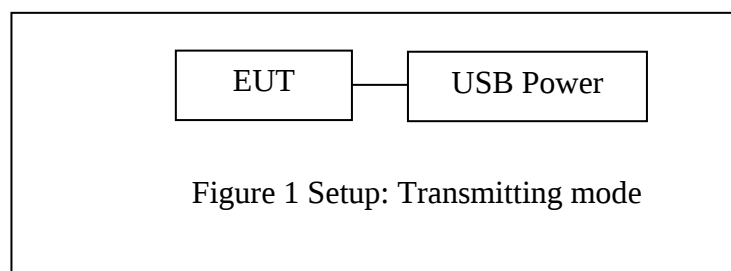


Comment A:
 Date: 16.AUG.2018 18:44:06

10.RADIATED EMISSION TEST

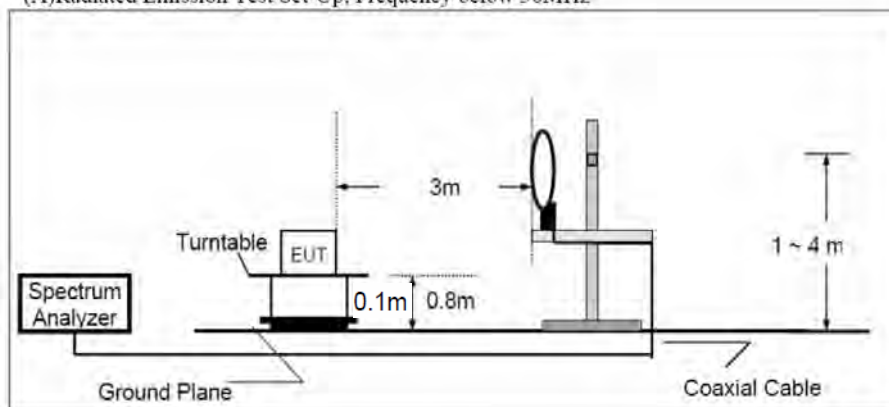
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

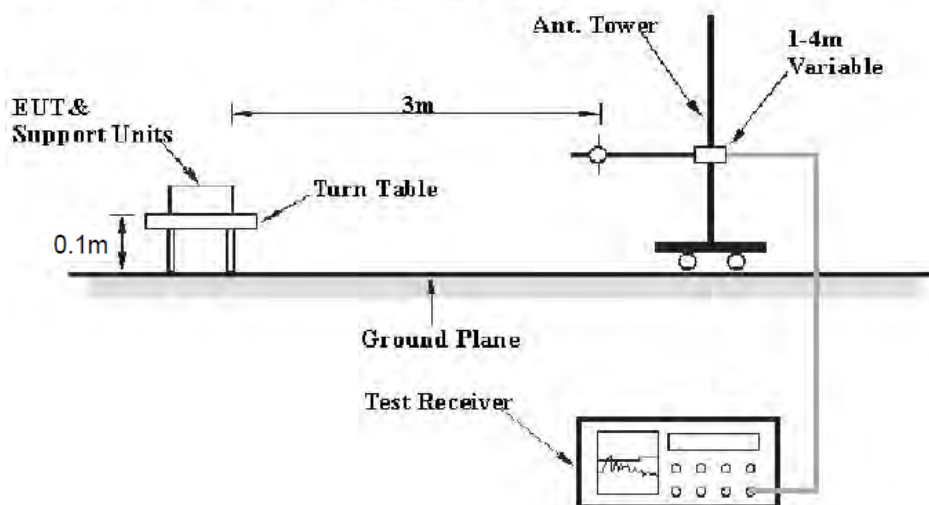


10.1.2.Semi-Anechoic Chamber Test Setup Diagram

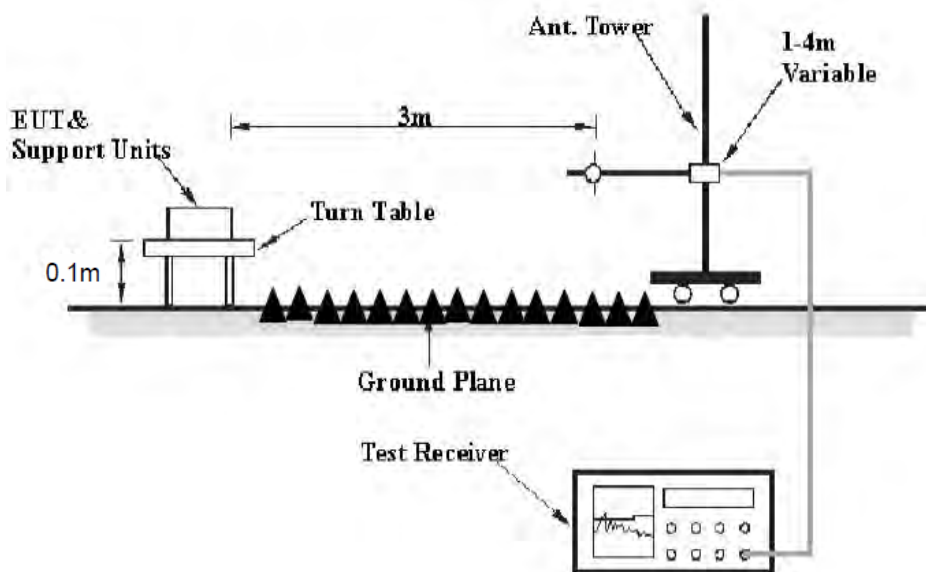
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B)Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



(C) Radiated Emission Test Set-Up. Frequency above 1GHz



10.2.The Limit For Section 15.247(d)

Section 15.247(d): 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.5. Operating Condition of EUT

10.5.1. Setup the EUT and simulator as shown as Section 10.1.

10.5.2. Turn on the power of all equipment.

10.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

10.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.1 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

10.7.Data Sample

Frequency (MHz)	Reading (dB μ v)	Factor (dB/m)	Result (dB μ v/m)	Limit (dB μ v/m)	Margin (dB)	Remark
X.XX	48.69	-13.35	35.34	46	-10.66	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB μ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB μ v/m) = Reading(dB μ v) + Factor(dB/m)

Limit (dB μ v/m) = Limit stated in standard

Margin (dB) = Result(dB μ v/m) - Limit (dB μ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB μ V/m)–Limit(dB μ V/m)

Result(dB μ V/m)= Reading(dB μ V)+ Factor(dB/m)

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.

10.8.The Field Strength of Radiation Emission Measurement Results

Pass.

Note: 1.We tested GFSK mode, $\Pi/4$ -DQPSK Mode & 8DPSK mode and recorded the worst case data (8DPSK mode) for all test mode.

2. Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and 18 to 26.5GHz.

The spectrum analyzer plots are attached as below.

Below 1GHz



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Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank2018 #1052

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2402MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

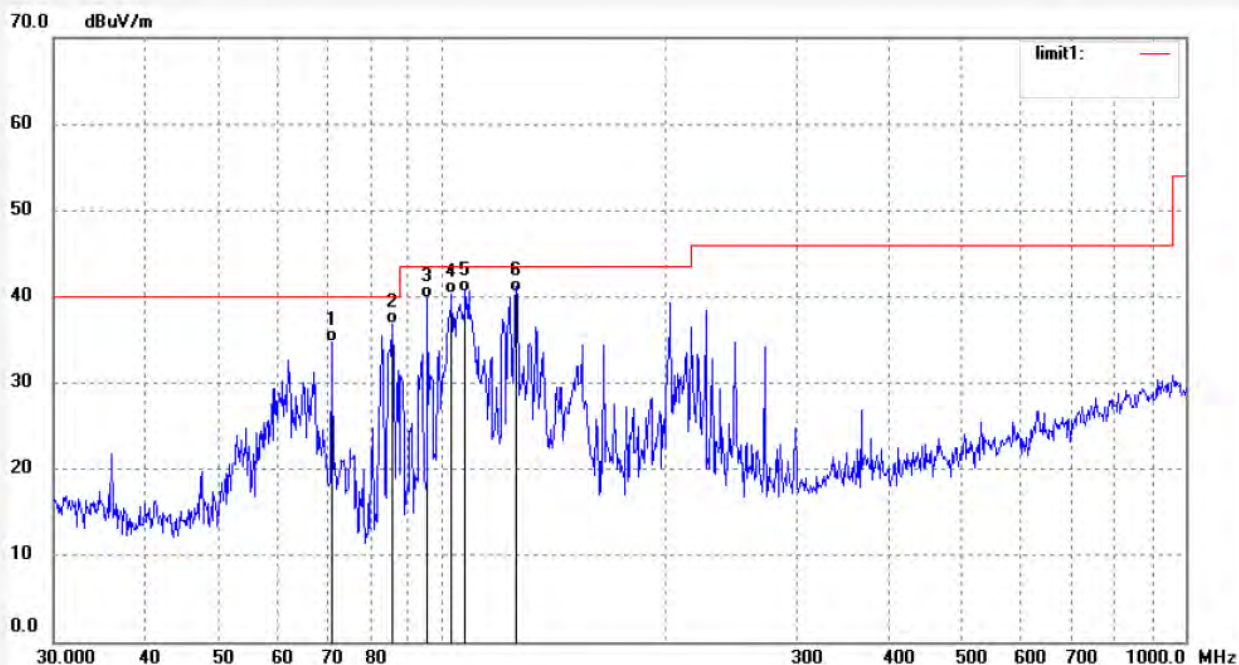
Date: 2018/08/23

Time: 15:59:03

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	70.9535	57.66	-22.90	34.76	40.00	-5.24	QP	200	205	
2	85.7776	59.16	-22.35	36.81	40.00	-3.19	QP	200	145	
3	95.6483	61.36	-21.48	39.88	43.50	-3.62	QP	200	48	
4	102.9728	62.17	-21.82	40.35	43.50	-3.15	QP	200	74	
5	107.4073	62.00	-21.50	40.50	43.50	-3.00	QP	200	189	
6	125.8058	62.05	-21.57	40.48	43.50	-3.02	QP	200	102	



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Site: 1# Chamber

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Fax:+86-0755-26503396

Job No.: frank2018 #1053

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2402MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

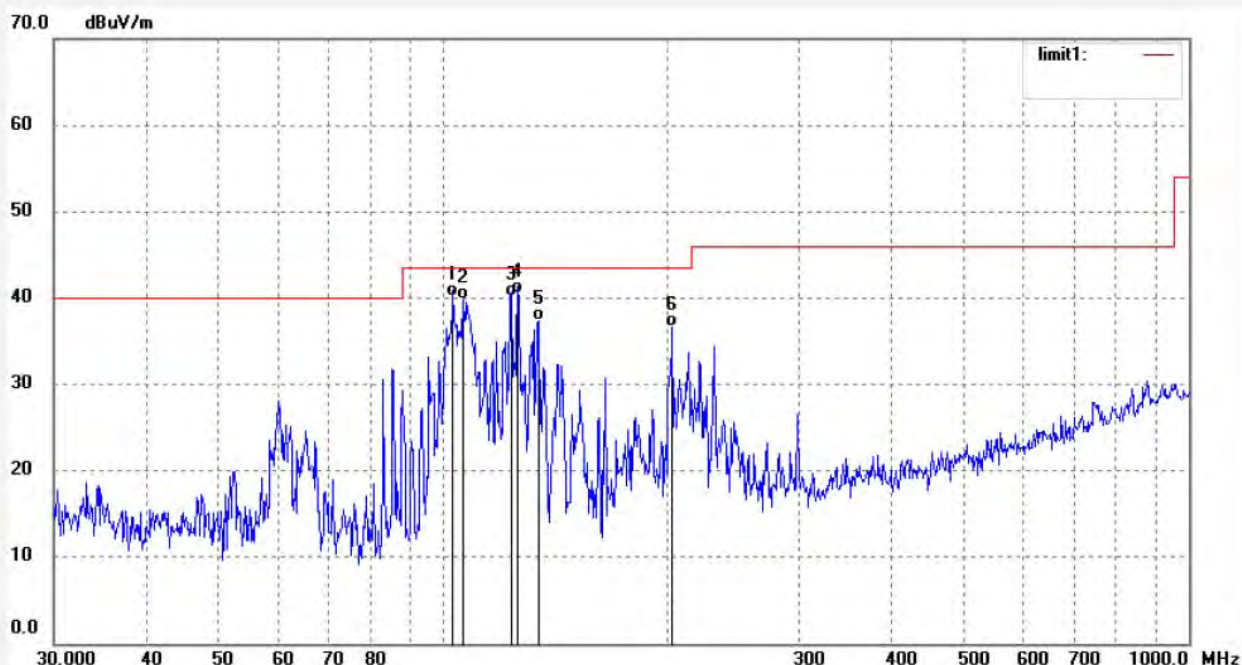
Date: 2018/08/23

Time: 15:59:26

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	102.9728	62.03	-21.82	40.21	43.50	-3.29	QP	100	195	
2	106.2810	61.47	-21.68	39.79	43.50	-3.71	QP	100	65	
3	123.1813	61.56	-21.46	40.10	43.50	-3.40	QP	100	165	
4	125.8058	62.04	-21.57	40.47	43.50	-3.03	QP	100	216	
5	134.0192	59.21	-21.88	37.33	43.50	-6.17	QP	100	331	
6	202.8745	55.19	-18.60	36.59	43.50	-6.91	QP	100	23	



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Site: 1# Chamber

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Job No.: frank2018 #1055

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2441MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

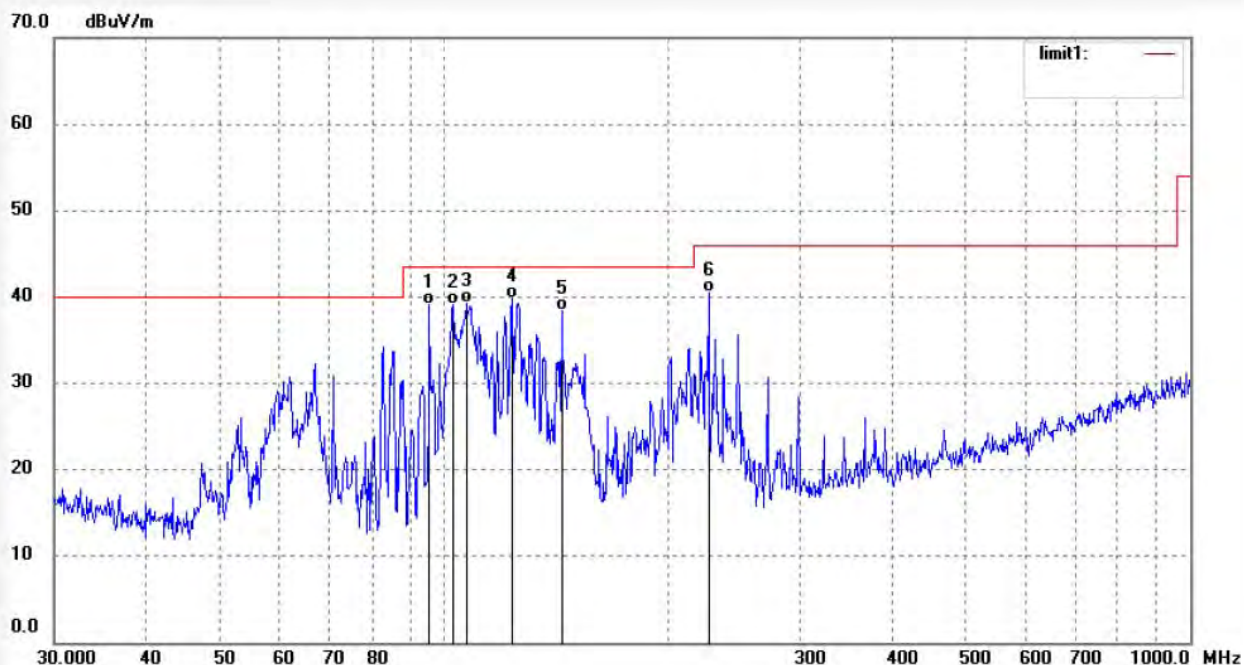
Date: 2018/08/23

Time: 16:00:08

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	60.66	-21.48	39.18	43.50	-4.32	QP	200	51	
2	102.9728	61.01	-21.82	39.19	43.50	-4.31	QP	200	234	
3	107.0306	60.91	-21.55	39.36	43.50	-4.14	QP	200	54	
4	123.6149	61.32	-21.48	39.84	43.50	-3.66	QP	200	115	
5	143.7760	60.60	-22.20	38.40	43.50	-5.10	QP	200	216	
6	226.2202	58.80	-18.35	40.45	46.00	-5.55	QP	200	196	



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Fax:+86-0755-26503396

Job No.: frank2018 #1054

Polarization: Vertical

Standard: FCC Class B 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 2018/08/23

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 15:59:36

EUT: KidzLane Stage Mic Sing-Off

Engineer Signature:

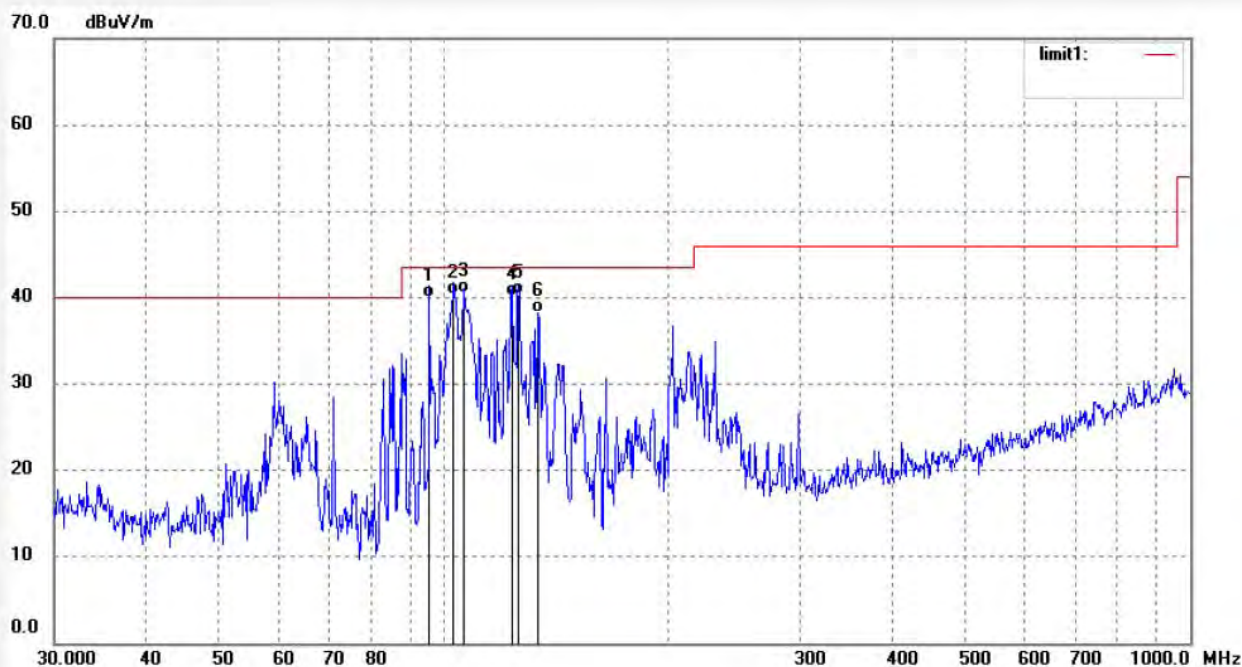
Mode: TX 2441MHz(8DPSK)

Distance:

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	61.55	-21.48	40.07	43.50	-3.43	QP	100	106	
2	102.9728	62.21	-21.82	40.39	43.50	-3.11	QP	100	54	
3	106.2810	62.12	-21.68	40.44	43.50	-3.06	QP	100	149	
4	123.1813	61.55	-21.46	40.09	43.50	-3.41	QP	100	64	
5	125.8058	61.87	-21.57	40.30	43.50	-3.20	QP	100	187	
6	133.5491	60.14	-21.86	38.28	43.50	-5.22	QP	100	156	



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Site: 1# Chamber

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Fax:+86-0755-26503396

Job No.: frank2018 #1056

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2480MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

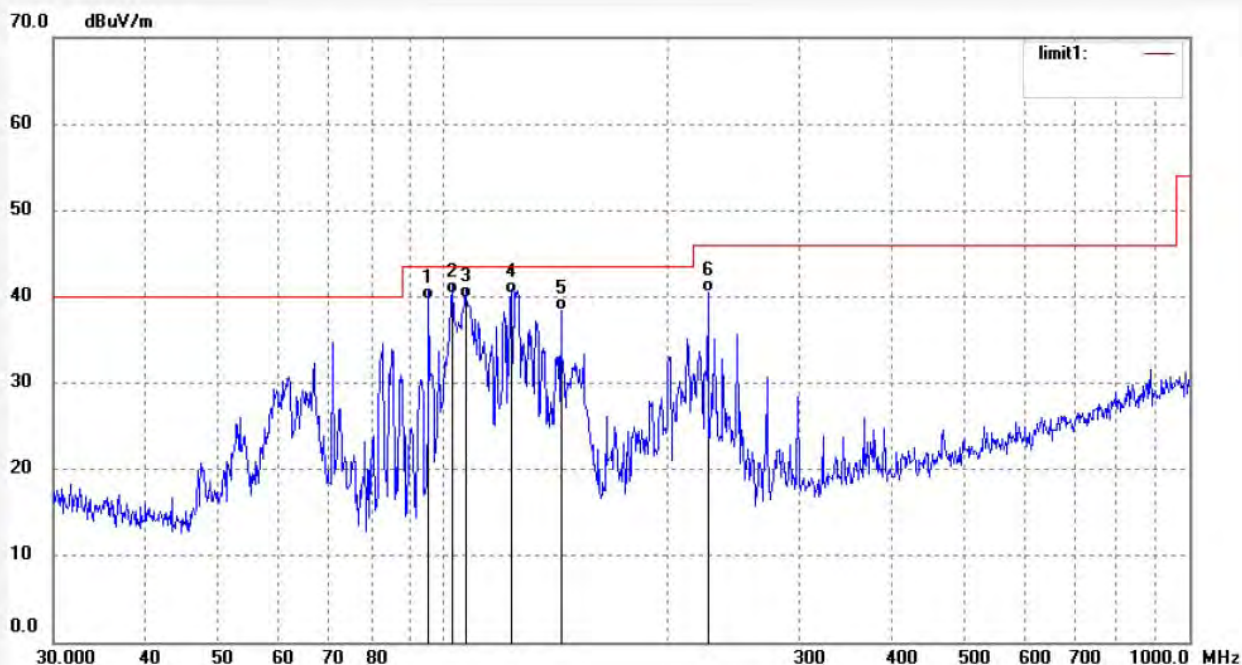
Date: 2018/08/23

Time: 16:00:17

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	61.12	-21.48	39.64	43.50	-3.86	QP	200	167	
2	102.9728	62.18	-21.82	40.36	43.50	-3.14	QP	200	148	
3	107.0306	61.32	-21.55	39.77	43.50	-3.73	QP	200	302	
4	123.6149	61.74	-21.48	40.26	43.50	-3.24	QP	200	123	
5	143.7760	60.60	-22.20	38.40	43.50	-5.10	QP	200	60	
6	226.2202	58.80	-18.35	40.45	46.00	-5.55	QP	200	102	



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Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank2018 #1057

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2480MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

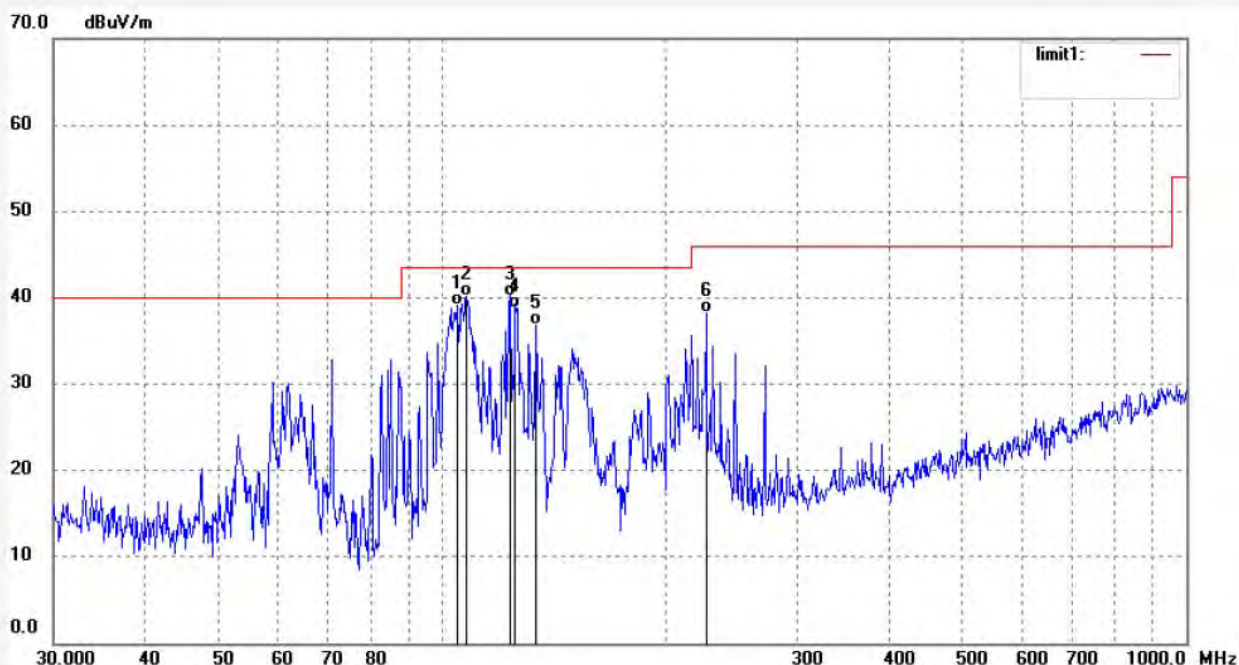
Date: 2018/08/23

Time: 16:00:34

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	104.7978	60.91	-21.88	39.03	43.50	-4.47	QP	100	109	
2	107.7853	61.51	-21.43	40.08	43.50	-3.42	QP	100	284	
3	123.1814	61.71	-21.46	40.25	43.50	-3.25	QP	100	212	
4	126.2486	60.38	-21.60	38.78	43.50	-4.72	QP	100	123	
5	133.5491	58.70	-21.86	36.84	43.50	-6.66	QP	100	145	
6	226.2202	56.55	-18.35	38.20	46.00	-7.80	QP	100	52	

Above 1GHz



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Site: 1# Chamber
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Fax:+86-0755-26503396

Job No.: frank2018 #1065

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2402MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

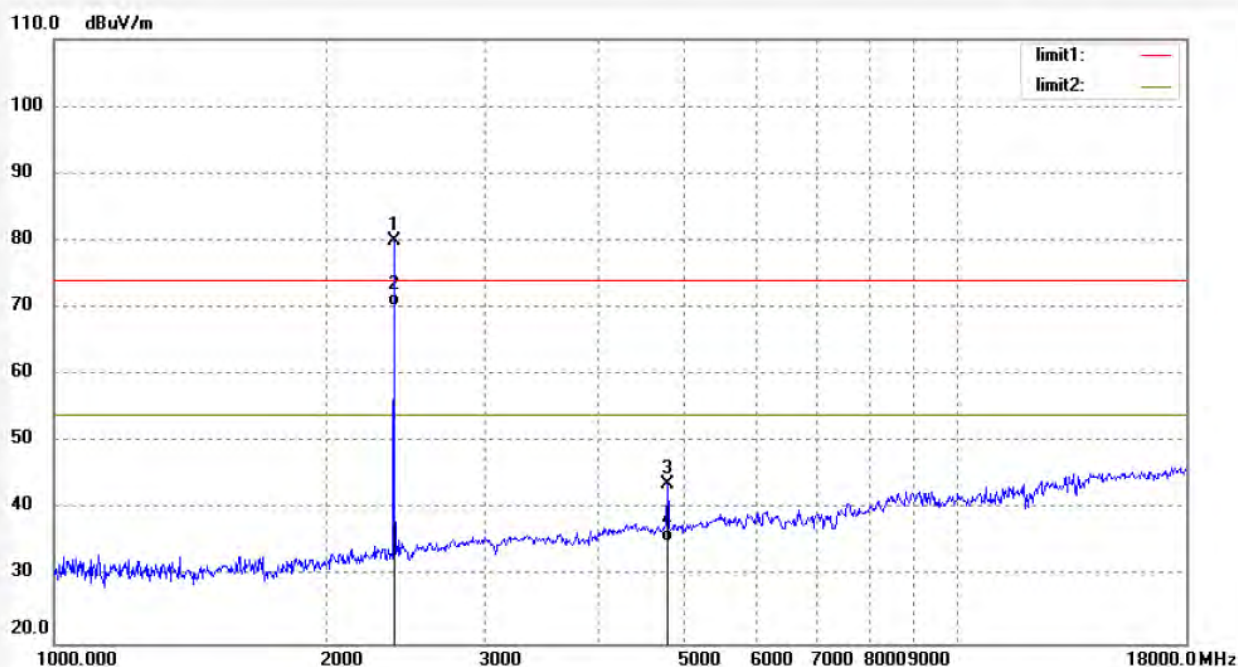
Date: 2018/08/23

Time: 16:16:49

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	87.89	-8.03	79.86			peak	250	159	
2	2402.019	78.34	-8.03	70.31			AVG	200	41	
3	4804.373	46.12	-2.34	43.78	74.00	-30.22	peak	250	233	
4	4804.373	37.42	-2.34	35.08	54.00	-18.92	AVG	200	196	

Note: Average measurement with peak detection at No. 2&No.4



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Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: frank2018 #1064

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2402MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

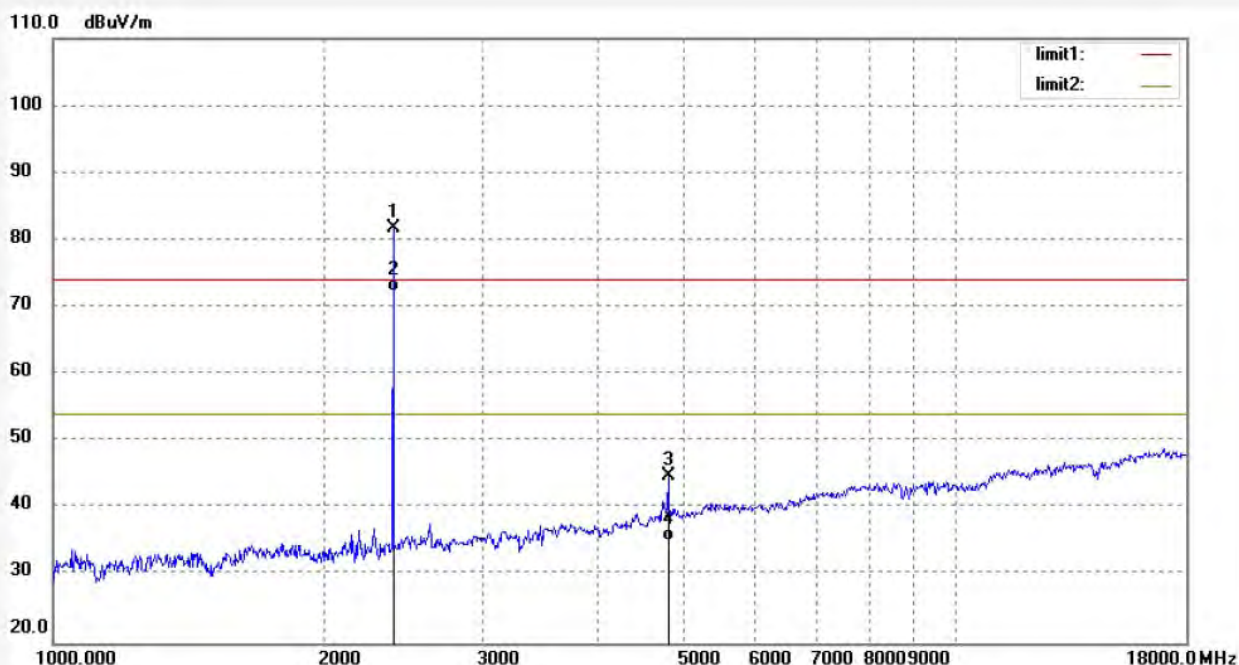
Date: 2018/08/23

Time: 16:15:11

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	89.76	-8.03	81.73			peak	200	103	
2	2402.019	80.45	-8.03	72.42			AVG	150	222	
3	4804.328	47.15	-2.30	44.85	74.00	-29.15	peak	200	36	
4	4804.328	37.46	-2.30	35.16	54.00	-18.84	AVG	150	156	

Note: Average measurement with peak detection at No. 2&No.4



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Fax:+86-0755-26503396

Job No.: frank2018 #1066

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2441MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

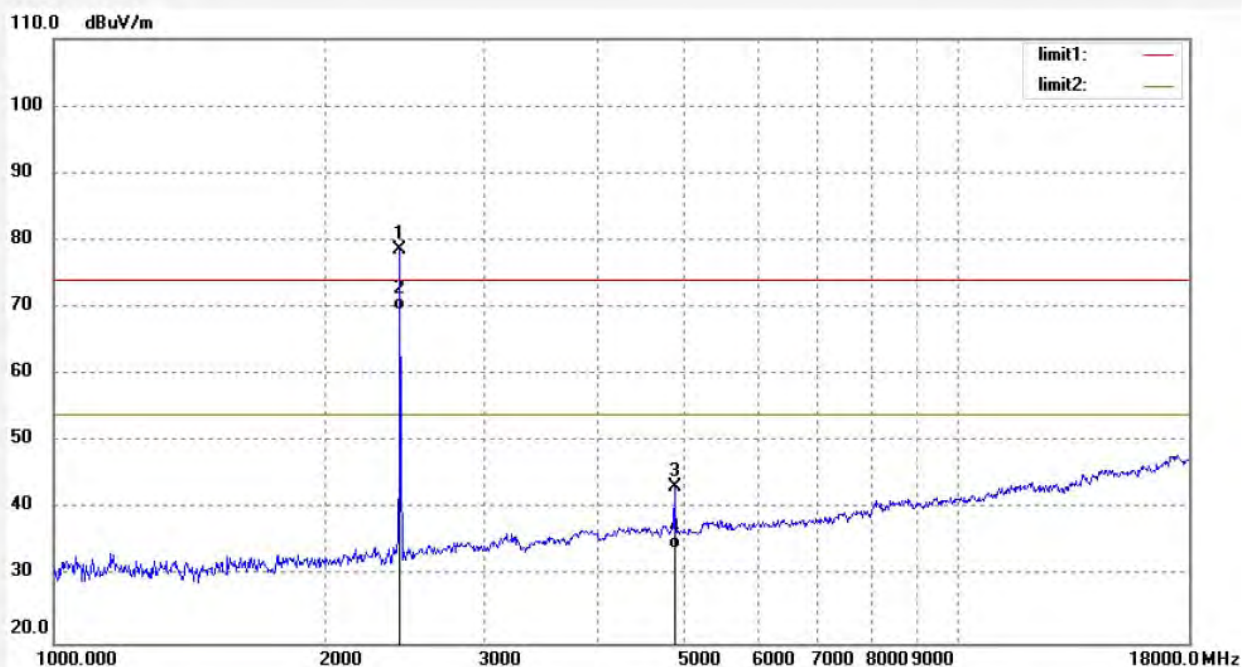
Date: 2018/08/23

Time: 16:19:41

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.021	86.55	-7.93	78.62			peak	250	165	
2	2441.021	77.45	-7.93	69.52			AVG	250	201	
3	4882.557	45.33	-2.10	43.23	74.00	-30.77	peak	250	100	
4	4882.557	36.15	-2.10	34.05	54.00	-19.95	AVG	200	210	

Note: Average measurement with peak detection at No. 2&No.4



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Job No.: frank2018 #1067

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2441MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

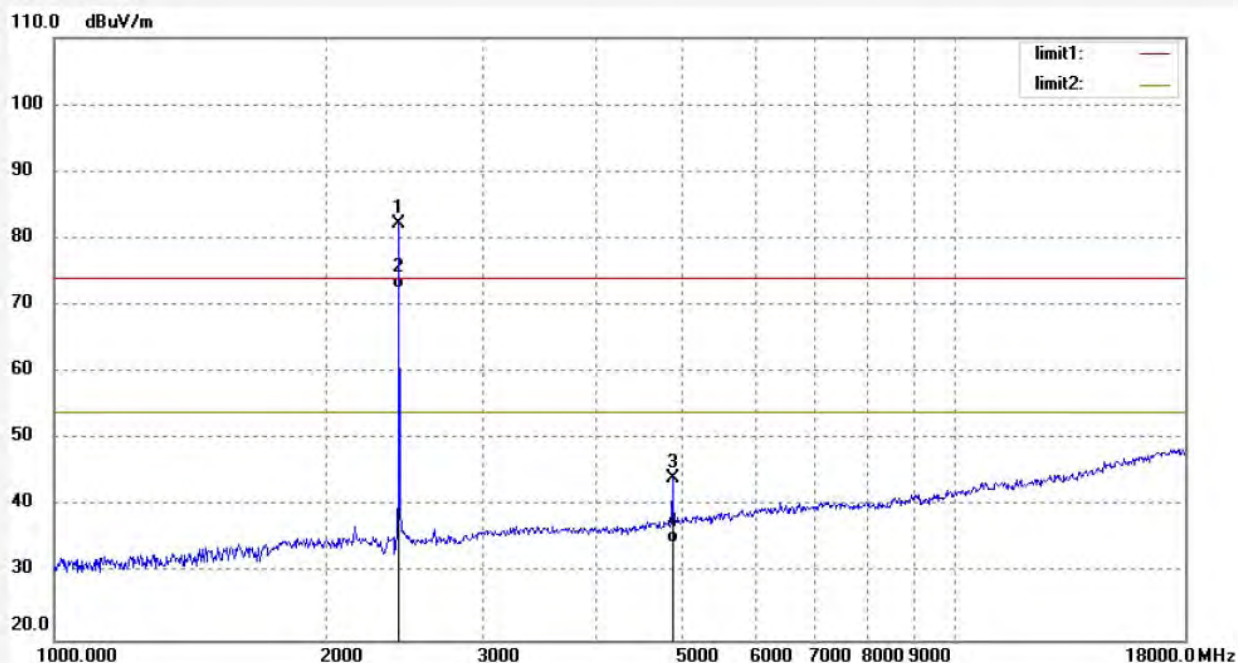
Date: 2018/08/23

Time: 16:19:47

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.021	90.05	-7.93	82.12			peak	200	198	
2	2441.021	80.45	-7.93	72.52			AVG	150	163	
3	4882.557	46.33	-2.10	44.23	74.00	-29.77	peak	200	294	
4	4882.557	36.54	-2.10	34.44	54.00	-19.56	AVG	150	320	

Note: Average measurement with peak detection at No. 2&No.4



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Job No.: frank2018 #1069

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2480MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

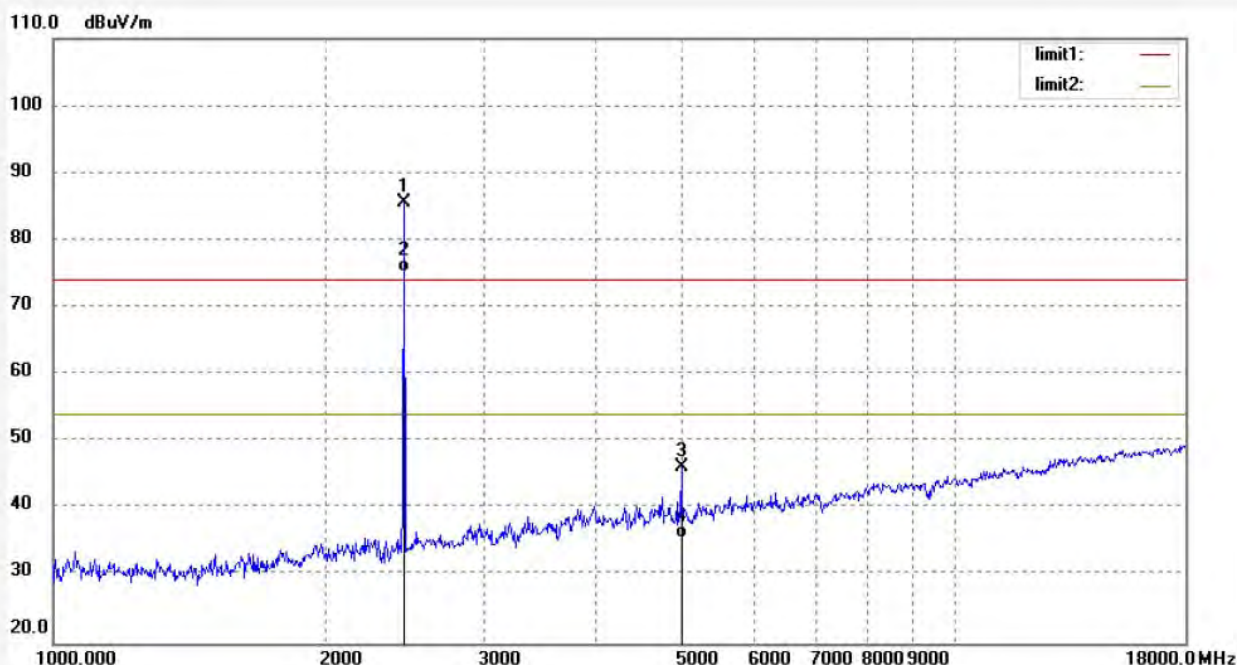
Date: 2018/08/23

Time: 16:20:53

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	93.37	-7.84	85.53			peak	250	320	
2	2480.034	83.12	-7.84	75.28			AVG	200	216	
3	4960.097	47.85	-1.72	46.13	74.00	-27.87	peak	250	165	
4	4960.097	37.45	-1.72	35.73	54.00	-18.27	AVG	200	210	

Note: Average measurement with peak detection at No. 2&No.4



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Fax:+86-0755-26503396

Job No.: frank2018 #1068

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2480MHz(8DPSK)

Model: KL-0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

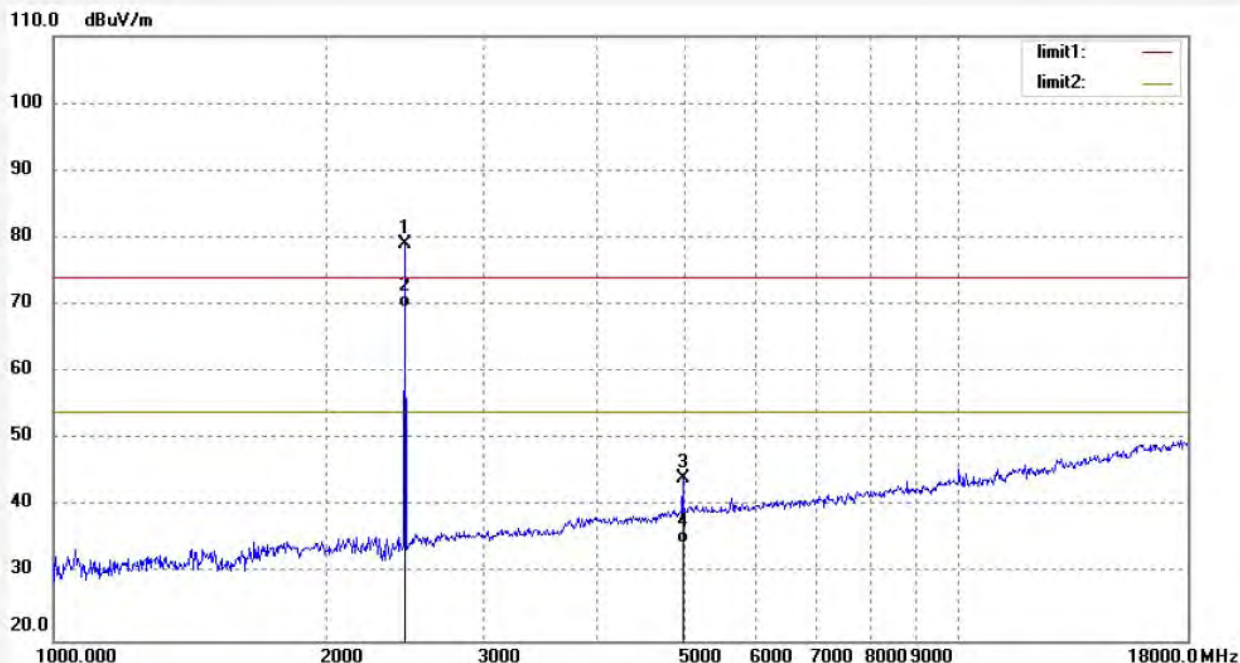
Date: 2018/08/23

Time: 16:20:48

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	86.87	-7.84	79.03			peak	150	195	
2	2480.034	77.54	-7.84	69.70			AVG	150	269	
3	4960.097	45.85	-1.72	44.13	74.00	-29.87	peak	200	167	
4	4960.097	36.22	-1.72	34.50	54.00	-19.50	AVG	150	266	

Note: Average measurement with peak detection at No. 2&No.4

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



11.2.The Requirement For Section 15.247(d)

Section 15.247(d): 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

11.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

11.5. Test Procedure

11.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

11.6. Test Result

Note: Both hopping-on mode and hopping-off mode had been pre-tested, and only the worst case was recorded in the test report.

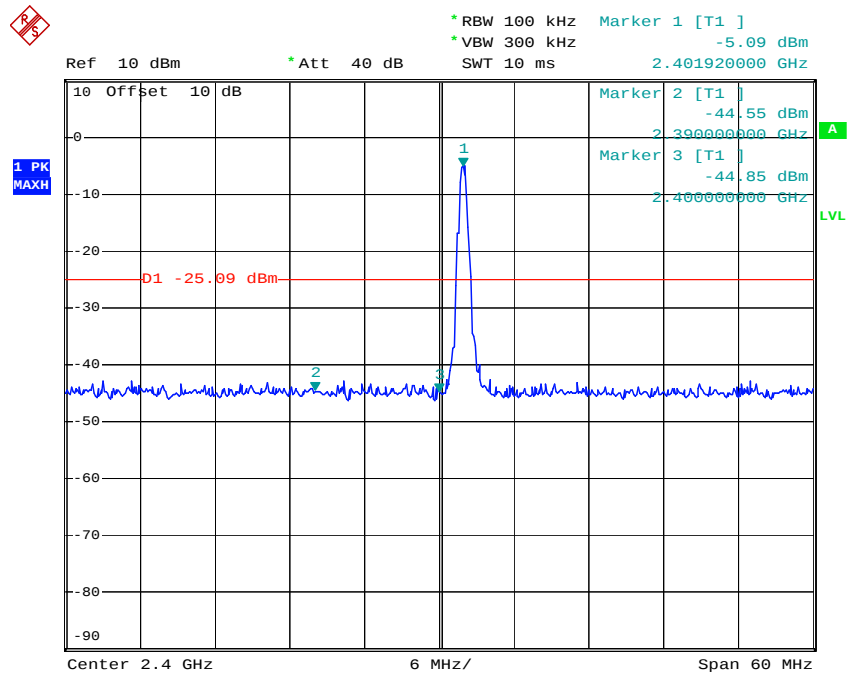
Conducted Band Edge Result:

Non-hopping mode

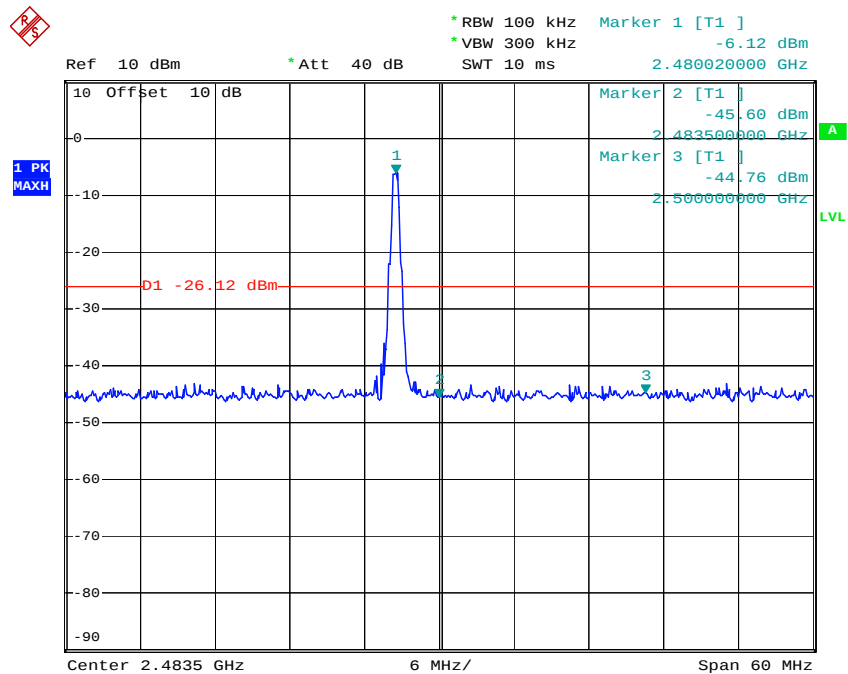
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)	Result
GFSK Mode			
2400.00	39.76	> 20dBc	Pass
2483.50	39.48	> 20dBc	Pass
Π/4-DQPSK Mode			
2400.00	36.17	> 20dBc	Pass
2483.50	36.98	> 20dBc	Pass
8DPSK Mode			
2400.00	36.99	> 20dBc	Pass
2483.50	36.54	> 20dBc	Pass

The spectrum analyzer plots are attached as below.

GFSK Mode

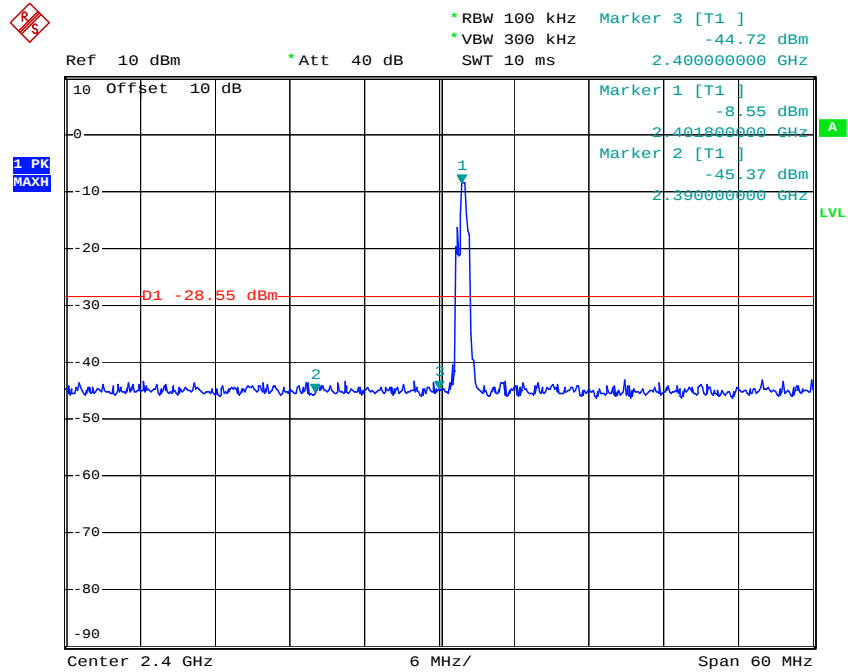


Comment A:
Date: 16.AUG.2018 19:11:13

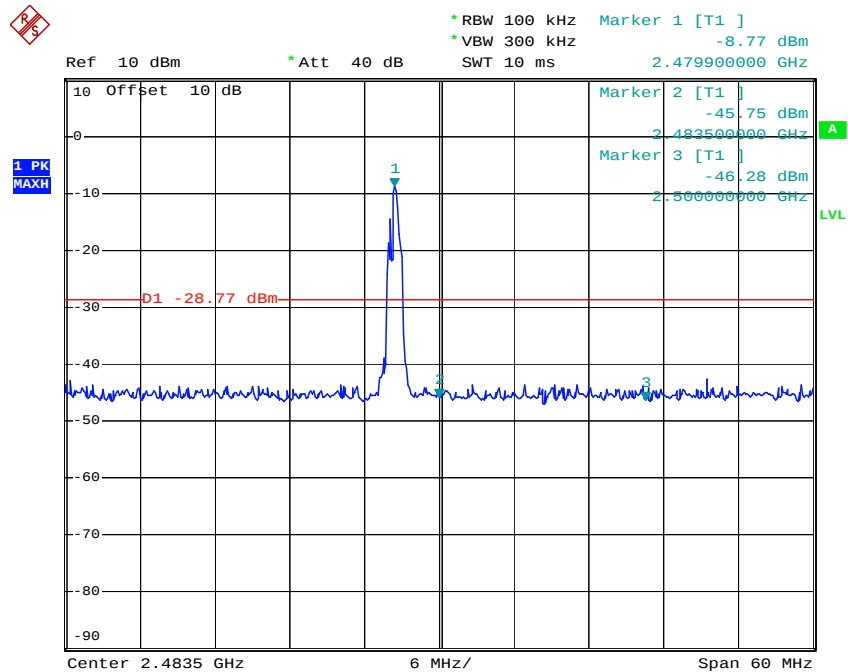


Comment A:
Date: 16.AUG.2018 19:12:11

Π/4-DQPSK Mode

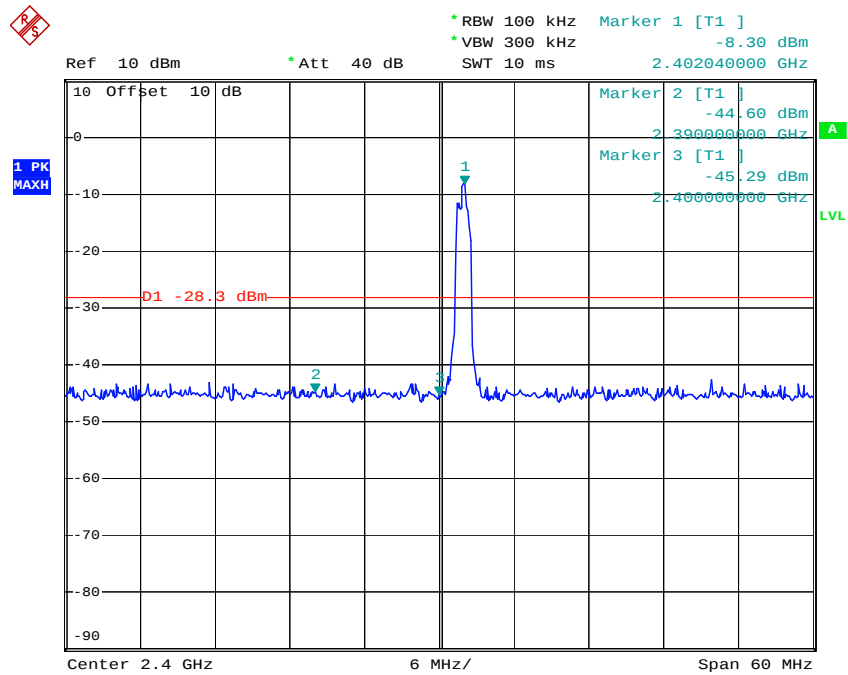


Comment A:
Date: 16.AUG.2018 19:14:02

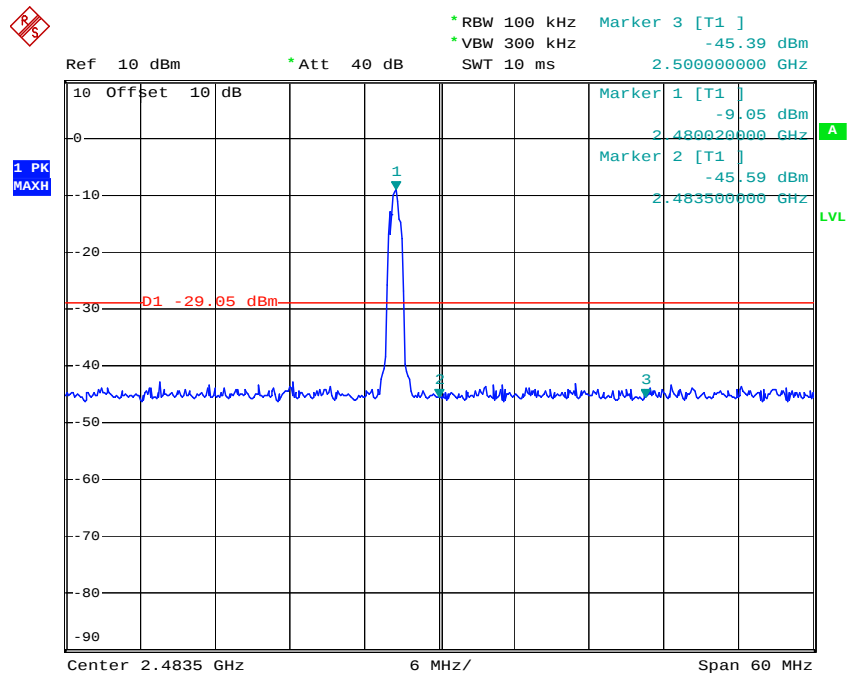


Comment A:
Date: 16.AUG.2018 19:13:01

8DPSK Mode



Comment A:
Date: 16.AUG.2018 19:14:55



Comment A:
Date: 16.AUG.2018 19:15:51

Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 0.1 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX (Hopping off, Hopping on) modes measure it.

We select 2402MHz, 2480MHz TX frequency to transmit(Hopping off mode).

We select 2402-2480MHz TX frequency to transmit(Hopping on mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:

- 1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 3.All modes of operation were investigated and the worst-case(8DPSK Mode) emissions are reported.



Non-hopping mode ACCURATE TECHNOLOGY CO., LTD.

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Site: 1# Chamber
Tel:+86-0755-26503290
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Job No.: frank2018 #1085

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2402MHz(8DPSK)

Model: K-L0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

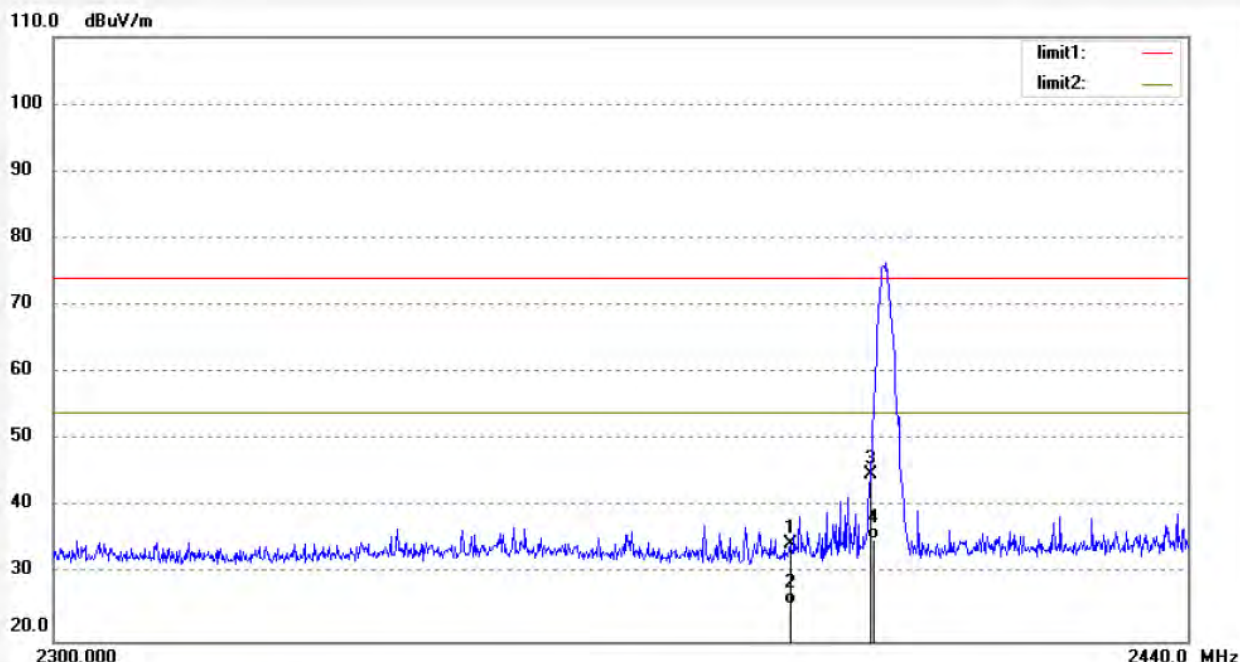
Date: 2018/08/23

Time: 17:21:22

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.58	-8.00	34.58	74.00	-39.42	peak	200	321	
2	2390.000	33.54	-8.00	25.54	54.00	-28.46	AVG	200	210	
3	2400.000	52.75	-7.97	44.78	74.00	-29.22	peak	200	24	
4	2400.000	43.20	-7.97	35.23	54.00	-18.77	AVG	200	158	

Note: Average measurement with peak detection at No.2&4



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Job No.: frank2018 #1086

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2402MHz(8DPSK)

Model: K-L0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

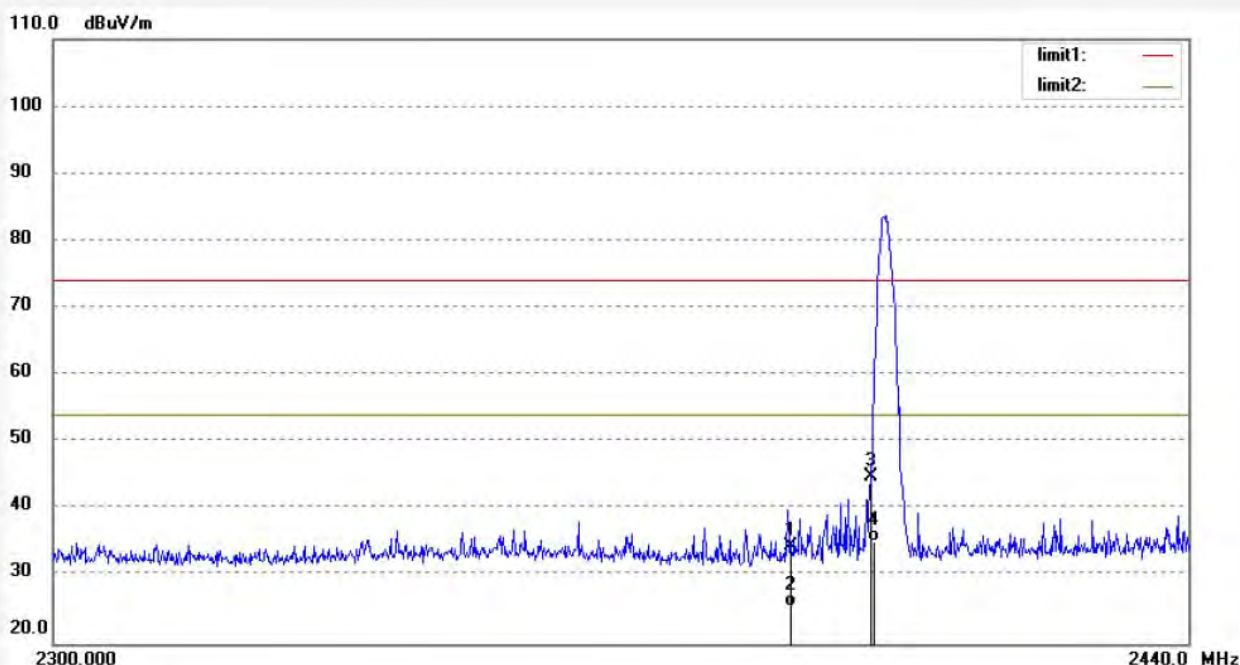
Date: 2018/08/23

Time: 17:21:26

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.58	-8.00	34.58	74.00	-39.42	peak	200	152	
2	2390.000	33.45	-8.00	25.45	54.00	-28.55	AVG	150	226	
3	2400.000	52.75	-7.97	44.78	74.00	-29.22	peak	200	118	
4	2400.000	43.15	-7.97	35.18	54.00	-18.82	AVG	150	168	

Note: Average measurement with peak detection at No.2&4



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Job No.: frank2018 #1087

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2480MHz(8DPSK)

Model: K-L0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

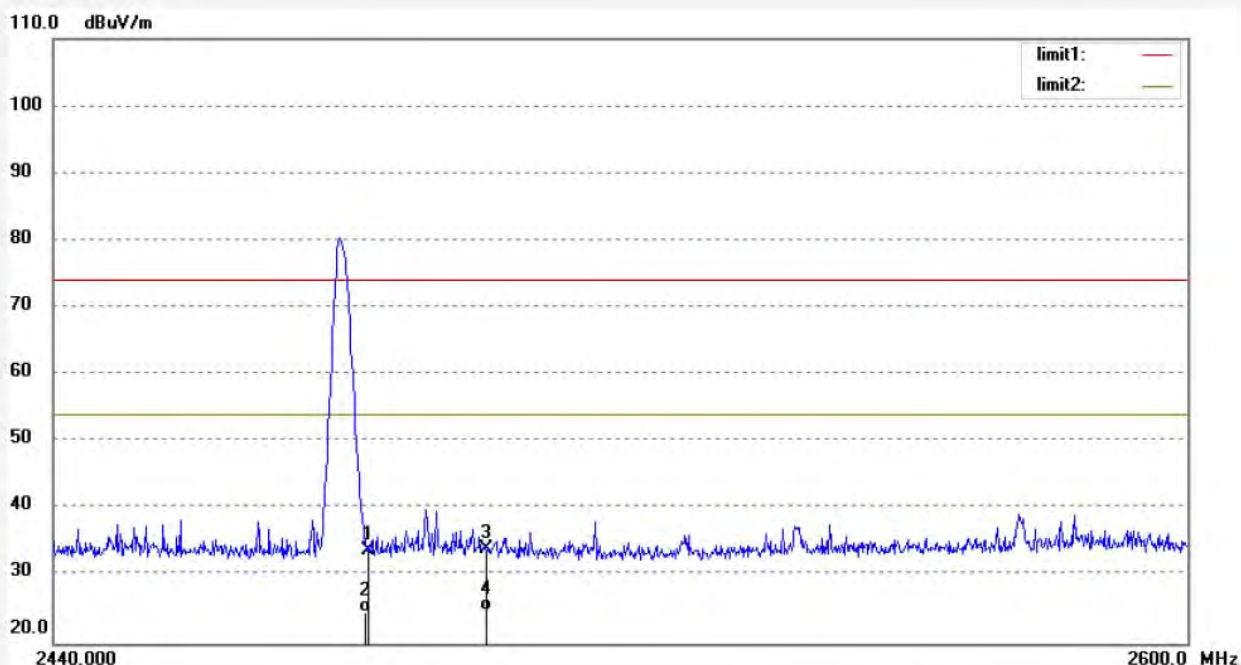
Date: 2018/08/23

Time: 17:23:39

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	41.66	-7.76	33.90	74.00	-40.10	peak	200	198	
2	2483.500	32.45	-7.76	24.69	54.00	-29.31	AVG	200	111	
3	2500.000	41.77	-7.71	34.06	74.00	-39.94	peak	200	156	
4	2500.000	32.46	-7.71	24.75	54.00	-29.25	AVG	200	230	

Note: Average measurement with peak detection at No.2&4



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Job No.: frank2018 #1088

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: TX 2480MHz(8DPSK)

Model: K-L0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

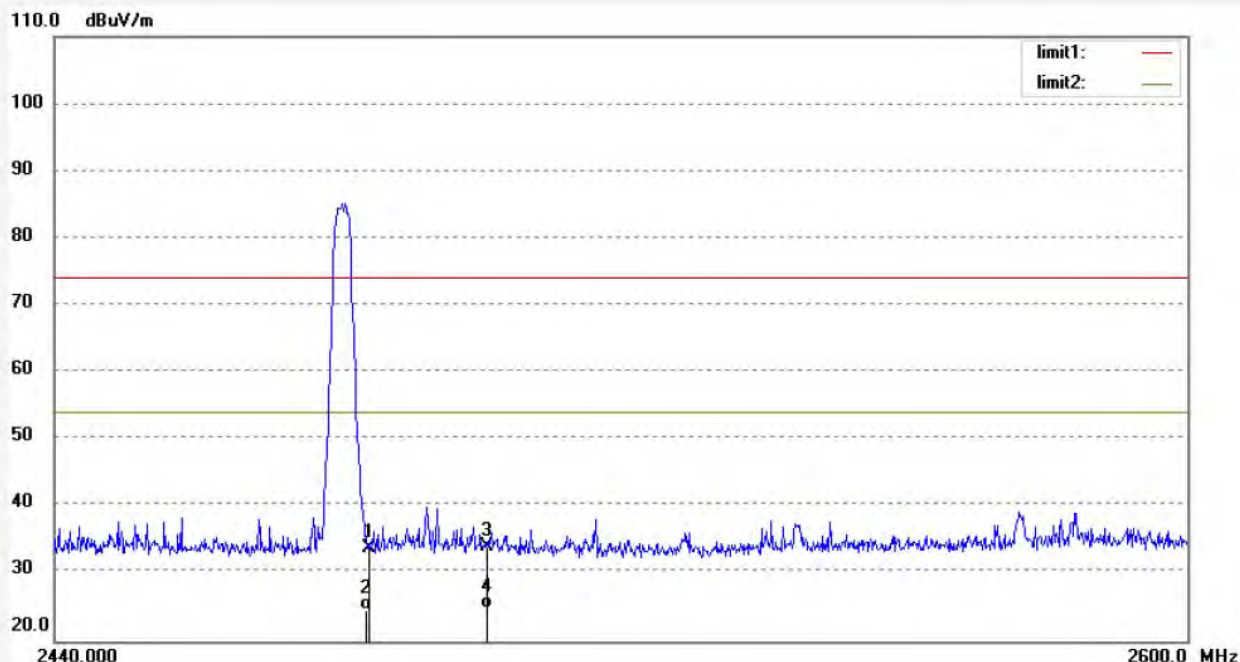
Date: 2018/08/23

Time: 17:23:47

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	41.66	-7.76	33.90	74.00	-40.10	peak	200	184	
2	2483.500	32.42	-7.76	24.66	54.00	-29.34	AVG	150	211	
3	2500.000	41.77	-7.71	34.06	74.00	-39.94	peak	200	201	
4	2500.000	32.55	-7.71	24.84	54.00	-29.16	AVG	150	195	

Note: Average measurement with peak detection at No.2&4

Hopping mode



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Site: 1# Chamber
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Fax:+86-0755-26503396

Job No.: frank2018 #1078

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: Hopping (8DPSK)

Model: K-L0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Horizontal

Power Source: DC 5V

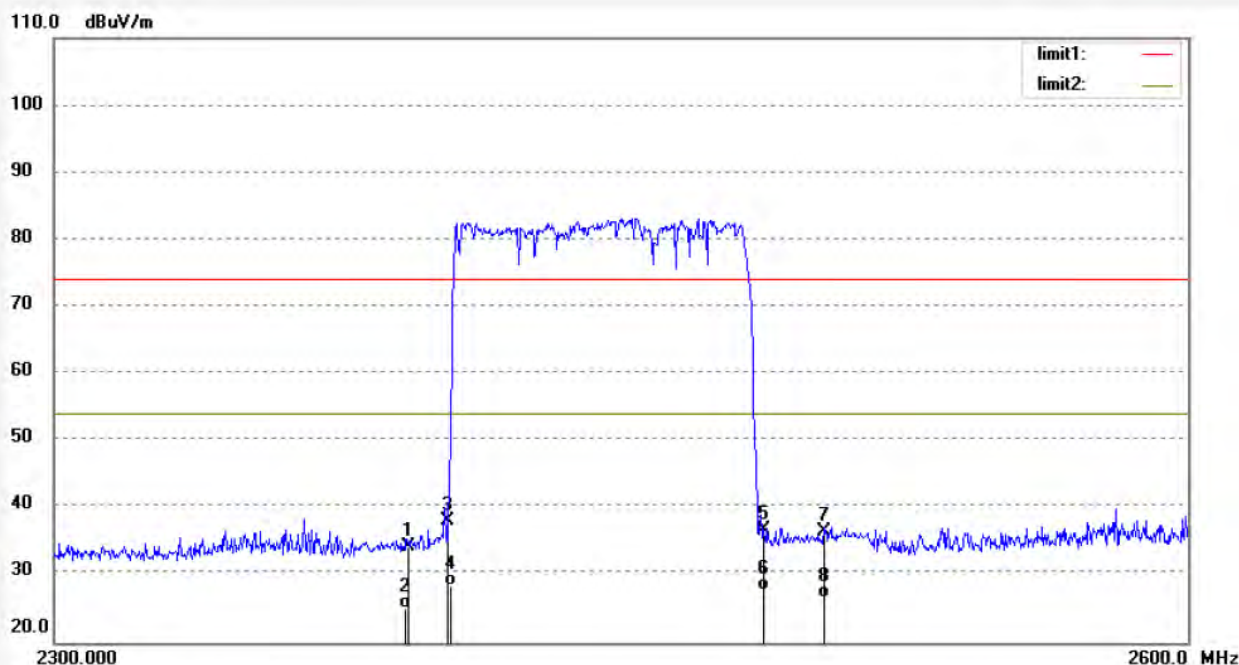
Date: 2018/08/23

Time: 17:11:28

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.23	-8.00	34.23	74.00	-39.77	peak	250	302	
2	2390.000	33.15	-8.00	25.15	54.00	-28.85	AVG	200	216	
3	2400.000	46.14	-7.97	38.17	74.00	-35.83	peak	250	223	
4	2400.000	36.45	-7.97	28.48	54.00	-25.52	AVG	200	133	
5	2483.500	44.56	-7.76	36.80	74.00	-37.20	peak	250	201	
6	2483.500	35.45	-7.76	27.69	54.00	-26.31	AVG	200	220	
7	2500.000	44.20	-7.71	36.49	74.00	-37.51	peak	250	46	
8	2500.000	34.45	-7.71	26.74	54.00	-27.26	AVG	200	166	

Note: Average measurement with peak detection at No.2&4&6&8



ACCURATE TECHNOLOGY CO., LTD.

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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: frank2018 #1080

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: KidzLane Stage Mic Sing-Off

Mode: Hopping (8DPSK)

Model: K-L0514

Manufacturer: Dynamic Scientific Ltd

Polarization: Vertical

Power Source: DC 5V

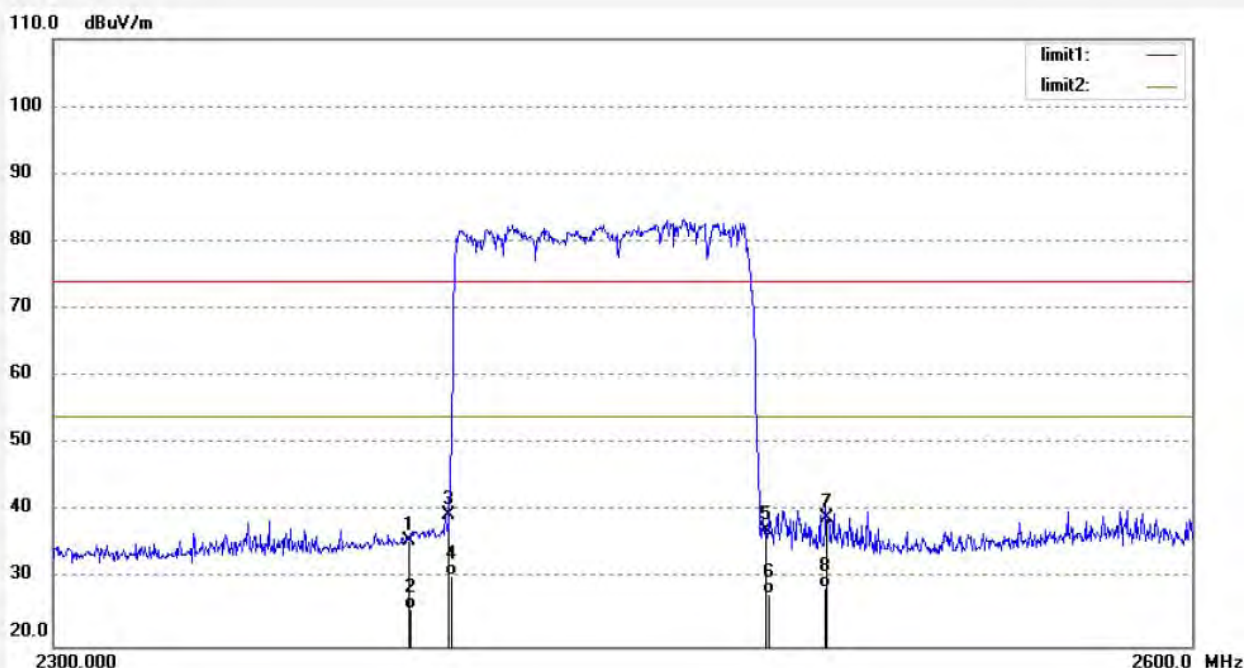
Date: 2018/08/23

Time: 17:13:32

Engineer Signature:

Distance:

Note: Report NO.:ATE20181454



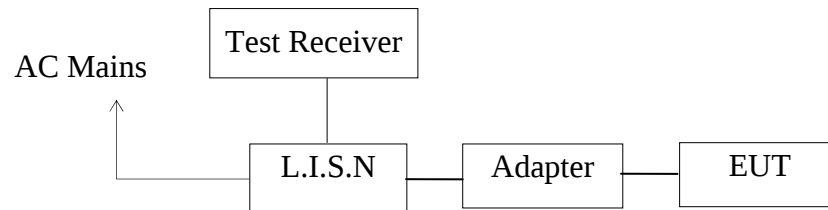
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	43.73	-8.00	35.73	74.00	-38.27	peak	200	195	
2	2390.000	33.48	-8.00	25.48	54.00	-28.52	AVG	150	226	
3	2400.000	47.50	-7.97	39.53	74.00	-34.47	peak	200	246	
4	2400.000	38.48	-7.97	30.51	54.00	-23.49	AVG	150	201	
5	2483.500	44.99	-7.76	37.23	74.00	-36.77	peak	200	320	
6	2483.500	35.49	-7.76	27.73	54.00	-26.27	AVG	150	194	
7	2500.000	46.70	-7.71	38.99	74.00	-35.01	peak	200	305	
8	2500.000	36.48	-7.71	28.77	54.00	-25.23	AVG	150	146	

Note: Average measurement with peak detection at No.2&4&6&8

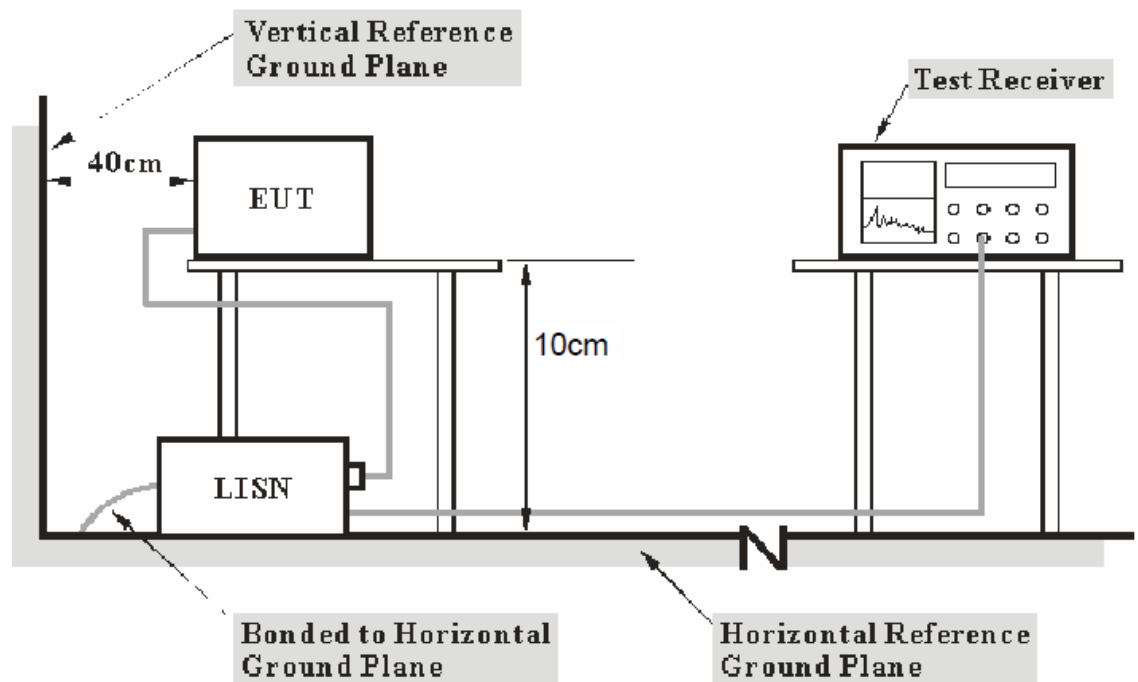
12.AC POWER LINE CONDUCTED EMISSION

12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators



12.1.2.Test System 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.

12.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μ V)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies.		
NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

12.3.Configuration of EUT on Measurement

The equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 12.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in test mode and measure it.

12.5.Test Procedure

The EUT is put on the plane 0.1m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement. The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

12.6.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dBμV)	Average Level (dBμV)	QuasiPeak Limit (dBμV)	Average Limit (dBμV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.5	51.1	34.2	56.0	46.0	4.9	11.8	Pass

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dBμV) = Limit stated in standard

Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:

Margin = Limit (dBμV) - Level (dBμV)

12.7.Power Line Conducted Emission Measurement Results

Pass.

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT. Emissions attenuated more than 20 dB below the permissible value are not reported.

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

The spectral diagrams are attached as below.

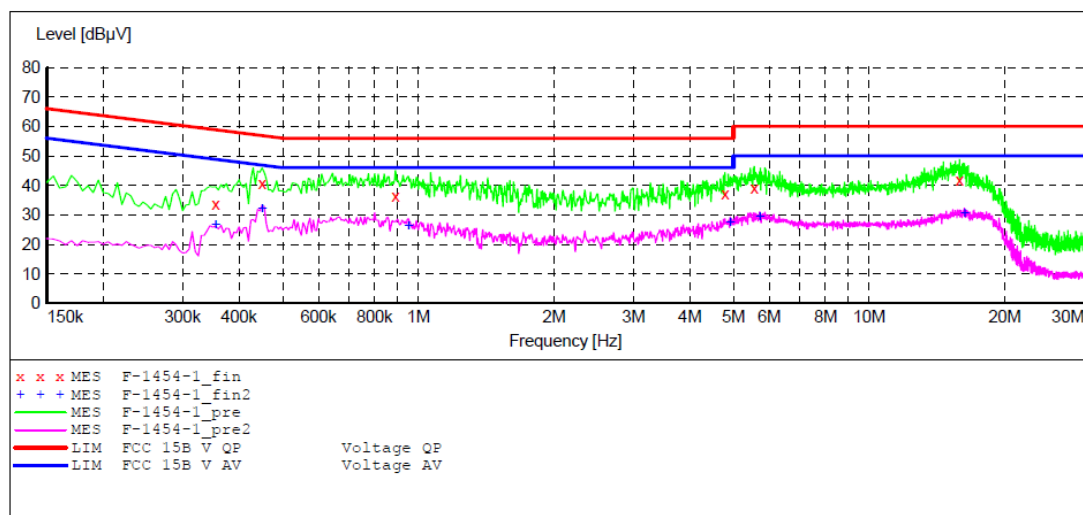
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: KidzLane Stage Mic Sing-Off M/N:KL-0514
 Manufacturer: Dynamic Scientific Ltd
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Frank
 Test Specification: N 120V/60Hz
 Comment: Report NO.:ATE20181454
 Start of Test: 8/10/2018 / 5:47:30PM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "F-1454-1_fin"

8/10/2018 5:50PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.355000	33.70	10.6	59	25.1	QP	N	GND
0.450000	40.70	10.7	57	16.2	QP	N	GND
0.890000	36.20	10.8	56	19.8	QP	N	GND
4.790000	37.30	11.1	56	18.7	QP	N	GND
5.560000	39.10	11.2	60	20.9	QP	N	GND
15.850000	41.60	11.4	60	18.4	QP	N	GND

MEASUREMENT RESULT: "F-1454-1_fin2"

8/10/2018 5:50PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.355000	26.50	10.6	49	22.3	AV	N	GND
0.450000	32.00	10.7	47	14.9	AV	N	GND
0.950000	26.40	10.8	46	19.6	AV	N	GND
4.920000	27.40	11.2	46	18.6	AV	N	GND
5.720000	29.20	11.2	50	20.8	AV	N	GND
16.255000	30.40	11.4	50	19.6	AV	N	GND

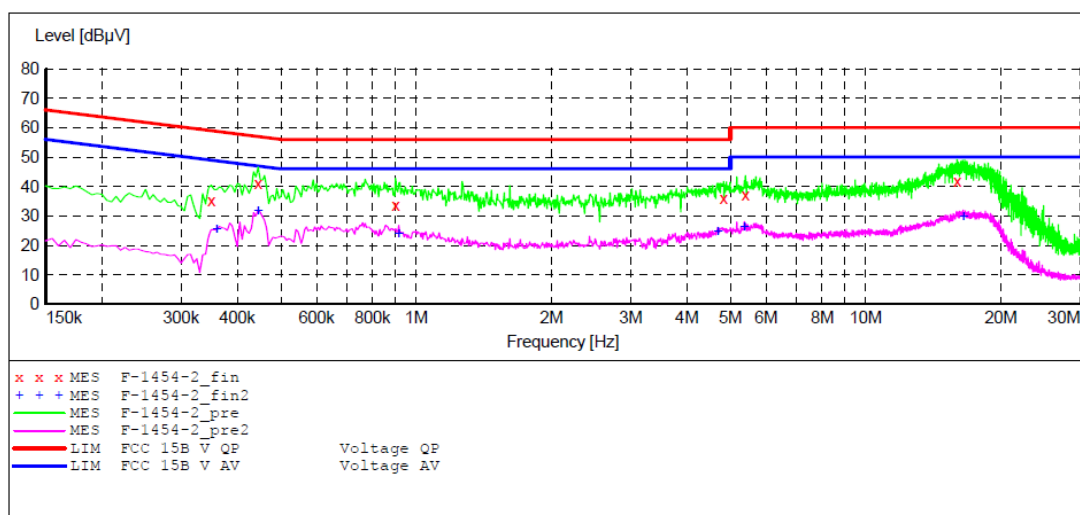
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: KidzLane Stage Mic Sing-Off M/N:KL-0514
 Manufacturer: Dynamic Scientific Ltd
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Frank
 Test Specification: L 120V/60Hz
 Comment: Report NO.:ATE20181454
 Start of Test: 8/10/2018 / 5:51:23PM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "F-1454-2_fin"

8/10/2018 5:54PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.350000	35.10	10.6	59	23.9	QP	L1	GND
0.445000	41.10	10.7	57	15.9	QP	L1	GND
0.900000	33.60	10.8	56	22.4	QP	L1	GND
4.830000	35.90	11.1	56	20.1	QP	L1	GND
5.400000	36.90	11.2	60	23.1	QP	L1	GND
15.970000	41.80	11.4	60	18.2	QP	L1	GND

MEASUREMENT RESULT: "F-1454-2_fin2"

8/10/2018 5:54PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	25.40	10.6	49	23.3	AV	L1	GND
0.445000	31.60	10.7	47	15.4	AV	L1	GND
0.915000	24.00	10.8	46	22.0	AV	L1	GND
4.690000	24.70	11.1	46	21.3	AV	L1	GND
5.370000	26.10	11.2	50	23.9	AV	L1	GND
16.480000	29.60	11.4	50	20.4	AV	L1	GND

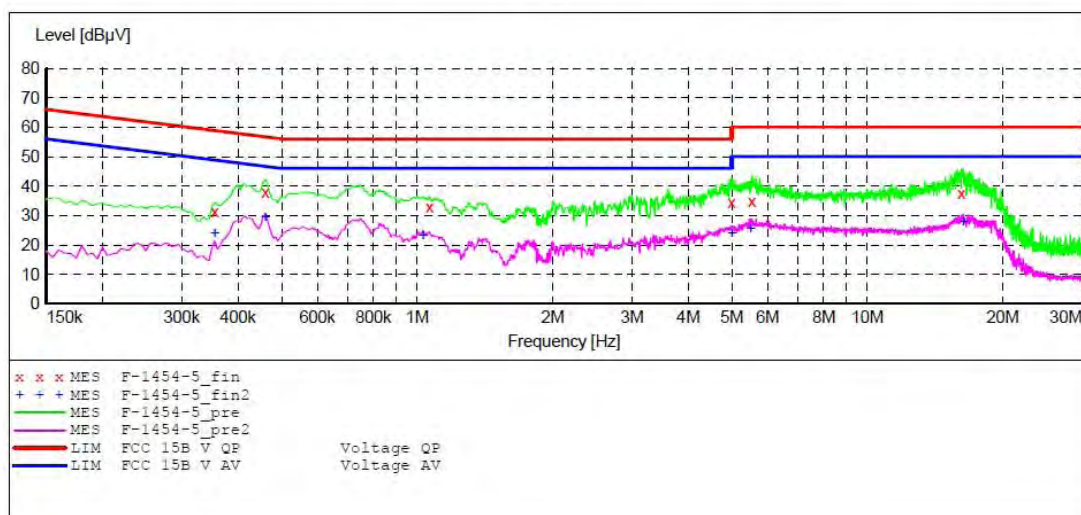
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: KidzLane Stage Mic Sing-Off M/N:KL-0514
 Manufacturer: Dynamic Scientific Ltd
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Frank
 Test Specification: N 240V/60Hz
 Comment: Report NO.:ATE20181454
 Start of Test: 8/10/2018 / 6:03:15PM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "F-1454-5_fin"

8/10/2018 6:06PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.355000	31.20	10.6	59	27.6	QP	N	GND
0.460000	37.90	10.7	57	18.8	QP	N	GND
1.065000	32.80	10.9	56	23.2	QP	N	GND
4.990000	34.50	11.2	56	21.5	QP	N	GND
5.540000	34.80	11.2	60	25.2	QP	N	GND
16.180000	37.50	11.4	60	22.5	QP	N	GND

MEASUREMENT RESULT: "F-1454-5_fin2"

8/10/2018 6:06PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.355000	23.80	10.6	49	25.0	AV	N	GND
0.460000	29.20	10.7	47	17.5	AV	N	GND
1.030000	22.90	10.8	46	23.1	AV	N	GND
5.000000	24.00	11.2	46	22.0	AV	N	GND
5.510000	25.60	11.2	50	24.4	AV	N	GND
16.330000	27.70	11.4	50	22.3	AV	N	GND

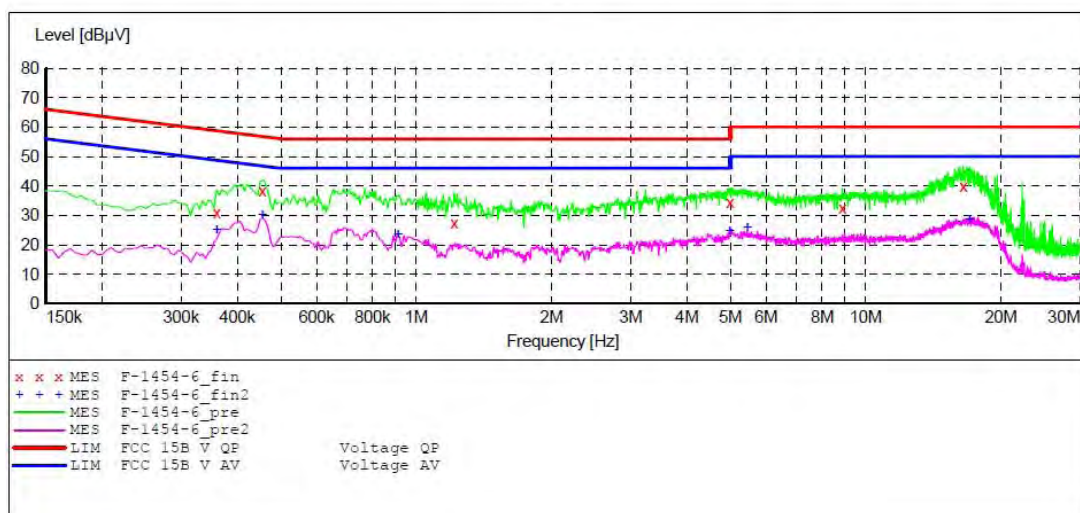
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: KidzLane Stage Mic Sing-Off M/N:KL-0514
 Manufacturer: Dynamic Scientific Ltd
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Frank
 Test Specification: L 240V/60Hz
 Comment: Report NO.:ATE20181454
 Start of Test: 8/10/2018 / 6:07:18PM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "F-1454-6_fin"

8/10/2018 6:10PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	31.00	10.6	59	27.7	QP	L1	GND
0.455000	38.20	10.7	57	18.6	QP	L1	GND
1.215000	27.20	10.9	56	28.8	QP	L1	GND
4.990000	34.20	11.2	56	21.8	QP	L1	GND
8.870000	32.50	11.3	60	27.5	QP	L1	GND
16.480000	39.90	11.4	60	20.1	QP	L1	GND

MEASUREMENT RESULT: "F-1454-6_fin2"

8/10/2018 6:10PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	25.10	10.6	49	23.6	AV	L1	GND
0.455000	30.00	10.7	47	16.8	AV	L1	GND
0.910000	23.60	10.8	46	22.4	AV	L1	GND
4.980000	24.60	11.2	46	21.4	AV	L1	GND
5.450000	25.60	11.2	50	24.4	AV	L1	GND
17.020000	28.70	11.4	50	21.3	AV	L1	GND

13.ANTENNA REQUIREMENT

13.1.The Requirement

According to Section 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.

13.2.Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is 0 dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

***** End of Test Report *****