APPLICATION CERTIFICATION FCC Part 15C
On Behalf of

Elec-Tech International Co., Ltd.

LED ceiling lamp

Model No.: 546203XX

FCC ID: XZH-5462032017

Prepared for	:	Elec-Tech International Co., Ltd.
Address	:	No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong Province, P.R. China 519085
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
Address	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China
		Tel: (0755) 26503290 Fax: (0755) 26503396

Report No.	:	ATE20171126
Date of Test	:	June 18-June 21, 2017
Date of Report	:	June 23, 2017

TABLE OF CONTENTS

Description Page

Test Report Certification

Applicant	:	Elec-Tech International Co., Ltd.
Manufacturer 1	:	WUHU 3E LIGHTING CO LTD
Manufacturer 2	:	Guangdong NVCETi Lighting Co., Ltd
EUT Description	:	LED ceiling lamp
Model No.	:	546203XX

(Note: XX = 00-99，which respectively represents different LED source colour temperature.)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247:2016
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 : June 18-June 21, 2017
Date of Report: June 23, 2017

Prepared by : Stan Yang
(Stan Yang, Engineer)

Approved & Authorized Signer :
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

Model Number	:	546203XX (Note: XX = 00-99， which respectively represents different LED source colour temperature, We hereby state that these models are identical in interior structure, electrical circuits and components, Therefore, only model 54620311 is tested for EMC tests.)
Bluetooth version	:	BT V4.1 Single mode This report is for BT classic mode
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79 for BT classic mode
Antenna Gain(Max)	:	-1.0dBi
Antenna type	:	Integrate Antenna
Adapter Input Voltage	:	AC 120V,60Hz
Modulation mode	:	GFSK, π/4 DQPSK, 8DPSK for BT classic mode
Applicant	:	Elec-Tech International Co., Ltd.
Address	:	No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong Province, P.R. China 519085
Manufacturer 1	:	WUHU 3E LIGHTING CO LTD
Address	:	11 WEI ER CI RD EASTERN WUHU ECONOMIC & TECHNOLOGICAL DEVELOPMENT AREA WUHU ANHUI 241000 China
Manufacturer 2	:	Guangdong NVCETi Lighting Co., Ltd
Address	:	Factory#2-2, No. 1, South Zhongzhu Road Science & Technology Road, Innovation Coast, High Tech District, Zhuhai City, Guangdong Province, P.R. China 519085
Date of sample received	:	June 15, 2017
Date of Test	:	June 18-June 21, 2017

1.2.Accessory and Auxiliary Equipment

PC :	Manufacturer: LENOVO M/N: 4290-RT8 S/N: R9-FW93G 11/08

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 (ISEDC) 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. 07, 2017	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 07, 2017	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 07, 2017	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 07, 2017	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 13, 2017	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 13, 2017	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 13, 2017	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 13, 2017	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 07, 2017	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 07, 2017	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 07, 2017	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 07, 2017	1 Year

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

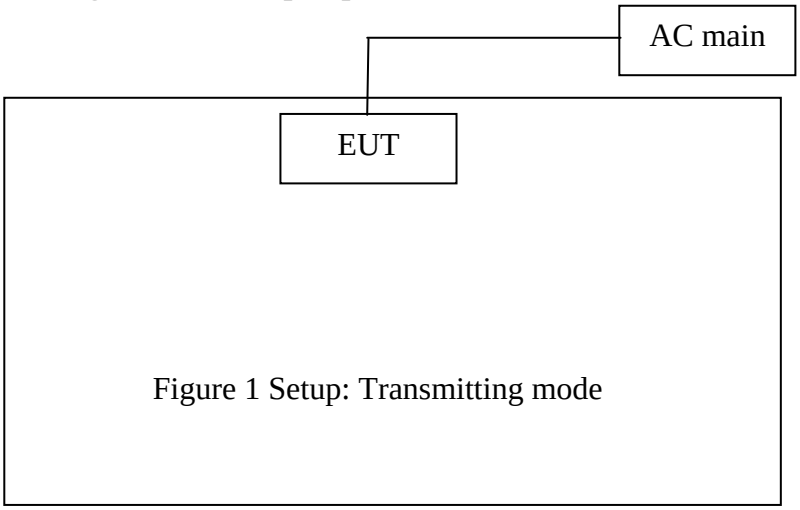


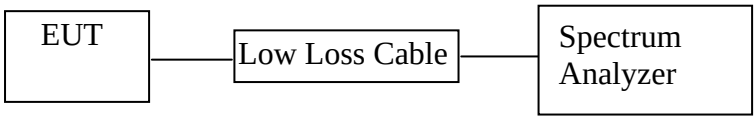
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	Compliant
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 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1.Block Diagram of Test Setup



(EUT: LED ceiling lamp)

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.

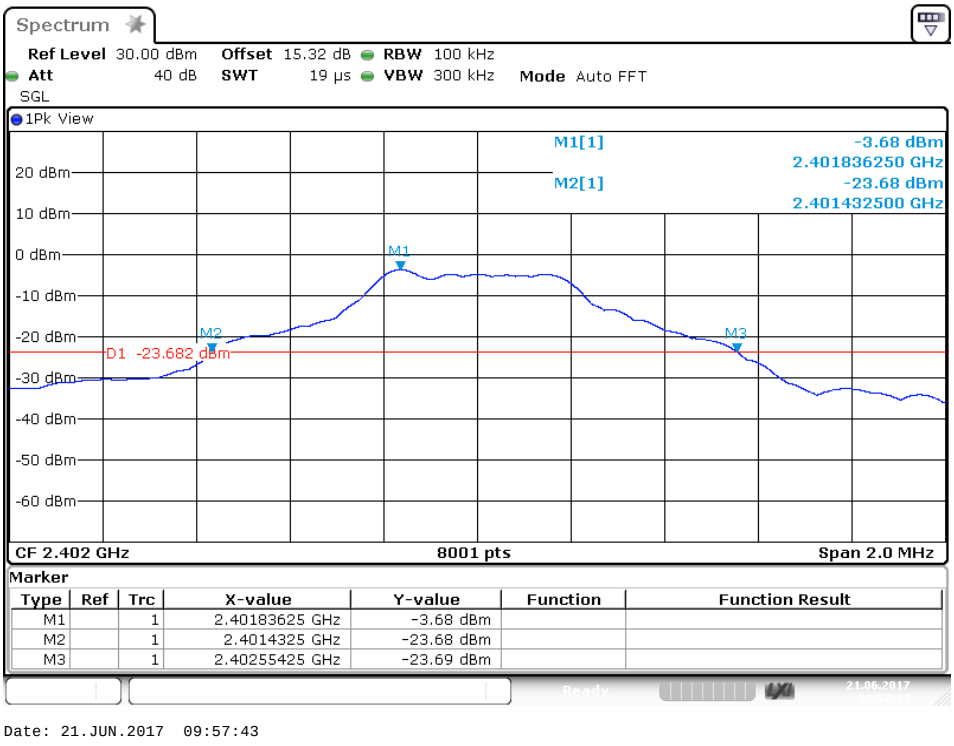
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.122	1.344	1.316	Pass
Middle	2441	1.127	1.341	1.308	Pass
High	2480	1.114	1.338	1.312	Pass

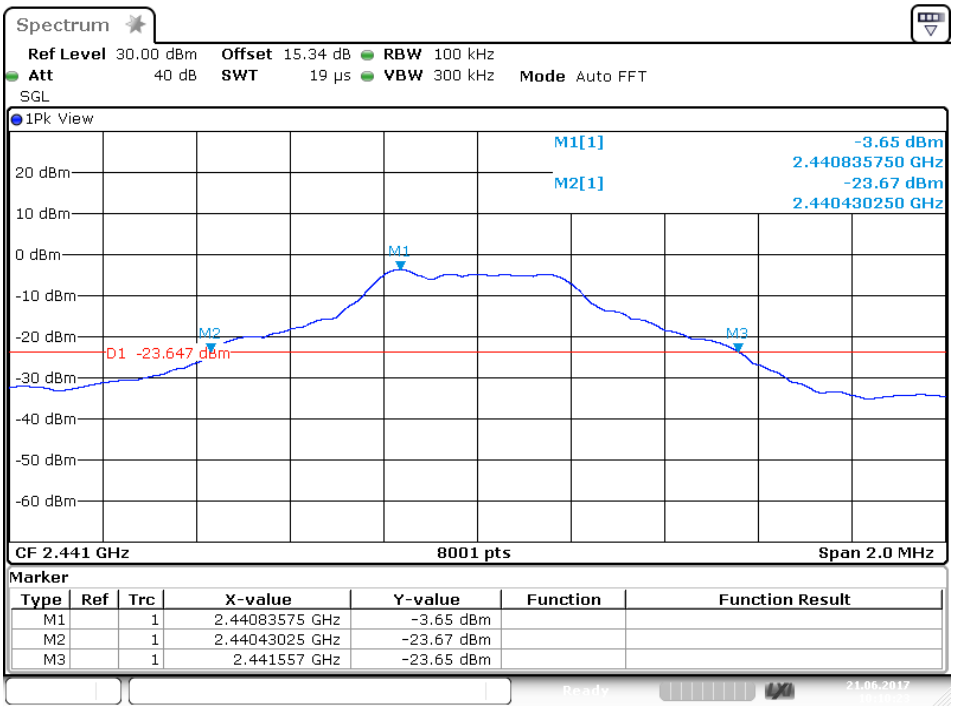
The spectrum analyzer plots are attached as below.

GFSK Mode

Low channel

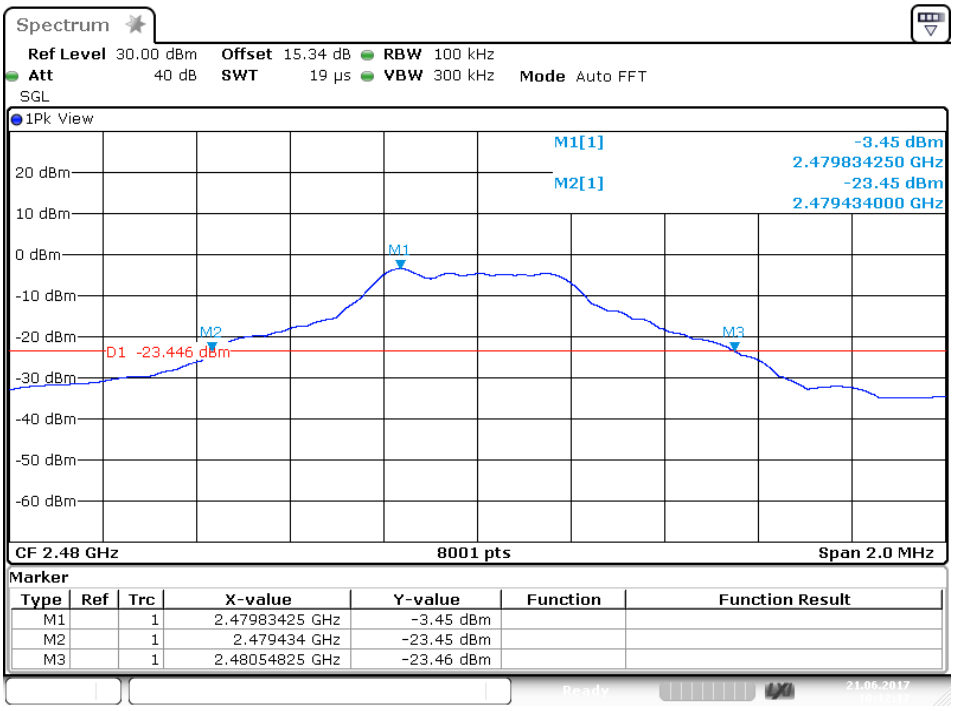


Middle channel



Date: 21.JUN.2017 10:10:23

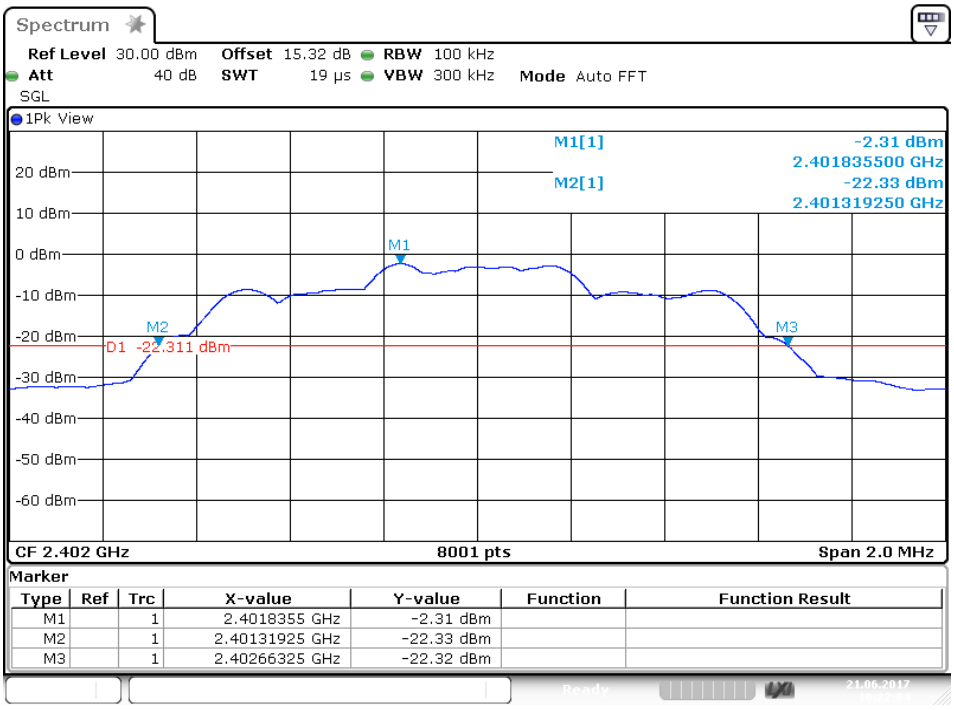
High channel



Date: 21.JUN.2017 10:12:17

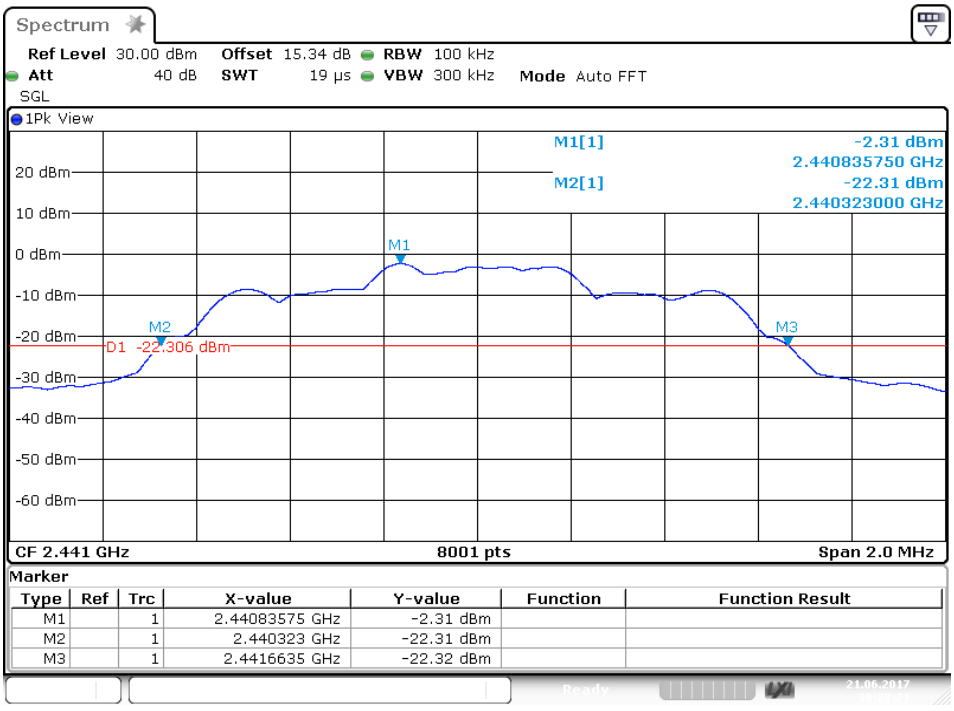
Π/4-DQPSK Mode

Low channel



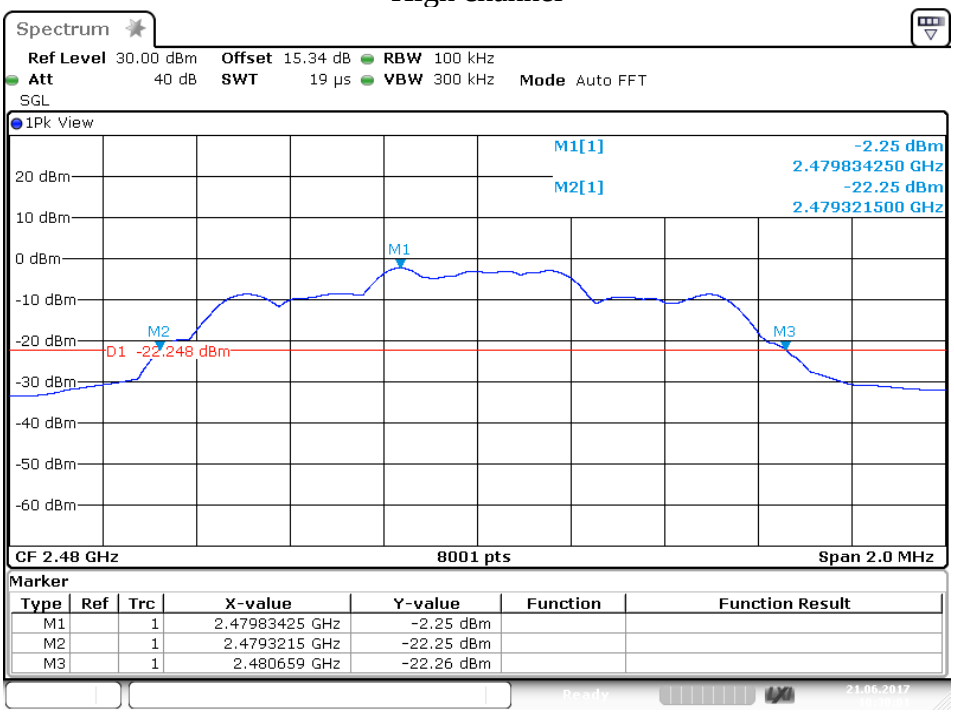
Date: 21.JUN.2017 10:22:04

Middle channel



Date: 21.JUN.2017 10:28:21

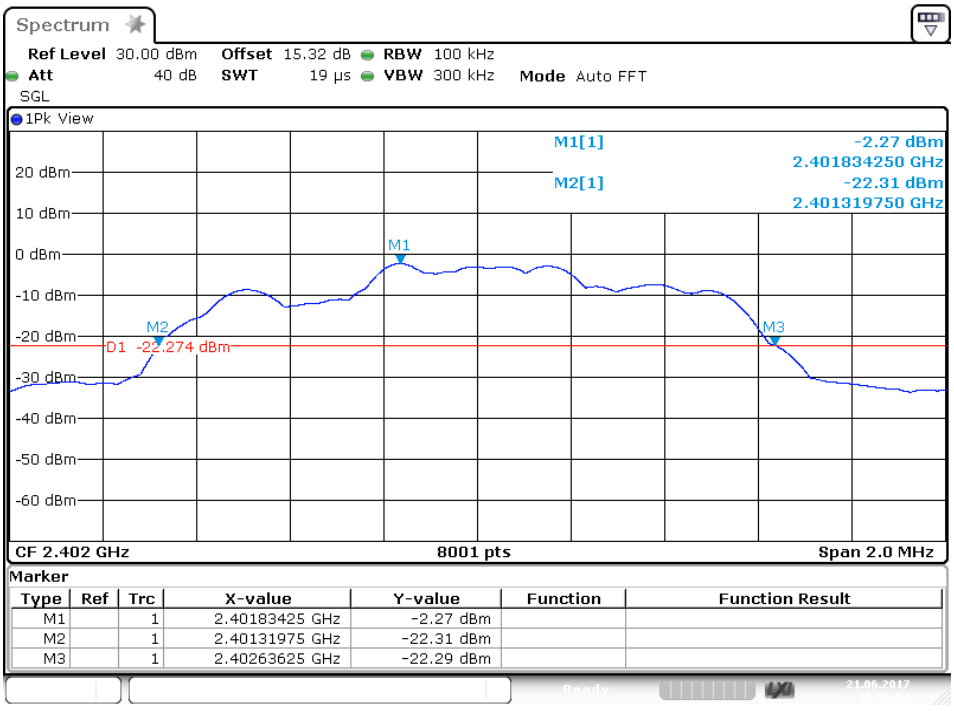
High channel



Date: 21.JUN.2017 10:30:01

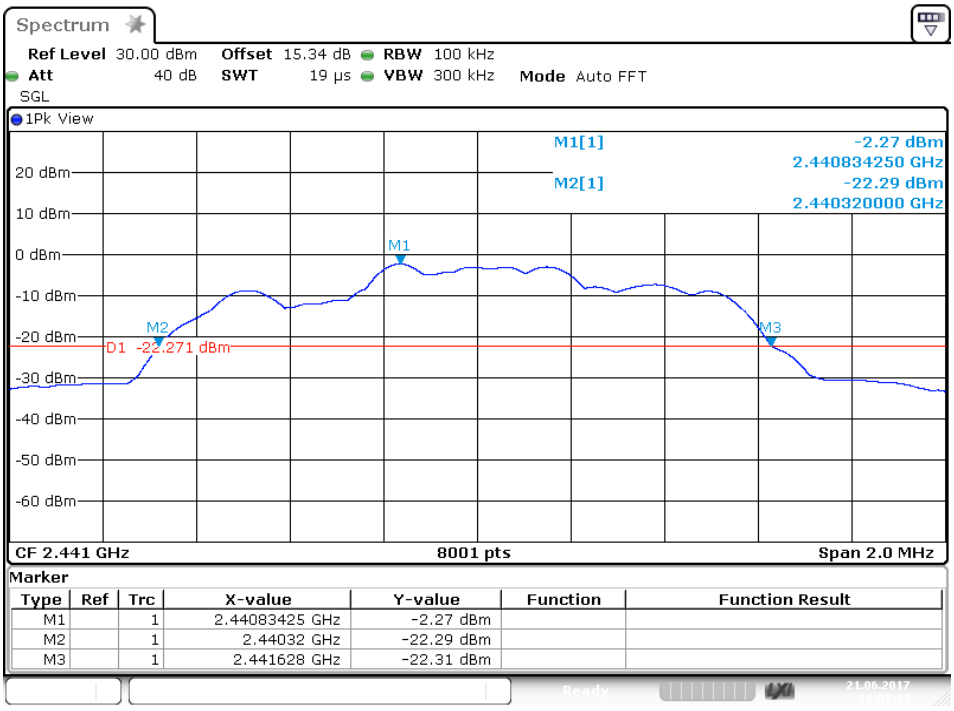
8DPSK Mode

Low channel



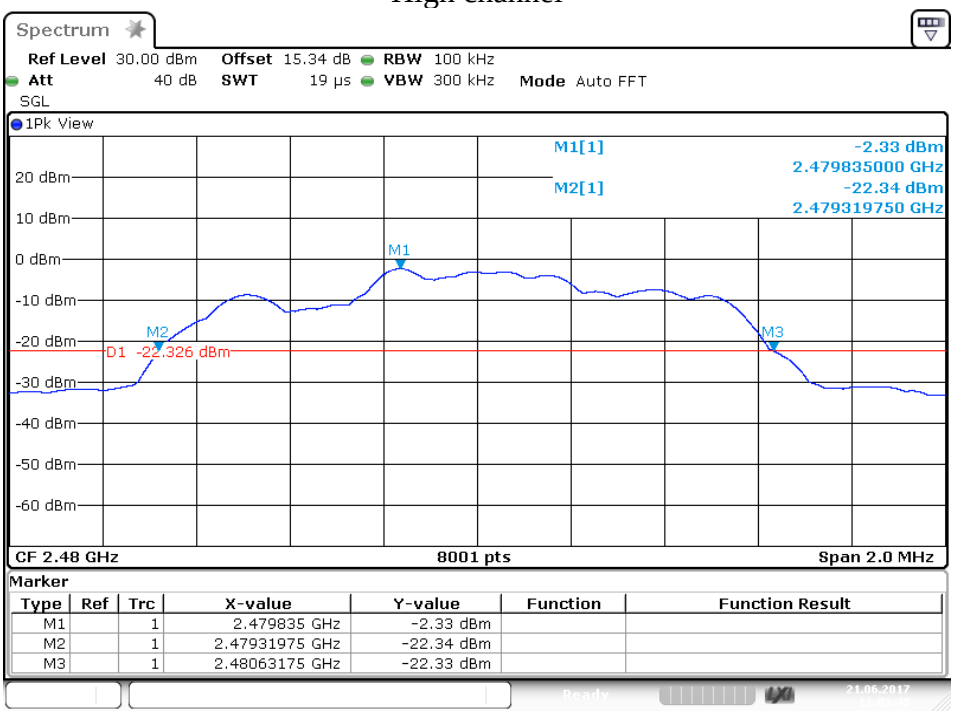
Date: 21.JUN.2017 10:56:54

Middle channel



Date: 21.JUN.2017 11:01:19

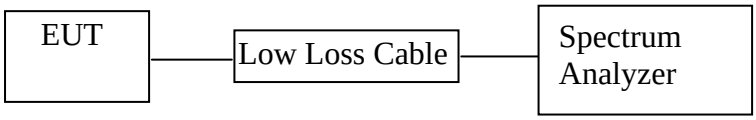
High channel



Date: 21.JUN.2017 11:03:48

6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



(EUT: LED ceiling lamp)

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 pseudorandomly 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	0.999	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	0.999	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	0.999	25KHz or 2/3*20dB bandwidth	PASS
	2480			

Π/4-DQPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.999	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	0.999	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.000	25KHz or 2/3*20dB bandwidth	PASS
	2480			

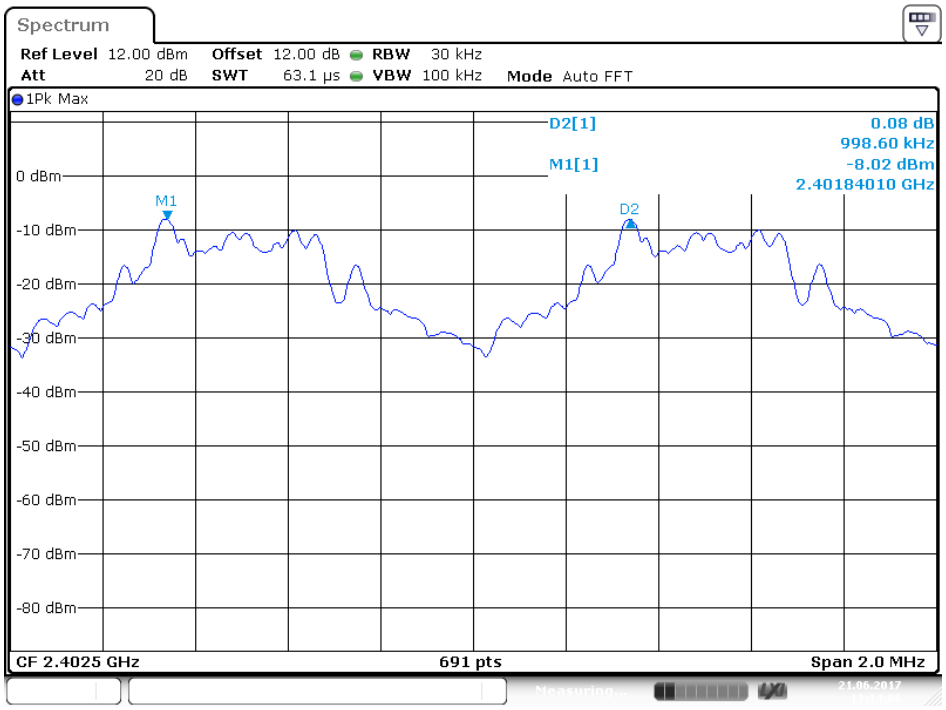
8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.999	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	0.999	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.003	25KHz or 2/3*20dB bandwidth	PASS
	2480			

The spectrum analyzer plots are attached as below.

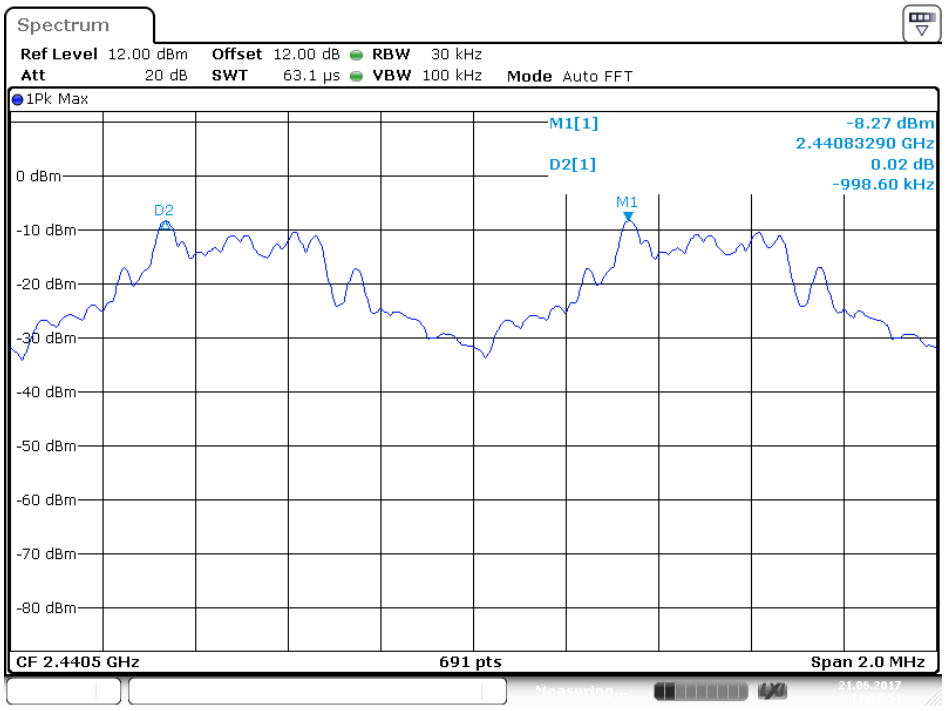
GFSK Mode

Low channel



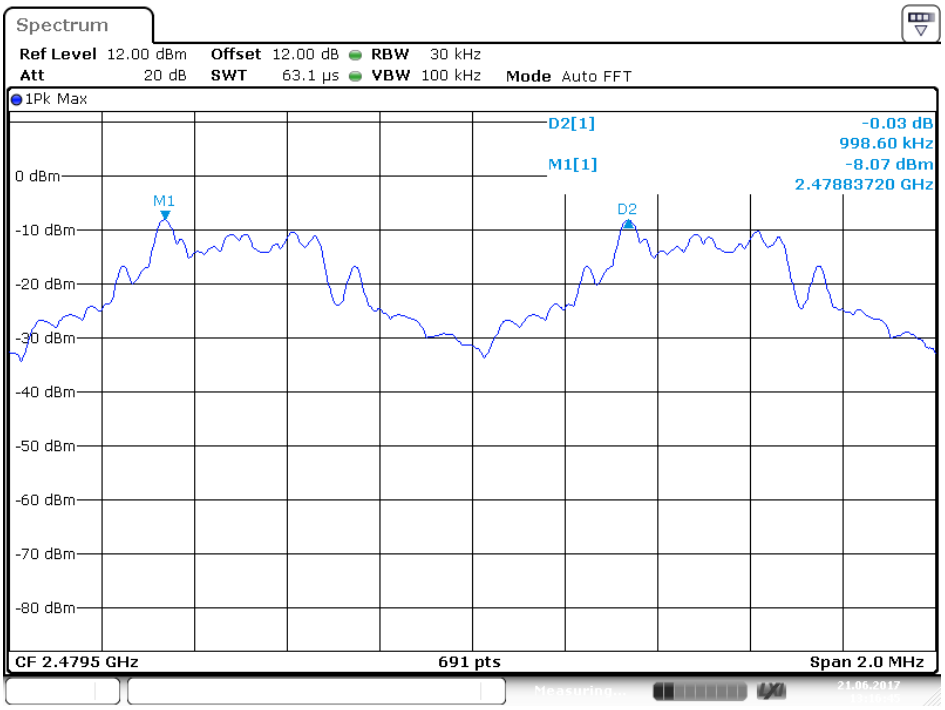
Date: 21.JUN.2017 13:14:06

Middle channel



Date: 21.JUN.2017 13:15:51

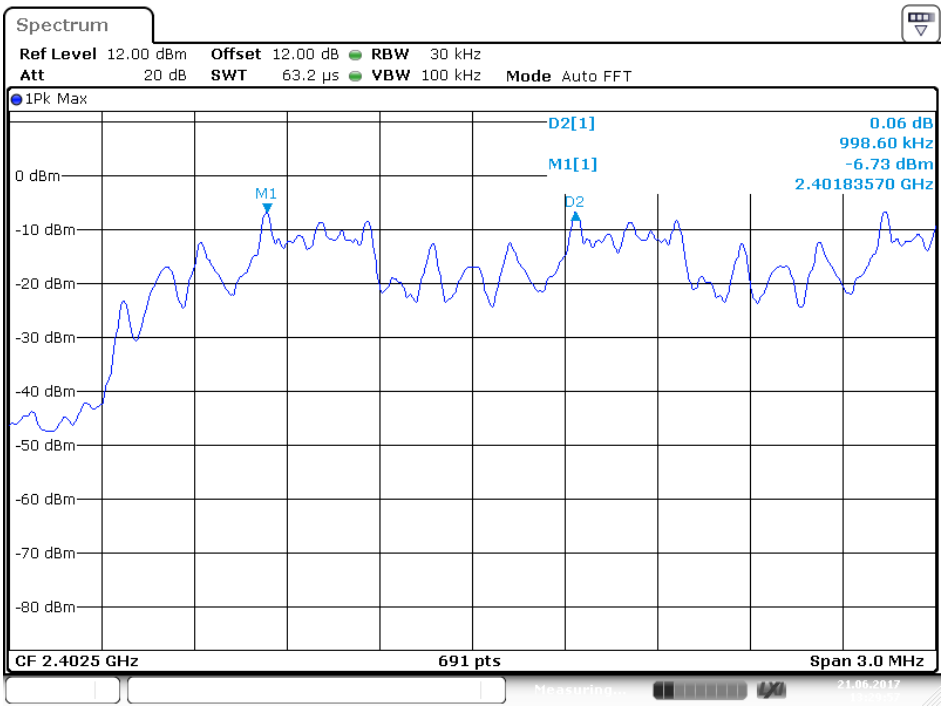
High channel



Date: 21.JUN.2017 13:16:45

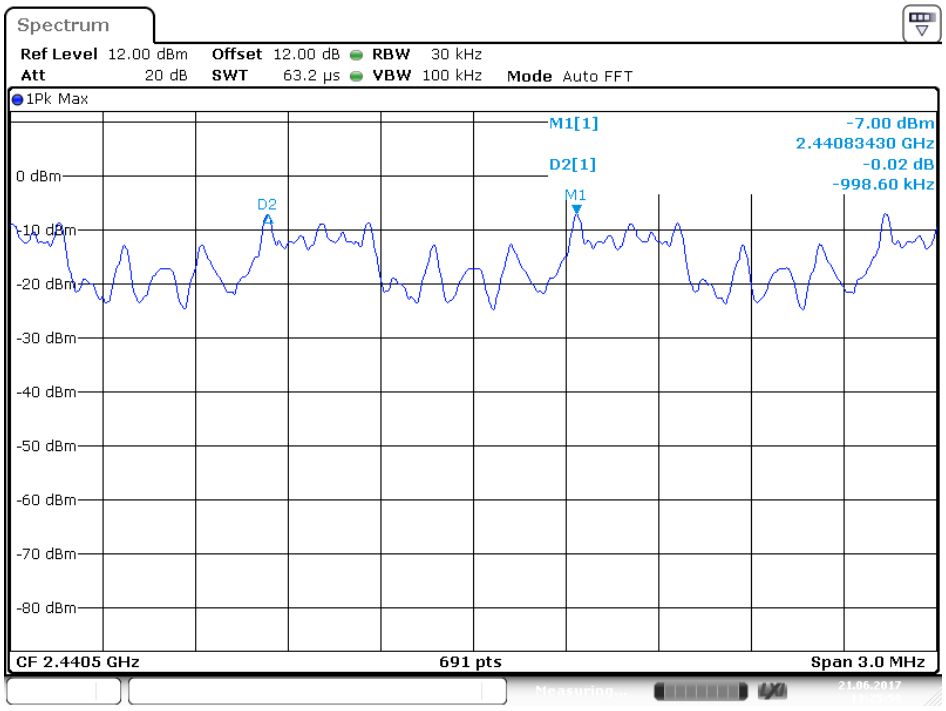
Π/4-DQPSK Mode

Low channel



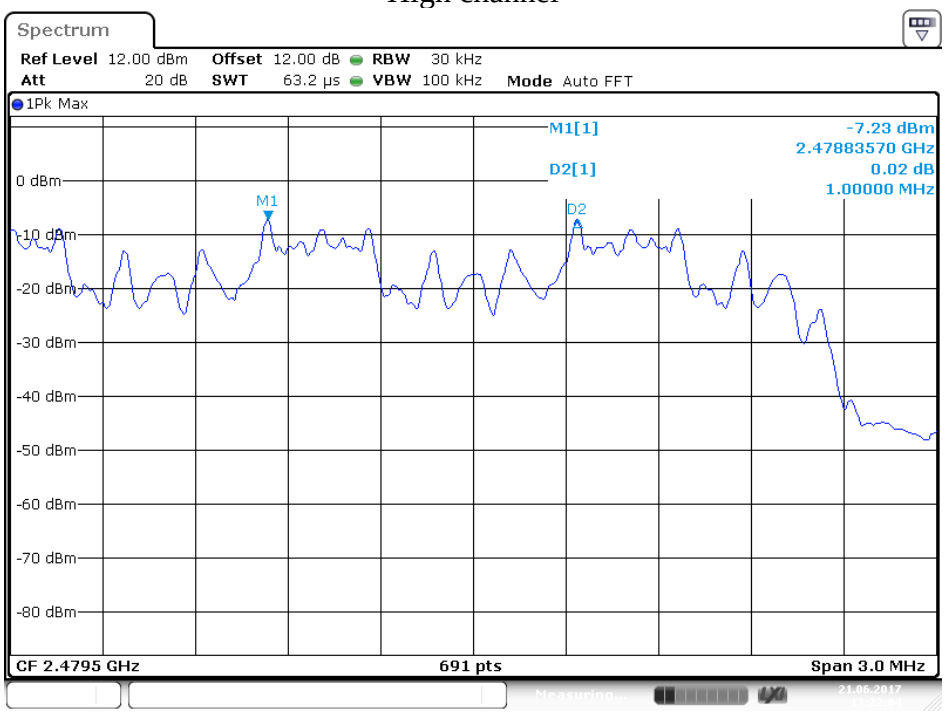
Date: 21.JUN.2017 13:29:57

Middle channel



Date: 21.JUN.2017 13:25:58

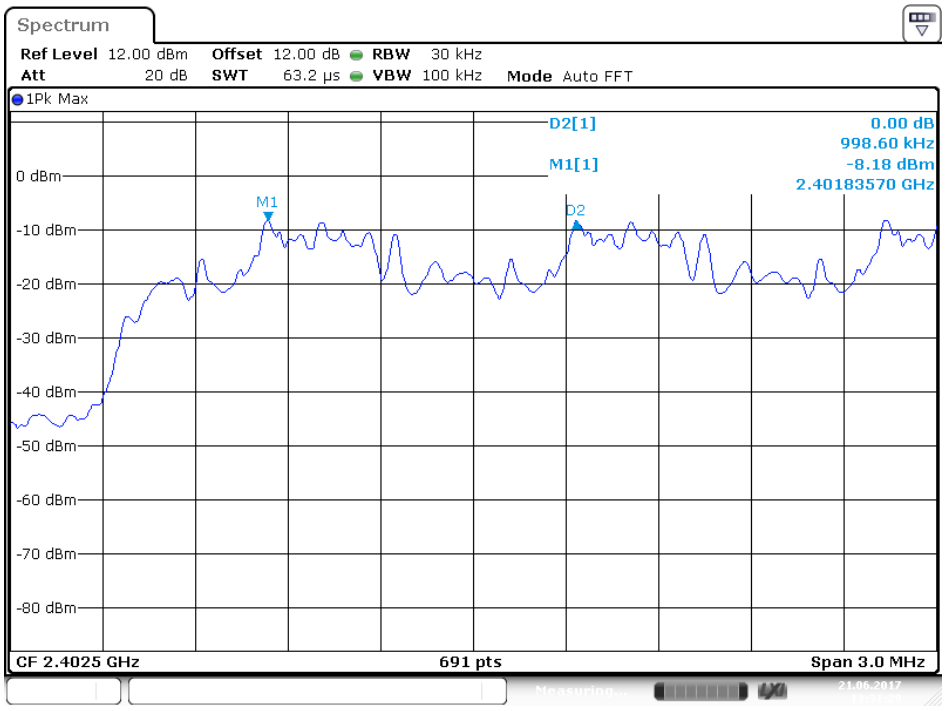
High channel



Date: 21.JUN.2017 13:22:04

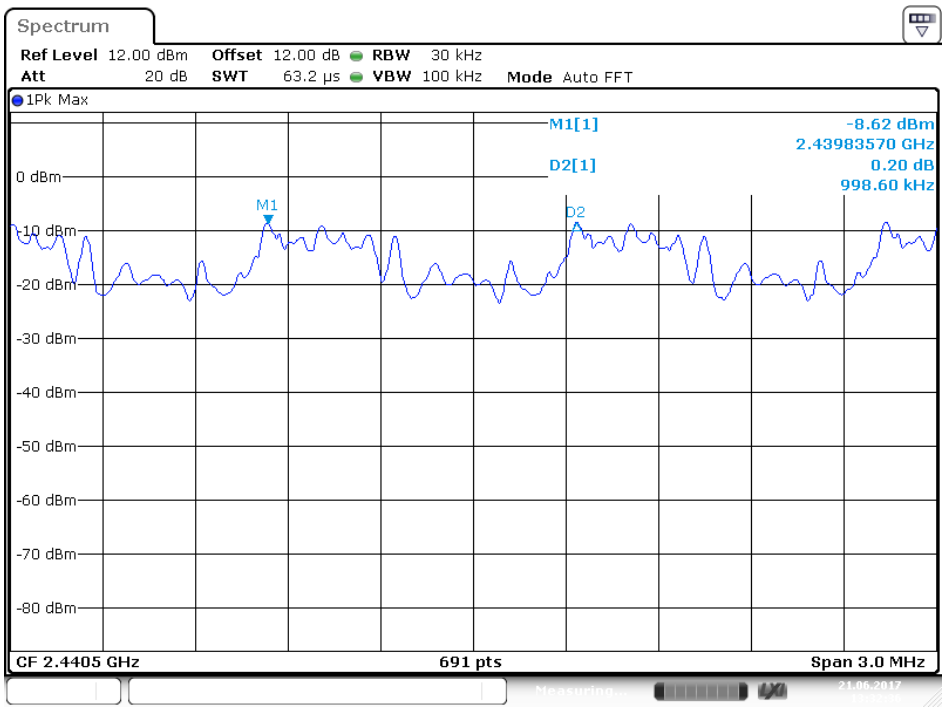
8DPSK Mode

Low channel



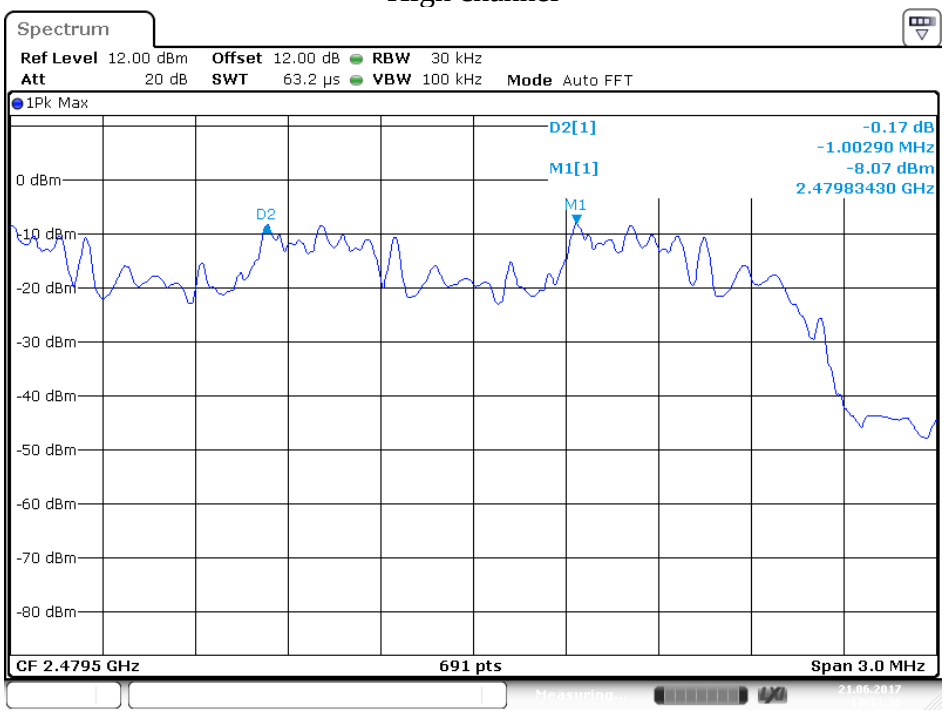
Date: 21.JUN.2017 13:31:29

Middle channel



Date: 21.JUN.2017 13:32:36

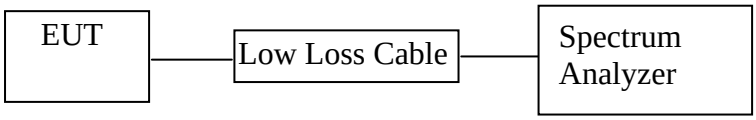
High channel



Date: 21.JUN.2017 13:33:28

7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



(EUT: LED ceiling lamp)

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.

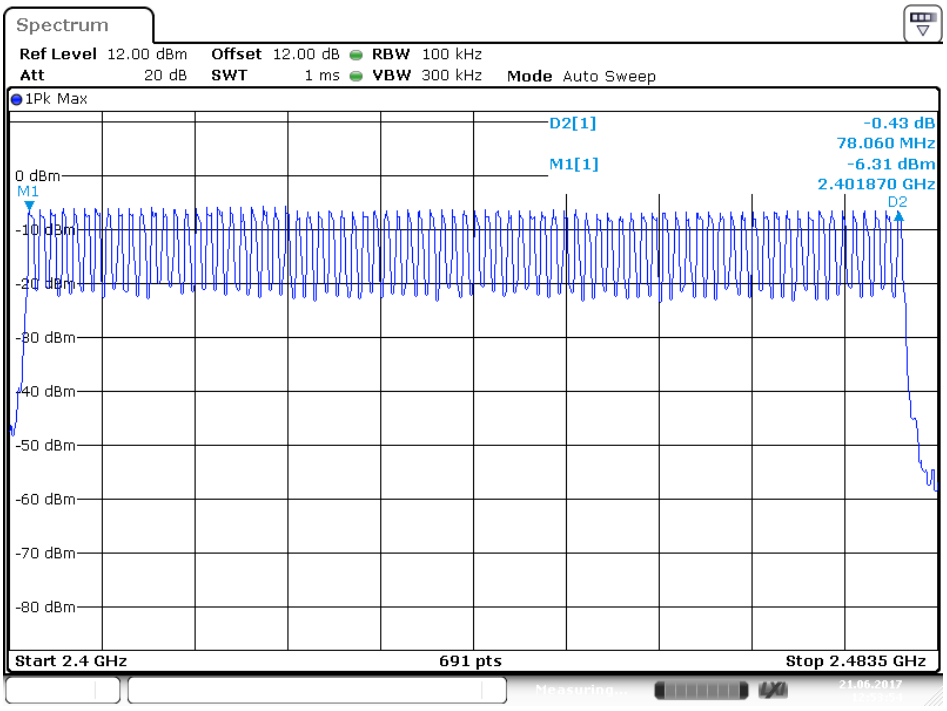
7.5.3.Max hold, view and count how many channel in the band.

7.6.Test Result

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

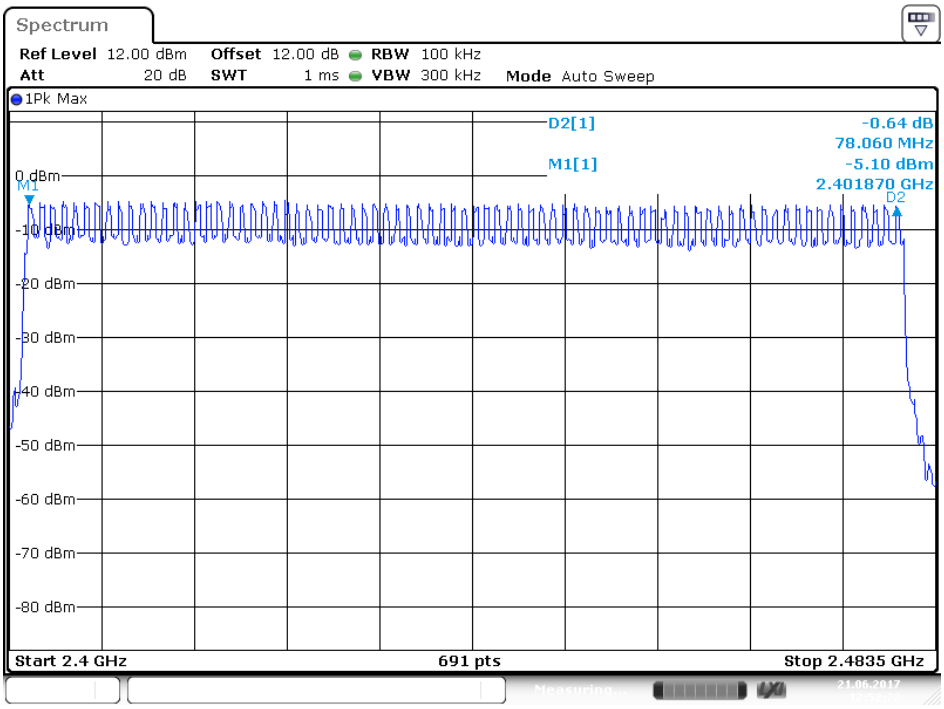
The spectrum analyzer plots are attached as below.

Number of hopping channels(GFSK)



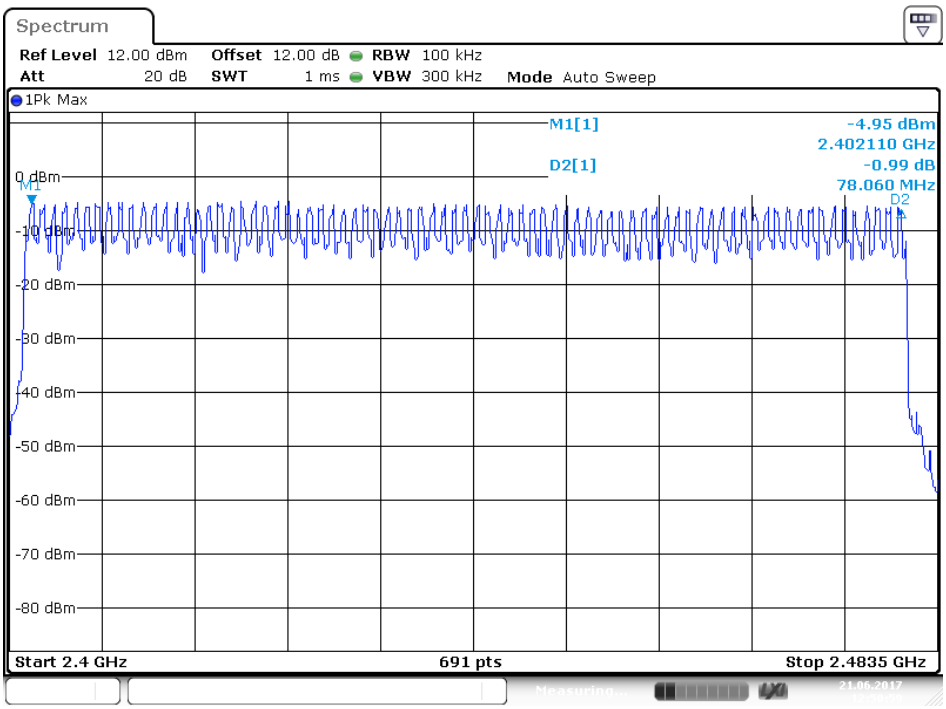
Date: 21.JUN.2017 12:53:54

Number of hopping channels(Π/4-DQPSK)



Date: 21.JUN.2017 12:52:22

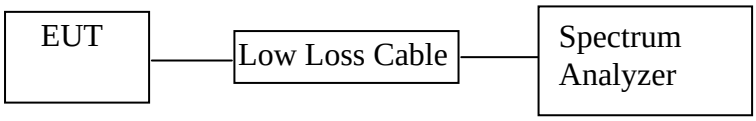
Number of hopping channels(8DPSK)



Date: 21.JUN.2017 12:50:59

8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



(EUT: LED ceiling lamp)

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

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.406	129.92	400
	2441	0.406	129.92	400
	2480	0.406	129.92	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.681	268.96	400
	2441	1.681	268.96	400
	2480	1.681	268.96	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	2.986	318.51	400
	2441	2. 986	318.51	400
	2480	2. 986	318.51	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

Π/4-DQPSK

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.406	129.92	400
	2441	0.406	129.92	400
	2480	0.406	129.92	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.667	266.72	400
	2441	1. 681	268.96	400
	2480	1. 681	268.96	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	2.986	318.51	400
	2441	2.986	318.51	400
	2480	2.986	318.51	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

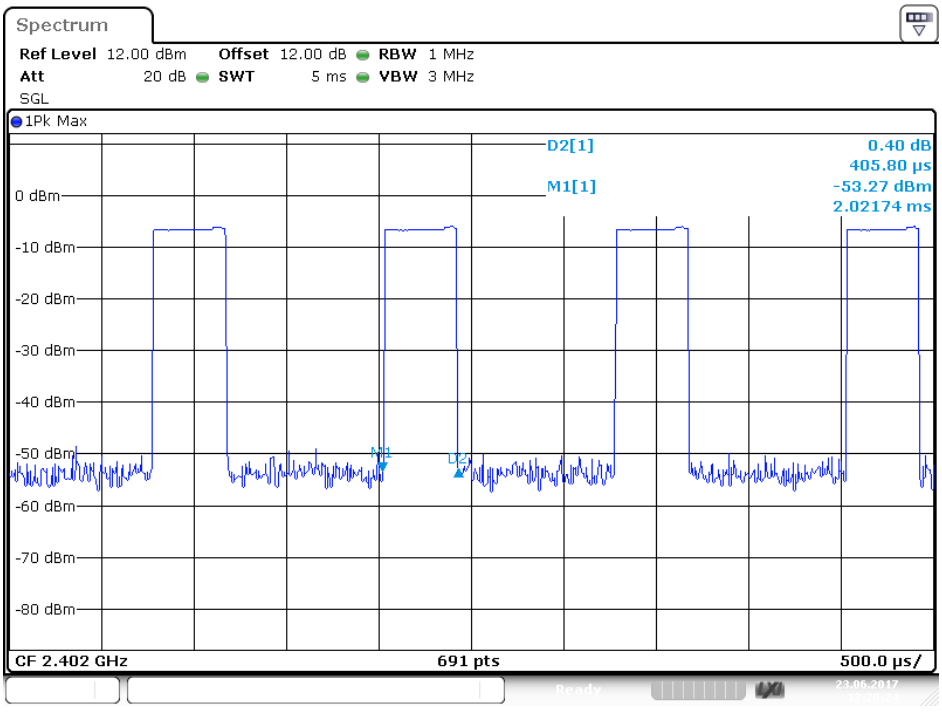
8DPSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.406	129.92	400
	2441	0.406	129.92	400
	2480	0.406	129.92	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.681	268.96	400
	2441	1.681	268.96	400
	2480	1.681	268.96	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	2.986	318.51	400
	2441	2.986	318.51	400
	2480	2.986	318.51	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

The spectrum analyzer plots are attached as below.

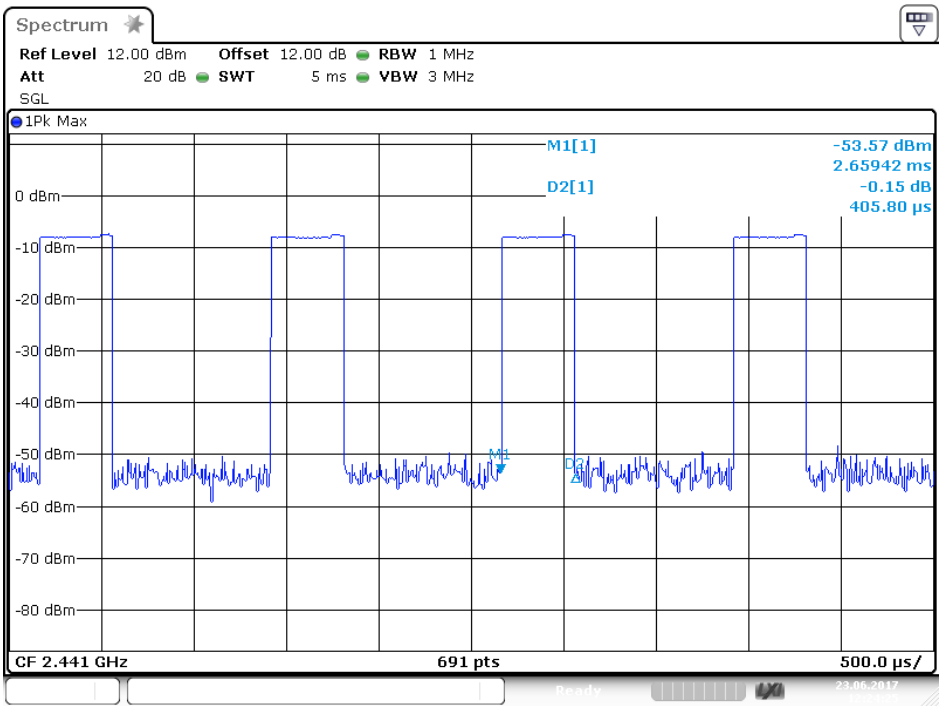
GFSK Mode

DH1 Low channel



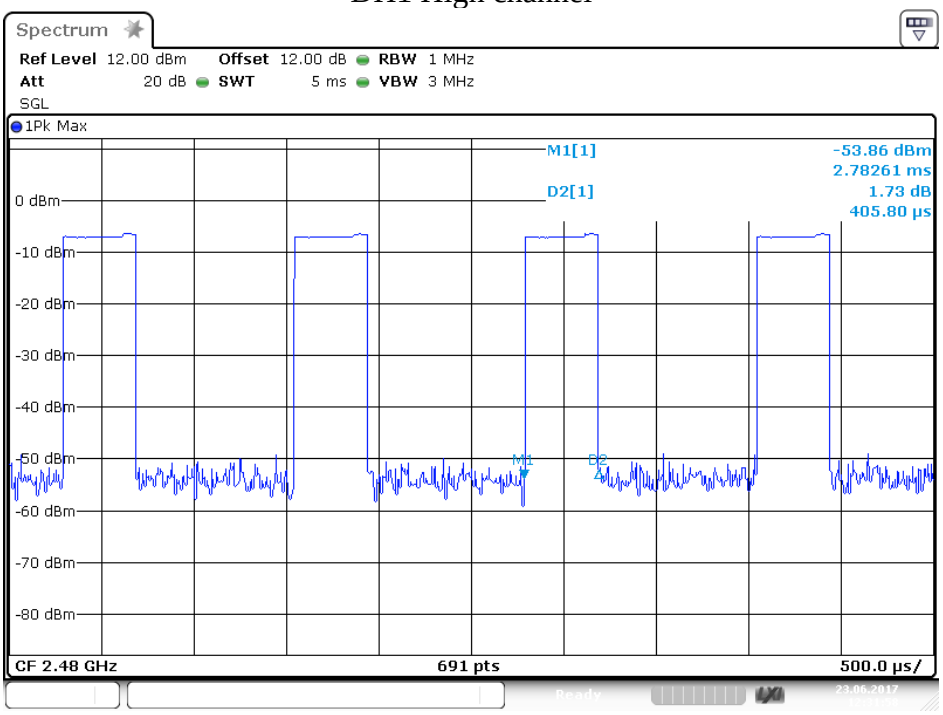
Date: 23.JUN.2017 12:20:25

DH1 Middle channel



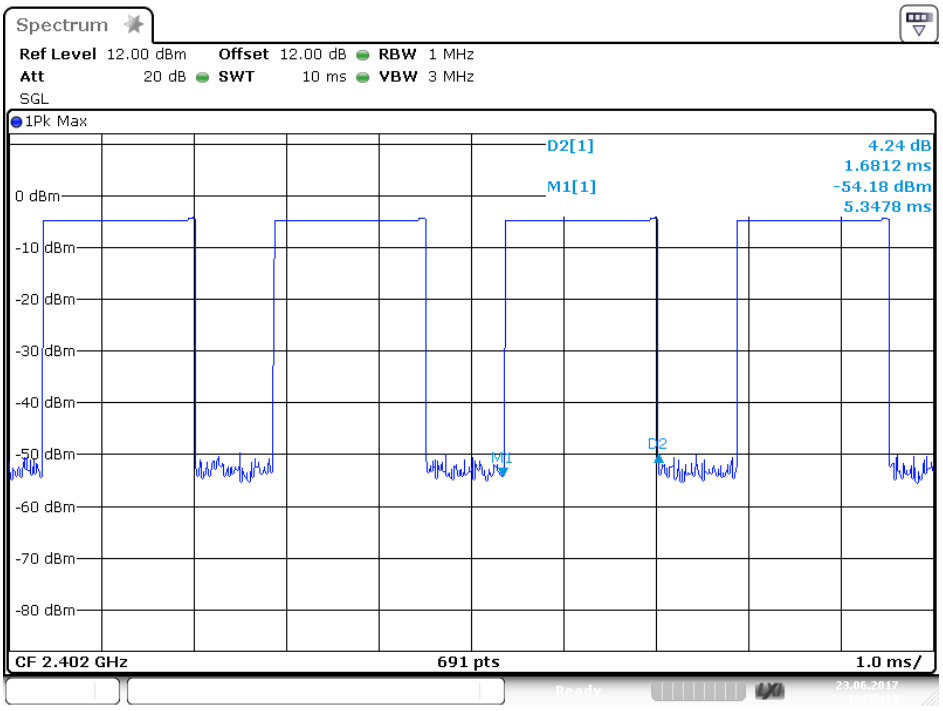
Date: 23.JUN.2017 12:24:25

DH1 High channel



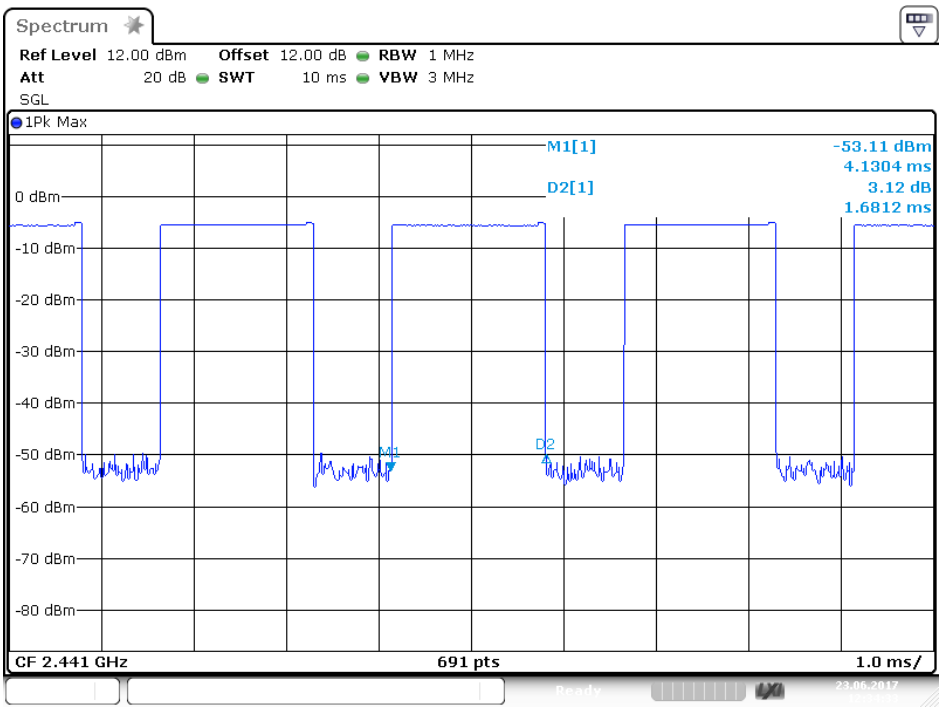
Date: 23.JUN.2017 12:31:58

DH3 Low channel



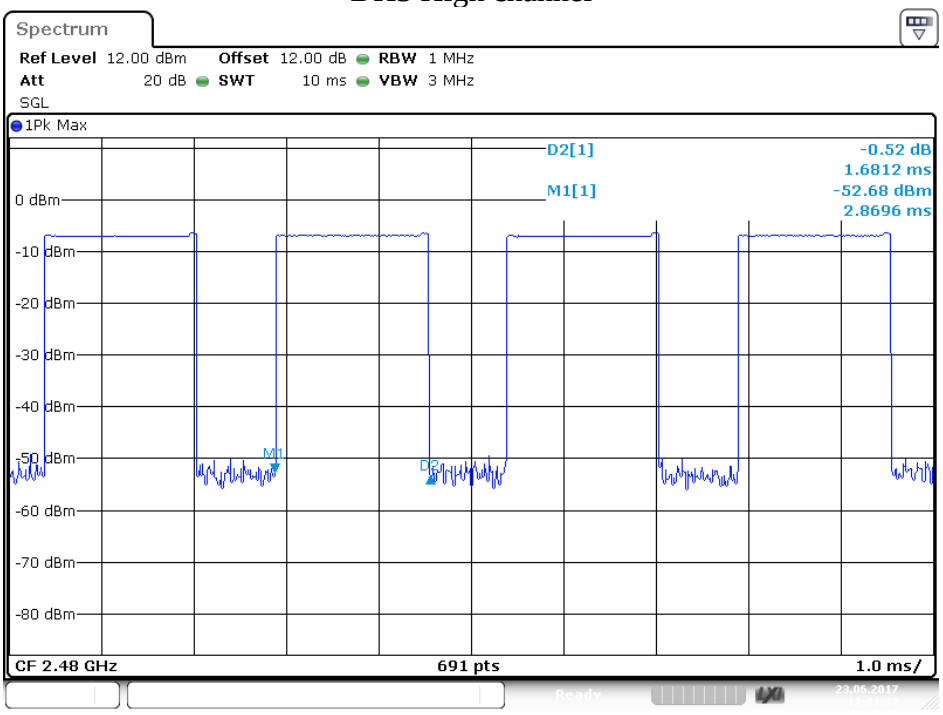
Date: 23.JUN.2017 12:35:20

DH3 Middle channel



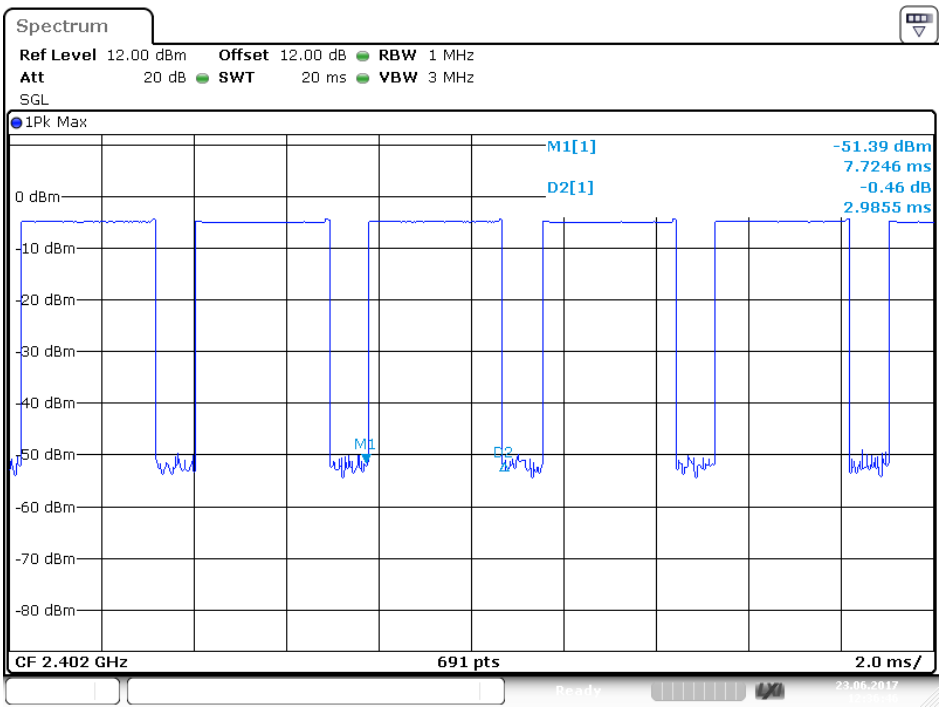
Date: 23.JUN.2017 12:34:34

DH3 High channel



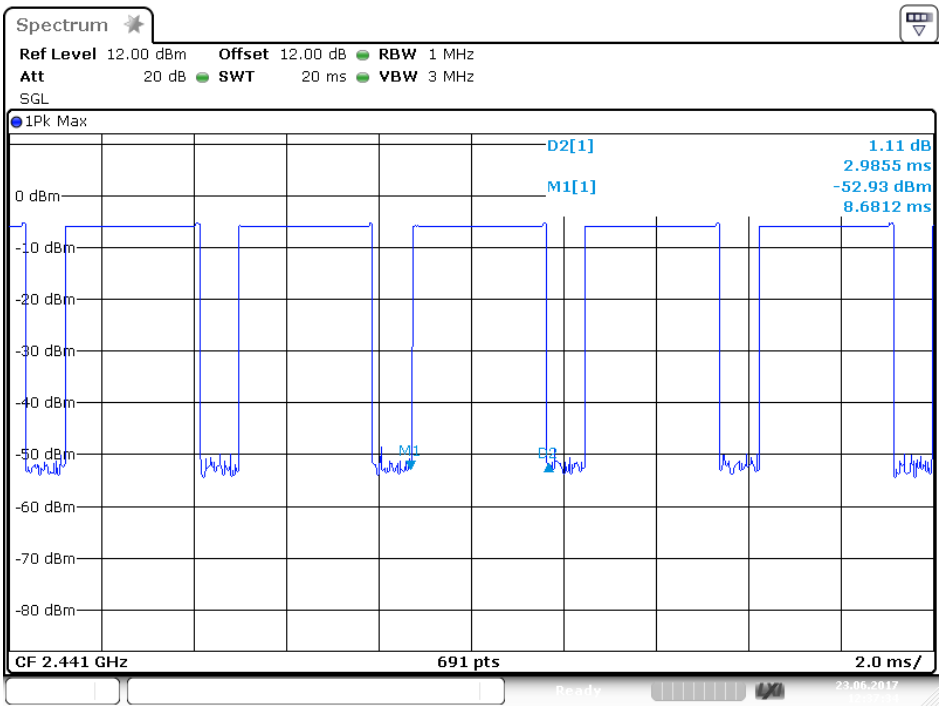
Date: 23.JUN.2017 12:33:38

DH5 Low channel



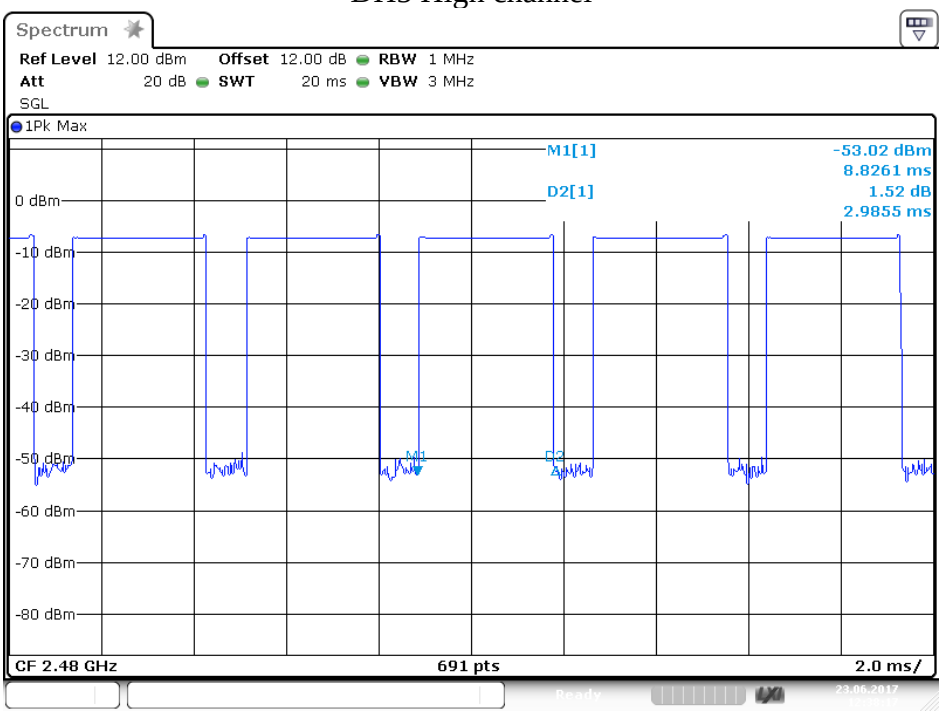
Date: 23.JUN.2017 12:36:46

DH5 Middle channel



Date: 23.JUN.2017 12:37:34

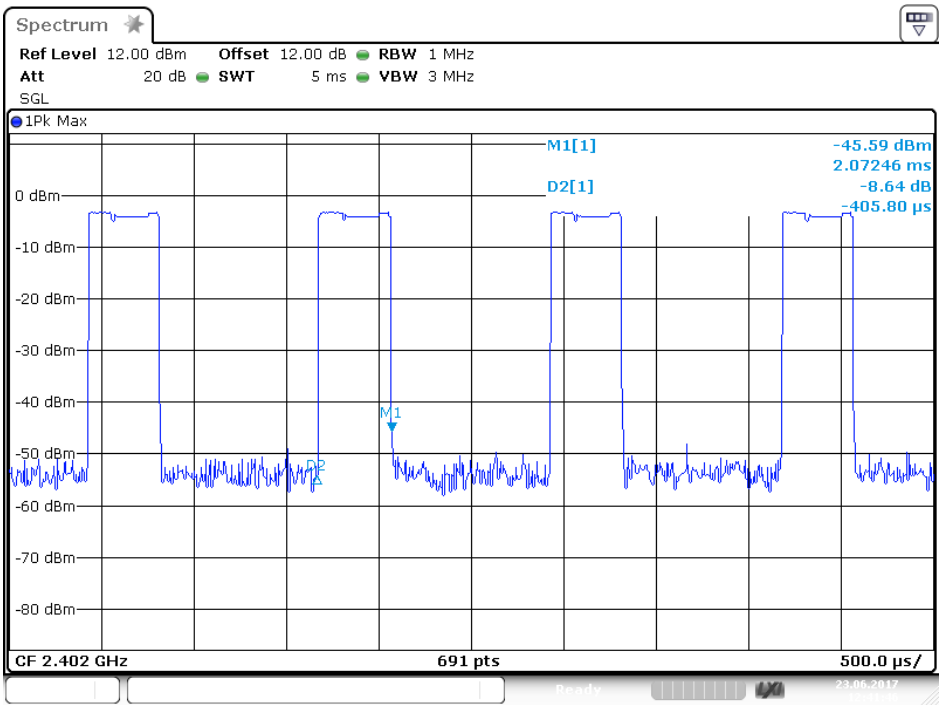
DH5 High channel



Date: 23.JUN.2017 12:38:18

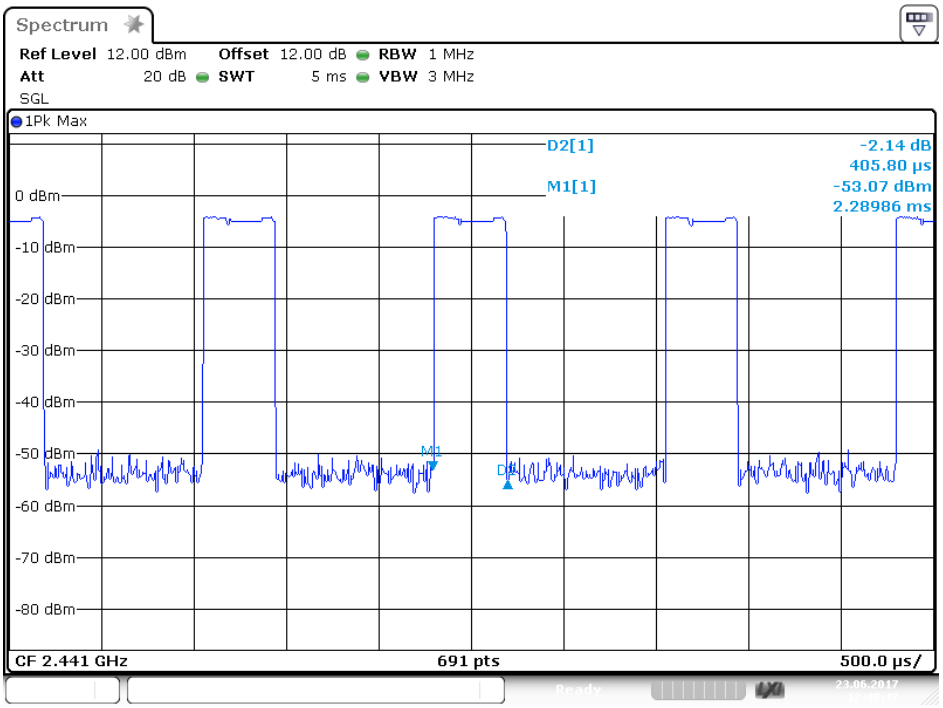
Π/4-DQPSK

2DH1 Low channel



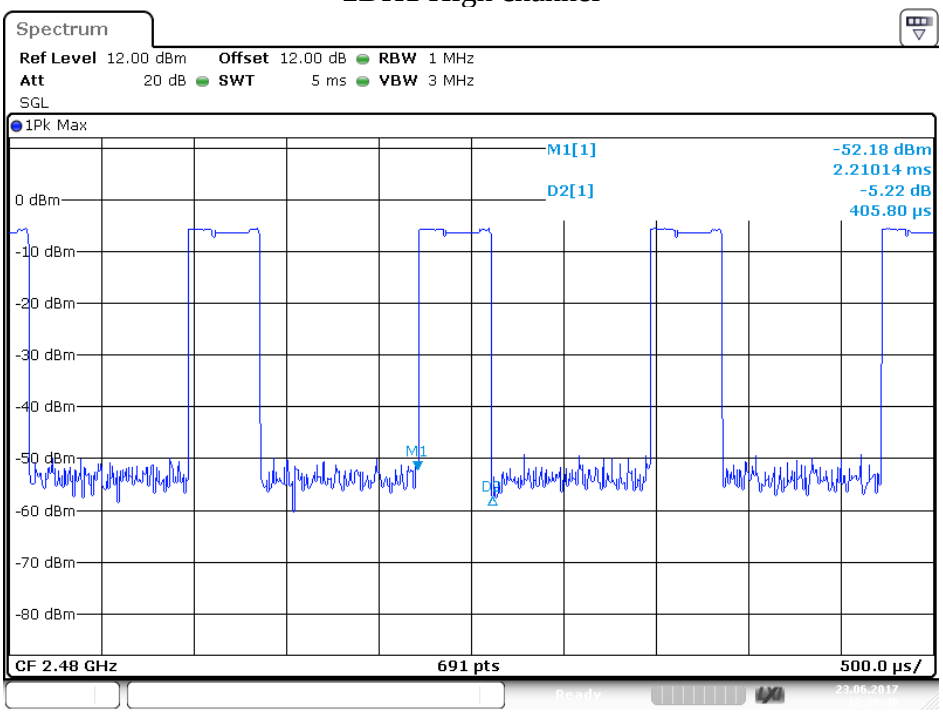
Date: 23.JUN.2017 12:41:46

2DH1 Middle channel



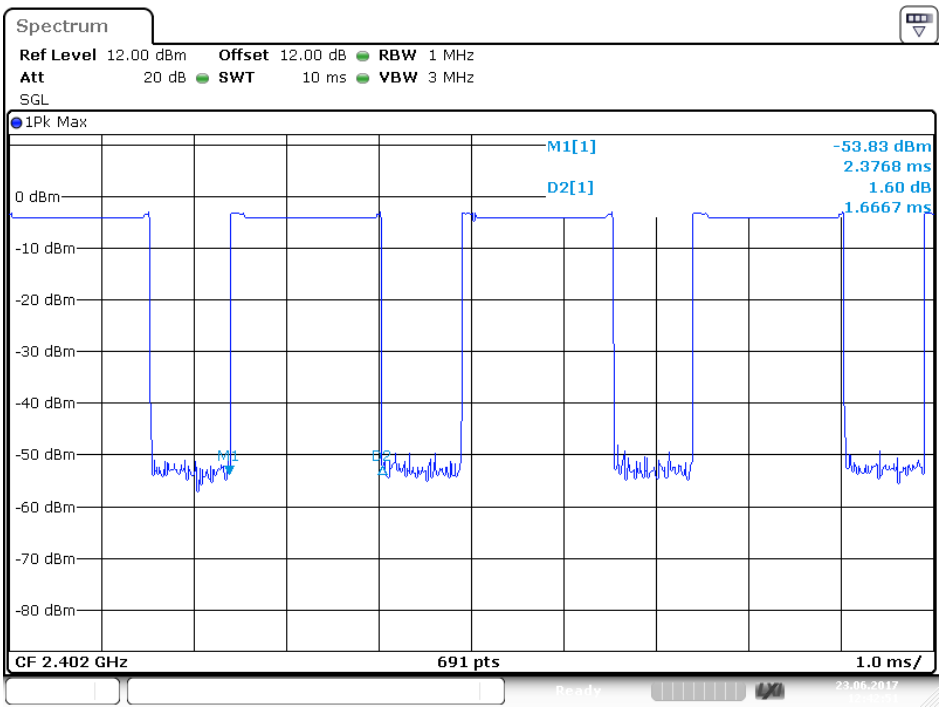
Date: 23.JUN.2017 12:40:47

2DH1 High channel



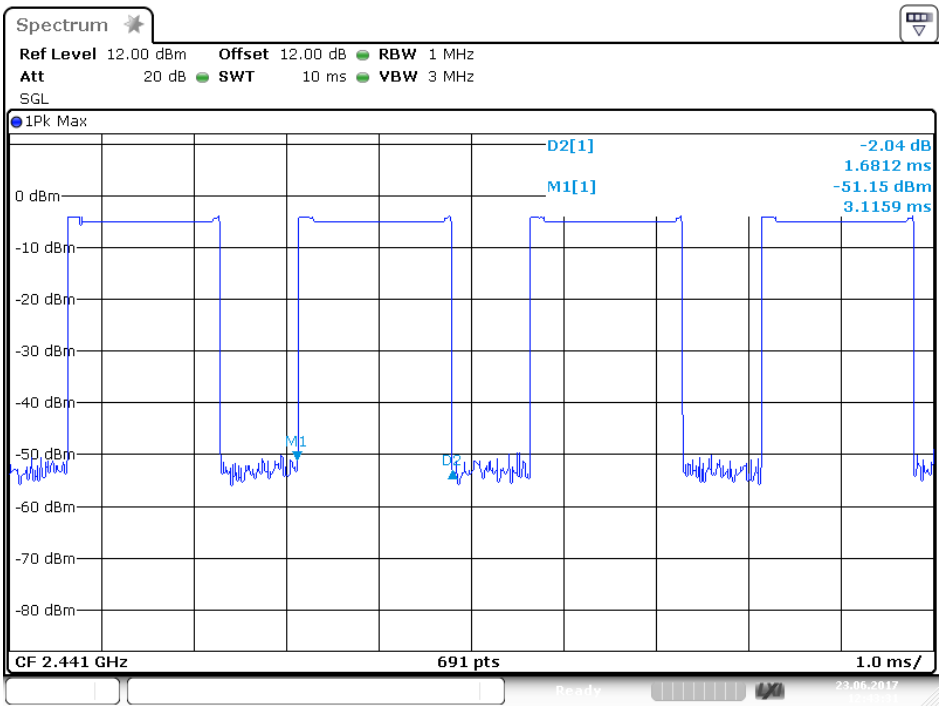
Date: 23.JUN.2017 12:39:47

2DH3 Low channel



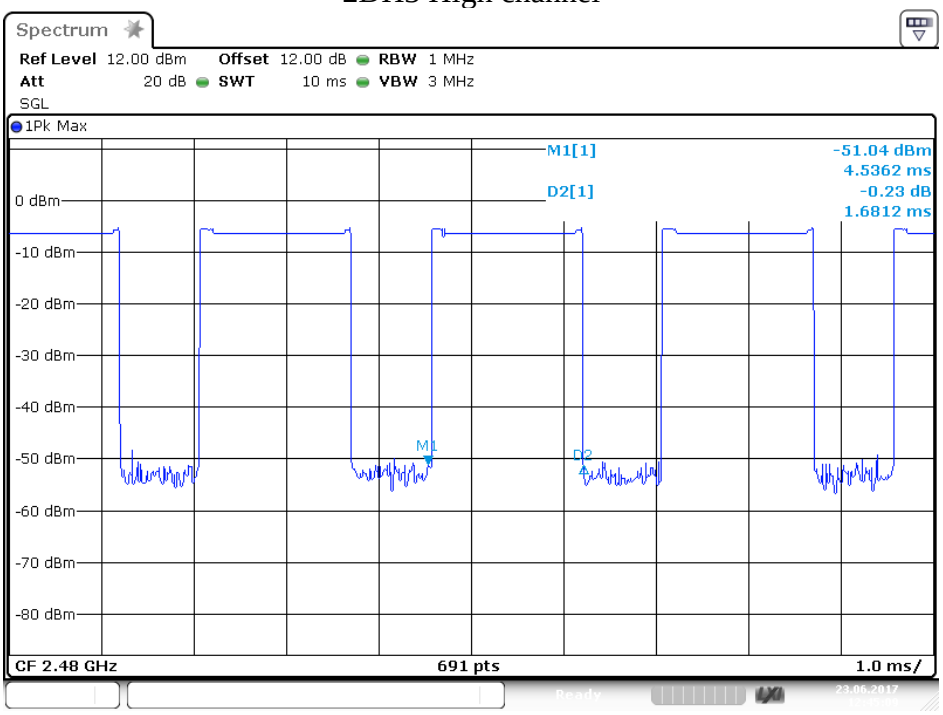
Date: 23.JUN.2017 12:42:51

2DH3 Middle channel



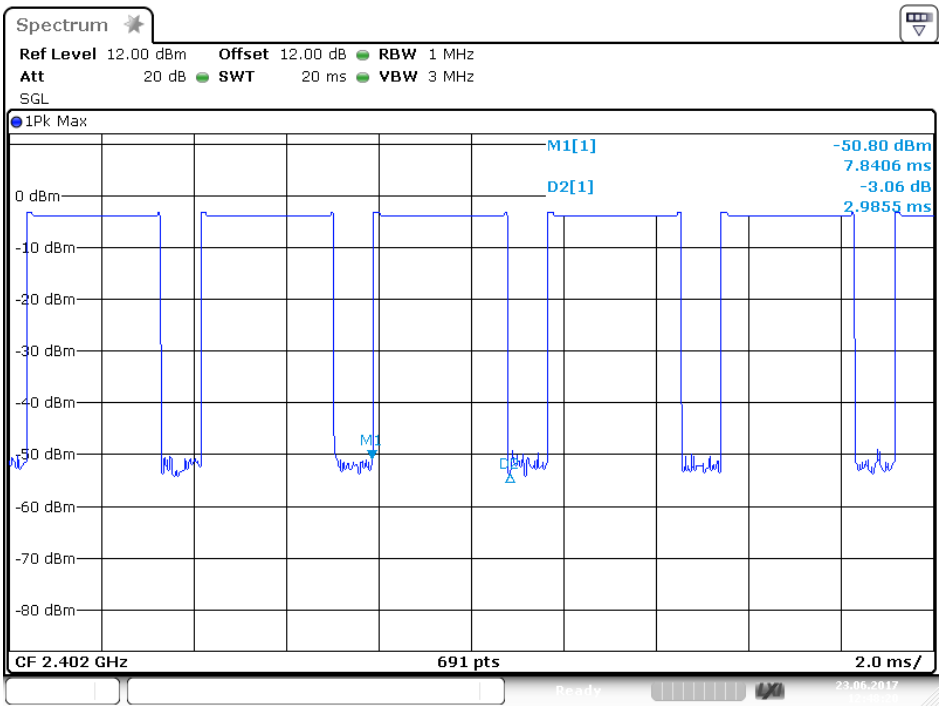
Date: 23.JUN.2017 12:43:31

2DH3 High channel



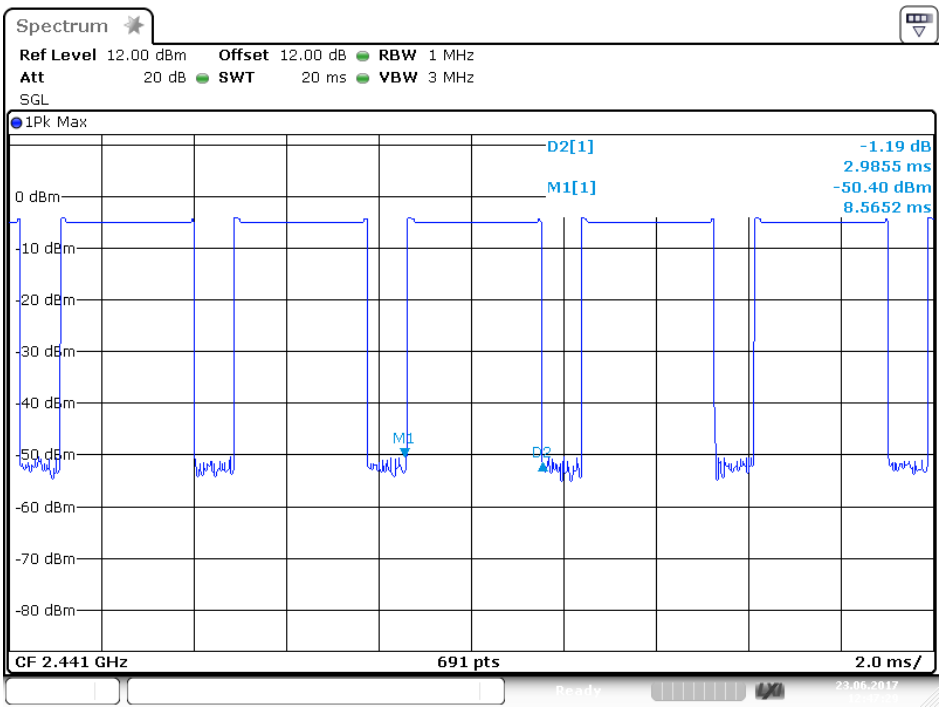
Date: 23.JUN.2017 12:45:09

2DH5 Low channel



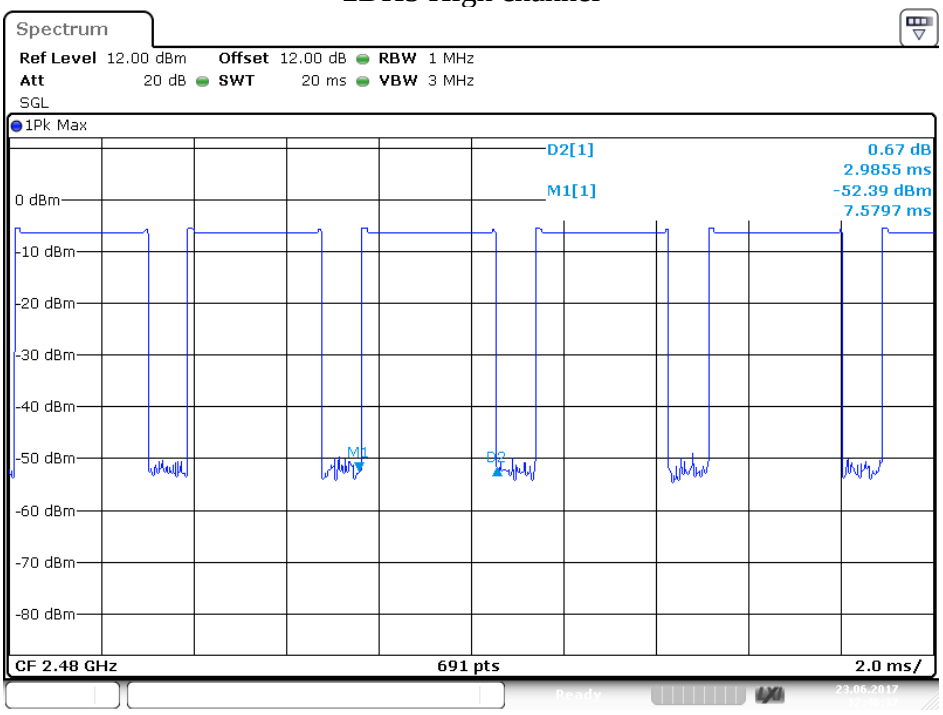
Date: 23.JUN.2017 12:48:20

2DH5 Middle channel



Date: 23.JUN.2017 12:47:30

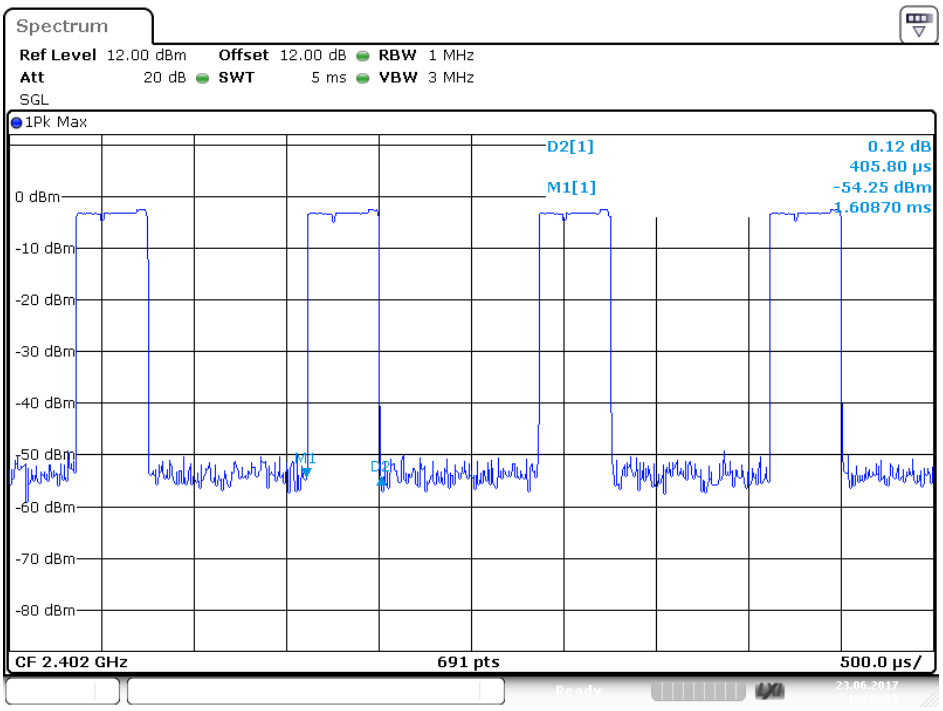
2DH5 High channel



Date: 23.JUN.2017 12:46:37

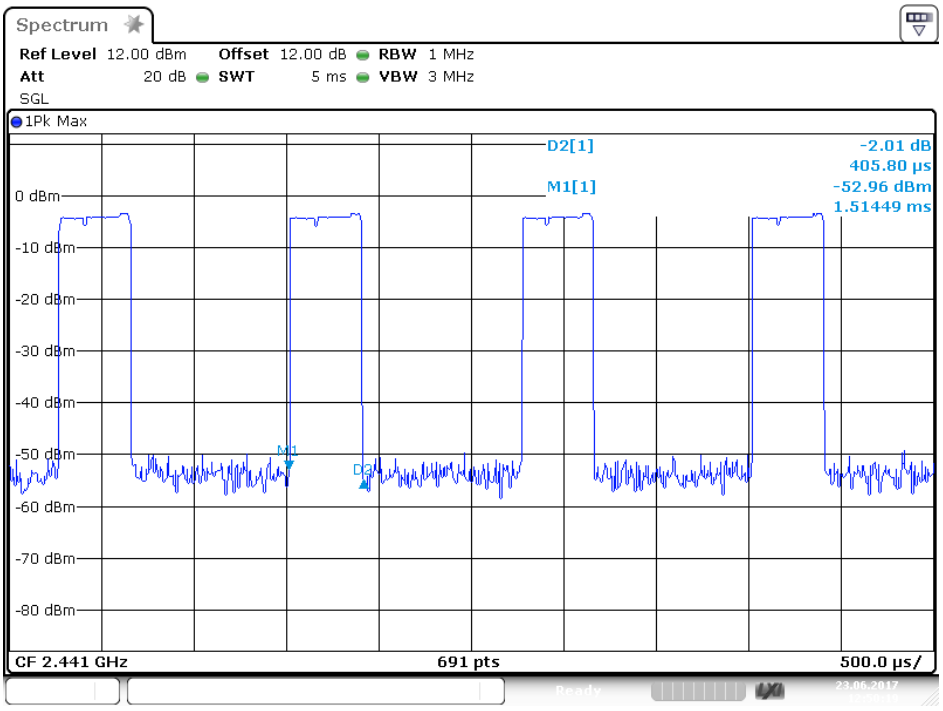
8DPSK Mode

3DH1 Low channel



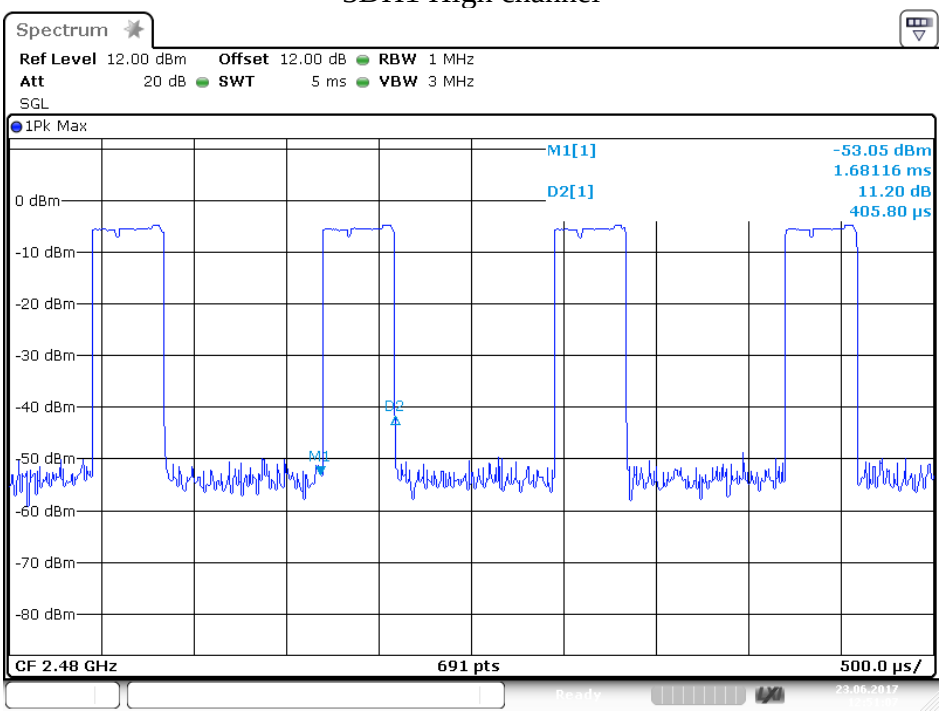
Date: 23.JUN.2017 12:49:36

3DH1 Middle channel



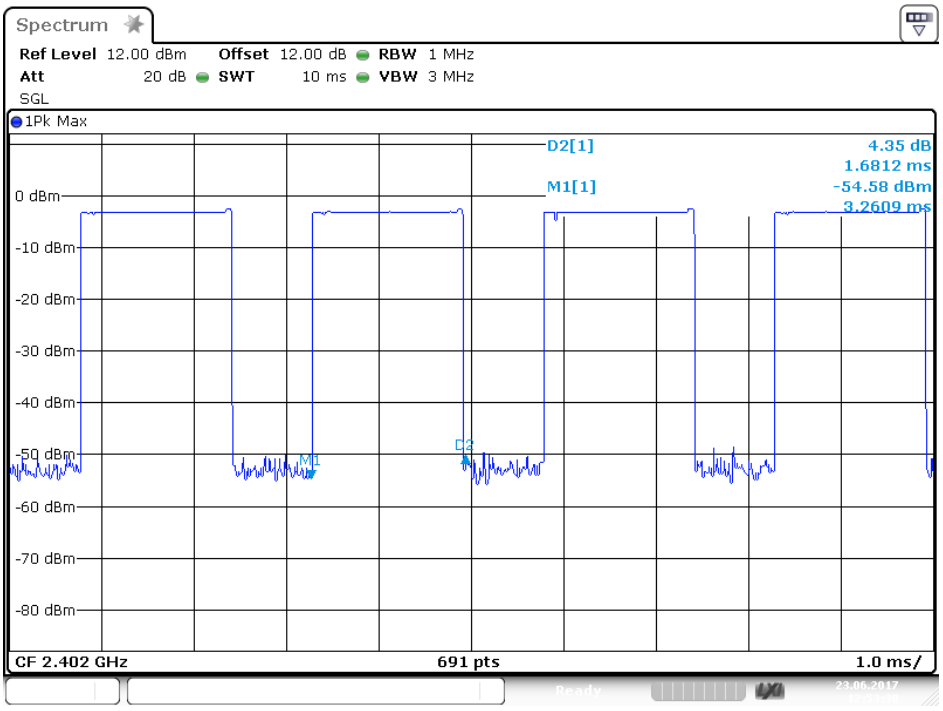
Date: 23.JUN.2017 12:50:19

3DH1 High channel



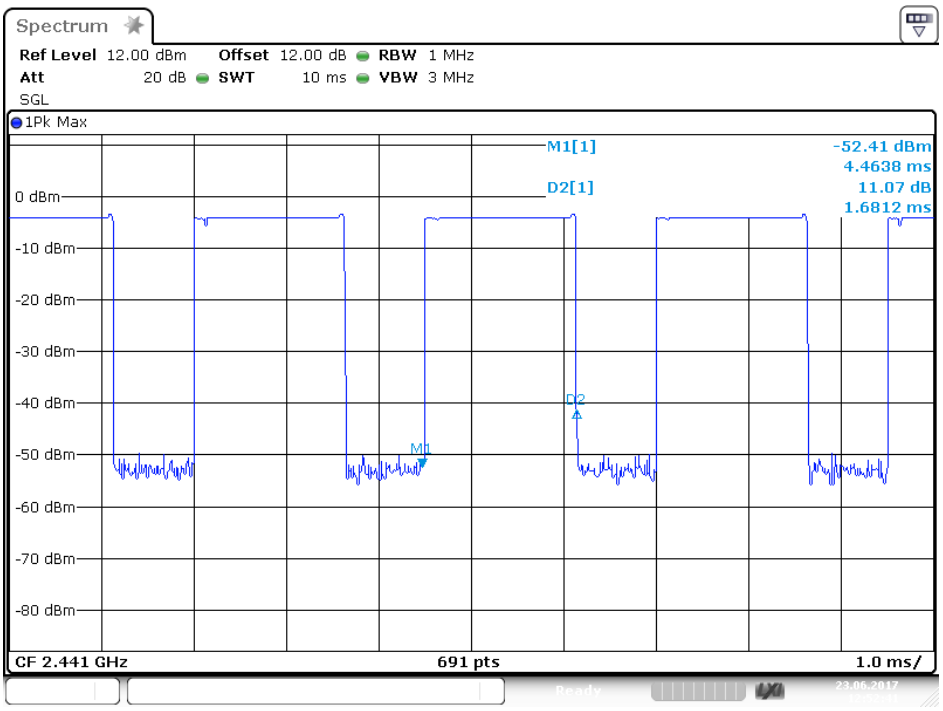
Date: 23.JUN.2017 12:51:07

3DH3 Low channel



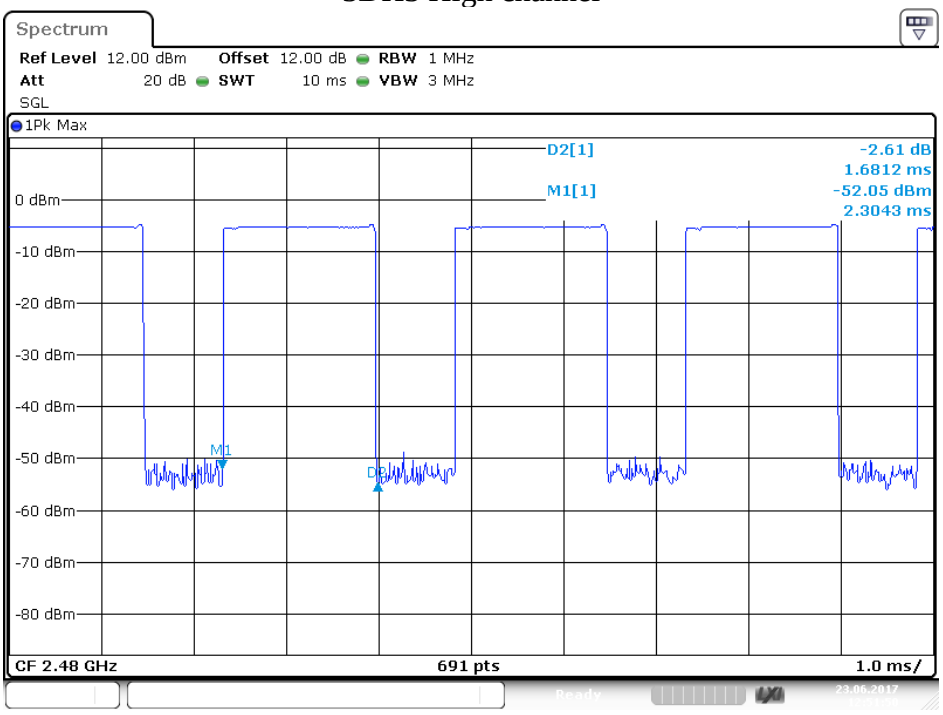
Date: 23.JUN.2017 12:53:30

3DH3 Middle channel



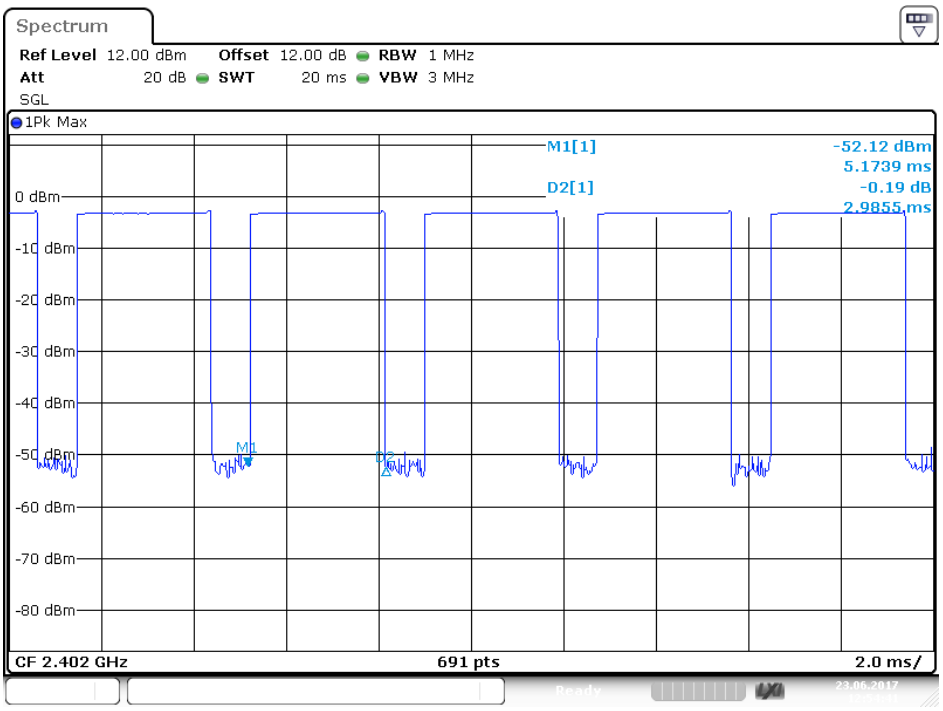
Date: 23.JUN.2017 12:52:41

3DH3 High channel



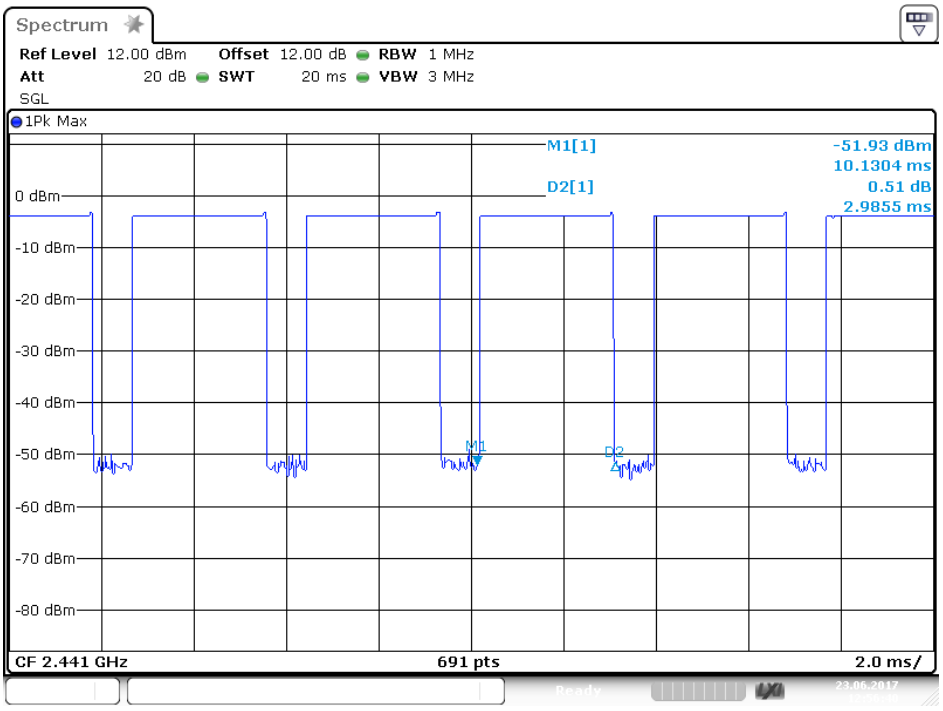
Date: 23.JUN.2017 12:51:50

3DH5 Low channel



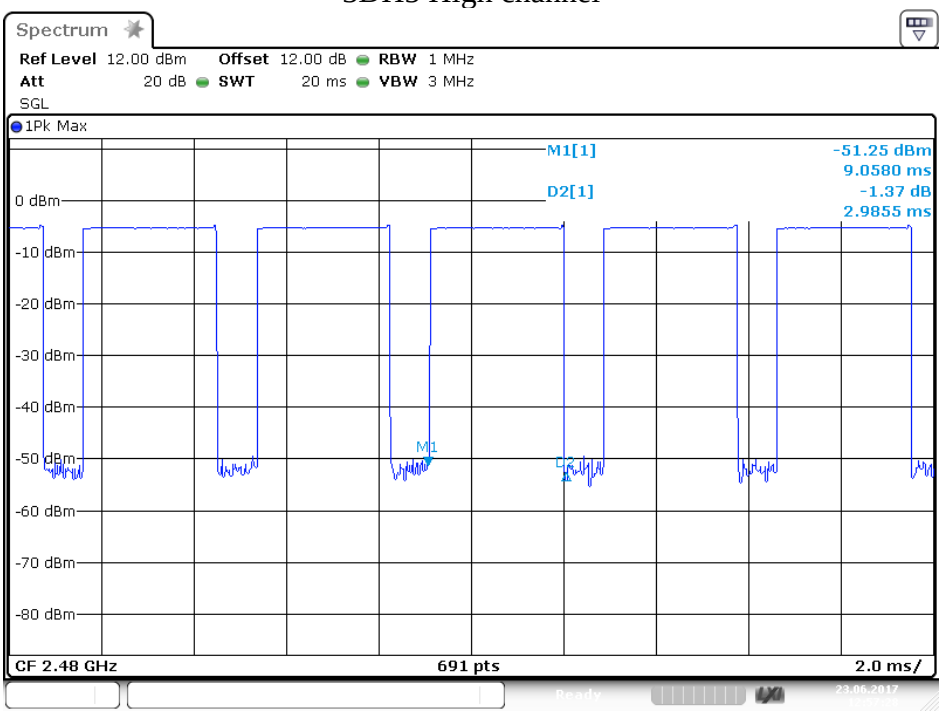
Date: 23.JUN.2017 12:54:42

3DH5 Middle channel



Date: 23.JUN.2017 12:56:41

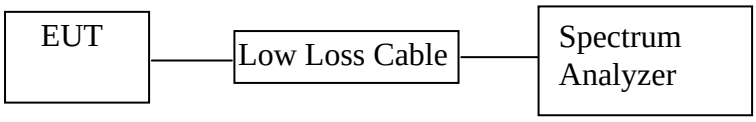
3DH5 High channel



Date: 23.JUN.2017 12:57:28

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



(EUT: LED ceiling lamp)

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
Low	2402	0.37/0.0011	21 / 0.125
Middle	2441	0.23/0.0011	21 / 0.125
High	2480	0.34/0.0011	21 / 0.125

∏/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-0.85/0.0008	21 / 0.125
Middle	2441	-0.87/0.0008	21 / 0.125
High	2480	-0.81/0.0008	21 / 0.125

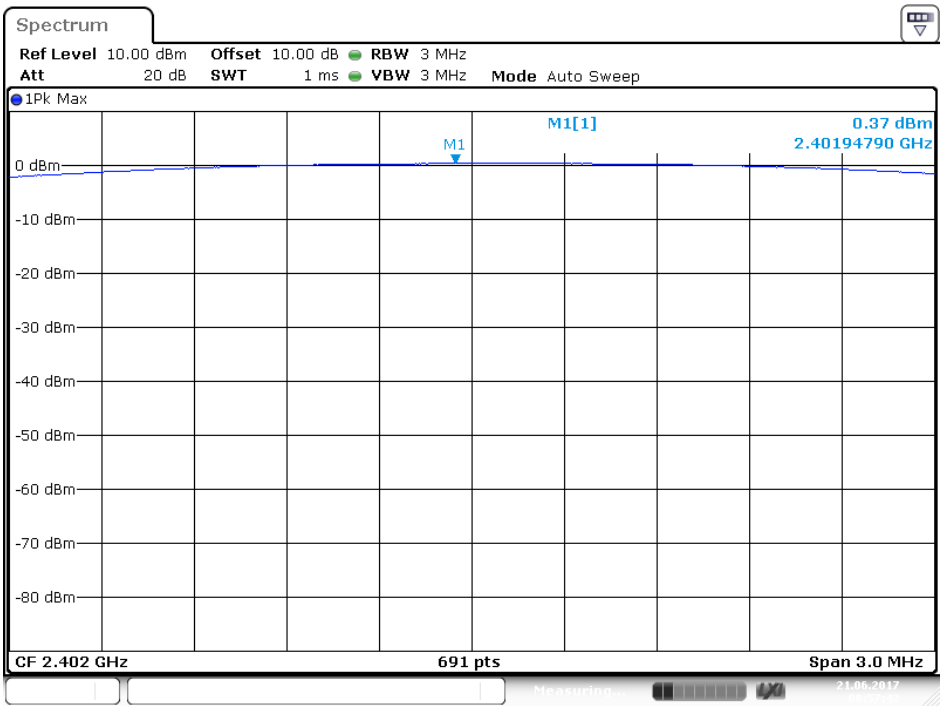
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-0.34/0.0009	21 / 0.125
Middle	2441	-0.29/0.0009	21 / 0.125
High	2480	-0.45/0.0009	21 / 0.125

The spectrum analyzer plots are attached as below.

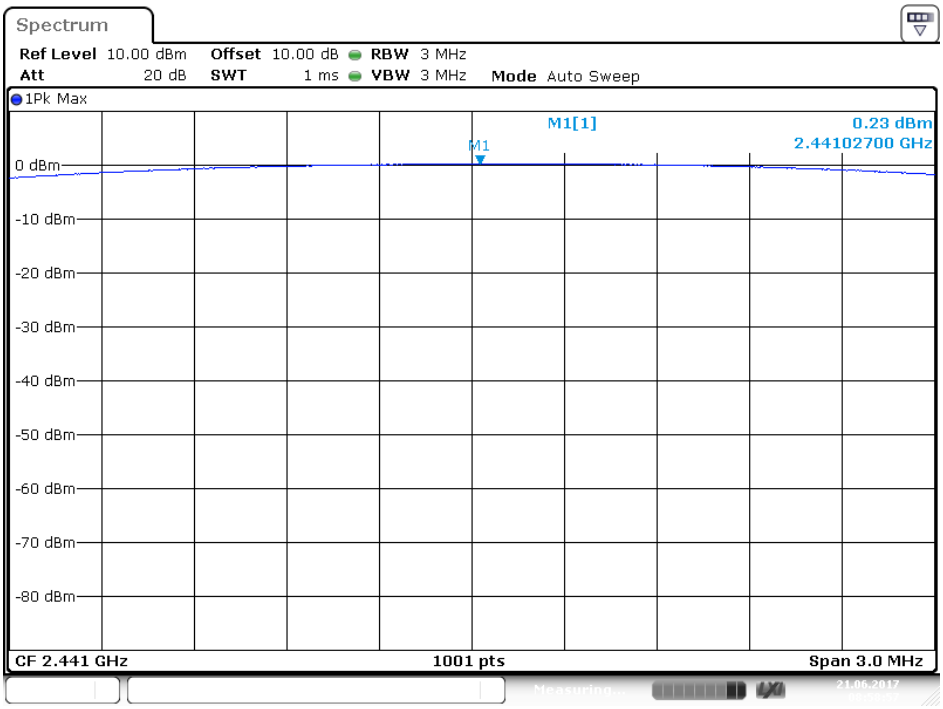
GFSK Mode

Low channel



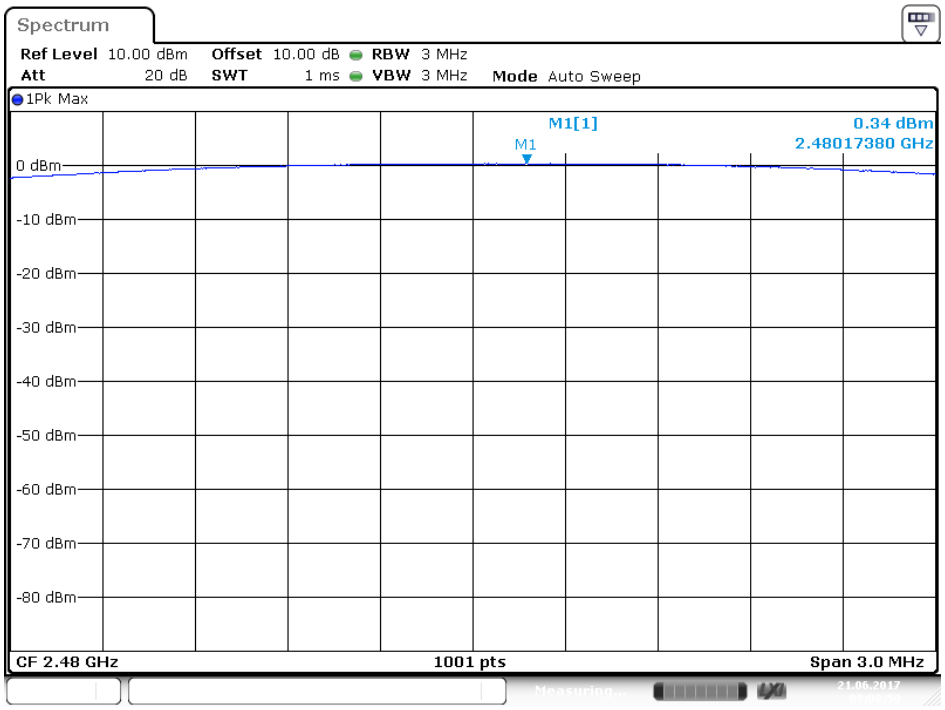
Date: 21.JUN.2017 08:57:42

Middle channel



Date: 21.JUN.2017 08:58:57

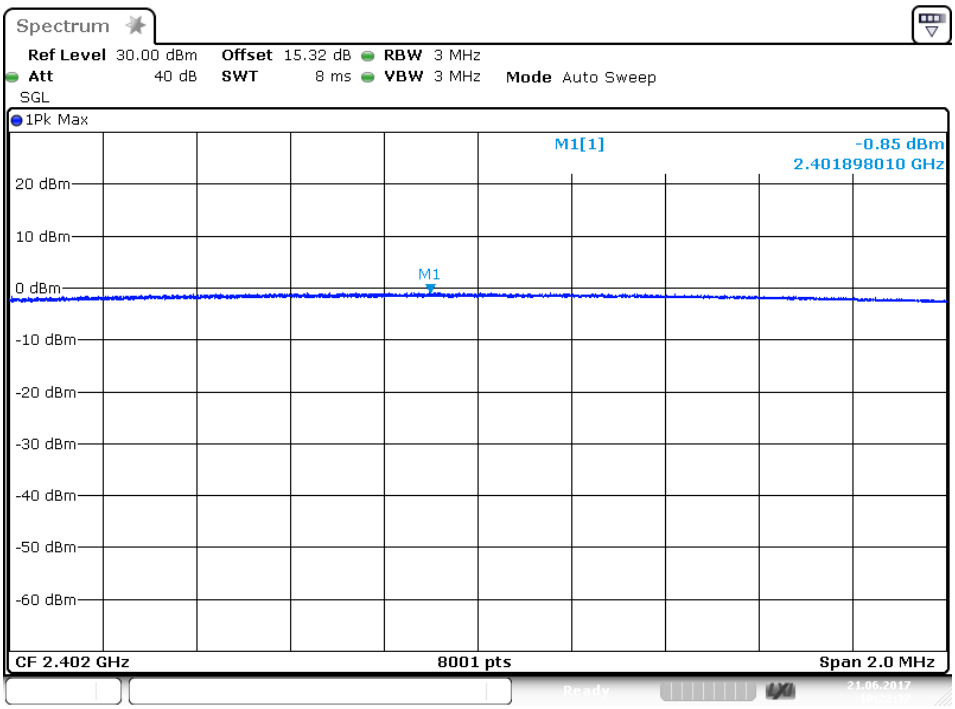
High channel



Date: 21.JUN.2017 09:00:51

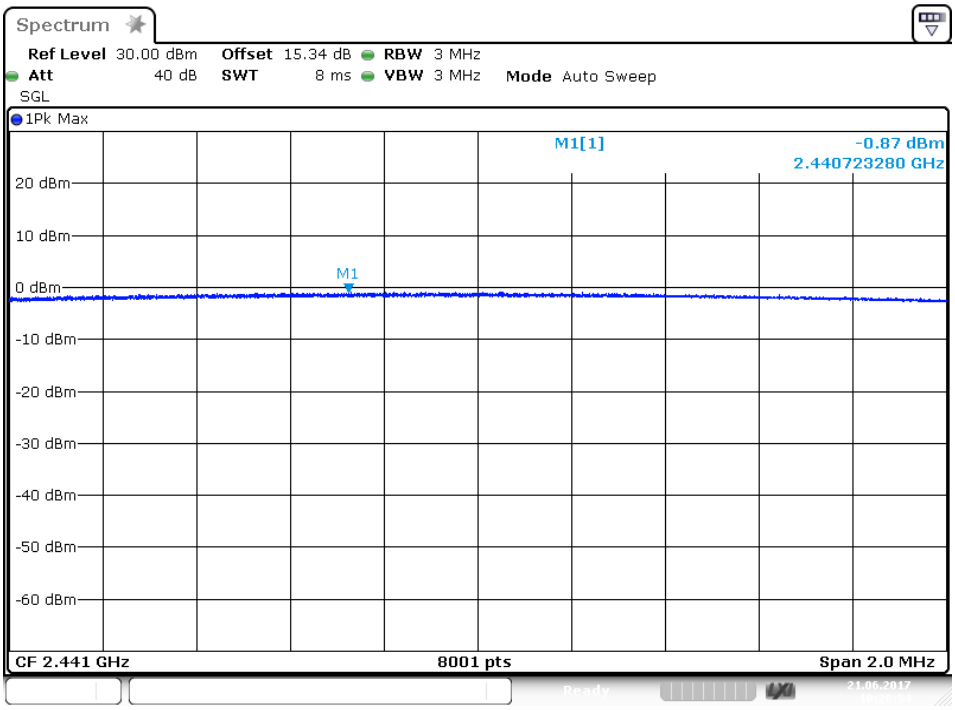
Π/4-DQPSK Mode

Low channel



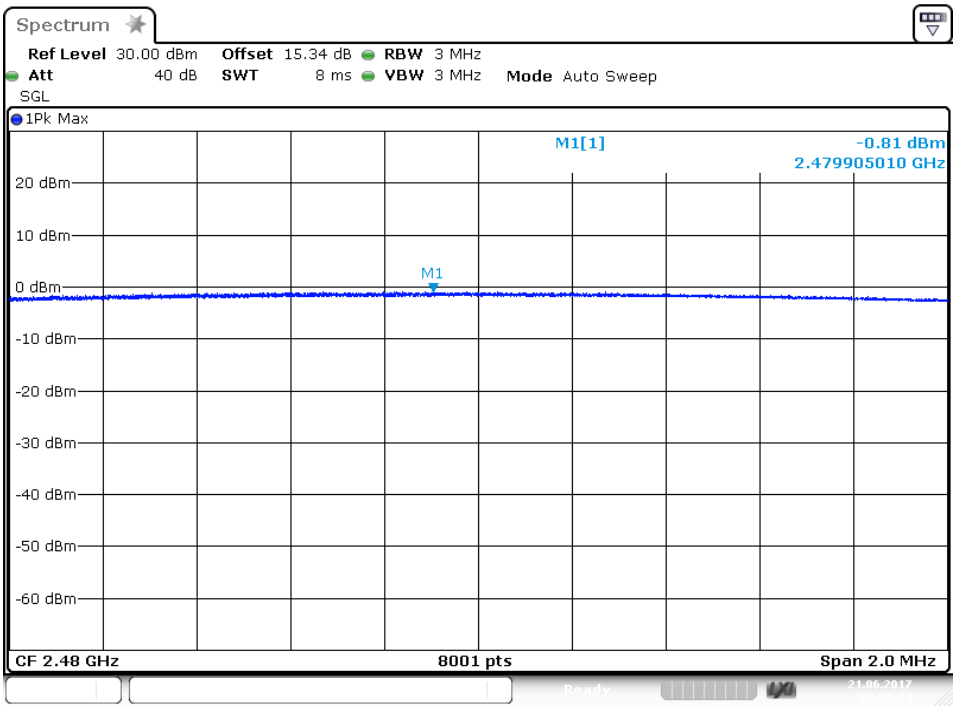
Date: 21.JUN.2017 10:22:37

Middle channel



Date: 21.JUN.2017 10:28:54

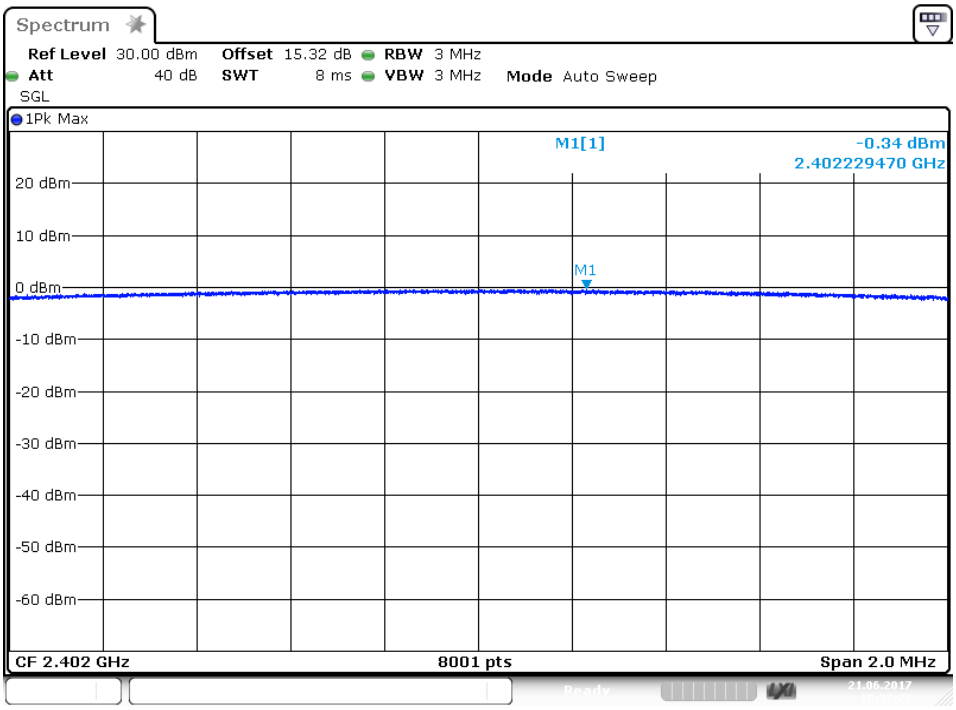
High channel



Date: 21.JUN.2017 10:30:34

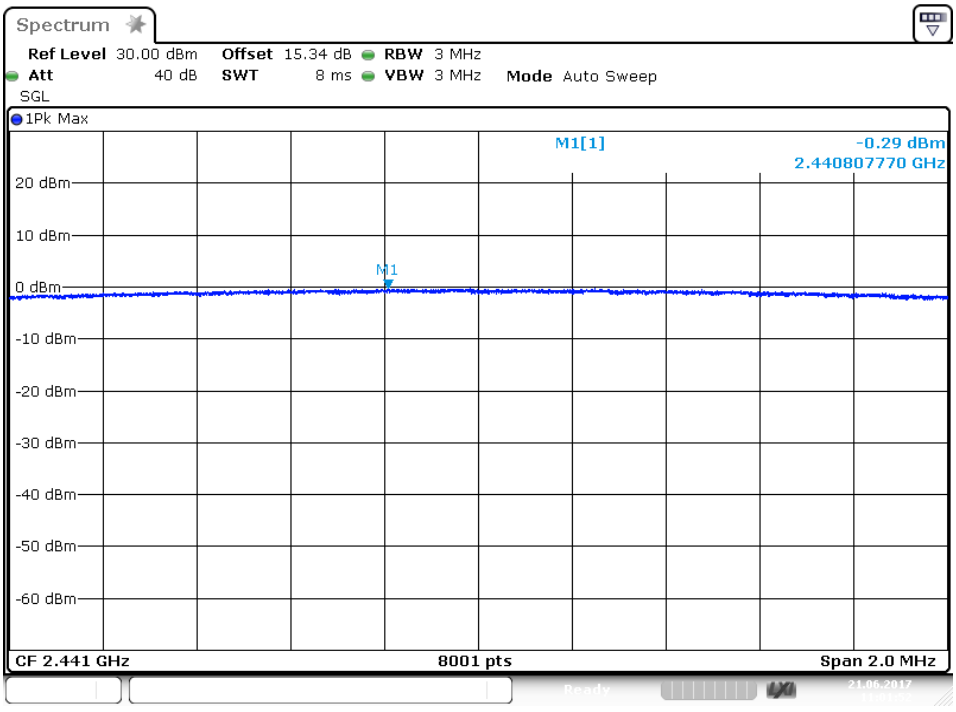
8DPSK Mode

Low channel



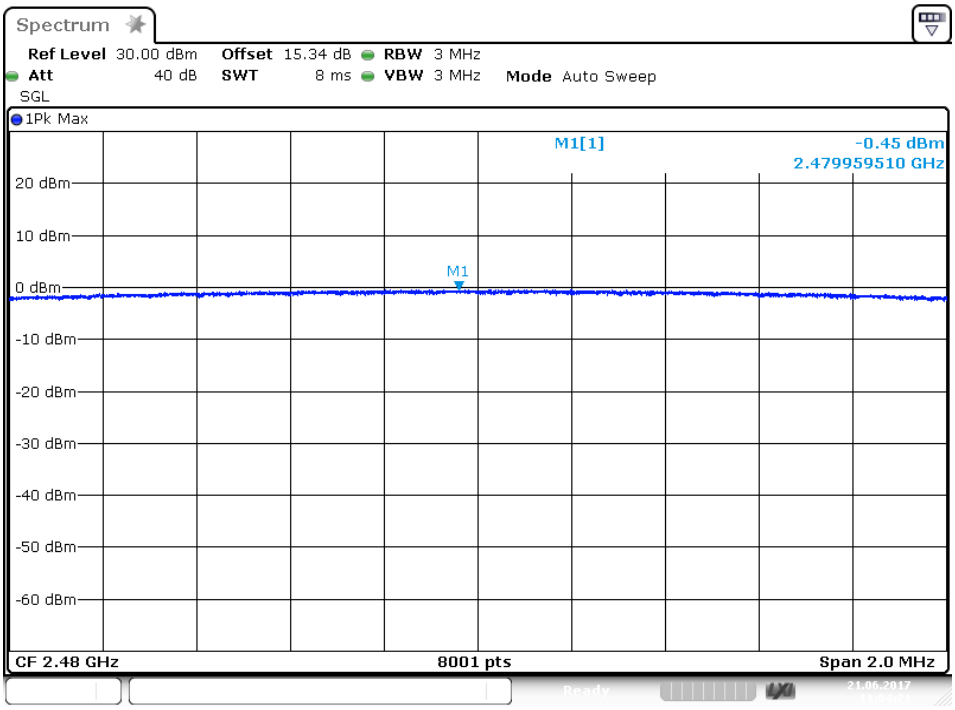
Date: 21.JUN.2017 10:57:27

Middle channel



Date: 21.JUN.2017 11:01:52

High channel



Date: 21.JUN.2017 11:04:21

10. RADIATED EMISSION TEST

10.1. Block Diagram of Test Setup

10.1.1. Block diagram of connection between the EUT and peripherals

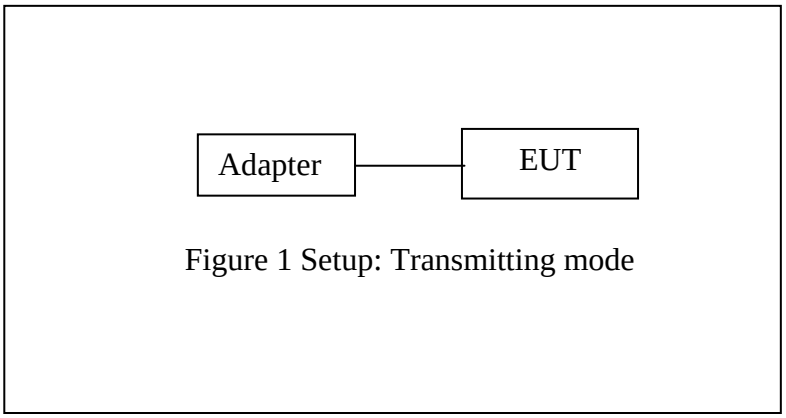
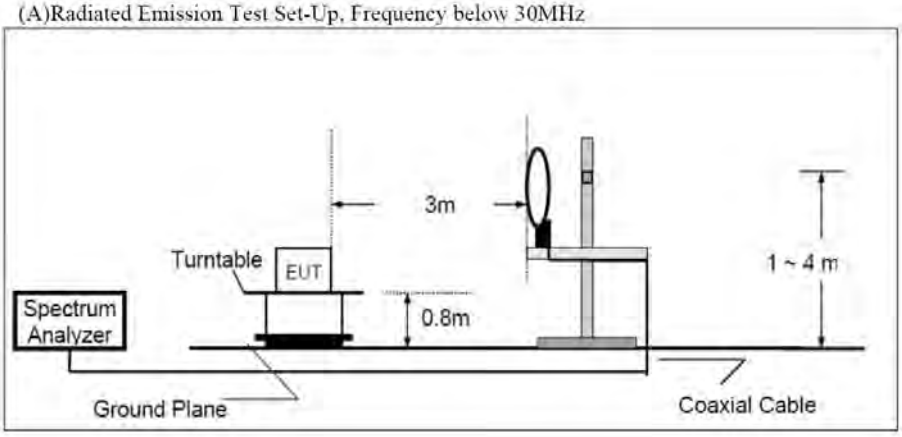


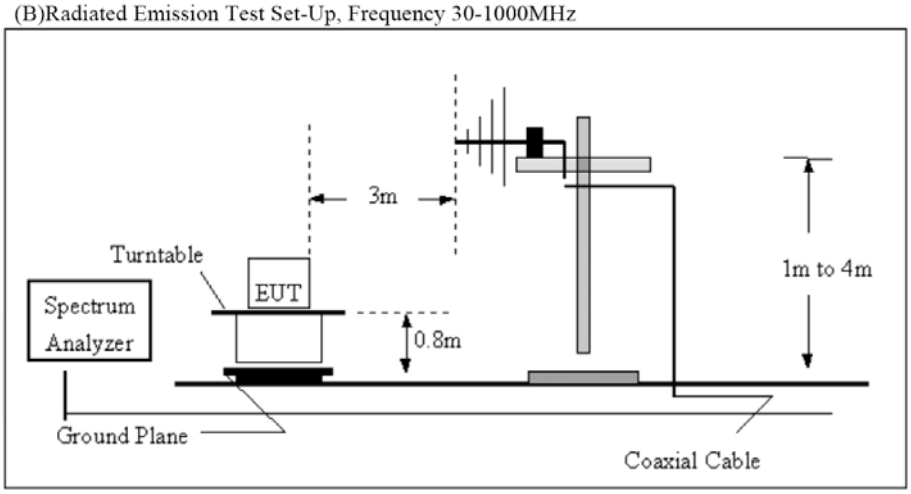
Figure 1 Setup: Transmitting mode

10.1.2. Semi-Anechoic Chamber Test Setup Diagram

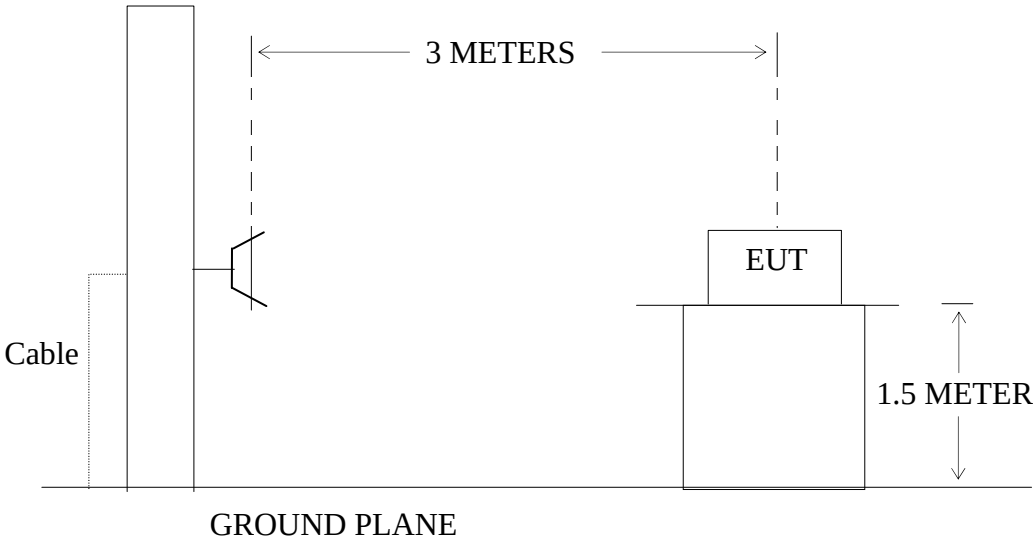
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B)Radiated Emission Test Set-Up, Frequency 30-1000MHz



(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			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 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 Section15.209 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.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). 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.

10.6.The Field Strength of Radiation Emission Measurement Results

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

2. The test frequency is from 30MHz to 25GHz, The 18-25GHz emissions are not reported, because the levels are too low against the limit.

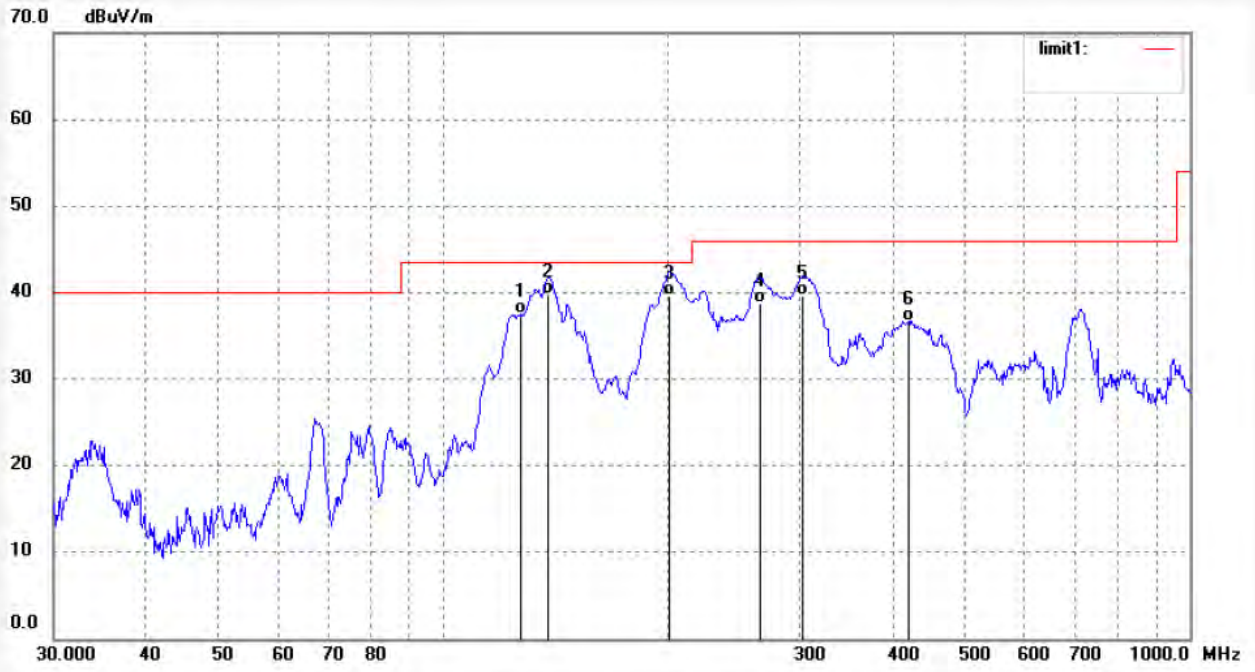
Below 1GHz

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: NTC #355
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/06/19
Time: 20:12:24
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171126

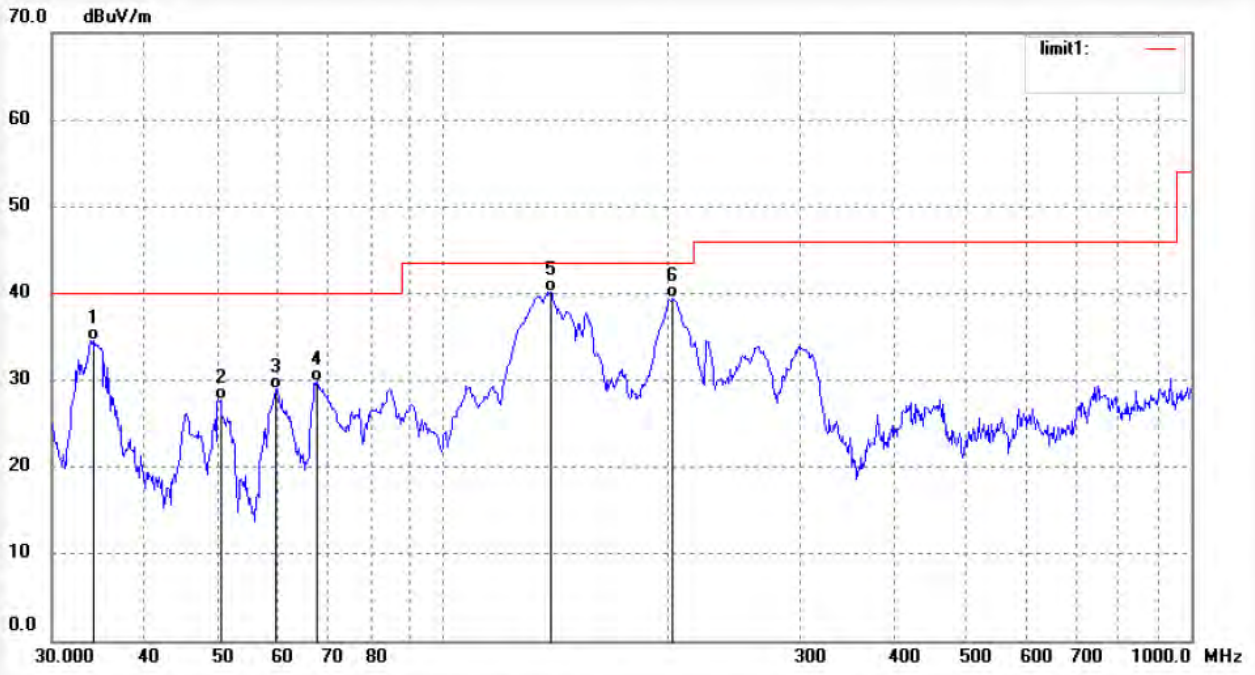


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	126.6931	59.62	-22.08	37.54	43.50	-5.96	QP			
2	138.3251	62.02	-22.28	39.74	43.50	-3.76	QP			
3	200.7473	58.19	-18.63	39.56	43.50	-3.94	QP			
4	265.9035	56.02	-17.21	38.81	46.00	-7.19	QP			
5	302.8193	55.32	-15.63	39.69	46.00	-6.31	QP			
6	419.8509	49.35	-12.67	36.68	46.00	-9.32	QP			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: NTC #354	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/06/19
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 20:10:51
EUT: LED ceiling lamp	Engineer Signature:
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: 54620311	
Manufacturer: WUHU 3E LIGHTING	

Note: Report NO.:ATE20171126



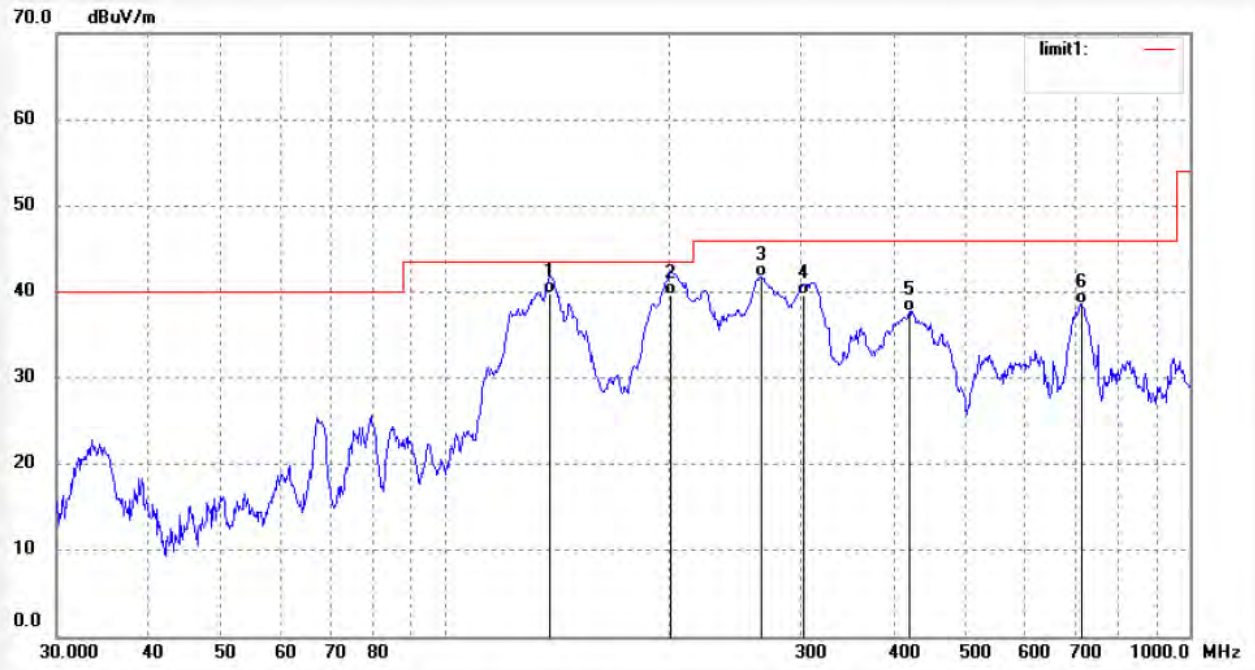
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.0451	50.31	-15.72	34.59	40.00	-5.41	QP			
2	50.4613	48.65	-20.88	27.77	40.00	-12.23	QP			
3	59.7314	50.83	-21.79	29.04	40.00	-10.96	QP			
4	67.7856	51.86	-22.00	29.86	40.00	-10.14	QP			
5	139.3006	62.45	-22.30	40.15	43.50	-3.35	QP			
6	202.8745	57.98	-18.56	39.42	43.50	-4.08	QP			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: NTC #356
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2441MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/06/19
Time: 20:14:24
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171126



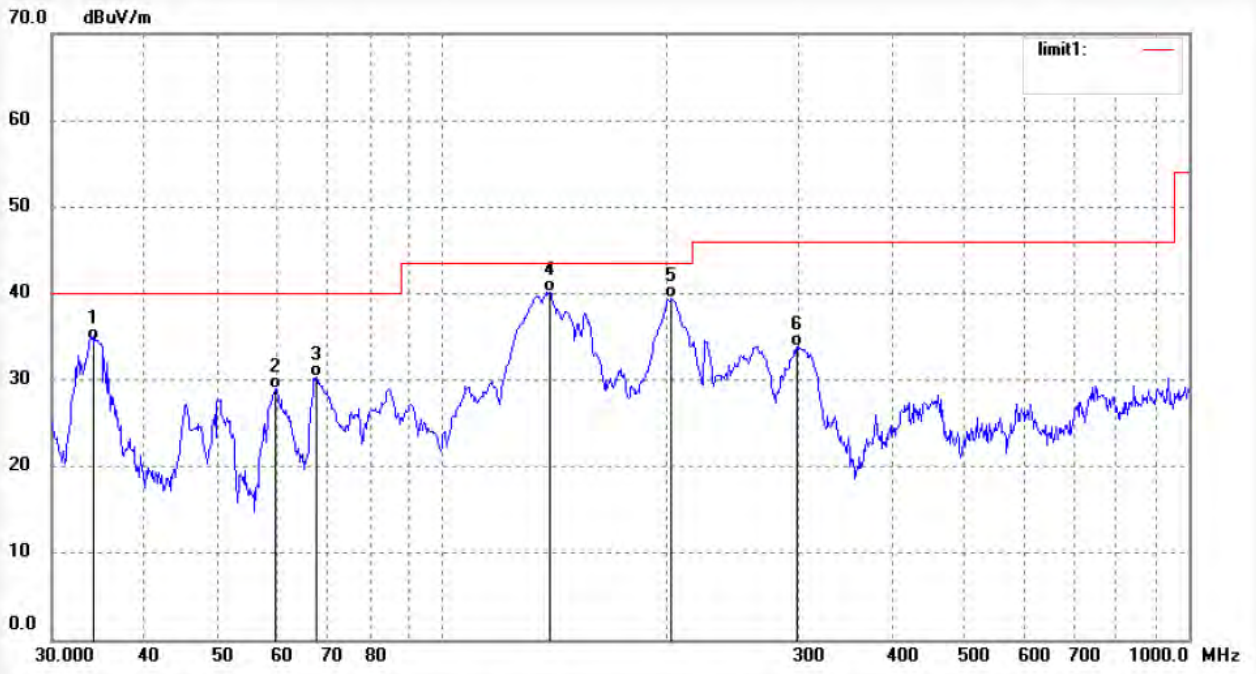
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	138.3251	62.02	-22.28	39.74	43.50	-3.76	QP			
2	200.7473	58.19	-18.63	39.56	43.50	-3.94	QP			
3	265.9035	59.02	-17.21	41.81	46.00	-4.19	QP			
4	302.8193	55.32	-15.63	39.69	46.00	-6.31	QP			
5	419.8509	50.35	-12.67	37.68	46.00	-8.32	QP			
6	716.2038	44.48	-5.96	38.52	46.00	-7.48	QP			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: NTC #357
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2441MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/06/19
Time: 20:16:51
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171126



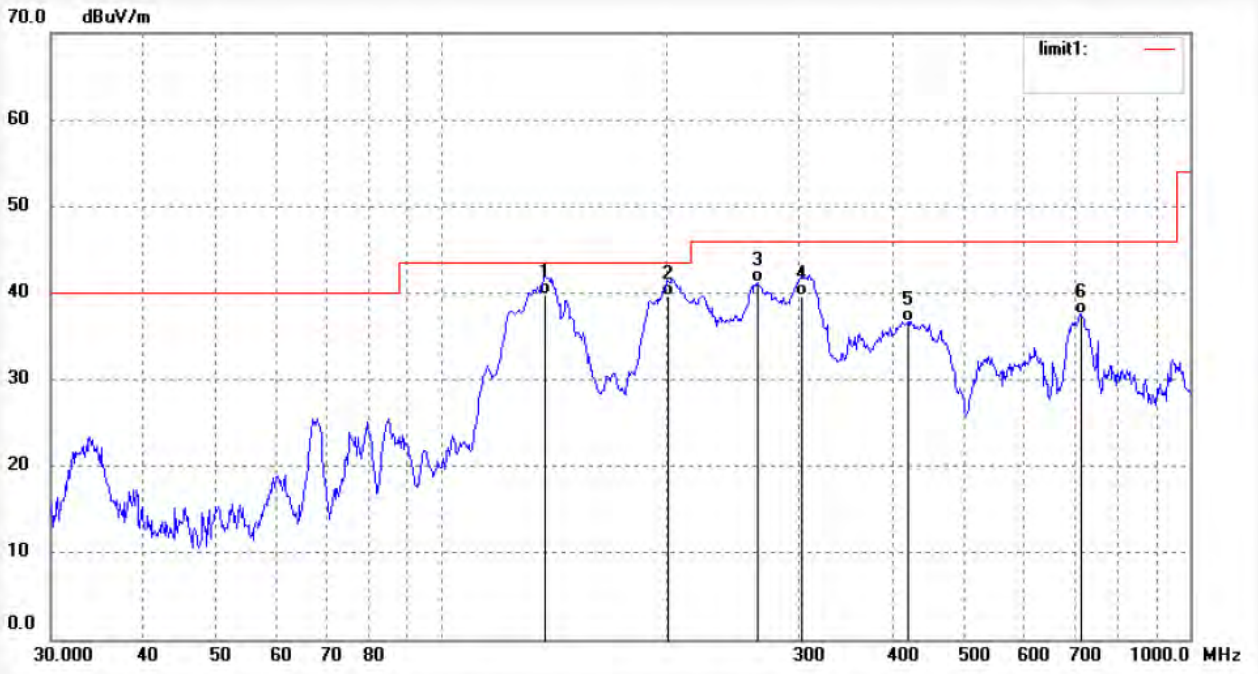
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.0451	50.31	-15.72	34.59	40.00	-5.41	QP			
2	59.7314	50.83	-21.79	29.04	40.00	-10.96	QP			
3	67.7856	52.36	-22.00	30.36	40.00	-9.64	QP			
4	139.3006	62.45	-22.30	40.15	43.50	-3.35	QP			
5	202.8745	57.98	-18.56	39.42	43.50	-4.08	QP			
6	298.5932	49.64	-15.78	33.86	46.00	-12.14	QP			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: NTC #359
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/06/19
Time: 20:20:24
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171126



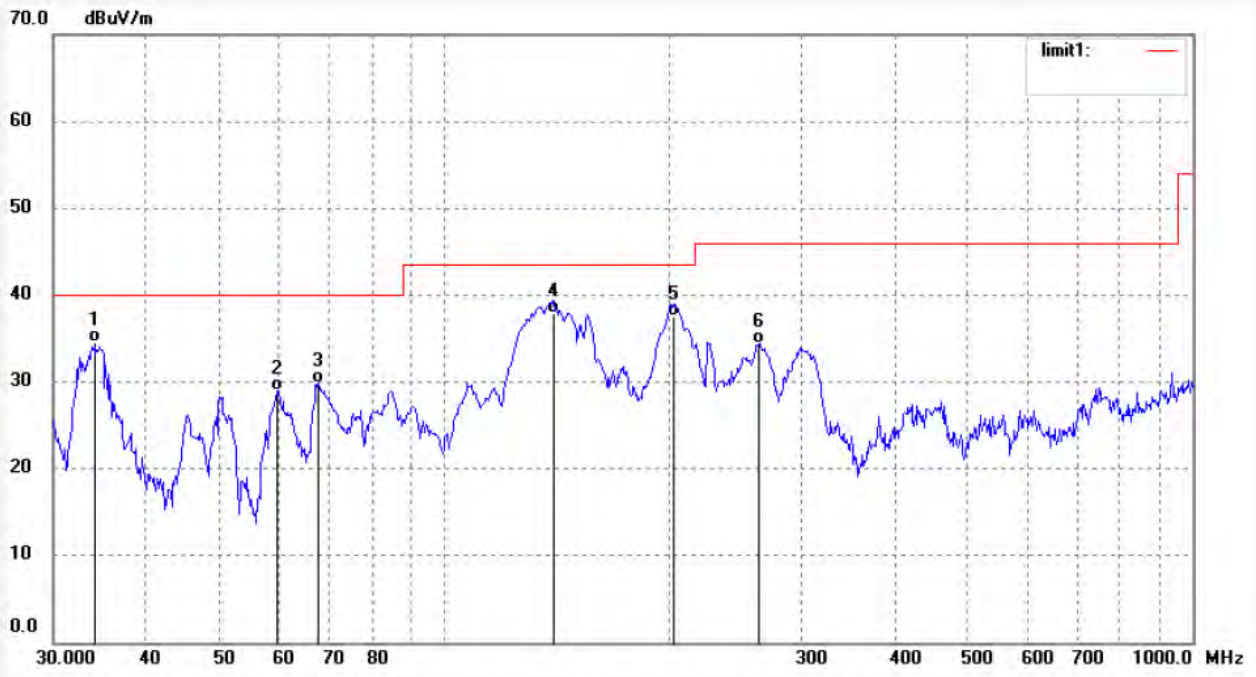
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	138.3251	62.02	-22.28	39.74	43.50	-3.76	QP			
2	200.7473	58.19	-18.63	39.56	43.50	-3.94	QP			
3	264.9707	58.42	-17.25	41.17	46.00	-4.83	QP			
4	302.8193	55.32	-15.63	39.69	46.00	-6.31	QP			
5	419.8509	49.35	-12.67	36.68	46.00	-9.32	QP			
6	716.2038	43.48	-5.96	37.52	46.00	-8.48	QP			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: NTC #358
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/06/19
Time: 20:18:33
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171126



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.0451	50.31	-15.72	34.59	40.00	-5.41	QP			
2	59.7314	50.83	-21.79	29.04	40.00	-10.96	QP			
3	67.7856	51.86	-22.00	29.86	40.00	-10.14	QP			
4	139.3006	60.24	-22.30	37.94	43.50	-5.56	QP			
5	202.8745	56.16	-18.56	37.60	43.50	-5.90	QP			
6	263.1154	51.70	-17.35	34.35	46.00	-11.65	QP			

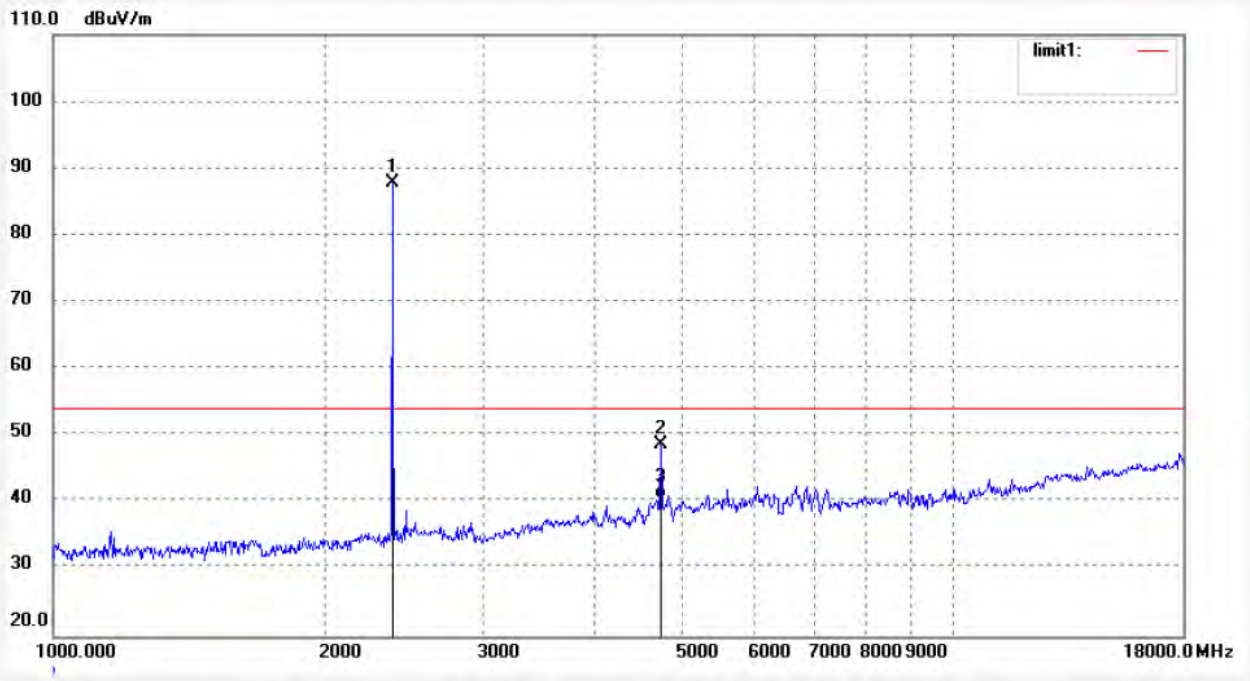
Above 1GHz

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #836
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 9/19/52
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.719	94.23	-6.37	87.86			peak			
2	4804.957	47.95	0.70	48.65	74.00	-25.35	peak			
3	4804.957	39.81	0.70	40.51	54.00	-13.49	AVG			

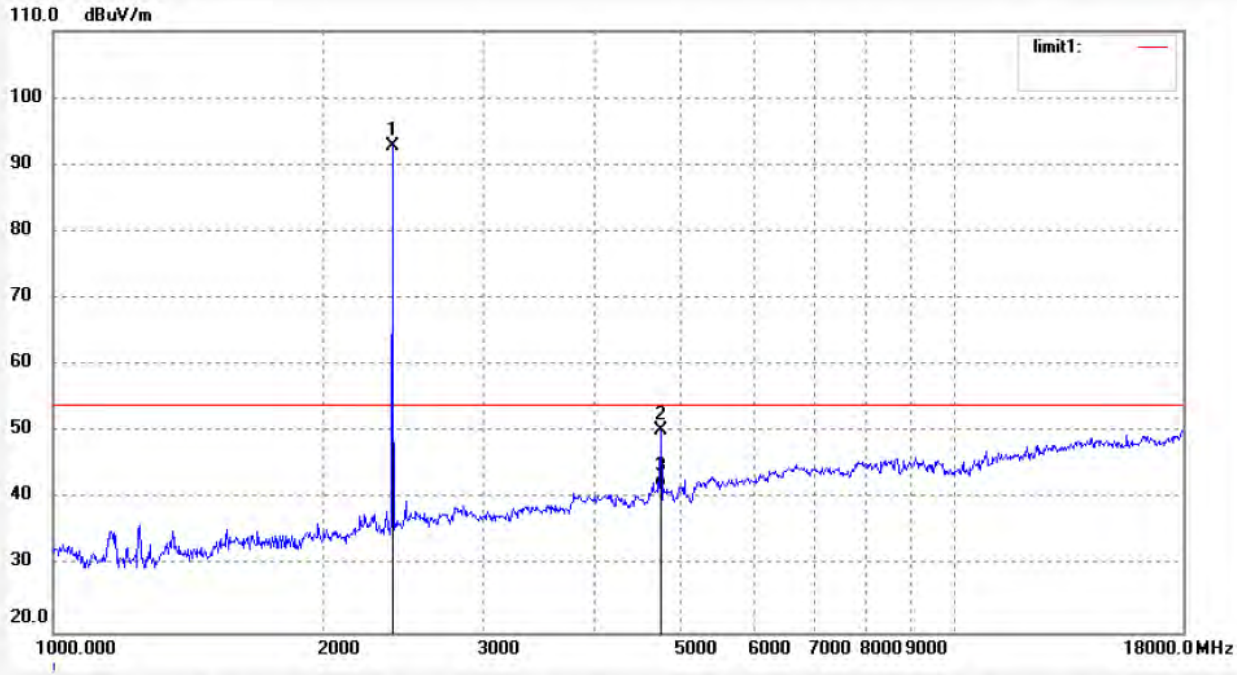
Note: Average measurement with peak detection at No.3

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #835
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 9/17/55
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.719	99.15	-6.37	92.78			peak			
2	4804.957	49.57	0.70	50.27	74.00	-23.73	peak			
3	4804.957	40.94	0.70	41.64	54.00	-12.36	AVG			

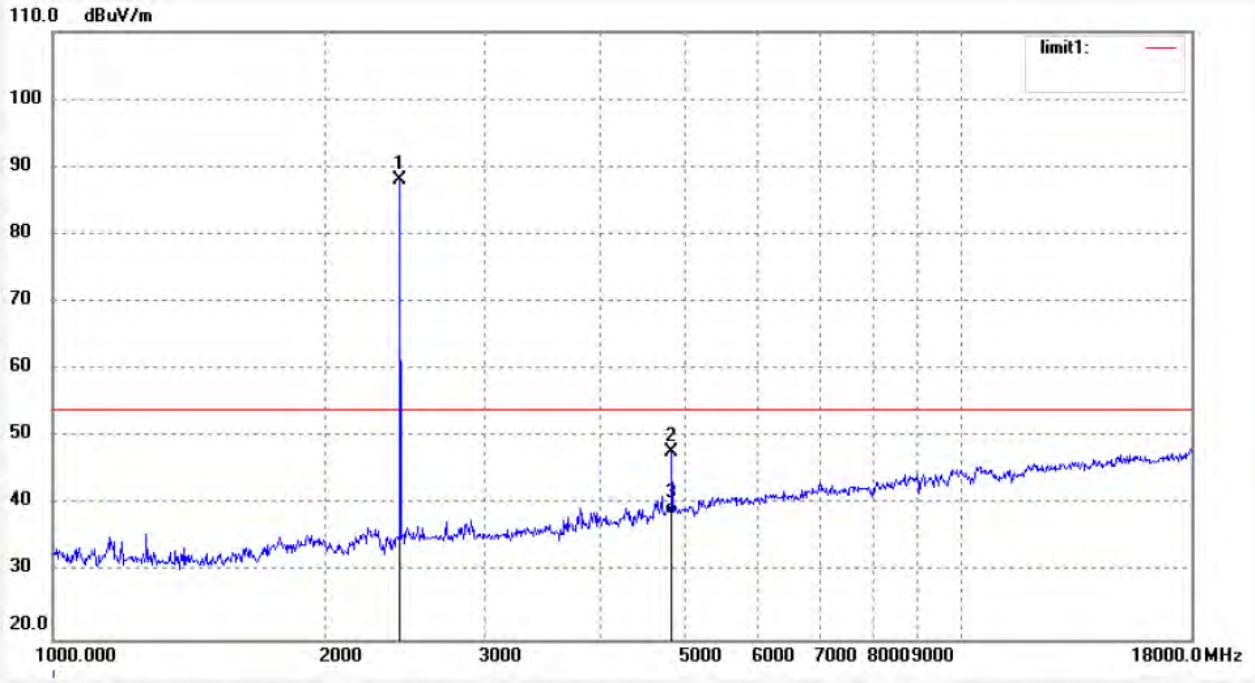
Note: Average measurement with peak detection at No.3

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #837
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2441MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 9/24/28
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.621	94.19	-6.20	87.99			peak			
2	4883.324	46.64	1.07	47.71	74.00	-26.29	peak			
3	4883.324	37.49	1.07	38.56	54.00	-15.44	AVG			

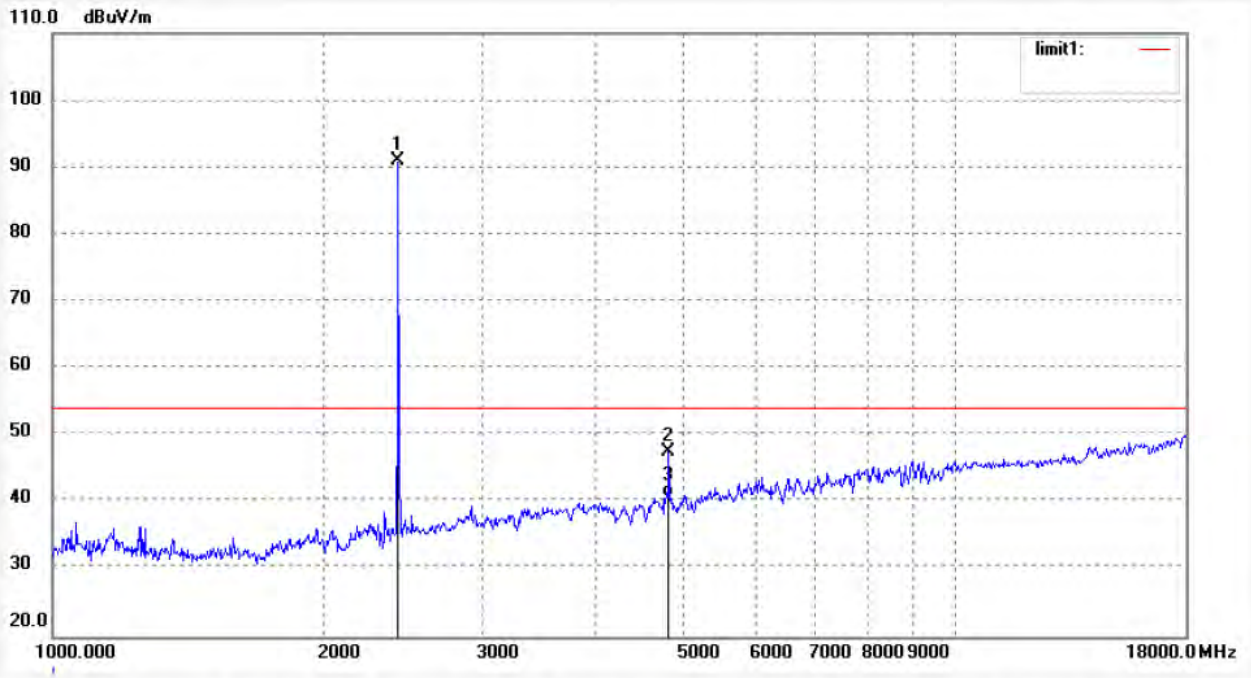
Note: Average measurement with peak detection at No.3

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #838
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2441MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 9/27/28
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.621	97.22	-6.20	91.02			peak			
2	4883.324	46.48	1.07	47.55	74.00	-26.45	peak			
3	4883.324	39.76	1.07	40.83	54.00	-13.17	AVG			

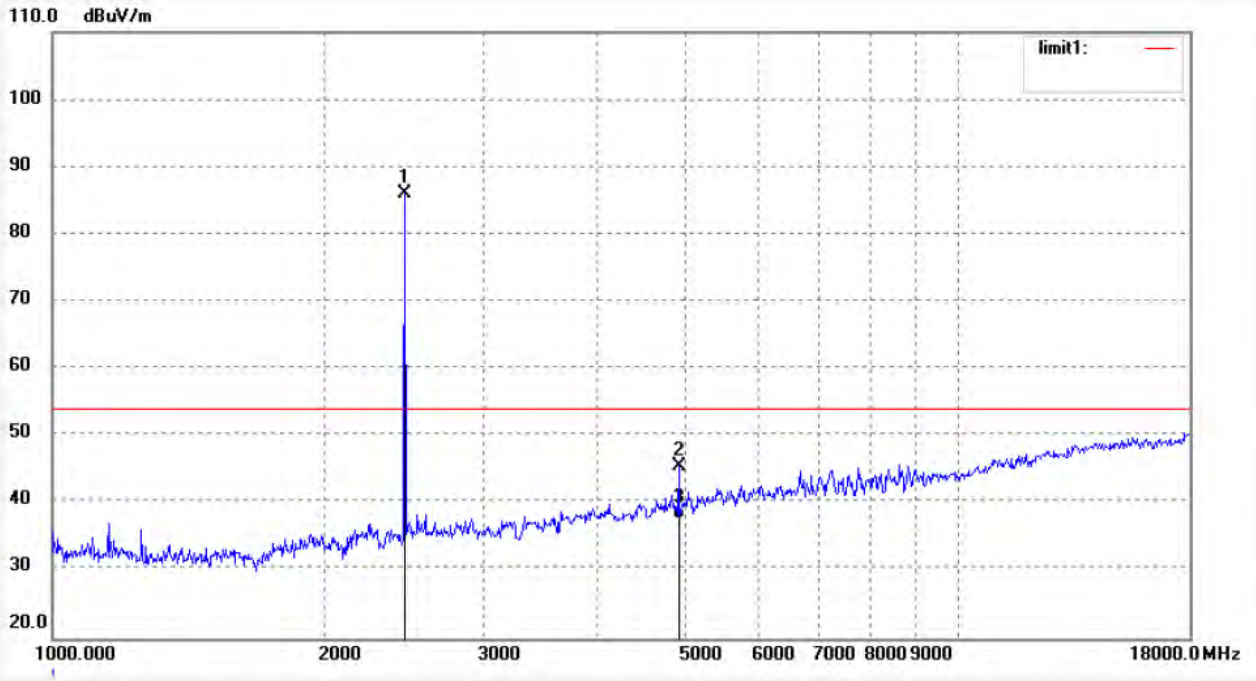
Note: Average measurement with peak detection at No.3

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #840
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 9/36/39
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	92.18	-6.04	86.14			peak			
2	4960.444	43.93	1.50	45.43	74.00	-28.57	peak			
3	4960.444	36.13	1.50	37.63	54.00	-16.37	AVG			

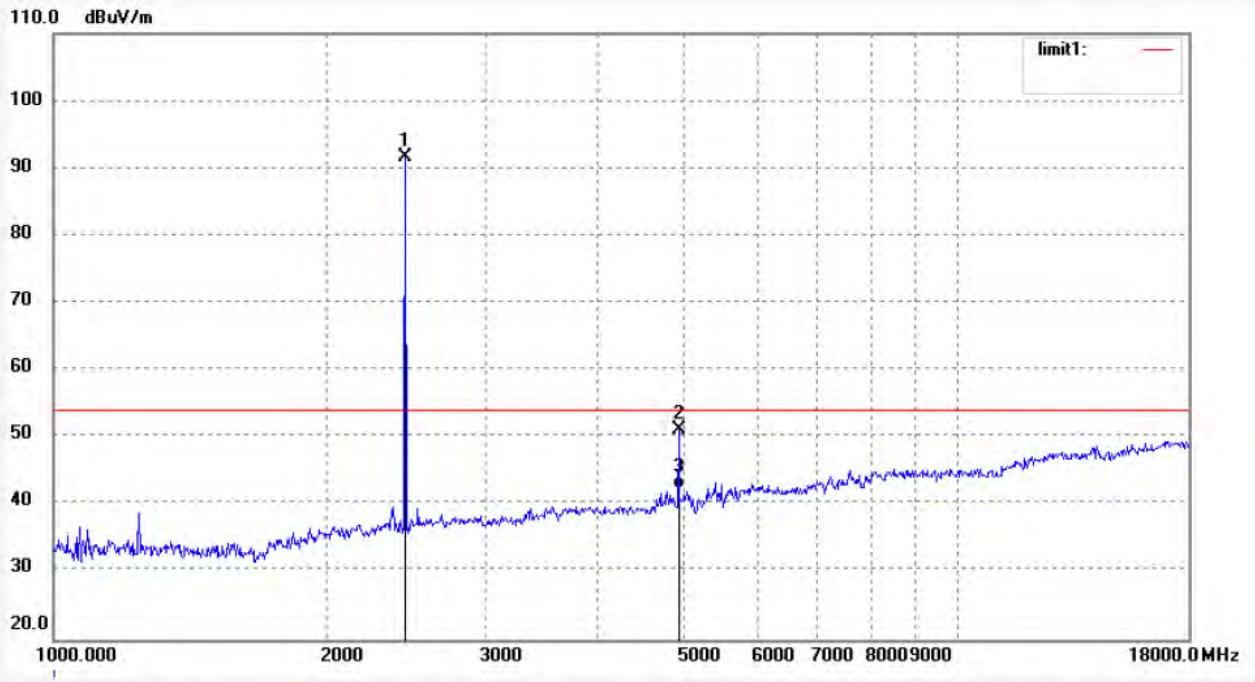
Note: Average measurement with peak detection at No.3

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #839
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 9/35/24
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126

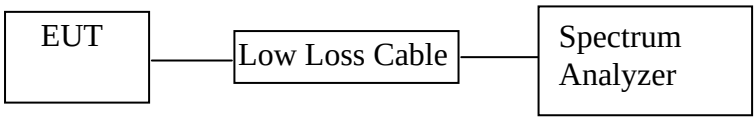


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	97.74	-6.04	91.70			peak			
2	4960.444	49.77	1.50	51.27	74.00	-22.73	peak			
3	4960.444	40.84	1.50	42.34	54.00	-11.66	AVG			

Note: Average measurement with peak detection at No.3

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: LED ceiling lamp)

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.

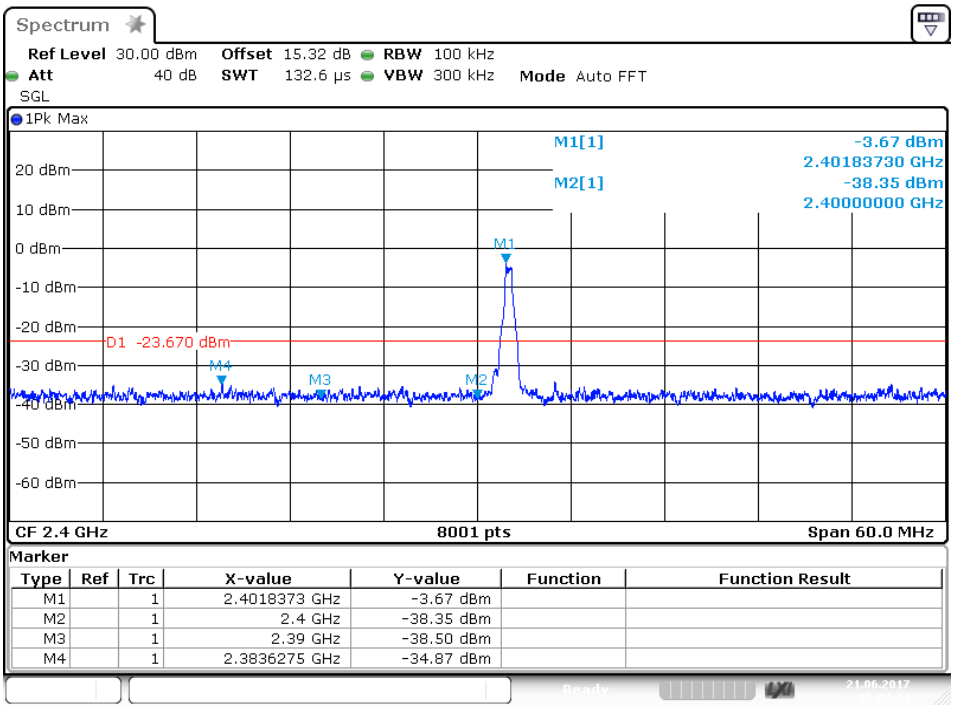
11.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3.The band edges was measured and recorded.

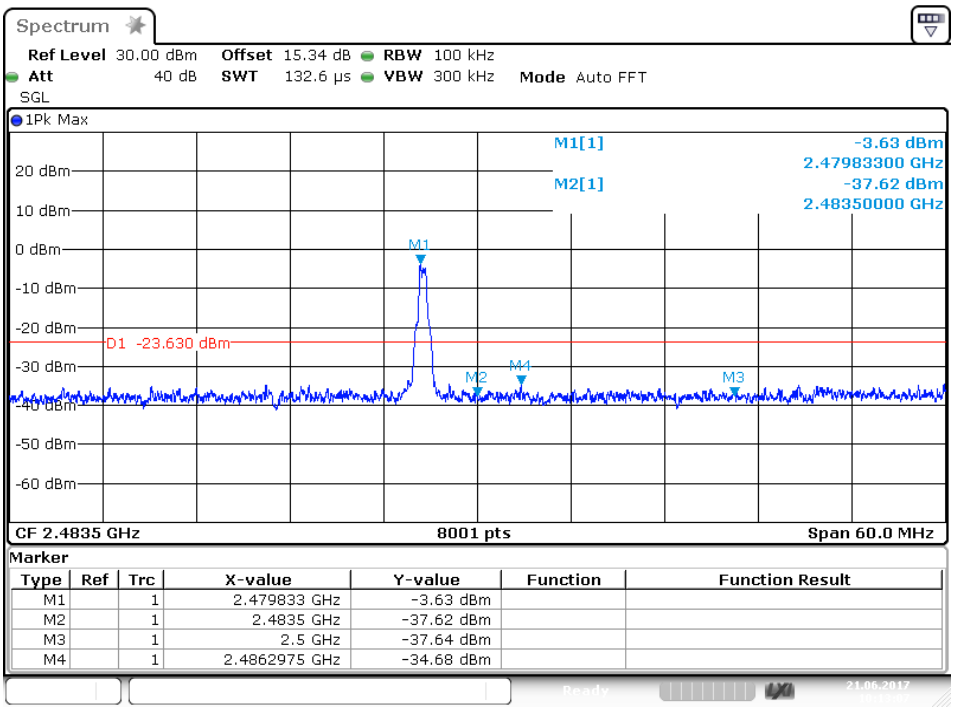
11.6.Test Result

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK		
2400.00	42.02	> 20dBc
2483.50	41.25	> 20dBc
Π/4-DQPSK Mode		
2400.00	40.87	> 20dBc
2483.50	39.89	> 20dBc
8DPSK		
2400.00	41.07	> 20dBc
2483.50	39.60	> 20dBc

GFSK

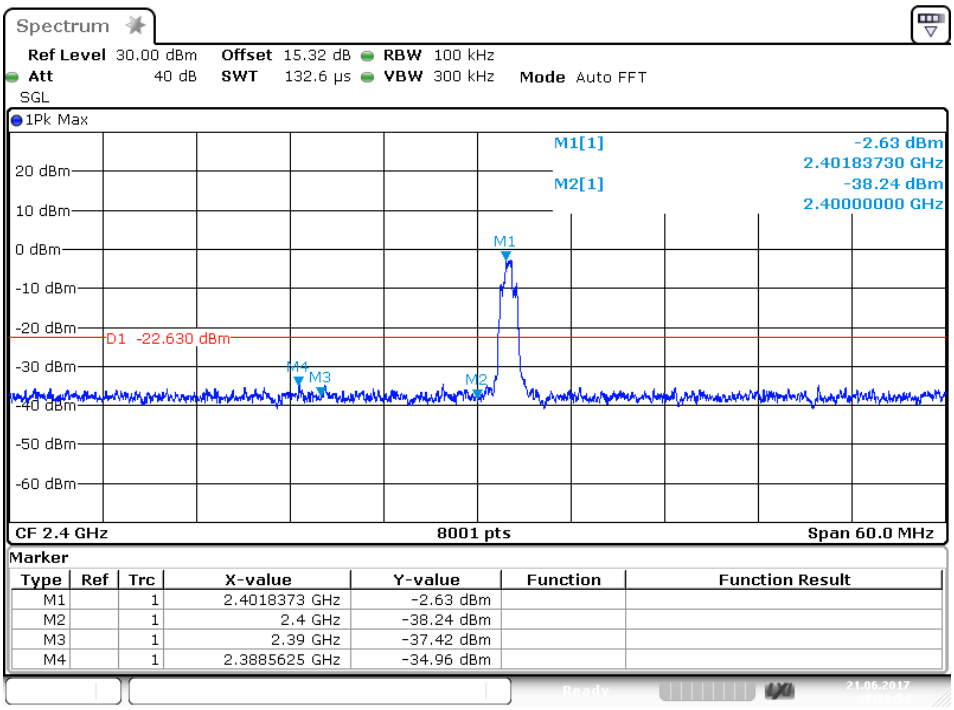


Date: 21.JUN.2017 10:04:44

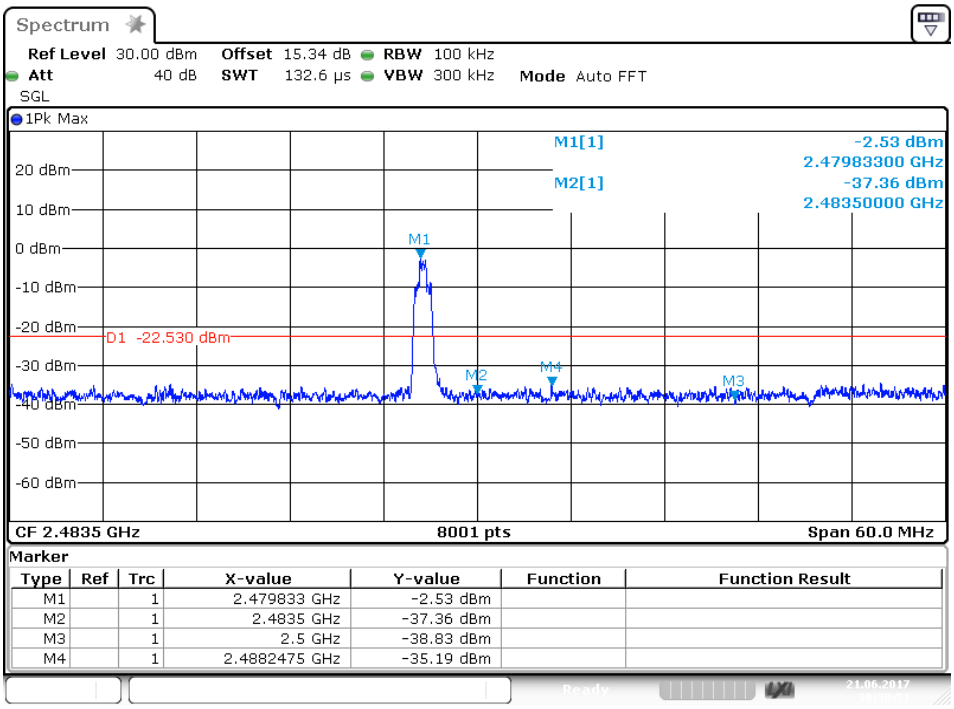


Date: 21.JUN.2017 10:13:07

Π/4-DQPSK Mode

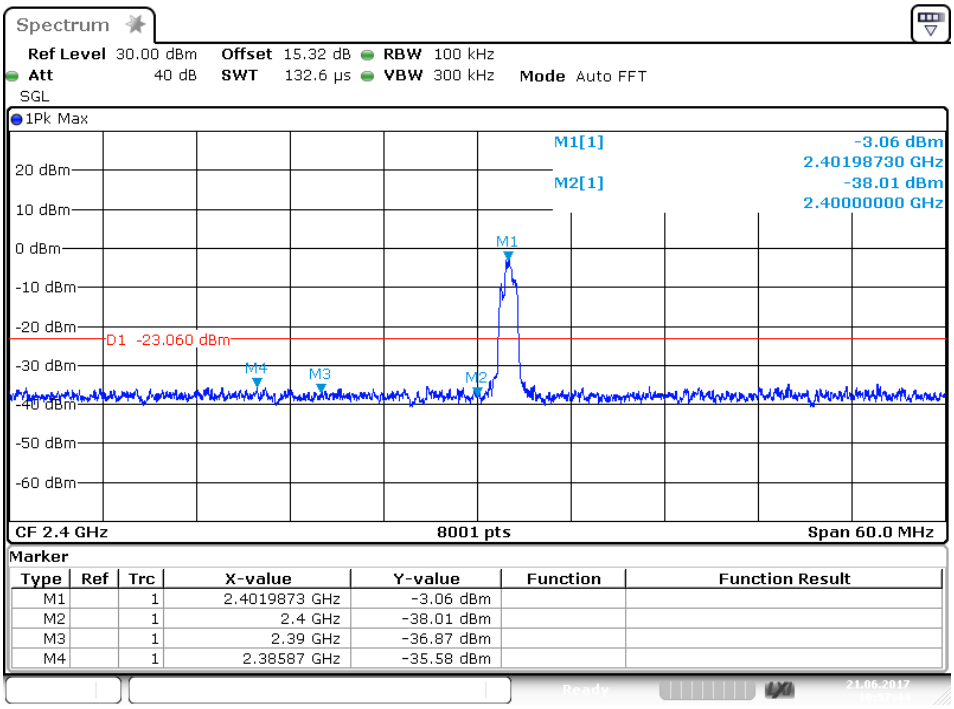


Date: 21.JUN.2017 10:22:54

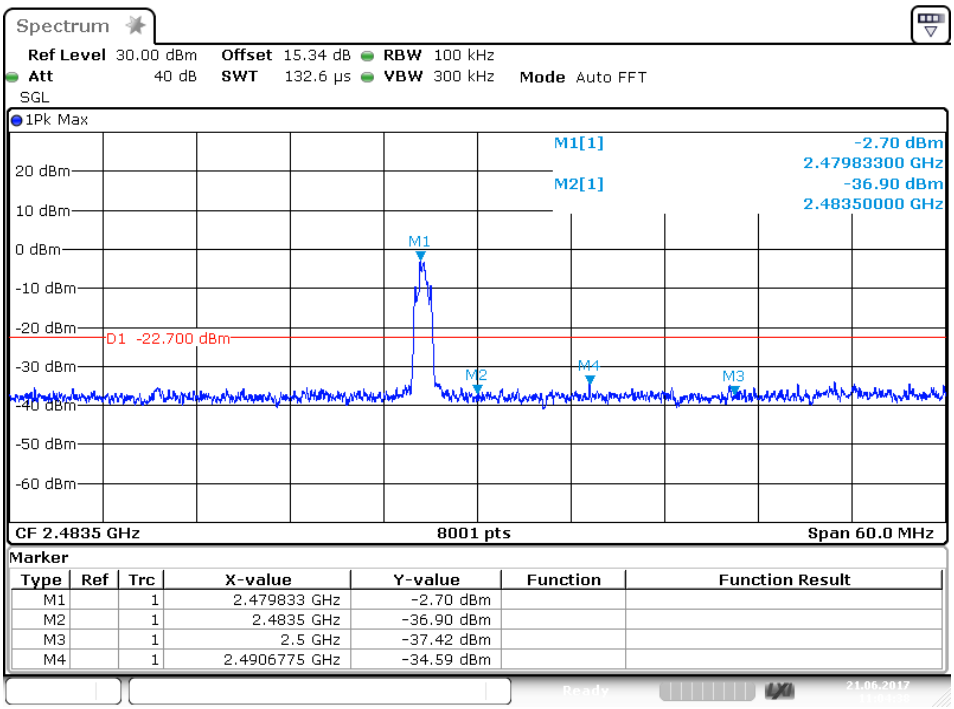


Date: 21.JUN.2017 10:30:51

8DPSK



Date: 21.JUN.2017 10:57:44



Date: 21.JUN.2017 11:04:38

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 1.5 meter high above ground(Above 1GHz). 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 emissions are reported.

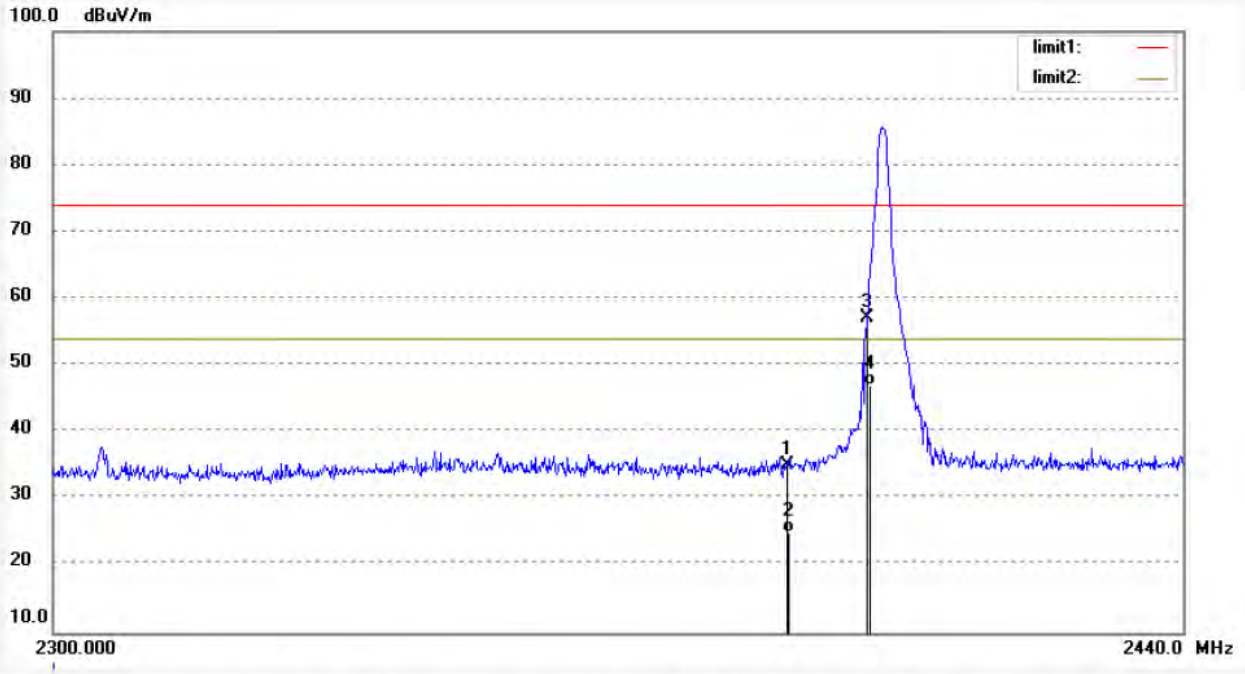
Non-hopping mode

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #864
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/42/04
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	40.93	-5.89	35.04	74.00	-38.96	peak			
2	2390.000	30.93	-5.89	25.04	54.00	-28.96	AVG			
3	2400.000	62.97	-5.80	57.17	74.00	-16.83	peak			
4	2400.000	52.87	-5.80	47.07	54.00	-6.93	AVG			

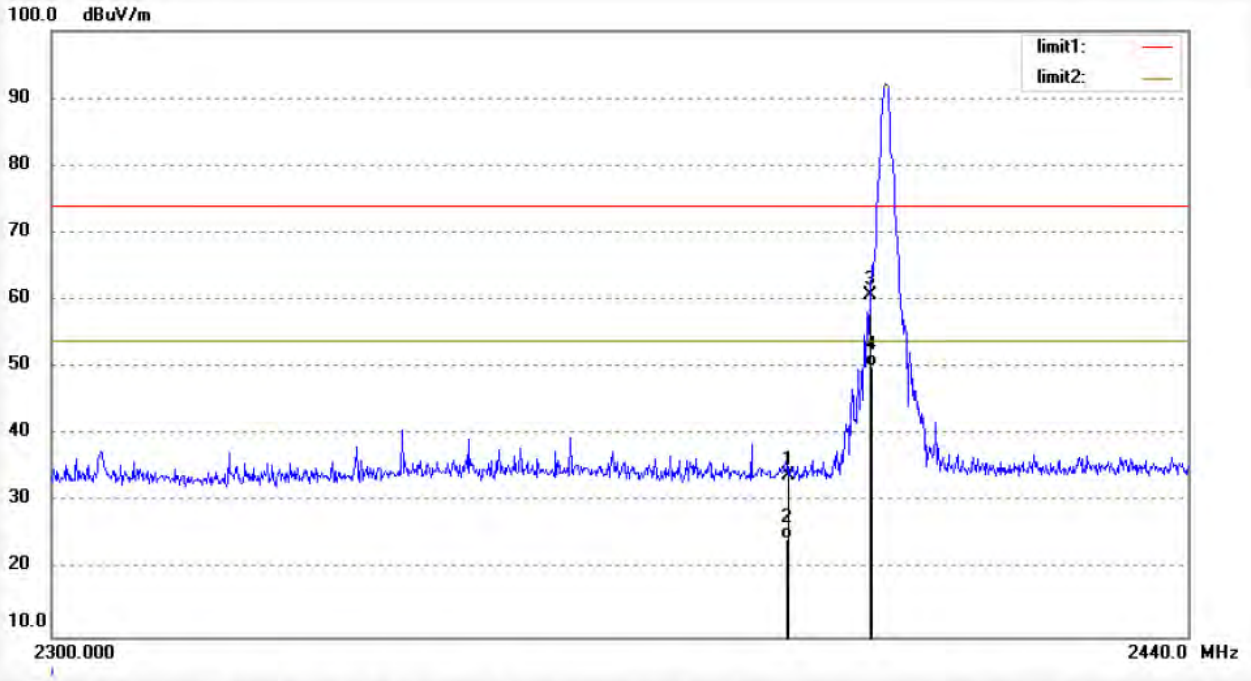
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #863
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/39/33
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	39.87	-5.89	33.98	74.00	-40.02	peak			
2	2390.000	30.46	-5.89	24.57	54.00	-29.43	AVG			
3	2400.000	66.62	-5.80	60.82	74.00	-13.18	peak			
4	2400.000	56.01	-5.80	50.21	54.00	-3.79	AVG			

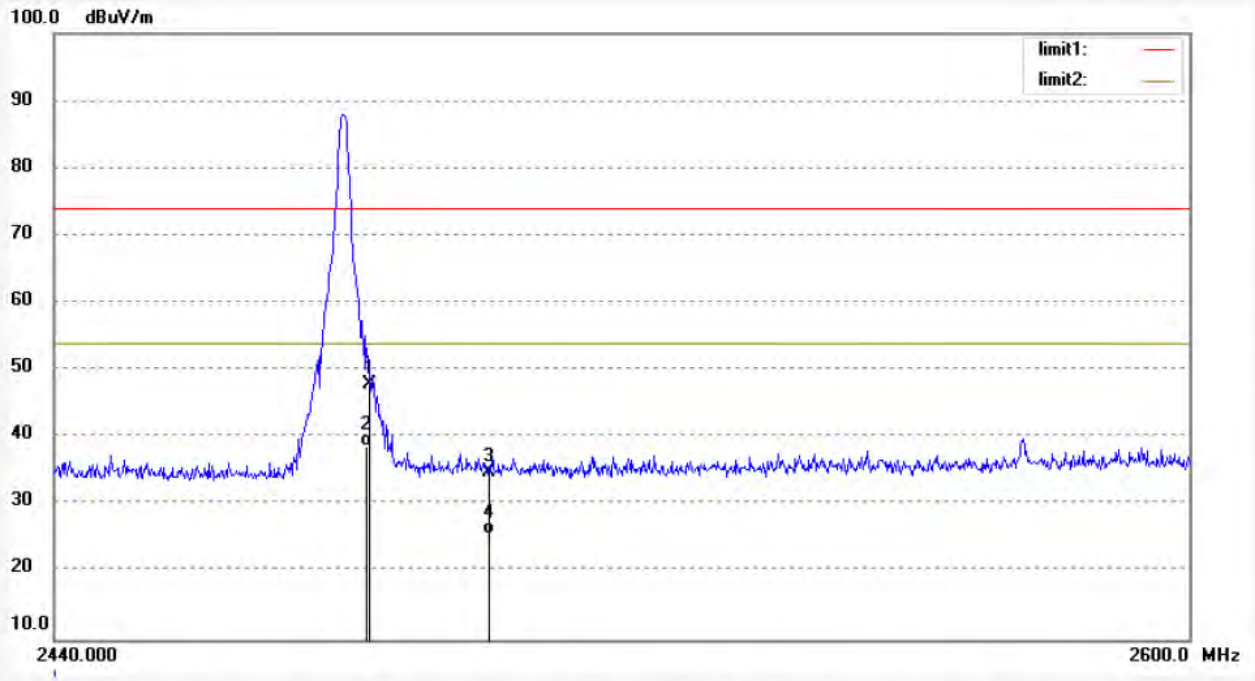
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #861
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/33/55
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	53.42	-5.51	47.91	74.00	-26.09	peak			
2	2483.500	44.15	-5.51	38.64	54.00	-15.36	AVG			
3	2500.000	40.35	-5.50	34.85	74.00	-39.15	peak			
4	2500.000	31.22	-5.50	25.72	54.00	-28.28	AVG			

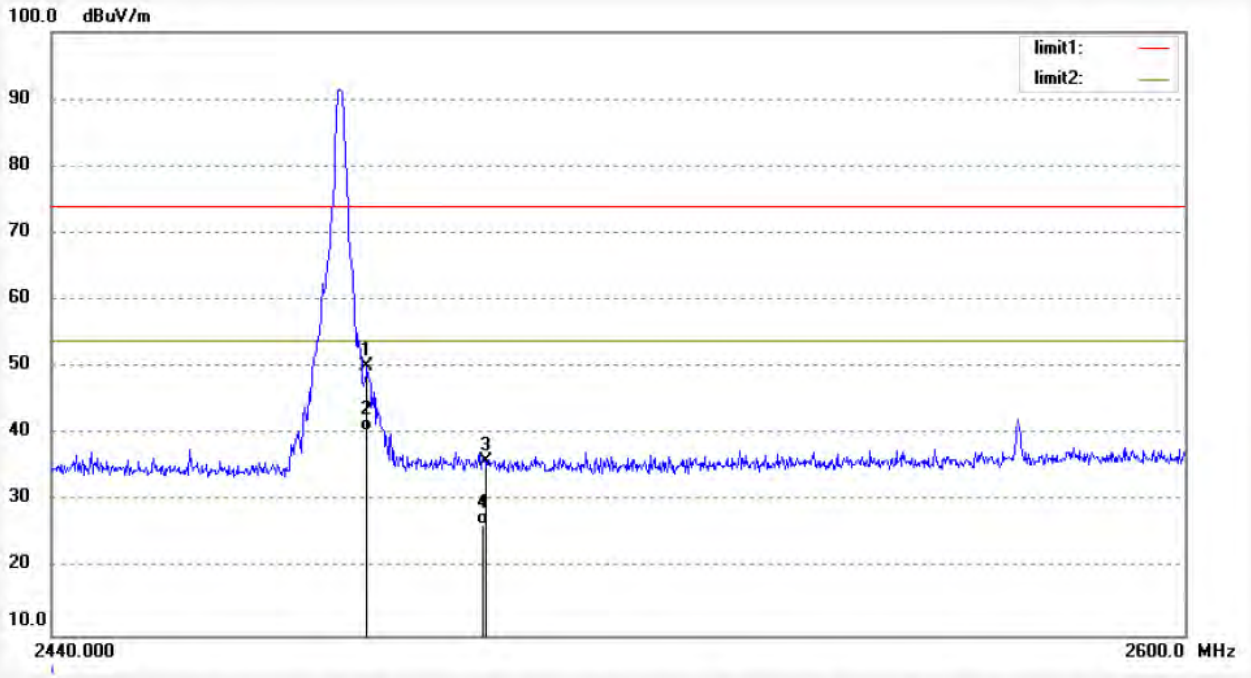
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #862
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/36/27
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	55.73	-5.51	50.22	74.00	-23.78	peak			
2	2483.500	45.91	-5.51	40.40	54.00	-13.60	AVG			
3	2500.000	41.48	-5.50	35.98	74.00	-38.02	peak			
4	2500.000	32.03	-5.50	26.53	54.00	-27.47	AVG			

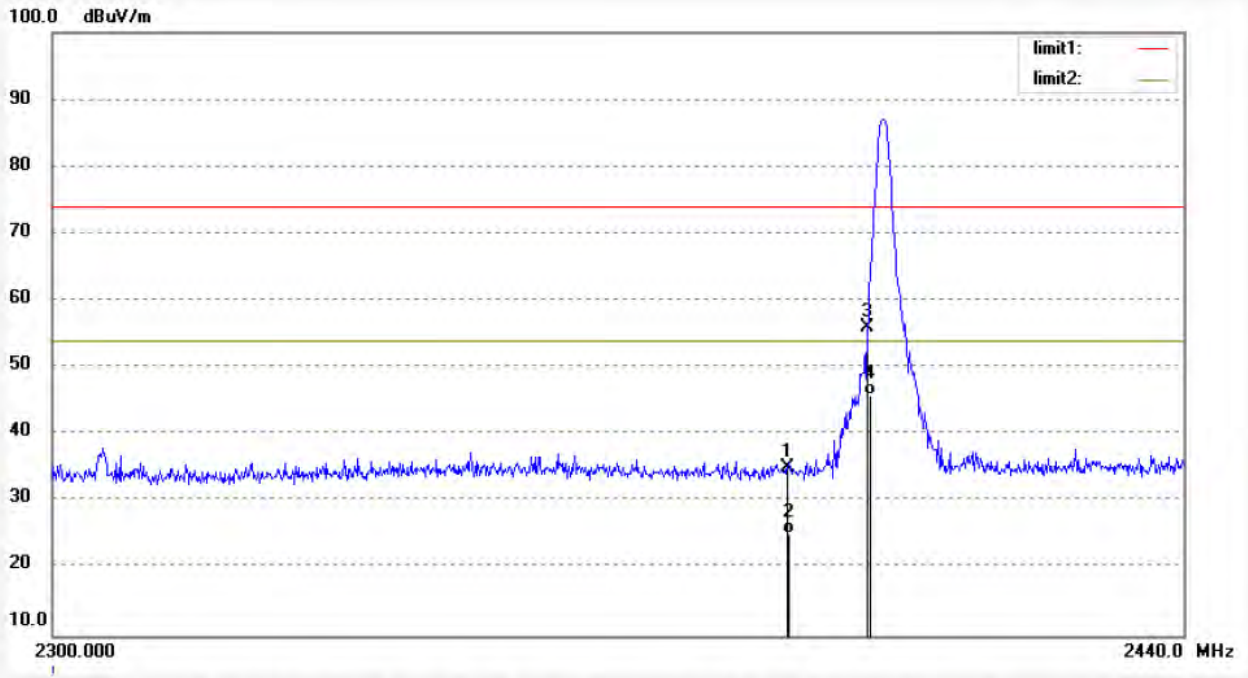
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #857
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(pi/4DQPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/23/37
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	41.05	-5.89	35.16	74.00	-38.84	peak			
2	2390.000	31.06	-5.89	25.17	54.00	-28.83	AVG			
3	2400.000	61.86	-5.80	56.06	74.00	-17.94	peak			
4	2400.000	51.73	-5.80	45.93	54.00	-8.07	AVG			

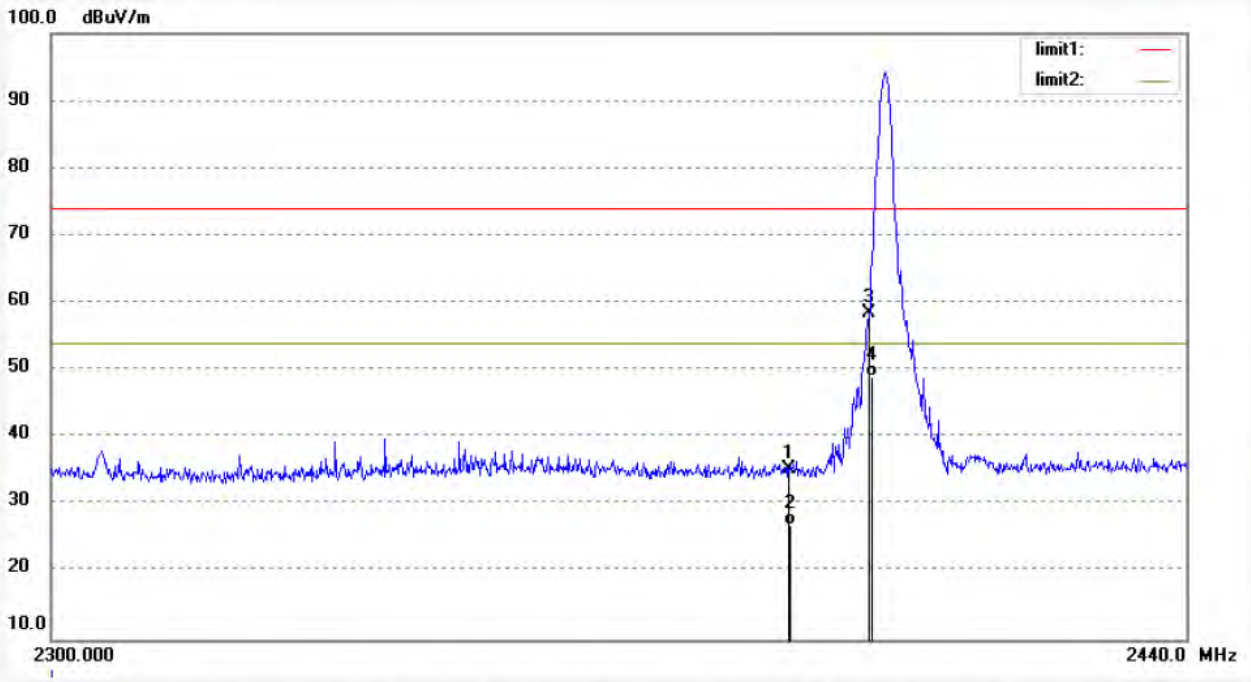
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #858
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(pi/4DQPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/25/22
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	41.23	-5.89	35.34	74.00	-38.66	peak			
2	2390.000	32.79	-5.89	26.90	54.00	-27.10	AVG			
3	2400.000	64.36	-5.80	58.56	74.00	-15.44	peak			
4	2400.000	54.82	-5.80	49.02	54.00	-4.98	AVG			

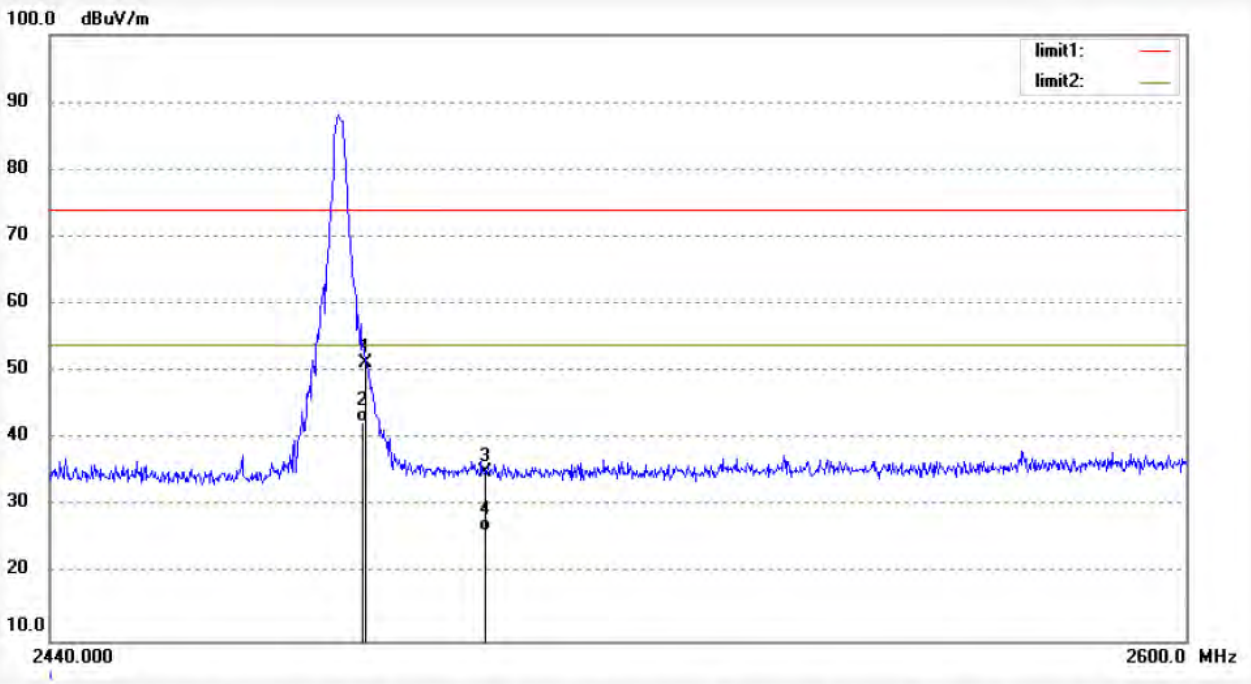
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #860
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(pi/4DQPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/30/35
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	56.89	-5.51	51.38	74.00	-22.62	peak			
2	2483.500	47.95	-5.51	42.44	54.00	-11.56	AVG			
3	2500.000	40.51	-5.50	35.01	74.00	-38.99	peak			
4	2500.000	31.79	-5.50	26.29	54.00	-27.71	AVG			

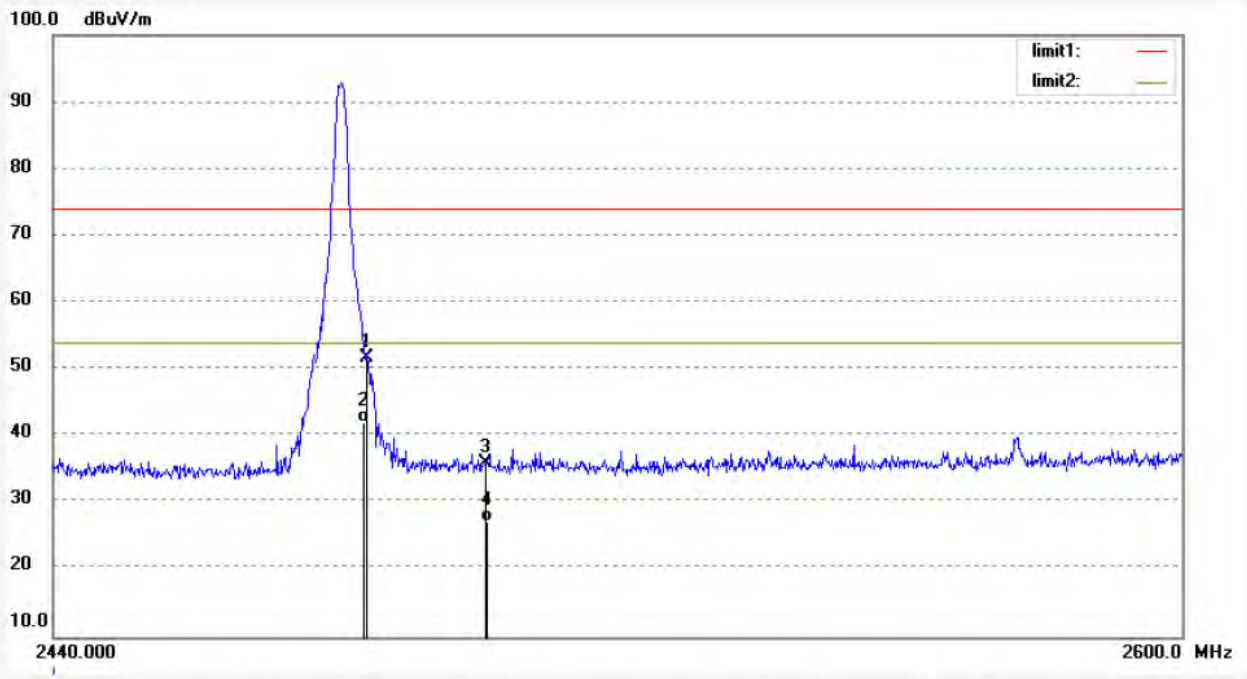
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #859
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(pi/4DQPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/28/49
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	57.34	-5.51	51.83	74.00	-22.17	peak			
2	2483.500	47.62	-5.51	42.11	54.00	-11.89	AVG			
3	2500.000	41.56	-5.50	36.06	74.00	-37.94	peak			
4	2500.000	32.74	-5.50	27.24	54.00	-26.76	AVG			

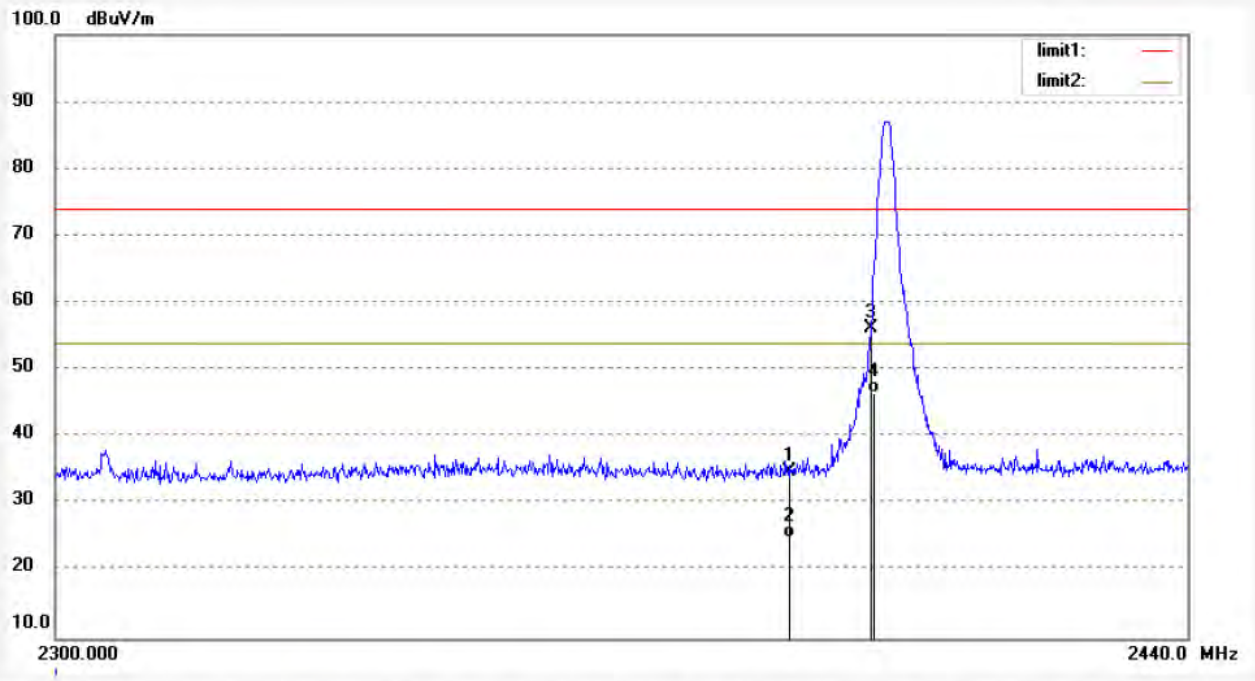
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #856
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(8DPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/19/56
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	40.69	-5.89	34.80	74.00	-39.20	peak			
2	2390.000	30.95	-5.89	25.06	54.00	-28.94	AVG			
3	2400.000	62.06	-5.80	56.26	74.00	-17.74	peak			
4	2400.000	52.34	-5.80	46.54	54.00	-7.46	AVG			

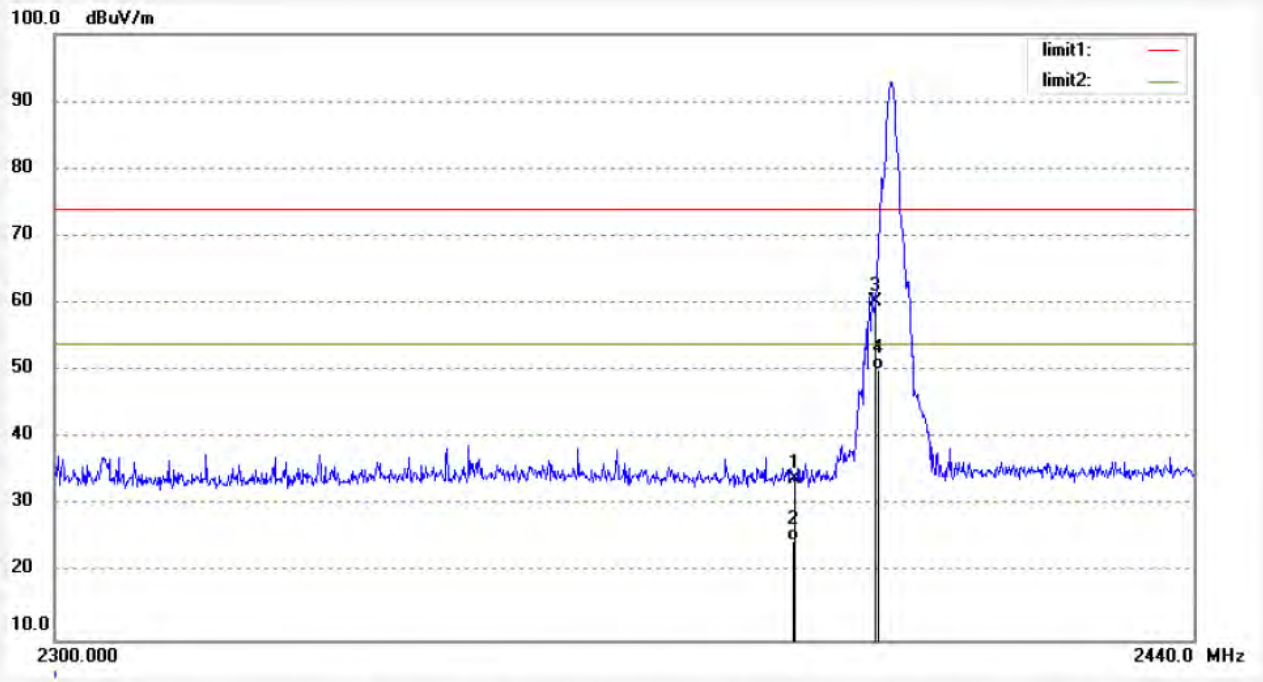
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #855
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2402MHz(8DPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/17/10
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	39.95	-5.89	34.06	74.00	-39.94	peak			
2	2390.000	30.64	-5.89	24.75	54.00	-29.25	AVG			
3	2400.000	66.04	-5.80	60.24	74.00	-13.76	peak			
4	2400.000	56.02	-5.80	50.22	54.00	-3.78	AVG			

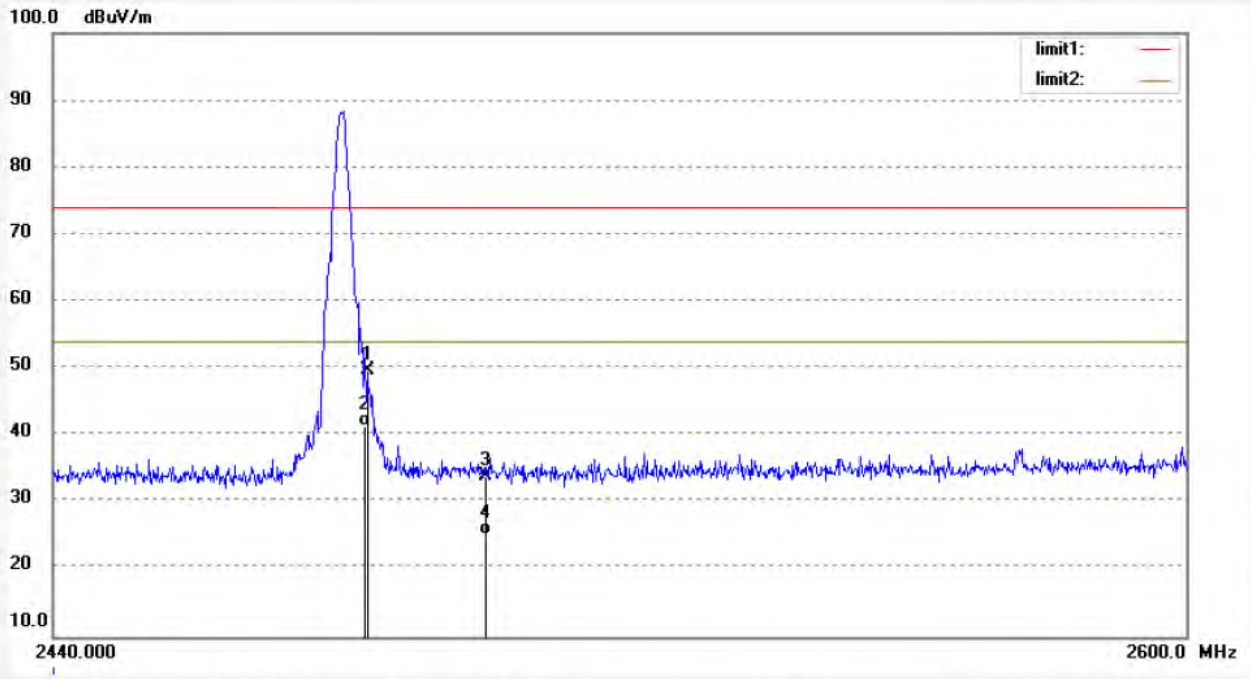
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #853
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(8DPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/12/12
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	55.29	-5.51	49.78	74.00	-24.22	peak			
2	2483.500	46.83	-5.51	41.32	54.00	-12.68	AVG			
3	2500.000	39.41	-5.50	33.91	74.00	-40.09	peak			
4	2500.000	30.67	-5.50	25.17	54.00	-28.83	AVG			

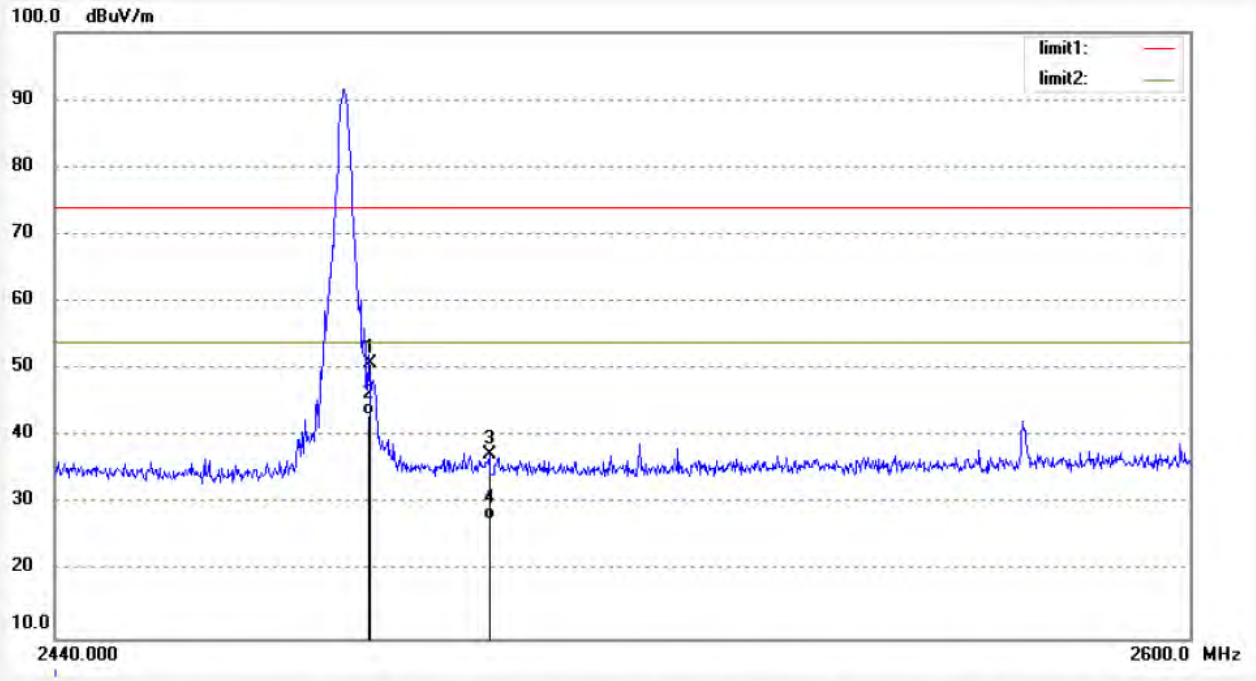
Note: Average measurement with peak detection at No.2&4

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #854
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: TX 2480MHz(8DPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/14/21
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	56.31	-5.51	50.80	74.00	-23.20	peak			
2	2483.500	48.72	-5.51	43.21	54.00	-10.79	AVG			
3	2500.000	42.85	-5.50	37.35	74.00	-36.65	peak			
4	2500.000	33.16	-5.50	27.66	54.00	-26.34	AVG			

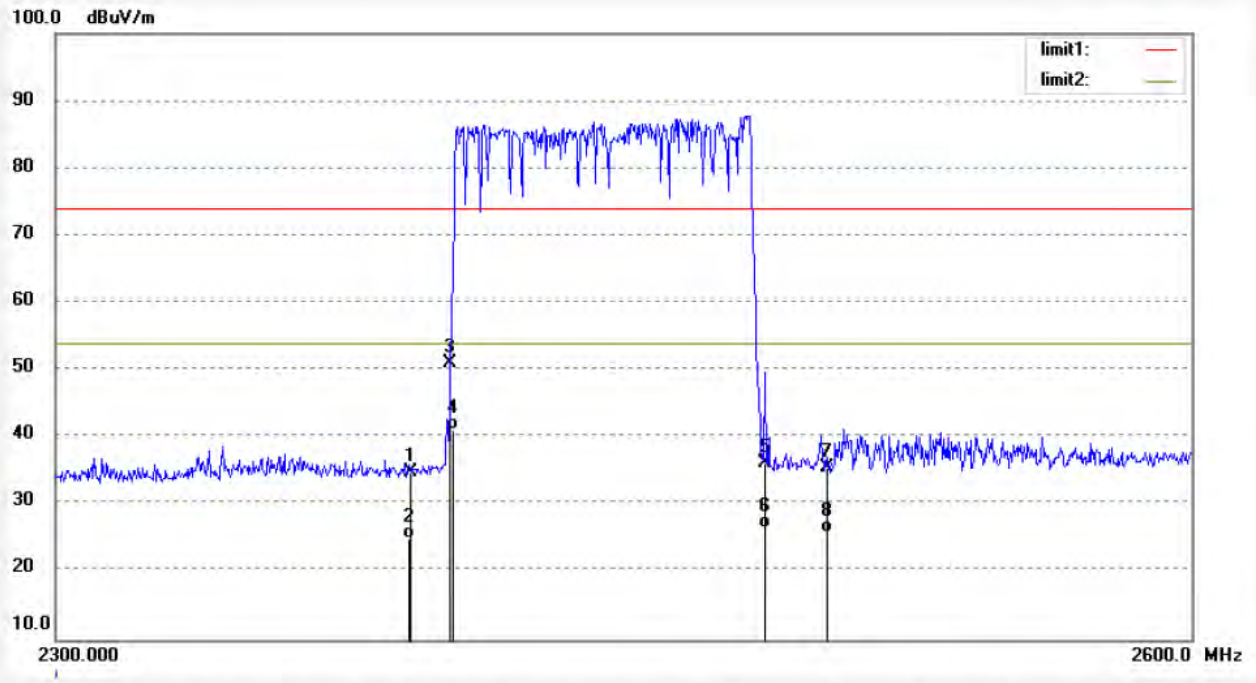
Note: Average measurement with peak detection at No.2&4

Hopping mode

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #865	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 17/06/20/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 13/48/30
EUT: LED ceiling lamp	Engineer Signature: DING
Mode: HOPPING(GFSK)	Distance: 3m
Model: 54620311	
Manufacturer: WUHU 3E LIGHTING	

Note: Report NO.:ATE20171126



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	40.83	-5.89	34.94	74.00	-39.06	peak			
2	2390.000	30.85	-5.89	24.96	54.00	-29.04	AVG			
3	2400.000	56.88	-5.80	51.08	74.00	-22.92	peak			
4	2400.000	46.91	-5.80	41.11	54.00	-12.89	AVG			
5	2483.500	41.74	-5.51	36.23	74.00	-37.77	peak			
6	2483.500	32.03	-5.51	26.52	54.00	-27.48	AVG			
7	2500.000	40.99	-5.50	35.49	74.00	-38.51	peak			
8	2500.000	31.42	-5.50	25.92	54.00	-28.08	AVG			

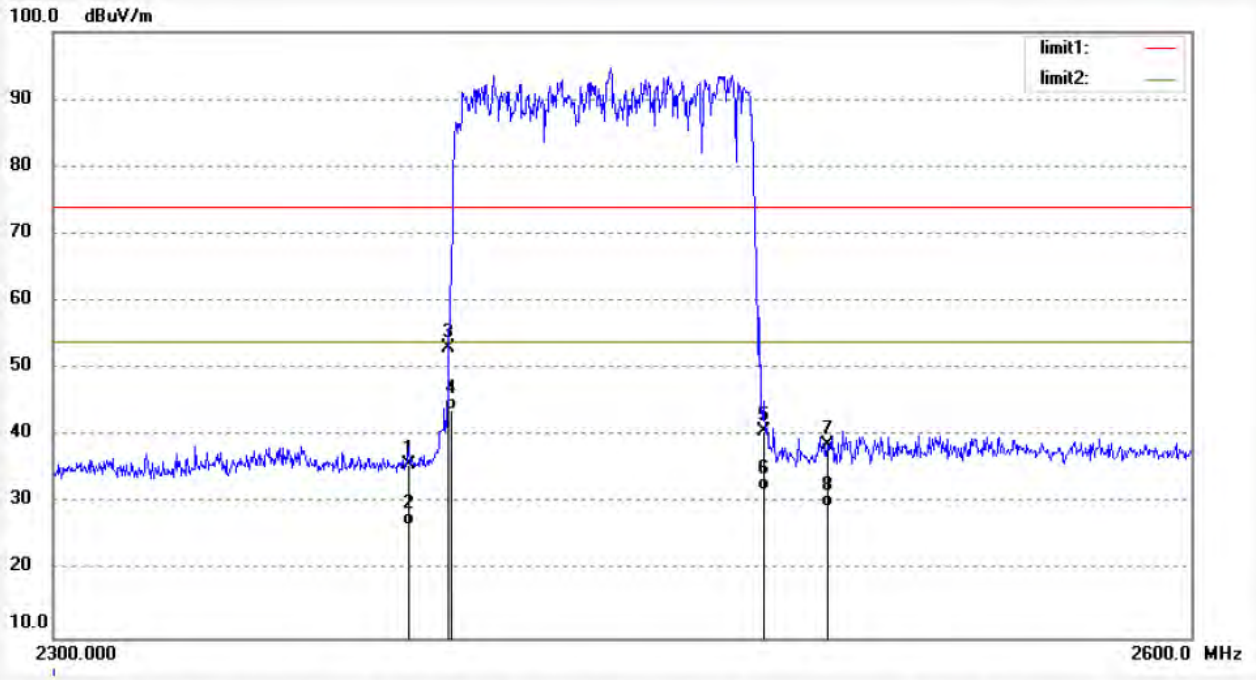
Note: Average measurement with peak detection at No.2&4&6&8

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #866
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: HOPPING(GFSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/51/54
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	41.58	-5.89	35.69	74.00	-38.31	peak			
2	2390.000	32.75	-5.89	26.86	54.00	-27.14	AVG			
3	2400.000	58.85	-5.80	53.05	74.00	-20.95	peak			
4	2400.000	49.61	-5.80	43.81	54.00	-10.19	AVG			
5	2483.500	46.24	-5.51	40.73	74.00	-33.27	peak			
6	2483.500	37.43	-5.51	31.92	54.00	-22.08	AVG			
7	2500.000	44.27	-5.50	38.77	74.00	-35.23	peak			
8	2500.000	34.86	-5.50	29.36	54.00	-24.64	AVG			

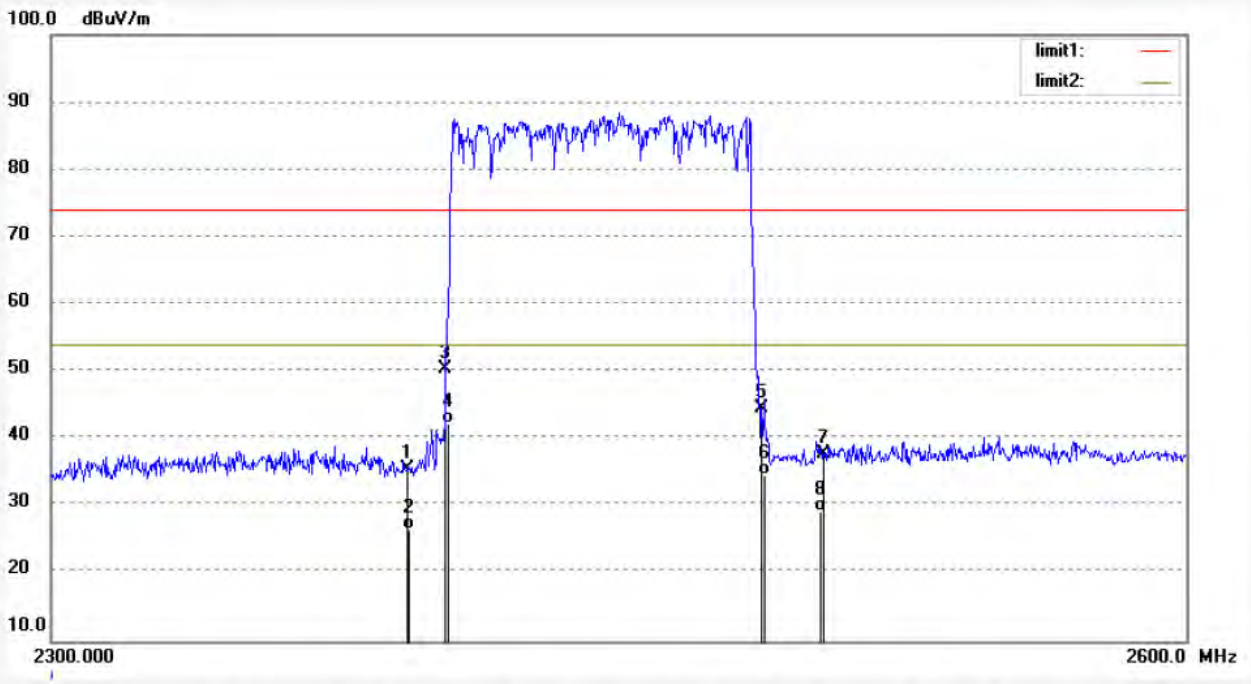
Note: Average measurement with peak detection at No.2&4&6&8

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #868
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: HOPPING(pi/4DQPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 14/06/08
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	41.49	-5.89	35.60	74.00	-38.40	peak			
2	2390.000	32.46	-5.89	26.57	54.00	-27.43	AVG			
3	2400.000	56.27	-5.80	50.47	74.00	-23.53	peak			
4	2400.000	48.17	-5.80	42.37	54.00	-11.63	AVG			
5	2483.500	49.96	-5.51	44.45	74.00	-29.55	peak			
6	2483.500	40.22	-5.51	34.71	54.00	-19.29	AVG			
7	2500.000	43.30	-5.50	37.80	74.00	-36.20	peak			
8	2500.000	34.64	-5.50	29.14	54.00	-24.86	AVG			

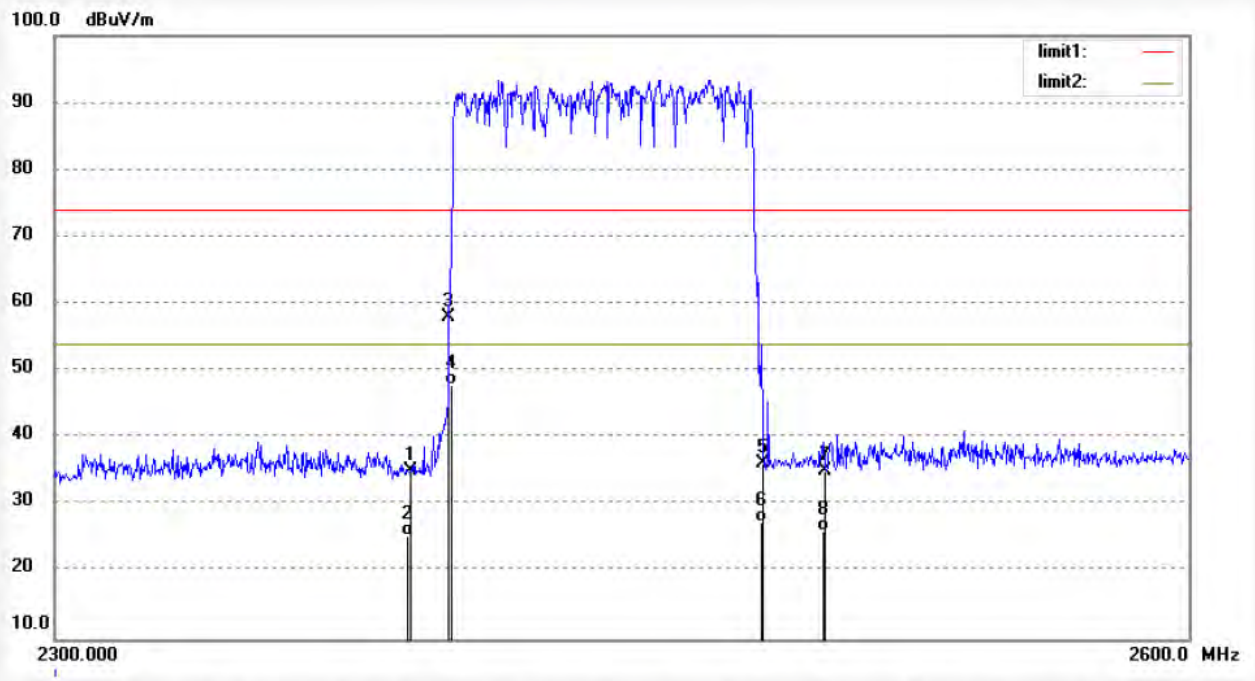
Note: Average measurement with peak detection at No.2&4&6&8

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #867
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: HOPPING(pi/4DQPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 13/56/24
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	40.92	-5.89	35.03	74.00	-38.97	peak			
2	2390.000	31.25	-5.89	25.36	54.00	-28.64	AVG			
3	2400.000	63.94	-5.80	58.14	74.00	-15.86	peak			
4	2400.000	53.76	-5.80	47.96	54.00	-6.04	AVG			
5	2483.500	41.73	-5.51	36.22	74.00	-37.78	peak			
6	2483.500	32.87	-5.51	27.36	54.00	-26.64	AVG			
7	2500.000	40.67	-5.50	35.17	74.00	-38.83	peak			
8	2500.000	31.56	-5.50	26.06	54.00	-27.94	AVG			

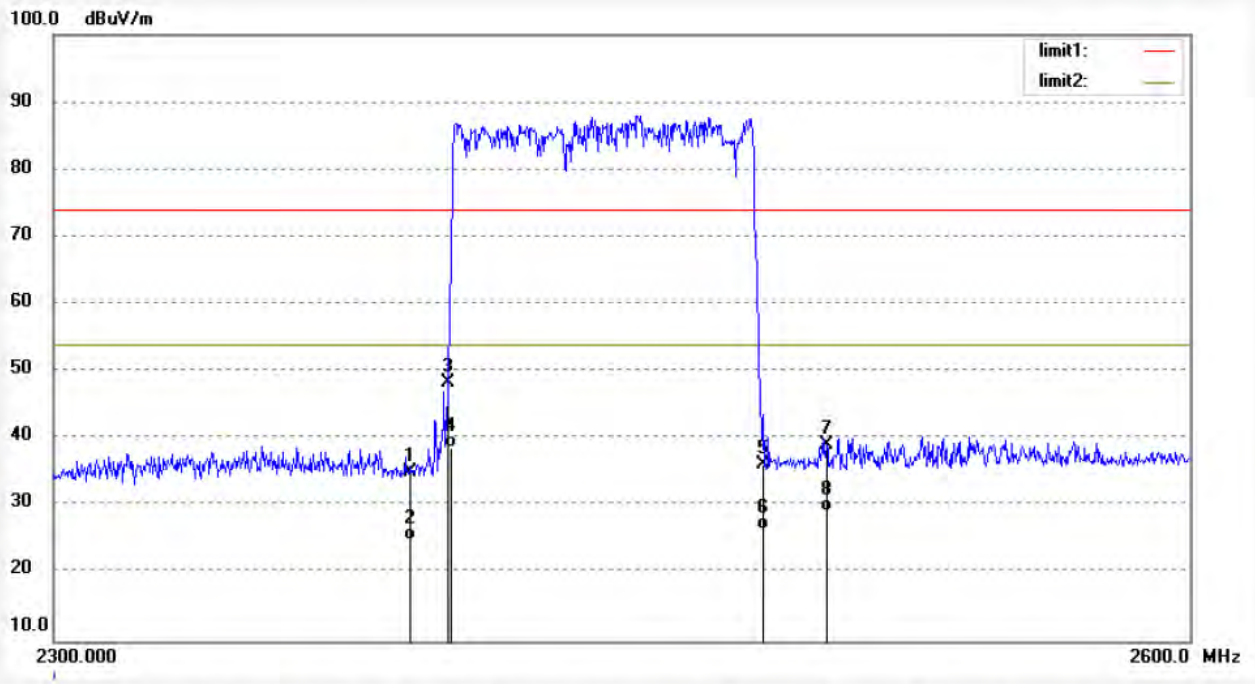
Note: Average measurement with peak detection at No.2&4&6&8

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #869
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: HOPPING(8DPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 14/13/06
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126



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	40.95	-5.89	35.06	74.00	-38.94	peak			
2	2390.000	30.84	-5.89	24.95	54.00	-29.05	AVG			
3	2400.000	54.09	-5.80	48.29	74.00	-25.71	peak			
4	2400.000	44.56	-5.80	38.76	54.00	-15.24	AVG			
5	2483.500	41.82	-5.51	36.31	74.00	-37.69	peak			
6	2483.500	32.01	-5.51	26.50	54.00	-27.50	AVG			
7	2500.000	44.71	-5.50	39.21	74.00	-34.79	peak			
8	2500.000	34.83	-5.50	29.33	54.00	-24.67	AVG			

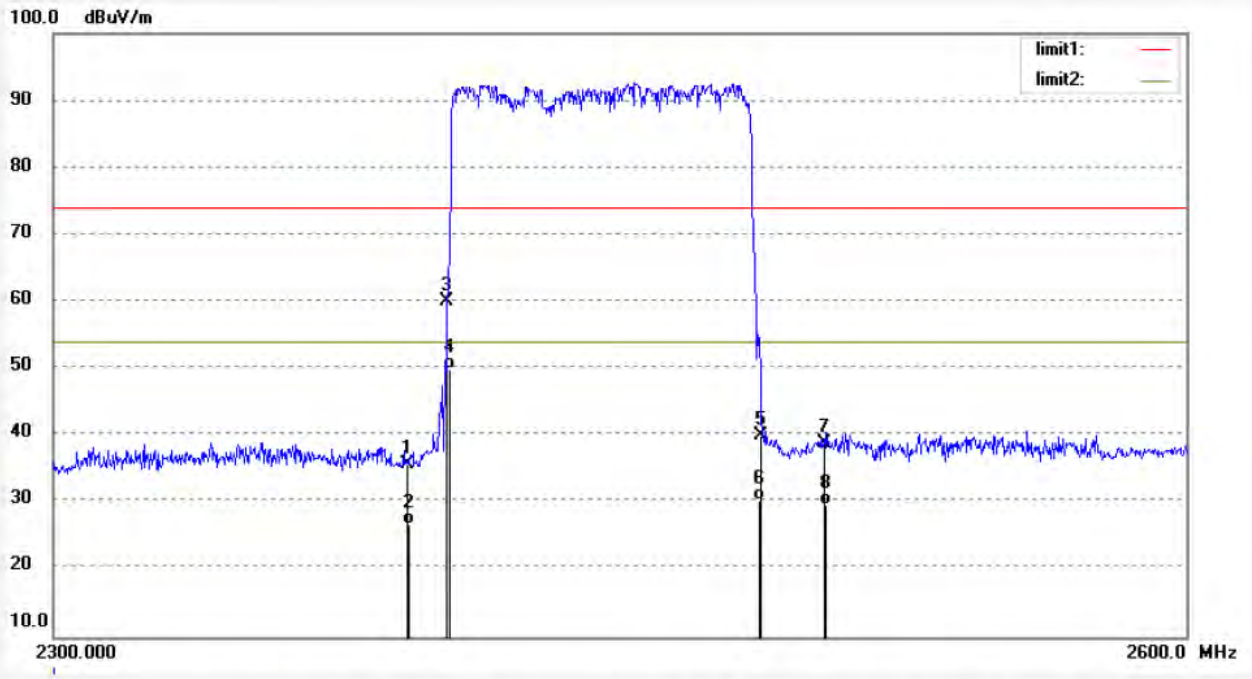
Note: Average measurement with peak detection at No.2&4&6&8

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: DING1 #870
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: LED ceiling lamp
Mode: HOPPING(8DPSK)
Model: 54620311
Manufacturer: WUHU 3E LIGHTING

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 17/06/20/
Time: 14/22/17
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20171126

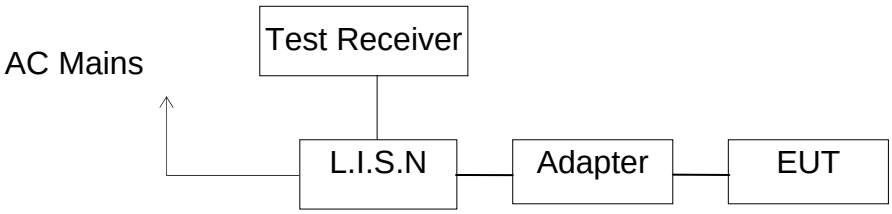


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.75	-5.89	35.86	74.00	-38.14	peak			
2	2390.000	32.74	-5.89	26.85	54.00	-27.15	AVG			
3	2400.000	65.77	-5.80	59.97	74.00	-14.03	peak			
4	2400.000	55.69	-5.80	49.89	54.00	-4.11	AVG			
5	2483.500	45.45	-5.51	39.94	74.00	-34.06	peak			
6	2483.500	35.98	-5.51	30.47	54.00	-23.53	AVG			
7	2500.000	44.33	-5.50	38.83	74.00	-35.17	peak			
8	2500.000	35.27	-5.50	29.77	54.00	-24.23	AVG			

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

12. AC POWER LINE CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.207(A)

12.1. Block Diagram of Test Setup



(EUT: LED ceiling lamp)

12.2. Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μV)	
	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 following 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 0.8m 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.Power Line Conducted Emission Measurement Results

PASS.

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

Test mode : BT communicating(AC 120V/60Hz)

MEASUREMENT RESULT: "CB-0618-01_fin"

6/18/2017 5:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.310000	37.40	10.6	60	22.6	QP	L1	GND
0.655000	41.10	10.8	56	14.9	QP	L1	GND
0.955000	40.30	10.8	56	15.7	QP	L1	GND
4.990000	40.50	11.2	56	15.5	QP	L1	GND
5.520000	41.20	11.2	60	18.8	QP	L1	GND
18.175000	36.60	11.4	60	23.4	QP	L1	GND

MEASUREMENT RESULT: "CB-0618-01_fin2"

6/18/2017 5:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.305000	28.70	10.6	50	21.4	AV	L1	GND
0.650000	33.40	10.8	46	12.6	AV	L1	GND
0.990000	31.70	10.8	46	14.3	AV	L1	GND
4.750000	30.00	11.1	46	16.0	AV	L1	GND
5.170000	31.80	11.2	50	18.2	AV	L1	GND
13.270000	28.10	11.3	50	21.9	AV	L1	GND

MEASUREMENT RESULT: "CB-0618-02_fin"

6/18/2017 5:21PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.305000	32.70	10.6	60	27.4	QP	N	GND
0.805000	35.60	10.8	56	20.4	QP	N	GND
0.890000	34.20	10.8	56	21.8	QP	N	GND
4.880000	33.50	11.1	56	22.5	QP	N	GND
6.170000	36.50	11.2	60	23.5	QP	N	GND
17.005000	29.70	11.4	60	30.3	QP	N	GND

MEASUREMENT RESULT: "CB-0618-02_fin2"

6/18/2017 5:21PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.325000	21.10	10.6	50	28.5	AV	N	GND
0.670000	26.30	10.8	46	19.7	AV	N	GND
0.895000	25.30	10.8	46	20.7	AV	N	GND
4.770000	24.40	11.1	46	21.6	AV	N	GND
5.670000	28.00	11.2	50	22.0	AV	N	GND
12.475000	23.20	11.3	50	26.8	AV	N	GND

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

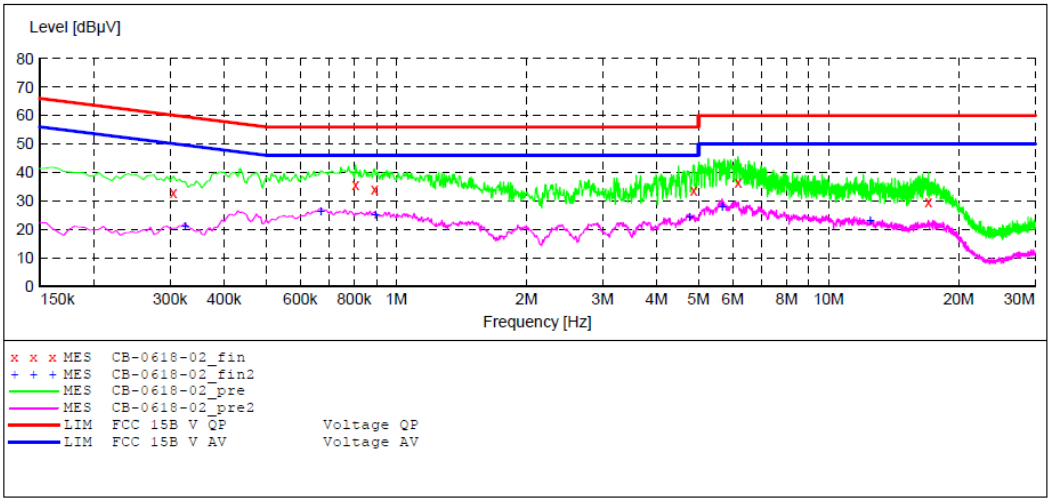
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  LED ceiling lamp M/N:54620311
Manufacturer:         WUHU 3E LIGHTING
Operating Condition:  BT communicating
Test Site:            1#Shielding Room
Operator:             DING
Test Specification:   N 120V/60Hz
Comment:              Report NO.:ATE20171126
Start of Test:        6/18/2017 / 5:18:16PM
```

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

Short Description: _SUB_STD_VTERM2 1.70

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



MEASUREMENT RESULT: "CB-0618-02_fin"

6/18/2017 5:21PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.305000	32.70	10.6	60	27.4	QP	N	GND
0.805000	35.60	10.8	56	20.4	QP	N	GND
0.890000	34.20	10.8	56	21.8	QP	N	GND
4.880000	33.50	11.1	56	22.5	QP	N	GND
6.170000	36.50	11.2	60	23.5	QP	N	GND
17.005000	29.70	11.4	60	30.3	QP	N	GND

MEASUREMENT RESULT: "CB-0618-02_fin2"

6/18/2017 5:21PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.325000	21.10	10.6	50	28.5	AV	N	GND
0.670000	26.30	10.8	46	19.7	AV	N	GND
0.895000	25.30	10.8	46	20.7	AV	N	GND
4.770000	24.40	11.1	46	21.6	AV	N	GND
5.670000	28.00	11.2	50	22.0	AV	N	GND
12.475000	23.20	11.3	50	26.8	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

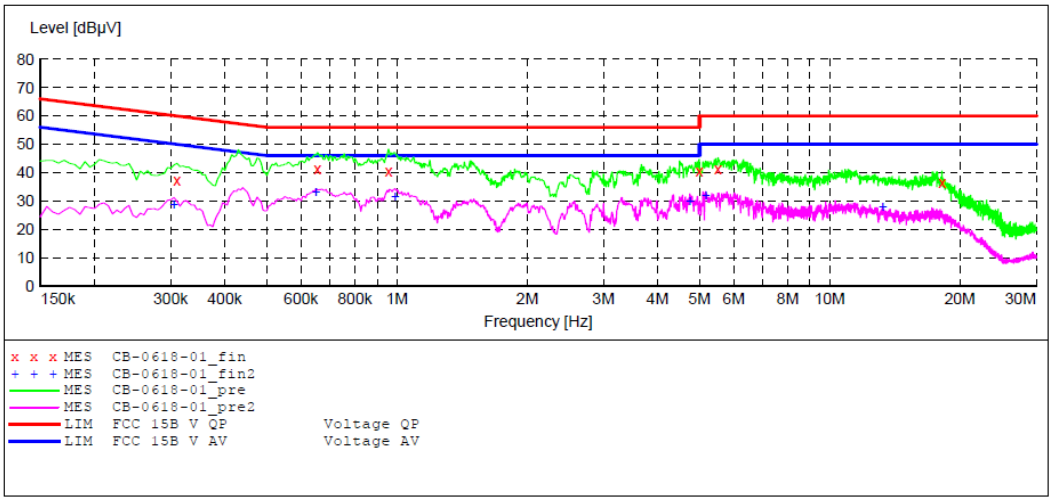
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: LED ceiling lamp M/N:54620311
Manufacturer: WUHU 3E LIGHTING
Operating Condition: BT communicating
Test Site: 1#Shielding Room
Operator: DING
Test Specification: L 120V/60Hz
Comment: Report NO.:ATE20171126
Start of Test: 6/18/2017 / 5:13:10PM

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

Short Description: _SUB_STD_VTERM2 1.70

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



MEASUREMENT RESULT: "CB-0618-01_fin"

6/18/2017 5:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.310000	37.40	10.6	60	22.6	QP	L1	GND
0.655000	41.10	10.8	56	14.9	QP	L1	GND
0.955000	40.30	10.8	56	15.7	QP	L1	GND
4.990000	40.50	11.2	56	15.5	QP	L1	GND
5.520000	41.20	11.2	60	18.8	QP	L1	GND
18.175000	36.60	11.4	60	23.4	QP	L1	GND

MEASUREMENT RESULT: "CB-0618-01_fin2"

6/18/2017 5:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.305000	28.70	10.6	50	21.4	AV	L1	GND
0.650000	33.40	10.8	46	12.6	AV	L1	GND
0.990000	31.70	10.8	46	14.3	AV	L1	GND
4.750000	30.00	11.1	46	16.0	AV	L1	GND
5.170000	31.80	11.2	50	18.2	AV	L1	GND
13.270000	28.10	11.3	50	21.9	AV	L1	GND

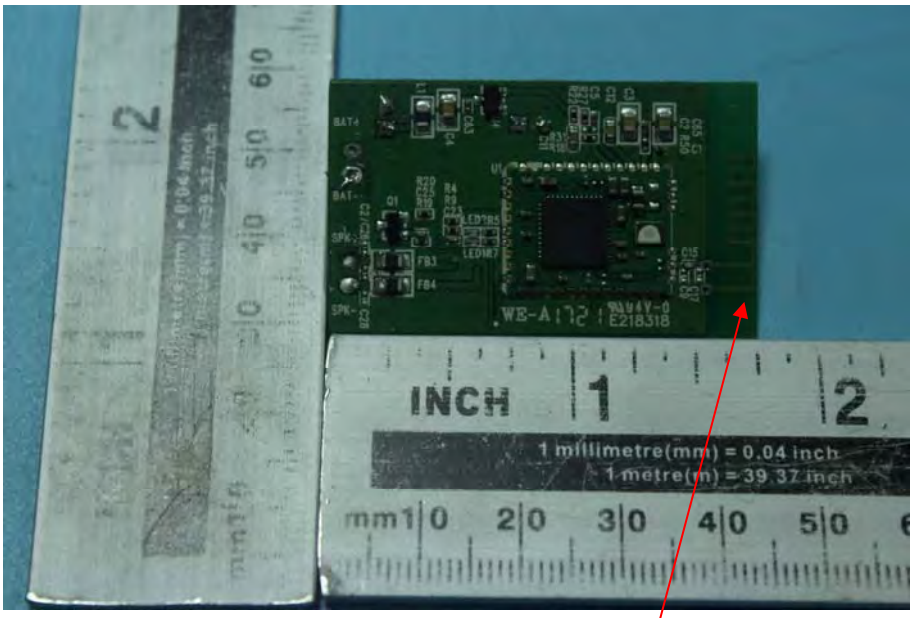
13. ANTENNA REQUIREMENT

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 -1.0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna