

APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Modern Marketing Concepts, Inc.

AV ROOM TURNTABLE

Model No.: CR6253U-001A, CR6253X-XXXX
(“X-XXXX” can be replaced by letter from “A” to “Z”, number from “0” to “9” or blank)

FCC ID: AUSCR6253

Prepared for : Modern Marketing Concepts, Inc.
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Report No. : ATE20190942
Date of Test : June 21-25, 2019
Date of Report : June 29, 2019

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Test Report Certification

Applicant : Modern Marketing Concepts, Inc.
Manufacturer : Timsen Development Limited
EUT : AV ROOM TURNTABLE
Model No. : CR6253U-001A, CR6253X-XXXX

("X-XXXX" can be replaced by letter from "A" to "Z", number from "0" to "9" or blank)

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 : June 21-25, 2019

Date of Report : June 29, 2019

Prepared by :

Bob Wang

(Bob Wang, Engineer)

Approved & Authorized Signer :


(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Model Number	:	CR6253U-001A, CR6253X-XXXX (“X-XXXX” can be replaced by letter from “A” to “Z”, number from “0” to “9” or blank) (Note: We hereby state that these models are identical in interior structure, electrical circuits and components, Just model name is different, Therefore, only model CR6253U-001A is tested for EMC test.)
Bluetooth version	:	V5.0
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	1.2dBi
Antenna type	:	PCB Antenna
Modulation mode	:	GFSK, $\pi/4$ DQPSK, 8DPSK
Power Supply	:	DC 12V (Power by Adapter)
Adapter	:	Model: SW1200500-F04 Input: AC 100-240V; 50/60Hz Output: DC 12V; 500mA
Applicant	:	Modern Marketing Concepts, Inc.
Address	:	1220 E Oak, St. Louisville, Kentucky, United States 40204
Manufacturer	:	Timsen Development Limited
Address	:	5F, 447# Tianhebei Road, Guangzhou, China

1.2. Accessory and Auxiliary Equipment

n.a.

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

Radiated emission expanded uncertainty (9kHz-30MHz)	:	U=2.66dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	:	U=4.28dB, k=2
Radiated emission expanded uncertainty (1G-18GHz)	:	U=4.98dB, k=2
Radiated emission expanded uncertainty (18G-26.5GHz)	:	U=5.06dB, k=2
Conduction Emission Expanded Uncertainty (Mains ports, 9kHz-30MHz)	:	U=2.72dB, k=2
Conduction Emission Expanded Uncertainty (Telecommunication ports, 150kHz-30MHz)	:	U=2.94dB, k=2
Power disturbance Expanded Uncertainty	:	U=2.92dB, k=2
Harmonic current expanded uncertainty	:	U=0.512%, 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. 05, 2019	1 Year
EMI Test Receiver	Rohde& Schwarz	ESR	101817	Jan. 05, 2019	1 Year
Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Jan. 05, 2019	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 05, 2019	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10S S	N/A	Jan. 05, 2019	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2 375/2510-60/11SS	N/A	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.3	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.4	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.5	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.6	Jan. 05, 2019	1 Year
Temporary antenna connector	NTGS	14AE	N/A	Jan. 21, 2019	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode

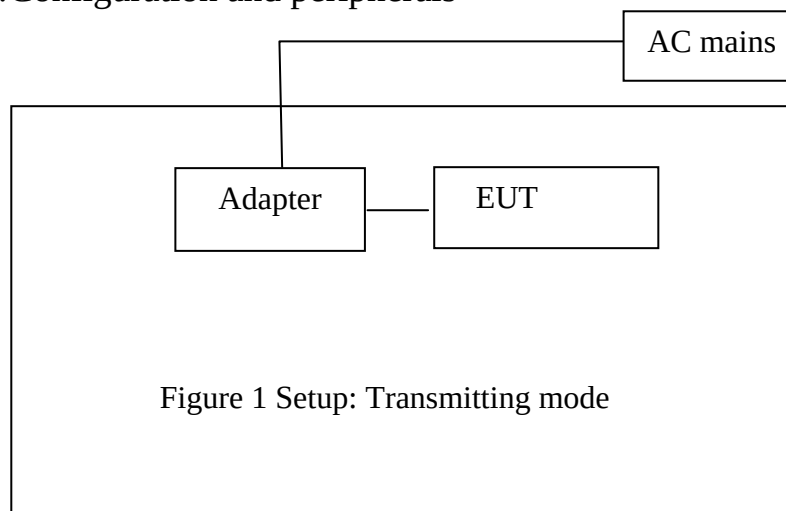
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2.Configuration and peripherals

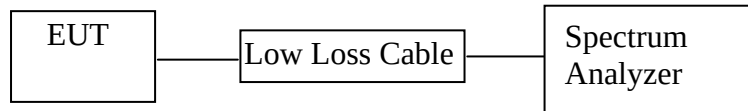


4. TEST PROCEDURES AND RESULTS

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 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

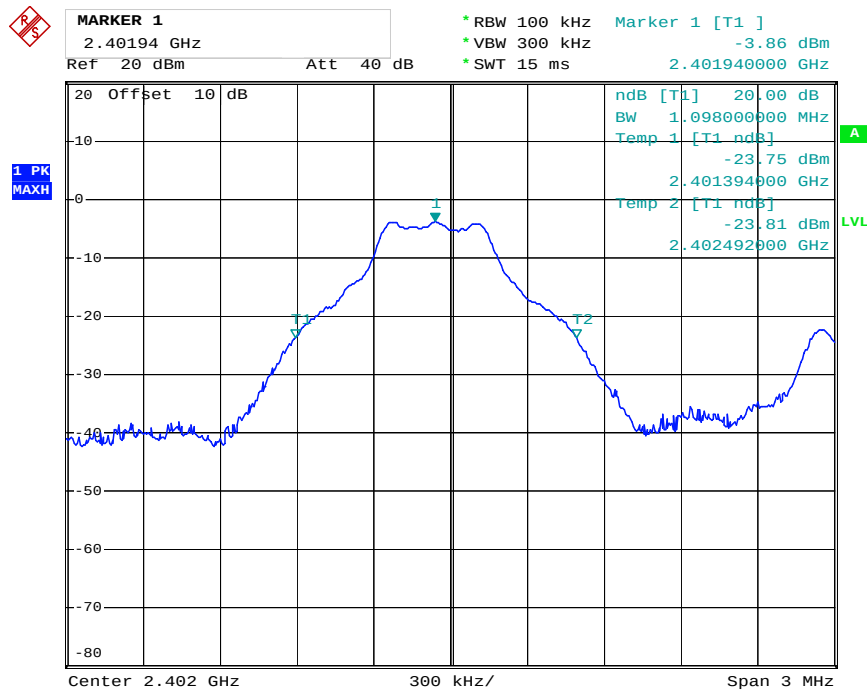
Test Lab: Shielding room

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	$\Pi/4$ -DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.098	1.380	1.350	Pass
Middle	2441	1.110	1.368	1.356	Pass
High	2480	1.110	1.368	1356	Pass

The spectrum analyzer plots are attached as below.

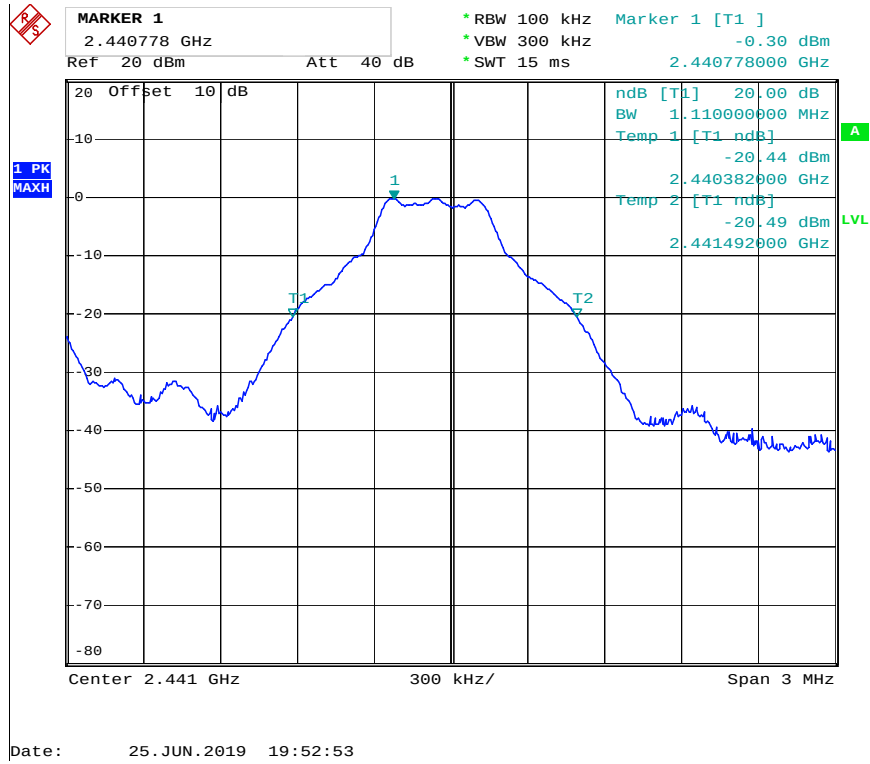
GFSK Mode

Low channel

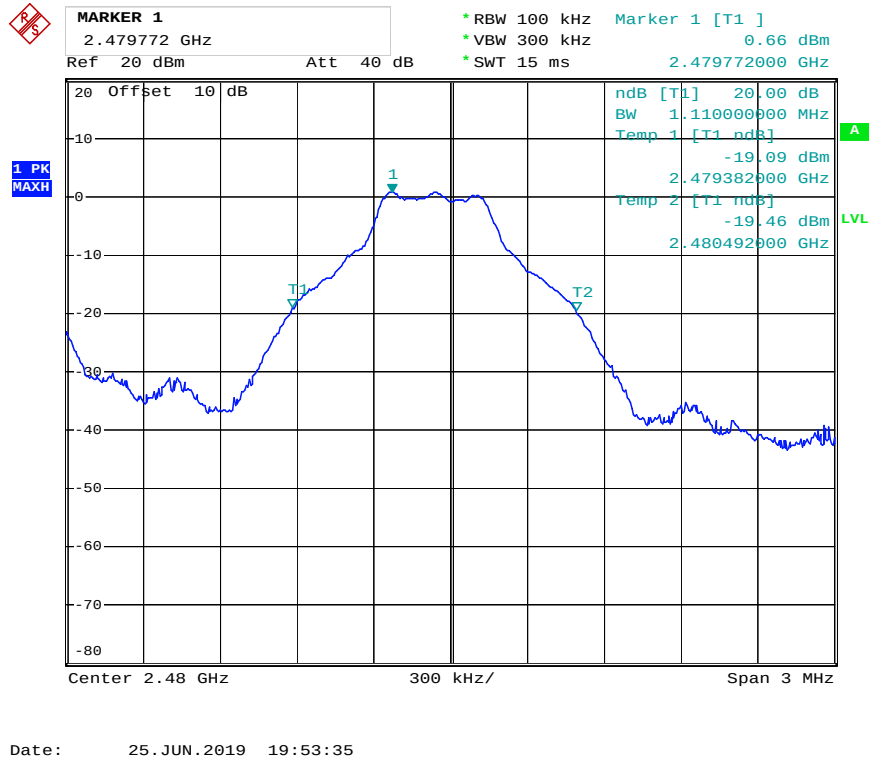


Date: 25.JUN.2019 19:52:00

Middle channel

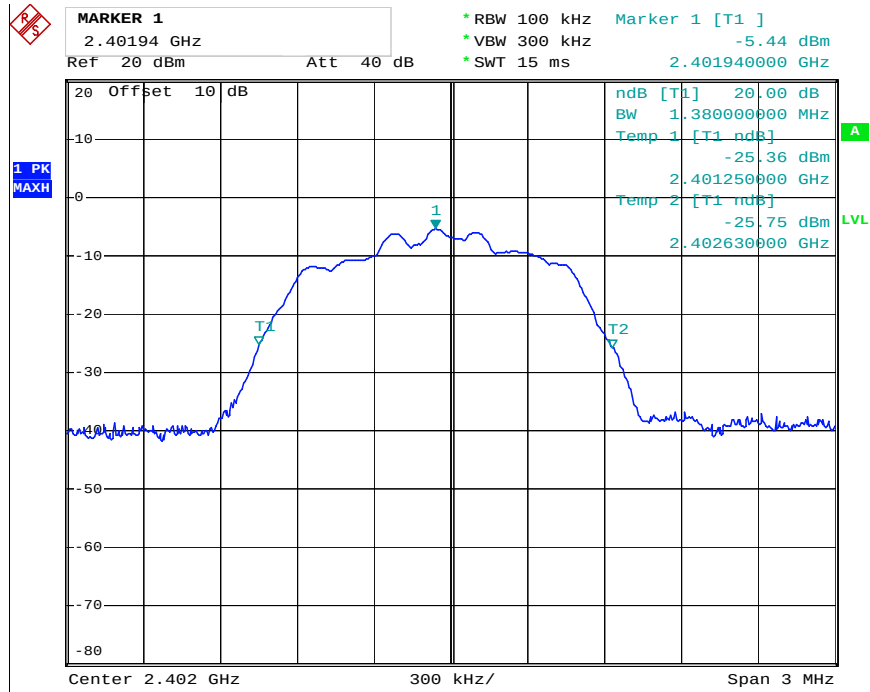


High channel



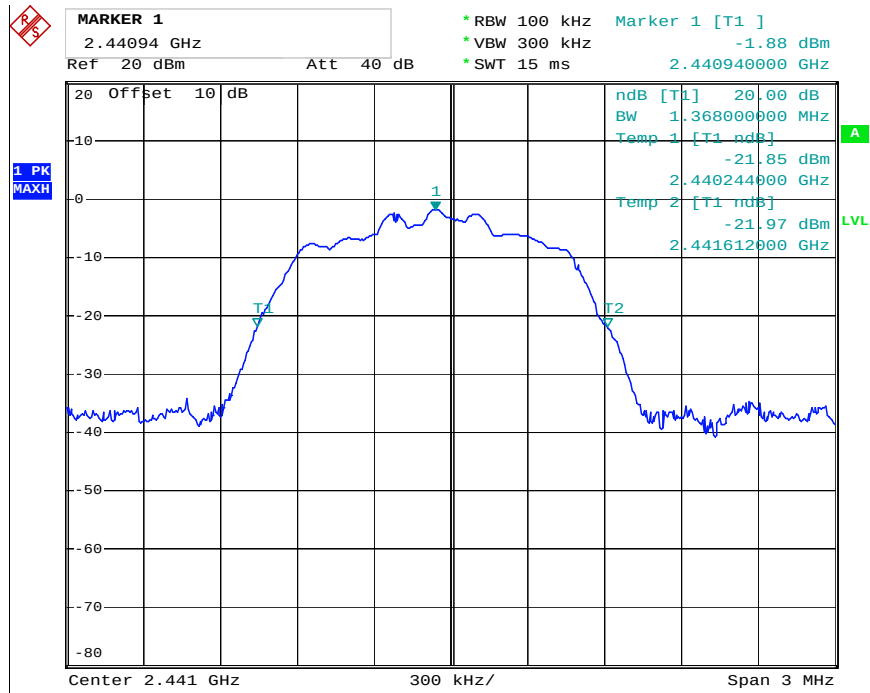
Π/4-DQPSK Mode

Low channel



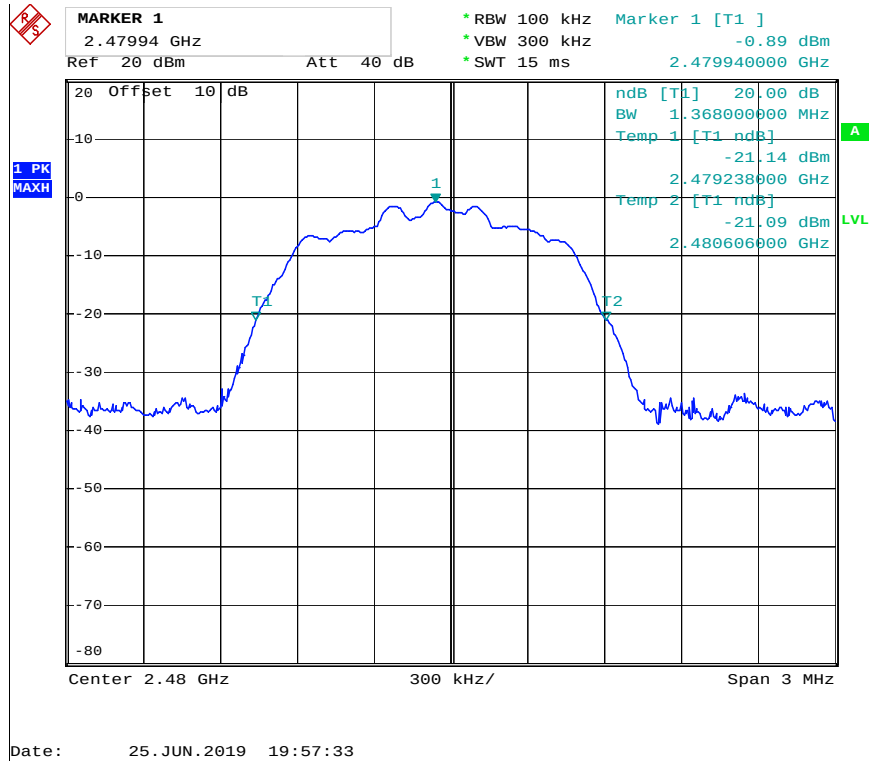
Date: 25.JUN.2019 19:56:27

Middle channel



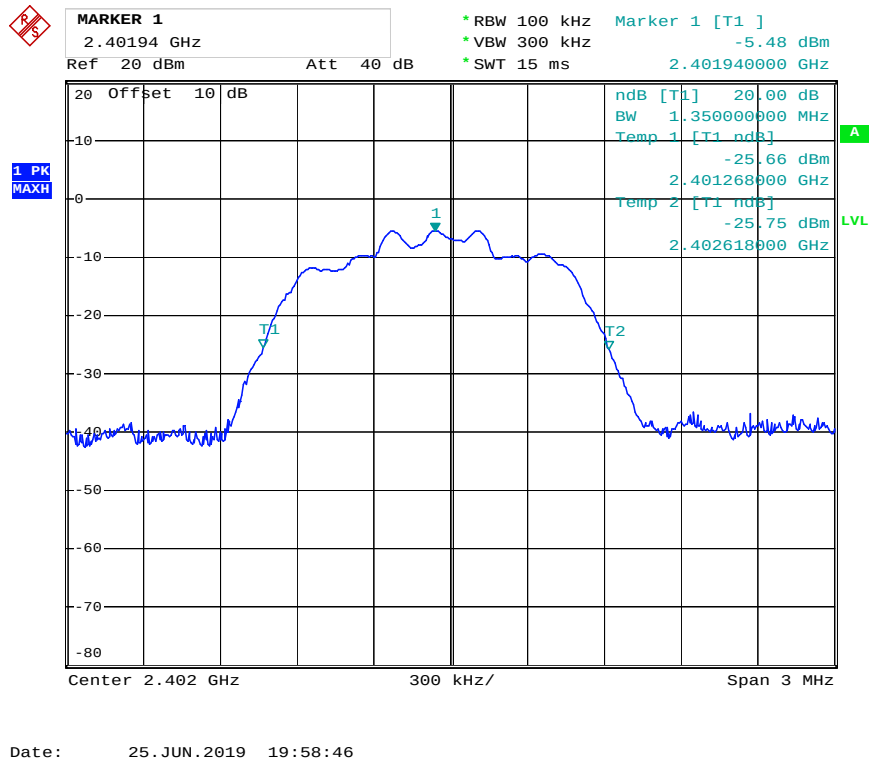
Date: 25.JUN.2019 19:57:04

High channel

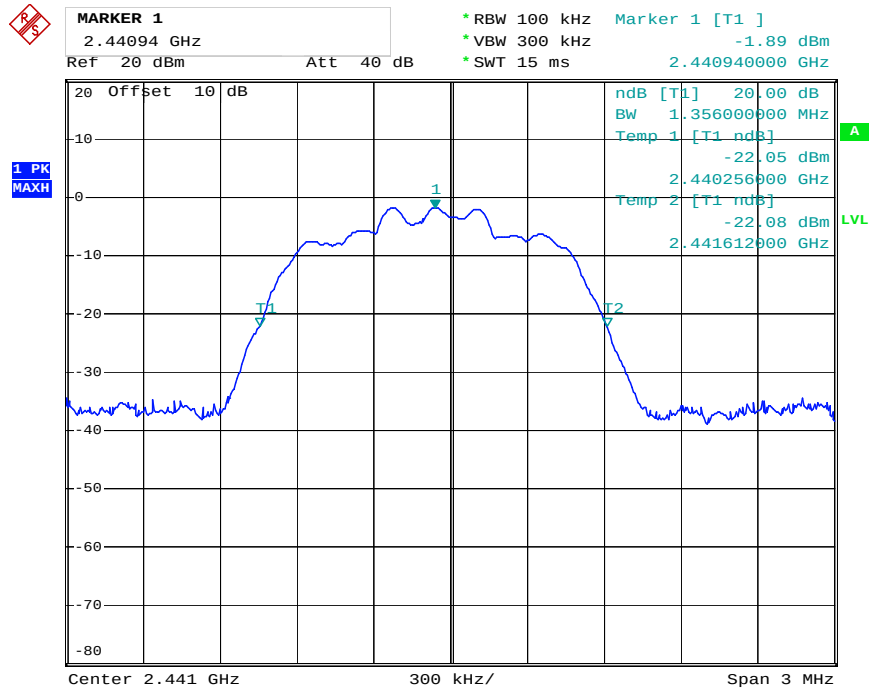


8DPSK Mode

Low channel

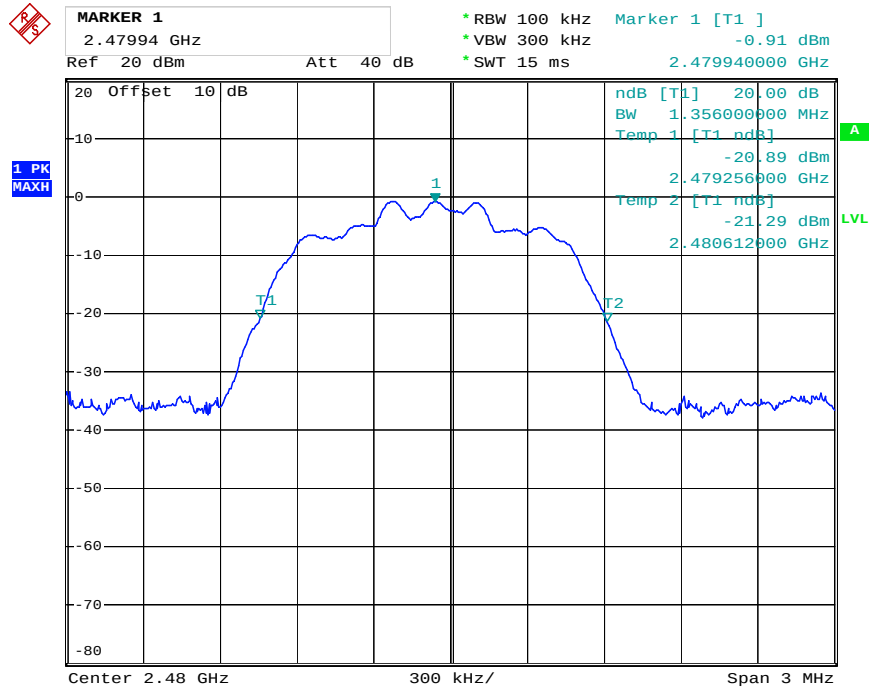


Middle channel



Date: 25.JUN.2019 20:00:19

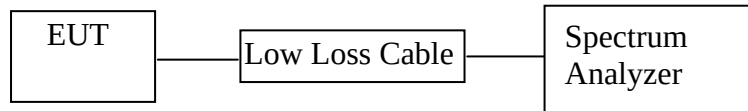
High channel



Date: 25.JUN.2019 20:00:51

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 3 MHz.

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

6.5.4. Measurement the channel separation

6.6. Test Result

Test Lab: Shielding room

GFSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.996	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

Π/4-DQPSK

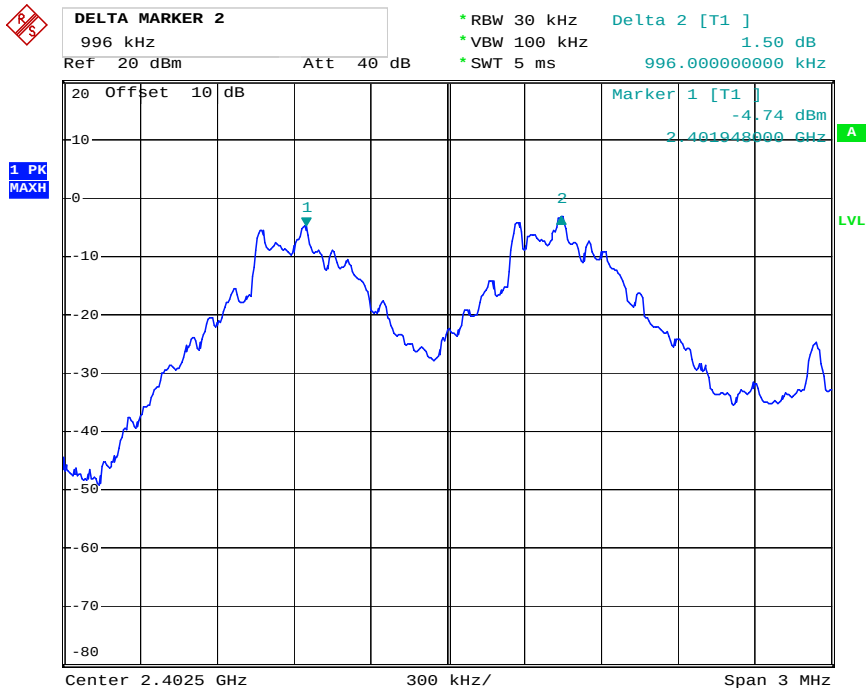
Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.008	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.996	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.008	25KHz or 2/3*20dB bandwidth	Pass
	2480			

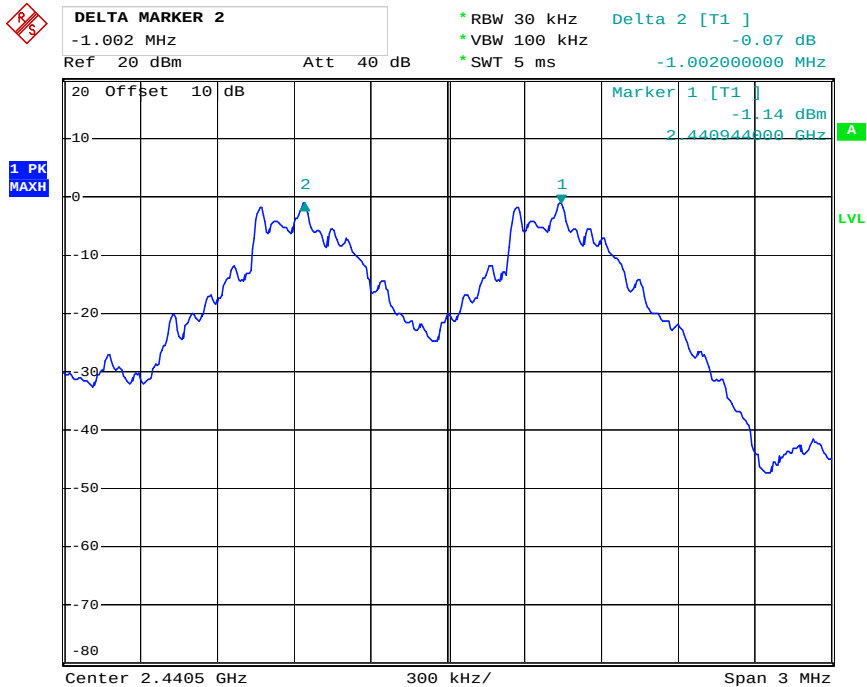
GFSK Mode

Low channel



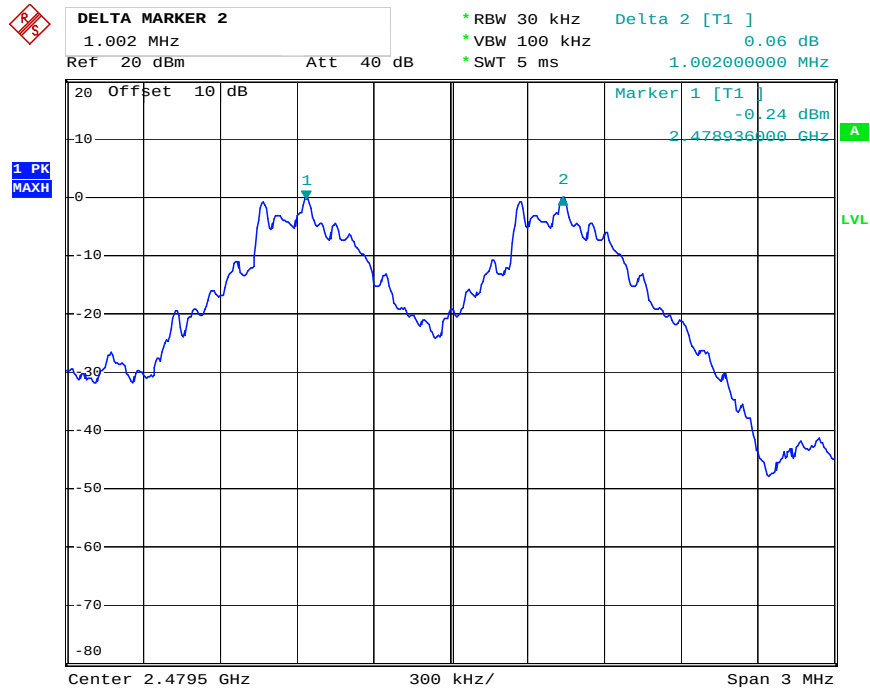
Date: 25.JUN.2019 19:26:12

Middle channel



Date: 25.JUN.2019 19:28:15

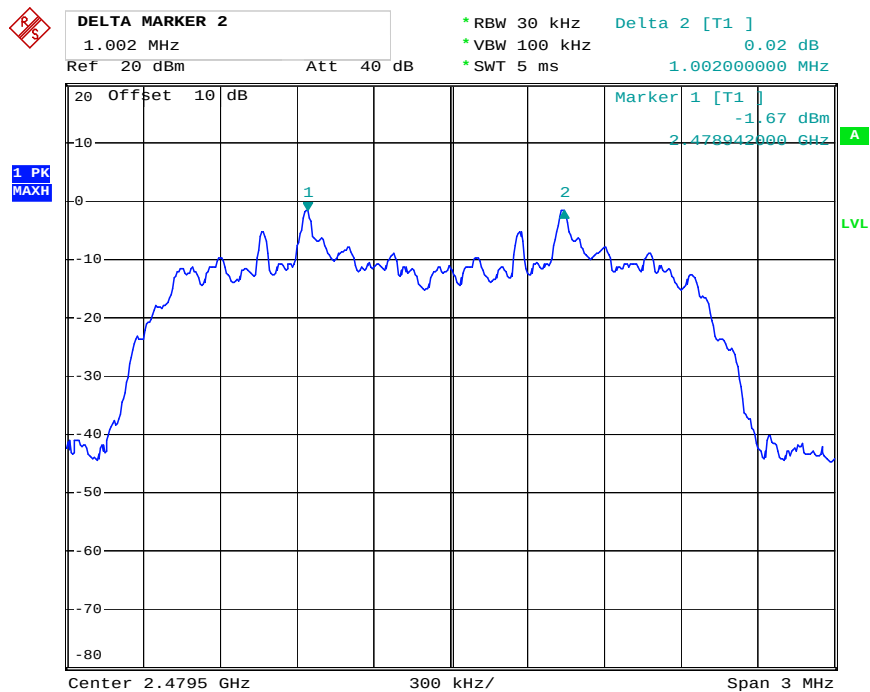
High channel



Date: 25.JUN.2019 19:29:18

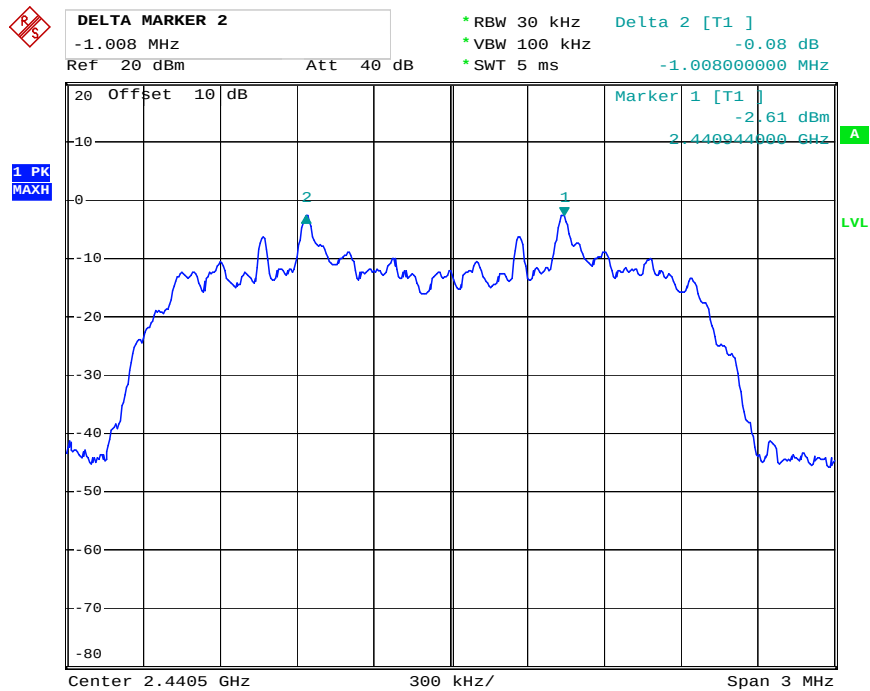
Π/4-DQPSK Mode

Low channel



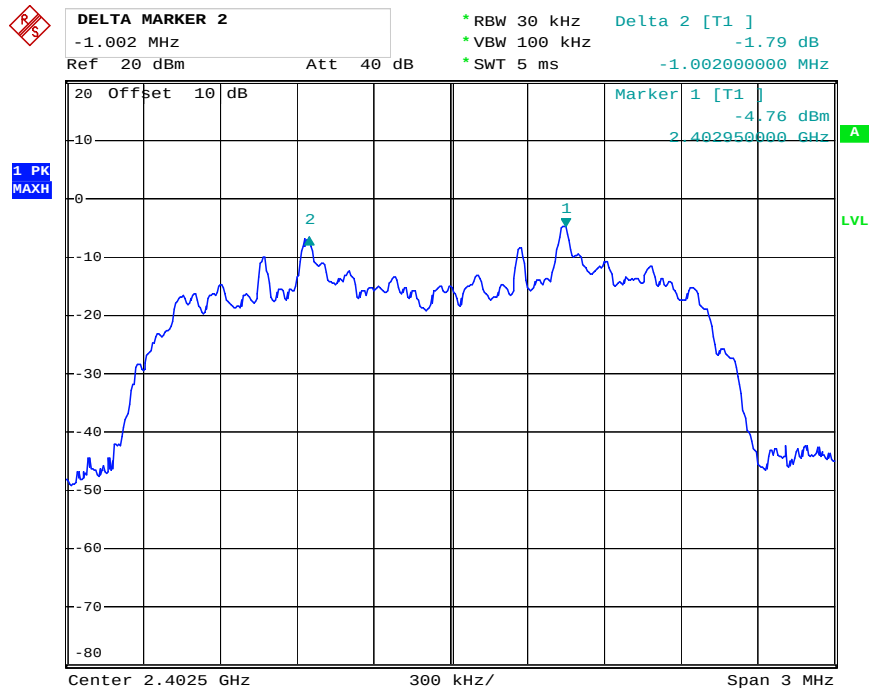
Date: 25.JUN.2019 19:31:09

Middle channel



Date: 25.JUN.2019 19:32:12

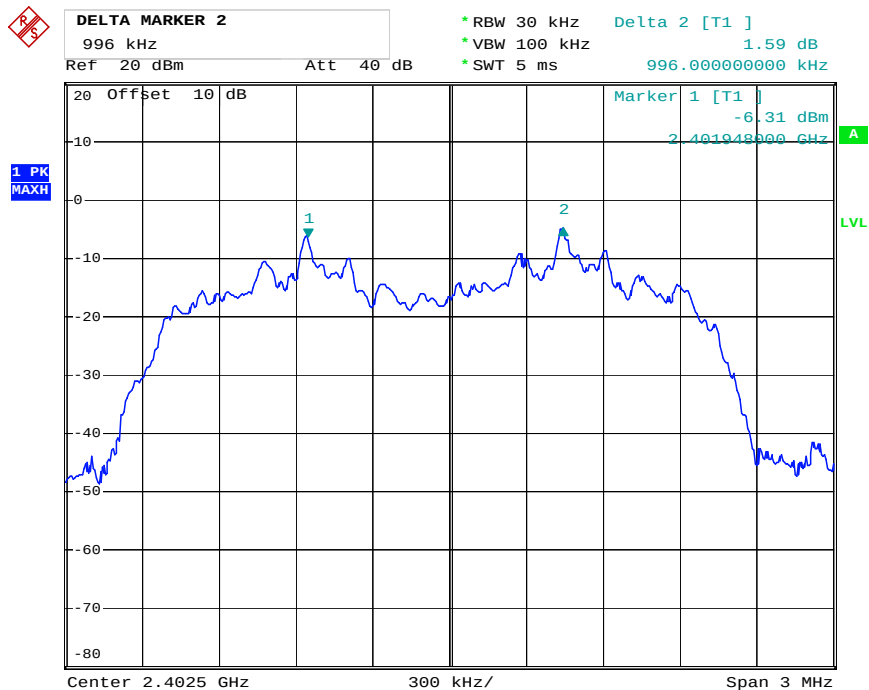
High channel



Date: 25.JUN.2019 19:33:43

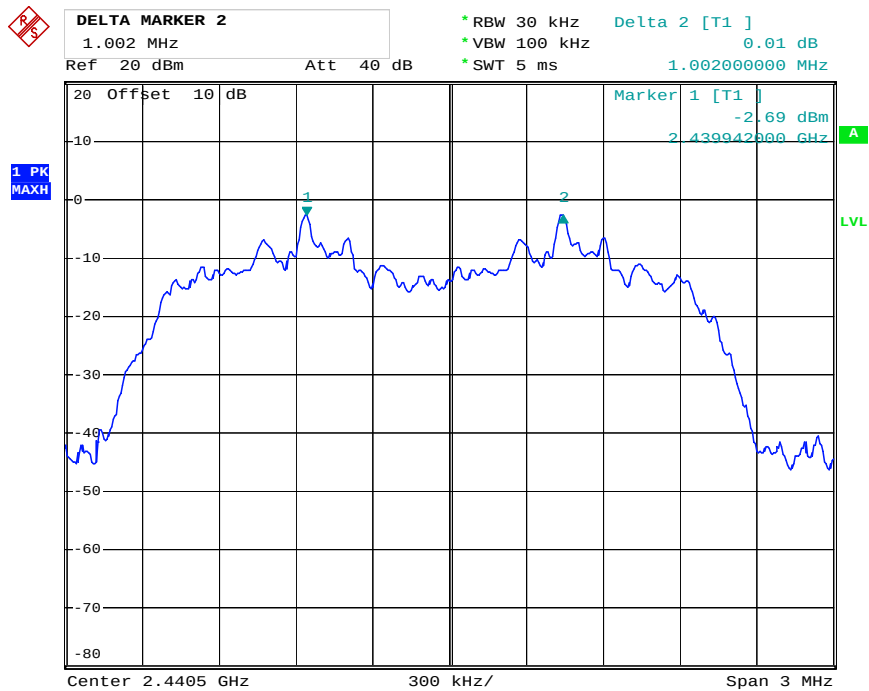
8DPSK Mode

Low channel



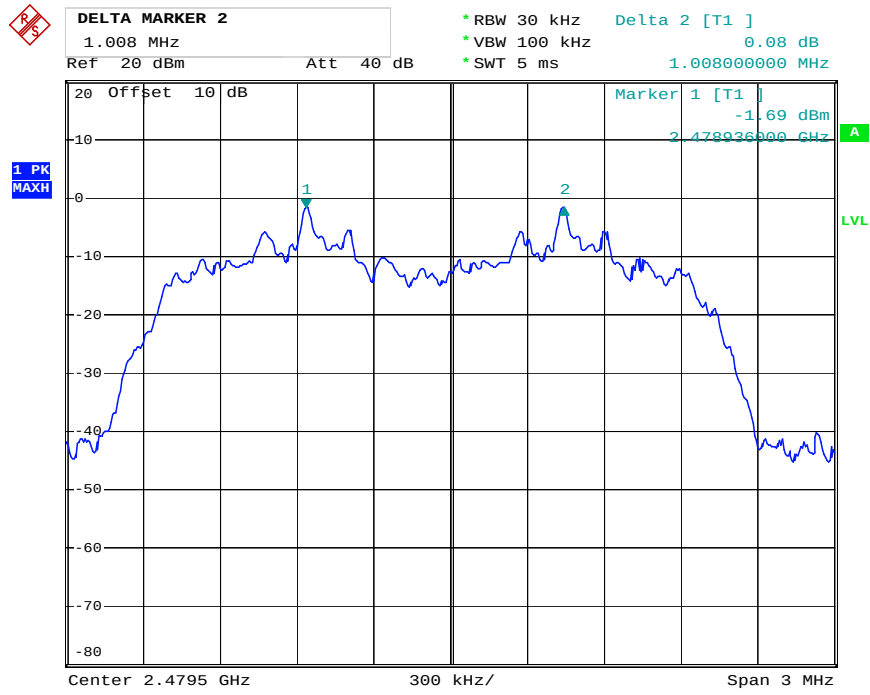
Date: 25.JUN.2019 19:34:52

Middle channel



Date: 25.JUN.2019 19:36:22

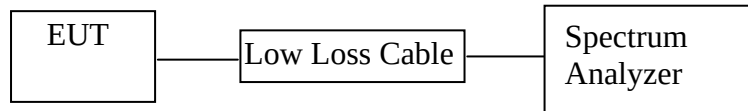
High channel



Date: 25.JUN.2019 19:37:12

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.

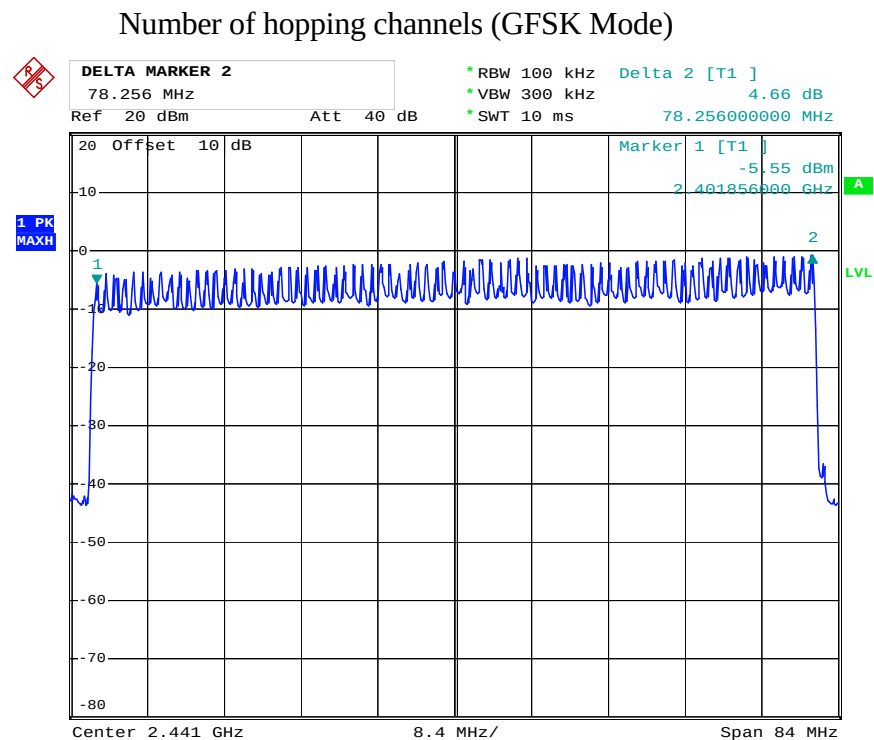
7.5.3. Max hold, view and count how many channel in the band.

7.6.Test Result

Test Lab: Shielding room

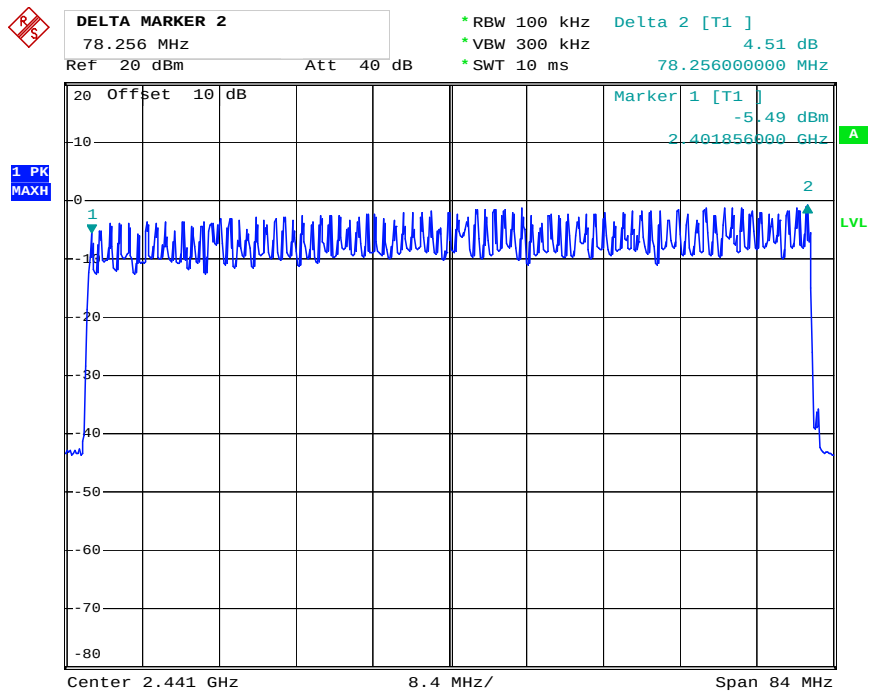
Total number of hopping channel	Measurement result(CH)	Limit(CH)	Result
	79	≥ 15	Pass

The spectrum analyzer plots are attached as below.



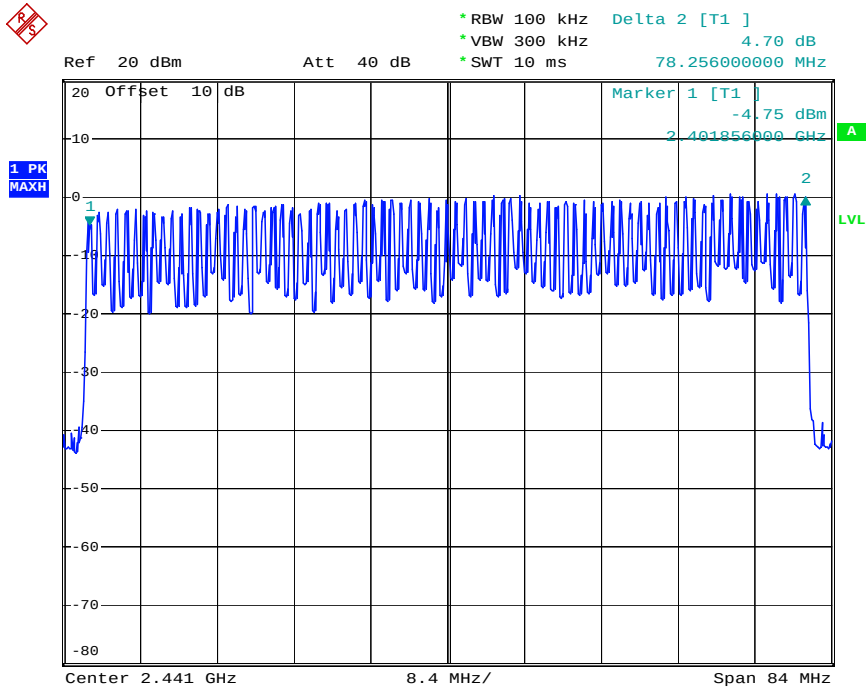
Date: 25.JUN.2019 19:45:56

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



Date: 25.JUN.2019 19:41:25

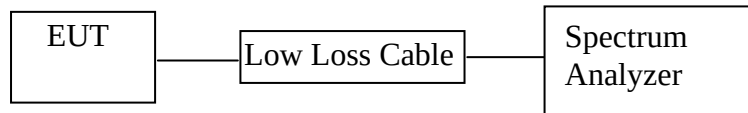
Number of hopping channels (8DPSK Mode)



Date: 25.JUN.2019 19:47:53

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

Test Lab: Shielding room

GFSK Mode (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.42	134.4	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	1.70	272.0	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	2.96	315.7	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

$\Pi/4$ -DQPSK (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.43	137.6	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	1.70	272.0	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	2.95	314.7	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 (Worse case)

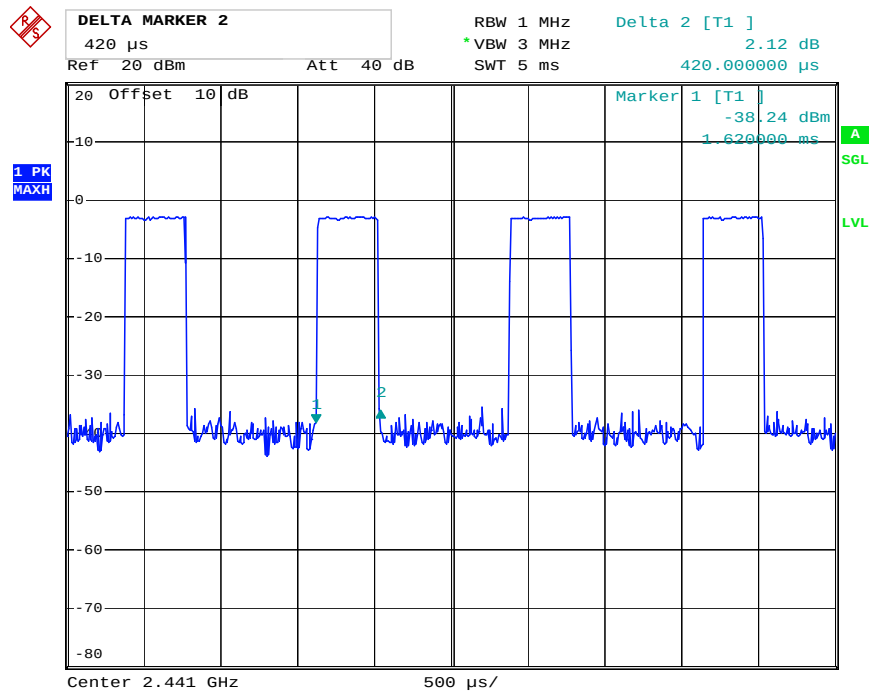
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.43	137.6	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2441	1.69	270.4	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2441	2.96	315.7	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

Note: We tested GFSK mode and $\Pi/4$ -DQPSK & 8DPSK mode the low, middle and high channel and recorded the Worse case data for all test mode.

The spectrum analyzer plots are attached as below.

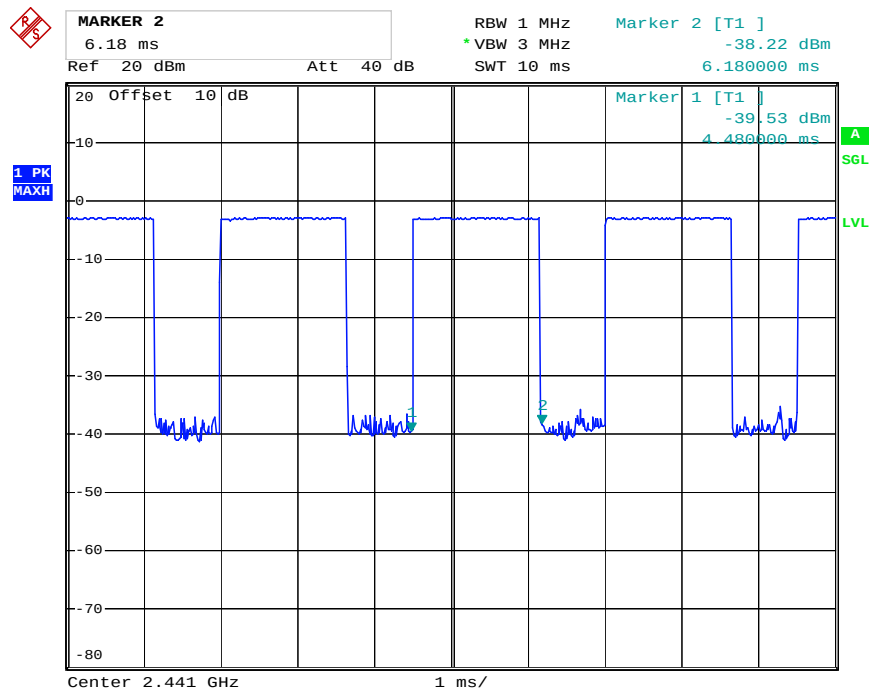
GFSK Mode

DH1 Middle channel



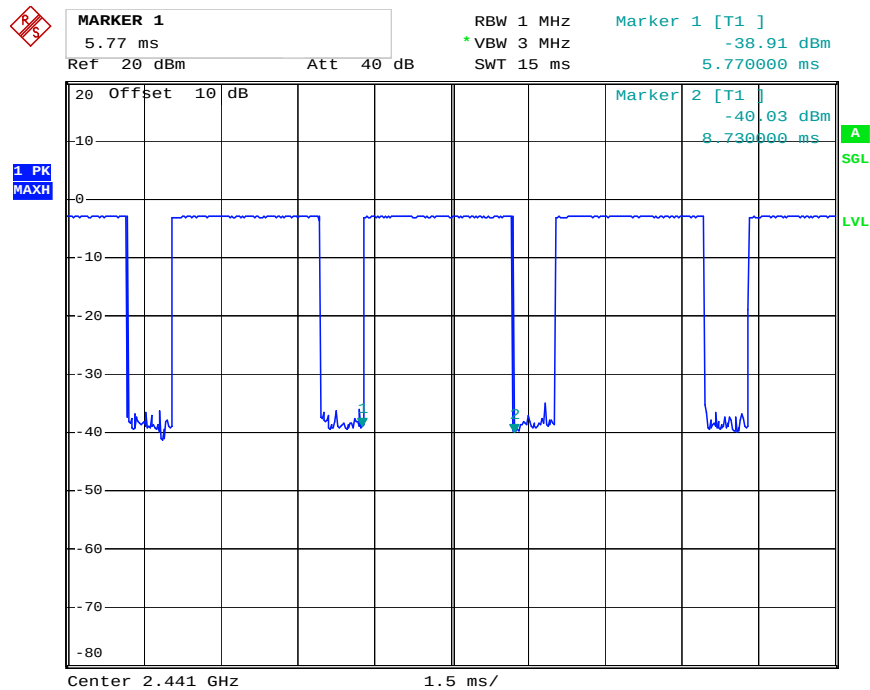
Date: 26.JUN.2019 18:17:10

DH3 Middle channel



Date: 26.JUN.2019 18:19:08

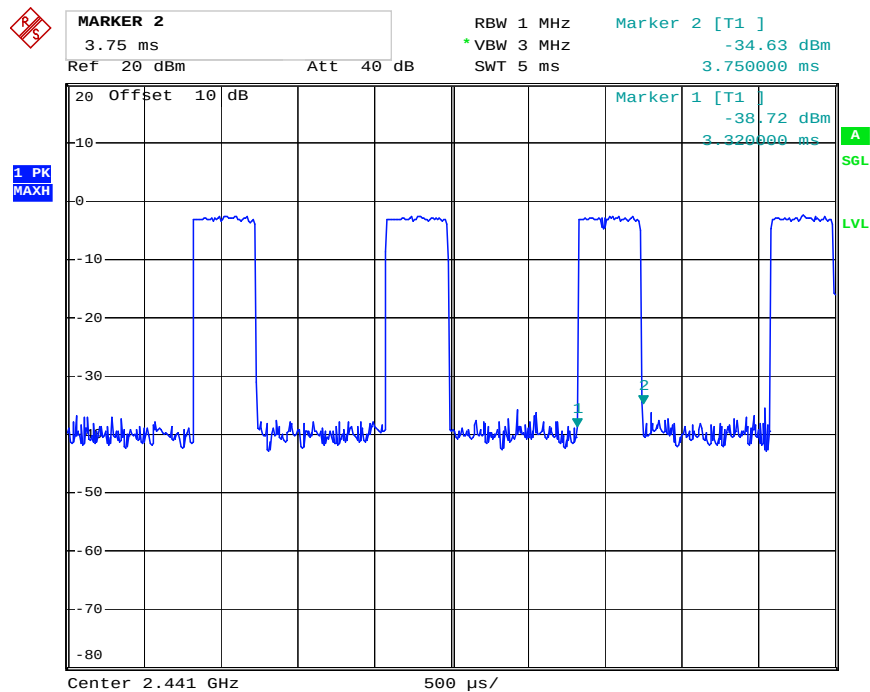
DH5 Middle channel



Date: 26.JUN.2019 18:20:36

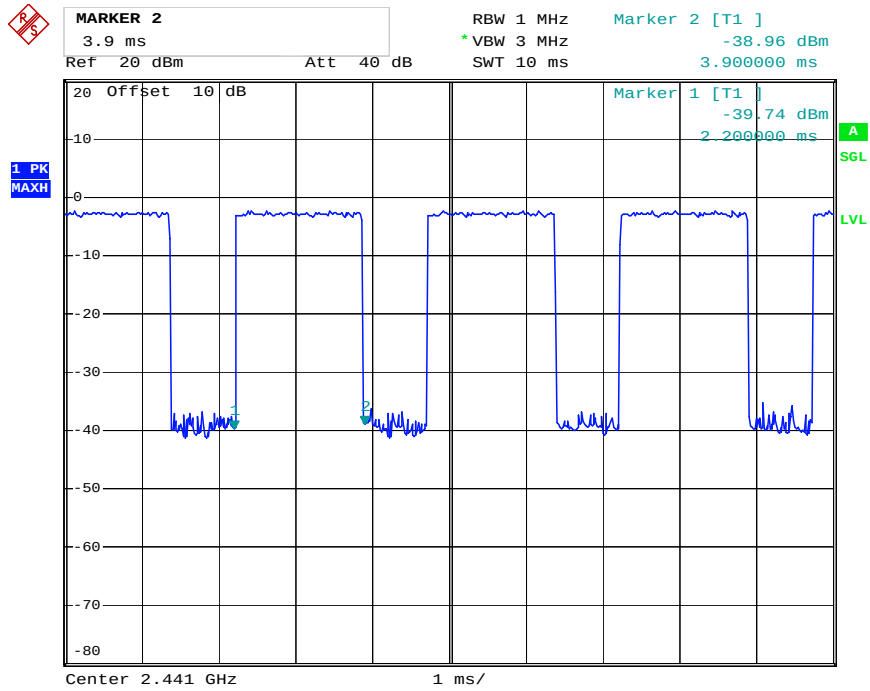
Π/4-DQPSK Mode

2DH1 Middle channel



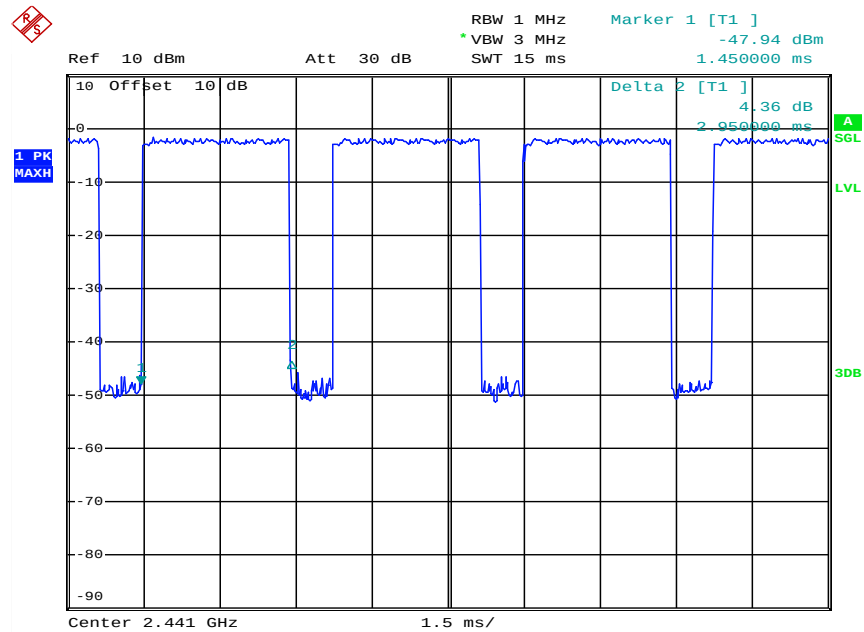
Date: 26.JUN.2019 18:27:18

2DH3 Middle channel



Date: 26.JUN.2019 18:34:05

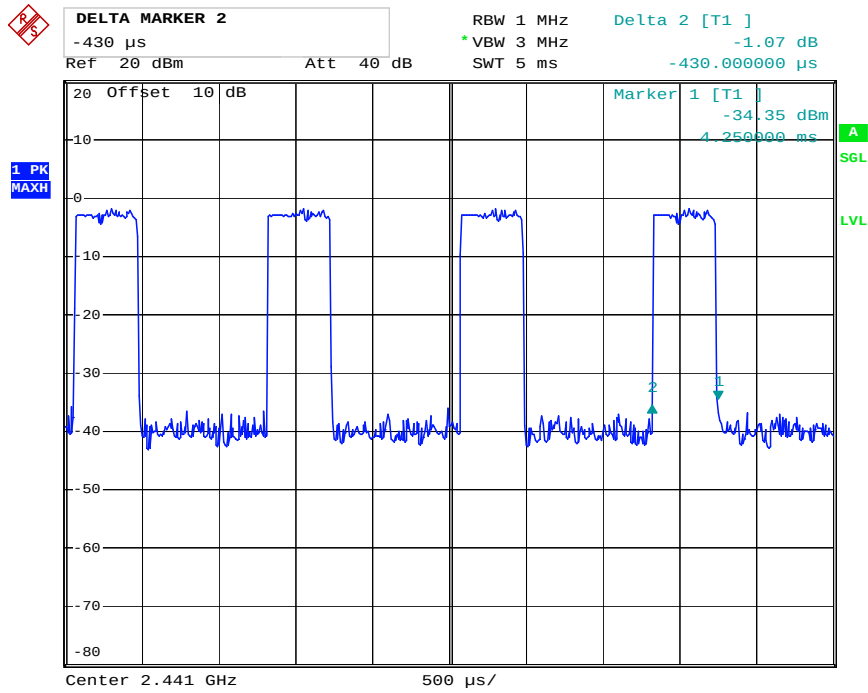
2DH5 Middle channel



Date: 26.JUN.2019 18:36:54

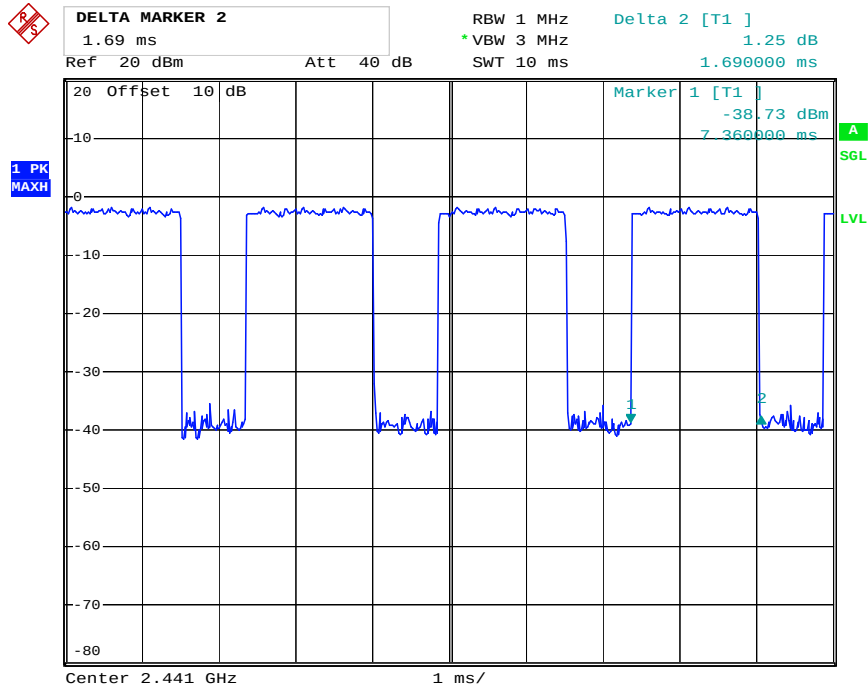
8DPSK Mode

3DH1 Middle channel



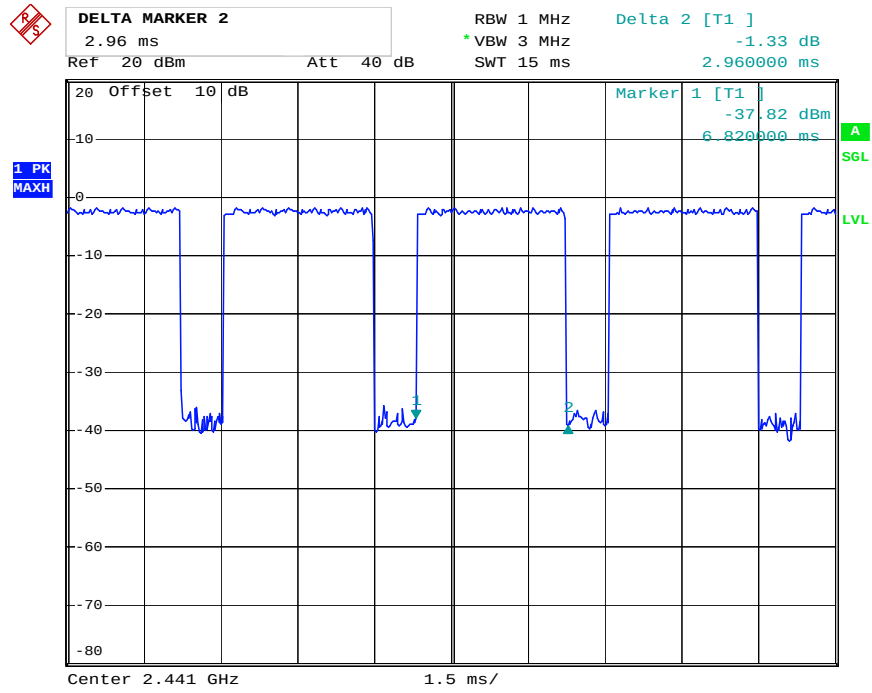
Date: 26.JUN.2019 18:40:50

3DH3 Middle channel



Date: 26.JUN.2019 18:46:26

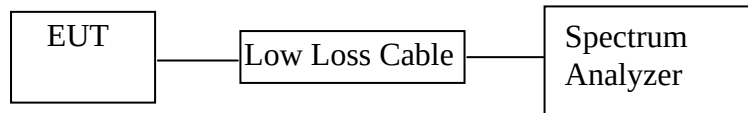
3DH5 Middle channel



Date: 26.JUN.2019 18:48:47

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 10MHz.

9.5.3. Measurement the maximum peak output power.

9.6.Test Result

Test Lab: Shielding room

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-3.33/0.0005	21 / 0.125
Middle	2441	-0.15/0.001	21 / 0.125
High	2480	1.07/0.0013	21 / 0.125

II/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-3.72/0.0004	21 / 0.125
Middle	2441	-0.15/0.001	21 / 0.125
High	2480	0.82/0.0012	21 / 0.125

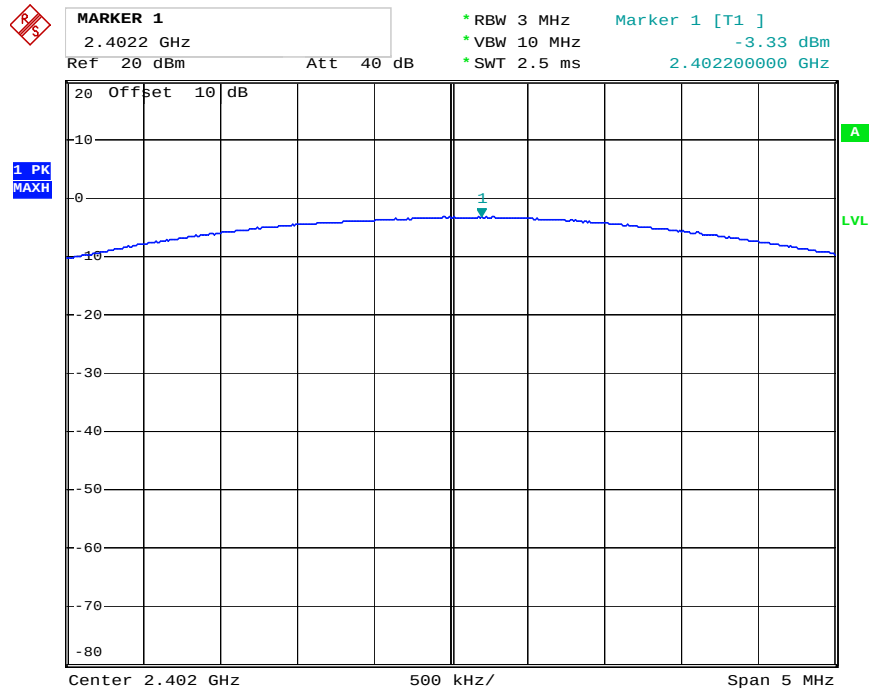
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-4.79/0.0003	21 / 0.125
Middle	2441	-1.16/0.0008	21 / 0.125
High	2480	-0.24/0.0009	21 / 0.125

The spectrum analyzer plots are attached as below.

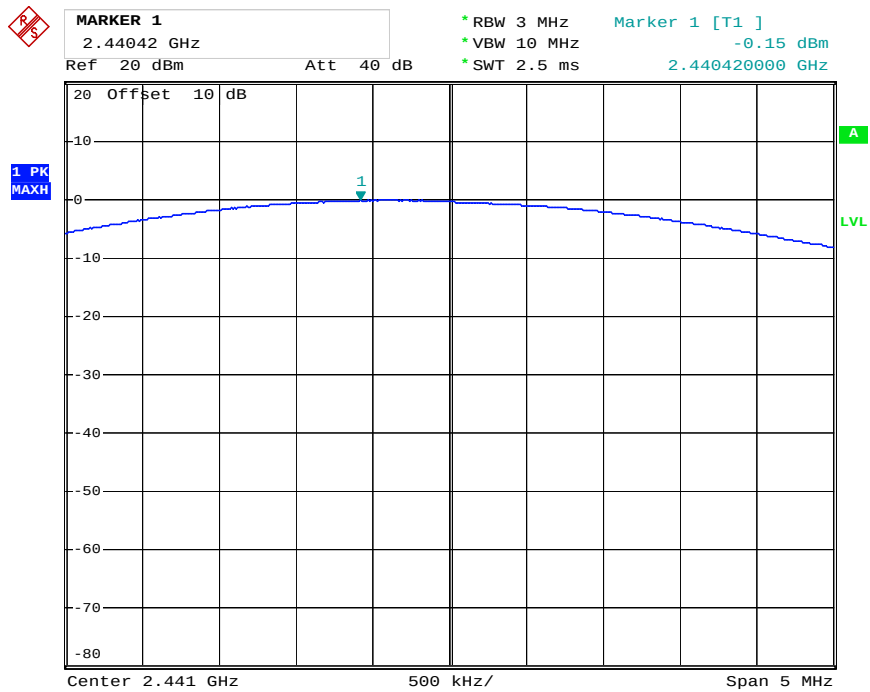
GFSK Mode

Low channel



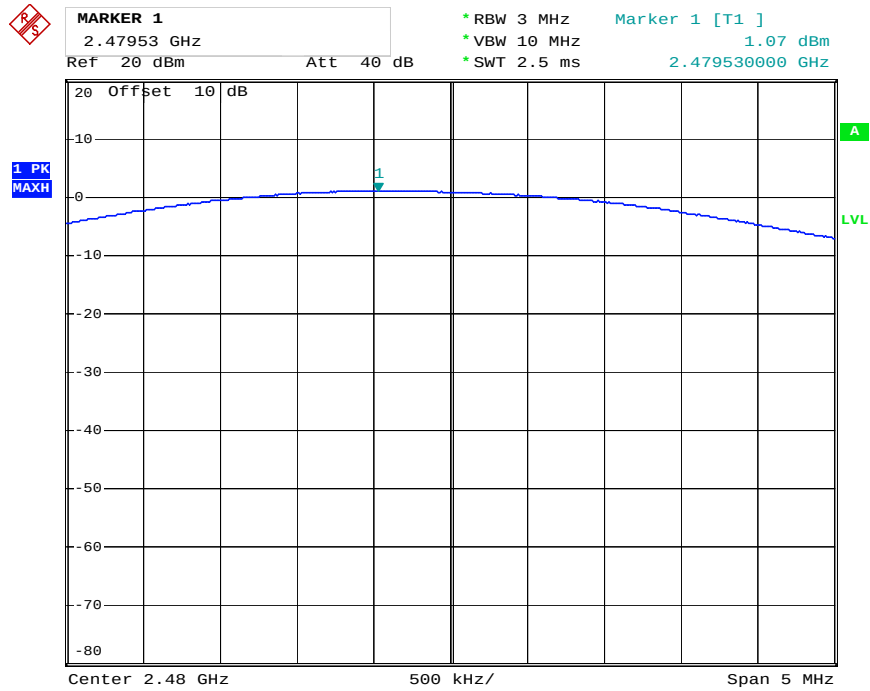
Date: 25.JUN.2019 18:51:14

Middle channel



Date: 25.JUN.2019 18:58:25

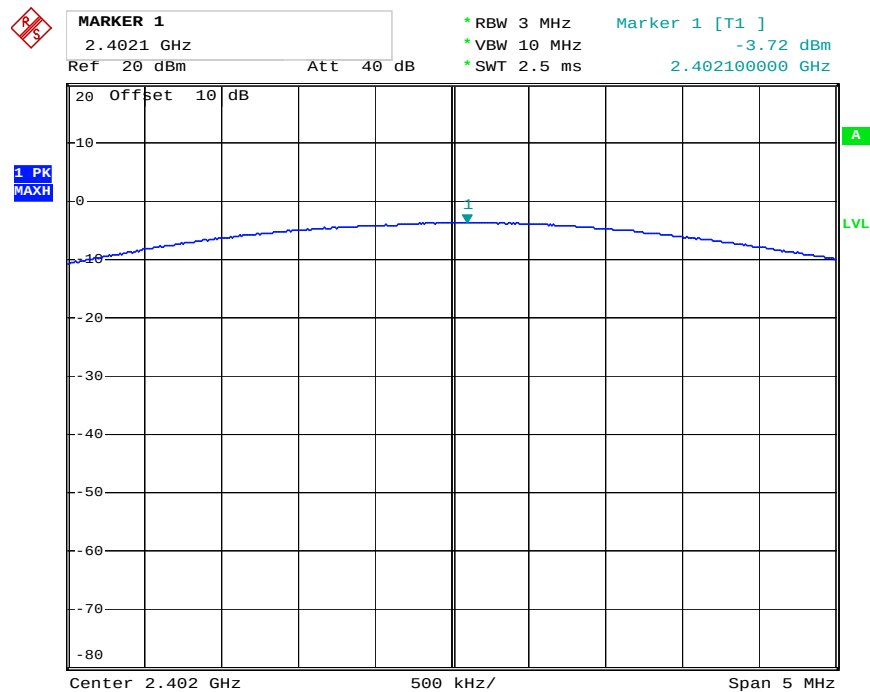
High channel



Date: 25.JUN.2019 18:49:40

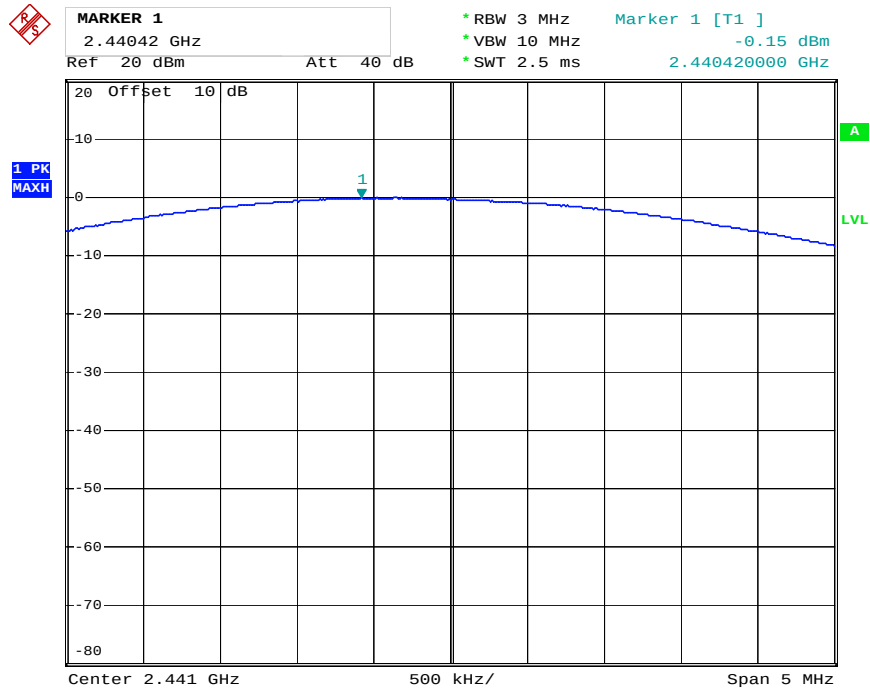
Π/4-DQPSK Mode

Low channel



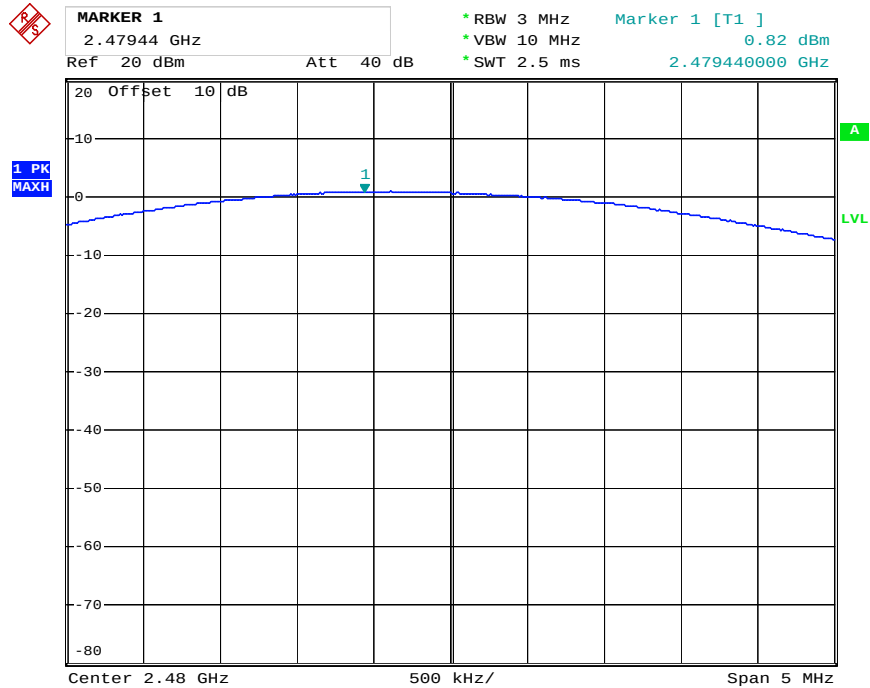
Date: 25.JUN.2019 18:55:08

Middle channel



Date: 25.JUN.2019 18:57:51

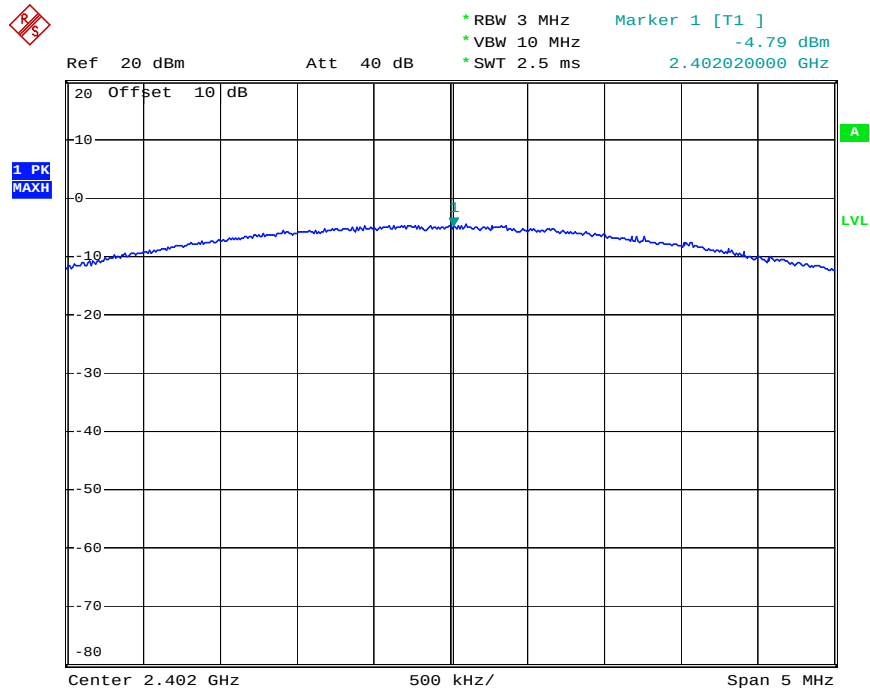
High channel



Date: 25.JUN.2019 18:56:52

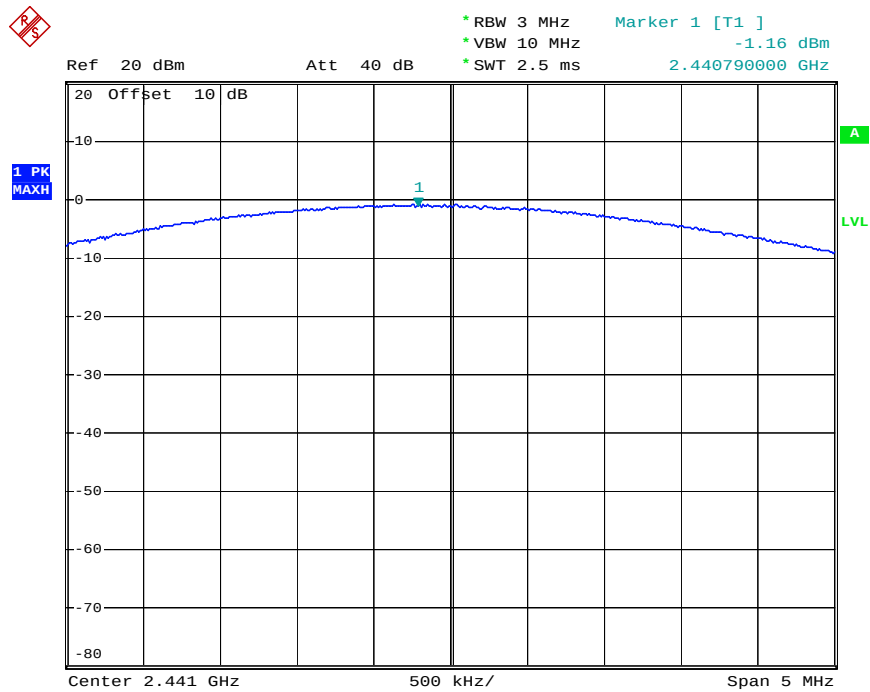
8DPSK Mode

Low channel



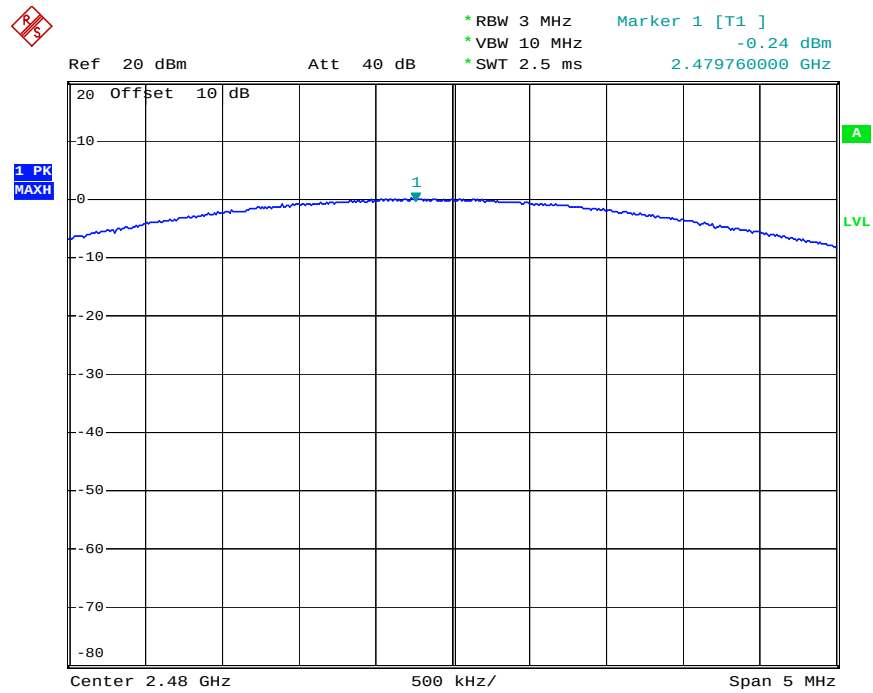
Date: 25.JUN.2019 19:16:18

Middle channel



Date: 25.JUN.2019 19:15:04

High channel

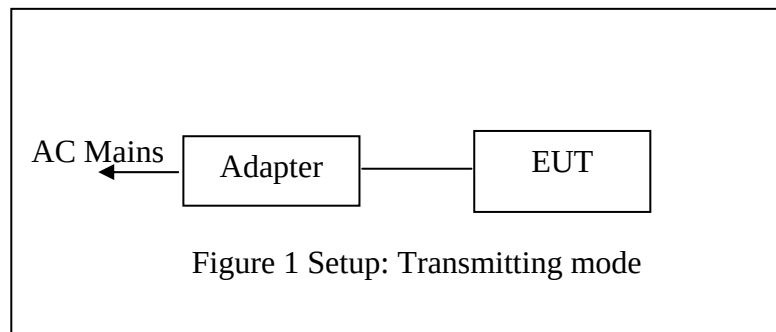


Date: 25.JUN.2019 19:17:45

10.RADIATED EMISSION TEST

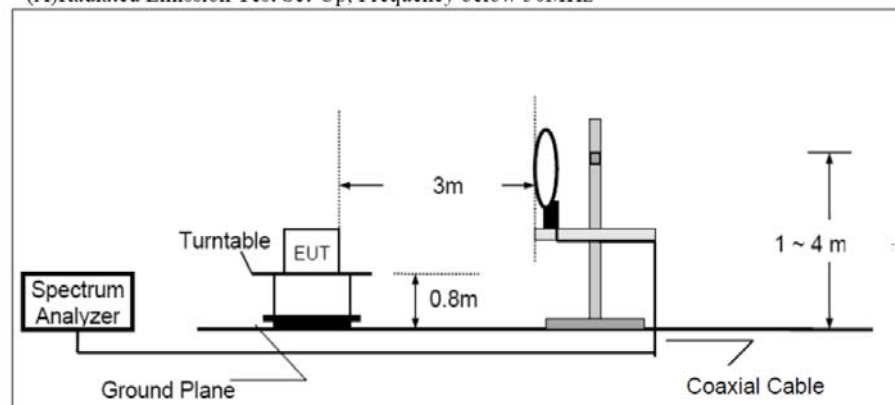
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

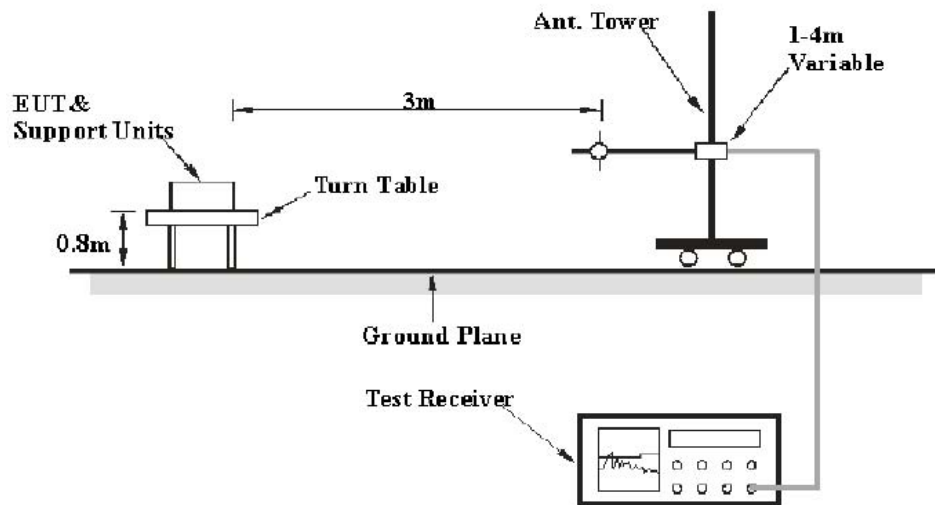


10.1.2.Semi-Anechoic Chamber Test Setup Diagram

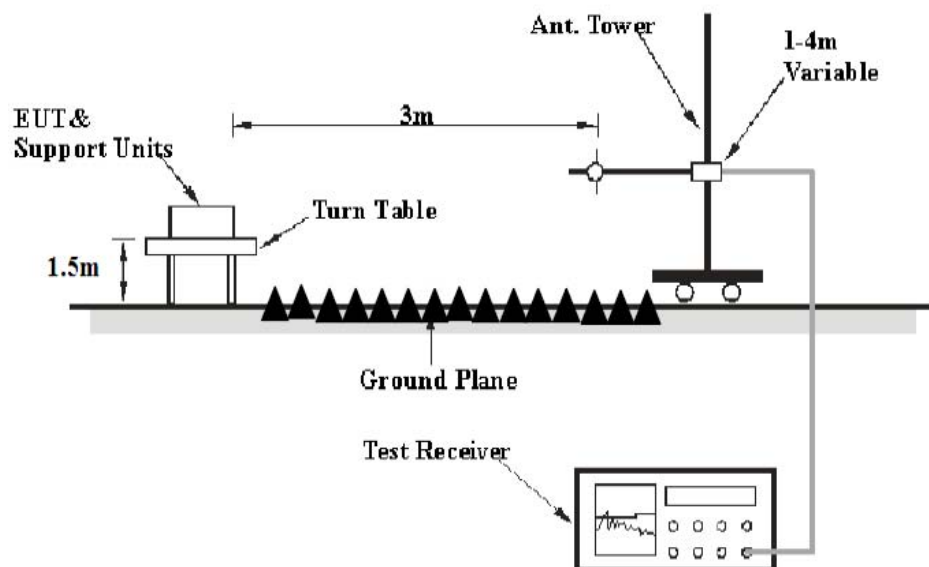
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(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 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. 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 0.8 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. This EUT was tested in 3 orthogonal positions and the Worse case position data was reported.

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	28.66	-15.19	13.47	40.0	-26.53	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.Tetst Results

Pass.

Test Lab: 3m Anechoic chamber

Note: 1.We tested GFSK mode, $\Pi/4$ -DQPSK Mode & 8DPSK mode and recorded the Worse case data (GFSK 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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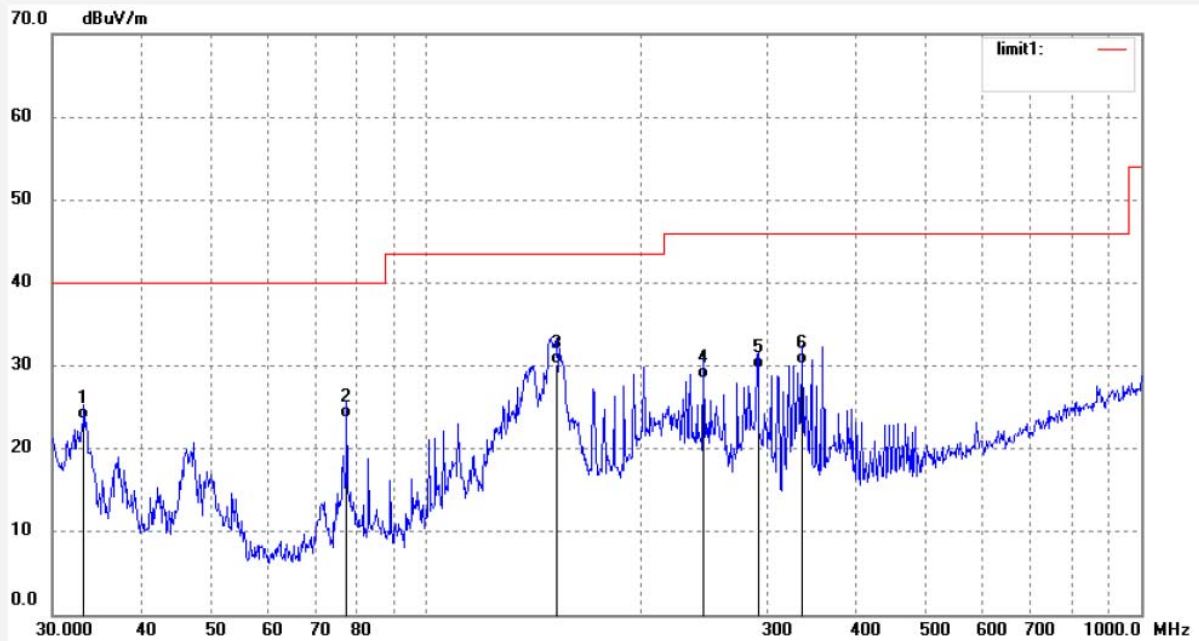
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: jp2018 #437
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: AV ROOM TURNTABLE
Mode: TX 2402MHz
Model: CR6253U-001A
Manufacturer: Timsen Development Limited

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2019/06/22
Time: 11:35:08
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.2180	44.60	-21.00	23.60	40.00	-16.40	QP	100	115	
2	77.4680	51.25	-27.55	23.70	40.00	-16.30	QP	100	126	
3	152.0902	58.07	-27.87	30.20	43.50	-13.30	QP	100	185	
4	244.4004	52.18	-23.68	28.50	46.00	-17.50	QP	100	215	
5	291.3388	51.31	-21.61	29.70	46.00	-16.30	QP	100	245	
6	335.3016	50.08	-19.88	30.20	46.00	-15.80	QP	100	306	



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Site: 1# Chamber

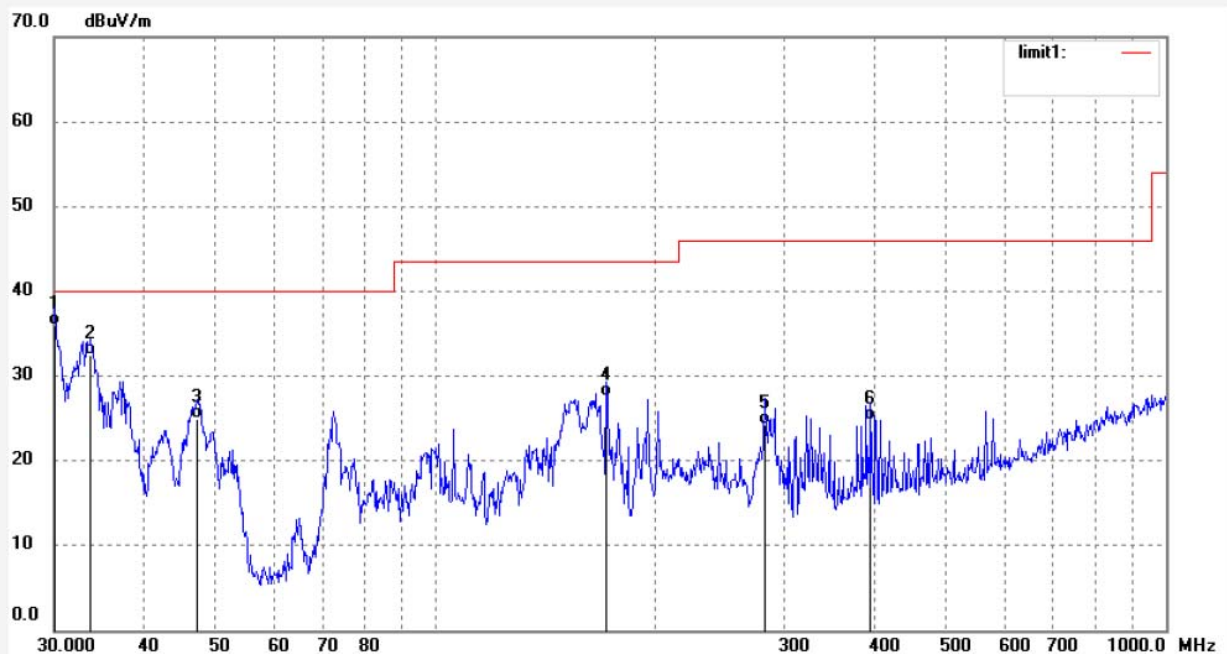
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2018 #438
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: AV ROOM TURNTABLE
Mode: TX 2402MHz
Model: CR6253U-001A
Manufacturer: Timsen Development Limited

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2019/06/22
Time: 11:37:57
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.1056	56.13	-20.23	35.90	40.00	-4.10	QP	100	132	
2	33.6881	53.62	-21.12	32.50	40.00	-7.50	QP	100	165	
3	47.2026	50.10	-25.20	24.90	40.00	-15.10	QP	100	185	
4	171.3890	53.63	-26.13	27.50	43.50	-16.00	QP	100	196	
5	282.2702	46.21	-22.01	24.20	46.00	-21.80	QP	100	245	
6	394.1199	43.21	-18.41	24.80	46.00	-21.20	QP	100	316	



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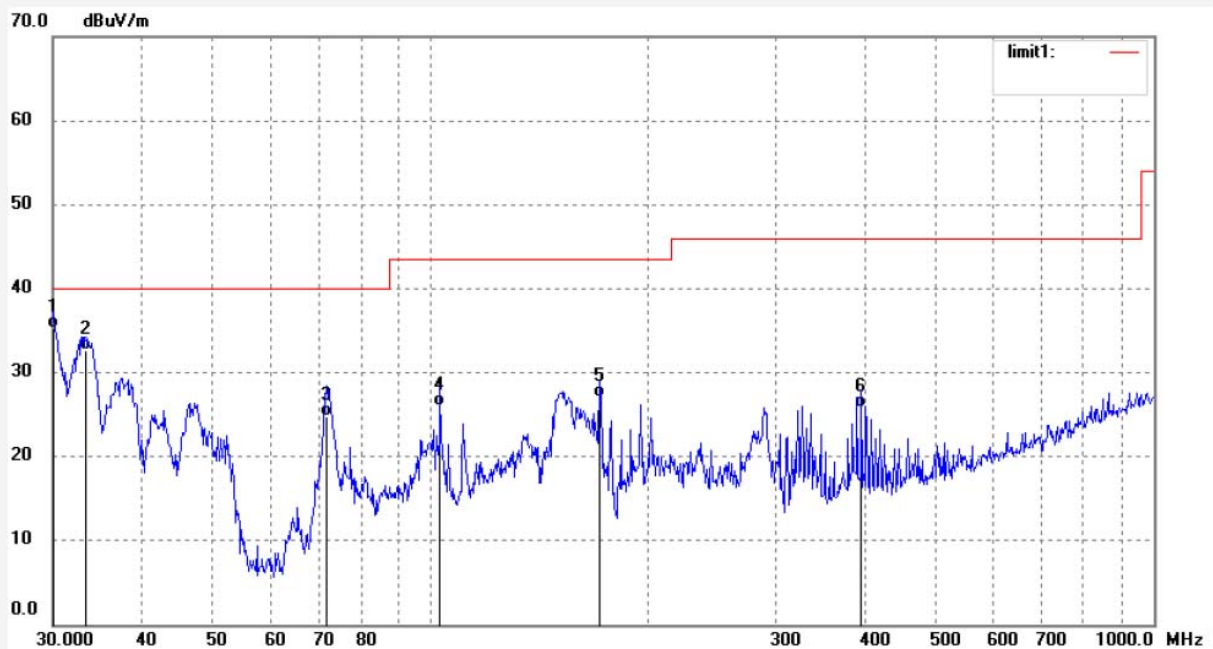
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: jp2018 #439
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: AV ROOM TURNTABLE
Mode: TX 2441MHz
Model: CR6253U-001A
Manufacturer: Timsen Development Limited

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2019/06/22
Time: 11:39:51
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.0000	55.42	-20.20	35.22	40.00	-4.78	QP	100	126	
2	33.3349	53.63	-21.03	32.60	40.00	-7.40	QP	100	145	
3	71.7054	52.36	-27.56	24.80	40.00	-15.20	QP	100	178	
4	102.9729	54.10	-28.10	26.00	43.50	-17.50	QP	100	215	
5	171.3890	53.23	-26.13	27.10	43.50	-16.40	QP	100	236	
6	394.1199	44.21	-18.41	25.80	46.00	-20.20	QP	100	285	



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Site: 1# Chamber

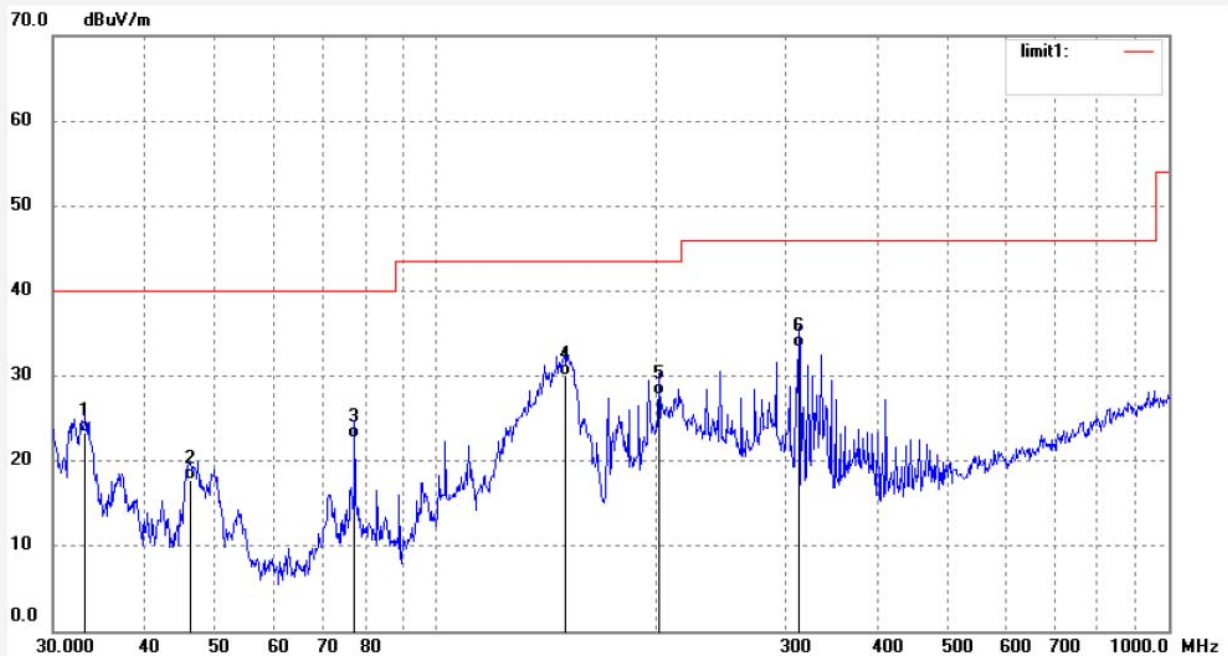
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2018 #440
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: AV ROOM TURNTABLE
Mode: TX 2441MHz
Model: CR6253U-001A
Manufacturer: Timsen Development Limited

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2019/06/22
Time: 11:41:32
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.2180	44.30	-21.00	23.30	40.00	-16.70	QP	100	165	
2	46.2180	42.55	-24.85	17.70	40.00	-22.30	QP	100	175	
3	77.4680	50.15	-27.55	22.60	40.00	-17.40	QP	100	195	
4	149.9676	58.15	-28.05	30.10	43.50	-13.40	QP	100	215	
5	201.4539	52.10	-24.30	27.80	43.50	-15.70	QP	100	265	
6	312.5482	54.16	-20.86	33.30	46.00	-12.70	QP	100	315	



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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2018 #441

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2480MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Vertical

Power Source: AC 120V/60Hz

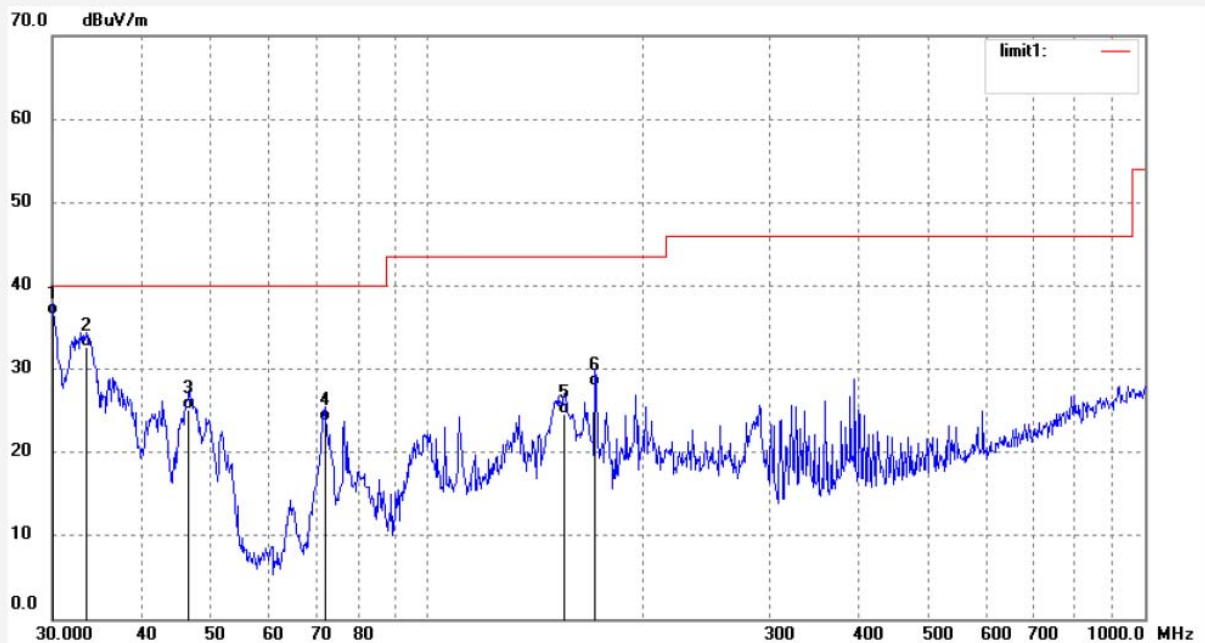
Date: 2019/06/22

Time: 11:43:31

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.0000	56.70	-20.20	36.50	40.00	-3.50	QP	100	125	
2	33.4522	53.66	-21.06	32.60	40.00	-7.40	QP	100	145	
3	46.5439	50.17	-24.97	25.20	40.00	-14.80	QP	100	163	
4	71.9578	51.27	-27.57	23.70	40.00	-16.30	QP	100	185	
5	155.3305	52.18	-27.58	24.60	43.50	-18.90	QP	100	215	
6	171.3890	54.13	-26.13	28.00	43.50	-15.50	QP	100	305	



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Job No.: jp2018 #442

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2480MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Horizontal

Power Source: AC 120V/60Hz

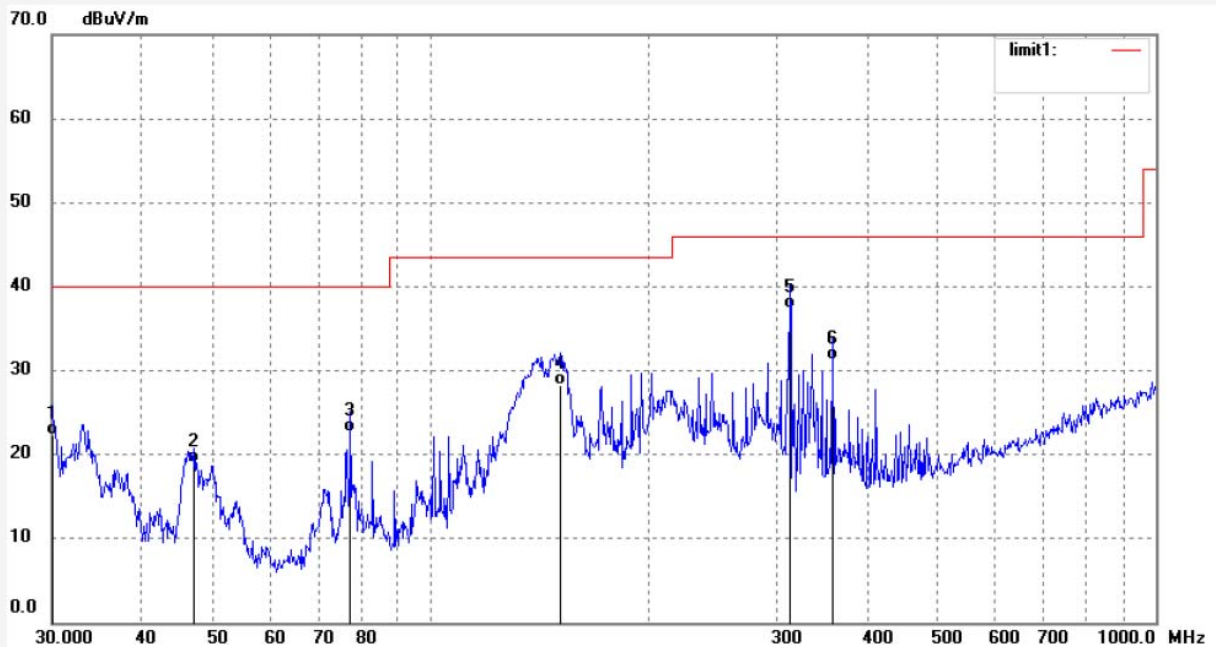
Date: 2019/06/22

Time: 11:45:29

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.0000	42.60	-20.20	22.40	40.00	-17.60	QP	100	136	
2	47.2026	44.20	-25.20	19.00	40.00	-21.00	QP	100	215	
3	77.4680	50.15	-27.55	22.60	40.00	-17.40	QP	100	186	
4	151.0252	56.26	-27.96	28.30	43.50	-15.20	QP	100	205	
5	312.5482	58.26	-20.86	37.40	46.00	-8.60	QP	100	195	
6	358.4497	50.18	-18.98	31.20	46.00	-14.80	QP	100	245	

Above 1GHz



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Job No.: jp2018 #428

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2402MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Horizontal

Power Source: AC 120V/60Hz

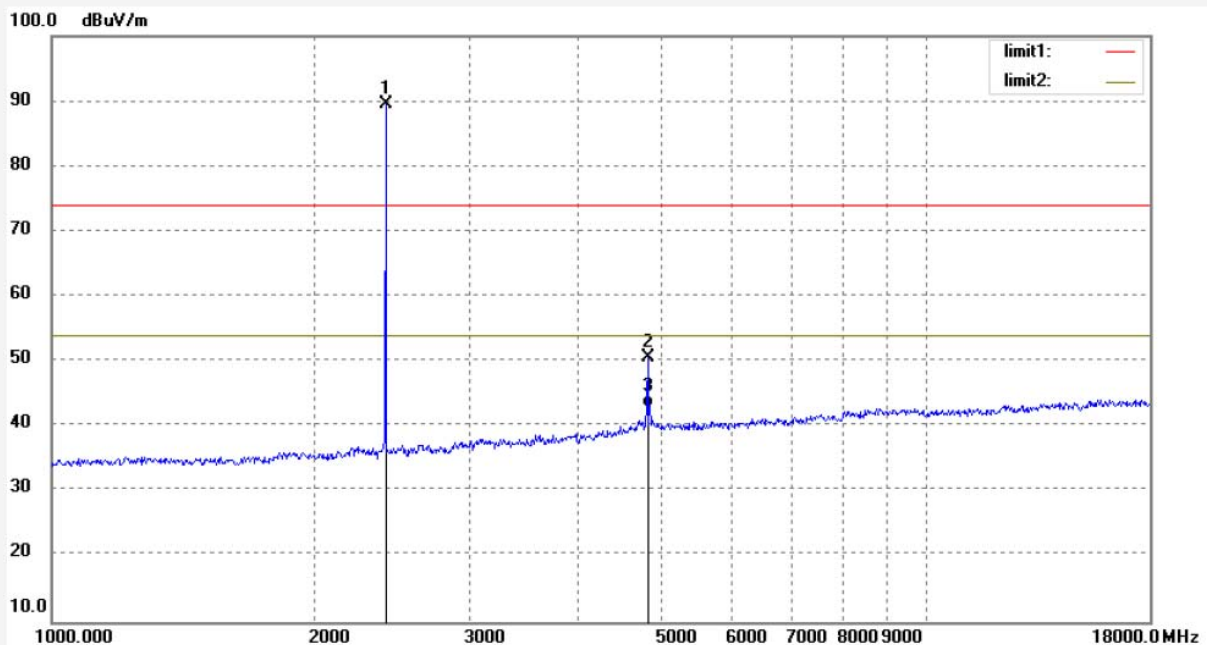
Date: 2019/06/21

Time: 18:42:44

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	95.83	-6.26	89.57			peak	100	121	
2	4804.000	49.61	1.00	50.61	74.00	-23.39	peak	100	165	
3	4804.000	41.90	1.00	42.90	54.00	-11.10	AVG	100	165	



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Job No.: jp2018 #427

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2402MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Vertical

Power Source: AC 120V/60Hz

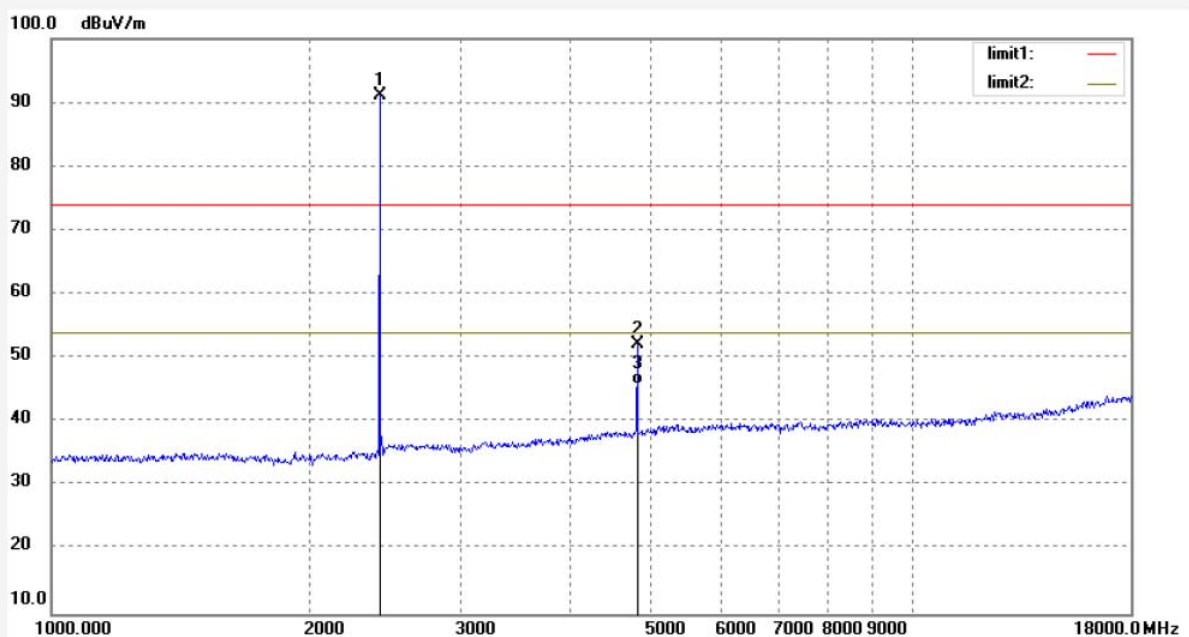
Date: 2019/06/21

Time: 18:39:27

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	97.34	-6.24	91.10			peak	100	154	
2	4804.000	51.15	1.00	52.15	74.00	-21.85	peak	100	185	
3	4804.000	44.90	1.00	45.90	54.00	-8.10	AVG	100	185	



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Job No.: jp2018 #426

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2441MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Vertical

Power Source: AC 120V/60Hz

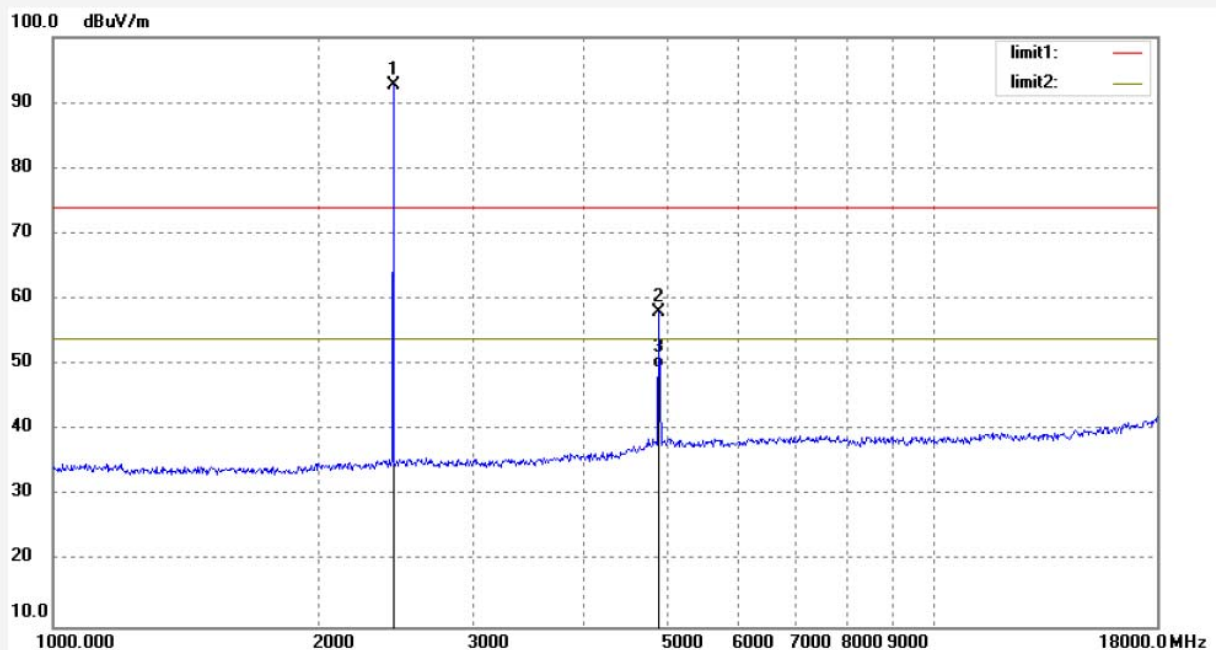
Date: 2019/06/21

Time: 18:37:57

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.000	98.87	-6.10	92.77			peak	100	155	
2	4882.000	56.66	1.35	58.01	74.00	-15.99	peak	100	175	
3	4882.000	48.04	1.36	49.40	54.00	-4.60	AVG	100	175	



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Job No.: jp2018 #425

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2441MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Horizontal

Power Source: AC 120V/60Hz

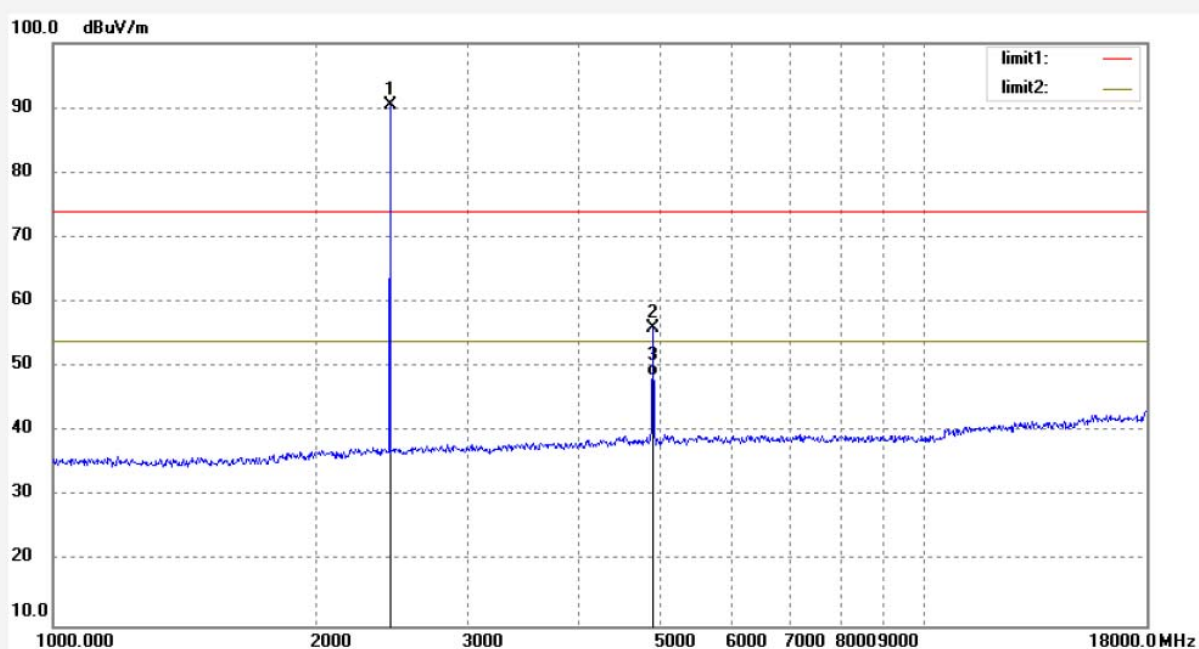
Date: 2019/06/21

Time: 18:35:48

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.000	96.62	-6.10	90.52			peak	100	36	
2	4882.000	54.59	1.36	55.95	74.00	-18.05	peak	100	196	
3	4882.000	47.24	1.36	48.60	54.00	-5.40	AVG	100	196	



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Job No.: jp2018 #424

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2480MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Horizontal

Power Source: AC 120V/60Hz

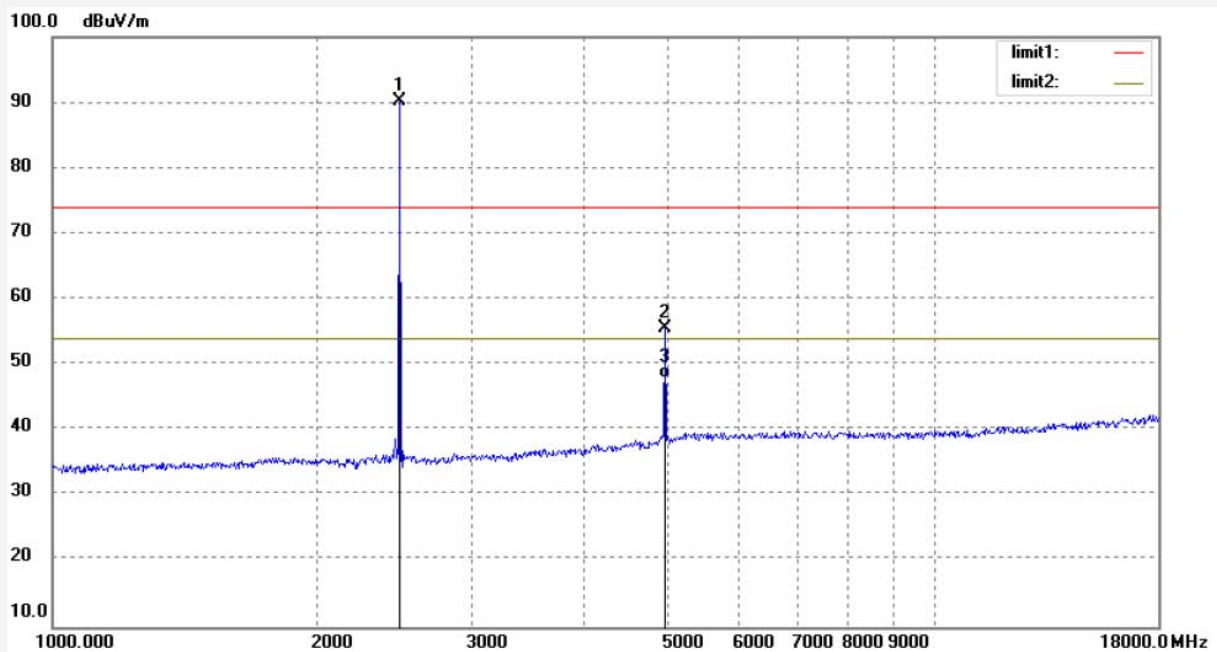
Date: 2019/06/21

Time: 18:33:17

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	96.22	-5.90	90.32			peak	100	200	
2	4960.000	53.94	1.68	55.62	74.00	-18.38	peak	100	185	
3	4960.000	46.22	1.68	47.90	54.00	-6.10	AVG	100	185	



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Job No.: jp2018 #423

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2480MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Vertical

Power Source: AC 120V/60Hz

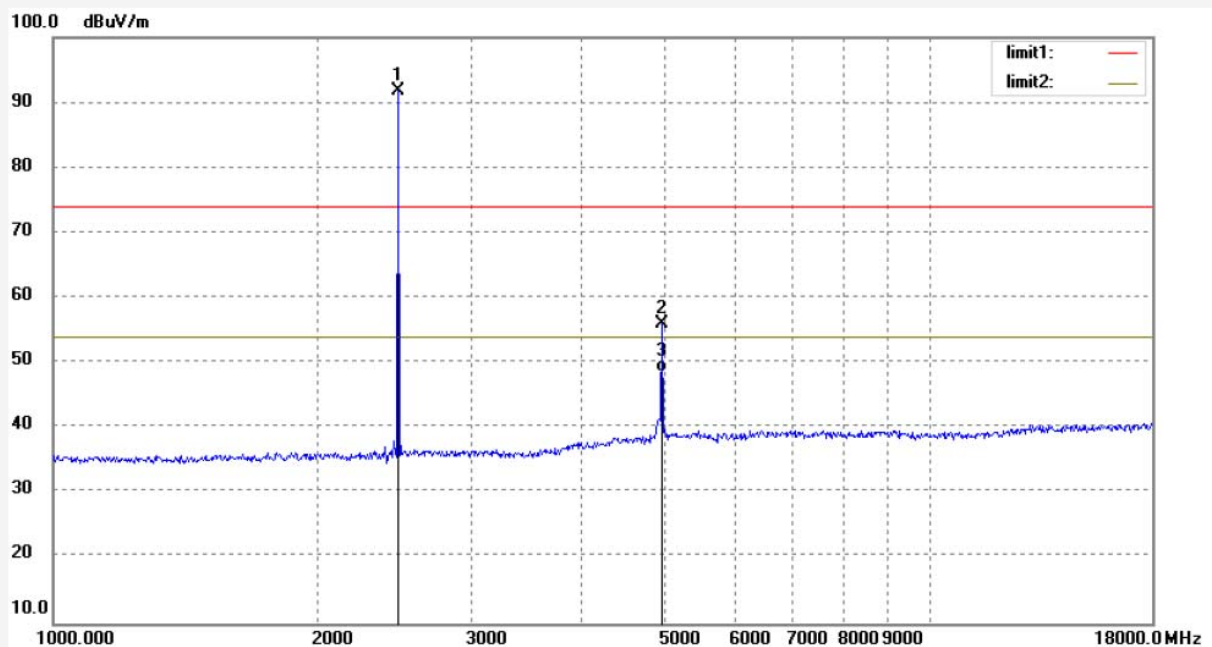
Date: 2019/06/21

Time: 18:31:01

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	97.73	-5.90	91.83			peak	100	126	
2	4960.000	54.44	1.68	56.12	74.00	-17.88	peak	100	165	
3	4960.000	46.82	1.68	48.50	54.00	-5.50	AVG	100	165	

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

Test Lab: Shielding room

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

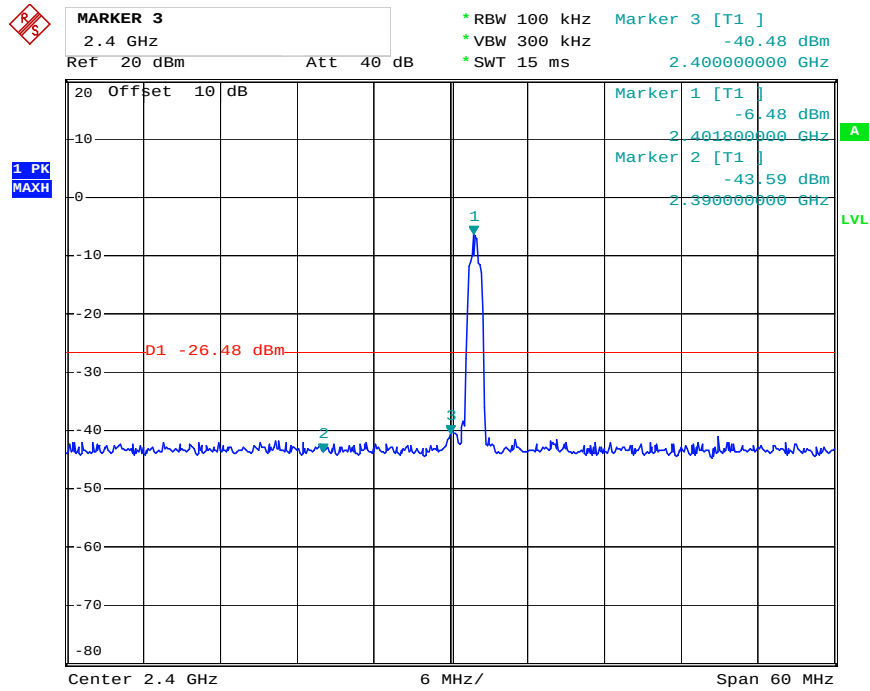
Conducted Band Edge Result

Non-hopping mode

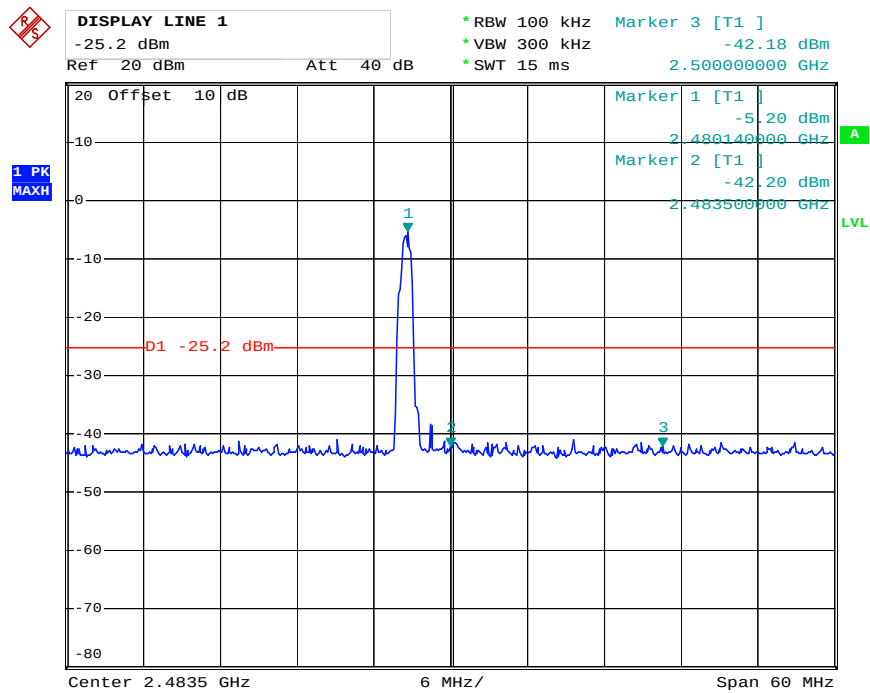
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)	Result
GFSK Mode			
2400.00	34.0	> 20dBc	Pass
2483.50	37.0	> 20dBc	Pass
Π/4-DQPSK Mode			
2400.00	32.82	> 20dBc	Pass
2483.50	36.82	> 20dBc	Pass
8DPSK Mode			
2400.00	33.89	> 20dBc	Pass
2483.50	37.29	> 20dBc	Pass

The spectrum analyzer plots are attached as below.

GFSK Mode

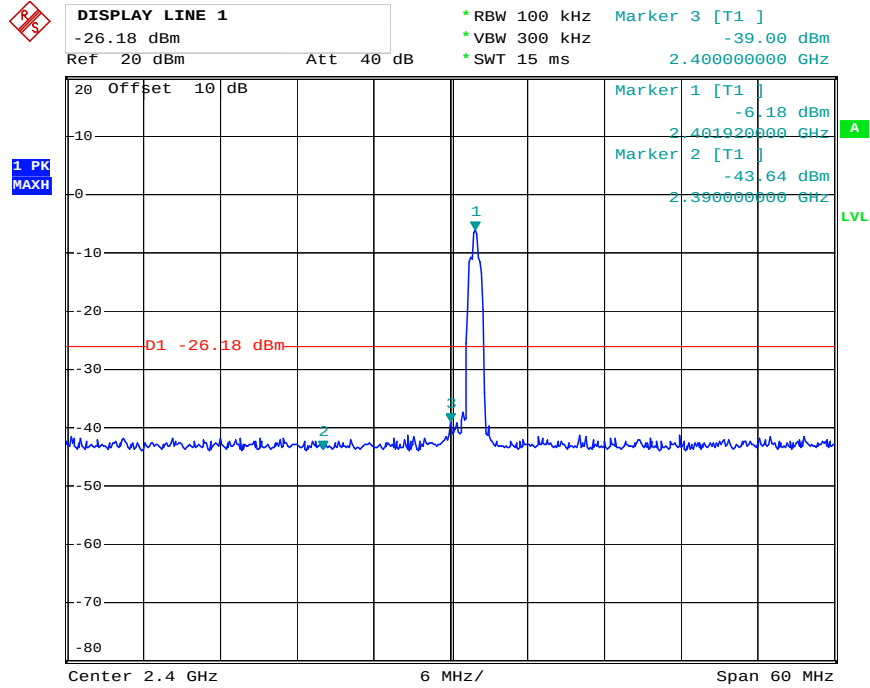


Date: 26.JUN.2019 18:00:09

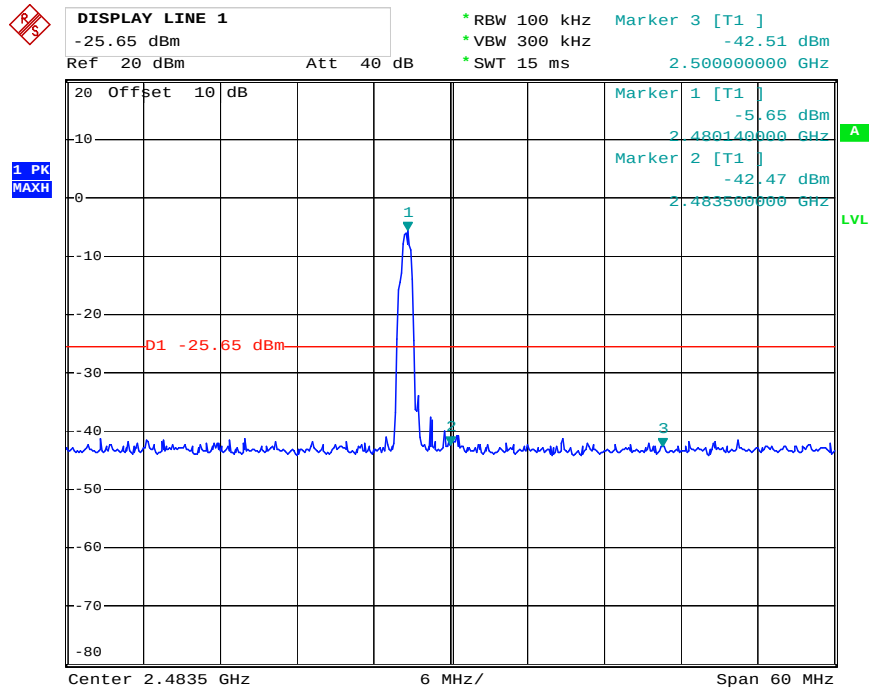


Date: 26.JUN.2019 18:02:59

Π/4-DQPSK Mode

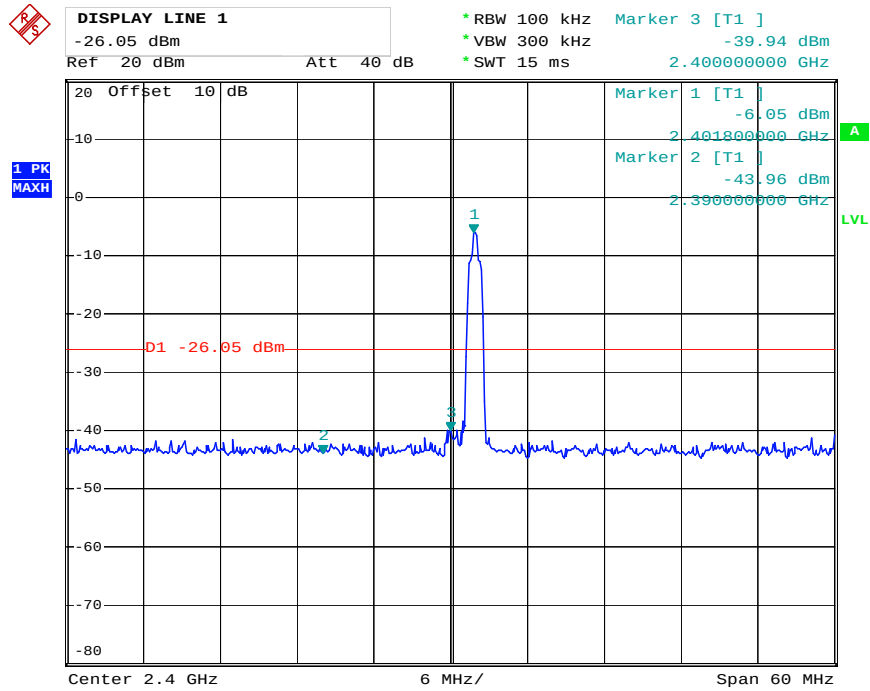


Date: 26.JUN.2019 18:10:51

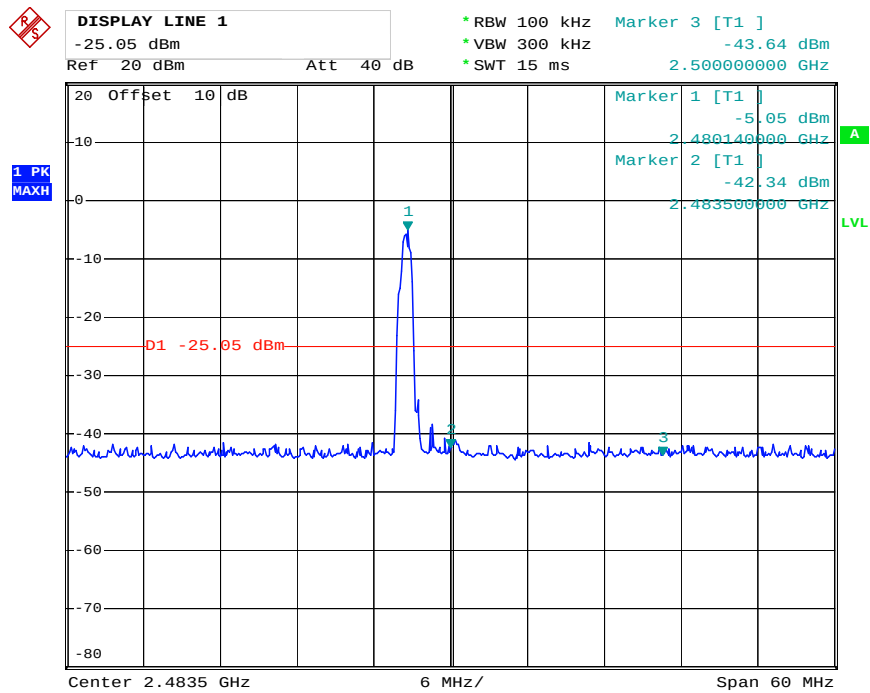


Date: 26.JUN.2019 18:06:17

8DPSK Mode



Date: 26.JUN.2019 18:12:39



Date: 26.JUN.2019 18:14:06

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 worse case (GFSK Mode) emissions are reported.

Test Lab: 3m Anechoic chamber

The spectrum analyzer plots are attached as below.

Non-hopping mode



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Job No.: jp2018 #429

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2402MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Horizontal

Power Source: AC 120V/60Hz

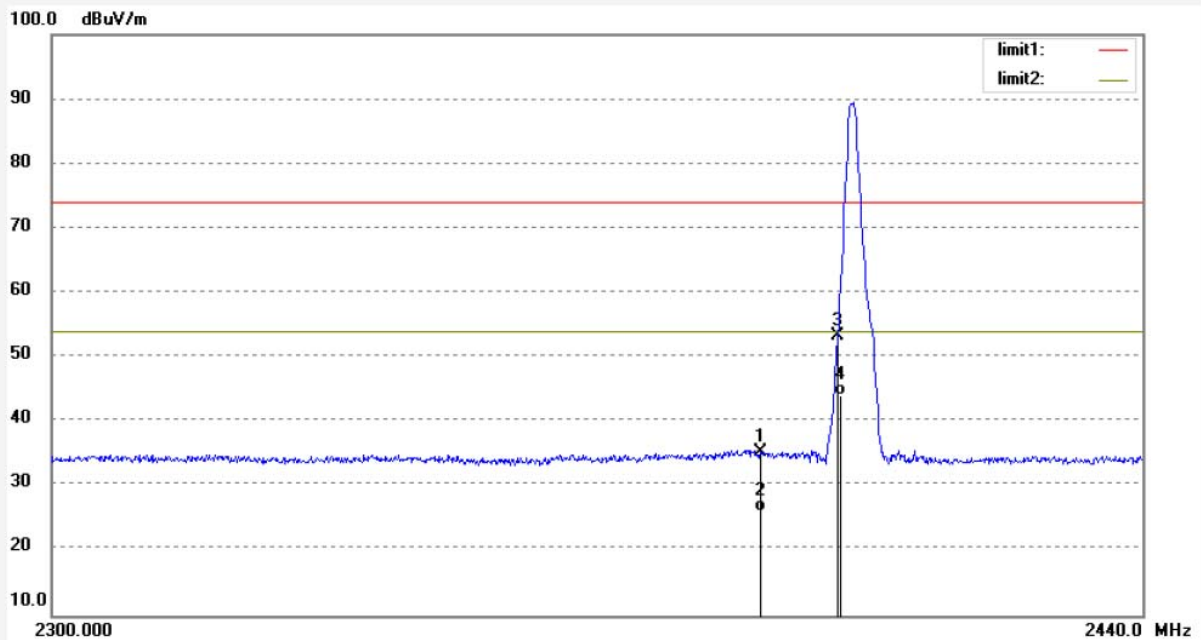
Date: 2019/06/21

Time: 18:44:36

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



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	41.55	-6.32	35.23	74.00	-38.77	peak	100	165	
2	2390.000	32.42	-6.32	26.10	54.00	-27.90	AVG	100	165	
3	2400.000	59.68	-6.27	53.41	74.00	-20.59	peak	100	236	
4	2400.000	50.37	-6.27	44.10	54.00	-9.90	AVG	100	236	

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



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Site: 1# Chamber

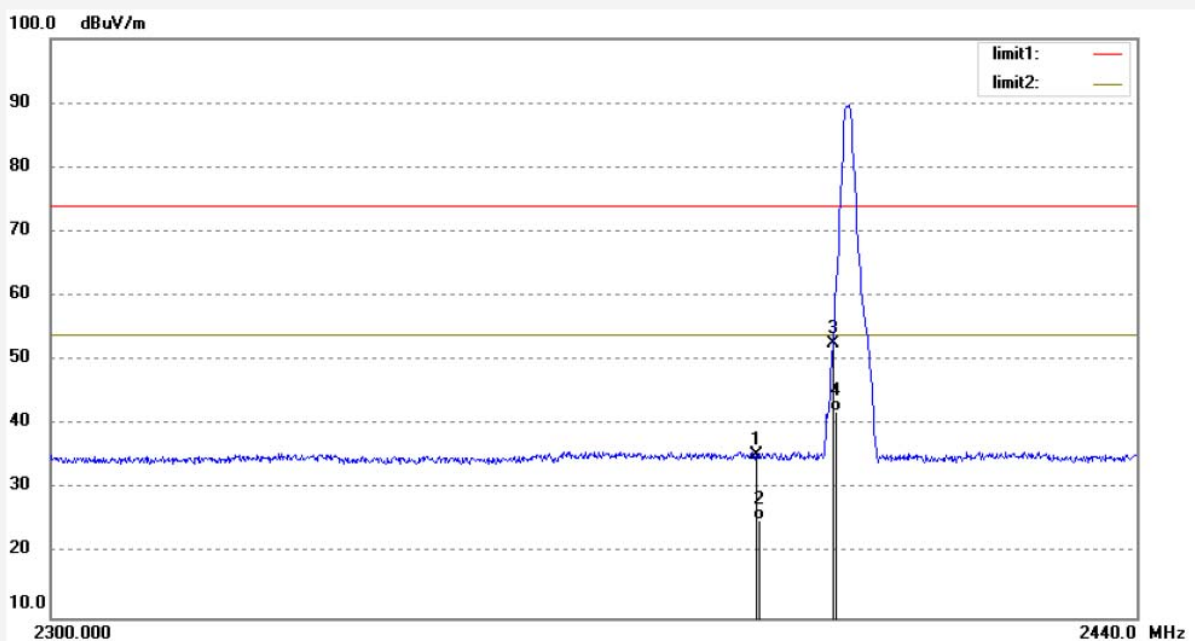
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2018 #430
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: AV ROOM TURNTABLE
Mode: TX 2402MHz
Model: CR6253U-001A
Manufacturer: Timsen Development Limited

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2019/06/21
Time: 18:46:55
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190942



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	41.55	-6.32	35.23	74.00	-38.77	peak	100	176	
2	2390.000	31.52	-6.32	25.20	54.00	-28.80	AVG	100	176	
3	2400.000	58.89	-6.27	52.62	74.00	-21.38	peak	100	263	
4	2400.000	48.37	-6.27	42.10	54.00	-11.90	AVG	100	263	

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



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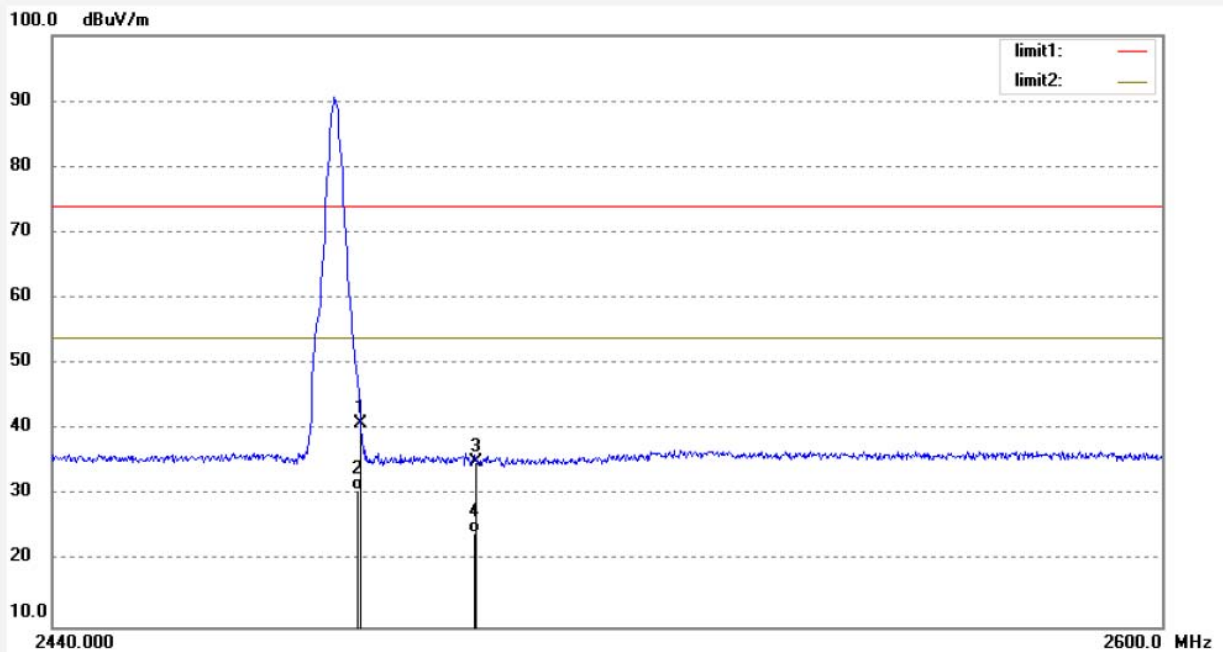
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: jp2018 #431
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: AV ROOM TURNTABLE
Mode: TX 2480MHz
Model: CR6253U-001A
Manufacturer: Timsen Development Limited

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2019/06/21
Time: 18:48:32
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190942



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	46.90	-5.89	41.01	74.00	-32.99	peak	100	195	
2	2483.500	36.79	-5.89	30.90	54.00	-23.10	AVG	100	195	
3	2500.000	40.98	-5.81	35.17	74.00	-38.83	peak	100	275	
4	2500.000	30.11	-5.81	24.30	54.00	-29.70	AVG	100	275	

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



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Job No.: jp2018 #432

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: TX 2480MHz

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Vertical

Power Source: AC 120V/60Hz

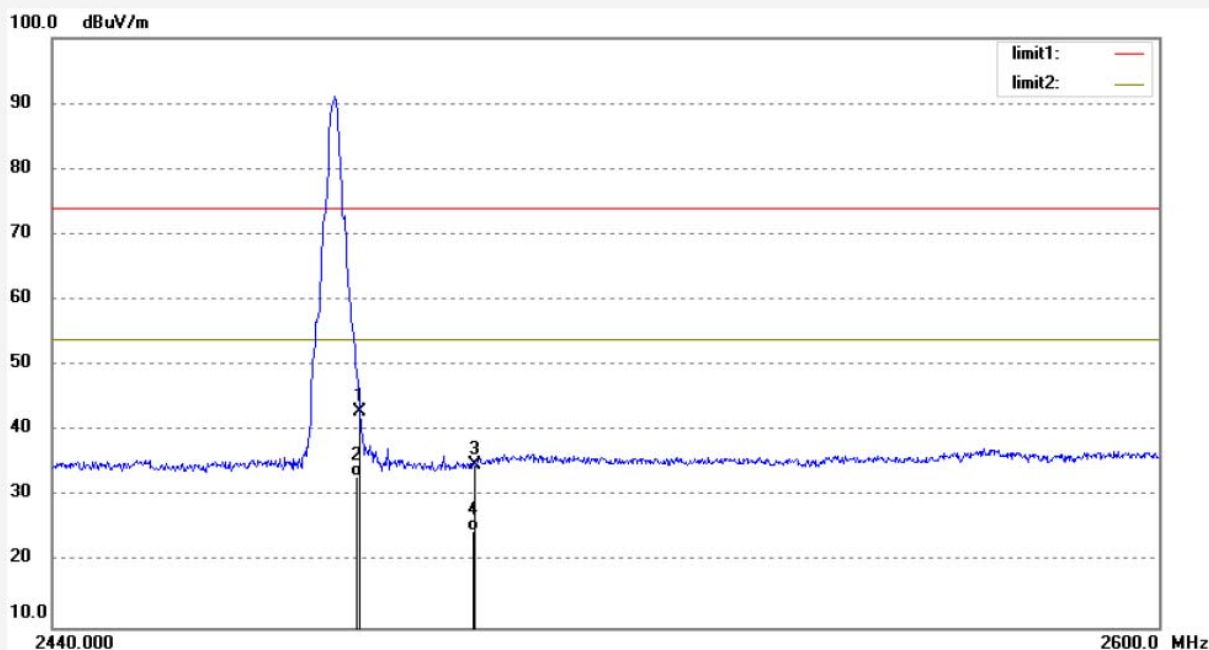
Date: 2019/06/21

Time: 18:50:32

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



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	48.85	-5.89	42.96	74.00	-31.04	peak	100	165	
2	2483.500	38.99	-5.89	33.10	54.00	-20.90	AVG	100	165	
3	2500.000	40.63	-5.81	34.82	74.00	-39.18	peak	100	245	
4	2500.000	30.51	-5.81	24.70	54.00	-29.30	AVG	100	245	

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

Hopping mode



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Job No.: jp2018 #433

Standard: FCC PK

Test item: Radiation Test

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

EUT: AV ROOM TURNTABLE

Mode: HOPPING

Model: CR6253U-001A

Manufacturer: Timsen Development Limited

Polarization: Vertical

Power Source: AC 120V/60Hz

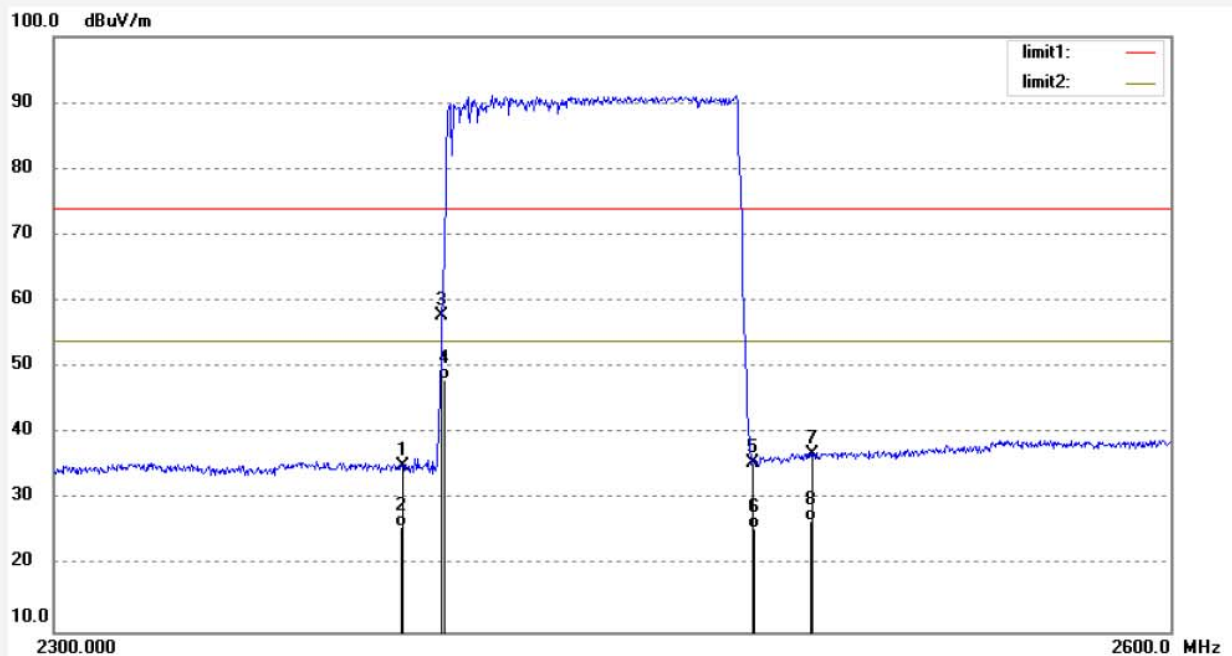
Date: 2019/06/21

Time: 18:53:34

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190942



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	41.33	-6.32	35.01	74.00	-38.99	peak	100	165	
2	2390.000	32.22	-6.32	25.90	54.00	-28.10	AVG	100	165	
3	2400.000	64.19	-6.27	57.92	74.00	-16.08	peak	100	189	
4	2400.000	54.37	-6.27	48.10	54.00	-5.90	AVG	100	189	
5	2483.500	41.54	-5.89	35.65	74.00	-38.35	peak	100	175	
6	2483.500	31.49	-5.89	25.60	54.00	-28.40	AVG	100	175	
7	2500.000	42.67	-5.81	36.86	74.00	-37.14	peak	100	263	
8	2500.000	32.51	-5.81	26.70	54.00	-27.30	AVG	100	263	

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



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F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

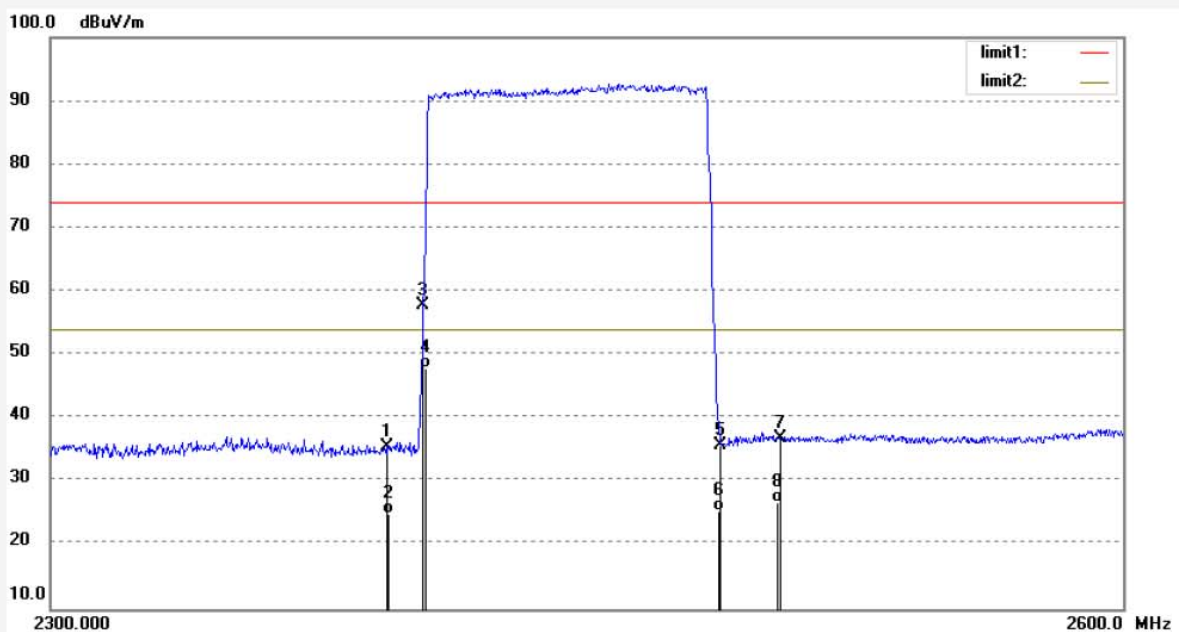
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2018 #434
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: AV ROOM TURNTABLE
Mode: HOPPING
Model: CR6253U-001A
Manufacturer: Timsen Development Limited

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2019/06/21
Time: 18:56:11
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190942



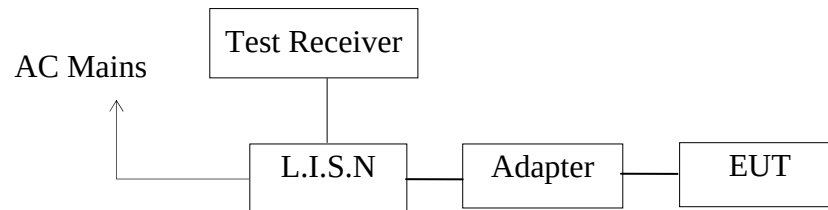
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.83	-6.32	35.51	74.00	-38.49	peak	100	162	
2	2390.000	31.22	-6.32	24.90	54.00	-29.10	AVG	100	162	
3	2400.000	64.19	-6.27	57.92	74.00	-16.08	peak	100	136	
4	2400.000	54.17	-6.27	47.90	54.00	-6.10	AVG	100	136	
5	2483.500	41.70	-5.89	35.81	74.00	-38.19	peak	100	195	
6	2483.500	31.29	-5.89	25.40	54.00	-28.60	AVG	100	195	
7	2500.000	42.77	-5.81	36.96	74.00	-37.04	peak	100	245	
8	2500.000	32.51	-5.81	26.70	54.00	-27.30	AVG	100	245	

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

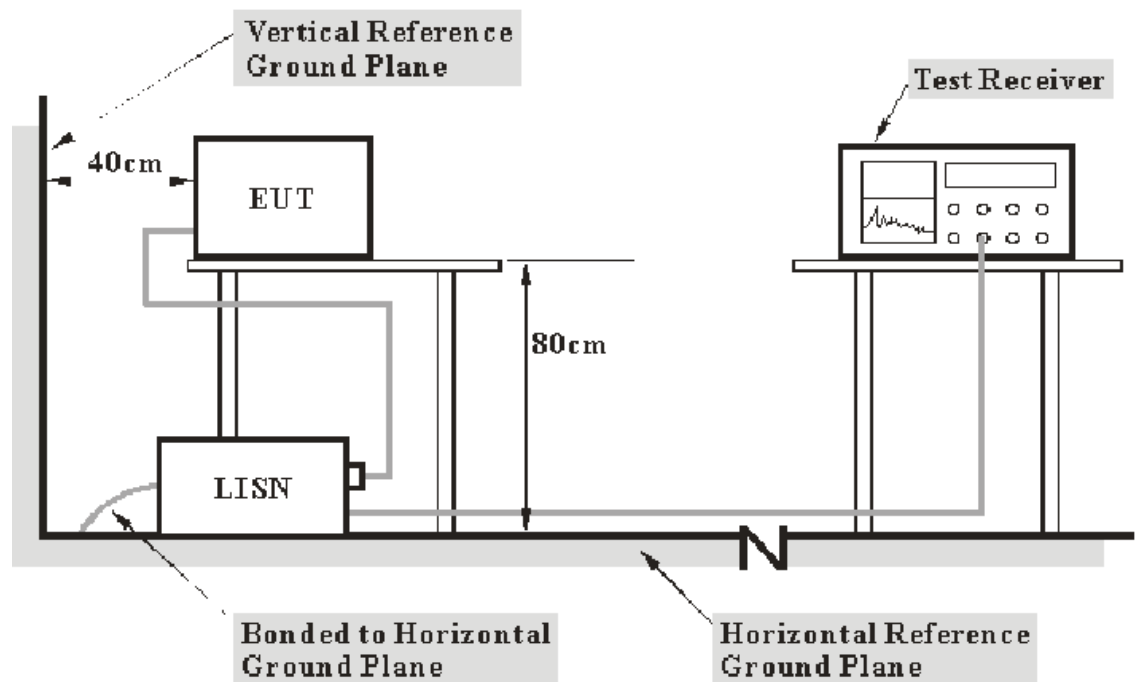
12.AC POWER LINE CONDUCTED EMISSION TEST

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 0.8m 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 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	10.6	25.3	17.0	59.0	49.0	33.4	31.7	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.Test Results

Pass.

Test Lab: 3m Anechoic chamber

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.

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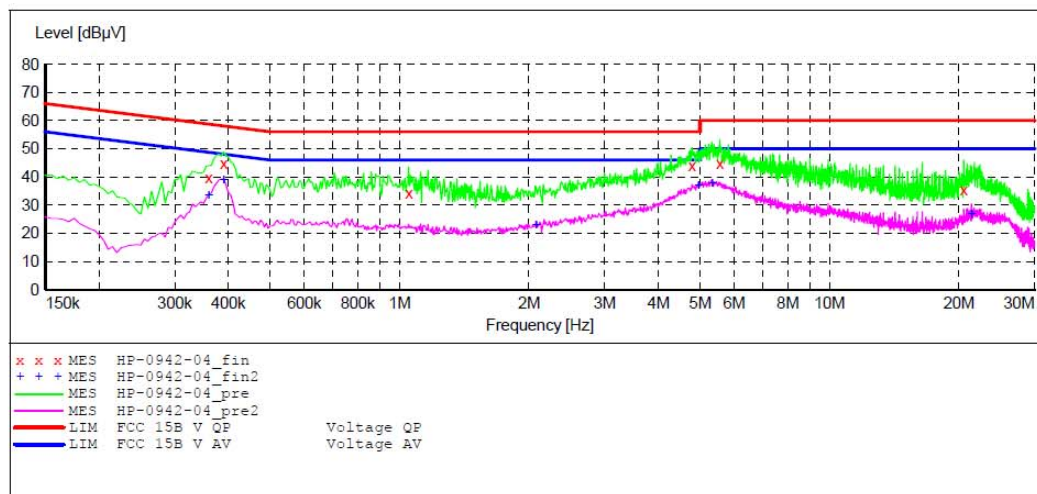
CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: AV ROOM TURNTABLE M/N:CR6253U-001A
 Manufacturer: Timsen Development Limited
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: L 120V/60Hz
 Comment: Report NO.:ATE20190942
 Start of Test: 6/22/2019 / 9:05:33AM

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	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	NSLK8126 2008
			Average			



MEASUREMENT RESULT: "HP-0942-04_fin"

6/22/2019 9:09AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	39.80	10.6	59	18.9	QP	L1	GND
0.390000	44.70	10.6	58	13.4	QP	L1	GND
1.050000	34.10	10.7	56	21.9	QP	L1	GND
4.790000	43.80	10.8	56	12.2	QP	L1	GND
5.560000	44.80	10.8	60	15.2	QP	L1	GND
20.530000	35.50	11.0	60	24.5	QP	L1	GND

MEASUREMENT RESULT: "HP-0942-04_fin2"

6/22/2019 9:09AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	33.50	10.6	49	15.2	AV	L1	GND
0.390000	38.80	10.6	48	9.3	AV	L1	GND
2.080000	22.70	10.7	46	23.3	AV	L1	GND
4.960000	36.90	10.8	46	9.1	AV	L1	GND
5.330000	37.80	10.8	50	12.2	AV	L1	GND
21.370000	26.90	11.0	50	23.1	AV	L1	GND

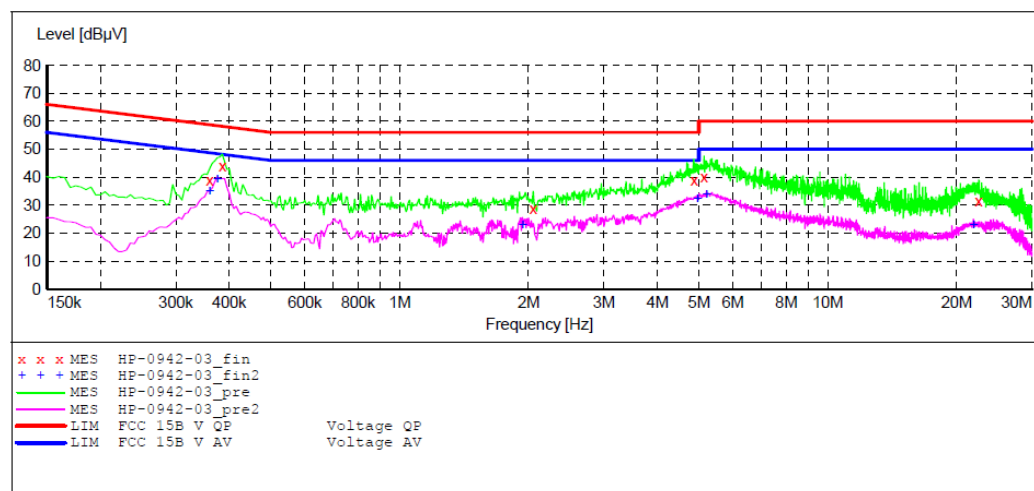
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: AV ROOM TURNTABLE M/N:CR6253U-001A
 Manufacturer: Timsen Development Limited
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: N 120V/60Hz
 Comment: Report NO.:ATE20190942
 Start of Test: 6/22/2019 / 9:00:52AM

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: "HP-0942-03_fin"

6/22/2019 9:04AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.360000	38.80	10.6	59	19.9	QP	N	GND
0.385000	43.80	10.6	58	14.4	QP	N	GND
2.050000	28.80	10.7	56	27.2	QP	N	GND
4.870000	38.90	10.8	56	17.1	QP	N	GND
5.140000	40.10	10.8	60	19.9	QP	N	GND
22.540000	31.60	11.0	60	28.4	QP	N	GND

MEASUREMENT RESULT: "HP-0942-03_fin2"

6/22/2019 9:04AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.360000	34.80	10.6	49	13.9	AV	N	GND
0.375000	39.40	10.6	48	9.0	AV	N	GND
1.935000	22.80	10.7	46	23.2	AV	N	GND
4.960000	32.40	10.8	46	13.6	AV	N	GND
5.210000	33.70	10.8	50	16.3	AV	N	GND
21.895000	23.00	11.0	50	27.0	AV	N	GND

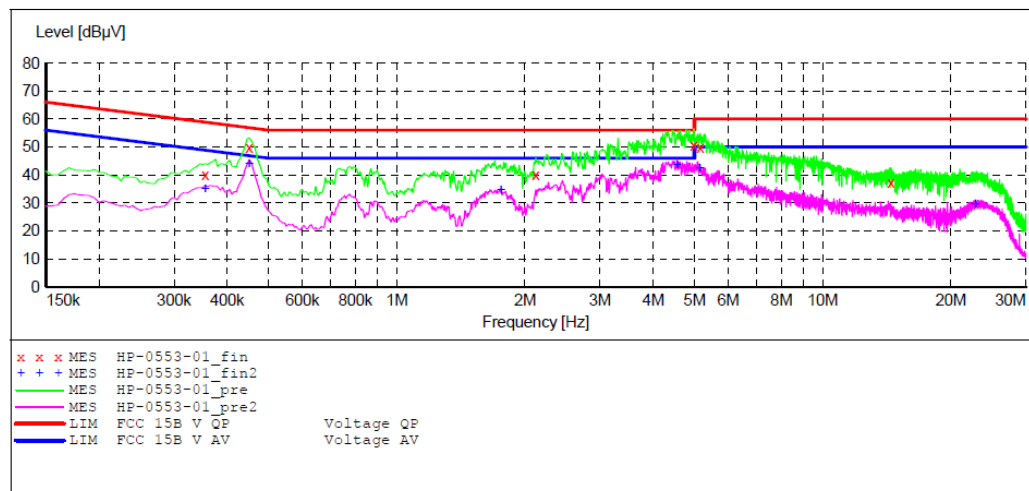
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: AV ROOM TURNTABLE M/N:CR6253U-001A
 Manufacturer: Timsen Development Limited
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: CHARLEY
 Test Specification: L 240V/60Hz
 Comment: Report NO.:ATE20190942
 Start of Test: 6/22/2019 / 8:45:08AM

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

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



MEASUREMENT RESULT: "HP-0553-01_fin"

6/22/2019 8:48AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.355000	40.10	10.6	59	18.7	QP	L1	GND
0.450000	49.60	10.7	57	7.3	QP	L1	GND
2.120000	40.10	11.0	56	15.9	QP	L1	GND
4.980000	50.60	11.2	56	5.4	QP	L1	GND
5.160000	49.80	11.2	60	10.2	QP	L1	GND
14.470000	37.40	11.4	60	22.6	QP	L1	GND

MEASUREMENT RESULT: "HP-0553-01_fin2"

6/22/2019 8:48AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.355000	35.10	10.6	49	13.7	AV	L1	GND
0.450000	43.90	10.7	47	3.0	AV	L1	GND
1.755000	34.50	11.0	46	11.5	AV	L1	GND
4.550000	43.50	11.1	46	2.5	AV	L1	GND
5.140000	42.30	11.2	50	7.7	AV	L1	GND
22.840000	29.60	11.4	50	20.4	AV	L1	GND

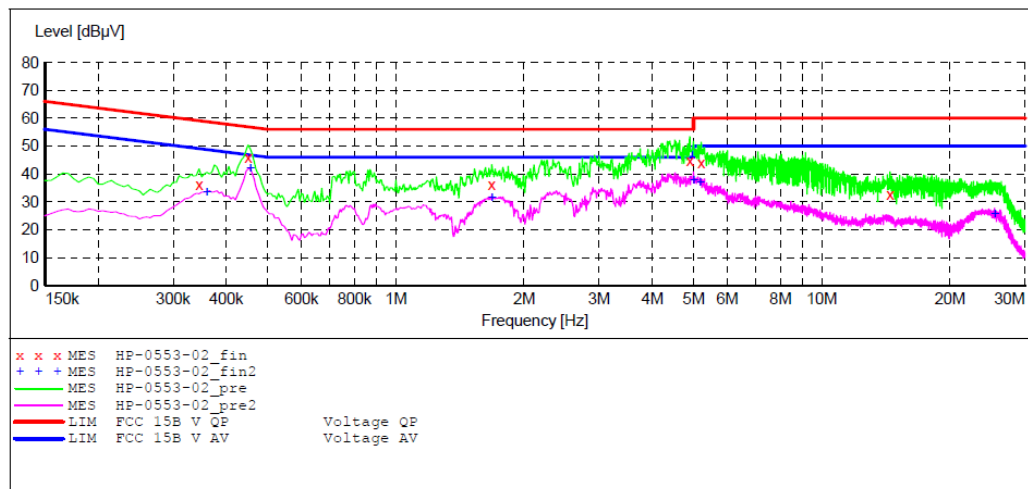
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: AV ROOM TURNTABLE M/N:CR6253U-001A
 Manufacturer: Timsen Development Limited
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: CHARLEY
 Test Specification: N 240V/60Hz
 Comment: Report NO.:ATE20190942
 Start of Test: 6/22/2019 / 8:49:26AM

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: "HP-0553-02_fin"

6/22/2019 8:52AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.345000	36.10	10.6	59	23.0	QP	N	GND
0.450000	45.80	10.7	57	11.1	QP	N	GND
1.680000	36.00	10.9	56	20.0	QP	N	GND
4.900000	44.50	11.2	56	11.5	QP	N	GND
5.210000	44.00	11.2	60	16.0	QP	N	GND
14.470000	32.60	11.4	60	27.4	QP	N	GND

MEASUREMENT RESULT: "HP-0553-02_fin2"

6/22/2019 8:52AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	33.30	10.6	49	15.4	AV	N	GND
0.455000	41.80	10.7	47	5.0	AV	N	GND
1.680000	31.30	10.9	46	14.7	AV	N	GND
5.000000	37.60	11.2	46	8.4	AV	N	GND
5.180000	37.00	11.2	50	13.0	AV	N	GND
25.465000	25.60	11.5	50	24.4	AV	N	GND

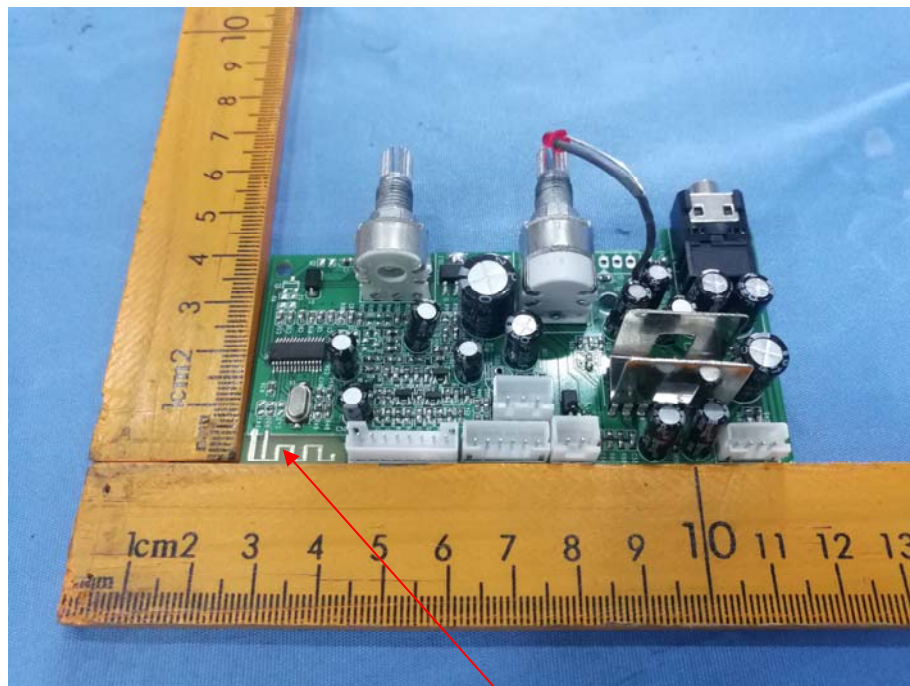
13.ANTENNA REQUIREMENT

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 1.2dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

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