

FCC

RF

TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR

Bluetooth audio with FM transmitter and charger

ISSUED TO
AAMP of Florida, dba AAMP of America

13190 56th Court, Suite 401, Clearwater, FL 33760



Prepared by: Zhang Yangqing

Zhang Yangqing
(Reporting Specialist)

Date Dec 9, 2014

Approved by: Wei Yanquan

Wei Yanquan
(Chief Engineer)

Date Dec 9, 2014

Report No.: BL-SZ1470121-601

EUT Type: Bluetooth audio with FM transmitter
and charger

Model Name: ISBT42

Brand Name: iSimple

Test Standard: 47 CFR Part 15 Subpart C

FCC ID: XBD-ISBT4

Test conclusion: PASS

Test Date: Aug 18, 2014 ~ Aug 28, 2014

Date of Issue: Dec 9, 2014

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Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055

TEL: +86-755-66850100, FAX: +86-755-61824271

Email: info@baluntek.com

www.baluntek.com

Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions</u>
<u>Rev. 01</u>	<u>Dec 9, 2014</u>	<u>Initial Issue</u>

TABLE OF CONTENTS

1	ADMINISTRATIVE DATA (GENERAL INFORMATION)	5
1.1	Identification of the Testing Laboratory.....	5
1.2	Identification of the Responsible Testing Location	5
1.3	Announce.....	5
2	PRODUCT INFORMATION	6
2.1	Applicant	6
2.2	Manufacturer	6
2.3	General Description for Equipment under Test (EUT)	6
2.4	Technical Information	6
2.5	Ancillary Equipment.....	6
3	SUMMARY OF TEST RESULTS	7
3.1	Test Standards.....	7
3.2	Verdict.....	7
4	GENERAL TEST CONFIGURATIONS	8
4.1	Test Environments	8
4.2	Test Equipment List.....	8
4.3	Test Configurations	9
4.4	Description of Test Setup	9
4.4.1	For Antenna Port Test	9
4.4.2	For AC Power Supply Port Test.....	10
4.4.3	For Radiated Test (Below 30MHz).....	10
4.4.4	For Radiated Test (30MHz-1GHz)	11
4.4.5	For Radiated Test (Above 1GHz)	11
4.5	Test Conditions	12
5	TEST ITEMS	13

5.1	Antenna Requirements.....	13
5.1.1	Standard Applicable	13
5.1.2	Antenna Anti-Replacement Construction	13
5.1.3	Antenna Gain	13
5.2	Number of Hopping Frequency	14
5.2.1	Limit.....	14
5.2.2	Test Procedure	14
5.3	Peak Output Power	15
5.3.1	Test Limit.....	15
5.3.2	Test Procedure	15
5.4	Occupied Bandwidth	16
5.4.1	Limit.....	16
5.4.2	Test Procedure	16
5.5	Carrier Frequency Separation	17
5.5.1	Limit.....	17
5.5.2	Test Procedure	17
5.6	Time of Occupancy (Dwell time).....	18
5.6.1	Limit.....	18
5.6.2	Test Procedure	18
5.7	Conducted Spurious Emission	19
5.7.1	Limit.....	19
5.7.2	Test Procedure	19
5.8	Conducted Emission	20
5.8.1	Limit.....	20
5.8.2	Test Procedure	20
5.9	Radiated Spurious Emission	21
5.9.1	Limit.....	21
5.9.2	Test Procedure	21
5.10	Band Edge.....	23
5.10.1	Limit	23
5.10.2	Test Procedure	23

ANNEX A	TEST RESULT	24
A.1	Number of Hopping Frequency	24
A.2	Peak Output Power	28
A.3	20dB and 99% bandwidth.....	34
A.4	Hopping Frequency Separation	40
A.5	Average Time of Occupancy	42
A.6	Conducted Spurious Emissions.....	48
A.7	Radiated Emission	61
A.8	Band Edge	111
ANNEX B	TEST SETUP PHOTOS	124
B.1	Conducted Test Photo.....	124
B.2	Radiated Test Photo.....	125
ANNEX C	EUT PHOTOS	128
C.1	Appearance of the EUT	128
C.2	Inside of the EUT	136

1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6683 3402
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory has met the requirements of the IAS Accreditation Criteria for Testing Laboratories (AC89), has demonstrated compliance with ISO/IEC Standard 17025:2005. The accreditation certificate number is TL-588. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Announce

- (1) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (2) The test report is invalid if there is any evidence and/or falsification.
- (3) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (4) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant

Applicant	AAMP of Florida, dba AAMP of America
Address	13190 56th Court, Suite 401, Clearwater, FL 33760

2.2 Manufacturer

Manufacturer	Skytech Creations Limited
Address	Qiaotou Industrial district, Qiaoli Zone, Changping town, Dongguan

2.3 General Description for Equipment under Test (EUT)

EUT Type	Bluetooth audio with FM transmitter and charger
Model Name	ISBT42
Hardware Version	N/A
Software Version	N/A
Network and Wireless connectivity	BT3.0, FM
About the Product	The equipment is Bluetooth audio receiver with FM transmitter battery, operating at 2.4GHz ISM band and 88MHz to 108MHz band, only BT 3.0 was tested in this report.

2.4 Technical Information

TX/ RX Operating Range	2400~2483.5MHz band $f_c = 2402 \text{ MHz} + N \times 1 \text{ MHz}$, where - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 0 to 78.	
Modulation Type	Carrier	Frequency Hopping Spread Spectrum
	Digital	GFSK, $\pi/4$ -DQPSK, 8DPSK
Antenna Type	PCB Antenna	
Antenna Gain	0dBi	

2.5 Ancillary Equipment

Ancillary Equipment	Audio line
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3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C (12-30-13 Edition)	Miscellaneous Wireless Communications Services
2	FCC PUBLIC NOTICE DA 00-705 (Mar. 30, 2000)	Filling and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
3	ANSI C63.4-2014	American National Standard for Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
4	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	Test Result	Verdict
1	Antenna Requirement	15.203	--	PASS ^{Note 1}
2	Number of Hopping Frequency	15.247(a)	ANNEX A.1	PASS
3	Peak Output Power	15.247(b)	ANNEX A.2	PASS
4	Occupied Bandwidth	15.247(a)	ANNEX A.3	PASS
5	Carrier Frequency Separation	15.247(a)	ANNEX A.4	PASS
6	Time of Occupancy (Dwell time)	15.247(a)	ANNEX A.5	PASS
7	Conducted Spurious Emission	15.247(d)	ANNEX A.6	PASS
8	Conducted Emission	15.207	--	N/A ^{Note 2}
9	Radiated Spurious Emission	15.209 15.247(d)	ANNEX A.7	PASS
10	Band Edge	15.209 15.247(d)	ANNEX A.8	PASS

Note 1: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.

Note 2: The EUT only support car charger power supply, So the Conducted Emission test was not applicable.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity (%)	45 - 55	
Atmospheric Pressure (kPa)	90 - 96	
Temperature	NT (Normal Temperature)	+22°C to +25°C
Working Voltage of the EUT	NV (Normal Voltage)	DC 12V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2014.07.07	2015.07.06
Spectrum Analyzer	ROHDE&SCHWARZ	FSL3	103640/003	2014.07.07	2015.07.06
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2014.07.07	2015.07.06
Power Splitter	KMW	DCPD-LDC	1305003215	2014.07.07	2015.07.06
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2014.07.07	2015.07.06
Attenuator (20dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2014.07.07	2015.07.06
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2014.07.07	2015.07.06
Test Antenna-Loop(9kHz-30MHz)	SCHWARZBECK	FMZB 1519	1519-037	2013.07.03	2015.07.02
Test Antenna-Bi-Log(30MHz-3GHz)	SCHWARZBECK	VULB 9163	9163-624	2013.07.02	2015.07.01
Test Antenna-Horn(1-18GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2013.07.02	2015.07.01
Test Antenna-Horn(15-26.5GHz)	SCHWARZBECK	BBHA 9170	9170-305	2013.07.02	2015.07.01
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2014.10.07	2015.10.06

4.3 Test Configurations

Test Configurations (TC) NO.	Description	
	Signal Description	Operating Frequency
Transmitter		
TC01	GFSK modulation, package type DH5, hopping on	--
TC02	GFSK modulation, package type DH5, hopping off	Ch No. 0/ 2402MHz
TC03	GFSK modulation, package type DH5, hopping off	Ch No. 39/ 2441MHz
TC04	GFSK modulation, package type DH5, hopping off	Ch No. 78/ 2480MHz
TC05	$\pi/4$ -DQPSK modulation, package type DH5, hopping on	--
TC06	$\pi/4$ -DQPSK modulation, package type DH5, hopping off	Ch No. 0/ 2402MHz
TC07	$\pi/4$ -DQPSK modulation, package type DH5, hopping off	Ch No. 39/ 2441MHz
TC08	$\pi/4$ -DQPSK modulation, package type DH5, hopping off	Ch No. 78/ 2480MHz
TC09	8DPSK modulation, package type DH5, hopping on	--
TC10	8DPSK modulation, package type DH5, hopping off	Ch No. 0/ 2402MHz
TC11	8DPSK modulation, package type DH5, hopping off	Ch No. 39/ 2441MHz
TC12	8DPSK modulation, package type DH5, hopping off	Ch No. 78/ 2480MHz

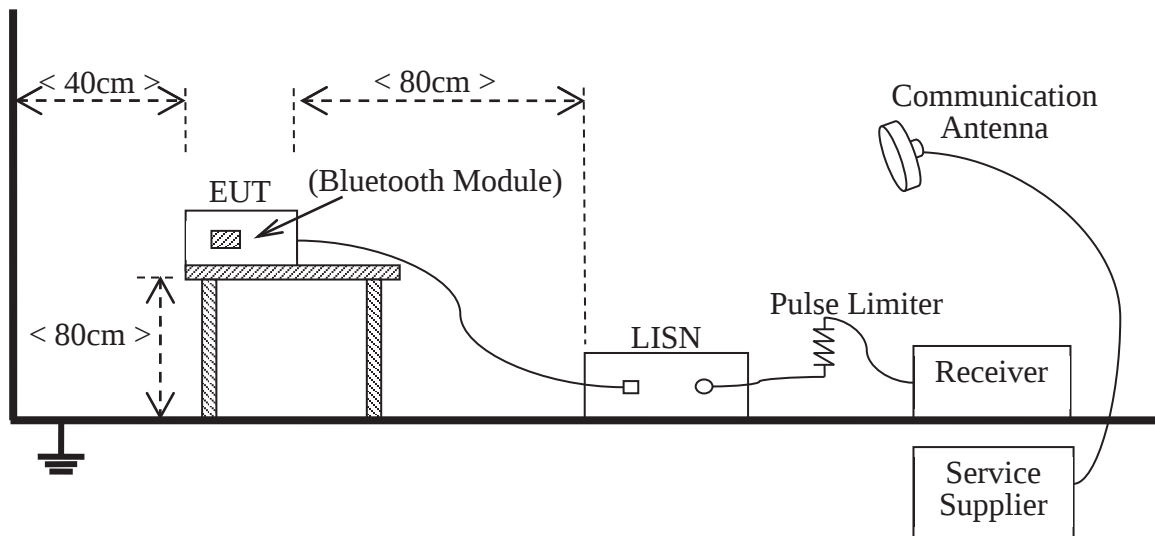
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



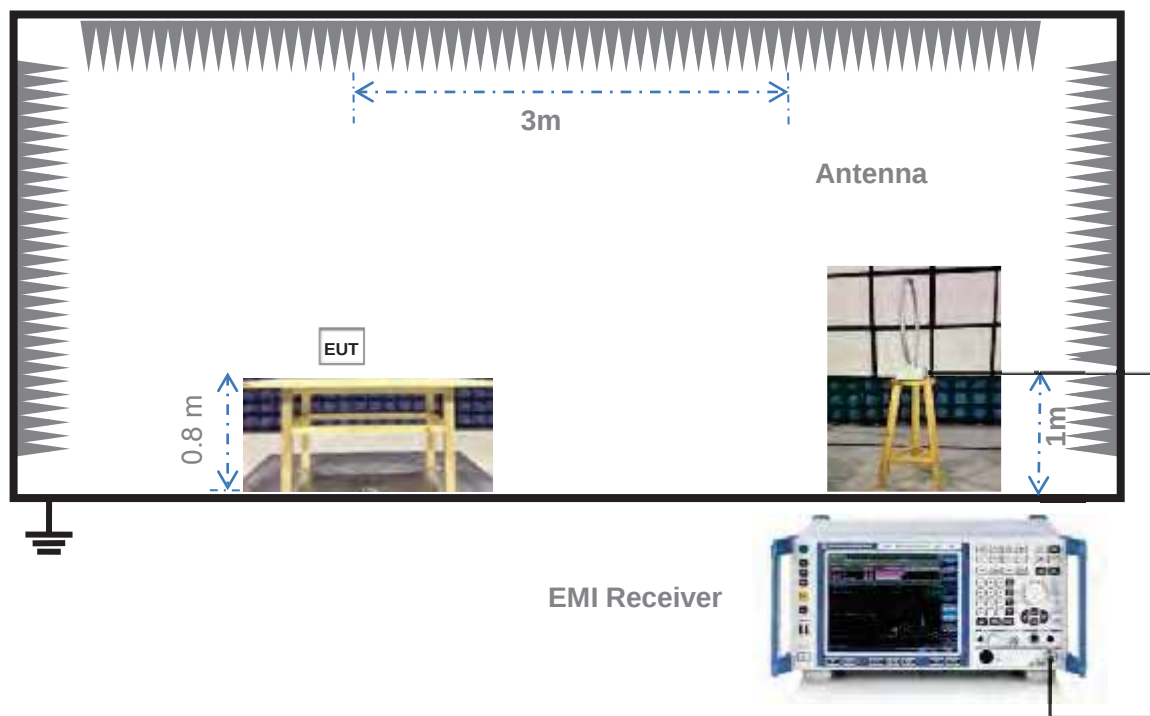
(Diagram 1)

4.4.2 For AC Power Supply Port Test



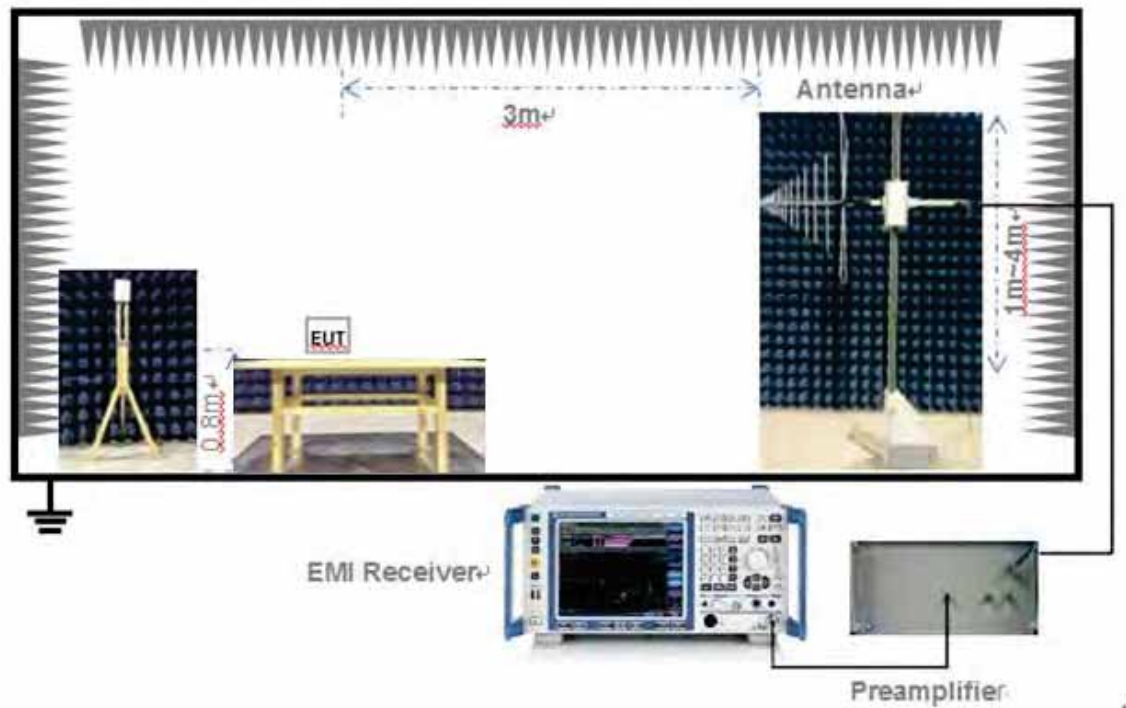
(Diagram 2)

4.4.3 For Radiated Test (Below 30MHz)



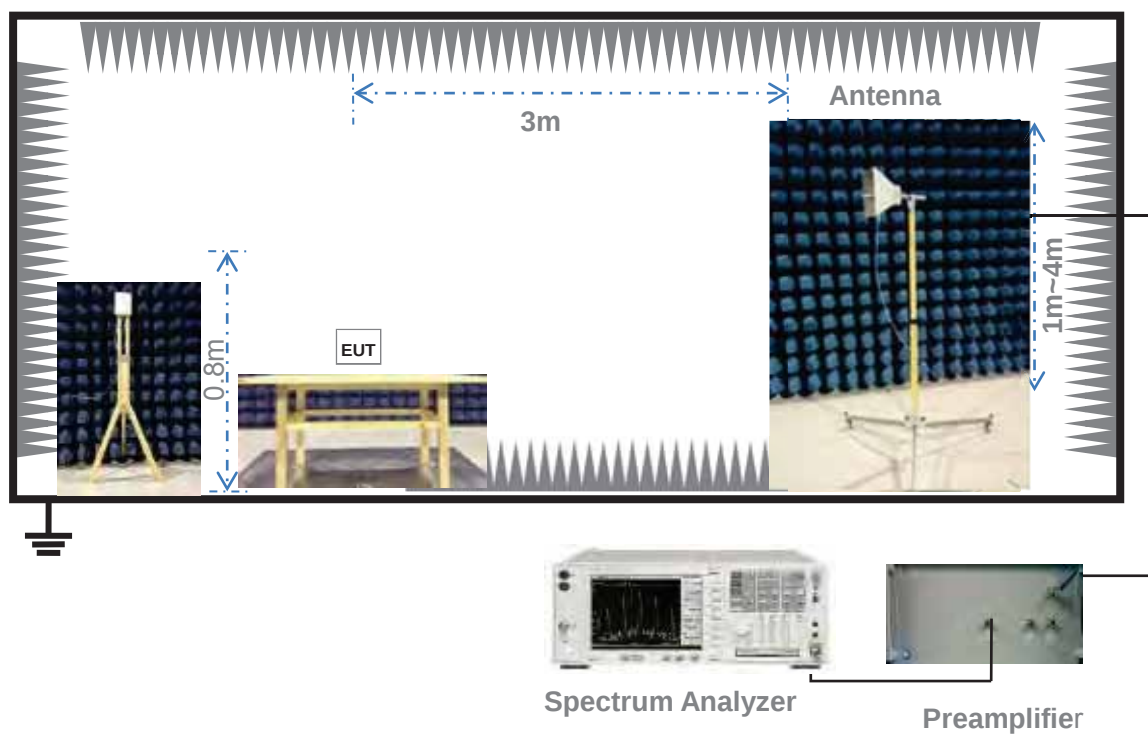
(Diagram 3)

4.4.4 For Radiated Test (30MHz-1GHz)



(Diagram 4)

4.4.5 For Radiated Test (Above 1GHz)



(Diagram 5)

4.5 Test Conditions

Test Case	Test Conditions		
	Test Env.	Test Setup ^{Note 1}	Test Configuration ^{Note 2}
Number of Hopping Frequency	NTNV	Test Setup 1	TC01, TC05, TC09
Peak Output Power	NTNV	Test Setup 1	TC02, TC03, TC04, TC06, TC07, TC08, TC10, TC11, TC12
Occupied Bandwidth	NTNV	Test Setup 1	TC03, TC07, TC011
Carrier Frequency Separation	NTNV	Test Setup 1	TC01, TC05, TC09
Time of Occupancy (Dwell time)	NTNV	Test Setup 1	TC01, TC05, TC09
Conducted Spurious Emission	NTNV	Test Setup 1	TC02, TC03, TC04, TC06, TC07, TC08, TC10, TC11, TC12
Conducted Emission	NTNV	Test Setup 2	TC02, TC03, TC04, TC06, TC07, TC08, TC10, TC11, TC12
Radiated Emission	NTNV	Test Setup 3 Test Setup 4 Test Setup 5	TC02, TC03, TC04, TC06, TC07, TC08, TC10, TC11, TC12
Band Edge	NTNV	Test Setup 5	TC01, TC02, TC04, TC05, TC06, TC08, TC09, TC10, TC12
Note: 1. Please refer to section 4.4 for test setup details. 2. Please refer to section 4.3 for test setup details.			

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Standard Applicable

FCC §15.203 & 15.247(b)

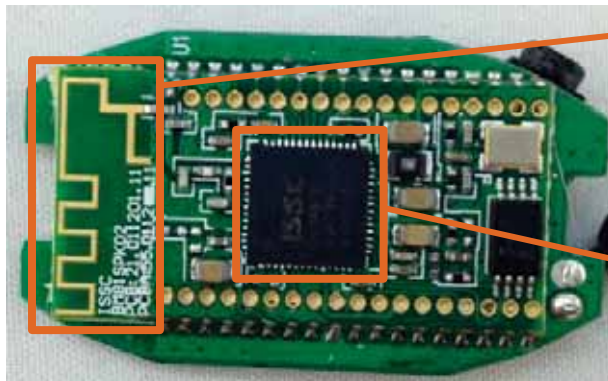
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is An embedded-in	An embedded-in antenna design is used.

Reference Documents	Item
Photo	

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5.2 Number of Hopping Frequency

5.2.1 Limit

FCC §15.247(a)(1)(iii)

Frequency hopping systems operating in the 2400MHz to 2483.5MHz bands shall use at least 15 hopping frequencies.

5.2.2 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

5.3 Peak Output Power

5.3.1 Test Limit

FCC § 15.247(b)

For frequency hopping systems that operates in the 2400MHz to 2483.5MHz band employing at least 75 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt.

5.3.2 Test Procedure

The Bluetooth Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW > the 20 dB bandwidth of the emission being measured

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.4 Occupied Bandwidth

5.4.1 Limit

FCC §15.247(a)

The 20dB bandwidth is known as the 99% emission bandwidth, or 20dB bandwidth ($10 \cdot \log 1\% = 20\text{dB}$) taking the total RF output power.

5.4.2 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW $\geq$ 1% of the 20 dB bandwidth

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.5 Carrier Frequency Separation

5.5.1 Limit

FCC §15.247(a)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

5.5.2 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) $\geq 1\%$ of the span

Video (or Average) Bandwidth (VBW) $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

5.6 Time of Occupancy (Dwell time)

5.6.1 Limit

FCC §15.247(a)

Frequency hopping systems in the 2400 - 2483.5MHz band shall use at least 15 non-overlapping 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.

5.6.2 Test Procedure

The average time of occupancy on any channel within the Period can be calculated with formulas:

For DH1 package type

$$\{\text{Total of Dwell}\} = \{\text{Pulse Time}\} * (1600 / 2) / \{\text{Number of Hopping Frequency}\} * \{\text{Period}\}$$

$$\{\text{Period}\} = 0.4s * \{\text{Number of Hopping Frequency}\}$$

For DH3 package type

$$\{\text{Total of Dwell}\} = \{\text{Pulse Time}\} * (1600 / 4) / \{\text{Number of Hopping Frequency}\} * \{\text{Period}\}$$

$$\{\text{Period}\} = 0.4s * \{\text{Number of Hopping Frequency}\}$$

For DH5 package type

$$\{\text{Total of Dwell}\} = \{\text{Pulse Time}\} * (1600 / 6) / \{\text{Number of Hopping Frequency}\} * \{\text{Period}\}$$

$$\{\text{Period}\} = 0.4s * \{\text{Number of Hopping Frequency}\}$$

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

5.7 Conducted Spurious Emission

5.7.1 Limit

FCC §15.247(d)

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.7.2 Test Procedure

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

5.8 Conducted Emission

5.8.1 Limit

FCC §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.8.2 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

5.9 Radiated Spurious Emission

5.9.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
0.009 - 0.490	$2400/F(\text{kHz})$	300
0.490 - 1.705	$24000/F(\text{kHz})$	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. Field Strength ($\text{dB}\mu\text{V}/\text{m}$) = $20 \cdot \log[\text{Field Strength } (\mu\text{V}/\text{m})]$.
2. In the emission tables above, the tighter limit applies at the band edges.
3. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
4. For above 1000MHz, limit field strength of harmonics: $54\text{dB}\mu\text{V}/\text{m}@3\text{m}$ (AV) and $74\text{dB}\mu\text{V}/\text{m}@3\text{m}$ (PK).

5.9.2 Test Procedure

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360° , and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1 \text{ GHz}$, 100 kHz for $f < 1 \text{ GHz}$

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.10 Band Edge

5.10.1 Limit

FCC §15.209&15.247(d)

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.10.2 Test Procedure

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak /AV

Trace = max hold

Allow the trace to stabilize.

$E \text{ [dB}\mu\text{V/m]} = UR + AT + AFactor \text{ [dB]}; AT = LCable \text{ loss [dB]} - Gpreamp \text{ [dB]}$

AT: Total correction Factor except Antenna

UR: Receiver Reading

Gpreamp: Preamplifier Gain

AFactor: Antenna Factor at 3m

ANNEX A TEST RESULT

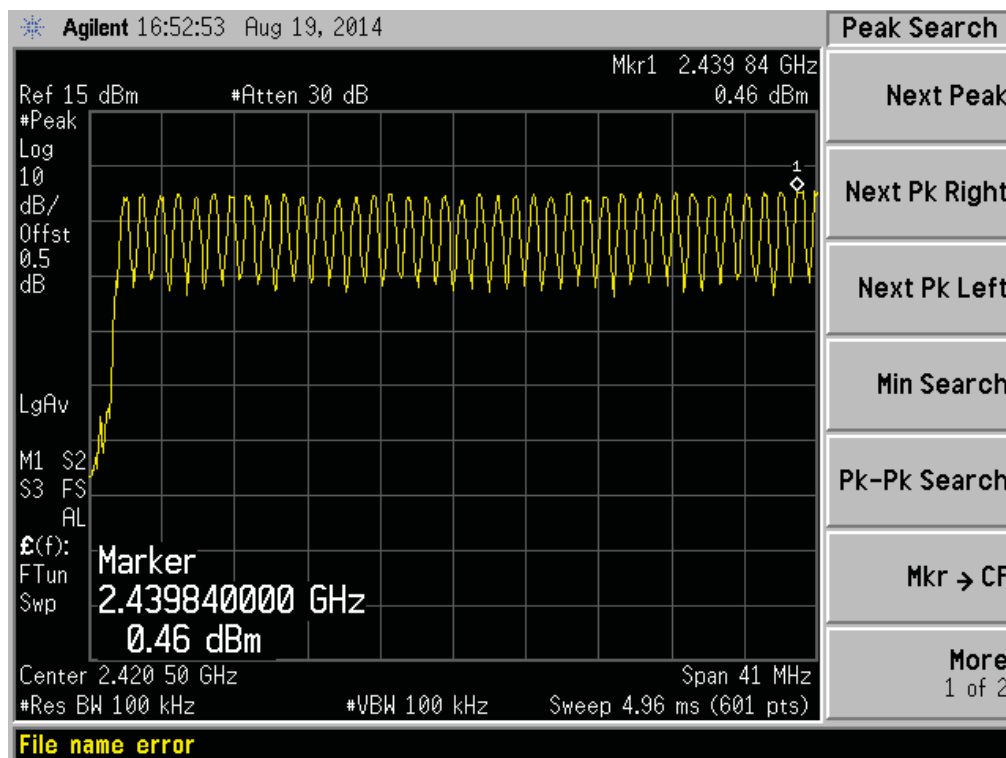
A.1 Number of Hopping Frequency

Test Data

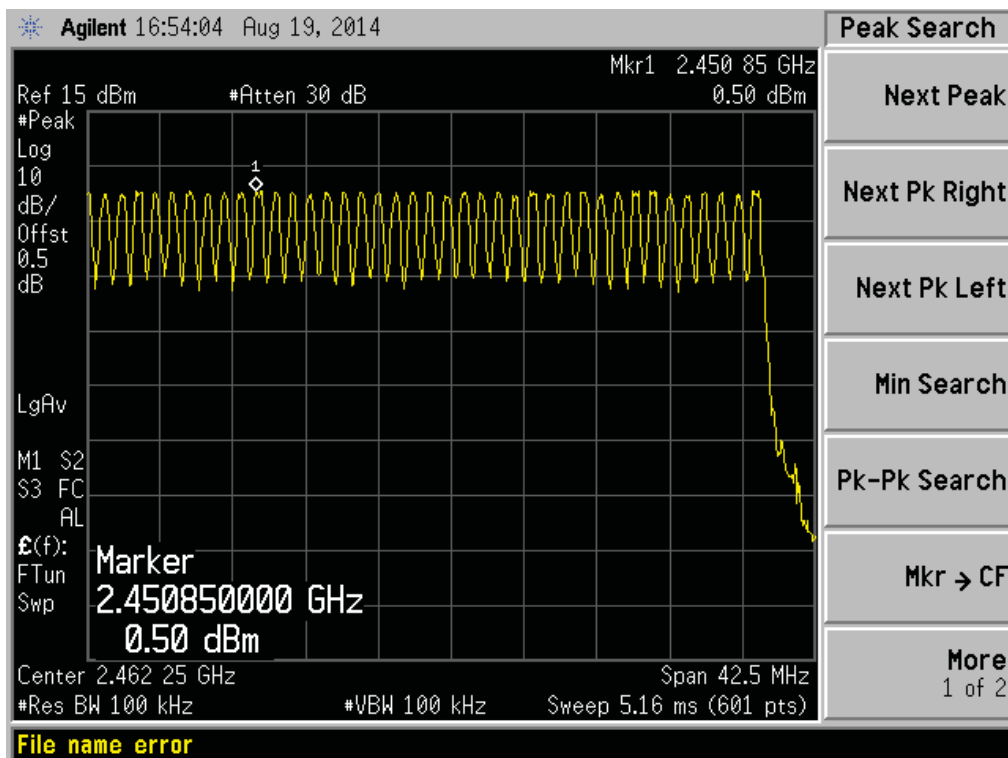
Test Mode	Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Verdict
GFSK	2400 - 2483.5	79	15	PASS
π/4-DQPSK	2400 - 2483.5	79	15	PASS
8-DPSK	2400 - 2483.5	79	15	PASS

Test plots

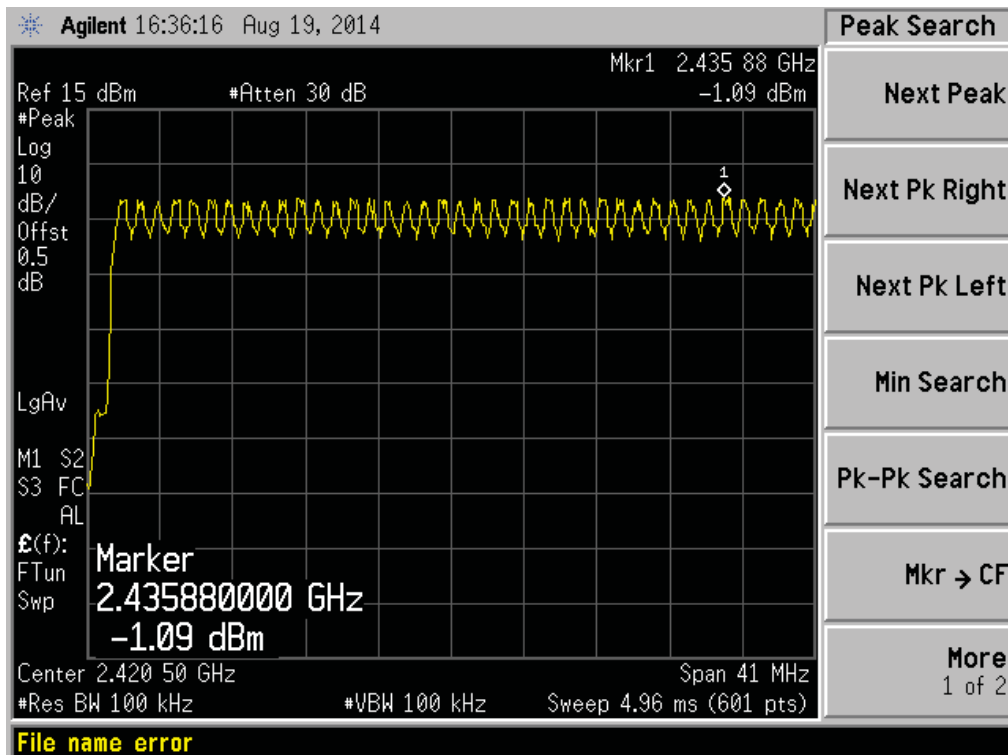
GFSK 2.4GHz~2.4415GHz



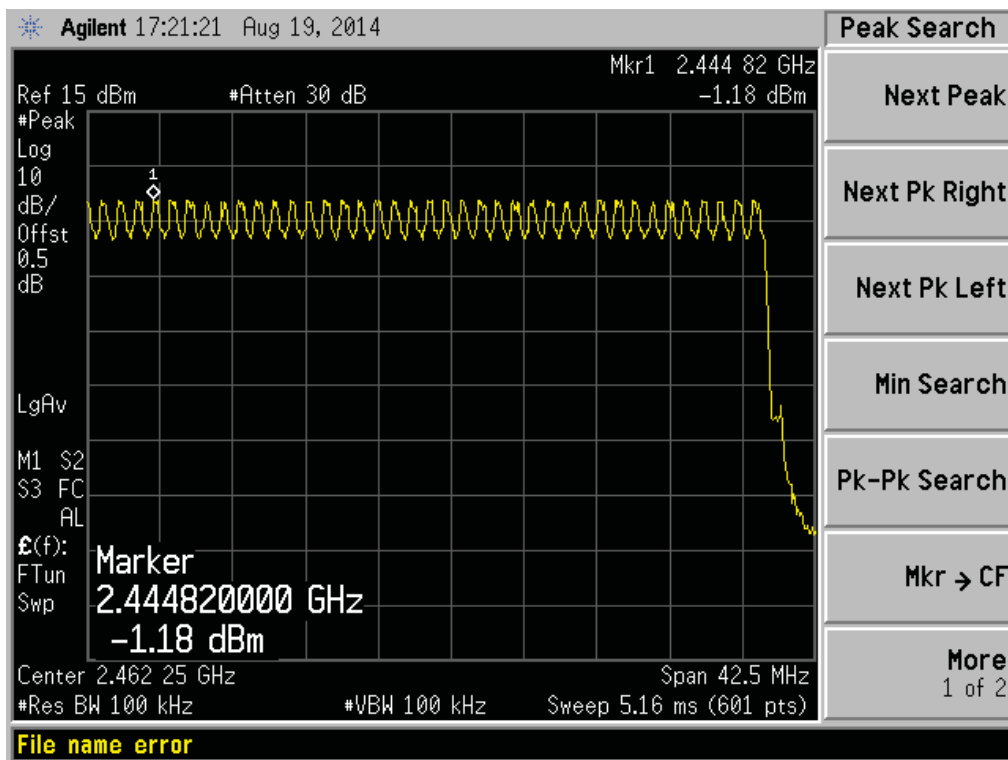
GFSK 2.4415GHz~2.4835GHz



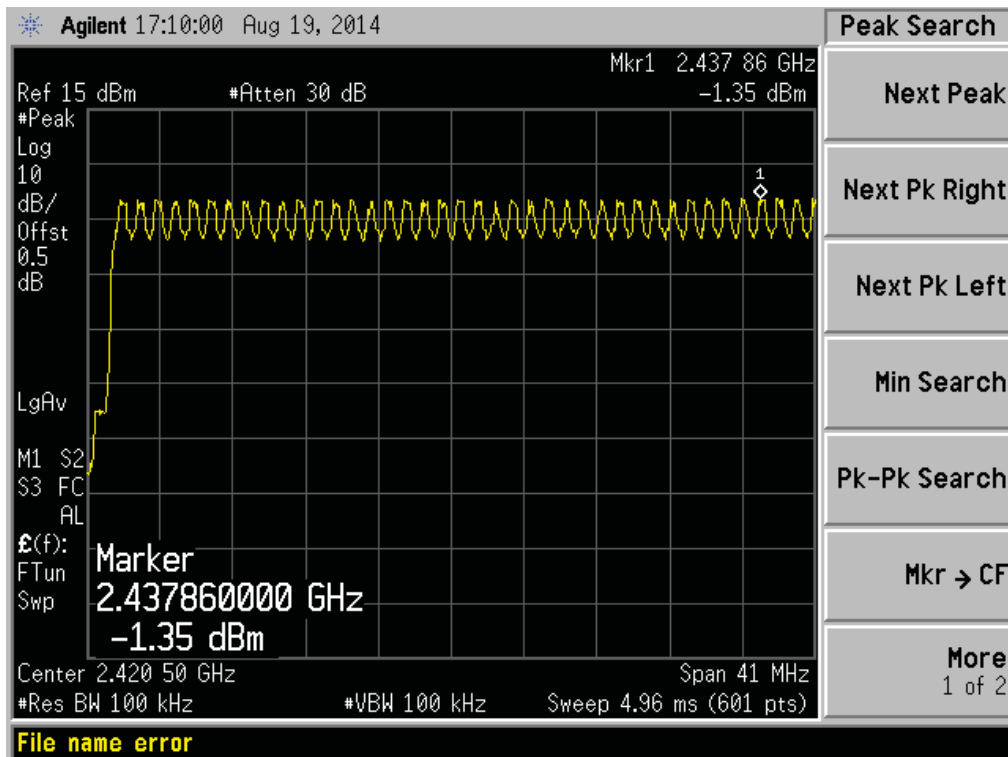
II/4-DQPSK 2.4GHz~2.4415GHz



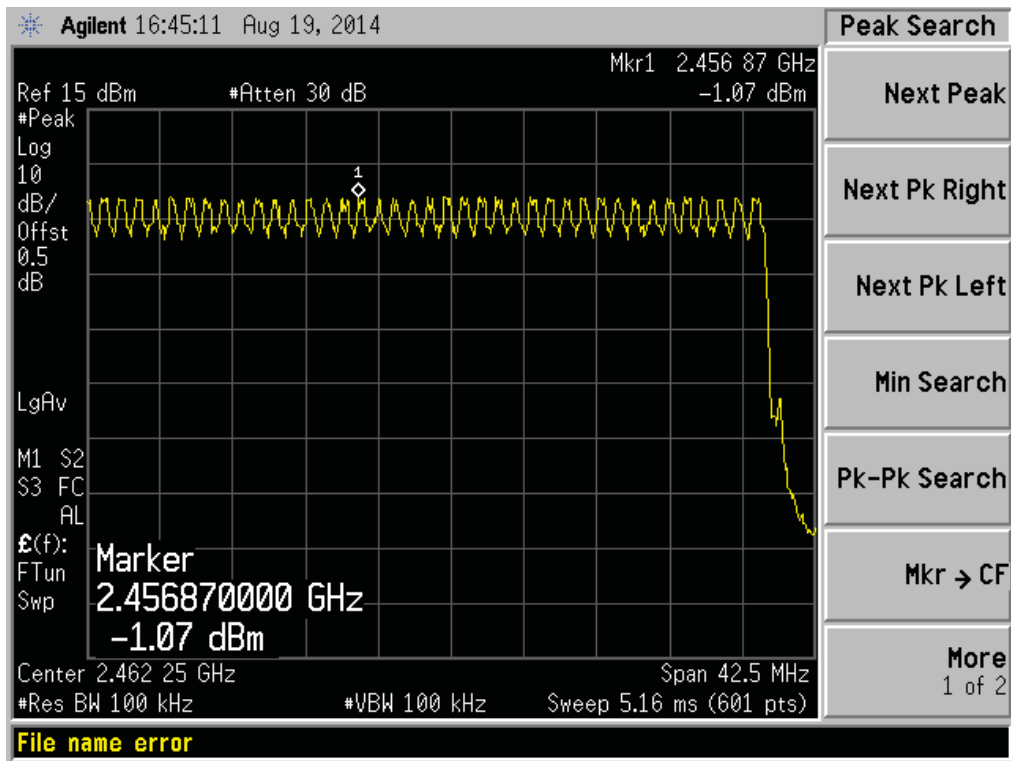
II/4-DQPSK 2.4415GHz~2.4835GHz



8-DPSK 2.4GHz~2.4415GHz



8-DPSK 2.4415GHz~2.4835GHz



A.2 Peak Output Power

Test Data

GFSK Mode:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	mW	dBm	mW	
Low	2402	0.45	1.11	30	1000	PASS
Middle	2441	0.76	1.19			PASS
High	2480	0.76	1.19			PASS

π/4-DQPSK Mode:

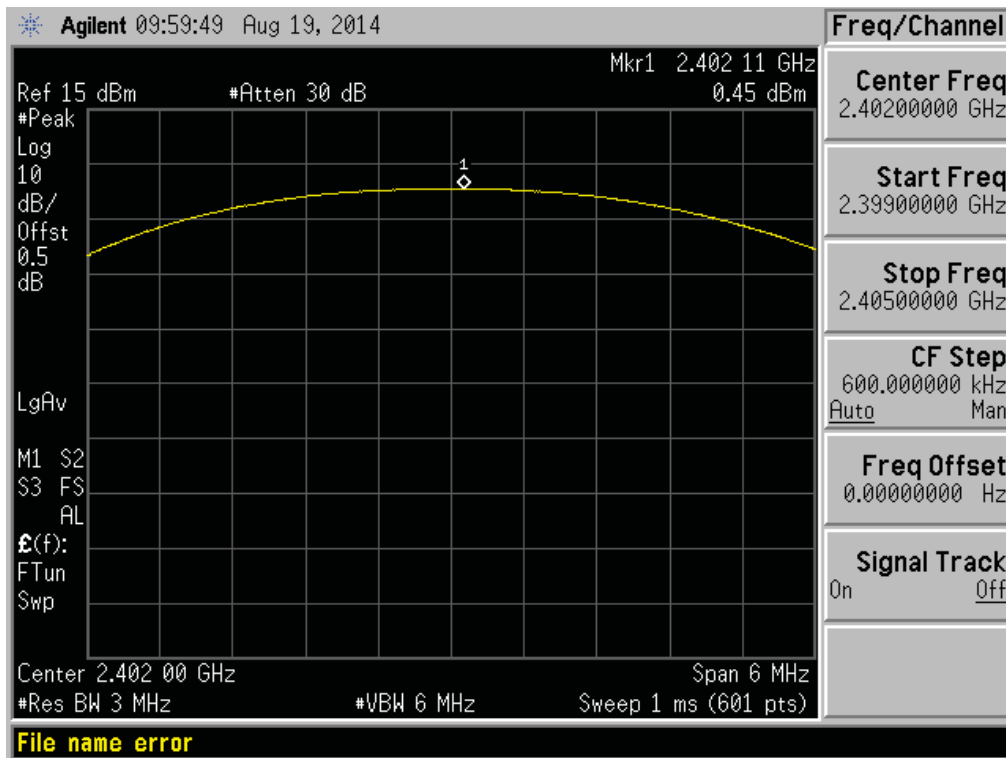
Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	mW	dBm	mW	
Low	2402	-1.36	0.73	30	1000	PASS
Middle	2441	-0.97	0.80			PASS
High	2480	-0.89	0.81			PASS

8-DPSK Mode:

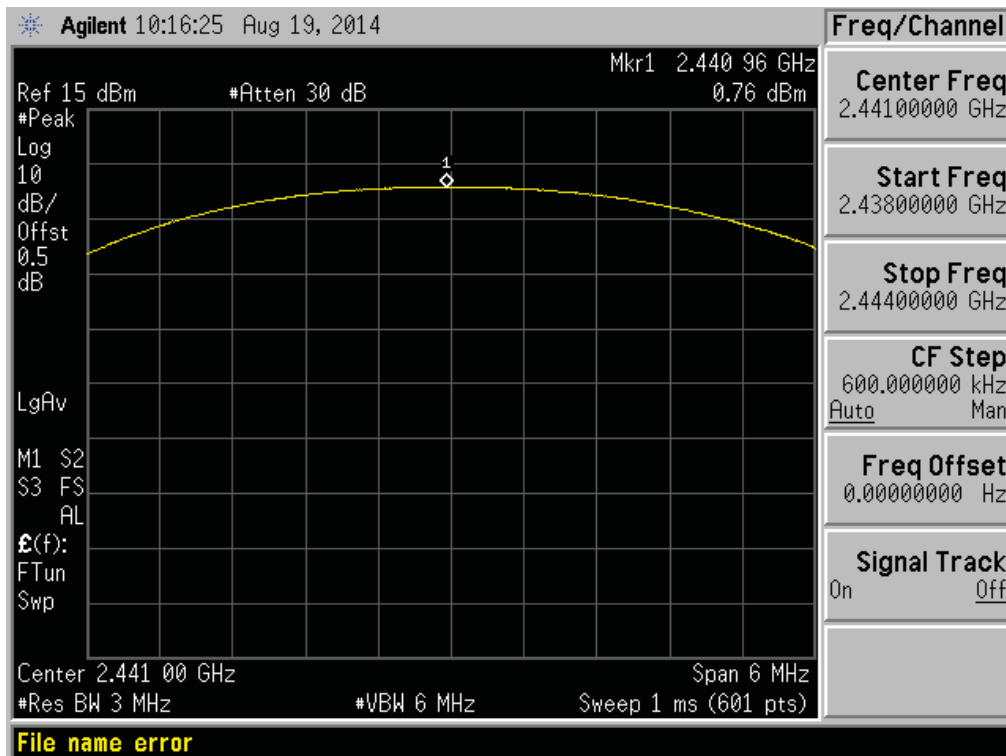
Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	mW	dBm	mW	
Low	2402	-0.59	0.87	30	1000	PASS
Middle	2441	0.06	1.01			PASS
High	2480	-0.36	0.92			PASS

Test plots

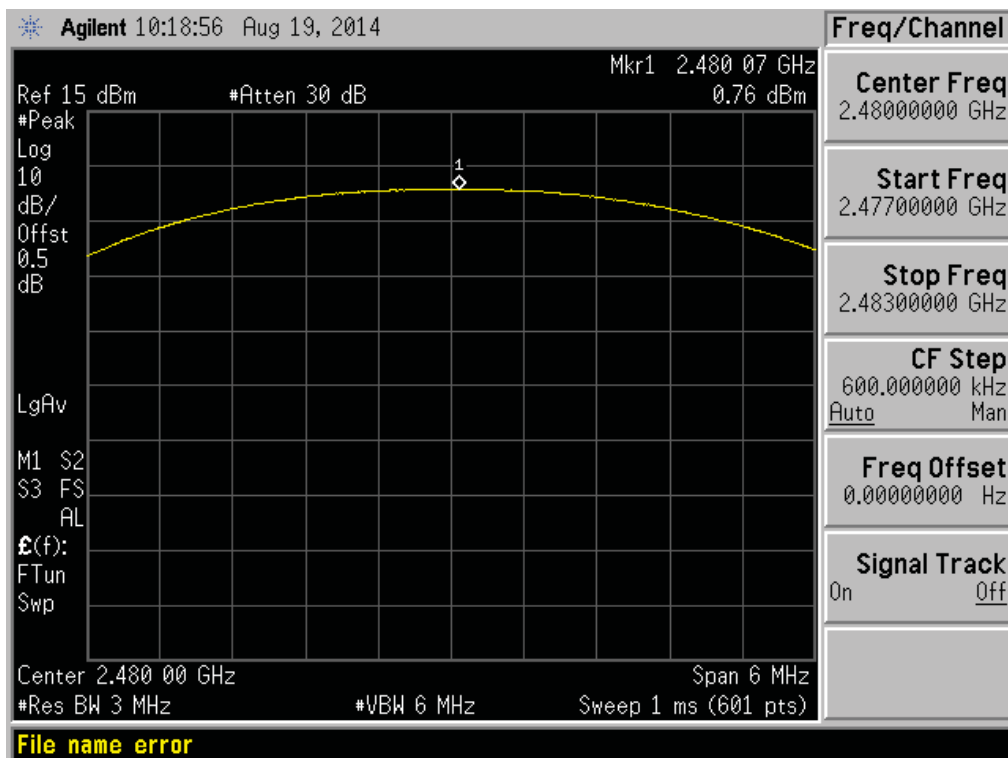
GFSK LOW CHANNEL



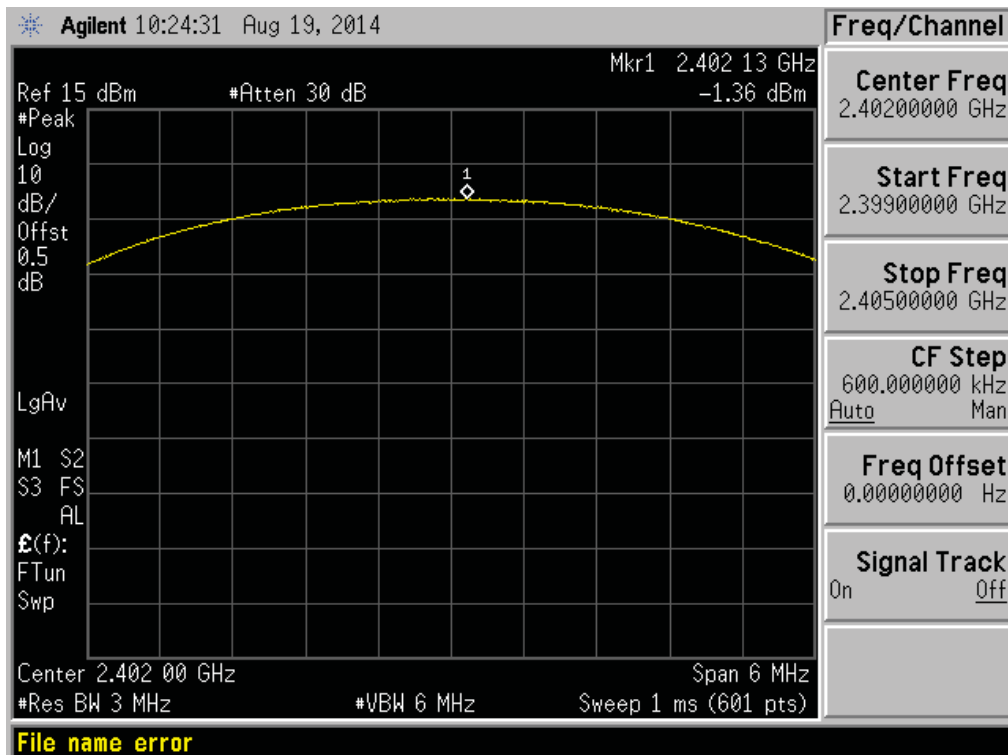
GFSK MID CHANAEL



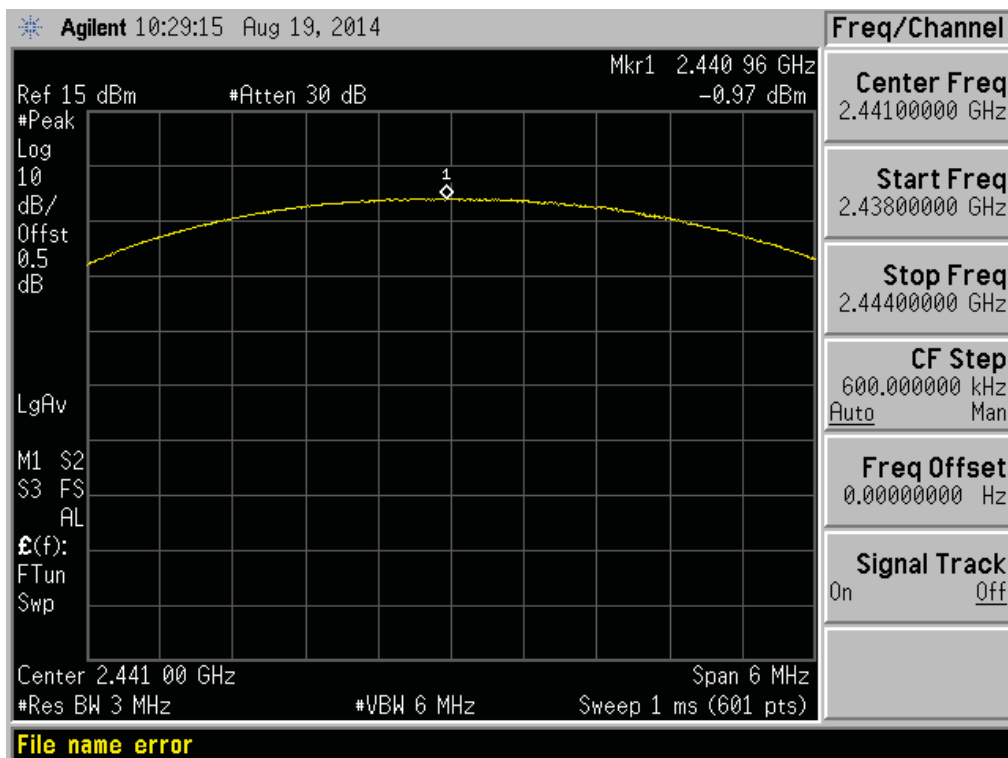
GFSK HIGH CHANNEL



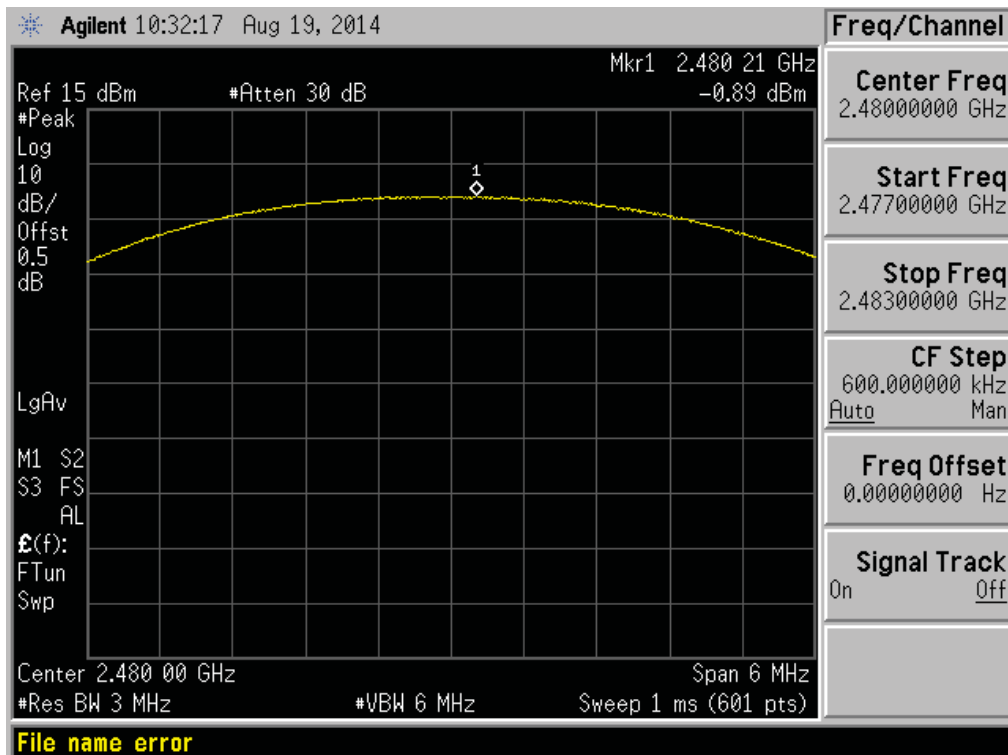
II/4-DQPSK LOW CHANNEL



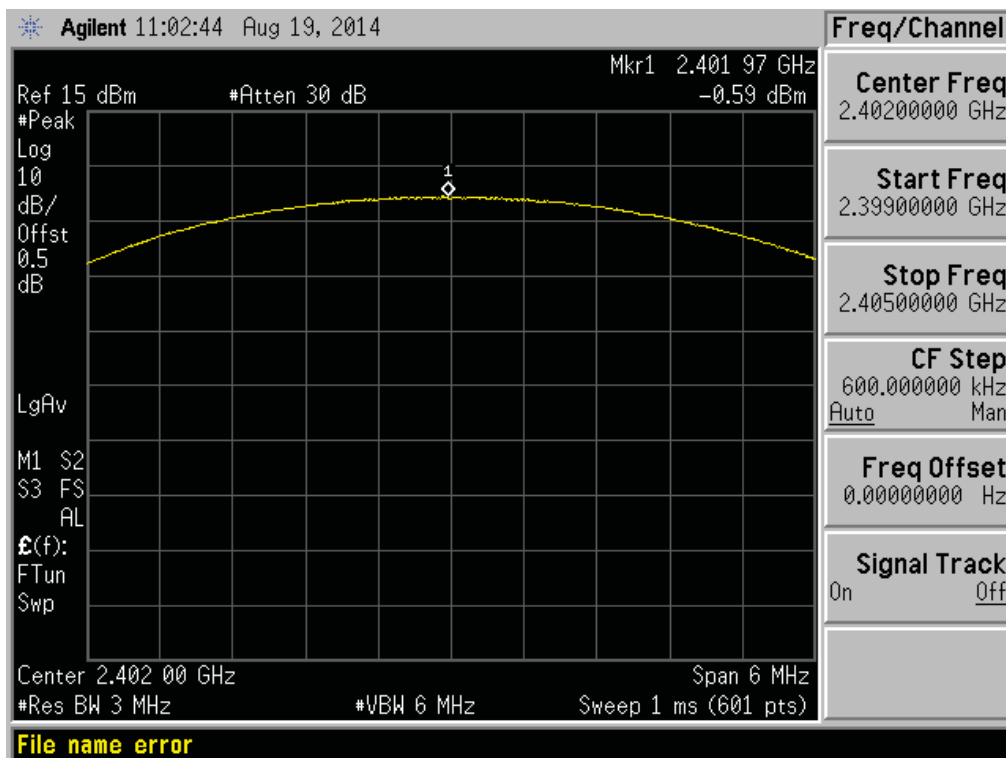
II/4-DQPSK MID CHANAEL



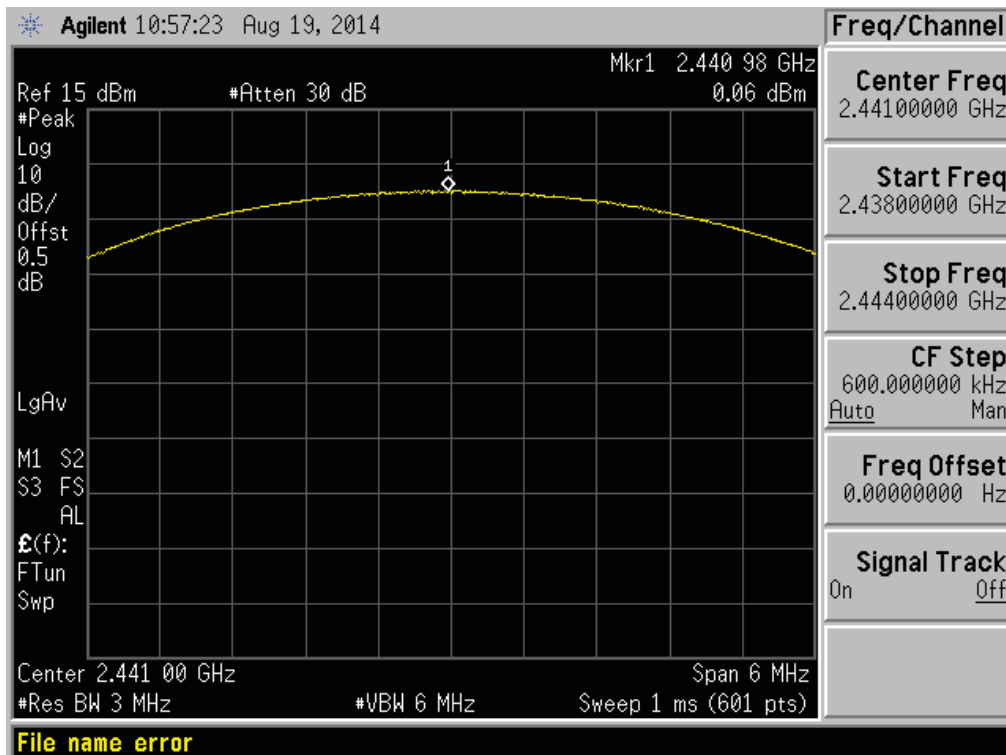
II/4-DQPSK HIGH CHANNEL



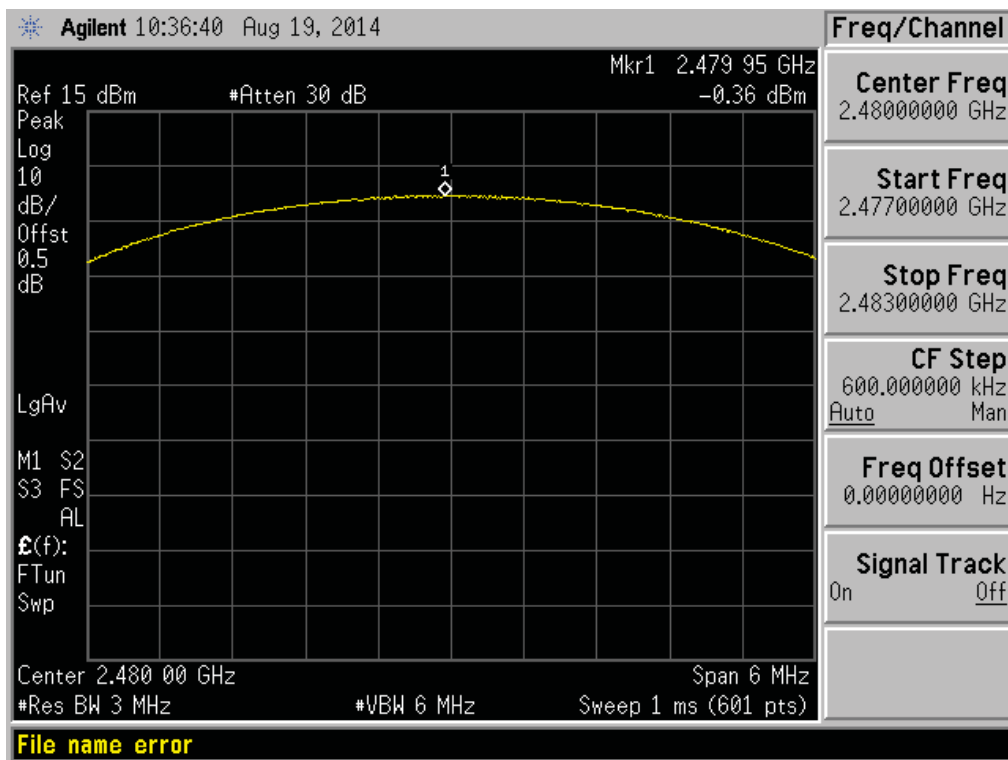
8-DPSK LOW CHANNEL



8-DPSK MID CHANAEL



8-DPSK HIGH CHANNEL



A.3 20dB and 99% bandwidth

Test Data

GFSK Mode:

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.139	1.0046
Middle	2441	1.128	1.0011
High	2480	1.129	1.0007

π/4-DQPSK Mode:

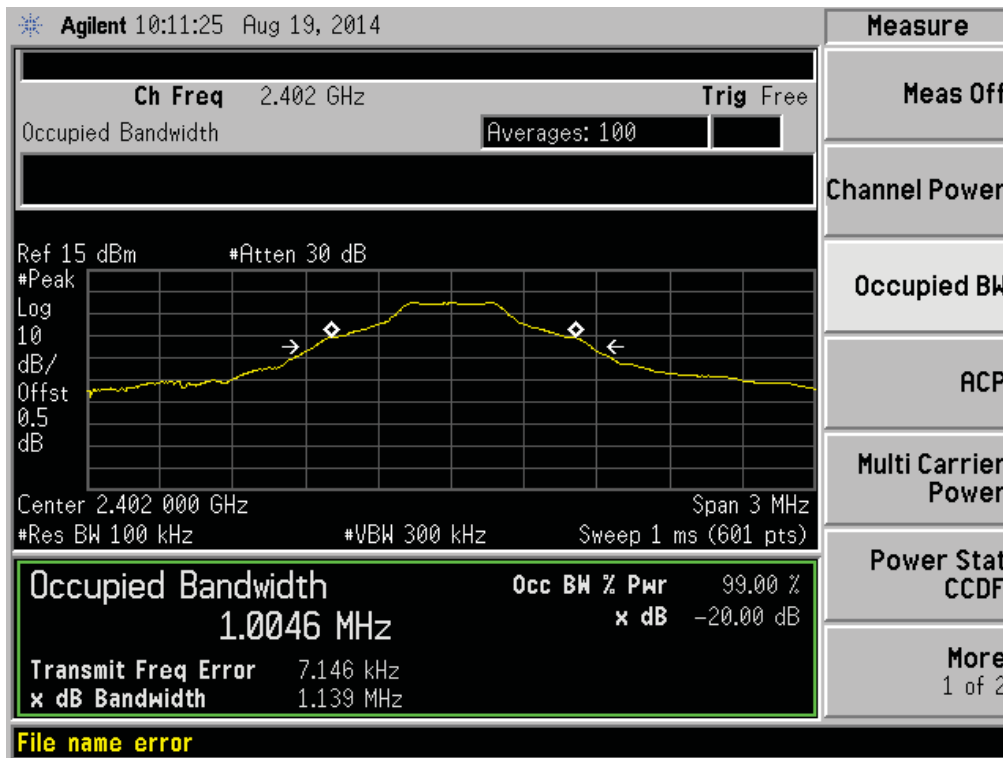
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.352	1.1951
Middle	2441	1.353	1.1926
High	2480	1.349	1.1918

8-DPSK Mode:

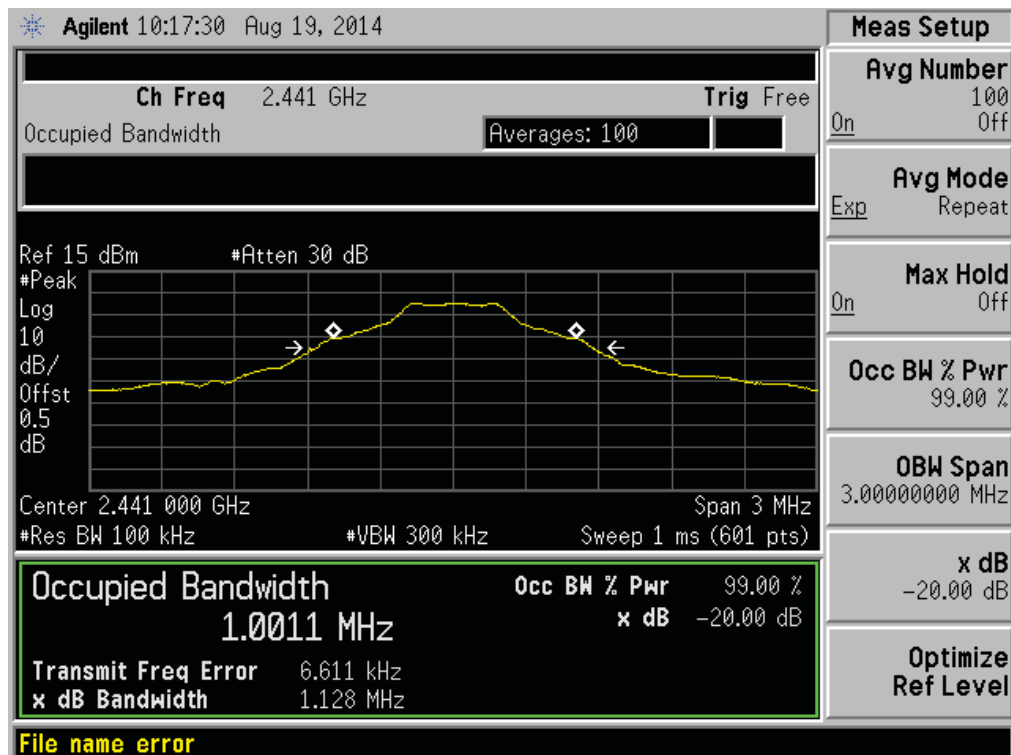
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.372	1.2073
Middle	2441	1.368	1.2021
High	2480	1.366	1.2039

Test plots

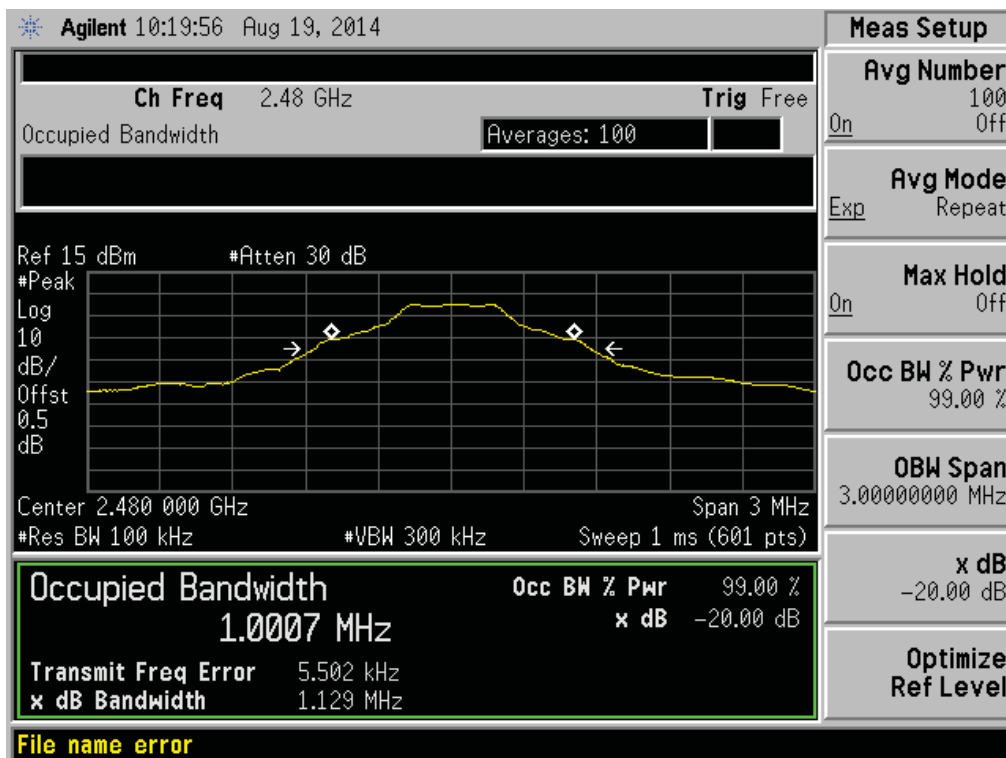
GFSK LOW CHANNEL



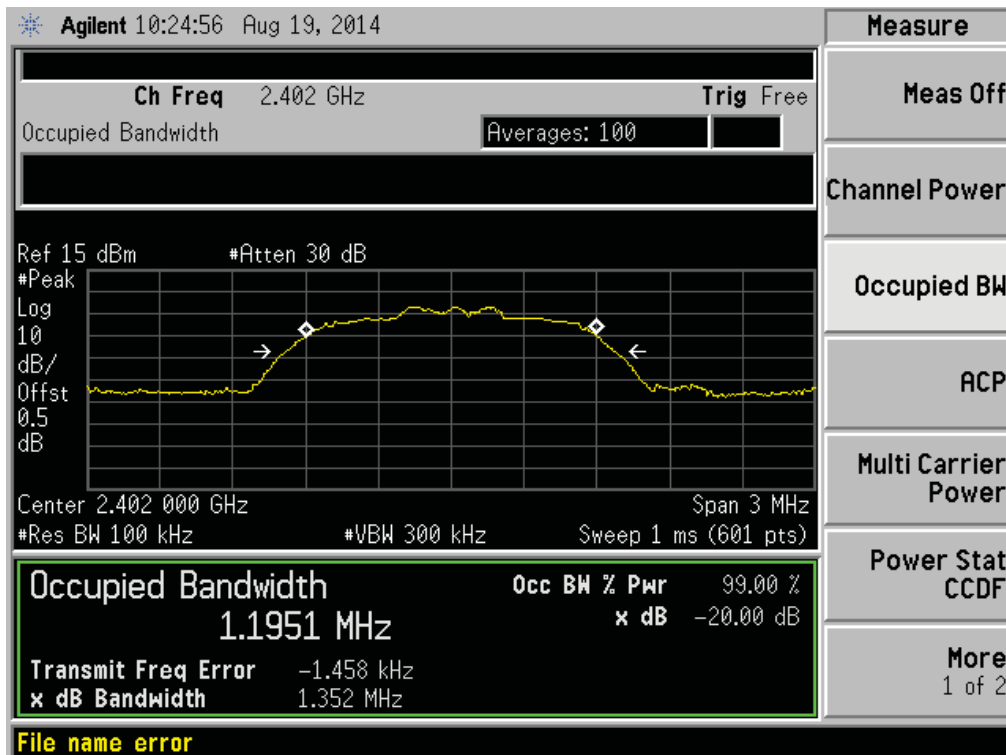
GFSK MID CHANAEL



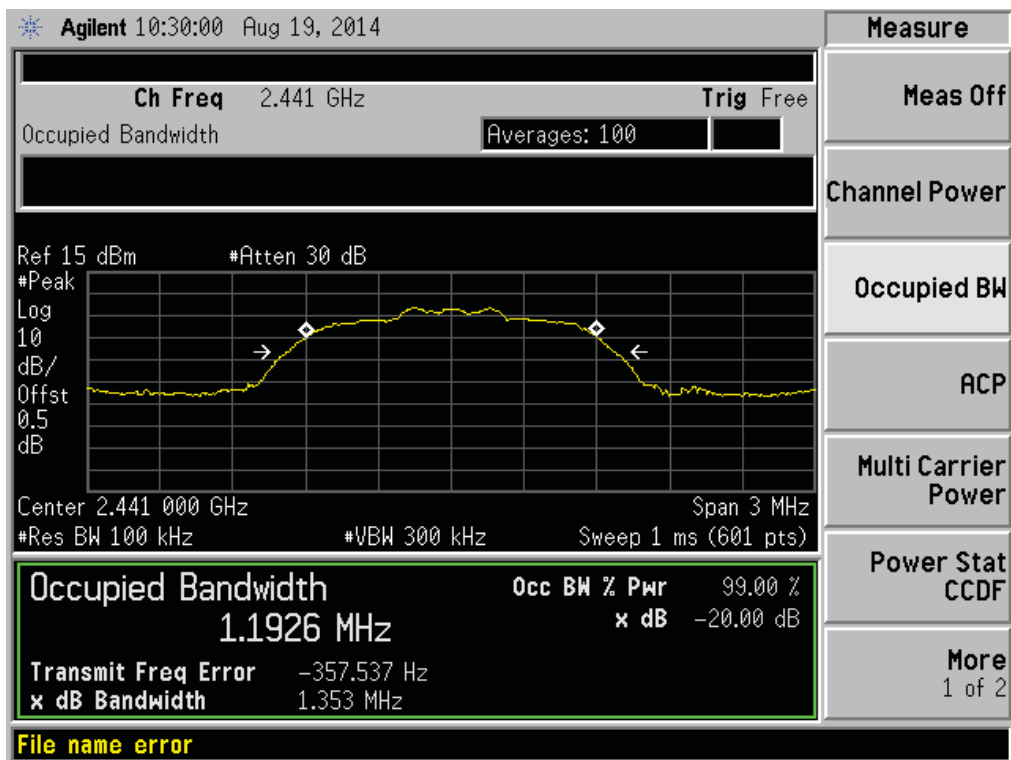
GFSK HIGH CHANNEL



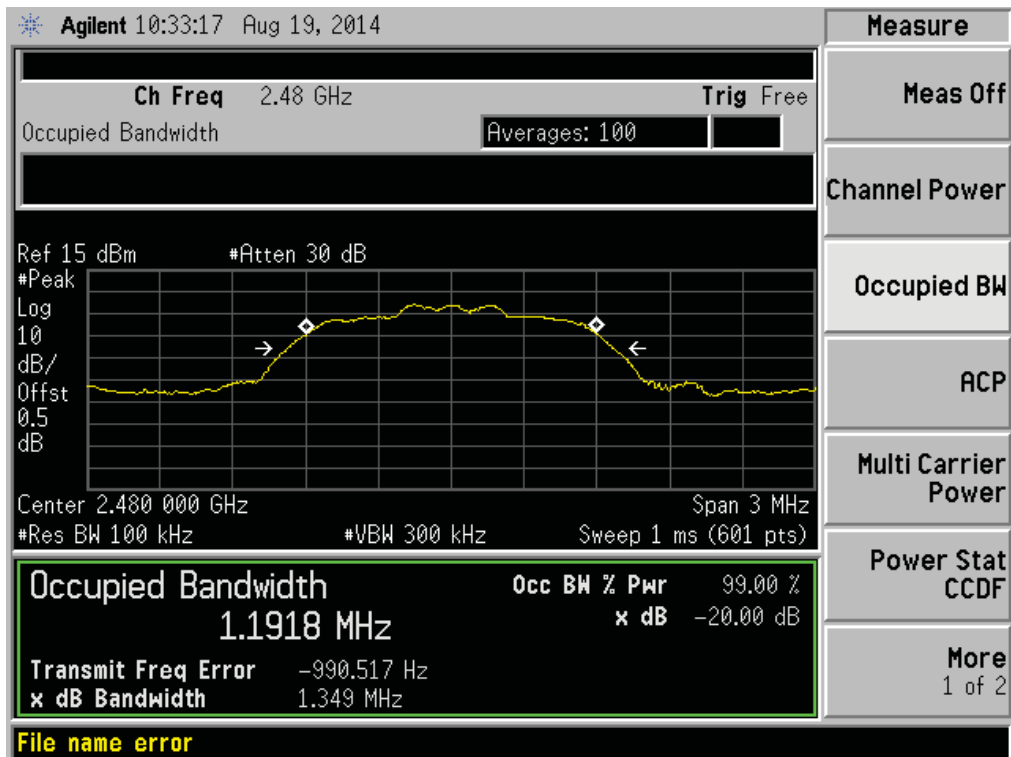
II/4-DQPSK LOW CHANNEL



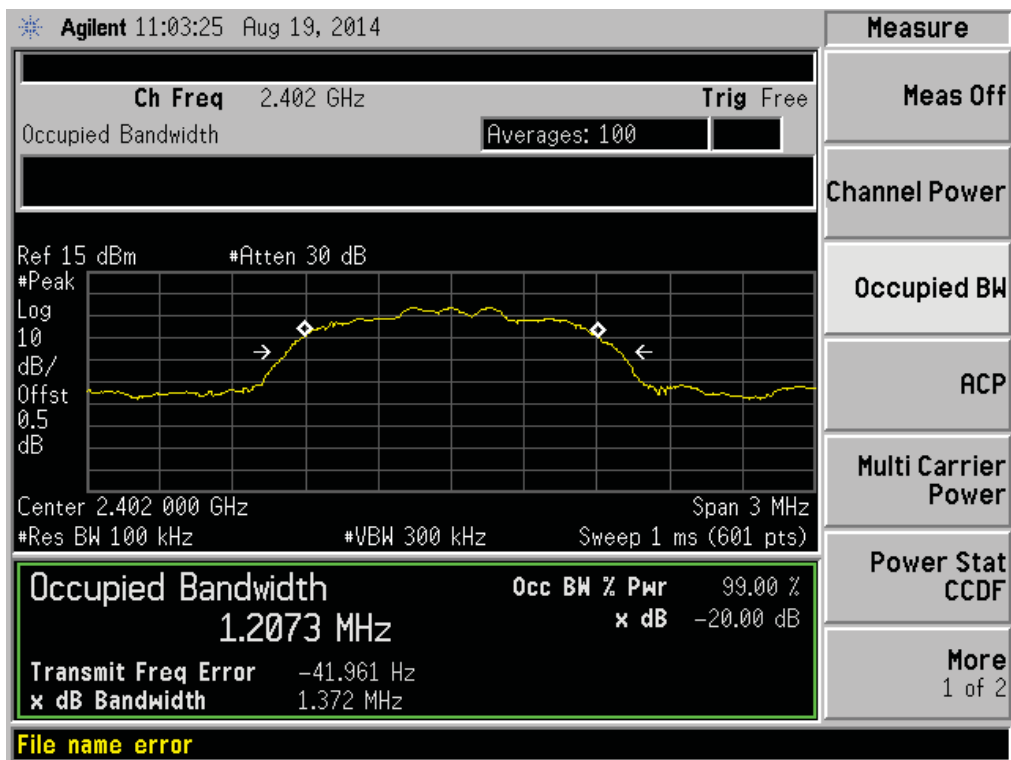
II/4-DQPSK MID CHANAEL



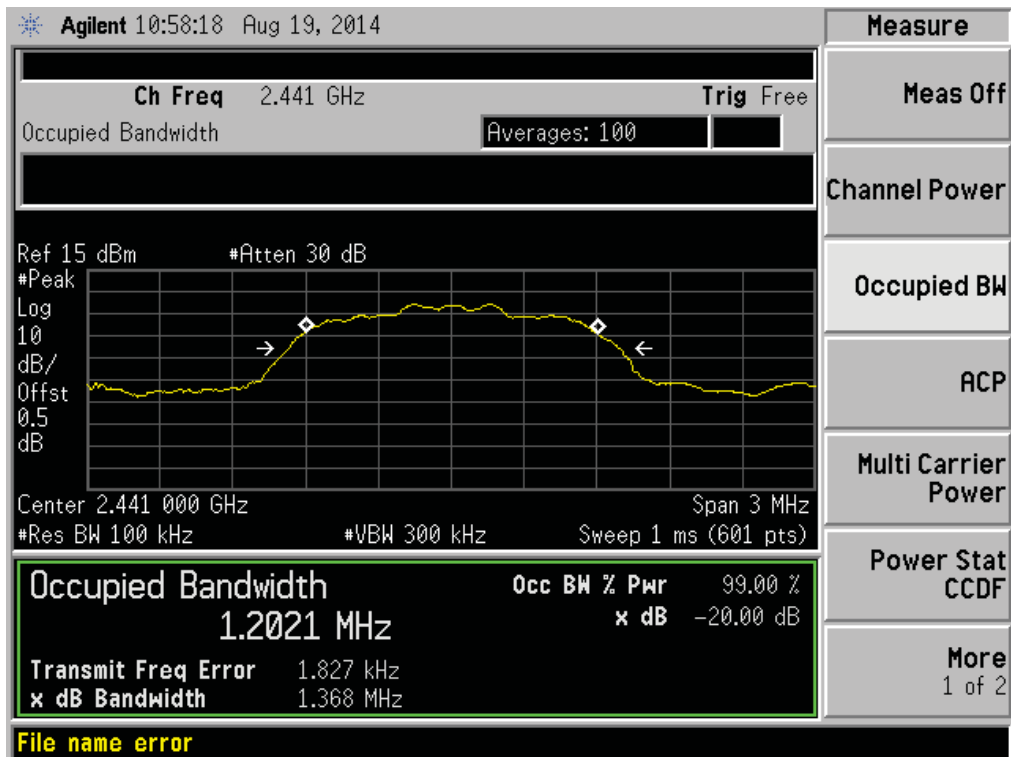
II/4-DQPSK HIGH CHANNEL



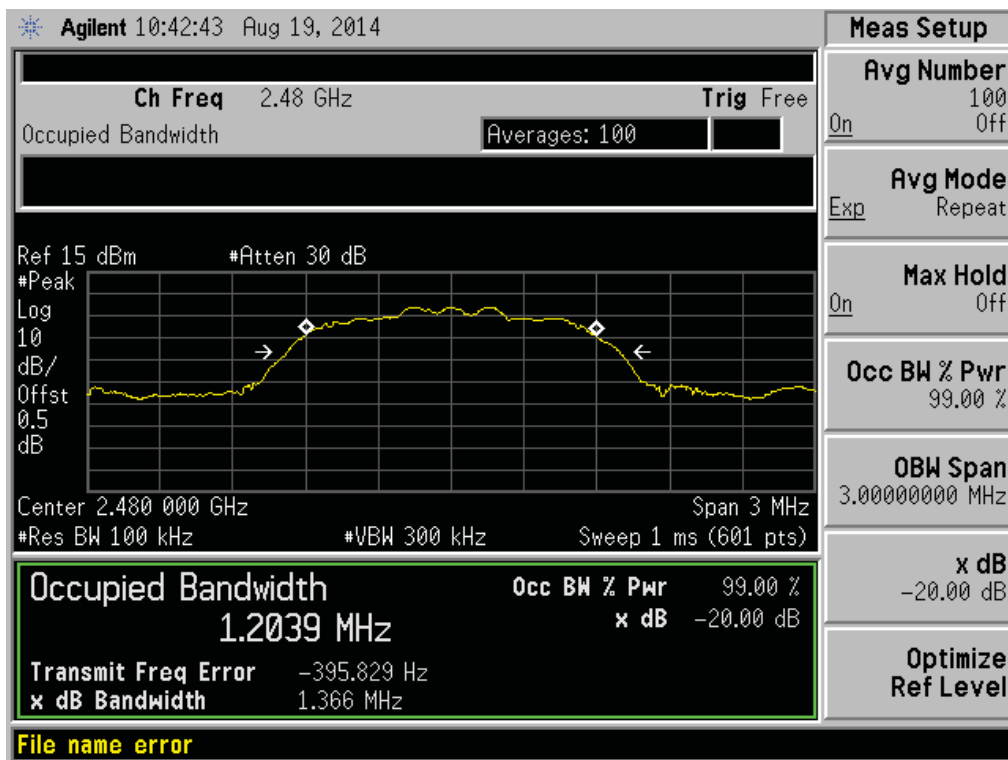
8-DPSK LOW CHANNEL



8-DPSK MID CHANAEL



8-DPSK HIGH CHANNEL



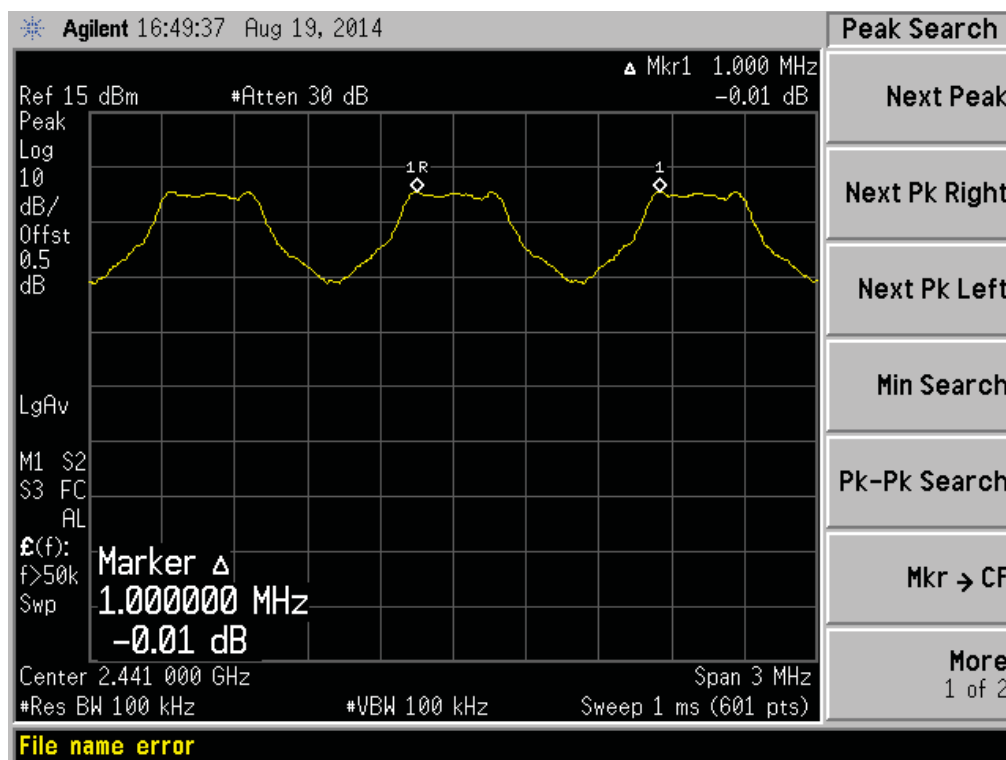
A.4 Hopping Frequency Separation

Test Data

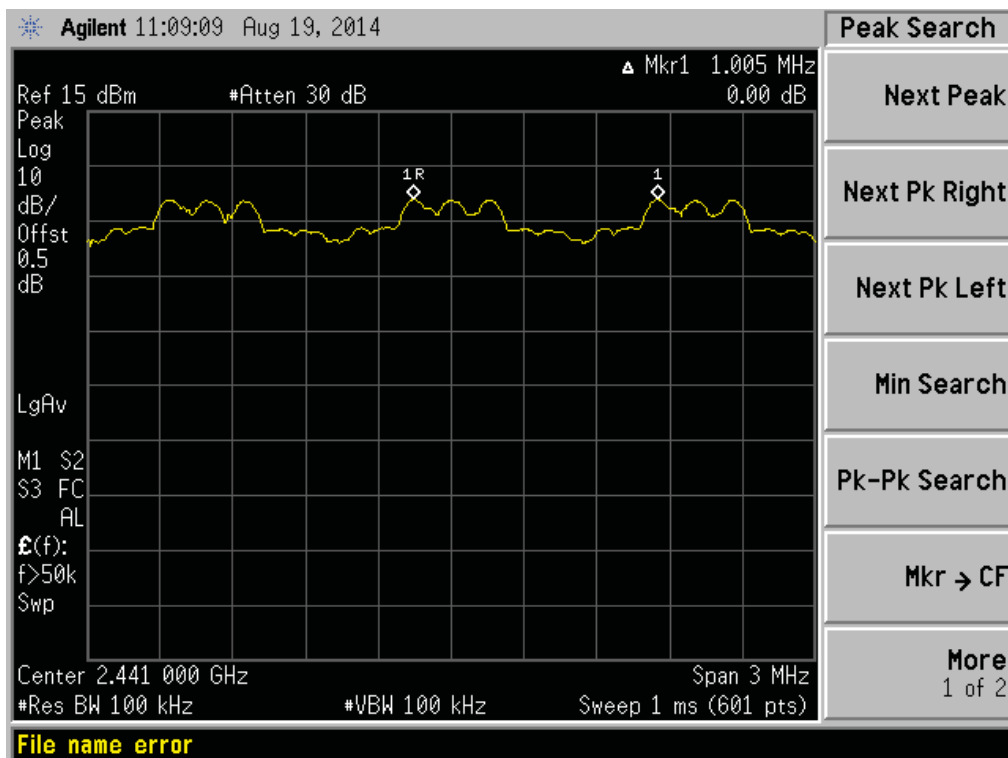
Mode	Frequency separation (MHz)	Max 20 dB Bandwidth (MHz)	Two-thirds of the 20dB bandwidth (MHz)	Verdict
GFSK	1.000	1.139	0.759	PASS
$\Pi/4$ -DQPSK Mode	1.005	1.353	0.902	PASS
8-DPSK Mode	1.010	1.372	0.915	PASS

Test plots

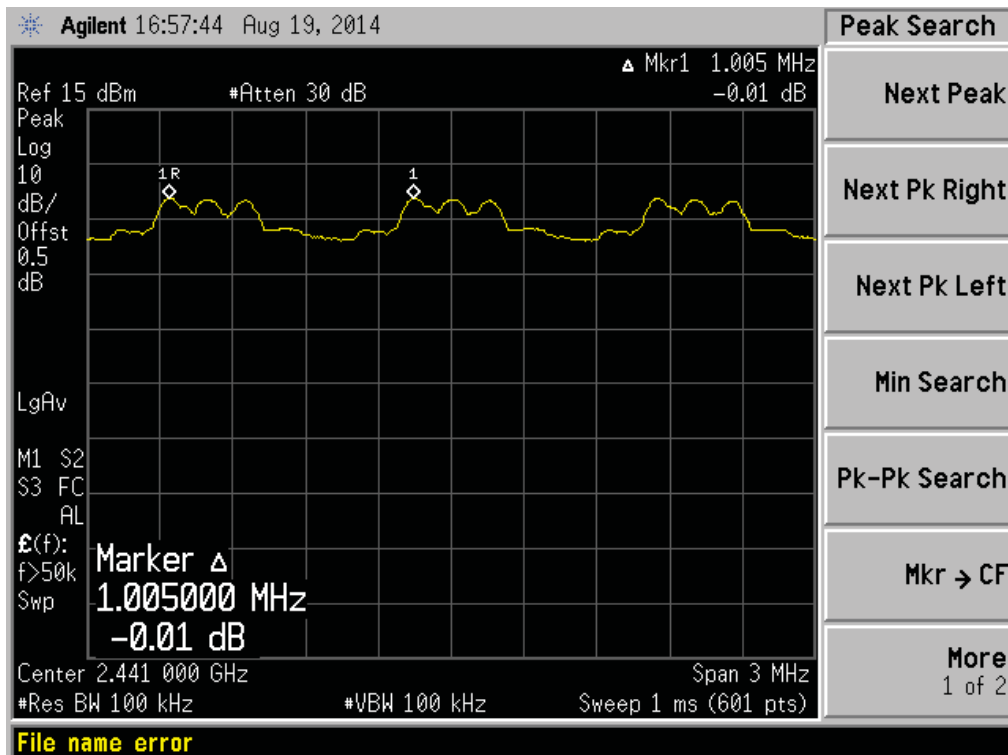
GFSK



II/4-DQPSK



8-DPSK



A.5 Average Time of Occupancy

Test Data

GFSK Mode:

DH Packet	Pulse Width (ms)	Total of Dwell (ms)	Limit (sec)	Verdict
DH 1	0.400	128.004	0.4	PASS
DH 3	1.653	264.488	0.4	PASS
DH 5	2.900	309.343	0.4	PASS

π/4-DQPSK Mode:

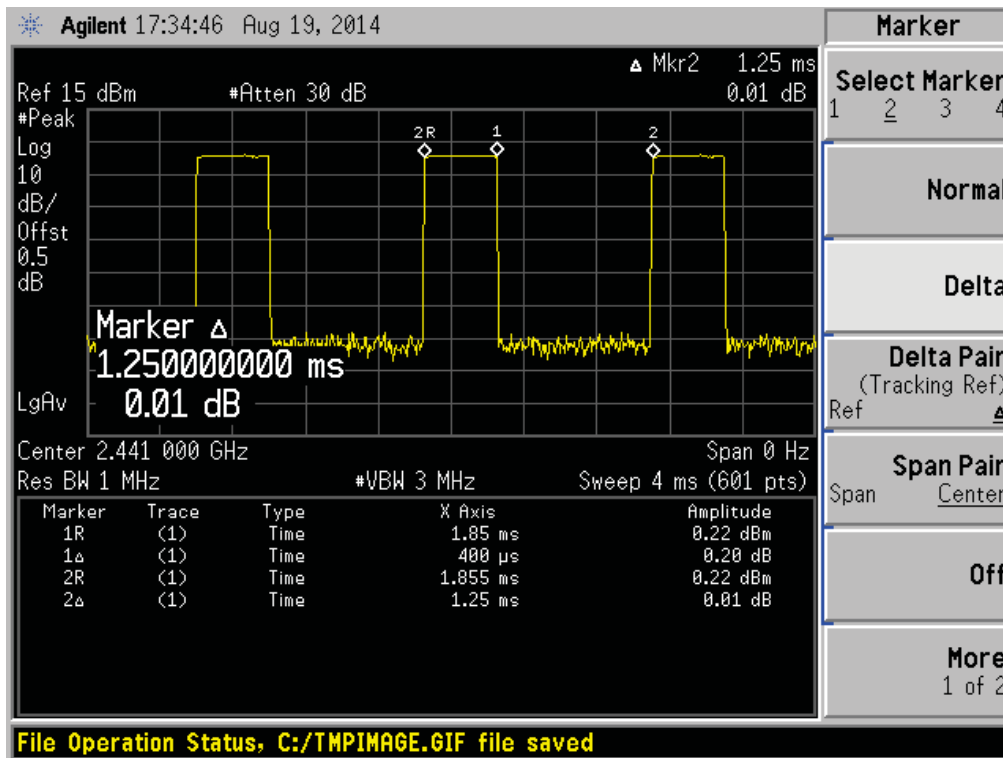
DH Packet	Pulse Width (ms)	Total of Dwell (ms)	Limit (sec)	Verdict
DH 1	0.400	128.004	0.4	PASS
DH 3	1.653	264.488	0.4	PASS
DH 5	2.900	309.343	0.4	PASS

8-DPSK Mode:

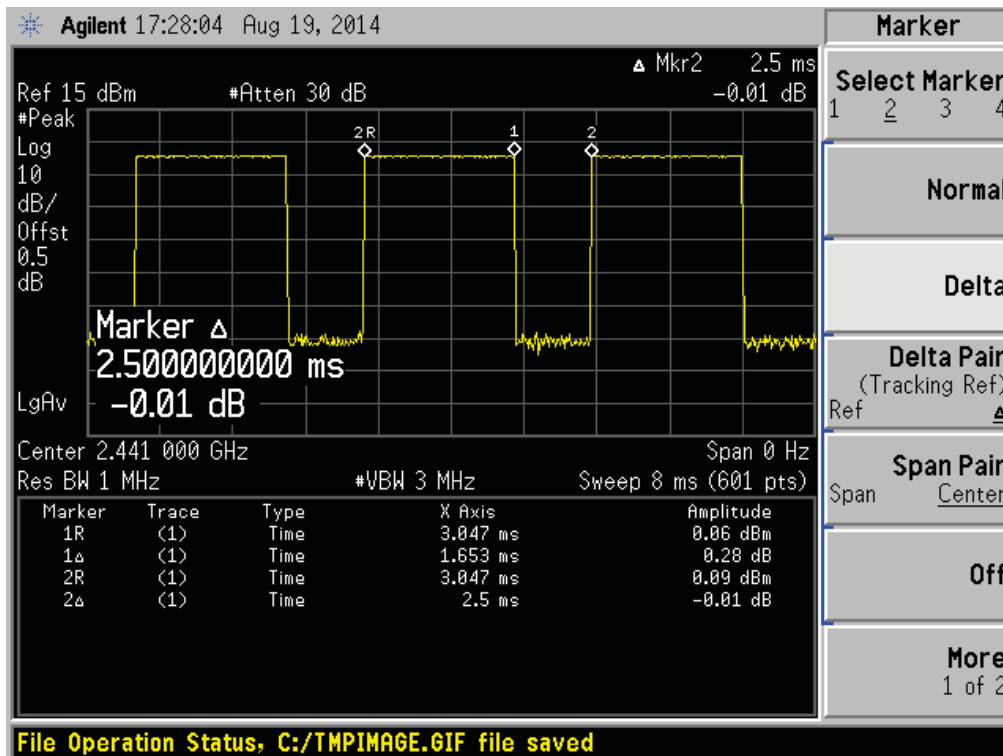
DH Packet	Pulse Width (ms)	Total of Dwell (ms)	Limit (sec)	Verdict
DH 1	0.400	128.004	0.4	PASS
DH 3	1.653	264.488	0.4	PASS
DH 5	2.900	309.343	0.4	PASS

Test Plots

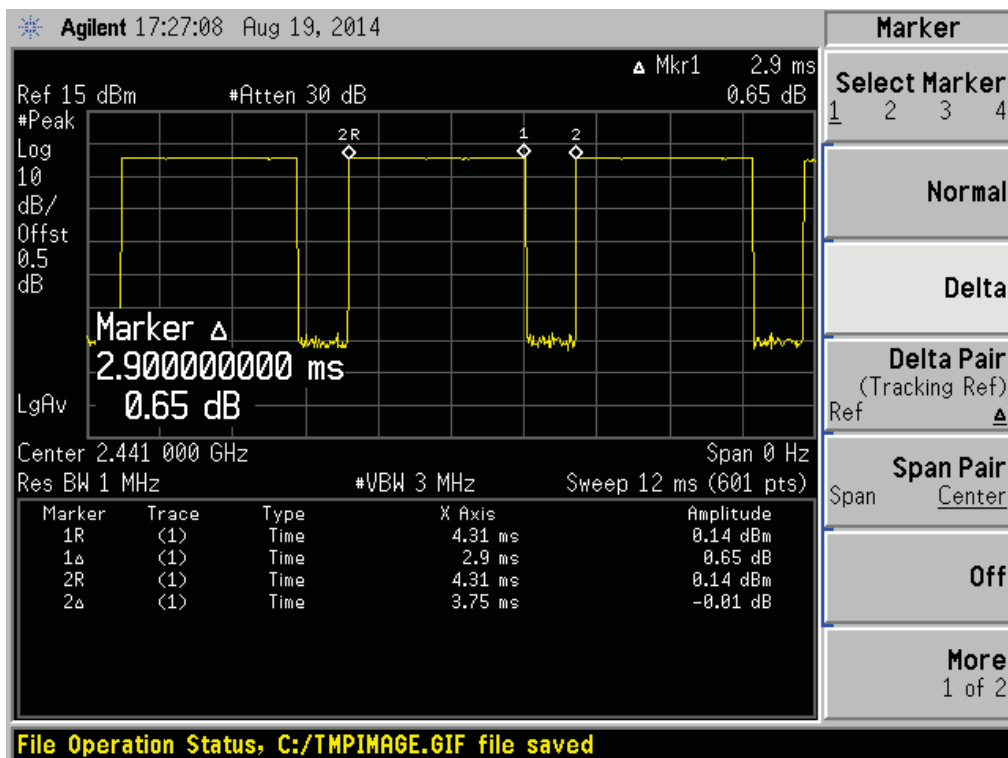
GFSK DH1



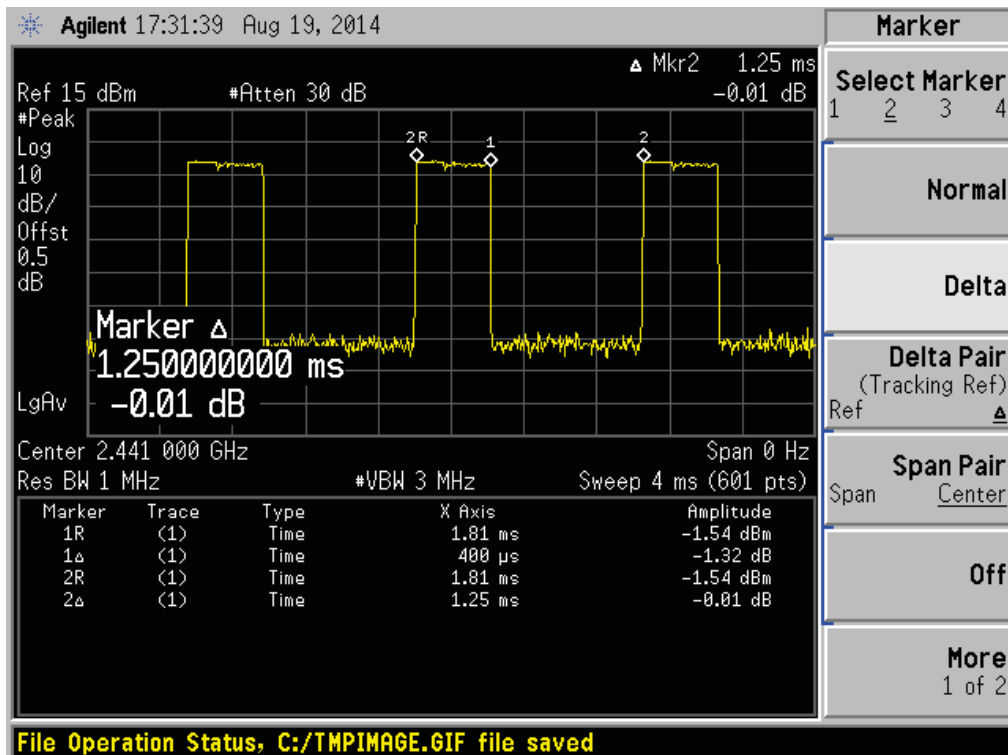
GFSK DH3



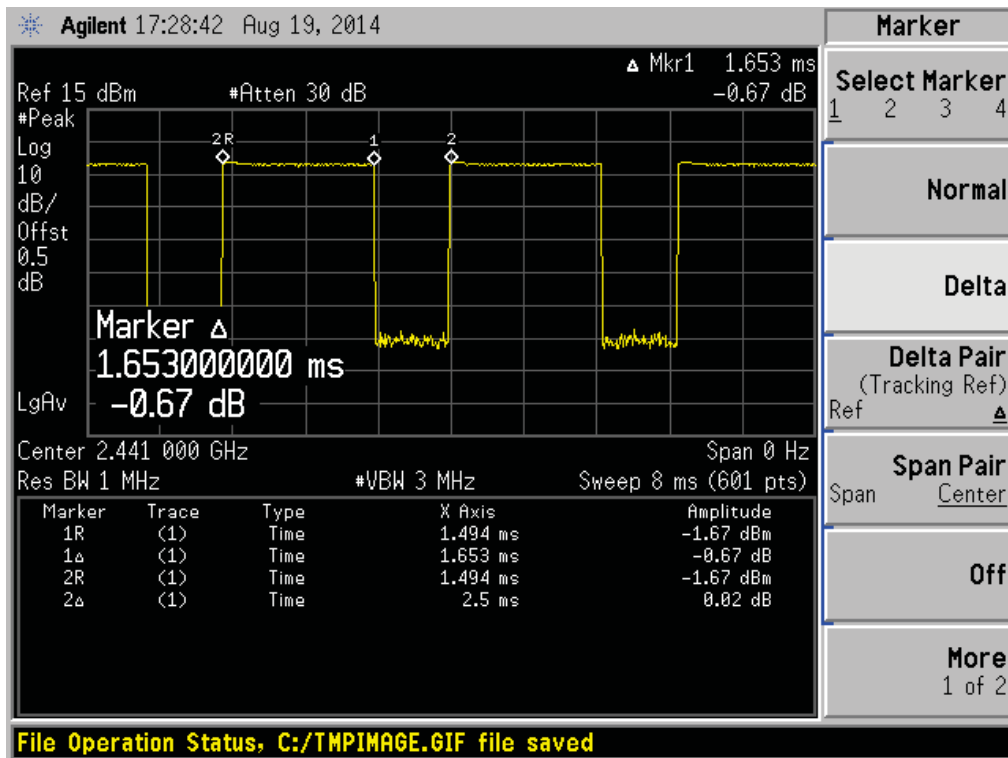
GFSK DH5



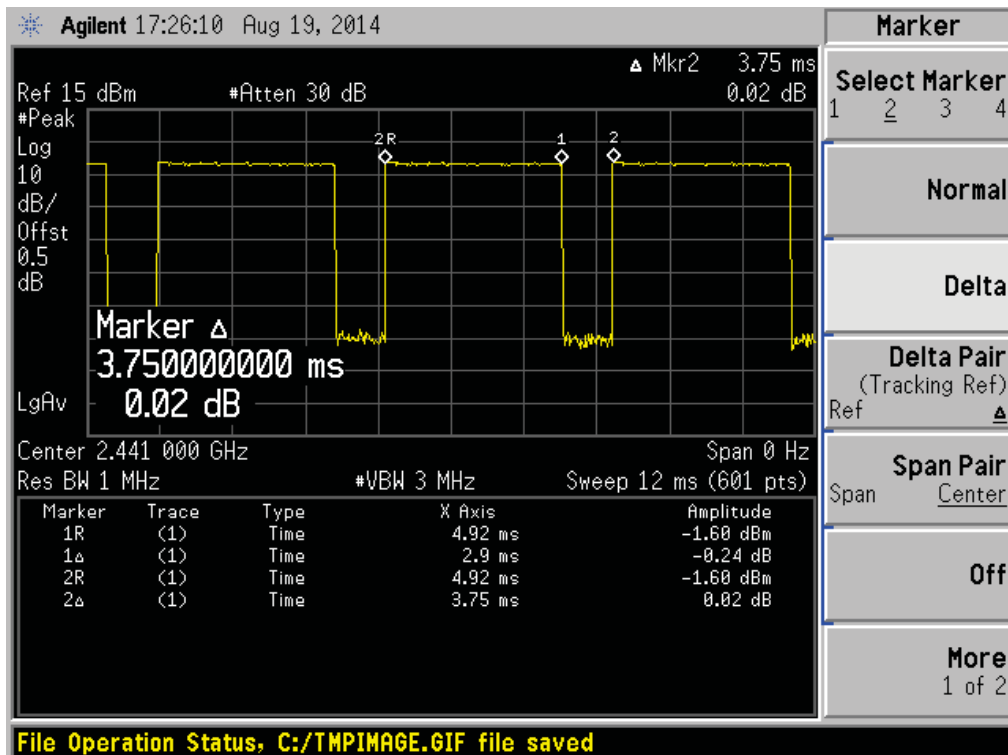
II/4-DQPSK DH1



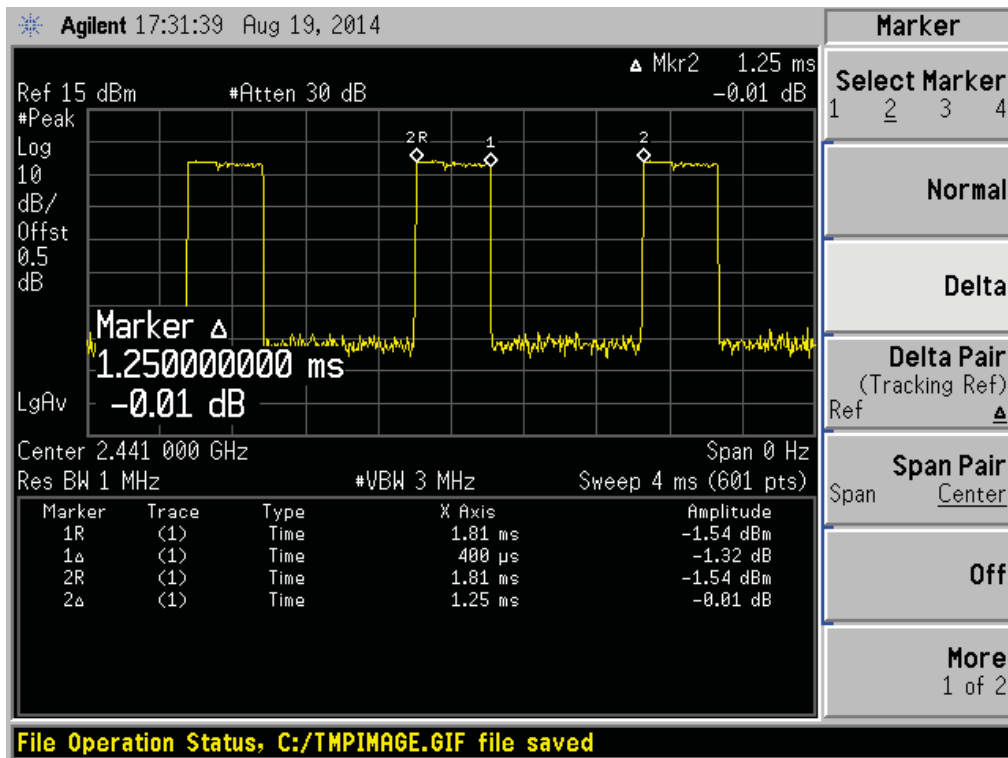
II/4-DQPSK DH3



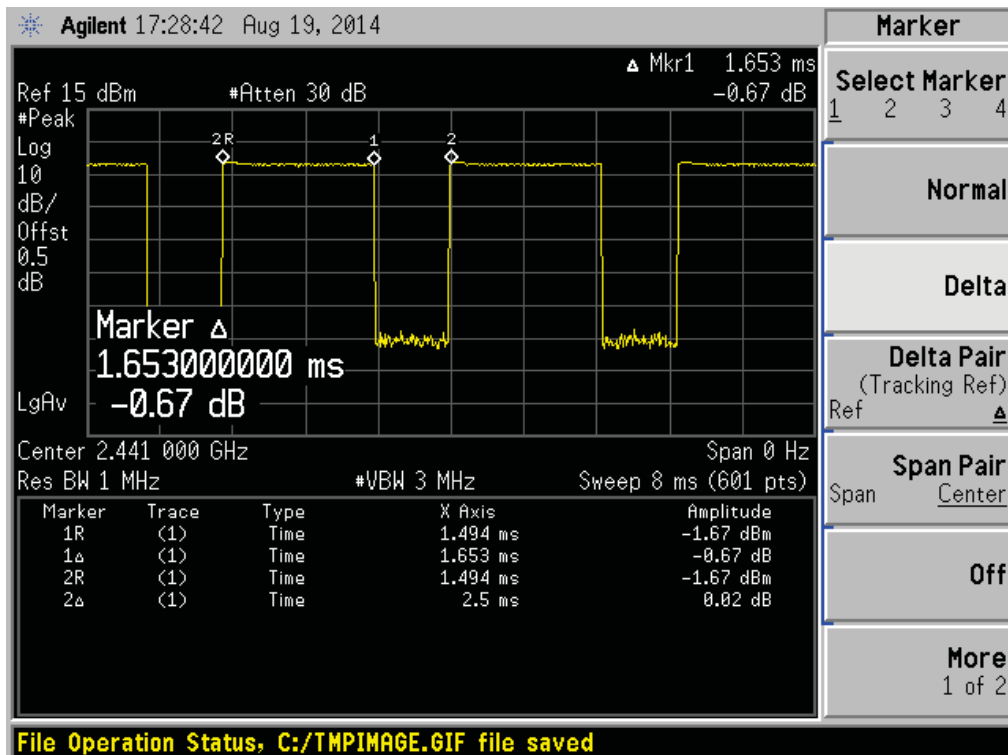
II/4-DQPSK DH5



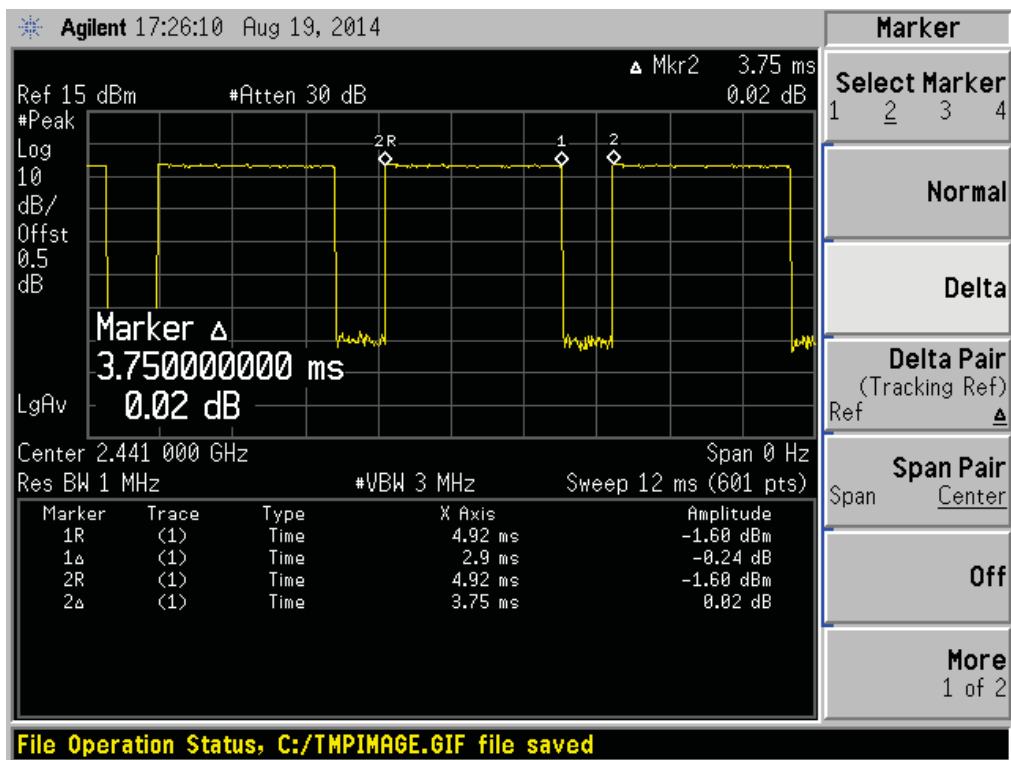
8-DPSK DH1



8-DPSK DH3



8-DPSK DH5



A.6 Conducted Spurious Emissions

Test Data

GFSK Mode:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated 20 dBc Limit	
Low	2402	-39.28	-0.44	-20.4	PASS
Middle	2441	-41.97	-0.03	-20.0	PASS
High	2480	-40.70	0.09	-19.9	PASS

π/4-DQPSK Mode:

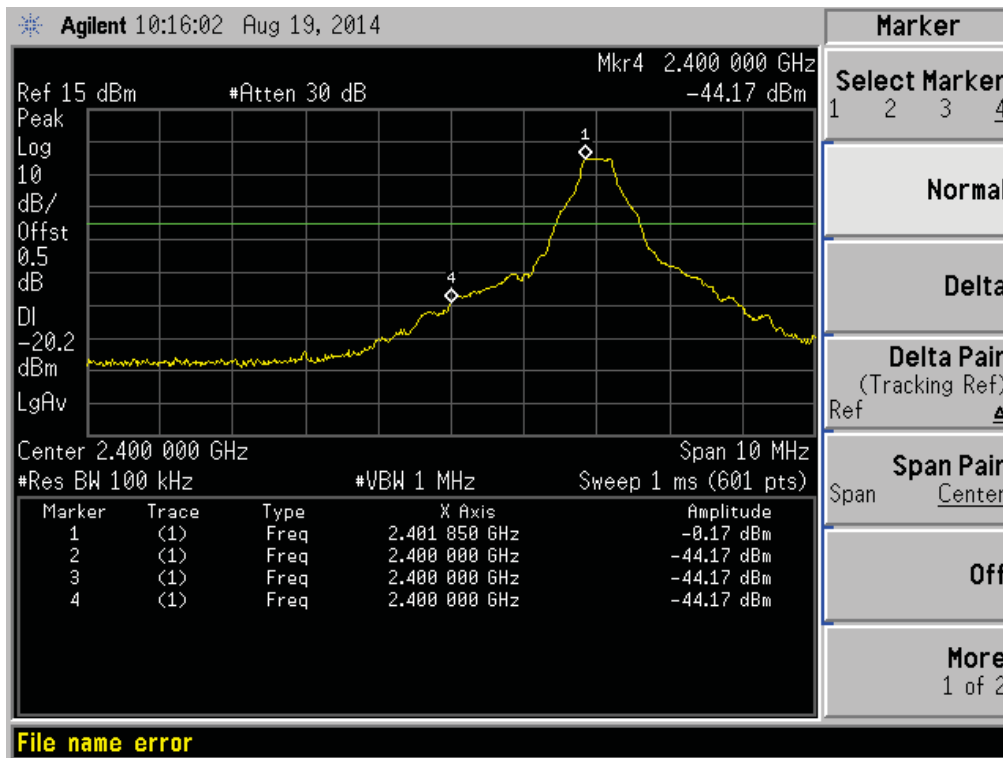
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated 20 dBc Limit	
Low	2402	-47.27	-2.27	-22.3	PASS
Middle	2441	-43.22	-3.03	-23.0	PASS
High	2480	-47.56	-2.25	-22.2	PASS

8-DPSK Mode:

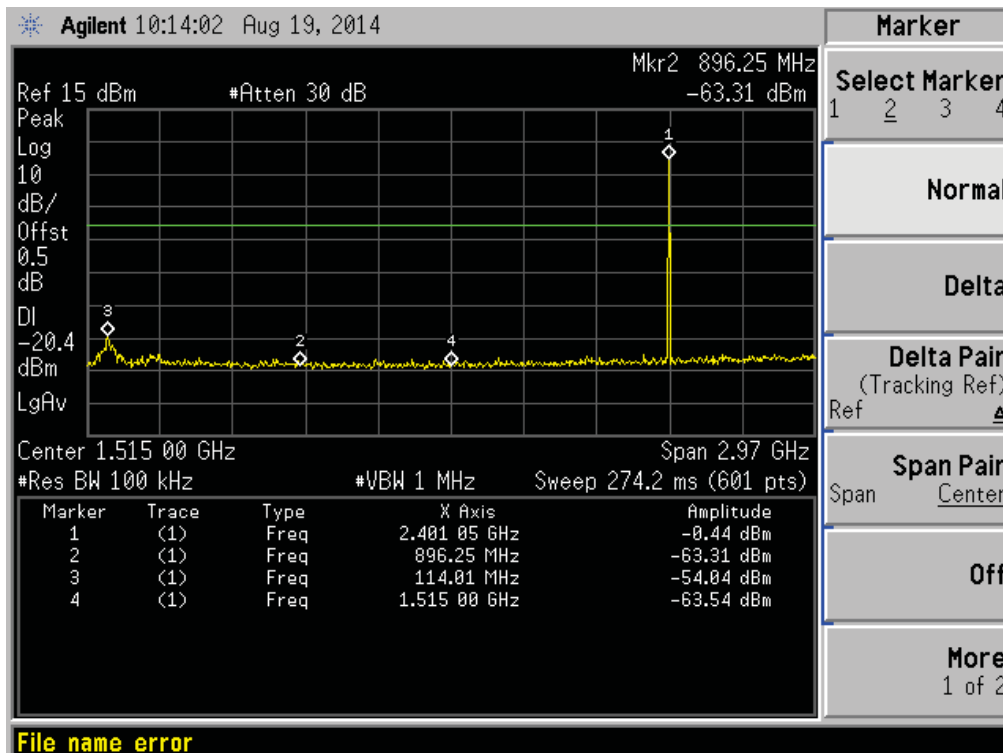
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated 20 dBc Limit	
Low	2402	-48.31	-1.52	-21.5	PASS
Middle	2441	-43.59	-1.51	-21.5	PASS
High	2480	-46.00	-1.36	-21.4	PASS

Test Plots

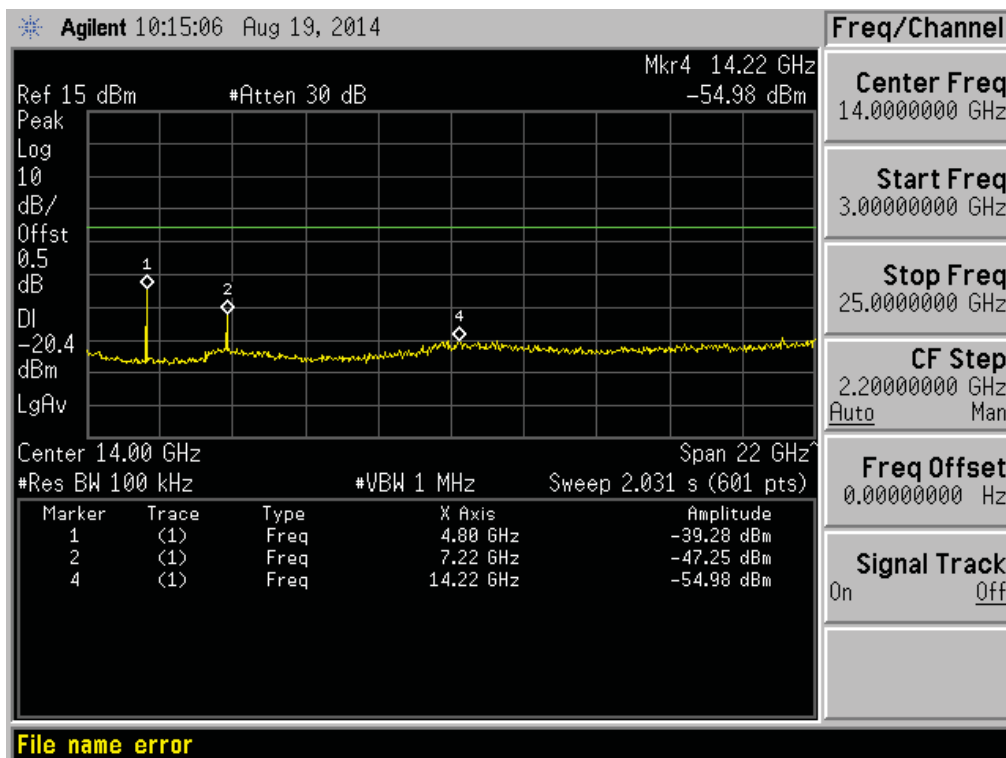
GFSK LOW CHANNEL , BANDEDGE



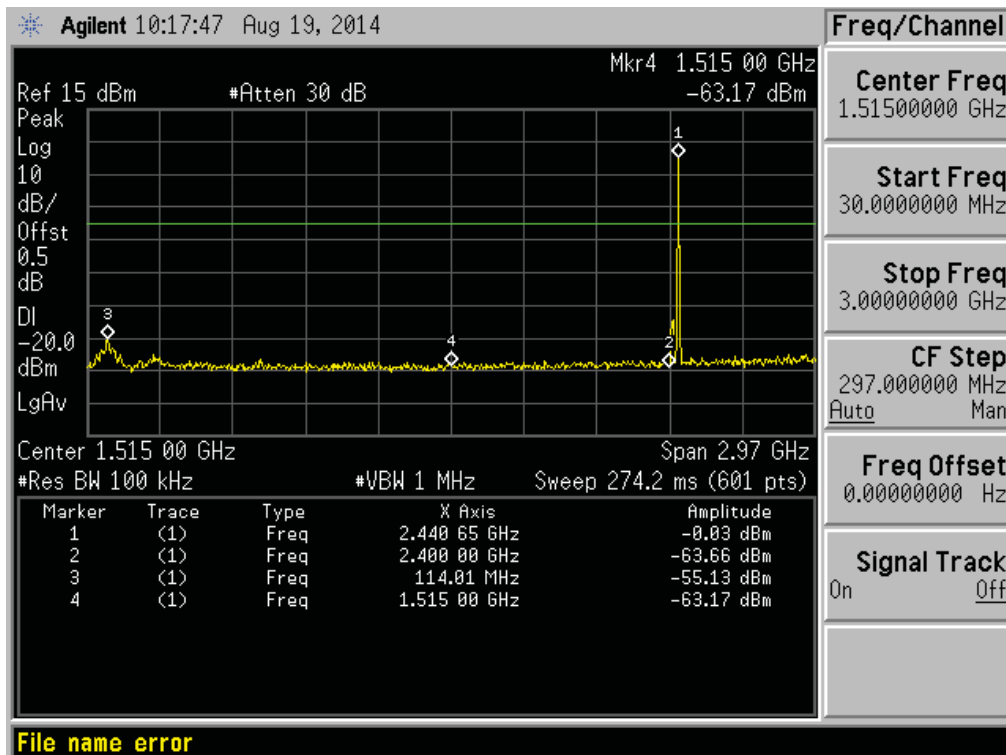
GFSK LOW CHANNEL , SPURIOUS 30MHz~3GHz



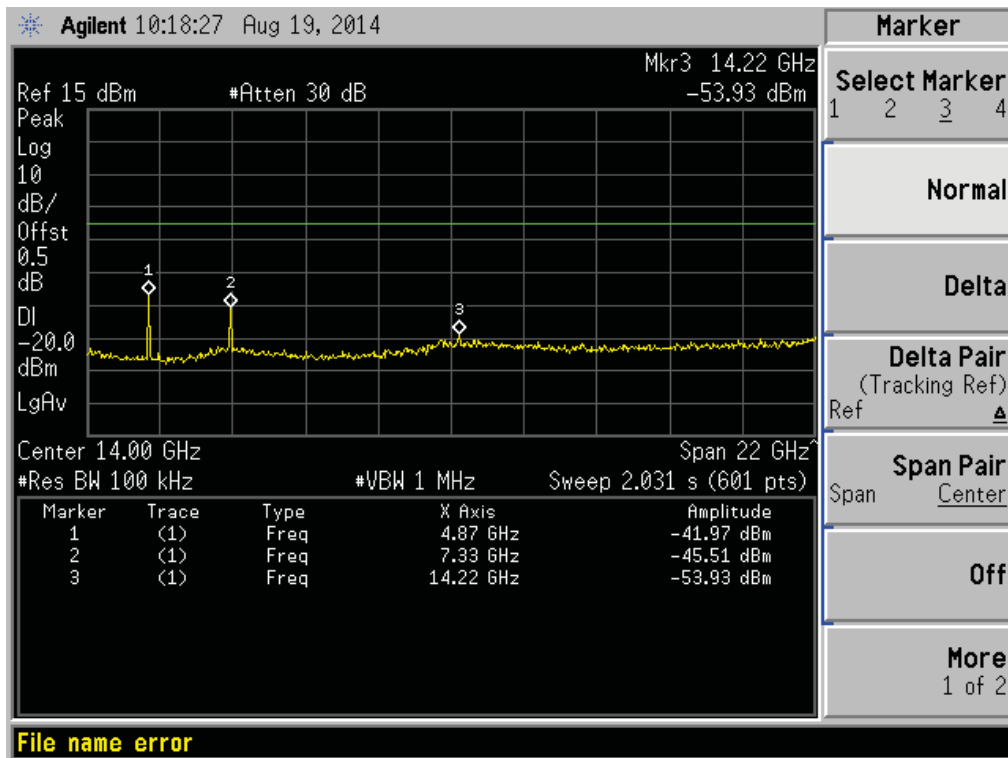
GFSK LOW CHANNEL , SPURIOUS 3GHz~25GHz



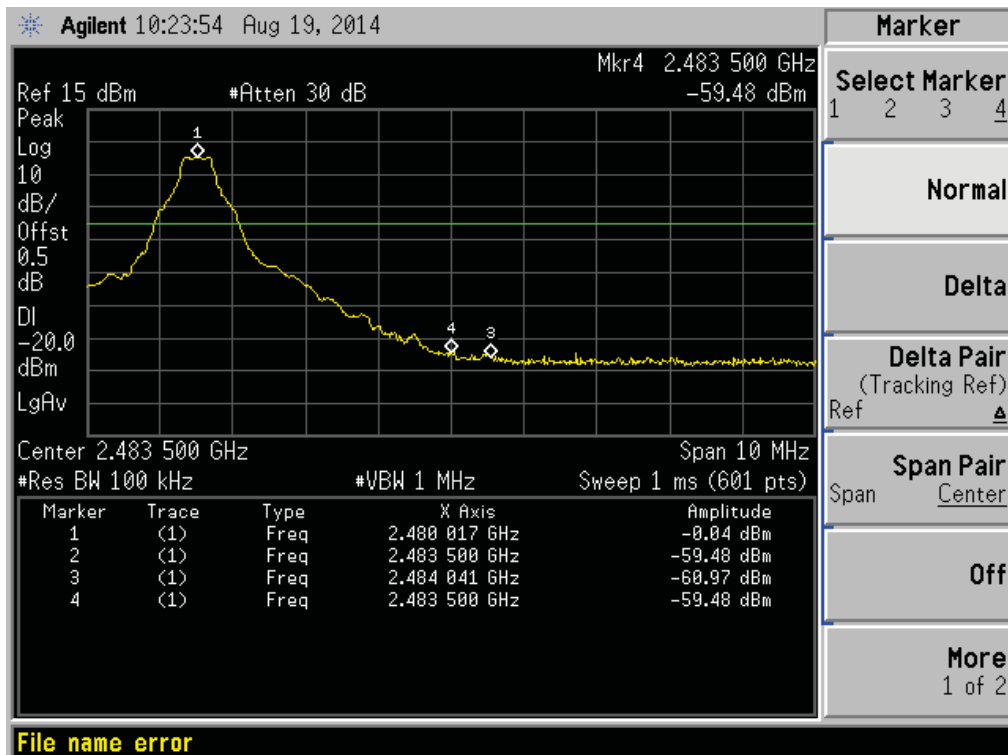
GFSK MID CHANNEL , SPURIOUS 30MHz~3GHz



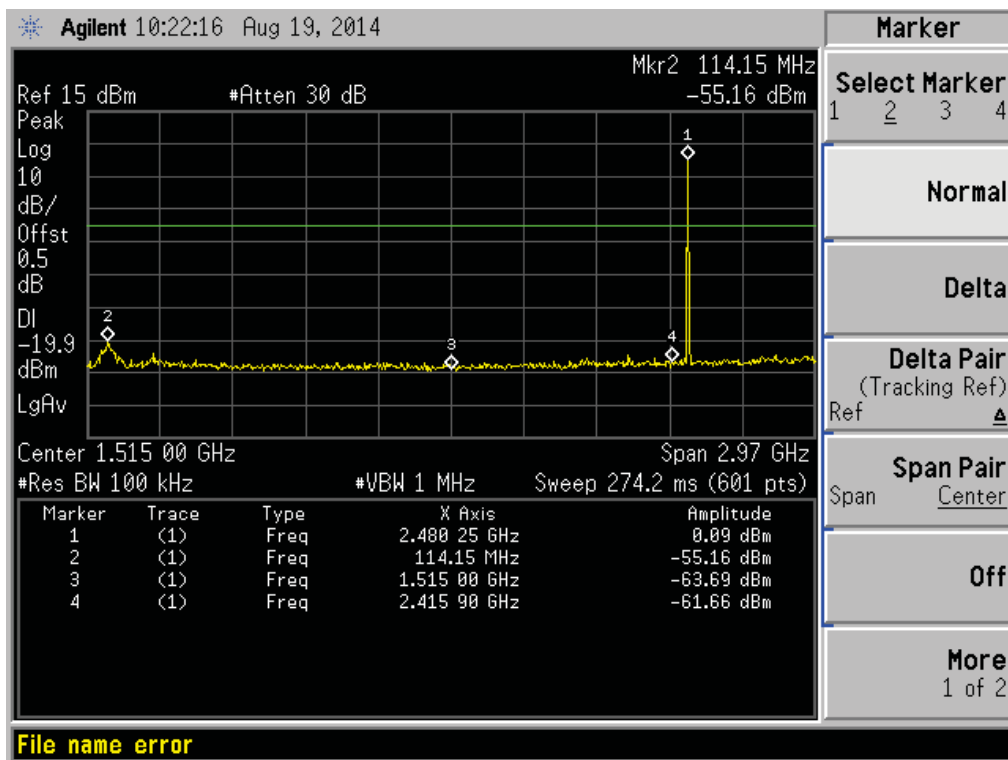
GFSK MID CHANNEL , SPURIOUS 3GHz~25GHz



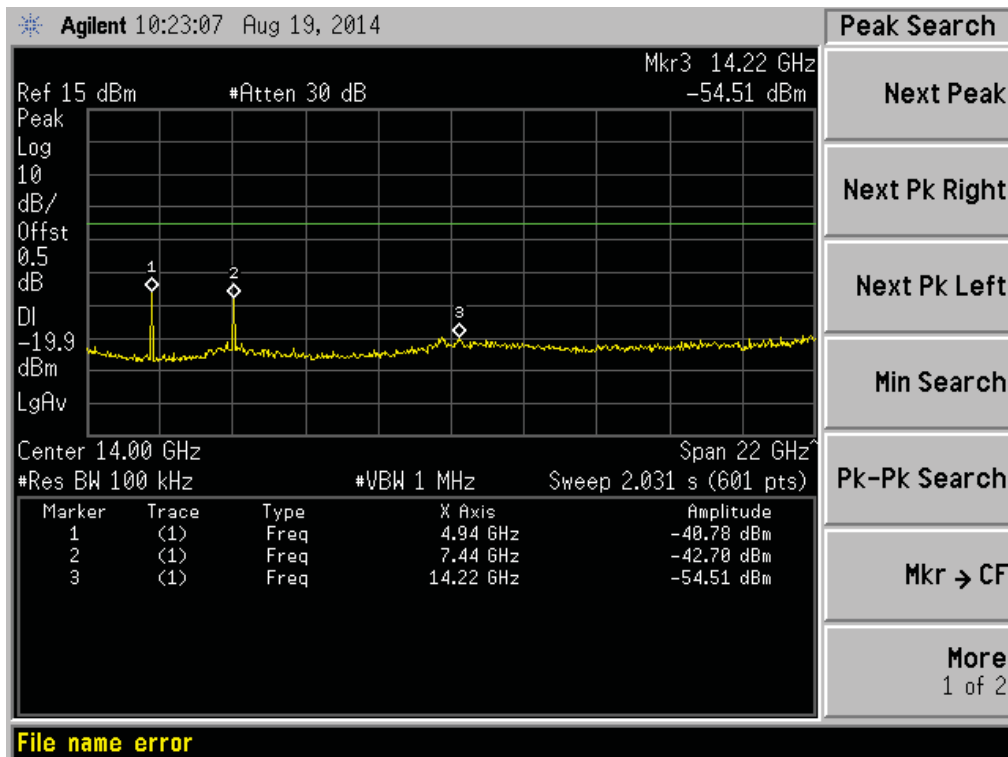
GFSK HIGH CHANNEL , BANDEDGE



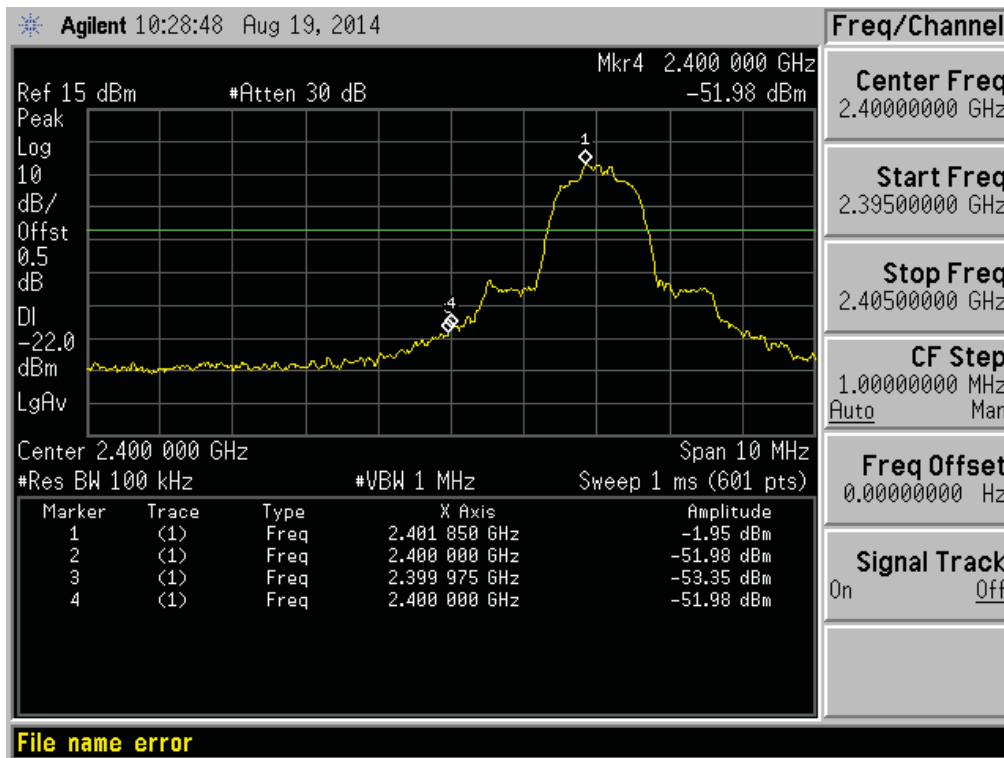
GFSK HIGH CHANNEL , SPURIOUS 30MHz~3GHz



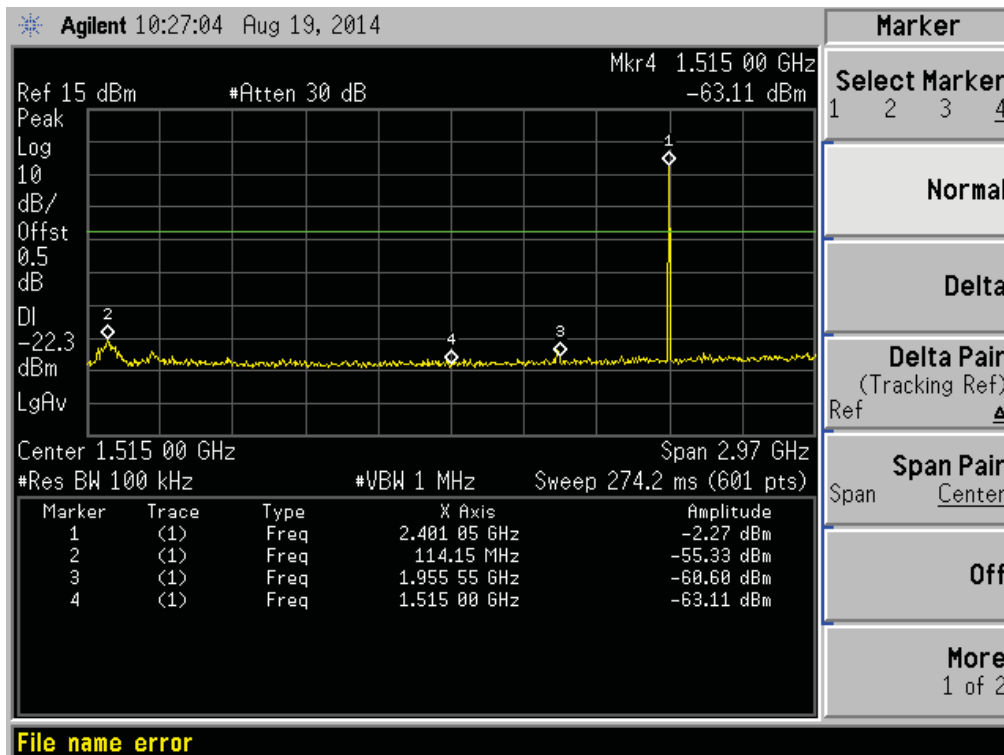
GFSK HIGH CHANNEL , SPURIOUS 3GHz~25GHz



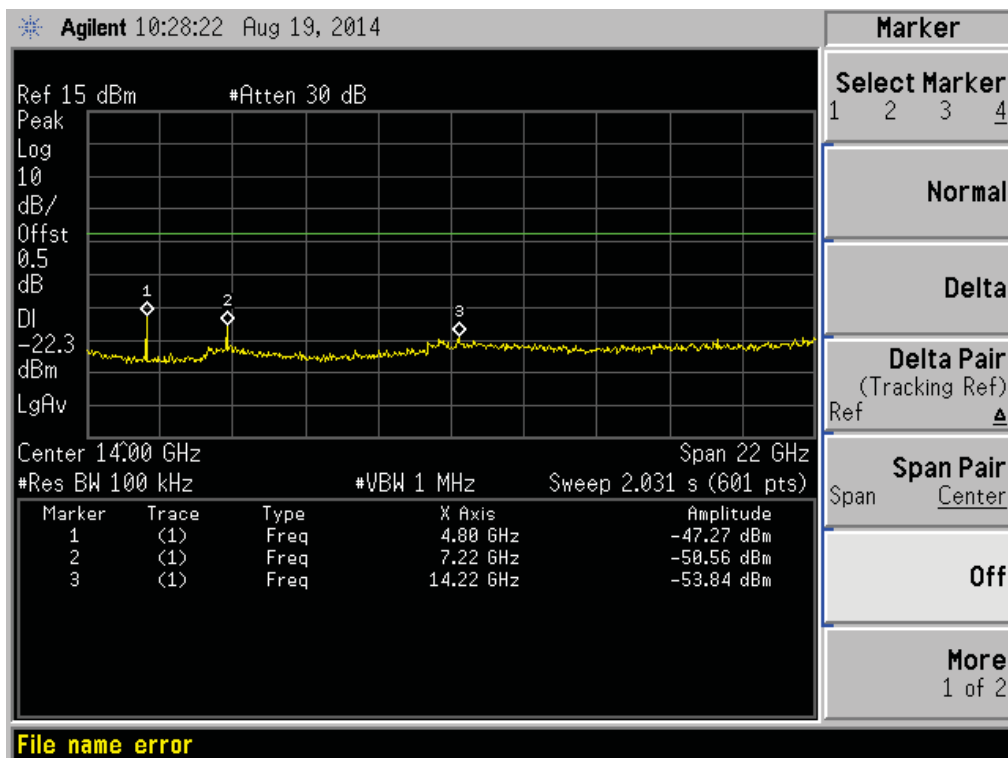
II/4-DQPSK LOW CHANNEL , BANDEDGE



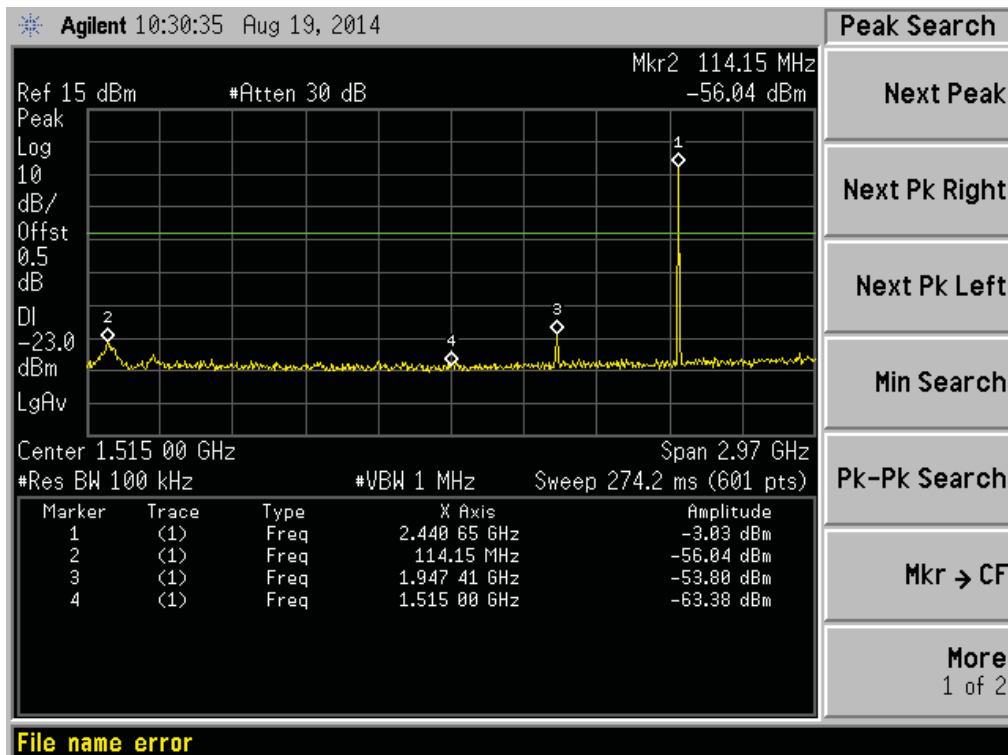
II/4-DQPSK LOW CHANNEL , SPURIOUS 30MHz~3GHz



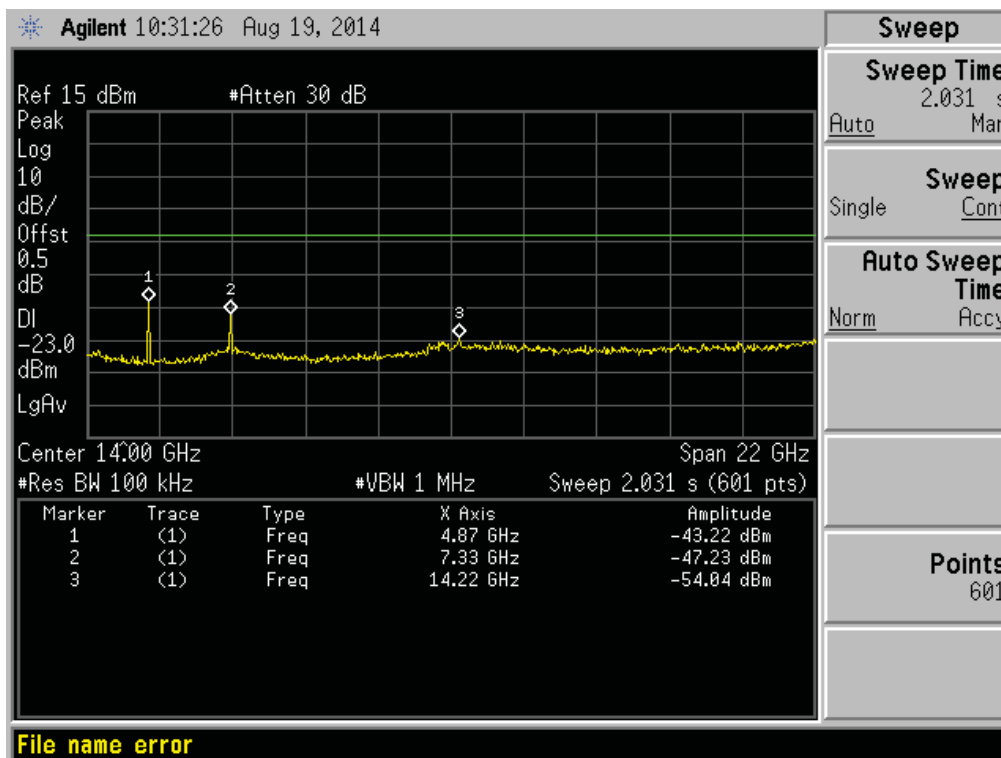
II/4-DQPSK LOW CHANNEL , SPURIOUS 3GHz~25GHz



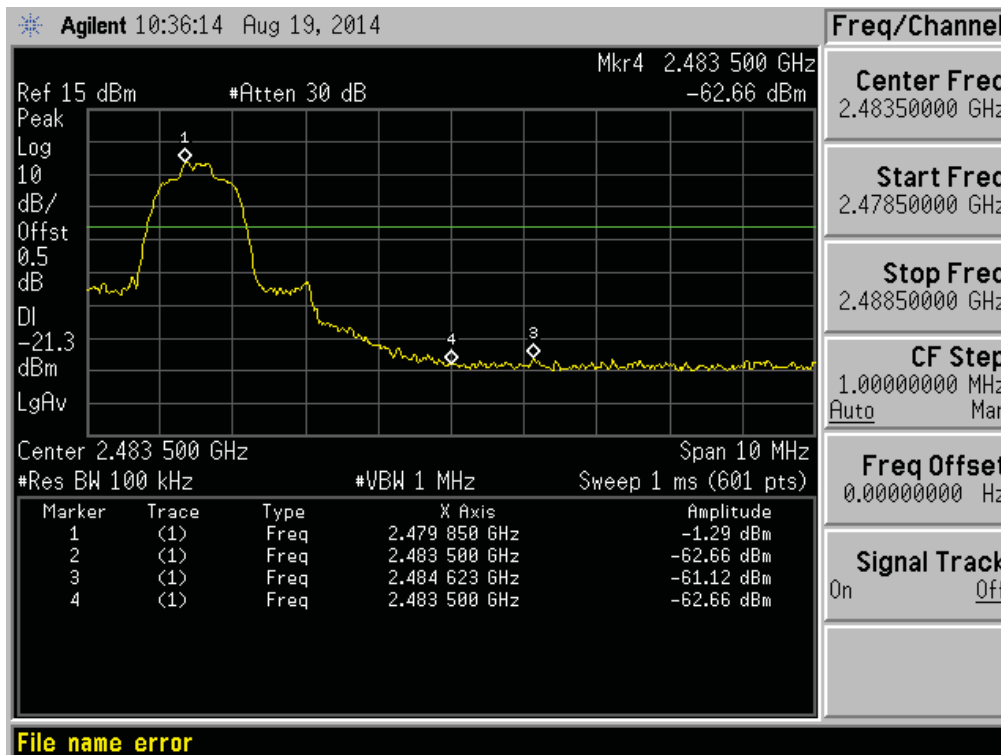
II/4-DQPSK MID CHANNEL , SPURIOUS 30MHz~3GHz



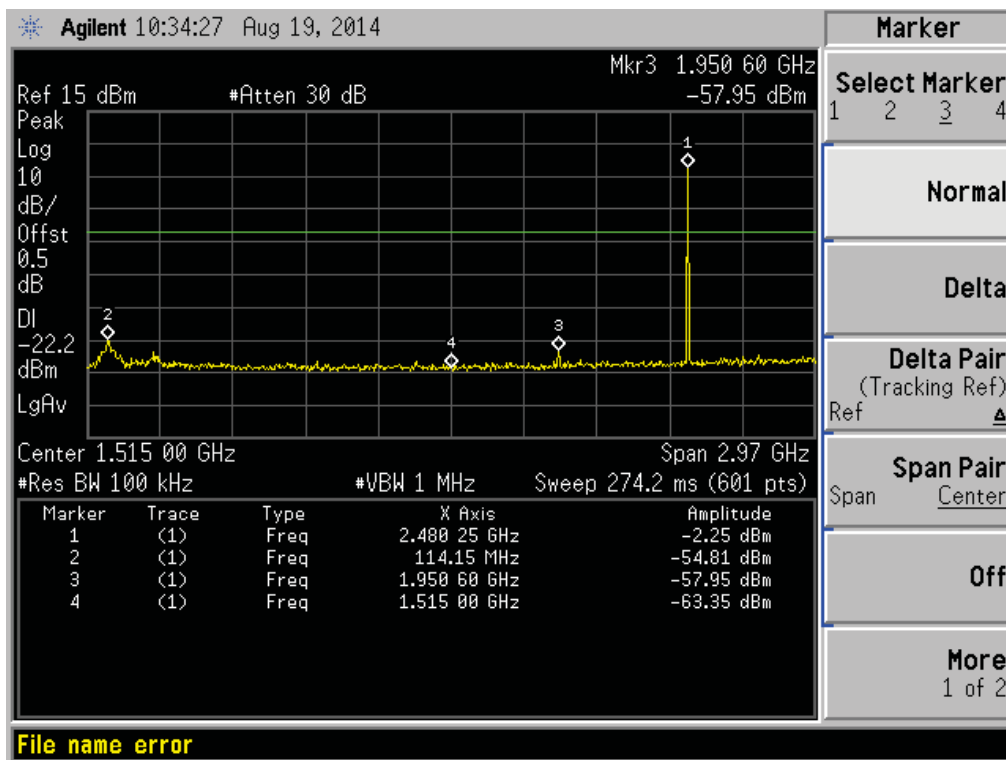
II/4-DQPSK MID CHANNEL , SPURIOUS 3GHz~25GHz



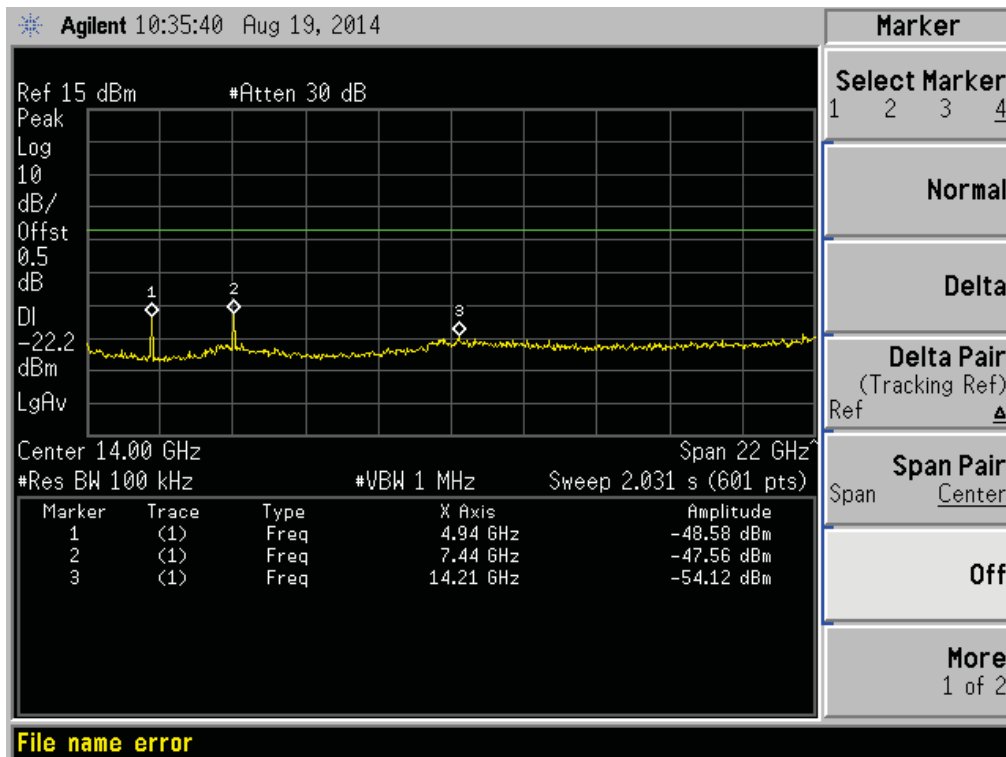
II/4-DQPSK HIGH CHANNEL , BANDEDGE



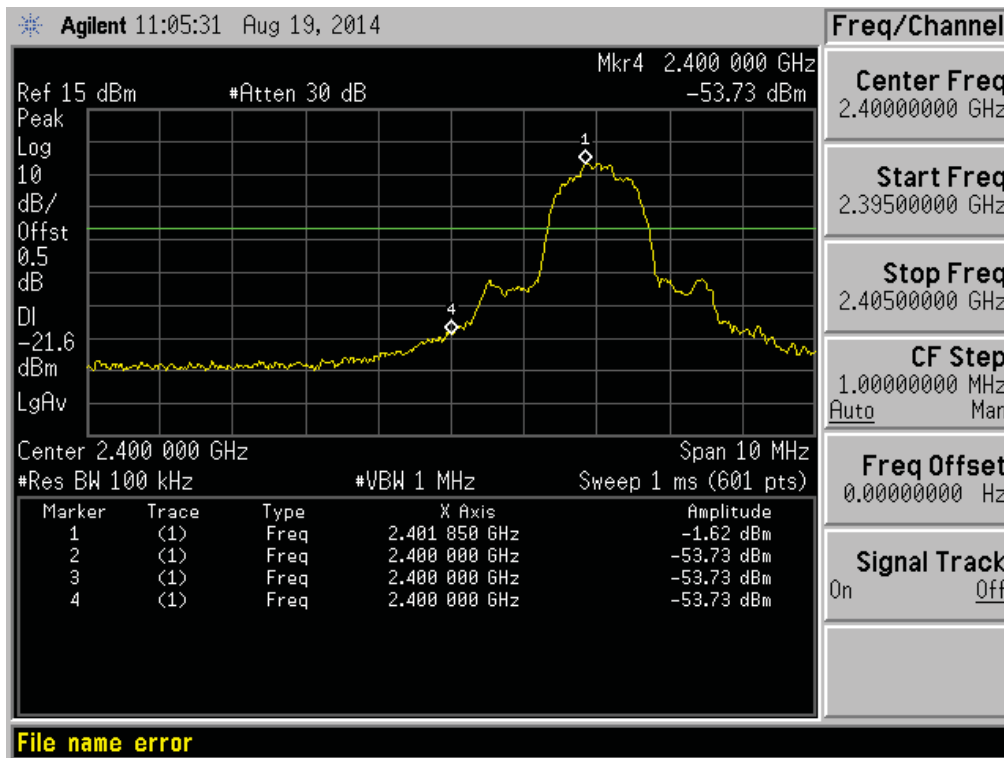
II/4-DQPSK HIGH CHANNEL , SPURIOUS 30MHz~3GHz



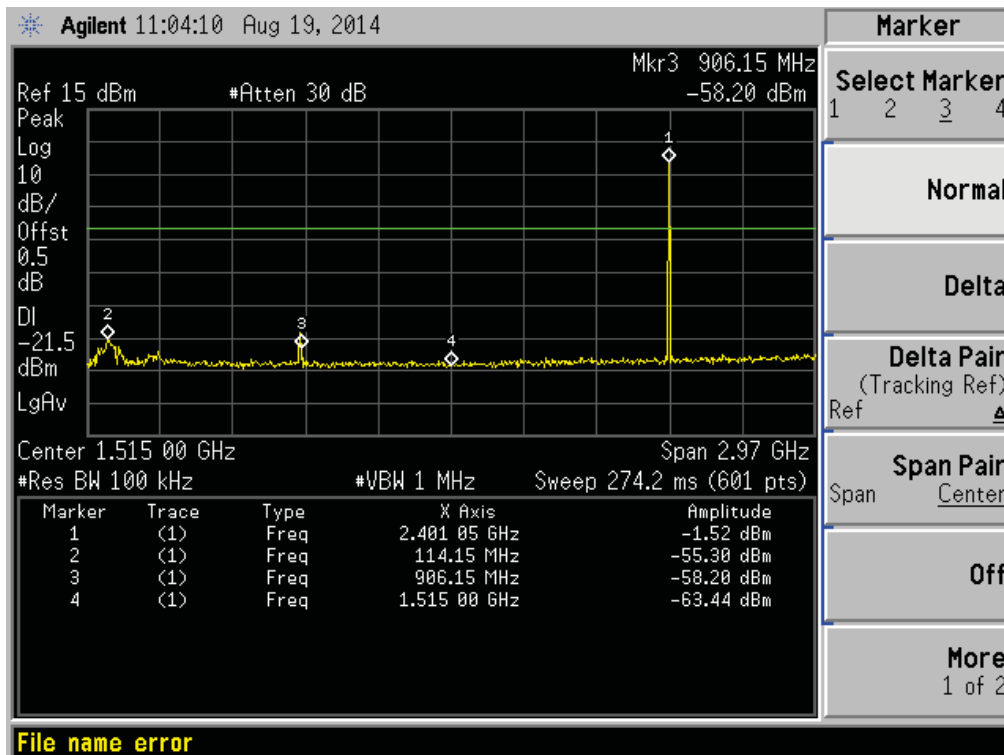
II/4-DQPSK HIGH CHANNEL , SPURIOUS 3GHz~25GHz



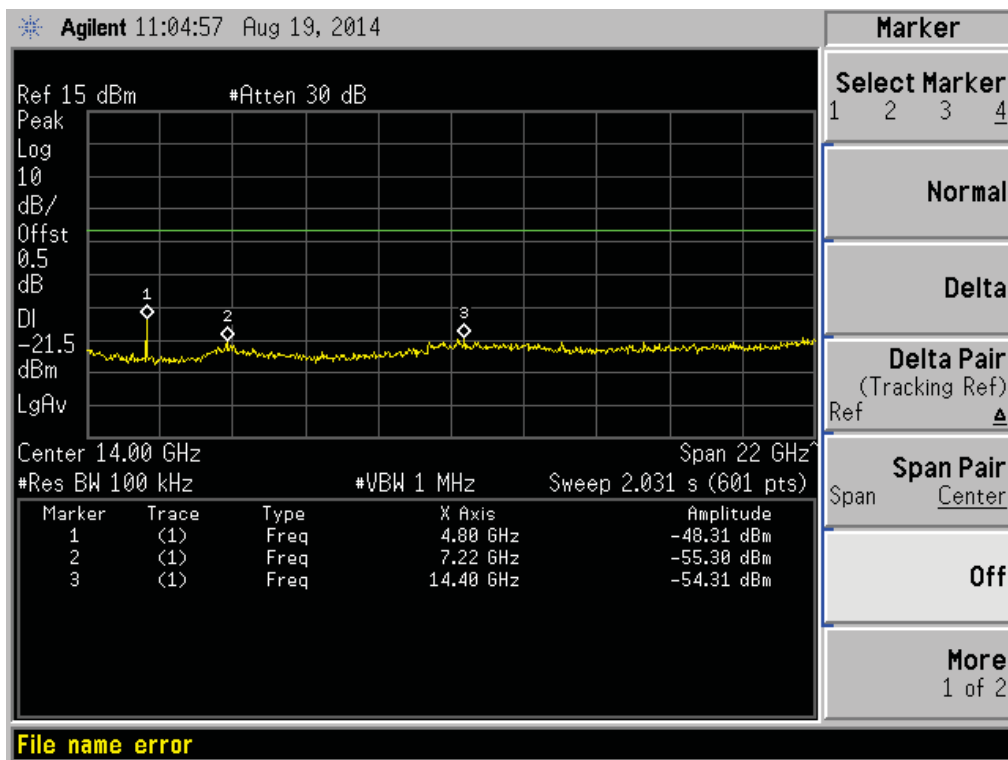
8-DPSK LOW CHANNEL , BANDEDGE



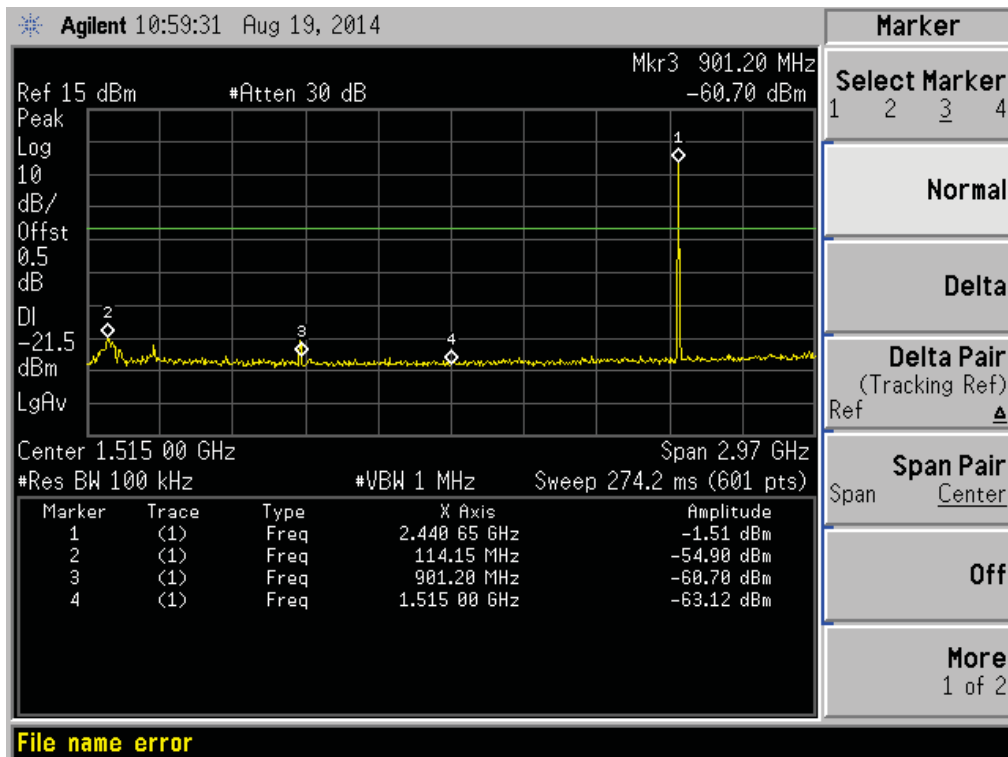
8-DPSK LOW CHANNEL , SPURIOUS 30MHz~3GHz



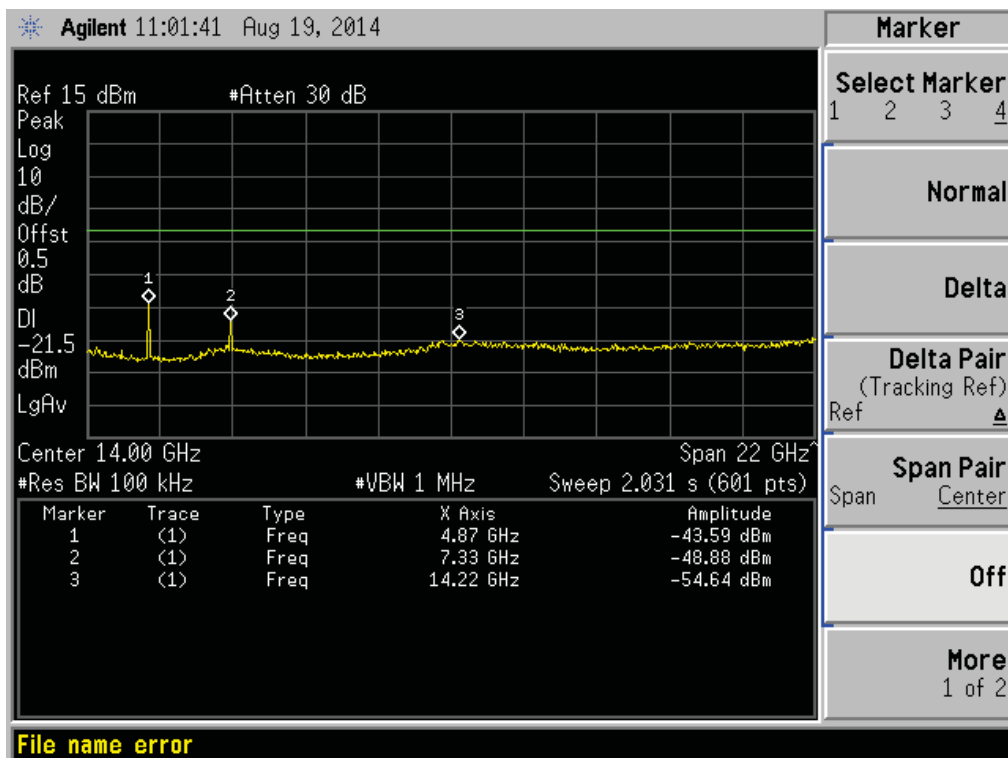
8-DPSK LOW CHANNEL , SPURIOUS 3GHz~25GHz



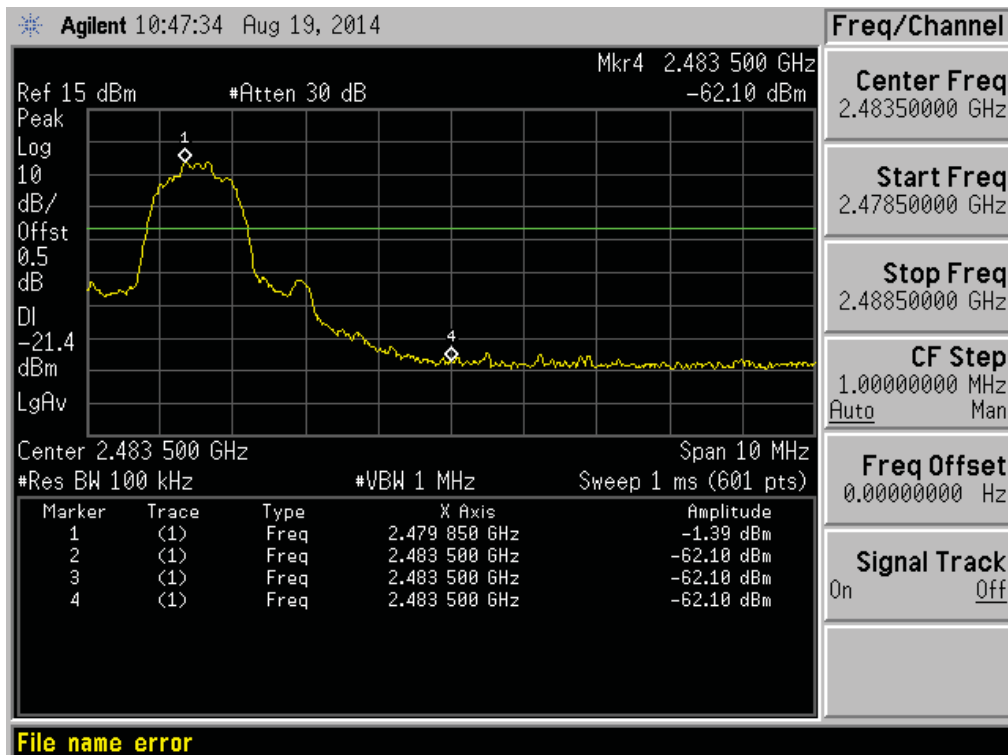
8-DPSK MID CHANNEL , SPURIOUS 30MHz~3GHz



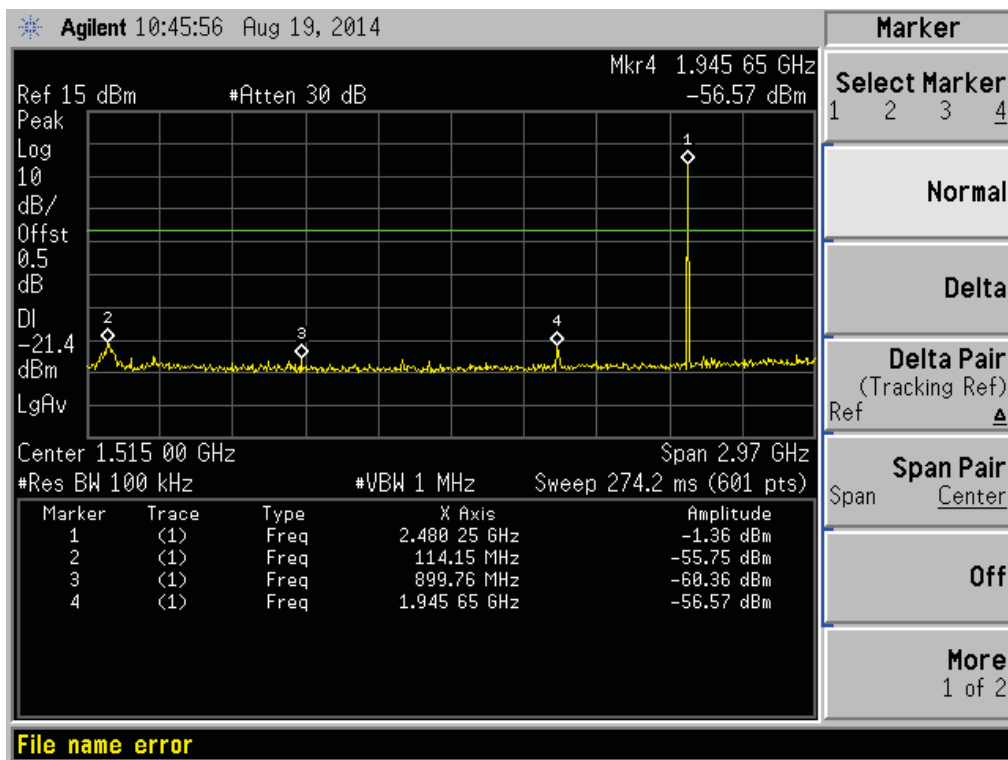
8-DPSK MID CHANNEL , SPURIOUS 3GHz~25GHz



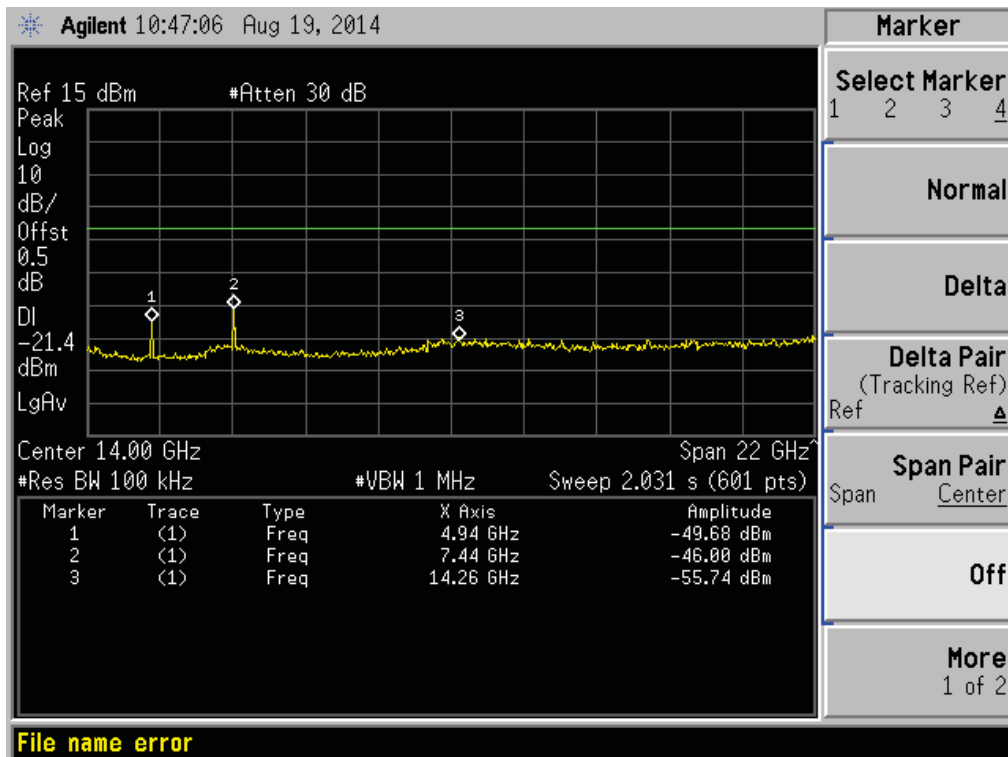
8-DPSK HIGH CHANNEL , BANDEDGE



8-DPSK HIGH CHANNEL , SPURIOUS 30MHz~3GHz



8-DPSK HIGH CHANNEL , SPURIOUS 3GHz~25GHz



A.7 Radiated Emission

Note 1: The symbol of “--” in the table which means not application.

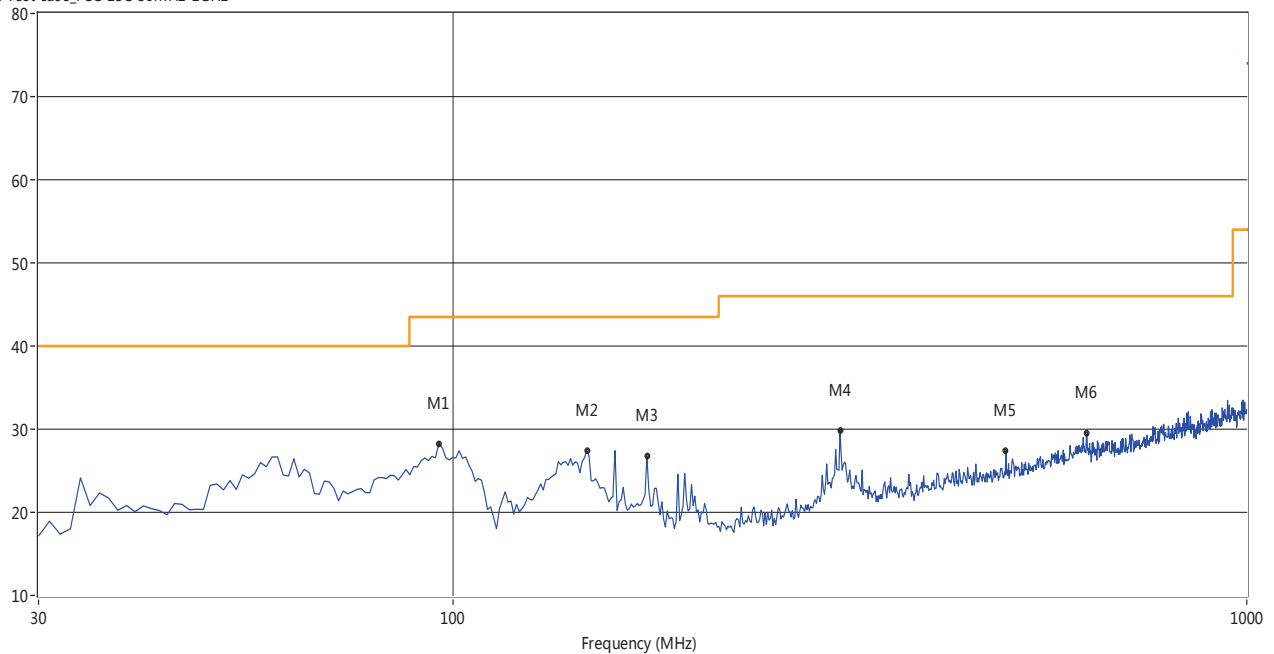
Note 2: For the test data above 1GHz, According the ANSI C63.4-2014, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note 3: The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Note 4: All configurations have been tested, only the worst configuration (GFSK Low Channel) shown here.

30MHz to 1GHz, ANT V

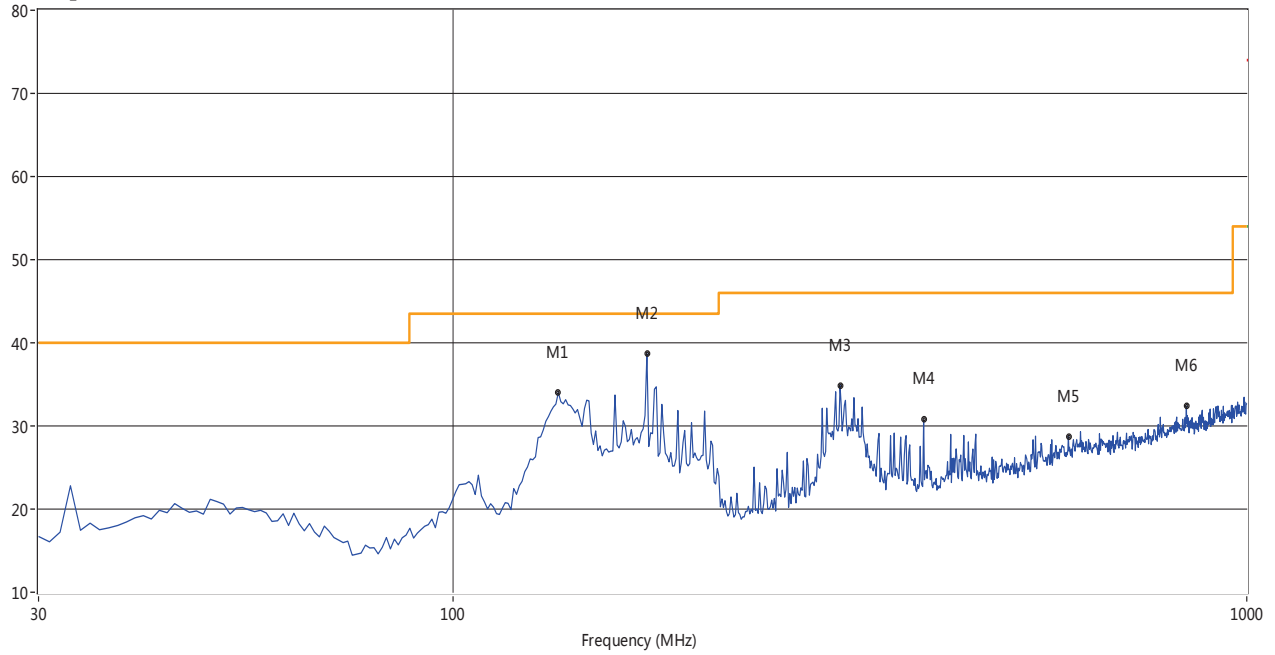
RE Test case_FCC 15C 30MHz-1GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
95.89	28.29			-20.33	--	43.5	--	15.21	127.50	100	Vertical	PASS
147.25	27.45			-23.07	--	43.5	--	16.05	328.30	100	Vertical	PASS
175.35	26.72			-21.86	--	43.5	--	16.78	228.10	100	Vertical	PASS
307.14	29.86			-17.18	--	46.0	--	16.14	0.80	100	Vertical	PASS
497.07	27.43			-12.73	--	46.0	--	18.57	359.20	100	Vertical	PASS
628.86	29.44			-9.77	--	46.0	--	16.56	359.60	100	Vertical	PASS

30MHz to 1GHz, ANT H

RE Test case_FCC 15C 30MHz-1GHz



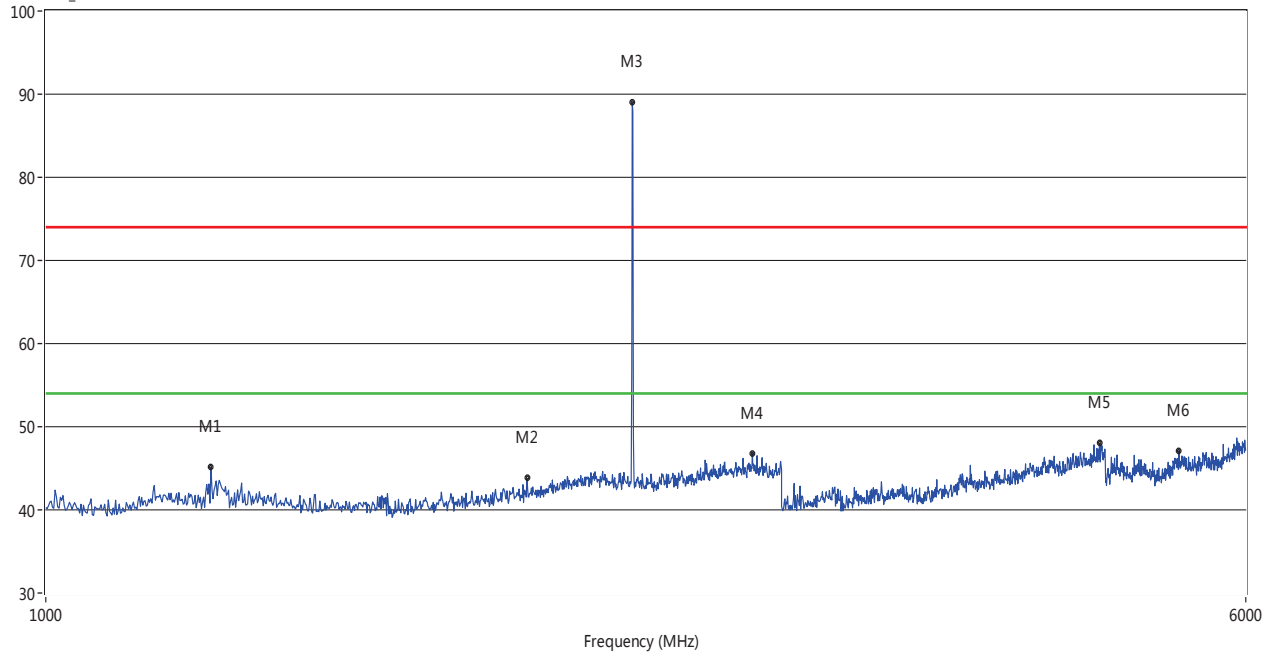
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
135.62	34.01			-22.96	--	43.5	--	9.49	29.90	100	Horizontal	PASS
175.35	38.69			-21.86	--	43.5	--	4.81	359.70	100	Horizontal	PASS
307.14	34.88			-17.18	--	46.0	--	11.12	25.10	100	Horizontal	PASS
391.45	30.73			-14.98	--	46.0	--	15.27	150.90	100	Horizontal	PASS
595.91	28.78			-10.31	--	46.0	--	17.22	39.90	100	Horizontal	PASS
839.14	32.39			-6.24	--	46.0	--	13.61	70.30	100	Horizontal	PASS

Note: The marked spikes near 2400MHz with circle should be ignored because they are Fundamental signal.

Test Data and Plots(1GHz ~ 10th Harmonic)

GFSK LOW CHANNEL 1GHz to 6GHz, ANT V

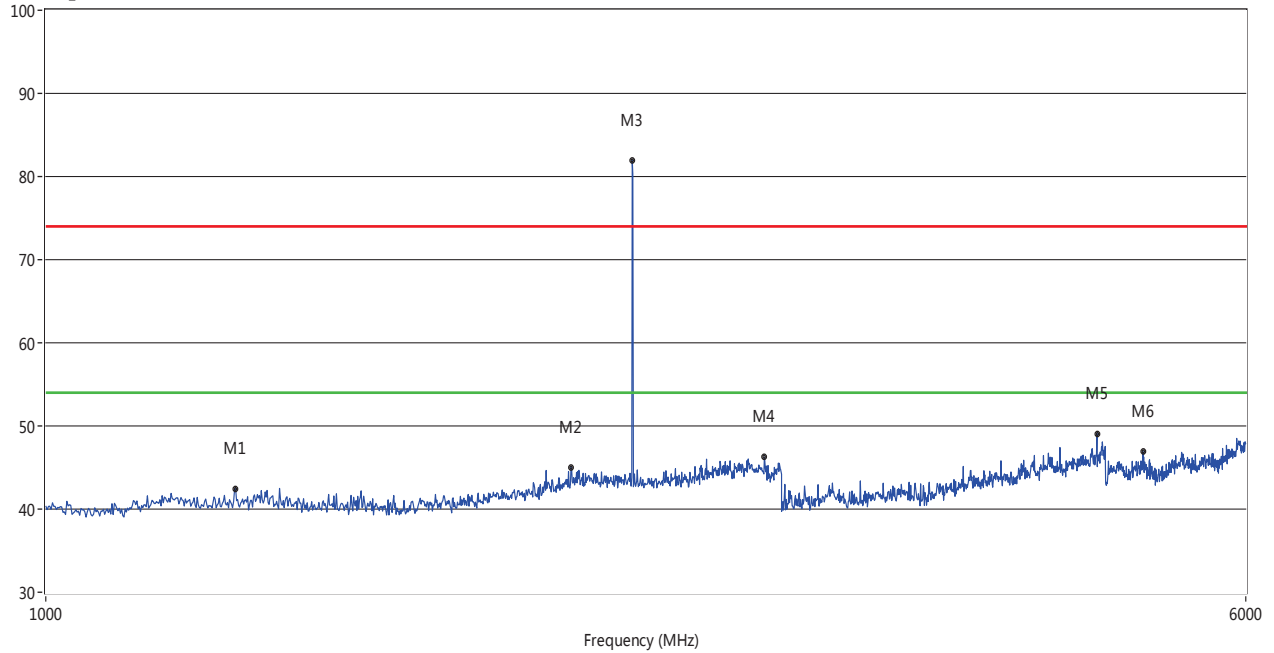
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1279.72	45.09			-4.14	74.0	--	54.0	8.91	4.20	100	Vertical	PASS
2050.95	43.80			-2.21	74.0	--	54.0	10.20	226.00	100	Vertical	PASS
2400.60	89.01			-0.67	74.0	--	54.0	-35.01	287.50	100	Vertical	N/A
2872.13	46.75			2.13	74.0	--	54.0	7.25	150.80	100	Vertical	PASS
4822.18	47.99			12.59	74.0	--	54.0	6.01	-0.00	100	Vertical	PASS
5430.57	47.13			13.23	74.0	--	54.0	6.87	360.30	100	Vertical	PASS

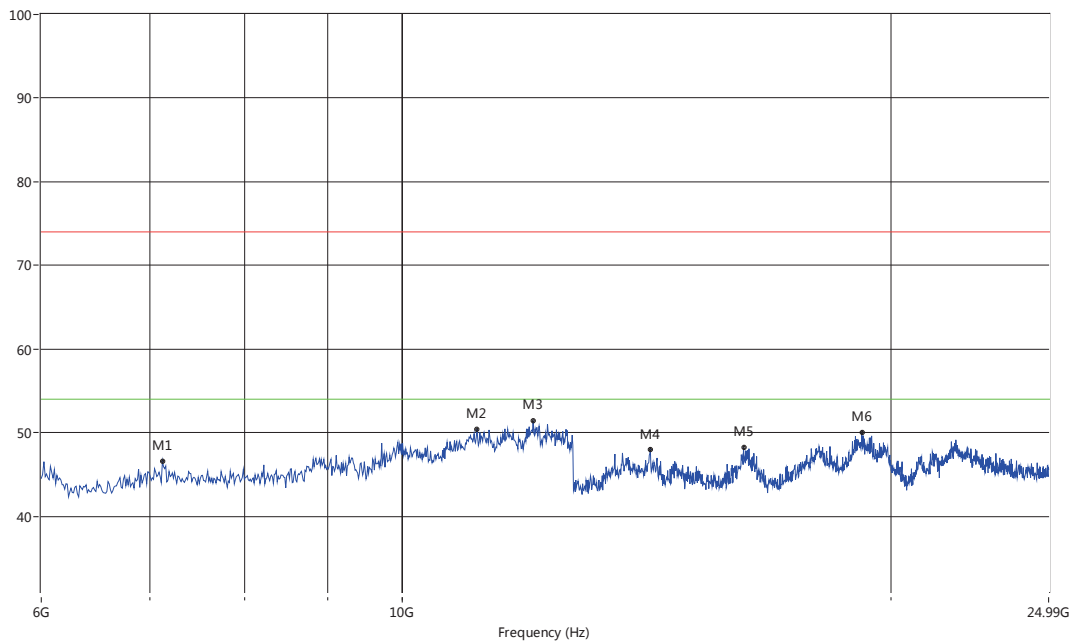
GFSK LOW CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



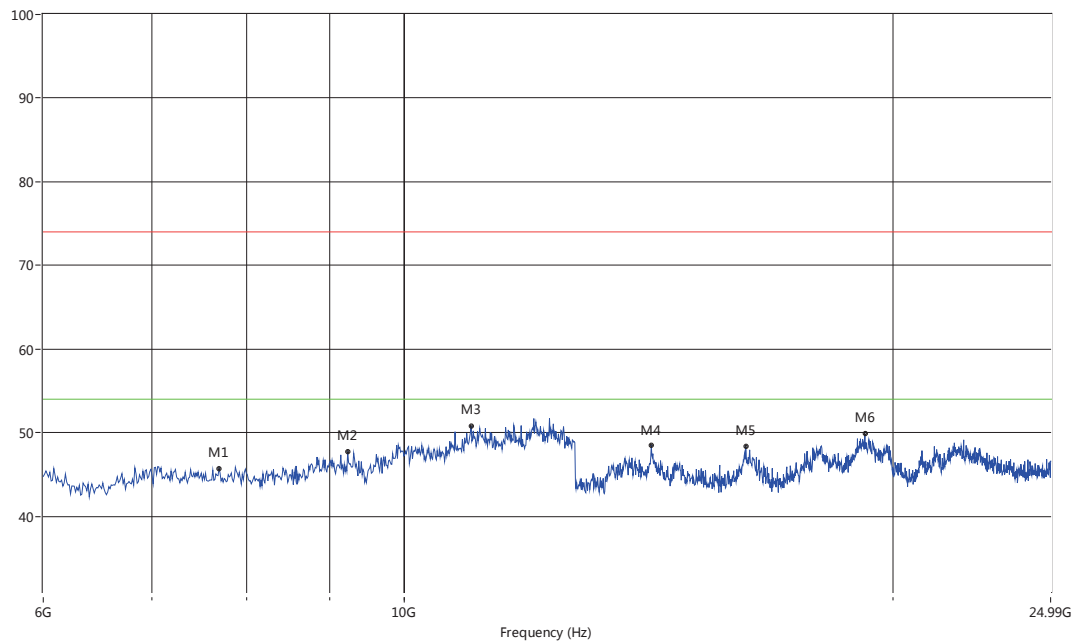
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1327.67	42.48			-4.12	74.0	--	54.0	11.52	54.80	100	Horizontal	PASS
2190.81	45.07			-0.73	74.0	--	54.0	8.93	295.80	100	Horizontal	PASS
2400.60	81.99			-0.67	74.0	--	54.0	-27.99	116.60	100	Horizontal	N/A
2924.08	46.26			2.38	74.0	--	54.0	7.74	47.70	100	Horizontal	PASS
4804.20	49.11			12.35	74.0	--	54.0	4.89	105.70	100	Horizontal	PASS
5145.85	46.91			13.31	74.0	--	54.0	7.09	223.80	100	Horizontal	PASS

GFSK LOW CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	46.64	--	--	74.0	--	54.0	27.36	106	100	Vertical	PASS
11121.46	50.43	--	--	74.0	--	54.0	23.57	88	100	Vertical	PASS
12042.43	51.44	--	--	74.0	--	54.0	22.56	35	100	Vertical	PASS
14216.31	48.03	--	--	74.0	--	54.0	25.97	267	100	Vertical	PASS
16223.38	48.26	--	--	74.0	--	54.0	25.74	206	100	Vertical	PASS
19179.70	50.00	--	--	74.0	--	54.0	24.00	126	100	Vertical	PASS

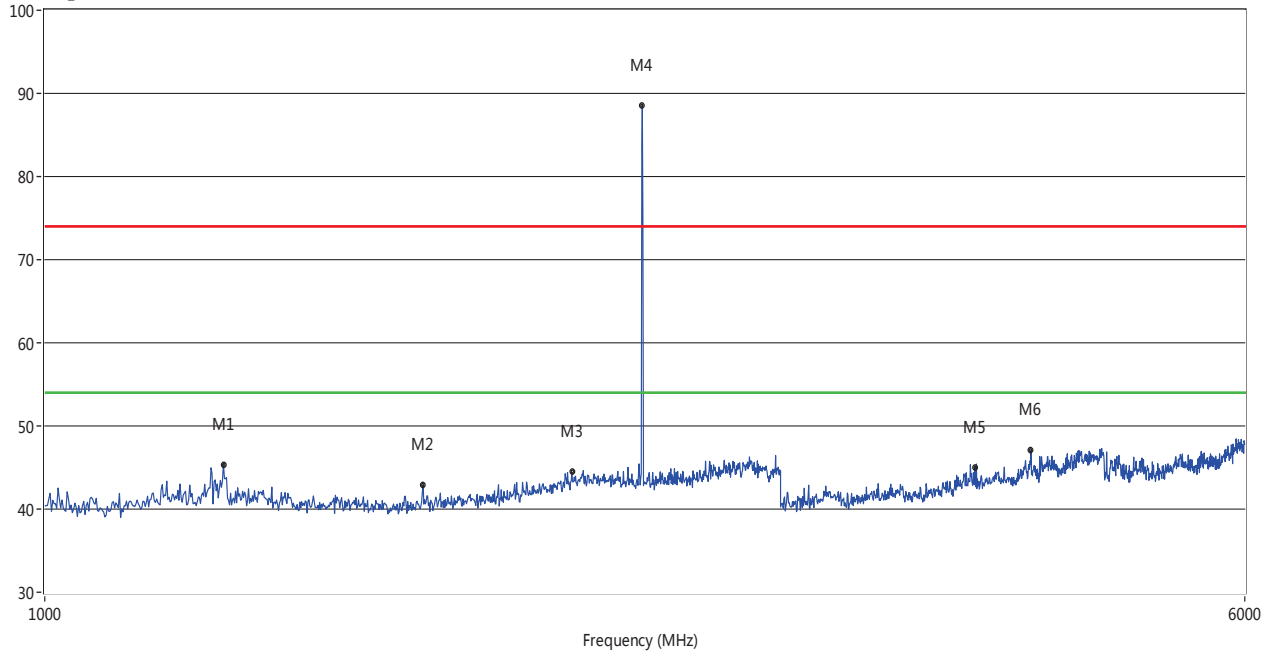
GFSK LOW CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7695.92	45.72	--	--	74.0	--	54.0	28.28	114	100	Horizontal	PASS
9234.61	47.75	--	--	74.0	--	54.0	26.25	117	100	Horizontal	PASS
10997.92	50.80	--	--	74.0	--	54.0	23.20	206	100	Horizontal	PASS
14195.51	48.52	--	--	74.0	--	54.0	25.48	43	100	Horizontal	PASS
16223.38	48.41	--	--	74.0	--	54.0	25.59	303	100	Horizontal	PASS
19209.65	49.87	--	--	74.0	--	54.0	24.13	81	100	Horizontal	PASS

GFSK MID CHANNEL 1GHz to 6GHz, ANT V

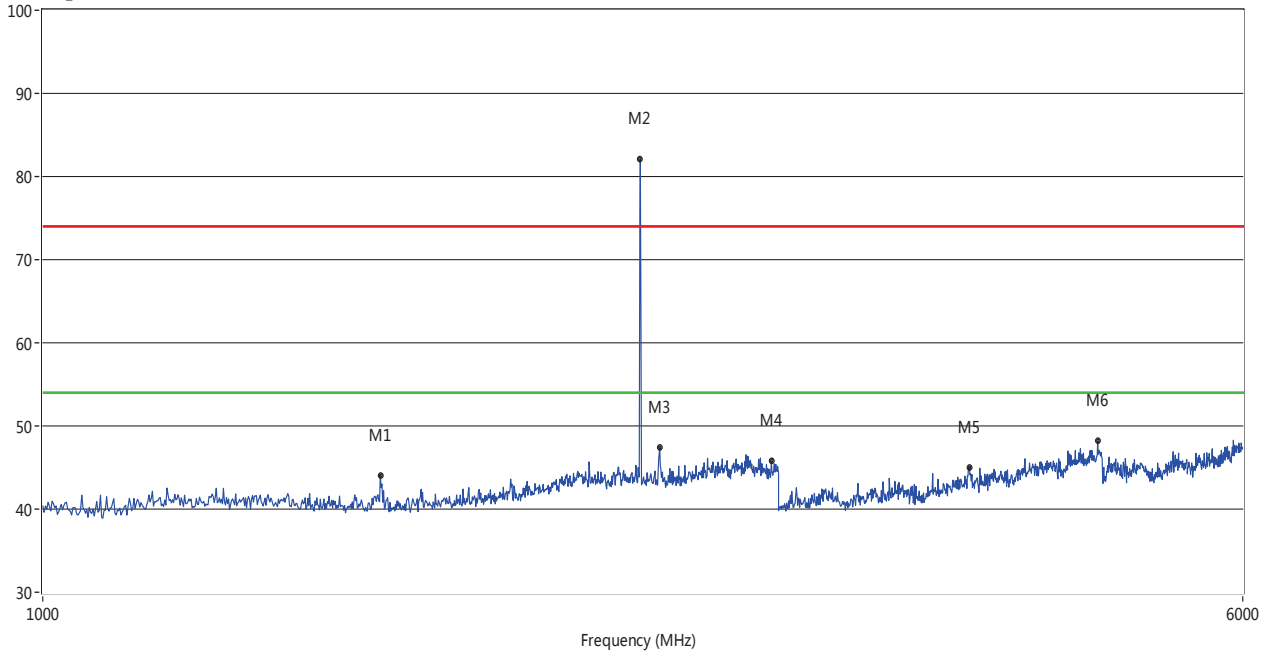
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1305.69	45.40			-4.09	74.0	--	54.0	8.60	4.20	100	Vertical	PASS
1759.24	42.91			-3.57	74.0	--	54.0	11.09	150.50	100	Vertical	PASS
2196.80	44.48			-0.78	74.0	--	54.0	9.52	20.30	100	Vertical	PASS
2440.56	88.63			-0.54	74.0	--	54.0	-34.63	301.00	100	Vertical	N/A
4009.99	45.06			9.96	74.0	--	54.0	8.94	355.90	100	Vertical	PASS
4360.64	47.06			11.09	74.0	--	54.0	6.94	306.00	100	Vertical	PASS

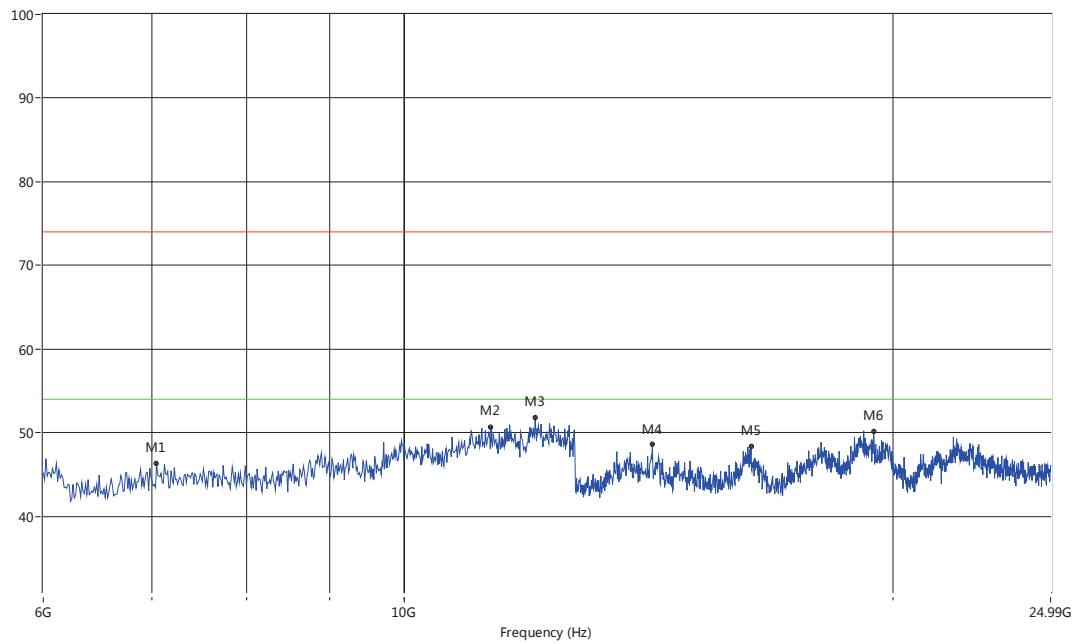
GFSK MID CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



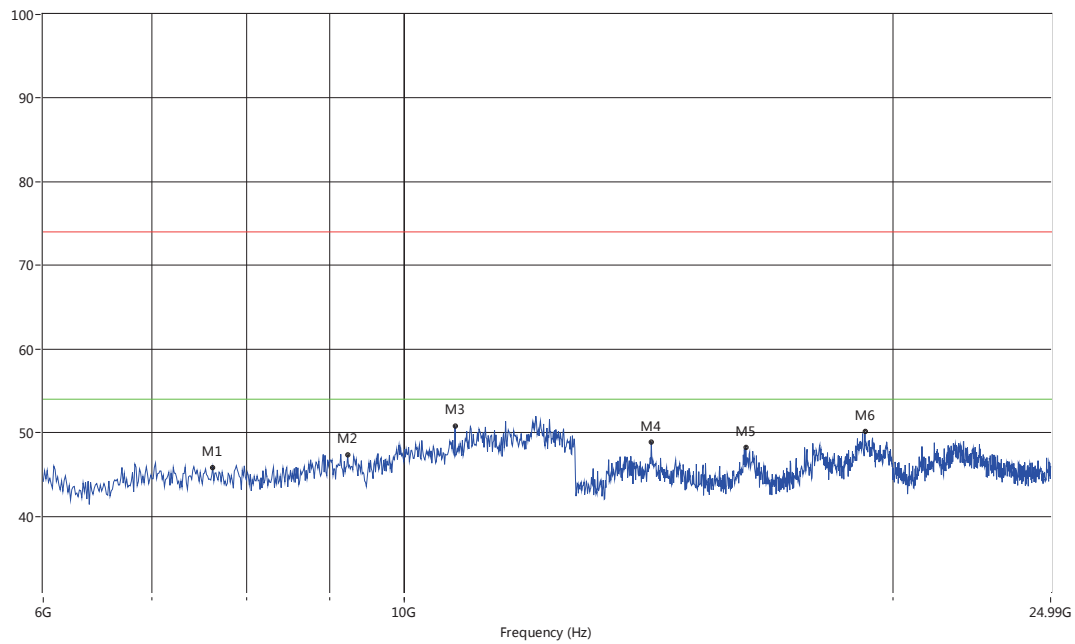
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1655.34	44.08			-4.33	74.0	--	54.0	9.92	67.90	100	Horizontal	PASS
2440.56	82.17			-0.54	74.0	--	54.0	-28.17	7.60	100	Horizontal	N/A
2512.49	47.41			-0.41	74.0	--	54.0	6.59	67.90	100	Horizontal	PASS
2968.03	45.76			2.10	74.0	--	54.0	8.24	67.90	100	Horizontal	PASS
3989.01	45.00			10.17	74.0	--	54.0	9.00	126.00	100	Horizontal	PASS
4831.17	48.19			12.87	74.0	--	54.0	5.81	179.70	100	Horizontal	PASS

GFSK MID CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7044.51	46.36	--	--	74.0	--	54.0	27.64	116	100	Vertical	PASS
11312.40	50.63	--	--	74.0	--	54.0	23.37	102	100	Vertical	PASS
12042.43	51.80	--	--	74.0	--	54.0	22.20	60	100	Vertical	PASS
14216.31	48.65	--	--	74.0	--	54.0	25.35	215	100	Vertical	PASS
16348.17	48.31	--	--	74.0	--	54.0	25.69	24	100	Vertical	PASS
19449.25	50.13	--	--	74.0	--	54.0	23.87	279	100	Vertical	PASS

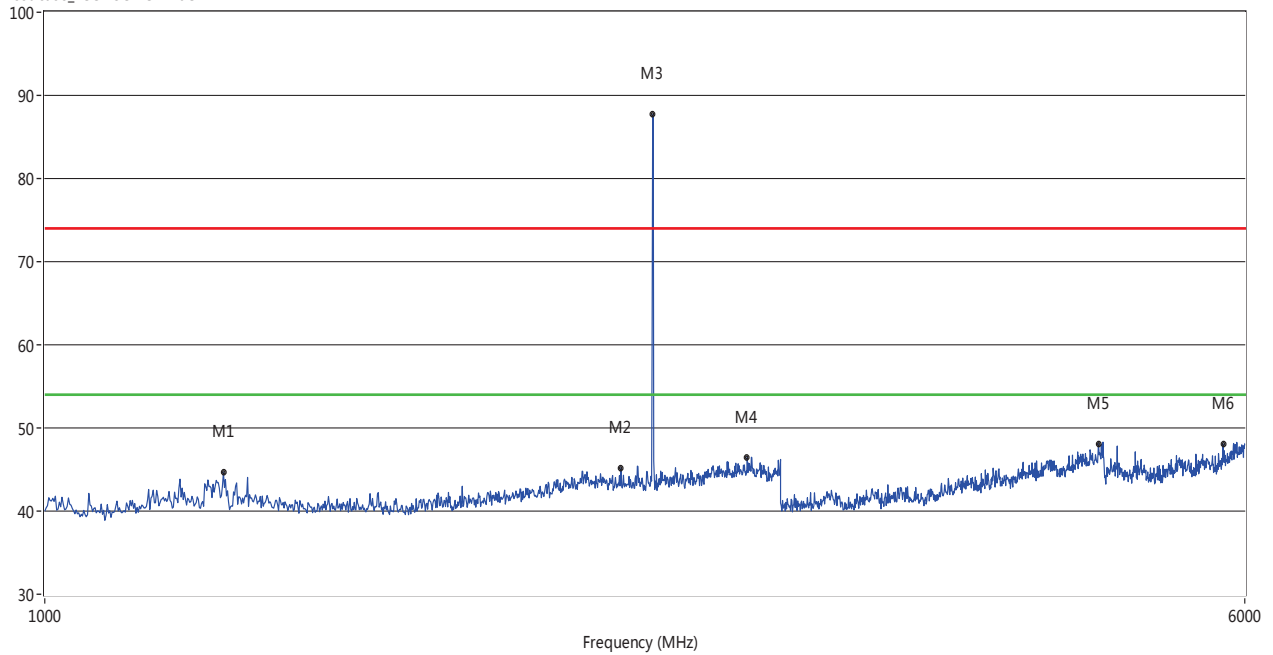
GFSK MID CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7628.54	45.85	--	--	74.0	--	54.0	28.15	202	100	Horizontal	PASS
9234.61	47.34	--	--	74.0	--	54.0	26.66	229	100	Horizontal	PASS
10750.83	50.74	--	--	74.0	--	54.0	23.26	169	100	Horizontal	PASS
14195.51	48.86	--	--	74.0	--	54.0	25.14	310	100	Horizontal	PASS
16223.38	48.23	--	--	74.0	--	54.0	25.77	89	100	Horizontal	PASS
19209.65	50.10	--	--	74.0	--	54.0	23.90	220	100	Horizontal	PASS

GFSK HIGH CHANNEL 1GHz to 6GHz, ANT V

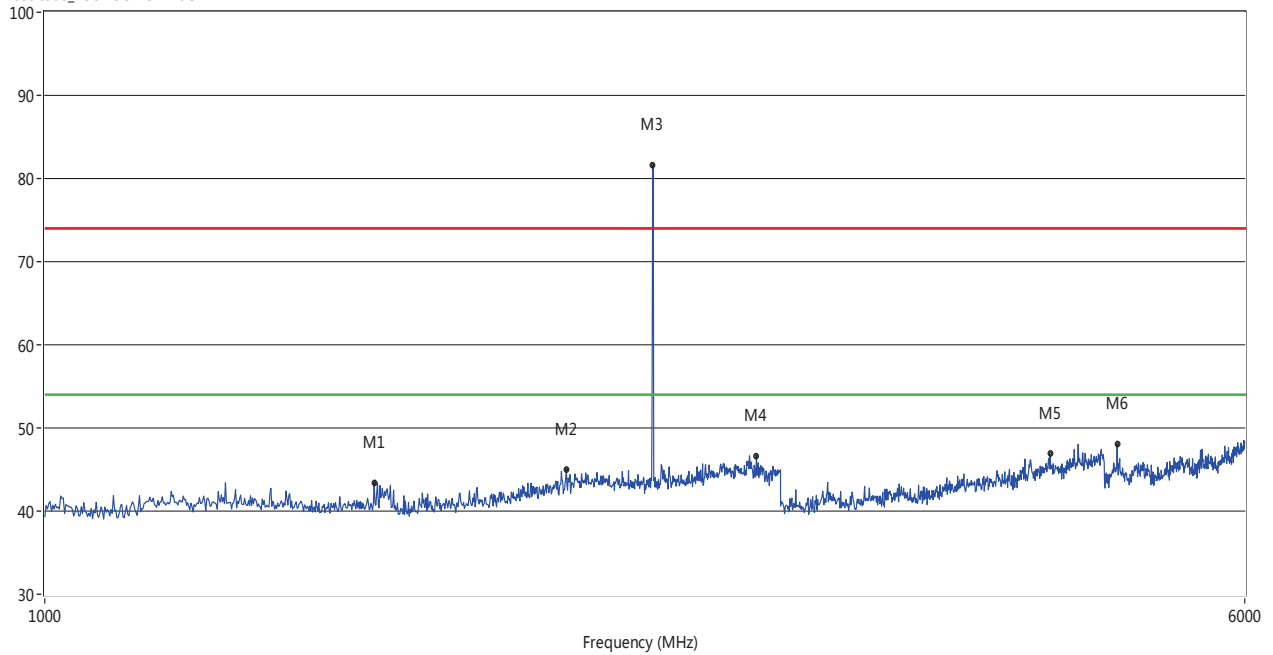
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1305.69	44.62			-4.09	74.0	--	54.0	9.38	0.50	100	Vertical	PASS
2364.64	45.16			-0.55	74.0	--	54.0	8.84	307.30	100	Vertical	PASS
2478.52	87.67			-0.62	74.0	--	54.0	-33.67	300.30	100	Vertical	N/A
2854.15	46.53			2.35	74.0	--	54.0	7.47	88.40	100	Vertical	PASS
4822.18	48.09			12.59	74.0	--	54.0	5.91	346.40	100	Vertical	PASS
5808.19	48.06			14.53	74.0	--	54.0	5.94	336.40	100	Vertical	PASS

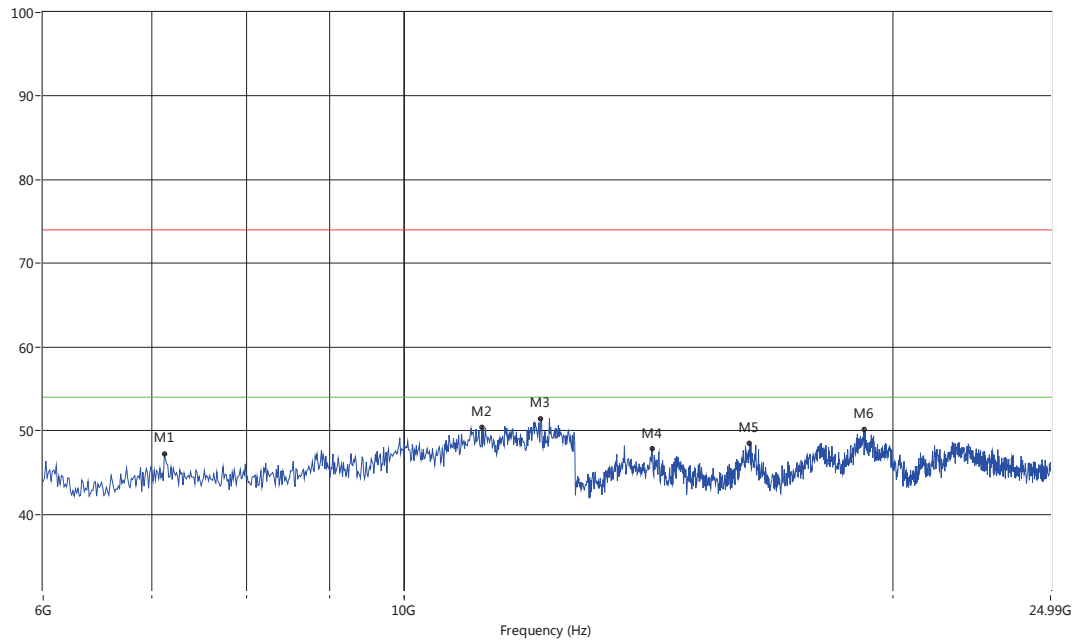
GFSK HIGH CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



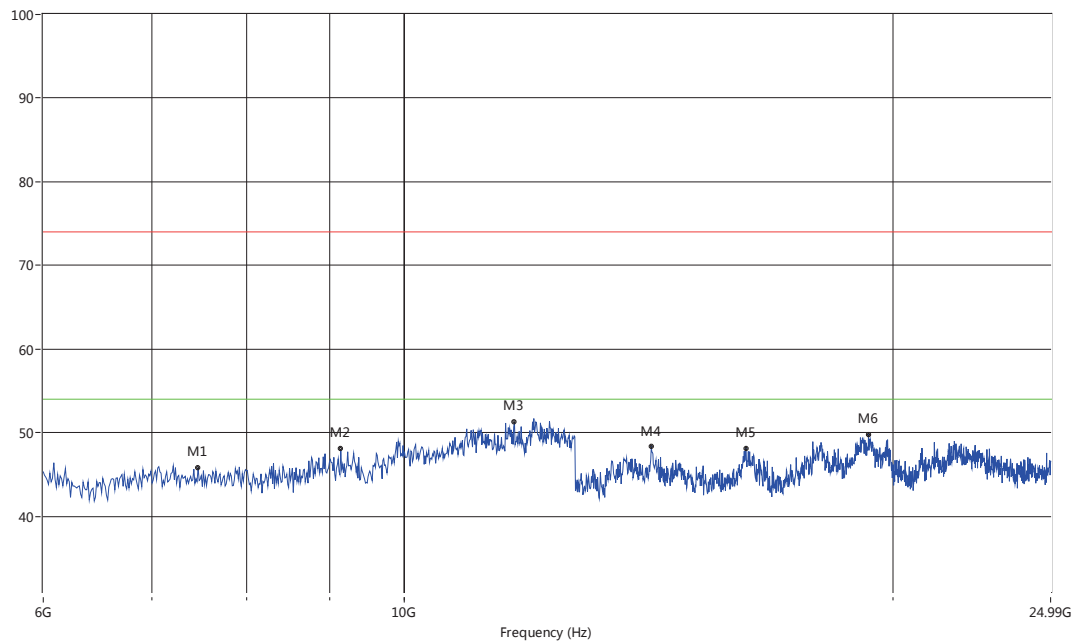
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1635.36	43.44			-4.30	74.0	--	54.0	10.56	360.00	100	Horizontal	PASS
2178.82	45.05			-0.72	74.0	--	54.0	8.95	150.60	100	Horizontal	PASS
2478.52	81.58			-0.62	74.0	--	54.0	-27.58	7.50	100	Horizontal	N/A
2894.11	46.65			1.88	74.0	--	54.0	7.35	82.10	100	Horizontal	PASS
4486.51	46.86			10.93	74.0	--	54.0	7.14	126.80	100	Horizontal	PASS
4960.04	48.00			12.64	74.0	--	54.0	6.00	48.70	100	Horizontal	PASS

GFSK HIGH CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	47.17	--	--	74.0	--	54.0	26.83	317	100	Vertical	PASS
11166.39	50.40	--	--	74.0	--	54.0	23.60	236	100	Vertical	PASS
12143.51	51.42	--	--	74.0	--	54.0	22.58	248	100	Vertical	PASS
14216.31	47.91	--	--	74.0	--	54.0	26.09	242	100	Vertical	PASS
16316.97	48.49	--	--	74.0	--	54.0	25.51	342	100	Vertical	PASS
19179.70	50.12	--	--	74.0	--	54.0	23.88	97	100	Vertical	PASS

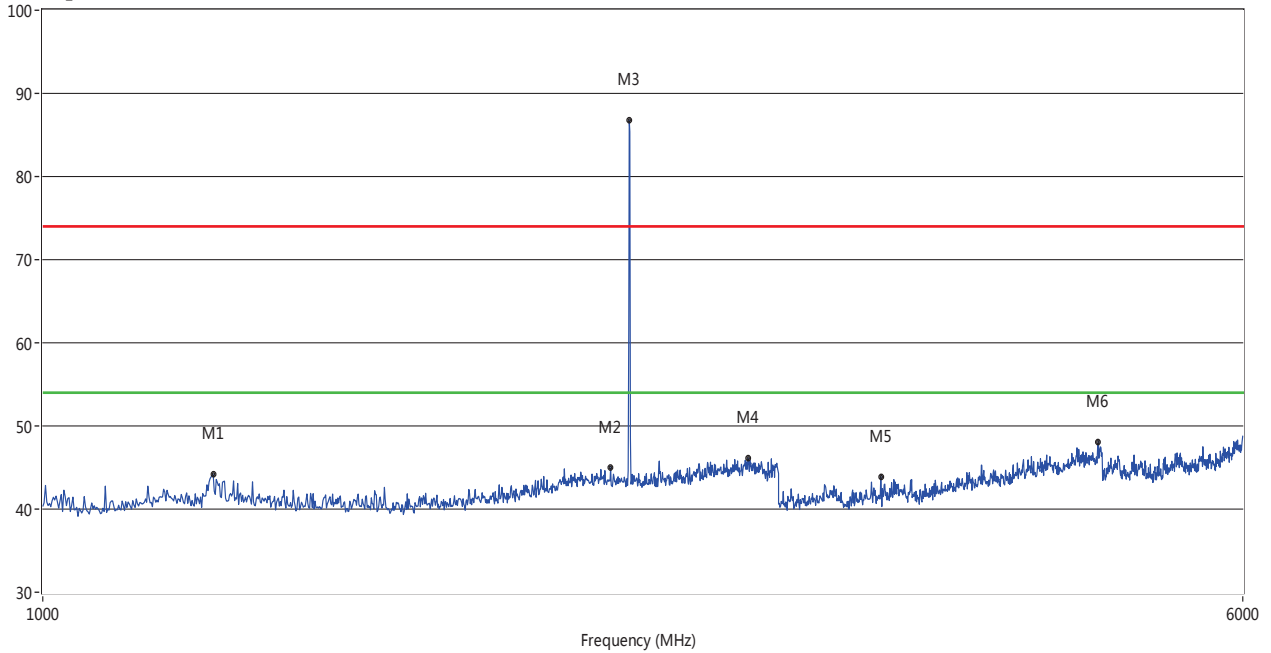
GFSK HIGH CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7471.30	45.83	--	--	74.0	--	54.0	28.17	38	100	Horizontal	PASS
9144.76	48.05	--	--	74.0	--	54.0	25.95	13	100	Horizontal	PASS
11694.26	51.26	--	--	74.0	--	54.0	22.74	106	100	Horizontal	PASS
14195.51	48.39	--	--	74.0	--	54.0	25.61	49	100	Horizontal	PASS
16233.78	48.15	--	--	74.0	--	54.0	25.85	254	100	Horizontal	PASS
19309.48	49.82	--	--	74.0	--	54.0	24.18	30	100	Horizontal	PASS

II/4-DQPSK LOW CHANNEL 1GHz to 6GHz, ANT V

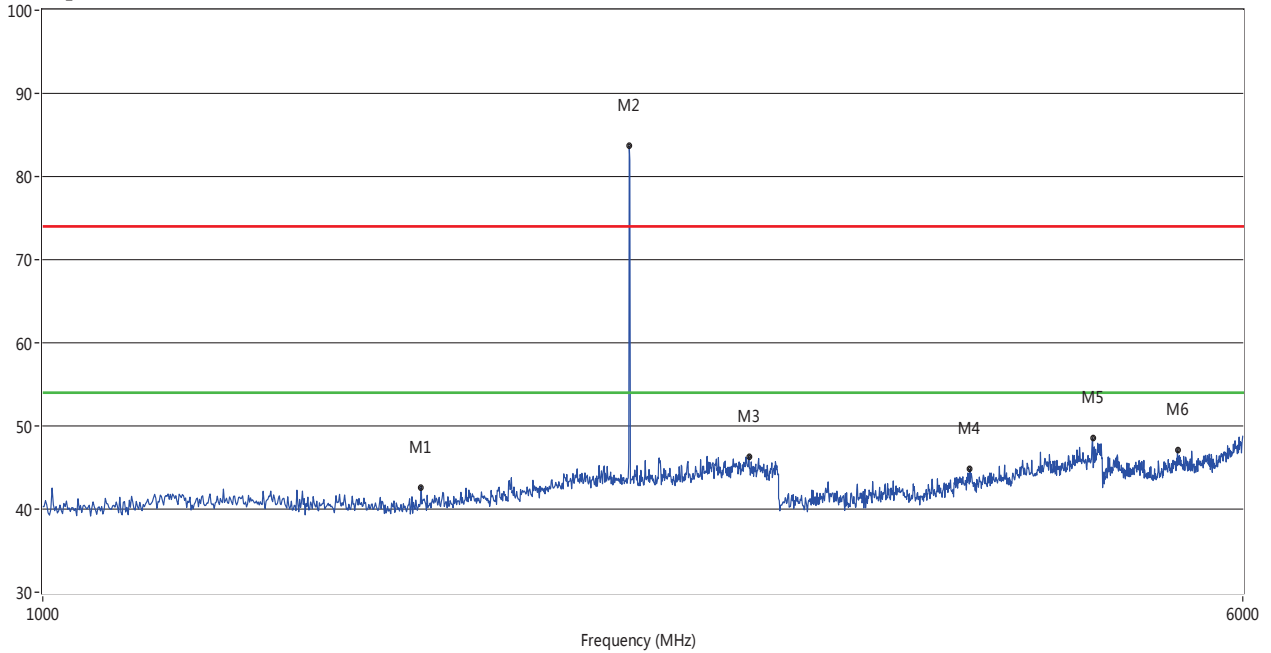
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1289.71	44.16			-4.28	74.0	--	54.	9.84	1.10	100	Vertical	PASS
2334.67	44.97			-0.58	74.0	--	54.0	9.03	218.40	100	Vertical	PASS
2400.60	86.77			-0.67	74.0	--	54.0	-32.77	300.30	100	Vertical	N/A
2866.13	46.09			2.32	74.0	--	54.0	7.91	190.60	100	Vertical	PASS
3494.51	43.93			8.86	74.0	--	54.0	10.07	53.00	100	Vertical	PASS
4837.16	48.14			13.00	74.0	--	54.0	5.86	326.40	100	Vertical	PASS

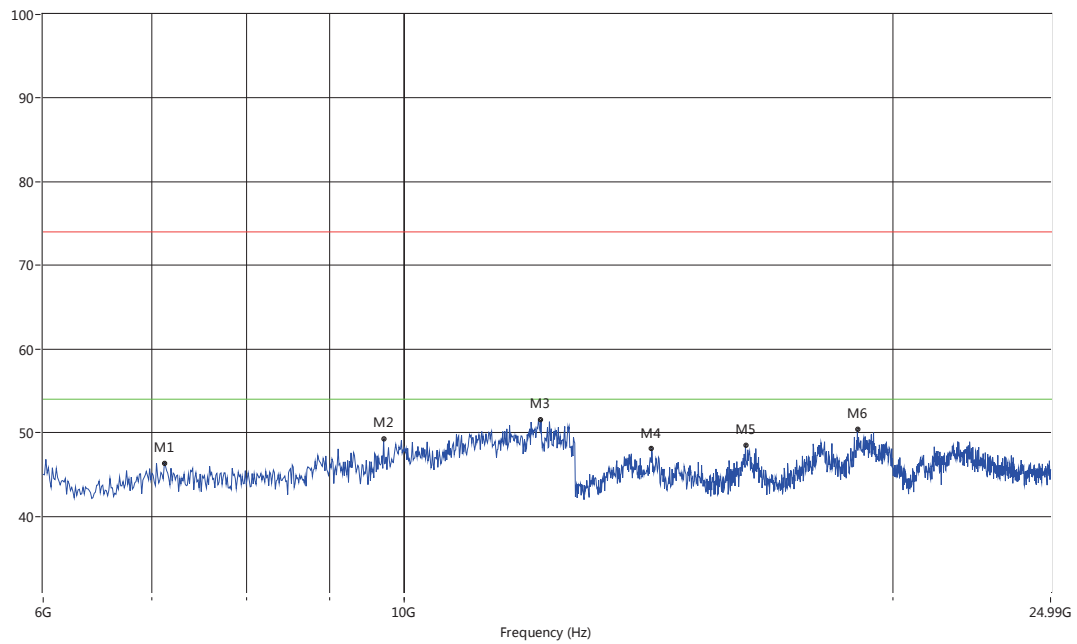
Π/4-DQPSK LOW CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



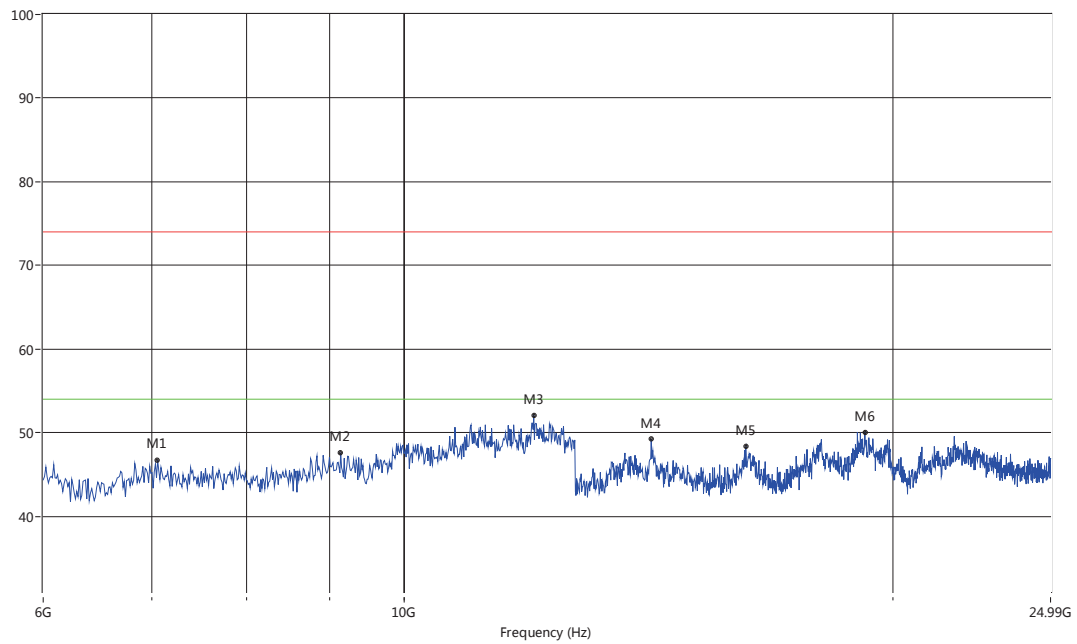
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1759.24	42.65			-3.57	74.0	-	4.	11.35	355.00	100	Horizontal	PASS
2400.60	83.67			-0.67	74.0	--	54.0	-29.67	7.80	100	Horizontal	N/A
2870.13	46.36			2.19	74.0	--	54.0	7.64	288.60	100	Horizontal	PASS
3992.01	44.76			10.15	74.0	--	54.0	9.24	169.80	100	Horizontal	PASS
4795.20	48.48			12.36	74.0	--	54.0	5.52	1.10	100	Horizontal	PASS
5442.56	47.09			13.52	74.0	--	54.0	6.91	355.80	100	Horizontal	PASS

II/4-DQPSK LOW CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	46.34	--	--	74.0	-	54.0	27.66	34	100	Vertical	PASS
9717.55	49.22	--	--	74.0	--	54.0	24.78	54	100	Vertical	PASS
12143.51	51.53	--	--	74.0	--	54.0	22.47	171	100	Vertical	PASS
14205.91	48.09	--	--	74.0	--	54.0	25.91	142	100	Vertical	PASS
16223.38	48.48	--	--	74.0	--	54.0	25.52	87	100	Vertical	PASS
19009.98	50.34	--	--	74.0	--	54.0	23.66	288	100	Vertical	PASS

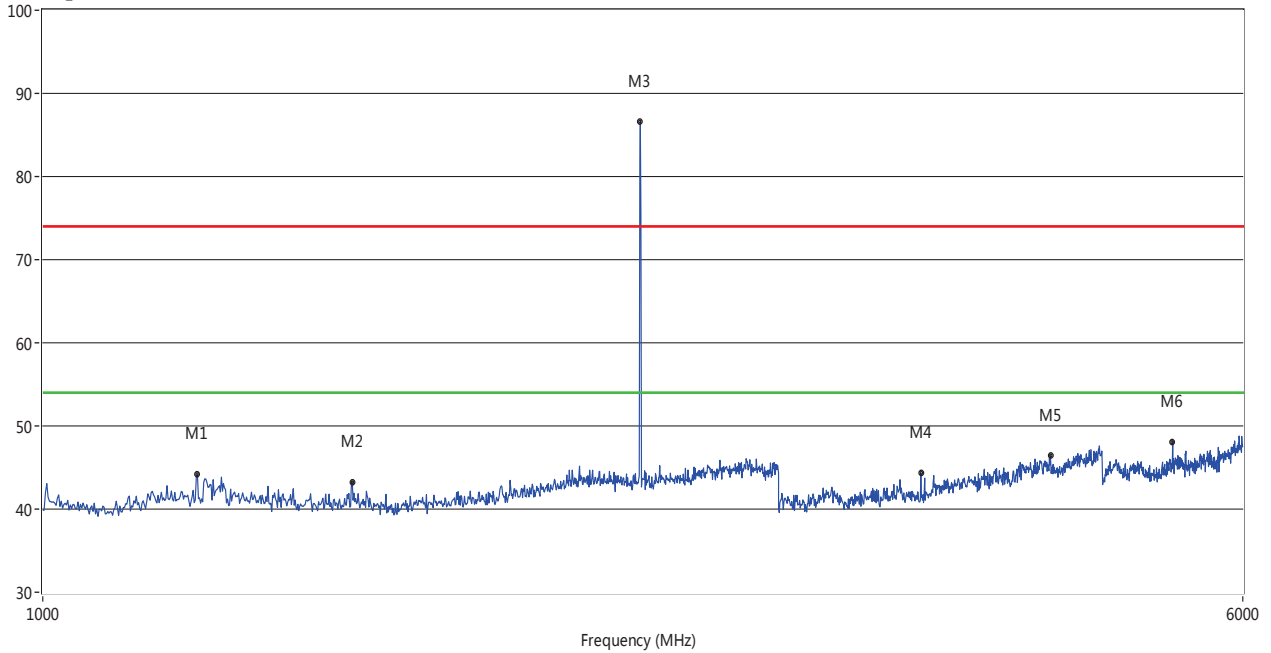
II/4-DQPSK LOW CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7055.74	46.69	--	--	74.0	-	54.0	27.31	102	100	Horizontal	PASS
9144.76	47.60	--	--	74.0	--	54.0	26.40	213	100	Horizontal	PASS
12019.97	52.09	--	--	74.0	--	54.0	21.91	107	100	Horizontal	PASS
14195.51	49.24	--	--	74.0	--	54.0	24.76	201	100	Horizontal	PASS
16233.78	48.33	--	--	74.0	--	54.0	25.67	312	100	Horizontal	PASS
19209.65	50.05	--	--	74.0	--	54.0	23.95	336	100	Horizontal	PASS

Π/4-DQPSK MID CHANNEL 1GHz to 6GHz, ANT V

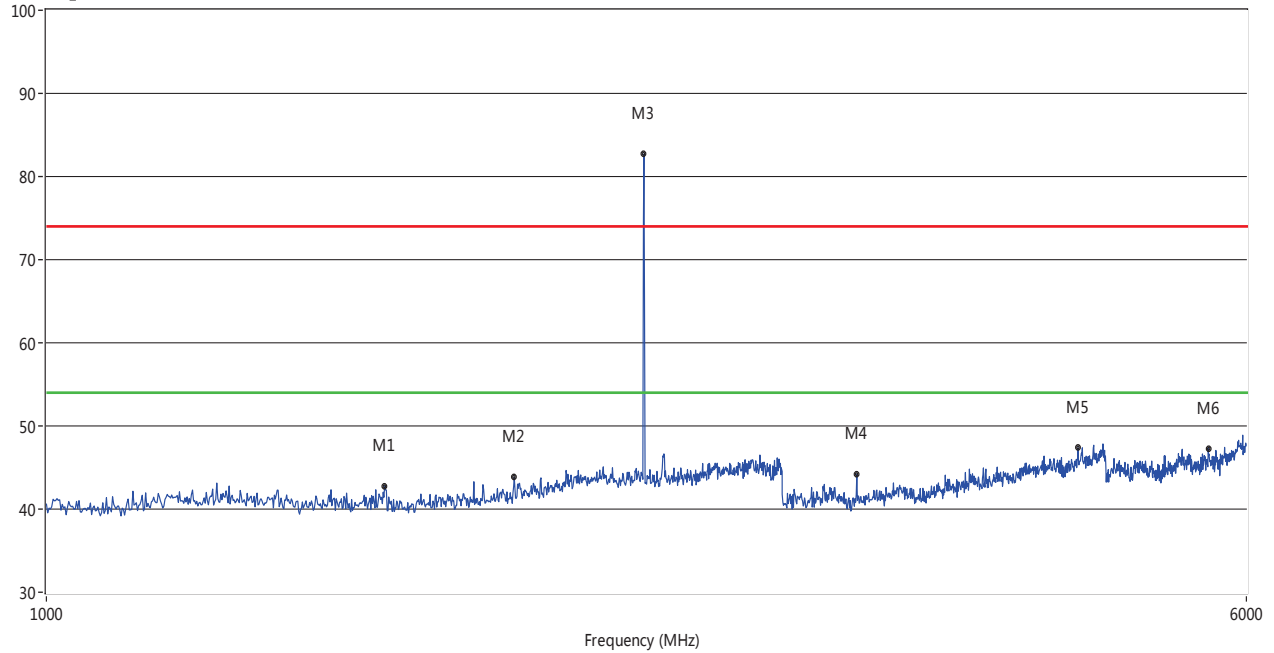
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1259.4	44.16			-4.13	74.0	--	54.0	9.84	355.90	100	Vertical	PASS
1587.41	43.31			-4.36	74.0	--	54.0	10.69	214.80	100	Vertical	PASS
2440.56	86.63			-0.54	74.0	--	54.0	-32.63	304.30	100	Vertical	N/A
3710.29	44.31			8.84	74.0	--	54.0	9.69	272.70	100	Vertical	PASS
4501.50	46.53			10.97	74.0	--	54.0	7.47	0.00	100	Vertical	PASS
5403.60	48.12			13.09	74.0	--	54.0	5.88	214.20	100	Vertical	PASS

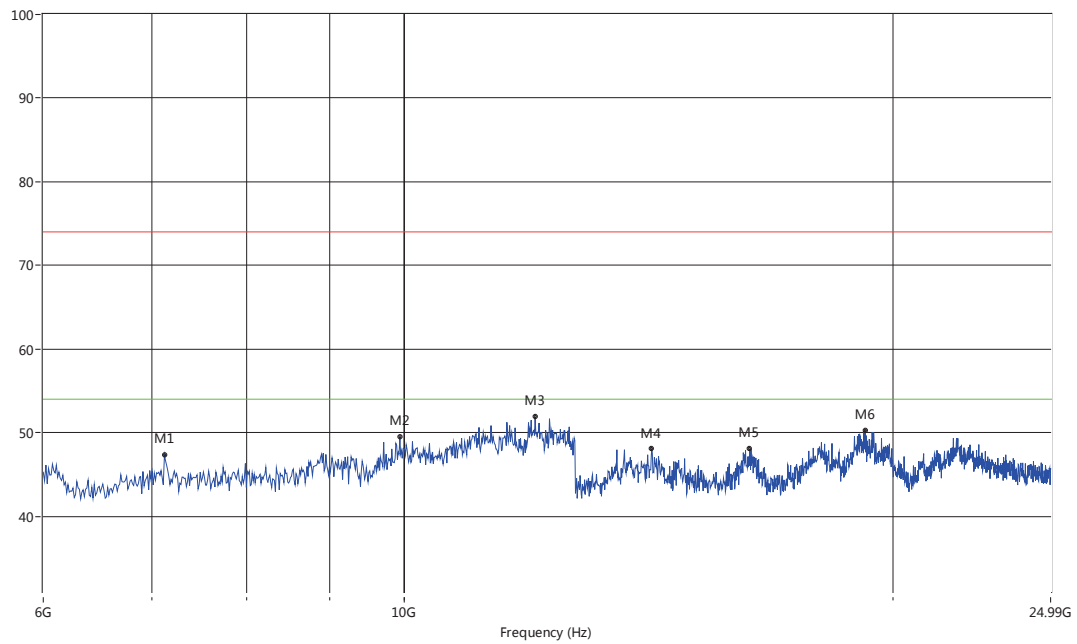
II/4-DQPSK MID CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



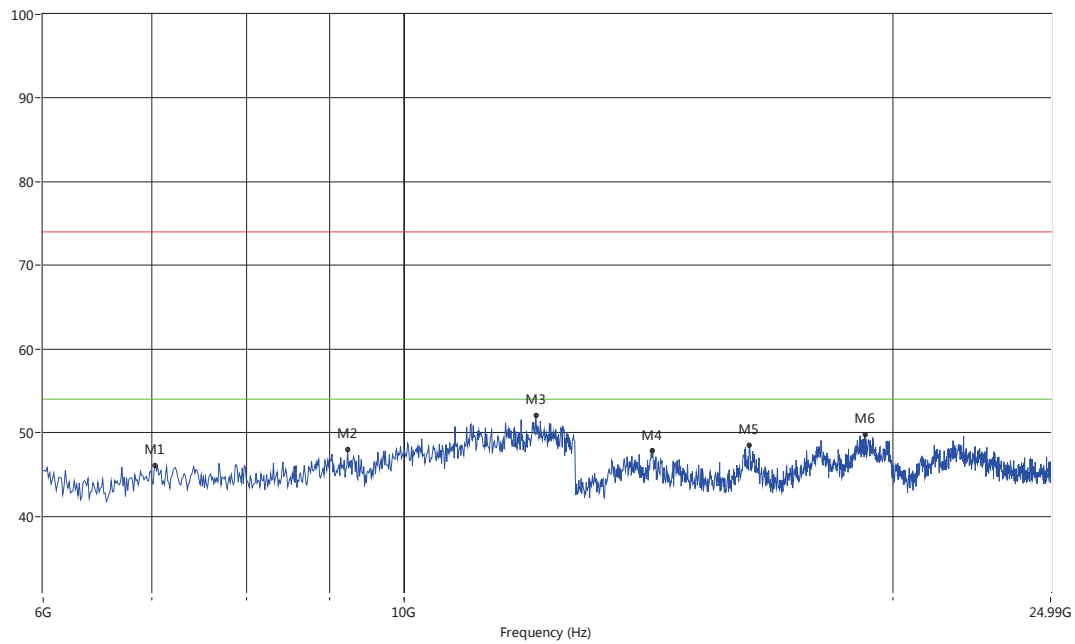
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1657.34	42.80			-4.30	74.0	--	54.0	11.20	61.10	100	Horizontal	PASS
2010.99	43.85			-2.63	74.0	--	54.0	10.15	212.90	100	Horizontal	PASS
2440.56	82.71			-0.54	74.0	--	54.0	-28.71	7.80	100	Horizontal	N/A
3353.65	44.19			8.11	74.0	--	54.0	9.81	238.10	100	Horizontal	PASS
4666.33	47.38			11.38	74.0	--	54.0	6.62	183.70	100	Horizontal	PASS
5667.33	47.32			13.95	74.0	--	54.0	6.68	135.20	100	Horizontal	PASS

II/4-DQPSK MID CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	47.33	--	--	74.0	-	54.0	26.67	17	100	Vertical	PASS
9942.18	49.51	--	--	74.0	--	54.0	24.49	228	100	Vertical	PASS
12042.43	51.91	--	--	74.0	--	54.0	22.09	92	100	Vertical	PASS
14205.91	48.11	--	--	74.0	--	54.0	25.89	198	100	Vertical	PASS
16316.97	48.07	--	--	74.0	--	54.0	25.93	135	100	Vertical	PASS
19219.63	50.30	--	--	74.0	--	54.0	23.70	335	100	Vertical	PASS

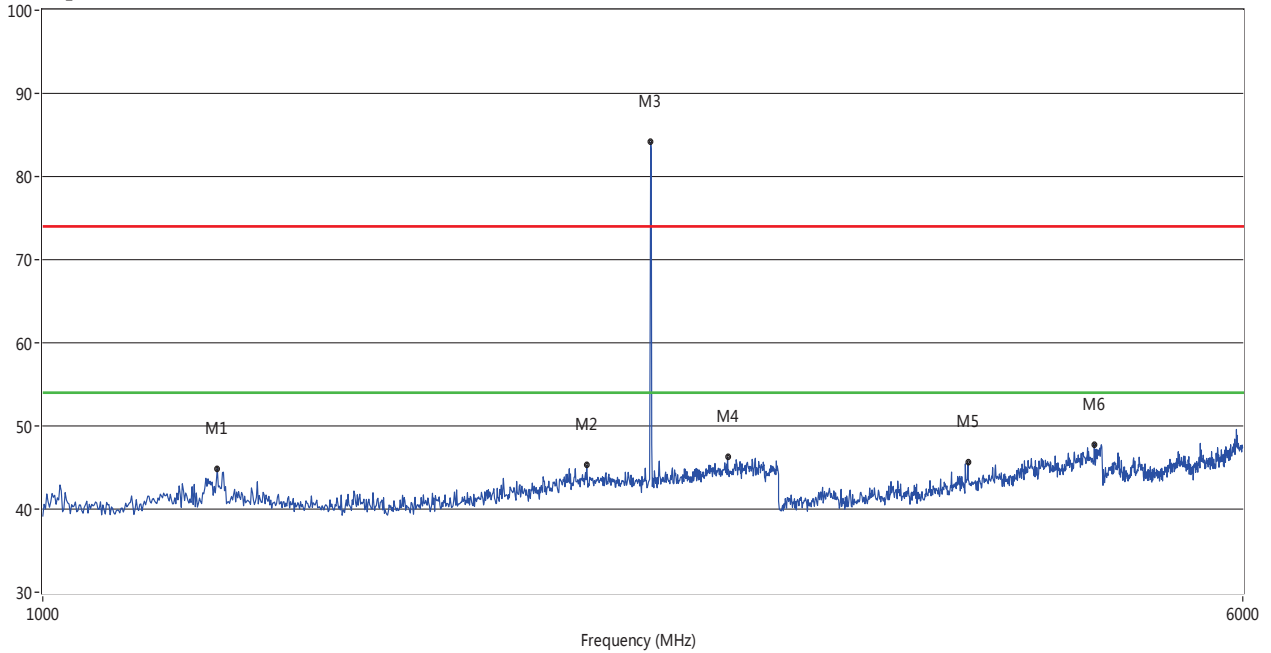
II/4-DQPSK MID CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7033.28	46.02	--	--	74.0	-	54.0	27.98	229	100	Horizontal	PASS
9234.61	47.94	--	--	74.0	--	54.0	26.06	246	100	Horizontal	PASS
12053.66	52.08	--	--	74.0	--	54.0	21.92	247	100	Horizontal	PASS
14226.70	47.84	--	--	74.0	--	54.0	26.16	186	100	Horizontal	PASS
16316.97	48.53	--	--	74.0	--	54.0	25.47	256	100	Horizontal	PASS
19209.65	49.81	--	--	74.0	--	54.0	24.19	355	100	Horizontal	PASS

Π/4-DQPSK HIGH CHANNEL 1GHz to 6GHz, ANT V

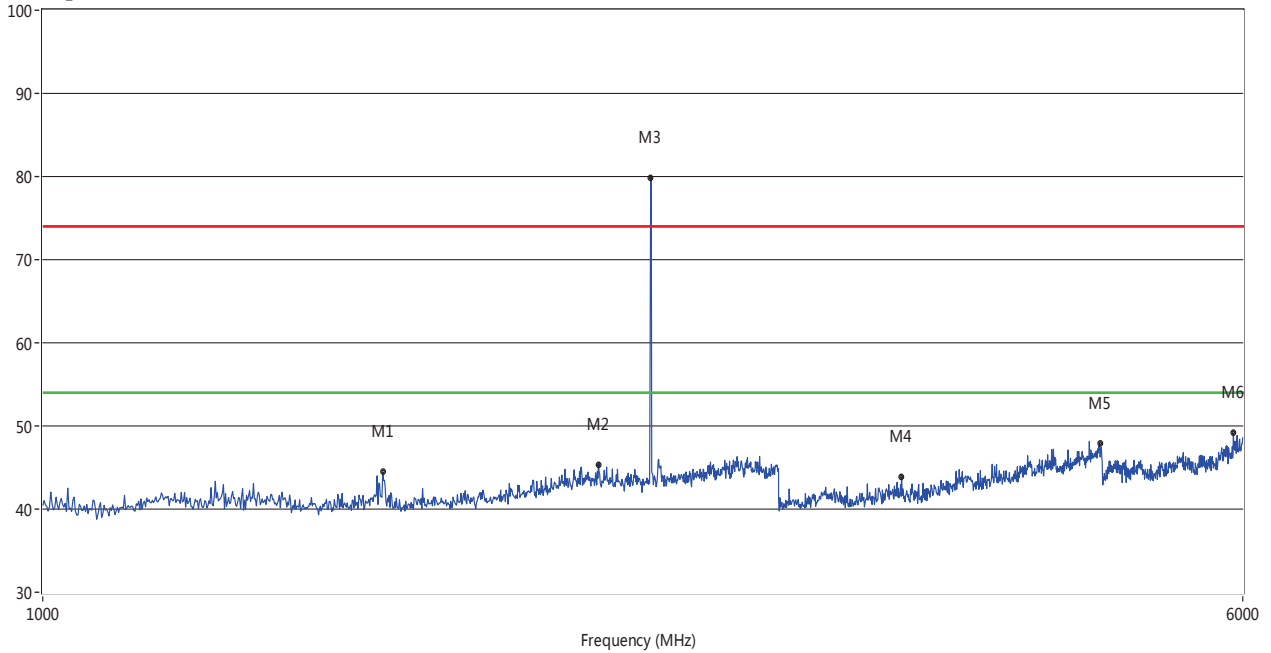
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
129.70	44.88			-4.13	74.0	--	54.0	9.12	1.10	100	Vertical	PASS
2252.75	45.26			-0.67	74.0	--	54.0	8.74	116.80	100	Vertical	PASS
2478.52	84.15			-0.62	74.0	--	54.0	-30.15	294.30	100	Vertical	N/A
2780.22	46.26			1.99	74.0	--	54.0	7.74	47.40	100	Vertical	PASS
3980.02	45.57			10.14	74.0	--	54.0	8.43	341.20	100	Vertical	PASS
4807.19	47.82			12.37	74.0	--	54.0	6.18	341.20	100	Vertical	PASS

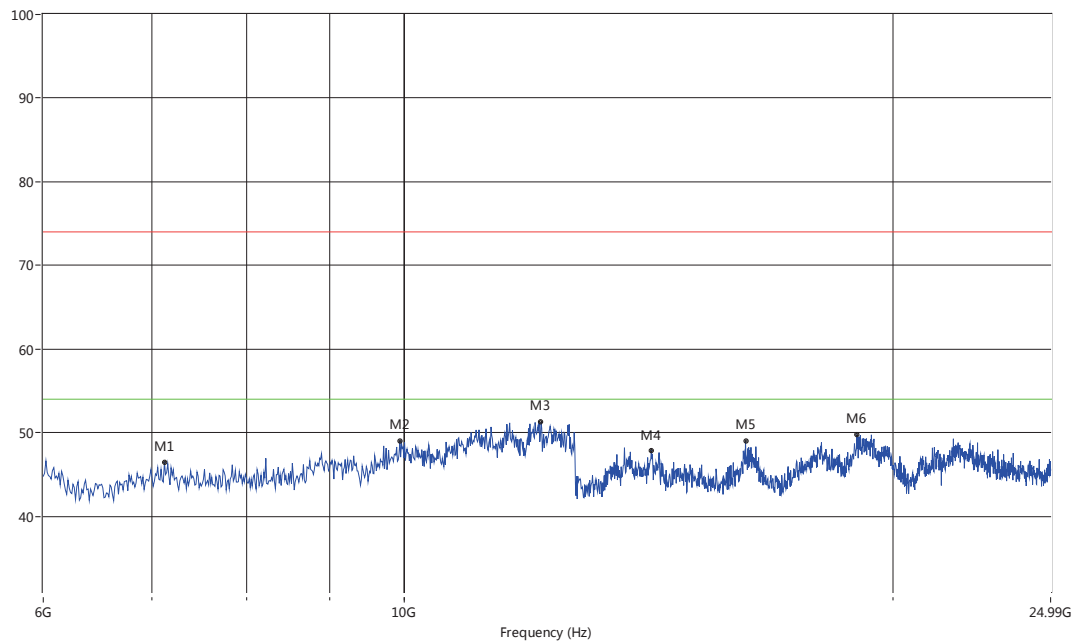
Π/4-DQPSK HIGH CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



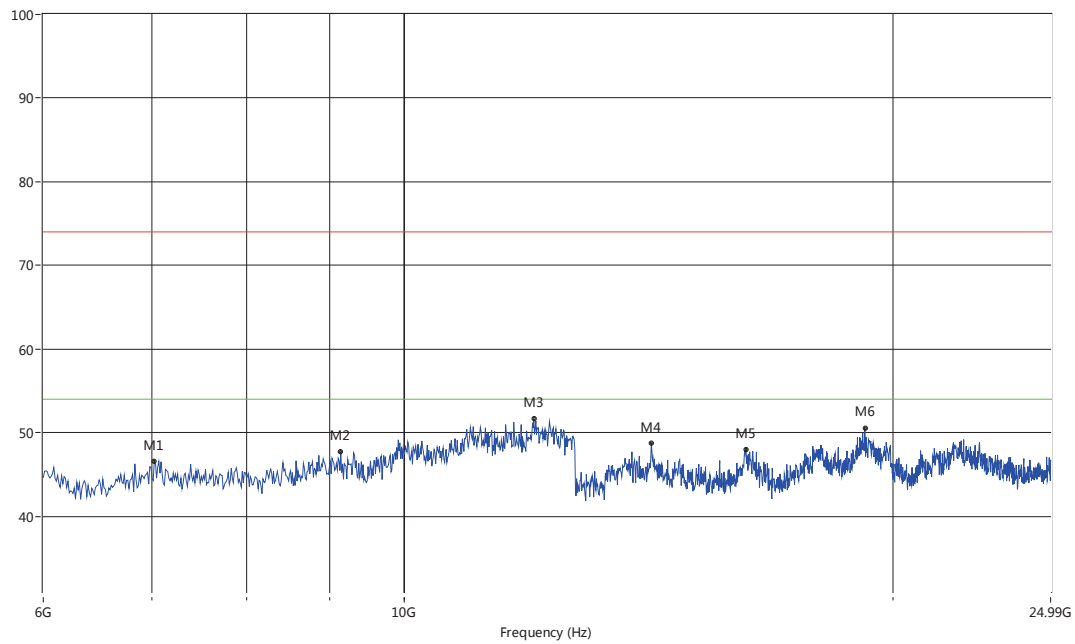
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1661.34	44.44			-4.34	74.0	--	54.0	9.56	360.00	100	Horizontal	PASS
2292.71	45.38			-0.56	74.0	--	54.0	8.62	273.50	100	Horizontal	PASS
2478.52	79.90			-0.62	74.0	--	54.0	-25.90	4.40	100	Horizontal	N/A
3605.39	43.87			8.65	74.0	--	54.0	10.13	321.90	100	Horizontal	PASS
4846.15	47.86			12.95	74.0	--	54.0	6.14	307.10	100	Horizontal	PASS
5916.08	49.15			15.29	74.0	--	54.0	4.85	360.30	100	Horizontal	PASS

II/4-DQPSK HIGH CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	46.46	--	--	74.0	-	54.0	27.54	101	100	Vertical	PASS
9942.18	49.04	--	--	74.0	--	54.0	24.96	65	100	Vertical	PASS
12143.51	51.25	--	--	74.0	--	54.0	22.75	41	100	Vertical	PASS
14195.51	47.89	--	--	74.0	--	54.0	26.11	287	100	Vertical	PASS
16223.38	49.04	--	--	74.0	--	54.0	24.96	165	100	Vertical	PASS
18989.60	49.76	--	--	74.0	--	54.0	24.24	93	100	Vertical	PASS

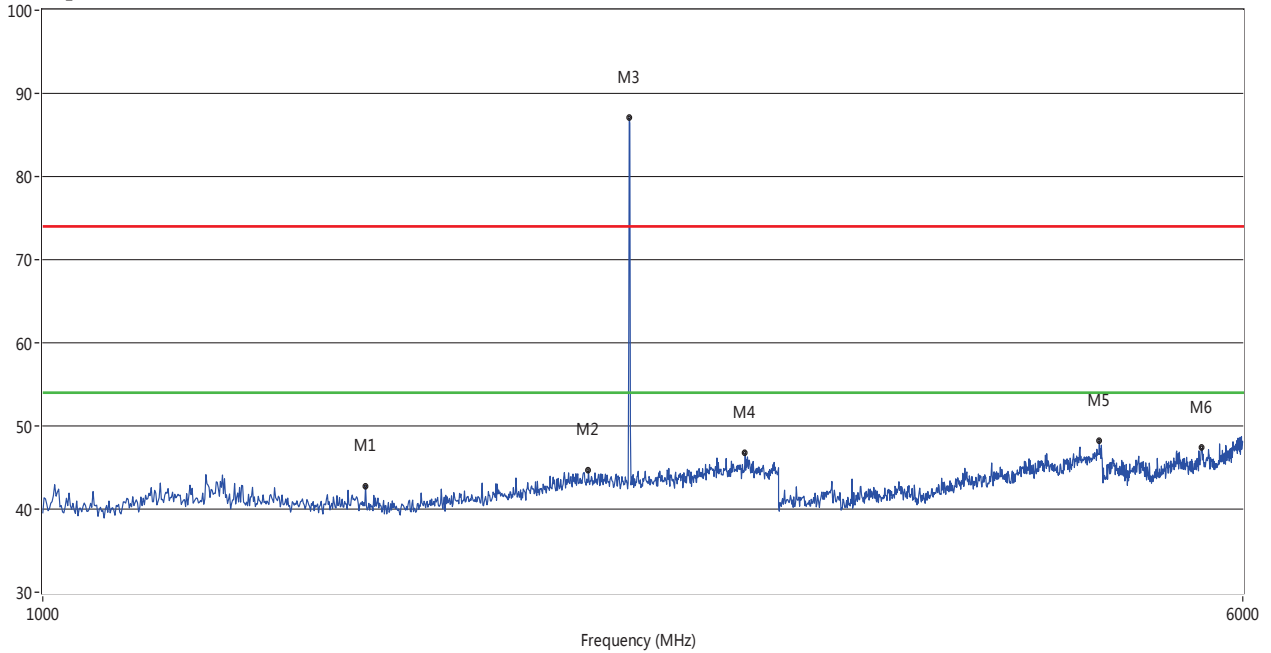
II/4-DQPSK HIGH CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7022.05	46.55	--	--	74.0	-	54.0	27.45	147	100	Horizontal	PASS
9144.76	47.71	--	--	74.0	--	54.0	26.29	121	100	Horizontal	PASS
12019.97	51.61	--	--	74.0	--	54.0	22.39	47	100	Horizontal	PASS
14195.51	48.72	--	--	74.0	--	54.0	25.28	198	100	Horizontal	PASS
16233.78	48.00	--	--	74.0	--	54.0	26.00	244	100	Horizontal	PASS
19209.65	50.52	--	--	74.0	--	54.0	23.48	21	100	Horizontal	PASS

8-DPSK LOW CHANNEL 1GHz to 6GHz, ANT V

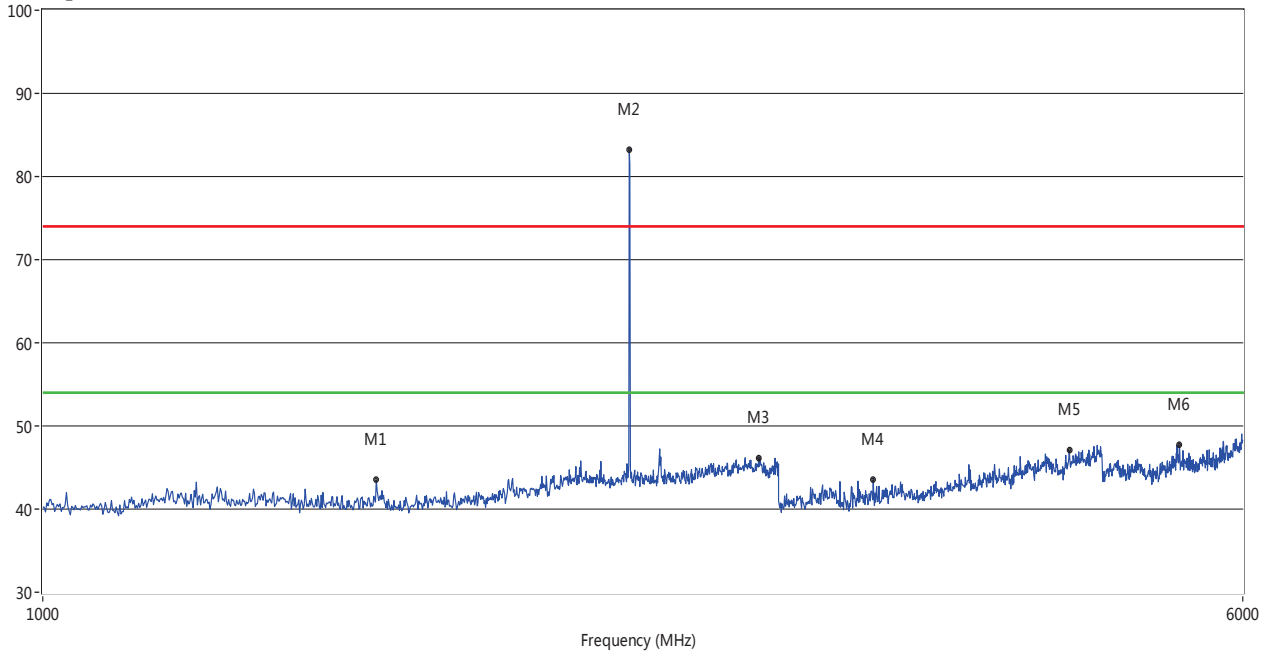
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1619.38	42.79			-4.45	74.0	--	54.0	11.21	341.40	100	Vertical	PASS
2258.74	44.60			-0.76	74.0	--	54.0	9.40	218.60	100	Vertical	PASS
2400.60	87.05			-0.67	74.0	--	54.0	-33.05	301.00	100	Vertical	N/A
2854.15	46.73			2.35	74.0	--	54.0	7.27	204.50	100	Vertical	PASS
4843.16	48.21			13.03	74.0	--	54.0	5.79	335.60	100	Vertical	PASS
5646.35	47.35			13.90	74.0	--	54.0	6.65	316.00	100	Vertical	PASS

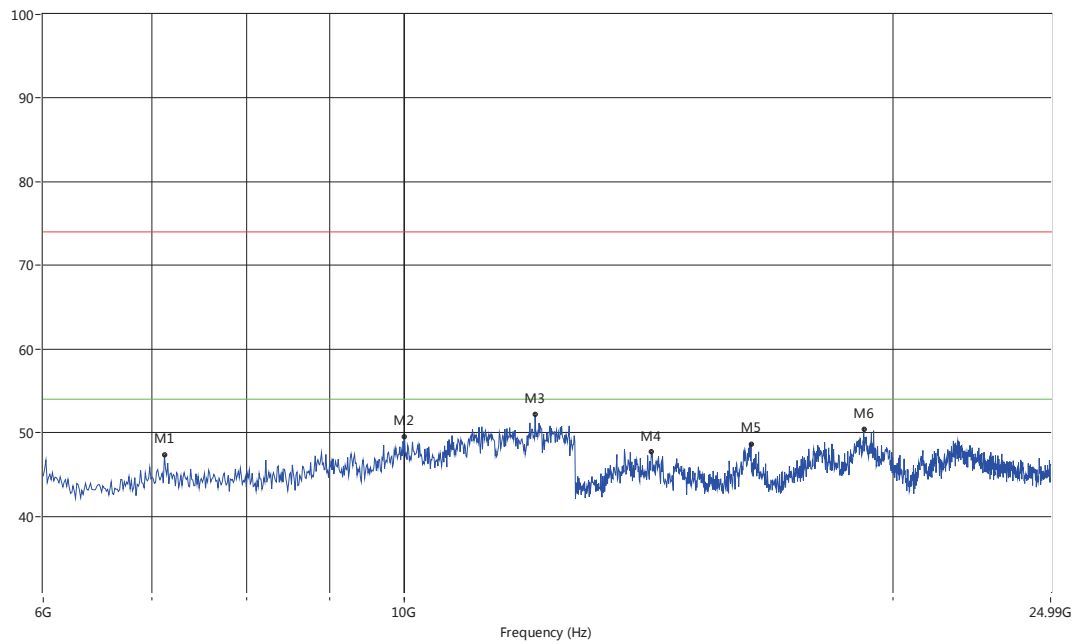
8-DPSK LOW CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



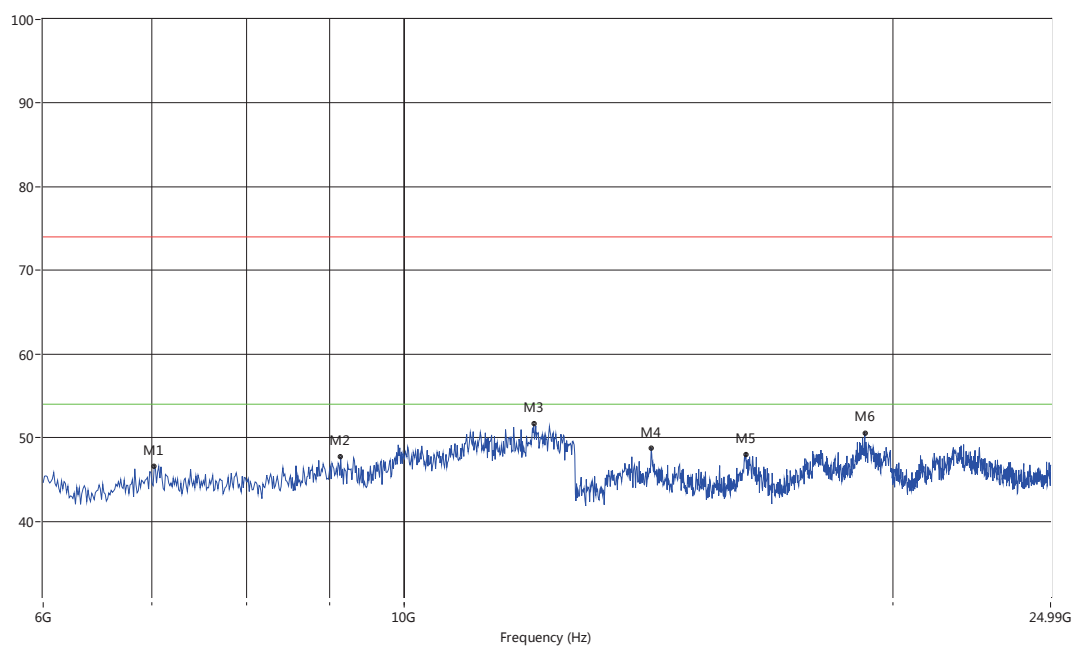
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1645.35	43.50			-4.33	74.0	--	54.0	10.50	14.80	100	Horizontal	PASS
2400.60	83.23			-0.67	74.0	--	54.0	-29.23	8.70	100	Horizontal	N/A
2912.09	46.17			2.29	74.0	--	54.0	7.83	296.70	100	Horizontal	PASS
3455.54	43.54			9.07	74.0	--	54.0	10.46	273.80	100	Horizontal	PASS
4630.37	47.04			11.31	74.0	--	54.0	6.96	0.70	100	Horizontal	PASS
5457.54	47.74			13.52	74.0	--	54.0	6.26	322.30	100	Horizontal	PASS

8-DPSK LOW CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	47.29	--	--	74.0	--	54.0	26.71	99	100	Vertical	PASS
10009.57	49.49	--	--	74.0	--	54.0	24.51	343	100	Vertical	PASS
12042.43	52.13	--	--	74.0	--	54.0	21.87	299	100	Vertical	PASS
14195.51	47.70	--	--	74.0	--	54.0	26.30	275	100	Vertical	PASS
16348.17	48.67	--	--	74.0	--	54.0	25.33	342	100	Vertical	PASS
19179.70	50.42	--	--	74.0	--	54.0	23.58	344	100	Vertical	PASS

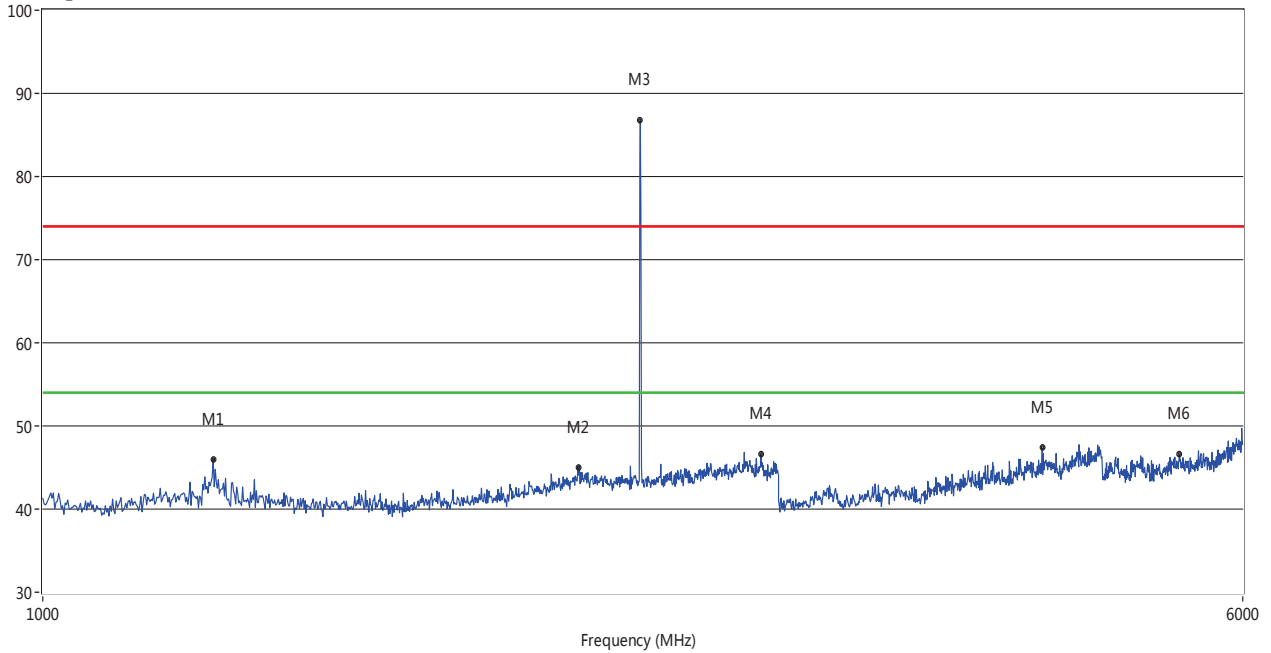
8-DPSK LOW CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7022.05	46.55	--	--	74.0	--	54.0	27.45	12	100	Horizontal	PASS
9144.76	47.71	--	--	74.0	--	54.0	26.29	229	100	Horizontal	PASS
12019.97	51.61	--	--	74.0	--	54.0	22.39	155	100	Horizontal	PASS
14195.51	48.72	--	--	74.0	--	54.0	25.28	112	100	Horizontal	PASS
16233.78	48.00	--	--	74.0	--	54.0	26.00	40	100	Horizontal	PASS
19209.65	50.52	--	--	74.0	--	54.0	23.48	158	100	Horizontal	PASS

8-DPSK MID CHANNEL 1GHz to 6GHz, ANT V

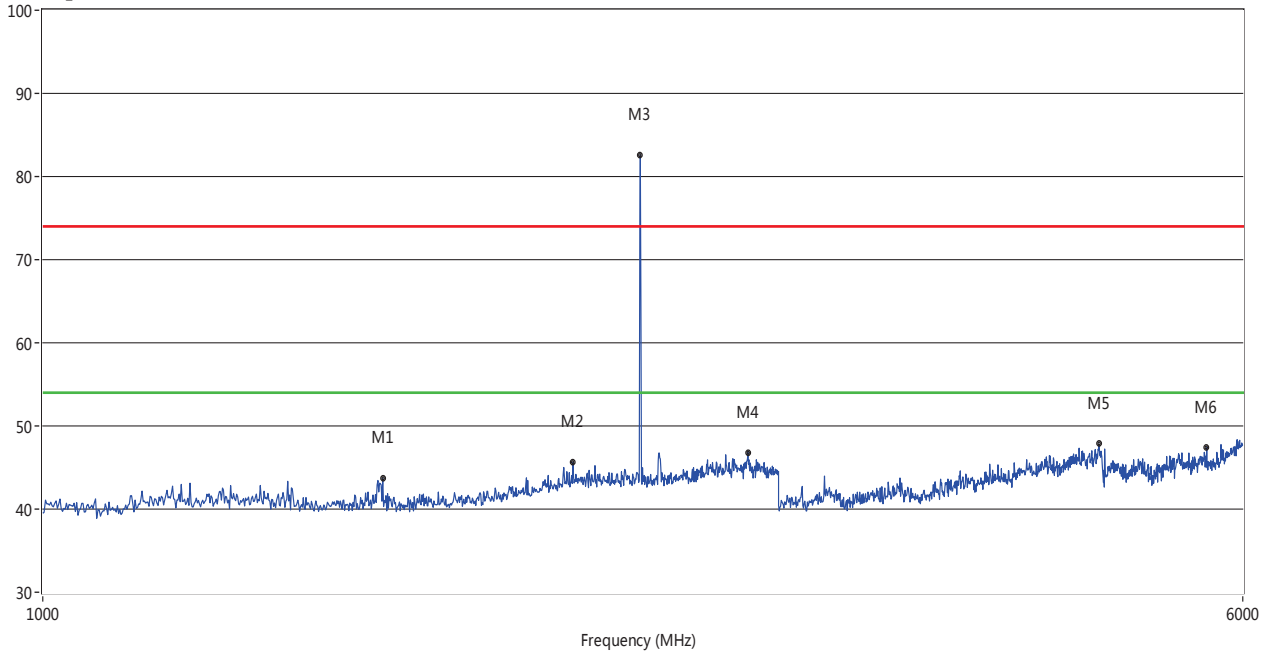
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1289.71	45.95			-4.28	74.0	--	54.0	8.05	7.50	100	Vertical	PASS
2224.78	45.02			-0.71	74.0	--	54.0	8.98	95.40	100	Vertical	PASS
2440.56	86.85			-0.54	74.0	--	54.0	-32.85	301.20	100	Vertical	N/A
2922.08	46.58			2.38	74.0	--	54.0	7.42	1.10	100	Vertical	PASS
4447.55	47.35			10.80	74.0	--	54.0	6.65	88.60	100	Vertical	PASS
5460.54	46.55			13.43	74.0	--	54.0	7.45	93.00	100	Vertical	PASS

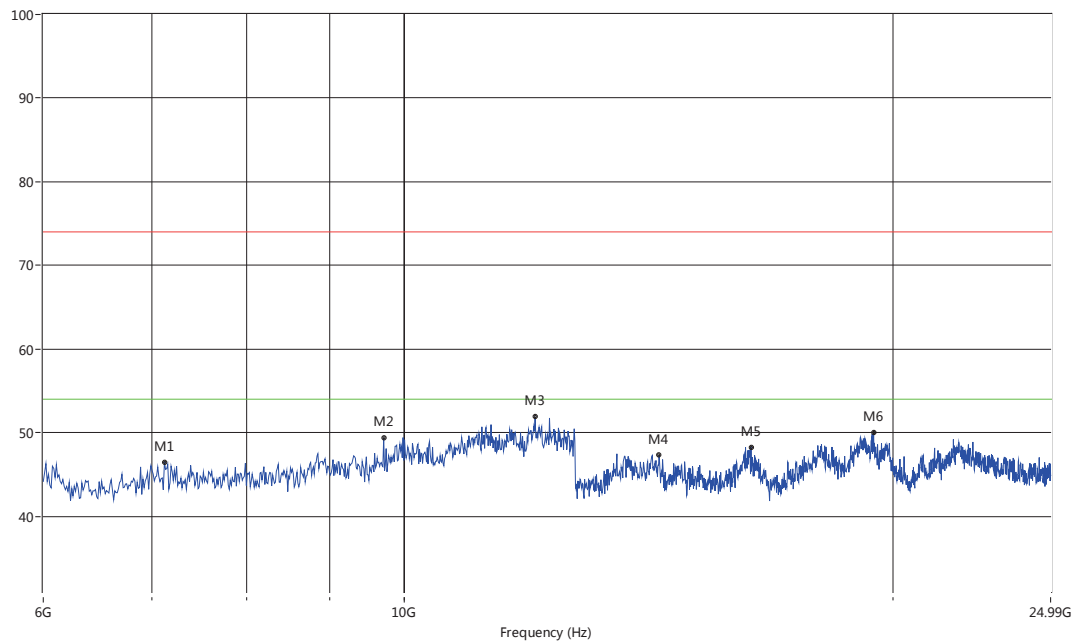
8-DPSK MID CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



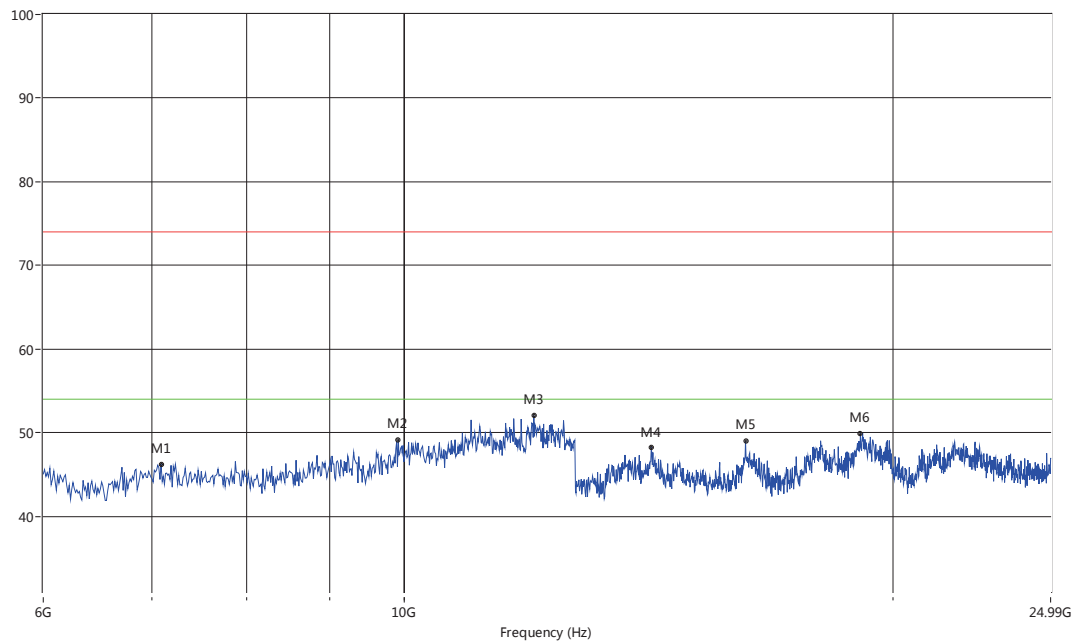
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1661.34	43.69			-4.34	74.0	--	54.0	10.31	61.90	100	Horizontal	PASS
2206.79	45.61			-0.70	74.0	--	54.0	8.39	2.30	100	Horizontal	PASS
2440.56	82.60			-0.54	74.0	--	54.0	-28.60	7.80	100	Horizontal	N/A
2866.13	46.83			2.32	74.0	--	54.0	7.17	281.80	100	Horizontal	PASS
4840.16	47.85			13.03	74.0	--	54.0	6.15	360.30	100	Horizontal	PASS
5685.31	47.44			14.00	74.0	--	54.0	6.56	194.10	100	Horizontal	PASS

8-DPSK MID CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	46.50	--	--	74.0	--	54.0	27.50	31	100	Vertical	PASS
9717.55	49.38	--	--	74.0	--	54.0	24.62	346	100	Vertical	PASS
12042.43	51.89	--	--	74.0	--	54.0	22.11	88	100	Vertical	PASS
14351.50	47.31	--	--	74.0	--	54.0	26.69	139	100	Vertical	PASS
16348.17	48.29	--	--	74.0	--	54.0	25.71	215	100	Vertical	PASS
19449.25	49.96	--	--	74.0	--	54.0	24.04	41	100	Vertical	PASS

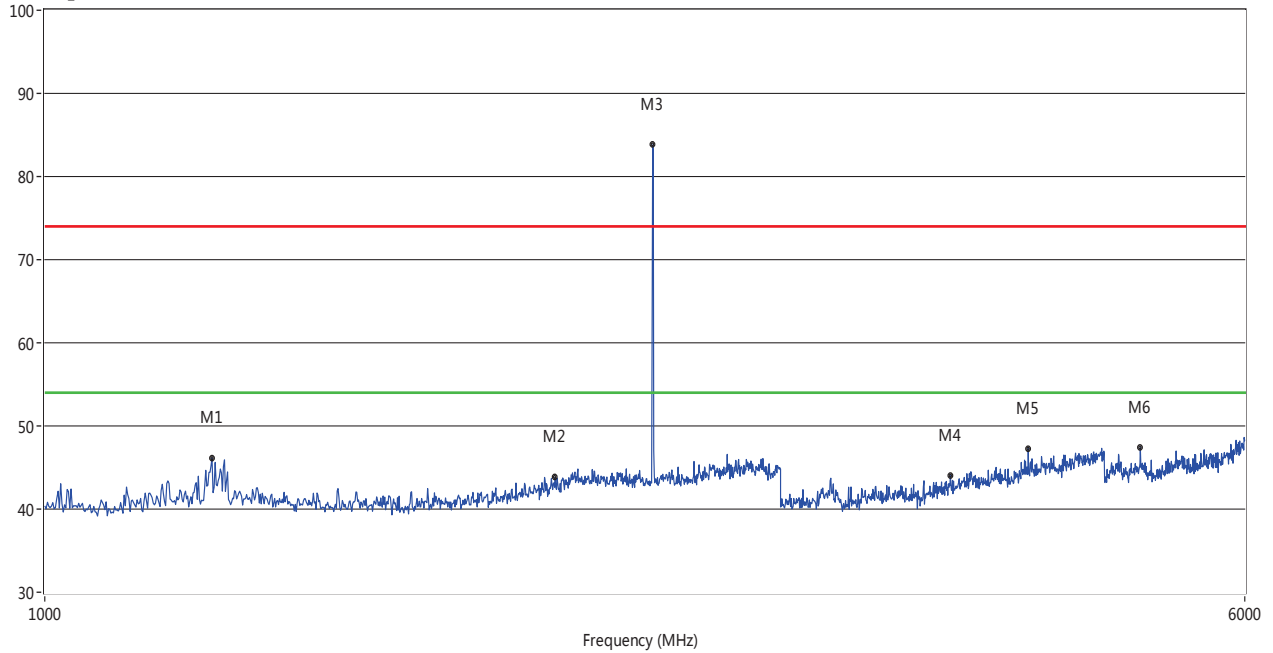
8-DPSK MID CHANNEL 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7089.43	46.23	--	--	74.0	--	54.0	27.77	80	100	Horizontal	PASS
9919.72	49.13	--	--	74.0	--	54.0	24.87	170	100	Horizontal	PASS
12019.97	52.05	--	--	74.0	--	54.0	21.95	10	100	Horizontal	PASS
14195.51	48.27	--	--	74.0	--	54.0	25.73	119	100	Horizontal	PASS
16223.38	49.01	--	--	74.0	--	54.0	24.99	232	100	Horizontal	PASS
19089.85	49.91	--	--	74.0	--	54.0	24.09	48	100	Horizontal	PASS

8-DPSK HIGH CHANNEL 1GHz to 6GHz, ANT V

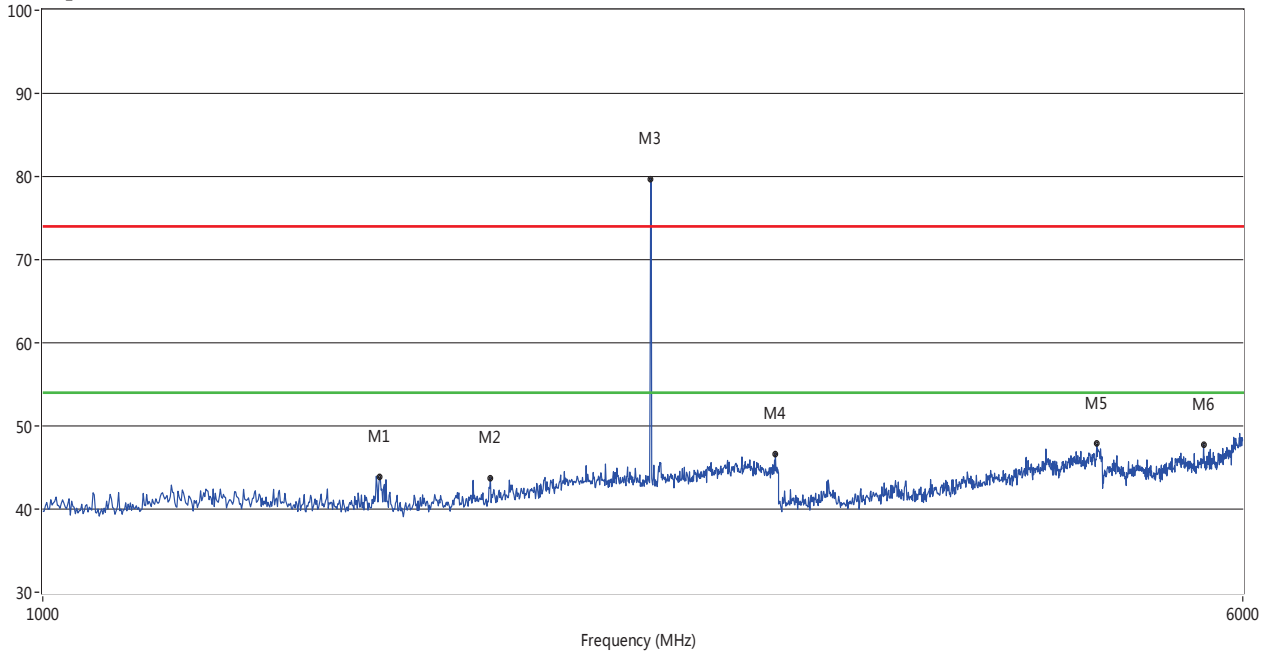
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1283.72	46.18			-4.27	74.0	--	54.0	7.82	2.60	100	Vertical	PASS
2142.86	43.86			-1.34	74.0	--	54.0	10.14	359.60	100	Vertical	PASS
2478.52	83.81			-0.62	74.0	--	54.0	-29.81	296.50	100	Vertical	N/A
3866.13	44.06			9.99	74.0	--	54.0	9.94	359.50	100	Vertical	PASS
4342.66	47.30			10.78	74.0	--	54.0	6.70	350.50	100	Vertical	PASS
5133.87	47.40			13.21	74.0	--	54.0	6.60	317.10	100	Vertical	PASS

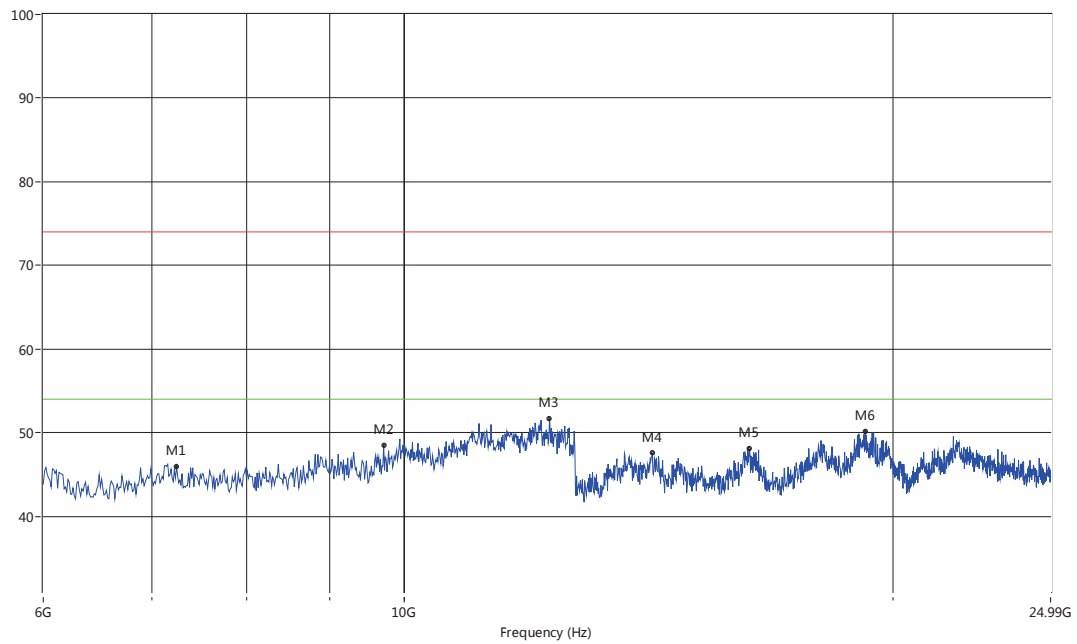
8-DPSK HIGH CHANNEL 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



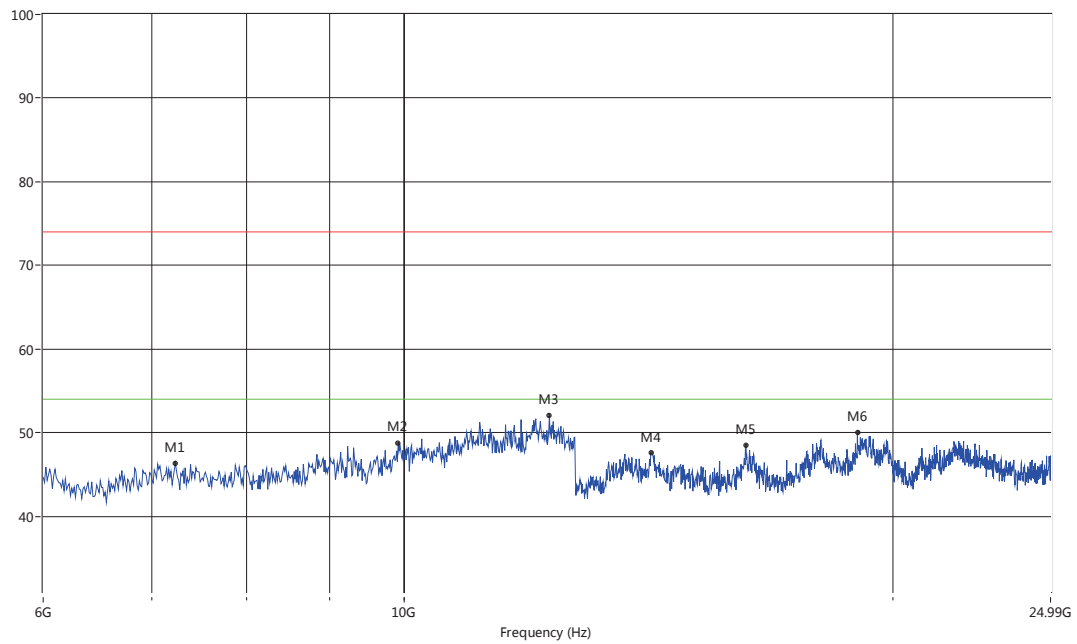
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1653.35	43.85			-4.34	74.0	--	54.0	10.15	68.70	100	Horizontal	PASS
1951.05	43.74			-3.02	74.0	--	54.0	10.26	157.50	100	Horizontal	PASS
2478.52	79.74			-0.62	74.0	--	54.0	-25.74	7.80	100	Horizontal	N/A
2986.01	46.68			2.27	74.0	--	54.0	7.32	95.80	100	Horizontal	PASS
4825.17	47.83			12.67	74.0	--	54.0	6.17	360.70	100	Horizontal	PASS
5658.34	47.79			13.95	74.0	--	54.0	6.21	346.00	100	Horizontal	PASS

8-DPSK HIGH CHANNEL 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7246.67	45.88	--	--	74.0	--	54.0	28.12	150	100	Vertical	PASS
9717.55	48.46	--	--	74.0	--	54.0	25.54	32	100	Vertical	PASS
12289.52	51.66	--	--	74.0	--	54.0	22.34	138	100	Vertical	PASS
14216.31	47.55	--	--	74.0	--	54.0	26.45	287	100	Vertical	PASS
16316.97	48.05	--	--	74.0	--	54.0	25.95	80	100	Vertical	PASS
19219.63	50.21	--	--	74.0	--	54.0	23.79	191	100	Vertical	PASS

8-DPSK HIGH CHANNEL 6GHz to 25GHz, ANT H

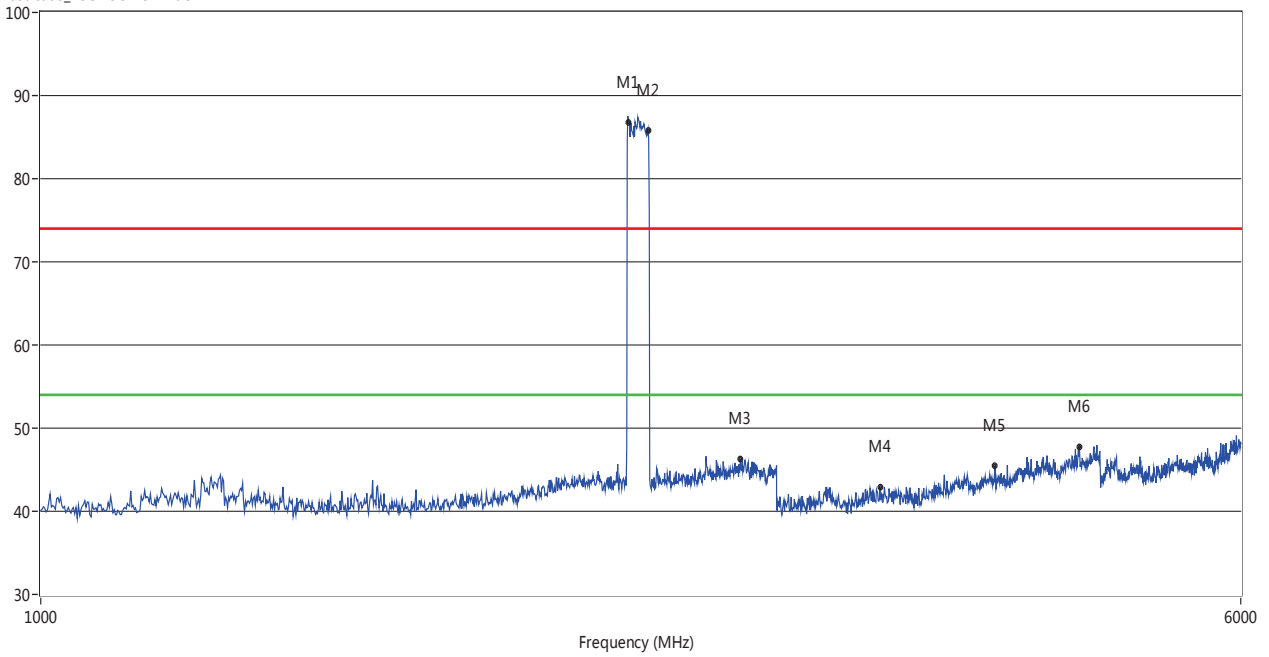


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7235.44	46.38	--	--	74.0	--	54.0	27.62	220	100	Horizontal	PASS
9919.72	48.78	--	--	74.0	--	54.0	25.22	119	100	Horizontal	PASS
12289.52	52.10	--	--	74.0	--	54.0	21.90	112	100	Horizontal	PASS
14195.51	47.61	--	--	74.0	--	54.0	26.39	200	100	Horizontal	PASS
16223.38	48.46	--	--	74.0	--	54.0	25.54	150	100	Horizontal	PASS
19009.98	50.05	--	--	74.0	--	54.0	23.95	67	100	Horizontal	PASS

Hopping Mode:

GFSK MODE 1GHz to 6GHz, ANT V

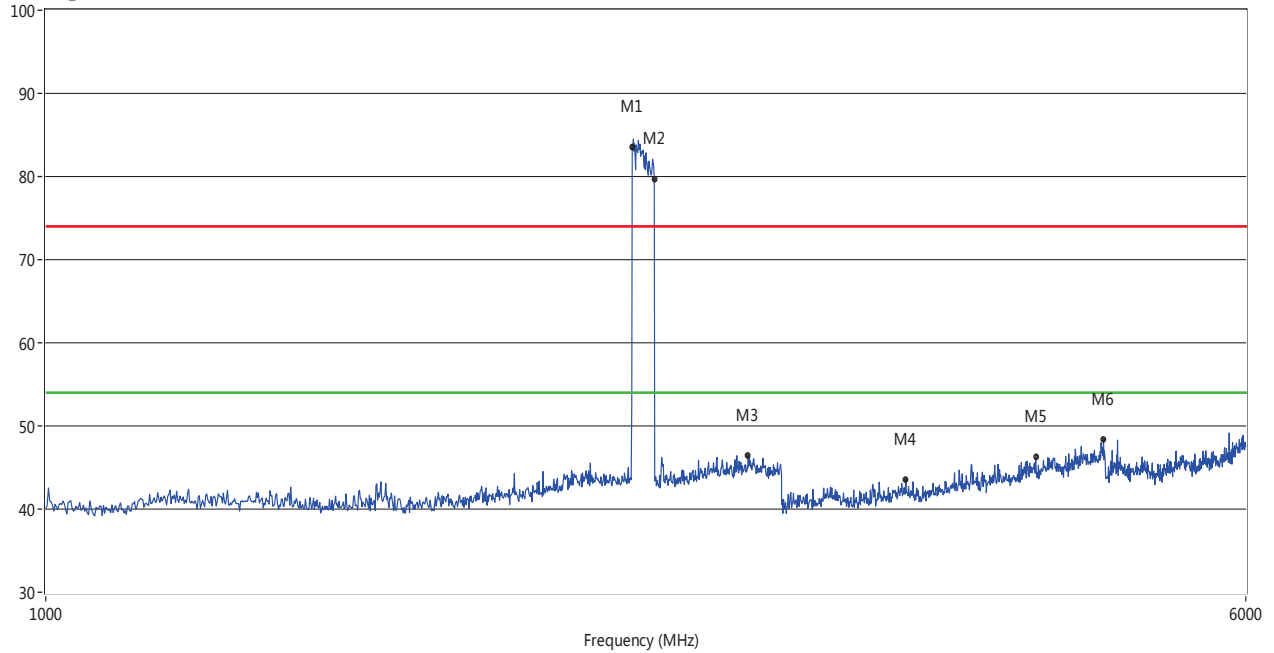
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2404.60	86.75			-0.78	74.0	--	54.0	-32.75	288.50	100	Vertical	N/A
2476.52	85.88			-0.57	74.0	--	54.0	-31.88	302.20	100	Vertical	N/A
2842.16	46.31			2.05	74.0	--	54.0	7.69	205.40	100	Vertical	PASS
3500.50	42.96			8.89	74.0	--	54.0	11.04	322.00	100	Vertical	PASS
4156.84	45.50			10.18	74.0	--	54.0	8.50	248.40	100	Vertical	PASS
4714.29	47.81			11.81	74.0	--	54.0	6.19	1.10	100	Vertical	PASS

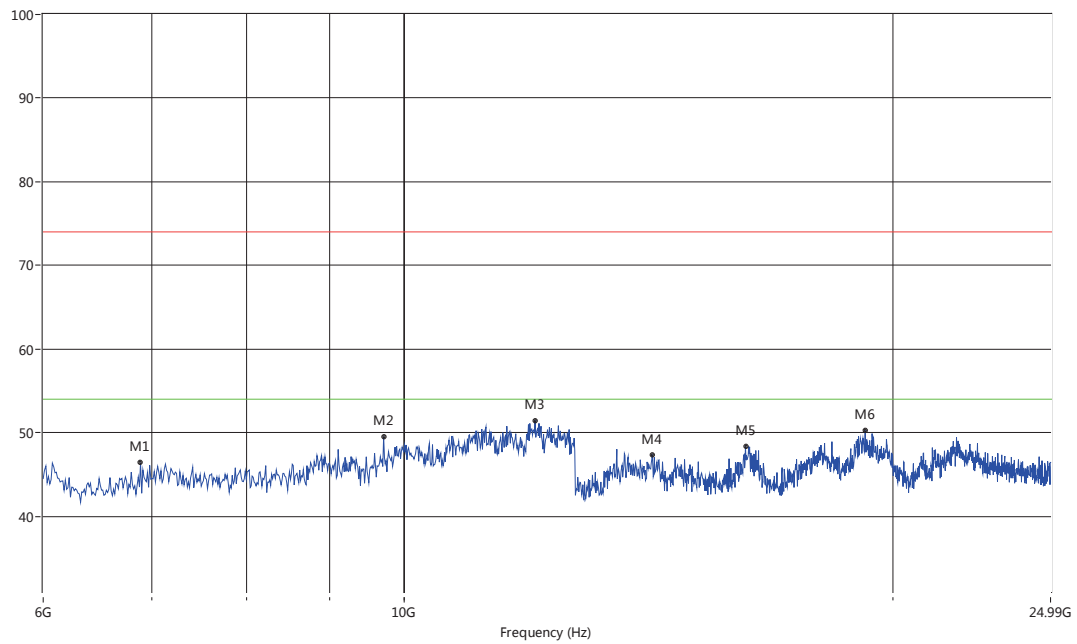
GFSK MODE 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



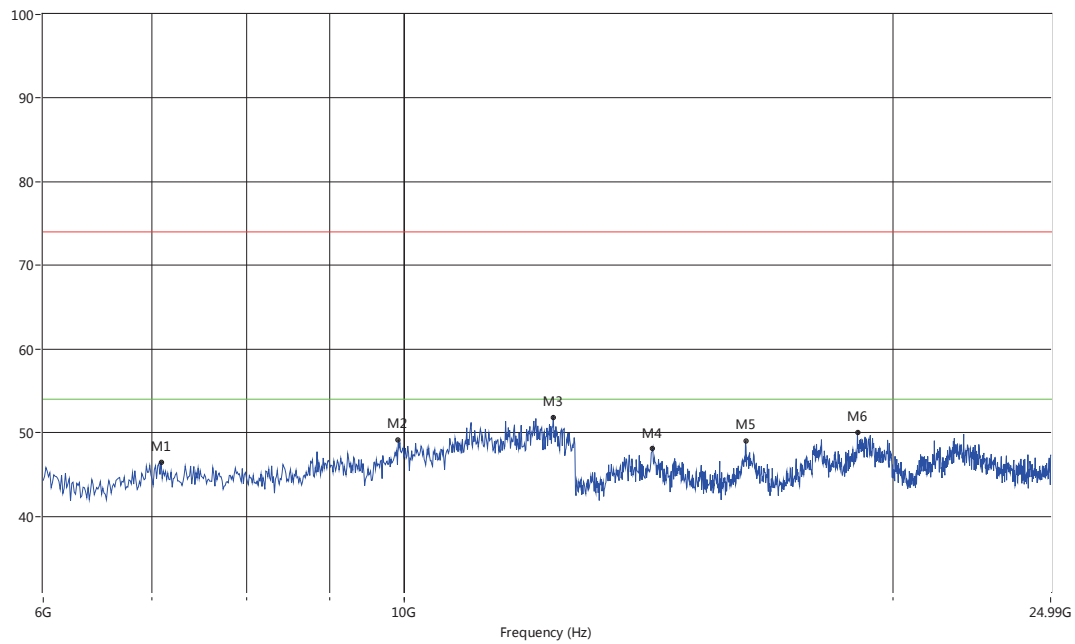
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2400.60	83.60			-0.67	74.0	--	54.0	-29.60	294.10	100	Horizontal	N/A
2480.52	79.61			-0.66	74.0	--	54.0	-25.61	1.00	100	Horizontal	N/A
2854.15	46.50			2.35	74.0	--	54.0	7.50	0.00	100	Horizontal	PASS
3611.39	43.60			8.56	74.0	--	54.0	10.40	41.90	100	Horizontal	PASS
4384.62	46.23			10.73	74.0	--	54.0	7.77	247.80	100	Horizontal	PASS
4852.15	48.43			12.70	74.0	--	54.0	5.57	164.40	100	Horizontal	PASS

GFSK MODE 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
6887.27	46.40	--	--	74.0	--	54.0	27.60	210	100	Vertical	PASS
9717.55	49.52	--	--	74.0	--	54.0	24.48	108	100	Vertical	PASS
12042.43	51.48	--	--	74.0	--	54.0	22.52	140	100	Vertical	PASS
14216.31	47.37	--	--	74.0	--	54.0	26.63	33	100	Vertical	PASS
16223.38	48.40	--	--	74.0	--	54.0	25.60	54	100	Vertical	PASS
19219.63	50.28	--	--	74.0	--	54.0	23.72	162	100	Vertical	PASS

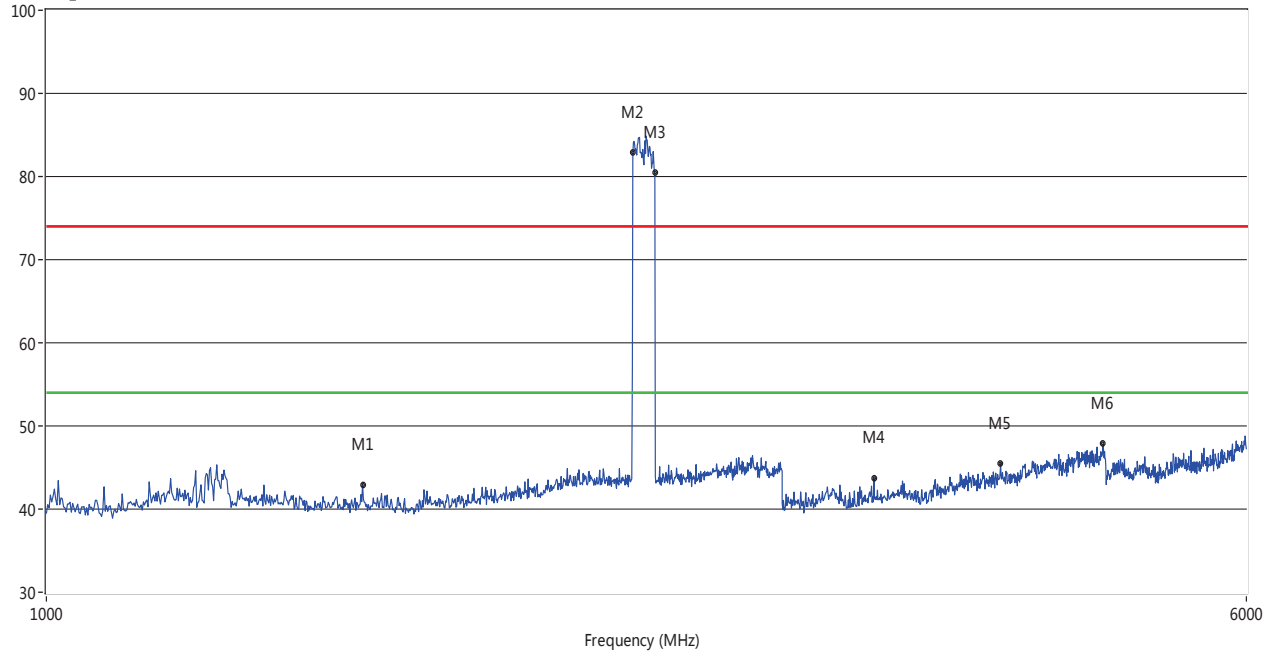
GFSK MODE 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7089.43	46.48	--	--	74.0	--	54.0	27.52	257	100	Horizontal	PASS
9919.72	49.11	--	--	74.0	--	54.0	24.89	176	100	Horizontal	PASS
12356.91	51.84	--	--	74.0	--	54.0	22.16	160	100	Horizontal	PASS
14226.70	48.12	--	--	74.0	--	54.0	25.88	351	100	Horizontal	PASS
16223.38	48.98	--	--	74.0	--	54.0	25.02	77	100	Horizontal	PASS
19009.98	50.05	--	--	74.0	--	54.0	23.95	217	100	Horizontal	PASS

II/4-DQPSK MODE 1GHz to 6GHz, ANT V

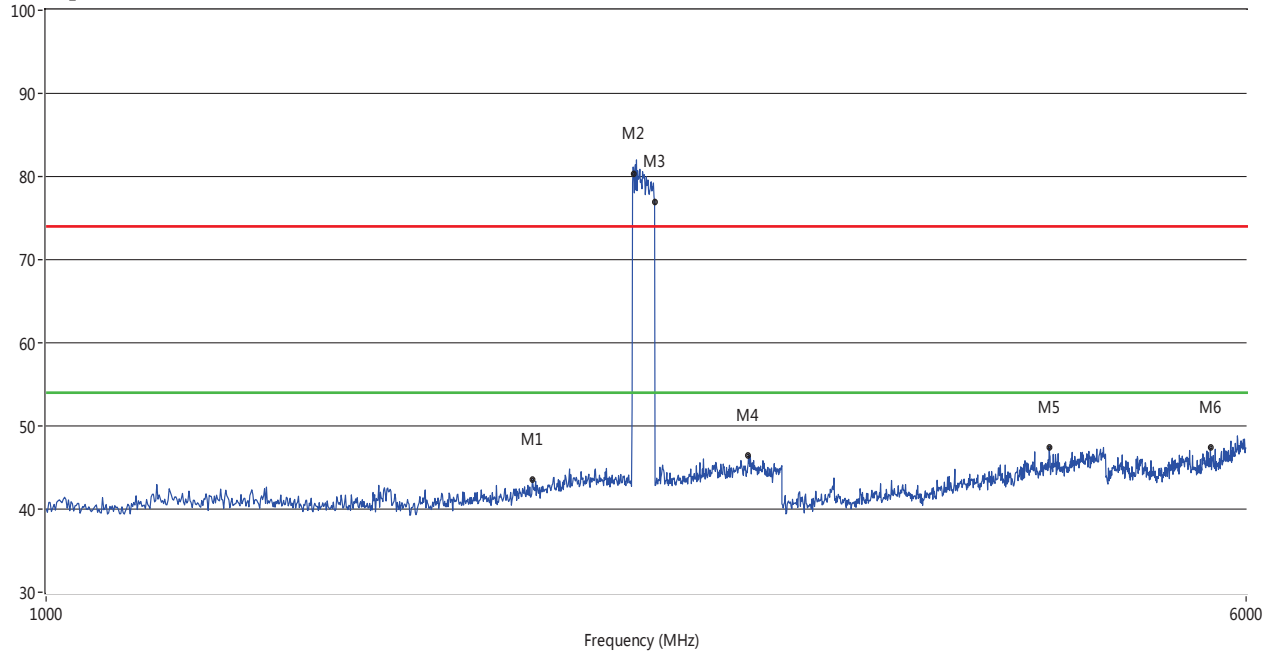
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1603.40	42.93			-4.43	74.0	--	54.0	11.07	2.20	100	Vertical	PASS
2400.60	82.85			-0.67	74.0	--	54.0	-28.85	294.60	100	Vertical	N/A
2480.52	80.53			-0.66	74.0	--	54.0	-26.53	280.50	100	Vertical	N/A
3440.56	43.71			8.88	74.0	--	54.0	10.29	169.60	100	Vertical	PASS
4156.84	45.51			10.18	74.0	--	54.0	8.49	27.50	100	Vertical	PASS
4843.16	47.84			13.03	74.0	--	54.0	6.16	291.90	100	Vertical	PASS

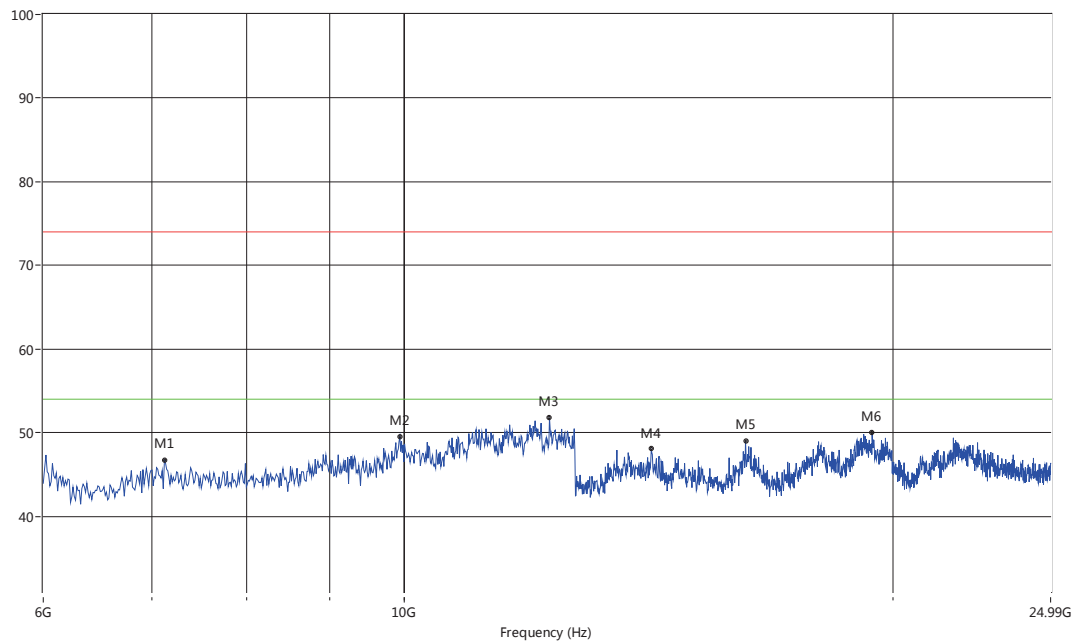
II/4-DQPSK MODE 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



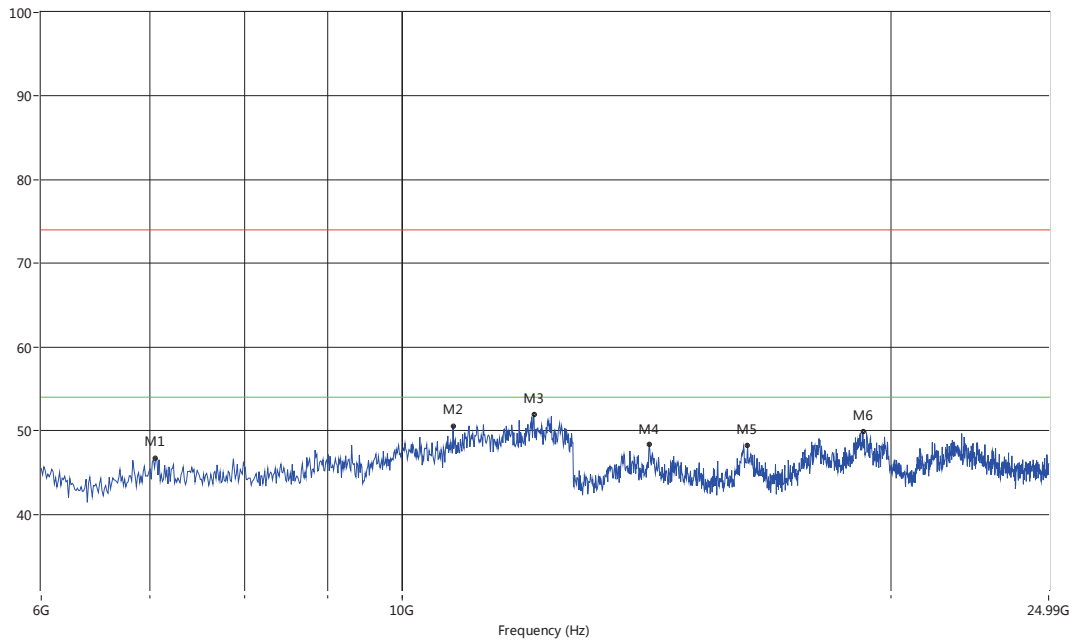
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2066.93	43.1			-2.29	4.0	--	54.0	10.49	241.30	100	Horizontal	PASS
2404.60	80.30			-0.78	74.0	--	54.0	-26.30	5.00	100	Horizontal	N/A
2480.52	76.92			-0.66	74.0	--	54.0	-22.92	0.60	100	Horizontal	N/A
2854.15	46.50			2.35	74.0	--	54.0	7.50	241.30	100	Horizontal	PASS
4471.53	47.44			11.07	74.0	--	54.0	6.56	360.30	100	Horizontal	PASS
5688.31	47.36			14.07	74.0	--	54.0	6.64	346.00	100	Horizontal	PASS

II/4-DQPSK MODE 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	46.71	--	--	74.0	--	54.0	7.29	38	100	Vertical	PASS
9942.18	49.54	--	--	74.0	--	54.0	24.46	230	100	Vertical	PASS
12289.52	51.77	--	--	74.0	--	54.0	22.23	53	100	Vertical	PASS
14195.51	48.07	--	--	74.0	--	54.0	25.93	270	100	Vertical	PASS
16223.38	49.05	--	--	74.0	--	54.0	24.95	102	100	Vertical	PASS
19409.32	49.95	--	--	74.0	--	54.0	24.05	357	100	Vertical	PASS

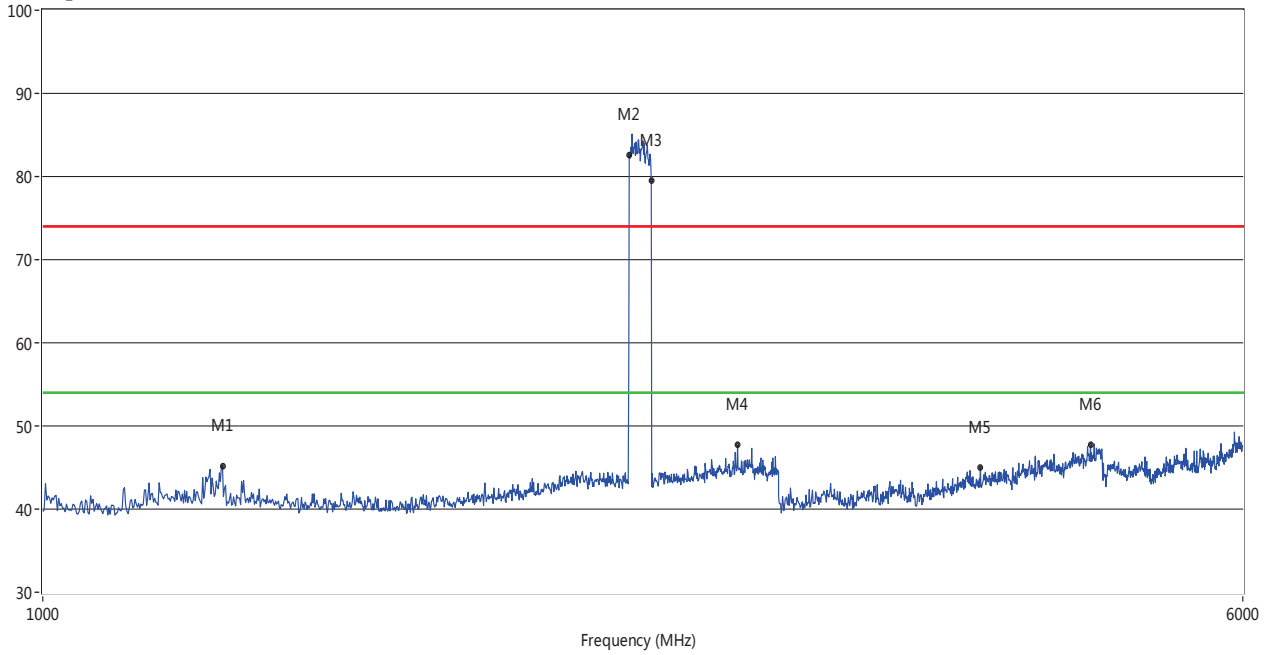
$\Pi/4$ -DQPSK MODE 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7055.74	46.71	--	--	74.0	--	54.0	7.29	330	100	Horizontal	PASS
10750.83	50.54	--	--	74.0	--	54.0	23.46	193	100	Horizontal	PASS
12053.66	51.89	--	--	74.0	--	54.0	22.11	302	100	Horizontal	PASS
14195.51	48.38	--	--	74.0	--	54.0	25.62	352	100	Horizontal	PASS
16316.97	48.27	--	--	74.0	--	54.0	25.73	247	100	Horizontal	PASS
19209.65	49.87	--	--	74.0	--	54.0	24.13	76	100	Horizontal	PASS

8-DPSK MODE 1GHz to 6GHz, ANT V

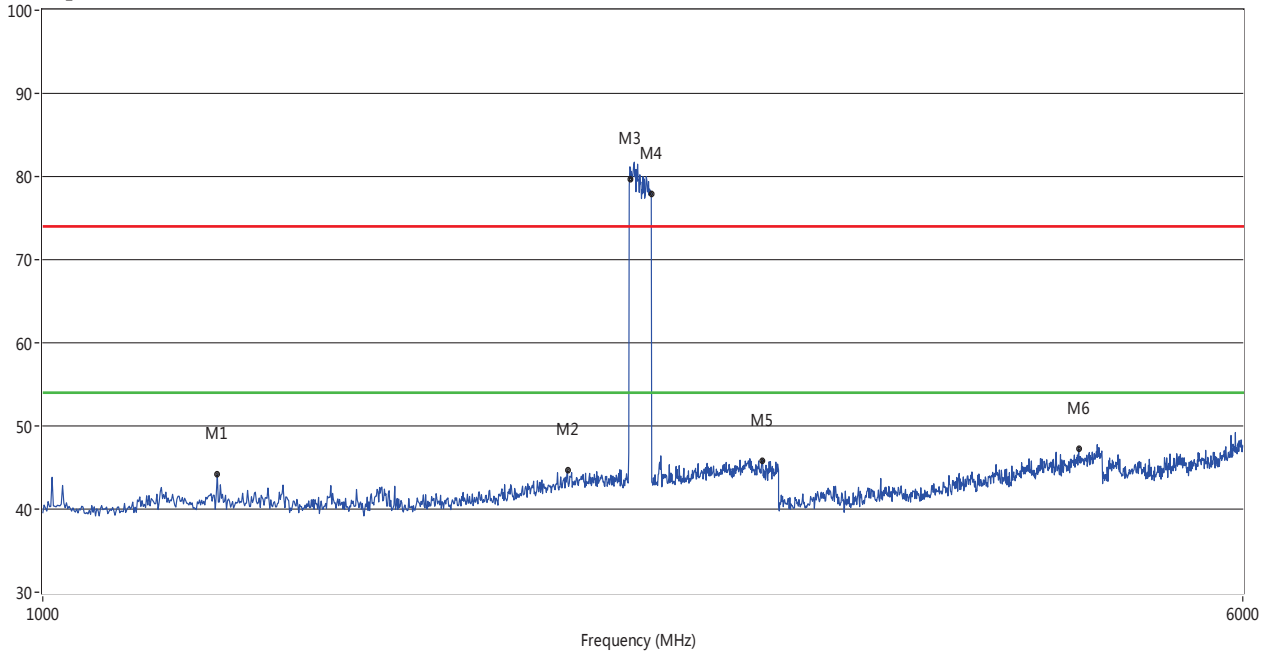
RE Test case_FCC 15C 1GHz-6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1307.69	45.19			-4.05	74.0	--	54.0	8.81	2.10	100	Vertical	PASS
2400.60	82.65			-0.67	74.0	--	54.0	-28.65	60.70	100	Vertical	N/A
2480.52	79.56			-0.66	74.0	--	54.0	-25.56	307.00	100	Vertical	N/A
2822.18	47.70			1.93	74.0	--	54.0	6.30	293.30	100	Vertical	PASS
4054.95	45.05			10.13	74.0	--	54.0	8.95	346.30	100	Vertical	PASS
4780.22	47.72			12.30	74.0	--	54.0	6.28	155.30	100	Vertical	PASS

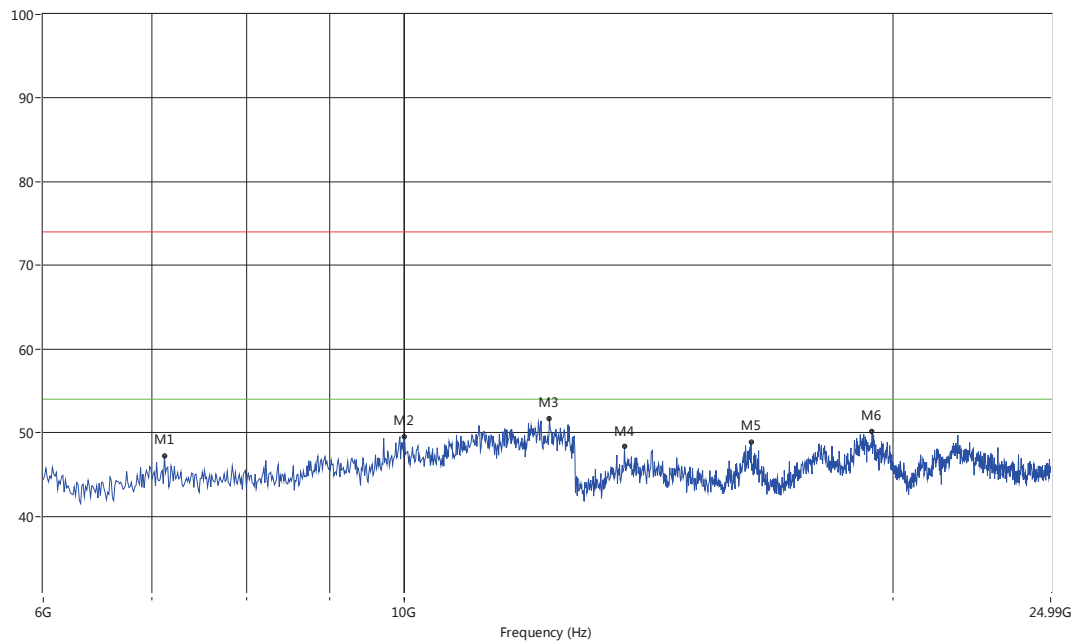
8-DPSK MODE 1GHz to 6GHz, ANT H

RE Test case_FCC 15C 1GHz-6GHz



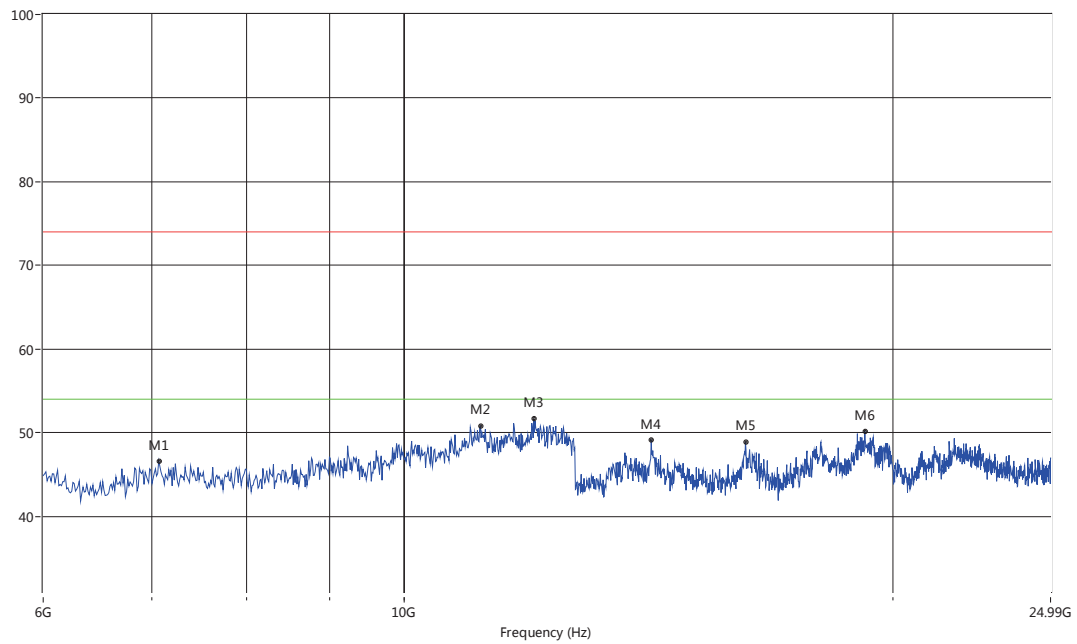
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1297.70	44.16			-4.13	74.0	--	54.0	9.84	75.20	100	Horizontal	PASS
2188.81	44.61			-0.68	74.0	--	54.0	9.39	212.00	100	Horizontal	PASS
2406.59	79.71			-0.78	74.0	--	54.0	-25.71	7.60	100	Horizontal	N/A
2480.52	77.97			-0.66	74.0	--	54.0	-23.97	1.10	100	Horizontal	N/A
2928.07	45.85			2.40	74.0	--	54.0	8.15	354.40	100	Horizontal	PASS
4696.30	47.25			11.72	74.0	--	54.0	6.75	301.80	100	Horizontal	PASS

8-DPSK MODE 6GHz to 25GHz, ANT V



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7123.13	47.21	--	--	74.0	--	54.0	26.79	102	100	Vertical	PASS
10009.57	49.55	--	--	74.0	--	54.0	24.45	9	100	Vertical	PASS
12289.52	51.69	--	--	74.0	--	54.0	22.31	248	100	Vertical	PASS
13665.14	48.31	--	--	74.0	--	54.0	25.69	87	100	Vertical	PASS
16348.17	48.82	--	--	74.0	--	54.0	25.18	347	100	Vertical	PASS
19409.32	50.12	--	--	74.0	--	54.0	23.88	219	100	Vertical	PASS

8-DPSK MODE 6GHz to 25GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7066.97	46.63	--	--	74.0	--	54.0	27.37	309	100	Horizontal	PASS
11143.93	50.72	--	--	74.0	--	54.0	23.28	39	100	Horizontal	PASS
12019.97	51.65	--	--	74.0	--	54.0	22.35	144	100	Horizontal	PASS
14195.51	49.15	--	--	74.0	--	54.0	24.85	298	100	Horizontal	PASS
16223.38	48.91	--	--	74.0	--	54.0	25.09	356	100	Horizontal	PASS
19209.65	50.18	--	--	74.0	--	54.0	23.82	272	100	Horizontal	PASS

A.8 Band Edge

Test Data

The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots are show the worst case.

Test Plots

GFSK LOW CHANNEL, PEAK



GFSK LOW CHANNEL, AVERAGE



Date: 21.AUG.2014 12:02:35

GFSK HIGH CHANNEL, PEAK



Date: 21.AUG.2014 14:20:31

GFSK HIGH CHANNEL, AVERAGE



$\pi/4$ DQPSK LOW CHANNEL, PEAK



π /4DQPSK LOW CHANNEL, AVERAGE



π /4DQPSK HIGH CHANNEL, PEAK



π /4DQPSK HIGH CHANNEL, AVERAGE



8-DPSK LOW CHANNEL, PEAK



8-DPSK LOW CHANNEL, AVERAGE



8-DPSK HIGH CHANNEL, PEAK



8-DPSK HIGH CHANNEL, AVERAGE



Hopping Mode:

GFSK LOW FREQUENCY BAND, PEAK



Date: 20.AUG.2014 11:01:46

GFSK LOW FREQUENCY BAND, AVERAGE



Date: 20.AUG.2014 11:05:16

GFSK HIGH FREQUENCY BAND, PEAK



GFSK HIGH FREQUENCY BAND, AVERAGE



π /4DQPSK LOW FREQUENCY BAND, PEAK



π /4DQPSK LOW FREQUENCY BAND, AVERAGE



π /4DQPSK HIGH FREQUENCY BAND, PEAK



Date: 20-AUG-2014 11:10:37

π /4DQPSK HIGH FREQUENCY BAND, AVERAGE



Date: 20-AUG-2014 11:18:42

8-DPSK LOW FREQUENCY BAND, PEAK



8-DPSK LOW FREQUENCY BAND, AVERAGE



8-DPSK HIGH FREQUENCY BAND, PEAK

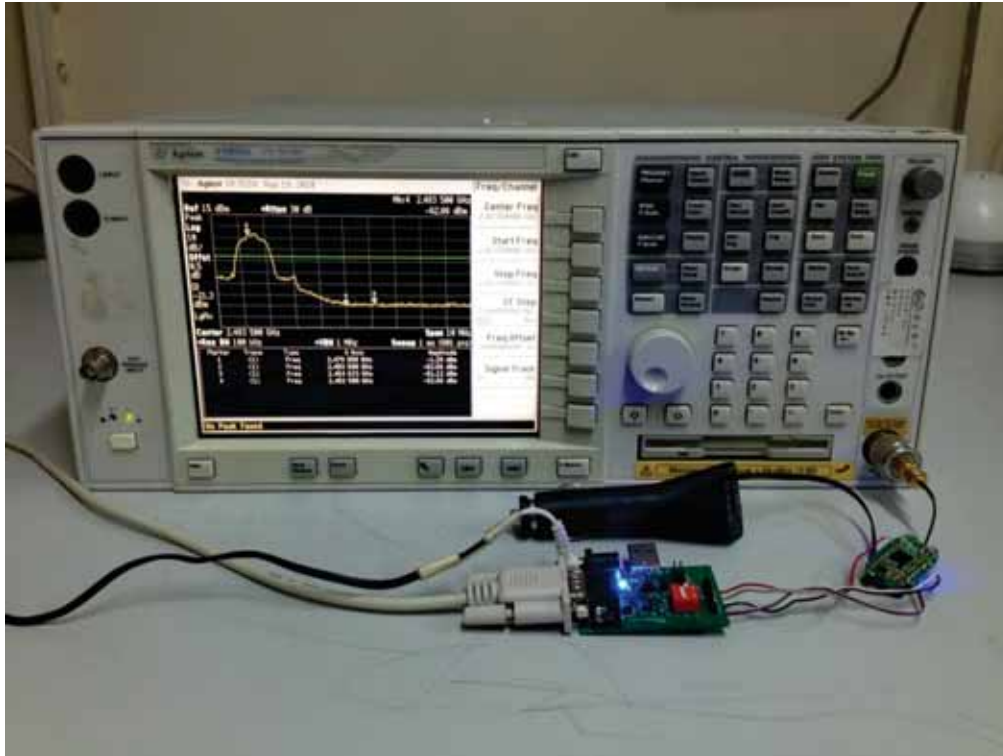


8-DPSK HIGH FREQUENCY BAND, AVERAGE

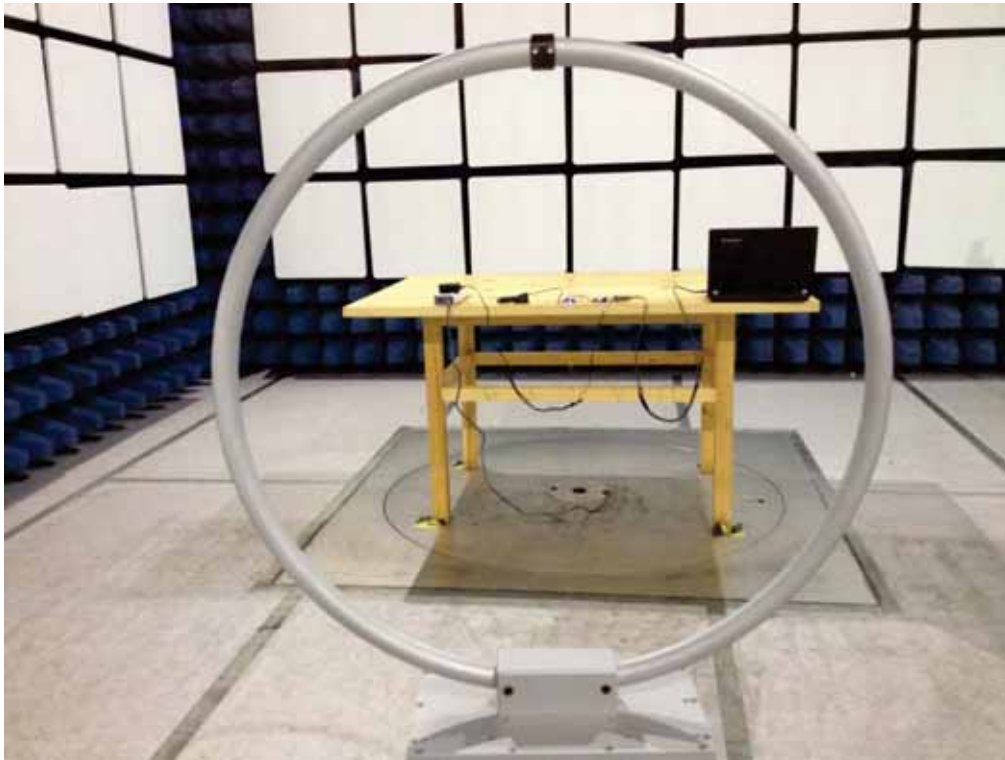


ANNEX B TEST SETUP PHOTOS

B.1 Conducted Test Photo



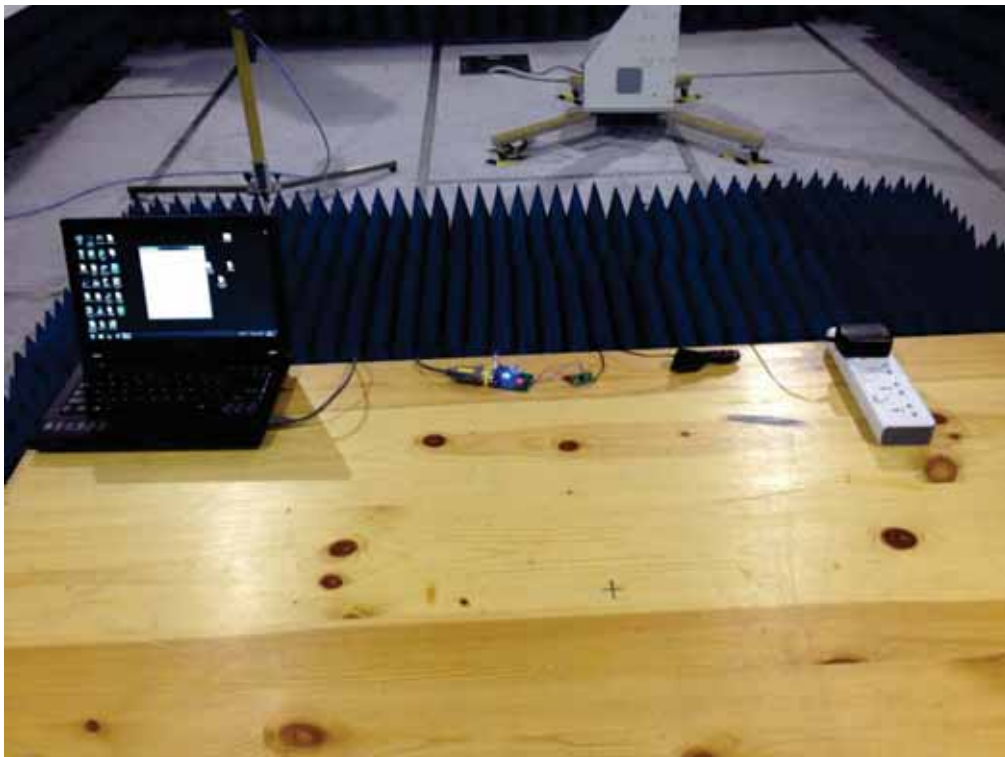
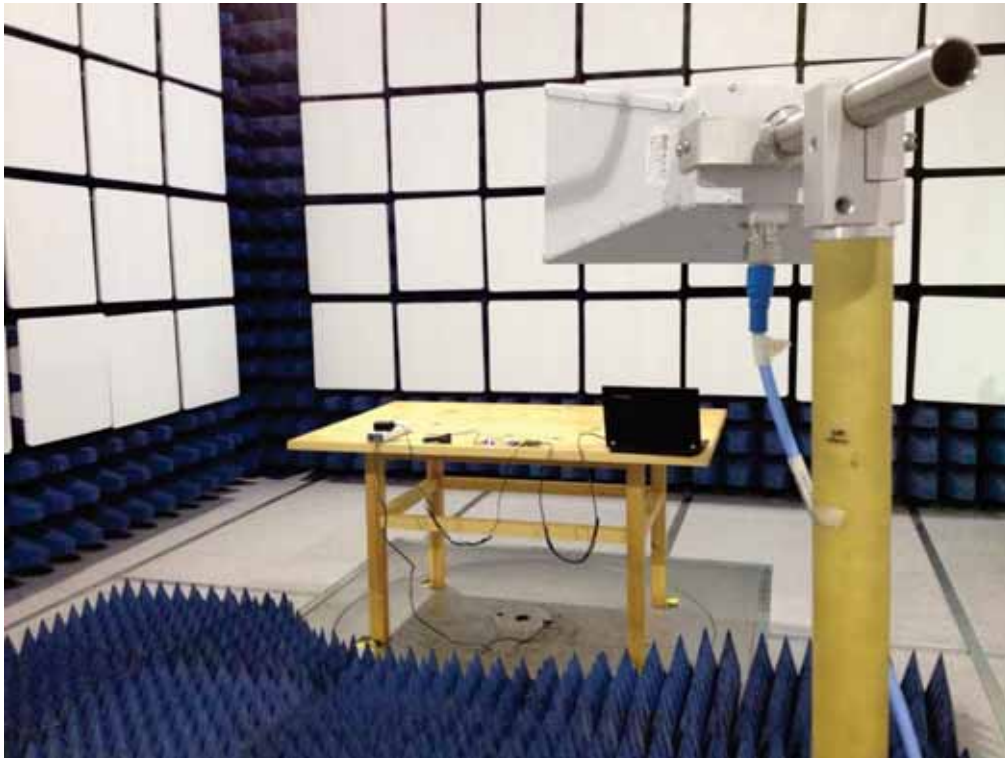
B.2 Radiated Test Photo



Below 30MHz



30MHz to 1GHz



Above 1GHz

ANNEX C EUT PHOTOS

C.1 Appearance of the EUT

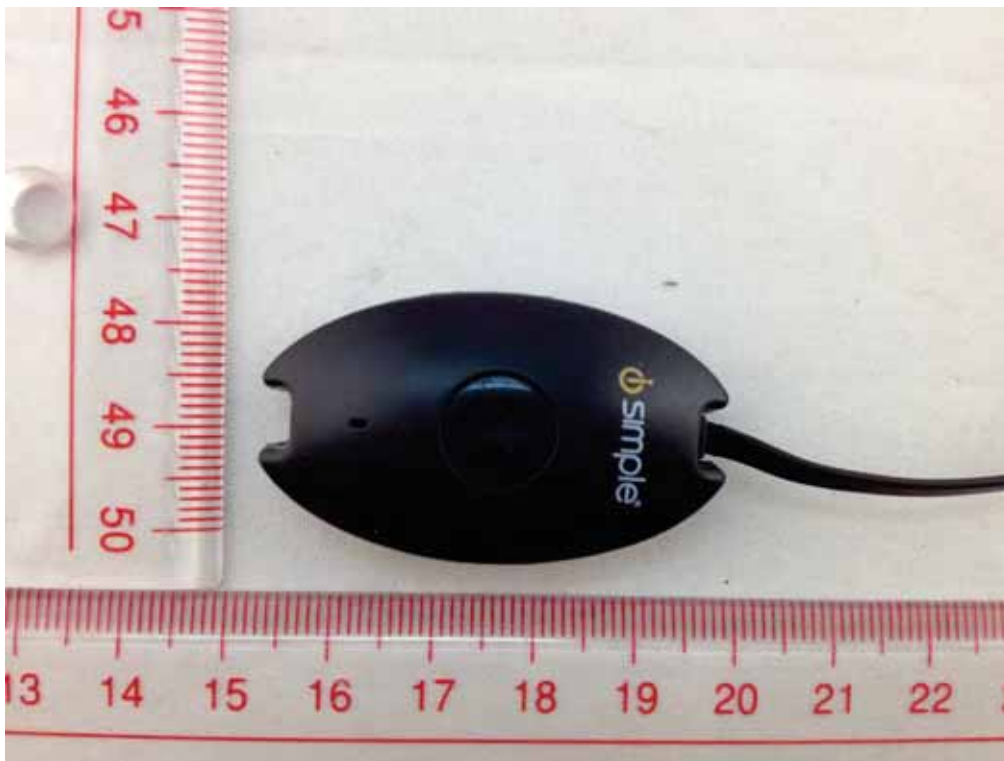


THE OVERALL FRONT OF EUT



THE OVERALL BACK OF EUT

BT PART:



THE FRONT OF BT



THE BACK OF BT



THE DOWN OF BT



THE UP OF BT



THE LEFT OF BT



THE RIGHT OF BT

FM PART



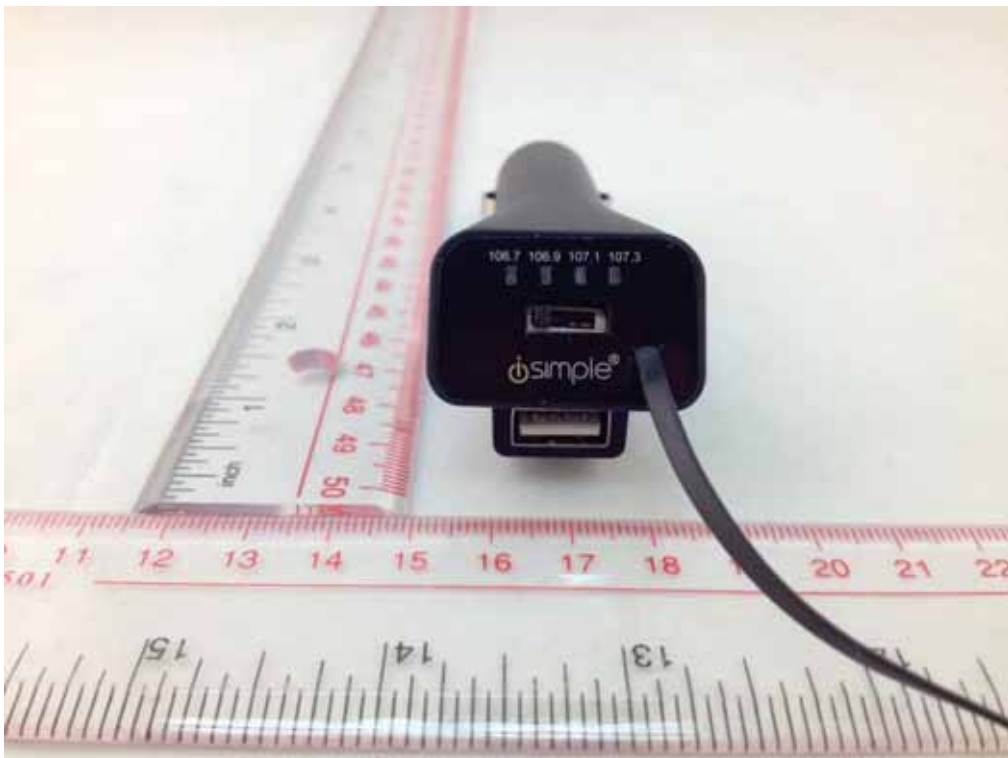
THE FRONT OF FM



THE BACK OF FM



THE DOWN OF FM



THE UP OF FM



THE LEFT OF FM



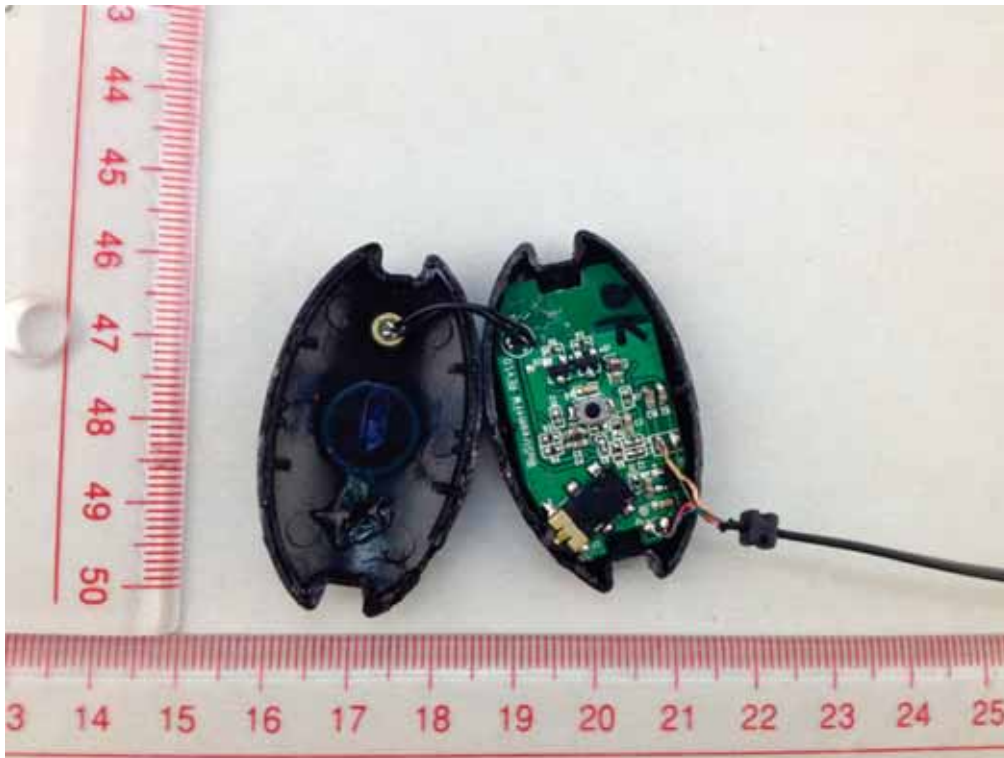
THE RIGHT OF FM



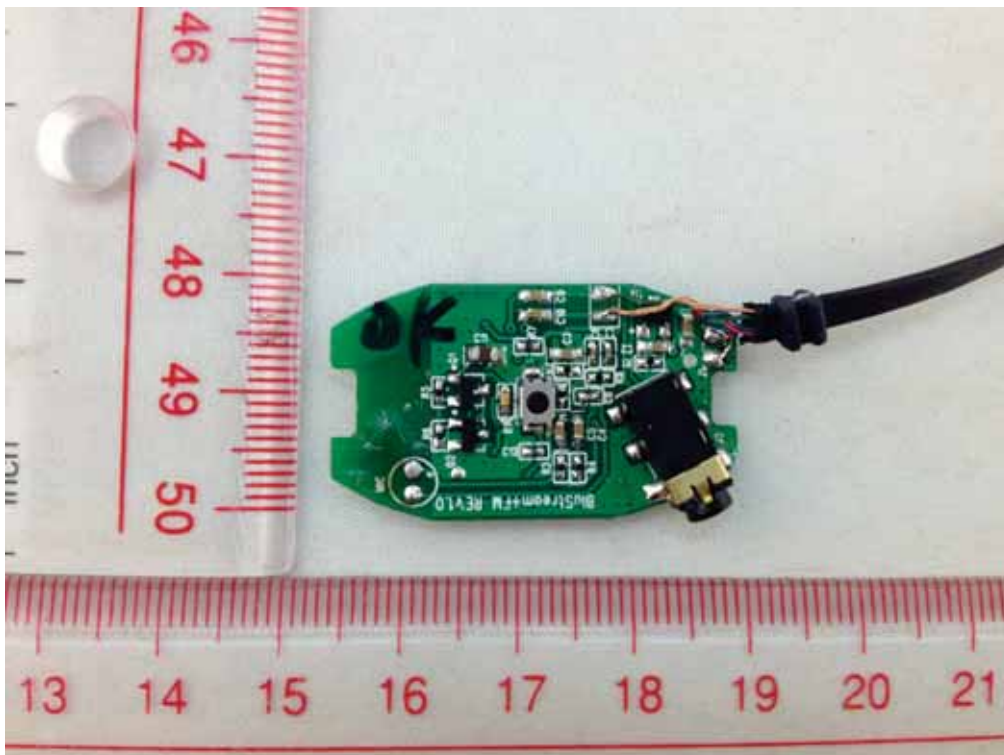
THE AUDIO LINE OF EUT

C.2 Inside of the EUT

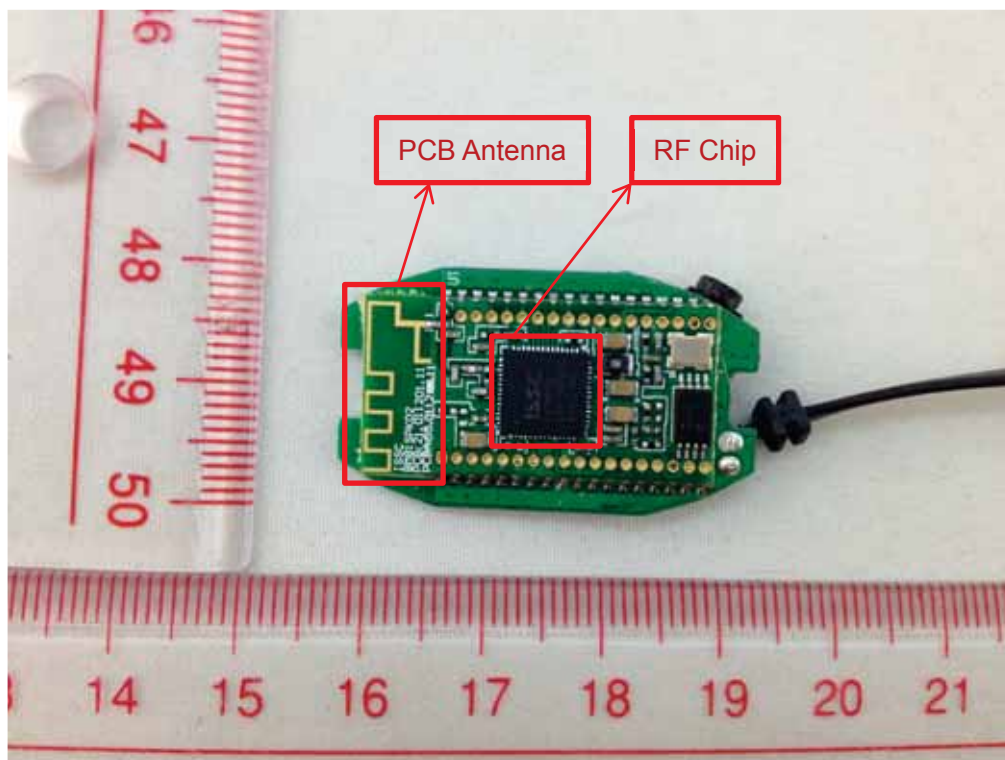
BT PART



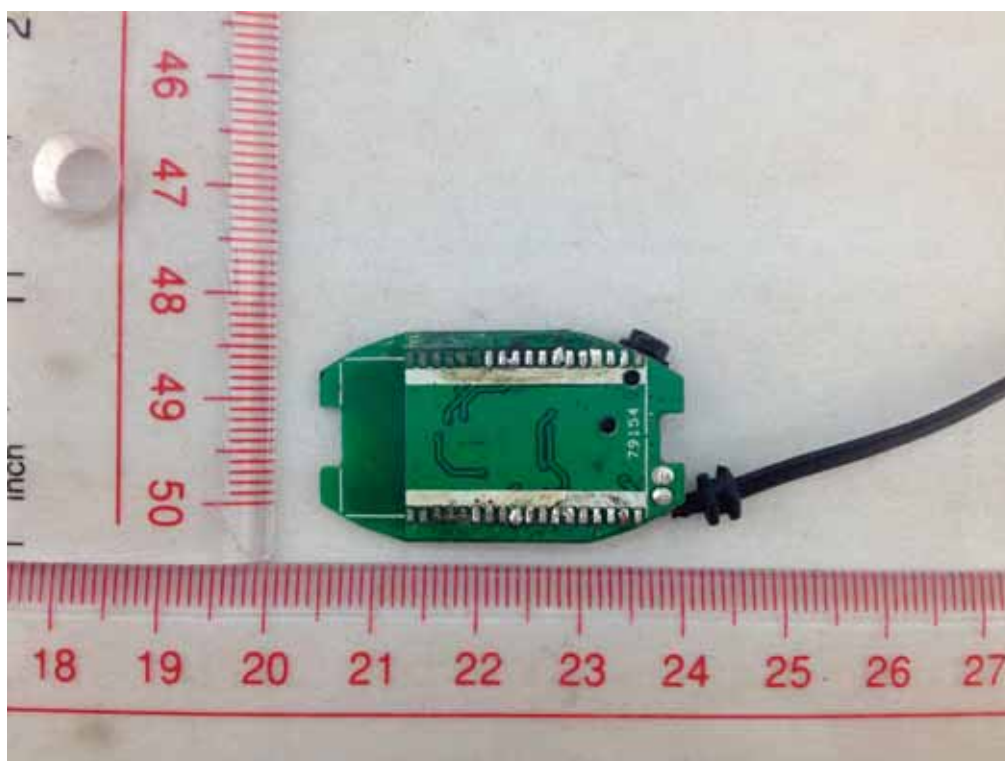
BT UNCOVER VIEW



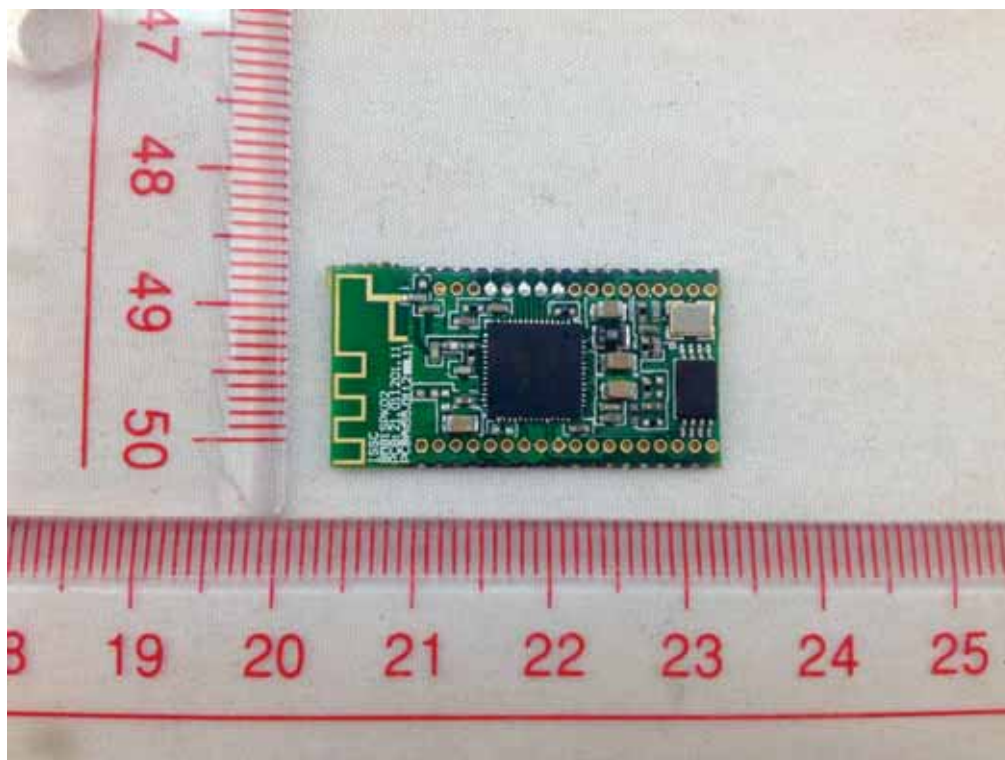
MAIN BOARD TOP VIEW



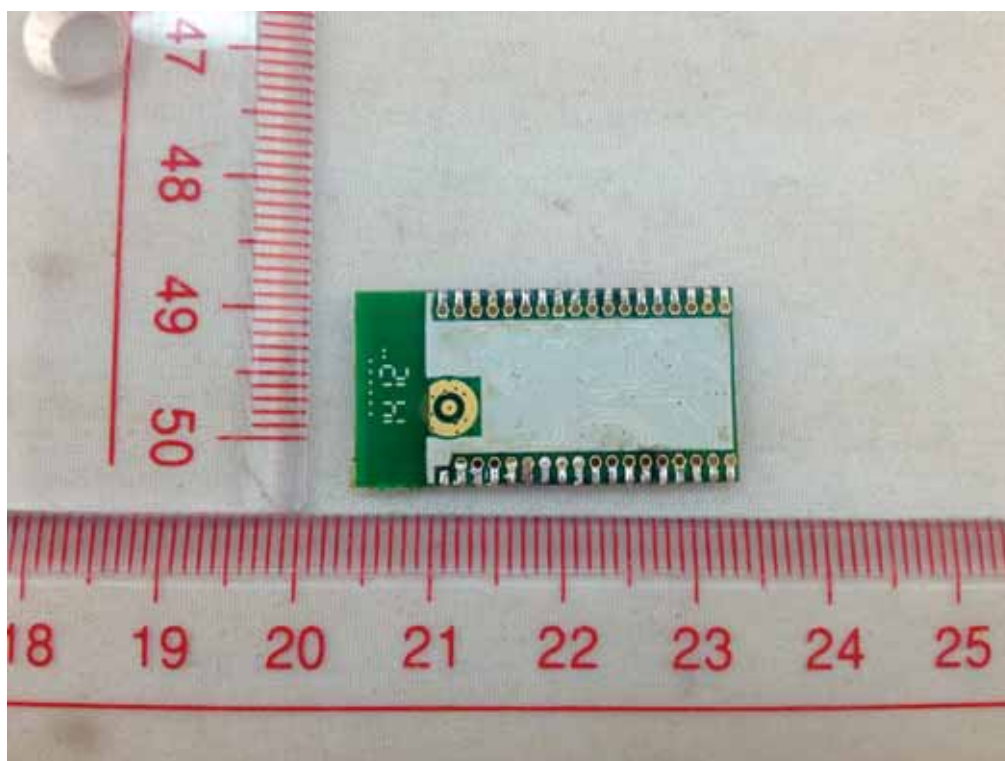
MAIN BOARD BACK VIEW 1



MAIN BOARD BACK VIEW 2



THE PHOTO OF RF MOUDLE 1

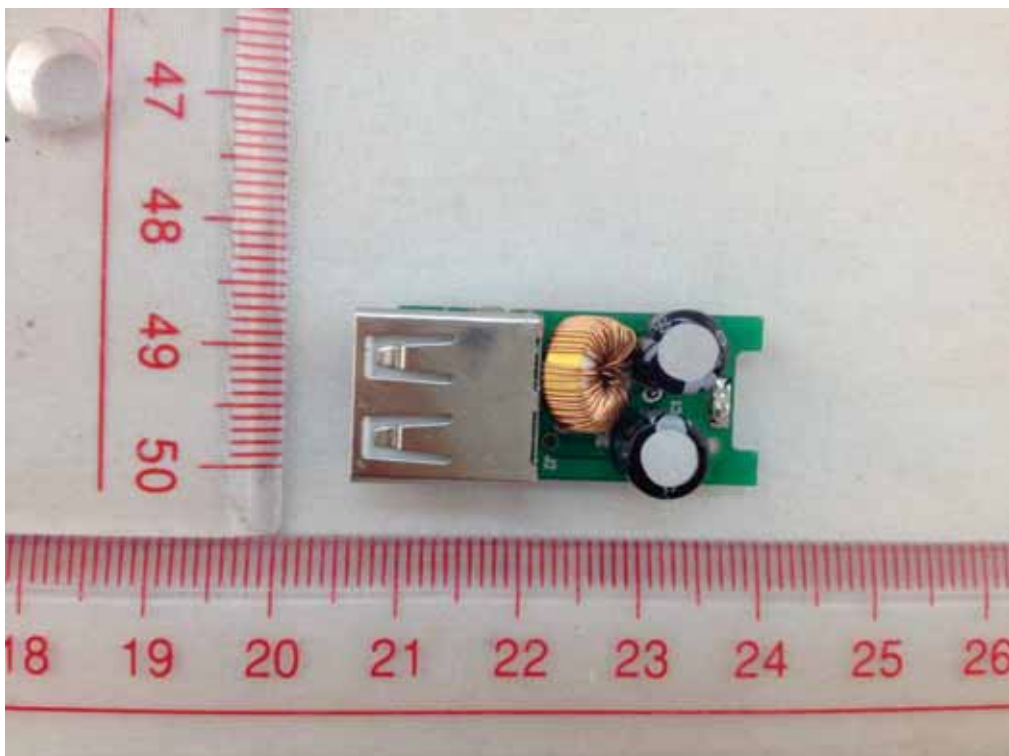


THE PHOTO OF RF MOUDLE 2

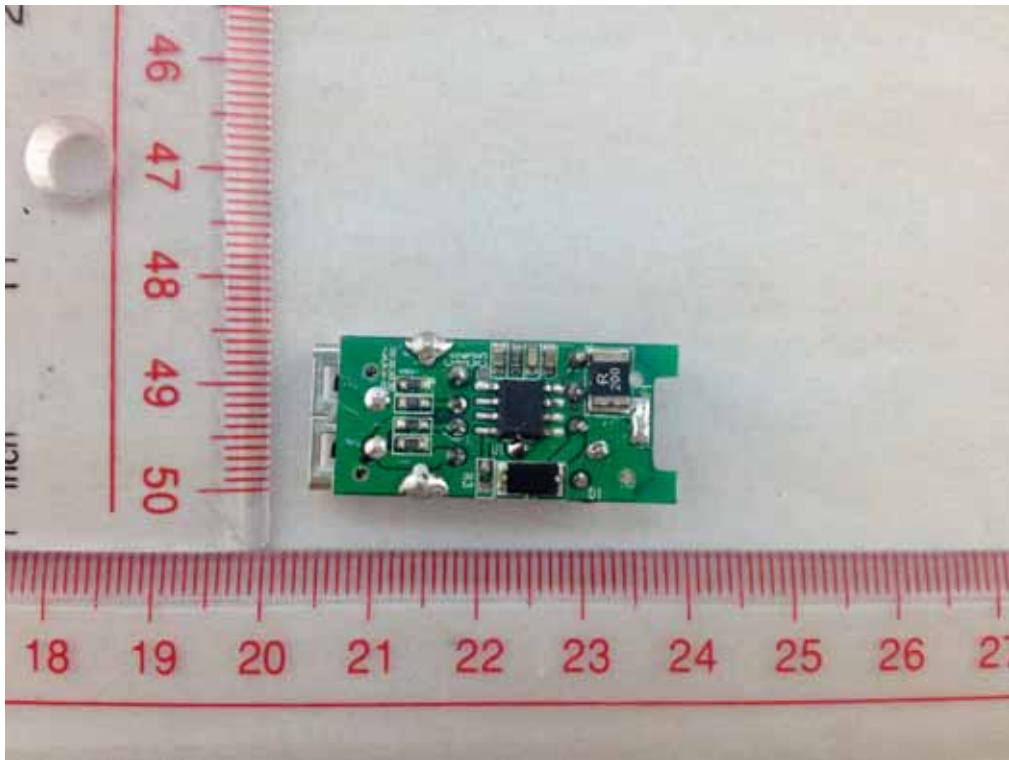
FM PART



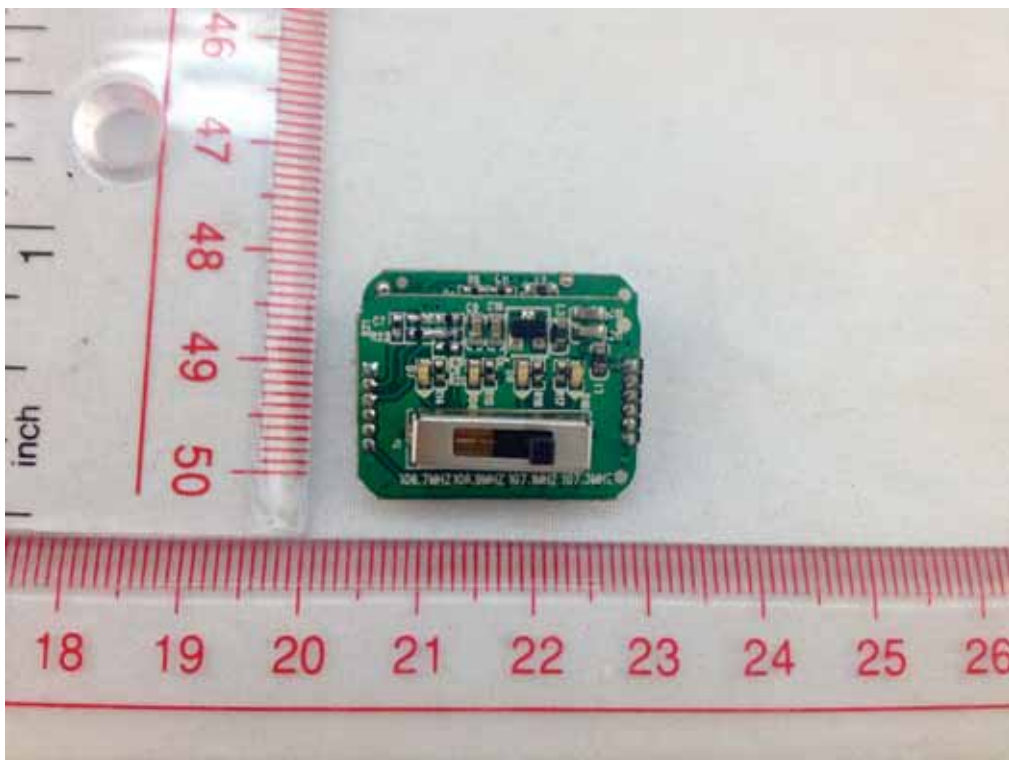
FM UNCOVER VIEW



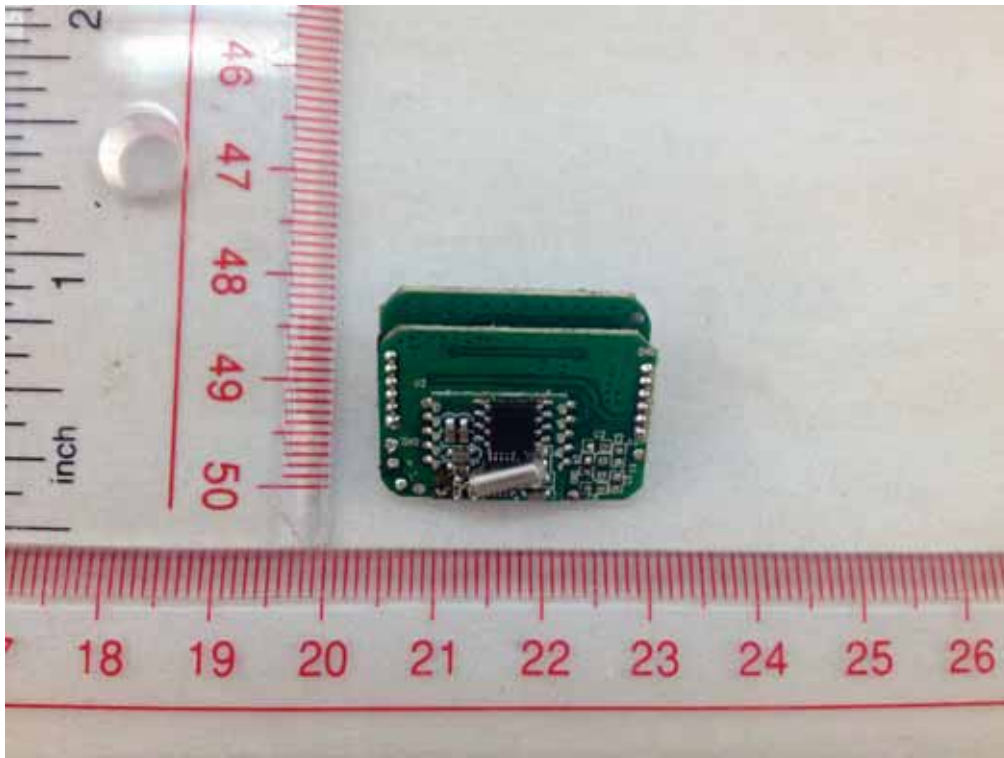
MAIN BOARD TOP VIEW 1



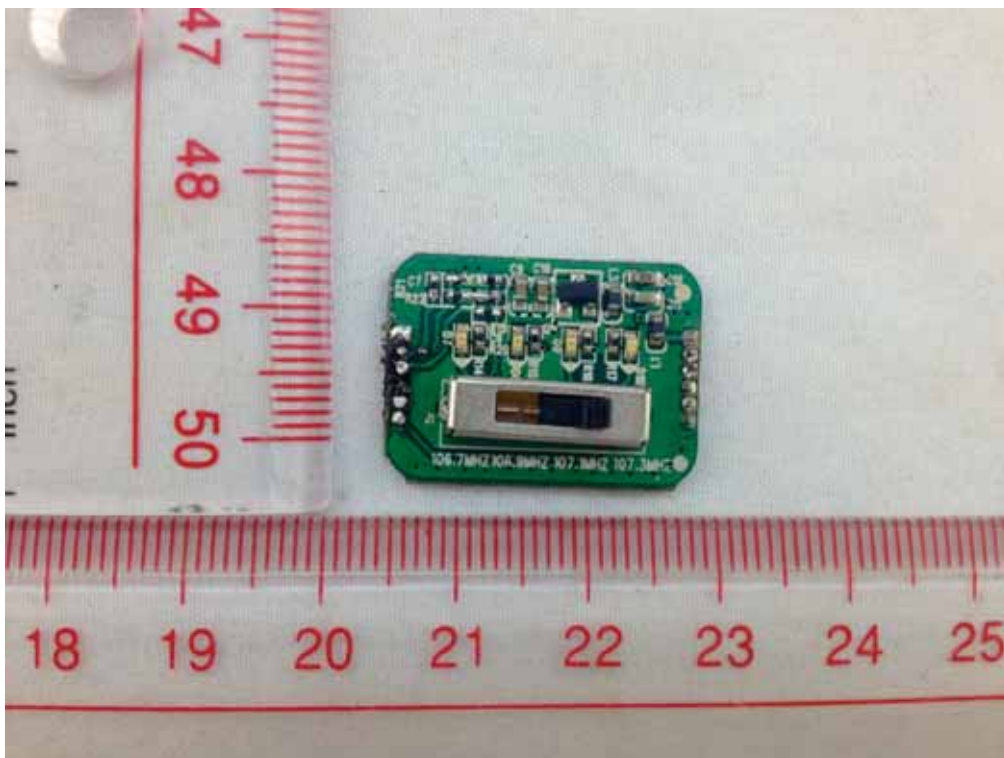
MAIN BOARD BACK VIEW 1



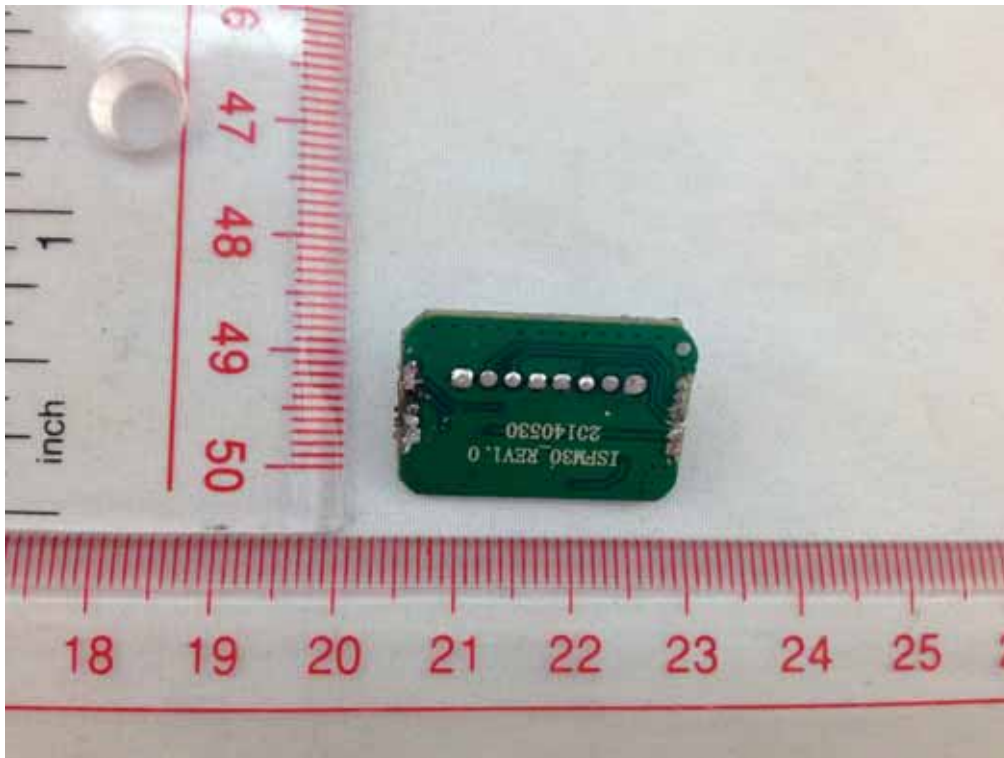
MAIN BOARD UP VIEW 2



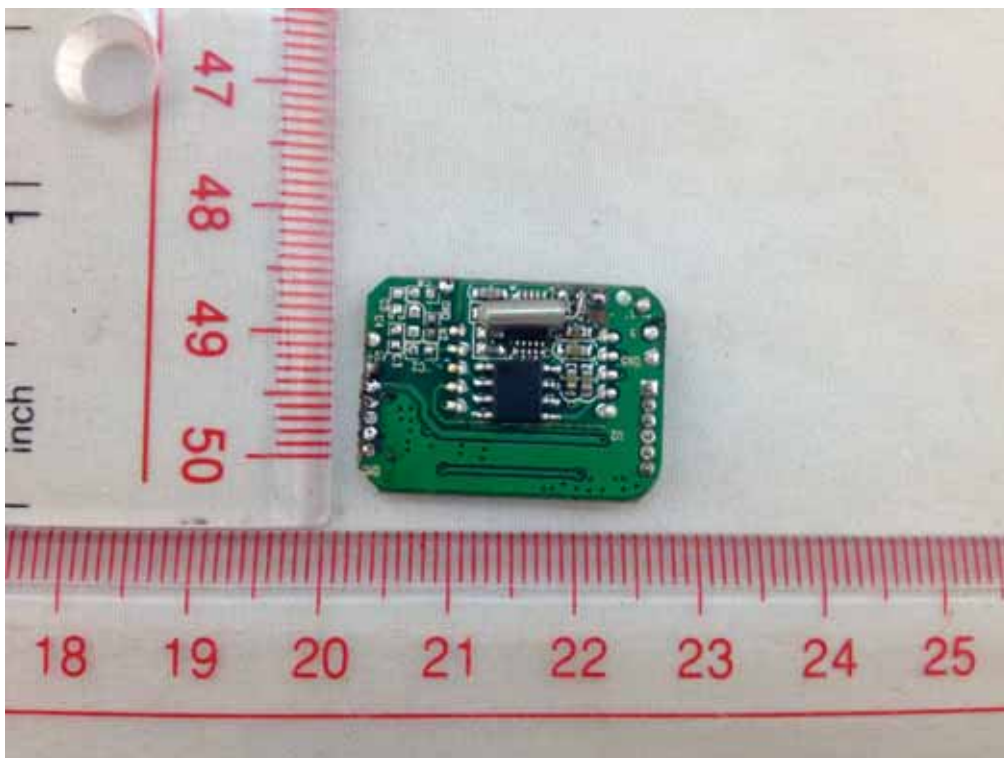
MAIN BOARD BACK VIEW 2



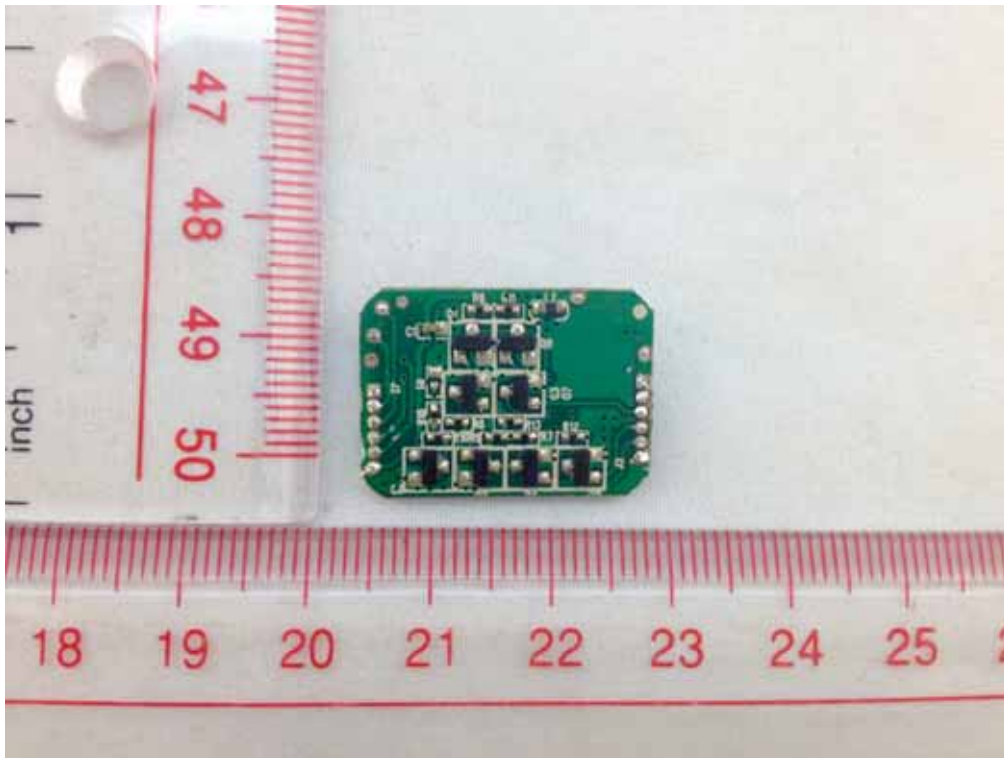
MAIN BOARD UP VIEW 3



MAIN BOARD BACK VIEW 3



MAIN BOARD UP VIEW 4



MAIN BOARD BACK VIEW 4

--END OF REPORT--