FCC Part 15C

Measurement And Test Report

For

SK Mtek microeletronics (shenzhen) limited.

12/F, Microprofit B.D. South 6 Road, High-Tech Industrial Park,

Nanshan District, Shenzhen, China

FCC ID: PDT-SK3742-7240

January 11, 2013

This Report Concerns: ☒ Original Report	**Equipment Type:** Tablet PC
Report Number:	MTI121218001RF-2
Test Engineer:	Bill Chen
Reviewed By:	Jason Zheng
Approved & Authorized By:	Hebe Lee
Test Date:	January 1- January 11,2013
Prepared By:	**Shenzhen Microtest Technology Co.,Ltd** 6F, Zhongbao Building, Gushu, Bao' an District, Shenzhen, P.R.China Tel: +86-755-8885 0135 Fax: +86-755-8885 0136

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Microtest Technology Co.,Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	SK Mtek microeletronics (shenzhen) limited.
Address of applicant:	12/F, Microprofit B.D. South 6 Road, High-Tech Industrial Park, Nanshan District, Shenzhen, China
Manufacturer:	SK Mtek microeletronics (shenzhen) limited.
Address of manufacturer:	12/F, Microprofit B.D. South 6 Road, High-Tech Industrial Park, Nanshan District, Shenzhen, China
Equipment Under Test:	Tablet PC
Trade Name:	GENESIS
Tested Model No.:	GT-7240
FCC ID:	PDT-SK3732-GT-7240
Radio Technology:	Bluetooth 2.1+EDR
Type of Modulation:	GFSK, π/4 DQPSK, 8-DPSK
Frequency Band:	2402 MHz ~ 2480MHz
Number of Channels:	79
Channel Separation:	1MHz
Max. output power:	-6~4 dBm
Type of Antenna:	Integral Antenna, Max Gain 0dBi
Power Supply:	DC 5V Form adapter with 120V/60Hz
Adapter:	Manufacturer: GENESIS
	Model: KSAS0100500200HU

Remark: * *The test data gathered are from the production sample provided by the manufacturer.*

1.2 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15:2010, Subpart C, and section 15.203, 15.207, and 15.247 rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2003, American National 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. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

All measurement required was performed at laboratory of NTEK Testing Technology Co., Ltd., at 1/F, Building E, Fenda Science Park Sanwei Community, Xixiang Street, Baoan District， Shenzhen,Guangdong

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 238937

NTEK Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 238937.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

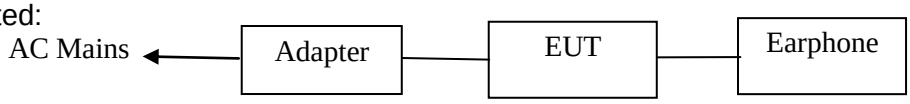
Radiated Emissions The EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 List of Measuring Equipments Used

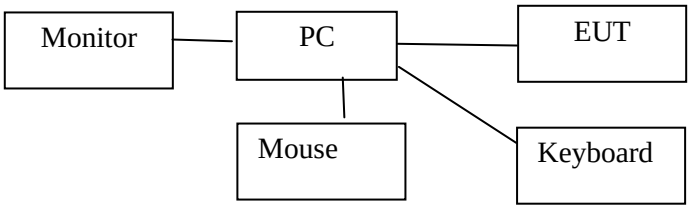
Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
1	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100079	2012/11/18	1 year
2	Horn Antenna	TESEQ	BHA 9118	9118698	2012/11/18	1 year
3	Loop Antenna	COM Power	AL-130	UBTL0031	2012/11/18	1 year
4	3m Semi- Anechoic Chamber	ETS	N/A	N/A	2012/11/18	1 year
5	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	2012/11/18	1 year
6	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100009	2012/11/18	1 year
7	Receiver/ Spectrum Analyzer	ROHDE & SCHWARZ	ESCI	100106	2012/11/18	1 year
8	Spectrum Analyzer	Agilent	E7405A	US41160415	2012/11/18	1 year
9	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2012/11/18	1 year
10	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2012/11/18	1 year
11	LISN	COM Power	LI-200	12212	2012/11/18	1 year
12	LISN	COM Power	LI-200	12019	2012/11/18	1 year
13	3m/5m Semi-Anechoic Chamber	ETS	N/A	N/A	2012/11/18	1 year
14	Ultra-Broadband Antenna	R/S	HL562	100015	2012/11/18	1 year
15	Horn Antenna	OCEAN MICROWAVE	OBH20265	OC134039	2012/11/18	1 year
16	RF Test Panel	R/S	TS / RSP	335015/ 0017	N/A	N/A
17	Turntable	ETS	2088	2149	N/A	N/A
18	Antenna Mast	ETS	2075	2346	N/A	N/A

2.5 Test conduction

For Conducted:



For Radiated: Below 1G



For Radiated: Above 1G

2.6 Test Peripheral Information

Items	Equipment	Manufacturer	Model No.
1	Earphone	GENESIS	N/A
2	PC	DELL	M18X
3	Monitor	DELL	U2312HM
4	Mouse	DELL	WM311
5	Keyboard	DELL	SK-8120

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.203/15.247(b)/(c)	Antenna Requirement	Pass
15.207	Conduction Emission	Pass
15.247(a)(1)(iii)	Quantity of Hopping Channel	Pass
15.247(a)(1)	Channel Separation	Pass
15.247(a)(1)(iii)	Time of Occupancy (Dwell time)	Pass
15.247(a)	20dB Bandwidth	Pass
15.247(b)(1)	Power Output	Pass
15.209(a)(f)	Radiated Emission	Pass
15.247(c)	Band edge	Pass

Note: The EUT has been tested as an independent unit. And Continual, Transmitting in maximum power (The adapter be used during Test for the conducted test, The PC be use during Test for the below 1G radiated emission test, the battery be used during test for the other test)
For π/4 QPSK its same modulation type with 8-DPSK, and based exploratory test, there is no significant difference of that two types test result, so except output power, all other items final test were only performed with 8-DPSK and GFSK.

4. ANTENNA REQUIREMENT

4.1 Standard Applicable

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. 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.

Section 15.247(b)/(c):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

4.2 Antenna Connected Construction

This product has a integral antenna, The maximum Gain of the antenna is 0dBi.
fulfill the requirement of this section.

5. CONDUCTED DISTURBANCES

5.1. Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is +2.4 dB.

5.2. Limit of Conducted Disturbances (Class B)

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

5.3. EUT Setup

The setup of EUT is according with CISPR 16-1: 2002, CISPR16-2: 2002 measurement procedure.

The EUT was placed center and the back edge of the test table.

The cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

5.4. Instrument Setup

The test receiver was set with the following configurations:
Test Receiver Setting:
Frequency Range……150 KHz to 30 MHz
Detector……..Peak & Quasi-Peak & Average
Sweep Speed……Auto
IF Band Width……..9 KHz

5.5. Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.
Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.
All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dBμV of specification limits). Quasi-peak readings are distinguished with a **"QP"**. Average readings are distinguished with a **"AV".**

5.6. Summary of Test Results

According to the data in section 3.6, the worst margin reading of:

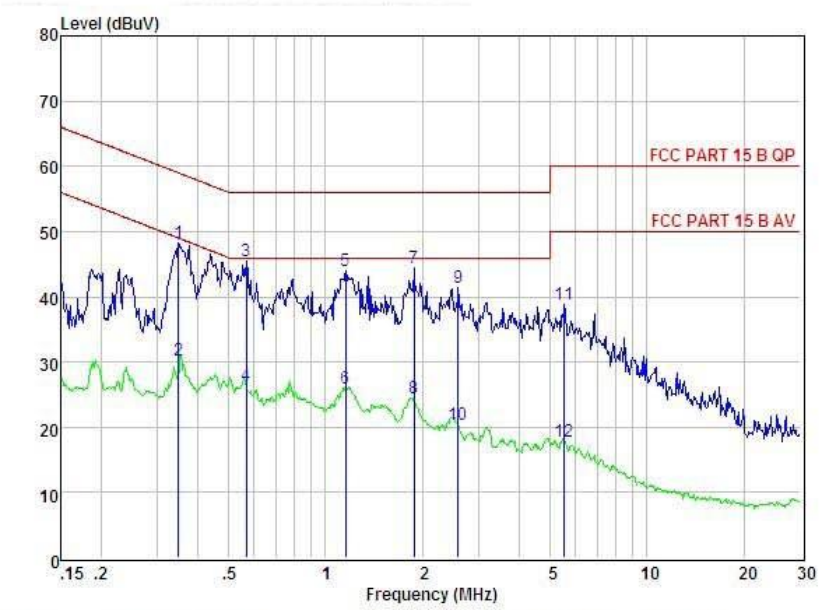
EUT Configuration on Test

Tablet PC
Model Number : GT-7240
Serial Number : N/A
Applicant : SK Mtek microeletronics (shenzhen) limited.

5.7. Test Result

Pass.
Detailed information please refers to the following page.

Plot of Conducted Emissions Test Data
Conducted Disturbance
EUT: Tablet PC
M/N: GT-7240
Operating Condition: Charge
Test Specification: L
Comment: AC 120V/60Hz connect to Adapter

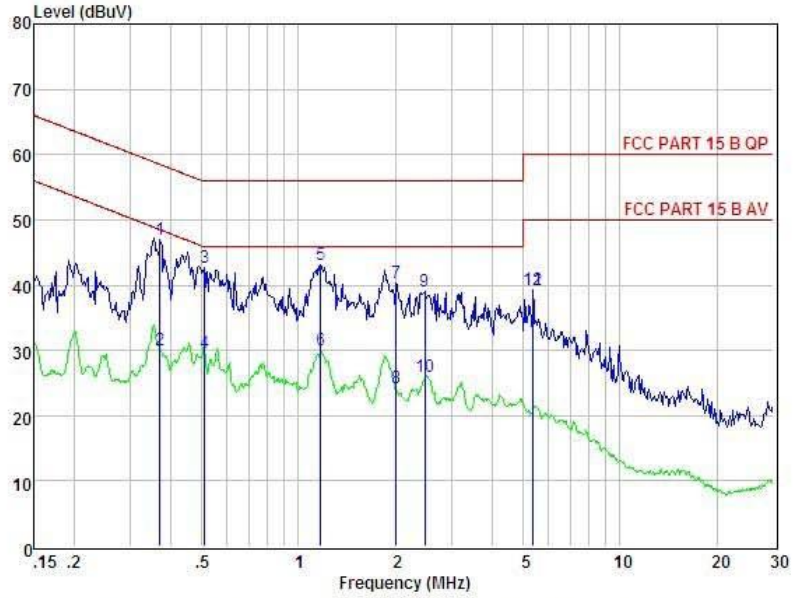


Condition : FCC PART 15 B QP POL: LINE Temp:24 ℃ Hum:56 %

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.35	38.47	0.03	-9.72	0.10	48.32	59.00	-10.68	QP
2	0.35	20.47	0.03	-9.72	0.10	30.32	49.00	-18.68	Average
3	0.57	35.55	0.03	-9.72	0.10	45.40	56.00	-10.60	QP
4	0.57	16.55	0.03	-9.72	0.10	26.40	46.00	-19.60	Average
5	1.15	34.16	0.04	-9.71	0.10	44.01	56.00	-11.99	QP
6	1.15	16.16	0.04	-9.71	0.10	26.01	46.00	-19.99	Average
7	1.89	34.59	0.05	-9.70	0.10	44.44	56.00	-11.56	QP
8	1.89	14.59	0.05	-9.70	0.10	24.44	46.00	-21.56	Average
9	2.58	31.58	0.06	-9.70	0.11	41.45	56.00	-14.55	QP
10	2.58	10.58	0.06	-9.70	0.11	20.45	46.00	-25.55	Average
11	5.53	29.00	0.10	-9.64	0.13	38.87	60.00	-21.13	QP
12	5.53	8.00	0.10	-9.64	0.13	17.87	50.00	-32.13	Average

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

Plot of Conducted Emissions Test Data
Conducted Disturbance
EUT: Tablet PC
M/N: GT-7240
Operating Condition: Charge
Test Specification: N
Comment: AC 120V/60Hz connect to Adapter



Condition : FCC PART 15 B QP POL: NEUTRAL Temp:24 ℃ Hum:56 %

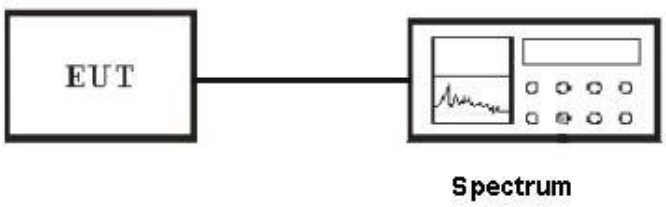
Item	Freq	Read	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.37	37.08	0.03	-9.72	0.10	46.93	58.47	-11.54	QP
2	0.37	20.08	0.03	-9.72	0.10	29.93	48.47	-18.54	Average
3	0.51	32.77	0.03	-9.72	0.10	42.62	56.00	-13.38	QP
4	0.51	19.77	0.03	-9.72	0.10	29.62	46.00	-16.38	Average
5	1.17	33.24	0.04	-9.71	0.10	43.09	56.00	-12.91	QP
6	1.17	20.24	0.04	-9.71	0.10	30.09	46.00	-15.91	Average
7	2.01	30.43	0.06	-9.70	0.10	40.29	56.00	-15.71	QP
8	2.01	14.43	0.06	-9.70	0.10	24.29	46.00	-21.71	Average
9	2.47	29.10	0.06	-9.70	0.11	38.97	56.00	-17.03	QP
10	2.47	16.10	0.06	-9.70	0.11	25.97	46.00	-20.03	Average
11	5.36	29.45	0.10	-9.66	0.13	39.34	60.00	-20.66	QP
12	5.36	29.45	0.10	-9.66	0.13	39.34	50.00	-10.66	Average

6. NUMBER OF HOPPING CHANNELS AND CHANNEL SPACING

6.1 Standard Applicable

According to FCC 15.247(a)(1), 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, and frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

6.2 EUT Setup



6.3 Test Equipment List and Details

See section 2.4.

6.4 Test Procedure

Set the Lowest channel to the Highest Channel, observed the band of 2400MHz to 2438.5MHz, than count it out the number of channels for comparing with the FCC rules. Adjust channel spacing can be read by adjusting the Analyzer SPAN.

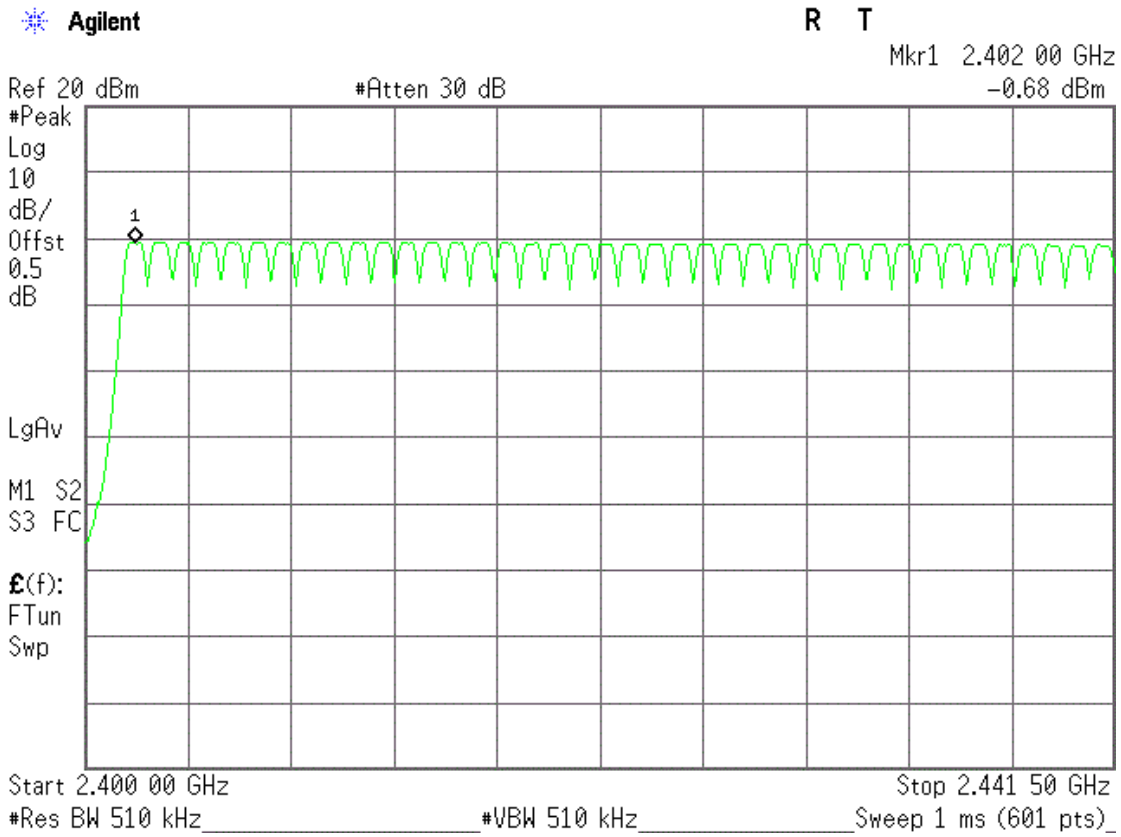
6.5 Test Result

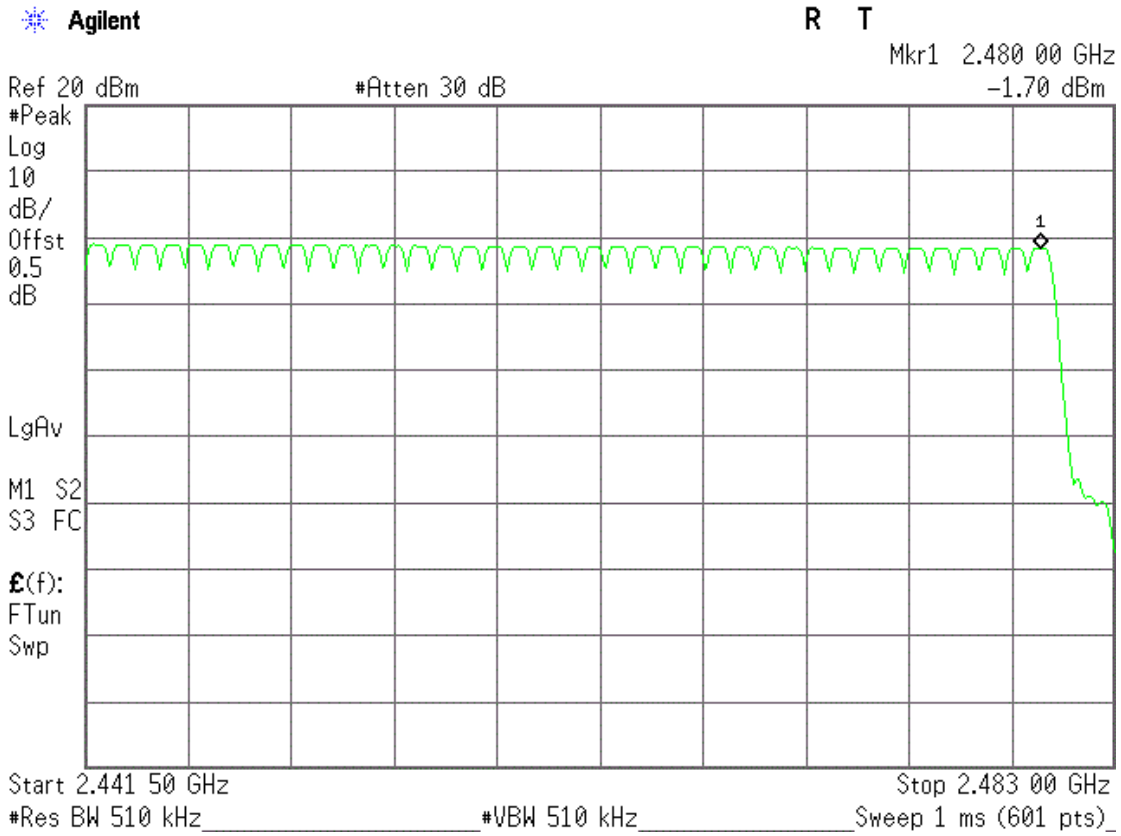
PASS

Mode	Channel separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz) 2/3 20dB bandwidth	Conclusion
GFSK	1.0	0.855	0.57	PASS
8-DPSK	1.0	1.290	0.86	PASS

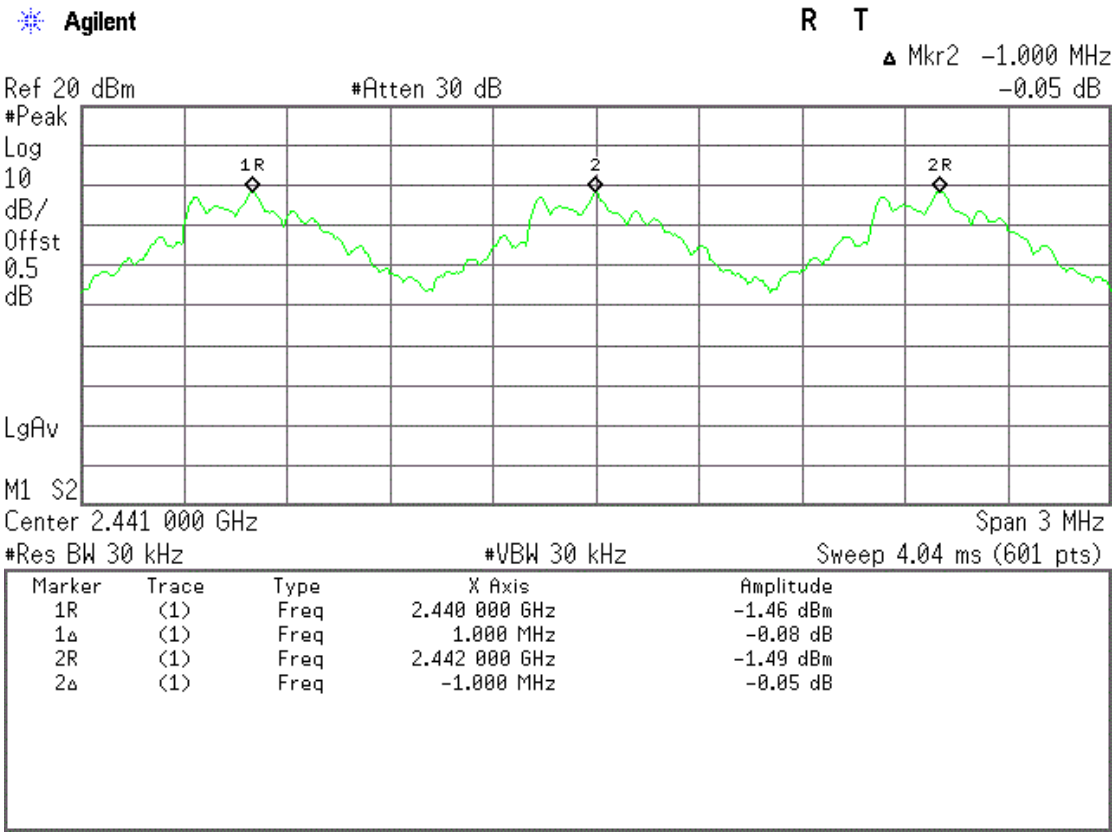
Detailed information, Please refer to the following pages.

For GFSK:
No. of Channel=79



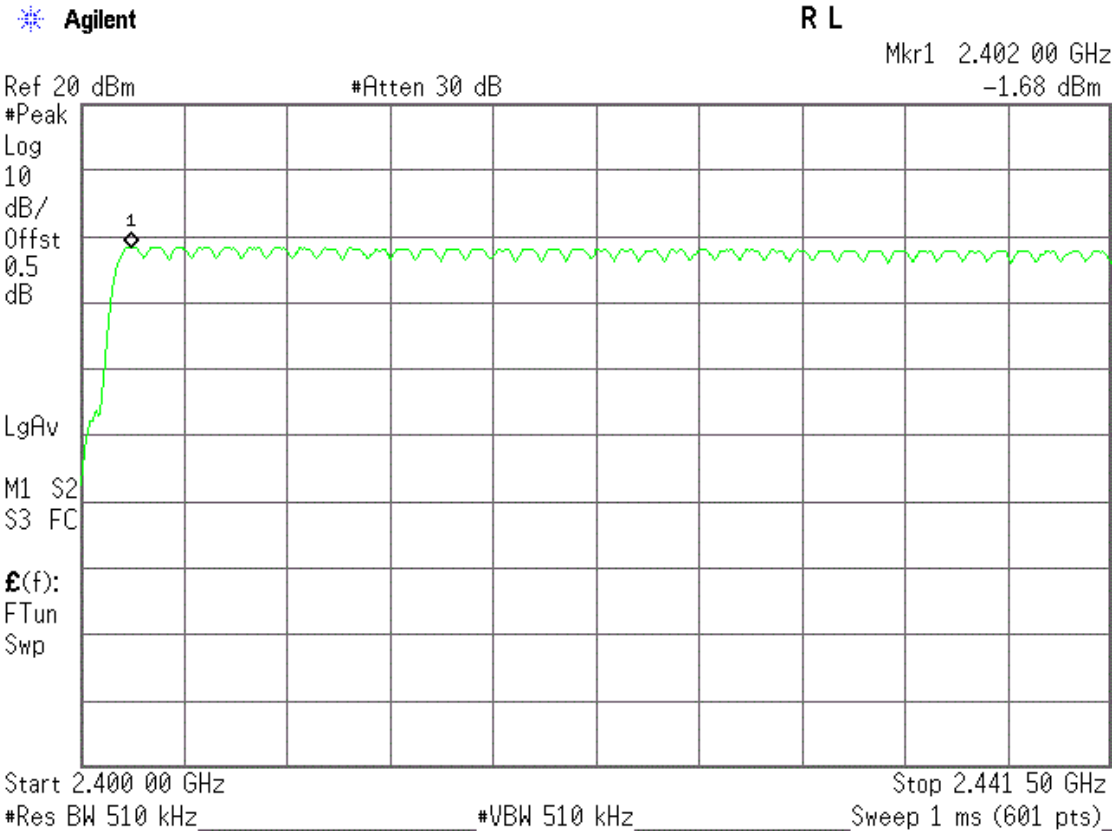


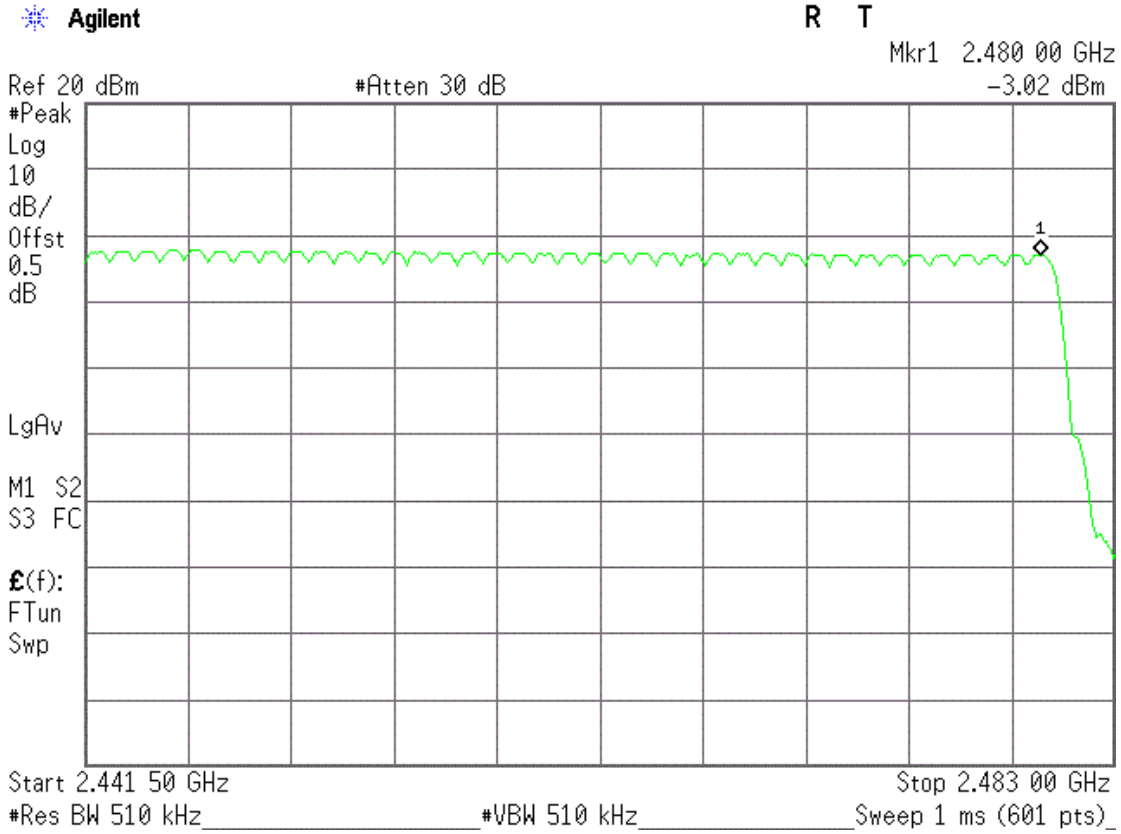
Channel Spacing (1MHz)



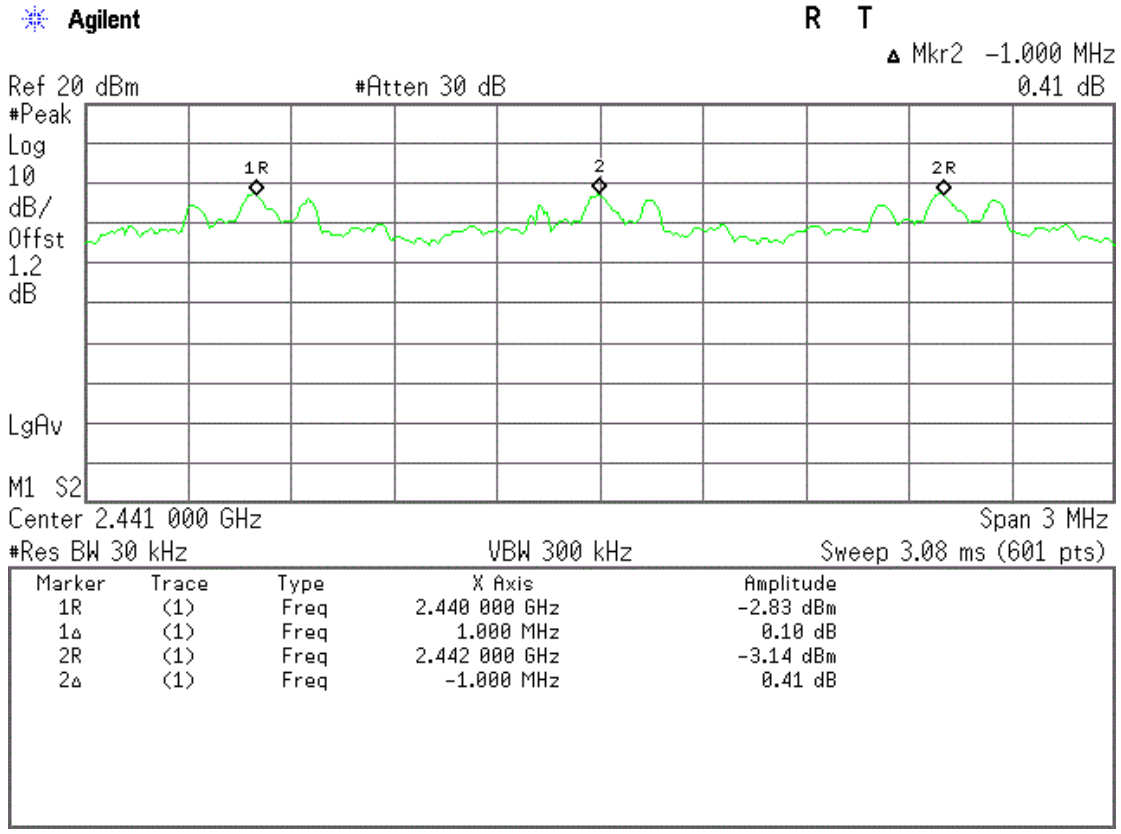
For 8-DPSK:

No. of Channel=79





Channel Spacing (1MHz)



Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	2.440 000 GHz	-2.83 dBm
1Δ	(1)	Freq	1.000 MHz	0.10 dB
2R	(1)	Freq	2.442 000 GHz	-3.14 dBm
2Δ	(1)	Freq	-1.000 MHz	0.41 dB

7. DWELL TIME OF A HOPPING CHANNEL

7.1 Limits of Dwell Time Measurement

According to 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.

7.2 EUT Setup

7.3 Test Equipment List and Details

See section 2.4.

7.4 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW, VBW=1000 kHz, Span = 0Hz.
4. Repeat above procedures until all frequency measured was complete.

7.5 Test Result /Plots

PASS

Detailed information please see the following page.

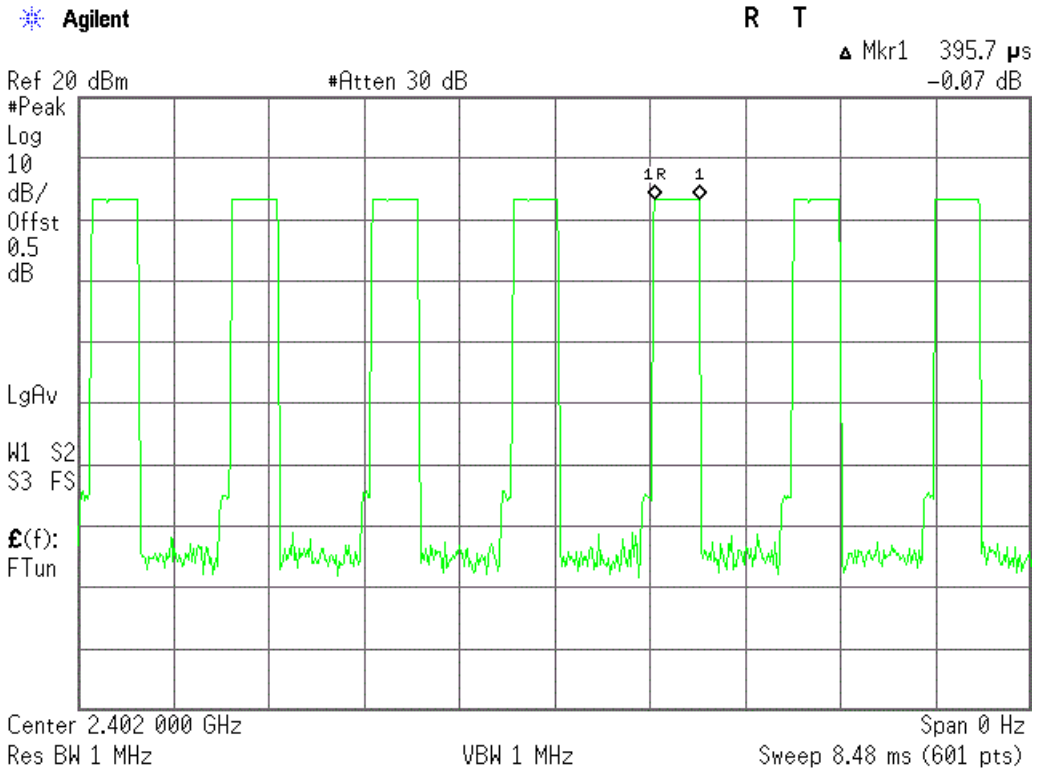
A period time = 0.4 (s) * 79 = 31.6(s)

CH Low:
DH1 time slot = 0.3957(ms) * (1600/(1*79)) * 31.6 = 253.2 (ms)
DH3 time slot = 1.63 (ms) * (1600/(3*79)) * 31.6 = 347.7 (ms)
DH5 time slot = 2.898 (ms) * (1600/(5*79)) * 31.6 = 370.9 (ms)
3-DH1 time slot = 0.4041 (ms) * (1600/(1*79)) * 31.6 = 258.6(ms)
3-DH3 time slot = 1.658 (ms) * (1600/(3*79)) * 31.6 = 353.7(ms)
3-DH5 time slot = 2.898 (ms) * (1600/(5*79)) * 31.6 = 370.9 (ms)

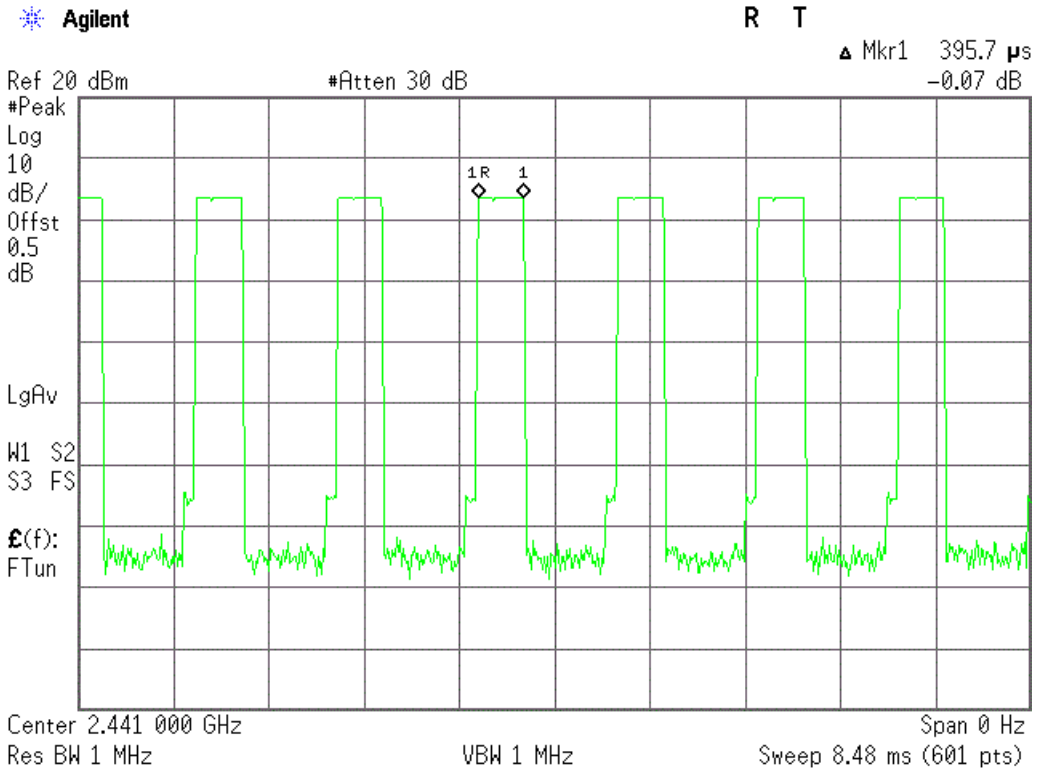
CH Mid:
DH1 time slot = 0.3957(ms) * (1600/(1*79)) * 31.6 = 253.2 (ms)
DH3 time slot = 1.658 (ms) * (1600/(3*79)) * 31.6 = 353.7 (ms)
DH5 time slot = 2.898 (ms) * (1600/(5*79)) * 31.6 = 370.9 (ms)
3-DH1 time slot = 0.4041 (ms) * (1600/(1*79)) * 31.6 = 258.6 (ms)
3-DH3 time slot = 1.658 (ms) * (1600/(3*79)) * 31.6 = 353.7 (ms)
3-DH5 time slot = 2.898(ms) * (1600/(5*79)) * 31.6 = 370.9 (ms)

CH High:
DH1 time slot =0.3901 (ms) * (1600/(1*79)) * 31.6 = 249.6 (ms)
DH3 time slot = 1.644 (ms) * (1600/(3*79)) * 31.6 = 350.7 (ms)
DH5 time slot = 2.898 (ms) * (1600/(5*79)) * 31.6 = 370.9 (ms)
3-DH1 time slot =0.4041 (ms) * (1600/(1*79)) * 31.6 = 258.6 (ms)
3-DH3 time slot = 1.658 (ms) * (1600/(3*79)) * 31.6 = 353.7 (ms)
3-DH5 time slot = 2.912(ms) * (1600/(5*79)) * 31.6 = 372.7 (ms)

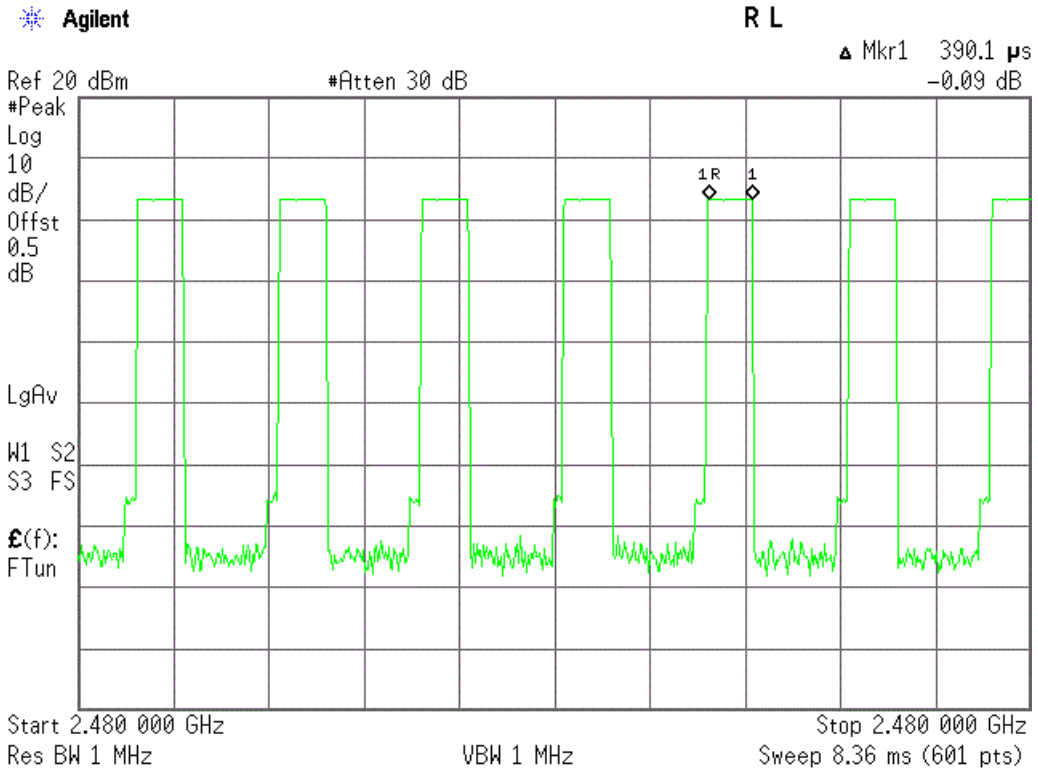
DH1: CH Low



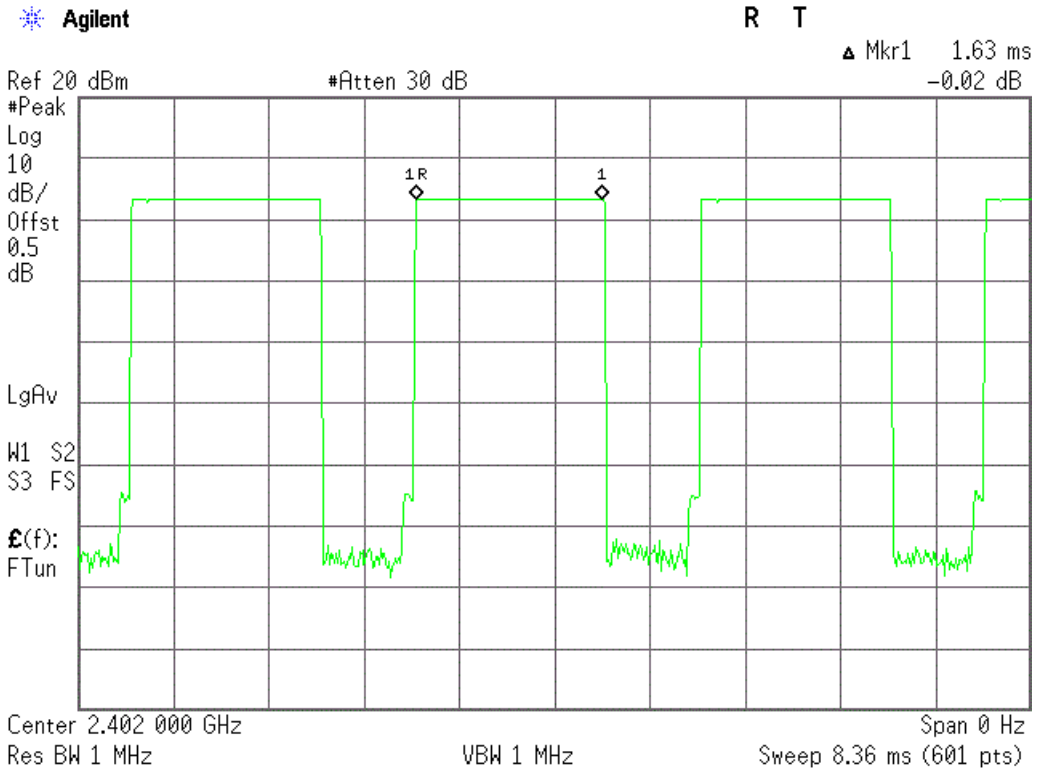
DH1: CH Mid



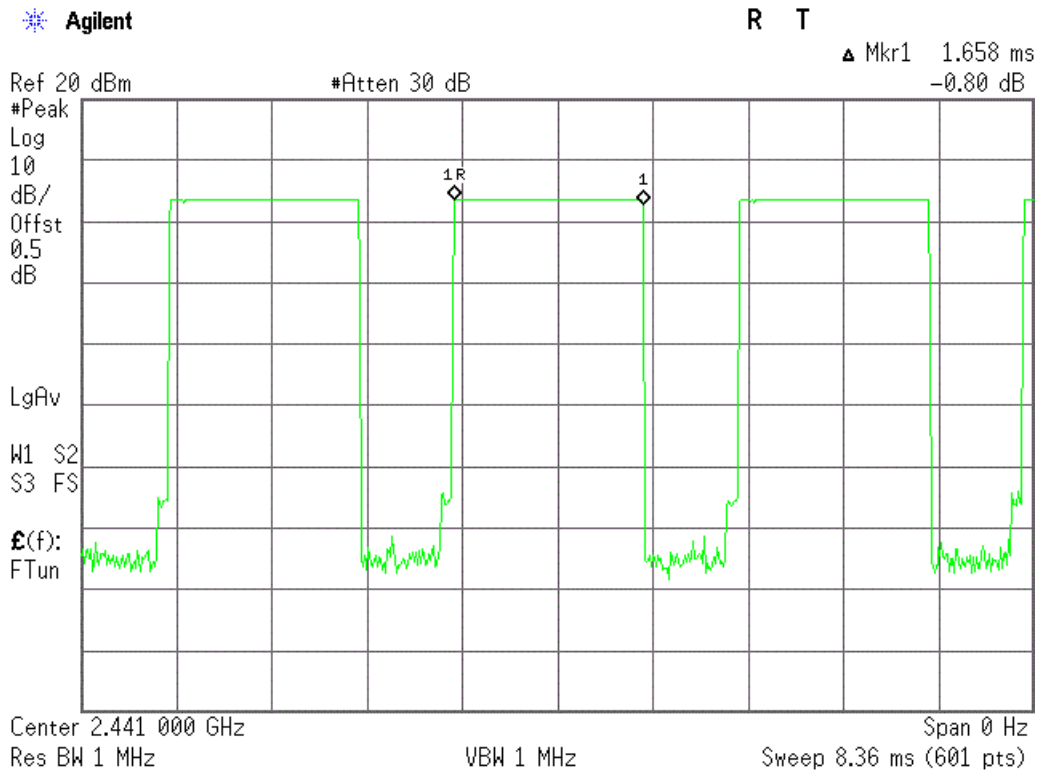
DH1: CH High



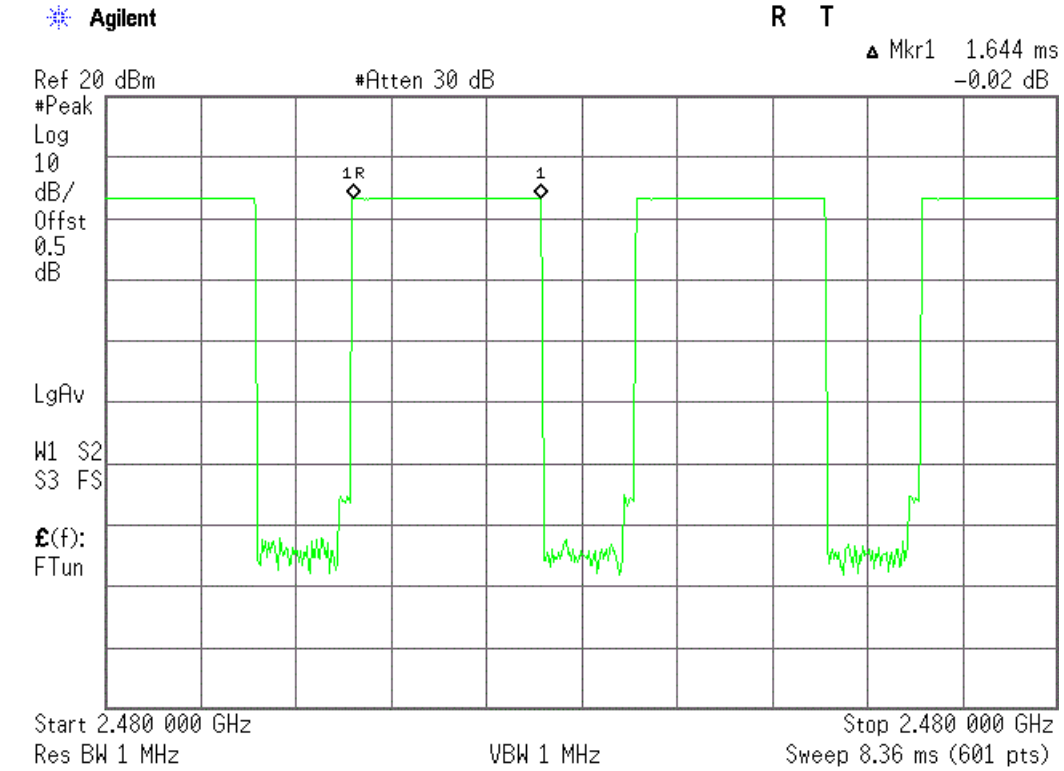
DH3: CH Low:



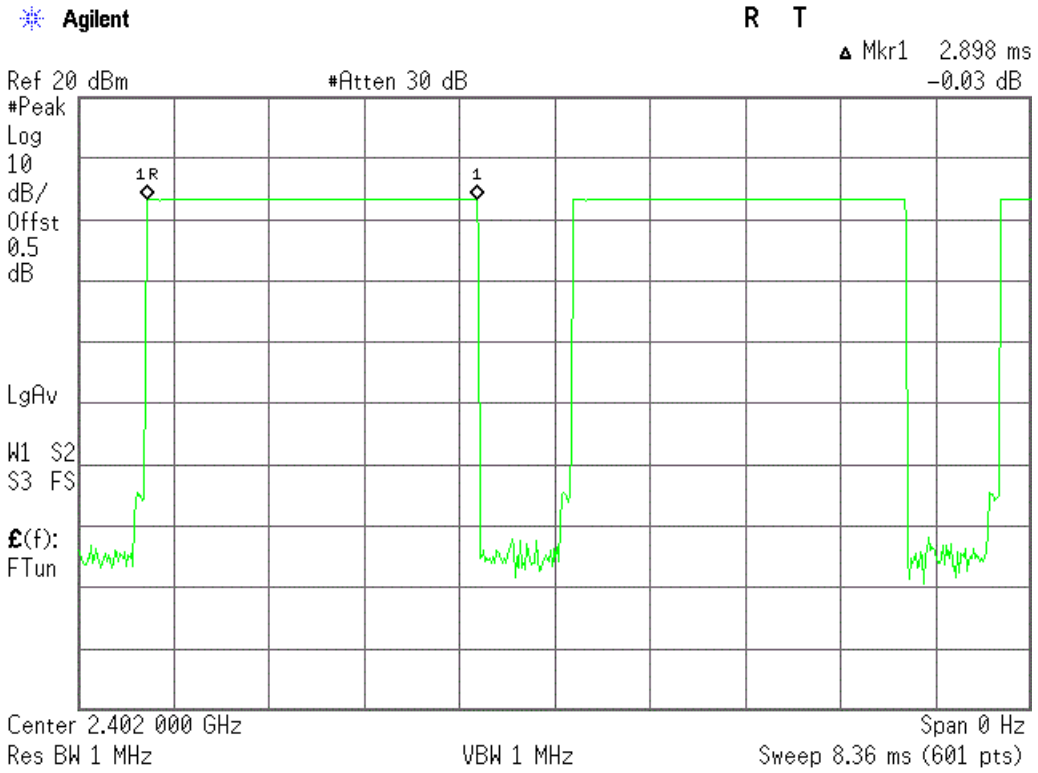
DH3: CH Mid



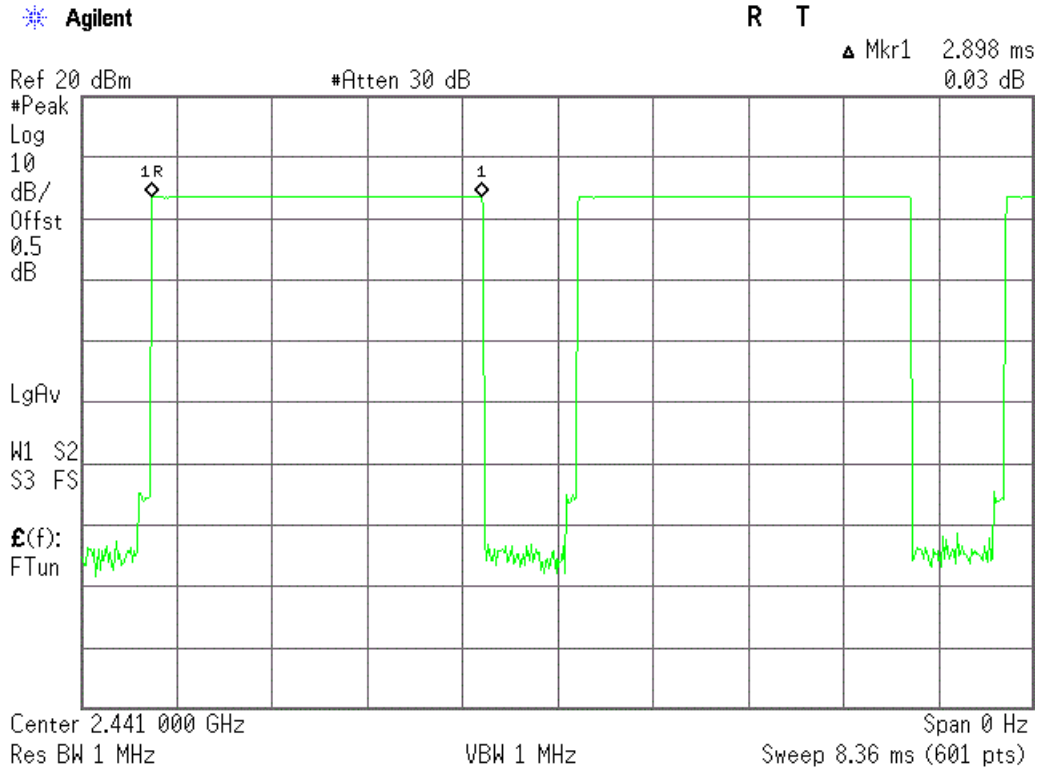
DH3 CH High



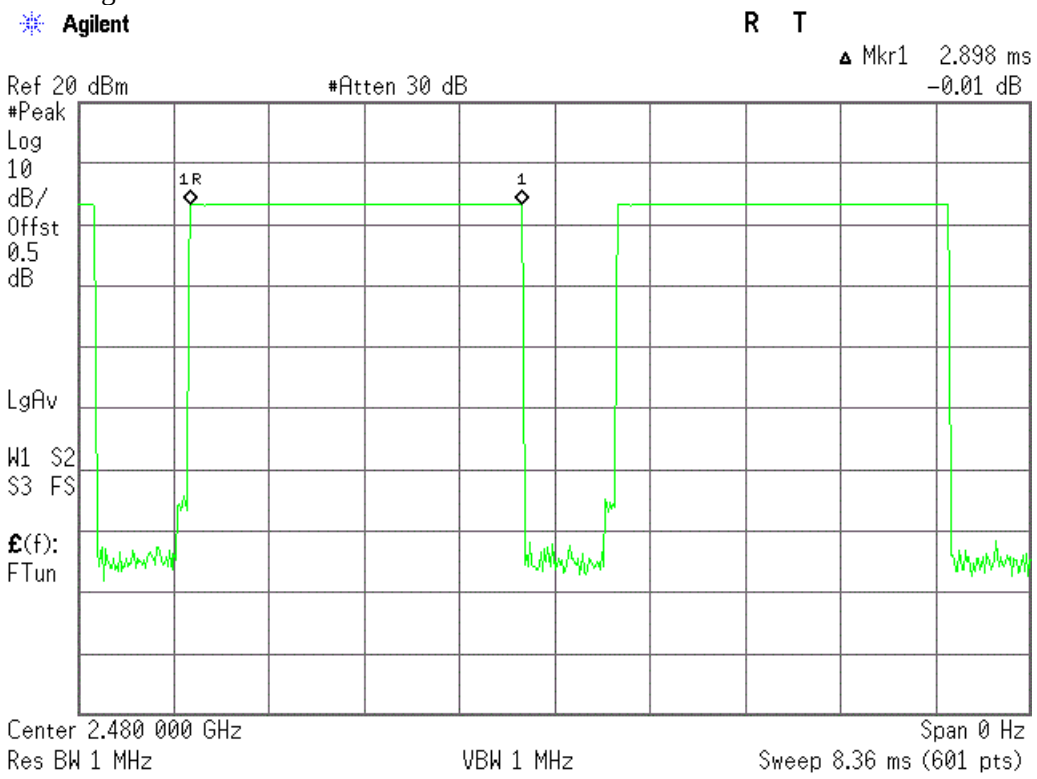
DH5 CH Low



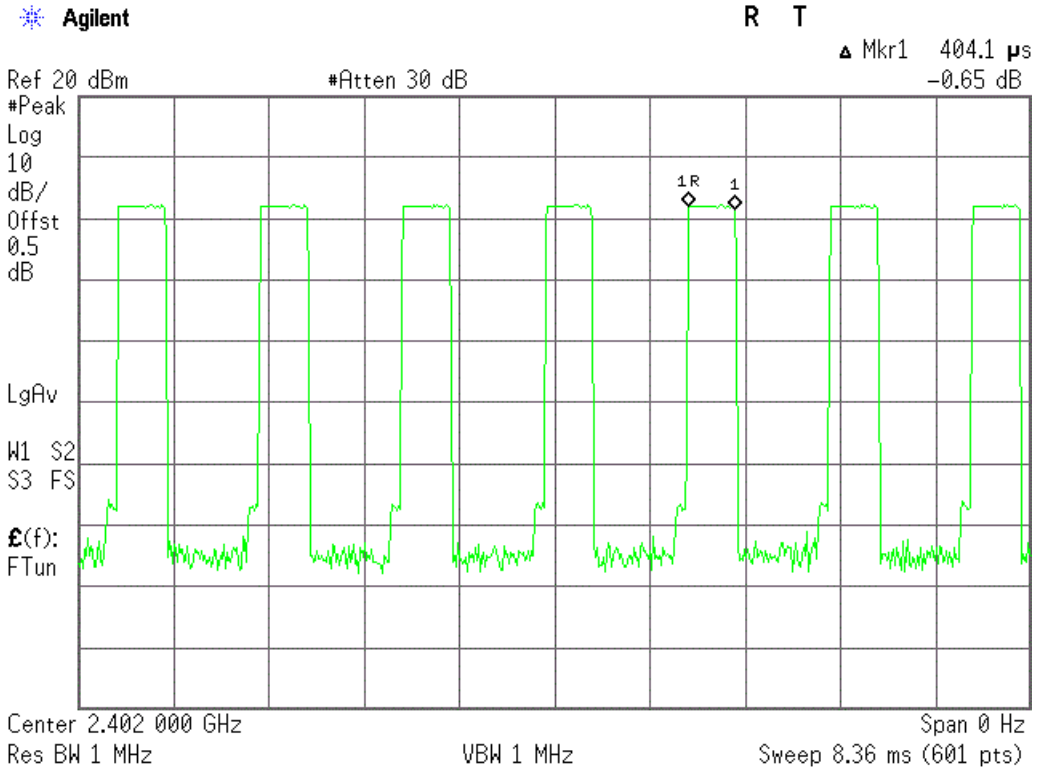
DH5 CH Mid



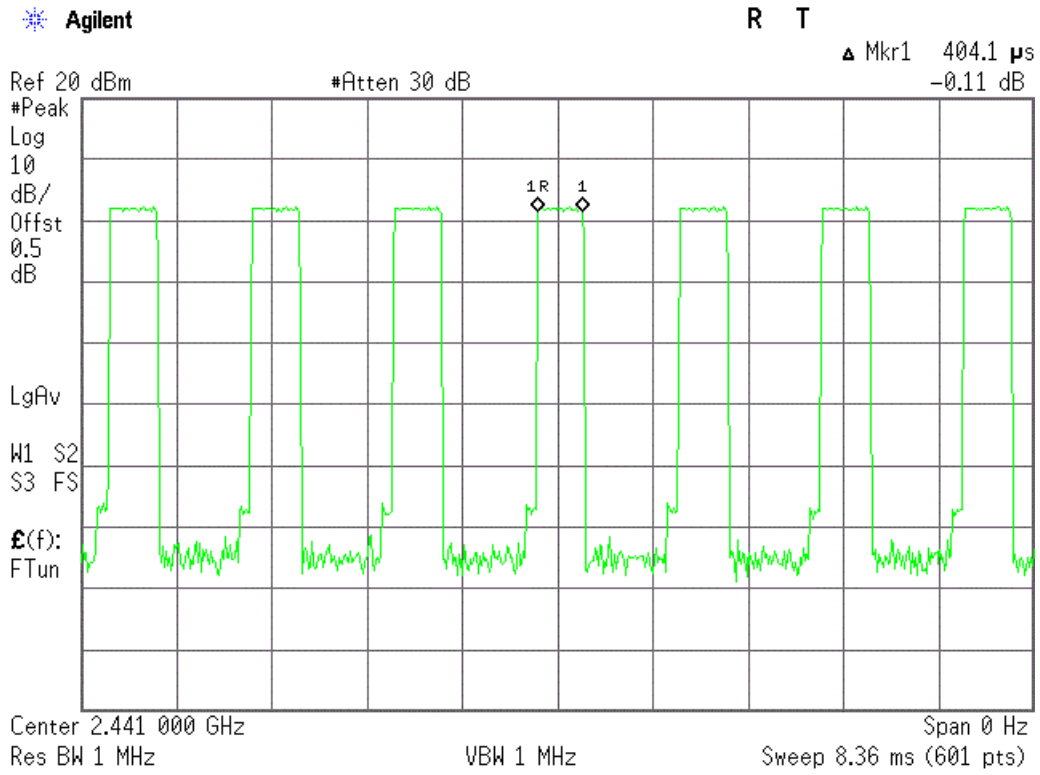
DH5 CH High



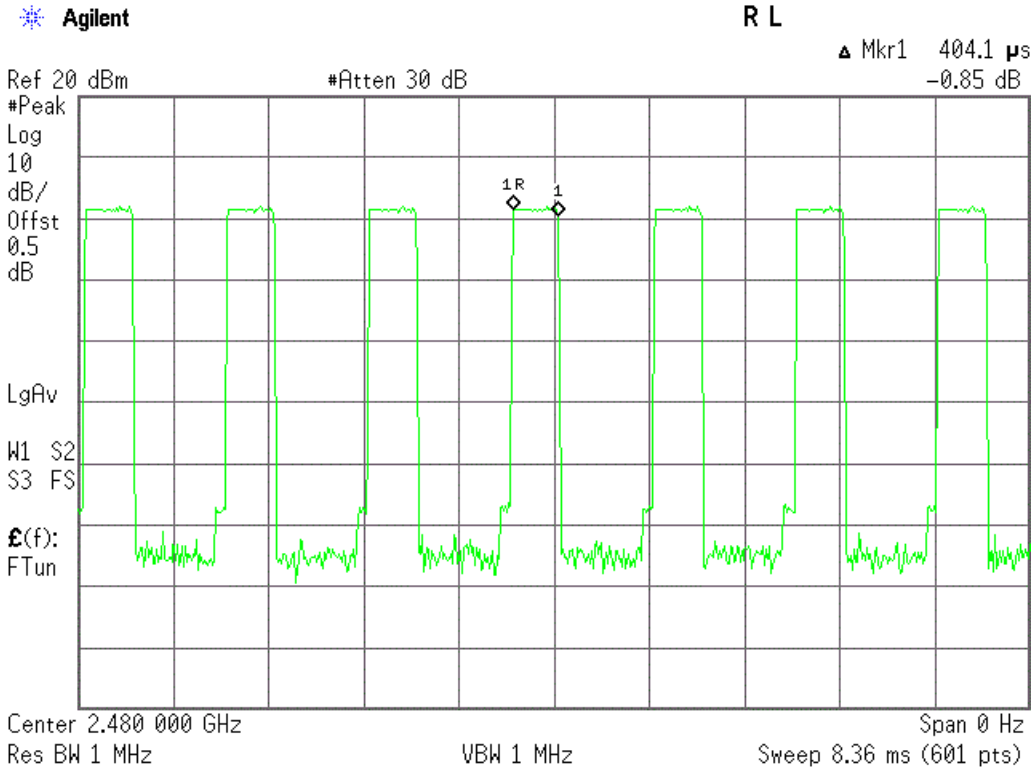
3-DH1: CH Low



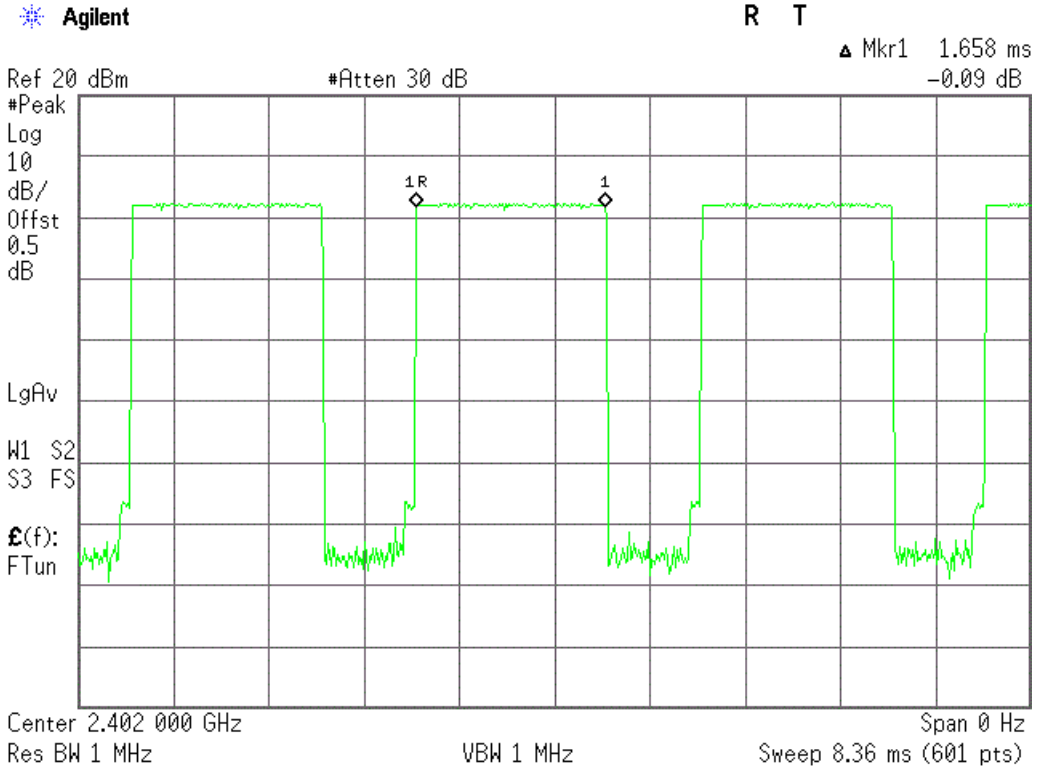
3-DH1: CH Mid



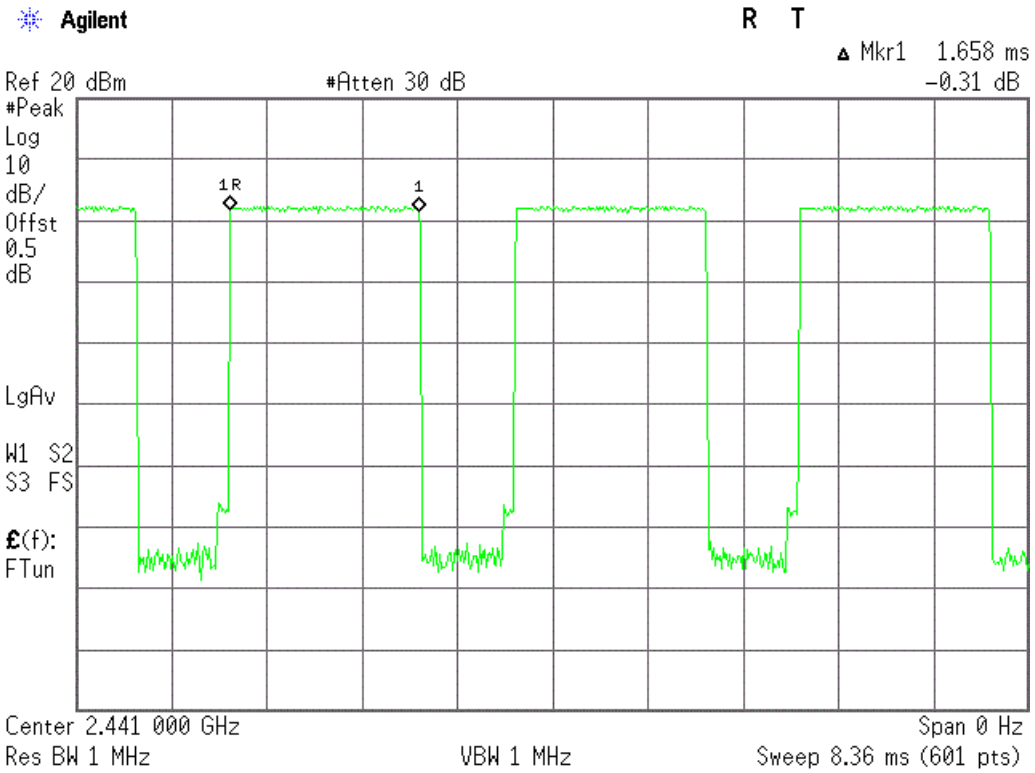
3-DH1: CH High



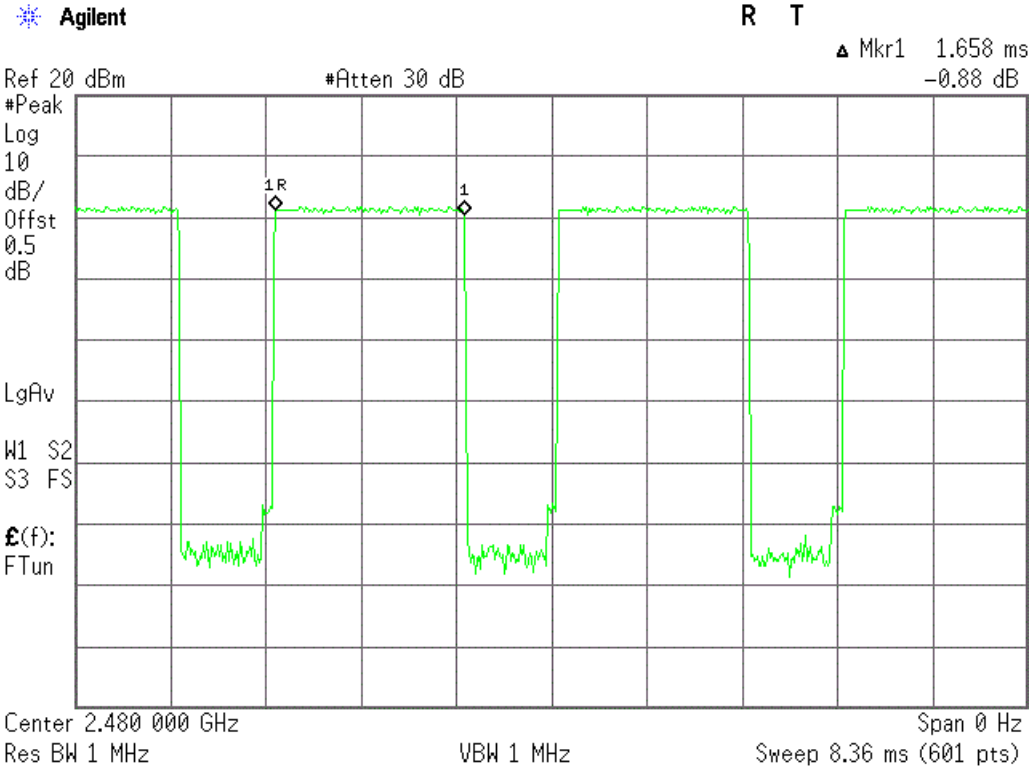
3-DH3: CH Low



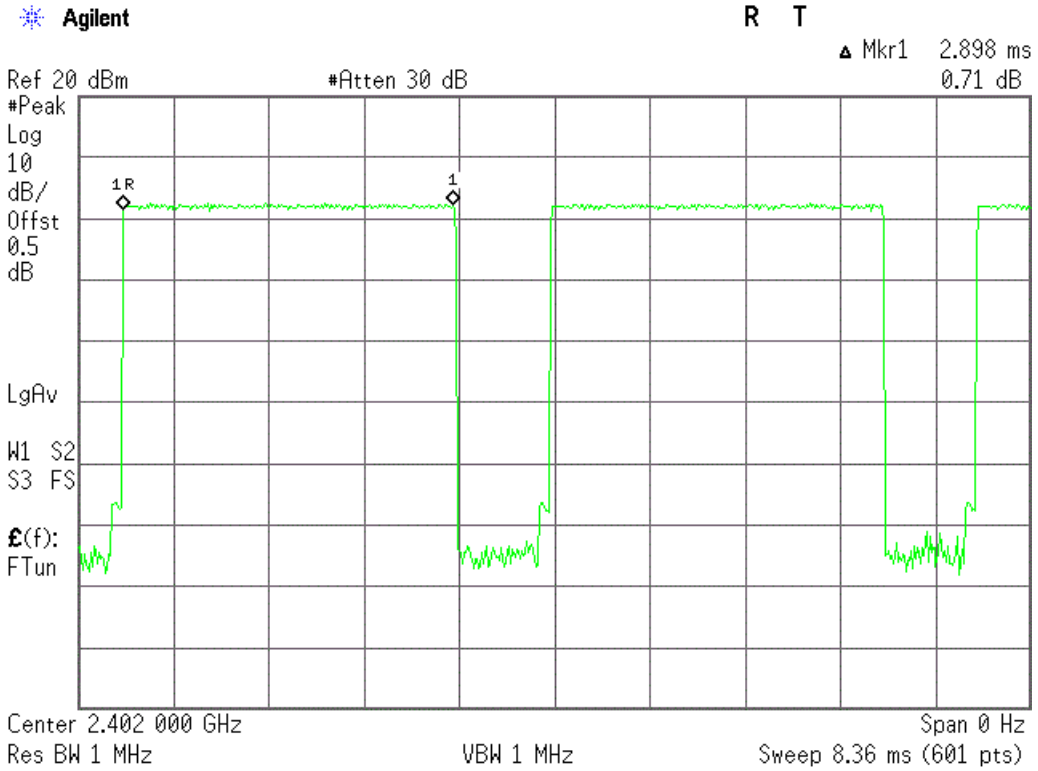
3-DH3: CH Mid



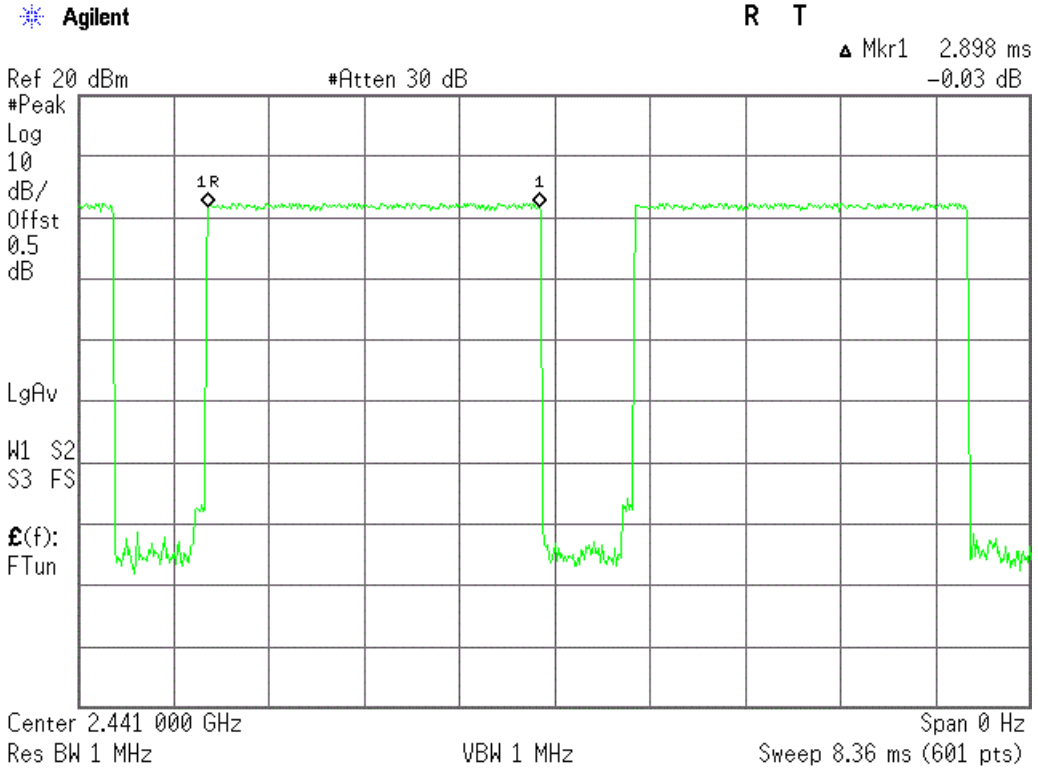
3-DH3: CH High



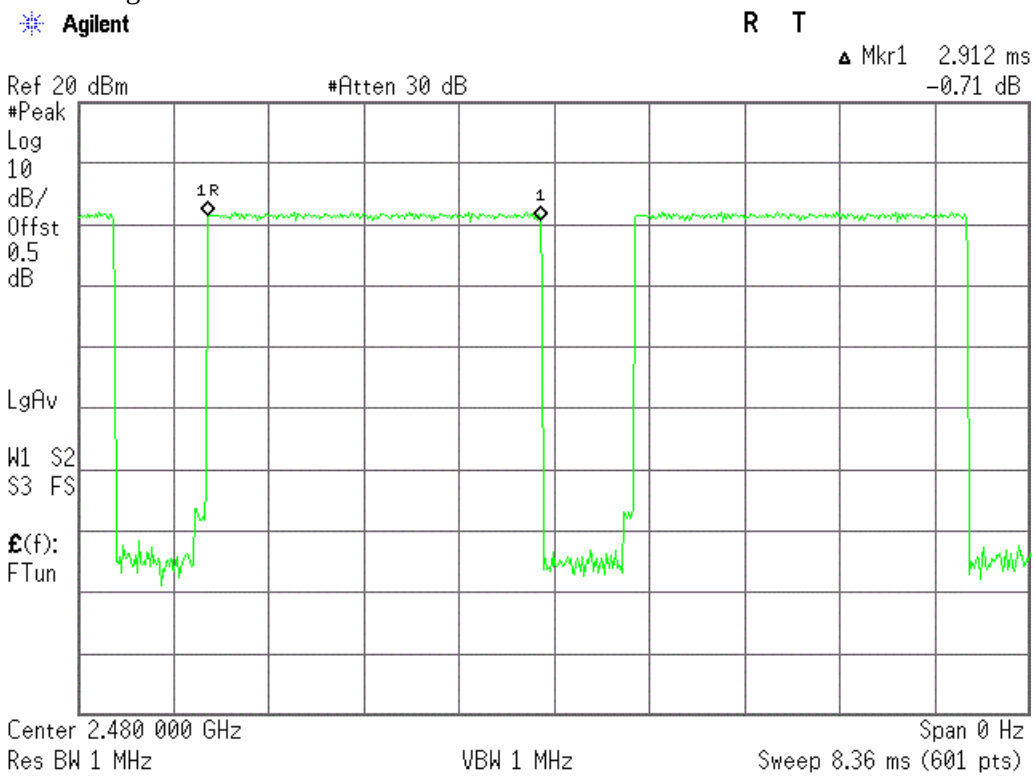
3-DH5: CH Low



3-DH5: CH Mid



3-DH5: CH High

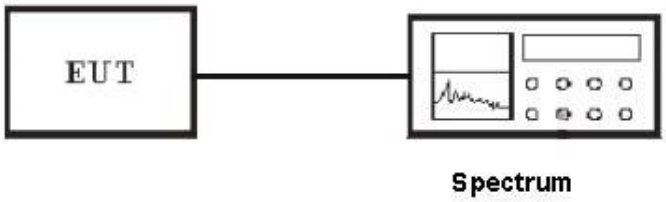


8. 20-dB BANDWIDTH

8.1 Limits of 20-dB Bandwidth Measurement

According to 15.247(a)(1)(iii). For frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

8.2 EUT Setup



8.3 Test Equipment List and Details

See section 2.4.

8.4 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

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

3. The spectrum analyzer as RBW=30 kHz (1 % of Bandwidth.), Sweep=auto

4. Mark the peak frequency and –20dB (upper and lower) frequency.

8.5 Test Result /Plots

For GFSK:

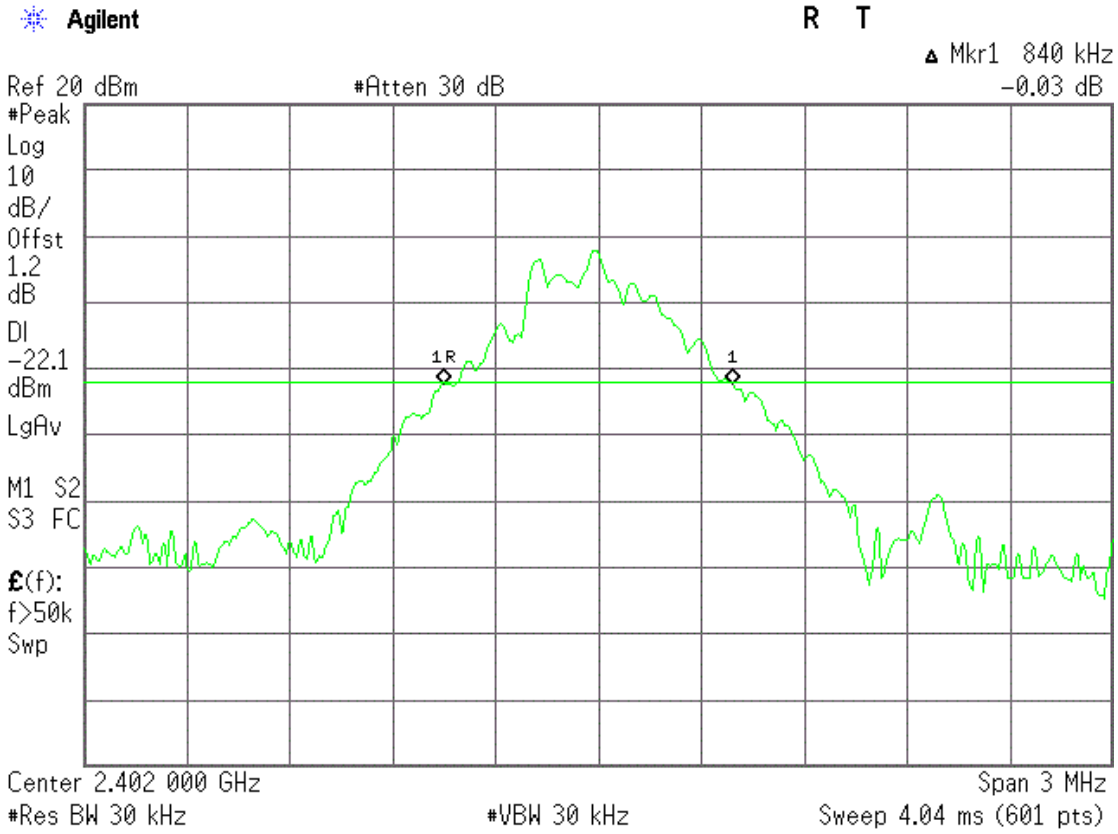
Frequency MHz	20 dB Bandwidth kHz	Limit dB
2402	0.840	/
2441	0.855	/
2480	0.845	/

For 8-DPSK:

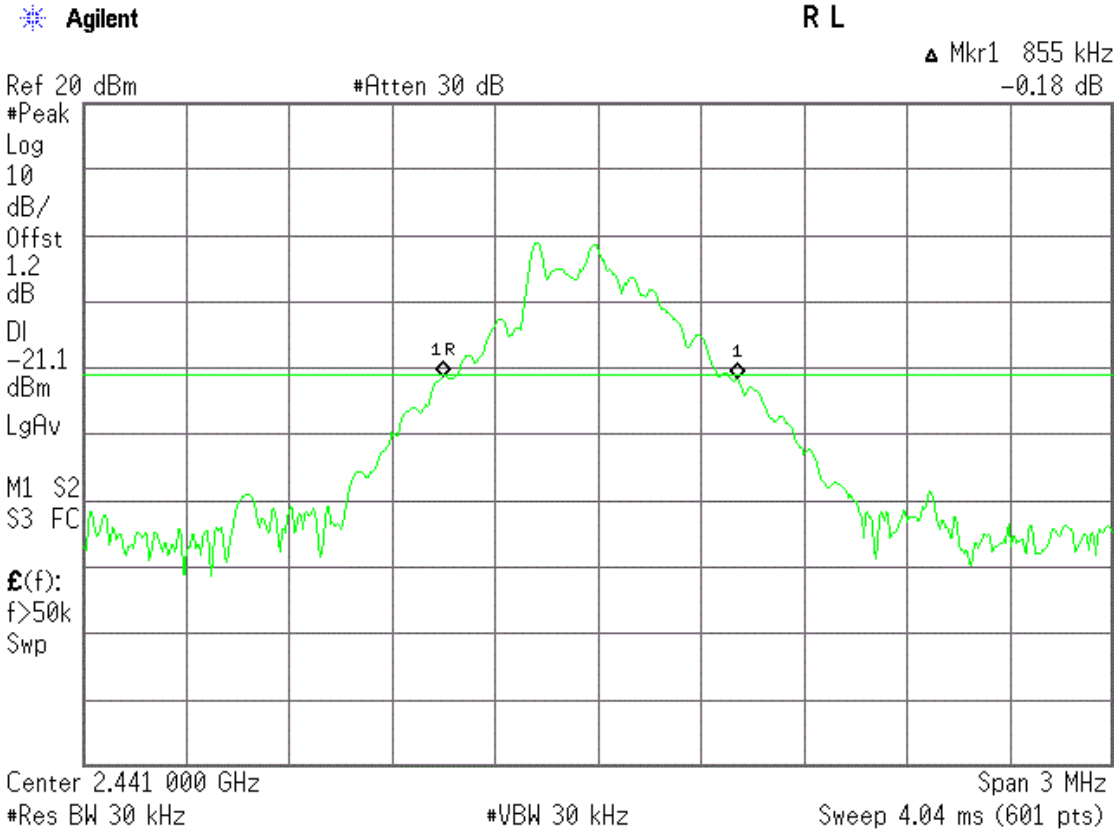
Frequency MHz	20 dB Bandwidth kHz	Limit dB
2402	1.290	/
2441	1.265	/
2480	1.265	/

Note: All modulations were tested and the worst case was reported

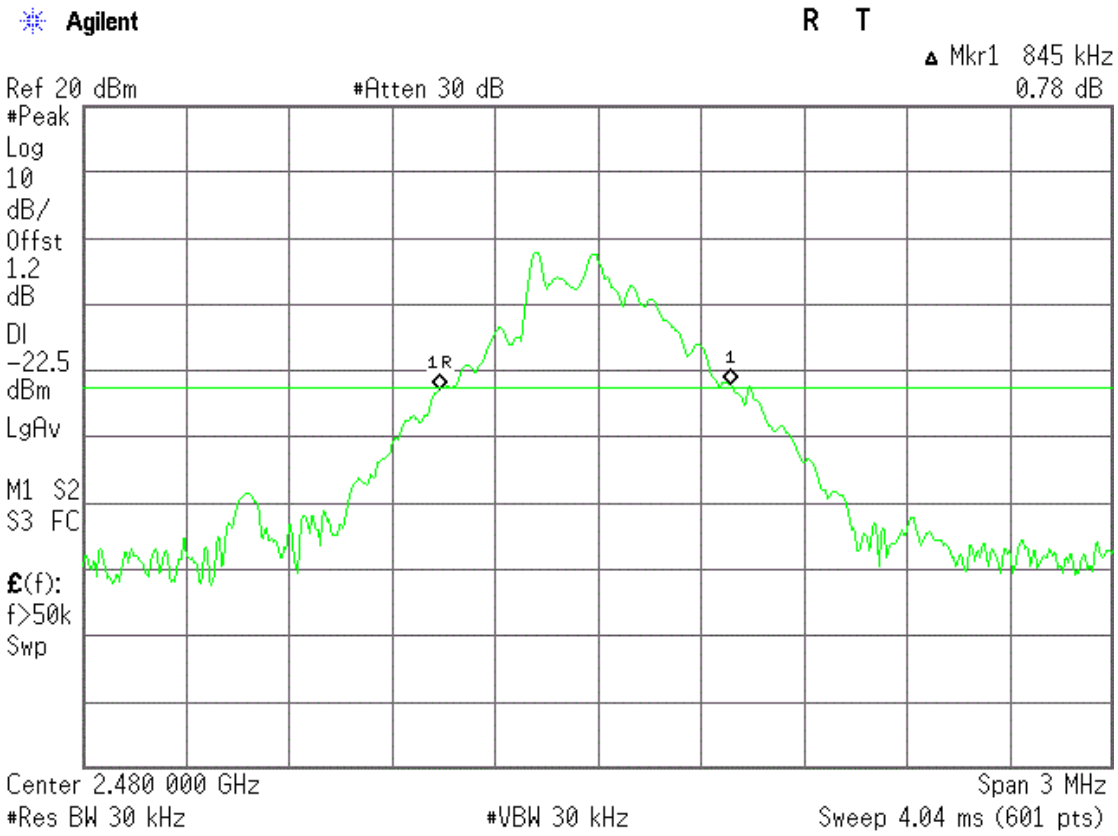
GFSK CH Low:



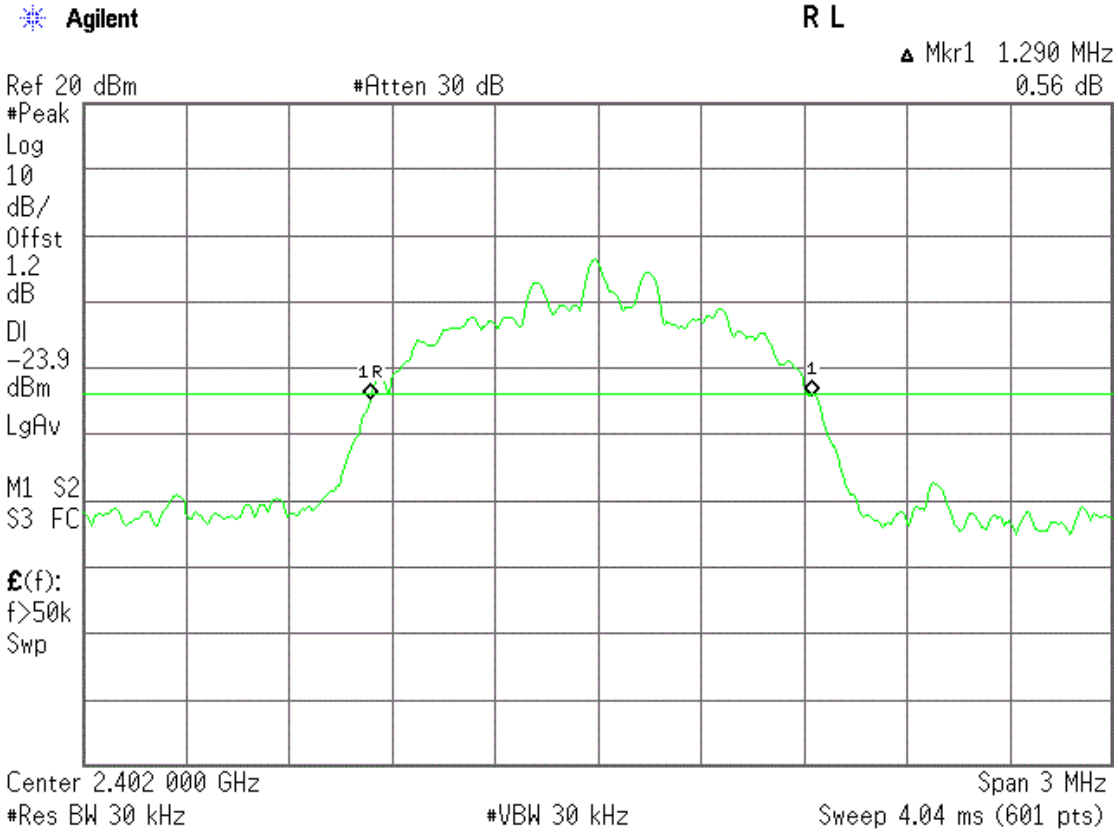
GFSK CH Mid:



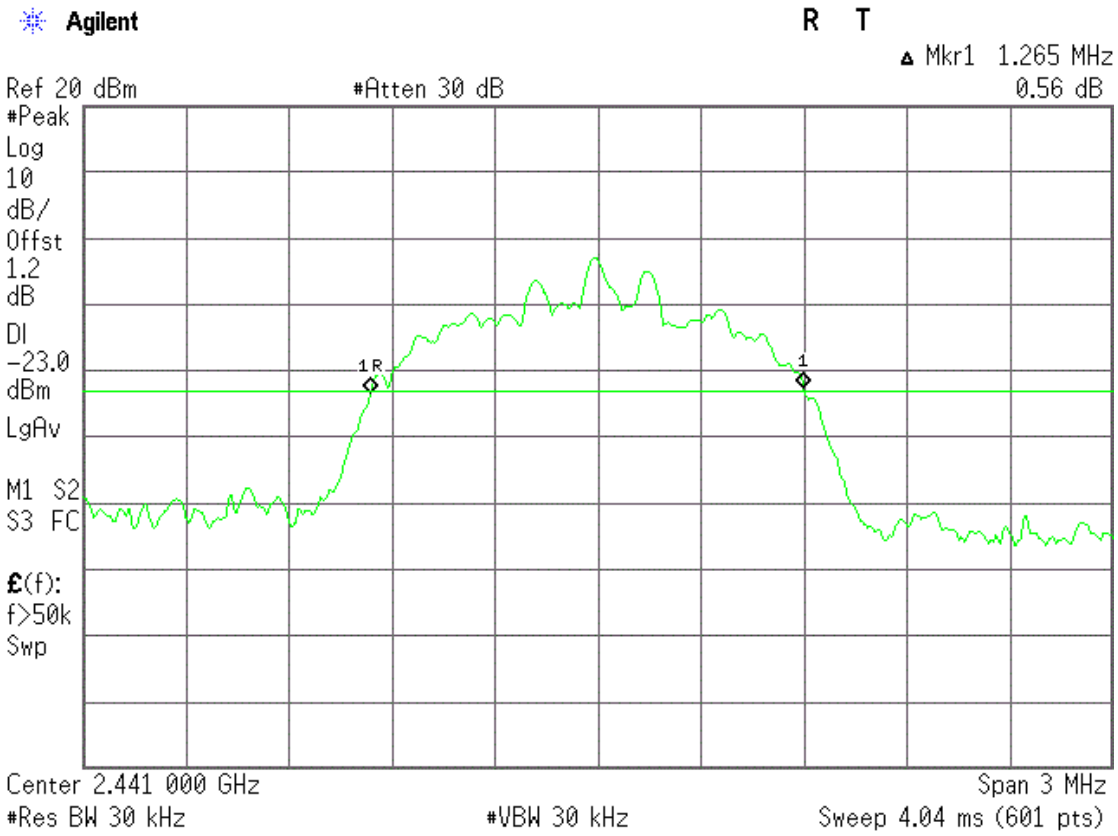
GFSK CH High:



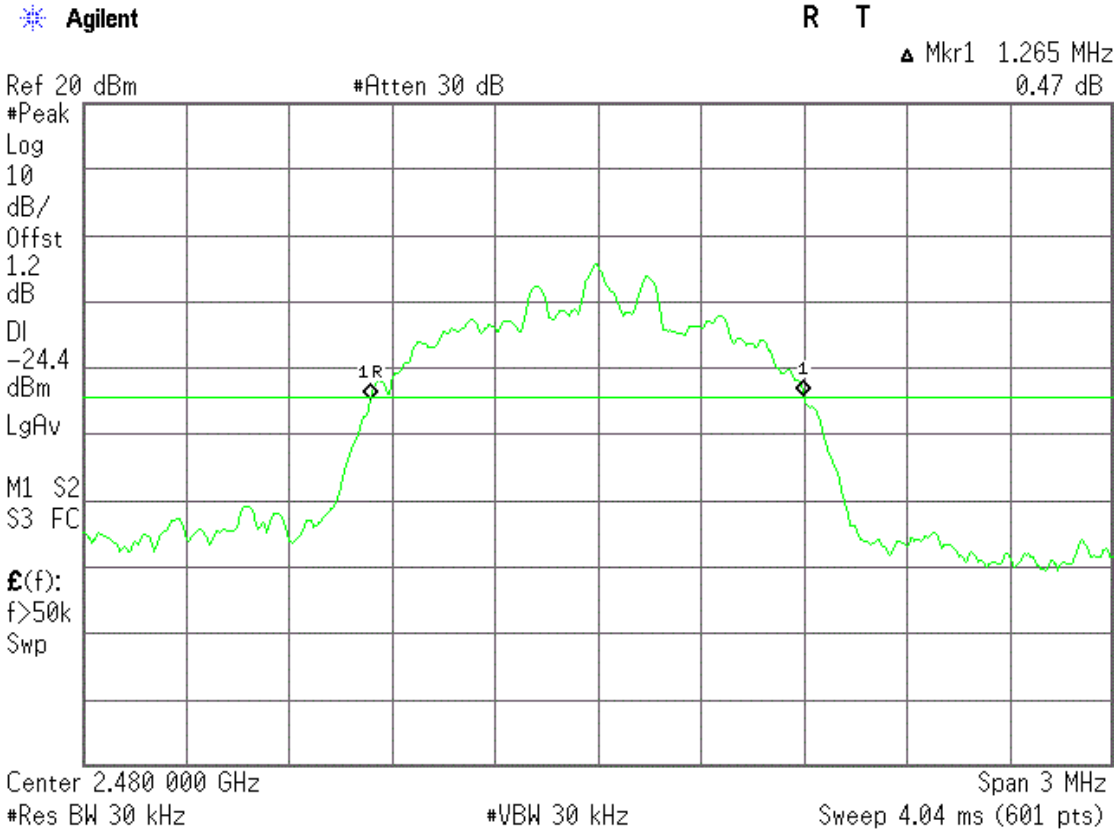
8-DPSK CH Low:



8-DPSK CH Mid:



8-DPSK CH High:



9. PEAK POWER

9.1 Limits of Power Measurement

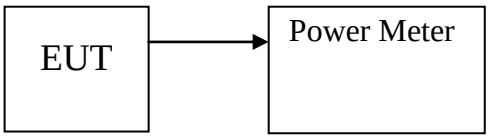
According to 15.247(b)(1). For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

9.2 Test Equipment List and Details

See section 2.4.

9.3 Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the peak power detection.



9.4 Test Result of Peak Power

For GFSK:

2402 MHz 1.9258 mW
2441 MHz 1.8179 mW
2480 MHz 1.8794 Mw

For π/4 DQPSK:

2402 MHz 1.9073 mW
2441 MHz 1.7947 mW
2480 MHz 1.8326 Mw

For 8-DPSK:

2402 MHz 1.8097 mW
2441 MHz 1.7654 mW
2480 MHz 1.7968 Mw

Note: The Antenna Gain is under considering.

.

10. FIELD STRENGTH OF SPURIOUS EMISSIONS

10.1 Limits of Radiated Emission Measurement

According to §15.247(c), 15.205 15.209(b) &15.35 (b), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Section 15.209:
0.009-0.490MHz 67.6 dBuV/m /F（KHz）@300M
0.490-1.705MHz 87.6 dBuV/m /F（KHz）@30M
1.705-30MHz 29.5 dBuV/m @30M
30 - 88 MHz 40 dBuV/m @3M
88 -216 MHz 43.5 dBuV/m @3M
216 -960 MHz 46 dBuV/m @3M
Above 960 MHz 54dBuV/m @3M

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

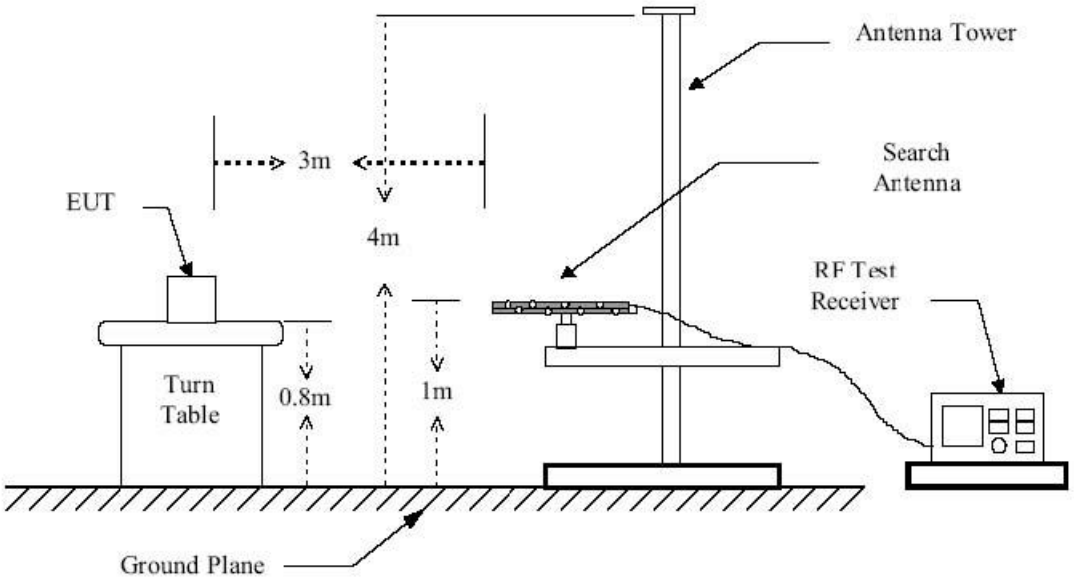
Emissions Radiated Outside Of The Specified Frequency Bands, Except For Harmonics, Shall Be Attenuated By At Least 20 Db Below The Level Of The Fundamental Or To The General Radiated Emission Limits In 15.209, Whichever Is The Lesser Attenuation.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

Note: 30m to 3m correction factor calculation:
40*Log(30m/3m)=40

10.2 EUT Setup

Radiated Measurement Setup



10.3 Test Equipment List and Details

See section 2.4.

10.4 Test Procedure

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

10.5 Test Result

According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst margin of:

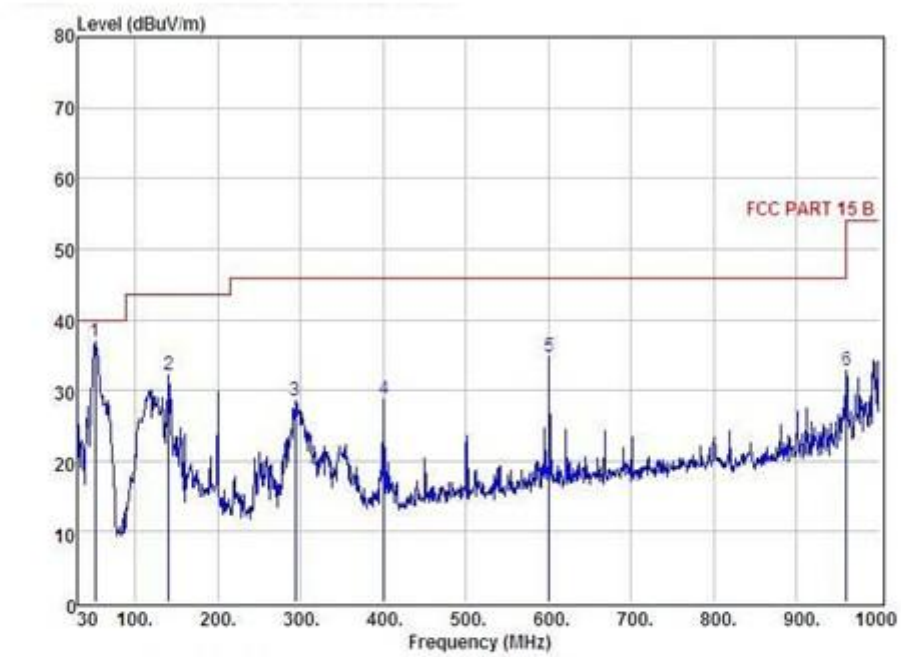
-3.17 dBμV at 51.34MHz in the Vertical polarization, with 9KHz to 25 GHz, 3Meters

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

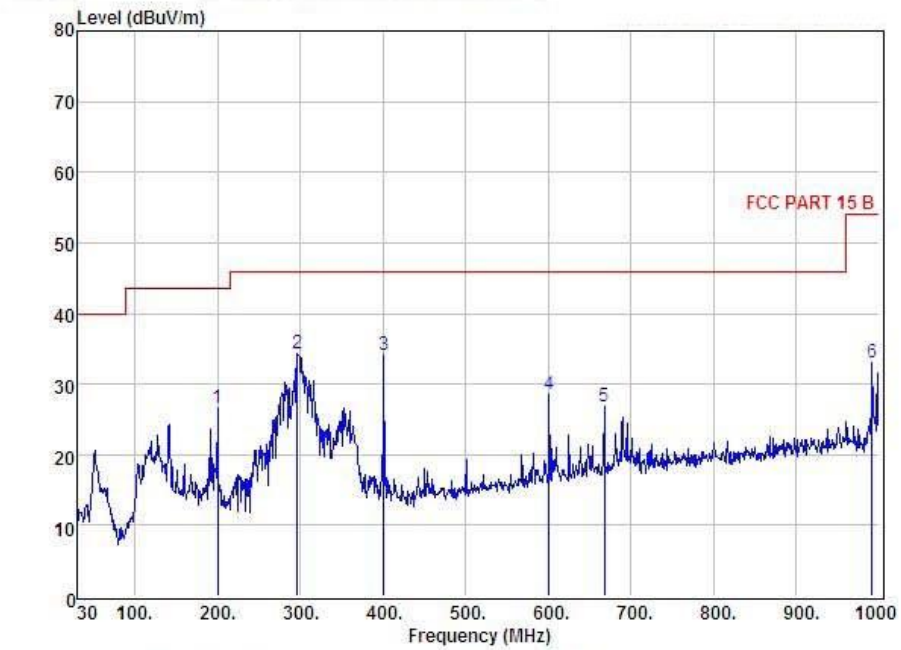
From 30 MHz to 1 GHz
Test Mode: Normal
Vertical



Condition : FCC PART 15 B 3m POL: VERTICAL

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	51.34	51.03	13.38	27.83	0.25	36.83	40.00	-3.17	QP
2	140.58	45.38	13.51	26.90	0.27	32.26	43.50	-11.24	QP
3	293.84	42.32	12.67	27.18	0.74	28.55	46.00	-17.45	QP
4	400.54	40.62	14.74	27.43	0.71	28.64	46.00	-17.36	QP
5	600.36	43.13	18.32	27.82	1.02	34.65	46.00	-11.35	QP
6	960.23	36.54	22.17	27.61	1.75	32.85	54.00	-21.15	QP

Horizontal



Condition : FCC PART 15 B 3m POL: HORIZONTAL

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	199.75	43.24	9.90	26.97	0.43	26.60	43.50	-16.90	QP
2	296.75	47.85	12.76	27.19	0.94	34.36	46.00	-11.64	QP
3	400.54	46.17	14.74	27.43	0.71	34.19	46.00	-11.81	QP
4	600.36	36.98	18.32	27.82	1.02	28.50	46.00	-17.50	QP
5	667.29	34.25	19.30	27.78	0.96	26.73	46.00	-19.27	QP
6	991.27	36.87	22.22	27.58	1.51	33.02	54.00	-20.98	QP

Spurious emission above 1G For GFSK:

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (1G to 25GHz)										
4804.0	AV	35.2	48	H	34.1	5.2	33.0	41.5	54	-12.5
4804.0	AV	34	29	V	34.1	5.2	33.0	40.3	54	-13.7
7206.0	AV	32.1	236	H	37.4	6.1	33.5	42.1	54	-11.9
7206.0	AV	31.5	158	V	37.4	6.1	33.5	41.5	54	-12.5
2402.0	AV	97.6	104	H	29.1	3.7	34.0	96.4		(Fund.)
2402.0	AV	96.9	217	V	29.1	3.7	34.0	95.7		(Fund.)
4804.0	PK	46.2	69	H	34.1	5.2	33.0	52.5	74	-21.5
4804.0	PK	45.3	43	V	34.1	5.2	33.0	51.6	74	-22.4
7206.0	PK	42.3	218	H	37.4	6.1	33.5	52.3	74	-21.7
7206.0	PK	40.8	124	V	37.4	6.1	33.5	50.8	74	-23.2
2402.0	PK	103.6	121	H	29.1	3.7	34.0	102.4		(Fund.)
2402.0	PK	103	286	V	29.1	3.7	34.0	101.8		(Fund.)
Middle Channel (1G to 25GHz)										
4882.0	AV	37.9	135	H	34.1	5.2	33.0	44.2	54	-9.8
4882.0	AV	37	128	V	34.1	5.2	33.0	43.3	54	-10.7
7323.0	AV	31.9	214	H	37.4	6.1	33.5	41.9	54	-12.1
7323.0	AV	32.6	86	V	37.4	6.1	33.5	42.6	54	-11.4
2441.0	AV	96.5	73	H	29.1	3.7	34.0	95.3		(Fund.)
2441.0	AV	95.9	69	V	29.1	3.7	34.0	94.7		(Fund.)
4882.0	PK	45.4	47	H	34.1	5.2	33.0	51.7	74	-22.3
4882.0	PK	45.9	147	V	34.1	5.2	33.0	52.2	74	-21.8
7323.0	PK	42.2	252	H	37.4	6.1	33.5	52.2	74	-21.8
7323.0	PK	40.6	135	V	37.4	6.1	33.5	50.6	74	-23.4
2441.0	PK	102	49	H	29.1	3.7	34.0	100.8		(Fund.)
2441.0	PK	100.8	63	V	29.1	3.7	34.0	99.6		(Fund.)

High Channel (1G to 25GHz)										
4960.0	AV	37	28	H	34.1	5.2	33.0	43.3	54	-10.7
4960.0	AV	36.3	84	V	34.1	5.2	33.0	42.6	54	-11.4
7440.0	AV	30.8	252	H	37.4	6.1	33.5	40.8	54	-13.2
7440.0	AV	31.8	136	V	37.4	6.1	33.5	41.8	54	-12.2
2480.0	AV	97	174	H	29.1	3.7	34.0	95.8		(Fund.)
2480.0	AV	95.6	87	V	29.1	3.7	34.0	94.4		(Fund.)
4960.0	PK	47.9	346	H	34.1	5.2	33.0	54.2	74	-19.8
4960.0	PK	47.3	129	V	34.1	5.2	33.0	53.6	74	-20.4
7440.0	PK	42.4	252	H	37.4	6.1	33.5	52.4	74	-21.6
7440.0	PK	42.9	85	V	37.4	6.1	33.5	52.9	74	-21.1
2480.0	PK	102.7	107	H	29.1	3.7	34.0	101.5		(Fund.)
2480.0	PK	100.7	164	V	29.1	3.7	34.0	99.5		(Fund.)

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 4th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

Spurious emission above 1G For 8-DPSK:

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (1G to 25GHz)										
4804.0	AV	38	48	H	34.1	5.2	33.0	44.3	54	-9.7
4804.0	AV	36.2	29	V	34.1	5.2	33.0	42.5	54	-11.5
7206.0	AV	31.8	236	H	37.4	6.1	33.5	41.8	54	-12.2
7206.0	AV	33.2	158	V	37.4	6.1	33.5	43.2	54	-10.8
2402.0	AV	97.5	104	H	29.1	3.7	34.0	96.3		(Fund.)
2402.0	AV	95.4	217	V	29.1	3.7	34.0	94.2		(Fund.)
4804.0	PK	46.3	69	H	34.1	5.2	33.0	52.6	74	-21.4
4804.0	PK	44.5	43	V	34.1	5.2	33.0	50.8	74	-23.2
7206.0	PK	42.3	218	H	37.4	6.1	33.5	52.3	74	-21.7
7206.0	PK	42.6	124	V	37.4	6.1	33.5	52.6	74	-21.4
2402.0	PK	100.7	121	H	29.1	3.7	34.0	99.5		(Fund.)
2402.0	PK	99.9	286	V	29.1	3.7	34.0	98.7		(Fund.)
Middle Channel (1G to 25GHz)										
4882.0	AV	36.9	135	H	34.1	5.2	33.0	43.2	54	-10.8
4882.0	AV	35.6	128	V	34.1	5.2	33.0	41.9	54	-12.1
7323.0	AV	32.1	214	H	37.4	6.1	33.5	42.1	54	-11.9
7323.0	AV	30.6	86	V	37.4	6.1	33.5	40.6	54	-13.4
2441.0	AV	98.6	73	H	29.1	3.7	34.0	97.4		(Fund.)
2441.0	AV	96.4	69	V	29.1	3.7	34.0	95.2		(Fund.)
4882.0	PK	45.2	47	H	34.1	5.2	33.0	51.5	74	-22.5
4882.0	PK	46	147	V	34.1	5.2	33.0	52.3	74	-21.7
7323.0	PK	41.2	252	H	37.4	6.1	33.5	51.2	74	-22.8
7323.0	PK	42.1	135	V	37.4	6.1	33.5	52.1	74	-21.9
2441.0	PK	104.4	49	H	29.1	3.7	34.0	103.2		(Fund.)
2441.0	PK	102.6	63	V	29.1	3.7	34.0	101.4		(Fund.)

High Channel (1G to 25GHz)										
4960.0	AV	37	28	H	34.1	5.2	33.0	43.3	54	-10.7
4960.0	AV	35.5	84	V	34.1	5.2	33.0	41.8	54	-12.2
7440.0	AV	32.1	252	H	37.4	6.1	33.5	42.1	54	-11.9
7440.0	AV	31.2	136	V	37.4	6.1	33.5	41.2	54	-12.8
2480.0	AV	96.5	174	H	29.1	3.7	34.0	95.3		(Fund.)
2480.0	AV	95.3	87	V	29.1	3.7	34.0	94.1		(Fund.)
4960.0	PK	47	346	H	34.1	5.2	33.0	53.3	74	-20.7
4960.0	PK	46.2	129	V	34.1	5.2	33.0	52.5	74	-21.5
7440.0	PK	41.6	252	H	37.4	6.1	33.5	51.6	74	-22.4
7440.0	PK	42.5	85	V	37.4	6.1	33.5	52.5	74	-21.5
2480.0	PK	103.4	107	H	29.1	3.7	34.0	102.2		(Fund.)
2480.0	PK	101.6	164	V	29.1	3.7	34.0	100.4		(Fund.)

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 4th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

11. Band Edges Measurement

11.1 Limits of Band Edges Measurement

According to §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 radiated power limits.

11.2 Test Equipment List and Details

See section 2.4.

11.3 Test Procedure

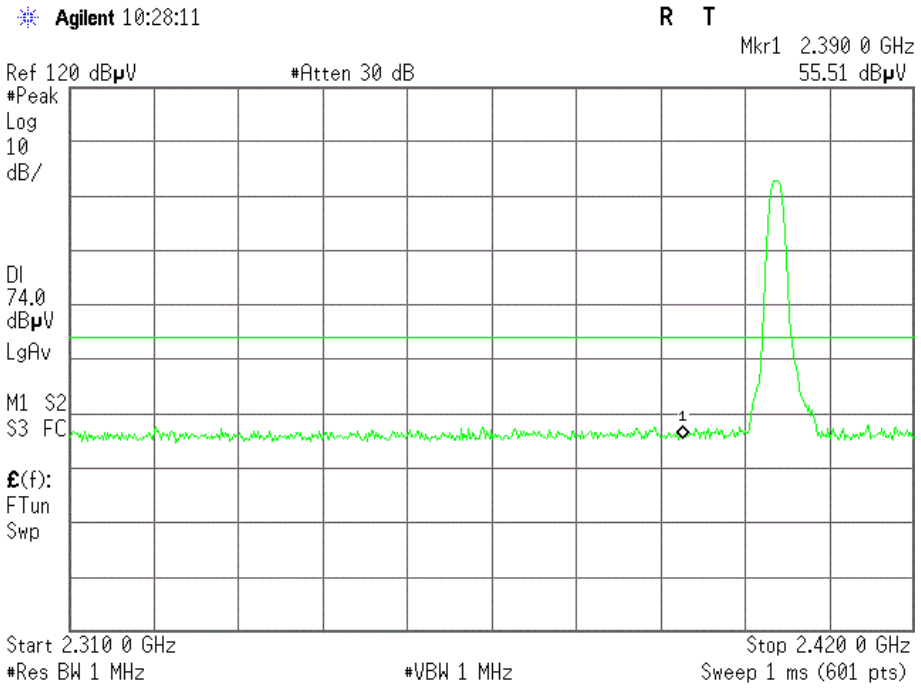
Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded. The spectrum plots (Peak RBW=VBW=100 kHz; Average RBW=1 MHz, VBW=10 Hz) are attached on the following pages.

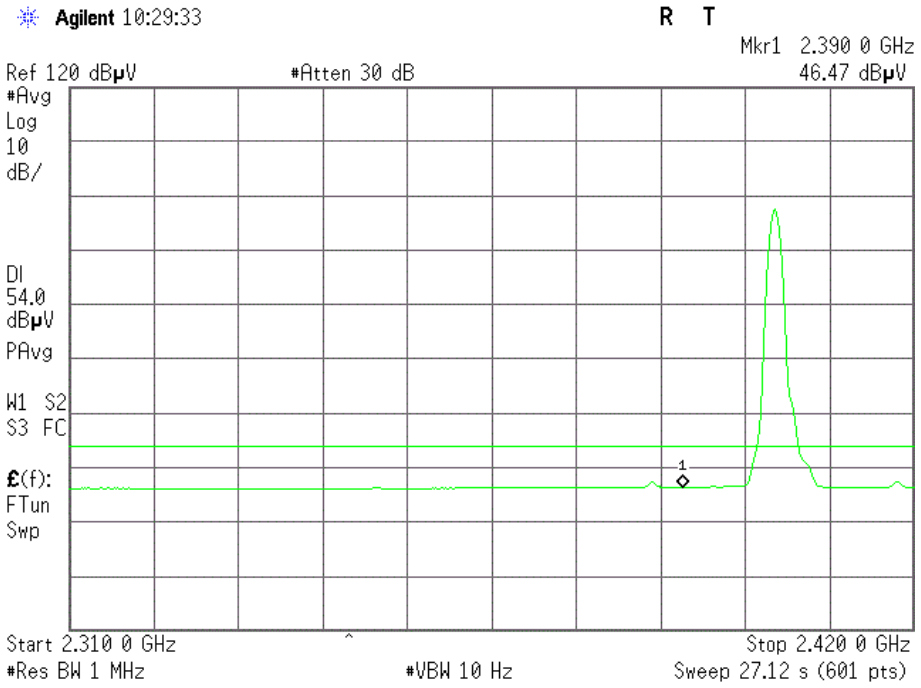
11.4 Test Result

Test mode	Frequency MHz	Limit dBuV /dB	Result
Lowest	2390.00	<54dBuv	PASS
	2400.00	>20dB	PASS
Highest	2483.50	<54DBUV	PASS

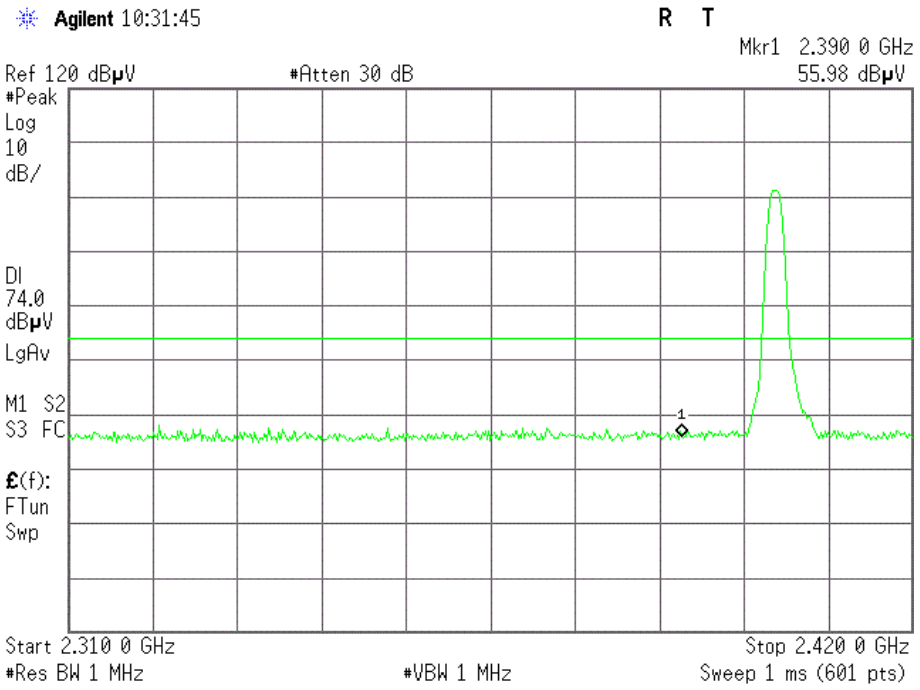
The edge emissions are below the FCC 15.209 Limits. Please refer to the test plots below.

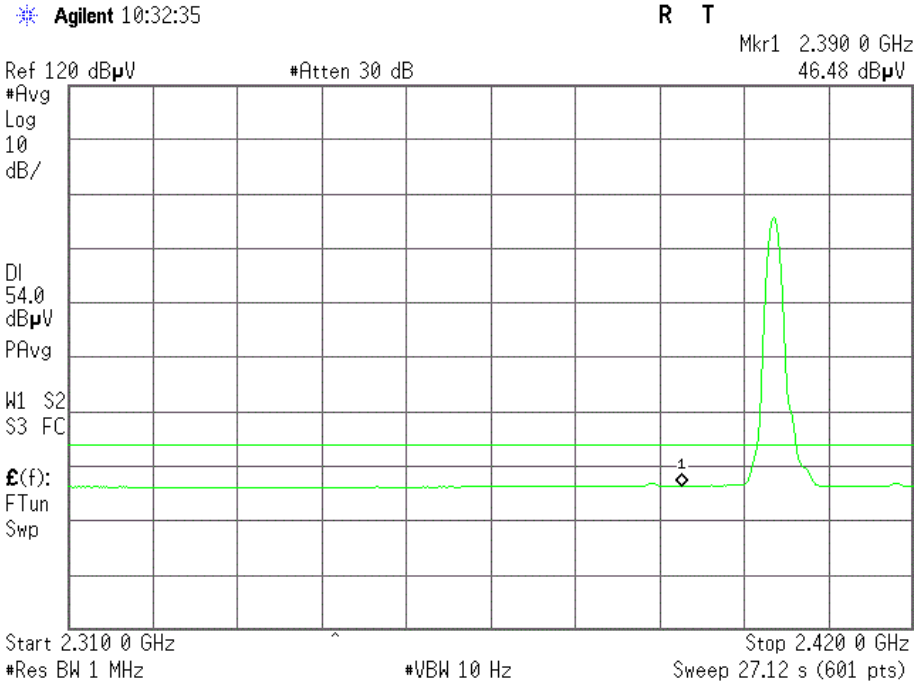
Lowest Bandedge-Horizontal



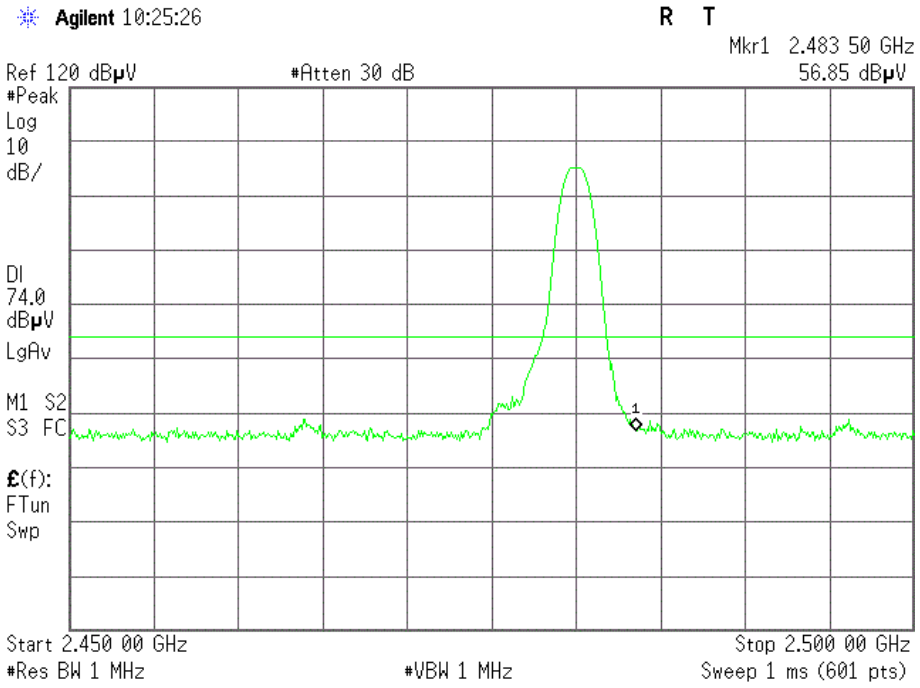


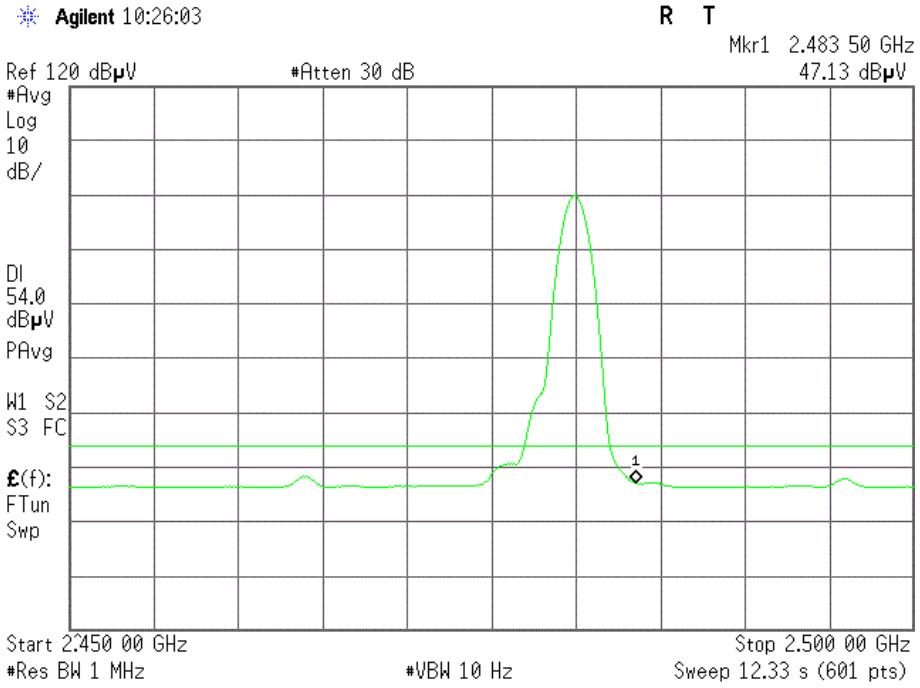
Lowest Bandedge- Vertical





High Bandedge-Horizontal





High Bandedge-Vertical