

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C
REQUIREMENT T**

OF

21.5" Android Commercial Tablet

MODEL No.: PD215T8-SC

Trademark: N/A

FCC ID: 2AFI3- PD215T8

REPORT NO: ES150626381E1

ISSUE DATE: August 07, 2015

Prepared for

NINGBO PLUS AND POPSCREENS ELECTRONIC TECHNOLOGY CO., LTD.

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VERIFICATION OF COMPLIANCE

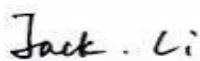
Applicant	:	NINGBO PLUS AND POPSCREENS ELECTRONIC TECHNOLOGY CO., LTD. #7 Hongda Road, Hong Tang Industrial Zone A, Jiangbei District, Ningbo, China
Manufacturer	:	NINGBO PLUS AND POPSCREENS ELECTRONIC TECHNOLOGY CO., LTD. #7 Hongda Road, Hong Tang Industrial Zone A, Jiangbei District, Ningbo, China
Product Description	:	21.5" Android Commercial Tablet
Brand Name	:	N/A
Model Number	:	PD215T8-SC
File Number	:	ES150626381E
Date of Test:	:	July 01, 2015 to July 22, 2015

We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247-2015.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : July 01, 2015 to July 22, 2015

Prepared by : 
Jack Li/Editor

Reviewer : 
Joe Xia/Supervisor

Approve & Authorized Signer : 
Lisa Wang/Manager

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1. General Information

1.1 Product Description

NINGBO PLUS AND POPSCREENS ELECTRONIC TECHNOLOGY CO., LTD.

Model: PD215T8-SC (referred to as the EUT in this report) The EUT (21.5" Android Commercial Tablet) is an short range, lower power Device. It is designed by way of utilizing the GFSK, $\pi/4$ -DQPSK and 8DPSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2402-2480MHz
- B). Modulation: GFSK, $\pi/4$ -DQPSK, 8DPSK
- C). Number of Channel: 79
- D). Channel Space: 1MHz
- E). BIT Rate of Transmission: 1Mbps, 2Mbps, 3Mbps
- F). Antenna Type: Dipole antenna
- G). Antenna Gain: 2dBi
- H). Power Supply: INPUT AC 100-240V, 50/60Hz 1.7A
OUTPUT 12V,5A

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AFI3- PD215T8 filing to comply with Section 15.247 of the FCC Part 15 Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.10 -2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Test Facility

Site Description
EMC Lab.

- : Accredited by CNAS, 2013.10.29
The certificate is valid until 2016.10.28
The Laboratory has been assessed and proved to be in compliance with
CNAS/CL01:2006(identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291
- Accredited by TUV Rheinland Shenzhen 2010.5.25
The Laboratory has been assessed according to the requirements ISO/IEC
17025
- Accredited by FCC, April 17, 2014
The Certificate Registration Number is 406365.
- Accredited by Industry Canada, March 5, 2010
The Certificate Registration Number is 4480A-2.

Name of Firm
Site Location

- : SHENZHEN EMTEK CO., LTD
- : Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen,
Guangdong, China

2. System Test Configuration

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 which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The Tx frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10-2013, conducted emissions from the EUT are measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The turn table 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 max. emission, the relative positions of this 21.5" Android Commercial Tablet (EUT) was rotated through three orthogonal axes according to the requirements in section 6.4, section 6.5 and section 6.6 of ANSI C63.10-2013.

2.4 Limitation

(1) Channel Separation Test

FCC Part 15, Subpart C Section 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB Bandwidth of the hopping channel, whichever is greater.

Frequency Range (MHz)	Limit(kHz)
902-928	>25kHz
2400-2483.5	>25kHz
5725-5850	>25kHz

(2) 20dB Bandwidth

Frequency Range(MHz)	Quantity of Hopping Channel	Limit(kHz)			
		50	25	15	75
902-928		<250	>250	NA	NA
2400-2483.5		NA	NA	>1000	<1000

(3) Quantity of Hopping Channel

FCC Part 15, Subpart C Section 15.247

Frequency Range (MHz)	20dB bandwidth <250kHz	Limit(Quantity of Hopping Channel)		
		20dB bandwidth >250k Hz	20dB bandwidth <1MHz	20dB bandwidth >1MHz
902-928	50	25	NA	NA
2400-2483.5	NA	NA	75	15
5725-5850	NA	NA	75	NA

(4) Time of Occupancy(Dwell Time)

FCC Part 15, Subpart C Section 15.247

Frequency Range (MHz)	20dB bandwidth <250kHz(50Channel)	LIMIT(rms)	
		20dB bandwidth >250kHz(25 Channel)	20dB bandwidth <1MHz(75Channel)
902-928	400(20S)	400(10S)	NA
2400-2483.5	NA	NA	400(30S)
5725-5850	NA	NA	400(30S)

Note: The “()” is all channel’s average time of occupancy.

(5) Maximum Peak Output Power

FCC Part 15, Subpart C Section 15.247

Frequency Range (MHz)	Quantity of Hopping Channel	LIMIT(W)			
		50	25	15	75
902-928		1(30dBm)	0.125(21dBm)	NA	NA
2400-2483.5		NA	NA	0.125(21dBm)	1(30dBm)
5725-5850		NA	NA	NA	1(30dBm)

(6) Band edge

FCC Part15, Subpart C Section 15.247, In any 100kHz bandwidth outside the frequency band in with the spread spectrum 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, attenuation below the general limits specified in section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).

Operating Frequency Range(MHz)	Spurious emission frequency	Limit Peak power ration to emission(dBc)	Emission level(dBuV/m)
902-928	<902	>20	NA
	>928	>20	NA
	960-1240	NA	54
2400-2483.5	<2400	>20	NA
	>2483.5-2500	NA	54
5725-5850	<5350-5460	NA	54
	<5725	>20	NA
	>5850	>20	NA

(7) Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

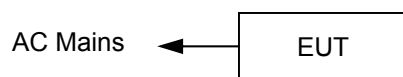
(8) Radiated Emission

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000GHz. The emissions from an intentional radiator shall not exceed the field strength level specified in the following table:

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance(m)	Field strength at 3m $\text{dB}\mu\text{V/m}$
0.009~0.490	2400/F(KHz)	300	/
0.490~1.705	2400/F(KHz)	30	/
1.705~30.0	30	30	/
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

- Remark:
1. Emission level in $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
 3. Distance extrapolation factor $= 40 \log (\text{Specific distance} / \text{test distance}) (\text{dB})$;
Limit line = Specific limits ($\text{dB}\mu\text{V}$) + distance extrapolation factor.

2.5 Configuration of Tested System



2.6 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	21.5" Android Commercial Tablet	N/A	PD215T8-SC	2AFI3- PD215T8	N/A	EUT
\		\	\	\	\	\

Note:

- (1) Unless otherwise denoted as EUT in 『Remark』 column, device(s) used in tested system is a support equipment.

2.7 Description of Test Modes

The EUT (21.5" Android Commercial Tablet) has been tested under normal operating condition. This EUT is a FHSS system. Pre-scanned tests, were conducted to determine the final configuration from all possible combinations. We use software control the EUT, Let EUT hopping on and transmit with highest power, all the modes have been tested. 79 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test

Channel	Frequency(MHz)
Low channel	2402
Middle channel	2441
High channel	2480

3. Summary of Test Results

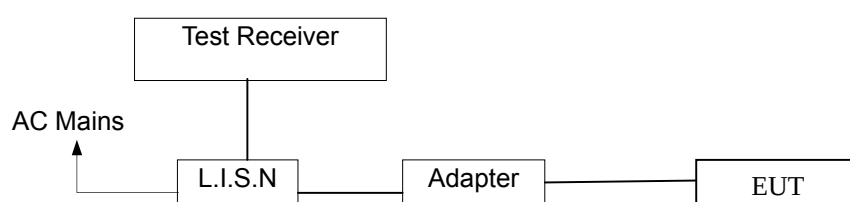
FCC Rules	Description Of Test	Result
FCC Part 15.247(a)(1)	Channel Separation Test	Compliant
FCC Part 15.247(a)(1)	20dB Bandwidth	Compliant
FCC Part 15.247(a)(1)	Quantity of Hopping Channel	Compliant
FCC Part 15.247(a)(1)	Time of Occupancy (Dwell Time)	Compliant
FCC Part 15.247(b)	Max Peak Output Power Test	Compliant
FCC Part 15.247(d)	Band Edge Test	Compliant
FCC Part 15.207	Conducted Emission	Compliant
FCC Part 15.247(d)&15.209	Radiated Emission	Compliant
FCC Part 15.247(d)	Antenna Port Emission	Compliant
FCC Part 15.203&15.247(b)	Antenna Requirement	Compliant

4. Conducted Emissions Test

4.1 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the three highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

4.2 Test SET-UP (Block Diagram of Configuration)



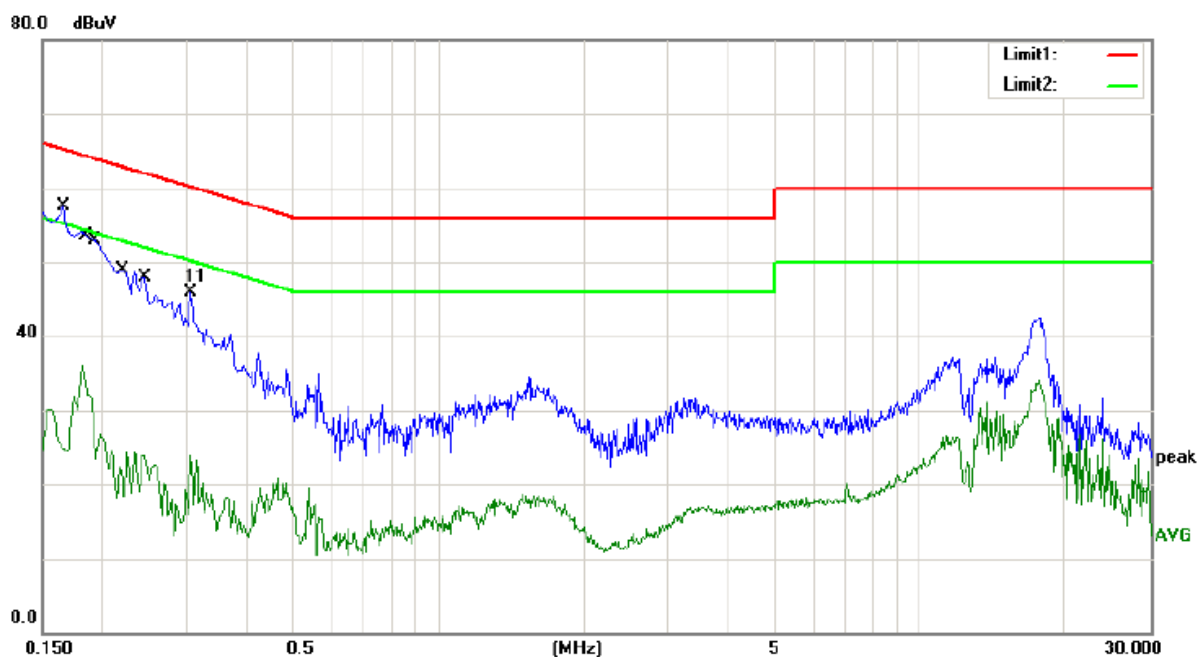
4.3 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/16/2015	05/15/2016
L.I.S.N.	Rohde & Schwarz	ENV216	101161	05/16/2015	05/15/2016
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	05/16/2015	05/15/2016
50Ω Coaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	05/16/2015	05/15/2016

4.4 Measurement Equipment Used

Pass.
 Please refer to the following data.

BT Mode:



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

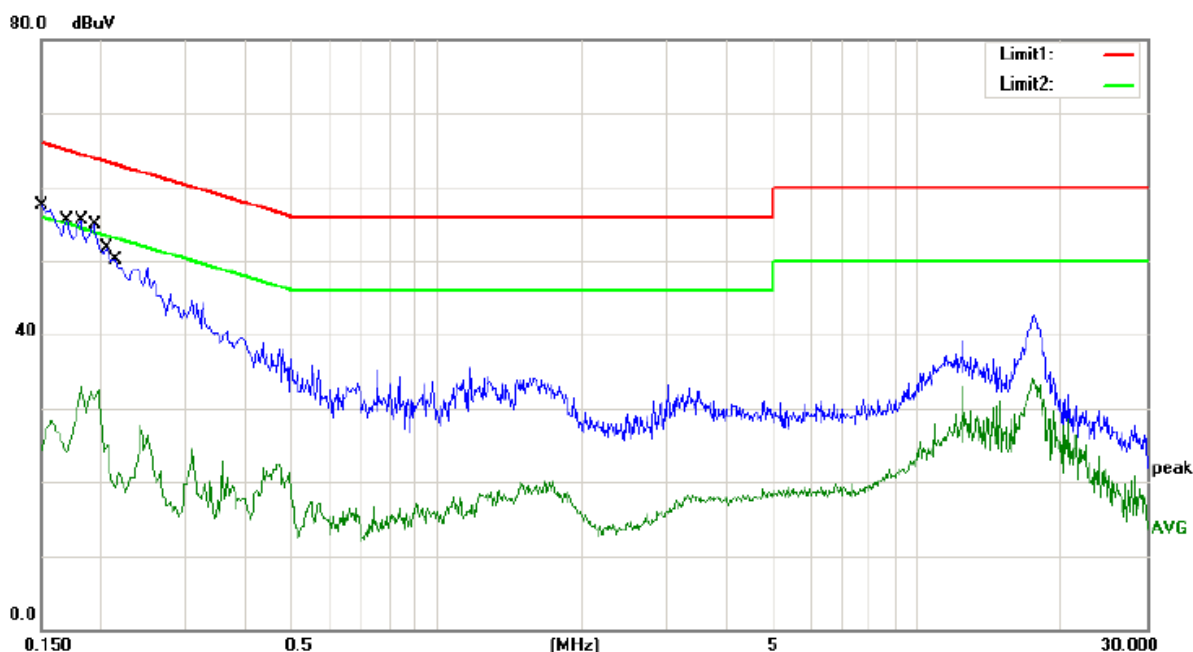
Power: AC 120V/60Hz

Humidity: 44 %

Mode: BT(GFSK,2402MHz)

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1660	46.40	11.00	57.40	65.16	-7.76	QP	
2		0.1660	13.90	11.00	24.90	55.16	-30.26	AVG	
3		0.1874	42.30	11.00	53.30	64.15	-10.85	QP	
4		0.1874	21.00	11.00	32.00	54.15	-22.15	AVG	
5		0.1955	41.40	11.00	52.40	63.80	-11.40	QP	
6		0.1955	13.70	11.00	24.70	53.80	-29.10	AVG	
7		0.2220	37.80	11.00	48.80	62.74	-13.94	QP	
8		0.2220	7.40	11.00	18.40	52.74	-34.34	AVG	
9		0.2460	36.90	11.00	47.90	61.89	-13.99	QP	
10		0.2460	12.70	11.00	23.70	51.89	-28.19	AVG	
11		0.3060	34.80	11.00	45.80	60.08	-14.28	QP	
12	*	0.3060	34.80	11.00	45.80	50.08	-4.28	AVG	



Site site #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

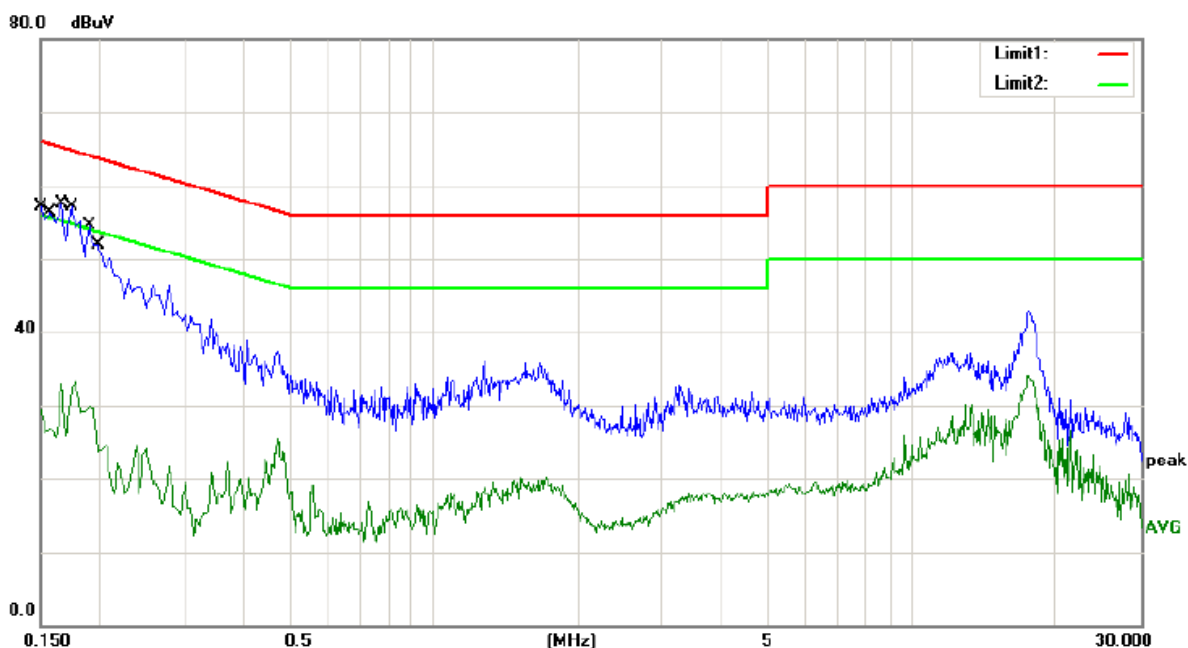
Power: AC 120V/60Hz

Humidity: 44 %

Mode: BT(GFSK,2402MHz)

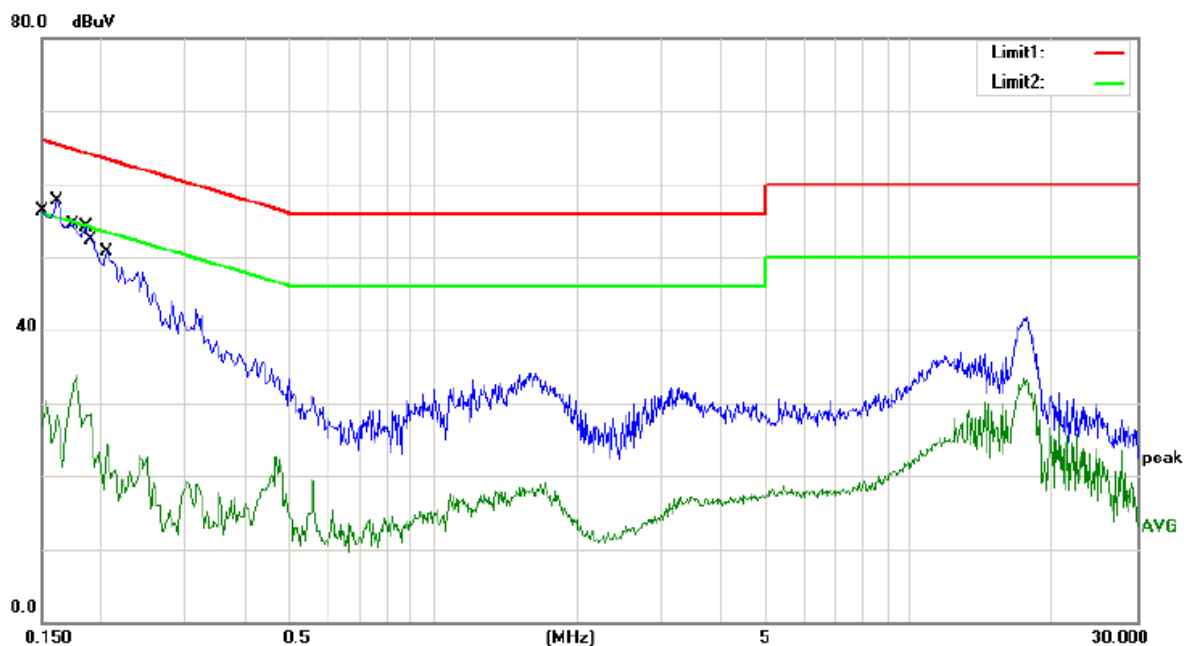
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	46.50	11.00	57.50	66.00	-8.50	QP	
2		0.1500	13.20	11.00	24.20	56.00	-31.80	AVG	
3		0.1700	44.40	11.00	55.40	64.96	-9.56	QP	
4		0.1700	13.00	11.00	24.00	54.96	-30.96	AVG	
5		0.1820	44.40	11.00	55.40	64.39	-8.99	QP	
6		0.1820	21.40	11.00	32.40	54.39	-21.99	AVG	
7		0.1940	43.90	11.00	54.90	63.86	-8.96	QP	
8		0.1940	20.40	11.00	31.40	53.86	-22.46	AVG	
9		0.2060	40.60	11.00	51.60	63.37	-11.77	QP	
10		0.2060	14.10	11.00	25.10	53.37	-28.27	AVG	
11		0.2140	39.10	11.00	50.10	63.05	-12.95	QP	
12		0.2140	8.40	11.00	19.40	53.05	-33.65	AVG	



Site site #1 Phase: **N** Temperature: 22
 Limit: (CE)FCC PART 15 class B_QP Power: AC 120V/60Hz Humidity: 44 %
 Mode: BT(GFSK,2441MHz)
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	46.10	11.00	57.10	66.00	-8.90	QP	
2		0.1500	18.50	11.00	29.50	56.00	-26.50	AVG	
3		0.1580	45.30	11.00	56.30	65.57	-9.27	QP	
4		0.1580	15.80	11.00	26.80	55.57	-28.77	AVG	
5	*	0.1660	46.50	11.00	57.50	65.16	-7.66	QP	
6		0.1660	21.80	11.00	32.80	55.16	-22.36	AVG	
7		0.1750	45.40	11.00	56.40	64.72	-8.32	QP	
8		0.1750	21.40	11.00	32.40	54.72	-22.32	AVG	
9		0.1900	43.50	11.00	54.50	64.04	-9.54	QP	
10		0.1900	18.80	11.00	29.80	54.04	-24.24	AVG	
11		0.1997	40.00	11.00	51.00	63.62	-12.62	QP	
12		0.1997	12.80	11.00	23.80	53.62	-29.82	AVG	



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

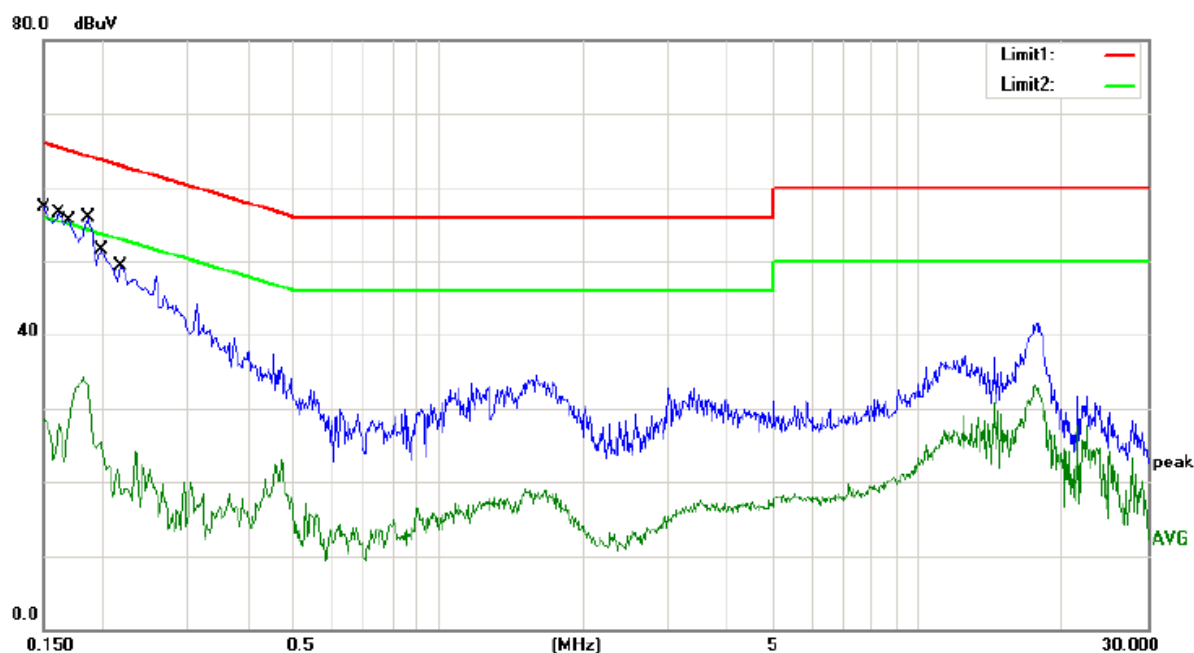
Power: AC 120V/60Hz

Humidity: 44 %

Mode: BT(GFSK,2441MHz)

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	44.90	11.00	55.90	66.00	-10.10	QP	
2		0.1500	15.80	11.00	26.80	56.00	-29.20	AVG	
3	*	0.1620	46.70	11.00	57.70	65.36	-7.66	QP	
4		0.1620	17.20	11.00	28.20	55.36	-27.16	AVG	
5		0.1740	43.40	11.00	54.40	64.77	-10.37	QP	
6		0.1740	21.40	11.00	32.40	54.77	-22.37	AVG	
7		0.1860	43.10	11.00	54.10	64.21	-10.11	QP	
8		0.1860	17.30	11.00	28.30	54.21	-25.91	AVG	
9		0.1924	40.90	11.00	51.90	63.93	-12.03	QP	
10		0.1924	13.10	11.00	24.10	53.93	-29.83	AVG	
11		0.2060	39.70	11.00	50.70	63.37	-12.67	QP	
12		0.2060	13.20	11.00	24.20	53.37	-29.17	AVG	



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

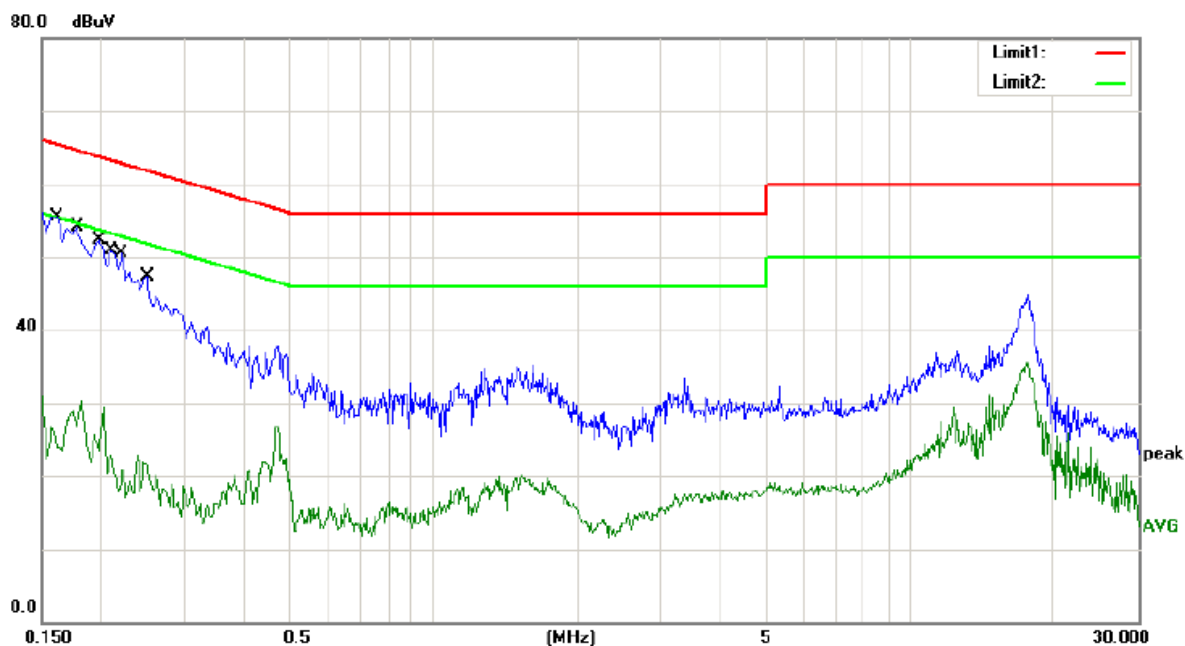
Power: AC 120V/60Hz

Humidity: 44 %

Mode: BT(GFSK,2480MHz)

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1516	45.60	11.00	56.60	65.91	-9.31	QP	
2		0.1516	17.20	11.00	28.20	55.91	-27.71	AVG	
3		0.1620	45.40	11.00	56.40	65.36	-8.96	QP	
4		0.1620	16.90	11.00	27.90	55.36	-27.46	AVG	
5		0.1700	44.40	11.00	55.40	64.96	-9.56	QP	
6		0.1700	17.30	11.00	28.30	54.96	-26.66	AVG	
7	*	0.1860	44.90	11.00	55.90	64.21	-8.31	QP	
8		0.1860	21.30	11.00	32.30	54.21	-21.91	AVG	
9		0.1980	40.40	11.00	51.40	63.69	-12.29	QP	
10		0.1980	14.00	11.00	25.00	53.69	-28.69	AVG	
11		0.2180	38.30	11.00	49.30	62.89	-13.59	QP	
12		0.2180	7.50	11.00	18.50	52.89	-34.39	AVG	



Site site #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

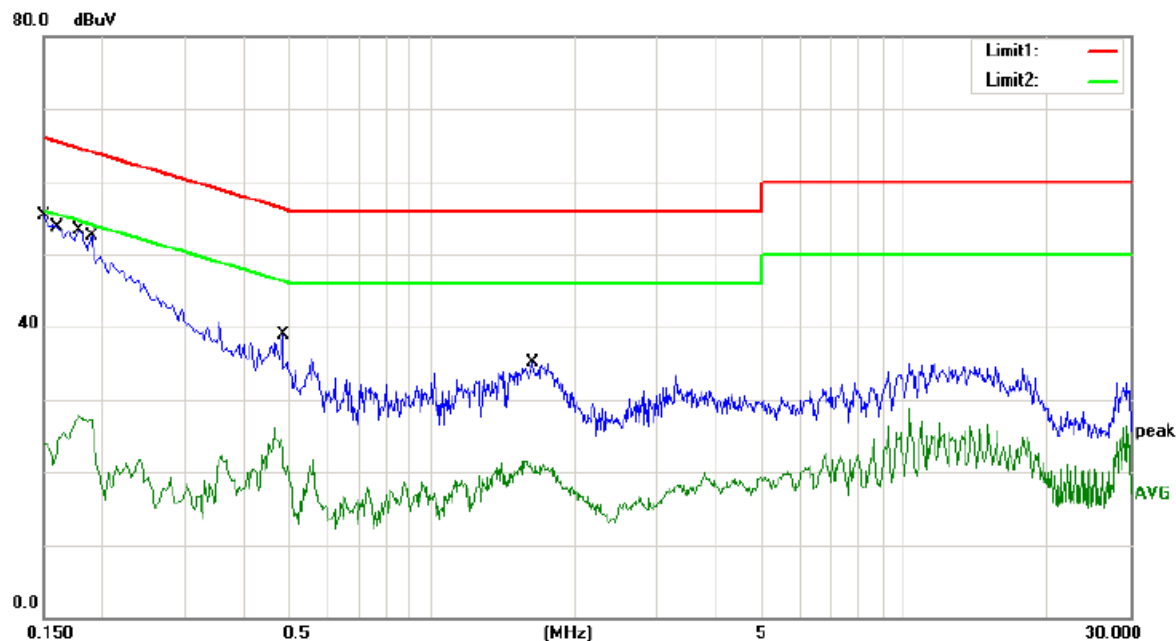
Humidity: 44 %

Mode: BT(GFSK,2480MHz)

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1620	44.50	11.00	55.50	65.36	-9.86	QP	
2		0.1620	12.90	11.00	23.90	55.36	-31.46	AVG	
3		0.1780	43.00	11.00	54.00	64.58	-10.58	QP	
4		0.1780	16.30	11.00	27.30	54.58	-27.28	AVG	
5		0.1980	41.30	11.00	52.30	63.69	-11.39	QP	
6		0.1980	13.30	11.00	24.30	53.69	-29.39	AVG	
7		0.2100	39.90	11.00	50.90	63.21	-12.31	QP	
8		0.2100	11.80	11.00	22.80	53.21	-30.41	AVG	
9		0.2220	39.50	11.00	50.50	62.74	-12.24	QP	
10		0.2220	9.90	11.00	20.90	52.74	-31.84	AVG	
11		0.2500	36.30	11.00	47.30	61.76	-14.46	QP	
12		0.2500	10.00	11.00	21.00	51.76	-30.76	AVG	

RJ45-ETHO



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

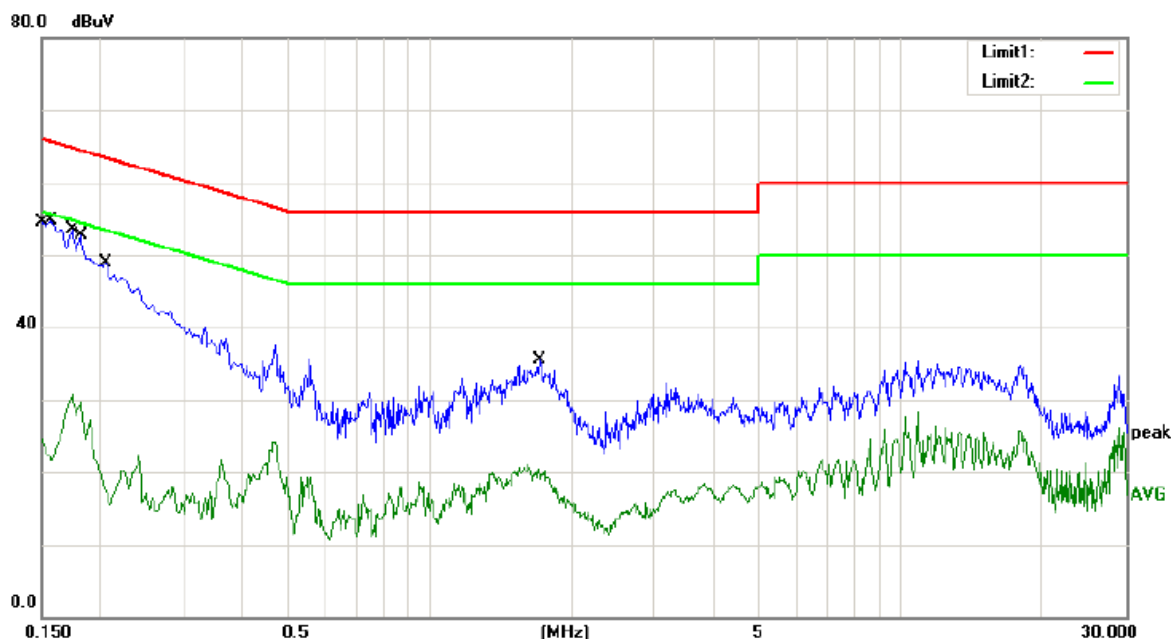
Power: AC 120V/60Hz

Humidity: 44 %

Mode: RJ45-ETHO

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	36.80	11.00	47.80	66.00	-18.20	QP	
2		0.1500	12.50	11.00	23.50	56.00	-32.50	AVG	
3		0.1620	35.60	11.00	46.60	65.36	-18.76	QP	
4		0.1620	13.90	11.00	24.90	55.36	-30.46	AVG	
5	*	0.1780	38.50	11.00	49.50	64.58	-15.08	QP	
6		0.1780	18.20	11.00	29.20	54.58	-25.38	AVG	
7		0.1900	33.70	11.00	44.70	64.04	-19.34	QP	
8		0.1900	12.60	11.00	23.60	54.04	-30.44	AVG	
9		0.4820	21.90	11.00	32.90	56.30	-23.40	QP	
10		0.4820	11.20	11.00	22.20	46.30	-24.10	AVG	
11		1.6300	19.10	11.00	30.10	56.00	-25.90	QP	
12		1.6300	9.60	11.00	20.60	46.00	-25.40	AVG	



Site site #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

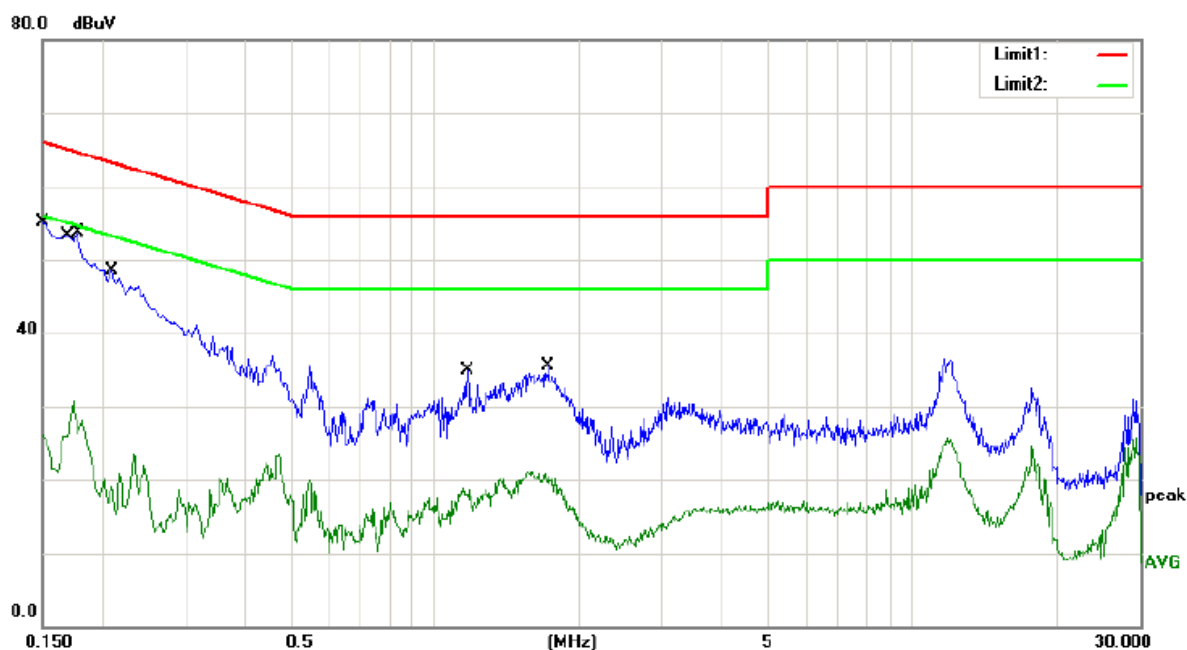
Humidity: 44 %

Mode: RJ45-ETHO

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	36.70	11.00	47.70	66.00	-18.30	QP	
2		0.1500	13.70	11.00	24.70	56.00	-31.30	AVG	
3		0.1580	35.70	11.00	46.70	65.57	-18.87	QP	
4		0.1580	10.70	11.00	21.70	55.57	-33.87	AVG	
5	*	0.1740	36.00	11.00	47.00	64.77	-17.77	QP	
6		0.1740	19.00	11.00	30.00	54.77	-24.77	AVG	
7		0.1820	35.30	11.00	46.30	64.39	-18.09	QP	
8		0.1820	18.00	11.00	29.00	54.39	-25.39	AVG	
9		0.2060	29.40	11.00	40.40	63.37	-22.97	QP	
10		0.2060	6.20	11.00	17.20	53.37	-36.17	AVG	
11		1.7100	19.10	11.00	30.10	56.00	-25.90	QP	
12		1.7100	8.10	11.00	19.10	46.00	-26.90	AVG	

HDMI OUTPUT



Site site #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

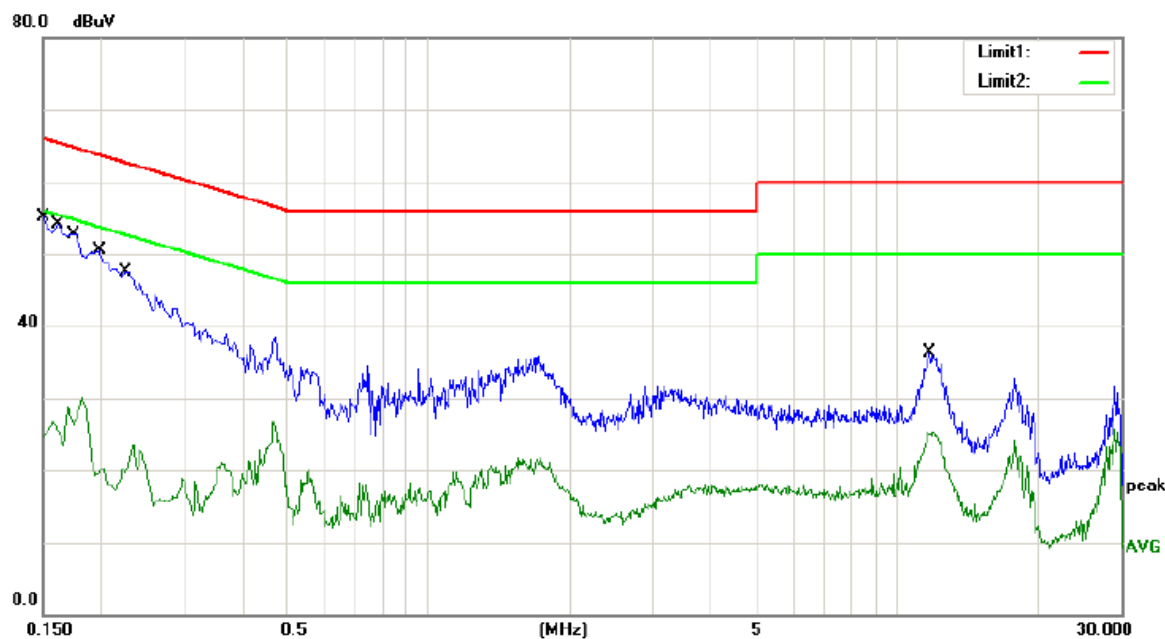
Power: AC 120V/60Hz

Humidity: 44 %

Mode: HDMI Output

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	36.80	11.00	47.80	66.00	-18.20	QP	
2		0.1500	15.00	11.00	26.00	56.00	-30.00	AVG	
3		0.1700	35.70	11.00	46.70	64.96	-18.26	QP	
4		0.1700	14.90	11.00	25.90	54.96	-29.06	AVG	
5	*	0.1780	36.10	11.00	47.10	64.58	-17.48	QP	
6		0.1780	16.00	11.00	27.00	54.58	-27.58	AVG	
7		0.2100	29.20	11.00	40.20	63.21	-23.01	QP	
8		0.2100	8.00	11.00	19.00	53.21	-34.21	AVG	
9		1.1700	16.70	11.00	27.70	56.00	-28.30	QP	
10		1.1700	6.60	11.00	17.60	46.00	-28.40	AVG	
11		1.7340	18.70	11.00	29.70	56.00	-26.30	QP	
12		1.7340	9.40	11.00	20.40	46.00	-25.60	AVG	



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

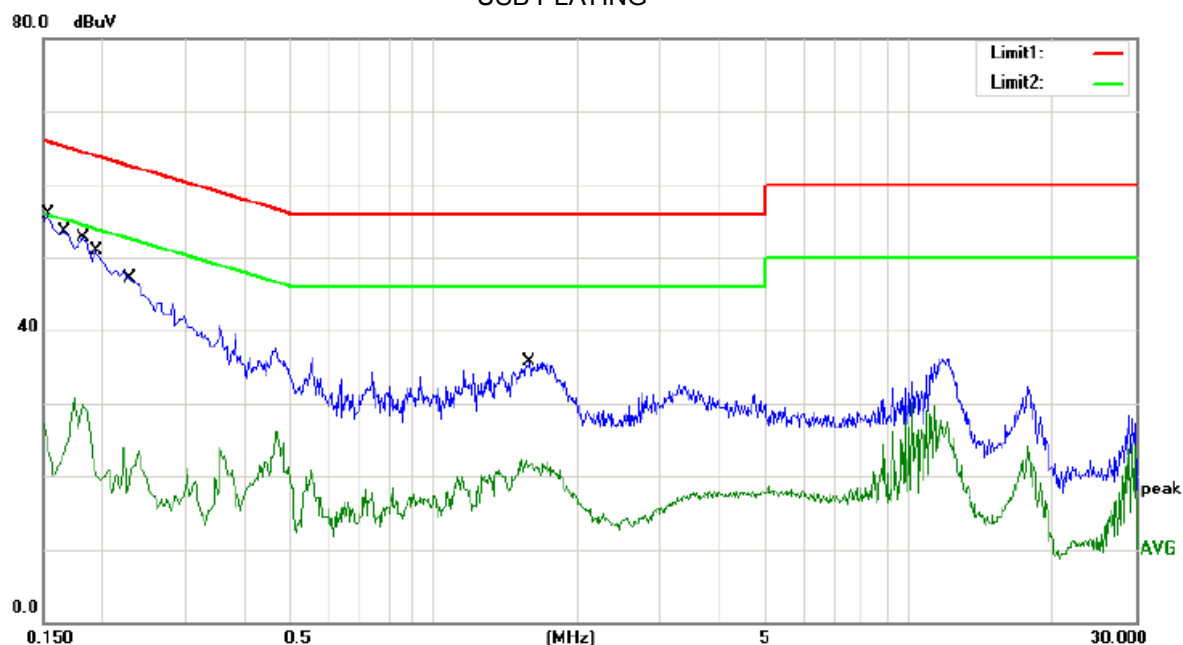
Humidity: 44 %

Mode: HDMI Output

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	37.00	11.00	48.00	66.00	-18.00	QP	
2		0.1500	13.70	11.00	24.70	56.00	-31.30	AVG	
3		0.1620	35.80	11.00	46.80	65.36	-18.56	QP	
4		0.1620	12.20	11.00	23.20	55.36	-32.16	AVG	
5	*	0.1750	36.20	11.00	47.20	64.72	-17.52	QP	
6		0.1750	15.60	11.00	26.60	54.72	-28.12	AVG	
7		0.1980	31.00	11.00	42.00	63.69	-21.69	QP	
8		0.1980	8.50	11.00	19.50	53.69	-34.19	AVG	
9		0.2260	28.40	11.00	39.40	62.60	-23.20	QP	
10		0.2260	8.70	11.00	19.70	52.60	-32.90	AVG	
11		11.6880	19.90	11.00	30.90	60.00	-29.10	QP	
12		11.6880	13.70	11.00	24.70	50.00	-25.30	AVG	

USB PLAYING



Site site #1

Phase: L1

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

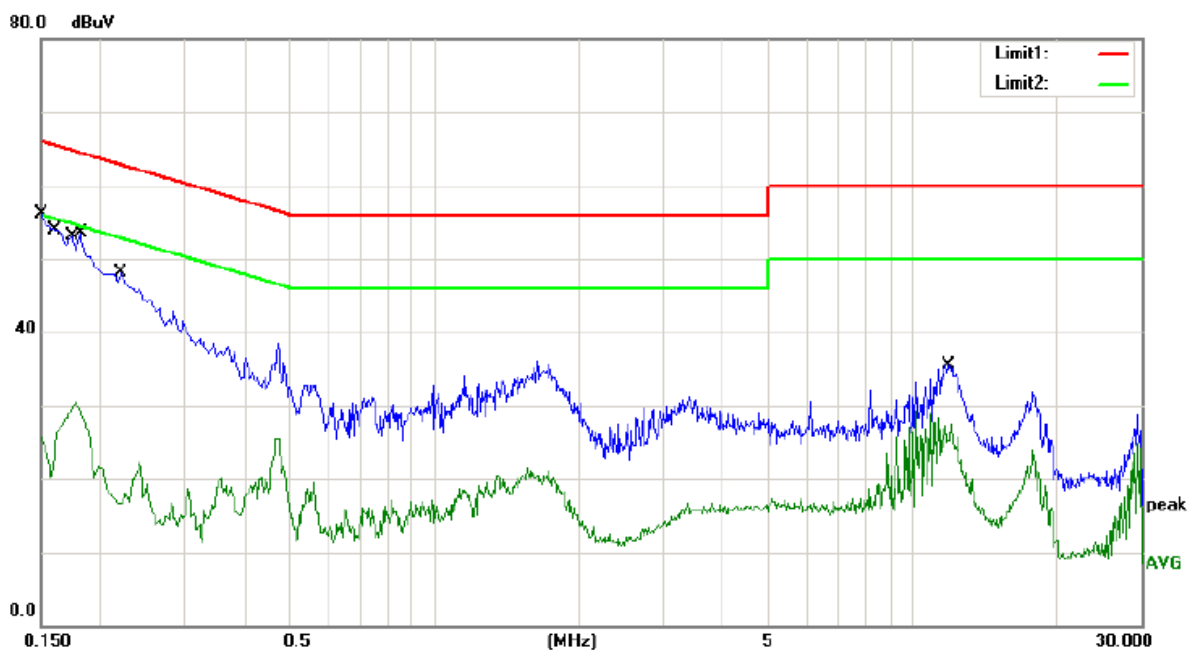
Power: AC 120V/60Hz

Humidity: 44 %

Mode: USB Playing

Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1540	36.70	11.00	47.70	65.78	-18.08	QP	
2	0.1540	12.90	11.00	23.90	55.78	-31.88	AVG	
3	0.1660	36.30	11.00	47.30	65.16	-17.86	QP	
4	0.1660	12.10	11.00	23.10	55.16	-32.06	AVG	
5 *	0.1820	35.70	11.00	46.70	64.39	-17.69	QP	
6	0.1820	18.70	11.00	29.70	54.39	-24.69	AVG	
7	0.1940	31.90	11.00	42.90	63.86	-20.96	QP	
8	0.1940	9.20	11.00	20.20	53.86	-33.66	AVG	
9	0.2316	28.00	11.00	39.00	62.39	-23.39	QP	
10	0.2316	10.20	11.00	21.20	52.39	-31.19	AVG	
11	1.5900	19.50	11.00	30.50	56.00	-25.50	QP	
12	1.5900	10.40	11.00	21.40	46.00	-24.60	AVG	



Site site #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

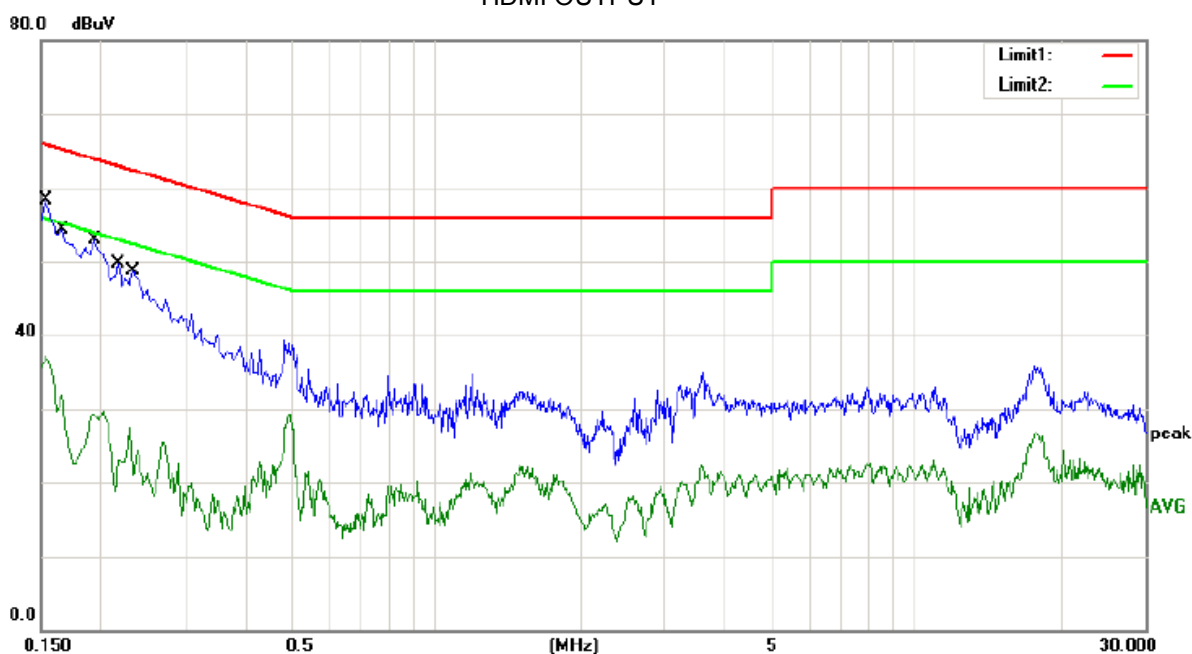
Humidity: 44 %

Mode: USB Playing

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	36.70	11.00	47.70	66.00	-18.30	QP	
2		0.1500	14.60	11.00	25.60	56.00	-30.40	AVG	
3		0.1620	35.30	11.00	46.30	65.36	-19.06	QP	
4		0.1620	15.30	11.00	26.30	55.36	-29.06	AVG	
5	*	0.1740	36.00	11.00	47.00	64.77	-17.77	QP	
6		0.1740	16.20	11.00	27.20	54.77	-27.57	AVG	
7		0.1820	35.20	11.00	46.20	64.39	-18.19	QP	
8		0.1820	17.90	11.00	28.90	54.39	-25.49	AVG	
9		0.2220	28.30	11.00	39.30	62.74	-23.44	QP	
10		0.2220	5.70	11.00	16.70	52.74	-36.04	AVG	
11		11.9200	19.40	11.00	30.40	60.00	-29.60	QP	
12		11.9200	14.40	11.00	25.40	50.00	-24.60	AVG	

HDMI OUTPUT



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

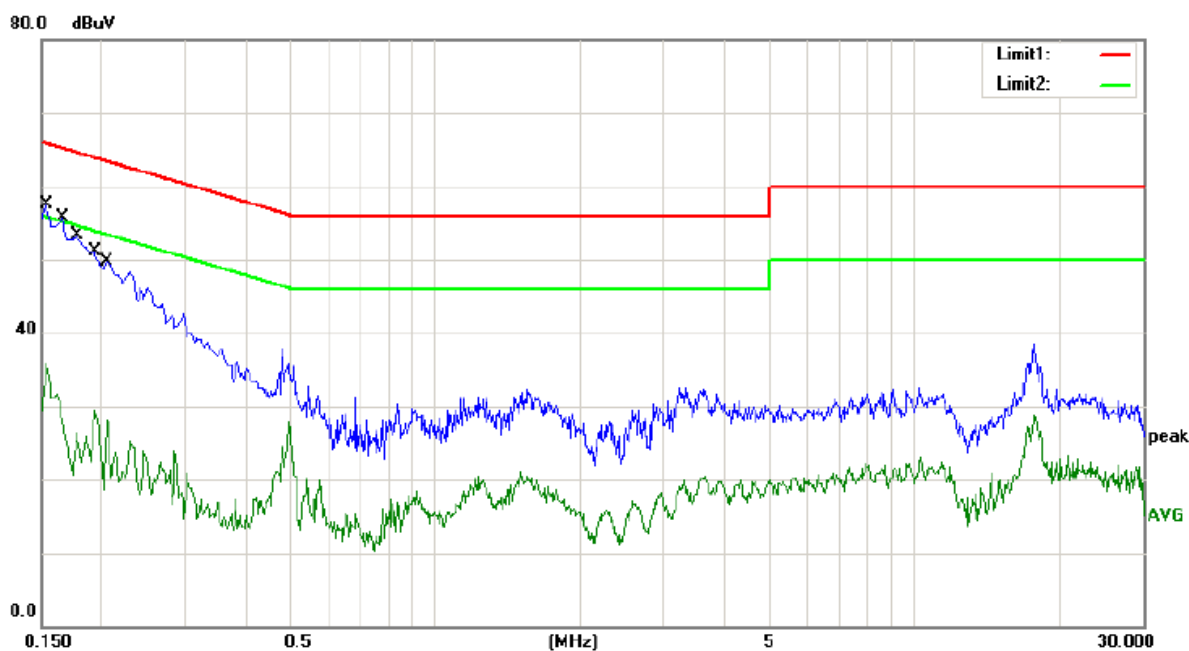
Power: AC 240V/60Hz

Humidity: 44 %

Mode: HDMI Output

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	44.60	11.00	55.60	66.00	-10.40	QP	
2		0.1500	24.60	11.00	35.60	56.00	-20.40	AVG	
3	*	0.1540	47.30	11.00	58.30	65.78	-7.48	QP	
4		0.1540	26.00	11.00	37.00	55.78	-18.78	AVG	
5		0.1660	43.30	11.00	54.30	65.16	-10.86	QP	
6		0.1660	21.00	11.00	32.00	55.16	-23.16	AVG	
7		0.1940	41.90	11.00	52.90	63.86	-10.96	QP	
8		0.1940	18.20	11.00	29.20	53.86	-24.66	AVG	
9		0.2180	38.70	11.00	49.70	62.89	-13.19	QP	
10		0.2180	12.00	11.00	23.00	52.89	-29.89	AVG	
11		0.2340	37.60	11.00	48.60	62.31	-13.71	QP	
12		0.2340	10.10	11.00	21.10	52.31	-31.21	AVG	



Site site #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 240V/60Hz

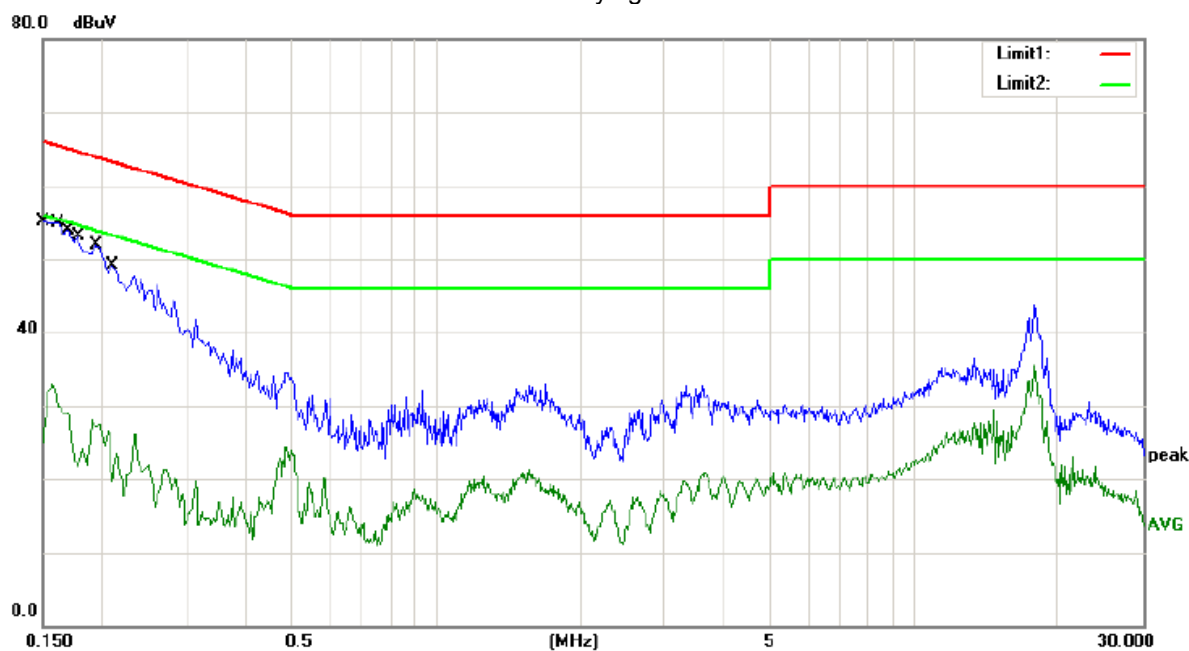
Humidity: 44 %

Mode: HDMI Output

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	44.60	11.00	55.60	66.00	-10.40	QP	
2		0.1500	18.50	11.00	29.50	56.00	-26.50	AVG	
3	*	0.1540	46.50	11.00	57.50	65.78	-8.28	QP	
4		0.1540	24.70	11.00	35.70	55.78	-20.08	AVG	
5		0.1660	44.70	11.00	55.70	65.16	-9.46	QP	
6		0.1660	16.90	11.00	27.90	55.16	-27.26	AVG	
7		0.1780	42.30	11.00	53.30	64.58	-11.28	QP	
8		0.1780	14.60	11.00	25.60	54.58	-28.98	AVG	
9		0.1940	40.00	11.00	51.00	63.86	-12.86	QP	
10		0.1940	18.30	11.00	29.30	53.86	-24.56	AVG	
11		0.2060	38.60	11.00	49.60	63.37	-13.77	QP	
12		0.2060	17.10	11.00	28.10	53.37	-25.27	AVG	

USB Playing



Site site #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

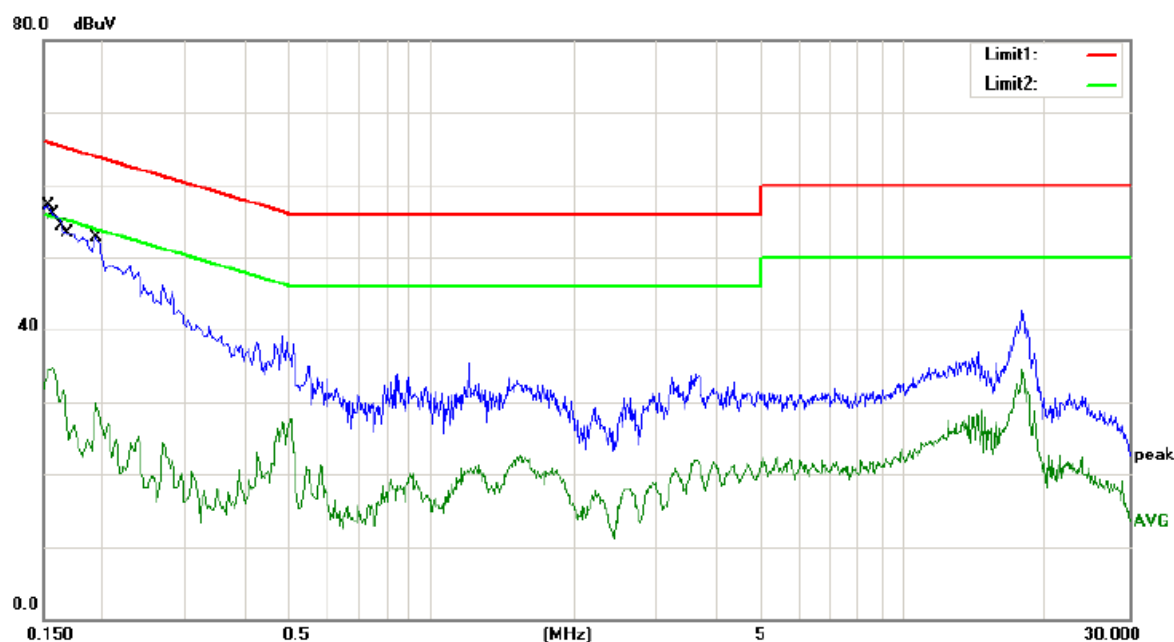
Power: AC 240V/60Hz

Humidity: 44 %

Mode: USB Playing

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	44.10	11.00	55.10	66.00	-10.90	QP	
2		0.1500	14.00	11.00	25.00	56.00	-31.00	AVG	
3	*	0.1620	43.90	11.00	54.90	65.36	-10.46	QP	
4		0.1620	18.90	11.00	29.90	55.36	-25.46	AVG	
5		0.1700	42.90	11.00	53.90	64.96	-11.06	QP	
6		0.1700	18.10	11.00	29.10	54.96	-25.86	AVG	
7		0.1780	42.00	11.00	53.00	64.58	-11.58	QP	
8		0.1780	11.00	11.00	22.00	54.58	-32.58	AVG	
9		0.1940	40.90	11.00	51.90	63.86	-11.96	QP	
10		0.1940	16.20	11.00	27.20	53.86	-26.66	AVG	
11		0.2100	38.00	11.00	49.00	63.21	-14.21	QP	
12		0.2100	8.70	11.00	19.70	53.21	-33.51	AVG	



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 240V/60Hz

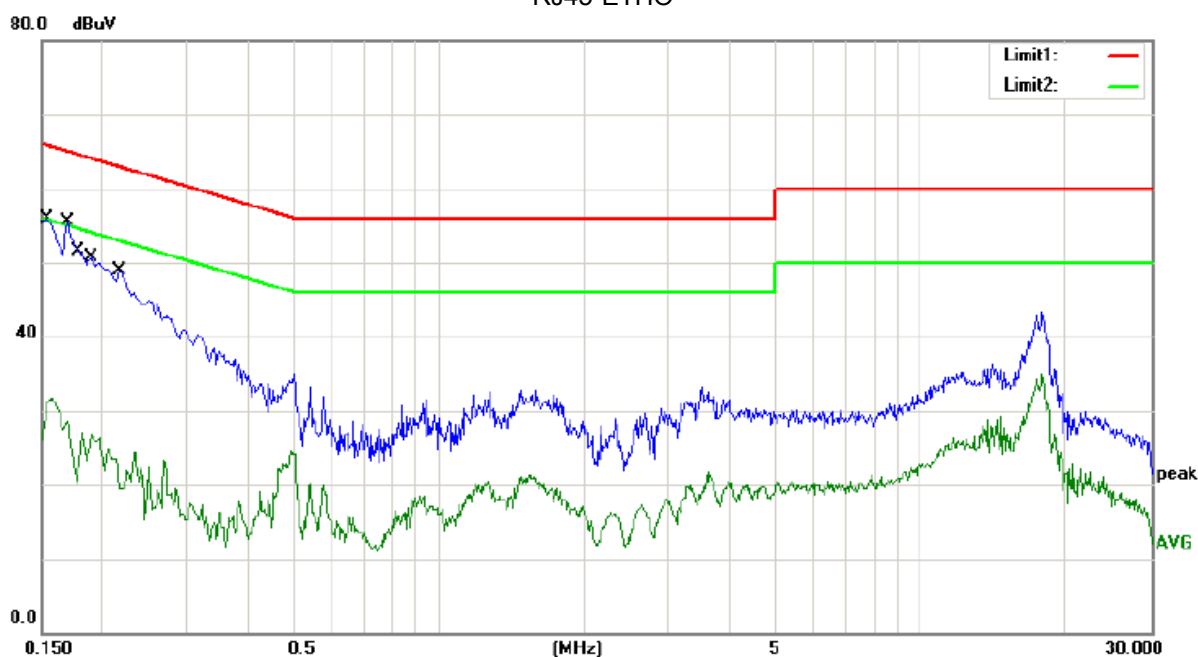
Humidity: 44 %

Mode: USB Playing

Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1500	45.70	11.00	56.70	66.00	-9.30	QP	
2	0.1500	20.90	11.00	31.90	56.00	-24.10	AVG	
3 *	0.1540	46.10	11.00	57.10	65.78	-8.68	QP	
4	0.1540	23.40	11.00	34.40	55.78	-21.38	AVG	
5	0.1590	44.70	11.00	55.70	65.52	-9.82	QP	
6	0.1590	22.50	11.00	33.50	55.52	-22.02	AVG	
7	0.1660	42.50	11.00	53.50	65.16	-11.66	QP	
8	0.1660	20.60	11.00	31.60	55.16	-23.56	AVG	
9	0.1720	42.20	11.00	53.20	64.86	-11.66	QP	
10	0.1720	14.90	11.00	25.90	54.86	-28.96	AVG	
11	0.1940	41.60	11.00	52.60	63.86	-11.26	QP	
12	0.1940	18.60	11.00	29.60	53.86	-24.26	AVG	

RJ45-ETHO



Site site #1

 Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

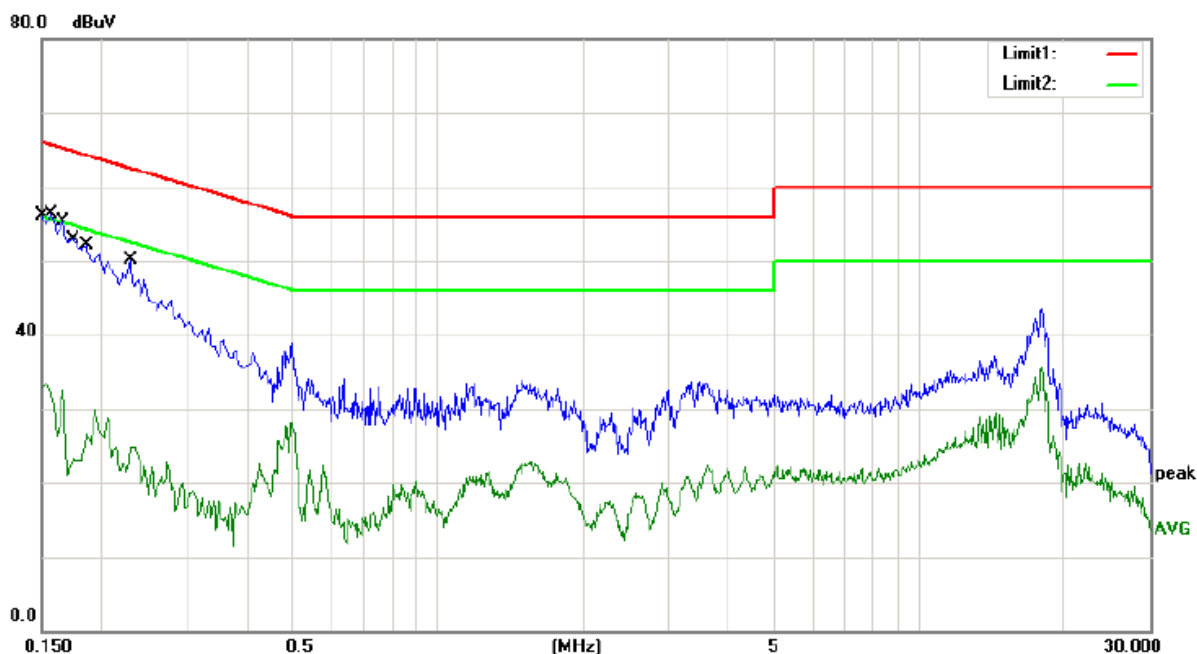
Power: AC 240V/60Hz

Humidity: 44 %

Mode: RJ45-ETHO

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	44.40	11.00	55.40	66.00	-10.60	QP	
2		0.1500	15.00	11.00	26.00	56.00	-30.00	AVG	
3		0.1540	44.90	11.00	55.90	65.78	-9.88	QP	
4		0.1540	20.20	11.00	31.20	55.78	-24.58	AVG	
5	*	0.1700	44.50	11.00	55.50	64.96	-9.46	QP	
6		0.1700	17.50	11.00	28.50	54.96	-26.46	AVG	
7		0.1806	40.50	11.00	51.50	64.46	-12.96	QP	
8		0.1806	13.60	11.00	24.60	54.46	-29.86	AVG	
9		0.1900	39.70	11.00	50.70	64.04	-13.34	QP	
10		0.1900	15.80	11.00	26.80	54.04	-27.24	AVG	
11		0.2180	37.80	11.00	48.80	62.89	-14.09	QP	
12		0.2180	8.50	11.00	19.50	52.89	-33.39	AVG	



Site site #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 240V/60Hz

Humidity: 44 %

Mode: RJ45-ETH0

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	45.00	11.00	56.00	66.00	-10.00	QP	
2		0.1500	21.80	11.00	32.80	56.00	-23.20	AVG	
3	*	0.1580	45.30	11.00	56.30	65.57	-9.27	QP	
4		0.1580	20.60	11.00	31.60	55.57	-23.97	AVG	
5		0.1660	44.20	11.00	55.20	65.16	-9.96	QP	
6		0.1660	21.50	11.00	32.50	55.16	-22.66	AVG	
7		0.1758	41.40	11.00	52.40	64.68	-12.28	QP	
8		0.1758	12.10	11.00	23.10	54.68	-31.58	AVG	
9		0.1864	40.50	11.00	51.50	64.20	-12.70	QP	
10		0.1864	15.40	11.00	26.40	54.20	-27.80	AVG	
11		0.2300	39.00	11.00	50.00	62.45	-12.45	QP	
12		0.2300	13.90	11.00	24.90	52.45	-27.55	AVG	

5. Radiated Emission Test

5.1 Measurement Procedure

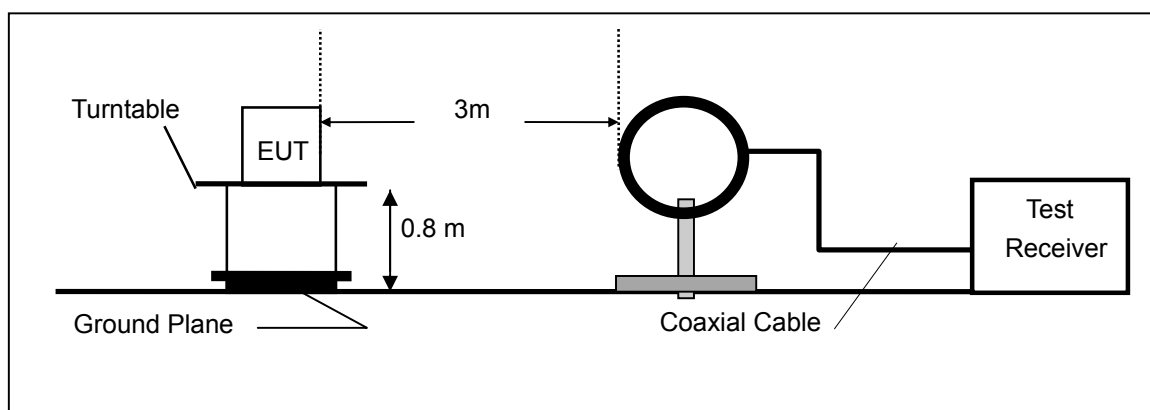
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured was complete.

The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector (RBW=100kHz, VBW=300kHz) and all final readings of measurement from Test Receiver are Quasi-Peak values(Quasi Peak detector used with a bandwidth of 120 kHz).

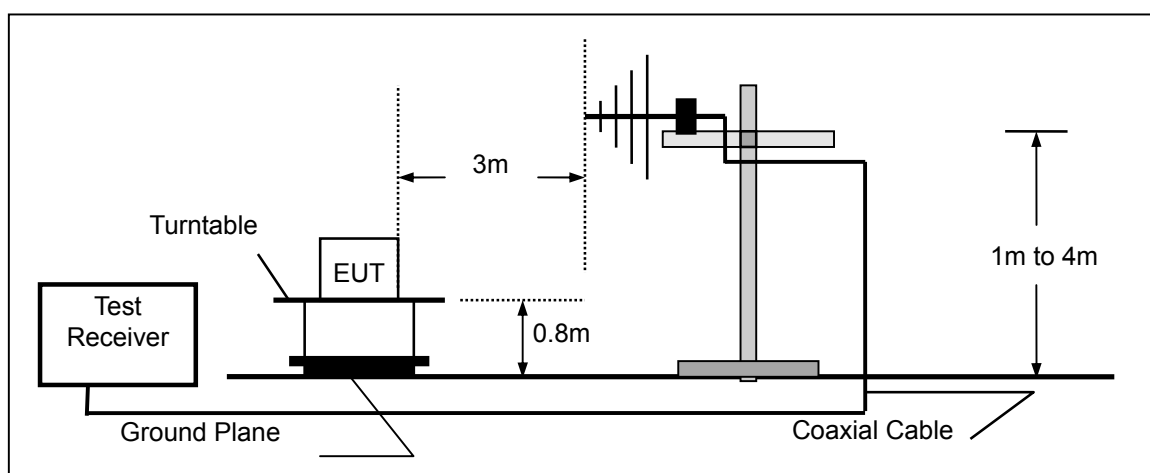
The frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

5.2 Test SET-UP (Block Diagram of Configuration)

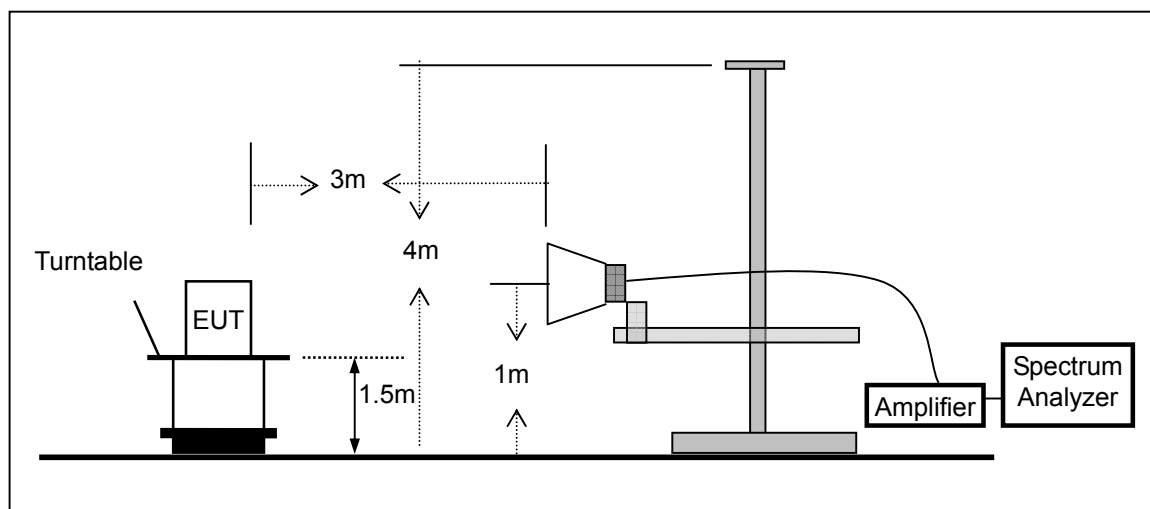
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



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



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



5.3 Measurement Equipment Used

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/16/2015	1 Year
2.	Pre-Amplifier	HP	8447D	2944A07999	05/16/2015	1 Year
3.	Pre-Amplifier	A.H.	PAM-0126	1415261	05/16/2015	1 Year
4.	Bilog Antenna	Schwarzbeck	VULB9163	142	05/16/2015	1 Year
5.	Loop Antenna	Schwarzbeck	FMZB 1519	1519-012	05/16/2015	1 Year
6.	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/16/2015	1 Year
7.	Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/16/2015	1 Year
8.	Cable	Schwarzbeck	AK9513	ACRX1	05/16/2015	1 Year
9.	Cable	Rosenberger	N/A	FP2RX2	05/16/2015	1 Year
10.	Cable	Schwarzbeck	AK9513	CRPX1	05/16/2015	1 Year
11.	Cable	Schwarzbeck	AK9513	CRRX2	05/16/2015	1 Year

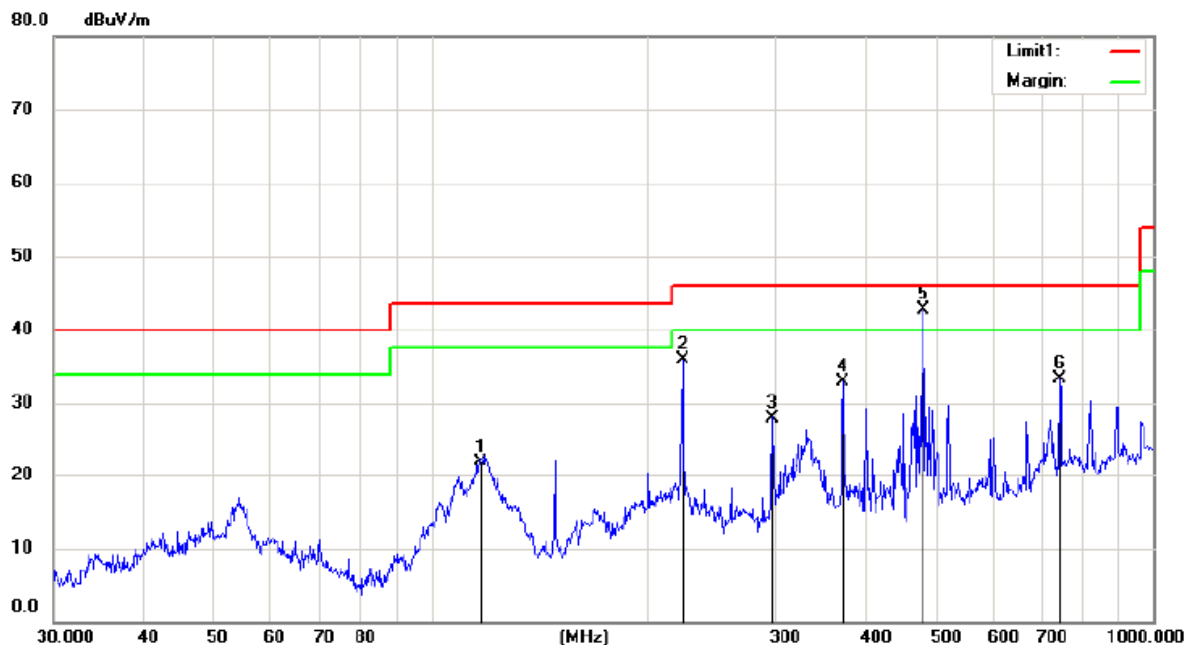
5.4 Measurement Result

(For range 9KHz~30MHz, The measured value is really too low to be recorded.)

Below 1000MHz (30M-1GHz)

Bluetooth mode:

(Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result was report as below.)



Site site #1

Polarization: **Horizontal**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

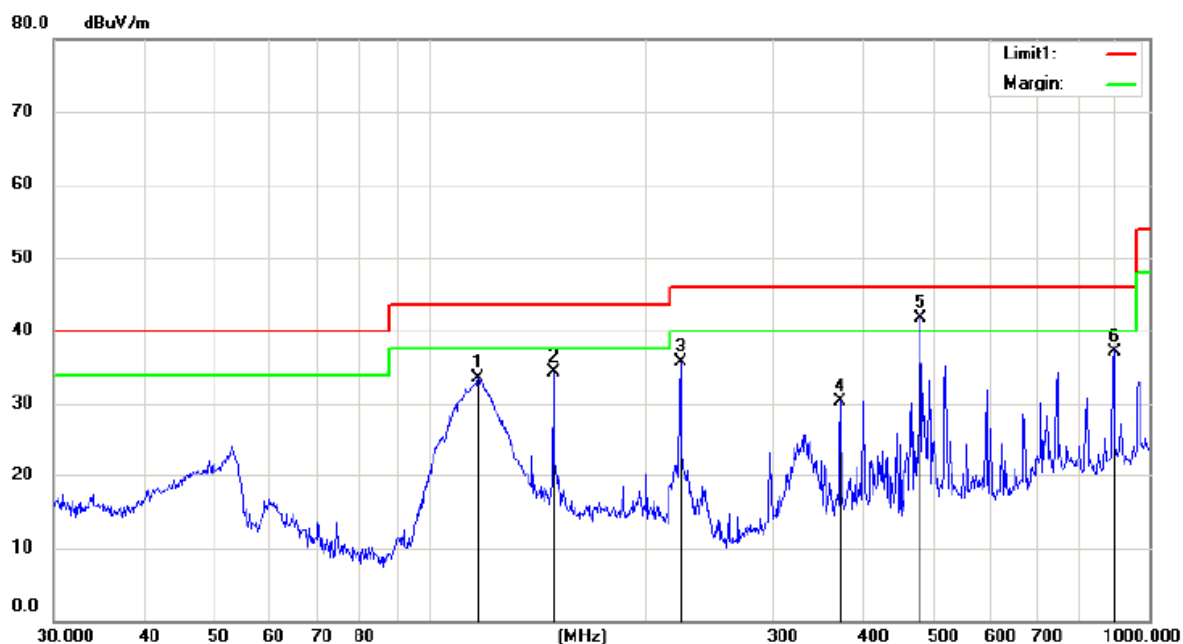
Power: AC 120V/60Hz

Humidity: 52 %

Mode:BT(GFSK,2402MHz)

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		116.5401	44.93	-22.93	22.00	43.50	-21.50	QP		
2		222.9502	57.90	-22.00	35.90	46.00	-10.10	QP		
3		297.2241	46.96	-18.96	28.00	46.00	-18.00	QP		
4		372.0045	50.26	-17.36	32.90	46.00	-13.10	QP		
5	*	480.5276	57.89	-15.19	42.70	46.00	-3.30	QP		
6		742.2587	42.35	-9.05	33.30	46.00	-12.70	QP		



Site site #1

Polarization: **Vertical**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

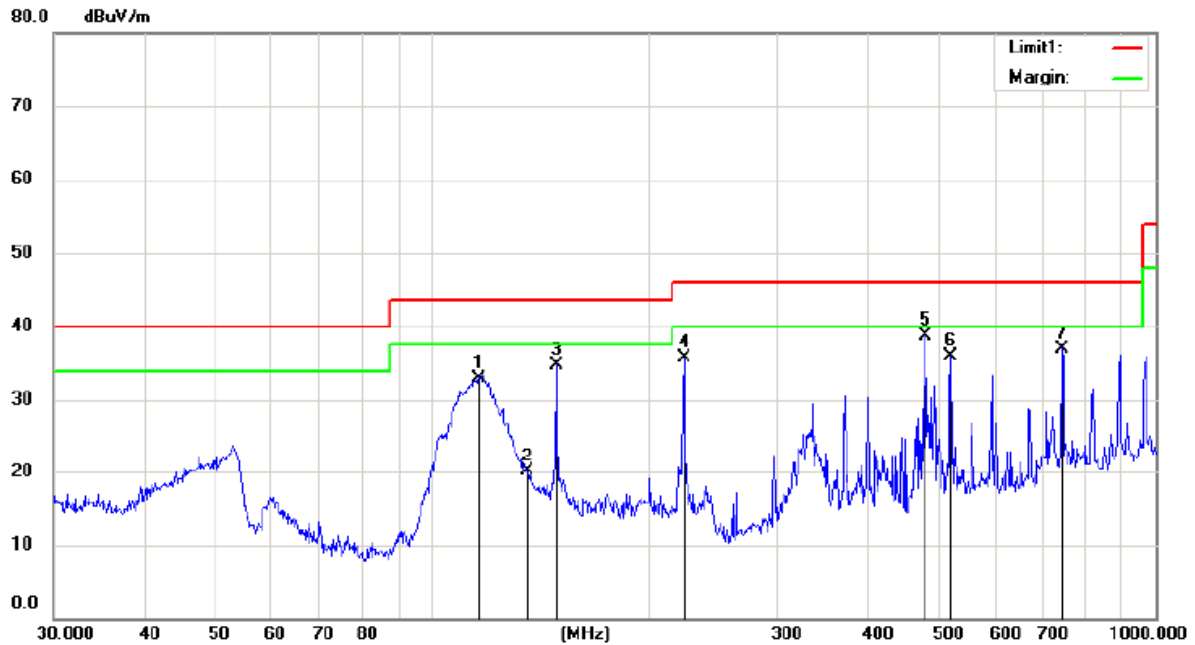
Power: AC 120V/60Hz

Humidity: 52 %

Mode:BT(GFSK,2402MHz)

Note:

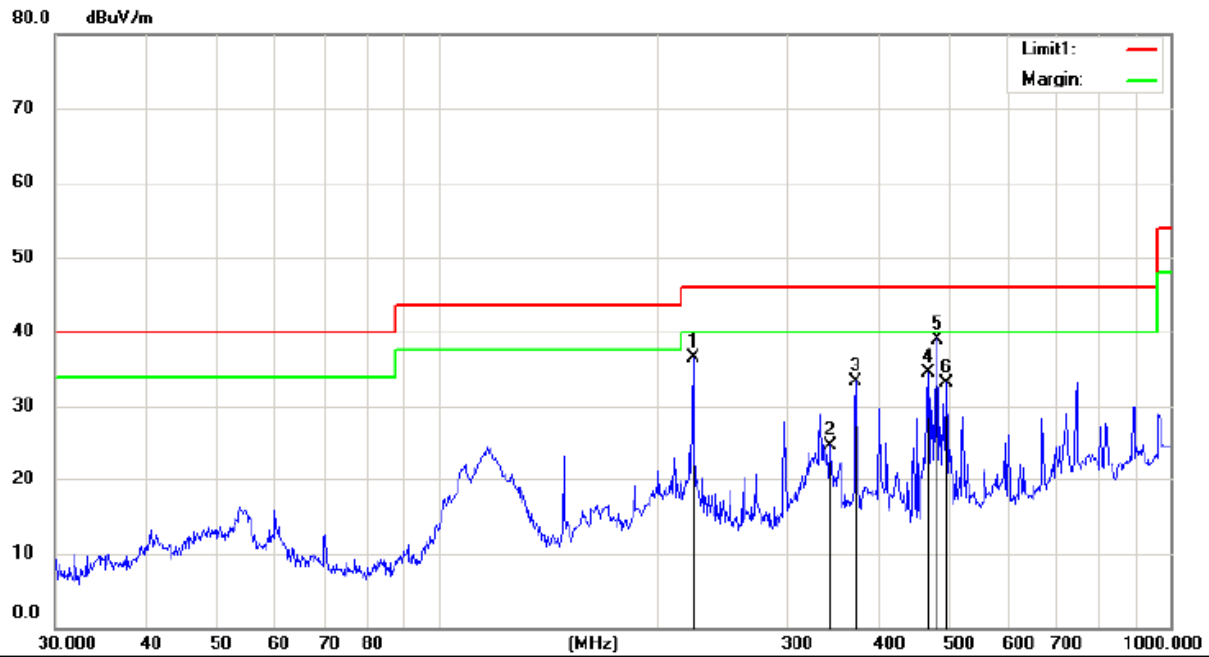
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		116.5401	56.53	-22.93	33.60	43.50	-9.90	QP		
2		148.4410	59.49	-25.19	34.30	43.50	-9.20	QP		
3		222.9502	57.70	-22.00	35.70	46.00	-10.30	QP		
4		372.0045	47.76	-17.36	30.40	46.00	-15.60	QP		
5	*	480.5276	56.89	-15.19	41.70	46.00	-4.30	QP		
6		893.8567	44.06	-6.86	37.20	46.00	-8.80	QP		



Site site #1
 Limit: FCC Part15 Class B 3M Radiation
 Mode:BT(GFSK,2441MHz)
 Note:

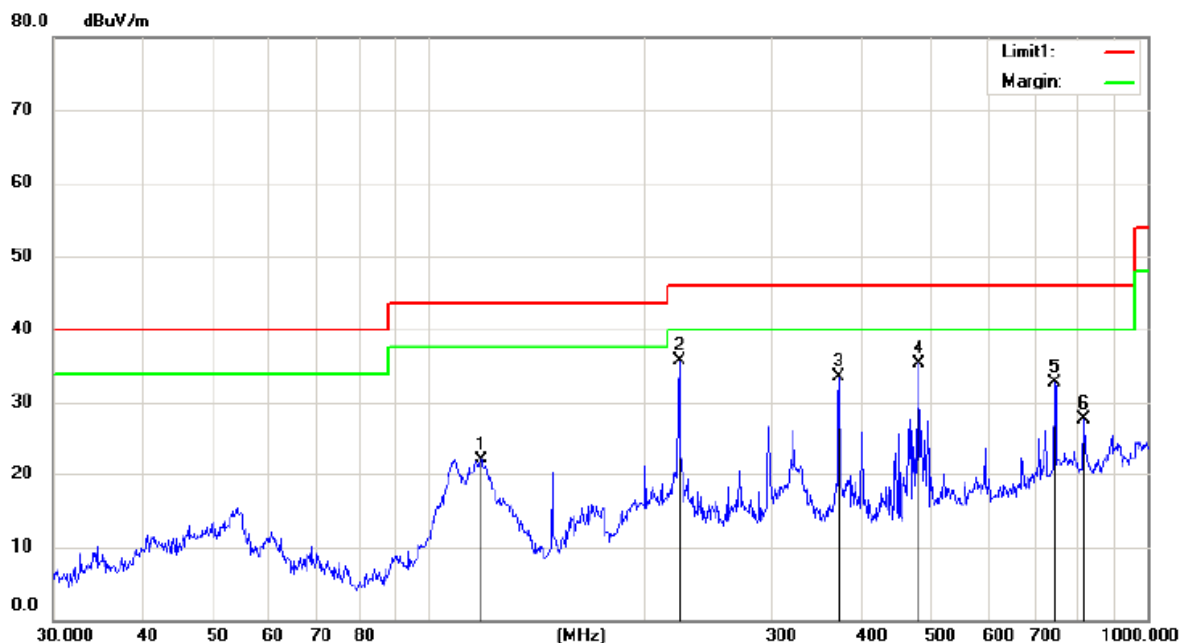
Polarization: **Vertical**
 Power: AC 120V/60Hz
 Temperature: 20 C
 Humidity: 52 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		116.1321	55.85	-22.85	33.00	43.50	-10.50	QP		
2		135.5062	45.88	-25.78	20.10	43.50	-23.40	QP		
3		148.4410	59.99	-25.19	34.80	43.50	-8.70	QP		
4		222.9502	57.70	-22.00	35.70	46.00	-10.30	QP		
5	*	480.5276	53.99	-15.19	38.80	46.00	-7.20	QP		
6		520.8882	49.26	-13.36	35.90	46.00	-10.10	QP		
7		742.2587	46.05	-9.05	37.00	46.00	-9.00	QP		



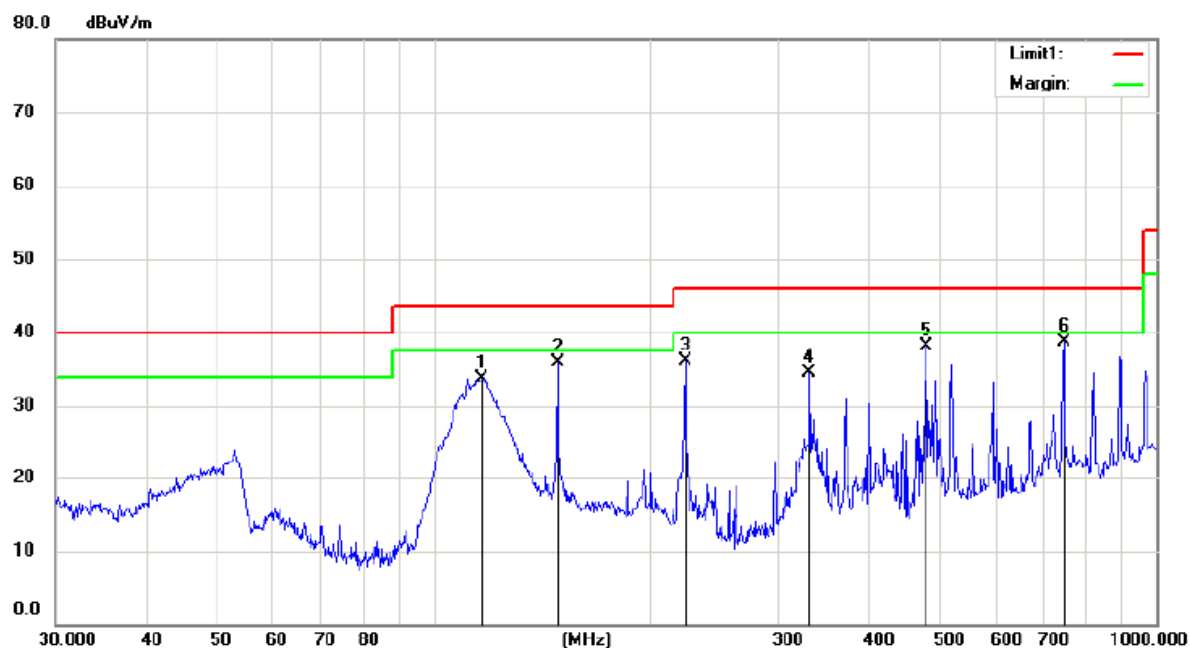
Site site #1 Polarization: **Horizontal** Temperature: 20 C
 Limit: FCC Part15 Class B 3M Radiation Power: AC 120V/60Hz Humidity: 52 %
 Mode:BT(GFSK,2441MHz)
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		222.9502	58.50	-22.00	36.50	46.00	-9.50			
2		343.1800	42.58	-17.78	24.80	46.00	-21.20			
3		372.0045	50.76	-17.36	33.40	46.00	-12.60			
4		467.2350	50.81	-16.31	34.50	46.00	-11.50			
5	*	480.5276	54.19	-15.19	39.00	46.00	-7.00			
6		494.1984	48.07	-14.97	33.10	46.00	-12.90			



Site site #1 Polarization: **Horizontal** Temperature: 20 C
 Limit: FCC Part15 Class B 3M Radiation Power: AC 120V/60Hz Humidity: 52 %
 Mode:BT(GFSK,2480MHz)
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		118.1862	45.45	-23.25	22.20	43.50	-21.30	QP		
2	*	222.9502	57.61	-22.00	35.61	46.00	-10.39	QP		
3		372.0045	50.81	-17.36	33.45	46.00	-12.55	QP		
4		480.5276	50.45	-15.19	35.26	46.00	-10.74	QP		
5		742.2587	41.66	-9.05	32.61	46.00	-13.39	QP		
6		815.9678	35.96	-8.28	27.68	46.00	-18.32	QP		



Site site #1

Polarization: **Vertical**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

Power: AC 120V/60Hz

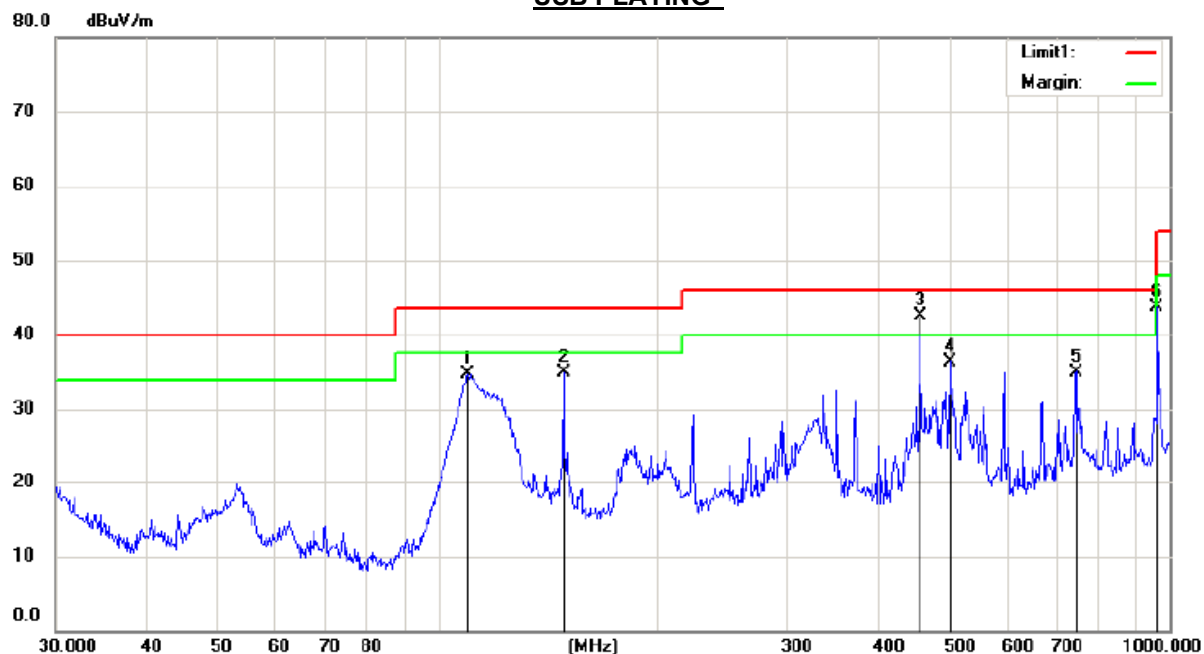
Humidity: 52 %

Mode:BT(GFSK,2480MHz)

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		116.5401	56.63	-22.93	33.70	43.50	-9.80	QP		
2		148.4410	61.09	-25.19	35.90	43.50	-7.60	QP		
3		222.9502	58.10	-22.00	36.10	46.00	-9.90	QP		
4		331.3546	52.52	-18.02	34.50	46.00	-11.50	QP		
5		480.5276	53.39	-15.19	38.20	46.00	-7.80	QP		
6	*	744.8661	47.58	-8.88	38.70	46.00	-7.30	QP		

USB PLAYING



Site site #1

Polarization: **Vertical**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

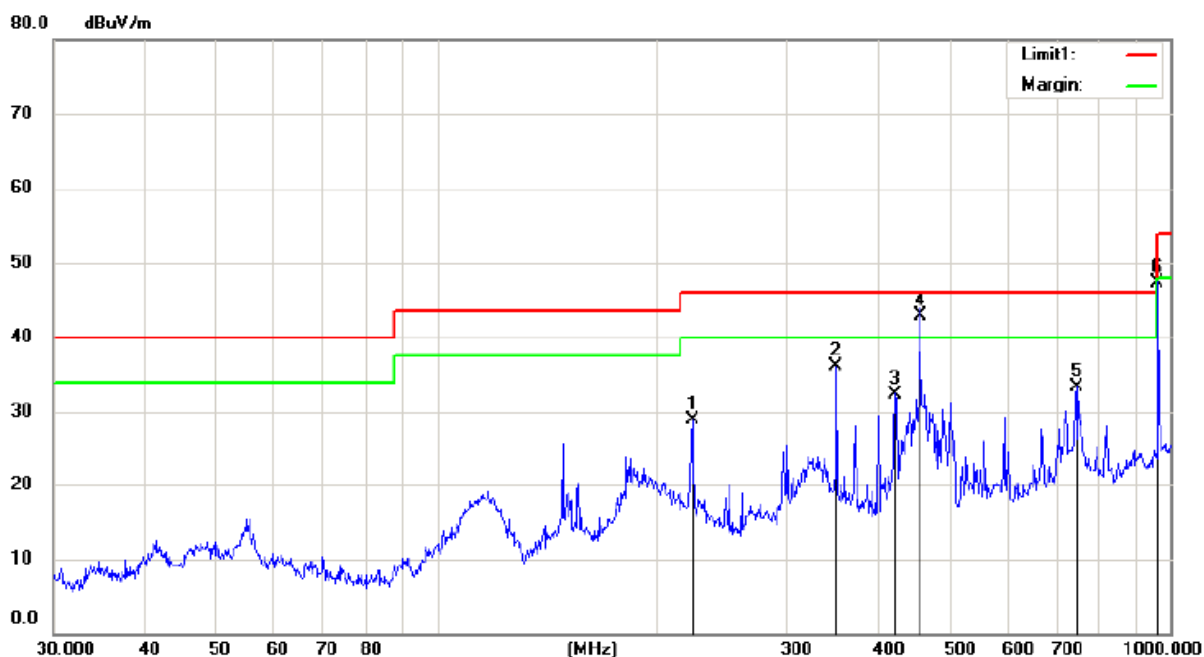
Power: AC 120V/60Hz

Humidity: 52 %

Mode:USB Playing

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		109.7960	56.53	-21.83	34.70	43.50	-8.80	QP		
2		148.4410	60.09	-25.19	34.90	43.50	-8.60	QP		
3	*	455.9058	58.89	-16.39	42.50	46.00	-3.50	QP		
4		501.1790	51.28	-14.88	36.40	46.00	-9.60	QP		
5		744.8661	43.88	-8.88	35.00	46.00	-11.00	QP		
6		962.1621	49.97	-6.27	43.70	54.00	-10.30	QP		



Site site #1

Polarization: **Horizontal**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

Power: AC 120V/60Hz

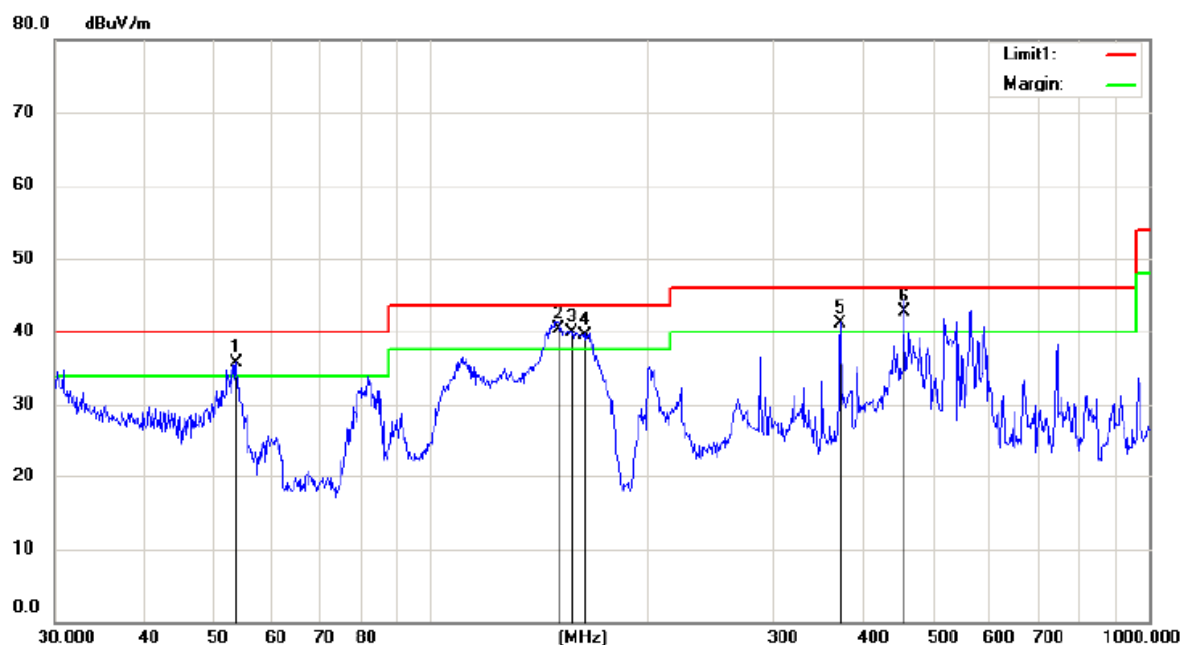
Humidity: 52 %

Mode:USB Playing

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		222.9502	50.90	-22.00	28.90	46.00	-17.10	QP		
2		350.4768	54.39	-18.29	36.10	46.00	-9.90	QP		
3		422.0577	49.08	-16.68	32.40	46.00	-13.60	QP		
4	*	455.9057	59.29	-16.39	42.90	46.00	-3.10	QP		
5		744.8661	42.28	-8.88	33.40	46.00	-12.60	QP		
6		962.1623	53.67	-6.27	47.40	54.00	-6.60	QP		

HDMI Output



Site site #1

Polarization: **Vertical**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

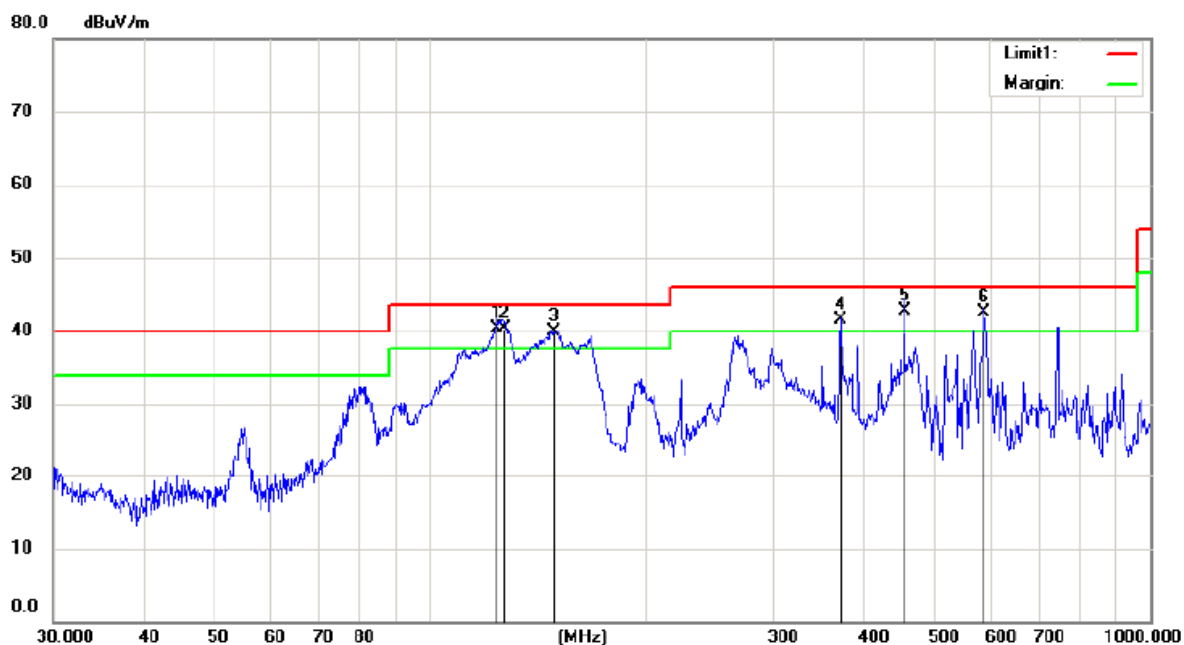
Power: AC 120V/60Hz

Humidity: 52 %

Mode:HDMI Output

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	!	53.6931	55.35	-19.55	35.80	40.00	-4.20	QP		
2	*	150.5377	65.16	-24.86	40.30	43.50	-3.20	QP		
3	!	157.5587	65.45	-25.55	39.90	43.50	-3.60	QP		
4	!	164.3301	65.15	-25.55	39.60	43.50	-3.90	QP		
5	!	372.0045	58.56	-17.36	41.20	46.00	-4.80	QP		
6	!	455.9057	59.19	-16.39	42.80	46.00	-3.20	QP		



Site site #1

Polarization: **Horizontal**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

Power: AC 120V/60Hz

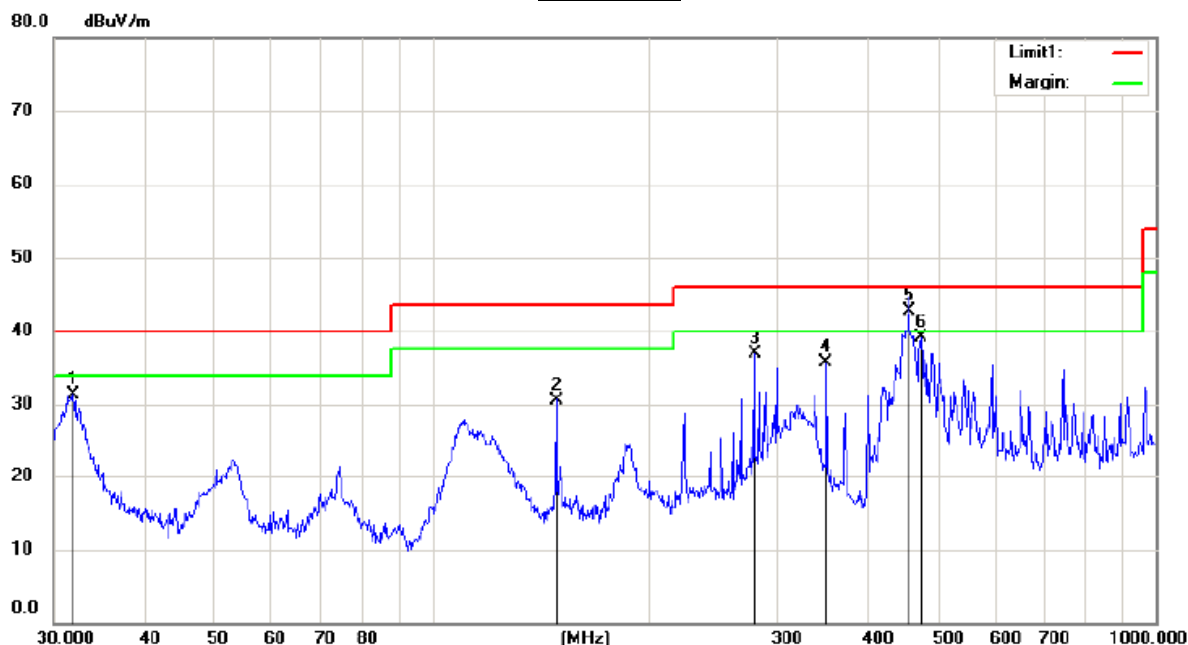
Humidity: 52 %

Mode:HDMI Output

Note:

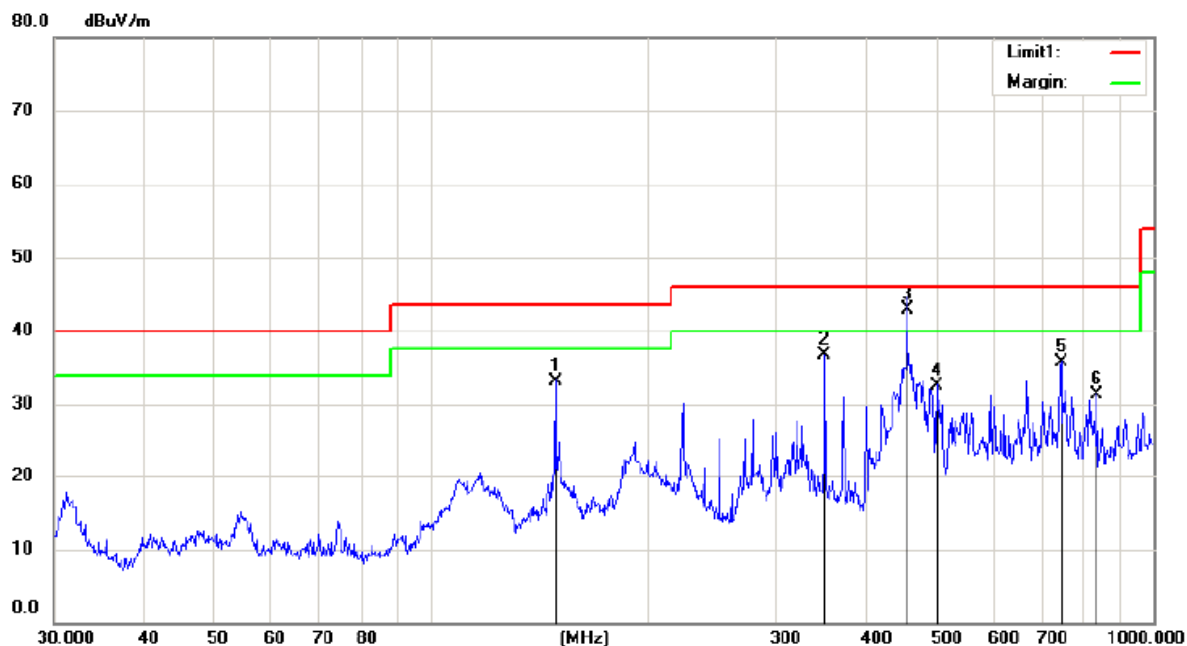
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	124.1330	64.31	-23.91	40.40	43.50	-3.10	QP		
2	!	126.7723	64.70	-24.40	40.30	43.50	-3.20	QP		
3	!	148.9624	64.95	-25.05	39.90	43.50	-3.60	QP		
4	!	372.0045	58.96	-17.36	41.60	46.00	-4.40	QP		
5	!	455.9057	59.19	-16.39	42.80	46.00	-3.20	QP		
6	!	588.9050	54.54	-11.94	42.60	46.00	-3.40	QP		

RJ45-ETHO



Site site #1 Polarization: **Vertical** Temperature: 20 C
 Limit: FCC Part15 Class B 3M Radiation Power: AC 120V/60Hz Humidity: 52 %
 Mode:RJ45-ETHO
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		31.9546	54.68	-23.28	31.40	40.00	-8.60	QP		
2		148.4410	55.79	-25.19	30.60	43.50	-12.90	QP		
3		279.0436	56.30	-19.40	36.90	46.00	-9.10	QP		
4		350.4768	53.99	-18.29	35.70	46.00	-10.30	QP		
5	*	455.9057	59.09	-16.39	42.70	46.00	-3.30	QP		
6		473.8347	55.08	-15.98	39.10	46.00	-6.90	QP		



Site site #1

Polarization: **Horizontal**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

Power: AC 120V/60Hz

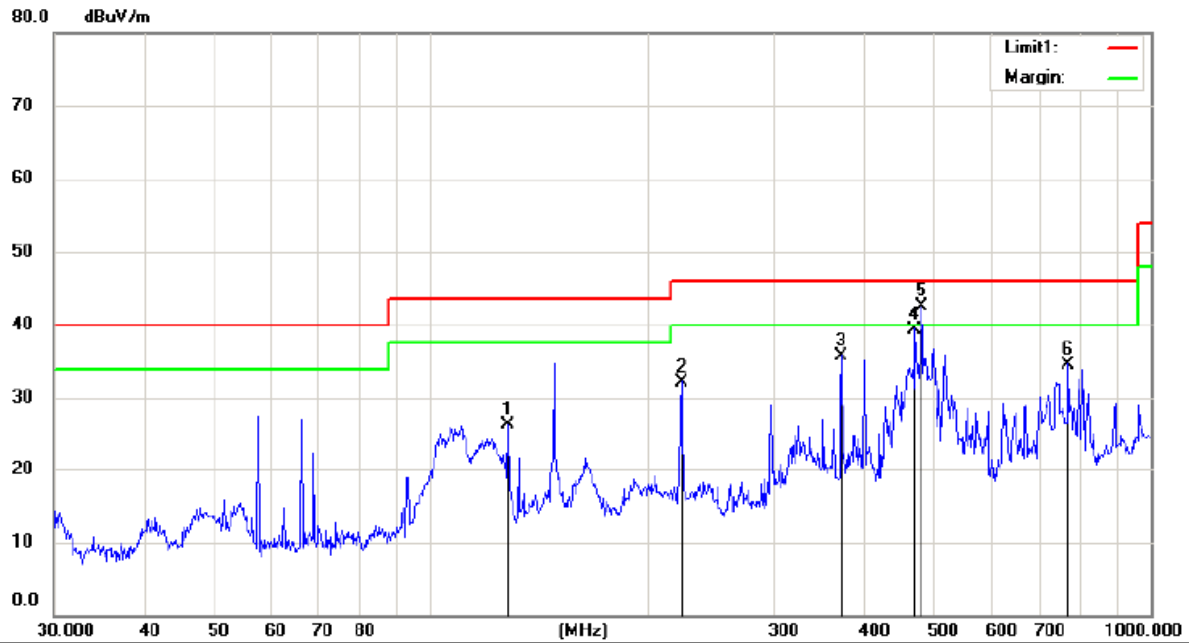
Humidity: 52 %

Mode:RJ45-ETHO

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		148.4410	58.39	-25.19	33.20	43.50	-10.30	QP		
2		350.4768	54.99	-18.29	36.70	46.00	-9.30	QP		
3	*	455.9057	59.29	-16.39	42.90	46.00	-3.10	QP		
4		501.1790	47.48	-14.88	32.60	46.00	-13.40	QP		
5		744.8661	44.68	-8.88	35.80	46.00	-10.20	QP		
6		836.2443	40.19	-8.79	31.40	46.00	-14.60	QP		

RJ45-ETHO



Site site #1

Polarization: **Horizontal**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

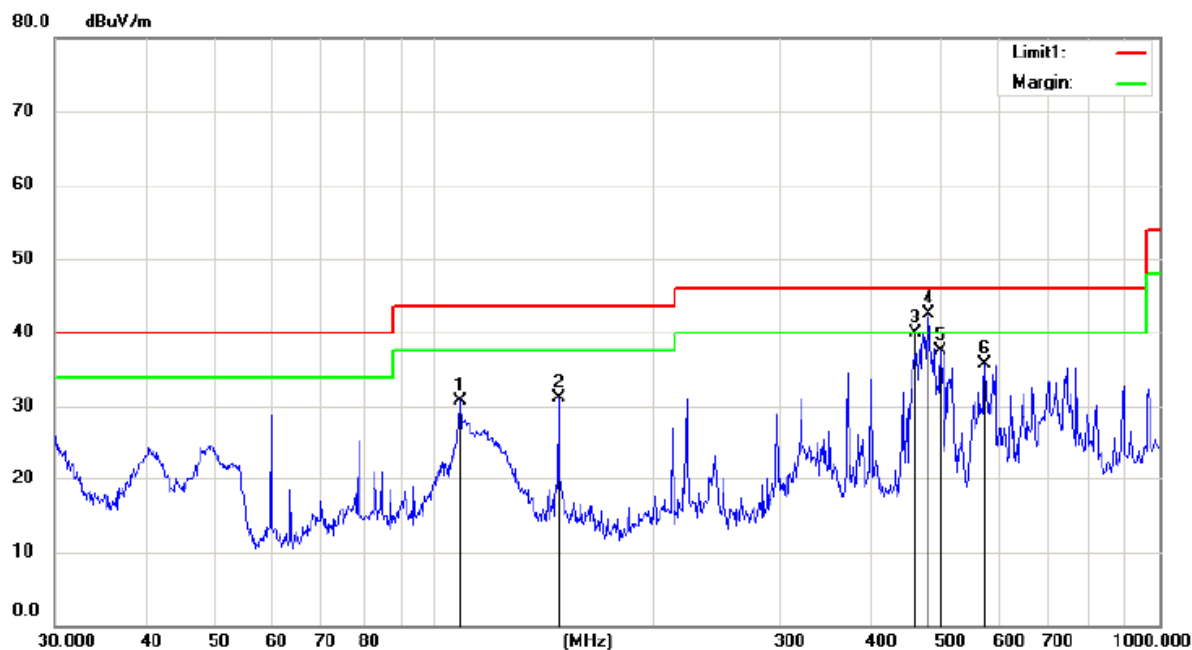
Power: AC 240V/60Hz

Humidity: 52 %

Mode:RJ45-ETHO

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		128.1130	51.02	-24.72	26.30	43.50	-17.20	QP		
2		222.9502	54.20	-22.00	32.20	46.00	-13.80	QP		
3		372.0045	53.16	-17.36	35.80	46.00	-10.20	QP		
4		470.5232	55.80	-16.40	39.40	46.00	-6.60	QP		
5	*	480.5276	57.69	-15.19	42.50	46.00	-3.50	QP		
6		768.7481	42.86	-8.26	34.60	46.00	-11.40	QP		



Site site #1

Polarization: **Vertical**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

Power: AC 240V/60Hz

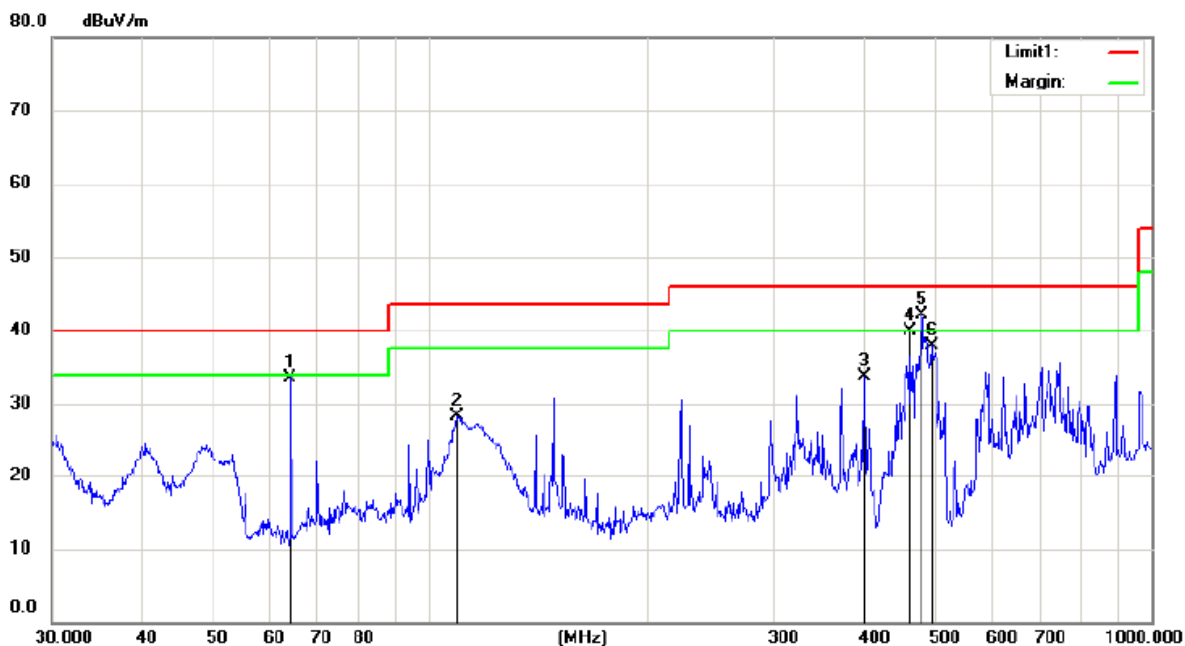
Humidity: 52 %

Mode:RJ45-ETHO

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		108.6470	52.49	-21.69	30.80	43.50	-12.70	QP		
2		148.4410	56.29	-25.19	31.10	43.50	-12.40	QP		
3		460.7271	55.86	-15.96	39.90	46.00	-6.10	QP		
4	*	480.5276	57.64	-15.19	42.45	46.00	-3.55	QP		
5		499.4246	52.42	-14.98	37.44	46.00	-8.56	QP		
6		574.6258	47.58	-11.81	35.77	46.00	-10.23	QP		

HDMI OUTPUT



Site site #1

Polarization: **Vertical**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

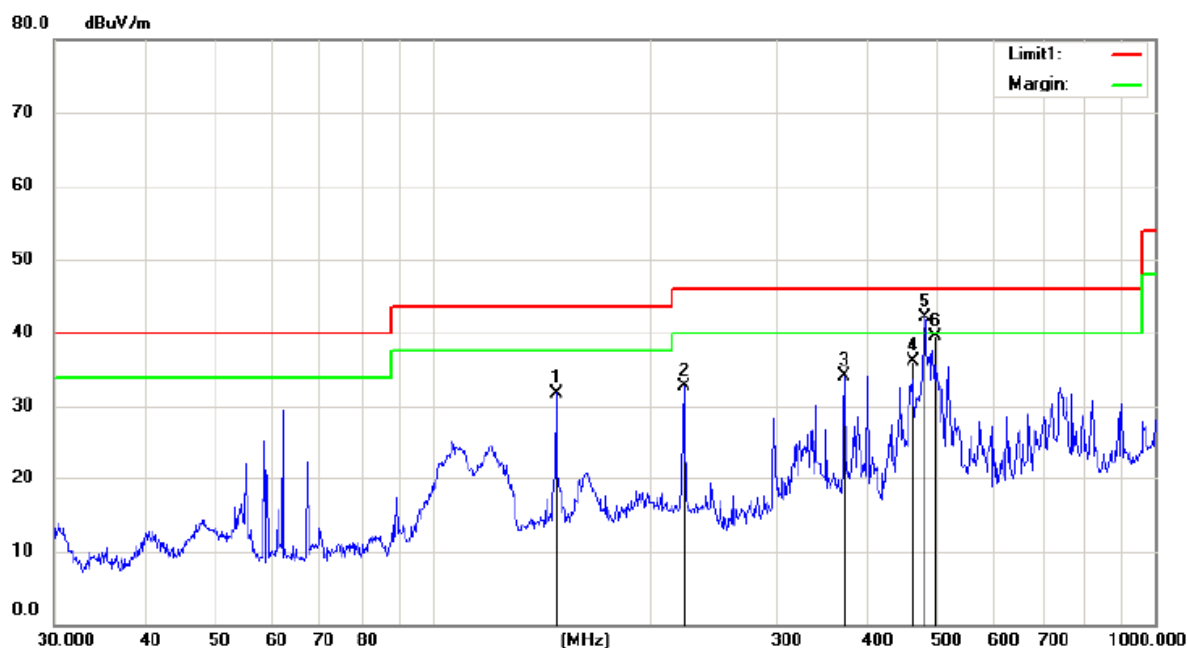
Power: AC 240V/60Hz

Humidity: 52 %

Mode:HDMI Output

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		64.2074	56.24	-22.64	33.60	40.00	-6.40	QP		
2		109.0286	50.02	-21.72	28.30	43.50	-15.20	QP		
3		400.4320	51.21	-17.51	33.70	46.00	-12.30	QP		
4		462.3455	56.04	-16.04	40.00	46.00	-6.00	QP		
5	*	480.5276	57.29	-15.19	42.10	46.00	-3.90	QP		
6		495.9344	52.97	-14.97	38.00	46.00	-8.00	QP		



Site site #1

Polarization: **Horizontal**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

Power: AC 240V/60Hz

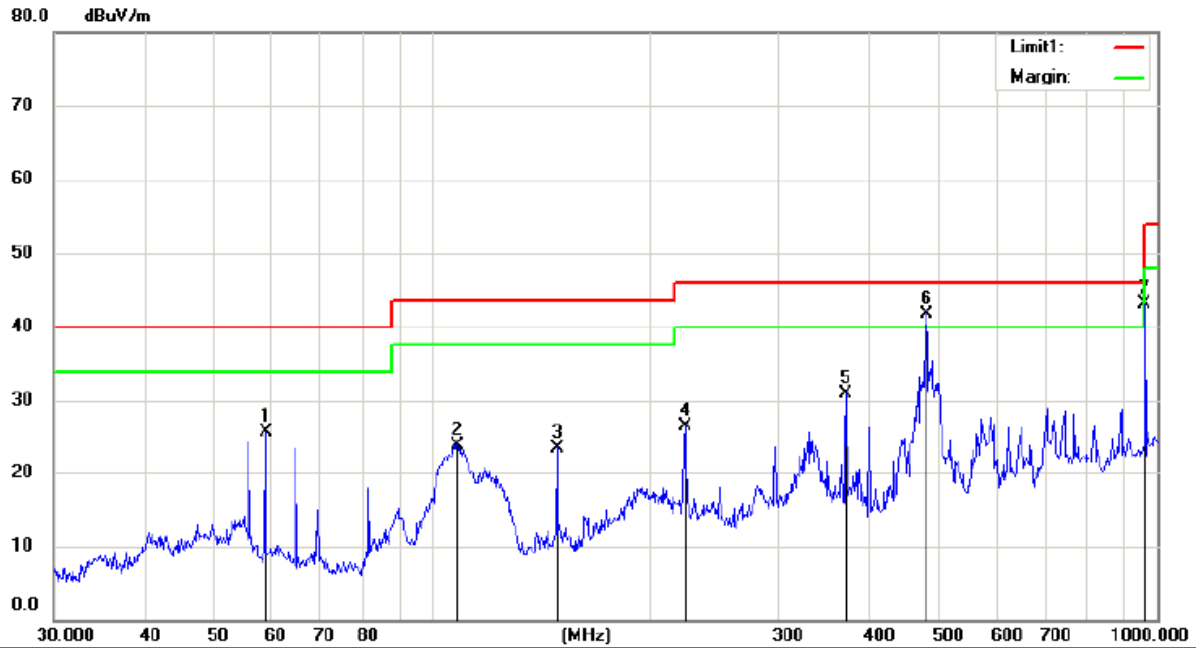
Humidity: 52 %

Mode:HDMI Output

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		148.4410	56.99	-25.19	31.80	43.50	-11.70	QP		
2		222.9502	54.70	-22.00	32.70	46.00	-13.30	QP		
3		372.0045	51.46	-17.36	34.10	46.00	-11.90	QP		
4		462.3455	52.14	-16.04	36.10	46.00	-9.90	QP		
5	*	480.5276	57.29	-15.19	42.10	46.00	-3.90	QP		
6		497.6765	54.49	-14.99	39.50	46.00	-6.50	QP		

USB Playing



Site site #1

Polarization: **Horizontal**

Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

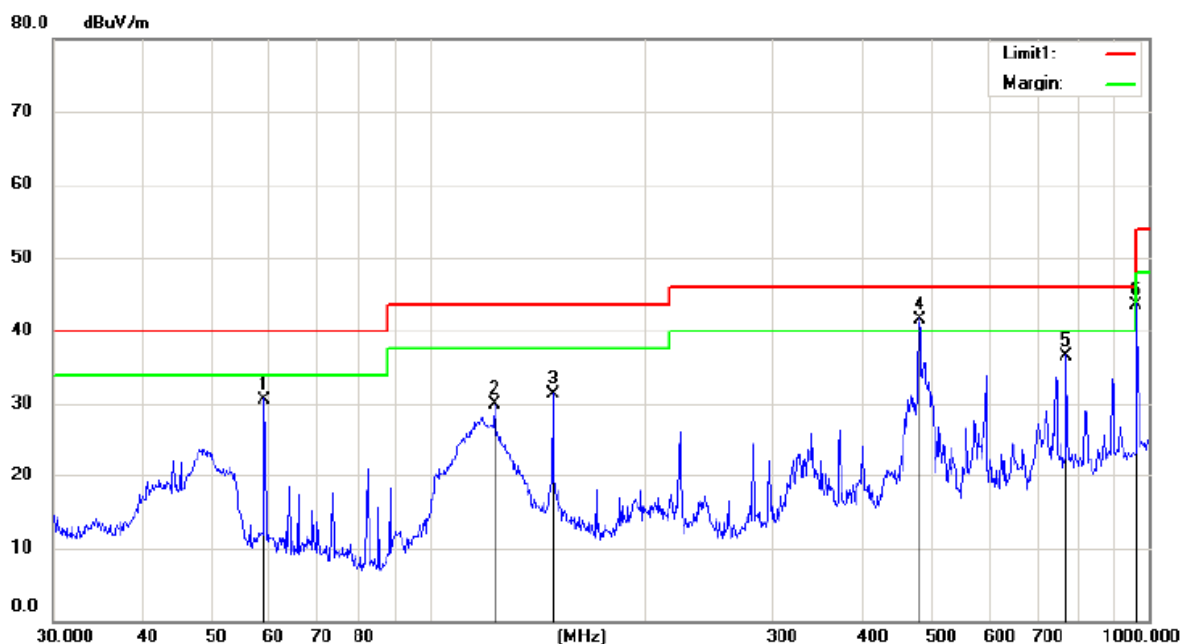
Power: AC 240V/60Hz

Humidity: 52 %

Mode:USB Playing

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		58.8185	47.29	-21.59	25.70	40.00	-14.30	QP		
2		108.2667	45.64	-21.64	24.00	43.50	-19.50	QP		
3		148.4410	48.79	-25.19	23.60	43.50	-19.90	QP		
4		222.9502	48.50	-22.00	26.50	46.00	-19.50	QP		
5		372.0045	48.26	-17.36	30.90	46.00	-15.10	QP		
6	*	480.5276	56.99	-15.19	41.80	46.00	-4.20	QP		
7		962.1621	49.37	-6.27	43.10	54.00	-10.90	QP		



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	59.0251	52.23	-21.63	30.60	40.00	-9.40	QP			
2	123.2655	53.74	-23.84	29.90	43.50	-13.60	QP			
3	148.4410	56.59	-25.19	31.40	43.50	-12.10	QP			
4 *	480.5276	56.79	-15.19	41.60	46.00	-4.40	QP			
5	768.7481	44.86	-8.26	36.60	46.00	-9.40	QP			
6	962.1621	49.87	-6.27	43.60	54.00	-10.40	QP			

Above 1000MHz:

Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result was report as below

Test Date :	07/16/2015	Temperature :	24 °C
Test Result:	PASS	Humidity :	53 %
Test By:	KK		

GFSK Mode: Low channel							
Freq. (MHz)	Ant.Pol. (H/V)	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
1204.00	V	51.55	35.20	74.00	54.00	-22.45	-18.80
1595.00	V	51.34	33.90	74.00	54.00	-22.66	-20.10
2547.00	V	48.62	31.60	74.00	54.00	-25.38	-22.40
3193.00	V	47.20	35.30	74.00	54.00	-26.80	-18.70
4791.00	V	47.95	40.00	74.00	54.00	-26.05	-14.00
7205.00	V	56.49	43.20	74.00	54.00	-17.51	-10.8
1391.00	H	51.15	40.20	74.00	54.00	-22.85	-13.80
1595.00	H	49.45	39.60	74.00	54.00	-24.55	-14.40
1901.00	H	48.37	30.20	74.00	54.00	-25.63	-23.80
3193.00	H	48.36	36.90	74.00	54.00	-25.64	-17.10
4808.00	H	48.74	40.20	74.00	54.00	-25.26	-13.80
7205.00	H	54.19	45.60	74.00	54.00	-19.81	-8.40

GFSK Mode: Middle channel							
Freq. (MHz)	Ant.Pol. (H/V)	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
1051.00	V	46.35	35.60	74.00	54.00	-27.65	-18.40
1272.00	V	45.58	37.00	74.00	54.00	-28.42	-17.00
1986.00	V	46.04	36.90	74.00	54.00	-27.96	-17.10
2598.00	V	43.39	36.00	74.00	54.00	-30.61	-18.00
3193.00	V	45.25	32.60	74.00	54.00	-28.75	-21.40
7324.00	V	59.08	43.60	74.00	54.00	-14.92	-10.40
1595.00	H	47.87	35.00	74.00	54.00	-26.13	-19.00
1986.00	H	43.55	34.60	74.00	54.00	-30.45	-19.40
2513.00	H	44.31	34.90	74.00	54.00	-29.69	-19.10
4876.00	H	49.60	32.90	74.00	54.00	-24.40	-21.10
7324.00	H	55.37	36.90	74.00	54.00	-18.63	-17.10
8939.00	H	52.72	33.90	74.00	54.00	-21.28	-20.10

GFSK Mode: High channel							
Freq. (MHz)	Ant.Pol. (H/V)	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
1017.00	V	52.09	35.30	74.00	54.00	-21.91	-18.70
1238.00	V	51.65	36.90	74.00	54.00	-22.35	-17.10
1748.00	V	51.39	33.90	74.00	54.00	-22.61	-20.10
2547.00	V	52.01	37.60	74.00	54.00	-21.99	-16.40
4961.00	V	55.66	45.00	74.00	54.00	-18.34	-9.00
9177.00	V	52.51	34.70	74.00	54.00	-21.49	-19.30
1595.00	H	48.21	32.90	74.00	54.00	-25.79	-21.10
1986.00	H	43.54	31.00	74.00	54.00	-30.46	-23.00
2581.00	H	45.23	36.10	74.00	54.00	-28.77	-17.90
4961.00	H	51.50	35.30	74.00	54.00	-22.50	-18.70
7443.00	H	53.55	37.30	74.00	54.00	-20.45	-16.70
9007.00	H	52.71	39.30	74.00	54.00	-21.29	-14.70

6. Channel Separation Test

6.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Print out the test result from the spectrum by hard copy function.

6.2 Test SET-UP (Block Diagram of Configuration)



6.3 Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	ESCI	10017	08/01/2014	08/01/2015

6.4 Measurement Results

The following table is the setting of spectrum analyzer.

Attenuation	Auto
RB	100KHz
VB	300KHz
Detector	Peak
Trace	Max hold

Refer to attached data chart.

Spectrum Detector:	PK	Test Date :	07/18/2015
Test By:	Kuki	Temperature :	21 °C
Test Result:	PASS	Humidity :	55 %

GFSK Mode:

Test Channel	Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit 20dB Down BW(kHz)
Low Channel	2402	1000.00	752
Adjacency Channel	2403		
Middle channel	2441	1000.00	744
Adjacency Channel	2440		
High Channel	2480	1000.00	744
Adjacency Channel	2479		

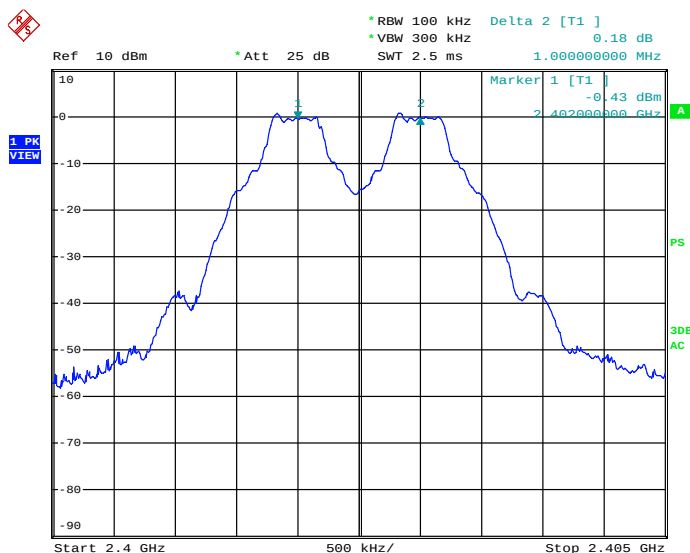
$\pi/4$ -DQPSK Mode

Test Channel	Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit 2/3 20dB Down BW(kHz)
Low Channel	2402	1000.00	856
Adjacency Chanel	2403		
Middle channel	2441	1000.00	868
Adjacency Chanel	2440		
High Channel	2480	1000.00	860
Adjacency Chanel	2479		

8DPSK Mode:

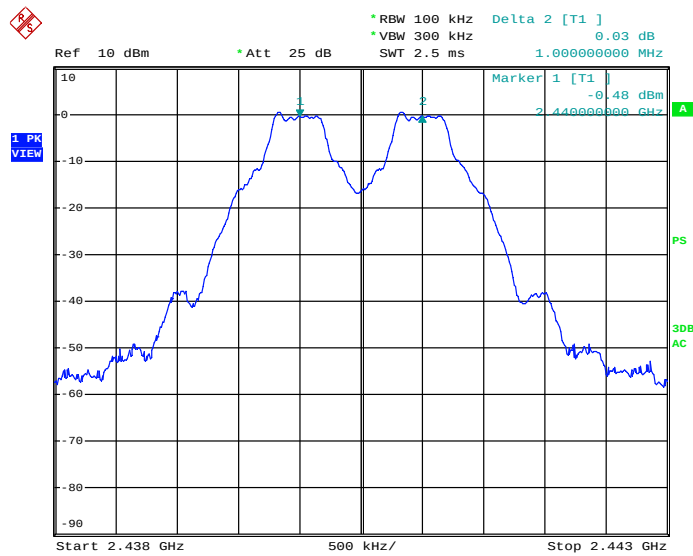
Test Channel	Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit 2/3 20dB Down BW(kHz)
Low Channel	2402	1000.00	880
Adjacency Chanel	2403		
Middle channel	2441	1000.00	880
Adjacency Chanel	2440		
High Channel	2480	1000.00	884
Adjacency Chanel	2479		

GFSK Mode: Low channel



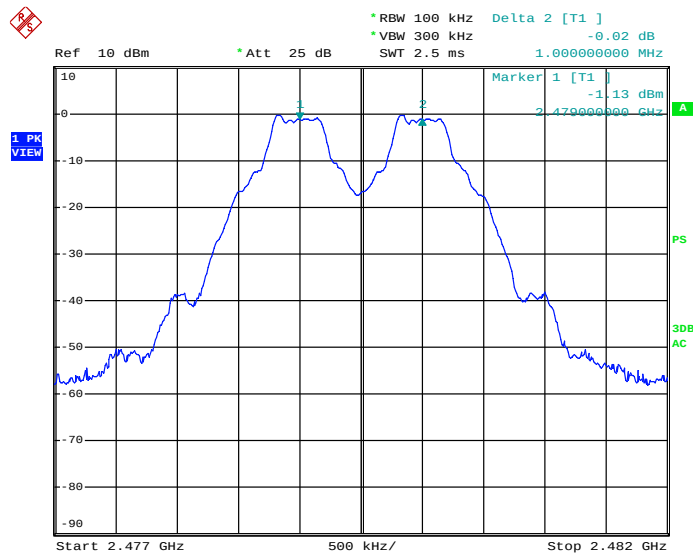
Date: 18.JUL.2015 03:22:00

GFSK Mode: Middle channel



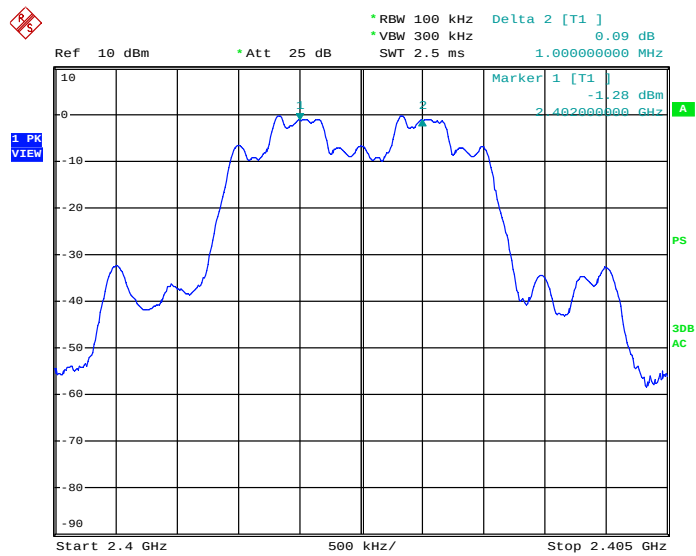
Date: 18.JUL.2015 03:23:30

GFSK Mode: High channel



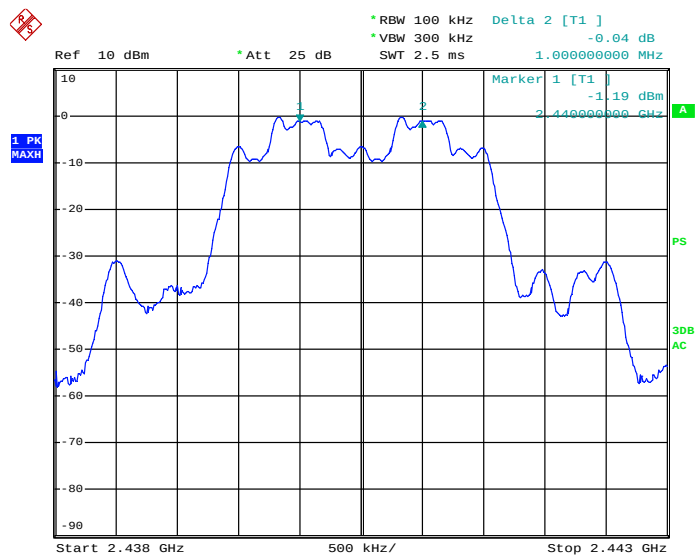
Date: 18.JUL.2015 03:24:51

$\pi/4$ -DQPSK Mode: Low channel



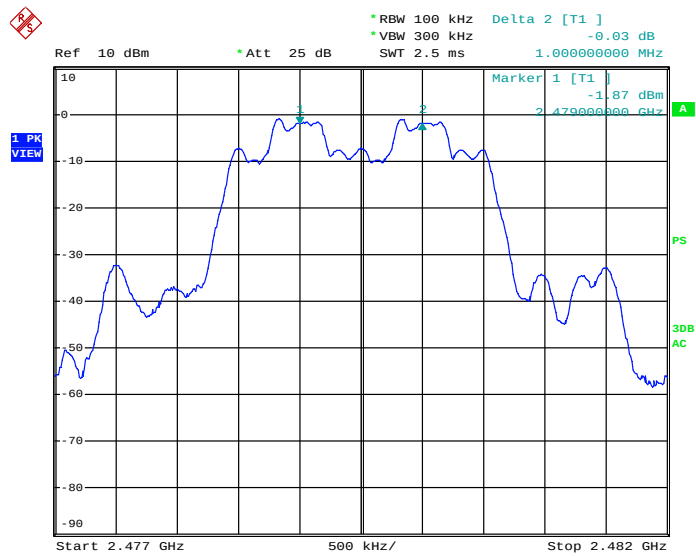
Date: 18.JUL.2015 03:28:17

$\pi/4$ -DQPSK Mode: Middle channel



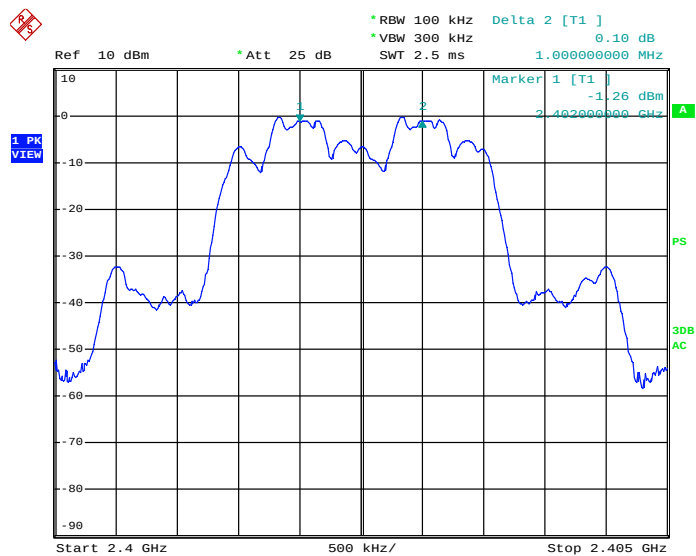
Date: 18.JUL.2015 03:29:43

$\pi/4$ -DQPSK Mode: High channel



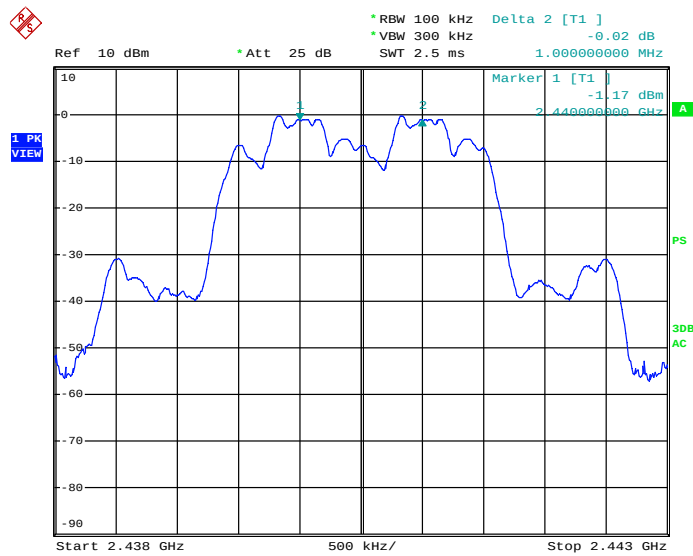
Date: 18.JUL.2015 03:31:08

8DPSK Mode: Low channel



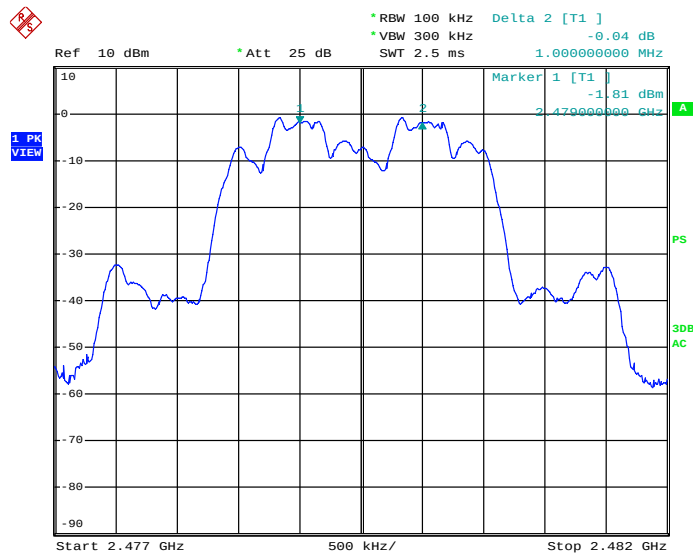
Date: 18.JUL.2015 03:32:50

8DPSK Mode: Middle channel



Date: 18.JUL.2015 03:35:11

8DPSK Mode: High channel



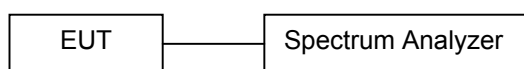
Date: 18.JUL.2015 03:36:34

7. Bandwidth Test

7.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Print out the test result from the spectrum by hard copy function.

7.2 Test SET-UP (Block Diagram of Configuration)



7.3 Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	ESCI	10017	08/01/2014	08/01/2015

7.4 Measurement Results

The following table is the setting of spectrum analyzer.

Attenuation	Auto
SPAN	3MHz
RB	30KHz
VB	100KHz
Detector	Peak
Trace	Max hold

20dB Bandwidth test data Chart:

Refer to attached data chart.

Spectrum Detector:	PK	Test Date:	07/18/2015
Test By:	Kuki	Temperature:	21 °C
Test Result:	N/A	Humidity:	55 %

GFSK Mode:

Channel number	Channel frequency (MHz)	20dB Down BW(kHz)
Low channel	2402	1128
Middle channel	2441	1116
High channel	2480	1116

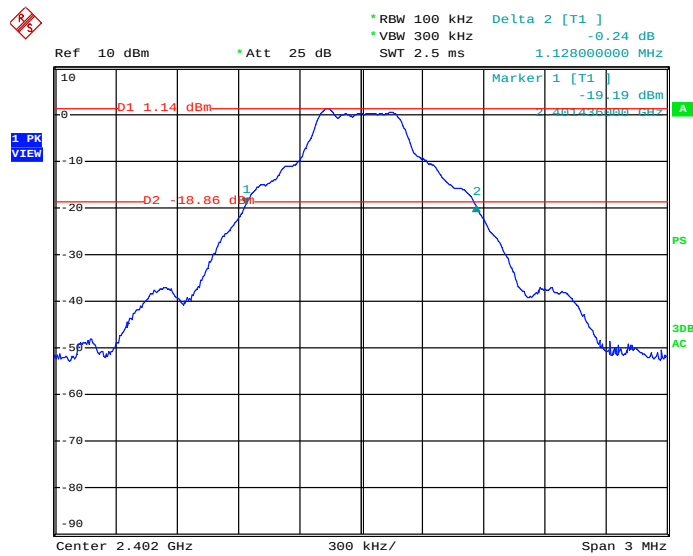
$\pi/4$ -DQPSK Mode:

Channel number	Channel frequency (MHz)	20dB Down BW(kHz)
Low channel	2402	1284
Middle channel	2441	1302
High channel	2480	1290

8DPSK Mode:

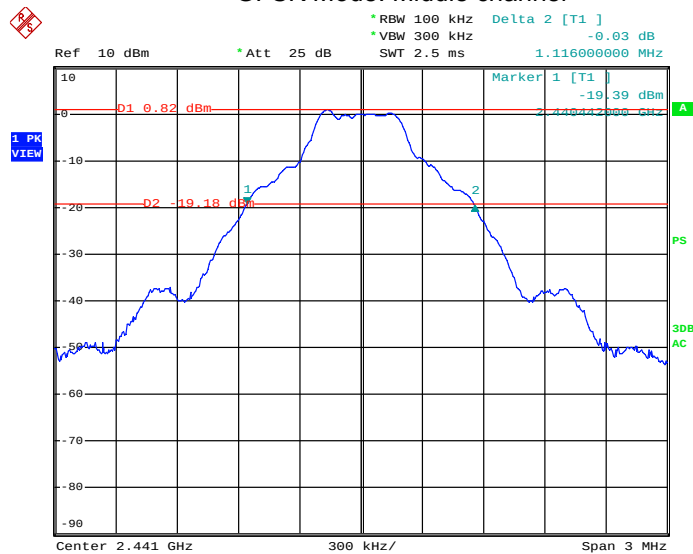
Channel number	Channel frequency (MHz)	20dB Down BW(kHz)
Low channel	2402	1320
Middle channel	2441	1320
High channel	2480	1326

GFSK Mode: Low channel



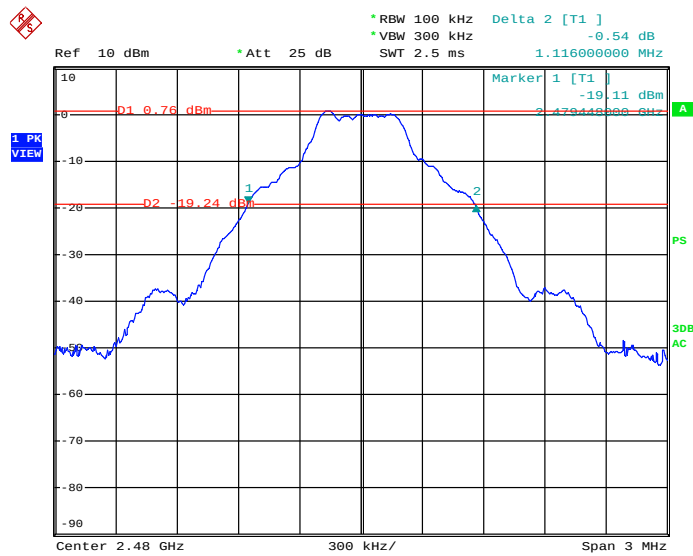
Date: 18.JUL.2015 02:32:17

GFSK Mode: Middle channel



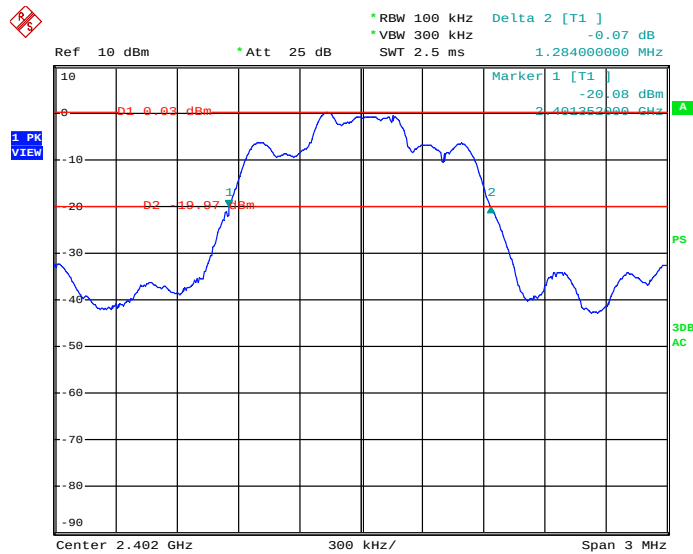
Date: 18.JUL.2015 02:33:35

GFSK Mode: High channel



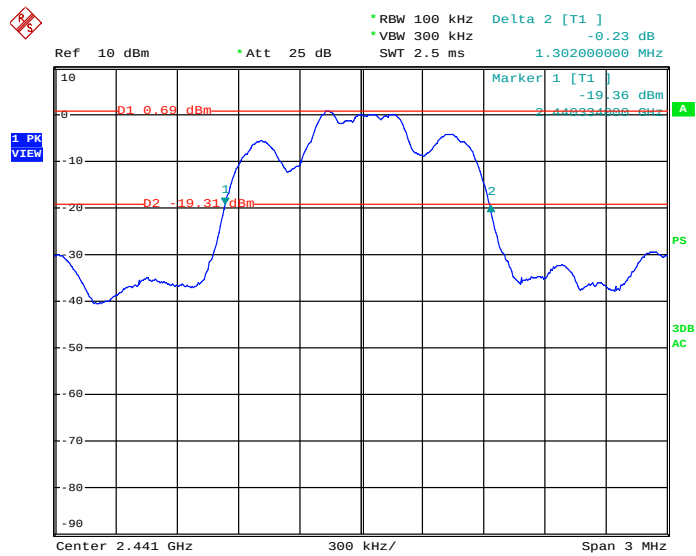
Date: 18.JUL.2015 07:13:21

$\pi/4$ -DQPSK Mode: Low channel



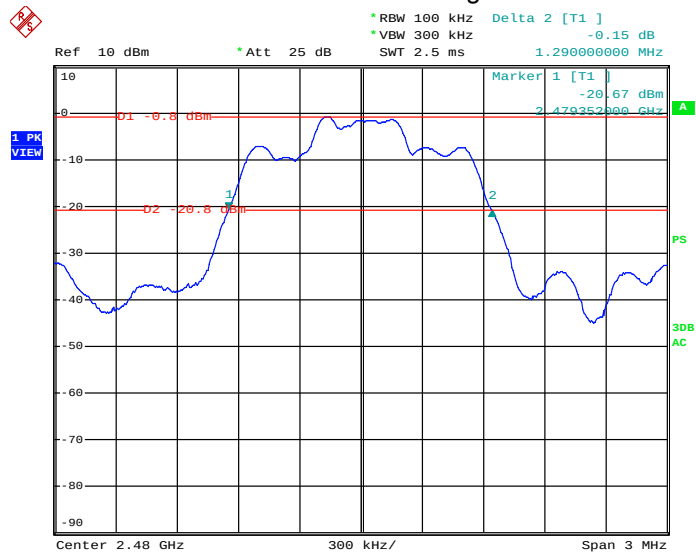
Date: 18.JUL.2015 02:35:19

$\pi/4$ -DQPSK Mode: Middle channel



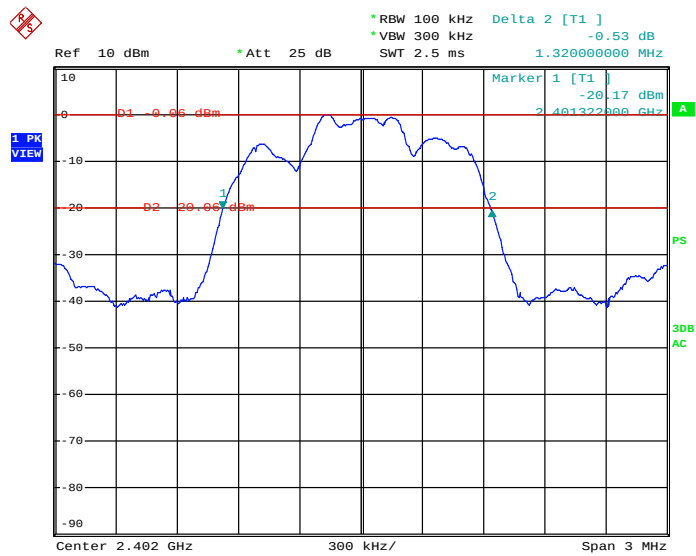
Date: 18.JUL.2015 07:14:32

$\pi/4$ -DQPSK Mode: High channel



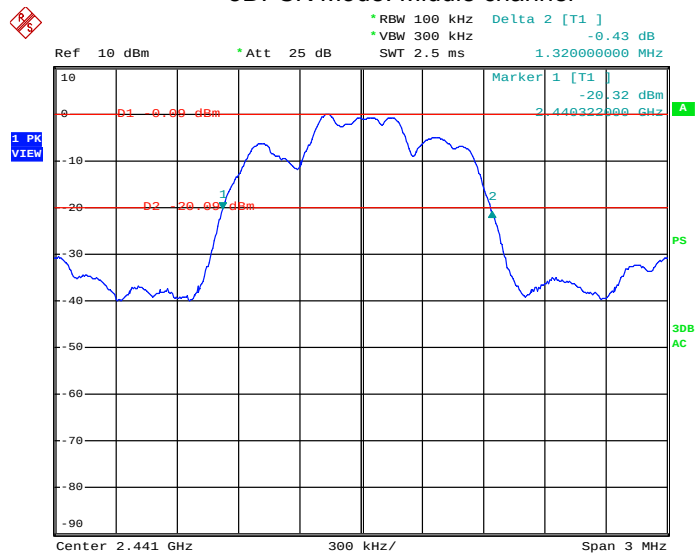
Date: 18.JUL.2015 02:37:24

8DPSK Mode: Low channel



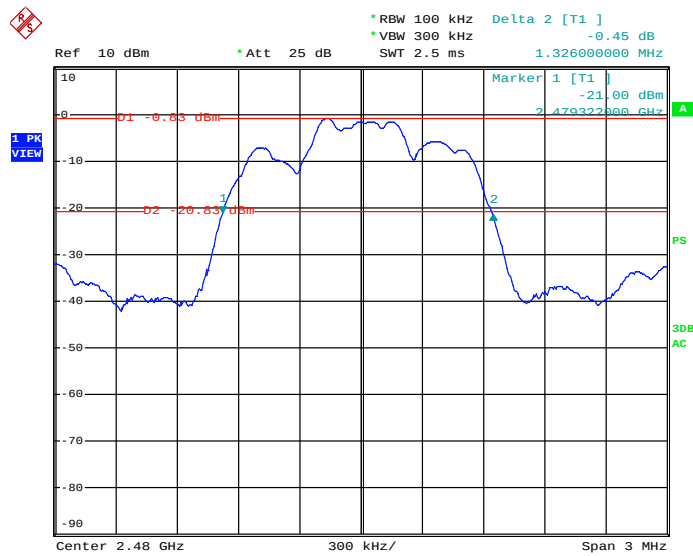
Date: 18.JUL.2015 02:38:36

8DPSK Mode: Middle channel



Date: 18.JUL.2015 02:39:46

8DPSK Mode: High channel



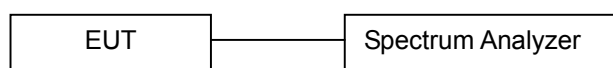
Date: 18.JUL.2015 02:40:38

8. Quantity of Hopping Channel Test

8.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Print out the test result from the spectrum by hard copy function.

8.2 Test SET-UP (Block Diagram of Configuration)



8.3 Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	ESCI	10017	08/01/2014	08/01/2015

8.4 Measurement Results

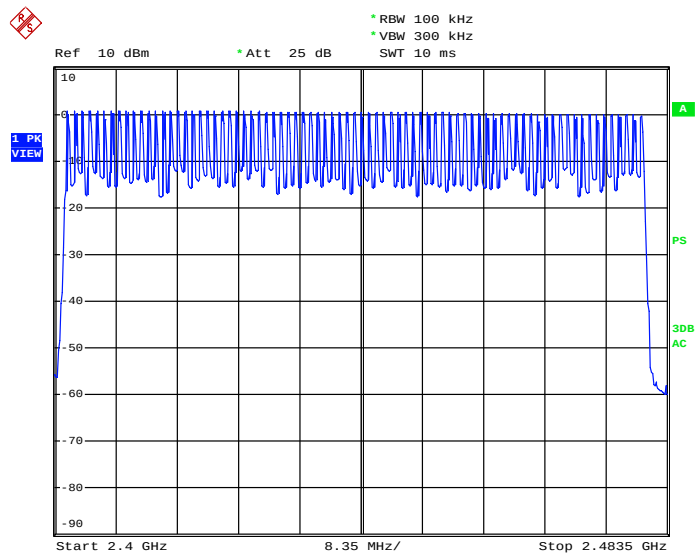
Refer to attached data chart.

Spectrum Detector:	PK	Test Date :	07/18/2015
Test By:	Jary	Temperature :	21 °C
Test Result:	Pass	Humidity :	55 %

GFSK Mode, $\pi/4$ -DQPSK Mode, 8DPSK Mode:

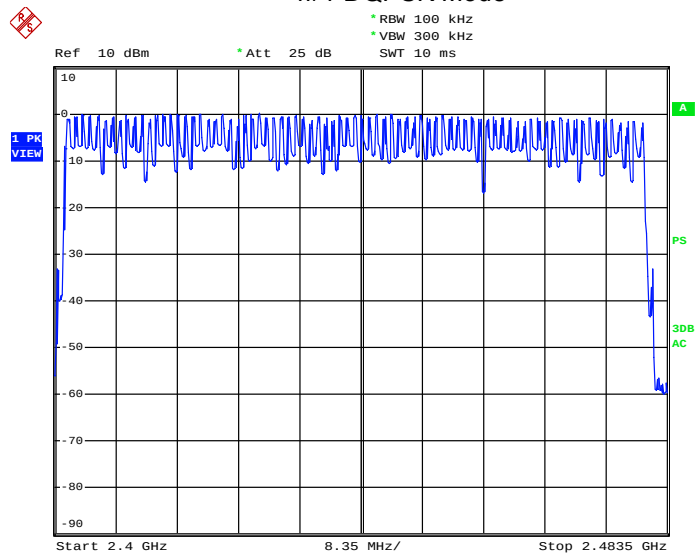
Hopping Channel Frequency Range	Quantity of Hopping Channel	Quantity of Hopping Channel limit
2402-2480	79	>15

GFSK Mode

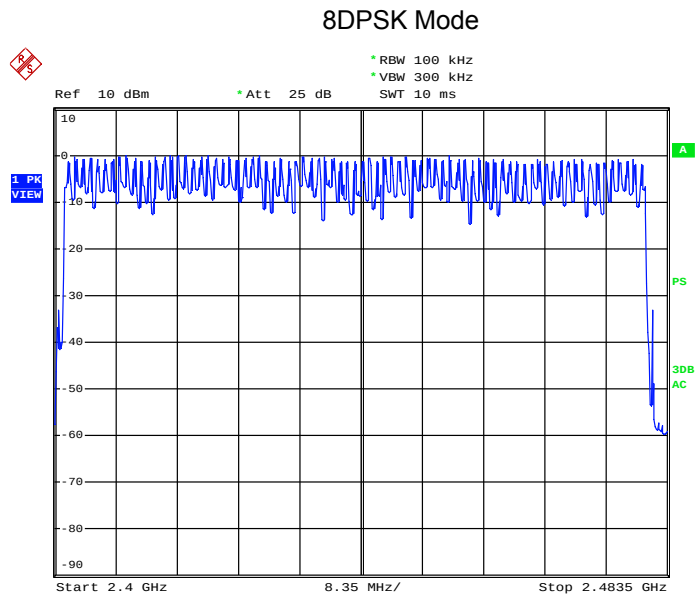


Date: 18.JUL.2015 03:11:15

$\pi/4$ -DQPSK Mode



Date: 18.JUL.2015 03:14:41



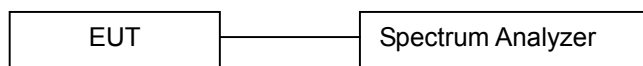
Date: 18.JUL.2015 03:17:32

9. Time of Occupancy (Dwell Time) Test

9.1 Measurement Procedure

- Check the calibration of the measuring instrument(SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- Repeat above procedures until all different time-slot modes have been completed.

9.2 Test SET-UP (Block Diagram of Configuration)



9.3 Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	ESCI	10017	08/01/2014	08/01/2015

9.4 Measurement Results

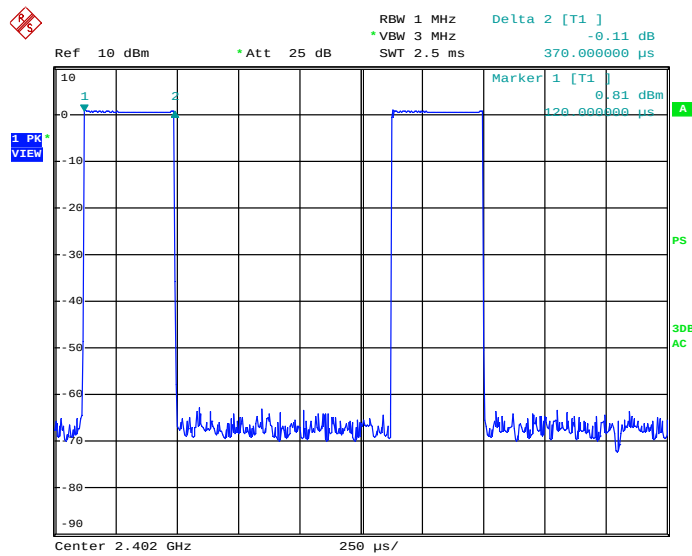
Refer to attached data chart.

Spectrum Detector: PK
 Test By: CX
 Test Result: PASS

Test Date : 07/18/2015
 Temperature : 21 °C
 Humidity : 55 %

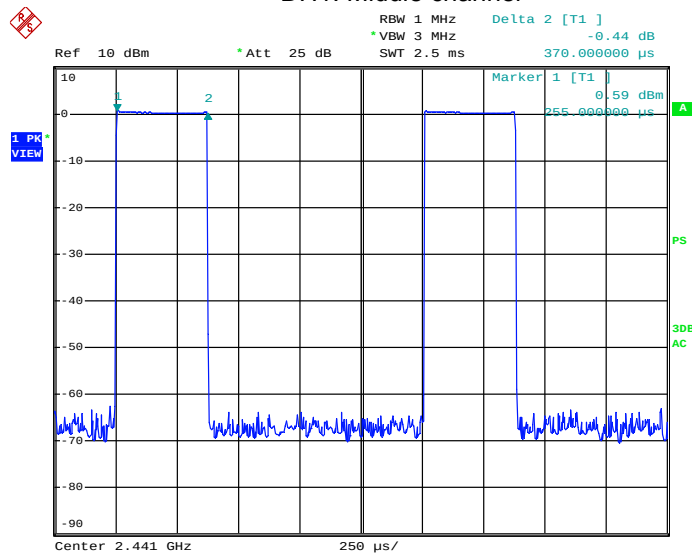
Mode	Channel	Pulse Width (ms)	Dwell Time (ms)	Limit (ms)	Result
GFSK Mode					
DH1	Low channel	0.370	118.40	400	Pass
	Middle channel	0.370	118.40	400	Pass
	High channel	0.375	120.00	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second				
DH3	Low channel	1.639	262.24	400	Pass
	Middle channel	1.639	262.24	400	Pass
	High channel	1.639	262.24	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second				
DH5	Low channel	2.879	307.09	400	Pass
	Middle channel	2.879	307.09	400	Pass
	High channel	2.879	307.09	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second				
8DPSK Mode					
2DH1	Low channel	0.380	121.60	400	Pass
	Middle channel	0.380	121.60	400	Pass
	High channel	0.380	121.60	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second				
2DH3	Low channel	1.637	261.92	400	Pass
	Middle channel	1.637	261.92	400	Pass
	High channel	1.637	261.92	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second				
2DH5	Low channel	2.917	311.15	400	Pass
	Middle channel	2.897	309.01	400	Pass
	High channel	2.897	309.01	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second				
8DPSK Mode					
3DH1	Low channel	0.378	120.96	400	Pass
	Middle channel	0.378	120.96	400	Pass
	High channel	0.378	120.96	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second				
3DH3	Low channel	1.626	260.16	400	Pass
	Middle channel	1.626	260.16	400	Pass
	High channel	1.626	260.16	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second				
3DH5	Low channel	2.886	307.84	400	Pass
	Middle channel	2.886	307.84	400	Pass
	High channel	2.886	307.84	400	Pass
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second				

DH1: Low channel



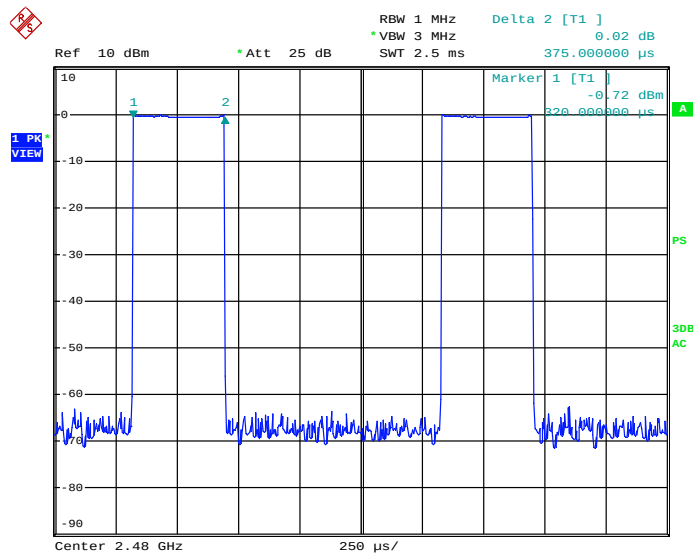
Date: 18.JUL.2015 02:48:50

DH1: Middle channel



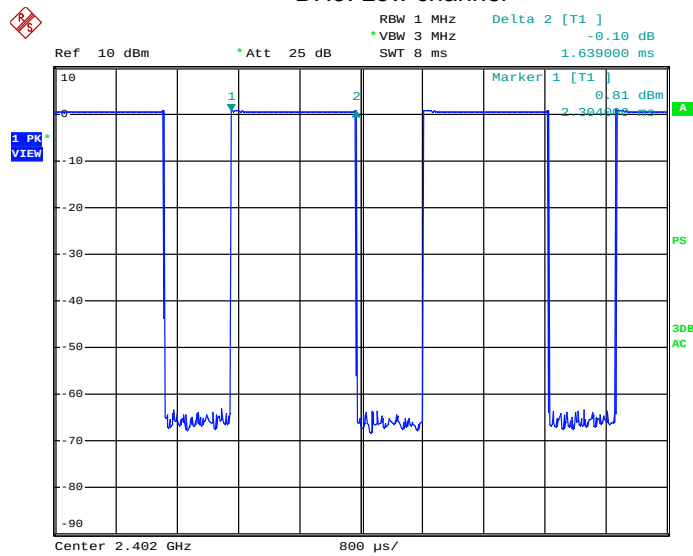
Date: 18.JUL.2015 02:50:22

DH1: High channel



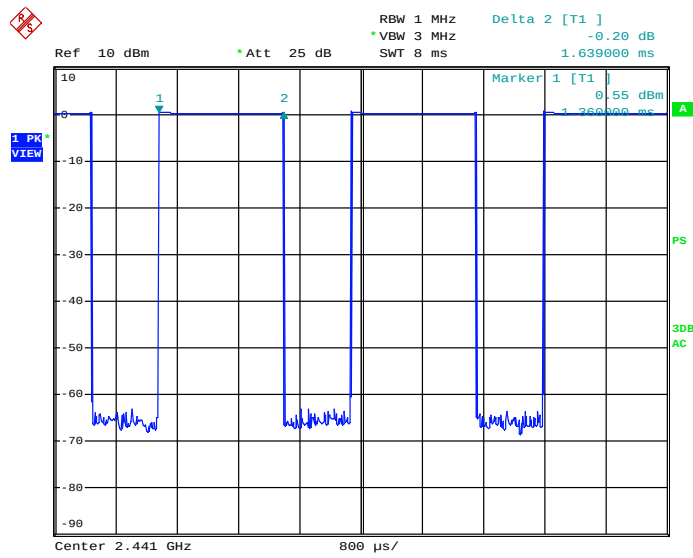
Date: 18.JUL.2015 02:50:58

DH3: Low channel



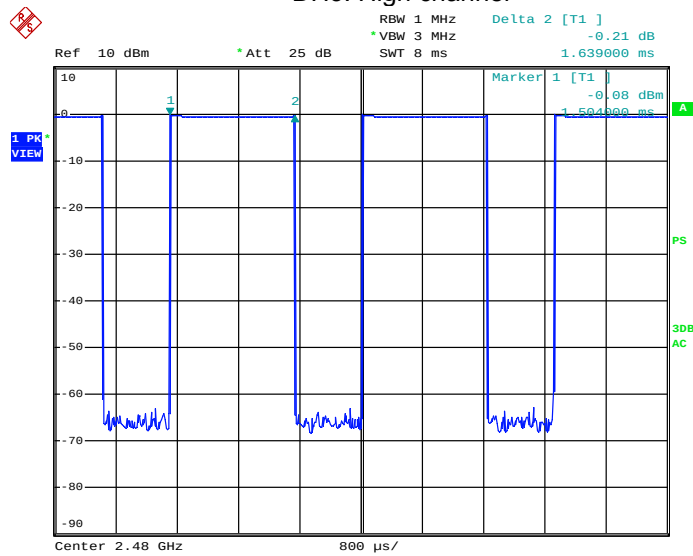
Date: 18.JUL.2015 02:51:59

DH3: Middle channel



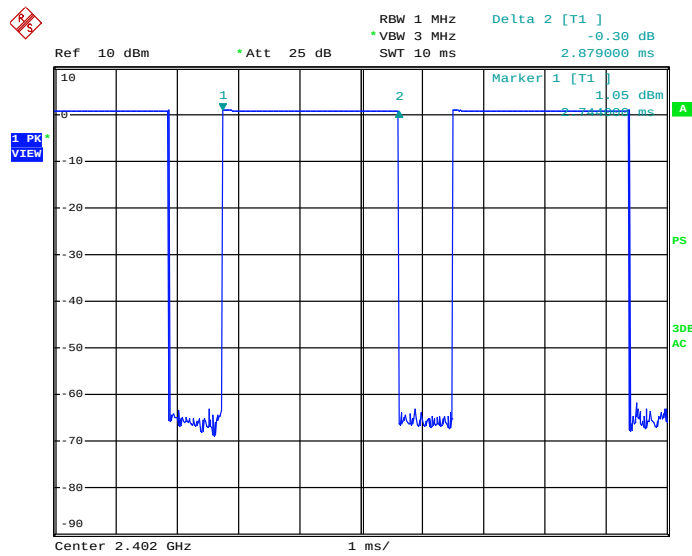
Date: 18.JUL.2015 02:52:41

DH3: High channel



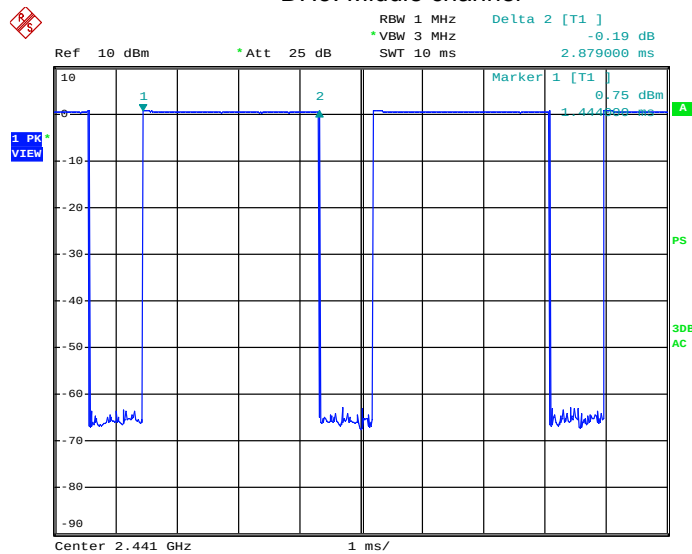
Date: 18.JUL.2015 02:53:08

DH5: Low channel



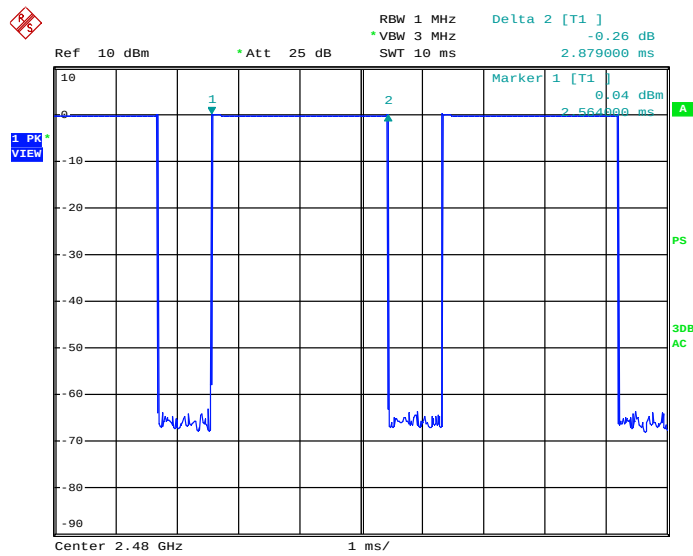
Date: 18.JUL.2015 02:53:59

DH5: Middle channel



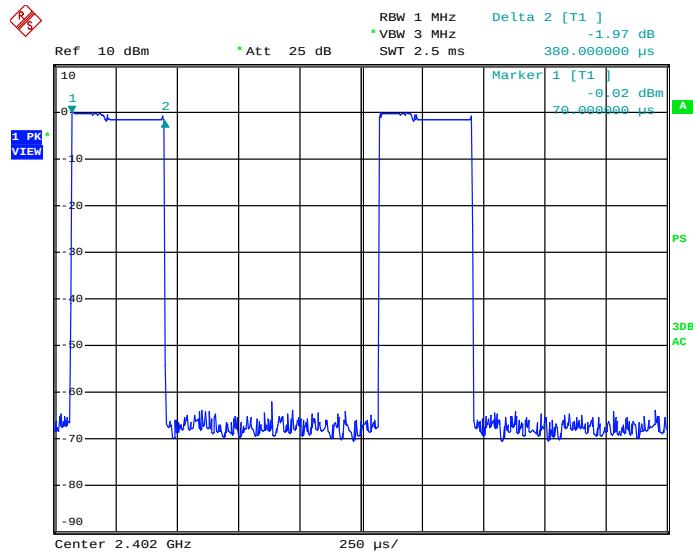
Date: 18.JUL.2015 02:54:33

DH5: High channel



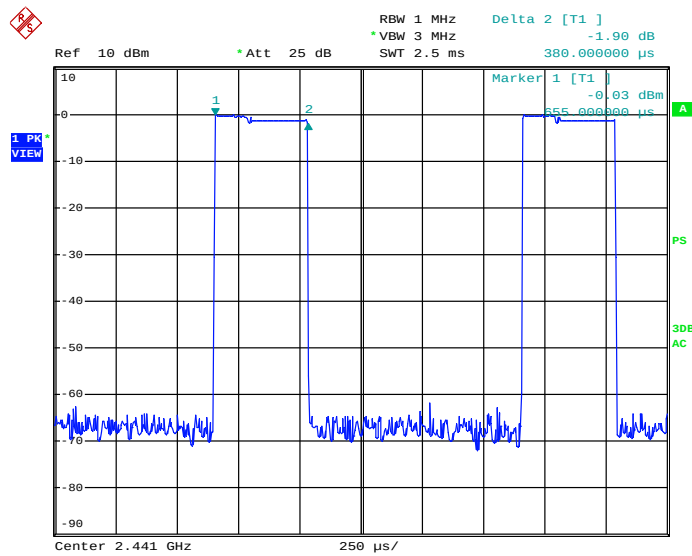
Date: 18.JUL.2015 02:55:10

2DH1: Low channel



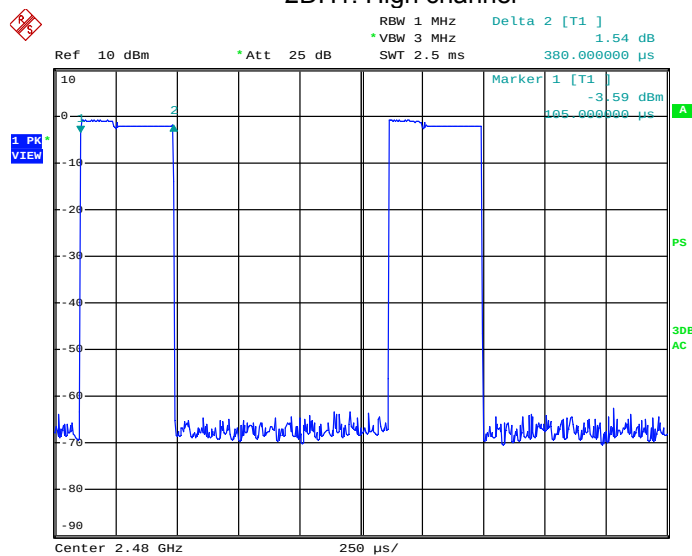
Date: 18.JUL.2015 02:56:33

2DH1: Middle channel



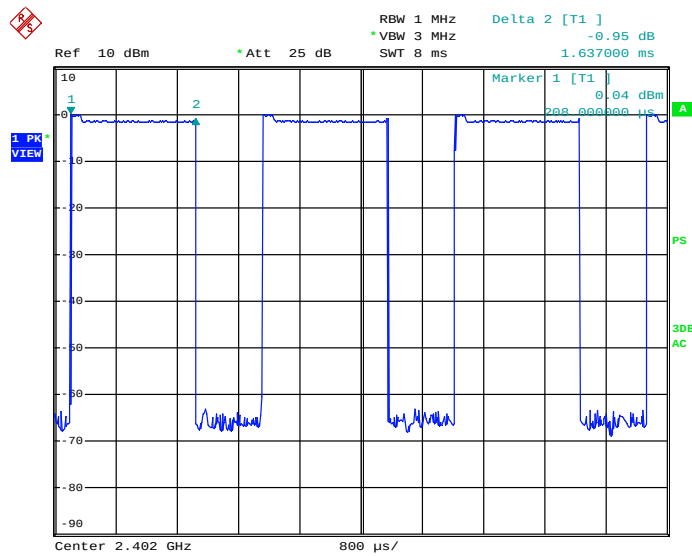
Date: 18.JUL.2015 02:57:08

2DH1: High channel



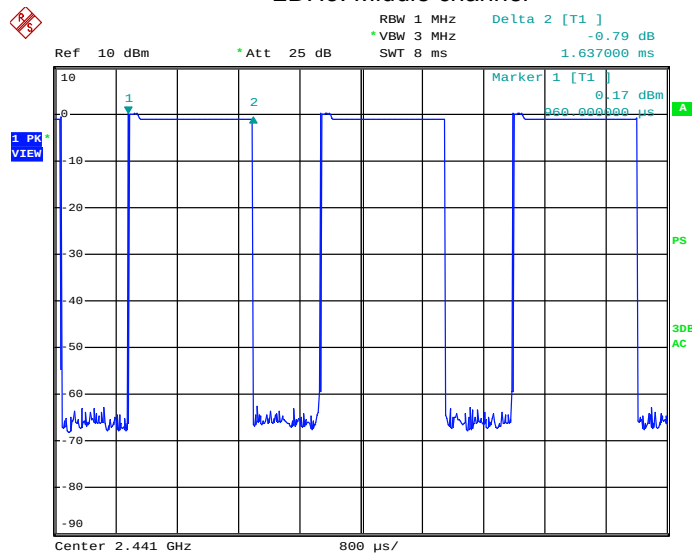
Date: 18.JUL.2015 02:57:45

2DH3: Low channel



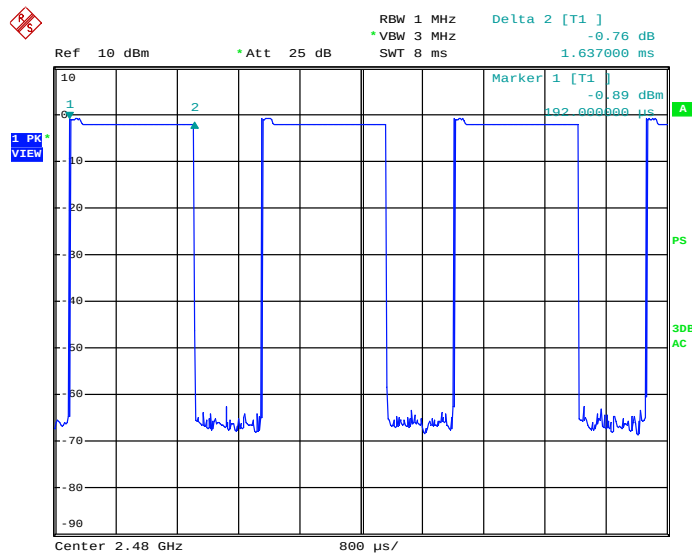
Date: 18.JUL.2015 02:58:36

2DH3: Middle channel



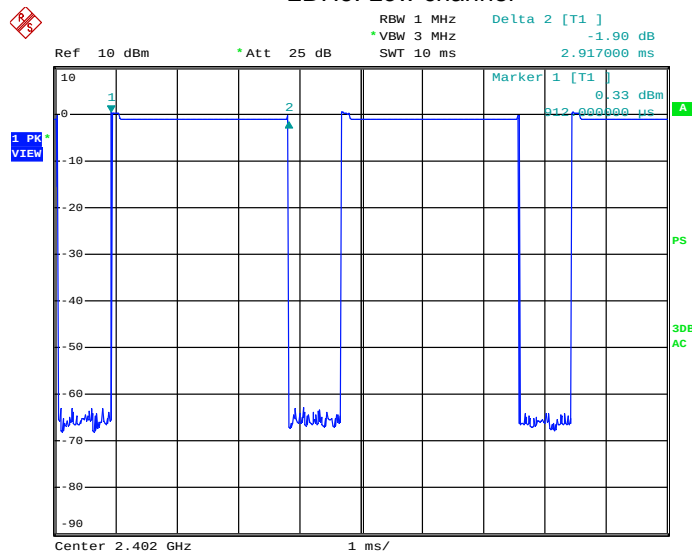
Date: 18.JUL.2015 02:59:15

2DH3: High channel



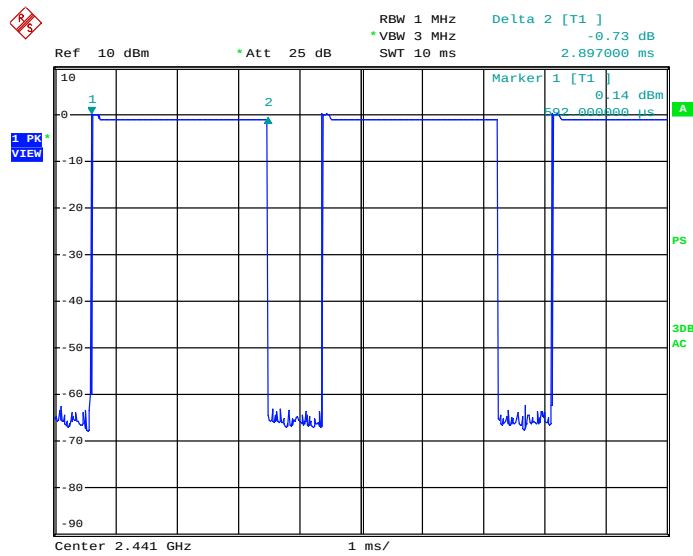
Date: 18.JUL.2015 02:59:56

2DH5: Low channel



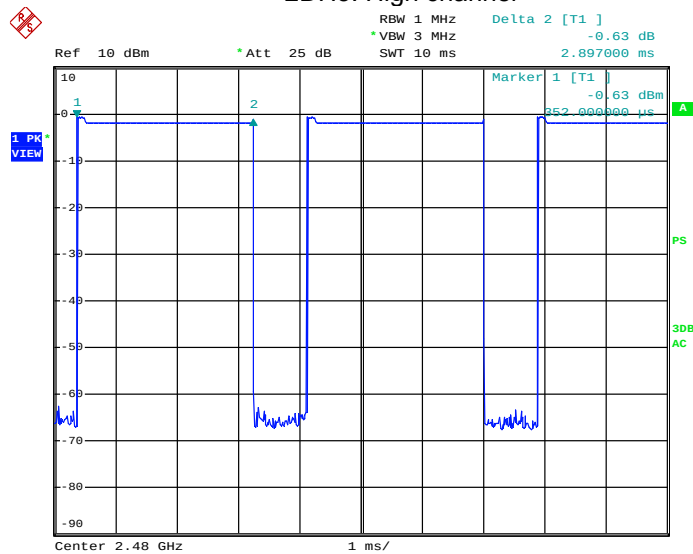
Date: 18.JUL.2015 03:01:08

2DH5: Middle channel



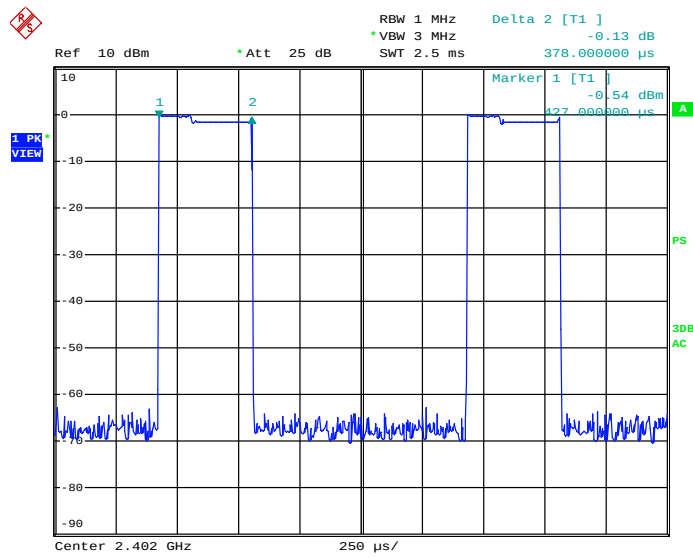
Date: 18.JUL.2015 03:01:41

2DH5: High channel



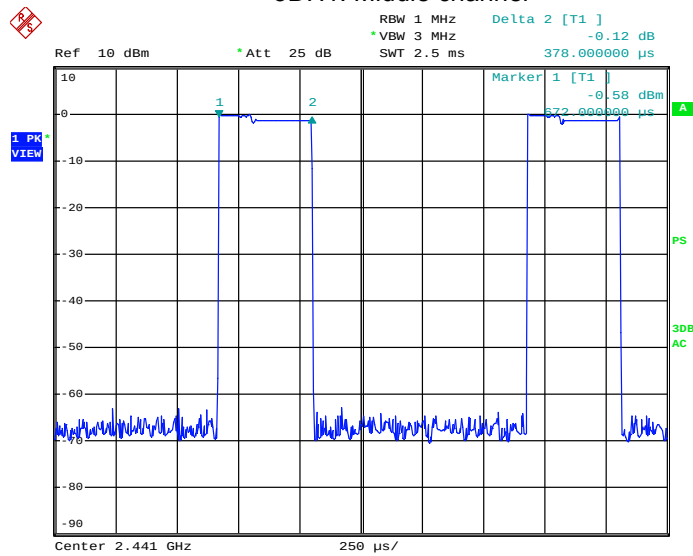
Date: 18.JUL.2015 03:02:13

3DH1: Low channel



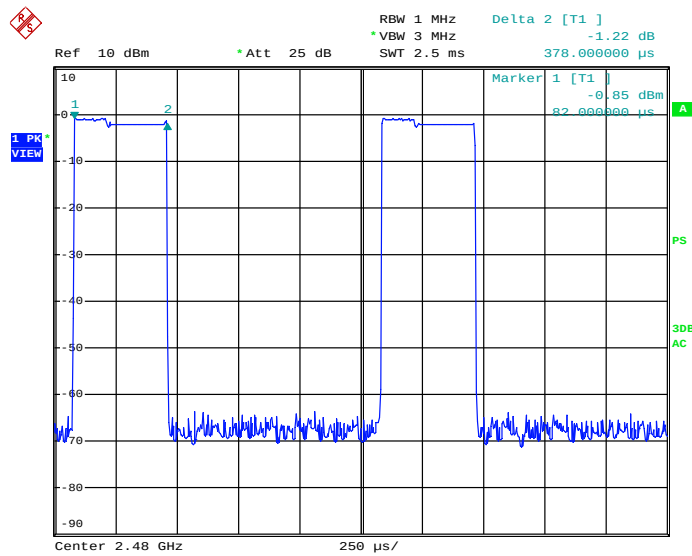
Date: 18.JUL.2015 03:03:10

3DH1: Middle channel



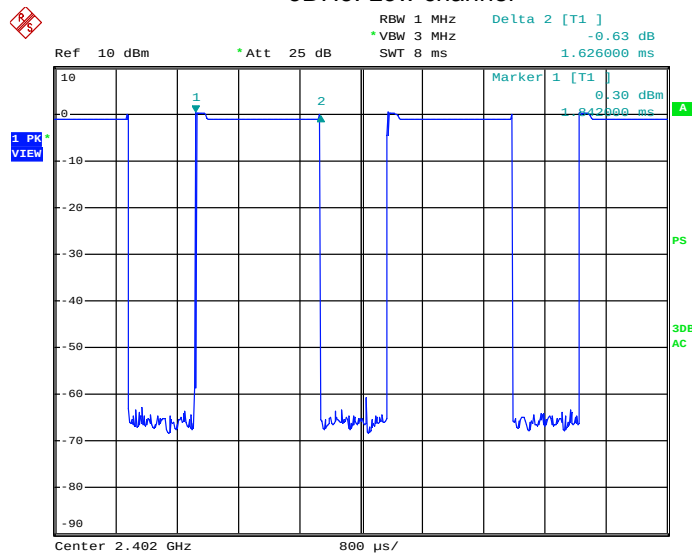
Date: 18.JUL.2015 03:04:00

3DH1: High channel



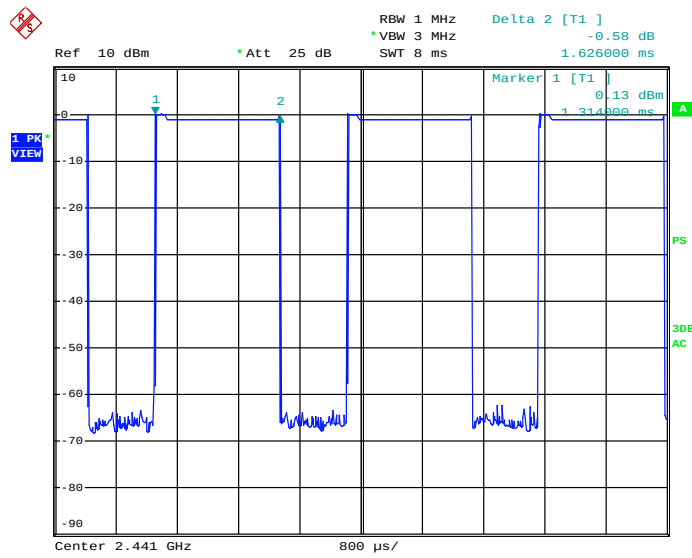
Date: 18.JUL.2015 03:04:59

3DH3: Low channel



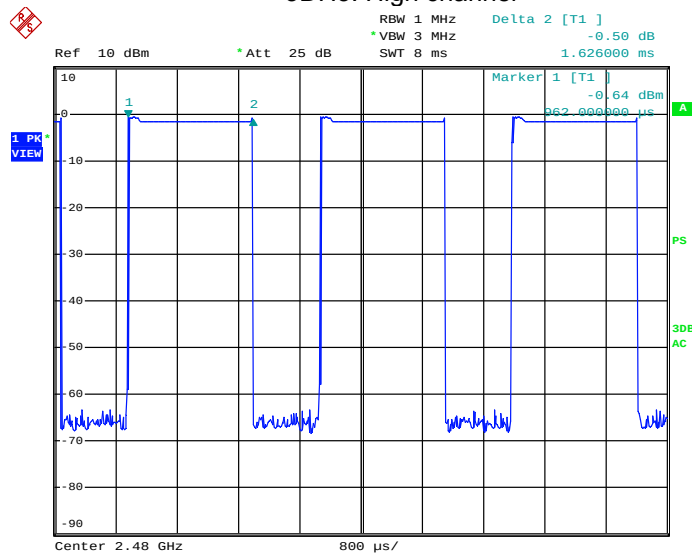
Date: 18.JUL.2015 03:05:59

3DH3: Middle channel



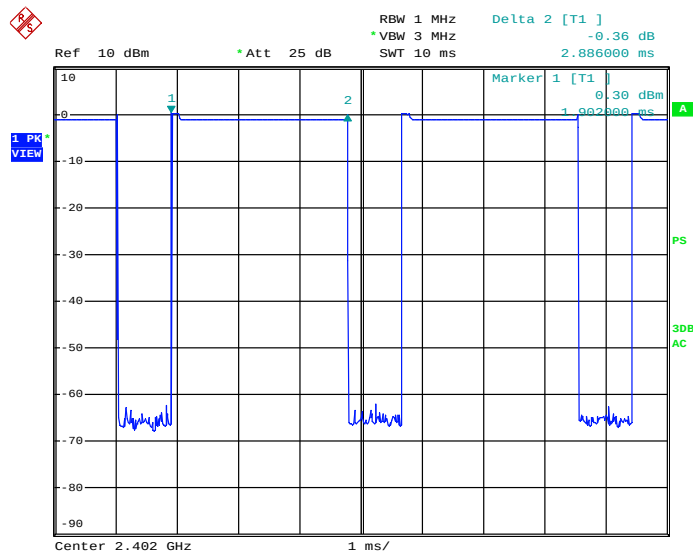
Date: 18.JUL.2015 03:06:30

3DH3: High channel



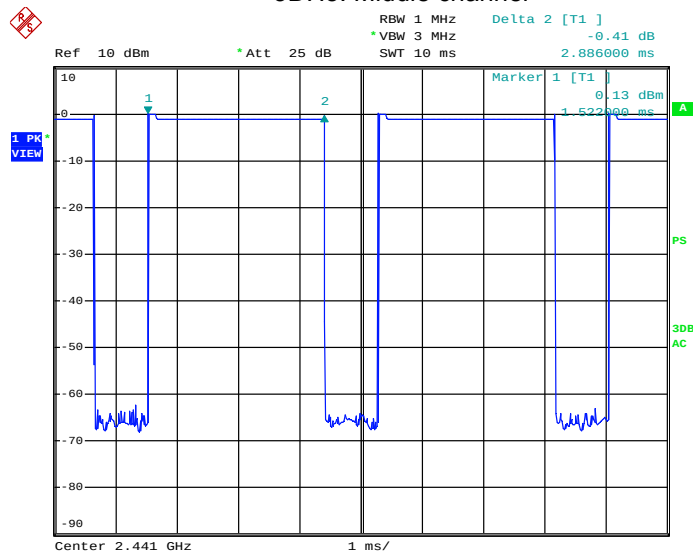
Date: 18.JUL.2015 03:06:57

3DH5: Low channel



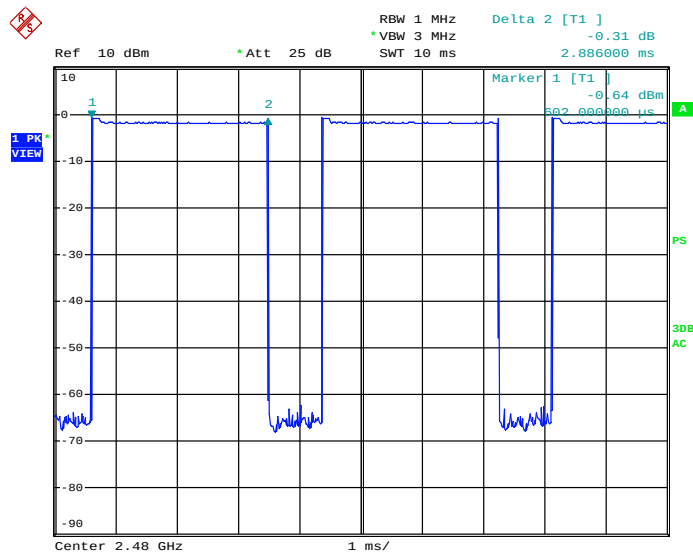
Date: 18.JUL.2015 03:07:37

3DH5: Middle channel



Date: 18.JUL.2015 03:08:07

3DH5: High channel



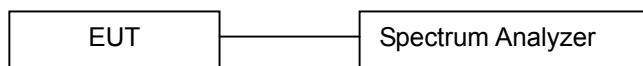
Date: 18.JUL.2015 03:08:38

10. Maximum Peak Output Power Test

10.1 Measurement Procedure

- Check the calibration of the measuring instrument(SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- The center frequency of the spectrum analyzer is set to the fundamental frequency and using proper RBW and VBW setting.
- Measure the captured power within the band and recording the plot.
- Repeat above procedures until all frequencies required were complete.

10.2 Test SET-UP (Block Diagram of Configuration)



10.3 Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	ESCI	10017	08/01/2014	08/01/2015

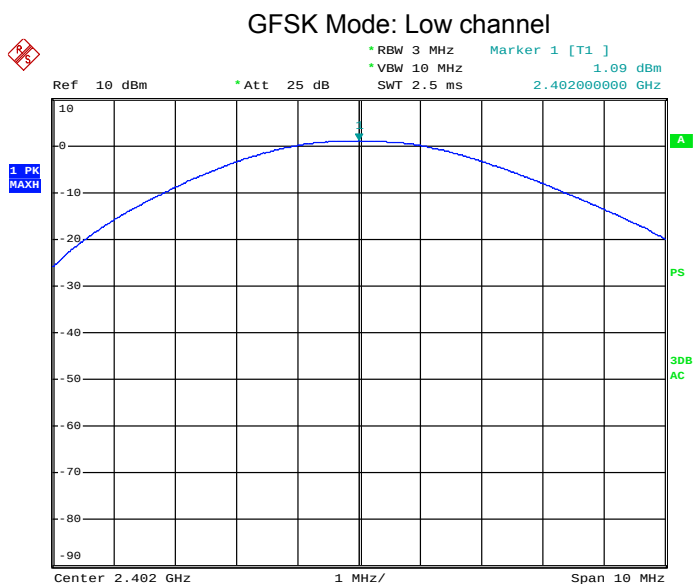
10.4 Measurement Results

Refer to attached data chart.

Spectrum Detector: PK
Test By: CX
Test Result: PASS

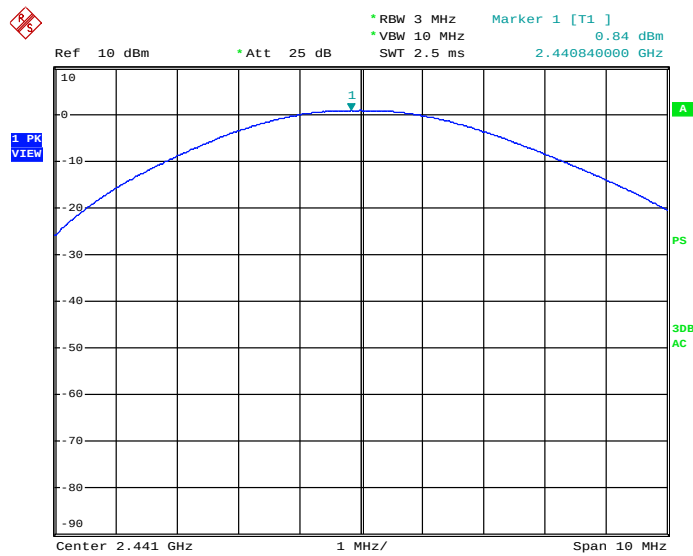
Test Date : 07/18/2015
Temperature : 21 °C
Humidity : 55 %

GFSK Mode					
Channel	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power output(mW)	Peak Power Limit(mW)	Pass/Fail
Low channel	2402.00	1.09	1.29	125	PASS
Middle channel	2441.00	0.84	1.21	125	PASS
High channel	2480.00	0.23	1.05	125	PASS
$\pi/4$ -DQPSK Mode					
Channel	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power output(mW)	Peak Power Limit(mW)	Pass/Fail
Low channel	2402.00	0.39	1.09	125	PASS
Middle channel	2441.00	0.29	1.07	125	PASS
High channel	2480.00	-0.35	0.92	125	PASS
8DPSK Mode					
Channel	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power output(mW)	Peak Power Limit(mW)	Pass/Fail
Low channel	2402.00	0.39	1.09	125	PASS
Middle channel	2441.00	0.35	1.08	125	PASS
High channel	2480.00	-0.32	0.92	125	PASS



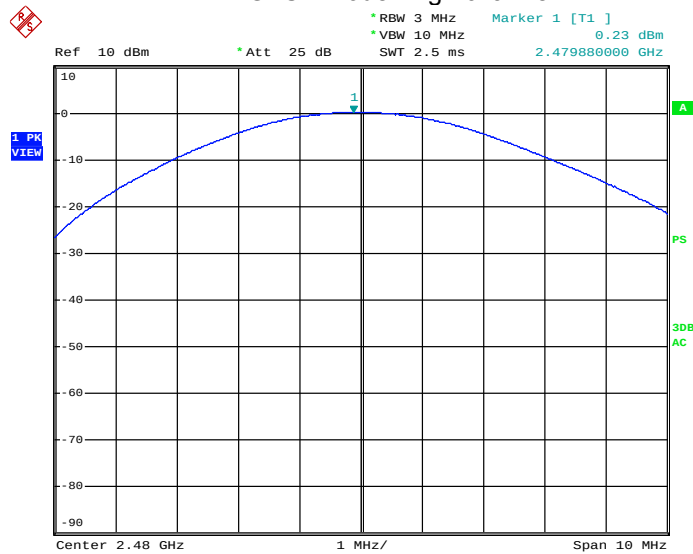
Date: 18.JUL.2015 02:42:26

GFSK Mode: Middle channel



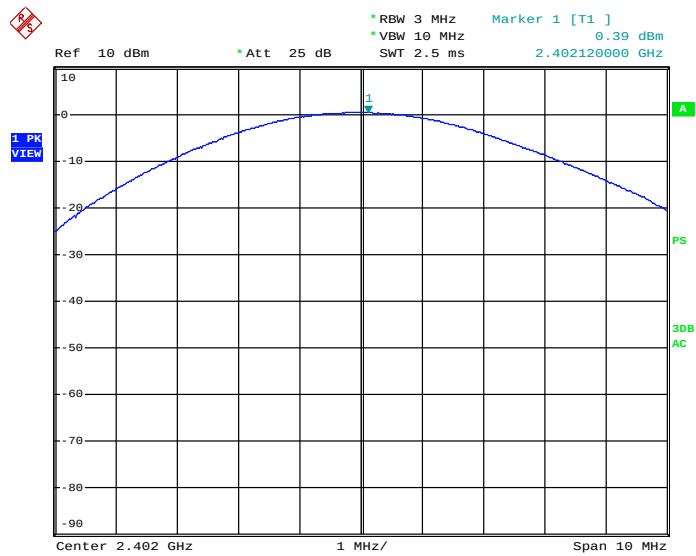
Date: 18.JUL.2015 02:42:46

GFSK Mode: High channel



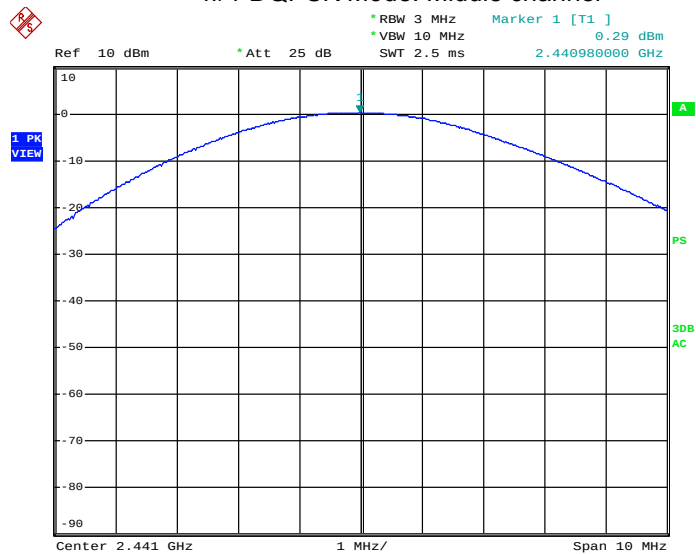
Date: 18.JUL.2015 02:43:33

$\pi/4$ -DQPSK Mode: Low channel



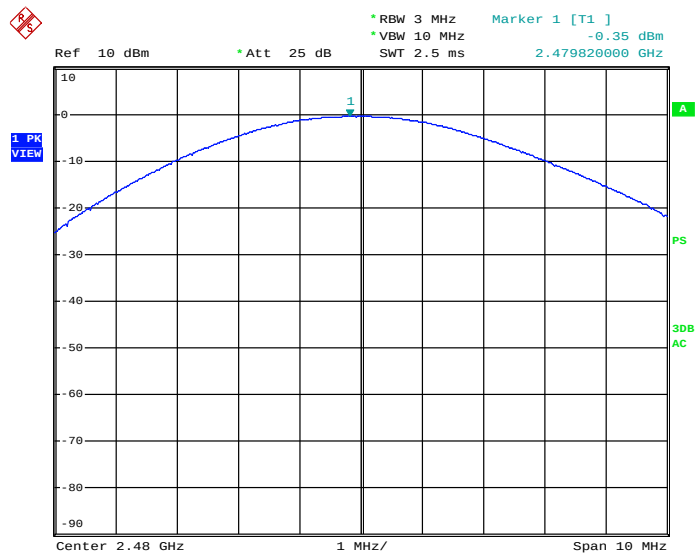
Date: 18.JUL.2015 02:44:37

$\pi/4$ -DQPSK Mode: Middle channel



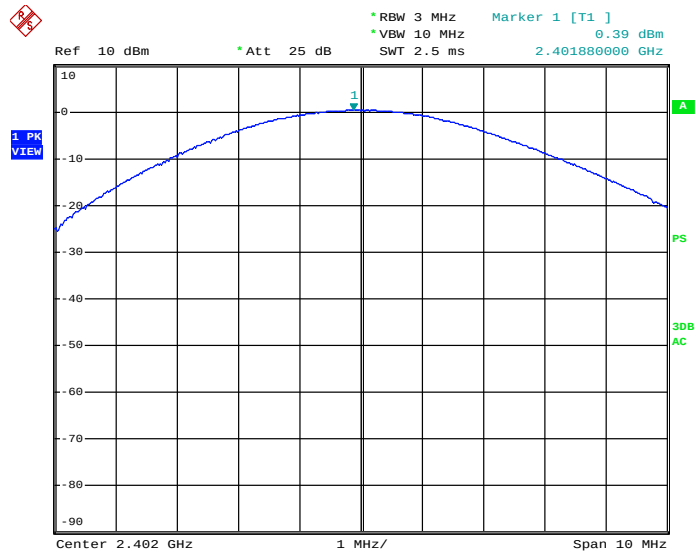
Date: 18.JUL.2015 02:45:15

$\pi/4$ -DQPSK Mode: High channel



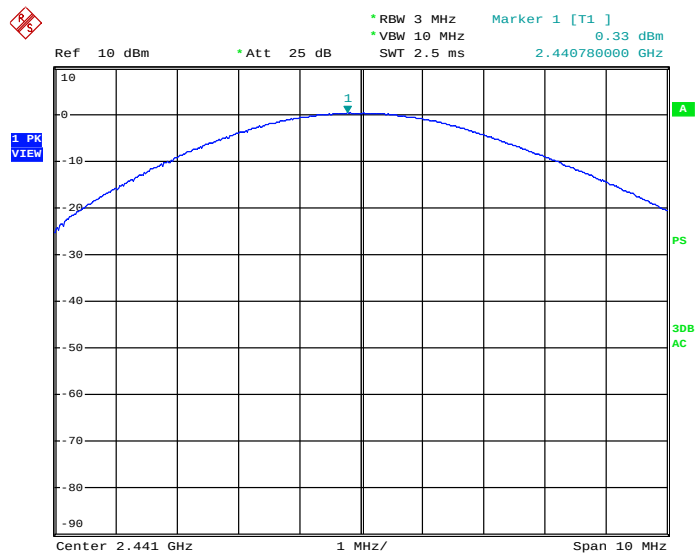
Date: 18.JUL.2015 02:45:50

8DPSK Mode: Low channel



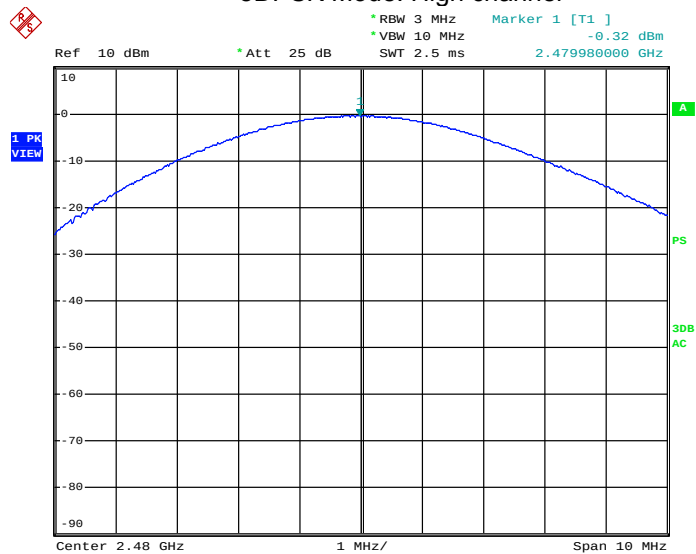
Date: 18.JUL.2015 02:46:33

8DPSK Mode: Middle channel



Date: 18.JUL.2015 02:47:02

8DPSK Mode: High channel



Date: 18.JUL.2015 02:47:29

11. Band Edge Test

11.1 Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

11.2 Measurement Procedure

(A) Conducted method:

Measurements were performed using a spectrum analyzer with a suitable span to encompass the peak of the fundamental and using the following settings: RBW = 100kHz, VBW = 300kHz.

(B) Radiated method:

1. The EUT was Operating in hopping mode or could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.
(Peak measurement: Peak detector, RBW=1MHz, VBW=3MHz, Sweep=Auto
Average measurement: Peak detector, RBW=1MHz, VBW=10Hz, Sweep=Auto)

11.3 Measurement Equipment Used

Conducted method: Same as 6.3 Channel Separation Measurement.

Radiated method: Same as 5.3 Radiated Emission Measurement.

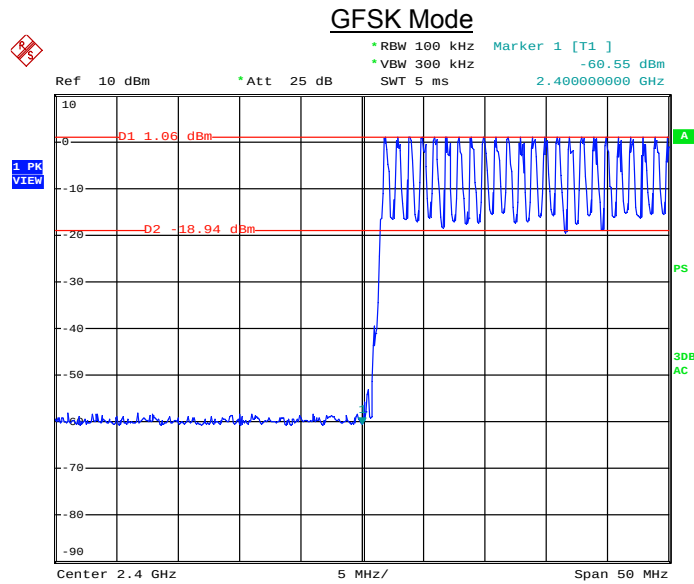
11.4 Measurement Results

Pass

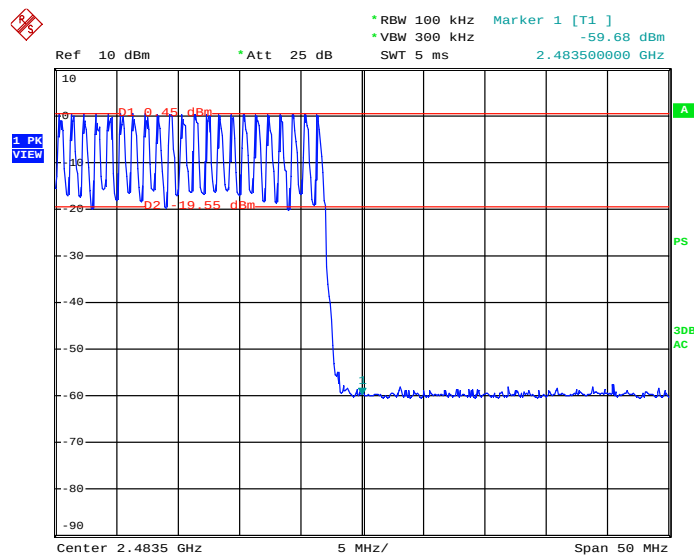
Refer to attached data chart.

(A) Conducted Measurement

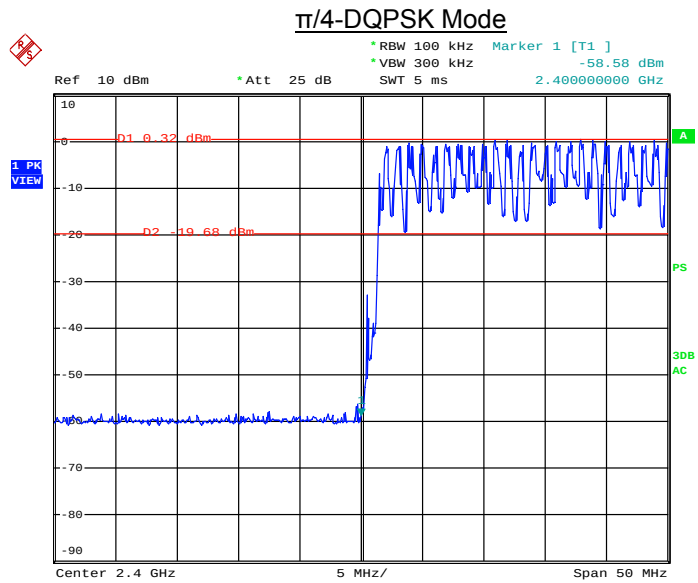
For Hopping Mode:



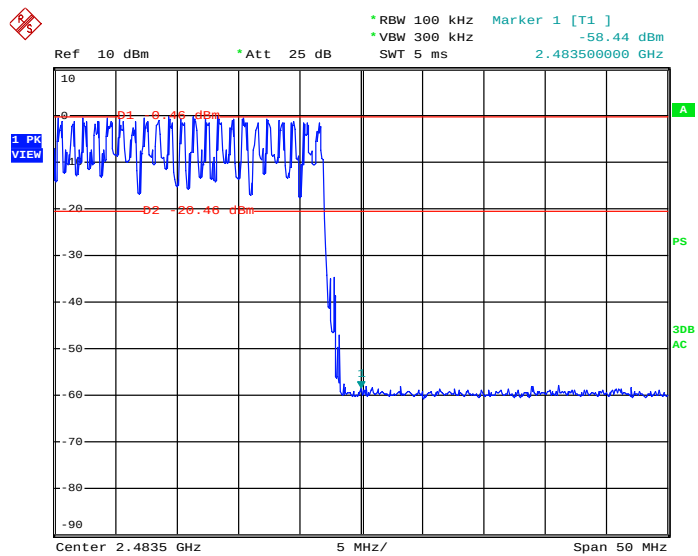
Date: 18.JUL.2015 03:47:53



Date: 18.JUL.2015 03:49:43

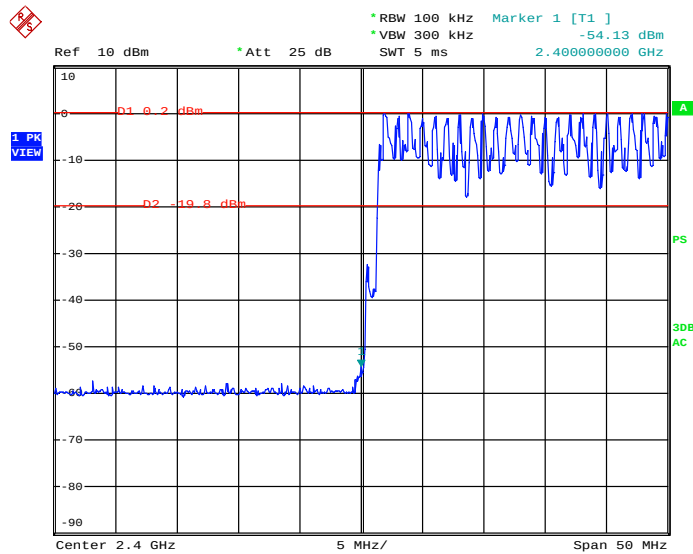


Date: 18.JUL.2015 03:55:10

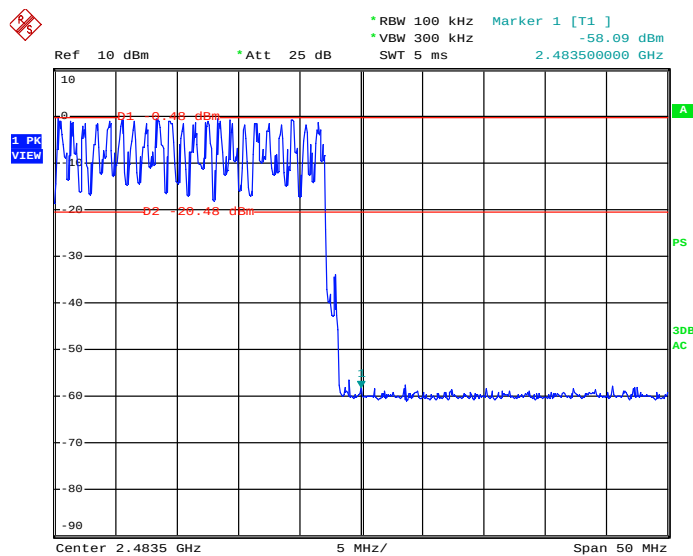


Date: 18.JUL.2015 03:52:23

8DPSK Mode



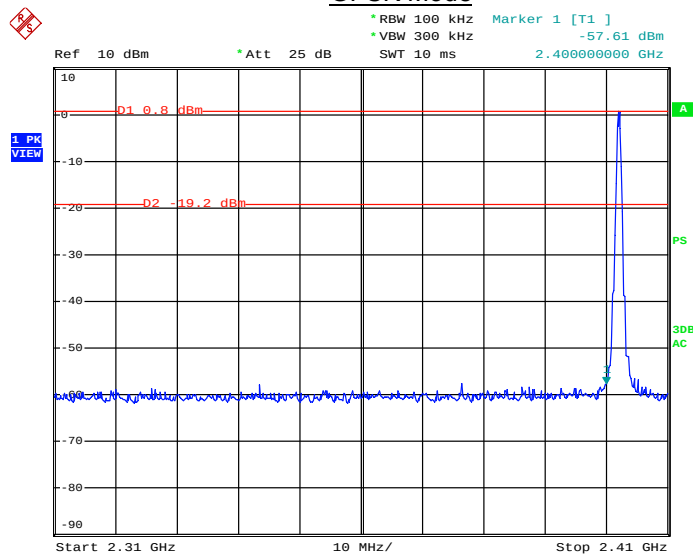
Date: 18.JUL.2015 03:57:30



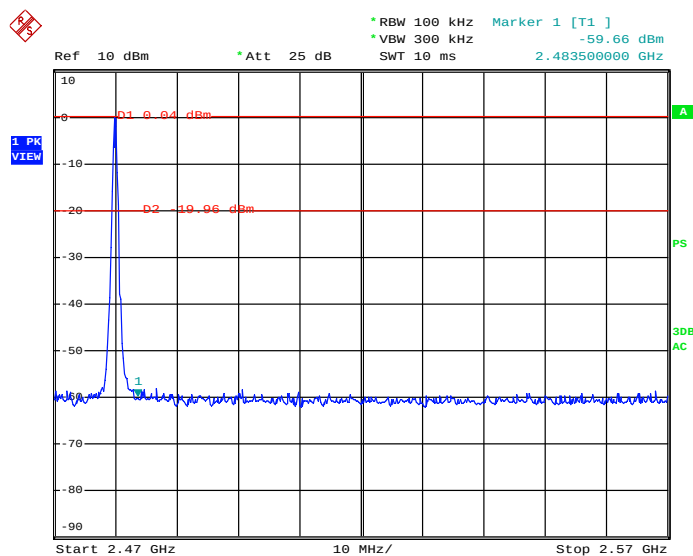
Date: 18.JUL.2015 03:59:11

For Non-Hopping Mode

GFSK Mode

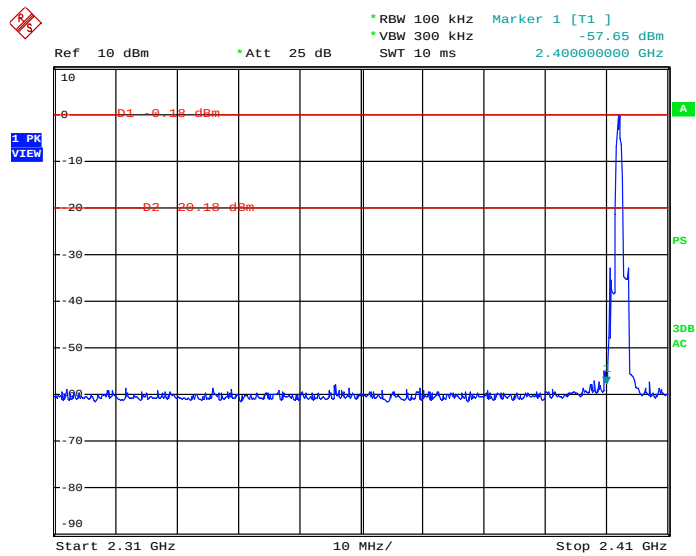


Date: 18.JUL.2015 03:38:00

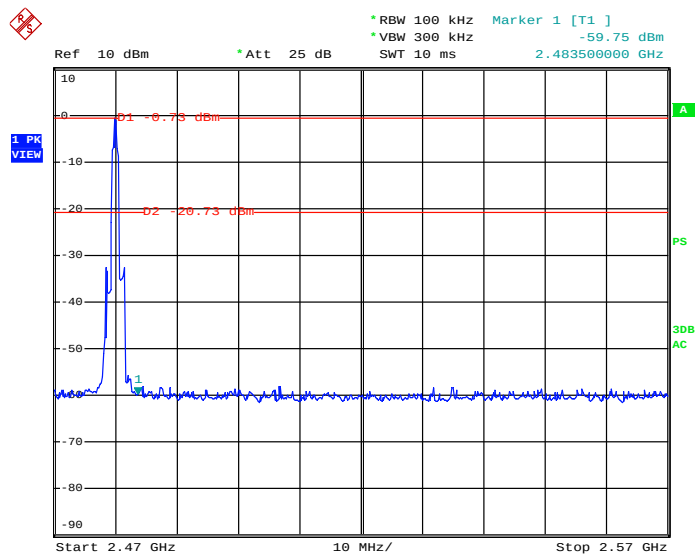


Date: 18.JUL.2015 03:39:12

$\pi/4$ -DQPSK Mode

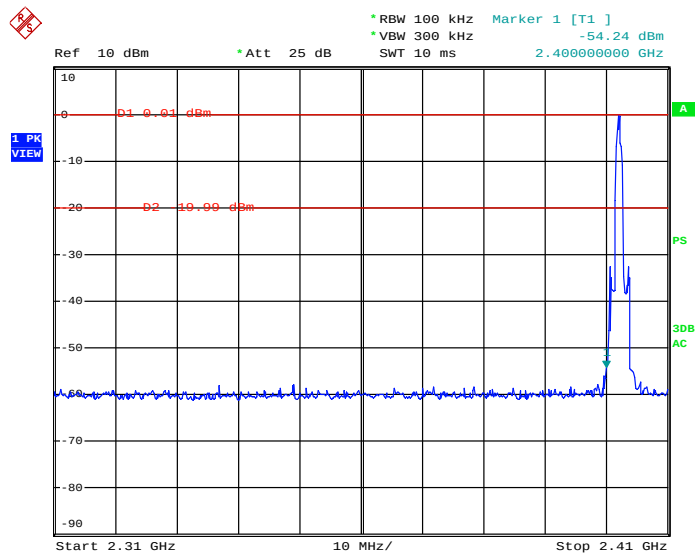


Date: 18.JUL.2015 03:40:15

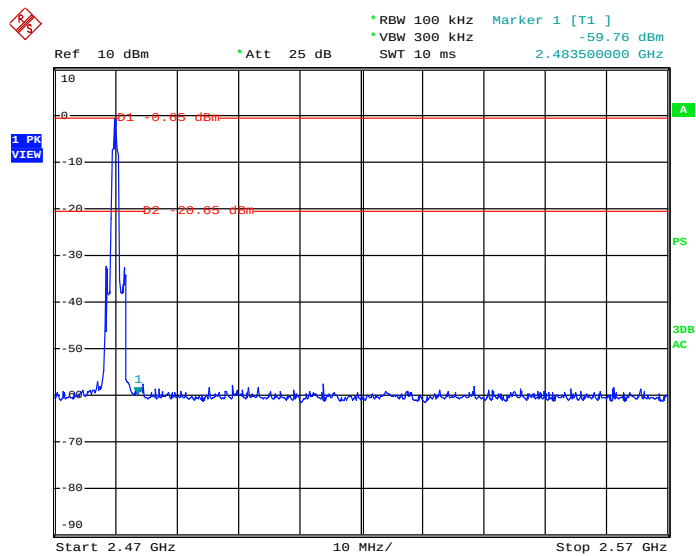


Date: 18.JUL.2015 03:41:25

8DPSK Mode



Date: 18.JUL.2015 03:42:36



Date: 18.JUL.2015 03:43:37

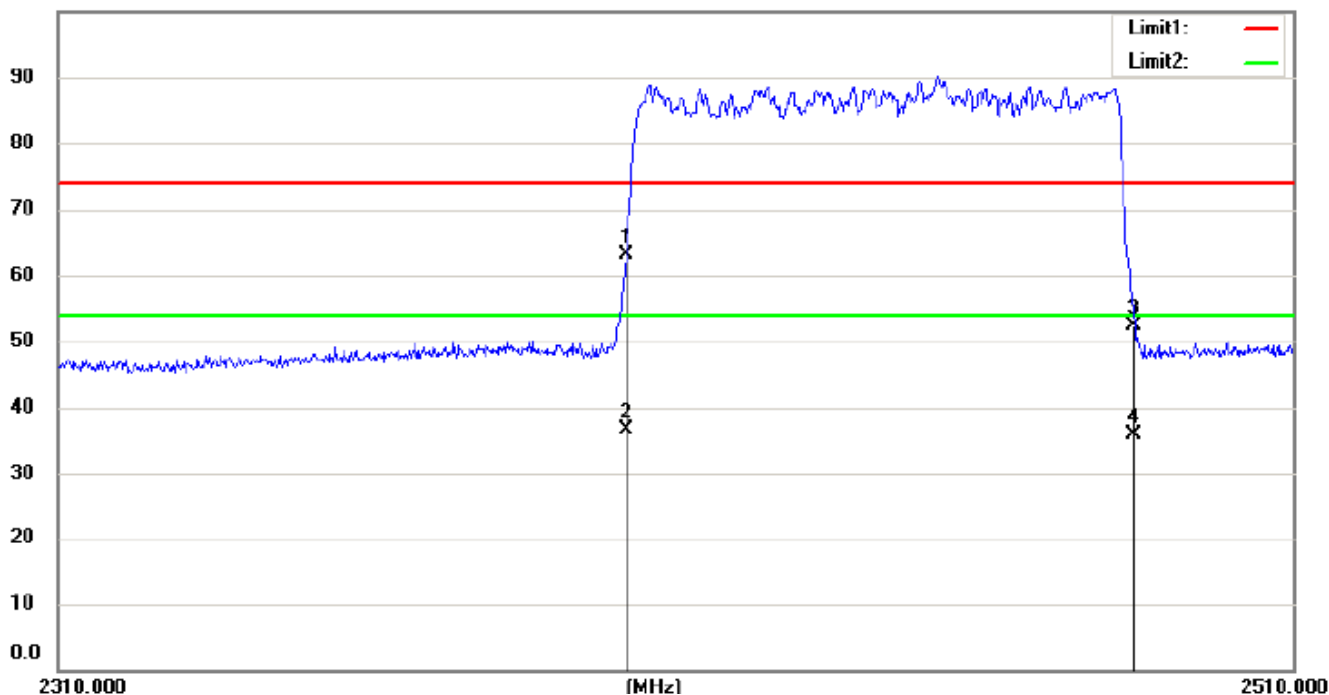
(B) Radiated Measurement

For Hopping Mode:

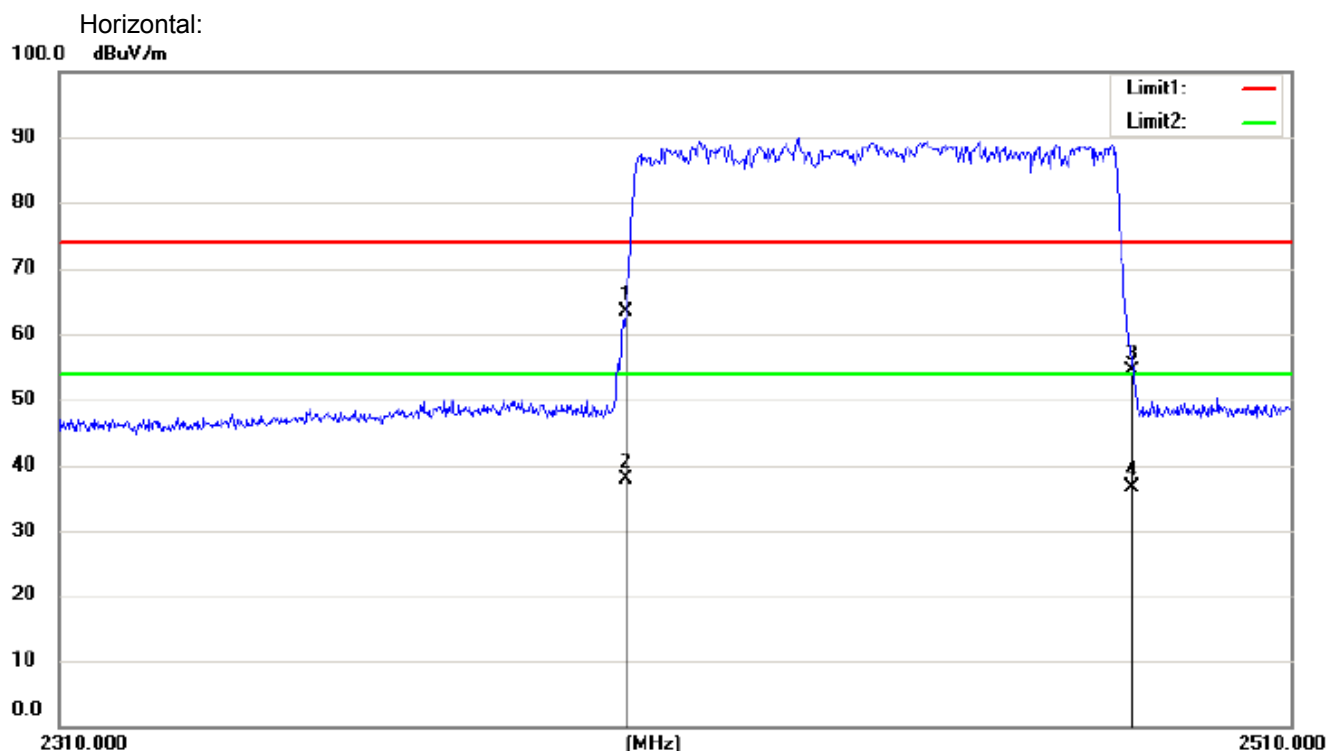
GFSK Mode

Vertical:

100.0 dBuV/m

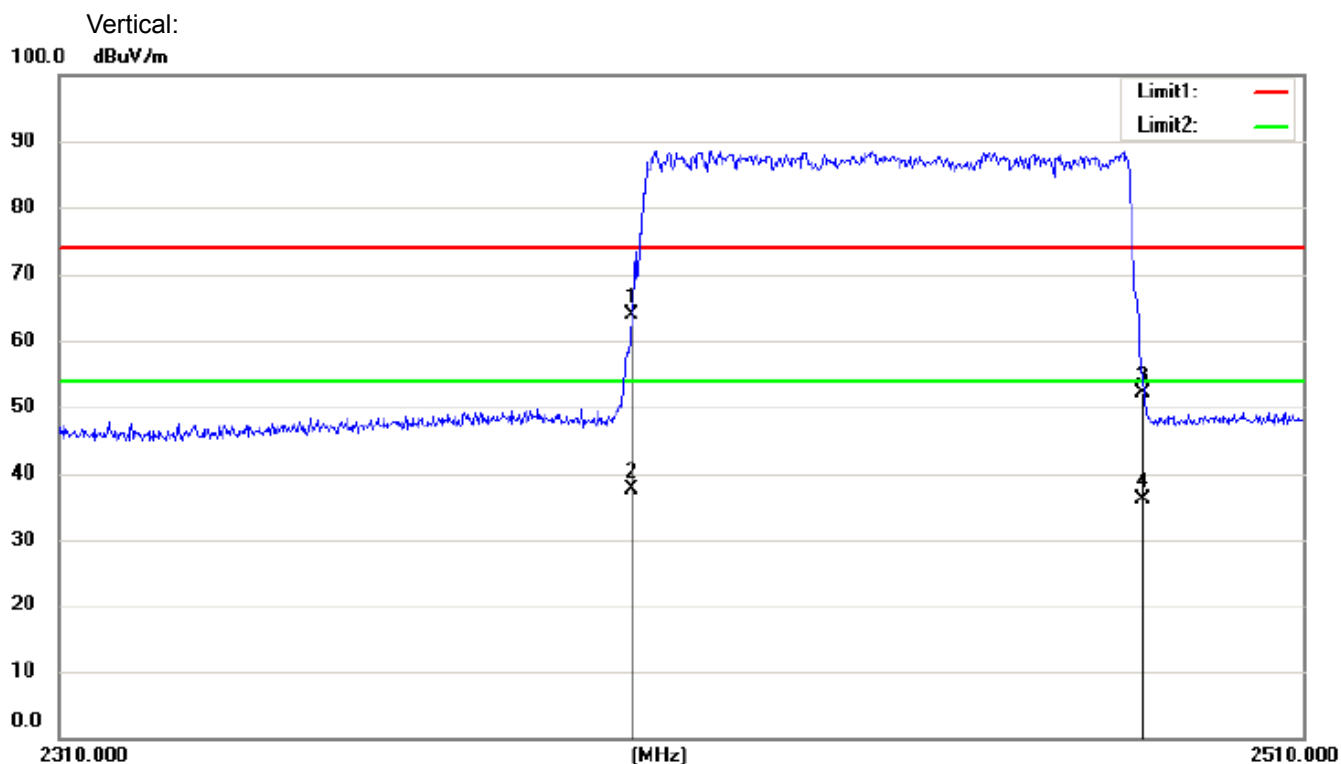


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dBuV/m	dB	
1	*	2400.000	52.14	10.93	63.07	73.90	-10.83	peak
2		2400.000	25.77	10.93	36.70	53.90	-17.20	AVG
3		2483.500	41.47	11.00	52.47	73.90	-21.43	peak
4		2483.500	24.80	11.00	35.80	53.90	-18.10	AVG

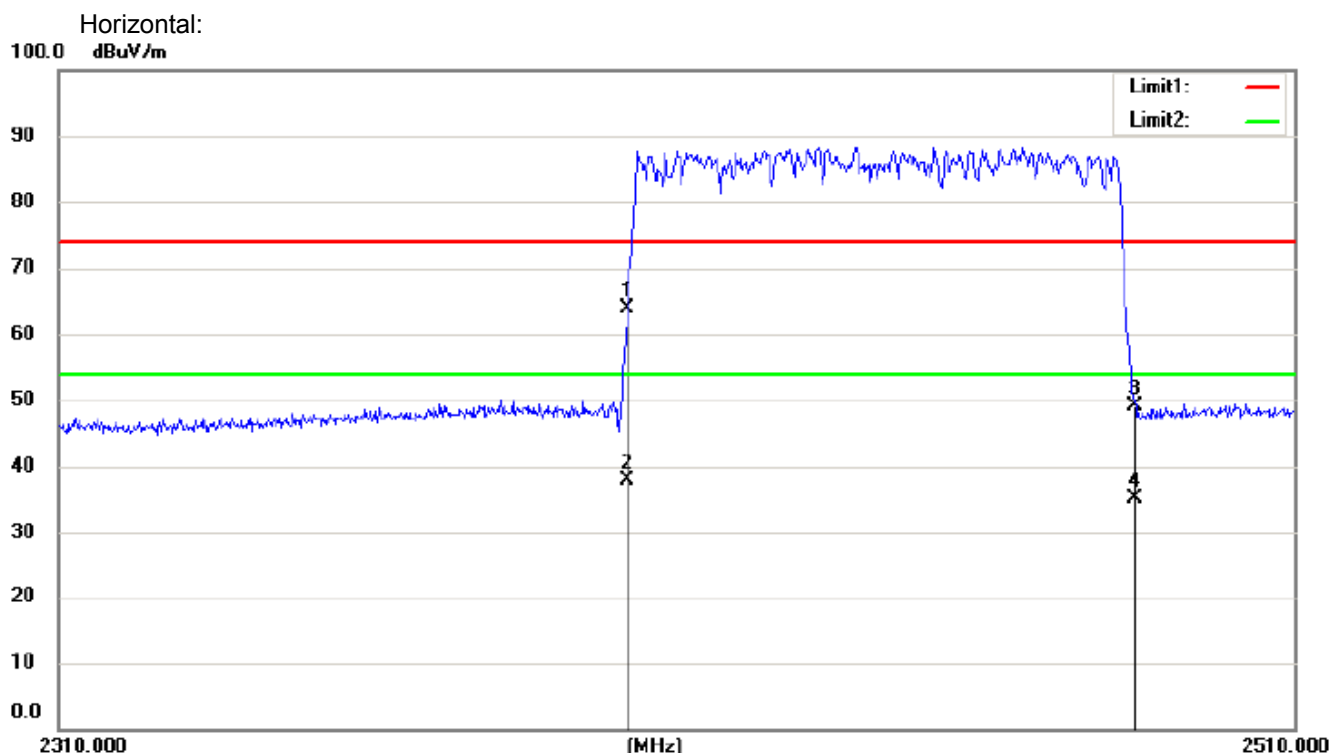


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2400.000	52.47	10.93	63.40	73.90	-10.50	peak
2		2400.000	26.87	10.93	37.80	53.90	-16.10	AVG
3		2483.500	43.45	11.00	54.45	73.90	-19.45	peak
4		2483.500	25.60	11.00	36.60	53.90	-17.30	AVG

$\pi/4$ -DQPSK Mode

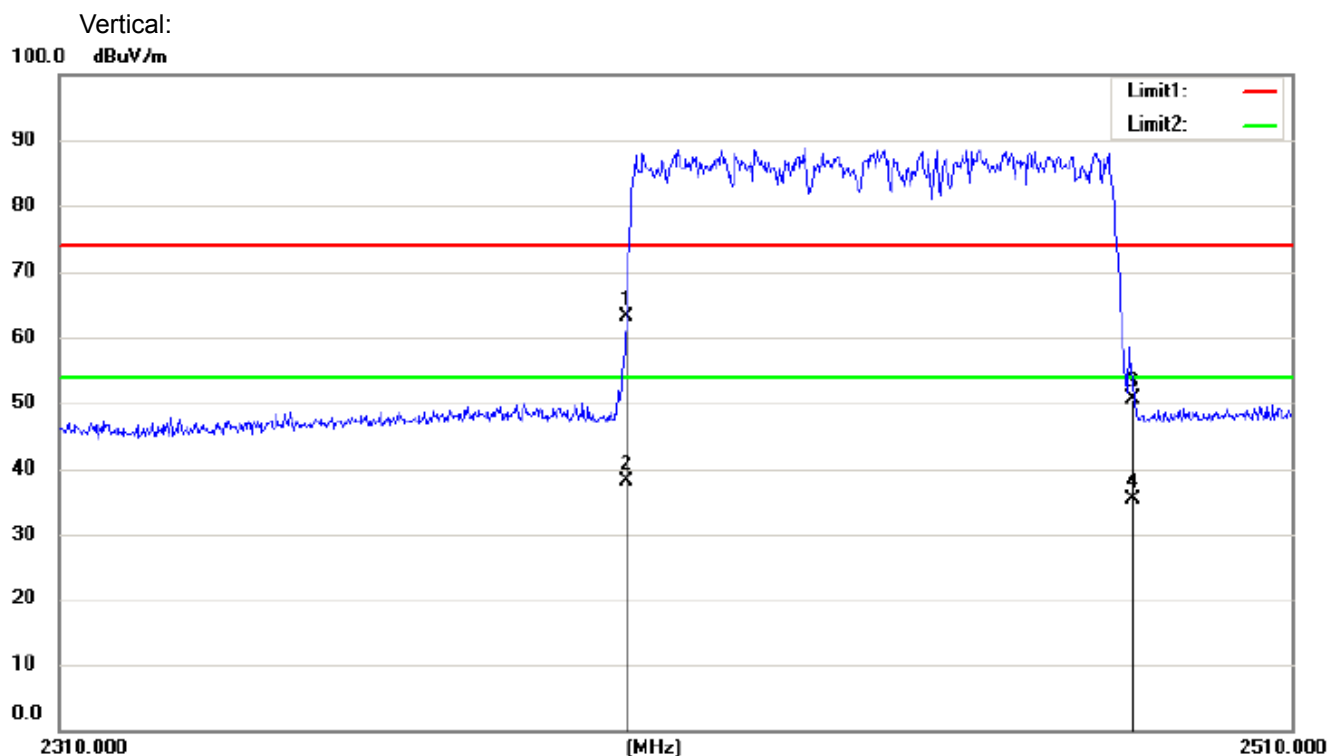


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2400.000	52.88	10.93	63.81	73.90	-10.09	peak
2		2400.000	26.77	10.93	37.70	53.90	-16.20	AVG
3		2483.500	41.16	11.00	52.16	73.90	-21.74	peak
4		2483.500	25.20	11.00	36.20	53.90	-17.70	AVG

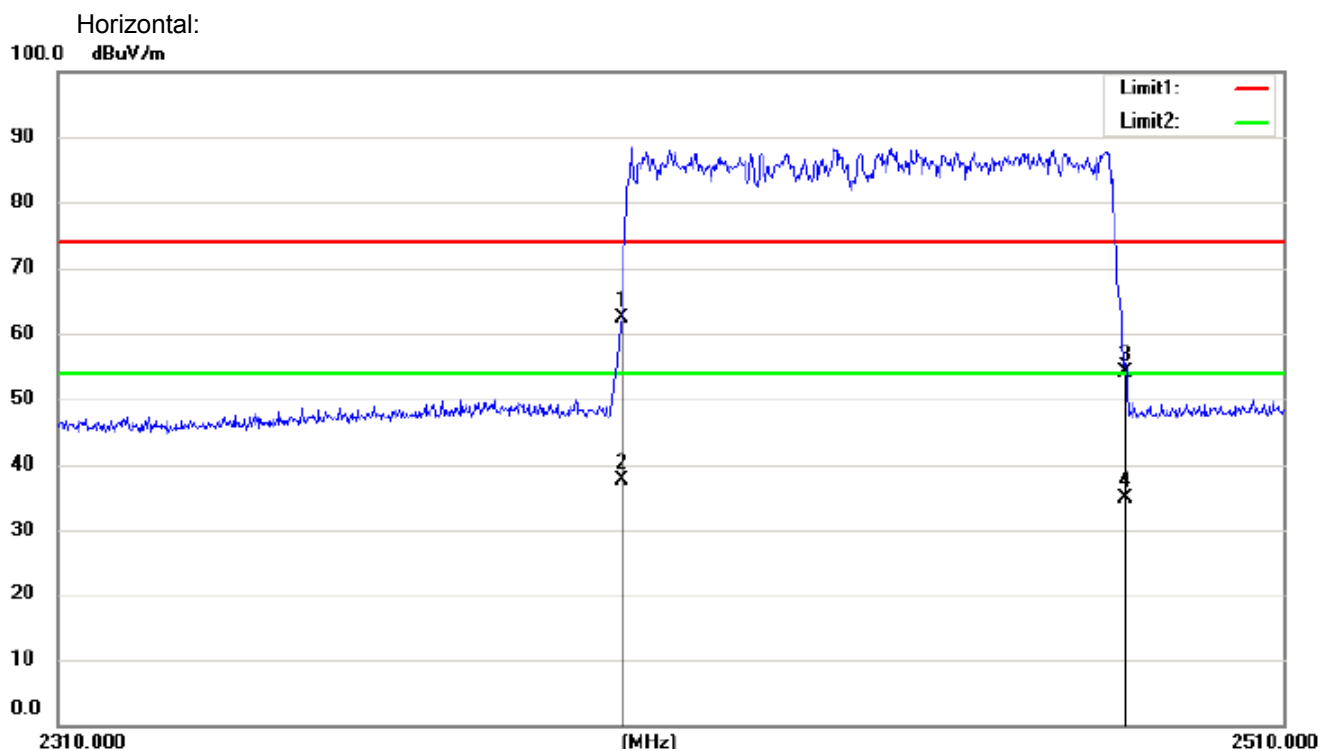


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2400.000	52.97	10.93	63.90	73.90	-10.00	peak
2		2400.000	26.97	10.93	37.90	53.90	-16.00	AVG
3		2483.500	38.11	11.00	49.11	73.90	-24.79	peak
4		2483.500	24.10	11.00	35.10	53.90	-18.80	AVG

8DPSK Mode



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	2400.000	52.13	10.93	63.06	73.90	-10.84	peak
2		2400.000	27.27	10.93	38.20	53.90	-15.70	AVG
3		2483.500	39.70	11.00	50.70	73.90	-23.20	peak
4		2483.500	24.50	11.00	35.50	53.90	-18.40	AVG

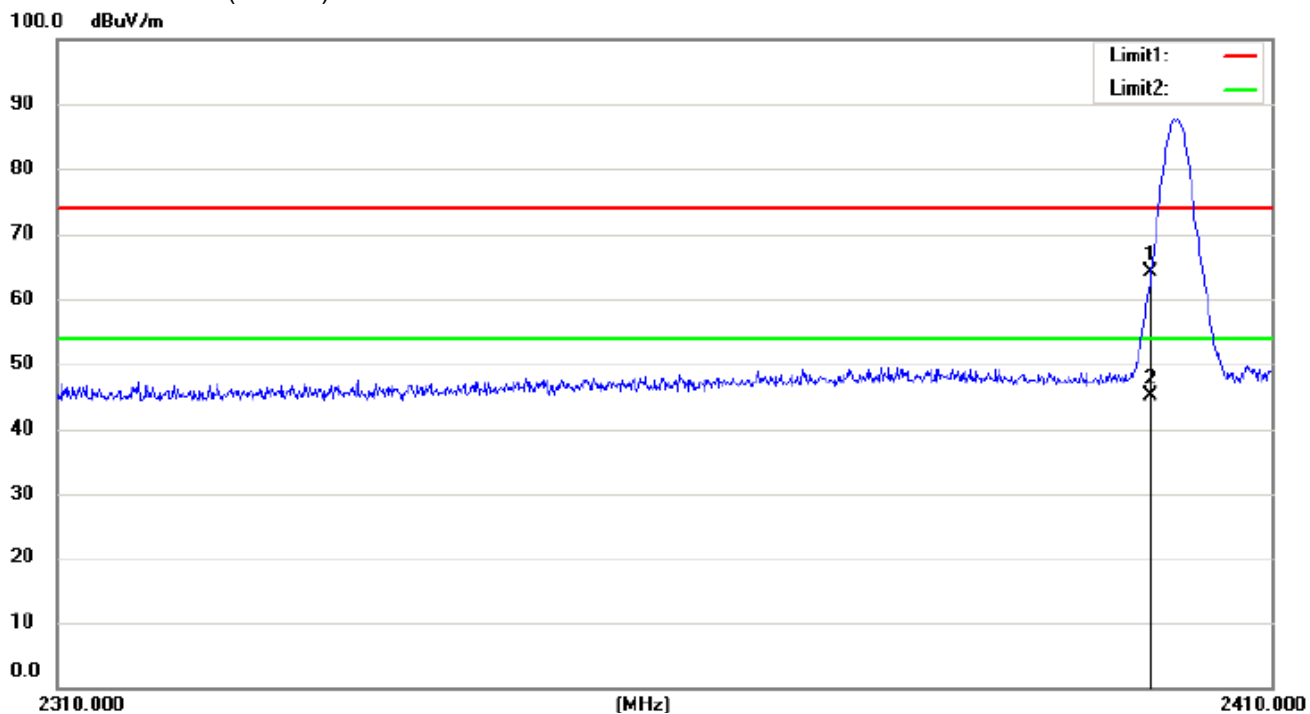


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2400.000	51.47	10.93	62.40	73.90	-11.50	peak
2		2400.000	26.77	10.93	37.70	53.90	-16.20	AVG
3		2483.500	43.03	11.00	54.03	73.90	-19.87	peak
4		2483.500	23.90	11.00	34.90	53.90	-19.00	AVG

For Non-Hopping Mode:

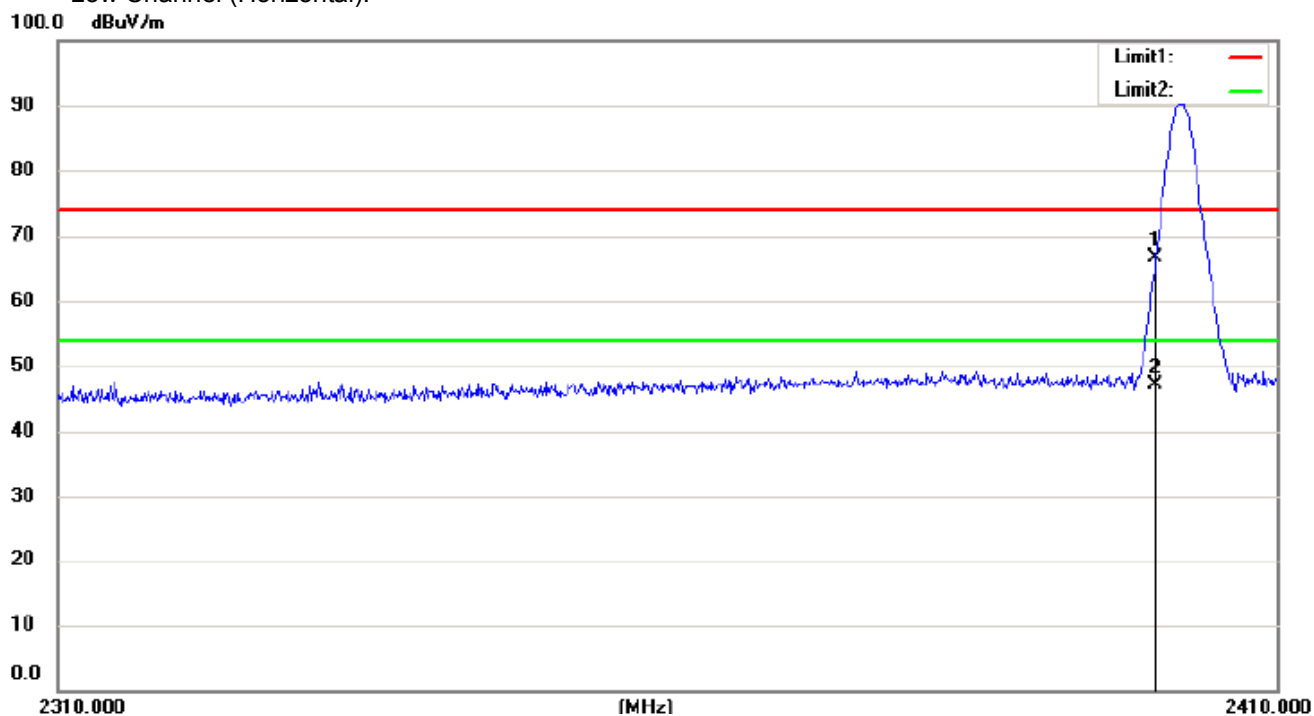
GFSK Mode

Low Channel (Vertical):



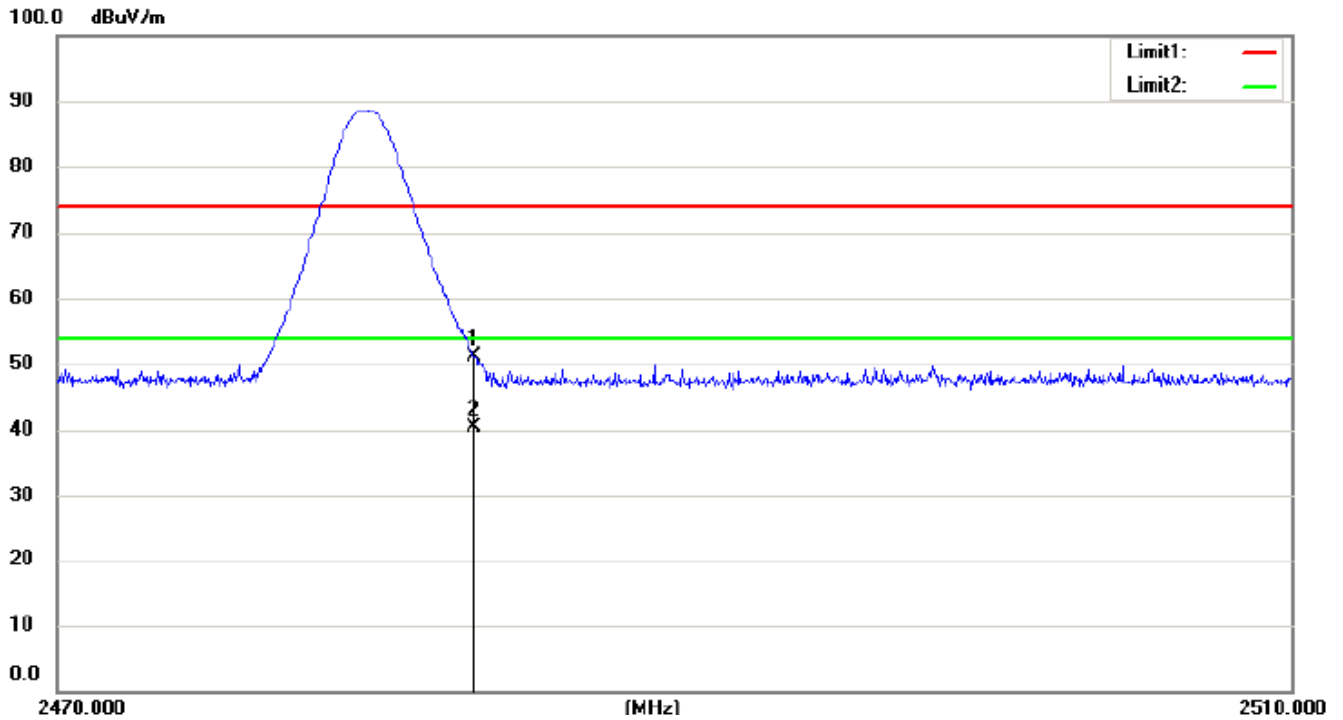
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2400.000	53.21	10.93	64.14	73.90	-9.76	peak
2	*	2400.000	34.27	10.93	45.20	53.90	-8.70	AVG

Low Channel (Horizontal):



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2400.000	55.64	10.93	66.57	73.90	-7.33	peak
2	*	2400.000	36.27	10.93	47.20	53.90	-6.70	AVG

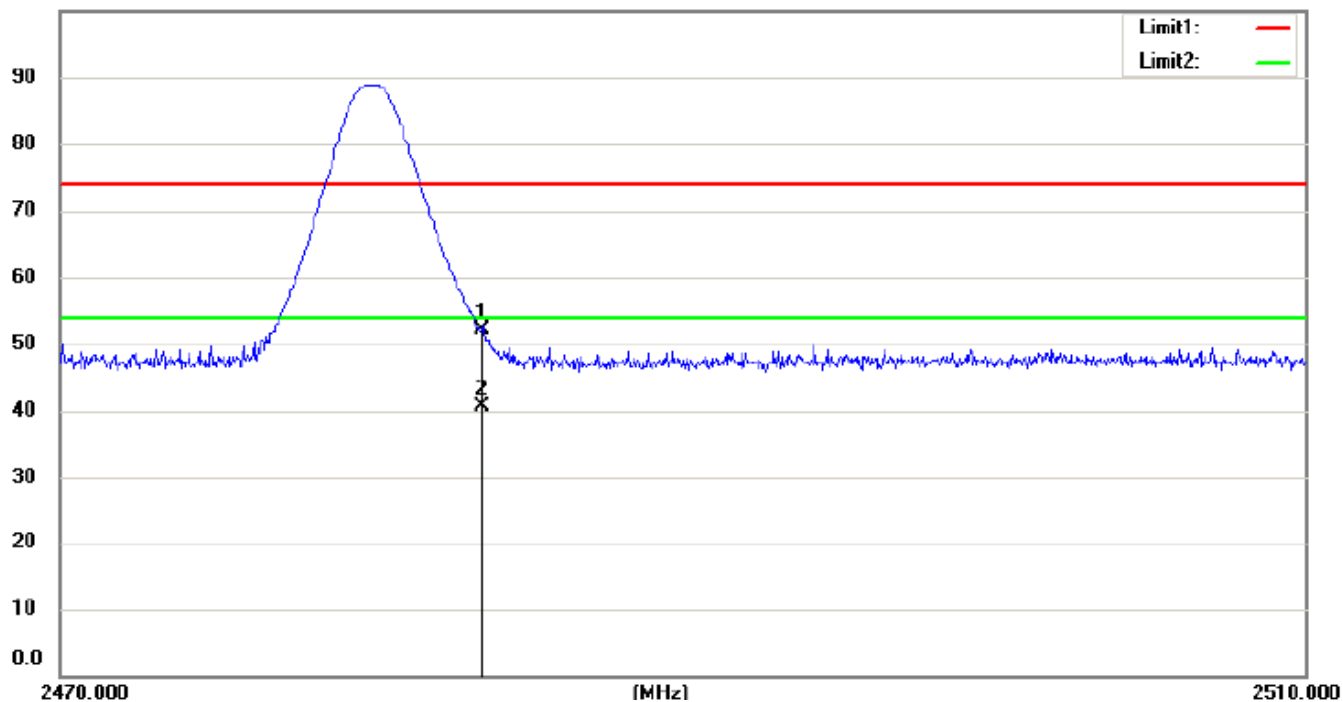
High Channel (Vertical):



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2483.500	40.09	11.00	51.09	73.90	-22.81	peak
2	*	2483.500	29.40	11.00	40.40	53.90	-13.50	AVG

High Channel (Horizontal):

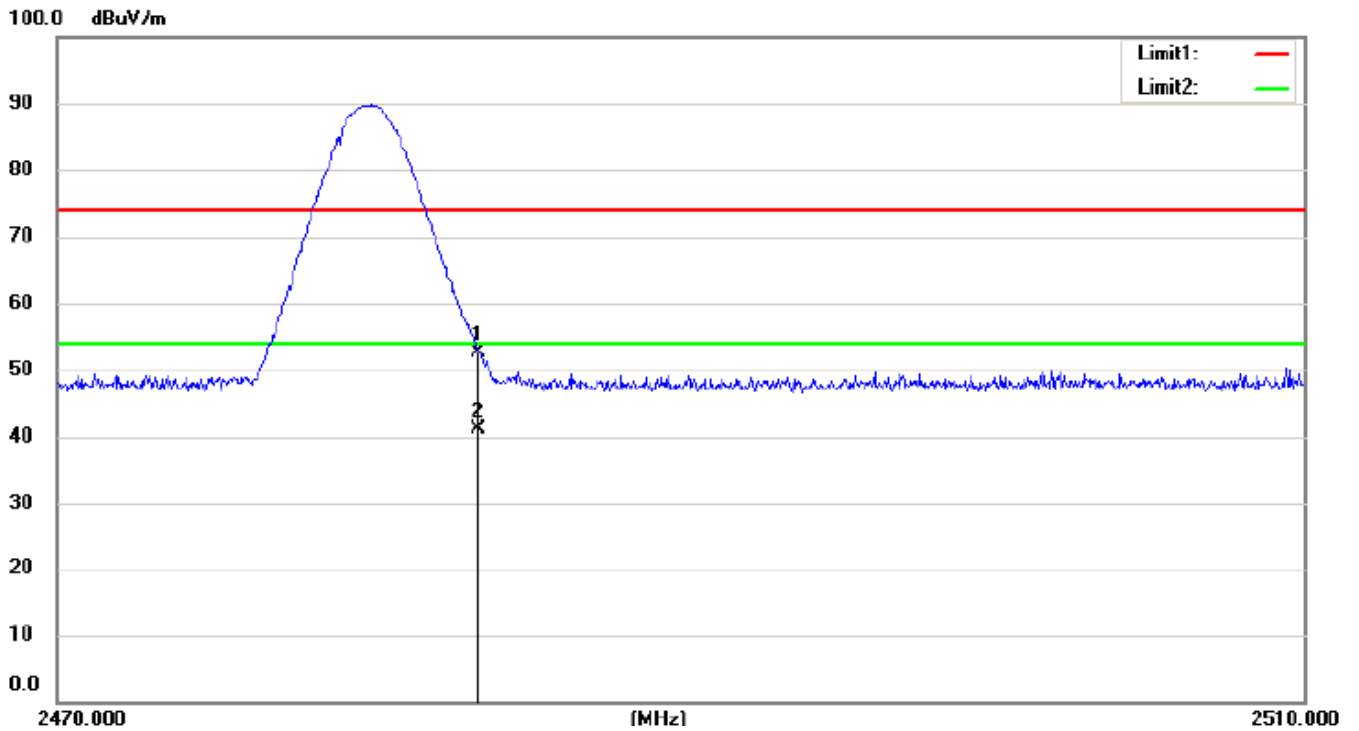
100.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2483.500	41.06	11.00	52.06	73.90	-21.84	peak
2	*	2483.500	29.60	11.00	40.60	53.90	-13.30	AVG

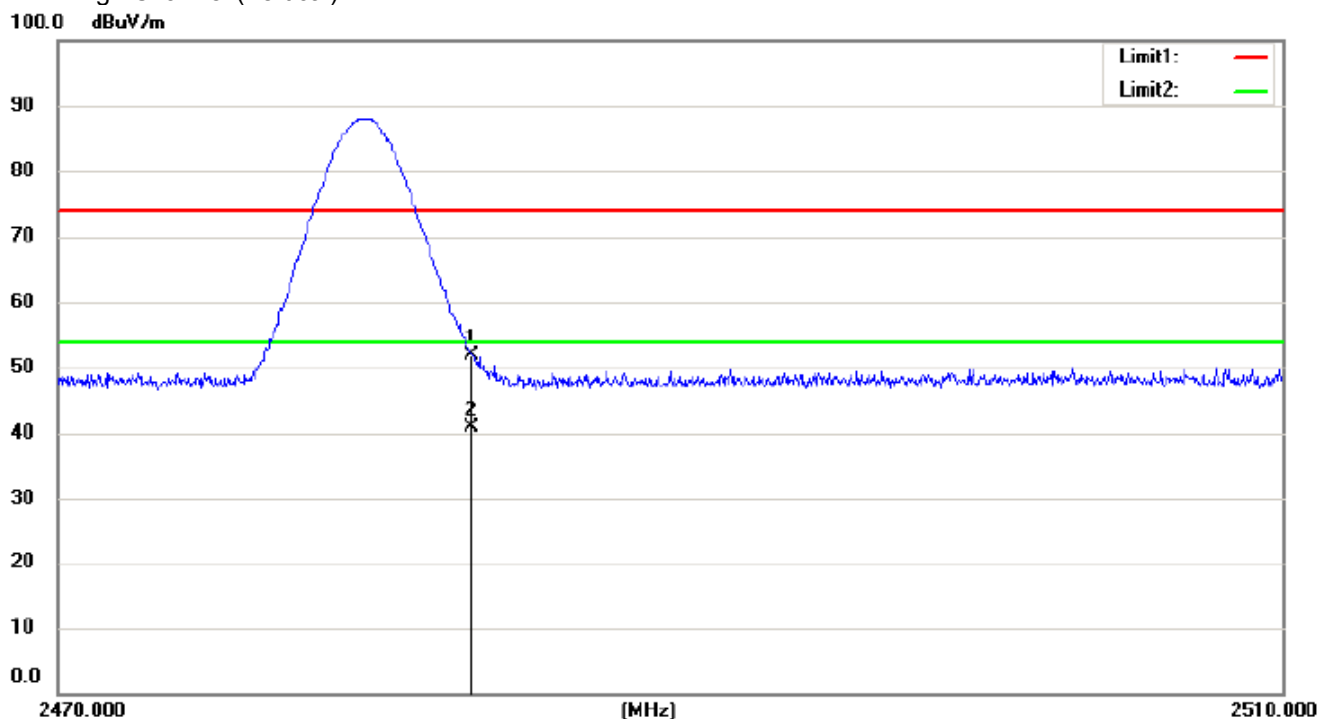
$\pi/4$ -DQPSK Mode

High Channel (Horizontal):



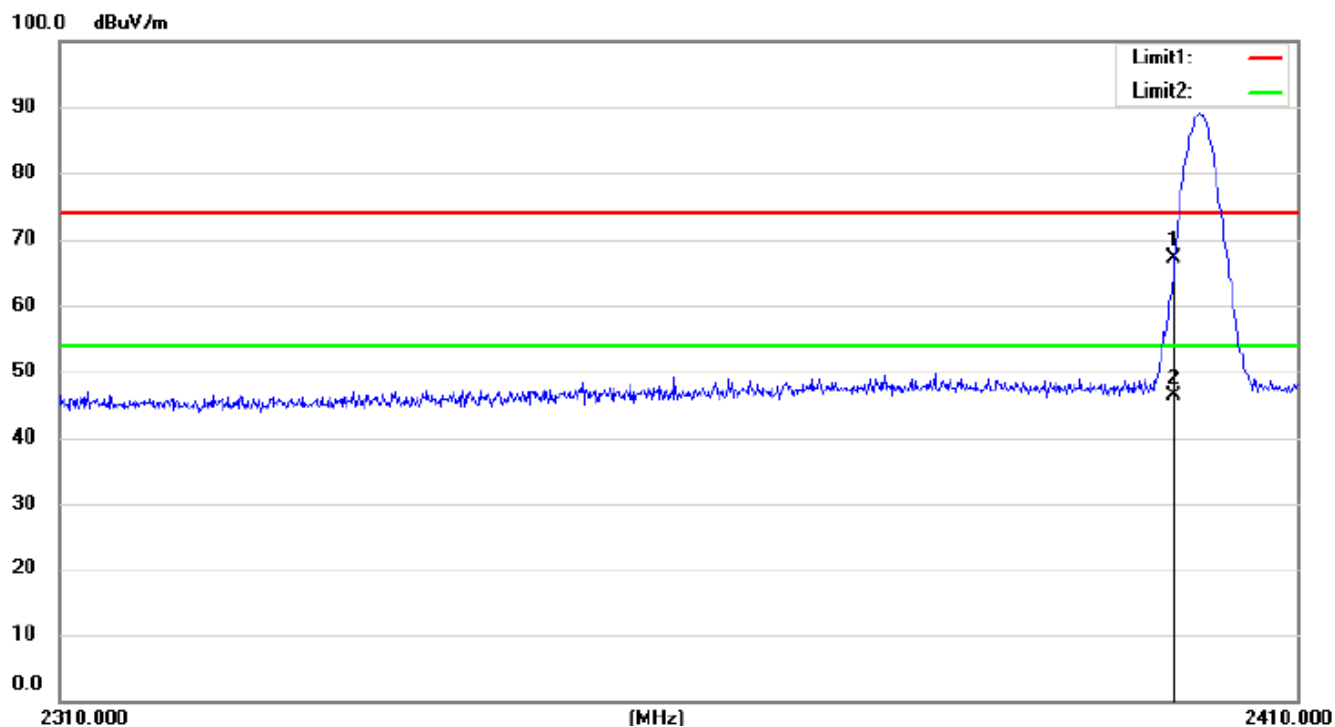
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2483.500	41.68	11.00	52.68	73.90	-21.22	peak
2	*	2483.500	30.10	11.00	41.10	53.90	-12.80	AVG

High Channel (Vertical):



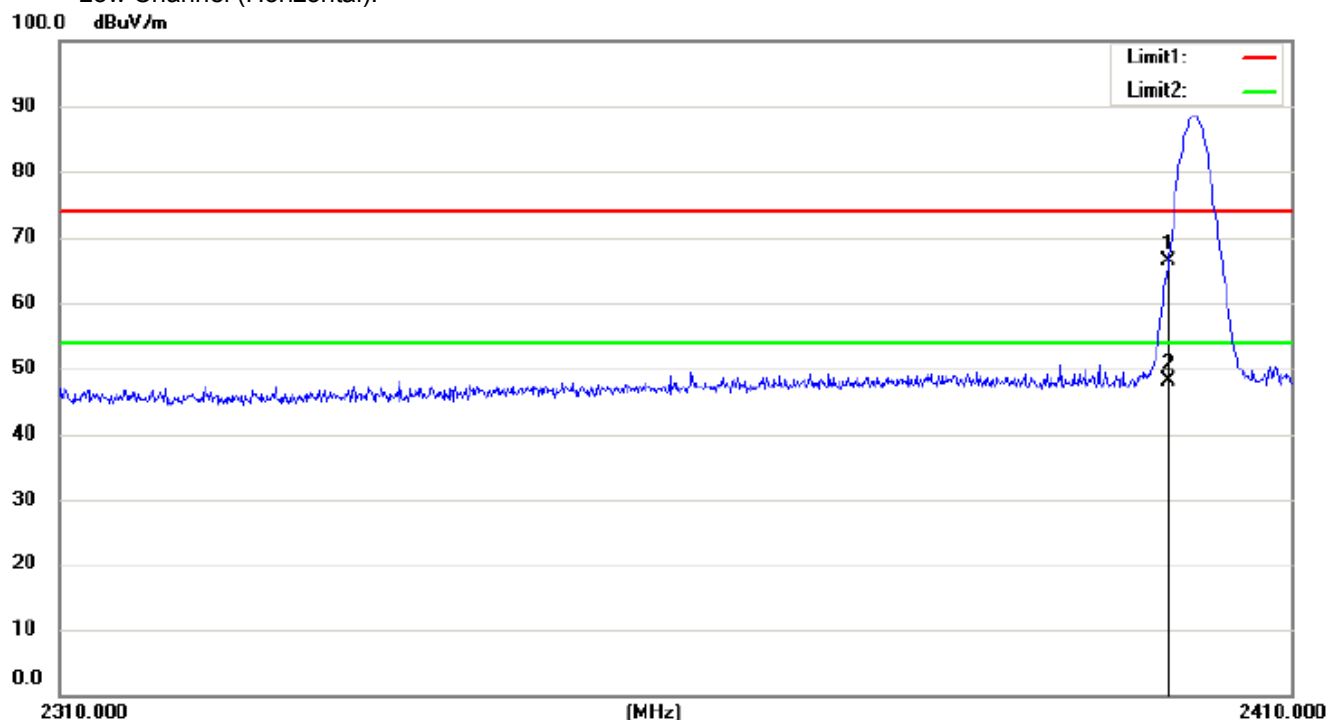
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	40.89	11.00	51.89	73.90	-22.01	peak
2	*	2483.500	29.80	11.00	40.80	53.90	-13.10	AVG

Low Channel (Vertical):



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	2400.000	56.15	10.93	67.08	73.90	-6.82	peak
2		2400.000	35.57	10.93	46.50	53.90	-7.40	AVG

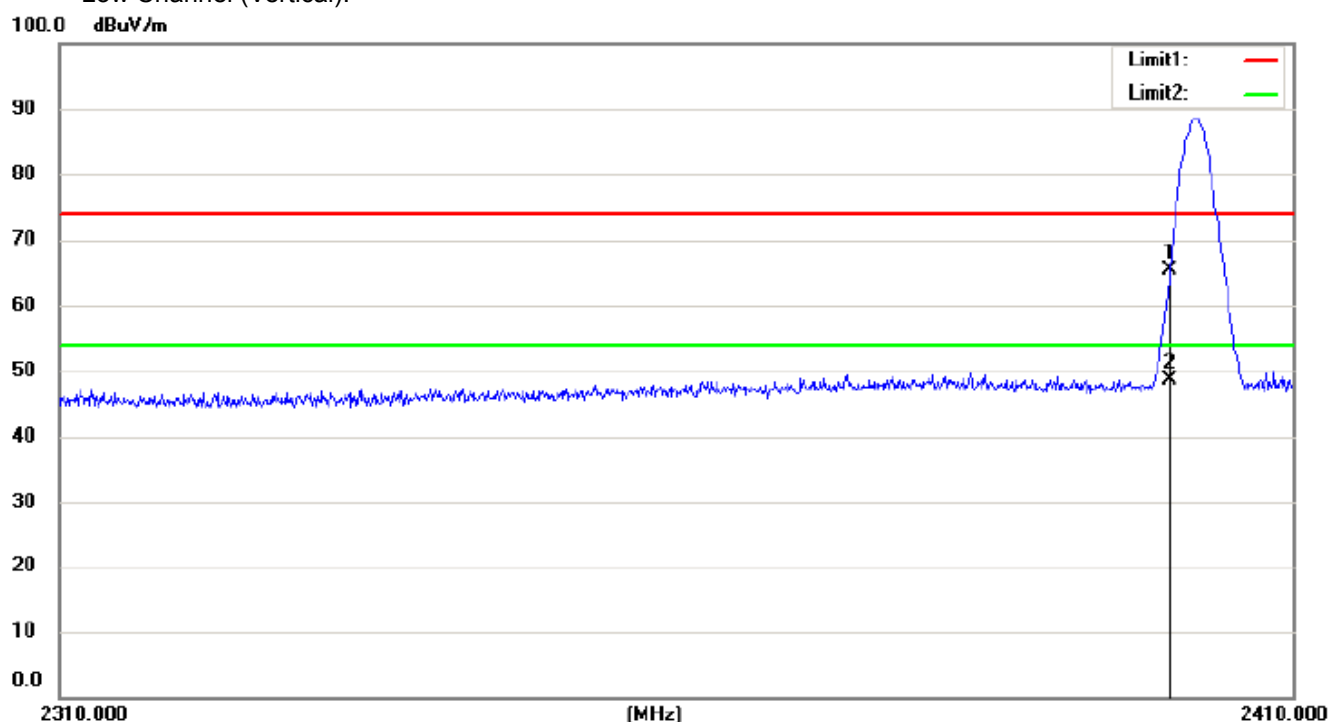
Low Channel (Horizontal):



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2400.000	55.40	10.93	66.33	73.90	-7.57	peak
2	*	2400.000	37.27	10.93	48.20	53.90	-5.70	AVG

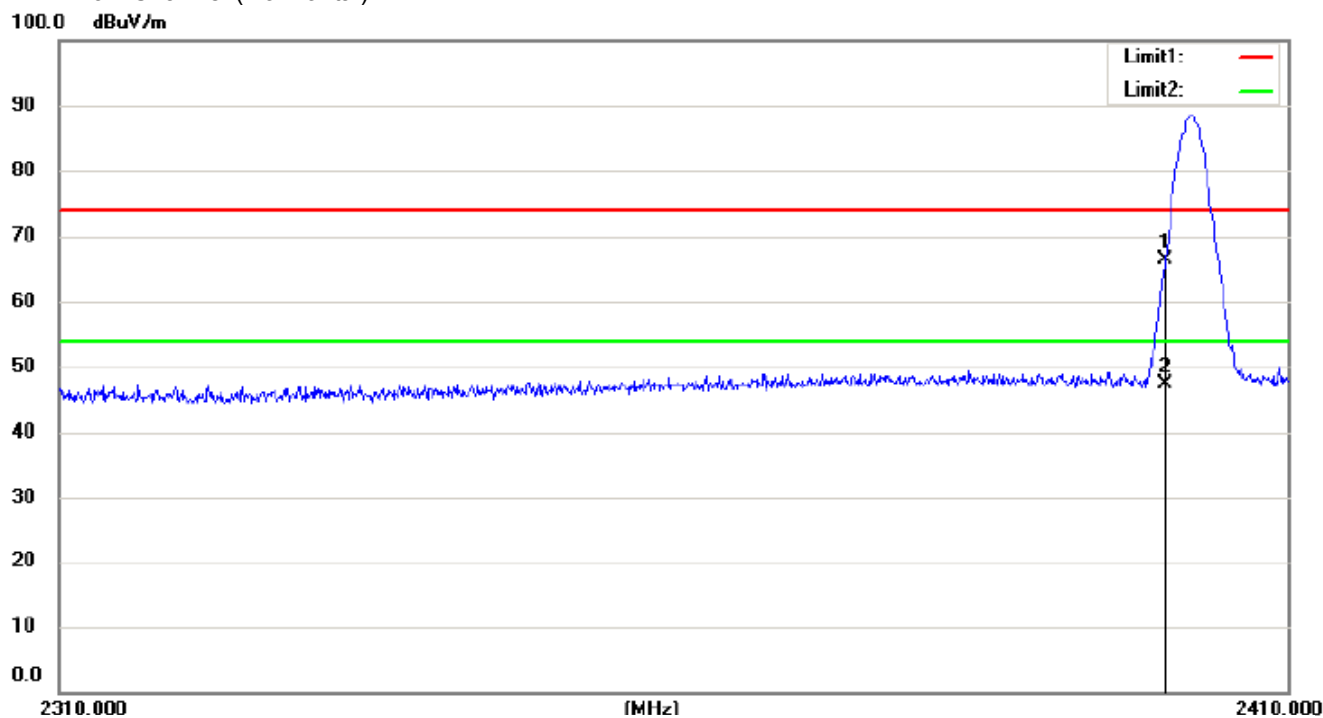
8DPSK Mode

Low Channel (Vertical):



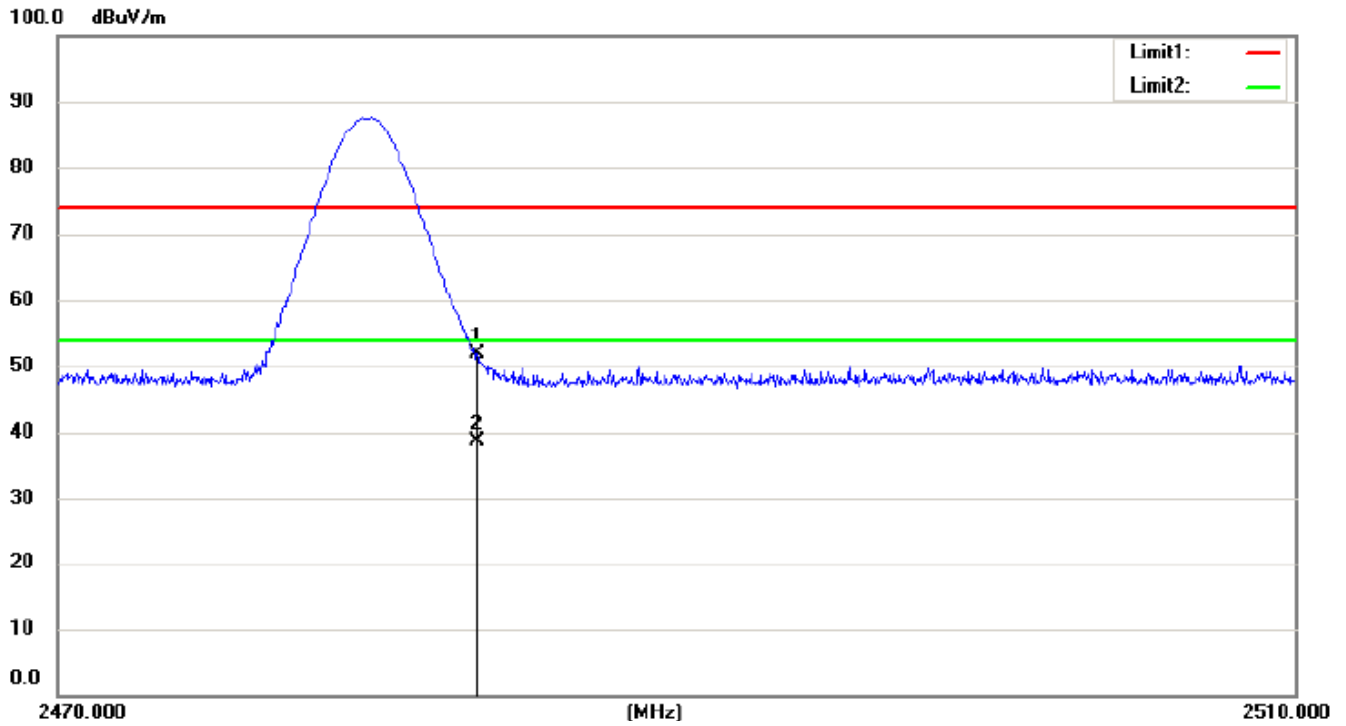
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2400.000	54.33	10.93	65.26	73.90	-8.64	peak
2	*	2400.000	37.77	10.93	48.70	53.90	-5.20	AVG

Low Channel (Horizontal):



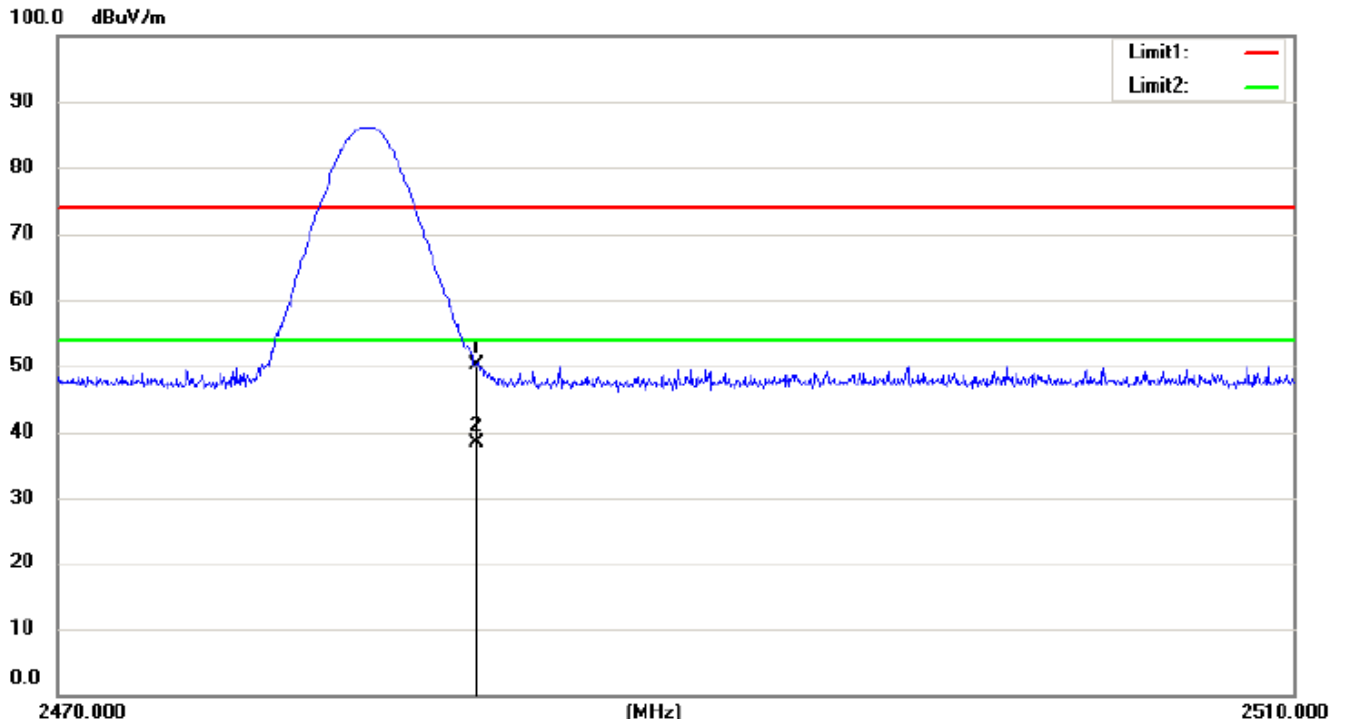
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2400.000	55.55	10.93	66.48	73.90	-7.42	peak
2	*	2400.000	36.37	10.93	47.30	53.90	-6.60	AVG

High Channel (Vertical):



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	40.81	11.00	51.81	73.90	-22.09	peak
2	*	2483.500	27.70	11.00	38.70	53.90	-15.20	AVG

High Channel (Horizontal):



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2483.500	39.25	11.00	50.25	73.90	-23.65	peak
2	*	2483.500	27.40	11.00	38.40	53.90	-15.50	AVG

12. Antenna Port Emission

12.1 Test Equipment

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	MY45107013	05/16/2015	05/15/2016

12.2 Measuring Instruments and setting

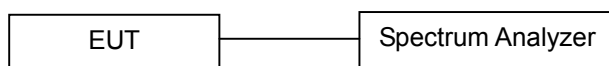
The following table is the setting of spectrum analyzer.

Attenuation	Auto
RB	100kHz
VB	300kHz
Detector	Peak
Trace	Max hold

12.3 Test Procedures

The conducted spurious emissions were measured conducted using a spectrum analyzer at low, mid, and hi channels, the limit was determined by attenuation 20dB of the RF peak power output.

12.4 Block Diagram of Test setup

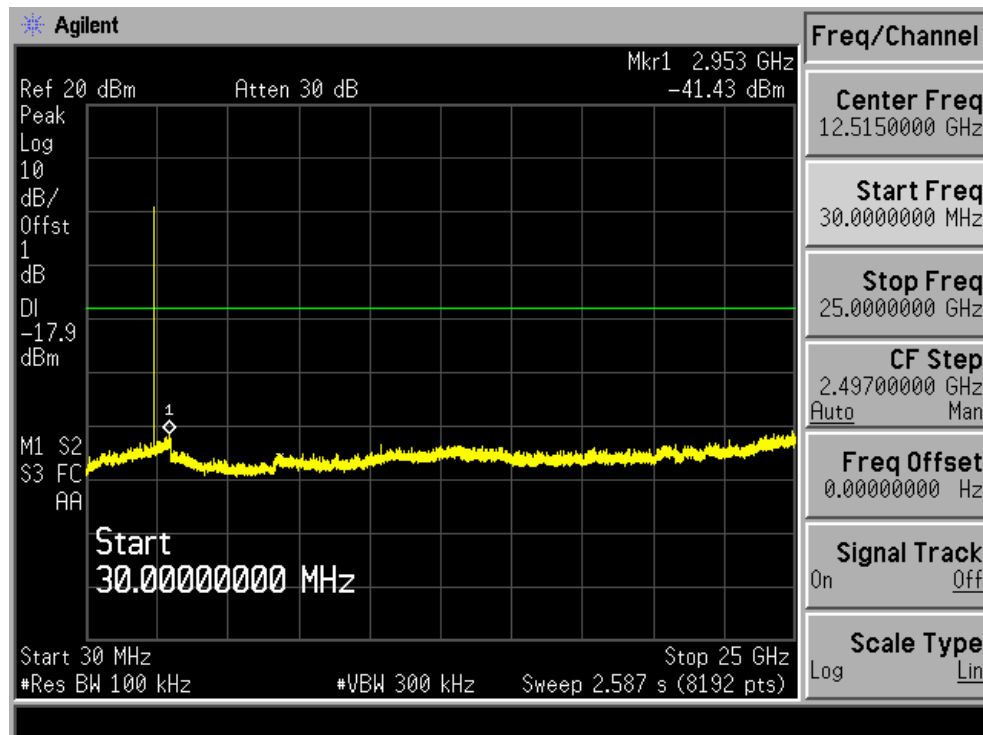


12.5 Test Result

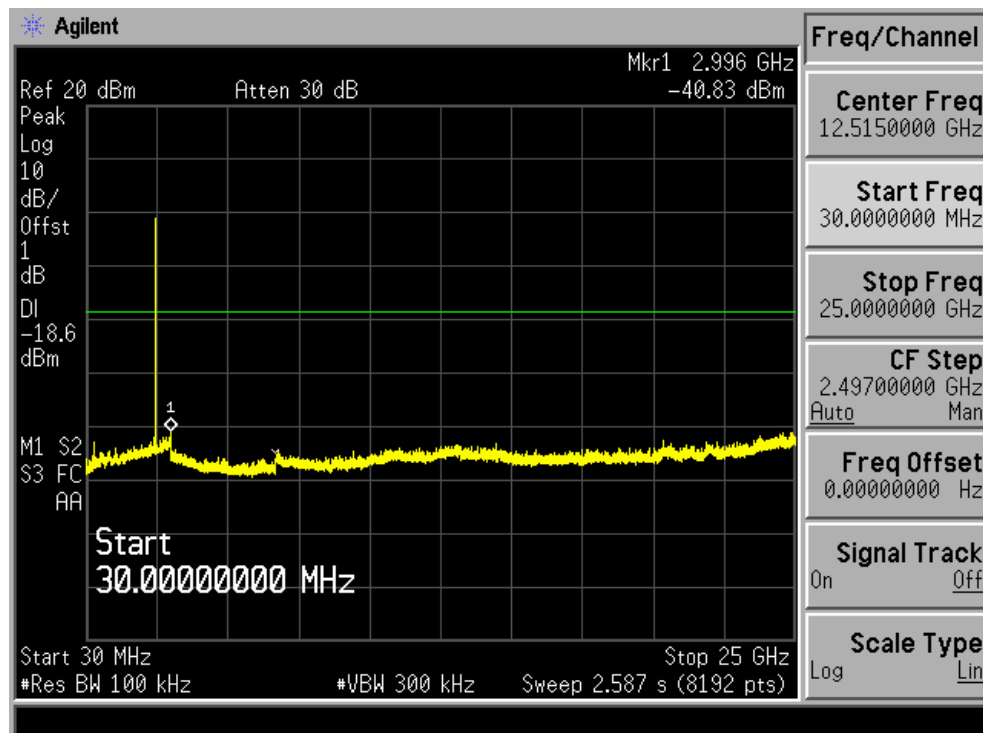
PASS.

(Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result(GFSK) was report as below.)

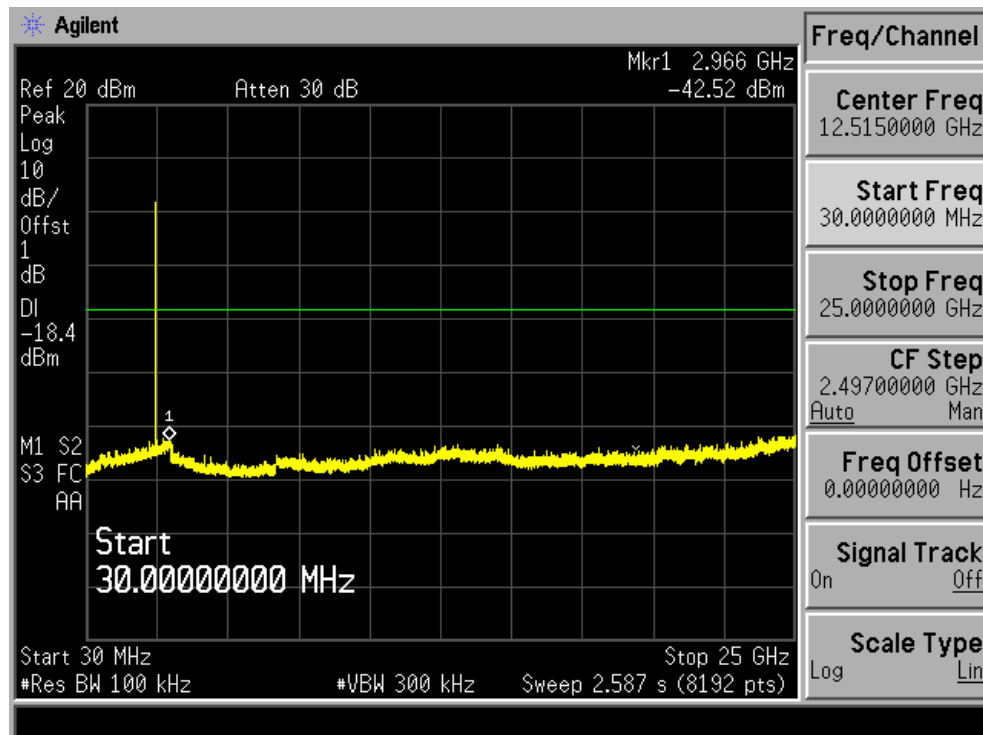
GFSK Mode: Low channel



GFSK Mode: Middle channel



GFSK Mode: High channel



13. Antenna Application

13.1 Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and 15.240.

FCC part 15C section 15.247 requirements:

Systems operating in the 2402-2480MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

13.2 Result

The EUT'S antenna is dipole antenna, and the antenna can't be replaced by the user, which in accordance to section 15.203, please refer to the internal photos. The antenna's gain is 2dBi and meets the requirement.

---The End---