FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

2400-2483.5MHZ TRANSCEIVER

MODEL NUMBER: A2541R24A & A2541R24C

FCC ID: X7J-A12062101
IC: 8975A-A12062101

REPORT NUMBER: SR9723856

ISSUE DATE: 2013-05-21

Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	5/21/13	Initial Issue	M. Antola

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ANAREN INC
6635 KIRKVILLE ROAD
EAST SYRACUSE, NY, 13057, USA

EUT DESCRIPTION: 2400-2483.5MHZ TRANSCEIVER

MODEL: A2541R24A & A2541R24C

SERIAL NUMBER: 01 & 06

DATE TESTED: 2013-04-16 to 2013-04-24

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL LLC By:

Bob DeLisi
WiSE Principal Engineer
UL

Tested By:

Mike Antola
WiSE Project Lead
UL

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/1002550.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB
Radiated Emissions, 1-26GHz (worst case, Ground Plane)	± 5.7, k=2 (95%)

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 2.4GHz transceiver that is manufactured by Anaren, Inc. with model numbers A2541R24A and A2541R24C. Models are identical except A2541R24A has an integral printed antenna and A2541R24C has a U.FL connector.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	GFSK 2Mbps 500kHz	1.87	1.54
2402 - 2480	GFSK 1Mbps 250kHz	2.05	1.60
2402 - 2480	MSK 500kbps	2.12	1.63

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio of model A2541R24A utilizes an integral PCB antenna, with a maximum gain of 2 dBi.

The radio of model A2541R24C utilizes a monopole antenna, with a maximum gain of 3 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was rev. 1.0.00.

The test utility software used during testing was CC2541 Certification Test ver. 1.0.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, Z.

It was determined that Y orientation was worst-case orientation for Model A2541R24A; therefore, all final radiated testing was performed with the EUT in Y orientation.

It was determined that Z orientation was worst-case orientation for Model A2541R24C; therefore, all final radiated testing was performed with the EUT in Z orientation.

Based on the baseline scan, the worst-case data rates were:

- GFSK 2Mbps 500kHz
- GFSK 1Mbps 250kHz
- MSK 500kbps

All final testing was performed in each of these modes. Other data rates that are also deemed compliant are:

- GFSK 2Mbps 320kHz
- GFSK 1Mbps 160kHz
- GFSK 250kbps 160kHz

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Test Board	Anaren	A253X/A254X	NA	NA
Laptop	IBM	Thinkpad T43	00045-636-421-009	DoC

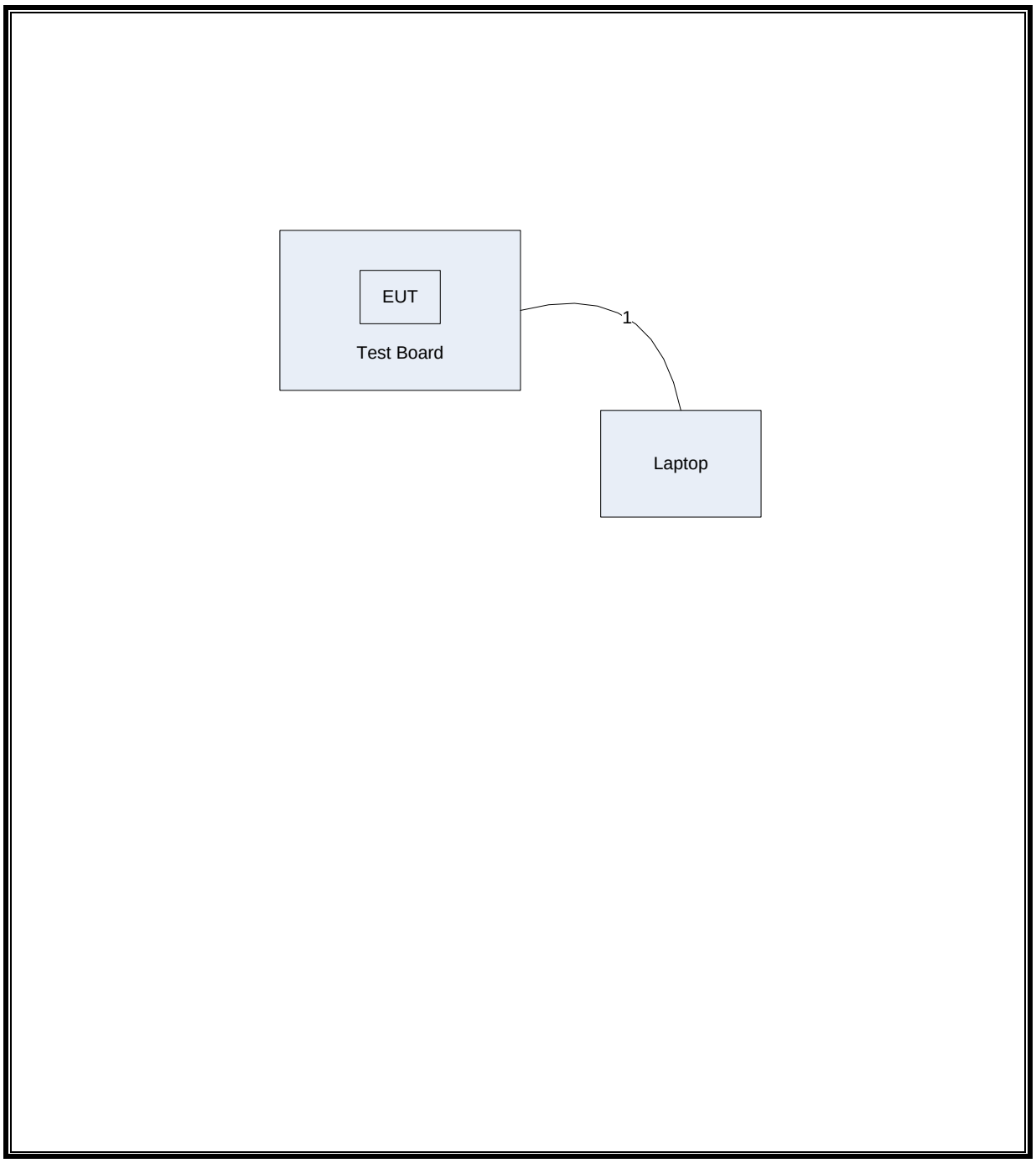
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB	1	Mini-Usb	Shielded	<3M	Connects to test board

TEST SETUP

The EUT is installed on a test board which is connected to a laptop computer during the tests. Test software exercised the radio module.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2013-01-29	2014-01-31
Log-P Antenna	Schaffner	UPA6109	44067	2012-05-16	2013-05-16
Bicon Antenna	Schaffner	VBA6106A	43441	2012-11-12	2013-11-12
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Above 1GHz (Band Optimized System)					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2013-01-30	2014-01-31
Horn Antenna (1-2 GHz)	ETS	3161-01 (26°)**	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02 (22°)**	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03 (22°)**	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07 (26°)**	8933	2008-11-24	See * below
Horn Antenna (12-18 GHz)	ETS	3160-08 (26°)**	8932	2007-09-27	See * below
Horn Antenna (18-26.5 GHz)	ETS	3160-09 (27°)**	8947	2007-09-26	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22

* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration.

Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.

** - Number in parentheses denotes antenna beam width.

Bench Tests					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
RF Room 1					
Spectrum Analyzer	Agilent	E4446A	72823	2013-01-29	2014-01-31
Power Sensor	Rohde & Schwarz	NRP-Z81	73137	2013-01-30	2014-01-31
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22

Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESCI 7	75141	2013-01-30	2014-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2013-01-31	2014-01-31
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-03-13	2014-03-13

7. ANTENNA PORT TEST RESULTS

7.1. GFSK 2Mbps 500kHz MODE

7.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

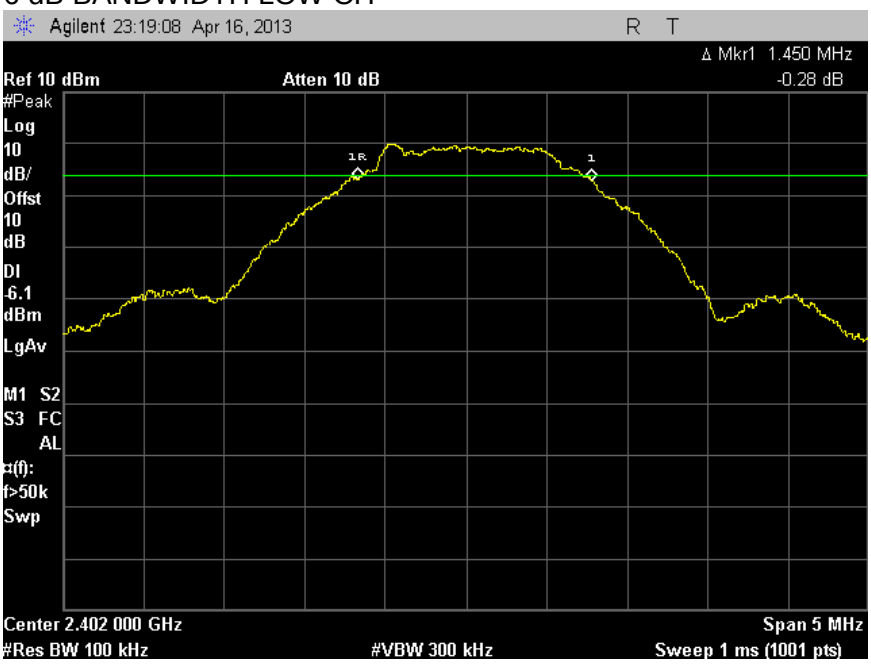
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

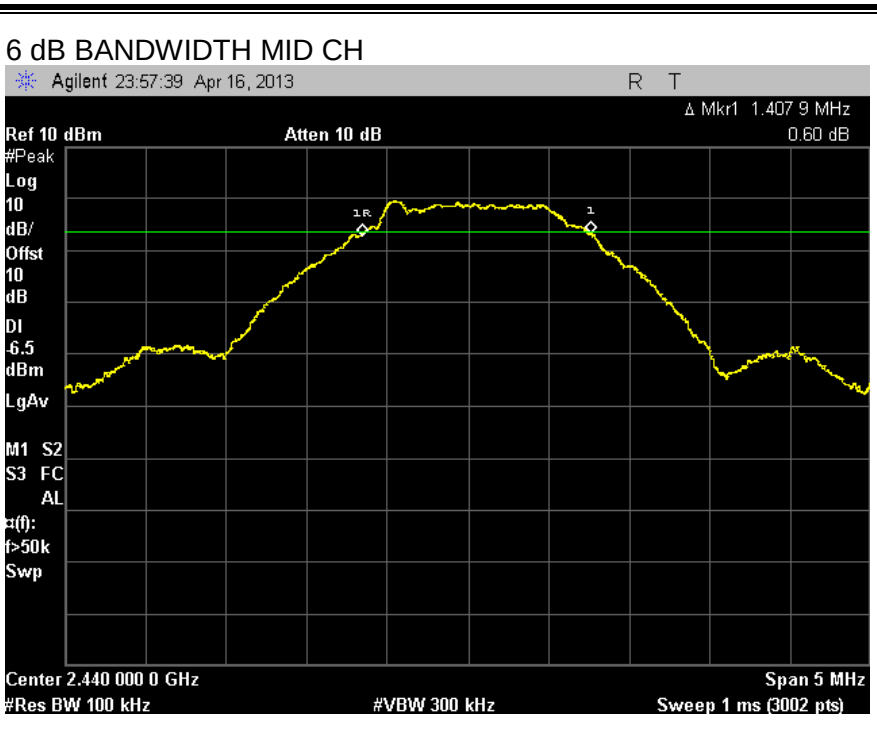
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	1.4500	0.5
Middle	2440	1.4100	0.5
High	2480	1.4600	0.5

6 dB BANDWIDTH

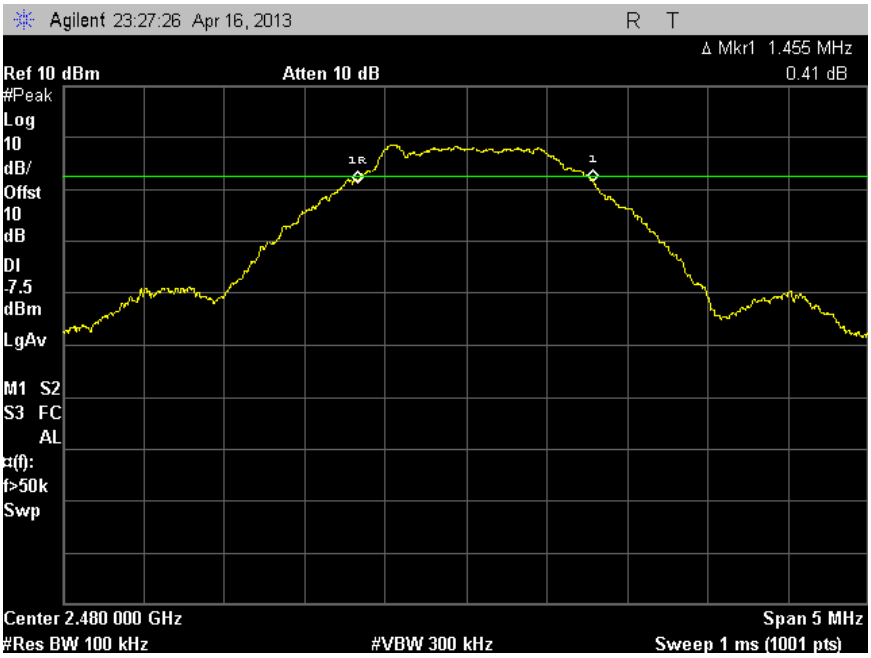
6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH



6 dB BANDWIDTH HIGH CH



7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

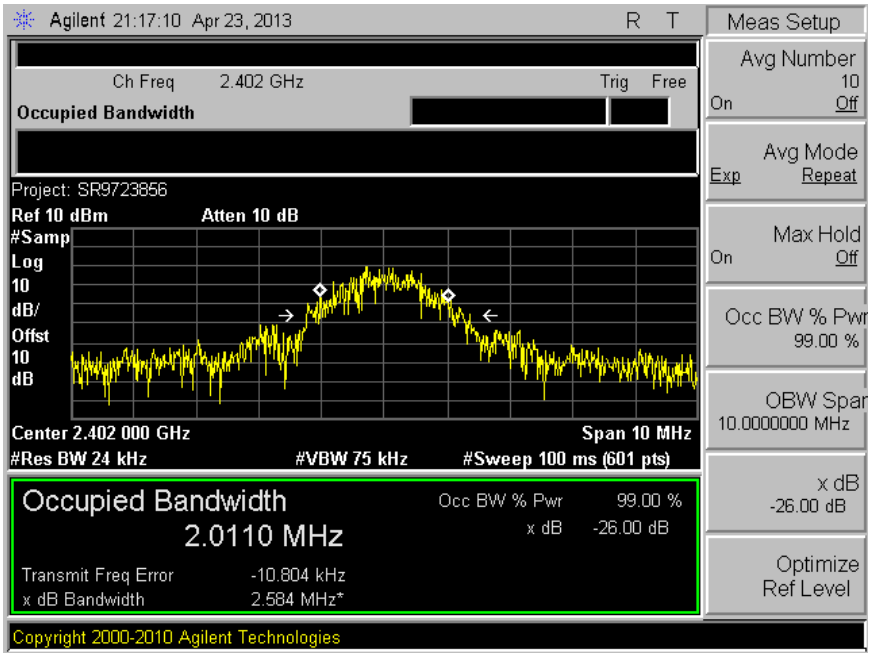
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

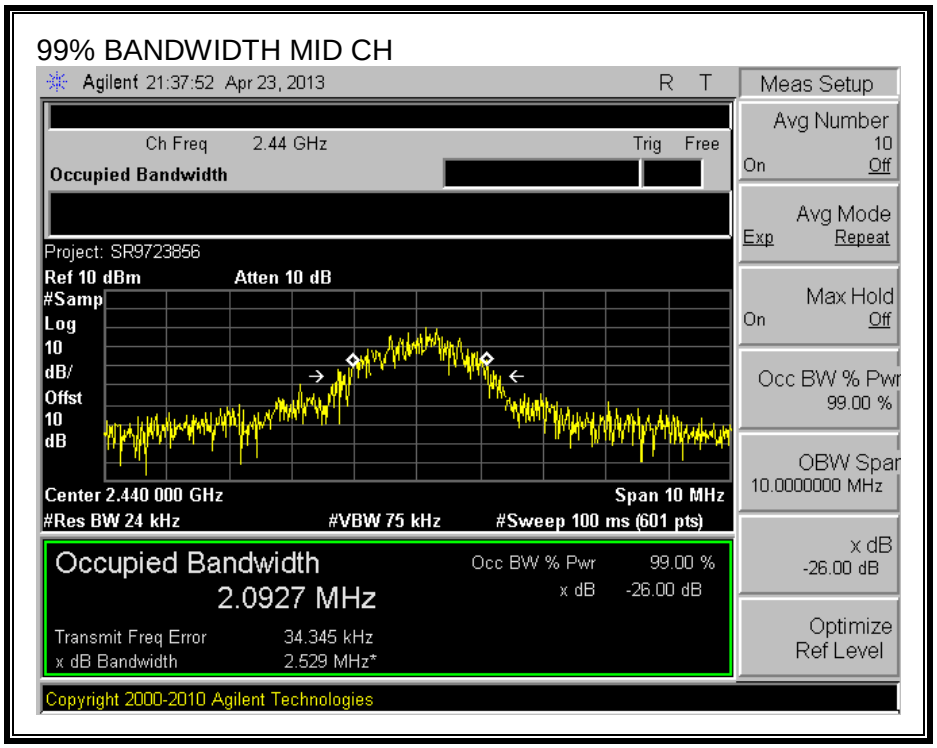
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	2.0000
Middle	2440	2.1000
High	2480	2.2000

99% BANDWIDTH

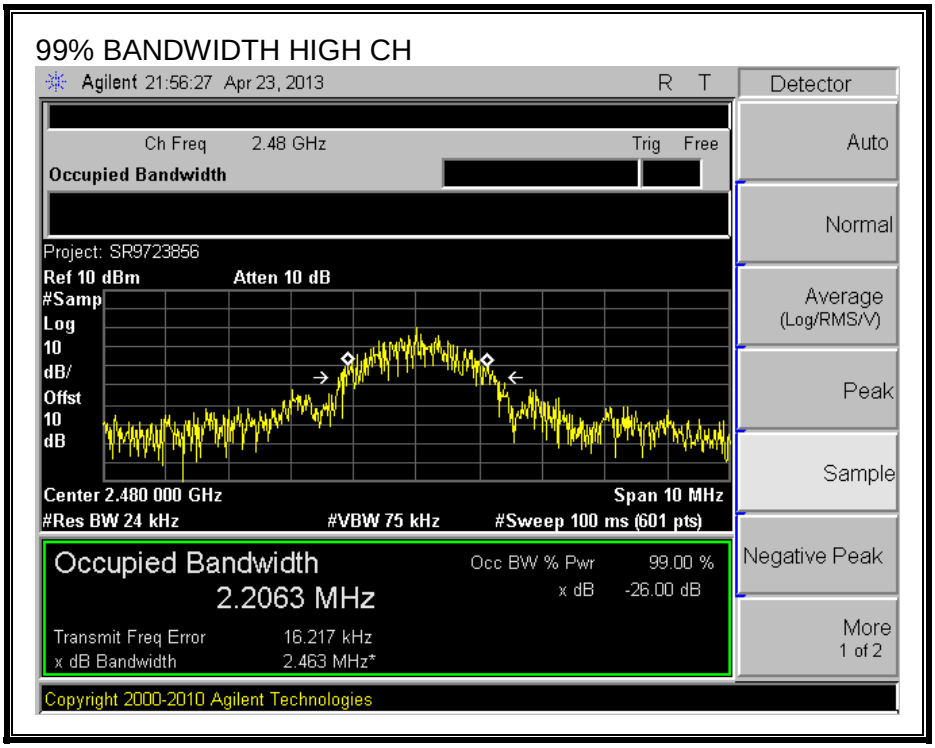
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



7.1.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

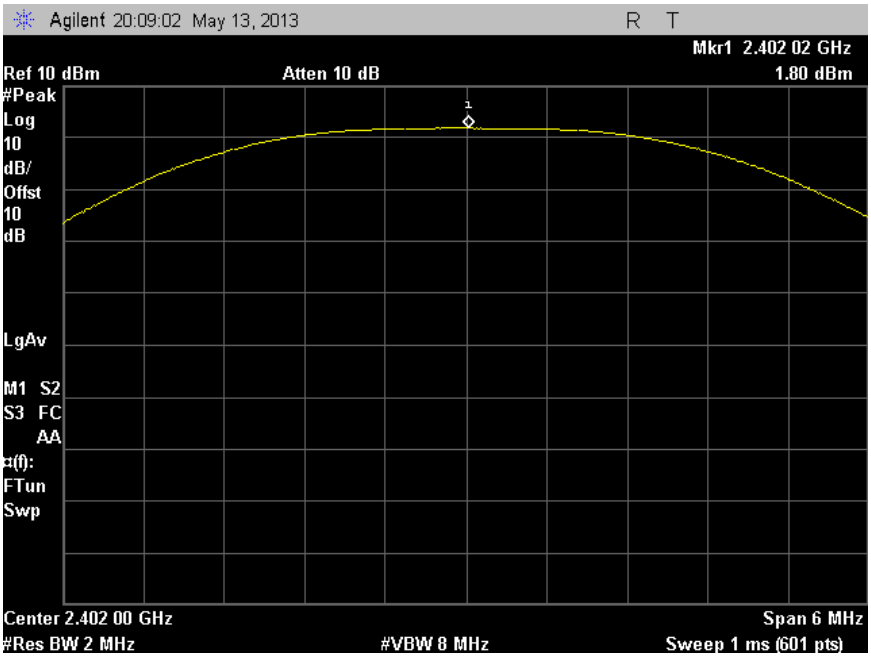
Peak power is measured using the maximum peak conducted output power procedure per section 9.1.1 specified in "558074 D01 DTS Meas Guidance v03" April 8, 2013.

RESULTS

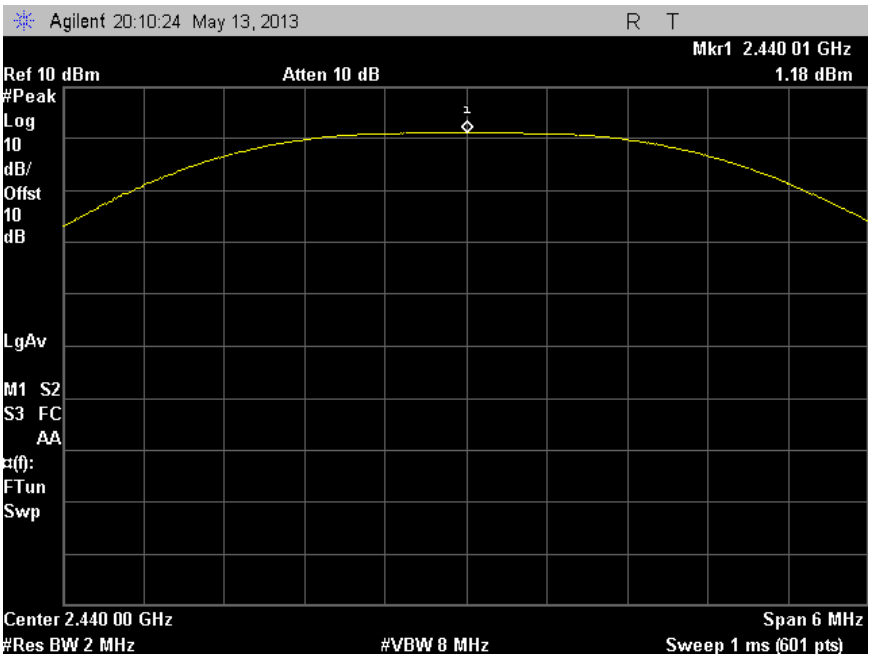
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.800	30	-28.200
Middle	2440	1.180	30	-28.820
High	2480	0.440	30	-29.560

OUTPUT POWER

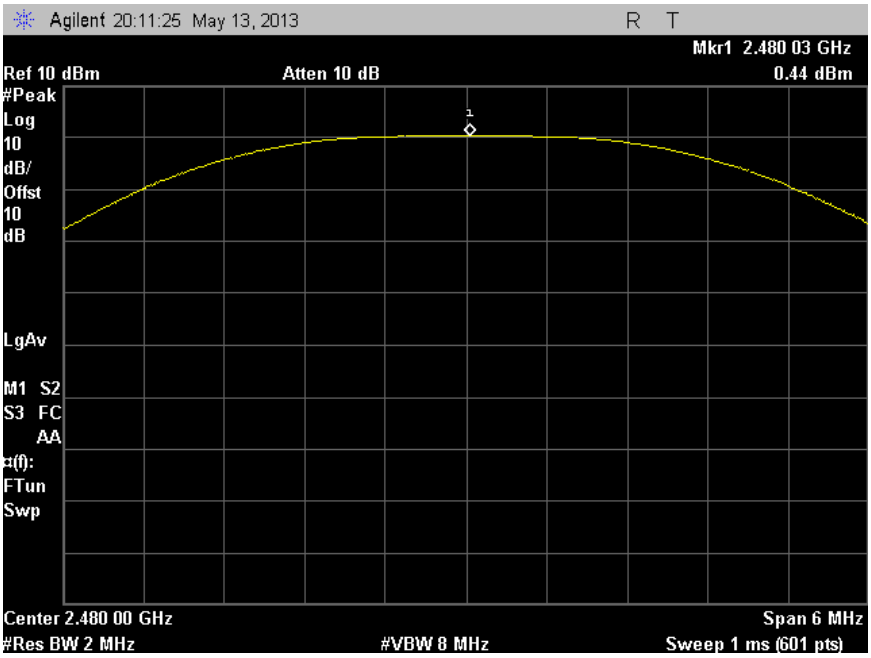
OUTPUT POWER LOW CH



OUTPUT POWER MID CH



OUTPUT POWER HIGH CH



7.1.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10 dB (including 10 dB pad) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	1.9
Middle	2440	1.28
High	2480	0.6

7.1.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

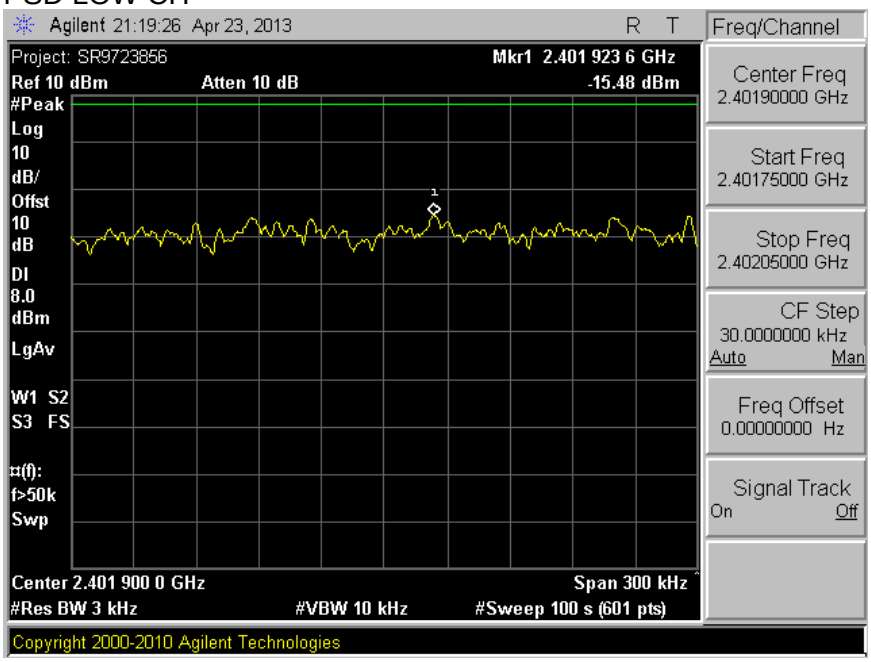
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option per section 10.2 in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, April 8, 2013.

RESULTS

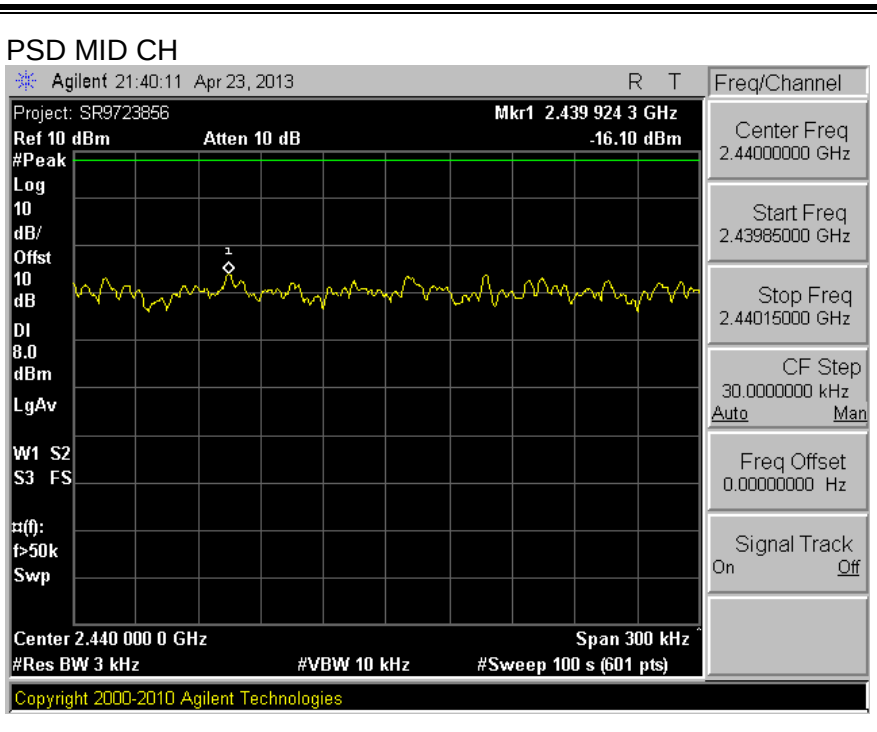
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-15.48	8	-23.48
Middle	2440	-16.10	8	-24.10
High	2480	-17.10	8	-25.10

POWER SPECTRAL DENSITY

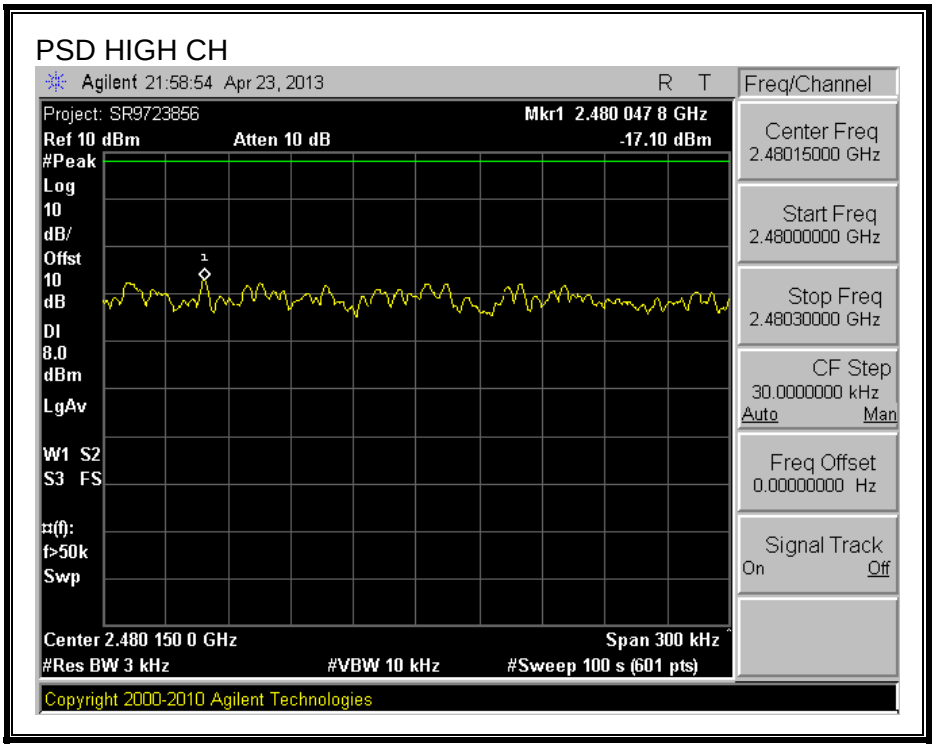
PSD LOW CH



PSD MID CH



PSD HIGH CH



7.1.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

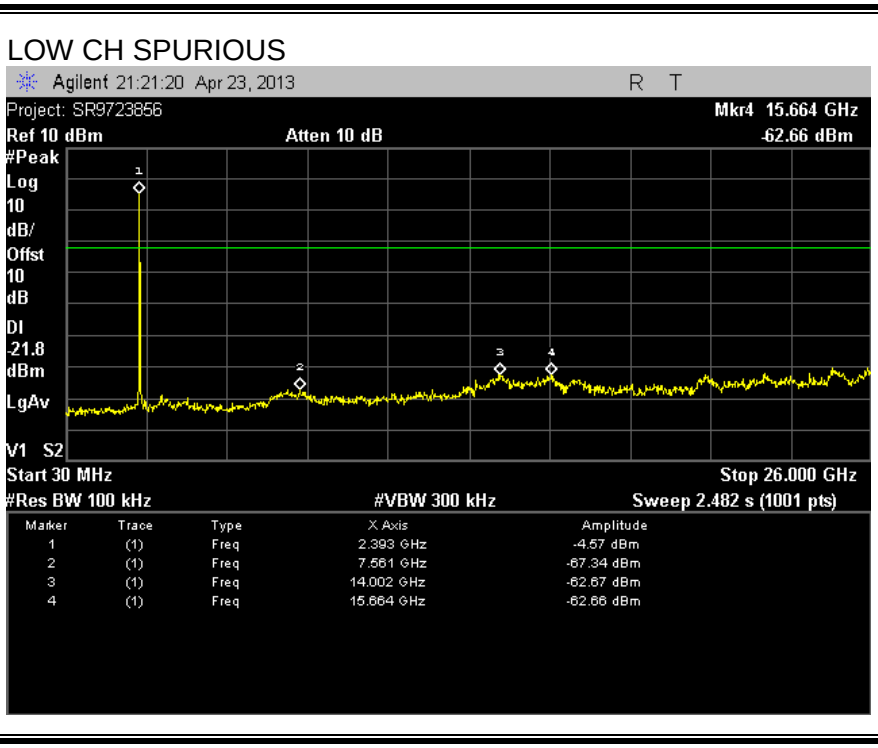
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

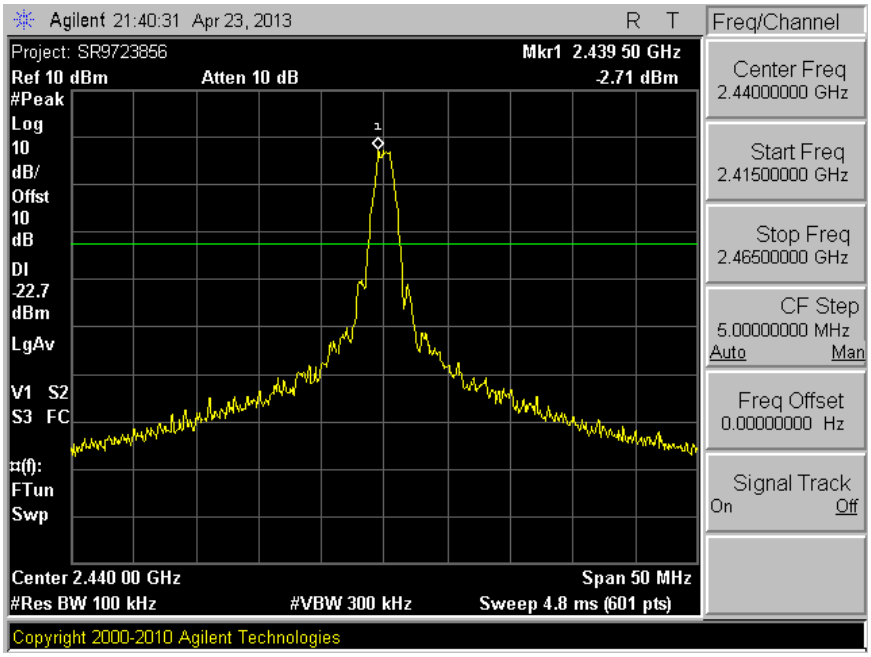
LOW CH BANDEDGE

LOW CH SPURIOUS

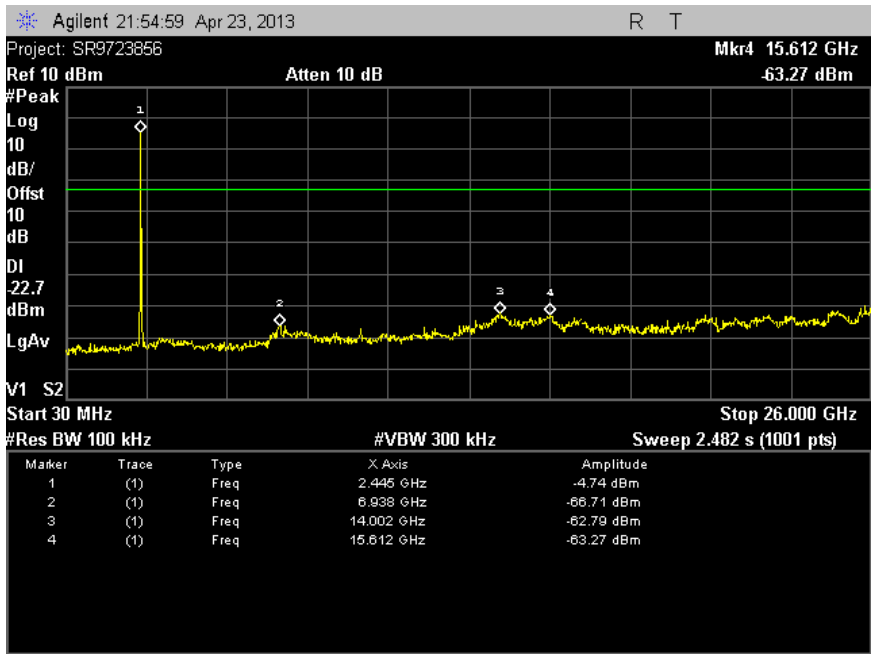


SPURIOUS EMISSIONS, MID CHANNEL

MID CH REFERENCE

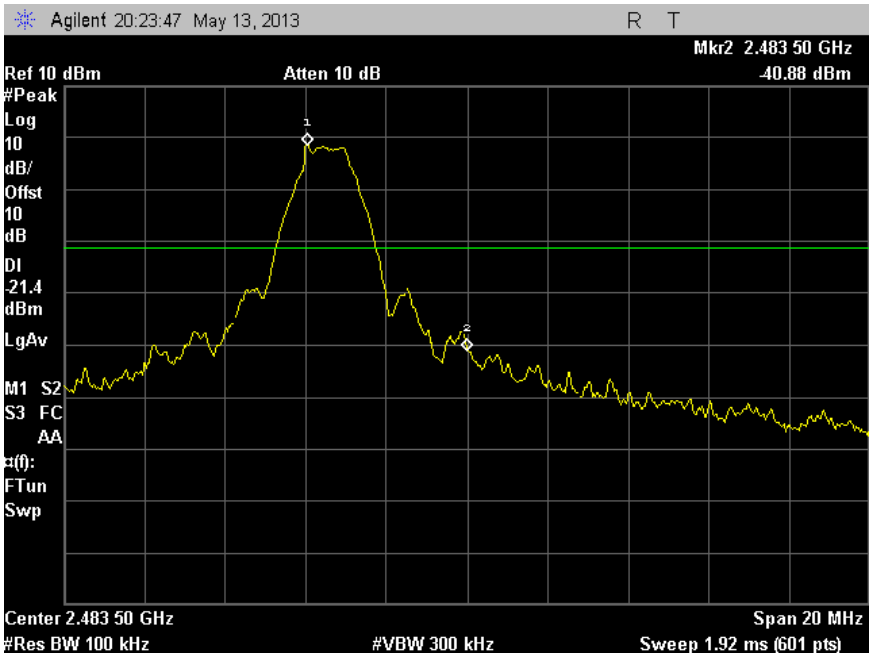


MID CH SPURIOUS

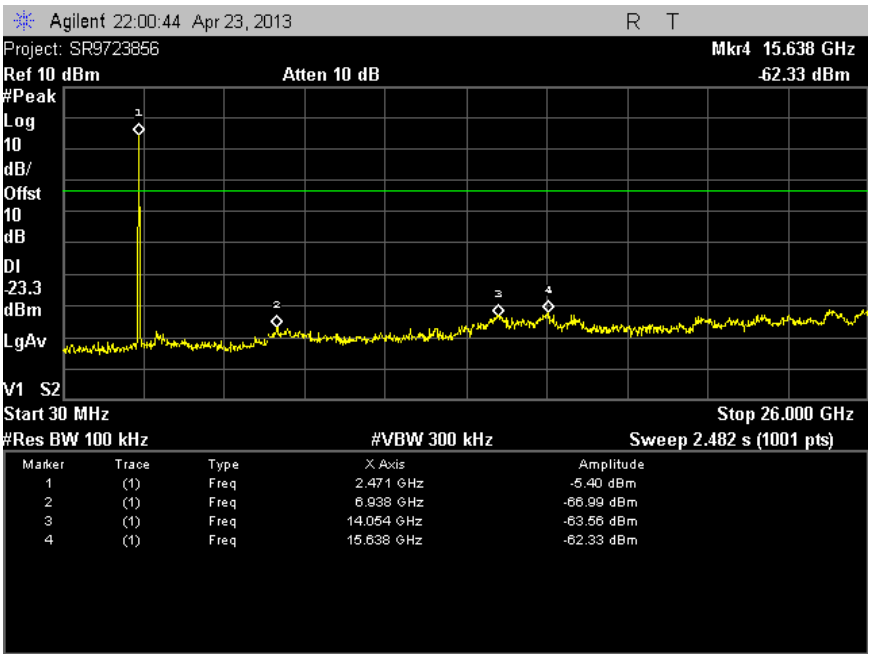


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CH BANDEDGE



HIGH CH SPURIOUS



7.2. GFSK 1Mbps 250kHz MODE

7.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

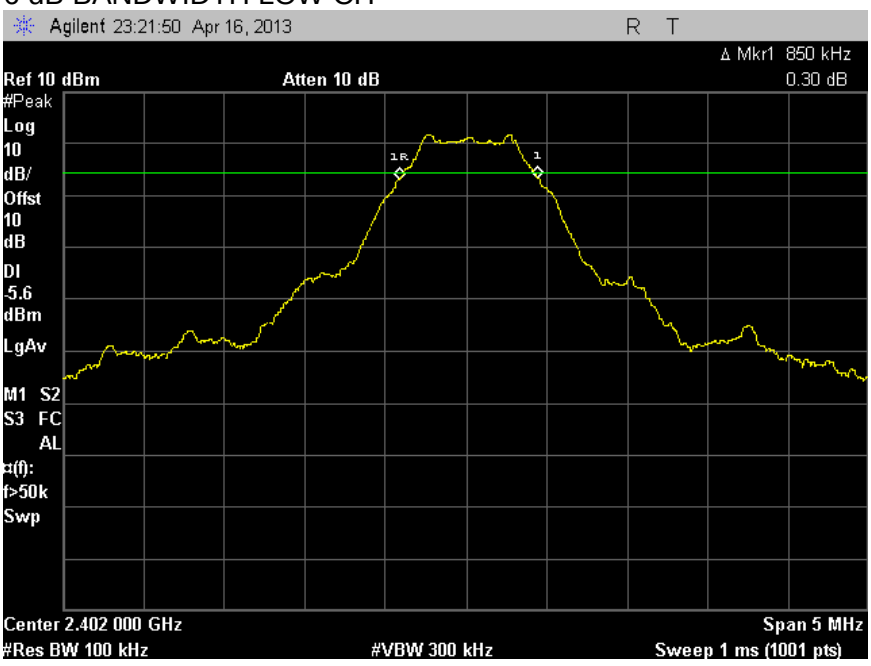
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

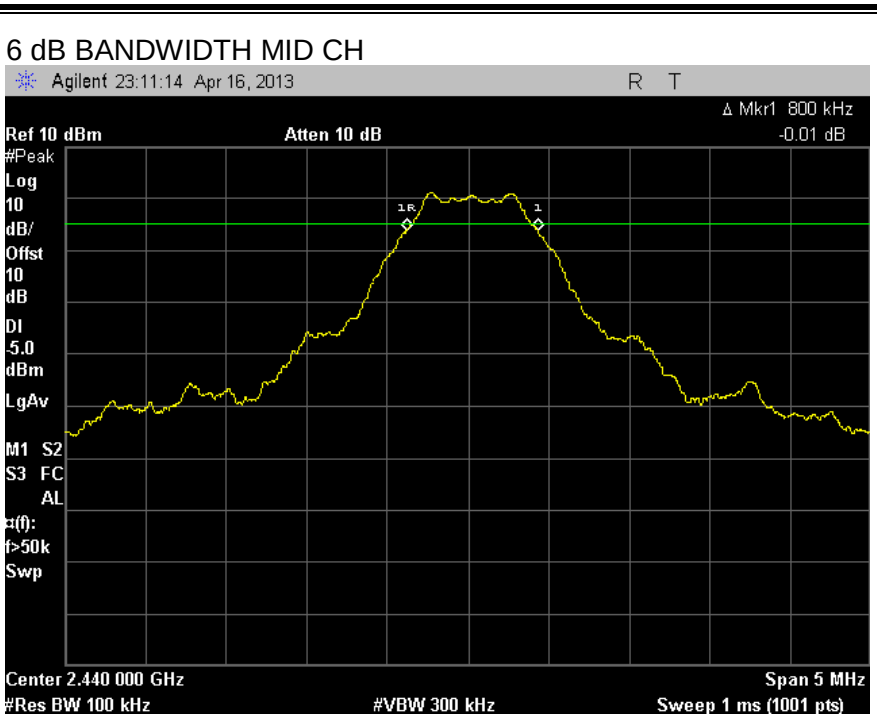
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.8500	0.5
Middle	2440	0.8000	0.5
High	2480	0.8150	0.5

6 dB BANDWIDTH

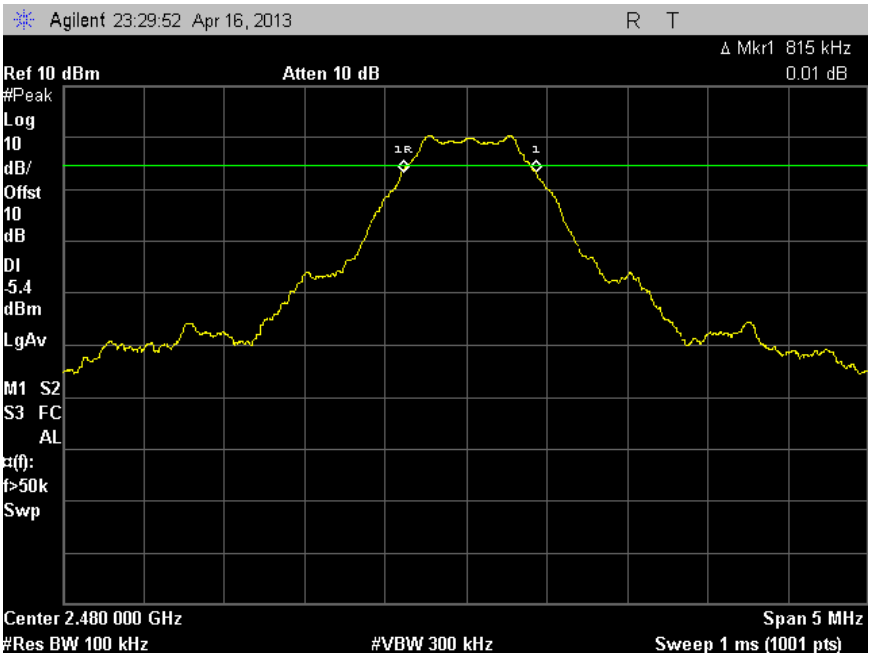
6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH



6 dB BANDWIDTH HIGH CH



7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

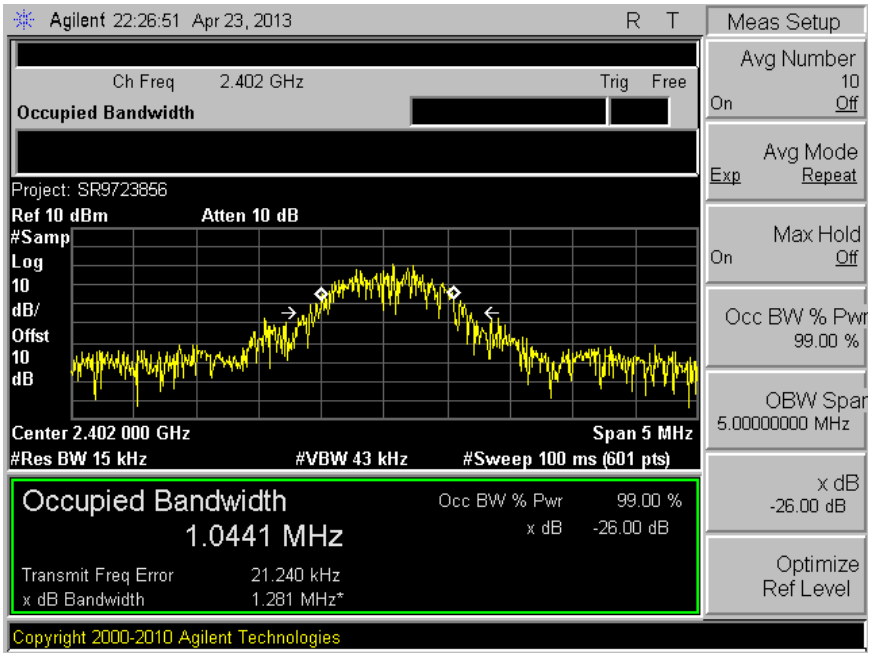
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

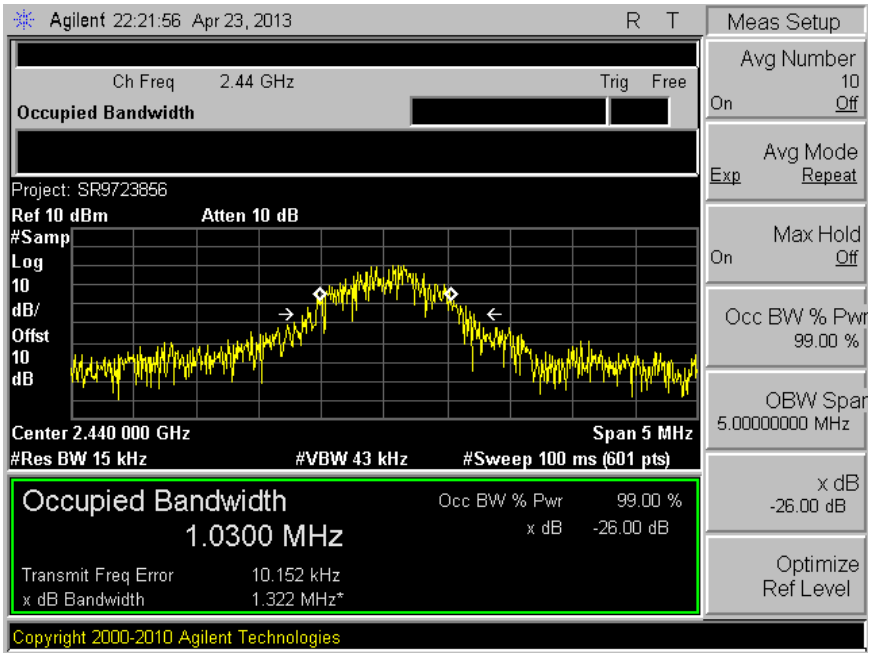
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0400
Middle	2440	1.0300
High	2480	1.0800

99% BANDWIDTH

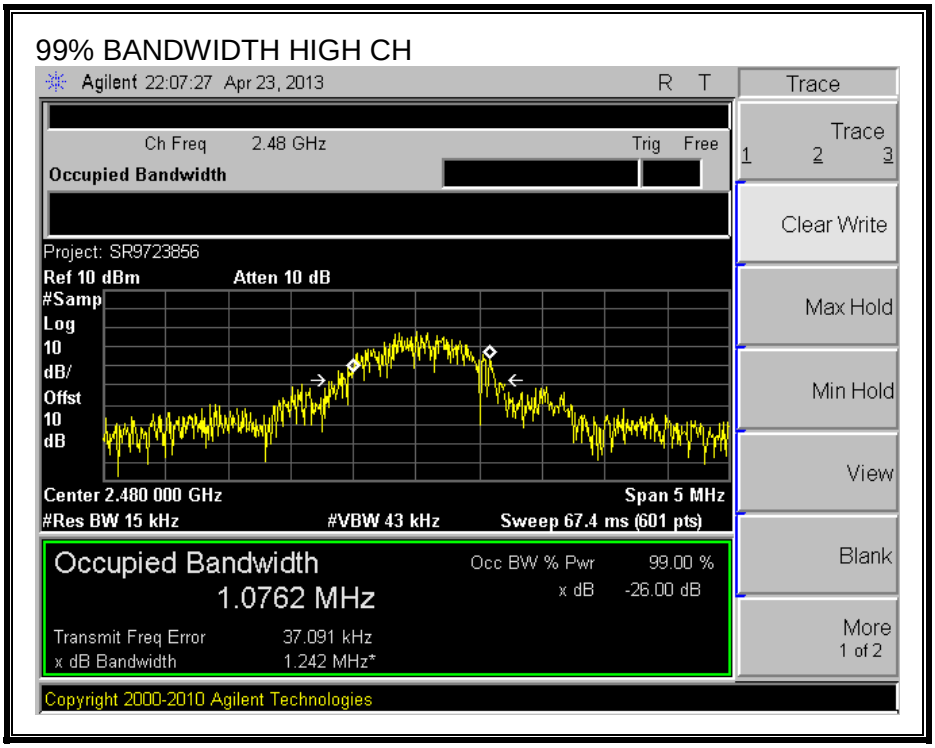
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



7.2.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

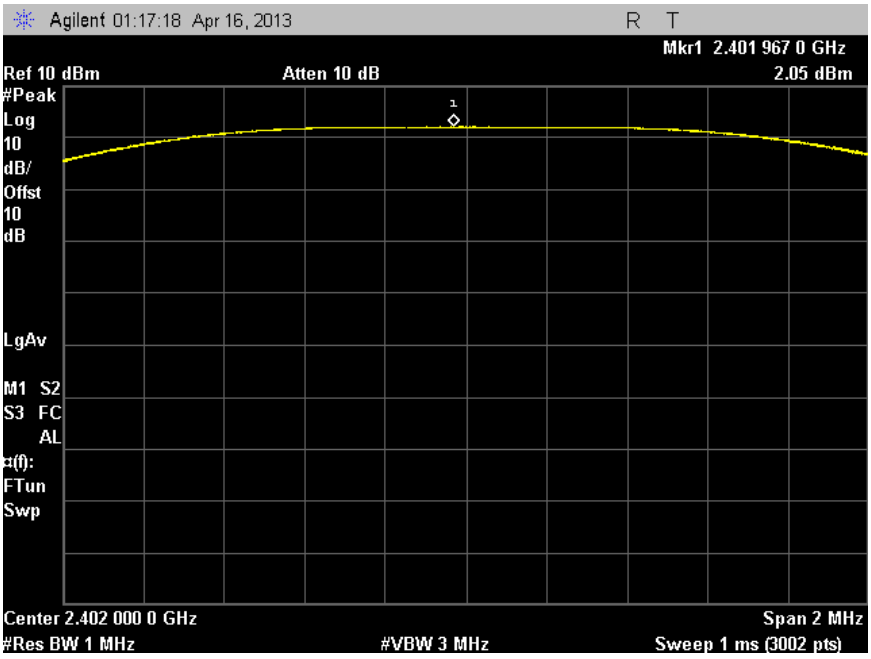
Peak power is measured using the maximum peak conducted output power procedure per section 9.1.1 specified in "558074 D01 DTS Meas Guidance v03" April 8, 2013.

RESULTS

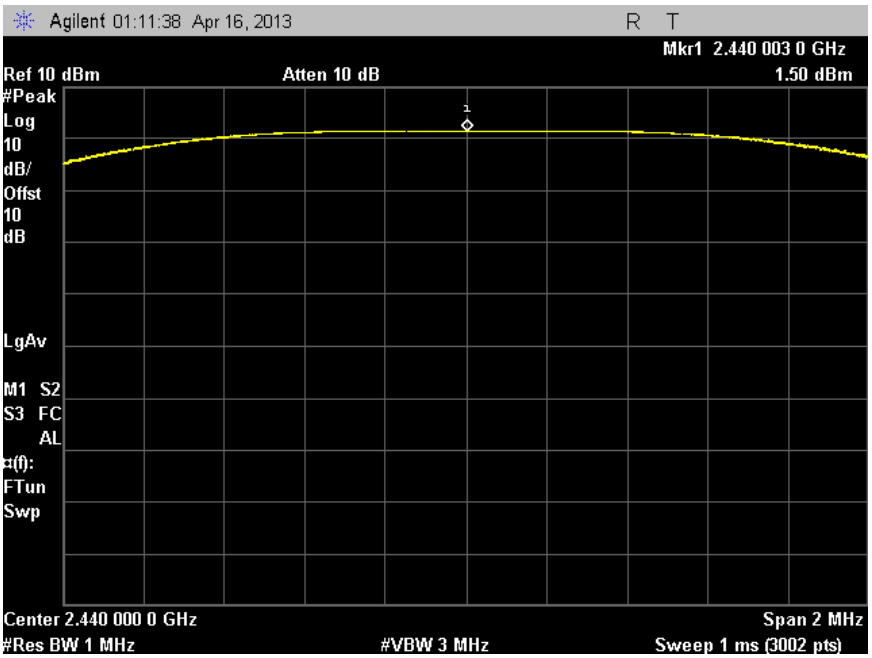
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.050	30	-27.950
Middle	2440	1.500	30	-28.500
High	2480	0.780	30	-29.220

OUTPUT POWER

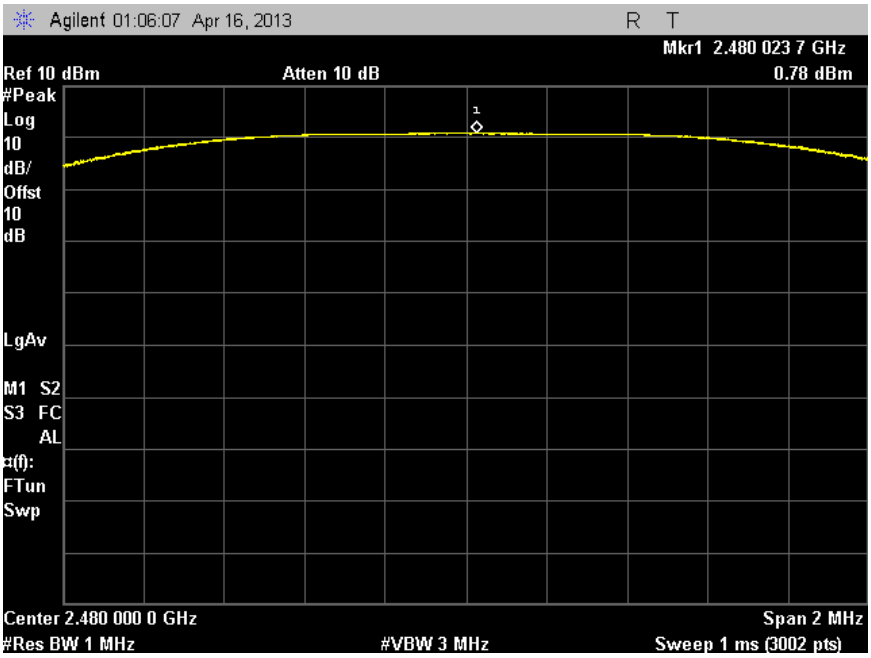
OUTPUT POWER LOW CH



OUTPUT POWER MID CH



OUTPUT POWER HIGH CH



7.2.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10 dB (including 10 dB pad) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	1.91
Middle	2440	1.3
High	2480	0.62

7.2.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

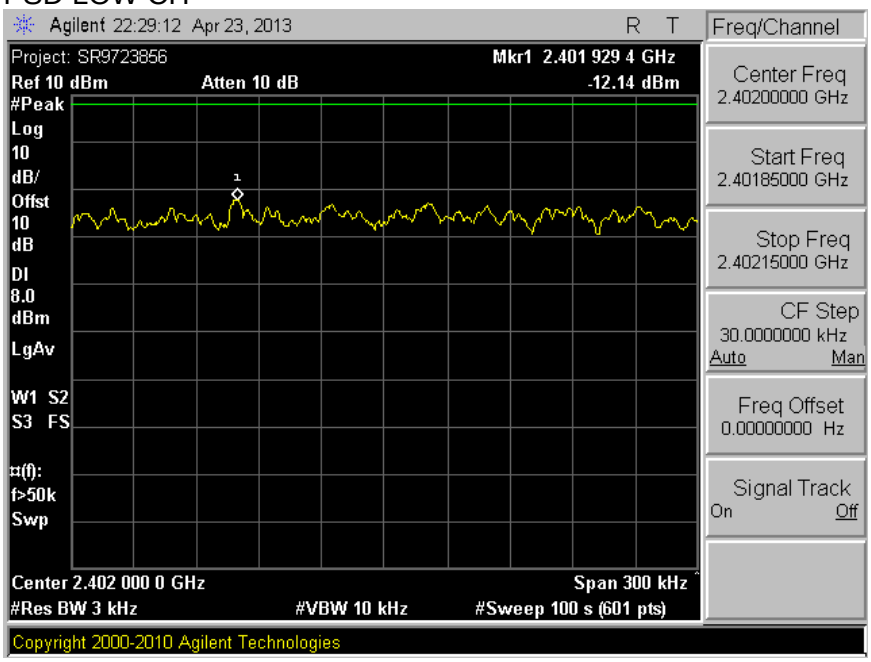
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option per section 10.2 in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, April 8, 2013.

RESULTS

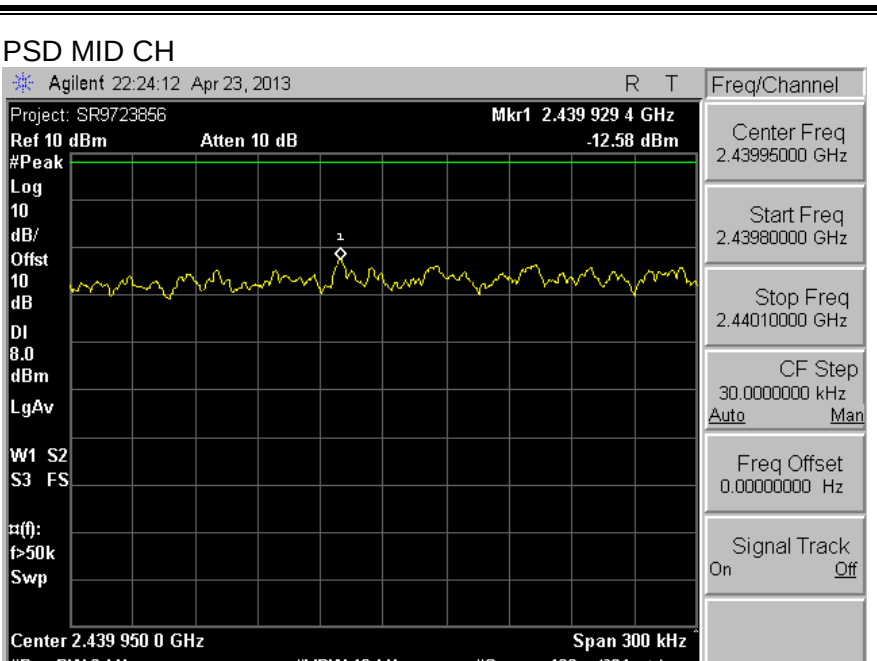
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-12.14	8	-20.14
Middle	2440	-12.58	8	-20.58
High	2480	-14.61	8	-22.61

POWER SPECTRAL DENSITY

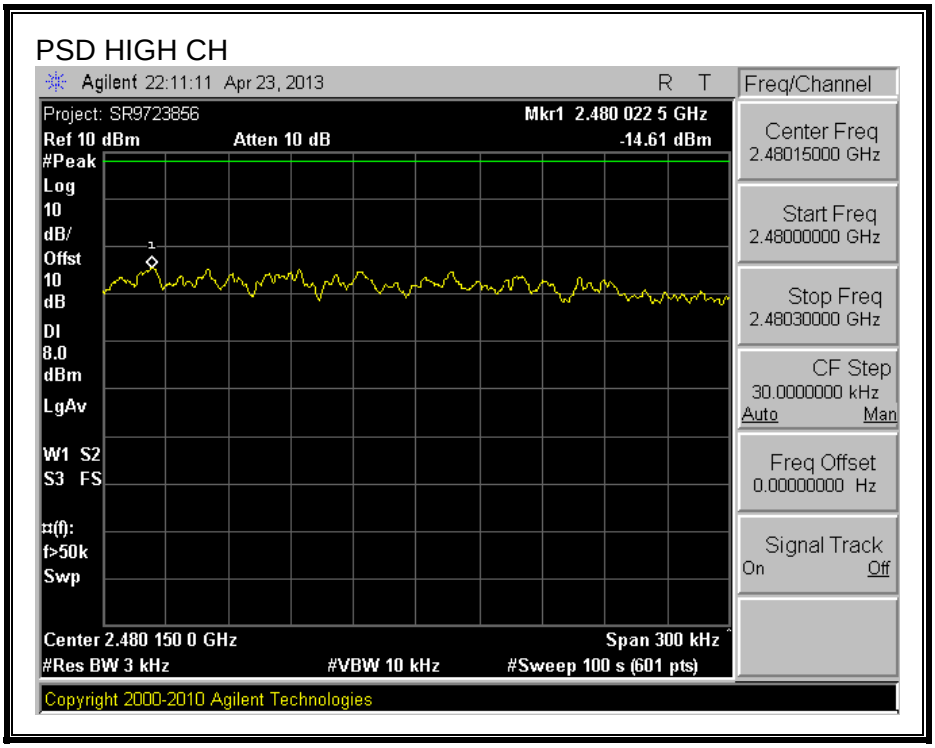
PSD LOW CH



PSD MID CH



PSD HIGH CH



7.2.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

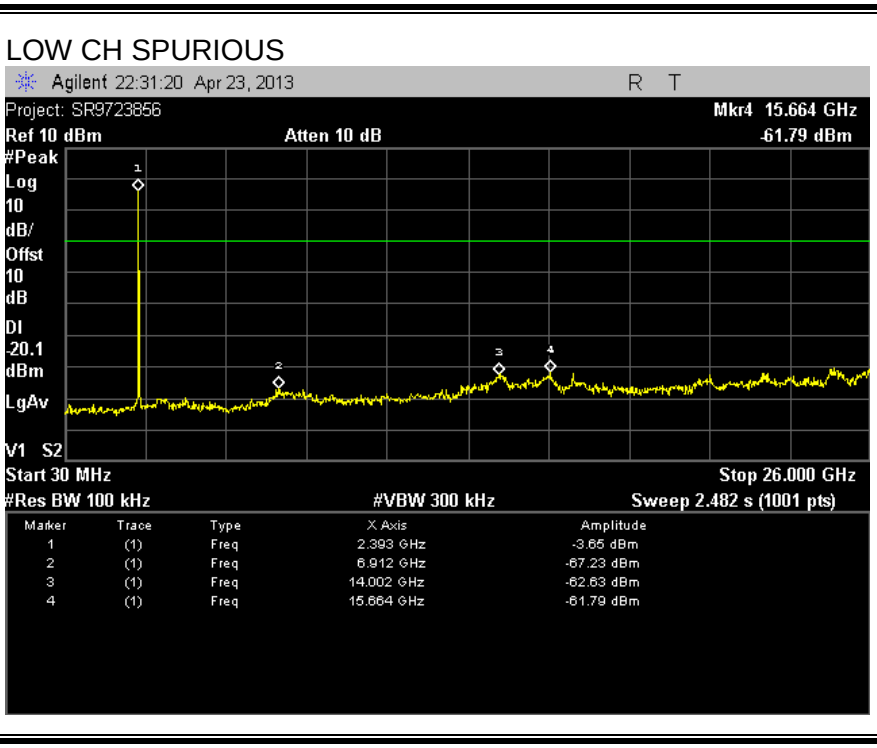
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

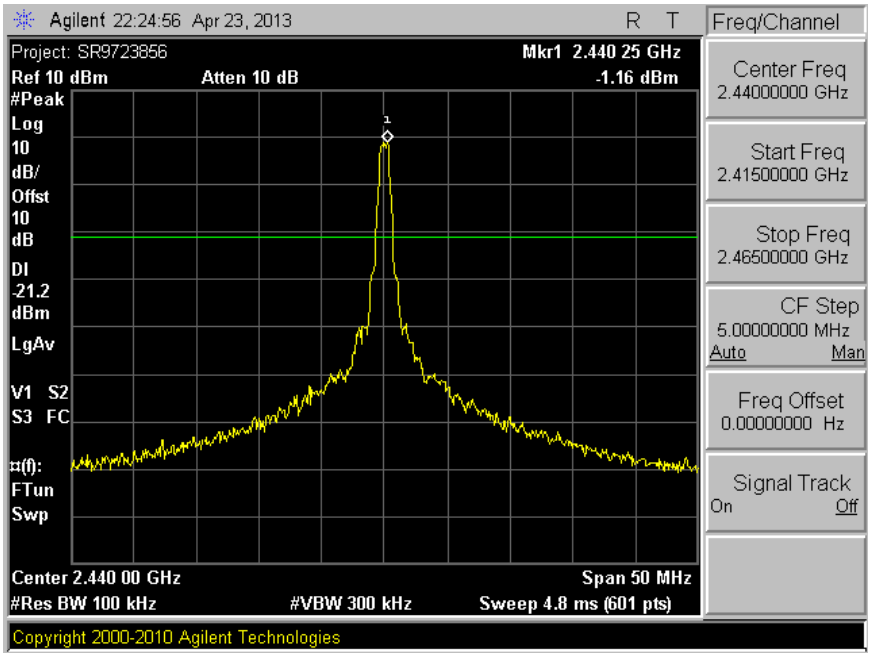
LOW CH BANDEDGE

LOW CH SPURIOUS

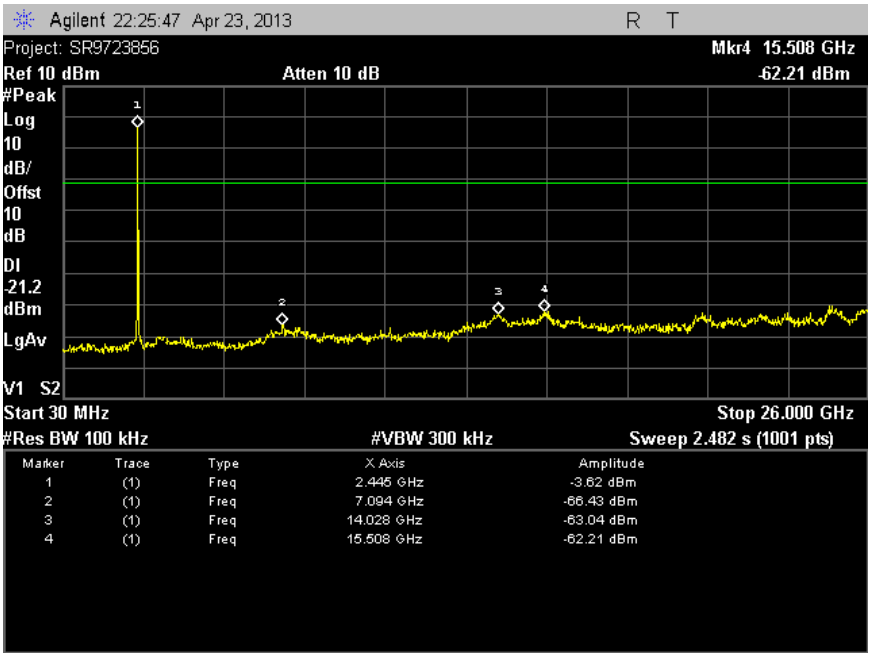


SPURIOUS EMISSIONS, MID CHANNEL

MID CH REFERENCE

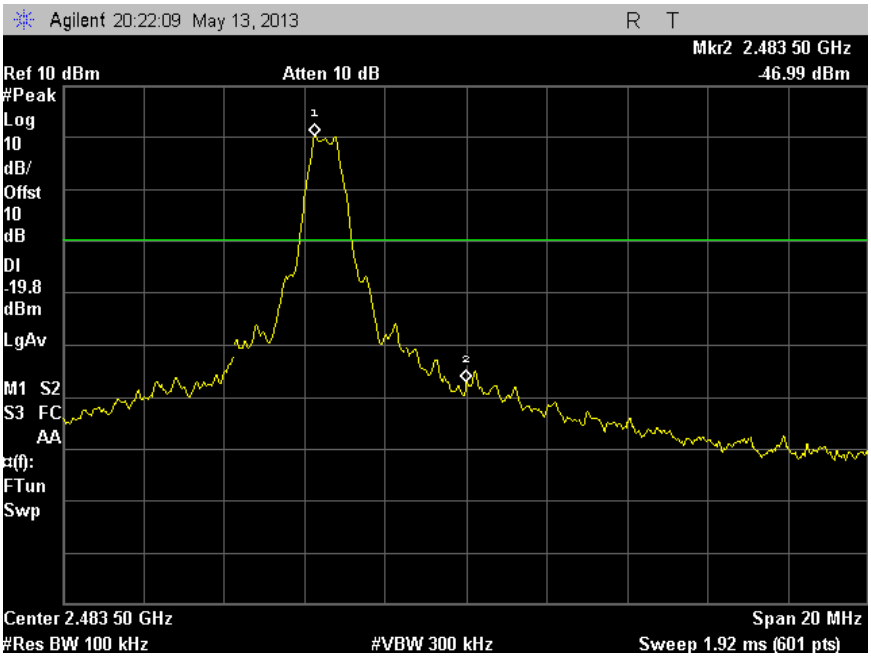


MID CH SPURIOUS

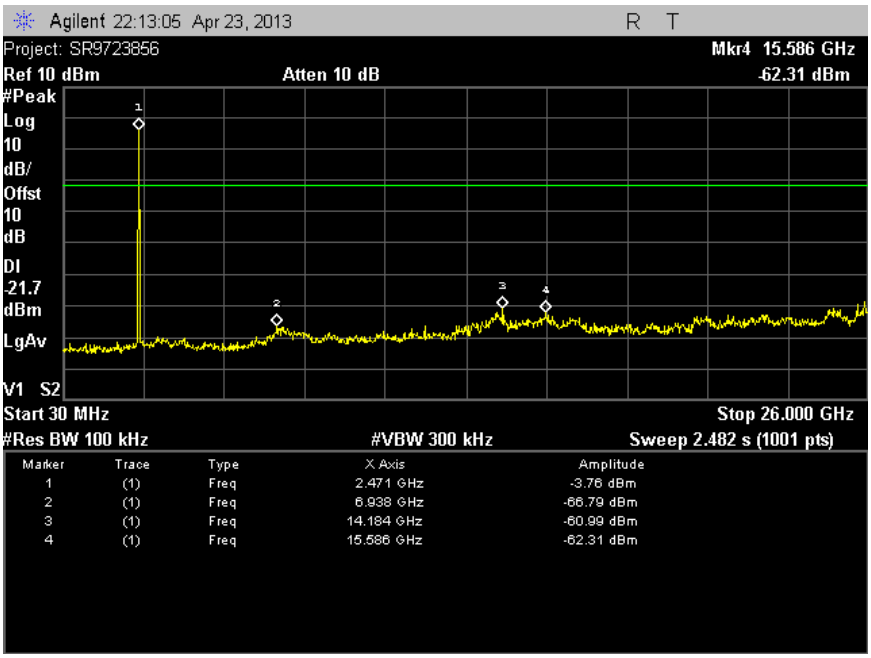


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CH BANDEDGE



HIGH CH SPURIOUS



7.3. MSK 500kbps MODE

7.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

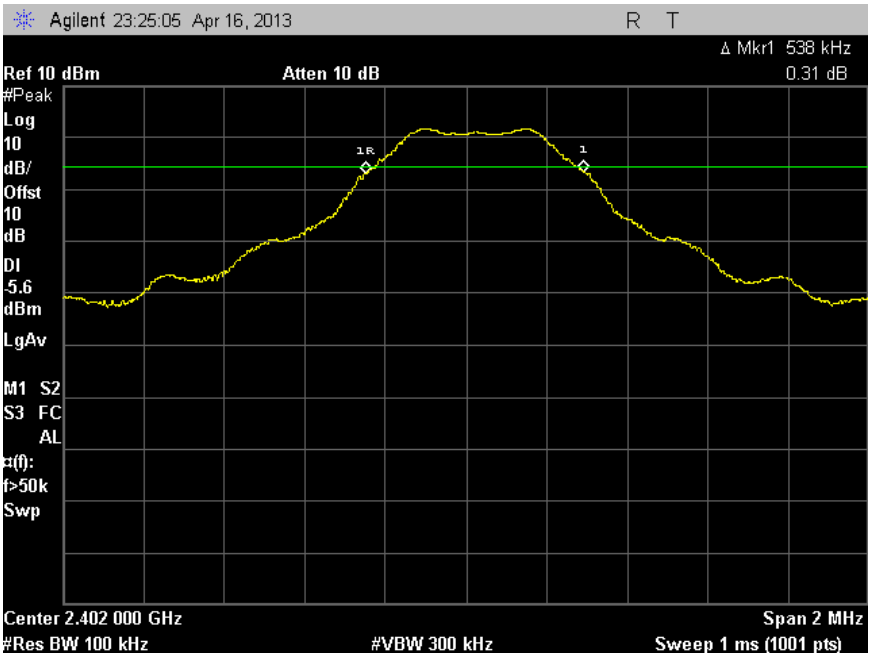
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

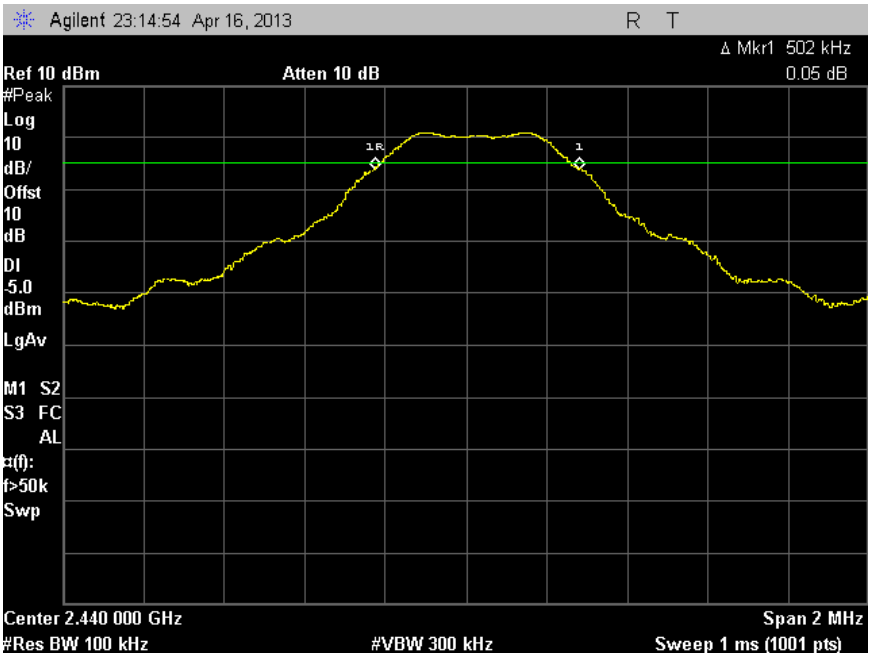
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.5380	0.5
Middle	2440	0.5020	0.5
High	2480	0.5070	0.5

6 dB BANDWIDTH

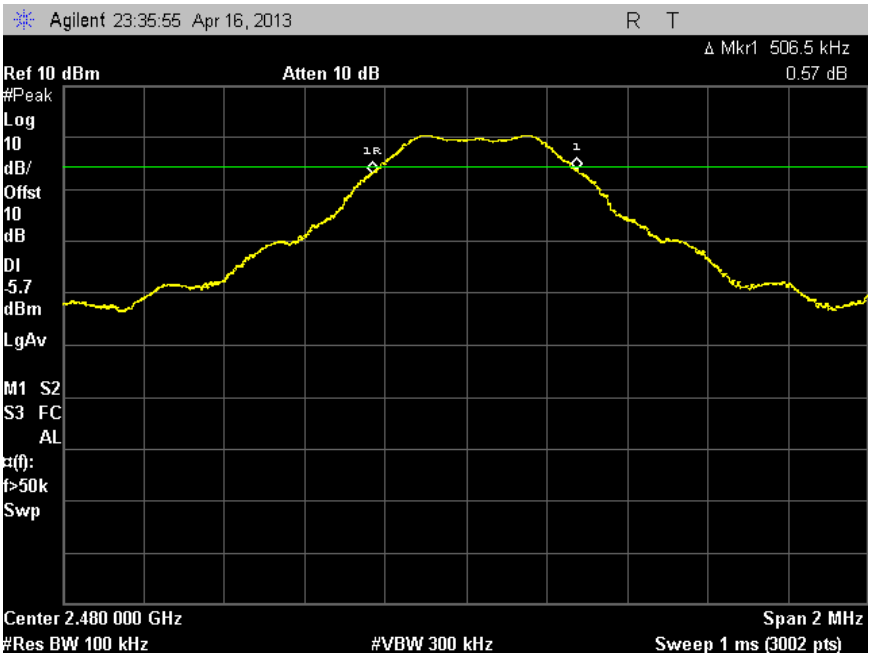
6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH



6 dB BANDWIDTH HIGH CH



7.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

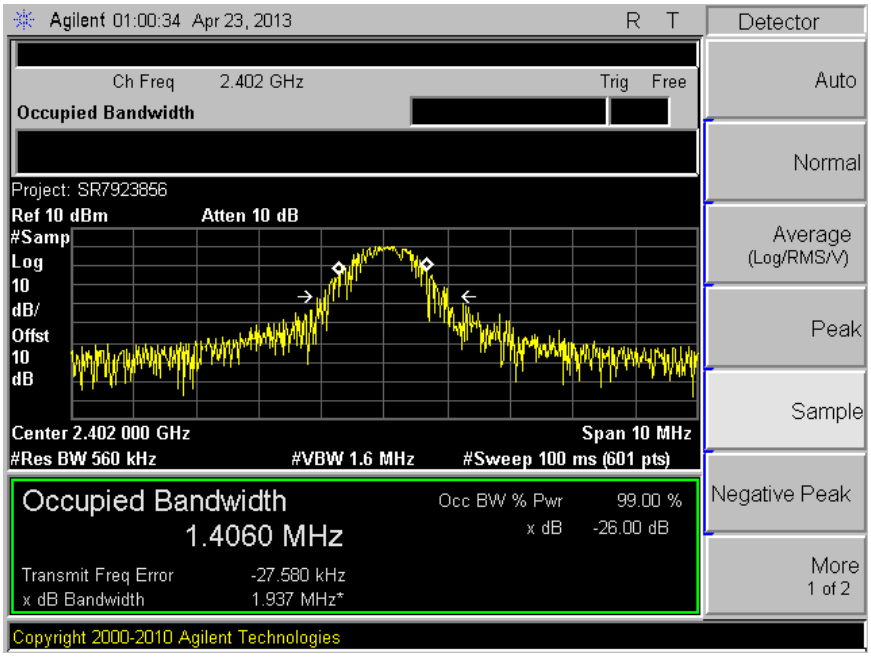
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

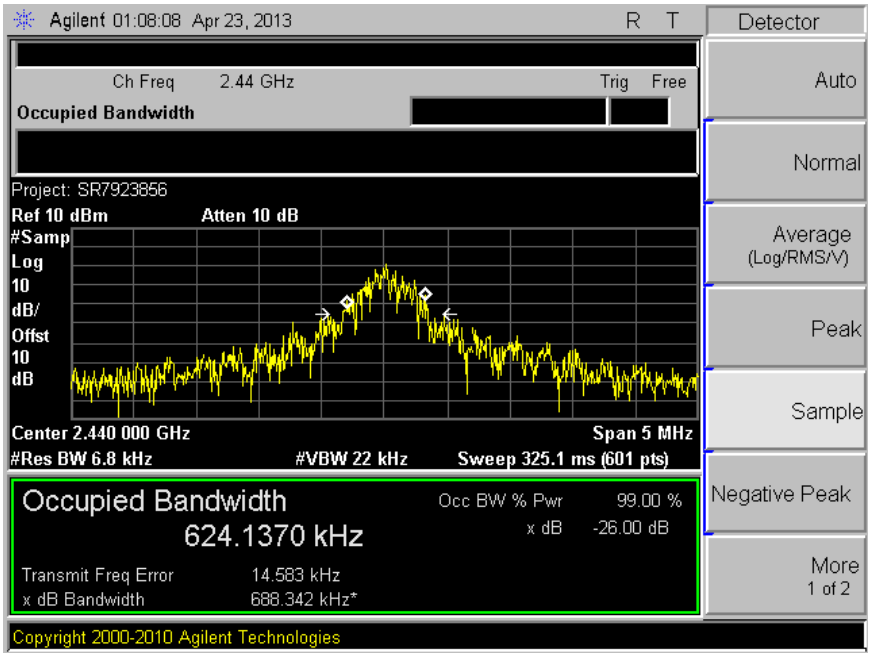
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.4000
Middle	2440	0.6240
High	2480	0.5820

99% BANDWIDTH

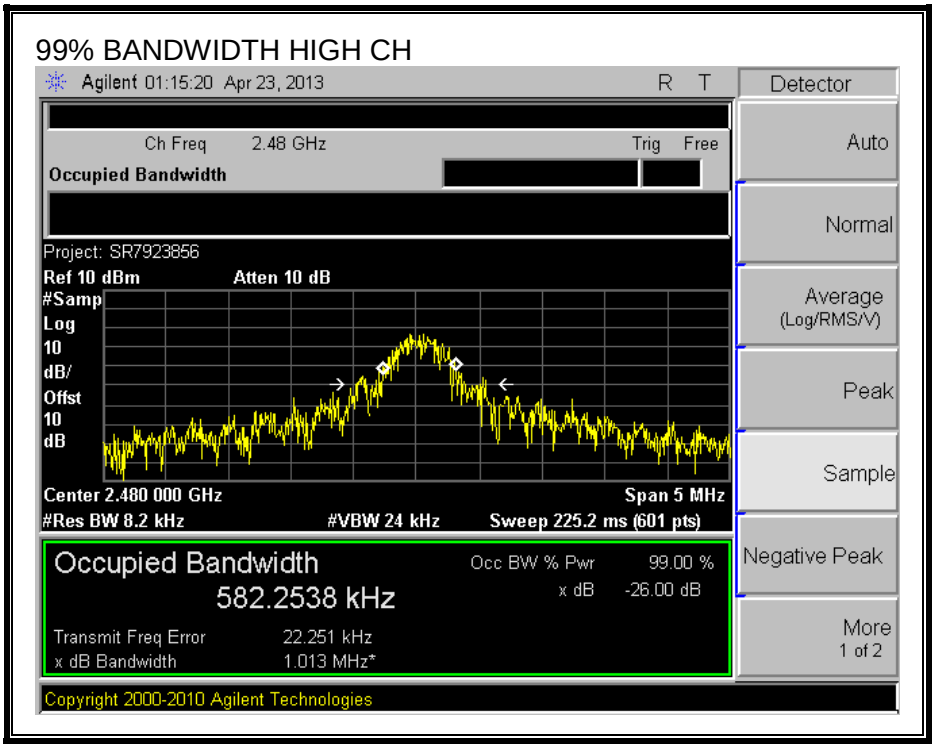
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



7.3.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

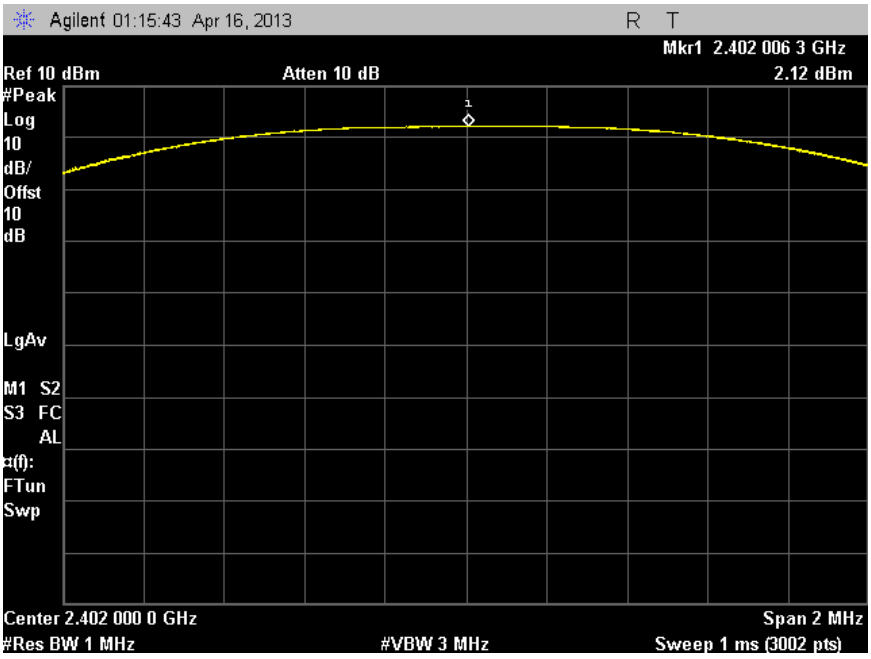
Peak power is measured using the maximum peak conducted output power procedure per section 9.1.1 specified in "558074 D01 DTS Meas Guidance v03" April 8, 2013.

RESULTS

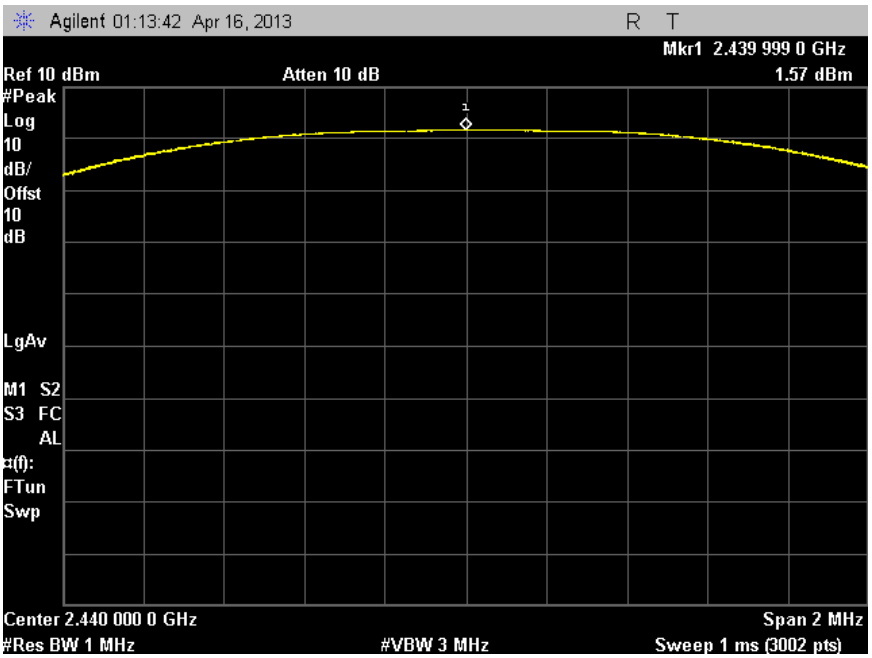
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.120	30	-27.880
Middle	2440	1.570	30	-28.430
High	2480	0.860	30	-29.140

OUTPUT POWER

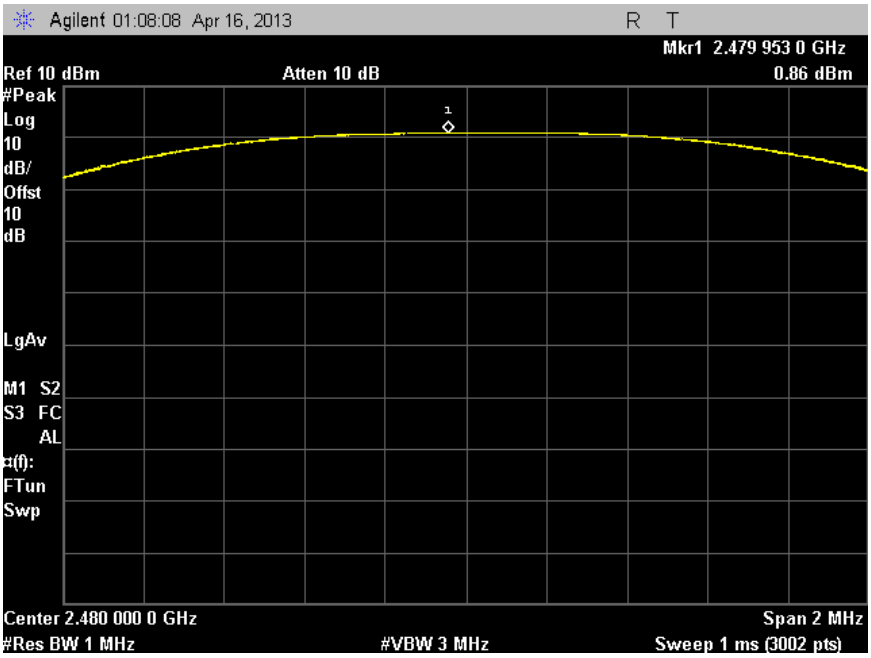
OUTPUT POWER LOW CH



OUTPUT POWER MID CH



OUTPUT POWER HIGH CH



7.3.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10 dB (including 10 dB pad) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	1.91
Middle	2440	1.3
High	2480	0.62

7.3.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

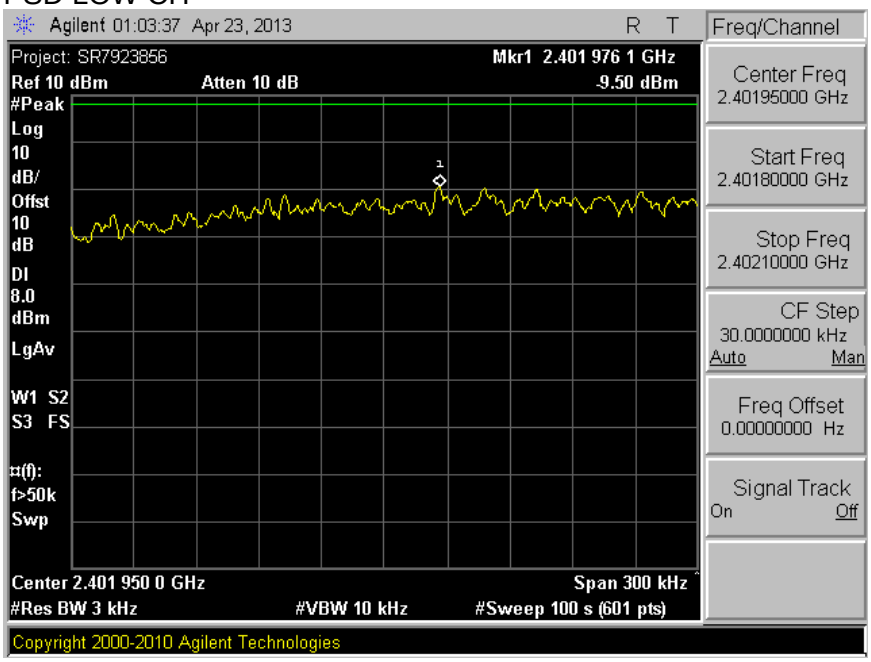
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option per section 10.2 in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, April 8, 2013.

RESULTS

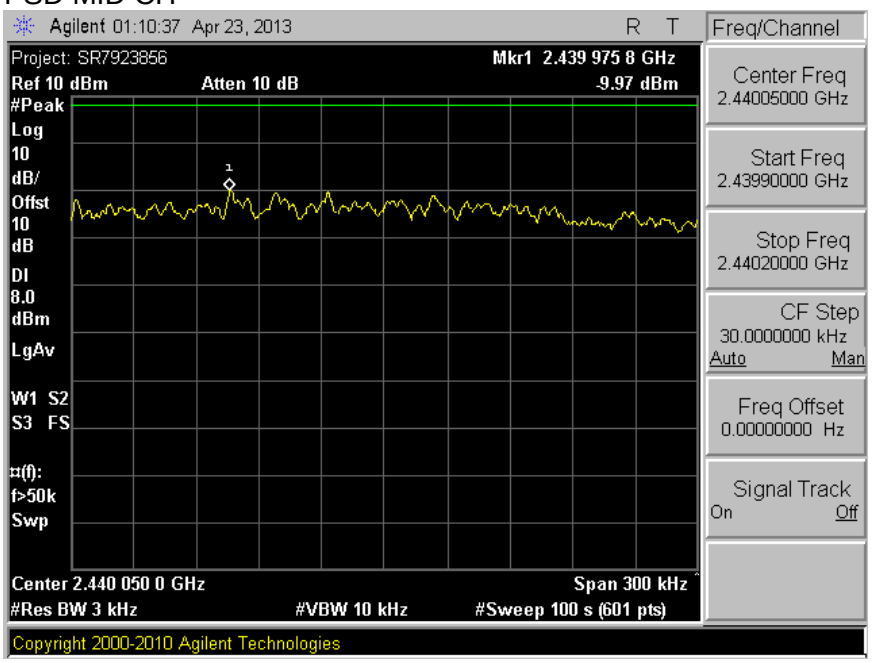
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-9.50	8	-17.50
Middle	2440	-9.97	8	-17.97
High	2480	-10.80	8	-18.80

POWER SPECTRAL DENSITY

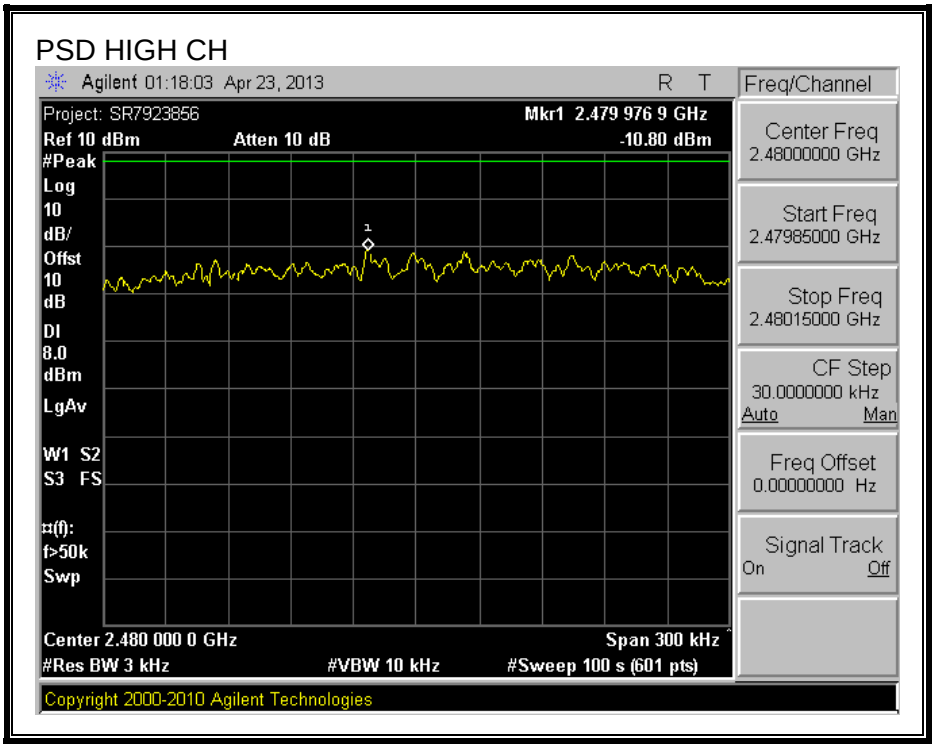
PSD LOW CH



PSD MID CH



PSD HIGH CH



7.3.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

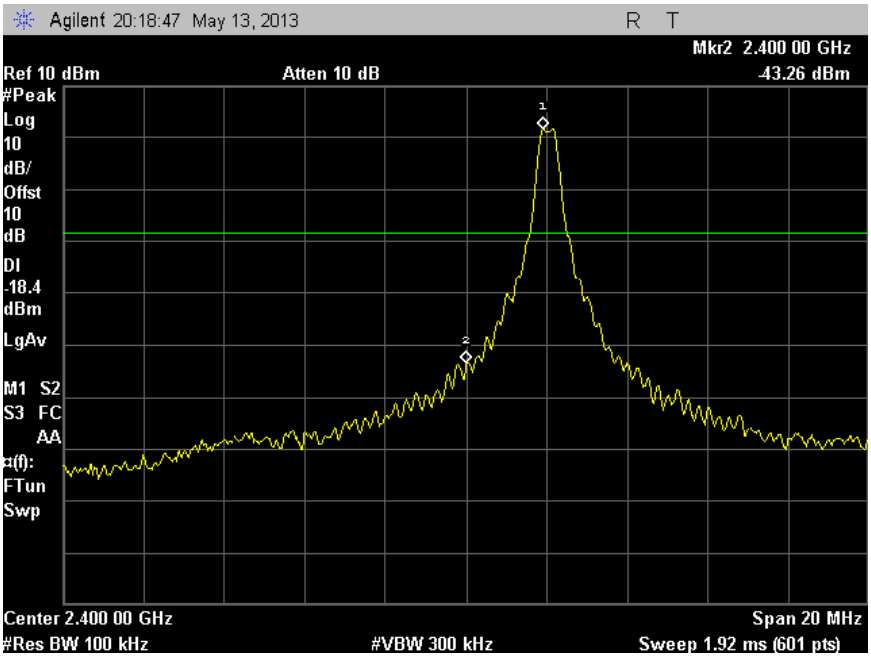
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

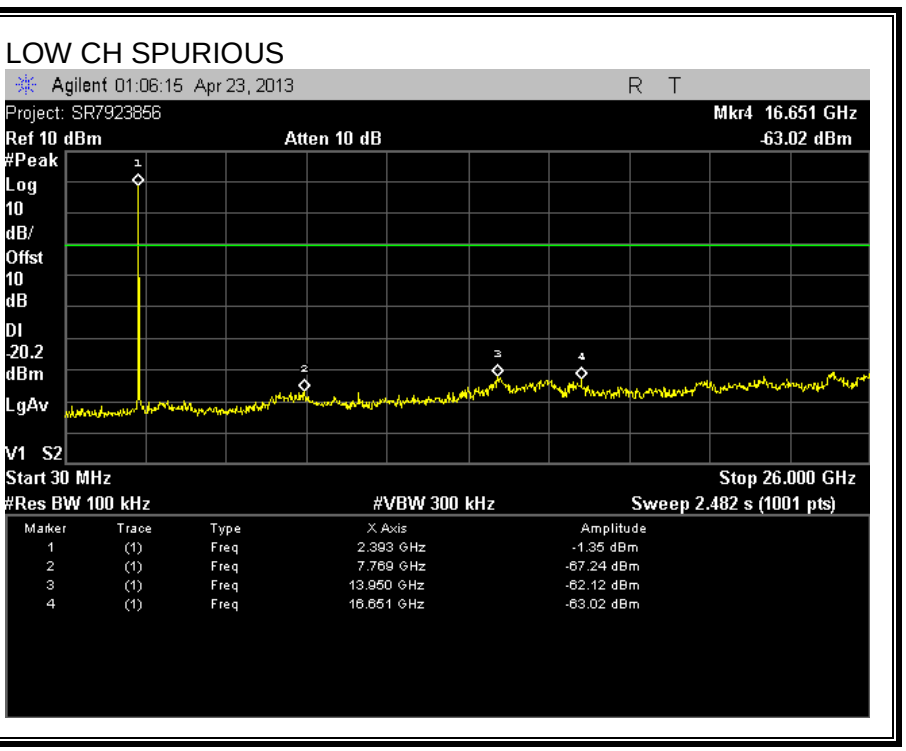
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CH BANDEDGE

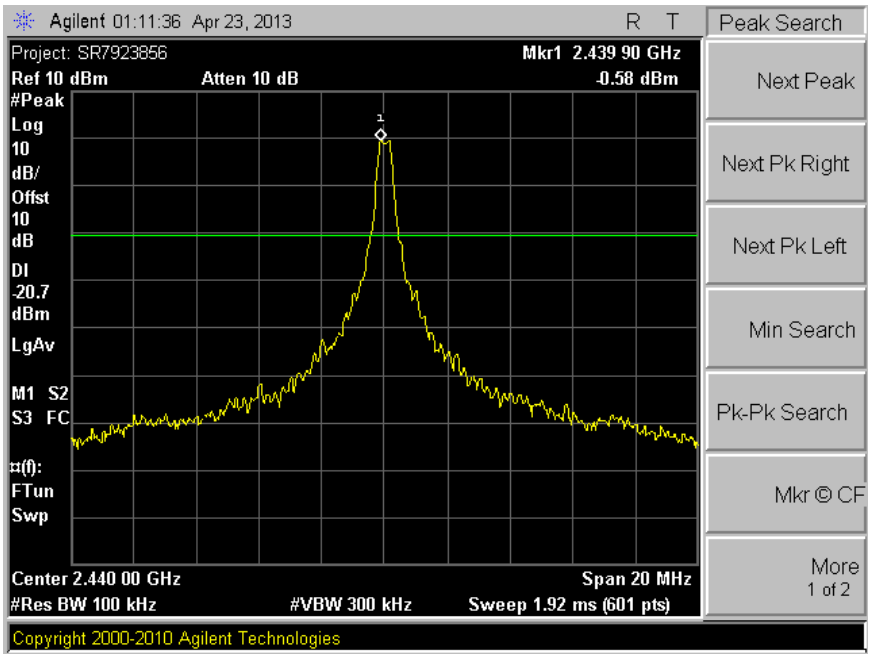


LOW CH SPURIOUS

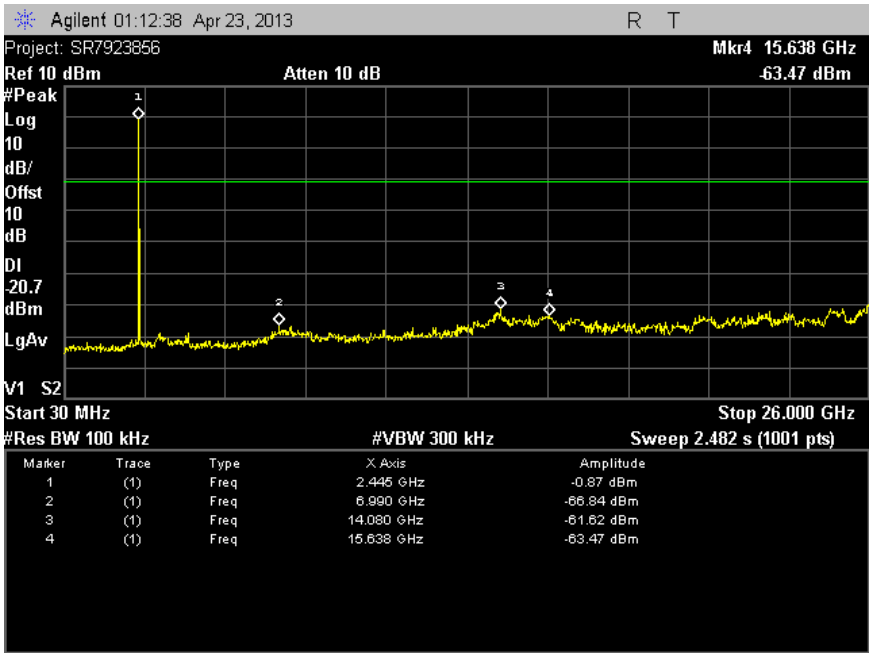


SPURIOUS EMISSIONS, MID CHANNEL

MID CH REFERENCE

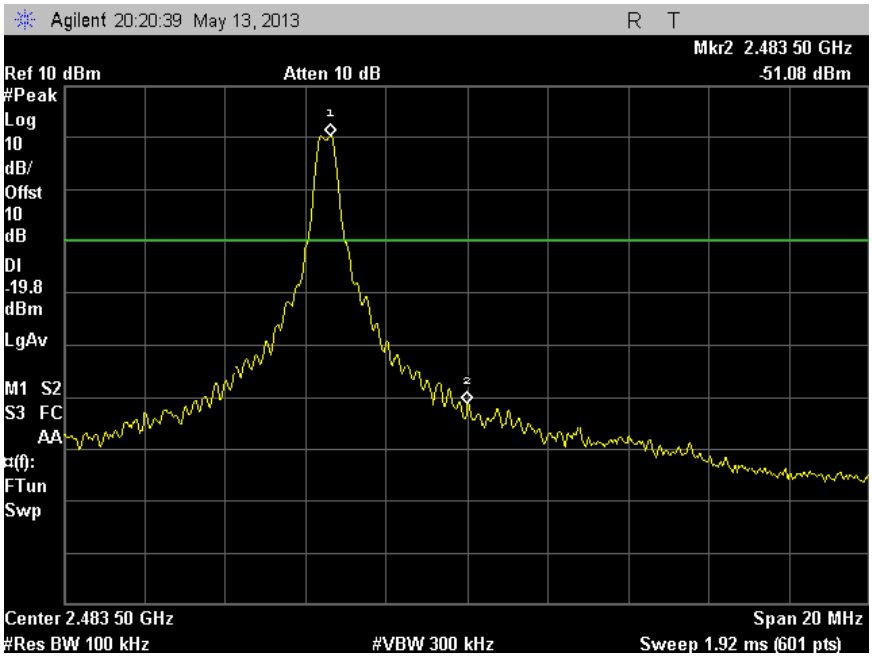


MID CH SPURIOUS

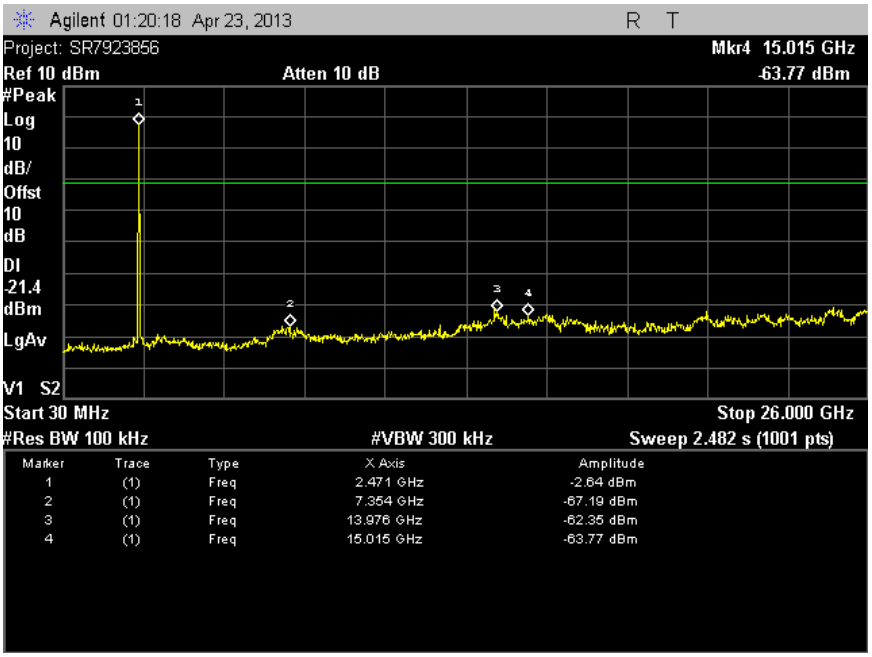


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CH BANDEDGE



HIGH CH SPURIOUS



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

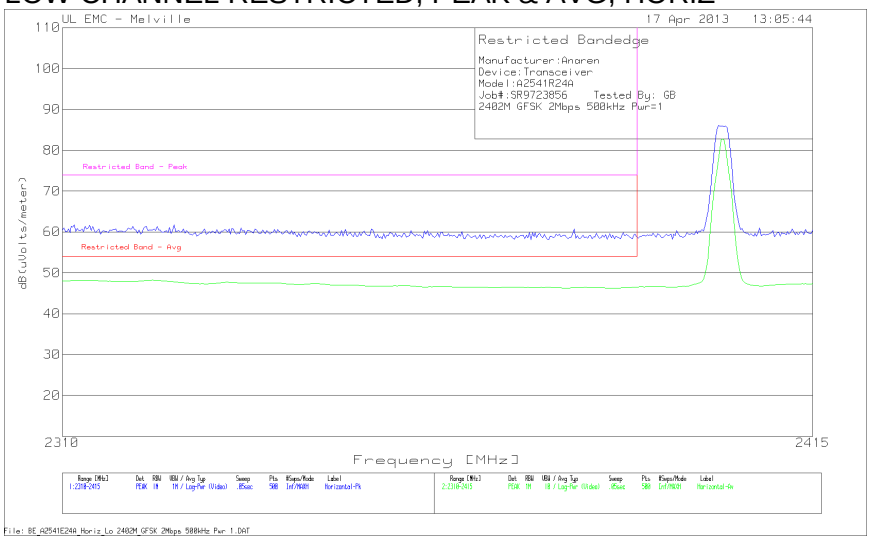
The EUT operates as a duty cycle of greater than 98%, thus a 10Hz VBW was utilized for all final measurements.

8.2. TRANSMITTER ABOVE 1 GHz – MODEL: A2541R24A

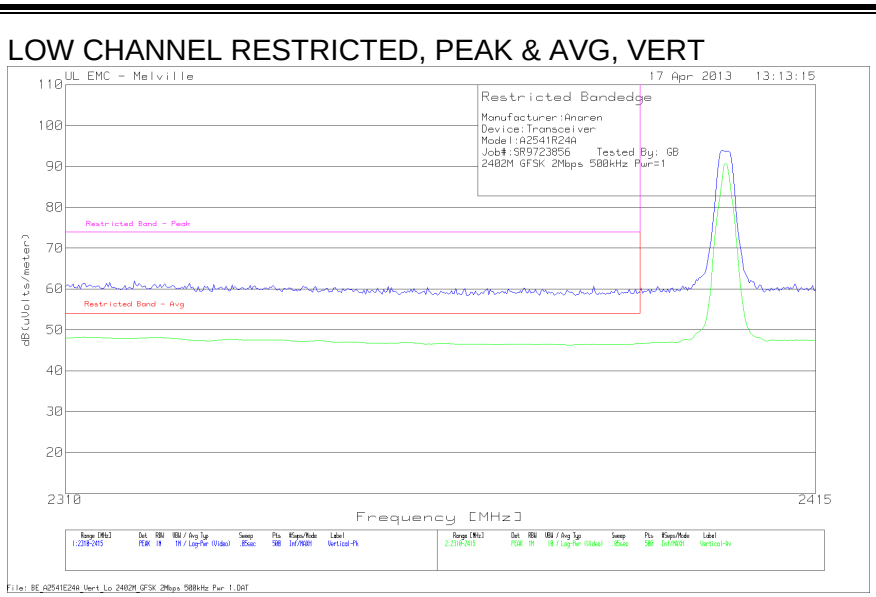
8.2.1. TX ABOVE 1 GHz FOR GFSK 2Mbps 500kHz MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

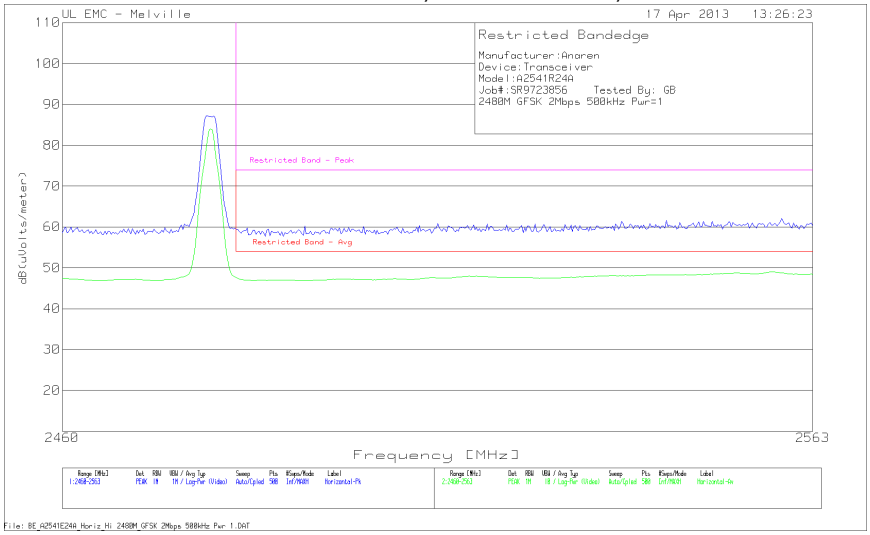


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

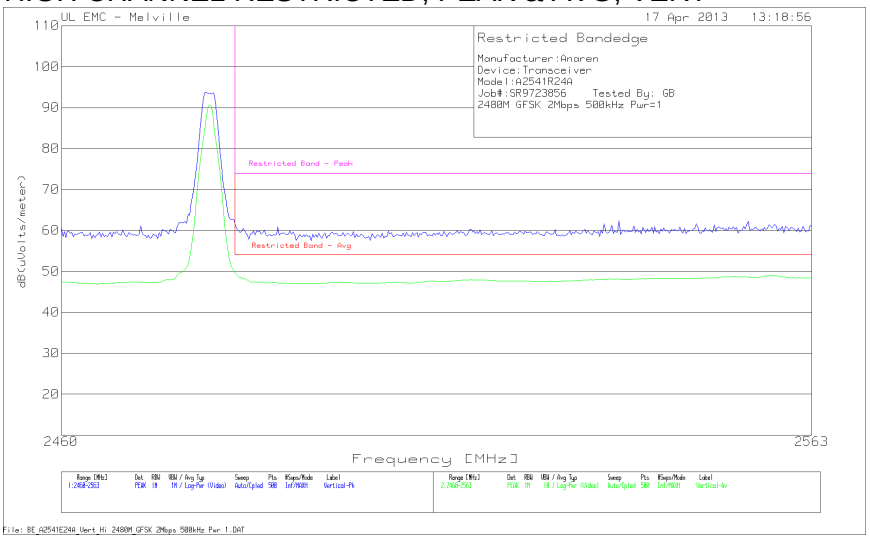


RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ



HIGH CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transciever
Model:A2541R24A
Job#:SR9723856 Tested By: GB
GFSK 2Mbps 500kHz Pwr=1

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804	68.76	PK	27.1	-53.31	42.55	-	-	74	-31.45	332	396	Horz
4804	71.72	PK	27.1	-53.31	45.51	-	-	74	-28.49	307	273	Vert
4804	64.12	LnAv	27.1	-53.31	37.91	54	-16.09	-	-	332	396	Horz
4804	68.24	LnAv	27.1	-53.31	42.03	54	-11.97	-	-	307	273	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880.1303	71.5	PK	27.2	-53.28	45.42	-	-	74	-28.58	317	340	Vert
4880.1303	68.64	PK	27.2	-53.28	42.56	-	-	74	-31.44	292	341	Horz
4880.1303	68.39	LnAv	27.2	-53.28	42.31	54	-11.69	-	-	317	340	Vert
4880.1303	63.93	LnAv	27.2	-53.28	37.85	54	-16.15	-	-	292	341	Horz

High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4960.1002	67.04	PK	27.3	-53.12	41.22	-	-	74	-32.78	32	353	Vert
4960.1002	69.74	PK	27.3	-53.12	43.92	-	-	74	-30.08	204	353	Horz
4960.1002	58.99	LnAv	27.3	-53.12	33.17	54	-20.83	-	-	32	353	Vert
4960.1002	64.84	LnAv	27.3	-53.12	39.02	54	-14.98	-	-	204	353	Horz

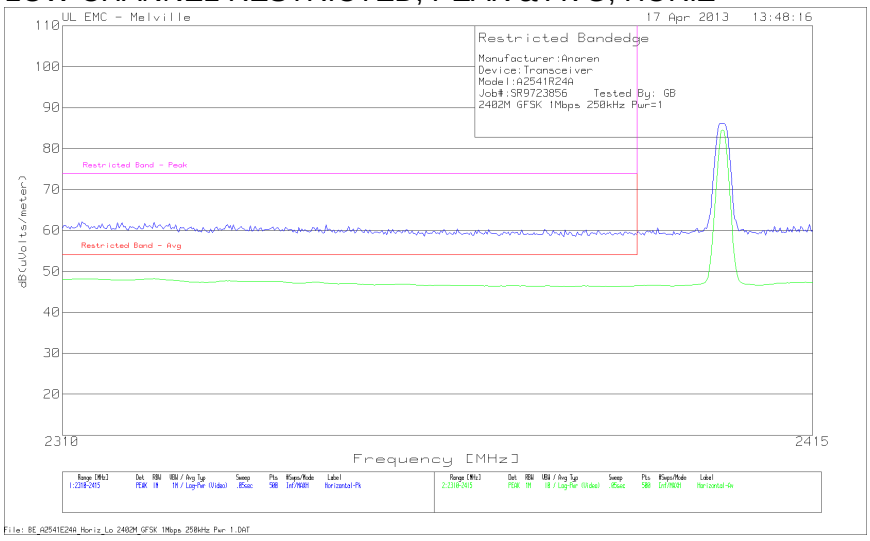
PK - Peak detector
LnAv - Linear Average detector

NOTE: No other emissions detected above the system noise floor

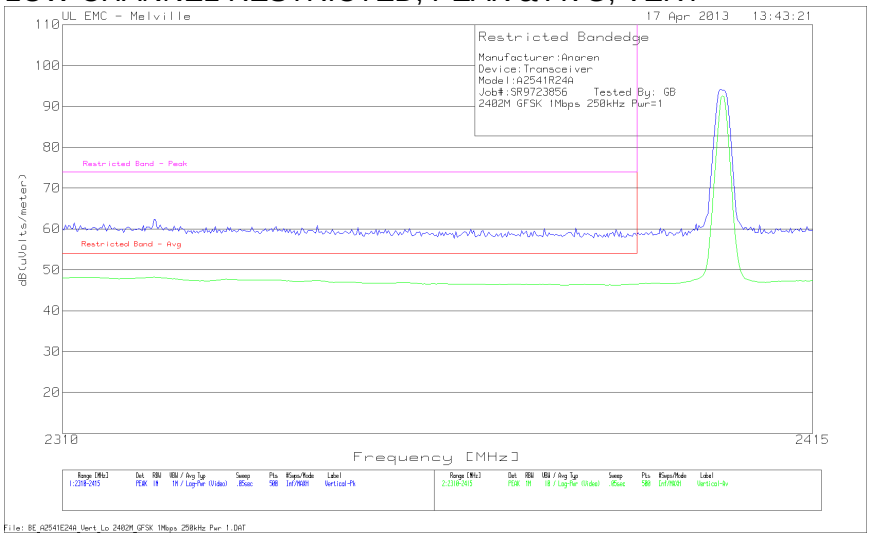
8.2.2. TX ABOVE 1 GHz FOR GFSK 1Mbps 250kHz MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

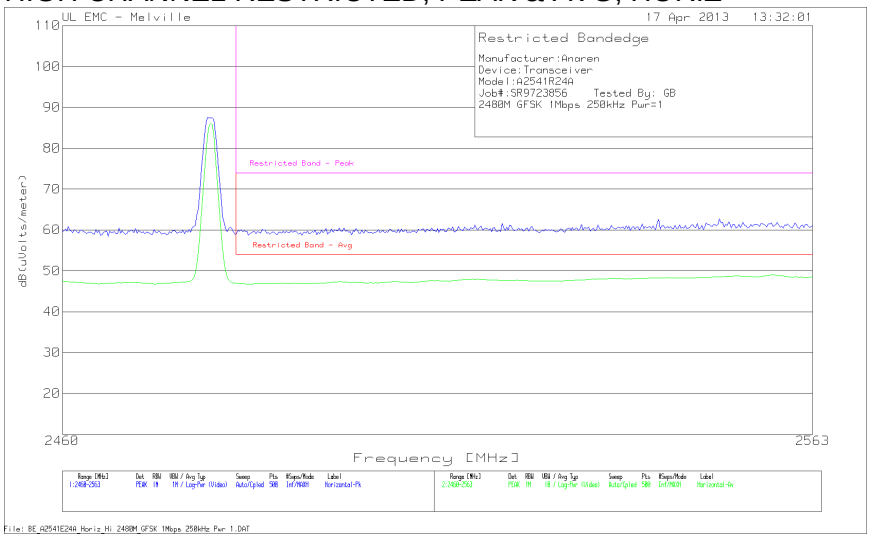


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

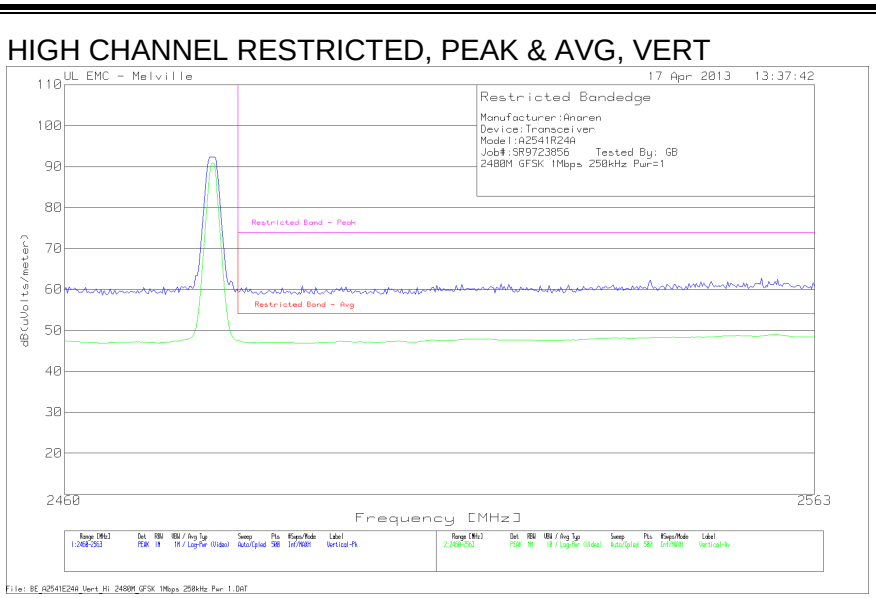


RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ



HIGH CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transciever
Model:A2541R24A
Job#:SR9723856 Tested By: GB
2440M GFSK 1Mbps 250kHz Pwr=1

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.0501	69.54	PK	27.1	-53.3	43.34	-	-	74	-30.66	287	398	Horz
4804.0621	71.38	PK	27.1	-53.3	45.18	-	-	74	-28.82	336	344	Vert
4804.0501	64.6	LnAv	27.1	-53.3	38.4	54	-15.6	-	-	287	398	Horz
4804.0621	67.01	LnAv	27.1	-53.3	40.81	54	-13.19	-	-	336	344	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880.0782	69.02	PK	27.2	-53.28	42.94	-	-	74	-31.06	209	110	Horz
4880.0762	72.12	PK	27.2	-53.28	46.04	-	-	74	-27.96	317	384	Vert
4880.0782	63.52	LnAv	27.2	-53.28	37.44	54	-16.56	-	-	209	110	Horz
4880.0762	68.74	LnAv	27.2	-53.28	42.66	54	-11.34	-	-	317	384	Vert

High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4959.9915	68.82	PK	27.3	-53.13	42.99	-	-	74	-31.01	229	260	Horz
4959.9915	72.82	PK	27.3	-53.13	46.99	-	-	74	-27.01	311	373	Vert
4959.9915	63.84	LnAv	27.3	-53.13	38.01	54	-15.99	-	-	229	260	Horz
4959.9915	69.16	LnAv	27.3	-53.13	43.33	54	-10.67	-	-	311	373	Vert

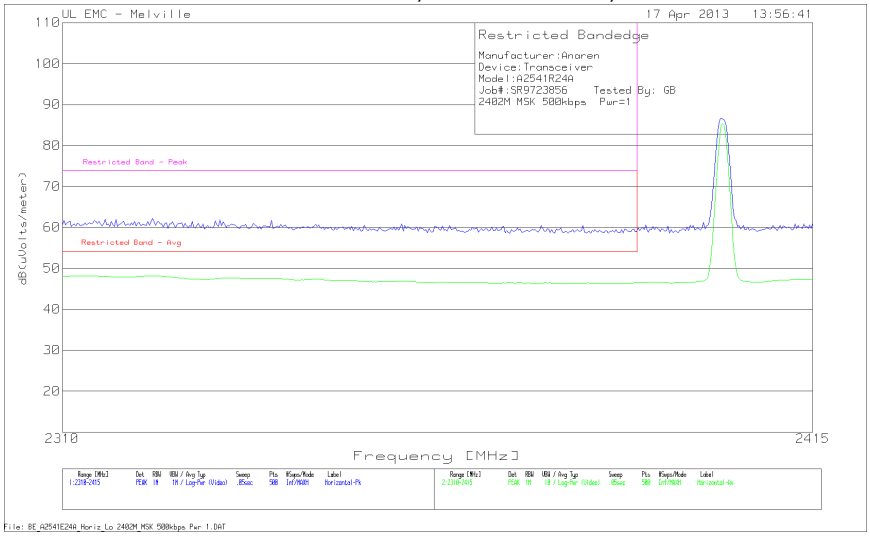
PK - Peak detector
LnAv - Linear Average detector

NOTE: No other emissions detected above the system noise floor

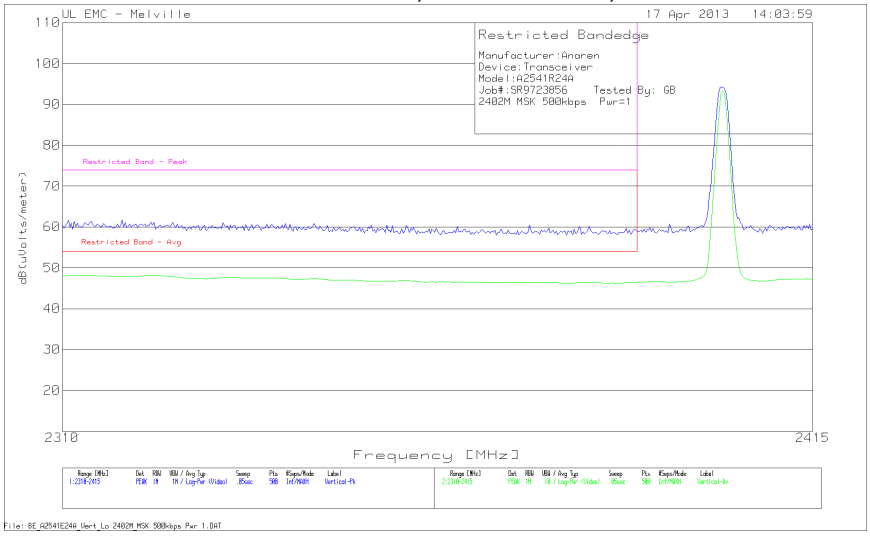
8.2.3. TX ABOVE 1 GHz FOR MSK 500kbps MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

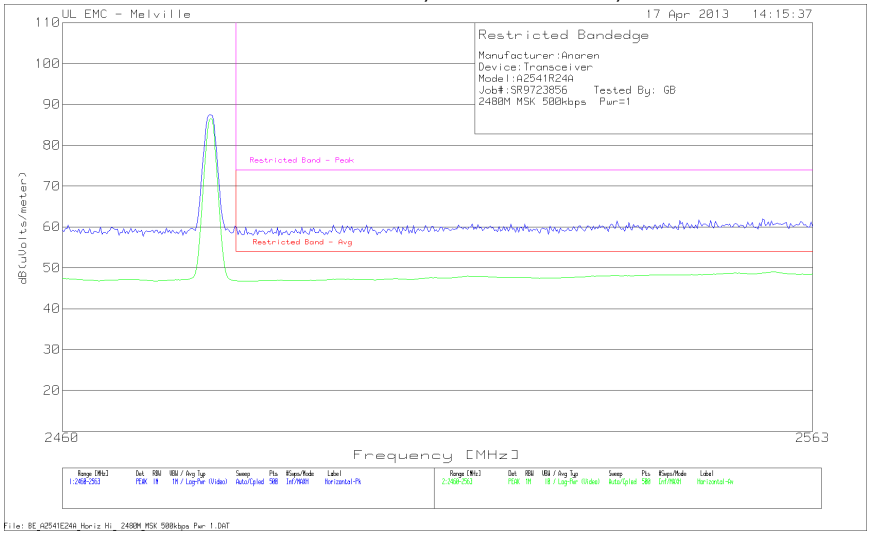


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

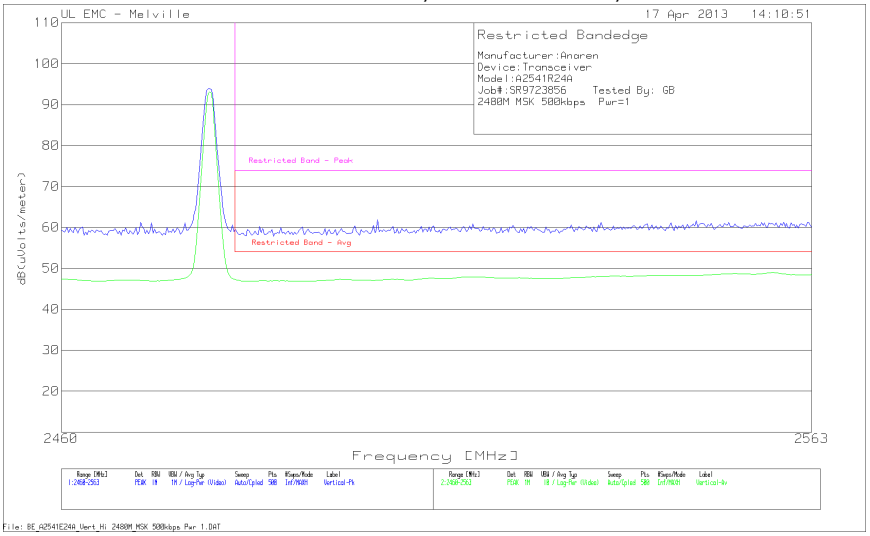


RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ



HIGH CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transciever
Model:A2541R24A
Job#:SR9723856 Tested By: GB
MSK 500kbps Pwr=1

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.0301	71.5	PK	27.1	-53.3	45.3	-	-	74	-28.7	304	397	Vert
4804.0301	69.7	PK	27.1	-53.3	43.5	-	-	74	-30.5	323	340	Horz
4804.0301	68.42	LnAv	27.1	-53.3	42.22	54	-11.78	-	-	304	397	Vert
4804.0301	64.62	LnAv	27.1	-53.3	38.42	54	-15.58	-	-	323	340	Horz

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880.01	71.8	PK	27.2	-53.28	45.72	-	-	74	-28.28	301	383	Vert
4880.01	69.23	PK	27.2	-53.28	43.15	-	-	74	-30.85	344	379	Horz
4880.01	68.81	LnAv	27.2	-53.28	42.73	54	-11.27	-	-	301	383	Vert
4880.01	64.5	LnAv	27.2	-53.28	38.42	54	-15.58	-	-	344	379	Horz

High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4959.99	72.12	PK	27.3	-53.13	46.29	-	-	74	-27.71	295	379	Vert
4959.99	68.55	PK	27.3	-53.13	42.72	-	-	74	-31.28	304	320	Horz
4959.99	69.12	LnAv	27.3	-53.13	43.29	54	-10.71	-	-	295	379	Vert
4959.99	63.32	LnAv	27.3	-53.13	37.49	54	-16.51	-	-	304	320	Horz

PK - Peak detector
LnAv - Linear Average detector

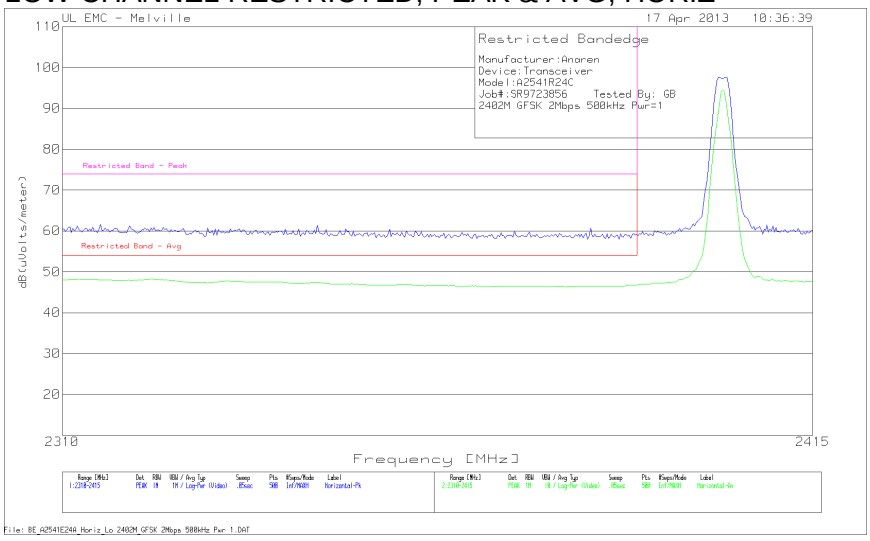
NOTE: No other emissions detected above the system noise floor

8.3. TRANSMITTER ABOVE 1 GHz – MODEL: A2541R24C

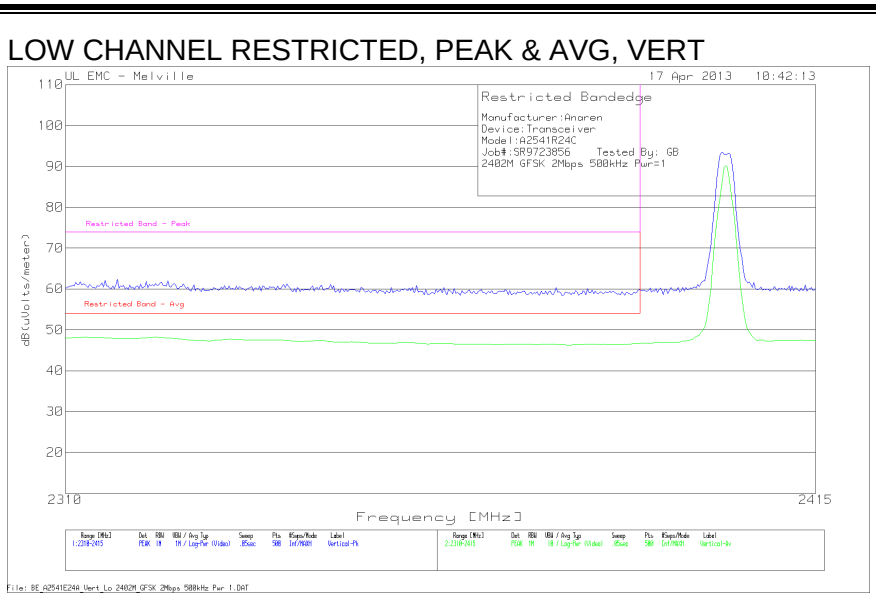
8.3.1. TX ABOVE 1 GHz FOR GFSK 2Mbps 500kHz MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

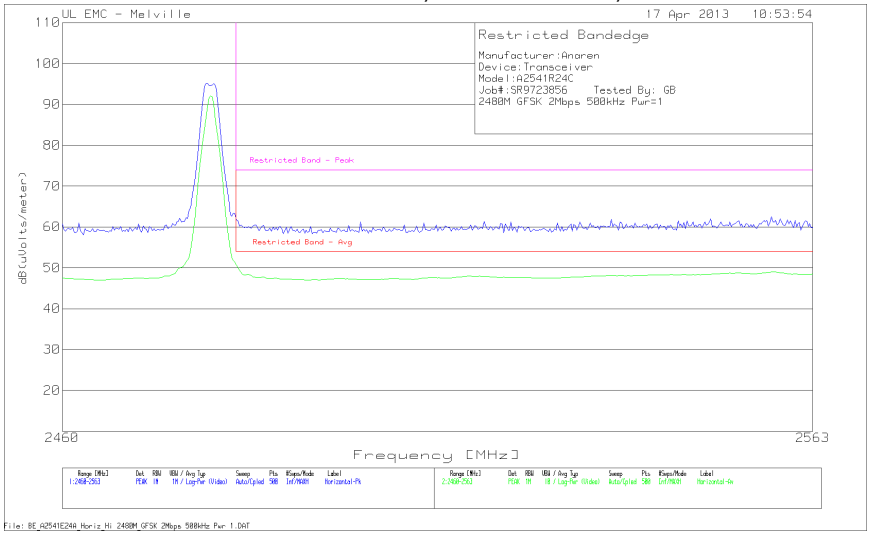


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

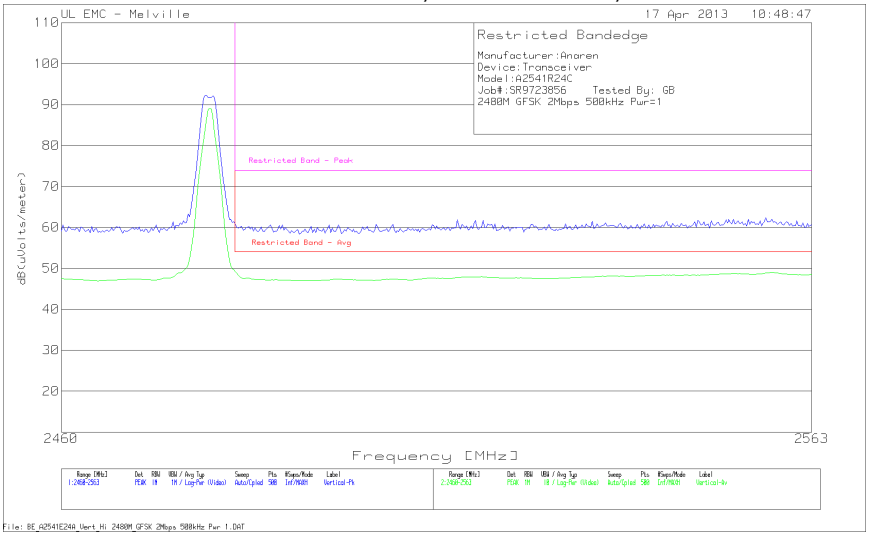


RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ



HIGH CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transciever
Model:A2541R24C
Job#:SR9723856 Tested By: GB
GFSK 2Mbps 500kHz Pwr=1

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.0902	67.24	PK	27.1	-53.3	41.04	-	-	74	-32.96	245	157	Vert
4804	68.76	PK	27.1	-53.31	42.55	-	-	74	-31.45	332	396	Horz
4804.0902	61.51	LnAv	27.1	-53.3	35.31	54	-18.69	-	-	245	157	Vert
4804.0902	66.18	LnAv	27.1	-53.3	39.98	54	-14.02	-	-	247	250	Horz

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880.0501	67.55	PK	27.2	-53.28	41.47	-	-	74	-32.53	238	272	Vert
4880.0501	70.96	PK	27.2	-53.28	44.88	-	-	74	-29.12	238	249	Horz
4880.0501	61.64	LnAv	27.2	-53.28	35.56	54	-18.44	-	-	238	272	Vert
4880.0501	67.1	LnAv	27.2	-53.28	41.02	54	-12.98	-	-	238	249	Horz

High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4960	66.23	PK	27.3	-53.13	40.4	-	-	74	-33.6	272	373	Vert
4960	70.52	PK	27.3	-53.13	44.69	-	-	74	-29.31	245	275	Horz
4960	61.15	LnAv	27.3	-53.13	35.32	54	-18.68	-	-	272	373	Vert
4960	66.25	LnAv	27.3	-53.13	40.42	54	-13.58	-	-	245	275	Horz

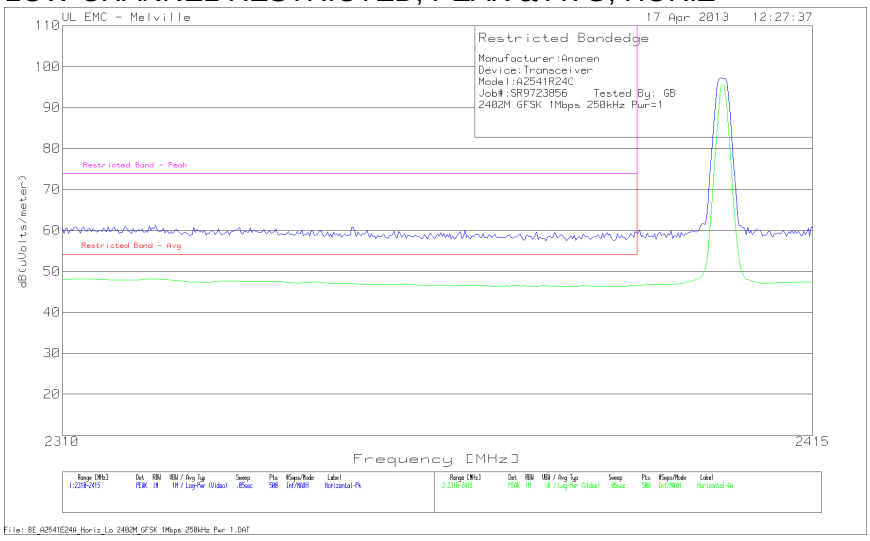
PK - Peak detector
LnAv - Linear Average detector

NOTE: No other emissions detected above the system noise floor

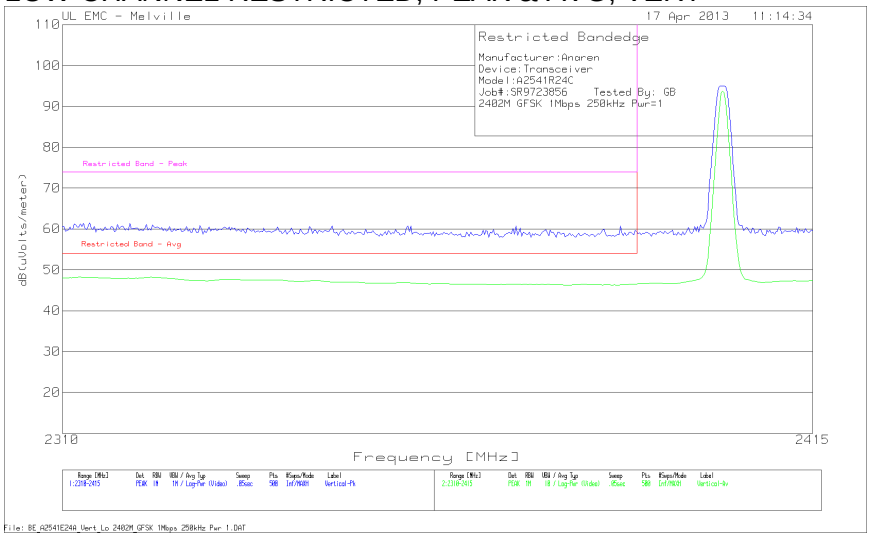
8.3.2. TX ABOVE 1 GHz FOR GFSK 1Mbps 250kHz MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

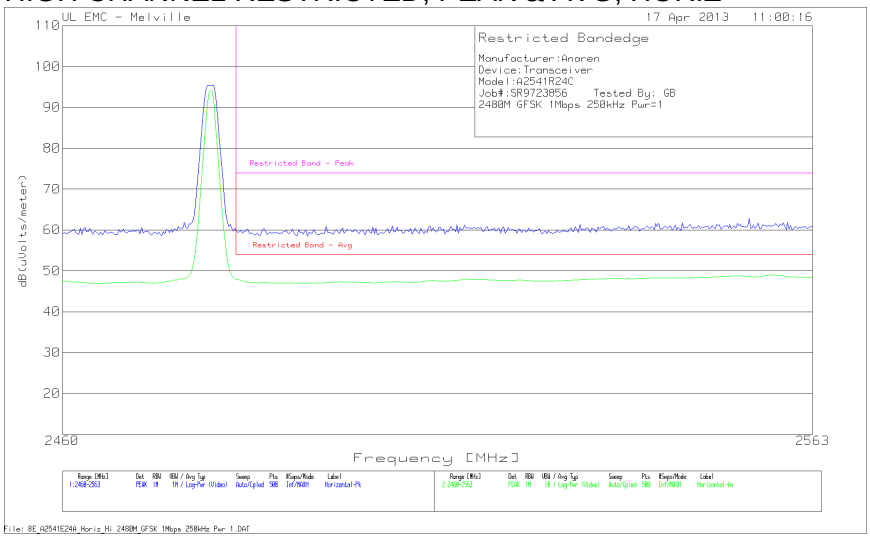


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

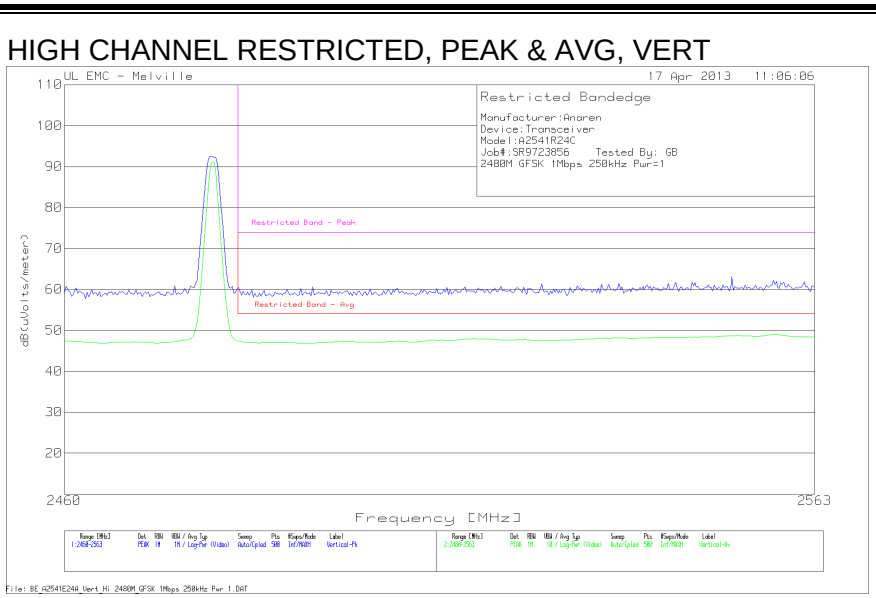


RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ



HIGH CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transciever
Model:A2541R24C
Job#:SR9723856 Tested By: GB
GFSK 1Mbps 250kHz Pwr=1

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804	70.45	PK	27.1	-53.31	44.24	-	-	74	-29.76	244	292	Horz
4804	69.64	PK	27.1	-53.31	43.43	-	-	74	-30.57	346	367	Vert
4804	65.41	LnAv	27.1	-53.31	39.2	54	-14.8	-	-	244	292	Horz
4804	64.63	LnAv	27.1	-53.31	38.42	54	-15.58	-	-	346	367	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880	66.43	PK	27.2	-53.28	40.35	-	-	74	-33.65	187	143	Vert
4880	70.76	PK	27.2	-53.28	44.68	-	-	74	-29.32	242	249	Horz
4880	58.96	LnAv	27.2	-53.28	32.88	54	-21.12	-	-	187	143	Vert
4880	66.65	LnAv	27.2	-53.28	40.57	54	-13.43	-	-	242	249	Horz

High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4960.0501	69.13	PK	27.3	-53.12	43.31	-	-	74	-30.69	346	390	Vert
4960.0501	70.87	PK	27.3	-53.12	45.05	-	-	74	-28.95	235	332	Horz
4960.0501	64.14	LnAv	27.3	-53.12	38.32	54	-15.68	-	-	346	390	Vert
4960.0501	67.13	LnAv	27.3	-53.12	41.31	54	-12.69	-	-	235	332	Horz

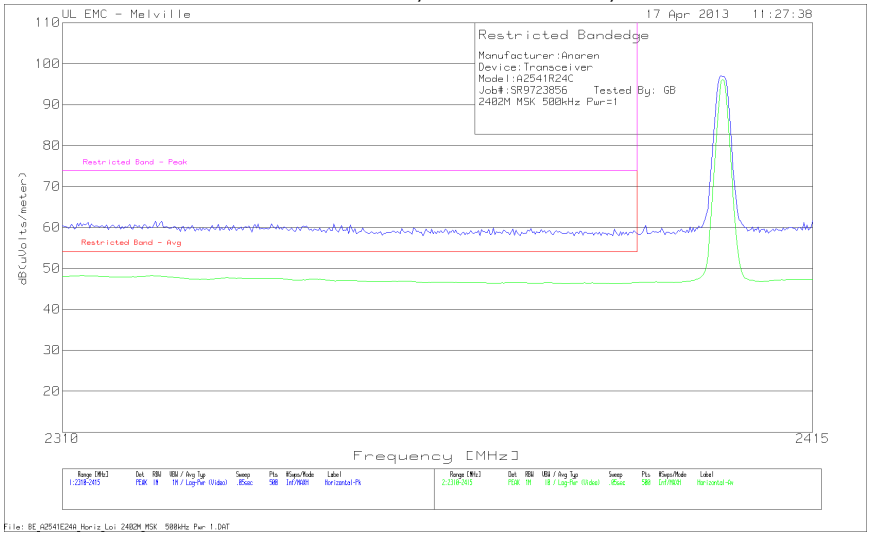
PK - Peak detector
LnAv - Linear Average detector

NOTE: No other emissions detected above the system noise floor

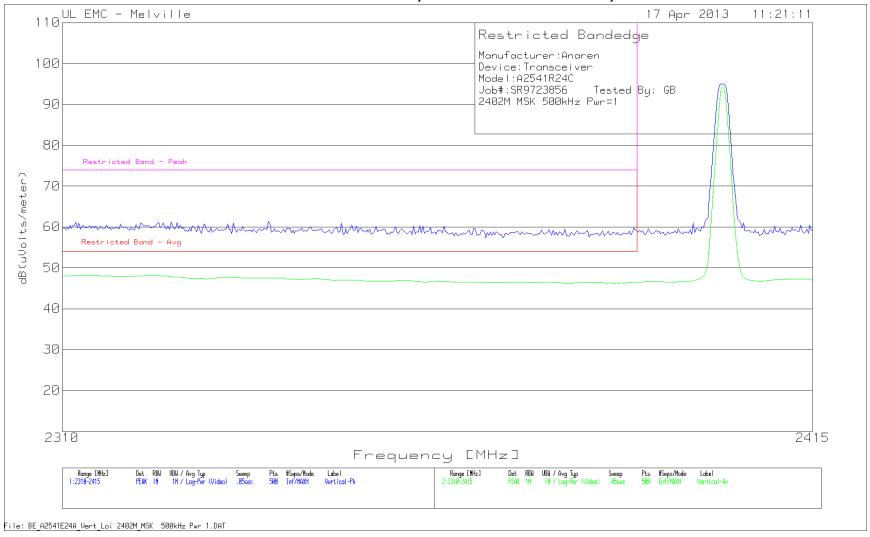
8.3.3. TX ABOVE 1 GHz FOR MSK 500kbps MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

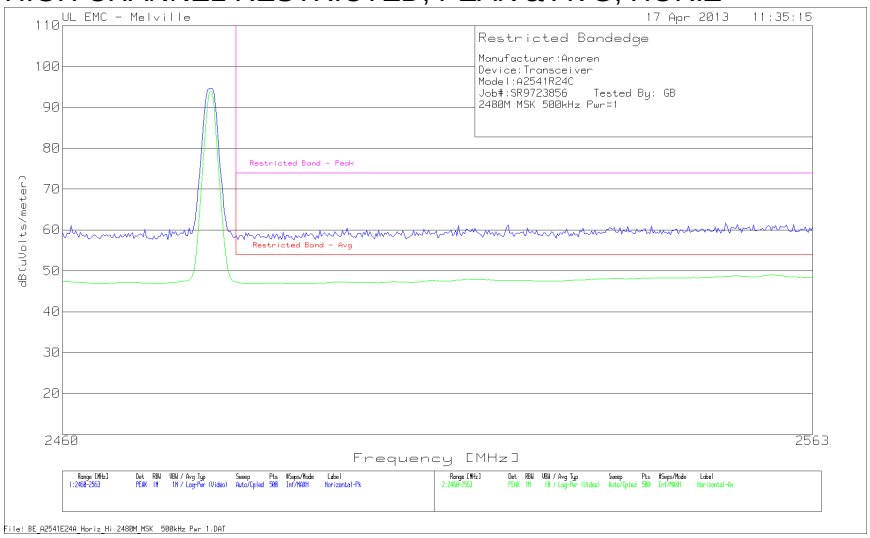


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

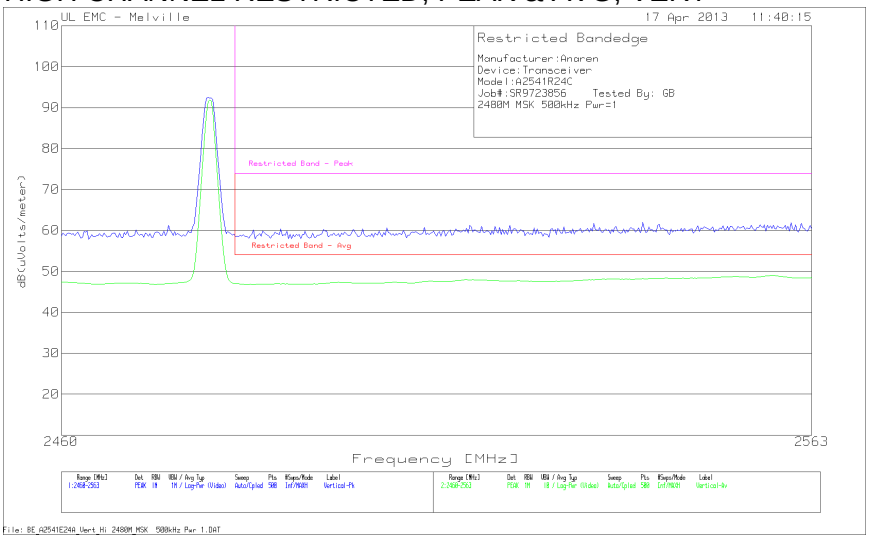


RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ



HIGH CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transciever
Model:A2541R24C
Job#:SR9723856 Tested By: GB
MSK 500kbps Pwr=1

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4803.99	70.76	PK	27.1	-53.31	44.55	-	-	74	-29.45	213	331	Horz
4803.99	69.53	PK	27.1	-53.31	43.32	-	-	74	-30.68	335	363	Vert
4803.99	66.56	LnAv	27.1	-53.31	40.35	54	-13.65	-	-	213	331	Horz
4803.99	64.5	LnAv	27.1	-53.31	38.29	54	-15.71	-	-	335	363	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880	67.33	PK	27.2	-53.28	41.25	-	-	74	-32.75	227	140	Vert
4880	70.91	PK	27.2	-53.28	44.83	-	-	74	-29.17	241	248	Horz
4880	61.27	LnAv	27.2	-53.28	35.19	54	-18.81	-	-	227	140	Vert
4880	66.55	LnAv	27.2	-53.28	40.47	54	-13.53	-	-	241	248	Horz

High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4960	65.65	PK	27.3	-53.13	39.82	-	-	74	-34.18	147	308	Horz
4960	72.12	PK	27.3	-53.13	46.29	-	-	74	-27.71	295	379	Vert
4960	57.25	LnAv	27.3	-53.13	31.42	54	-22.58	-	-	147	308	Horz
4960	64.11	LnAv	27.3	-53.13	38.28	54	-15.72	-	-	348	390	Vert

PK - Peak detector
LnAv - Linear Average detector

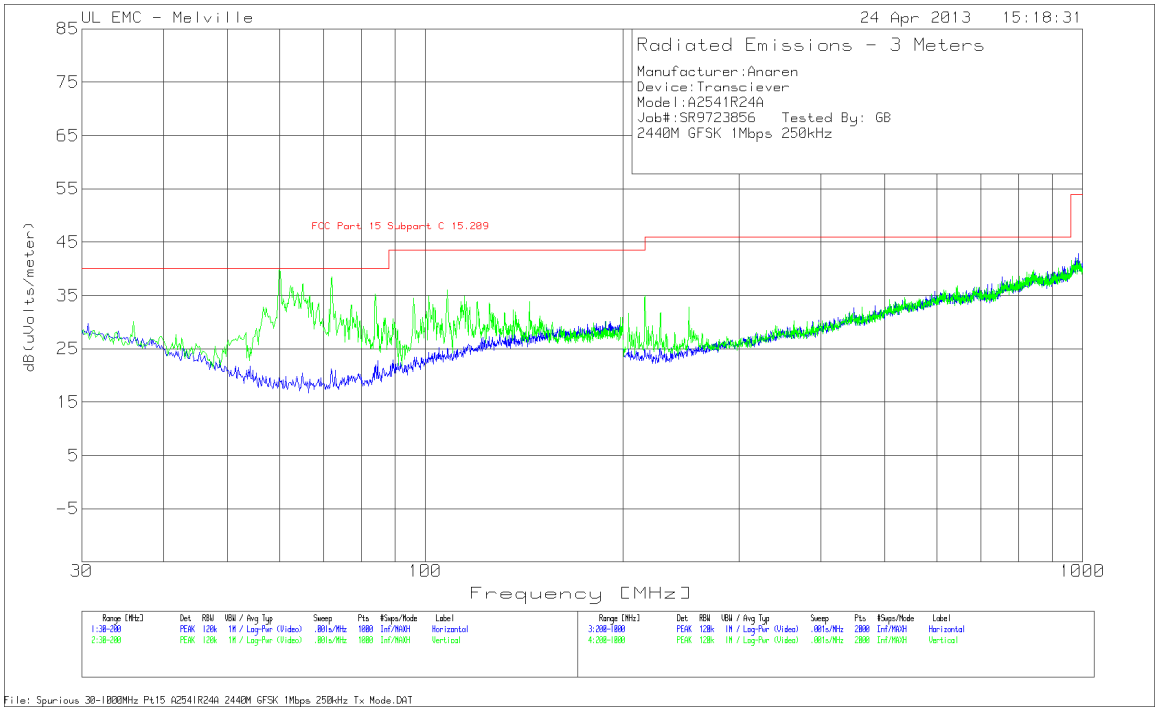
NOTE: No other emissions detected above the system noise floor

8.4. WORST-CASE BELOW 1 GHz

8.4.1. WORST-CASE BELOW 1 GHz – MODEL: A2541R24A

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL & VERTICAL PLOT



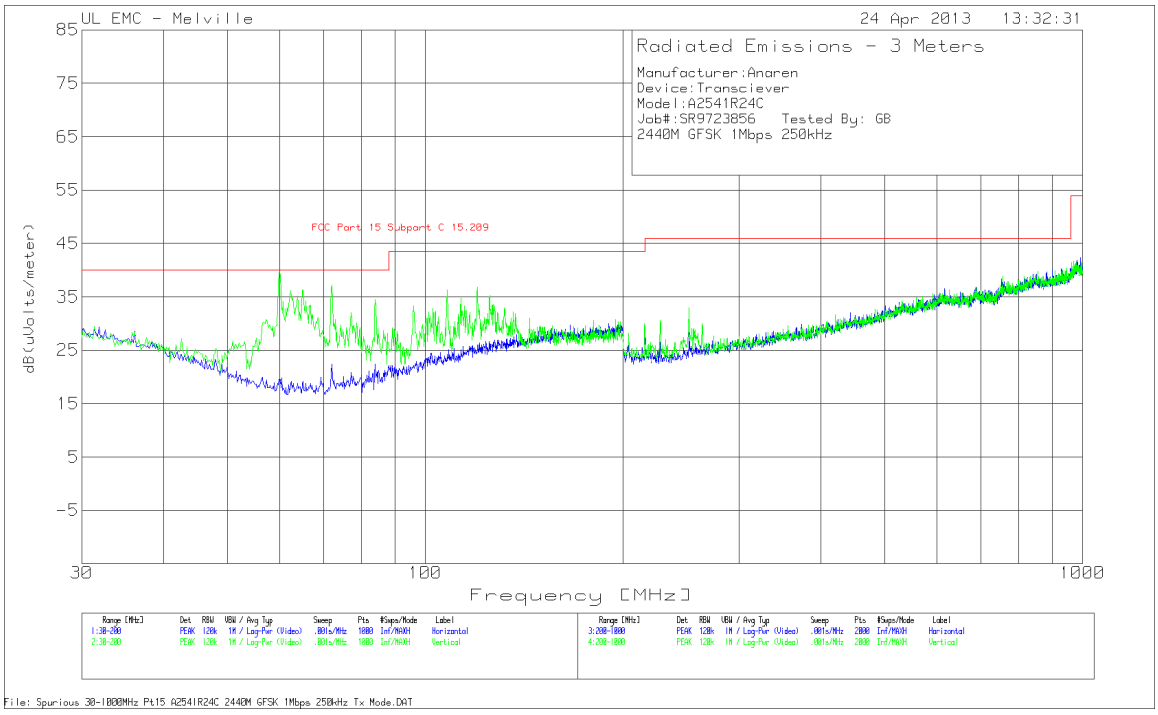
HORIZONTAL & VERTICAL DATA

Manufacturer:Anaren										
Device:Transciever										
Model:A2541R24A										
Job#:SR9723856 Tested By: GB										
2440M GFSK 1Mbps 250kHz										
Vertical 30 - 200MHz										
Test Frequency	Meter Reading	Detector	AF-43441 [dB/m]	GL-3M [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
59.995	32.79	QP	6.5	0.1	39.39	40	-0.61	178	119	Vert
62.8797	28.54	QP	6	0.3	34.84	40	-5.16	84	104	Vert
65.205	29.45	QP	5.8	0.2	35.45	40	-4.55	253	108	Vert
72.015	29.94	QP	6.3	0.4	36.64	40	-3.36	69	115	Vert
84.0251	24.64	QP	8.4	0.3	33.34	40	-6.66	36	101	Vert
108.015	21.96	QP	11.8	0.4	34.16	43.5	-9.34	292	108	Vert
QP - Quasi-Peak detector										

8.4.2. WORST-CASE BELOW 1 GHz – MODEL: A2541R24C

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL & VERTICAL PLOT



HORIZONTAL & VERTICAL DATA

Manufacturer:Anaren
Device:Transciever
Model:A2541R24A
Job#:SR9723856 Tested By: GB
2440M GFSK 1Mbps 250kHz

Vertical 30 - 200MHz

Test Frequency	Meter Reading	Detector	AF-43441 [dB/m]	GL-3M [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
59.99	31.06	QP	6.5	0.1	37.66	40	-2.34	184	102	Vert
62.4177	27.28	QP	6.1	0.3	33.68	40	-6.32	41	112	Vert
65.1649	28.46	QP	5.8	0.2	34.46	40	-5.54	259	101	Vert
72.005	29.36	QP	6.3	0.4	36.06	40	-3.94	5	136	Vert
107.9975	21.68	QP	11.8	0.4	33.88	43.5	-9.62	19	105	Vert
119.995	18.95	QP	13.1	0.4	32.45	43.5	-11.05	26	132	Vert

QP - Quasi-Peak detector

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

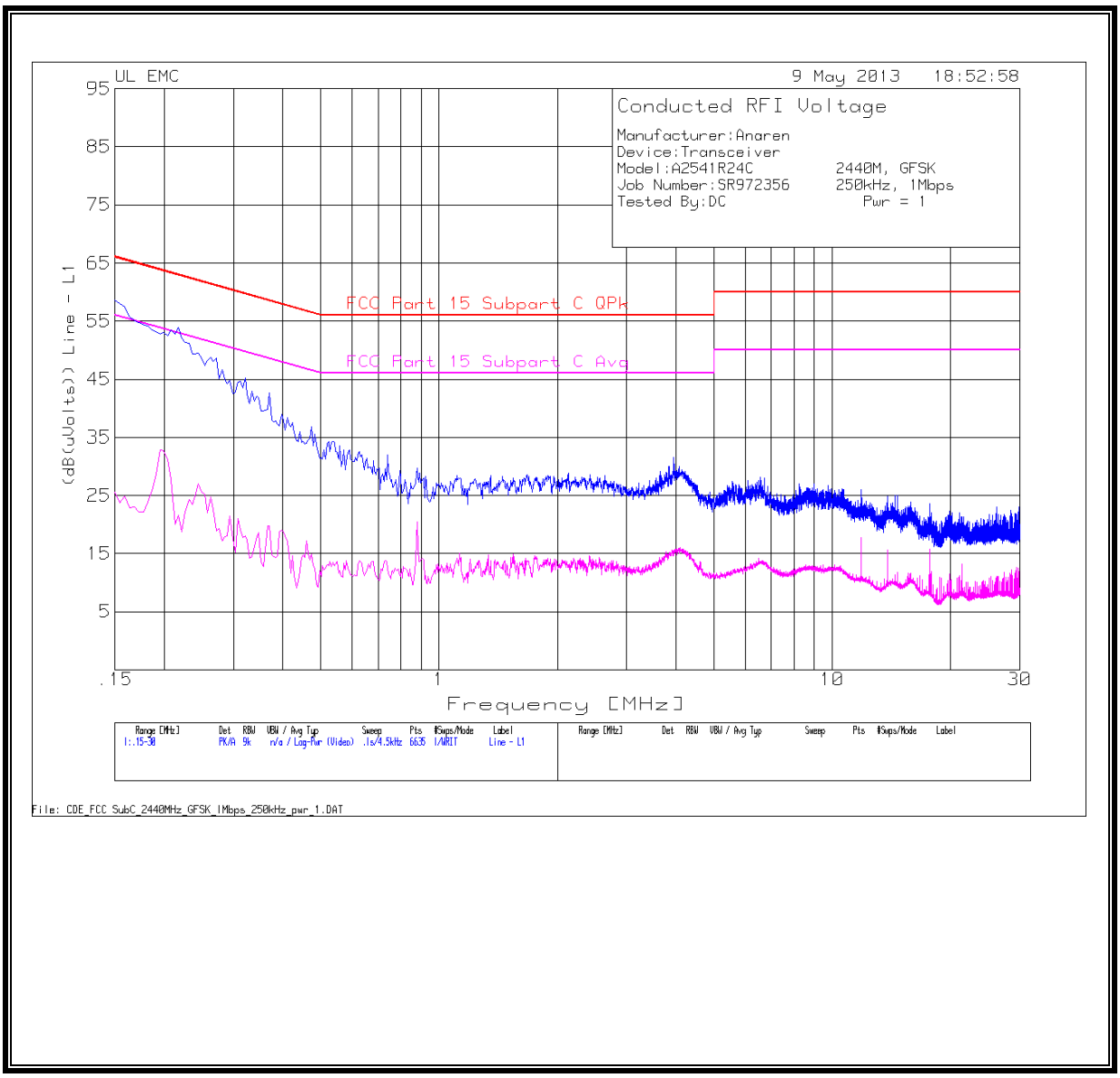
ANSI C63.4

RESULTS

6 WORST EMISSIONS

Manufacturer:Anaren							
Device:Transceiver							
Model:A2541R24C 2440M, GFSK							
Job Number:SR972356 250kHz, 1Mbps							
Tested By:DC Pwr = 1							
Line - L1 .15 - 30MHz							
Test Frequency [MHz]	Meter Reading [dBuV]	Detector	5A636 L1 [dB]	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin (dB)	FCC Part 15 Subpart C Avg	Margin (dB)
0.159	47.42	PK	10	57.42	65.52	-8.1	-	-
0.2175	43.83	PK	10	53.83	62.91	-9.08	-	-
0.2625	38.78	PK	10	48.78	61.35	-12.57	-	-
0.321	35.21	PK	10	45.21	59.68	-14.47	-	-
3.9525	21.37	PK	10.2	31.57	56	-24.43	-	-
8.25	16.67	PK	10.4	27.07	60	-32.93	-	-
0.159	14.94	Av	10	24.94	65.52	-40.58	55.52	-30.58
0.2175	11.56	Av	10	21.56	62.91	-41.35	52.91	-31.35
0.2625	14.68	Av	10	24.68	61.35	-36.67	51.35	-26.67
0.321	8.08	Av	10	18.08	59.68	-41.6	49.68	-31.6
3.9525	5.07	Av	10.2	15.27	56	-40.73	46	-30.73
8.25	2.11	Av	10.4	12.51	60	-47.49	50	-37.49
Neutral .15 - 30MHz								
Test Frequency [MHz]	Meter Reading [dBuV]	Detector	5A636 L4Neut [dB]	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin (dB)	FCC Part 15 Subpart C Avg	Margin (dB)
0.1545	50.24	PK	10.1	60.34	65.75	-5.41	-	-
0.177	43.84	PK	10	53.84	64.63	-10.79	-	-
0.2175	40.8	PK	10	50.8	62.91	-12.11	-	-
4.047	17	PK	10.2	27.2	56	-28.8	-	-
5.568	18.53	PK	10.3	28.83	60	-31.17	-	-
14.316	15.39	PK	10.9	26.29	60	-33.71	-	-
0.15	38.41	QP	10.1	48.51	66	-17.49	56	-7.49
0.1545	24.14	Av	10.1	34.24	65.75	-31.51	55.75	-21.51
0.177	10.73	Av	10	20.73	64.63	-43.9	54.63	-33.9
0.2175	18.6	Av	10	28.6	62.91	-34.31	52.91	-24.31
4.047	2.8	Av	10.2	13	56	-43	46	-33
5.568	1.17	Av	10.3	11.47	60	-48.53	50	-38.53
14.316	4.06	Av	10.9	14.96	60	-45.04	50	-35.04
PK - Peak detector								
QP - Quasi-Peak detector								
Av - Average detector								

LINE 1 RESULTS



LINE 2 RESULTS