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

CERTIFICATION TEST REPORT

FOR

2400-2483.5MHZ TRANSCEIVER

MODEL NUMBER: A2541E24A & A2541E24C

FCC ID: X7J-A13022601
IC: 8975A-A13022601

REPORT NUMBER: SR9723856A

ISSUE DATE: 2013-07-04

Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	6/12/13	Initial Issue	M. Antola
A	7/04/13	Added section for Duty Cycle	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: A2541E24A & A2541E24C

SERIAL NUMBER: 203 & 204

DATE TESTED: 2013-04-16 to 2013-06-11

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:

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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 A2541E24A and A2541E24C. Models are identical except A2541E24A has an integral printed antenna and A2541E24C has a U.FL connector.

5.2. MAXIMUM OUTPUT POWER

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

Model: A2541E24A				
Frequency Range (MHz)	Mode	PA_Table Value (Hex)	Output Power (dBm)	Output Power (mW)
2402 - 2480	GFSK 2Mbps 500kHz	0xCF	7.96	6.25
2402 - 2480	GFSK 2Mbps 320kHz	0xCF	7.93	6.21
2402 - 2480	GFSK 1Mbps 250kHz	0xCF	7.95	6.24
2402 - 2480	GFSK 1Mbps 160kHz	0xCF	7.99	6.30
Model: A2541E24C				
Frequency Range (MHz)	Mode	PA_Table Value (Hex)	Output Power (dBm)	Output Power (mW)
2402 - 2480	GFSK 2Mbps 500kHz	0xC6	7.46	5.57
2402 - 2480	GFSK 2Mbps 320kHz	0xC6	7.39	5.48
2402 - 2480	GFSK 1Mbps 250kHz	0xC6	7.15	5.19
2402 - 2480	GFSK 1Mbps 160kHz	0xC6	7.23	5.28

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio of model A2541E24A utilizes an integral PCB antenna, with a maximum gain of 2 dBi.

The radio of model A2541E24C 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

Conducted antenna port and power line conducted emission tests were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. Radiated emissions tests were performed at the highest output power setting per model (i.e. A2541E24A set to PA_Table value 0xCF, A2541E24C set to PA_Table value 0xC6).

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 A2541E24A; 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 A2541E24C; 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
- GFSK 2Mbps 320kHz
- GFSK 1Mbps 160kHz

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

- 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

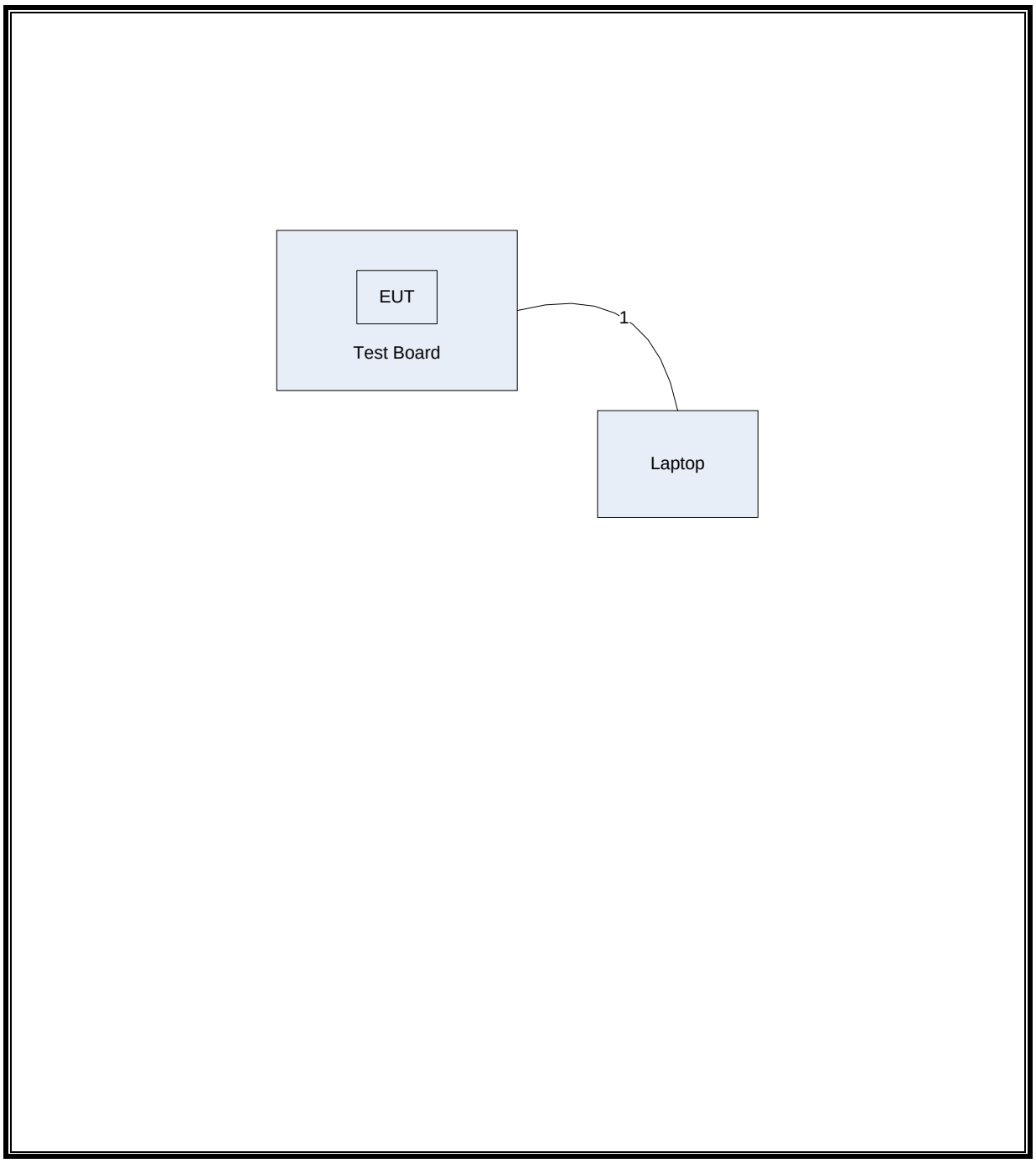
I/O CABLES

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	2013-06-30
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. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

RESULTS

The EUT operates at 100% duty cycle

8. ANTENNA PORT TEST RESULTS

8.1. GFSK 1Mbps 250kHz MODE

8.1.1. 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.

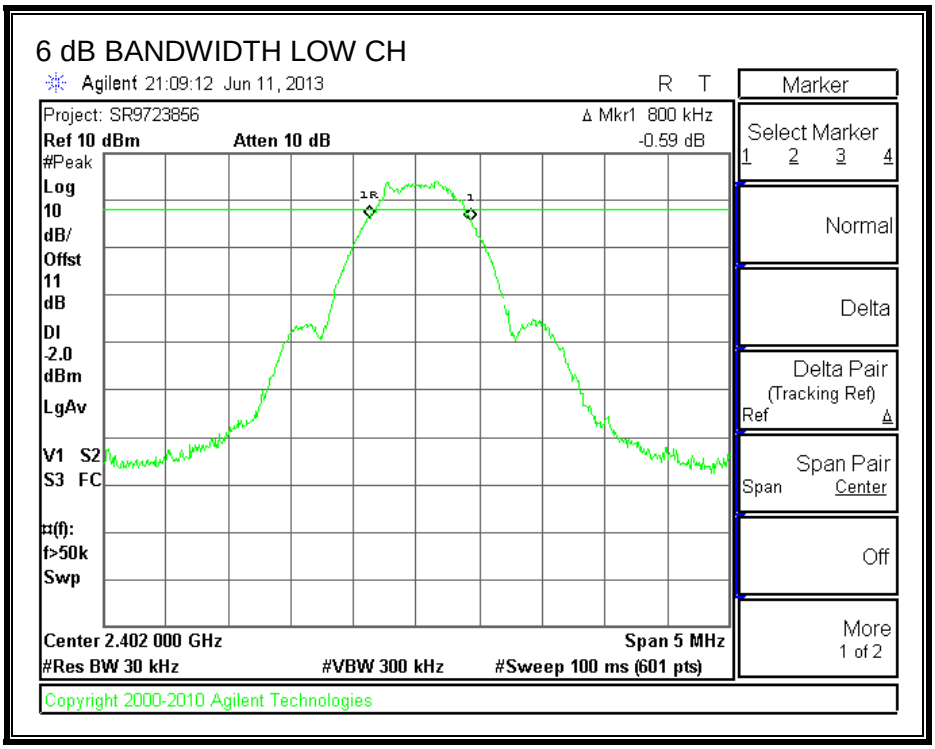
TEST PROCEDURE

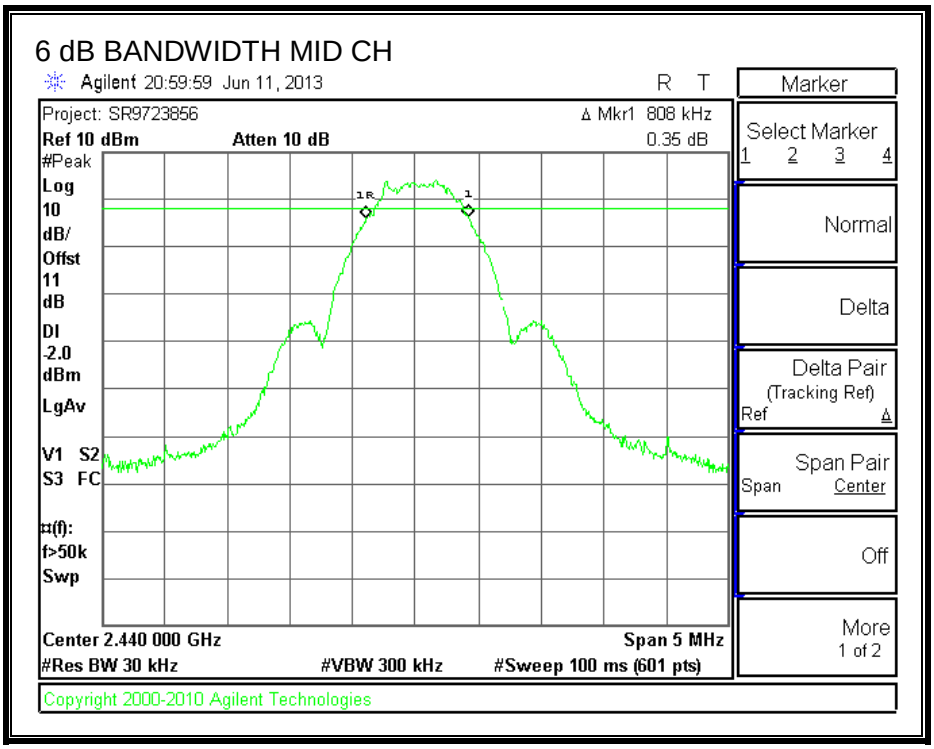
The transmitter output is connected to a spectrum analyzer. The RBW is set to 1-5% the EBW and the VBW is set to 3 times the RBW. The sweep time is coupled.

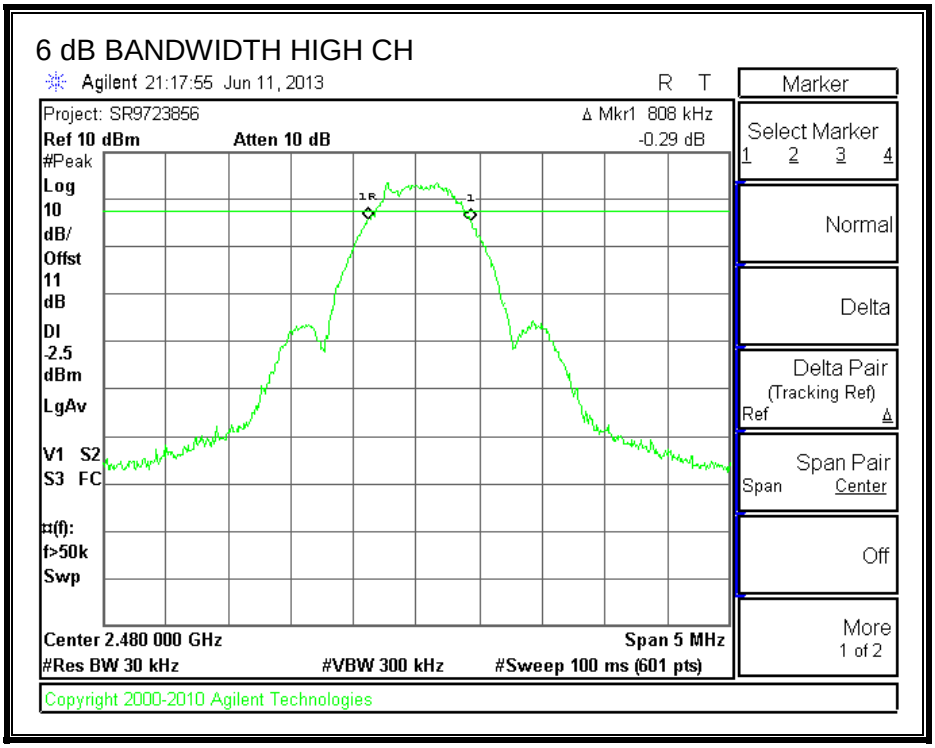
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.8000	0.5
Middle	2440	0.8080	0.5
High	2480	0.8080	0.5

6 dB BANDWIDTH







8.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

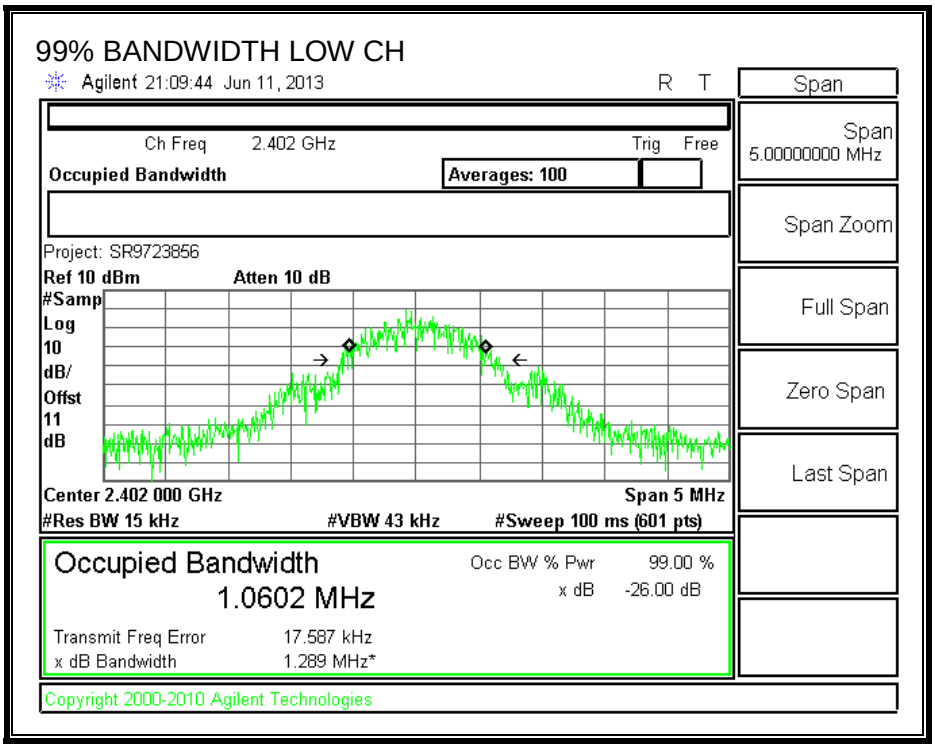
TEST PROCEDURE

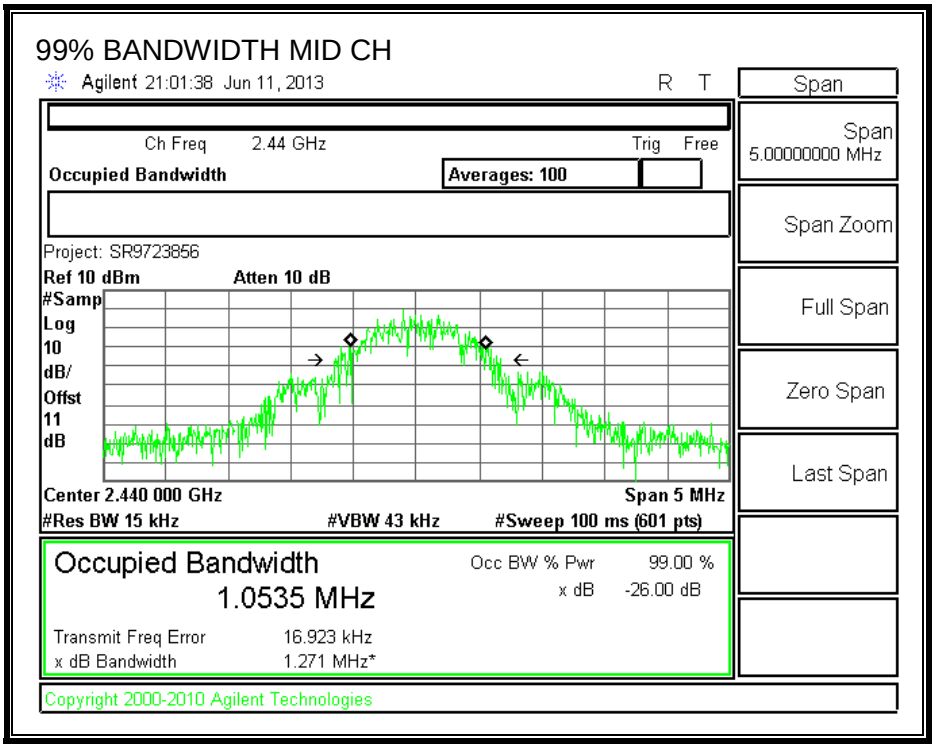
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

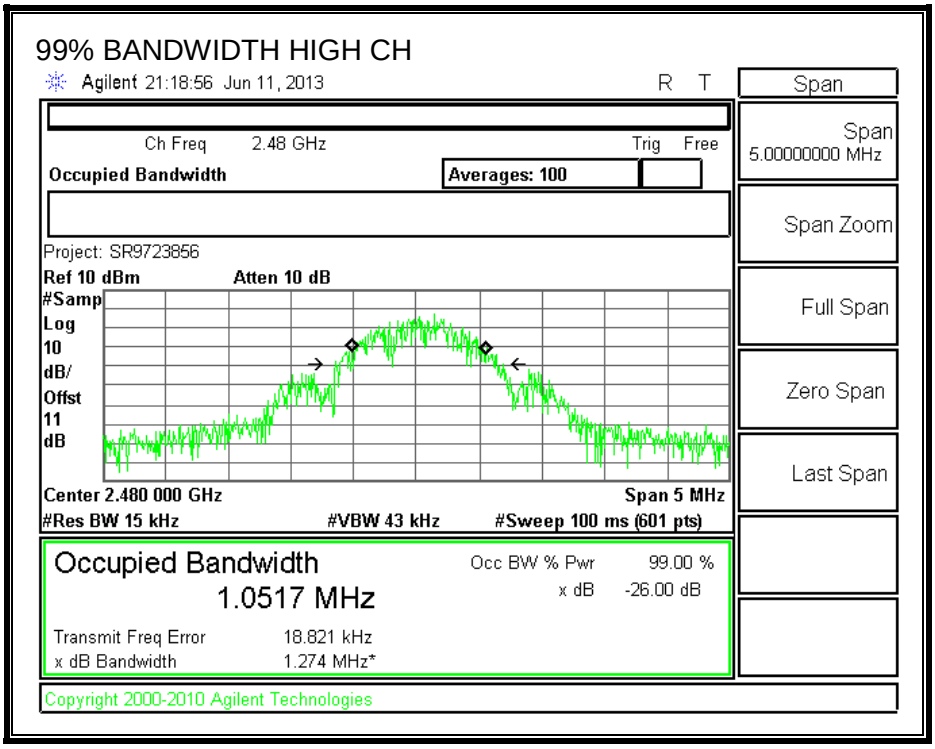
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0602
Middle	2440	1.0535
High	2480	1.0517

99% BANDWIDTH







8.1.3. 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

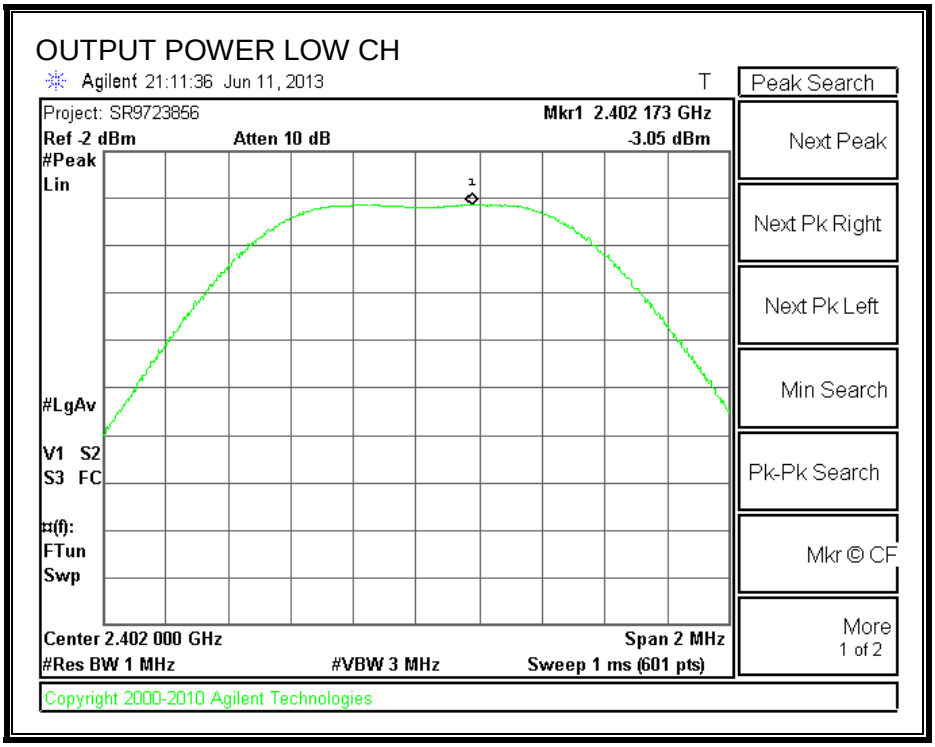
Peak power is measured using the maximum peak conducted output power procedure per section 9.1.1 specified in "558074 D01 DTS Meas Guidance v03" April 8, 2013.

RESULTS

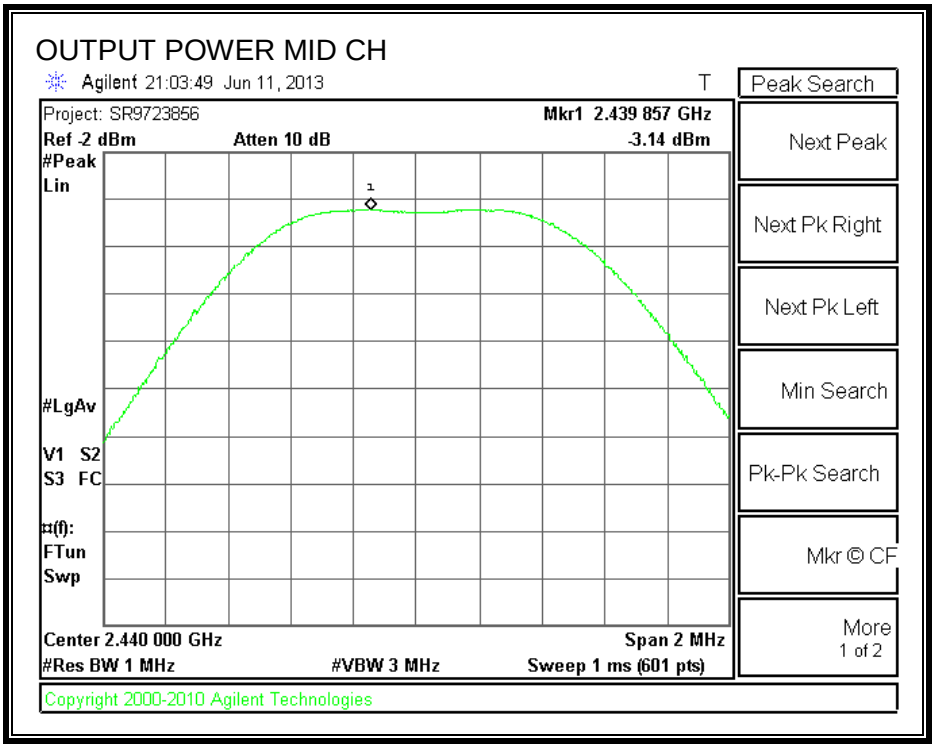
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Offset (dBm)	Total Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-3.05	11.00	7.95	30	-22.050
Middle	2440	-3.14	11.00	7.86	30	-22.140
High	2480	-3.51	11.00	7.49	30	-22.510

OUTPUT POWER

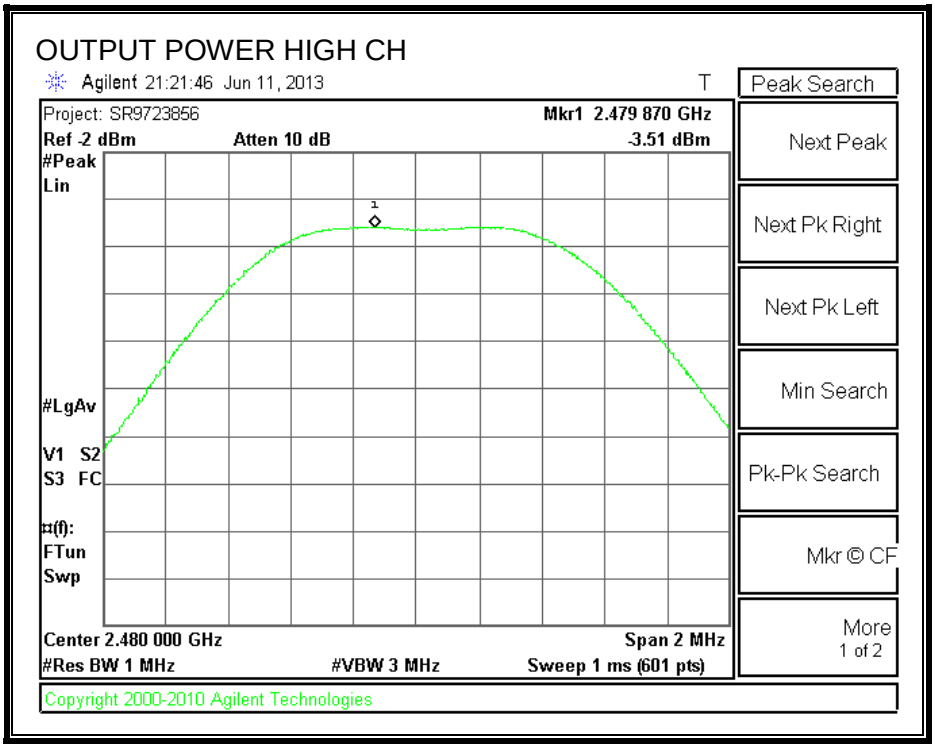
OUTPUT POWER LOW CH



OUTPUT POWER MID CH



OUTPUT POWER HIGH CH



8.1.4. 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 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	7.81
Middle	2440	7.66
High	2480	7.33

8.1.5. 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.

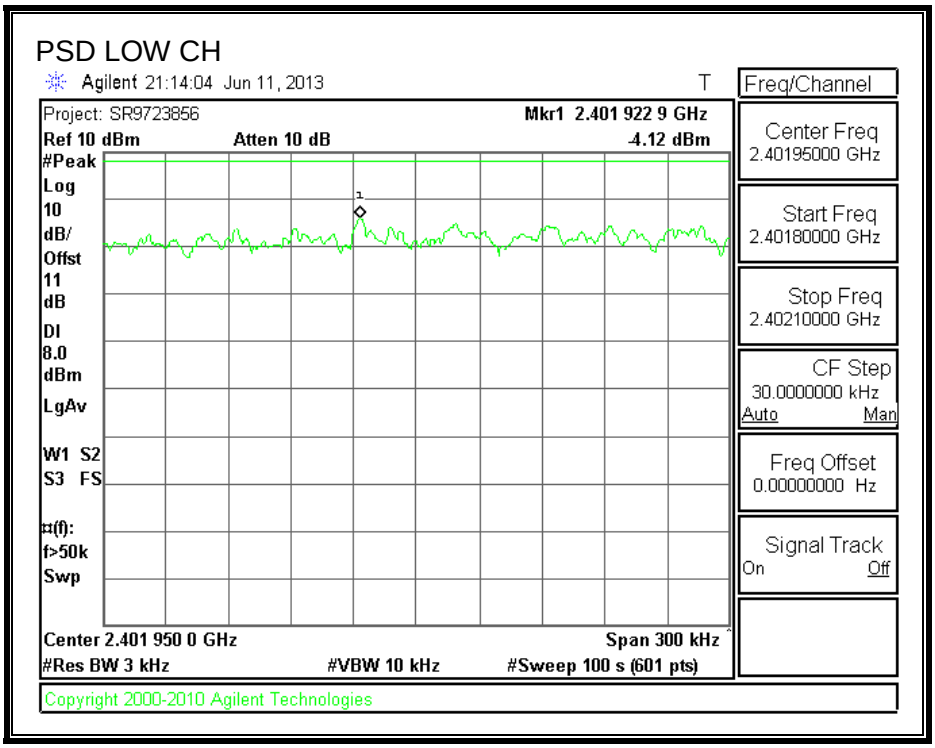
TEST PROCEDURE

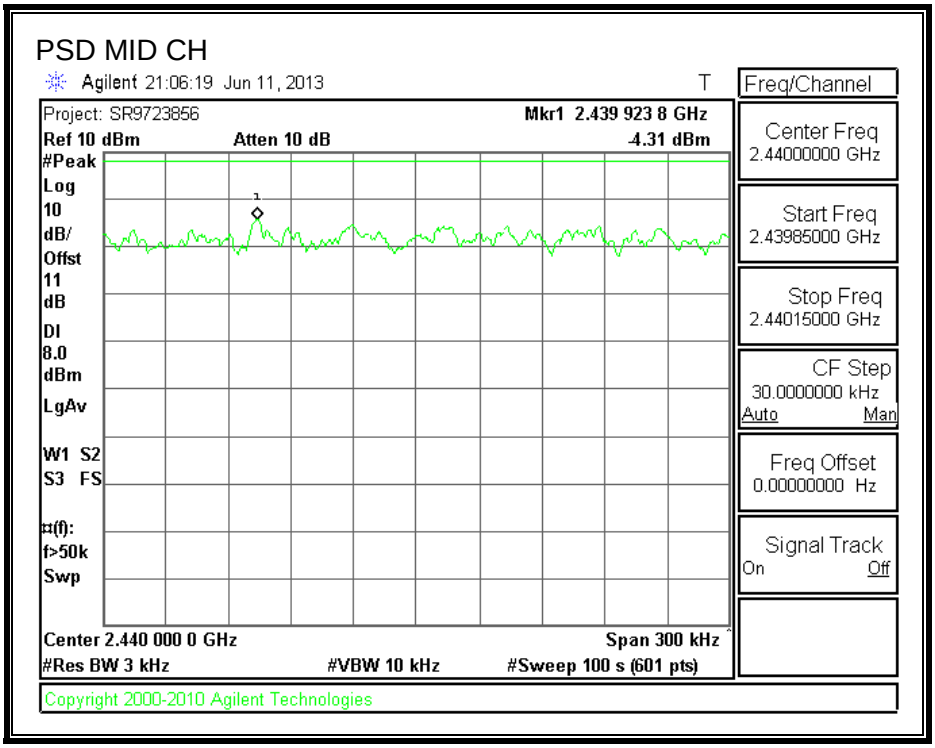
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option per section 10.2 in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, April 8, 2013.

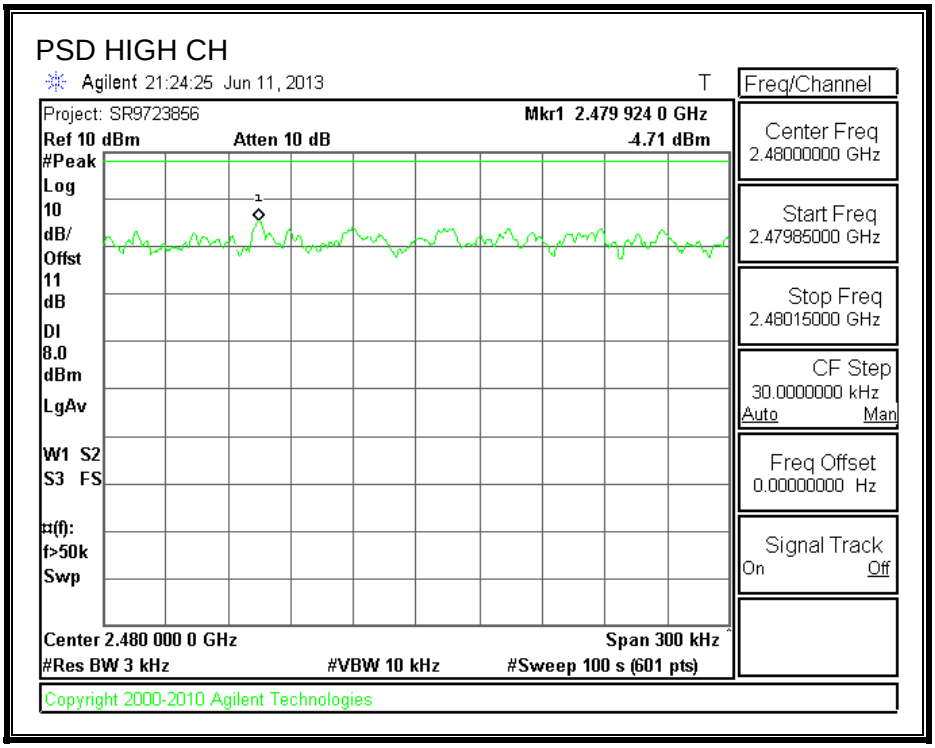
RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-4.12	8	-12.12
Middle	2440	-4.31	8	-12.31
High	2480	-4.71	8	-12.71

POWER SPECTRAL DENSITY







8.1.6. 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.

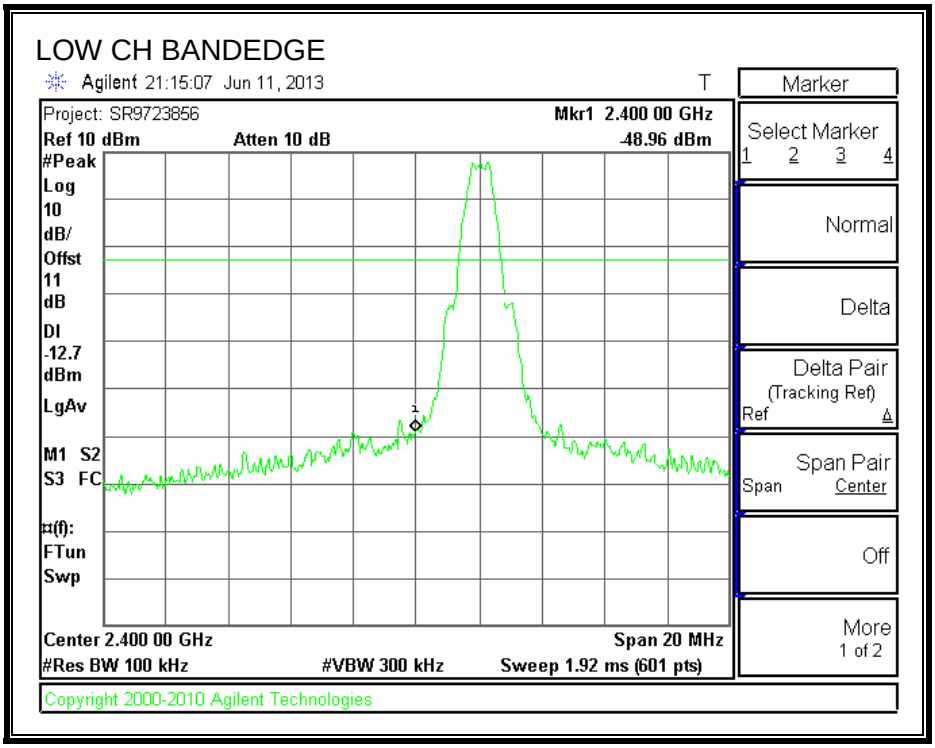
TEST PROCEDURE

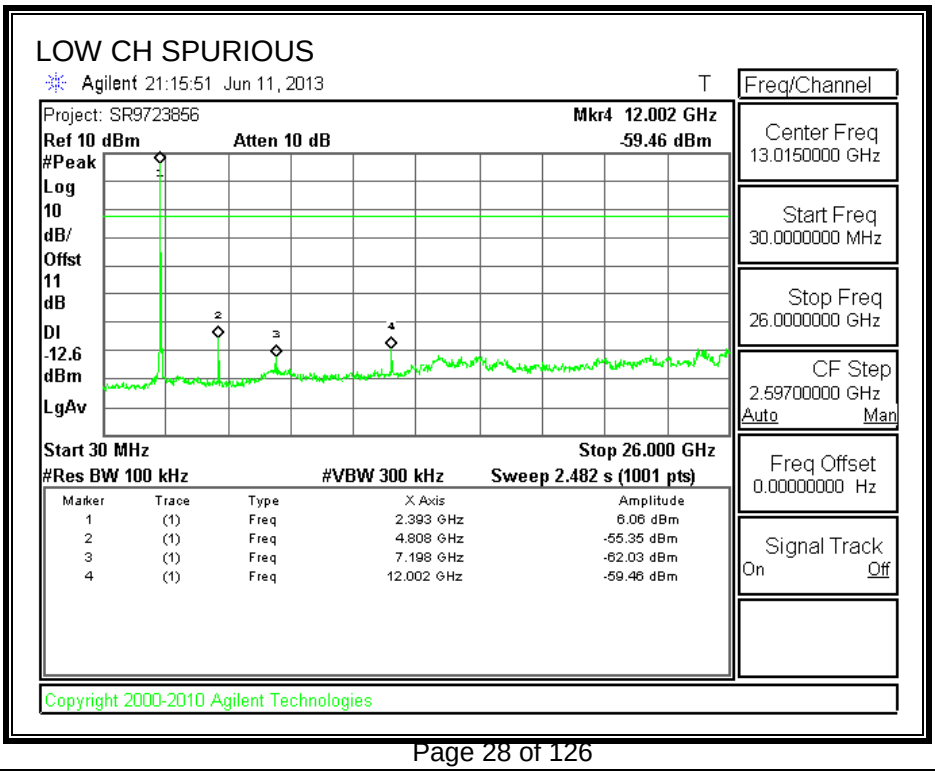
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

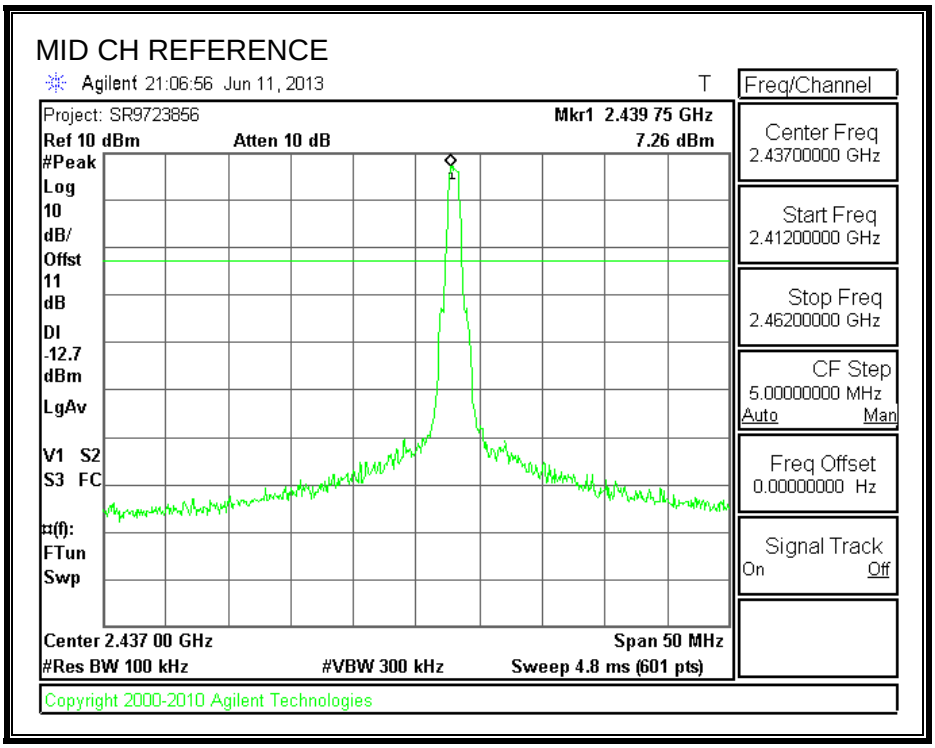
RESULTS

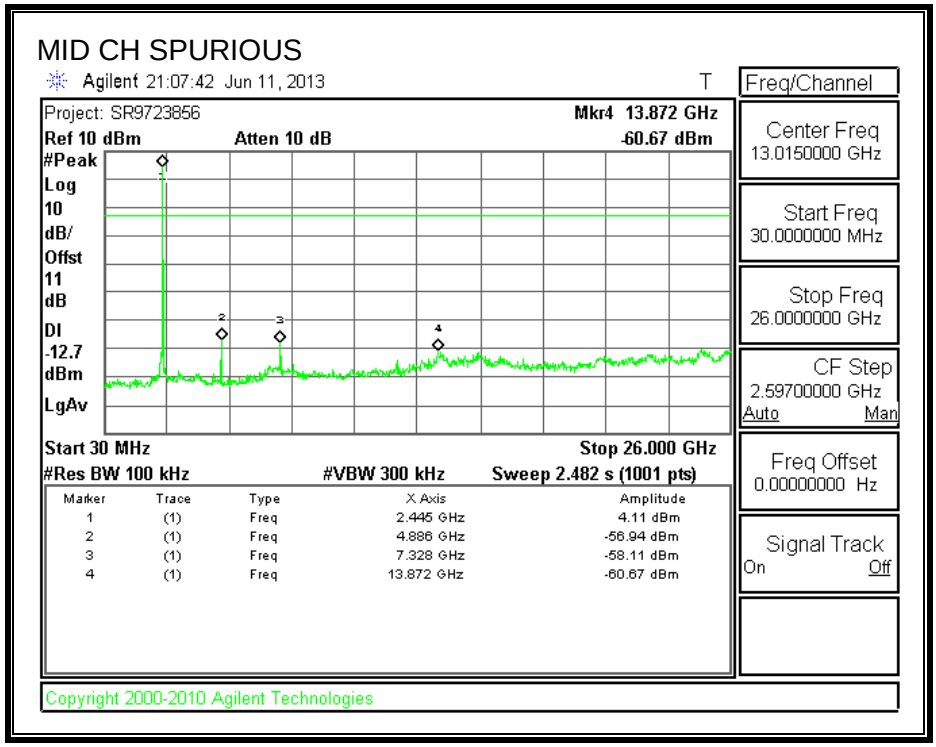
SPURIOUS EMISSIONS, LOW CHANNEL



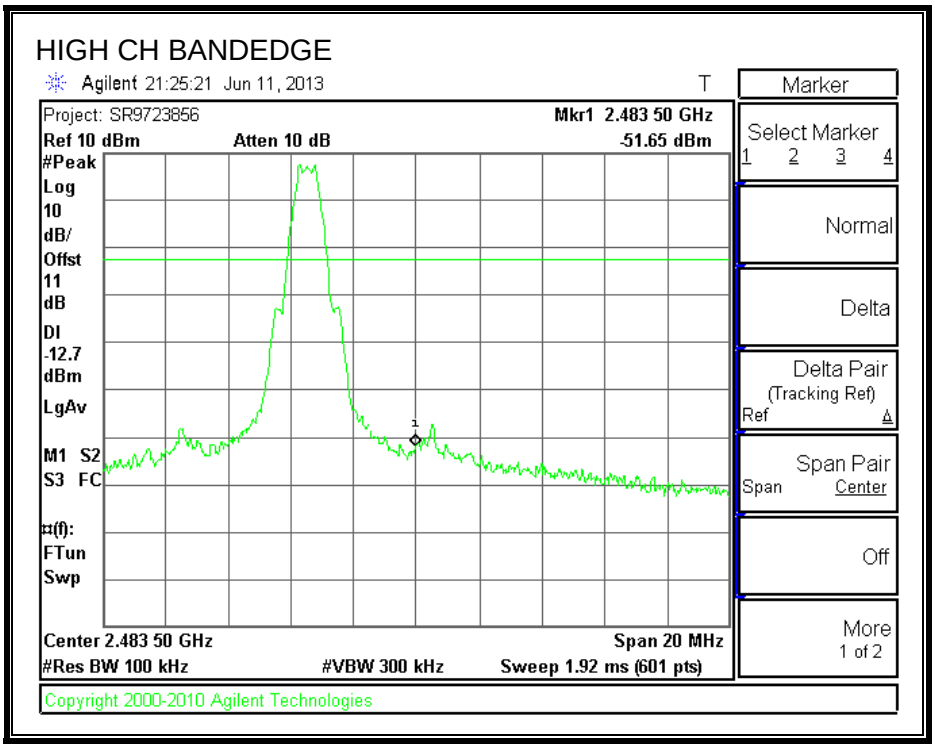


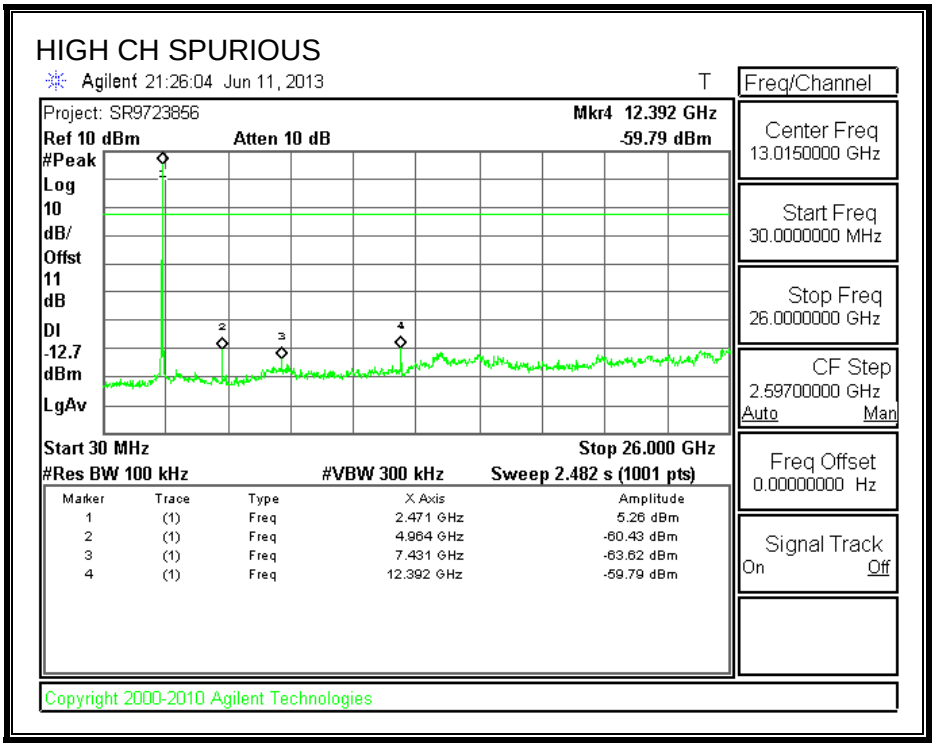
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





8.2. GFSK 1Mbps 160kHz MODE

8.2.1. 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.

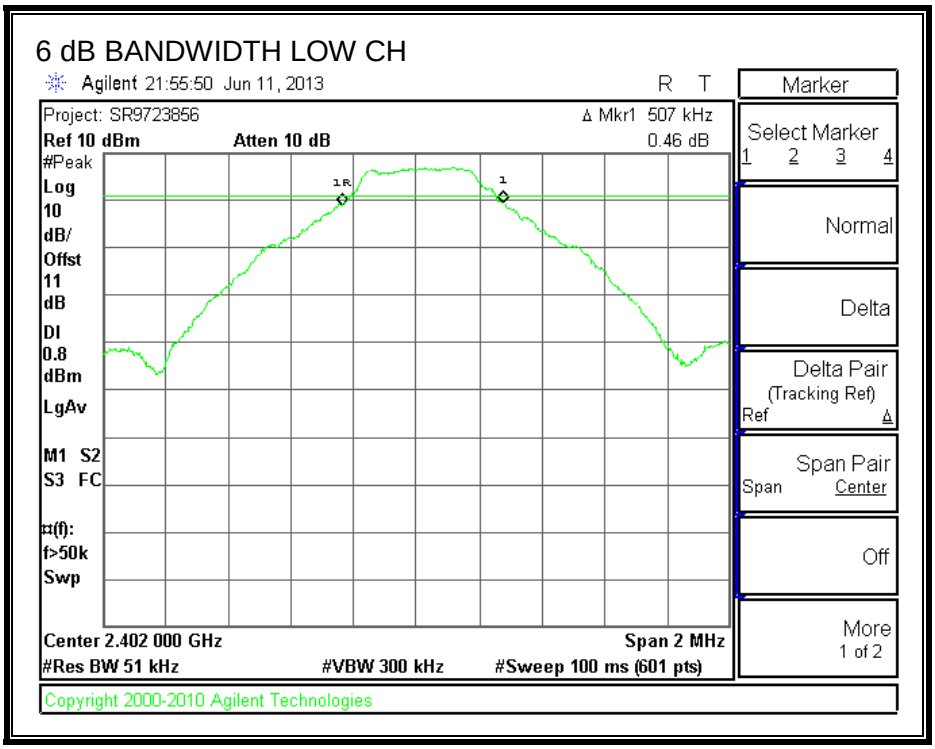
TEST PROCEDURE

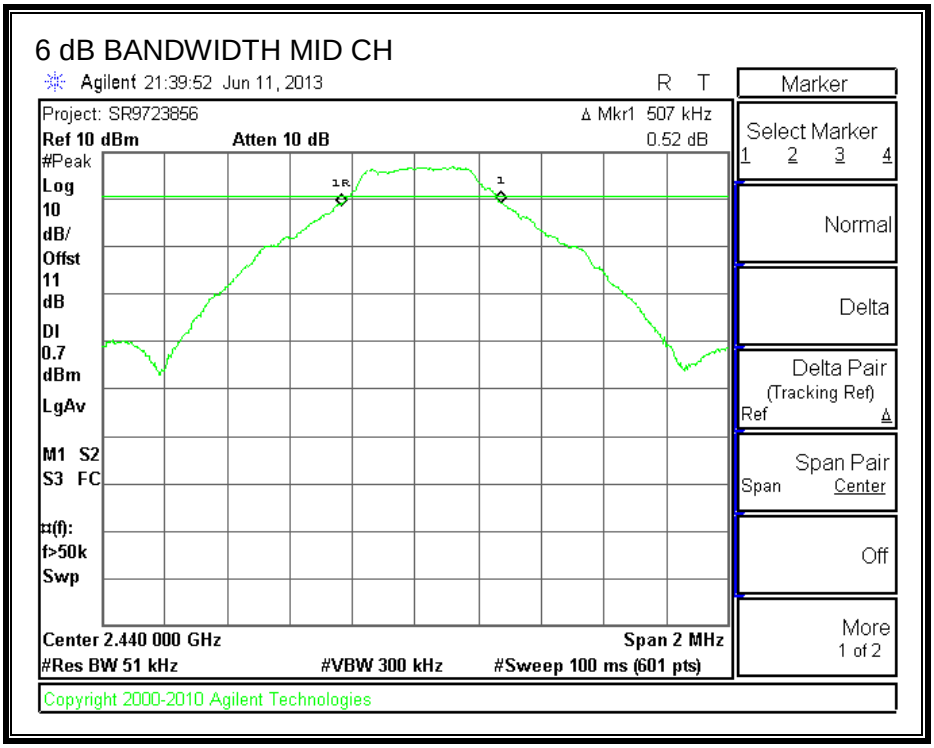
The transmitter output is connected to a spectrum analyzer. The RBW is set to 1-5% of the EBW and the VBW is set to 3 times the RBW. The sweep time is coupled.

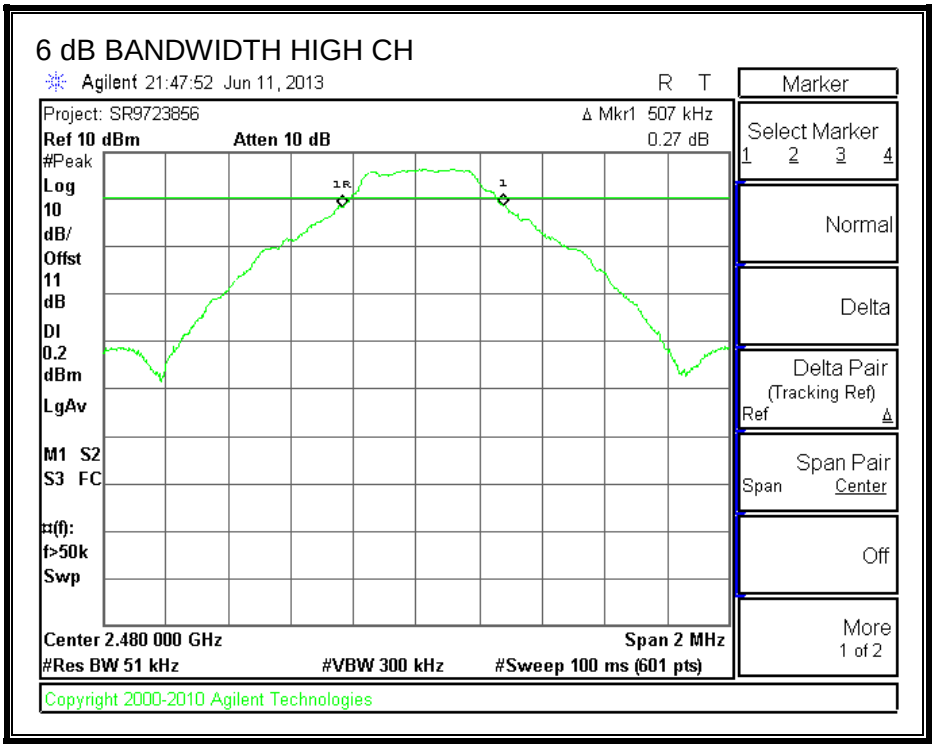
RESULTS

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

6 dB BANDWIDTH







8.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

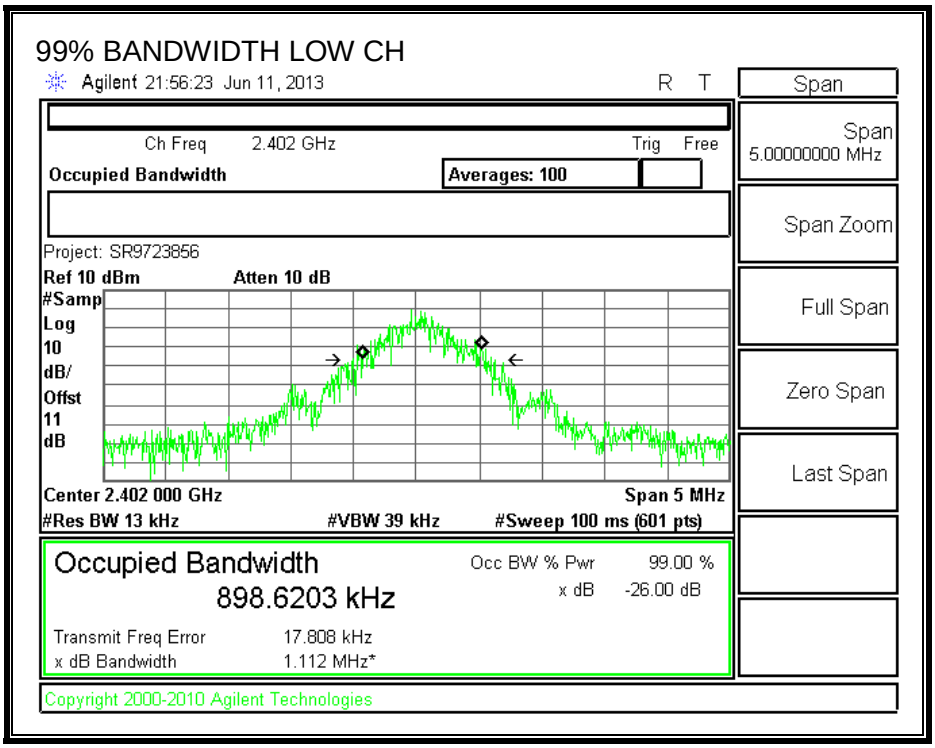
TEST PROCEDURE

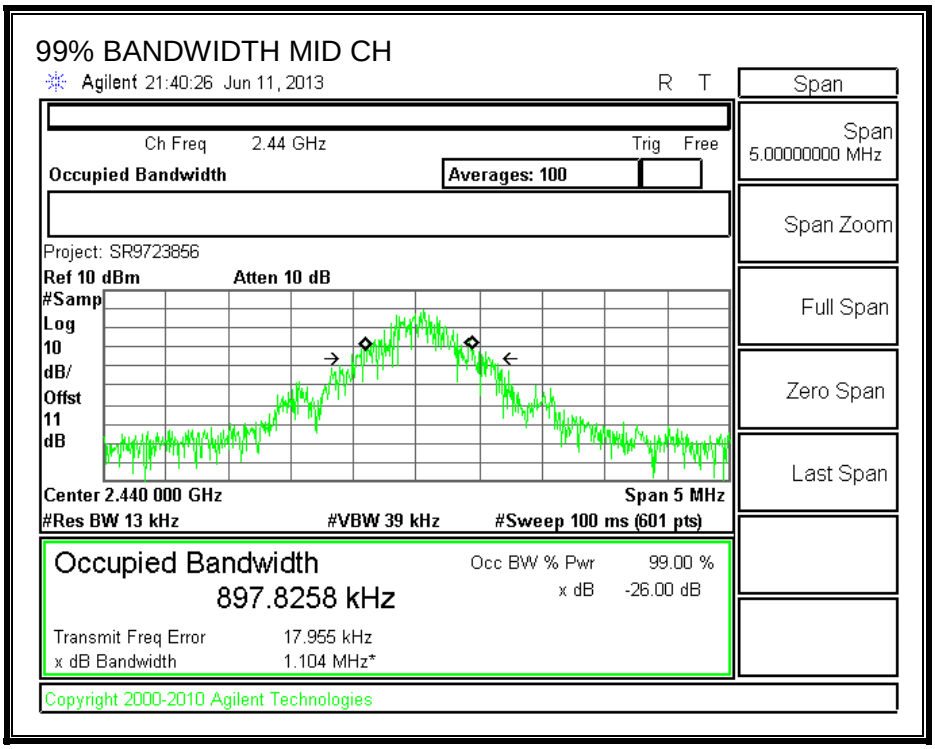
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

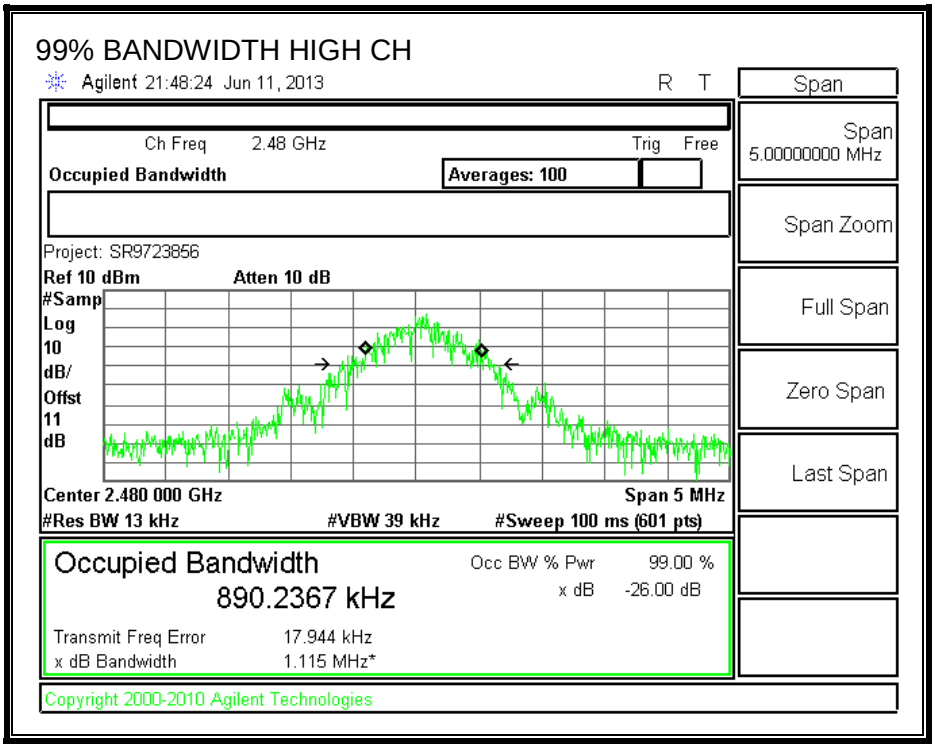
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	0.8990
Middle	2440	0.8980
High	2480	0.8900

99% BANDWIDTH







8.2.3. 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.

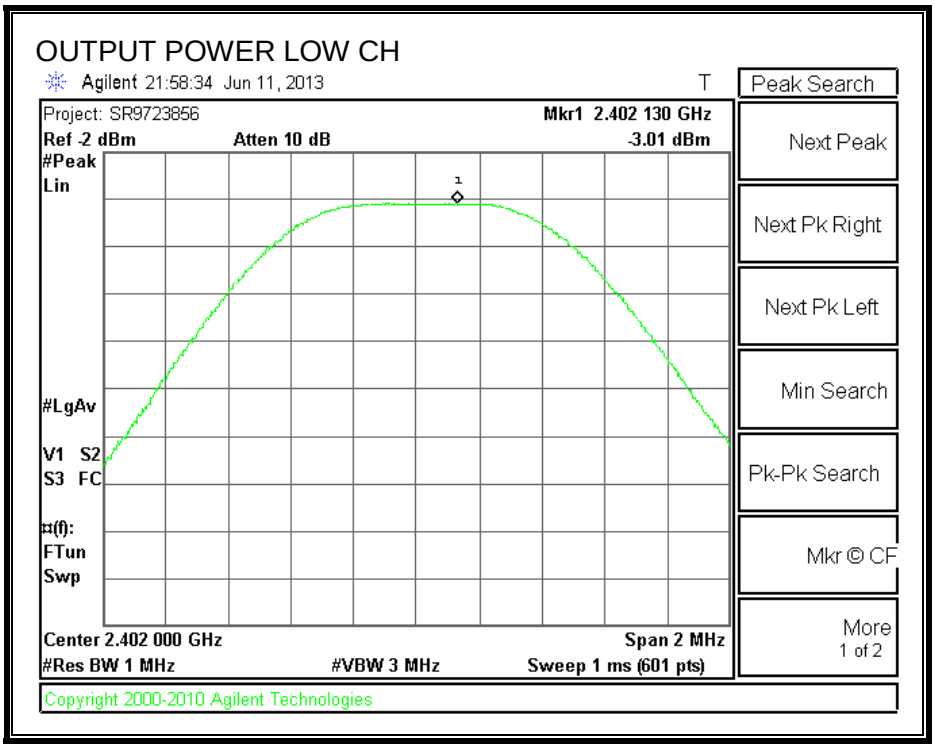
TEST PROCEDURE

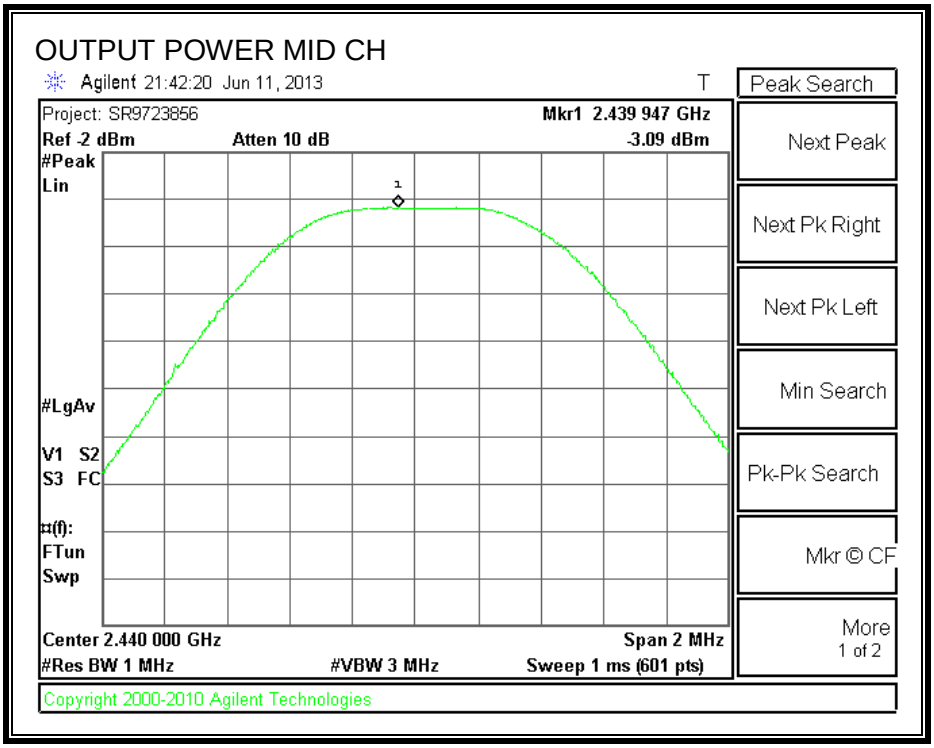
Peak power is measured using the maximum peak conducted output power procedure per section 9.1.1 specified in "558074 D01 DTS Meas Guidance v03" April 8, 2013.

RESULTS

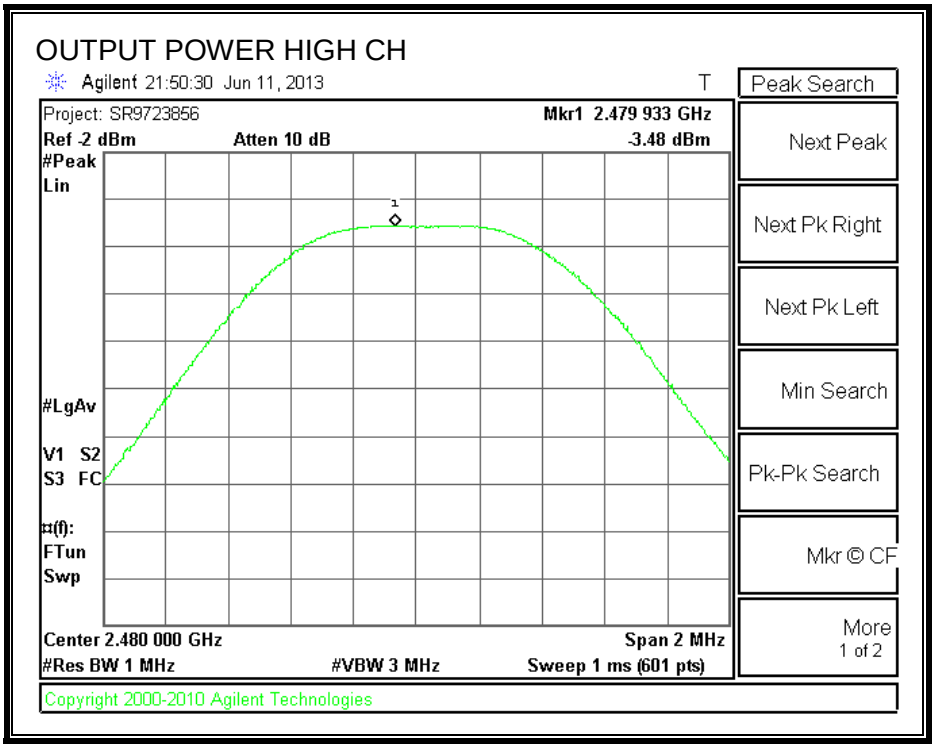
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Offset (dBm)	Total Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-3.01	11.00	7.99	30	-22.010
Middle	2440	-3.09	11.00	7.91	30	-22.090
High	2480	-3.48	11.00	7.52	30	-22.480

OUTPUT POWER





OUTPUT POWER HIGH CH



8.2.4. 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 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	7.82
Middle	2440	7.68
High	2480	7.34

8.2.5. 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.

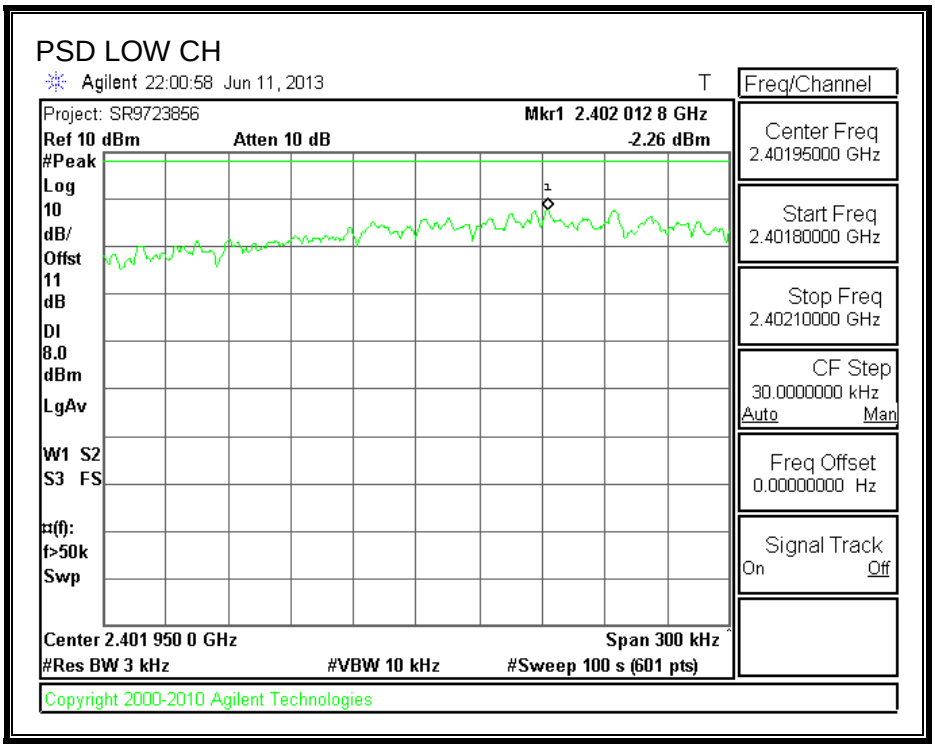
TEST PROCEDURE

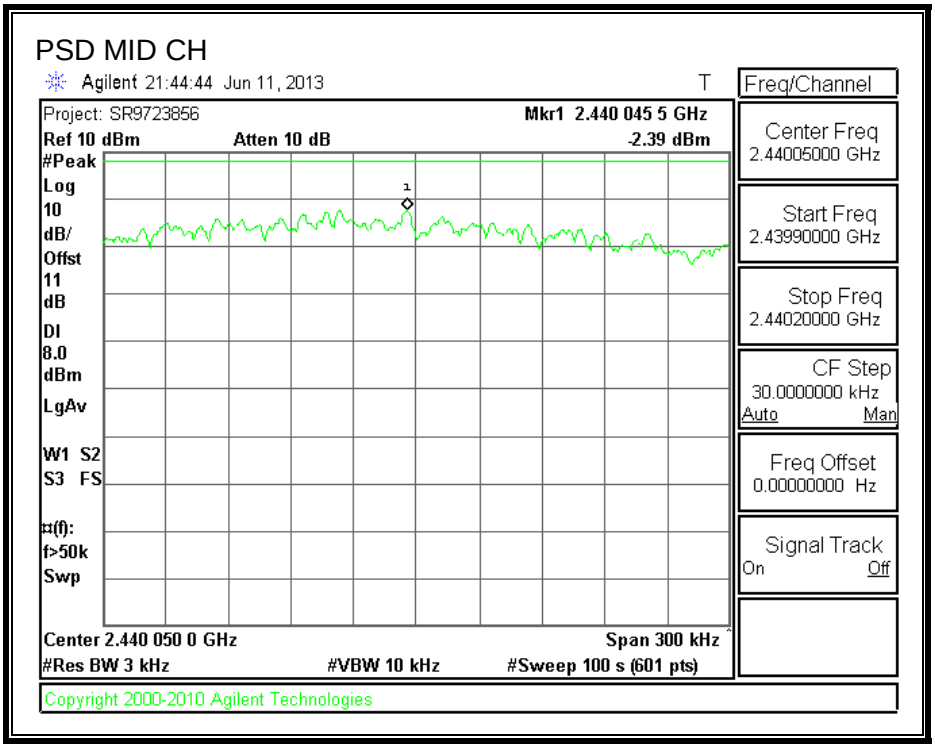
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option per section 10.2 in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, April 8, 2013.

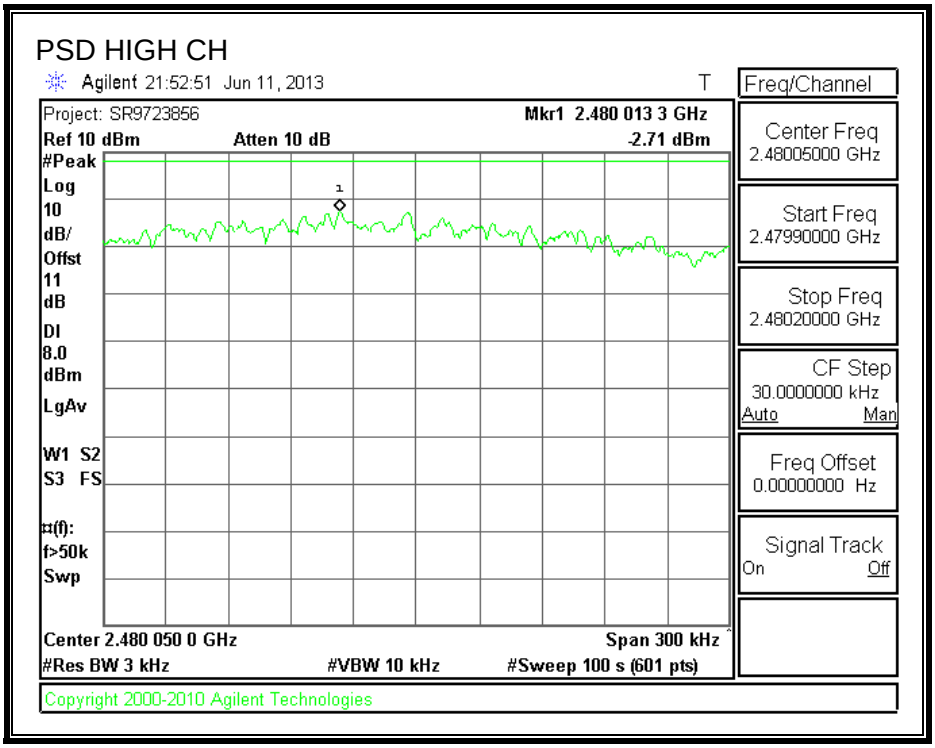
RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-2.26	8	-10.26
Middle	2440	-2.39	8	-10.39
High	2480	-2.71	8	-10.71

POWER SPECTRAL DENSITY







8.2.6. 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.

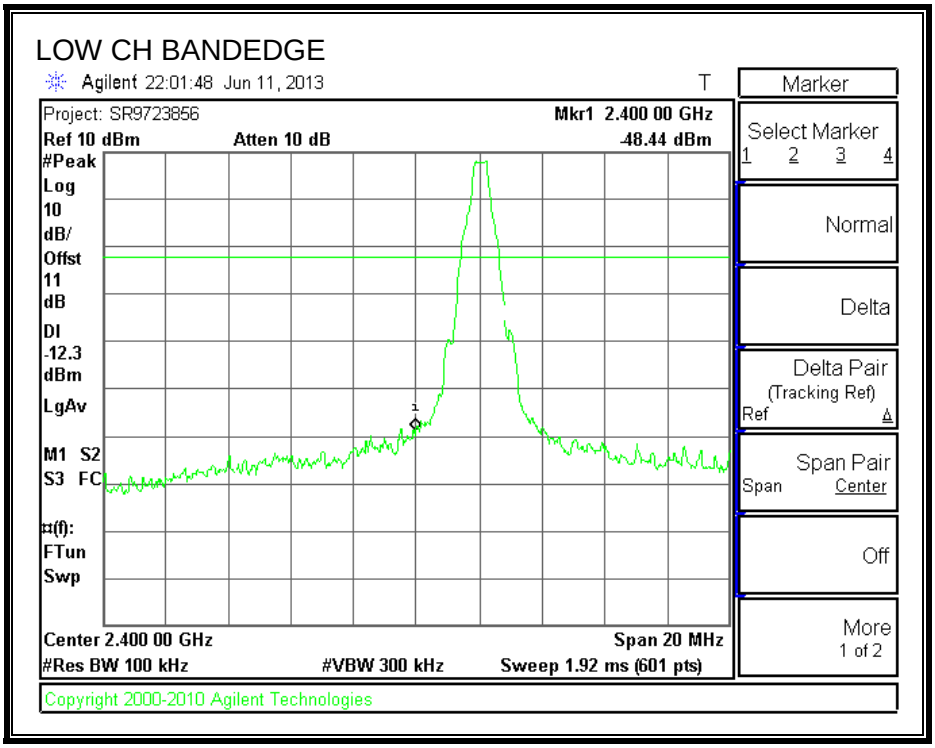
TEST PROCEDURE

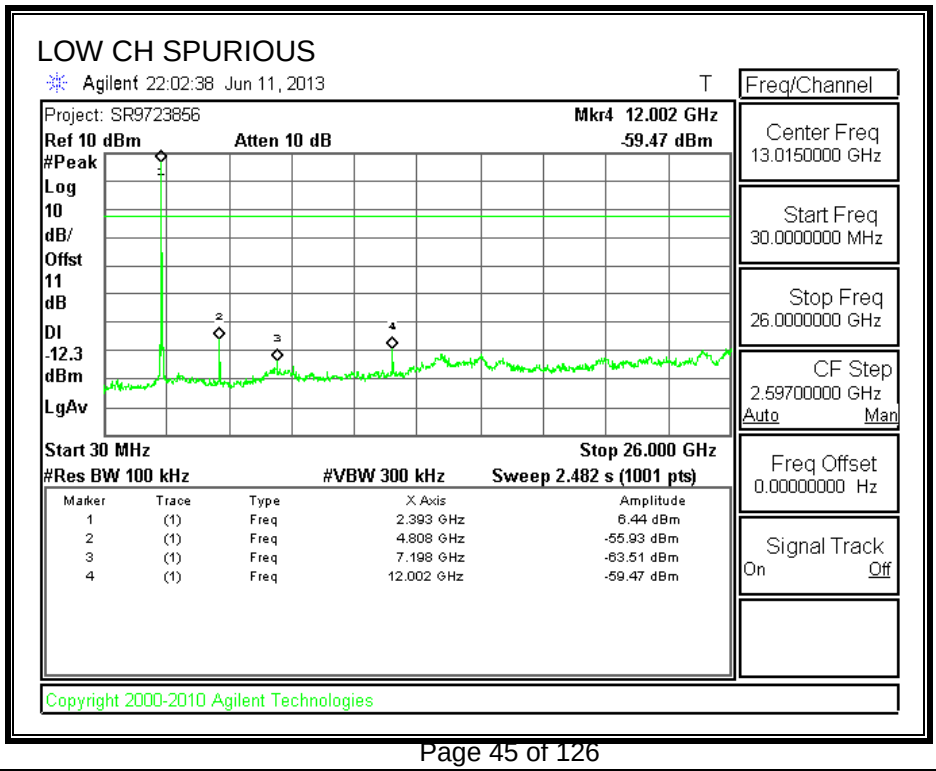
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

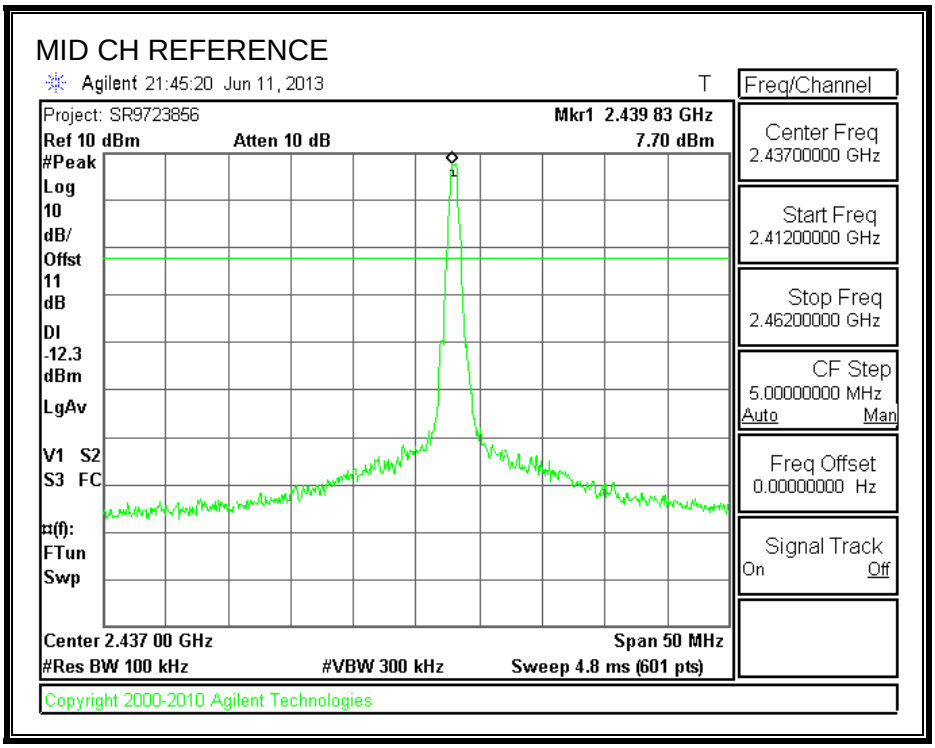
RESULTS

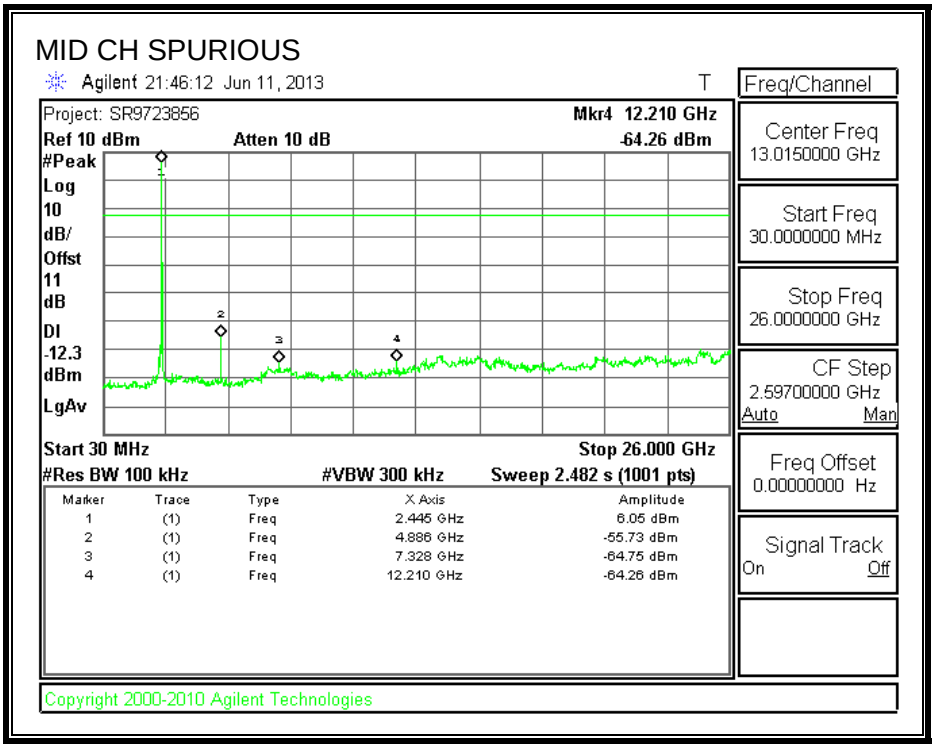
SPURIOUS EMISSIONS, LOW CHANNEL



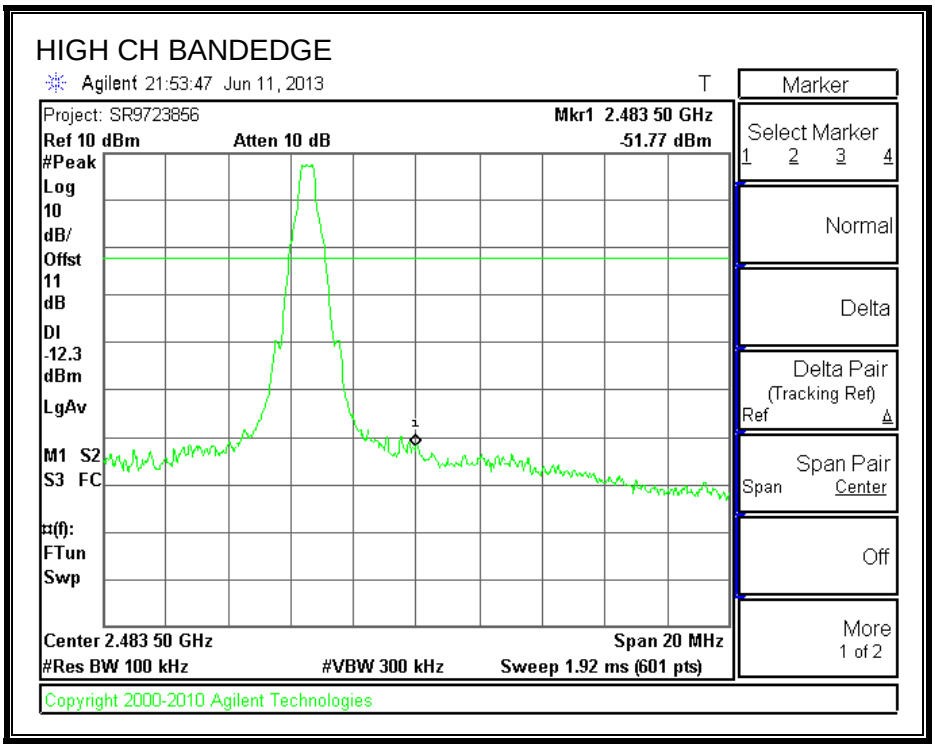


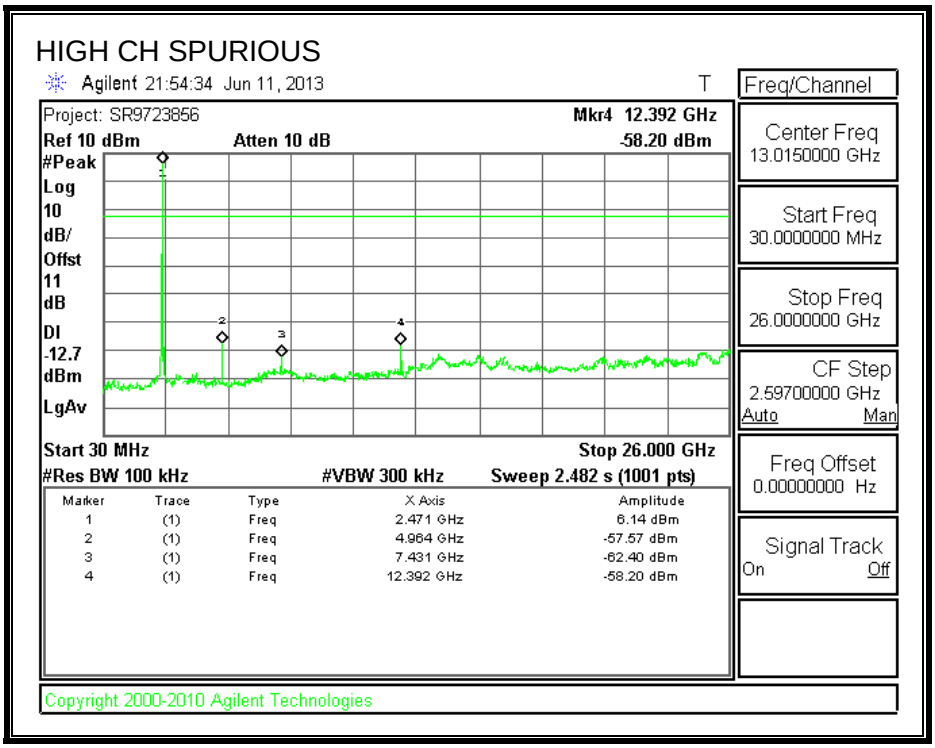
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





8.3. GFSK 2Mbps 500kHz MODE

8.3.1. 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.

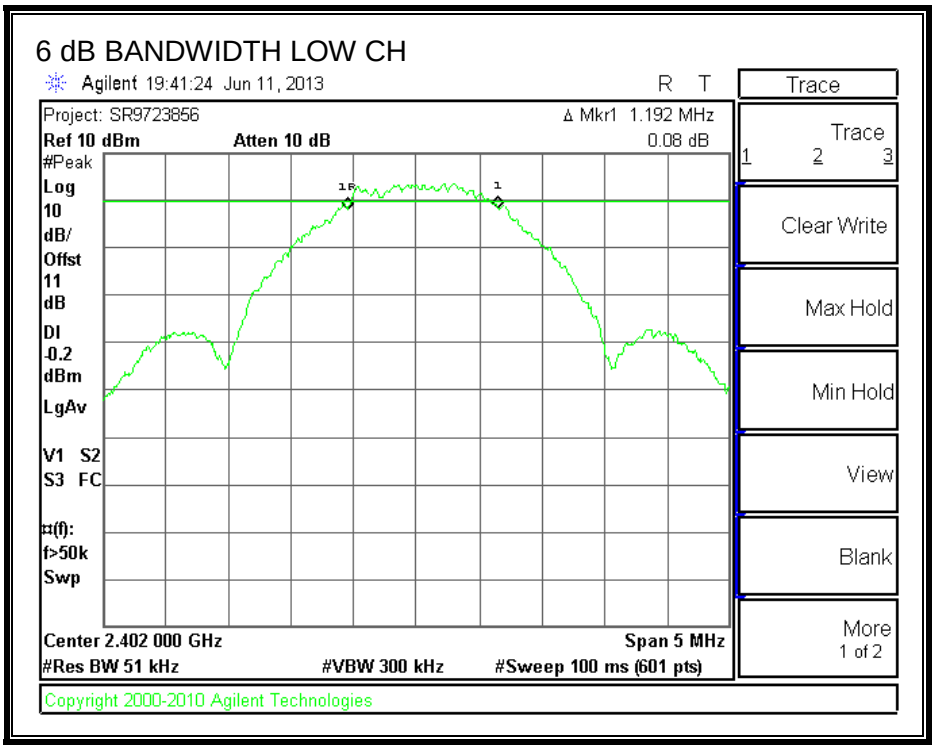
TEST PROCEDURE

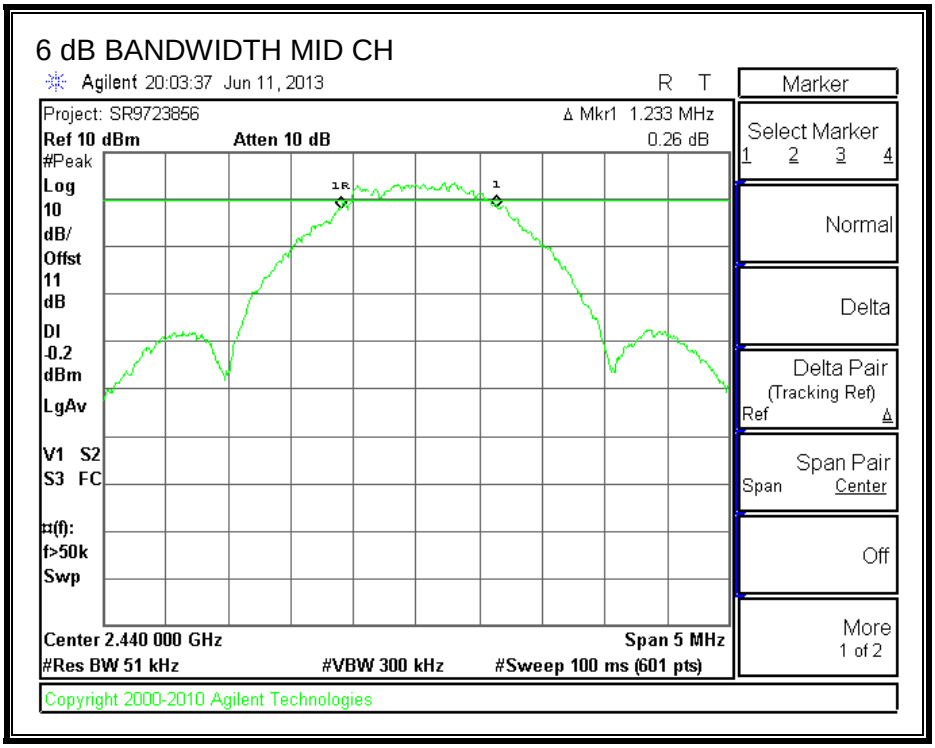
The transmitter output is connected to a spectrum analyzer. The RBW is set to 1-5% of the EBW and the VBW is set to 3 times the RBW. The sweep time is coupled.

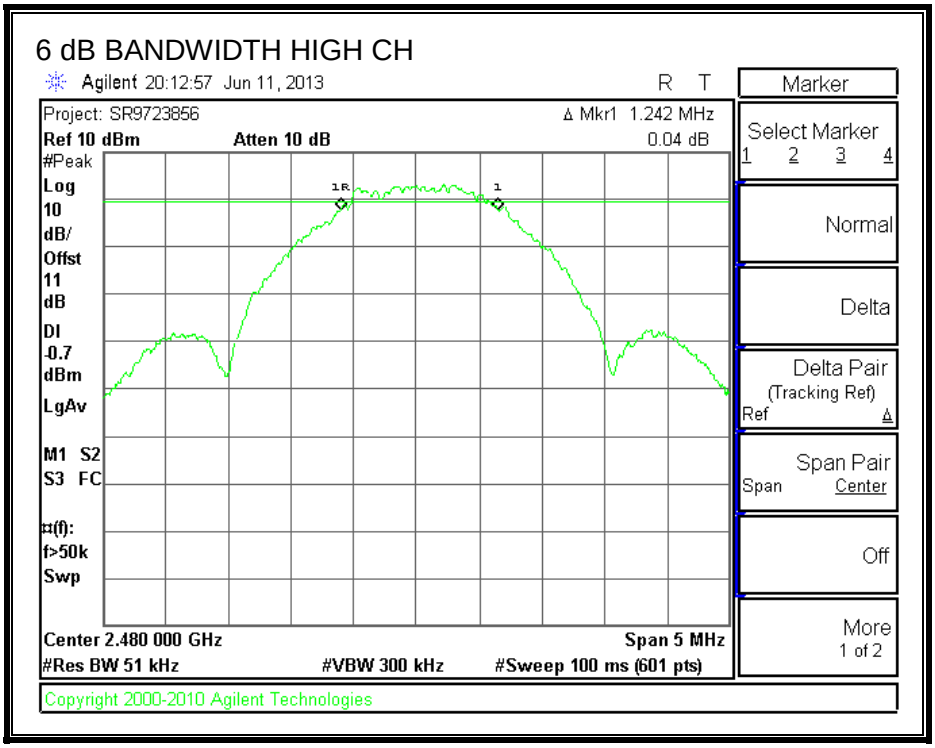
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	1.1920	0.5
Middle	2440	1.2330	0.5
High	2480	1.2420	0.5

6 dB BANDWIDTH







8.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

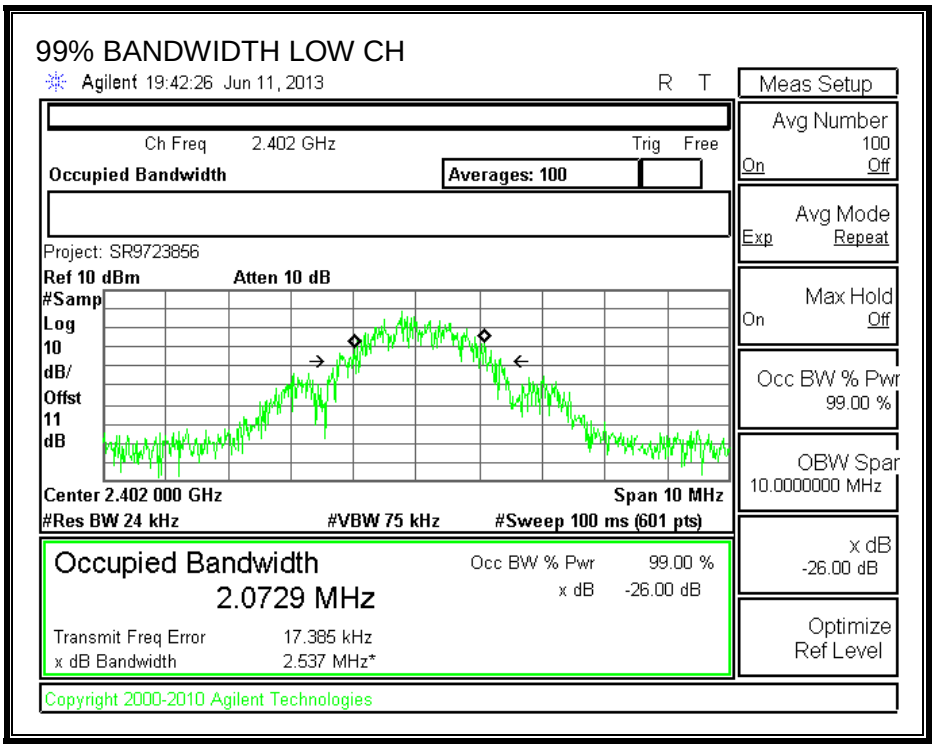
TEST PROCEDURE

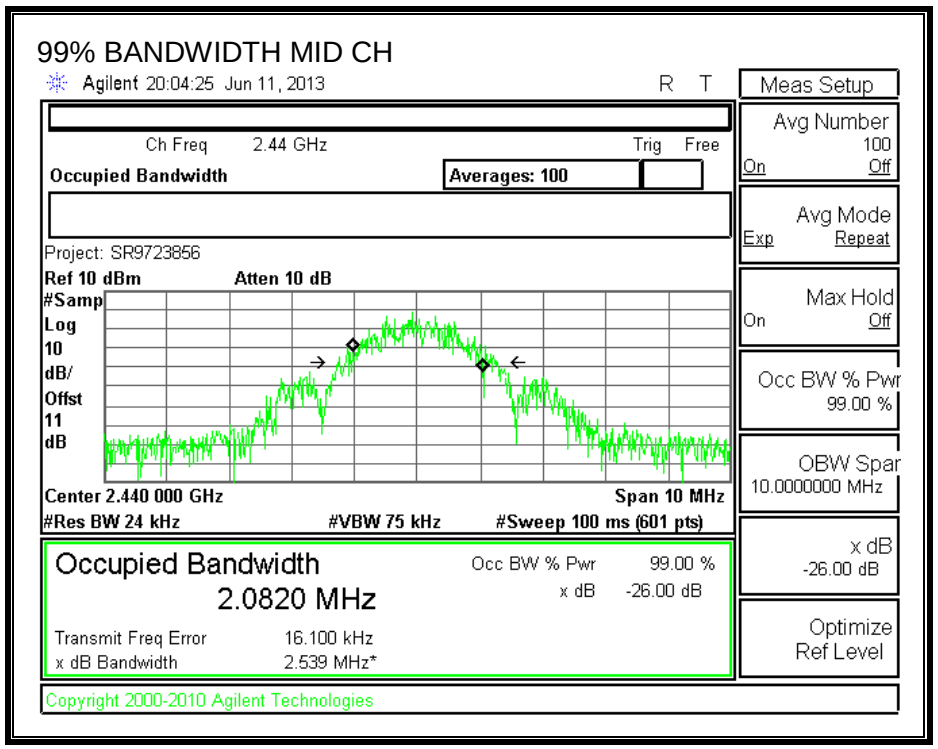
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

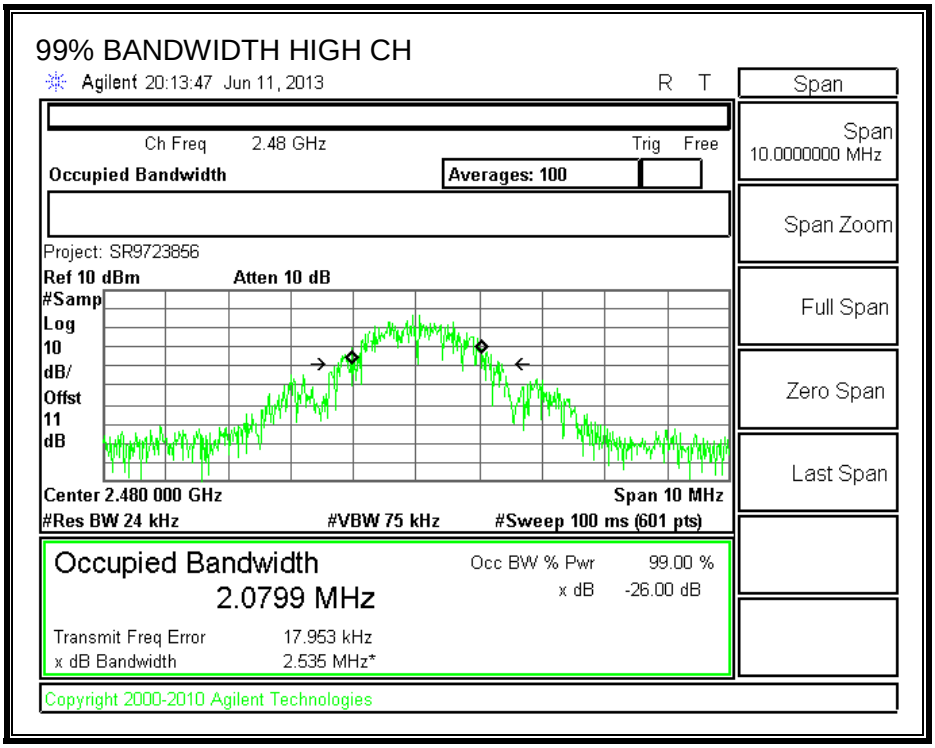
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	2.0729
Middle	2440	2.0820
High	2480	2.0799

99% BANDWIDTH







8.3.3. 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.

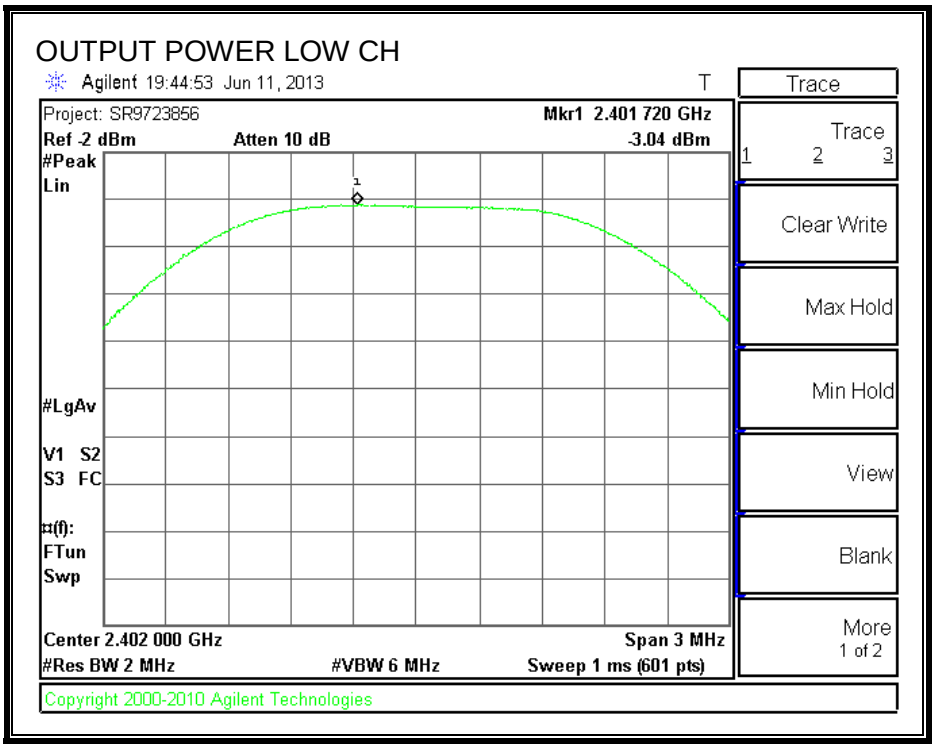
TEST PROCEDURE

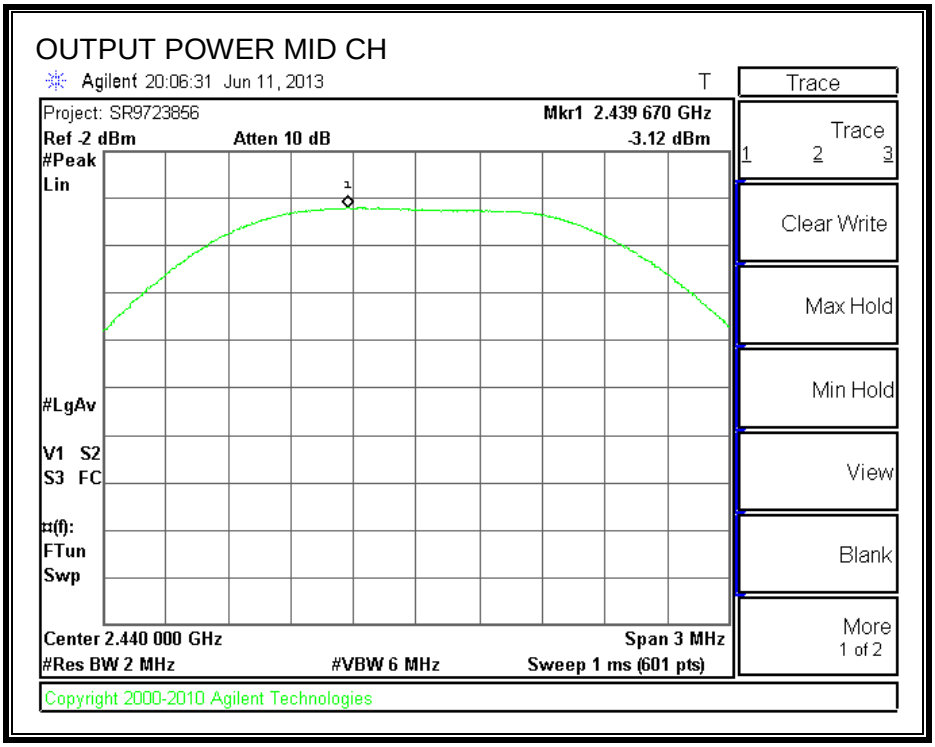
Peak power is measured using the maximum peak conducted output power procedure per section 9.1.1 specified in "558074 D01 DTS Meas Guidance v03" April 8, 2013.

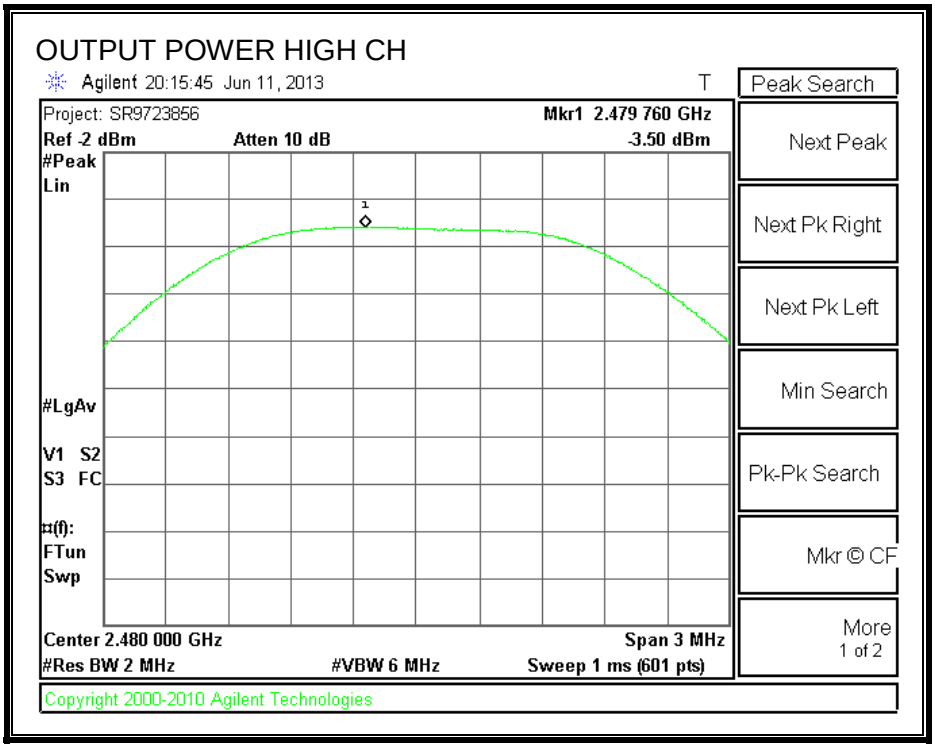
RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Offset (dBm)	Total Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-3.04	11.00	7.96	30	-22.040
Middle	2440	-3.12	11.00	7.88	30	-22.120
High	2480	-3.5	11.00	7.50	30	-22.500

OUTPUT POWER







8.3.4. 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 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	7.75
Middle	2440	7.61
High	2480	7.27

8.3.5. 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.

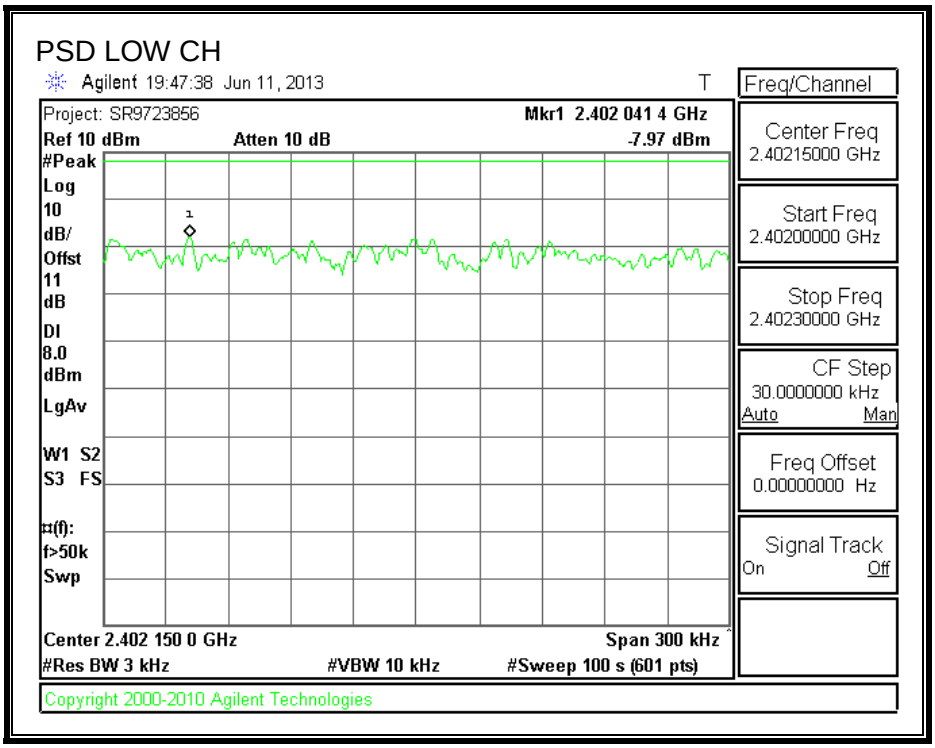
TEST PROCEDURE

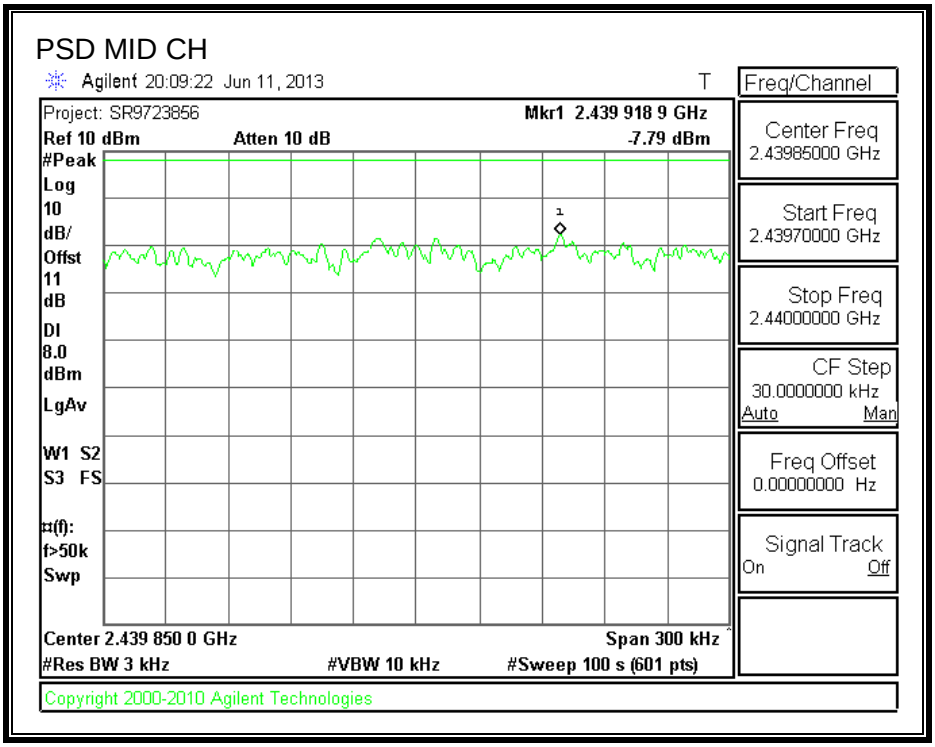
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option per section 10.2 in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, April 8, 2013.

RESULTS

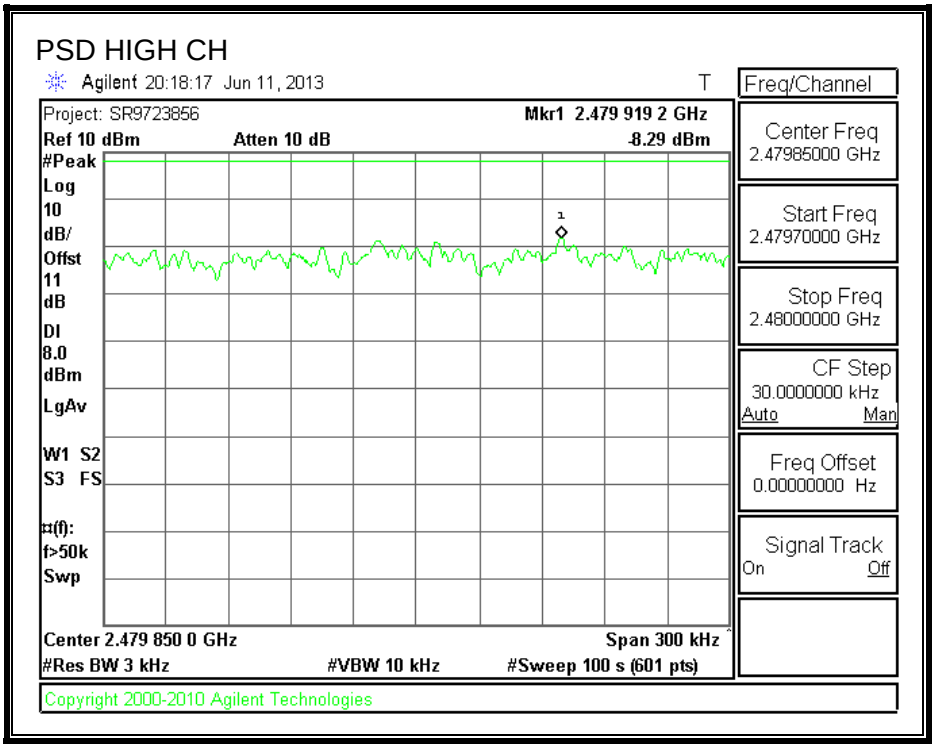
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-7.79	8	-15.79
Middle	2440	-7.79	8	-15.79
High	2480	-8.29	8	-16.29

POWER SPECTRAL DENSITY





PSD HIGH CH



8.3.6. 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.

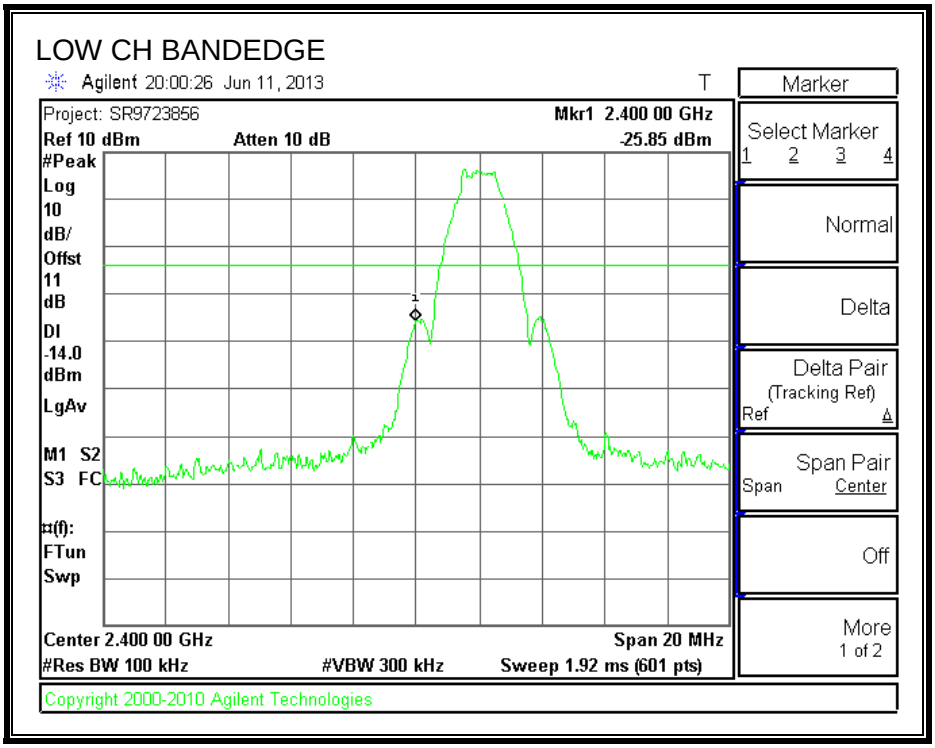
TEST PROCEDURE

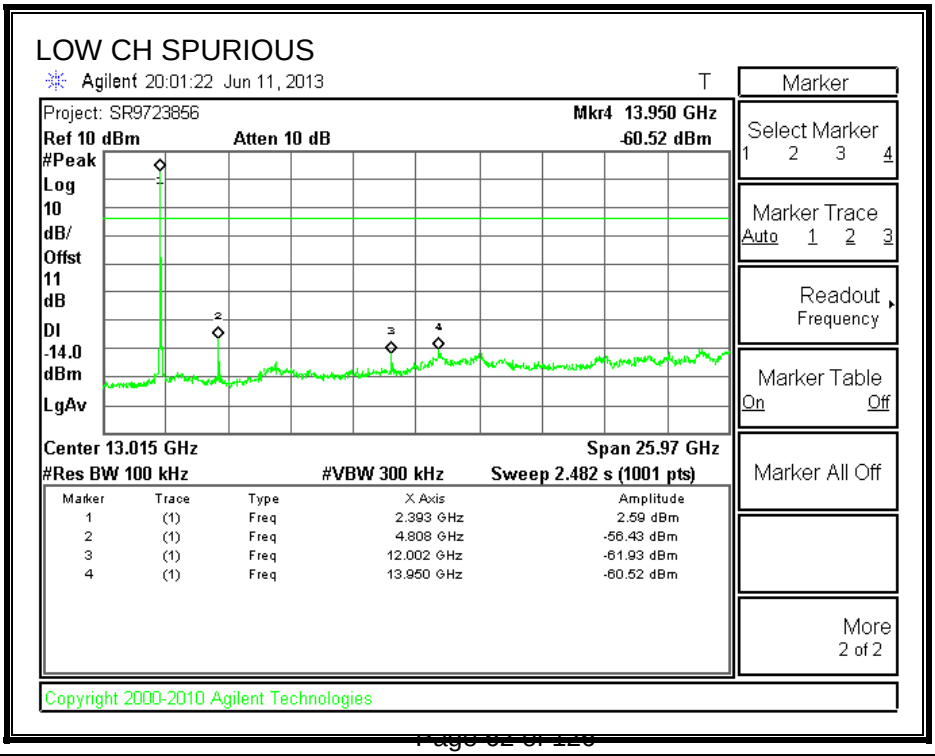
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

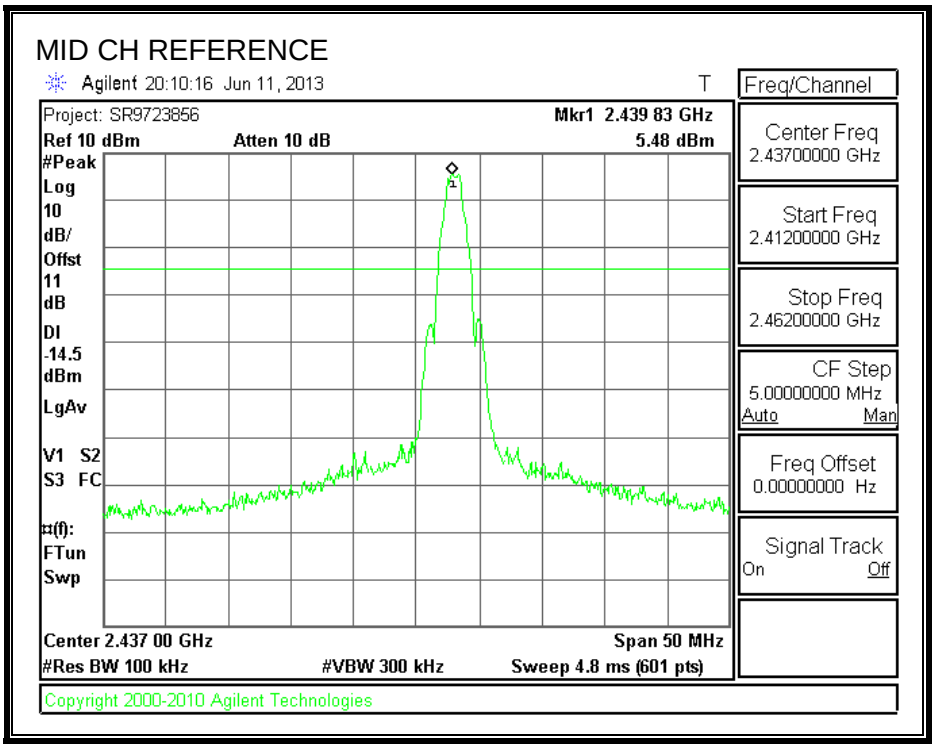
RESULTS

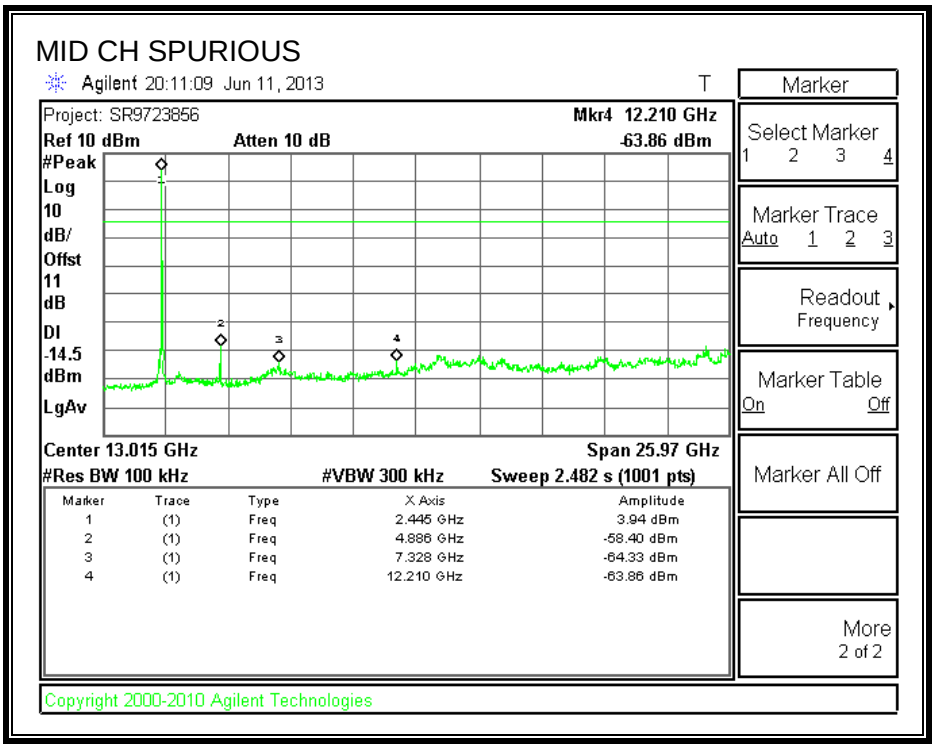
SPURIOUS EMISSIONS, LOW CHANNEL



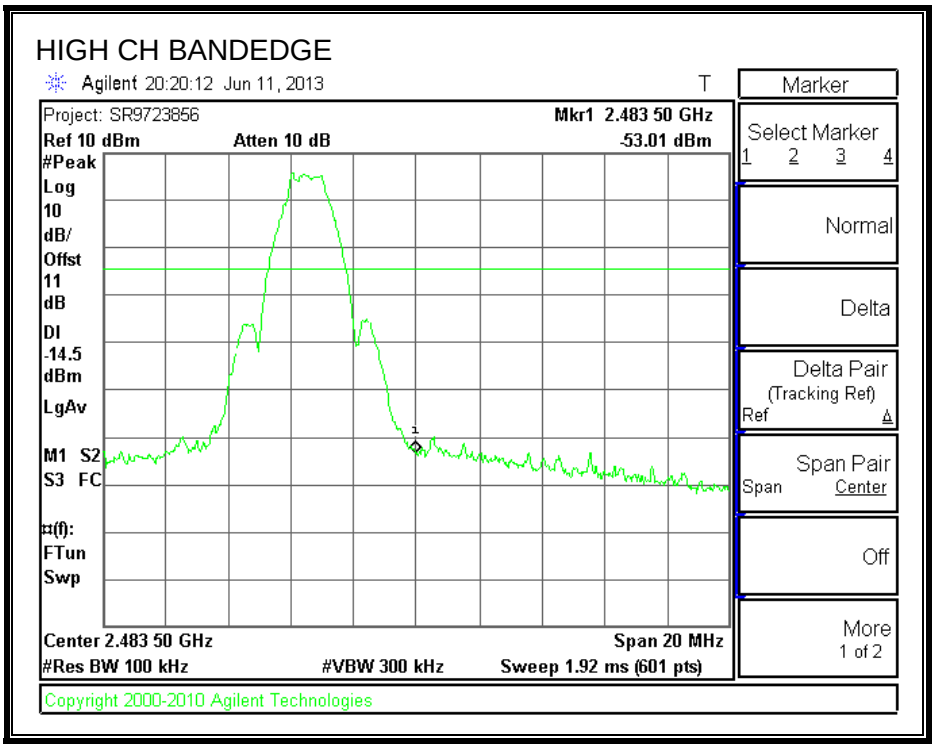


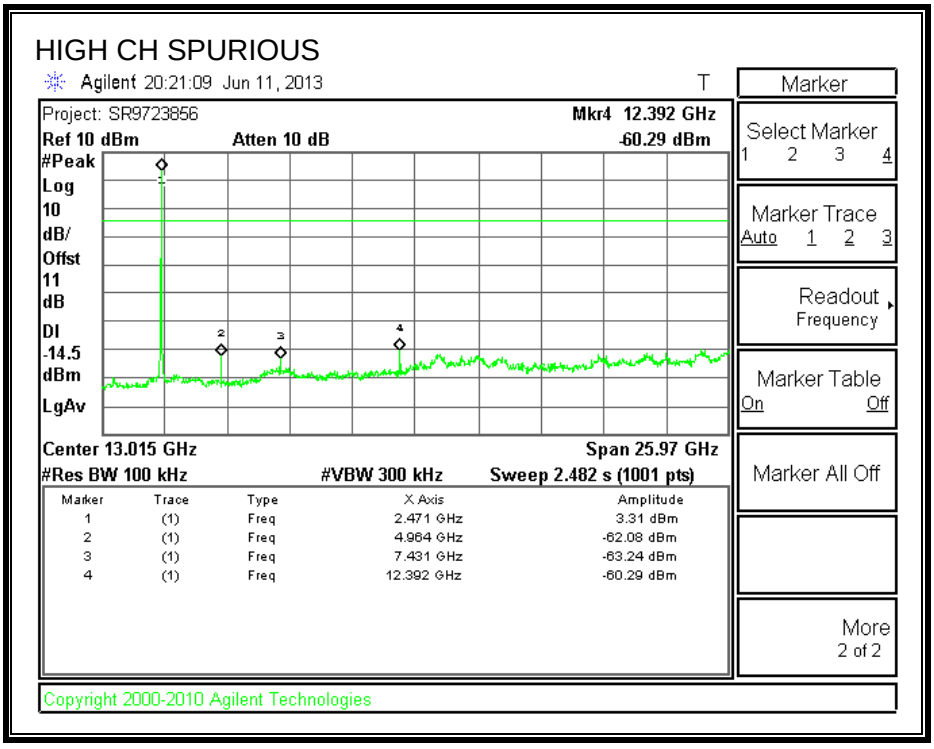
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





8.4. GFSK 2Mbps 320kHz MODE

8.4.1. 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.

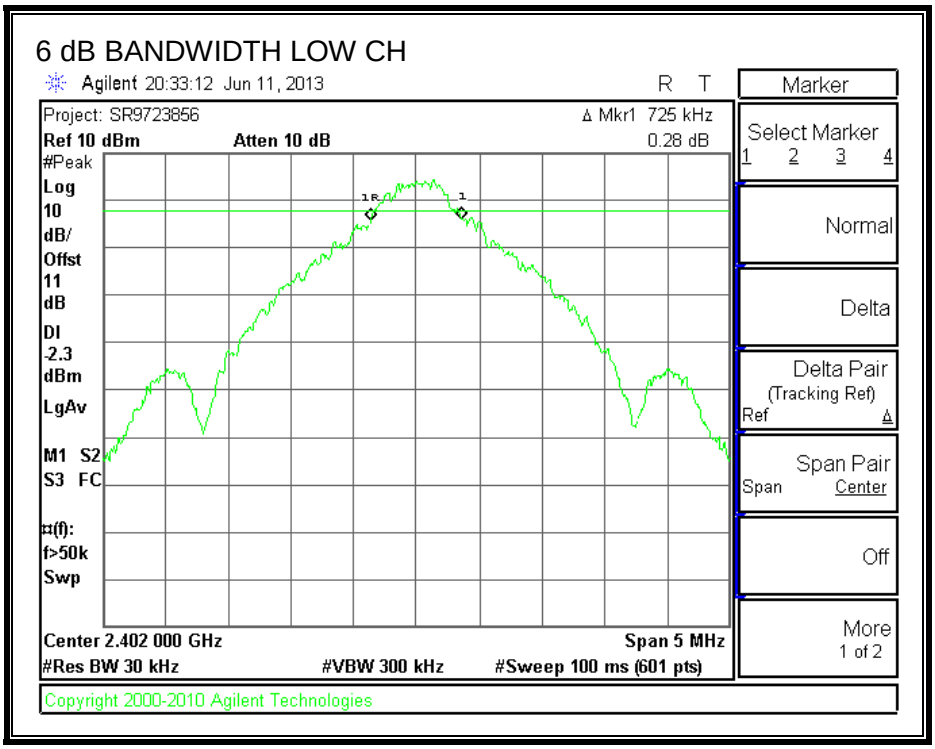
TEST PROCEDURE

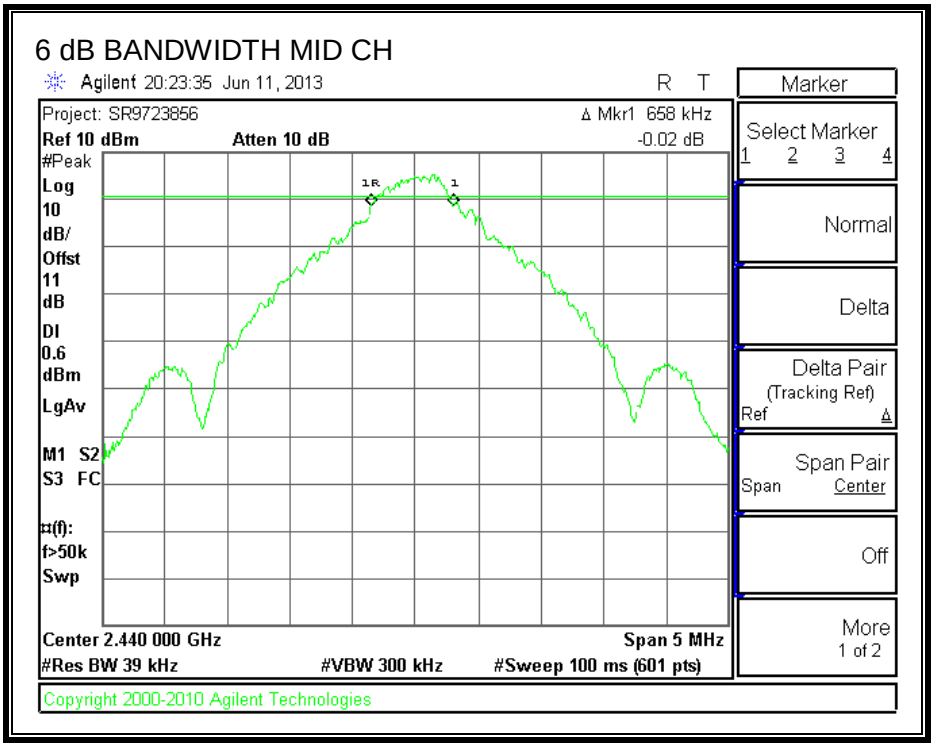
The transmitter output is connected to a spectrum analyzer. The RBW is set to 1-5% of the EBW and the VBW is set to 3 times the RBW. The sweep time is coupled.

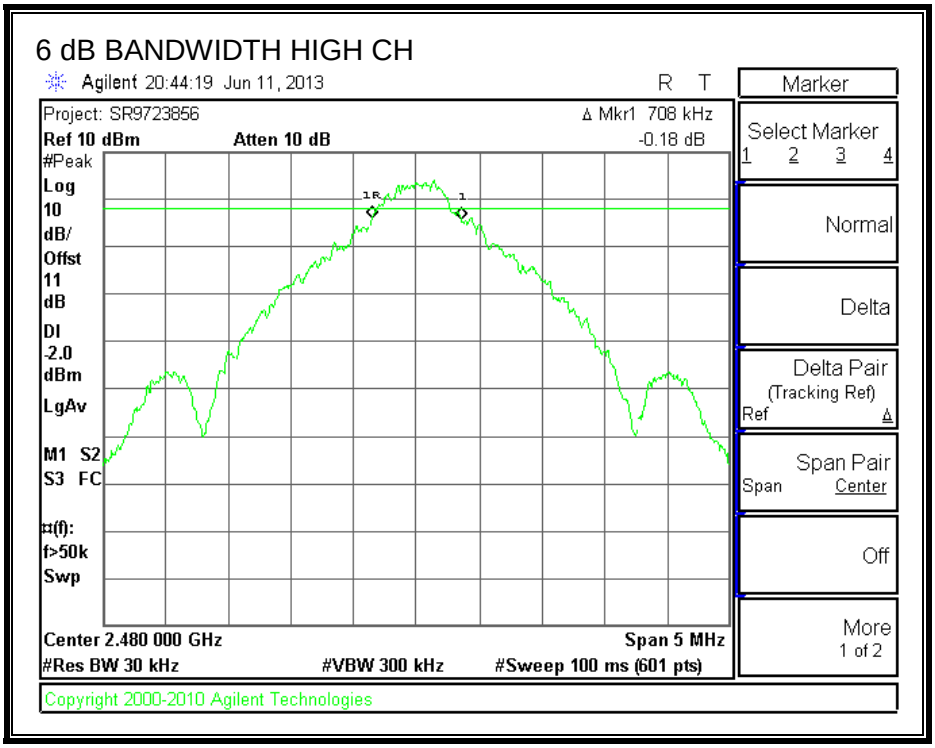
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7250	0.5
Middle	2440	0.6580	0.5
High	2480	0.7080	0.5

6 dB BANDWIDTH







8.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

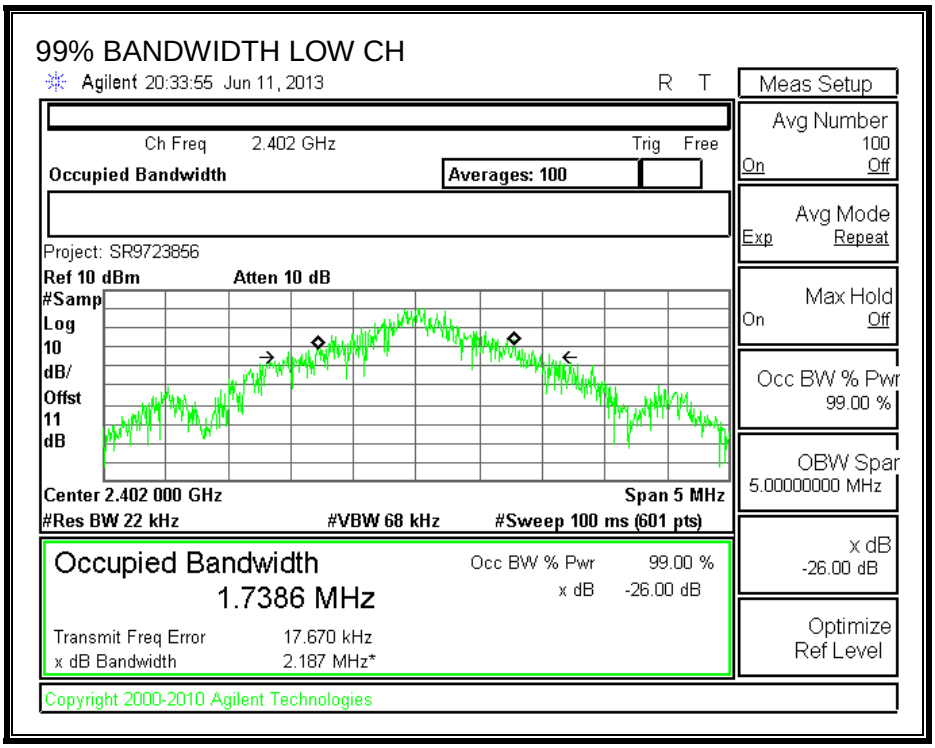
TEST PROCEDURE

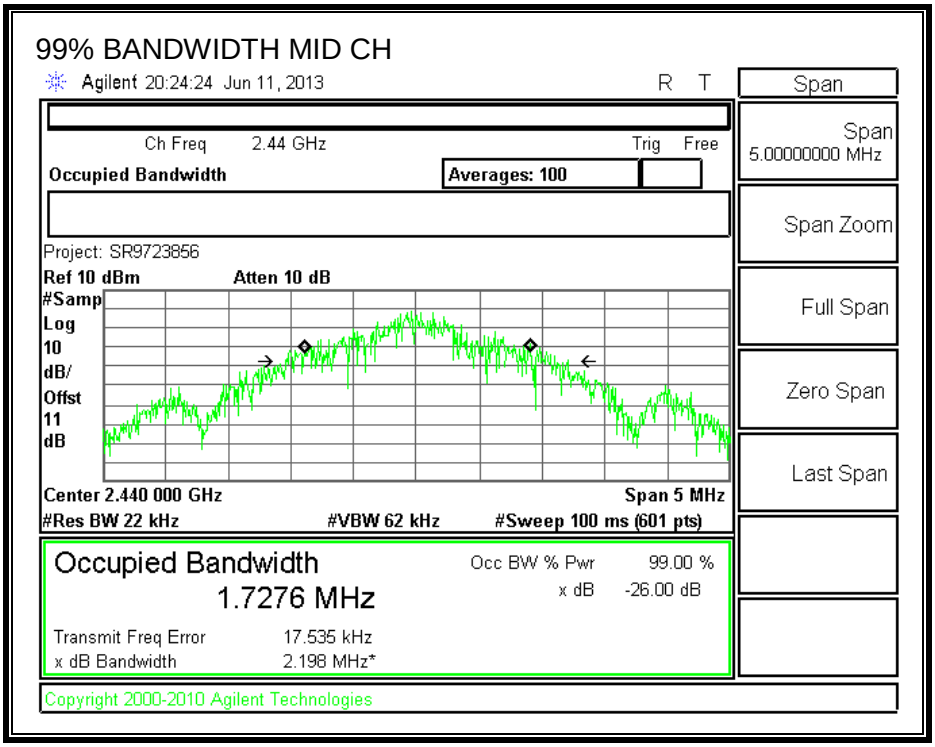
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

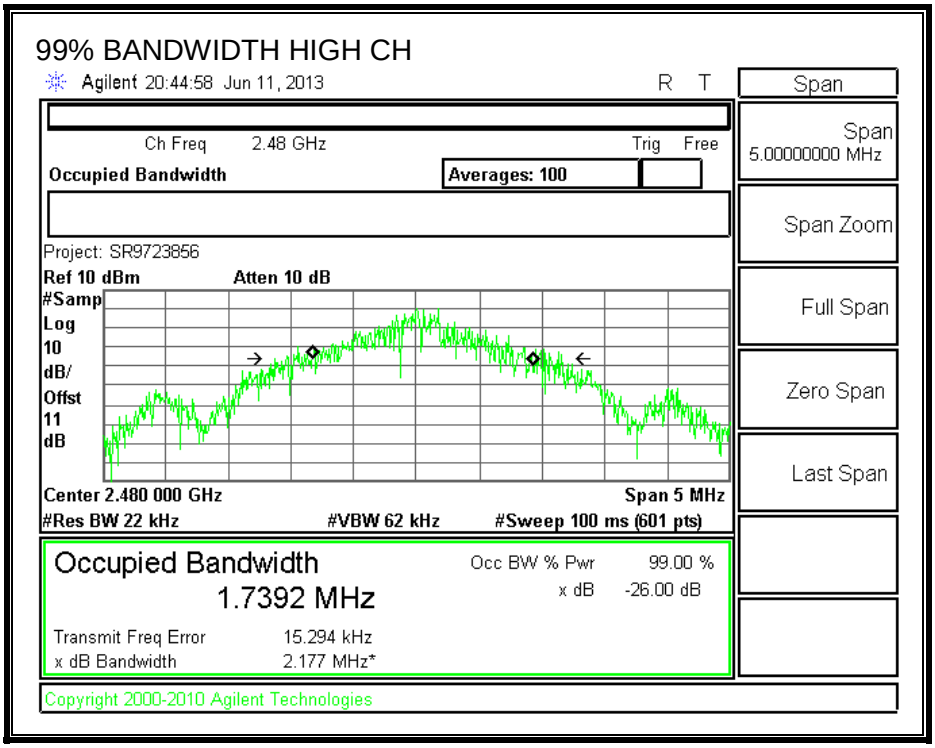
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.7386
Middle	2440	1.7276
High	2480	1.7372

99% BANDWIDTH







8.4.3. 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.

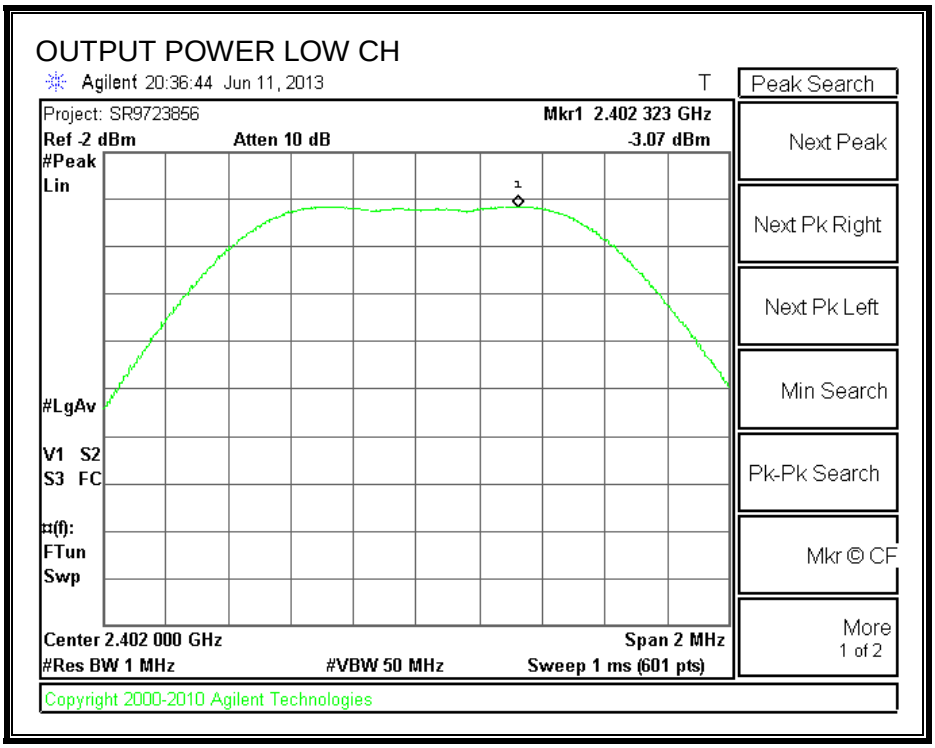
TEST PROCEDURE

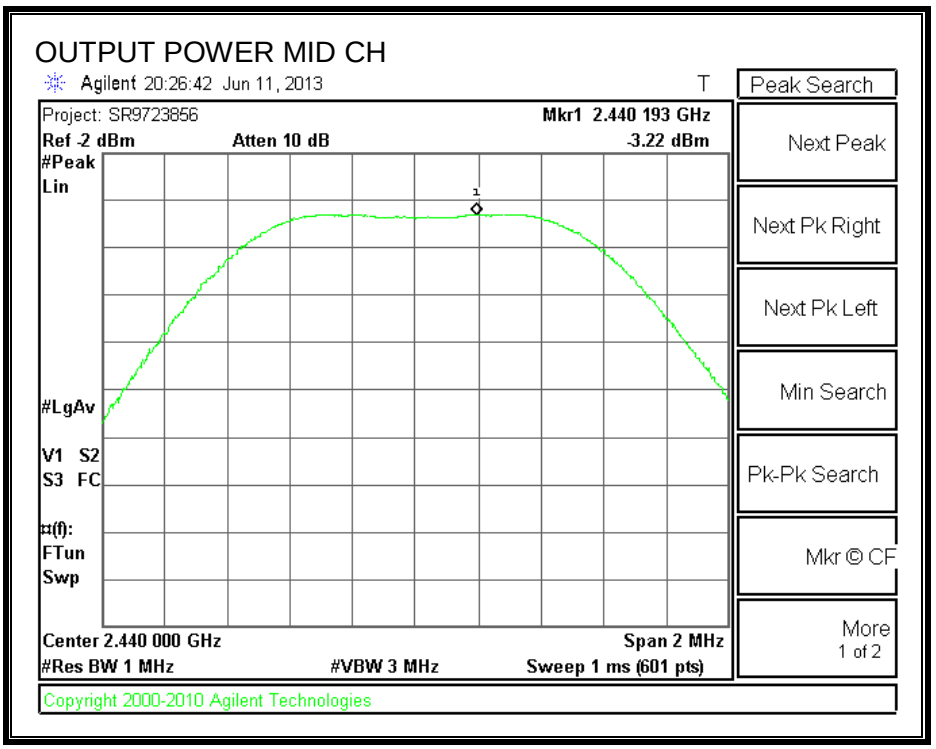
Peak power is measured using the maximum peak conducted output power procedure per section 9.1.1 specified in "558074 D01 DTS Meas Guidance v03" April 8, 2013.

RESULTS

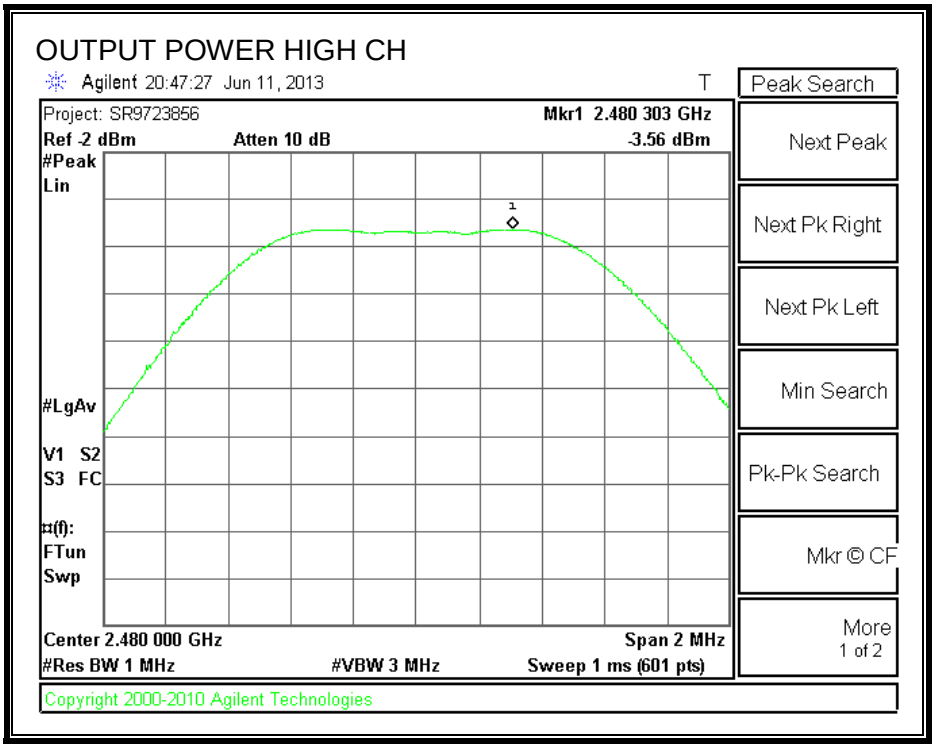
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Offset (dBm)	Total Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-3.07	11.00	7.93	30	-22.070
Middle	2440	-3.22	11.00	7.78	30	-22.220
High	2480	-3.56	11.00	7.44	30	-22.560

OUTPUT POWER





OUTPUT POWER HIGH CH



8.4.4. 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 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	7.8
Middle	2440	7.65
High	2480	7.31

8.4.5. 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.

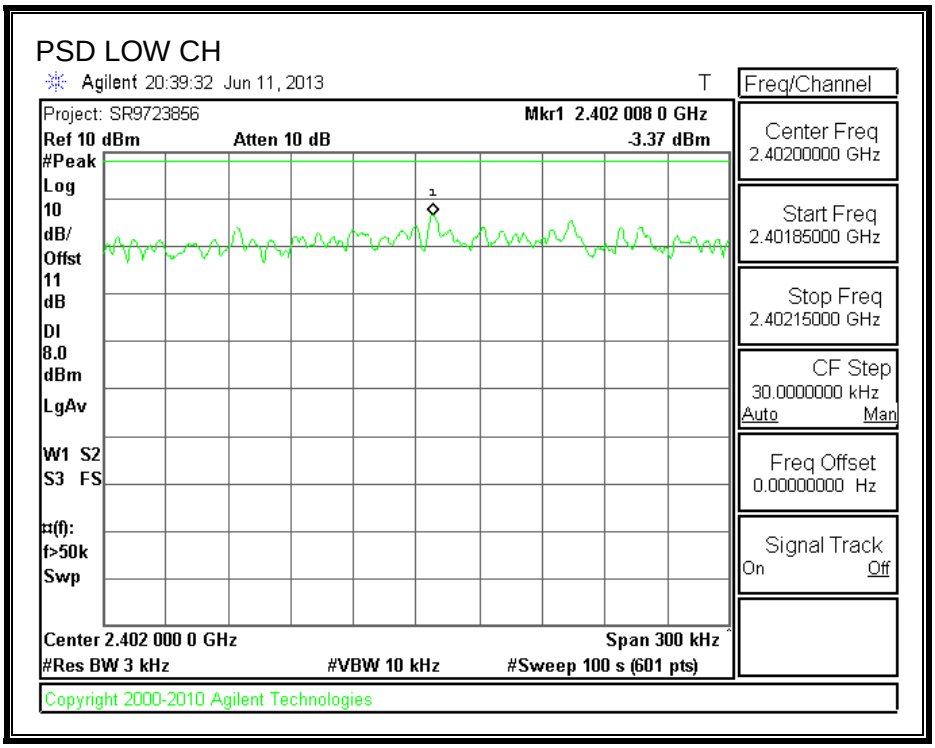
TEST PROCEDURE

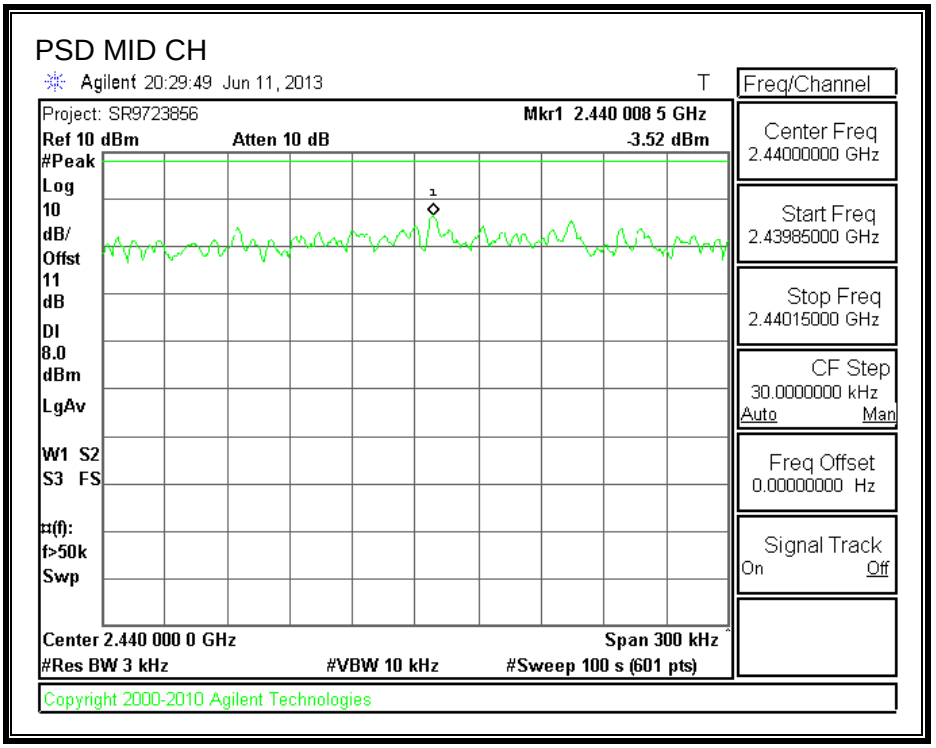
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option per section 10.2 in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, April 8, 2013.

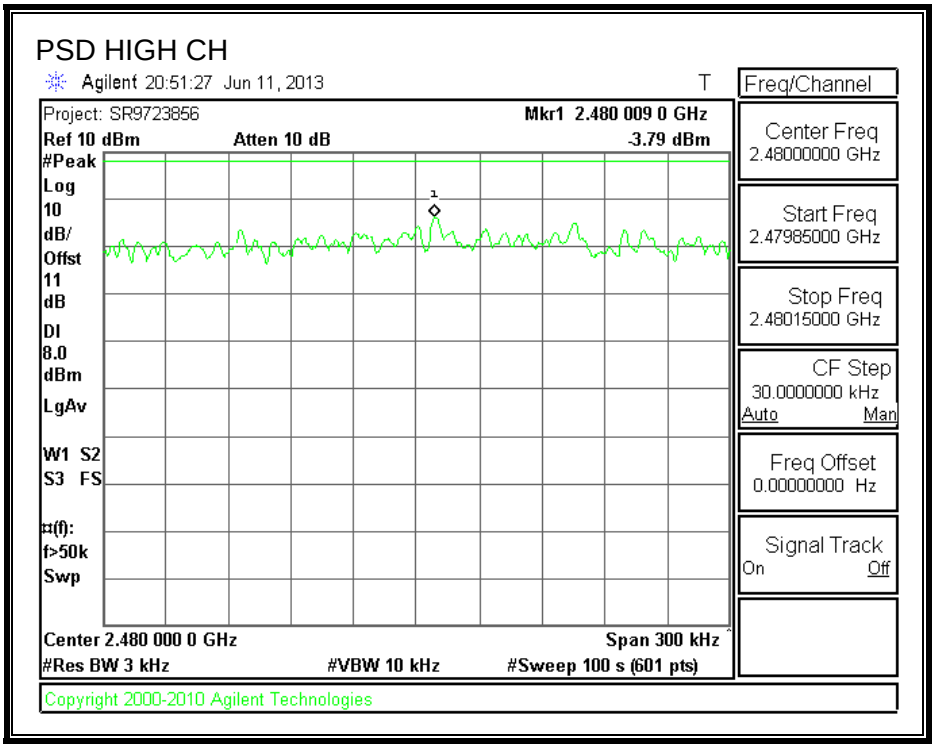
RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-3.37	8	-11.37
Middle	2440	-3.52	8	-11.52
High	2480	-3.79	8	-11.79

POWER SPECTRAL DENSITY







8.4.6. 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.

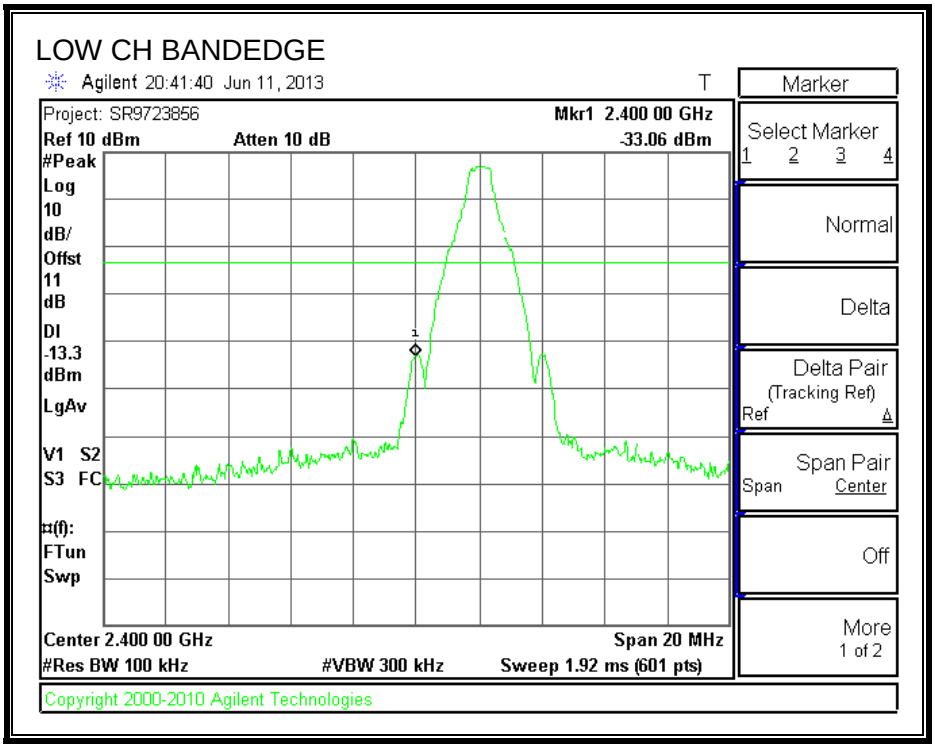
TEST PROCEDURE

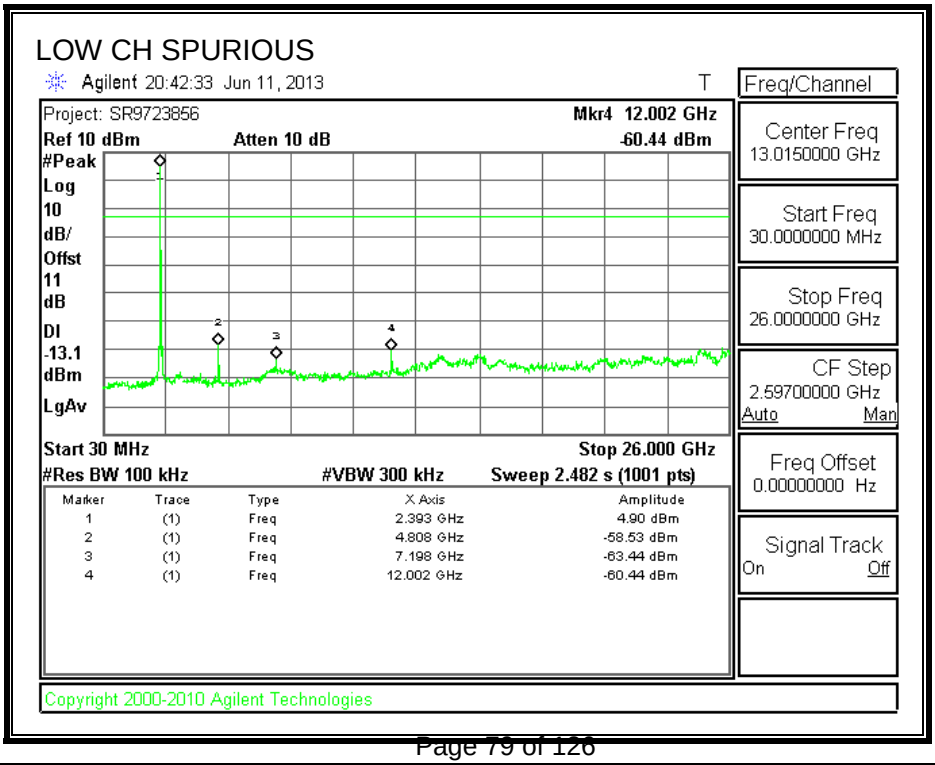
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

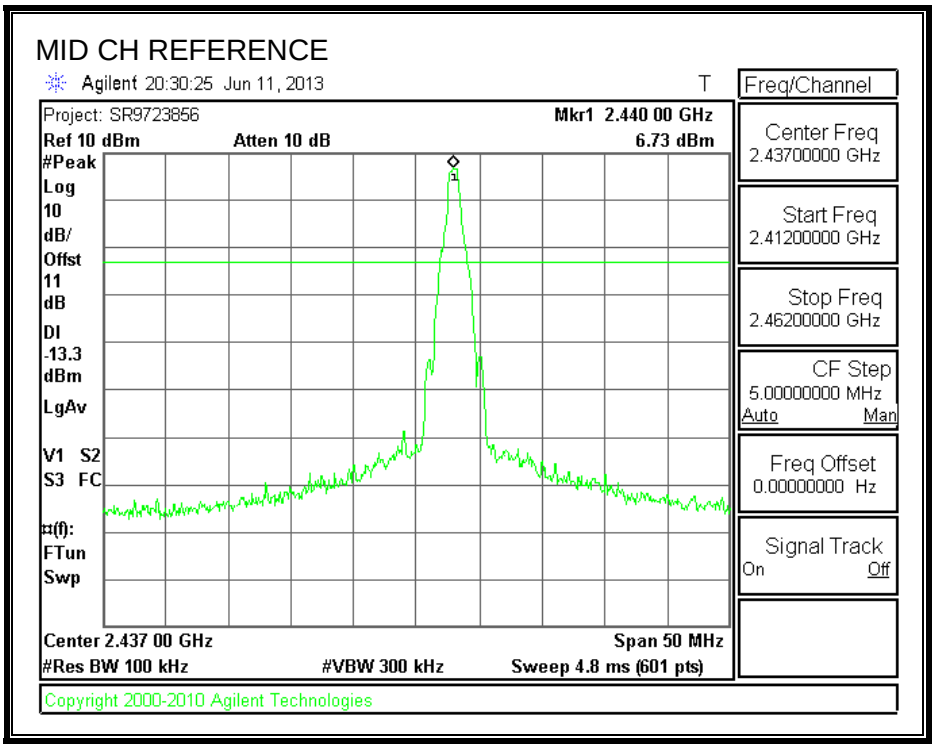
RESULTS

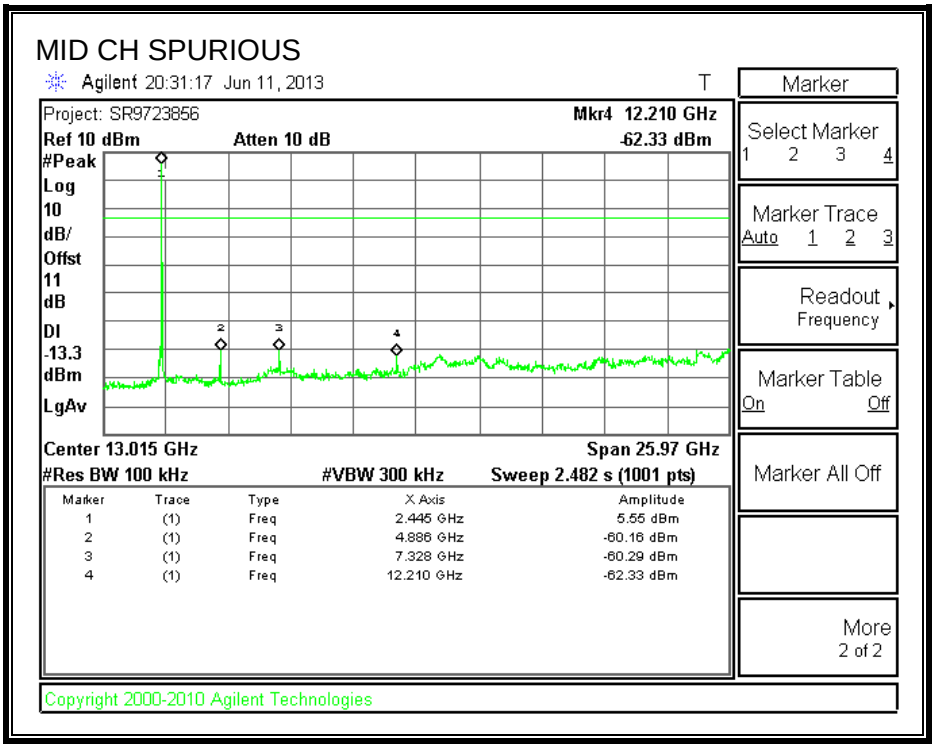
SPURIOUS EMISSIONS, LOW CHANNEL



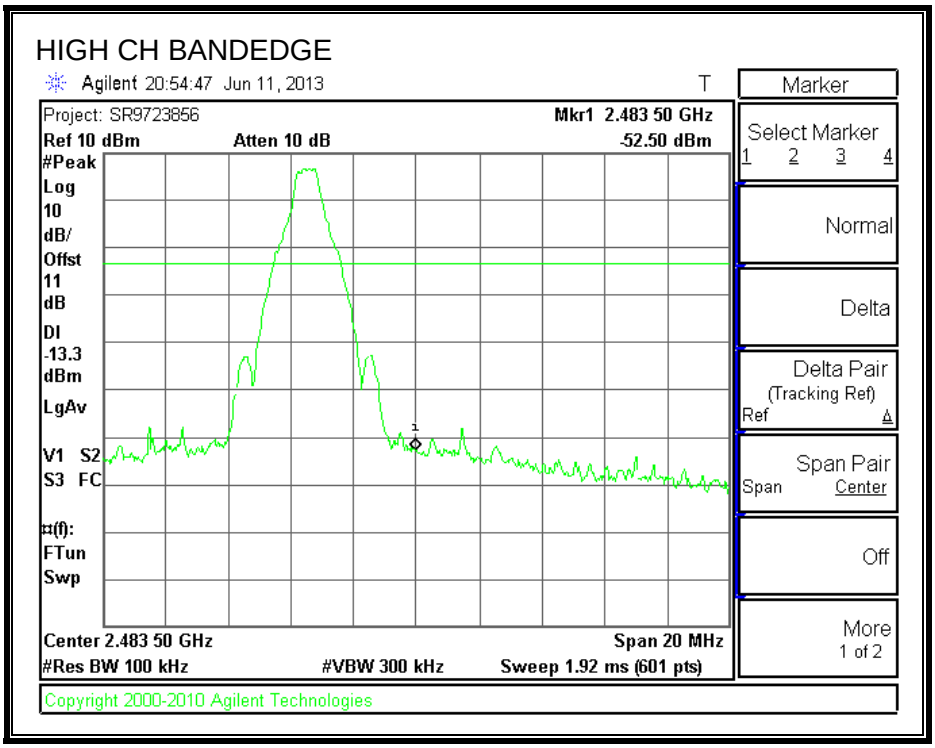


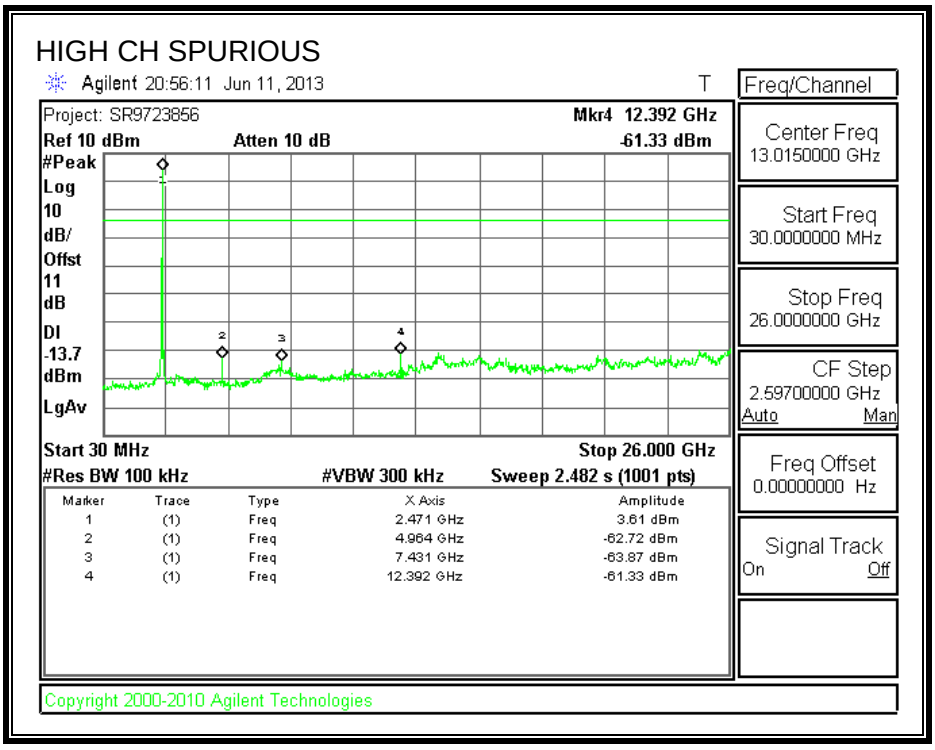
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





9. RADIATED TEST RESULTS

9.1. 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 band edge 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.

For spurious 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 the RMS Averaging method per KDB 558074 was utilized for average measurements.

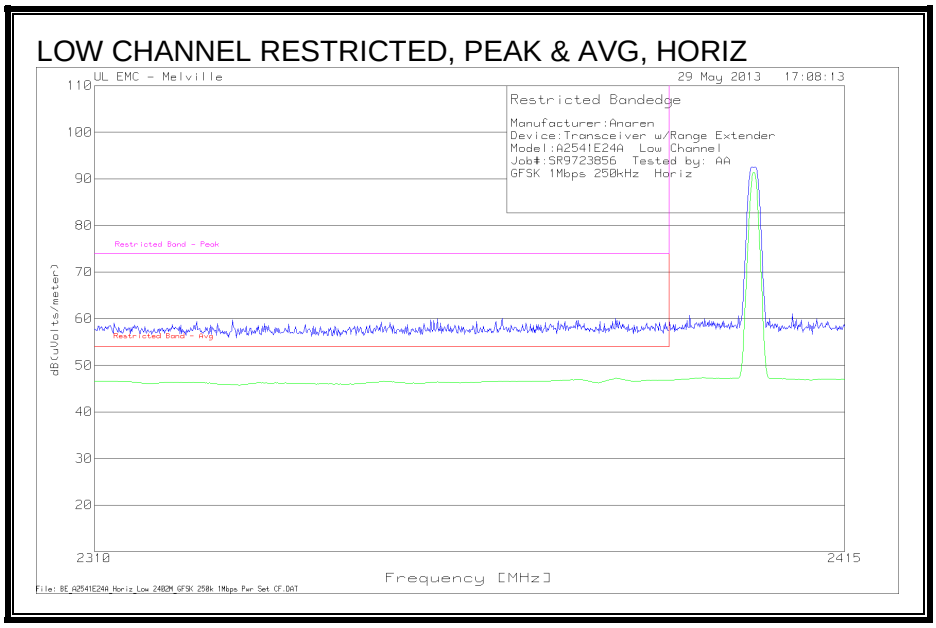
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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.

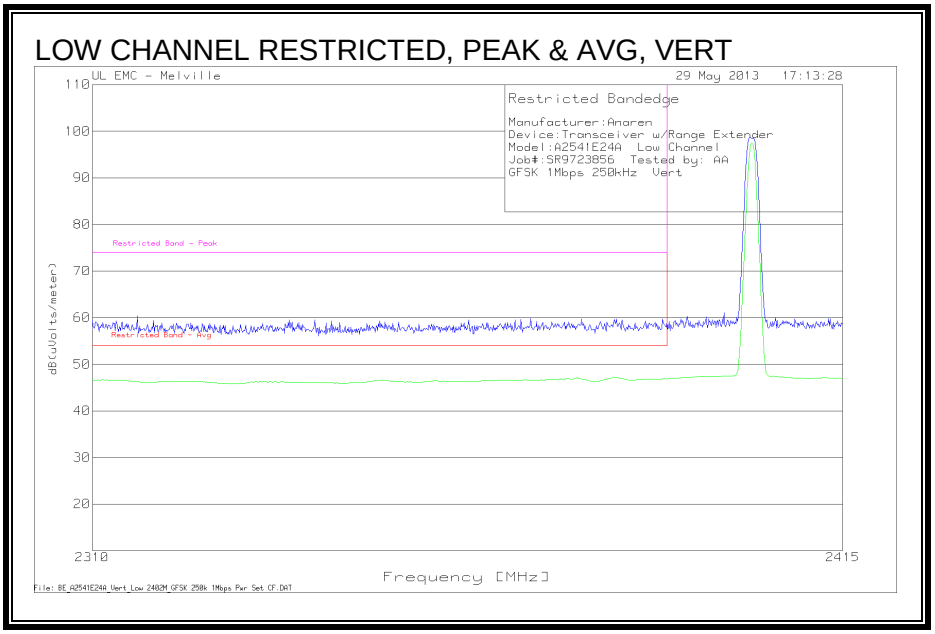
9.2. TRANSMITTER ABOVE 1 GHz – MODEL: A2541E24A

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

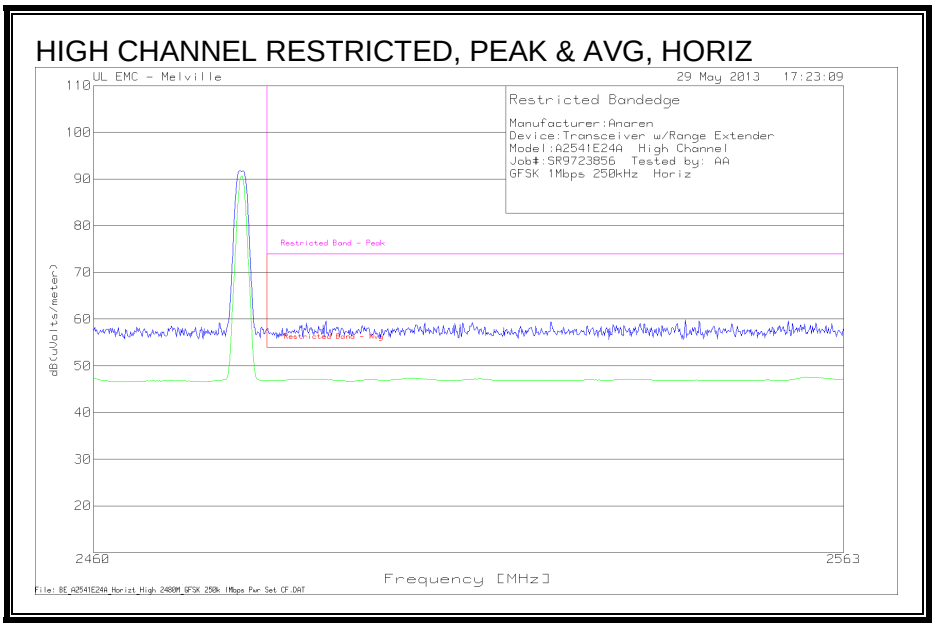
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



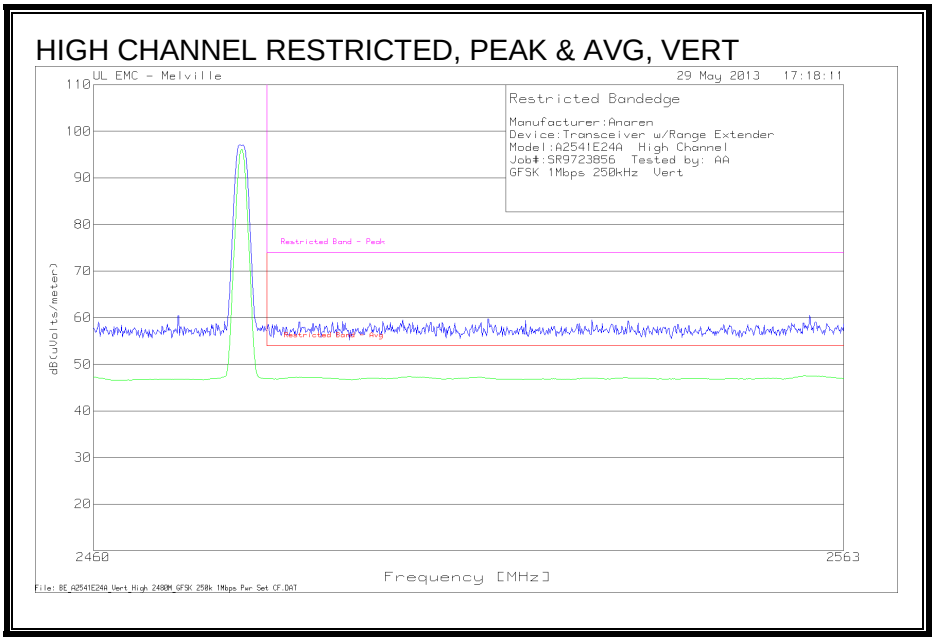
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24A
Job#:SR9723856 Tested by: DC/RM
GFSK 1Mbps 250kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4803.639	77.7	PK2	27.1	-52.2	52.6	-	-	74	-21.4	291	313	Horz
4804.127	76.93	PK2	27.1	-52.17	51.86	-	-	74	-22.14	10	230	Vert
12011.673	62.21	PK2	37.2	-47.78	51.63	-	-	74	-22.37	283	287	Vert
12011.028	60.78	PK2	37.2	-47.81	50.17	-	-	74	-23.83	248	236	Horz
4804.102	73.58	MAv1	27.1	-52.17	48.51	54	-5.49	-	-	291	313	Horz
4804.113	72.3	MAv1	27.1	-52.17	47.23	54	-6.77	-	-	10	230	Vert
12011.347	52.16	MAv1	37.2	-47.79	41.57	54	-12.43	-	-	283	287	Vert
12009.099	51.48	MAv1	37.2	-47.9	40.78	54	-13.22	-	-	248	236	Horz

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880.2646	78.5	PK2	27.2	-52.12	53.58	-	-	74	-20.42	302	304	Horz
4880.1907	76.61	PK2	27.2	-52.12	51.69	-	-	74	-22.31	268	221	Vert
7319.26	79.68	PK2	28	-51.12	56.56	-	-	74	-17.44	265	102	Vert
7319.28	80.05	PK2	28	-51.12	56.93	-	-	74	-17.07	241	289	Horz
12201.319	61.1	PK2	37.2	-47.38	50.92	-	-	74	-23.08	301	366	Vert
12201.129	59.92	PK2	37.2	-47.37	49.75	-	-	74	-24.25	251	387	Horz
4880.208	74.38	MAv1	27.2	-52.12	49.46	54	-4.54	-	-	302	304	Horz
4879.9788	72.42	MAv1	27.2	-52.12	47.5	54	-6.5	-	-	268	221	Vert
7319.631	75.33	MAv1	28	-51.12	52.21	54	-1.79	-	-	265	102	Vert
7319.49	75.91	MAv1	28	-51.12	52.79	54	-1.21	-	-	241	289	Horz
12201.094	50.39	MAv1	37.2	-47.37	40.22	54	-13.78	-	-	301	366	Vert
12201.182	49.56	MAv1	37.2	-47.38	39.38	54	-14.62	-	-	251	387	Horz

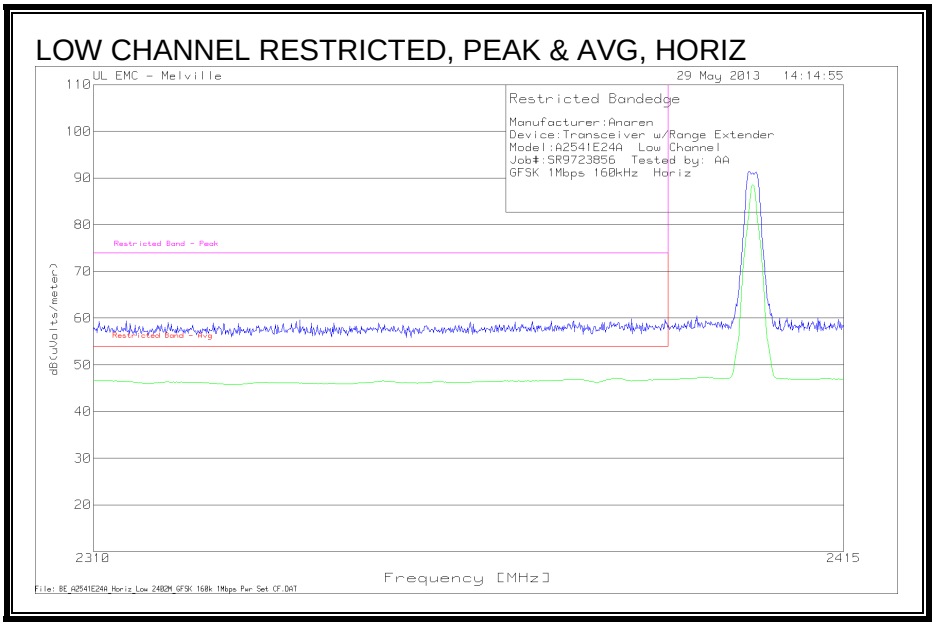
High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4959.782	78.9	PK2	27.3	-51.95	54.25	-	-	74	-19.75	296	263	Horz
4959.68	78.74	PK2	27.3	-51.95	54.09	-	-	74	-19.91	278	382	Vert
7439.4	74.48	PK2	28.1	-50.84	51.74	-	-	74	-22.26	326	325	Horz
7440.502	74.87	PK2	28.1	-50.87	52.1	-	-	74	-21.9	91	251	Vert
12401.438	59.94	PK2	37.2	-47.64	49.5	-	-	74	-24.5	311	362	Vert
12398.903	58.4	PK2	37.2	-47.48	48.12	-	-	74	-25.88	248	120	Horz
4960.145	75.5	MAv1	27.3	-51.94	50.86	54	-3.14	-	-	296	263	Horz
4960.139	74.74	MAv1	27.3	-51.94	50.1	54	-3.9	-	-	278	382	Vert
7439.54	69.73	MAv1	28.1	-50.85	46.98	54	-7.02	-	-	326	325	Horz
7439.51	70.23	MAv1	28.1	-50.85	47.48	54	-6.52	-	-	91	251	Vert
12398.978	48.89	MAv1	37.2	-47.49	38.6	54	-15.4	-	-	311	362	Vert
12398.888	48.87	MAv1	37.2	-47.48	38.59	54	-15.41	-	-	248	120	Horz

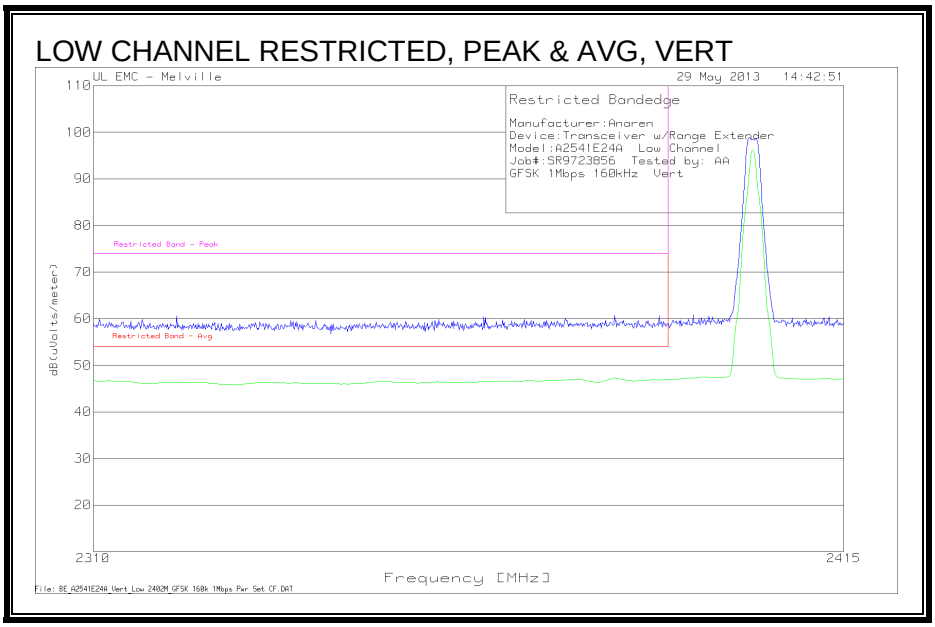
PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

9.2.2. TX ABOVE 1 GHz FOR GFSK 1Mbps 160kHz MODE IN THE 2.4 GHz BAND

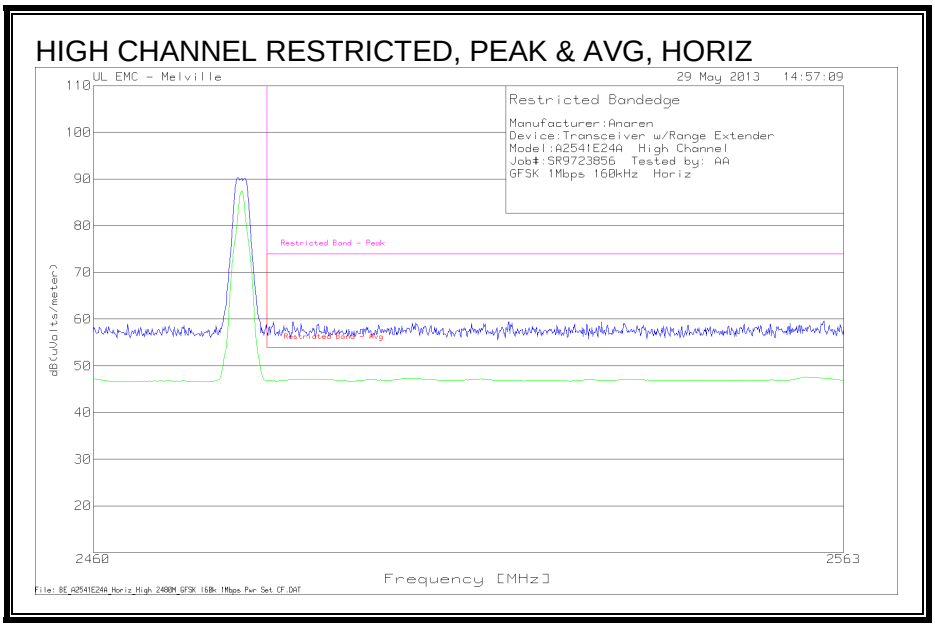
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



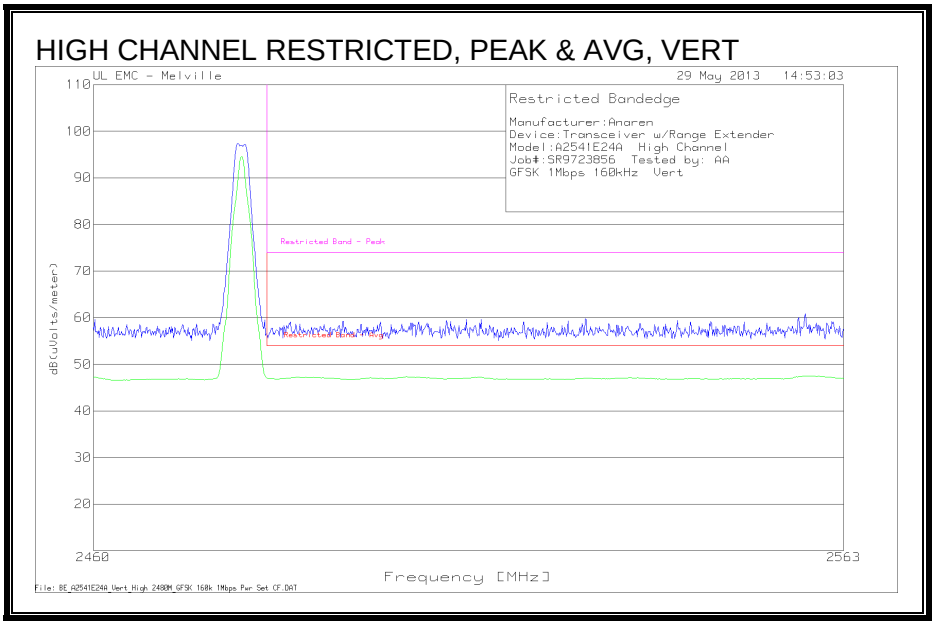
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24A
Job#:SR9723856 Tested by: AA/RM
GFSK 1Mbps 160kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.303	78.28	PK2	27.1	-52.2	53.22	-	-	74	-20.78	283	284	Horz
4804.1227	75.54	PK2	27.1	-52.2	50.47	-	-	74	-23.53	265	202	Vert
12010.785	62.4	PK2	37.2	-47.8	51.78	-	-	74	-22.22	243	357	Horz
12010.887	62.45	PK2	37.2	-47.8	51.83	-	-	74	-22.17	296	263	Vert
4804.044	75.11	MAv1	27.1	-52.2	50.04	54	-3.96	-	-	283	284	Horz
4804.0135	71.66	MAv1	27.1	-52.2	46.59	54	-7.41	-	-	265	202	Vert
12010.716	53.19	MAv1	37.2	-47.8	42.57	54	-11.43	-	-	243	357	Horz
12010.704	52.58	MAv1	37.2	-47.8	41.96	54	-12.04	-	-	296	263	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4879.8577	78.3	PK2	27.2	-52.1	53.38	-	-	74	-20.62	300	363	Horz
4879.7695	76.32	PK2	27.2	-52.1	51.4	-	-	74	-22.6	261	269	Vert
7318.5611	79	PK2	28	-52.3	54.66	-	-	74	-19.34	242	298	Horz
7318.7013	80.43	PK2	28	-52.3	56.09	-	-	74	-17.91	94	187	Vert
12199.65	61.14	PK2	37.2	-47.3	51.06	-	-	74	-22.94	237	326	Horz
12200.002	60.97	PK2	37.2	-47.3	50.87	-	-	74	-23.13	299	302	Vert
4880.0811	75.1	MAv1	27.2	-52.1	50.18	54	-3.82	-	-	300	363	Horz
4879.995	72.74	MAv1	27.2	-52.1	47.82	54	-6.18	-	-	261	269	Vert
7318.7916	74.09	MAv1	28	-52.3	49.75	54	-4.25	-	-	242	298	Horz
7318.7714	74.56	MAv1	28	-52.3	50.22	54	-3.78	-	-	94	187	Vert
12199.411	49.98	MAv1	37.2	-47.3	39.91	54	-14.09	-	-	237	326	Horz
12200.498	50.19	MAv1	37.2	-47.3	40.06	54	-13.94	-	-	299	302	Vert

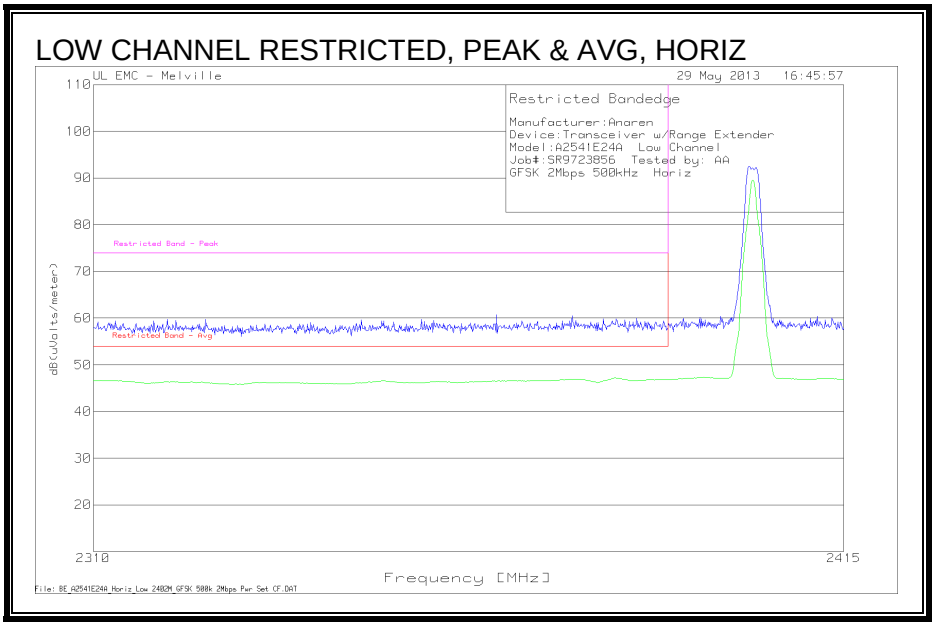
High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4960.2866	79.12	PK2	27.3	-51.9	54.48	-	-	74	-19.52	300	398	Horz
4959.9038	78.1	PK2	27.3	-52	53.45	-	-	74	-20.55	258	194	Vert
7441.4329	75.22	PK2	28.1	-52.1	51.19	-	-	74	-22.81	92	224	Vert
7441.3728	74.25	PK2	28.1	-52.1	50.22	-	-	74	-23.78	273	303	Horz
12399.699	59.93	PK2	37.2	-47.5	49.6	-	-	74	-24.4	247	235	Horz
12400.878	60.79	PK2	37.2	-47.6	50.39	-	-	74	-23.61	298	326	Vert
4960.0872	76.78	MAv1	27.3	-52	52.13	54	-1.87	-	-	300	398	Horz
4960.1814	74.82	MAv1	27.3	-51.9	50.18	54	-3.82	-	-	258	194	Vert
7441.2626	69.29	MAv1	28.1	-52.1	45.26	54	-8.74	-	-	92	224	Vert
7441.3427	68.19	MAv1	28.1	-52.1	44.16	54	-9.84	-	-	273	303	Horz
12399.586	49.32	MAv1	37.2	-47.5	39	54	-15	-	-	247	235	Horz
12400.747	50.24	MAv1	37.2	-47.6	39.84	54	-14.16	-	-	298	326	Vert

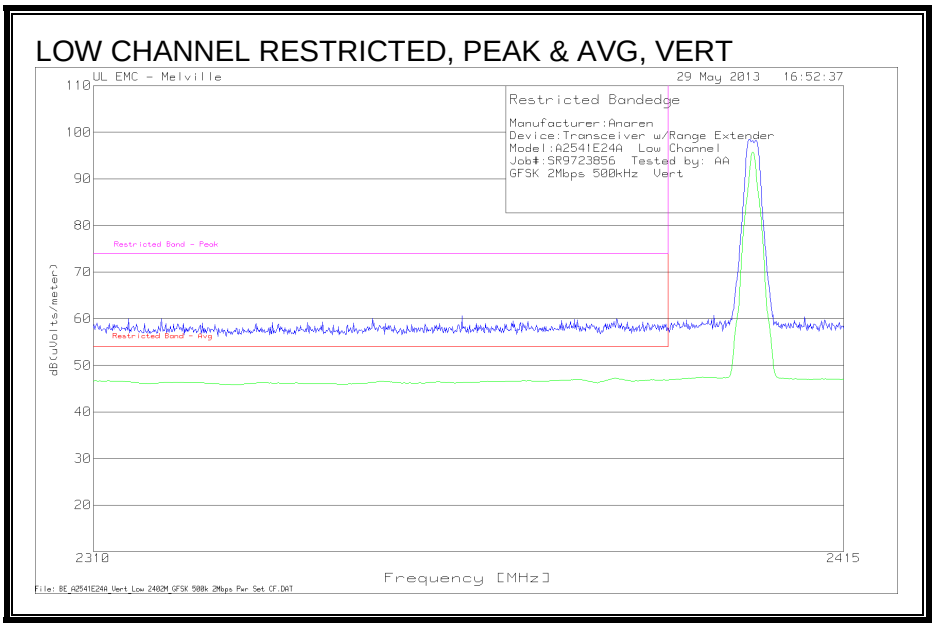
PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

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

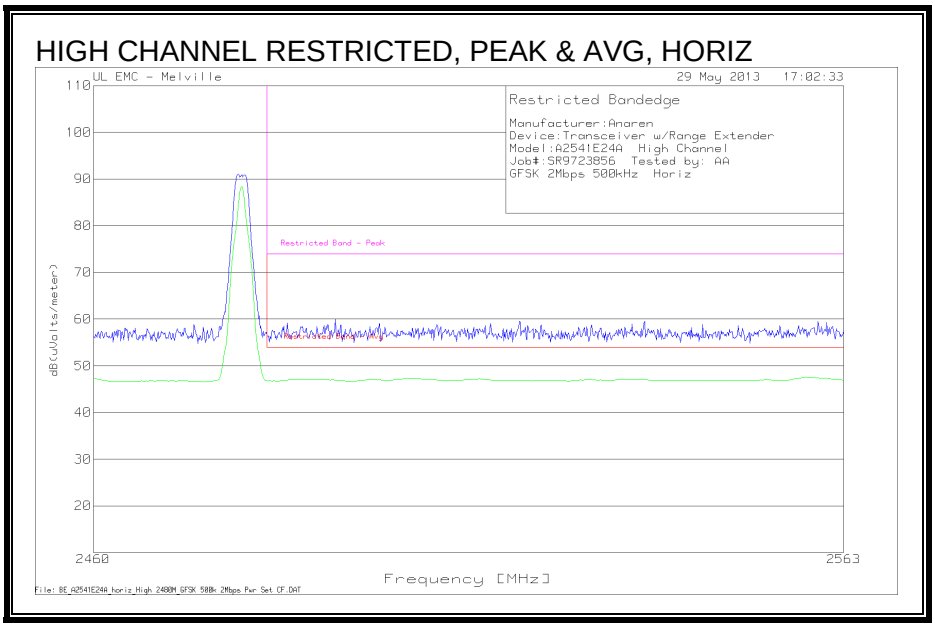
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



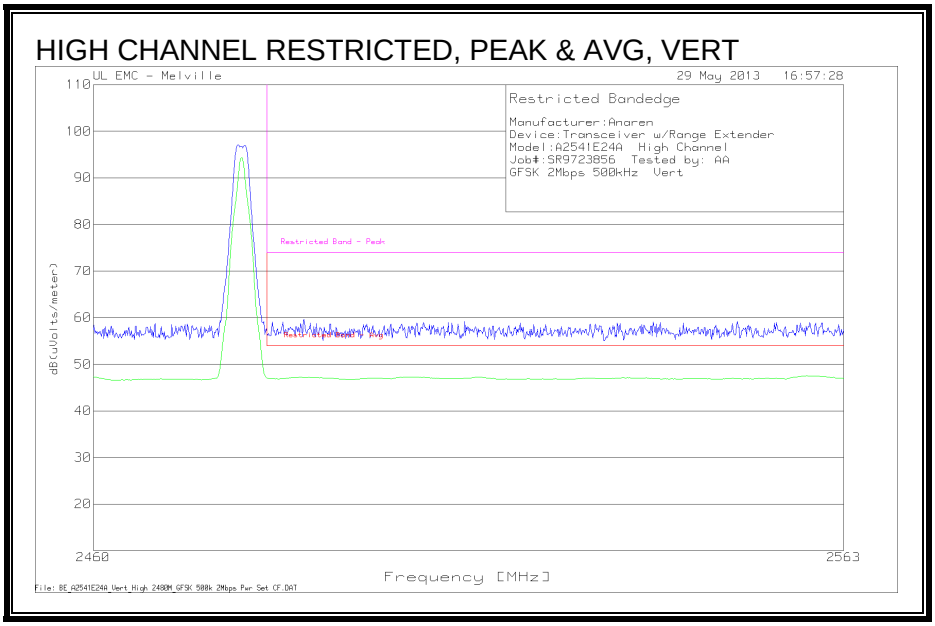
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24A
Job#:SR9723856 Tested by: AA/RM
GFSK 2Mbps 500kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.08	69.53	PK2	27.1	-52.2	44.46	-	-	74	-29.54	360	350	Horz
4804.1165	75.84	PK2	27.1	-52.2	50.77	-	-	74	-23.23	11	345	Vert
12012.413	61.06	PK2	37.2	-47.7	50.52	-	-	74	-23.48	281	377	Vert
12007.811	60.68	PK2	37.2	-48	49.92	-	-	74	-24.08	250	200	Horz
4804.1315	62.09	MAv1	27.1	-52.2	37.02	54	-16.98	-	-	360	350	Horz
4804.083	70.17	MAv1	27.1	-52.2	45.1	54	-8.9	-	-	11	345	Vert
12012.41	50.91	MAv1	37.2	-47.7	40.37	54	-13.63	-	-	281	377	Vert
12007.776	50.05	MAv1	37.2	-48	39.29	54	-14.71	-	-	250	200	Horz

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4879.9769	77.49	PK2	27.2	-52.1	52.57	-	-	74	-21.43	290	359	Horz
4880.05	74.61	PK2	27.2	-52.1	49.69	-	-	74	-24.31	248	178	Vert
7318.62	81.4	PK2	28	-51.1	58.27	-	-	74	-15.73	222	386	Horz
7318.66	73.83	PK2	28	-51.1	50.7	-	-	74	-23.3	121	386	Vert
9758.2008	66.01	PK2	33.2	-48.5	50.74	-	-	74	-23.26	309	398	Horz
9758.3311	61.86	PK2	33.2	-48.5	46.58	-	-	74	-27.42	360	246	Vert
4880.0257	72.04	MAv1	27.2	-52.1	47.12	54	-6.88	-	-	290	359	Horz
4880.0934	68.78	MAv1	27.2	-52.1	43.86	54	-10.14	-	-	248	178	Vert
7318.94	76.5	MAv1	28	-51.1	53.38	54	-0.62	-	-	222	386	Horz
7318.85	68.2	MAv1	28	-51.1	45.08	54	-8.92	-	-	121	386	Vert
9758.2209	57.74	MAv1	33.2	-48.5	42.47	54	-11.53	-	-	309	398	Horz
9758.3386	51.5	MAv1	33.2	-48.5	36.22	54	-17.78	-	-	360	246	Vert

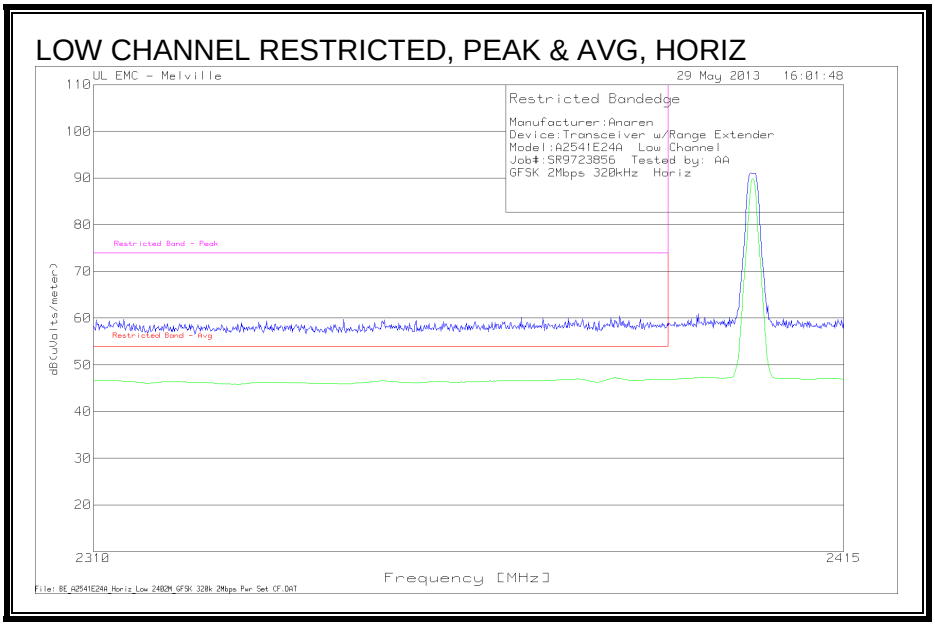
High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4960.912	78.58	PK2	27.3	-51.9	53.97	-	-	74	-20.03	303	391	Horz
4959.8	76.18	PK2	27.3	-52	51.53	-	-	74	-22.47	262	283	Vert
7438.557	75.96	PK2	28.1	-50.8	53.25	-	-	74	-20.75	304	387	Horz
7438.577	75.27	PK2	28.1	-50.8	52.56	-	-	74	-21.44	81	204	Vert
4960.626	73.56	MAv1	27.3	-51.9	48.94	54	-5.06	-	-	303	391	Horz
4959.424	70.52	MAv1	27.3	-52	45.86	54	-8.14	-	-	262	283	Vert
7438.848	70.97	MAv1	28.1	-50.8	48.25	54	-5.75	-	-	304	387	Horz
7441.272	69.47	MAv1	28.1	-50.9	46.7	54	-7.3	-	-	81	204	Vert

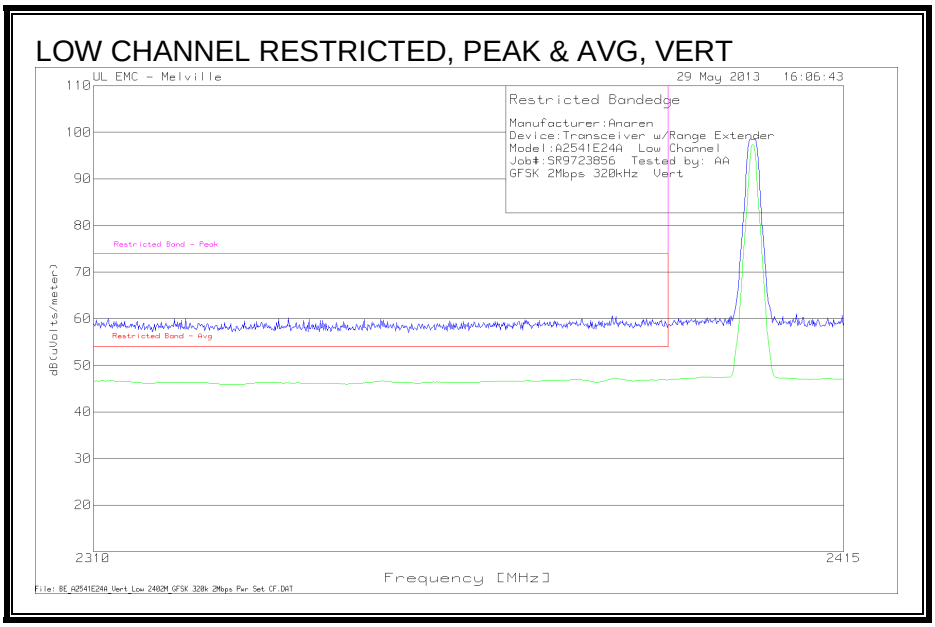
PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

9.2.4. TX ABOVE 1 GHz FOR GFSK 2Mbps 320kHz MODE IN THE 2.4 GHz BAND

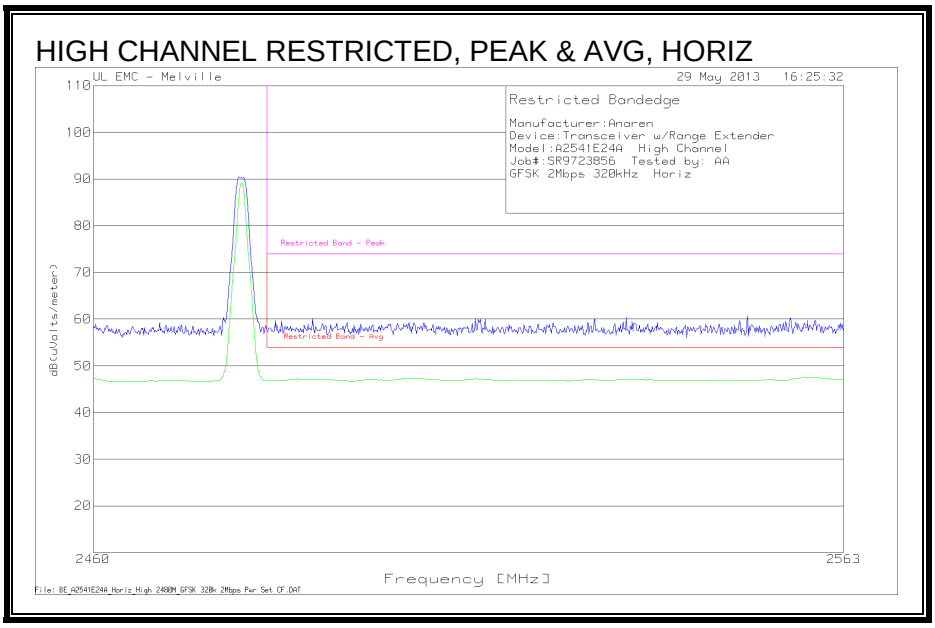
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



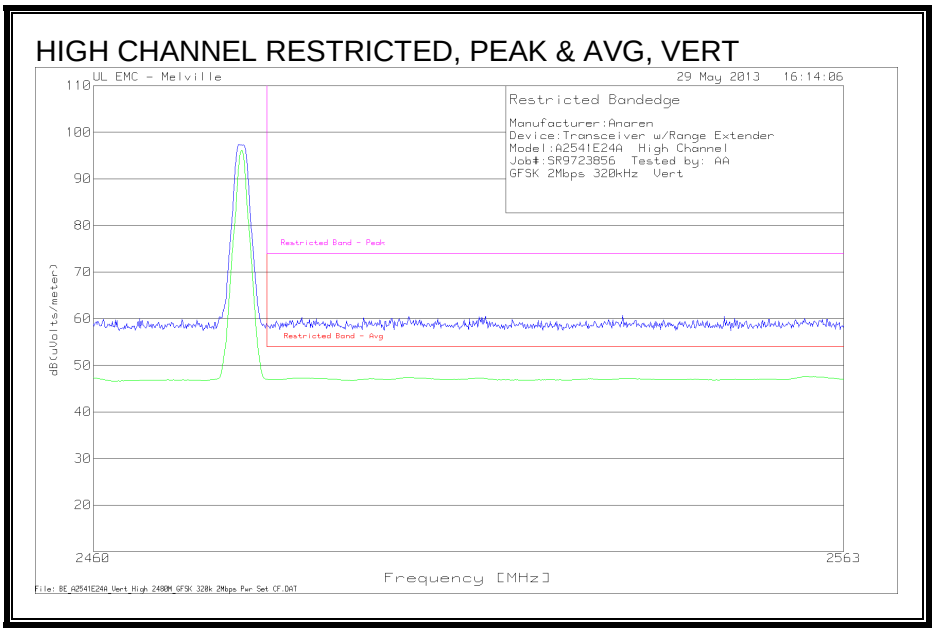
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24A
Job#:SR9723856 Tested by: AA/RM
GFSK 2Mbps 320kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4803.98	77.56	PK2	27.1	-52.2	52.48	-	-	74	-21.52	310	368	Horz
4804.06	72.9	PK2	27.1	-52.2	47.83	-	-	74	-26.17	155	249	Vert
12008.583	61.55	PK2	37.2	-47.9	50.82	-	-	74	-23.18	285	222	Vert
12008.681	60.79	PK2	37.2	-47.9	50.07	-	-	74	-23.93	249	113	Horz
4804.145	73.44	MAv1	27.1	-52.2	48.37	54	-5.63	-	-	310	368	Horz
4804.075	67.74	MAv1	27.1	-52.2	42.67	54	-11.33	-	-	155	249	Vert
12008.885	51.75	MAv1	37.2	-47.9	41.04	54	-12.96	-	-	285	222	Vert
12008.604	50.33	MAv1	37.2	-47.9	39.61	54	-14.39	-	-	249	113	Horz

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880.15	77.68	PK2	27.2	-52.1	52.76	-	-	74	-21.24	310	304	Horz
4879.679	75.9	PK2	27.2	-52.1	50.98	-	-	74	-23.02	267	225	Vert
7319.198	79.44	PK2	28	-51.1	56.32	-	-	74	-17.68	278	101	Vert
7320.821	79.89	PK2	28	-51.1	56.75	-	-	74	-17.25	239	288	Horz
4880.055	73.74	MAv1	27.2	-52.1	48.82	54	-5.18	-	-	310	304	Horz
4879.945	71.58	MAv1	27.2	-52.1	46.66	54	-7.34	-	-	267	225	Vert
7319.308	74.38	MAv1	28	-51.1	51.26	54	-2.74	-	-	278	101	Vert
7319.128	75.17	MAv1	28	-51.1	52.05	54	-1.95	-	-	239	288	Horz

High Channel - 2480MHz

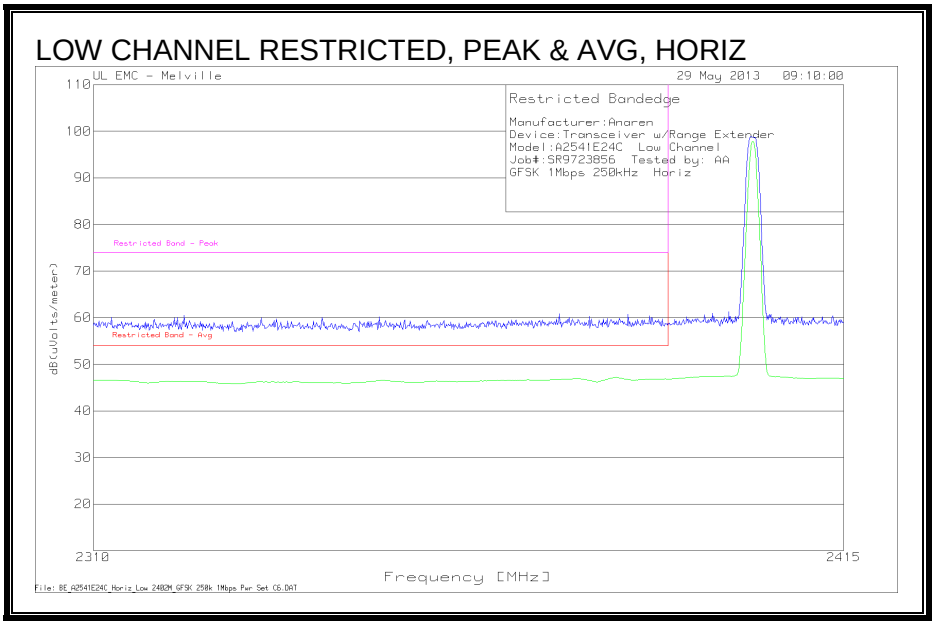
Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4959.549	78.42	PK2	27.3	-52	53.77	-	-	74	-20.23	308	299	Horz
4959.865	77.54	PK2	27.3	-52	52.89	-	-	74	-21.11	251	284	Vert
7438.998	73.81	PK2	28.1	-50.8	51.08	-	-	74	-22.92	331	322	Horz
7439.138	75.42	PK2	28.1	-50.8	52.69	-	-	74	-21.31	76	182	Vert
12401.543	58.96	PK2	37.2	-47.7	48.51	-	-	74	-25.49	312	350	Vert
12400.11	60.73	PK2	37.2	-47.6	50.37	-	-	74	-23.63	236	241	Horz
4959.995	74.59	MAv1	27.3	-52	49.94	54	-4.06	-	-	308	299	Horz
4959.998	73.62	MAv1	27.3	-52	48.97	54	-5.03	-	-	251	284	Vert
7439.389	67.99	MAv1	28.1	-50.8	45.25	54	-8.75	-	-	331	322	Horz
7439.348	70.11	MAv1	28.1	-50.8	47.37	54	-6.63	-	-	76	182	Vert
12401.493	48.66	MAv1	37.2	-47.6	38.22	54	-15.78	-	-	312	350	Vert
12398.657	48.99	MAv1	37.2	-47.5	38.72	54	-15.28	-	-	236	241	Horz

PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

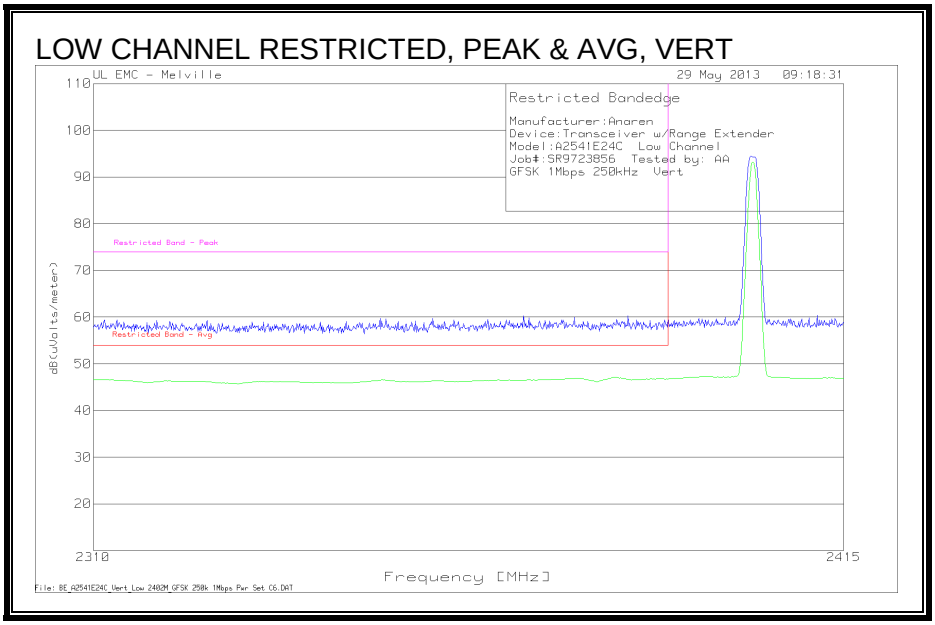
9.3. TRANSMITTER ABOVE 1 GHz – MODEL: A2541E24C

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

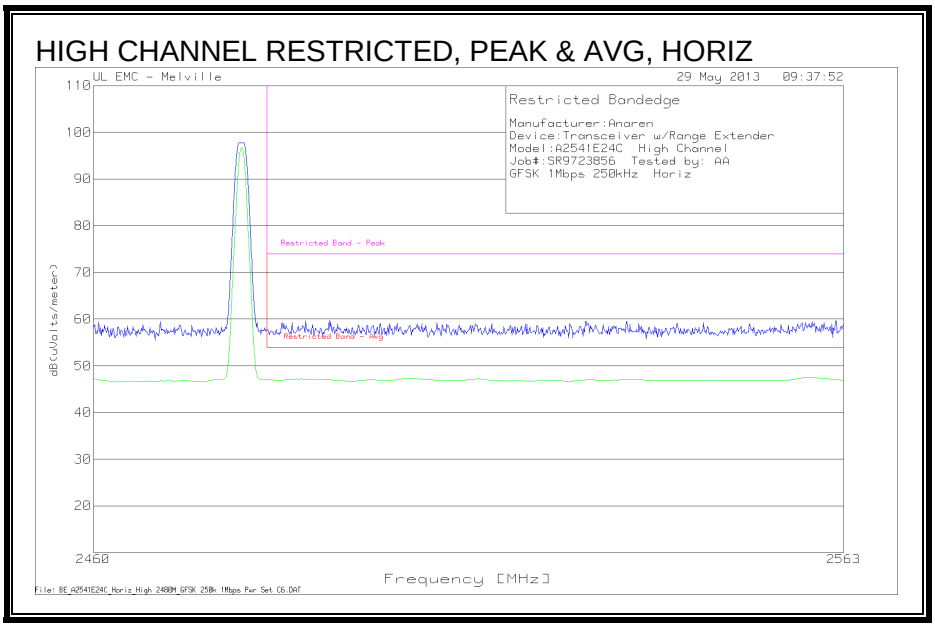
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



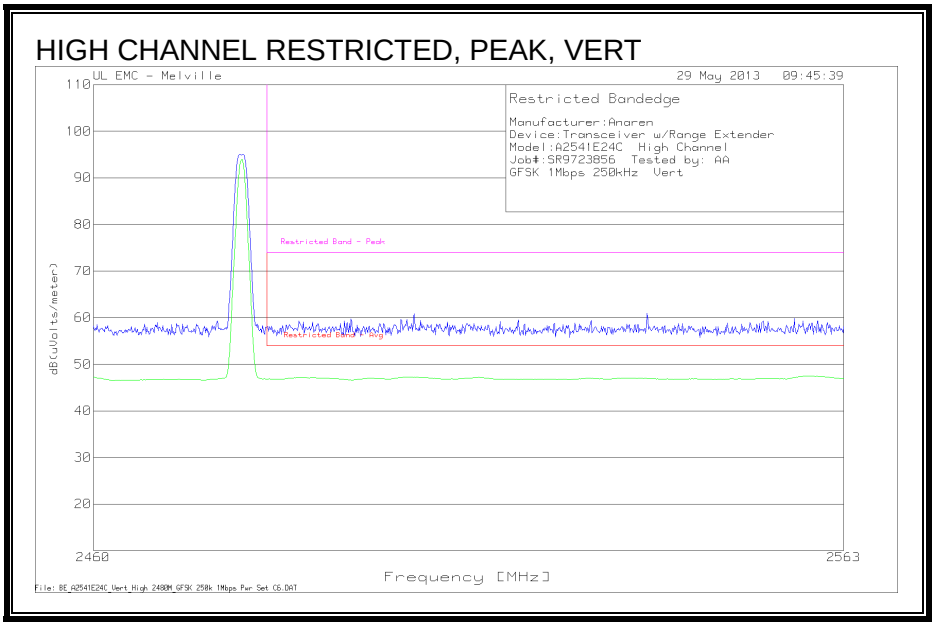
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24C
Job#:SR9723856 Tested by: AA/RM
GFSK 1Mbps 250kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.24	79.95	PK2	27.1	-52.2	54.89	-	-	74	-19.11	268	158	Horz
4804.64	81.65	PK2	27.1	-52.1	56.61	-	-	74	-17.39	222	172	Vert
4803.98	76.78	MAv1	27.1	-52.2	51.7	54	-2.3	-	-	268	158	Horz
4803.94	78.33	MAv1	27.1	-52.2	53.25	54	-0.75	-	-	222	172	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4880.551	73.31	PK2	27.2	-43.7	56.8	-	-	74	-17.2	354	304	Horz
4879.709	71.87	PK2	27.2	-43.7	55.36	-	-	74	-18.64	240	108	Vert
7319.36	80.31	PK2	28	-51.1	57.19	-	-	74	-16.81	92	225	Horz
7319.24	79.34	PK2	28	-51.1	56.22	-	-	74	-17.78	327	384	Vert
12201.193	59.86	PK2	37.2	-47.4	49.68	-	-	74	-24.32	317	131	Vert
12199.369	58.87	PK2	37.2	-47.3	48.81	-	-	74	-25.19	143	130	Horz
4880.195	69.51	MAv1	27.2	-43.7	53	54	-1	-	-	354	304	Horz
4879.924	67.27	MAv1	27.2	-43.7	50.76	54	-3.24	-	-	240	108	Vert
7319.41	76.05	MAv1	28	-51.1	52.93	54	-1.07	-	-	92	225	Horz
7319.47	75.05	MAv1	28	-51.1	51.93	54	-2.07	-	-	327	384	Vert
12201.208	50.3	MAv1	37.2	-47.4	40.12	54	-13.88	-	-	317	131	Vert
12201.378	48.15	MAv1	37.2	-47.4	37.96	54	-16.04	-	-	143	130	Horz

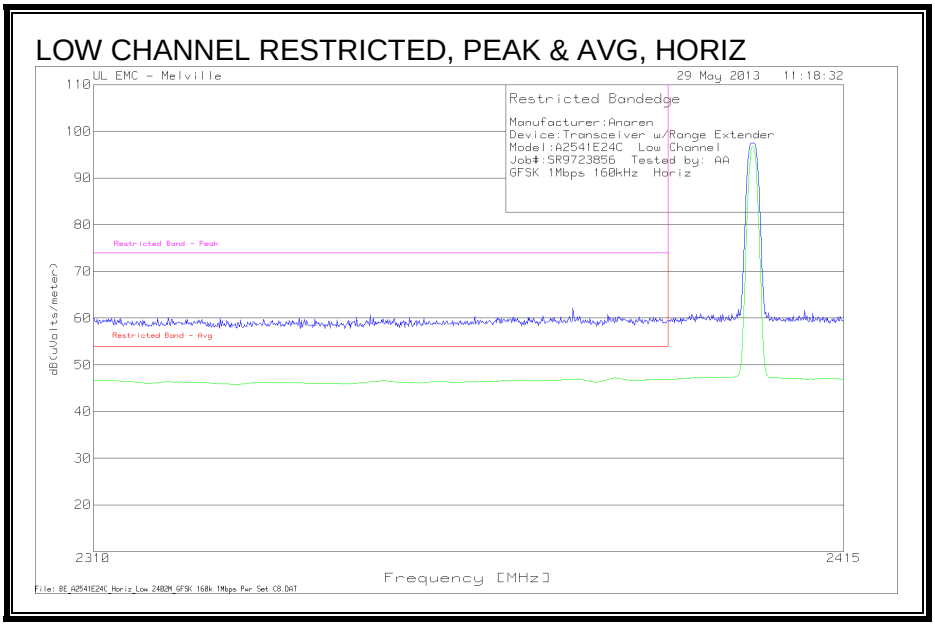
High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4960.461	71.67	PK2	27.3	-43.7	55.27	54	-	-	-18.73	357	220	Horz
4960.416	72.01	PK2	27.3	-43.7	55.61	54	-	-	-18.39	29	317	Vert
7439.23	75.54	PK2	28.1	-50.8	52.8	54	-	-	-21.2	292	380	Vert
7439.591	76.44	PK2	28.1	-50.9	53.69	54	-	-	-20.31	6	305	Horz
12399.289	59.08	PK2	37.2	-47.5	48.78	54	-	-	-25.22	327	344	Vert
12401.403	59.83	PK2	37.2	-47.6	49.39	54	-	-	-24.61	227	312	Horz
4959.835	67.22	MAv1	27.3	-43.7	50.8	54	-3.2	74	-	-	220	Horz
4959.79	67.42	MAv1	27.3	-43.7	51	54	-3	74	-	-	317	Vert
7440.69	70.93	MAv1	28.1	-50.9	48.16	54	-5.84	74	-	-	380	Vert
7440.563	71.81	MAv1	28.1	-50.9	49.04	54	-4.96	74	-	-	305	Horz
12398.733	49.12	MAv1	37.2	-47.5	38.85	54	-15.15	74	-	-	344	Vert
12398.928	49.48	MAv1	37.2	-47.5	39.2	54	-14.8	74	-	-	312	Horz

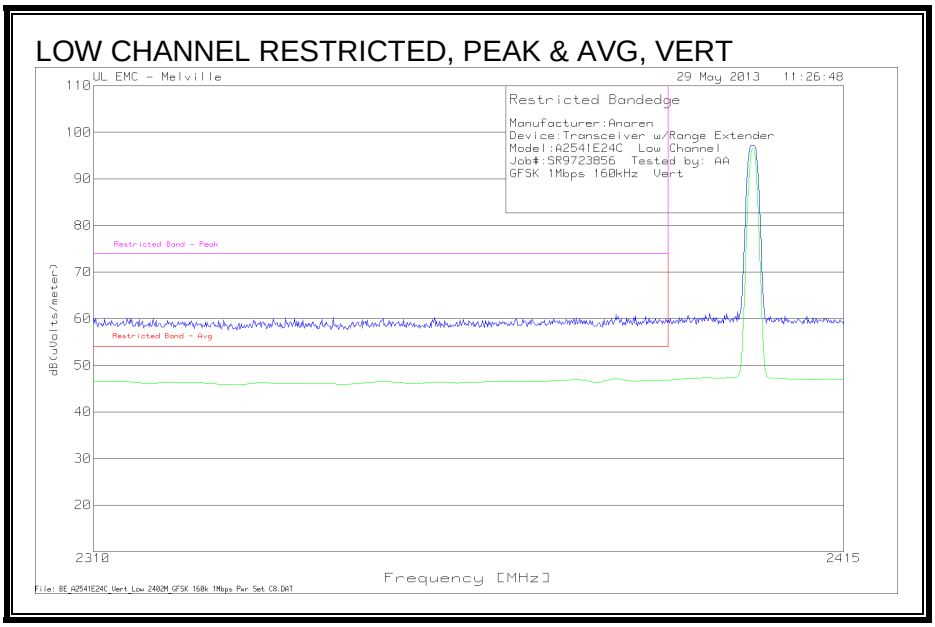
PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

9.3.2. TX ABOVE 1 GHz FOR GFSK 1Mbps 160kHz MODE IN THE 2.4 GHz BAND

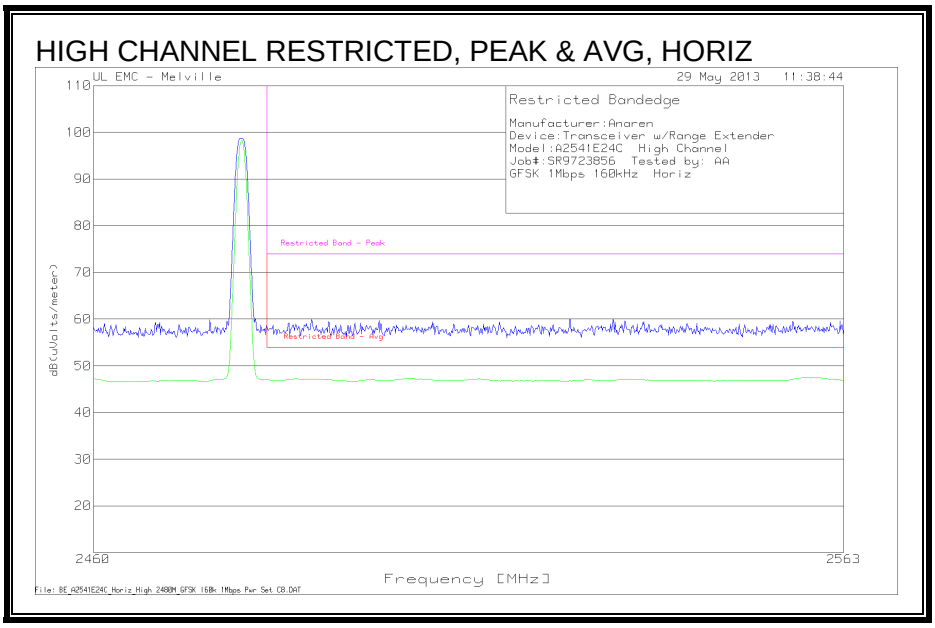
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



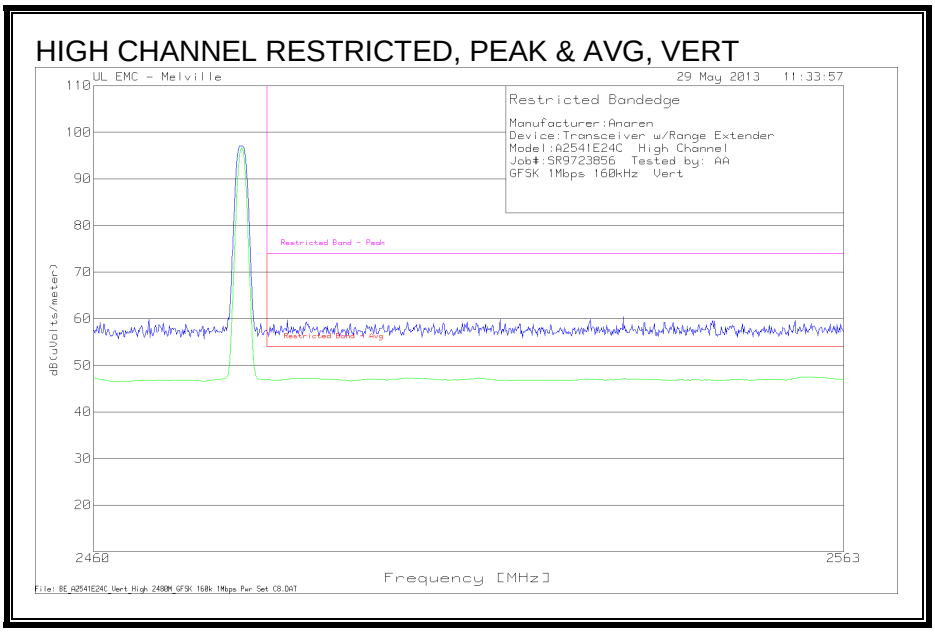
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24C
Job#:SR9723856 Tested by: AA/RM
GFSK 1Mbps 160kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4803.92	81.09	PK2	27.1	-52.2	56.01	-	-	74	-17.99	232	135	Vert
4804.32	79.14	PK2	27.1	-52.2	54.08	-	-	74	-19.92	270	189	Horz
4804.09	78.81	MAv1	27.1	-52.2	53.74	54	-0.26	-	-	232	135	Vert
4804.029	76.69	MAv1	27.1	-52.2	51.62	54	-2.38	-	-	270	189	Horz

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4879.68	79.77	PK2	27.2	-52.1	54.85	-	-	74	-19.15	230	131	Vert
4880.08	77.89	PK2	27.2	-52.1	52.97	-	-	74	-21.03	307	243	Horz
7319.722	79.27	PK2	28	-51.1	56.15	-	-	74	-17.85	81	250	Horz
7320.443	79.51	PK2	28	-51.1	56.38	-	-	74	-17.62	338	382	Vert
12200.92	59.2	PK2	37.2	-47.4	49.04	-	-	74	-24.96	249	291	Horz
12199.818	59.21	PK2	37.2	-47.3	49.12	-	-	74	-24.88	38	259	Vert
4880.02	77.36	MAv1	27.2	-52.1	52.44	54	-1.56	-	-	230	131	Vert
4879.98	75.5	MAv1	27.2	-52.1	50.58	54	-3.42	-	-	307	243	Horz
7319.832	76.18	MAv1	28	-51.1	53.06	54	-0.94	-	-	81	250	Horz
7320.172	76.45	MAv1	28	-51.1	53.33	54	-0.67	-	-	338	382	Vert
12199.54	49.64	MAv1	37.2	-47.3	39.57	54	-14.43	-	-	249	291	Horz
12199.608	50.01	MAv1	37.2	-47.3	39.93	54	-14.07	-	-	38	259	Vert

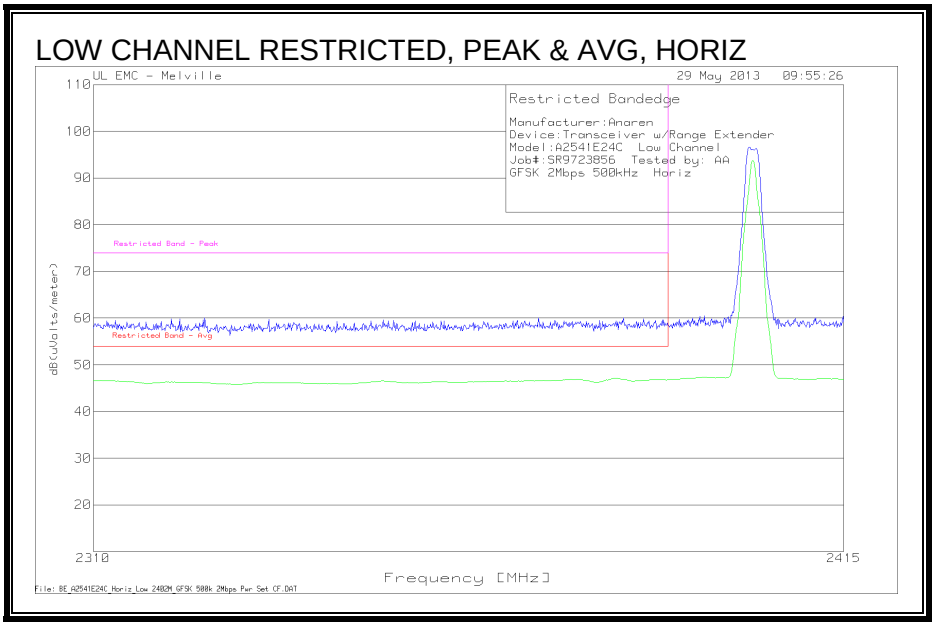
High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4959.96	77.43	PK2	27.3	-52	52.78	-	-	74	-21.22	255	295	Vert
4960.06	77.02	PK2	27.3	-52	52.37	-	-	74	-21.63	308	201	Horz
7439.461	77.55	PK2	28.1	-50.8	54.81	-	-	74	-19.19	286	380	Vert
7439.621	77.6	PK2	28.1	-50.9	54.85	-	-	74	-19.15	8	307	Horz
12400.32	59.66	PK2	37.2	-47.6	49.29	-	-	74	-24.71	238	230	Horz
12400.6	58.88	PK2	37.2	-47.6	48.49	-	-	74	-25.51	13	139	Vert
4959.98	75.13	MAv1	27.3	-52	50.48	54	-3.52	-	-	255	295	Vert
4960.05	74.24	MAv1	27.3	-52	49.59	54	-4.41	-	-	308	201	Horz
7440.192	74.08	MAv1	28.1	-50.9	51.31	54	-2.69	-	-	286	380	Vert
7440.172	74.27	MAv1	28.1	-50.9	51.5	54	-2.5	-	-	8	307	Horz
12399.46	50.51	MAv1	37.2	-47.5	40.19	54	-13.81	-	-	238	230	Horz
12400.71	49.21	MAv1	37.2	-47.6	38.82	54	-15.18	-	-	13	139	Vert

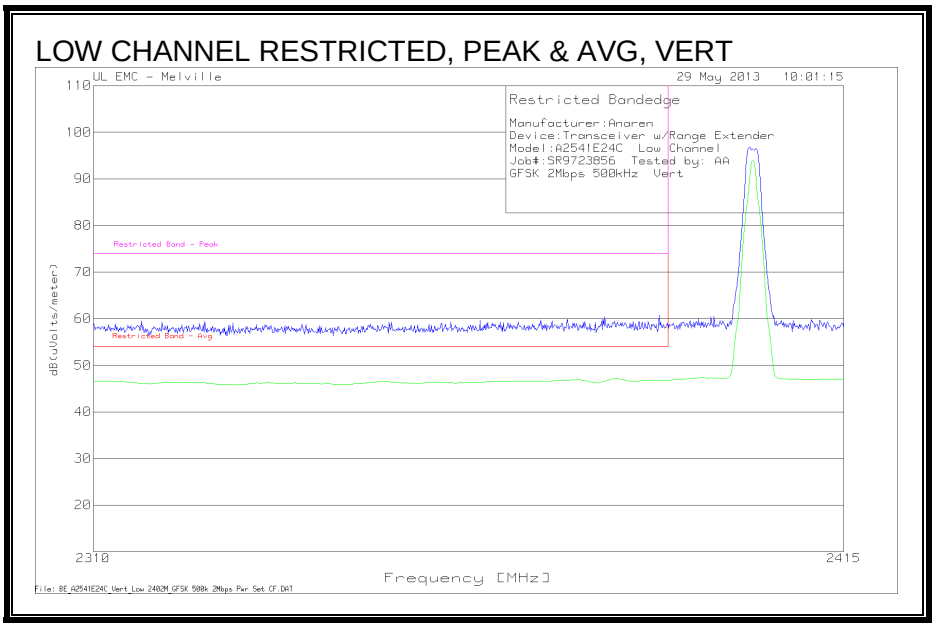
PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

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

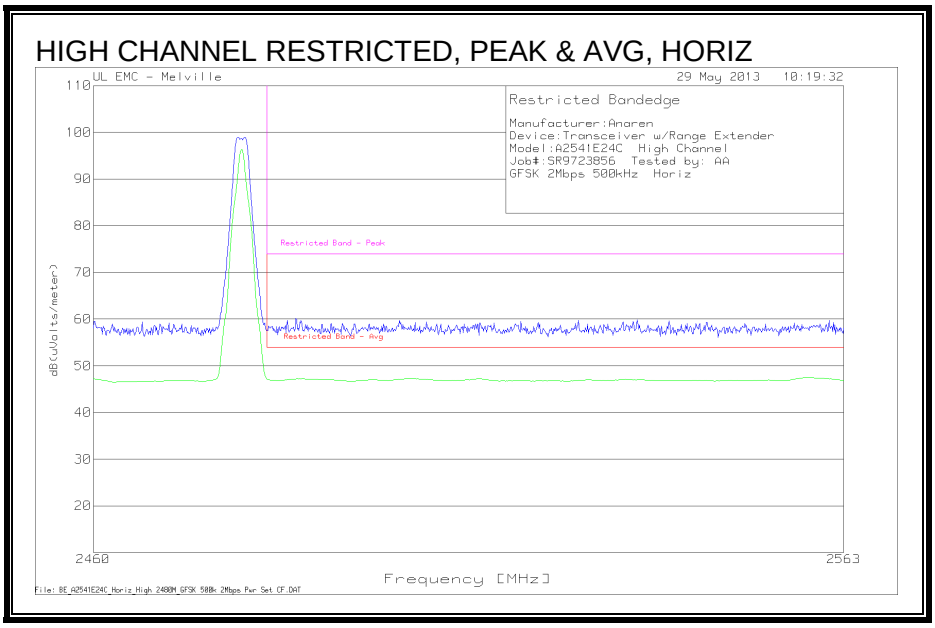
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



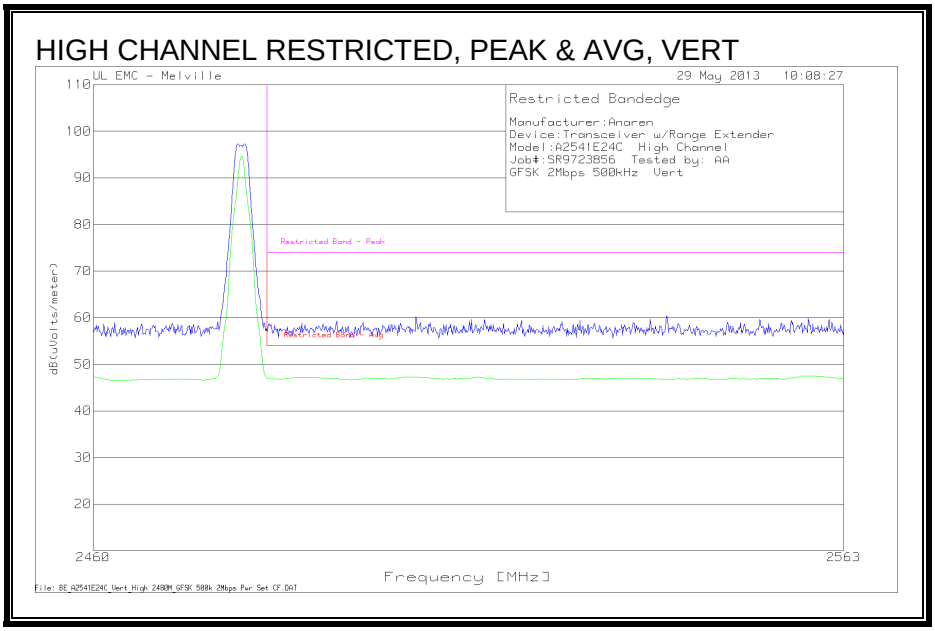
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24C
Job#:SR9723856 Tested by: AA/RM
GFSK 2Mbps 500kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.836	80.85	PK2	27.1	-52.1	55.83	-	-	74	-18.17	286	219	Vert
4804.91	81.43	PK2	27.1	-52.1	56.41	-	-	74	-17.59	299	311	Horz
12000.86	59.71	PK2	37.2	-48	48.87	-	-	74	-25.13	247	338	Horz
12009.069	60.79	PK2	37.2	-47.9	50.09	-	-	74	-23.91	252	250	Vert
4804.734	76.14	MAv1	27.1	-52.1	51.11	54	-2.89	-	-	286	219	Vert
4804.684	76.88	MAv1	27.1	-52.1	51.85	54	-2.15	-	-	299	311	Horz
12007.793	50.09	MAv1	37.2	-48	39.33	54	-14.67	-	-	247	338	Horz
12007.831	51.16	MAv1	37.2	-48	40.4	54	-13.6	-	-	252	250	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4879.12	79.89	PK2	27.2	-52.1	54.97	-	-	74	-19.03	302	219	Vert
4879.112	80.25	PK2	27.2	-52.1	55.33	-	-	74	-18.67	303	299	Horz
7318.592	81.11	PK2	28	-51.1	57.98	-	-	74	-16.02	347	386	Vert
7321.418	81.19	PK2	28	-51.2	58.04	-	-	74	-15.96	101	287	Horz
4879.194	75.25	MAv1	27.2	-52.1	50.33	54	-3.67	-	-	302	219	Vert
4879.33	75.48	MAv1	27.2	-52.1	50.56	54	-3.44	-	-	303	299	Horz
7318.923	76.19	MAv1	28	-51.1	53.07	54	-0.93	-	-	347	386	Vert
7318.783	76.65	MAv1	28	-51.1	53.53	54	-0.47	-	-	101	287	Horz

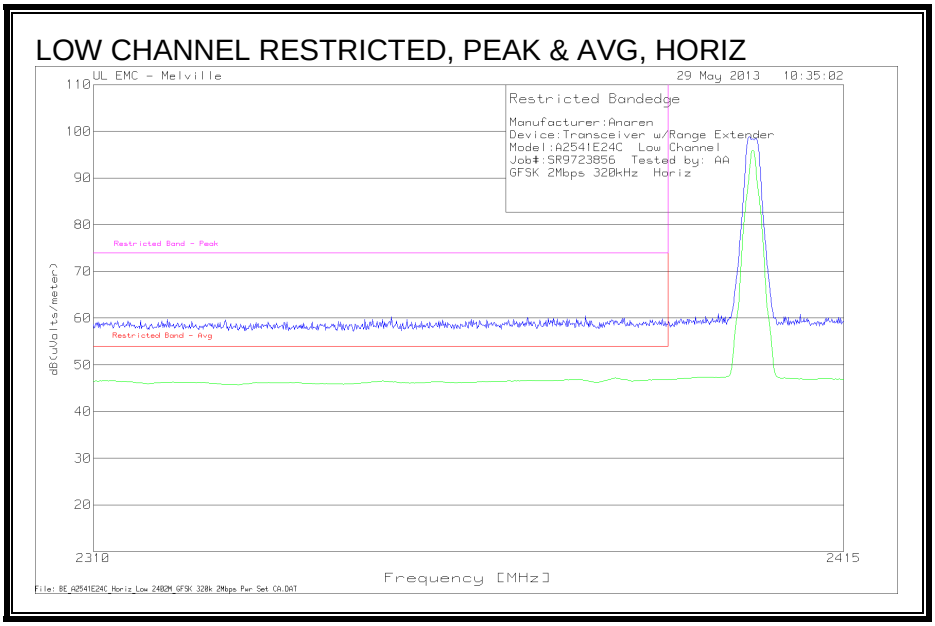
High Channel - 2480MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
7438.88	73.48	RMS	28.1	-50.8	50.76	-	-	74	-23.24	260	213	Vert
4959.088	80.14	PK2	27.3	-52	55.48	-	-	74	-18.52	294	372	Vert
4959.29	75.91	PK2	27.3	-52	51.25	-	-	74	-22.75	328	139	Horz
7438.65	78.59	PK2	28.1	-50.8	55.88	-	-	74	-18.12	5	307	Horz
7441.375	78.54	PK2	28.1	-50.9	55.77	-	-	74	-18.23	260	213	Vert
12402.37	60.23	PK2	37.2	-47.7	49.73	-	-	74	-24.27	263	219	Vert
4959.359	75.38	MAv1	27.3	-52	50.72	54	-3.28	-	-	294	372	Vert
4960.71	70.84	MAv1	27.3	-51.9	46.22	54	-7.78	-	-	328	139	Horz
7438.91	74.02	MAv1	28.1	-50.8	51.3	54	-2.7	-	-	5	307	Horz
12398	58.61	MAv1	37.2	-47.4	48.39	54	-5.61	-	-	134	163	Horz
12402.27	48.84	MAv1	37.2	-47.7	38.35	54	-15.65	-	-	134	163	Horz
12402.27	49.82	MAv1	37.2	-47.7	39.33	54	-14.67	-	-	263	219	Vert

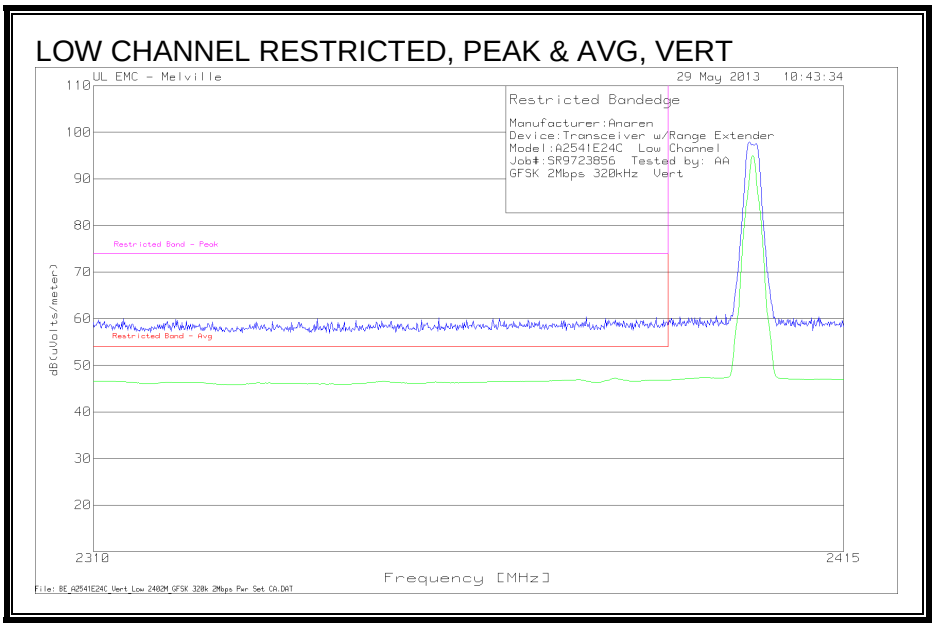
PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

9.3.4. TX ABOVE 1 GHz FOR GFSK 2Mbps 320kHz MODE IN THE 2.4 GHz BAND

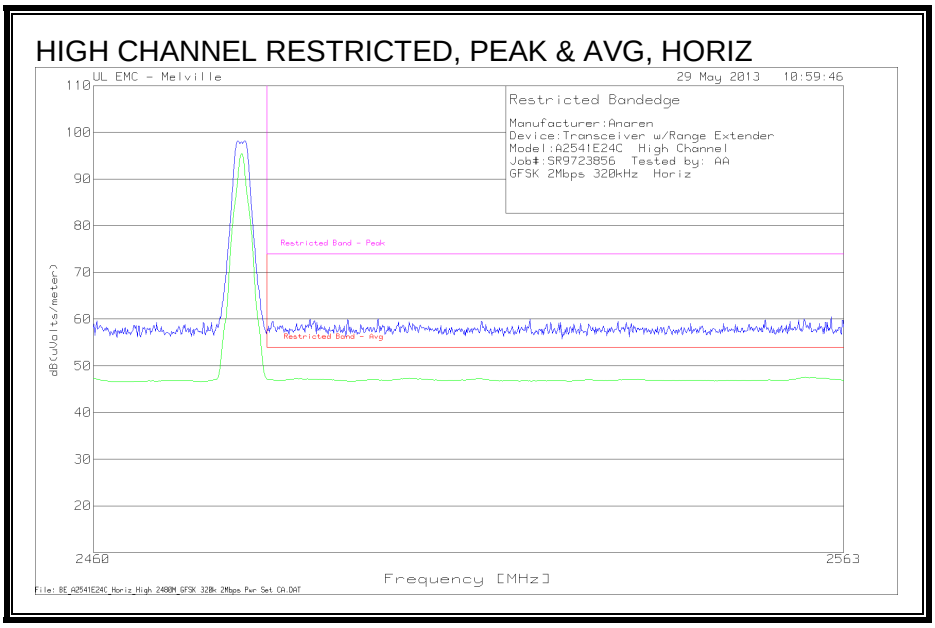
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



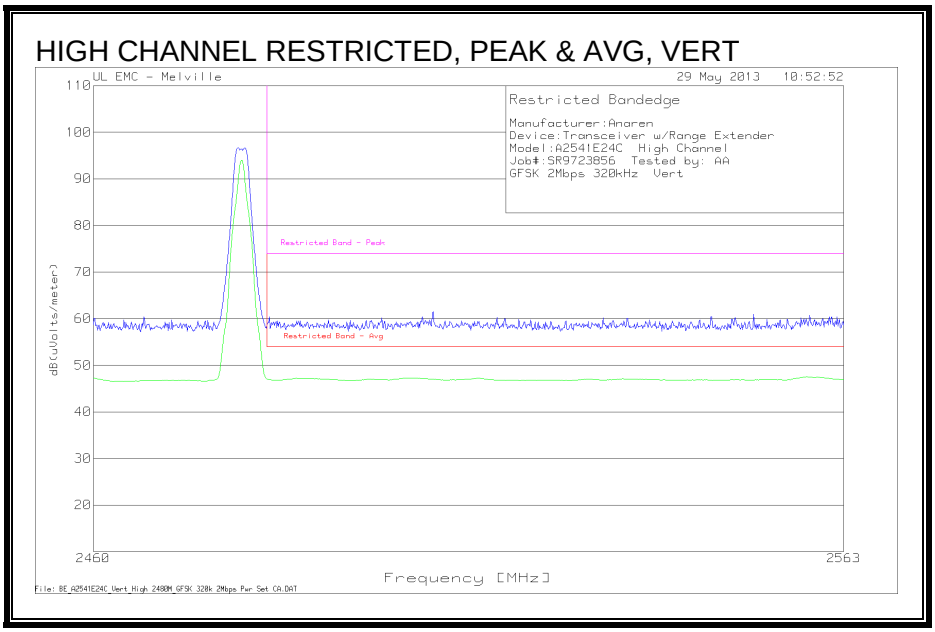
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

Manufacturer:Anaren
Device:Transceiver with Range Extender
Model:A2541E24C
Job#:SR9723856 Tested by: AA/RM
GFSK 2Mbps 320kHz

Low Channel - 2402MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4804.56	80.47	PK2	27.1	-52.1	55.43	-	-	74	-18.57	302	309	Horz
4804.681	80.49	PK2	27.1	-52.1	55.46	-	-	74	-18.54	302	260	Vert
4804.14	77.69	MAv1	27.1	-52.2	52.62	54	-1.38	-	-	302	309	Horz
4804.01	77.18	MAv1	27.1	-52.2	52.11	54	-1.89	-	-	302	260	Vert

Mid Channel - 2440MHz

Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4879.407	80.43	PK2	27.2	-52.1	55.51	-	-	74	-18.49	308	245	Horz
4879.467	78.99	PK2	27.2	-52.1	54.07	-	-	74	-19.93	308	245	Vert
7319.111	80.93	PK2	28	-51.1	57.81	-	-	74	-16.19	86	248	Horz
7319.131	79.72	PK2	28	-51.1	56.6	-	-	74	-17.4	219	379	Vert
12198.27	60.38	PK2	37.2	-47.2	50.38	-	-	74	-23.62	325	326	Vert
12201.817	59.73	PK2	37.2	-47.4	49.52	-	-	74	-24.48	236	153	Horz
4879.958	77.37	MAv1	27.2	-52.1	52.45	54	-1.55	-	-	308	245	Horz
4879.878	75.89	MAv1	27.2	-52.1	50.97	54	-3.03	-	-	308	245	Vert
7319.301	76.24	MAv1	28	-51.1	53.12	54	-0.88	-	-	86	248	Horz
7319.361	75.02	MAv1	28	-51.1	51.9	54	-2.1	-	-	219	379	Vert
12201.04	49.67	MAv1	37.2	-47.4	39.5	54	-14.5	-	-	325	326	Vert
12201.727	48.43	MAv1	37.2	-47.4	38.22	54	-15.78	-	-	236	153	Horz

High Channel - 2480MHz

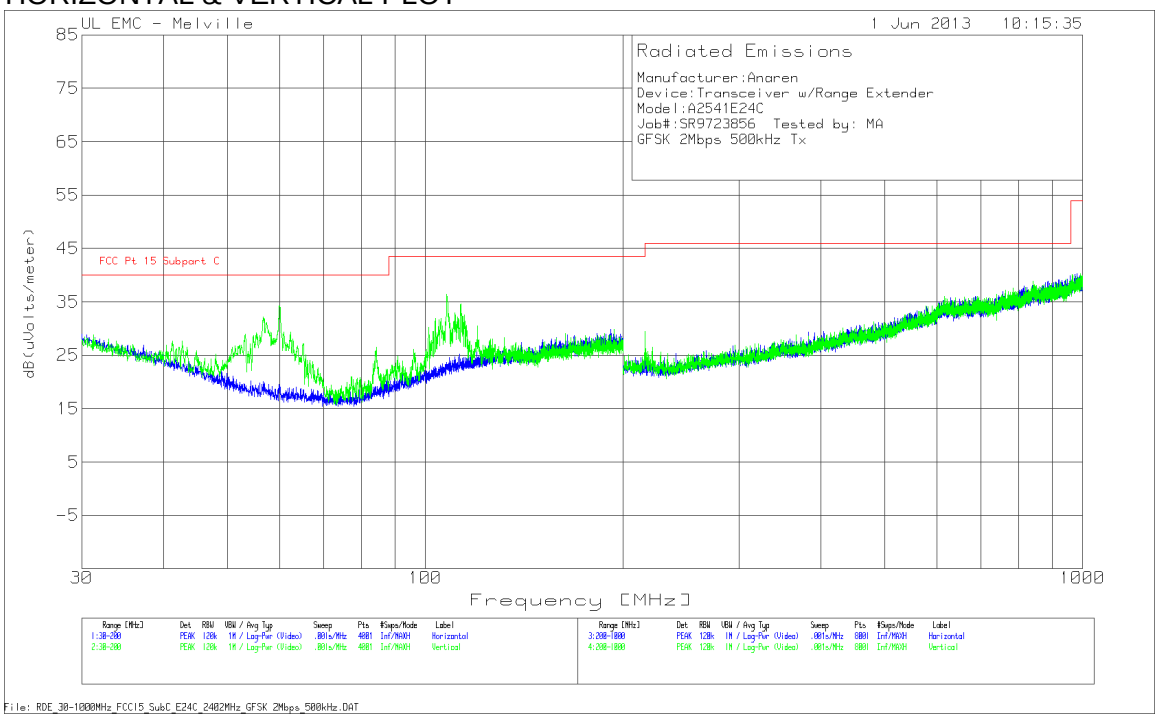
Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/r	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4959.56	78.83	PK2	27.3	-52	54.18	-	-	74	-19.82	312	205	Horz
4959.42	79.69	PK2	27.3	-52	55.03	-	-	74	-18.97	294	366	Vert
7439.18	77.01	PK2	28.1	-50.8	54.28	-	-	74	-19.72	289	381	Vert
7439.28	77.89	PK2	28.1	-50.8	55.15	-	-	74	-18.85	8	306	Horz
12398.36	58.88	PK2	37.2	-47.5	48.63	-	-	74	-25.37	45	316	Vert
12398.48	59.67	PK2	37.2	-47.5	49.42	-	-	74	-24.58	193	207	Horz
4960.14	75.48	MAv1	27.3	-51.9	50.84	54	-3.16	-	-	312	205	Horz
4959.771	76.49	MAv1	27.3	-52	51.84	54	-2.16	-	-	294	366	Vert
7440.633	72.16	MAv1	28.1	-50.9	49.39	54	-4.61	-	-	289	381	Vert
7440.773	72.98	MAv1	28.1	-50.9	50.21	54	-3.79	-	-	8	306	Horz
12401.43	49.58	MAv1	37.2	-47.6	39.14	54	-14.86	-	-	45	316	Vert
12401.476	49.53	MAv1	37.2	-47.6	39.09	54	-14.91	-	-	193	207	Horz

PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

9.4. WORST-CASE BELOW 1 GHz

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

HORIZONTAL & VERTICAL PLOT



HORIZONTAL & VERTICAL DATA

Manufacturer:Anaren
Device:Transceiver w/Range Extender
Model:A2541E24C
Job#:SR9723856 Tested by: MA
GFSK 2Mbps 500kHz Tx

Vertical 30 - 200MHz

Test Frequency	Meter Reading	Detector	AF-54 [dB/m]	GL-3M [dB]	dB(uVolts/meter)	FCC Pt 15 Subpart C	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
60.0198	23.24	QP	6.9	0.1	30.24	40	-9.76	241	113	Vert
56.705	20.38	QP	7.5	0.2	28.08	40	-11.92	298	121	Vert
107.9675	18.97	QP	12.1	0.4	31.47	43.5	-12.03	88	131	Vert
113.216	16.5	QP	12.8	0.4	29.7	43.5	-13.8	83	106	Vert
103.471	15.07	QP	11.4	0.4	26.87	43.5	-16.63	158	104	Vert
53.273	13.75	QP	8.6	0.1	22.45	40	-17.55	209	117	Vert

QP - Quasi-Peak detector

10. 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

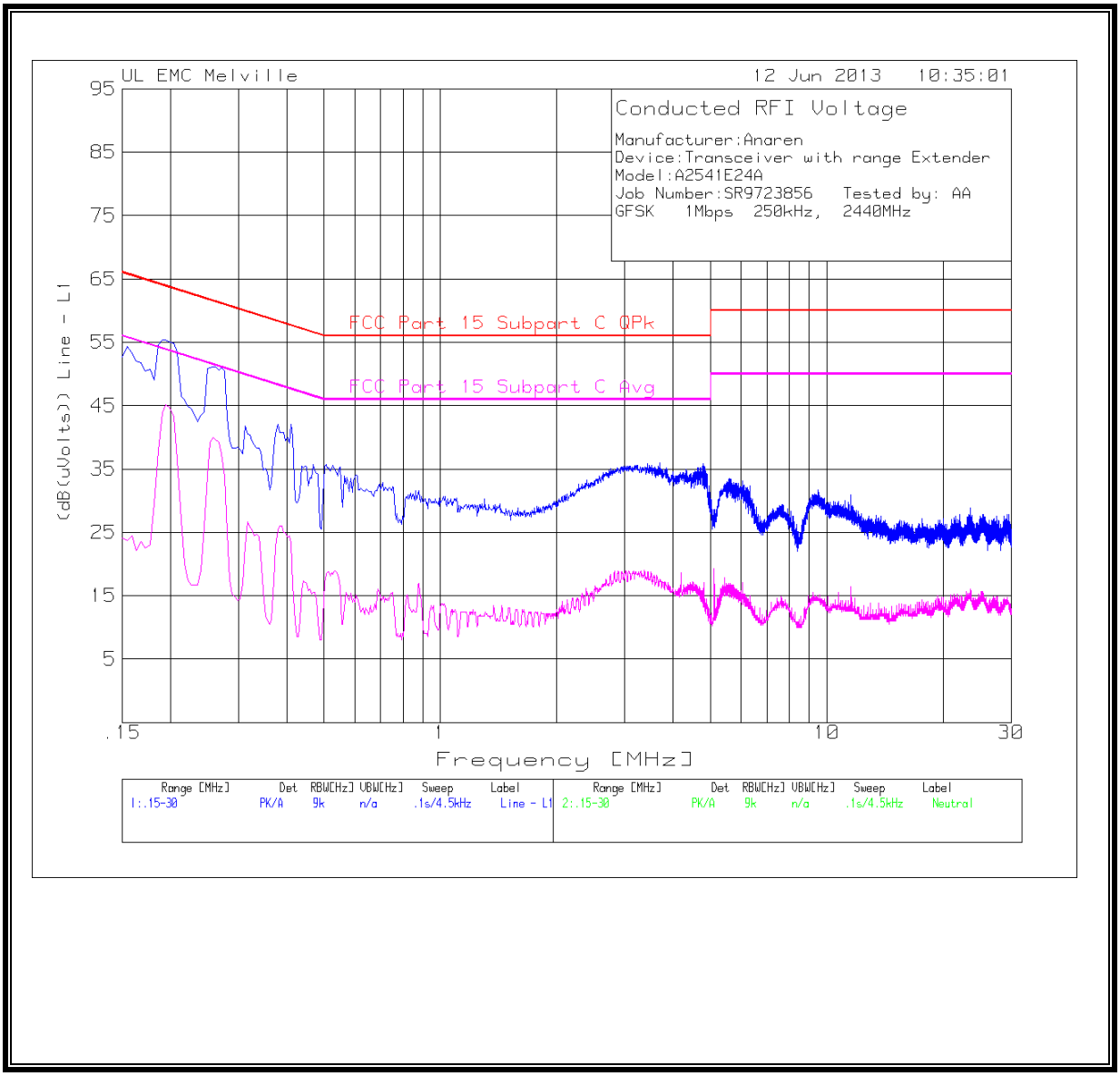
ANSI C63.4

RESULTS

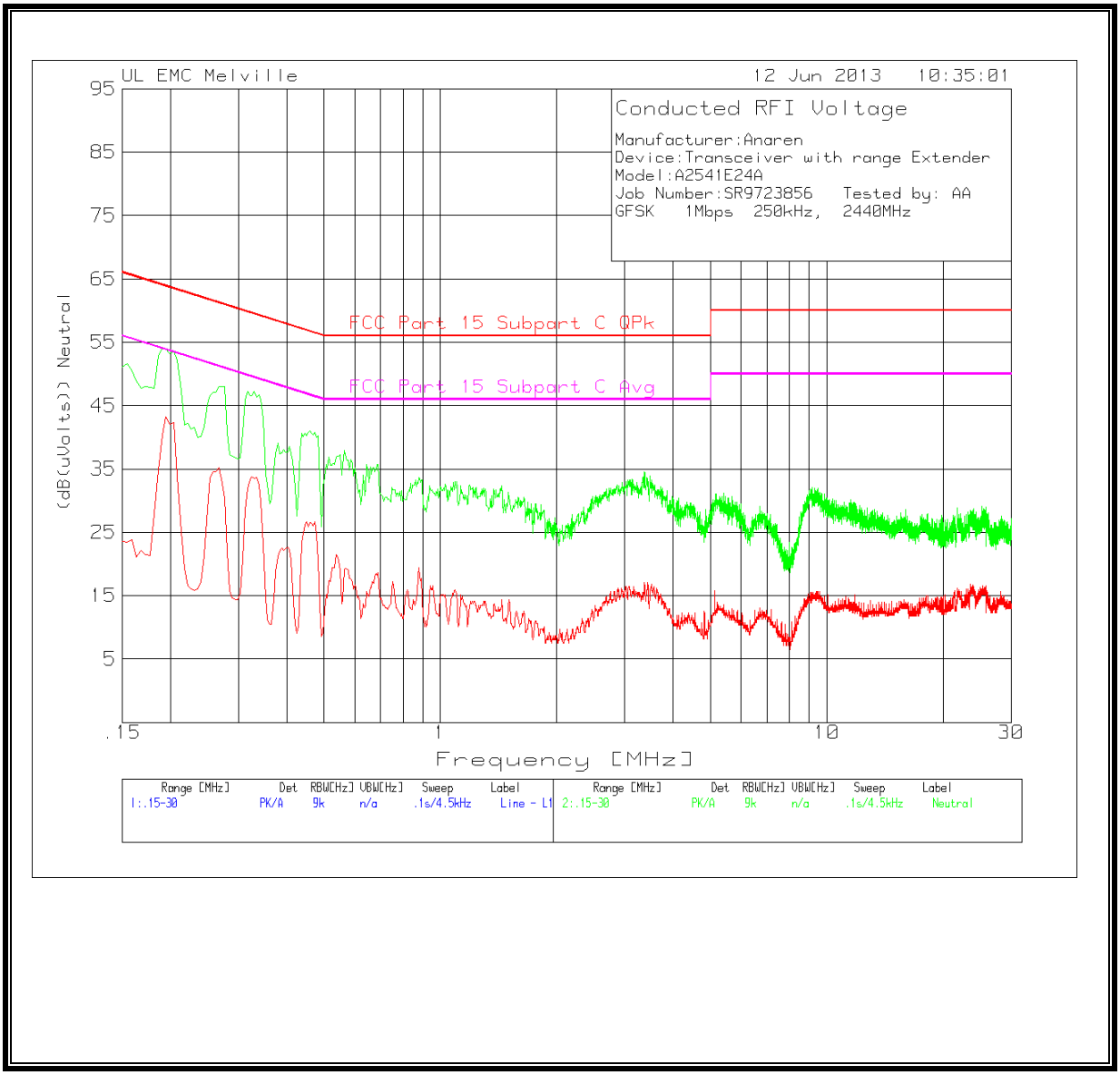
6 WORST EMISSIONS

Manufacturer:Anaren								
Device:Transceiver with range Extender								
Model:A2541E24A								
Job Number:SR9723856 Tested by: AA								
GFSK 1Mbps 250kHz, 2440MHz								
Line - L1 .15 - 30MHz								
Test Frequency	Meter Reading	Detector	5A636 L1 (dB)	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.19275	45.34	PK	10	55.34	63.9	-8.56	-	-
0.26025	41.06	PK	10	51.06	61.4	-10.34	-	-
0.3795	32.07	PK	10	42.07	58.3	-16.23	-	-
0.411	32.07	PK	10	42.07	57.6	-15.53	-	-
3.354	25.12	PK	10.1	35.22	56	-20.78	-	-
4.7895	25.64	PK	10.2	35.84	56	-20.16	-	-
0.19275	35.18	Av	10	45.18	-	-	53.9	-8.72
0.26025	29.63	Av	10	39.63	-	-	51.4	-11.77
0.3795	15.35	Av	10	25.35	-	-	48.3	-22.95
0.411	13.33	Av	10	23.33	-	-	47.6	-24.27
3.354	7.91	Av	10.1	18.01	-	-	46	-27.99
4.7895	4.78	Av	10.2	14.98	-	-	46	-31.02
Neutral .15 - 30MHz								
Test Frequency	Meter Reading	Detector	5A636 L4Neut (dB)	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.1905	44.05	PK	10	54.05	64	-9.95	-	-
0.276	37.97	PK	10	47.97	60.9	-12.93	-	-
0.3165	37.21	PK	10	47.21	59.8	-12.59	-	-
0.4605	31.07	PK	10	41.07	56.7	-15.63	-	-
3.417	23.44	PK	10.2	33.64	56	-22.36	-	-
5.4015	21	PK	10.2	31.2	60	-28.8	-	-
0.1905	30.34	Av	10	40.34	-	-	54	-13.66
0.276	20.36	Av	10	30.36	-	-	50.9	-20.54
0.3165	21.97	Av	10	31.97	-	-	49.8	-17.83
0.4605	16.49	Av	10	26.49	-	-	46.7	-20.21
3.417	5.53	Av	10.2	15.73	-	-	46	-30.27
5.4015	2.43	Av	10.2	12.63	-	-	50	-37.37
PK - Peak detector								
Av - Average detector								

LINE 1 RESULTS



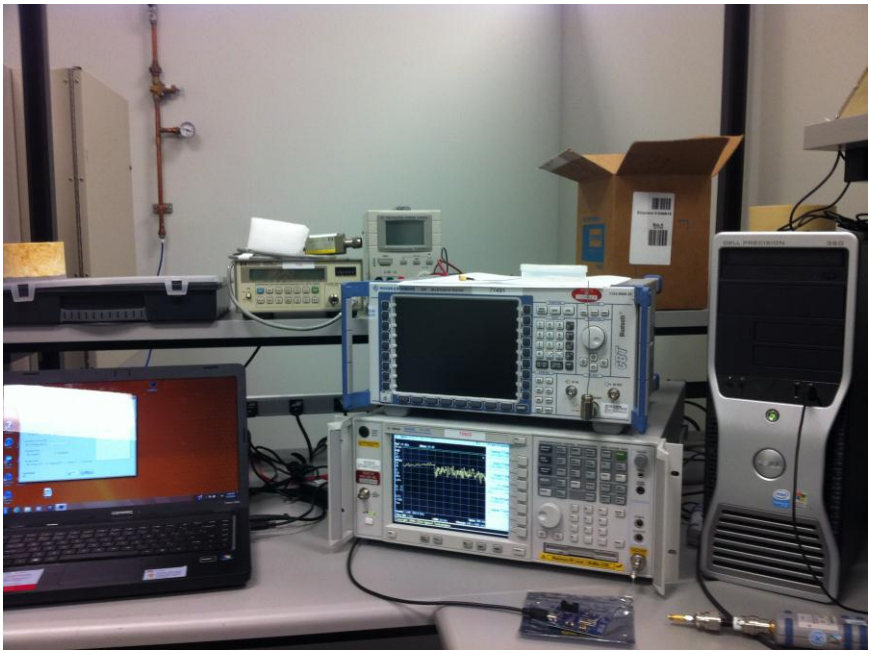
LINE 2 RESULTS



11. SETUP PHOTOS

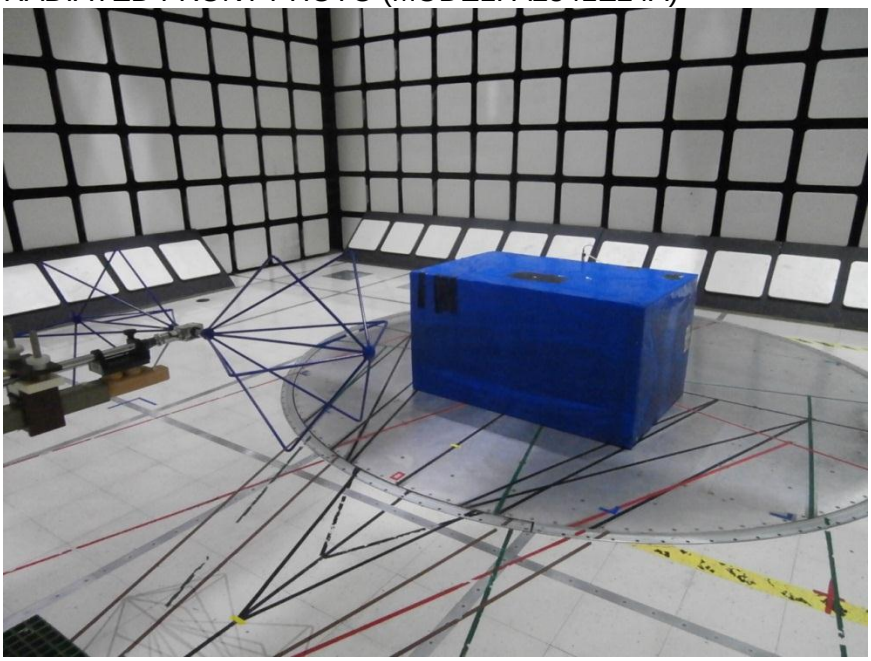
ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO

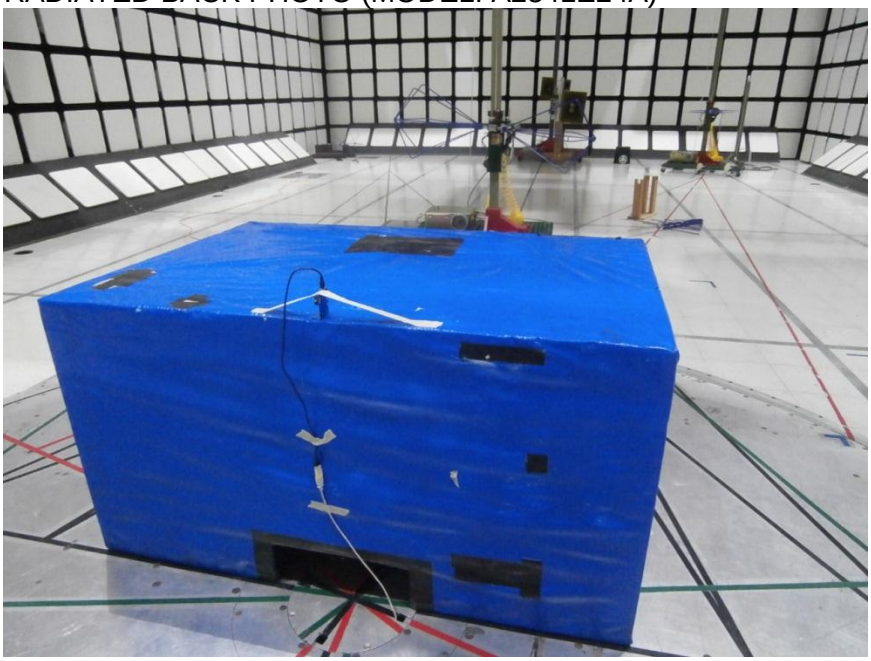


RADIATED RF MEASUREMENT SETUP (BELOW 1 GHz)

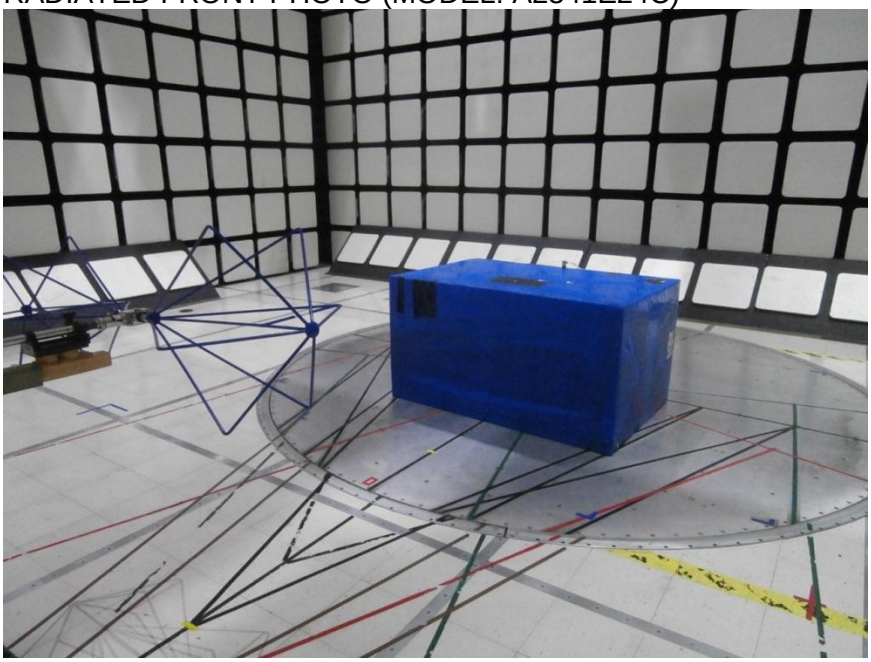
RADIATED FRONT PHOTO (MODEL: A2541E24A)



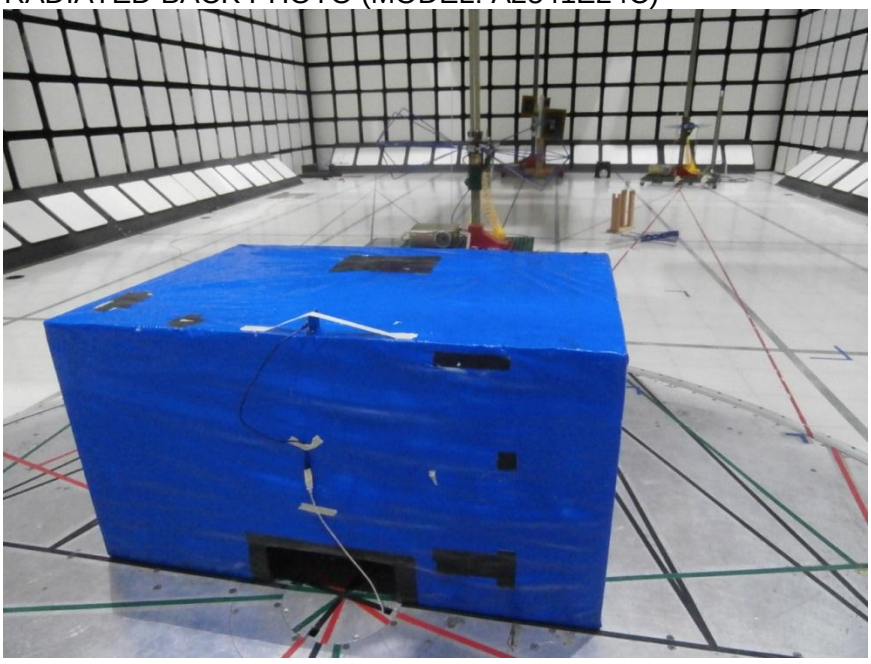
RADIATED BACK PHOTO (MODEL: A2541E24A)



RADIATED FRONT PHOTO (MODEL: A2541E24C)

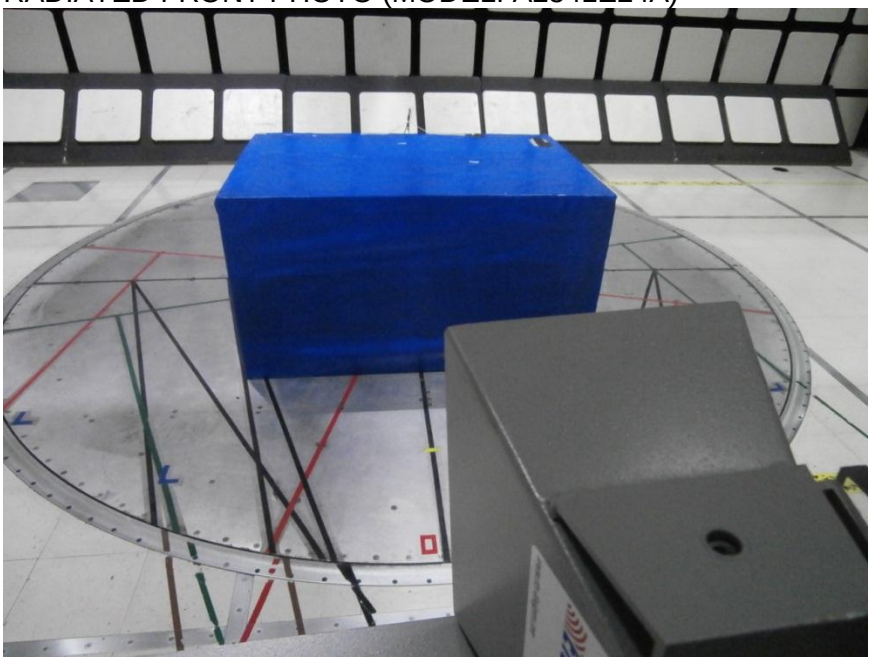


RADIATED BACK PHOTO (MODEL: A2541E24C)

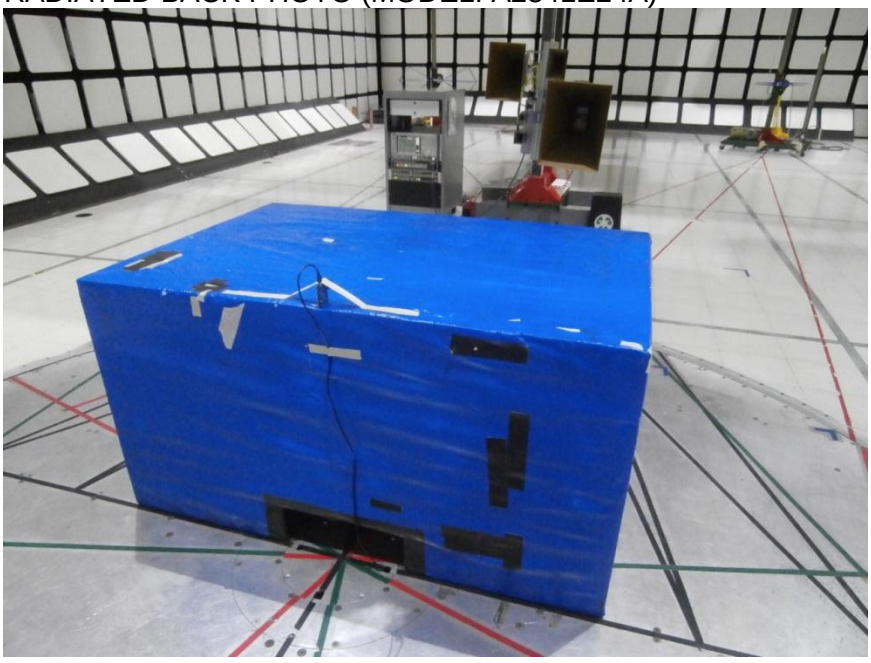


RADIATED RF MEASUREMENT SETUP (ABOVE 1 GHz)

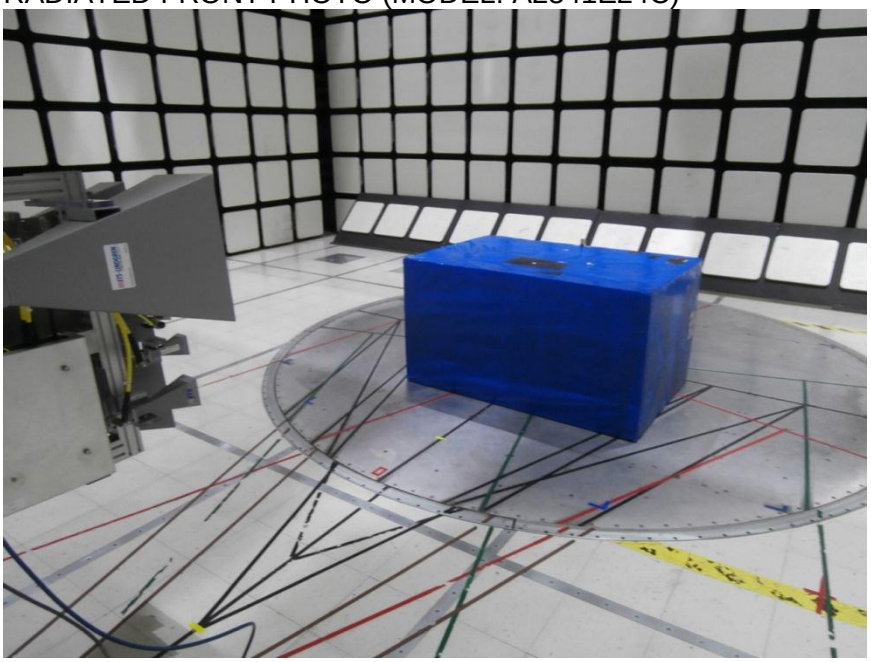
RADIATED FRONT PHOTO (MODEL: A2541E24A)



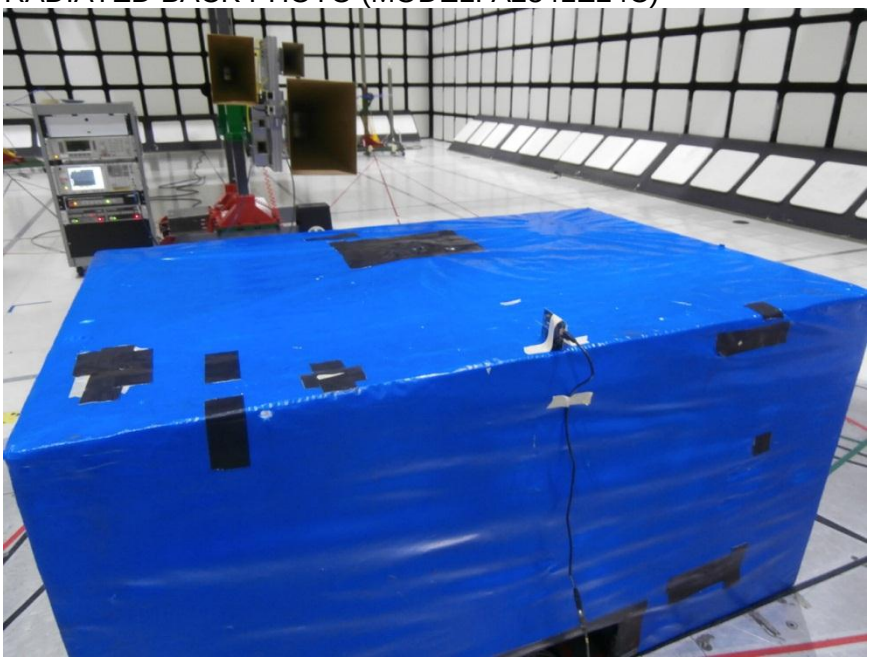
RADIATED BACK PHOTO (MODEL: A2541E24A)



RADIATED FRONT PHOTO (MODEL: A2541E24C)

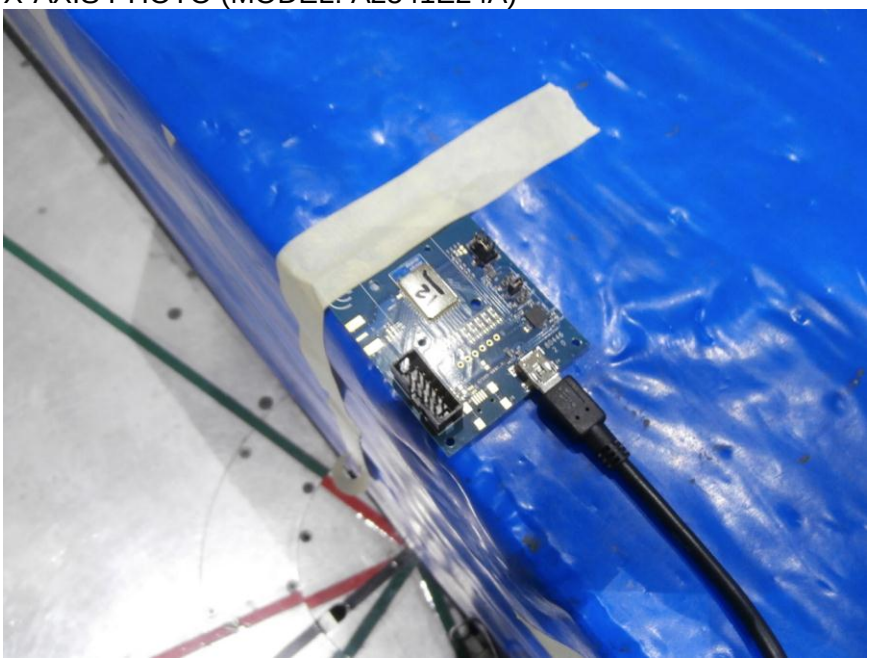


RADIATED BACK PHOTO (MODEL: A2541E24C)

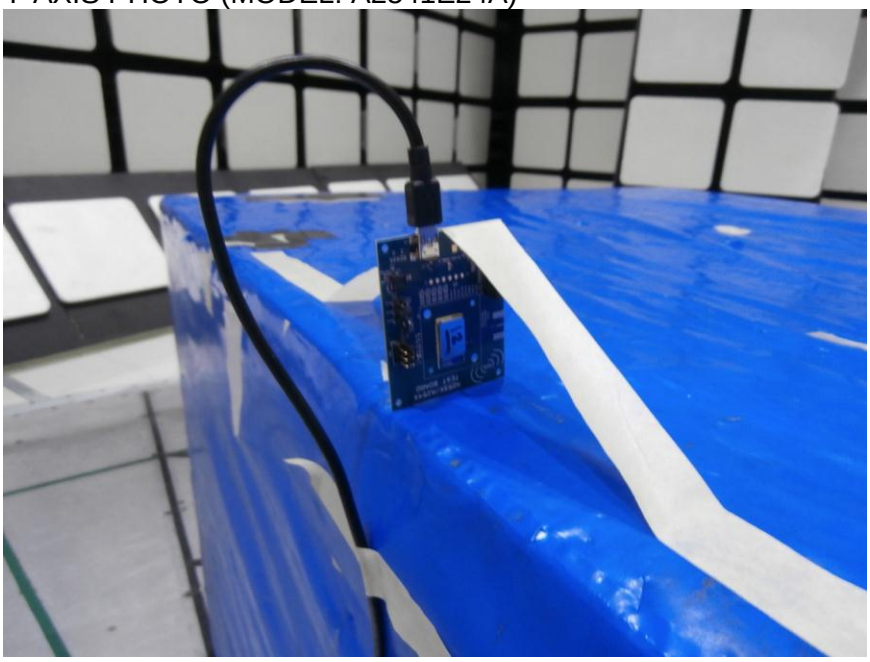


RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

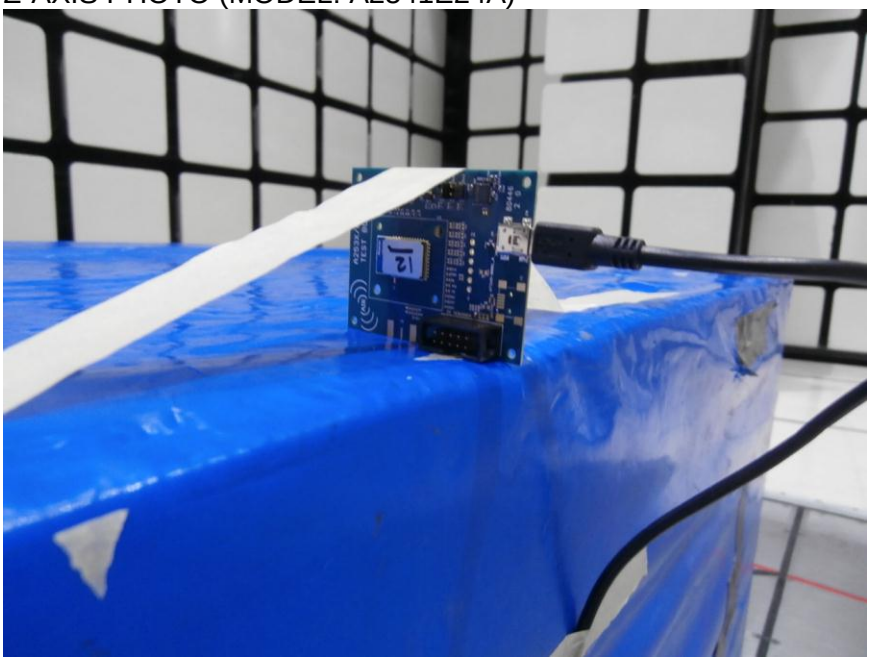
X-AXIS PHOTO (MODEL: A2541E24A)



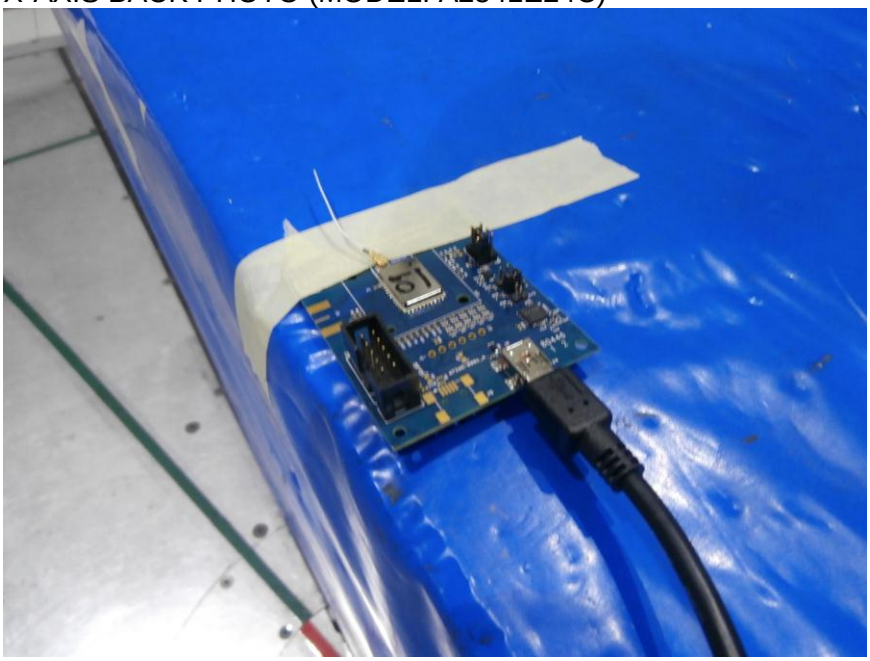
Y-AXIS PHOTO (MODEL: A2541E24A)



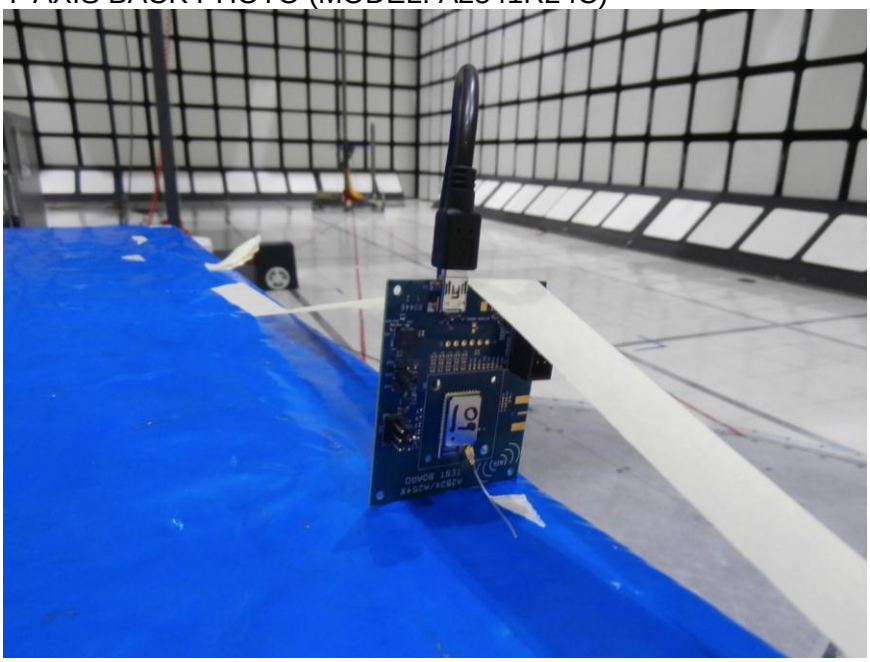
Z-AXIS PHOTO (MODEL: A2541E24A)



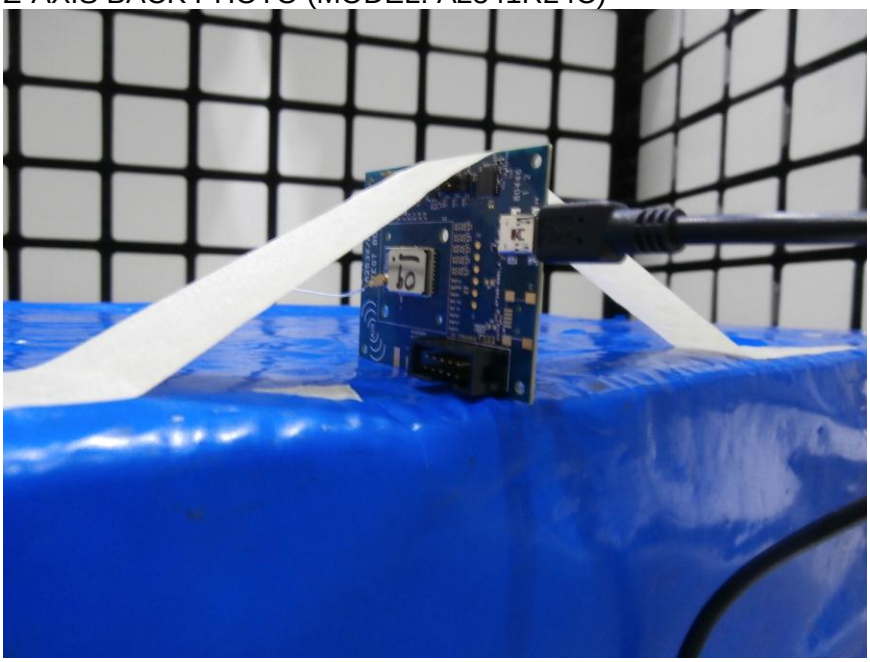
X-AXIS BACK PHOTO (MODEL: A2541E24C)



Y-AXIS BACK PHOTO (MODEL: A2541R24C)

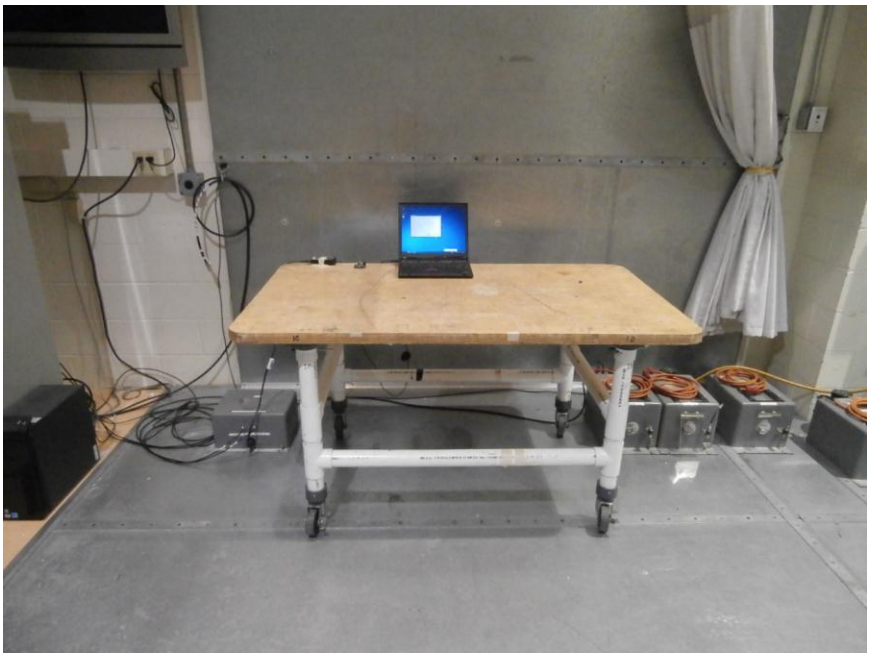


Z-AXIS BACK PHOTO (MODEL: A2541R24C)



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO



LINE CONDUCTED BACK PHOTO

END OF REPORT