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

CERTIFICATION TEST REPORT

FOR

802.11a/b/g/n/ac WLAN + Bluetooth PCI-E Mini Card

MODEL NUMBER: BCM94352HMB

FCC ID: QDS-BRCM1068
IC: 4324A-BRCM1068

REPORT NUMBER: 12U14473-1, Revision A

ISSUE DATE: SEPTEMBER 13, 2012

Prepared for
BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

Prepared by
UL CCS
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	09/04/12	Initial Issue	F. Ibrahim
A	09/13/12	Revised sections 5.2, and 5.5.	F. Ibrahim

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

EUT DESCRIPTION: 802.11a/b/g/n/ac WLAN + Bluetooth PCI-E Mini Card

MODEL: BCM94352HMB

SERIAL NUMBER: 265 (P238)

DATE TESTED: July 01 – September 04, 2012

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 CCS 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 CCS 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS 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 CCS By:

FRANK IBRAHIM
WiSE PROJECT LEADER
UL CCS

Tested By:

VIEN TRAN
WiSE ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2003, 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 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/b/g/n/ac WLAN + Bluetooth PCI-E Mini Card.

The radio module is manufactured by Broadcom.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

2400 - 2483.5 MHz Authorized Frequency Band					
Frequency Range (MHz)	Mode	Power, Chain 1 (dBm)	Power, Chain 2 (dBm)	Total power (dBm)	Total power (mW)
2412 - 2462	802.11b Legacy 1TX	Covered by the worst case 802.11b HT20 2TX Mode testing			
2412 - 2462	802.11b CDD 2TX	19.009	18.228	21.646	146.094
2412 - 2462	802.11g Legacy 1TX	18.836	N/A	18.836	76.489
2412 - 2462	802.11n HT20 1TX	Covered by the worst case 802.11n HT20 CDD 2TX Mode testing			
2412 - 2462	802.11n HT20 CDD 2TX	18.342	18.327	21.345	136.295
2422 - 2452	802.11n HT40 CDD 1TX	Covered by the worst case 802.11n HT40 CDD 2TX Mode testing			
2422 - 2452	802.11n HT40 CDD 2TX	16.393	14.834	18.693	74.018
5725 - 5850 MHz Authorized Frequency Band					
Frequency Range (MHz)	Mode	Power, Chain 1 (dBm)	Power, Chain 2 (dBm)	Total power (dBm)	Total power (mW)
5745 - 5825	802.11a Legacy 1TX	Covered by the worst case 802.11n HT20 CDD 2TX Mode testing			
5745 - 5825	802.11a CDD 2TX	Covered by the worst case 802.11n HT20 CDD 2TX Mode testing			
5745 - 5825	802.11n HT20 1TX	Covered by the worst case 802.11a Legacy 1TX Mode testing			
5745 - 5825	802.11n HT20 CDD 2TX	19.120	19.649	22.403	173.894
5755 - 5795	802.11n HT40 1TX	Covered by the worst case 802.11n HT40 CDD 2TX Mode testing			
5755 - 5795	802.11n HT40 CDD 2TX	18.837	19.852	22.384	173.156
5775 MHz	802.11n HT80 CDD 2TX	15.385	16.478	18.976	78.997

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

BCM94352HMB FCC ID: QDS-BRCM1068					
Antenna Type	Model	Peak gain (dBi) @ 2400-2483.5MHz	Peak gain (dBi @ 5150-5350MHz	Peak gain (dBi @ 5470-5725MHz	Peak gain (dBi @ 5725 -5850MHz
802.11bgn WLAN, Bluetooth Antenna	HMT05/HFT17-DL07	3.9 (Main / Aux)	5.6 (Main / Aux)	4.2 (Main / Aux)	5.8dBi (Main / Aux)

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 6.30.0.0.
The test utility software used during testing was BCM Internal, rev. 6.30.RC307.1166.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an external module installed in a test jig board connected to a host Laptop PC. The EUT was oriented in a flat orientation, similar to the orientation it would have in real installations; see setup photos for details.

Worst-Case data rates, as provided by the client, were as follows:

For 2.4 GHz Band:
802.11b: 1 Mb/s.
802.11g: 6 Mb/s.
802.11n 20MHz: MCS0.
802.11n 40MHz: MCS0.

For 5.8 GHz Band:
802.11a: 6 Mb/s.
802.11n 20MHz: MCS0.
802.11n 40MHz: MCS0.
802.11n 80MHz: MCS0.

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.

For Radiated Band Edge measurements preliminary testing showed that the worst case was horizontal polarization, so final measurements were performed with horizontal polarization.

For all modes with single chain SISO, chain 1 (J0) was used for both 2.4GHz and 5GHz bands as worst case.

For 802.11b CDD 2TX mode, the output power for each chain used for the testing purpose was equal to the output power on single chain for 8022.11b 1TX mode; therefore, 802.11b CDD 2TX mode covers 802.11b 1TX mode as worst-case scenario.

For 802.11n HT20 CDD 2TX mode in the 5.8 GHz band, the output power for each chain used for the testing purpose was equal to the output power on single chain for 8022.11a 1TX mode; therefore, 802.11n HT20 CDD 2TX mode covers 802.11a 1TX mode as worst-case scenario

For 802.11n HT20 CDD 2TX mode in both 2.4 GHz and 5.8 GHz bands, the output power for each chain used for the testing purpose was equal to the output power on single chain for 8022.11n HT20 1TX mode; therefore, 802.11n HT20 CDD 2TX mode covers 802.11n HT20 1TX mode as worst-case scenario.

For 802.11n HT40 CDD 2TX mode in both 2.4 GHz and 5.8 GHz bands, the output power for each chain used for the testing purpose was equal to the output power on single chain for 8022.11n HT40 1TX mode; therefore, 802.11n HT40 CDD 2TX mode covers 802.11n HT40 1TX mode as worst-case scenario

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	G560	CBU4473193	DoC
AC/DC Adapter	Lenovo	PA-1650-56LC	11S36001646ZZ400008KCM8	DoC
Jig Board	Catalyst	MINI2EXP	BRCM 2011-05	N/A

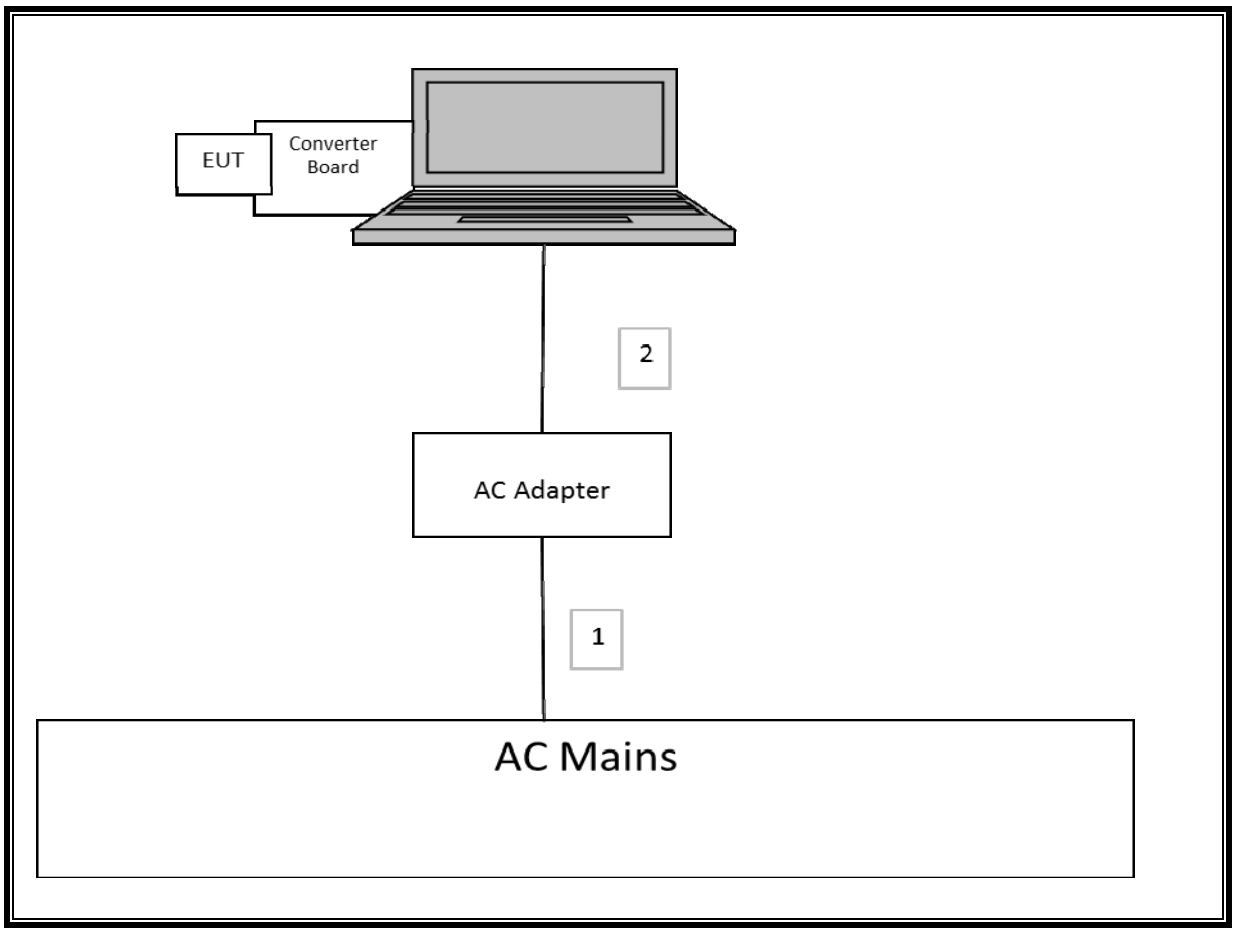
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Shielded	1.5m	NA
2	DC	1	DC	Un-shielded	1.5m	Ferrite at laptop's end

TEST SETUP

The EUT is attached to a jig board which is installed in the PCMCI slot of a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	**Manufacturer**	**Model**	**Asset**	**Cal Date**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/15/11	12/15/12
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	09/02/11	09/02/12
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/13/12	07/06/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/19/11	08/19/13
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/11	12/13/12
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/11	12/13/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	09/20/11	09/20/12
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	11/01/11	11/01/12
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/12	06/14/13
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C00682	02/07/12	02/07/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	11/11/11	11/11/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/12/12	07/12/13
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/13
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/11	12/13/12
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRC13192	N02683	CNR	CNR
Reject Filter, 5.15-5.35 GHz	Micro-Tronics	BRC13190	N02680	CNR	CNR
Reject Filter, 5.47-5.725 GHz	Micro-Tronics	BRC13191	N02678	CNR	CNR
Reject Filter, 5.725-5.825 GHz	Micro-Tronics	BRC13192	N02676	CNR	CNR

7. ANTENNA PORT TEST RESULTS

7.1. 802.11b CDD 2TX MODE IN THE 2.4 GHz BAND

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.

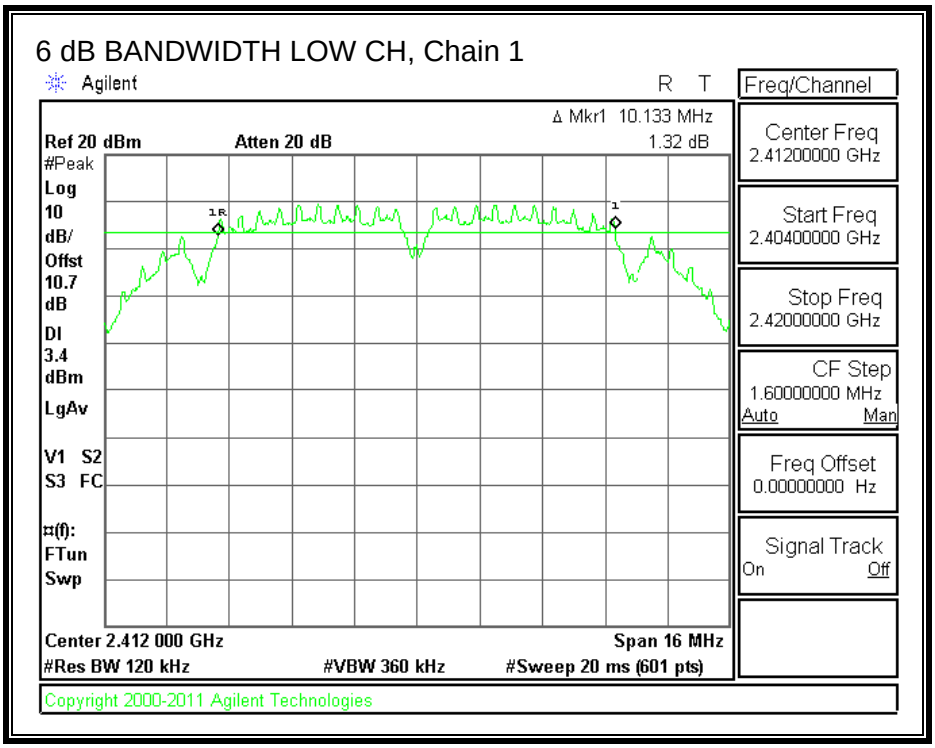
TEST PROCEDURE

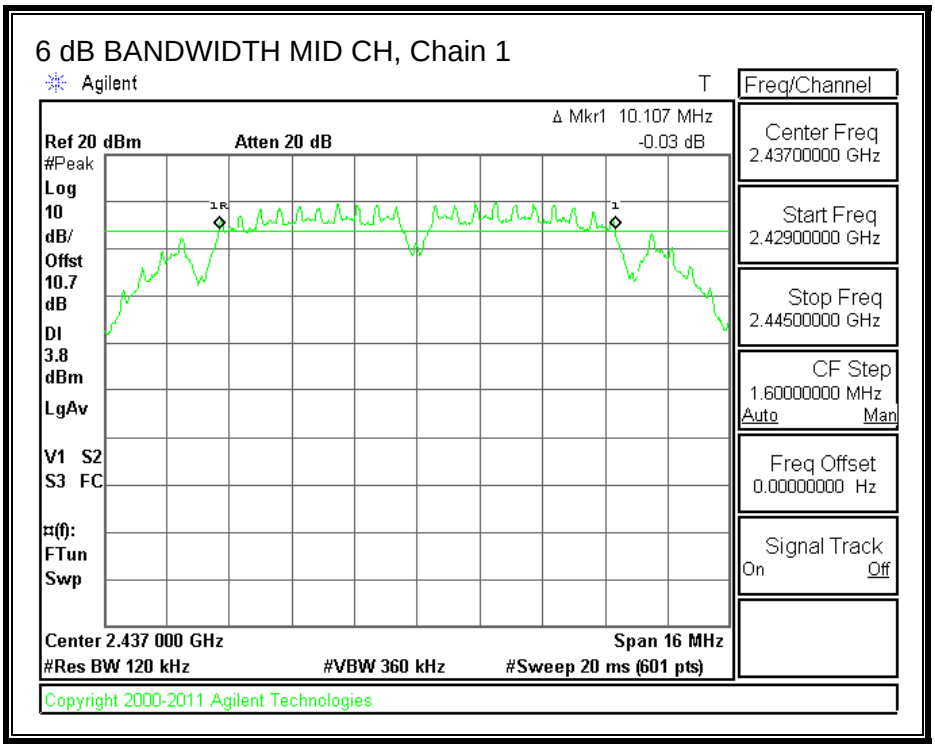
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

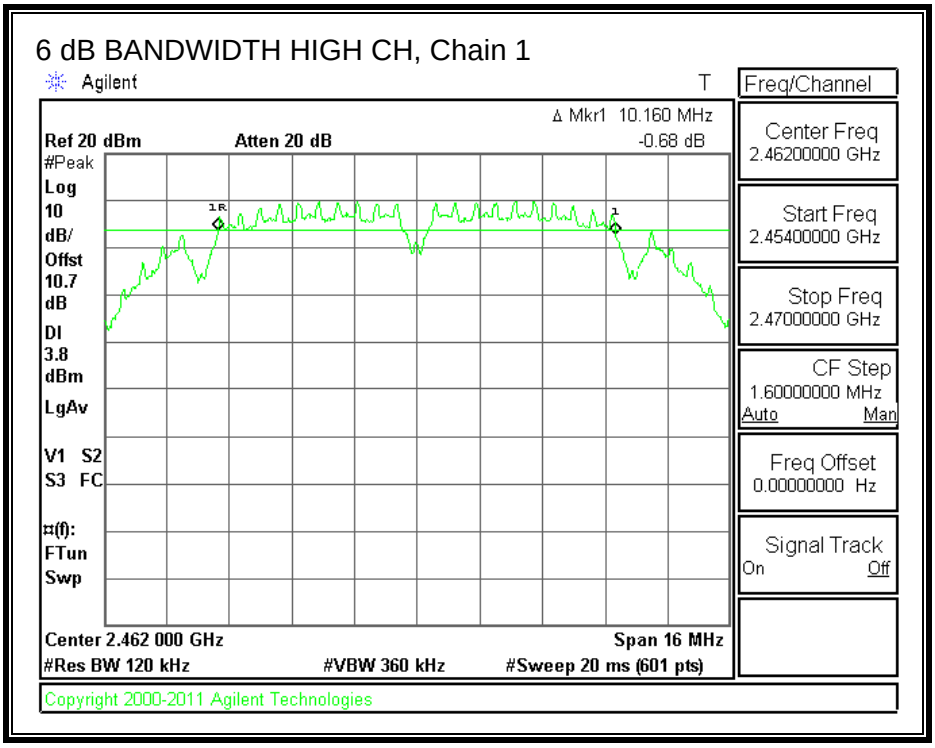
RESULTS

Channel	Frequency (MHz)	Chain 1 6 dB Bandwidth (MHz)	Chain 2 6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	10.133	10.160	0.5
Middle	2437	10.107	10.133	0.5
High	2462	10.160	10.133	0.5

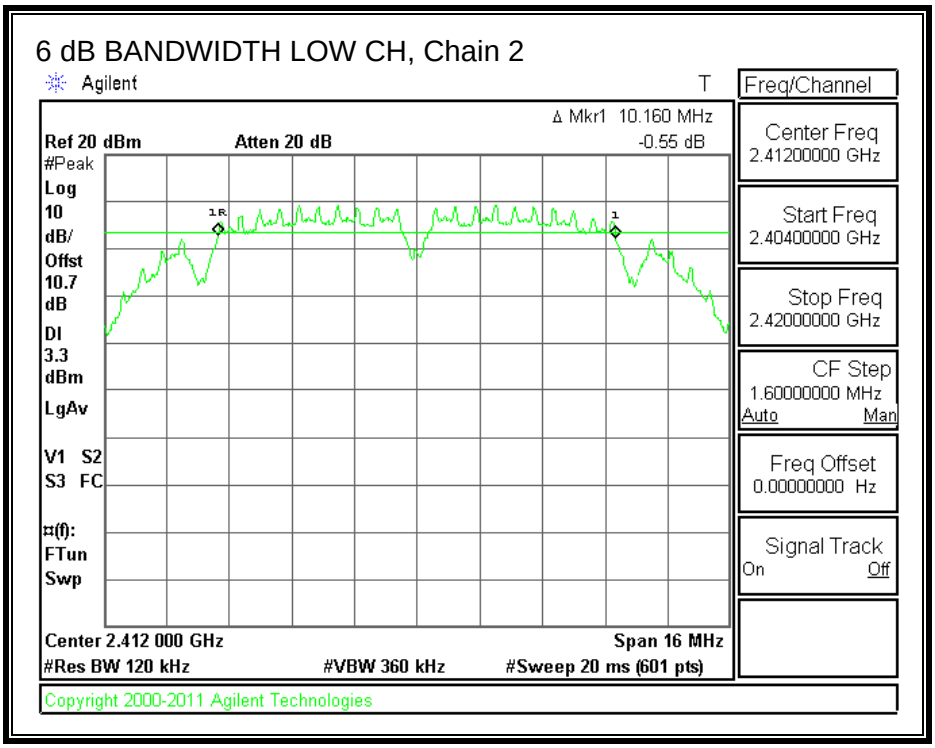
6 dB BANDWIDTH, Chain 1

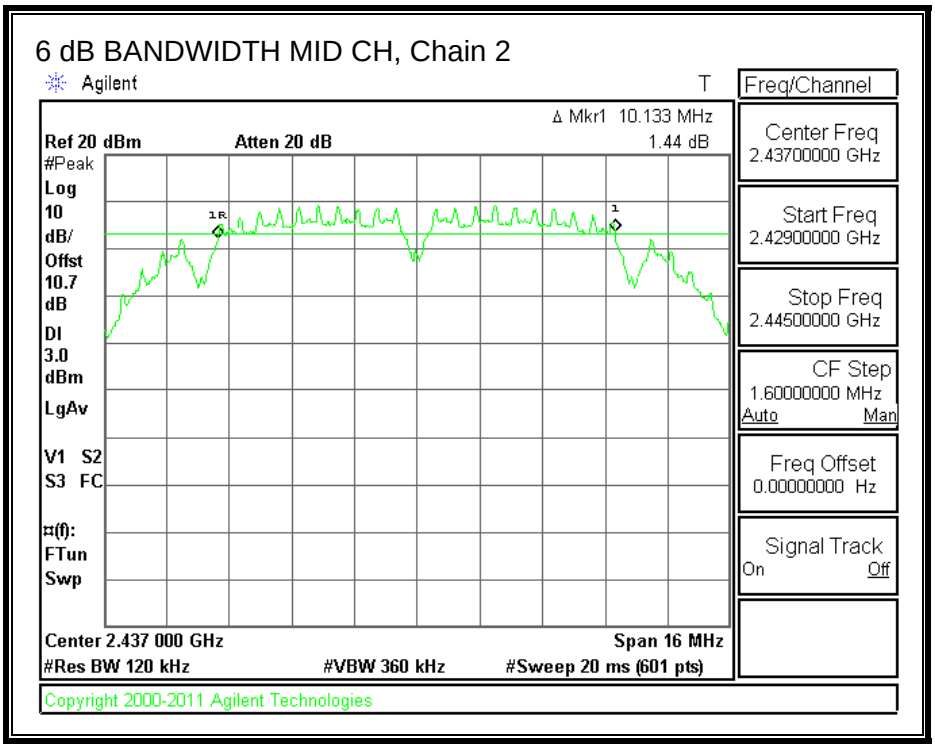


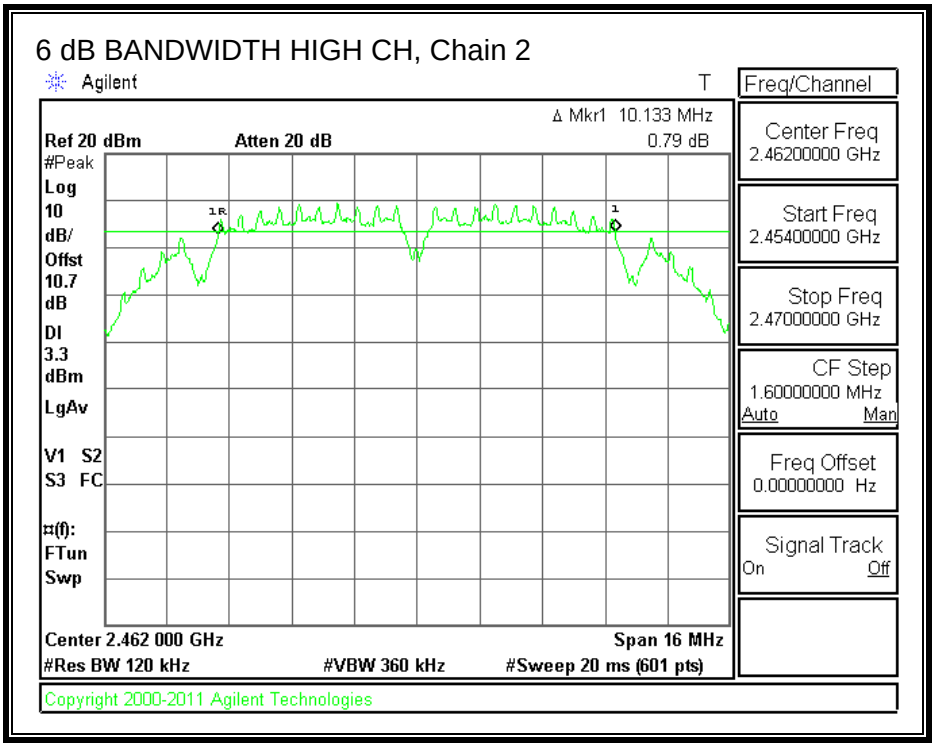




6 dB BANDWIDTH, Chain 2







7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

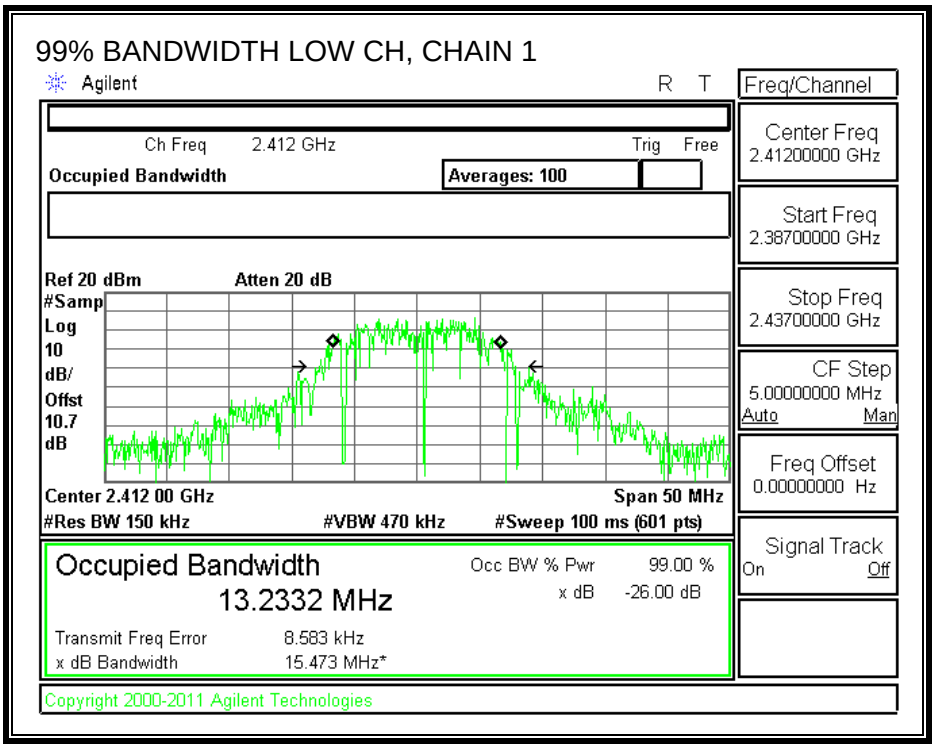
TEST PROCEDURE

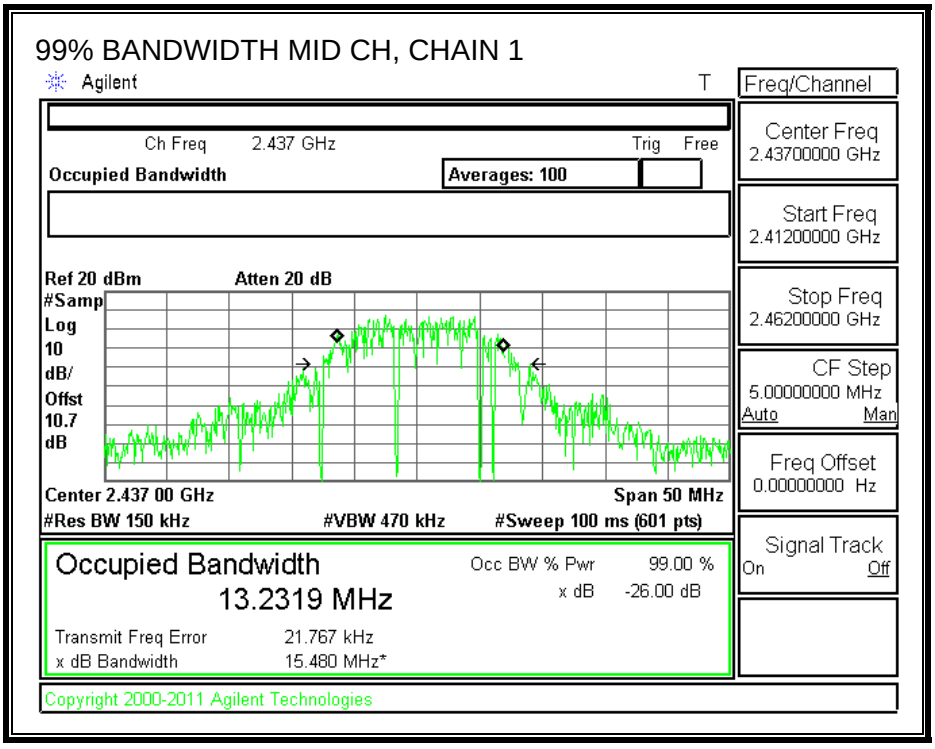
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

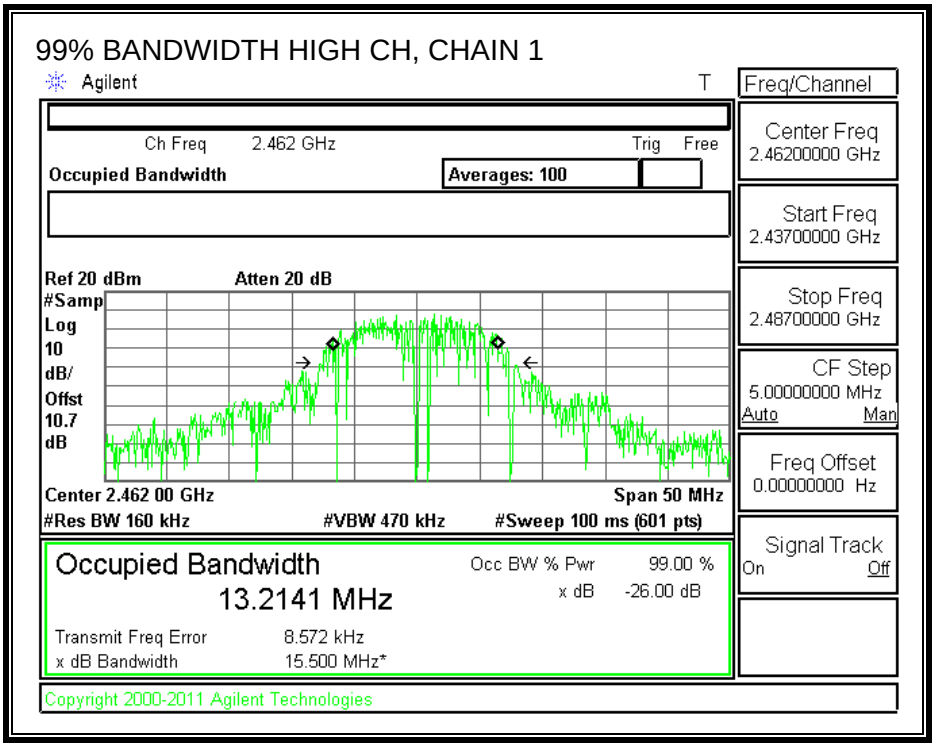
RESULTS

Channel	Frequency (MHz)	Chain 1 99% Bandwidth (MHz)	Chain 2 99% Bandwidth (MHz)
Low	2412	13.2332	13.2394
Middle	2437	13.2319	13.1917
High	2462	13.2141	13.2162

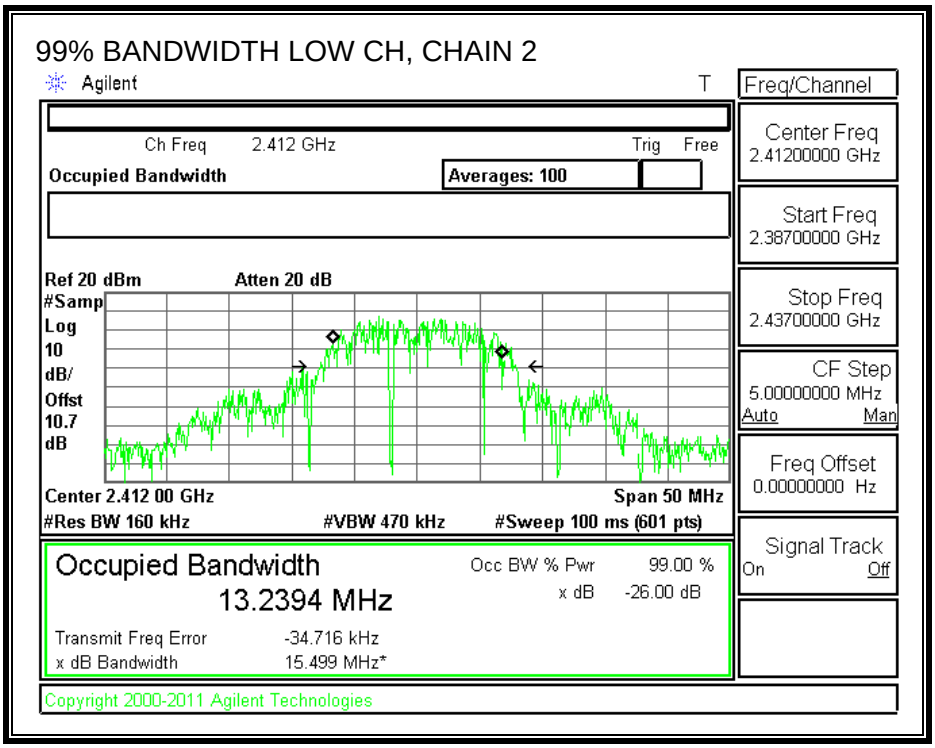
99% BANDWIDTH, CHAIN 1

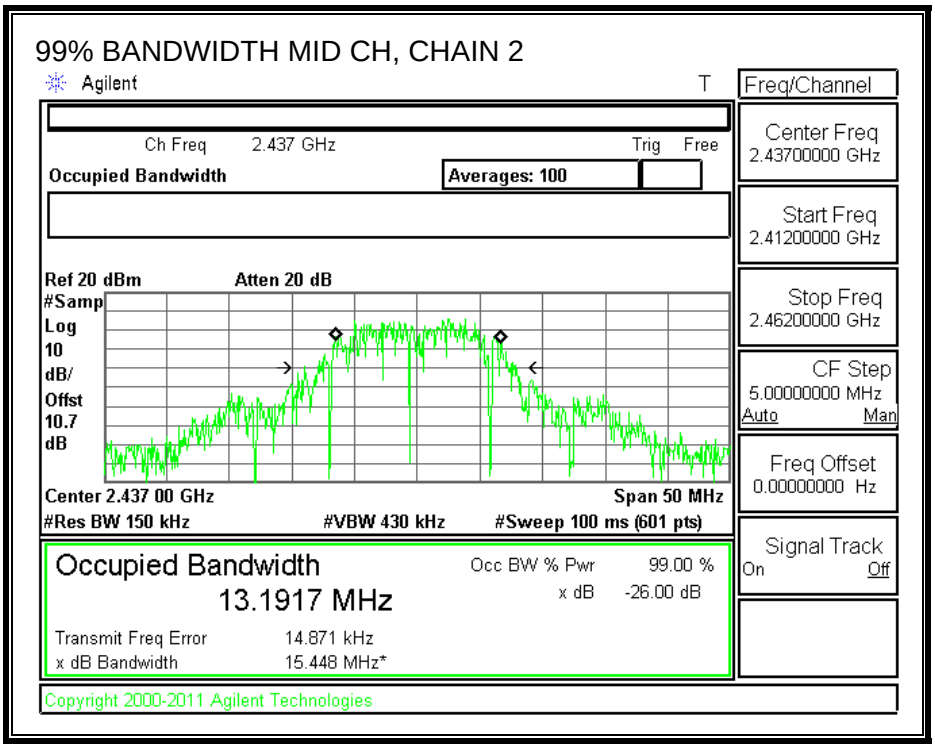


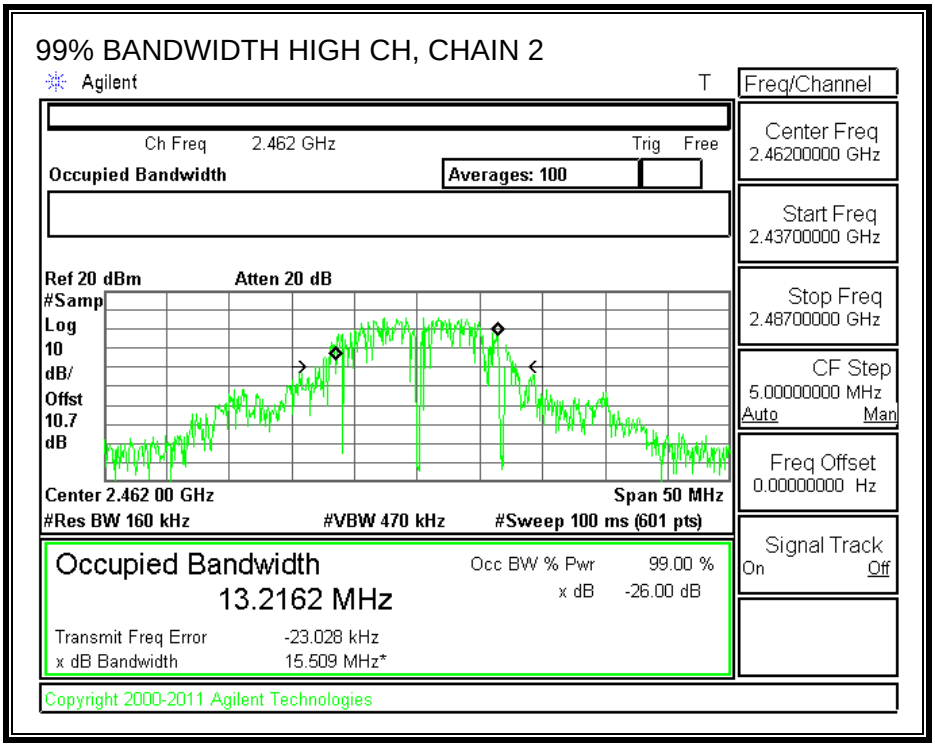




99% BANDWIDTH, CHAIN 2







7.1.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
3.90	3.01	6.91

The maximum effective legacy gain is 6.91 dBi for other than fixed, point-to-point operations, therefore the limit is 29.09 dBm.

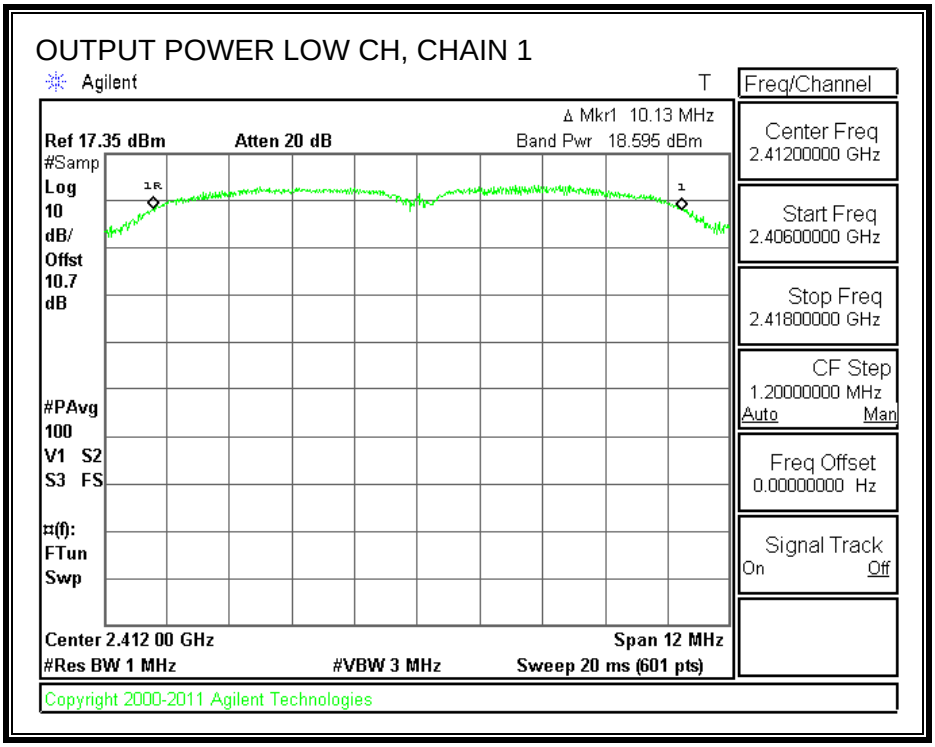
TEST PROCEDURE

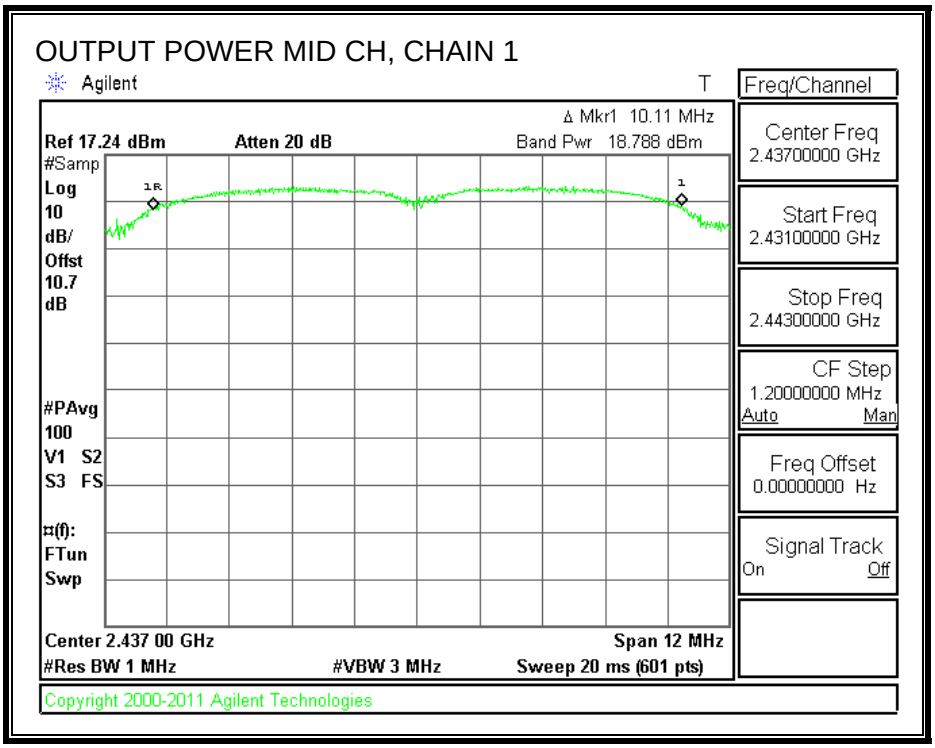
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

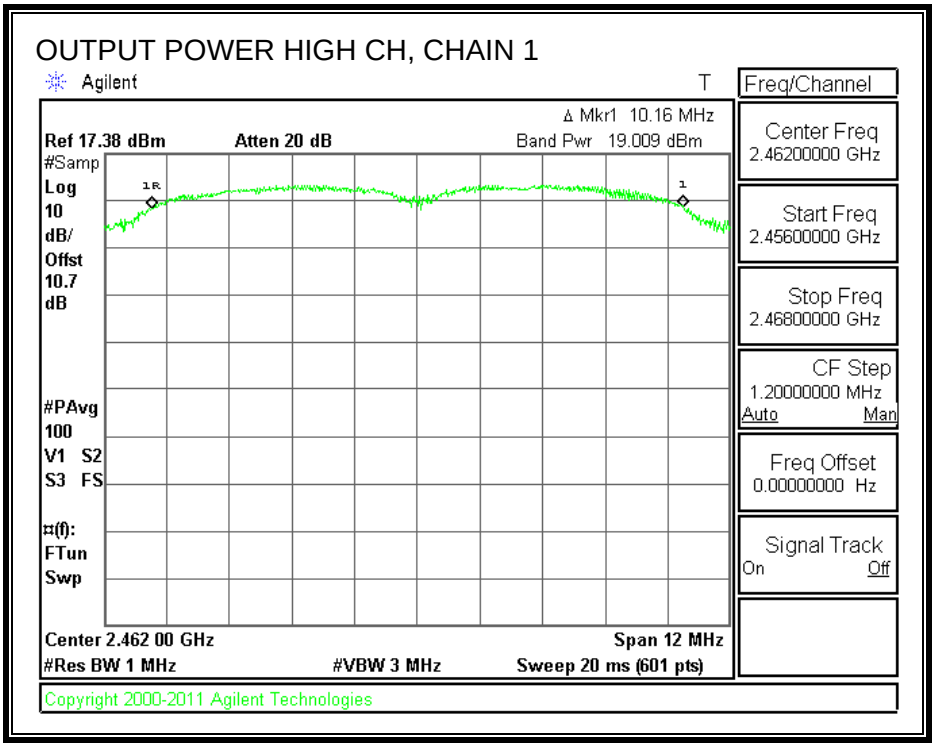
RESULTS

Channel	Frequency (MHz)	Chain 1 PK Power (dBm)	Chain 2 PK Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	18.595	18.395	21.506	29.09	-7.584
Mid	2437	18.788	18.212	21.520	29.09	-7.570
High	2462	19.009	18.228	21.646	29.09	-7.444

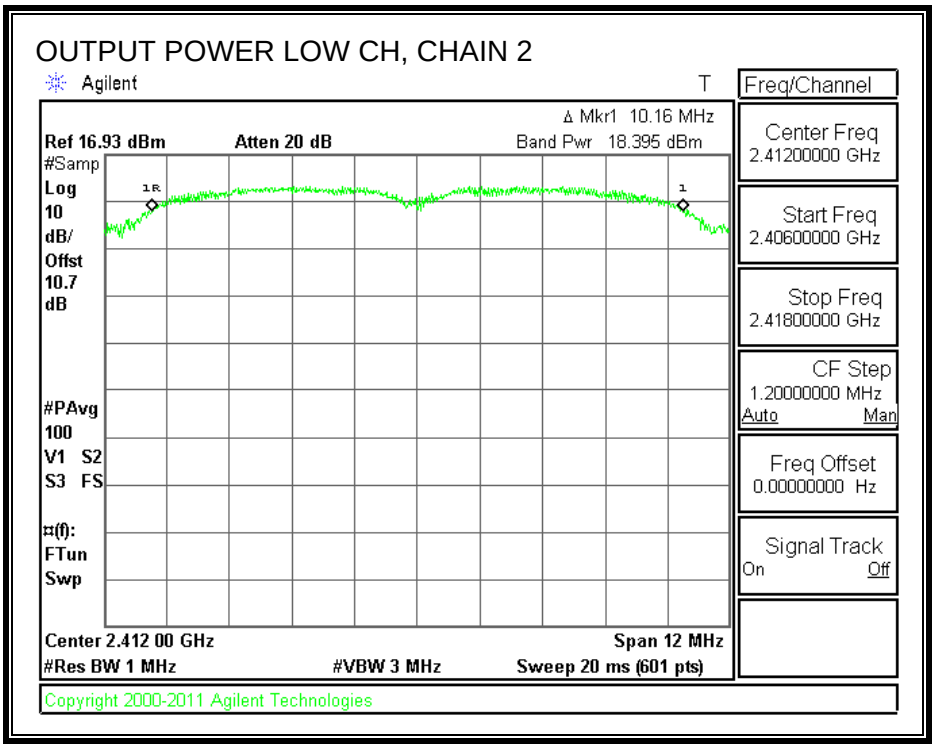
CHAIN 1 OUTPUT POWER

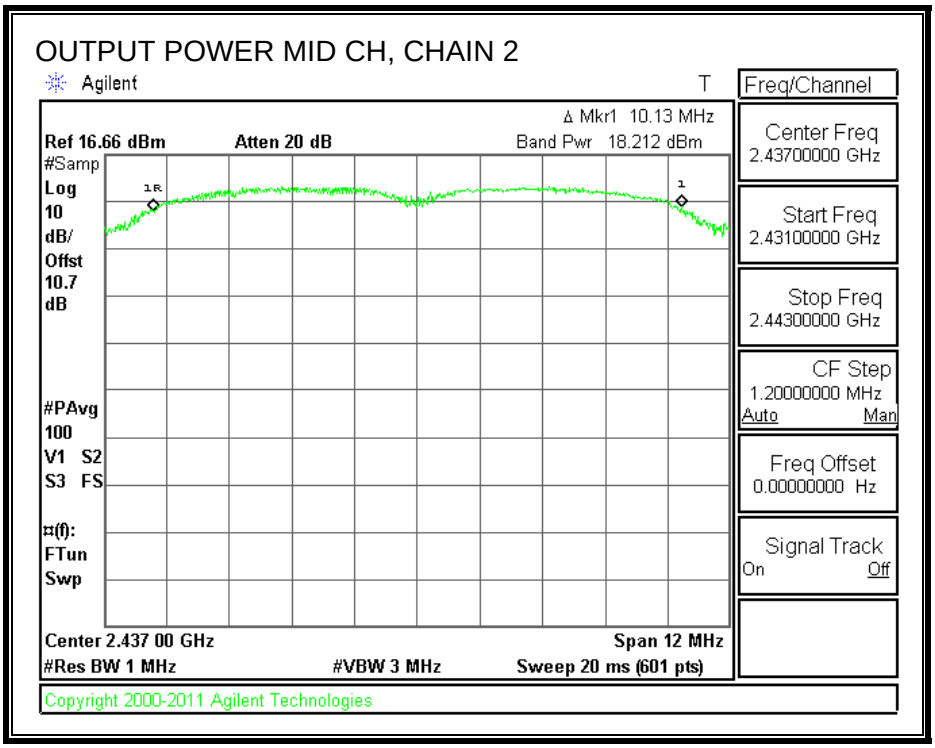


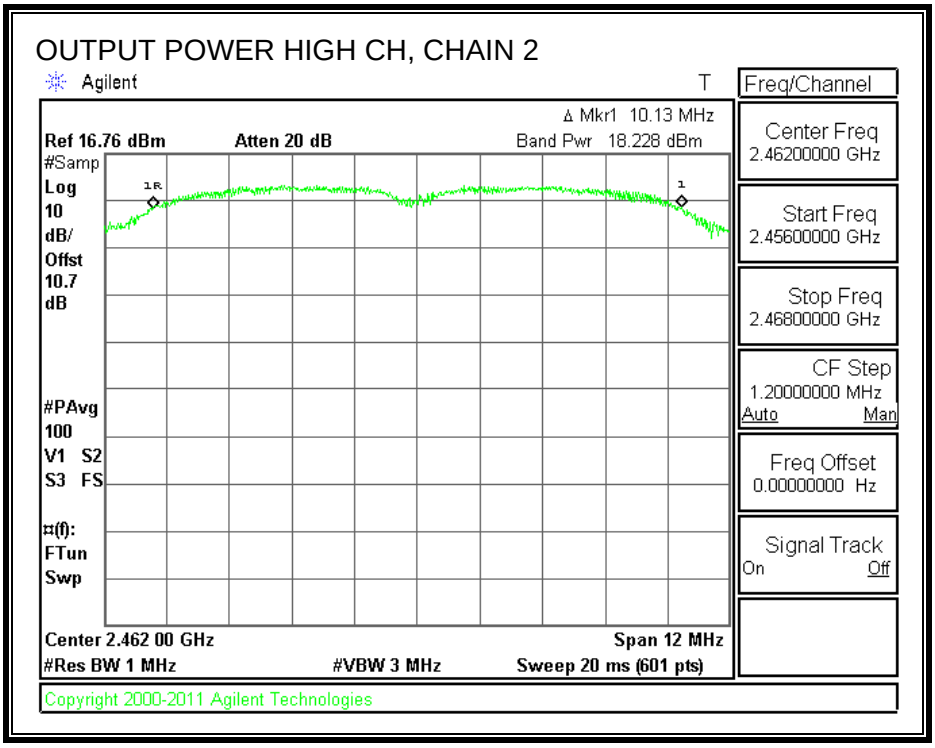




CHAIN 2 OUTPUT POWER







7.1.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

TEST PROCEDURE

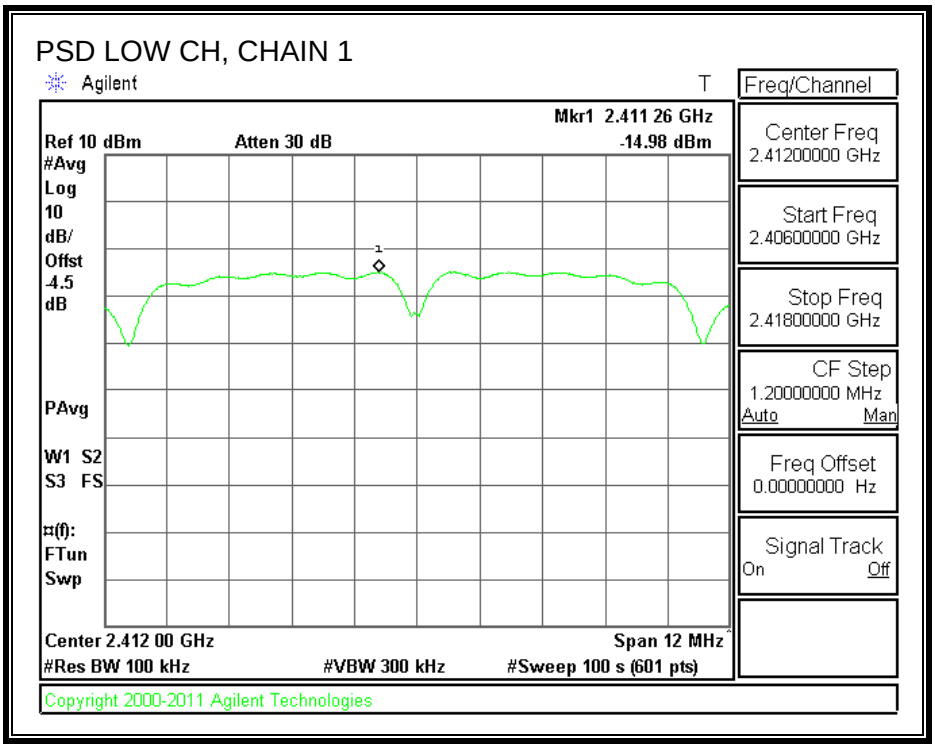
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

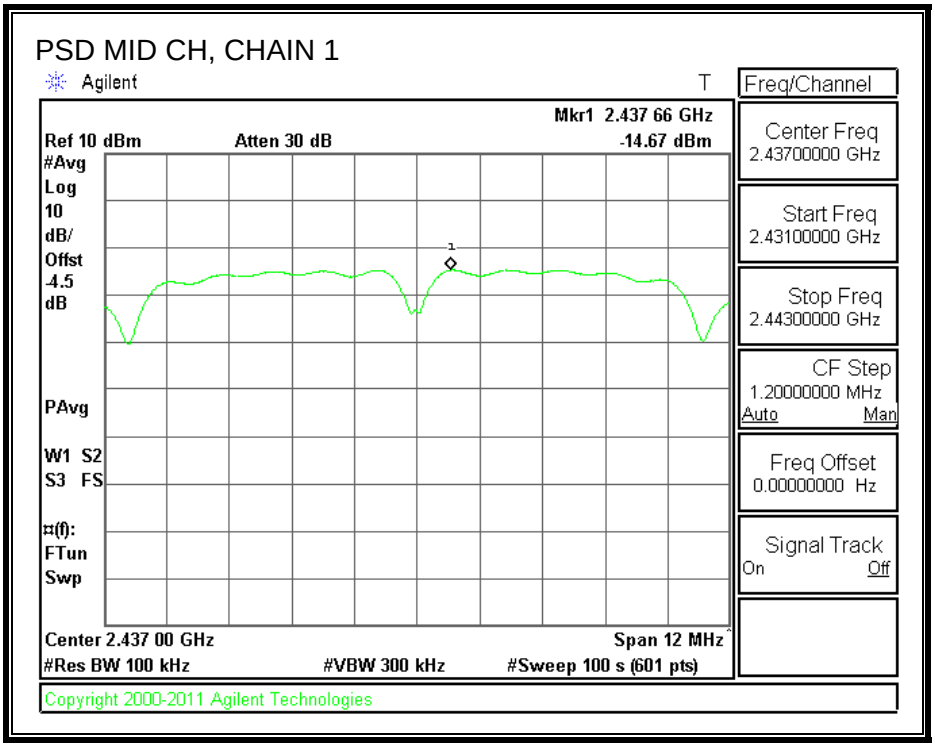
RESULTS

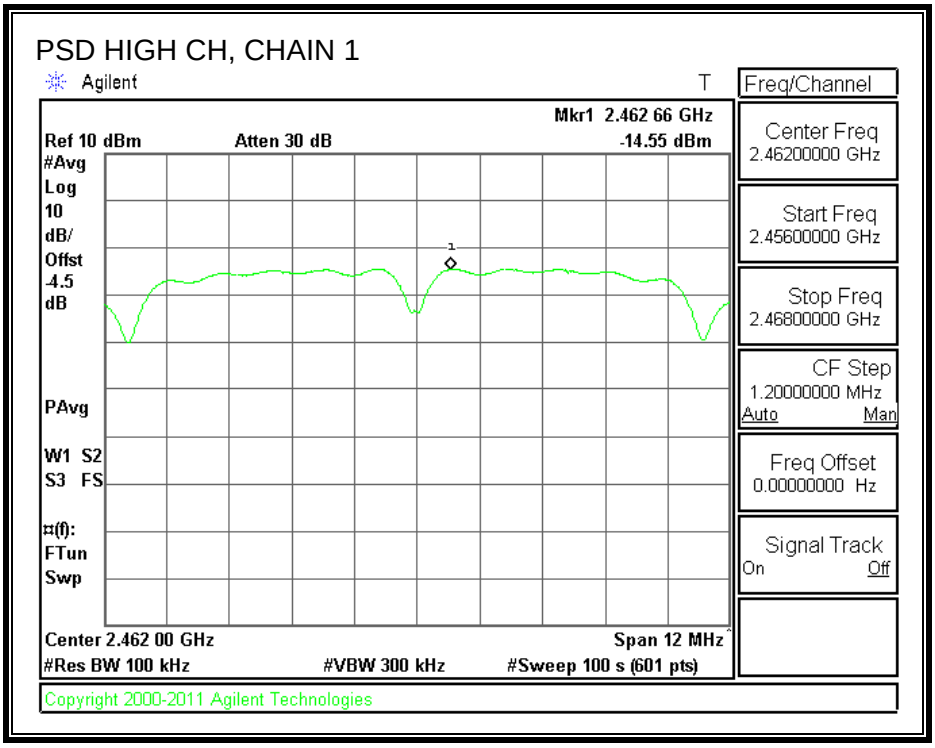
Channel	Frequency (MHz)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-14.98	-15.30	-12.13	8	-20.13
Middle	2437	-14.67	-15.37	-12.00	8	-20.00
High	2462	-14.55	-15.34	-11.92	8	-19.92

Note: Analyzer offset = cable loss + attenuator + 10 log(3/100)

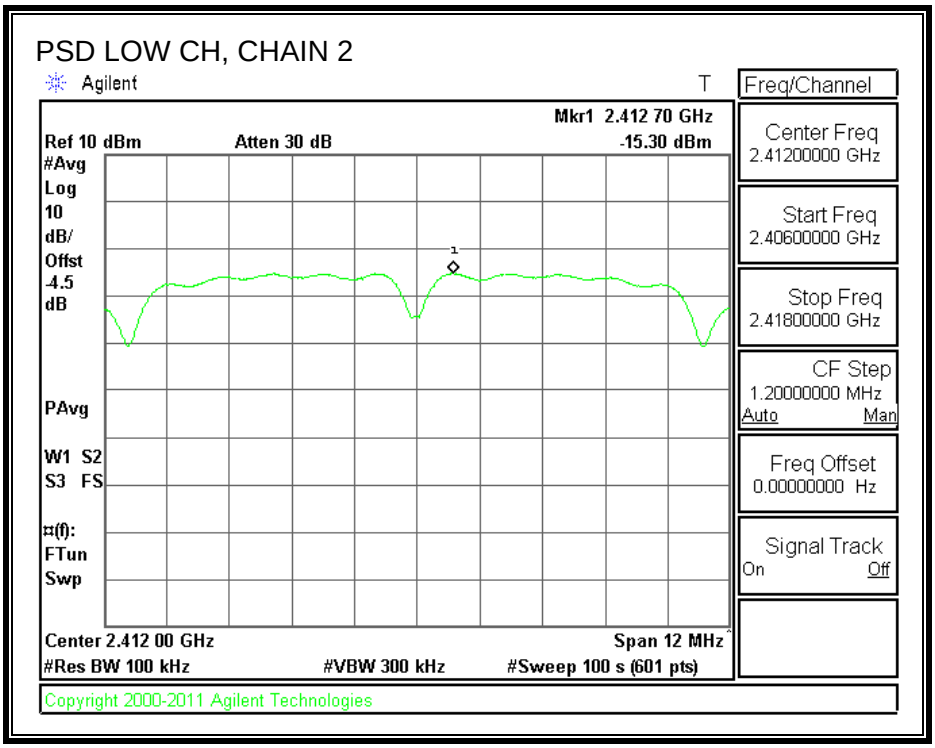
POWER SPECTRAL DENSITY, CHAIN 1

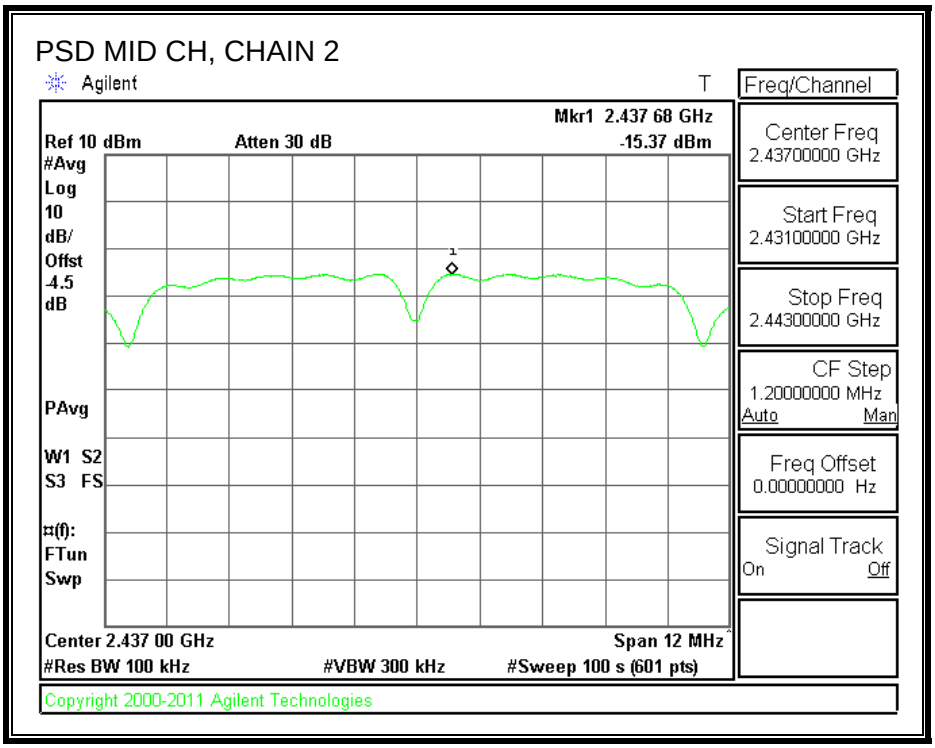


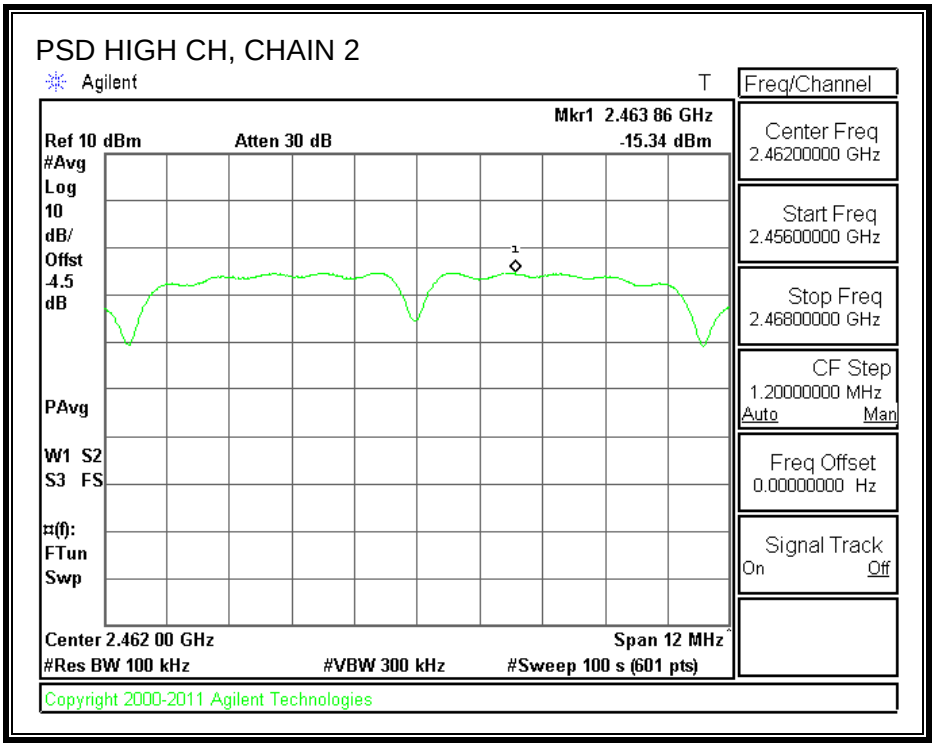




POWER SPECTRAL DENSITY, CHAIN 2







7.1.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

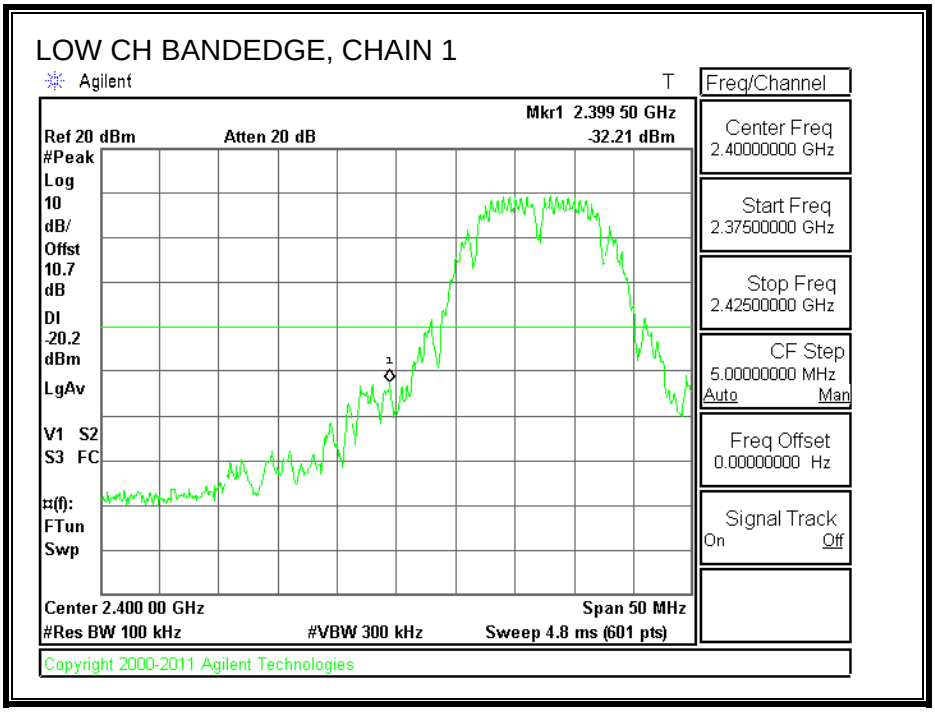
Output power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

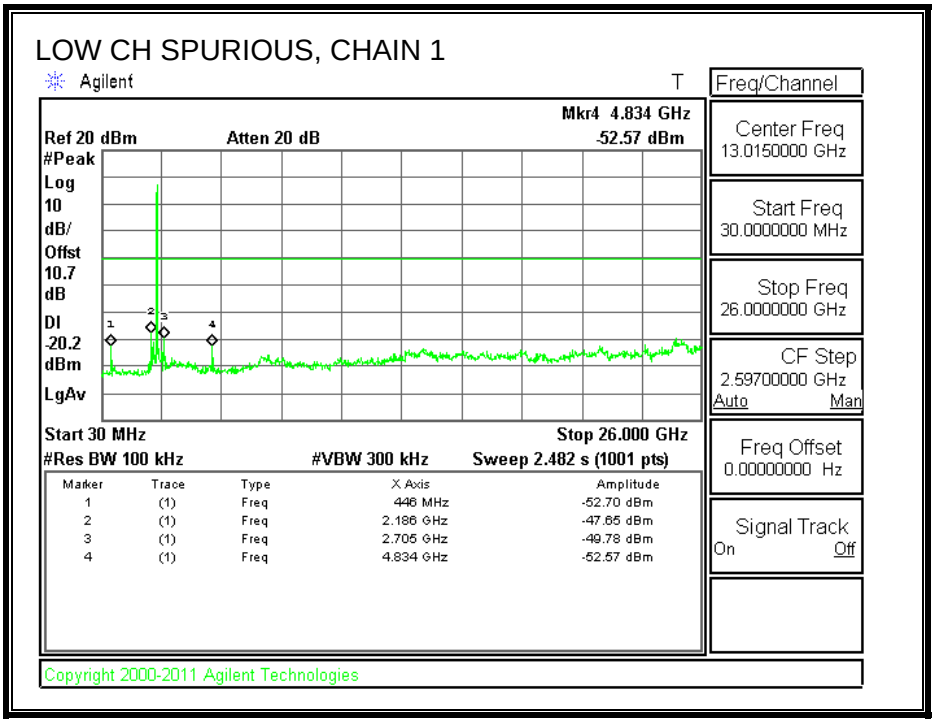
TEST PROCEDURE

KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

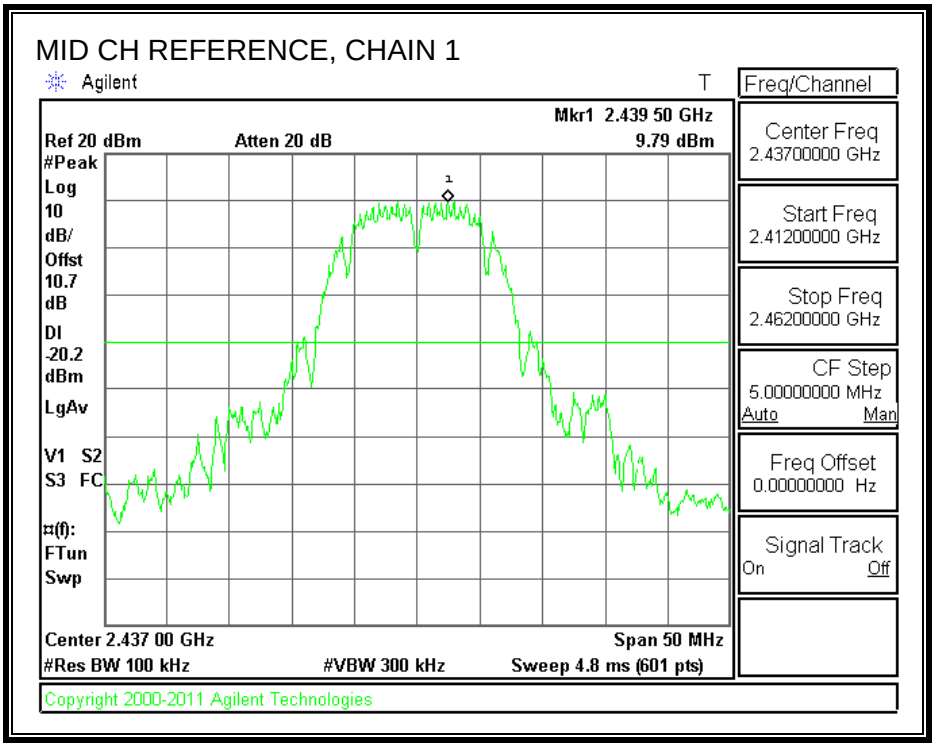
RESULTS

CHAIN 1 SPURIOUS EMISSIONS

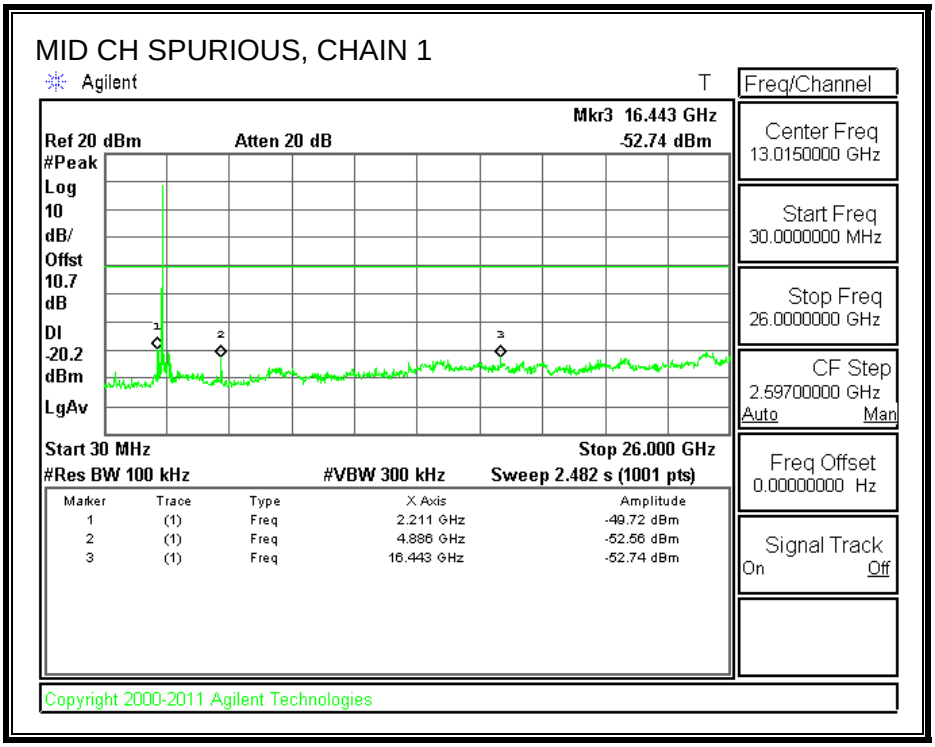




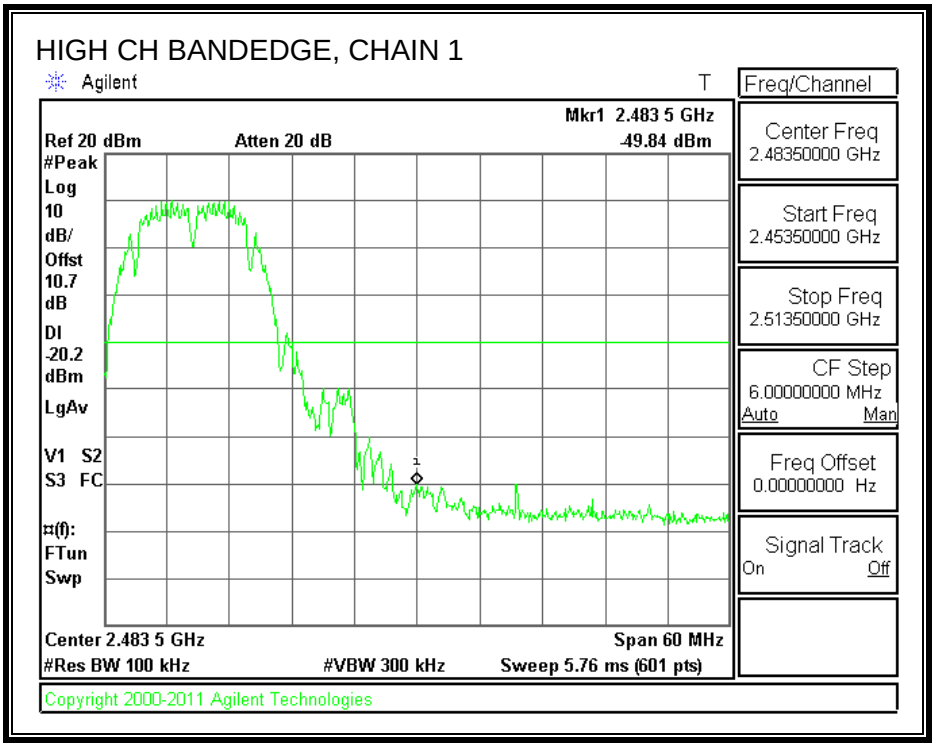
MID CH REFERENCE, CHAIN 1



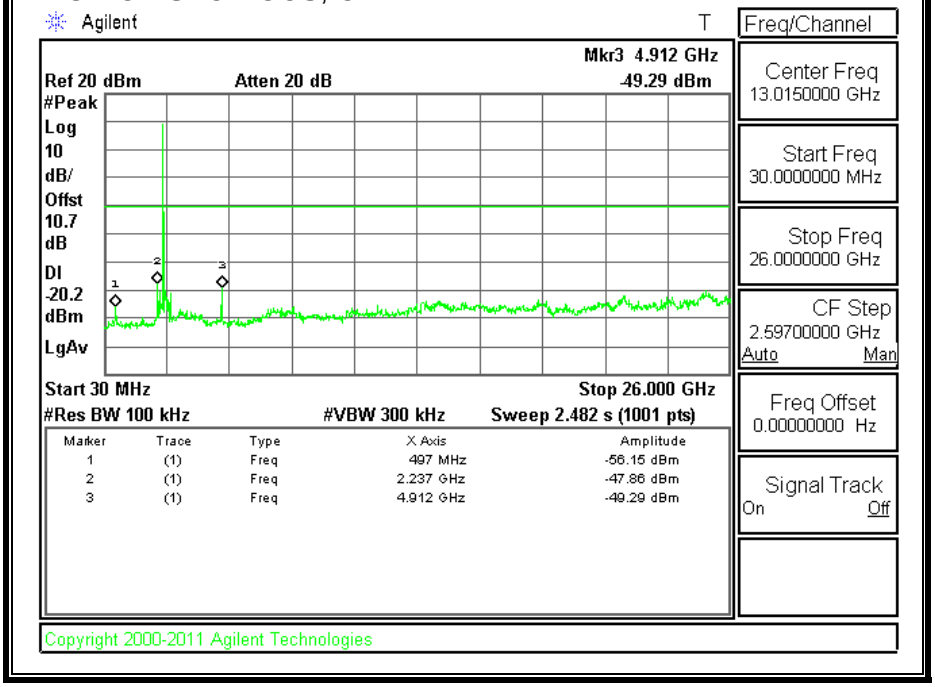
MID CH SPURIOUS, CHAIN 1



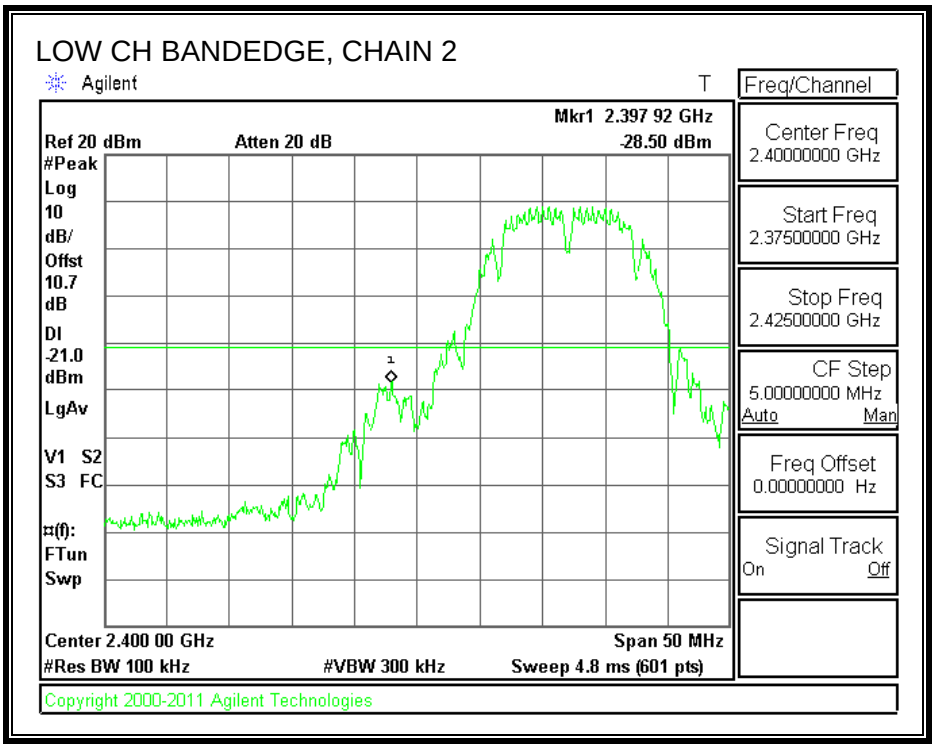
HIGH CH BANDEDGE, CHAIN 1

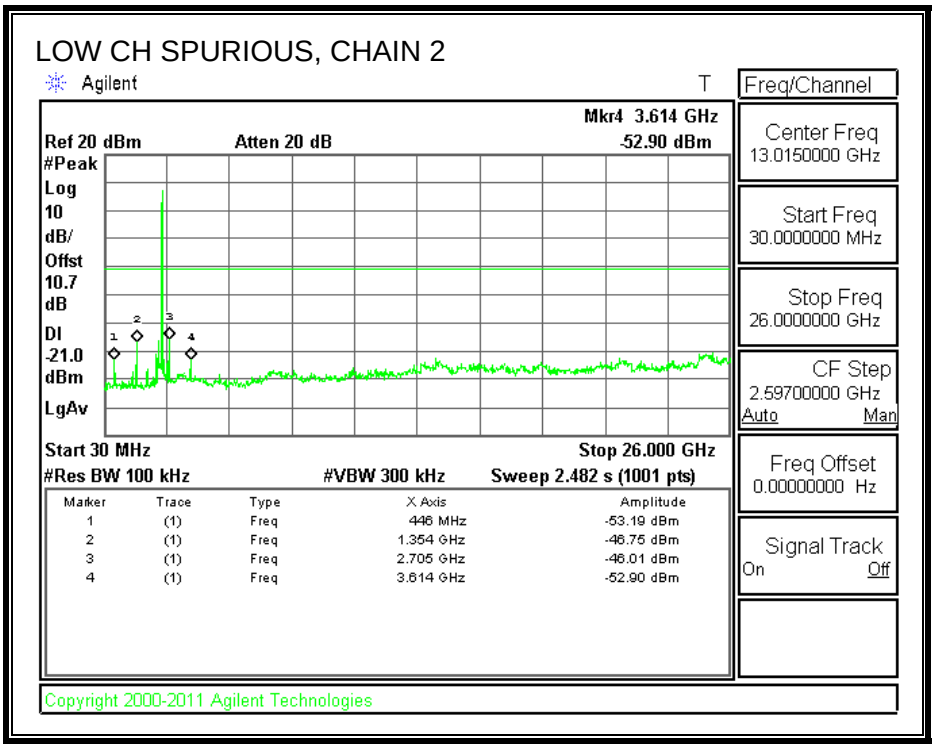


HIGH CH SPURIOUS, CHAIN 1

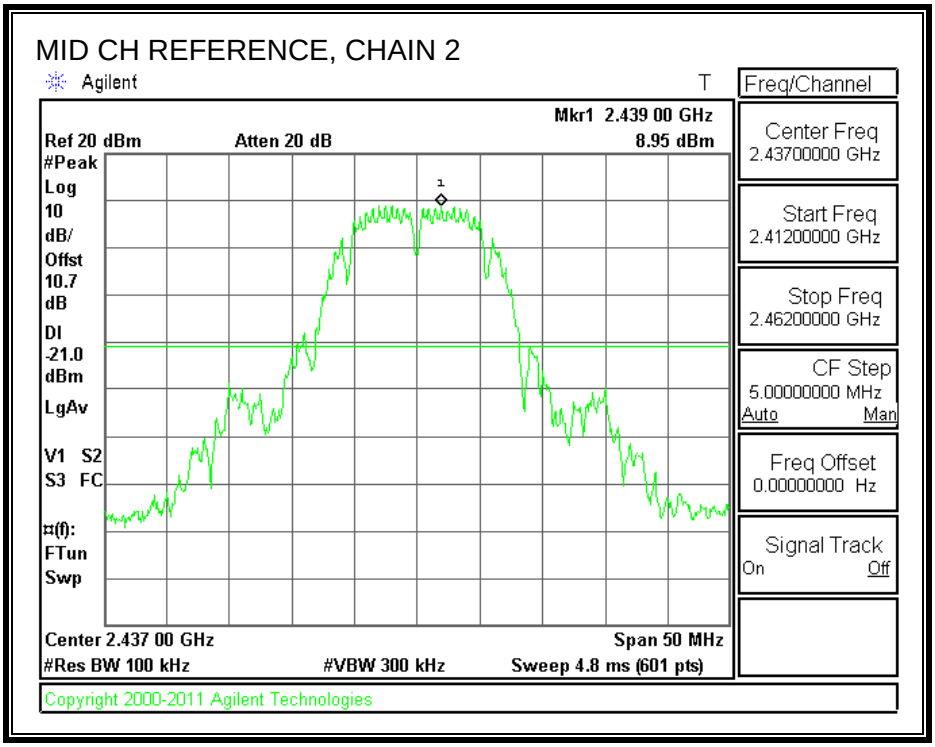


CHAIN 2 SPURIOUS EMISSIONS

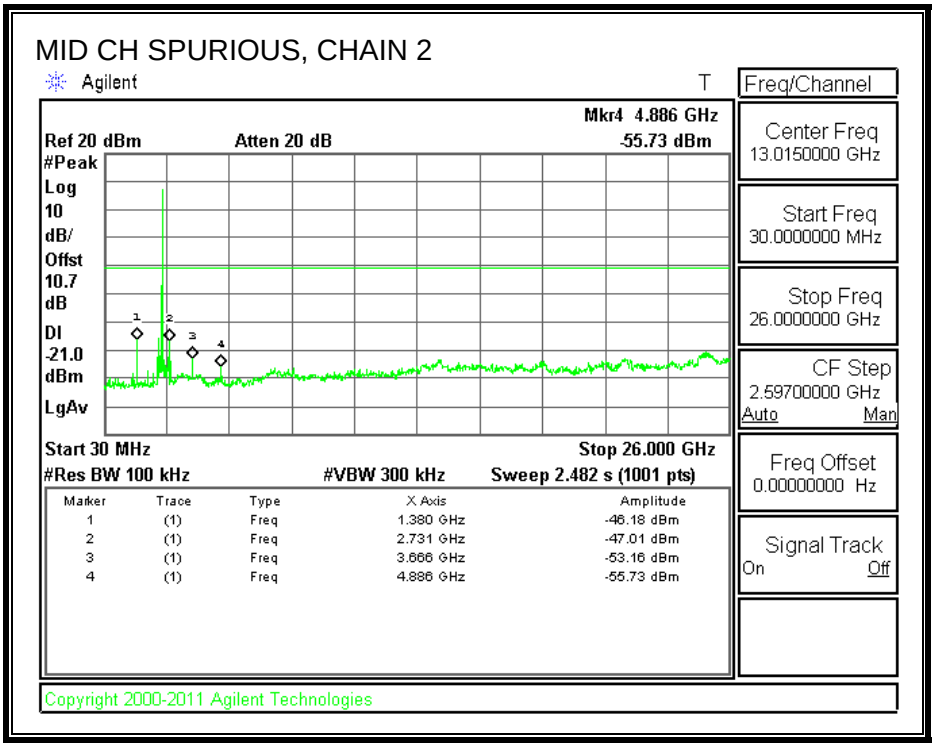




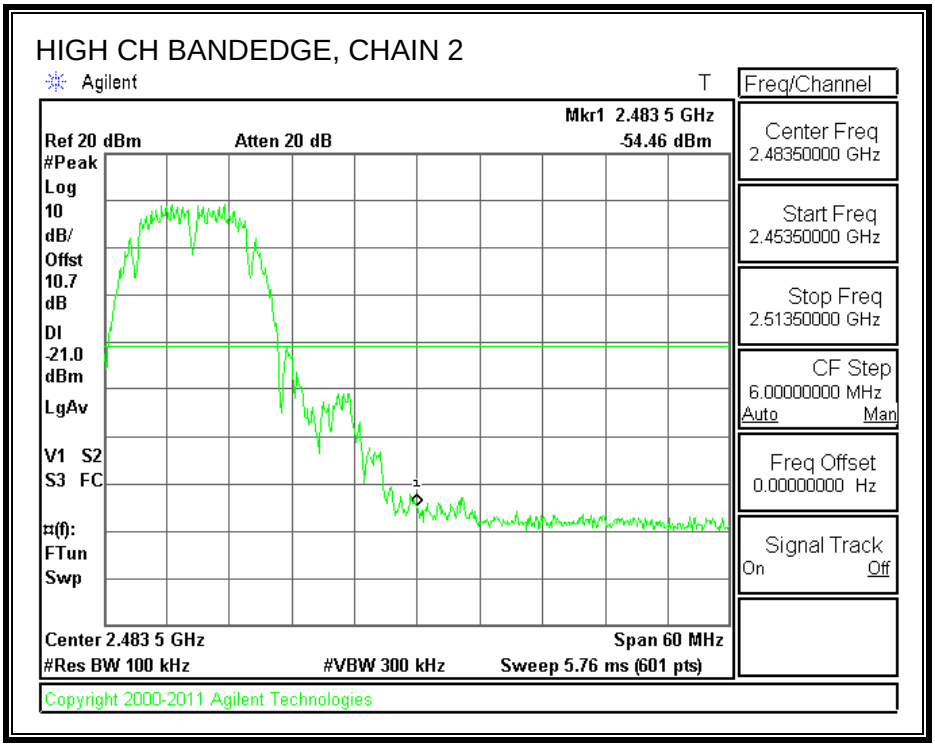
MID CH REFERENCE, CHAIN 2



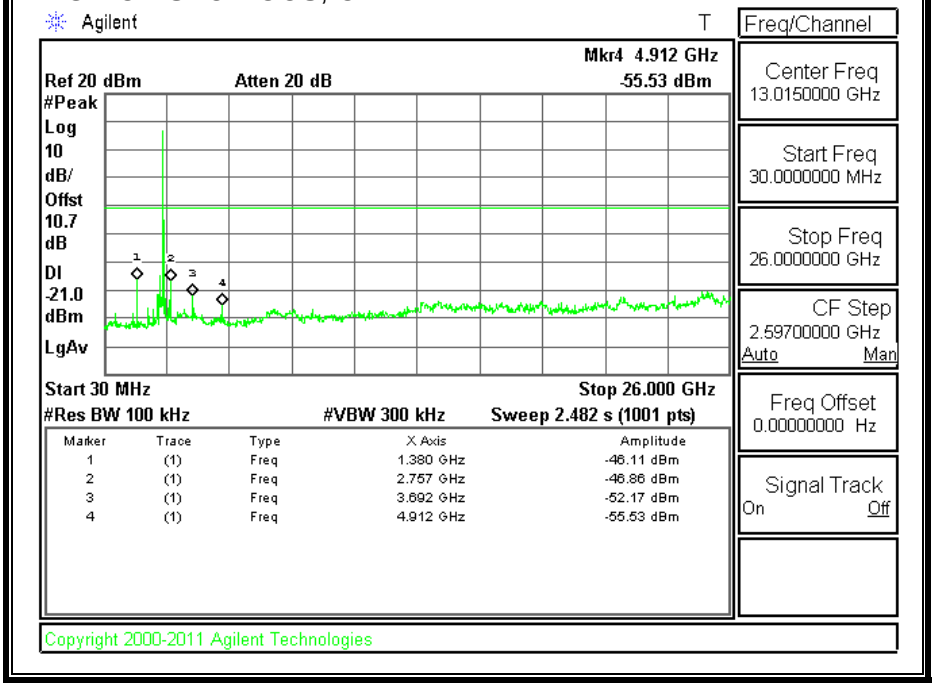
MID CH SPURIOUS, CHAIN 2



HIGH CH BANDEDGE, CHAIN 2



HIGH CH SPURIOUS, CHAIN 2



7.2. 802.11g LEGACY 1TX MODE IN THE 2.4 GHz BAND

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.

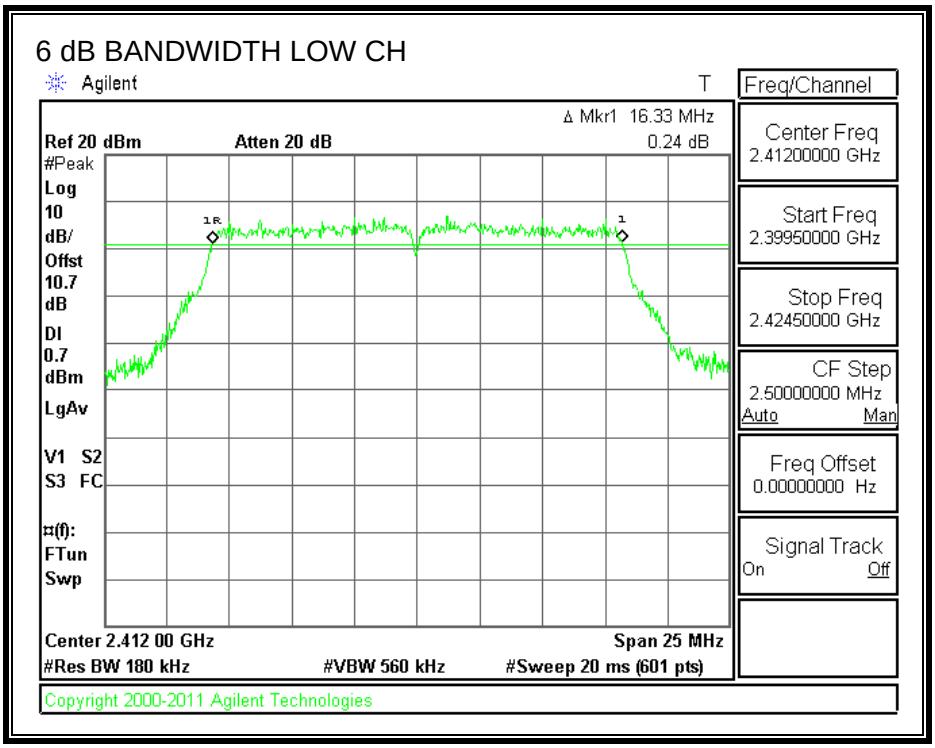
TEST PROCEDURE

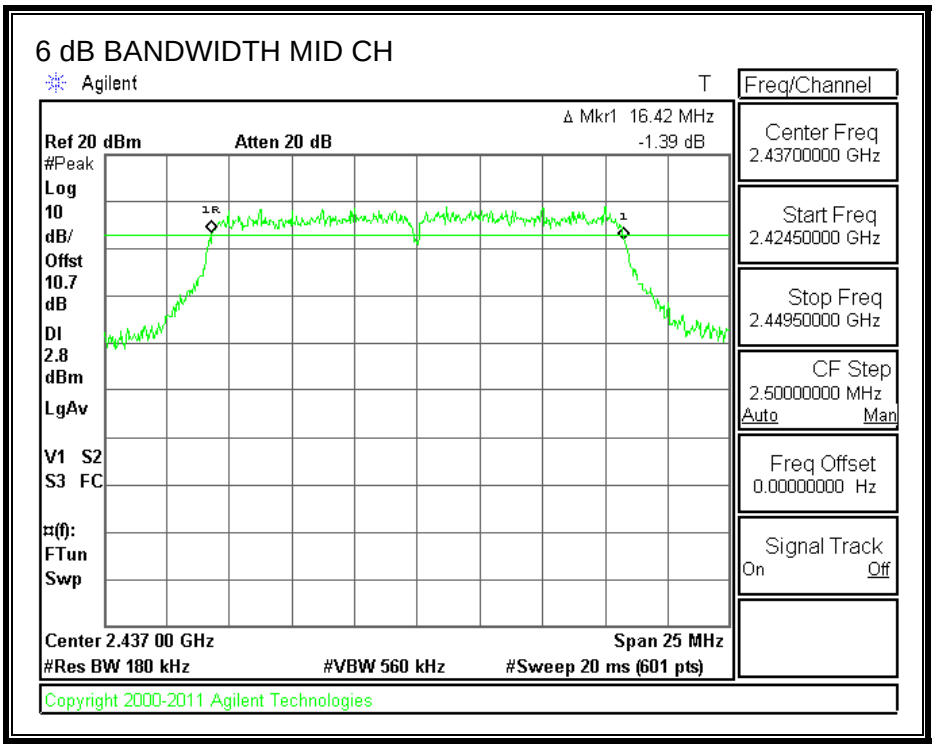
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

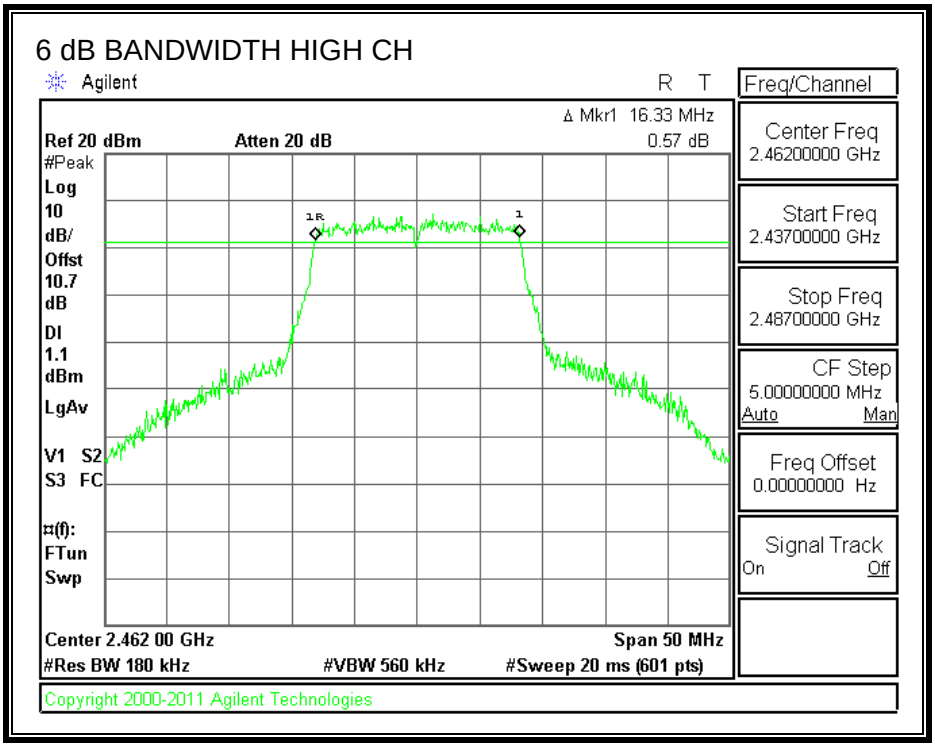
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.33	0.5
Middle	2437	16.42	0.5
High	2462	16.33	0.5

6 dB BANDWIDTH







7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

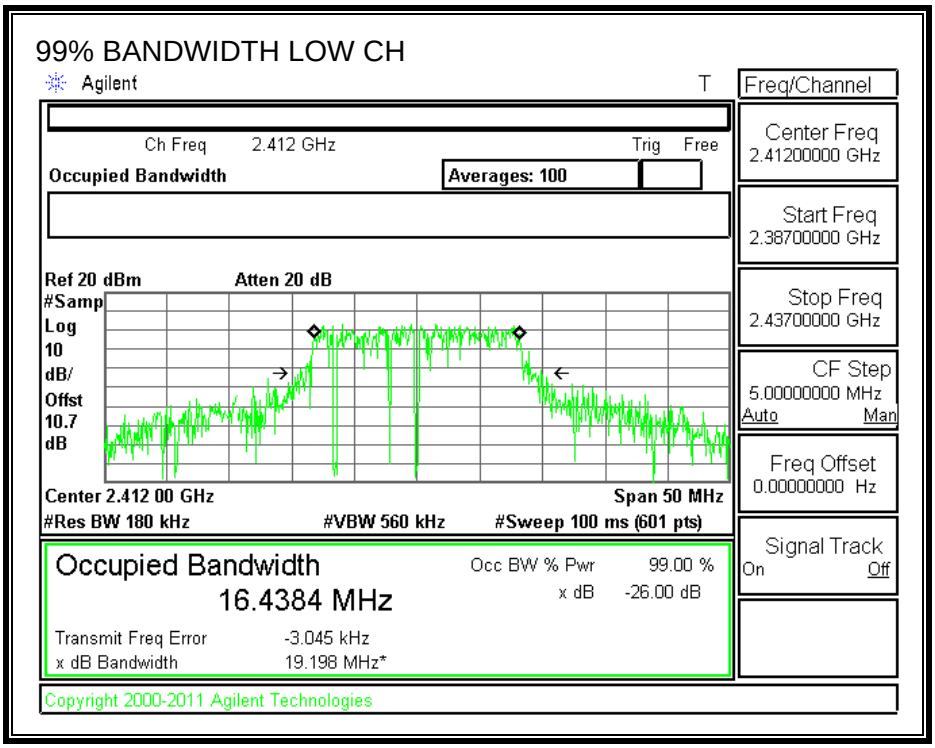
TEST PROCEDURE

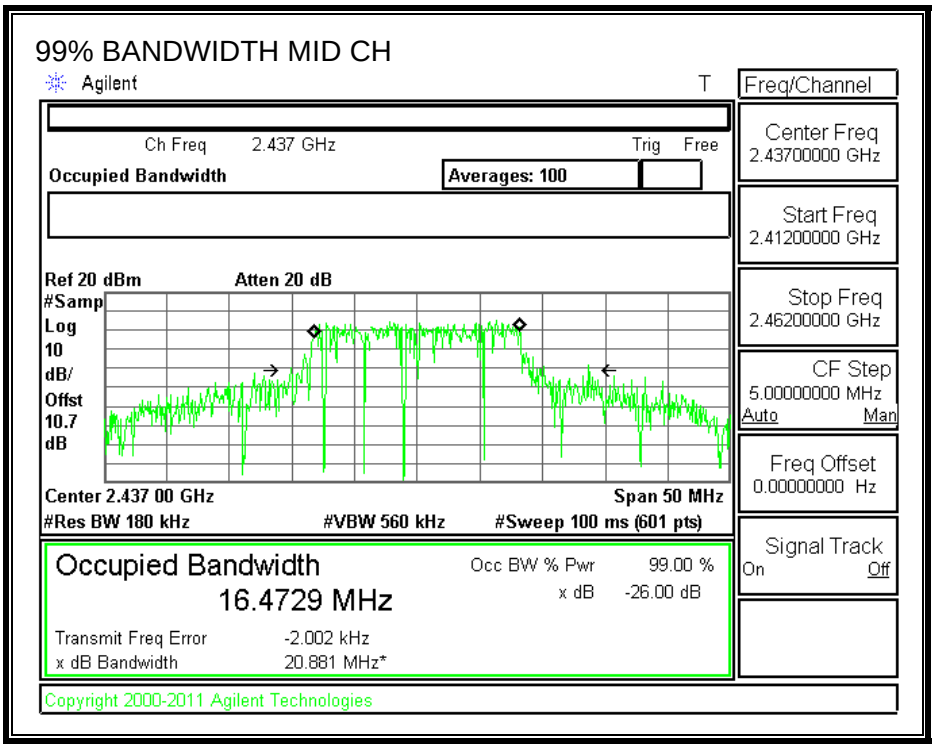
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

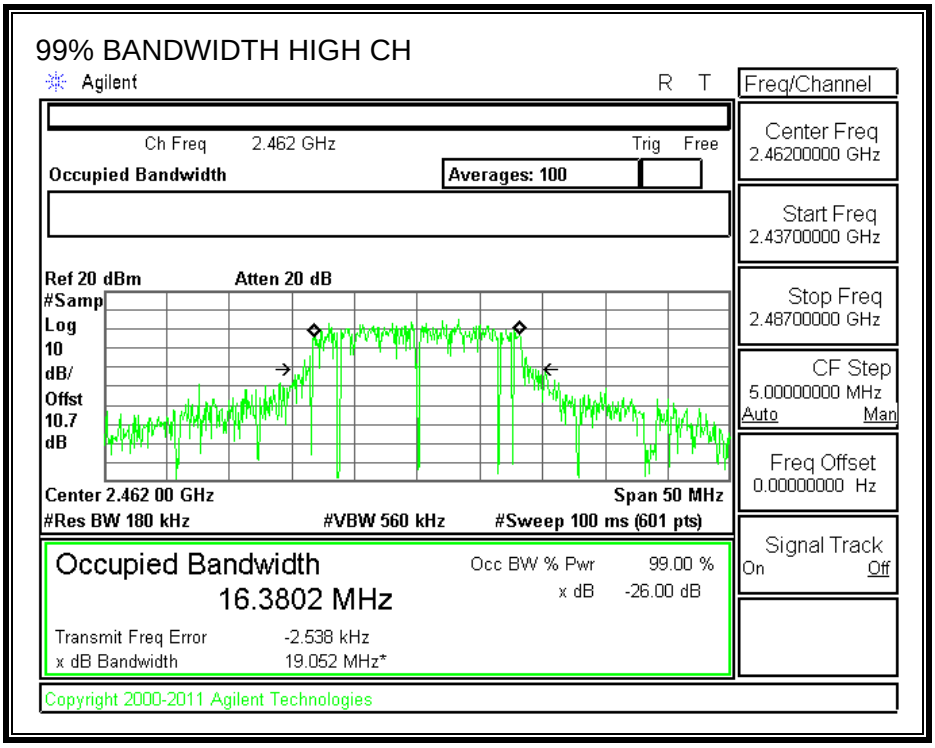
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.4384
Middle	2437	16.4729
High	2462	16.3802

99% BANDWIDTH







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.

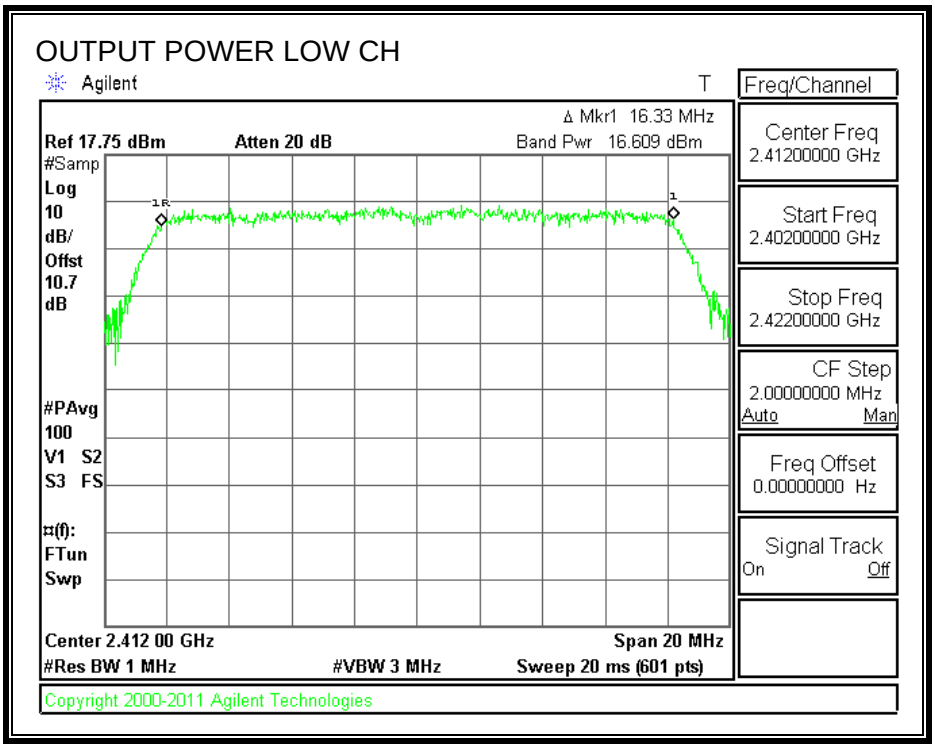
TEST PROCEDURE

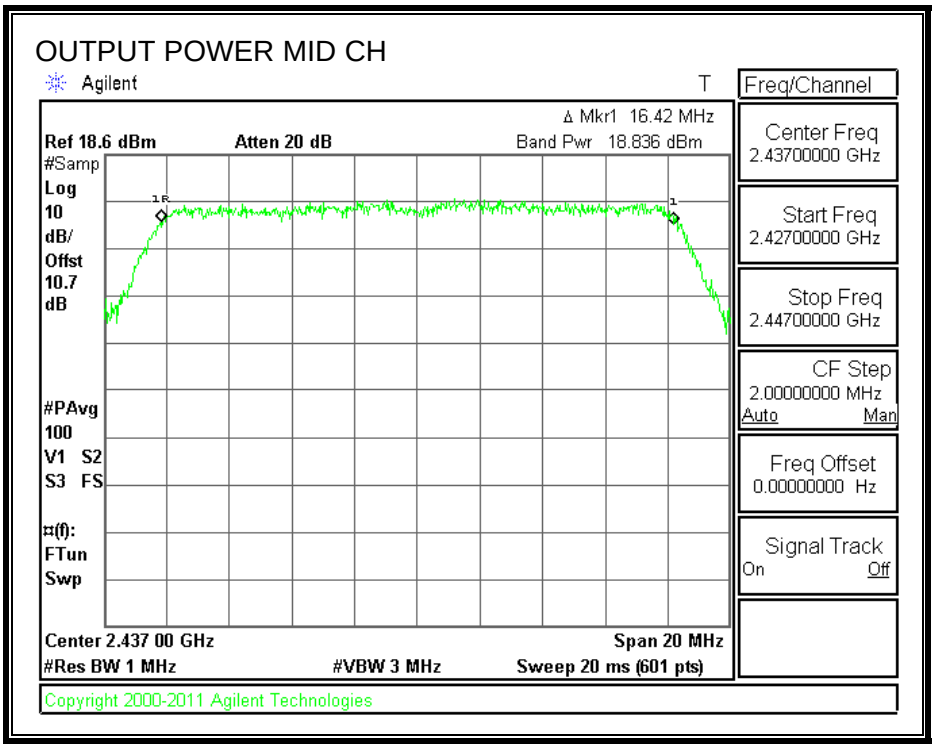
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

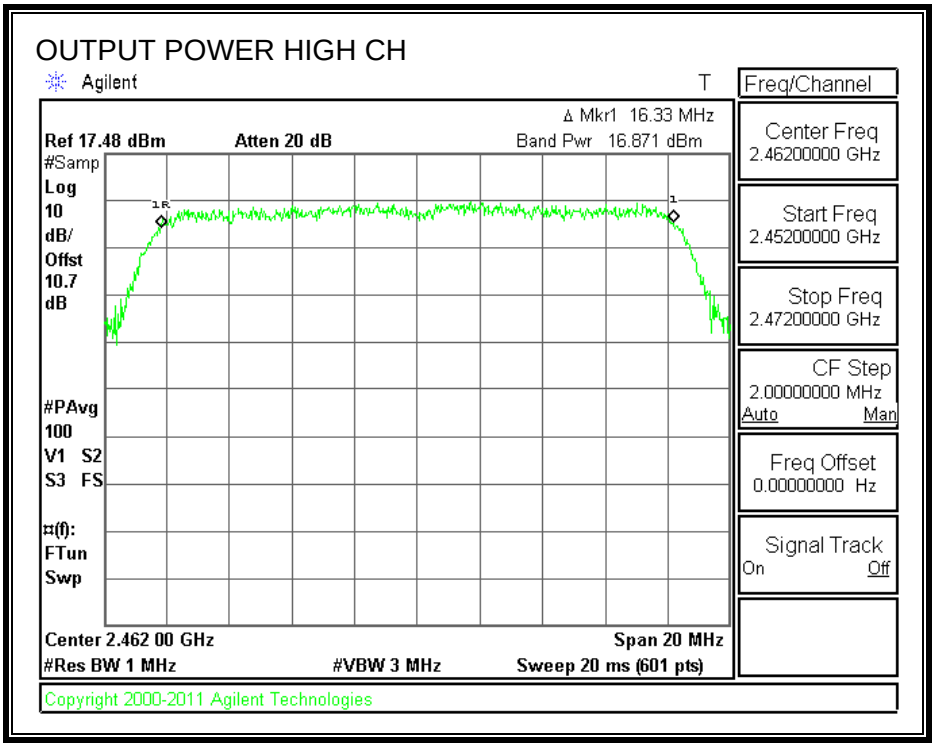
RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2412	16.609	30	-13.391
Middle	2437	18.836	30	-11.164
High	2462	16.871	30	-13.129

OUTPUT POWER







7.2.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

TEST PROCEDURE

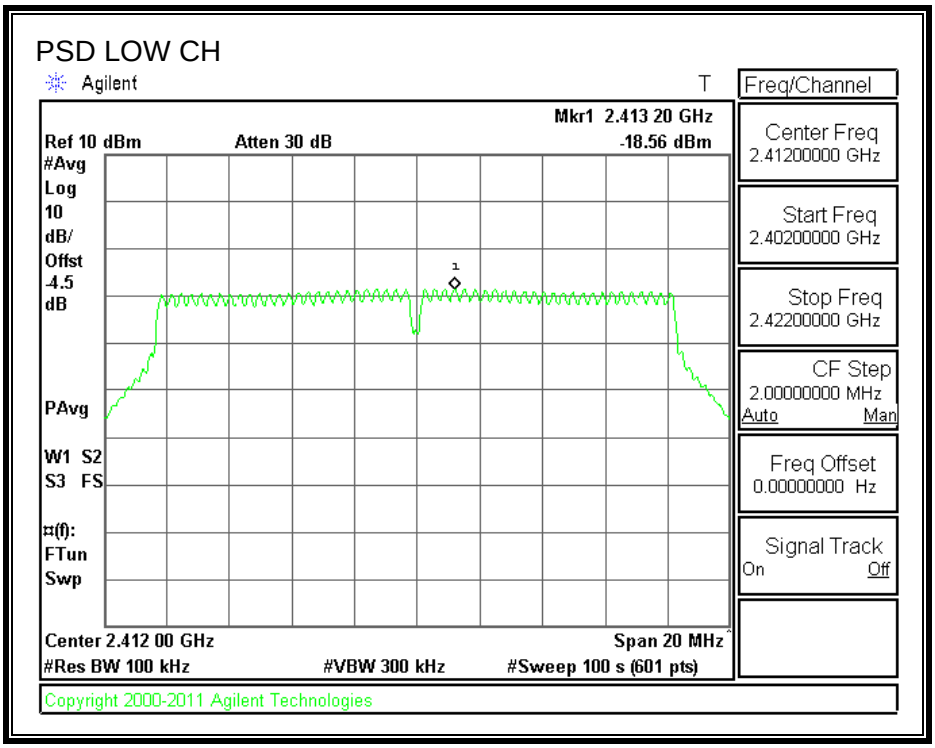
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

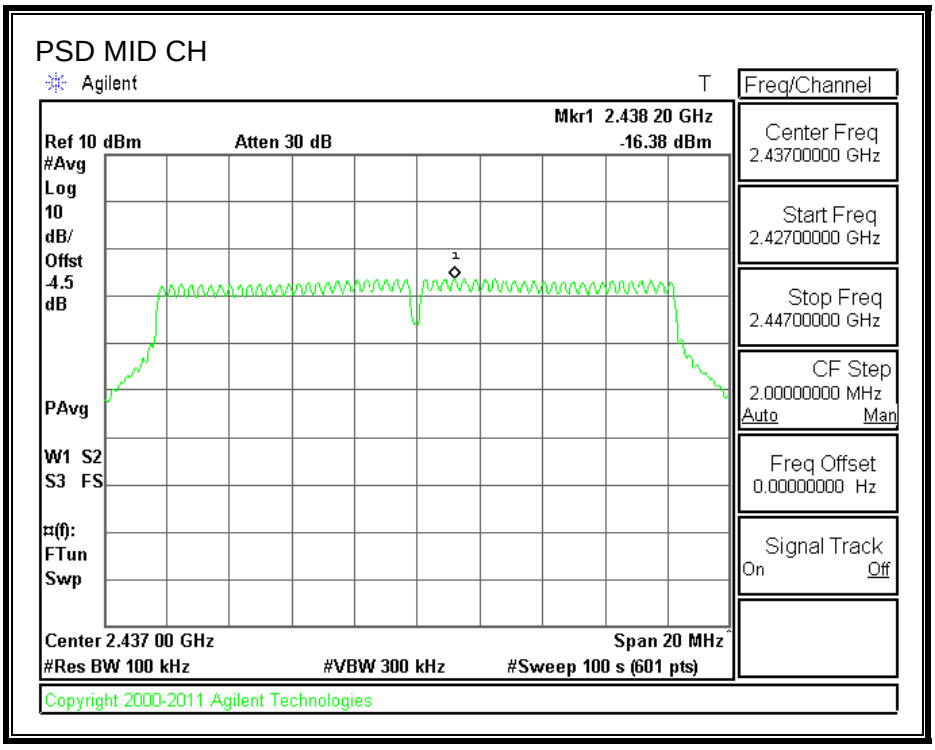
RESULTS

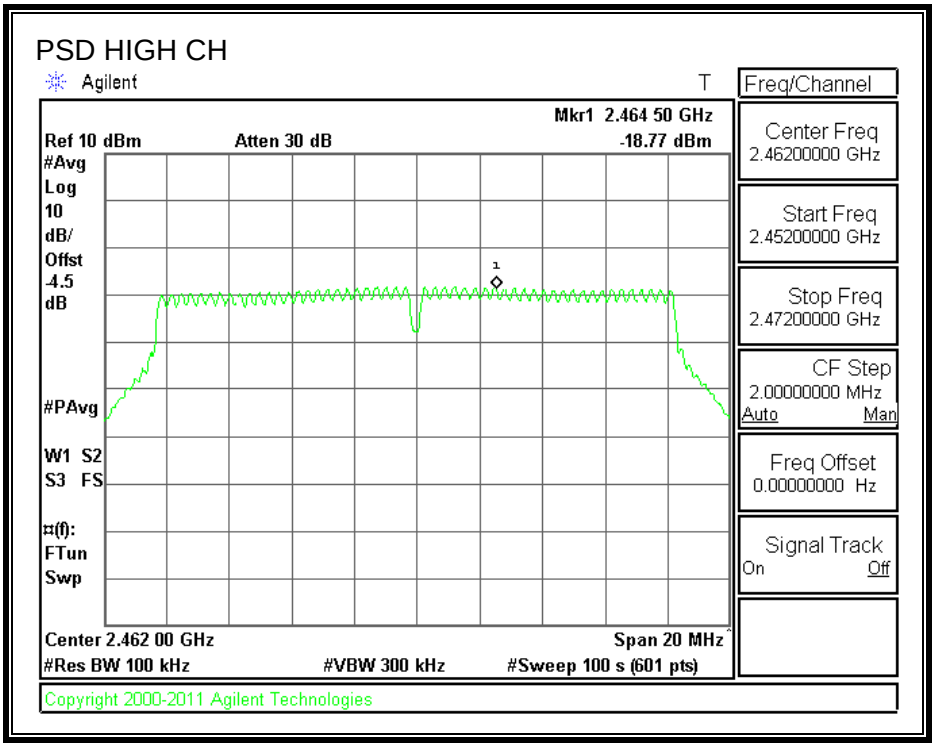
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-18.56	8	-26.56
Middle	2437	-16.38	8	-24.38
High	2462	-18.77	8	-26.77

Note: Analyzer offset = cable loss + attenuator + 10 log(3/100)

POWER SPECTRAL DENSITY







7.2.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

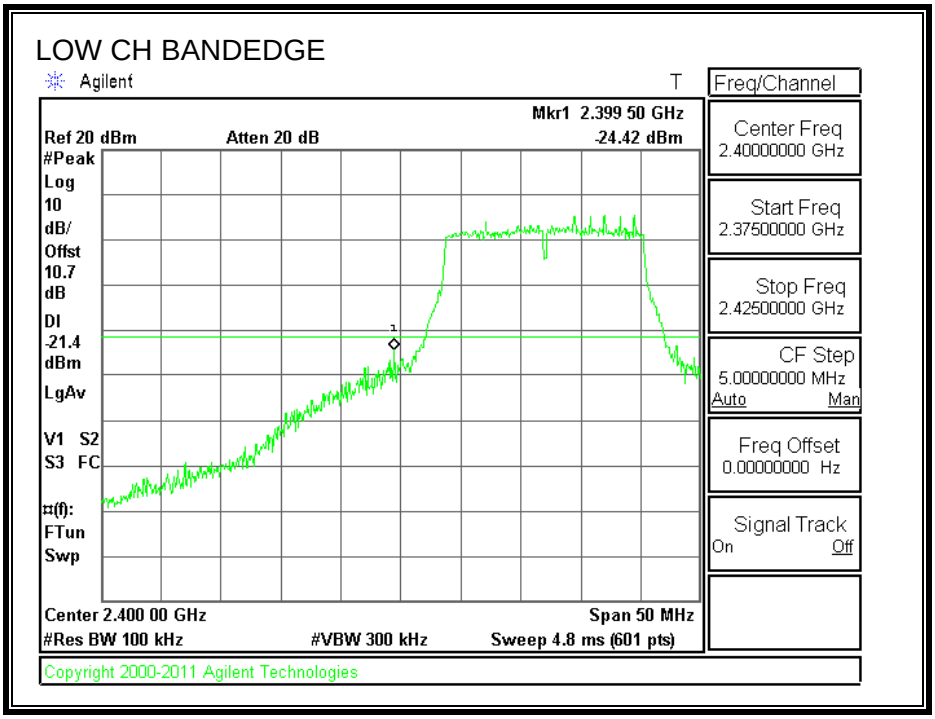
Output power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

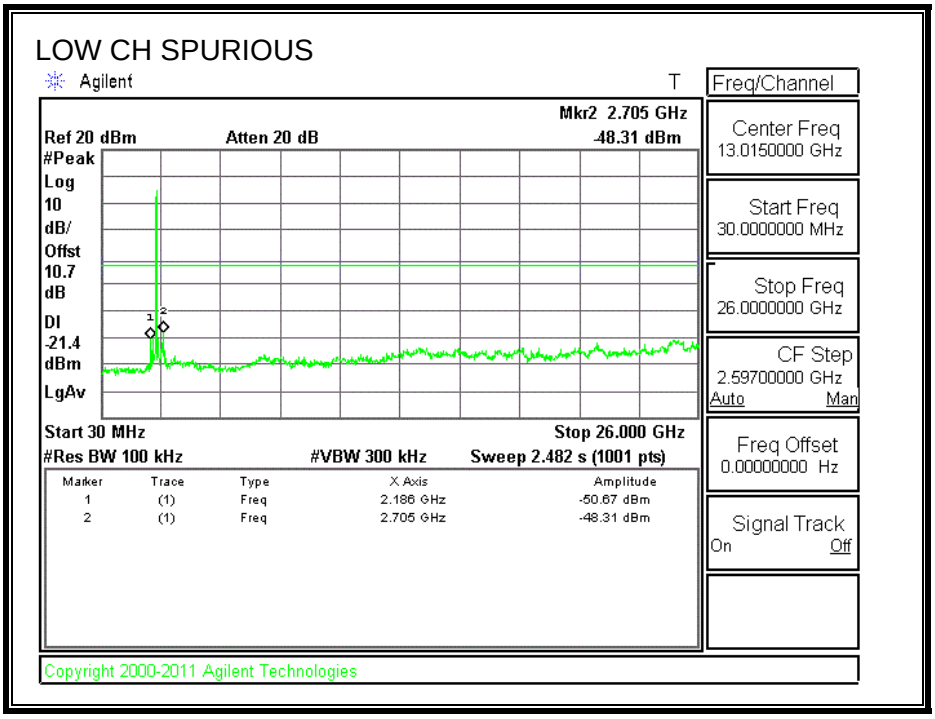
TEST PROCEDURE

KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

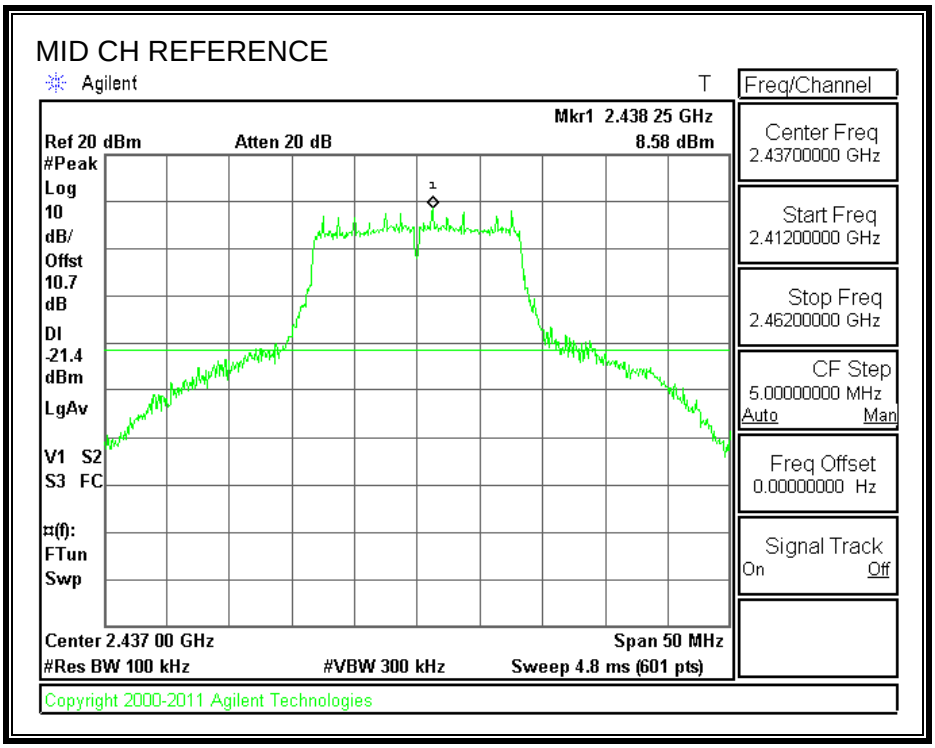
RESULTS

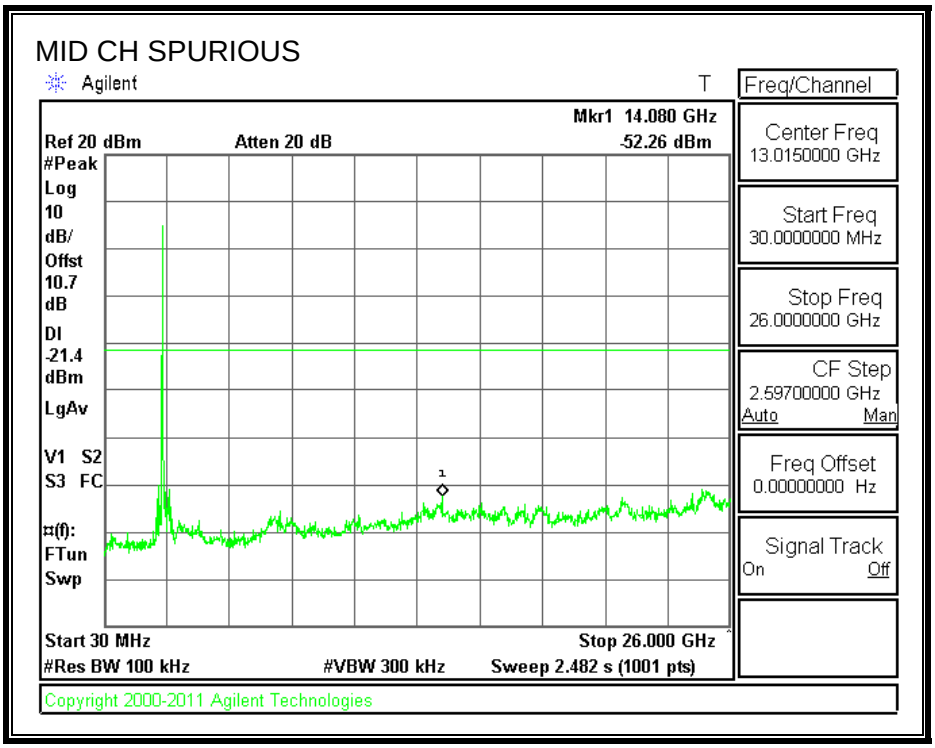
SPURIOUS EMISSIONS, LOW CHANNEL



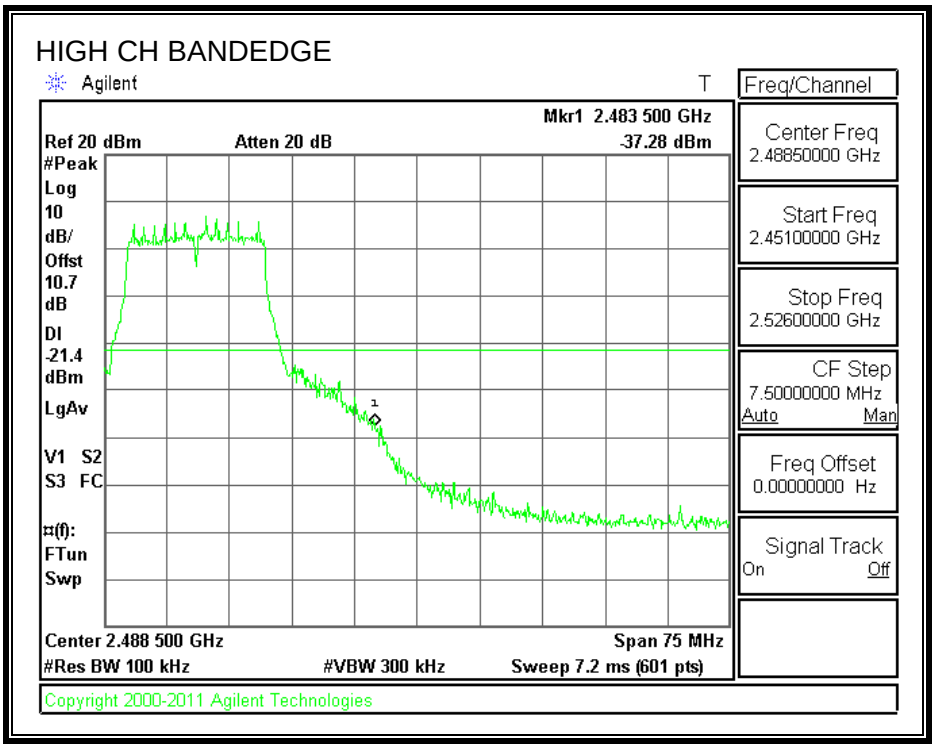


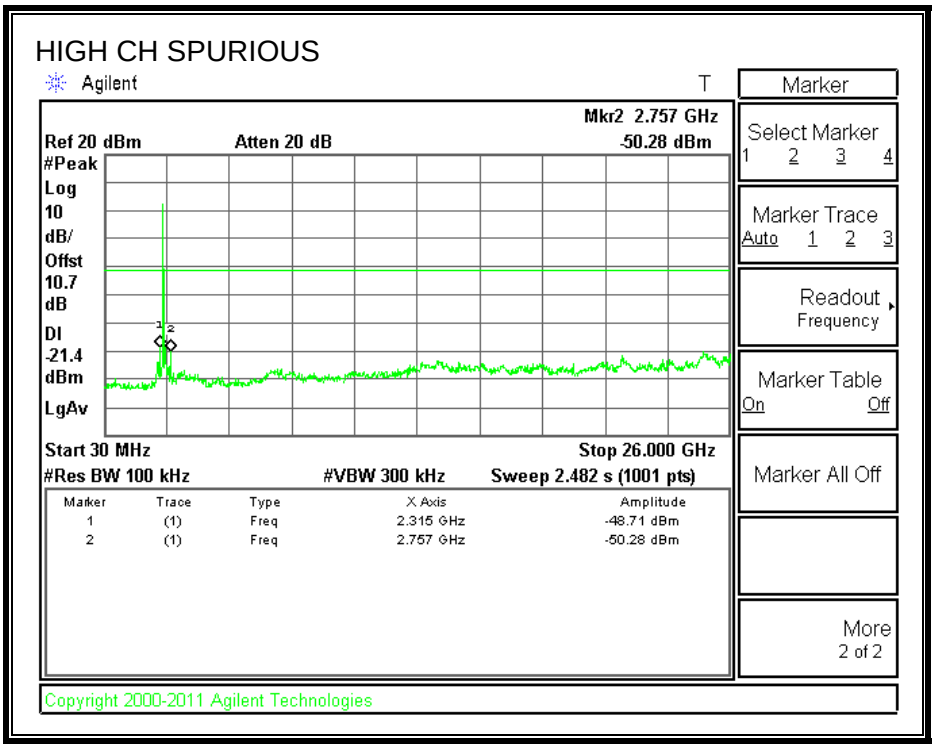
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





7.3. 802.11n HT20 CDD MCS0 2TX MODE IN THE 2.4 GHz BAND

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.

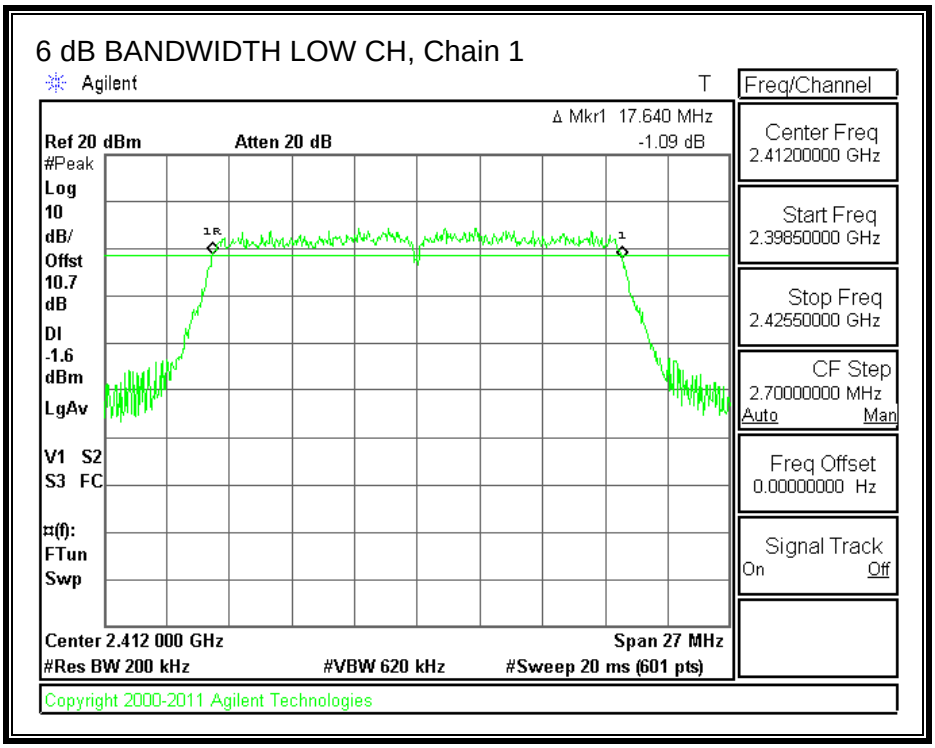
TEST PROCEDURE

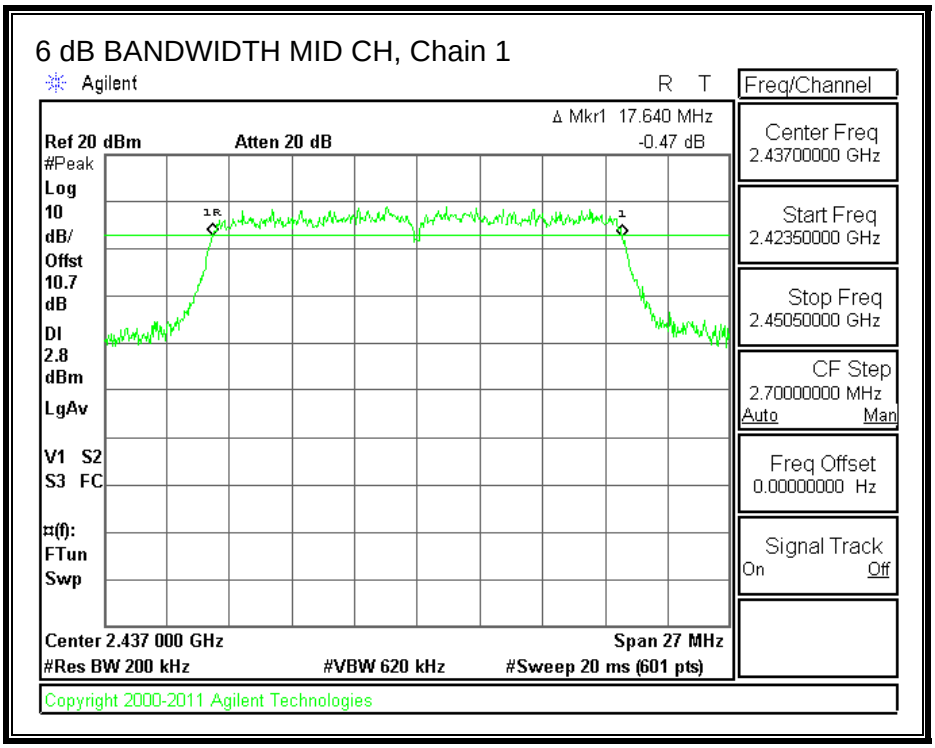
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

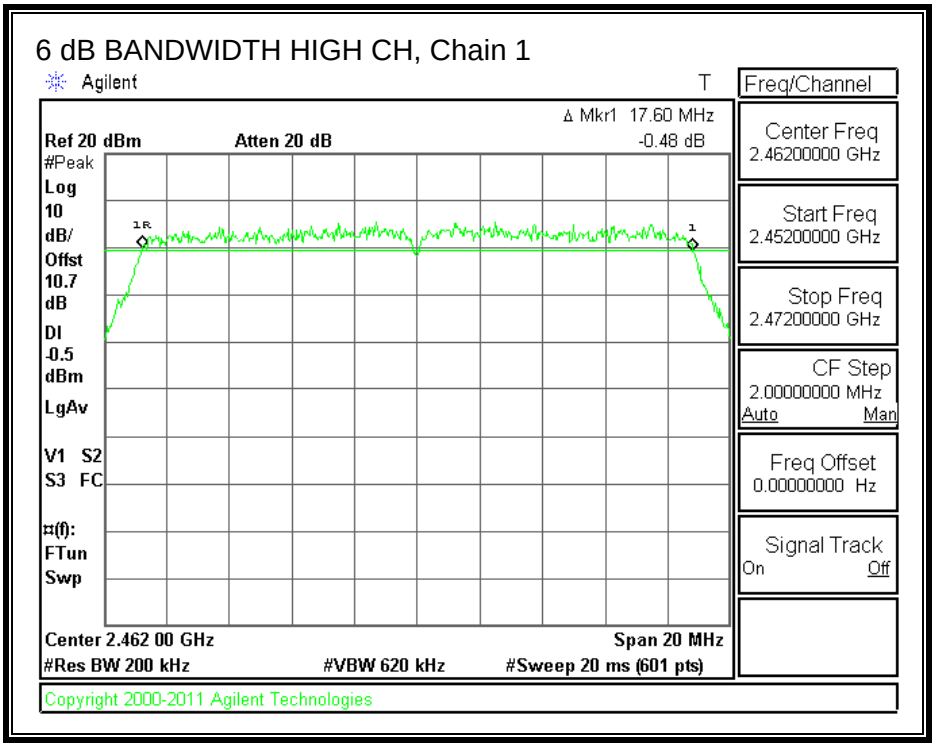
RESULTS

Channel	Frequency (MHz)	Chain 1 6 dB Bandwidth (MHz)	Chain 2 6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.640	17.685	0.5
Middle	2437	17.640	17.685	0.5
High	2462	17.600	17.700	0.5

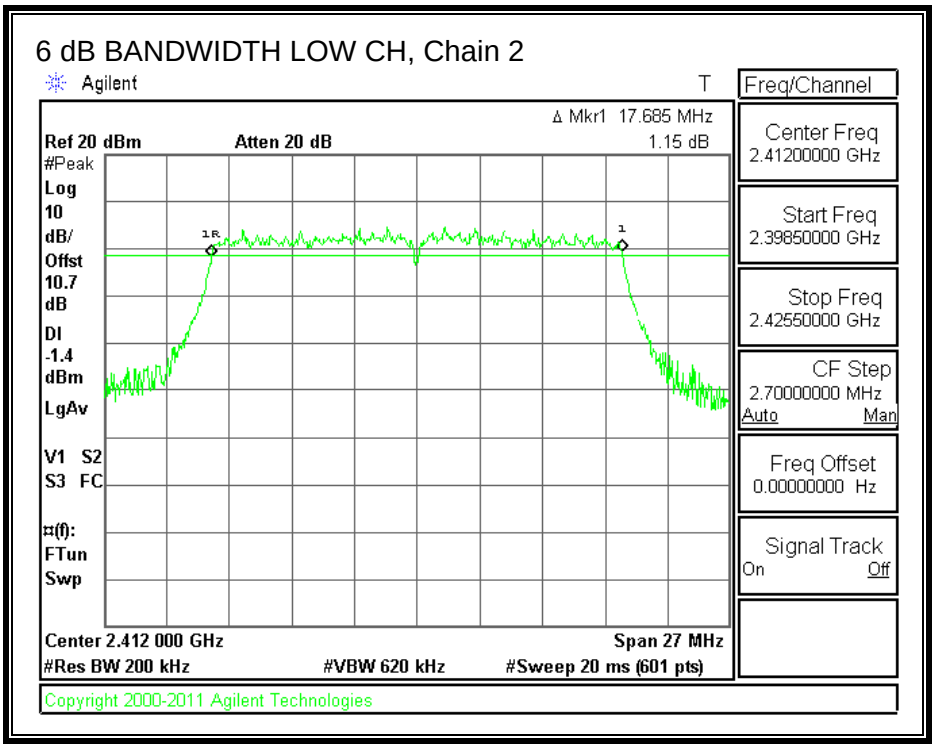
6 dB BANDWIDTH, Chain 1

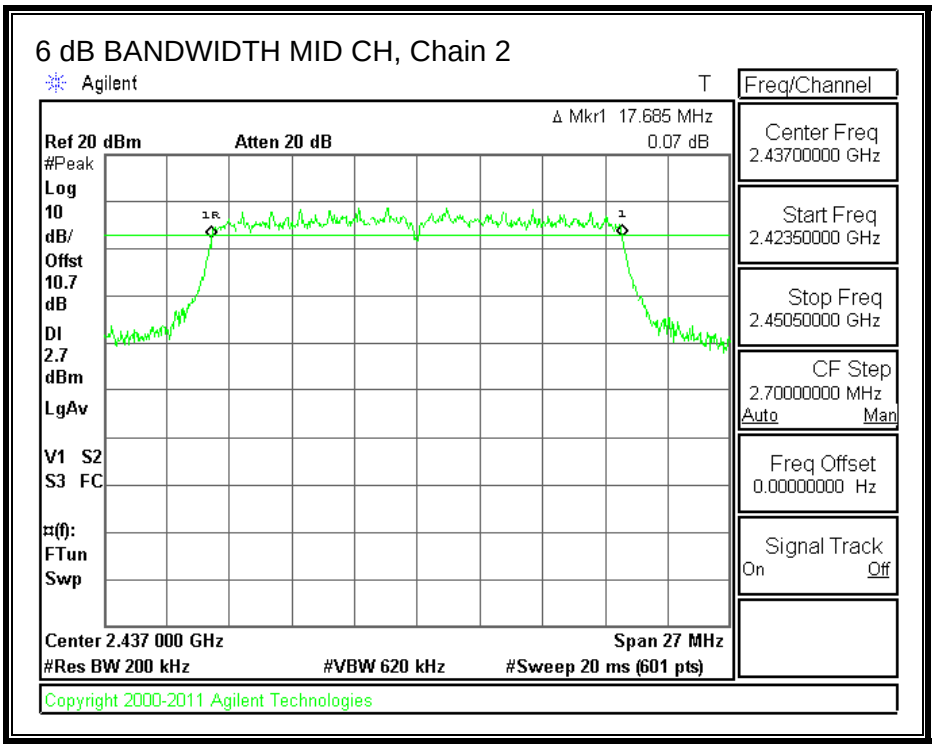


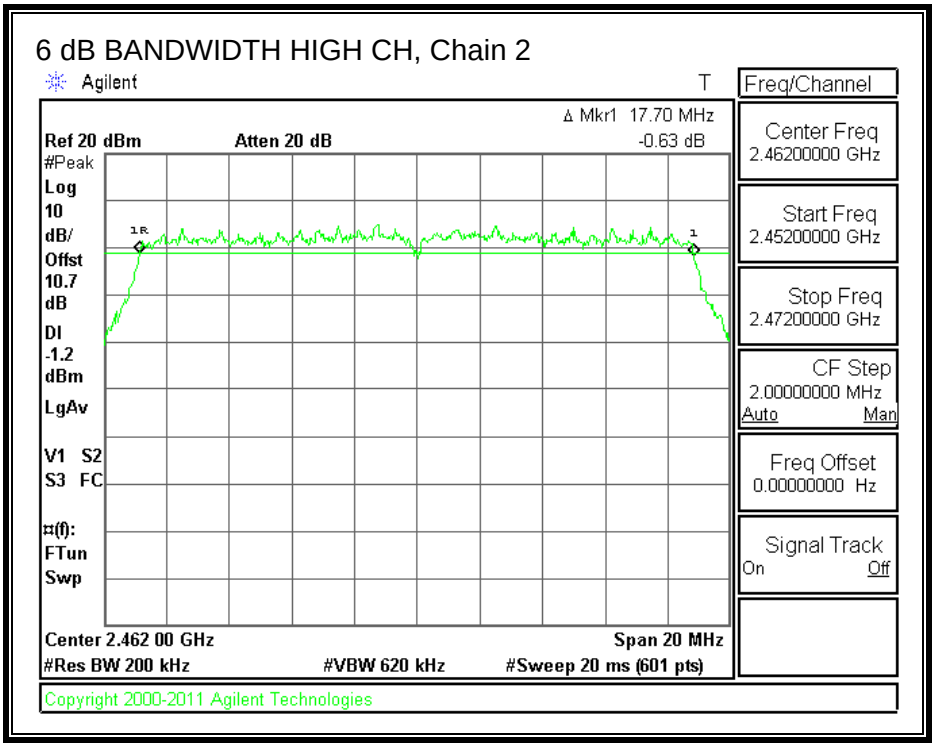




6 dB BANDWIDTH, Chain 2







7.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

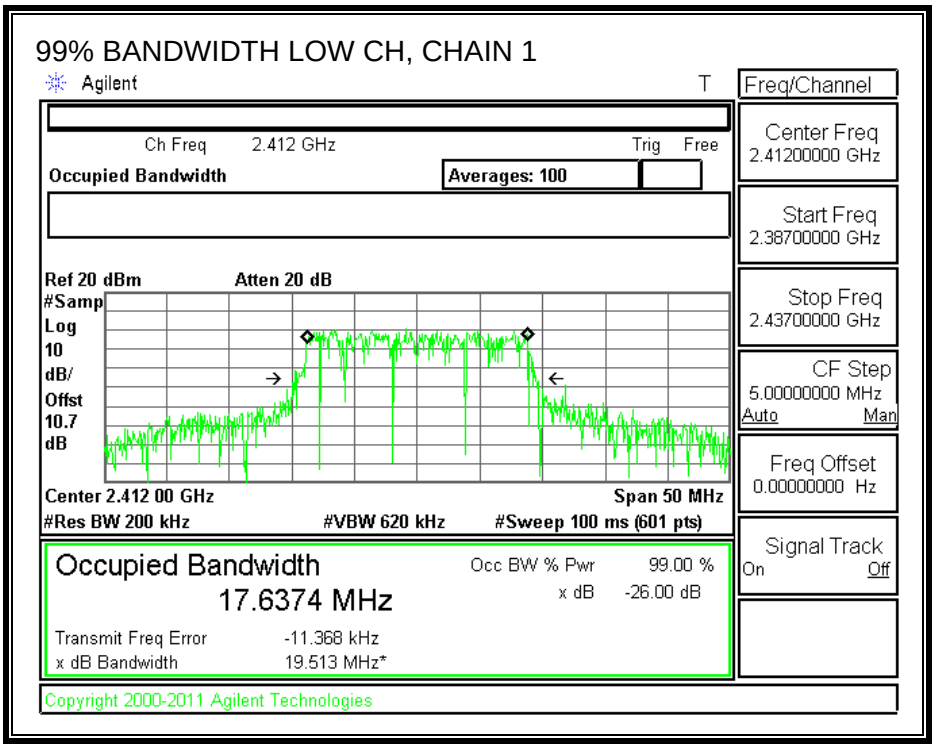
TEST PROCEDURE

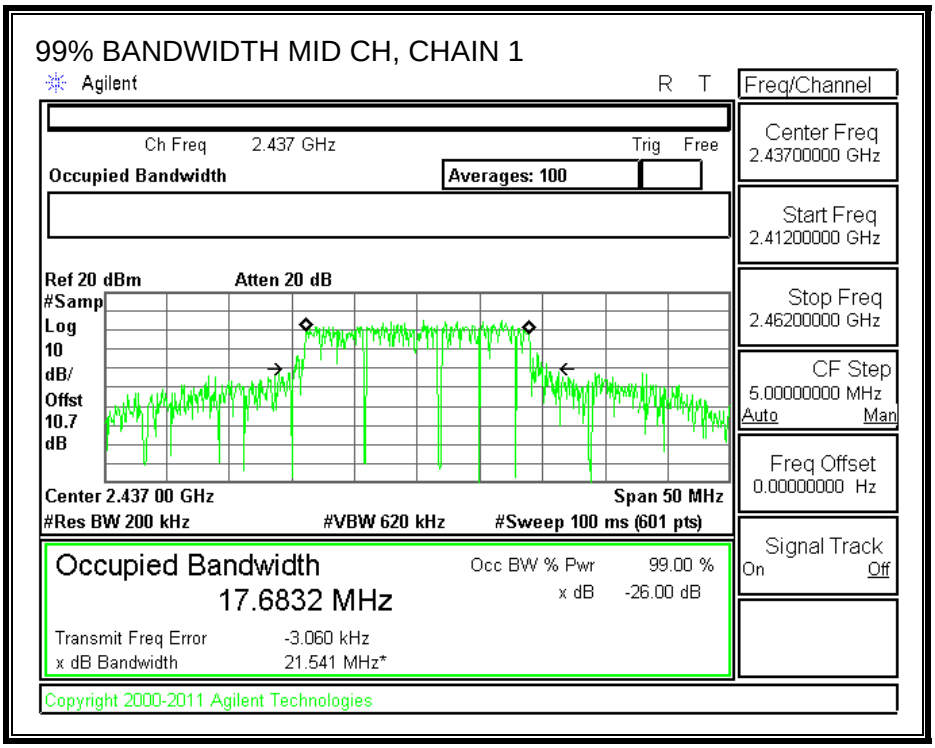
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

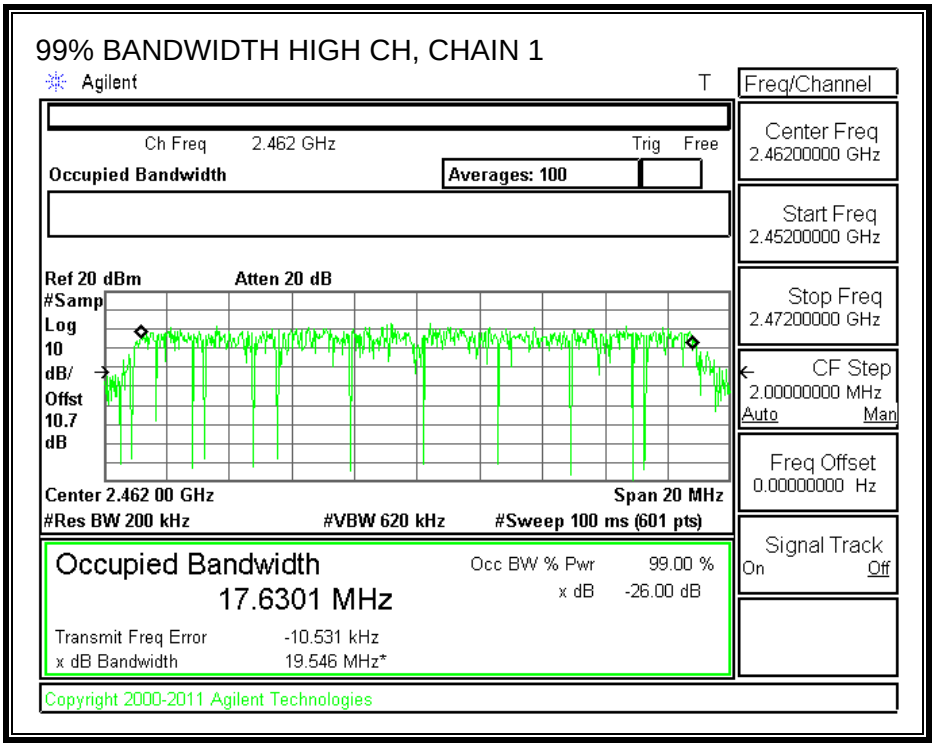
RESULTS

Channel	Frequency (MHz)	Chain 1 99% Bandwidth (MHz)	Chain 2 99% Bandwidth (MHz)
Low	2412	17.6374	17.6267
Middle	2437	17.6832	17.6592
High	2462	17.6301	17.6391

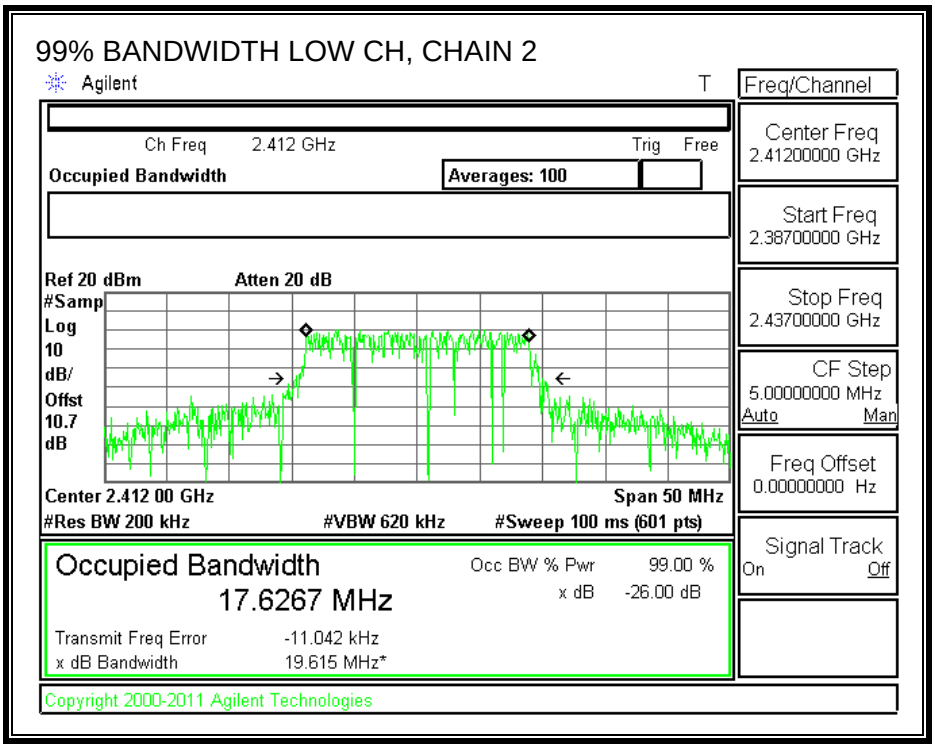
99% BANDWIDTH, CHAIN 1

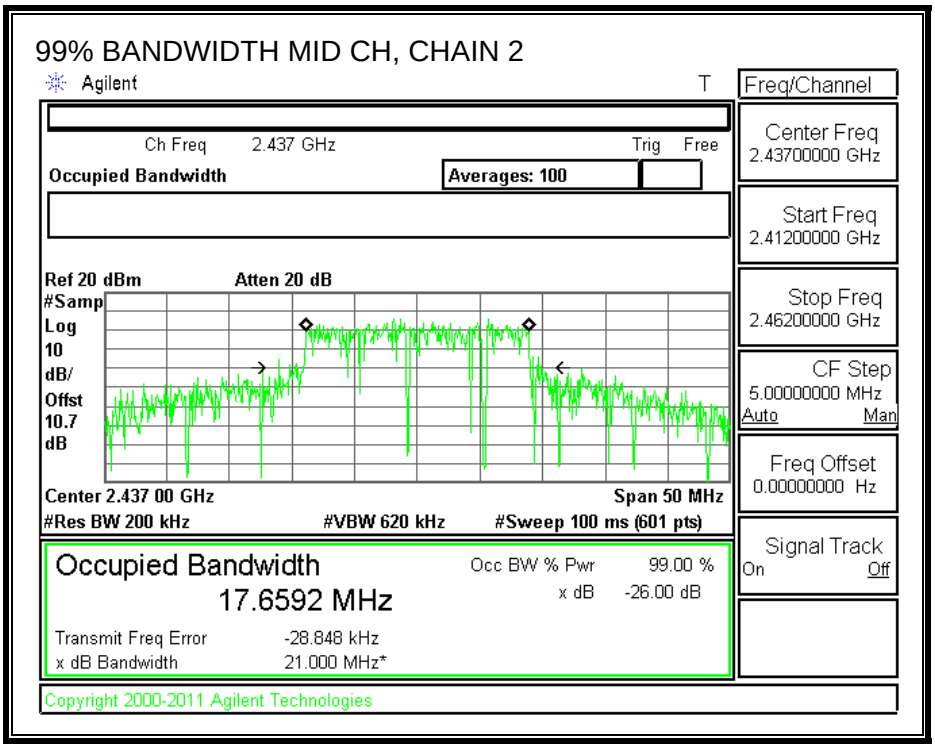


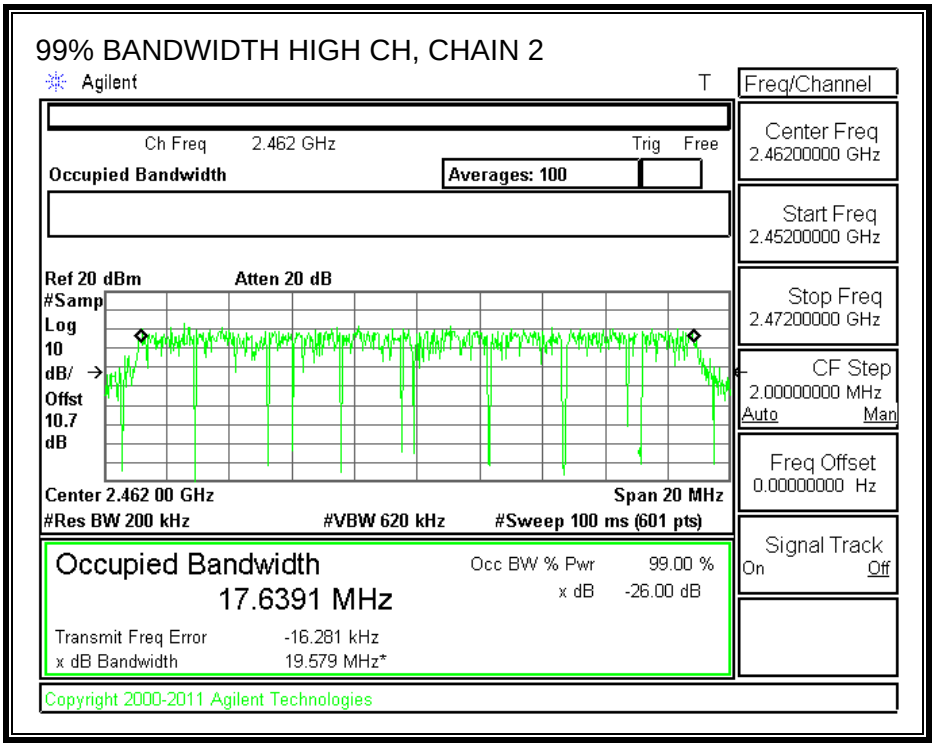




99% BANDWIDTH, CHAIN 2







7.3.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
3.90	3.01	6.91

The maximum effective legacy gain is 6.91 dBi for other than fixed, point-to-point operations, therefore the limit is 29.09 dBm.

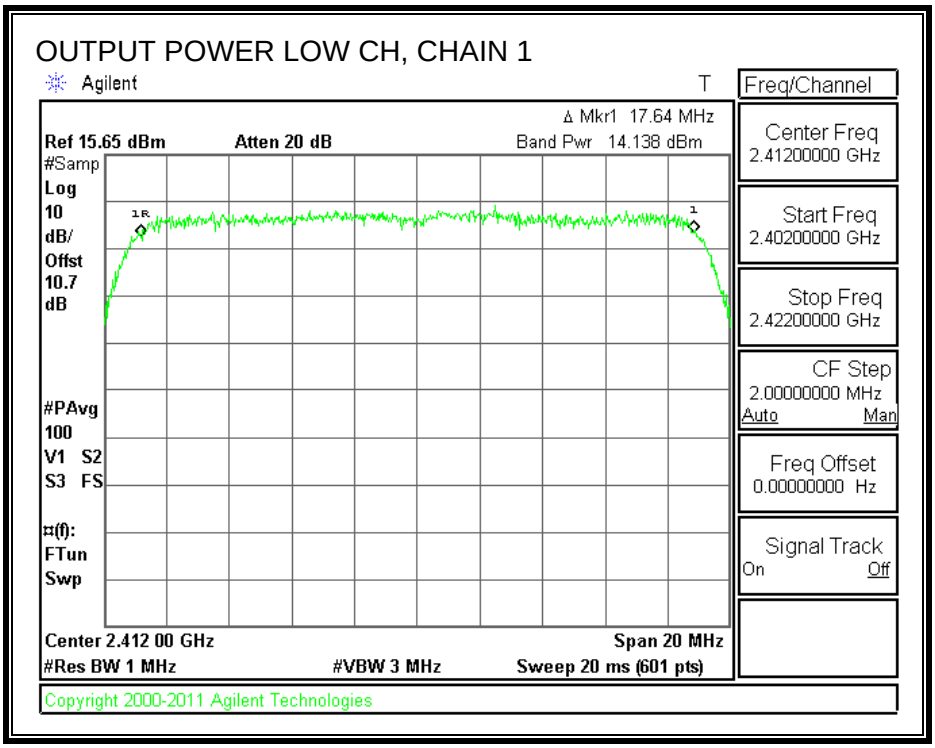
TEST PROCEDURE

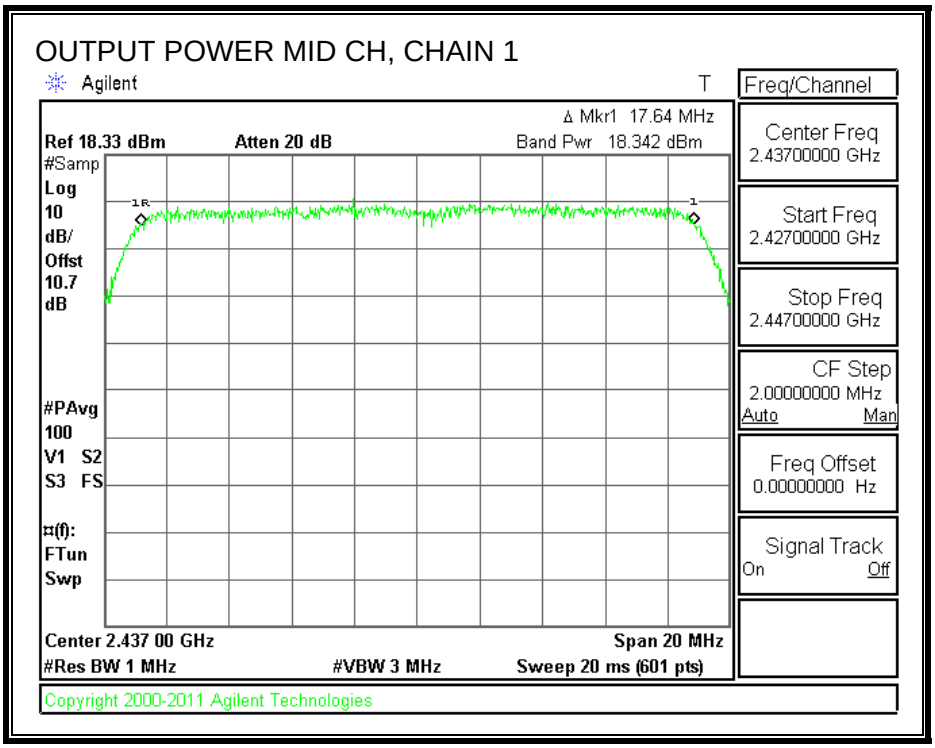
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

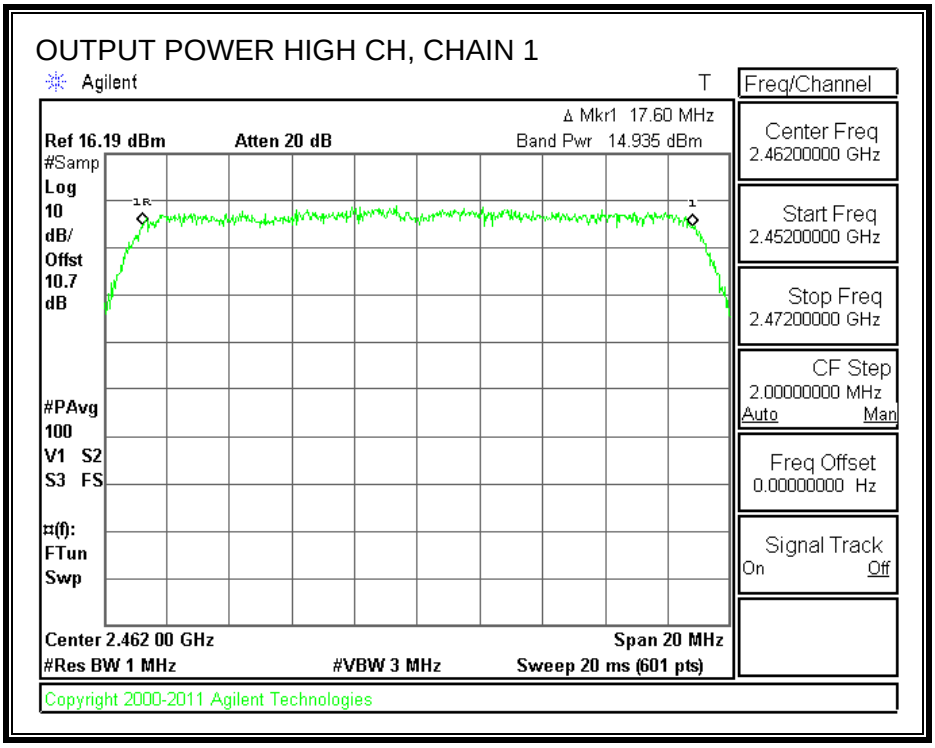
RESULTS

Channel	Frequency (MHz)	Chain 1 PK Power (dBm)	Chain 2 PK Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	14.138	14.552	17.360	29.09	-11.730
Mid	2437	18.342	18.327	21.345	29.09	-7.745
High	2462	14.935	14.590	17.776	29.09	-11.314

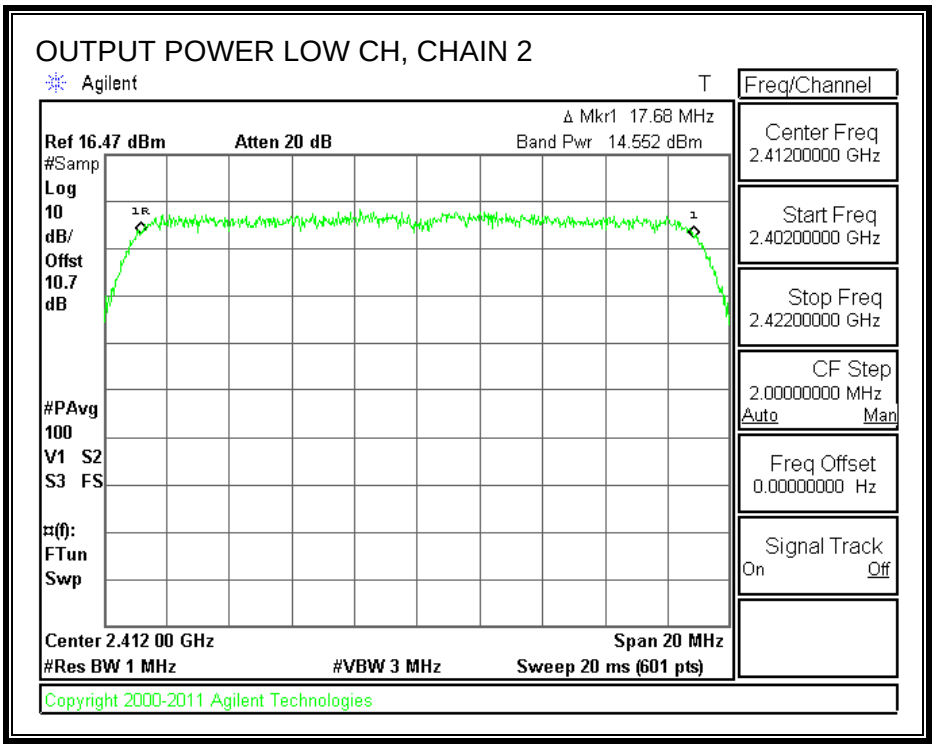
CHAIN 1 OUTPUT POWER

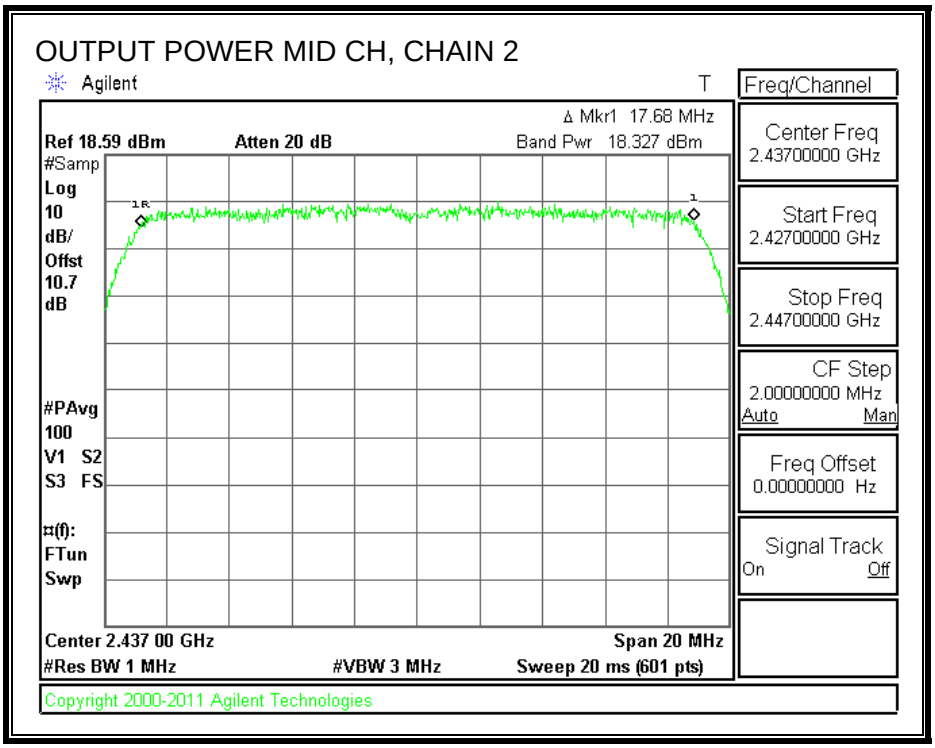


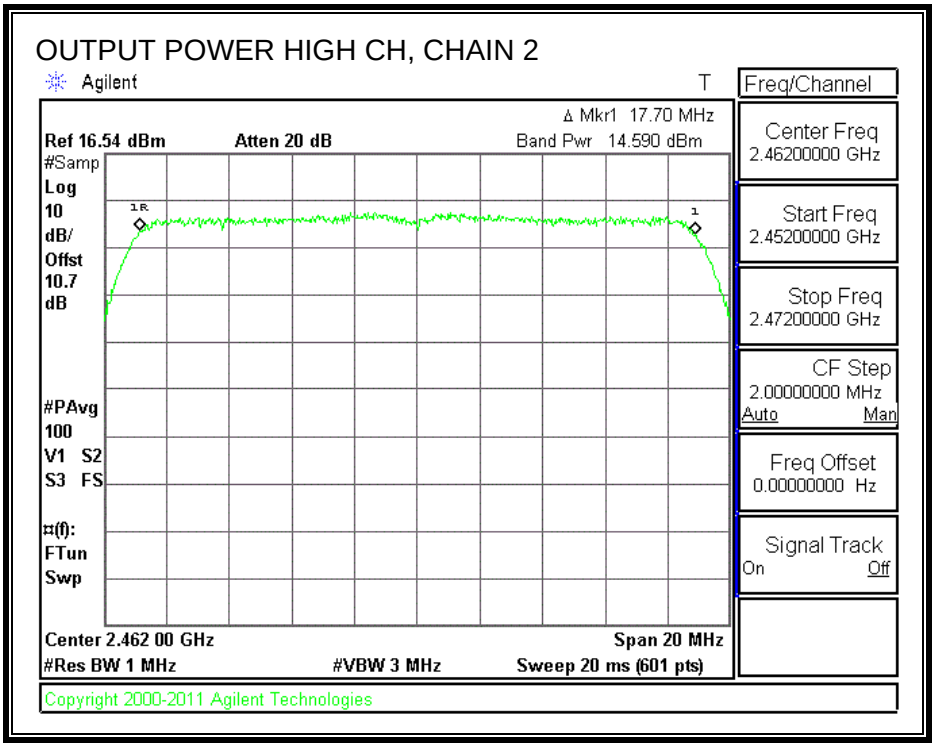




CHAIN 2 OUTPUT POWER







7.3.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

TEST PROCEDURE

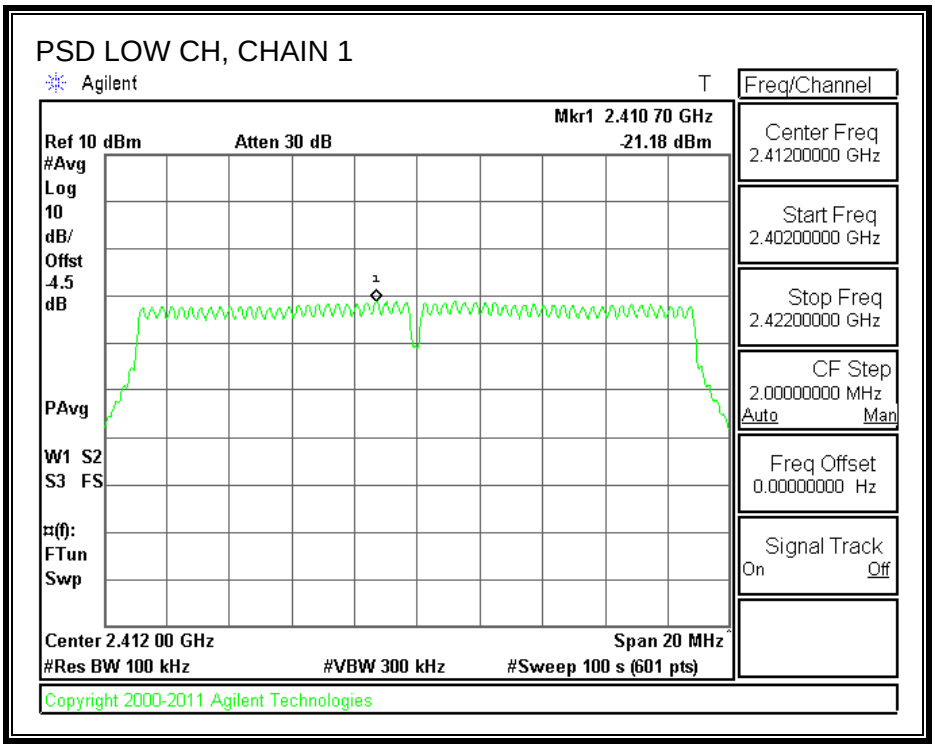
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

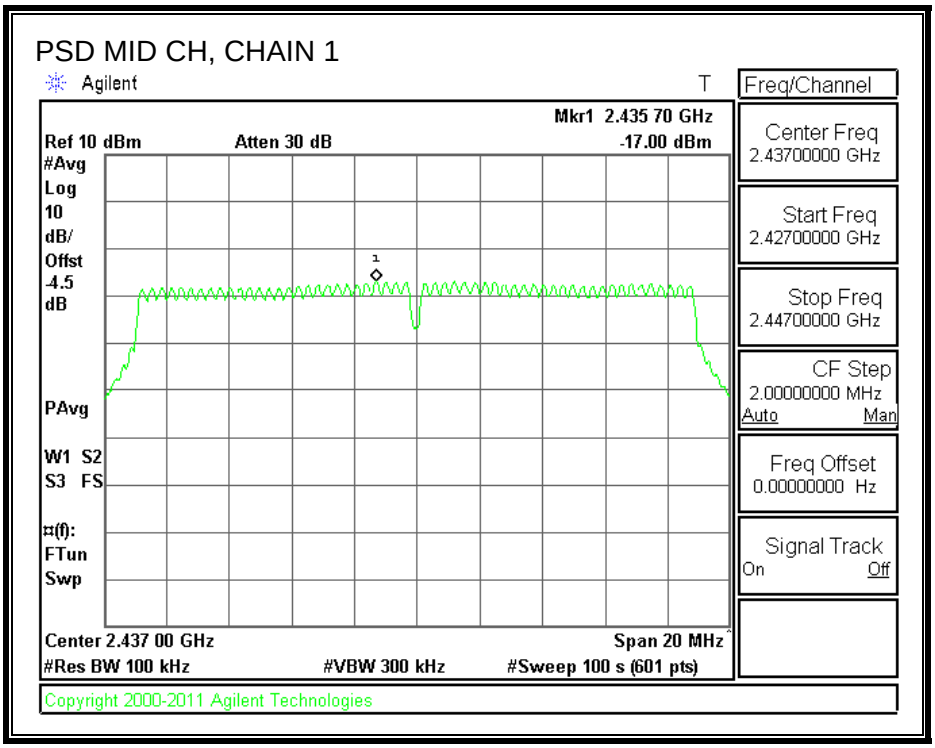
RESULTS

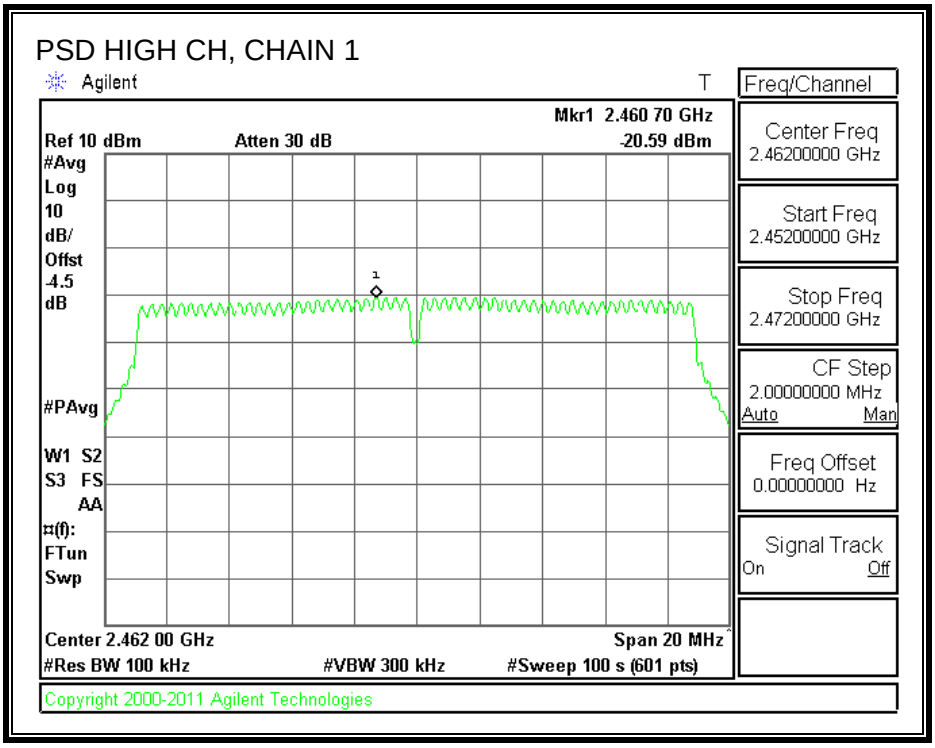
Channel	Frequency (MHz)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-21.18	-20.73	-17.94	8	-25.94
Middle	2437	-17.00	-17.00	-13.99	8	-21.99
High	2462	-20.59	-20.45	-17.51	8	-25.51

Note: Analyzer offset = cable loss + attenuator + 10 log(3/100)

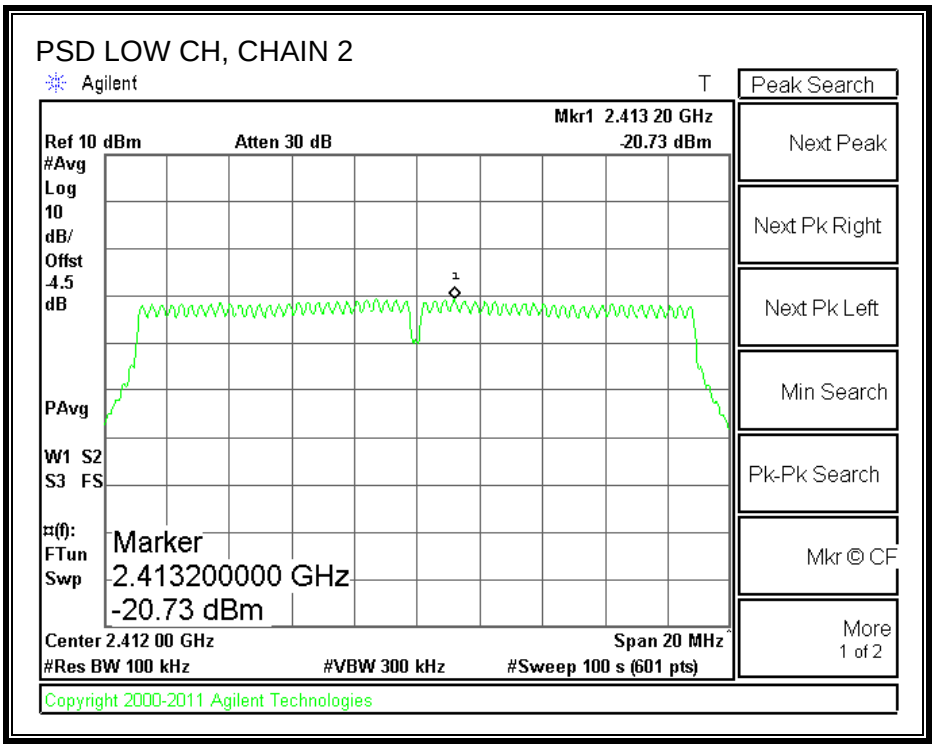
POWER SPECTRAL DENSITY, CHAIN 1

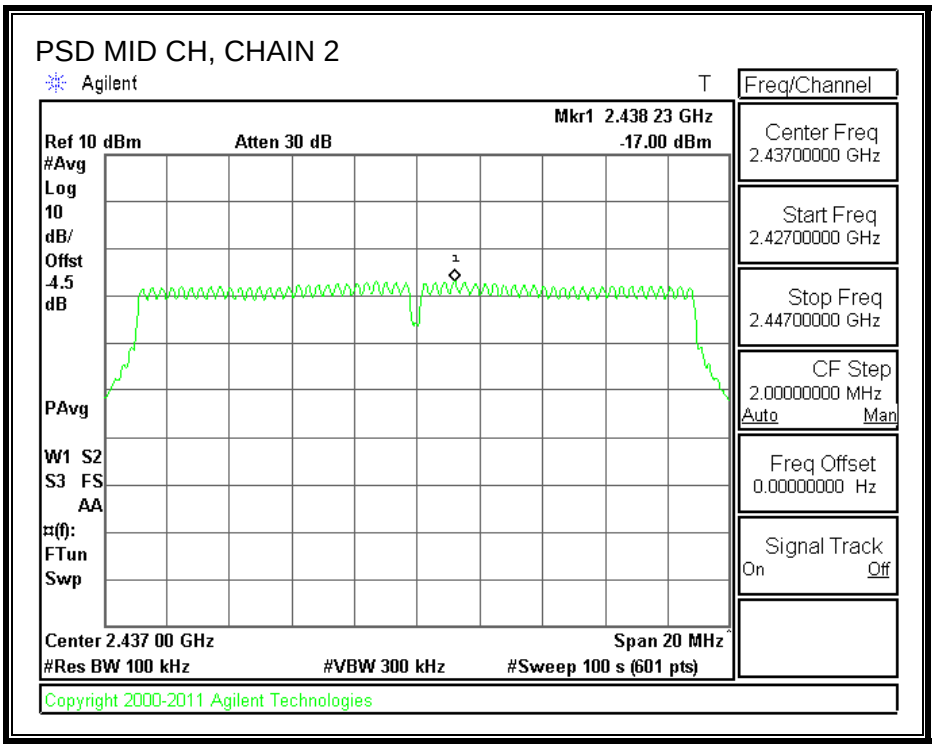


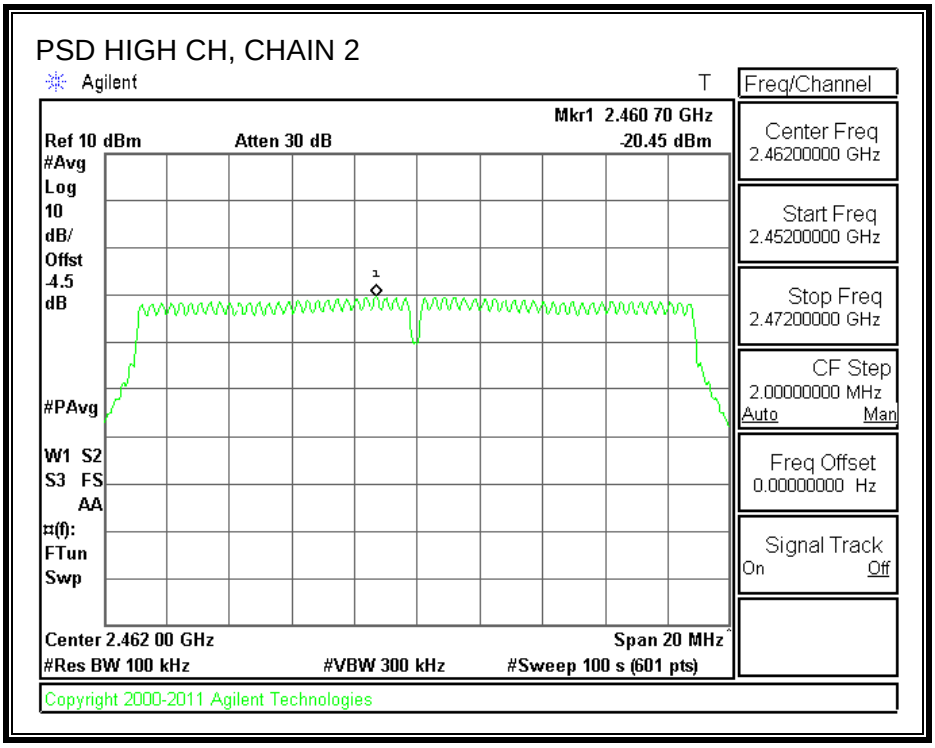




POWER SPECTRAL DENSITY, CHAIN 2







7.3.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

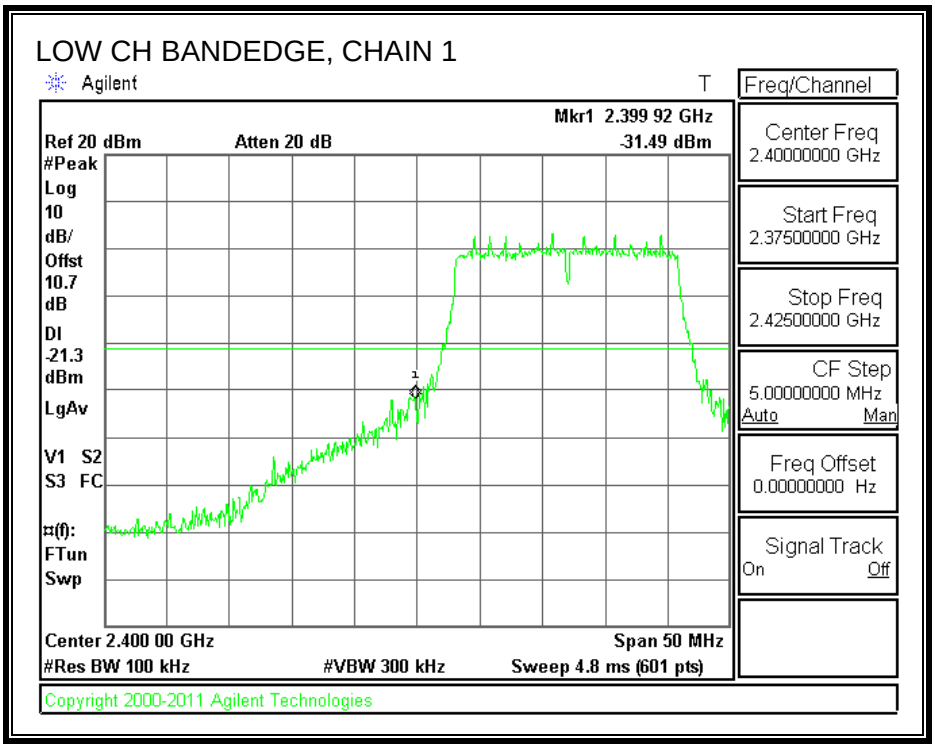
IC RSS-210 A8.5

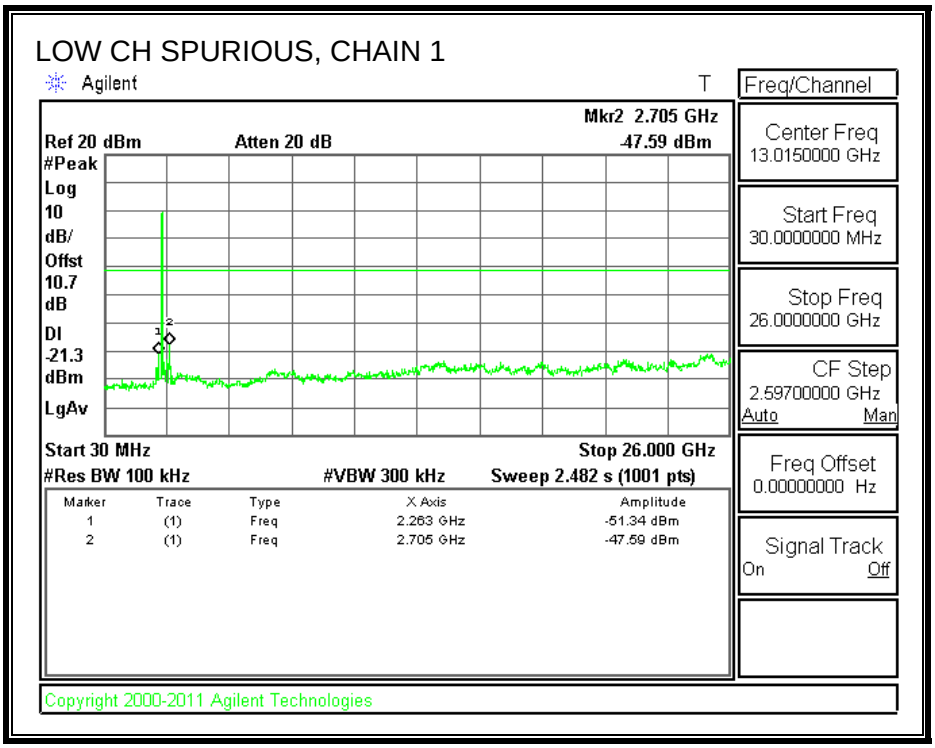
Output power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

TEST PROCEDURE

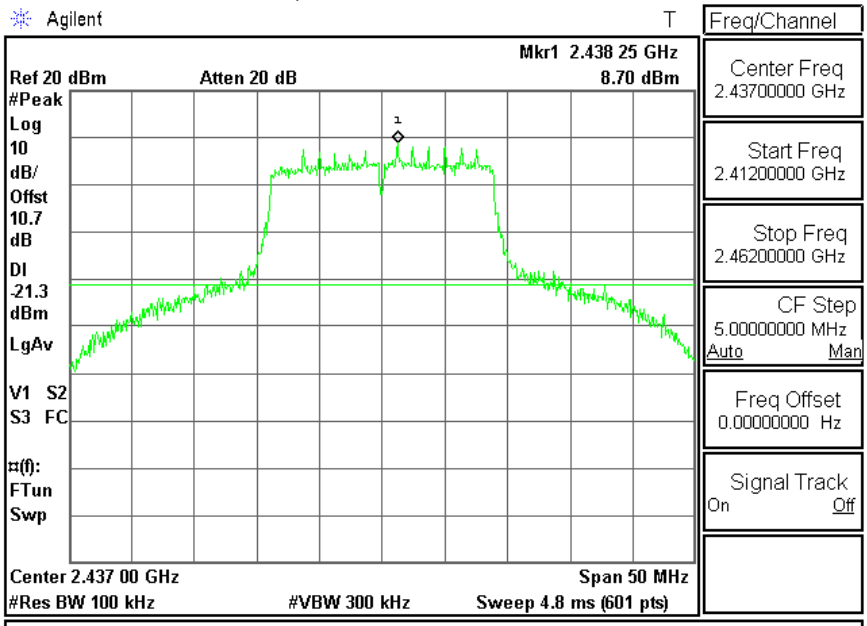
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

CHAIN 1 SPURIOUS EMISSIONS

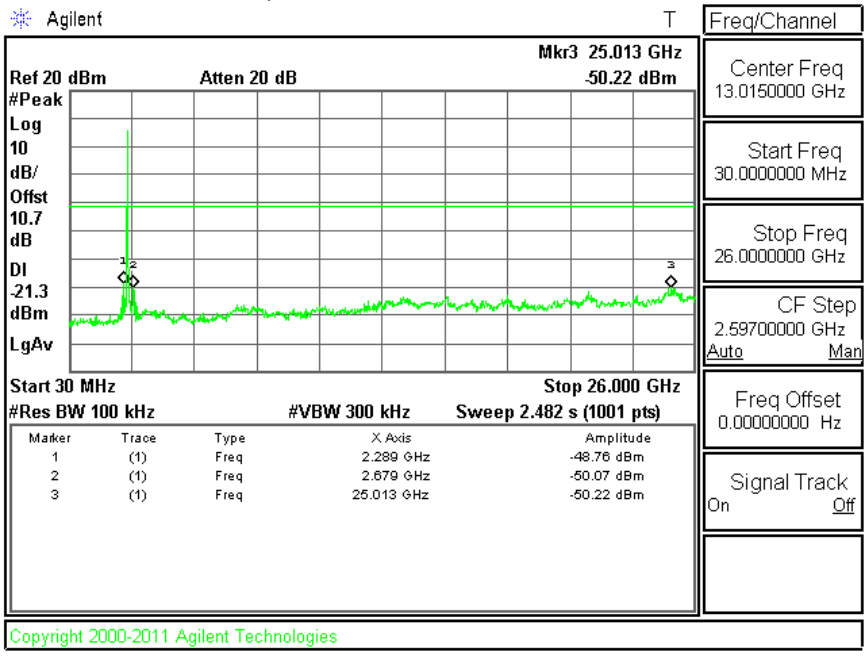




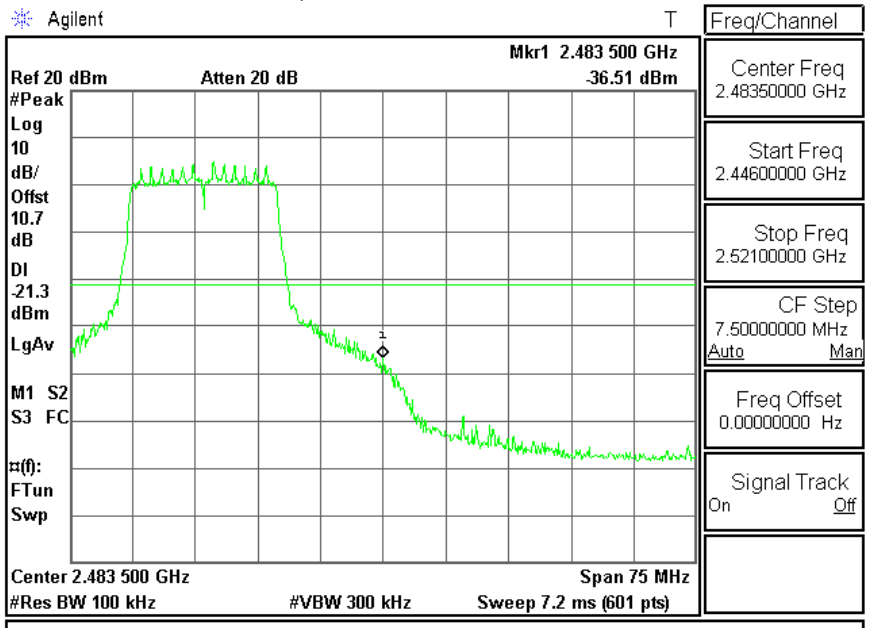
MID CH REFERENCE, CHAIN 1



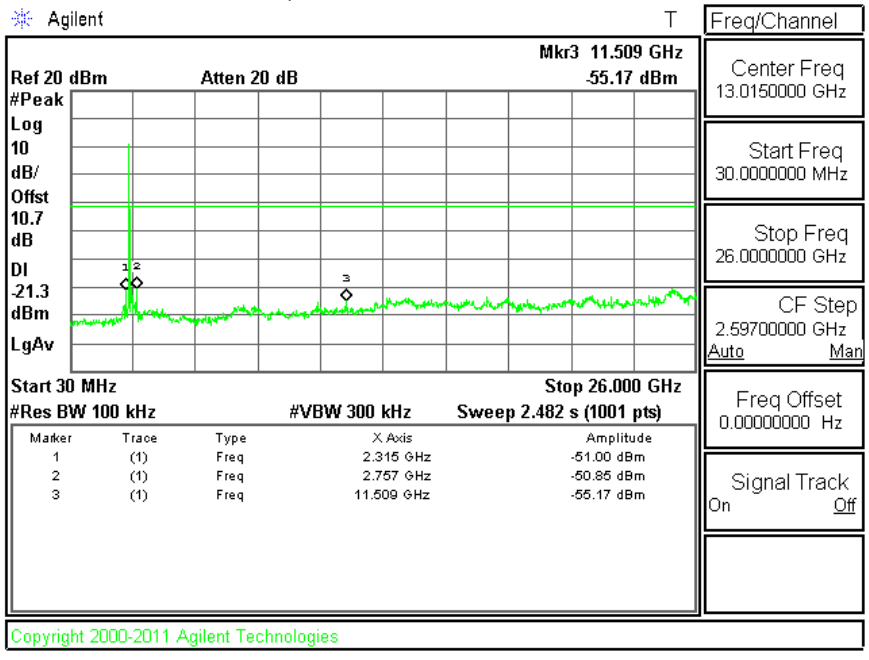
MID CH SPURIOUS, CHAIN 1



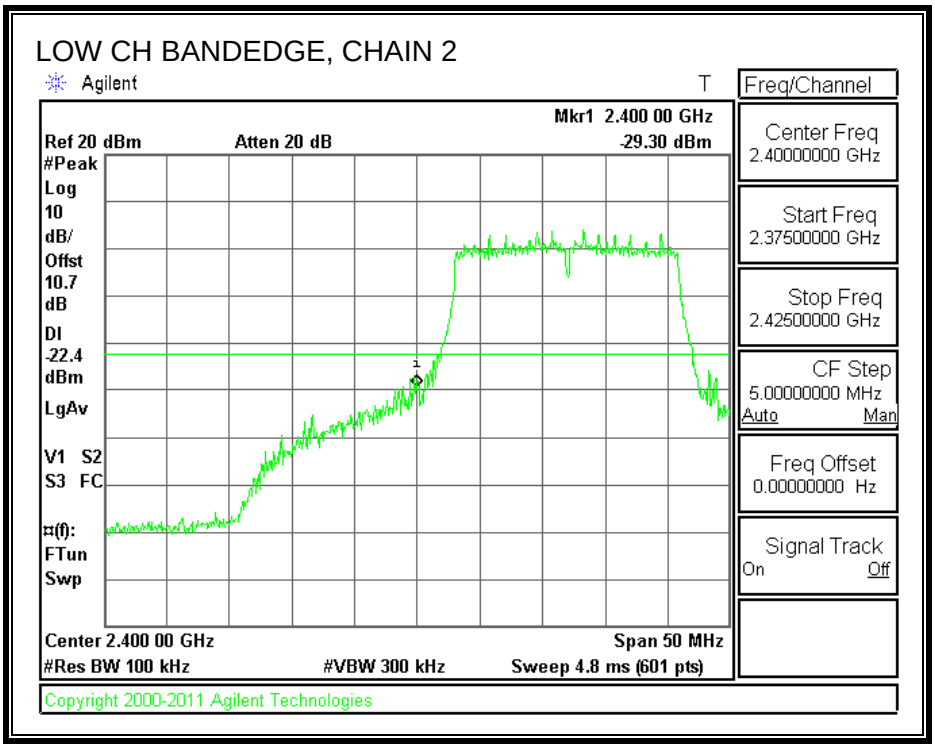
HIGH CH BANDEDGE, CHAIN 1

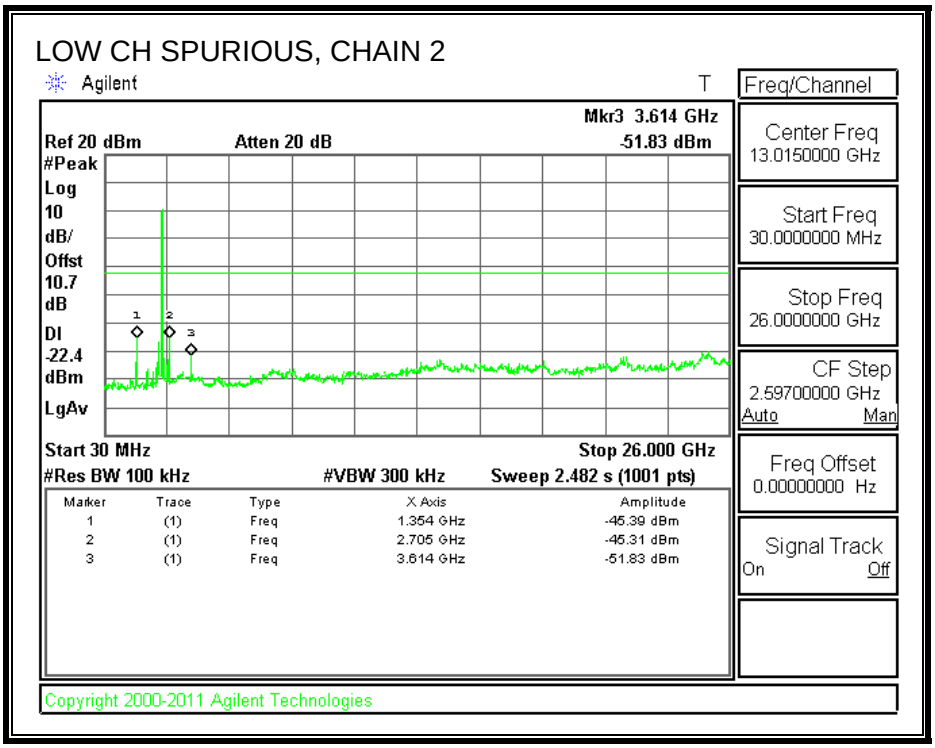


HIGH CH SPURIOUS, CHAIN 1

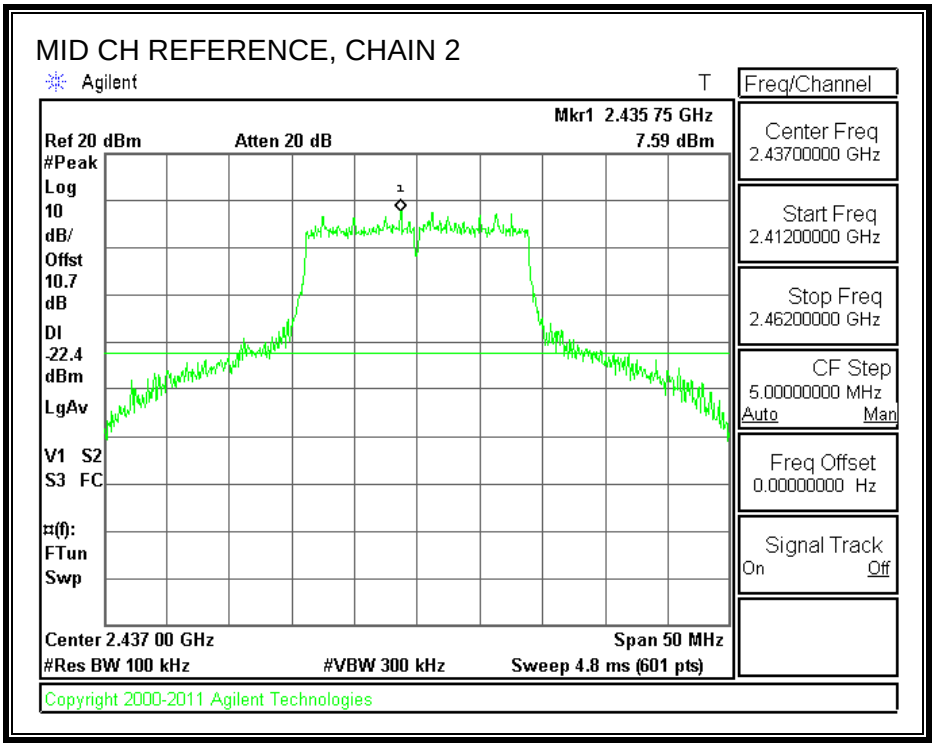


CHAIN 2 SPURIOUS EMISSIONS

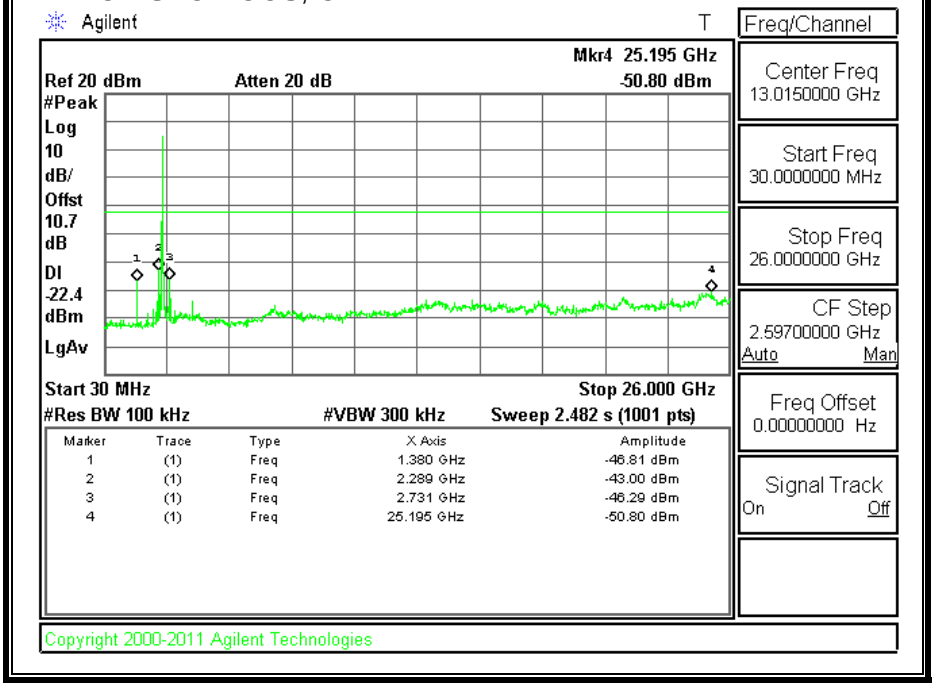




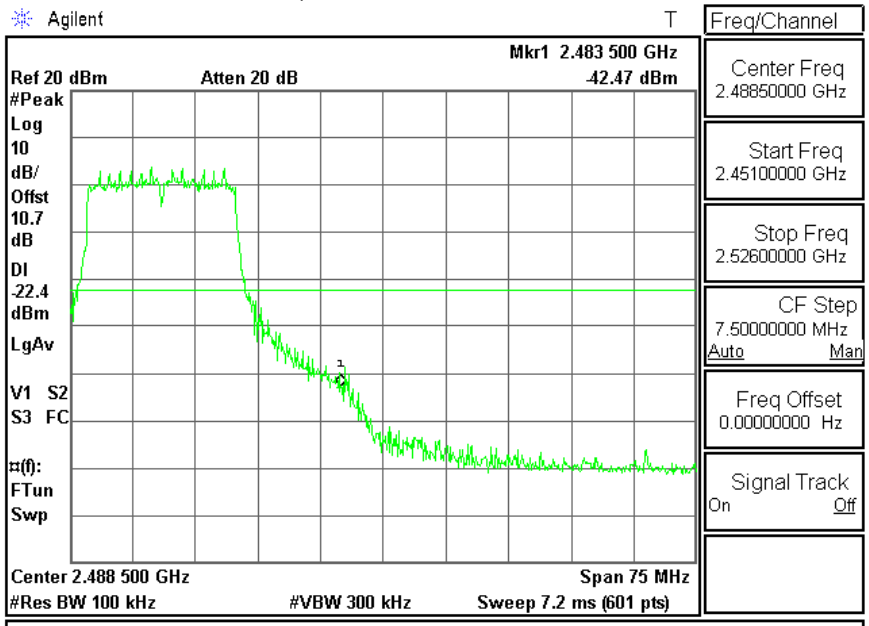
MID CH REFERENCE, CHAIN 2



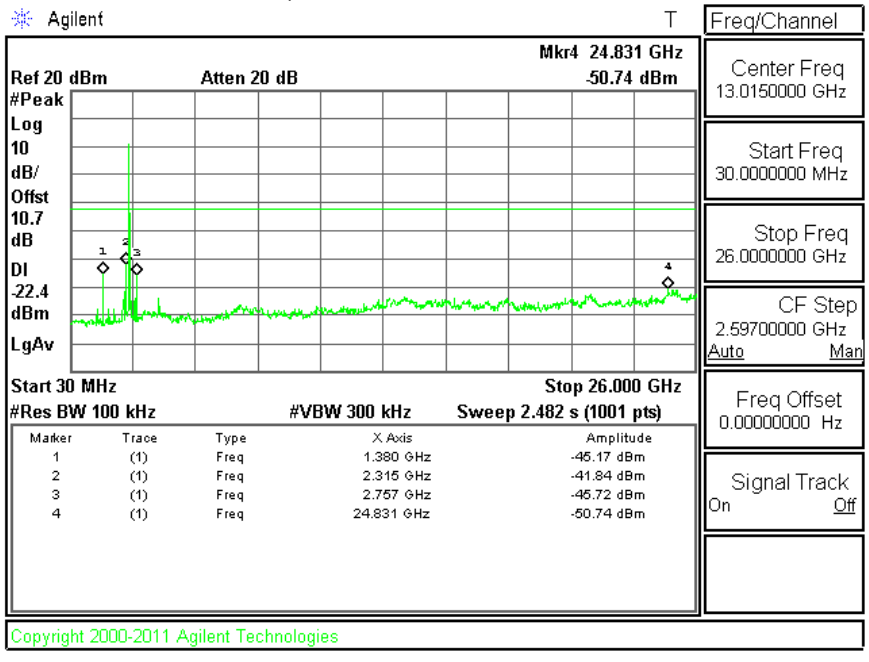
MID CH SPURIOUS, CHAIN 2



HIGH CH BANDEDGE, CHAIN 2



HIGH CH SPURIOUS, CHAIN 2



7.4. 802.11n HT40 1TX MODE IN THE 2.4 GHz BAND

Covered by testing HT40 CCD MCS0 2TX

7.5. 802.11n HT40 CDD MCS0 2TX MODE IN THE 2.4 GHz BAND

7.5.1. 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.

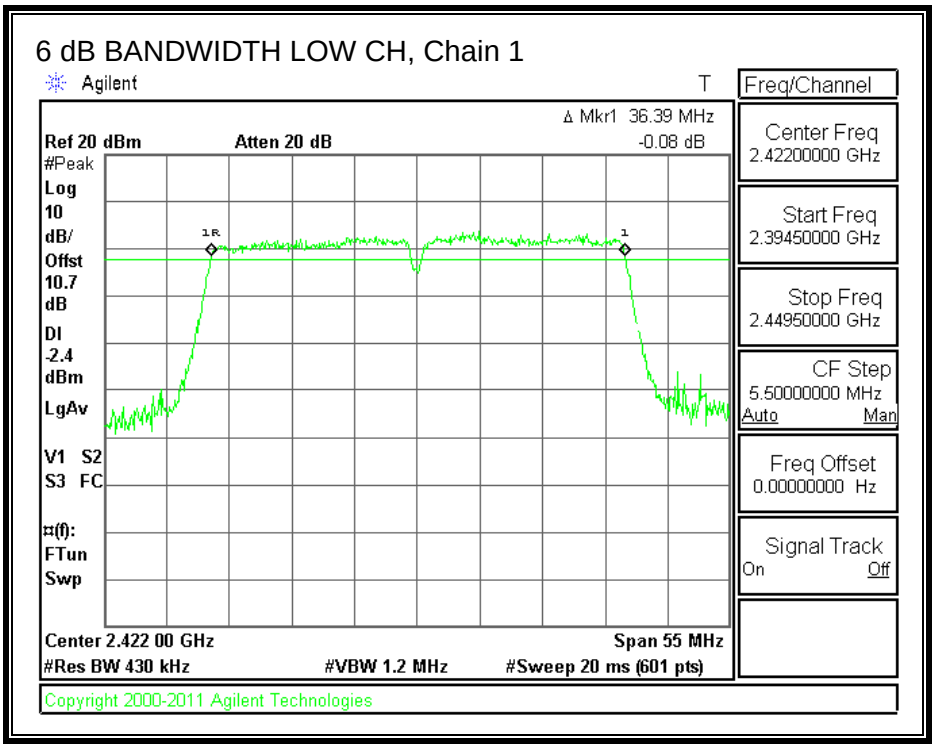
TEST PROCEDURE

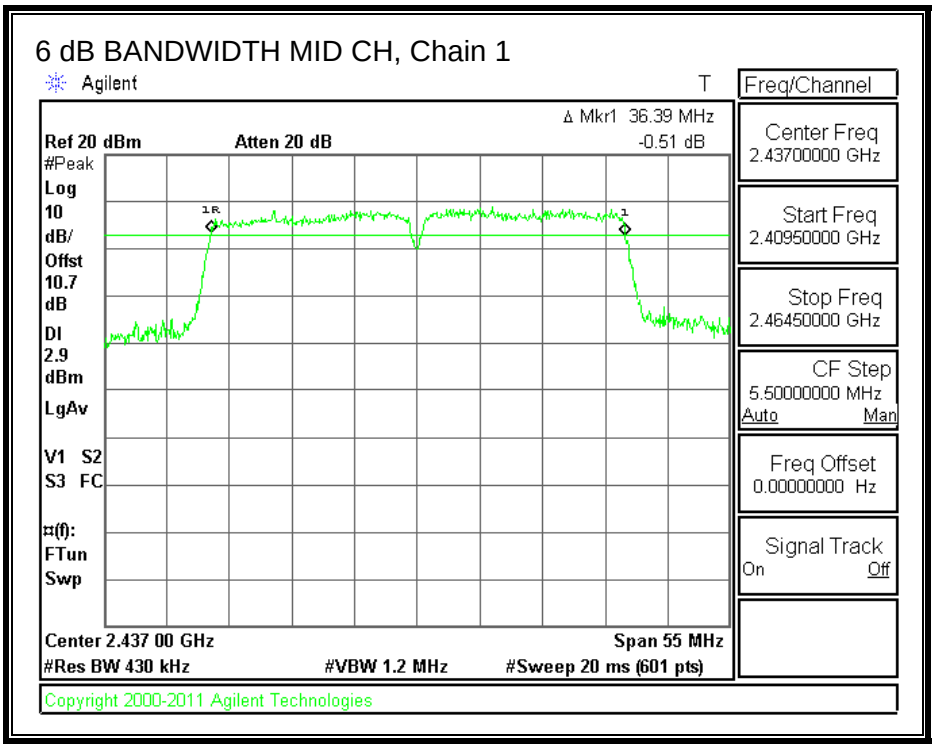
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

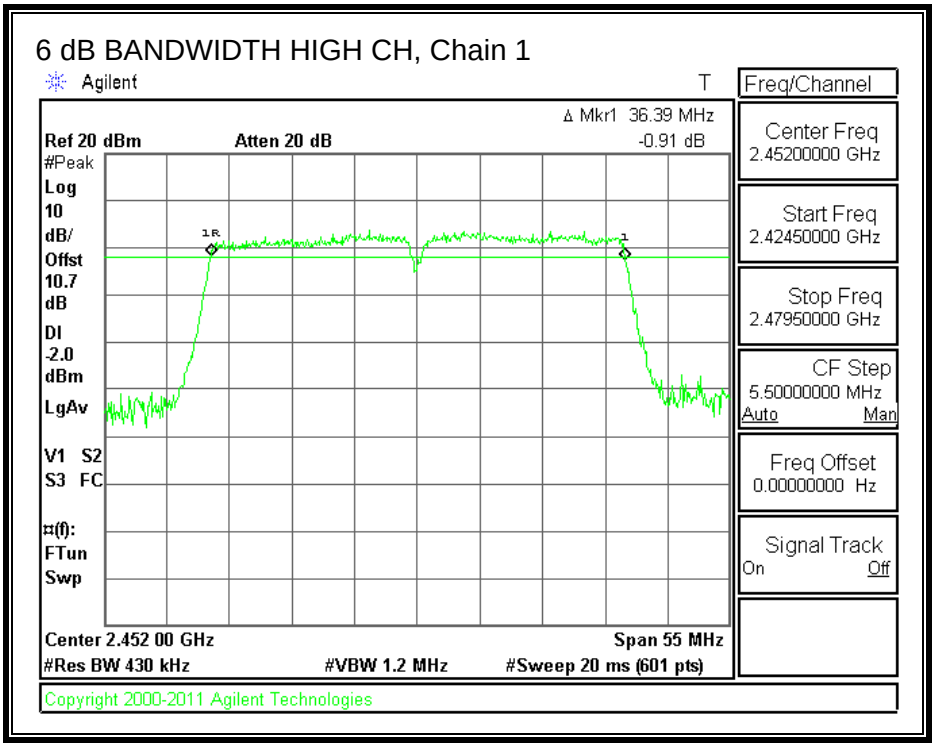
RESULTS

Channel	Frequency (MHz)	Chain 1 6 dB Bandwidth (MHz)	Chain 2 6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2422	36.39	36.48	0.5
Middle	2437	36.39	36.39	0.5
High	2452	36.39	36.48	0.5

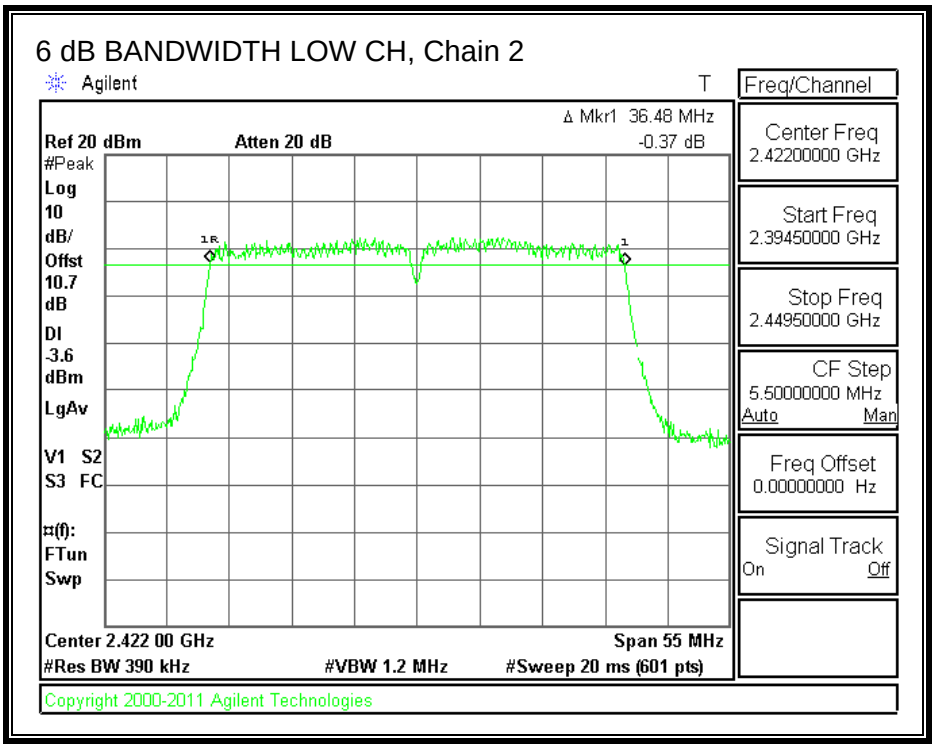
6 dB BANDWIDTH, Chain 1

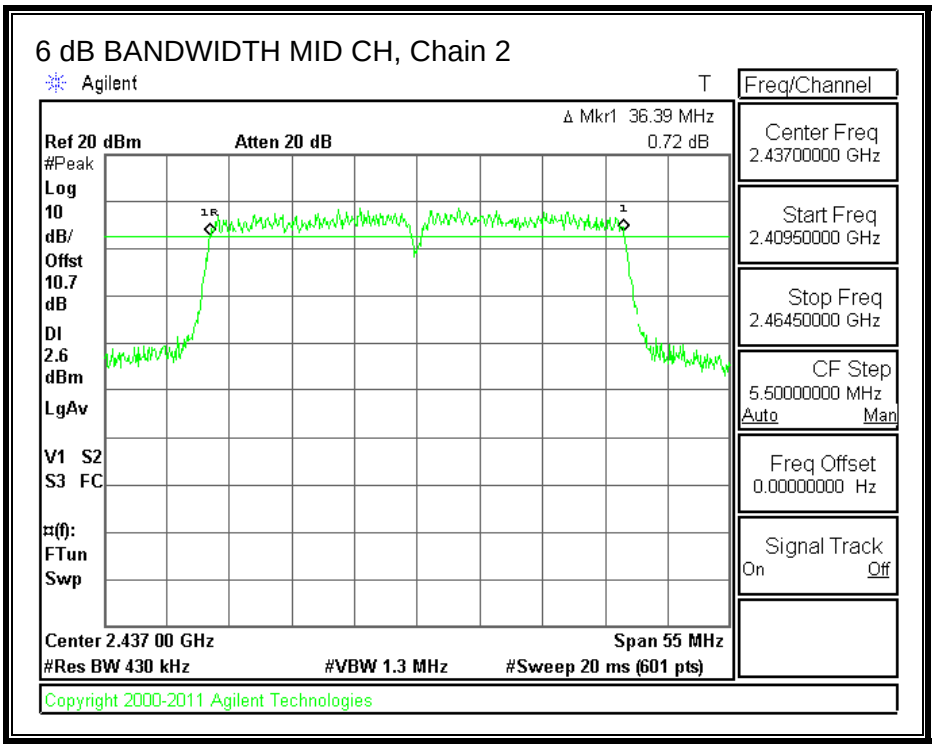


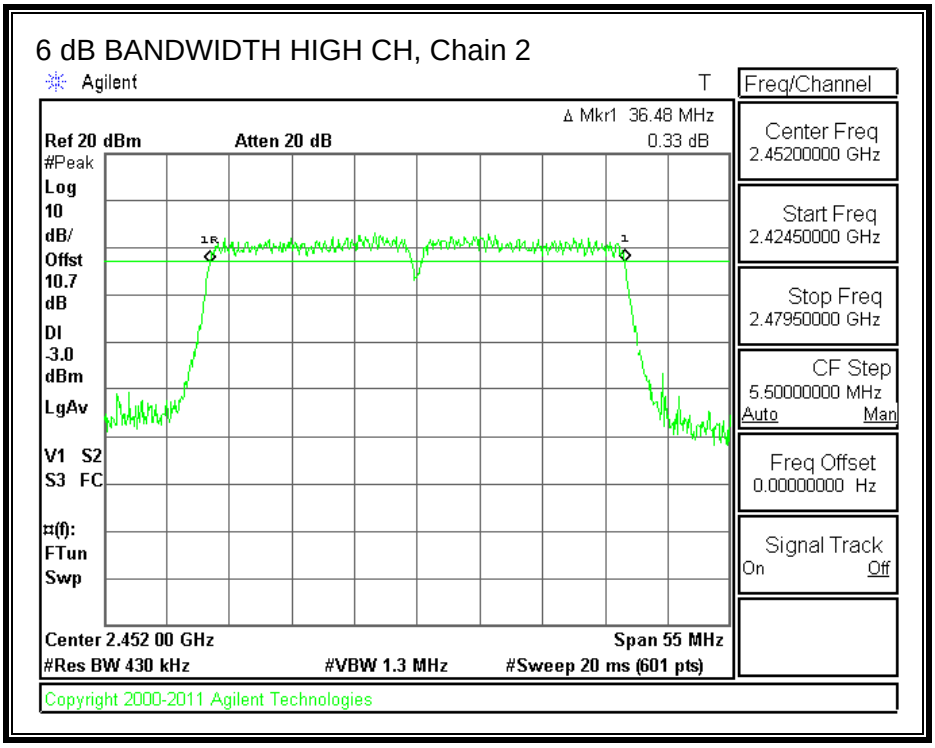




6 dB BANDWIDTH, Chain 2







7.5.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

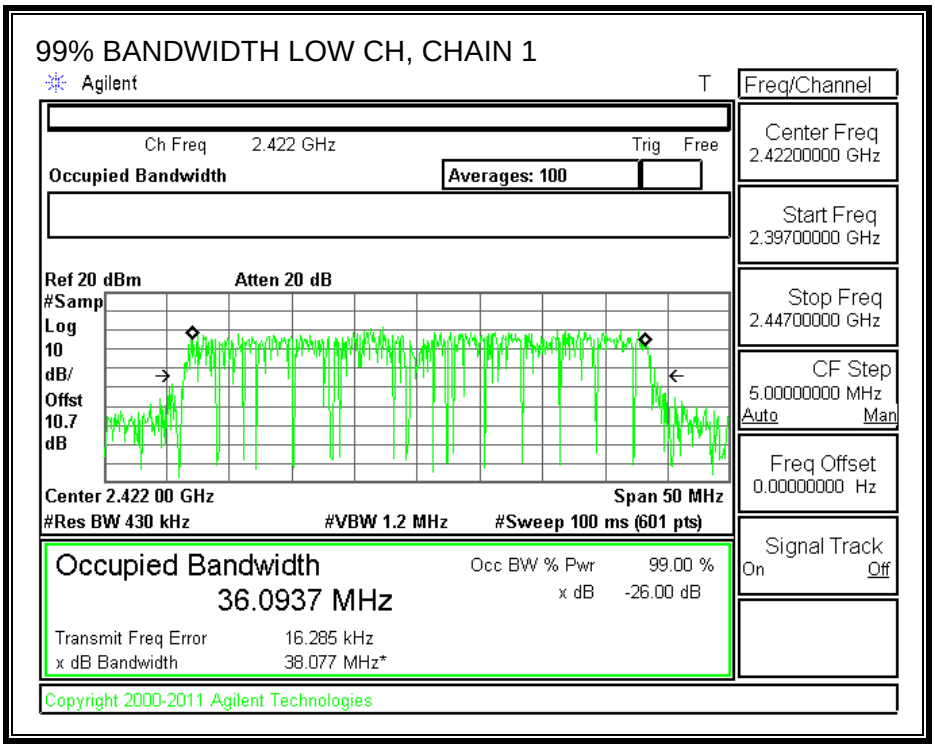
TEST PROCEDURE

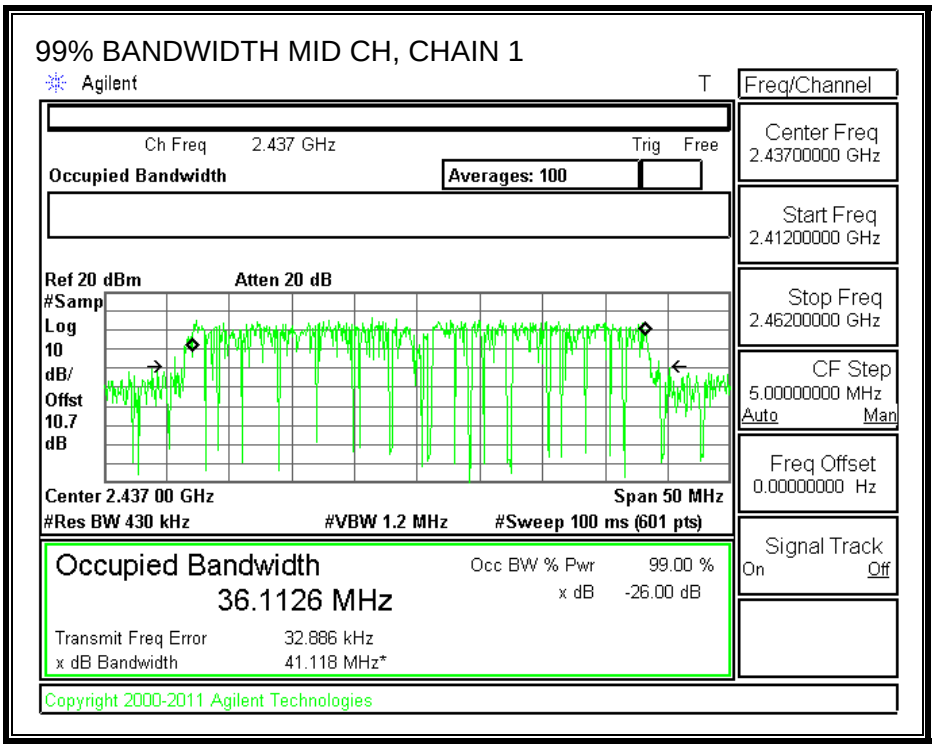
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

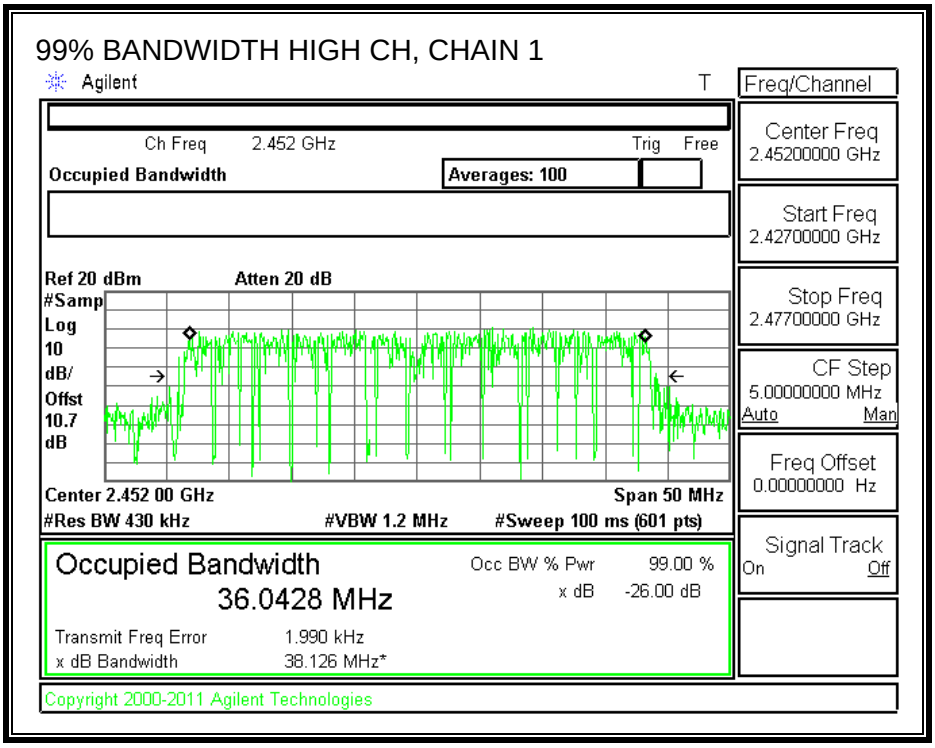
RESULTS

Channel	Frequency (MHz)	Chain 1 99% Bandwidth (MHz)	Chain 2 99% Bandwidth (MHz)
Low	2422	39.0937	36.0189
Middle	2437	36.1126	36.0923
High	2452	36.0428	36.1195

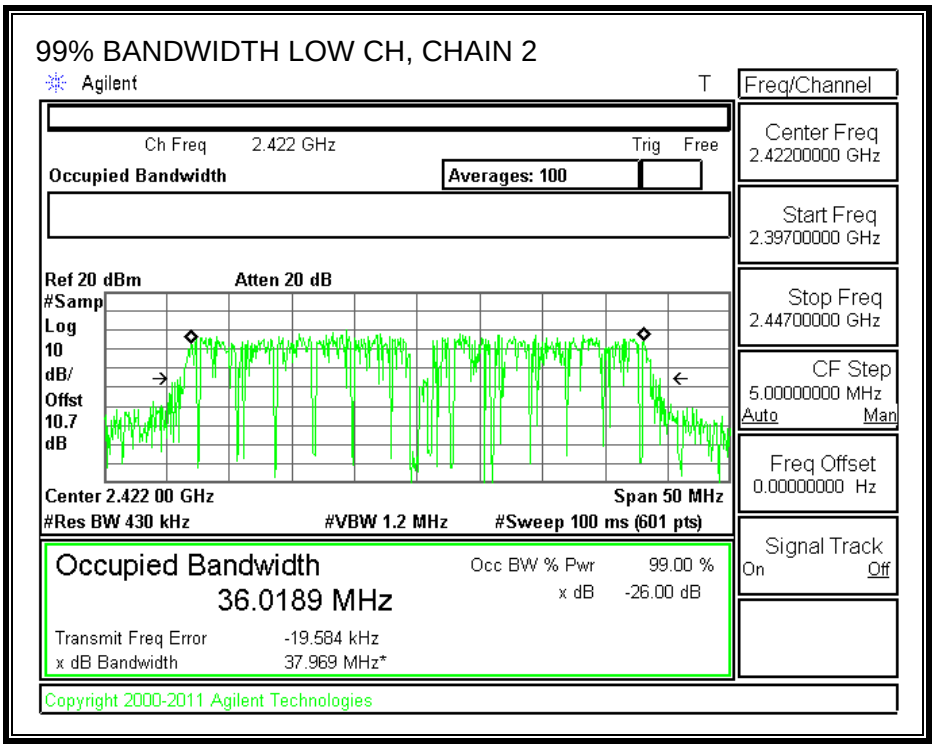
99% BANDWIDTH, CHAIN 1

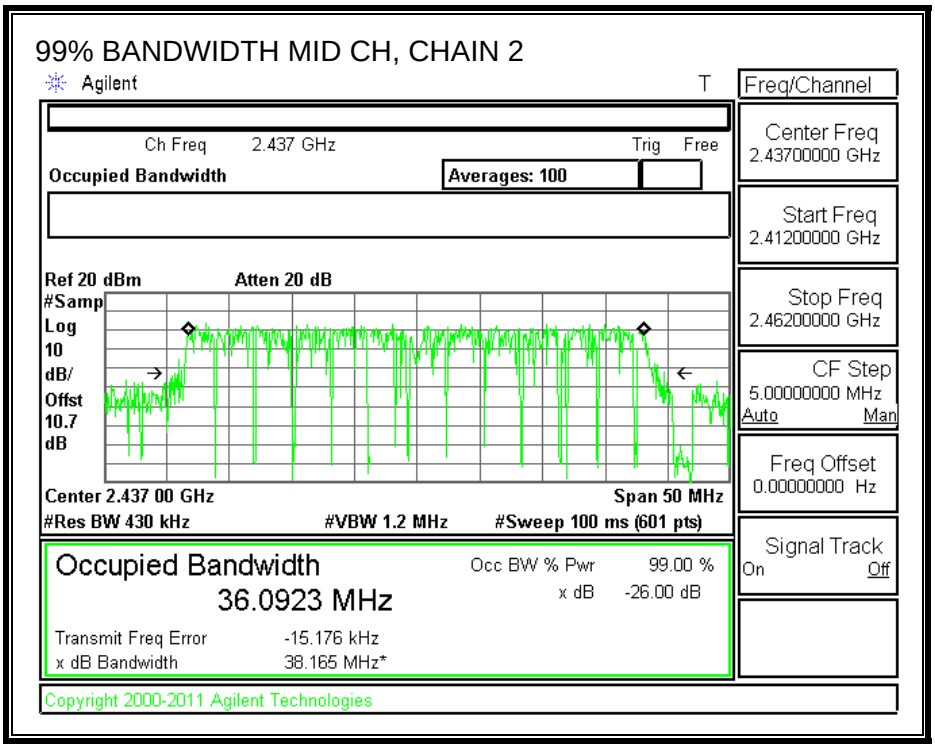


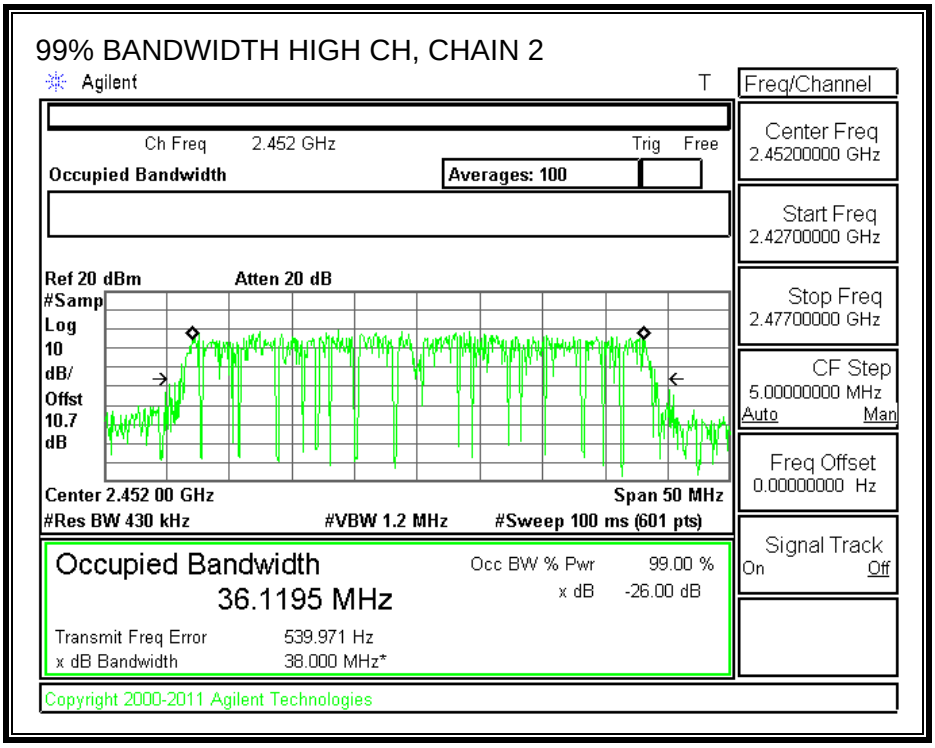




99% BANDWIDTH, CHAIN 2







7.5.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
3.90	3.01	6.91

The maximum effective legacy gain is 6.91 dBi for other than fixed, point-to-point operations, therefore the limit is 29.09 dBm.

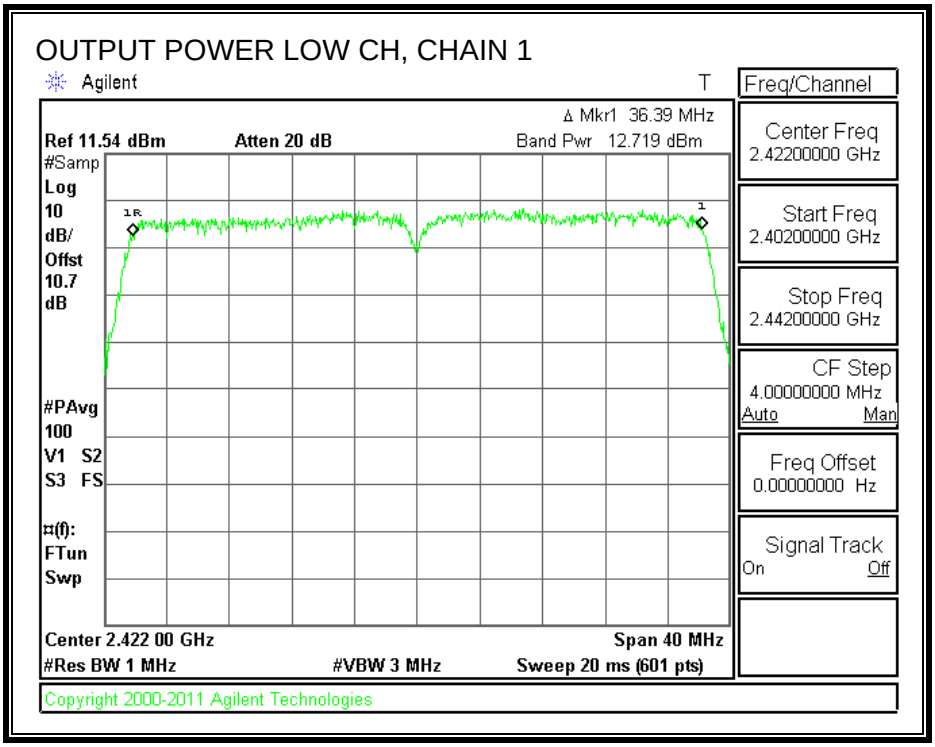
TEST PROCEDURE

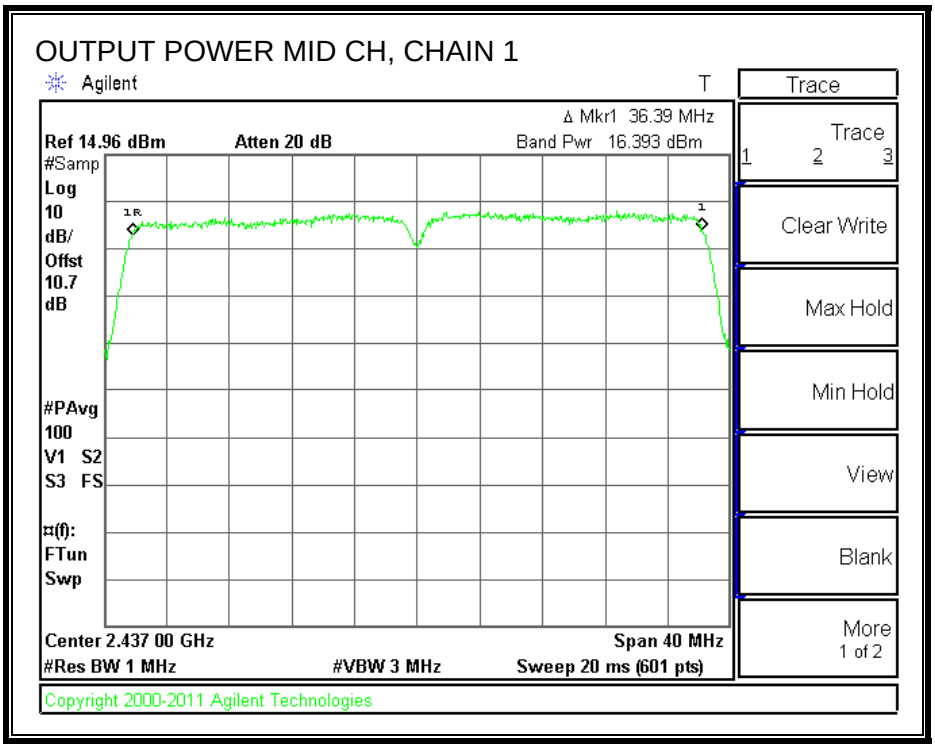
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

RESULTS

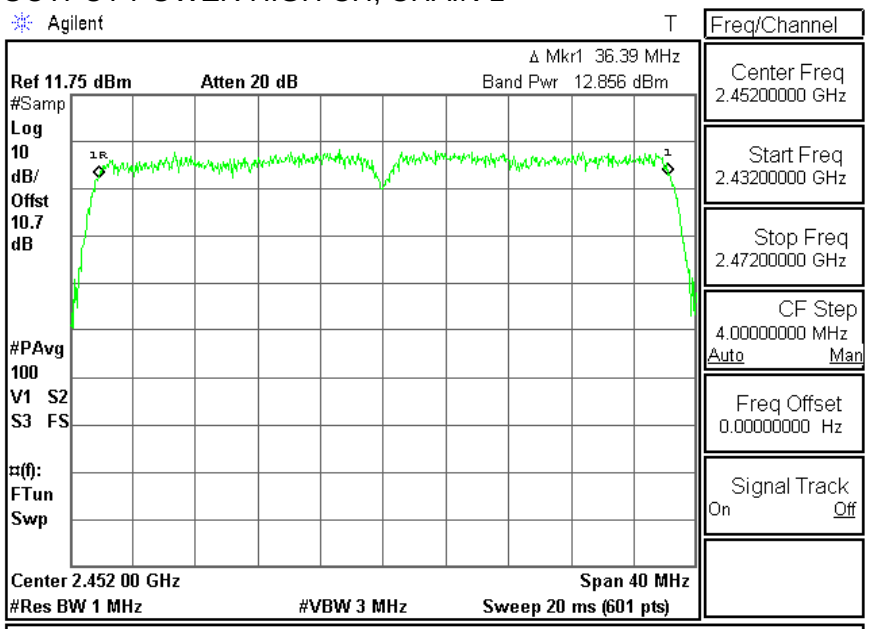
Channel	Frequency (MHz)	Chain 1 PK Power (dBm)	Chain 2 PK Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2422	12.719	10.867	14.901	29.09	-14.189
Mid	2437	16.393	14.834	18.693	29.09	-10.397
High	2452	12.856	11.085	15.070	29.09	-14.020

CHAIN 1 OUTPUT POWER

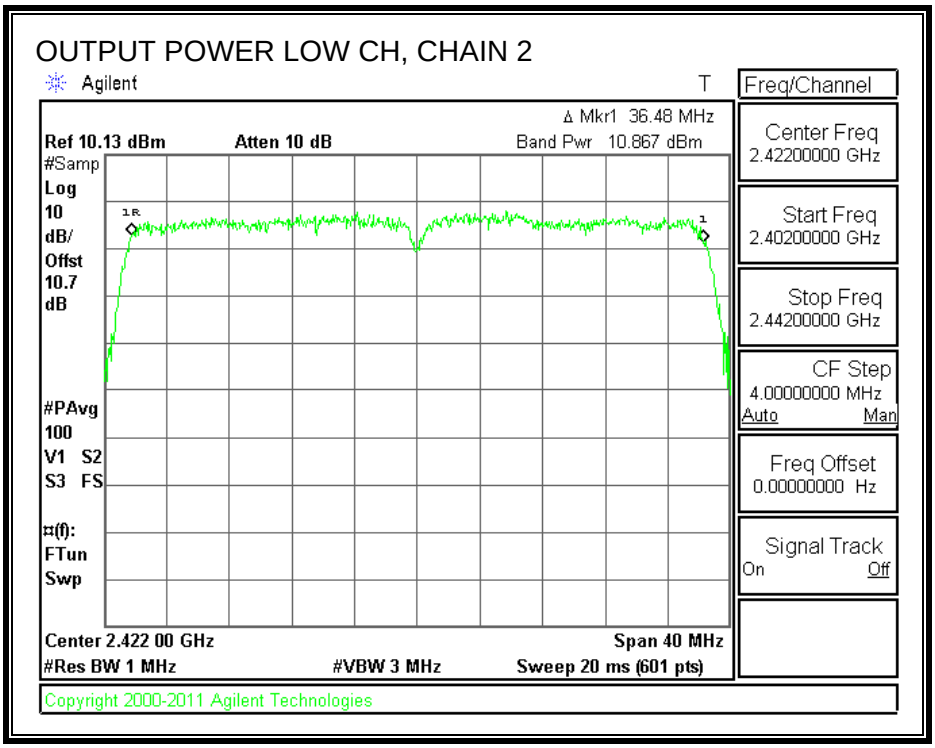


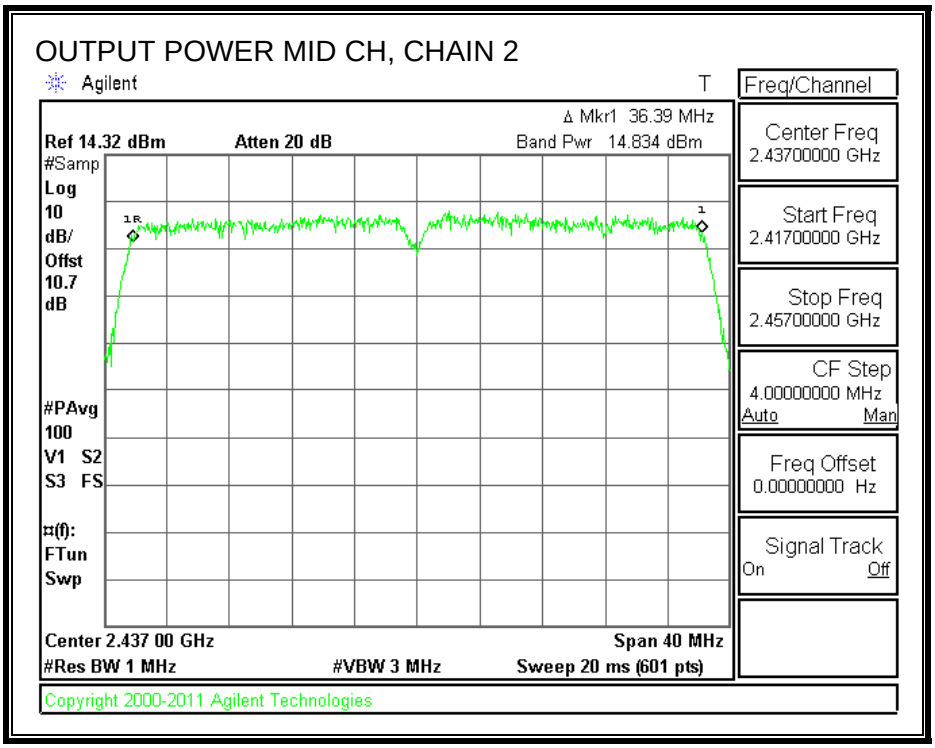


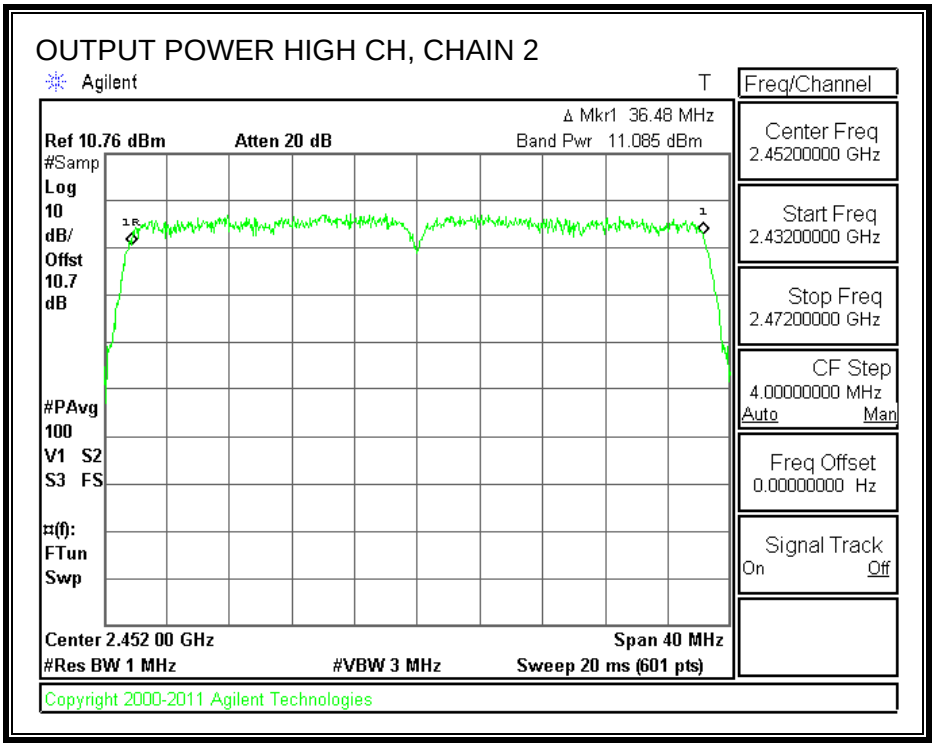
OUTPUT POWER HIGH CH, CHAIN 1



CHAIN 2 OUTPUT POWER







7.5.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

TEST PROCEDURE

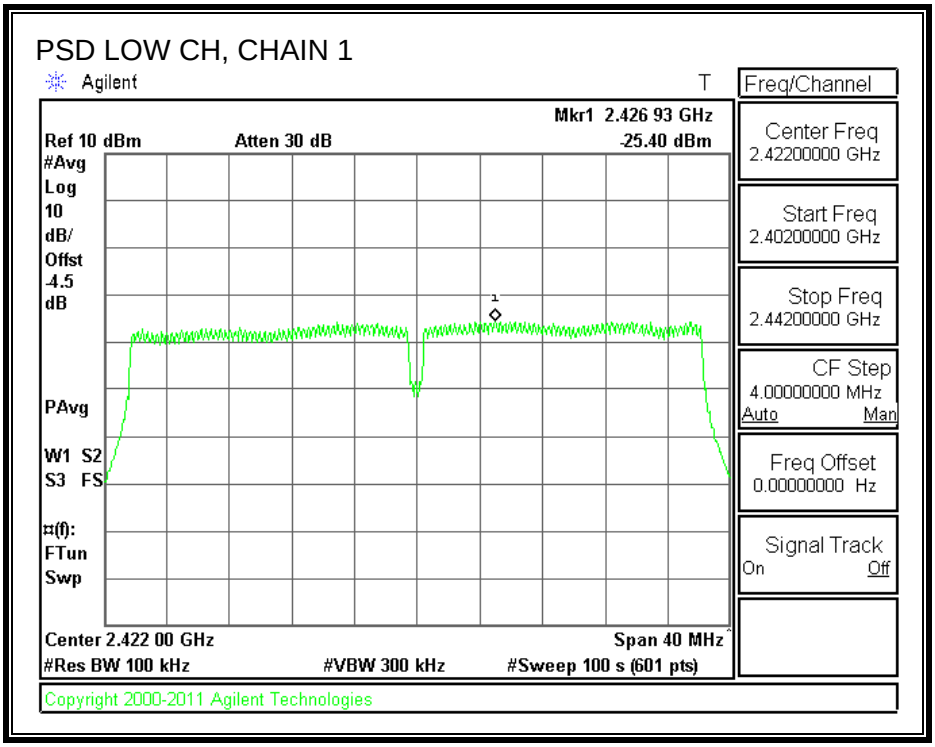
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

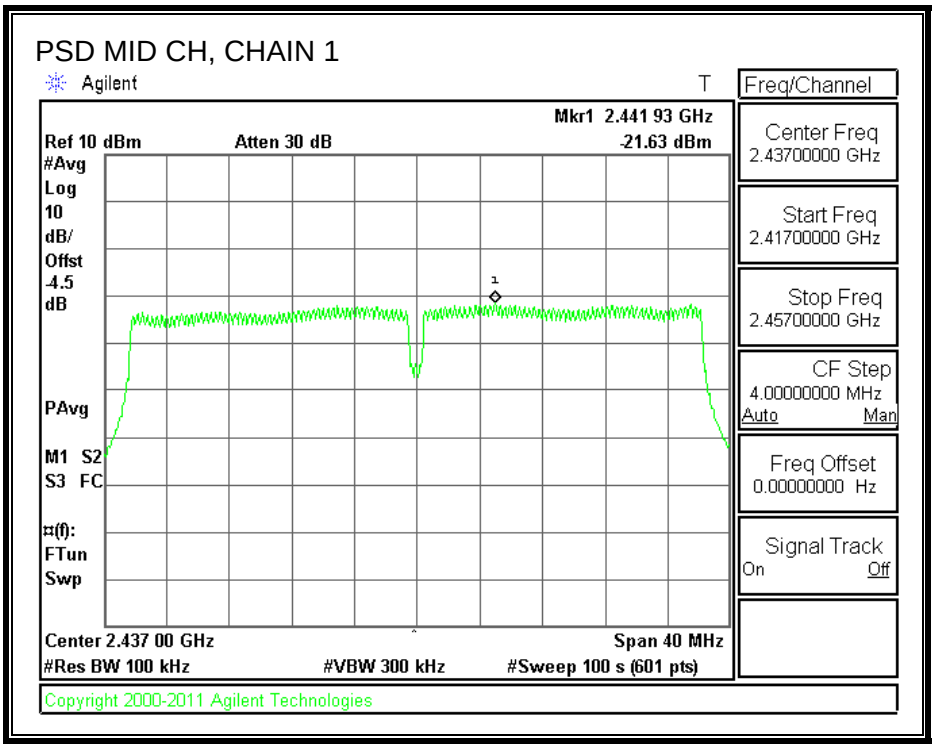
RESULTS

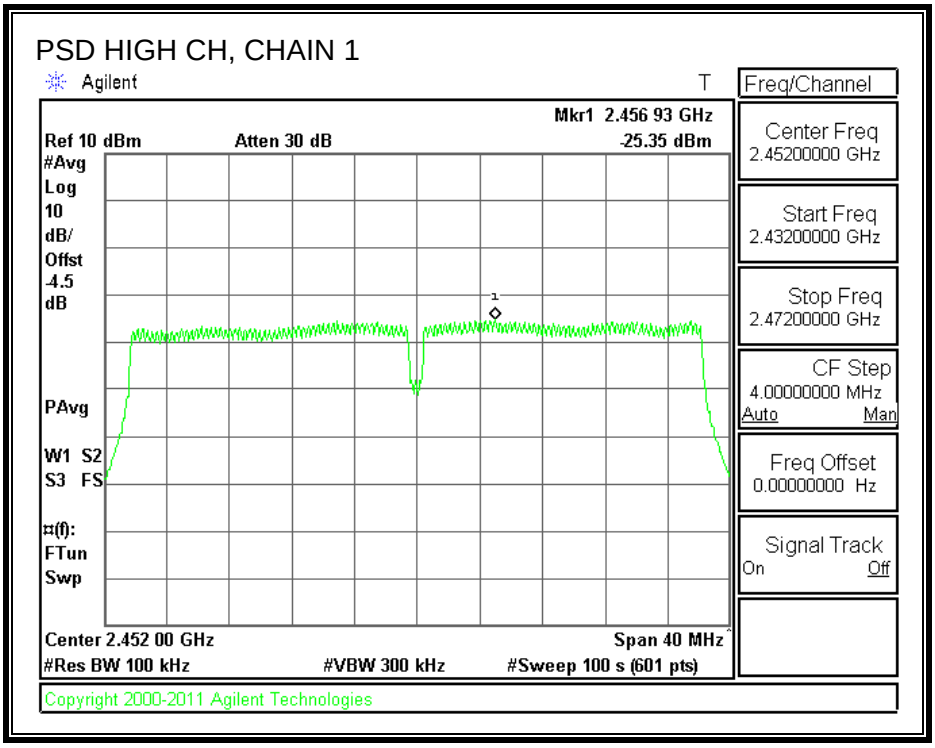
Channel	Frequency (MHz)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2422	-25.40	-27.29	-23.23	8	-31.23
Middle	2437	-21.63	-23.51	-19.46	8	-27.46
High	2452	-25.35	-27.21	-23.17	8	-31.17

Note: Analyzer offset = cable loss + attenuator + 10 log(3/100)

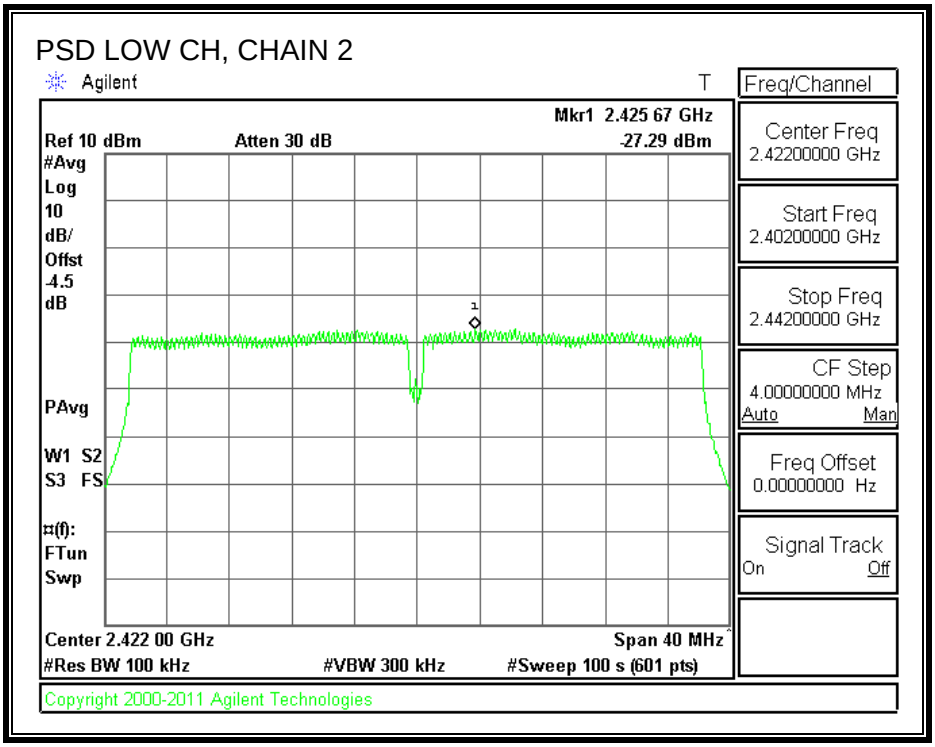
POWER SPECTRAL DENSITY, CHAIN 1

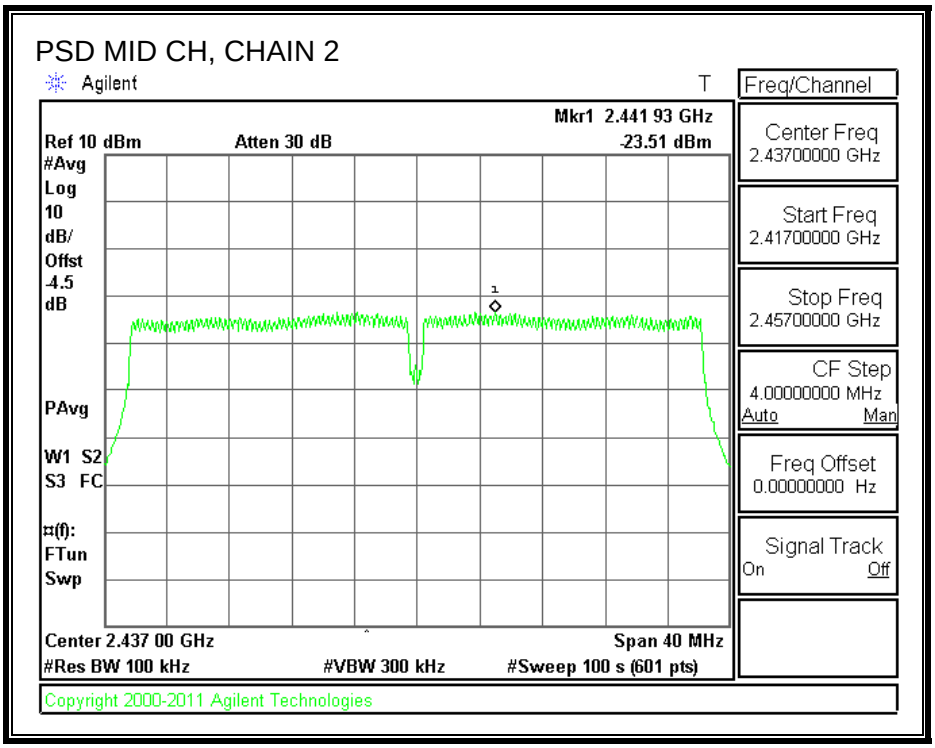


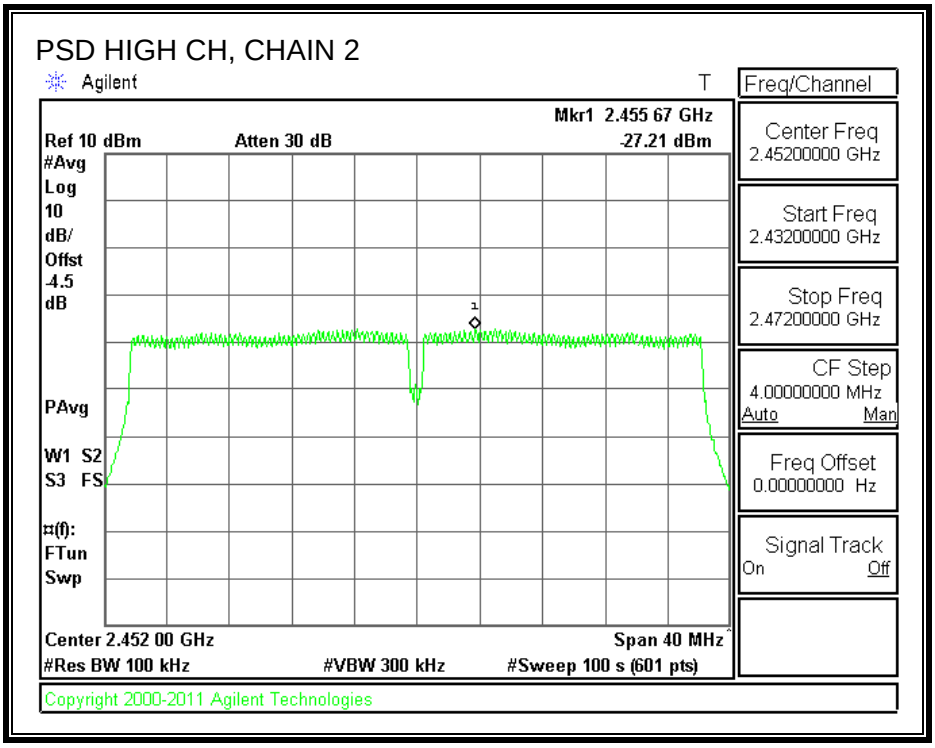




POWER SPECTRAL DENSITY, CHAIN 2







7.5.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

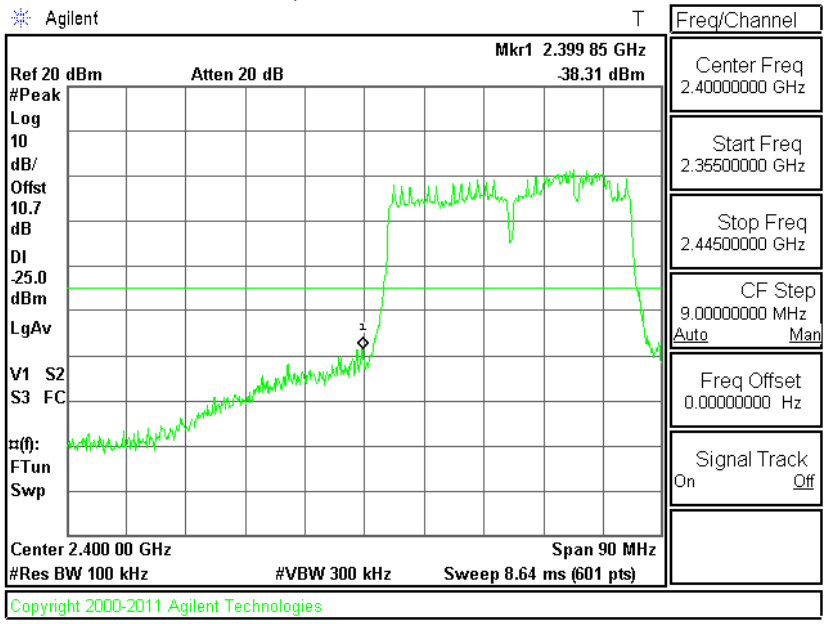
TEST PROCEDURE

KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

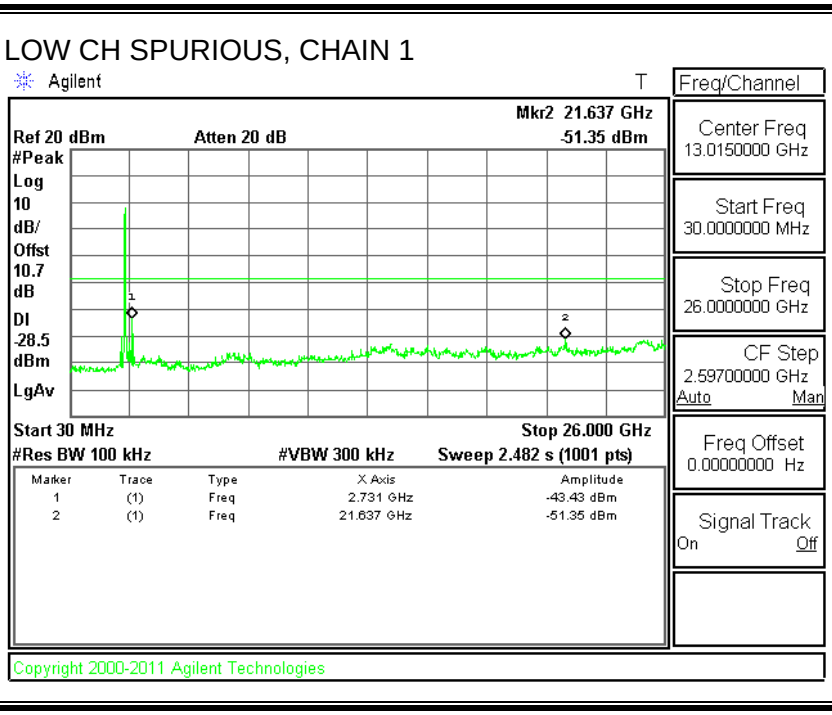
RESULTS

CHAIN 1 SPURIOUS EMISSIONS

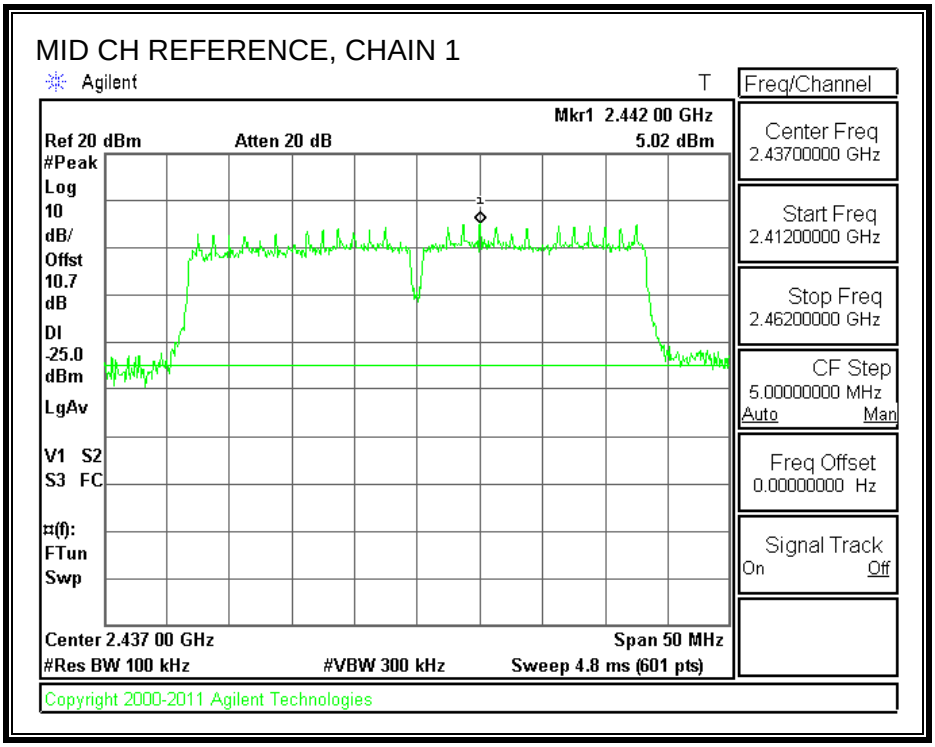
LOW CH BANDEDGE, CHAIN 1



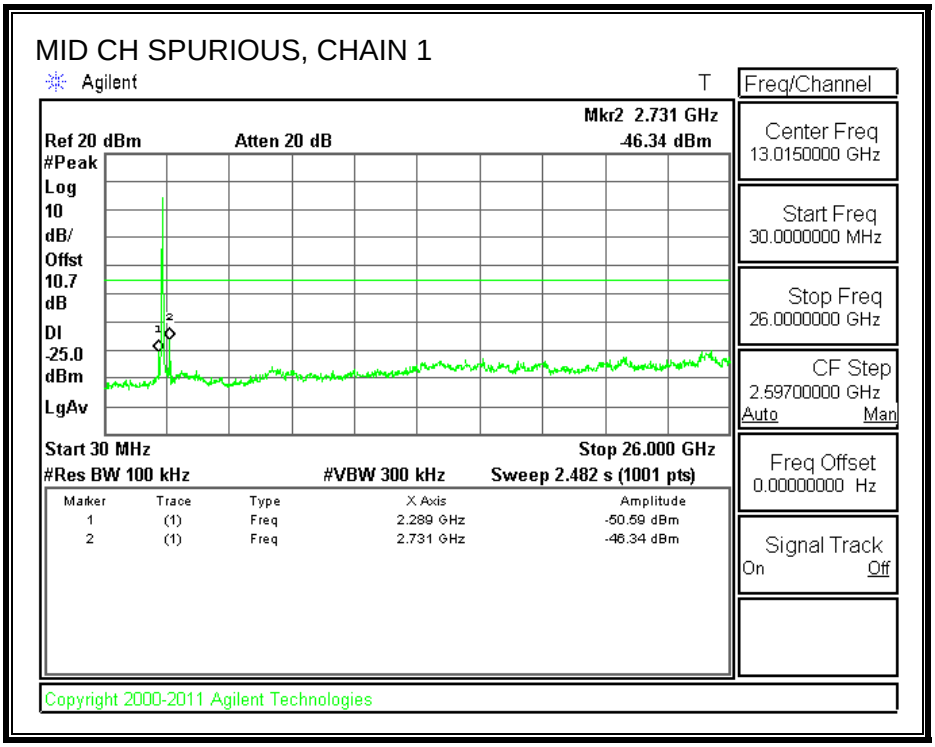
LOW CH SPURIOUS, CHAIN 1



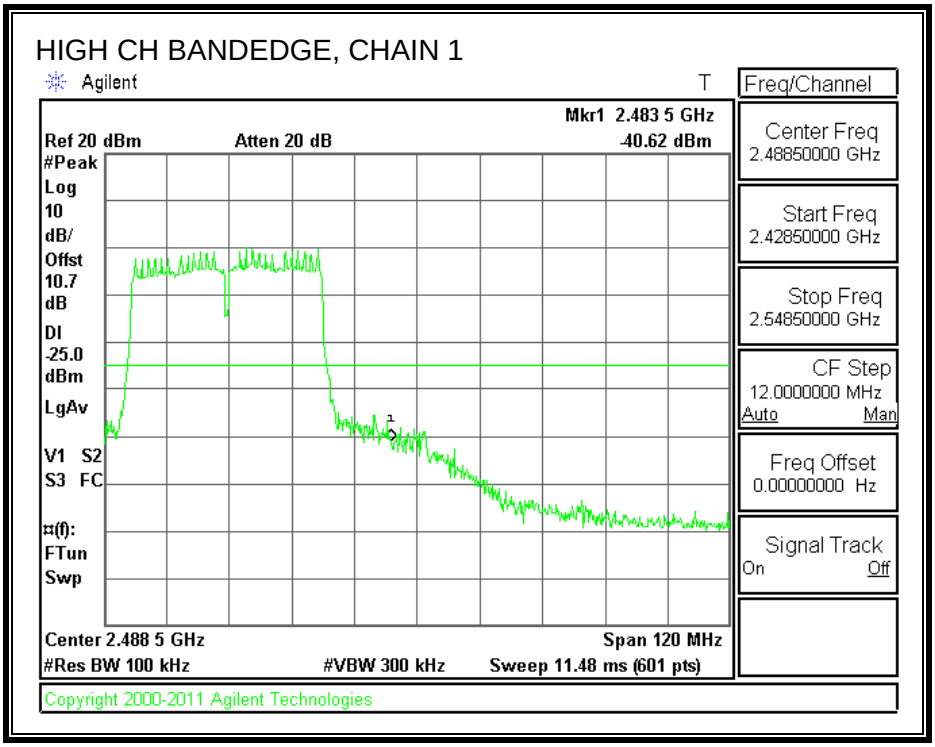
MID CH REFERENCE, CHAIN 1



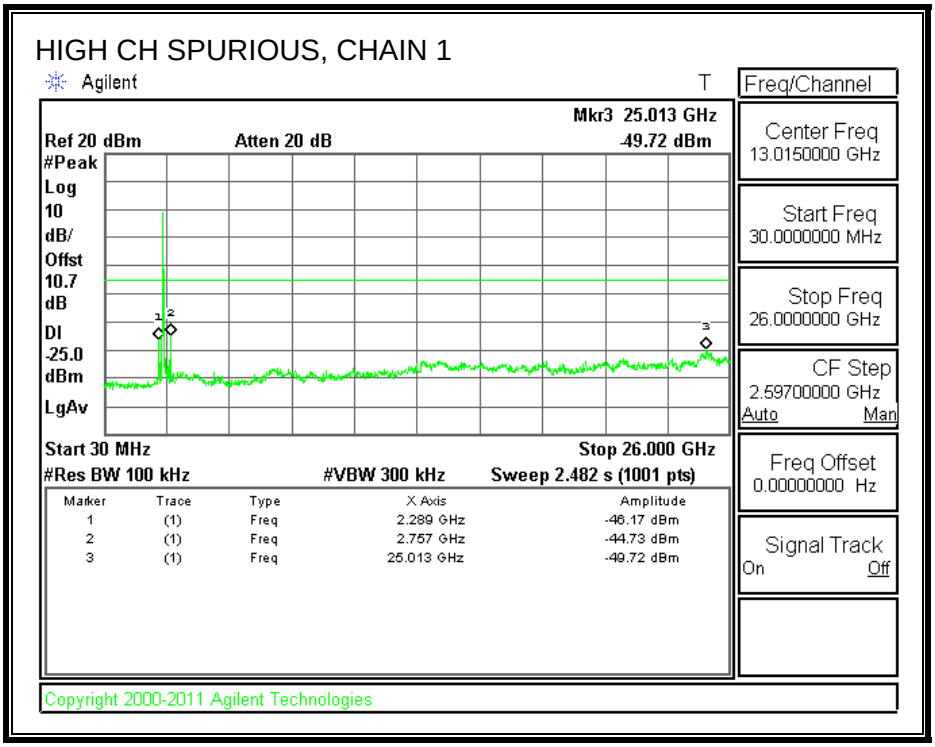
MID CH SPURIOUS, CHAIN 1



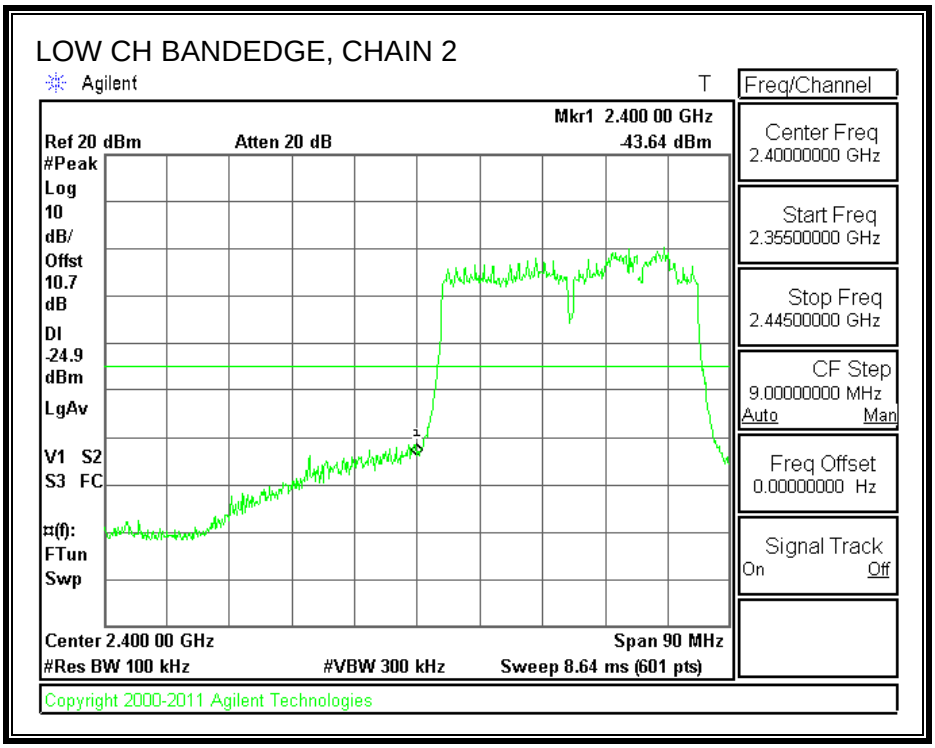
HIGH CH BANDEDGE, CHAIN 1

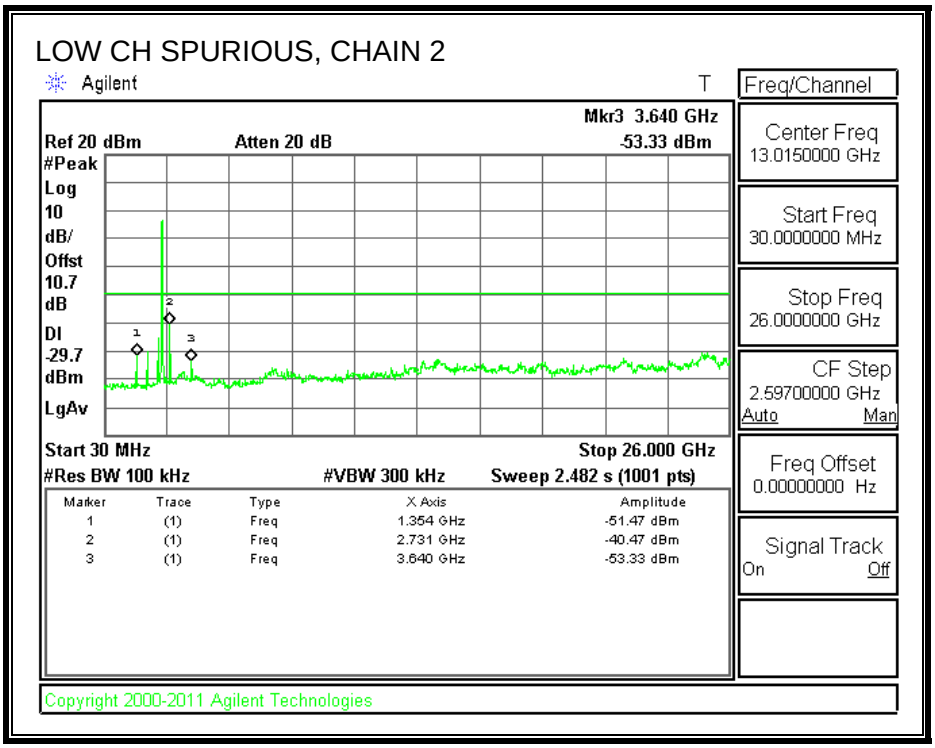


HIGH CH SPURIOUS, CHAIN 1

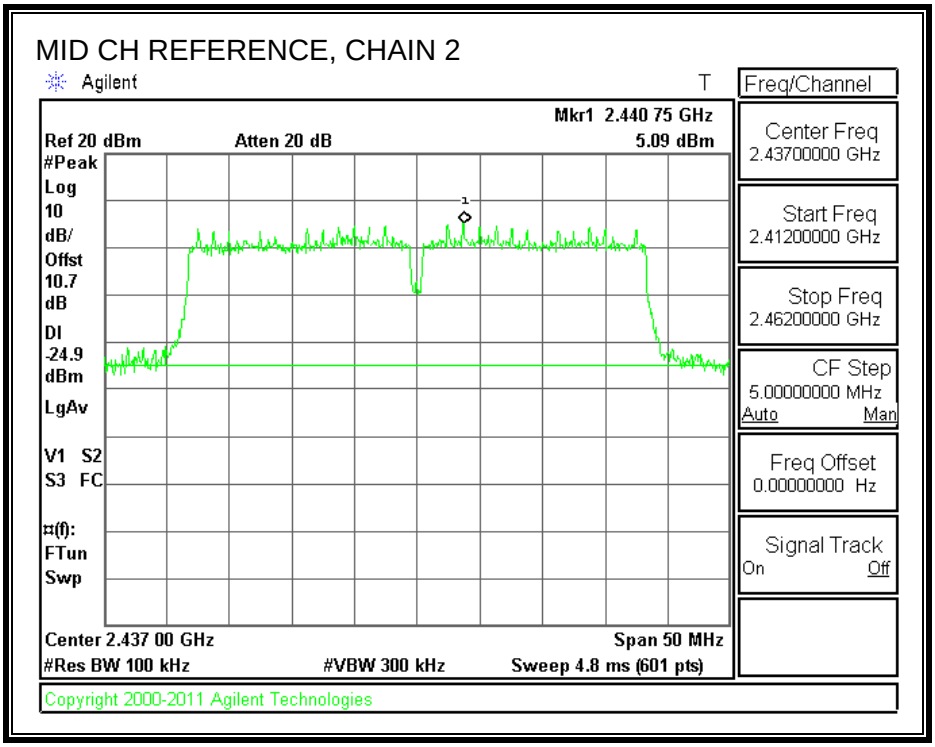


CHAIN 2 SPURIOUS EMISSIONS

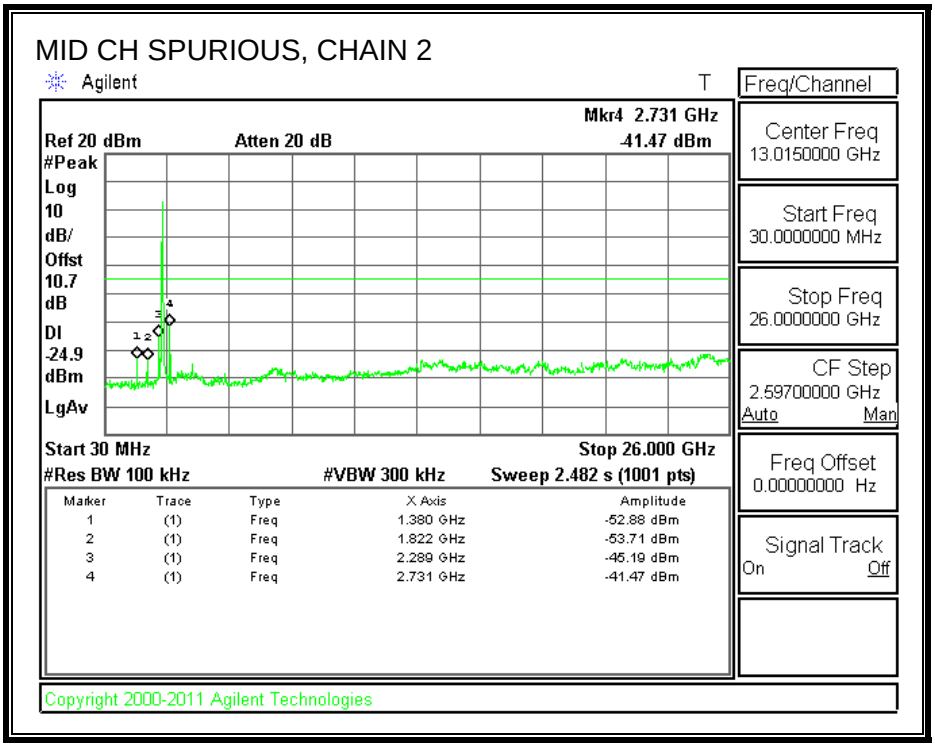




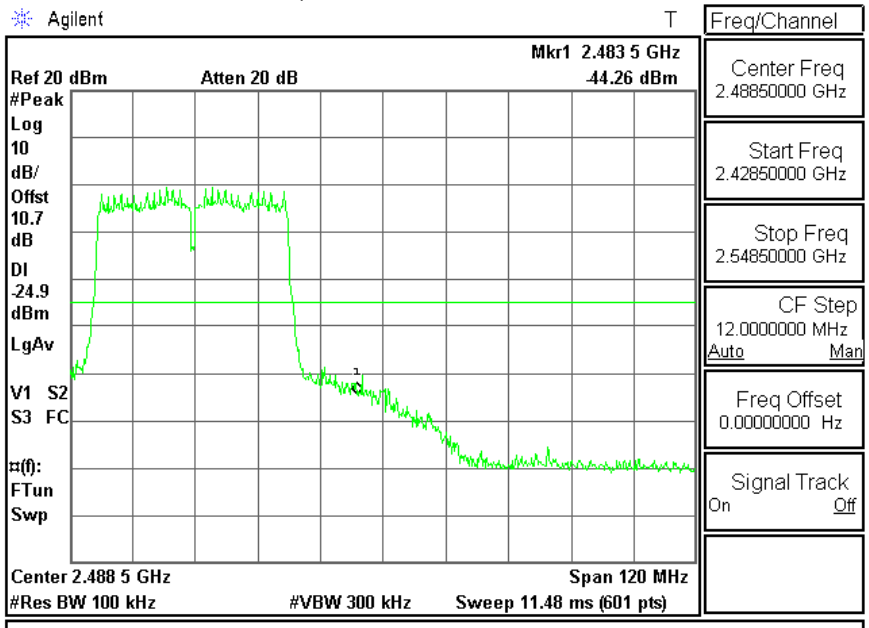
MID CH REFERENCE, CHAIN 2



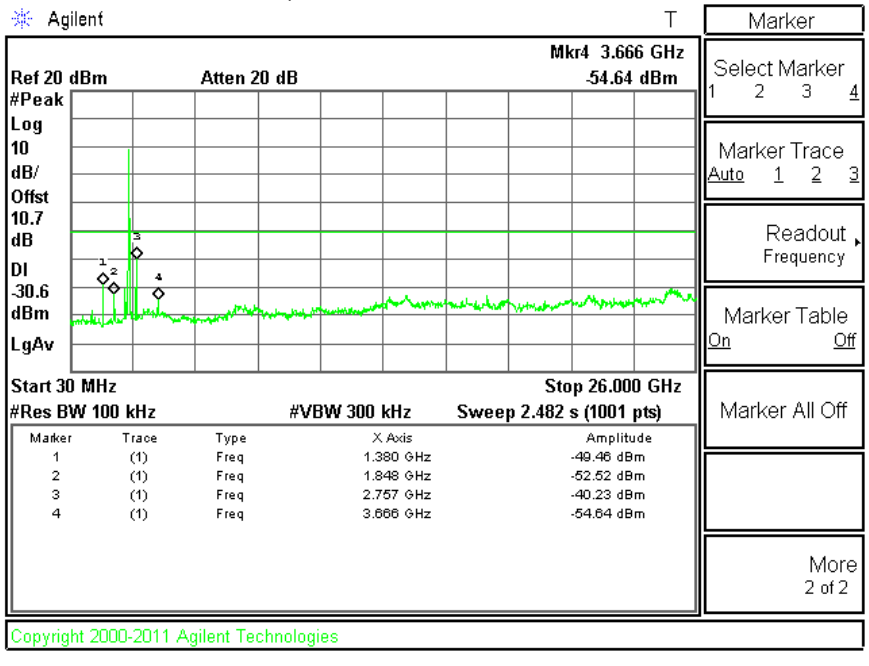
MID CH SPURIOUS, CHAIN 2



HIGH CH BANDEDGE, CHAIN 2



HIGH CH SPURIOUS, CHAIN 2



7.6. 802.11a 1TX MODE IN THE 5.8 GHz BAND

Covered by testing to HT20 CDD MCS0 2TX

7.7. 802.11n HT20 CDD MCS0 2TX MODE IN THE 5.8 GHz BAND

7.7.1. 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.

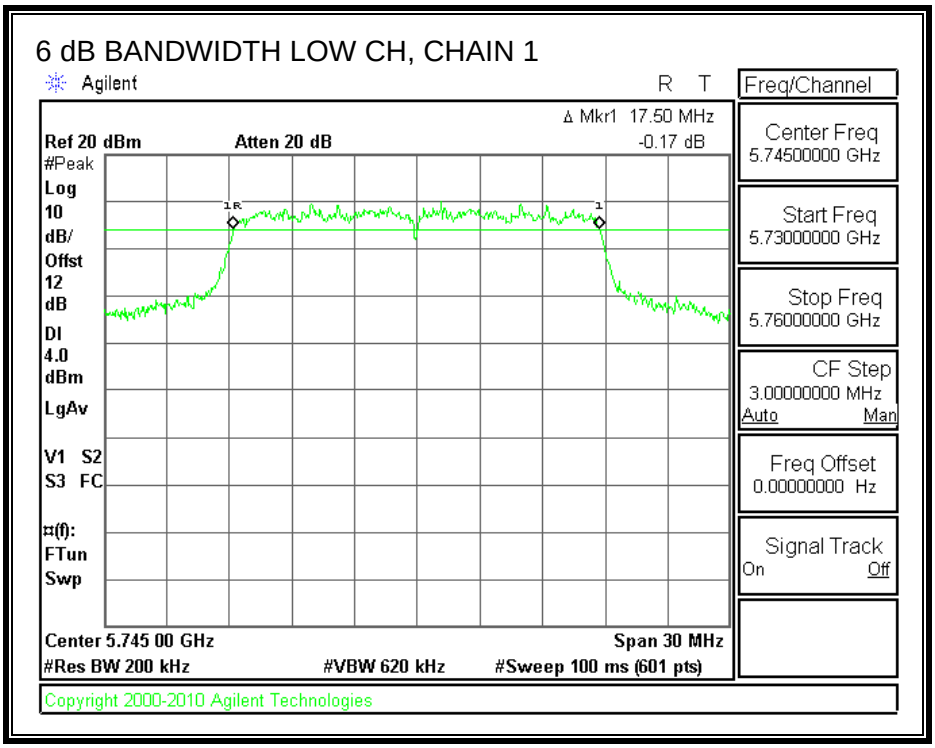
TEST PROCEDURE

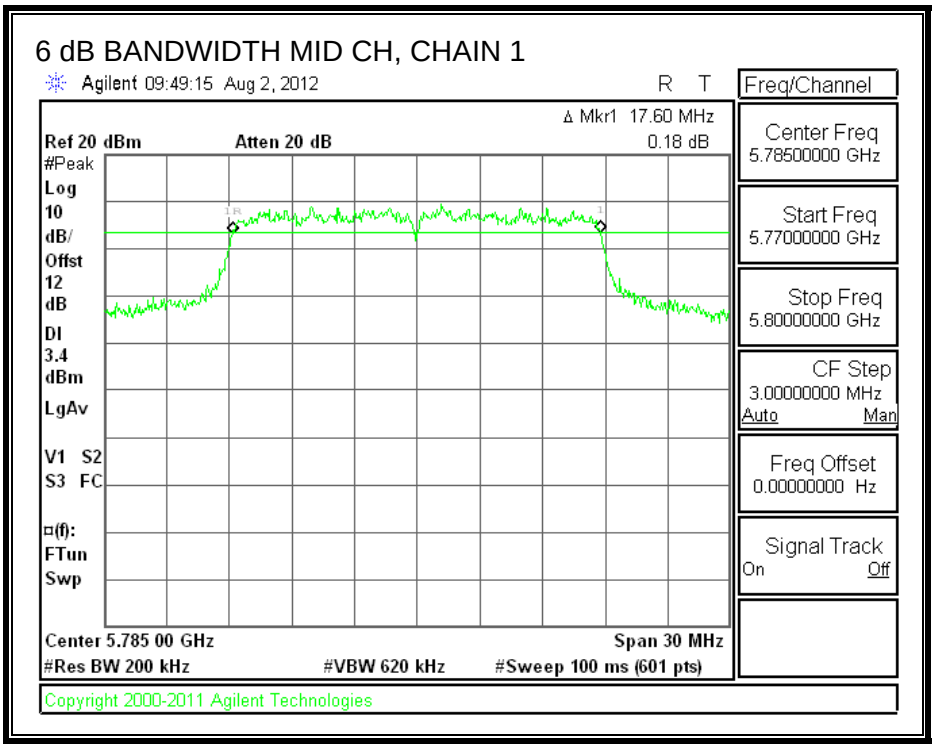
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

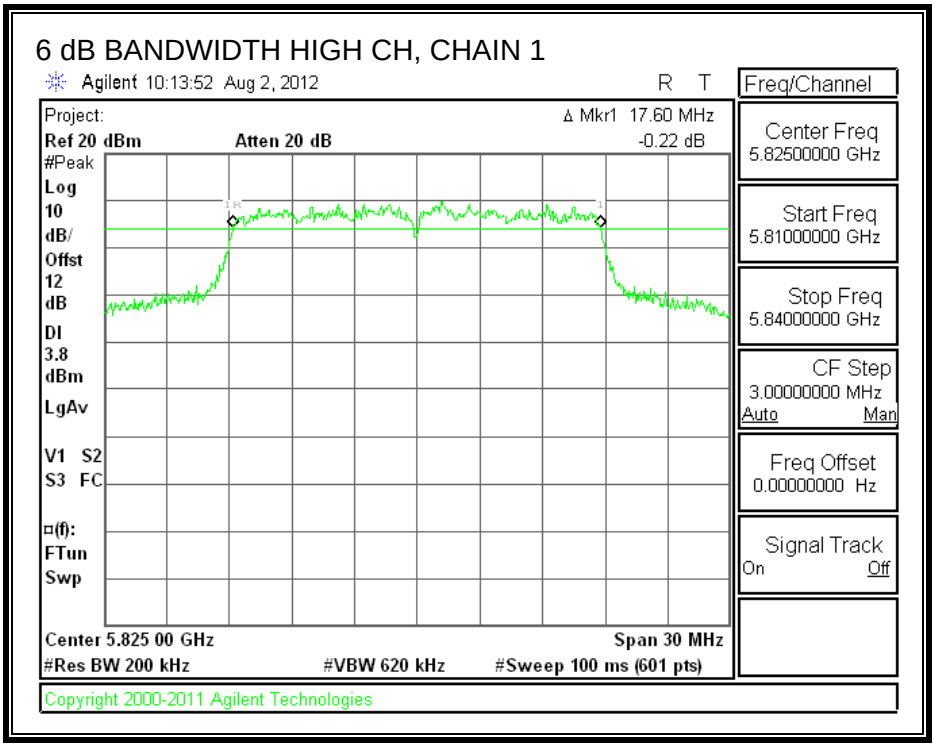
RESULTS

Channel	Frequency (MHz)	Chain 1 6 dB BW (MHz)	Chain 2 6 dB BW (MHz)	Minimum Limit (MHz)
Low	5745	17.50	17.60	0.5
Middle	5785	17.60	17.70	0.5
High	5825	17.60	17.70	0.5

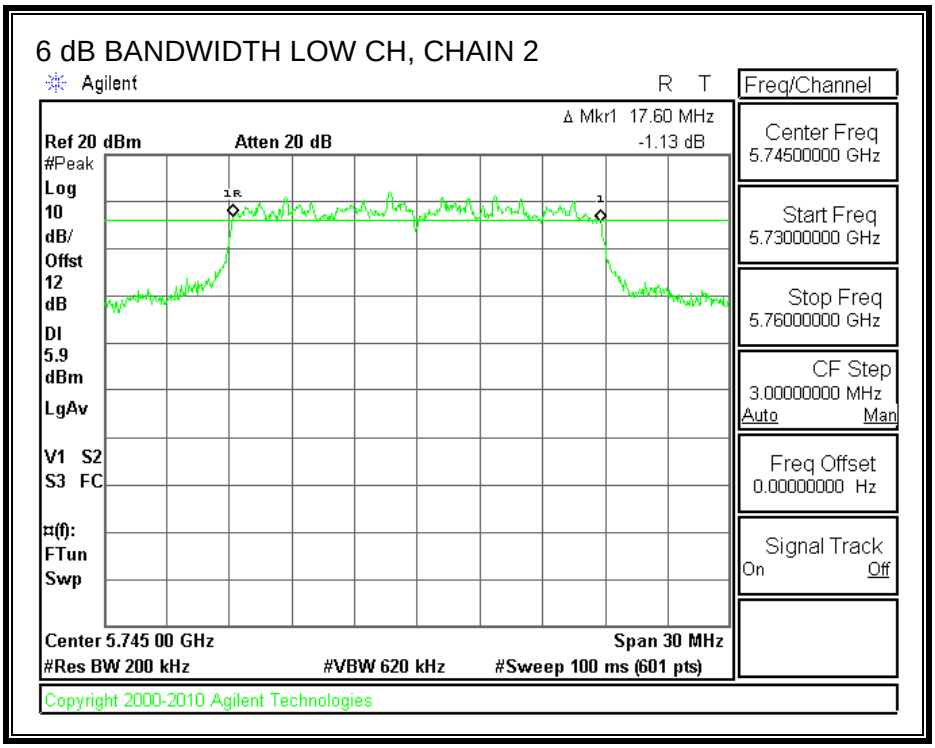
6 dB BANDWIDTH, CHAIN 1

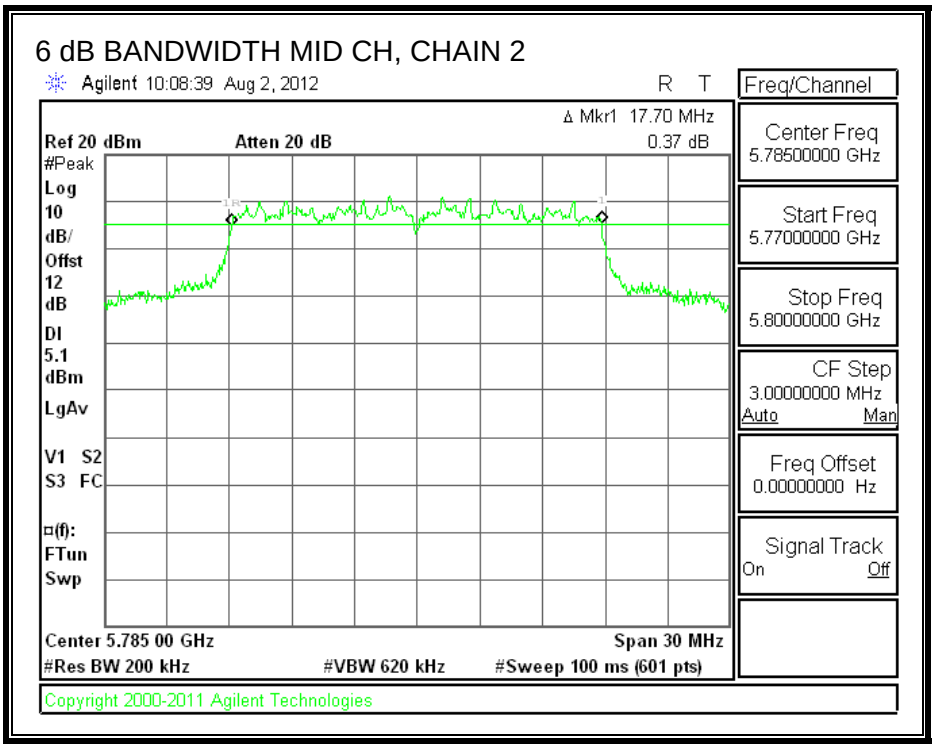


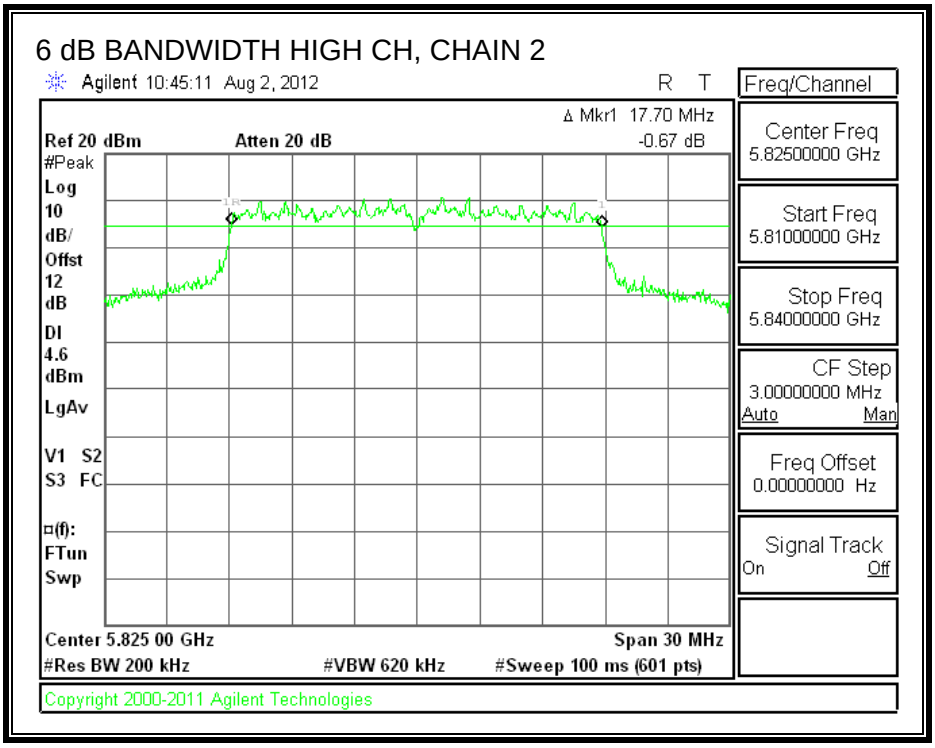




6 dB BANDWIDTH, CHAIN 2







7.7.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

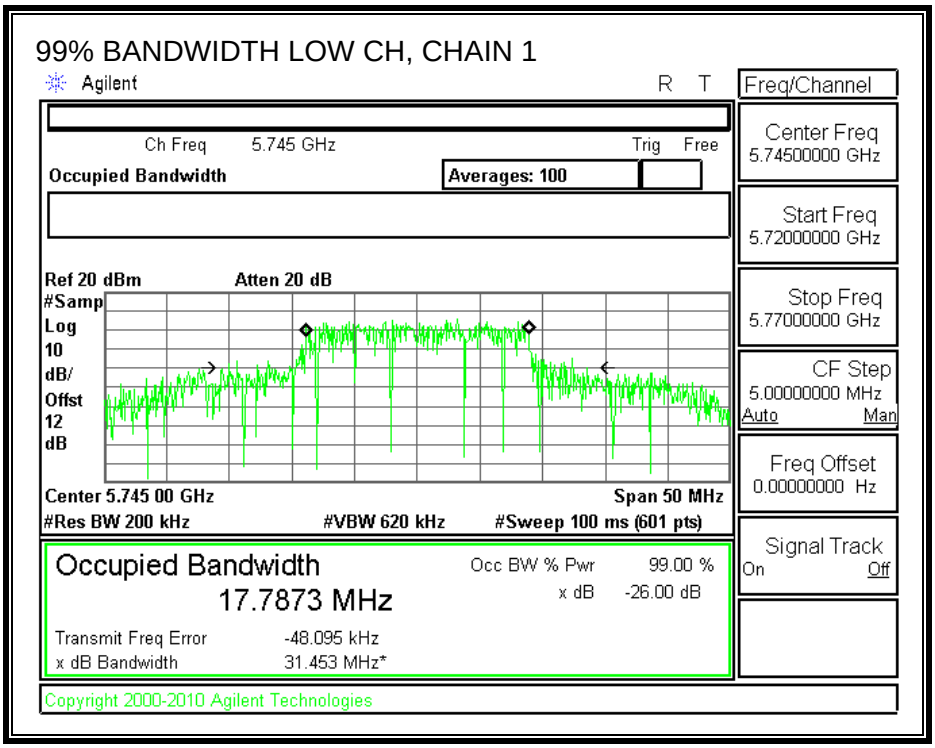
TEST PROCEDURE

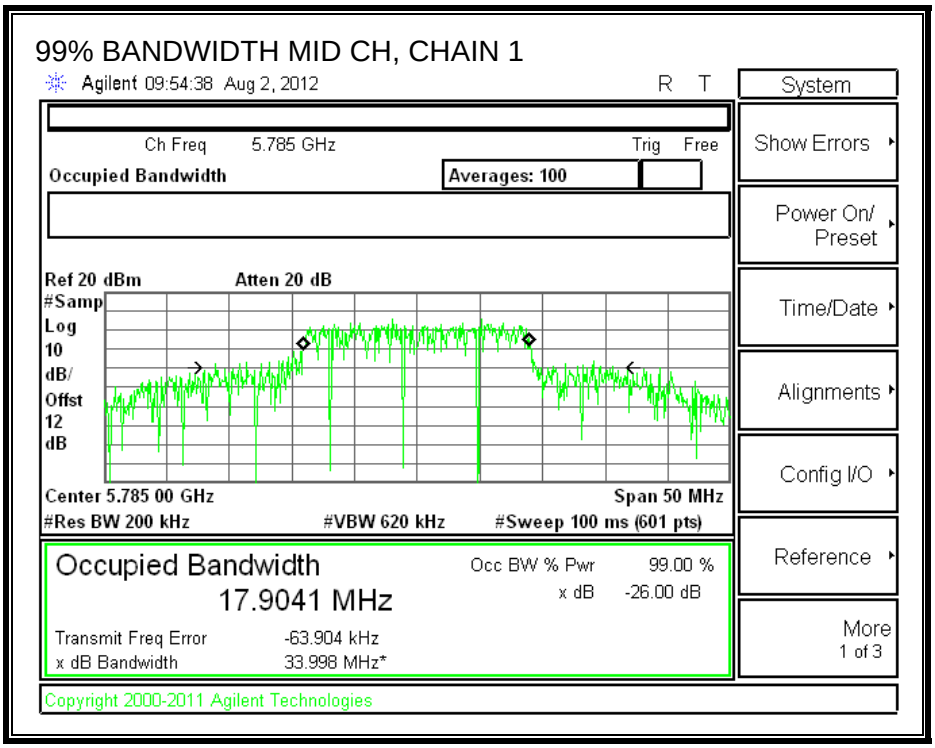
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

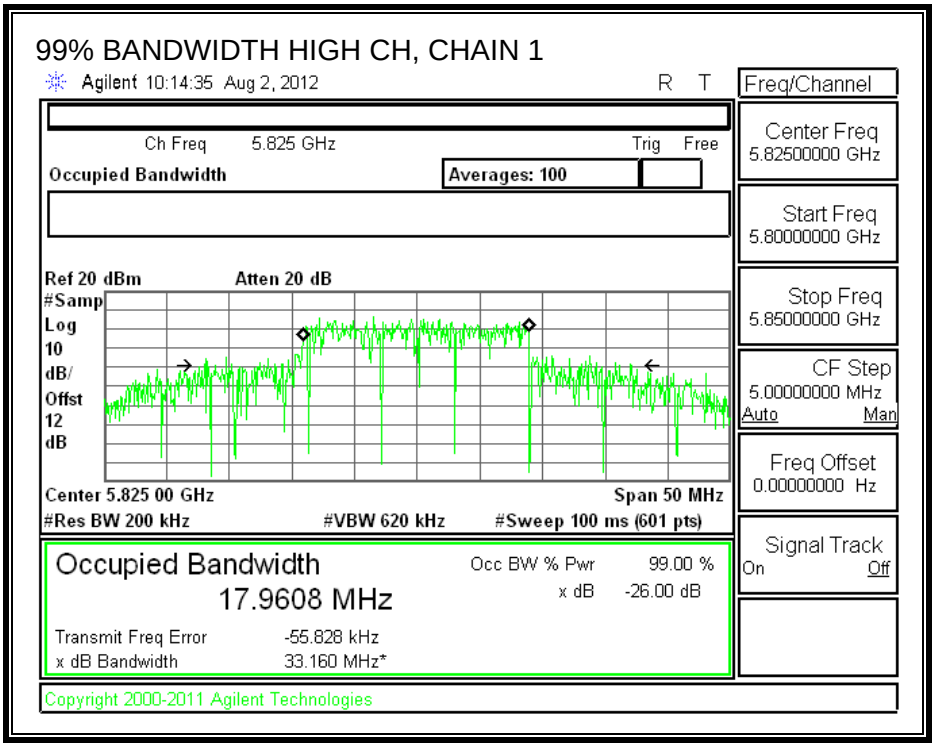
RESULTS

Channel	Frequency (MHz)	Chain 1 99% Bandwidth (MHz)	Chain 2 99% Bandwidth (MHz)
Low	5745	17.7873	18.0647
Middle	5785	17.9041	18.9089
High	5825	17.9608	18.6965

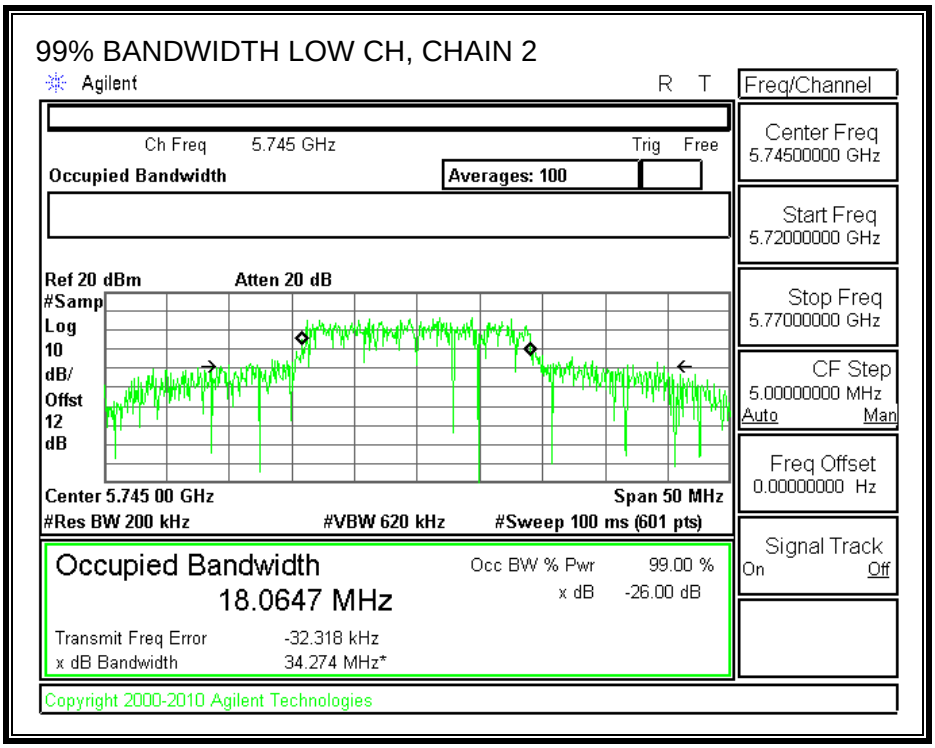
99% BANDWIDTH, CHAIN 1

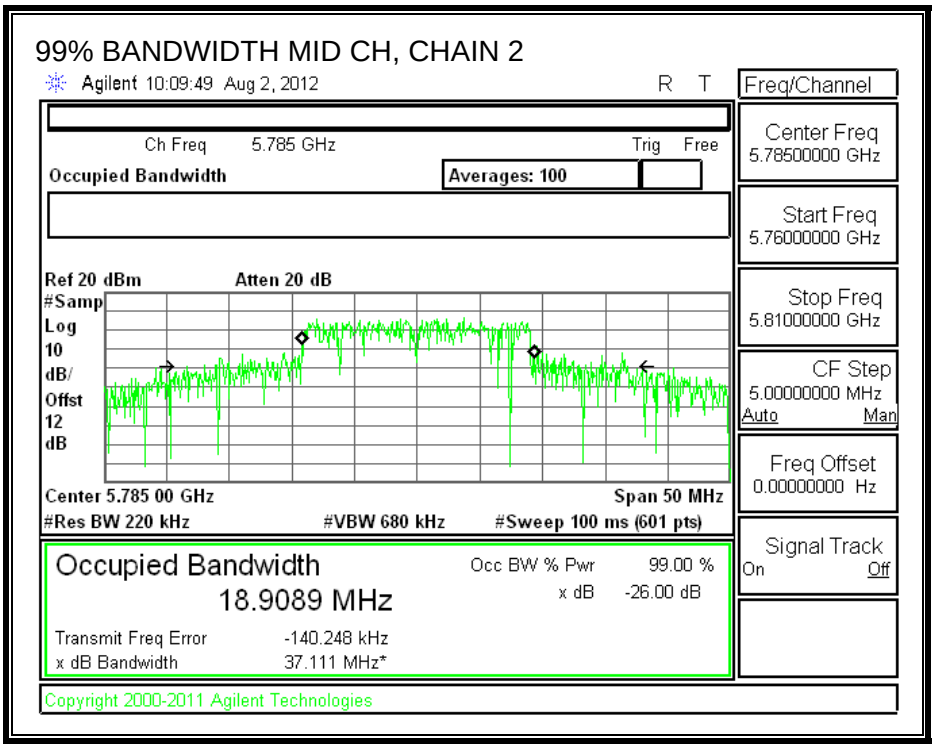


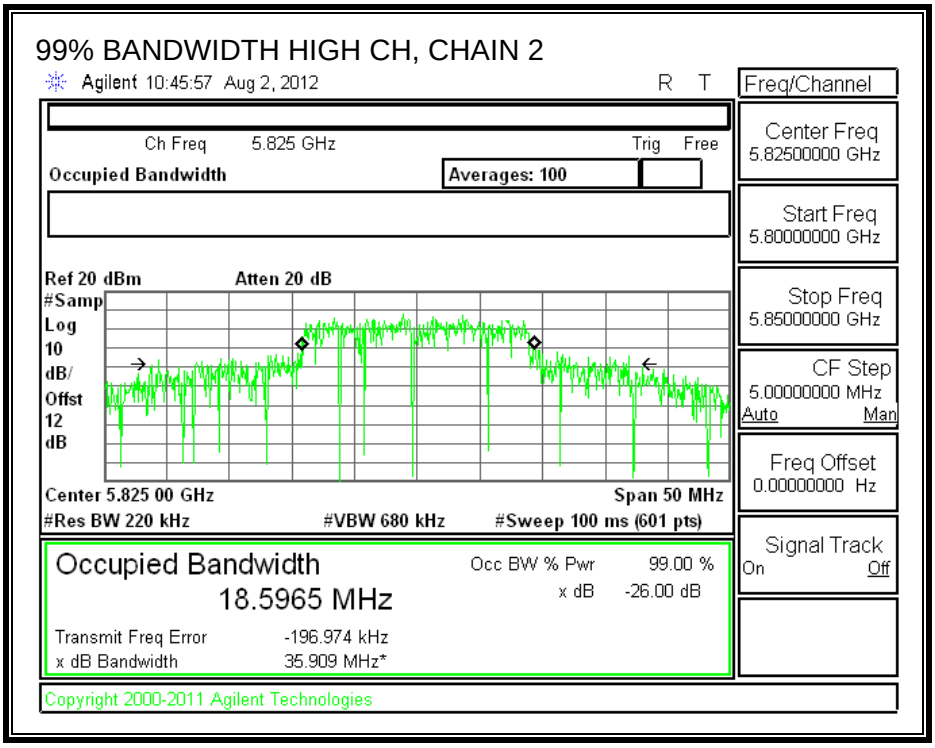




99% BANDWIDTH, CHAIN 2







7.7.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Antenna Gain (dBi)	10 Log (# Tx Chains) (dB)	Effective Legacy Gain (dBi)
5.8	3.01	8.81

The maximum effective composite gain is 8.81 dBi for other than fixed, point-to-point operations, therefore the limit is 27.19 dBm.

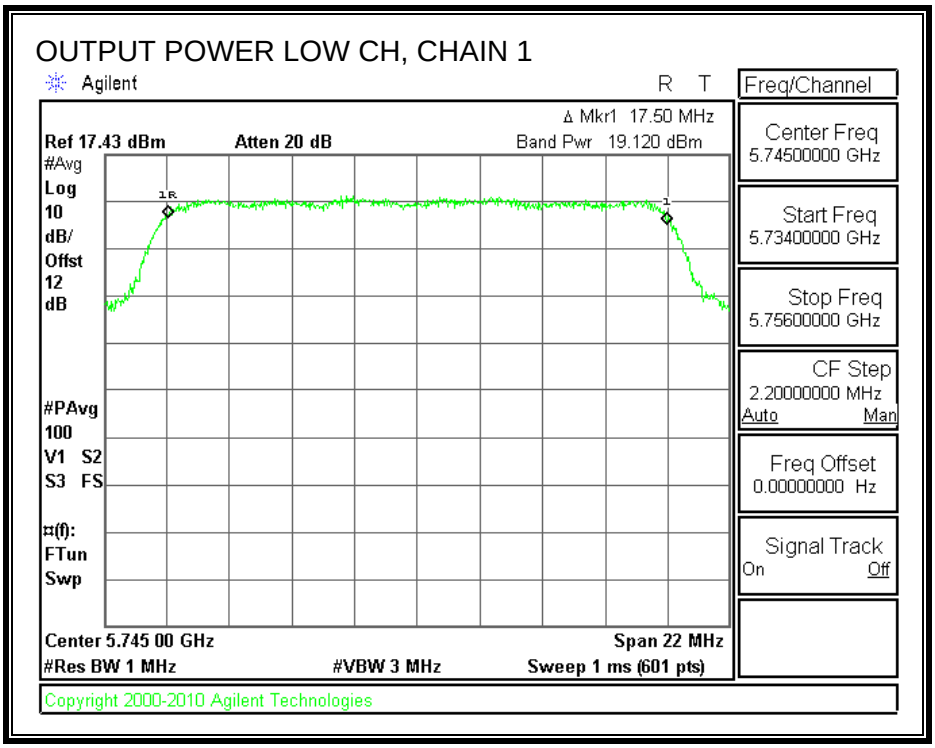
TEST PROCEDURE

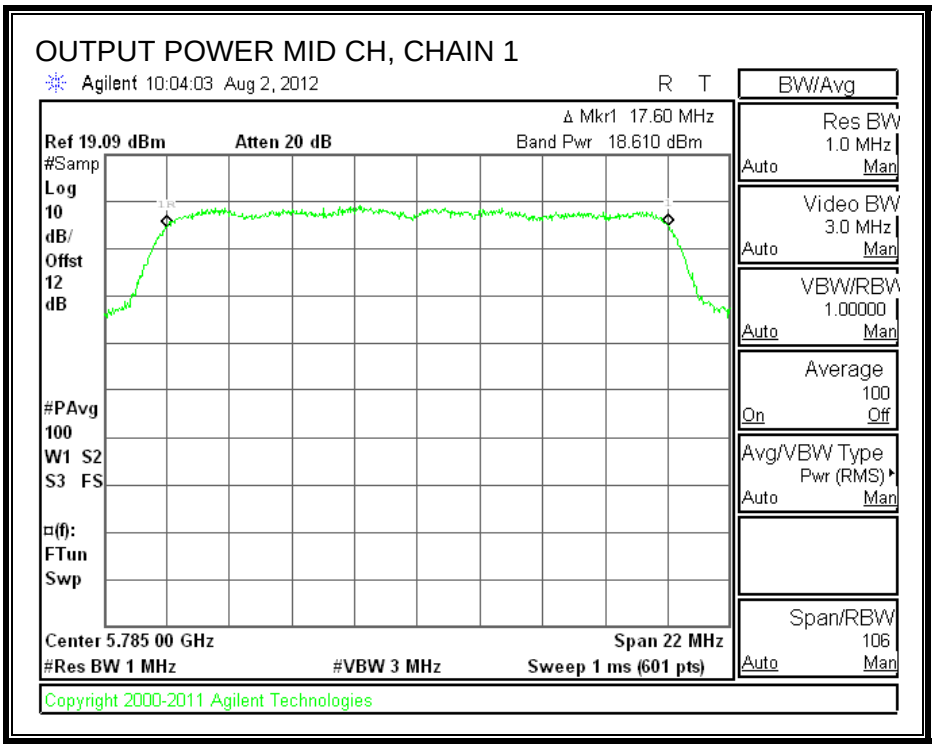
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

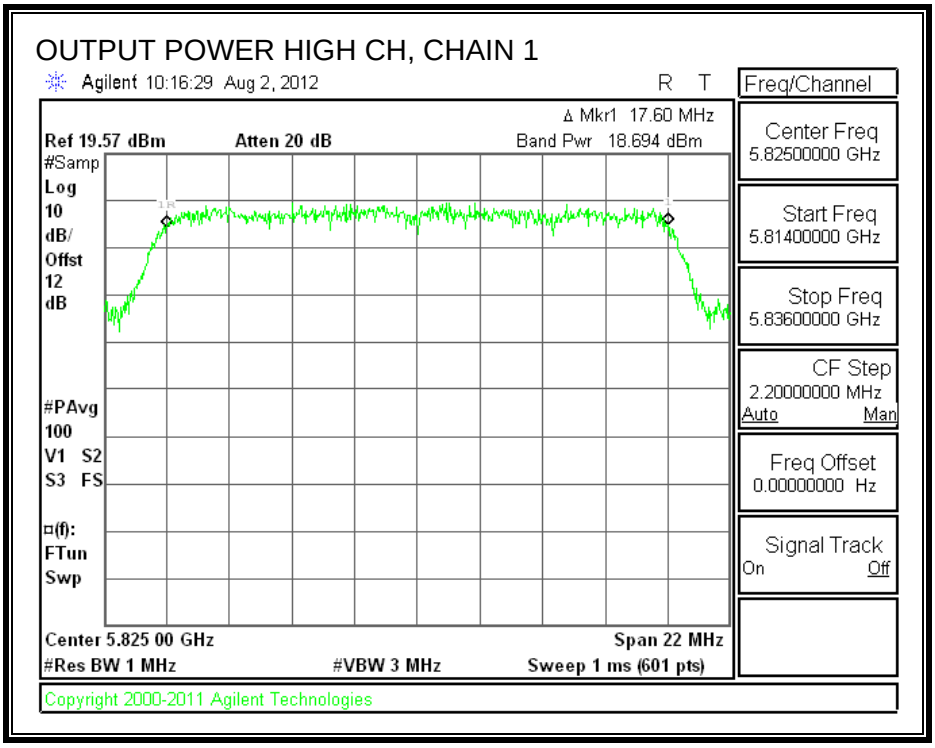
RESULTS

Channel	Frequency (MHz)	Chain 1 PK Power (dBm)	Chain 2 PK Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5745	19.120	19.649	22.403	27.19	-4.787
Mid	5785	18.610	19.654	22.174	27.19	-5.016
High	5825	18.694	19.423	22.084	27.19	-5.106

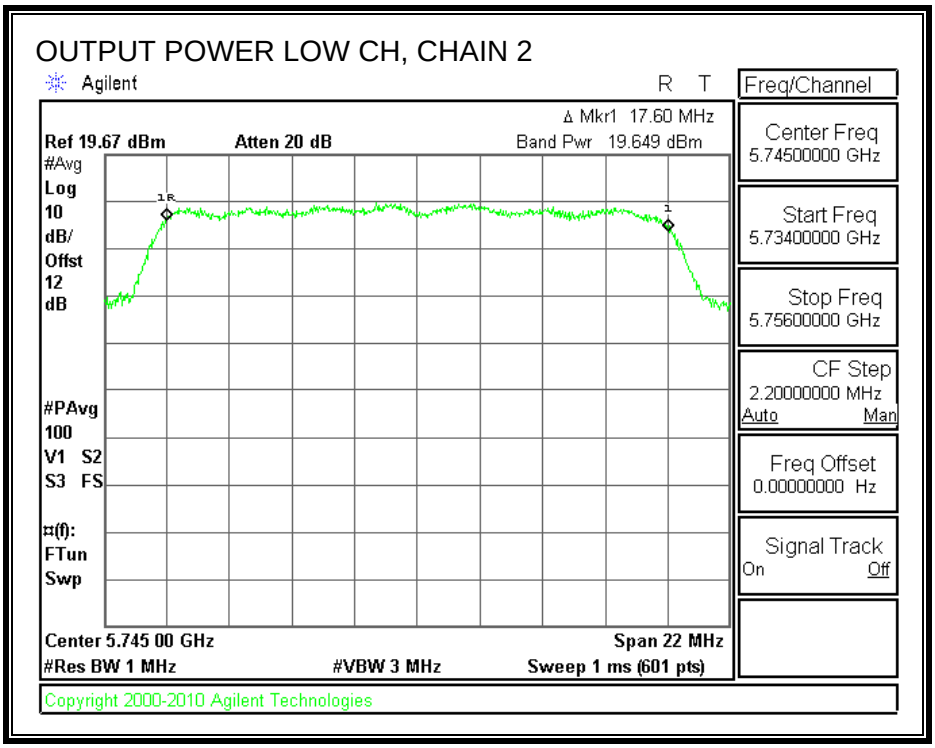
CHAIN 1 OUTPUT POWER

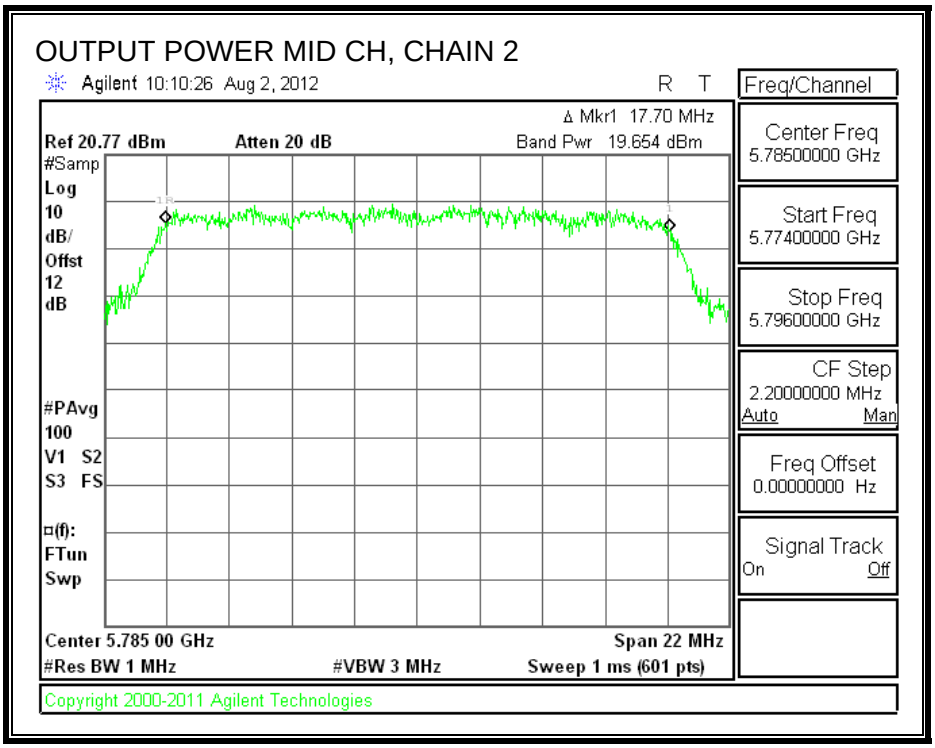


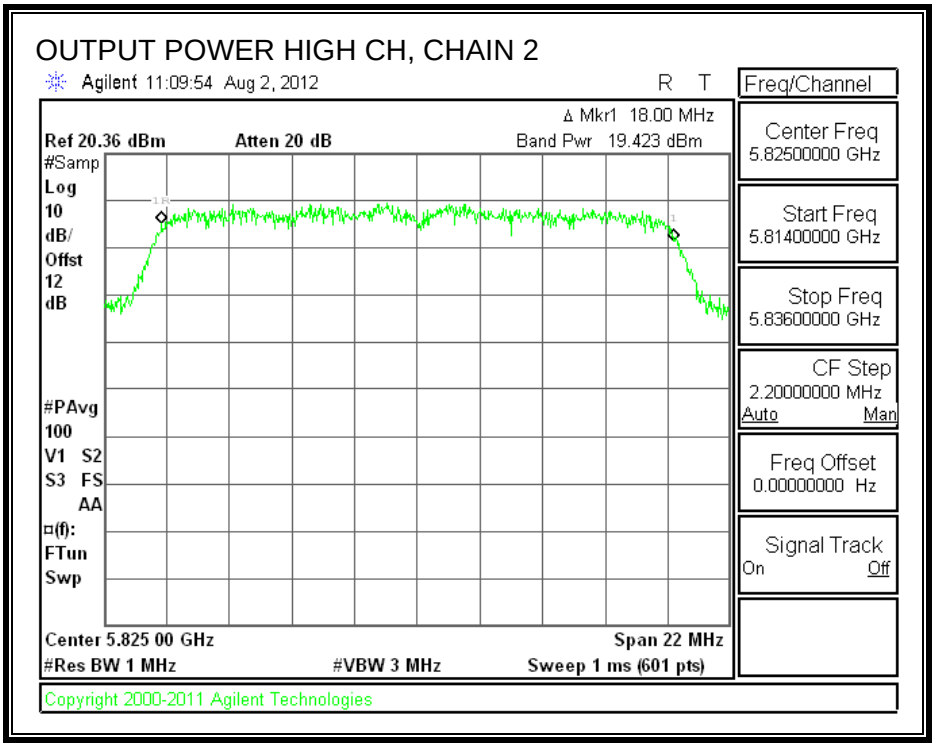




CHAIN 2 OUTPUT POWER







7.7.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

TEST PROCEDURE

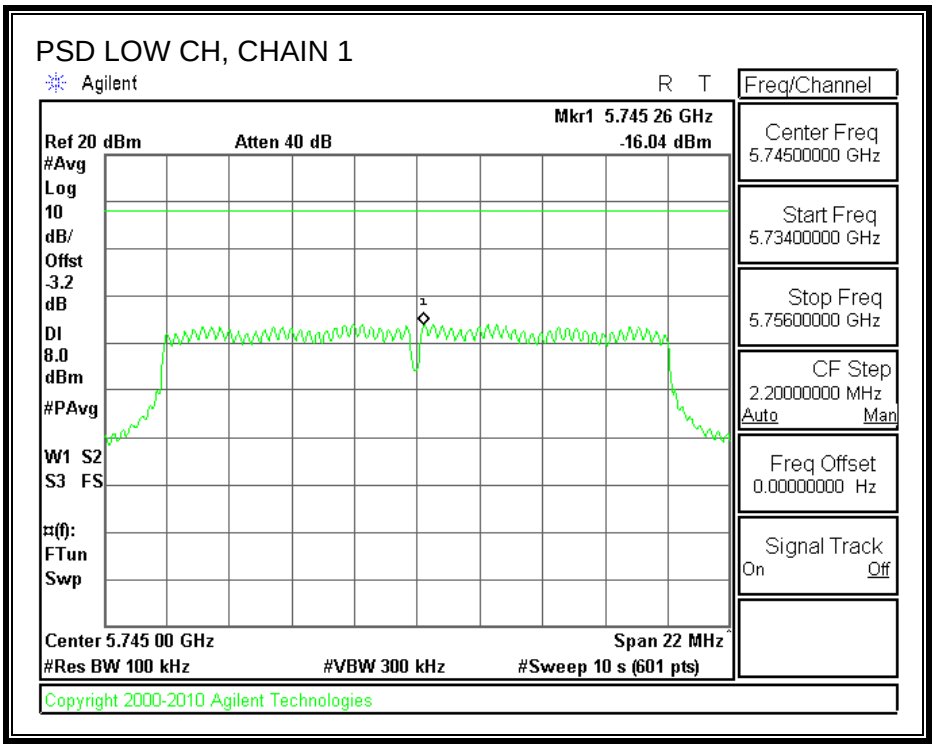
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

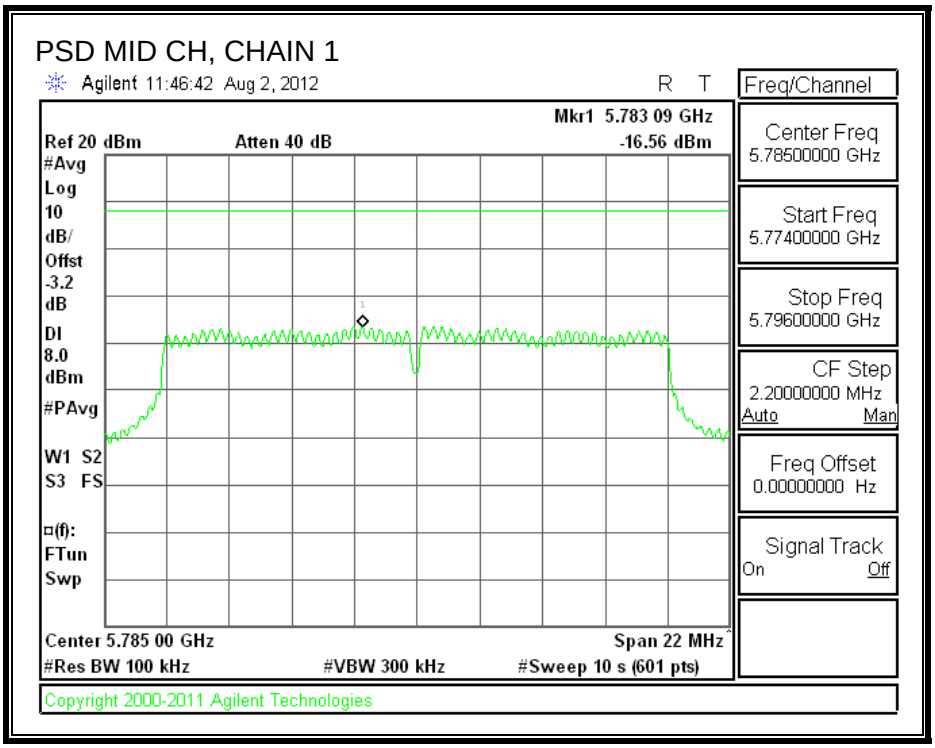
RESULTS:

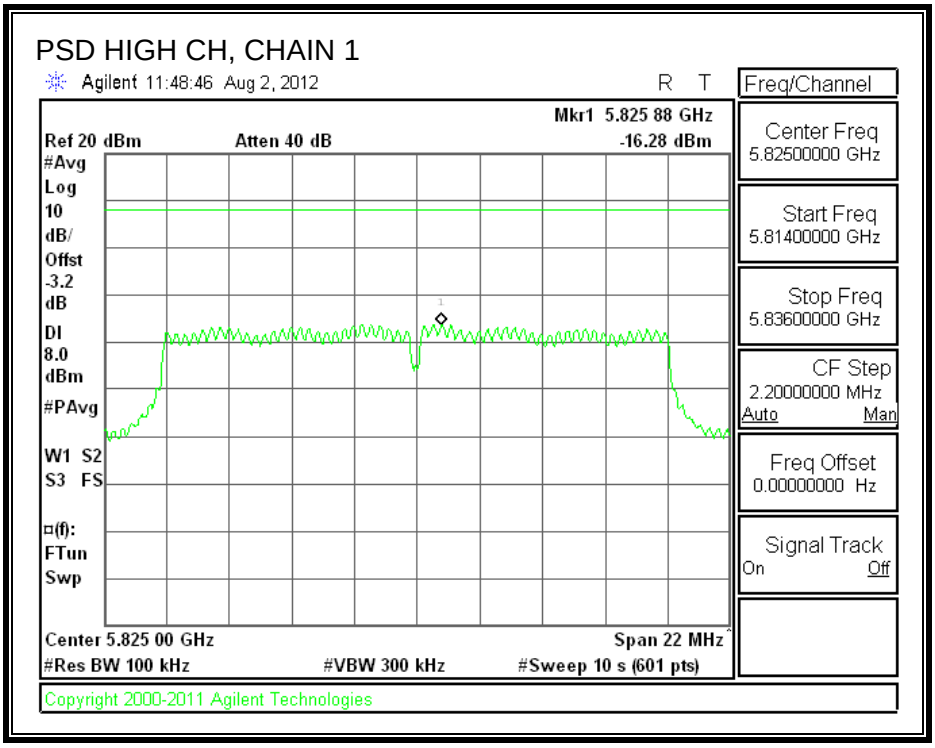
Channel	Frequency (MHz)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-16.04	-14.88	-12.41	8	-20.41
Middle	5785	-16.56	-15.00	-12.70	8	-20.70
High	5825	-16.28	-15.85	-13.05	8	-21.05

Note: The spectrum analyzer offset = attenuator loss + cable loss + 10 log (3/100 kHz) = -3.20 dB

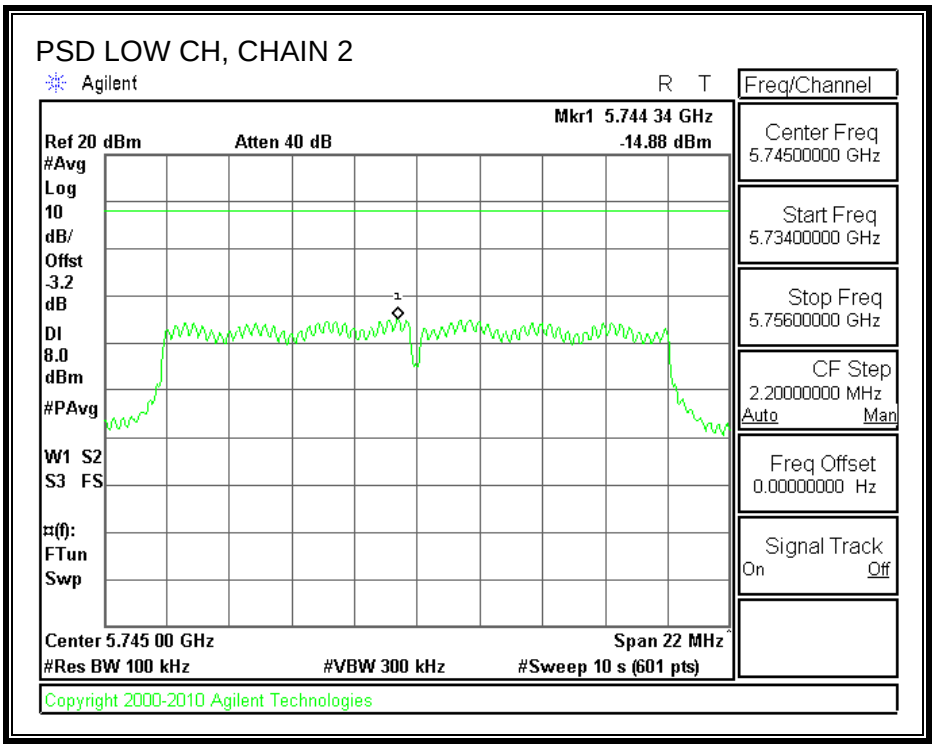
POWER SPECTRAL DENSITY, CHAIN 1

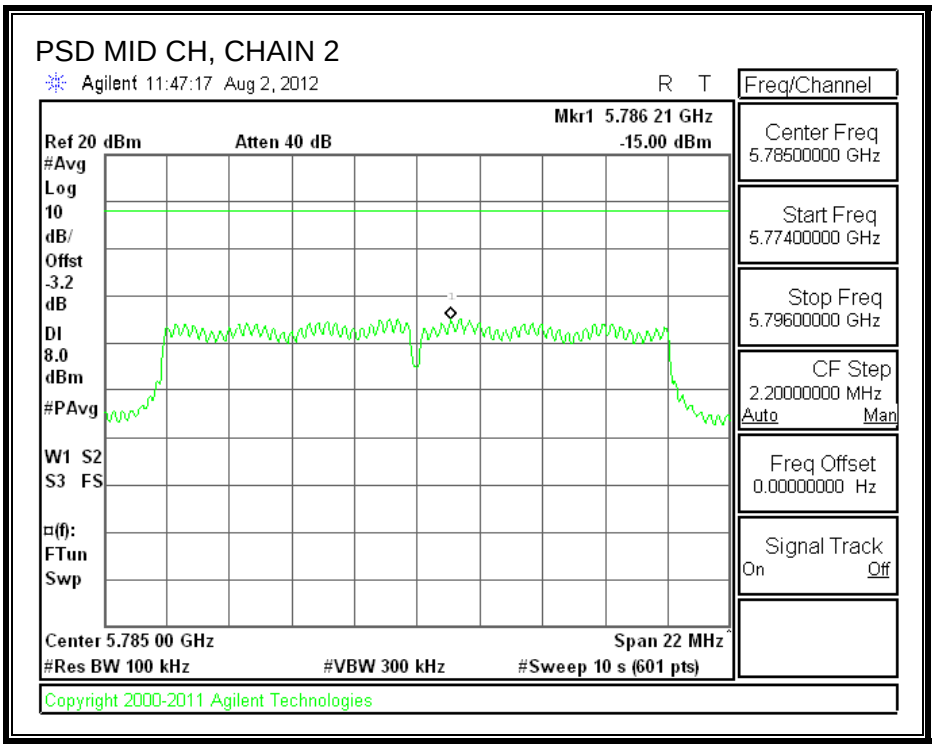


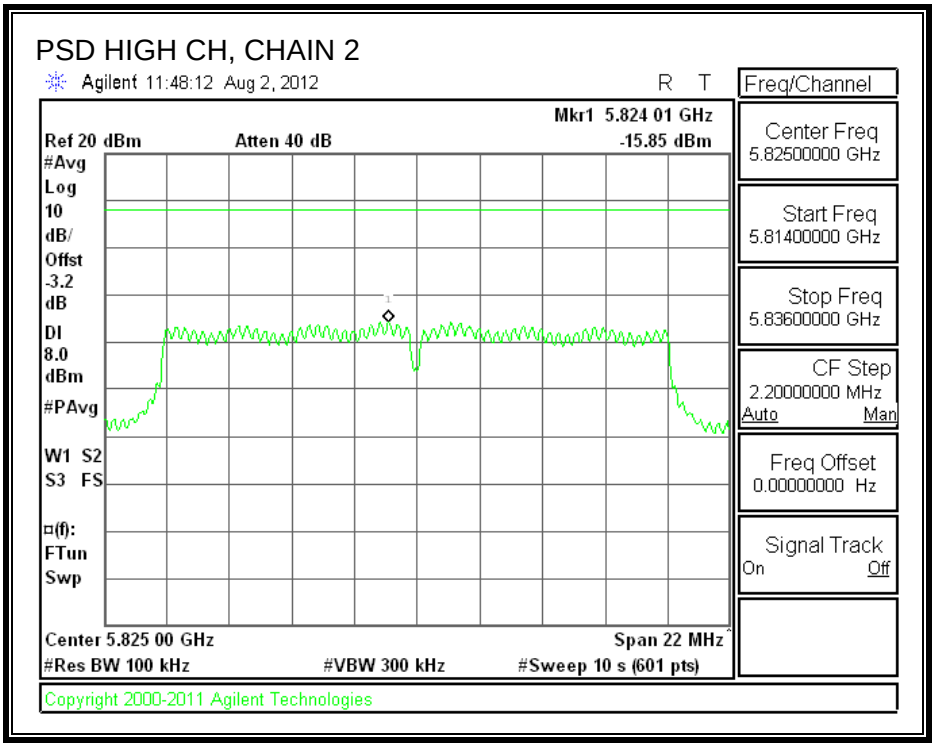




POWER SPECTRAL DENSITY, CHAIN 2







7.7.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

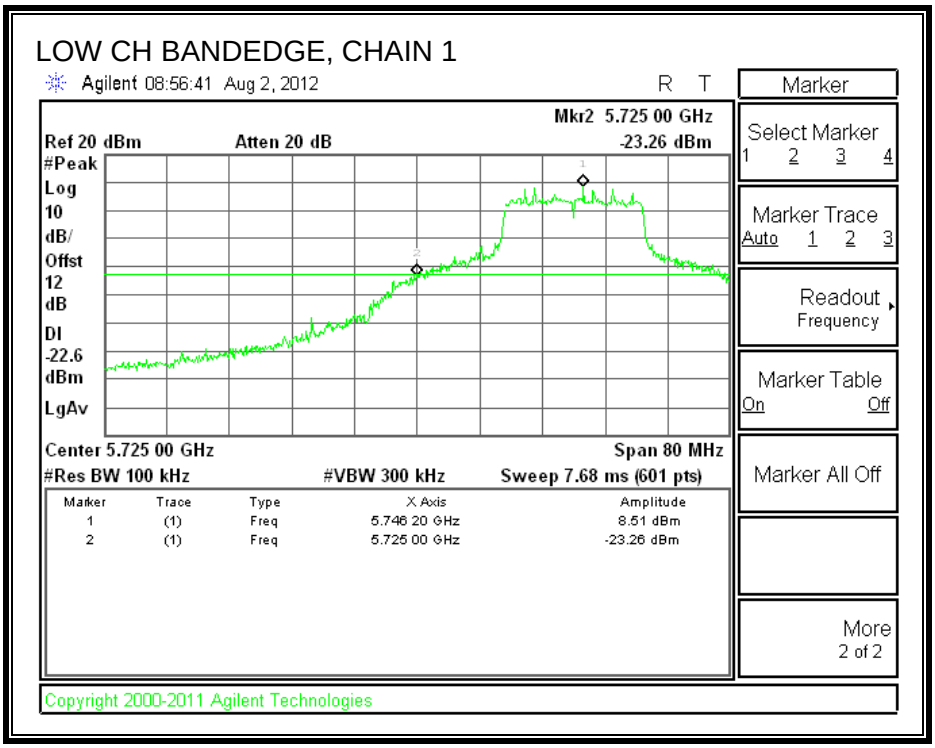
IC RSS-210 A8.5

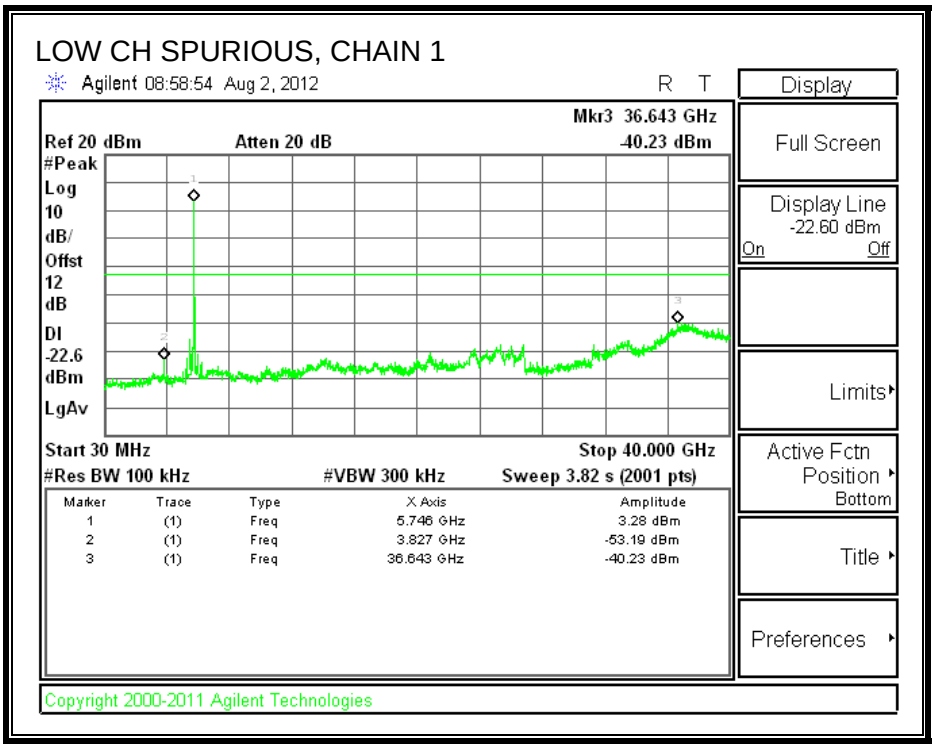
Output power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

TEST PROCEDURE

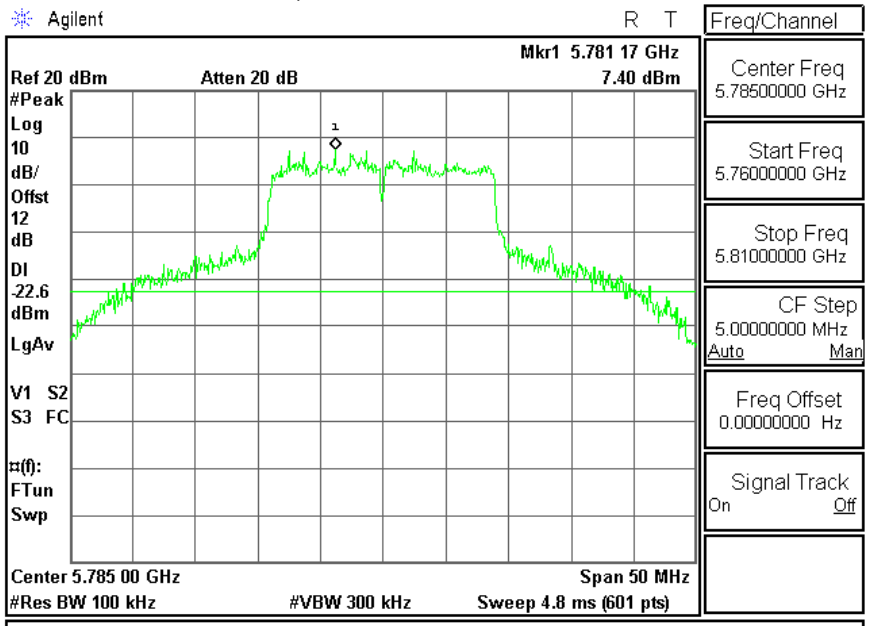
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

CHAIN 1 SPURIOUS EMISSIONS

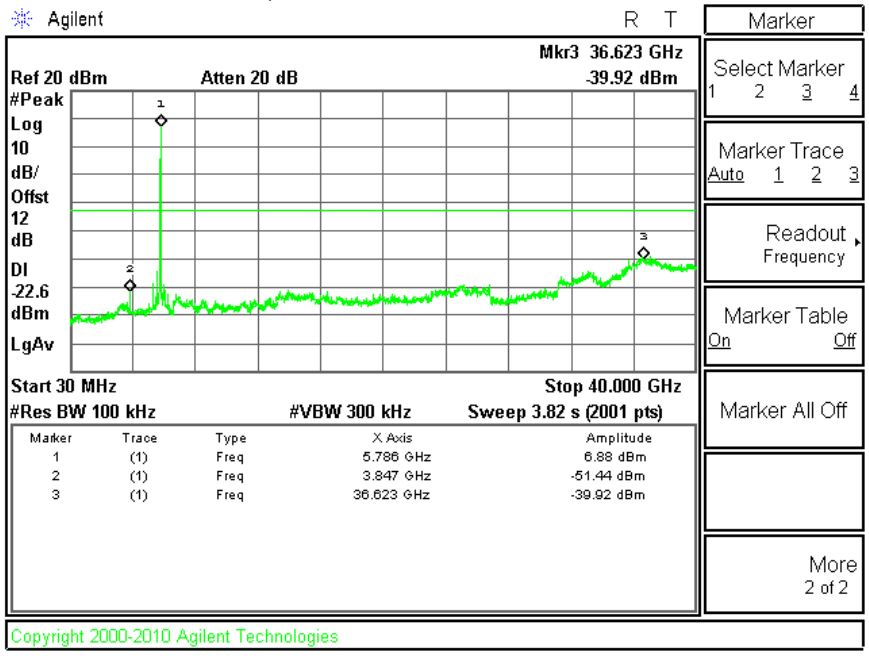




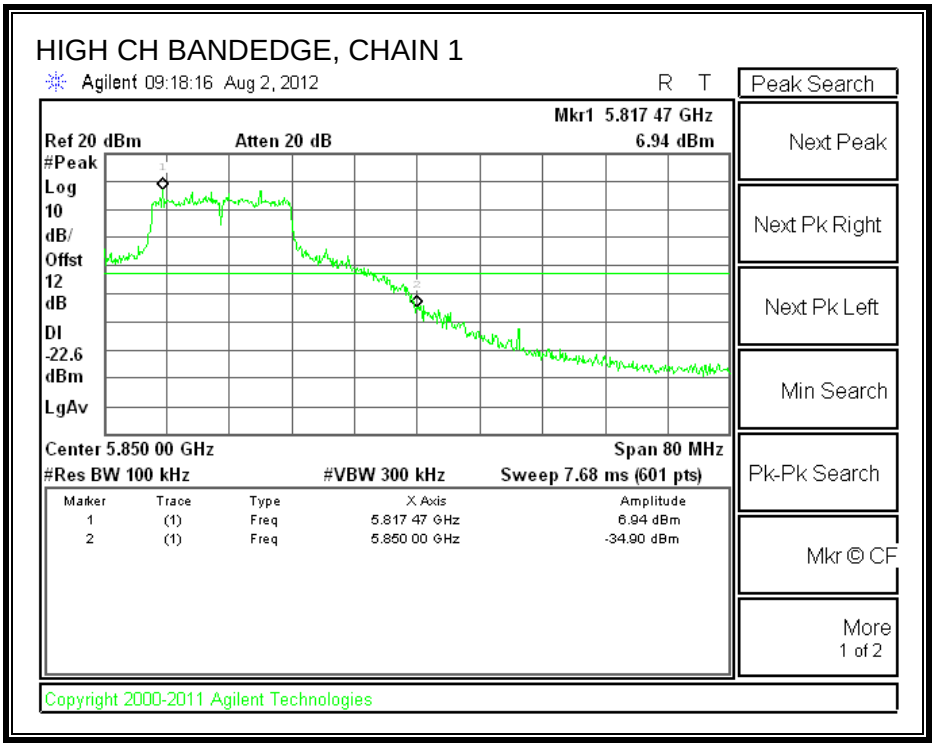
MID CH REFERENCE, CHAIN 1



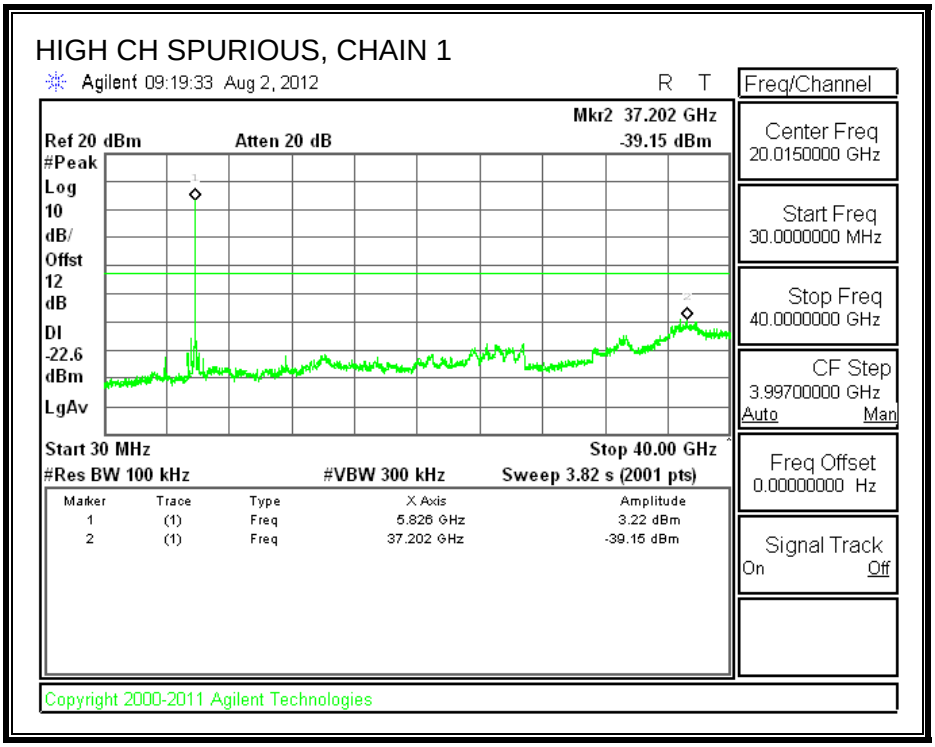
MID CH SPURIOUS, CHAIN 1



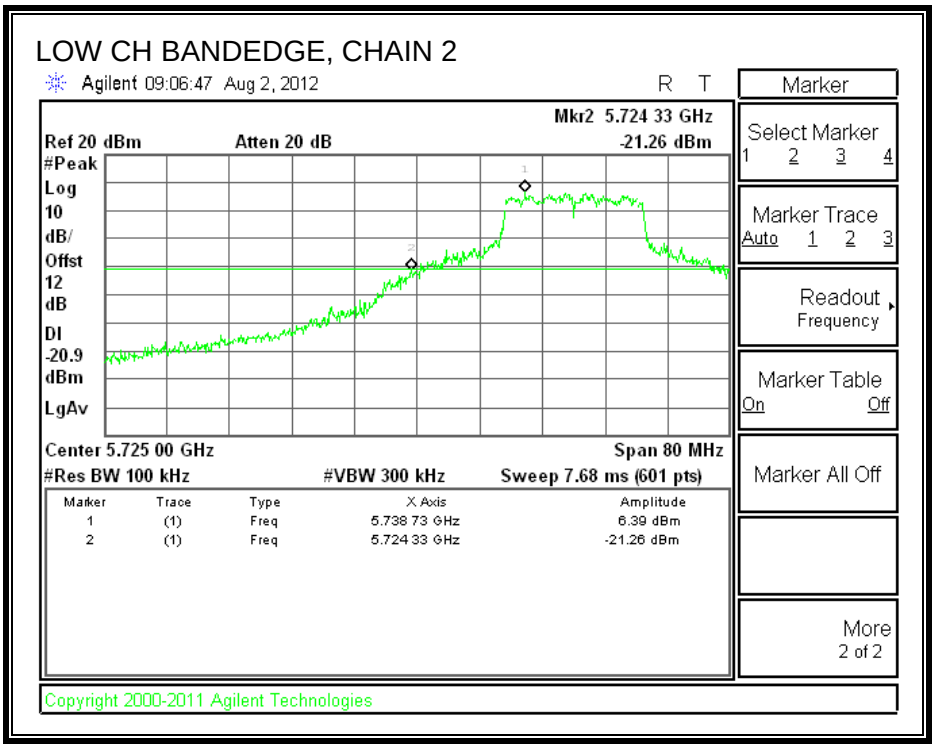
HIGH CH BANDEDGE, CHAIN 1

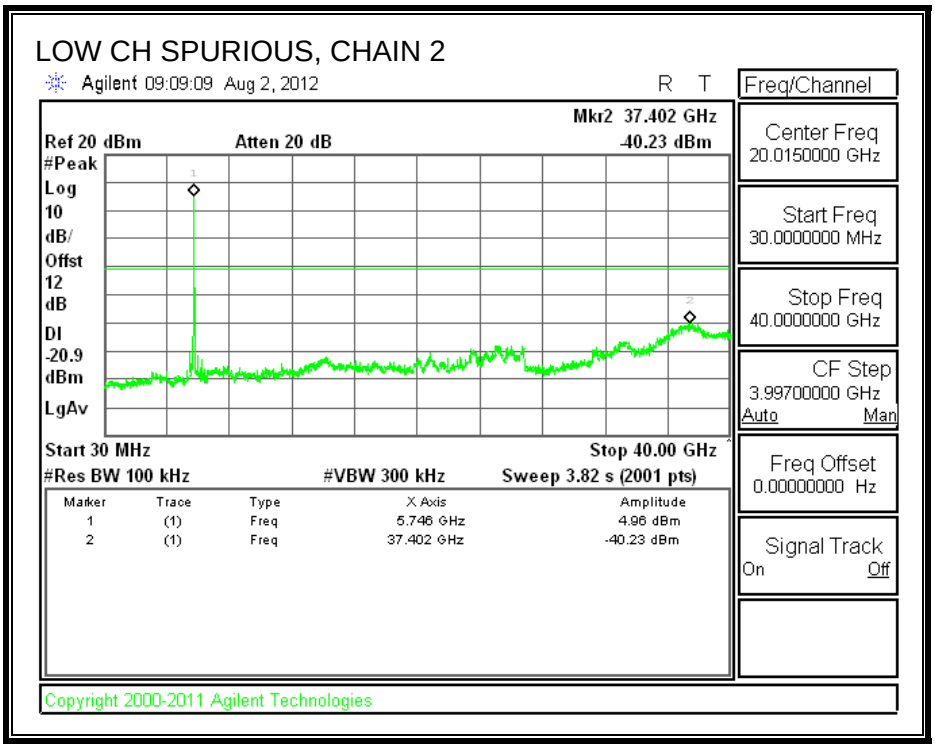


HIGH CH SPURIOUS, CHAIN 1

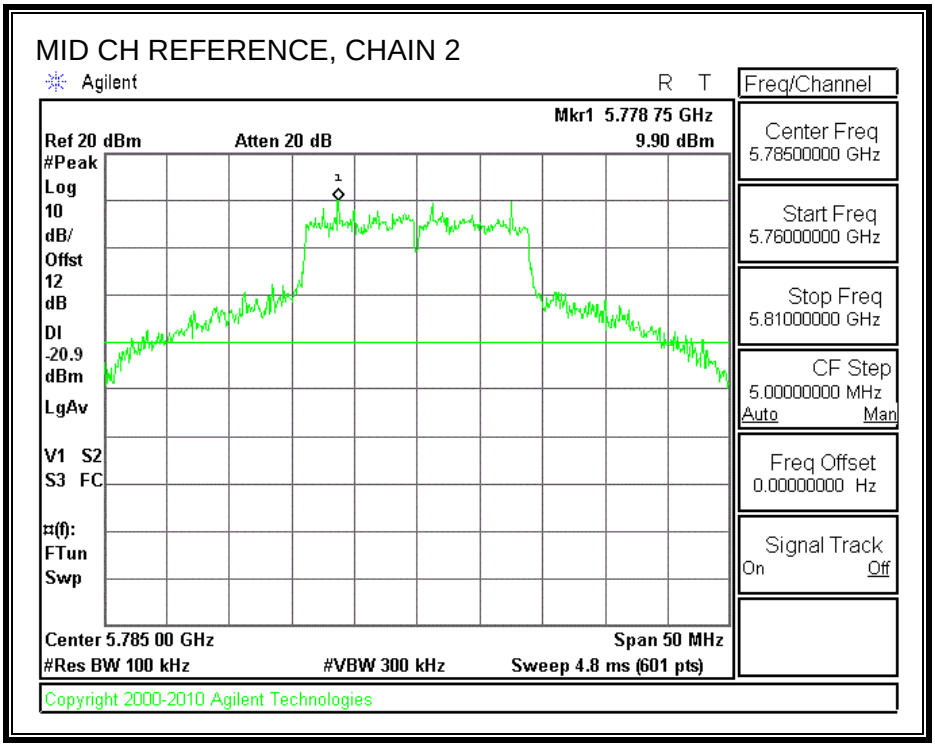


CHAIN 2 SPURIOUS EMISSIONS

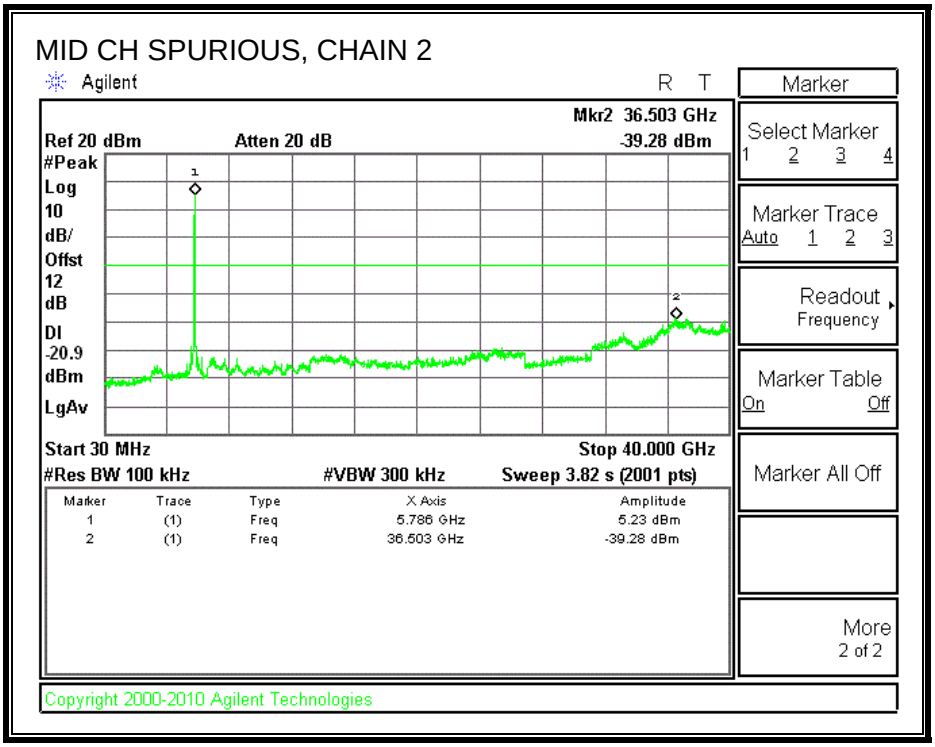




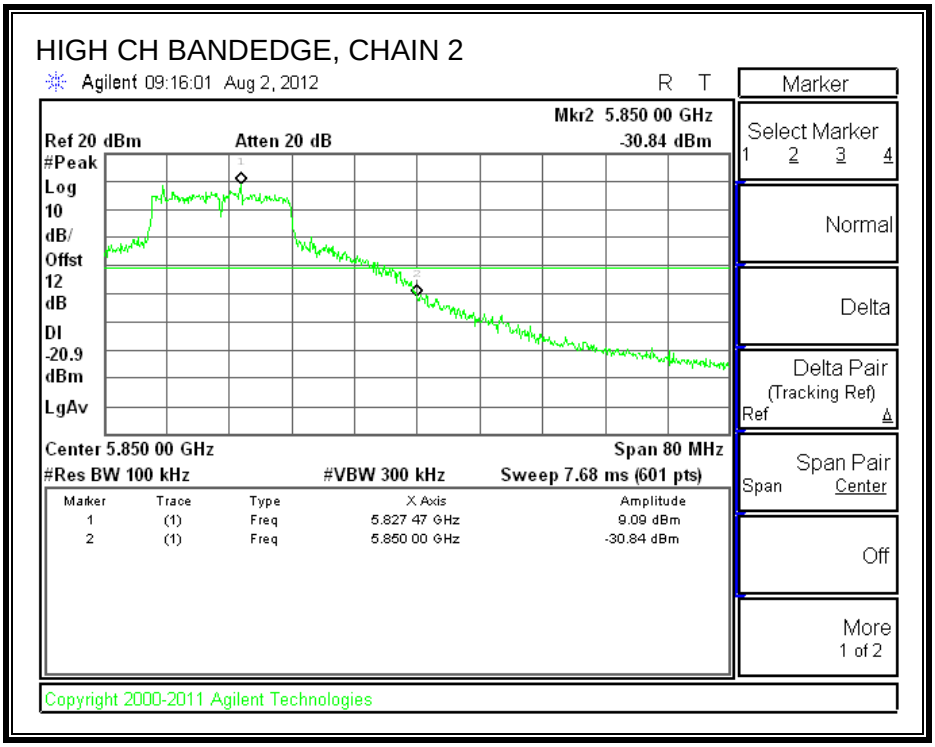
MID CH REFERENCE, CHAIN 2



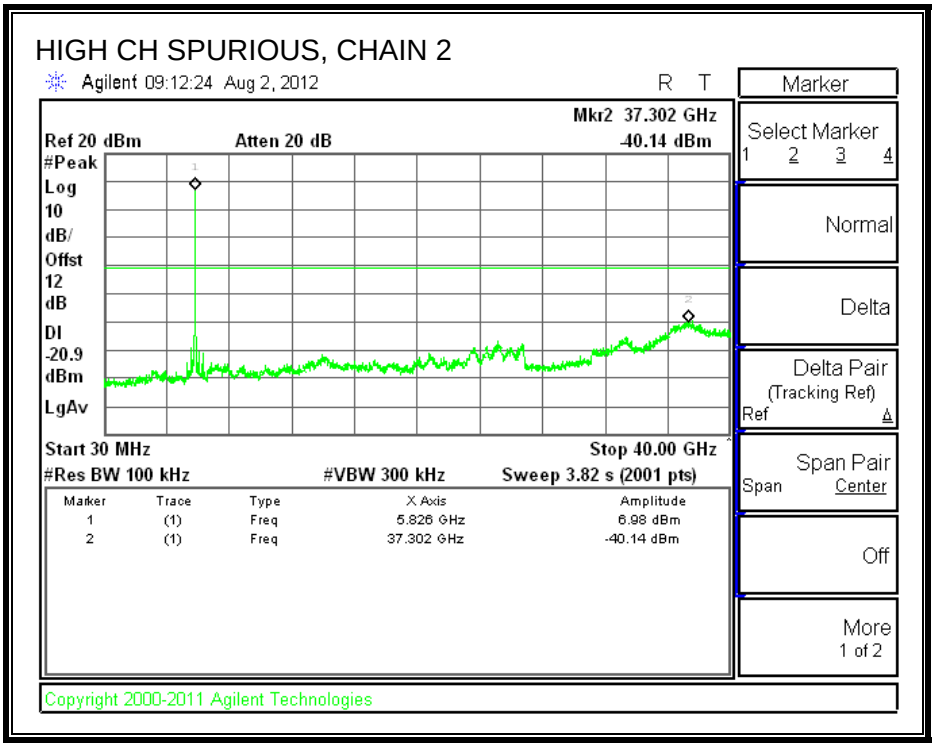
MID CH SPURIOUS, CHAIN 2



HIGH CH BANDEDGE, CHAIN 2



HIGH CH SPURIOUS, CHAIN 2



7.8. 802.11n HT40 1TX MODE IN THE 5.8 GHz BAND

Covered by testing to HT40 CDD MCS0 2TX

7.9. 802.11n HT40 CDD MCS0 2TX MODE IN THE 5.8 GHz BAND

7.9.1. 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.

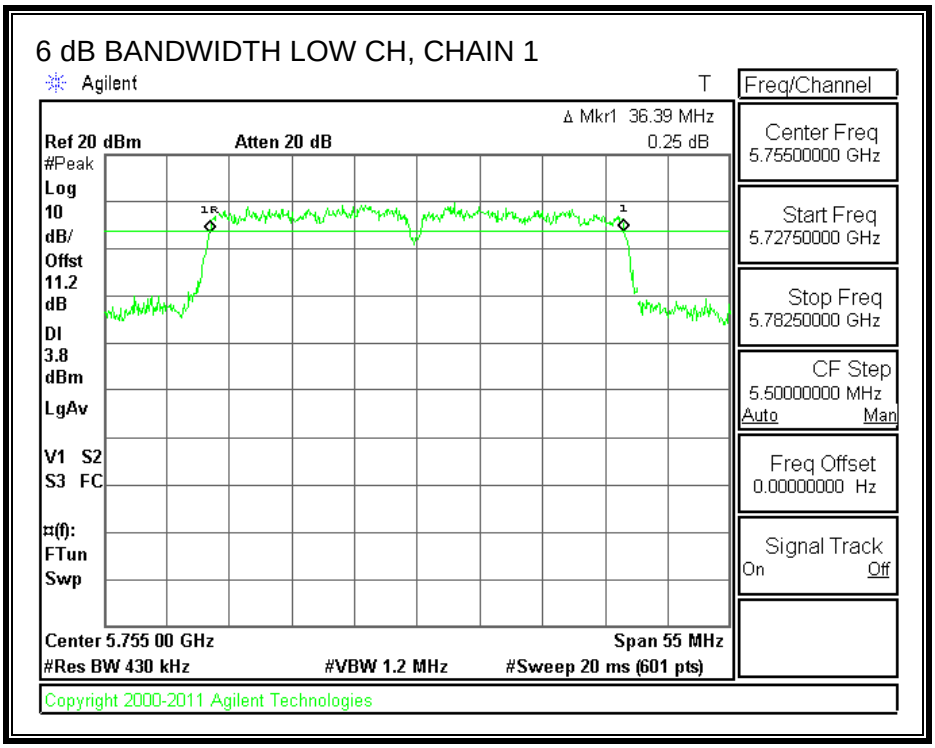
TEST PROCEDURE

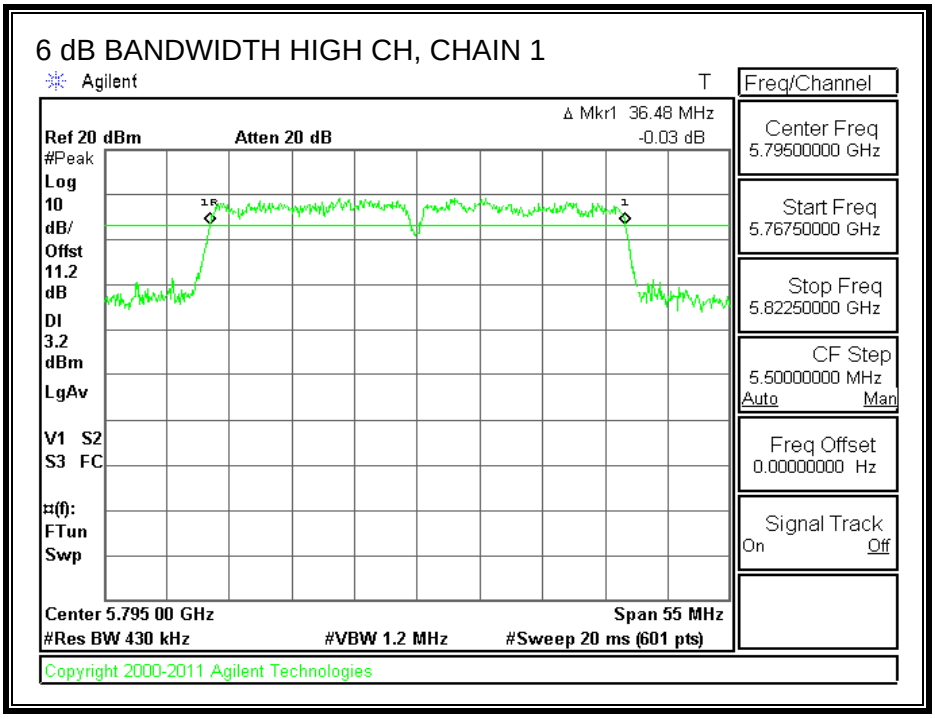
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

RESULTS

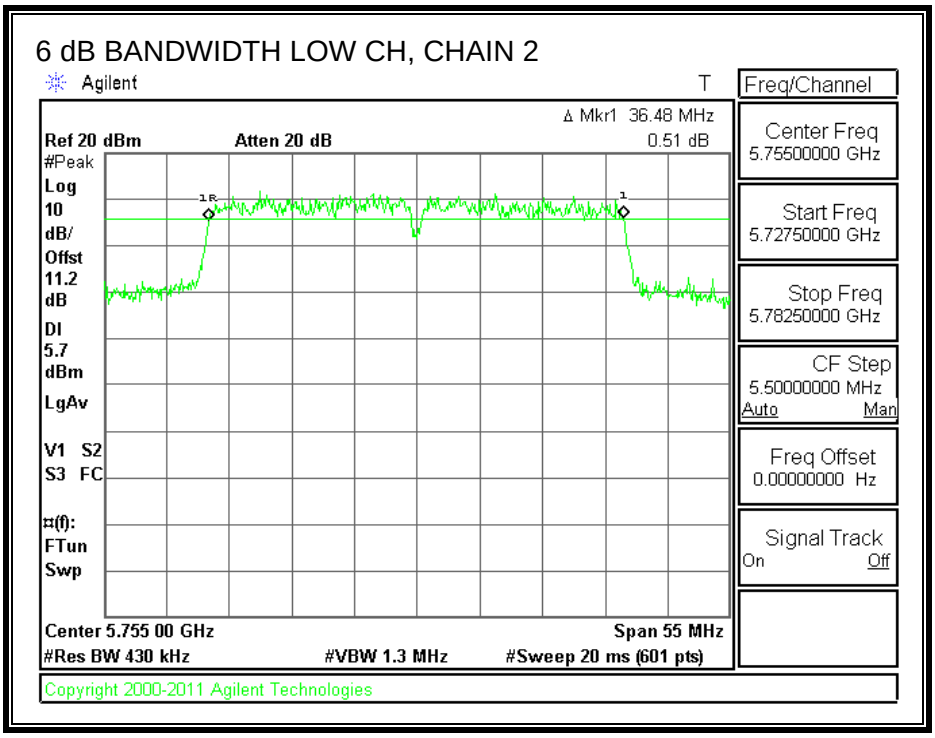
Channel	Frequency (MHz)	Chain 1 6 dB BW (MHz)	Chain 2 6 dB BW (MHz)	Minimum Limit (MHz)
Low	5755	36.39	36.48	0.5
High	5795	36.48	36.30	0.5

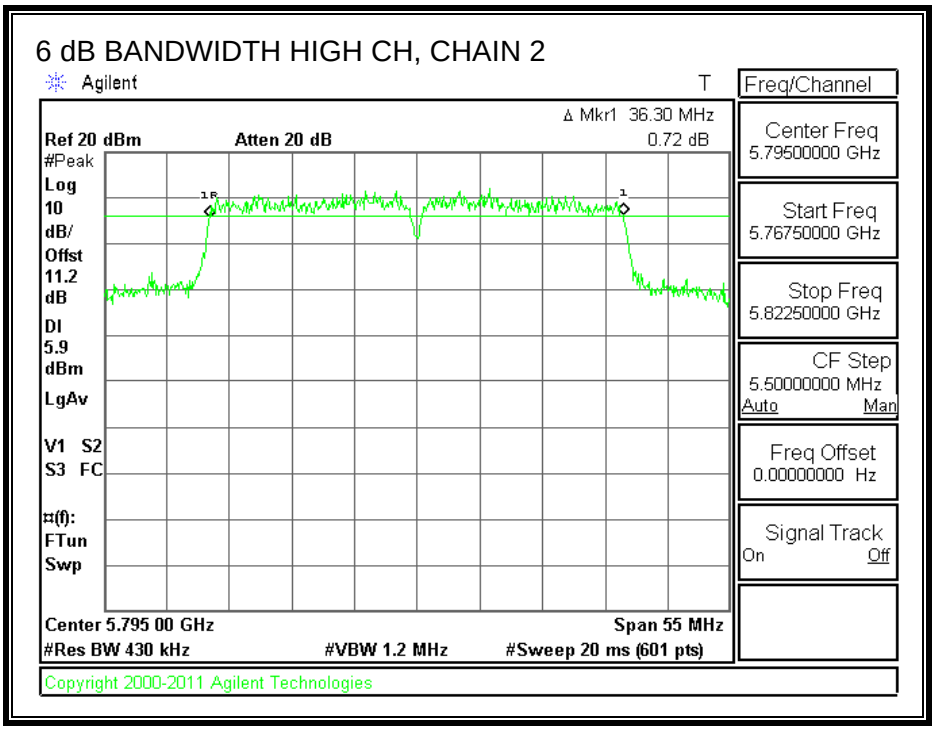
6 dB BANDWIDTH, CHAIN 1





6 dB BANDWIDTH, CHAIN 2





7.9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

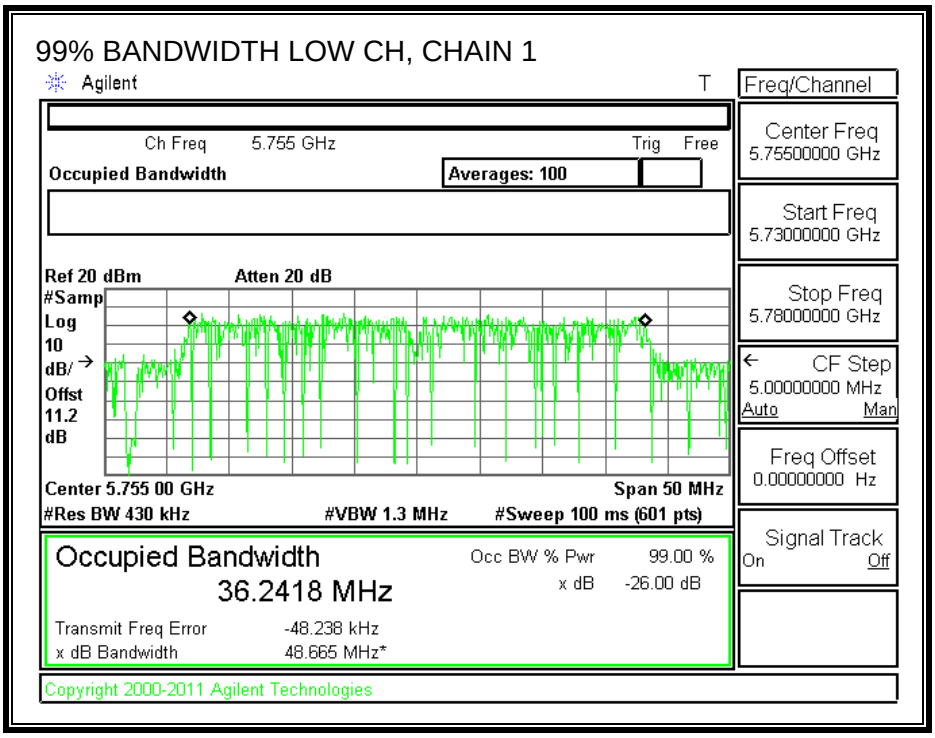
TEST PROCEDURE

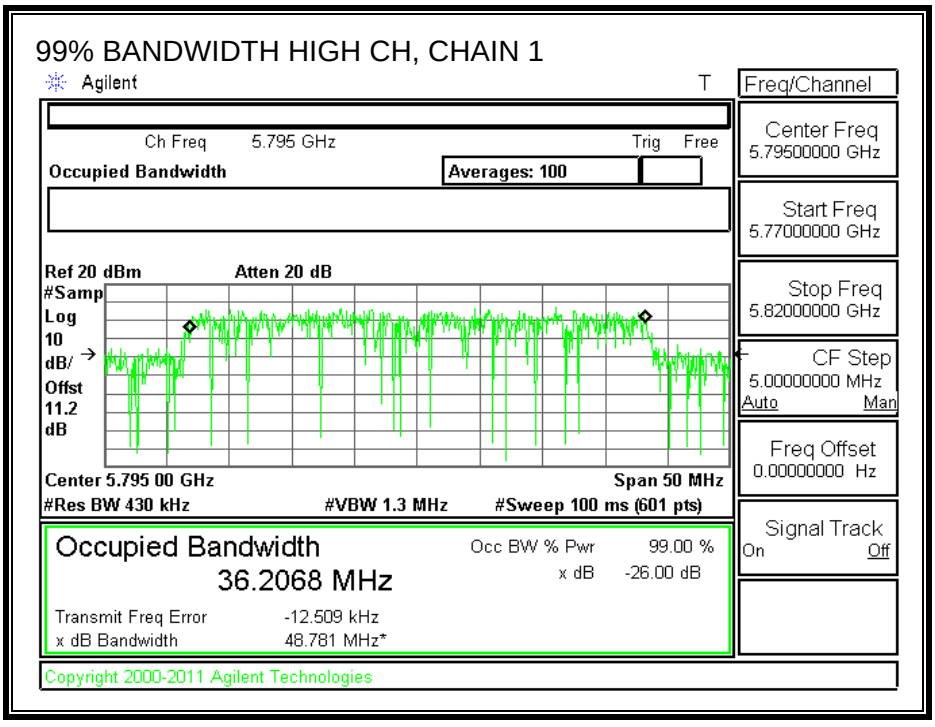
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

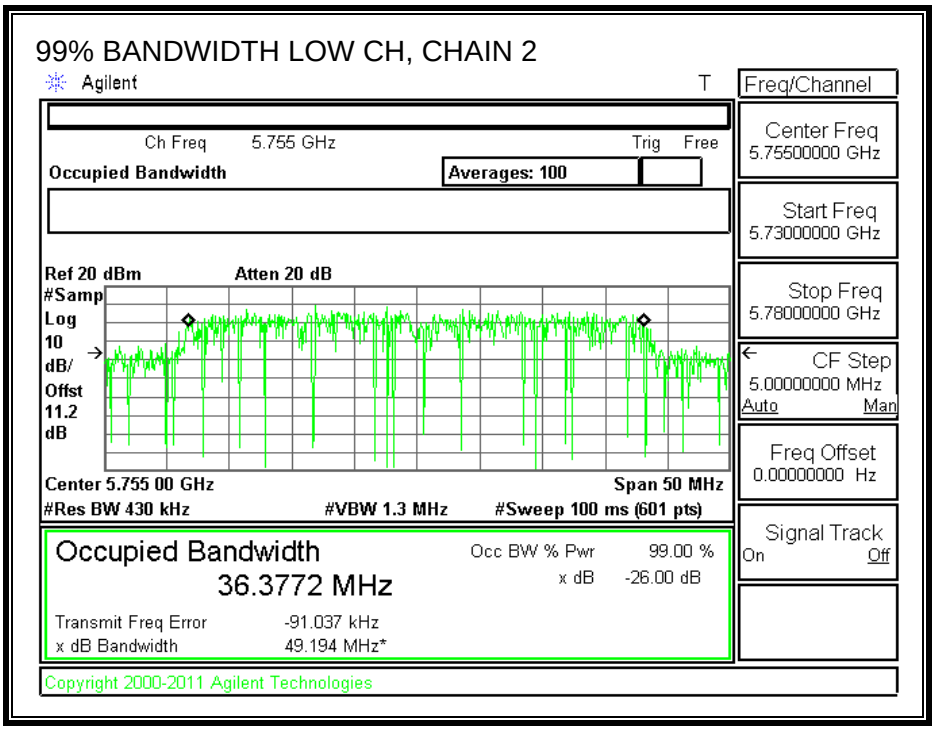
Channel	Frequency (MHz)	Chain 1 99% Bandwidth (MHz)	Chain 2 99% Bandwidth (MHz)
Low	5755	36.2418	36.3772
High	5795	36.2068	36.3387

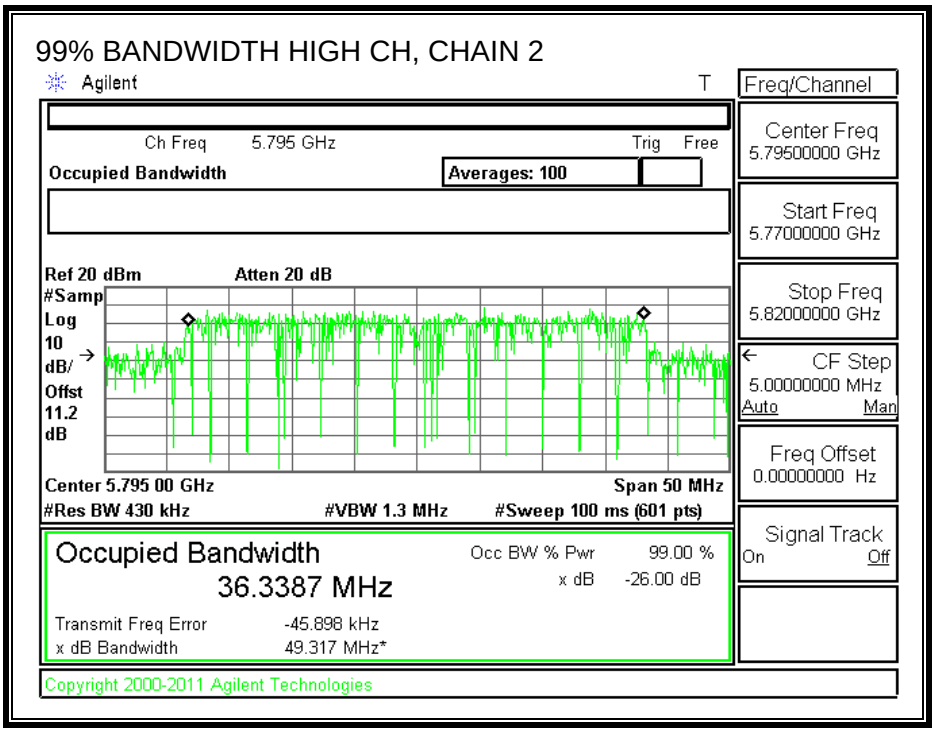
99% BANDWIDTH, CHAIN 1





99% BANDWIDTH, CHAIN 2





7.9.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The TX chains are correlated and the antenna gain is equal among the chains. The directional gain is:

Antenna Gain (dBi)	10 Log (# Tx Chains) (dB)	Effective Legacy Gain (dBi)
5.8	3.01	8.81

The maximum effective composite gain is 8.81 dBi for other than fixed, point-to-point operations, therefore the limit is 27.19 dBm.

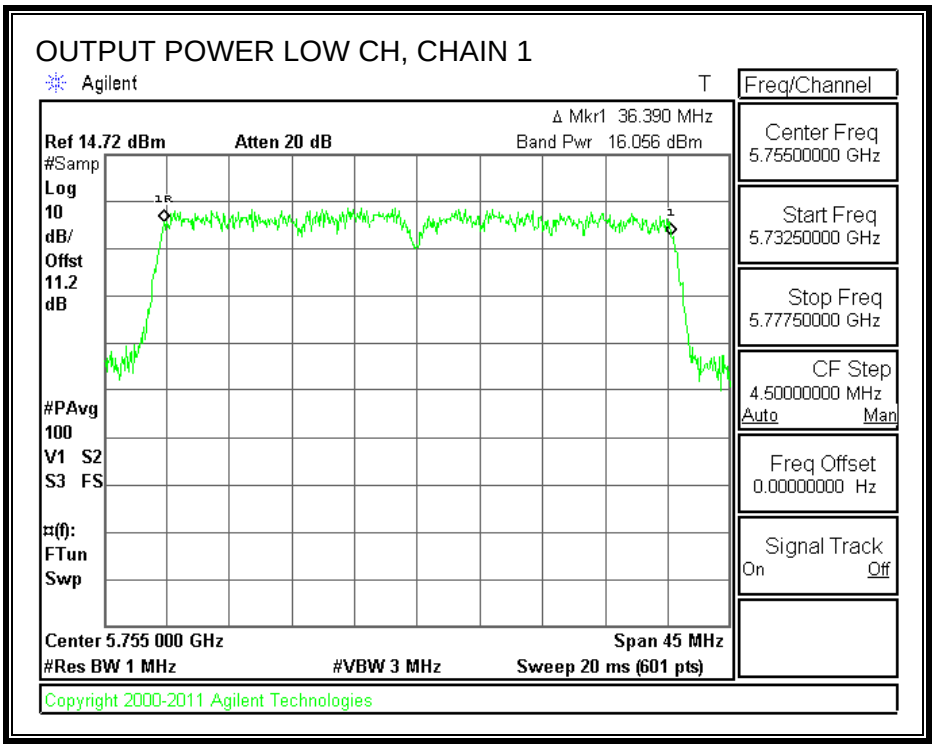
TEST PROCEDURE

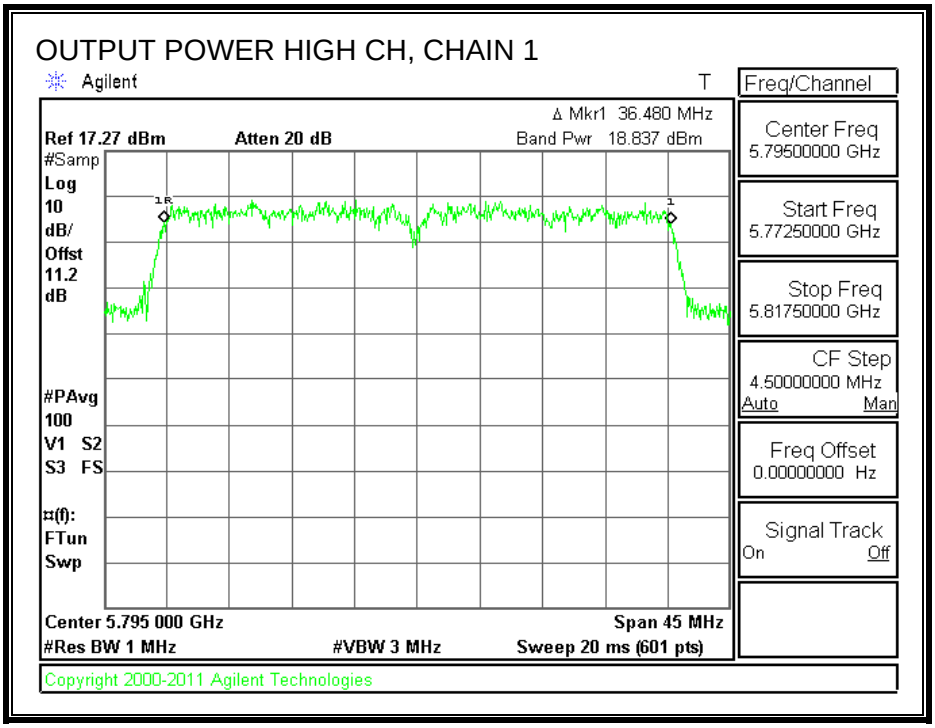
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

RESULTS

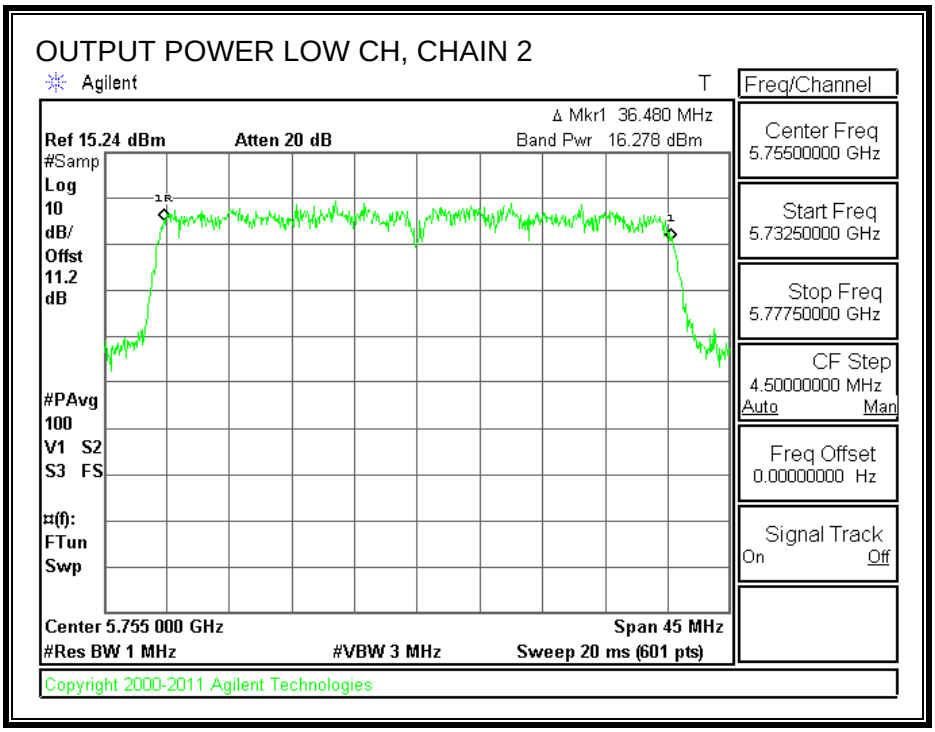
Channel	Frequency (MHz)	Chain 1 PK Power (dBm)	Chain 2 PK Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5755	16.056	16.278	19.179	27.19	-8.011
High	5795	18.837	19.852	22.384	27.19	-4.806

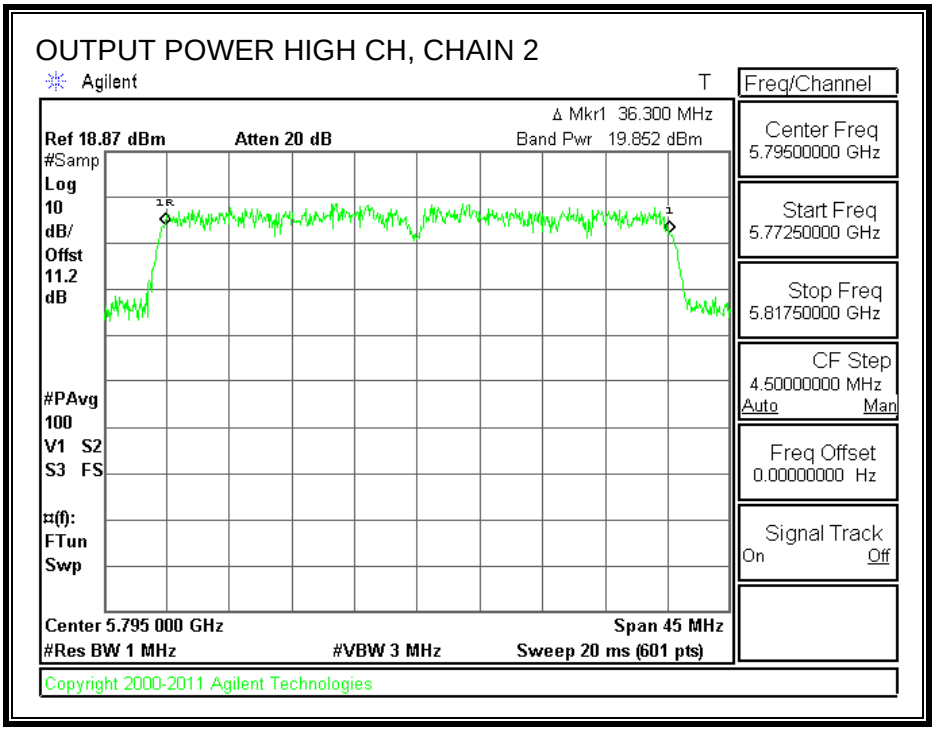
CHAIN 1 OUTPUT POWER





CHAIN 2 OUTPUT POWER





7.9.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

TEST PROCEDURE

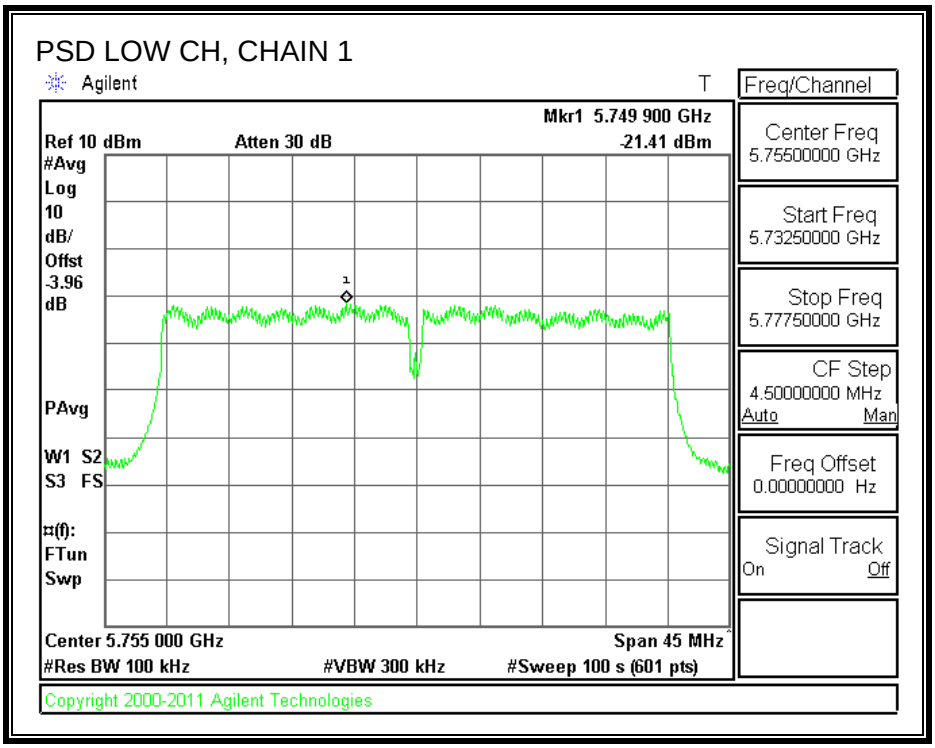
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

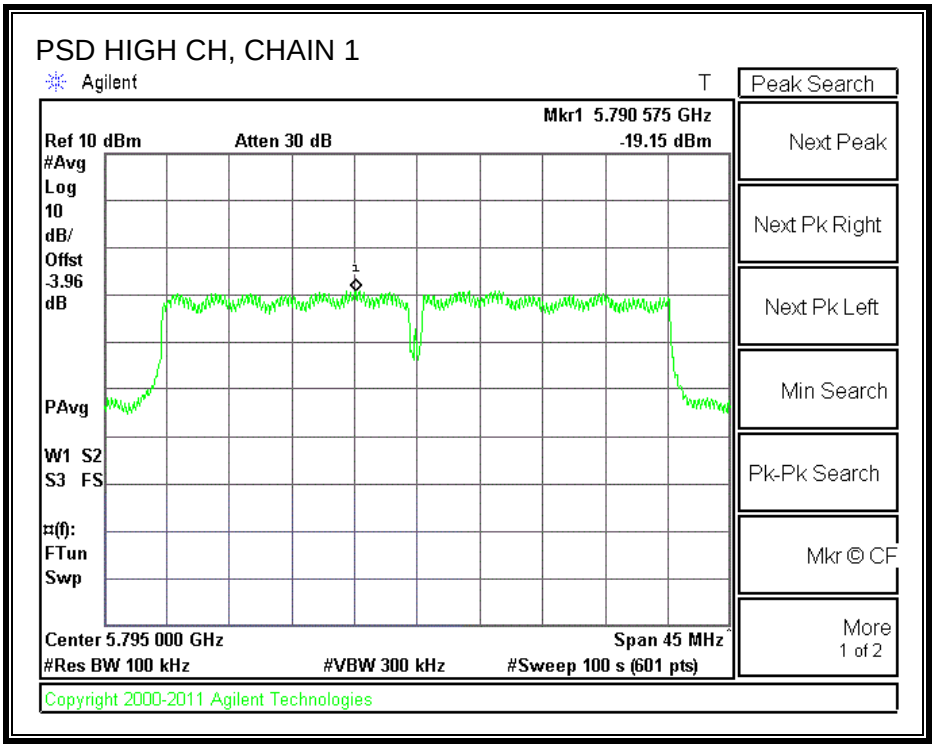
RESULTS:

Channel	Frequency (MHz)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5755	-21.41	-21.03	-18.21	8	-26.21
High	5795	-19.15	-18.03	-15.54	8	-23.54

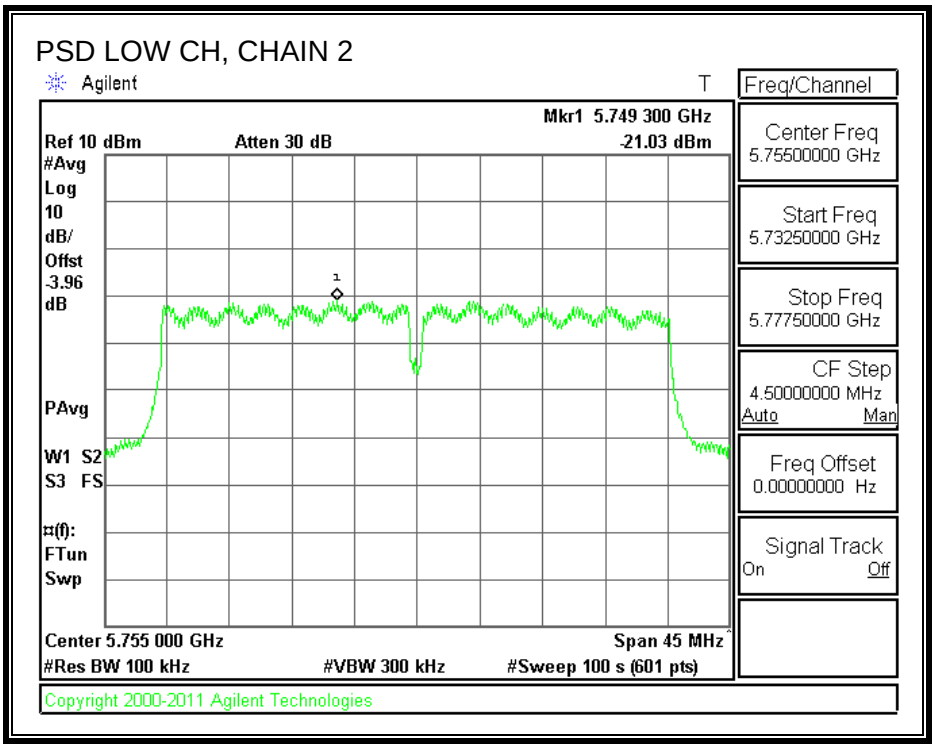
Note: Analyzer offset = cable loss + attenuator + 10 log(3/100)

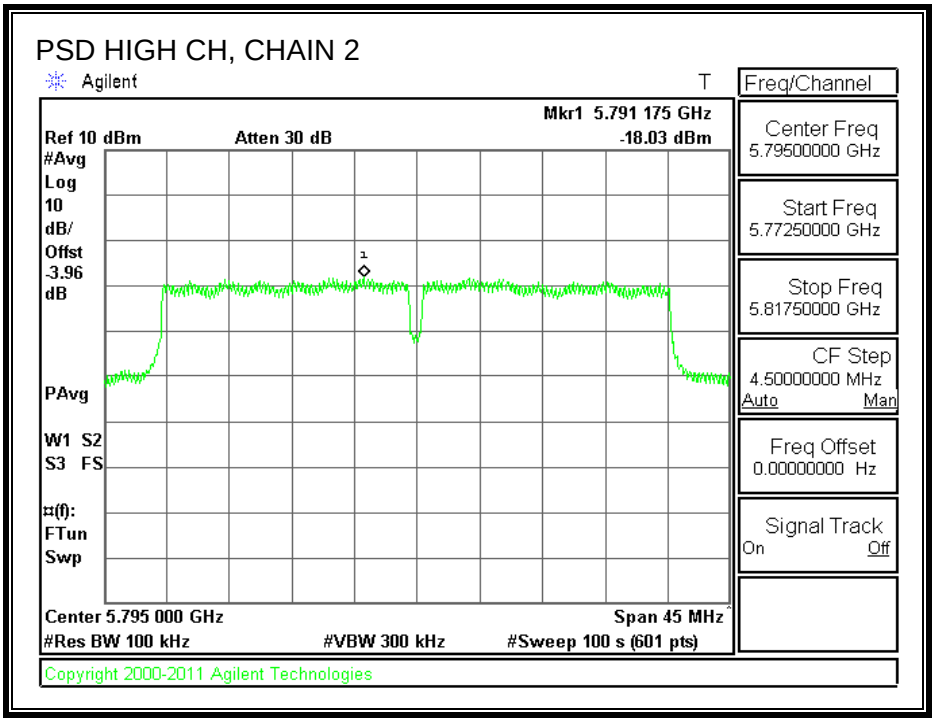
POWER SPECTRAL DENSITY, CHAIN 1





POWER SPECTRAL DENSITY, CHAIN 2





7.9.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

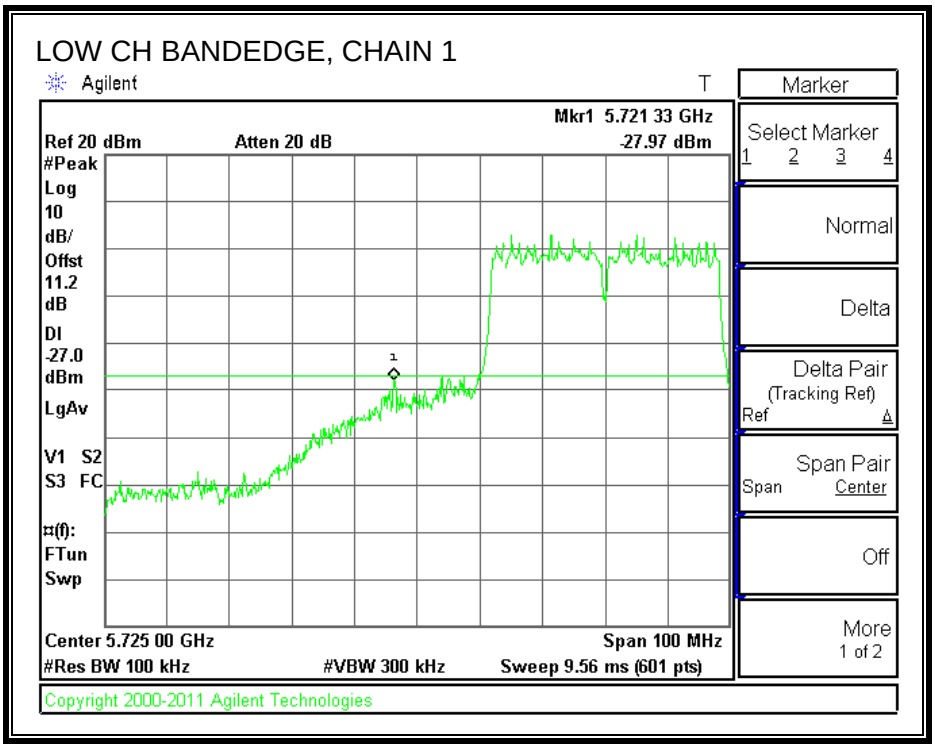
IC RSS-210 A8.5

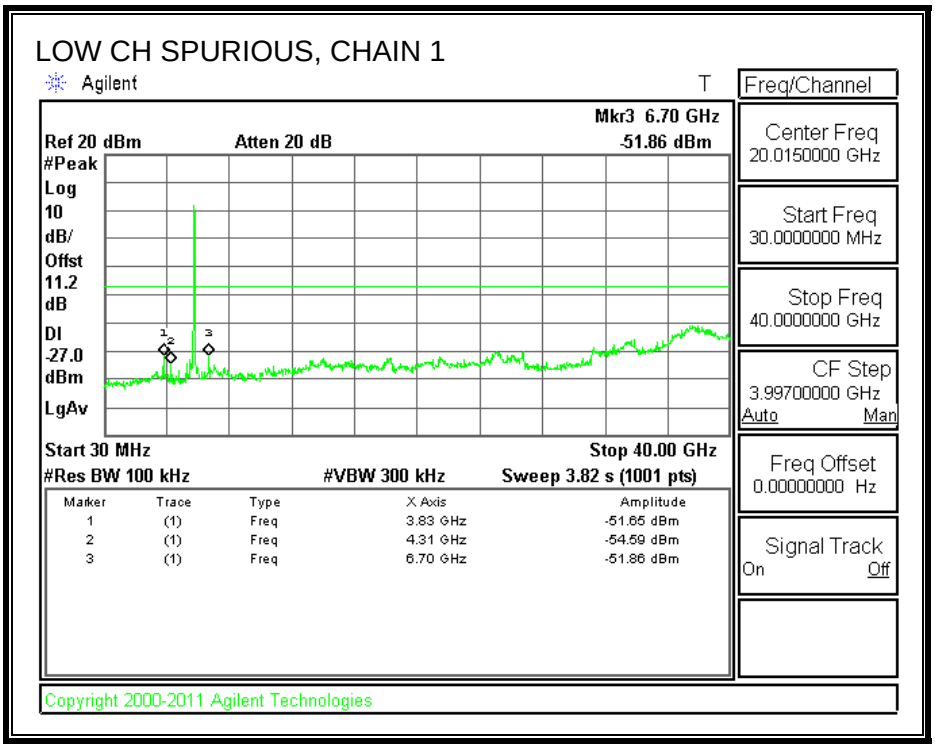
Output power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

TEST PROCEDURE

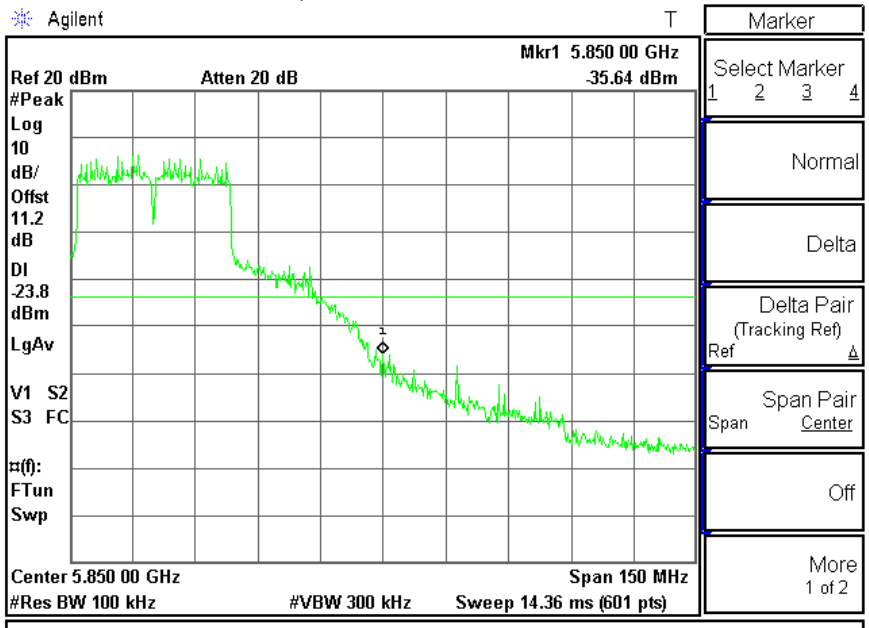
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

CHAIN 1 SPURIOUS EMISSIONS

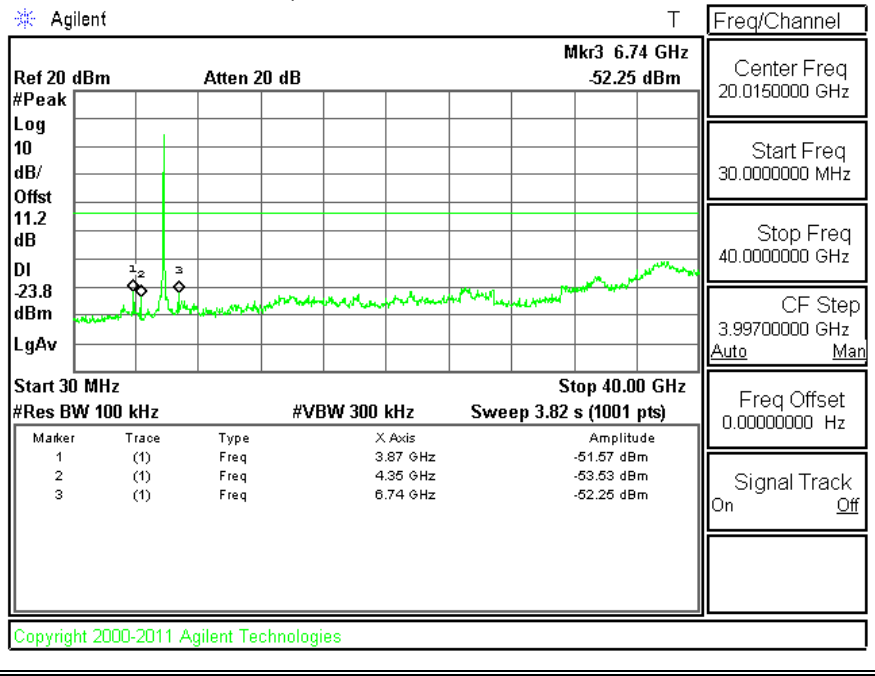




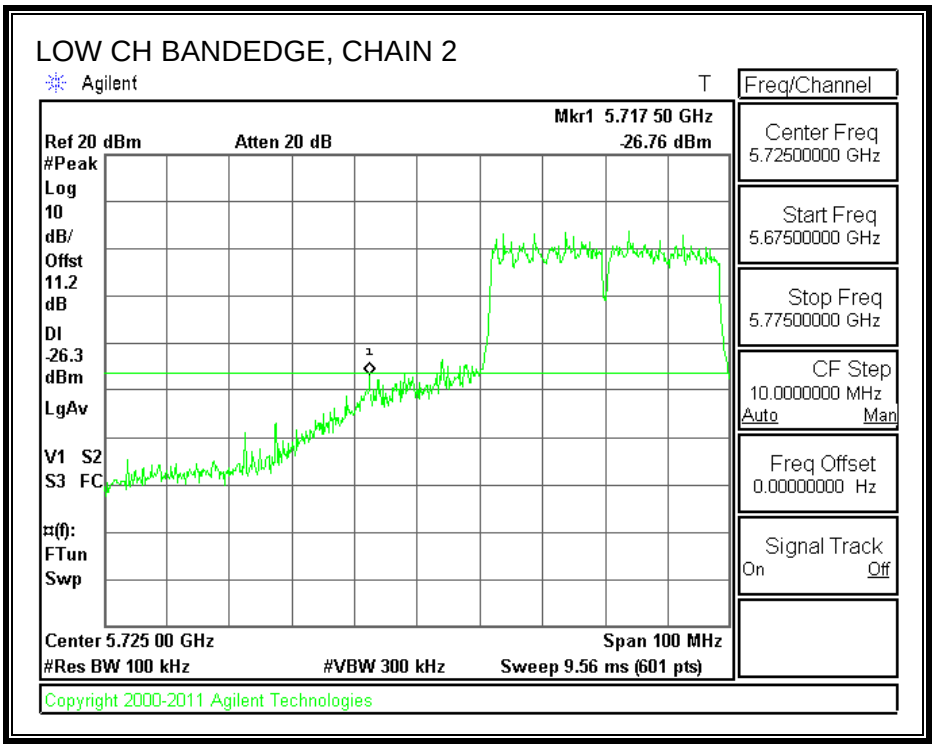
HIGH CH BANDEDGE, CHAIN 1

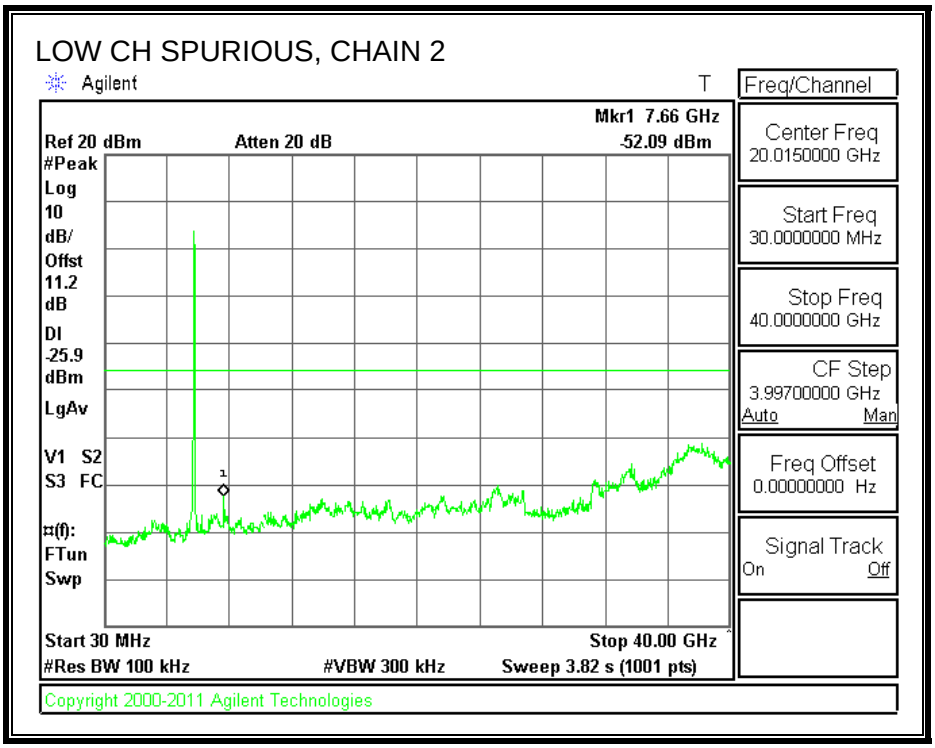


HIGH CH SPURIOUS, CHAIN 1

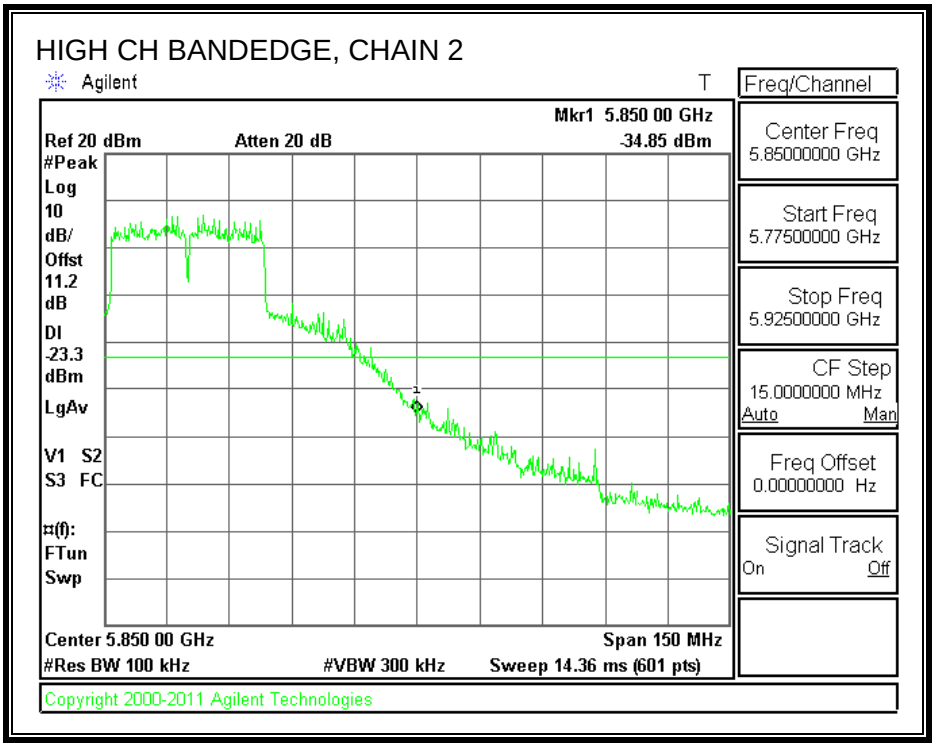


CHAIN 2 SPURIOUS EMISSIONS

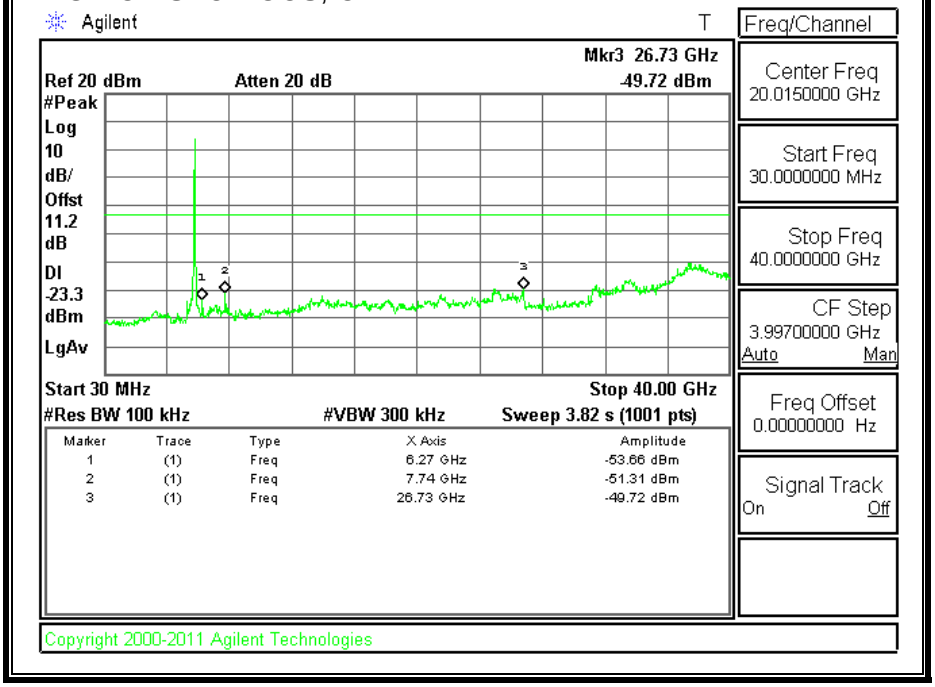




HIGH CH BANDEDGE, CHAIN 2



HIGH CH SPURIOUS, CHAIN 2



7.10. 802.11n HT80 CDD MCS0 MODE IN THE 5.8 GHz BAND

7.10.1. 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.

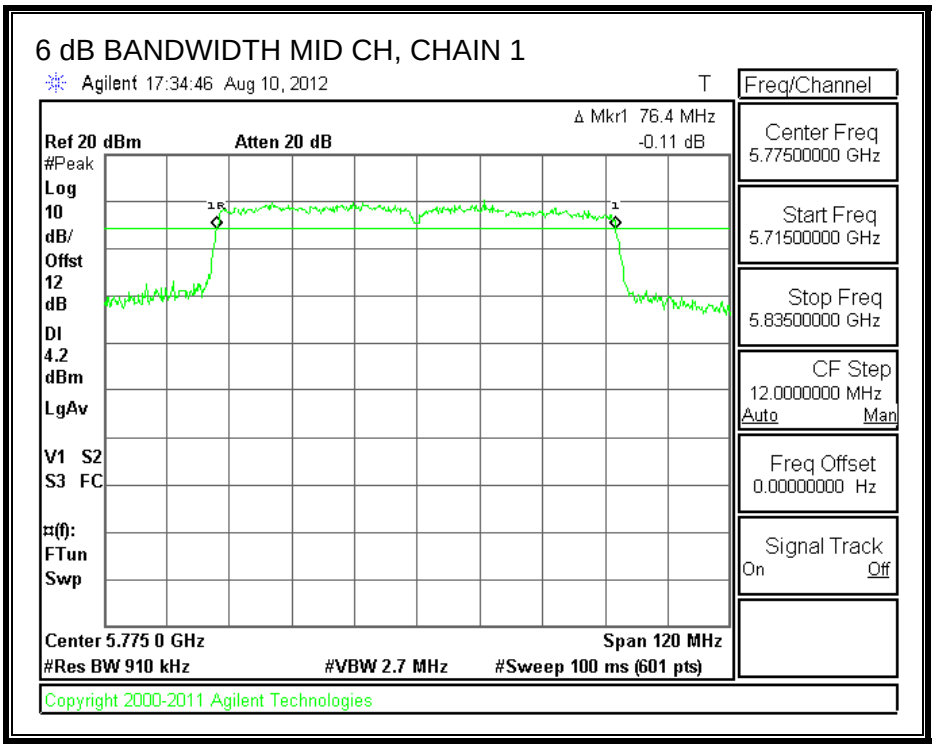
TEST PROCEDURE

KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

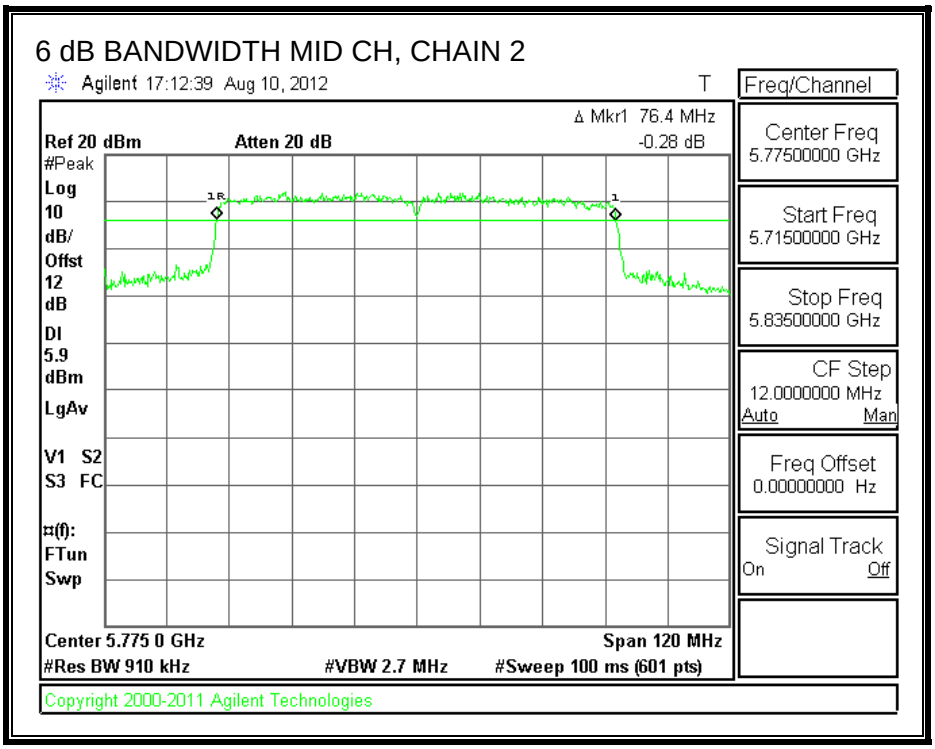
RESULTS

Channel	Frequency (MHz)	Chain 1 6 dB BW (MHz)	Chain 2 6 dB BW (MHz)	Minimum Limit (MHz)
Mid	5775	76.4	76.4	0.5

6 dB BANDWIDTH, CHAIN 1



6 dB BANDWIDTH, CHAIN 2



7.10.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

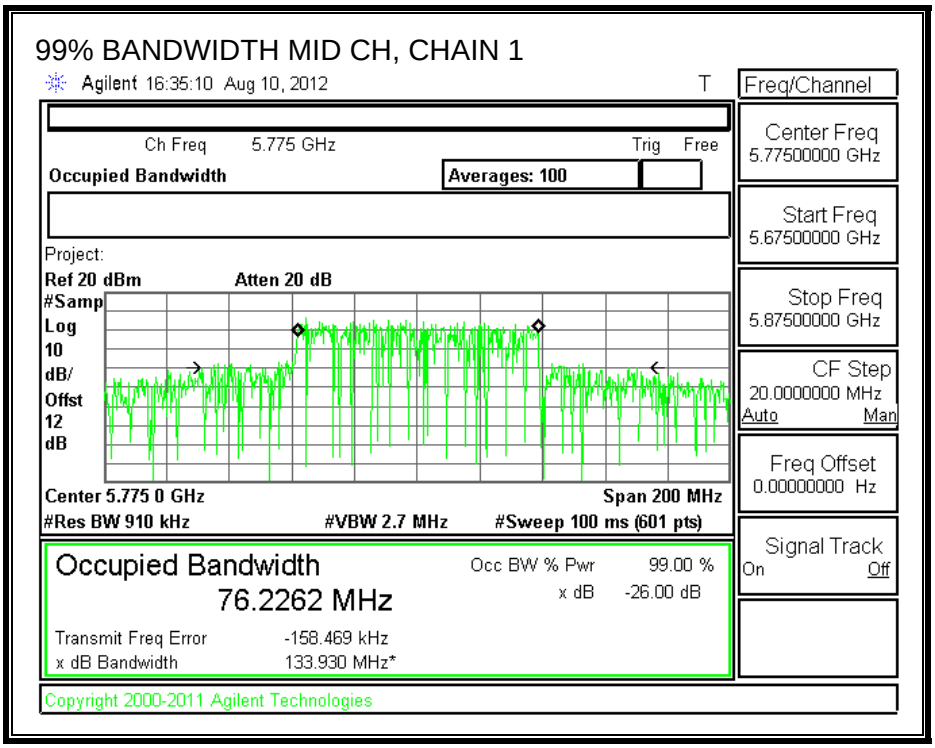
TEST PROCEDURE

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

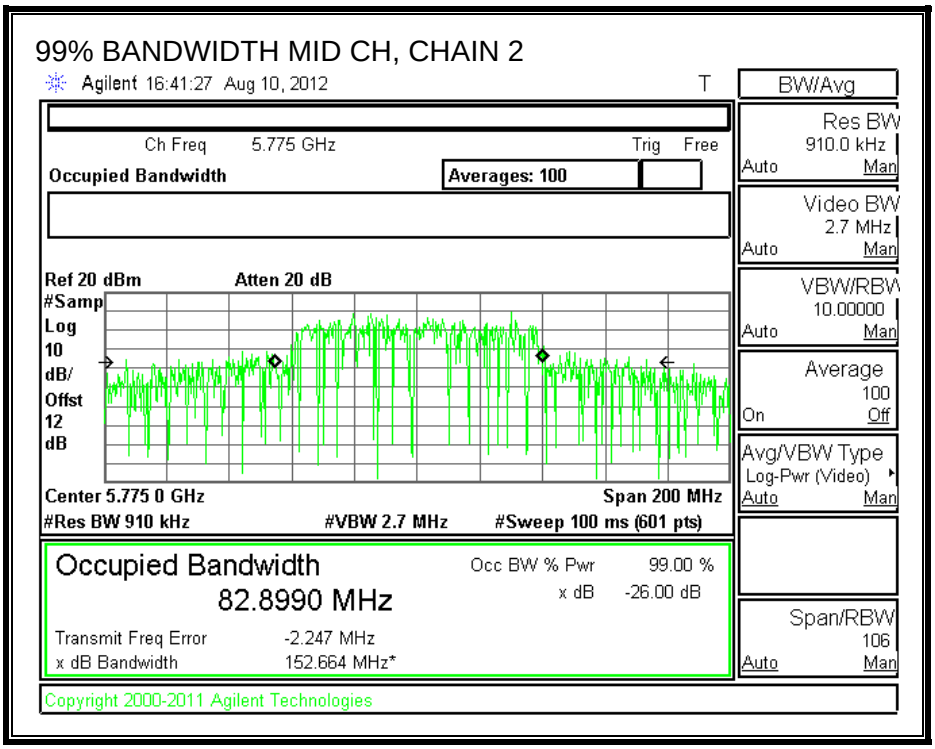
RESULTS

Channel	Frequency (MHz)	Chain 1 99% BW (MHz)	Chain 2 99% BW (MHz)
Mid	5775	76.2262	83.8990

99% BANDWIDTH, CHAIN 1



99% BANDWIDTH, CHAIN 2



7.10.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The TX chains are correlated and the antenna gain is equal among the chains. The directional gain is:

Antenna Gain (dBi)	10 Log (# Tx Chains) (dB)	Effective Legacy Gain (dBi)
5.8	3.01	8.81

The maximum effective composite gain is 8.81 dBi for other than fixed, point-to-point operations, therefore the limit is 27.19 dBm.

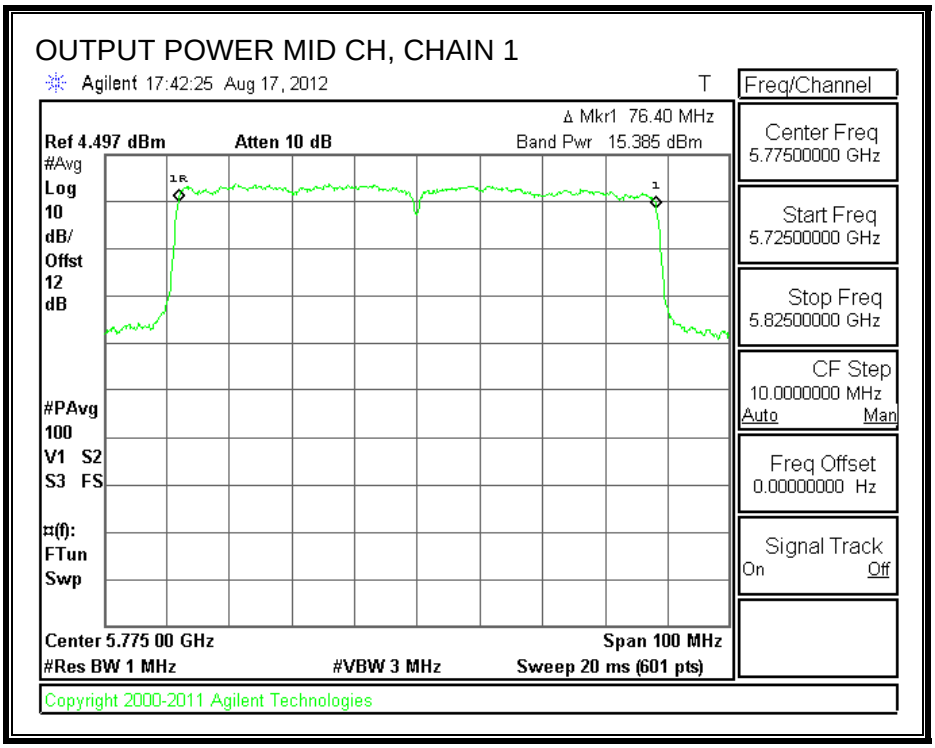
TEST PROCEDURE

KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

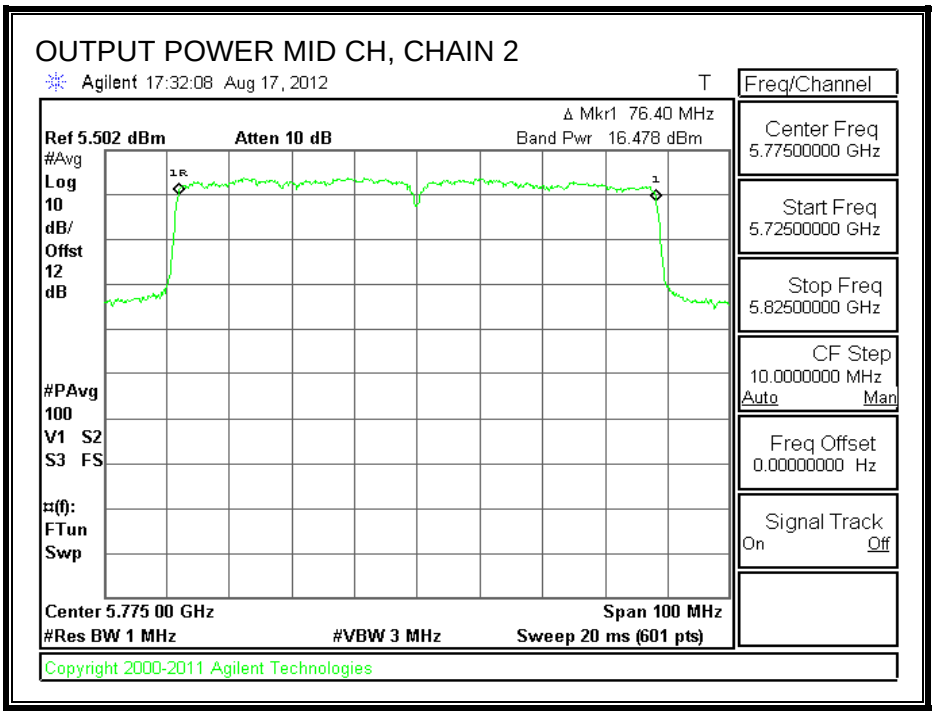
RESULTS

Channel	Frequency (MHz)	Chain 1 PK Power (dBm)	Chain 2 PK Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Mid	5775	15.385	16.478	18.976	27.19	-8.214

CHAIN 1 OUTPUT POWER



CHAIN 2 OUTPUT POWER



7.10.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

TEST PROCEDURE

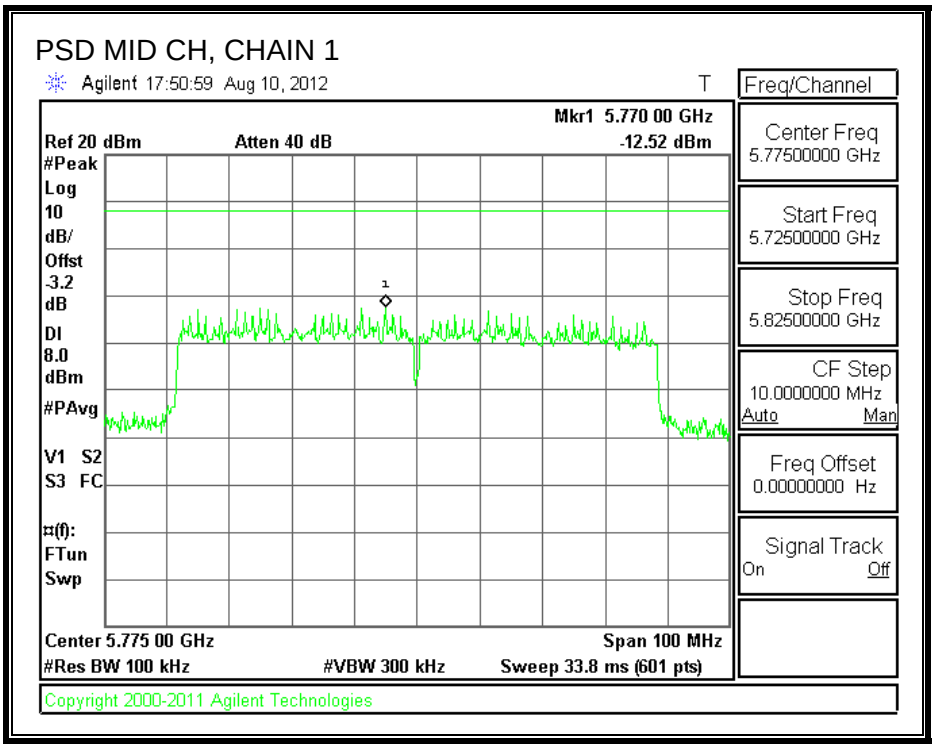
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

RESULTS

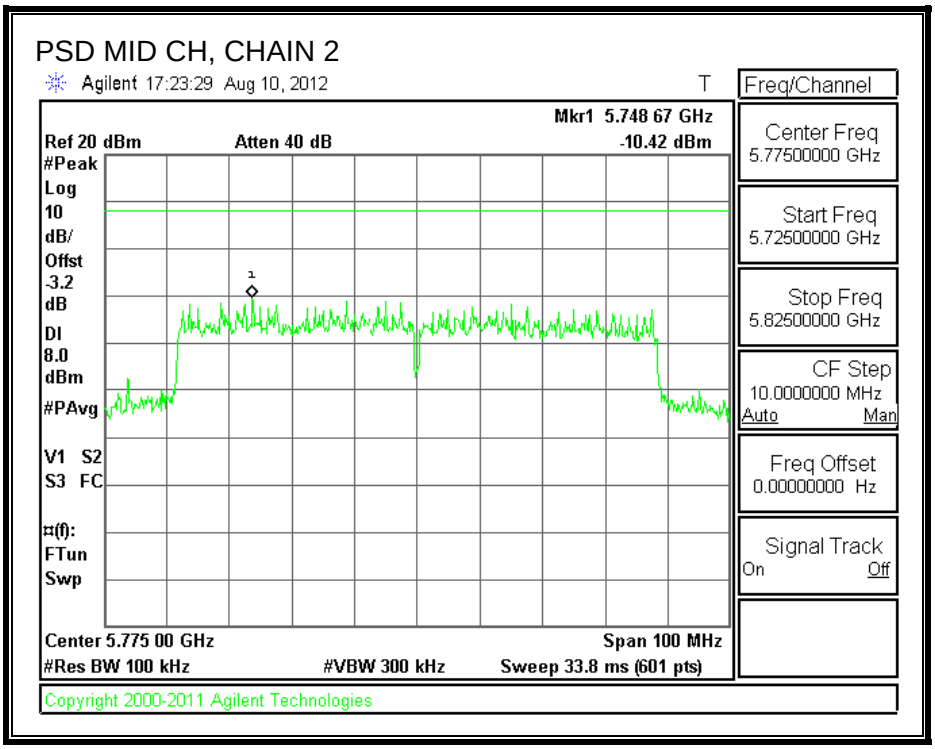
Channel	Frequency (MHz)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Middle	5775	-12.53	-10.42	-8.34	8	-16.34

Note: Analyzer offset = cable loss + attenuator + 10 log(3/100)

POWER SPECTRAL DENSITY, CHAIN 1



POWER SPECTRAL DENSITY, CHAIN 2



7.10.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

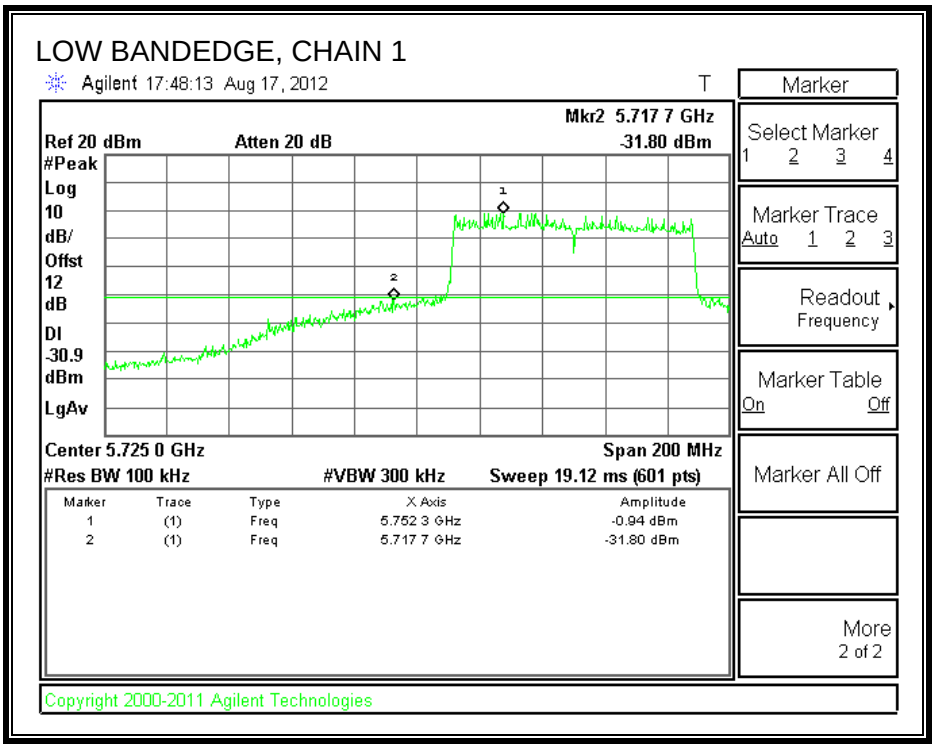
IC RSS-210 A8.5

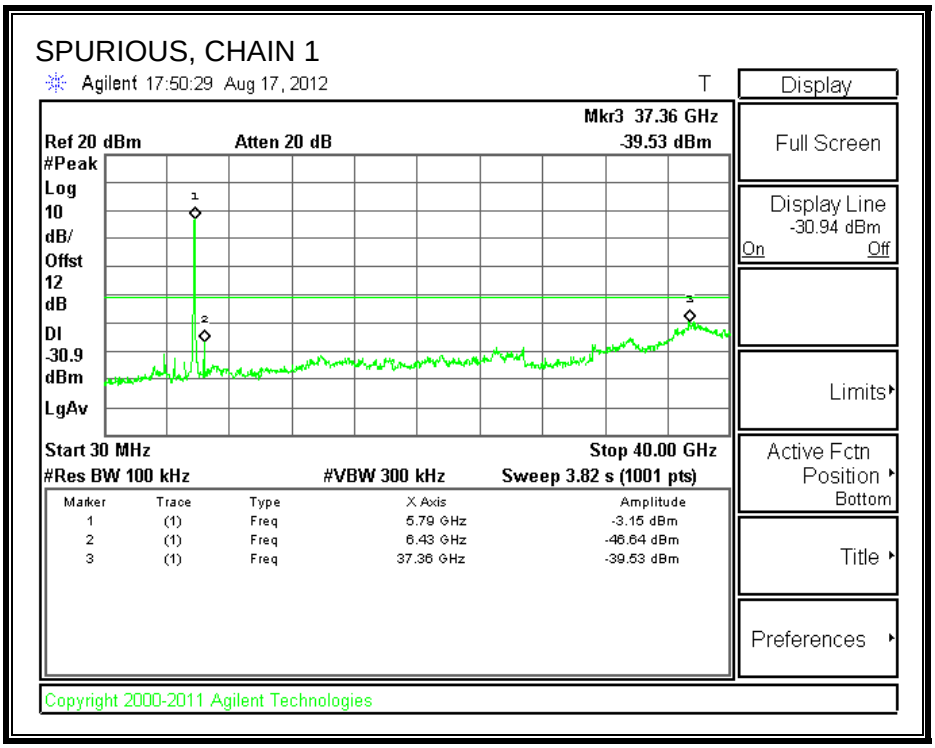
Output power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

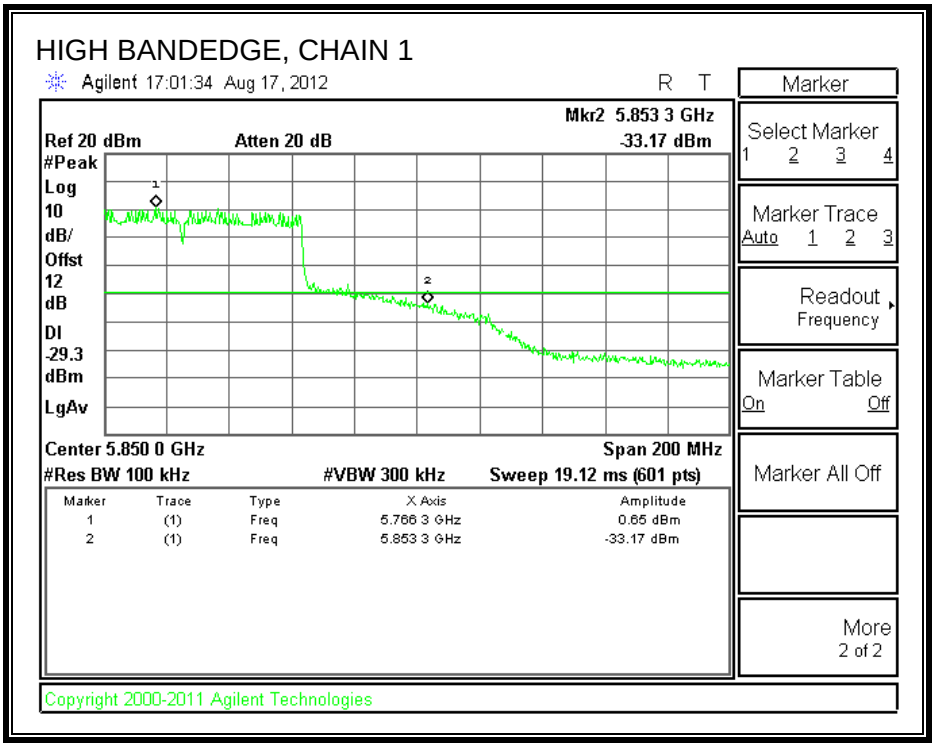
TEST PROCEDURE

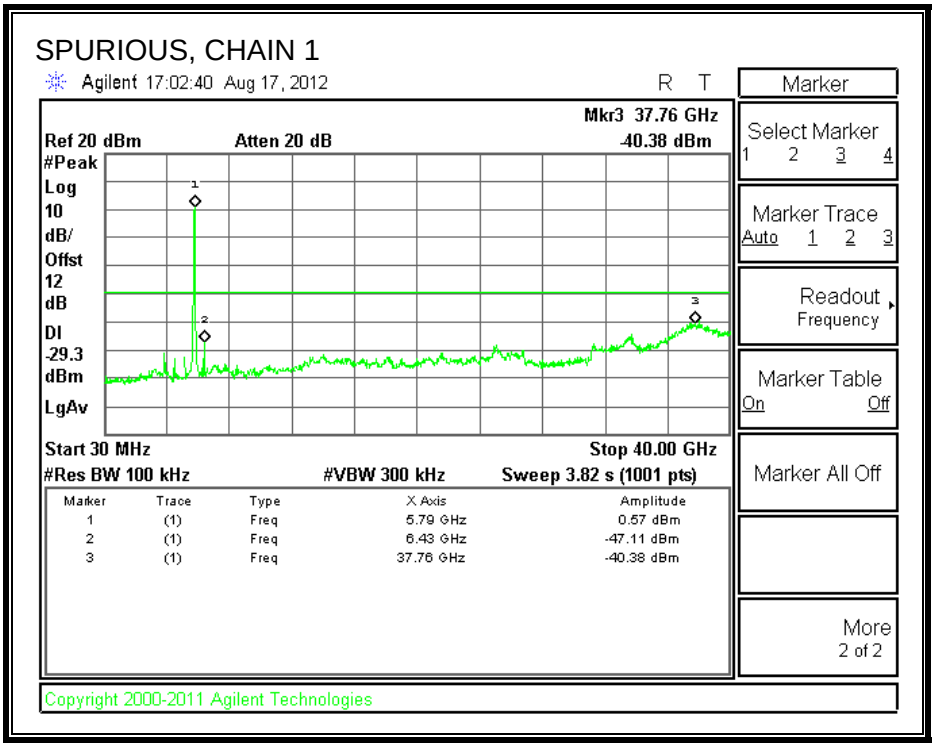
KDB 558074 D01 V01 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”, dated 01/18/2012.

CHAIN 1 SPURIOUS EMISSIONS

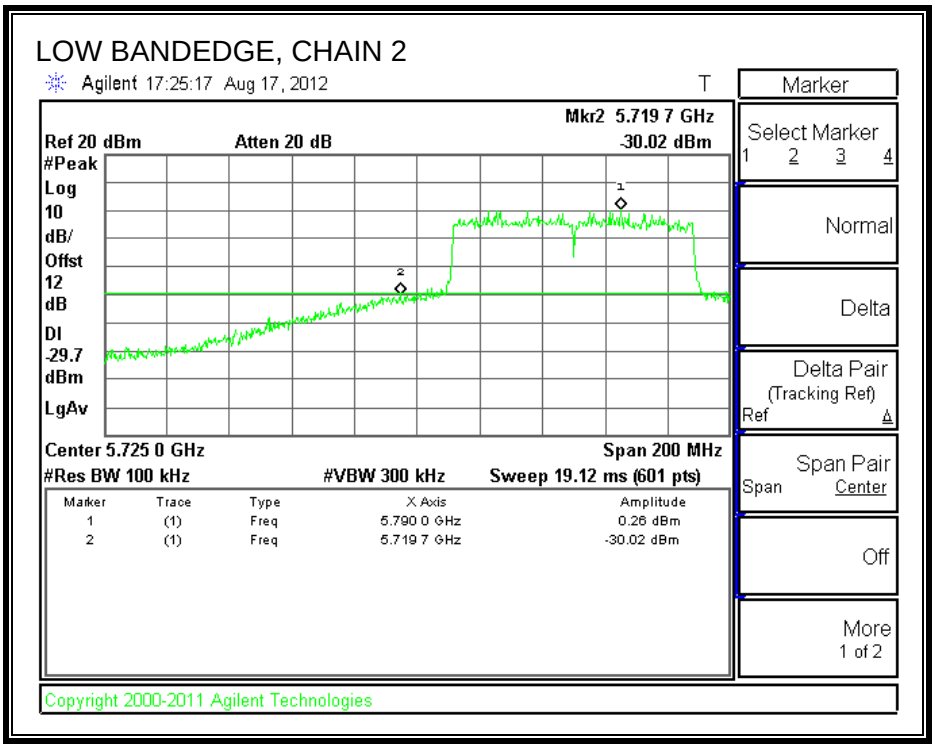


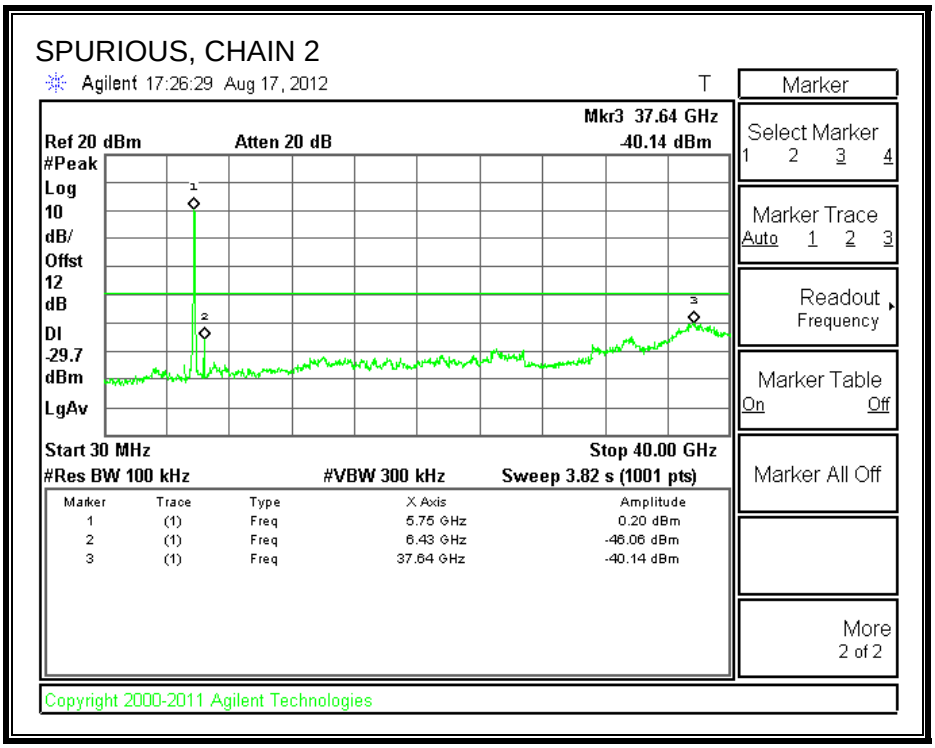




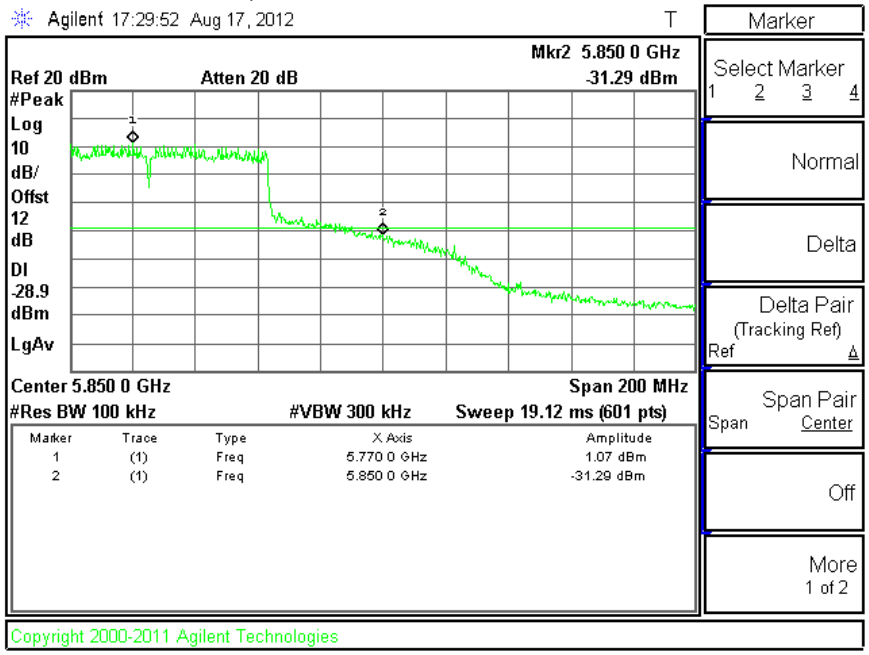


CHAIN 2 SPURIOUS EMISSIONS

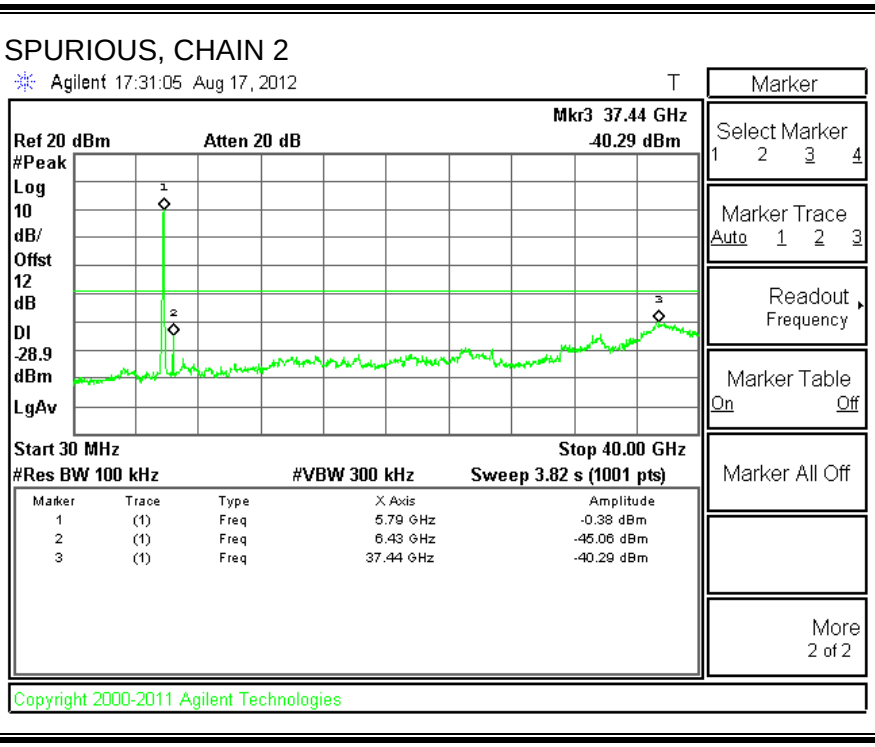




HIGH BANDEDGE, CHAIN 2



SPURIOUS, CHAIN 2



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.

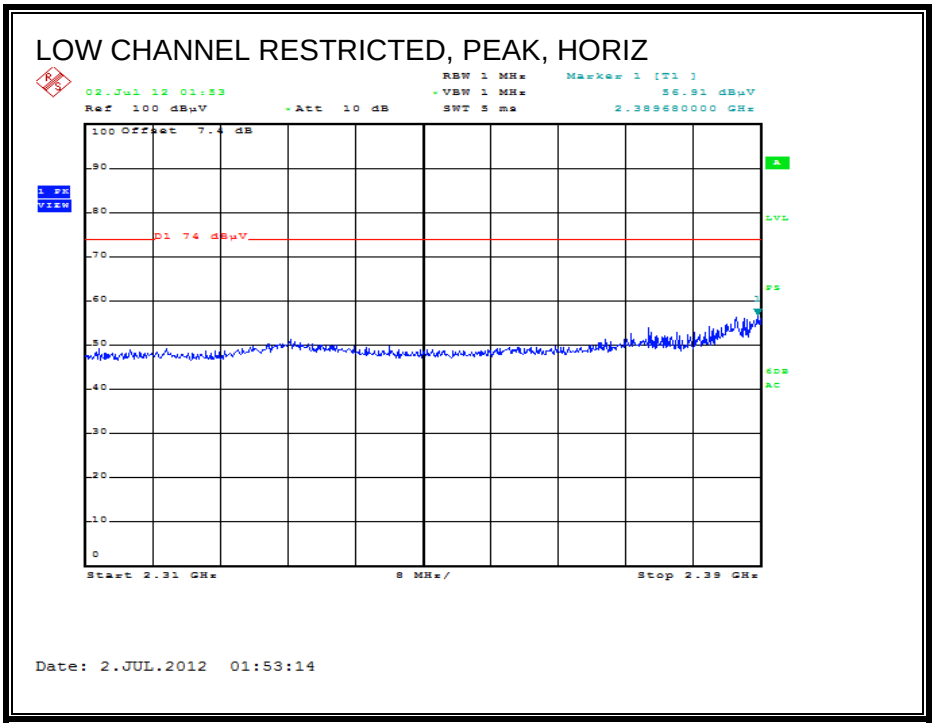
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

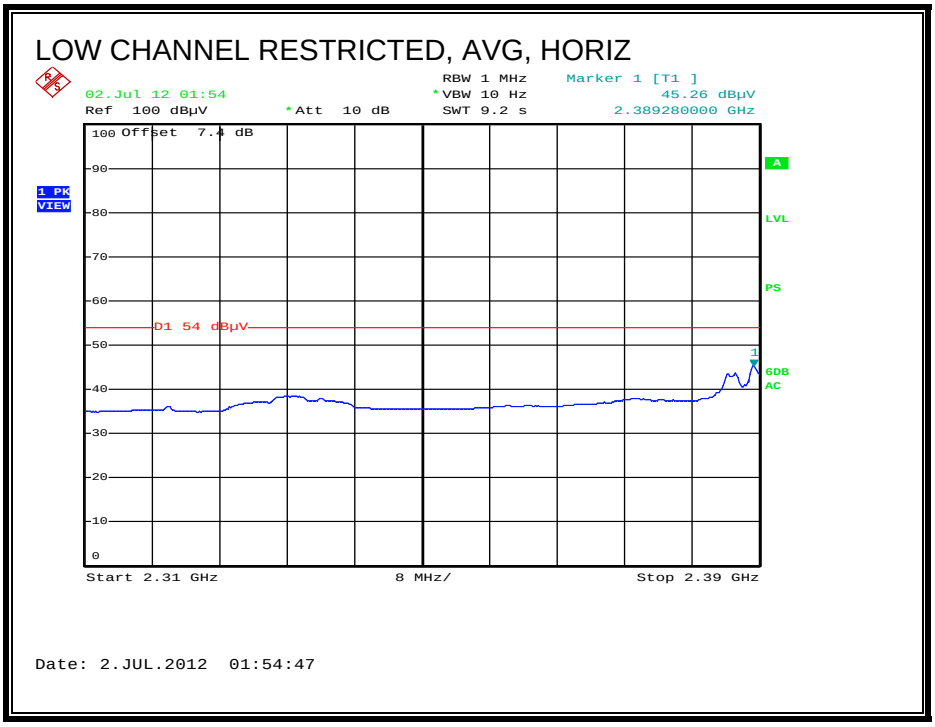
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

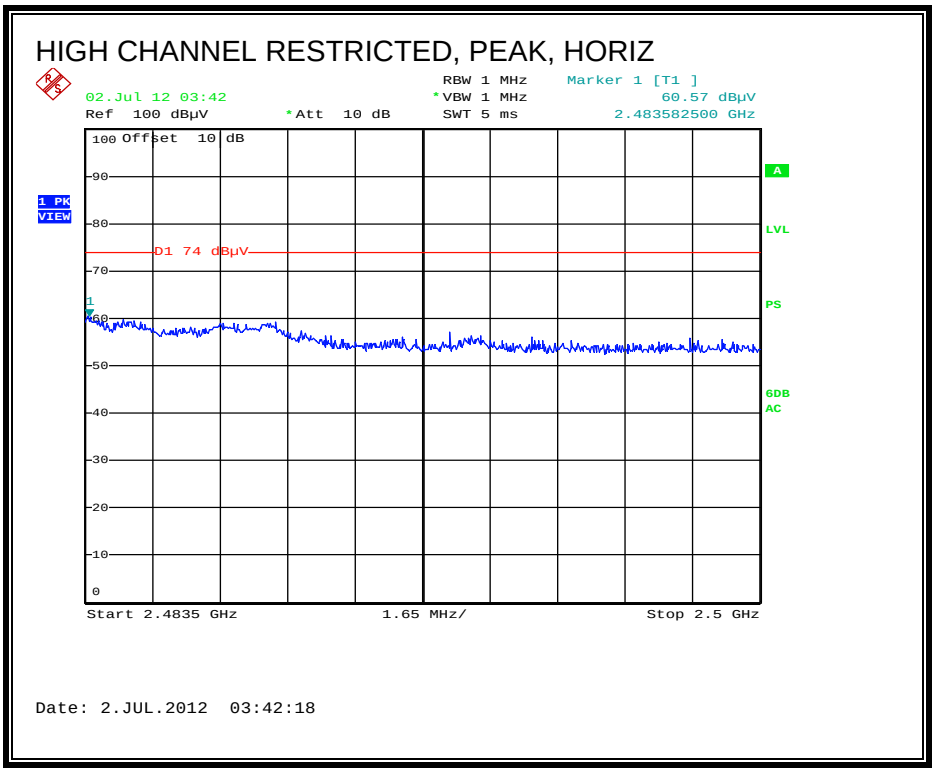
8.2.1. 802.11b CDD 2TX MODE IN THE 2.4 GHz BAND

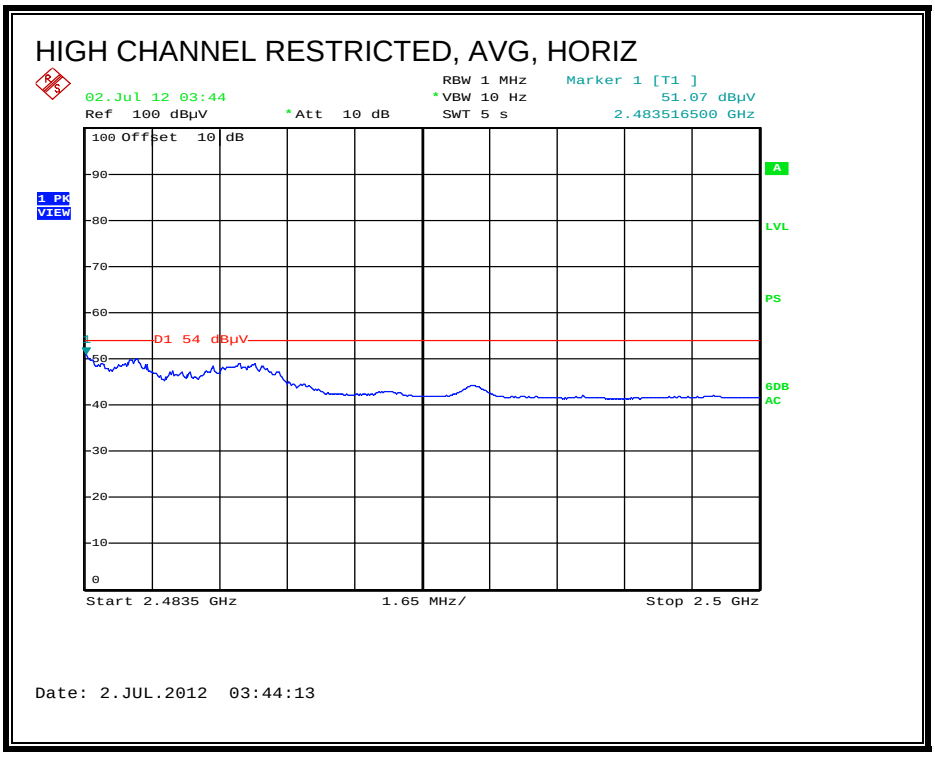
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: Broadcom
Project #: 12U14473
Date: 6/27/2012 and 07/02/2012
Test Engineer: David Garcia/Mengistu Mekuria
Configuration: Laptop, adapter board, antenna
Mode: Tx 11b 2x2 CDD

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26-40GHz	T39; ARA 18-26GHz; S/N:1013	FCC 15.209

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

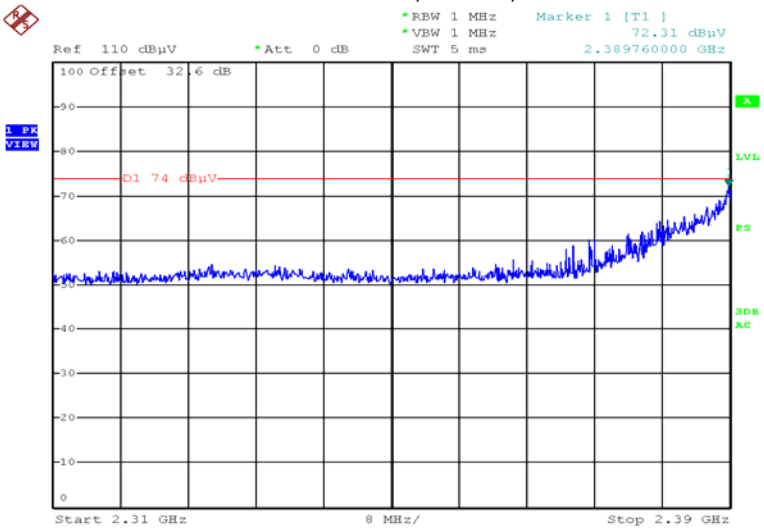
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 2412 MHz															
Spur															
1.353	3.0	55.6	53.3	26.0	3.2	-37.3	0.0	0.0	47.5	45.2	74	54	-26.5	-8.8	H
1.353	3.0	52.0	48.4	26.0	3.2	-37.3	0.0	0.0	43.9	40.4	74	54	-30.1	-13.6	V
2.186	3.0	53.2	48.7	28.3	4.3	-36.0	0.0	0.0	49.7	45.2	74	54	-24.3	-8.8	H
2.186	3.0	49.5	45.5	28.3	4.3	-36.0	0.0	0.0	46.0	41.9	74	54	-28.0	-12.1	V
2.261	3.0	48.9	45.3	28.4	4.3	-35.9	0.0	0.0	45.7	42.1	74	54	-28.3	-11.9	H
2.261	3.0	47.2	42.0	28.4	4.3	-35.9	0.0	0.0	44.0	38.8	74	54	-30.0	-15.2	V
2.713	3.0	48.9	45.2	29.4	4.8	-35.5	0.0	0.0	47.7	44.0	74	54	-26.3	-10.0	H
2.713	3.0	44.3	37.7	29.4	4.8	-35.5	0.0	0.0	43.1	36.4	74	54	-30.9	-17.6	V
Harmonics															
4.824	3.0	44.5	40.0	33.1	6.8	-34.1	0.0	0.0	50.3	45.8	74	54	-23.7	-8.2	V
4.824	3.0	44.0	39.3	33.1	6.8	-34.1	0.0	0.0	49.9	45.1	74	54	-24.1	-8.9	H
Middle Channel: 2437 MHz															
Spur															
1.371	3.0	54.7	51.6	26.1	3.2	-37.3	0.0	0.0	46.7	43.7	74	54	-27.3	-10.3	H
1.371	3.0	48.6	43.1	26.1	3.2	-37.3	0.0	0.0	40.7	35.2	74	54	-33.3	-18.8	V
1.660	3.0	51.4	45.5	27.0	3.6	-36.8	0.0	0.0	45.2	39.2	74	54	-28.8	-14.8	V
2.208	3.0	53.8	48.9	28.3	4.3	-36.0	0.0	0.0	50.3	45.5	74	54	-23.7	-8.5	H
2.208	3.0	51.2	46.8	28.3	4.3	-36.0	0.0	0.0	47.8	43.4	74	54	-26.2	-10.6	V
2.741	3.0	48.9	44.3	29.5	4.9	-35.5	0.0	0.0	47.8	43.3	74	54	-26.2	-10.7	H
2.741	3.0	45.0	37.1	29.5	4.9	-35.5	0.0	0.0	43.9	36.0	74	54	-30.1	-18.0	V
Harmonics															
4.874	3.0	48.6	46.2	33.2	6.8	-34.0	0.0	0.0	54.6	52.1	74	54	-19.4	-1.9	V
7.311	3.0	44.6	33.9	36.3	9.1	-33.1	0.0	0.0	56.9	46.2	74	54	-17.1	-7.8	V
4.874	3.0	47.6	44.7	33.2	6.8	-34.0	0.0	0.0	53.5	50.6	74	54	-20.5	-3.4	H
7.311	3.0	42.9	31.3	36.3	9.1	-33.1	0.0	0.0	55.2	43.5	74	54	-18.8	-10.5	H
High Channel: 2462 MHz															
Spur															
1.385	3.0	51.5	48.3	26.1	3.3	-37.2	0.0	0.0	43.7	40.5	74	54	-30.3	-13.5	H
1.385	3.0	49.3	44.3	26.1	3.3	-37.2	0.0	0.0	41.4	36.5	74	54	-32.6	-17.5	V
2.230	3.0	52.4	48.1	28.3	4.3	-36.0	0.0	0.0	49.1	44.8	74	54	-24.9	-9.2	H
2.230	3.0	50.4	45.7	28.3	4.3	-36.0	0.0	0.0	47.1	42.3	74	54	-26.9	-11.7	V
2.769	3.0	50.2	47.1	29.6	4.9	-35.5	0.0	0.0	49.3	46.2	74	54	-24.7	-7.8	H
2.769	3.0	45.8	40.1	29.6	4.9	-35.5	0.0	0.0	44.8	39.2	74	54	-29.2	-14.8	V
Harmonics															
4.924	3.0	47.1	43.6	33.2	6.8	-34.0	0.0	0.0	53.1	49.7	74	54	-20.9	-4.3	V
7.386	3.0	42.4	31.9	36.4	9.1	-33.1	0.0	0.0	54.8	44.3	74	54	-19.2	-9.7	V
4.924	3.0	46.3	43.2	33.2	6.8	-34.0	0.0	0.0	52.3	49.2	74	54	-21.7	-4.8	H
7.386	3.0	39.6	29.7	36.4	9.1	-33.1	0.0	0.0	52.1	42.1	74	54	-21.9	-11.9	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

8.2.2. 802.11g 1TX MODE IN THE 2.4 GHz BAND

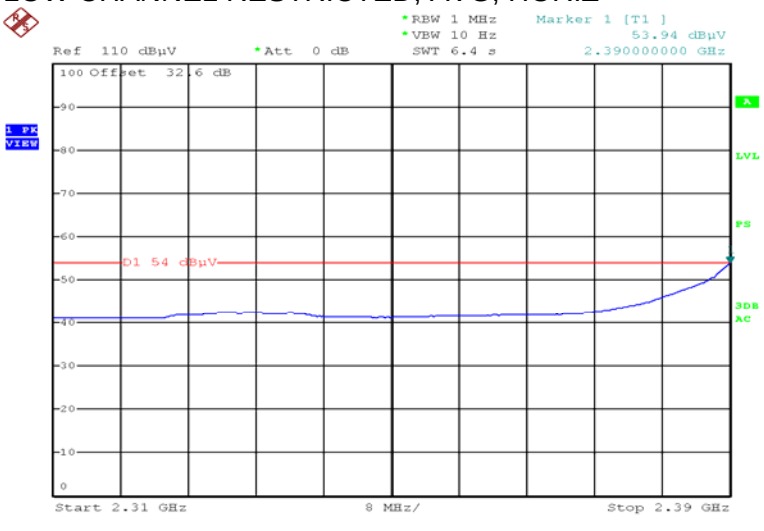
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK, HORIZ



Date: 26.JUL.2012 17:09:19

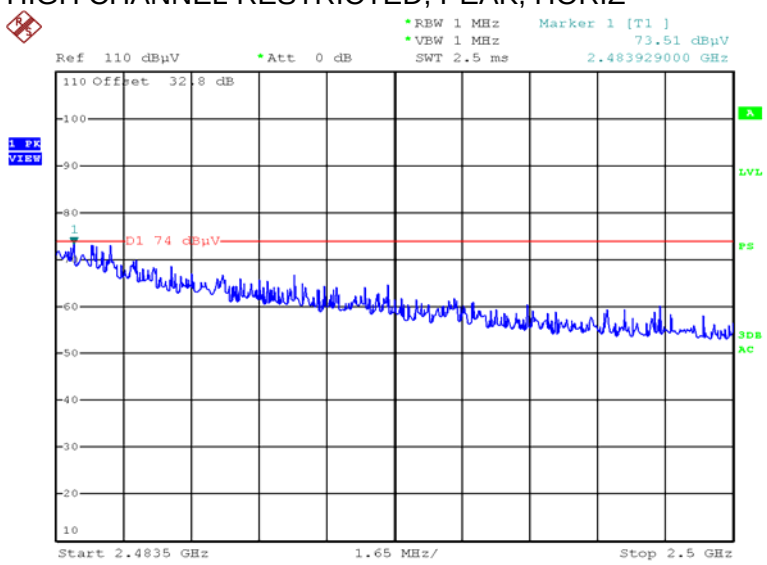
LOW CHANNEL RESTRICTED, AVG, HORIZ



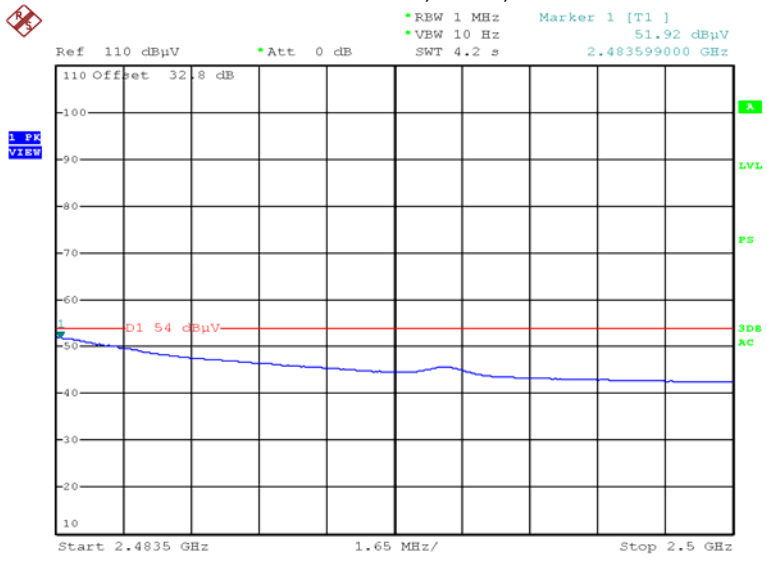
Date: 26.JUL.2012 17:07:45

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

HIGH CHANNEL RESTRICTED, PEAK, HORIZ



HIGH CHANNEL RESTRICTED, AVG, HORIZ



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 07/25/12
Project #: 12U14473
Company: Broadcom
Test Target: FCC 14.247
Mode Oper: Tx 11g Mode, High Channel 2462MHz

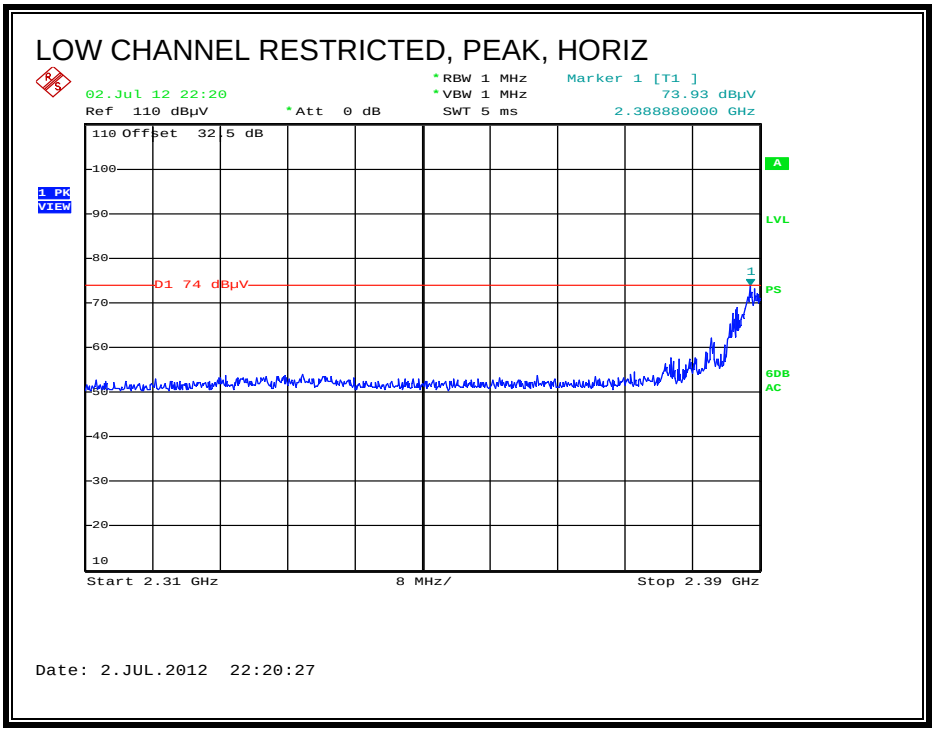
f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

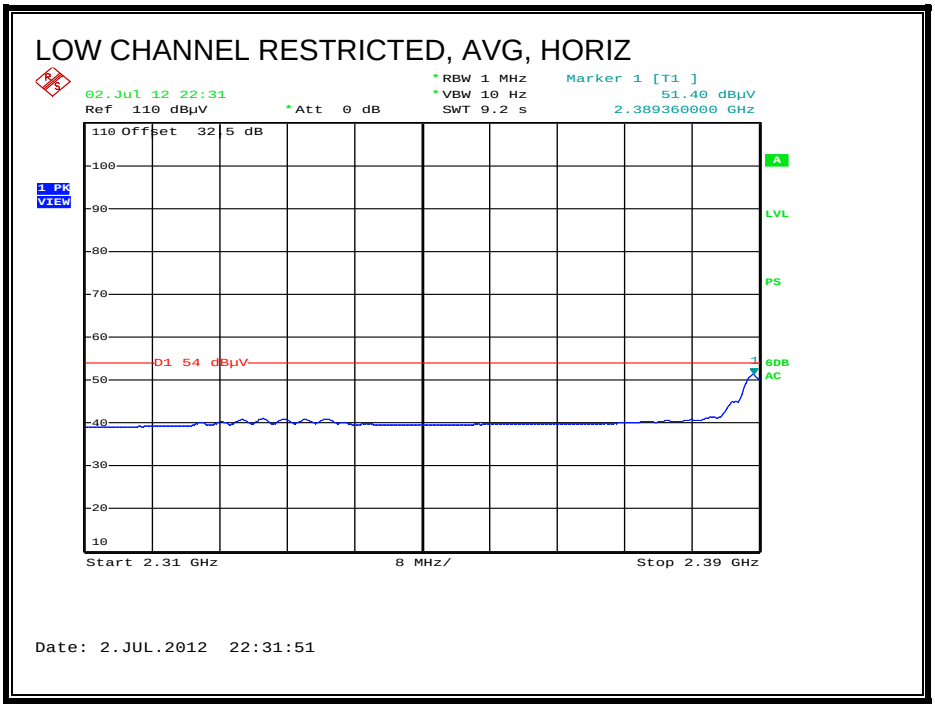
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low and Mid channel are covered by HT2x2 CDD													
HIGH CHANNEL (11), 2462MHz													
Harmonic													
4.924	3.0	44.6	33.2	6.8	-34.0	0.0	0.0	50.7	74.0	-23.3	V	P	
4.924	3.0	27.6	33.2	6.8	-34.0	0.0	0.0	33.6	54.0	-20.4	V	A	
7.386	3.0	37.8	36.4	9.1	-33.1	0.0	0.0	50.2	74.0	-23.8	V	P	
7.386	3.0	24.6	36.4	9.1	-33.1	0.0	0.0	37.0	54.0	-17.0	V	A	
12.310	3.0	33.6	39.4	12.0	-32.5	0.0	0.0	52.5	74.0	-21.5	V	P	
12.310	3.0	21.0	39.4	12.0	-32.5	0.0	0.0	39.9	54.0	-14.1	V	A	
4.924	3.0	45.6	33.2	6.8	-34.0	0.0	0.0	51.7	74.0	-22.3	H	P	
4.924	3.0	27.2	33.2	6.8	-34.0	0.0	0.0	33.2	54.0	-20.8	H	A	
7.386	3.0	39.1	36.4	9.1	-33.1	0.0	0.0	51.5	74.0	-22.5	H	P	
7.386	3.0	25.4	36.4	9.1	-33.1	0.0	0.0	37.8	54.0	-16.2	H	A	
12.310	3.0	32.8	39.4	12.0	-32.5	0.0	0.0	51.8	74.0	-22.2	H	P	
12.310	3.0	20.9	39.4	12.0	-32.5	0.0	0.0	39.8	54.0	-14.2	H	A	
Spur													
2.128	3.0	53.4	28.3	4.3	-36.0	0.0	0.0	50.0	74.0	-24.0	V	P	
2.128	3.0	42.8	28.3	4.3	-36.0	0.0	0.0	39.5	54.0	-14.5	V	A	
2.128	3.0	49.8	28.3	4.3	-36.0	0.0	0.0	46.5	74.0	-27.5	H	P	
2.128	3.0	39.3	28.3	4.3	-36.0	0.0	0.0	36.0	54.0	-18.0	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

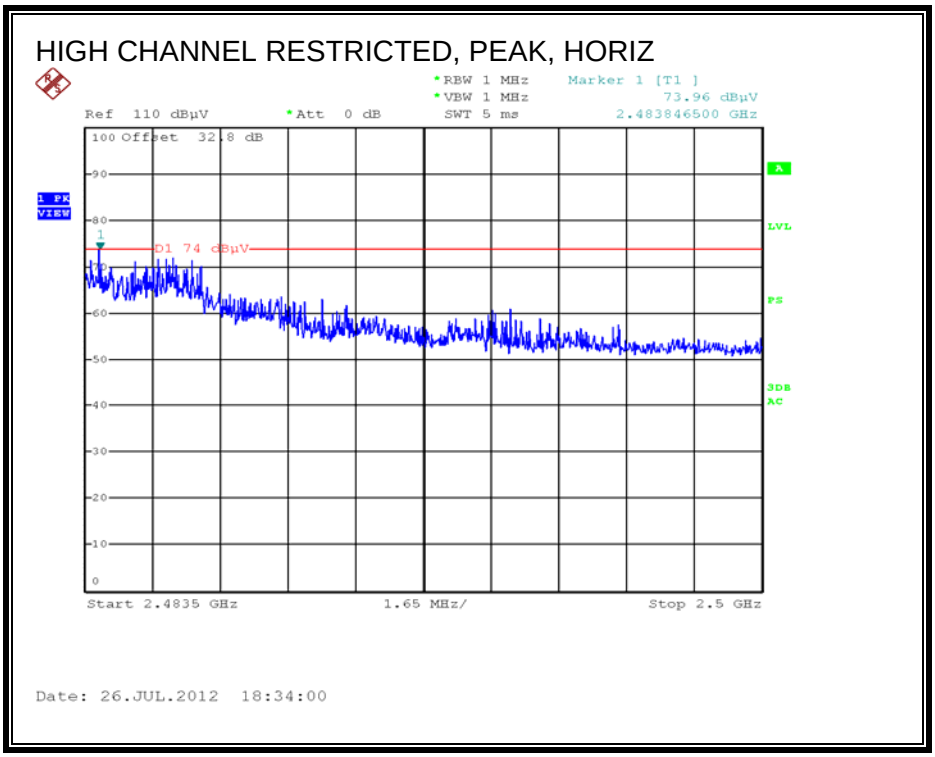
8.2.3. 802.11n HT20 CDD MCS0 2TX MODE IN THE 2.4 GHz BAND

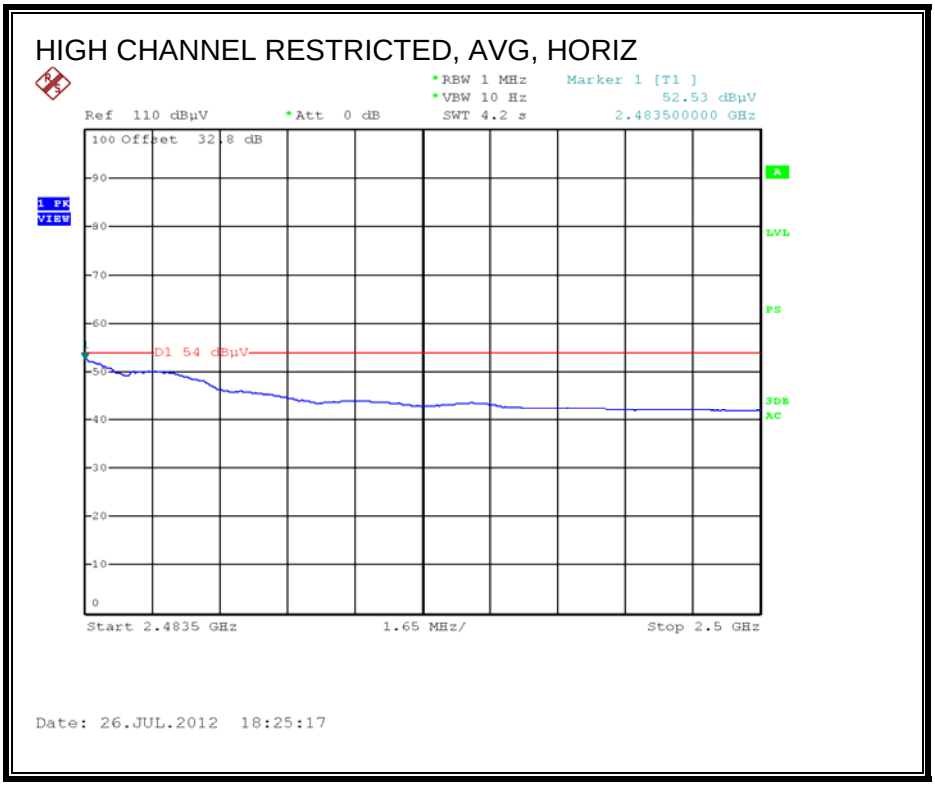
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 07/27/12
Project #: 12U14473
Company: Broadcom
Test Target: FCC 14.247
Mode Oper: Tx HT20 2x2 CDD Mode

f	Measurement Frequency	Amp	Preamp Gain
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m
AF	Antenna Factor	Peak	Calculated Peak Field Strength
CL	Cable Loss	HPF	High Pass Filter

Average Field Strength Limit
Peak Field Strength Limit
Margin vs. Average Limit
Margin vs. Peak Limit

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
LOW CHANNEL (1), 2412MHz													
4.824	3.0	41.9	33.1	6.8	-34.1	0.0	0.0	47.8	74.0	-26.2	V	P	
4.824	3.0	30.6	33.1	6.8	-34.1	0.0	0.0	36.4	54.0	-17.6	V	A	
4.824	3.0	42.1	33.1	6.8	-34.1	0.0	0.0	48.0	74.0	-26.0	H	P	
4.824	3.0	33.3	33.1	6.8	-34.1	0.0	0.0	39.1	54.0	-14.9	H	A	
MID CHANNEL (6), 2437MHz													
4.874	3.0	42.4	33.2	6.8	-34.0	0.0	0.0	48.3	74.0	-25.7	V	P	
4.874	3.0	28.9	33.2	6.8	-34.0	0.0	0.0	34.9	54.0	-19.1	V	A	
7.311	3.0	41.7	36.3	9.1	-33.1	0.0	0.0	54.0	74.0	-20.0	V	P	
7.311	3.0	28.2	36.3	9.1	-33.1	0.0	0.0	40.5	54.0	-13.5	V	A	
4.874	3.0	43.0	33.2	6.8	-34.0	0.0	0.0	48.9	74.0	-25.1	H	P	
4.874	3.0	29.7	33.2	6.8	-34.0	0.0	0.0	35.6	54.0	-18.4	H	A	
7.311	3.0	36.8	36.3	9.1	-33.1	0.0	0.0	49.0	74.0	-25.0	H	P	
7.311	3.0	24.4	36.3	9.1	-33.1	0.0	0.0	36.6	54.0	-17.4	H	A	
HIGH CHANNEL (11), 2462MHz													
4.924	3.0	45.2	33.2	6.8	-34.0	0.0	0.0	51.2	74.0	-22.8	H	P	
4.924	3.0	30.5	33.2	6.8	-34.0	0.0	0.0	36.5	54.0	-17.5	H	A	
7.386	3.0	39.3	36.4	9.1	-33.1	0.0	0.0	51.7	74.0	-22.3	H	P	
7.386	3.0	25.3	36.4	9.1	-33.1	0.0	0.0	37.7	54.0	-16.3	H	A	
4.924	3.0	44.8	33.2	6.8	-34.0	0.0	0.0	50.8	74.0	-23.2	V	P	
4.924	3.0	29.8	33.2	6.8	-34.0	0.0	0.0	35.8	54.0	-18.2	V	A	
7.386	3.0	40.9	36.4	9.1	-33.1	0.0	0.0	53.3	74.0	-20.7	V	P	
7.386	3.0	27.3	36.4	9.1	-33.1	0.0	0.0	39.7	54.0	-14.3	V	A	
Spur													
2.228	3.0	53.9	28.3	4.3	-36.0	0.0	0.0	50.6	74.0	-23.4	V	P	
2.228	3.0	42.6	28.3	4.3	-36.0	0.0	0.0	39.3	54.0	-14.7	V	A	
2.228	3.0	51.9	28.3	4.3	-36.0	0.0	0.0	48.6	74.0	-25.4	H	P	
2.228	3.0	40.1	28.3	4.3	-36.0	0.0	0.0	36.8	54.0	-17.2	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

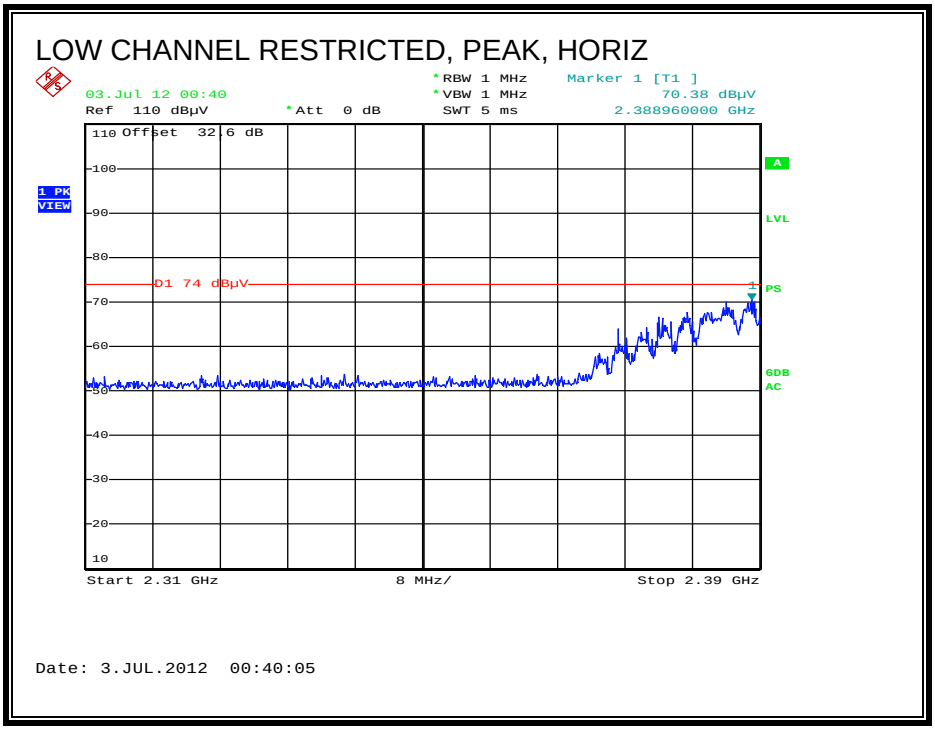
Note: tested with highest output powers at 19dBm to cover 1TX.

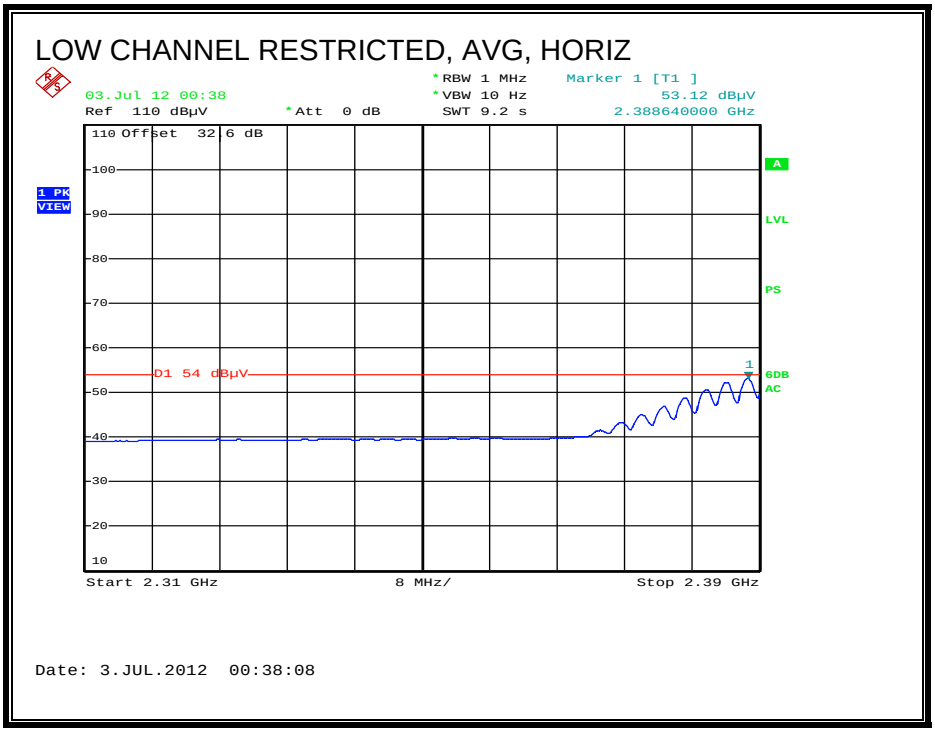
8.2.4. 802.11n HT40 1TX MODE IN THE 2.4 GHz BAND

Covered by testing to HT40 CDD MCS0 2TX

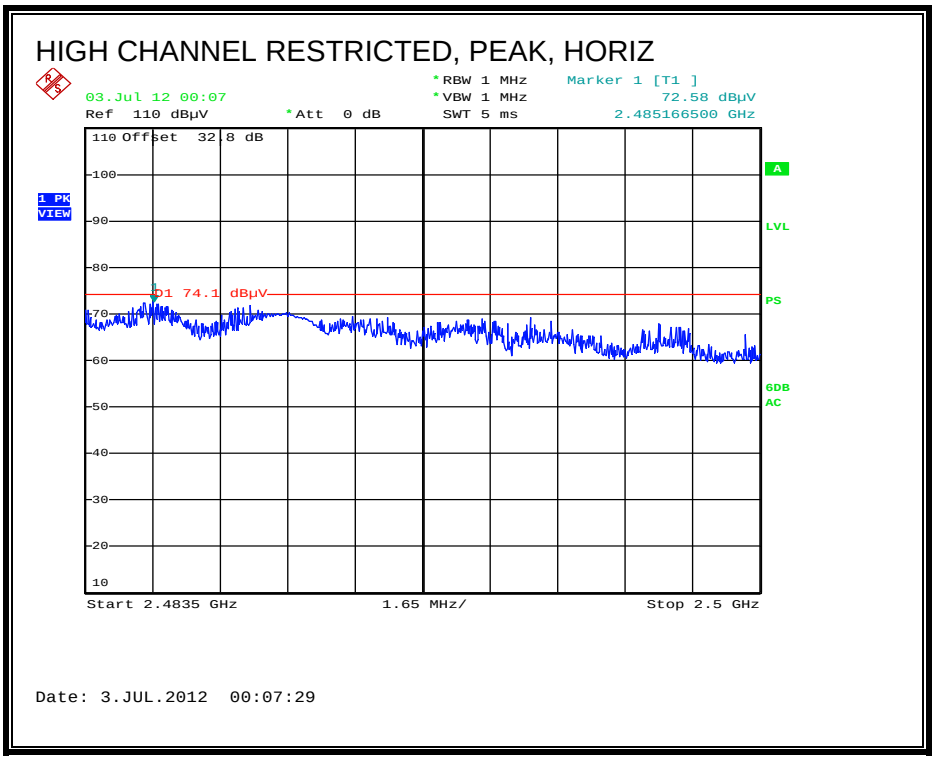
8.2.5. 802.11n HT40 CDD MCS0 2TX CDD MODE IN THE 2.4 GHz BAND

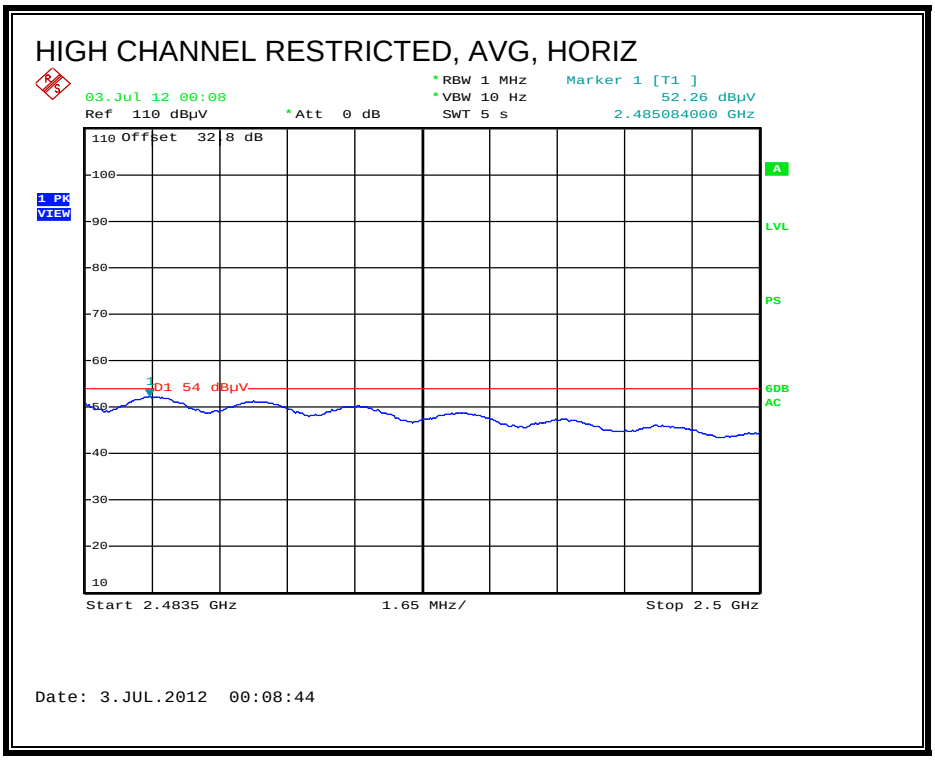
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 07/30/12
Project #: 12U14473
Company: Broadcom
Test Target: FCC 14.247
Mode Oper: Tx HT40 2x2 CDD Mode

f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
LOW CHANNEL (3), 2422MHz													
4.844	3.0	38.5	33.1	6.8	-34.0	0.0	0.0	44.4	74.0	-29.6	V	P	
4.844	3.0	26.4	33.1	6.8	-34.0	0.0	0.0	32.3	54.0	-21.7	V	A	
7.266	3.0	39.0	36.2	9.1	-33.2	0.0	0.0	51.2	74.0	-22.8	V	P	
7.266	3.0	25.6	36.2	9.1	-33.2	0.0	0.0	37.8	54.0	-16.2	V	A	
12.110	3.0	34.8	39.4	12.0	-32.5	0.0	0.0	53.6	74.0	-20.4	V	P	
12.110	3.0	21.8	39.4	12.0	-32.5	0.0	0.0	40.6	54.0	-13.4	V	A	
4.844	3.0	40.6	33.1	6.8	-34.0	0.0	0.0	46.5	74.0	-27.5	H	P	
4.844	3.0	28.4	33.1	6.8	-34.0	0.0	0.0	34.3	54.0	-19.7	H	A	
7.266	3.0	35.7	36.2	9.1	-33.2	0.0	0.0	47.9	74.0	-26.1	H	P	
7.266	3.0	23.2	36.2	9.1	-33.2	0.0	0.0	35.4	54.0	-18.6	H	A	
MID CHANNEL (6), 2437MHz													
4.874	3.0	39.5	33.2	6.8	-34.0	0.0	0.0	45.4	74.0	-28.6	V	P	
4.874	3.0	26.6	33.2	6.8	-34.0	0.0	0.0	32.5	54.0	-21.5	V	A	
7.311	3.0	37.5	36.3	9.1	-33.1	0.0	0.0	49.8	74.0	-24.2	V	P	
7.311	3.0	25.2	36.3	9.1	-33.1	0.0	0.0	37.5	54.0	-16.5	V	A	
12.185	3.0	34.4	39.4	12.0	-32.5	0.0	0.0	53.3	74.0	-20.7	V	P	
12.185	3.0	21.3	39.4	12.0	-32.5	0.0	0.0	40.1	54.0	-13.9	V	A	
4.874	3.0	41.8	33.2	6.8	-34.0	0.0	0.0	47.8	74.0	-26.2	H	P	
4.874	3.0	28.7	33.2	6.8	-34.0	0.0	0.0	34.6	54.0	-19.4	H	A	
7.311	3.0	35.5	36.3	9.1	-33.1	0.0	0.0	47.7	74.0	-26.3	H	P	
7.311	3.0	23.5	36.3	9.1	-33.1	0.0	0.0	35.8	54.0	-18.2	H	A	
HIGH CHANNEL (9), 2452MHz													
4.904	3.0	41.4	33.2	6.8	-34.0	0.0	0.0	47.4	74.0	-26.6	V	P	
4.904	3.0	28.2	33.2	6.8	-34.0	0.0	0.0	34.2	54.0	-19.8	V	A	
7.356	3.0	36.3	36.4	9.1	-33.1	0.0	0.0	48.7	74.0	-25.3	V	P	
7.356	3.0	23.7	36.4	9.1	-33.1	0.0	0.0	36.1	54.0	-17.9	V	A	
4.904	3.0	42.0	33.2	6.8	-34.0	0.0	0.0	48.0	74.0	-26.0	H	P	
4.904	3.0	28.1	33.2	6.8	-34.0	0.0	0.0	34.1	54.0	-19.9	H	A	
7.356	3.0	35.2	36.4	9.1	-33.1	0.0	0.0	47.6	74.0	-26.4	H	P	
7.356	3.0	22.8	36.4	9.1	-33.1	0.0	0.0	35.2	54.0	-18.8	H	A	
Spur													
2.228	3.0	53.8	28.3	4.3	-36.0	0.0	0.0	50.5	74.0	-23.5	V	P	
2.228	3.0	43.3	28.3	4.3	-36.0	0.0	0.0	39.9	54.0	-14.1	V	A	
2.228	3.0	50.2	28.3	4.3	-36.0	0.0	0.0	46.9	74.0	-27.1	H	P	
2.228	3.0	39.7	28.3	4.3	-36.0	0.0	0.0	36.4	54.0	-17.6	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 19dBm to cover 1TX.

8.2.6. 802.11a 1TX MODE IN THE 5.8 GHz BAND

Covered by testing to HT20 CDD MCS0 2TX

8.2.7. 802.11n HT20 CDD MCS0 2TX MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: Broadcom
Project #: 12U14473
Date: 7/4/2012
Test Engineer: Mengistu Mekuria
Configuration: EUT/ Laptop/Extender Card
Mode: Tx HT20 2x2 CDD MCS0, 5.8GHz Band
With 5GHz Reject Filter

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26-40GHz	T39; ARA 18-26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
CHANNEL 149, 5745MHz															
11.490	3.0	41.9	27.6	38.9	11.2	-32.4	0.0	0.0	59.5	45.2	74	54	-14.5	-8.8	H
11.490	3.0	42.3	29.8	38.9	11.2	-32.4	0.0	0.0	60.0	47.5	74	54	-14.0	-6.5	V
CHANNEL 157, 5785MHz															
11.570	3.0	39.4	28.5	38.9	11.3	-32.4	0.0	0.0	57.3	46.4	74	54	-16.7	-7.6	H
11.570	3.0	38.2	29.4	38.9	11.3	-32.4	0.0	0.0	56.1	47.3	74	54	-17.9	-6.7	V
CHANNEL 165, 5825MHz															
11.650	3.0	44.2	28.7	39.0	11.4	-32.4	0.0	0.0	62.3	46.8	74	54	-11.7	-7.2	H
11.650	3.0	44.7	29.7	39.0	11.4	-32.4	0.0	0.0	62.8	47.8	74	54	-11.2	-6.2	V

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: tested with highest output powers at 19dBm to cover 1TX.

8.2.8. 802.11n HT40 1TX MODE IN THE 5.8 GHz BAND

Covered by testing HT40 CCD MCS0 2TX

8.2.9. 802.11n HT40 CDD MCS0 2TX MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 07/31/12
Project #: 12U14473
Company: Broadcom
Test Target: FCC 15.247
Mode Oper: Tx HT40 2x2 CDD Mode_5.8GHz Band

f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
LOW CHANNEL (151), 5755MHz															
11.510	3.0	40.0	38.9	11.2	-33.0	0.0	0.0	57.0	74.0	-17.0	V	P	182.0	80.0	
11.510	3.0	26.4	38.9	11.2	-33.0	0.0	0.0	43.5	54.0	-10.5	V	A	182.0	80.0	
11.510	3.0	37.5	38.9	11.2	-33.0	0.0	0.0	54.5	74.0	-19.5	H	P	135.0	0.0	
11.510	3.0	24.5	38.9	11.2	-33.0	0.0	0.0	41.5	54.0	-12.5	H	A	135.0	0.0	
HIGH CHANNEL (157), 5795MHz															
11.590	3.0	37.6	39.0	11.3	-33.0	0.0	0.0	54.9	74.0	-19.1	V	P	168.0	349.0	
11.590	3.0	26.0	39.0	11.3	-33.0	0.0	0.0	43.4	54.0	-10.6	V	A	168.0	349.0	
11.590	3.0	37.1	39.0	11.3	-33.0	0.0	0.0	54.5	74.0	-19.5	H	P	163.0	5.0	
11.590	3.0	26.5	39.0	11.3	-33.0	0.0	0.0	43.9	54.0	-10.1	H	A	163.0	5.0	

Rev. 4.1.2.7

Note: tested with highest output powers at 19dBm to cover 1TX.

8.2.10. 802.11n HT80 CDD MCS0 2TX MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 07/31/12
Project #: 12U14473
Company: Broadcom
Test Target: FCC 14.247
Mode Oper: Tx HT80 2x2 CDD Mode_Channel 155, 5775MHz_5.8GHz Band

f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

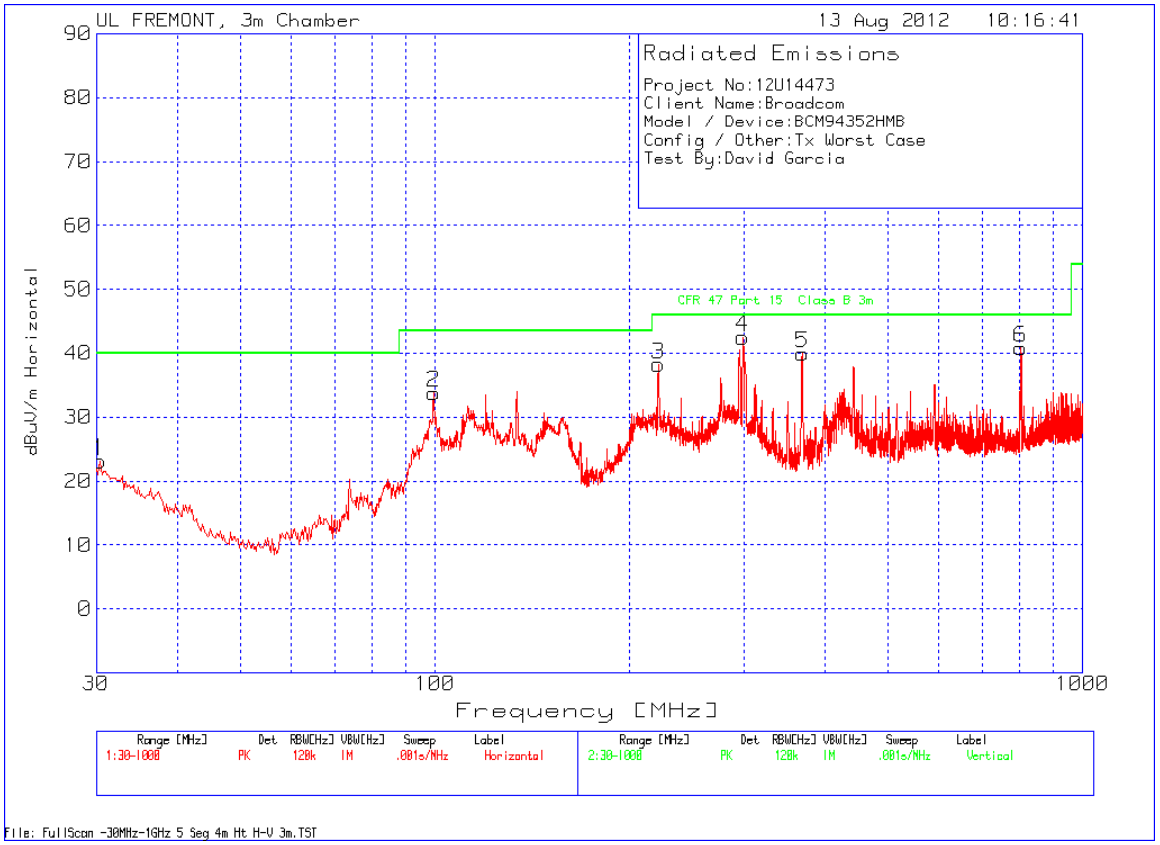
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
CHANNEL (155), 5775MHz															
11.550	3.0	36.1	38.9	11.3	-33.0	0.0	0.0	53.3	74.0	-20.7	V	P	156.0	239.0	
11.550	3.0	28.2	38.9	11.3	-33.0	0.0	0.0	45.4	54.0	-8.6	V	A	156.0	239.0	
11.550	3.0	36.0	38.9	11.3	-33.0	0.0	0.0	53.2	74.0	-20.8	H	P	143.0	203.0	
11.550	3.0	27.9	38.9	11.3	-33.0	0.0	0.0	45.1	54.0	-8.9	H	A	143.0	203.0	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

8.3. WORST-CASE BELOW 1 GHz

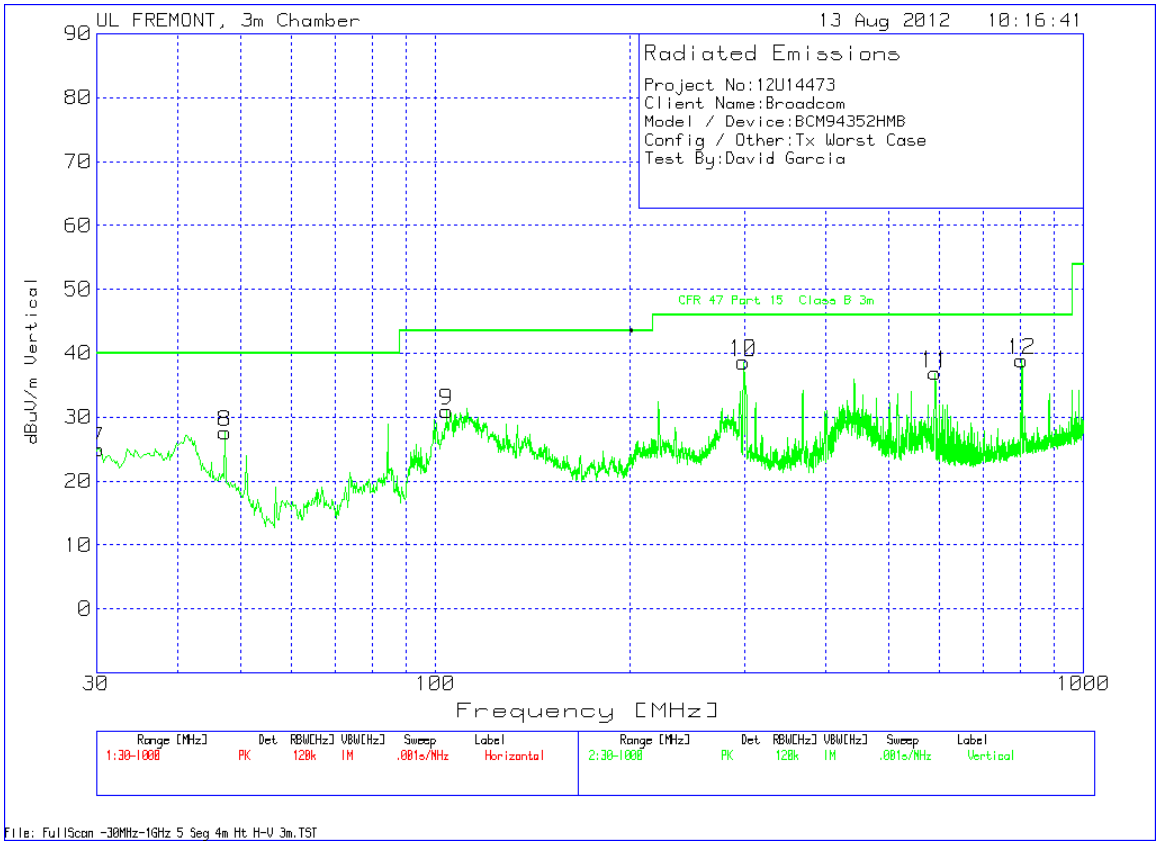
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



Project No:12U14473
Client Name:Broadcom
Model / Device:BCM94352HMB
Config / Other:Tx Worst Case
Test By:David Garcia

Horizontal 30 - 1000MHz

Test Frequency	Meter Reading	Detector	25MHz-1GHz Chambr 3m Amplified (dB)	Antenna T185 (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
30.3877	29.74	PK	-27.5	20.9	23.14	40.0	-16.86	400	Horz
99.5903	50.90	PK	-26.8	9.7	33.80	43.5	-9.70	201	Horz
221.3249	53.16	PK	-25.7	10.8	38.26	46.0	-7.74	100	Horz
298.8629	54.43	PK	-25.2	13.3	42.53	46.0	-3.47	100	Horz
369.0348	50.46	PK	-25.5	15.0	39.96	46.0	-6.04	100	Horz
803.2474	44.23	PK	-24.6	21.2	40.83	46.0	-5.17	100	Horz

Vertical 30 - 1000MHz

Test Frequency	Meter Reading	Detector	25MHz-1GHz Chambr 3m Amplified (dB)	Antenna T185 (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
30.1938	31.40	PK	-27.5	21.1	25.00	40.0	-15.00	101	Vert
47.446	45.97	PK	-27.3	9.0	27.67	40.0	-12.33	101	Vert
104.2426	46.67	PK	-26.8	11.1	30.97	43.5	-12.53	101	Vert
298.8629	50.54	PK	-25.2	13.3	38.64	46.0	-7.36	200	Vert
590.5995	44.22	PK	-25.7	18.4	36.92	46.0	-9.08	101	Vert
803.4412	42.30	PK	-24.6	21.2	38.90	46.0	-7.10	101	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection
Text File: Project No12U14473_Tx_Worst_Case.TXT
File: FullScan -30MHz-1GHz 5 Seg 4m Ht H-V 3m.TST

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

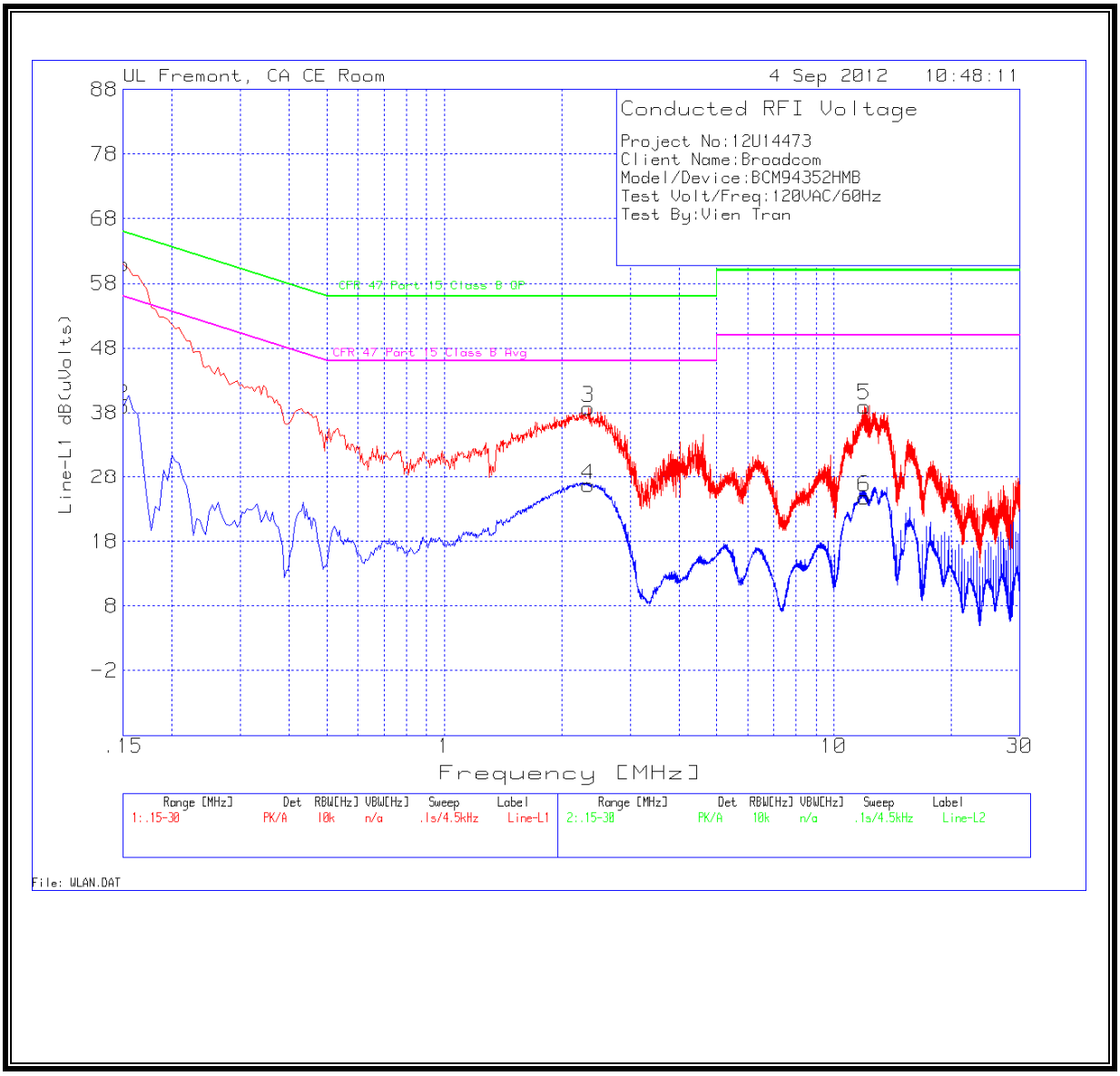
6 WORST EMISSIONS

Project No:12U14473
Client Name:Broadcom
Model/Device:BCM94352HMB
Test Volt/Freq:120VAC/60Hz
Test By:Vien Tran

Frequency MHz	Reading dB(µV)	Detector	T24 LISN dB	Cables dB	Corrected dB(µV)	Class B QP Limit dB(µV)	QP Margin dB	Class B Av Limit dB(µV)	Av Margin dB
Line-L1 .15 - 30MHz									
0.15	60.88	PK	0.1	0	60.98	66	-5.02	-	-
0.15	38.86	Av	0.1	0	38.96	-	-	56	-17.04
2.3415	38.6	PK	0.1	0.1	38.8	56	-17.2	-	-
2.3415	26.55	Av	0.1	0.1	26.75	-	-	46	-19.25
12.003	38.67	PK	0.2	0.2	39.07	60	-20.93	-	-
12.003	24.42	Av	0.2	0.2	24.82	-	-	50	-25.18
Line-L2 .15 - 30MHz									
0.15	59.32	PK	0.1	0	59.42	66	-6.58	-	-
0.15	37.04	Av	0.1	0	37.14	-	-	56	-18.86
2.679	38.52	PK	0.1	0.1	38.72	56	-17.28	-	-
2.679	25.94	Av	0.1	0.1	26.14	-	-	46	-19.86
12.1155	37.77	PK	0.2	0.2	38.17	60	-21.83	-	-
12.1155	21.56	Av	0.2	0.2	21.96	-	-	50	-28.04

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector
Text File: WLAN.TXT
File: WLAN.DAT

LINE 1 RESULTS



LINE 2 RESULTS