FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC

MODEL NUMBER: SM-G355HN

FCC ID: A3LSMG355HN

REPORT NUMBER: 14I17986-2 REVISION A

ISSUE DATE: June 19, 2014

Prepared for

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Prepared by

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NVLAP LAB CODE 200065-0

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--	6/18/14	Initial issue	P. Zhang
A	6/19/14	Updated statement	P. Zhang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA
EUT DESCRIPTION:	GSM/WCDMA Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC
MODEL:	SM-G355HN
SERIAL NUMBER:	FL-164-C, FL-230-A (Radiated), FL-164-D (Conducted)
DATE TESTED:	April 25 – June 18, 2014

APPLICABLE STANDARDS

STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. 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 18000 MHz	4.94 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC.

The model FCC ID: A3LSMG355HN shares the same enclosure and circuit board as mode FCC ID: A3LSMG355H. The WWAN/WLAN/Bluetooth/WWAN circuitry and layout, are almost identical between the two units. The WLAN/Bluetooth antenna and surrounding circuitry is the same between these two units.

Conducted test results have been re-used for A3LSMG355HN after confirming the performance is the same.

Radiated emissions were fully re-evaluated since Main Antenna pattern have been changed for A3LSMG355HN. Other differences between the two FCC IDs are NFC chipset being added for A3LSMG355HN. NFC has been fully tested for FCC ID: A3LSMG355HN.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	12.87	19.36
2402 - 2480	Enhanced 8PSK	13.32	21.48

Note: GFSK, Pi/4-DQPSK, 8PSK average Power are all investigated, The GFSK & 8PSK Power are the worst case. Testing is based on this mode to showing compliance. For average power data please refer to section 8.6.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.4 dBi.

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5.4. WORST-CASE CONFIGURATION AND MODE

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

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Samsung	G355H	N/A	N/A
Earphone	Samsung	G355H	N/A	N/A

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

TEST SETUP

The EUT is continuously communicating to the Bluetooth tester during the tests.
EUT was set in the Hidden menu mode to enable BT communications.

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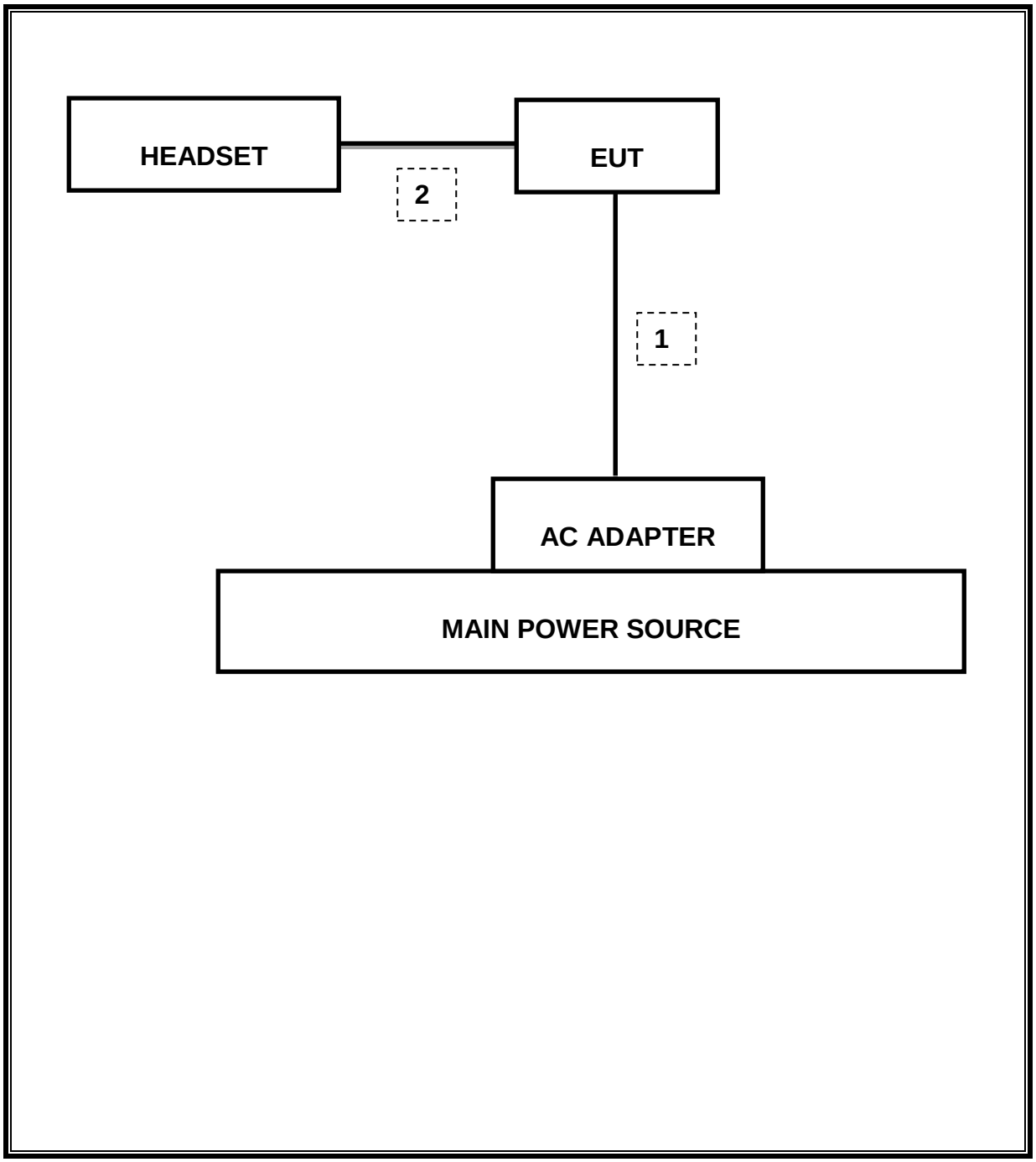
SETUP DIAGRAM FOR TESTS



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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 Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/15
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/14
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/15
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/14
CBT Bluetooth Tester	R & S	CBT	None	07/12/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/14
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/15
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/14
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/14

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7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	RSS-GEN 4.6	Occupied Band width (99%)	N/A	Conducted	Pass	1.224 MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-34.94dBm
15.247 (b)(1)	RSS-210 A8.4	TX conducted output power	<21dBm		Pass	13.32 dBm
15.247 (a)(1)	RSS-210 A8.1(b)	Hopping frequency separation	> 25KHz		Pass	1.000 MHz
15.247 (a)(1)(iii)	RSS-210 A8.1(d)	Number of Hopping channels	More than 15 non-overlapping channels		Pass	79
15.247 (a)(1)(iii)	RSS-210 A8.1(d)	Avg Time of Occupancy	< 0.4sec		Pass	0.288 sec
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	48.59dBuV
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	47.48dBuV/m

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8. ANTENNA PORT TEST RESULTS

8.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

RESULTS

8.1.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.924	0.834
Middle	2441	0.922	0.826
High	2480	0.923	0.902
Worst		0.924	0.902

8.1.1. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.314	1.224
Middle	2441	1.334	1.215
High	2480	1.336	1.212
Worst		1.336	1.224

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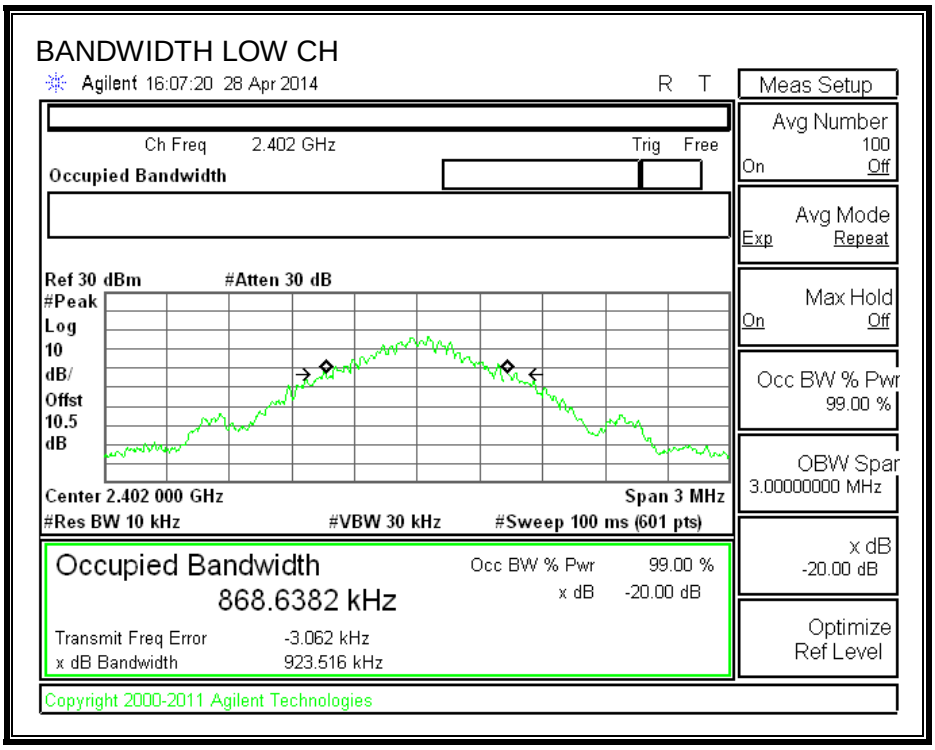
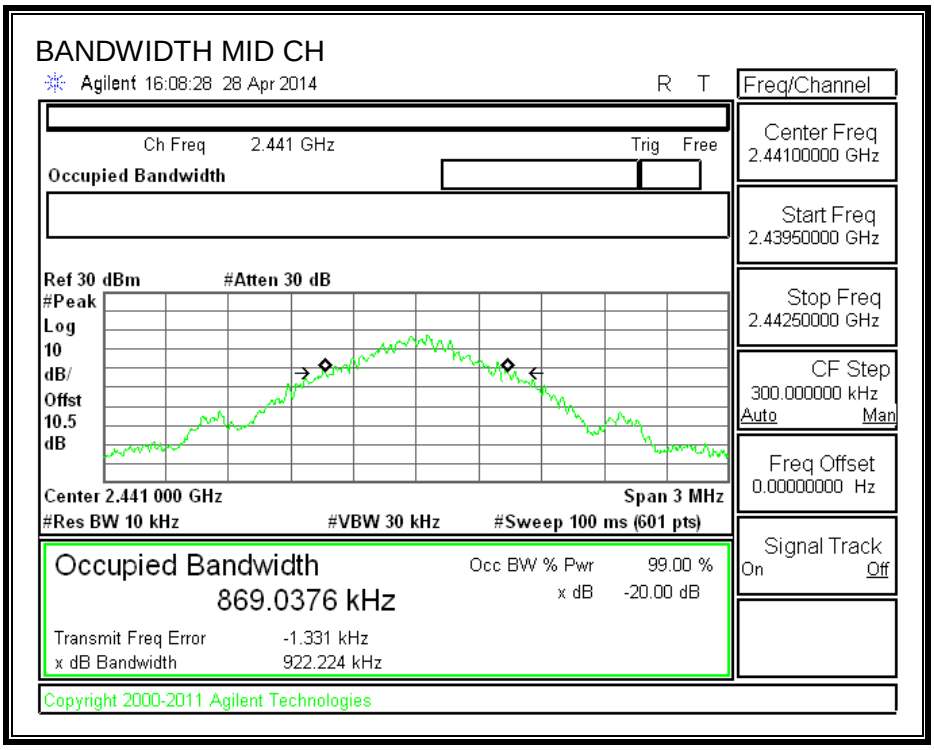
GFSK 20 dB BANDWIDTH





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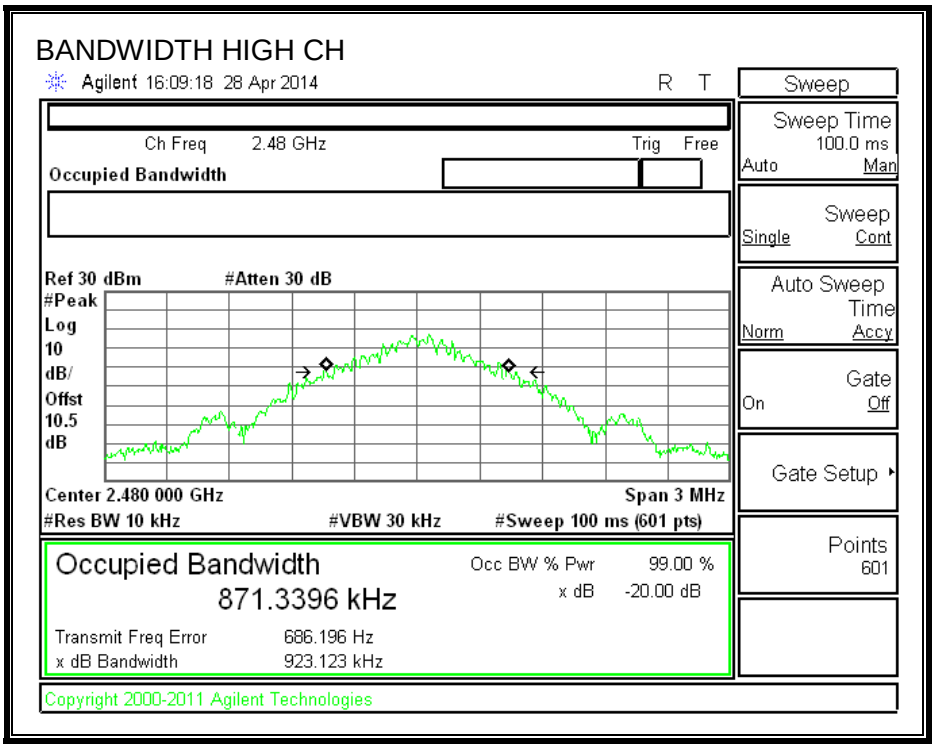

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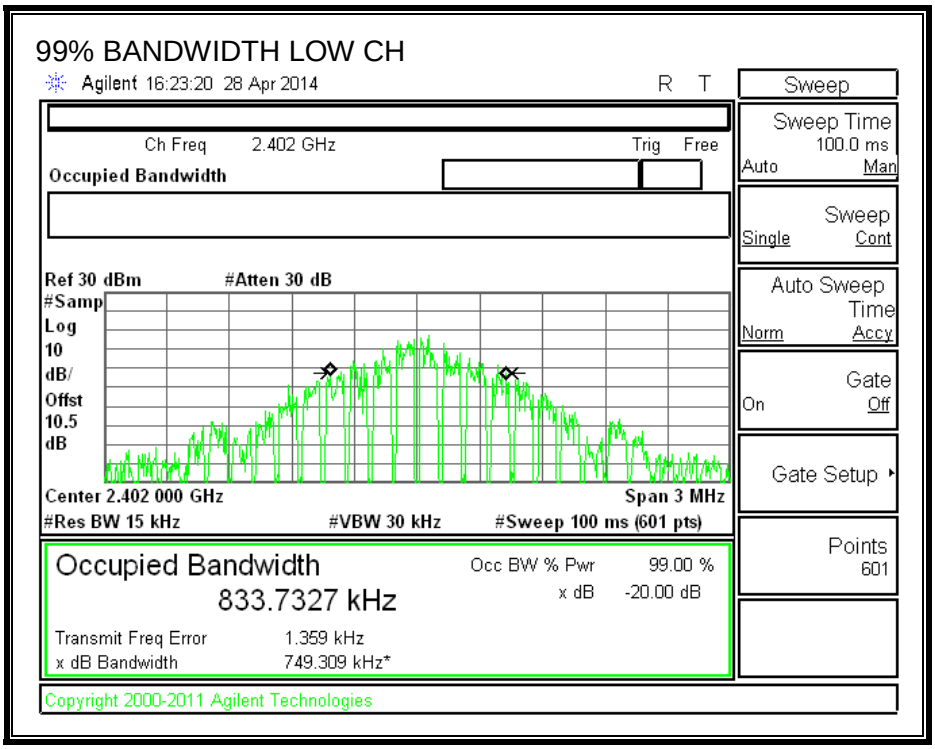
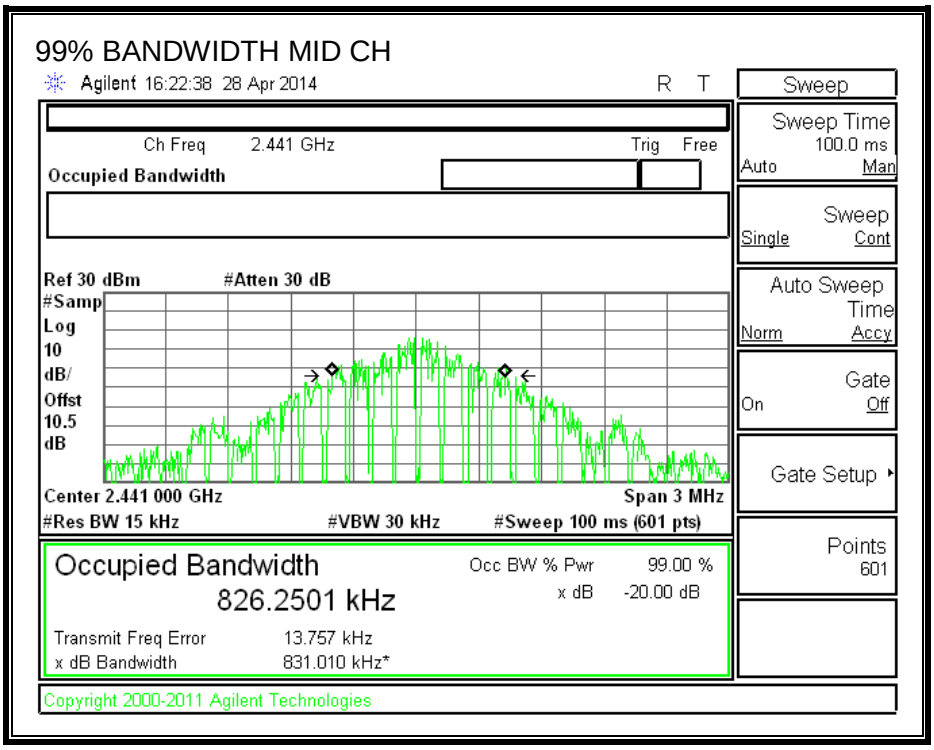
GFSK 99% BANDWIDTH





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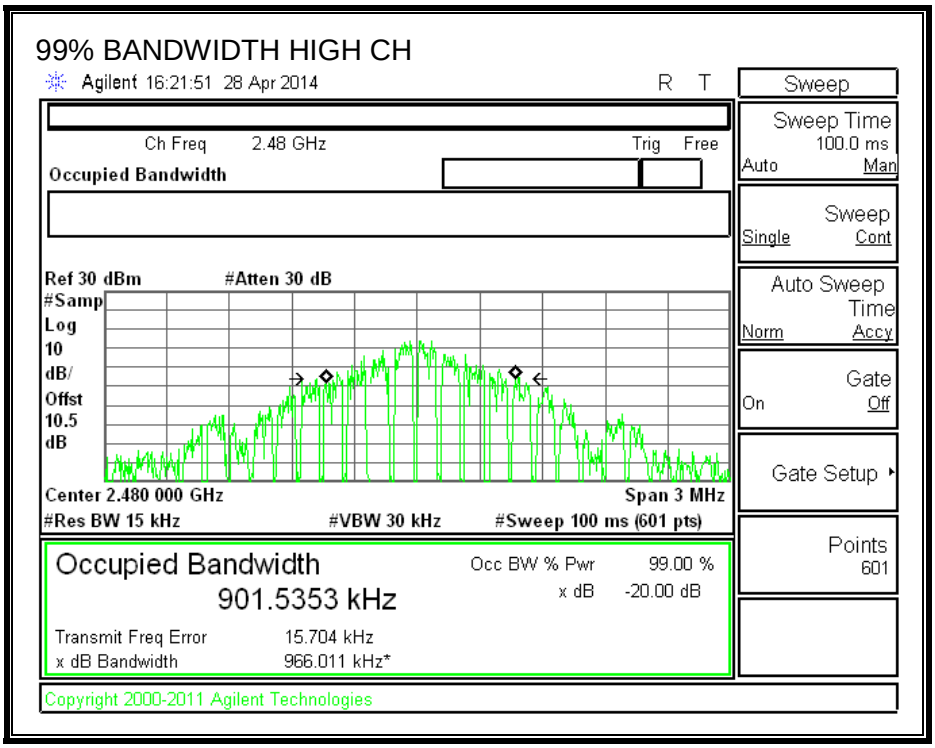

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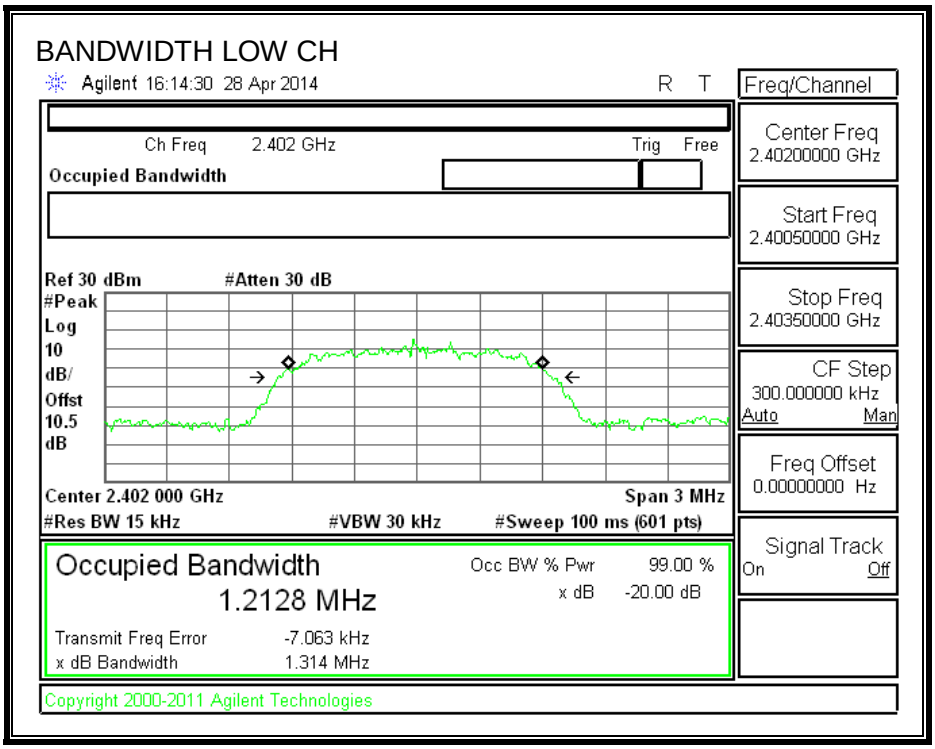
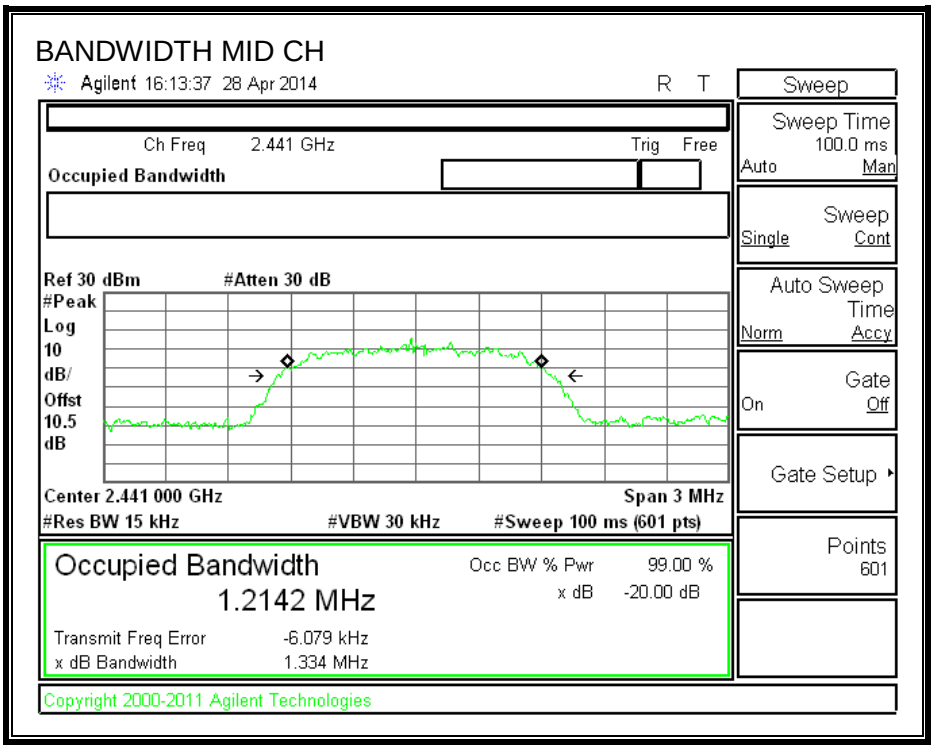
8PSK 20 dB BANDWIDTH





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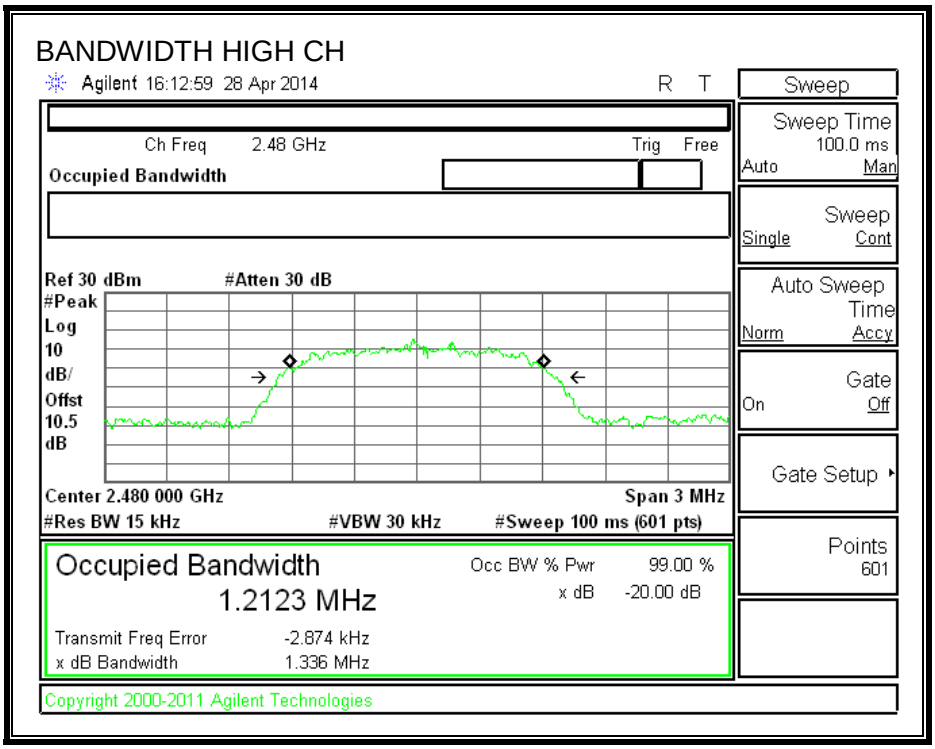

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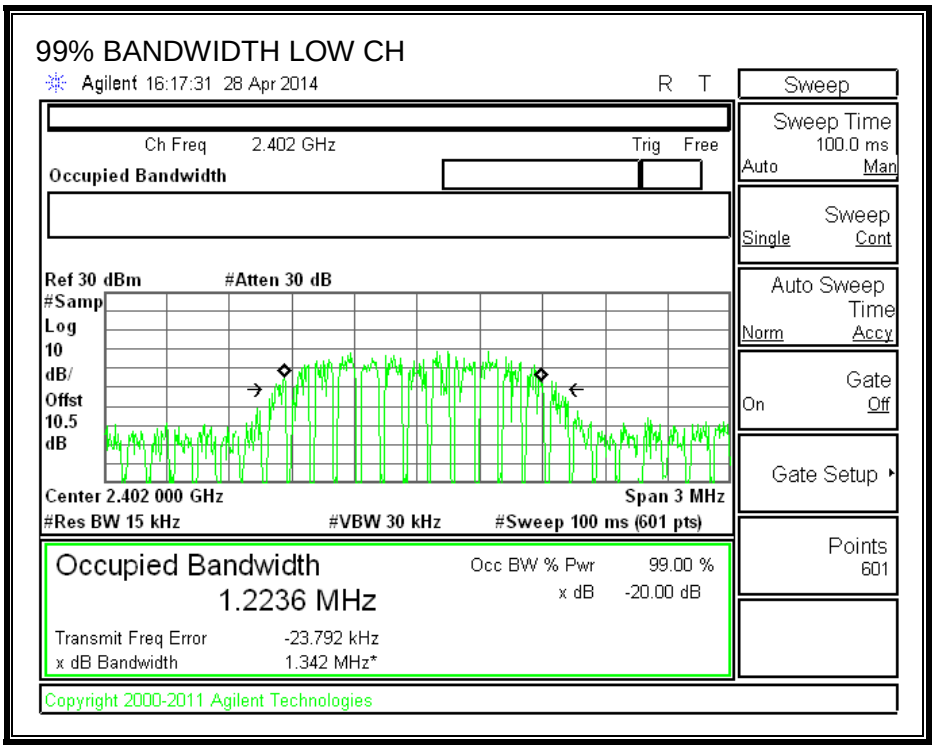
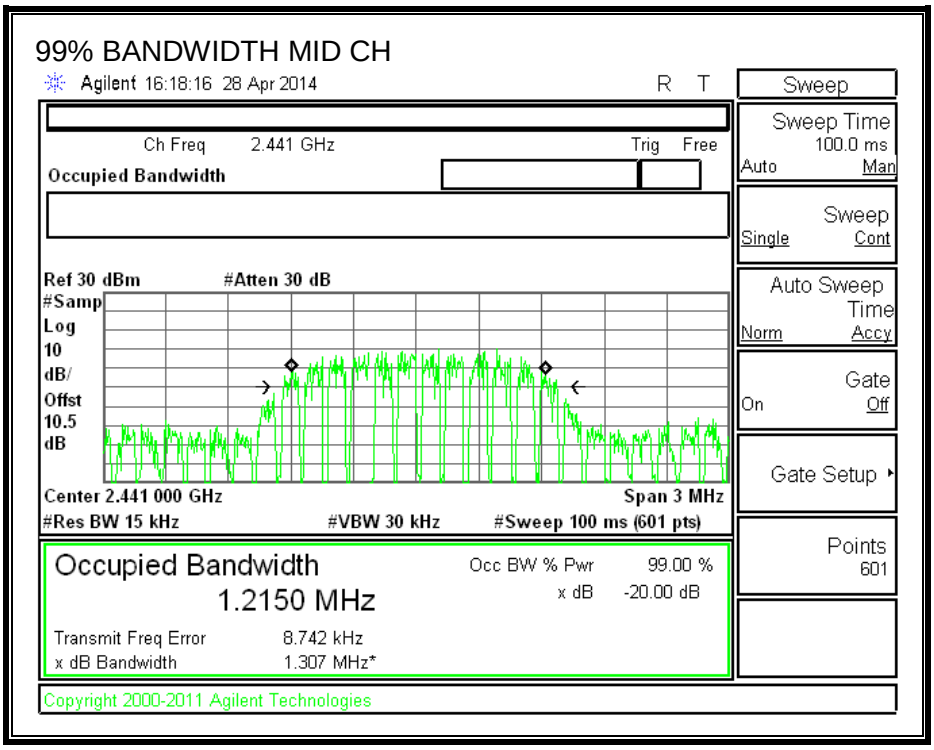
8PSK 99% BANDWIDTH





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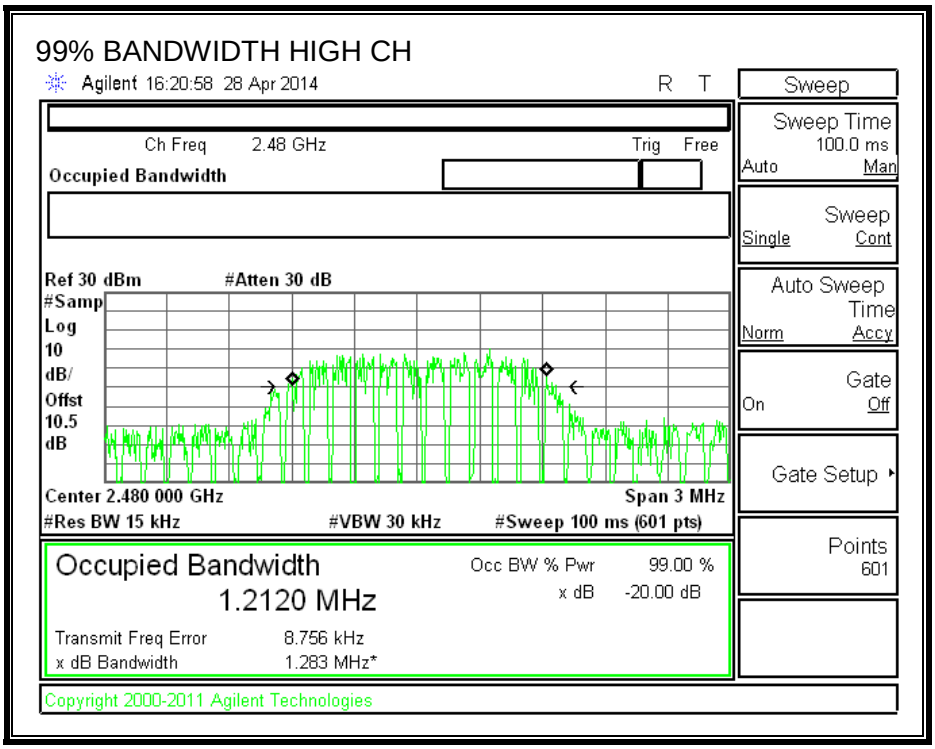

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8.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

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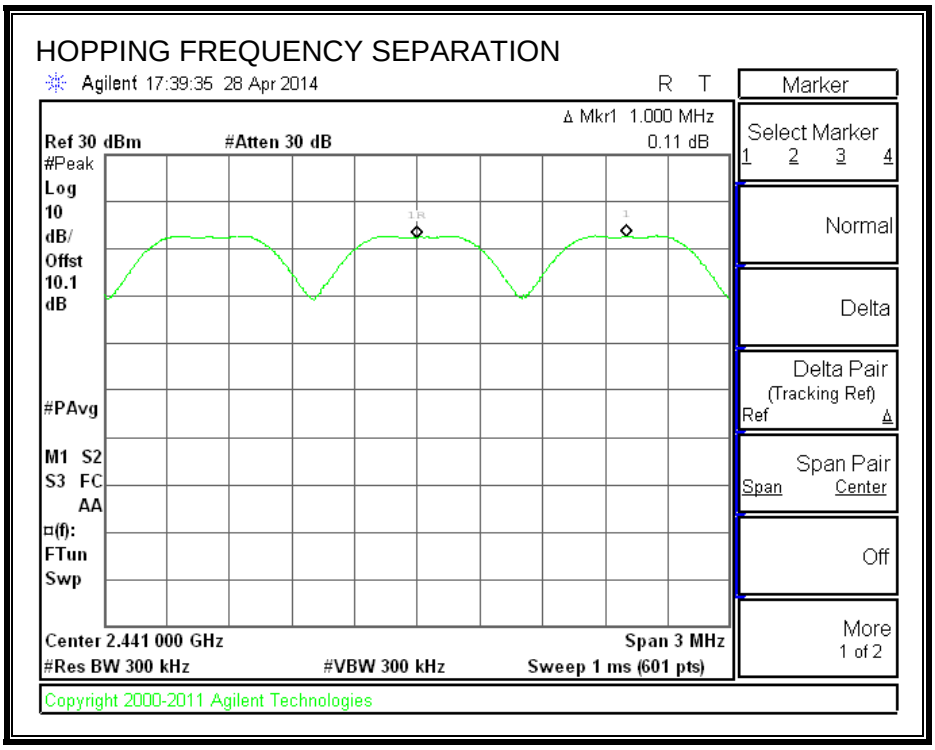
HOPPING FREQUENCY SEPARATION



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8.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Normal Mode: 79 Channels observed.

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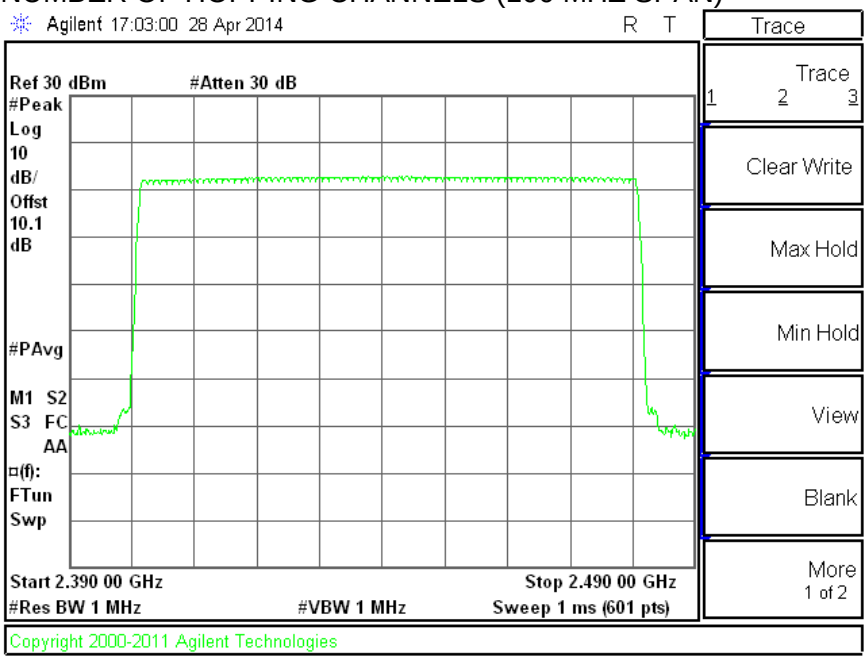
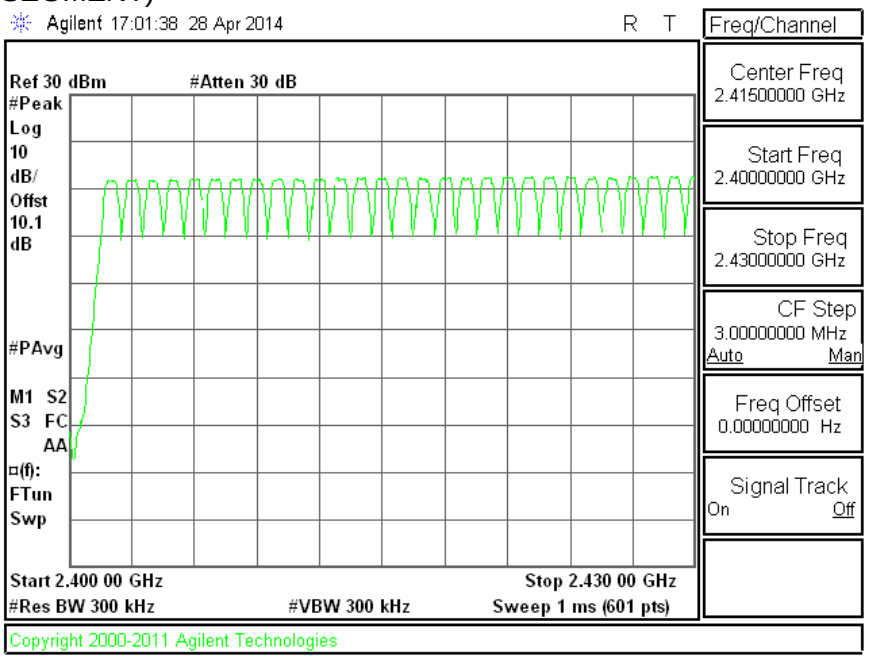
NUMBER OF HOPPING CHANNELS

NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



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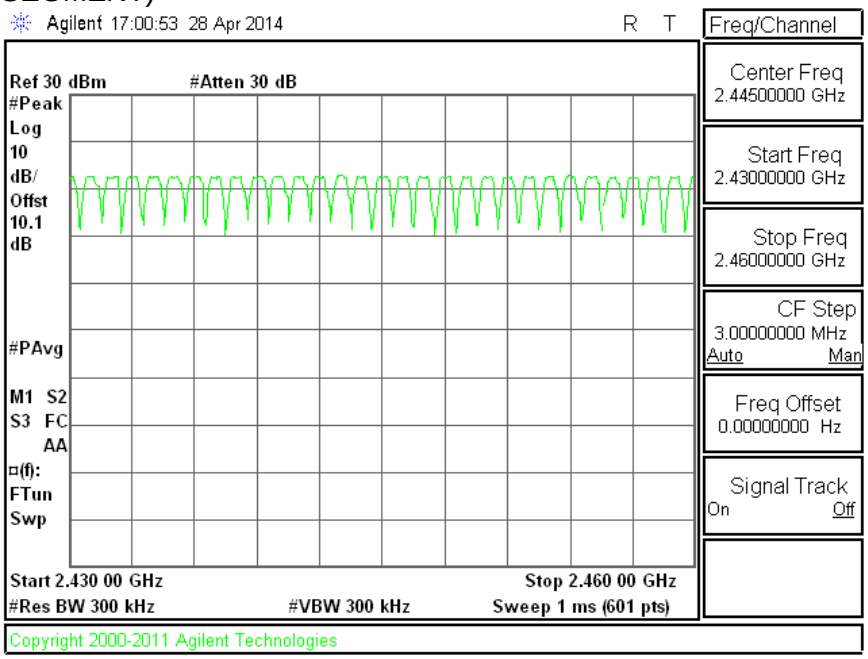
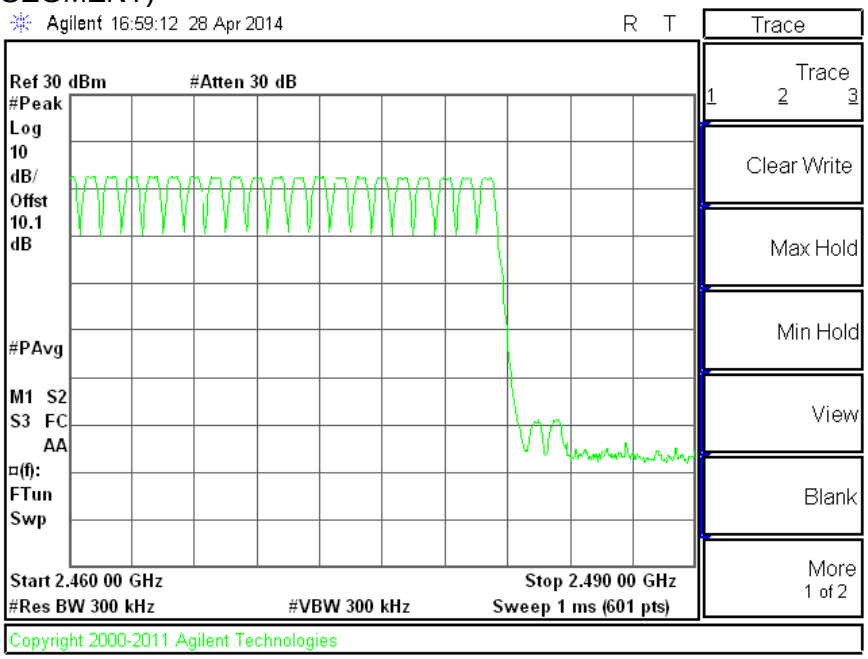
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



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8.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

RESULTS

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.3968	31	0.123	0.4	-0.277
DH3	1.653	17	0.281	0.4	-0.119
DH5	2.877	10	0.288	0.4	-0.112

DH Packet	Pulse Width (msec)	Number of Pulses in 0.8	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.3968	8	0.032	0.4	-0.368
DH3	1.653	5	0.083	0.4	-0.317
DH5	2.877	3	0.086	0.4	-0.314

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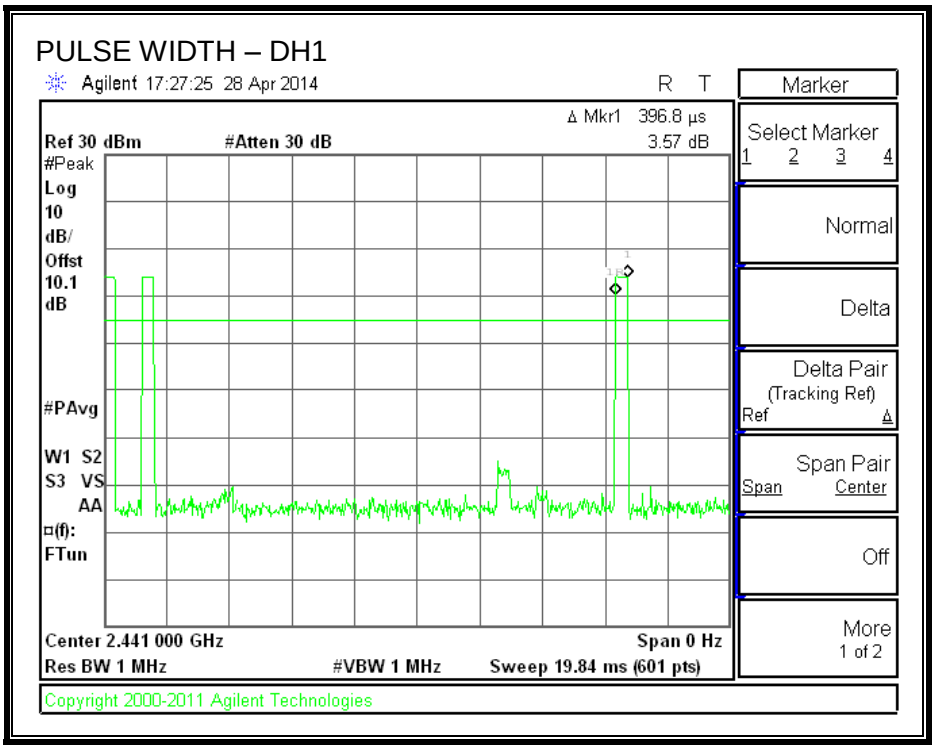
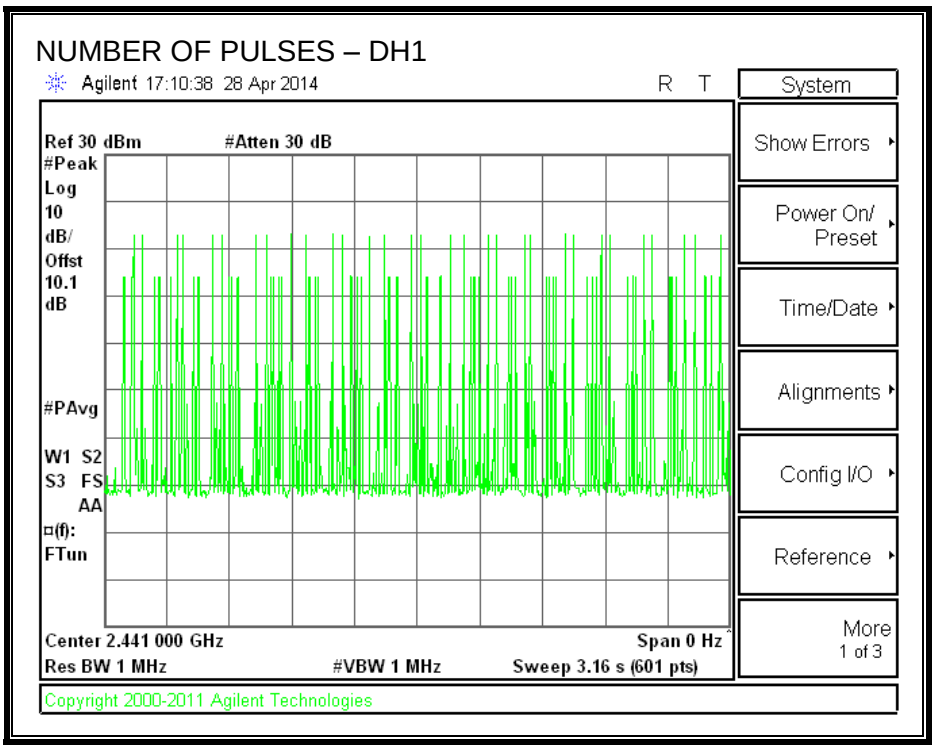
PULSE WIDTH - DH1



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



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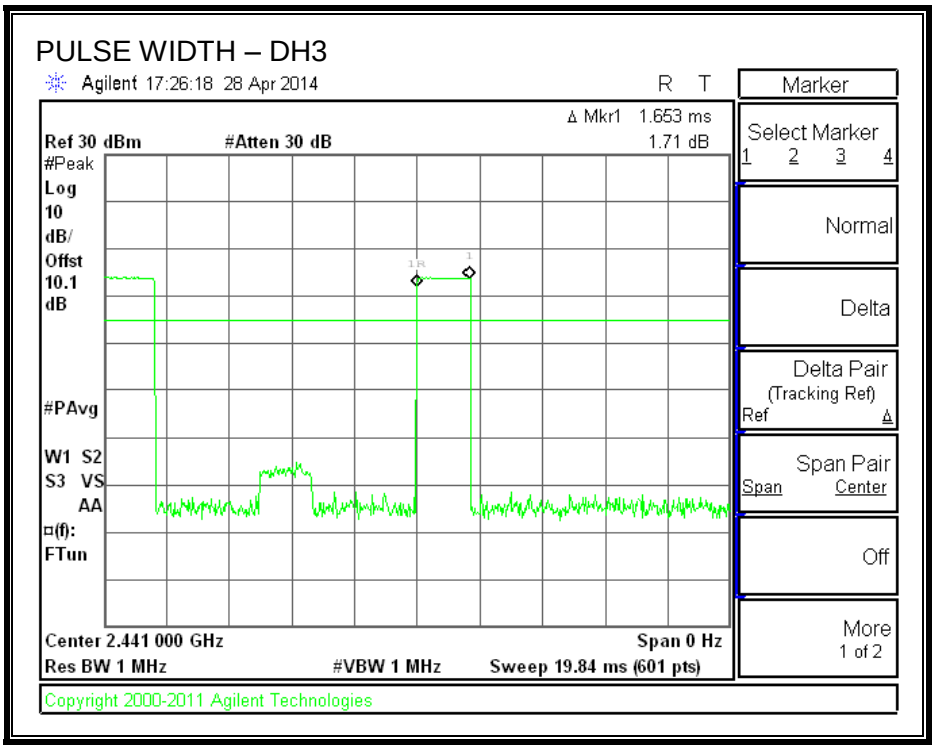
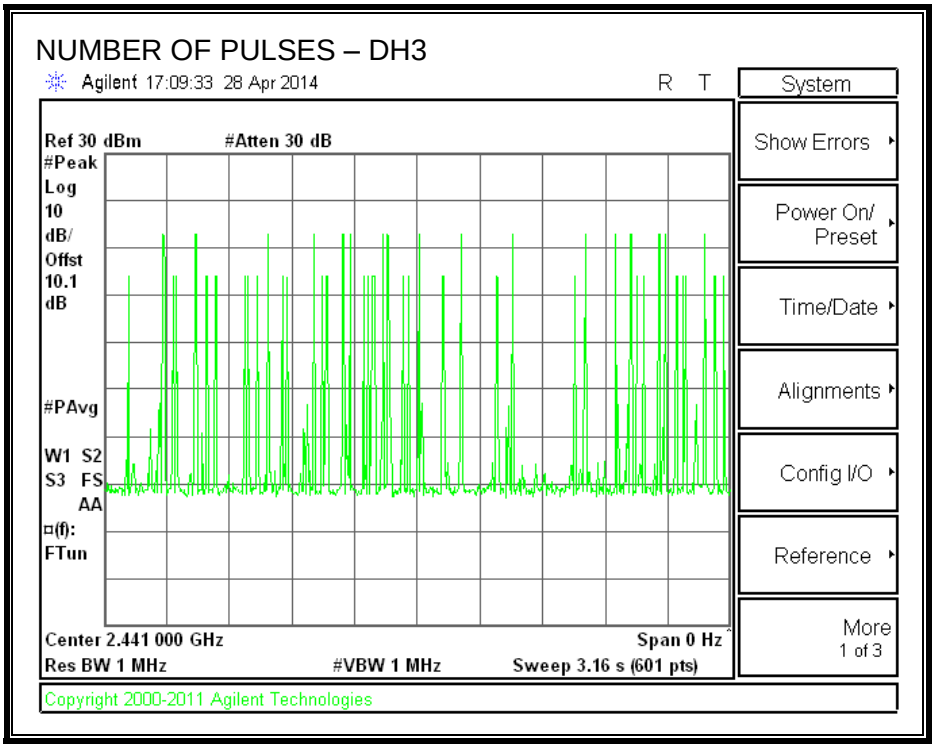
PULSE WIDTH – DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



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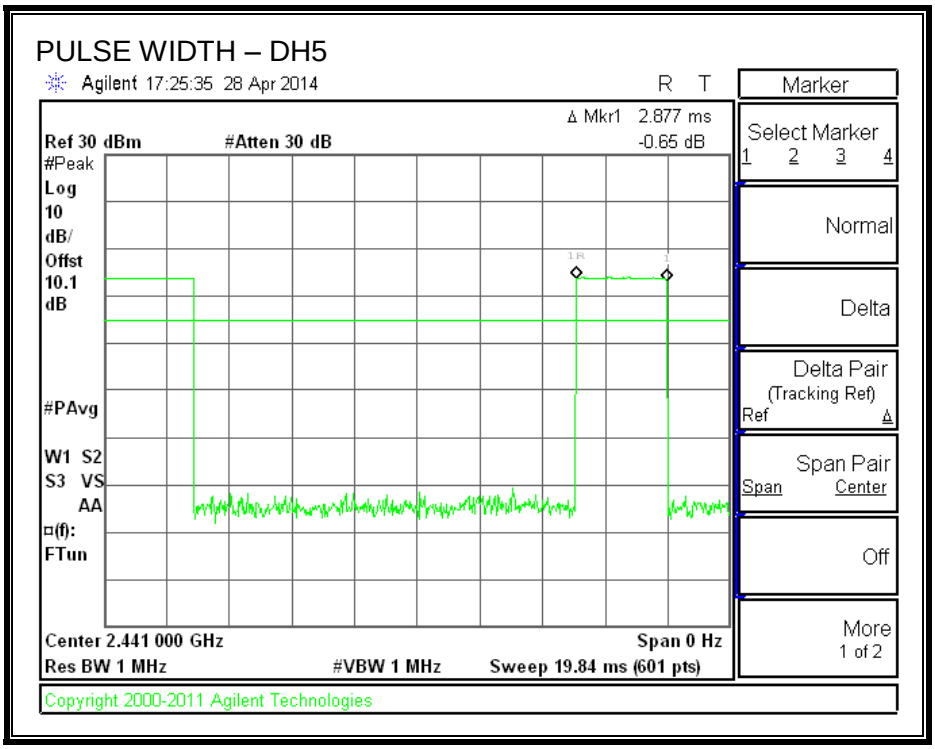
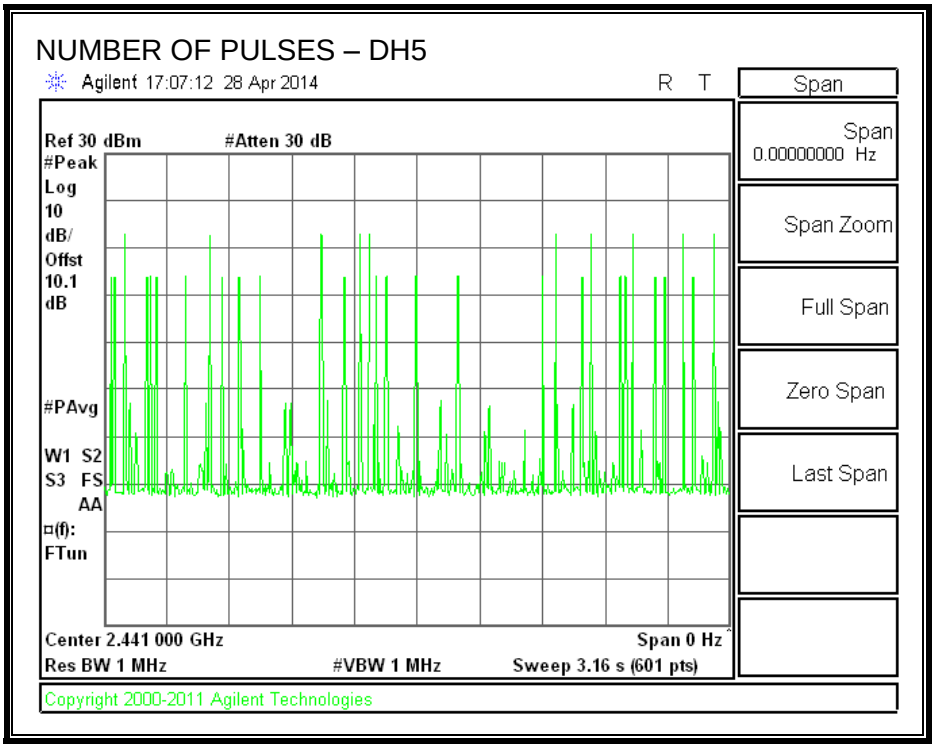
PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



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8.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 21 dBm.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

8.5.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.13	21	-8.87
Middle	2441	12.87	21	-8.13
High	2480	12.53	21	-8.47
Worst		12.87		-8.13

8.5.2. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.53	21	-8.47
Middle	2441	13.32	21	-7.68
High	2480	12.98	21	-8.02
Worst		13.32		-7.68

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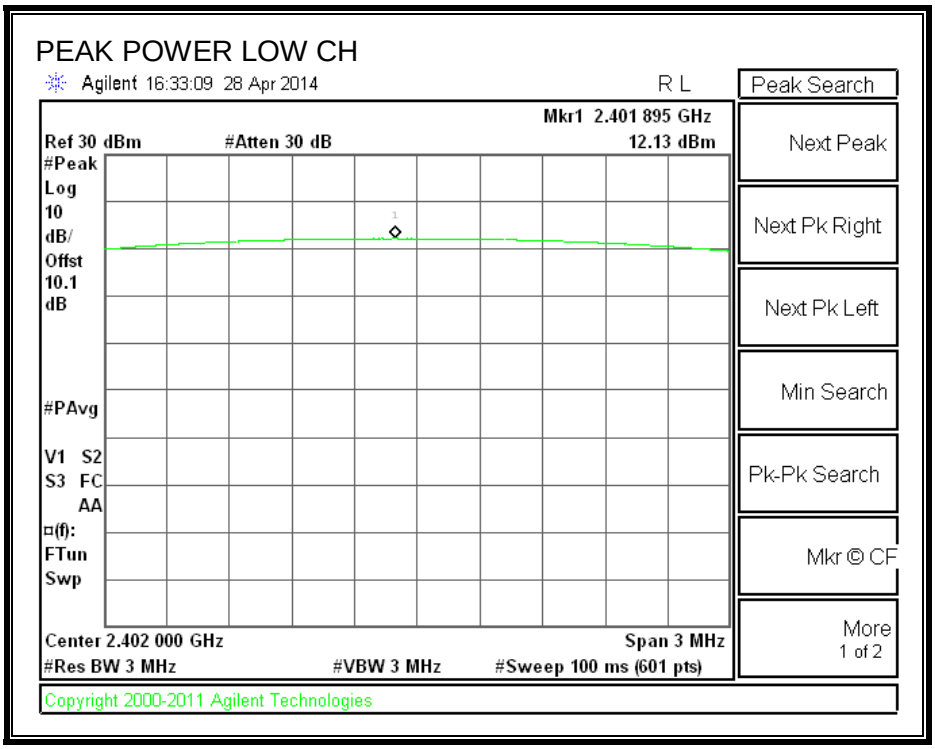
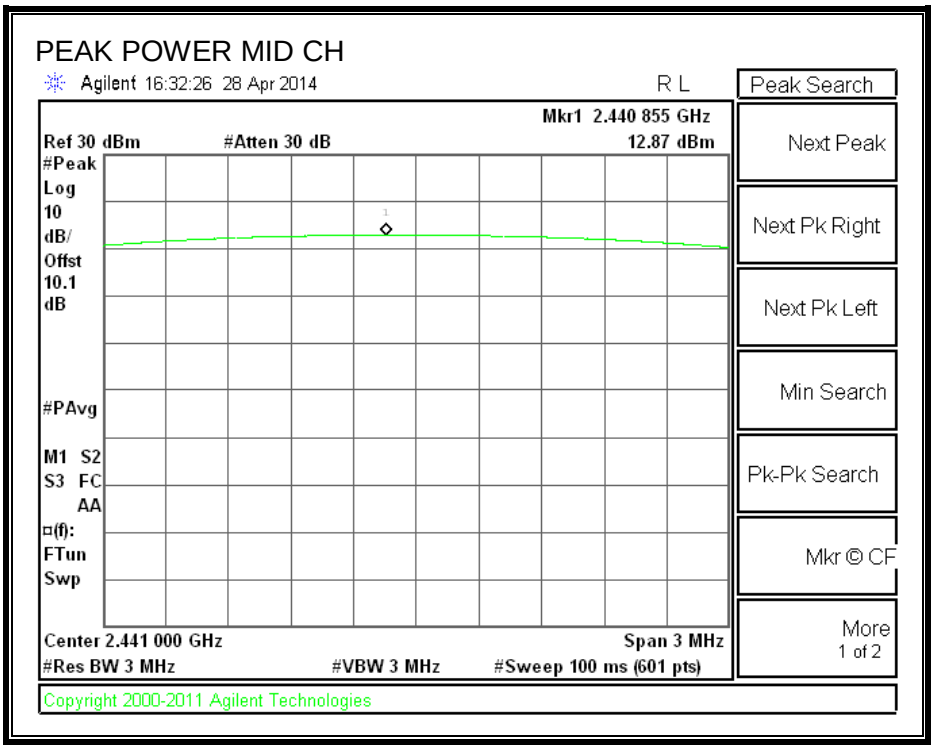
GFSK OUTPUT POWER





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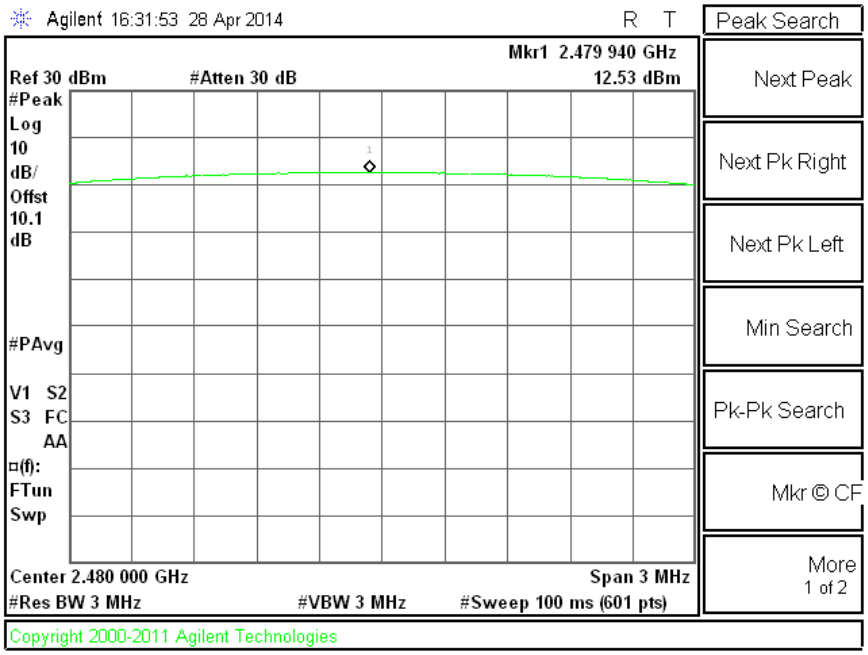
PEAK POWER HIGH CH



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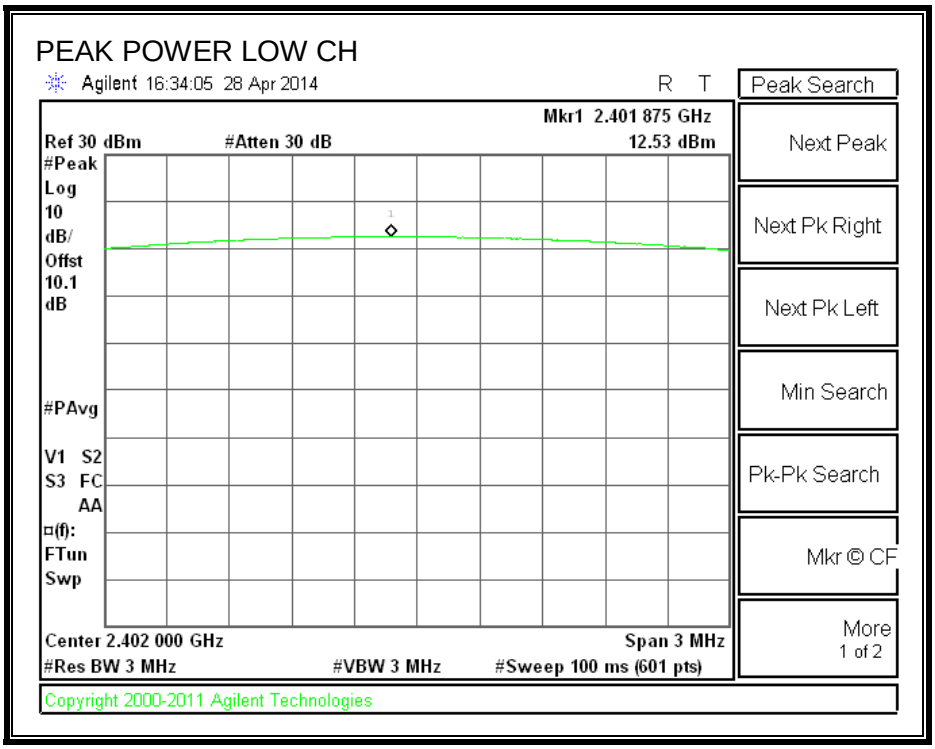
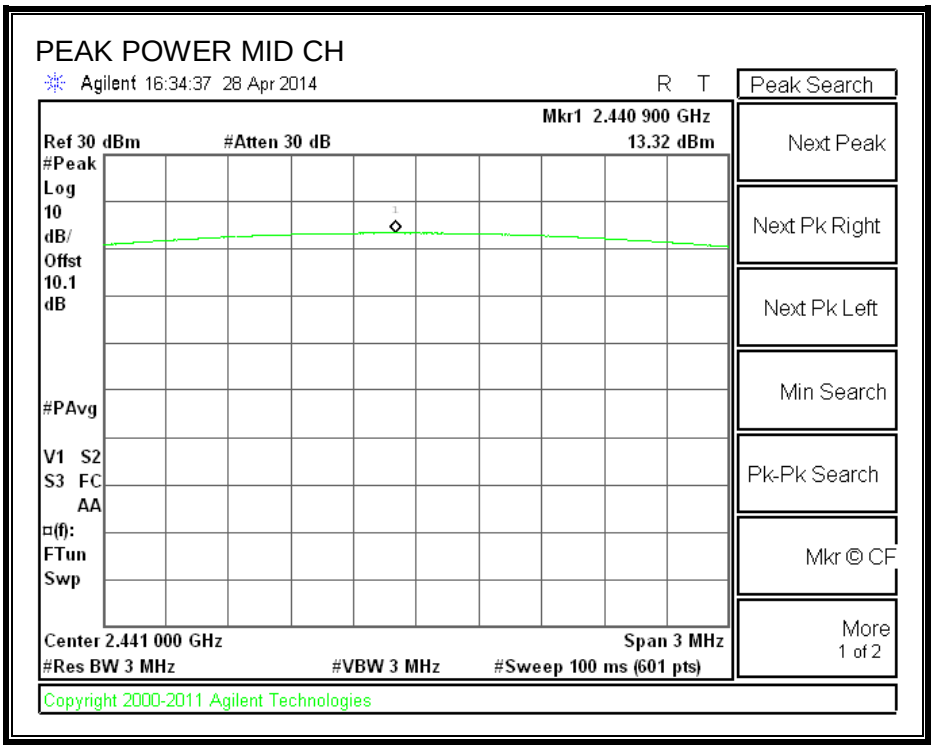
8PSK OUTPUT POWER





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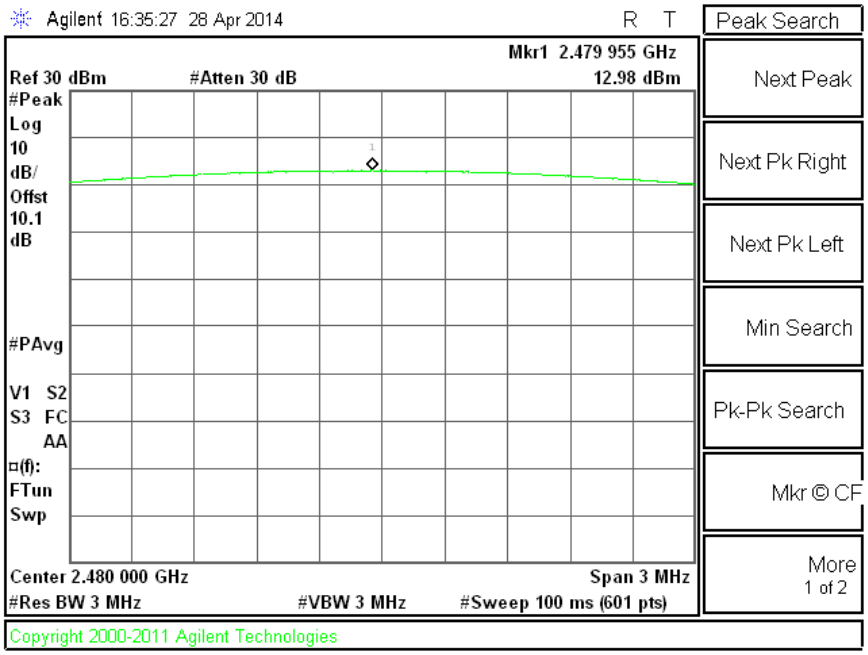
PEAK POWER HIGH CH



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8.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.7 dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

8.6.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	11.6
Middle	2441	12.2
High	2480	12.2
Worst		12.20

8.6.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.6
Middle	2441	10.2
High	2480	10.1
Worst		10.20

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8.6.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.6
Middle	2441	10.2
High	2480	10.1
Worst		10.20

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8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

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

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

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

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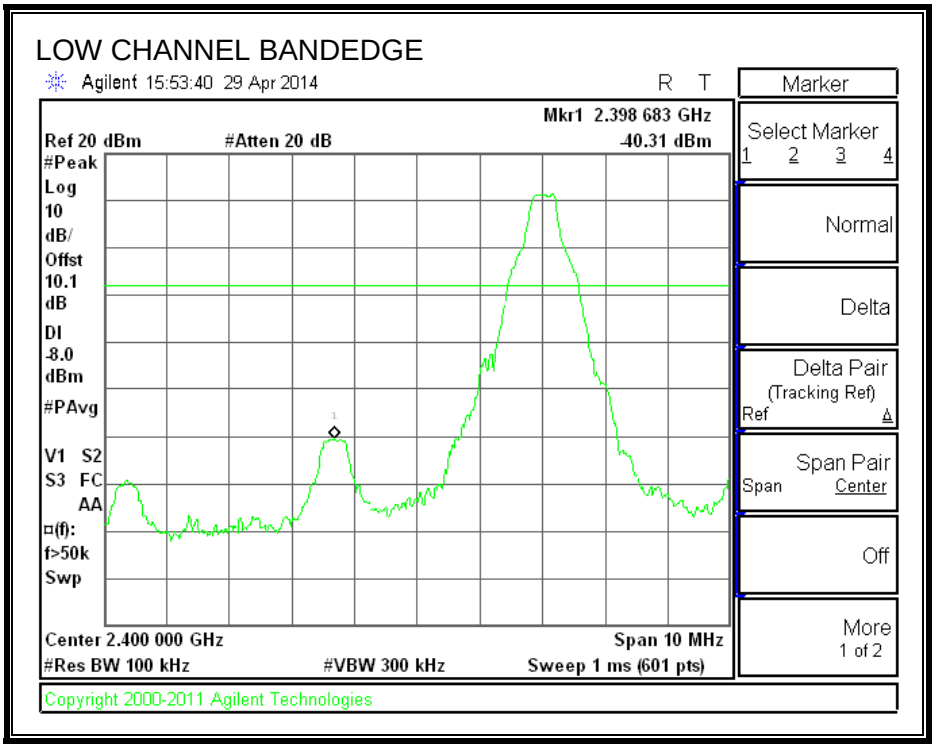
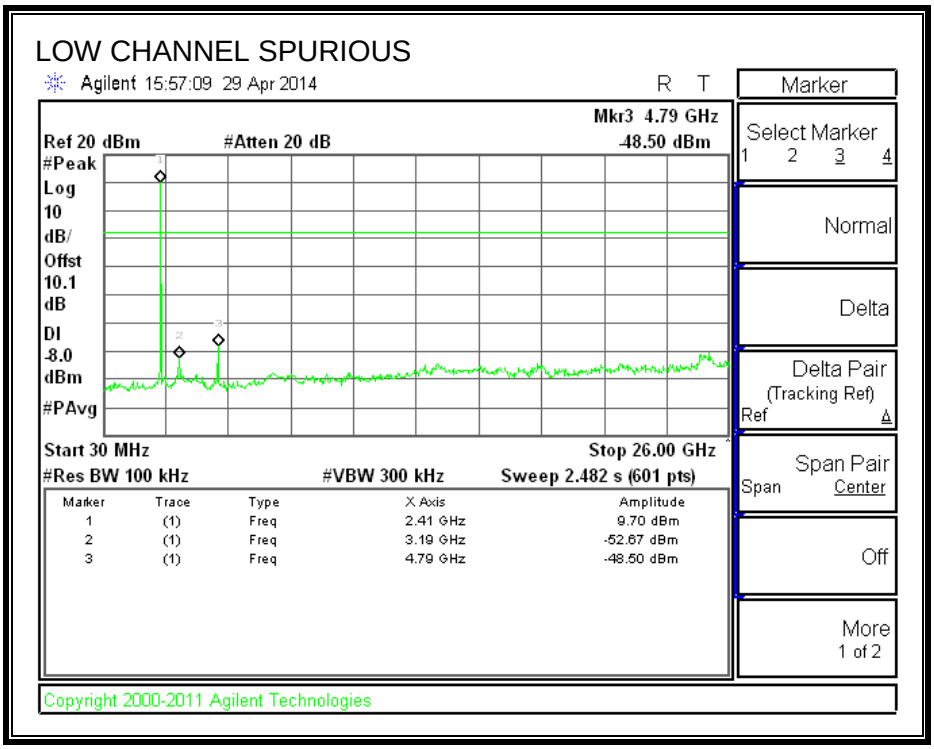
8.7.1. BASIC DATA RATE GFSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL





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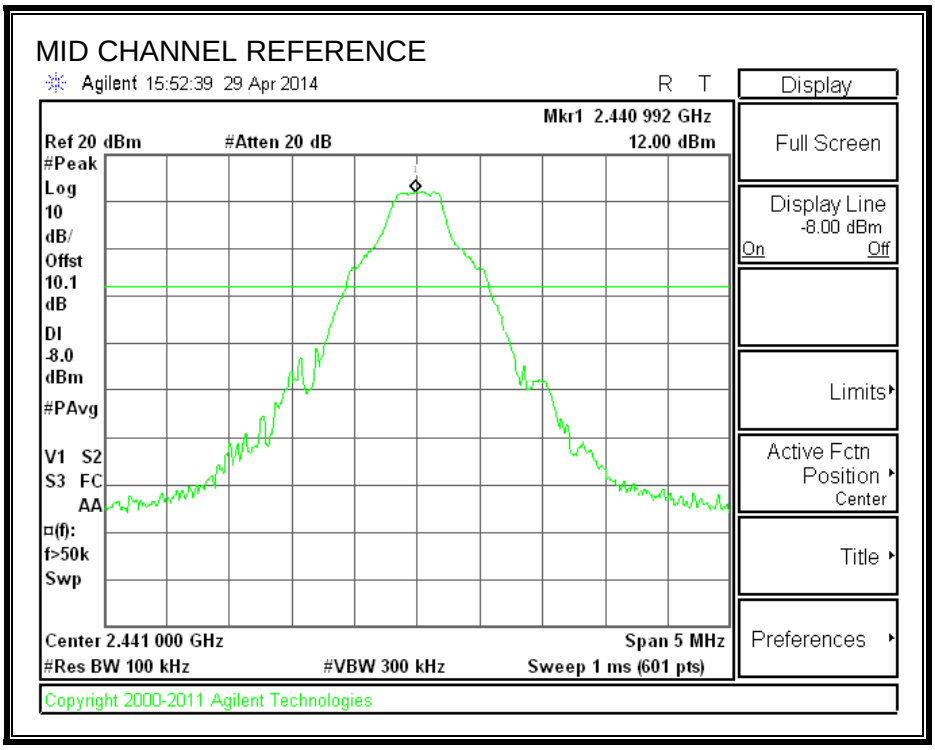
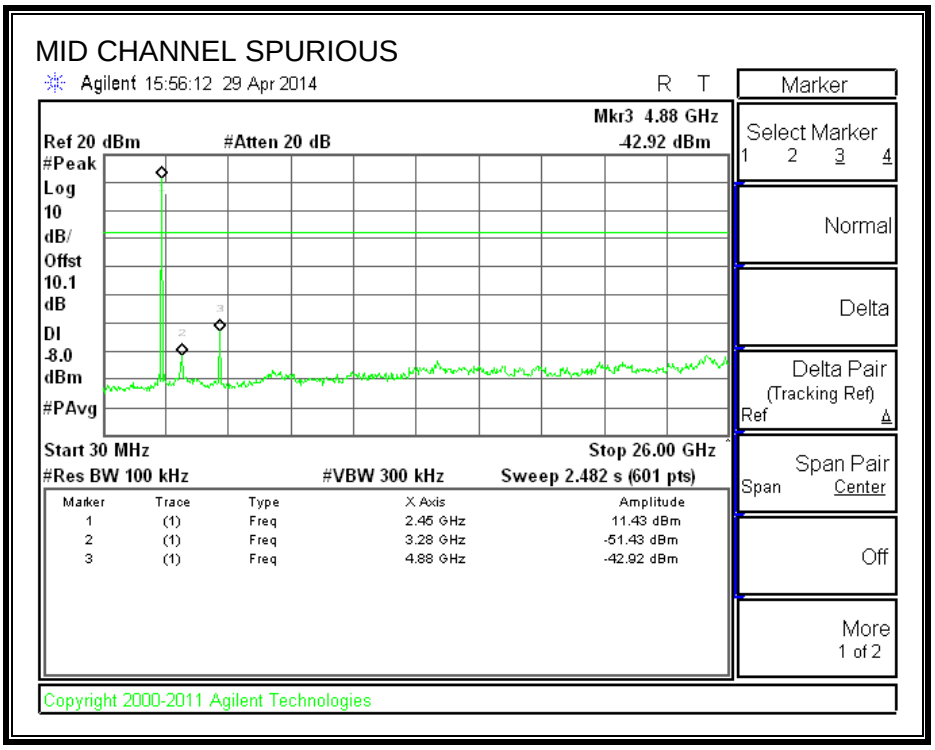
SPURIOUS EMISSIONS, MID CHANNEL





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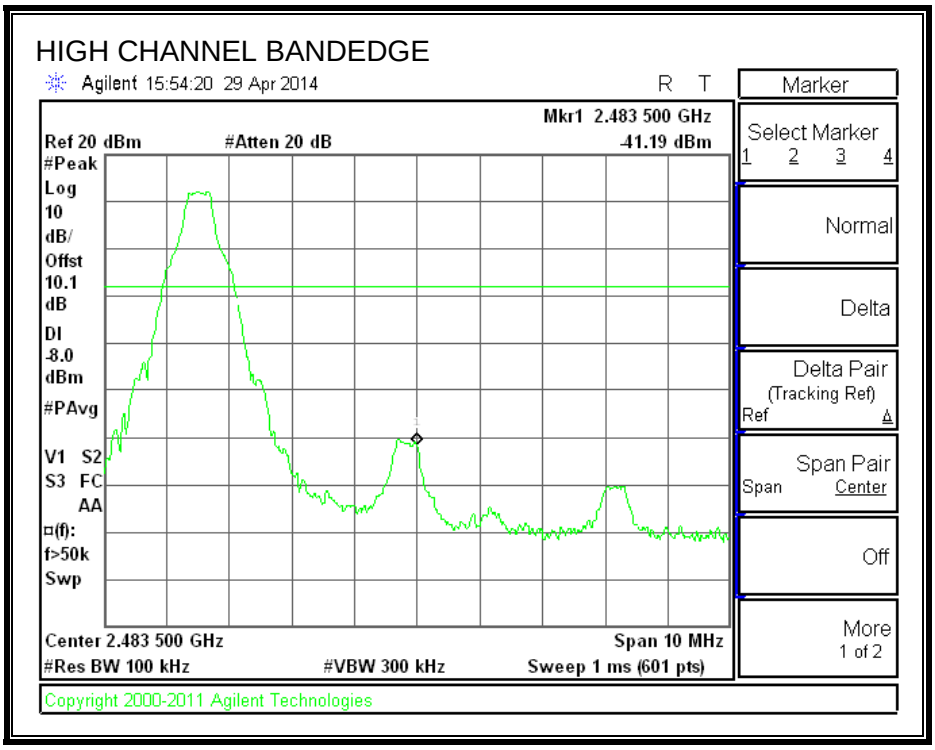
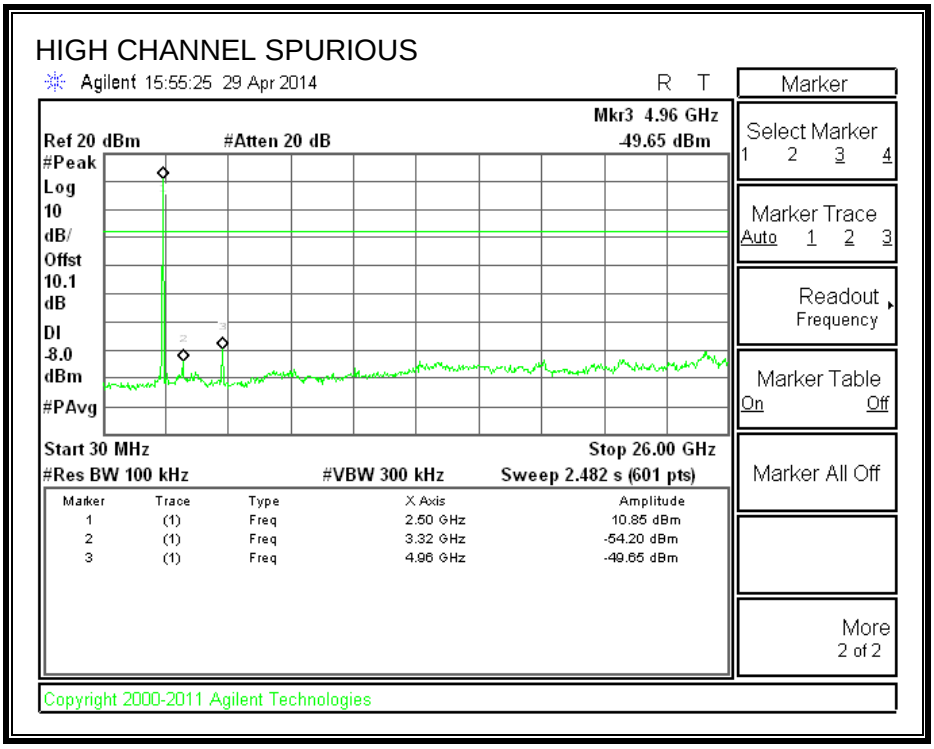
SPURIOUS EMISSIONS, HIGH CHANNEL





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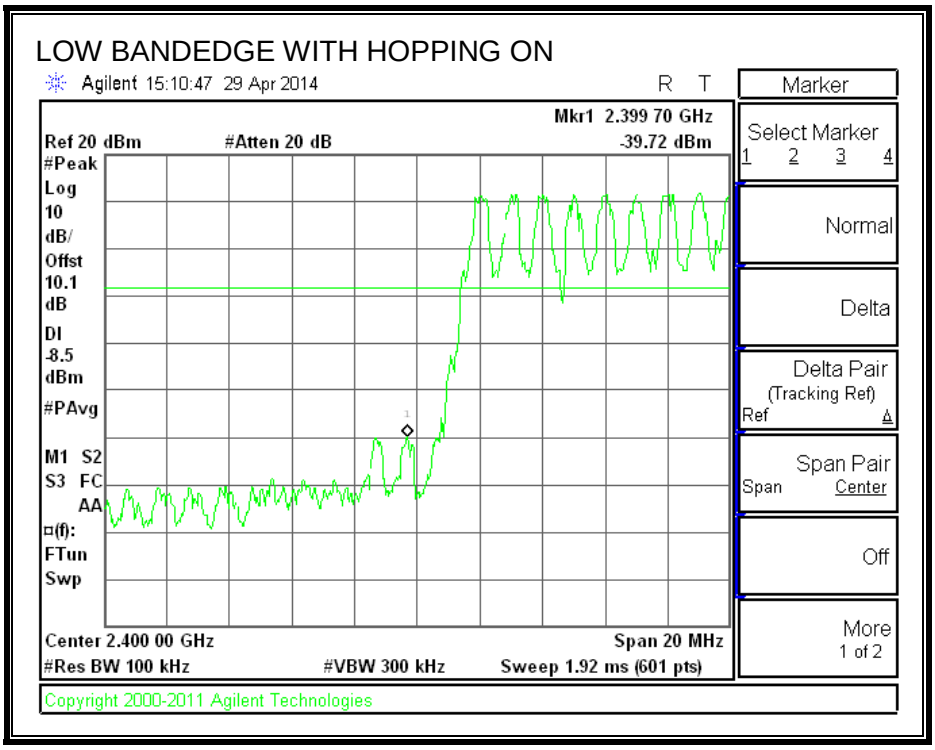
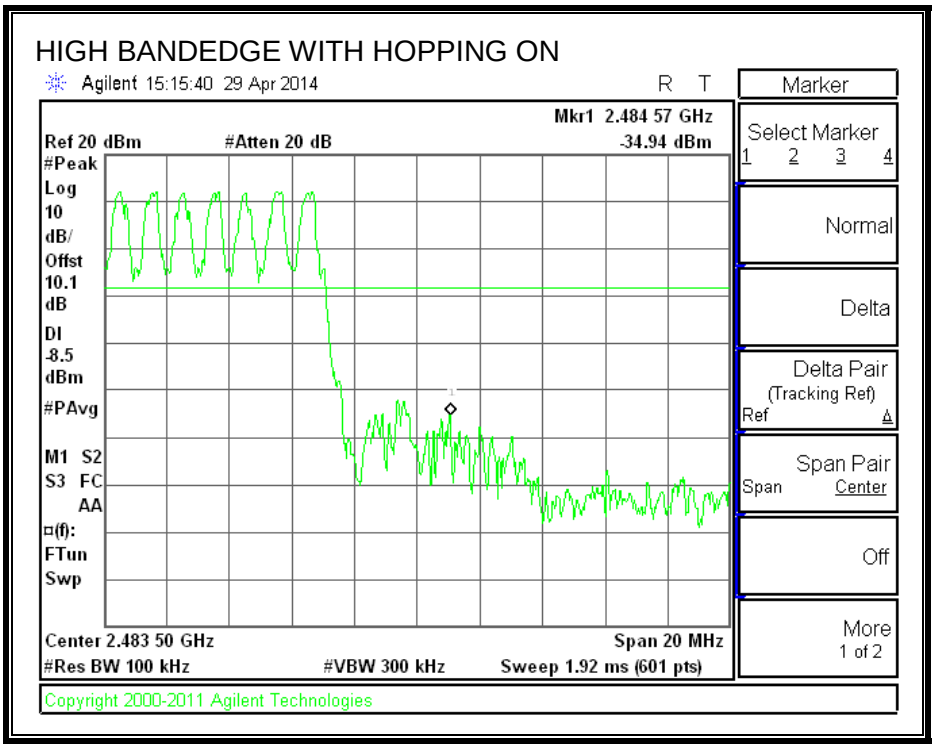
SPURIOUS BANDEDGE EMISSIONS WITH GFSK HOPPING ON





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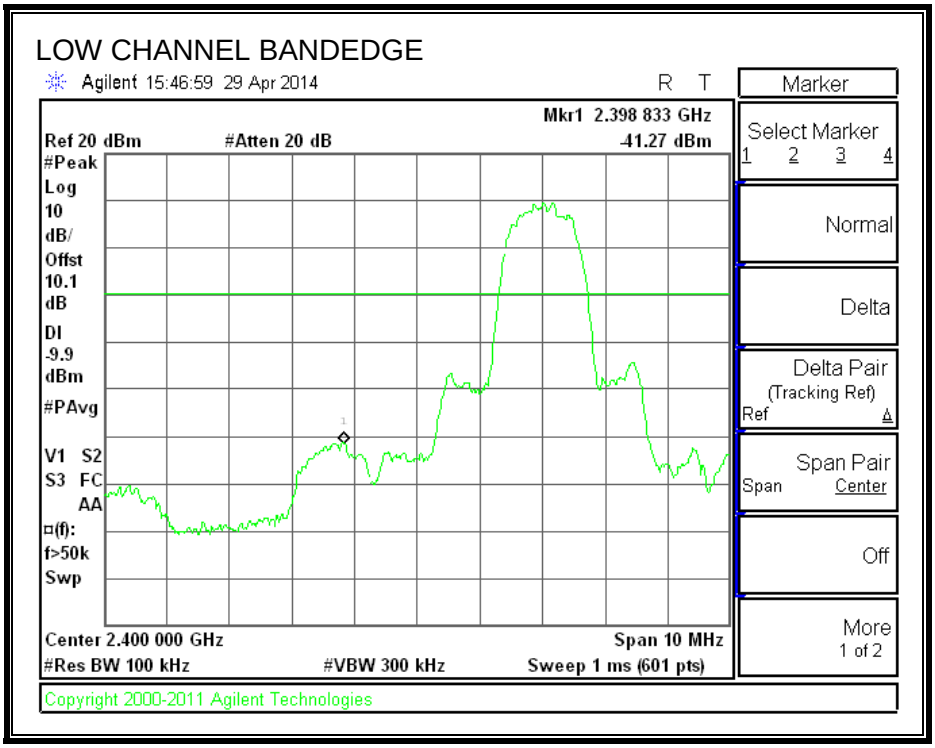
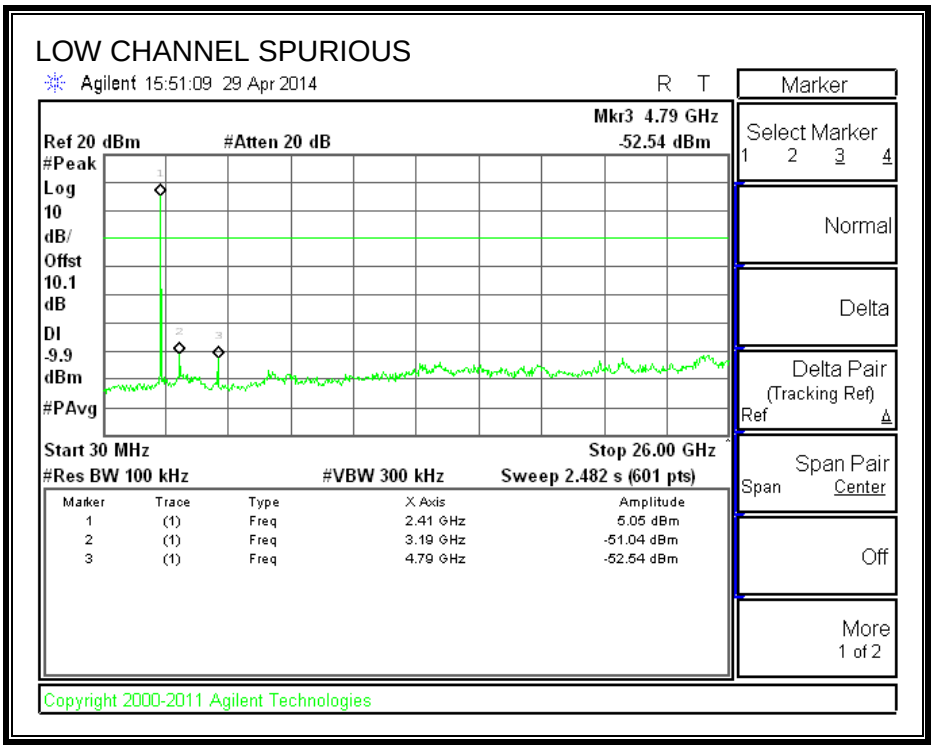
8.7.1. ENHANCED DATA RATE 8PSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL





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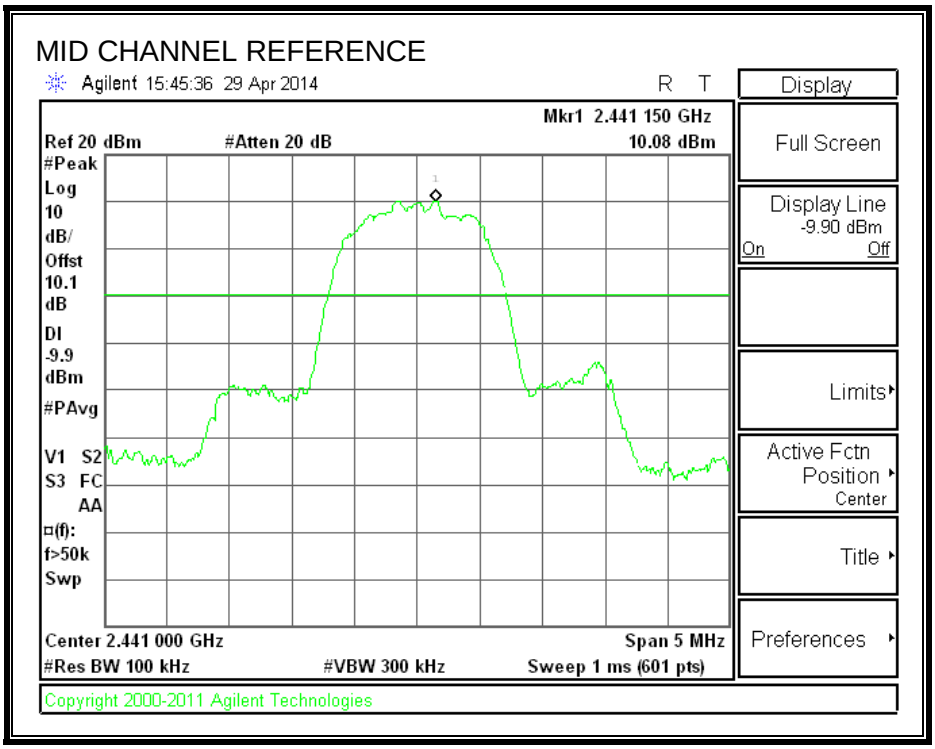
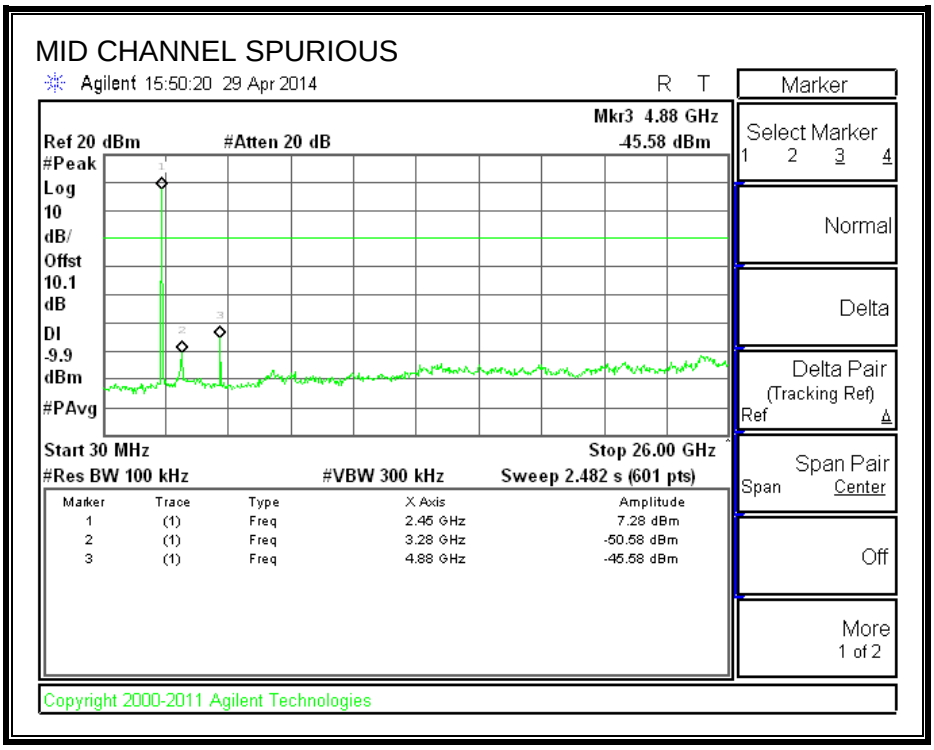
SPURIOUS EMISSIONS, MID CHANNEL





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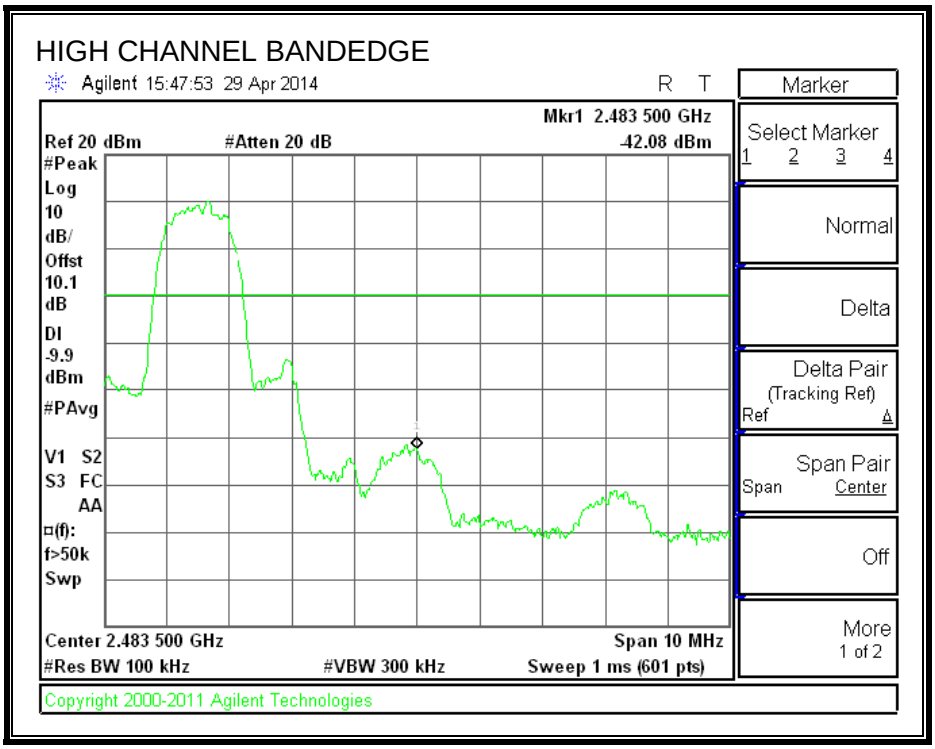
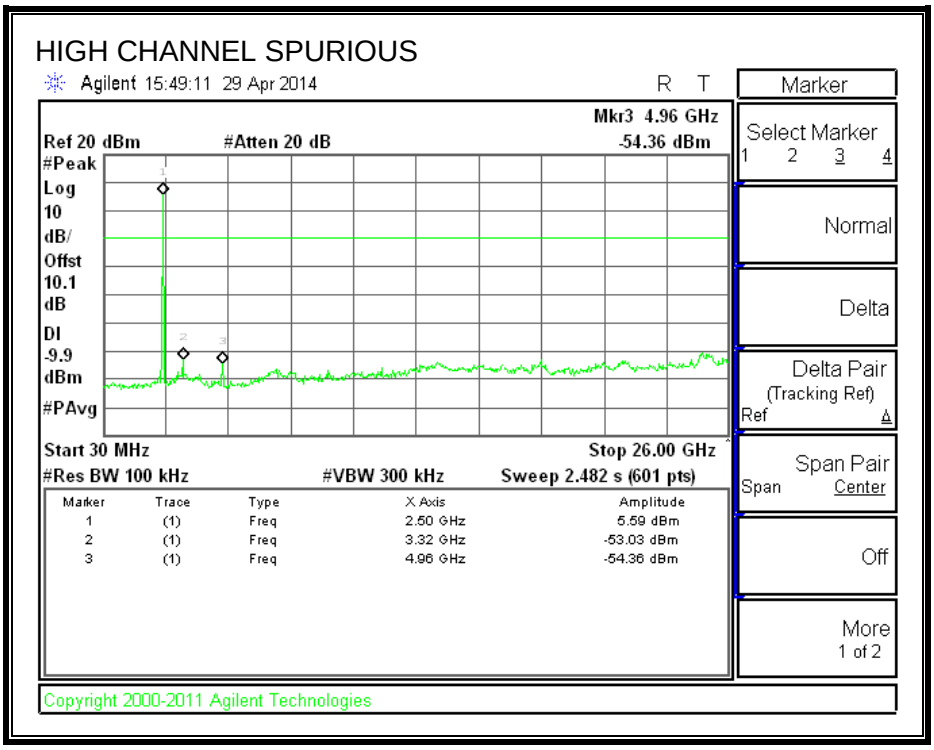
SPURIOUS EMISSIONS, HIGH CHANNEL





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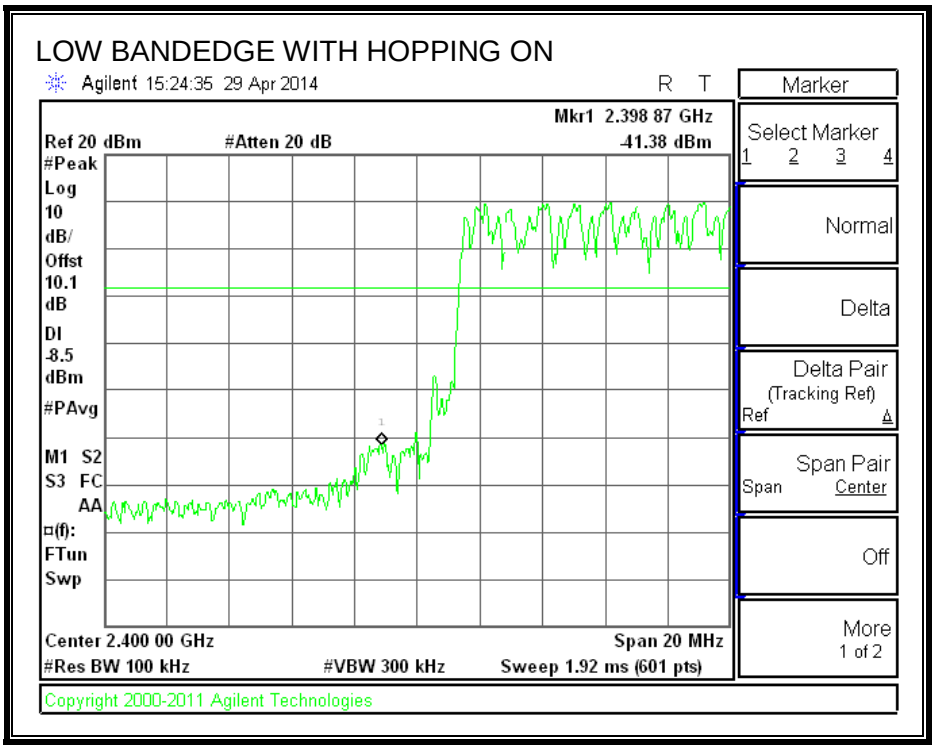
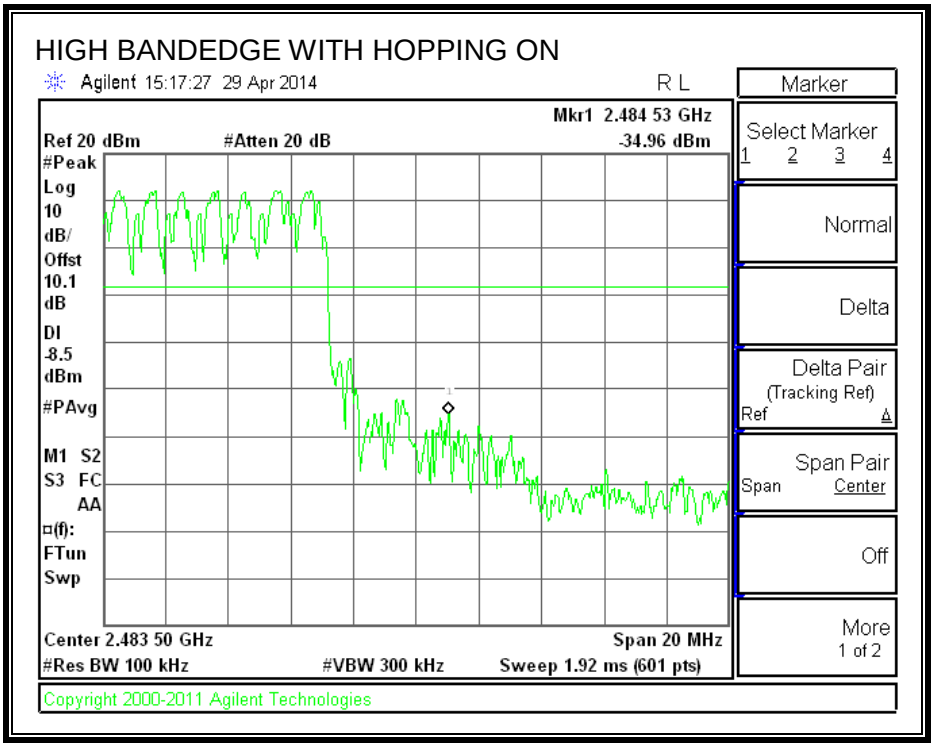
SPURIOUS BANDEDGE EMISSIONS WITH 8PSK HOPPING ON





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9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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

TEST PROCEDURE

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

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

For band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 1/T (on time) for average measurement. GFSK = 1/T = 1 / 0.0029S = 350Hz.

The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

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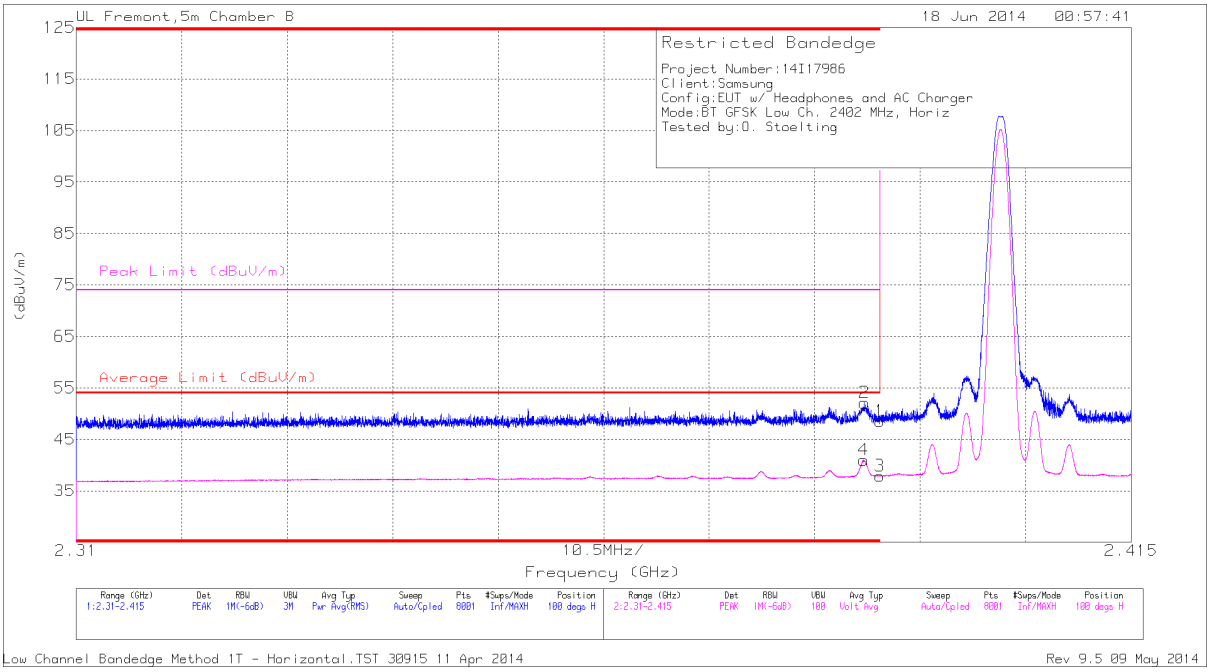
9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.22	PK	32.1	-22.8	48.52	-	-	74	-25.48	100	296	H
2	* 2.388	42.81	PK	32.1	-22.8	52.11	-	-	74	-21.89	100	296	H
3	* 2.39	28.58	VB1T	32.1	-22.8	37.88	54	-16.12	-	-	100	296	H
4	* 2.388	31.7	VB1T	32.1	-22.8	41	54	-13	-	-	100	296	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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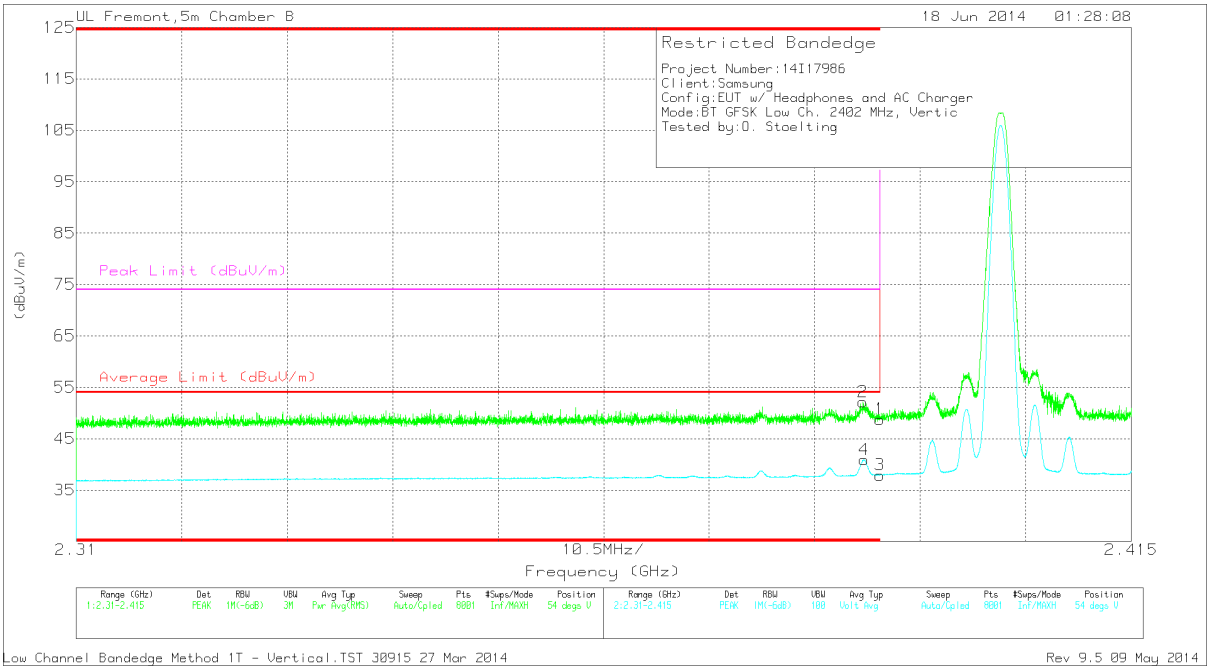
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.388	42.84	PK	32.1	-22.8	52.14	-	-	74	-21.86	54	361	V
4	* 2.388	31.61	VB1T	32.1	-22.8	40.91	54	-13.09	-	-	54	361	V
1	* 2.39	39.5	PK	32.1	-22.8	48.8	-	-	74	-25.2	54	361	V
3	* 2.39	28.63	VB1T	32.1	-22.8	37.93	54	-16.07	-	-	54	361	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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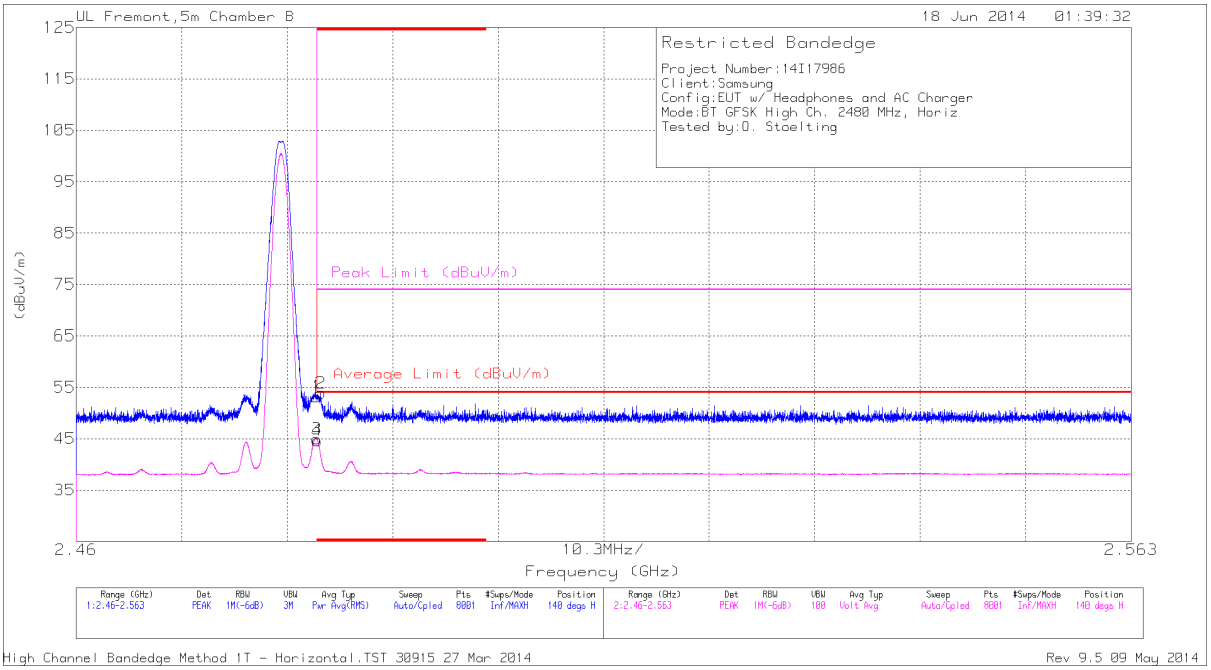
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.5	PK	32.4	-22.7	53.2	-	-	74	-20.8	140	335	H
2	* 2.484	44.18	PK	32.4	-22.7	53.88	-	-	74	-20.12	140	335	H
3	* 2.484	35.23	VB1T	32.4	-22.7	44.93	54	-9.07	-	-	140	335	H
4	* 2.484	34.95	VB1T	32.4	-22.7	44.65	54	-9.35	-	-	140	335	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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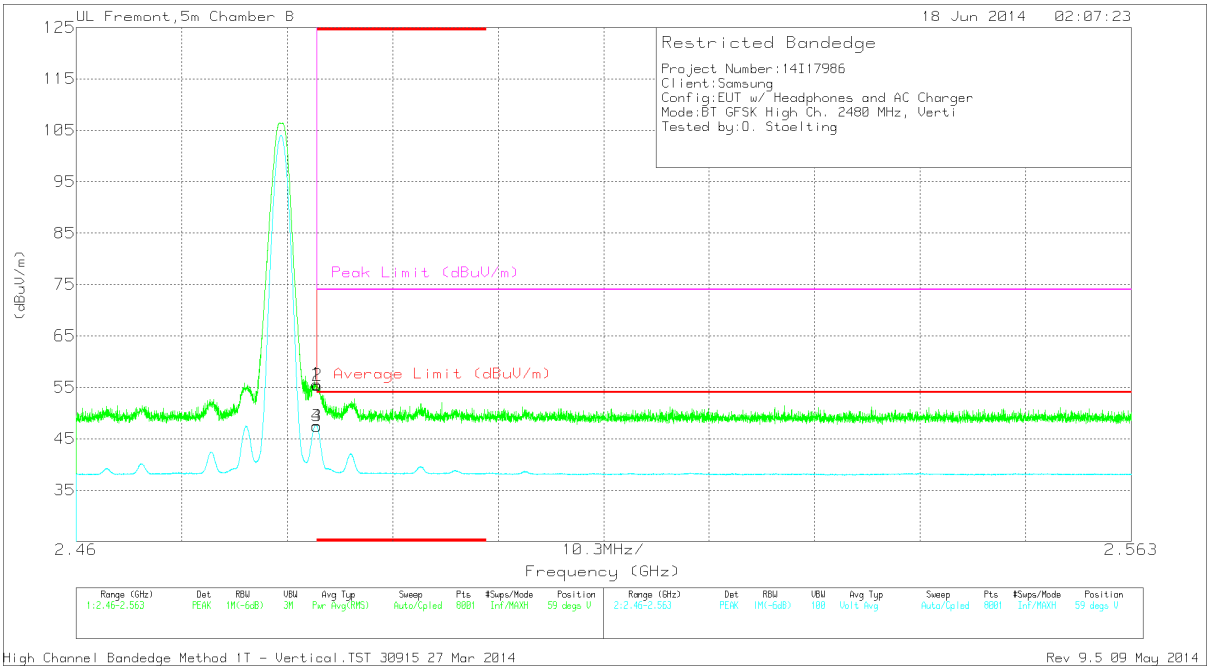
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.92	PK	32.4	-22.7	55.62	-	-	74	-18.38	59	280	V
2	* 2.484	45.67	PK	32.4	-22.7	55.37	-	-	74	-18.63	59	280	V
3	* 2.484	37.75	VB1T	32.4	-22.7	47.45	54	-6.55	-	-	59	280	V
4	* 2.484	37.78	VB1T	32.4	-22.7	47.48	54	-6.52	-	-	59	280	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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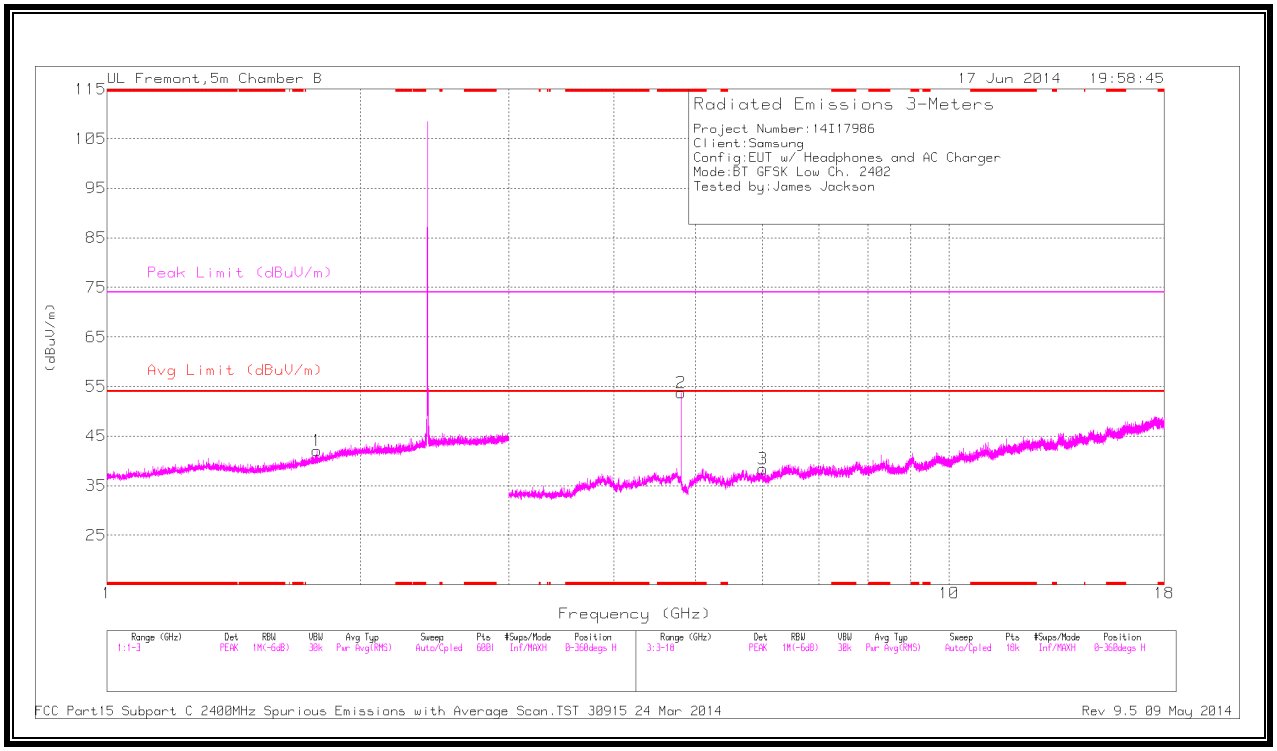
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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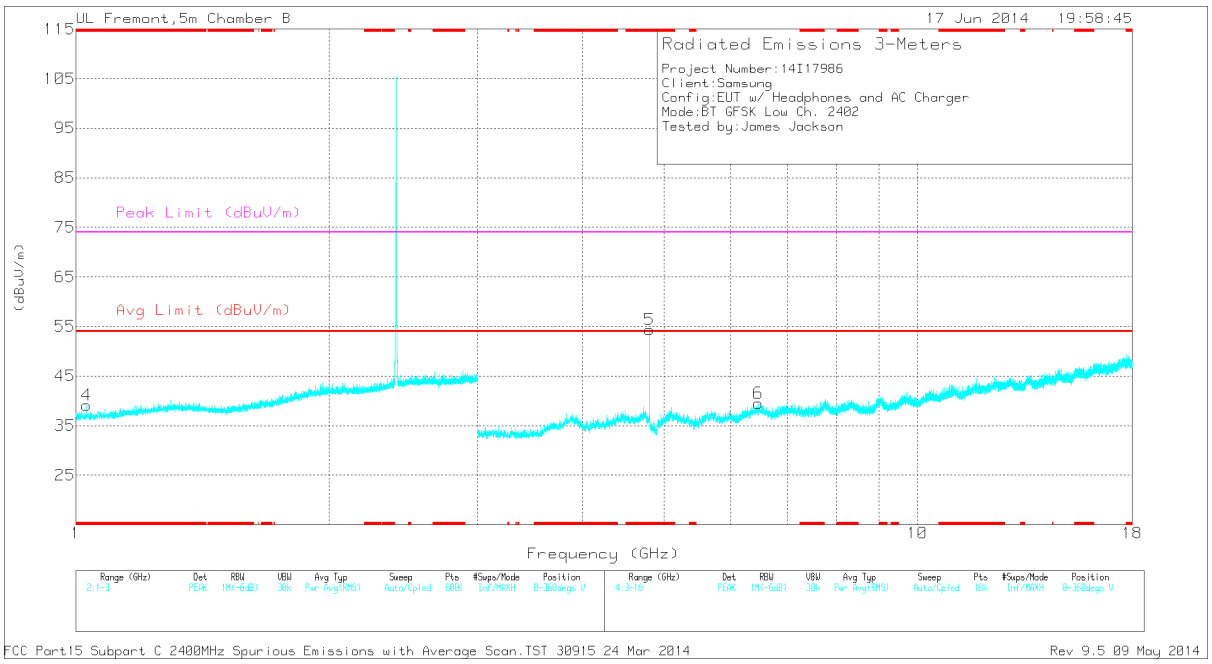
VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.029	36.81	PK	27.1	-24.8	0	39.11	-	-	74	-34.89	0-360	201	V
2	* 4.804	48.9	PK	34.2	-29.4	0	53.7	-	-	74	-20.3	0-360	201	H
5	* 4.804	49.57	PK	34.2	-29.4	0	54.37	-	-	74	-19.63	0-360	201	V
1	1.775	35.72	PK	29.9	-23.6	0	42.02	-	-	-	-	0-360	337	H
3	6.006	31.75	PK	35.3	-28.7	0	38.35	-	-	-	-	0-360	101	H
6	6.471	32.7	PK	35.6	-28.8	0	39.5	-	-	-	-	0-360	101	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.032	43.62	PK3	27.1	-24.8	0	45.92	-	-	74	-28.08	206	138	H
* 1.025	31.02	VB1T	27.1	-24.8	0	33.32	54	-20.68	-	-	206	138	H
* 1.024	43.26	PK3	27.1	-24.8	0	45.56	-	-	74	-28.44	160	273	V
* 1.024	31.04	VB1T	27.1	-24.8	0	33.34	54	-20.66	-	-	160	273	V
* 4.804	46.37	PK3	34.2	-29.4	0	51.17	-	-	74	-22.83	0	268	H
* 4.804	42.37	VB1T	34.2	-29.4	0	47.17	54	-6.83	-	-	0	268	H
* 4.804	52.85	PK3	34.2	-29.4	0	57.65	-	-	74	-16.35	85	244	V
* 4.804	51.1	VB1T	34.2	-29.4	0	55.9			-	-	85	244	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

For Marker 3, 4.804MHz spur, used the following method to do averaging:
DCCF = 20 * Log (100ms / Ton)
Ton = 2.867ms (from section 8.4)
DCCF = 30.9
Corrected AV reading = Peak Reading – DCCF
= 57.65 – 30.9
= 26.75 dB

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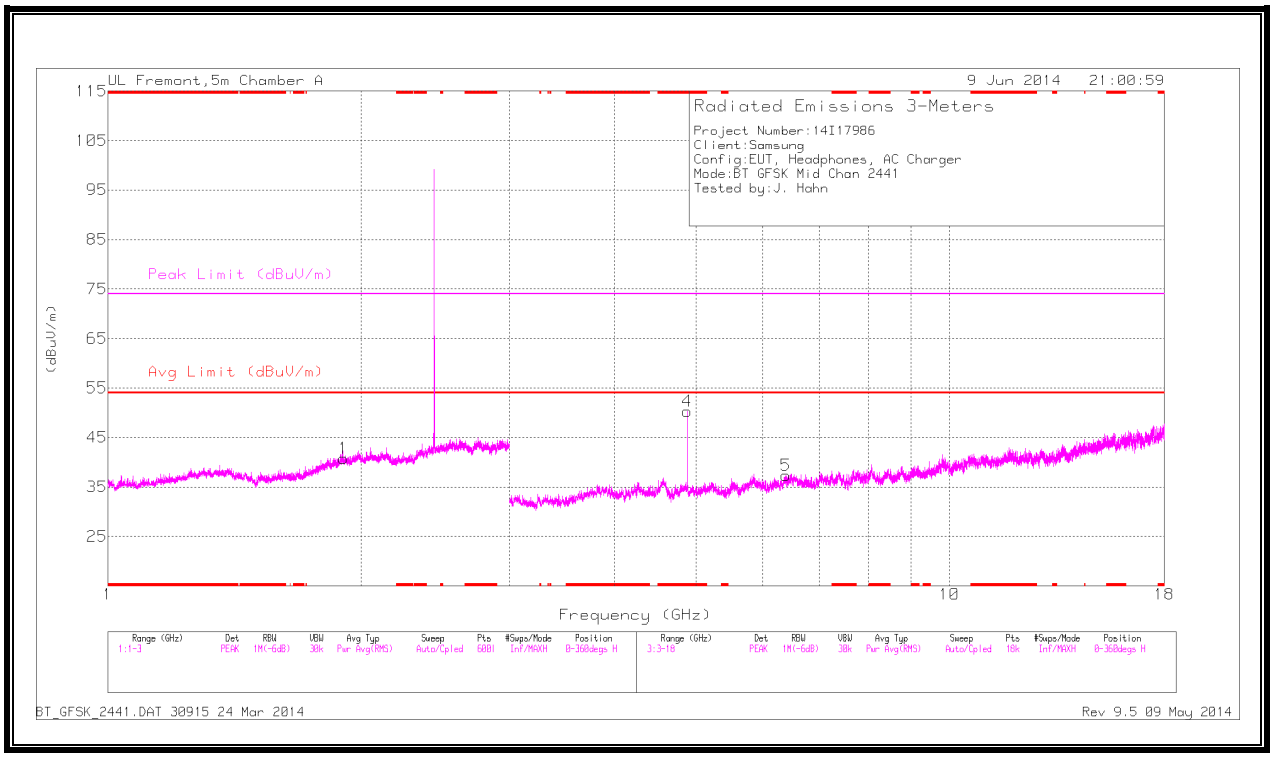
MID CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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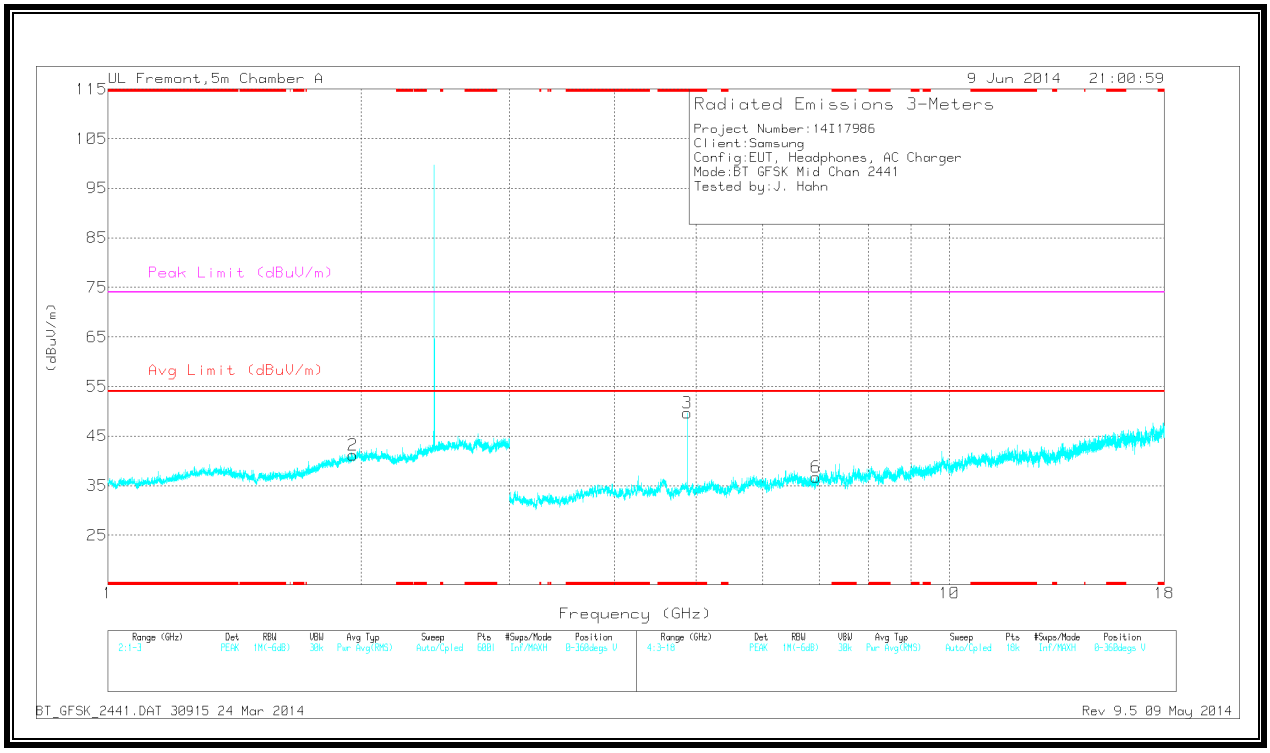
VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 4.882	51.23	PK	34.2	-30.6	0	54.83	-	-	74	-19.17	0-360	99	H
3	* 3.52	34.42	PK	32.9	-31.3	0	36.02	-	-	74	-37.98	0-360	202	V
4	* 3.555	35.16	PK	33	-31.2	0	36.96	-	-	74	-37.04	0-360	202	V
1	2.052	34.67	PK	31.3	-23.5	0	42.47	-	-	-	-	0-360	202	H
2	3.255	34.06	PK	32.8	-31	0	35.86	-	-	-	-	0-360	202	H
6	9.764	28.88	PK	36.9	-24.2	0	41.58	-	-	-	-	0-360	202	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 4.882	44.6	PK	34	-28.3	0	50.3	-	-	74	-23.7	0-360	100	H
3	* 4.882	43.91	PK	34	-28.3	0	49.61	-	-	74	-24.39	0-360	200	V
1	1.904	34.28	PK	31.7	-25.2	0	40.78	-	-	-	-	0-360	199	H
2	1.955	34.29	PK	31.9	-25	0	41.19	-	-	-	-	0-360	200	V
5	6.389	29.84	PK	35.5	-28	0	37.34	-	-	-	-	0-360	100	H
6	6.941	28.87	PK	35.3	-27.5	0	36.67	-	-	-	-	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.882	49.89	PK2	34	-28.4	55.49	-	-	74	-18.51	31	195	H
* 4.882	46.68	VB1T	34	-28.4	53.38	54	-.62	-	-	31	195	H
* 4.882	49.83	PK2	34	-28.4	55.43	-	-	74	-18.57	344	269	V
* 4.882	46.59	VB1T	34	-28.3	53.39	54	-.61	-	-	344	269	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

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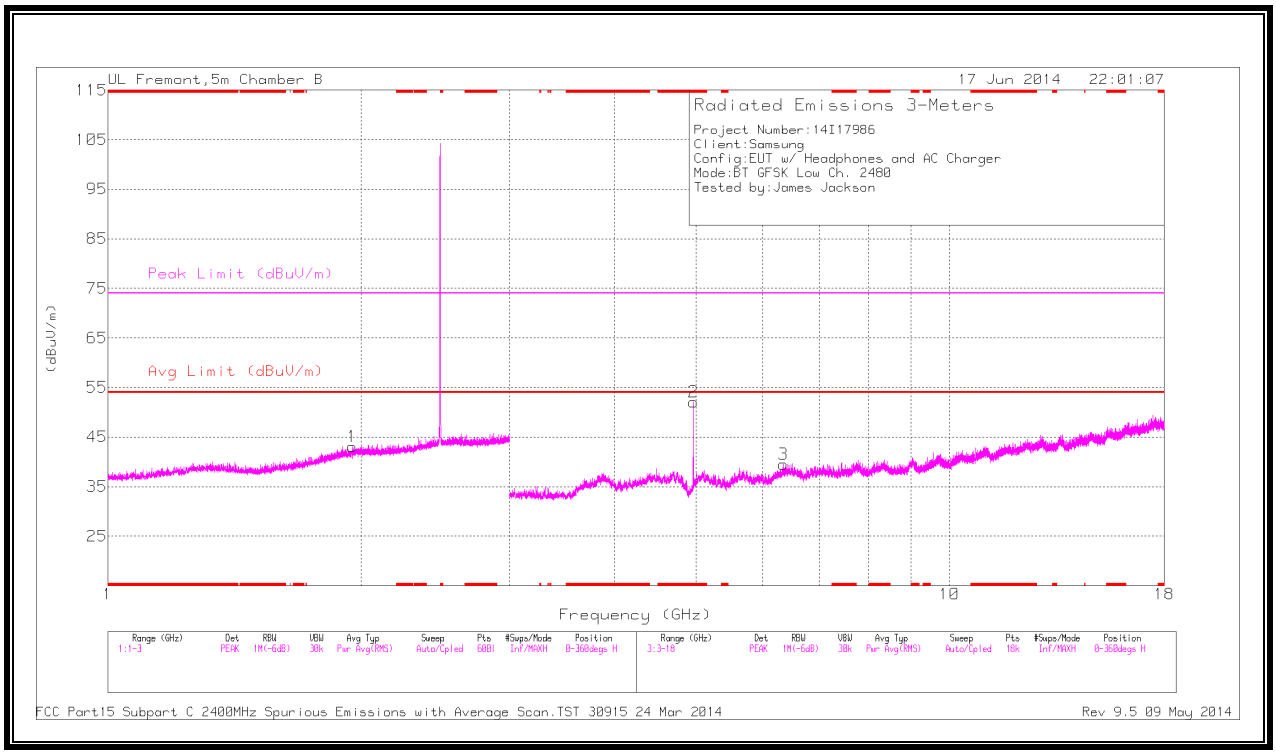
HIGH CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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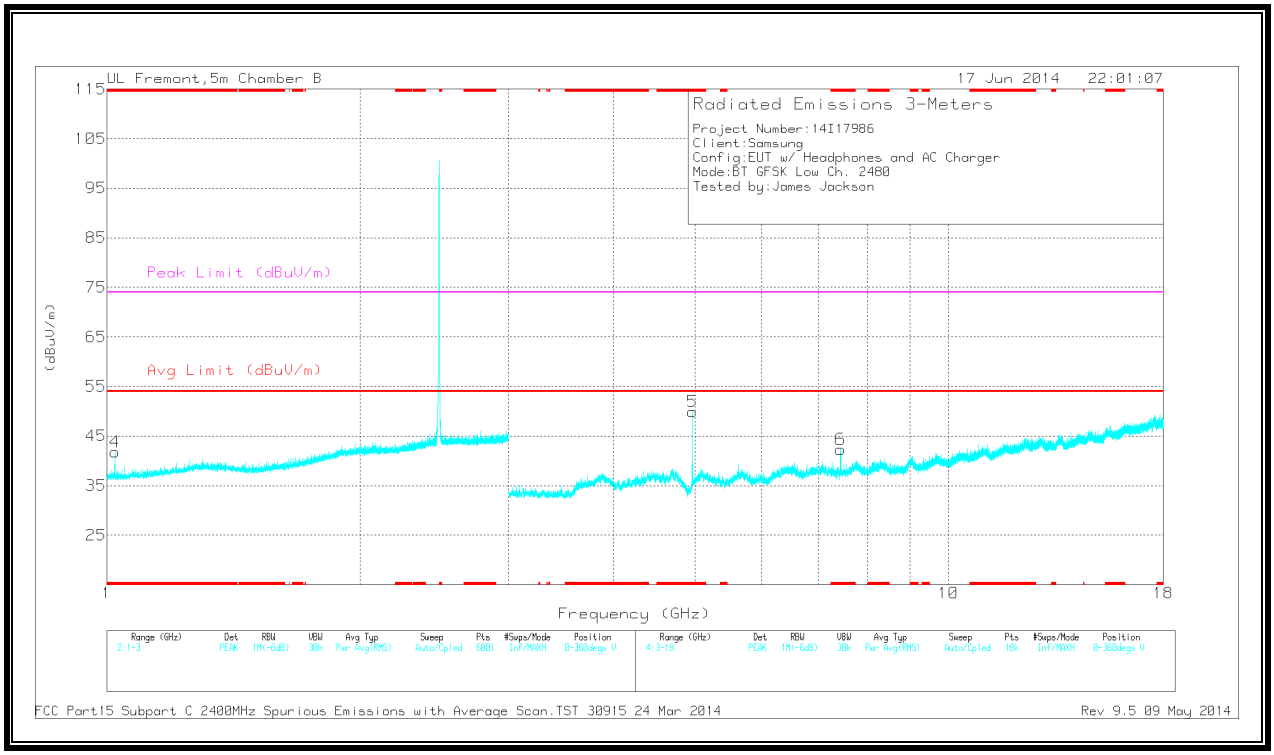
VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.022	39.49	PK	27.1	-24.8	0	41.79	-	-	74	-32.21	0-360	201	V
2	* 4.962	48.25	PK	34.2	-30.4	0	52.05	-	-	74	-21.95	0-360	101	H
5	* 4.962	46.15	PK	34.2	-30.4	0	49.95	-	-	74	-24.05	0-360	101	V
6	* 7.442	33.11	PK	35.6	-26.4	0	42.31	-	-	74	-31.69	0-360	101	V
1	1.951	35.34	PK	31.2	-23.5	0	43.04	-	-	-	-	0-360	201	H
3	6.352	32.81	PK	35.6	-28.9	0	39.51	-	-	-	-	0-360	201	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.014	43.73	PK3	27.1	-24.8	0	46.03	-	-	74	-27.97	1	101	V
* 4.962	53.04	PK3	34.2	-30.4	0	56.84	-	-	74	-17.16	221	189	H
* 4.962	50.3	VB1T	34.2	-30.4	0	54.1			-	-	221	189	H
* 4.962	51.08	PK3	34.2	-30.4	0	54.88	-	-	74	-19.12	352	102	V
* 4.962	47.79	VB1T	34.2	-30.4	0	51.59	54	-2.41	-	-	352	102	V
* 7.442	38.45	PK3	35.6	-26.4	0	47.65	-	-	74	-26.35	352	102	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

For Marker 3, 4.962MHz spur, used the following method to do averaging:
DCCF = 20 * Log (100ms / Ton)
Ton = 2.867ms(from section 8.4)
DCCF = 30.9
Corrected AV reading = Peak Reading – DCCF
= 56.84 – 30.9
= 25.94 dB

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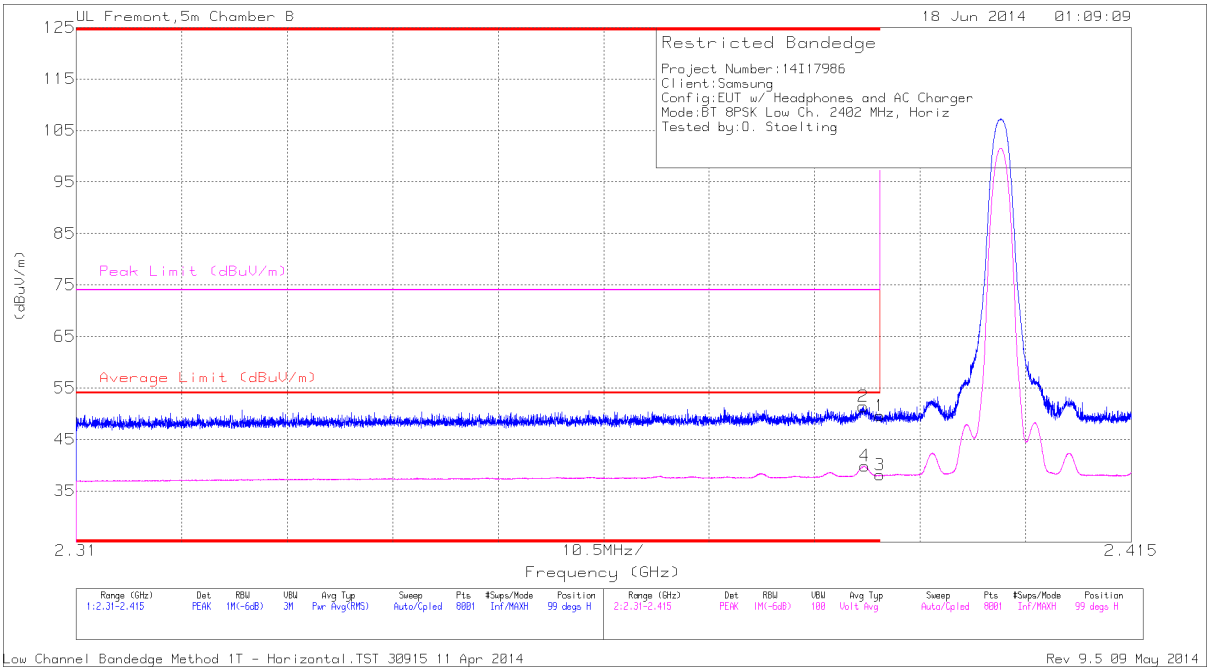
9.2.2. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.388	42.09	PK	32.1	-22.8	51.39	-	-	74	-22.61	99	298	H
4	* 2.388	30.55	VB1T	32.1	-22.8	39.85	54	-14.15	-	-	99	298	H
1	* 2.39	40.27	PK	32.1	-22.8	49.57	-	-	74	-24.43	99	298	H
3	* 2.39	28.78	VB1T	32.1	-22.8	38.08	54	-15.92	-	-	99	298	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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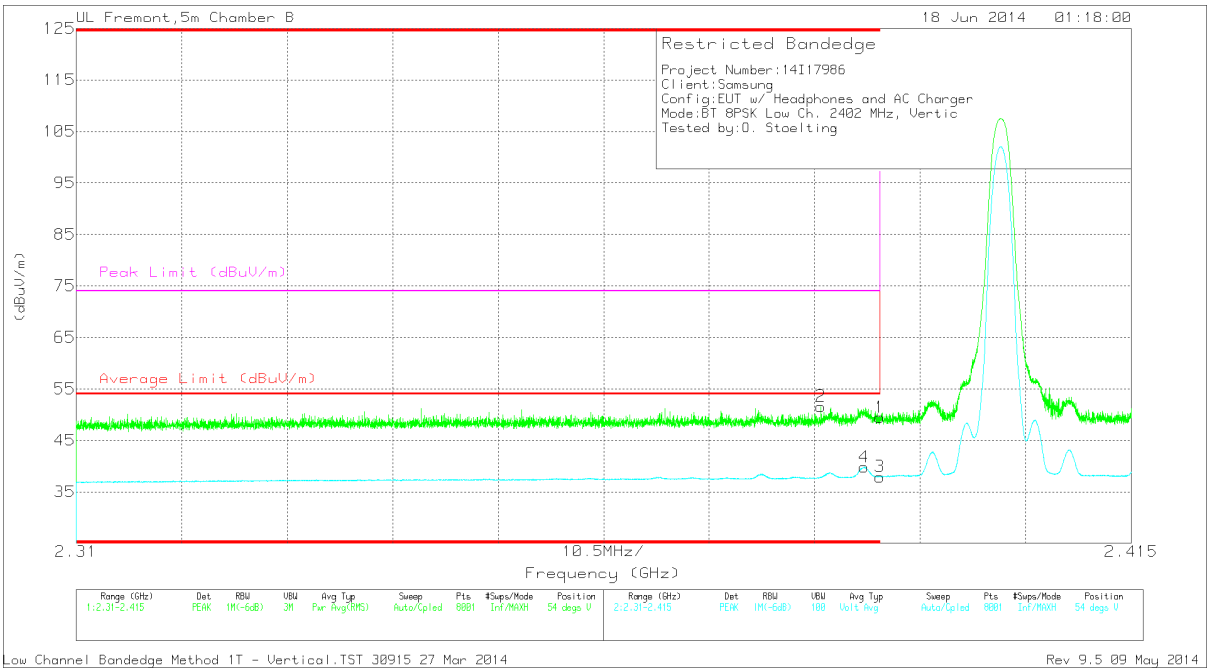
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.384	42.37	PK	32.1	-22.9	51.57	-	-	74	-22.43	54	365	V
4	* 2.388	30.5	VB1T	32.1	-22.8	39.8	54	-14.2	-	-	54	365	V
1	* 2.39	40.18	PK	32.1	-22.8	49.48	-	-	74	-24.52	54	365	V
3	* 2.39	28.63	VB1T	32.1	-22.8	37.93	54	-16.07	-	-	54	365	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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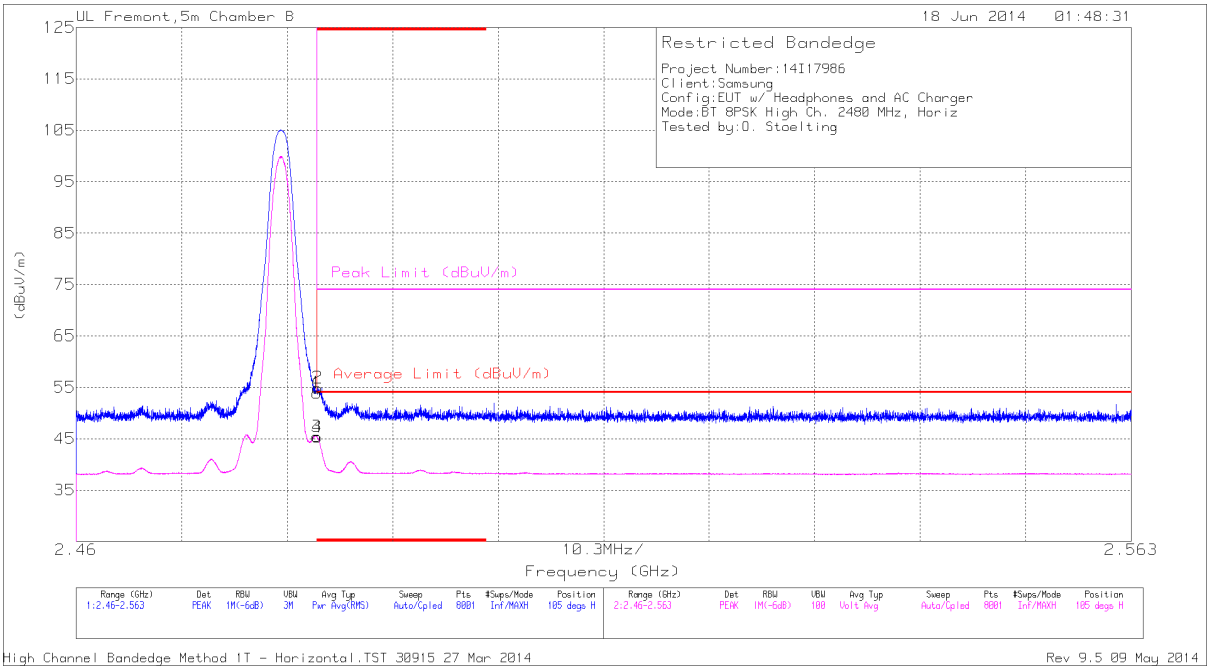
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	44.2	PK	32.4	-22.7	53.9	-	-	74	-20.1	105	281	H
2	* 2.484	45.19	PK	32.4	-22.7	54.89	-	-	74	-19.11	105	281	H
3	* 2.484	35.74	VB1T	32.4	-22.7	45.44	54	-8.56	-	-	105	281	H
4	* 2.484	35.61	VB1T	32.4	-22.7	45.31	54	-8.69	-	-	105	281	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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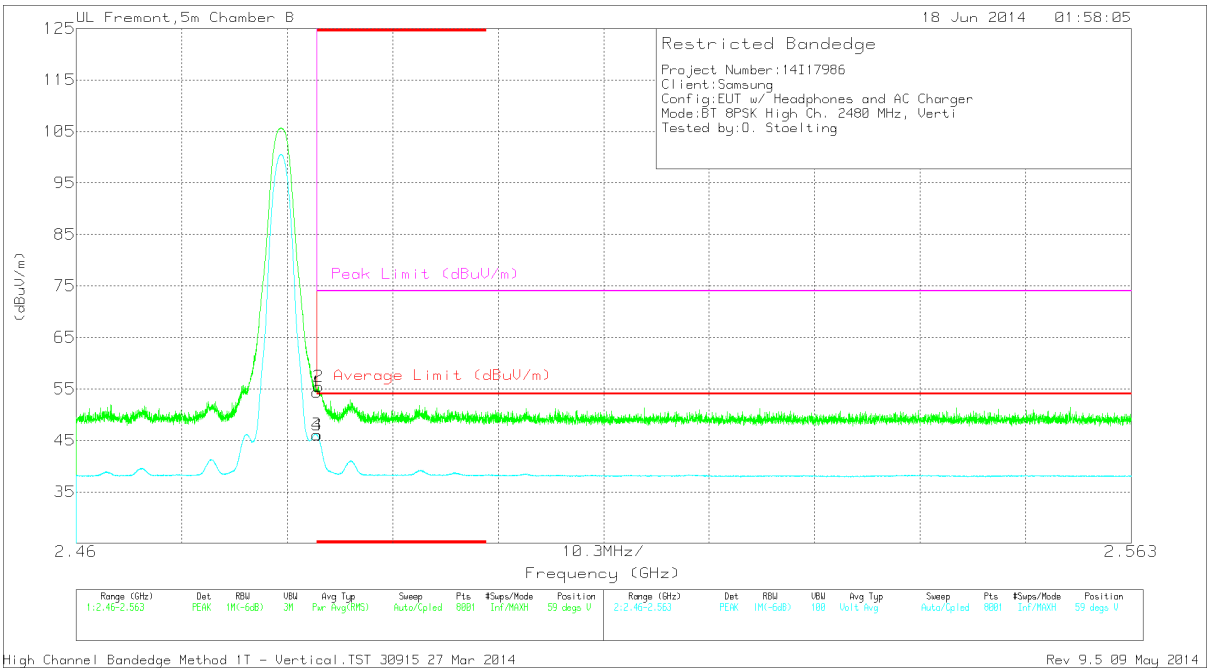
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	44.64	PK	32.4	-22.7	54.34	-	-	74	-19.66	59	281	V
2	* 2.484	45.75	PK	32.4	-22.7	55.45	-	-	74	-18.55	59	281	V
3	* 2.484	36.38	VB1T	32.4	-22.7	46.08	54	-7.92	-	-	59	281	V
4	* 2.484	36.32	VB1T	32.4	-22.7	46.02	54	-7.98	-	-	59	281	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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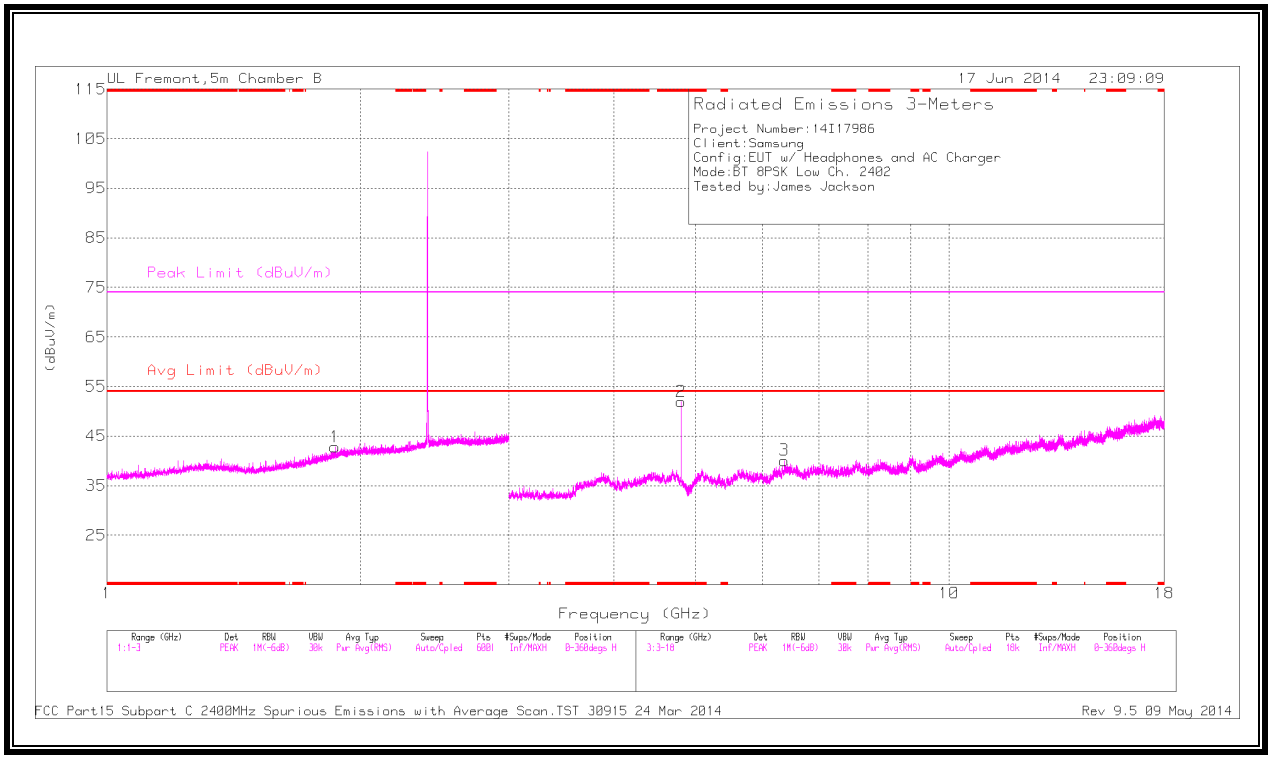
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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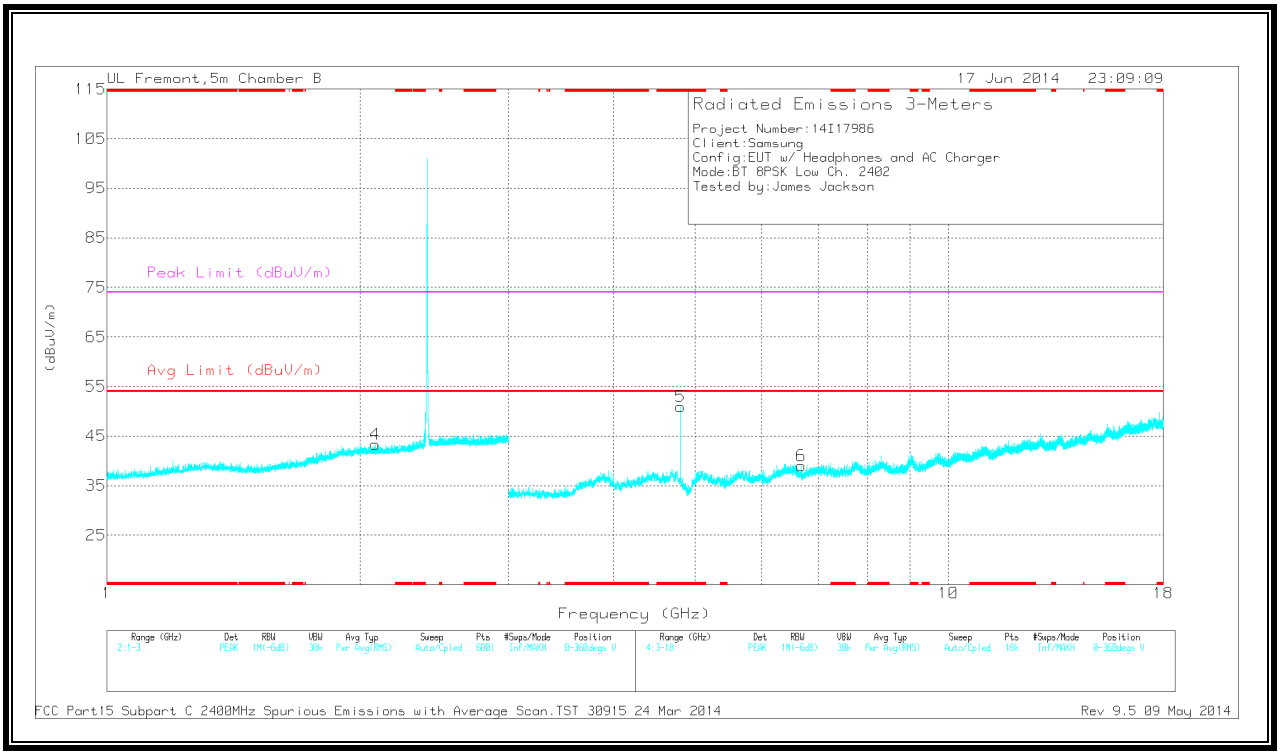
VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.804	47.15	PK	34.2	-29.4	0	51.95	-	-	74	-22.05	0-360	201	H
5	* 4.804	46.12	PK	34.2	-29.4	0	50.92	-	-	74	-23.08	0-360	201	V
1	1.865	35.67	PK	30.7	-23.6	0	42.77	-	-	-	-	0-360	100	H
4	2.082	35.3	PK	31.3	-23.3	0	43.3	-	-	-	-	0-360	100	V
3	6.374	33.48	PK	35.6	-29	0	40.08	-	-	-	-	0-360	101	H
6	6.682	32.03	PK	35.7	-28.7	0	39.03	-	-	-	-	0-360	101	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.804	52.55	PK3	34.2	-29.4	0	57.35	-	-	74	-16.65	185	251	H
* 4.804	45.49	VB1T	34.2	-29.4	0	50.29	54	-3.71	-	-	185	251	H
* 4.804	52.73	PK3	34.2	-29.4	0	57.53	-	-	74	-16.47	169	271	V
* 4.804	45.84	VB1T	34.2	-29.4	0	50.64	54	-3.36	-	-	169	271	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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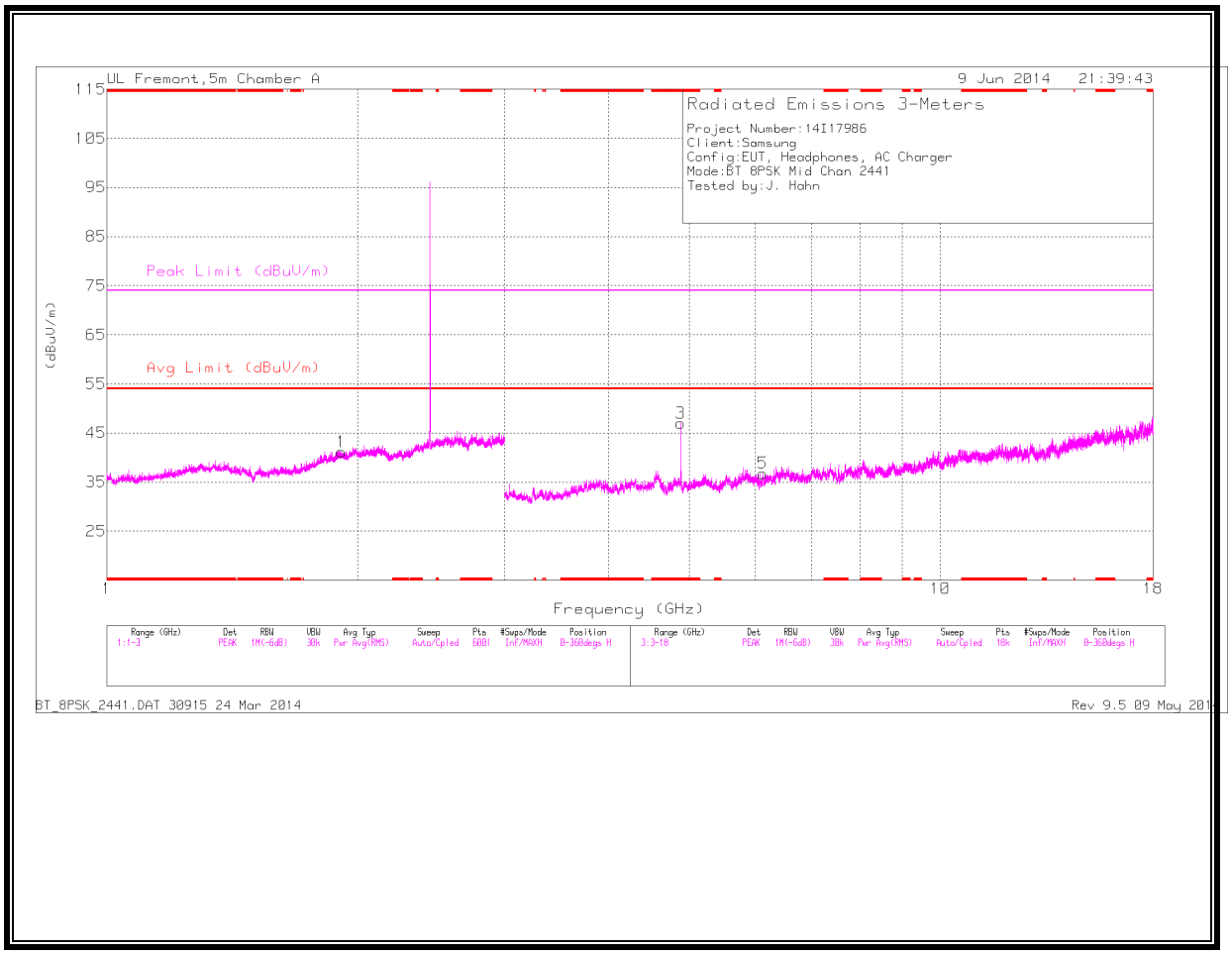
MID CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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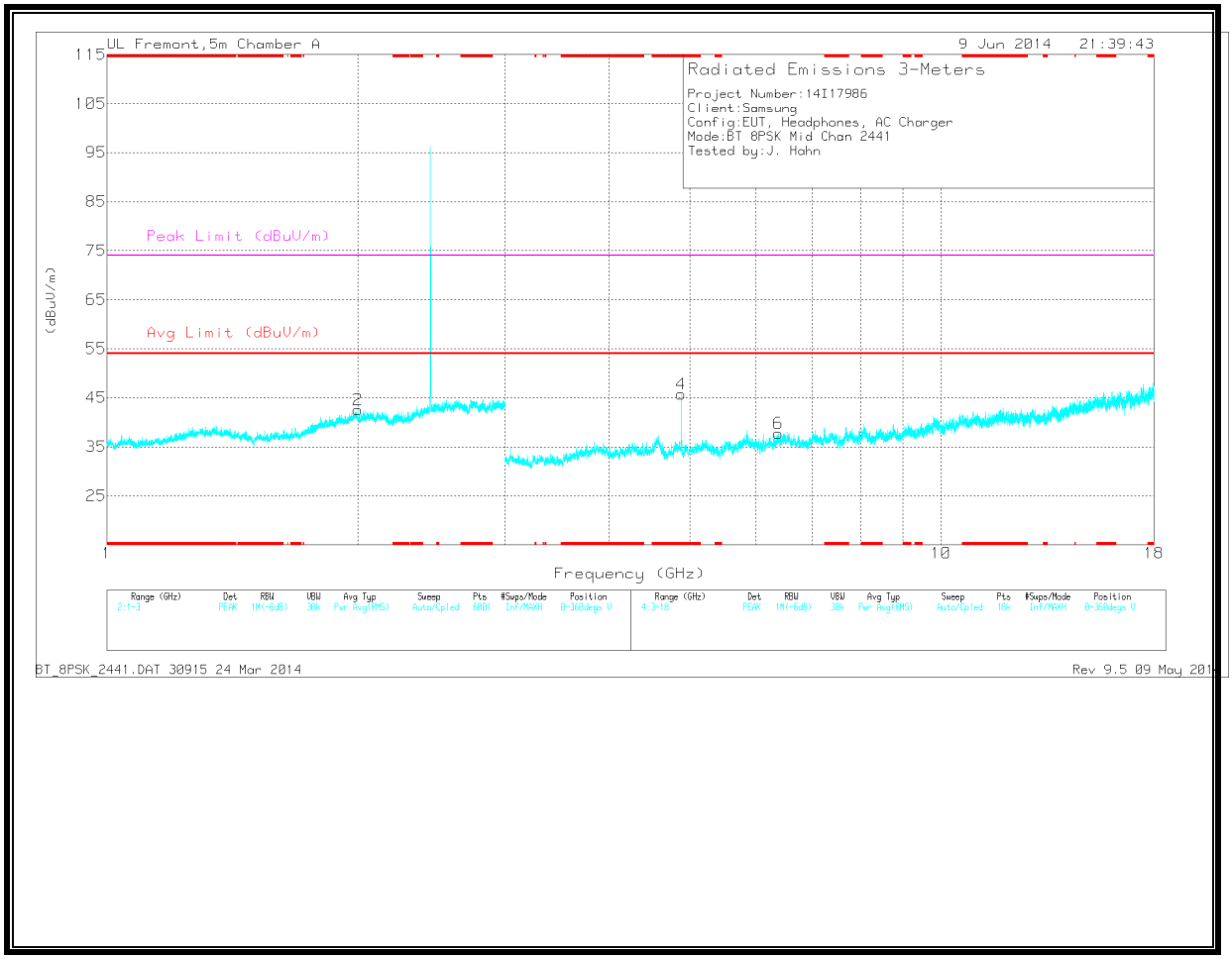
VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.882	41.35	PK	34	-28.3	0	47.05	-	-	74	-26.95	0-360	200	H
4	* 4.882	40.05	PK	34	-28.3	0	45.75	-	-	74	-28.25	0-360	200	V
1	1.913	34.59	PK	31.7	-25.1	0	41.19	-	-	-	-	0-360	199	H
2	1.999	35.54	PK	32.1	-25.1	0	42.54	-	-	-	-	0-360	100	V
5	6.124	30.08	PK	35.4	-28.7	0	36.78	-	-	-	-	0-360	100	H
6	6.377	30.61	PK	35.5	-28.4	0	37.71	-	-	-	-	0-360	200	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.882	45.88	PK2	34	-28.4	51.48	-	-	74	-22.52	119	263	H
* 4.882	39.95	VB1T	34	-28.3	46.75	54	-7.25	-	-	119	263	H
* 4.882	47.98	PK2	34	-28.3	53.68	-	-	74	-20.32	339	219	V
* 4.882	42.12	VB1T	34	-28.3	48.92	54	-5.08	-	-	339	219	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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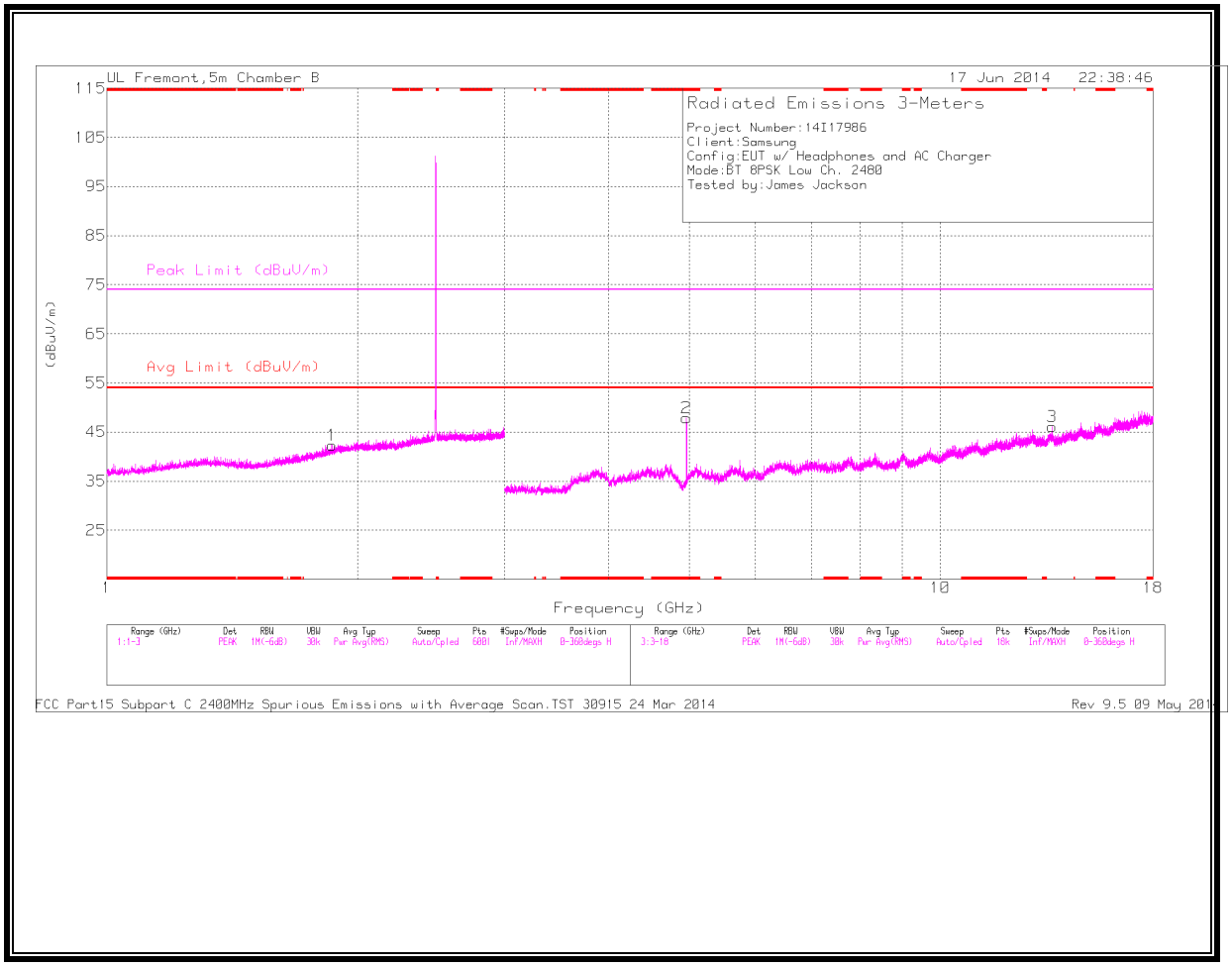
HIGH CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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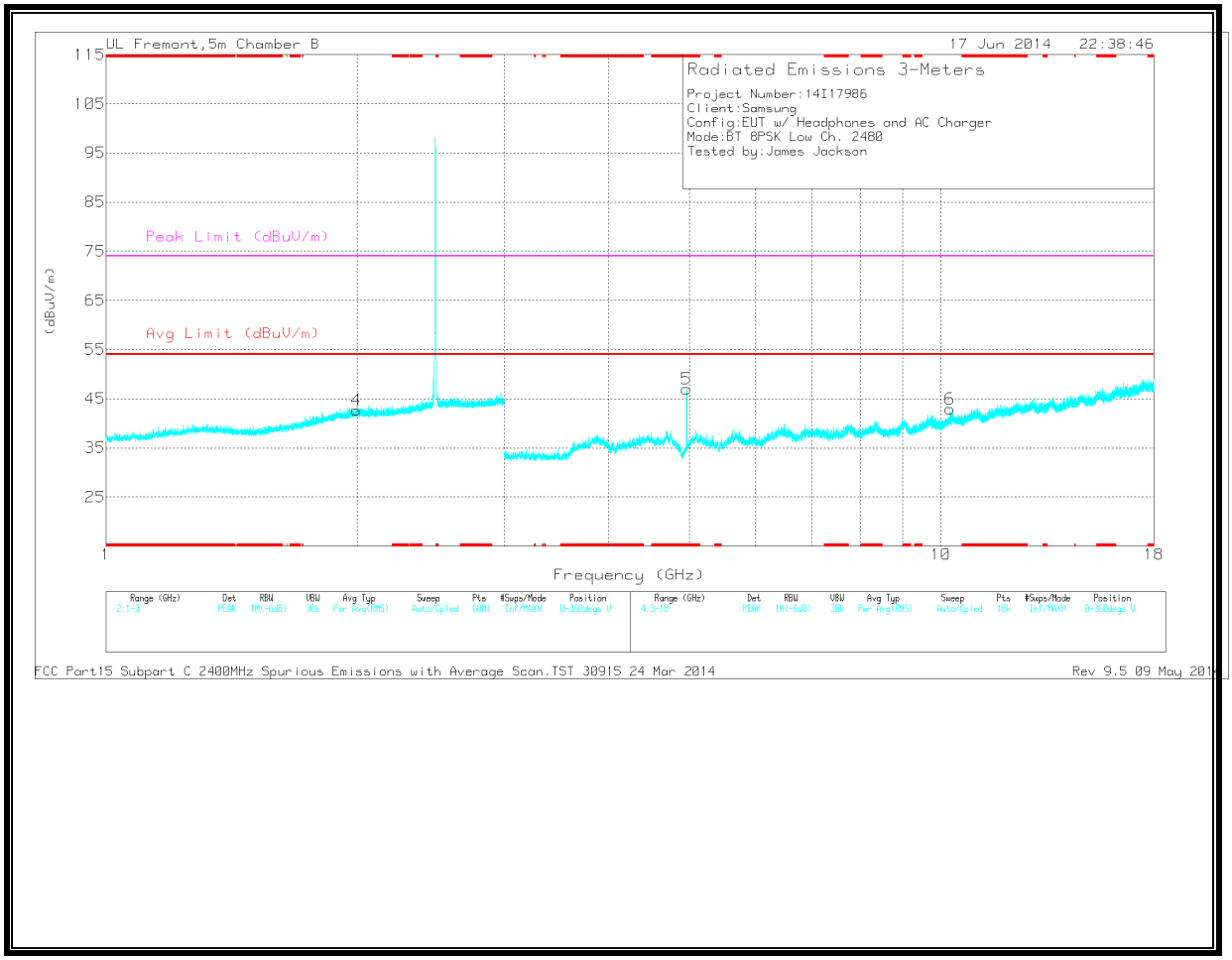
VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.96	44.03	PK	34.2	-30.4	0	47.83	-	-	74	-26.17	0-360	101	H
5	* 4.96	43.21	PK	34.2	-30.4	0	47.01	-	-	74	-26.99	0-360	201	V
1	1.863	35.33	PK	30.7	-23.7	0	42.33	-	-	-	-	0-360	201	H
4	1.997	34.76	PK	31.3	-23.4	0	42.66	-	-	-	-	0-360	101	V
6	10.258	28.88	PK	37.1	-23.1	0	42.88	-	-	-	-	0-360	201	V
3	13.61	27.7	PK	38.8	-20.4	0	46.1	-	-	-	-	0-360	201	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	52.65	PK3	34.2	-30.4	0	56.45	-	-	74	-17.55	219	190	H
* 4.96	46.18	VB1T	34.2	-30.4	0	49.98	54	-4.02	-	-	219	190	H
* 4.96	51.98	PK3	34.2	-30.4	0	55.78	-	-	74	-18.22	215	191	H
* 4.96	45.19	VB1T	34.2	-30.4	0	48.99	54	-5.01	-	-	215	191	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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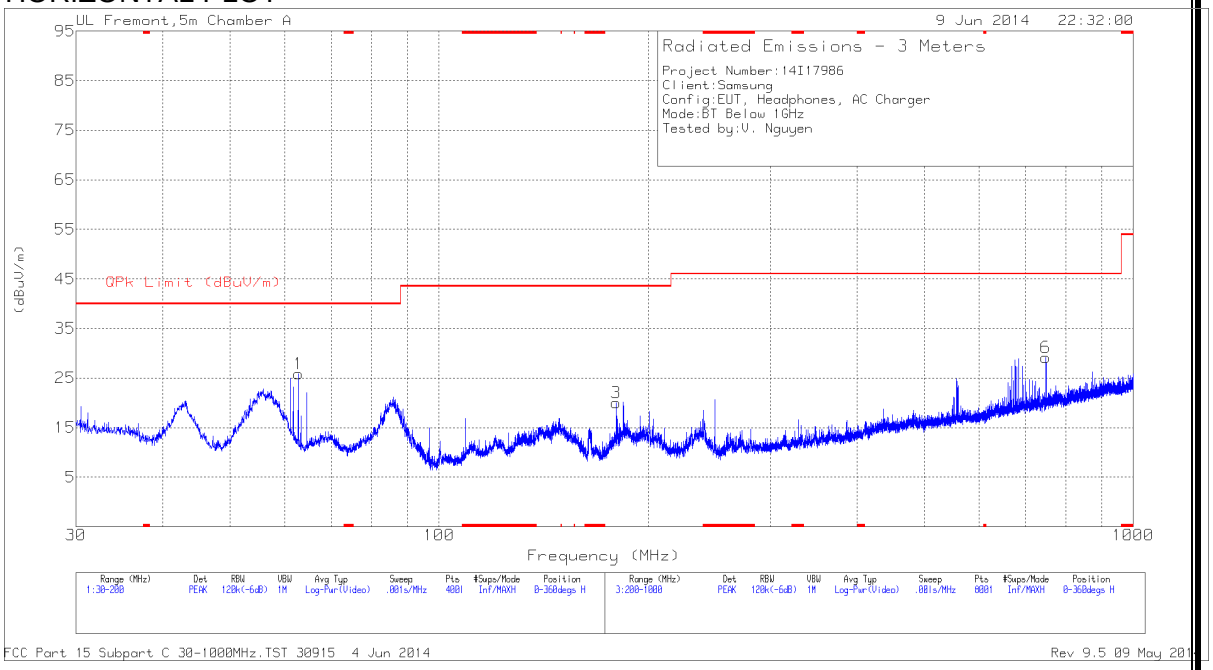
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



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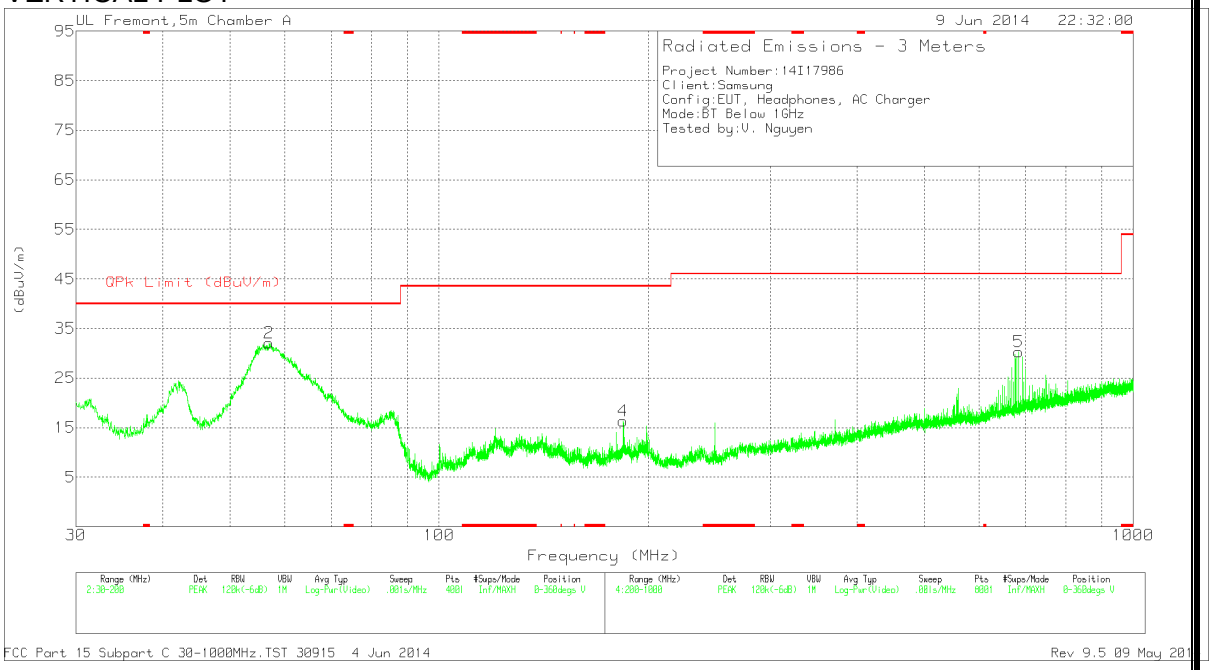
VERTICAL PLOT



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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	56.945	55.37	PK	7.4	-30.7	0	32.07	40	-7.93	0-360	101	V
1	62.7675	48.79	PK	8	-30.9	0	25.89	40	-14.11	0-360	300	H
3	179.9825	38.73	PK	11.3	-30	0	20.03	43.52	-23.49	0-360	300	H
4	184.3175	34.95	PK	11.3	-29.9	0	16.35	43.52	-27.17	0-360	101	V
5	684	38.54	PK	20	-28.2	0	30.34	46.02	-15.68	0-360	101	V
6	748.8	36.71	PK	20.7	-28.2	0	29.21	46.02	-16.81	0-360	101	H

PK - Peak detector

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

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6 WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.1725	46.7	PK	1.2	0	47.9	64.8	-16.9	-	-
2	.1725	26.04	Av	1.2	0	27.24	-	-	54.8	-27.56
3	.312	39.92	PK	.5	0	40.42	59.9	-19.48	-	-
4	.312	19.89	Av	.5	0	20.39	-	-	49.9	-29.51
5	.501	33.98	PK	.3	0	34.28	56	-21.72	-	-
6	.501	22.91	Av	.3	0	23.21	-	-	46	-22.79
7	.564	40	PK	.3	0	40.3	56	-15.7	-	-
8	.564	34.55	Av	.3	0	34.85	-	-	46	-11.15
9	1.194	29.85	PK	.2	.1	30.15	56	-25.85	-	-
10	1.194	23.27	Av	.2	.1	23.57	-	-	46	-22.43
11	5.514	26.73	PK	.2	.1	27.03	60	-32.97	-	-
12	5.514	10.55	Av	.2	.1	10.85	-	-	50	-39.15
13	8.8485	26.85	PK	.2	.1	27.15	60	-32.85	-	-
14	8.8485	9.96	Av	.2	.1	10.26	-	-	50	-39.74
15	17.9295	25.75	PK	.3	.2	26.25	60	-33.75	-	-
16	17.9295	21.3	Av	.3	.2	21.8	-	-	50	-28.2
17	29.958	28.37	PK	.3	.3	28.97	60	-31.03	-	-
18	29.958	14.25	Av	.3	.3	14.85	-	-	50	-35.15

Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
19	.168	47.29	PK	1.3	0	48.59	65.1	-16.51	-	-
20	.168	21.59	Av	1.3	0	22.89	-	-	55.1	-32.21
21	.3165	41.68	PK	.6	0	42.28	59.8	-17.52	-	-
22	.3165	17.17	Av	.6	0	17.77	-	-	49.8	-32.03
23	.51	33.04	PK	.4	0	33.44	56	-22.56	-	-
24	.51	19.31	Av	.4	0	19.71	-	-	46	-26.29
25	.564	41.02	PK	.3	0	41.32	56	-14.68	-	-
26	.564	29.22	Av	.3	0	29.52	-	-	46	-16.48
27	1.068	22.55	PK	.3	.1	22.95	56	-33.05	-	-
28	1.068	9.95	Av	.3	.1	10.35	-	-	46	-35.65
29	5.5815	19.66	PK	.2	.1	19.96	60	-40.04	-	-
30	5.5815	4.13	Av	.2	.1	4.43	-	-	50	-45.57
31	8.8395	30	PK	.2	.1	30.3	60	-29.7	-	-
32	8.8395	10.83	Av	.2	.1	11.13	-	-	50	-38.87
33	17.9385	25.44	PK	.3	.2	25.94	60	-34.06	-	-
34	17.9385	18.29	Av	.3	.2	18.79	-	-	50	-31.21
35	29.913	28.01	PK	.3	.3	28.61	60	-31.39	-	-
36	29.913	15.64	Av	.3	.3	16.24	-	-	50	-33.76

PK - Peak detector
Av - average detection

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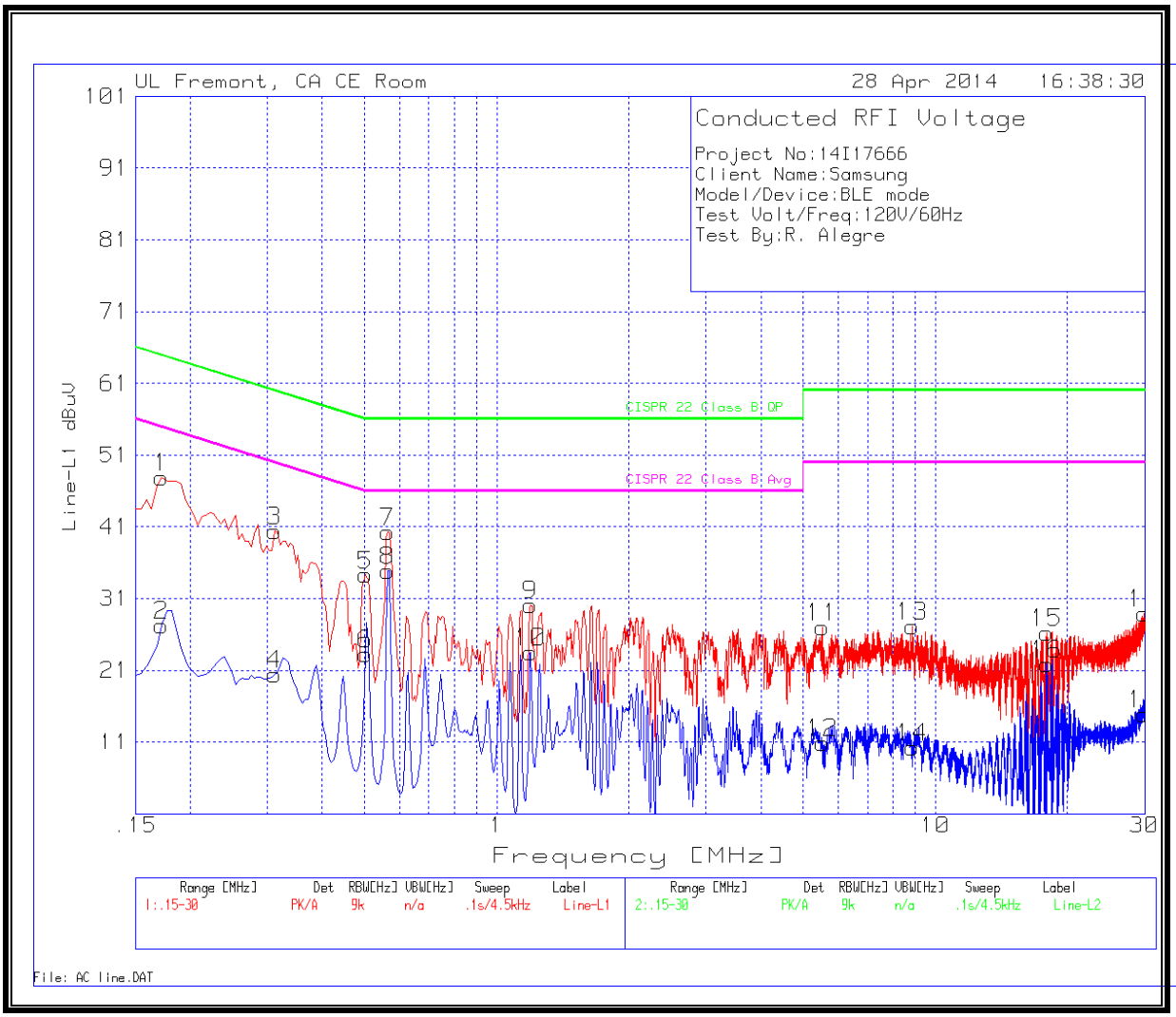
LINE 1 RESULTS



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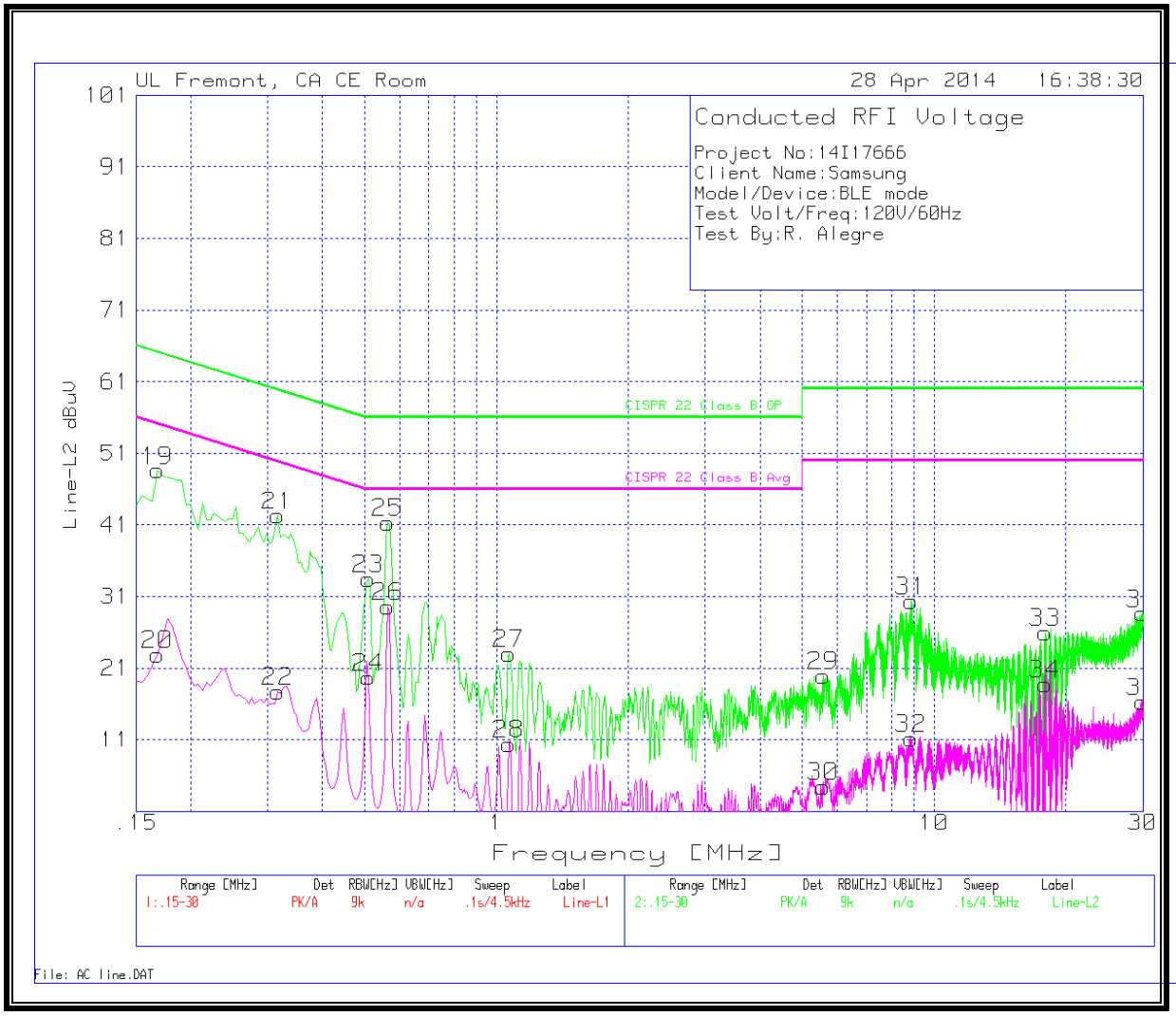
LINE 2 RESULTS



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