



FCC 47 CFR PART 15 SUBPART C

**CERTIFICATION TEST REPORT
FOR**

GSM/WCDMA/LTE Phone + BLUETOOTH and WLAN 2.4GHz b/g/n

MODEL NUMBER: SM-G5500

FCC ID: A3LSMG5500

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	09/15/15	Initial Issue	P. Zhang
V2	09/30/15	Added Duty cycle plots	C. Vergonio

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Samsung Electronics CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth and WLAN 2.4GHz b/g/n

MODEL: SM-G5500

SERIAL NUMBER: RV8G81T9GEA (Conducted); RV8G81T9FBA (Radiated)

DATE TESTED: SEPTEMBER 10 – 15, 2015

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.

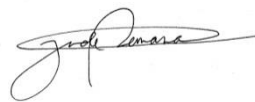
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. 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 C63.10-2013, FCC CFR 47 Part 2, and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☐ Chamber D
☐ Chamber B	☐ Chamber E
☒ Chamber C	☐ Chamber F

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

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%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone + Bluetooth and WLAN 2.4 GHz b/g/n.

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	10.11	10.26
2402 - 2480	Enhanced 8PSK	7.93	6.21

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 -0.45 dBi.

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.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

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

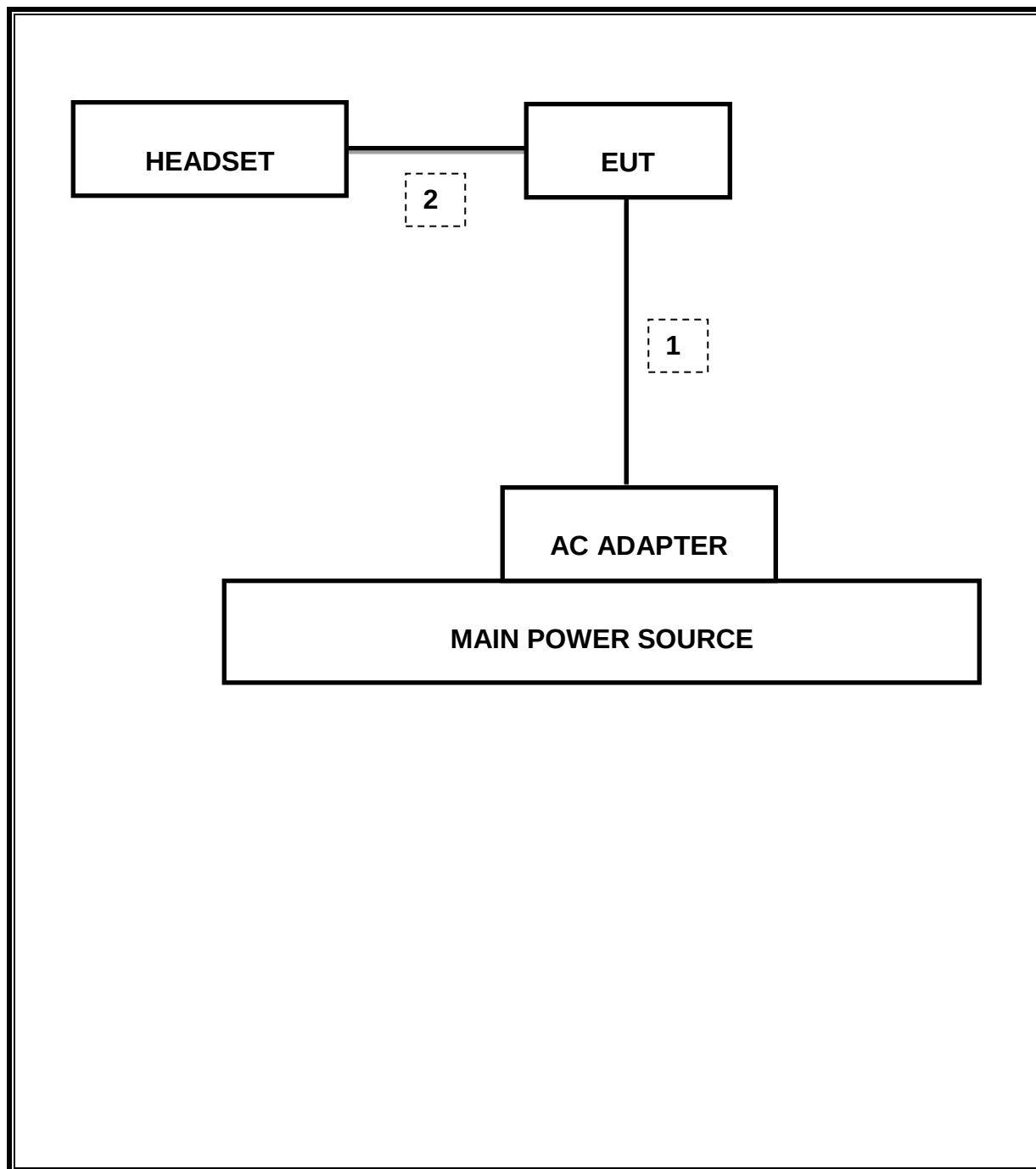
I/O CABLES

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.

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 Due
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/16
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
CBT Bluetooth Tester	R & S	CBT	None	07/12/16
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/16
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012	
CLT Software	UL	UL RF	Ver 1.0, Feb 2 2015	
Antenna Port Software	UL	UL RF	Ver 2.1.1.1, Jan 20 2015	

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	1.2363 MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-43.63dBm
15.247 (b)(1)	RSS-210 A8.4	TX conducted output power	<21dBm		Pass	10.11 dBm
15.247 (a)(1)	RSS-210 A8.1(b)	Hopping frequency separation	> 25KHz		Pass	1MHz
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	0.259 s
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	16.74 dBuV
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	42.05 dbuV/m

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

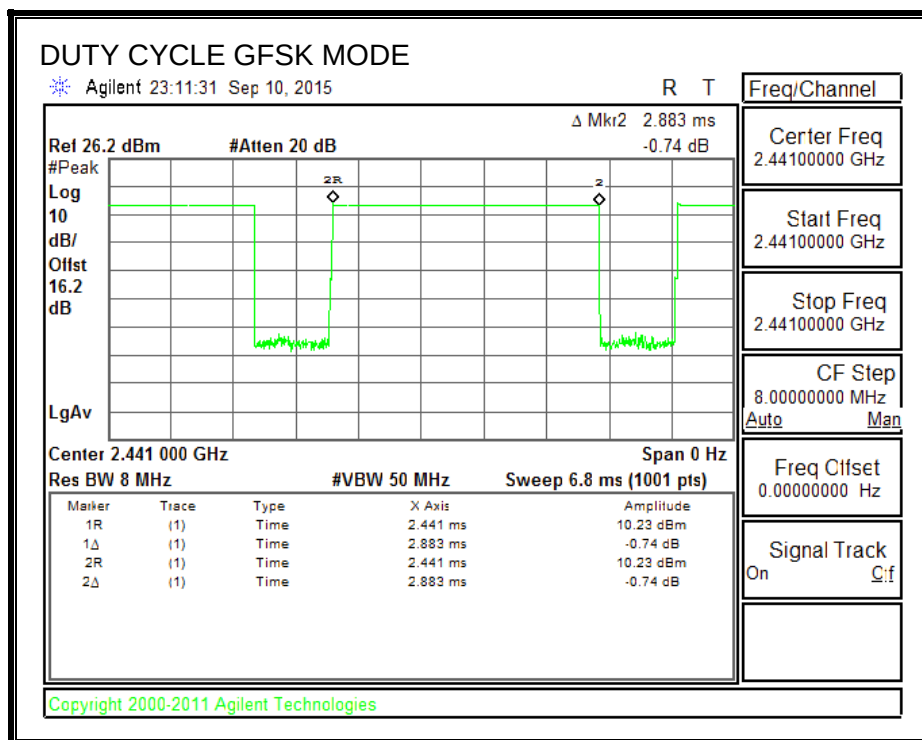
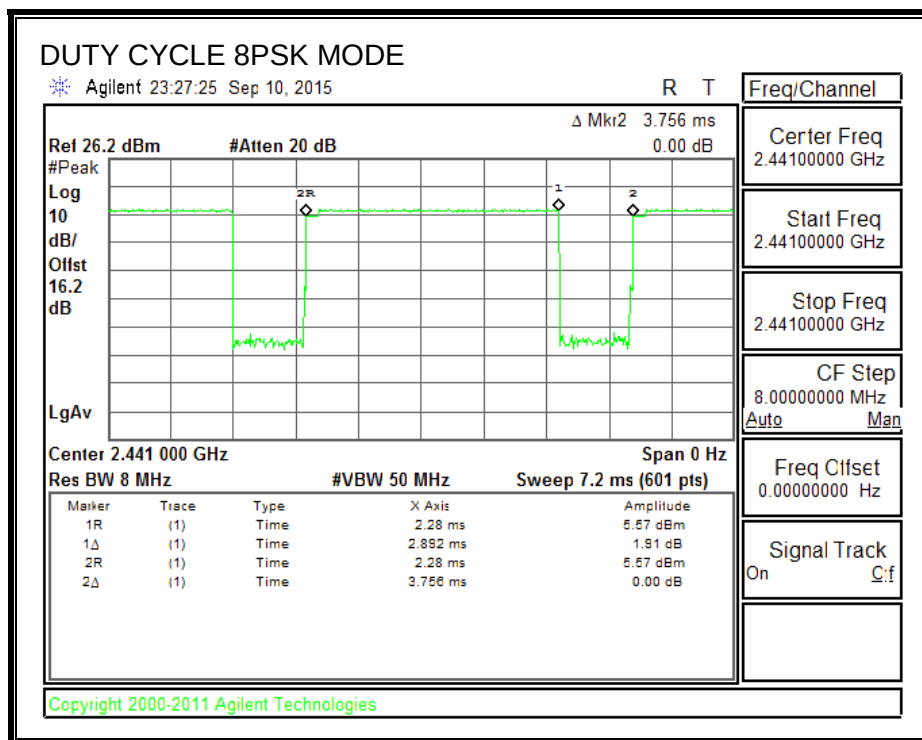
KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	1/B Minimum VBW (kHz)
2.4GHz Band		
8PSK	2.892	0.346
GFSK	2.883	0.347

8.1.1. DUTY CYCLE PLOTS

Bluetooth



8.2. 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 $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

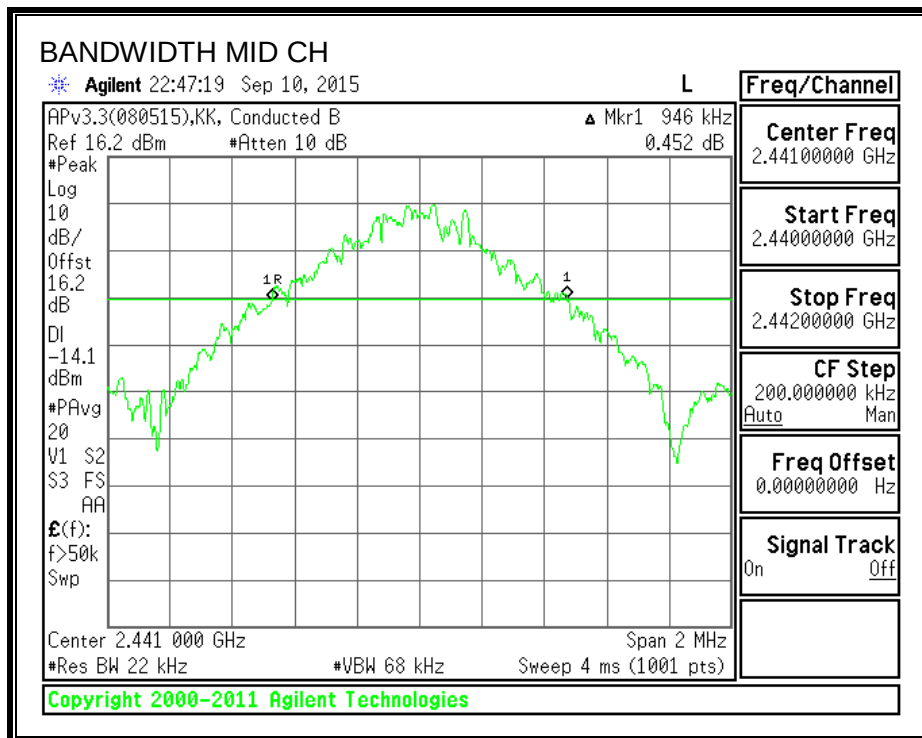
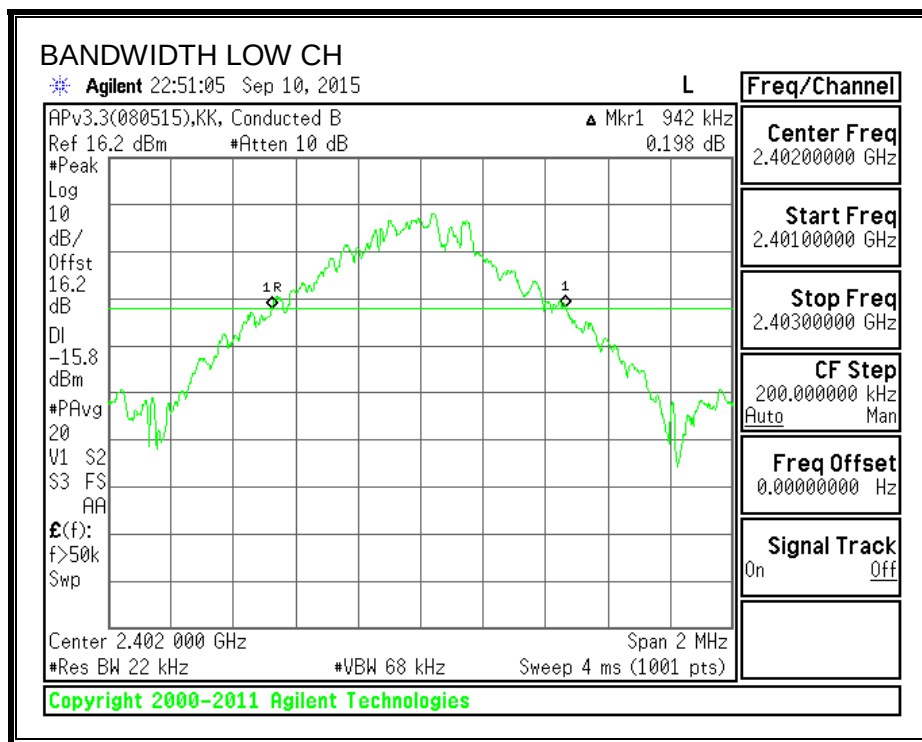
8.2.1. BASIC DATA RATE GFSK MODULATION

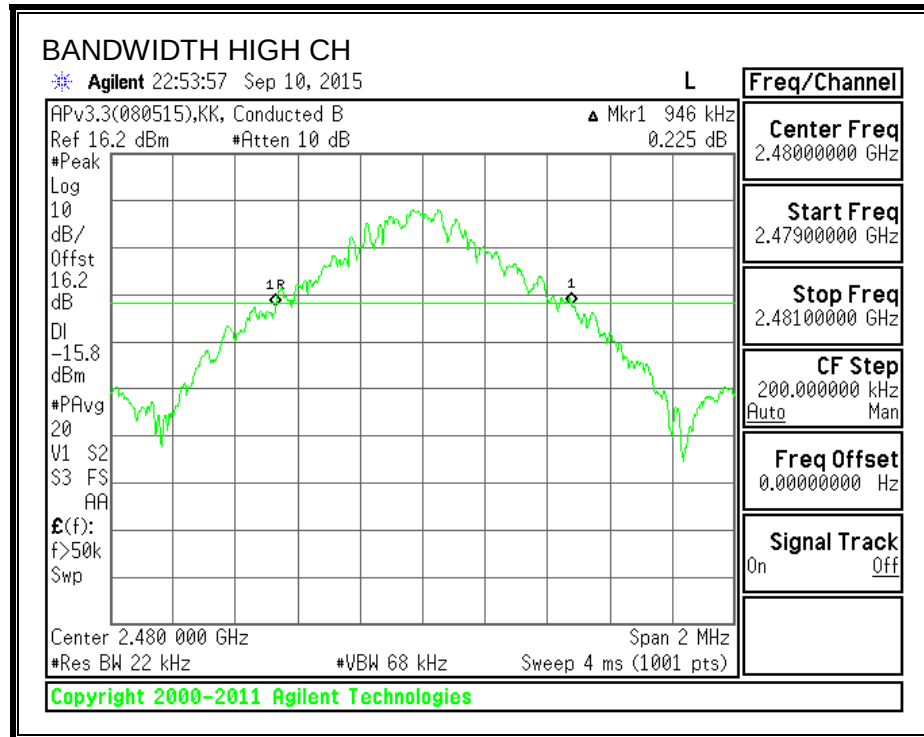
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.942	0.9059
Middle	2441	0.946	0.9031
High	2480	0.946	0.9024
Worst		0.946	0.9059

8.2.1. ENHANCED DATA RATE 8PSK MODULATION

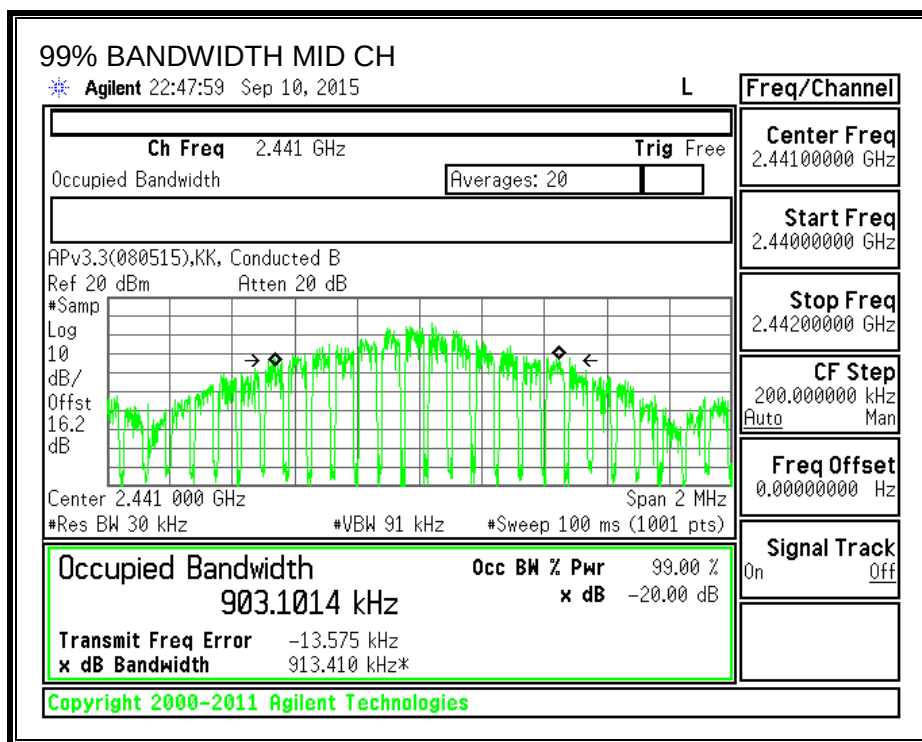
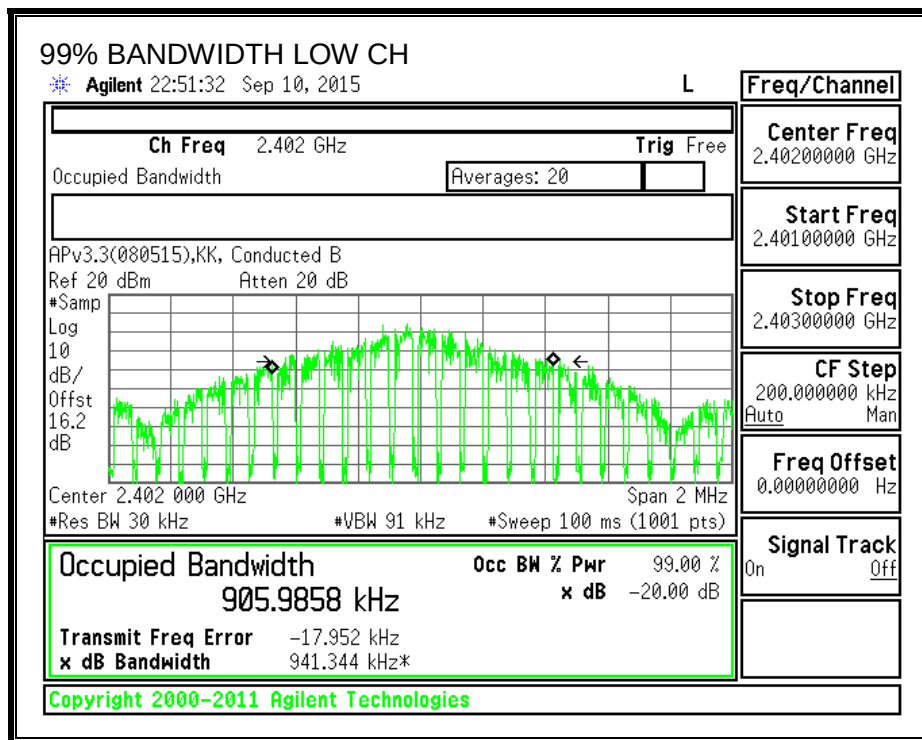
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.353	1.2188
Middle	2441	1.362	1.2244
High	2480	1.362	1.2363
Worst		1.362	1.2363

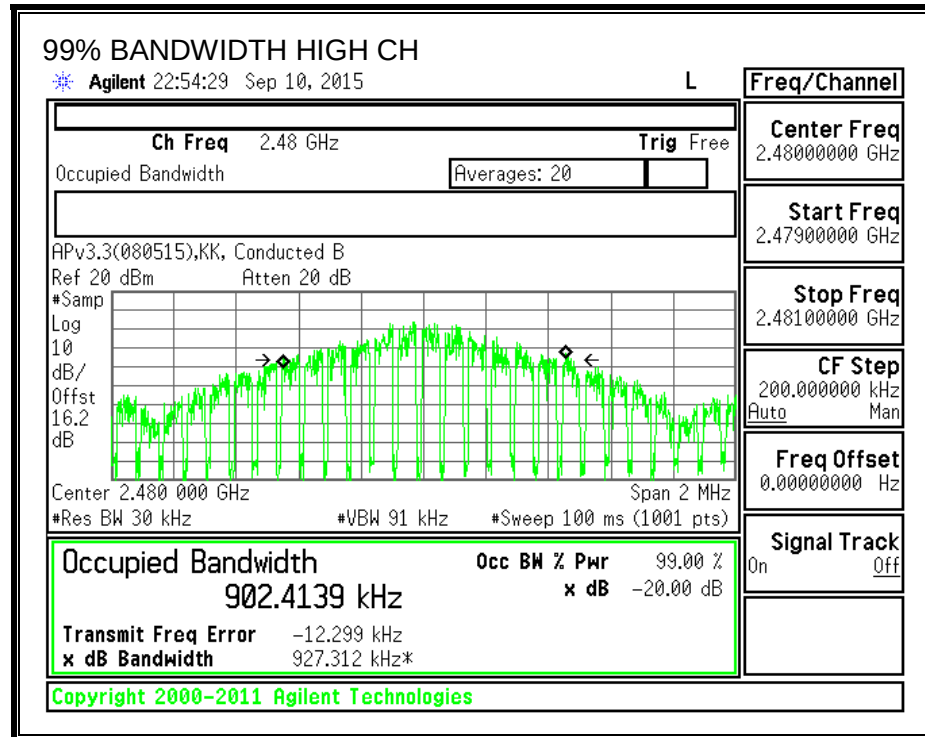
GFSK 20 dB BANDWIDTH



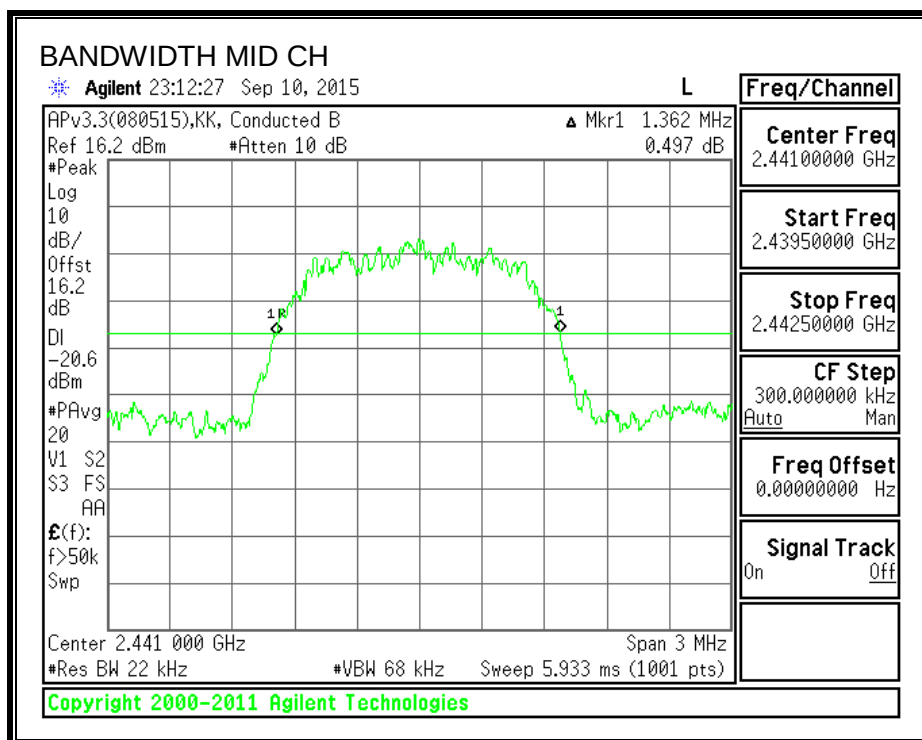
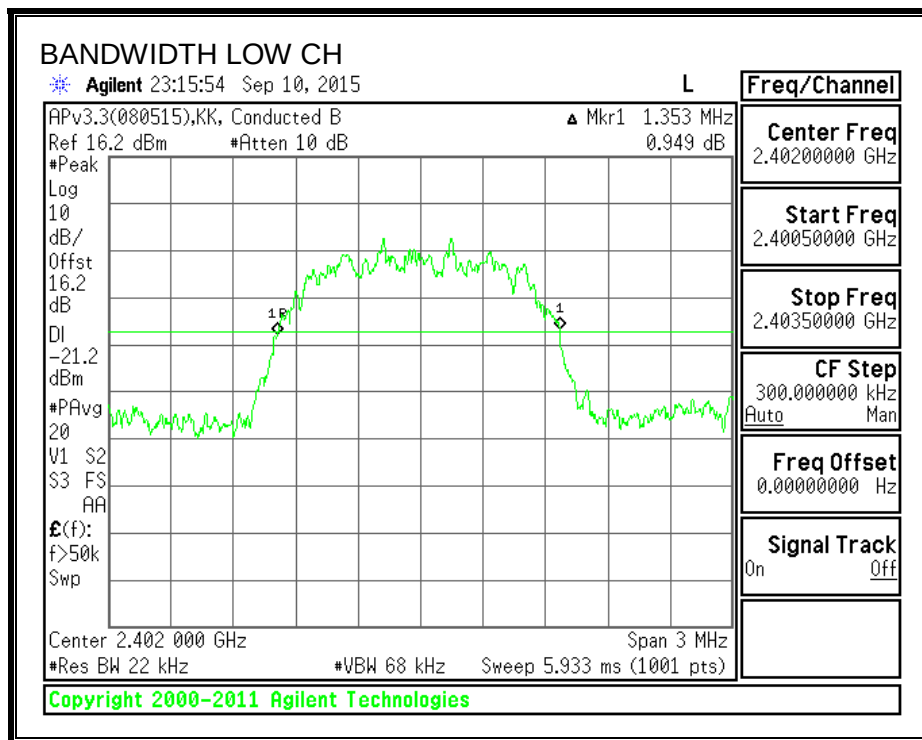


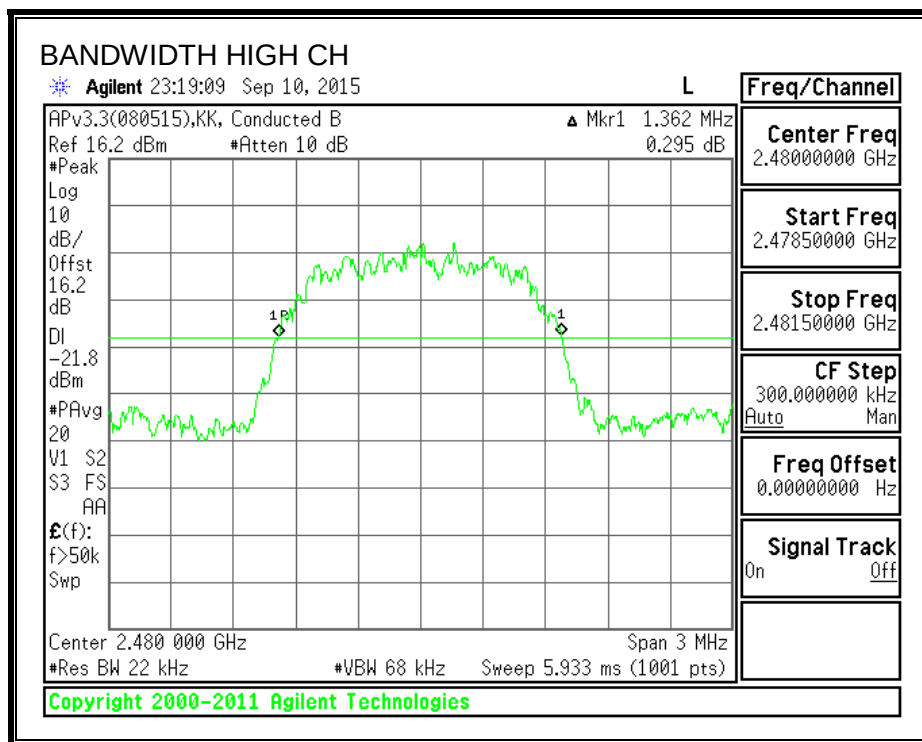
GFSK 99% BANDWIDTH



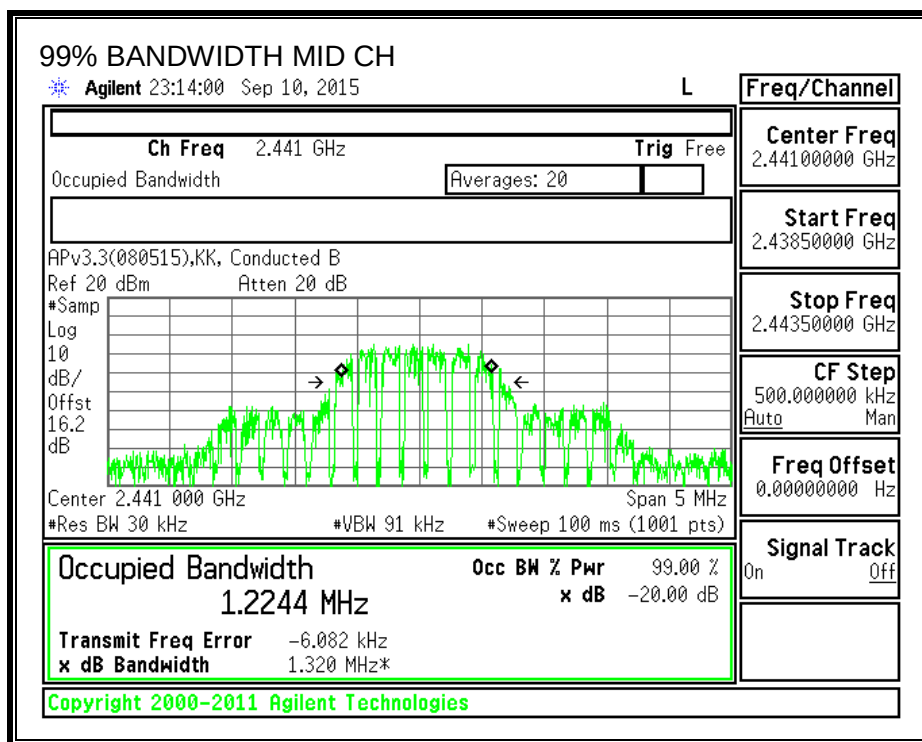
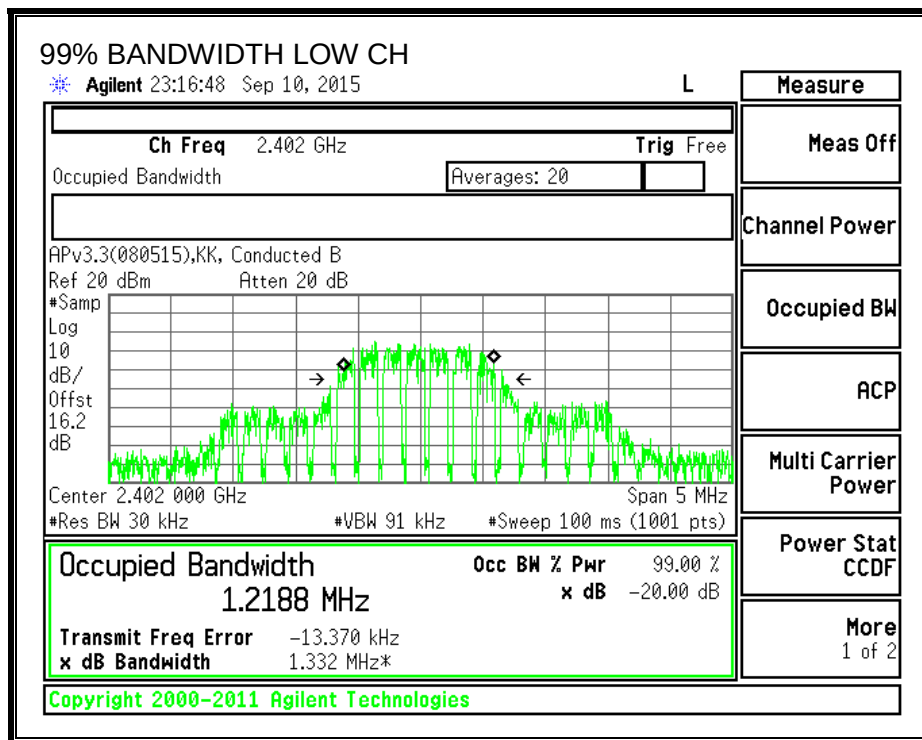


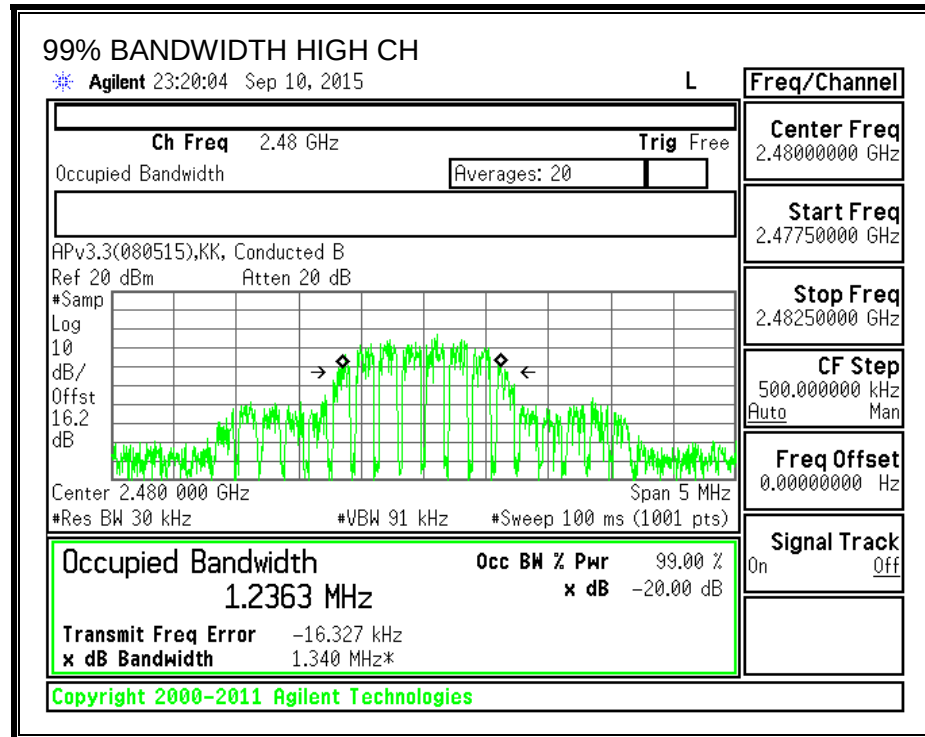
8PSK 20 dB BANDWIDTH





8PSK 99% BANDWIDTH





8.3. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

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

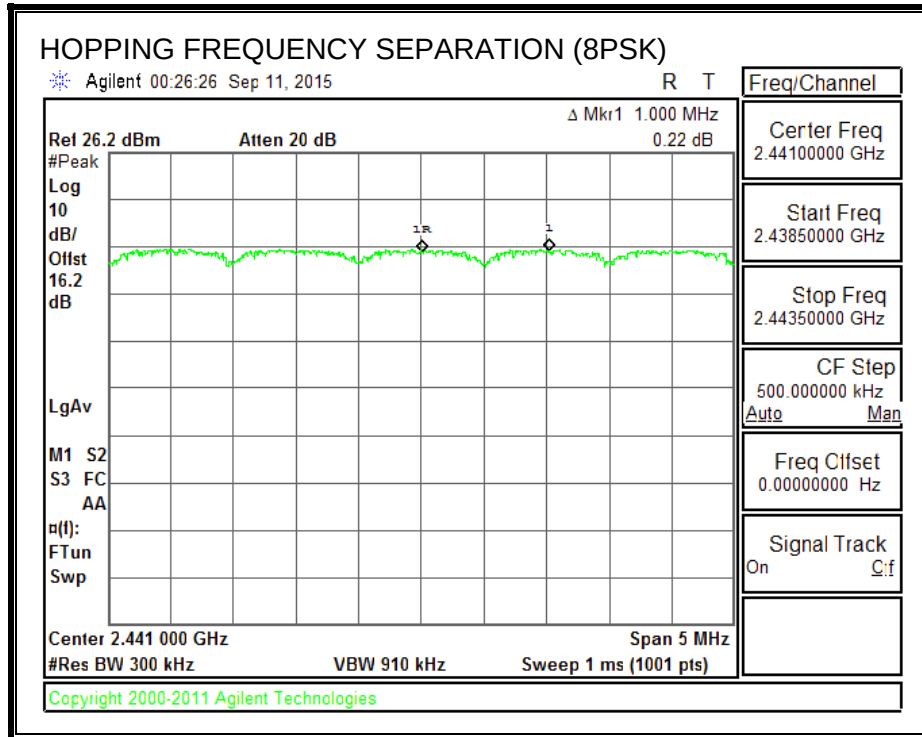
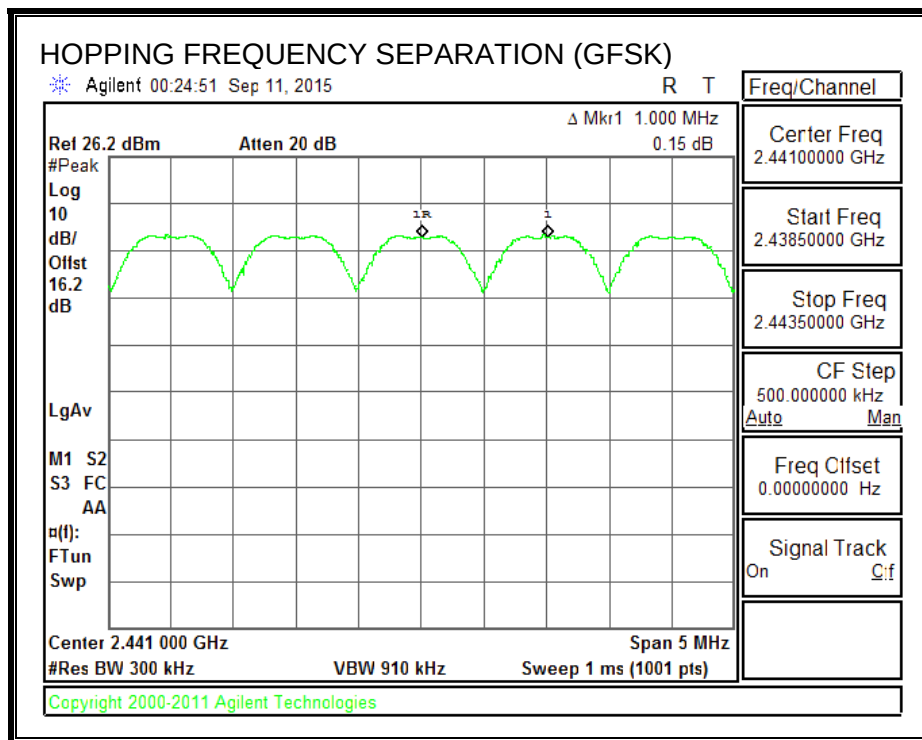
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 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 3xRBW. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



8.4. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

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

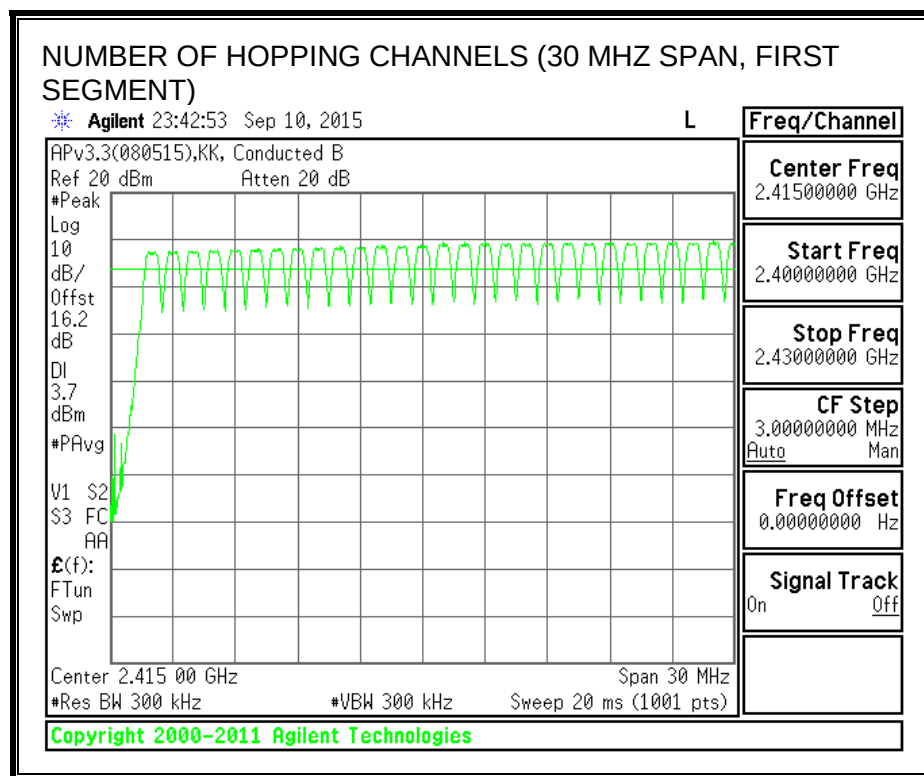
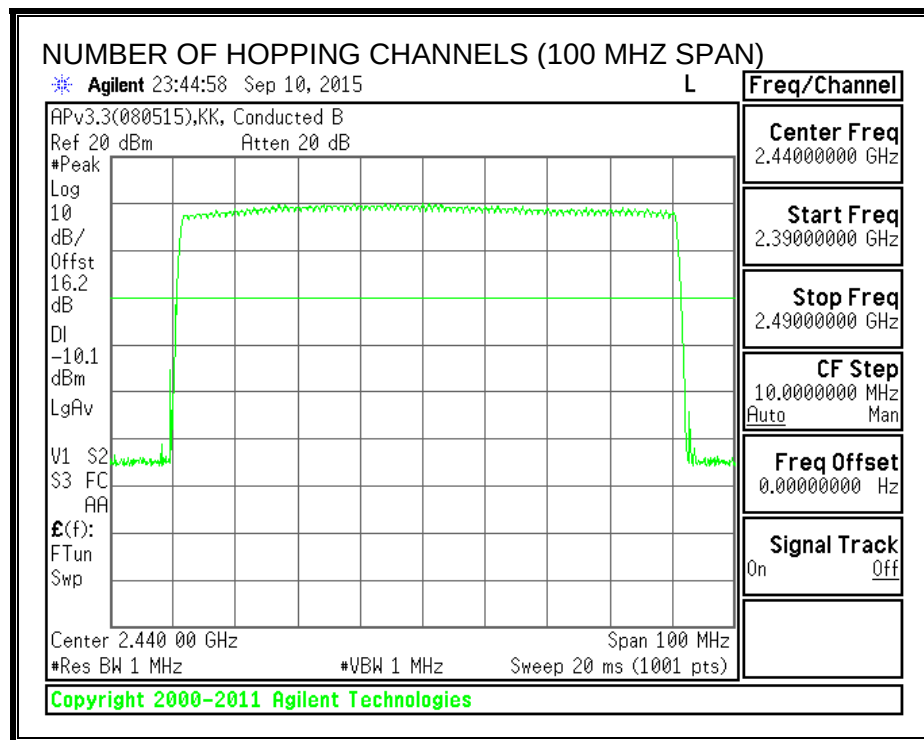
TEST PROCEDURE

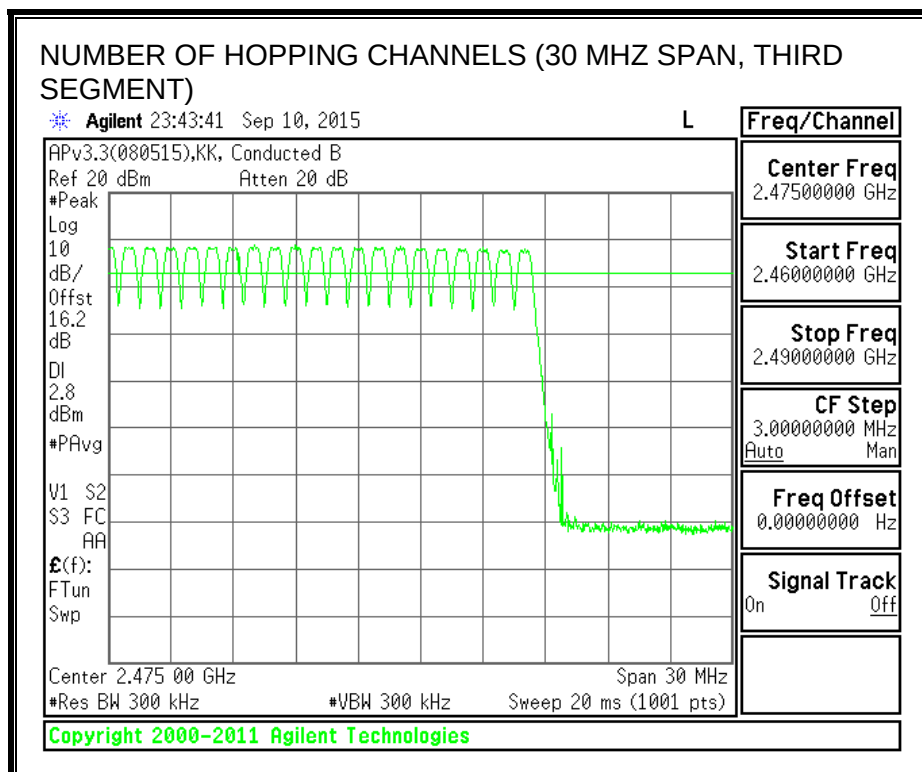
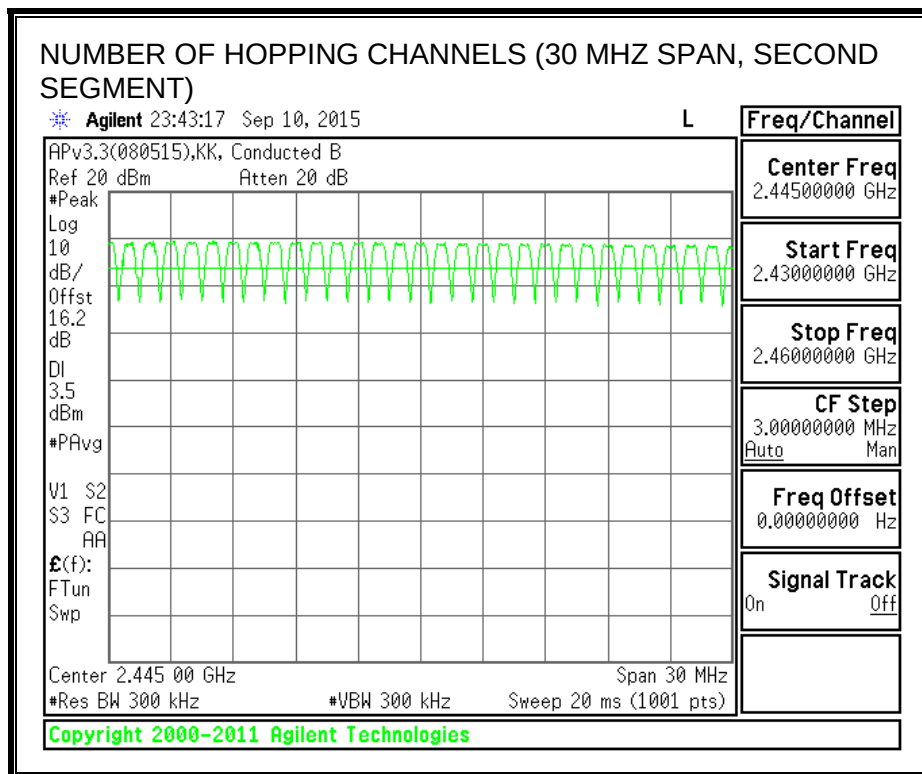
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS





8.5. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

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.

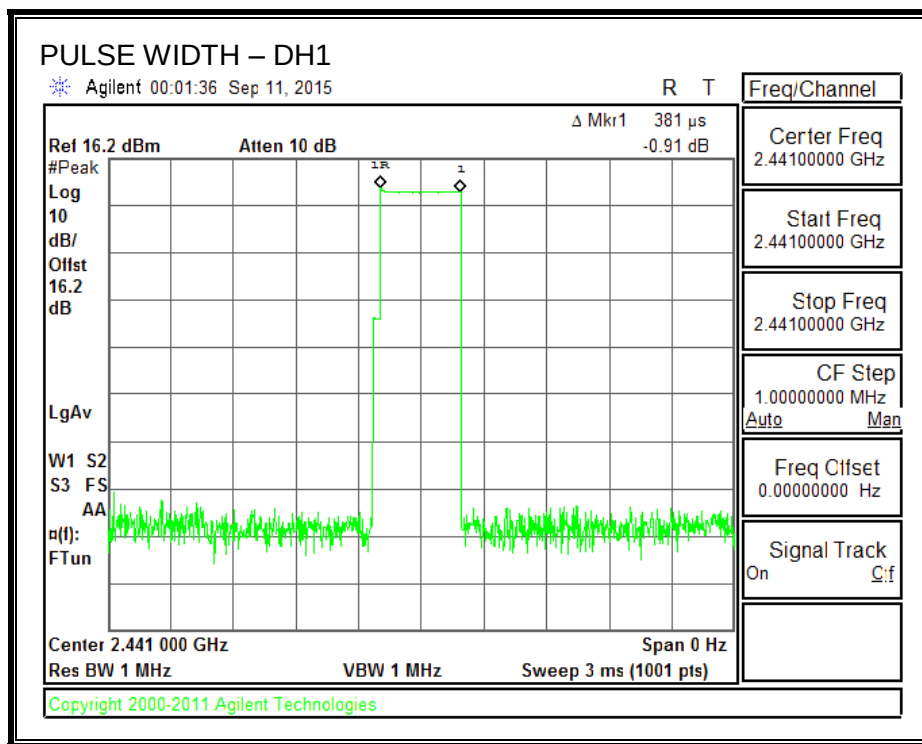
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{pulse width}$.

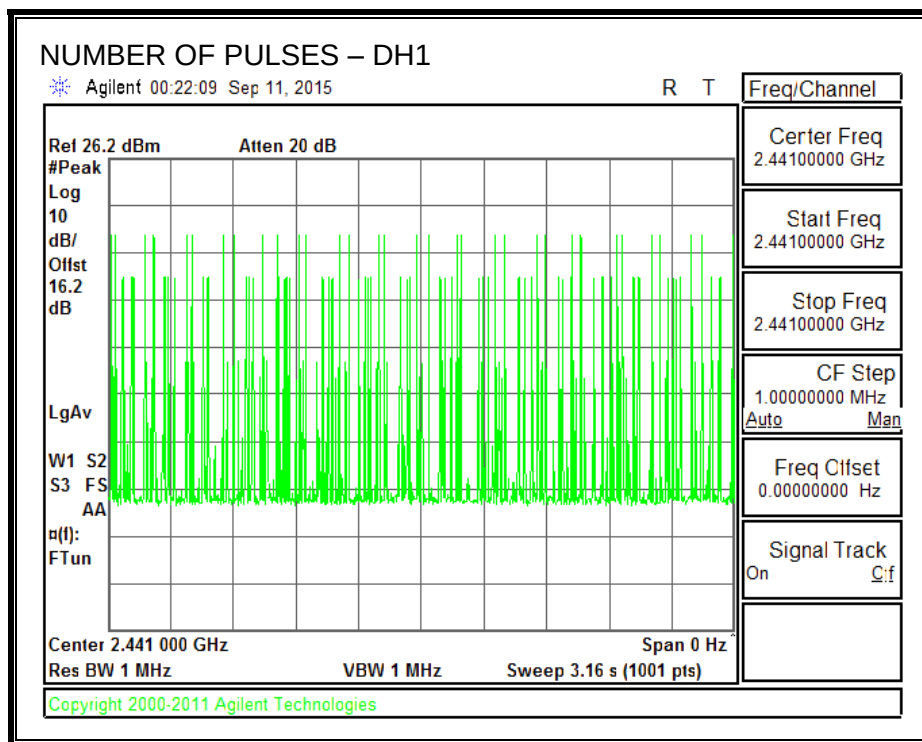
RESULTS

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	0.381	32	0.122	0.4	-0.278
DH3	1.637	12	0.196	0.4	-0.204
DH5	2.877	9	0.259	0.4	-0.141
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.381	8	0.030	0.4	-0.370
DH3	1.637	3	0.049	0.4	-0.351
DH5	2.877	2.25	0.065	0.4	-0.335

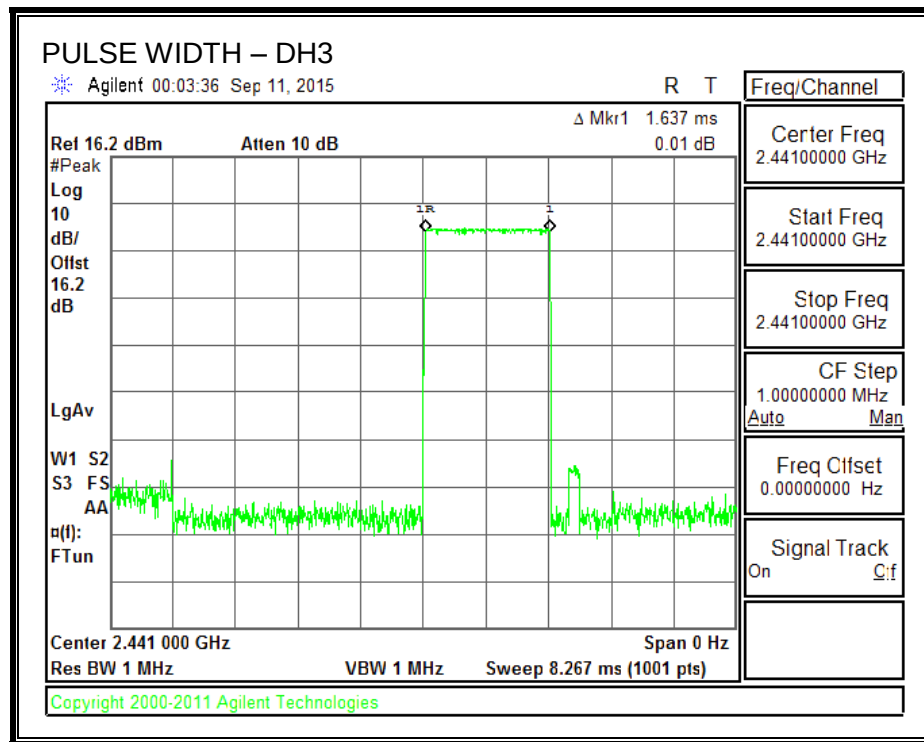
PULSE WIDTH - DH1



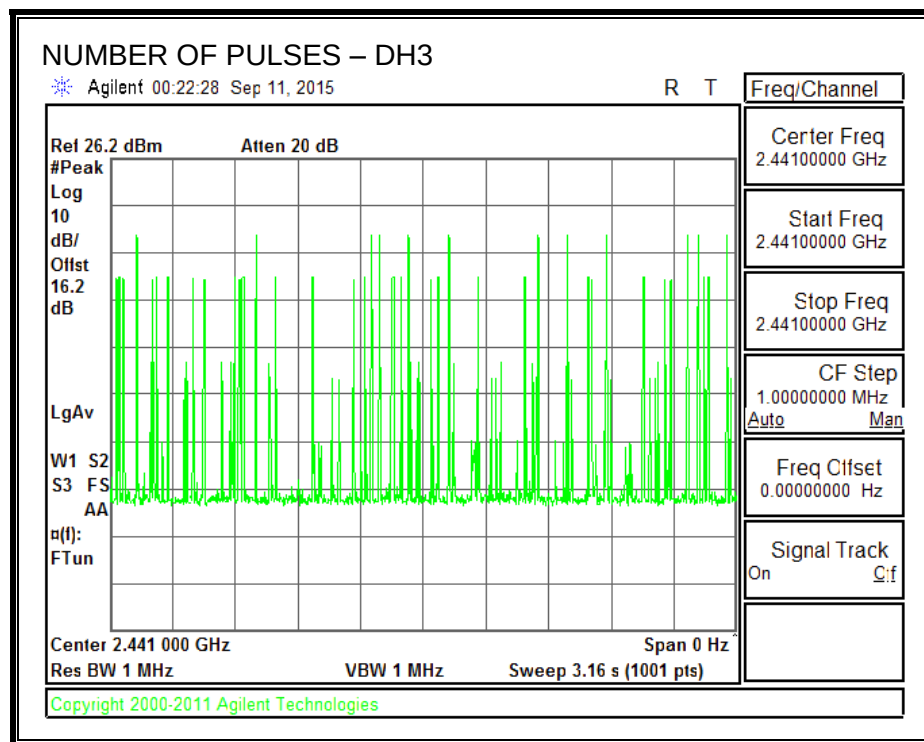
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



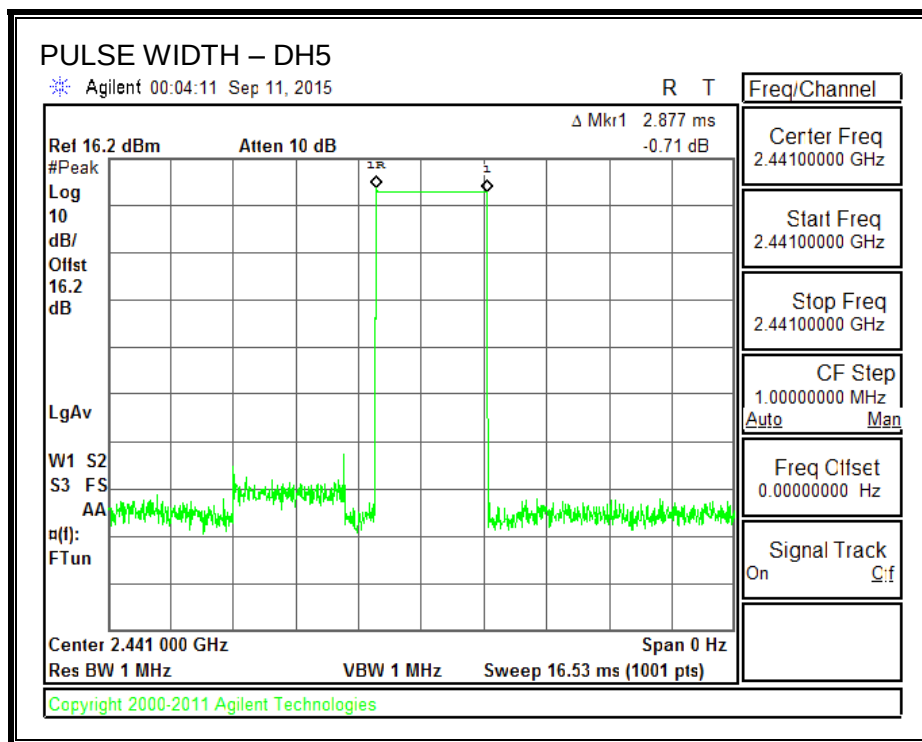
PULSE WIDTH – DH3



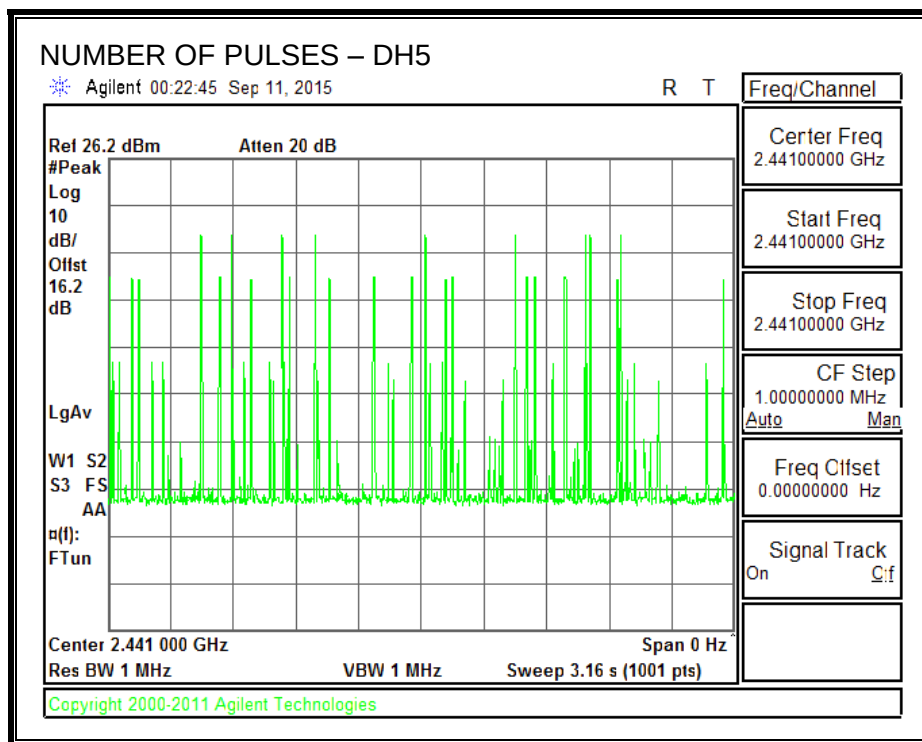
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



8.6. OUTPUT POWER

LIMIT

§15.247 (b) (1)

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

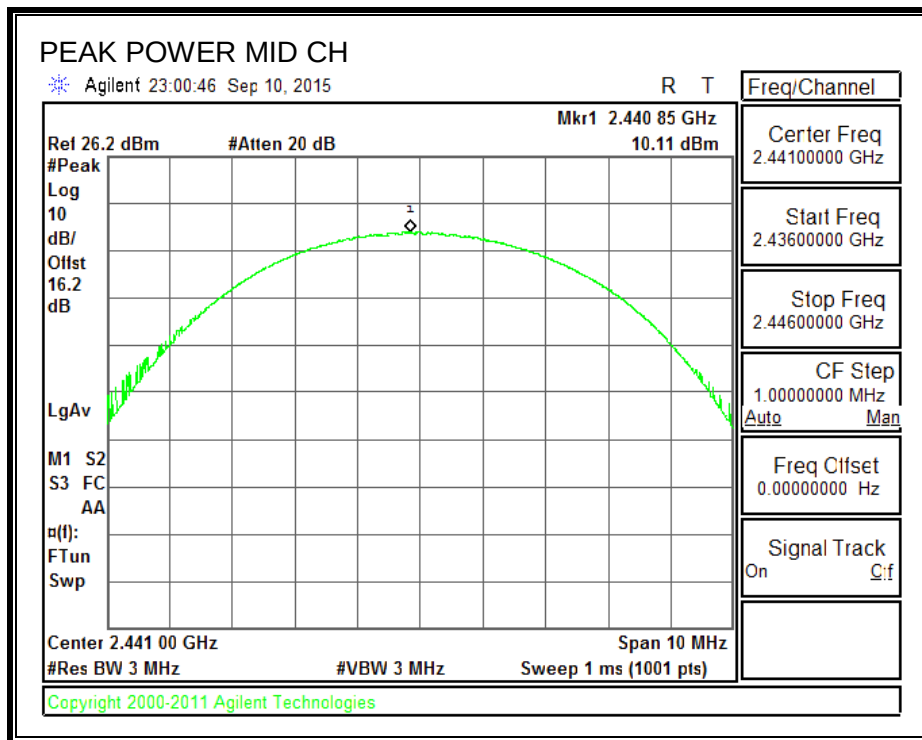
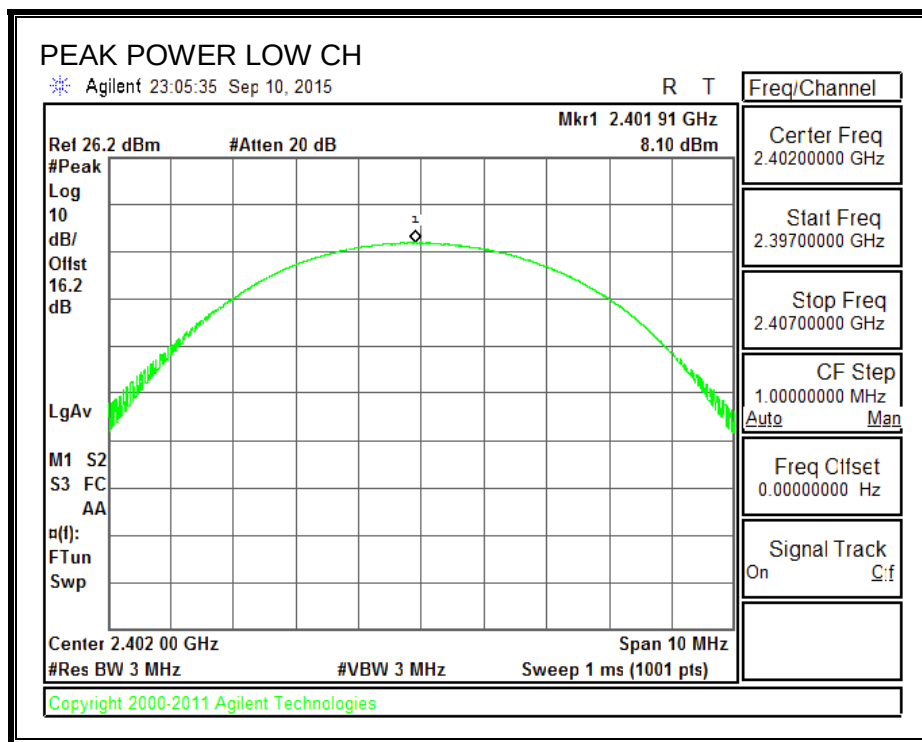
8.6.1. BASIC DATA RATE GFSK MODULATION

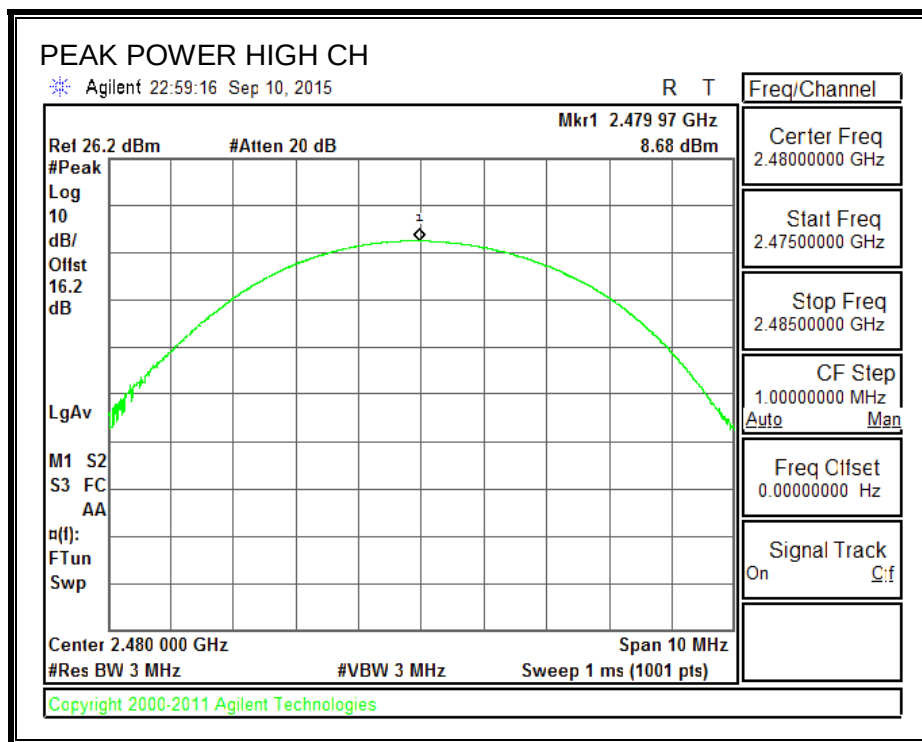
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.10	21	-12.90
Middle	2441	10.11	21	-10.89
High	2480	8.68	21	-12.32
Worst		10.11		-10.89

8.6.2. ENHANCED DATA RATE 8PSK MODULATION

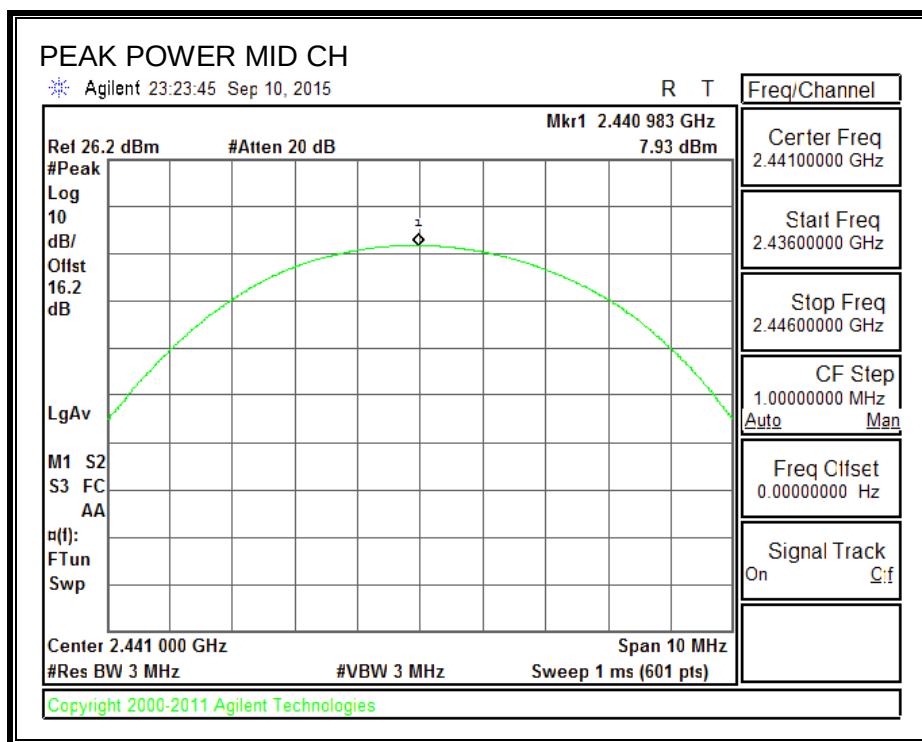
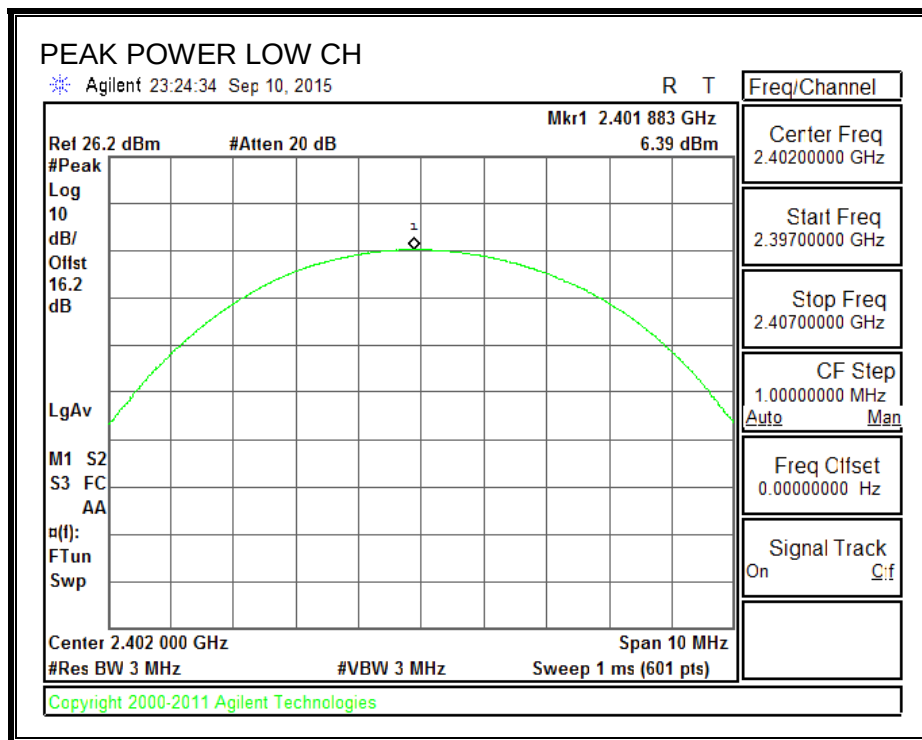
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	6.39	21	-14.61
Middle	2441	7.93	21	-13.07
High	2480	6.35	21	-14.65
Worst		7.93		-13.07

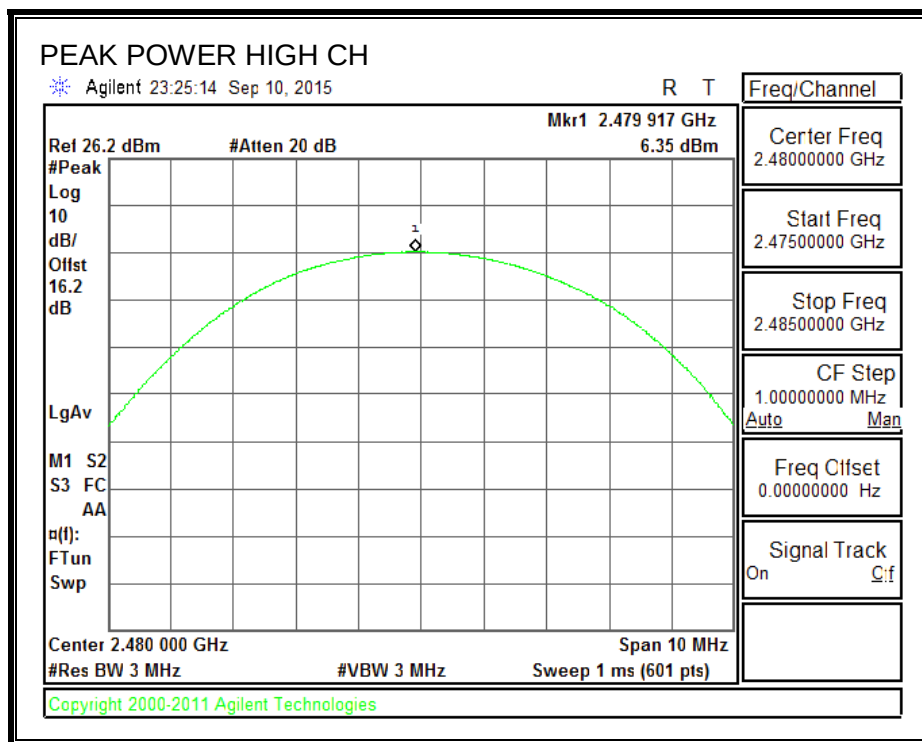
GFSK OUTPUT POWER





8PSK OUTPUT POWER





8.7. 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.

8.7.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.10
Middle	2441	8.70
High	2480	7.60
Worst		8.70

8.7.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.30
Middle	2441	4.30
High	2480	3.20
Worst		6.30

8.7.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.20
Middle	2441	4.30
High	2480	3.30
Worst		6.20

8.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

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.

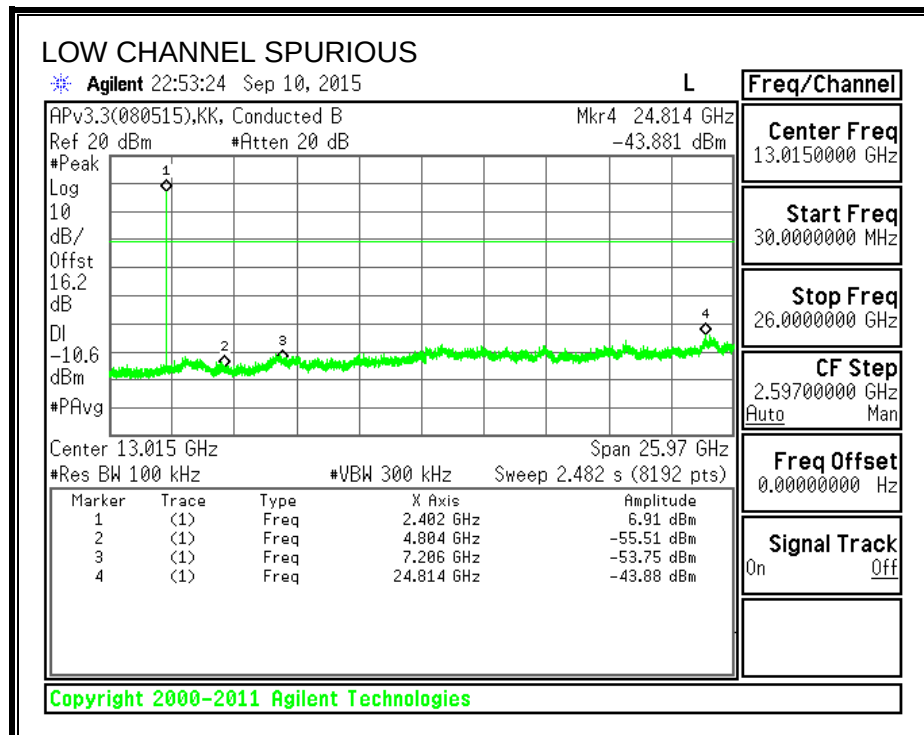
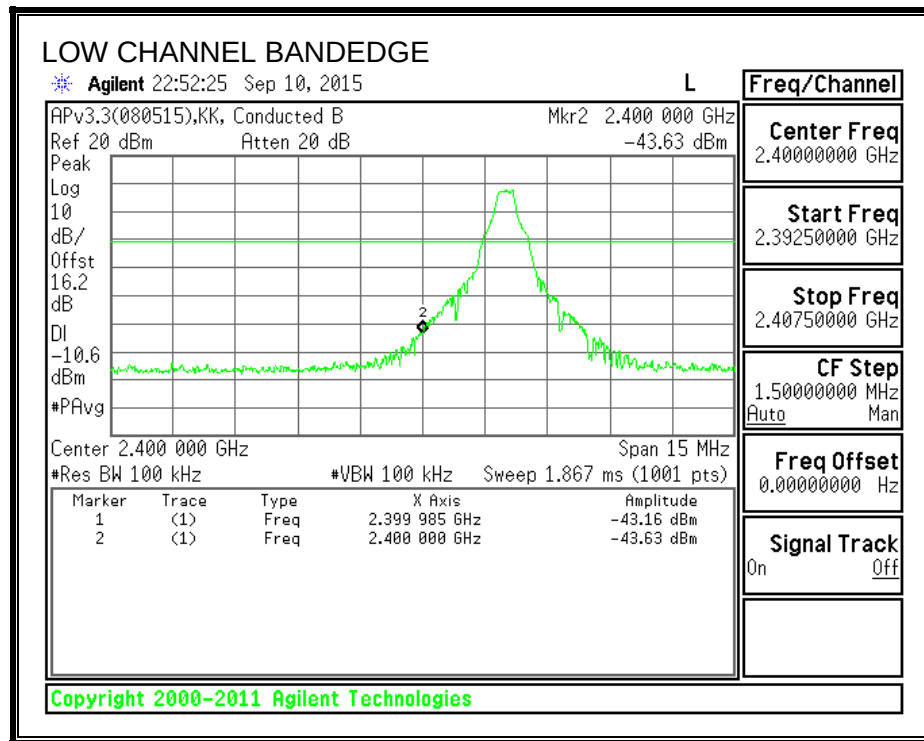
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

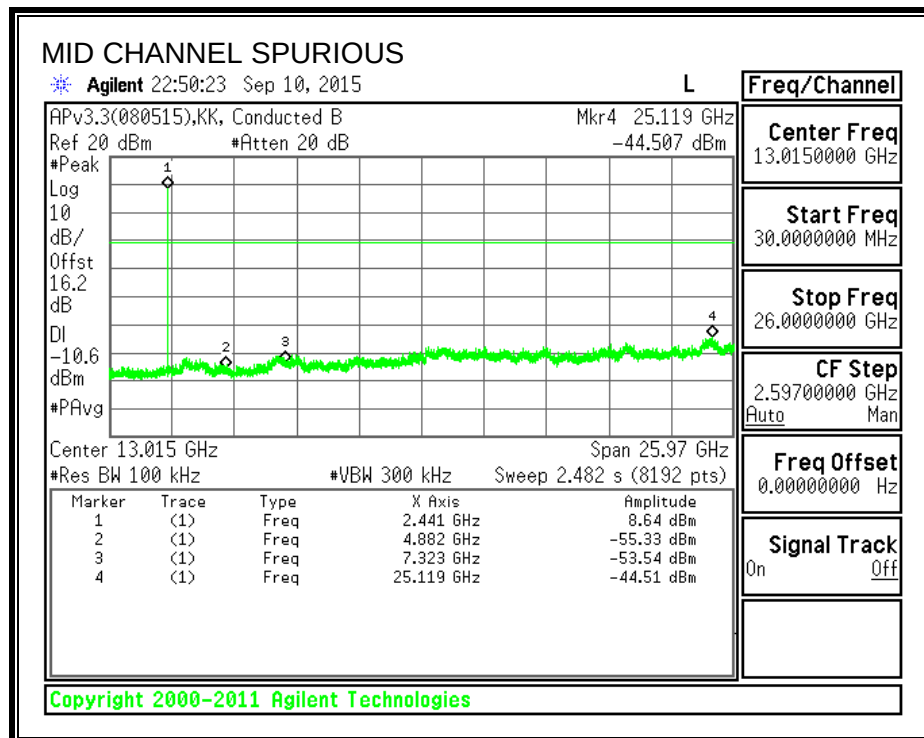
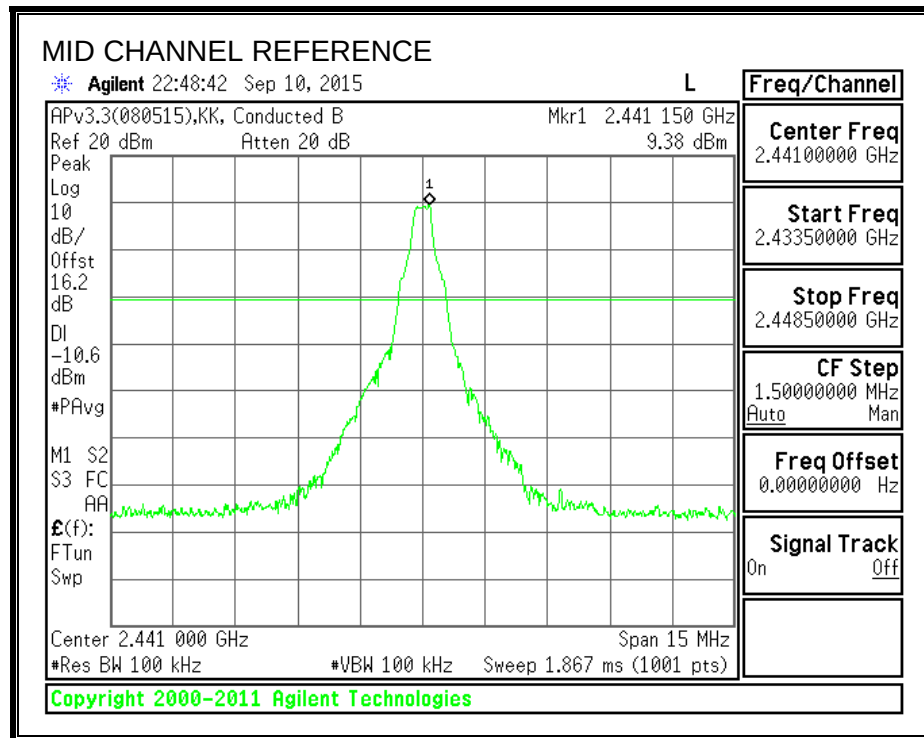
RESULTS

8.8.1. BASIC DATA RATE GFSK MODULATION

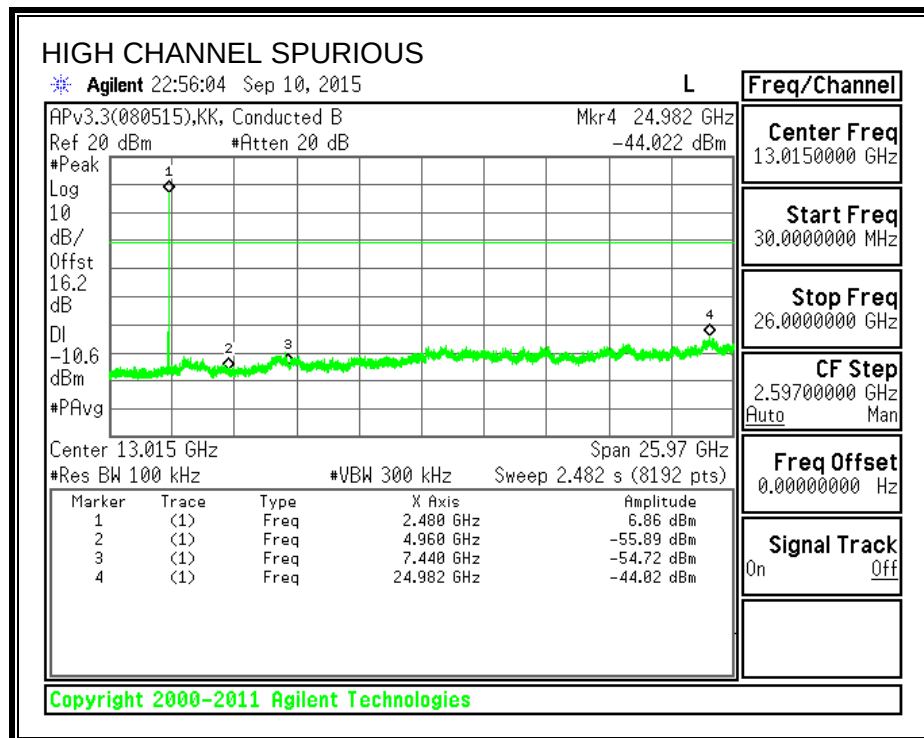
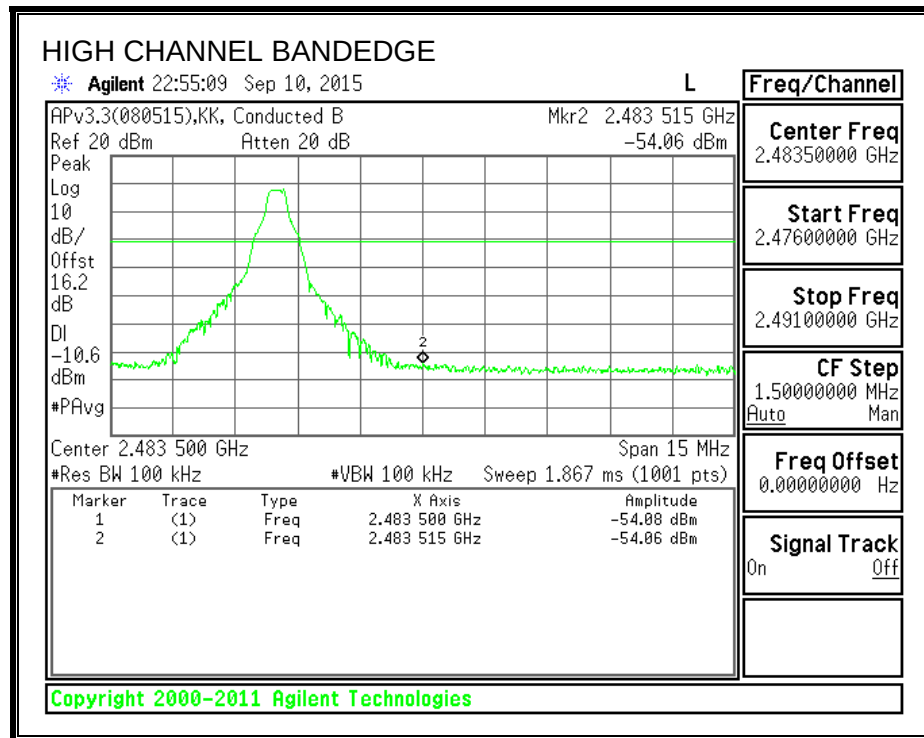
SPURIOUS EMISSIONS, LOW CHANNEL



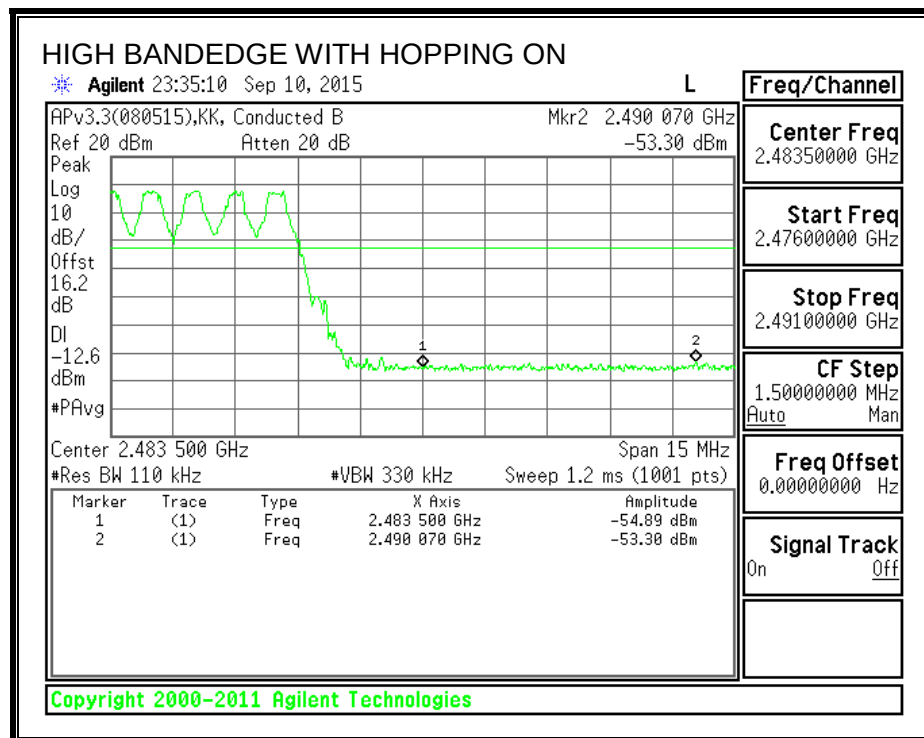
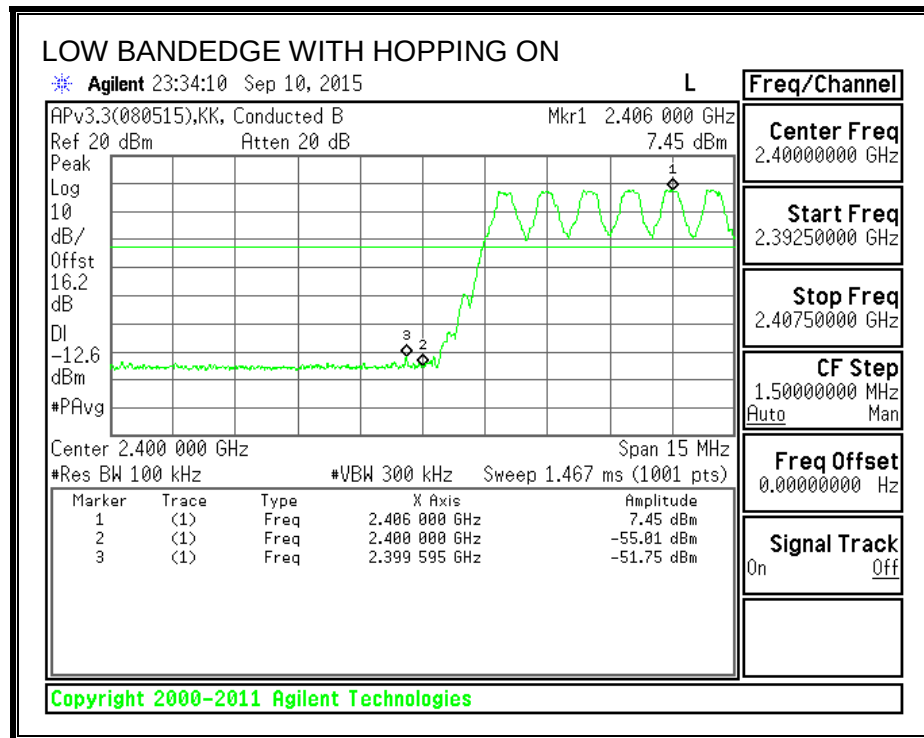
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL

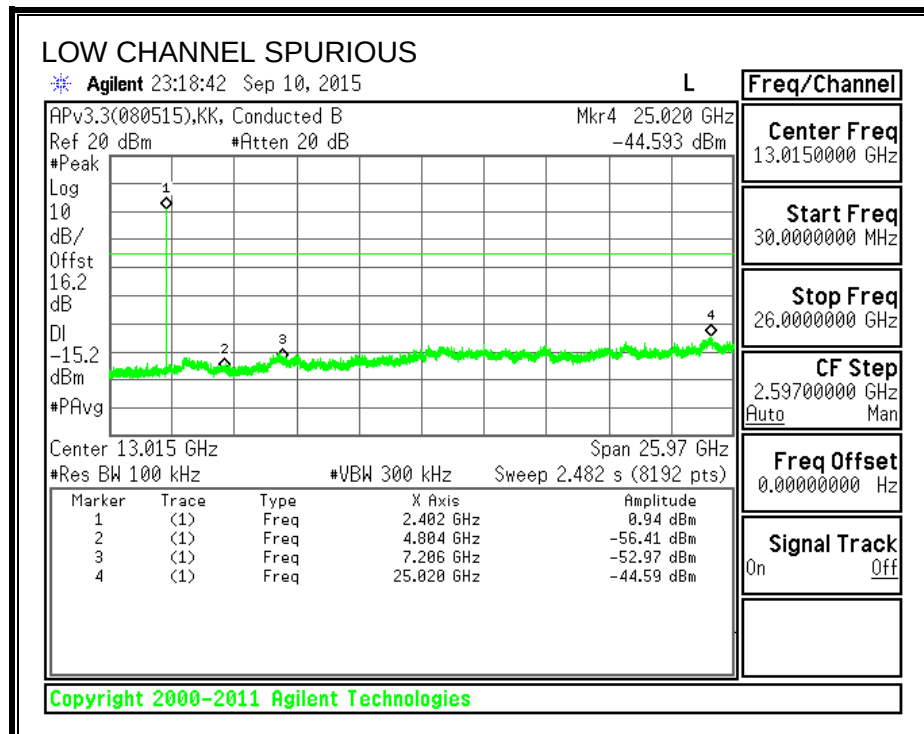
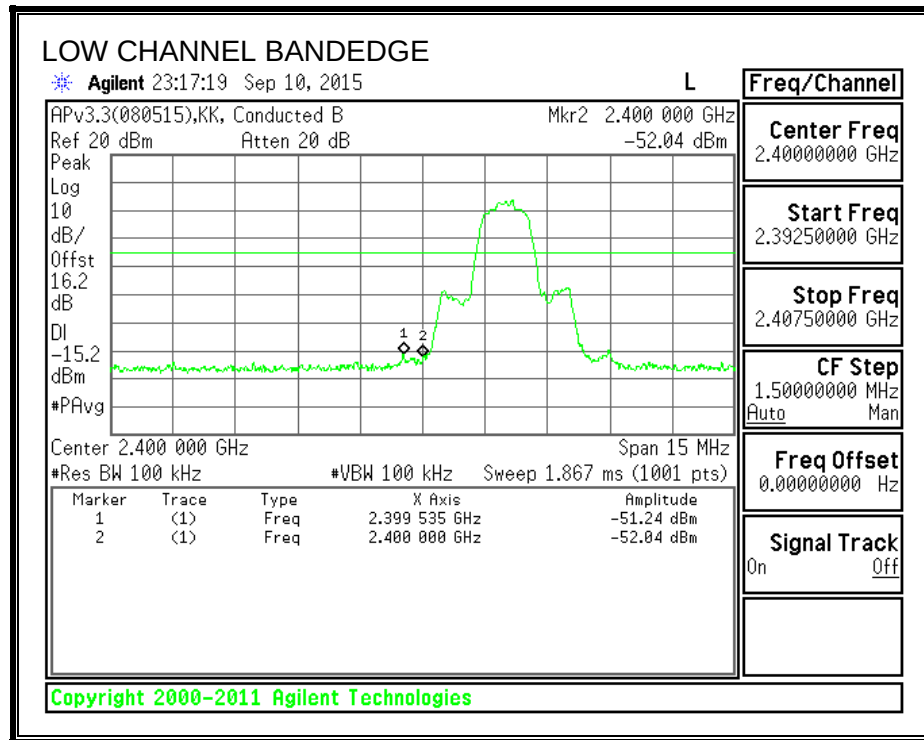


SPURIOUS BANDEDGE EMISSIONS WITH GFSK HOPPING ON

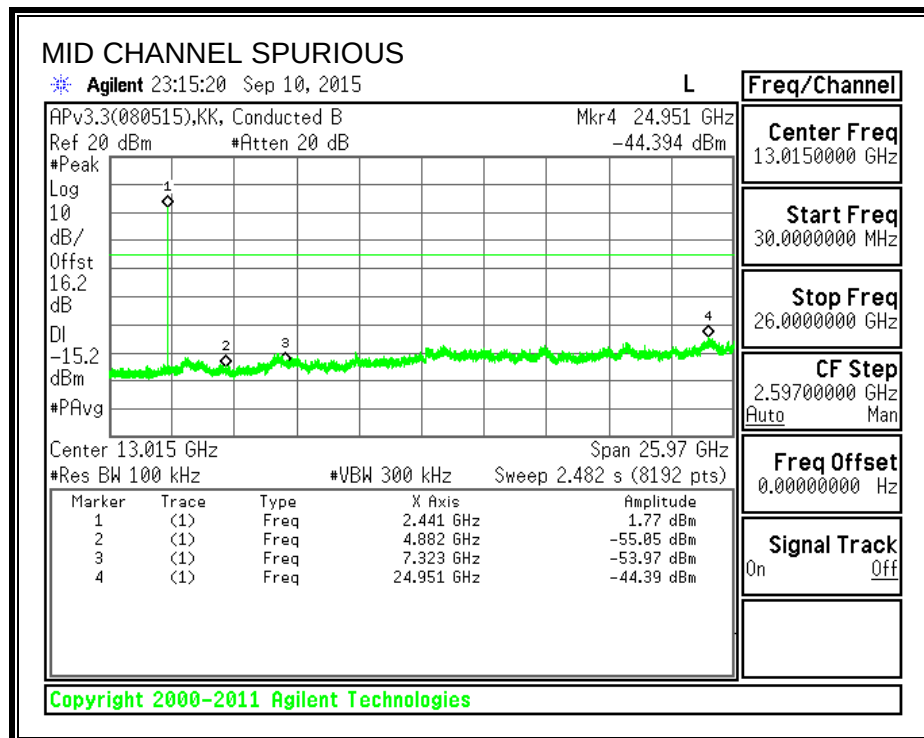
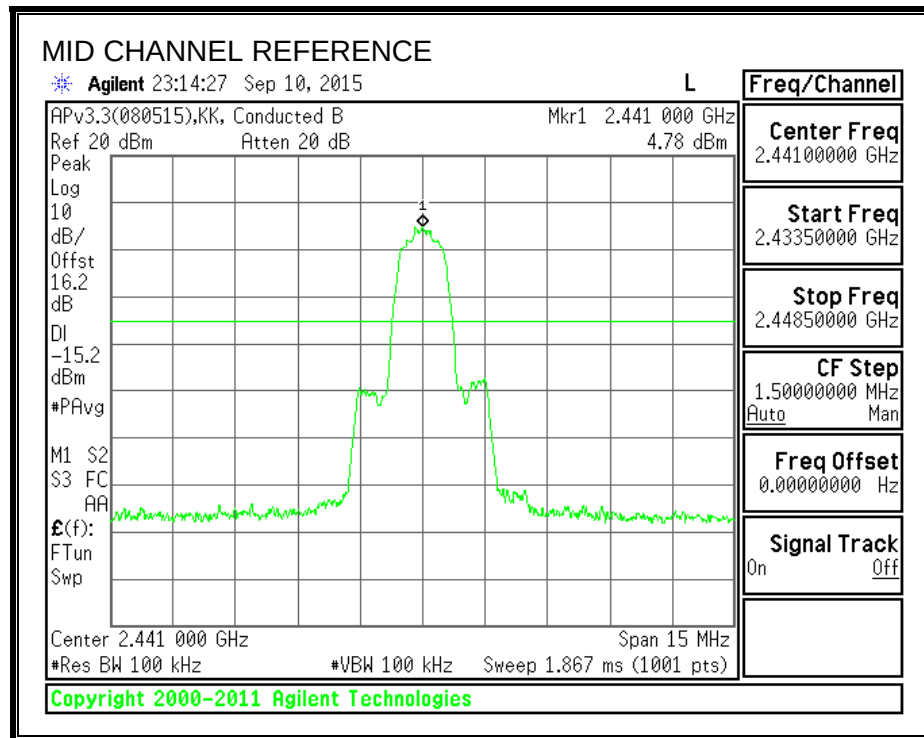


8.8.1. ENHANCED DATA RATE 8PSK MODULATION

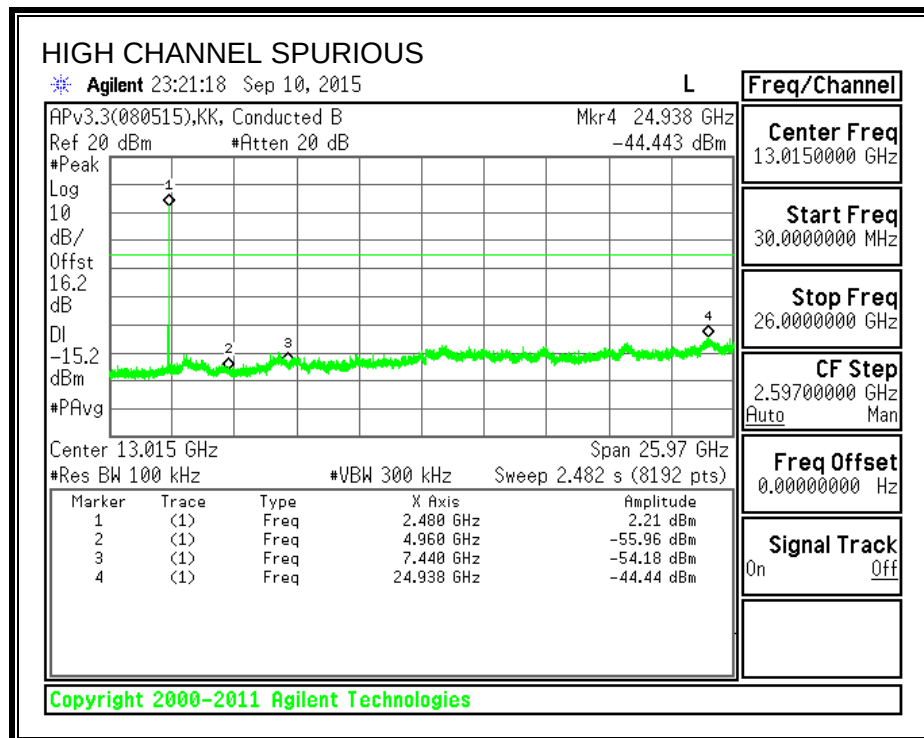
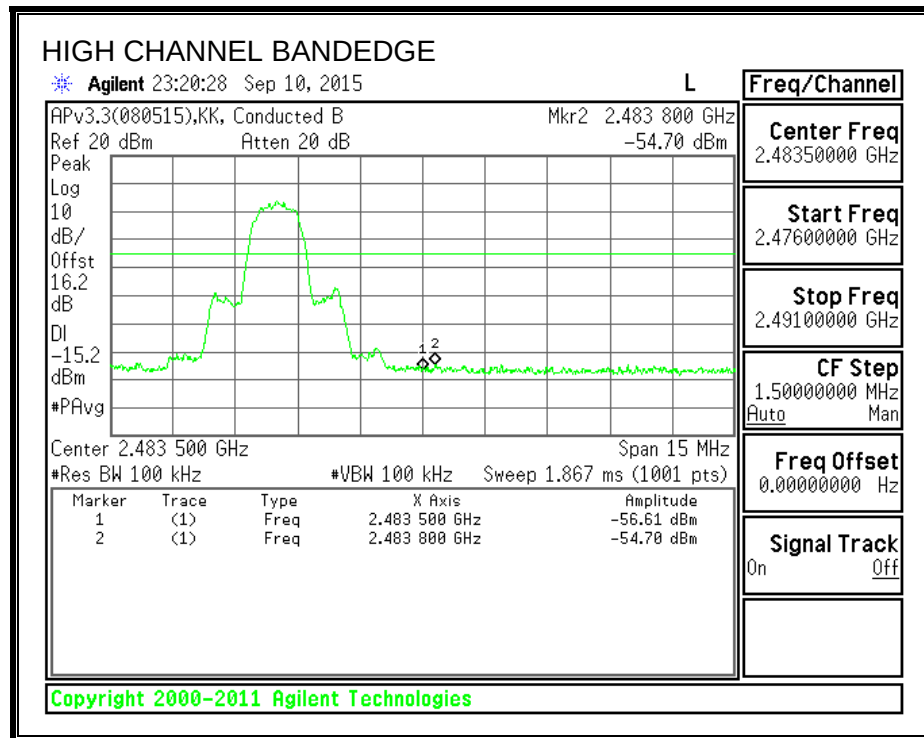
SPURIOUS EMISSIONS, LOW CHANNEL



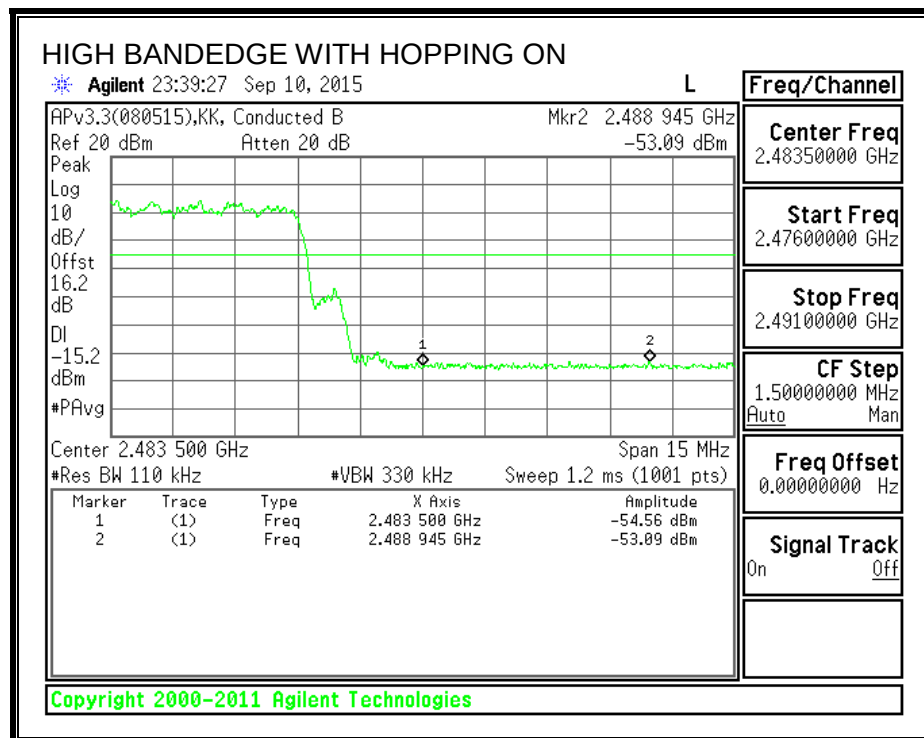
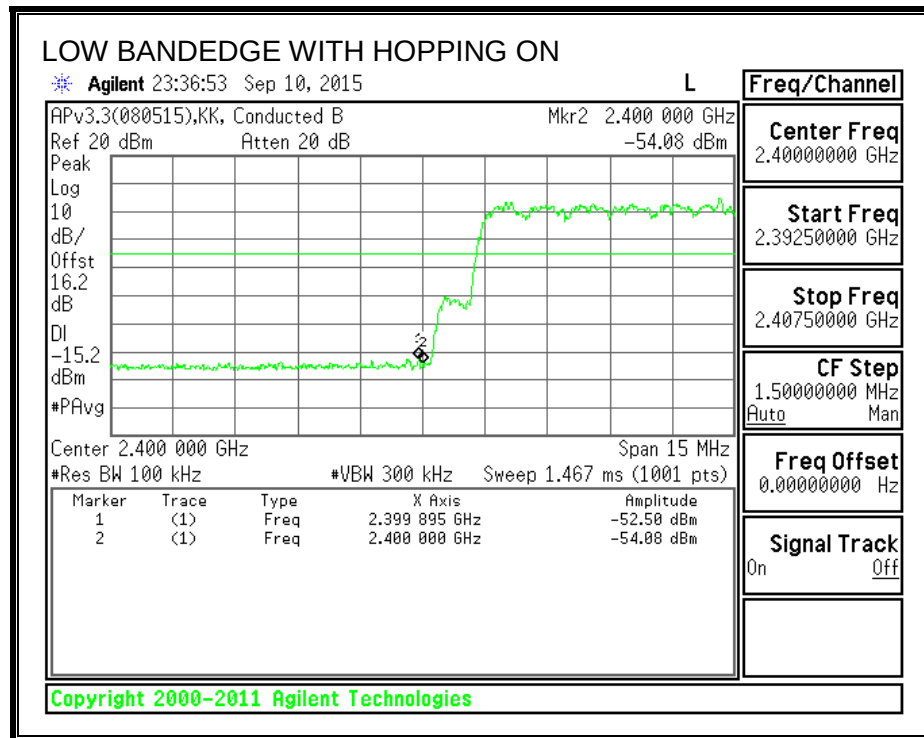
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



SPURIOUS BANDEDGE EMISSIONS WITH 8PSK HOPPING ON



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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 1.5 meter above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10 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.

$$\text{GFSK} = 1/T = 1 / 0.0037\text{S} = 270\text{Hz}.$$

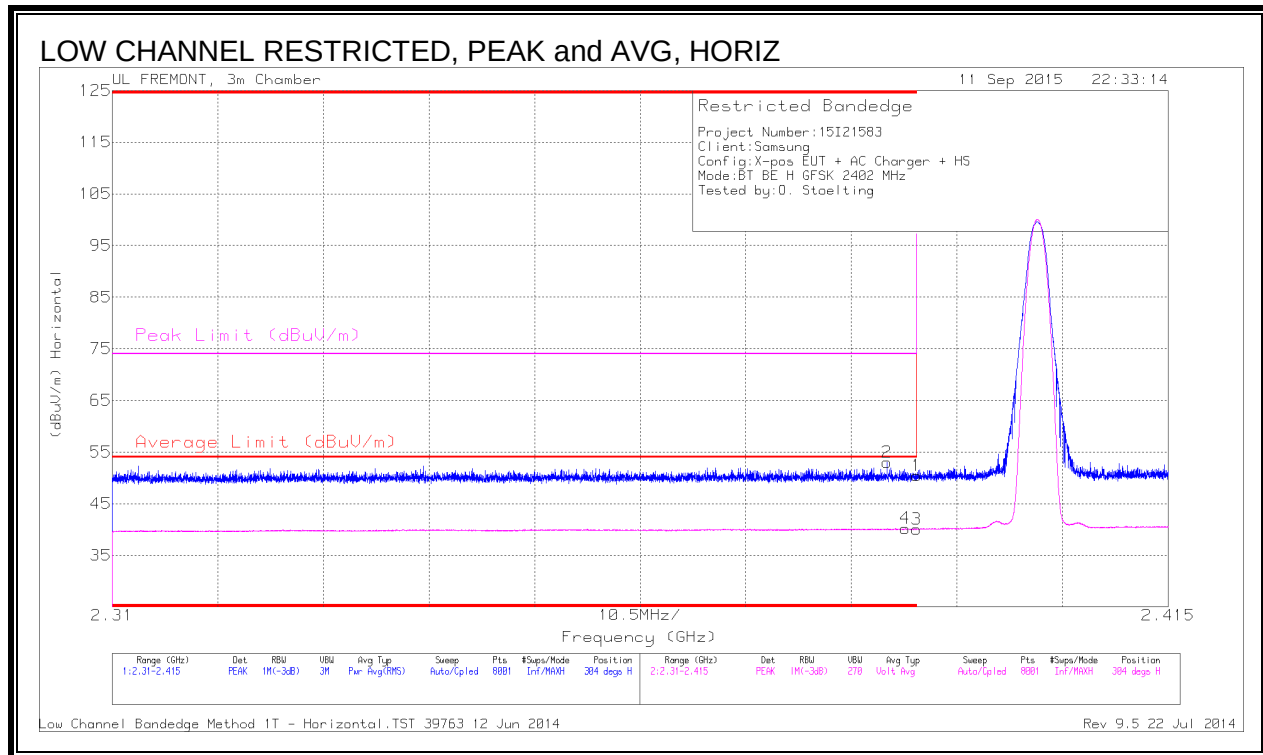
The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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.

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Trace Markers

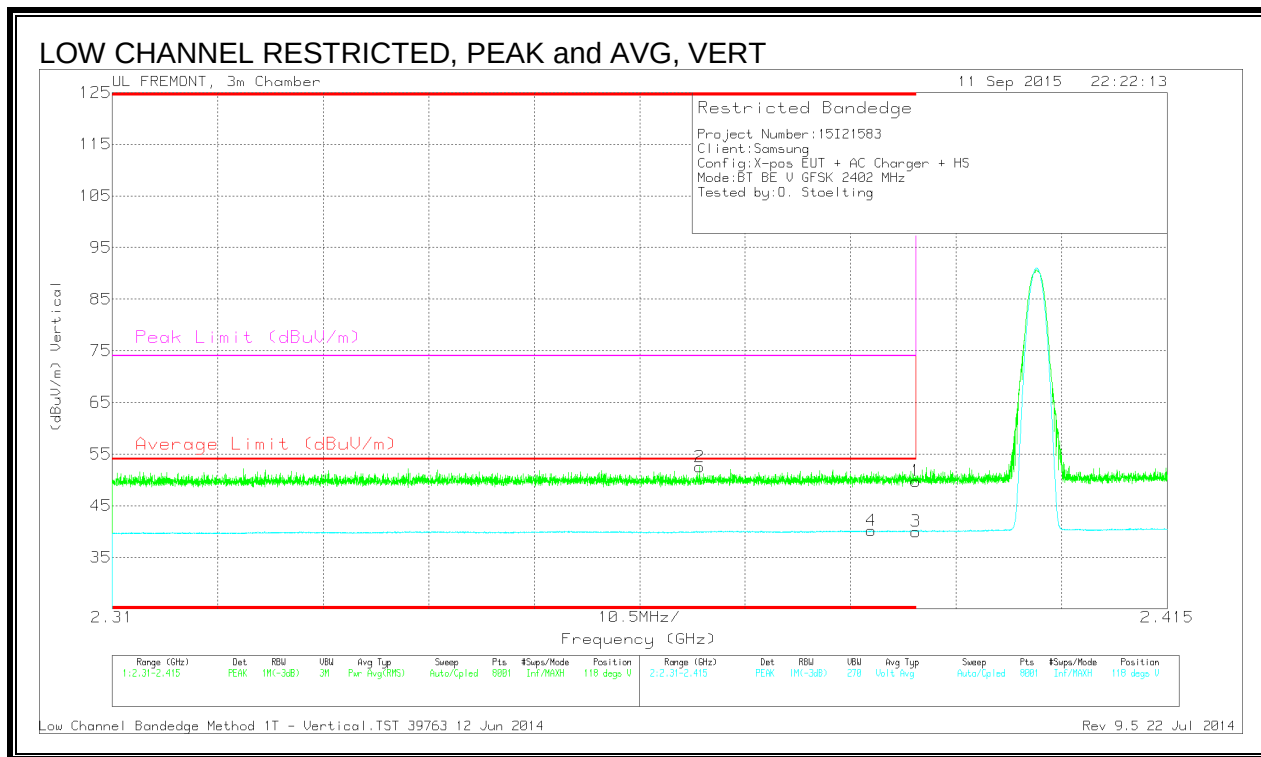
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.387	43.4	PK	32	-22.4	0	53	-	-	74	-21	304	378	H
4	* 2.389	30.63	VB1T	32	-22.4	0	40.23	54	-13.77	-	-	304	378	H
1	* 2.39	40.82	PK	32	-22.4	0	50.42	-	-	74	-23.58	304	378	H
3	* 2.39	30.47	VB1T	32	-22.4	0	40.07	54	-13.93	-	-	304	378	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

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



Trace Markers

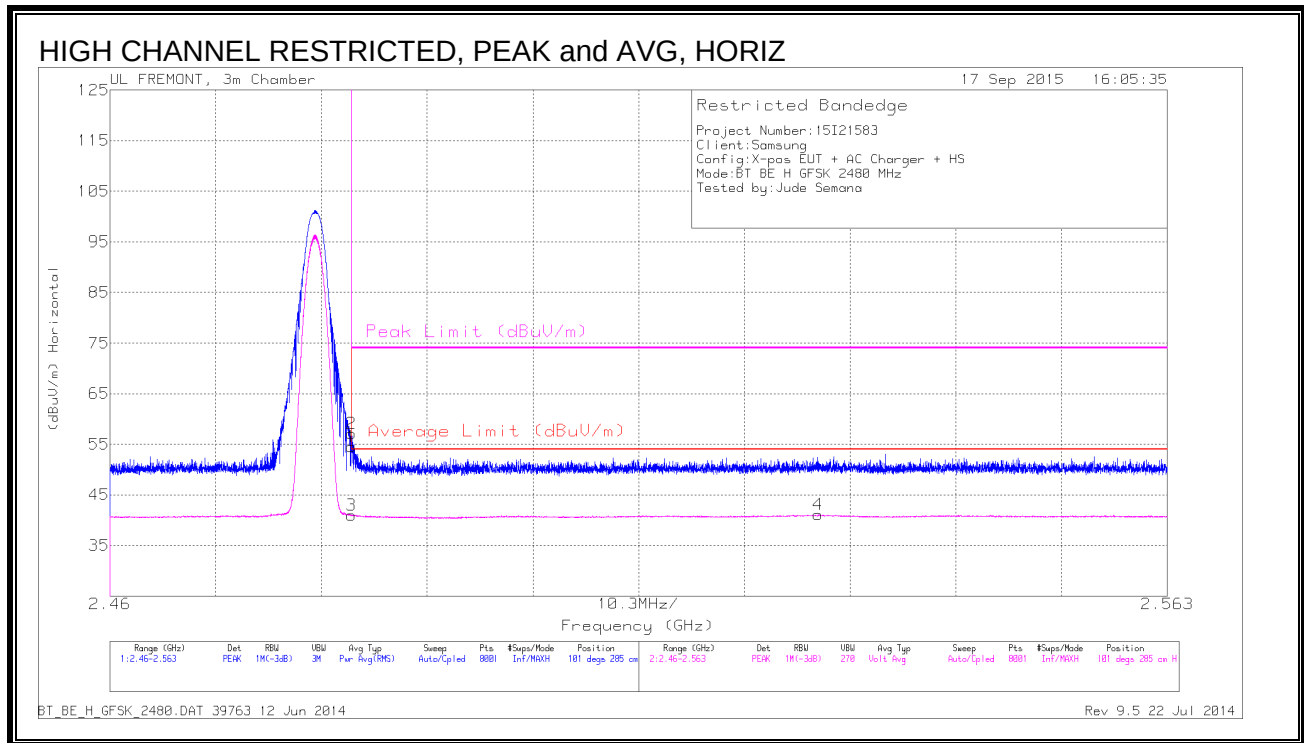
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dBm)	Ampl/Cbl/Fil tri/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.368	43.01	PK	31.9	-22.4	0	52.51	-	-	74	-21.49	118	100	V
4	* 2.386	30.58	VB1T	32	-22.4	0	40.18	54	-13.82	-	-	118	100	V
1	* 2.39	40.17	PK	32	-22.4	0	49.77	-	-	74	-24.23	118	100	V
3	* 2.39	30.4	VB1T	32	-22.4	0	40	54	-14	-	-	118	100	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

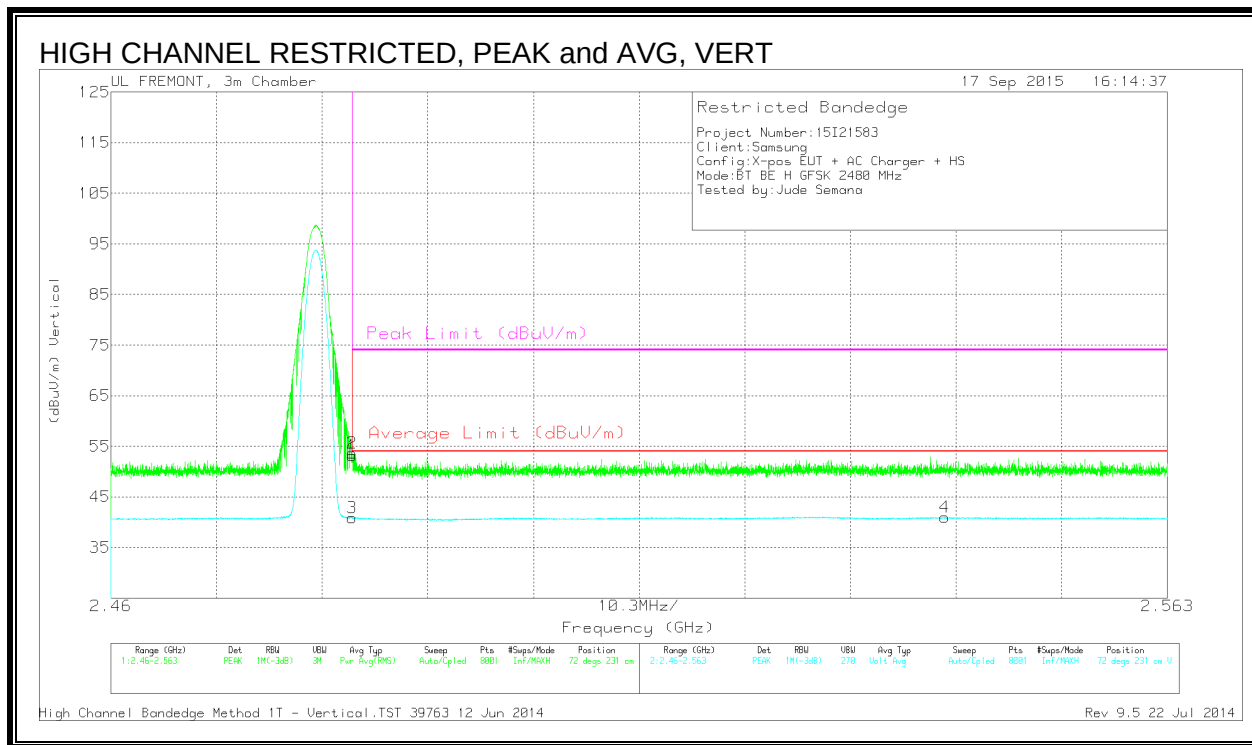
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (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	44.27	PK	32.3	-22.1	0	54.47	-	-	74	-19.53	101	285	H
2	2.484	46.87	PK	32.3	-22.1	0	57.07	-	-	74	-16.93	101	285	H
3	2.484	30.76	VB1T	32.3	-22.1	0	40.96	54	-13.04	-	-	101	285	H
4	2.529	30.65	VB1T	32.4	-22	0	41.05	54	-12.95	-	-	101	285	H

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

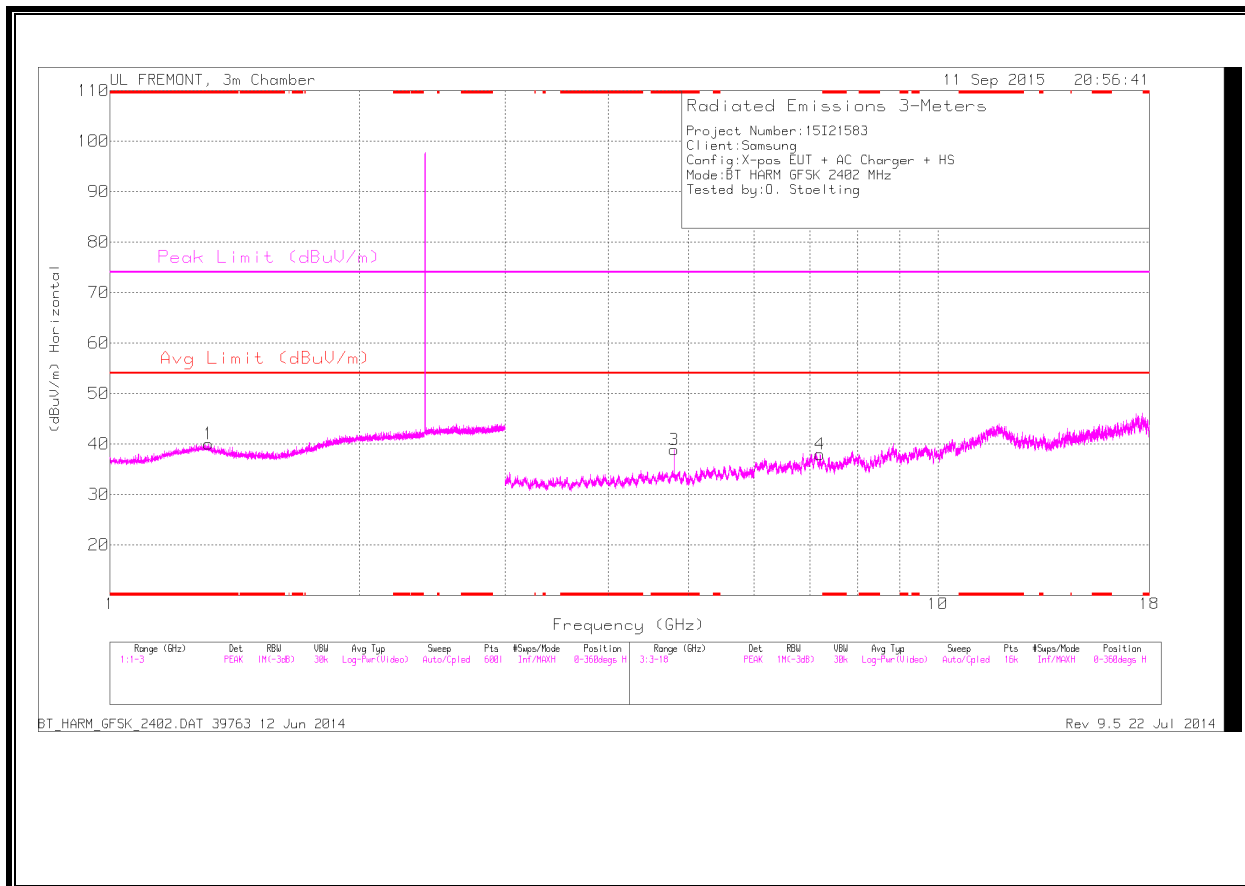


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (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	42.98	PK	32.3	-22.1	0	53.18	-	-	74	-20.82	72	231	V
2	2.484	43.47	PK	32.3	-22.1	0	53.67	-	-	74	-20.33	72	231	V
3	2.484	30.67	VB1T	32.3	-22.1	0	40.87	54	-13.13	-	-	72	231	V
4	2.541	30.52	VB1T	32.4	-21.9	0	41.02	54	-12.98	-	-	72	231	V

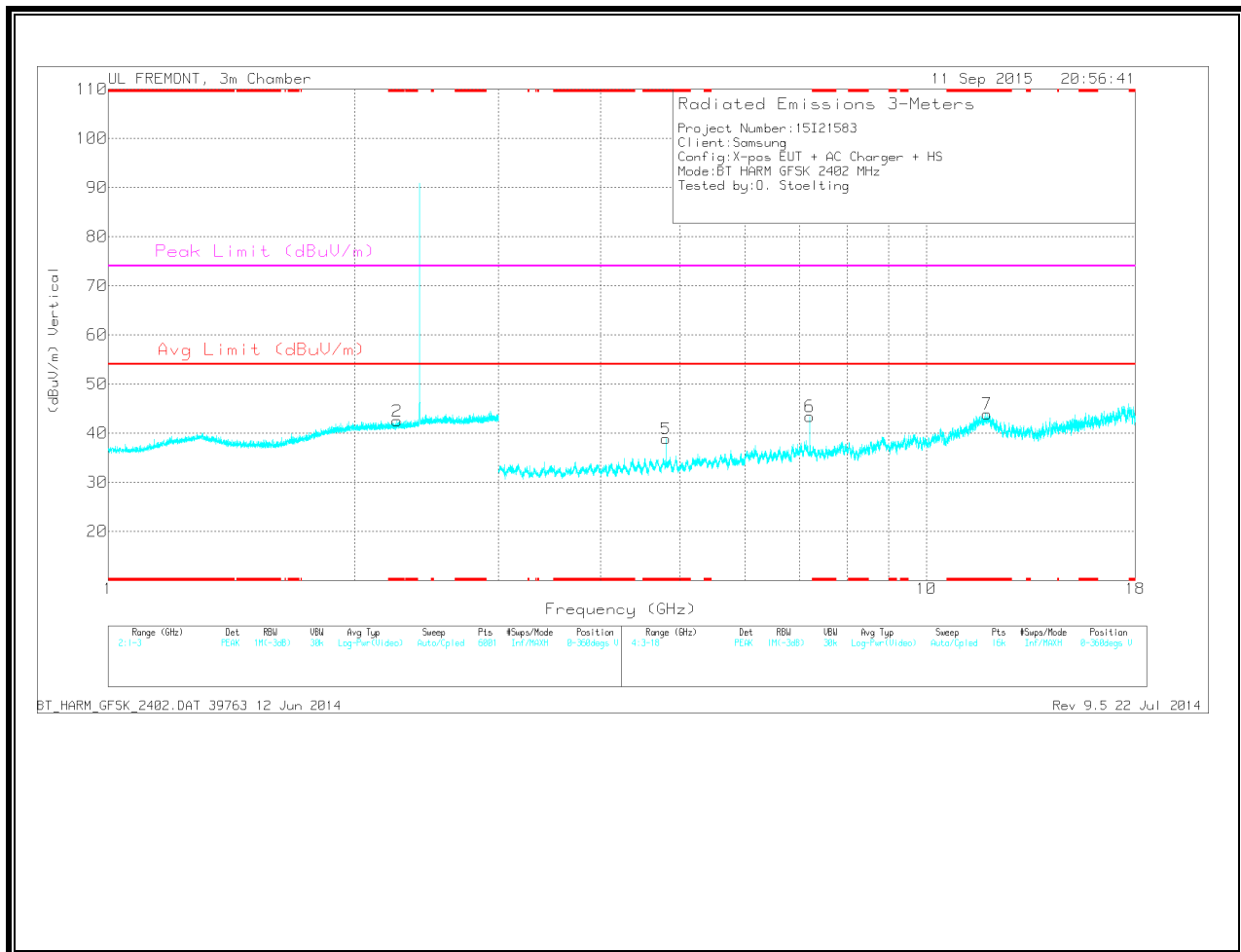
HARMONICS AND SPURIOUS EMISSIONS

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.

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.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/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	* 1.315	33.49	PK	29.7	-23.2	0	39.99	-	-	74	-34.01	0-360	100	H
2	* 2.256	33.27	PK	31.5	-22.3	0	42.47	-	-	74	-31.53	0-360	100	V
3	* 4.805	34.21	PK	34	-29.4	0	38.81	-	-	74	-35.19	0-360	100	H
5	* 4.804	34.21	PK	34	-29.4	0	38.81	-	-	74	-35.19	0-360	100	V
7	* 11.86	27.49	PK	39.1	-22.7	0	43.89	-	-	74	-30.11	0-360	200	V
4	7.205	30.72	PK	35.6	-28.4	0	37.92	-	-	-	-	0-360	100	H
6	7.206	36.18	PK	35.6	-28.4	0	43.38	-	-	-	-	0-360	100	V

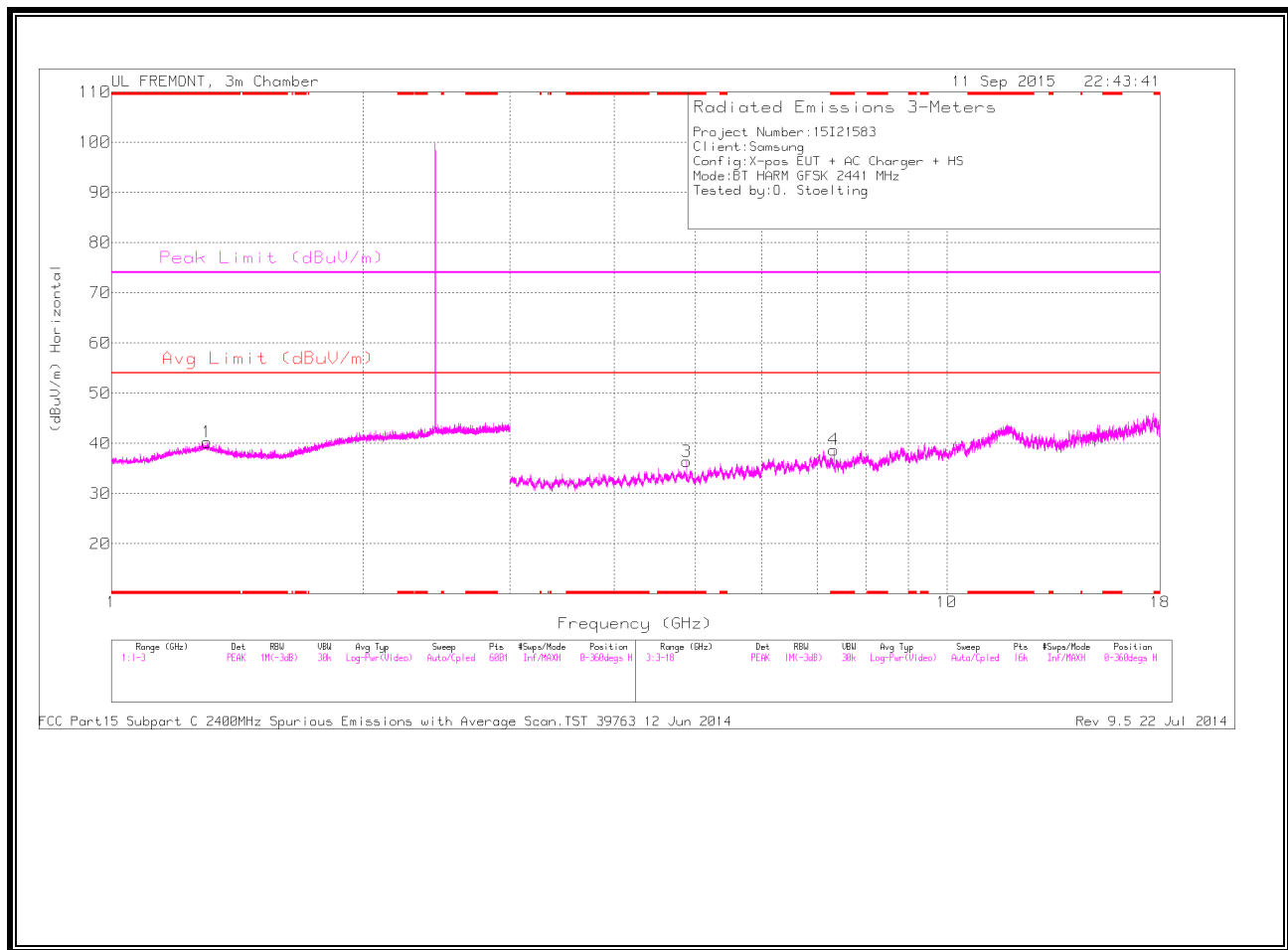
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.313	42.89	PK2	29.7	-23.2	49.39	-	-	74	-24.61	360	100	H
* 1.313	31.08	VB1T	29.7	-23.2	37.58	54	-16.42	-	-	360	100	H
* 2.256	42.34	PK2	31.5	-22.3	51.54	-	-	74	-22.46	360	100	V
* 2.256	30.78	VB1T	31.5	-22.3	39.98	54	-14.02	-	-	360	100	V
* 4.804	41.62	PK2	34	-29.4	46.22	-	-	74	-27.78	287	100	H
* 4.804	32.8	VB1T	34	-29.4	37.4	54	-16.6	-	-	287	100	H
* 4.804	41.93	PK2	34	-29.4	46.53	-	-	74	-27.47	320	107	V
* 4.804	32.97	VB1T	34	-29.4	37.57	54	-16.43	-	-	320	107	V
* 11.861	37.25	PK2	39.1	-22.7	53.65	-	-	74	-20.35	213	138	V
* 11.859	25.07	VB1T	39.1	-22.7	41.47	54	-12.53	-	-	213	138	V
7.206	40.91	PK2	35.6	-28.4	48.11	-	-	74	-25.89	53	117	H
7.206	30.66	VB1T	35.6	-28.4	37.86	54	-16.14	-	-	53	117	H
7.206	42.23	PK2	35.6	-28.4	49.43	-	-	74	-24.57	62	105	V
7.206	33.26	VB1T	35.6	-28.4	40.46	54	-13.54	-	-	62	105	V

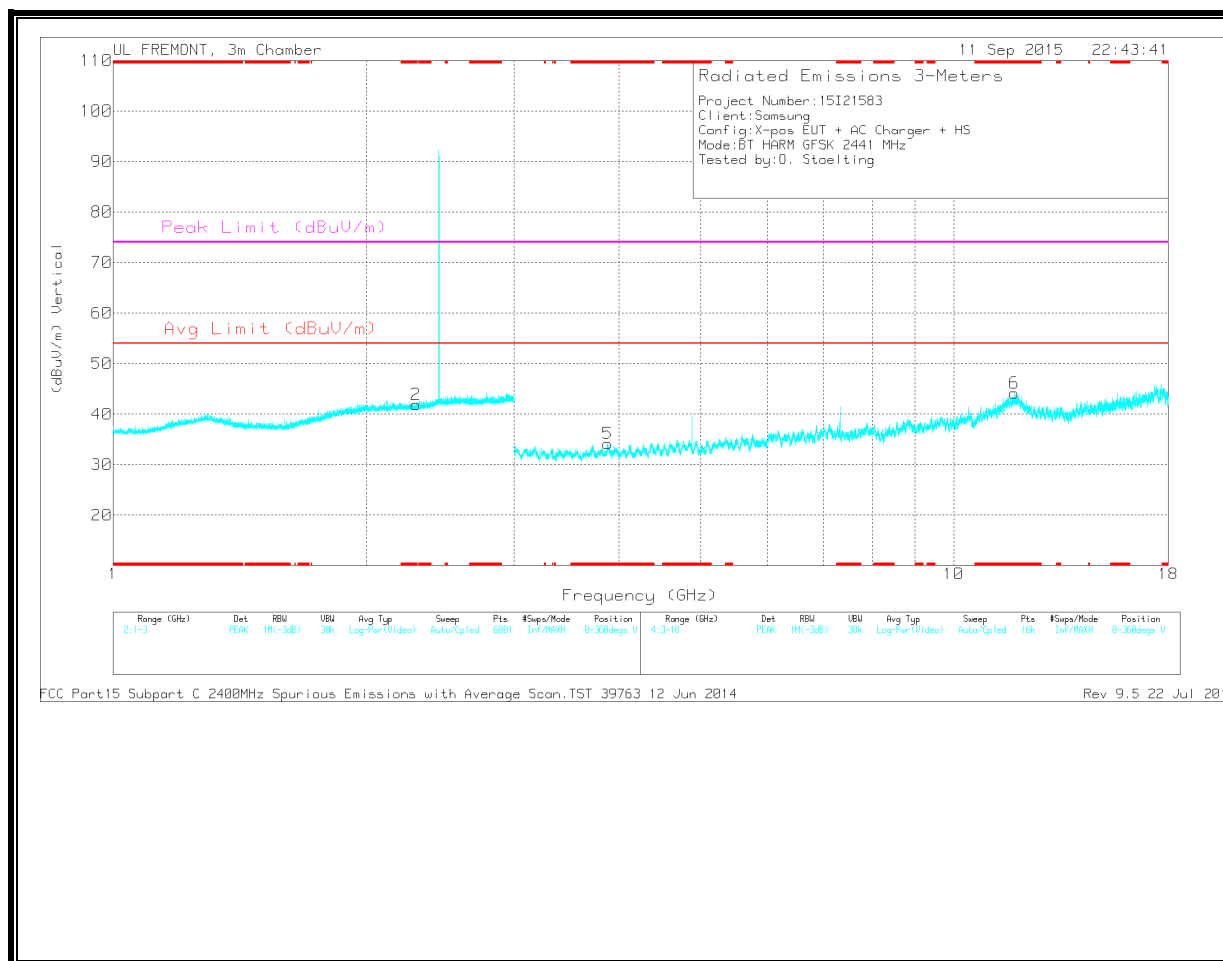
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

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.

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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fil/Filr/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	* 1.301	33.54	PK	29.9	-23.2	0	40.24	-	-	74	-33.76	0-360	100	H
6	* 11.802	27.62	PK	39	-22.5	0	44.12	-	-	74	-29.88	0-360	100	V
2	* 2.293	32.67	PK	31.6	-22.4	0	41.87	-	-	74	-32.13	0-360	100	V
5	* 3.877	31.45	PK	33.2	-30.5	0	34.15	-	-	74	-39.85	0-360	100	V
3	* 4.882	31.48	PK	34	-29.1	0	36.38	-	-	74	-37.62	0-360	100	H
4	* 7.323	30.21	PK	35.6	-27.1	0	38.71	-	-	74	-35.29	0-360	100	H

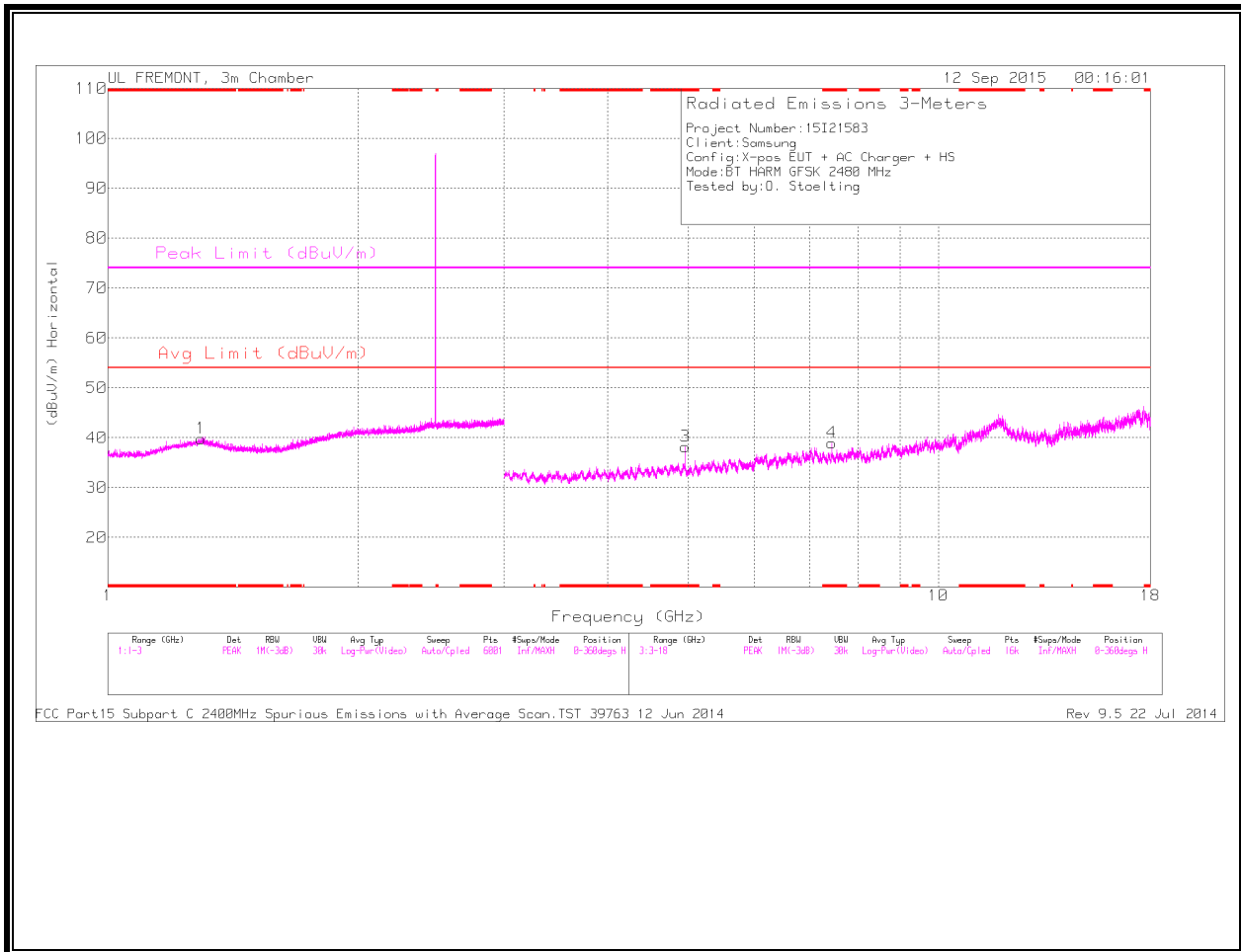
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.303	42.5	PK2	29.9	-23.2	49.2	-	-	74	-24.8	360	100	H
* 1.301	30.91	VB1T	29.9	-23.2	37.61	54	-16.39	-	-	360	100	H
* 2.294	42.73	PK2	31.6	-22.4	51.93	-	-	74	-22.07	360	100	V
* 2.292	30.71	VB1T	31.6	-22.4	39.91	54	-14.09	-	-	360	100	V
* 4.881	38.74	PK2	34	-29.1	43.64	-	-	74	-30.36	360	100	H
* 4.882	27.74	VB1T	34	-29.1	32.64	54	-21.36	-	-	360	100	H
* 7.322	38.22	PK2	35.6	-27.1	46.72	-	-	74	-27.28	360	100	H
* 7.323	27.36	VB1T	35.6	-27.1	35.86	54	-18.14	-	-	360	100	H
* 3.877	41.14	PK2	33.2	-30.5	43.84	-	-	74	-30.16	360	100	V
* 3.876	29.29	VB1T	33.2	-30.5	31.99	54	-22.01	-	-	360	100	V
* 11.8	37.02	PK2	39	-22.4	53.62	-	-	74	-20.38	266	156	V
* 11.8	25.24	VB1T	39	-22.4	41.84	54	-12.16	-	-	266	156	V

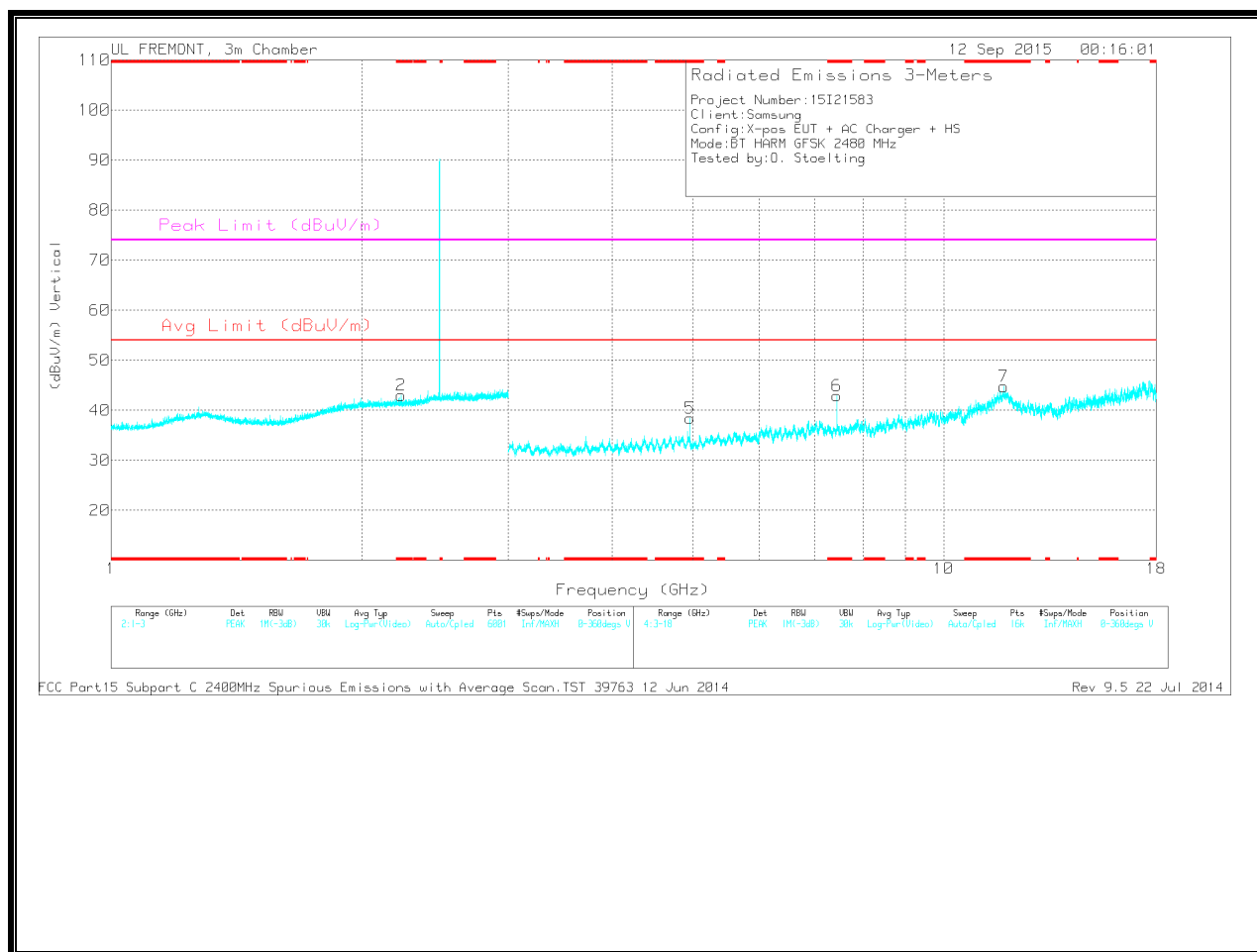
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

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.

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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/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	* 1.295	33.24	PK	29.8	-23.2	0	39.84	-	-	74	-34.16	0-360	200	H
2	* 2.23	33.78	PK	31.5	-22.3	0	42.98	-	-	74	-31.02	0-360	100	V
3	* 4.96	34.52	PK	34	-30.3	0	38.22	-	-	74	-35.78	0-360	100	H
4	* 7.44	30.76	PK	35.7	-27.5	0	38.96	-	-	74	-35.04	0-360	100	H
5	* 4.96	34.69	PK	34	-30.3	0	38.39	-	-	74	-35.61	0-360	100	V
6	* 7.441	34.77	PK	35.7	-27.6	0	42.87	-	-	74	-31.13	0-360	100	V
7	* 11.798	28.13	PK	39	-22.4	0	44.73	-	-	74	-29.27	0-360	200	V

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

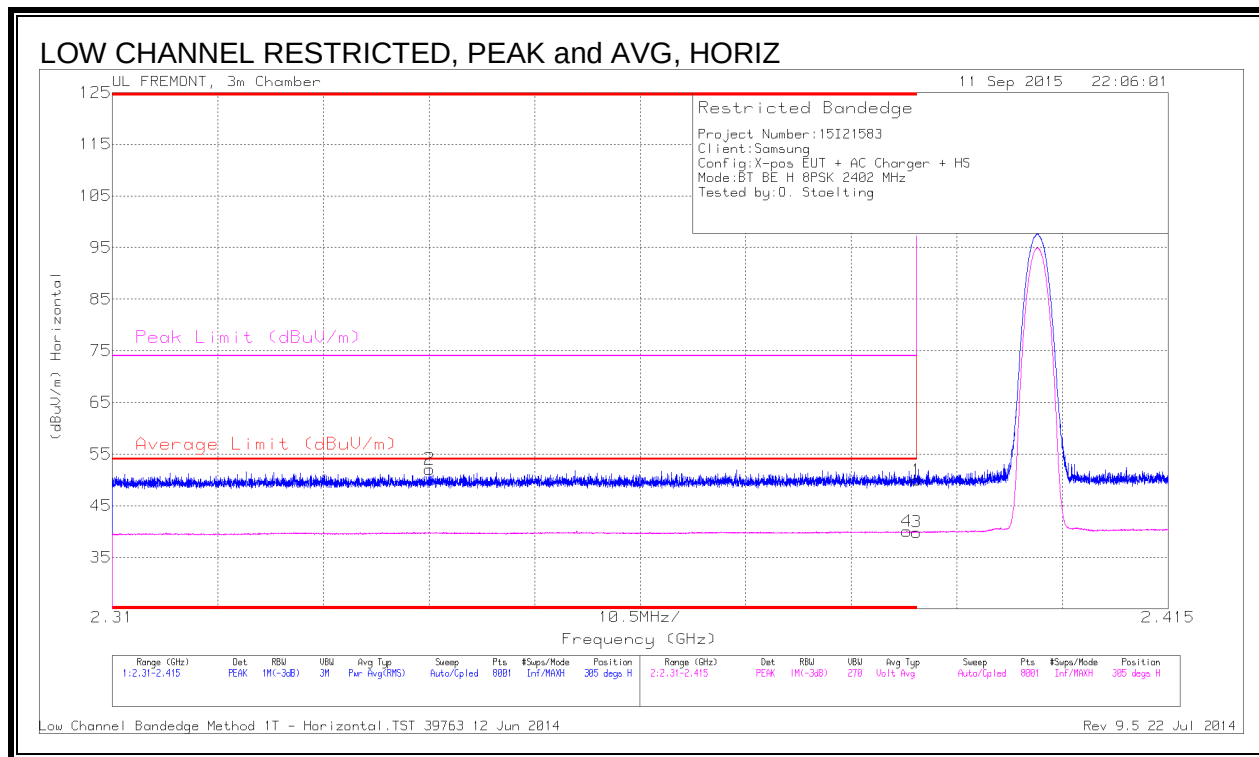
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.297	42.46	PK2	29.9	-23.2	49.16	-	-	74	-24.84	360	200	H
* 1.293	31.09	VB1T	29.8	-23.2	37.69	54	-16.31	-	-	360	200	H
* 2.231	42.54	PK2	31.5	-22.3	51.74	-	-	74	-22.26	360	100	V
* 2.229	30.67	VB1T	31.5	-22.3	39.87	54	-14.13	-	-	360	100	V
* 4.96	41.85	PK2	34	-30.3	45.55	-	-	74	-28.45	131	397	H
* 4.96	32.74	VB1T	34	-30.3	36.44	54	-17.56	-	-	131	397	H
* 7.439	40.42	PK2	35.7	-27.5	48.62	-	-	74	-25.38	55	112	H
* 7.44	30.29	VB1T	35.7	-27.6	38.39	54	-15.61	-	-	55	112	H
* 4.96	42.39	PK2	34	-30.3	46.09	-	-	74	-27.91	178	142	V
* 4.96	33	VB1T	34	-30.3	36.7	54	-17.3	-	-	178	142	V
* 7.44	42.01	PK2	35.7	-27.6	50.11	-	-	74	-23.89	75	105	V
* 7.44	33.95	VB1T	35.7	-27.6	42.05	54	-11.95	-	-	75	105	V
* 11.796	36.54	PK2	39	-22.4	53.14	-	-	74	-20.86	339	329	V
* 11.796	24.83	VB1T	39	-22.4	41.43	54	-12.57	-	-	339	329	V

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

9.2.2. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Trace Markers

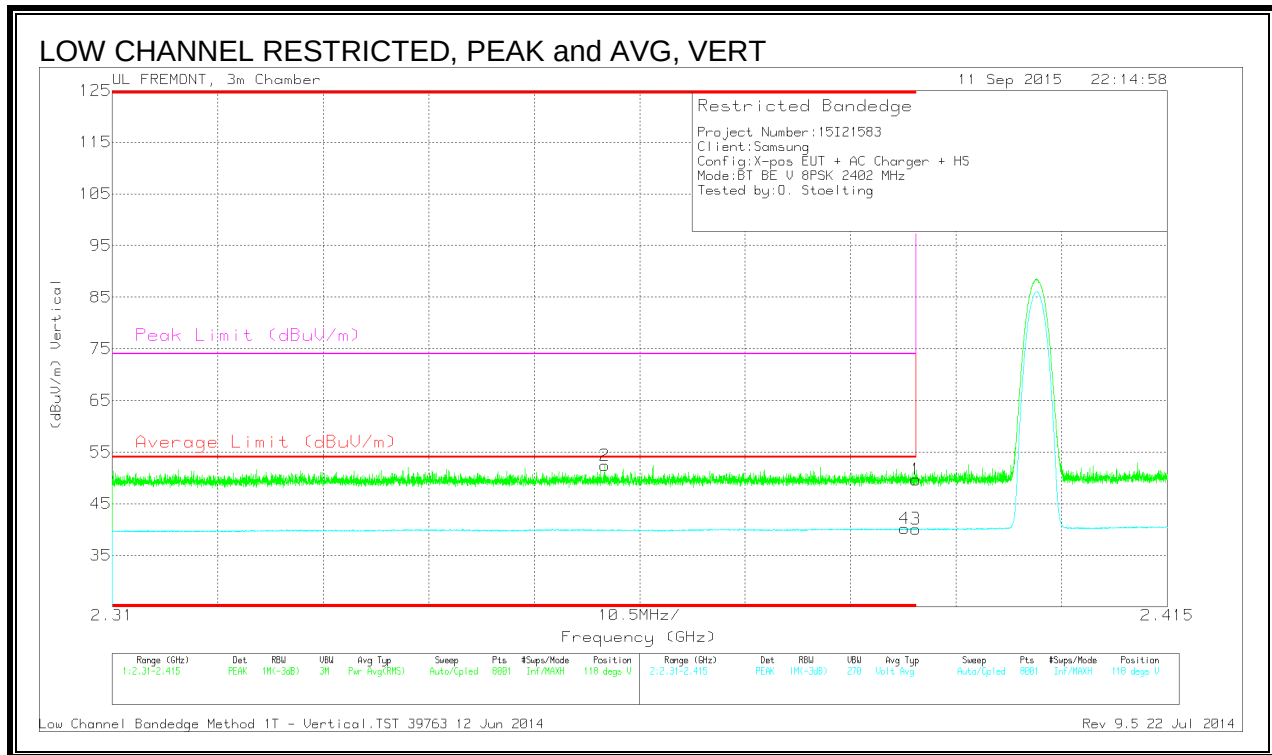
Marker	Frequenc y (GHz)	Meter Readin g (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.36	PK	32	-22.4	0	49.96	-	-	74	-24.04	305	106	H
2	* 2.342	42.68	PK	31.8	-22.4	0	52.08	-	-	74	-21.92	305	106	H
3	* 2.39	30.28	VB1T	32	-22.4	0	39.88	54	-14.12	-	-	305	106	H
4	* 2.389	30.44	VB1T	32	-22.4	0	40.04	54	-13.96	-	-	305	106	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

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



Trace Markers

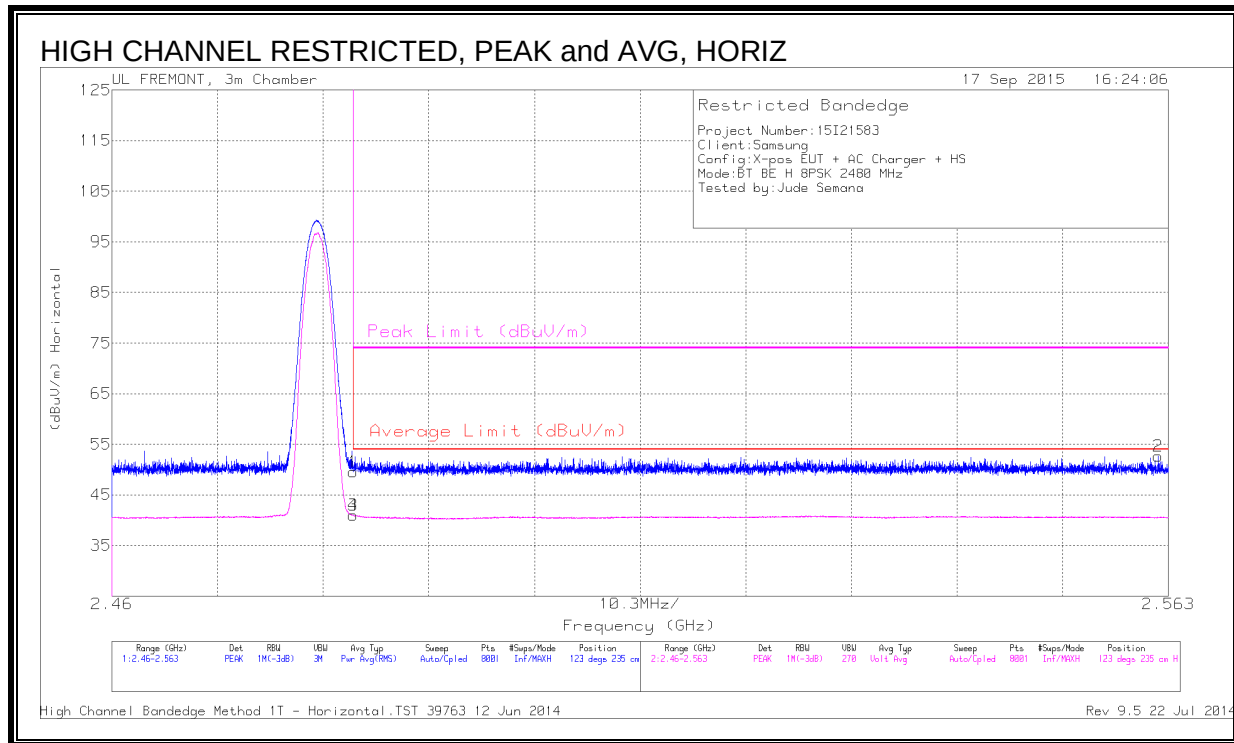
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dBm)	Ampl/Cbl/Filtri/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.359	42.9	PK	31.9	-22.4	0	52.4	-	-	74	-21.6	118	100	V
4	* 2.389	30.57	VB1T	32	-22.4	0	40.17	54	-13.83	-	-	118	100	V
1	* 2.39	40.08	PK	32	-22.4	0	49.68	-	-	74	-24.32	118	100	V
3	* 2.39	30.48	VB1T	32	-22.4	0	40.08	54	-13.92	-	-	118	100	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

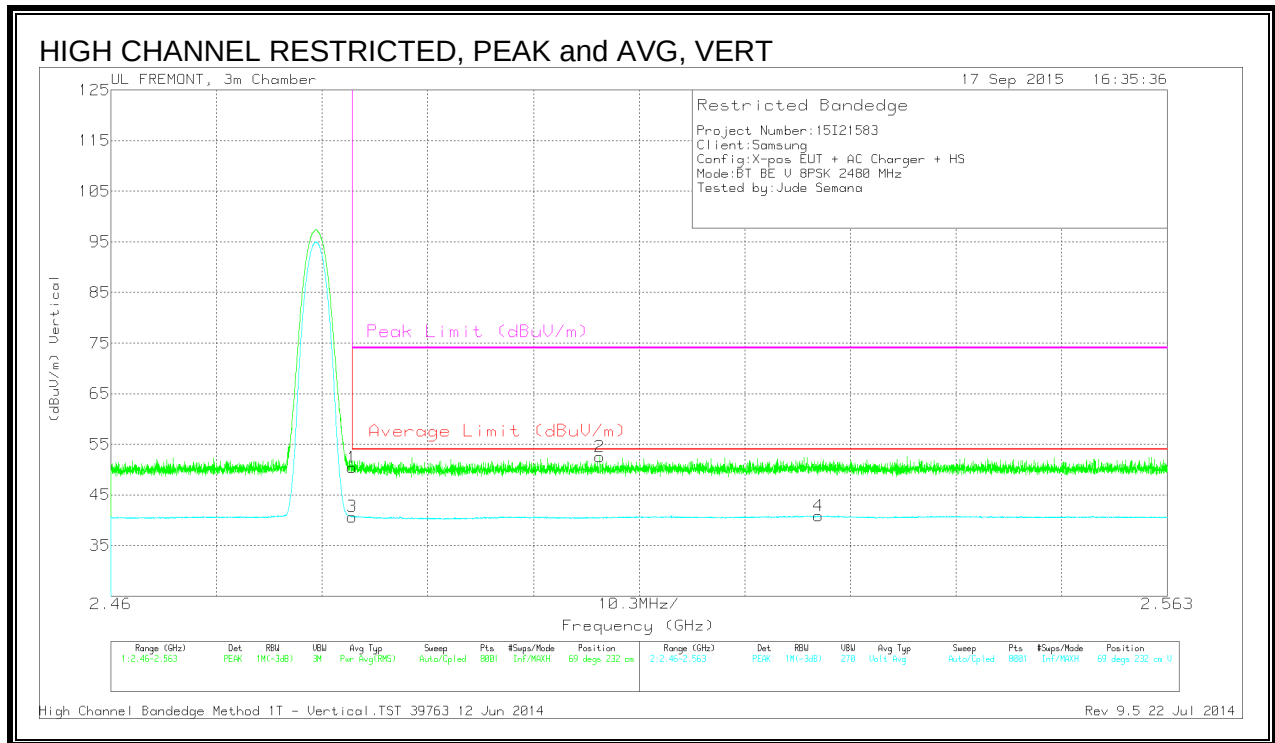
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (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	39.36	PK	32.3	-22.1	0	49.56	-	-	74	-24.44	123	235	H
3	2.484	30.83	VB1T	32.3	-22.1	0	41.03	54	-12.97	-	-	123	235	H
4	2.484	30.83	VB1T	32.3	-22.1	0	41.03	54	-12.97	-	-	123	235	H
2	2.562	42.2	PK	32.4	-22	0	52.6	-	-	74	-21.4	123	235	H

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

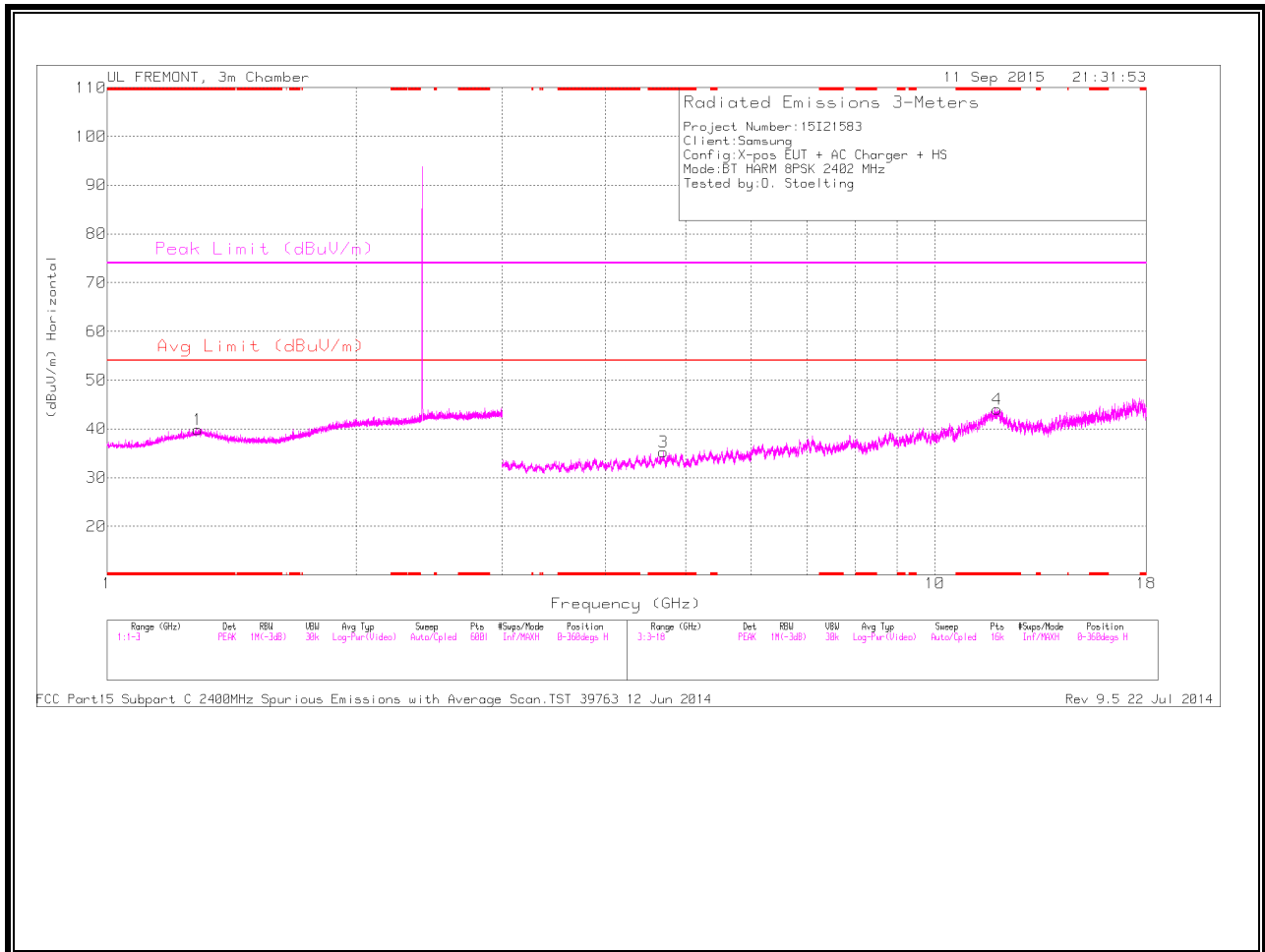


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (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	40.16	PK	32.3	-22.1	0	50.36	-	-	74	-23.64	69	232	V
3	2.484	30.47	VB1T	32.3	-22.1	0	40.67	54	-13.33	-	-	69	232	V
2	2.508	42.32	PK	32.3	-22.1	0	52.52	-	-	74	-21.48	69	232	V
4	2.529	30.46	VB1T	32.4	-22	0	40.86	54	-13.14	-	-	69	232	V

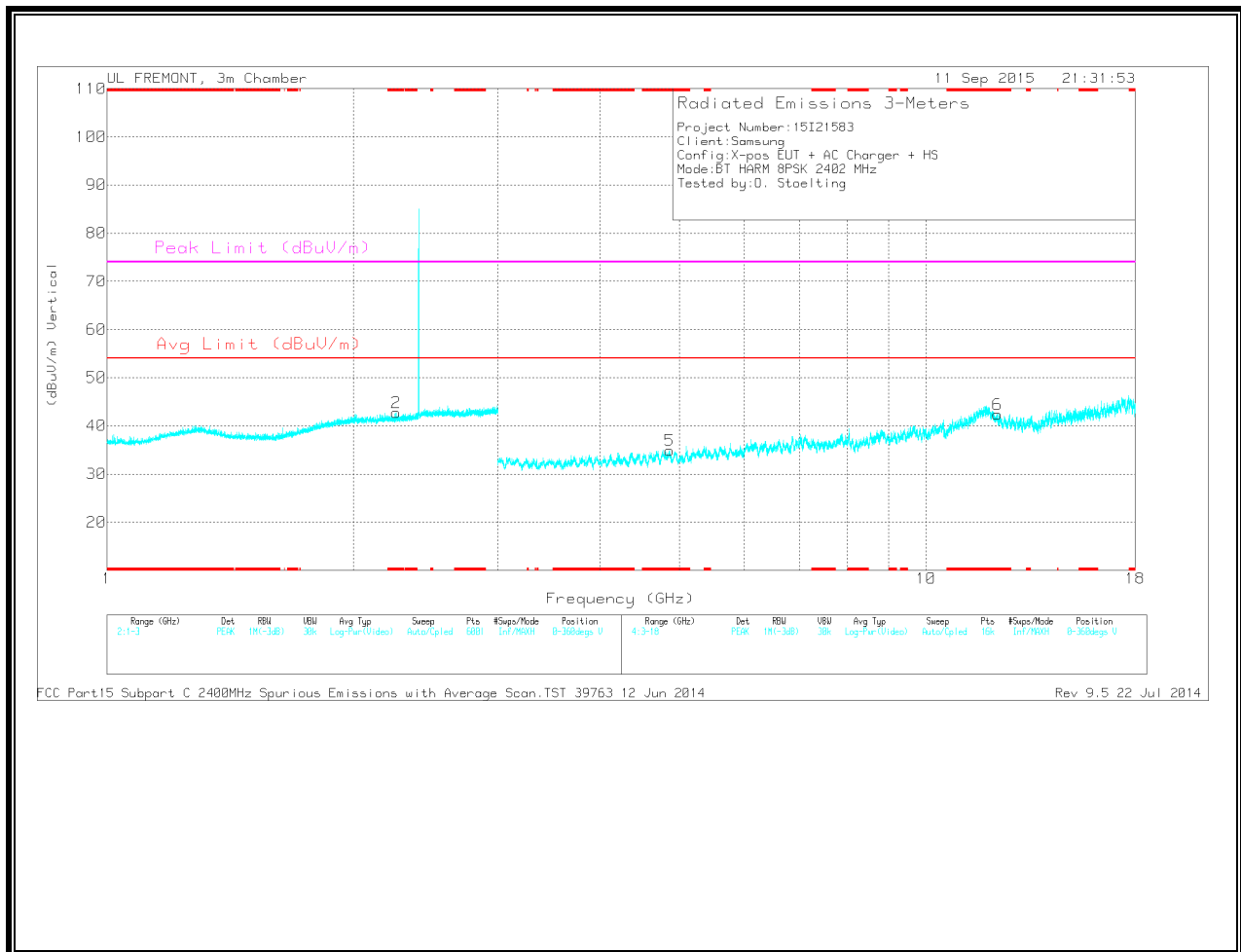
HARMONICS AND SPURIOUS EMISSIONS

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.

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.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/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	* 1.287	33.13	PK	29.8	-23.1	0	39.83	-	-	74	-34.17	0-360	200	H
4	* 11.883	27.7	PK	39.1	-22.8	0	44	-	-	74	-30	0-360	200	H
6	* 12.213	27.71	PK	39	-24.3	0	42.41	-	-	74	-31.59	0-360	100	V
2	* 2.254	33.57	PK	31.5	-22.3	0	42.77	-	-	74	-31.23	0-360	100	V
3	* 4.701	31.41	PK	34.1	-30.2	0	35.31	-	-	74	-38.69	0-360	200	H
5	* 4.864	30.02	PK	34	-29.1	0	34.92	-	-	74	-39.08	0-360	200	V

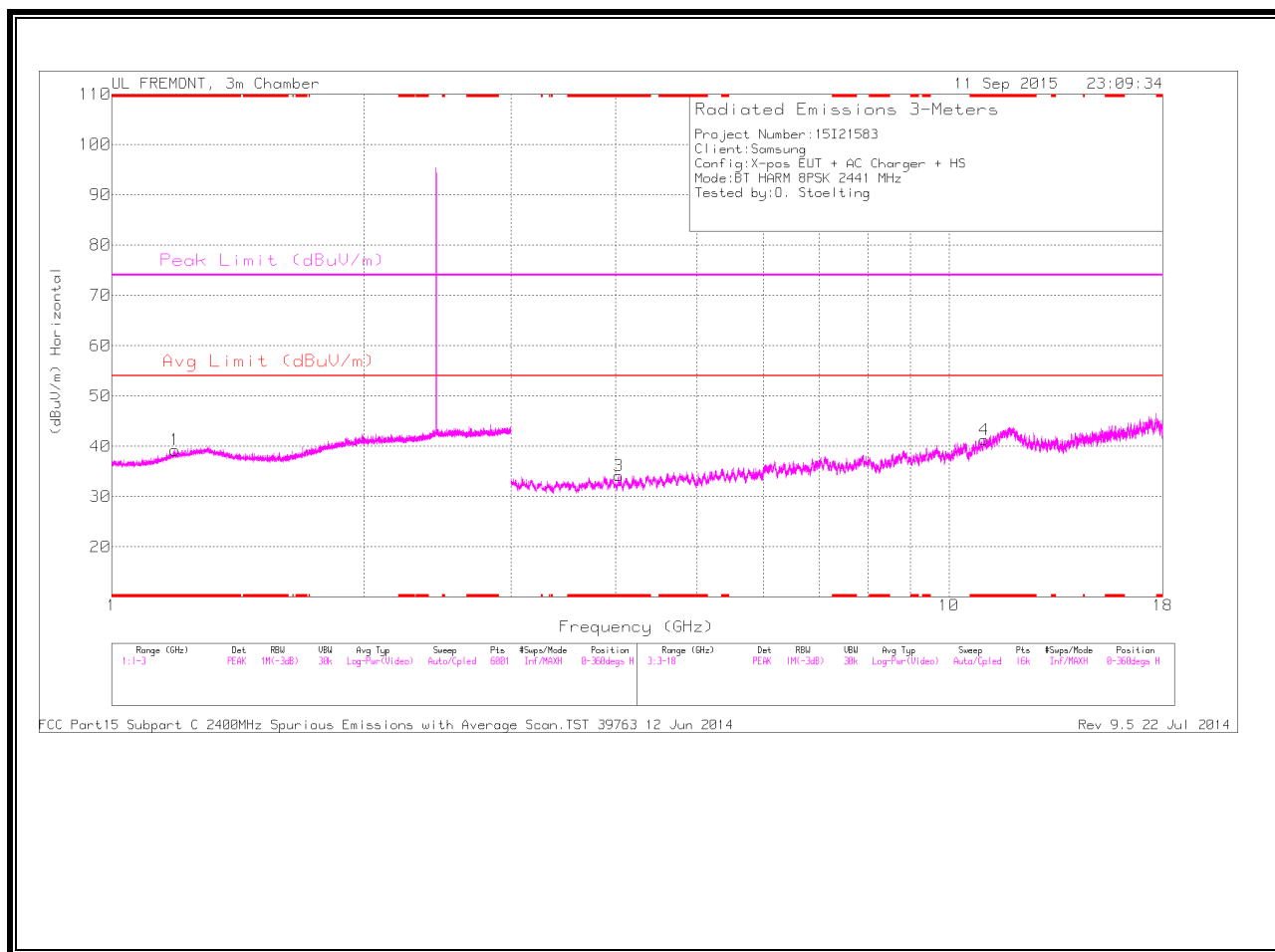
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.287	42.66	PK2	29.8	-23.1	49.36	-	-	74	-24.64	360	200	H
* 1.286	31.08	VB1T	29.8	-23.1	37.78	54	-16.22	-	-	360	200	H
* 2.255	42.51	PK2	31.5	-22.3	51.71	-	-	74	-22.29	360	100	V
* 2.254	30.78	VB1T	31.5	-22.3	39.98	54	-14.02	-	-	360	100	V
* 4.7	40.07	PK2	34.1	-30.2	43.97	-	-	74	-30.03	360	200	H
* 4.703	28.85	VB1T	34.1	-30.2	32.75	54	-21.25	-	-	360	200	H
* 11.882	36.66	PK2	39.1	-22.8	52.96	-	-	74	-21.04	41	209	H
* 11.882	24.57	VB1T	39.1	-22.8	40.87	54	-13.13	-	-	41	209	H
* 4.864	39.75	PK2	34	-29.1	44.65	-	-	74	-29.35	41	200	V
* 4.862	28.24	VB1T	34	-29.1	33.14	54	-20.86	-	-	41	200	V
* 12.215	37.14	PK2	39	-24.3	51.84	-	-	74	-22.16	41	100	V
* 12.215	25.45	VB1T	39	-24.3	40.15	54	-13.85	-	-	41	100	V

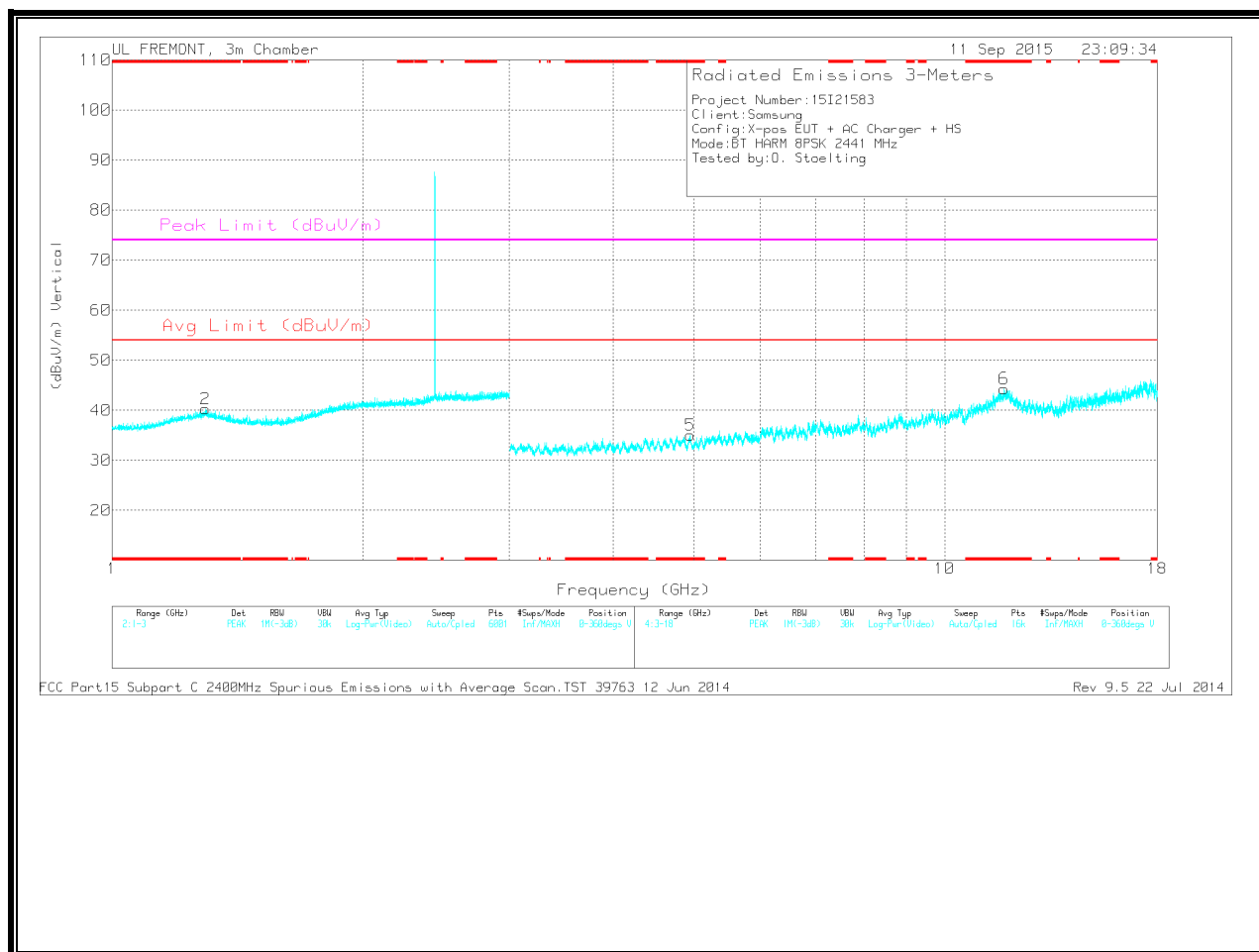
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

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.

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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fil/Filr/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	* 1.19	33.64	PK	28.8	-23.2	0	39.24	-	-	74	-34.76	0-360	200	H
2	* 1.296	33.68	PK	29.8	-23.2	0	40.28	-	-	74	-33.72	0-360	100	V
3	* 4.034	31.86	PK	33.2	-30.9	0	34.16	-	-	74	-39.84	0-360	200	H
4	* 11.024	26.96	PK	37.8	-23.5	0	41.26	-	-	74	-32.74	0-360	100	H
5	* 4.947	31	PK	34	-30	0	35	-	-	74	-39	0-360	200	V
6	* 11.778	27.8	PK	39	-22.5	0	44.3	-	-	74	-29.7	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 T119 (dB/m)	Amp/Cbl/Filr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.191	42.22	PK2	28.8	-23.2	47.82	-	-	74	-26.18	360	200	H
* 1.189	31.07	VB1T	28.8	-23.2	36.67	54	-17.33	-	-	360	200	H
* 1.297	42.68	PK2	29.9	-23.2	49.38	-	-	74	-24.62	360	100	V
* 1.295	31	VB1T	29.8	-23.2	37.6	54	-16.4	-	-	360	100	V
* 4.036	40.46	PK2	33.2	-30.8	42.86	-	-	74	-31.14	360	200	H
* 4.033	29.1	VB1T	33.2	-30.9	31.4	54	-22.6	-	-	360	200	H
* 11.023	36.51	PK2	37.9	-23.5	50.91	-	-	74	-23.09	360	100	H
* 11.023	25.08	VB1T	37.9	-23.5	39.48	54	-14.52	-	-	360	100	H
* 4.946	40.72	PK2	34	-29.9	44.82	-	-	74	-29.18	360	200	V
* 4.946	29.11	VB1T	34	-29.9	33.21	54	-20.79	-	-	360	200	V
* 11.778	37.98	PK2	39	-22.5	54.48	-	-	74	-19.52	28	193	V
* 11.777	24.95	VB1T	39	-22.5	41.45	54	-12.55	-	-	28	193	V

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

UL FREMONT, 3m Chamber

11 Sep 2015 23:36:47

Radiated Emissions 3-Meters

Project Number: 15121583
 Client: Samsung
 Config: X-pas EUT + AC Charger + HS
 Mode: BT HARM BPSK 2480 MHz
 Tested by: O. Stoelting

Peak Limit (dBuV/m)

Avg Limit (dBuV/m)

(dBuV/m) Horizontal

Frequency (GHz)

Range (GHz)	Det	RBW	VBW	Avg Typ	Sweep	Pts	#Sups/Mode	Position
1.1-3	PEAK	1Hz-3dB	30K	Log-Pwr(Video)	Auto/Cpld	6601	Inf/NA001	0-300deg H

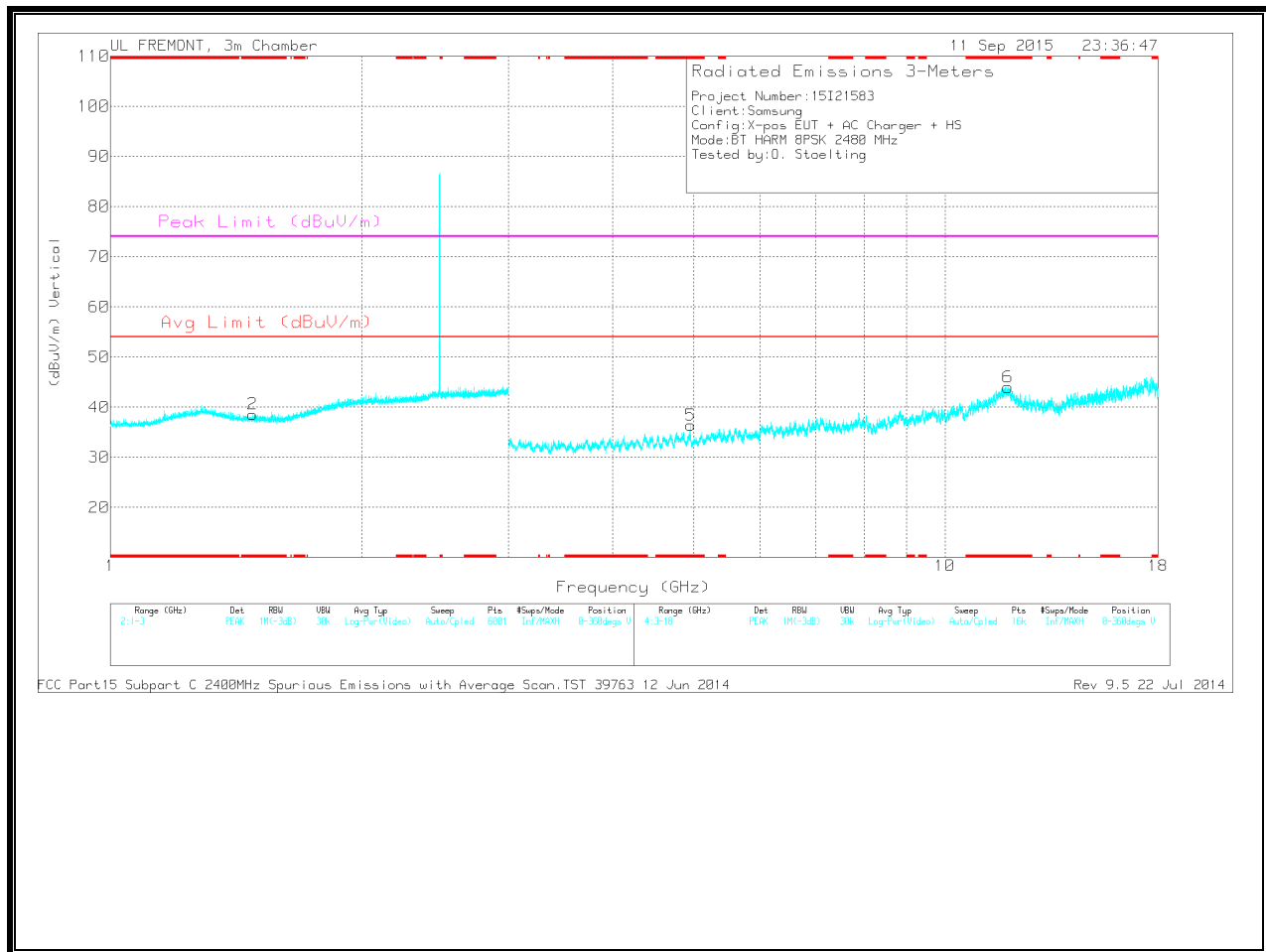
Range (GHz)	Det	RBW	VBW	Avg Typ	Sweep	Pts	#Sups/Mode	Position
3.3-18	PEAK	1Hz-3dB	30K	Log-Pwr(Video)	Auto/Cpld	16K	Inf/NA001	0-300deg H

FCC Part15 Subpart C 2480MHz Spurious Emissions with Average Scan.IST 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

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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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/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	* 1.304	33.39	PK	29.8	-23.1	0	40.09	-	-	74	-33.91	0-360	200	H
2	* 1.48	33.29	PK	28.2	-22.9	0	38.59	-	-	74	-35.41	0-360	200	V
3	* 3.81	31.57	PK	33.1	-30.5	0	34.17	-	-	74	-39.83	0-360	200	H
4	* 11.302	26.87	PK	38.1	-22.7	0	42.27	-	-	74	-31.73	0-360	200	H
5	* 4.959	32.71	PK	34	-30.3	0	36.41	-	-	74	-37.59	0-360	100	V
6	* 11.897	27.68	PK	39.1	-22.8	0	43.98	-	-	74	-30.02	0-360	200	V

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

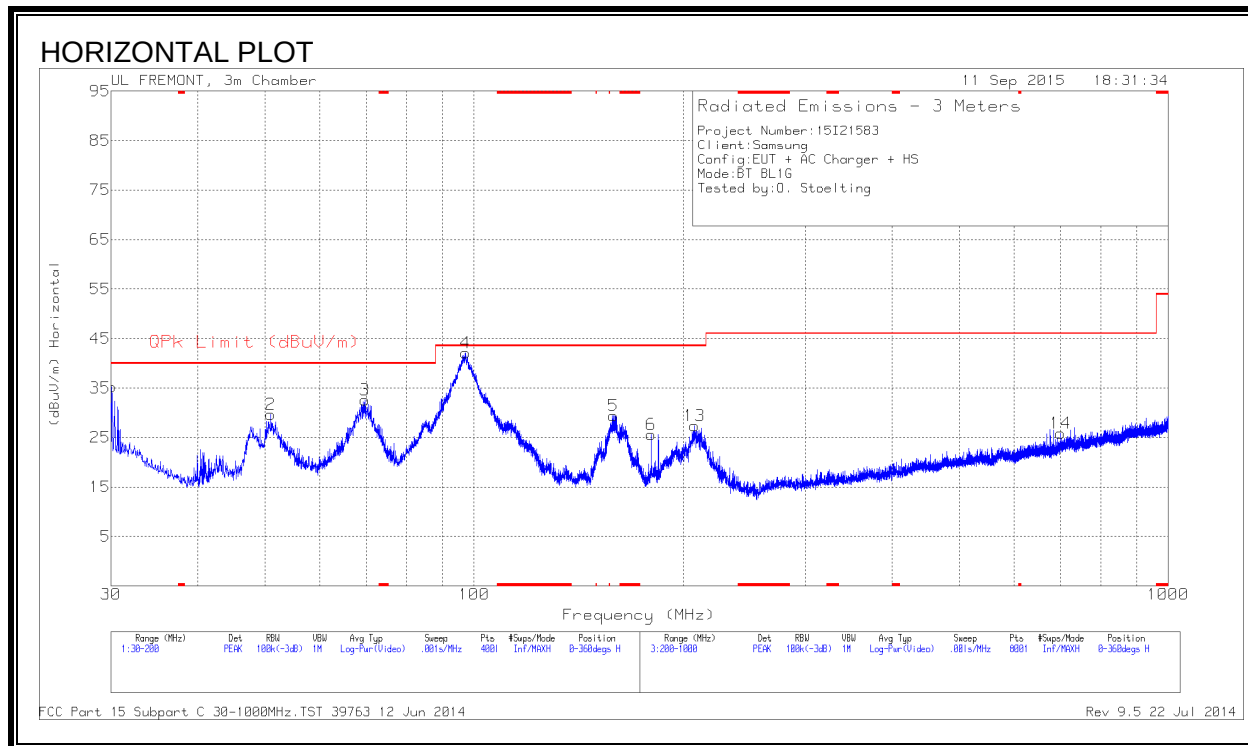
Radiated Emissions

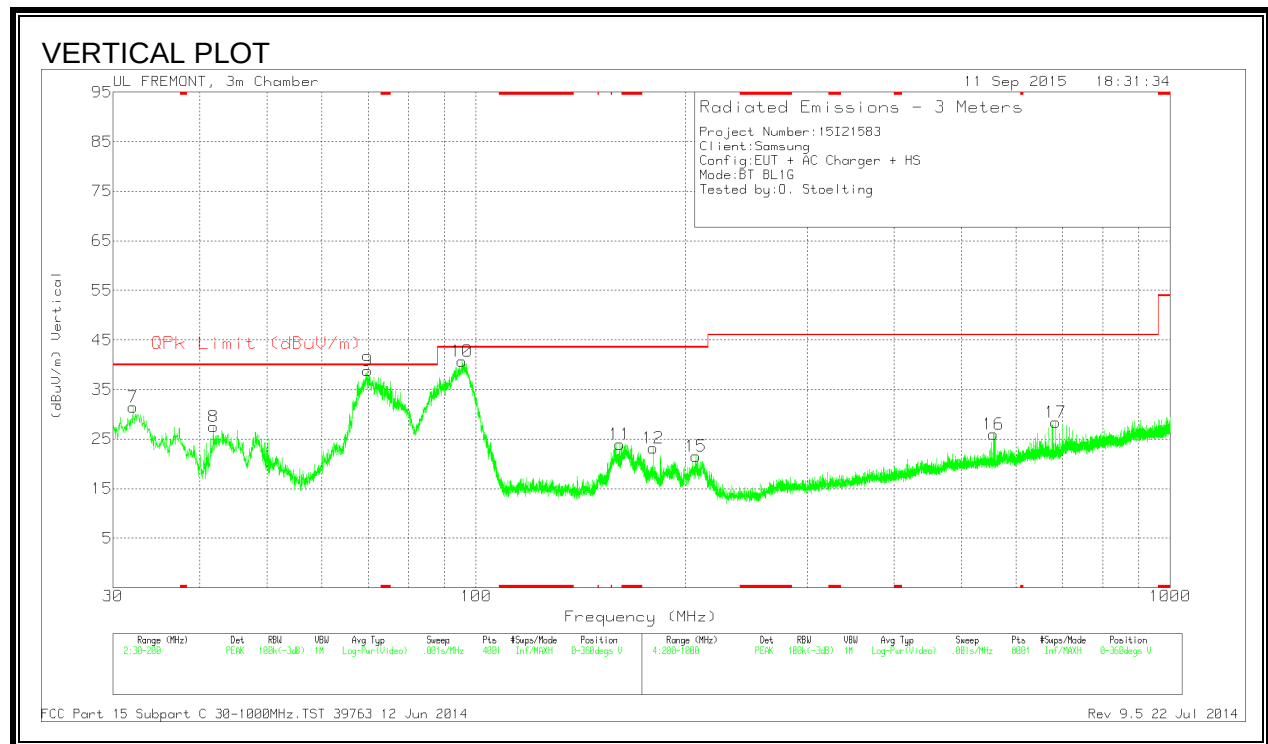
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtri/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.304	42.57	PK2	29.8	-23.1	49.27	-	-	74	-24.73	0	200	H
* 1.303	30.93	VB1T	29.9	-23.2	37.63	54	-16.37	-	-	0	200	H
* 3.809	40.46	PK2	33.1	-30.5	43.06	-	-	74	-30.94	0	200	H
* 3.808	28.84	VB1T	33.1	-30.6	31.34	54	-22.66	-	-	0	200	H
* 11.303	36.59	PK2	38.1	-22.7	51.99	-	-	74	-22.01	0	200	H
* 11.303	24.85	VB1T	38.1	-22.7	40.25	54	-13.75	-	-	0	200	H
* 4.96	40.51	PK2	34	-30.3	44.21	-	-	74	-29.79	0	100	V
* 4.96	29.46	VB1T	34	-30.3	33.16	54	-20.84	-	-	0	100	V
* 11.897	36.2	PK2	39.1	-22.8	52.5	-	-	74	-21.5	315	317	V
* 11.896	24.24	VB1T	39.1	-22.8	40.54	54	-13.46	-	-	315	317	V

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

9.3. WORST-CASE BELOW 1 GHz

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





DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.0425	40.69	PK	21.8	-27.3	35.19	40	-4.81	0-360	100	H
7	32.04	38.19	PK	20.4	-27.2	31.39	40	-8.61	0-360	100	V
8	41.9	41.68	PK	12.9	-27.1	27.48	40	-12.52	0-360	100	V
2	50.995	48.79	PK	7.9	-27	29.69	40	-10.31	0-360	400	H
3	69.61	50.86	PK	8.4	-26.7	32.56	40	-7.44	0-360	300	H
9	69.78	57.11	PK	8.4	-26.7	38.81	40	-1.19	0-360	100	V
10	95.535	58.32	PK	8.7	-26.3	40.72	43.52	-2.8	0-360	100	V
4	97.2775	59.16	PK	9.2	-26.3	42.06	43.52	-1.46	0-360	200	H
5	158.6475	43.05	PK	12.1	-25.7	29.45	43.52	-14.07	0-360	200	H
11	160.985	37.58	PK	12	-25.6	23.98	43.52	-19.54	0-360	100	V
6	179.9825	40.02	PK	11	-25.4	25.62	43.52	-17.9	0-360	200	H
12	179.9825	37.64	PK	11	-25.4	23.24	43.52	-20.28	0-360	100	V
15	207.3	35.54	PK	11.1	-25.1	21.54	43.52	-21.98	0-360	100	V
13	207.8	41.47	PK	11	-25.1	27.37	43.52	-16.15	0-360	200	H
16	556	33.37	PK	17.5	-24.9	25.97	46.02	-20.05	0-360	100	V
17	684	32.95	PK	19.6	-24.2	28.35	46.02	-17.67	0-360	100	V
14	700	30.24	PK	19.7	-24.1	25.84	46.02	-20.18	0-360	300	H

PK - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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 C63.10

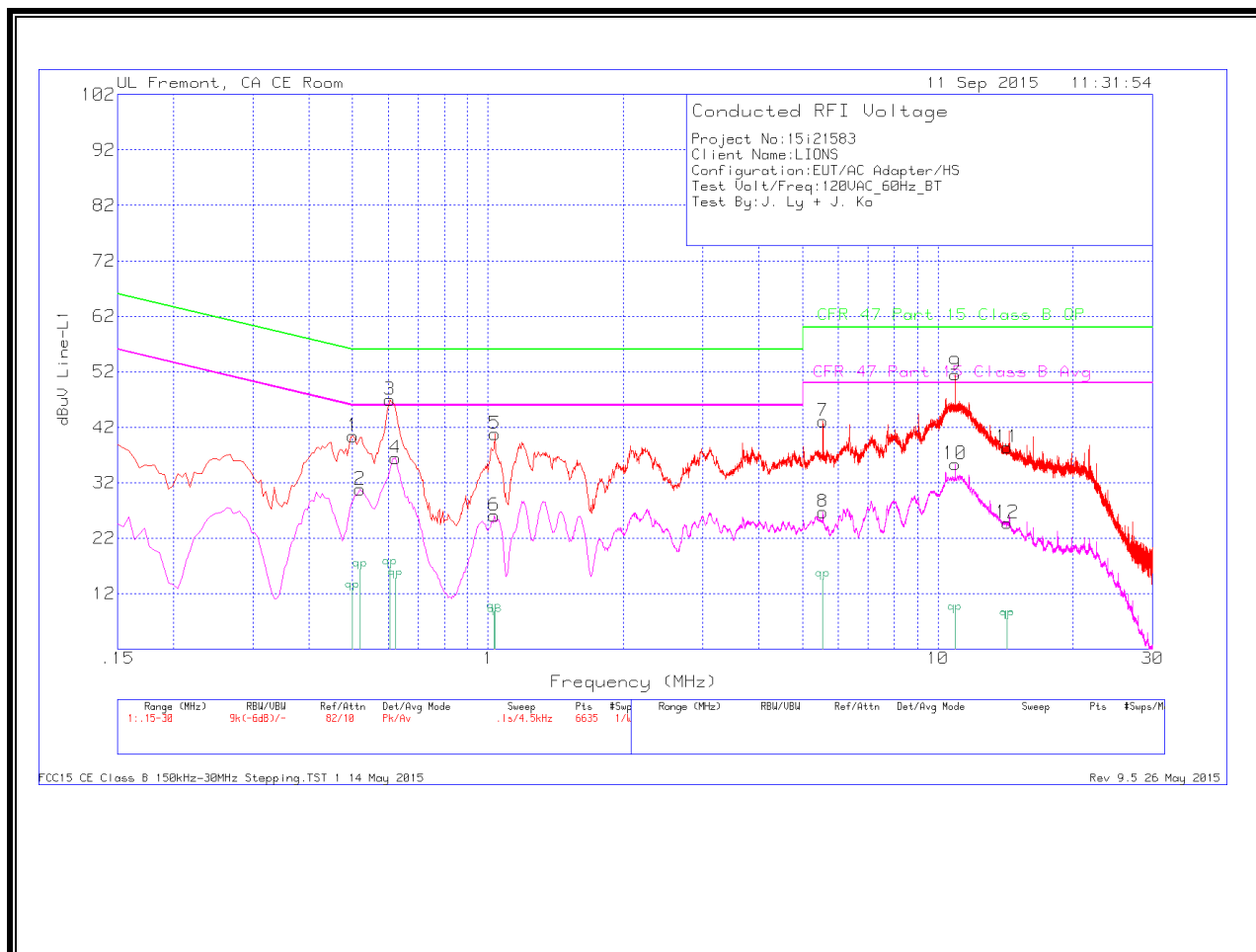
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 RESULTS



11. Data

Trace Markers

Peak/Average/RMS Emissions

Range 1: Line-L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
.49988	-1.41	Ca	.3	0	-1.11	-	-	46	-47.11
.52013	-.42	Ca	.3	0	-.12	-	-	46	-46.12
.60563	-.89	Ca	.3	0	-.59	-	-	46	-46.59
.62363	-.59	Ca	.3	0	-.29	-	-	46	-46.29
1.03538	-2.38	Ca	.2	0	-2.18	-	-	46	-48.18
1.03178	-2.35	Ca	.2	0	-2.15	-	-	46	-48.15
5.54978	-1.1	Ca	.2	.1	-.8	-	-	50	-50.8
10.9174	-3.01	Ca	.2	.2	-2.61	-	-	50	-52.61
14.2676	-2.16	Ca	.2	.2	-1.76	-	-	50	-51.76
14.2699	-1.54	Ca	.2	.2	-1.14	-	-	50	-51.14

Ca - CISPR average detection

Range 2: Line-L2 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
.44318	-.52	Ca	.4	0	-.12	-	-	47	-47.12
.42428	-.61	Ca	.4	0	-.21	-	-	47.36	-47.57
.61688	.78	Ca	.3	0	1.08	-	-	46	-44.92
1.16768	.27	Ca	.3	.1	.67	-	-	46	-45.33
1.19738	-.55	Ca	.3	.1	-.15	-	-	46	-46.15
6.27113	-.57	Ca	.2	.1	-.27	-	-	50	-50.27
11.6878	-2.67	Ca	.2	.2	-2.27	-	-	50	-52.27
17.0599	-3.44	Ca	.3	.2	-2.94	-	-	50	-52.94

Ca - CISPR average detection

Quasi-Peak Emissions

Range 1: Line-L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
.49988	12.31	Qp	.3	0	12.61	56	-43.39	-	-
.52013	16.14	Qp	.3	0	16.44	56	-39.56	-	-
.60563	16.44	Qp	.3	0	16.74	56	-39.26	-	-
.62363	14.5	Qp	.3	0	14.8	56	-41.2	-	-
1.03538	7.94	Qp	.2	0	8.14	56	-47.86	-	-
1.03178	8.59	Qp	.2	0	8.79	56	-47.21	-	-
5.54978	14.26	Qp	.2	.1	14.56	60	-45.44	-	-
10.9174	8.17	Qp	.2	.2	8.57	60	-51.43	-	-
14.2676	7.11	Qp	.2	.2	7.51	60	-52.49	-	-
14.2699	7.15	Qp	.2	.2	7.55	60	-52.45	-	-

Qp - Quasi-Peak detector

Range 2: Line-L2 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
.44318	15.92	Qp	.4	0	16.32	57	-40.68	-	-
.42428	12.81	Qp	.4	0	13.21	57.36	-44.15	-	-
.61688	15.62	Qp	.3	0	15.92	56	-40.08	-	-
1.16768	13.38	Qp	.3	.1	13.78	56	-42.22	-	-
1.19738	11.81	Qp	.3	.1	12.21	56	-43.79	-	-
6.27113	14.7	Qp	.2	.1	15	60	-45	-	-
11.6878	9.3	Qp	.2	.2	9.7	60	-50.3	-	-
17.0599	5.33	Qp	.3	.2	5.83	60	-54.17	-	-

Qp - Quasi-Peak detector