



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

TRI-BAND CDMA MOBILE PHONE WITH BLUETOOTH

MODEL NUMBER: S2151

FCC ID: V65S2151

REPORT NUMBER: 12U14701- 1

ISSUE DATE: NOVEMBER 27, 2012

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	11/27/12	Initial Issue	T. LEE

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: KYOCERA COMMUNICATIONS INC.
8611 BALBOA AVENUE
SAN DIEGO, CA 92123, U.S.A.

EUT DESCRIPTION: TRI-BAND CDMA MOBILE PHONE WITH BLUETOOTH

MODEL: S2151

SERIAL NUMBER: 268435457816730017

DATE TESTED: NOVEMBER 27, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

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

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

Approved & Released For UL CCS By:

Tested By:



TIM LEE
WISE PROGRAM MANAGER
UL CCS

STEVE AGUILAR
EMC TECNICIAN
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth transceiver and CDMA Phone that is manufactured by Kyocera Communications, Inc.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an PIFA antenna, with a maximum gain of -1.0 dBi.

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 0.400BT.

The test utility software used during testing was BT Test.

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 Z -orientation with the AC adapter and headset was worst-case orientation in the DH5 mode therefore, all final radiated testing was performed with the EUT in Z-orientation.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Kyocera	SCP-36ADT	N/A	N/A
Headset	N/A	N/A	N/A	N/A

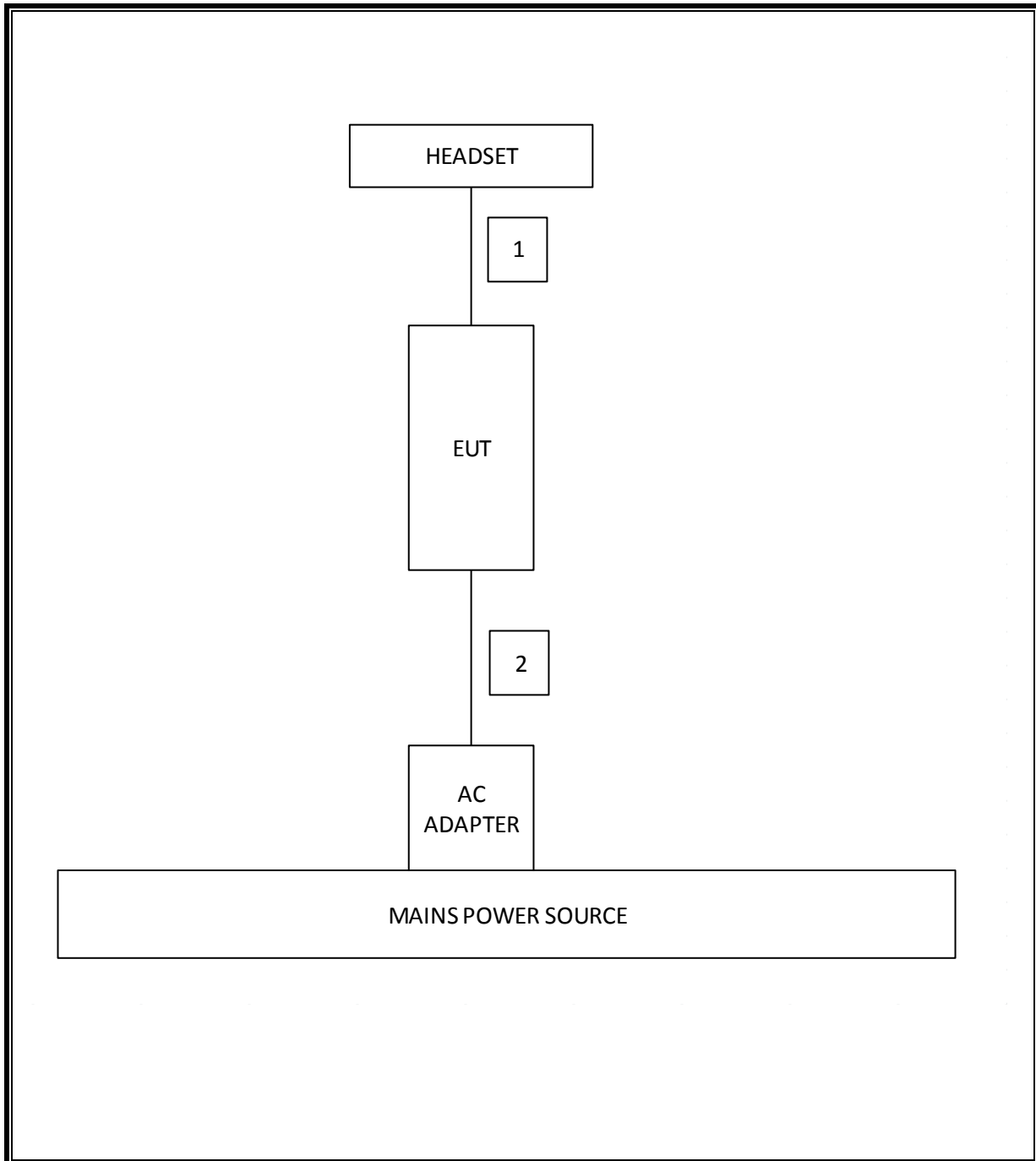
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	USB	Unshielded	1.5	N/A
2	Headset	2	Mini-Jack	Shielded	1.5	N/A

TEST SETUP

The EUT is a stand-alone device.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	3/22/2012	3/22/2013
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	12/30/2011	12/30/2012
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	3/23/2012	3/23/2013
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/2012	10/22/2013
Antenna, Horn, 18 GHz	EMCO	3115	C00783	10/25/2012	10/25/2013
Antenna, Horn, 26.5 GHz	ARA	SWH-28	C01015	4/23/2012	4/23/2013
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	8/8/2012	8/8/2013
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/2011	12/13/2012

7. RADIATED TEST RESULTS

7.1. 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 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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

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

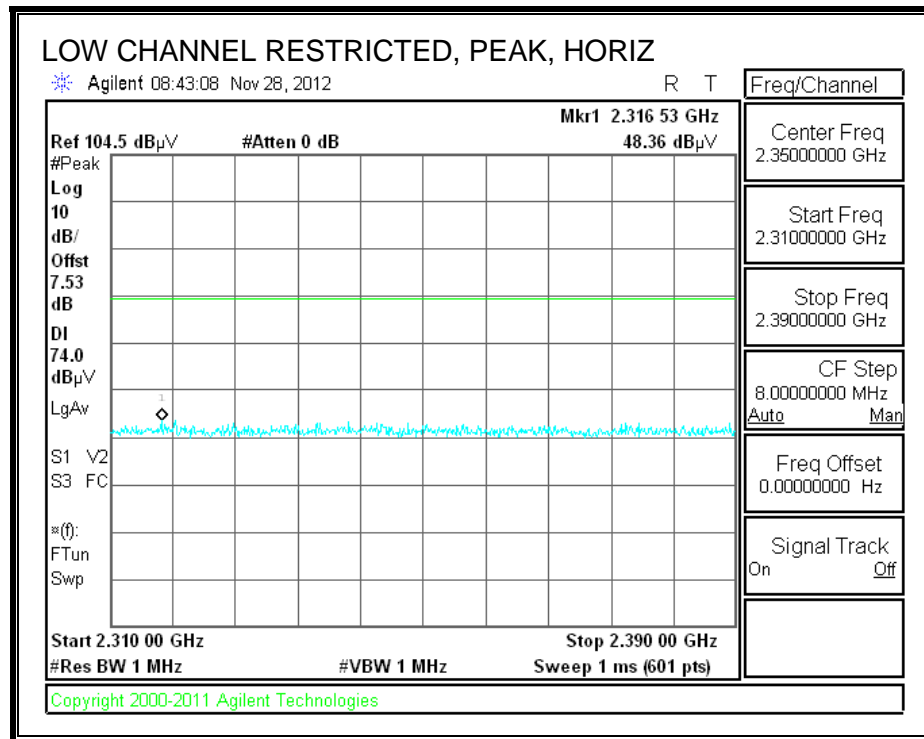
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

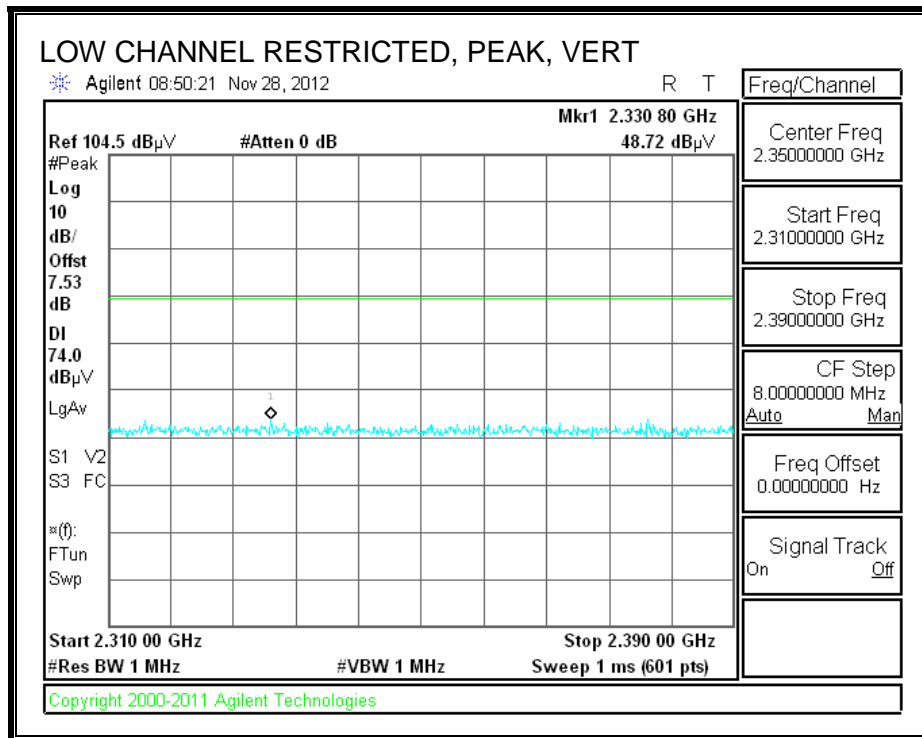
7.2. TRANSMITTER ABOVE 1 GHz

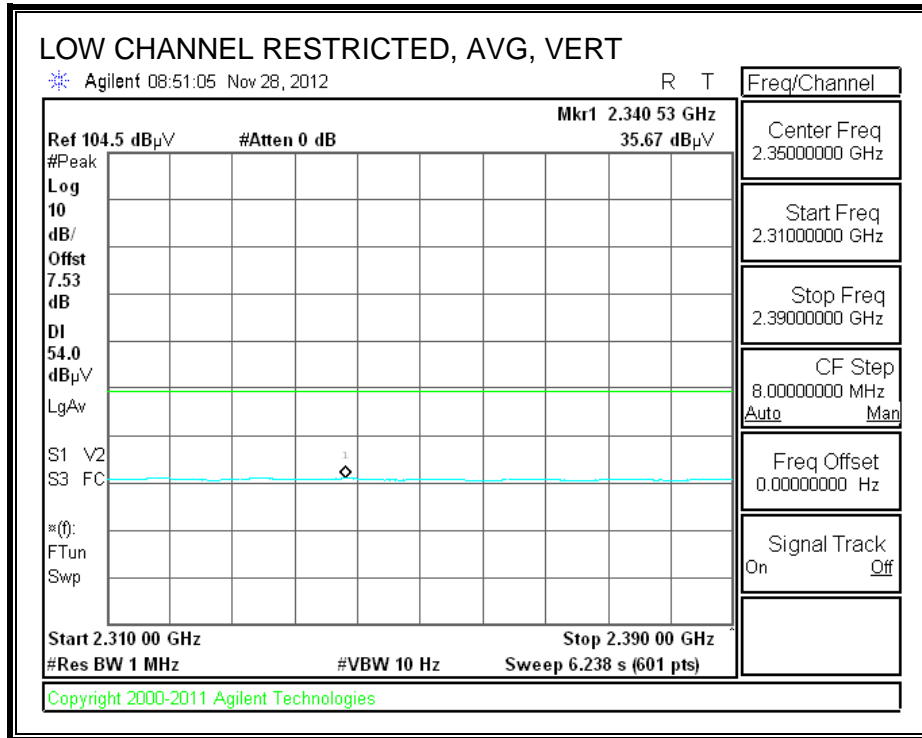
7.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

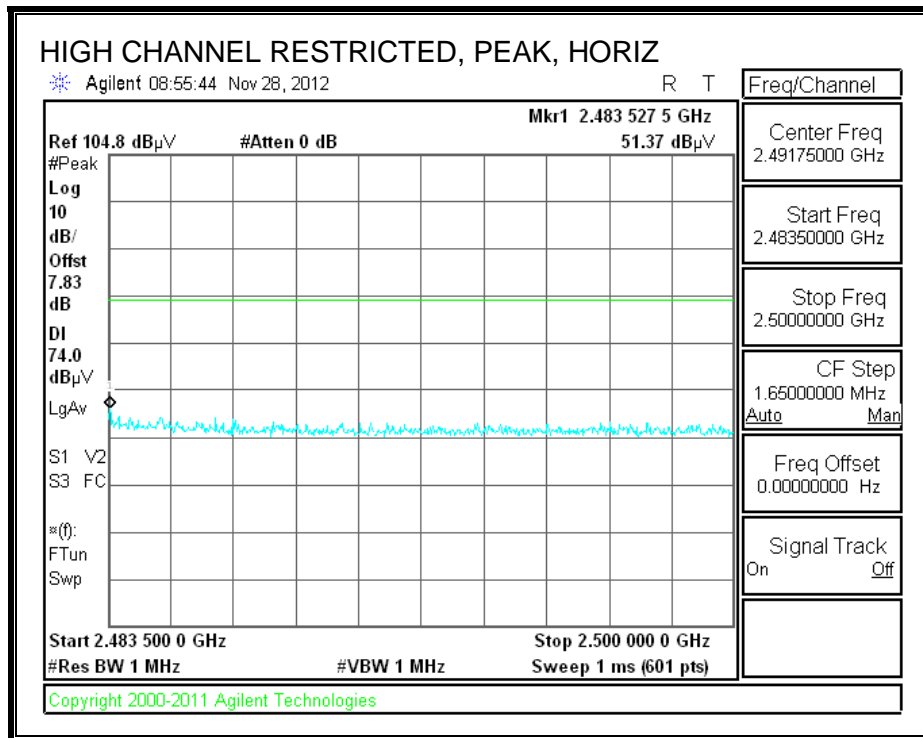


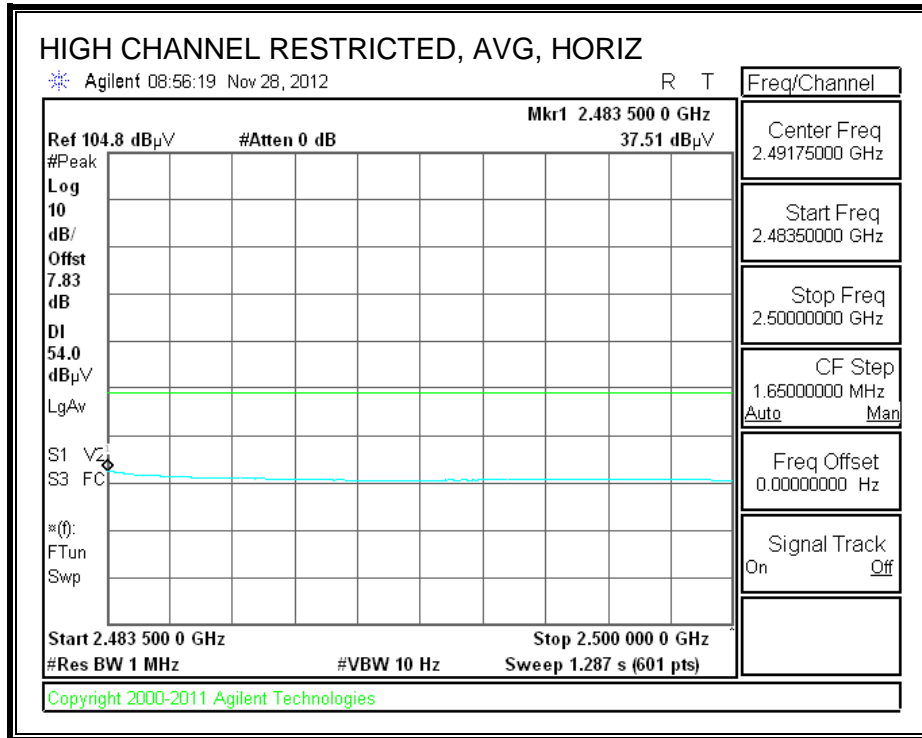
RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)



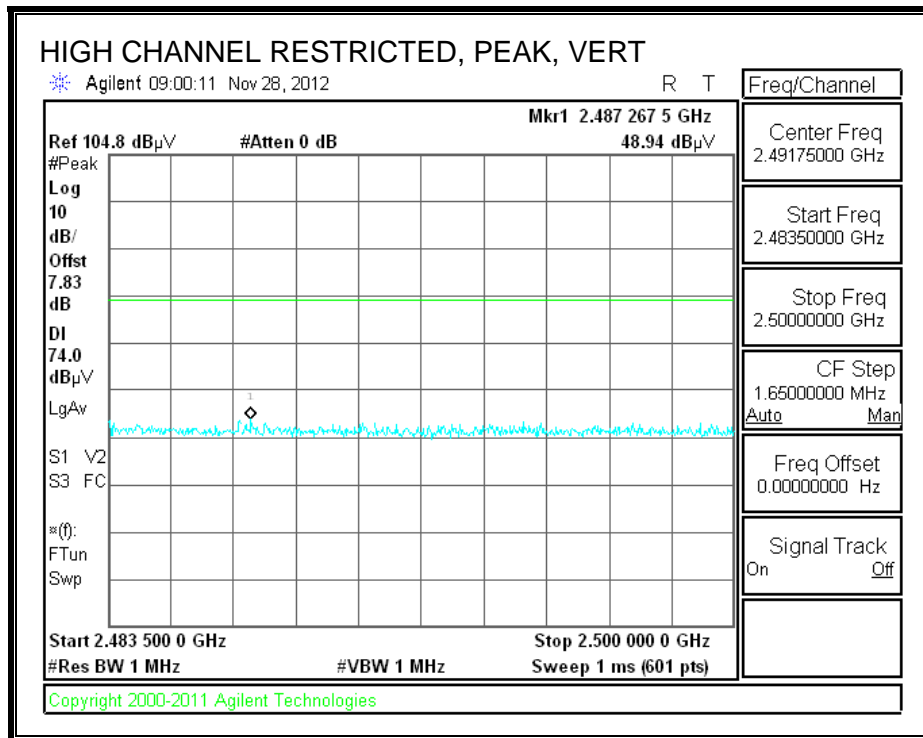


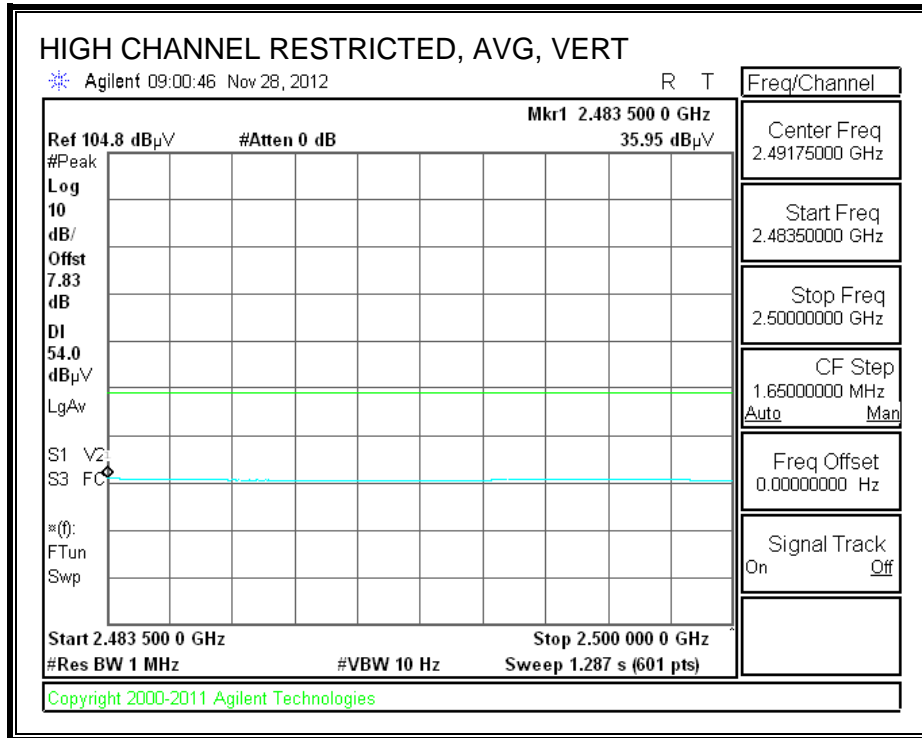
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)



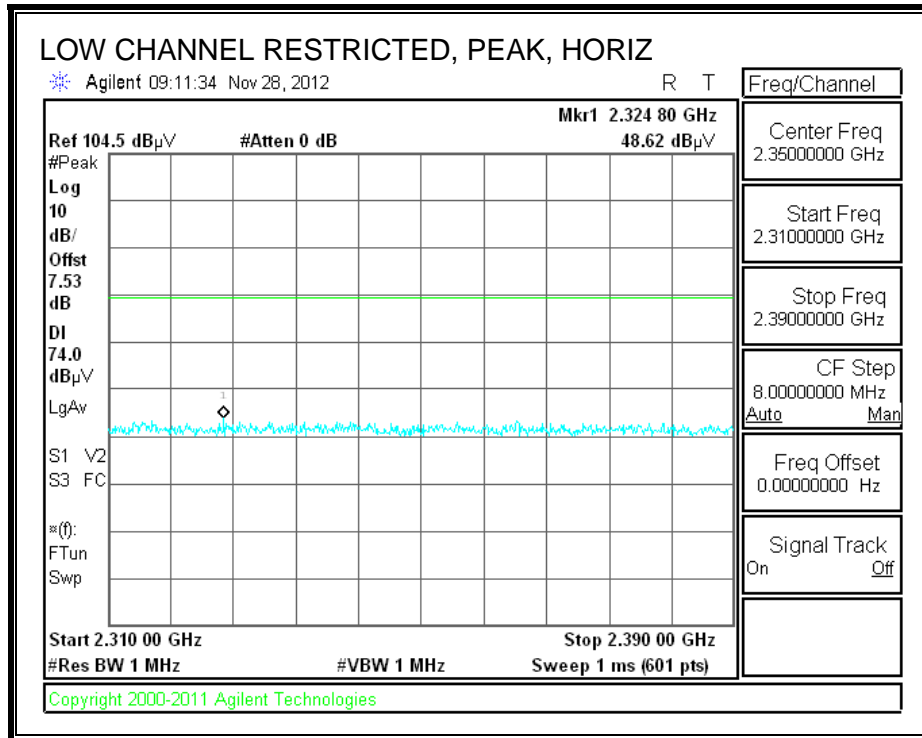


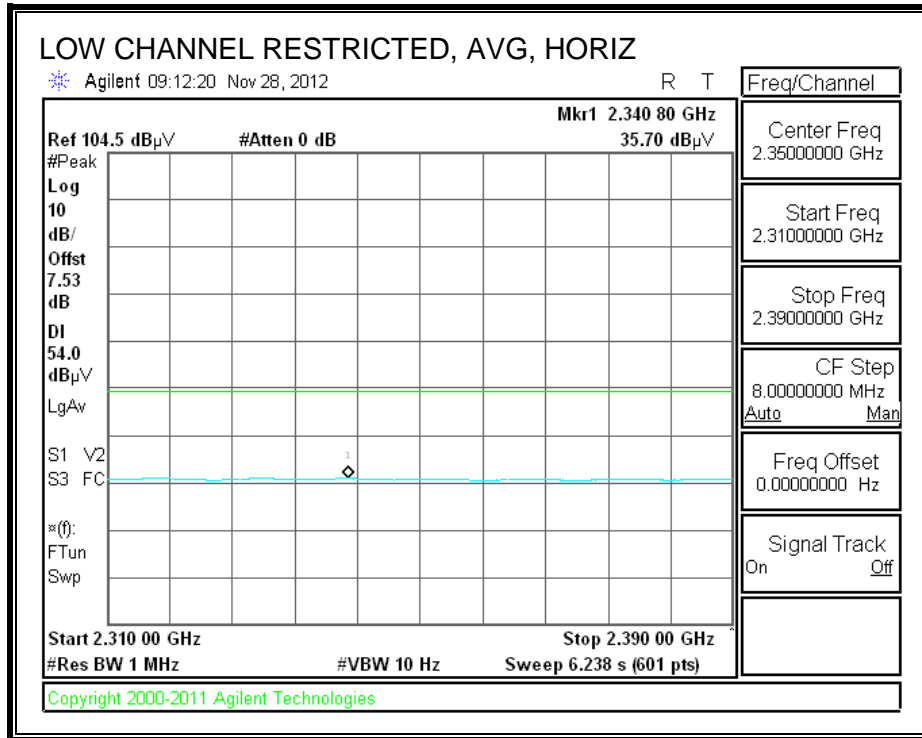
HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement																	
Compliance Certification Services, Fremont 5m Chamber-B																	
Company:		Kyocera															
Project #:		12U14701															
Date:		11/27/2012															
Test Engineer:		S. Aguilar															
Configuration:		EUT + Adapter + headset															
Mode:		BT GFSK TX Mode															
Test Equipment:																	
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit					
T59; S/N: 3245 @3m			T145 Agilent 3008A0056						T125; ARA 18-26GHz; S/N:1007			FCC 15.209					
Hi Frequency Cables																	
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz		
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			Average Measurements RBW=1MHz; VBW=10Hz		
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)		
2402 MHz (GFSK)																	
4.804	3.0	37.63	26.96	33.1	6.3	-34.8	0.0	0.0	42.2	31.5	74	54	-31.8	-22.5	H		
4.804	3.0	38.26	26.06	33.1	6.3	-34.8	0.0	0.0	42.8	30.6	74	54	-31.2	-23.4	V		
2441 MHz (GFSK)																	
4.882	3.0	37.79	27.14	33.1	6.3	-34.8	0.0	0.0	42.4	31.8	74	54	-31.6	-22.2	H		
4.882	3.0	38.07	25.78	33.1	6.3	-34.8	0.0	0.0	42.7	30.4	74	54	-31.3	-23.6	V		
2480 MHz (GFSK)																	
4.960	3.0	38.44	28.18	33.2	6.4	-34.8	0.0	0.0	43.2	33.0	74	54	-30.8	-21.0	H		
4.960	3.0	37.87	26.57	33.2	6.4	-34.8	0.0	0.0	42.6	31.3	74	54	-31.4	-22.7	V		
Rev. 11.10.11 Note: No other emissions were detected above the system noise floor																	
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit				
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit				
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit				
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit				
CL	Cable Loss					HPF	High Pass Filter										

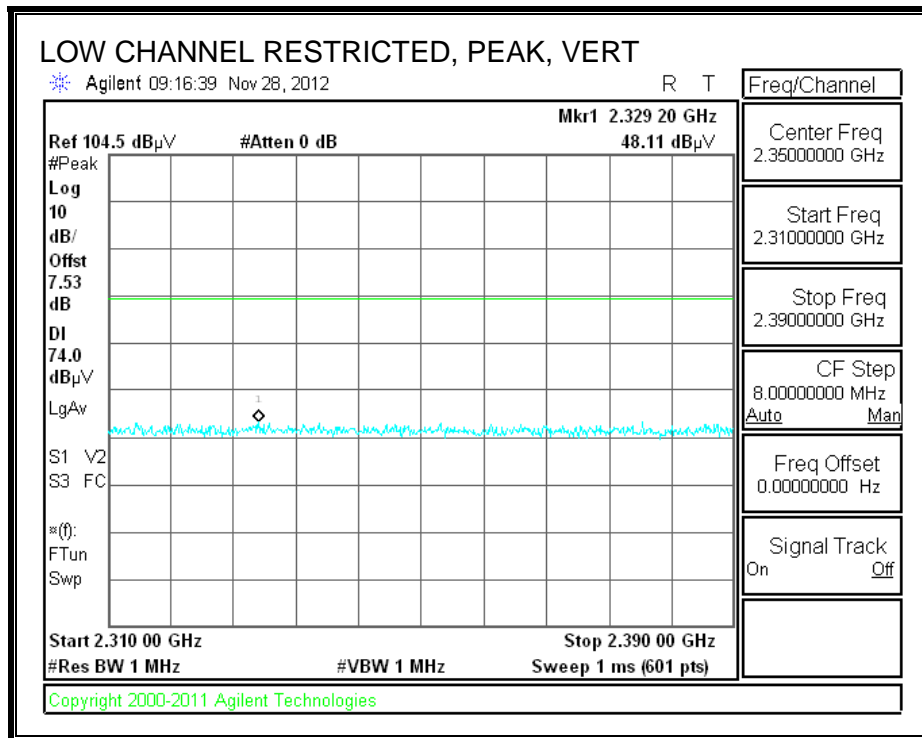
7.2.2. ENHANCED DATA RATE 8PSK MODULATION

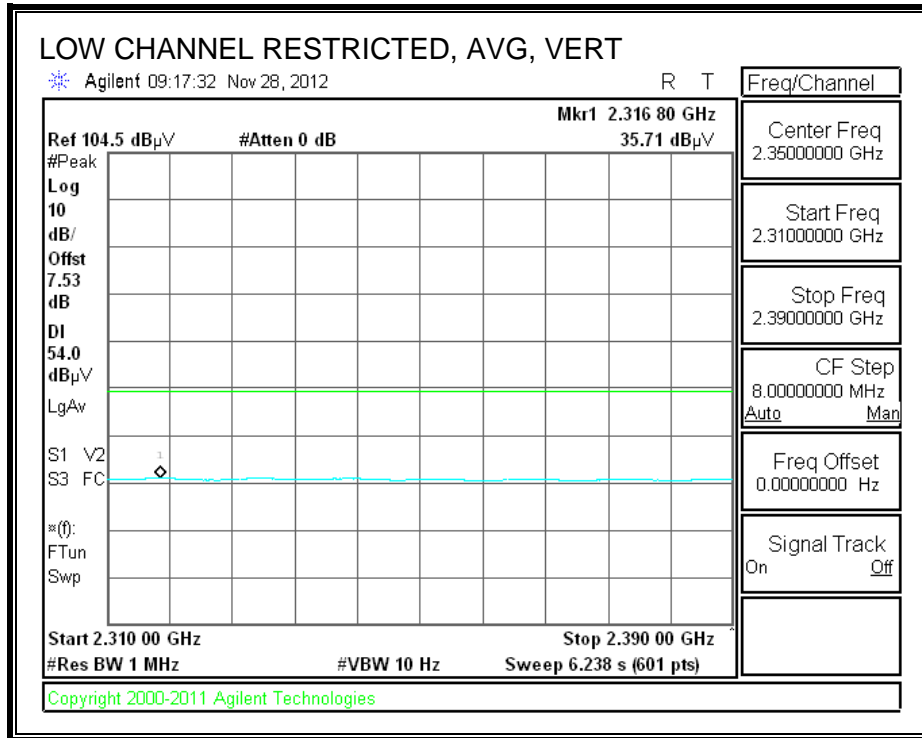
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



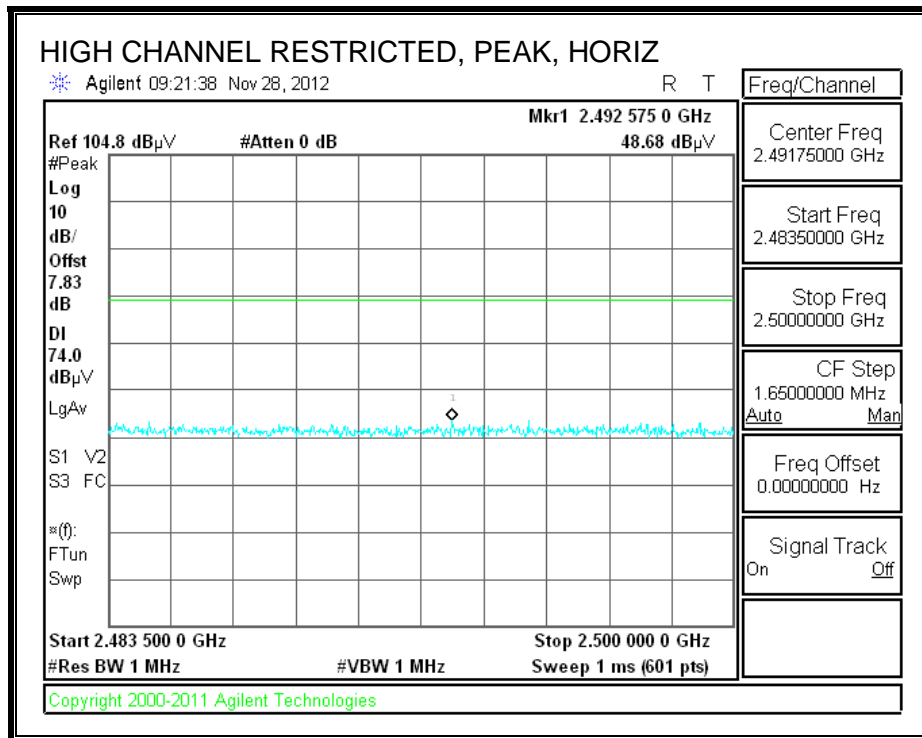


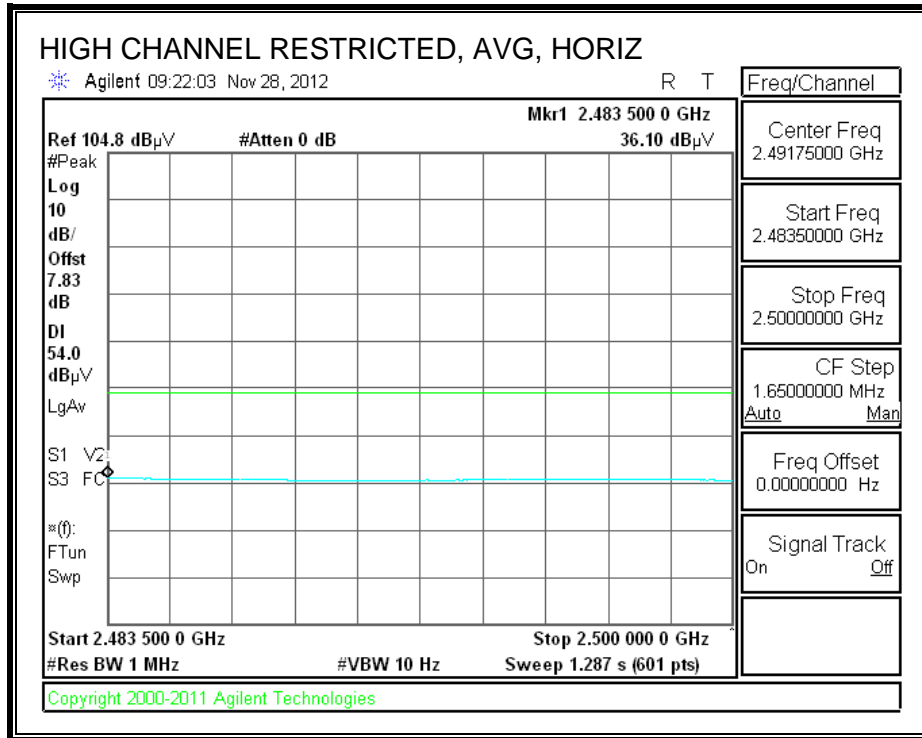
RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)



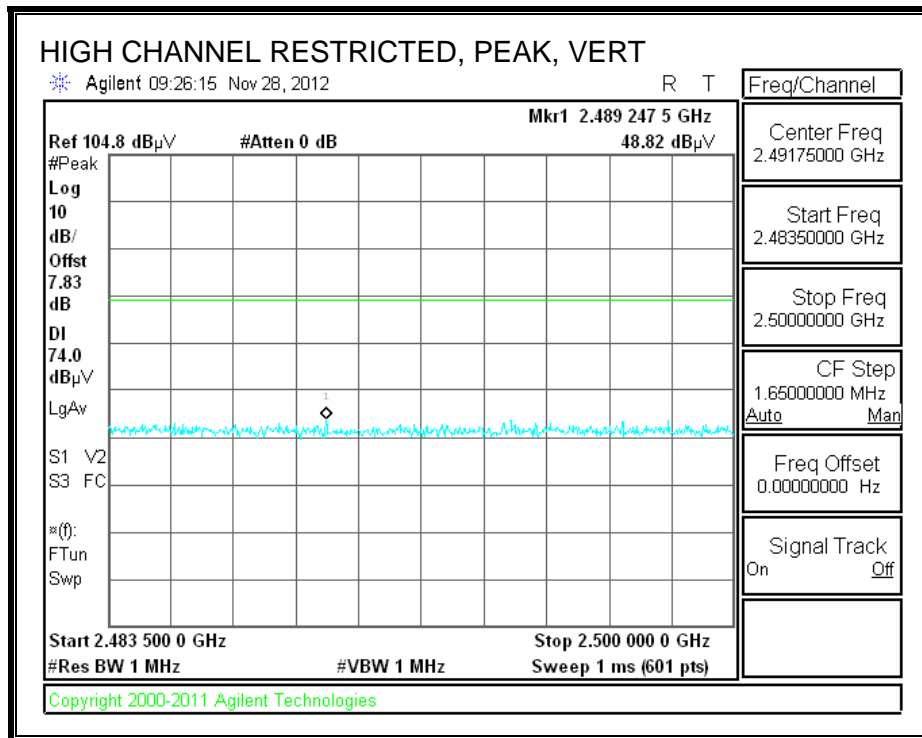


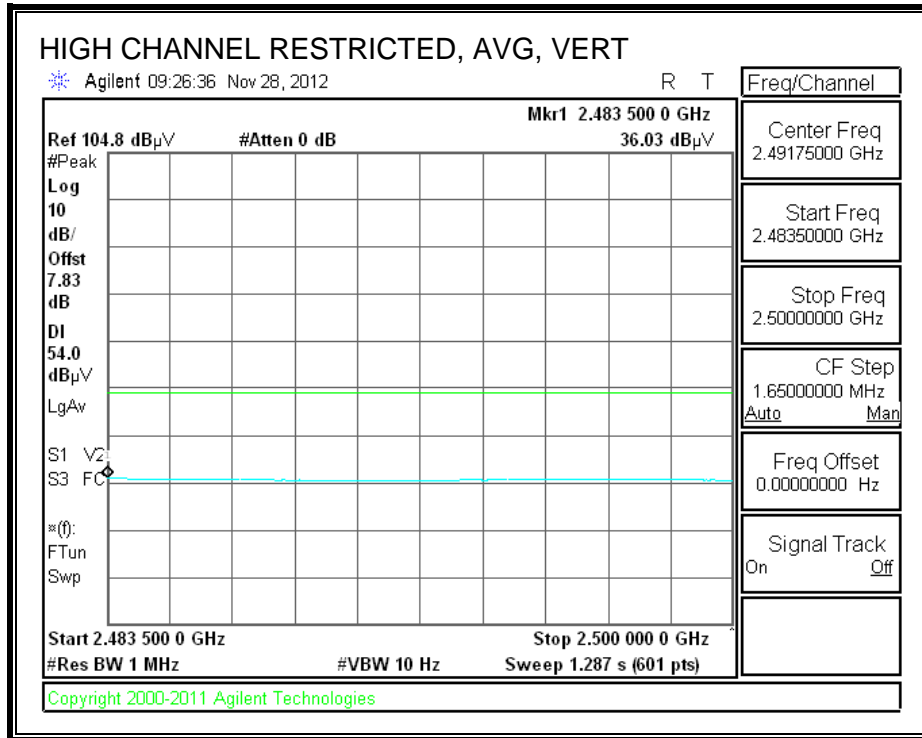
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)



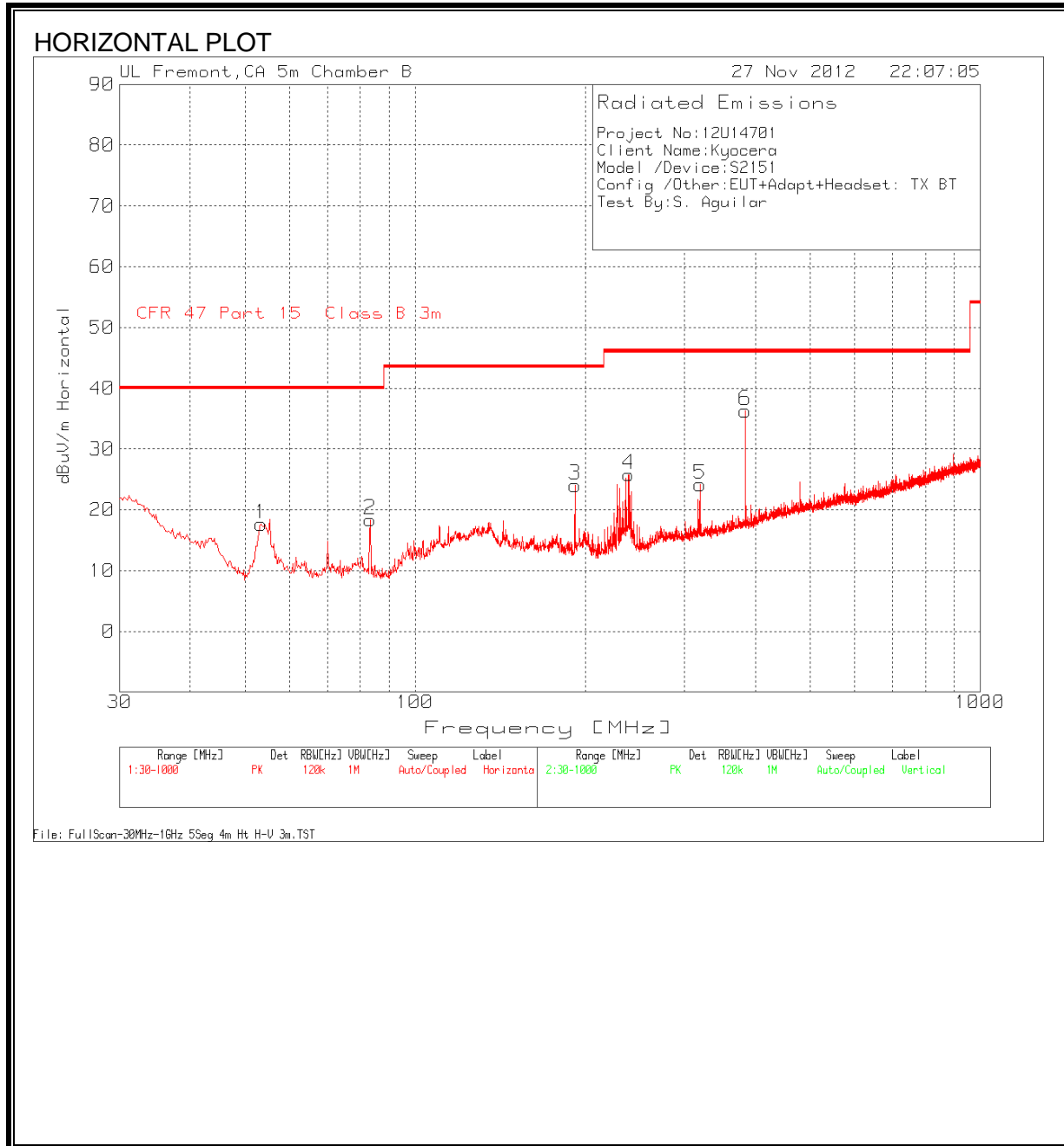


HARMONICS AND SPURIOUS EMISSIONS

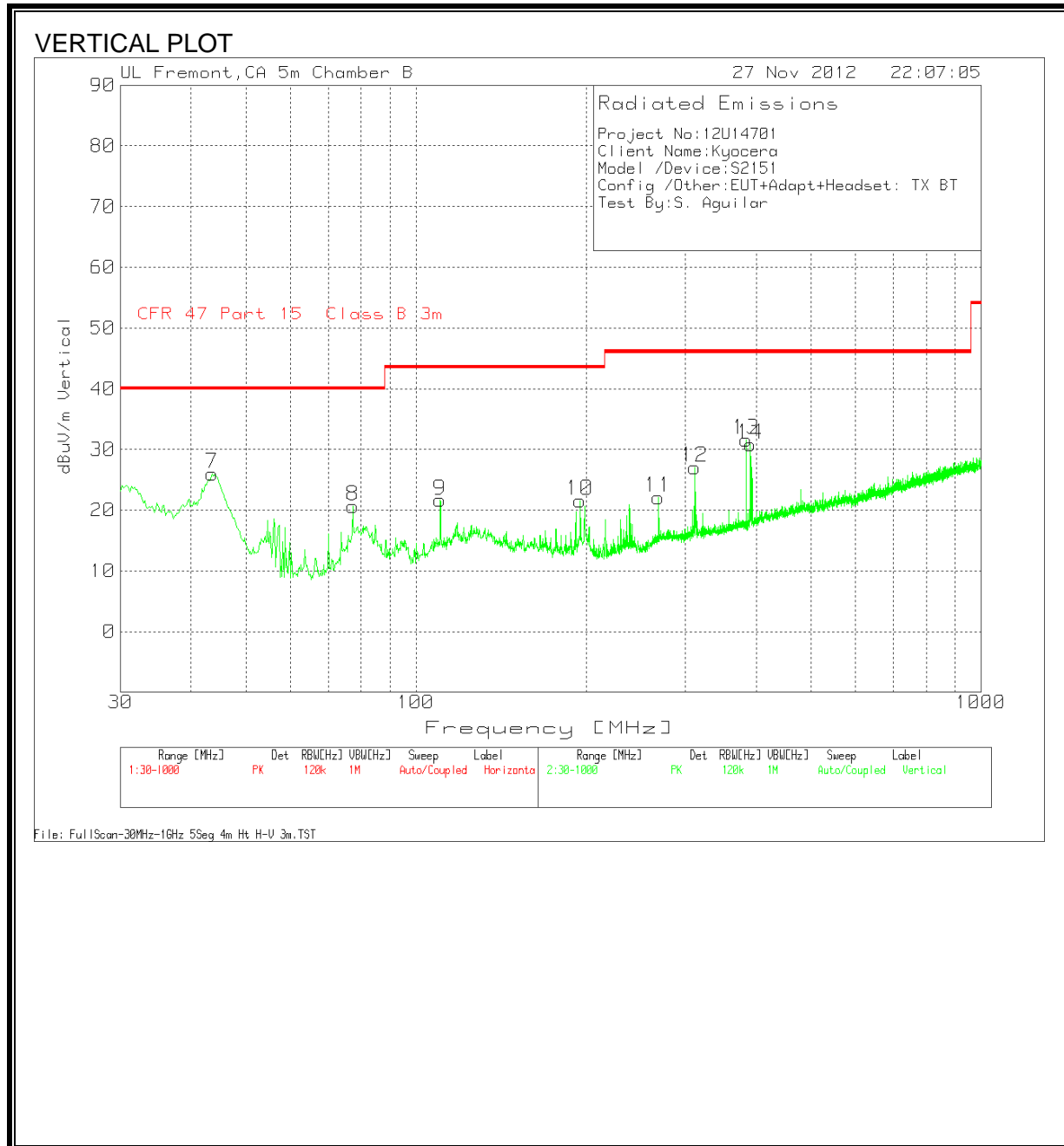
High Frequency Measurement																	
Compliance Certification Services, Fremont 5m Chamber-B																	
Company:		Kyocera															
Project #:		12U14701															
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Configuration:		EUT + Adapter + headset															
Mode:		BT 8PSK TX Mode															
Test Equipment:																	
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz				Limit	
T59; S/N: 3245 @3m				T145 Agilent 3008A0056								T125; ARA 18-26GHz; S/N:1007				FCC 15.209	
Hi Frequency Cables																	
3' cable 22807700				12' cable 22807600				20' cable 22807500				HPF		Reject Filter		Peak Measurements	
3' cable 22807700				12' cable 22807600				20' cable 22807500						R_001		RBW=VBW=1MHz	
Average Measurements																	
RBW=1MHz ; VBW=10Hz																	
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)		
2402 MHz (8PSK)																	
4.804	3.0	38.47	27.95	33.1	6.3	-34.8	0.0	0.0	43.0	32.5	74	54	-31.0	-21.5	H		
4.804	3.0	37.71	25.40	33.1	6.3	-34.8	0.0	0.0	42.2	29.9	74	54	-31.8	-24.1	V		
2441 MHz (8PSK)																	
4.882	3.0	37.12	26.74	33.1	6.3	-34.8	0.0	0.0	41.8	31.4	74	54	-32.2	-22.6	H		
4.882	3.0	37.13	25.60	33.1	6.3	-34.8	0.0	0.0	41.8	30.2	74	54	-32.2	-23.8	V		
2480 MHz (8PSK)																	
4.960	3.0	38.06	28.90	33.2	6.4	-34.8	0.0	0.0	42.8	33.7	74	54	-31.2	-20.3	H		
4.960	3.0	37.15	25.17	33.2	6.4	-34.8	0.0	0.0	41.9	29.9	74	54	-32.1	-24.1	V		
Rev. 11.10.11 Note: No other emissions were detected above the system noise floor																	
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit				
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit				
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit				
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit				
CL	Cable Loss					HPF	High Pass Filter										

7.3. WORST-CASE BELOW 1 GHz

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



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



HORIZONTAL AND VERTICAL DATA

Company Name: Kyocera
Project: 12U14701
Model/Device: S2151
Date: 11/27/2012
Configuraiton: EUT + AC adapter + Headset
Tested by: Steve Aguilar

Test Frequency [MHz]	Meter Reading [dB(μV)]	Detector	Pre Amp Factor [dB]	Antenna Factor [dB/m]	Corrected [dB(μV/m)]	Class B limit [dB(μV/m)]	Margin [dB]	Height [cm]	Polarity
Range 1 30 - 1000MHz									
53.4552	39.24	PK	7.4	-29	17.64	40	-22.36	300	Horz
83.3074	39.39	PK	7.7	-28.7	18.39	40	-21.61	400	Horz
191.8605	40.3	PK	11.5	-27.7	24.1	43.5	-19.4	100	Horz
238.771	41.51	PK	11.6	-27.3	25.81	46	-20.19	100	Horz
319.2166	37.14	PK	13.8	-26.8	24.14	46	-21.86	200	Horz
383.9608	48.07	PK	15	-26.8	36.27	46	-9.73	100	Horz
Range 2 30 - 1000MHz									
43.5691	44.03	PK	11.2	-29.2	26.03	40	-13.97	100	Vert
77.2982	41.49	PK	8	-28.8	20.69	40	-19.31	100	Vert
110.4456	37.45	PK	12.7	-28.5	21.65	43.5	-21.85	100	Vert
195.3497	37.19	PK	12	-27.6	21.59	43.5	-21.91	100	Vert
268.8169	35.97	PK	13.1	-27	22.07	46	-23.93	300	Vert
311.6567	40.13	PK	13.7	-26.8	27.03	46	-18.97	100	Vert
383.9608	43.45	PK	15	-26.8	31.65	46	-14.35	100	Vert
390.9392	42.64	PK	15.1	-26.9	30.84	46	-15.16	100	Vert

PK - Peak detector
 QP - Quasi-peak detector

8. 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

6 WORST EMISSIONS

Company Name: Kyocera
Project: S2151
Model/Device: 12U14501
Date: 11/28/2012
Configuraiton: EUT + Adapter + Headset
Test Voltage/Frequency: 120 VAC 60Hz
Tested by: Steve Aguilar

Line-L1 .15 - 30MHz

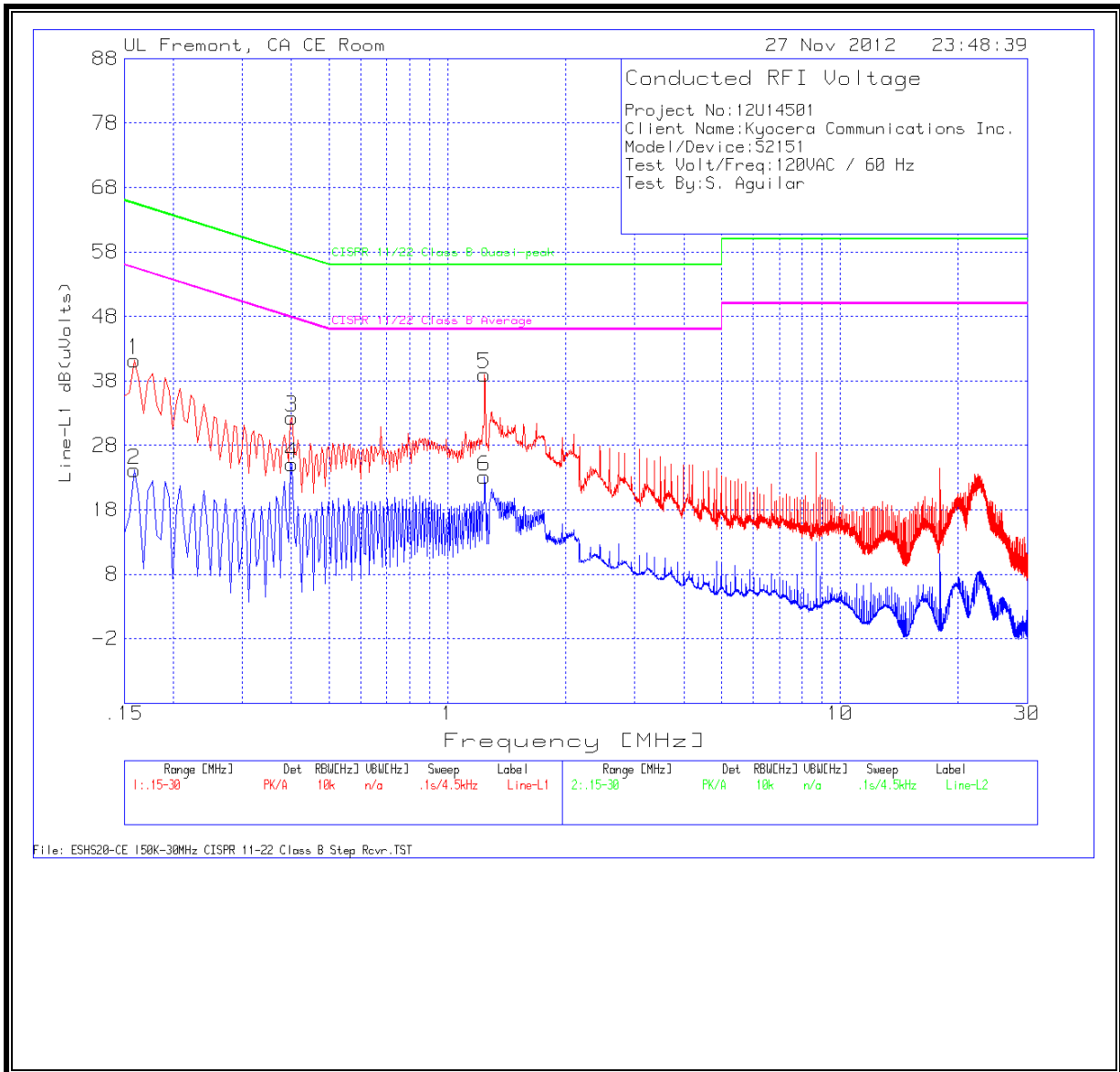
Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.159	41.06	PK	0.1	0	41.16	65.5	-24.34	-	-
0.159	24.02	Av	0.1	0	24.12	-	-	55.5	-31.38
0.402	32.17	PK	0.1	0	32.27	57.8	-25.53	-	-
0.402	25.03	Av	0.1	0	25.13	-	-	47.8	-22.67
1.2435	38.92	PK	0.1	0	39.02	56	-16.98	-	-
1.2435	22.99	Av	0.1	0	23.09	-	-	46	-22.91

Line-L2 .15 - 30MHz

Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.159	42.12	PK	0.1	0	42.22	65.5	-23.28	-	-
0.159	19.84	Av	0.1	0	19.94	-	-	55.5	-35.56
0.1815	36.25	PK	0.1	0	36.35	64.4	-28.05	-	-
0.1815	18.89	Av	0.1	0	18.99	-	-	54.4	-35.41
0.3975	35.97	PK	0.1	0	36.07	57.9	-21.83	-	-
0.3975	28.75	Av	0.1	0	28.85	-	-	47.9	-19.05

PK - Peak detector
 QP - Quasi-Peak detector
 Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS

