FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 7
CERTIFICATION
TEST REPORT

FOR

RF MODULE

MODEL NUMBER: FHD256M

FCC ID: UY6-FHD256M

IC: 6561B-FHD256M

REPORT NUMBER: 08J11757-1, Revision A

ISSUE DATE: MAY 15, 2008

Prepared for
TOHNICHI MFG CO., LTD
2-12, OMORI-KITA 2-CHOME, OTA-KU
TOKYO 143-0016, JAPAN

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

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/30/08	Initial Issue	F. Ibrahim
A	05/15/08	Revised antennas description.	F. Ibrahim

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: TOHNICHI MFG. CO., LTD
2-12, OMORI-KITA 2-CHOME
OTA-KU, TOKYO, 143-0016, JAPAN

EUT DESCRIPTION: RF MODULE

MODEL: FHD256M

SERIAL NUMBER: CS02177

DATE TESTED: APRIL 25, 2008

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED
IC RSS-210 ISSUE 7 ANNEX 2	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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 Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

FRANK IBRAHIM
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

TOM CHEN
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, IC RSS-210, IC RSS-212 and 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. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Radiated Emission, Above 2000 MHz	+/- 4.3 dB
Power Line Conducted Emission	+/- 2.9 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The FHD256M RF Module is operating in the 2402-2479 MHz-frequency range with 78 channels of GFSK modulation type in 1MHz spacing channel. It's installed onto TOHNICHI torque wrenches, sends the tightening completion signal to the RF Modules in Terminal far from the wrench using GFSK wave.

After the testing has commenced EUT model was changed from FHD256M-C and FHD256M-D to a unified model FHD256M.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antennas:

- Dipole Antenna (Senton / AP09), with a gain of 2 dBi, the antenna is a detachable antenna.

- Chip Antenna (Tohnichi / T-FH256MC-ANT), with a gain of 1 dBi, the antenna is a detachable antenna.

5.3. SOFTWARE AND FIRMWARE

Not Applicable.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2402MHz.

For EUT with Dipole Antenna, the EUT has been evaluated at X and Y. The highest measured output power was at Y-Axis.

For EUT with Chip Antenna, the EUT has been evaluated at X, Y and Z. The highest measured output power was at Z-Axis

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	AK II TECHNOLOGY	A1OP-05MP	02179	DoC

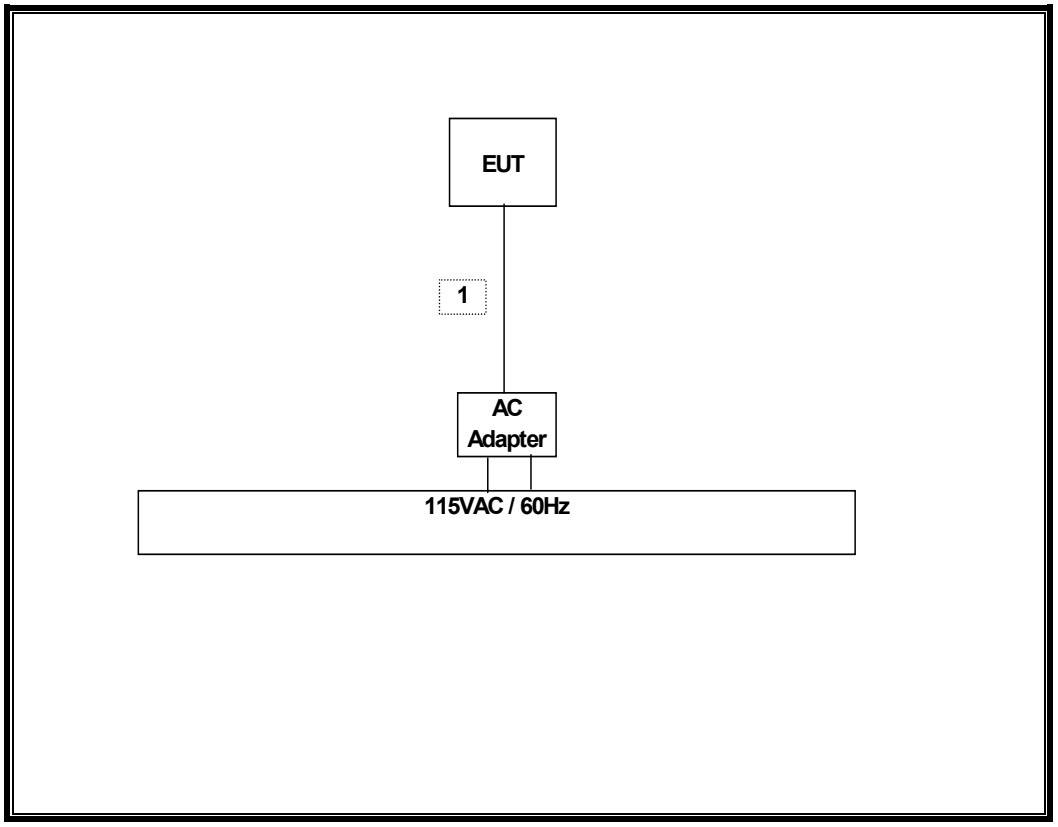
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	DC	1	DC Jack	Un-Shielded	1.5m	N/A

TEST SETUP

The EUT is a stand-alone unit.

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	C01012	05/02/06	08/07/08
EMI Receiver, 2.9 GHz	Agilent / HP	8542E	C00957	02/06/07	06/12/08
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	02/06/07	06/12/08
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	03/31/08	03/31/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	08/03/07	09/27/08
Antenna, Horn, 18 GHz	EMCO	3115	C00872	04/22/08	04/22/09
Antenna, Horn, 18 GHz	EMCO	3115	C00945	04/22/08	04/22/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	08/03/07	08/03/08
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	10/11/07	10/11/08
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	09/29/07	09/29/08
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	09/28/07	09/28/08

7. LIMITS AND RESULTS

7.1. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

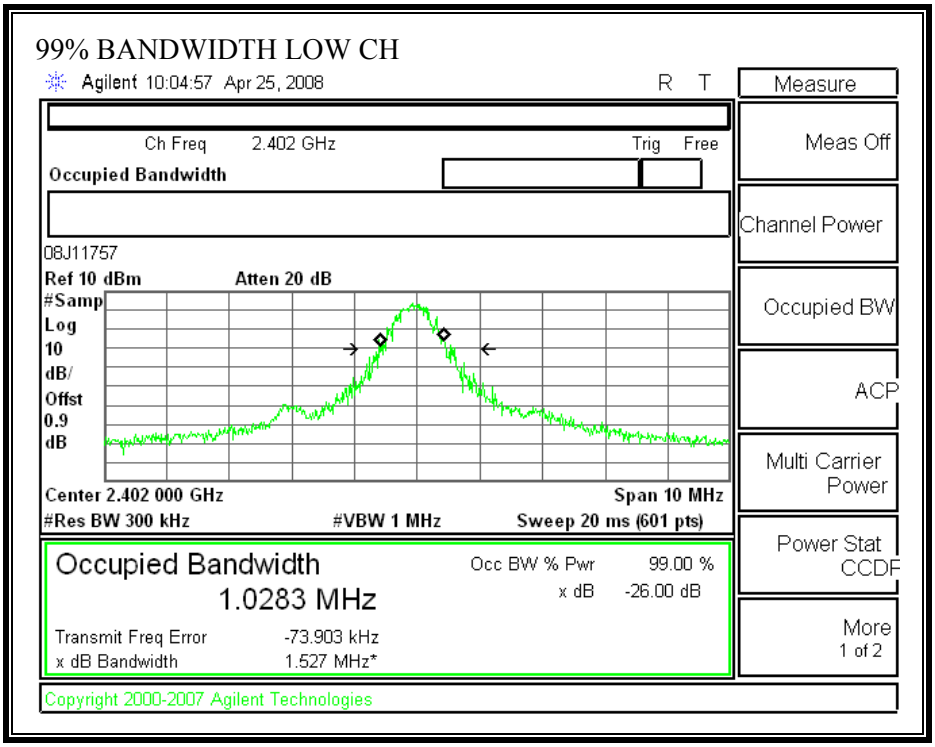
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

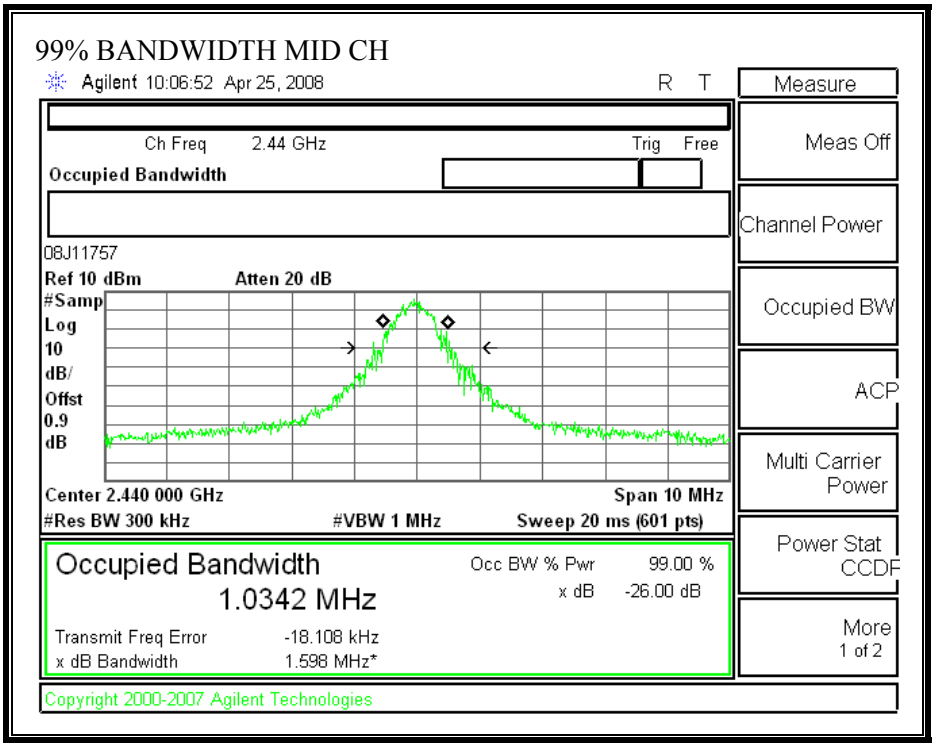
RESULTS

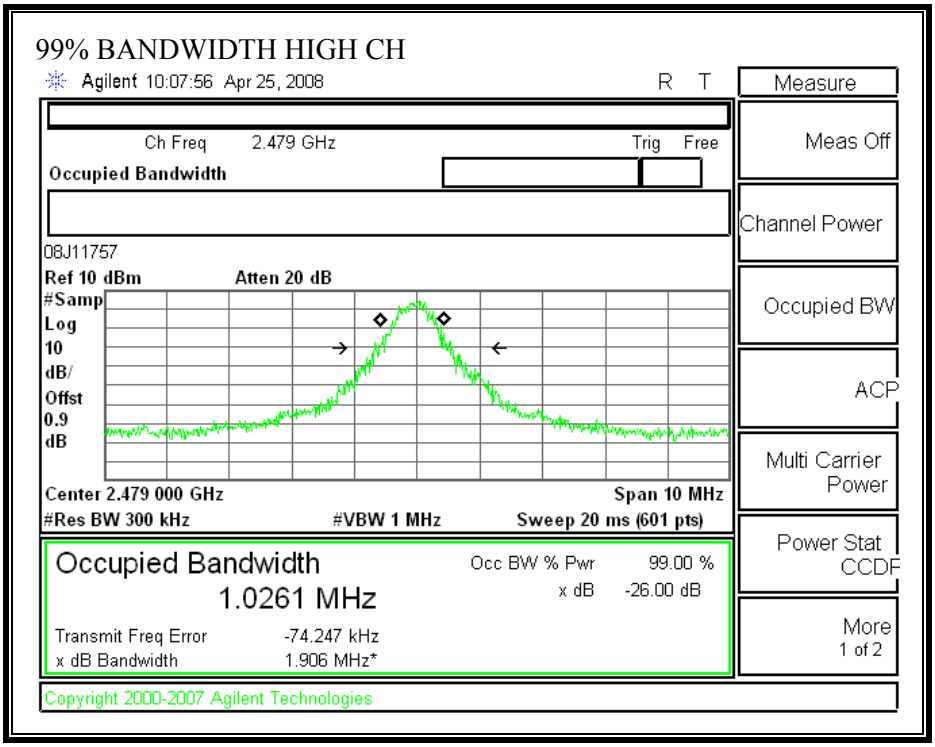
No non-compliance noted:

Channel	Frequency (MHz)	99% Bandwidth (KHz)
Low	2402	1028.3
Middle	2440	1034.2
High	2479	1026.1

99% BANDWIDTH







7.2. TRANSMITTER RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4

LIMIT

IC RSS-210, A2.9
FCC 15.249

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHZ, and 24.0–24.25 GHz.
(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/ meter)	Field strength of harmonics (microvolts/ meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100 **	3
88–216	150 **	3
216–960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

RESULTS

No non-compliance noted:

7.2.1. FUNDAMENTAL FREQUENCY RADIATED EMISSION

EUT with Dipole Antenna:

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Tohnichi
Project #: 08J11757
Date: 04/25/08
Test Engineer: Tom Chen
Configuration: EUT only
Mode: Continuous TX **20 log(duty cycle)** -18.8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m				FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch.2402 MHz, Y pos															
2.402	3.0	61.0	42.2	29.3	5.1	0.0	0.0	0.0	95.3	76.5	114.0	94.0	-18.7	-17.5	V
2.402	3.0	52.7	33.9	29.3	5.1	0.0	0.0	0.0	87.1	68.3	114.0	94.0	-26.9	-25.7	H
Mid Ch. 2440 MHz, Y pos															
2.440	3.0	62.9	44.1	29.4	5.1	0.0	0.0	0.0	97.4	78.6	114.0	94.0	-16.6	-15.4	V
2.440	3.0	50.5	31.7	29.4	5.1	0.0	0.0	0.0	85.0	66.2	114.0	94.0	-29.0	-27.8	H
High Ch. 2479 MHz, Y pos															
2.479	3.0	64.6	45.8	29.5	5.1	0.0	0.0	0.0	99.2	80.4	114.0	94.0	-14.8	-13.6	V
2.479	3.0	54.8	36.0	29.5	5.1	0.0	0.0	0.0	89.4	70.6	114.0	94.0	-24.6	-23.4	H

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

EUT with Chip Antenna:

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Tohnichi
Project #: 08J11758
Date: 04/28/08
Test Engineer: Tom Chen
Configuration: EUT only
Mode: Continuous TX 20 LOG (Duty Cycle) -18.8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m				FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		A-5m Chamber		

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

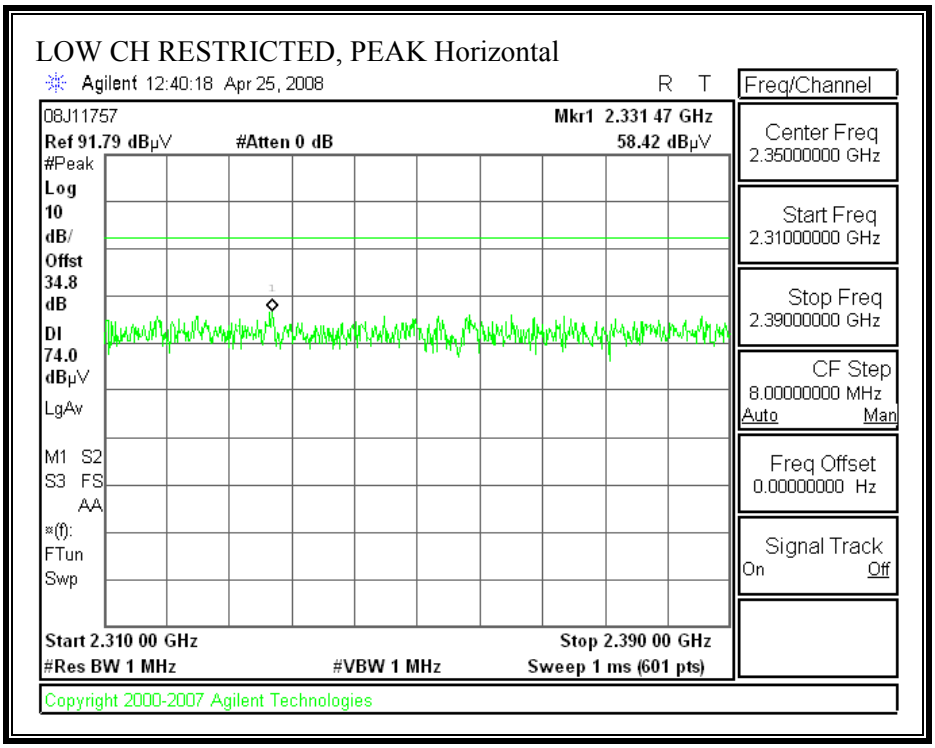
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch.2402 MHz, Z pos															
2.402	3.0	60.5	41.7	29.5	4.8	0.0	0.0	0.0	94.8	76.0	114.0	94.0	-19.2	-18.0	V
2.402	3.0	56.8	38.0	29.5	4.8	0.0	0.0	0.0	91.1	72.3	114.0	94.0	-22.9	-21.7	H
Mid Ch. 2440 MHz, Z pos															
2.440	3.0	65.2	46.4	29.6	4.9	0.0	0.0	0.0	99.6	80.8	114.0	94.0	-14.4	-13.2	V
2.440	3.0	59.8	41.0	29.6	4.9	0.0	0.0	0.0	94.2	75.4	114.0	94.0	-19.8	-18.6	H
High Ch. 2479 MHz, Z pos															
2.479	3.0	64.4	44.4	29.7	4.9	0.0	0.0	0.0	99.0	79.0	114.0	94.0	-15.0	-15.0	V
2.479	3.0	61.7	41.7	29.7	4.9	0.0	0.0	0.0	96.3	76.3	114.0	94.0	-17.7	-17.7	H

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

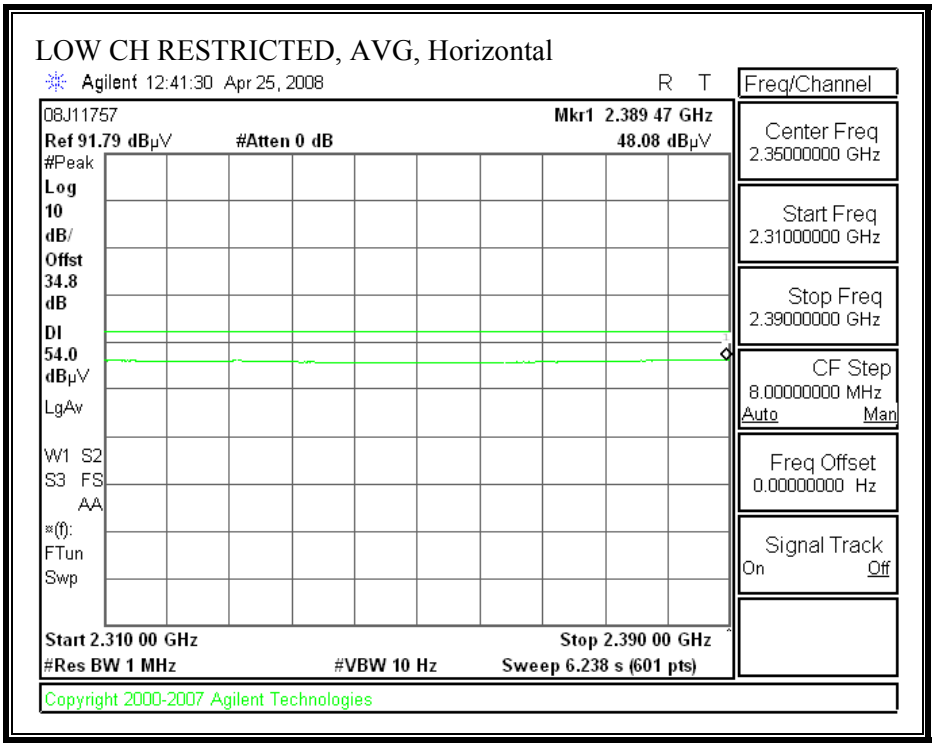
7.2.2. TRANSMITTER RESTRICTED BAND EDGES

EUT with Dipole Antenna:

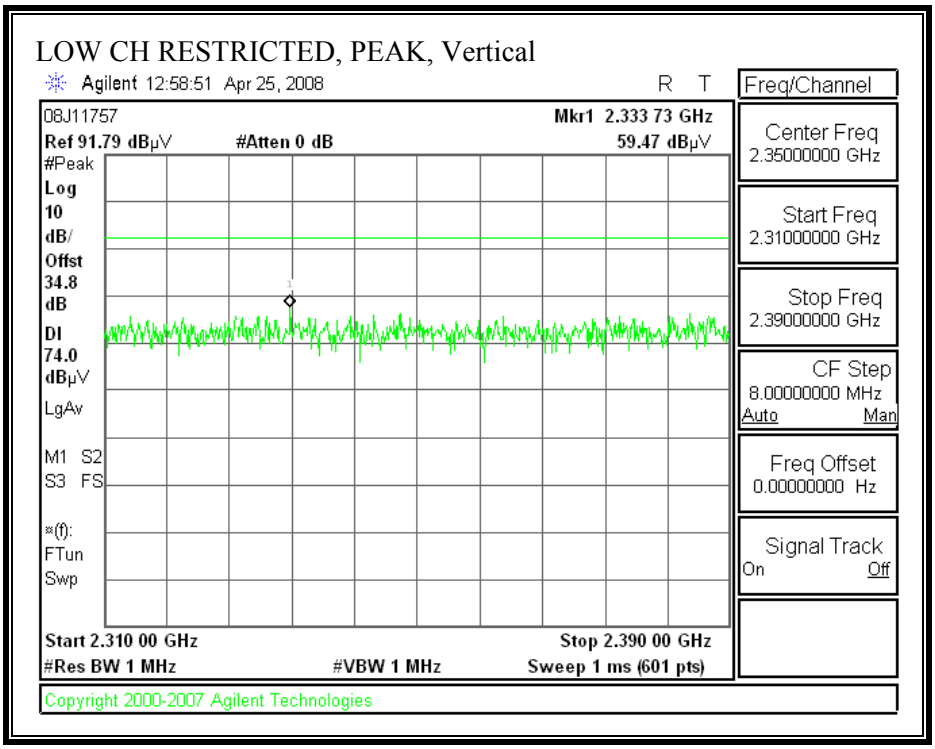
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

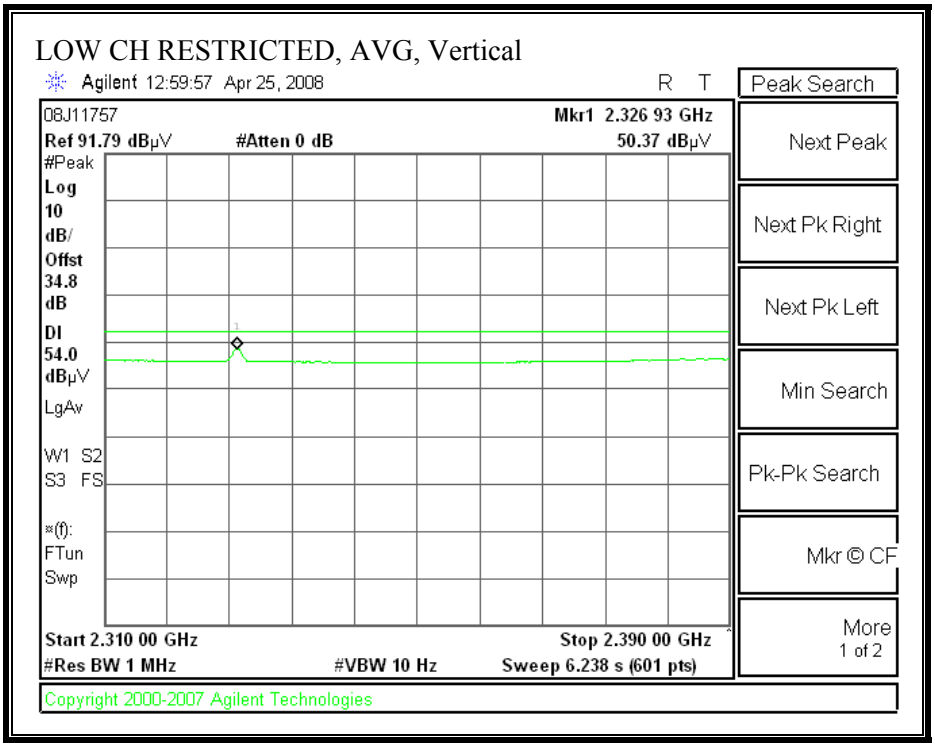


LOW CH RESTRICTED, AVG, Horizontal

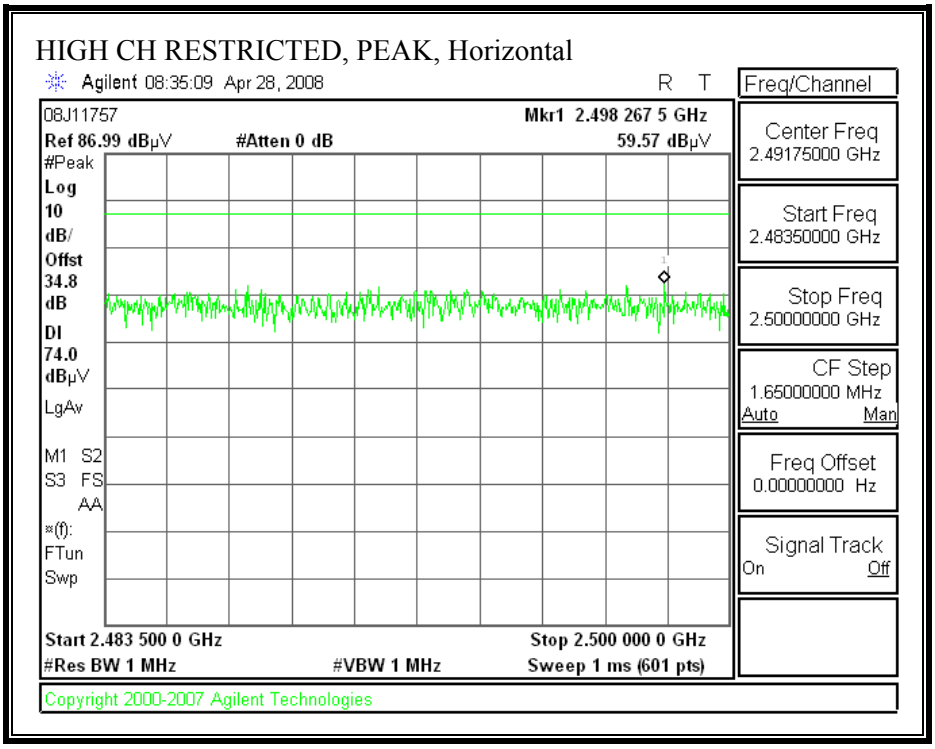


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

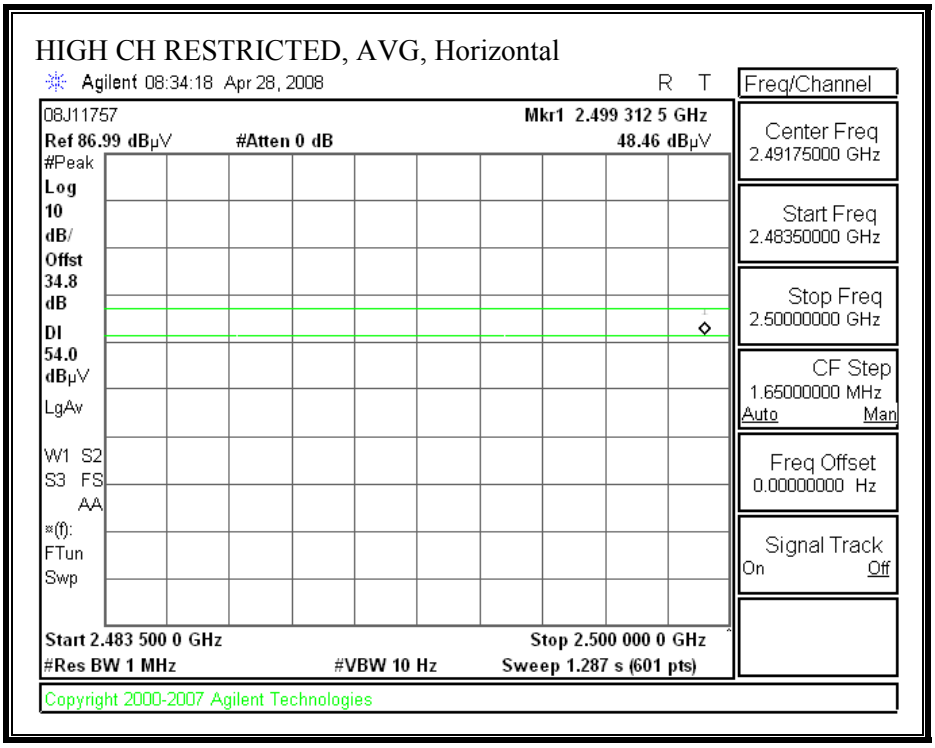




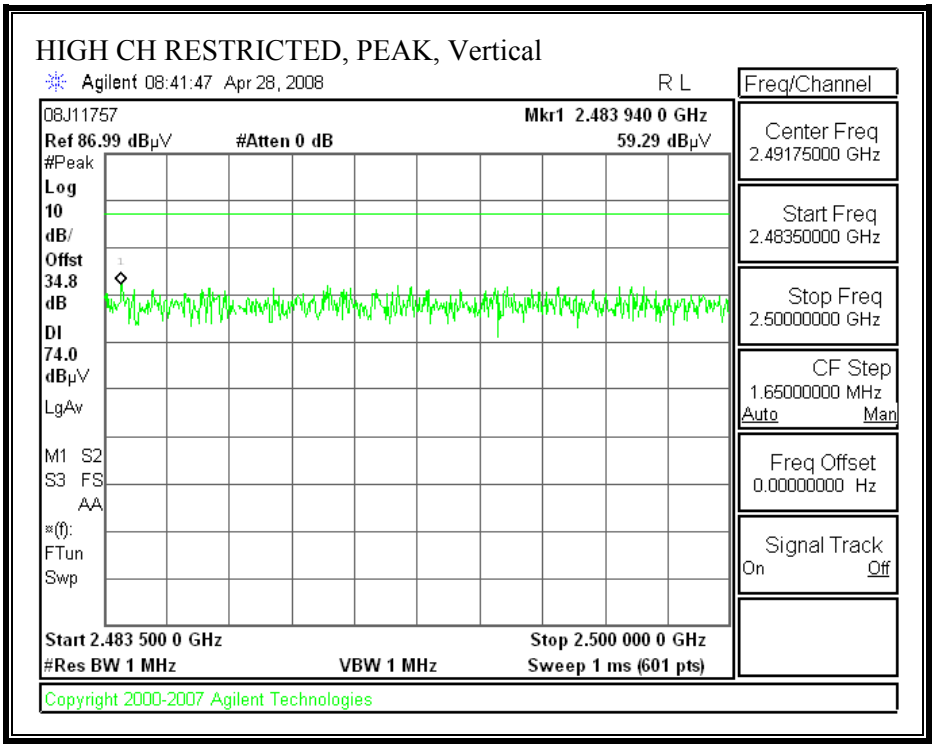
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

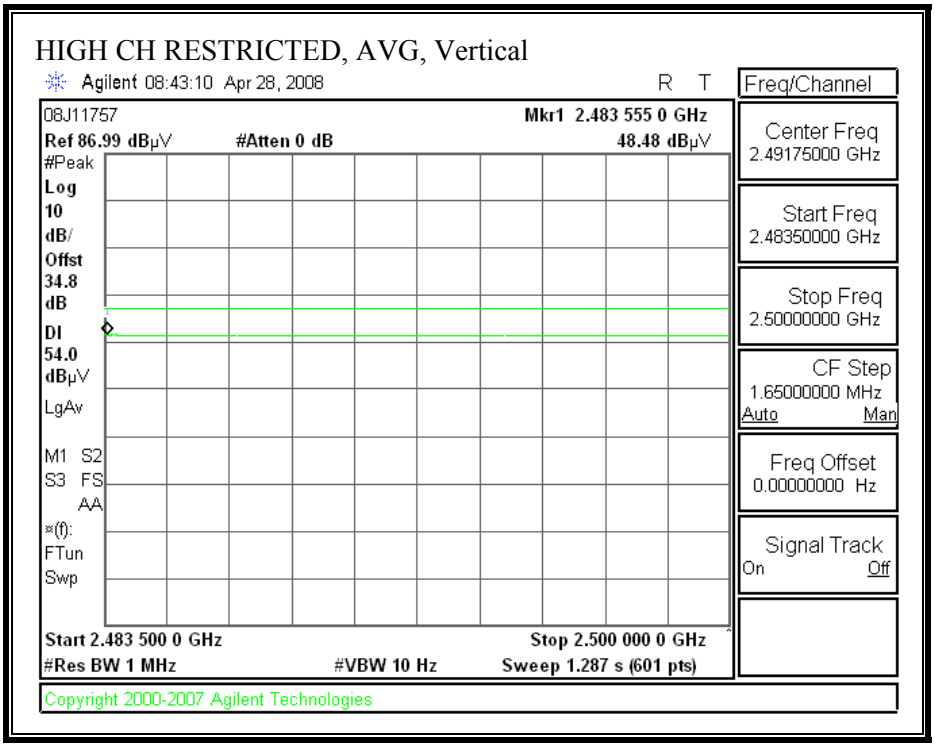


HIGH CH RESTRICTED, AVG, Horizontal



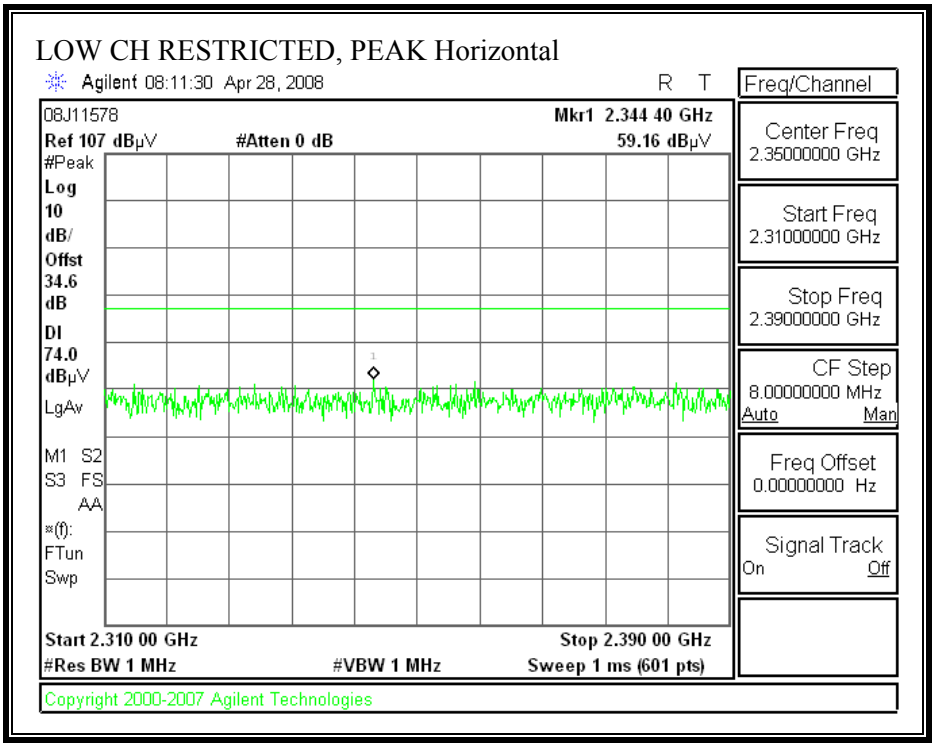
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

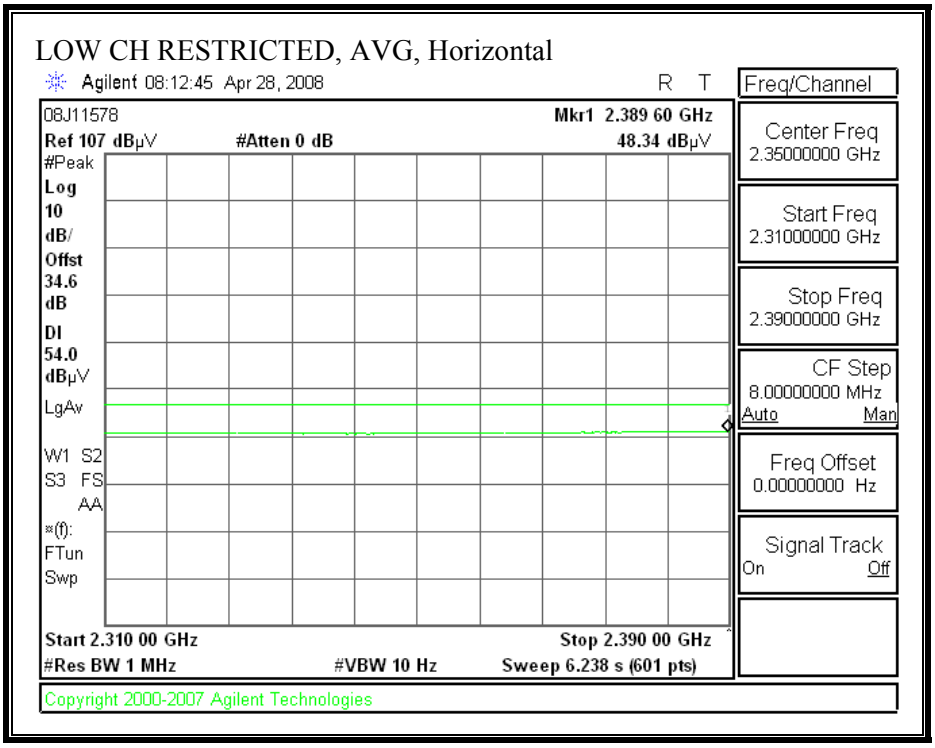




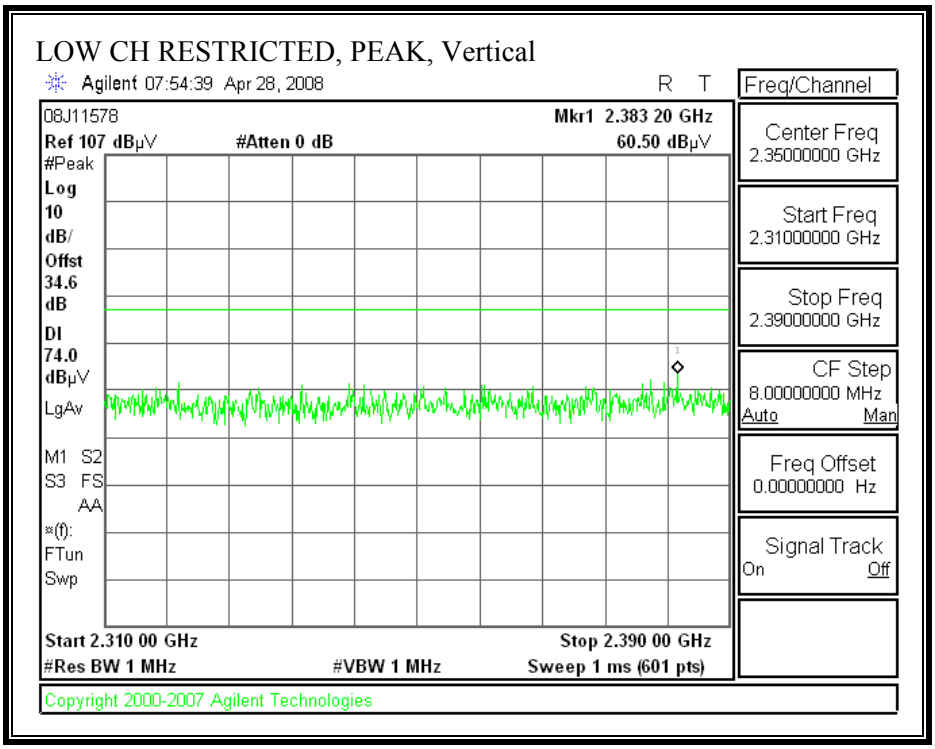
EUT with Chip Antenna:

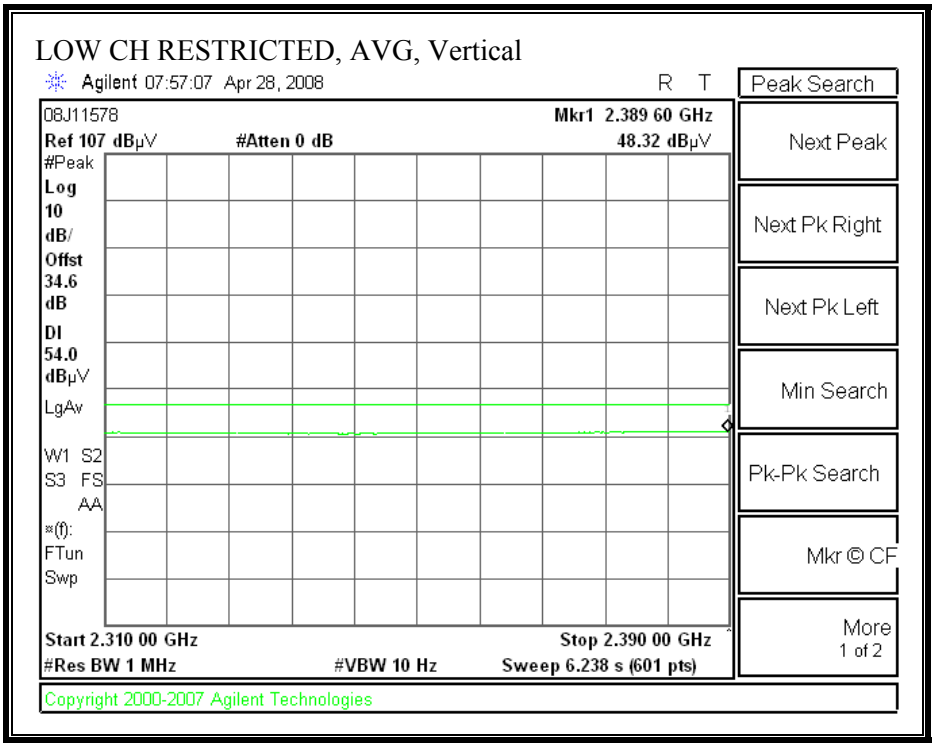
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



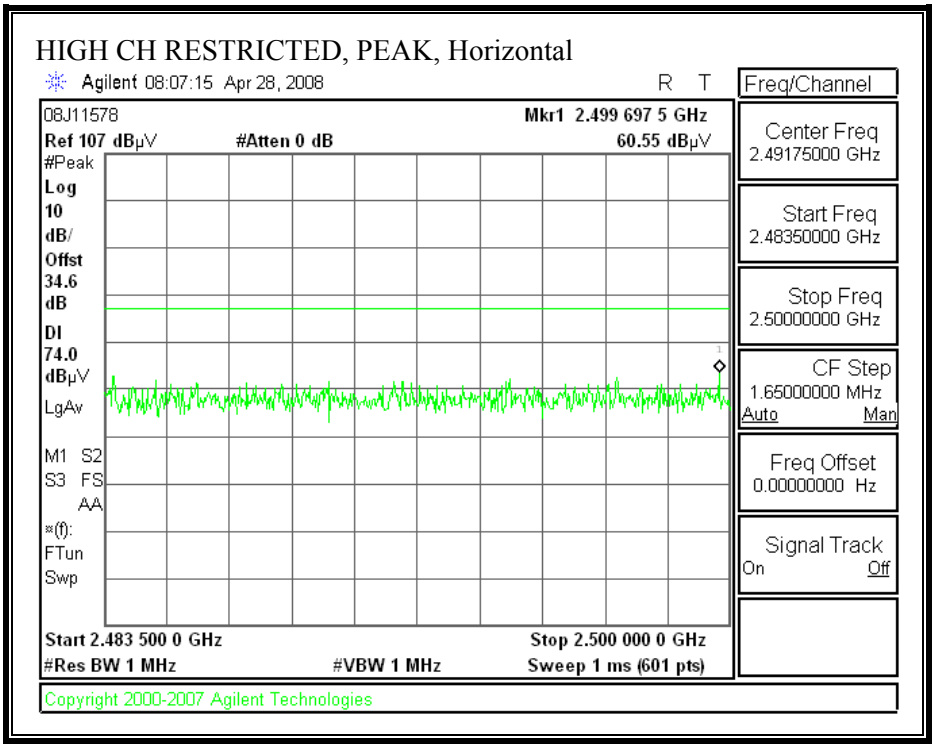


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

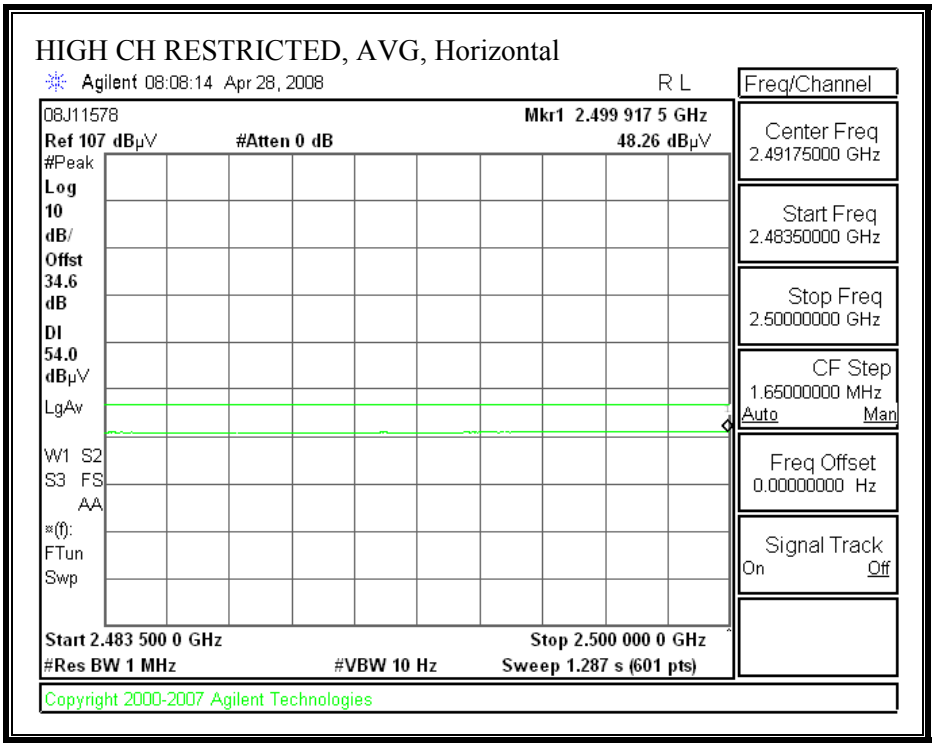




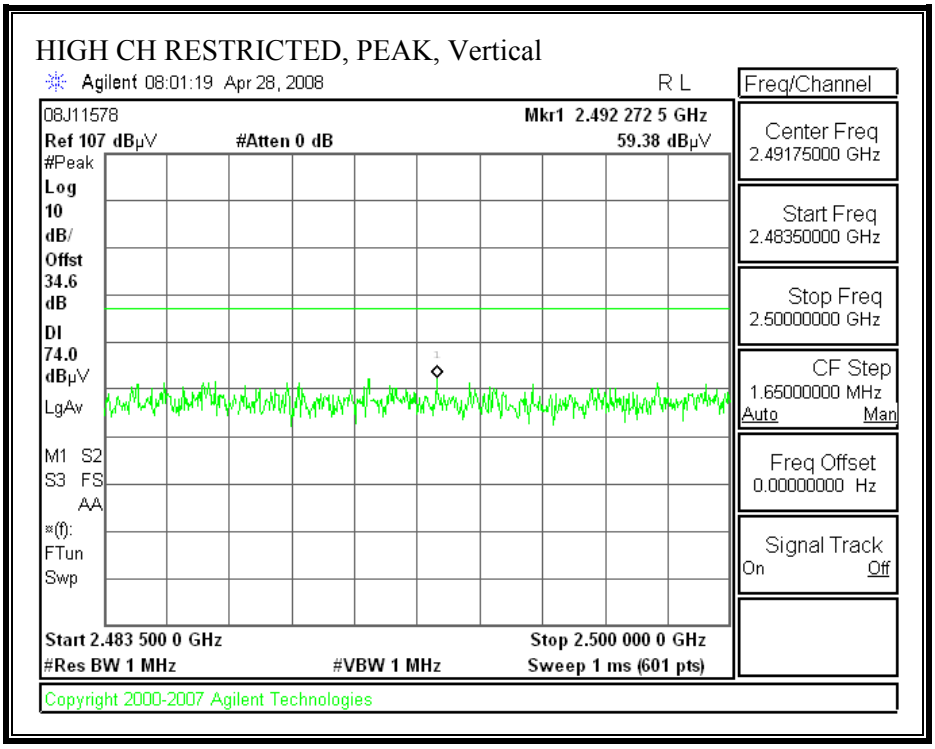
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



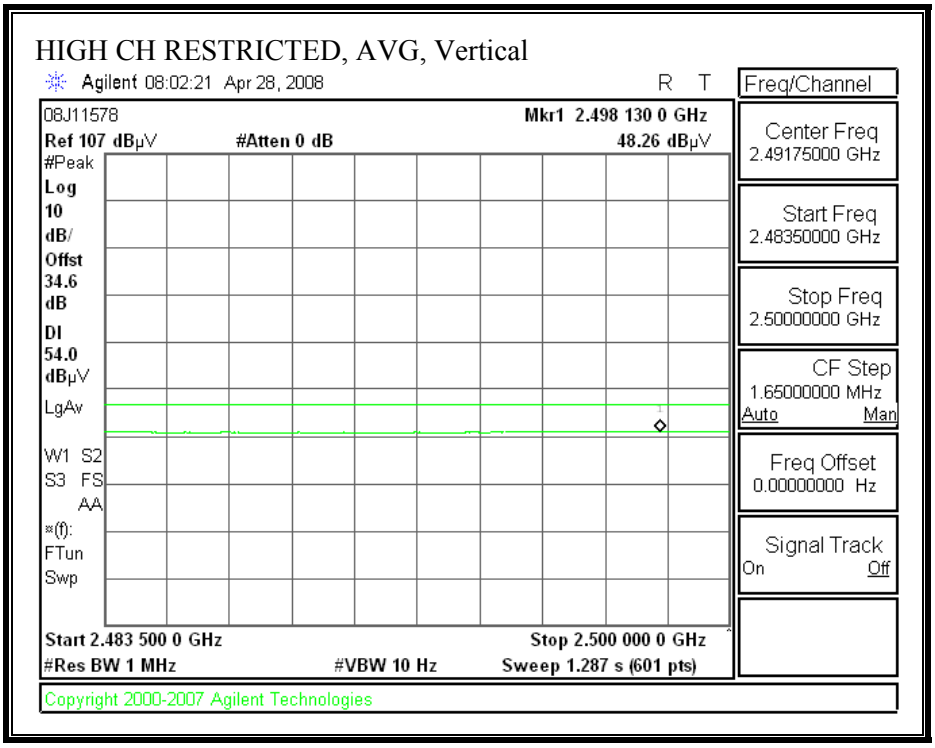
HIGH CH RESTRICTED, AVG, Horizontal



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG, Vertical



7.2.3. HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz

EUT with Dipole Antenna:

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company:	Tohnichi		
Project #:	08J11757		
Date:	04/29/08		
Test Engineer:	Tom Chen		
Configuration:	EUT only		
Mode:	Continuous TX	**20 log (duty cycle)**	-18.8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		R_001

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch.2402 MHz, Ypos															
4.804	3.0	63.4	44.6	33.7	7.1	-34.8	0.0	0.0	69.4	50.6	74	54	-4.6	-3.4	V
7.206	3.0	46.0	27.2	36.2	8.6	-34.2	0.0	0.0	56.6	37.8	74	54	-17.4	-16.2	V
4.804	3.0	57.0	38.2	33.7	7.1	-34.8	0.0	0.0	63.0	44.2	74	54	-11.0	-9.8	H
7.206	3.0	46.6	27.8	36.2	8.6	-34.2	0.0	0.0	57.2	38.4	74	54	-16.8	-15.6	H
Mid Ch. 2440 MHz, Ypos															
4.880	3.0	64.8	46.0	33.8	7.2	-34.8	0.0	0.0	70.9	52.1	74	54	-3.1	-1.9	V
7.319	3.0	45.3	26.5	36.2	8.7	-34.1	0.0	0.0	56.0	37.2	74	54	-18.0	-16.8	V
4.880	3.0	60.9	42.1	33.8	7.2	-34.8	0.0	0.0	67.0	48.2	74	54	-7.0	-5.8	H
7.319	3.0	46.8	28.0	36.2	8.7	-34.1	0.0	0.0	57.5	38.7	74	54	-16.5	-15.3	H
High Ch. 2479 MHz, Ypos															
4.958	3.0	64.6	45.8	33.9	7.2	-34.8	0.0	0.0	70.9	52.1	74	54	-3.1	-1.9	V
7.437	3.0	44.7	25.9	36.3	8.7	-34.1	0.0	0.0	55.7	36.9	74	54	-18.3	-17.1	V
4.958	3.0	65.2	46.4	33.9	7.2	-34.8	0.0	0.0	71.5	52.7	74	54	-2.5	-1.3	H
7.437	3.0	47.1	28.3	36.3	8.7	-34.1	0.0	0.0	58.0	39.2	74	54	-16.0	-14.8	H

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

EUT with Chip Antenna:

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Tohnichi
Project #: 08J11758
Date: 04/28/08
Test Engineer: Tom Chen
Configuration: EUT only
Mode: Continuous TX **20 log (duty cycle)** -18.8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		A-5m Chamber		

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch.2402 MHz, Zpos															
4.804	3.0	59.7	40.9	33.7	6.9	-36.5	0.0	0.0	63.8	45.0	74	54	-10.2	-9.0	V
7.206	3.0	37.2	18.4	36.6	8.4	-36.2	0.0	0.0	46.0	27.2	74	54	-28.0	-26.8	V
4.804	3.0	58.4	39.6	33.7	6.9	-36.5	0.0	0.0	62.5	43.7	74	54	-11.5	-10.3	H
7.206	3.0	38.6	19.8	36.6	8.4	-36.2	0.0	0.0	47.4	28.6	74	54	-26.6	-25.4	H
Mid Ch. 2440 MHz, Zpos															
4.880	3.0	58.5	39.7	33.7	6.9	-36.5	0.0	0.0	62.7	43.9	74	54	-11.3	-10.1	V
7.319	3.0	37.3	18.5	36.7	8.4	-36.2	0.0	0.0	46.2	27.4	74	54	-27.8	-26.6	V
4.880	3.0	58.7	39.9	33.7	6.9	-36.5	0.0	0.0	62.9	44.1	74	54	-11.1	-9.9	H
7.319	3.0	35.6	16.8	36.7	8.4	-36.2	0.0	0.0	44.5	25.7	74	54	-29.5	-28.3	H
High Ch. 2479 MHz, Zpos															
4.958	3.0	56.5	37.7	33.8	7.0	-36.5	0.0	0.0	60.9	42.1	74	54	-13.1	-11.9	V
7.437	3.0	36.9	18.1	36.8	8.5	-36.2	0.0	0.0	46.0	27.2	74	54	-28.0	-26.8	V
4.958	3.0	60.7	41.9	33.8	7.0	-36.5	0.0	0.0	65.1	46.3	74	54	-8.9	-7.7	H
7.437	3.0	38.3	19.5	36.8	8.5	-36.2	0.0	0.0	47.4	28.6	74	54	-26.6	-25.4	H

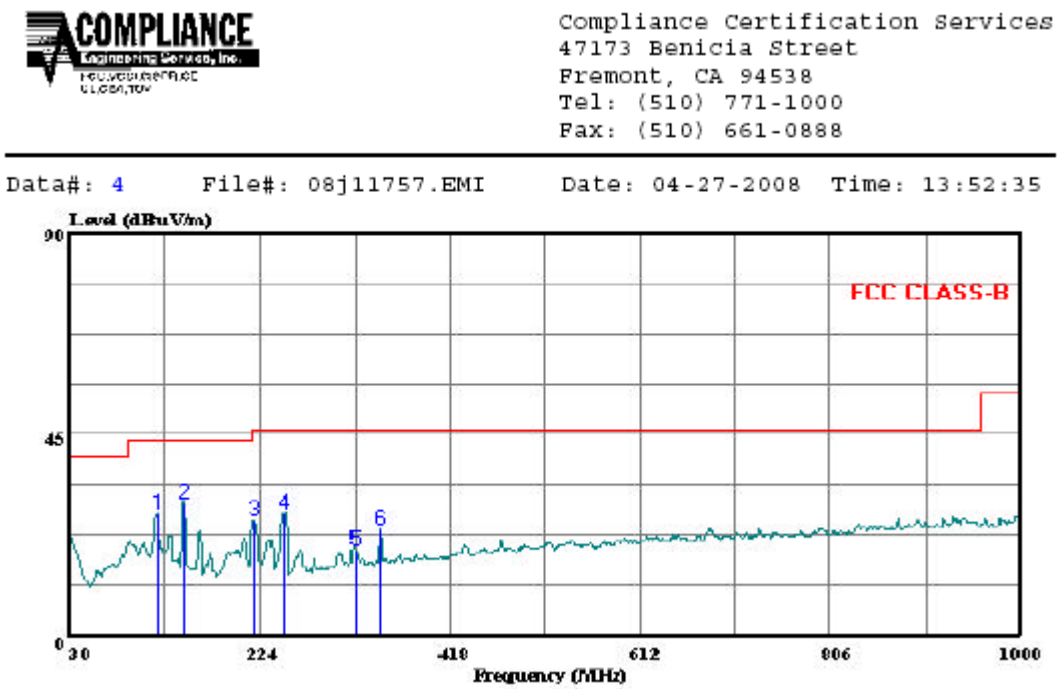
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

7.2.4. WORST-CASE BELOW 1 GHz

EUT with Dipole Antenna:

SPURIOUS EMISSIONS 30 TO 1000 MHz (HORIZONTAL)

HORIZONTAL PLOT



HORIZONTAL DATA

Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Can Ming Chung
Project #: : 08J11757
Company: : TOHNICHI
Model: : FHD256-D
Configuration:: EUT Alone
Mode : : Tx On-low ch
Target: : FCC Class B

Page: 1

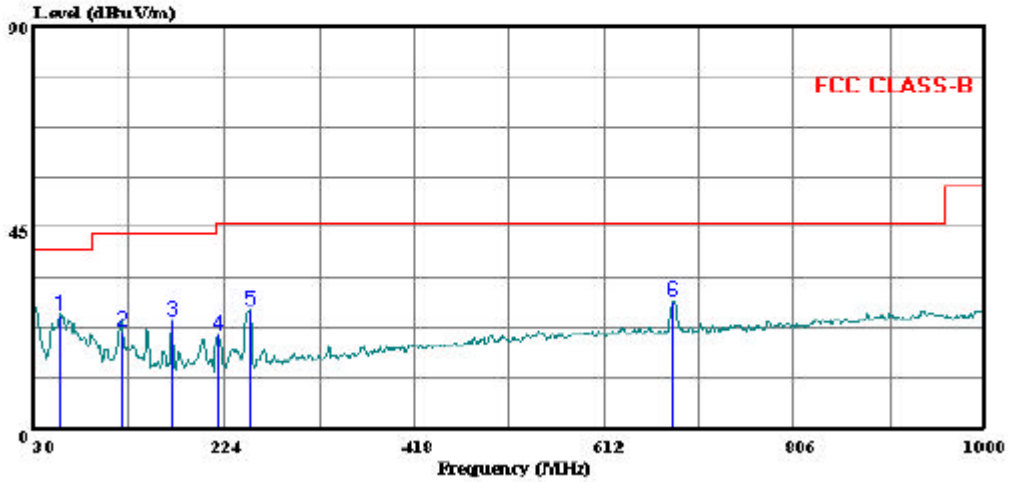
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	119.240	40.41	-13.32	27.09	43.50	-16.41	Peak
2	147.370	43.40	-13.68	29.73	43.50	-13.77	Peak
3	218.180	40.99	-15.17	25.82	46.00	-20.18	Peak
4	247.280	41.64	-14.41	27.23	46.00	-18.77	Peak
5	321.000	30.98	-11.82	19.16	46.00	-26.84	Peak
6	347.190	34.98	-11.22	23.76	46.00	-22.24	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (VERTICAL)

VERTICAL PLOT

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 2 File#: 08j11757.EMI Date: 04-27-2008 Time: 13:42:41



VERTICAL DATA

Condition: FCC CLASS-B VERTICAL
Test Operator:: Can Ming Chung
Project #: : 08J11757
Company: : TOHNICHI
Model: : FHD256-D
Configuration:: EUT Alone
Mode : : Tx On-low ch
Target: : FCC Class B

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	57.160	44.98	-19.51	25.47	40.00	-14.53	Peak
2	120.210	34.97	-13.19	21.78	43.50	-21.72	Peak
3	169.680	38.88	-14.61	24.27	43.50	-19.23	Peak
4	218.180	36.04	-15.17	20.87	46.00	-25.13	Peak
5	250.190	40.60	-14.23	26.37	46.00	-19.63	Peak
6	681.840	32.56	-4.09	28.47	46.00	-17.53	Peak

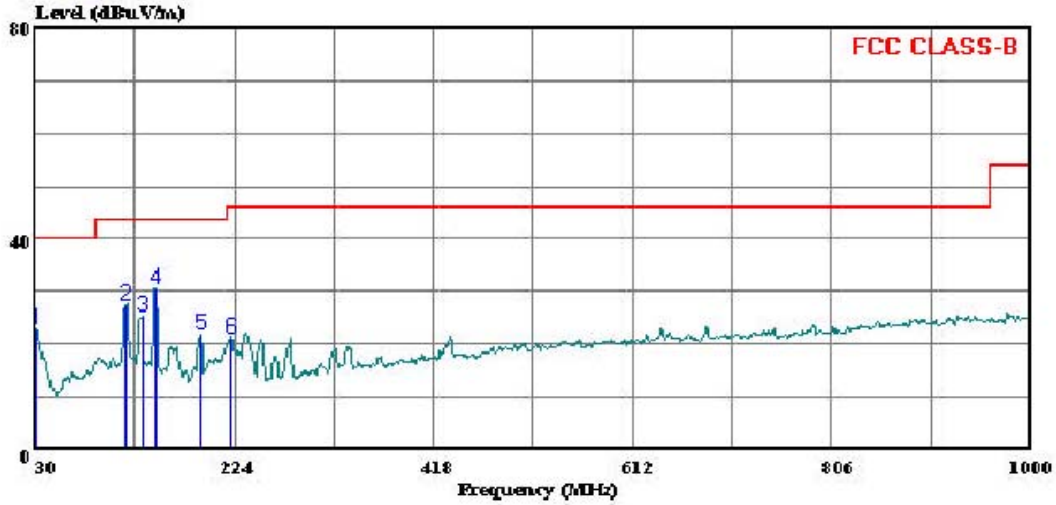
EUT with Chip Antenna:

SPURIOUS EMISSIONS 30 TO 1000 MHz (HORIZONTAL)

HORIZONTAL PLOT

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 2 File#: 08J11758.EMI Date: 04-29-2008 Time: 09:45:00



Trace: 1 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Tom Chen
Project #: : 08J11758
Company: : TOHNICHI
Model: : FHD256M-C
Configuration:: EUT with Adapter
Mode : : TX on High CH
Target: : FCC Class B

HORIZONTAL DATA

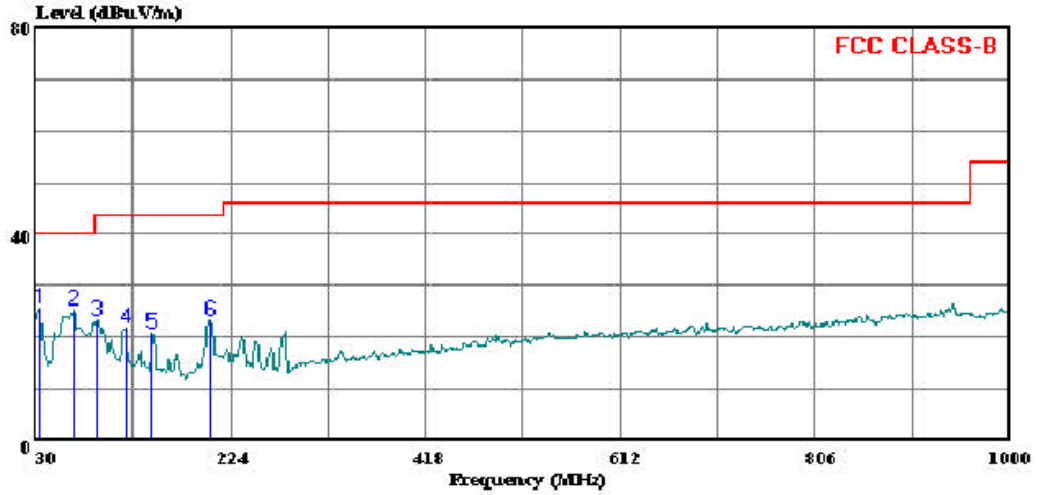
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.970	28.47	-5.75	22.72	40.00	-17.28	Peak
2	118.270	40.87	-13.55	27.32	43.50	-16.18	Peak
3	133.790	38.37	-13.19	25.18	43.50	-18.32	Peak
4	146.400	44.26	-13.68	30.58	43.50	-12.92	Peak
5	191.990	36.38	-14.49	21.89	43.50	-21.61	Peak
6	220.120	36.26	-15.14	21.12	46.00	-24.88	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (VERTICAL)

VERTICAL PLOT

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 4 File#: 08J11758.EMI Date: 04-29-2008 Time: 10:03:06



Trace: 3 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator:: Tom Chen
Project #: : 08J11758
Company: : TOHNICHI
Model: : FHD256M-C
Configuration:: EUT with Adapter
Mode : : TX on High CH
Target: : FCC Class B

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	33.54	-8.07	25.47	40.00	-14.53	Peak
2	67.830	44.36	-19.24	25.12	40.00	-14.88	Peak
3	91.110	42.34	-19.22	23.12	43.50	-20.38	Peak
4	119.240	35.23	-13.32	21.91	43.50	-21.59	Peak
5	145.430	34.20	-13.55	20.65	43.50	-22.85	Peak
6	203.630	37.32	-13.97	23.35	43.50	-20.15	Peak

7.3. RECEIVER RADIATED EMISSION

RSS-210 Table 2: General Field Strength Limits (for transmitter and receiver)

FREQUENCY (MHz)	FIELD STRENGTH[1] microvolts/m at 3 metres (watts, EIRP)	
	Transmitter[2]	Receivers
30-88	100 (3 nW)	100 (3 nW),
88-216	150 (6.8 nW)	150 (6.8 nW),
216-960	200 (12 nW)	200 (12 nW),
960 - 1610	500 (75 nW)	500 (75 nW)
above 1610	500 (75 nW)	1000 (300 nW)

Note 1: Use quasi-peak below 1000 MHz and averaging meter above 1000 MHz.

Note 2: Transmitting devices are not permitted in Table 2 bands or in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz). Prohibition of operation in TV bands does not apply to section 6.1 on momentary devices, or to 6.2.2(Ll) on medical telemetry devices in the band 174-216 MHz), and perimeter protection systems in the bands 54-72 and 76-88 MHz. The perimeter protection devices are to meet Table 3 field strengths limits.

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 receive 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, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 5th harmonic is investigated with the transmitter set to the middle channel.

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.

RESULTS

No non-compliance noted:

RECEIVER SPURIOUS EMISSIONS

EUT with Dipole Antenna:

High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Company: HOHNICHI
Project #: 08J11757
Date: 04/27/08
Test Engineer: Can Ming Chung
Configuration: EUT Only
Mode: Rx Mode-Mid Ch

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T34 HP 8449B			RX RSS 210

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001		

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Mid CH															
1.059	3.0	48.7	36.3	24.0	5.3	-38.2	0.0	0.0	39.9	27.5	74	54	-34.1	-26.5	H
6.930	3.0	46.6	33.1	34.7	12.4	-34.3	0.0	0.0	59.5	46.0	74	54	-14.5	-8.0	H
1.153	3.0	48.3	35.9	24.4	5.5	-38.0	0.0	0.0	40.1	27.8	74	54	-33.9	-26.2	V
6.829	3.0	46.3	33.4	34.6	12.3	-34.3	0.0	0.0	58.9	46.0	74	54	-15.1	-8.0	V

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

EUT with Chip Antenna:

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Tohnichi
Project #: 08J11758
Date: 04/29/08
Test Engineer: Tom Chen
Configuration: EUT only
Mode: RX on Mid CH 20 log (duty cycle) -18.8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T34 HP 8449B			RX RSS 210

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Mid Ch. 2440 MHz, Z pos															
1.253	3.0	44.1	25.3	26.4	3.6	-37.9	0.0	0.0	36.1	17.3	74	54	-37.9	-36.7	V
4.167	3.0	41.4	22.6	33.0	6.6	-34.9	0.0	0.0	46.0	27.2	74	54	-28.0	-26.8	V
6.883	3.0	42.9	24.1	35.9	8.5	-34.3	0.0	0.0	53.0	34.2	74	54	-21.0	-19.8	V
1.440	3.0	43.4	24.6	26.9	3.8	-37.7	0.0	0.0	36.4	17.6	74	54	-37.6	-36.4	H
4.340	3.0	42.3	23.5	33.2	6.7	-34.9	0.0	0.0	47.2	28.4	74	54	-26.8	-25.6	H
7.000	3.0	43.5	24.7	36.0	8.5	-34.2	0.0	0.0	53.8	35.0	74	54	-20.2	-19.0	H

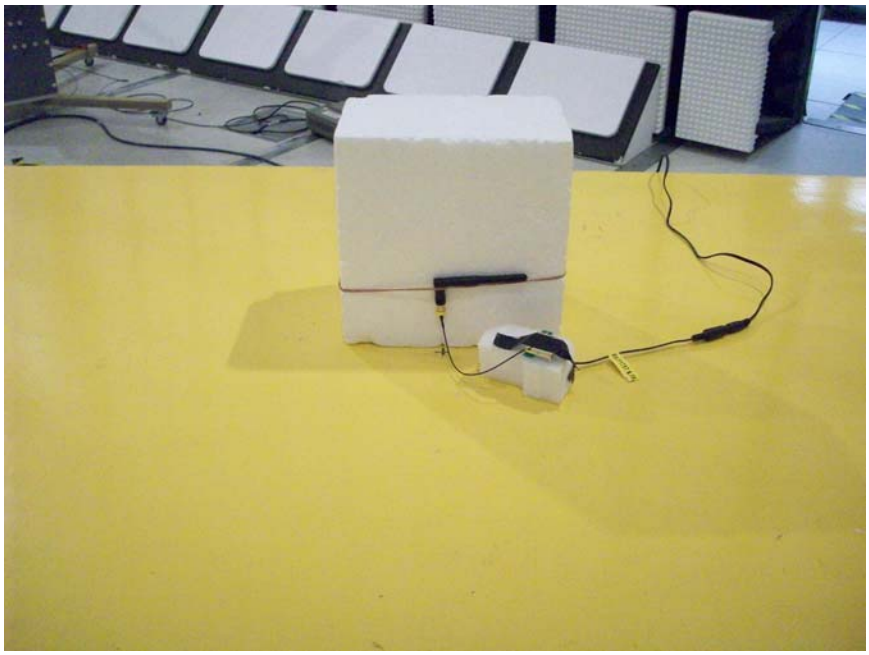
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

8. SETUP PHOTOS

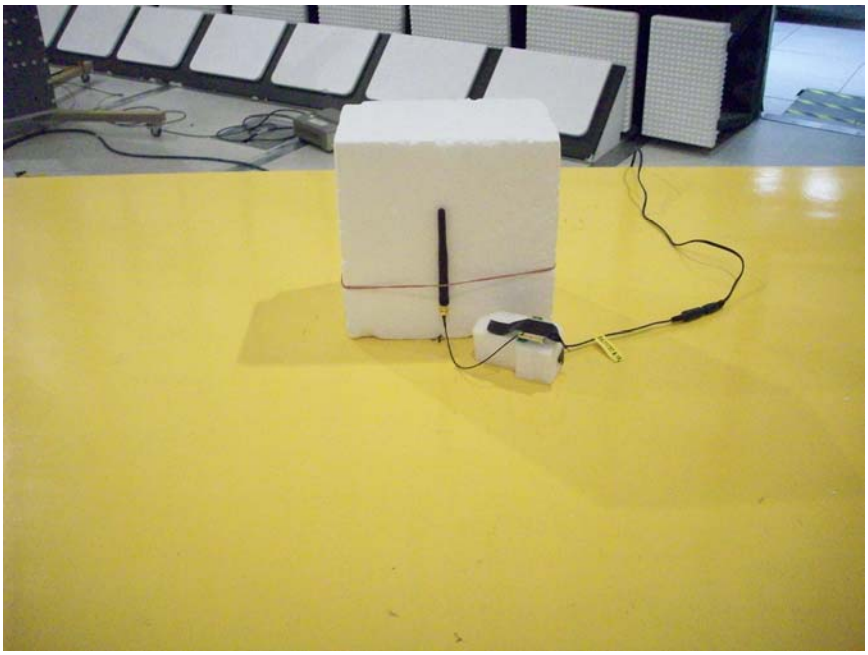
EUT with Dipole Antenna:

RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

X-AXIS PHOTO



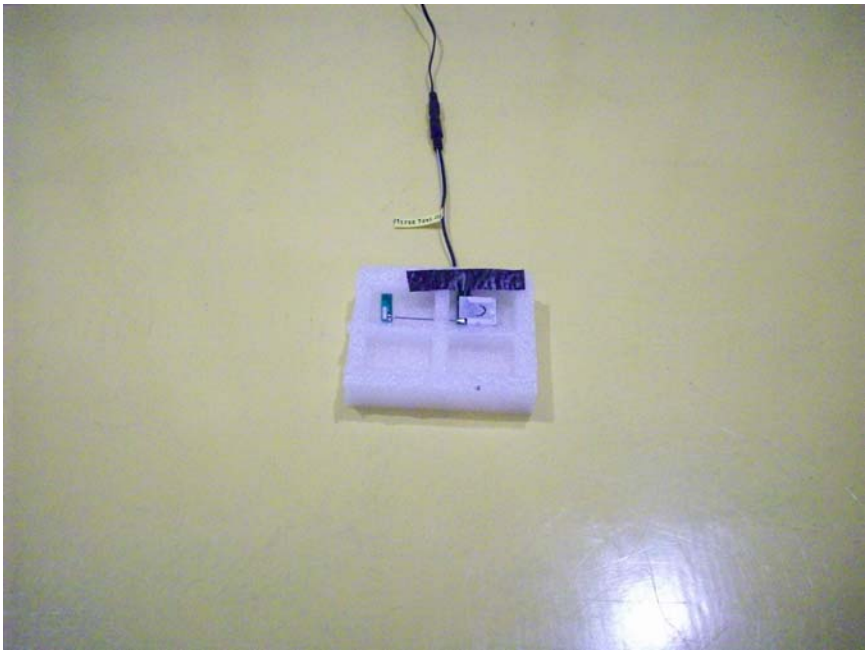
Y-AXIS PHOTO



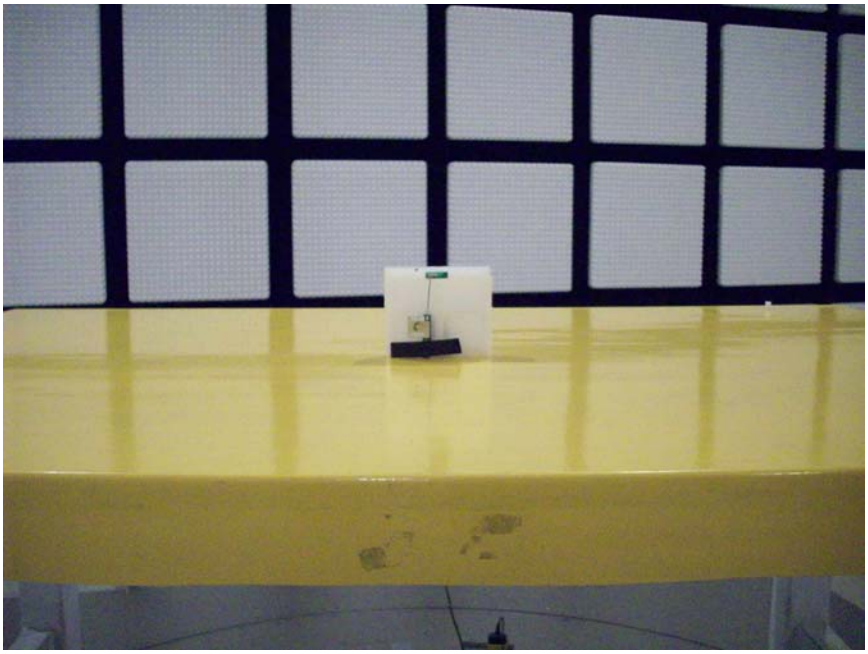
EUT with Chip Antenna:

RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

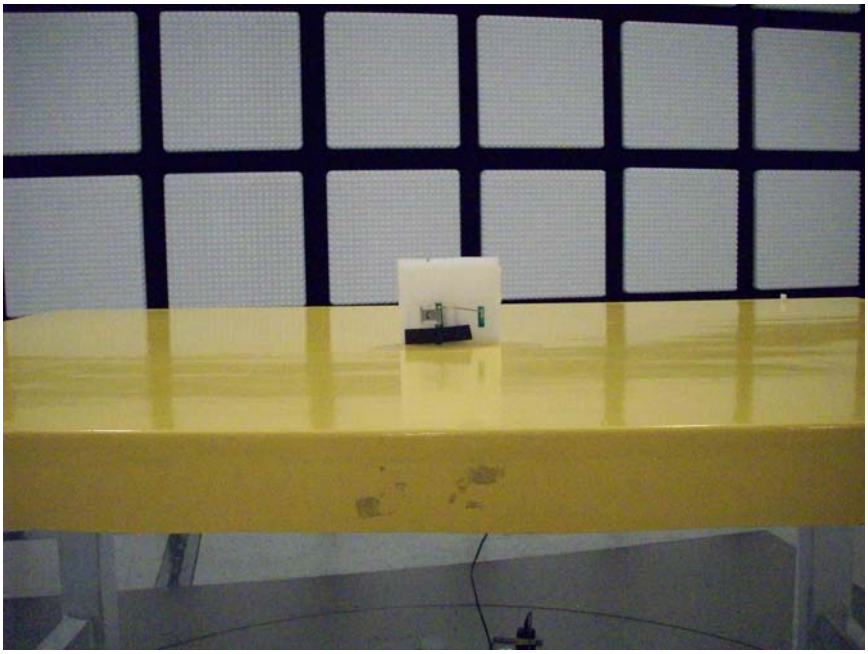
X-AXIS FRONT PHOTO



Y-AXIS FRONT PHOTO



Z-AXIS FRONT PHOTO



END OF REPORT