



**FCC CFR47 PART 15 SUBPART C  
CERTIFICATION  
TEST REPORT**

**FOR**

**RF SETTING BOX**

**MODEL NUMBER: SB-FH256**

**FCC ID: UY6-SBFH256**

**REPORT NUMBER: 07J11242-1**

**ISSUE DATE: SEPTEMBER 05, 2007**

*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.**  
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**NVLAP**<sup>®</sup>

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	09/05/07	Initial Issue	T. Chan

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## 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 SETTING BOX

**MODEL:** SB-FH256

**SERIAL NUMBER:** 2009

**DATE TESTED:** AUGUST 28-30, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	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.

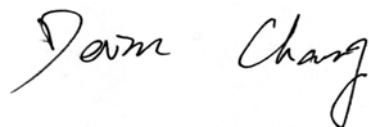
Approved & Released For CCS By:



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THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



---

DEVIN CHANG  
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 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 SB-FH256 RF SETTING BOX operates in the 2402-2479MHz frequency range with 78 channels of GFSK modulation type in 1MHz spacing channels. It is installed onto TOHNICHI torque wrenches, and sends the tightening completion signal to the TOHNICHI SB-FH256 RF Terminal far from the wrench using GFSK wave.

### 5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a permanently attached dipole antenna with maximum peak gain of 2dBi. Antenna Manufacturer / Model Number: SENTON / AP09.

### 5.3. SOFTWARE AND FIRMWARE

EUT transmits continuously if the switches are set to low, mid or high channel.

### 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 2440MHz.

EUT has been evaluated at X, Y, and Z-axis. The highest measured output power was at X-Axis

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

NA

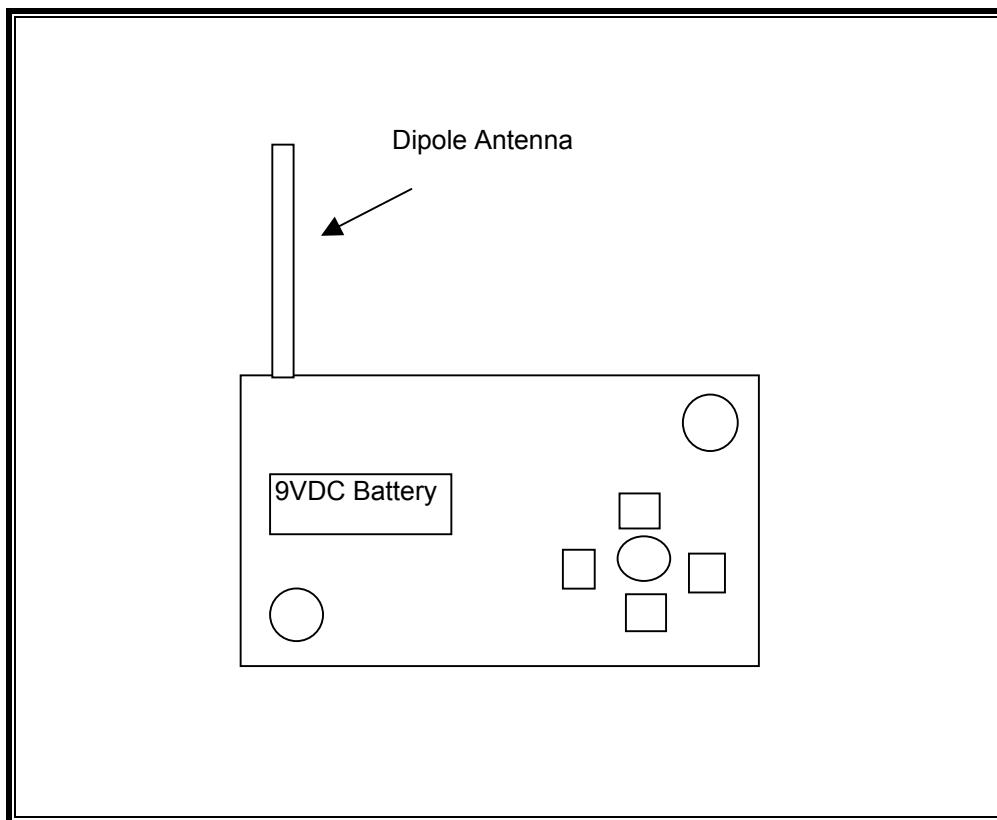
### I/O CABLES

NA

### TEST SETUP

The EUT is a standalone 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	Serial Number	Cal Due
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	8/10/2008
Preamplifier, 1300 MHz	Agilent / HP	8447D	1937A02062	1/23/2008
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY45300064	3/18/2008
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	10/3/2007
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/15/2008
SA Display Section 2	Agilent / HP	85662A	2816A16696	4/7/2008
SA RF Section, 1.5 GHz	Agilent / HP	85680B	2814A04227	1/7/2008
Quasi-Peak Adaptor	Agilent / HP	85650A	3145A01654	1/21/2008
2.4GHz Reject Filter	MicroTronic	BRM50702	2	CNR

## 7. LIMITS AND RESULTS

### 7.1. RADIATED EMISSIONS

#### TEST PROCEDURE

ANSI C63.4

#### LIMIT

§ 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 (microwolts/meter)	Measure- ment dis- tance (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:

### 7.1.1. FUNDAMENTAL FREQUENCY RADIATED EMISSION

## High Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Company: Tolnichi

Project #: 07j11242

Date: 08/29/07

Test Engineer: Devin Chang

Configuration: EUT only

Mode: Tx (Worst Case)

### Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T119; S/N: 29301 @3m	T144 Miteq 3008A00931			FCC 15.209
Hi Frequency Cables				
2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		
<u>Peak Measurements</u> RBW=VBW=1MHz				
<u>Average Measurements</u> RBW=1MHz ; VBW=10Hz				

Average=peak-Duty Cycle=19.34

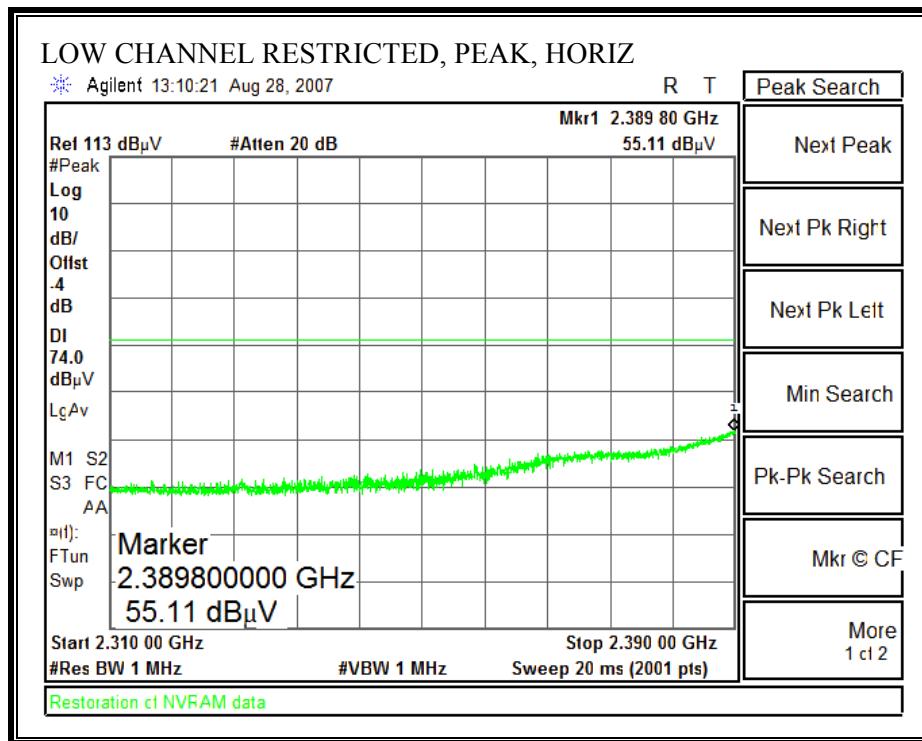
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>LO CH</b>															
2.402	3.0	95.6	76.2	29.5	4.0	-37.5	0.0	0.0	91.6	72.2	114.0	94.0	-22.4	-21.8	H
2.402	3.0	105.9	86.5	29.5	4.0	-37.5	0.0	0.0	101.9	82.5	114.0	94.0	-12.1	-11.5	V
<b>MID CH</b>															
2.440	3.0	95.8	76.5	29.5	4.0	-37.5	0.0	0.0	91.8	72.5	114.0	94.0	-22.2	-21.5	H
2.440	3.0	106.8	87.4	29.5	4.0	-37.5	0.0	0.0	102.8	83.4	114.0	94.0	-11.2	-10.6	V
<b>HI CH</b>															
2.479	3.0	95.9	76.5	29.5	4.0	-37.5	0.0	0.0	91.9	72.6	114.0	94.0	-22.1	-21.4	H
2.479	3.0	105.4	86.1	29.5	4.0	-37.5	0.0	0.0	101.4	82.1	114.0	94.0	-12.6	-11.9	V

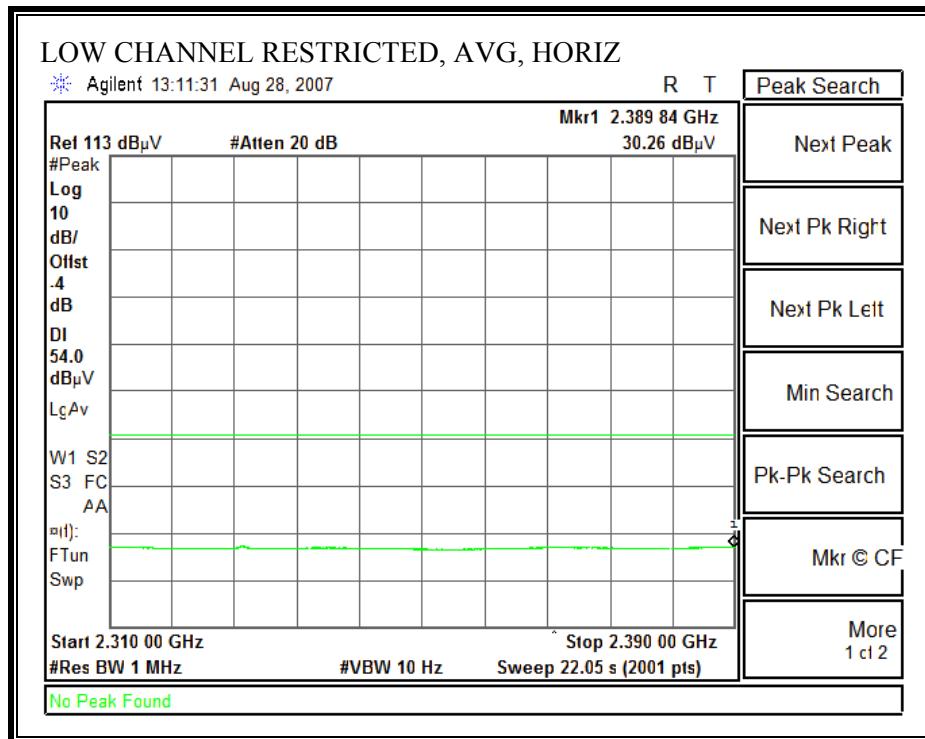
Rev. 4.12.7

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		

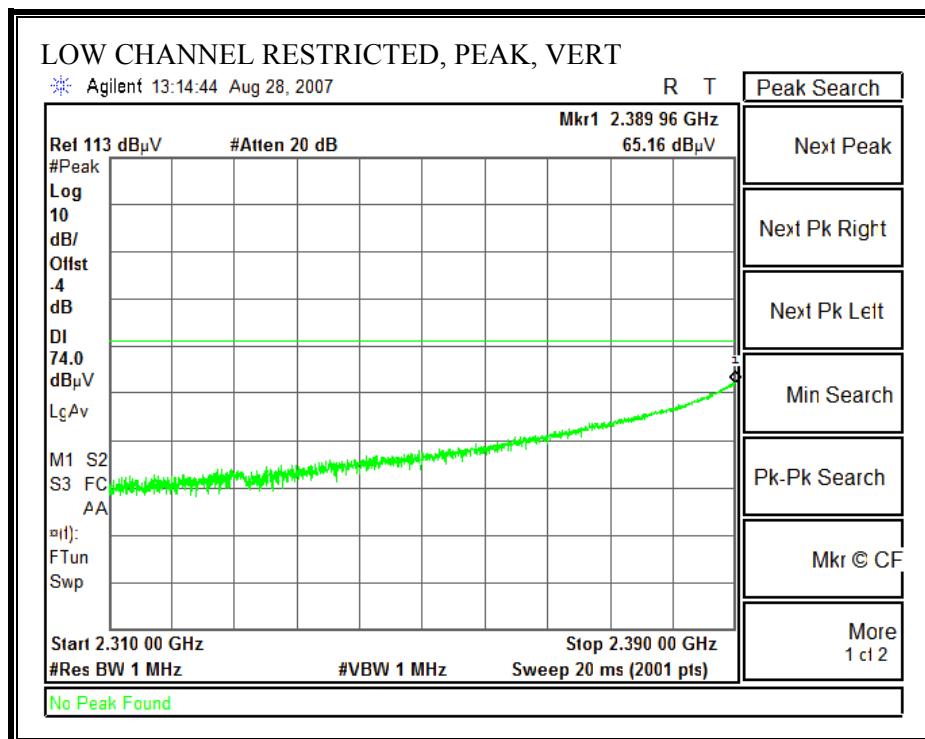
### 7.1.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

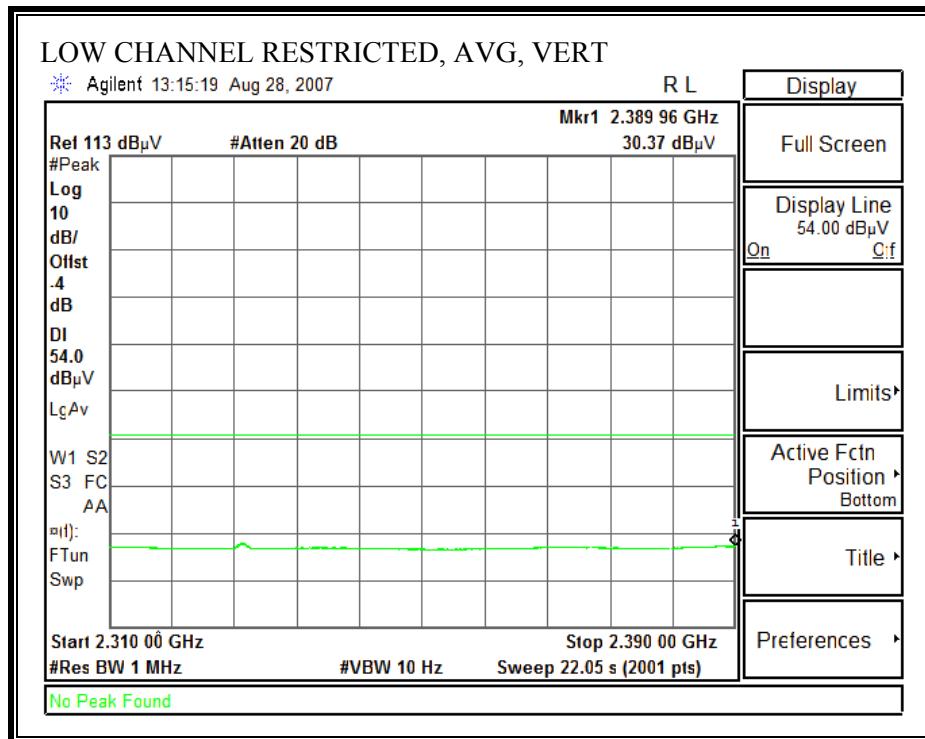
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



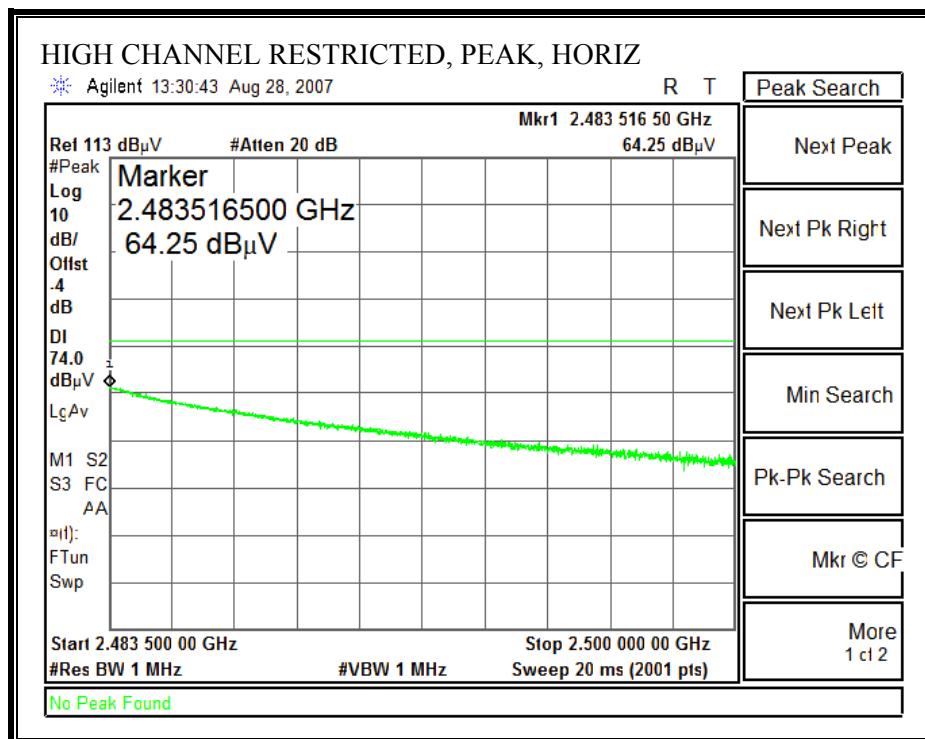


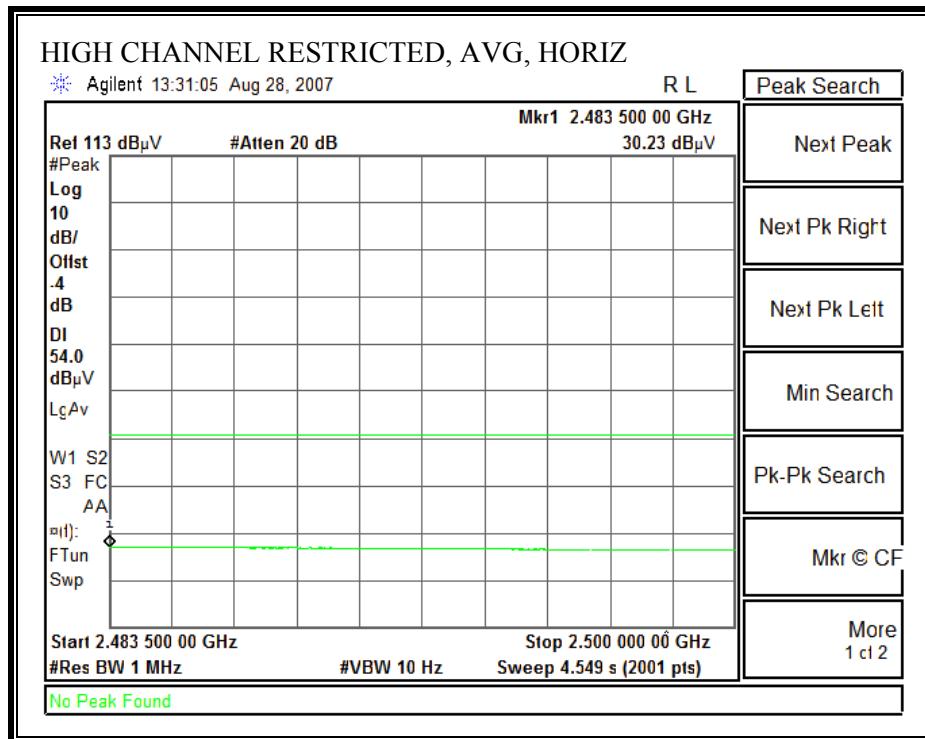
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



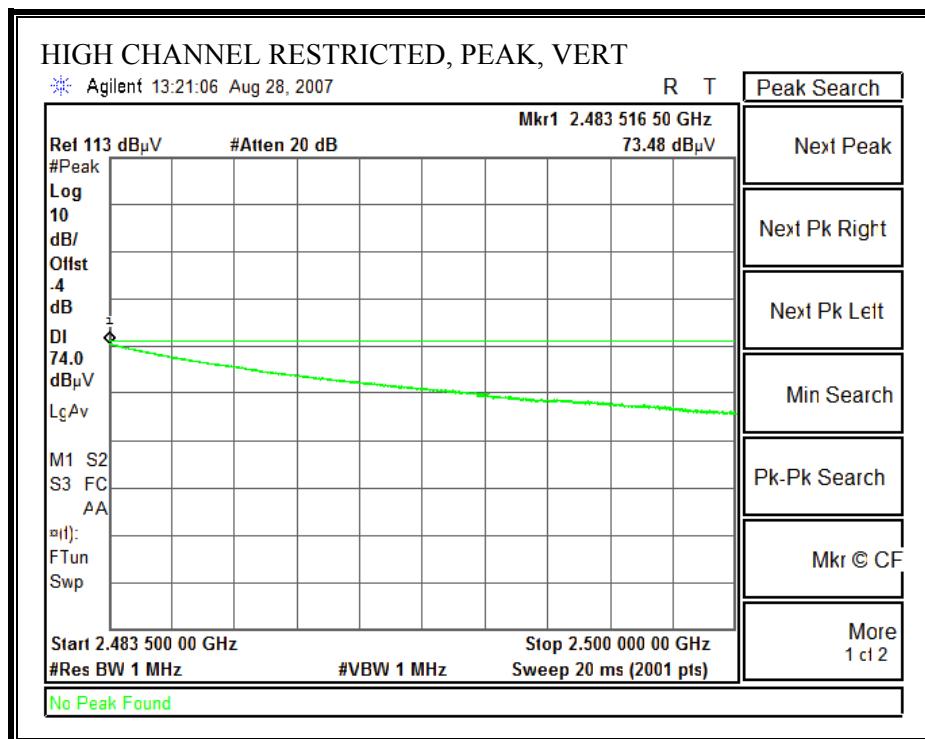


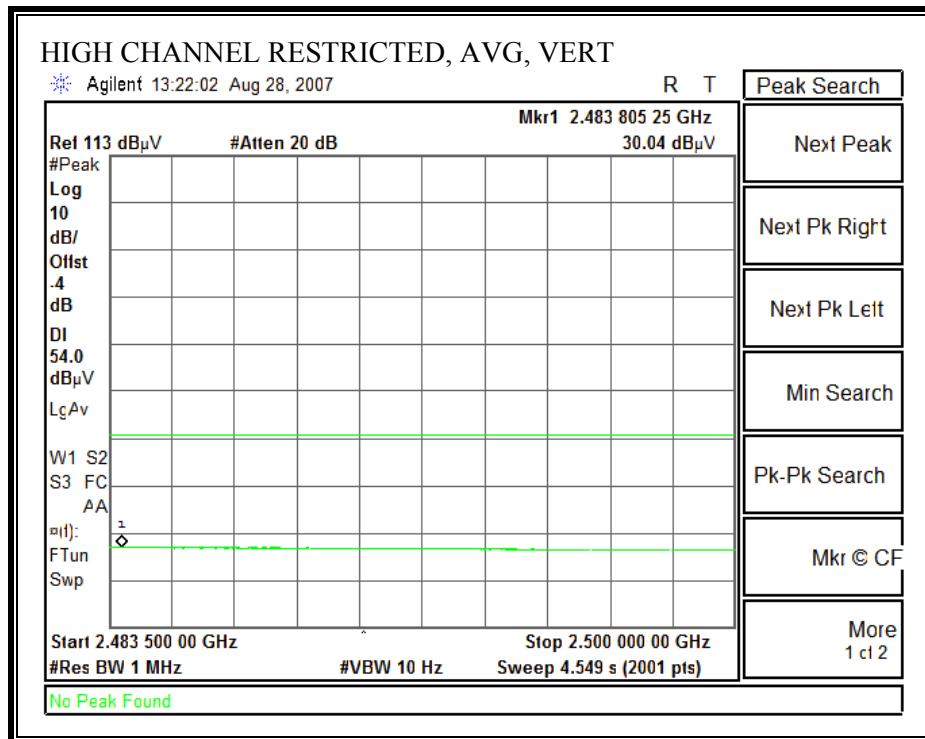
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**





### 7.1.3. WORST-CASE BELOW 1 GHz

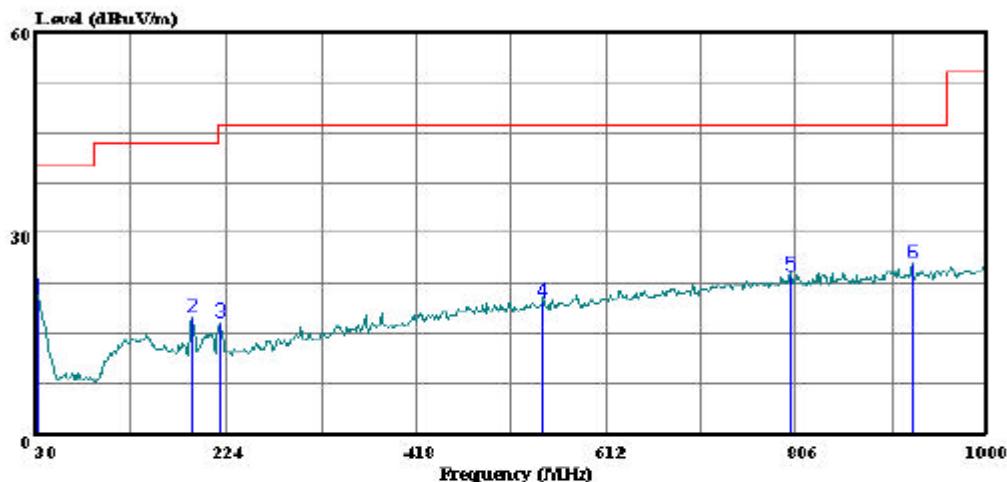
#### SPURIOUS EMISSIONS 30 TO 1000 MHz (LOW CHANNEL 2402 MHz, HORIZONTAL)

HORIZONTAL PLOT



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

Data#: 12 File#: 07j11241-rev.EMI Date: 08-30-2007 Time: 20:27:06



Trace: 11

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL  
Test Operator:: Can Ming Chung  
Project #: 07j11242  
Company: Tohnichi  
Configuration:: EUT Only  
Mode : TX, Low Ch  
Target: FCC Class B

Page: 1

Freq MHz	Read Level dBuV	Factor	Level dB	Limit Line dBuV/m	Over Line dBuV/m	Over Limit dB	Remark
	Read Level dBuV/m			Over Line dBuV/m	Over Limit dB		
1 32.910	26.87	-6.60	20.28	40.00	-19.72	Peak	
2 189.080	32.08	-14.75	17.33	43.50	-26.17	Peak	
3 218.180	31.73	-15.24	16.49	46.00	-29.51	Peak	
4 547.010	26.23	-6.41	19.82	46.00	-26.18	Peak	
5 801.150	25.76	-2.05	23.71	46.00	-22.29	Peak	
6 924.340	26.23	-0.87	25.36	46.00	-20.64	Peak	

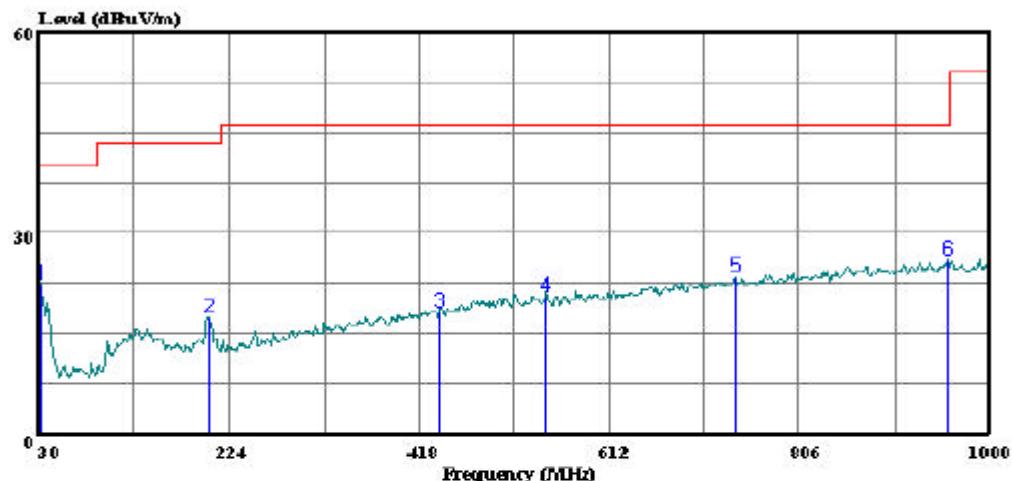
**SPURIOUS EMISSIONS 30 TO 1000 MHz (LOW CHANNEL 2402 MHz, VERTICAL)**

VERTICAL PLOT



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

Data#: 2 File#: 07j11241-rev.EMI Date: 08-30-2007 Time: 19:20:32



Trace: 1

Ref Trace:

Condition: FCC CLASS-B VERTICAL  
Test Operator:: Can Ming Chung  
Project #: 07j11242  
Company: Tohnichi  
Configuration:: EUT Only  
Mode : Tx, Low Ch  
Target: FCC Class B

Page: 1

Freq	Read		Limit	Over	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	31.940	29.05	-6.60	22.45	40.00 -17.55 Peak
2	203.630	31.46	-13.98	17.48	43.50 -26.02 Peak
3	438.370	27.16	-8.85	18.31	46.00 -27.69 Peak
4	547.010	27.00	-6.41	20.59	46.00 -25.41 Peak
5	740.040	26.32	-2.83	23.49	46.00 -22.51 Peak
6	958.290	26.69	-0.70	25.99	46.00 -20.01 Peak

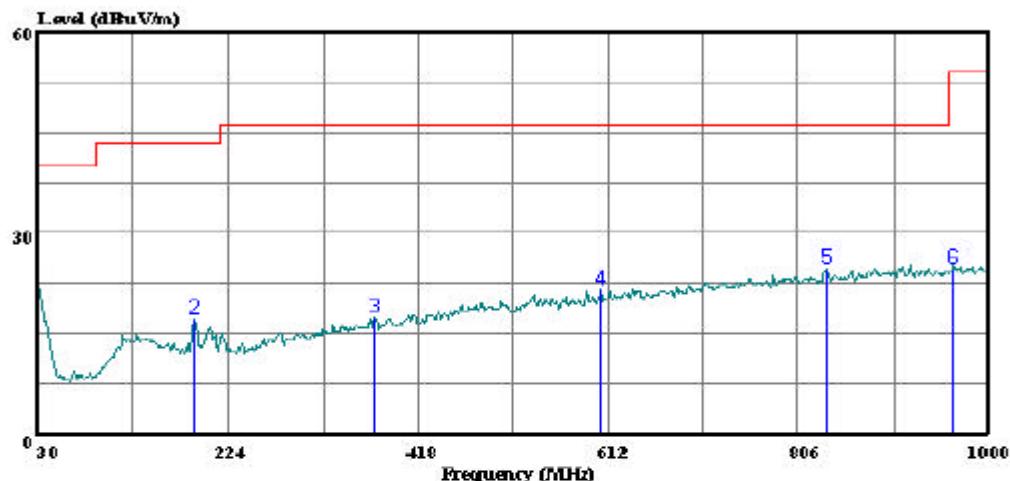
**SPURIOUS EMISSIONS 30 TO 1000 MHz (MID CHANNEL 2440 MHz, HORIZONTAL)**

HORIZONTAL PLOT



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

Data#: 10 File#: 07j11241-rev.EMI Date: 08-30-2007 Time: 20:15:26



Trace: 9

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL  
Test Operator:: Can Ming Chung  
Project #: 07j11242  
Company: Tohnichi  
Configuration:: EUT Only  
Mode : TX, Mid Ch  
Target: FCC Class B

Page: 1

Freq	Read		Limit	Over	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1 30.000	27.93	-5.76	22.17	40.00	-17.83 Peak
2 189.080	31.99	-14.75	17.24	43.50	-26.26 Peak
3 373.380	27.93	-10.49	17.44	46.00	-28.56 Peak
4 604.240	26.78	-5.31	21.47	46.00	-24.53 Peak
5 834.130	26.34	-1.73	24.61	46.00	-21.39 Peak
6 964.110	25.42	-0.72	24.70	54.00	-29.30 Peak

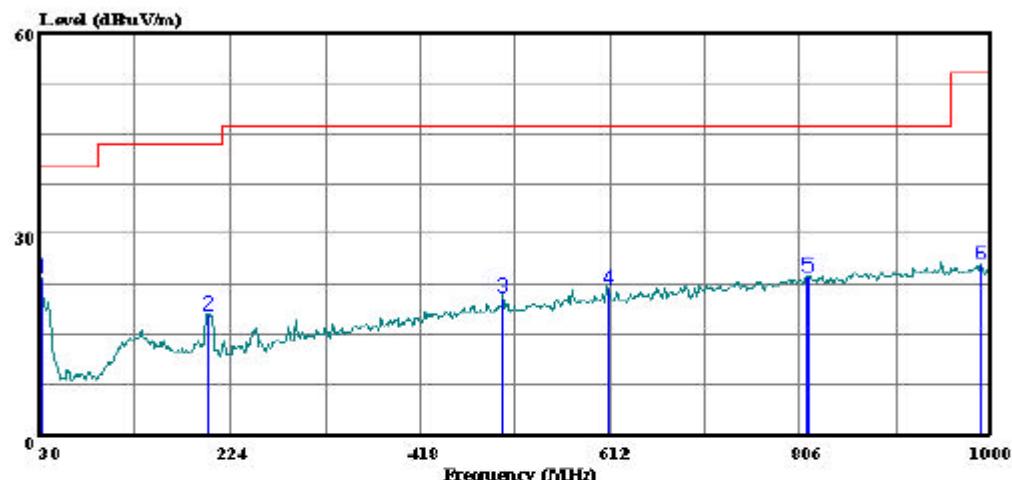
**SPURIOUS EMISSIONS 30 TO 1000 MHz (MID CHANNEL 2440 MHz, VERTICAL)**

VERTICAL PLOT



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

Data#: 4 File#: 07j11241-rev.EMI Date: 08-30-2007 Time: 19:30:51



Trace: 3

Ref Trace:

Condition: FCC CLASS-B VERTICAL  
Test Operator:: Can Ming Chung  
Project #: : 07j11242  
Company: : Tohnichi  
Configuration:: EUT Only  
Mode : : TX, Mid Ch  
Target: : FCC Class B

Page: 1

Freq	Read		Limit	Over	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1 31.940	29.90	-6.60	23.30	40.00	-16.70 Peak
2 201.690	31.64	-13.60	18.04	43.50	-25.46 Peak
3 501.420	27.77	-7.35	20.42	46.00	-25.58 Peak
4 610.060	26.98	-5.18	21.80	46.00	-24.20 Peak
5 813.760	25.64	-2.01	23.62	46.00	-22.38 Peak
6 989.330	26.11	-0.57	25.54	54.00	-28.46 Peak

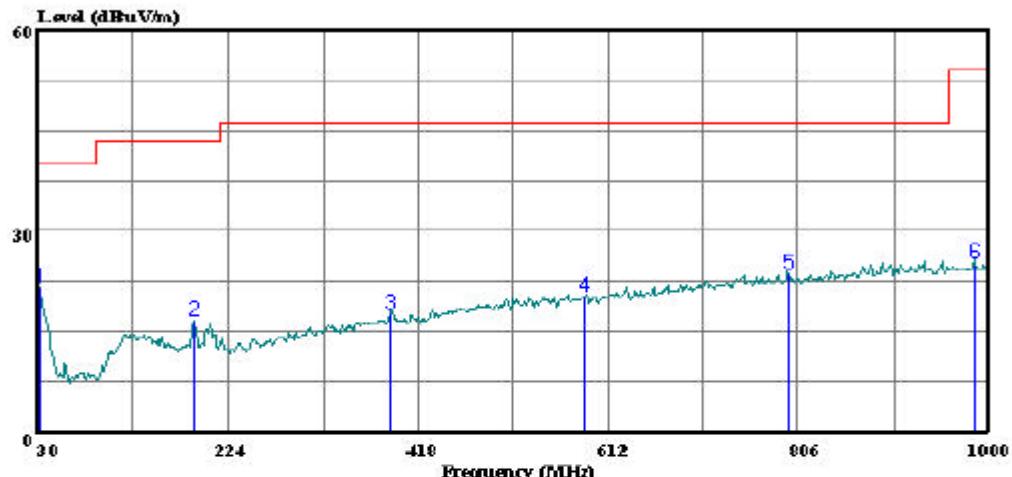
**SPURIOUS EMISSIONS 30 TO 1000 MHz (HIGH CHANNEL 2479 MHz, HORIZONTAL)**

HORIZONTAL PLOT



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

Data#: 8 File#: 07j11241-rev.EMI Date: 08-30-2007 Time: 20:05:01



Trace: 7

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL  
Test Operator:: Can Ming Chung  
Project #: 07j11242  
Company: Tohnichi  
Configuration:: EUT Only  
Mode : TX, High Ch  
Target: FCC Class B

Page: 1

Freq	Read		Limit	Over	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	31.940	28.21	-6.60	21.61	40.00 -18.39 Peak
2	189.080	31.44	-14.75	16.69	43.50 -26.81 Peak
3	389.870	27.82	-10.13	17.69	46.00 -28.31 Peak
4	587.750	25.78	-5.64	20.14	46.00 -25.86 Peak
5	796.300	25.67	-2.12	23.55	46.00 -22.45 Peak
6	985.450	25.82	-0.65	25.17	54.00 -28.83 Peak

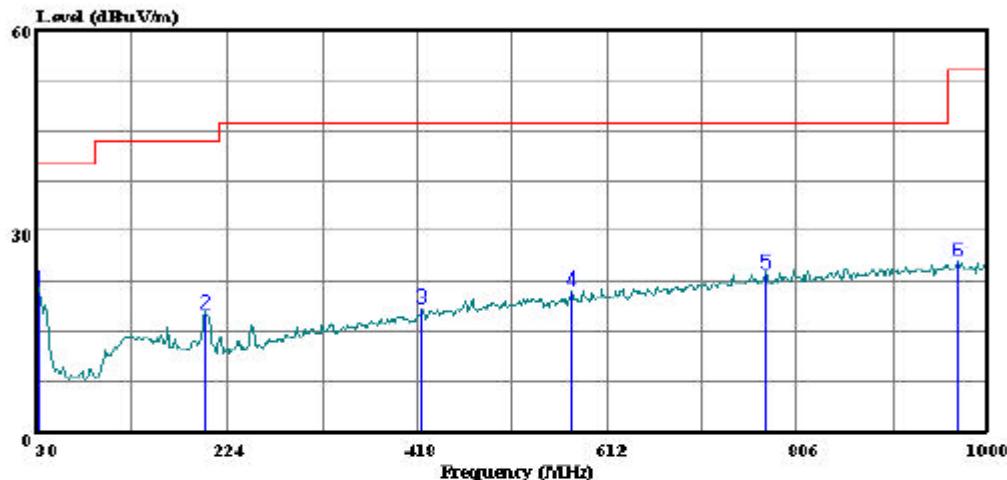
**SPURIOUS EMISSIONS 30 TO 1000 MHz (HIGH CHANNEL 2479 MHz, VERTICAL)**

VERTICAL PLOT



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

Data#: 6 File#: 07j11241-rev.EMI Date: 08-30-2007 Time: 19:40:00



Trace: 5

Ref Trace:

Condition: FCC CLASS-B VERTICAL  
Test Operator:: Can Ming Chung  
Project #: 07j11242  
Company: Tohnichi  
Configuration:: EUT Only  
Mode : TX, High Ch  
Target: FCC Class B

Page: 1

Freq	Read		Limit Level	Over Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	32.910	27.52	-6.60	20.93	40.00	-19.07 Peak
2	202.660	31.45	-13.73	17.72	43.50	-25.78 Peak
3	421.880	27.68	-9.31	18.37	46.00	-27.63 Peak
4	575.140	26.95	-5.83	21.12	46.00	-24.88 Peak
5	773.020	25.96	-2.40	23.56	46.00	-22.44 Peak
6	969.930	26.07	-0.73	25.34	54.00	-28.66 Peak

### 7.1.4. HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company: Tohnichi Project #: 07J11242 Date: 08/29/07 Test Engineer: Devin Chang Configuration: EUT only Mode: Tx Model: SB-FH256															
<b>Test Equipment:</b>															
<b>Horn 1-18GHz</b>		<b>Pre-amplifier 1-26GHz</b>		<b>Pre-amplifier 26-40GHz</b>		<b>Horn &gt; 18GHz</b>		<b>Limit</b>							
T119; S/N: 29301 @3m		T144 Miteq 3008A00931						FCC 15.209							
Hi Frequency Cables 2 foot cable      3 foot cable      12 foot cable B-5m Chamber															
HPF      Reject Filter <b>Peak Measurements</b> RBW=VBW=1MHz <b>Average Measurements</b> RBW=1MHz ; VBW=10Hz															
Average=peak-Duty Cycle=-17.76															
<b>f</b>	<b>Dist</b>	<b>Read Pk</b>	<b>Read Avg.</b>	<b>AF</b>	<b>CL</b>	<b>Amp</b>	<b>D Corr</b>	<b>Fltr</b>	<b>Peak</b>	<b>Avg</b>	<b>Pk Lim</b>	<b>Avg Lim</b>	<b>Pk Mar</b>	<b>Avg Mar</b>	<b>Notes</b>
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
<b>LO CH (2412MHz)</b>															
4.804	3.0	45.5	29.2	29.5	4.0	-36.5	0.0	0.0	42.6	26.2	74.0	54.0	-31.4	-27.8	H
4.804	3.0	56.3	30.9	29.5	4.0	-36.5	0.0	0.0	53.4	27.9	74.0	54.0	-20.6	-26.1	V
<b>MID CH (2437MHz)</b>															
4.880	3.0	44.7	28.7	29.5	4.0	-36.5	0.0	0.0	41.7	25.7	74.0	54.0	-32.3	-28.3	H
4.880	3.0	53.1	29.0	29.5	4.0	-36.5	0.0	0.0	50.2	26.0	74.0	54.0	-23.8	-28.0	V
<b>HI CH (2462MHz)</b>															
4.958	3.0	42.4	27.2	29.5	4.0	-36.5	0.0	0.0	39.5	24.3	74.0	54.0	-34.5	-29.7	H
4.958	3.0	47.6	28.9	29.5	4.0	-36.5	0.0	0.0	44.6	25.9	74.0	54.0	-29.4	-28.1	V
Rev. 4.12.7															
f      Measurement Frequency Dist      Distance to Antenna Read      Analyzer Reading AF      Antenna Factor CL      Cable Loss					Amp      Preamp Gain D Corr      Distance Correct to 3 meters Avg      Average Field Strength @ 3 m Peak      Calculated Peak Field Strength HPF      High Pass Filter					Avg Lim      Average Field Strength Limit Pk Lim      Peak Field Strength Limit Avg Mar      Margin vs. Average Limit Pk Mar      Margin vs. Peak Limit					