



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

**FOR**

**HANDHELD PRINTER TERMINAL**

**MODEL NUMBER: IT-3000M53E, IT-3000M54E2, IT-3000M55U,  
IT-3000M56U**

**FCC ID: BBQIT3000**

**REPORT NUMBER: 07J11169-10, REVISION E**

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*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>
--	8/13/07	Initial Issue	Hsin Fu Shih
B	8/14/07	Revised model name	Tiffany Hong
C	8/17/07	Corrected some typo in Sec. 5.3	Hsin Fu Shih
D	8/20/07	Updated EUT description	Hsin Fu Shih
E	8/23/07	Added Antenna Port Peak Output Power Section	Tom Chen

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** CASIO COMPUTER CO., LTD.  
6-2 HON-MACHI 1-CHOME  
SHIBUYA-KU, TOKYO 151-8543, JAPAN

**EUT DESCRIPTION:** HANDHELD PRINTER TERMINAL

**MODEL:** IT-3000M55U

**SERIAL NUMBER:** 780HE915400831AAAB1

**DATE TESTED:** JULY12-JULY16, 2007

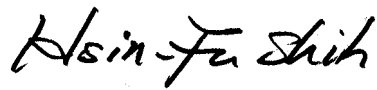
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

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:

Tested By:



HSIN FU SHIH  
ENGINEERING SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

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 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 EUT is a handheld printer terminal that is intended to work with different battery charger units. The EUT and the battery charger units are manufactured by Casio Computer Co., Ltd.

The EUT model was chosen as a representative of the following four models:

Model Number	Magnetic card reader	CMOS Imager	Bluetooth
IT-3000M53E	No	No	Yes
IT-3000M54E2	Yes (Track 1,2,3)	N/A	Yes
IT-3000M55U*	Yes (Track 1,2,3)	Yes	Yes
IT-3000M56U	No	Yes	Yes

\*: Model tested

### 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	GFSK	1.60	1.45

### 5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was BTRadioTest WCE, Ver. 100 and LMWIN, Ver 1.06c.

## 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 2402 MHz.

Worst case configuration t was determined to be when the EUT sited on the Bridge Satellite cradle. So all emission testing has been done with this configuration.

## 5.5. DESCRIPTION OF TEST SETUP

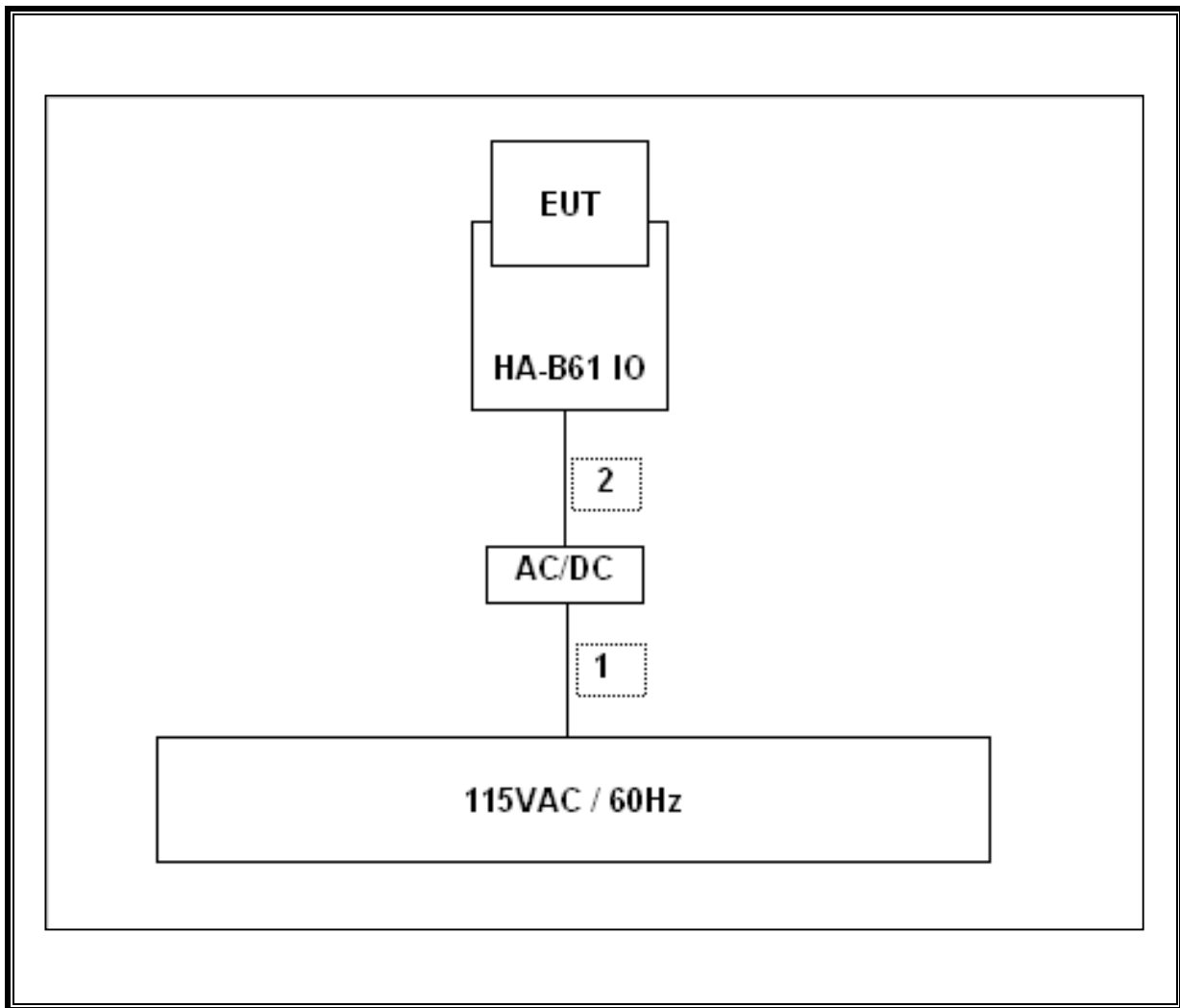
### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
BRIDGE SATELLITE CRADLE	CASIO	HA-D61 IO	CS117	N/A
AC ADAPTER	CASIO	AD-S42120B	8	N/A

### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC	UNSHIELDED	2m	N/A
2	DC	1	DC	UNSHIELDED	1.92m	Ferrite on DC output side

**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	S/N	Cal Due
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	7/15/1905	09/15/07
Antenna, Bilog 30MHz ~ 2GHz	Sunol Sciences	JB1	A0022704	08/13/07
Preamplifier	HP	8447D	1937A02062	09/15/07
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	06/12/08
RF Filter Section	HP	85420E	3705A00256	06/12/08
Preamplifier 1-26.5 GHz	HP	8449B	3008A00931	08/01/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	04/15/08
EMI Test Receiver	R & S	ESHS 20	827129/006	01/27/08
EMI Test Receiver	R & S	ESIB40	100192	09/26/07
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	09/15/07
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	C.N.R.
4.0 High Pass Filter	Micro Tronics	HPM13351	3	N/A
2.4 - 2.5 Reject Filter	Micro Tronics	BRM50702	3	N/A
Peak Power Meter	Agilent	E4416A	GB41291160	38757

## 7. LIMITS AND RESULTS

### 7.1. ANTENNA PORT TEST RESULTS

#### 7.1.1. PEAK OUTPUT POWER

##### PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels: 1 watt.

§15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is  $-0.35$  dBi, therefore the limit is 30 dBm.

##### TEST PROCEDURE

The transmitter output is connected to a peak power meter of the EUT.

##### RESULTS

No non-compliance noted:

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.60	30	-28.40
Middle	2441	1.06	30	-28.94
High	2480	0.43	30	-29.57

## 7.2. RADIATED EMISSIONS

### 7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

#### LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
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., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

### **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.

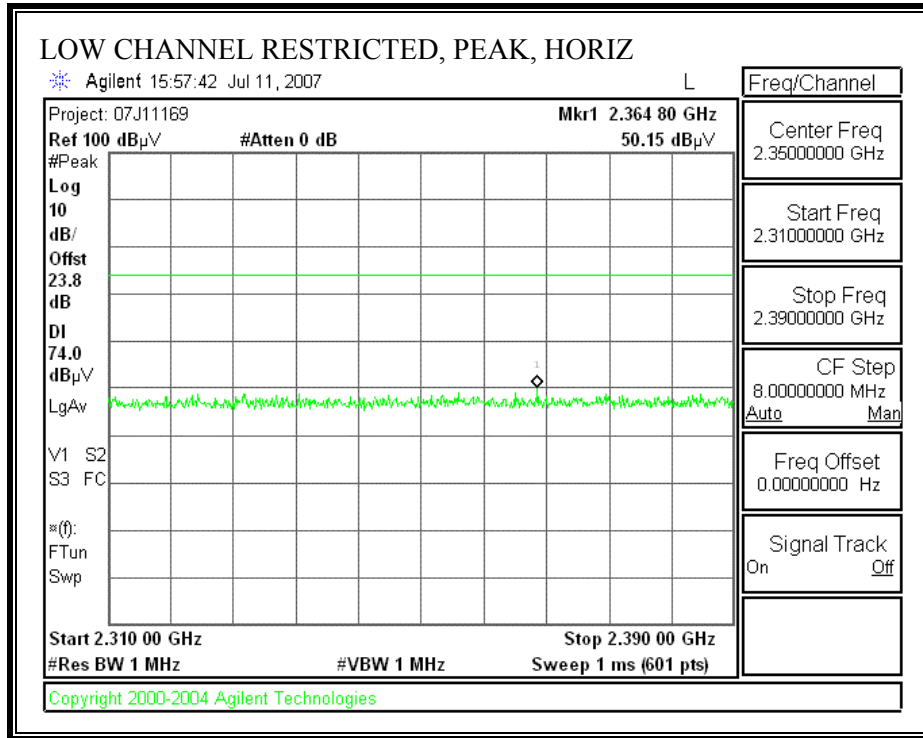
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

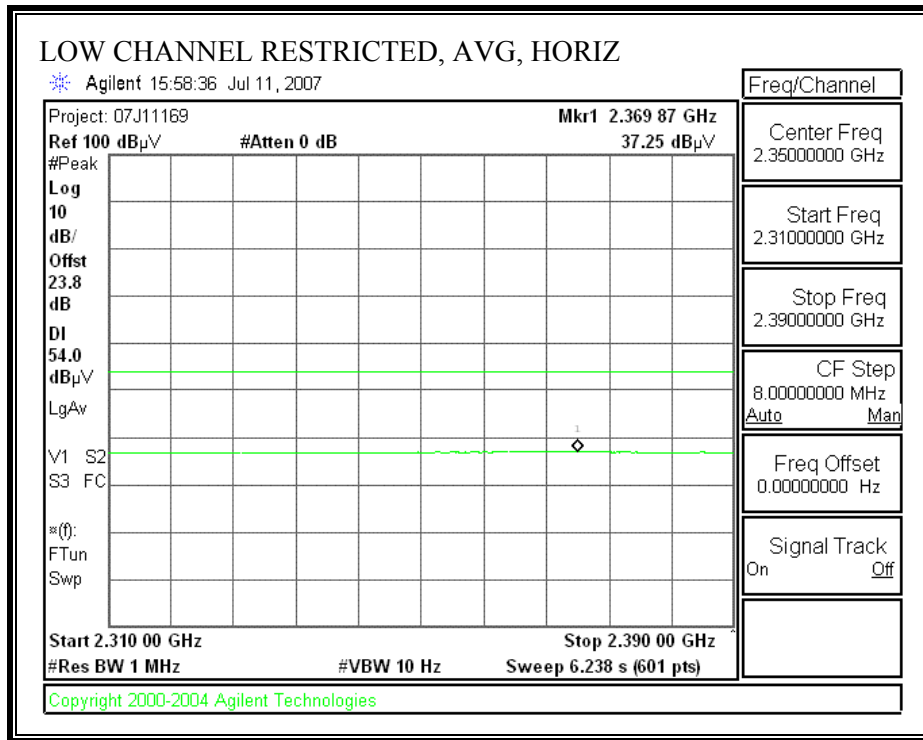
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

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.

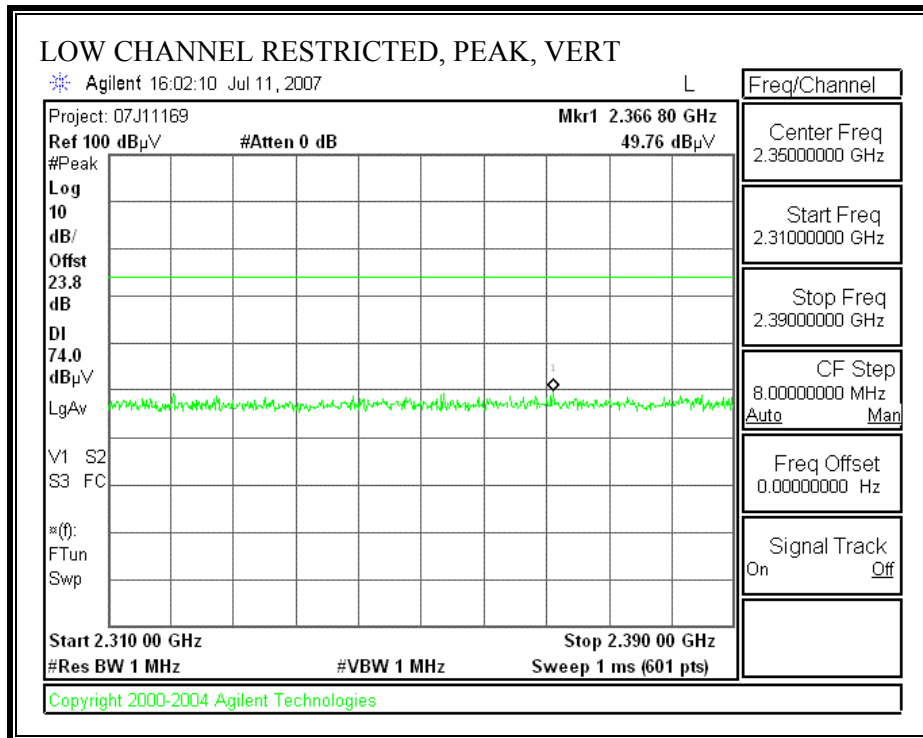
### 7.2.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

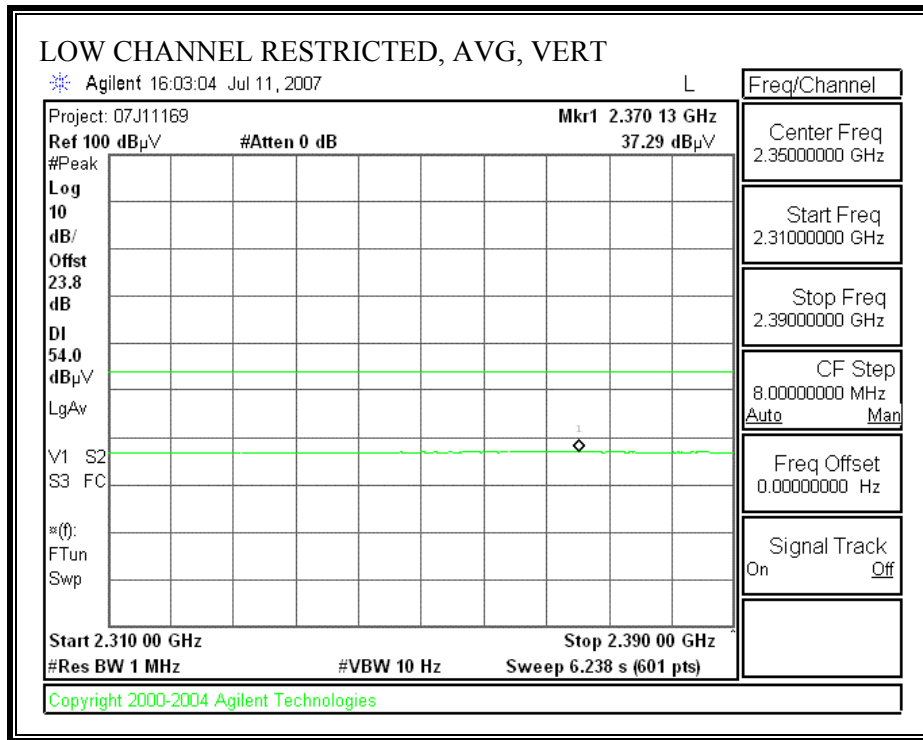
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





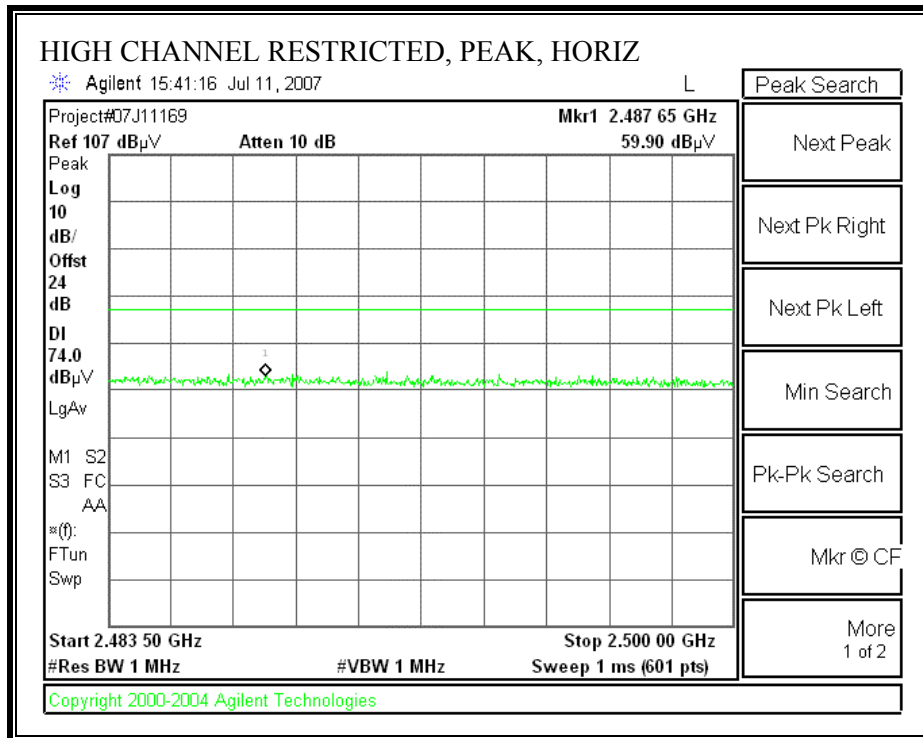
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

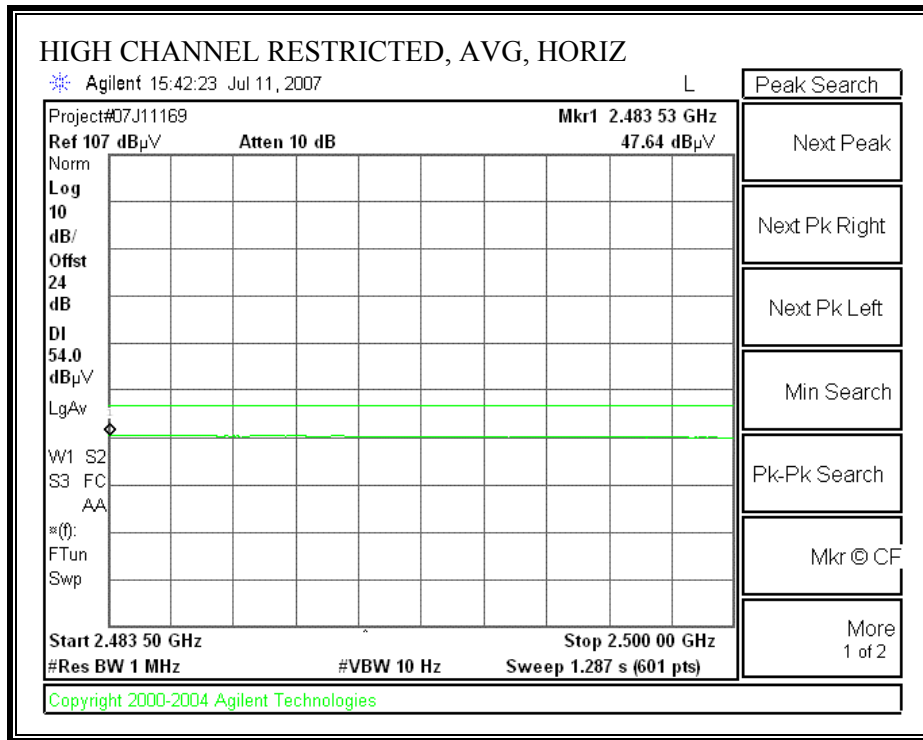




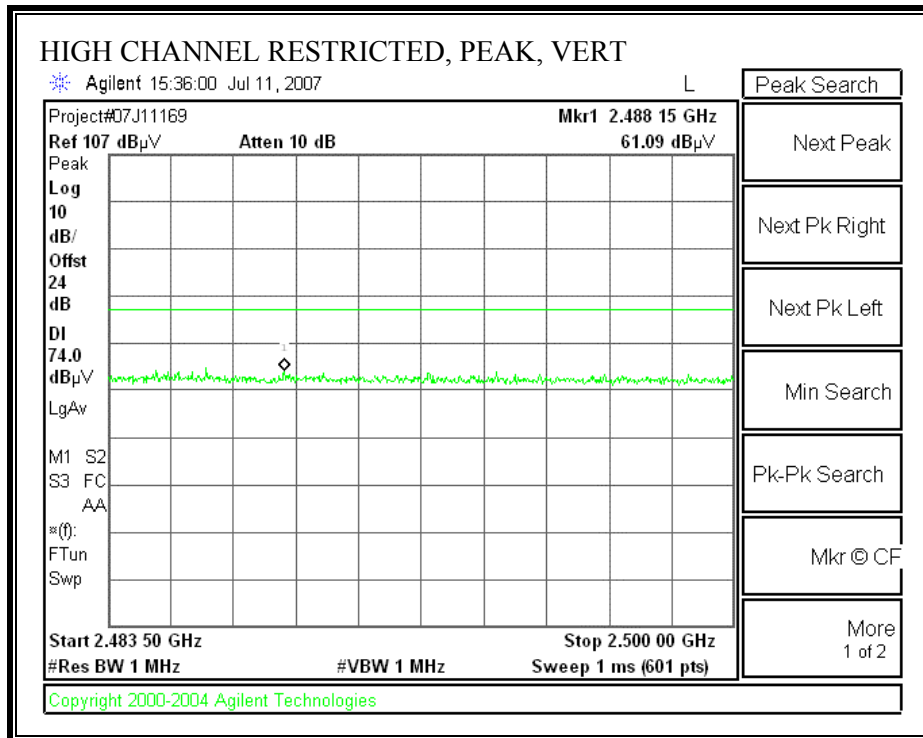


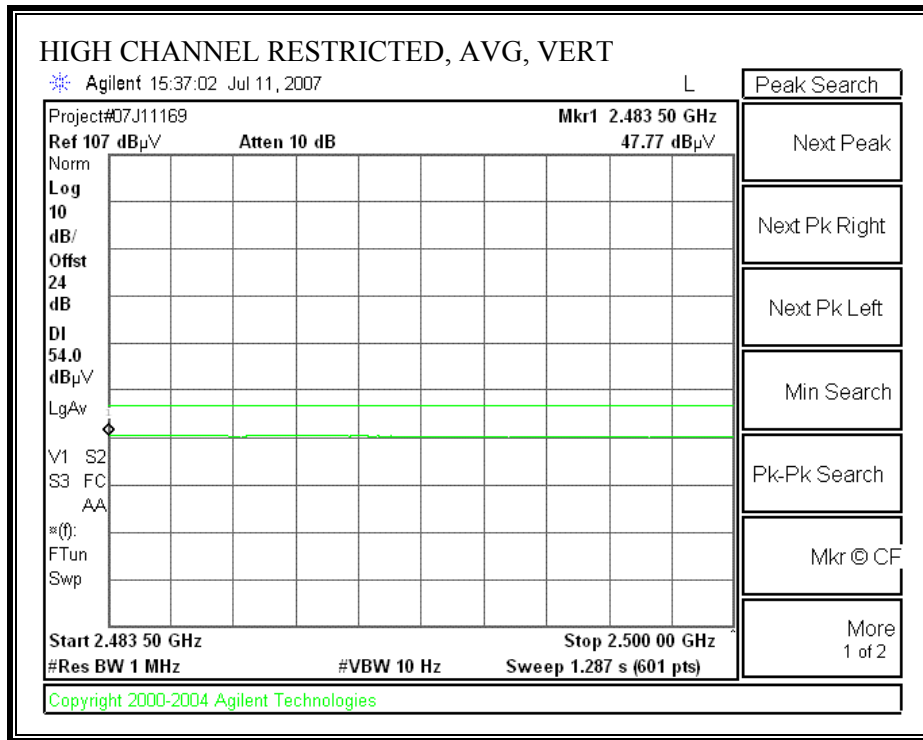
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





**HARMONICS AND SPURIOUS EMISSIONS**

**High Frequency Measurement**  
 Compliance Certification Services, Fremont 5m Chamber

Company: Casio Computer  
 Project #: 07J11169  
 Date: 7/11/2007  
 Test Engineer: Tom Chen  
 Configuration: EUT with Bridge Satellite Cradle / AC Adaptor  
 Mode: Tx Low / Mid / Hi Channels

**Test Equipment:**

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

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		A-5m Chamber	HPF_4.0GHz	

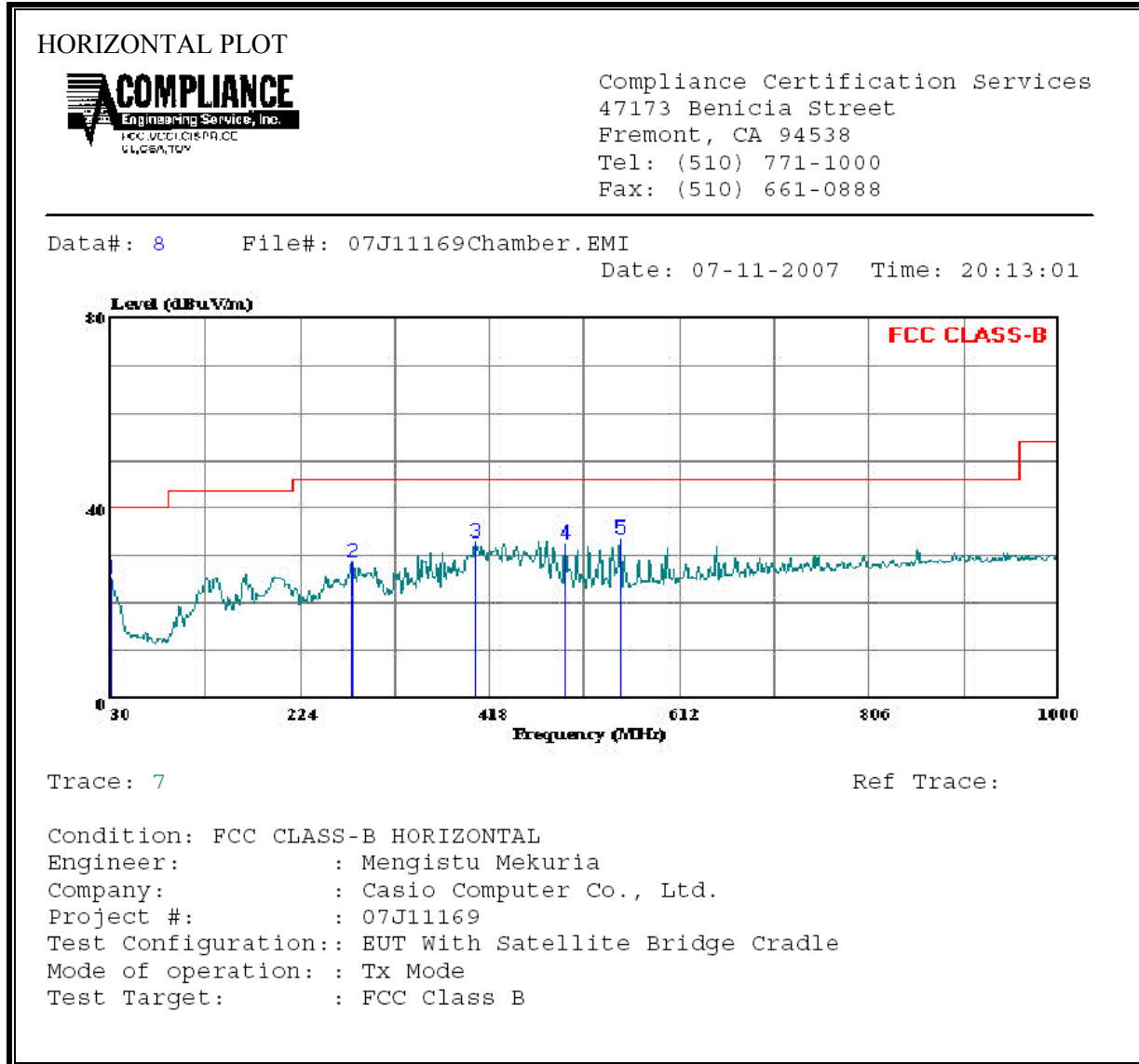
**Peak Measurements**  
 RBW=VBW=1MHz  
**Average Measurements**  
 RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	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)
<b>Low Ch (2402MHz)</b>															
4.804	3.0	42.7	33.1	33.0	6.9	-36.5	0.0	0.6	46.7	37.1	74	54	-27.3	-16.9	V
7.206	3.0	39.0	27.0	35.4	8.4	-36.2	0.0	0.6	47.1	35.1	74	54	-26.9	-18.9	V
4.804	3.0	44.6	39.5	33.0	6.9	-36.5	0.0	0.6	48.6	43.5	74	54	-25.4	-10.5	H
7.206	3.0	38.8	26.0	35.4	8.4	-36.2	0.0	0.6	46.9	34.1	74	54	-27.1	-19.9	H
<b>Mid Ch (2441MHz)</b>															
4.882	3.0	42.8	34.3	33.1	6.9	-36.5	0.0	0.6	46.9	38.4	74	54	-27.1	-15.6	V
7.323	3.0	38.9	26.7	35.5	8.4	-36.2	0.0	0.6	47.2	35.0	74	54	-26.8	-19.0	V
4.882	3.0	42.7	36.5	33.1	6.9	-36.5	0.0	0.6	46.8	40.6	74	54	-27.2	-13.4	H
7.323	3.0	38.2	26.1	35.5	8.4	-36.2	0.0	0.6	46.5	34.4	74	54	-27.5	-19.6	H
<b>Hi Ch (2480MHz)</b>															
4.960	3.0	43.3	36.0	33.1	7.0	-36.5	0.0	0.6	47.6	40.3	74	54	-26.4	-13.7	V
7.440	3.0	39.4	26.2	35.6	8.5	-36.2	0.0	0.6	47.9	34.7	74	54	-26.1	-19.3	V
4.960	3.0	41.9	32.5	33.1	7.0	-36.5	0.0	0.6	46.2	36.8	74	54	-27.8	-17.2	H
7.440	3.0	39.0	26.6	35.6	8.5	-36.2	0.0	0.6	47.5	35.1	74	54	-26.5	-18.9	H
No other emissions were detected above 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		

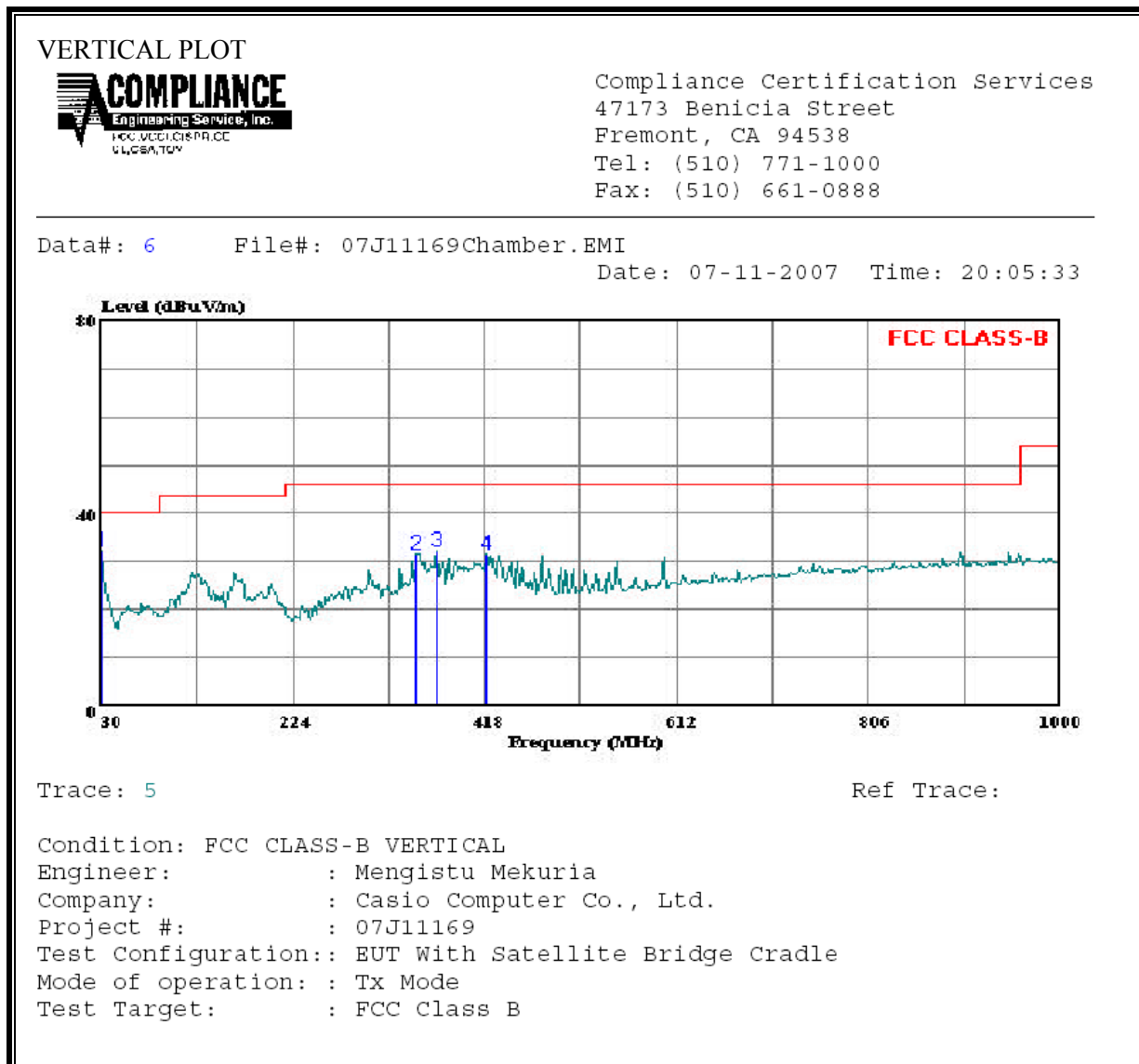
### 7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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



HORIZONTAL DATA							
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.000	30.98	-5.76	25.22	40.00	-14.78	Peak
2	276.380	41.76	-13.15	28.61	46.00	-17.39	Peak
3	402.480	42.59	-9.86	32.73	46.00	-13.27	Peak
4	494.630	40.21	-7.49	32.72	46.00	-13.28	Peak
5	550.890	39.82	-6.36	33.46	46.00	-12.54	Peak

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





VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.000	38.12	-5.76	32.36	40.00	-7.64	Peak
2	349.130	42.58	-11.03	31.55	46.00	-14.45	Peak
3	368.530	42.67	-10.59	32.08	46.00	-13.92	Peak
4	419.940	40.97	-9.35	31.62	46.00	-14.38	Peak

### 7.3. POWERLINE CONDUCTED EMISSIONS

#### LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

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 resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

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

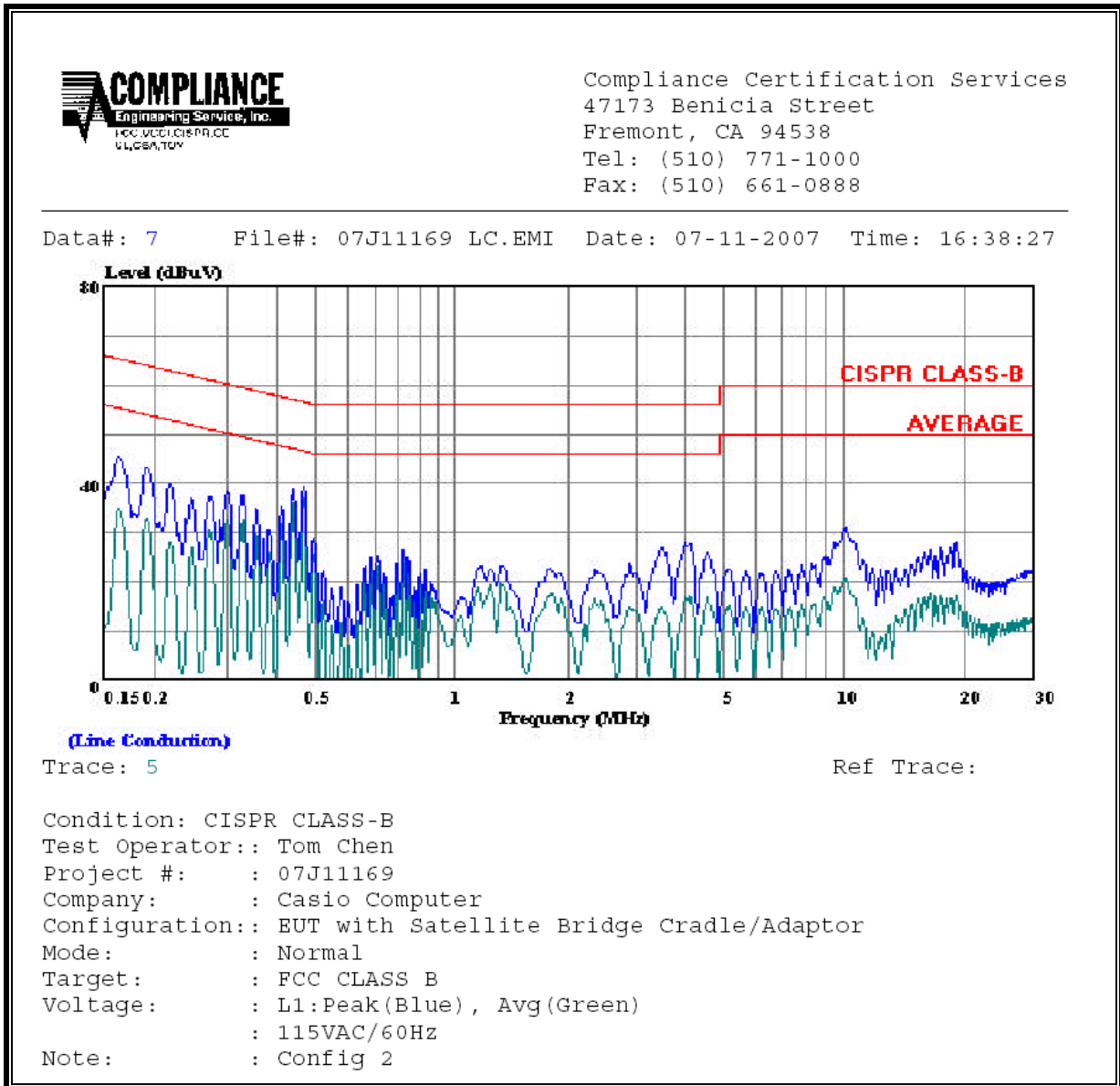
#### RESULTS

No non-compliance noted:

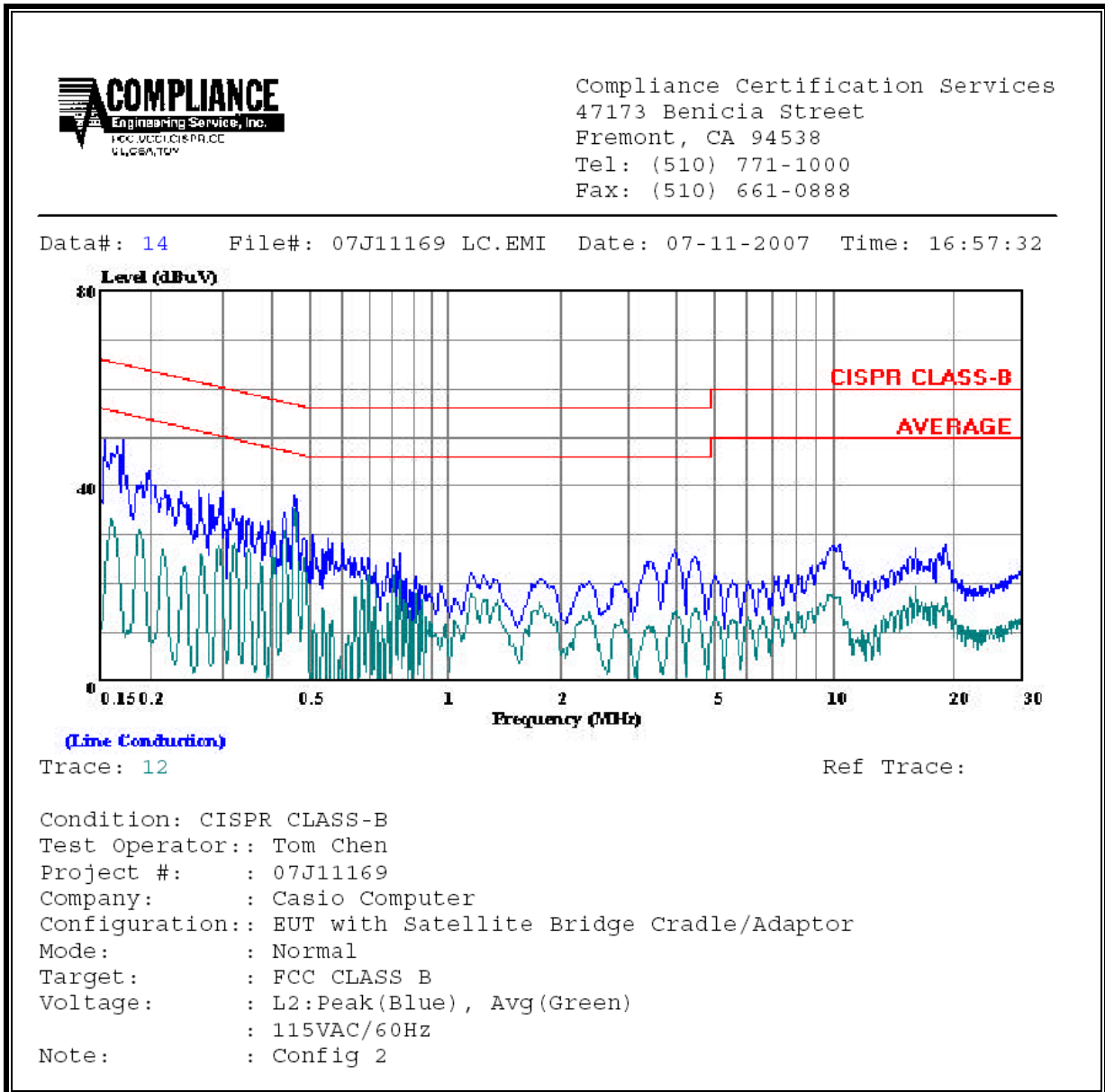
**6 WORST EMISSIONS**

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Class	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.16	45.40	--	34.88	0.00	65.31	55.31	-19.91	-20.43	L1
0.19	43.34	--	32.60	0.00	64.08	54.08	-20.74	-21.48	L1
0.46	39.64	--	36.69	0.00	56.62	46.62	-16.98	-9.93	L1
0.15	49.58	--	19.62	0.00	65.84	55.84	-16.26	-36.22	L2
0.17	49.48	--	16.01	0.00	65.01	55.01	-15.53	-39.00	L2
0.46	38.20	--	35.28	0.00	56.77	46.77	-18.57	-11.49	L2
6 Worst Data									

**LINE 1 RESULTS**

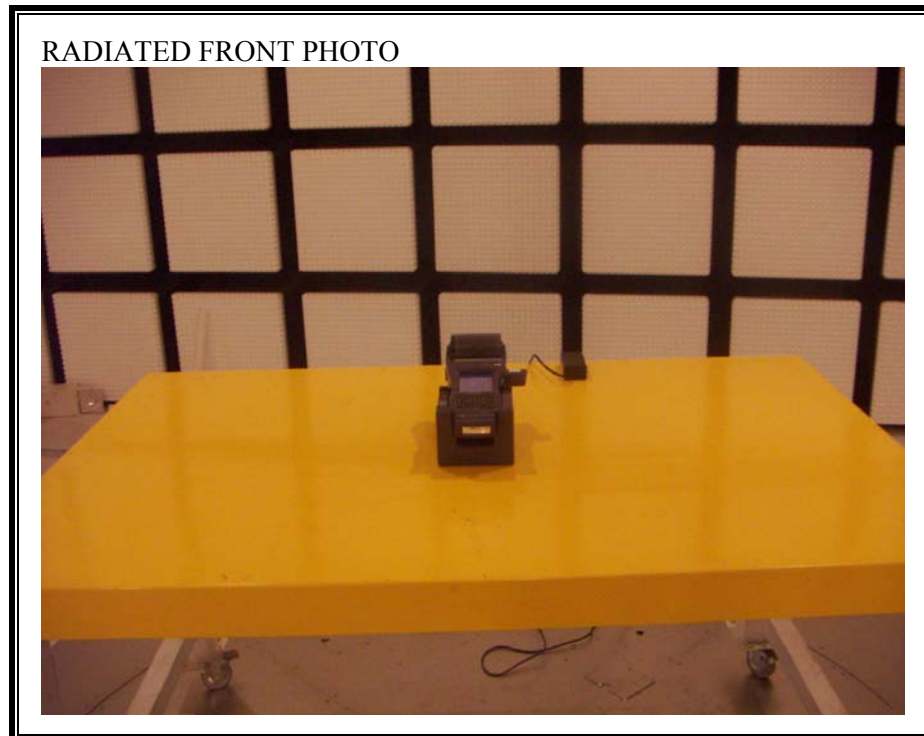


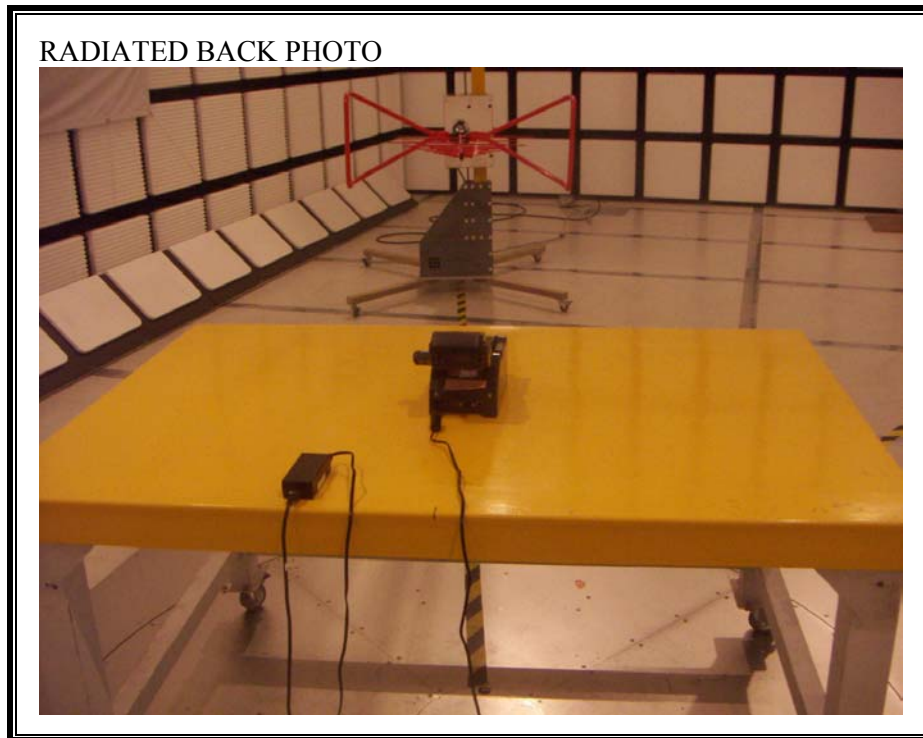
**LINE 2 RESULTS**



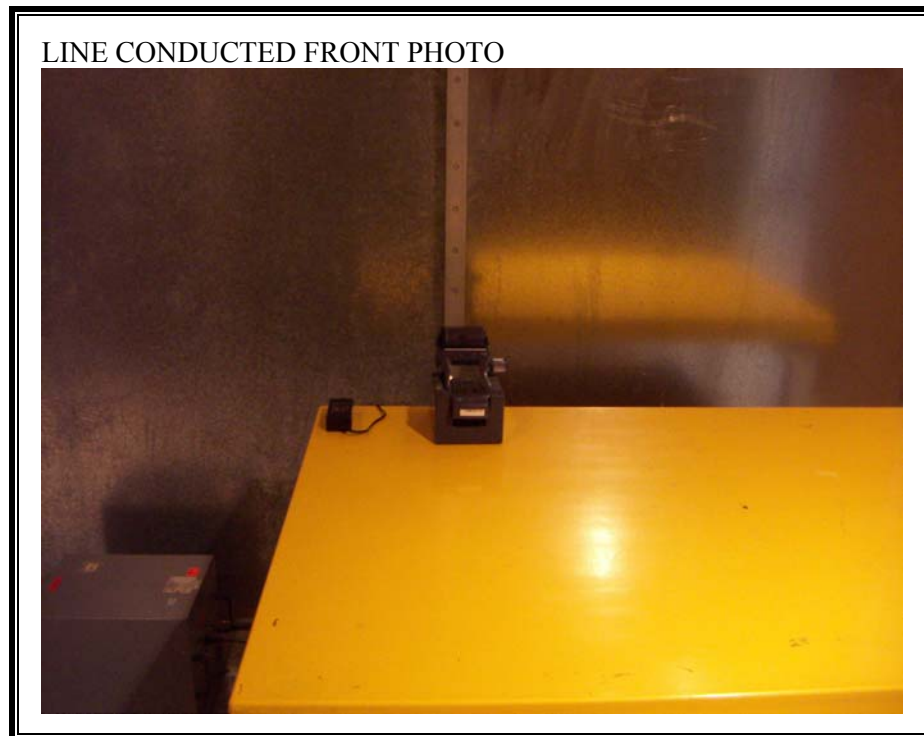
## 8. SETUP PHOTOS

### RADIATED RF MEASUREMENT SETUP





**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP**







**END OF REPORT**