Test Report

Report No	EG1214-1
Client	MU Net, Inc. Josh Schadel
Address	442 Marrett Road Lexington, MA 02421
Phone	781-861-8644
Items tested	WG-TP-MIM-IC
Equipment Type	Digital Transmission System
Equipment Code	DTS
Application Type	☑ New ☐ Class II Permissive Change
Modular Approval	☐ YES ☑ NO
FRN	0016087074
FCC ID	U2R-TPM0100
IC	6958A-TPM0100
Emissions Designator	F7D
Standards	FCC 15.247, and RSS-210
Test Dates	January 17 and February 8-9, 2007
Results	As detailed within this report
Prepared by	Josh LeBlanc – Test Engineer
Authorized by	Michael Buchholz – EMC Manager
Issue Date	4/2/07
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 22 of this report.

Contents

Form Final Report REV 12-8-06 (DW)

Summary

This report is an application for a transmitter operating under 47 CFR 15.247 and RSS-210. The product covered by this report is the WG-TP-MIM-IC radio. The product was tested using the methods outlined in ANSI C63.4 (2003).

Test Methodology

The EUT was maximized around three orthogonal axes. The EUT antenna is permanently soldered to the PCB and cannot be maximized separately. The EUT was tested on a non-conductive table 80cm above the ground plane. The EUT was powered with 120V, 60Hz. AC line conducted emissions were performed using a 50Ω/50μH LISN.

Date	Temperature	Humidity
1/17/07	23.6°C	1032.3mb
2/8/07	23.6°C	1001.6mb
2/9/07	24.1°C	1002mb

Frequency range investigated:	30 MHz- 26.5GHz

Measurement Distance:		
Frequency (MHz)	*Distance (m)*	*Comments*
AC conducted 0.15 – 30MHz	-	Conducted
Fundamental 2405.06, 2440.05, 2475.06MHz	3 m	Radiated
Spurious & harmonics 30 –18000 MHz	3 m	Radiated
Spurious & harmonics 18-26.5 GHz	1 m	Radiated

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	March 7, 2007

Product Tested - Configuration Documentation

EUT Configuration

Work Order: G1214
Company: MU Net, Inc.
Company Address: 442 Marrett Road, Suite 9
Lexington, MA 02421
Contact: Josh Schadel
Person Present: Josh Schadel

	MN	SN
EUT:	WG-TP-MIM-IC	1
EUT Description:	Electric utility meter with wireless interface	

Support Equipment:	MN	SN
none		

EUT Cables:	Qty	Shielded?	Length	Ferrites
AC power	1	no	1.5m	none

Unpopulated EUT Ports:	Qty	Reason
none		

Software / Operating Mode Description:

The EUT is operating in TX and RX modes.

Compliance Statement

RSS-GEN	RSS-210	47 CFR Part #	*Comments*
5.3		15.15(b)	The product contains no user accessible controls that increase transmission power above allowable levels.
5.2		15.19	The label is shown in the label exhibit.
7.1.5		15.21	Information to the user is shown in the instruction manual exhibit.
		15.27	No special accessories are required for compliance.
		15.31(e)	The voltage was varied to ±15% of the rated voltage.
7.1.4		15.203	The device is professionally installed.
7.1.4		15.204	See attached documentation describing the antennas.
7.2.2		15.207	The EUT meets the AC power line conducted limits.
7.2.3	2.6	15.205 15.209	The fundamental is not in a restricted band and the spurious emissions in the restricted bands comply with the general emission limits of 15.209.
	A8.2	15.247(a)	The EUT is digitally modulated.
4.4.2	A8.2(1)	15.247(a)(2)	The minimum 6dB bandwidth is greater than 500kHz.
	A8.4(4)	15.247(b)(3)	The EUT meets the conducted power limit at the fundamental.
	A8.6	15.247(b)(4)	Antenna gains are less than 6dBi. See antenna exhibits for details.
	A8.6	15.247(c)	Antenna gains are less than 6dBi. See antenna exhibits for details.
7.2.3	A8.5	15.247(d)	The EUT meets the spurious emissions requirements.
	A8.2(2)	15.247(e)	The PSD conducted to the antenna is less than 8dBm.
4.4.1			Occupied Bandwidth
5.5		15.247(i)	See MPE report for details

Modifications Required for Compliance

In order to meet the radiated emissions limit at the upper bandedge while operating at the highest channel, the TX power setting at the highest channel was lowered to the 0dB power setting.

Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jan-07 **Company:** MU Net, Inc **Work Order:** G1214

Engineer: Evan Gould **EUT Desc:** WG-TP-MIM-IC

Frequency Range: 1-18GHz **Measurement Distance:** 3 m

Notes: TX and RX modes scanned

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Vpk	4951.2	65.6	40.9	35.7	1.8	62.2	---	---	---	74.0	-11.8	Pass
Vav	4951.2	44.8	40.9	35.7	1.8	41.4	---	---	---	54.0	-12.6	Pass
Vpk	7426.9	67.1	40.8	38.7	2.1	67.1	---	---	---	74.0	-6.9	Pass
Vav	7426.9	45.2	40.8	38.7	2.1	45.2	---	---	---	54.0	-8.8	Pass
Hpk	12373.0	53.1	39.7	41.3	3.0	57.7	---	---	---	74.0	-16.3	Pass
Hav	12373.0	30.8	39.7	41.3	3.0	35.4	---	---	---	54.0	-18.6	Pass
High Band Edge			---	---	---	---	---	---	---	---	---	---
Hpk	2483.5	80.5	42.7	30.0	1.2	69.0	---	---	---	74.0	-5.0	Pass
Hav	***2483.5***	***66.8***	***42.7***	***30.0***	***1.2***	***55.3***	---	---	---	***54.0***	***1.3***	***Fail***
Lowered Power by 3dB (TX Power Setting 0dB)										---	---	---
Hpk	2483.5	78.7	42.7	30.0	1.2	67.2	---	---	---	74.0	-6.8	Pass
Hav	2483.5	65.2	42.7	30.0	1.2	53.7	---	---	---	54.0	-0.3	Pass
Lowered Power by 2dB more (TX Power Setting -2dB)										---	---	---
Hpk	2483.5	77.7	42.7	30.0	1.2	66.2	---	---	---	74.0	-7.8	Pass
Hav	2483.5	64.3	42.7	30.0	1.2	52.8	---	---	---	54.0	-1.2	Pass
RX MODE 1-18GHz			---	---	---	---	---	---	---	---	---	---
Vav	4842.0	51.1	40.9	35.4	1.8	47.4	---	---	---	54.0	-6.6	Pass

Test Site: "A" **Pre-Amp:** Red-Greer **Cable:** EMIR-HIGH 20 **Analyzer:** Orange **Antenna:** Orange Horn

Test Results

AC Line Conducted Emissions

FCC part 15.207 & RSS GEN 7.2.2

AC Mains Conducted Emissions — ***Curtis-Straus LLC***

Date: 05-Mar-07 **Company:** MU Net, Inc **Work Order:** G1214
Engineer: Evan Gould **EUT Desc:** WG-TP-MIM-IC **Test Site:** EMI1
Notes:
Measurement Device: Yellow LISN
Range: 0.15-30MHz **Spectrum Analyzer:** Blue

Frequency	Q.P. Readings		Ave. Readings		Impedance Factor	---		FCC/CISPR B		FCC/CISPR B		Overall Result
	QP1	QP2	AV1	AV2		Limit	Margin	qp Limit	qp Margin	AVE Limit	AVE Margin	
(MHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBµV)	dB	(dBµV)	dB	(dBµV)	dB	(Pass/Fail)
0.15	28.3	7.6	24.7	7.6	21.3	---	---	66.0	-16.4	56.0	-10.0	Pass
10.80	8.0	8.0	9.1	9.1	20.3	---	---	60.0	-31.7	50.0	-20.6	Pass
12.40	2.6	2.6	2.5	2.5	20.3	---	---	60.0	-37.1	50.0	-27.2	Pass
12.90	3.8	3.8	6.7	7.6	20.3	---	---	60.0	-35.9	50.0	-22.1	Pass
19.00	2.2	2.2	5.1	5.1	20.3	---	---	60.0	-37.5	50.0	-24.6	Pass
22.80	2.1	2.1	4.1	4.1	20.3	---	---	60.0	-37.6	50.0	-25.6	Pass

Table Result: Pass by -10.00 dB ***Worst Freq:*** 0.15 MHz

Voltage Variation

FCC part 15.31(e)

Voltage Variations

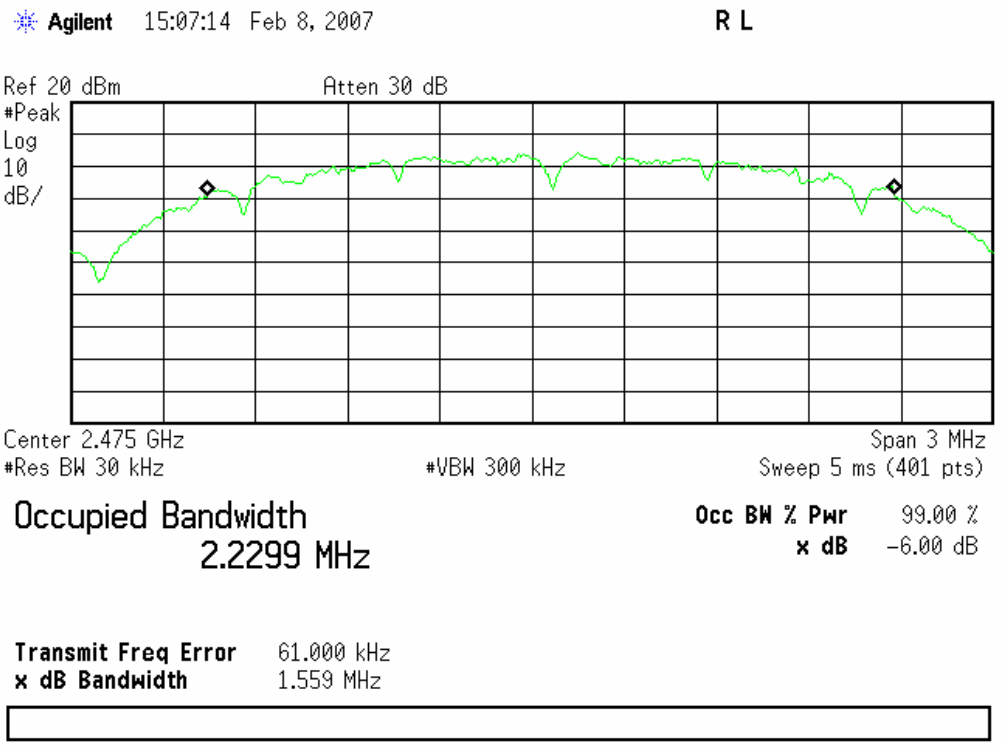
Work Order: G1214
Date: 9-Feb-07
Engineer: Evan Gould
EUT: WG-TP-MIM-IC

	AC input voltage		Fundamental Reading (dBm)
	163.20		17.0
	244V		17.0
	331.20		16.9

Analyzer: Orange Result: Pass

6dB Bandwidth

FCC part 15.247(a)(2), RSS 210 A8.2(1) & RSS GEN 4.4.2



Spurious Radiated Emissions

FCC part 15.205 & 15.209, RSS 210 2.6, RSS GEN 7.2.3

Radiated Emissions Table — *Curtis-Straus LLC*

Date: 08-Feb-07 **Company:** MU Net, Inc **Work Order:** G1214
Engineer: Evan Gould **EUT Desc:** WG-TP-MIM-IC
Frequency Range: 30-1000MHz **Measurement Distance:** 3 m
Notes: normal operation **EUT Max Freq:** 2.4GHz

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Vpk	146.8	31.0	22.3	13.1	0.3	22.1	---	---	---	43.5	-21.4	Pass
noise floor	275.0	20.7	22.3	13.7	0.6	12.7	---	---	---	46.0	-33.3	Pass
Hbb	332.6	32.2	22.3	14.7	0.8	25.4	---	---	---	46.0	-20.6	Pass
noise floor	450.0	18.0	22.2	17.0	1.0	13.8	---	---	---	46.0	-32.2	Pass
noise floor	674.0	17.5	22.0	20.4	1.6	17.5	---	---	---	46.0	-28.5	Pass
noise floor	980.6	11.2	21.7	23.4	2.3	15.2	---	---	---	54.0	-38.8	Pass

Table Result: Pass by -20.6 dB ***Worst Freq:*** 332.6 MHz

Test Site: "A" **Pre-Amp:** Blue **Cable:** EMIR-HIGH-09 **Analyzer:** White **Antenna:** Red-Black

Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jan-07 **Company:** MU Net, Inc **Work Order:** G1214
Engineer: Evan Gould **EUT Desc:** WG-TP-MIM-IC
Frequency Range: 1-18GHz **Measurement Distance:** 3 m
Notes: TX and RX modes scanned

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Vpk	4951.2	65.6	40.9	35.7	1.8	62.2	---	---	---	74.0	-11.8	Pass
Vav	4951.2	44.8	40.9	35.7	1.8	41.4	---	---	---	54.0	-12.6	Pass
Vpk	7426.9	67.1	40.8	38.7	2.1	67.1	---	---	---	74.0	-6.9	Pass
Vav	7426.9	45.2	40.8	38.7	2.1	45.2	---	---	---	54.0	-8.8	Pass
Hpk	12373.0	53.1	39.7	41.3	3.0	57.7	---	---	---	74.0	-16.3	Pass
Hav	12373.0	30.8	39.7	41.3	3.0	35.4	---	---	---	54.0	-18.6	Pass
Lowered Power by 3dB (TX Power Setting 0dB)							---	---	---	---	---	---
Hpk	2483.5	78.7	42.7	30.0	1.2	67.2	---	---	---	74.0	-6.8	Pass
Hav	2483.5	65.2	42.7	30.0	1.2	53.7	---	---	---	54.0	-0.3	Pass
RX MODE 1-18GHz			---	---	---	---	---	---	---	---	---	---
Vav	4842.0	51.1	40.9	35.4	1.8	47.4	---	---	---	54.0	-6.6	Pass

Table Result: Pass by -0.3 dB ***Worst Freq:*** 2483.5 MHz

Test Site: "A" **Pre-Amp:** Red-Greer **Cable:** EMIR-HIGH 20 **Analyzer:** Orange **Antenna:** Orange Horn

Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jan-07 **Company:** MU Net, Inc **Work Order:** G1214
Engineer: Evan Gould **EUT Desc:** WG-TP-MIM-IC
Frequency Range: 18-25GHz **Measurement Distance:** 1 m
Notes: TX and RX modes scanned

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Hpk	19400.0	36.4	19.9	40.3	3.7	60.5	---	---	---	83.5	-23.0	Pass
Hav	19400.0	25.1	19.9	40.3	3.7	49.2	---	---	---	63.5	-14.3	Pass

Table Result: Pass by -14.3 dB ***Worst Freq:*** 19400.0 MHz

Test Site: "A" **Pre-Amp:** 18-26.5GH **Cable:** EMIR-HIGH 20 **Analyzer:** Orange **Antenna:** 18-26.5GHz Horn

Conducted POP

FCC part 15.247(b)(3) & RSS 210 A8.4(4)

Peak Output Power — *Curtis-Straus LLC*

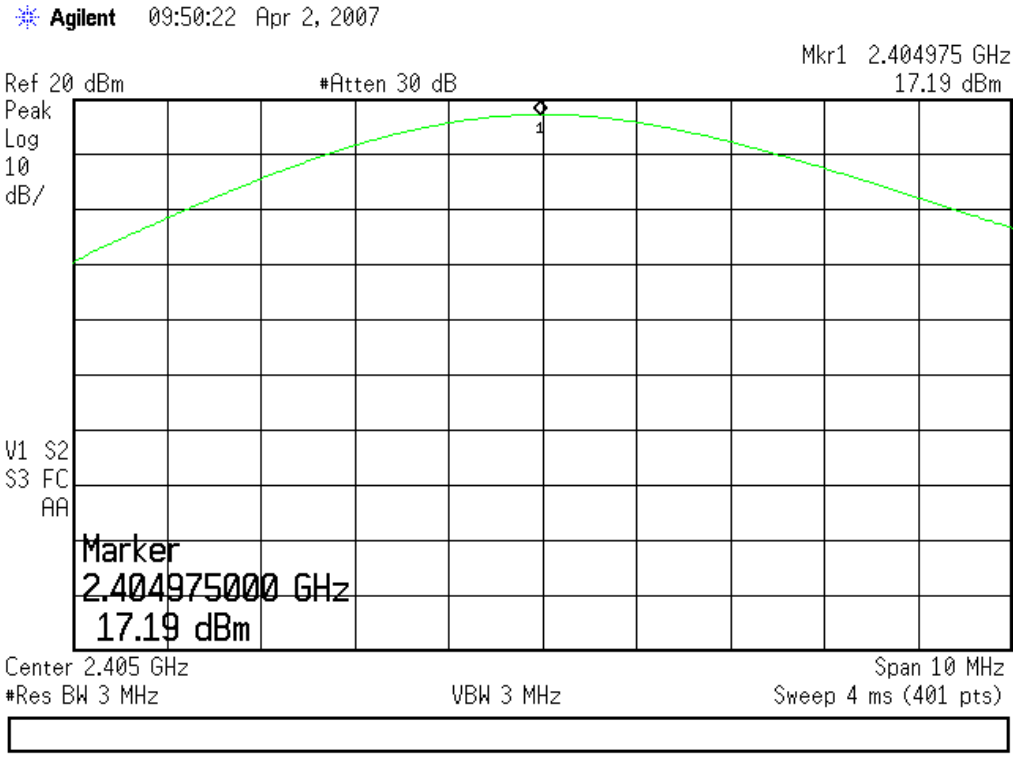
Date: 02-Apr-07 **Compa** Mu Net, Inc. **Work Order:** G1214

Engineer: Josh LeBlanc **EUT De** WG-TP-MIM-IC

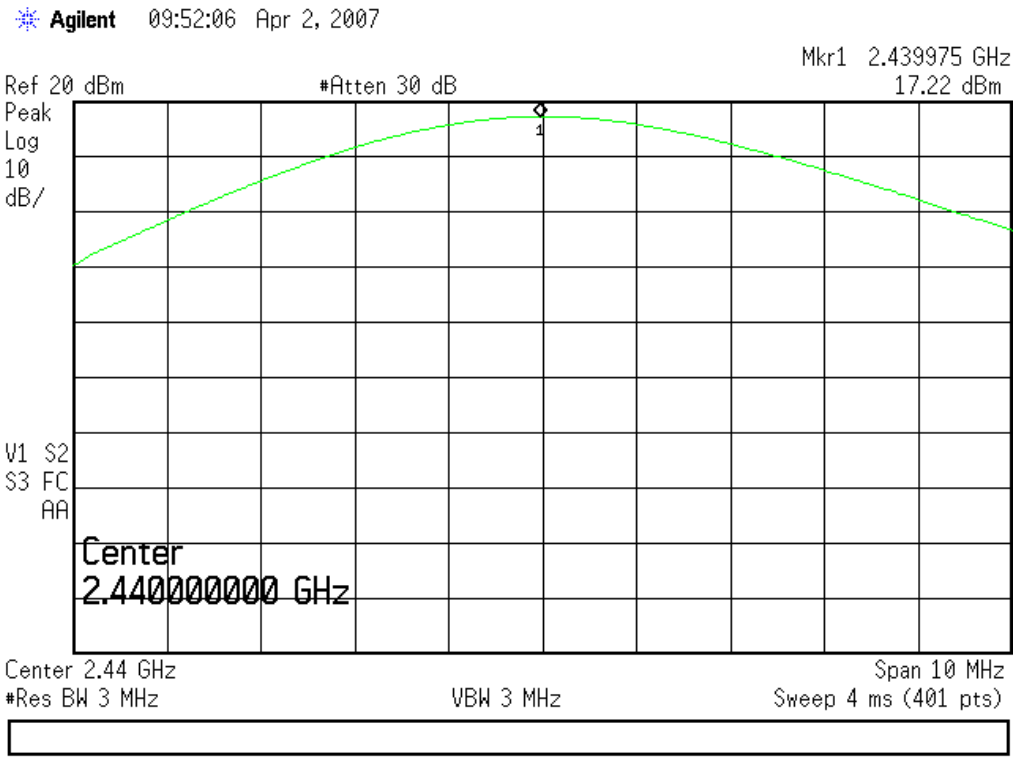
Channel	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Adjusted Reading (dBm)	FCC 15.247 Limit (dBm)	FCC 15.247 Margin (dB)	FCC 15.247 Result (Pass/Fail)
CH 11	2405.0	17.2	1.2	18.4	30.0	-11.6	Pass
CH 18	2440.0	17.2	1.2	18.4	30.0	-11.6	Pass
CH 25	2475.0	15.5	1.2	16.7	30.0	-13.3	Pass

Test Site: EMI1 **Cable:** EMIR-HIGH-20 **Analyzer** Brown

Ch.11 POP



Ch.18 POP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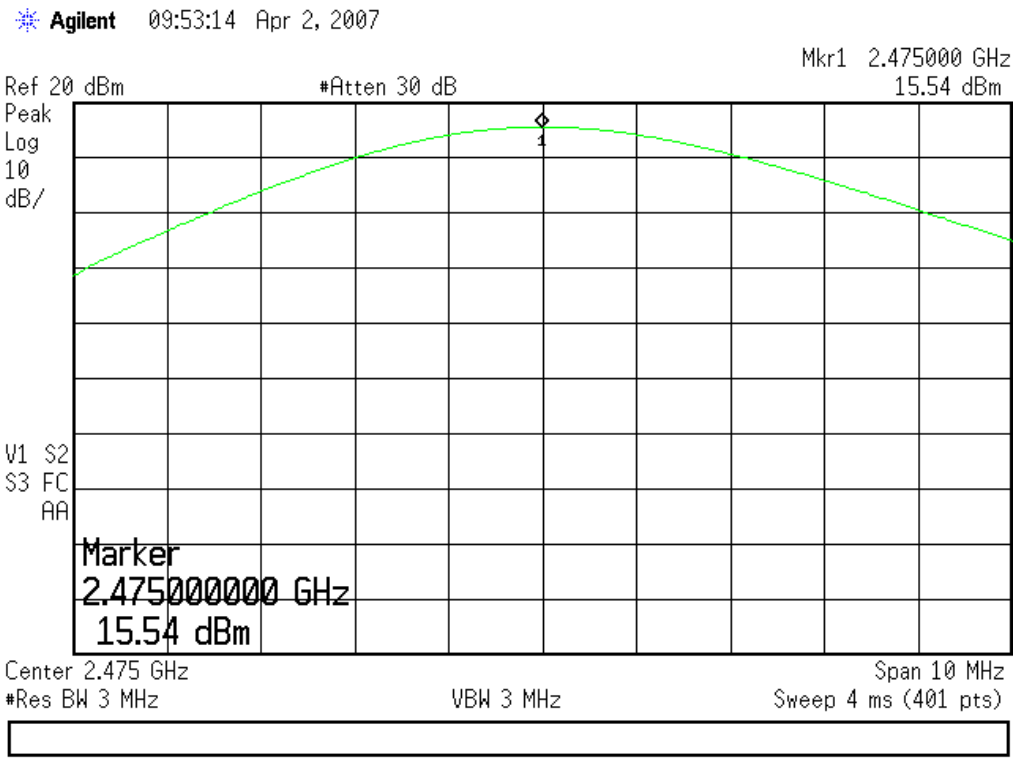
Mkr1 2.439975 GHz
Ref 20 dBm
#Atten 30 dB
17.22 dBm
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center
2.440000000 GHz
Center 2.44 GHz
#Res BW 3 MHz
VBW 3 MHz
Span 10 MHz
Sweep 4 ms (401 pts)

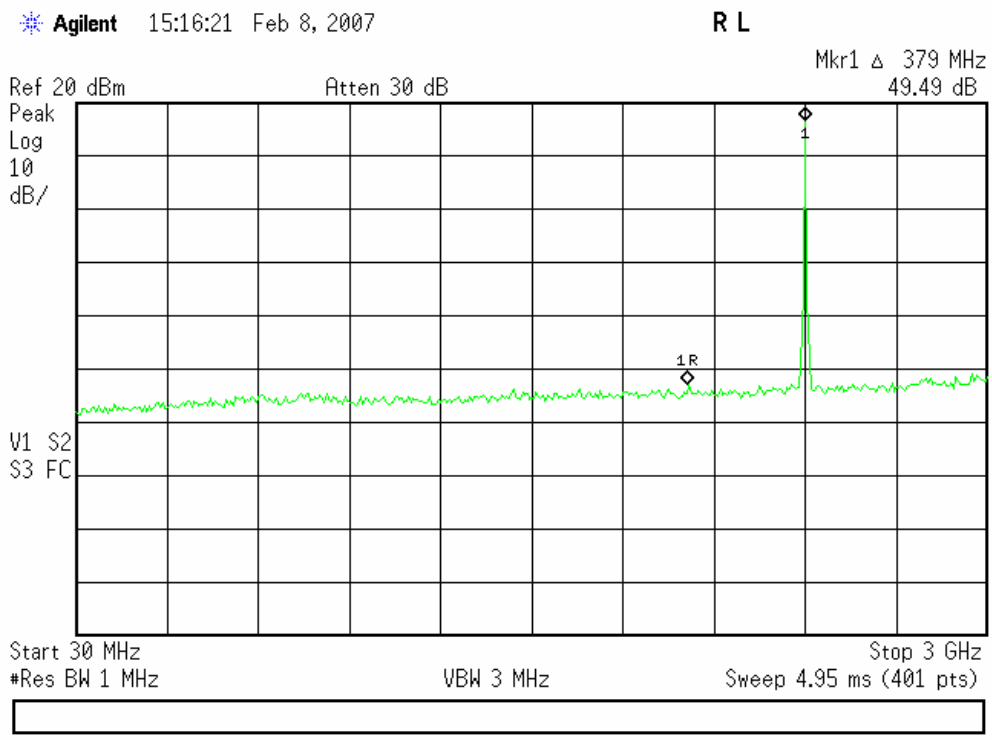
Ch.25 POP


Agilent 09:53:14 Apr 2, 2007
Mkr1 2.475000 GHz
Ref 20 dBm
#Atten 30 dB
15.54 dBm
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Marker
2.475000000 GHz
15.54 dBm
Center 2.475 GHz
#Res BW 3 MHz
VBW 3 MHz
Span 10 MHz
Sweep 4 ms (401 pts)

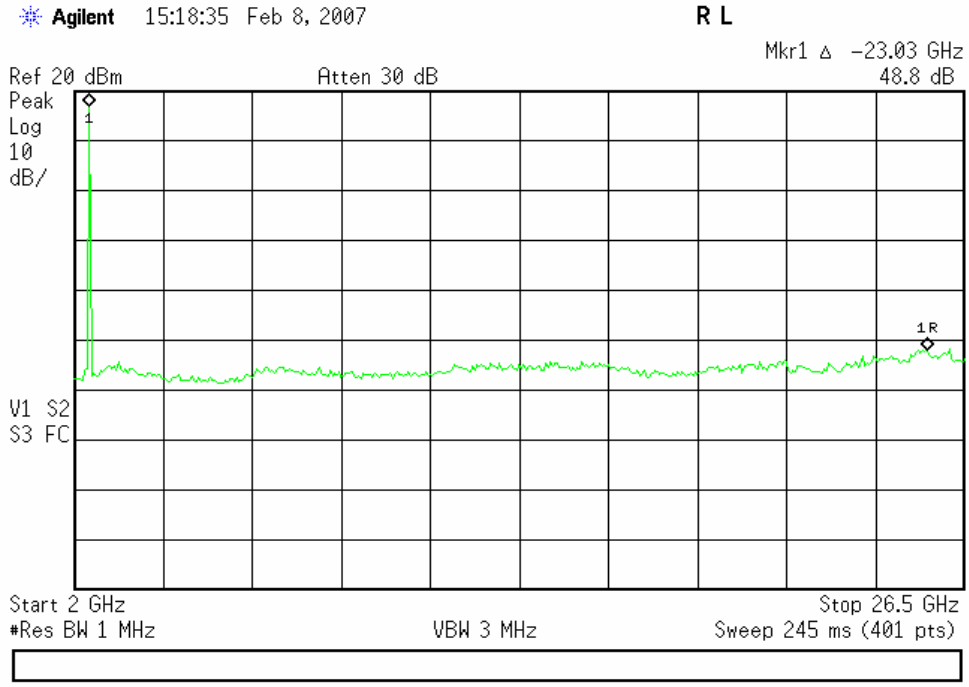
Spurious Conducted Emissions

FCC part 15.247(d), RSS 210 A8.5 & RSS GEN 7.2.3

Conducted Spurious 30-3000MHz TX Mode

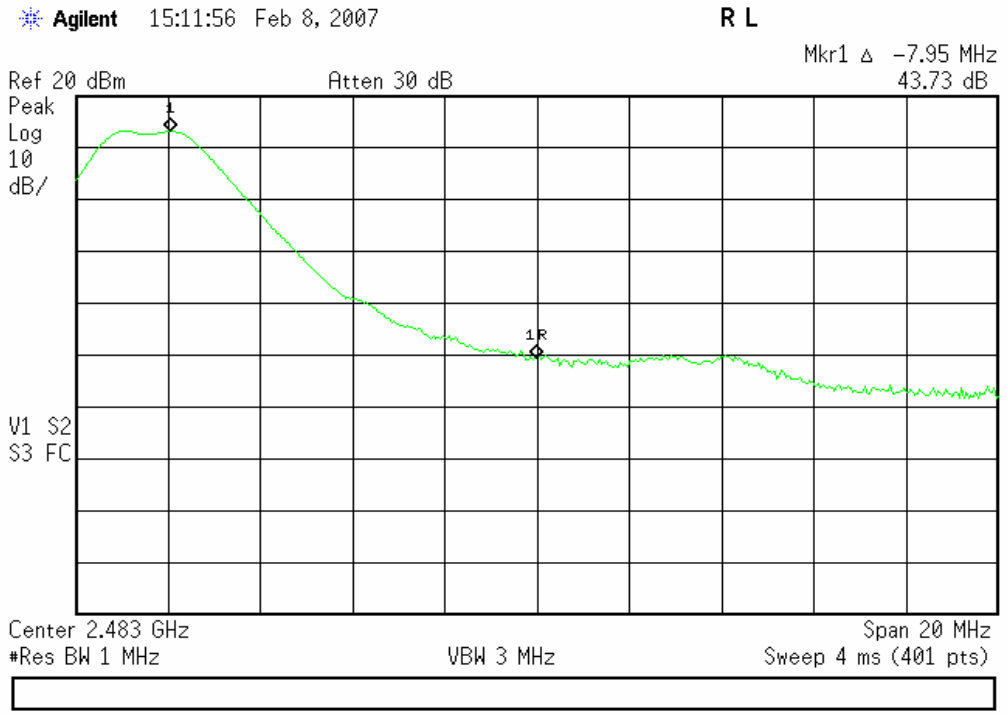


Conducted Spurious 2-26GHz TX Mode



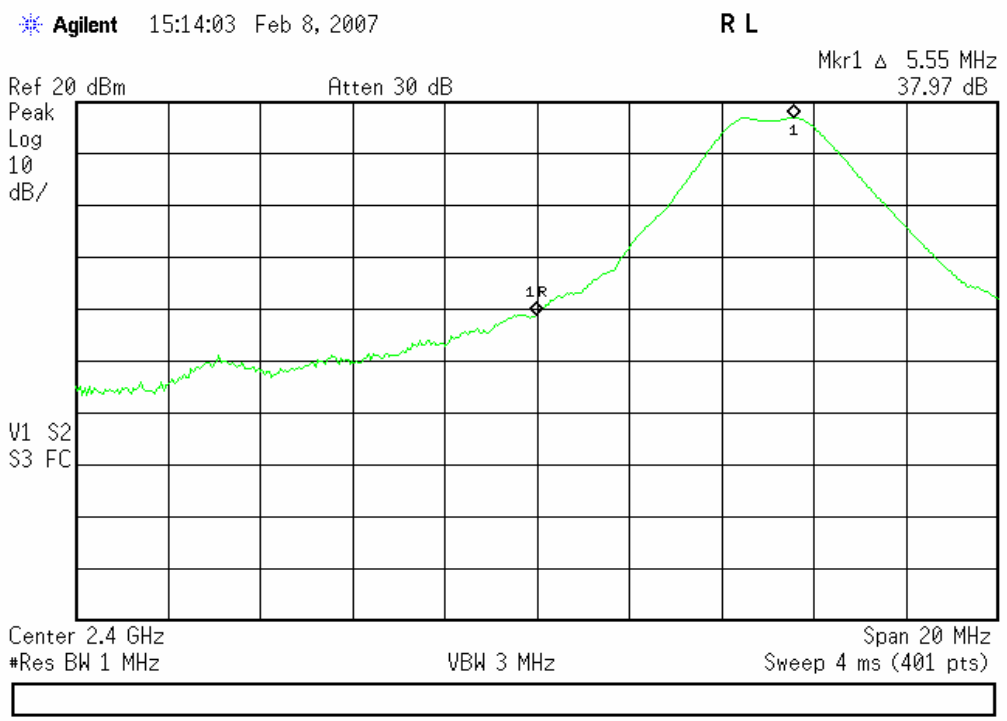
Conclusion: All harmonics and spurs are >20dB below the fundamental.

Conducted High Band Edge



Conclusion: The emission at the bandedge is >20dB below the level of the fundamental

Conducted Low Band Edge



Conclusion: The emission at the bandedge is >20dB below the level of the fundamental

Power Spectral Density

FCC part 15.247(e) & RSS 210 A8.2(2)

Power Spectral Density — *Curtis-Straus LLC*

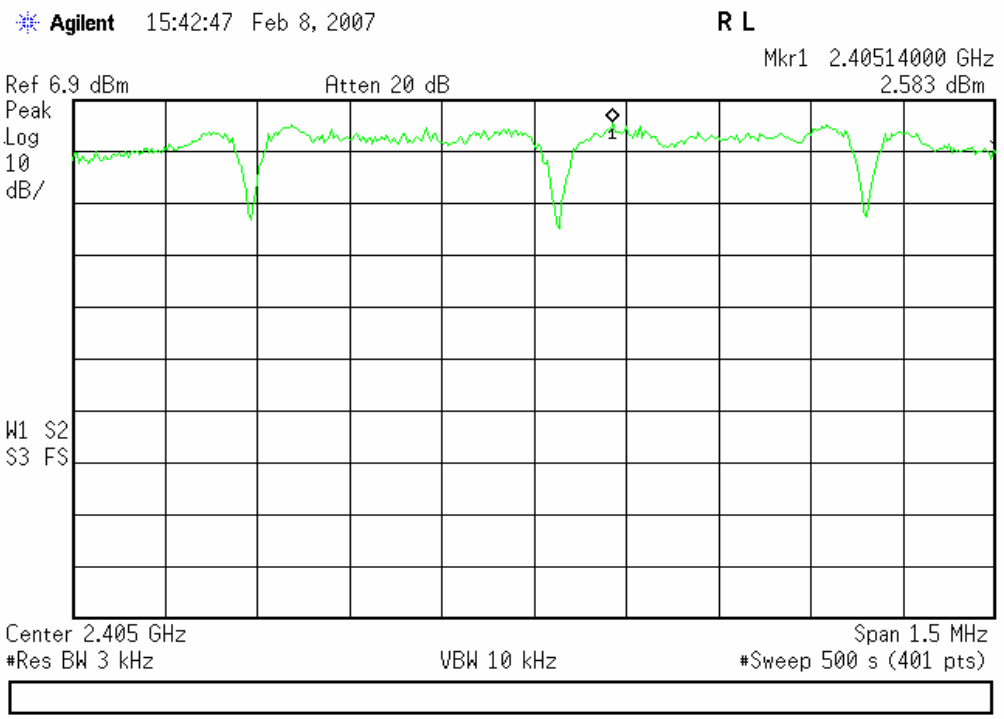
Date: 08-Feb-07 **Compa** Mu Net, Inc. **Work Order:** G1214

Engineer: Evan Gould **EUT De** WG-TP-MIM-IC

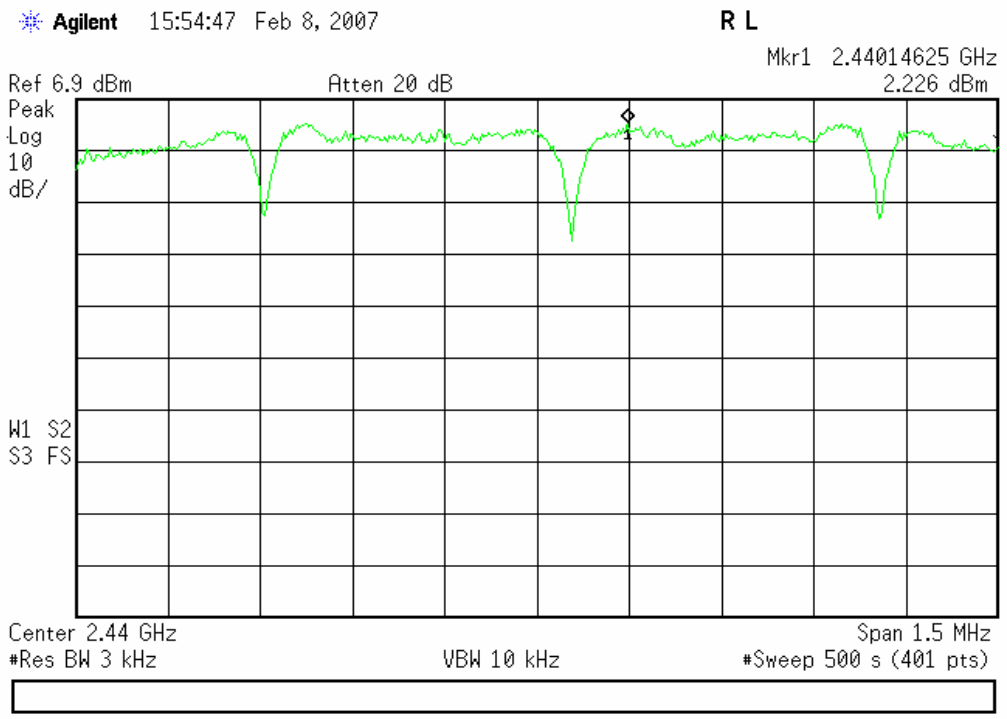
Channel	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Adjusted Reading (dBm)	FCC 15.247 Limit (dBm)	FCC 15.247 Margin (dB)	FCC 15.247 Result (Pass/Fail)
CH 11	2405.0	2.6	1.2	3.8	8.0	-4.2	Pass
CH 18	2440.0	2.2	1.2	3.4	8.0	-4.6	Pass
CH 25	2475.0	-1.4	1.2	-0.2	8.0	-8.2	Pass

Test Site: EMI1 **Cable:** EMIR-HIGH-20 **Analyzer** Brown

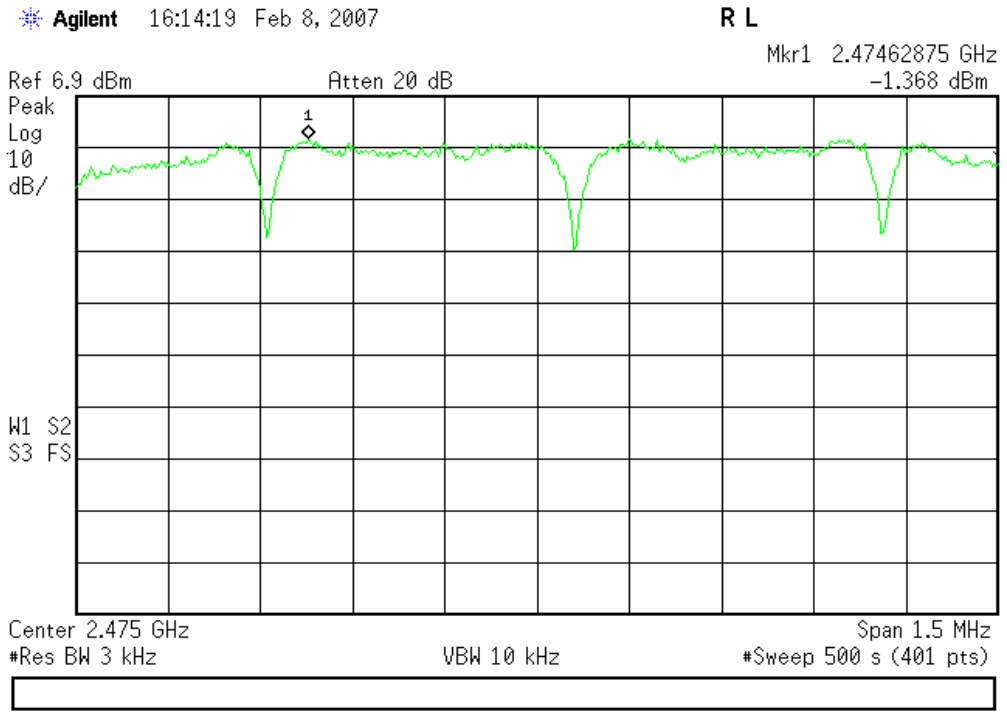
Ch.11 PSD



Ch.18 PSD

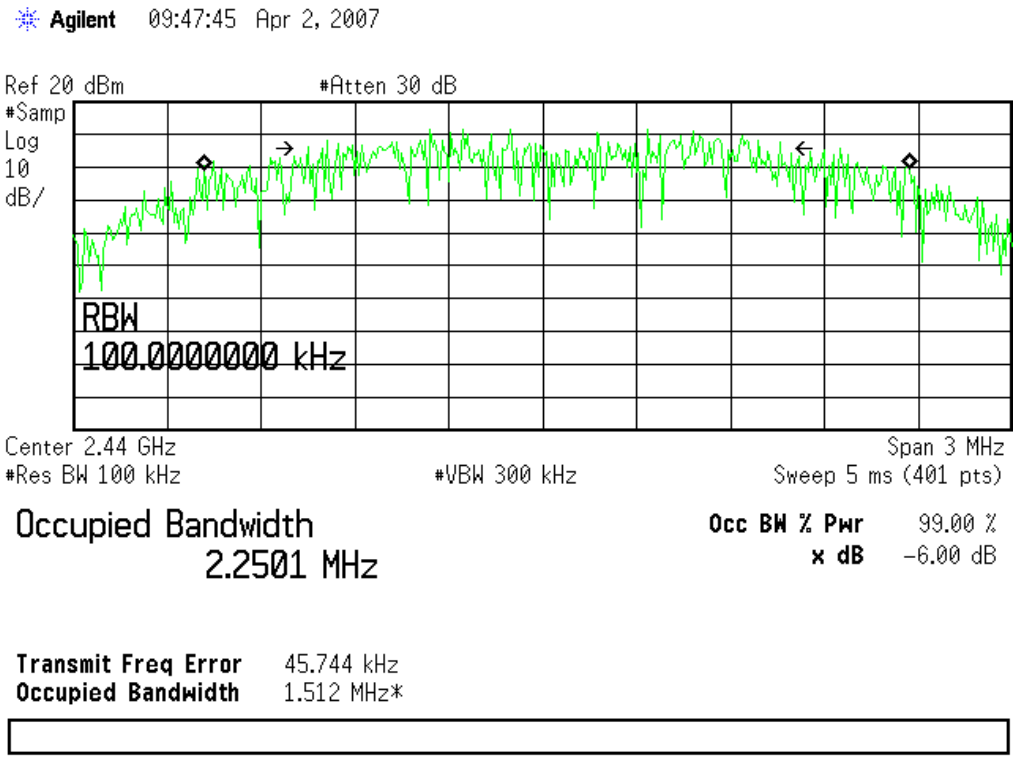


Ch.25 PSD



Occupied Bandwidth

RSS GEN 4.4.1



Test Equipment Used

REV. 01-FEB-2007

SPECTRUM ANALYZERS / RECEIVERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
WHITE	9kHz-22GHz	8593E	Agilent	3547U01252	00022	I	06-OCT-2007
BLUE	9kHz-1.8GHz	8591E	Agilent	3223A00227	00070	I	18-DEC-2007
ORANGE	9kHz-26.5GHz	E4407B	Agilent	US39440975	00394	I	18-DEC-2007

LISNs/MEASUREMENT PROBES	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
YELLOW	10KHZ-30MHZ	8012-50-R-24-BNC	SOLAR	0411658	1080	II	05-MAY-2007

OPEN AREA TEST SITES (OATS)	FCC CODE	IC CODE	VCCI CODE	CAT	CALIBRATION DUE
SITE A	93448	IC 2762-A	R-903	II	13-AUG-2007

CONDUCTED TEST SITES (MAINS / TELCO)	FCC CODE	IC CODE	VCCI CODE	CAT	CALIBRATION DUE
EMI 1	93448	N/A	C-1801, T-268	III	NA

HARMONIC & FLICKER ANALYZER	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
HFTS	HP6842A	HP	3531A-00169	00738	II	30-DEC-2007

PREAMPS / ATTENUATORS / FILTERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
BLUE	0.01-2000MHZ	ZFL-1000-LN	C-S	N/A	00759	II	20-JUL-2007
RED-GREEN	1-20GHZ	PM2-38-218-4R5-17-15-SFF	C-S			II	14-AUG-2007
HF (YELLOW)	18-26.5GHZ	AFS4-18002650-60-8P-4	C-S	467559	00758	II	23-AUG-2007

ANTENNAS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED-BLACK BILOG	30-2000MHZ	JB1	SUNOL	A091604-2	01106	I	20-OCT-2008
ORANGE HORN	1-18GHZ	3115	EMCO	0004-6123	00390	I	09-JUN-2007

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

FCC Requirements

Required Equipment Authorization for Device Type

Type of Device	Equipment Authorization Required
TV broadcast receiver	Verification
FM broadcast receiver	Verification
CB receiver	Declaration of Conformity or Certification
Superregenerative receiver	Declaration of Conformity or Certification
Scanning receiver	Certification
All other receivers subject to part 15	Declaration of Conformity or Certification
TV interface device	Declaration of Conformity or Certification
Cable system terminal device	Declaration of Conformity
Stand-alone cable input selector switch	Verification
Class B personal computers and peripherals	Declaration of Conformity or Certification
CPU boards and internal power supplies used with Class B personal computers	Declaration of Conformity or Certification
Class B personal computers assembled using authorized CPU boards or power supplies	Declaration of Conformity
Class B external switching power supplies	Verification
Other Class B digital devices & peripherals	Verification
Class A digital devices, peripherals & external switching power supplies	Verification
All other devices	Verification

FCC Required labeling for Verified Devices 47 CFR Part 15.19

Verified devices must have the following label permanently affixed in a location accessible to the user:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

No distinction is made between Class A or Class B devices on the label.

When the device is so small or for such use that it is not practicable to place label on it, the information may be shall be placed in a prominent location in the instruction manual supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

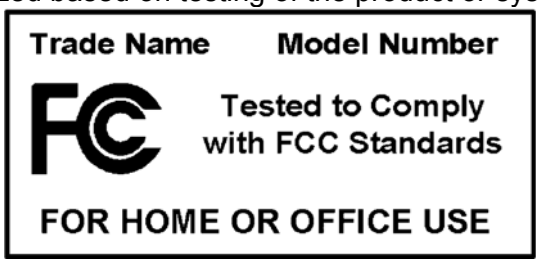
Where a device is constructed in two or more sections connected by wires and marketed together, the label is only required to be affixed to the main control unit.

FCC Required labeling for Class B Personal Computers and Peripherals Devices 47 CFR Part 15.19 subject to Declaration of Conformity

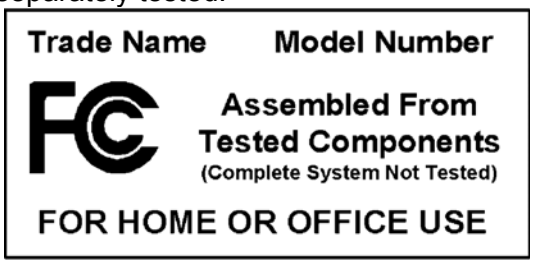
Personal computers and peripherals subject to authorization under a Declaration of Conformity shall be labeled as follows:

(1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 and the following logo:

(i) If the product is authorized based on testing of the product or system:



(ii) If the product is authorized based on assembly using separately authorized components and the resulting product is not separately tested:



(2) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

(3) The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d). "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

FCC Required Instruction Manual Inserts CFR 47 Part 15.21 and 15.105

The user's manual must caution the user that changes or modifications not expressly approved by the manufacturer could void the user's FCC granted authority to operate the equipment. In addition the following information should be inserted:

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: this equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial

environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

(c) The provisions of paragraphs (a) and (b) of this section do not apply to digital devices exempted from the technical standards under the provisions of § 15.103.

(d) For systems incorporating several digital devices, the statement shown in paragraph (a) or (b) of this section needs to be contained only in the instruction manual for the main control unit.

Our facility codes can be found in the *Test Equipment Used* Section starting on page 16.

Canadian Requirements

Digital products and ISM products must be labeled by a notice in French and English. The notice **must** take the form of a label on the product. As an alternative, where it is not feasible to label the product due to product size or other consideration, the notice must be reproduced in the manual. Note that considerations such as product appearance are not considered to meet the feasibility test. The notice must state that the product is in compliance with Canadian Interference-Causing Equipment regulations and may be in your own words. A suggested text is:

For ITE products:

This Class A or B digital apparatus complies with Canadian ICES-003.
Cet appareil numerique de la classe A or B est conforme a la norme NMB-003 du Canada.

For ISM products:

This ISM apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Ce generateur de frequence radio ISM respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

Although the ITE limits are different from the FCC in some minor ways, equipment which complies with the FCC limits is considered by Industry Canada to be compliant with the Canadian rules. For ITE, equipment in compliance with either FCC Part 15 or CISPR 22 is considered to meet ICES-003. ISM equipment limits are the same as the EU EN55011 emission limits. Reports must be kept on file for review by the appropriate Canadian Minister for a period of five years.

Our facility codes can be found in the *Test Equipment Used* Section starting on page 16.

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("**Client**"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "**Conditions**"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("**Test Report**") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS**," "**BUREAU VERITAS CONSUMER PRODUCTS SERVICES**," "**BVCPS**", "**MTL**", "**ACTS**", "**MTL-ACTS**" and **CURTIS-STRAUS** (collectively, the "**Marks**") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS

AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

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A2LA Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

CURTIS-STRAUS[1]
527 Great Road
Littleton, MA 01460
Barry Quinlan Phone: 978-486-8880
ELECTRICAL

Valid until: July 31, 2007 Certificate Number: 1627.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility (EMC), Telecommunications, and Product Safety tests:

Electromagnetic Compatibility (EMC)
Radiated emissions testing (electric and magnetic fields)*; Conducted emissions testing (voltage and current)*; Electrostatic Discharge testing*; Electrical Fast Transient testing*; Radiated Immunity testing*; Conducted Immunity testing*; Lightning Immunity testing*; Voltage Dips*, Interrupts and Voltage Variations testing*; Magnetic Immunity testing*; RF Power measurements*; Frequency Stability Measurements*; Longitudinal Induction measurements*; Harmonic emissions testing*; Light flicker testing*; Low frequency disturbance voltage testing*; Disturbance Power measurements*; Power Cross Overvoltage testing*;

Test Type	Test Method(s)
Emissions	
Radiated and Conducted Emissions	FCC 47 CFR Parts 15 & 18; C63.4; CISPR 22; EN55022; SABS CISPR 22; AS/NZS CISPR 22; AS/NZS 3548; Canada ICES-003; CNS13438; KN 22 (RRL No. 2005-82, September 29, 2005); CISPR 11; EN 55011; SABS CISPR 11; AS/NZS CISPR 11; AS/NZS 2064; Canada ICES-001; CNS13803; CISPR 13; EN 55013; SABS CISPR 13; AS/NZS CISPR 13; AS/NZS 1053; CISPR 14-1; EN 55014-1; SABS CISPR 14; AS/NZS CISPR 14; AS/NZS 1044; CNS 13439; CISPR 15; EN 55015; GR-1089-CORE; CSA C108.8-M1983;
Harmonics	EN 61000-3-2; AS/NZS 61000.3.2
Flicker	EN 61000-3-3; AS/NZS 61000.3.3

1 Note: This accreditation covers testing performed at the laboratory listed above and the satellite facility located at 168 Ayer Rd, Littleton, MA 01460 and, for test types marked with an asterisk, at other sites as defined in *"A2LA specific criteria for the accreditation of site testing and site calibration laboratories."*

Immunity	RRL No. 2005-130 (December 27, 2005)
Electrostatic Discharge (ESD)	EN 61000-4-2; AS/NZS 61000.4.2; KN61000-4-2
Radiated Immunity (RFI)	EN 61000-4-3, AS/NZS 61000.4.3; KN61000-4-3
Electrical Fast Transient Bursts (EFT)	EN 61000-4-4; AS/NZS 61000.4.4; KN61000-4-4
Surge	EN 61000-4-5, AS/NZS 61000.4.5; KN61000-4-5
Conducted Immunity	EN 61000-4-6, AS/NZS 61000.4.6; KN61000-4-6
Magnetic Immunity	EN 61000-4-8; AS/NZS 61000.4.8; KN61000-4-8
Voltage Dips and Interrupts	EN 61000-4-11; KN61000-4-11
Low Frequency Conducted Disturbances	EN 61000-2-2

Family Product or Industry Specific Specifications *including emissions and/or immunity*	GR-1089-CORE; GR-78-CORE (ESD) EN50081-1; EN50081-2; EN50082-2; EN50082-1; EN 61000-6-1; EN 61000-6-2; EN 61000-6-3; EN 61000-6-4; EN 50091-2; EN 55024; CISPR 24 EN 55103-1; EN 55103-2; EN 61326; EN 61547; EN 50130-4; EN 50083-2; EN 60601-1-2; EN 60601-2-2; EN 60601-2-24; EN 60601-2-32; EN 60601-2-38; EN 60601-2-47; IEC 1800-3; EN 61800-3; EN 55020; CISPR 20; EN 60555 Part 2; EN 60555 Part 3; ETS 300 386-1; EN 300 386-2; EN 300 386, ETS 300 132-1; ETS 300 132-2; EN 60669-2-1; AS/NZS 3200.1.2; CNS 13783-1; ETR 283; C62.41
Radiocommunications	
EU R&TTE Radio Standards;	EN 300 220-1; EN 300 220-3; EN 300 330-1; EN 300 330-2; EN 300 440-1; EN 300 440-2; EN 300 328; EN 300 385; EN 301 893
EU R&TTE EMC Standards	EN 300 339; EN 301 489-01; EN 301 489-03; EN 301 489-17
Canada Radio Standards	RSS-102; RSS-117; RSS-118; RSS-119; RSS-123; RSS-125; RSS-128; RSS-129; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-136; RSS-137; RSS-138; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-187; RSS-188; RSS-191; RSS-192; RSS-193; RSS-195; RSS-210; RSS-212; RSS-213; RSS-215; RSS-243; RSS-GEN; RSS-310; GL-36;
Australia/New Zealand Radio Standards	AS/NZS 4268; AS/NZS 4771; RFS29; Radiocommunications (Data Transmission Equipment Using Spread Spectrum Modulation Techniques); Radiocommunications (Spread Spectrum Devices); Radiocommunications (Short Range Devices); Radiocommunications (Low Interference Potential Devices);

Other Radio Standards	RTTE 01 (DGT-Taiwan);

FCC Standards and Test methods Support TCB Status--	
FCC Scope A – Unlicensed Radio Frequency Devices	
A1	1. 47 CFR Parts 11, 15 and 18 2. FCC MP-5, 3. ANSI C63.4-2003,
A2	1. 47 CFR Part 15, 2. ANSI C63.4-2003,
A3	1. 47 CFR Part 15, 2. ANSI C63.17-1998, 3. ANSI C63.4-2003,
A4	1. 47 CFR Part 15, 2. ANSI C63.4-2003,
FCC Scope B – Licensed Radio Service Equipment	
B1	1. 47 CFR Parts 2, 22, 24, 25, and 27 2. ANSI/TIA-603-C (2004)
B2	1. 47 CFR Parts 2, 22, 74, 90, 95, and 97 2. ANSI/TIA-603-C (2004)
B3	1. 47 CFR Parts 2, 80, and 87 2. ANSI/TIA-603-C (2004)
B4	1. 47 CFR Parts 2, 21, 74, and 101 2. ANSI/TIA-603-C (2004)

Country Specific Standards and Other	
ITU EMC Standards	K.20; K.21; K.41; K.44
Swedish EMC Standards	BAKOM 3336.3
South African EMC Standards other then CISPR equivalents	SABS 1718-1; SANS 211/SABS CISPR 11; SANS 224/SABS CISPR 24; SANS 213/SABS CISPR 13; SANS 2200; SANS214-1/SABS CISPR 14-1; SANS214-2/SABS CISPR 14-2; SANS 215/SABS CISPR 15; SANS 222/SABS CISPR 22
Hong Kong EMC Standards	HKTA 1006; HKTA 1007; HKTA 1008; HKTA 1010; HKTA 1015; HKTA 1026; HKTA 1035; HKTA 1039; HKTA 1041; HKTA 1042; HKTA 1045
Singapore EMC Standards	IDA TS SRD; IDA TS EMC
Japanese VCCI Standards	VCCI V-3, VCCI V-4

Telecommunications
Telecommunications Registration; General test methods; Lightning surge*; Drop testing*; Balance testing*; Signal power (metallic and longitudinal)*; Frequency measurements*; Pulse templates*; Leakage testing*; Impedance testing*; Hearing Aid Compatibility testing (*excluding volume control*)*; Protocol analysis* and Jitter testing*.

Telecom Standards	Title
North American standards	
FCC 47 CFR Part 68 Telephone Terminal Equipment	Connection of terminal equipment to the telephone network. Analog and Digital Equipment. TCB Scope C1.
CS-03 Issue 9	Specification for terminal equipment, terminal systems, Network protection devices, connection arrangements and hearing aids compatibility.
TIA/EIA TSB31-B 1998	Bulletin Part 68 Rationale and Measurement Guidelines (Feb 1998)
TIA-968-A, A1, A2, A3	Telecommunications Telephone Terminal Equipment Technical Requirements for Connection of Terminal Equipment to the Telephone Network
T1.TRQ.6-2001	Technical Requirements for SHDSL, HDSL2, HDSL4 Digital Subscriber Line Terminal Equipment to Prevent Harm to the Telephone Network Industry
Australia standards	
AS/ACIF S002-2001	Analogue interworking and non-interference requirements for Customer Equipment for connection to the Public Switched Telephone Network
AS/ACIF S016-2001	Requirements for Customer Equipment for connection to hierarchical digital interfaces
AS/ACIF S031-2001	Requirements for ISDN Basic Access Interface
AS/ACIF S038-2001	Requirements for ISDN Primary Rate Access Interface
AS/ACIF S043-2001	Requirements for Customer Equipment for Connection to a Metallic Local Loop Interface of a Telecommunications Network — Part 1: General Part 2: Broadband Part 3: DC, Low Frequency AC and Voice band
International standards	
ITU-T G.703	Physical/electrical characteristics of hierarchical Digital interfaces
Hong Kong standards	
HKTA 2011	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to Direct Exchange Lines (DEL) of the Public Switched Telephone Network (PSTN) in Hong Kong
HKTA 2014	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong using ISDN Basic Rate Access (BRA) based on ITU-T Recommendations

Telecom Standards	Title
HKTA 2028	Network connection specification for connection of CPE to the PTNs in Hong Kong using digital leased circuits at data rate of 1544 kbit/s
HKTA 2029	Network connection specification for connection of CPE to the PTNs in Hong Kong using digital leased circuits at data rate of 2048 kbit/s
HKTA 2030	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong using Digital Leased Circuits at nx64 kbit/s
HKTA 2031	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong using Digital Leased Circuits below 64 kbit/s
HKTA 2032	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Networks in Hong Kong using Asymmetric Digital Subscriber Lines (ADSL) based on ITU-T Recommendation G.992.1
HKTA 2033	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to Fixed Telecommunications Networks in Hong Kong using Splitterless Asymmetric Digital Subscriber Lines (ADSL) based on ITU-T Recommendation G.992.2
European standards	
TBR 1: 1995	Attachment requirements for terminal equipment to Be connected to circuit switched data networks and Leased circuits using a CCITT Recommendation X.21 interface, or at an interface physically, functionally and electrically compatible with CCITT Recommendation X.21 but operating at any data signaling rate up to, and including, 1 984 kbit/s
TBR 2: 1997	Attachment requirements for Data Terminal Equipment (DTE) to connect to Packet Switched Public Data Networks (PSPDNs) for CCITT Recommendation X.25 interfaces at data signaling rates up to 1 920 kbit/s utilizing interfaces derived from CCITT Recommendations X.21 and X.21 bit
TBR 3: 1995 + Amdt : 1997	Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access
TBR 4: 1995 + Amdt : 1997	Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN primary rate access
TBR 012: 1993 + Amdt : 1996	Business Telecommunications (BT); Open Network Provision (ONP) technical requirements; 2 048 kbit/s digital unstructured leased line (D2048U) Attachment requirements for terminal equipment
TBR 013: 1996	Business TeleCommunications (BTC); 2 048 kbit/s digital structured leased lines (D2048S); Attachment requirements for terminal equipment interface

European standards (cont'd)	
TBR 21: 1998	Terminal Equipment (TE); Attachment requirements For pan-European approval for connection to the Analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signaling
TBR 24: 1997	Business TeleCommunications (BTC); 34 Mbit/s Digital Unstructured and structured leased lines (D34U and D34S); Attachment requirements for Terminal equipment interface
Taiwan standards (DGT)	
ADSL01	Asymmetric Digital Subscriber Line Terminal Equipment and POTS Splitter Technical Specifications
ID0002	DS1 Equipment Type Approval Guidelines
IS6100	ISDN Terminal Equipment Technical Specifications
PSTN01 (non-voice only)	Technical Specifications for Terminal Equipment for Connection to Public Switched Telephone Network
New Zealand standards	
PTC 200 (non-voice only)	Requirements for Connection of Customer Equipment to Analogue Lines
PTC 217	Requirements for Bandwidth Management Devices
TNA 117	Telecom 2048 kbit/s Standard Network Interface
PTC 270	Interim arrangements for ADSL CPE
Singapore Standards	
IDA TS ADSL	Type Approval Specification for Asymmetric Digital Subscriber Line (Full-rate ADSL) Modems
IDA TS ADSL 2	Type Approval Specification for Asymmetric Digital Subscriber Line Splitterless (G-Lite) Modems
IDA TS DLCN 1	Type Approval Specification for Digital Interfaces based on hierarchical bit rates of 2048 kbit/s, 34 368 kbit/s and 139 264 kbit/s
IDA TS ISDN 1	Type Approval Specification for connection of Terminal Equipment to Integrated Services Digital Network (ISDN) Basic Access
IDA TS ISDN 2	Type Approval Specification for connection of Terminal Equipment to Integrated Services Digital Network (ISDN) Primary Rate Access (PRA)
IDA TS PSTN (non-voice only)	Type Approval Specification for connection of Terminal Equipment to Public Switched Telephone Network (PSTN)
South Africa standards	
TE-001 (non-voice only)	Standard for Telecommunication Line Terminal Equipment (TLTE) for Connection to the Public Switched Telephone Network (PSTN)

Product Safety
General test methods:
Power input*, Permanence of marking*, Accessibility*, Permissibly limits*, Energy hazard measurement*, SELV circuits*, TNV limits*, Limited current*, Capacitor Discharge / voltage limitation*, Ring signal*, Humidity conditioning*, Creepage / Clearance / Distance thru Insulation (excluding CTI)*, Limited power measurement*, Ground Bond/Earthing*, Ground continuity*, Temperature*, Stability*, Applied force*, Steel sphere impact*, Mold stress*, Battery reverse current*, Ball pressure*, Leakage current*, Component abnormal*, Electric strength*, Impulse*, Overvoltage*, Acoustic sound pressure*, 130mm / 20mm flame*, Needle flame*, Hot flaming oil*, Locked rotor/motor armature*, Vibration, Bump, Drop*, Strain relief*, Torque*, Insulation resistance*, Sound level*, Handle loading*, Liquid overflow*, Spillage*, Liquid leakage*, Transformer shorts/overloads*, Rain test*, Wall mount*, Laser radiation (excluding x-ray)*, Voltage surge*, Functionality*, Protective impedance abnormal*, Capacitor short circuit abnormal*, Output abnormal*, Multi-supply abnormal*, Cooling abnormal*, Heating device abnormal*, Interlock abnormal*, Rigidity*, Cleaning*

Product Safety Standards	Title
Specific Product Safety Standards	
UL 60950 2000	Safety of information technology equipment
IEC 60950 1999	Safety of information technology equipment
EN 60950 2000	Safety of information technology equipment, including
IEC 60950-1 2001	Electrical business equipment.
UL 60950-1 2003	
CSA C22.2 No. 60950-00	
CSA C22.2 No. 60950-1 03	
IEC 61010-1 1993	Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements.
EN 61010-1 1993, 2001	Safety requirements for electrical equipment for measurement,
IEC 61010-1 2001	control and laboratory use, Part 1: General requirements.
UL 61010B-1 2003	
CAN/CSA 1010-1 1999 (*Including AM 2*)	Electrical equipment for laboratory use Part 1: General requirements.
IEC 60601-1 1995	Medical electrical equipment. Part 1: General requirements for safety.
EN 60601-1 1995 (*Including AM 2*)	Medical electrical equipment
UL 2601-1 1997	Medical electrical equipment. Part 1: General Requirements for safety.
IEC 60065 1998, 2000	Audio, video and similar electronic apparatus – Safety requirements
ANSI/UL 6500: 1998	Audio/video and musical instrument apparatus for Household,
CAN/CSA 60065-00	commercial and similar general use Australian/New Zealand
AS/NZS 60065 2000	Standard – Approval and test Specification – Mains operated electronic and related Equipment for household and similar general use
Canadian C22.2 No. 1-94 (1-98)	Audio, video and similar electronic equipment.
1994, 1998	Consumer and commercial products
EN 60065 1994	Safety requirements for main operated electronic and related apparatus for household and similar general use.
IEC 60825 1990	Radiation safety of laser products, equipment Classification, requirements and user's guide
EN 60825-1 1994	Safety of laser products Part 1: equipment

Product Safety Standards	Title
IEC 60825-1 2001	Classification, requirements and user's guide.
IEC 60825-2 2000-5	Safety of laser products – Part 2: Safety of optical communication systems
IEC 60825-4 1997-11	Safety of laser products – Part 4: Laser guards
21 CFR 1040.10	Performance standard for laser products
IEC 60335-1 1995	Safety of household and similar electrical appliances
(*Including AM2 – 1997 & AM 12 – 1997*)	Part 1: General requirements
EN 60335-1 2001	
UL 60335-1 1998	
CAN/CSA E335-1 1994	
UL 61010A-1: 2002	Electrical equipment for laboratory use; part 1: General requirements
EN 61010-1: 2001	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
AS/NZS 60950: 2000	Safety information technology equipment
EN 60950-1: 2001	Information Technology Equipment – Safety – Part1: General Requirements
AS/NZS 60950.1: 2003	Information Technology Equipment – Safety – General requirements
UL 61010 -1: 2004	Electrical Equipment for Measurement, Control and Laboratory Use; Part 1: General Requirements
UL 60601-1: 2003	Medical Electrical Equipment, Part 1: General Requirements for Safety
IEC 60601-1-1: 2000	Medical Electrical Equipment - Part 1: General Requirements For Safety 1: Collateral Standard: Safety Requirements For Medical Electrical Systems
EN 60601-1-1: 2001	Medical Electrical Equipment - Part 1: General Requirements for Safety – Section 1-1. Collateral Standard: Safety Requirements For Medical Electrical Systems
UL 60065: 2003	Audio, Video and Similar Electronic Apparatus – Safety Requirements
CSA 60065: 2003	Audio, Video and Similar Electronic Apparatus – Safety Requirements
IEC 60065: 2001	Audio, Video and Similar Electronic Apparatus – Safety Requirements
EN 60065: 2002	Audio, Video and Similar Electronic Apparatus – Safety Requirements
EN 60204 -1: 1998	Safety of Machinery – Electrical Equipment of Machines – Part 1: Specification for General Requirements
HKTA 2001	Compliance Test Specification – Safety and Electrical Protection Requirements for Subscriber Equipment Connected to the Public Telecommunications Networks In Hong Kong

Environmental Simulation

Test Technology	Test Standard	Supporting Standards
Accessibility*	IEC 60529	IP-0x thru IP-6x
Acoustic Noise*	GR-63-CORE Sec 4.6	
Airborne Contaminants	GR-63-CORE Sec 4.5	MFG & Hygroscopic Dust
Altitude	GR-63-CORE Sec 4.1.3	
Cold Start*	ETS 300 019	IEC 60068-2-1
Drip	IEC 60529	IP-x1 & IP-x2
Drops*	ETS 300 019	IEC 60068-2-32
	GR-63-CORE Sec 4.3	
Dust	IEC 60529	IP-5x & IP-6x
Firearms Resistance Testing	GR-487	
Fire Resistance	ANSLT1.319	
	GR-63-CORE Sec 4.2	Fire & Needle Flame
Heat Dissipation*	GR-63-CORE Sec 4.1.4	
Illumination	GR-63-CORE Sec 4.7	
Operational Temperature & Humidity (OpTH)*	ETS 300 019	IEC 60068-2-1 IEC 60068-2-2 IEC 60068-2-14 IEC 60068-2-56
	GR-63-CORE Sec 4.1.2	
Salt Fog & Spray	ASTM B117	
Spatial*	GR-63-CORE Sec 2.0 & 3.0	
Spraying-Splashing	IEC 60529	IP-x3 & IP-x4
Storage (Temperature & Humidity)*	ETS 300 019	IEC 60068-2-1 IEC 60068-2-2 IEC 60068-2-14 IEC 60068-2-30 IEC 60068-2-56
	GR-63-CORE Sec 4.1.1	
Vibration	ETS 300 019	IEC 60068-2-6 IEC 60068-2-27 IEC 60068-2-29 IEC 60068-2-32 IEC 60068-2-57 IEC 60068-2-64 Earthquake, Office & Transportation
	GR-63-CORE Sec 4.4	
Water Immersion	IEC 60529	IP-x7 & IP-x8
Water Jet	IEC 60529	IP-x5 & IP-x6

Note 1. For standards or methods listed on the scope of accreditation without a revision date, laboratories are expected to be competent in the use of the current version within one year of the date of publication of the standard test method or upon the date specified by the standard test method originator when the originator has implementation authority. When a superseded standard or method is required for an accredited test, the scope will include the superseded date/version. For those that support the TCB/CB status of the organization acting as a certifier on behalf of the FCC or IC the expectation is currency within 30 days of Federal Register publication of changes for FCC and 30 days after IC website update. This note shall not be construed as an Accreditation Body implication to adopt a more current standard than is required in a regulation or code (i.e. the legal requirement) which is adopted by the lab under their responsibility.

* On-site test service is available for this technology, test, or method.