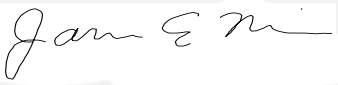
Report Administration

Report Number: SC1308738 Revision Number: 0

EQUIPMENT TESTED:	Portable Oxygen Concetrator
MODEL/PART NO(S):	Model 4000
SERIAL NO(S):	Sample # 4
TEST DATE(S):	Starting: August 30, 2013 Completing: August 30, 2013
PREPARED FOR:	Caire Inc. 12230 World Trade Drive, Suite 100 San Diego, CA 92128
CLIENT REQUESTER:	Name: Lorenzo Subido Tel: 858-202-3161 E-mail: lorenzo.subido@chartindustries.com
TEST LOCATION:	TÜV SÜD America San Diego (Mira Mesa) Laboratory 10040 Mesa Rim Road San Diego, CA 92121 Tel: 858 678 1400
Prepared By:	Name: James E. Morris Tel: 858-673-1453 E-mail: jmorris@tuvam.com

The information presented in this report is, to the best of our knowledge, true and correct in all respects.

	Tested By:	Written By:	Reviewed By:
Signature:			
Name:	James E Morris	James E Morris	David Gray
Title:	Senior EMC Engineer	Senior EMC Engineer	EMC Engineer

VERSION HISTORY

Version #	Implemented By	Revision Date	Page Numbers Revised	Total Number of Pages	Reason
N/A	J. Morris	30 August, 2013	N/A	22	Initial Release

Directory

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1.0 TEST STANDARDS / DOCUMENTS

1.1 The following documents were applicable to the preparation and performance of the EMC tests discussed:

RTCA/DO-160G: Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference

Other Documents: None

2.0 SUMMARY

2.1 Description of Equipment under Test::
Caire Model 4000 Portable Oxygen Concentrator.

2.2 Power Requirements:
The EUTs were designed to operate with internal battery for normal operational modes.
The EUT was not tested in charging mode as this is not a operational condition aboard aircraft.

2.3 Deviations from the Test Plan:
None

2.4 Recommendations.
None

2.5 TEST SPECIFICATION DEVIATIONS:
Additions To: None
Exclusions From: None

3.0 STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are accurate. The reader is cautioned that there is some measurement variability due to the tolerances of the test equipment that can contribute to a nominal product measurement uncertainty. Furthermore, component differences and manufacturing process variability of production units similar to that tested may result in additional product uncertainty. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests.

4.0 MODIFICATIONS REQUIRED TO PASS:

No modifications were implemented.

5.0 TEST CONFIGURATION AND GENERAL TEST PROCEDURES .

5.1 Description of Test Site

The testing was performed at TÜV SÜD America, Inc., San Diego, California, within a Shielded Room, 20' x 28' x 16', Metal, Semi-Anechoic Chamber.

5.2 Sequence of Testing

The test sequence was followed per the test engineer's discretion.

5.3 Ambient Measurements

Ambient surveys were performed to establish background noise levels where needed. For each ambient survey, EMI test equipment configuration was as it would be for the test. Receiver sweep speed, bandwidth, etc. was the same during the ambient survey as during testing. The frequency range for each test method was swept and measured levels recorded. As a minimum, ambient levels were 6 dB below the applicable test limit.

5.4 Instrumentation

Calibration intervals and requirements of all measurement instrumentation used were in accordance with ANSI/NCSL Z540-1-1994. All instruments and model numbers used during testing are listed in each test section.

5.5 Table 1: Test Summaries and Results lists the EMI/EMC tests performed and the compliance results.

6.0 TEST SPECIFICATION DEVIATIONS:

Additions To: None
Exclusions From: None

7.0 STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are accurate. The reader is cautioned that there is some measurement variability due to the tolerances of the test equipment that can contribute to a nominal product measurement uncertainty. Furthermore, component differences and manufacturing process variability of production units similar to that tested may result in additional product uncertainty. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests.

8.0 MODIFICATIONS REQUIRED TO PASS:

Oscillator crystals were grounded.

9.0 GENERAL CONFIGURATION AND BONDING TEST PROCEDURES

9.1 Electrical Bonding

A ground plane, having physical and electrical characteristics as defined in RTCA/DO-160G, was used to electrically bond the test sample to the shielded enclosure. Bond resistance between the test sample and ground plane satisfied the resistance requirements for Class R bonds per ANSI-NCSL Z540-1-1994 (i.e., 2.5 mΩ or less). Each time the test sample was repositioned bond resistance was verified and recorded. No physical bonding to the EUT is possible.

9.2 Test Configuration

The general EMI/EMC test configuration was as shown in photographs for each setup.

Table 1: Test Summaries and Results

RTCA/DO-160G	Description	Result	Appendix
SECTION 21	RTCA/DO-160G, SECTION 21 RADIATED RF EMMISIONS, Radiated Emissions, Electric Field, 100 MHz to 6 GHz, Category M	Pass	A

Appendix A.

SECTION 21 RADIATED RF EMMISIONS Category M.

Test Conditions: SECTION 21 RADIATED RF EMMISIONS –

The *SECTION 21 RADIATED RF EMMISIONS* test was performed in the following test location at the San Diego Testing Facility:

SR4, Shielded Room, 20' x 28' x 16', Metal, Semi-Anechoic Chamber

Test Equipment Used:

Table 2: SECTION 21 RADIATED RF EMMISIONS Test Equipment List

Model No.:	Prop. No.:	Manufacturer:	Description:	Serial No.:	Cal Due Date:
3115	SDGE06475	EMCO	DOUBLE RIDGE GUIDE ANT	9908-5927	19 Dec 13
94455-1	SDGE06611	Eaton	Antenna, Biconical	0811	23 Aug 14
96000	SDGE06720	Eaton	Antenna, Double Ridge Horn	2278	17 Nov 13
E4446A	SDGE06823	Agilent	SPECTRUM ANALYZER, PSA	US443300486	20 Sep 13
ZFL-1000	SDGE06386	TÜV SÜD America	Pre-Amplifier	--	07 Aug 14
AMF-5D-010180	SDGE06786	Miteq	Pre-Amplifier	--	01 Feb 14
SML03	SDGE07496	Rohde Schwarz	Signal Generator	100931	08 Aug 14

Test Specification:

Frequency: 100 MHz– 6 GHz

Ambient: Performed

Test Distance: 1 meter

Antenna Polarization: Vertical / Horizontal

Electrical Continuity Check: Yes

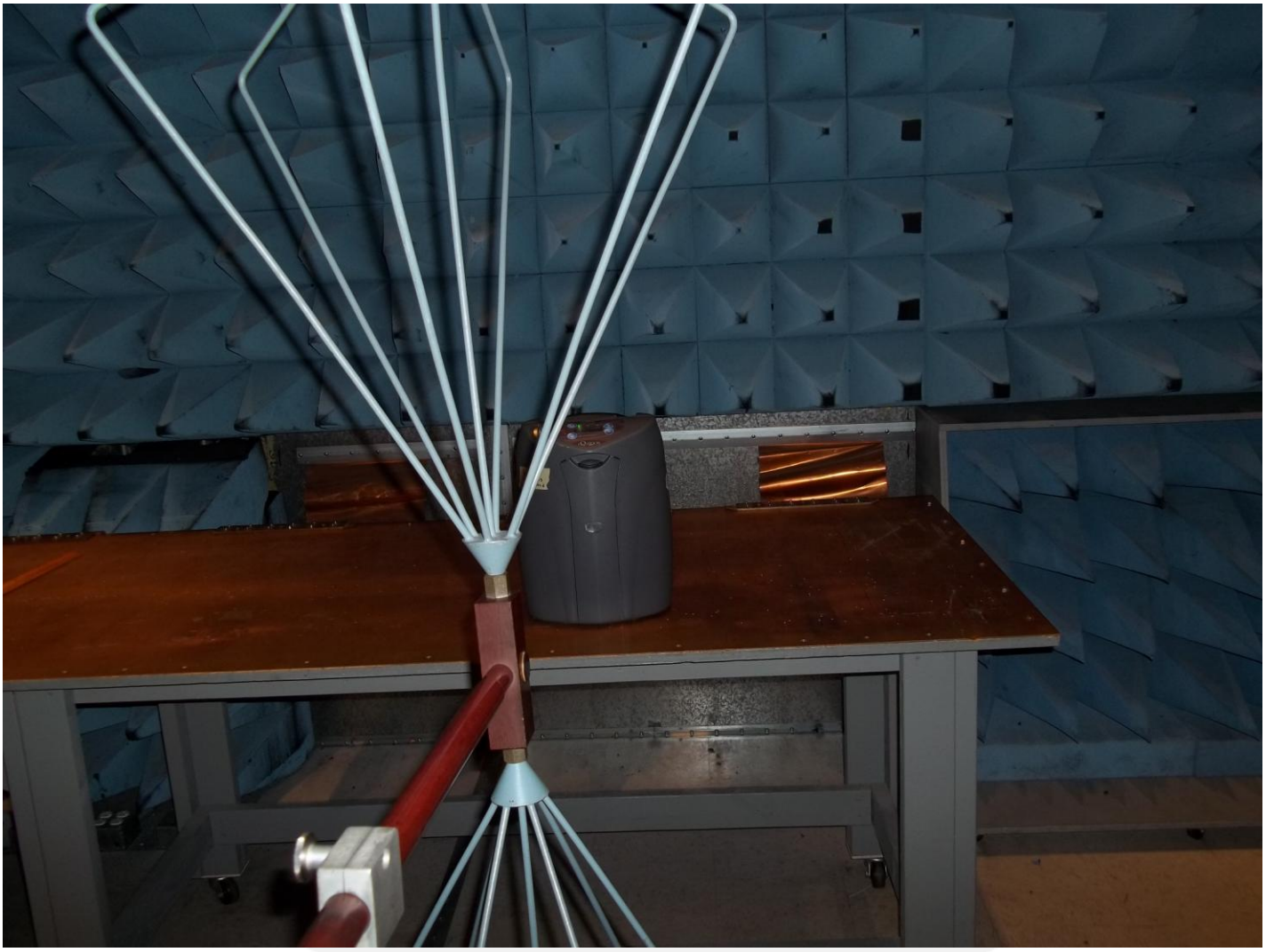
Test Type: Peak

Bandwidths: 10kHz (100 MHz – 400 MHz)
100 kHz (400 MHz – .98 GHz)
1 MHz (.98 – 6 GHz)

Result:
Positive

Remarks: See Test Plan and RTCA/DO-160G for test procedures and limit.

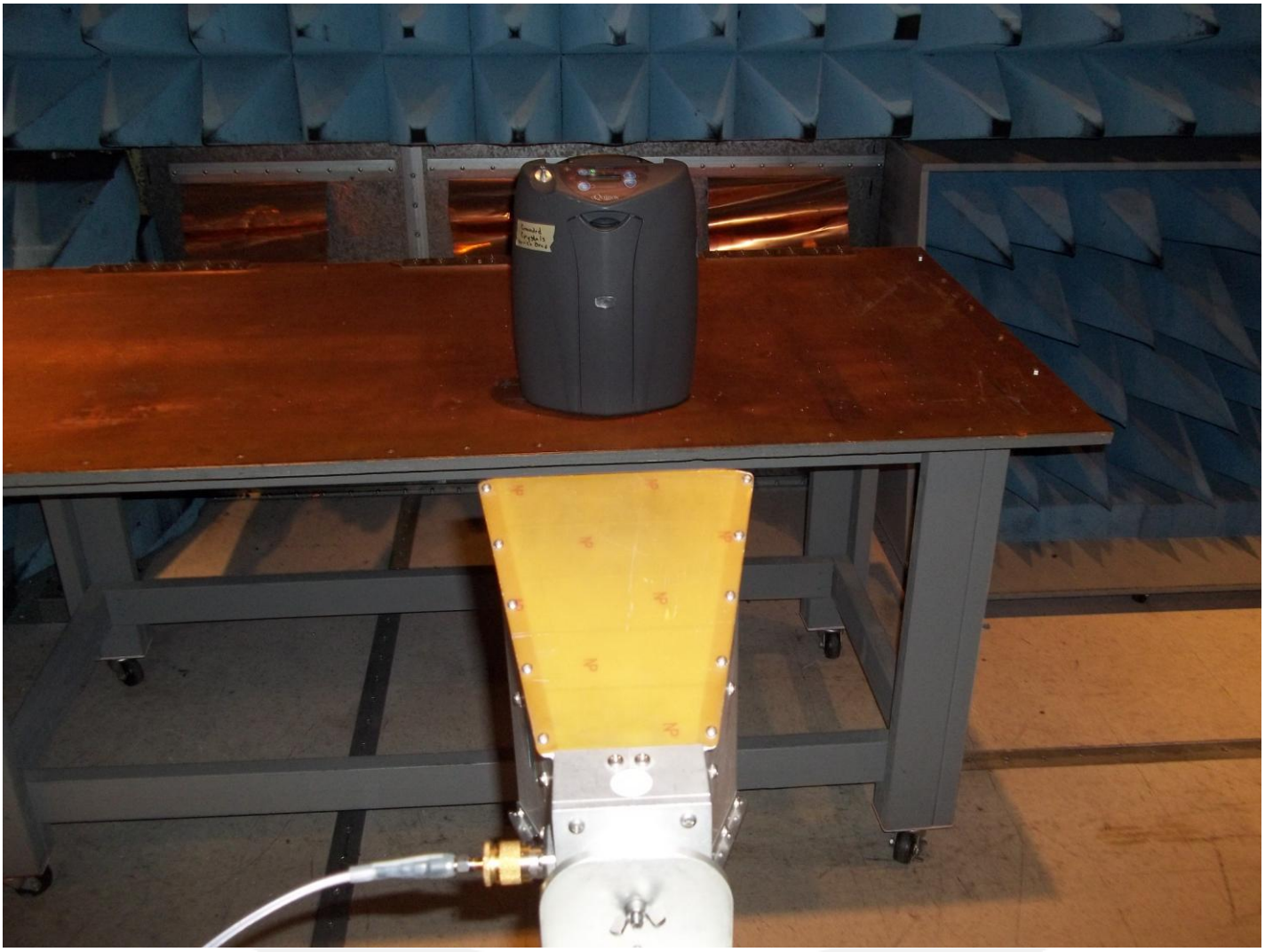
Photograph of Test Setup:
SECTION 21 RADIATED RF EMMISIONS Radiated Emissions



Photograph 1: SECTION 21 RADIATED RF EMMISIONS 100 MHz to 200 MHz,

Biconical Antenna 1 m Setup

Photograph 2: SECTION 21 RADIATED RF EMMISIONS 200 MHz to 1 GHz, Double Ridge Guide 1m Setup



Photograph 3: SECTION 21 RADIATED RF EMMISIONS 1 GHz to 6 GHz, Double Ridge Guide Antenna

Appendix B.

Accreditations

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

TUV SUD AMERICA INC.
10040 Mesa Rim Road
San Diego, CA 92121
Mr. Barry Quinlan bquinlan@tuvam.com
Phone: 978-573-2528

ELECTRICAL (EMC)

Valid to: December 31, 2013 Certificate Number: 2955.13

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

Test Technology:	Test Method(s)[1]:
Emissions [2]	
Generic (Commercial)	IEC/EN 61000-6-1; KN 61000-6-1; AS/NZS 61000.6.1; IEC/EN 61000-6-2; KN 61000-6-2; AS/NZS 61000.6.2; IEC/EN 61000-6-3; KN 61000-6-3; AS/NZS 61000.6.3; IEC/EN 61000-6-4; KN 61000-6-4; AS/NZS 61000.6.4; CISPR 13; EN 50121-3-2; EN 50155; EN 55013; KN 13; CISPR 20; KN 20 (*only for audio/video equipment without tuner*); CISPR 24; EN 55024; KN 24; CISPR 25; EN 50130-4; EN 55014-1; CISPR 14-1; KN 14-1; CISPR 14-2; KN 14-2; EN 55014-2; EN 55103-1; EN 55103-2; EN 61326-1; EN 61326-2-1; EN 61326-2-6; IEC 60601-1-2; EN 60601-1-2; EN 60601-2-2; EN 60601-2-10; EN 60601-2-18; EN 60601-2-22; EN 60601-2-24; EN 301 437; EN 300 386; EN 301 449 EN 301 511; EN 301 489-1 to -34; EN 301 908-1 to -22; ES 203 021; KN 301 489-01; KN 301 489-7; KN 301 489-17; KN 301 489-24; RTCA/DO-160 D, F[3] (section 21); RTCA/DO-160 E[3] (section 21)
Radiated & Conducted	Code of Federal Regulation (CFR) 47, FCC Part 18 (using FCC MP-5); EN 55011; KN 11; CISPR 11; AS/NZS CISPR 11; ICES-001; EN 55022; KN 22; CISPR 22; AS/NZS CISPR 22; ICES-003; CNS 13438 (*up to 6 GHz*); VCCI V-3 (*up to 6 GHz*); ICES-005; ICES-006; TEC/EMI/TEL-001/01/FEB-09; TCVN 7189:2009 (CISPR 22:2006)
Harmonics	IEC 61000-3-2; EN 61000-3-2
Voltage Flicker / Fluctuations	IEC 61000-3-3; EN 61000-3-3

5301 Buckeystown Pike, Suite 350 | Frederick, Maryland 21704-8373 | Phone: 301 644 3248 | Fax: 301 662 2974 | www.A2LA.org

Test Technology:	Test Method(s)[1]:
Immunity [2]	
Generic Immunity	RTCA/DO-160 D, F[3] (sections 15, 16, 17, 18, 19, 20, 22, 25); RTCA/DO-160 E[3] (sections 15, 16, 17, 18, 19, 20.4, 20.5, 22, 25); ANSI/AAMI PC69 (*sections 4.8 and 4.9 only*); TCVN 7317:2003 (CISPR 24:1997)
ESD	IEC 61000-4-2; KN 61000-4-2
Radiated Immunity	IEC 61000-4-3; KN 61000-4-3
EFT/Burst	IEC 61000-4-4; KN 61000-4-4
Surge	IEC 61000-4-5; KN 61000-4-5
Conducted Immunity	IEC 61000-4-6; KN 61000-4-6
Magnetic Field Immunity	IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8
Pulse Magnetic Field Immunity	IEC 61000-4-9
Damped Oscillatory Magnetic Field Immunity	IEC 61000-4-10
Voltage Dips, Shorts, Variations	IEC 61000-4-11; KN 61000-4-11
Harmonics and Interharmonics	IEC 61000-4-13
Common Mode Disturbance – Conducted Immunity from 0 to 150 kHz	IEC 61000-4-16

EPA ENERGY STAR Testing

Product Type:	Product Specification / Test Methods:
Audio/Video	EPA ENERGY STAR Product Specification for Audio/Video Equipment; EPA ENERGY STAR Test Method for Audio/Video (sections 7 through 9)
Battery Chargers	IEC 61951-1; IEC 61951-2; IEC 61960; EPA ENERGY STAR Product Specification for Battery Charging Systems; EPA ENERGY STAR Test Method for Battery Charging Systems
Computers	EPA ENERGY STAR Product Specification for Computers; EPA ENERGY STAR Test Method for Computers; IPS Generalized Internal Power Supply Efficiency Test Protocol (ver 6.4.2)
Computer Servers	EPA ENERGY STAR Product Specification for Computer Servers; EPA ENERGY STAR Test Method for Computer Servers (Appendix A)

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Test Technology:	Test Method(s)[1]:
EPA ENERGY STAR Testing (Continued)	
Product Type:	**Product Specification / Test Methods:**
Imaging Equipment	EPA ENERGY STAR Product Specification for Imaging Equipment; EPA ENERGY STAR Test Method for Imaging Equipment; IEC 62301 (2005)
Telephony	EPA ENERGY STAR Product Specification for Telephony; EPA ENERGY STAR Test Method for Telephony
Product Safety Tests	
CONT	IEC 60730-1 (2007); CAN/CSA-E60730-1 (2013); UL 60730-1 Ed. 4 (2009)
HOUS	IEC 60335-1 (2001+A1:2004+A2:2006, 2010); IEC 60335-2-9 (ed.5); am1; am2 – 2002; IEC 60335-2-9 (ed.6) – 2008; IEC 60335-2-12 (ed.5) – 2002; IEC 60335-2-14 (ed.5); am1 – 2006; IEC 60335-2-29 (ed.4); am1 – 2002; IEC 60335-2-30 (ed.4); am1; am2 – 2002; IEC 60335-2-30 (ed.5) – 2009; IEC 60335-2-41 (ed.3); am1; am2 – 2002; IEC 60335-2-45 (ed.3) – 2002; IEC 60335-2-51 (ed.3); am1 – 2002; IEC 60335-2-52 (ed.3); am1 – 2002; IEC 60335-2-55 (ed.3) – 2002; IEC 60335-2-60 (ed.3); am1; am2 – 2002; IEC 60335-2-66 (ed.2) – 2002; IEC 60335-2-69 (ed.3); am1; am2 – 2002; IEC 60335-2-75 (ed.2); am1; am2 – 2002; IEC 60335-2-80 (ed.2); am1; am2 – 2002; UL 60335-1 Ed. 5 (Oct 31 2011); CAN/CSA-E60335-2-9 (2013); CAN/CSA-E60335-2-12 (2013); CAN/CSA-E60335-2-14-05 (R2009); CAN/CSA-E60335-2-29-06 (R2011); CAN/CSA-E60335-2-30 (2013); CAN/CSA-E60335-2-41 (2013); CAN/CSA-E60335-2-51-01 (R2011); CAN/CSA-E60335-2-52-01 (R2011); CAN/CSA-E60335-2-55-05 (R2009); CAN/CSA-E60335-2-69-01 (R2010)
MEAS	IEC 61010-1 (2001, 2010); IEC 61010-2-010 (ed.2) – 2003; IEC 61010-2-020 (ed.2) – 2006; IEC 61010-2-031 (ed.1) – 1993; IEC 61010-2-032 (ed.2) – 2002; IEC 61010-2-040 (ed.1) – 2005 CAN/CSA-C22.2 NO. 61010-1-12;

Test Technology:	Test Method(s)[1]:
Product Safety Tests (Cont'd)	
MEAS (Cont'd)	CAN/CSA-C22.2 NO. 61010-2-010-04 (R09); CAN/CSA-C22.2 NO. 61010-2-020-09; CAN/CSA-C22.2 NO. 61010-2-032-04 (R2009); CAN/CSA-C22.2 NO. 61010-2-040-07 (R2013); UL 61010-1 Ed. 2 (2004); UL 61010-1 Ed. 3 (2012)
MED	IEC 60601-1 (1988+A1:1991+A2:1995, 2005+A1:2012); IEC 60601-1-1 (2000); IEC 60601-1-2 (2007); IEC 60601-1-4 (1996+A1, 2000); IEC 60601-1-6 (2004, 2006, 2010); IEC 60601-1-8 (2003+A1, 2006+A1); IEC 60601-1-11 (2010); IEC 60601-2-2 (2006, 2009); IEC 60601-2-4 (2002, 2010); IEC 60601-2-10 (1987+A1, 2012); IEC 60601-2-12 (2001); IEC 60601-2-14 (1989); IEC 60601-2-18 (1996, 2009); IEC 60601-2-19 (1996+A1, 2012); IEC 60601-2-20 (1990+A1, 2009); IEC 60601-2-21 (1996+A1, 2009); IEC 60601-2-22 (1995, 2007+A1, 2012); IEC 60601-2-23 (1999, 2011); IEC 60601-2-24 (1998, 2012); IEC 60601-2-25 (1993+A1, 2011); IEC 60601-2-26 (1994, 2002, 2012); IEC 60601-2-27 (1994, 2005, 2011); IEC 60601-2-29 (1993+A1, 1999, 2008); IEC 60601-2-30 (1995, 1999); IEC 60601-2-31 (1994+A1, 2008+A1); IEC 60601-2-34 (1994, 2000, 2011); IEC 60601-2-36 (1997); IEC 60601-2-38 (1996+A1); IEC 60601-2-40 (1998); IEC 60601-2-41 (2000, 2009); IEC 60601-2-47 (2001, 2012); IEC 60601-2-49 (2001, 2011); IEC 60601-2-51 (2003); IEC 62304 (2006); IEC 62366 (2007); EN 60601-1 (1988+A2:1995, 2006); EN 60601-1-1 (2001); EN 60601-1-2 (2007); EN 60601-1-4 (1996+A1); EN 60601-1-6 (2007, 2010);

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Test Technology:	Test Method(s)[1]:
Product Safety Tests (Cont'd)	
MED (Cont'd)	EN 60601-1-8 (2006); EN 60601-1-11 (2010); EN 60601-2-2 (2007, 2009+A1); EN 60601-2-4 2003, 2011); EN 60601-2-10 (2000+A1); EN 60601-2-12 (2006); EN 60601-2-19 (1996+A1, 2009+A11); EN 60601-2-20 (2009+A11); EN 60601-2-21 (1996+A1, 2009+A11); EN 60601-2-22 (1996, 2013) EN 60601-2-24 (1998); EN 60601-2-26 (1994, 2003); EN 60601-2-29 (1995+A1, 1999, 2008+A11); EN 60601-2-30 (1995, 2000); EN 60601-2-31 (1995+A1, 2008+A1); EN 60601-2-34 (2000); EN 60601-2-36 (1997); EN 60601-2-38 (1996+A1); EN 60601-2-40 (1998); EN 60601-2-41 (2000, 2009+A11); EN 60601-2-47 (2001); EN 60601-2-51 (2003); EN 62304 (2006); EN 62366 (2008); UL 60601-1 (2003); CAN/CSA C22.2 No. 601.1-M90); CAN/CSA C22.2 No. 60601-1-08); CAN/CSA C22.2 No. 60601-1-1 (2002); CAN/CSA C22.2 No. 60601-1-4 (2002); CAN/CSA C22.2 No. 60601-1-6 (2008, 2011); CAN/CSA C22.2 No. 60601-1-8 (2005, 2008); CAN/CSA C22.2 No. 60601-1-11 (2011); CAN/CSA C22.2 No. 60601-2-2 (2008, 2009); CAN/CSA C22.2 No. 601.2.4 (1992); CAN/CSA C22.2 No. 60601-2-18 (2011); CAN/CSA C22.2 No. 60601-2-19 (2009); CAN/CSA C22.2 No. 60601-2-20 (2010); CAN/CSA C22.2 No. 60601-2-21 (2010); CAN/CSA C22.2 No. 60601-2-22 (2001, 2008); CAN/CSA C22.2 No. 60601-2-23 (2002, 2012); CAN/CSA C22.2 No. 60601-2-27 (2006, 2011); CAN/CSA C22.2 No. 60601.2.29 (2002, 2010); CAN/CSA C22.2 No. 60601-2-30 (2001, 2002); CAN/CSA C22.2 No. 60601-2-31 (2009); CAN/CSA C22.2 No. 60601.2.40 (2001);

Test Technology:	Test Method(s)[1]:
Product Safety Tests (Cont'd)	
MED (Cont'd)	CAN/CSA C22.2 No. 60601-2-41 (2002, 2011); CAN/CSA C22.2 No. 60601.2.49 (2004, 2011); ANSI/AAMI ES 60601-1 (2005); AAMI HA 60601-1-11 (2011); AAMI IEC 60601-2-2 (2006, 2009); AAMI IEC 60601-2-4 (2010); AAMI IEC 60601-2-19 (2009); AAMI IEC 60601-2-20 (2009); AAMI IEC 60601-2-21 (2000+A1, 2009); AAMI IEC 60601-2-25 (2011); AAMI IEC 60601-2-47 (2012); AAMI IEC 62304 (2006); AAMI IEC 62366 (2007); ISO 80601-2-12 (2011); EN ISO 80601-2-12 (2011); ISO 80601-2-55 (2011); EN ISO 80601-2-55 (2011); ISO 80601-2-61 (2011); EN ISO 80601-2-61 (2011);
MISC	IEC 60825-1 (1993+A1+A2, 2007); IEC 60825-2 (2000, 2004+A1+A2); CAN/CSA-E60825-1-03 (R2012)
OFF	AS/NZS 60950.1 (2003+A1:2006+A2:2008+A3:2008, 2011); IEC 60950 (1991+A1+A2+A3+A4, 1999); IEC 60950-1 (2001, 2005+A1); IEC 60950-22 (2005) IEC 62040-1-1 (2004); IEC 62040-1 (2008); CAN/CSA-C22.2 NO. 60950-1-07 (R2012); CAN/CSA-C22.2 NO. 60950-22-07 (R2012) UL 60950-22 Ed. 1 (2007); UL 60950-1 Ed. 1 (2003, 2007);
TRON	IEC 60065 (2001+A1+A2); UL 60065 Ed. 7 (2003)
SAFE	IEC 61558-1 (2005+A1); IEC 61558-2-6 (2009)

Test Technology:	Test Method(s)[1]:
Radio Tests	ANSI/TIA 603-C-2004; EN 300 220-1; EN 300 220-2; EN 300 220-3; EN 300 330-1; EN 300 330-2; EN 300 440-1; EN 300 440-2; EN 301-357-2; EN 300 328; EN 300 761-1; EN 301 426; EN 301 427; EN 301 428; EN 301 444; EN 301 839; EN 301 893; EN 302 502; EN 302 291-1; EN 302 291-2; EN 302 208-1; EN 302 208-2; EN 300 761-2; EN 301 908-1-22; EN 601 681; AS/NZS 4268; NOM-121-SCTI-2009; LP0002; QCVN 47:2011/BTTTT (*2450 MHz to 10.5 GHz*); ANATEL Resolution 506 ;ARIB STD-T66 (v2.1); RSS-GEN; RSS-102; RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-138*; RSS-139; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196; RSS-197; RSS-199; RSS-210; RSS-213; RSS-215; RSS-220; RSS-236; RSS-243; RSS-287; RSS-288; RSS-310; 47 CFR (FCC Rules) Parts 2 and 11; 47 CFR (FCC Rules) Part 15.B using ANSI C63.4-2003; 47 CFR (FCC Rules) Part 15.C using ANSI C63.4-2003; 47 CFR (FCC Rules) Part 15.D using ANSI C63.17-1998; 47 CFR (FCC Rules) Part 15.E using ANSI C63.4-2003; 47 CFR (FCC Rules) Part 18 using FCC MP-5; 47 CFR (FCC Rules) Parts 22 (cellular and non-cellular), 24, 25, 27, 73, 74, 80, 87, 90, 95, 97 and 101 using Part 2 and ANSI/TIA 603-C-2004; HKCA 1002 (issue 6); HKCA 1003 (issue 4); HKCA 1007 (issue 5); HKCA 1008 (issue 3); HKCA 1033 (issue 7); HKCA 1035 (issue 6);HKCA 1039 (issue 4); HKCA 1042 (issue 2); HKCA 1043 (issue 4); HKCA 1048 (issue 2); HKCA 1049 (issue 1); HKCA 1052 (issue 2); HKCA 1054 (issue 1); HKCA 1057 (issue 1); HKCA 1061 (issue 1); IDA TS LMR (Issue 1, Rev 4); IDA TS WBA (Issue 1, Rev 2); IDA TS GMPCS (Issue 1, Rev 4); IDA TS SRD (Issue 1, Rev 7); IDA TS CMT (Issue 1, 2011); IDA TS UWB (Issue 1, Rev 1); LP0002 (2011); ARIB STD-66; QCVN 11:2010/BTTTT; QCVN 12:2010/BTTTT; QCVN 13:2010/BTTTT; QCVN 15:2010/BTTTT; QCVN 18:2010/BTTTT; QCVN 54:2011/BTTTT; QCVN 55:2011/BTTTT; NOM-121-SCTI-2009; PLMN01 (2007); PLMN08 (2007); RTTE01 (2007); IEC 62209 - Part 1, Part 2; EN 62209 - Part 1, Part 2; EN 50360; EN 50364; EN 50371; IEC 62311; EN 62311

Test Technology:	Test Method(s)[1]:
Military Emissions & Immunity	Emissions Tests: MIL-STD-462 (methods RE01, RE02, RE03, CE01, CE02, CE03, CE04, CE06, CE07); MIL-STD-462 D (methods RE101, RE102, RE103, CE101, CE102, CE106); MIL-STD-461 E (methods RE101, RE102, RE103, CE101, CE102, CE106); MIL-STD-461 F (methods RE101, RE102, RE103, CE101, CE102, CE106) Immunity Tests: MIL-STD-462 (methods RS01, RS02, RS03[4], CS03, CS04, CS05, CS07, CS12, CS13); MIL-STD-462 D (methods RS101, RS103, CS101, CS103, CS104, CS105, CS109, CS114, CS115, CS116); MIL-STD-461 E (methods CS101, CS103, CS104, CS105, CS109, CS114, CS115, CS116); MIL-STD-461 F (methods RS101, RS103, CS101, CS103, CS104, CS105, CS106, CS109, CS114, CS115, CS116)
Technical Regulations for the Republic of Korea *(issued by Korea June 10, 2013)*	Technical Requirements for Electromagnetic Interference (RRA Public Notification 2012-13, June 28, 2012); Technical Requirements for Electromagnetic Susceptibility (RRA Public Notification 2012-14, June 28, 2012); Test Methods for Electromagnetic Interference (RRA Announce 2012-21, June 28, 2012); Test Methods for Electromagnetic Susceptibility (RRA Announce 2012-21, June 28, 2012) Notice on Conformity Assessment of Broadcasting and Communications Equipment (RRA Public Notification 2012-16, Sept 24, 2012)

[1] When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is required to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*. If a specifier/regulator imposes a different transition period, this will supersede the A2LA one year implementation period.

[2] This laboratory utilizes a 10m Semi-Anechoic Chamber (SAC) located at 16530 Via Esprillo, San Diego, CA

[3] Single stroke waveform only, 1, 2, 3, 4, 5B

[4] Laboratory utilizes RADHAZ procedures for high level testing

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American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

TUV SUD AMERICA INC.

San Diego, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 17th day of June 2013.

President & CEO
For the Accreditation Council
Certificate Number 2955.13
Valid to December 31, 2013
Revised July 24, 2013

For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.