



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8**

CERTIFICATION TEST REPORT

FOR

MAGNETIC CHARGING CASE

MODEL NUMBER: A1647

REPORT NUMBER: 15U19950-E1, REVISION B

**FCC ID: BCGA1647
IC: 579C-A1647**

ISSUE DATE: FEBRUARY 23, 2015

Prepared for
**APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.**

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	02/13/2015	Initial Issue	M. Mekuria
A	02/19/2015	Revised report to address TCB's questions	M. Mekuria
B	02/23/2015	Revised report to address TCB's question on Section 5.4	T. Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: MAGNETIC CHARGING CASE

MODEL: A1647

SERIAL NUMBER: DLC5036000QG6L429

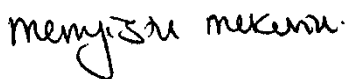
DATE TESTED: FEBRUARY 03 – 04, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Pass
RSS-210 Issue 8	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

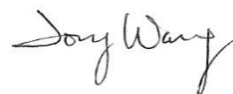
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:



MENGISTU MEKURIA
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.

Tested By:



TONY WANG
EMC ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, FCC CFR 47 Part 2, and FCC CFR 47 Part 15, RSS-GEN Issue 4 and RSS-210 Issue 8 December 2010.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☐ Chamber D
☐ Chamber B	☐ Chamber E
☐ Chamber C	☐ Chamber F
	☒ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a stainless steel magnetic charger enclosed in a plastic case. The charger includes an inductive charging coil to charge the Apple Watch.

5.2. MAXIMUM OUTPUT POWER

The transmitter has maximum peak radiated electric field strength at 300m distance as follows:

Fundamental Frequency (KHz)	Mode	E field (300m distance) (dBuV/m)
326.5	Standby	-18.19

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was v092.

5.4. WORST-CASE CONFIGURATION AND MODE

The EUT is a single frequency stainless steel magnetic charger enclosed in a plastic case. The For the entire radiated emissions test, the EUT was investigated on the following configuration during the test at its natural orientation.

Configuration	Mode	Descriptions
1	Standby	EUT Alone powered by AC/DC adapter
2	Operating	EUT and Watch powered by AC/DC adapter

AC power line conducted emissions were also investigated with the following configurations and EUT powered by AC/DC adapter was the worst-case scenario. All final tests conducted on configuration 1 and 2.

Configuration	Mode	Descriptions
1	Standby	EUT Alone powered by AC/DC adapter
2	Operating	EUT and Watch powered by AC/DC adapter
3	Standby	EUT Alone powered by laptop
4	Operating	EUT and Watch powered by laptop

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Apple	A1385	D29236C3AFDHLHCT	N/A
Watch	Apple	A1554	FG7NPOVLFY2H	BCG-E2871
Watch	Apple	A1553	FG7NG0CVFY1P	BCG-E2870

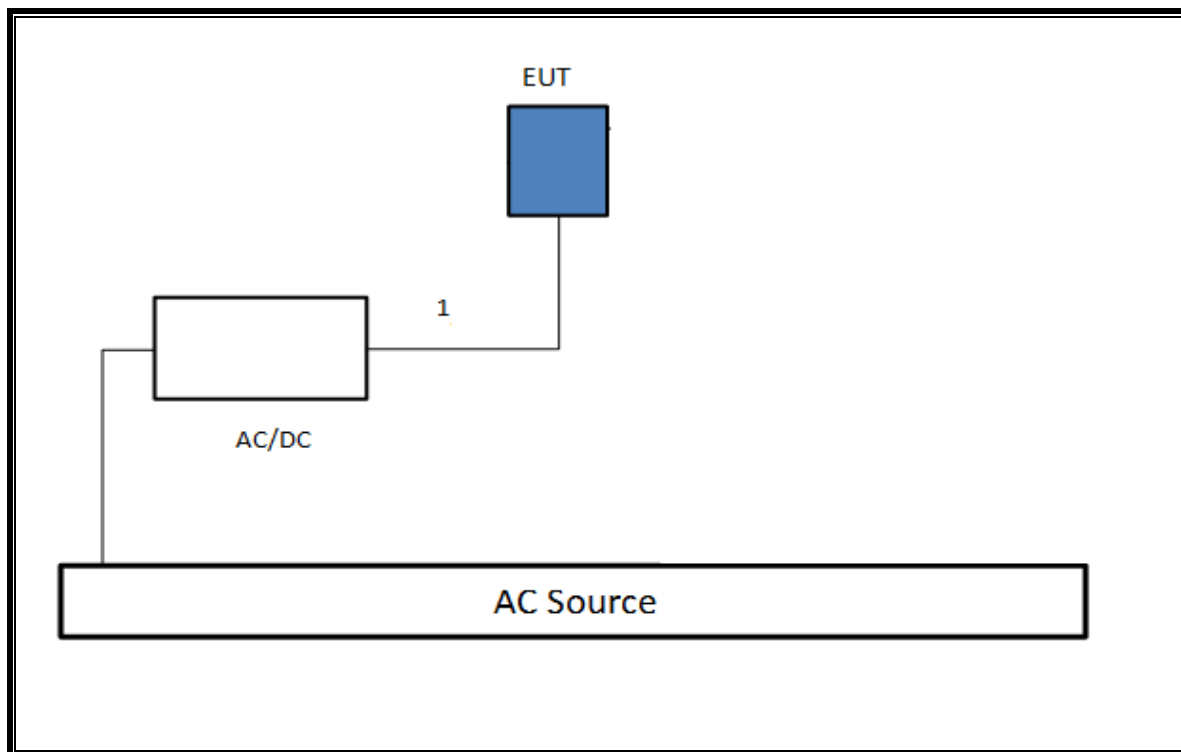
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	USB	Un-shielded	2	N/A

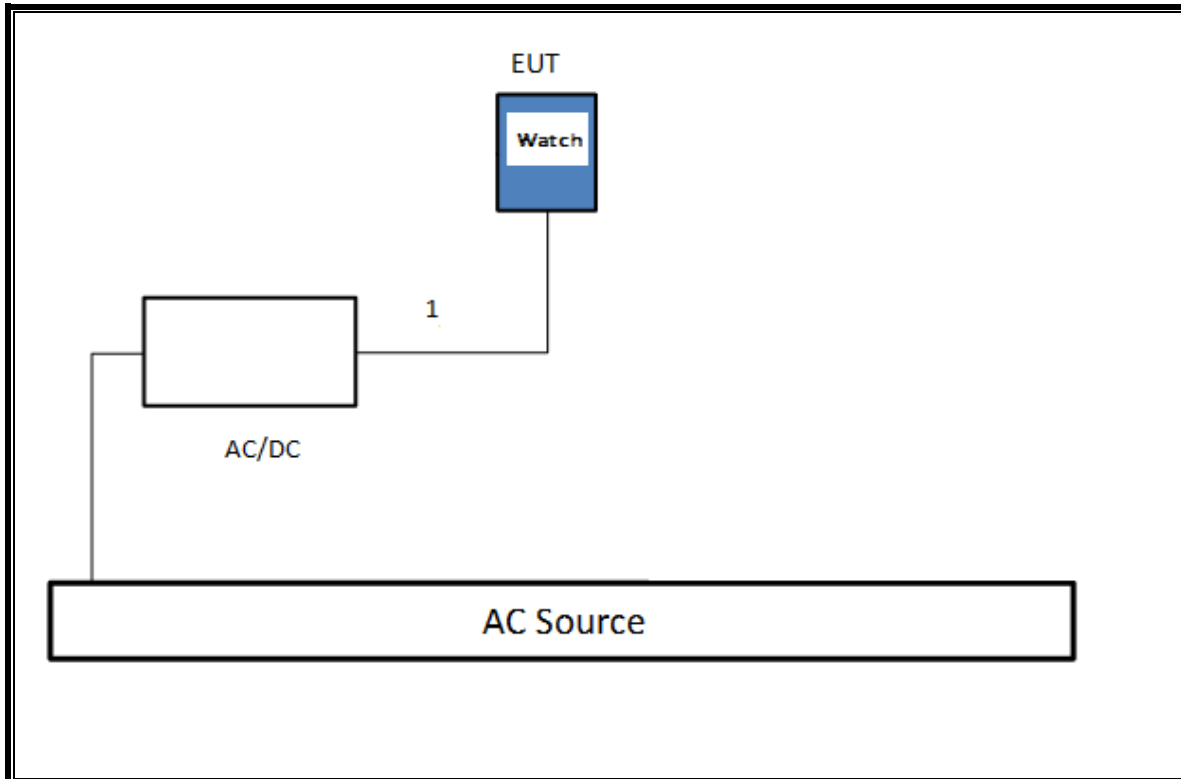
TEST SETUP

Please see the following configurations for the test setups. Both configurations indicate that the EUT is directly connected to an AC/DC adapter via USB cable.

CONFIGURATION 1: STANDBY MODE



CONFIGURATION 2: OPERATING MODE



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Description	Manufacturer	Model	Asset	Cal Due
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	A051314-2	06/05/15
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	325118	04/27/15
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY53311010	05/17/15
Antenna, Loop, 30 MHz	ETS Lindgren	6502	F00366	10/04/15
Switch Driver	ACS	11713A	2508A04052	N/A
Antenna, Hybrid 30MHz to 2GHz	Sunol Sciences	JB3	T407	05/05/15
PXA Signal Analyzer 3Hz to 44GHz	Agilent	N9030A	T340	03/11/15
EMI Test Receiver	R & S	ESCI 7	T284	09/16/15
LISN, 10 kHz - 30 MHz	FCC	50/250-25-2	T24	01/17/16

7. OCCUPIED BANDWIDTH

The emission bandwidth ($\times$ dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated $\times$ dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least $3\times$ the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

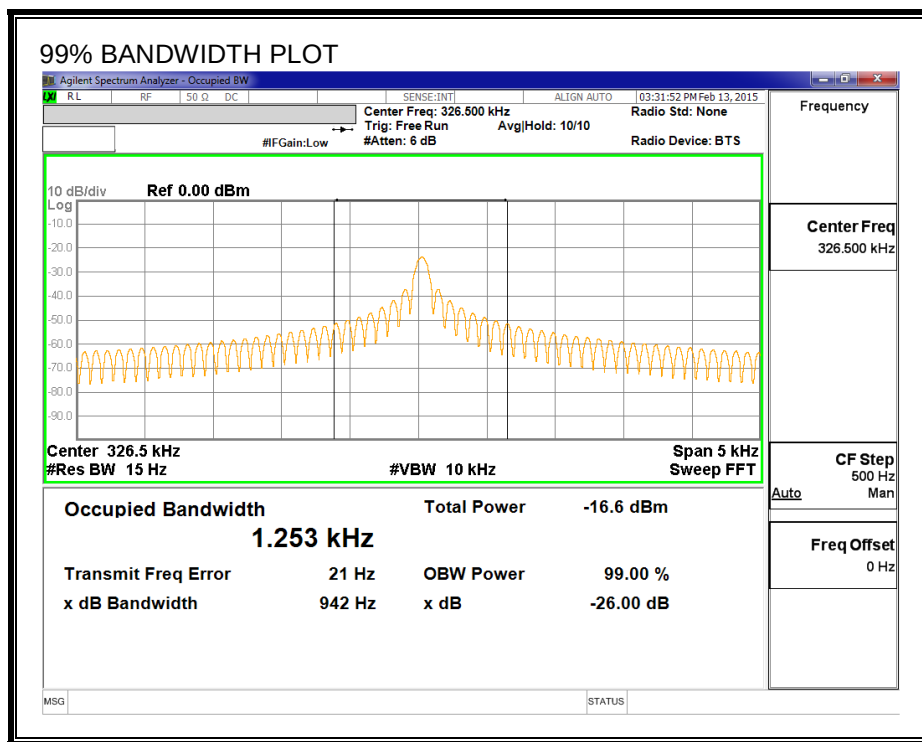
- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately $3\times$ RBW.

Note: Video averaging is not permitted.

A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.

The difference between the two recorded frequencies is the 99% occupied bandwidth.



8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.209 (a)

IC RSS-GEN, Section 8.9 and 8.10.

IC RSS-GEN, Section 7 (Receiver)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (m)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960 MHz	500	3
Note: The lower limit shall apply at the transition frequency.		

RESULTS

8.2. TX FUNDAMENTAL FROM 0.15 TO 30 MHz

8.2.1. STANDBY CONFIGURATION CHARGER

FCC Part 15, Subpart B & C

3 Meter Distance Measurement At Chamber-G

Company:

Project #: 15U19950

EUT configuration #: Charger

Mode of operation: Standby

Tester: T Wang

Date: 2/3/2015

Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF dB/m	Distance (m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes
Loop Antenna Face On:													
0.3265	51.27		38.23	10.54	3	-80.00	-18.19	-31.23	37.33	17.33	-55.5	-48.6	
Loop Antenna Face Off:													
0.3265	47.61		32.73	10.54	3	-80.00	-21.85	-36.73	37.33	17.33	-59.2	-54.1	

* No more emissions were found up to 30MHz

Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.

P.K. = Peak

Q.P. = Quasi Peak Readings Below 150kHz => RBW=VBW=200 or 300Hz

A.F. = Antenna factor Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)

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8.2.2. OPERATING CONFIGURATION CHARGER

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FCC Part 15, Subpart B & C														3 Meter Distance Measurement At Chamber-G	
Company:															
Project #: 15U19950															
EUT configuration #: Charger + Supporting Device															
Mode of operation: Operating															
Tester: T Wang															
Date: 2/3/2015															
Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF (dB/m)	Distance (m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes		
Loop Antenna Face On:															
0.3265	42.45		32.64	10.54	3	-80.00	-27.01	-36.82	37.33	17.33	-64.3	-54.1			
Loop Antenna Face Off:															
0.3265	41.67		31.43	10.54	3	-80.00	-27.79	-38.03	37.33	17.33	-65.1	-55.4			
* No more emissions were found up to 30MHz															
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.															
P.K. = Peak															
Q.P. = Quasi Peak Readings Below 150kHz => RBW=VBW=200 or 300Hz															
A.F. = Antenna factor Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)															
Rev. 060314															

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FCC Part 15, Subpart B & C														3 Meter Distance Measurement At Chamber-G	
Company:															
Project #: 15U19950															
EUT configuration #: Charger + Supporting Device															
Mode of operation: Operating															
Tester: T Wang															
Date: 2/4/2015															
Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF (dB/m)	Distance (m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes		
Loop Antenna Face On:															
0.3265	42.49		32.41	10.54	3	-80.00	-26.97	-37.05	37.33	17.33	-64.3	-54.4			
Loop Antenna Face Off:															
0.3265	41.57		31.75	10.54	3	-80.00	-27.89	-37.71	37.33	17.33	-65.2	-55.0			
* No more emissions were found up to 30MHz															
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.															
P.K. = Peak															
Q.P. = Quasi Peak Readings Below 150kHz => RBW=VBW=200 or 300Hz															
A.F. = Antenna factor Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)															
Rev. 060314															

8.3. TX SPURIOUS EMISSIONS FROM 0.15 TO 30 MHz

8.3.1. STANDBY CONFIGURATION CHARGER

Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF (dB/m)	Distance (m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes
Face On													
0.653	39.15	33.11	-	10.53	3	-40.00	3.64	-	31.31	-	-27.7	-	
0.978	35.27	29.36	-	10.6	3	-40.00	-0.04	-	27.80	-	-27.8	-	
1.307	30.38	24.27	-	10.6	3	-40.00	-5.13	-	25.28	-	-30.4	-	
Face Off:													
0.658	36.36	30.23	-	10.53	3	-40.00	0.76	-	31.24	-	-30.5	-	
1.305	27.98	21.76	-	10.6	3	-40.00	-7.64	-	25.29	-	-32.9	-	

* No more emissions were found up to 30MHz

Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.

P.K. = Peak
Q.P. = Quasi Peak Readings Below 150kHz => RBW=VBW=200 or 300Hz
A.F. = Antenna factor Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)

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8.3.2. OPERATING CONFIGURATION CHARGER

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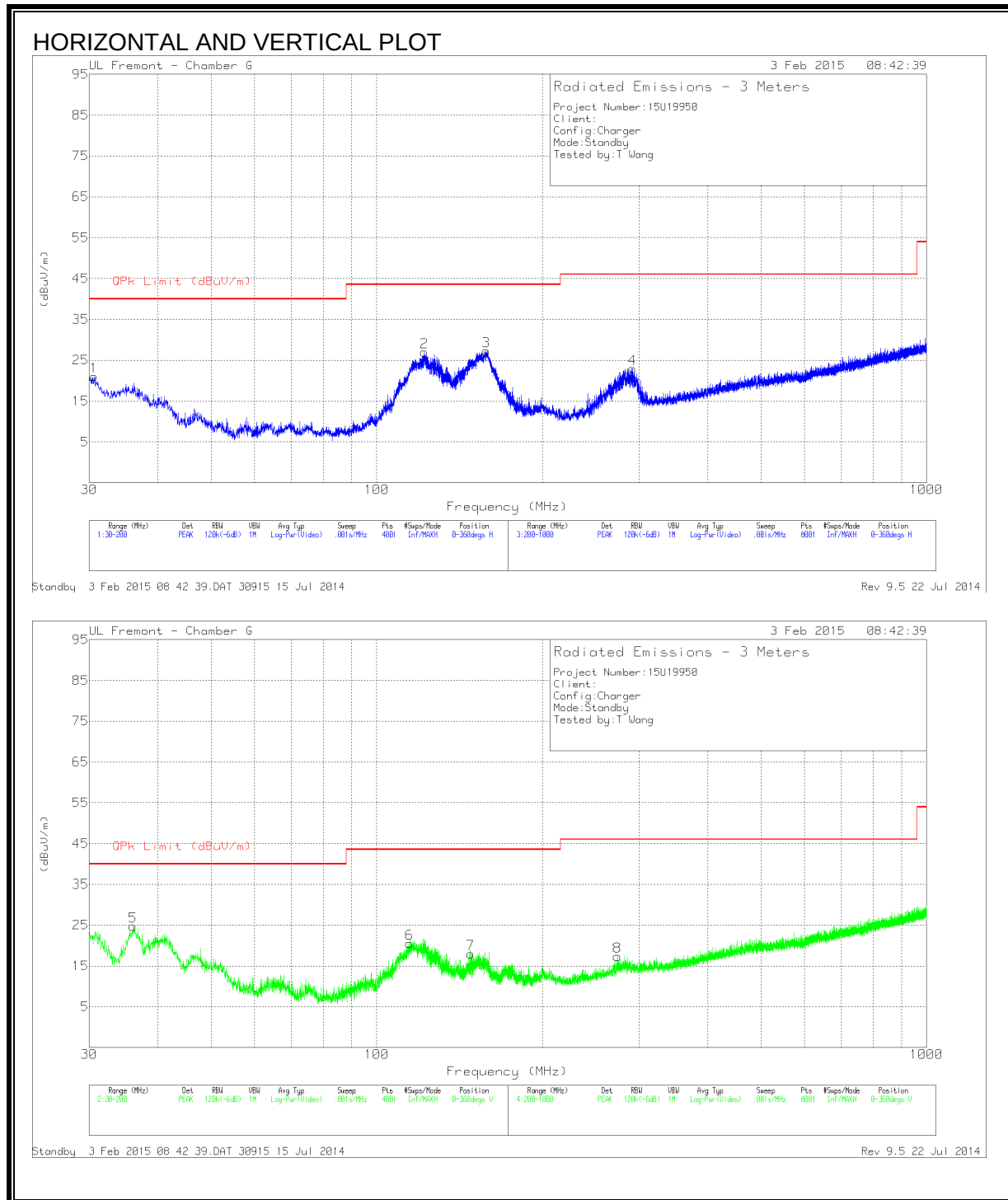
FCC Part 15, Subpart B & C													3 Meter Distance Measurement At Chamber-G	
Company:														
Project #: 15U19950														
EUT configuration #: Charger + Supporting Device														
Mode of operation: Operating														
Tester: T Wang														
Date: 2/3/2015														
Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF (dB/m)	Distance (m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes	
Face On														
0.673	35.52	29.41	-	10.53	3	-40.00	-0.06	-	31.04	-	-31.1	-		
1.558	28.36	22.14	-	10.6	3	-40.00	-7.26	-	23.75	-	-31.0	-		
3.013	22.43	16.22	-	10.6	3	-40.00	-13.18	-	29.54	-	-42.7	-		
Face Off:														
0.738	34.82	28.59	-	10.55	3	-40.00	-0.86	-	30.24	-	-31.1	-		
1.871	27.7	21.49	-	10.6	3	-40.00	-7.91	-	29.54	-	-37.5	-		
2.671	23.36	17.03	-	10.6	3	-40.00	-12.37	-	29.54	-	-41.9	-		
* No more emissions were found up to 30MHz														
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 10000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.														
P.K. = Peak														
Q.P. = Quasi Peak Readings														
A.F. = Antenna factor														
Below 150kHz => RBW=VBW=200 or 300Hz														
Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)														
Rev. 060314														

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FCC Part 15, Subpart B & C													3 Meter Distance Measurement At Chamber-G	
Company:														
Project #: 15U19950														
EUT configuration #: Charger + Supporting Device														
Mode of operation: Operating														
Tester: T Wang														
Date: 2/4/2015														
Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF (dB/m)	Distance (m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes	
Face On														
0.659	35.52	29.65	-	10.53	3	-40.00	0.18	-	31.23	-	-31.0	-		
1.058	30.95	25.19	-	10.6	3	-40.00	-4.21	-	27.11	-	-31.3	-		
2.287	23.92	17.86	-	10.6	3	-40.00	-11.54	-	29.54	-	-41.1	-		
Face Off:														
0.579	36.49	30.63	-	10.52	3	-40.00	1.15	-	32.35	-	-31.2	-		
1.258	28.96	22.02	-	10.6	3	-40.00	-7.38	-	25.61	-	-33.0	-		
2.957	21.66	15.67	-	10.6	3	-40.00	-13.73	-	29.54	-	-43.3	-		
* No more emissions were found up to 30MHz														
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 10000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.														
P.K. = Peak														
Q.P. = Quasi Peak Readings														
A.F. = Antenna factor														
Below 150kHz => RBW=VBW=200 or 300Hz														
Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)														
Rev. 060314														

8.4. TX SPURIOUS EMISSION 30 TO 1000 MHz

8.4.1. STANDBY CONFIGURATION CHARGER



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.6375	28.24	PK	23.7	-30.9	21.04	40	-18.96	0-360	301	H
2	* 122.055	40.27	PK	16.6	-29.9	26.97	43.52	-16.55	0-360	201	H
3	158.265	41.54	PK	15.3	-29.6	27.24	43.52	-16.28	0-360	201	H
4	292	35.08	PK	16.4	-28.5	22.98	46.02	-23.04	0-360	100	H
5	36.035	35.73	PK	19.9	-30.9	24.73	40	-15.27	0-360	100	V
6	* 114.7875	34.46	PK	16.1	-30	20.56	43.52	-22.96	0-360	100	V
7	148.1075	31.83	PK	15.8	-29.6	18.03	43.52	-25.49	0-360	100	V
8	* 274	29.93	PK	16	-28.6	17.33	46.02	-28.69	0-360	201	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector

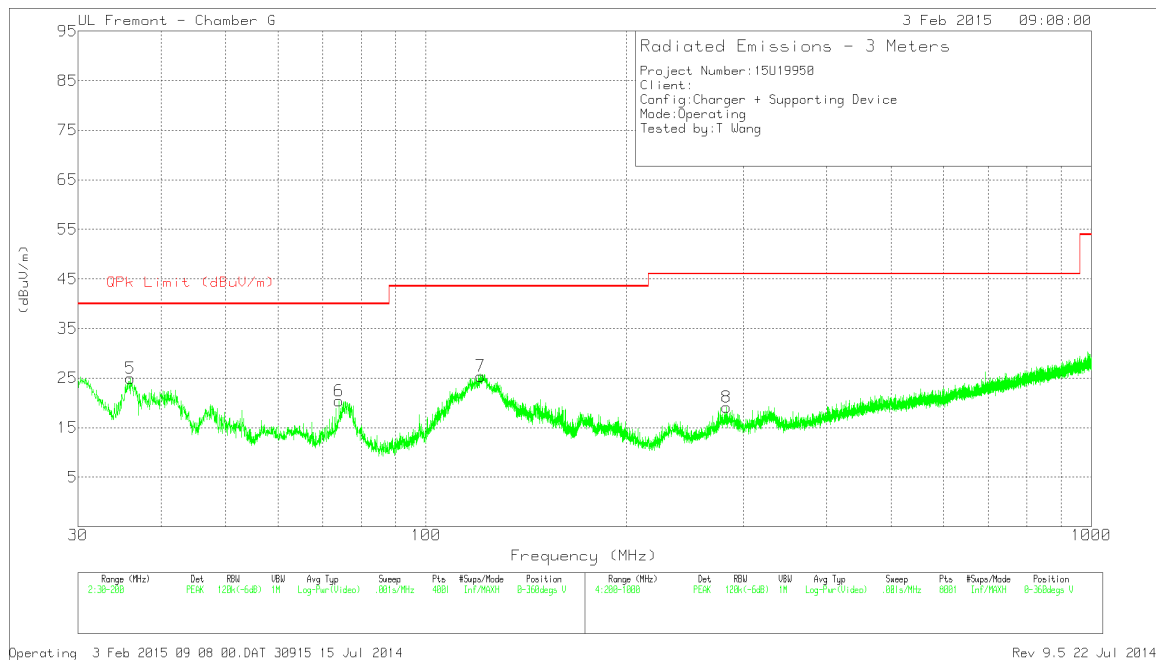
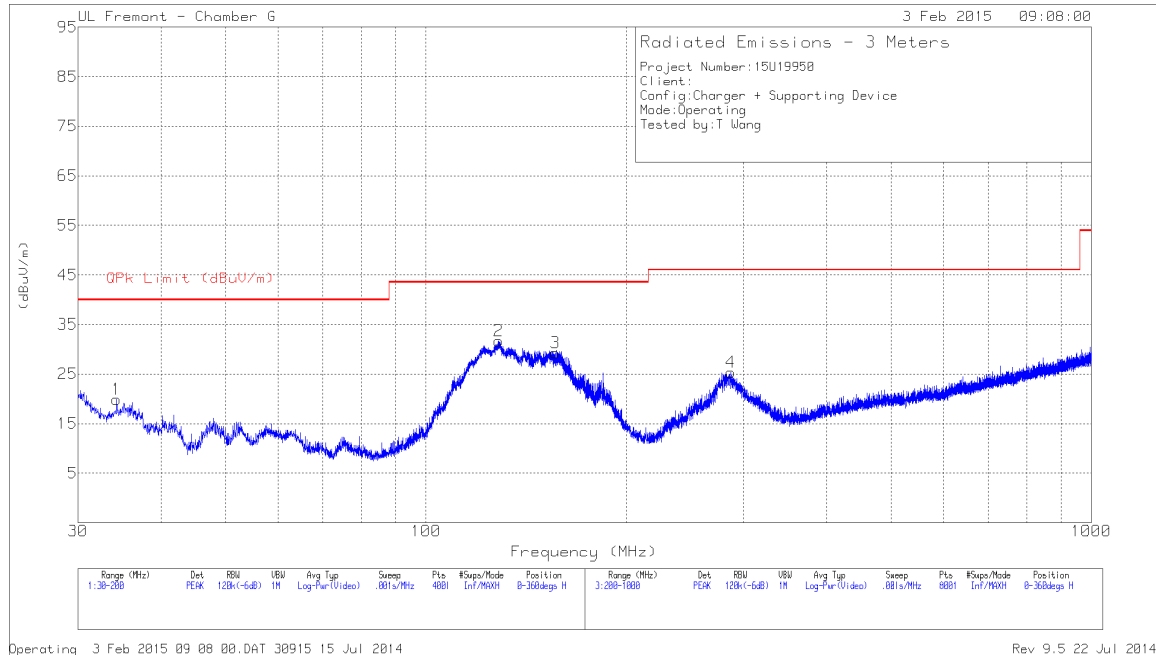
Standby 3 Feb 2015 08 42 39.DAT 30915 15 Jul 2014

Rev 9.5 22 Jul 2014

8.4.2. OPERATING CONFIGURATION CHARGER

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HORIZONTAL AND VERTICAL PLOT



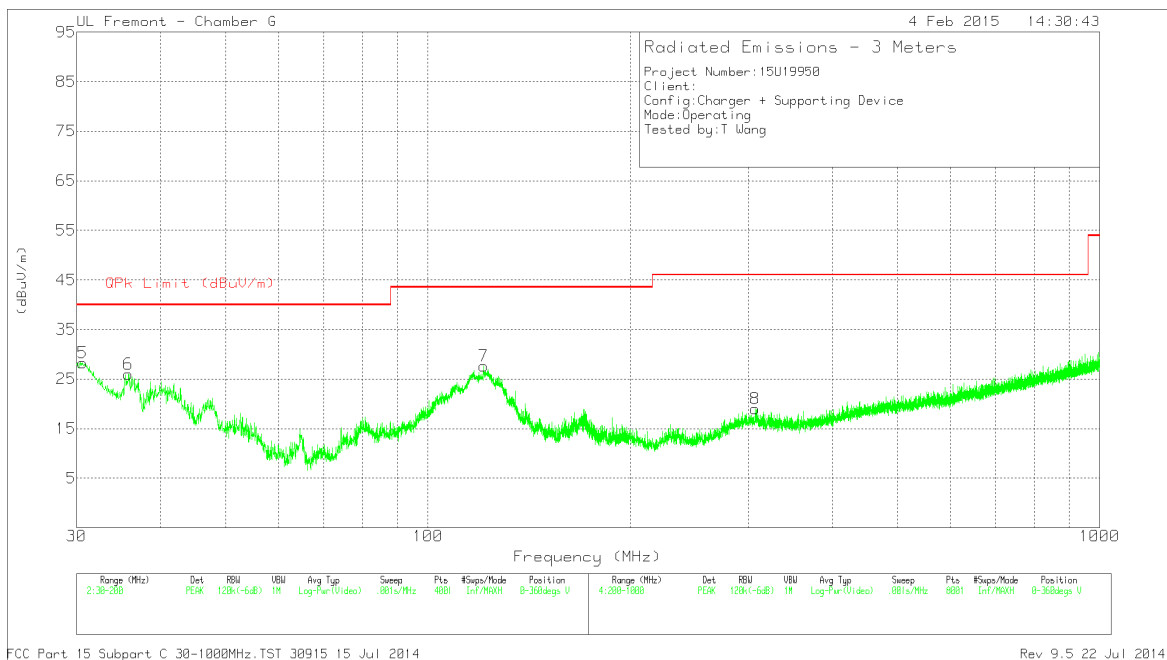
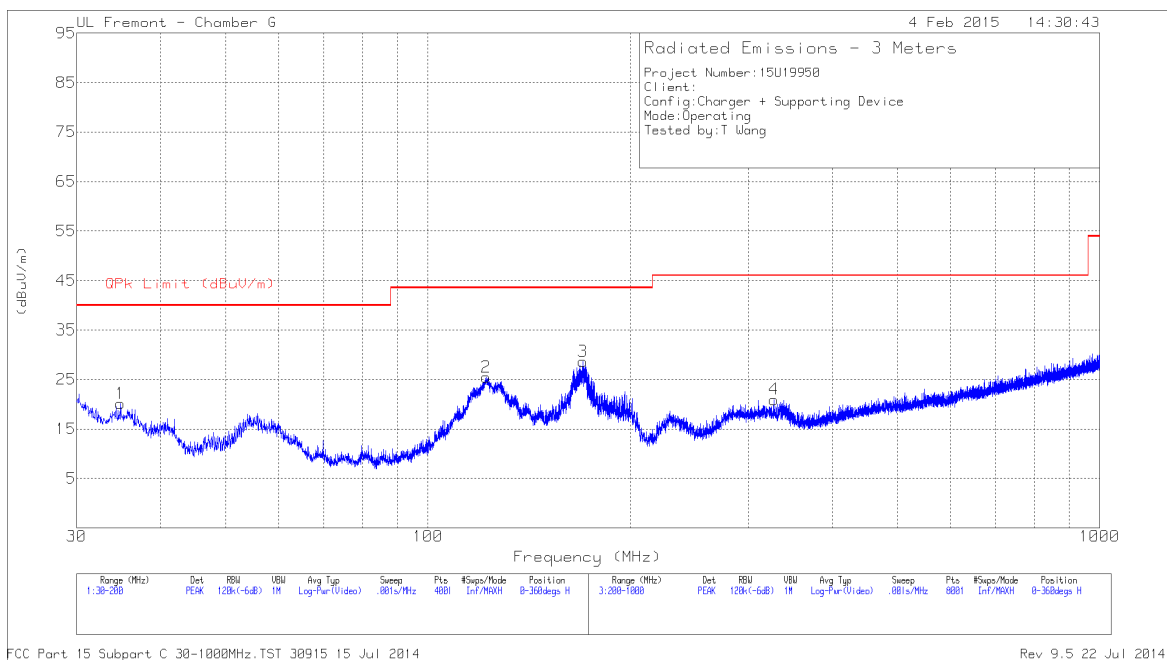
DATA

Marker	Frequency (MHz)	Meter Reading (dBUV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBUV/m)	QPk Limit (dBUV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	34.2925	29.69	PK	21.1	-30.9	19.89	40	-20.11	0-360	301	H
2	* 128.7275	44.68	PK	16.8	-29.8	31.68	43.52	-11.84	0-360	201	H
3	156.6075	43.61	PK	15.3	-29.6	29.31	43.52	-14.21	0-360	201	H
4	286.9	37.67	PK	16.3	-28.6	25.37	46.02	-20.65	0-360	100	H
5	35.9925	35.82	PK	20	-30.9	24.92	40	-15.08	0-360	100	V
6	* 73.9875	39.64	PK	11	-30.3	20.34	40	-19.66	0-360	100	V
7	* 120.9075	38.71	PK	16.6	-29.9	25.41	43.52	-18.11	0-360	100	V
8	* 282.8	31.37	PK	16.3	-28.6	19.07	46.02	-26.95	0-360	100	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK - Peak detector

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HORIZONTAL AND VERTICAL PLOT



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	34.8875	30.32	PK	20.7	-30.9	20.12	40	-19.88	0-360	103	H
2	* 122.0975	38.82	PK	16.6	-29.9	25.52	43.52	-18	0-360	201	H
3	* 170.08	43.25	PK	14.9	-29.5	28.65	43.52	-14.87	0-360	103	H
4	* 327.7	32.47	PK	16.8	-28.3	20.97	46.02	-25.05	0-360	100	H
5	30.595	35.45	PK	23.7	-30.9	28.25	40	-11.75	0-360	100	V
6	35.8225	36.75	PK	20.1	-30.9	25.95	40	-14.05	0-360	100	V
7	* 121.1625	40.92	PK	16.6	-29.9	27.62	43.52	-15.9	0-360	100	V
8	307.2	30.98	PK	16.5	-28.5	18.98	46.02	-27.04	0-360	201	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014

Rev 9.5 22 Jul 2014

8.5. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207 (a)

IC RSS-GEN, Section 8.8

Frequency of emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50
* Decreases with the logarithm of the frequency.		

TEST PROCEDURE

ANSI C63.4-2009

RESULTS

8.5.1. STANDBY CONFIGURATION CHARGER

WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.303	45.7	PK	.5	0	46.2	60.2	-14	-	-
2	.303	40.12	Av	.5	0	40.62	-	-	50.2	-9.58
3	.6045	46.78	PK	.3	0	47.08	56	-8.92	-	-
4	.6045	40.09	Av	.3	0	40.39	-	-	46	-5.61
5	.906	45.27	PK	.3	0	45.57	56	-10.43	-	-
6	.906	37.73	Av	.3	0	38.03	-	-	46	-7.97

Line-L2 .15 - 30MHz

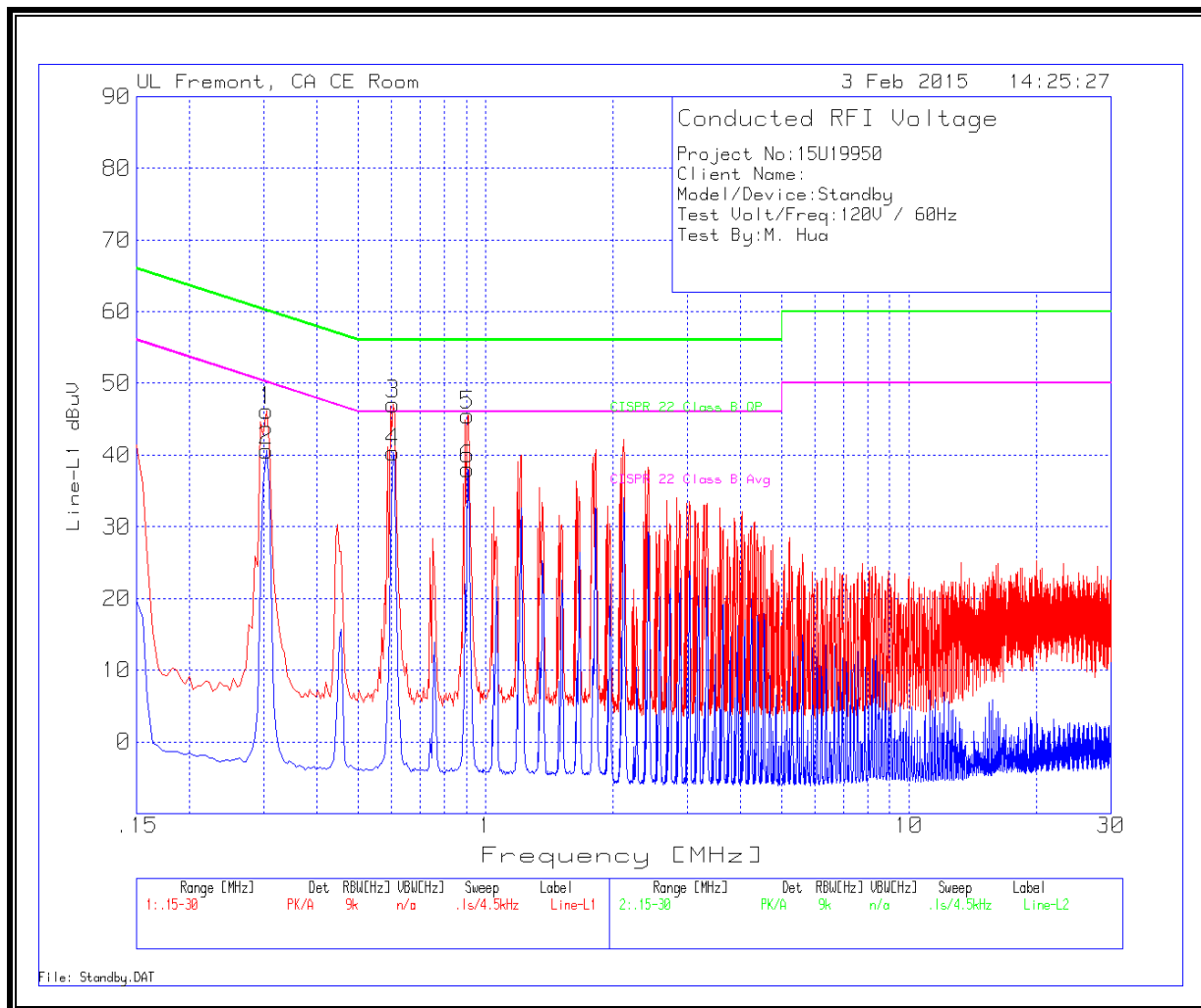
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
7	.303	39.98	PK	.6	0	40.58	60.2	-19.62	-	-
8	.303	30.96	Av	.6	0	31.56	-	-	50.2	-18.64
9	.5955	38.55	PK	.3	0	38.85	56	-17.15	-	-
10	.5955	16.08	Av	.3	0	16.38	-	-	46	-29.62
11	.8925	36.44	PK	.3	0	36.74	56	-19.26	-	-
12	.8925	12.63	Av	.3	0	12.93	-	-	46	-33.07

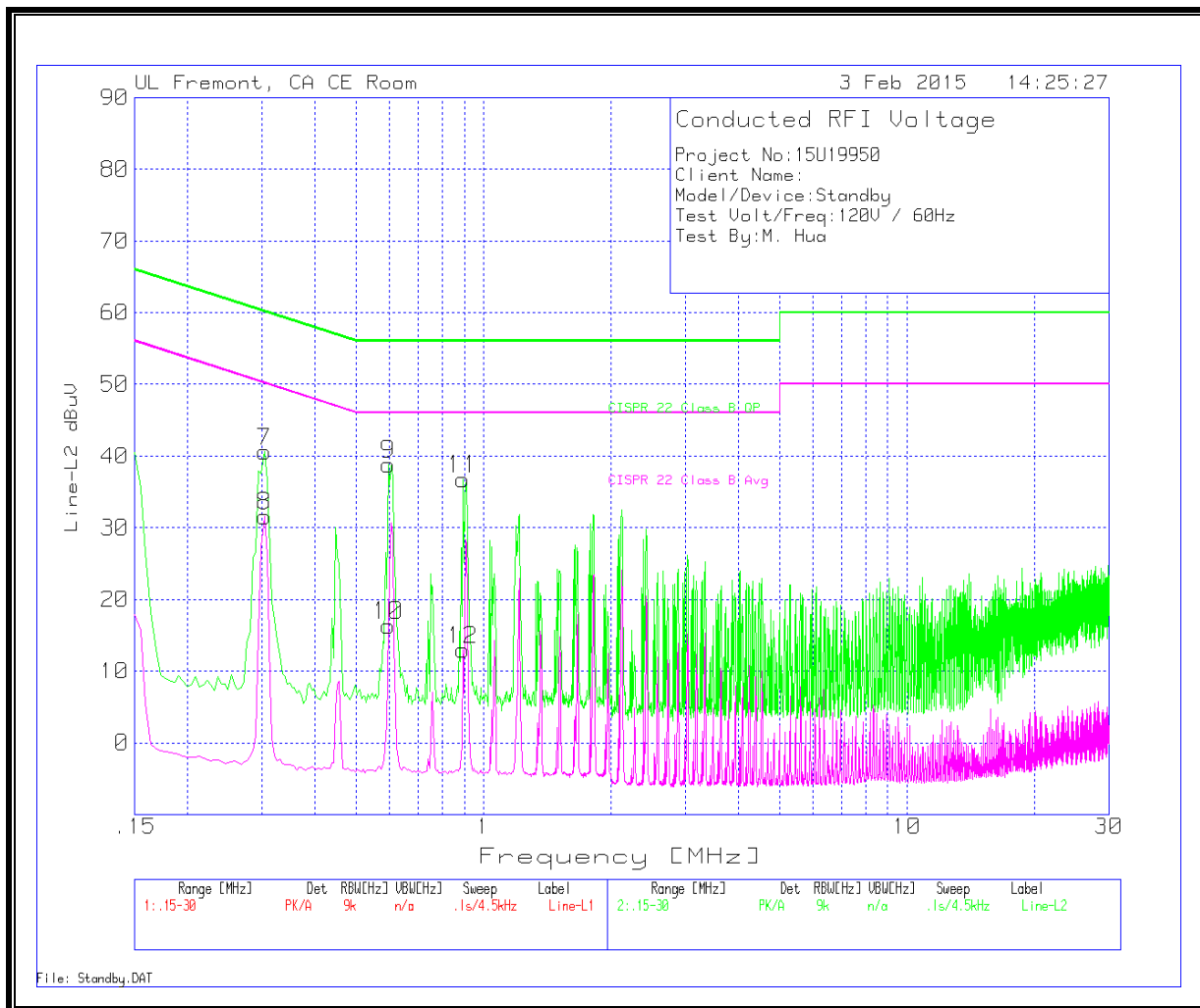
PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS



8.5.2. OPERATING CONFIGURATION CHARGER

A1554

WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.24	50.2	PK	.7	0	50.9	62.1	-11.2	-	-
2	.24	40.25	Av	.7	0	40.95	-	-	52.1	-11.15
3	.474	45.66	PK	.4	0	46.06	56.4	-10.34	-	-
4	.474	39.82	Av	.4	0	40.22	-	-	46.4	-6.18
5	1.14	42.66	PK	.2	0	42.86	56	-13.14	-	-
6	1.14	25.1	Av	.2	0	25.3	-	-	46	-20.7

Line-L2 .15 - 30MHz

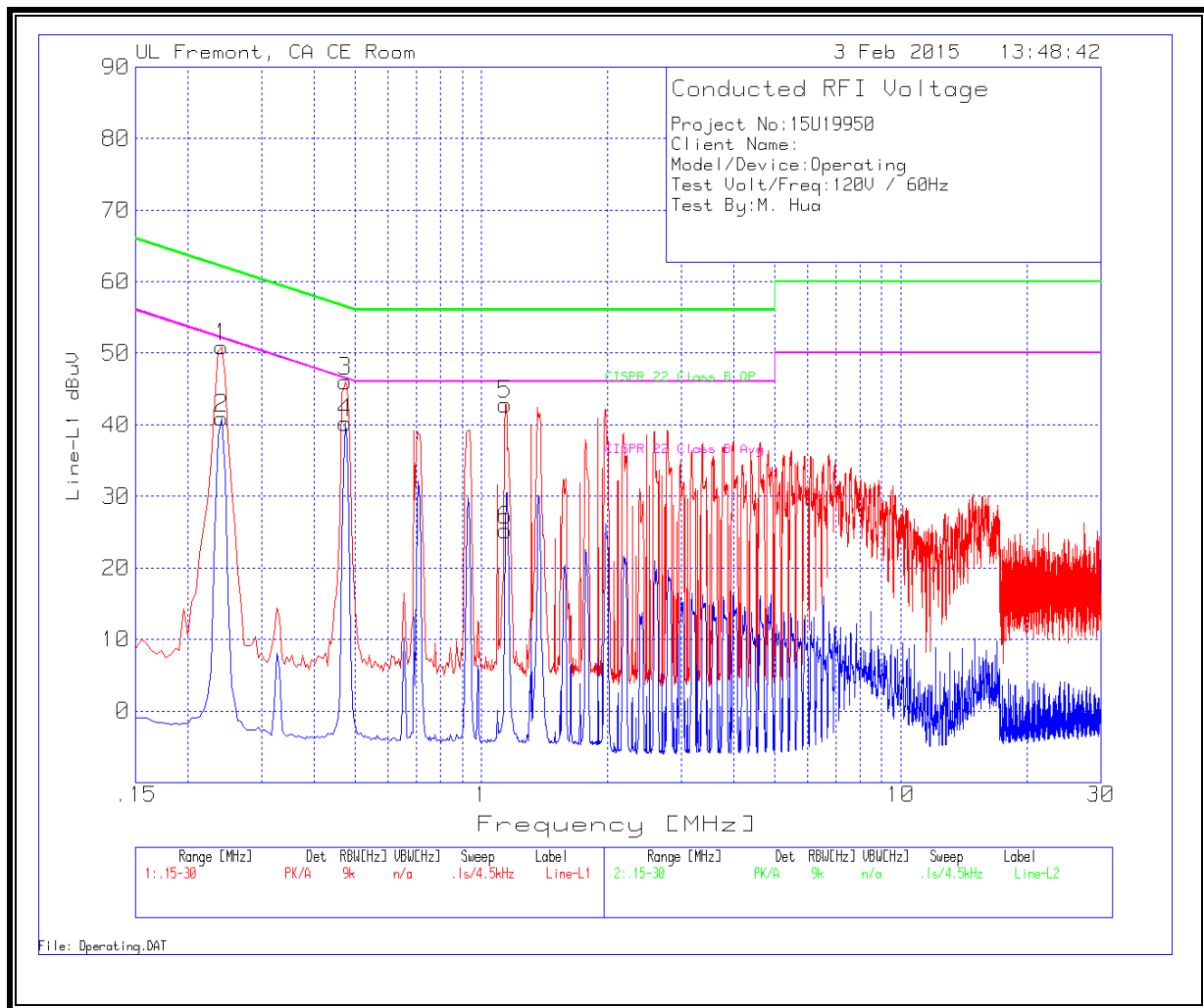
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
7	.285	40.66	PK	.6	0	41.26	60.7	-19.44	-	-
8	.285	11.48	Av	.6	0	12.08	-	-	50.7	-38.62
9	.6045	38.16	PK	.3	0	38.46	56	-17.54	-	-
10	.6045	30.31	Av	.3	0	30.61	-	-	46	-15.39
11	.8475	37.68	PK	.3	0	37.98	56	-18.02	-	-
12	.8475	9.38	Av	.3	0	9.68	-	-	46	-36.32

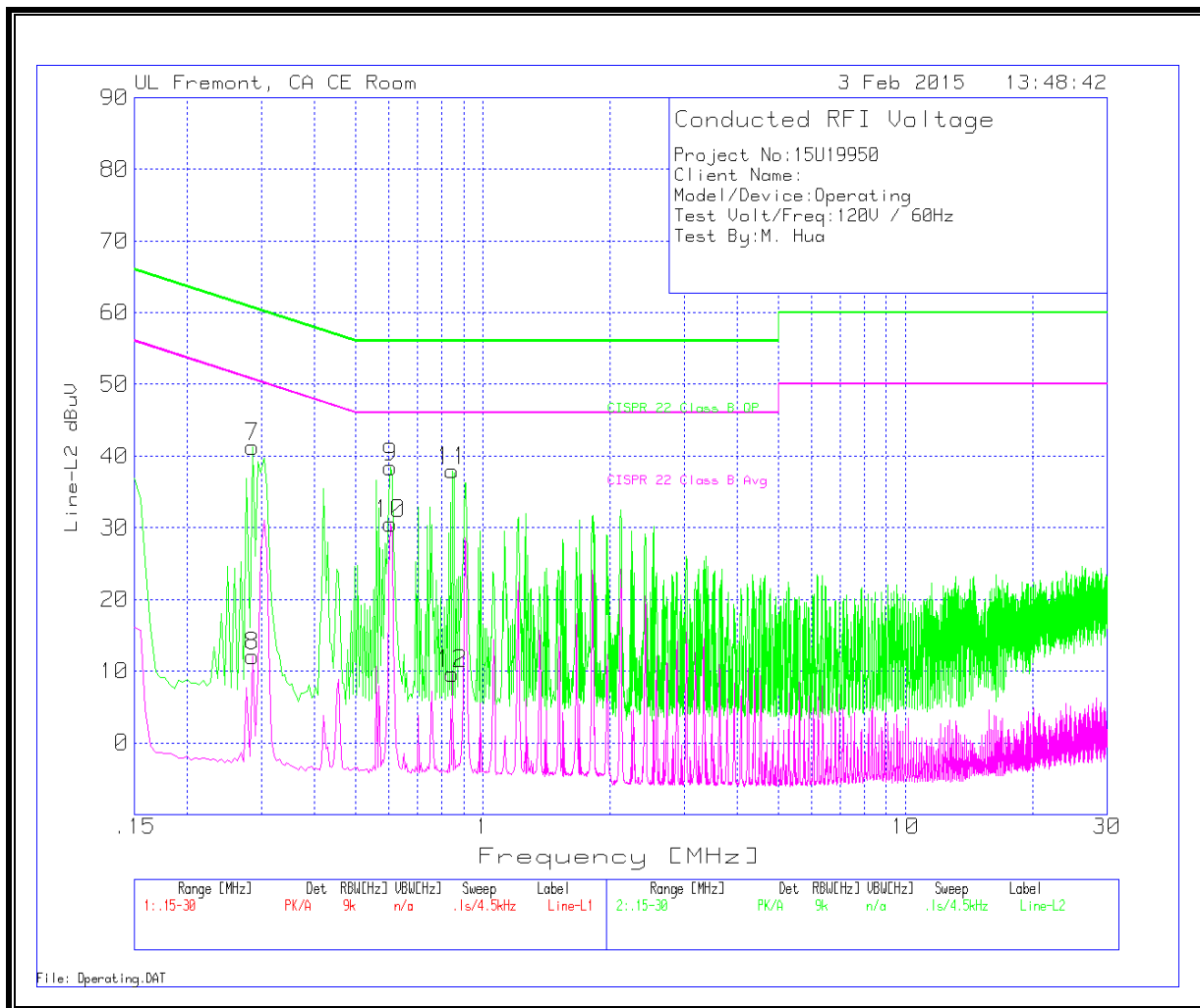
PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS



A1553

WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.1635	47.6	PK	1.2	0	48.8	65.3	-16.5	-	-
2	.1635	16.03	Av	1.2	0	17.23	-	-	55.3	-38.07
3	.2445	45.12	PK	.7	0	45.82	61.9	-16.08	-	-
4	.2445	12.38	Av	.7	0	13.08	-	-	51.9	-38.82
5	.591	39.35	PK	.3	0	39.65	56	-16.35	-	-
6	.591	8.25	Av	.3	0	8.55	-	-	46	-37.45
7	6.1215	35.58	PK	.2	.1	35.88	60	-24.12	-	-
8	6.1215	21.38	Av	.2	.1	21.68	-	-	50	-28.32
9	17.6325	35.6	PK	.3	.2	36.1	60	-23.9	-	-
10	17.6325	19.22	Av	.3	.2	19.72	-	-	50	-30.28

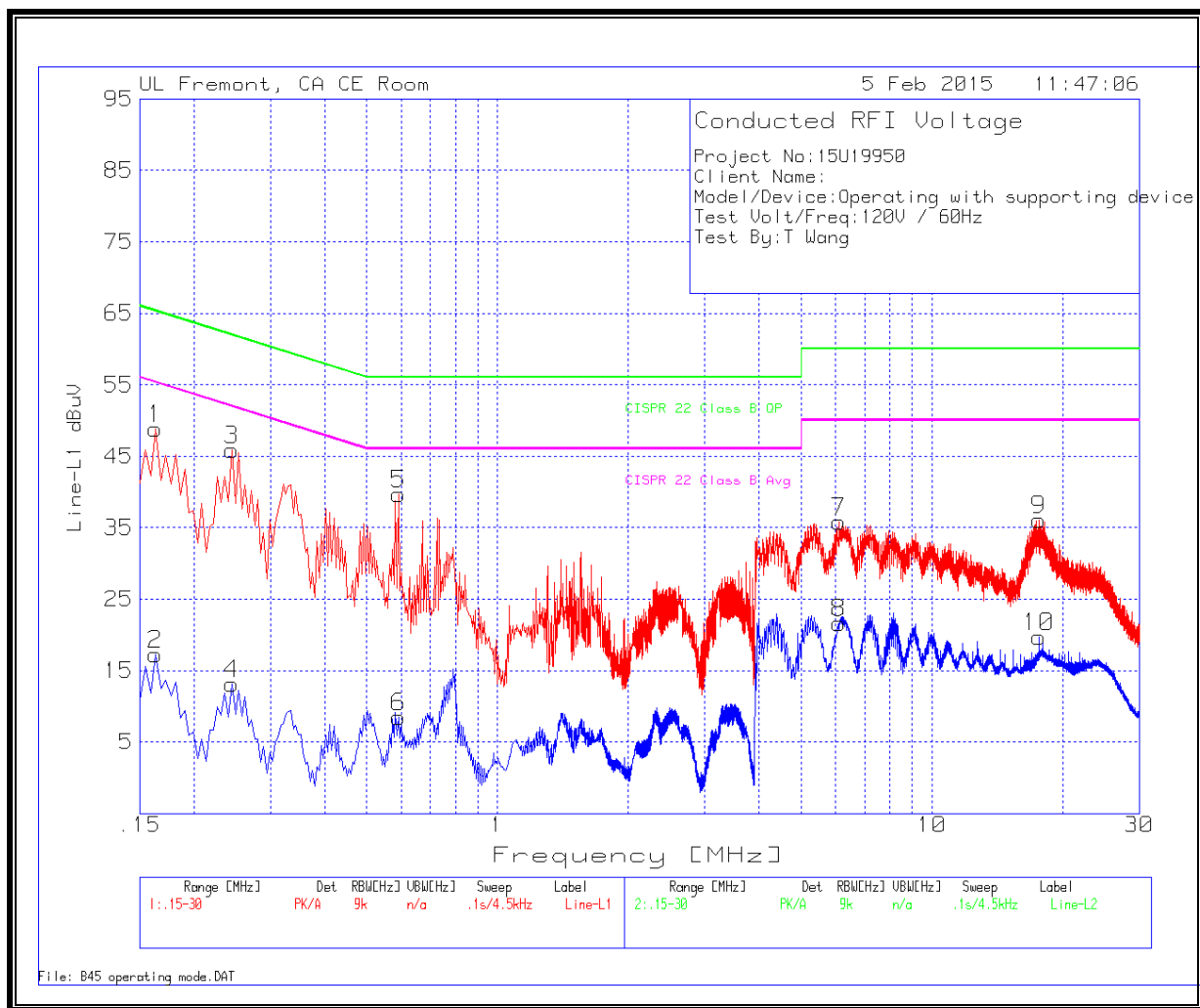
Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
11	.1635	46.44	PK	1.3	0	47.74	65.3	-17.56	-	-
12	.1635	12.86	Av	1.3	0	14.16	-	-	55.3	-41.14
13	.2445	42.57	PK	.8	0	43.37	61.9	-18.53	-	-
14	.2445	11.28	Av	.8	0	12.08	-	-	51.9	-39.82
15	.7845	36.53	PK	.3	0	36.83	56	-19.17	-	-
16	.7845	14.91	Av	.3	0	15.21	-	-	46	-30.79
17	17.565	31.7	PK	.3	.2	32.2	60	-27.8	-	-
18	17.565	19.99	Av	.3	.2	20.49	-	-	50	-29.51

PK - Peak detector
Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS

