



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

CERTIFICATION TEST REPORT

FOR

APPLE WATCH MAGNETIC CHARGING CABLE

MODEL NUMBER: A1570

REPORT NUMBER: 14U19490-E3, REVISION B

FCC ID: BCGA1570
IC: 579C-A1570

ISSUE DATE: FEBRUARY 23, 2015

Prepared for
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NVLAP[®]

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	02/12/2015	Initial Issue	M. Mekuria
A	02/18/2015	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: APPLE WATCH MAGNETIC CHARGING CABLE

MODEL: A1570

SERIAL NUMBER: DLC451508N5FTP G3K

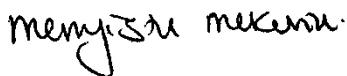
DATE TESTED: JANUARY 15-17 AND FEBRUARY 12, 2015

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
LAB 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, 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
<input type="checkbox"/> Chamber A	<input checked="" type="checkbox"/> Chamber D
<input type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F
	<input checked="" type="checkbox"/> Chamber G
	<input type="checkbox"/> 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 charging cable which 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	-19.03

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 device with stainless steel enclosure. The EUT was investigated at X, Y and Z orientations and the worst case orientation with support device. After the investigation the Y orientation is turned out to be the worst case. The final radiated tests conducted on using a stainless steel EUT as a standby and a stainless steel EUT with the support device as operational modes.

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

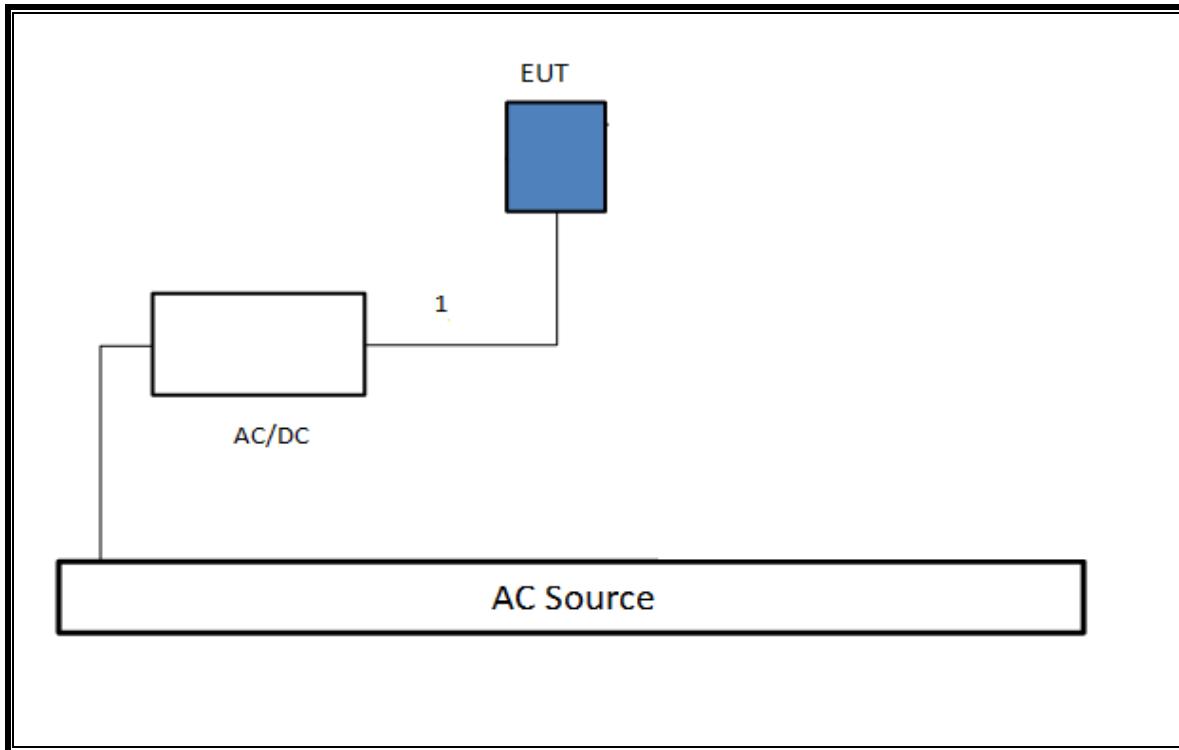
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	USB	Un-shielded	2.0	N/A

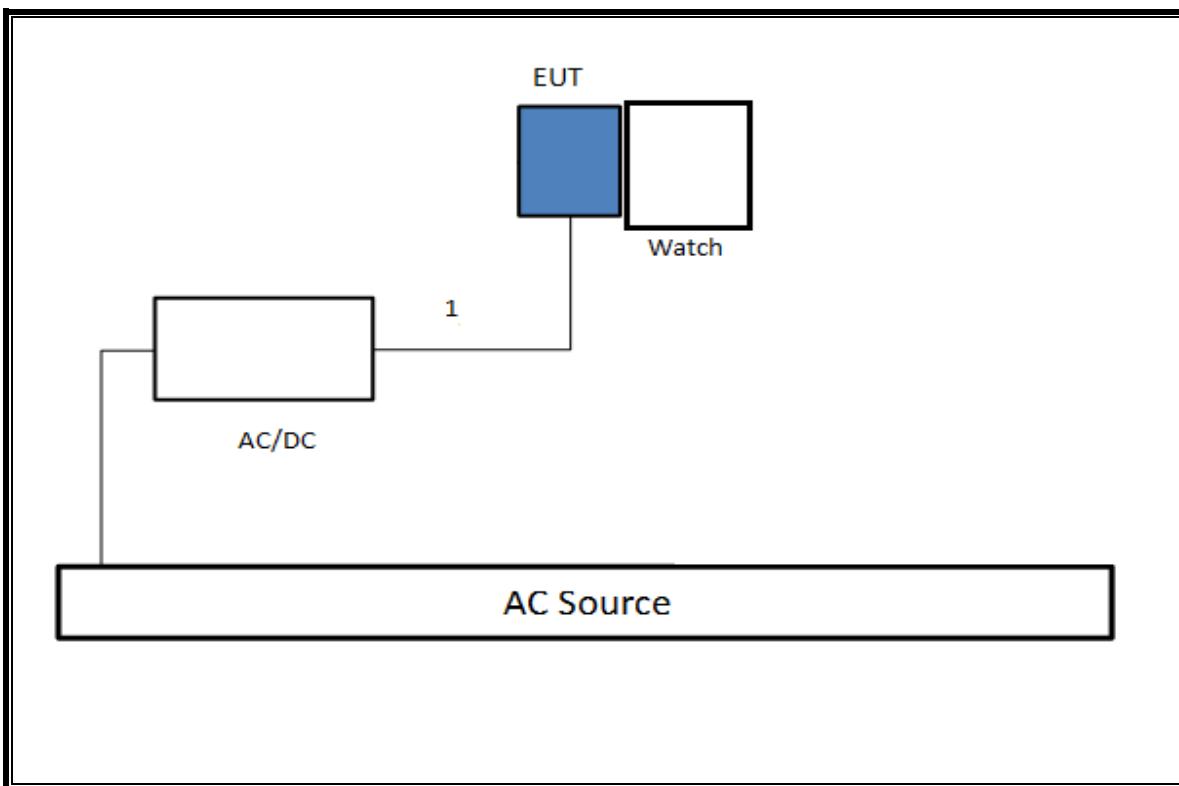
TEST SETUP

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
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	325118	06/05/15
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	A051314-2	04/27/15
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	F00488	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.

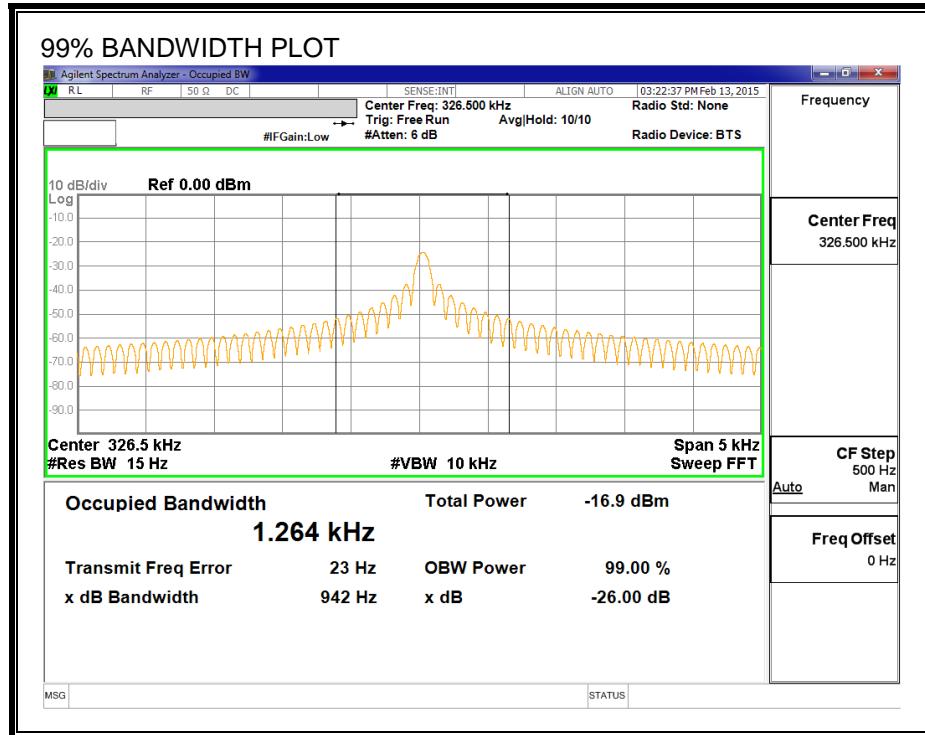
- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied 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. 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: Company: Project #: 14U19490 EUT configuration #: Model A1570 Mode of operation: Standby Tester: T Wang Date: 1/15/2015													
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	50.43		44.8	10.54	3	-80.00	-19.03	-24.66	37.33	17.33	-56.4	-42.0	
Loop Antenna Face Off:													
0.3265	48.3		42.9	10.54	3	-80.00	-21.16	-26.56	37.33	17.33	-58.5	-43.9	

* 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)

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8.2.2. OPERATING CONFIGURATION CHARGER

A1554

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G													
Company: 14U19490													
Project #:	14U19490	EUT configuration #: Model A1570 and Supporting Devices											
Mode of operation:	Operating												
Tester:	T Wang												
Date:	1/15/2015												
Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB/m)	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.3265	43.76		38.2	10.54	3	-80.00	-25.70	-31.26	37.33	17.33	-63.0	-48.6	
Loop Antenna Face Off:													
0.3265	41.77		36.6	10.54	3	-80.00	-27.69	-32.86	37.33	17.33	-65.0	-50.2	

* 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)

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A1553

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G													
Company: 14U19490													
Project #:	14U19490	EUT configuration #: Model A1570 and Supporting Devices											
Mode of operation:	Operating												
Tester:	T. Chu												
Date:	2/12/2015												
Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB/m)	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.3265	42.541		37.041	10.54	3	-80.00	-26.92	-32.42	37.33	17.33	-64.2	-49.7	
Loop Antenna Face Off:													
0.3265	41.125		35.915	10.54	3	-80.00	-28.33	-33.54	37.33	17.33	-65.7	-50.9	

* 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)

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8.3. SPURIOUS EMISSIONS FROM 0.15 TO 30 MHz

8.3.1. STANDBY CONFIGURATION CHARGER

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G													
Company:													
Project #:	14U19490												
EUT configuration #:	Model A1570												
Mode of operation:	Standby												
Tester:	T Wang												
Date:	1/15/2015												
Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB/m)	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.64936	40.35	35.85	-	10.53	3	-40.00	6.38	-	31.35	-	-25.0	-	
2.55745	25.25	20.75	-	10.6	3	-40.00	-8.65	-	29.54	-	-38.2	-	
Loop Antenna Face Off:													
0.64936	36.31	31.38	-	10.53	3	-40.00	1.91	-	31.35	-	-29.4	-	
2.24776	25.41	20.91	-	10.6	3	-40.00	-8.49	-	29.54	-	-38.0	-	

* 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
A.F. = Antenna factor
Below 150kHz => RBW=VBW=200 or 300Hz
Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)

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8.3.2. OPERATING CONFIGURATION CHARGER

A1554

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G													
Company: 14U19490													
Project #:	14U19490	EUT configuration #: Model A1570 and Supporting Devices											
Mode of operation:	Operating												
Tester:	T Wang												
Date:	1/15/2015												
Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB/m)	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
1.109	30.27	25.25	-	10.6	3	-40.00	-4.15	-	26.71	-	-30.9	-	
1.978	25.23	20.11	-	10.6	3	-40.00	-9.29	-	29.54	-	-38.8	-	
12.465	14.21	10.01	-	10.65	3	-40.00	-19.34	-	29.54	-	-48.9	-	
Loop Antenna Face Off:													
1.658	25.56	20.34	-	10.6	3	-40.00	-9.06	-	23.21	-	-32.3	-	
6.413	17.23	12.05	-	10.7	3	-40.00	-17.25	-	29.54	-	-46.8	-	
14.682	16.01	10.82	-	10.61	3	-40.00	-18.57	-	29.54	-	-48.1	-	

* 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
A.F. = Antenna factor

Below 150kHz => RBW=VBW=200 or 300Hz
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A1553

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G													
Company: 14U19490													
Project #:	14U19490	EUT configuration #: Model A1570 and Supporting Devices											
Mode of operation:	Operating												
Tester:	T. Chu												
Date:	2/12/2015												
Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB/m)	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
1.378	28.899	24.18	-	10.6	3	-40.00	-5.22	-	24.82	-	-30.0	-	
2.277	24.177	20.78	-	10.6	3	-40.00	-8.62	-	29.54	-	-38.2	-	
15.351	14.384	10.25	-	10.56	3	-40.00	-19.19	-	29.54	-	-48.7	-	
Loop Antenna Face Off:													
15.329	14.902	10.945	-	10.57	3	-40.00	-18.49	-	29.54	-	-48.0	-	
16.000	16.184	13.483	-	10.5	3	-40.00	-16.02	-	29.54	-	-45.6	-	
20.567	14.096	10.482	-	9.987	3	-40.00	-19.53	-	29.54	-	-49.1	-	

* 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.

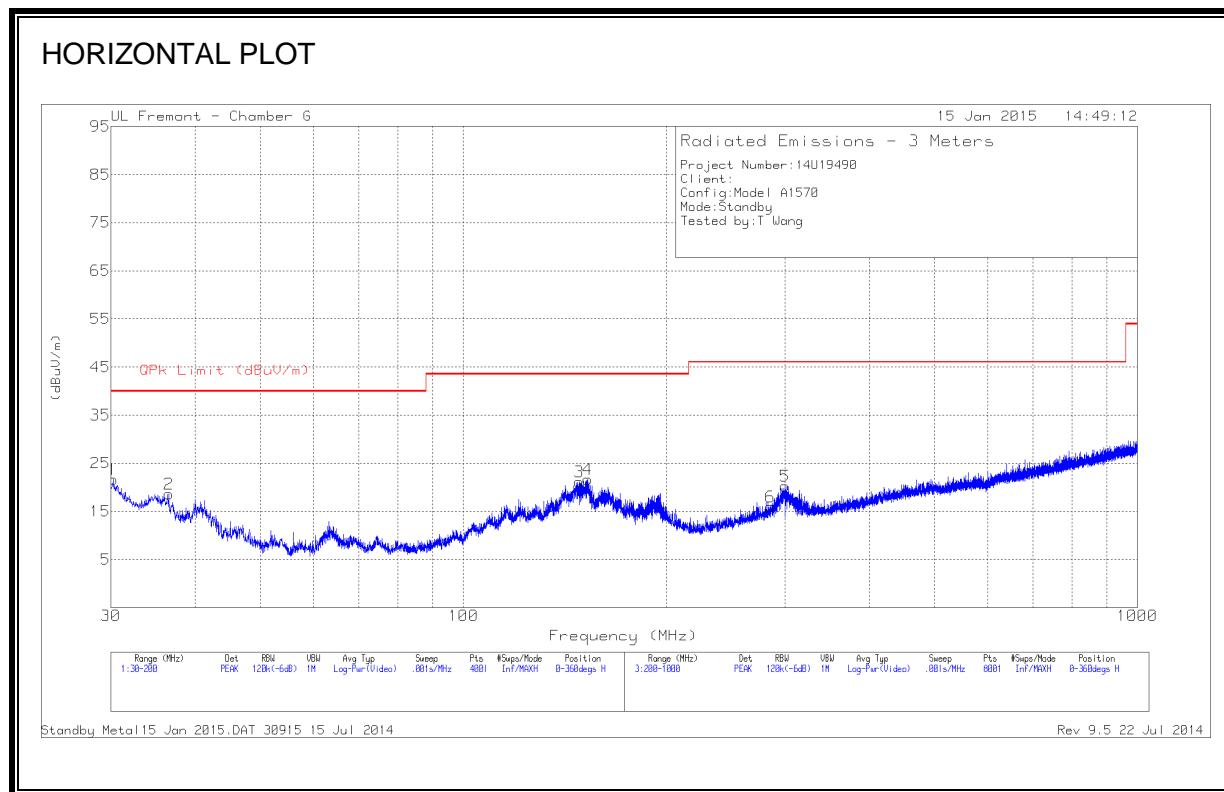
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A.F. = Antenna factor

Below 150kHz => RBW=VBW=200 or 300Hz
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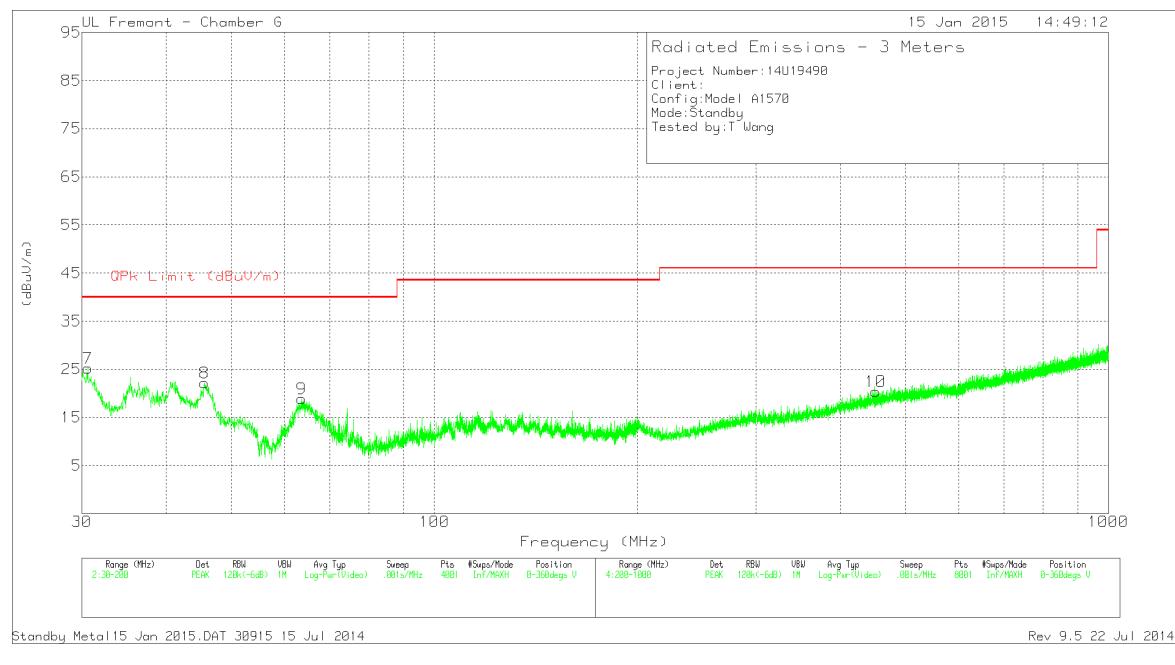
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8.4. SPURIOUS EMISSION 30 TO 1000 MHz

8.4.1. STANDBY CONFIGURATION CHARGER



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	30.2125	28.56	PK	24	-30.9	21.66	40	-18.34	0-360	301	H
2	36.545	29.94	PK	19.6	-30.9	18.64	40	-21.36	0-360	301	H
3	148.575	34.99	PK	15.8	-29.6	21.19	43.52	-22.33	0-360	201	H
4	152.825	35.75	PK	15.5	-29.6	21.65	43.52	-21.87	0-360	301	H
5	300.3	32.43	PK	16.4	-28.6	20.23	46.02	-25.79	0-360	99	H
6	285.2	28.26	PK	16.3	-28.6	15.96	46.02	-30.06	0-360	99	H
7	30.595	32.47	PK	23.7	-30.9	25.27	40	-14.73	0-360	100	V
8	45.5975	39.82	PK	13.1	-30.7	22.22	40	-17.78	0-360	100	V
9	63.6175	38.22	PK	11.1	-30.5	18.82	40	-21.18	0-360	100	V
10	451.3	28.24	PK	19.8	-27.7	20.34	46.02	-25.68	0-360	95	V

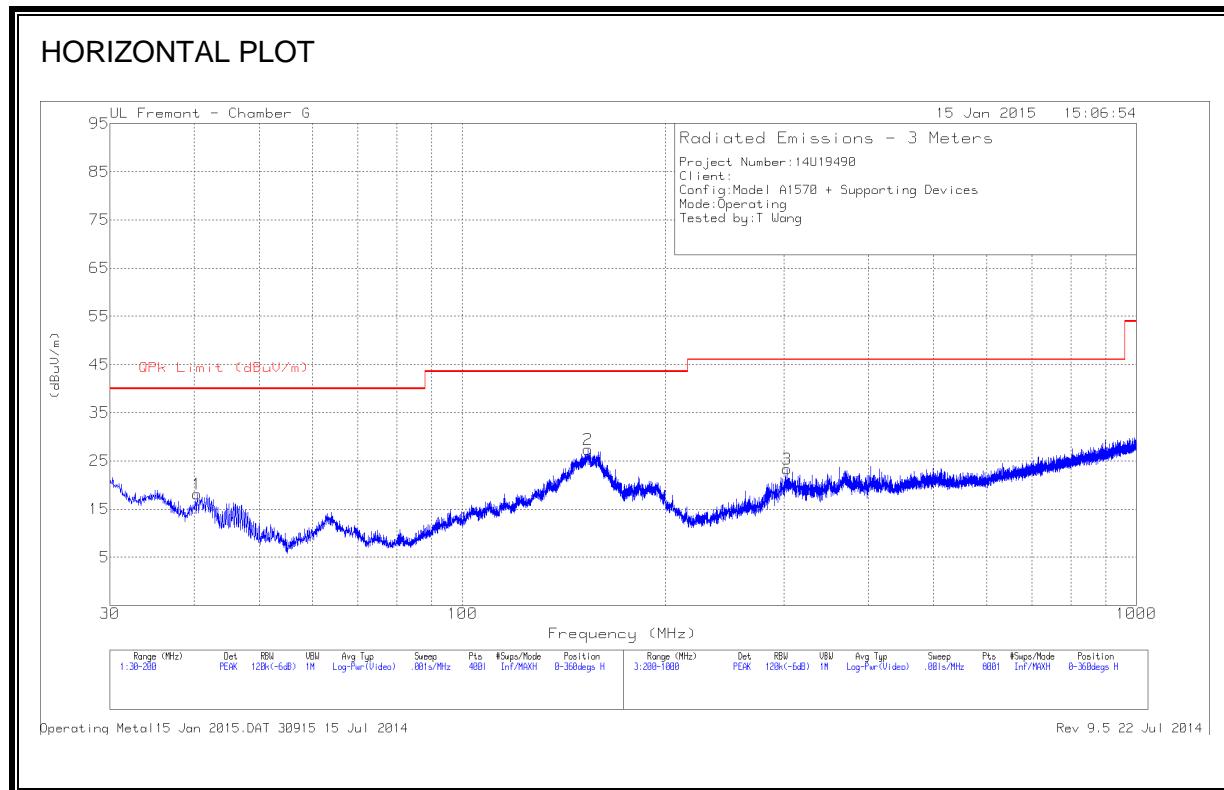
PK - Peak detector

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

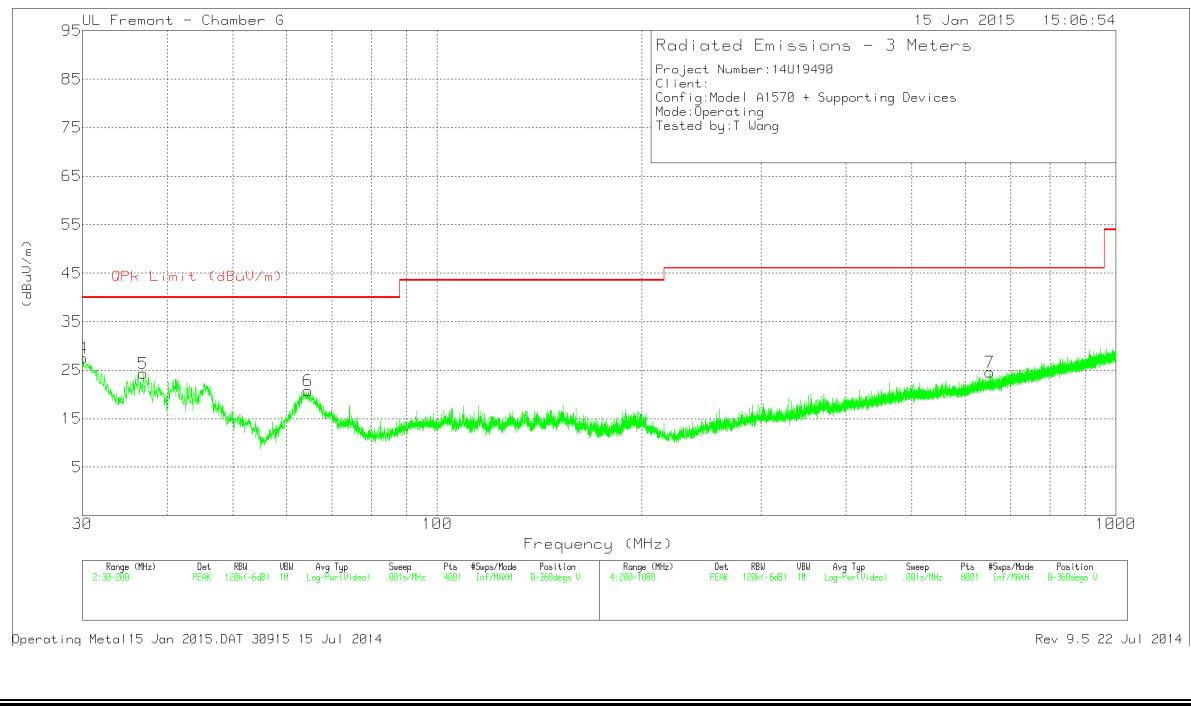
Rev 9.5 10 Jul 2014

8.4.2. OPERATING CONFIGURATION CHARGER

A1554



VERTICAL PLOT



DATA

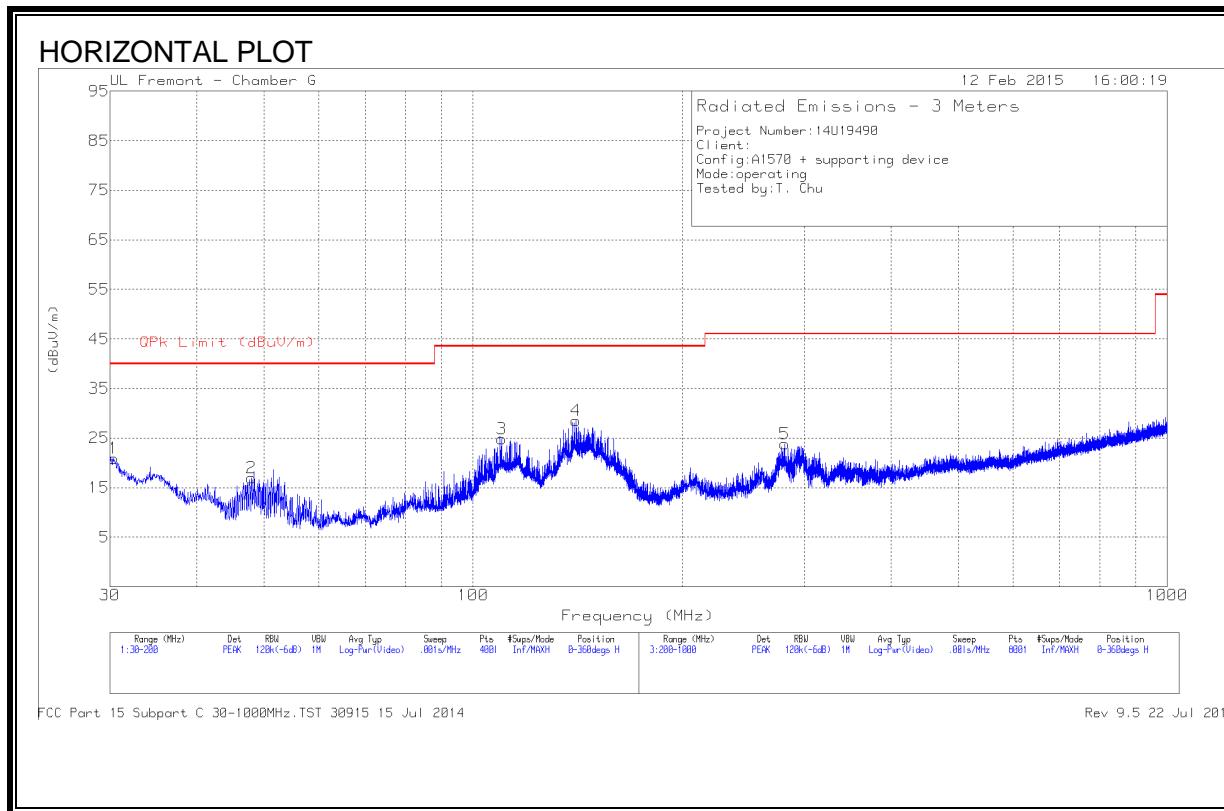
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	30.085	34.33	PK	24.1	-30.9	27.53	40	-12.47	0-360	100	V
5	36.8425	35.84	PK	19.4	-30.9	24.34	40	-15.66	0-360	100	V
1	40.4125	31.89	PK	17	-30.8	18.09	40	-21.91	0-360	201	H
6	64.5525	40.03	PK	11.2	-30.5	20.73	40	-19.27	0-360	100	V
2	153.505	41.45	PK	15.5	-29.6	27.35	43.52	-16.17	0-360	201	H
3	303	35.19	PK	16.5	-28.4	23.29	46.02	-22.73	0-360	100	H
7	652.1	28.96	PK	22.6	-27	24.56	46.02	-21.46	0-360	301	V

PK - Peak detector

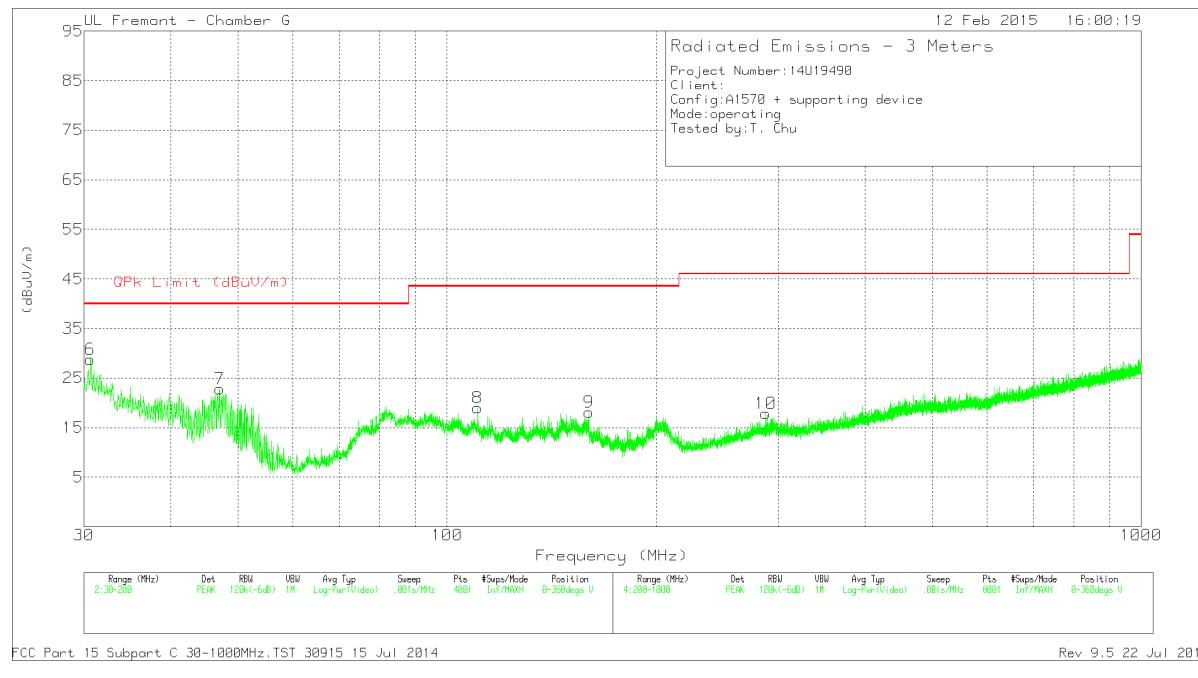
FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014

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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	30.34	28.33	PK	23.9	-31.3	20.93	40	-19.07	0-360	103	H
2	47.9775	36.27	PK	11.8	-31.1	16.97	40	-23.03	0-360	403	H
3	* 109.985	39.79	PK	15.4	-30.4	24.79	43.52	-18.73	0-360	301	H
4	140.7125	42.37	PK	16.3	-30.1	28.57	43.52	-14.95	0-360	202	H
5	* 281.2	36.71	PK	16.3	-29.2	23.81	46.02	-22.21	0-360	100	H
6	30.6375	36.36	PK	23.7	-31.3	28.76	40	-11.24	0-360	100	V
7	47.0425	41.5	PK	12.3	-31	22.8	40	-17.2	0-360	100	V
8	* 110.7925	33.9	PK	15.5	-30.4	19	43.52	-24.52	0-360	100	V
9	160.0075	32.94	PK	15.2	-30	18.14	43.52	-25.38	0-360	100	V
10	288	30.61	PK	16.3	-29.1	17.81	46.02	-28.21	0-360	201	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

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

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9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207 (a)
IC RSS-GEN, Section 8.8

Frequency of emission (MHz)	Conducted Limit (dB μ V)	
	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

9.1.1. 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	.15	37.22	PK	1.4	0	38.62	66	-27.38	-	-
2	.15	9.86	Av	1.4	0	11.26	-	-	56	-44.74
3	.825	34.32	PK	.3	0	34.62	56	-21.38	-	-
4	.825	18.33	Av	.3	0	18.63	-	-	46	-27.37
5	1.392	24.12	PK	.2	.1	24.42	56	-31.58	-	-
6	1.392	11.73	Av	.2	.1	12.03	-	-	46	-33.97

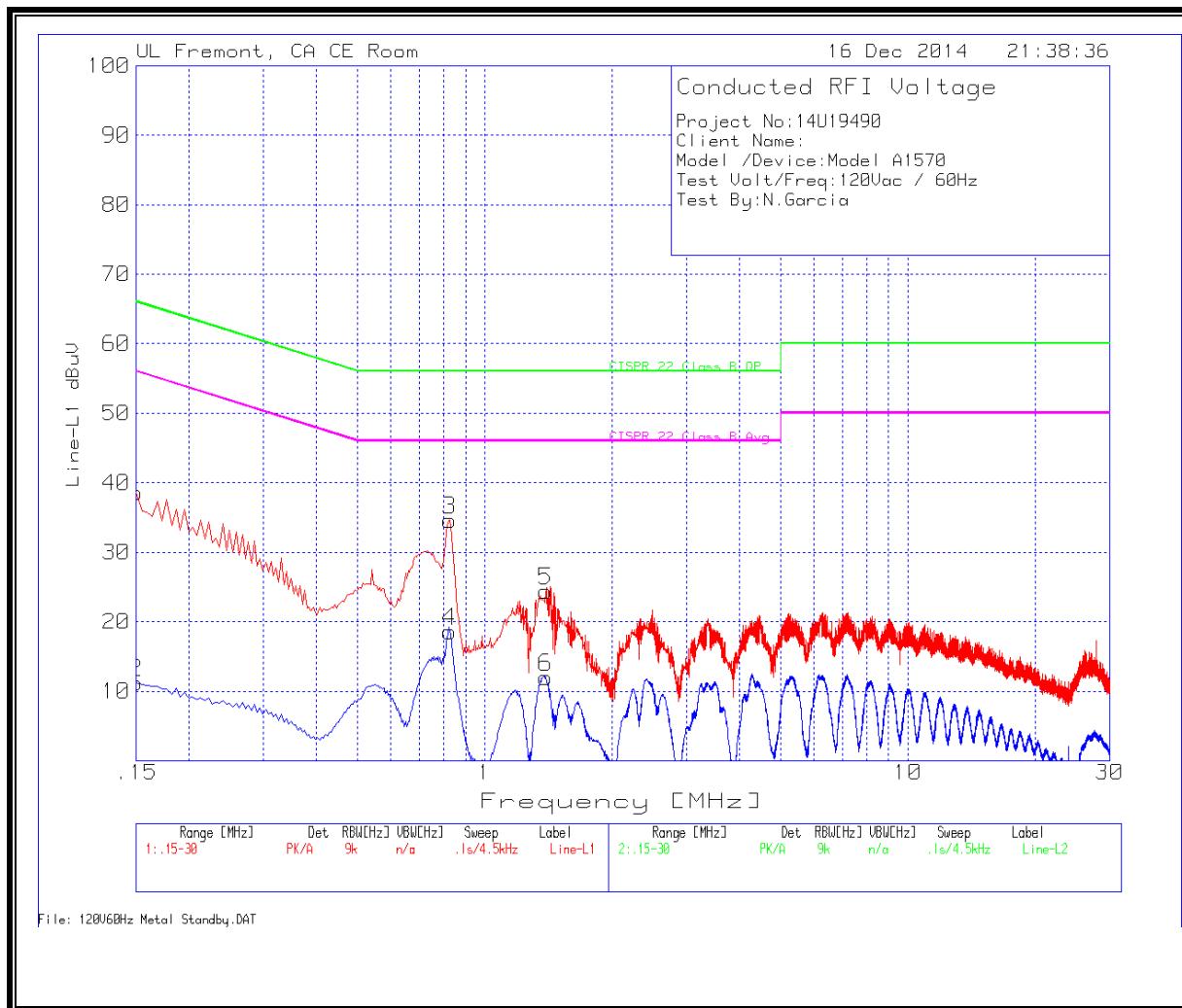
Line-L2 .15 - 30MHz

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	.159	36.7	PK	1.4	0	38.1	65.5	-27.4	-	-
8	.159	10.43	Av	1.4	0	11.83	-	-	55.5	-43.67
9	.8115	35.51	PK	.3	0	35.81	56	-20.19	-	-
10	.8115	20.85	Av	.3	0	21.15	-	-	46	-24.85
11	1.203	22.66	PK	.2	.1	22.96	56	-33.04	-	-
12	1.203	12.68	Av	.2	.1	12.98	-	-	46	-33.02

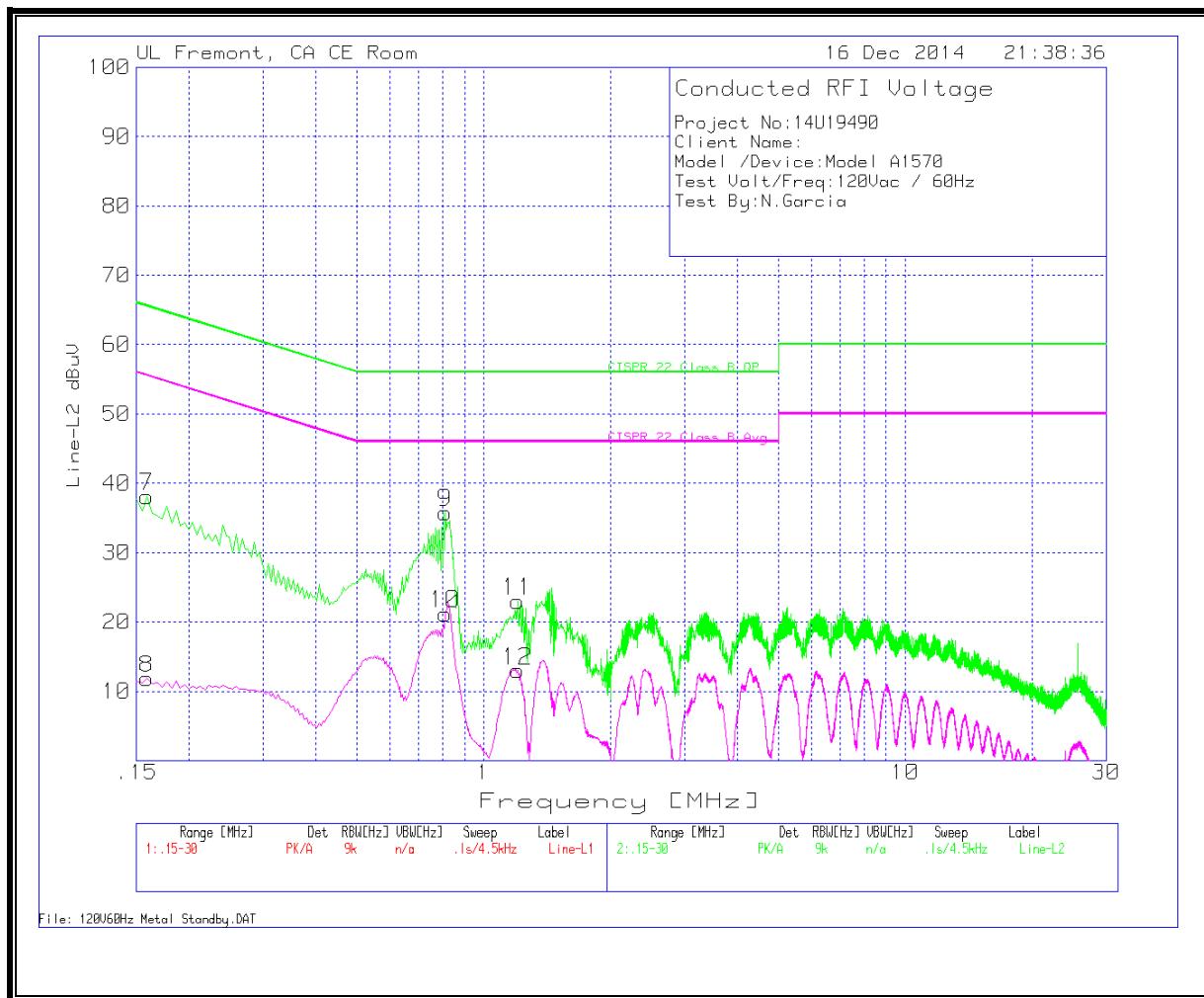
PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS



9.1.2. 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	.1725	53.22	PK	1.2	0	54.42	64.8	-10.38	-	-
2	.1725	35.94	Av	1.2	0	37.14	-	-	54.8	-17.66
3	.2535	46.59	PK	.7	0	47.29	61.6	-14.31	-	-
4	.2535	30.89	Av	.7	0	31.59	-	-	51.6	-20.01
5	.825	43.73	PK	.3	0	44.03	56	-11.97	-	-
6	.825	31.12	Av	.3	0	31.42	-	-	46	-14.58
7	4.308	37.01	PK	.2	.1	37.31	56	-18.69	-	-
8	4.308	22.1	Av	.2	.1	22.4	-	-	46	-23.6

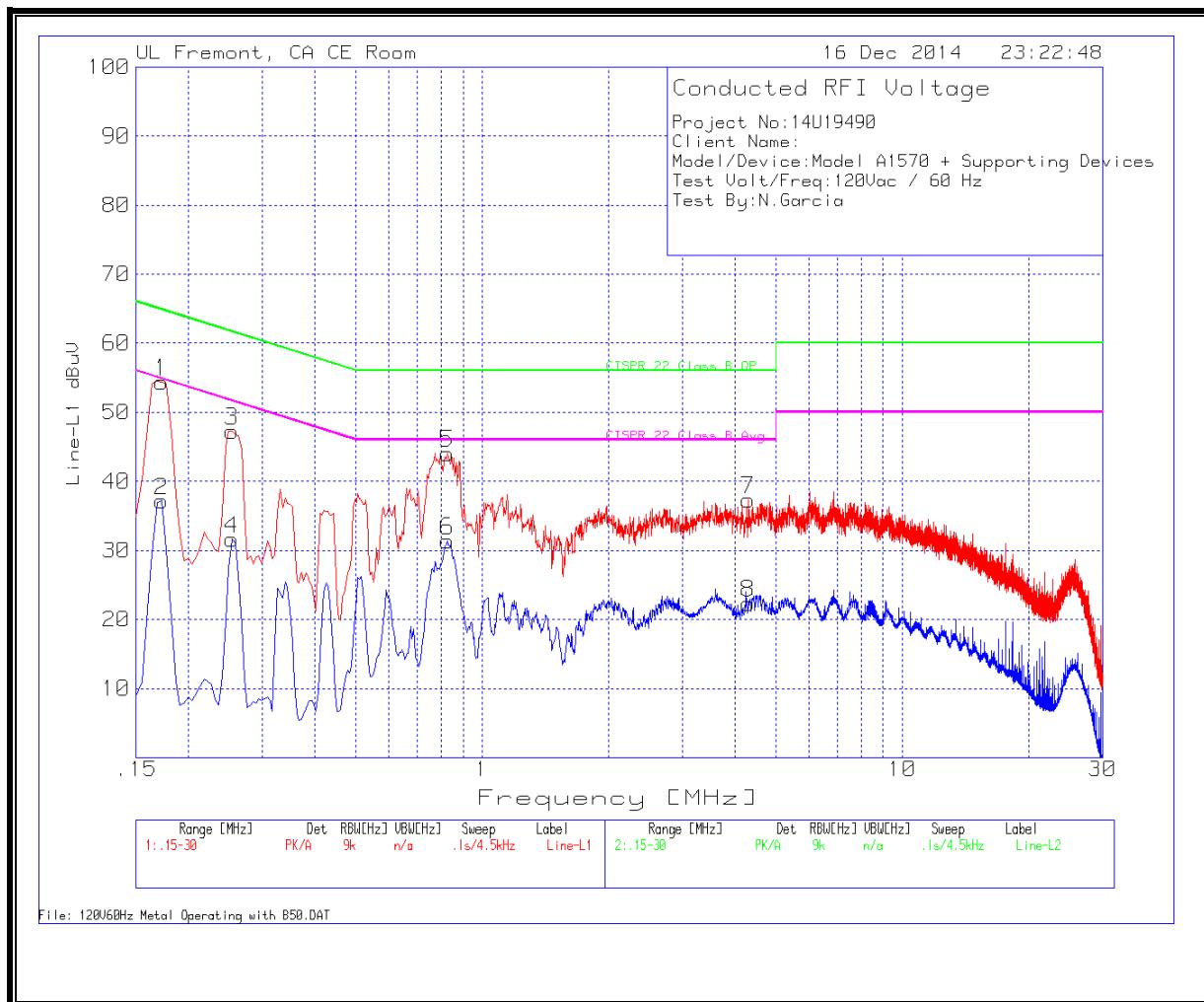
Line-L2 .15 - 30MHz

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)
9	.168	50.11	PK	1.3	0	51.41	65.1	-13.69	-	-
10	.168	32.73	Av	1.3	0	34.03	-	-	55.1	-21.07
11	.2535	45.73	PK	.7	0	46.43	61.6	-15.17	-	-
12	.2535	26.71	Av	.7	0	27.41	-	-	51.6	-24.19
13	.3255	41.52	PK	.5	0	42.02	59.6	-17.58	-	-
14	.3255	24.96	Av	.5	0	25.46	-	-	49.6	-24.14
15	.8295	42.35	PK	.3	0	42.65	56	-13.35	-	-
16	.8295	25.01	Av	.3	0	25.31	-	-	46	-20.69

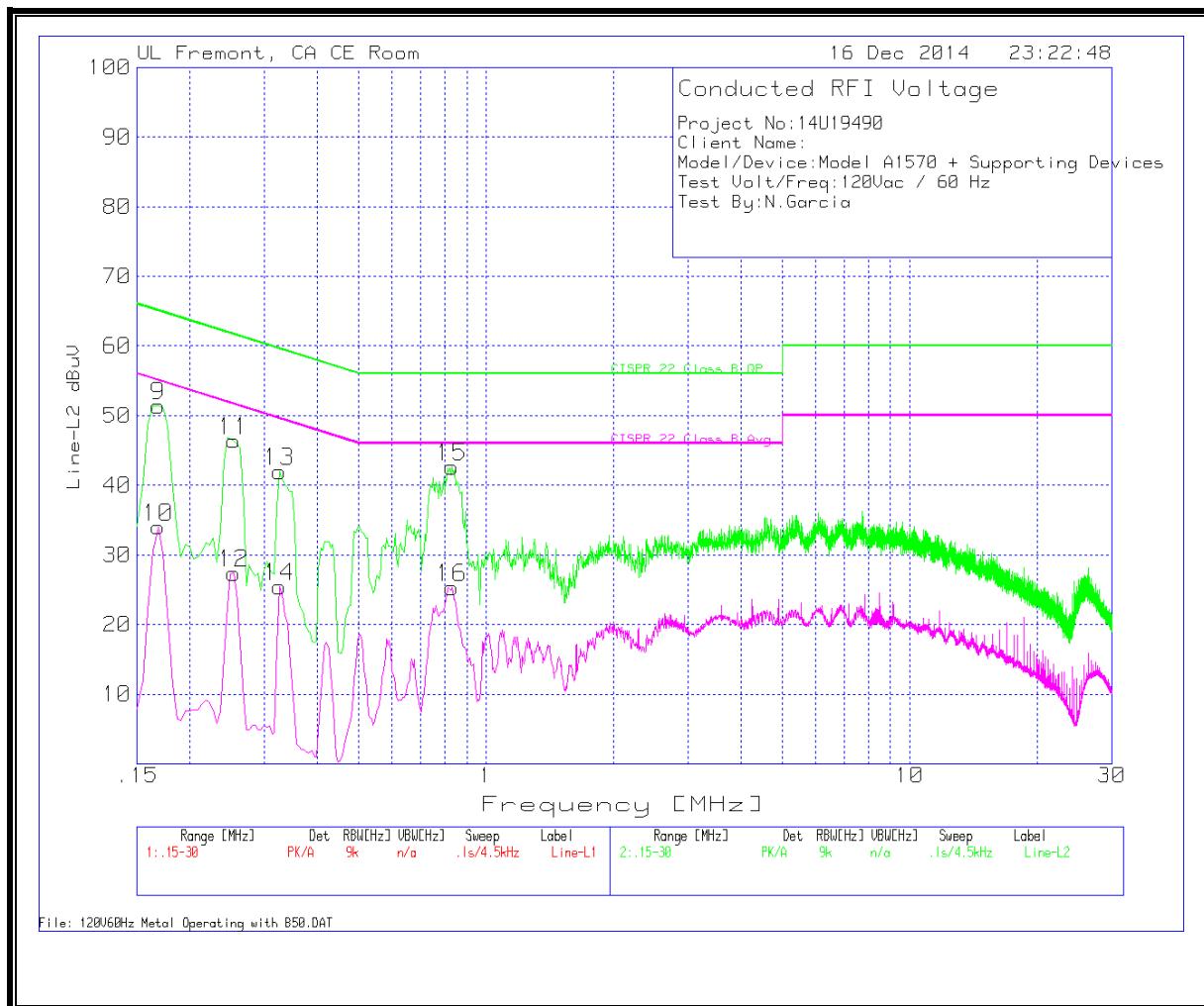
PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS



A1553

WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

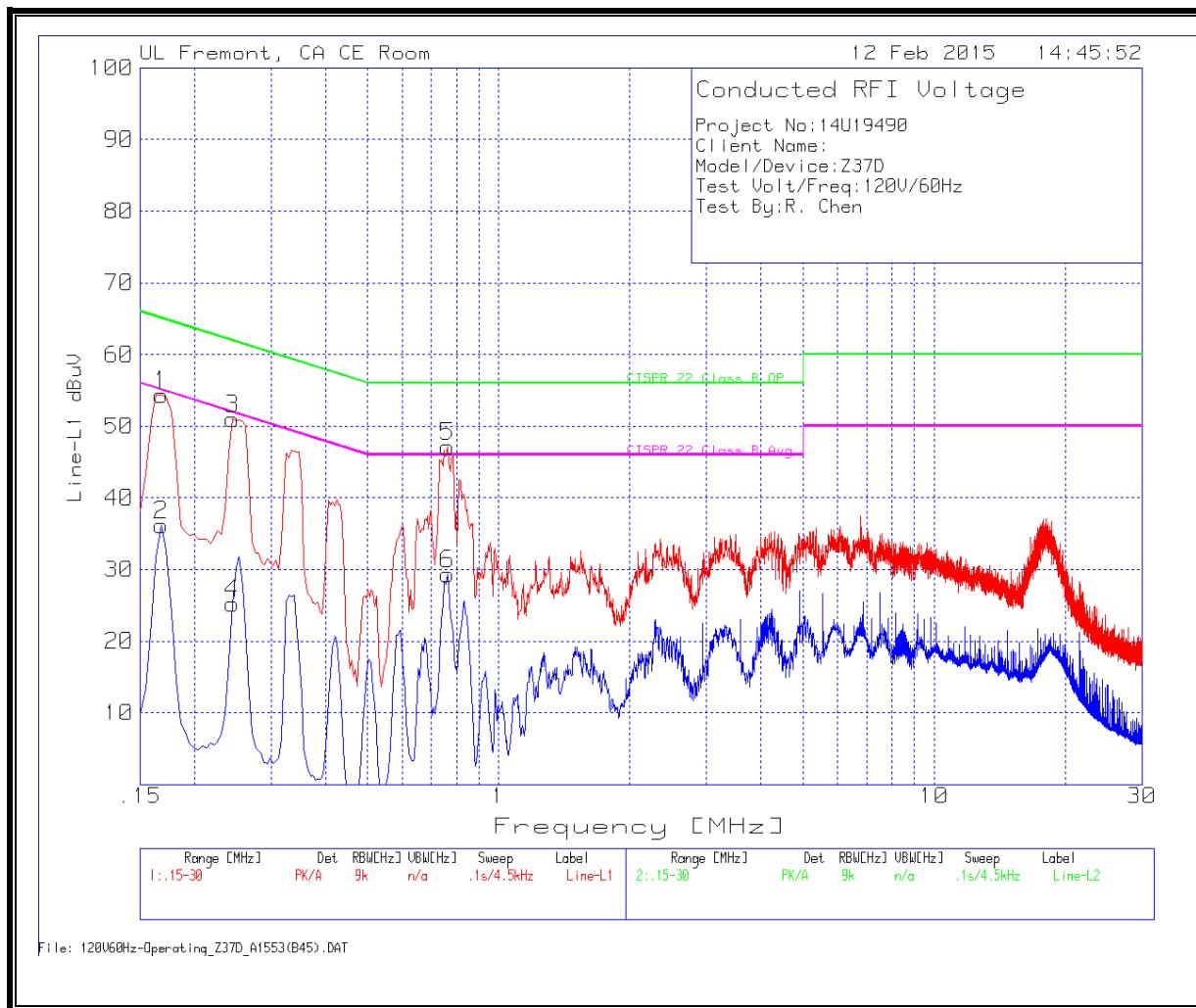
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.168	53.2	PK	1.2	0	54.4	65.1	-10.7	-	-
2	.168	34.93	Av	1.2	0	36.13	-	-	55.1	-18.97
3	.2445	50.3	PK	.7	0	51	61.9	-10.9	-	-
4	.2445	24.55	Av	.7	0	25.25	-	-	51.9	-26.65
5	.762	46.8	PK	.3	0	47.1	56	-8.9	-	-
6	.762	29.07	Av	.3	0	29.37	-	-	46	-16.63

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	.1635	51.39	PK	1.3	0	52.69	65.3	-12.61	-	-
8	.1635	31.51	Av	1.3	0	32.81	-	-	55.3	-22.49
9	.249	48.52	PK	.7	0	49.22	61.8	-12.58	-	-
10	.249	30.01	Av	.7	0	30.71	-	-	51.8	-21.09
11	.7575	44.29	PK	.3	0	44.59	56	-11.41	-	-
12	.7575	26.43	Av	.3	0	26.73	-	-	46	-19.27

LINE 1 RESULTS



LINE 2 RESULTS

