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

CERTIFICATION TEST REPORT

FOR

APPLE WATCH MAGNETIC CHARGING BRACELET

MODEL NUMBER: A1626

REPORT NUMBER: 14U19490-E1, REVISION B

FCC ID: BCGA1626
IC: 579C-A1626

ISSUE DATE: FEBRUARY 23, 2015

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

Prepared by
UL VERIFICATION SERVICES INC.
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	02/12/2015	Initial Issue	M. Mekuria
A	02/19/2015	Address TCB's questions on Section 5.2	C. Pang
B	02/23/2015	Revised report to address TCB's question on Section 5.4	T. Chu

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: APPLE WATCH MAGNETIC CHARGING BRACELET

MODEL: A1626

SERIAL NUMBER: DLCNT0STG4K8

DATE TESTED: JANUARY 15 – 21 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
☐ 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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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 bracelet 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	-18.36

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

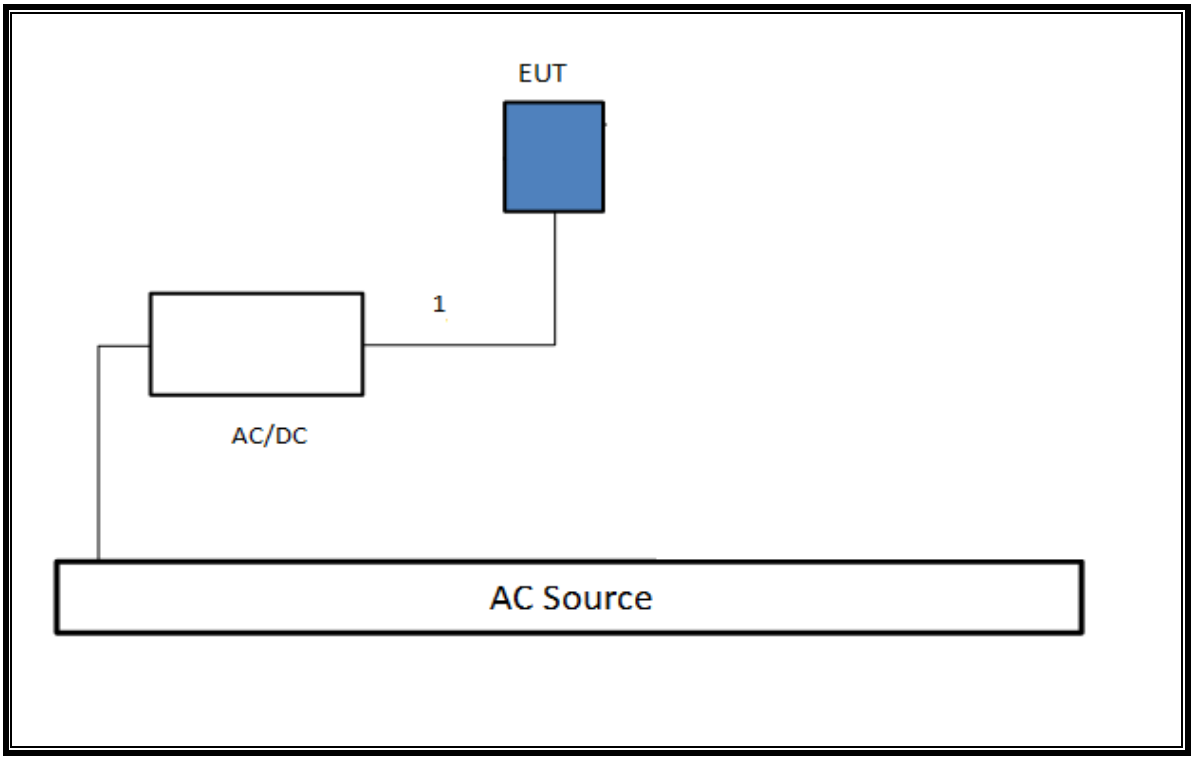
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	USB	Un-shielded	1.0	N/A

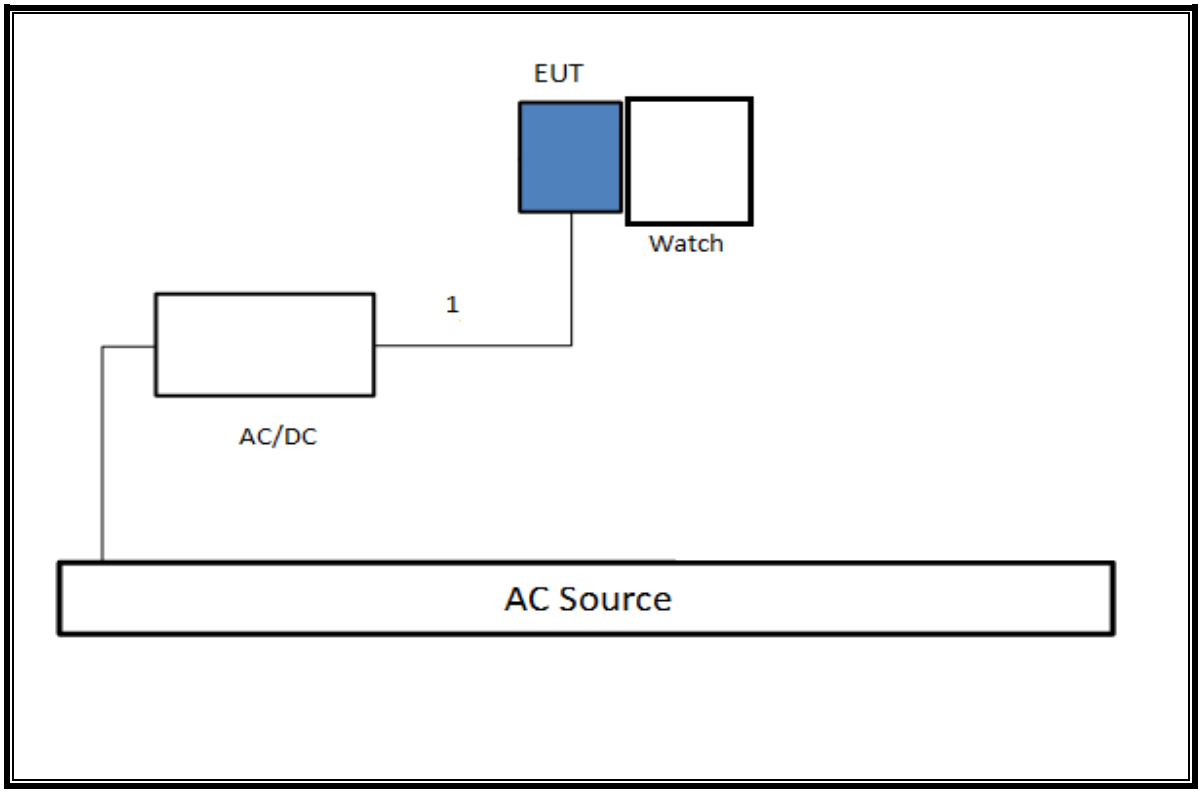
TEST SETUP

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:

Test Equipment List				
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 (×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 × 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× 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×RBW.

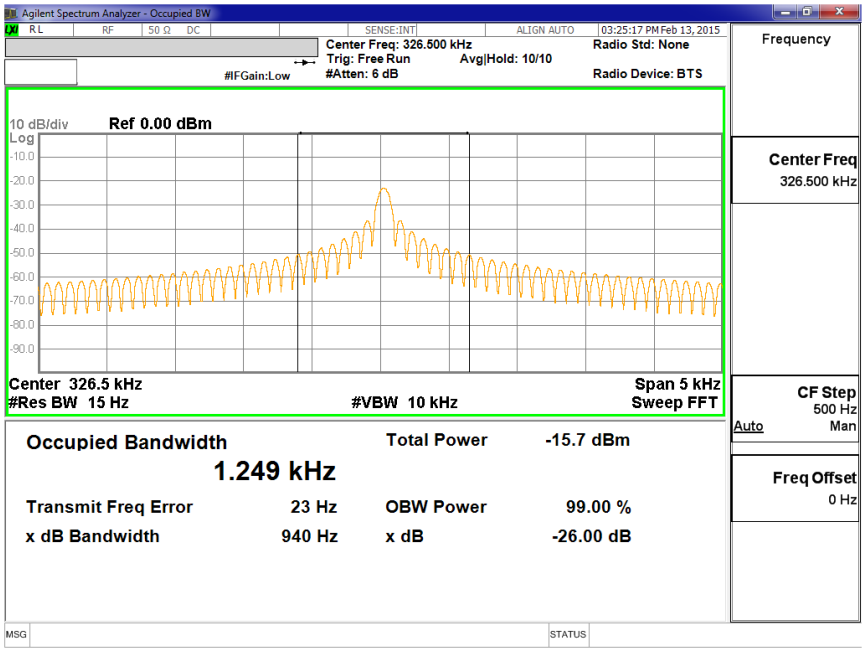
Note: Video averaging is not permitted.

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.

99% BANDWIDTH PLOT



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:
Project #: 14U19490
EUT configuration #: Model A1626
Mode of operation: Standby
Tester: T Wang
Date: 1/16/2015

Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBu/V)	(dBu/V)	(dBuV)	dB/m	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.3265	51.1		45.6	10.54	3	-80.00	-18.36	-23.86	37.33	17.33	-55.7	-41.2	
Loop Antenna Face Off:													
0.3265	48.4		43.1	10.54	3	-80.00	-21.06	-26.36	37.33	17.33	-58.4	-43.7	

* 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

8.2.2. OPERATING CONFIGURATION CHARGER

A1554

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G

Company:
Project #: 14U19490
EUT configuration #: Model A1626 and Supporting Devices
Mode of operation: Operating
Tester: T Wang
Date: 1/16/2015

Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBu/V)	(dBu/V)	(dBuV)	dB/m	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.3265	42.312		36.92	10.54	3	-80.00	-27.14	-32.54	37.33	17.33	-64.5	-49.9	
Loop Antenna Face Off:													
0.3265	41.494		35.78	10.54	3	-80.00	-27.96	-33.68	37.33	17.33	-65.3	-51.0	

* 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

A1553

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G

Company:
Project #: 14U19490
EUT configuration #: Model A1626 and Supporting Devices A1553
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)	(dBu/V)	(dBu/V)	(dBuV)	dB/m	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.3265	42.012		34.541	10.54	3	-80.00	-27.44	-34.92	37.33	17.33	-64.8	-52.2	
Loop Antenna Face Off:													
0.3265	41.472		33.854	10.54	3	-80.00	-27.98	-35.60	37.33	17.33	-65.3	-52.9	

* 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)

Rev. 060314

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 A1626
Mode of operation: Standby
Tester: T Wang
Date: 1/16/2015

Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBu/V)	(dBu/V)	(dBuV)	dB/m	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.646	38.85	33.65	-	10.53	3	-40.00	4.18	-	31.40	-	-27.2	-	
0.976	33.56	28.36	-	10.6	3	-40.00	-1.04	-	27.82	-	-28.9	-	
7.824	17.16	12.13	-	10.7	3	-40.00	-17.17	-	29.54	-	-46.7	-	
Loop Antenna Face Off:													
0.646	37.96	32.73	-	10.53	3	-40.00	3.26	-	31.40	-	-28.1	-	
1.575	28.38	23.16	-	10.6	3	-40.00	-6.24	-	23.66	-	-29.9	-	

* 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)

Rev. 060314

8.3.2. OPERATING CONFIGURATION CHARGER

A1554

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G

Company:
Project #: 14U19490
EUT configuration #: Model A1626 and Supporting Devices
Mode of operation: Operating
Tester: T Wang
Date: 1/16/15

Frequency	PK	QP	AV	AF	Distance	Distance	PK Corrected	AV Corrected	PK Limit	AV Limit	PK Margin	AV Margin	Notes
(MHz)	(dBu/V)	(dBu/V)	(dBuV)	dB/m	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.626	39.75	34.64	-	10.53	3	-40.00	5.17	-	31.67	-	-26.5	-	
1.918	25.91	20.82	-	10.6	3	-40.00	-8.58	-	29.54	-	-38.1	-	
5.329	18.36	13.17	-	10.7	3	-40.00	-16.13	-	29.54	-	-45.7	-	
Loop Antenna Face Off:													
0.609	36.57	31.08	-	10.52	3	-40.00	1.60	-	31.91	-	-30.3	-	
4.143	19.81	14.61	-	10.66	3	-40.00	-14.73	-	29.54	-	-44.3	-	
7.787	17.22	12.04	-	10.7	3	-40.00	-17.26	-	29.54	-	-46.8	-	

* 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

A1553

FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Chamber-G

Company:
Project #: 14U19490
EUT configuration #: Model A1626 and Supporting Devices A1553
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)	(dBu/V)	(dBu/V)	(dBuV)	dB/m	(m)	Correction (dB)	Reading (dBuV/m)	Reading (dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	
Loop Antenna Face On:													
0.653	35.312	29.535	-	10.53	3	-40.00	0.07	-	31.31	-	-31.2	-	
0.979	25.78	21.41	-	10.6	3	-40.00	-7.99	-	27.79	-	-35.8	-	
1.306	28.605	22.34	-	10.6	3	-40.00	-7.06	-	25.29	-	-32.3	-	
Loop Antenna Face Off:													
0.653	35.072	29.5	-	10.53	3	-40.00	0.03	-	31.31	-	-31.3	-	
0.979	34.274	28.48	-	10.6	3	-40.00	-0.92	-	27.79	-	-28.7	-	
1.306	31.724	22.13	-	10.6	3	-40.00	-7.27	-	25.29	-	-32.6	-	

* 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.

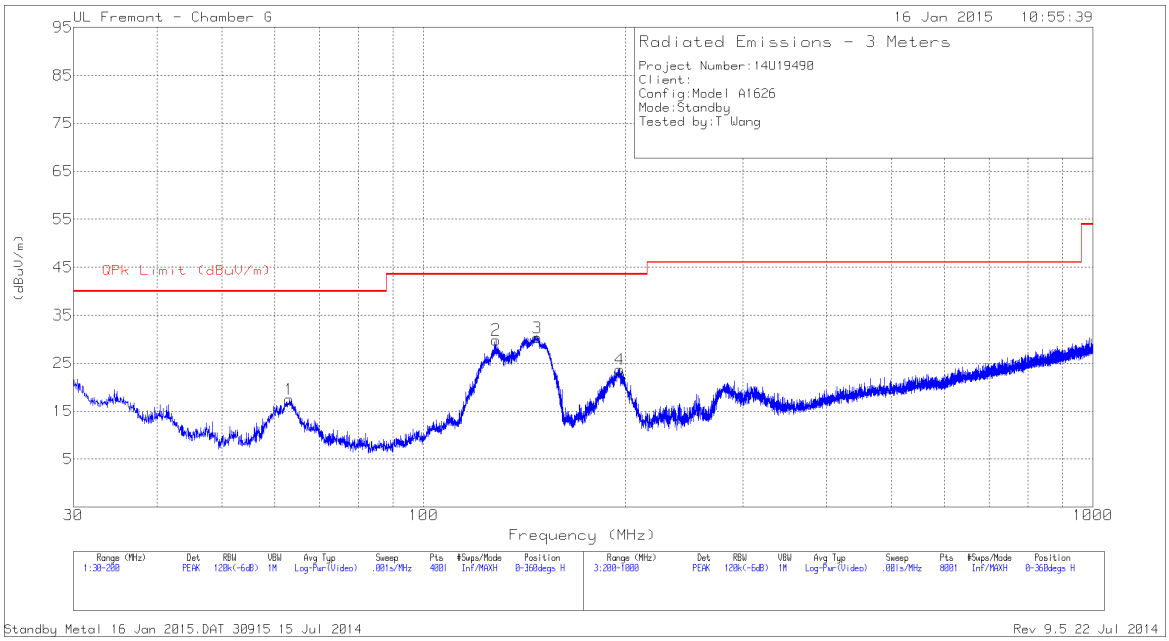
P.K. = Peak
Q.P. = Quasi Peak Readings Below 150kHz => RBW=VBW=200 or 300Hz
A.F. = Antenna factor Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)

Rev. 060314

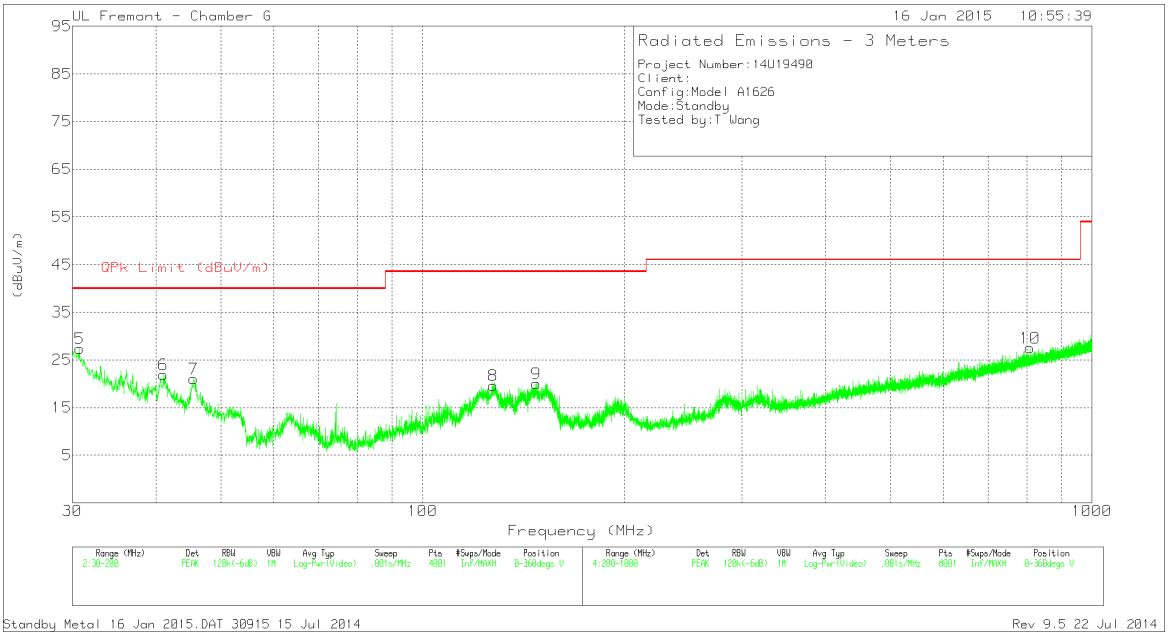
8.4. SPURIOUS EMISSION 30 TO 1000 MHz

8.4.1. STANDBY CONFIGURATION CHARGER

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL 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	63.0225	36.94	PK	11	-30.5	17.44	40	-22.56	0-360	401	H
2	* 128.3025	42.95	PK	16.8	-29.9	29.85	43.52	-13.67	0-360	201	H
3	147.8525	44.14	PK	15.8	-29.6	30.34	43.52	-13.18	0-360	201	H
4	196.26	38.09	PK	14.9	-29.3	23.69	43.52	-19.83	0-360	103	H
5	30.7225	34.68	PK	23.6	-30.9	27.38	40	-12.62	0-360	104	V
6	41.05	36.25	PK	16.5	-30.8	21.95	40	-18.05	0-360	104	V
7	45.555	38.67	PK	13.1	-30.7	21.07	40	-18.93	0-360	104	V
8	* 127.495	32.69	PK	16.8	-29.9	19.59	43.52	-23.93	0-360	104	V
9	147.9375	33.85	PK	15.8	-29.6	20.05	43.52	-23.47	0-360	104	V
10	808.3	29.27	PK	24.4	-26.2	27.47	46.02	-18.55	0-360	301	V

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

PK - Peak detector

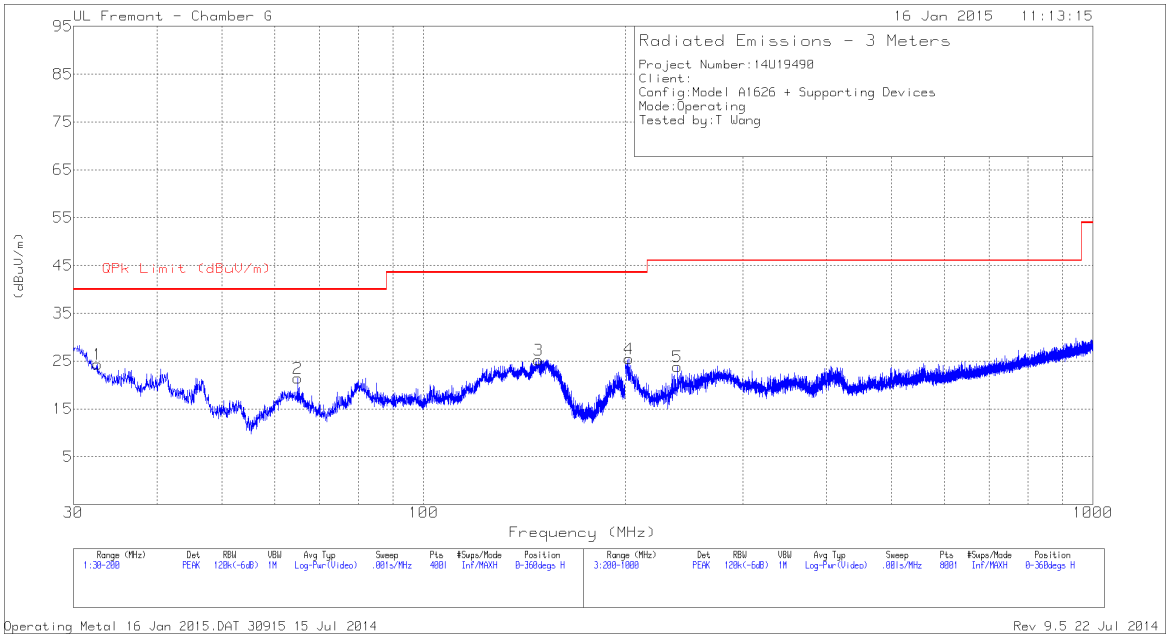
FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014

Rev 9.5 10 Jul 2014

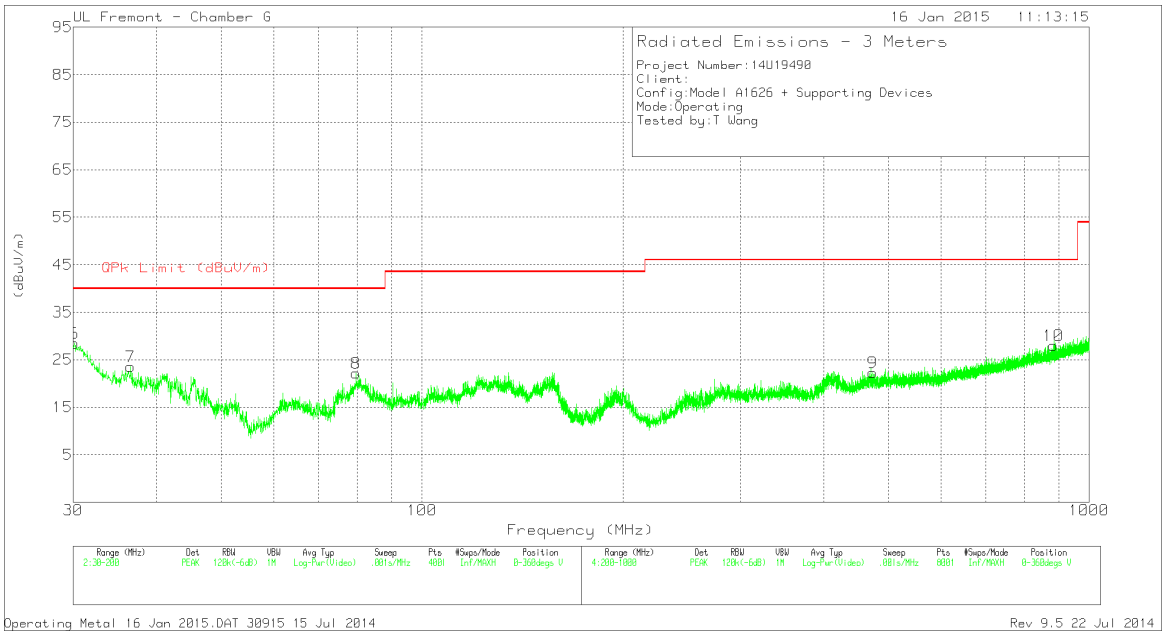
8.4.2. OPERATING CONFIGURATION CHARGER

A1554

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL 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	32.5925	32.98	PK	22.3	-30.9	24.38	40	-15.62	0-360	103	H
2	64.935	40.69	PK	11.2	-30.5	21.39	40	-18.61	0-360	301	H
3	148.66	38.99	PK	15.8	-29.6	25.19	43.52	-18.33	0-360	301	H
4	202.8	39.34	PK	15.3	-29.2	25.44	43.52	-18.08	0-360	101	H
5	239.7	38.39	PK	14.3	-28.9	23.79	46.02	-22.23	0-360	101	H
6	30.1275	35.36	PK	24	-30.9	28.46	40	-11.54	0-360	101	V
7	36.5875	34.88	PK	19.6	-30.9	23.58	40	-16.42	0-360	101	V
8	79.64	42.05	PK	10.4	-30.3	22.15	40	-17.85	0-360	101	V
9	473.6	29.68	PK	20.3	-27.7	22.28	46.02	-23.74	0-360	100	V
10	884.1	28.76	PK	24.9	-25.6	28.06	46.02	-17.96	0-360	100	V

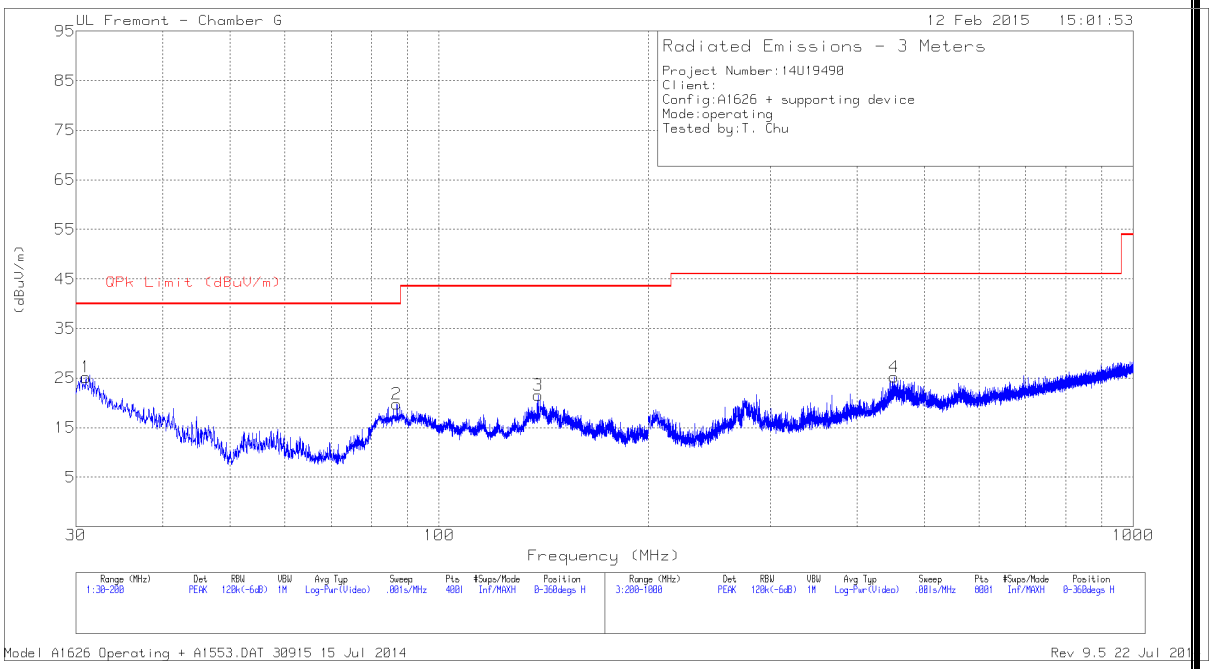
PK - Peak detector

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

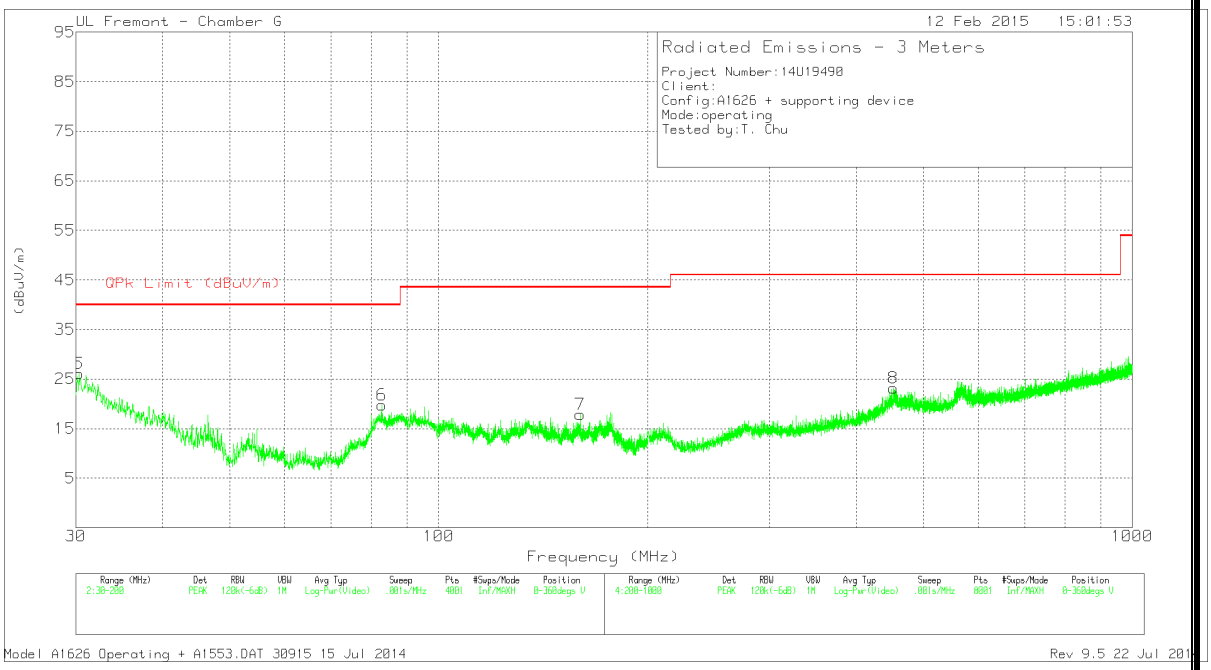
Rev 9.5 10 Jul 2014

A1553

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL 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	31.02	33.06	PK	23.4	-31.3	25.16	40	-14.84	0-360	103	H
2	86.95	40.18	PK	10.3	-30.7	19.78	40	-20.22	0-360	103	H
3	138.97	35.25	PK	16.4	-30.1	21.55	43.52	-21.97	0-360	201	H
4	452.5	33.84	PK	19.9	-28.5	25.24	46.02	-20.78	0-360	201	H
5	30.2975	33.49	PK	23.9	-31.3	26.09	40	-13.91	0-360	100	V
6	82.785	40.2	PK	10.2	-30.6	19.8	40	-20.2	0-360	100	V
7	159.965	32.65	PK	15.2	-30	17.85	43.52	-25.67	0-360	100	V
8	452.2	31.75	PK	19.9	-28.5	23.15	46.02	-22.87	0-360	100	V

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014
Rev 9.5 22 Jul 2014

9. 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

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	.1545	42.98	PK	1.3	0	44.28	65.8	-21.52	-	-
2	.1545	18.95	Av	1.3	0	20.25	-	-	55.8	-35.55
3	.807	41.05	PK	.3	0	41.35	56	-14.65	-	-
4	.807	27.42	Av	.3	0	27.72	-	-	46	-18.28
5	6.216	28.55	PK	.2	.1	28.85	60	-31.15	-	-
6	6.216	16.53	Av	.2	.1	16.83	-	-	50	-33.17

Line-L2 .15 - 30MHz

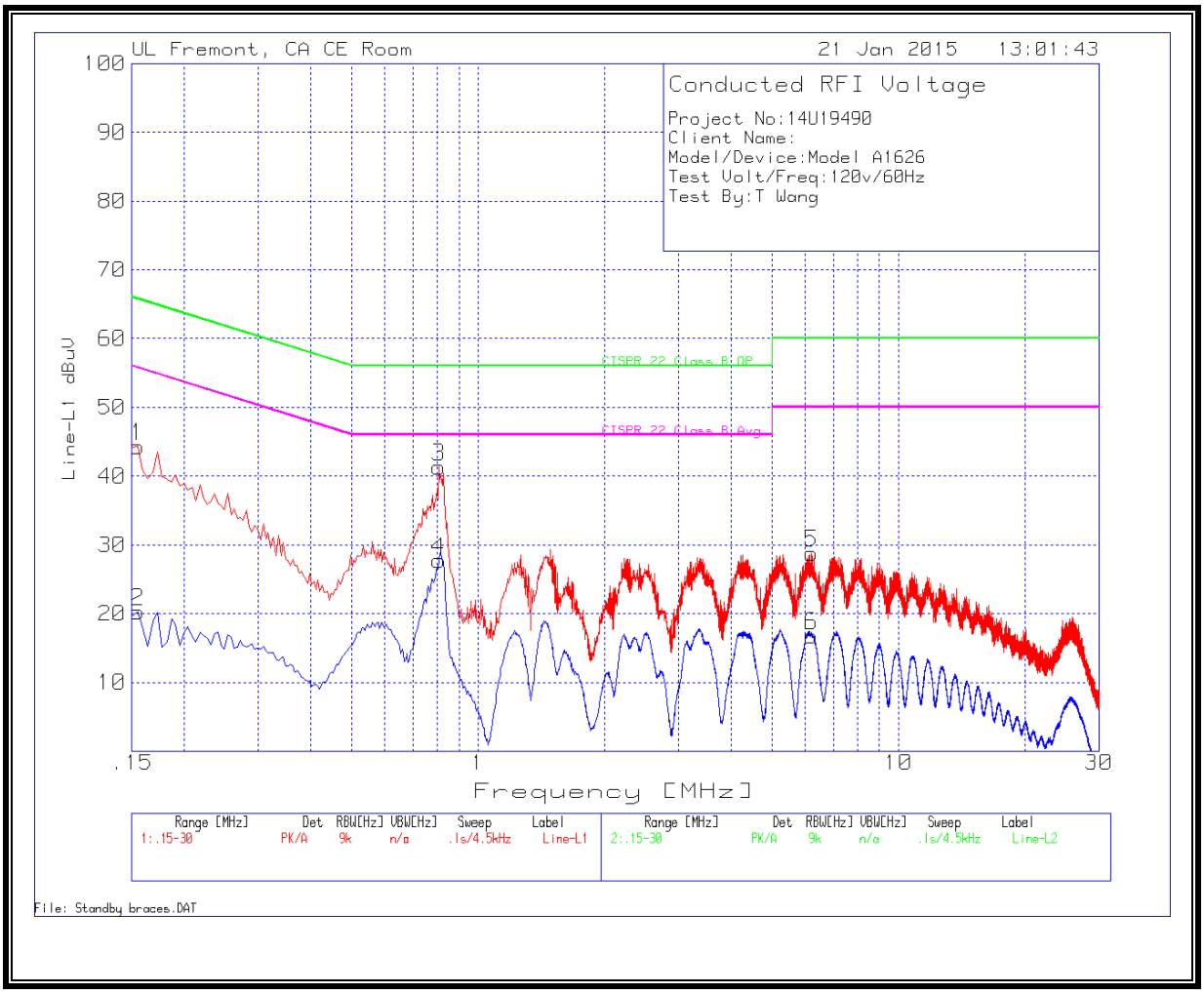
Trace Markers

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	.15	39.35	PK	1.5	0	40.85	66	-25.15	-	-
8	.15	15.5	Av	1.5	0	17	-	-	56	-39
9	.8115	40.94	PK	.3	0	41.24	56	-14.76	-	-
10	.8115	22.98	Av	.3	0	23.28	-	-	46	-22.72
11	6.2025	26.6	PK	.2	.1	26.9	60	-33.1	-	-
12	6.2025	16.74	Av	.2	.1	17.04	-	-	50	-32.96

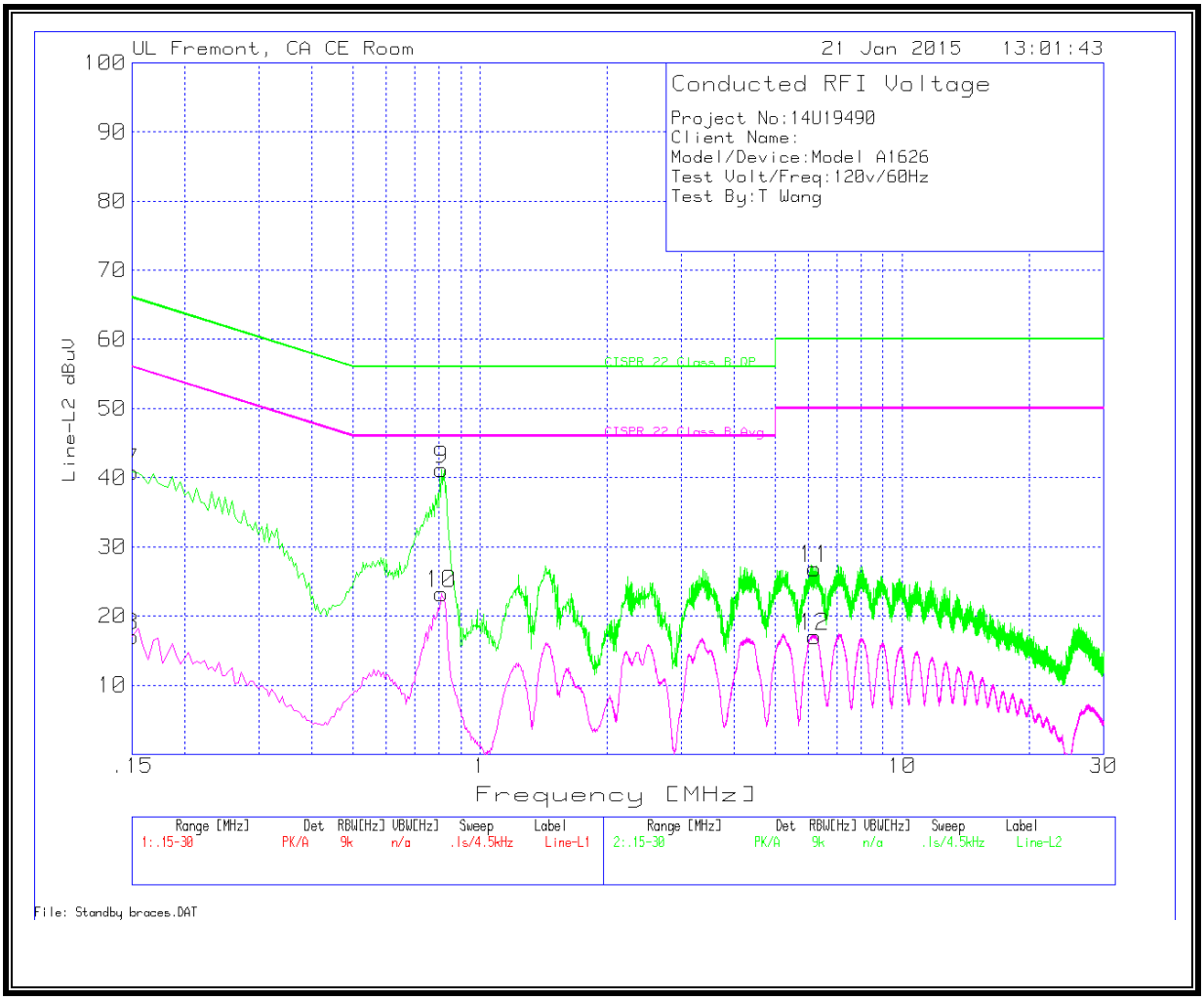
PK - Peak detector

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	.168	53.18	PK	1.2	0	54.38	65.1	-10.72	-	-
2	.168	35.4	Av	1.2	0	36.6	-	-	55.1	-18.5
3	.249	46.31	PK	.7	0	47.01	61.8	-14.79	-	-
4	.249	25.95	Av	.7	0	26.65	-	-	51.8	-25.15
5	.8205	43.15	PK	.3	0	43.45	56	-12.55	-	-
6	.8205	30.44	Av	.3	0	30.74	-	-	46	-15.26
7	6.819	37.69	PK	.2	.1	37.99	60	-22.01	-	-
8	6.819	22.03	Av	.2	.1	22.33	-	-	50	-27.67

Line-L2 .15 - 30MHz

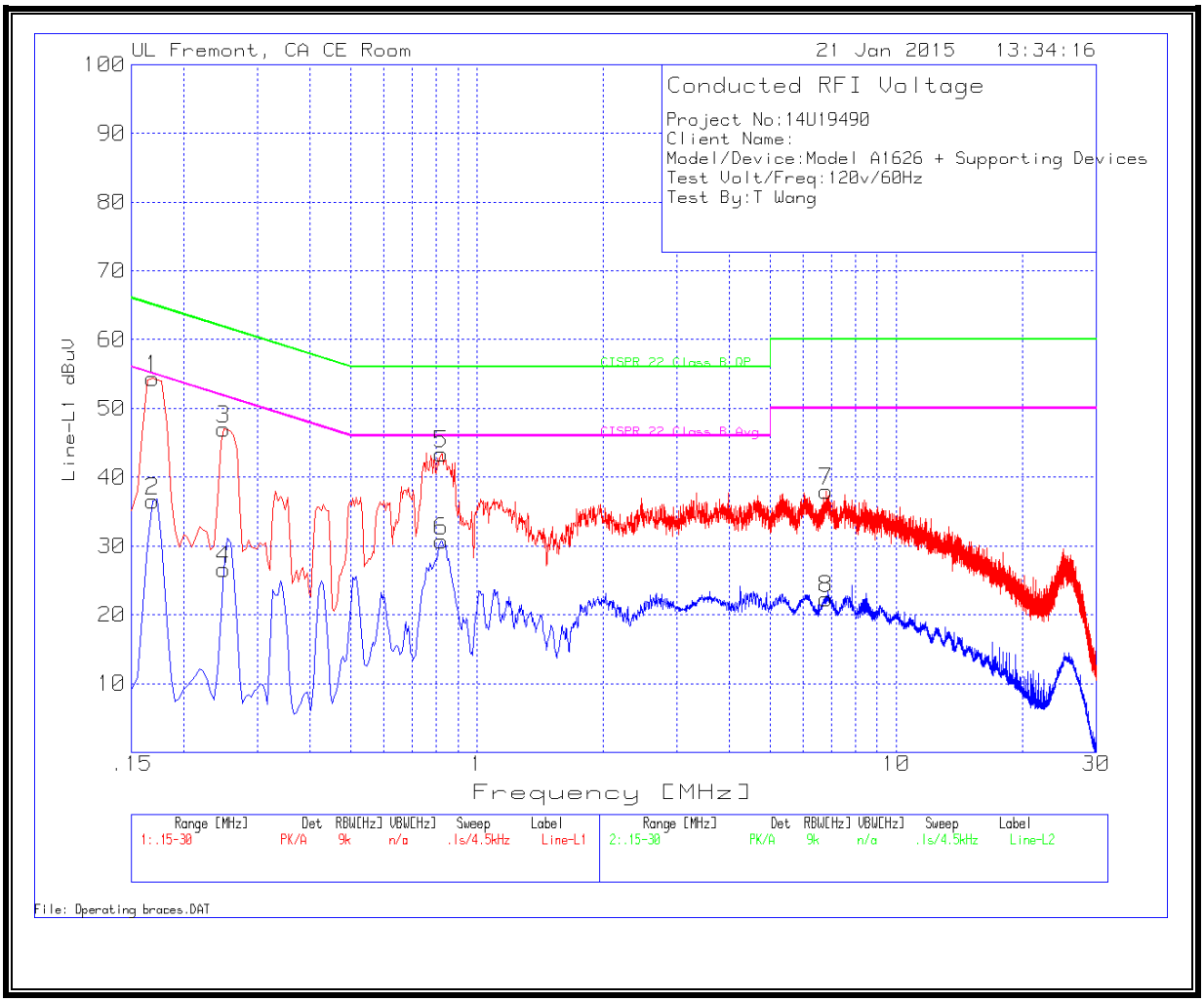
Trace Markers

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	.1635	50.71	PK	1.3	0	52.01	65.3	-13.29	-	-
10	.1635	28.98	Av	1.3	0	30.28	-	-	55.3	-25.02
11	.2445	46.21	PK	.8	0	47.01	61.9	-14.89	-	-
12	.2445	20.97	Av	.8	0	21.77	-	-	51.9	-30.13
13	.7845	43.72	PK	.3	0	44.02	56	-11.98	-	-
14	.7845	20.95	Av	.3	0	21.25	-	-	46	-24.75
15	5.3025	36.32	PK	.2	.1	36.62	60	-23.38	-	-
16	5.3025	22.24	Av	.2	.1	22.54	-	-	50	-27.46

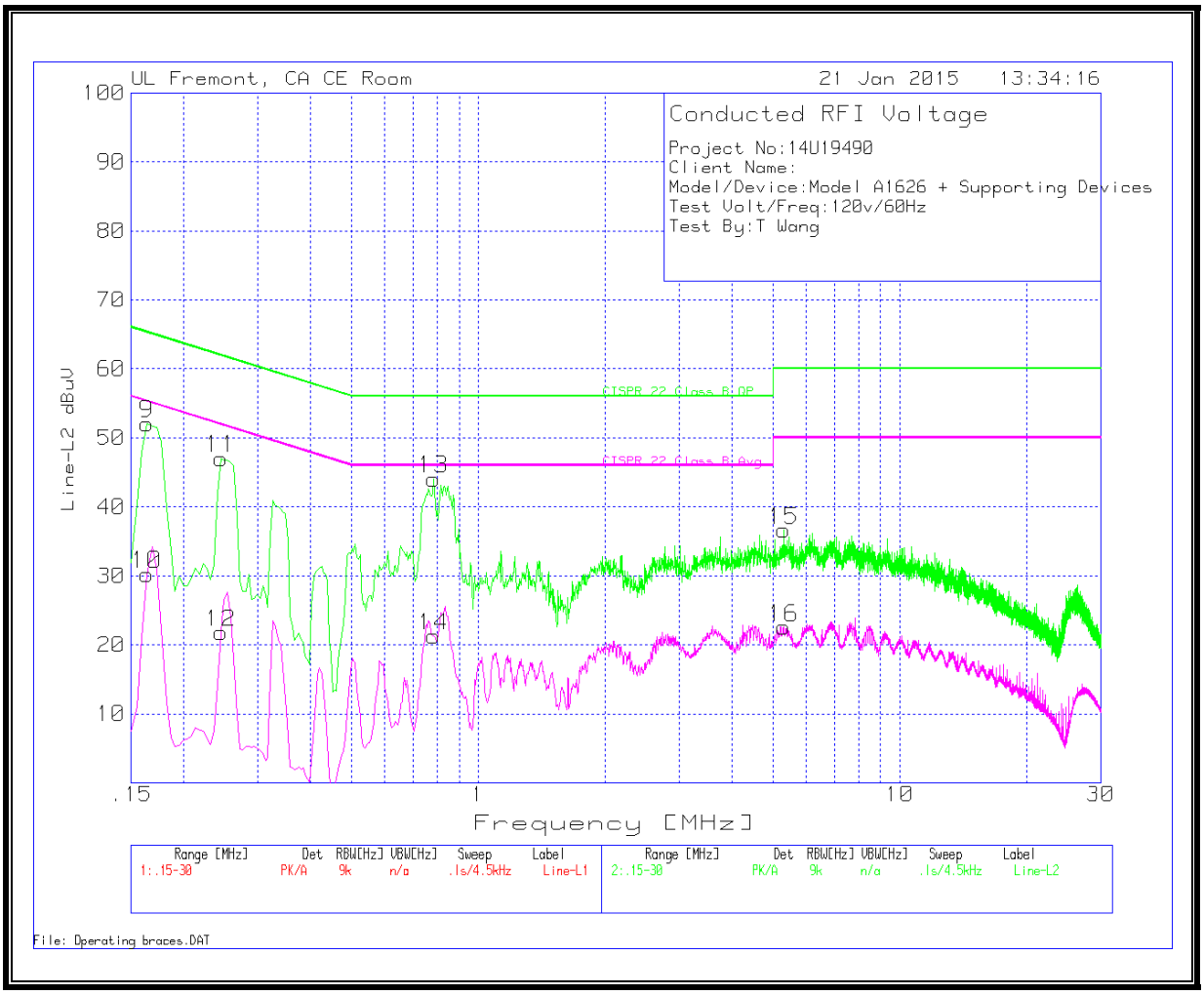
PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS



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WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

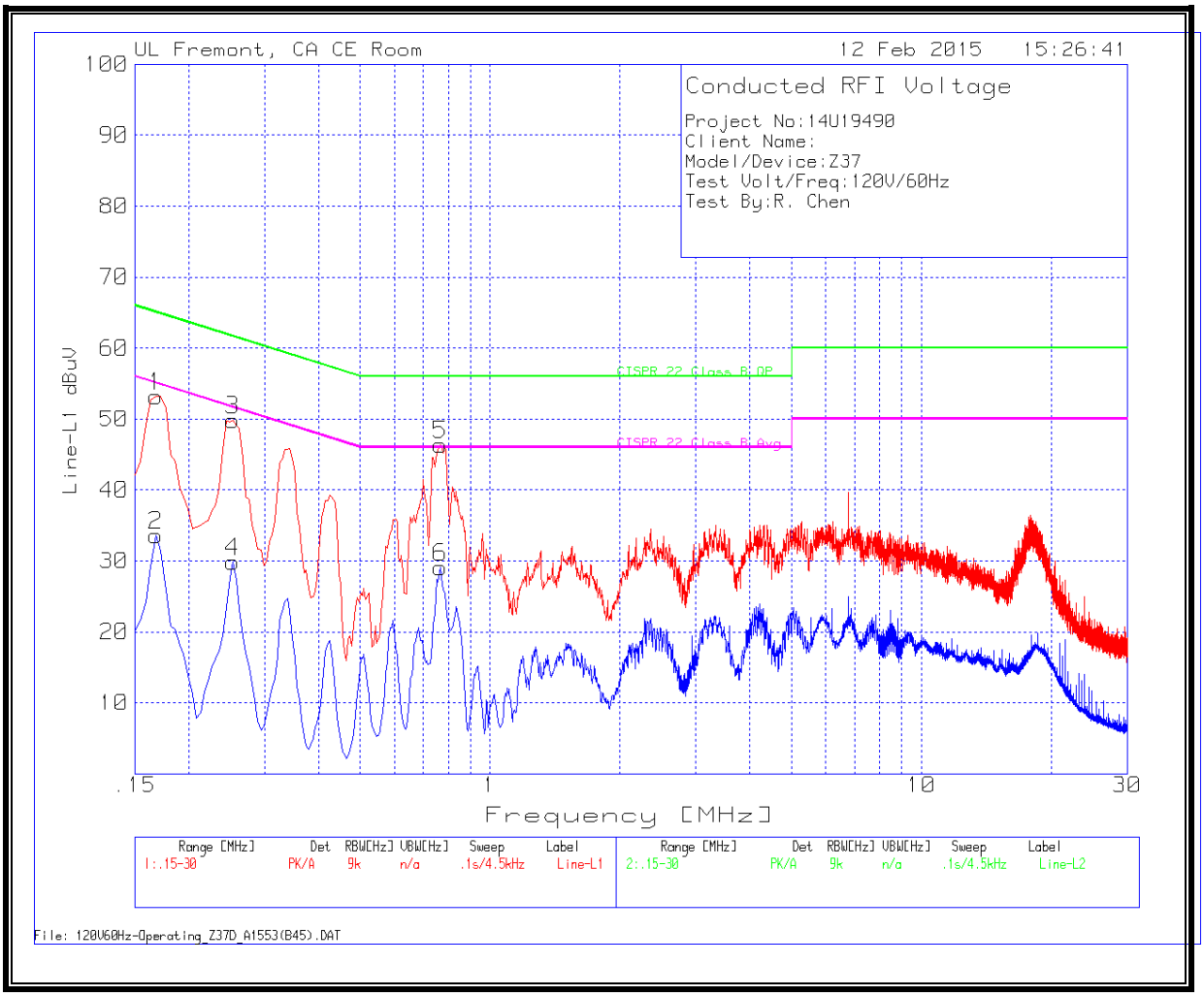
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.168	52	PK	1.2	0	53.2	65.1	-11.9	-	-
2	.168	32.37	Av	1.2	0	33.57	-	-	55.1	-21.53
3	.2535	49.11	PK	.7	0	49.81	61.6	-11.79	-	-
4	.2535	29.13	Av	.7	0	29.83	-	-	51.6	-21.77
5	.7665	46.04	PK	.3	0	46.34	56	-9.66	-	-
6	.7665	28.81	Av	.3	0	29.11	-	-	46	-16.89

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	51.5	PK	1.3	0	52.8	65.3	-12.5	-	-
8	.1635	31.94	Av	1.3	0	33.24	-	-	55.3	-22.06
9	.2445	48.41	PK	.8	0	49.21	61.9	-12.69	-	-
10	.2445	26.23	Av	.8	0	27.03	-	-	51.9	-24.87
11	.7485	43.66	PK	.3	0	43.96	56	-12.04	-	-
12	.7485	25.51	Av	.3	0	25.81	-	-	46	-20.19

LINE 1 RESULTS



LINE 2 RESULTS