



**FCC 47 CFR PART 15 SUBPART C
Radiated Emissions Only**

CERTIFICATION TEST REPORT

FOR

Lyric

MODEL NUMBER: AIO

**FCC ID: CFS8DLAIO
IC: 573F-AIO**

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Prepared for
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Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Honeywell Security
PO Box 9040 2 Corporate Center Dr., Suite 100
Melville, NY 11747

EUT DESCRIPTION: Smart Home Interface

MODEL: AIO

SERIAL NUMBER: N/A

DATE TESTED: August 5, 2015 – September 23, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

UL LLC 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 LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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 LLC By:



Bob Delisi
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UL LLC

Tested By:



Michael Ferrer
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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

Testing Deviation – EUT was tested 1.5m height for above 1GHz Radiated Emissions in accordance with TCB Conference Call Dec 2014.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfungsten Road, Northbrook, IL 60062 USA.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0.

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

Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)

Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)

Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

4.3. MEASUREMENT UNCERTAINTY

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

Test	Range	Equipment	Uncertainty k=2
Radiated Emissions	30-200MHz	Bicon 10m Horz	4.27dB
Radiated Emissions	30-200MHz	Bicon 10m Vert	4.28dB
Radiated Emissions	200-1000MHz	LogP 10m Horz	3.33dB
Radiated Emissions	200-1000MHz	LogP 10m Vert	3.39dB
Radiated Emissions	30-200MHz	Bicon 3m Horz	3.30dB
Radiated Emissions	30-130MHz	Bicon 3m Vert	4.84dB
Radiated Emissions	130-200MHz	Bicon 3m Vert	4.94dB
Radiated Emissions	200-1000MHz	LogP 3m Horz	3.46dB
Radiated Emissions	200-1000MHz	LogP 3m Vert	4.98dB
Radiated Emissions	1-6GHz	Horn	5.02dB
Radiated Emissions	6-18GHz	Horn	5.34dB
Radiated Emissions	18-26GHz	Horn	6.60dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Smart Home Interface containing a 908MHz transmitter.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an internal fixed metal rod antenna.

5.3. WORST-CASE CONFIGURATION AND MODE

The EUT was setup in the upright position as it would be for installation. The EUT was programmed the for highest output power and only transmits at one frequency 908.4MHz

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Power Supply	Honeywell	300-04705V1	-	DoC

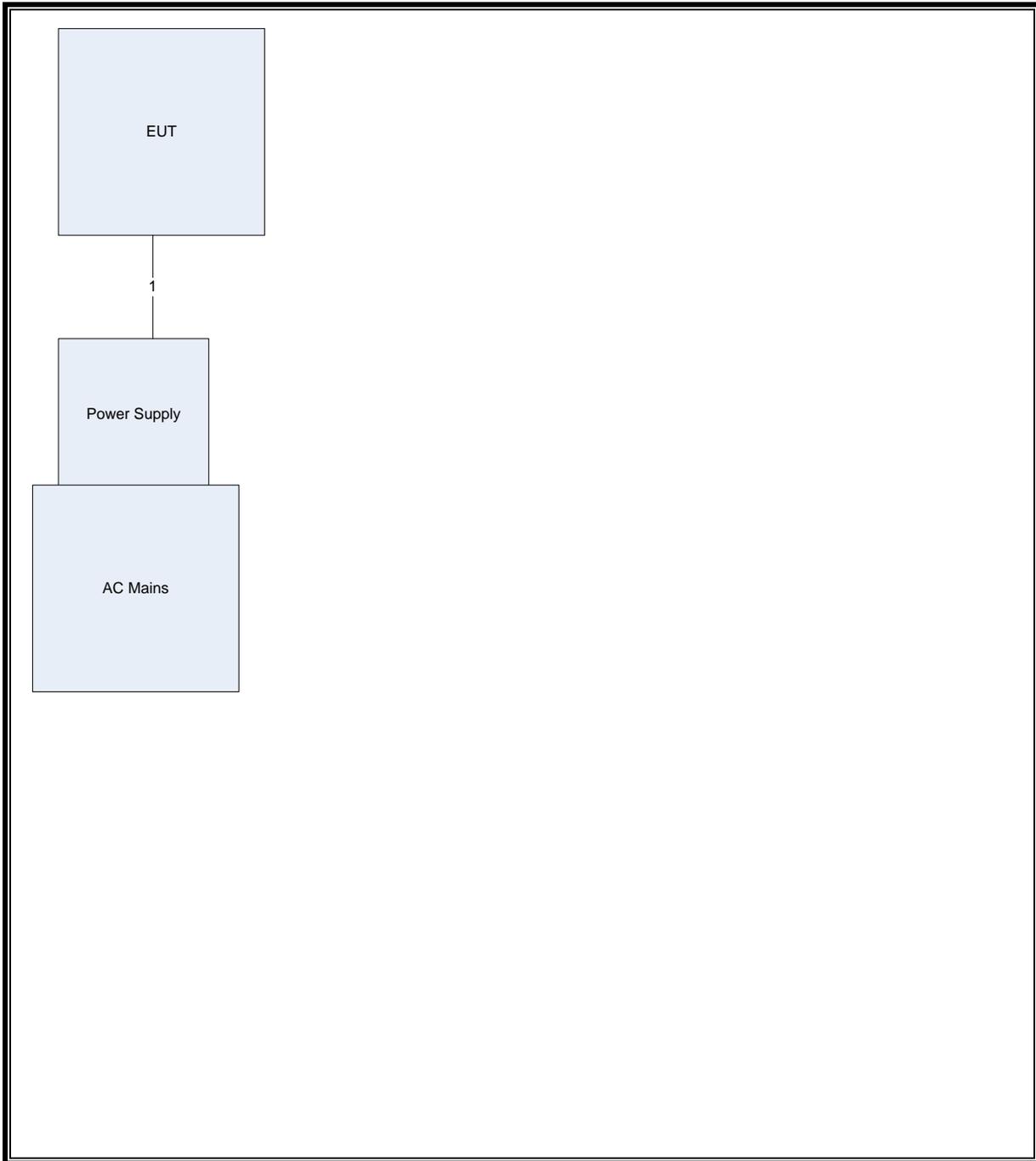
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	DC	Wire	1	None

TEST SETUP

The EUT is a stand alone unit. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



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	T No.	Cal Date	Cal Due
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014		
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012		
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC4328	20141830	20151231
Bicon Antenna	Electro-Metrics	EM6912A	EMC4070	20141014	20151031
Log-P Antenna	Chase	UPA6109	EMC4313	24141119	20151130
Spectrum Analyzer	Rohde & Schwarz	ESU	EMC4323	20141216	20151231
Antenna Array	UL	BOMS	EMC4276	20141201	20151231

7. RADIATED TEST RESULTS

7.1. RADIATED EMISSIONS

LIMIT

IC RSS-210, A2.9
 FCC 15.249

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz.

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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
88–216	150 **	3
216–960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

Fundamental Frequency measurements

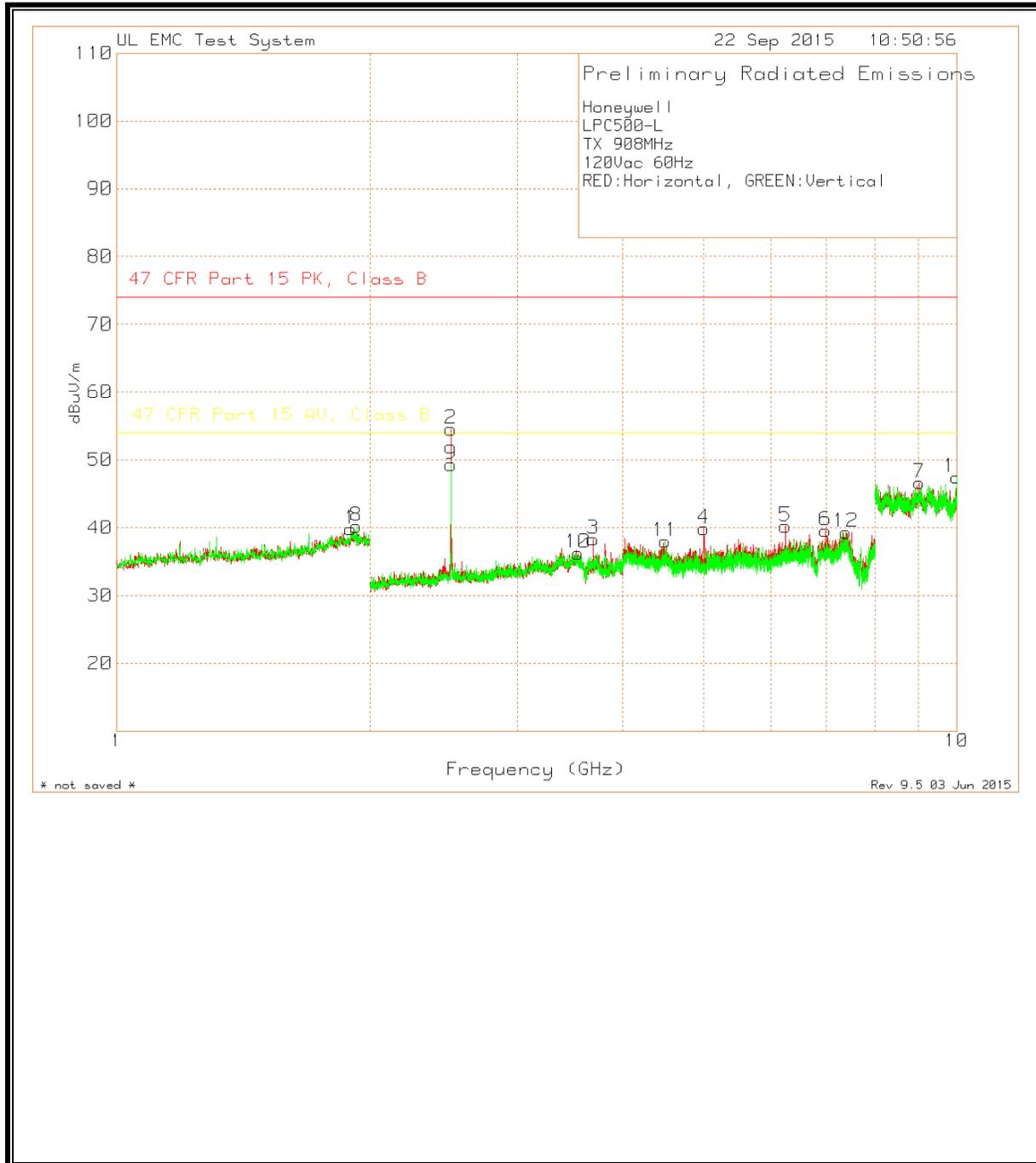
Test Frequency (MHz)	Meter		Antenna		Corrected Reading		Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	Reading (dBuV)	Detector	Factor dB/m	Cable Factor dB	dB(uVolts /meter)	TX Limit				
908.3941	55.17	Pk	23.3	10.3	88.77	114	-25.23	38	114	V
908.3951	54.82	Qp	23.3	10.3	88.42	94	-5.58	38	114	V
908.3941	51.11	Pk	23.3	10.3	84.71	114	-29.29	240	101	H
908.3941	50.88	Qp	23.3	10.3	84.48	94	-9.52	240	101	H

Pk - Peak detector

Qp - Quasi-Peak detector

7.2. TRANSMITTER ABOVE 1 GHz

HARMONICS AND SPURIOUS EMISSIONS



Honeywell
 LPC500-L
 TX 908MHz
 120Vac 60Hz
 RED:Horizontal, GREEN:Vertical

Marker No.	Test	Meter	Antenna		Corrected		PK Limit	Margin	AV limit	Margin	Azimuth	Height	Polarity
	Frequency (GHz)	Reading (dBuV)	Detector	Factor (dB/m)	Gain/Loss (dB)	Reading (dBuV/m)							
1	1.899	65.94	Pk	27.4	-53.55	39.79	74	-34.21	54	-14.21	0-360	100	H
2	2.5	84.4	Pk	22.1	-51.96	54.54	74	-19.46	54	0.54	0-360	100	H
3	3.688	64.33	Pk	23.5	-49.52	38.31	74	-35.69	54	-15.69	0-360	150	H
4	5	62.84	Pk	27.8	-50.8	39.84	74	-34.16	54	-14.16	0-360	101	H
5	6.25	58.16	Pk	29.2	-47.17	40.19	74	-33.81	54	-13.81	0-360	149	H
6	6.982	55.99	Pk	29.3	-45.71	39.58	74	-34.42	54	-14.42	0-360	149	H
7	9.023	58.98	Pk	36.1	-48.45	46.63	74	-27.37	54	-7.37	0-360	100	H
8	1.929	66.26	Pk	27.4	-53.46	40.2	74	-33.8	54	-13.8	0-360	150	V
9	2.5	79.18	Pk	22.1	-51.96	49.32	74	-24.68	54	-4.68	0-360	100	V
10	3.541	62.92	Pk	23.4	-50.1	36.22	74	-37.78	54	-17.78	0-360	100	V
11	4.496	62.04	Pk	27.9	-51.96	37.98	74	-36.02	54	-16.02	0-360	100	V
12	7.381	54.58	Pk	31.1	-46.37	39.31	74	-34.69	54	-14.69	0-360	100	V
13	10	58.33	Pk	36.4	-47.3	47.43	74	-26.57	54	-6.57	0-360	150	V

Pk - Peak detector

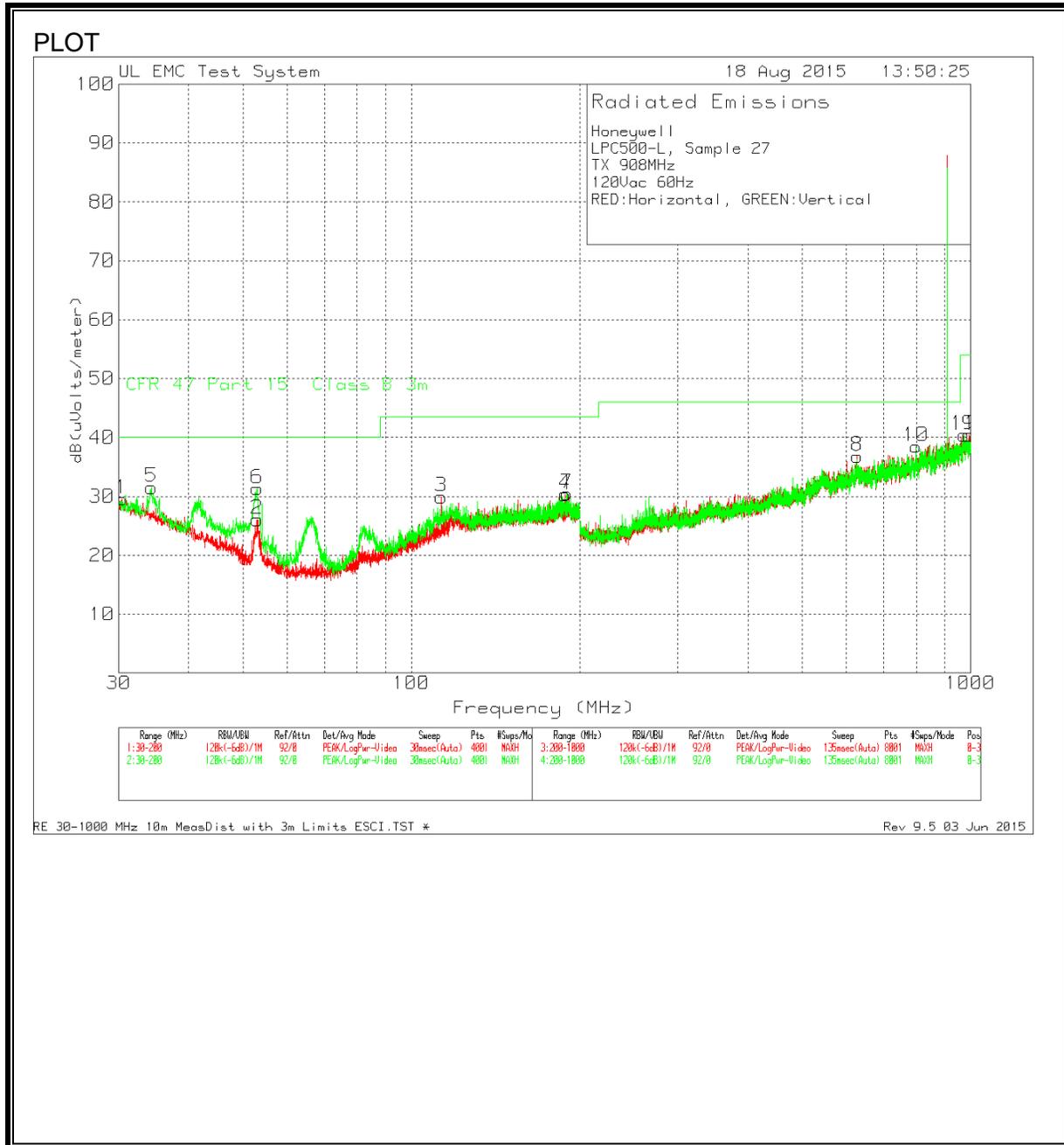
Frequency (GHz)	Test	Meter	Antenna		Corrected		PK Limit	Margin	AV limit	Margin	Azimuth	Height	Polarity
	Reading (dBuV)	Detector	Factor (dB/m)	Gain/Loss (dB)	Reading (dBuV/m)	Reading (dBuV/m)							
2.4999	78.13	Pk	22.1	-51.96	48.27	74	-25.73	54	-5.73	316	100	H	
2.4999	76.62	Av	22.1	-51.96	46.76	74	-27.24	54	-7.24	316	100	H	
2.5	81.07	Pk	22.1	-51.96	51.21	74	-22.79	54	-2.79	268	100	V	
2.4999	79.9	Av	22.1	-51.96	50.04	74	-23.96	54	-3.96	268	100	V	

Pk - Peak detector

Av - Average detection

7.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



Honeywell
 LPC500-L, Sample 27
 TX 908MHz
 120Vac 60Hz
 RED:Horizontal, GREEN:Vertical

Corrected CFR 47												
Marker	Test	Meter	Antenna	10M to	Reading	Part 15						
No.	Frequency	Reading(d	Factor	Cable	3M Factor	dB(uVolts	Class B	Margin	Azimuth	Height		Polarity
	(MHz)	BuV)	Detector	dB/m	Factor dB	dB	/meter)	3m	(dB)	[Degs]	[cm]	
1	30.3825	31.19	Pk	18.1	-30.2	10.5	29.59	40	-10.41	0-360	98	H
2	52.9925	37.59	Pk	8.1	-30.1	10.5	26.09	40	-13.91	0-360	400	H
3	113.1725	36.32	Pk	13	-29.9	10.5	29.92	43.52	-13.6	0-360	249	H
4	188.4825	32.99	Pk	16	-29.2	10.5	30.29	43.52	-13.23	0-360	98	H
5	34.2925	34.74	Pk	16.4	-30.1	10.5	31.54	40	-8.46	0-360	100	V
6	53.035	42.84	Pk	8.1	-30.1	10.5	31.34	40	-8.66	0-360	100	V
7	189.8425	33.08	Pk	16	-29.1	10.5	30.48	43.52	-13.04	0-360	250	V
8	627.8	31.59	Pk	20.7	-26	10.5	36.79	46.02	-9.23	0-360	101	H
9	992.6	31.64	Pk	23.7	-25.4	10.5	40.44	53.97	-13.53	0-360	300	H
10	799.4	32.67	Pk	21.5	-26.2	10.5	38.47	46.02	-7.55	0-360	400	V
11	973.9	30.89	Pk	24.1	-25.1	10.5	40.39	53.97	-13.58	0-360	299	V

Pk - Peak detector