

FCC CFR47 PART 15 SUBPART E INDUSTRY CANADA RSS-210 ISSUE 8 CLASS II PERMISSIVE CHANGE

CERTIFICATION TEST REPORT

FOR

WIFI 11A/N MODULE

FCC ID: MCLMICA IC: 2878D-MICA

REPORT NUMBER: 11J13632-1

ISSUE DATE: FEBRUARY 16, 2011

Prepared for HON HAI PRECISION IND. CO., LTD. 5F-1, 5 HSIN-AN ROAD HSINCHU SCIENCE-BASED INDUSTRIAL PARK TAIWAN, R.O.C.

Prepared by COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 771-1000 FAX: (510) 661-0888



NVLAP LAB CODE 200065-0

.

Revision History

Rev.	Issue Date	Revisions	Revised By
	2/16/2011	Initial Issue	T. Chan

Page 2 of 44

TABLE OF CONTENTS

1. A	TTESTATION OF TEST RESULTS	. 5
2. T	EST METHODOLOGY	. 6
3. F	ACILITIES AND ACCREDITATION	. 6
4. C	ALIBRATION AND UNCERTAINTY	. 6
4.1.	MEASURING INSTRUMENT CALIBRATION	. 6
4.2.	SAMPLE CALCULATION	. 6
4.3.	MEASUREMENT UNCERTAINTY	. 6
5. E	QUIPMENT UNDER TEST	.7
5.1.	DESCRIPTION OF EUT	. 7
5.2.	DESCRIPTION OF CLASS II PERMISSIVE CHANGE	. 7
5.3.	MAXIMUM OUTPUT POWER	. 7
5.4.	DESCRIPTION OF AVAILABLE ANTENNAS	. 7
5.5.	SOFTWARE AND FIRMWARE	. 7
5.6.	WORST-CASE CONFIGURATION AND MODE	. 8
5.7.	DESCRIPTION OF TEST SETUP	. 8
6. T	EST AND MEASUREMENT EQUIPMENT	10
7. A	NTENNA PORT TEST RESULTS	11
7.1. 7.	802.11a MODE IN THE 5.2 GHz BAND 1.1. OUTPUT POWER	
7.2. 7.	802.11n HT20 SISO MODE IN THE 5.2 GHz BAND 2.1. OUTPUT POWER	
	802.11n HT40 SISO MODE IN THE 5.2 GHz BAND 3.1. OUTPUT POWER	
8. R	ADIATED TEST RESULTS	19
8.1.		19
8.2.	TRANSMITTER ABOVE 1 GHz	20
8. B 8.	 2.1. TX ABOVE 1 GHz FOR 802.11a MODE IN THE LOWER 5.2 GHz BAND	20
8.3.		29
8	3.1. RECEIVER ABOVE 1 GHz (20MHz Bandwidth) 3.2. RECEIVER ABOVE 1 GHz (40MHz Bandwidth)	29
8.4.	WORST-CASE BELOW 1 GHz	31
	Page 3 of 44	
COMP 47173	LIANCE CERTIFICATION SERVICES (UL CCS) BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-08	
in	is report shall not be reproduced except in full, without the written approval of UL CCS.	

9.	AC POWER LINE CONDUCTED EMISSIONS	34
10.	MAXIMUM PERMISSIBLE EXPOSURE	38
11.	SETUP PHOTOS	41

Page 4 of 44

Pass

1. ATTESTATION OF TEST RESULTS

INDUSTRY CANADA RSS-210 Issue 8 Annex 9

COMPANY NAME:	HON HAI PRECISION IND. CO., LTD. 5F-1, 5 HSIN-AN ROAD HSINCHU SCIENCE-BASED INDUSTRIAL PARK TAIWAN, R.O.C.				
EUT DESCRIPTION:	WIFI 11A/N MODULE				
MODEL:	MIC-A				
SERIAL NUMBER:	N/A				
DATE TESTED:	FEBRUARY 15-16, 20110				
APPLICABLE STANDARDS					
ST	ANDARD TEST RESULTS				
CFR 47 P	art 15 Subpart E Pass				

INDUSTRY CANADA RSS-GEN Issue 3PassCompliance Certification Services (UL CCS) 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 CCS 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS 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 CCS By:

Tested By:

THU CHAN ENGINEERING MANAGER UL CCS

Chin Pany

CHIN PANG EMC ENGINEER UL CCS

Page 5 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS. FORM NO: CCSUP4701D FAX: (510) 661-0888

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <u>http://www.ccsemc.com</u>.

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

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

Page 6 of 44

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a WIFI Module with 802.11A/HT20/HT40.

The radio module is manufactured by Hon Hai Precision.

5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding the module to the new host.

5.3. MAXIMUM OUTPUT POWER

Frequency Range Mode		cy Range Mode Output Power	
(MHz)		(dBm)	(mW)
5180 - 5240	802.11a	10.65	11.61
5180 - 5240	802.11n HT20	10.30	10.72
5190 - 5230	802.11n HT40	9.81	9.57

The transmitter has a maximum peak conducted output power as follows:

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PiFA antenna for TX/RX diversity, with a maximum gain of 2.3dBi.

5.5. SOFTWARE AND FIRMWARE

The EUT test utility software installed in the host computer during testing was test program Linux Driver TCL.

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case data rate for each mode is determined to be as follows, based on preliminary tests of the chipset utilized in this radio.

All final tests in the 802.11a mode were made at 6 Mb/s. All final tests in the 802.11n HT20 SISO mode were made at MCS0. All final tests in the 802.11n HT40 SISO mode were made at MCS0.

For radiated emissions below 1 GHz the worst-case configuration is determined to be the mode and channel with the highest output power.

To determine the worst-position of highest emissions, the EUT was investigated for X, Y, Z positions, and the worst position was turned out to be a Y-position.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST								
Description Manufacturer Model Serial Number FCC ID								
Laptop PC	DELL	PP09S	57Y1DG1	DOC				
AC Adapter	Phihong	PSAA10R-050	P104800031A1	DOC				
AC Adapter	DELL	LA65NS0-00	CN0DF26371615775605A	DOC				

I/O CABLES

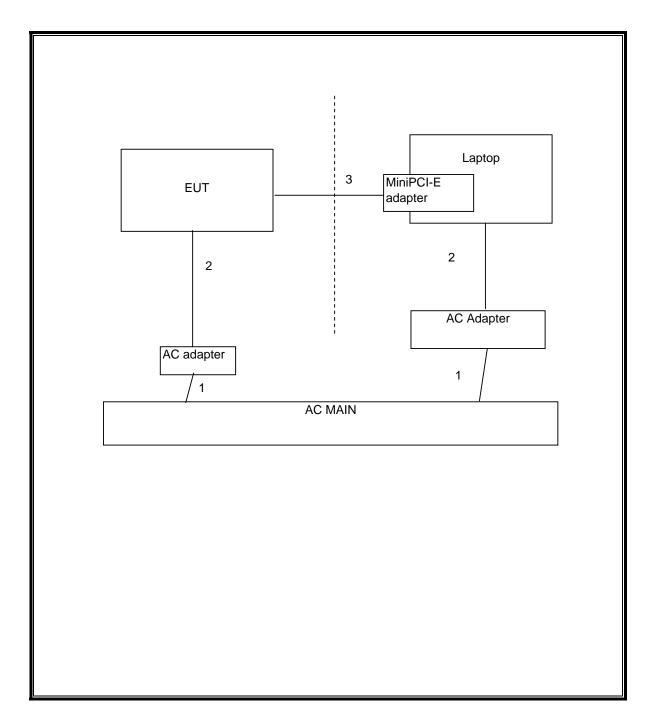
	I/O CABLE LIST								
CablePort# ofNo.IdenticalPorts			Connector Type	Cable Type	Cable Length	Remarks			
1	AC	2	US 115V	Un-shielded	2m	NA			
2	DC	2	US 115V	Un-shielded	1m	NA			
3	19 pins Connector	1	Ribbon Cable	Un-shielded	2m	NA			

TEST SETUP

The EUT is connected to a host laptop computer via MiniPCI-E adapter board for setup and was tested as a standalone device during the test.

Page 8 of 44

SETUP DIAGRAM FOR TESTS



Page 9 of 44

6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST											
Description											
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/27/12							
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/12/11							
EMI Test Receiver, 30 MHz	R&S	ESHS 20	N02396	05/06/11							
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/14/11							
Antenna, Horn, 18 GHz EMCO		3115	C00945	06/29/11							
High Pass Filter, 7.6 GHz Micro-Tronics		HPM13195	N02682	CNR							
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/11							
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/06/11							
Peak Power Meter	Boonton	4541	C01186	03/01/11							
Peak Power Sensor	Boonton	57318	C01202	02/23/11							

Page 10 of 44

7. ANTENNA PORT TEST RESULTS

7.1. 802.11a MODE IN THE 5.2 GHz BAND

7.1.1. OUTPUT POWER

<u>LIMITS</u>

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

Limit

Channel	Frequency	Fixed	В	4 + 10 Log B	Antenna	Limit			
		Limit		Limit	Gain				
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)			
Low	5180	17	23.60	17.73	2.30	17.00			
Mid	5200	17	22.10	17.44	2.30	17.00			
High	5240	17	23.43	17.70	2.30	17.00			

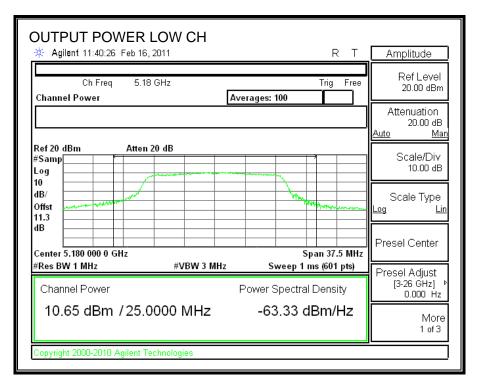
Results

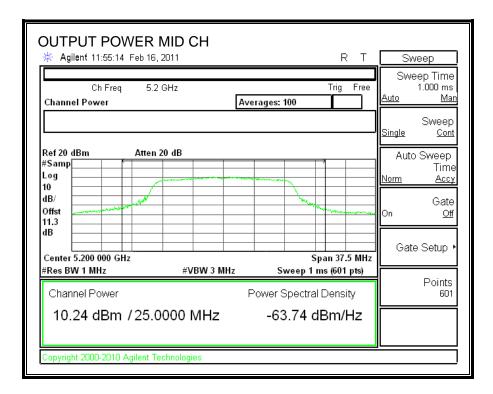
Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5180	10.65	17.00	-6.35
Mid	5200	10.24	17.00	-6.76
High	5240	10.19	17.00	-6.81

Page 11 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS. FORM NO: CCSUP4701D TEL: (510) 771-1000 FAX: (510) 661-0888

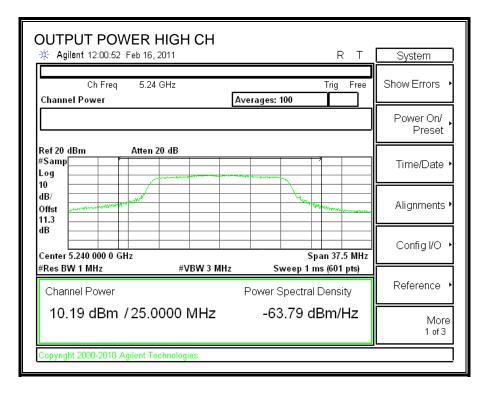
OUTPUT POWER





Page 12 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS.



Page 13 of 44

7.2. 802.11n HT20 SISO MODE IN THE 5.2 GHz BAND

7.2.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

Limit

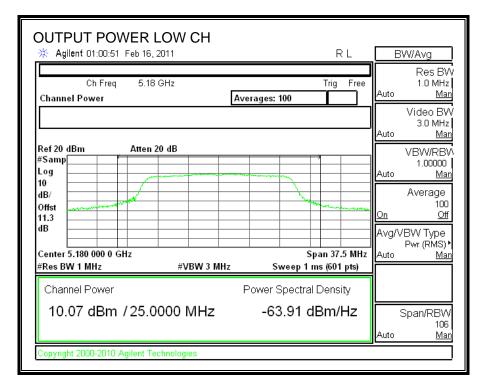
Channel	Frequency	Fixed	В	4 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5180	17	22.51	17.52	2.30	17.00
Mid	5200	17	23.74	17.75	2.30	17.00
High	5240	17	23.96	17.79	2.30	17.00

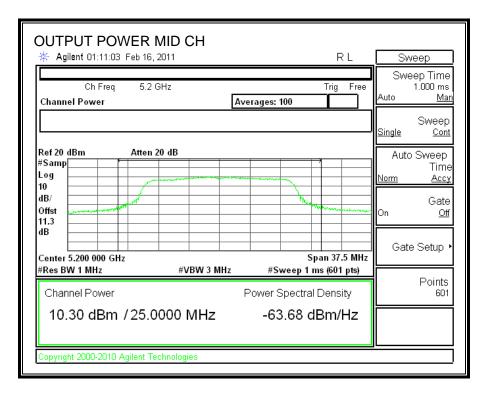
Results

Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5180	10.07	17.00	-6.93
Mid	5200	10.30	17.00	-6.70
High	5240	10.20	17.00	-6.80

Page 14 of 44

OUTPUT POWER





Page 15 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS)FORM NO: CCSUP4701D47173 BENICIA STREET, FREMONT, CA 94538, USATEL: (510) 771-1000FAX: (510) 661-0888This report shall not be reproduced except in full, without the written approval of UL CCS.

OUTPUT POWER			RL	BW//	Avg
Ch Freq 5.24 Channel Power	GHz	erages: 100	Trig Free		Res BW 1.0 MHz <u>Man</u>
					deo BW 3.0 MHz <u>Man</u>
Ref 20 dBm Atten #Samp Log 10 dB/ Offst 11.3 dB Start 5.221 250 0 GHz #Res BW 1 MHz	20 dB	Stop 5.258 7 Sweep 1 ms		Auto	
Channel Power 10.20 dBm /25.0		Power Spectral D -63.78 dE	-	Spa Auto	an/RBW 106 <u>Man</u>

Page 16 of 44

7.3. 802.11n HT40 SISO MODE IN THE 5.2 GHz BAND

7.3.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

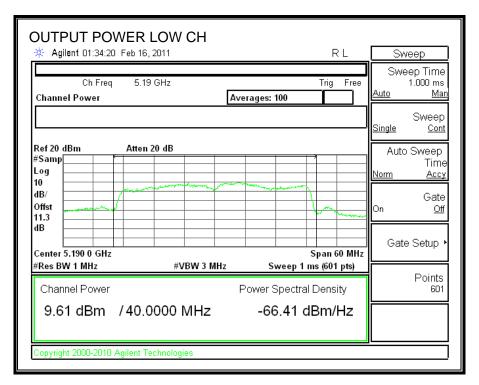
Limit

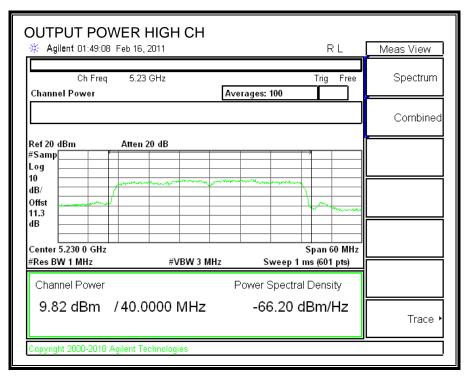
Channel	Frequency	Fixed	В	4 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5190	17	60.52	21.82	4.99	17.00
High	5230	17	76.70	22.85	4.99	17.00

Results

Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5190	9.61	17.00	-7.39
High	5230	9.82	17.00	-7.18

OUTPUT POWER





Page 18 of 44

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

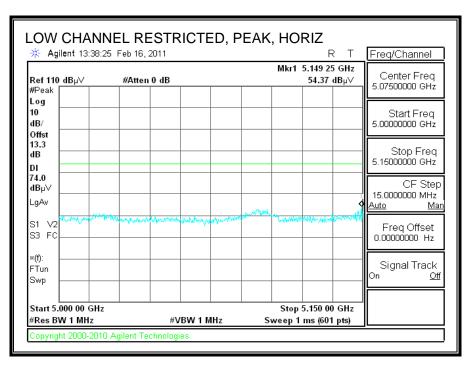
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

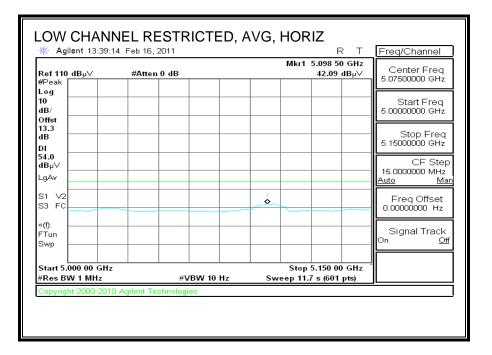
Page 19 of 44

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. TX ABOVE 1 GHz FOR 802.11a MODE IN THE LOWER 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

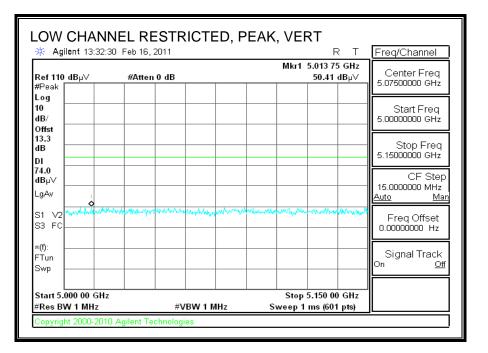


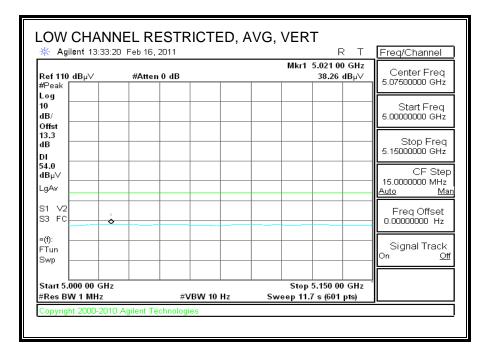


Page 20 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS)FORM NO: CCSUP4701D47173 BENICIA STREET, FREMONT, CA 94538, USATEL: (510) 771-1000FAX: (510) 661-0888This report shall not be reproduced except in full, without the written approval of UL CCS.COMPLIANCE CERTIFICATION SERVICES (UL CCS)

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





Page 21 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS. FORM NO: CCSUP4701D FAX: (510) 661-0888

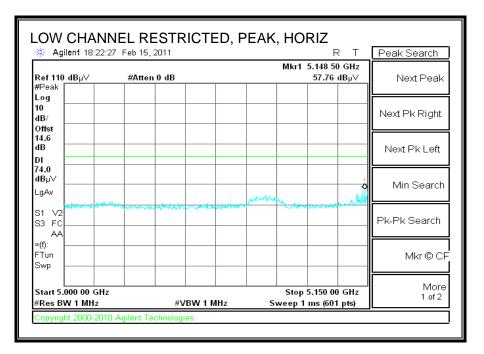
HARMONICS AND SPURIOUS EMISSIONS

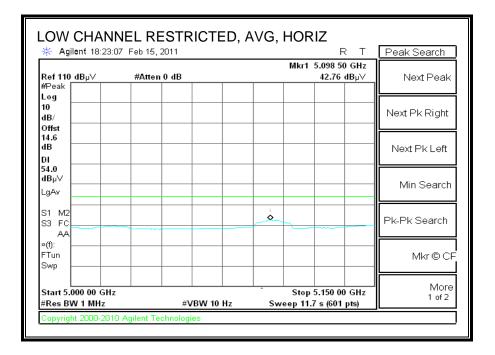
Company:				s, Frei	nont 51	n Chamb	er						
Date: Project #: Company:		Chin Pa	ng										
Project #: Company: Fest Target		02/16/11	-										
Company:		11J1363	2										
Fest Target		Hon Hai	i										
	:	FCC 15.	407										
Mode Oper		TX, 5.2G	Hz Ban	d, Leg	acy								
	f	Measuren			-	Preamp (-	Field Stren	-	
	Dist	Distance				Distance					ld Strength		
	Read	Analyzer	-		Avg	-		trength @		-	s. Average		
	AF	Antenna			Peak			Field Stre	ngth	Margin v	s. Peak Lii	nit	
	CL	Cable Los	;5		HPF	High Pas	s Filter	:					
f	Dist	Read	AF	CL	Amp	D Corr		Согт.			Ant. Pol.		Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Low Ch, 51		······		ļ						ļ			
15.540	3.0	34.5	38.7	11.3	-34.8	0.0	10.7	60.5	74.0	-23.6	H	P	
15.540	3.0	22.3	38.7	11.3	-34.8	0.0	10.7	48.2	54.0	-15.8	H	A	
15.540	3.0	35.1	38.7	11.3	-34.8	0.0	10.7	61.0	74.0	-23.0	V	P	
15.540	3.0	22.3	38.7	11.3	-34.8	0.0	10.7	48.2	54.0	-15.8	v	A	
	0034777	L											
Mid Ch, 52 15.600	00MH 3.0	z 39.3	38.4	11.4	-34.7	0.0	0.7	55.1	74.0	-18.9	н	Р	
15.600	3.0	39.3 24.5	38.4	11.4	-34.7 -34.7	0.0	0.7	40.3	74.0 54.0	-18.9	п Н	A A	
15.600	3.0	36.0	38.4	11.4	-34.7	0.0	0.7	40.J 51.7	74.0	-13.7	v	P	
15.600	3.0	22.7	38.4	11.4	-34.7	0.0	0.7	38.4	54.0	-15.6	v	Å	
					·····								
High Ch 53	240MH	[z		1						1		·····	
15.720	3.0	39.0	38.2	11.4	-34.7	0.0	0.7	54.6	74.0	-19.4	H	P	
15.720	3.0	24.8	38.2	11.4	-34.7	0.0	0.7	40.5	54.0	-13.5	H	A	
15.720	3.0	38.3	38.2	11.4	-34.7	0.0	0.7	54.0	74.0	-20.0	V	P	
15.720	3.0	24.0	38.2	11.4	-34.7	0.0	0.7	39.6	54.0	-14.4	V	A	
		ļ		ļ		ļ				ļ			

Page 22 of 44

8.2.2. TX ABOVE 1 GHz FOR 802.11n HT20 SISO MODE IN THE LOWER 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

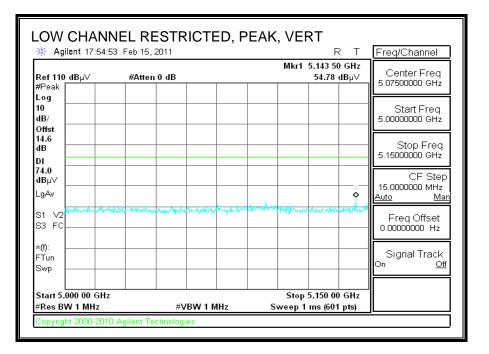


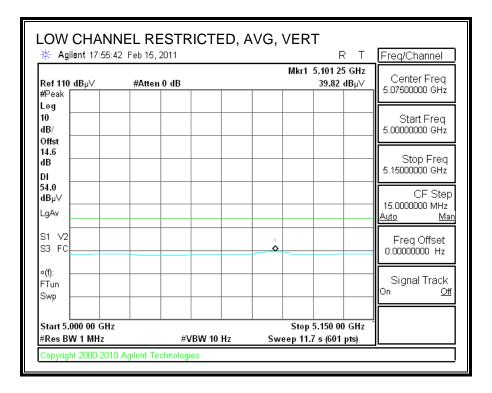


Page 23 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





Page 24 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS. FORM NO: CCSUP4701D TEL: (510) 771-1000 FAX: (510) 661-0888

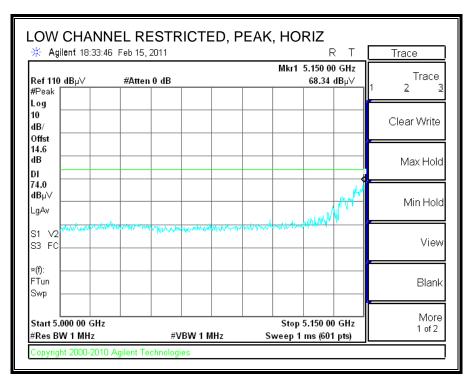
HARMONICS AND SPURIOUS EMISSIONS

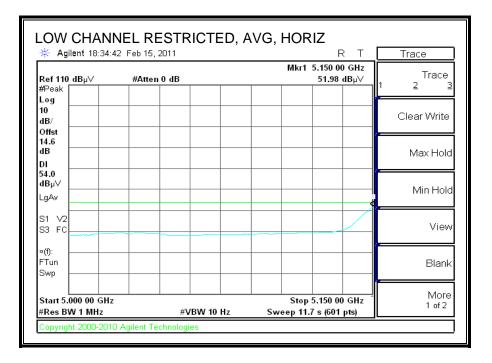
Company: lest Target:		Chin Pa 02/15/11 11J1363: Hon Hai	-				er						
Date: Project #: Company: Gest Target:		02/15/11 11J1363:	-										
Project #: Company: Test Target: Mode Oper:		11J1363											
Company: Test Target:			2										
Test Target:													
-		FCC 15.											
		TX, 5.2G		acy M	ode								
f		Measuren			-	Preamp (_		-	Field Stren	-	
Dist		Distance				Distance					ld Strength		
Rea		Analyzer	-		Avg	-		trength @		-	rs. Average		
AF		Antenna			Peak			: Field Stre	ength	Margin v	rs. Peak Lii	mit	
CL		Cable Los	55		HPF	High Pas	s Filter	r					
	ist	Read	AF	CL	Amp	D Corr		Corr.		-	Ant. Pol.		Note <i>s</i>
GHz (n	<u> </u>	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Low Ch, 51801			20.5	11.0				F. 0	- 4 0		**		
15.540 3.		33.7	38.5	11.3	-32.2	0.0	0.7	52.0	74.0	-22.0	V	Р	
15.540 3.		21.0	38.5	11.3	-32.2	0.0 0.0	0.7	39.4	54.0	-14.6 -22.6	V	A	
	.0 .0	33.0 21.0	38.5 38.5	11.3 11.3	-32.2 -32.2	0.0	0.7 0.7	51.4 39.3	74.0 54.0	-44.0	H H	P A	
12.240 J.		¥ 1.V	J0.7	11.3	-36.6	0.0	U. /	J7.J	24.U	-1967		<u>.</u>	
Mid Ch, 52001	MH	r	•										
15.600 3.		33.3	38.1	11.4	-32.2	0.0	0.7	51.4	74.0	-22.6	H	Р	
15.600 3.		21.1	38.1	11.4	-32.2	0.0	0.7	39.2	54.0	-14.8	H	A	
15.600 3.	.0	34.1	38.1	11.4	-32.2	0.0	0.7	52.2	74.0	-21.8	V	Р	
5.600 3.	.0	21.1	38.1	11.4	-32.2	0.0	0.7	39.2	54.0	-14.8	V	A	
High Ch, 5240			ļ										
·····�	.0	32.9	38.0	11.4	-32.2	0.0	0.7	50.8	74.0	-23.2	V	Р	
15.720 3.		21.0	38.0	11.4	-32.2	0.0	0.7	38.9	54.0	-15.1	<u>v</u>	<u>A</u>	
15.720 3.		33.0	38.0	11.4	-32.2	0.0	0.7	51.0	74.0	-23.0	H	Р	
15.720 3.	.0	21.0	38.0	11.4	-32.2	0.0	0.7	39.0	54.0	-15.0	H	A	

Page 25 of 44

8.2.3. TX ABOVE 1 GHz FOR 802.11n HT40 SISO MODE IN THE LOWER 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

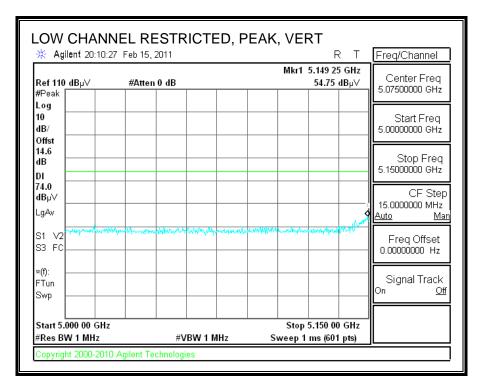


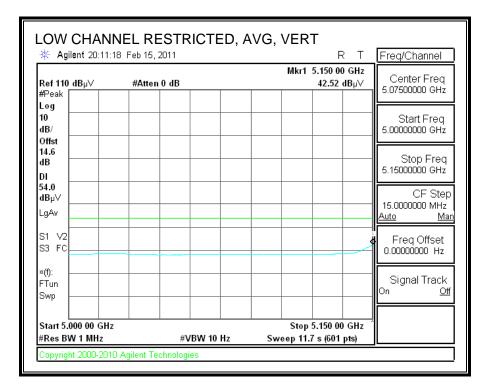


Page 26 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS. FORM NO: CCSUP4701D FAX: (510) 661-0888

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





Page 27 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS.

HARMONICS AND SPURIOUS EMISSIONS

-		Weasuren tification		s, Frei	mont 51	n Chamb	er						
lest Engr		Chin Pa	ng										
Date:		02/15/11											
Project #		11J1363											
Company		Hon Hai											
Fest Targ		FCc 15.4											
Iode Op	er:	TX, HT40	,										
	f	Measuren	nent Fre	piency	Amp	Preamp (Gain			Average	Field Stren	gth Limit	
	Dist	Distance			D Corr	Distance					ld Strength		
	Read	Analyzer	-		Avg	-		trength @		-	s. Average		
	AF	Antenna			Peak			: Field Str	ength	Margin v	s. Peak Lii	nit	
	CL	Cable Los	55		HPF	High Pas	s Filter	r					
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m		Ant. Pol. V/H	Det. P/A/QP	Notes
ow Ch,	<u> </u>	•											
5.570	3.0	33.2	38.4	11.4	-32.2	0.0	0.7	51.5	74.0	-22.5	v	Р	
5.570	3.0	21.1	\$	11.4	-32.2	0.0	0.7	39.4	54.0	-14.6	V	A	
5.570	3.0	32.9	38.4		-32.2	0.0	0.7	51.2	74.0	-22.8	H	Р	
5.570	3.0	21.0	38.4	11.4	-32.2	0.0	0.7	39.3	54.0	-14.7	H	A	
C-1 C1	5230MI	i T_											
ugn Cn, 5.690	3.0	33.5	38.1	11.4	-32.2	0.0	0.7	51.5	74.0	-22.5	н	Р	
5.690	3.0	21.1	38.1	11.4	-32.2	0.0	0.7	39.1	54.0	-14.9	H	Â	
5.690	3.0	33.1	\$	11.4		0.0	0.7	51.1	74.0	-22.9	V	Р	
5.690	3.0	21.0	38.1	11.4	-32.2	0.0	0.7	39.1	54.0	-14.9	V	A	
Rev. 4.1.2 Note: No		missions :	were de	tected	l above :	the syster	m nois	se floor.					

Page 28 of 44

8.3. RECEIVER ABOVE 1 GHz

8.3.1. RECEIVER ABOVE 1 GHz (20MHz Bandwidth)

T73; S/N: 6717 @3m T144 Miteq 3008A00931 RX RSS 2: H Frequency Cables 20' cable 22807500 HPF Reject Filter Peak Measurement RBW=VBW=1M 3' cable 22807700 12' cable 22807600 20' cable 22807500 • • • f Dist Read Avg. AF CL Amp D Corr Fltr Peak Avg Pk Lim Avg Lim Pk Mar Avg Mar Noto	Burger Methods Product Reject Filter Peak Measurements RBW=VBW=1MHz Average Measurements RBW=VBW=1MHz Average Measurements working Max Avg Mar Notes nV/m dBuV/m dBuV/m dB (V/H) 23 228 74 54 -31.7 -31.2 H 32 258 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -31.9 V
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	But with the second s
Date: 2062011 Test Engineer: Chin Pang Configuration: EUT only Mode: RX, HT20 Test Equipment: Horn 1-18GHz Pre-amplifer 1-26GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T144 Miteq 3008A00931 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T144 Miteq 3008A00931 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T144 Miteq 3008A00931 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T144 Miteq 3008A00931 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T144 Miteq 3008A00931 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T144 Miteq 3008A00931 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T144 Miteq 3008A00931 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; SN: 6717 @ T12 cable 22807600 20' cable 22807500 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit Tr3; Cable 22807700 12' cable 22807600 20' cable 22807500 @ Pre-amplifer 26-40GHz Horn > 18 GHz Limit RW=VBW=1M Arcrage Measurement RBW=VBW=1M Arcrage Measurement RBW=VBW=1M Arcrage Measurement Pre-amplifer 26-40GHz Horn + 100 00 423 228 74 54 31.7 31.2 Hr 2665 30 505 30.6 29.0 4.1 -37.4 0.0 0.0 423 22.8 74 54 31.7 -31.2 Hr 2665 30 505 30.6 29.0 4.1 -37.4 0.0 0.0 423 22.8 74 54 31.7 -31.2 Hr 2665 30 505 30.6 29.0 4.1 -37.4 0.0 0.0 46.1 26.2 74 54 27.9 -27.8 Hr 2665 30 50.5 30.6 29.0 4.1 -37.4 0.0 0.0 46.1 26.2 74 54 27.9 -27.8 Hr 2665 30 50.5 30.6 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 34.9 -31.9 V 265 30 30 48.8 31.8 25.9 30 .38.6 0.0 0.0 39.1 22.1 74 54 34.9 -31.9 V 265 30 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 27.9 -27.8 Hr 265 30 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 27.9 -27.8 Hr 265 30 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 27.9 -27.8 Hr 27.209 Ter: No other emissions were detected above the system noise flow. Rev 07.2209 Ter: No other emissions were detected above the system noise flow. Rev 07.2209 Ter: No other emissions were detected above the system noise flow. Rev 07.2209 Ter: No other emissions were detected above the system no	Burner Burner Right State Rig
Test Engineer:Chin Pang EUT only Wode:Curl only EUT only Wode:EUT only BUT only EngineericTest Equipment:Horn 1-18GHzPre-amplifer 1-26GHzPre-amplifer 26-40GHzHorn > 18 GHzLimi RX RSS 2173; SN: 6717 @3mT144 Miteq 3008A0093120' cable 22807500 20' cable 22807500HPFReject Filter Average Fild Strength Limit RBW=VBW=IM Average Field Strength Limit Point State Correct to 3 meters Red Analyzer Reading A FAng D Corr A State Correct to 3 meters Areage Field Strength Limit Point State Correct to 3 meters Red Analyzer Reading A FAng Lim Areage Field Strength Limit Pream Marging Areage Field Strength Limit Pream Pream	But with the second s
Configuration: EUT enty RX, HT20 Intermation: RX, HT20 Test Equipment: Pre-amplifer 1-26 GHz Pre-amplifer 26-40 GHz Horn > 18 GHz Linin RX RSS 2 173: S Nt: 6717 @3m T144 Miteq 3008A00931 20' cable 22807500 12' cable 22807600 20' cable 22807500 Pre-amplifer 26-40 GHz HPF Reject Filter Peak Measurem RBW=1MHz; VBW 12' cable 22807700 12' cable 22807600 20' cable 22807500 Not Avg Im Pk Mat Avg Mat Not 60 30 48.2 30.8 25.5 30 30.6 0.0 0.43.2 25.8 74 54 31.8 28.2 H 600 3.0 48.2 30.8 25.5 3.0 30.6 0.0 0.0 43.2 25.8 74 54 31.8 28.2 H 600 3.0 48.2 30.8 25.9 30 36.4 0.0 0.0 43.2 25.8 74 54 31.8 27.9 27.8 H 605	But with the second s
Lest Equipment: Horn 1-18GHz Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18 GHz Limit T73: S/N: 6717 @3m T144 Miteg 308A00931 20' cable 22807500 20' cable 22807500 Pre-amplifer 26-40GHz HORN > 18 GHz Limit 3' cable 22807700 12' cable 22807600 20' cable 22807500 20' cable 22807500 Pre-amplifer 26-40GHz Pre-amplifer 26-40GHz Pre-amplifer 26-40GHz Pre-amplifer 26-40GHz Pre-amplifer 26-40GHz RX RSS 2' 1'' cable 22807700 12' cable 22807600 20' cable 22807500 Pre-amplifer 26-40GHz Pre-amplifer 26-200760 Pre-amplifer 26-200760 Pre-amplifer 26-200760 Pre-	Build Stress Stres St
Horn 1-18GHz Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18 GHz Limi T73; S/N: 6717 @3m T144 Miteq 3008A00931 Pre-amplifer 26-40GHz Horn > 18 GHz Limi W rate T144 Miteq 3008A00931 20' cable 22807500 Pre-amplifer Pre-amplifer 20' cable Pre-amplifer Pre-amplifer <td>Build Stress Stres St</td>	Build Stress Stres St
Trist Nie 6717 @3m Ti44 Miteq 3008A00931 RX RSS 2: I Ti44 Miteq 3008A00931 RX RSS 2: I Ti44 Miteq 3008A00931 RX RSS 2: I Peak Measurement RBW=708W=1M 20' cable 22807500 Peak Measurement RBW=708W=1M 20' cable 22807500 I 2' cable 22807500 Peak Measurement RBW=708W=1M 20' cable 22807500 I Peak Measurement RBW=708W=1M 20' cable 22807500 I Peak Measurement RBW=708W=1M Average Measurement RBW=1MHz; VBW I D Corr Fltr Peak Avg Pk Lim Avg Lim Nt Avg Mar Notot (VF 600 3.0 48.2 30.8 28.5 3.9 37.5 0.0 0.0 43.2 22.8 74 54 31.7 31.2 H 500 3.0 48.2 30.8 28.5 3.9 37.5 0.0 0.0 43.2 22.8 74 54 31.7 31.2 H 500 3.0 48.2 30.8 28.5 3.9 37.5 0.0 0.0 43.2 22.8 74 54 31.7 31.2 H 500 3.0 48.2 30.8 28.5 3.9 37.5 0.0 0.0 43.2 22.8 74 54 31.7 31.2 H 500 3.0 48.2 30.8 29.0 4.1 37.4 0.0 0.0 46.6 26.4 74 54 31.7 31.2 H 500 3.0 48.2 30.8 29.0 4.1 37.4 0.0 0.0 46.6 26.4 74 54 31.7 31.2 H 500 3.0 48.2 30.8 29.0 4.1 37.4 0.0 0.0 46.6 26.4 74 54 31.7 31.2 H 500 3.0 48.8 31.8 25	Box Constraint
Inversion in tegram Inversion in tegram Peak Measurem Image: Structure of the system noise floor. Inversion in tegram Peak Measurem Image: Structure of the system noise floor. Image: Structure of the system n	HPF Reject Filter Peak Measurements RBW=VBW=1MHz Average Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz avvim dBuV/m dBuV/m dB uV/m dBuV/m dBuV/m dB uV/m dBuV/m dBuV/m dB uV/m 23 228 74 54 -31.7 -31.2 H 32 258 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -37.9 -27.8 H 9.1 22.1 74 54 -34.9 -31.9 V
3' cable 22807700 12' cable 22807600 20' cable 22807500 Peak Measurement RBW=VBW=1M 3' cable 22807700 12' cable 22807600 20' cable 22807500 Pit Pit Pit Reject Filter Peak Measurement RBW=VBW=1M 4 Average Measurement RBW Average Measurement RBW=VBW=1M Average Measurement RBW=VBW=1M 6 Dist Read Pk Read Avg AF CL Amp D Corr Fltr Peak Avg Pk Lin Avg Lin Pk Mar Avg Mar Note 600 3.0 52.0 32.5 25.9 3.0 38.6 0.0 0.0 42.2 22.8 74 54 -31.7 -31.2 H 500 3.0 48.2 31.8 25.9 3.0 38.6 0.0 0.0 43.2 25.8 74 54 -31.7 -31.2 H 600 3.0 48.2 31.8 25.9 3.0 38.6 0.0 0.0 43.2 25.8 74 54 -31.7 -31.2 H 600 3.0 48.8	Register
In the 2200700 In the 2200700 Reget Pilter Reget Pilter 3' cable 22807700 12' cable 22807600 20' cable 22907500 10' 10' 10' 10' 10' 10' 10' RBW=VBW=1M 4 Average Measurer RBW Max Average Measurer RBW=VBW=1M 6 Dist Read Pk Read Avg AF CL Amp D Corr Fltr Peak Avg Pk Lin Avg Lin Pk Mar Avg Mar Note 6 30 52.0 32.5 25.9 30 38.6 0.0 0.0 42.2 22.8 74 54 -31.7 -31.2 H 2500 30 48.2 30.8 28.5 39 -37.5 0.0 0.0 43.2 25.8 74 54 -31.7 -31.2 H 600 3.0 48.8 31.8 25.9 3.0 -38.6 0.0 0.0 39.1 22.1 74 54 -27.4 -27.6 V 665 3.0 51.0 <t< td=""><td>Pk Lim Avg Lim Pk Mar Avg Mar Notes aV/m dBuV/m dBuV/m</td></t<>	Pk Lim Avg Lim Pk Mar Avg Mar Notes aV/m dBuV/m
f Dist Read Pk Read Avg. AF CL Amp D Corr Fltr Peak Avg Pk Lin Avg Lin Pk Mar Avg Mar Not GHz (m) dBuV dBuV dB dB dB dB dB dB dB dBuVm	RBW=1MHz; VBW=10Hz eak Avg Pk Lim Avg Lim Pk Mar Avg Mar Notes nV/m dBuV/m dBuV/m dB dB (V/H) 23 22.8 74 54 -31.7 -31.2 H 32 25.8 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -37.9 -27.8 H 9.1 22.1 74 54 -34.9 -31.9 V
f Dist Read Pk Read Avg AF CL Amp D Corr Flt Peak Avg Pk Lin Avg Lin Pk Mar Avg Mar Note GHz (m) dBuV dBv dB dB dB dB dBuV/m dBuV/m dB Mar (V/r 600 3.0 52.0 32.5 25.9 3.0 38.6 0.0 0.0 42.3 22.8 74 54 -31.7 -31.2 H 500 3.0 48.2 30.8 28.5 3.9 -37.5 0.0 0.0 43.2 25.8 74 54 -30.8 -28.2 H 665 3.0 50.5 30.6 29.0 4.1 -37.4 0.0 0.0 46.1 26.2 74 54 -34.9 -31.9 V 605 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 <td>eak Avg Pk Lim Avg Lim Pk Mar Avg Mar Notes nV/m dBuV/m dBuV/m dBuV/m dB dB (V/H) 2.3 22.8 74 54 -31.7 -31.2 H 3.2 25.8 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -27.9 -27.8 H 9.1 22.1 74 54 -34.9 -31.9 V</td>	eak Avg Pk Lim Avg Lim Pk Mar Avg Mar Notes nV/m dBuV/m dBuV/m dBuV/m dB dB (V/H) 2.3 22.8 74 54 -31.7 -31.2 H 3.2 25.8 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -27.9 -27.8 H 9.1 22.1 74 54 -34.9 -31.9 V
GHz (m) dBuV dBvV dB dB dB dB dB dB dBuV/m dBuV/m dBuV/m dB dB (V/r 600 3.0 52.0 32.5 25.9 3.0 -38.6 0.0 0.0 42.3 22.8 74 54 -31.7 -31.2 H 500 3.0 48.2 30.8 28.5 3.9 -37.5 0.0 0.0 43.2 25.8 74 54 -30.8 -28.2 H 600 3.0 48.2 30.8 28.9 3.0 0.0 0.0 45.1 26.2 74 54 -37.9 -27.8 H 600 3.0 48.8 31.8 25.9 3.0 -38.6 0.0 0.0 39.1 22.1 74 54 -27.4 -27.6 V 665 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 7	nV/m dBuV/m dBuV/m dB dB (V/H) 2.3 22.8 74 54 -31.7 -31.2 H 3.2 25.8 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -27.9 -27.8 H 9.1 22.1 74 54 -34.9 -31.9 V
600 3.0 52.0 32.5 25.9 3.0 -38.6 0.0 0.0 42.3 22.8 74 54 -31.7 -31.2 H 500 3.0 48.2 30.8 28.5 3.9 -37.5 0.0 0.0 43.2 25.8 74 54 -30.8 -28.2 H 665 3.0 50.5 30.6 29.0 4.1 -37.4 0.0 0.0 45.1 26.2 74 54 -30.8 -28.2 H 665 3.0 48.8 31.8 25.9 3.0 -38.6 0.0 0.0 39.1 22.1 74 54 -34.9 -31.9 V 665 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V 665 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 <	2.3 22.8 74 54 -31.7 -31.2 H 3.2 25.8 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -27.9 -27.8 H 9.1 22.1 74 54 -34.9 -31.9 V
500 3.0 48.2 30.8 28.5 3.9 -37.5 0.0 0.0 43.2 25.8 74 54 -30.8 -28.2 H 665 3.0 50.5 30.6 29.0 4.1 -37.4 0.0 0.0 46.1 26.2 74 54 -30.8 -28.2 H 665 3.0 48.8 31.8 25.9 3.0 -38.6 0.0 0.0 30.1 22.1 74 54 -27.9 -27.8 H 665 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V 665 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V 64: 1.0 1.0 1.0 0.0 0.0 46.6 26.4 74 54 -27	3.2 258 74 54 -30.8 -28.2 H 6.1 26.2 74 54 -27.9 -27.8 H 9.1 22.1 74 54 -34.9 -31.9 V
600 3.0 48.8 31.8 25.9 3.0 -38.6 0.0 0.0 39.1 22.1 74 54 -34.9 -31.9 V 665 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 -34.9 -31.9 V ev. 07.22.09 or 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V ev. 07.22.09 or 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V ore: No other emissions were detected above the system noise floor. 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V ore: No other emissions were detected above the system noise floor. 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V ote: No other emissions were detected above the system noise floor. 0.0 0.0 0.0 0.0 0.0 <td< td=""><td>9.1 22.1 74 54 <u>-34.9</u> <u>-31.9</u> V</td></td<>	9.1 22.1 74 54 <u>-34.9</u> <u>-31.9</u> V
665 3.0 51.0 30.8 29.0 4.1 -37.4 0.0 0.0 46.6 26.4 74 54 -27.4 -27.6 V ev. 07.22.09 other emissions were detected above the system noise floor. f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
iote: No other emissions were detected above the system noise floor. f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
iote: No other emissions were detected above the system noise floor. f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
iote: No other emissions were detected above the system noise floor. f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
AF Antenna Factor	
CL Cable Loss HPF High Pass Filter	

Page 29 of 44

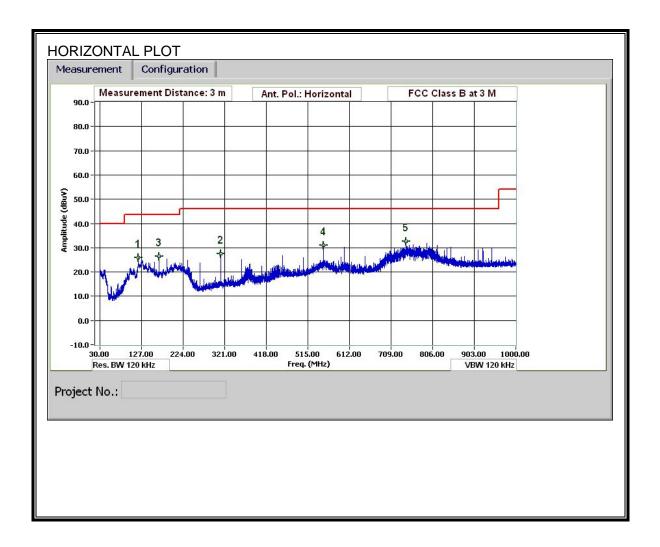
8.3.2. RECEIVER ABOVE 1 GHz (40MHz Bandwidth)

	-		y Measurer												
ompli	ance Ce	rtification	Services, F	remont	5m Ch	amber									
ompai	ny:		Hon Hai												
roject ate:	#:		11J13632												
	ngineer:		2/16/2011 Chin Pang												
onfigu	ration:		EUT only												
lode:			RX, HT40												
est Eq	uipmen	<u>t:</u>													
н	lorn 1-	18GHz	Pre-a	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	Но	orn > 180	SHz		Limit
T73; S	S/N: 671	7@3m	- T144	Miteq 30	08A009	931 🖵				-				-	RX RSS 210
Hi Frei	quency Cal	bles —												_	
3'	cable 2	2807700	12'	cable 2	28076	500	20' ca	ble 22	807500		HPF	Re	eject Filte		<u>Measurements</u>
2' 0	able 228	207700	421	-11- 220	07000		20' cab	10 2290	7500					RB	W=VBW=1MHz ge Measurements
50	able 220	01100	• 12 C	able 228	07600	•	20 (a)	16 2200	• •			-			1MHz; VBW=10Hz
f	Dist	Read Pk	Read Ave	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Tim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
500	3.0	53.5	38.4	25.9	3.0	-38.6	0.0	0.0	43.8	28.7	74	54	-30.2	-25.3	Н
125 565	3.0 3.0	48.6 52.4	31.6 29.4	27.5 29.0	3.6 4.1	-37.9 -37.4	0.0 0.0	0.0 0.0	41.8 48.0	24.8 25.0	74 74	54 54	-32.2 -26.0	-29.2 -29.0	H H
125	3.0	46.0	30.0	27.5	3.6	-37.9	0.0	0.0	39.2	23.2	74	54	-34.8	- 30.8	v
650	3.0	47.1	29.0	29.0	4.1	-37 <i>A</i>	0.0	0.0	42.7	24.6	74	54	-31.3	-29.4	v
			-									-			
ev. 07.2: ote: No	other emi f Dist				m noise	Amp		Corre	ct to 3 mete			Pk Lim	Peak Field	field Strengti I Strength Li Average Li	imit
	AF	Antenna F	0			Peak			c Field Stre			0		. Peak Limit	
	CL	Cable Los	s			HPF	High Pas			0			0		
	01	04010 200						0 1 1001							

Page 30 of 44

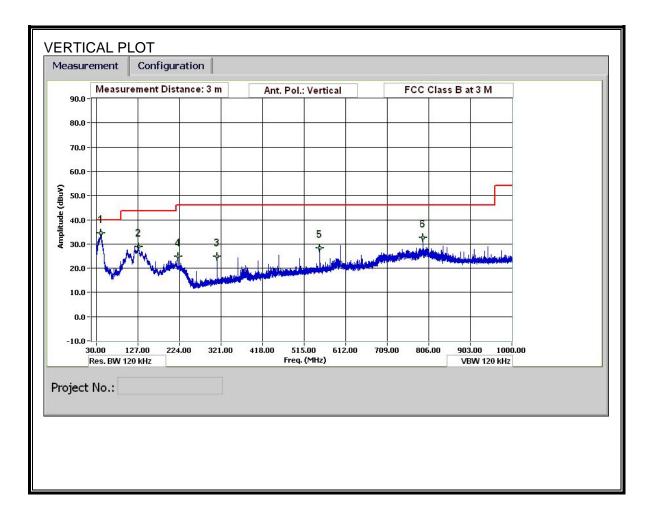
8.4. WORST-CASE BELOW 1 GHz

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



Page 31 of 44 COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS.

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



Page 32 of 44 COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL CCS.

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

Company: Test Targe Mode Ope	t:	Chin Par 02/16/11 11J13632 Hon Hai FCC 15C TX (Wor											
	f Dist Read AF CL	Measurem Distance t Analyzer I Antenna F Cable Loss	o Antenn Reading 'actor		Amp D Corr Filter Corr. Limit	Preamp G Distance Filter Inse Calculated Field Stree	Correct ert Loss 1 Field S	trength		Margin	Margin vs.	Limit	
f MHz	Dist	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/OP	Notes
vert	(m)	abuv	ab/m	۵۵	<u>ab</u>	<u> </u>	۵۵	abuv/m	abuv/m	<u>ab</u>	v/n	PIAJQP	
иегт 40.08	3.0	48.6	13.8	0.6	28.4	0.0	0.0	34.6	40.0	-5.4	v	Р	
+0.08 127.804	3.0	40.0	13.6	1.1	28.3	0.0	0.0	34.0 28.8	43.5	-2.4	v	P P	
220.928	3.0	39.8	11.9	1.3	28.2	0.0	0.0	24.8	46.0	-21.2	v	P	
312.012	3.0	37.9	13.6	1.5	28.1	0.0	0.0	24.9	46.0	-21.1	v	P	
552.022	3.0	36.3	17.6	2.1	27.7	0.0	0.0	28.4	46.0	-17.6	v	P	
792.031	3.0	36.7	20.9	2.6	27.4	0.0	0.0	32.7	46.0	-13.3	V	P	
	3.0	39.5	13.6	1.0	28.3	0.0	0.0	25.9	43.5	-17.6	H	Р	
120.004	3.0	42.6	11.0	1.2	28.2	0.0	0.0	26.5	43.5	-17.0	H	Р	
120.004 168.006		40.6	13.6	1.5	28.1	0.0	0.0	27.6	46.0	- 18.4	H	Р	
168.006 312.012	3.0						0.0	30.9	40.0	-15.1	н	Р	
168.006	&	38.9 37.3	17.6 20.2	2.1 2.5	27.7	0.0 0.0	0.0	30.9	46.0 46.0	-13.2	H	P	

Page 33 of 44

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted I	.imit (dBuV)
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 "
0.5-5	56	46
5-30	60	50

Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

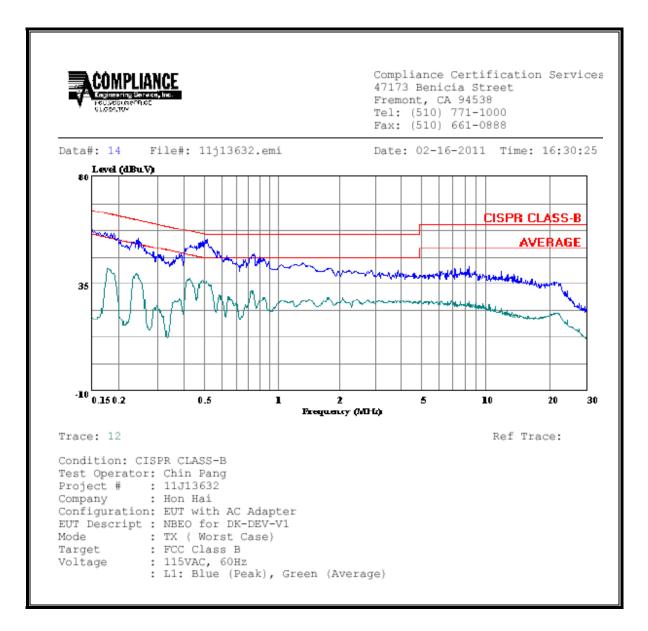
Page 34 of 44

6 WORST EMISSIONS

Freq.	Reading		Closs	Limit	EN_B	Margin		Remark	
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.18	58.08		39.88	0.00	64.35	54.35	-6.27	-14.47	L1
0.52	52.18		35.35	0.00	56.00	46.00	-3.82	-10.65	L1
1.45	43.51		27.28	0.00	56.00	46.00	-12.49	-18.72	L1
0.18	56.50		41.44	0.00	64.58	54.58	-8.08	-13.14	L2
0.42	54.00		37.36	0.00	57.37	47.37	-3.37	-10.01	L2
1.45	43.64		28.45	0.00	56.00	46.00	-12.36	-17.55	L2
6 Worst E									

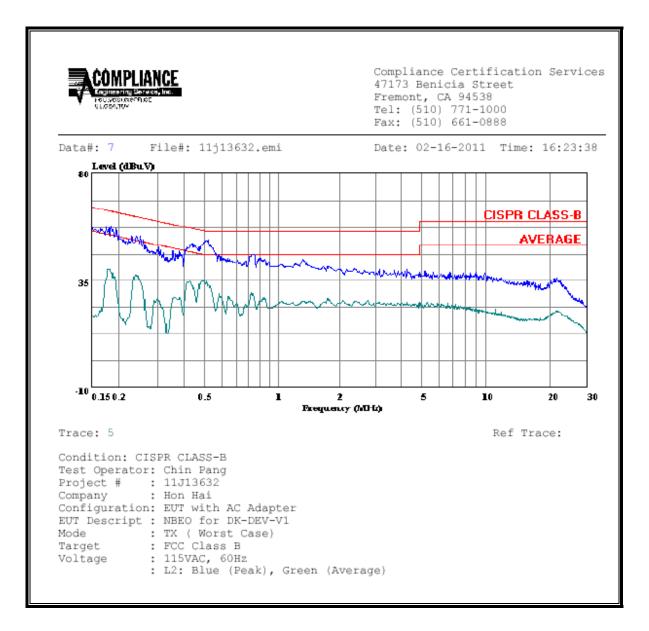
Page 35 of 44

LINE 1 RESULTS



Page 36 of 44 COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL CCS.

LINE 2 RESULTS



Page 37 of 44

10. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)				
(A) Limits for Occupational/Controlled Exposures								
0.3–3.0 3.0–30 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6				
(B) Limits	for General Populati	ion/Uncontrolled Exp	posure					
0.3–1.34 1.34–30	614 824 <i>/</i> f	1.63 2.19/f	*(100) *(180/f ²)	30 30				

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)-Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)	
30–300	27.5	0.073	0.2	30	
300–1500 1500–100,000			f/1500 1.0	30 30	

f = frequency in MHz * = Plane-wave equivalent power density NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occu-pational/controlled limits apply provided he or she is made aware of the potential for exposure. NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be ex-posed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

Page 38 of 44

COMPLIANCE CERTIFICATION SERVICES (UL CCS) FORM NO: CCSUP4701D 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL CCS.

IC RULES

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

Table 5

Exposure Limits for Persons Not Classed As RF and Microwave Exposed Workers (Including the General Public)

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ²)	5 Averaging Time (min)
0.003–1	280	2.19		6
1–10	280/f	2.19/ <i>f</i>		6
10–30	28	2.19/ <i>f</i>		6
30–300	28	0.073	2*	6
300–1 500	1.585 <i>f</i> ^{0.5}	0.0042f ^{0.5}	f/150	6
1 500–15 000	61.4	0.163	10	6
15 000–150 000	61.4	0.163	10	616 000 /f ^{1.2}
150 000–300 000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ f ^{0.5}	6.67 x 10 ⁻⁵ f	616 000 /f ^{1.2}

* Power density limit is applicable at frequencies greater than 100 MHz.

Notes: 1. Frequency, f, is in MHz.

- 2. A power density of 10 W/m^2 is equivalent to 1 mW/cm².
- A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

Page 39 of 44

EQUATIONS

Power density is given by:

S = EIRP / (4 * Pi * D^2)

where

S = Power density in W/m² EIRP = Equivalent Isotropic Radiated Power in W D = Separation distance in m

Power density in units of W/m² is converted to units of mWc/m² by dividing by 10.

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2

From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m^2

RESULTS

Band	Mode	Separation	Output	Antenna	IC Power	FCC Power
		Distance	Power	Gain	Density	Density
		(m)	(dBm)	(dBi)	(W/m^2)	(mW/cm^2)
5 GHz	WLAN	0.20	10.65	2.30	0.04	0.004

COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL CCS.

Page 40 of 44