

RADIATED SPURIOUS EMISSIONS PORTIONS OF FCC CFR47 PART 22H AND 24E INDUSTRY CANADA RSS-132 ISSUE 2 INDUSTRY CANADA RSS-133 ISSUE 5

CERTIFICATION TEST REPORT

FOR

10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETOOTH

FCC MODEL NUMBER: TP00043A IC MODEL NUMBER: TP00043AEF

> FCC ID: PU5-TP00043AEF IC: 4182A-TP00043AEF

REPORT NUMBER: 12U14468-4

ISSUE DATE: SEPTEMBER 25, 2012

Prepared for WISTRON CORPORATION 21F, 88, SEC. 1, HSIN TAI WU RD., HSICHIH TAIPEI HSIEN 221, 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

REPORT NO: 12U14468-4	DATE: SEPTEMBER 25, 2012
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUET	ООТН
FCC ID: TP00043AEF	IC: 4182A-TP00043AEF

		Revision History	
	Issue		
Rev.	Date	Revisions	Revised By
	09/25/12	Initial Issue	T. Chan

Page 2 of 25

REPORT NO: 12U14468-4

DATE: SEPTEMBER 25, 2012

EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETOOTH FCC ID: TP00043AEF IC: 4182A-TP00043AEF

TABLE OF CONTENTS

1.	AT	TESTATION OF TEST RESULTS	4
2.	TES	ST METHODOLOGY	5
3.	FAG	CILITIES AND ACCREDITATION	5
4.	CA	LIBRATION AND UNCERTAINTY	5
4	.1.	MEASURING INSTRUMENT CALIBRATION	5
4	.2.	SAMPLE CALCULATION	5
4	.3.	MEASUREMENT UNCERTAINTY	5
5.	EQ	UIPMENT UNDER TEST	6
5	.1.	DESCRIPTION OF EUT	6
5	.2.	MAXIMUM OUTPUT POWER	6
5	.3.	SOFTWARE AND FIRMWARE	7
5	.4.	WORST-CASE CONFIGURATION AND MODE	7
5	.5.	DESCRIPTION OF TEST SETUP	8
6.	TES	ST AND MEASUREMENT EQUIPMENT1	0
7.	RA	DIATED TEST RESULTS1	1
7	.1.	RADIATED POWER (ERP & EIRP)1	1
7	.2.	FIELD STRENGTH OF SPURIOUS RADIATION1	7
8.	SE	TUP PHOTOS2	22

Page 3 of 25

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	WISTRON CORPORATION 21F, 88, SEC. 1, HSIN TAI WU RI TAIPEI HSIEN 221, TAIWAN, R.C	•
EUT DESCRIPTION:	10.1" TABLET WITH LTE/WWAN BLUETOOTH.	AND WLAN RADIO WITH
FCC MODEL: IC MODEL:	TP00043A TP00043AEF	
SERIAL NUMBER:	PROTOTYPE	
DATE TESTED:	SEPTEMBER 24, 2012	
	APPLICABLE STANDARDS	
ST	TANDARD	TEST RESULTS
FCC PA	RT 22H and 24E	Pass
IC RSS13	2 AND IC RSS133	Pass

Compliance 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

MENGISTU MEKURIA EMC ENGINEER UL CCS

Page 4 of 25

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, RSS-132 Issue 2, and RSS-133 Issue 5.

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 5 of 25

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 10.1" Tablet featured with LTE/WWAN, WLAN and BLUETOOTH functionality. The Tablet PC is manufactured by Lenovo.

5.2. MAXIMUM OUTPUT POWER

The measured conductive peak power values were within \pm 0.5 dB of the original ones.

The RF radiated measurement with maximum peak ERP / EIRP output powers are as follows:

Part 22 Cell Band						
Frequency range Modulation EIRP						
(MHz)	Modulation	dBm	mW			
826.4 - 846.6	UMTS WCDMA	24.40	275.4			
020.4 - 040.0	UMTS HSUPA	25.98	396.3			

Part 24 PCS Band				
Frequency range Modulation EIRP				
(MHz)	Modulation	dBm	mW	
1852.4 - 1907.6	UMTS WCDMA	25.32	340.4	
1052.4 - 1907.0	UMTS HSUPA	25.98	396.3	

Page 6 of 25

5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent 8960 Communication Test Sets.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case is EUT on the highest power. Based on Peak Power measurement investigations, the following modes should be considered as worst-case scenario for all other measurements.

Worst-case modes:

- UMTS WCDMA
- UMTS HSUPA

For the fundamental investigation, since the EUT is a portable device that has three orientations; an X, Y and Z orientations and the worst among X, Y, and Z with AC/DC adapter and headset have been investigated. After the investigation the worst case was found to be a Y-position with headset for Cell band and X-Position with an AC adapter for PCS band respectively.

Page 7 of 25

5.5. DESCRIPTION OF TEST SETUP

RADIATED TESTS SUPPORT EQUIPMENT

Support Equipment List						
Description Manufacturer Model Serial Number FCC ID						
AC Adapter	LENOVO	ADP-10AW	04MW24800J7	DoC		
Headset	NA	N/A	N/A	N/A		

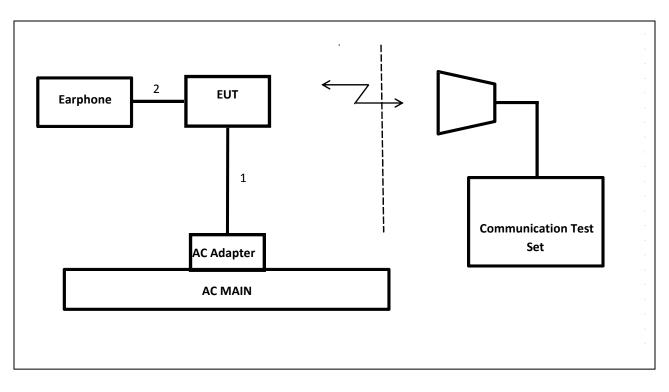
I/O CABLES (RF Radiated Test)

	I/O CABLE LIST						
Cable	Port	# of	Connector	Cable	Cable	Remarks	
No.		Identical	Туре	Туре	Length		
		Ports					
1	DC	1	USB	SHELDED	1.0m	N/A	
2	Audio	1	Earphone	UN-SHELDED	1.0m	Mic on Cable	

Page 8 of 25

REPORT NO: 12U14468-4DATE: SEPTEMBER 25, 2012EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETOOTHFCC ID: TP00043AEFIC: 4182A-TP00043AEF

RADIATED SETUP



Page 9 of 25

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 D						
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	03/22/13		
Antenna, Horn, 18 GHz	EMCO	3115	C00943	CNR		
Antenna, Horn, 18 GHz	EMCO	3115	C00783	10/18/12		
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	03/23/13		
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	11/07/12		
Communications Test Set	Agilent / HP	E5515C	C01086	06/20/13		
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR		
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR		
Sleeve Dipole 1880MHz	ETS	3126-1880	C01157	04/27/13		
Vector signal generator, 6 GHz	Agilent / HP	E4438C	N/A	07/06/13		
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	10/16/12		

Page 10 of 25

7. RADIATED TEST RESULTS

7.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232 RSS132 & RSS133

LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

RSS-133 § 6.4 - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

RSS-132 § 4.4, SRSP503 5.1.3 - The maximum ERP shall be 11.5 Watts for mobile stations.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17, RSS-132 and RSS-133

MODES TESTED

- UMTS WCDMA
- UMTS HSUPA

RESULTS

Page 11 of 25

REPORT NO: 12U14468-4 DATE: SEPTEMBER 25, 2012 EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETOOTH IC: 4182A-TP00043AEF FCC ID: TP00043AEF

CELL BAND (ERP)

			ERP	
Mode	Channel	f (MHz)	dBm	mW
	4357	826.40	24.40	275.42
UMTS WCDMA	4408	836.60	22.32	170.61
	4458	846.60	23.88	244.34
	4357	826.40	25.98	396.28
UMTS HSUPA	4408	836.60	24.26	266.69
	4458	846.60	25.79	379.31

PCS BAND (EIRP)

			EIRP		
Mode	Channel	f (MHz)	dBm	mW	
	9662	1852.40	23.40	218.78	
UMTS WCDMA	9800	1880.00	24.77	299.92	
	9938	1907.60	25.32	340.41	
	9662	1852.40	23.60	229.09	
UMTS HSUPA	9800	1880.00	25.32	340.41	
	9938	1907.60	25.98	396.28	

COMPLIANCE CERTIFICATION SERVICES (UL CCS) FORM NO: CCSUP4031B 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 12 of 25

REPORT NO: 12U14468-4	DATE:	SEPTEMBER 25, 2012
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETC	DOTH	
FCC ID: TP00043AEF	I	C: 4182A-TP00043AEF

UMTS WCDMA850 BAND

		-		titution Measur on Services Cha					
ompany		LENOVO							
roject #:		12U14468							
ate:		09/24/12							
est Engi	neer:	MENGISTU M	IEKURIA						
onfigura	tion:	EUT WITH HE	ADSET						
ode:		TX 850 MH-	BAND, UMTS W	CDMA MODE					
est Equi	<u>pment:</u> g: Sunol T122,	and 5m Cha I: 1629, 4ft S	mber B N-typ MA Cable (24	e Cable (Setup 1 5182002) Wareh Antenna Gain		or testing Limit	EUT) Margin	Notes	
est Equi eceiving ubstituti	<u>pment:</u> g: Sunol T122, on: Dipole S/N	and 5m Cha I: 1629, 4ft S	mber B N-typ MA Cable (24	e Cable (Setup 1 5182002) Wareh	ouse.	_		Notes	
est Equi eceiving ubstituti f MHz	<u>pment:</u> g: Sunol T122, on: Dipole S/N SG reading (dBm)	and 5m Cha I: 1629, 4ft S Ant. Pol.	mber B N-typ MA Cable (24 Cable Loss (dB)	e Cable (Setup 1 5182002) Wareh Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
<u>est Equi</u> eceiving ubstituti f	<u>pment:</u> g: Sunol T122, on: Dipole S/N SG reading	and 5m Cha I: 1629, 4ft S Ant. Pol. (H/V)	mber B N-typ MA Cable (24 Cable Loss	e Cable (Setup 1 5182002) Wareh Antenna Gain	ERP	Limit	Margin	Notes	
est Equi eceiving ubstituti f MHz 824.20 824.20	<u>pment:</u> j: Sunol T122, on: Dipole S/N SG reading (dBm) 24.90 18.29	and 5m Cha I: 1629, 4ft S Ant. Pol. (H/V) V	mber B N-typ MA Cable (24 Cable Loss (dB) 0.5 0.5	e Cable (Setup t 5182002) Wareh Antenna Gain (dBd) 0.0 0.0	ERP (dBm) 24.40 17.79	Limit (dBm) 38.5 38.5	Margin (dB) -14.0 -20.7	Notes	
est Equi eceiving ubstituti f MHz 824.20	<u>pment:</u> g: Sunol T122, on: Dipole S/N SG reading (dBm) 24.90	and 5m Cha I: 1629, 4ft S Ant. Pol. (H/V) V H	mber B N-typ MA Cable (24 Cable Loss (dB) 0.5	e Cable (Setup 1 5182002) Wareh Antenna Gain (dBd) 0.0	ERP (dBm) 24.40	Limit (dBm) 38.5	Margin (dB)	Notes	
est Equi eceiving ubstituti f MHz 824.20 824.20 836.60	pment: j: Sunol T122, on: Dipole S/N SG reading (dBm) 24.90 18.29 22.82	and 5m Cha I: 1629, 4ft S Ant. Pol. (H/V) V H	mber B N-typ MA Cable (24 Cable Loss (dB) 0.5 0.5	e Cable (Setup 1 5182002) Wareh Antenna Gain (dBd) 0.0 0.0 0.0	ERP (dBm) 24.40 17.79 22.32	Limit (dBm) 38.5 38.5 38.5	Margin (dB) -14.0 -20.7 -16.1	Notes	

Page 13 of 25

REPORT NO: 12U14468-4	DATE: SEPTEMBER 25, 201	2
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETC	ООТН	
FCC ID: TP00043AEF	IC: 4182A-TP00043AE	F

UMTS HSUPA850 BAND

		-		titution Measur on Services Cha				
ompany	:	LENOVO						
roject #:		12U14468						
ate:		09/24/12						
est Engi	ineer:	MENGISTU M	IEKURIA					
onfigura		EUT WITH HE	ADSET					
ode:		TX, 850 MHz	BAND, UMTS H	SUPA MODE				
eceiving	g: Sunol T122, ion: Dipole S/N	l: 1629, 4ft S	MA Cable (24	e Cable (Setup t 5182002) Wareho Antenna Gain		or testing Limit		Notes
ubstituti	g: Sunol T122, ion: Dipole S/N	l: 1629, 4ft S	MA Cable (24	• •	ouse.	_	EUT) Margin (dB)	Notes
eceiving ubstituti f MHz	g: Sunol T122, ion: Dipole S/N SG reading (dBm)	I: 1629, 4ft S Ant. Pol. (H/V)	MA Cable (24 Cable Loss (dB)	5182002) Wareho Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
eceiving ubstituti f MHz 824.20	g: Sunol T122, ion: Dipole S/N SG reading (dBm) 26.48	l: 1629, 4ft S Ant. Pol. (H/V) V	MA Cable (24 Cable Loss (dB)	5182002) Wareho Antenna Gain (dBd) 0.0	ERP (dBm) 25.98	Limit (dBm) 38.5	Margin (dB)	Notes
eceiving ubstituti f MHz	g: Sunol T122, ion: Dipole S/N SG reading (dBm)	I: 1629, 4ft S Ant. Pol. (H/V)	MA Cable (24 Cable Loss (dB)	5182002) Wareho Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
eceiving ubstituti f MHz 824.20	g: Sunol T122, ion: Dipole S/N SG reading (dBm) 26.48	l: 1629, 4ft S Ant. Pol. (H/V) V	MA Cable (24 Cable Loss (dB)	5182002) Wareho Antenna Gain (dBd) 0.0	ERP (dBm) 25.98	Limit (dBm) 38.5	Margin (dB)	Notes
eceiving ubstituti f MHz 824.20 824.20	g: Sunol T122, ion: Dipole S/N SG reading (dBm) 26.48 19.59	I: 1629, 4ft S Ant. Pol. (H/V) V H	MA Cable (24 Cable Loss (dB) 0.5 0.5	5182002) Wareho Antenna Gain (dBd) 0.0 0.0	ERP (dBm) 25.98 19.09	Limit (dBm) 38.5 38.5	Margin (dB) -12.5 -19.4	Notes
eceiving ubstituti f MHz 824.20 824.20 836.60 836.60	g: Sunol T122, ion: Dipole S/N SG reading (dBm) 26.48 19.59 24.76 19.94	I: 1629, 4ft S Ant. Pol. (H/V) V H V H	MA Cable (24 Cable Loss (dB) 0.5 0.5 0.5 0.5	5182002) Wareho Antenna Gain (dBd) 0.0 0.0 0.0 0.0	ERP (dBm) 25.98 19.09 24.26 19.44	Limit (dBm) 38.5 38.5 38.5 38.5	Margin (dB) -12.5 -19.4 -14.2 -19.0	Notes
eceiving ubstituti f MHz 824.20 824.20 836.60	g: Sunol T122, ion: Dipole S/N SG reading (dBm) 26.48 19.59 24.76	I: 1629, 4ft S Ant. Pol. (H/V) V H	MA Cable (24 Cable Loss (dB) 0.5 0.5 0.5	5182002) Wareho Antenna Gain (dBd) 0.0 0.0 0.0	ERP (dBm) 25.98 19.09 24.26	Limit (dBm) 38.5 38.5 38.5	Margin (dB) -12.5 -19.4 -14.2	Notes

Page 14 of 25

REPORT NO: 12U14468-4	DATE: SEPTEMBER 25, 201
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETC	ООТН
FCC ID: TP00043AEF	IC: 4182A-TP00043AE

UMTS WCDMA1900 BAND

			-	ental Measuremen Services Chamber				
Company	:	LENOVO						
Project #:		12U14468						
Date:		09/24/12						
lest Engi	neer:	MENGISTU ME	KURIA					
Configura	tion:	EUT WITH AC A	ADAPTER					
lode:		TX, 1900 MHz B.	AND, UMTS WCDN	IA MODE				
est Equi eceiving	g: Horn T59, an on: Horn T217	Substitution,	4ft SMA Cable	(245182002) Wareho Antenna Gain		Limit	Delta	Notes
<u>Fest Equi</u> Receiving Substitut	g: Horn T59, an			(245182002) Wareho Antenna Gain (dBi)	use EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Test Equi Receiving Substitut f GHz	g: Horn T59, an on: Horn T217 SG reading (dBm)	Substitution, Ant. Pol. (H/V)	4ft SMA Cable Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	(dBm)	(dB)	Notes
<u>Fest Equi</u> Receiving Substitut	g: Horn T59, an on: Horn T217 SG reading	Substitution, Ant. Pol.	4ft SMA Cable	Antenna Gain	EIRP			Notes
Fest Equing Receiving Substitut f GHz .852 .852	g: Horn T59, an on: Horn T217 SG reading (dBm) 12.1	Substitution, Ant. Pol. (H/V) V	4ft SMA Cable Cable Loss (dB) 0.85	Antenna Gain (dBi) 8.62	EIRP (dBm) 19.89	(dBm) 33.0	(dB) -13.1	Notes
Test Equi Receiving Substitut f GHz .852	2: Horn T59, an on: Horn T217 SG reading (dBm) 12.1 15.8	Substitution, Ant. Pol. (H/V) V H	4ft SMA Cable Cable Loss (dB) 0.85 0.85	Antenna Gain (dBi) 8.62 8.47	EIRP (dBm) 19.89 23.40	(dBm) 33.0 33.0	(dB) -13.1 -9.6	Notes
Fest Equi Receiving Substituti f GHz .852 .852 .880	2: Horn T59, an on: Horn T217 SG reading (dBm) 12.1 15.8 12.3	Substitution, Ant. Pol. (H/V) V H V	4ft SMA Cable Cable Loss (dB) 0.85 0.85 0.85	Antenna Gain (dBi) 8.62 8.47 8.46	EIRP (dBm) 19.89 23.40 19.94	(dBm) 33.0 33.0 33.0 33.0	(dB) -13.1 -9.6 -13.1	Notes

Page 15 of 25

REPORT NO: 12U14468-4	DATE:	SEPTEMBER 25, 2012
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETC	DOTH	
FCC ID: TP00043AEF	I	IC: 4182A-TP00043AEF

UMTS HSUPA1900 BAND

			•	ental Measuremen Services Chamber				
ompany	:	LENOVO						
roject #	:	12U14468						
ate:		09/24/12						
est Eng	ineer:	MENGISTU ME	KURIA					
onfigura		EUT WITH AC A	ADAPTER					
-								
<u>st Equ</u> ceivin	i <u>pment:</u> g: Horn T59, an	d Camber B		(245182002) Wareho Antenna Gain	use	Limit	Delta	Notes
est Equ eceiving ubstitut	i <u>pment:</u> g: Horn T59, an ion: Horn T217	d Camber B S Substitution,	SMA Cables 4ft SMA Cable	(245182002) Wareho		Limit (dBm)	Delta (dB)	Notes
eceivin ubstitut f GHz	ip <u>ment:</u> g: Horn T59, an ion: Horn T217 SG reading (dBm)	d Camber B Substitution, Ant. Pol. (H/V)	SMA Cables 4ft SMA Cable Cable Loss (dB)	(245182002) Wareho Antenna Gain (dBi)	EIRP (dBm)	(dBm)	(dB)	Notes
est Equ eceiving ubstitut f GHz 852	i <u>pment:</u> g: Horn T59, an ion: Horn T217 SG reading	d Camber B Substitution, Ant. Pol.	SMA Cables 4ft SMA Cable Cable Loss	(245182002) Wareho Antenna Gain (dBi) 8.62	EIRP	(dBm) 33.0	(dB) -12.3	Notes
est Equ eceivin ubstitut f GHz	ipment: g: Horn T59, an ion: Horn T217 SG reading (dBm) 12.9	d Camber B Substitution, Ant. Pol. (H/V) V	SMA Cables 4ft SMA Cable Cable Loss (dB) 0.85	(245182002) Wareho Antenna Gain (dBi)	EIRP (dBm) 20.68	(dBm)	(dB)	Notes
est Equ eceivin ubstitut f GHz 852 852 880	ipment: g: Horn T59, an ion: Horn T217 SG reading (dBm) 12.9 16.0 13.1	d Camber B Substitution, Ant. Pol. (H/V) V H	SMA Cables 4ft SMA Cable Cable Loss (dB) 0.85 0.85 0.85	(245182002) Wareho Antenna Gain (dBi) 8.62 8.47 8.46	EIRP (dBm) 20.68 23.60 20.72	(dBm) 33.0 33.0 33.0 33.0	(dB) -12.3 -9.4 -12.3	Notes
est Equ eceiving ubstitut f GHz 852	ipment: g: Horn T59, an ion: Horn T217 SG reading (dBm) 12.9 16.0	d Camber B Substitution, Ant. Pol. (H/V) V H	SMA Cables 4ft SMA Cable Cable Loss (dB) 0.85 0.85	(245182002) Wareho Antenna Gain (dBi) 8.62 8.47	EIRP (dBm) 20.68 23.60	(dBm) 33.0 33.0	(dB) -12.3 -9.4	Notes
est Equ eceivin ubstitut f GHz 852 852 880	ipment: g: Horn T59, an ion: Horn T217 SG reading (dBm) 12.9 16.0 13.1	d Camber B Substitution, Ant. Pol. (H/V) V H	SMA Cables 4ft SMA Cable Cable Loss (dB) 0.85 0.85 0.85	(245182002) Wareho Antenna Gain (dBi) 8.62 8.47 8.46	EIRP (dBm) 20.68 23.60 20.72	(dBm) 33.0 33.0 33.0 33.0	(dB) -12.3 -9.4 -12.3	Notes

Page 16 of 25

7.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238 IC: RSS-132, RSS-133

LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

IC: RSS-132, 4.5 & RSS-133, 6.5: Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P) dB$.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

MODES TESTED

- UMTS WCDMA
- UMTS HSUPA

REPORT NO: 12U14468-4	DATE: SEPTEMBER 25, 2012
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUET	ООТН
FCC ID: TP00043AEF	IC: 4182A-TP00043AEF

RESULTS

UMTS WCDMA850 BAND

			Co Above 1GH	mpliance Co z High Free				ement	
Company Project # Date: Test Eng Configura Mode:	: ineer: ation:	LENOVO 12U14468 09/24/12 MENGISTU MI EUT WITH HE TX, 850 MHz E		CDMA MODE					
	Chambe	r	Pre-ar	nplifer		Filter		Li	imit
5r	n Chamber B	•	T145 8449	в	Fil	ter 1	•	Part 22	•
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (8					. ,				
1.653	-16.5	V	3.0	35.5	1.0	-51.1	-13.0	-38.1	
	-21.2	V	3.0	35.4	1.0	-55.6	-13.0	-42.6	
		н	3.0	35.5	1.0	-48.6	-13.0	-35.6	
1.653	-14.1		7						
1.653	-14.1 -23.5	H	3.0	35.4	1.0	-57.9	-13.0	-44.9	
1.653 2.479	-23.5		3.0	35.4	1.0	-57.9	-13.0	-44.9	
1.653 2.479 Mid Ch, (8	-23.5 36.6MHz)	Н							
1.653 2.479 Mid Ch, (8 1.673	-23.5		3.0	35.4 35.5 35.4	1.0 1.0 1.0	_46.0	-13.0	-33.0	
1.653 2.479 Mid Ch, (8 1.673 2.510	-23.5 336.6MHz) -11.5	H V		35.5	1.0				
1.653 2.479 Mid Ch, (8 1.673 2.510 1.673	-23.5 336.6MHz) -11.5 -22.1	H V V	3.0 3.0	35.5 35.4	1.0 1.0	_46.0 _56.5	-13.0 -13.0	-33.0 -43.5	
1.653 2.479 Mid Ch, (8 1.673 2.510 1.673 2.510	-23.5 336.6MHz) -11.5 -22.1 -11.2 -23.5	H V V H	3.0 3.0 3.0	35.5 35.4 35.5	1.0 1.0 1.0	_46.0 _56.5 _45.7	-13.0 -13.0 -13.0	-33.0 -43.5 -32.7	
1.653 2.479 Mid Ch, (8 1.673 2.510 1.673 2.510 High Ch, (8	-23.5 336.6MHz) -11.5 -22.1 -11.2 -23.5 346.6MHz)	H V V H H	3.0 3.0 3.0 3.0 3.0	35.5 35.4 35.5 35.4	1.0 1.0 1.0 1.0	-46.0 -56.5 -45.7 -57.9	-13.0 -13.0 -13.0 -13.0	-33.0 43.5 -32.7 -44.9	
1.653 2.479 Mid Ch, ({ 1.673 2.510 1.673 2.510 High Ch, (1.693	-23.5 336.6MHz) -11.5 -22.1 -11.2 -23.5 -22.1 -11.5 -22.1 -11.2 -23.5 -2	H V V H H	3.0 3.0 3.0 3.0 3.0	35.5 35.4 35.5 35.4 35.4 35.5	1.0 1.0 1.0 1.0	_46.0 _56.5 _45.7 _57.9 _50.6	-13.0 -13.0 -13.0 -13.0 -13.0	-33.0 43.5 -32.7 -44.9 -37.6	
1.653 2.479 Mid Ch, (8 1.673 2.510 1.673 2.510 High Ch, (1.693 2.540	-23.5 336.6MHz) -11.5 -22.1 -11.2 -23.5 -23.5 -23.5 -23.5 -23.5 -16.1 -22.2	H V H H V V	3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.5 35.4 35.5 35.4 35.4 35.4	1.0 1.0 1.0 1.0 1.0		-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	33.0 43.5 32.7 44.9 37.6 43.7	
1.653 2.479 Mid Ch, (8 1.673 2.510 1.673 2.510 High Ch, (6 1.693 2.540 1.693	-23.5 336.60Hz) -11.5 -22.1 -11.2 -23.5 346.60Hz) -16.1 -22.2 -13.1	H V H H V V V H	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.5 35.4 35.5 35.4 35.5 35.4 35.5 35.4 35.5	1.0 1.0 1.0 1.0 1.0 1.0	46.0 -56.5 45.7 -57.9 -50.6 -56.7 47.7	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	-33.0 43.5 32.7 44.9 	
2.479 1.653 2.479 Mid Ch, (§ 1.673 2.510 1.673 2.510 High Ch, (§ 1.693 2.540 1.693 2.540	-23.5 336.6MHz) -11.5 -22.1 -11.2 -23.5 -23.5 -23.5 -23.5 -23.5 -16.1 -22.2	H V H H V V	3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.5 35.4 35.5 35.4 35.4 35.4	1.0 1.0 1.0 1.0 1.0		-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	33.0 43.5 32.7 44.9 37.6 43.7	

Page 18 of 25

REPORT NO: 12U14468-4	DATE: SEPTEMBER 25, 2012
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETC	ООТН
FCC ID: TP00043AEF	IC: 4182A-TP00043AEF

UMTS WCDMA1900 BAND

			Cor Above 1GH	mpliance Co z High Frec				ement	
Company	:	LENOVO							
Project #:		12U14468							
Date:		09/24/12							
Test Engi	neer:	MENGISTU MI	EKURIA						
Configura		EUT WITH AC	ADAPTER						
Mode:		TX, 1900 MHz	BAND, UMTS V	VCDMA MODE					
	Chambe	r	Pre-an	nplifer		Filter			Limit
E.	n Chamber B		T145 84498	В 🗸	Fil	ter 1	-	Part 24	4 _
on		•							
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	EIRP	Limit	Delta	Notes
O 11-	(dDma)	(110.0	()	(15)	(-15)	(10-1)			
GHz	(dBm)	(H/V)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)	
		(H/V)	(m)	(dB)	(dB)	(aBm)	(dBm)	(dB)	
Low Ch, (1		(H/V) V	(m) 3.0	(dB) 35.4	(dB) 1.0	(dBm)	(dBm) -13.0	(dB) -37.7	
Low Ch, (1 3.705 5.557	8524MHz) -16.4 -15.4	VVV	3.0 3.0	35.4 35.4	1.0 1.0	-50.7 -49.8	-13.0 -13.0	-37.7 -36.8	
Low Ch, (1 3.705 5.557 3.705	8524MHz) -16.4 -15.4 -10.9	V V H	3.0 3.0 3.0	35.4 35.4 35.4	1.0 1.0 1.0	-50.7 -49.8 -45.3	-13.0 -13.0 -13.0	-37.7 -36.8 -32.3	
Low Ch, (1 3.705 5.557 3.705	8524MHz) -16.4 -15.4	VVV	3.0 3.0	35.4 35.4	1.0 1.0	-50.7 -49.8	-13.0 -13.0	-37.7 -36.8	
Low Ch, (1 3.705 5.557 3.705 5.557	8524MHz) -16.4 -15.4 -10.9 -12.0	V V H	3.0 3.0 3.0	35.4 35.4 35.4	1.0 1.0 1.0	-50.7 -49.8 -45.3	-13.0 -13.0 -13.0	-37.7 -36.8 -32.3	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz)	V V H H	3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4	1.0 1.0 1.0 1.0	-50.7 -49.8 -45.3 -46.4	-13.0 -13.0 -13.0 -13.0	-37.7 -36.8 -32.3 -33.4	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5	V V H H	3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.4 35.3	1.0 1.0 1.0 1.0	-50.7 -49.8 -45.3 -46.4 -53.9	-13.0 -13.0 -13.0 -13.0 -13.0	-37.7 -36.8 -32.3 -33.4 -40.9	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5 -16.7	V V H H V V	3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.4 35.3 35.3	1.0 1.0 1.0 1.0 1.0 1.0	-50.7 -49.8 -45.3 -46.4 -53.9 -51.1	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0	-37.7 -36.8 -32.3 -33.4 -40.9 -38.1	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640 3.760	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5	V V H H	3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.4 35.3	1.0 1.0 1.0 1.0	-50.7 -49.8 -45.3 -46.4 -53.9	-13.0 -13.0 -13.0 -13.0 -13.0	-37.7 -36.8 -32.3 -33.4 -40.9	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640 3.760 5.640	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5 -16.7 -19.0 -13.0	V V H H V V H	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.4 35.3 35.3 35.4 35.3	1.0 1.0 1.0 1.0 1.0 1.0 1.0	-50.7 49.8 45.3 46.4 -53.9 -51.1 -53.3	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	37.7 36.8 32.3 33.4 40.9 38.1 40.3	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640 3.760 5.640 High Ch, (1	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5 -16.7 -19.0 -13.0 907.60MHz)	V V H H V V V H H	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.3 35.3 35.4 35.3 35.4	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	-50.7 49.8 45.3 46.4 -53.9 -51.1 -53.3 47.4	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	37.7 36.8 32.3 33.4 40.9 38.1 40.3 34.4	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640 3.760 5.640 High Ch, (1 3.815	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5 -16.7 -19.0 -13.0 907.60MHz) -17.3	V V H H H V V V H H	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.3 35.3 35.4 35.3 35.4 35.3 35.4 35.3	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	-50.7 49.8 45.3 46.4 -53.9 -51.1 -53.3 47.4 -51.6	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	37.7 36.8 32.3 33.4 40.9 38.1 40.3 34.4 38.6	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640 3.760 5.640 High Ch, (1 3.815 5.723	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5 -16.7 -19.0 -13.0 907.60MHz) -17.3 -16.4	V V H H V V V H H H V V V	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.3 35.4 35.3 35.4 35.3 35.4 35.3 35.4	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	-50.7 49.8 45.3 46.4 -53.9 -51.1 -53.3 47.4 -51.6 -50.9	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	37.7 36.8 32.3 33.4 40.9 38.1 40.3 34.4 38.6 37.9	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640 3.760 5.640 High Ch, (1 3.815 5.723 3.815	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5 -16.7 -19.0 -13.0 907.60MHz) -17.3 -16.4 -18.2	V V H H H V V V V V V V V	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.3 35.4 35.3 35.4 35.3 35.4 35.3 35.4 35.3	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	-50.7 49.8 45.3 46.4 -53.9 -51.1 -53.3 47.4 -51.6 -50.9 -52.5	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	37.7 36.8 32.3 33.4 40.9 38.1 40.3 34.4 38.6 37.9 39.5	
Low Ch, (1 3.705 5.557 3.705 5.557 Mid Ch, (1 3.760 5.640 3.760 5.640 High Ch, (1 3.815 5.723	8524MHz) -16.4 -15.4 -10.9 -12.0 880.00MHz) -19.5 -16.7 -19.0 -13.0 907.60MHz) -17.3 -16.4	V V H H V V V H H H V V V	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	35.4 35.4 35.4 35.4 35.3 35.4 35.3 35.4 35.3 35.4 35.3 35.4	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	-50.7 49.8 45.3 46.4 -53.9 -51.1 -53.3 47.4 -51.6 -50.9	-13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0 -13.0	37.7 36.8 32.3 33.4 40.9 38.1 40.3 34.4 38.6 37.9	

Page 19 of 25

REPORT NO: 12U14468-4	DATE: SEPTEMBER 25, 2012
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETC	ООТН
FCC ID: TP00043AEF	IC: 4182A-TP00043AEF

UMTS HSUPA850 BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company Project # Date: Test Eng Configur Mode:	: ineer: ation:	LENOVO 12U14468 09/24/12 MENGISTU M EUT WITH AC TX, 1900 MHz		ISUPA MODE					
Chamber			Pre-ar	nplifer		Filter		Limit	
5m Chamber B ▼		T145 8449B 🗸		Filter 1 🗸			Part 22		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (V = 1			11				
1.653	-16.2	V	3.0	35.5	1.0	-50.8	-13.0	-37.8	
2.479	-21.3	V	3.0	35.4	1.0	-55.7	-13.0	-42.7	
1.653	-15.5	H	3.0	35.5	1.0	-50.0	-13.0	-37.0	
2.479	-23.2	Η	3.0	35.4	1.0	-57.6	-13.0	-44.6	
Mid Ch, (36 6MHz)								
1.673	-12.6	V	3.0	35.5	1.0	-47.1	-13.0	-34.1	
2.510	-20.0	v	3.0	35.4	1.0	-54.4	-13.0	-41.4	
1.673	-11.4	H	3.0	35.5	1.0	-45.9	-13.0	-32.9	
2.510	-22.5	Н	3.0	35.4	1.0	-56.9	-13.0	-43.9	
				ļ				·	
	846.6MHz)			25.5		50.0	42.0		
1.693 2.540	-17.6	V V	3.0	35.5 35.4	1.0 1.0	-52.2	-13.0 -13.0	-39.2	
2.340	-21.6 -15.1	V H	3.0 3.0	35.4 35.5	1.0	-56.0	-13.0 -13.0	-43.0 -36.7	
1 602	-15.1	H H	3.0	35.3 35.4	1.0	-49.7	-13.0 -13.0	-36.7	
1.693	-21.0	•••	J.V	JJ.4	1.0	-30.2	-13.0	-43.2	
1.693 2.540	7		1	[[

Page 20 of 25

REPORT NO: 12U14468-4	DATE: SEPTEMBER 25, 2012
EUT: 10.1" TABLET WITH LTE/WWAN AND WLAN RADIO WITH BLUETC	ООТН
FCC ID: TP00043AEF	IC: 4182A-TP00043AEF

UMTS HSUPA1900 BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company Project # Date: Test Eng Configur Mode:	ineer: ation:	LENOVO 12U14468 09/24/12 MENGISTU M EUT WITH HE TX, 850 MHz E	ADSET						
	Chamber 5m Chamber B ▼		Pre-amplifer T145 8449B 🗸		Filter Filter 1			Limit Part 24	
51									
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (852.40MHz)								
3.705	-15.4	V	3.0	35.4	1.0	-49.7	-13.0	-36.7	
5.557	-16.2	V	3.0	35.4	1.0	-50.6	-13.0	-37.6	
3.705	-11.5	H	3.0	35.4	1.0	-45.9	-13.0	-32.9	
5.557	-11.8	Н	3.0	35.4	1.0	-46.2	-13.0	-33.2	
Mid Ch (880.00MHz)								
3.760	-20.6	V	3.0	35.3	1.0	-54.9	-13.0	-41.9	
5.640	-17.0	v	3.0	35.4	1.0	-51.4	-13.0	-38.4	
3.760	-19.5	Н	3.0	35.3	1.0	-53.8	-13.0	-40.8	
5.640	-12.6	H	3.0	35.4	1.0	-47.0	-13.0	-34.0	
	007.000								
High Ch, (3.815	1907.60MHz)	V	2.0	25.2	4.0	F2 C	42.0	40.0	
3.815 5.723	-19.3 -16.6	V	3.0	35.3 35.4	1.0 1.0	-53.6	-13.0 -13.0	-40.6 -38.1	
3.815	-10.0	H	3.0	35.3	1.0	-51.1	-13.0	-30.1	
	-10.5	H	3.0	35.3 35.4	1.0	-46.2	-13.0	-33.2	
		••				7012	-1010	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
5.723			1	ſ			1		

Page 21 of 25