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Report On

FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA)

COMMERCIAL-IN-CONFIDENCE
FCC ID: APYHRO00178

Document 75918726 Report 17 Issue 1 October 2012

Product Service

TÜV SÜD Product Service Ltd, Octagon House, Concorde Way, Segensworth North,
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Tel: +44 (0) 1489 558100. Website: www.tuvps.co.uk

REPORT ON

FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA)

Document 75918726 Report 17 Issue 1

October 2012

PREPARED FOR

Sharp Communication Compliance Ltd
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Bagshot Road
Bracknell
Berkshire
RG12 7QY

PREPARED BY

Natalie Bennett
Senior Administrator (Technical)

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED 02 October 2012

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

B Airs G Lawler

UKAS TESTING 0141

Product Service

CONTENTS

Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA)

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS to the requirements of FCC CFR 47 Part 2 and FCC CFR 47 Part 22.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Sharp Corporation
Model Number(s)	CDMA SHL21
Serial Number(s)	IMEI 004401114094291 IMEI 004401114094580
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2011) FCC CFR 47 Part 22 (2011)
Incoming Release Date	Application Form 30 July 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	9290 03 August 2012
Start of Test	14 August 2012
Finish of Test	18 September 2012
Name of Engineer(s)	B Airs G Lawler
Related Document(s)	ANSI C63.4: 2009

Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 is shown below.

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	Pt 2	Pt 22			
WCDMA FDD V					
2.1	2.1051	22.905	Spurious Emissions at Band Edge	Pass	
2.2	-	22.913 (a)	Effective Radiated Power	Pass	
2.3	2.1046	22.913 (a)	Maximum Peak Output Power - Conducted	Pass	
2.4	22.917		Emission Limitations for Cellular Equipment	Pass	
2.5	2.1051	22.917 (a)	Conducted Spurious Emissions	Pass	
2.6	2.1049 (h)	22.917 (b)	Occupied Bandwidth	Pass	
2.7	2.1047 (d)	-	Modulation Characteristics	-	Customer Declaration
2.8	2.1055	22.355	Frequency Stability	Pass	

Product Service

1.3 APPLICATION FORM

APPLICANT'S DETAILS			
COMPANY NAME :	Sharp Telecommunications of Europe Ltd		
ADDRESS :	Azure House, Bagshot Road Bracknell, Berkshire RG12 7QY		
NAME FOR CONTACT PURPOSES : Ken Newman			
TELEPHONE NO: 01344 301 883	FAX NO:	01344 300 293	
		E-MAIL:	ken.newman@sharp.eu

EQUIPMENT INFORMATION

Equipment designator:
Model name/number CDMA SHL21 Identification number APYHRO00178

Supply Voltage:

[ ]	AC mains	State AC voltage …… V	and AC frequency …… Hz
[ ]	DC (external)	State DC voltage …… V	and DC current …… A
[X]	DC (internal)	State DC voltage …3.7 V	and Battery type…Li-Ion.

Frequency characteristics:
Frequency range 826.4 MHz to 846,6 MHz Channel spacing ……. (if channelized)

Designated test frequencies:
Bottom: 826.4 MHz Middle: 836.6 MHz Top: 846.6 MHz

Power characteristics:
Maximum transmitter power 0.26W(24.2dBm) Minimum transmitter power …… W (if variable)

[X]	Continuous transmission	
[ ]	Intermittent transmission	State duty cycle ……

If intermittent, can transmitter be set to continuous transmit test mode? Y/N

Antenna characteristics:

[X]	Antenna connector	State impedance 50 ohm
[ ]	Temporary antenna connector	State impedance …… ohm
[ ]	Integral antenna	State gain …… dBi

Modulation characteristics:

[ ]	Amplitude	[ ]	Other
[ ]	Frequency	Details: ……..	
[X]	Phase		

Can the transmitter operate un-modulated? ~~Y~~/N
ITU Class of emission: ……

Extreme conditions:
Maximum temperature 55 ºC Minimum temperature -10 ºC
Maximum supply voltage 4.0 V Minimum supply voltage 3.7 V

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature : M. Kishino

Name : Masahiko Kishino
Position held : Manager
Date : 30 July 2012

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 4.0 V DC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard or test plan were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.

Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA)

2.1 SPURIOUS EMISSIONS AT BAND EDGE

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 22, Clause 22.905

2.1.2 Equipment Under Test and Modification State

CDMA SHL21 S/N: IMEI 004401114094291 - Modification State 0

2.1.3 Date of Test

14 August 2012

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

In accordance with 22.917(e), any emissions outside of the block edges shall be attenuated by at least 43 + 10 log (P). The measurements are shown to ±1 MHz from the block edges. The plots shown under the Spurious Emissions sections covers the required range of 9 kHz to 9 GHz.

The reference power and path losses of all channels used for testing in each frequency block were measured. Having entered the reference level offset, a limit line was displayed, showing the -13 dBm (43 + 10 log (P)), limit. The EUT was operated at maximum power WCDMA modulation schemes.

2.1.6 Environmental Conditions

Ambient Temperature	26.1°C
Relative Humidity	41.5%

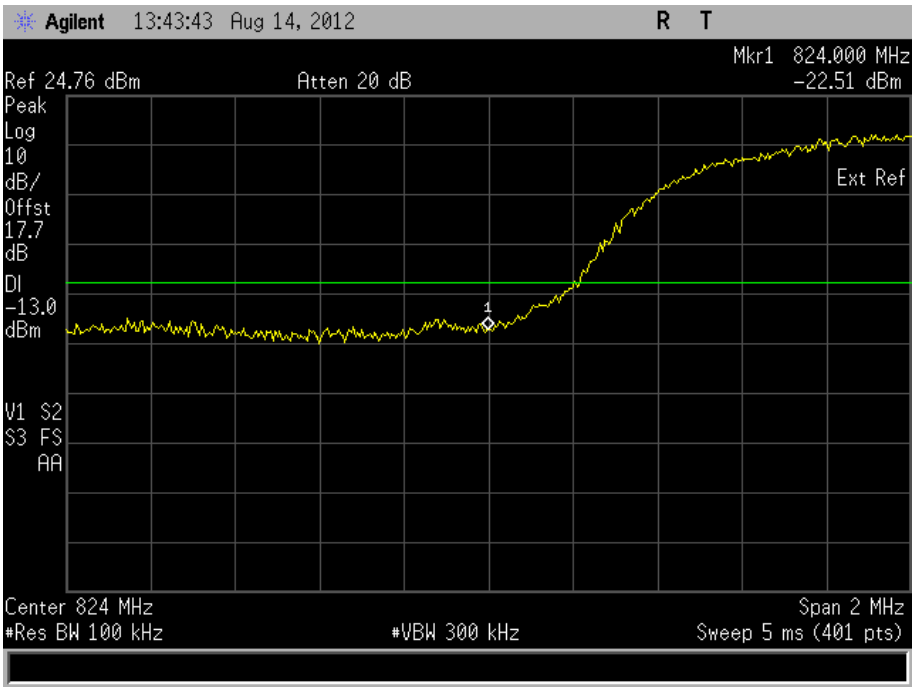
Product Service

2.1.7 Test Results

4.0 V DC Supply

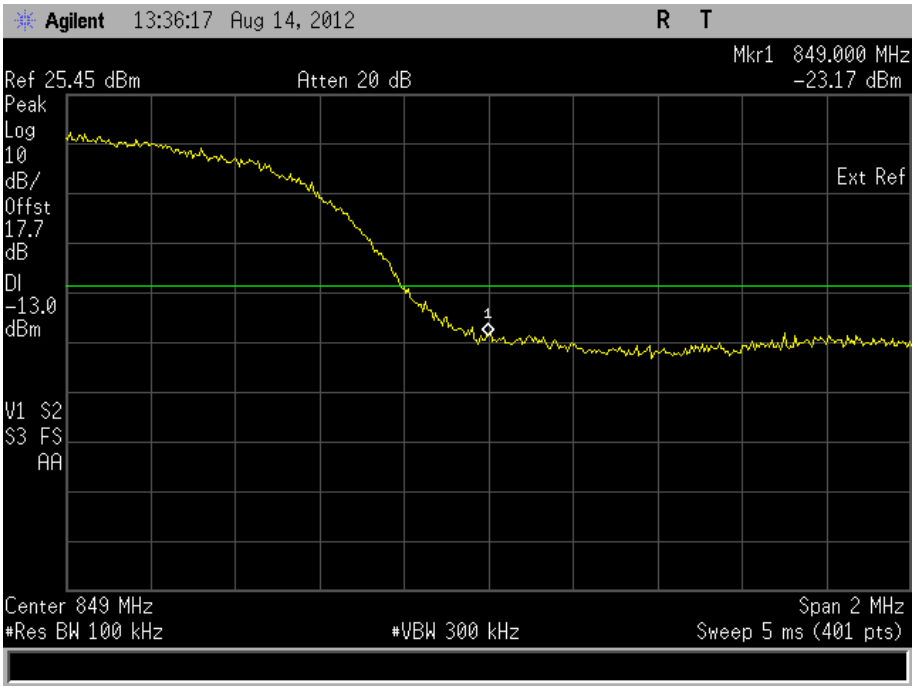
Frequency Block (MHz)	Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
A :(824.0 – 835.0)	Channel : 4133 Frequency : 826.6 MHz	N/A
B :(846.5 – 849.0)	N/A	Channel : 4232 Frequency : 846.4MHz

Frequency Block A



Product Service

Frequency Block B



Limit Clause

-13 dBm at block edge.

2.2 EFFECTIVE RADIATED POWER

2.2.1 Specification Reference

FCC CFR 47 Part 22, Clause 22.913 (a)

2.2.2 Equipment Under Test and Modification State

CDMA SHL21 S/N: IMEI 004401114094580 - Modification State 0

2.2.3 Date of Test

18 September 2012

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

Measurements of the fundamental from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The fundamental frequency was maximised by adjusting the antenna height, antenna polarisation and turntable azimuth. A peak detector was used with the trace set to max hold. The maximum result was recorded.

The EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result (ERP) was determined by a calculation using the signal generator level, antenna gain and cable loss.

The measurements were performed at a 3m distance unless otherwise stated.

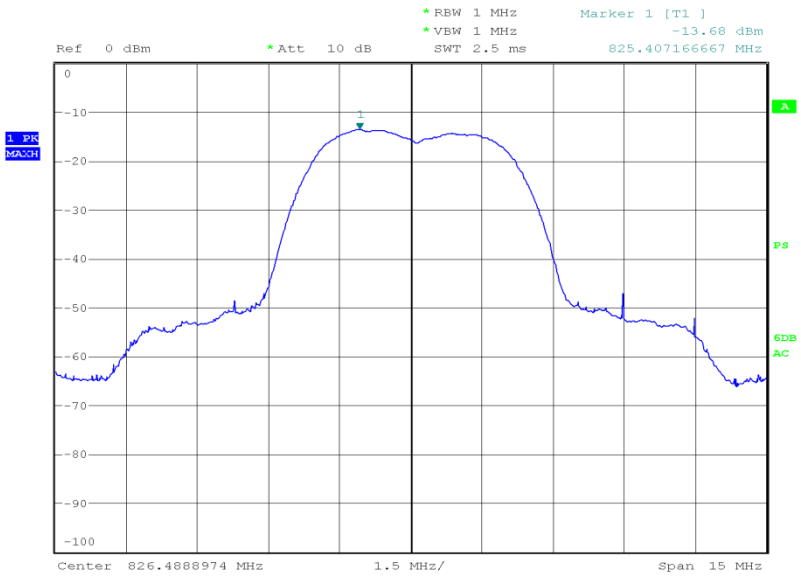
2.2.6 Environmental Conditions

Ambient Temperature	19.3°C
Relative Humidity	40.0%

2.2.7 Test Results

826.60 MHz

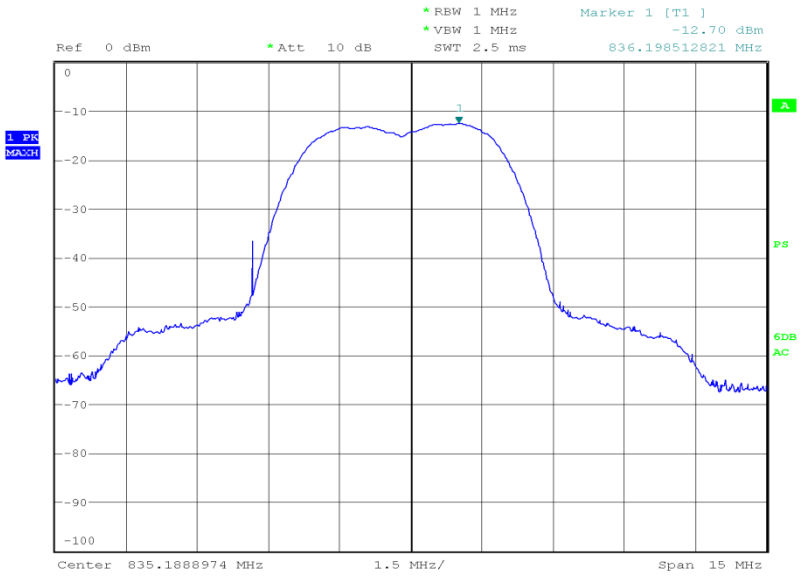
Result (dBm)	Result (W)
22.97	0.198



Product Service

835.00 MHz

Result (dBm)	Result (W)
23.16	0.207

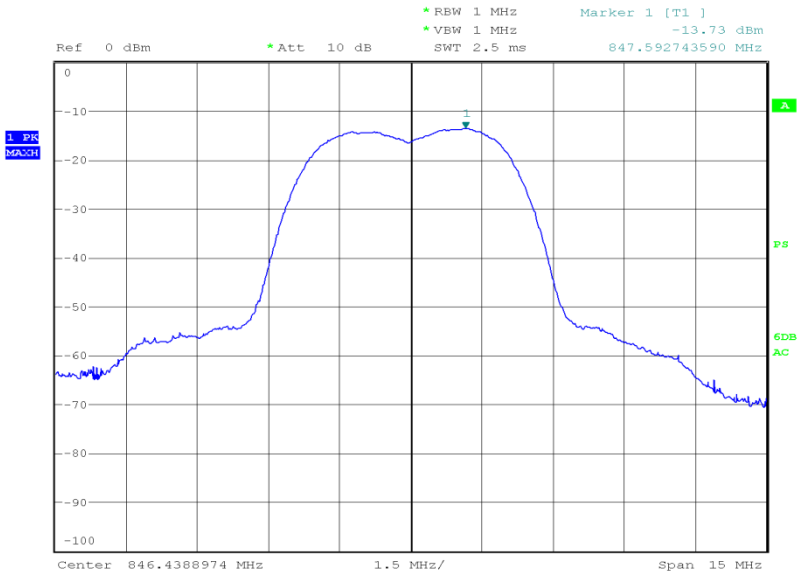


Date: 18.SEP.2012 18:42:35

Product Service

846.40 MHz

Result (dBm)	Result (W)
21.77	0.150



Date: 18.SEP.2012 18:28:31

Limit Clause

Mobile – 7 W or 38.45 dBm
Base Stations – 500 W or 57 dBm

2.3 MAXIMUM PEAK OUTPUT POWER - CONDUCTED

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 22, Clause 22.913 (a)

2.3.2 Equipment Under Test and Modification State

CDMA SHL21 S/N: IMEI 004401114094291 - Modification State 0

2.3.3 Date of Test

15 August 2012

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Procedure

Using a spectrum analyser and attenuator(s), the output power of the EUT was measured at the antenna terminals.

The EUT supports WCDMA and was tested in this mode of operation.

2.3.6 Environmental Conditions

Ambient Temperature	26.1°C
Relative Humidity	41.5%

Product Service

2.3.7 Test Results

4.0 V DC Supply

826.60 MHz

Result (dBm)	Result (W)
27.45	0.556

835.00 MHz

Result (dBm)	Result (W)
27.73	0.593

846.40 MHz

Result (dBm)	Result (W)
27.72	0.592

Limit Clause

Mobile – 7 W or 38.45 dBm
Base Stations – 500 W or 57 dBm

2.4 EMISSION LIMITATIONS FOR CELLULAR EQUIPMENT

2.4.1 Specification Reference

FCC CFR 47 Part 22, Clause 22.917

2.4.2 Equipment Under Test and Modification State

CDMA SHL21 S/N: IMEI 004401114094580 - Modification State 0

2.4.3 Date of Test

18 September 2012

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

A preliminary profile of the Spurious Radiated Emissions was obtained up to the 10th harmonic by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The EUT was set to transmit on maximum power with modulation. The EUT was tested on bottom, middle and top channels at maximum power.

For any emissions found the EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss.

The measurements were performed at a 3m distance unless otherwise stated.

2.4.6 Environmental Conditions

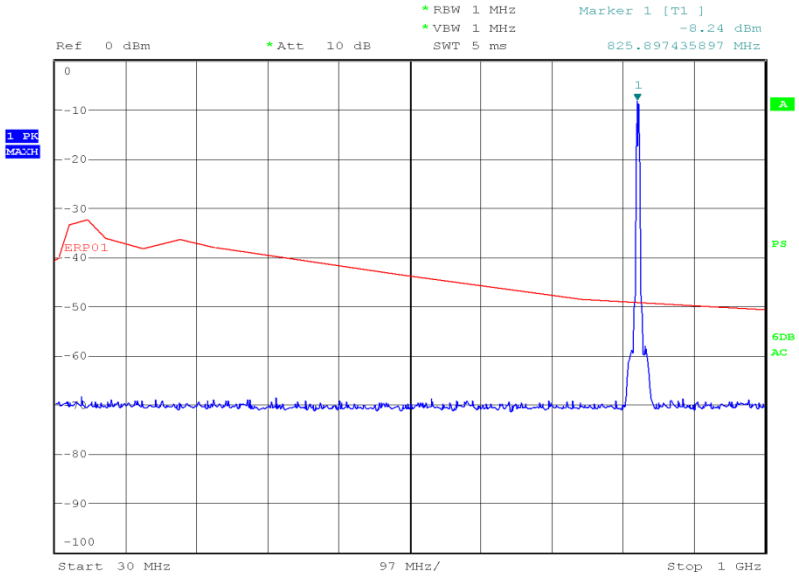
Ambient Temperature	19.3°C
Relative Humidity	40.0%

Product Service

2.4.7 Test Results

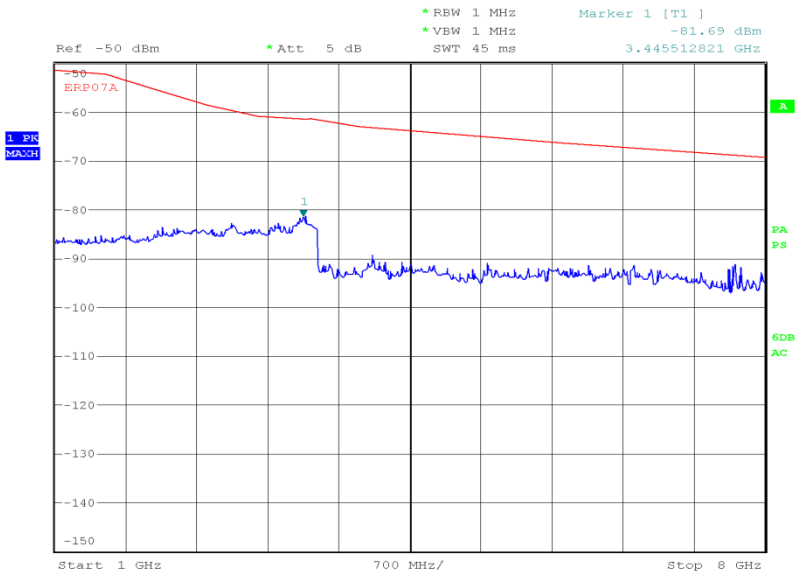
826.60 MHz

30 MHz to 1 GHz



Date: 18.SEP.2012 18:05:07

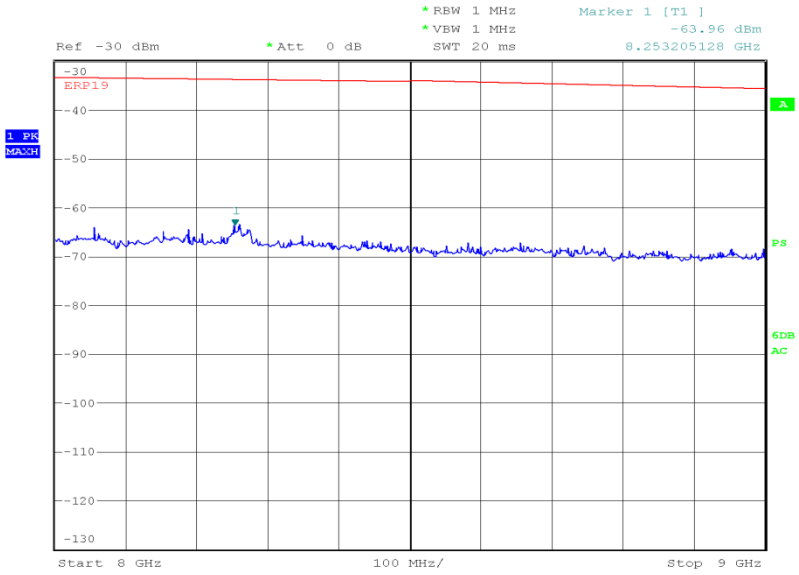
1 GHz to 8 GHz



Date: 18.SEP.2012 18:49:05

Product Service

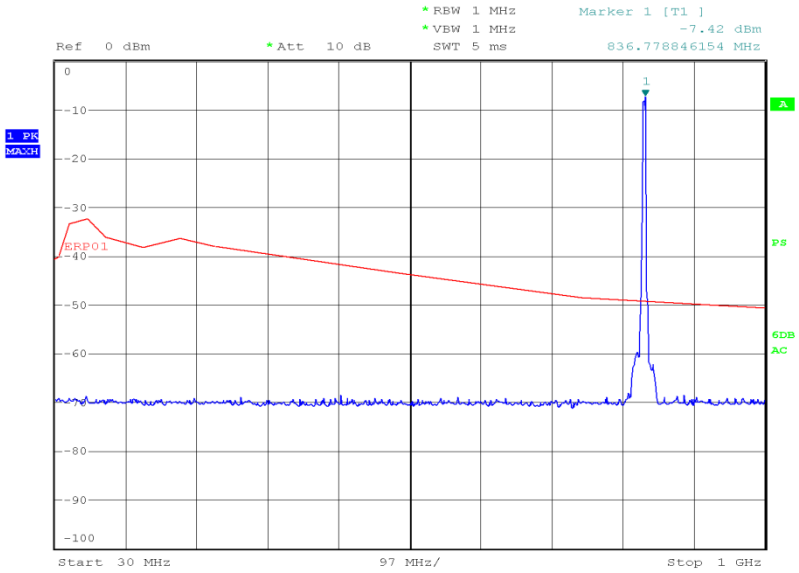
8 GHz to 9 GHz



Date: 18.SEP.2012 20:28:28

835.00 MHz

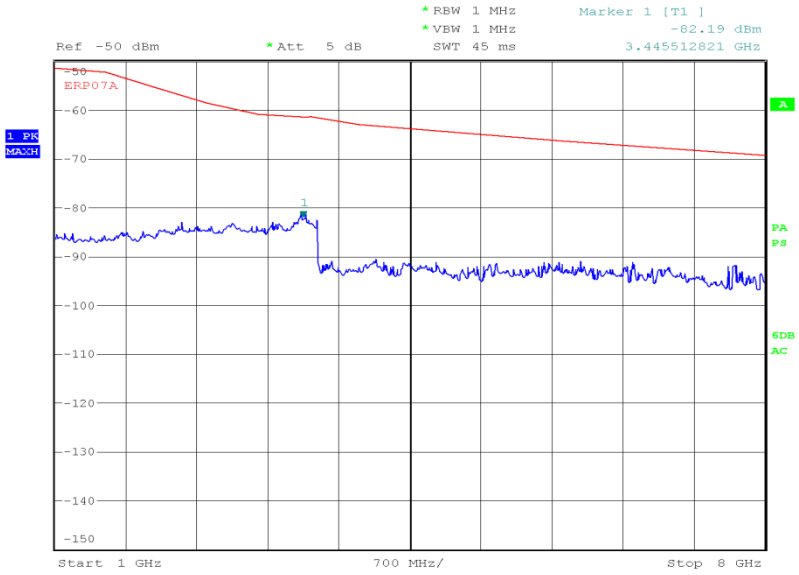
30 MHz to 1 GHz



Date: 18.SEP.2012 18:11:10

Product Service

1 GHz to 8 GHz



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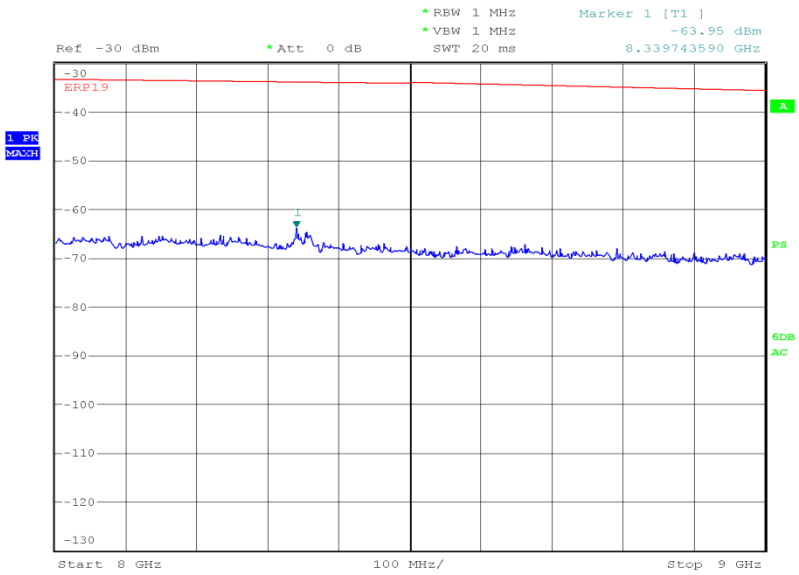
8 GHz to 9 GHz

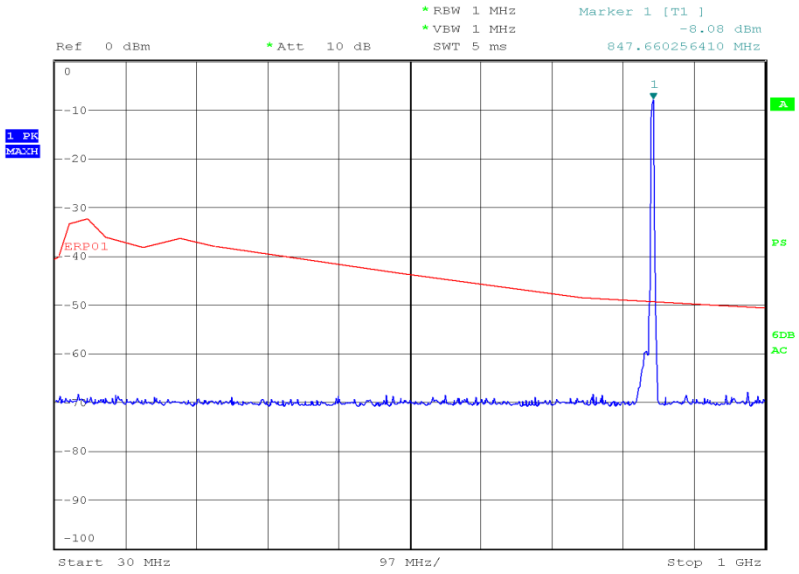


Date: 18.SEP.2012 20:30:13

Product Service

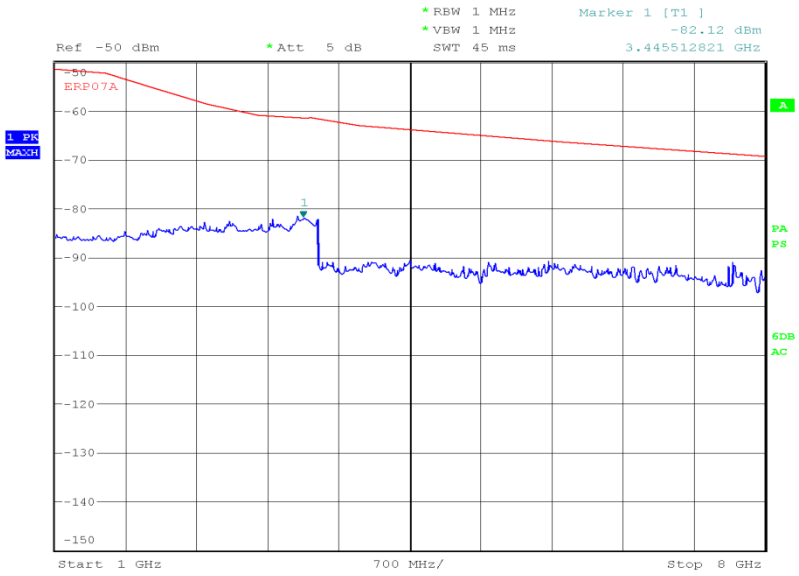
846.40 MHz

30 MHz to 1 GHz



Date: 18.SEP.2012 18:12:55

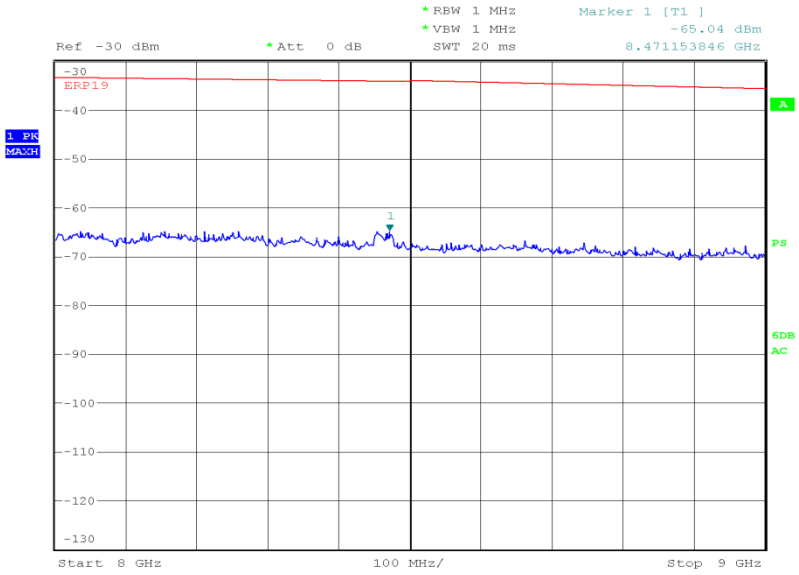
1 GHz to 8 GHz



Date: 18.SEP.2012 18:57:11

Product Service

8 GHz to 9 GHz



Date: 18.SEP.2012 20:35:40

Limit Clause

43+10log(P) or -13 dBm

2.5 CONDUCTED SPURIOUS EMISSIONS

2.5.1 Specification Reference

FCC CFR 47 Part 2 , Clause 2.1051
FCC CFR 47 Part 22, Clause 22.917 (a)

2.5.2 Equipment Under Test and Modification State

CDMA SHL21 S/N: IMEI 004401114094291 - Modification State 0

2.5.3 Date of Test

14 August 2012

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Procedure

In accordance with Part 2.1051, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 9 kHz to the 10th harmonic. The EUT was set to transmit on full power with modulation. The EUT was tested on Bottom, Middle and Top channels for maximum power. The resolution and video bandwidths were set to 1 MHz and 3 MHz thus meeting the requirements of Part 22.917(b). The spectrum analyser detector was set to max hold.

From 9 kHz to 4 GHz, an attenuator was used. For measuring the range 1.5 GHz to 9 GHz an attenuator and high pass filter were used. This was to reduce saturation effects in the spectrum analyser.

The maximum path loss across the measurement bands were used as reference level offsets to ensure worst case.

2.5.6 Environmental Conditions

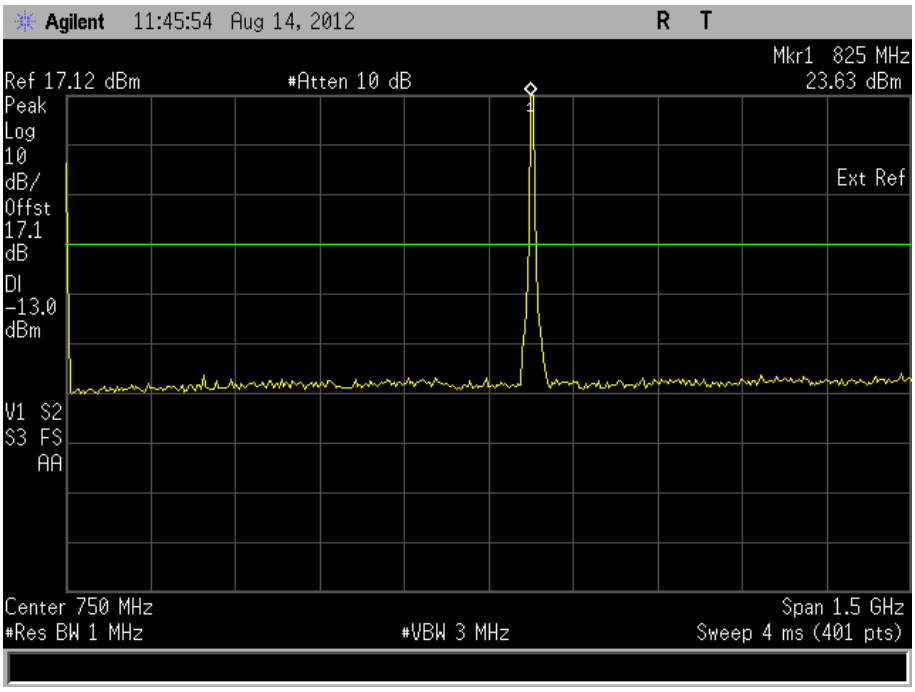
Ambient Temperature	26.1°C
Relative Humidity	51.2%

Product Service

2.5.7 Test Results

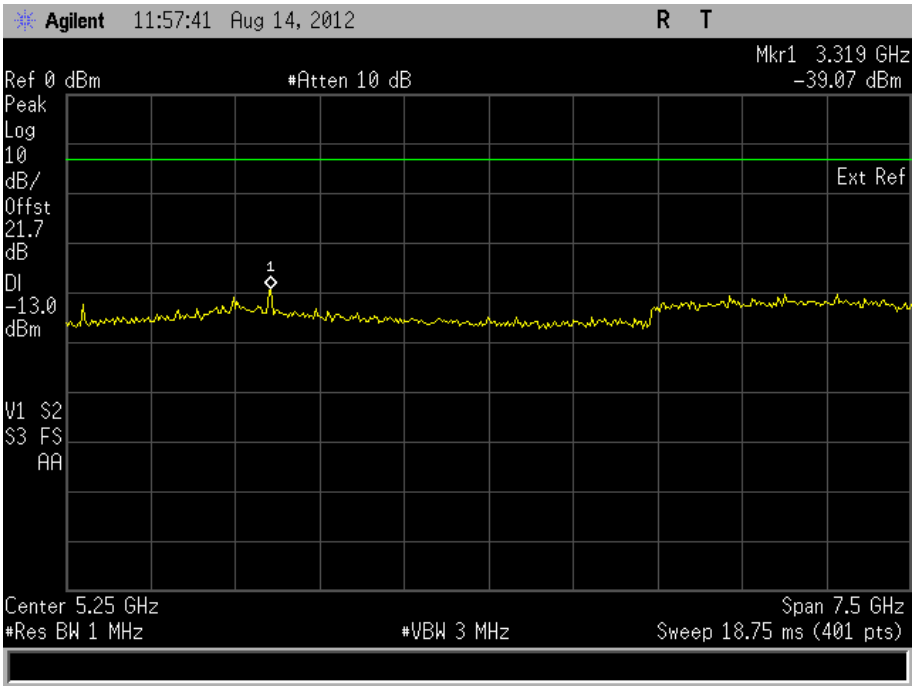
826.60 MHz

9 kHz to 1.5 GHz



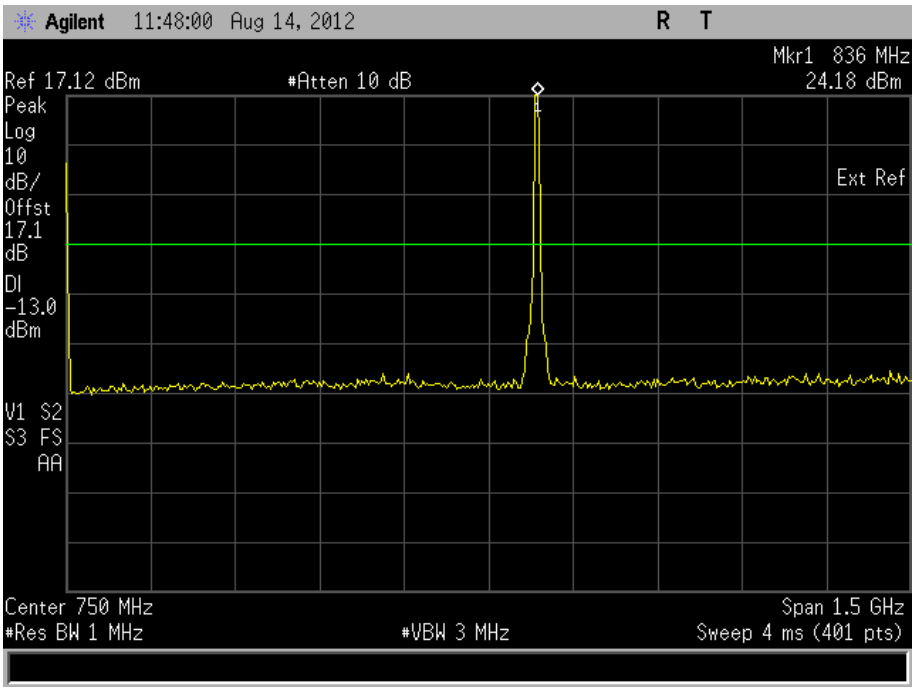
Product Service

1.5 GHz to 9 GHz



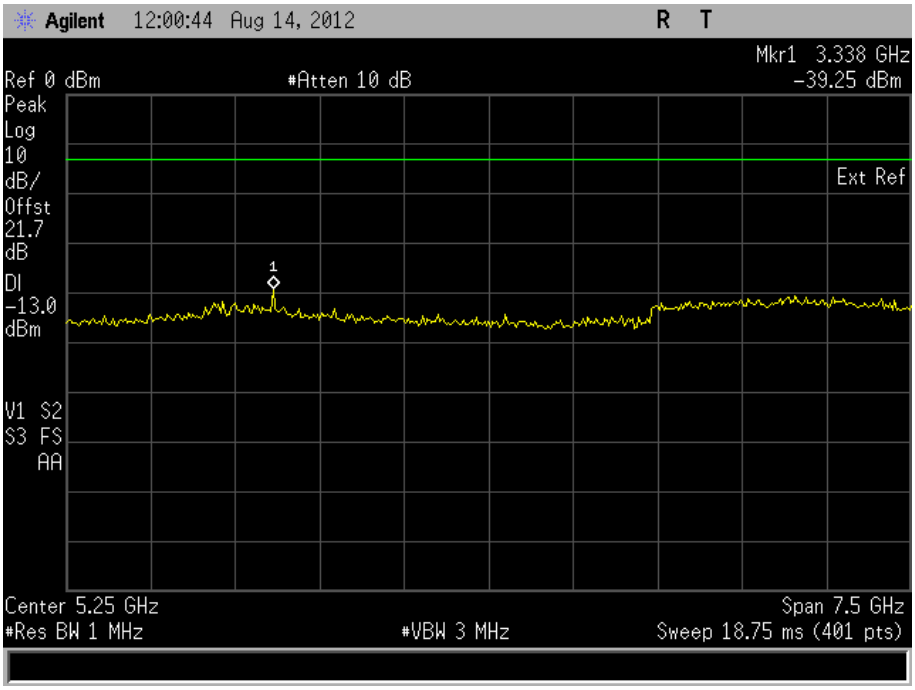
835.00 MHz

9 kHz to 1.5 GHz



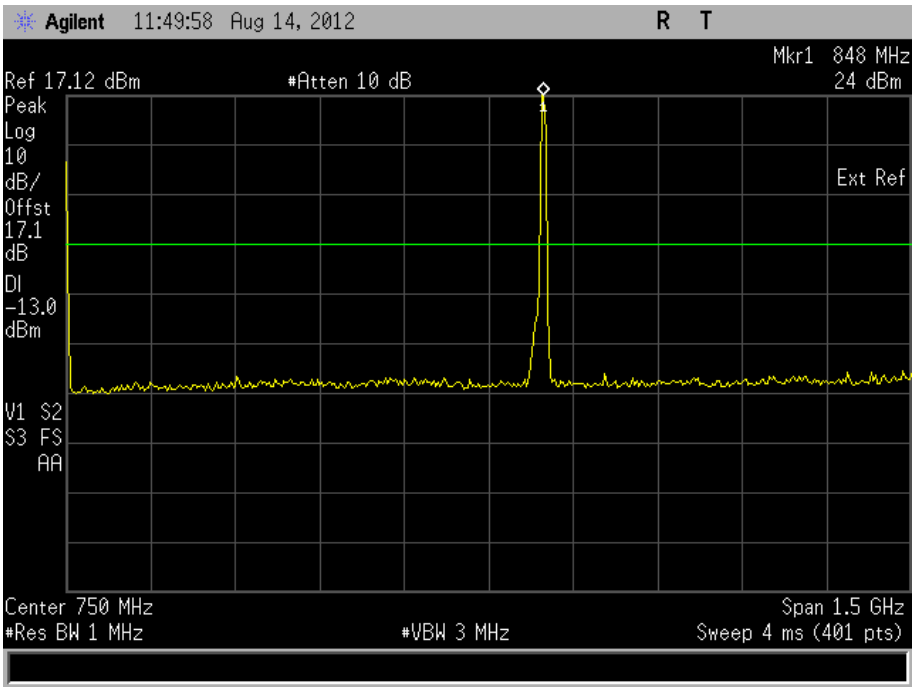
Product Service

1.5 GHz to 9 GHz



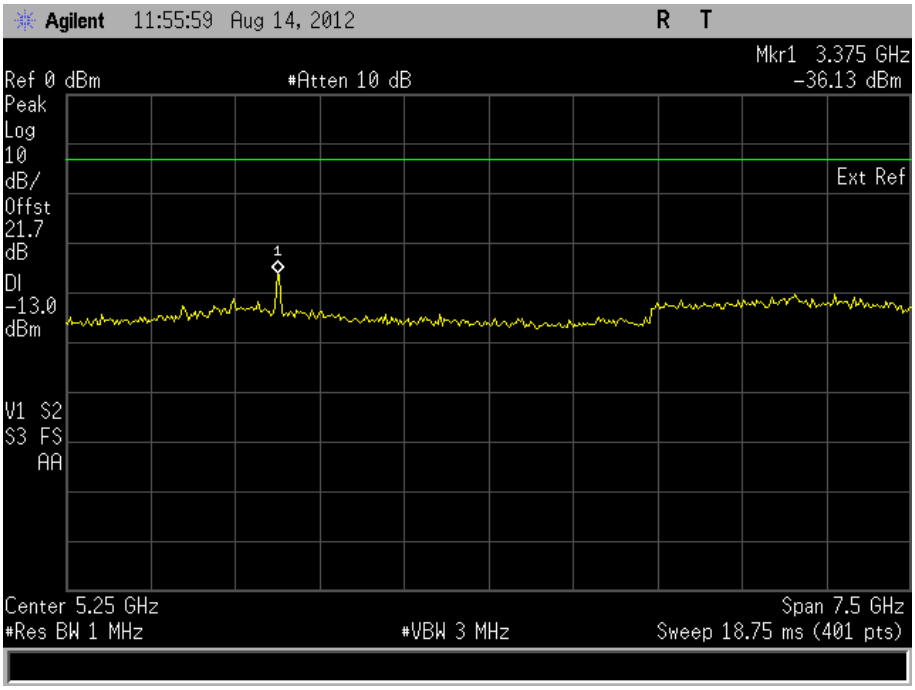
846.40 MHz

9 kHz to 1.5 GHz



Product Service

1.5 GHz to 9 GHz



Limit Clause

43+10log(P) or -13 dBm

2.6 OCCUPIED BANDWIDTH

2.6.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049 (h
FCC CFR 47 Part 22, Clause 22.917 (b)

2.6.2 Equipment Under Test and Modification State

CDMA SHL21 S/N: IMEI 004401114094291 - Modification State 0

2.6.3 Date of Test

14 August 2012

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.5 Test Procedure

The EUT was transmitting at maximum power, with modulation. Using a resolution bandwidth of 10 kHz and a video bandwidth of 30 kHz, the -26 dBc points were established and the emission bandwidth determined.

The plot of the following pages shows the resultant display from the Spectrum Analyser.

2.6.6 Environmental Conditions

Ambient Temperature	26.1°C
Relative Humidity	41.5%

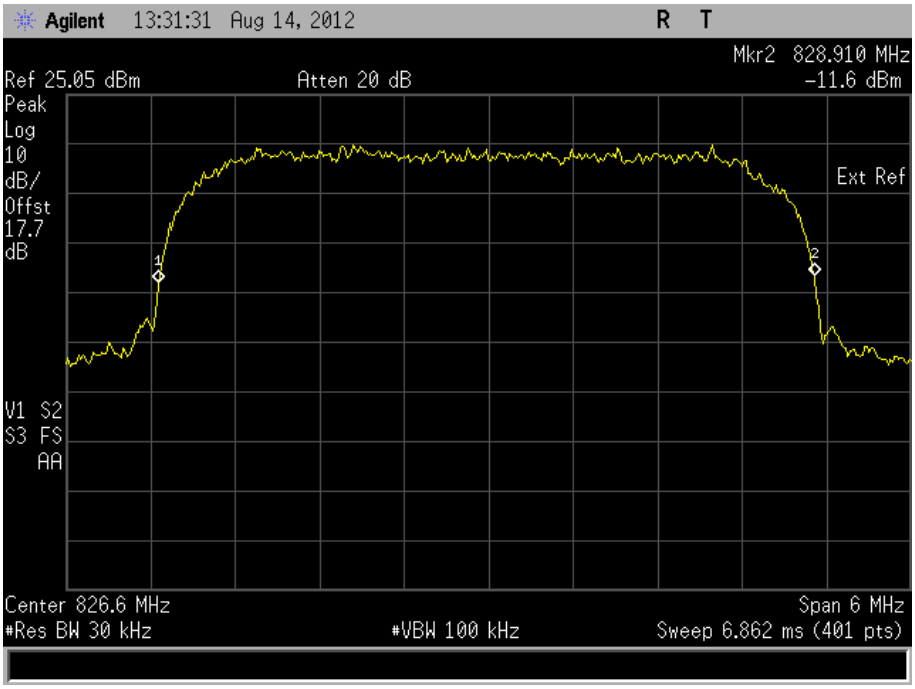
Product Service

2.6.7 Test Results

4.0 V DC Supply

826.60 MHz

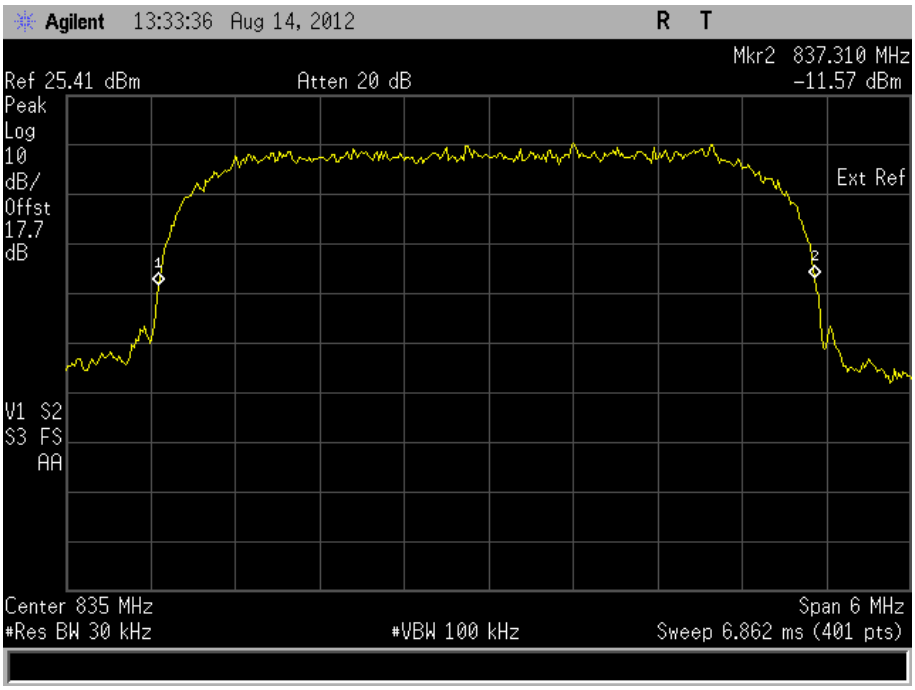
Occupied Bandwidth (kHz)
4650



Product Service

835.00 MHz

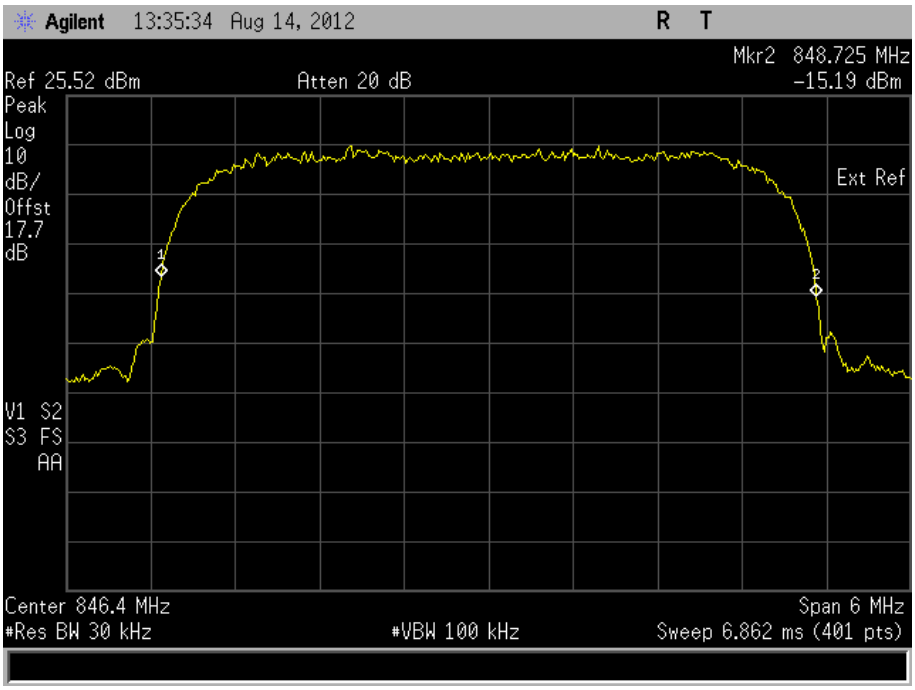
Occupied Bandwidth (kHz)
4650



Product Service

846.40 MHz

Occupied Bandwidth (kHz)
4650



Limit Clause

The occupied bandwidth, that is the frequency bandwidth such that, below is lower and above is upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.

Product Service

2.7 MODULATION CHARACTERISTICS

2.7.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1047 (d)

2.7.2 Equipment Under Test

CDMA SHL21

2.7.3 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2.1047(d).

The EUT was set to transmit on maximum power. Various plots were recorded to show the modulation characteristics of the EUT which can be seen on the following pages.

2.7.4 Test Results

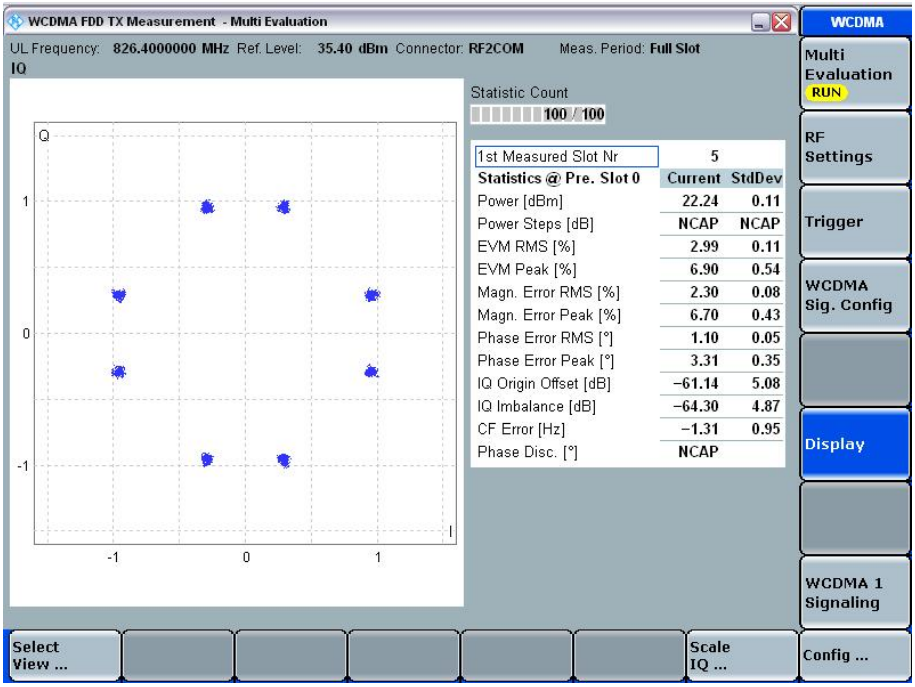
For the period of test the EUT met the requirements of FCC CFR 47 Part 2 for Modulation Characteristics.

The test results are shown below.

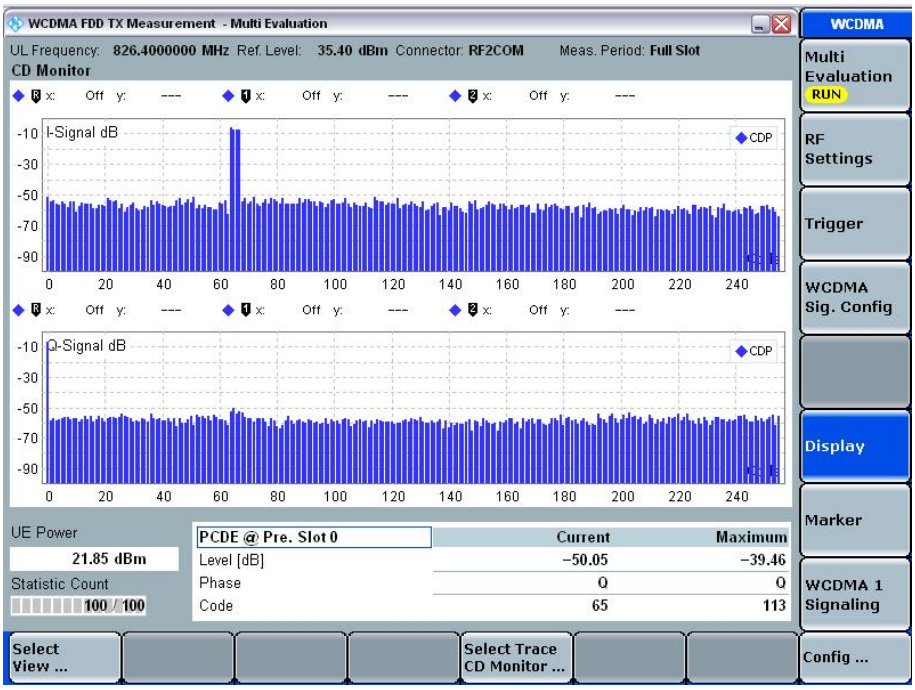
4.0 V DC Supply

QPSK

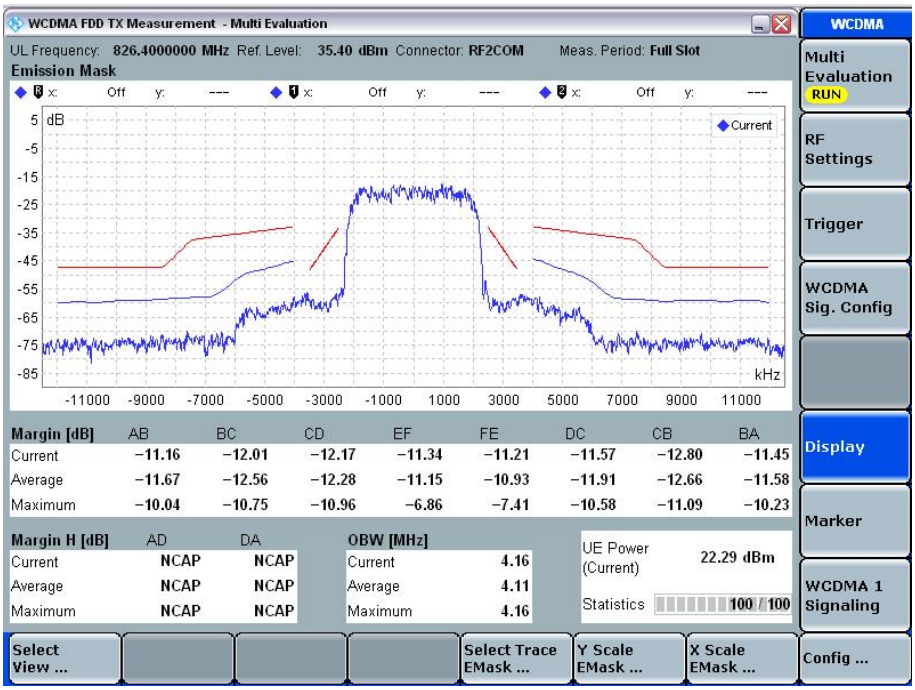
Constellation Diagram



I and Q Code Domain



Spectrum Emission Mask



Limit Clause

A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

2.8 FREQUENCY STABILITY

2.8.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 22, Clause 22.355

2.8.2 Equipment Under Test and Modification State

CDMA SHL21 S/N: IMEI 004401114094291 - Modification State 0

2.8.3 Date of Test

24 August 2012

2.8.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.5 Test Procedure

The EUT was set to transmit on maximum power with modulation. An FSQ Signal Analyser, was used to measure the frequency error. The maximum result was taken over 200 bursts. The temperature was adjusted between -30°C and +50°C in 10° steps as per 2.1055 and the frequency error was measured at each temperature.

2.8.6 Environmental Conditions

Ambient Temperature	25.3°C
Relative Humidity	42.6%

Product Service

2.8.7 Test Results

Temperature Interval (ºC)	Deviation (ppm)
-30	-0.003
-20	-0.004
-10	-0.003
0	-0.004
+10	-0.003
+20	-0.004
+30	-0.003
+40	-0.006
+50	-0.005

Limit Clause

Frequency Range (MHz)	Base, Fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20	20	50
50 to 450	5	5	50
450 to 512	2.5	5	5
821 to 896	1.5	2.5	2.5
928 to 929	5.0	-	-
929 to 960	1.5	-	-
2110 to 2220	10	-	-

Under Voltage Variations

835.00 MHz

DC Voltage (V)	Deviation (ppm)
4.0 V DC	-0.004
3.7 V DC	-0.003
4.0 V DC	-0.004

Limit Clause

Frequency Range (MHz)	Base, Fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20	20	50
50 to 450	5	5	50
450 to 512	2.5	5	5
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10	n/a	n/a

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - Spurious Emissions at Band Edge					
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	14-Jun-2013
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
Section 2.2 - Effective Radiated Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	10-Feb-2013
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	8-Dec-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3159	12	13-Jun-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	-	01-May-2013

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 - Maximum Peak Output Power - Conducted					
Signal Generator	Marconi	2031	53	12	TU
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	21-Sep-2012
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Programmable Power Supply	Iso-tech	IPS 2010	2438	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	14-Jun-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
Combiner/Splitter	Weinschel	1506A	3879	12	19-Mar-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	27-Jun-2013
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 - Emission Limitations for Cellular Equipment					
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	13-Sep-2013
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	20-Feb-2013
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Pre-Amplifier	Phase One	PSO4-0087	1534	12	26-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	20-Sep-2012
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	29-May-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	16-Apr-2013
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3694	-	TU
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3695	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	-	TU
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	-	01-May-2013

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - Conducted Spurious Emissions					
Signal Generator	Rohde & Schwarz	SMX	185	12	TU
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Programmable Power Supply	Iso-tech	IPS 2010	2438	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	20-Sep-2012
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	21-Dec-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	27-Jun-2013
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	14-Jun-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	16-Apr-2013
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
Combiner/Splitter	Weinschel	1506A	3879	12	19-Mar-2013
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.6 - Occupied Bandwidth					
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	14-Jun-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
Section 2.7- Modulation Characteristics					
True RMS Multimeter	Fluke	79 Series III	411	12	10-Sep-2013
Programmable Power Supply	Iso-tech	IPS 2010	2436	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Communications Test Set	Rohde & Schwarz	CMW500	4144	12	01-May-2013
Section 2.8- Frequency Stability					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	8-Jun-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3159	12	13-Jun-2013
Attenuator (20dB, 50W)	Aeroflex / Weinschel	47-20-34	3165	12	13-Jun-2013
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Termination	Diamond Antenna	DL-30N	3400	12	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013

'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
True RMS Multimeter	Fluke	179	4007	12	16-Feb-2013
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	-	01-May-2013

TU – Traceability Unscheduled
O/P MON – Output Monitored with Calibrated Equipment

Product Service

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Effective Radiated Power	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Spurious Emissions at Band Edge	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Maximum Peak Output Power - Conducted	± 0.70 dB
Emission Limitations for Cellular Equipment	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Conducted Spurious Emissions	± 3.454 dB
Occupied Bandwidth	± 16.74 kHz
Modulation Characteristics	-
Frequency Stability	± 46.70 Hz

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).