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Report On

FCC Testing of the Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS

In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22

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FCC ID: APYHRO00172

Document 75917214 Report 12 Issue 1

June 2012



Product Service

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REPORT ON

FCC Testing of the
Sharp CDMA SH116 Dual Band CDMA (BC0 and BC6) and Tri Band
GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V)
Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC
(FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22

Document 75917214 Report 12 Issue 1

June 2012

PREPARED FOR

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Bagshot Road
Bracknell
Berkshire
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PREPARED BY

Natalie Bennett
Senior Administrator (Technical)

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED

15 June 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):

R Pennell

Document 75917214 Report 12 Issue 1

B Airs



G Lawler

S Bennett

Page 1 of 85

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CONTENTS

Section	Page No
1	REPORT SUMMARY 3
1.1	Introduction 4
1.2	Brief Summary of Results 5
1.3	Application Form 7
1.4	Product Information 8
1.5	Test Conditions 8
1.6	Deviations from the Standard 8
1.7	Modification Record 8
2	TEST DETAILS 9
2.1	Spurious Emissions at Band Edge 10
2.2	Effective Radiated Power 17
2.3	Maximum Peak Output Power - Conducted 27
2.4	Emission Limitations for Cellular Equipment 31
2.5	Conducted Spurious Emissions 47
2.6	Occupied Bandwidth 60
2.7	Frequency Stability 70
3	TEST EQUIPMENT USED 77
3.1	Test Equipment Used 78
3.2	Measurement Uncertainty 83
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 84
4.1	Accreditation, Disclaimers and Copyright 85



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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900
MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN,
WiMAX, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, 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 SHI16
Serial Number(s)	IMEI 004401113852533 IMEI 004401113852566 IMEI 004401113852723
Number of Samples Tested	3
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2011) FCC CFR 47 Part 22 (2011)
Incoming Release Date	Application Form 29 March 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	9096 29 March 2012
Start of Test	22 April 2012
Finish of Test	14 June 2012
Name of Engineer(s)	R Pennell B Airs G Lawler S Bennett
Related Document(s)	ANSI C63.4: 2009



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 24			
CDMA 2000 - Loopback Service					
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	
CDMA 2000 - Test Data Service					
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

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	Pt 2	Pt 24			
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			
<u>Equipment designator:</u>			
Model name/number	CDMA SHI16	Identification number	APYHRO00172
<u>Supply Voltage:</u>			
[]	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 ...3.8 V	and Battery type...Li-Ion.
<u>Frequency characteristics:</u>			
Frequency range	13.56MHz to 13.56MHz	Channel spacing	(if channelized)
Designated test frequencies:			
Bottom:	Middle:	Top:MHz	
<u>Power characteristics:</u>			
Maximum transmitter powerW	Minimum transmitter power W
[X]	Continuous transmission (Type-B/F)	(if variable)	
[X]	Intermittent transmission (Type-A)	State duty cycle	
	If intermittent, can transmitter be set to continuous transmit test mode? Y/N		
<u>Antenna characteristics:</u>			
[]	Antenna connector	State impedance	ohm
[]	Temporary antenna connector	State impedance	ohm
[X]	Integral antenna	State gain	0 dBi
<u>Modulation characteristics:</u>			
[X]	Amplitude (Type-A:100%, Type-B/F:10%)	[]	Other
[]	Frequency	Details:	
[]	Phase		
Can the transmitter operate un-modulated?	N		
ITU Class of emission:			
<u>Extreme conditions:</u>			
Maximum temperature	60 °C	Minimum temperature	-20 °C
Maximum supply voltage	4.0 V	Minimum supply voltage	3.8 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 : *Toshiroh Shiomi*
 Name : Toshiroh Shiomi
 Position held : Manager
 Date : 29 March 2012



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, 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 SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900
MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN,
WiMAX, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22



Product Service

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 SHI16 S/N: IMEI 004401113852533 - Modification State 0
CDMA SHI16 S/N: IMEI 004401113852566 - Modification State 0

2.1.3 Date of Test

27 April 2012 & 11 May 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 $-13 \text{ dBm} (43 + 10 \log (P))$, limit. The EUT was operated at maximum power in loopback service and Test Data Service modulation schemes for CDMA 2000 and FDD band 5 for WCDMA.

2.1.6 Environmental Conditions

Ambient Temperature	21.7 - 23.7°C
Relative Humidity	31.1 - 43.0%



Product Service

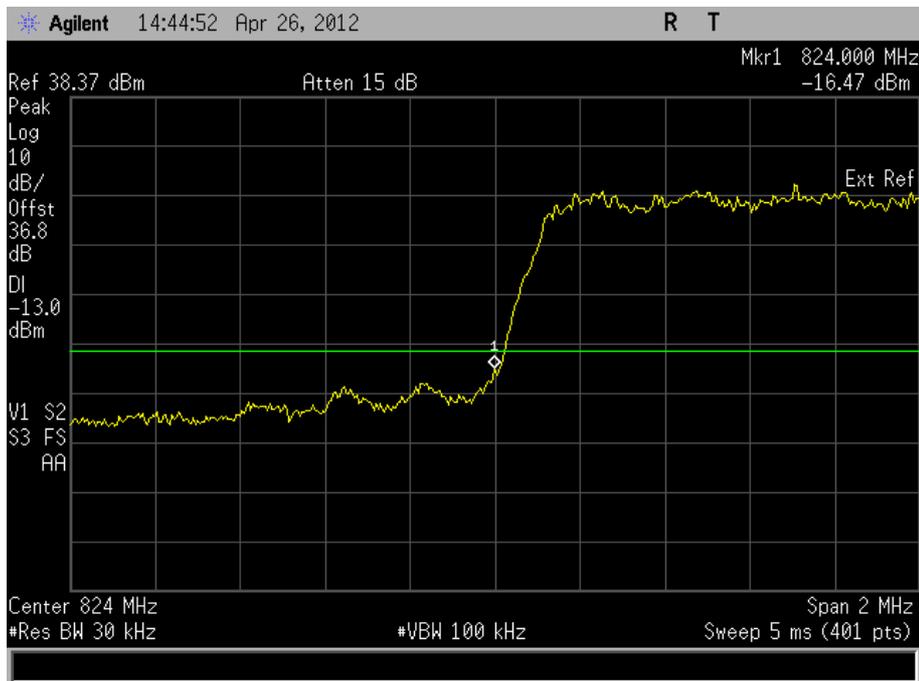
2.1.7 Test Results

CDMA 2000 - Loopback Service

4.0 V DC Supply

Frequency Block (MHz)	Mode	Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
A : (824.0 – 835.0)	SO55, RC1	Channel : 1015 Frequency : 824.76 MHz	N/A
B : (846.5 – 849.0)	SO55, RC1	N/A	Channel : 775 Frequency : 848.25MHz

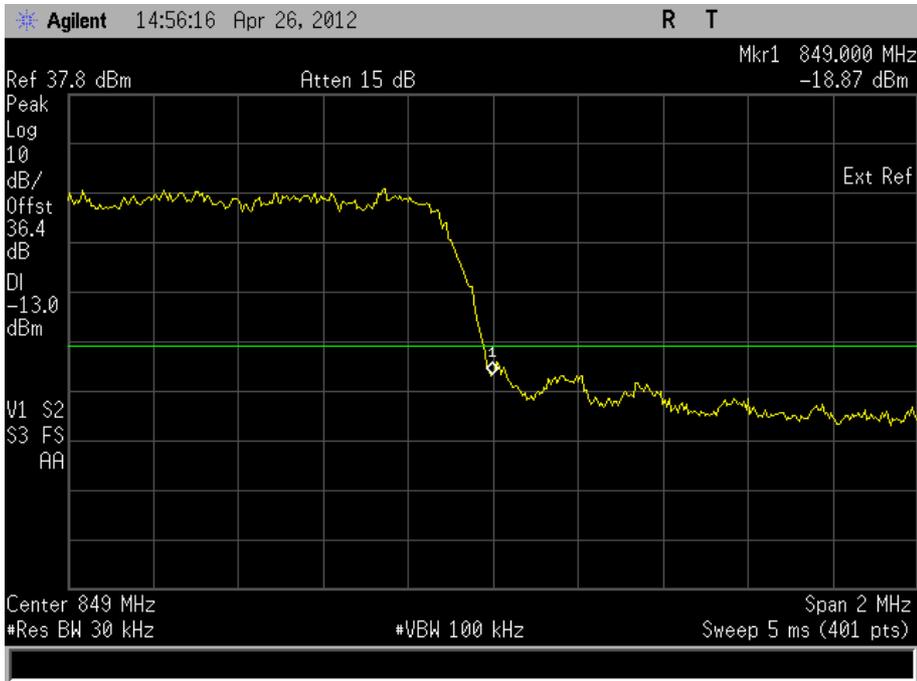
Frequency Block A





Product Service

Frequency Block B



Limit Clause

-13 dBm at block edge.



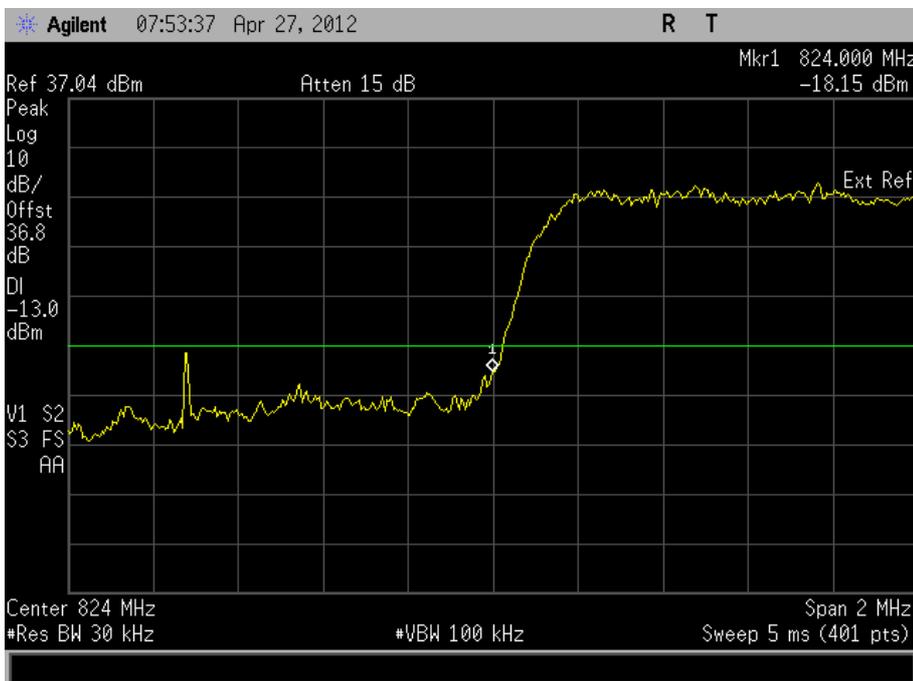
Product Service

CDMA 2000 - Test Data Service

4.0 V DC Supply

Frequency Block (MHz)	Mode	Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
A : (824.0 – 835.0)	SO55, RC1	Channel : 1015 Frequency : 824.76 MHz	N/A
B : (846.5 – 849.0)	SO55, RC1	N/A	Channel : 775 Frequency : 848.25MHz

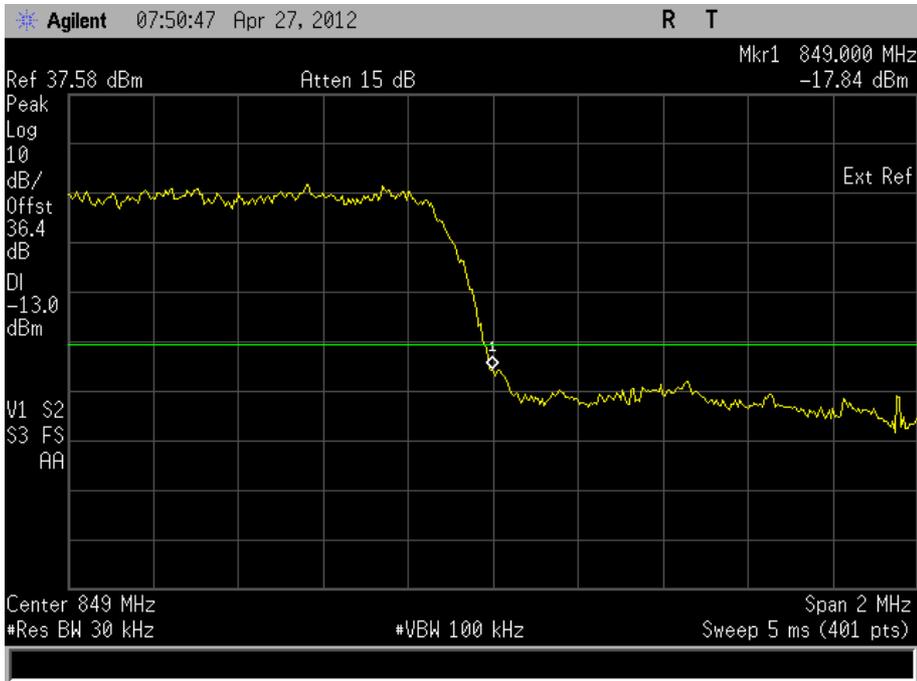
Frequency Block A





Product Service

Frequency Block B



Limit Clause

-13 dBm at block edge.



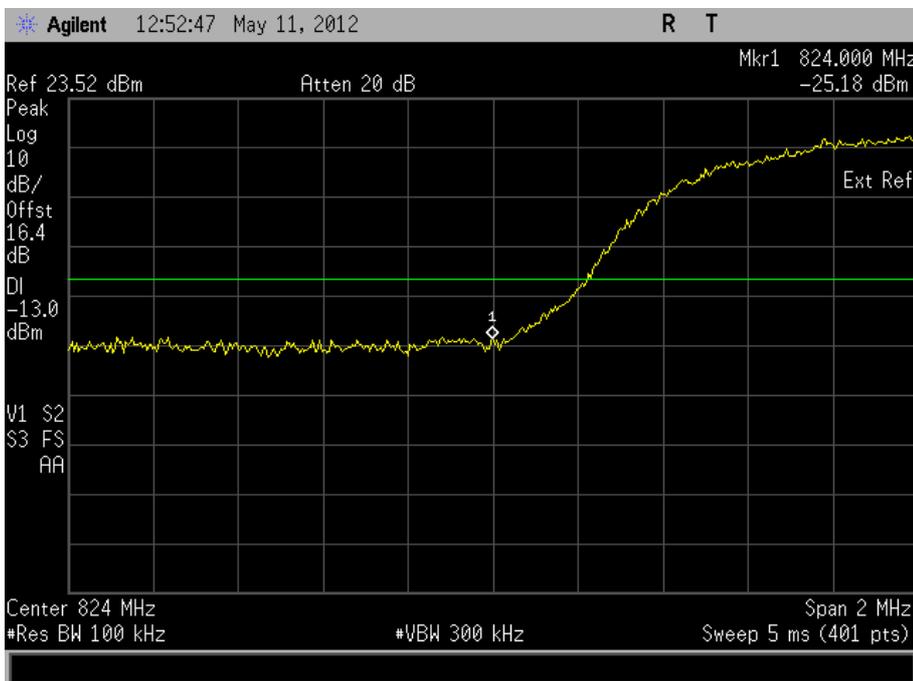
Product Service

WCDMA FDD V

4.0 V DC Supply

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

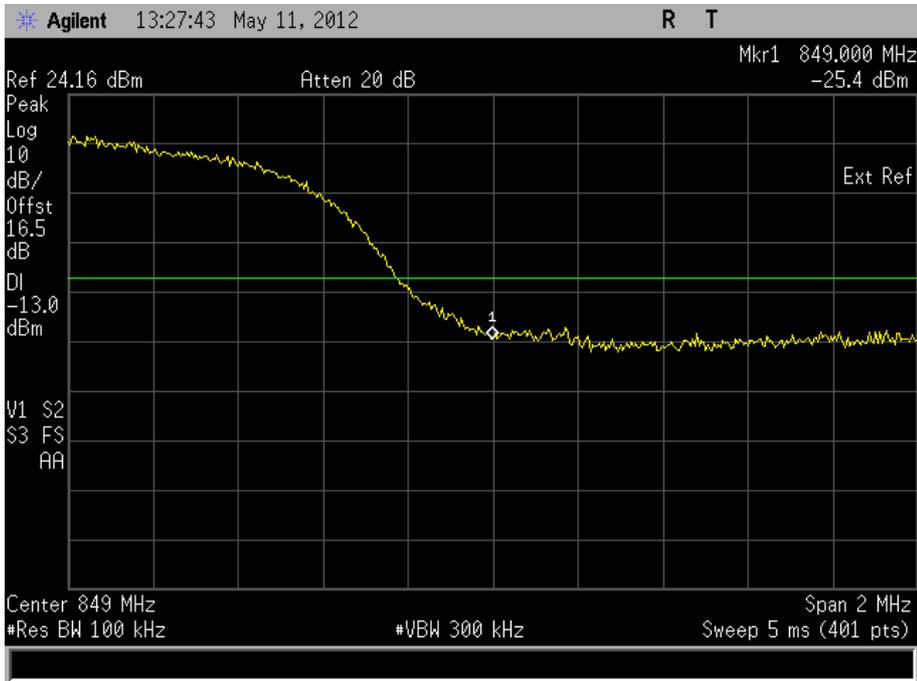
Frequency Block A





Product Service

Frequency Block B



Limit Clause

-13 dBm at block edge.



Product Service

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 SHI16 S/N: IMEI 004401113852723 - Modification State 0
CDMA SHI16 S/N: IMEI 004401113852566 - Modification State 0

2.2.3 Date of Test

22 April 2012, 24 April 2012 & 25 April 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 Polarisation. 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	18.4 - 19.2°C
Relative Humidity	34.0 - 39.0%



Product Service

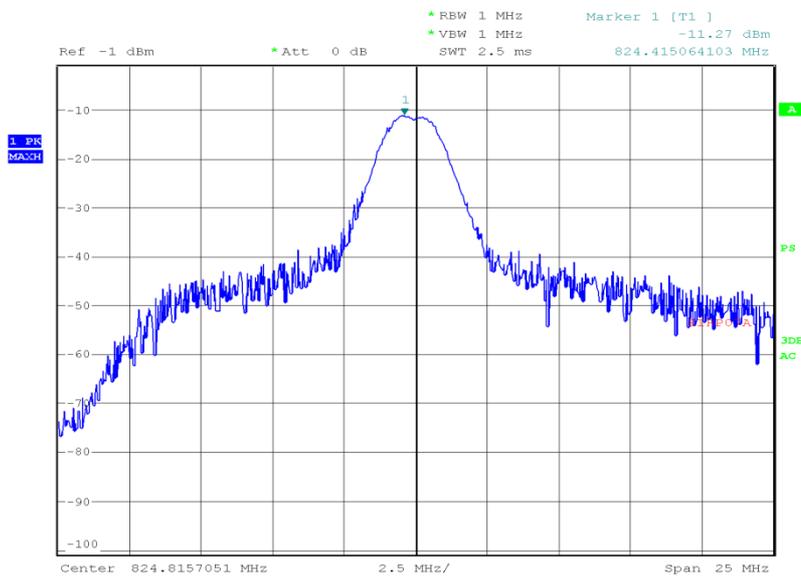
2.2.7 Test Results

CDMA 2000 - Loopback Service

4.0 V DC Supply

824.70 MHz

Result (dBm)	Result (W)
20.84	0.121



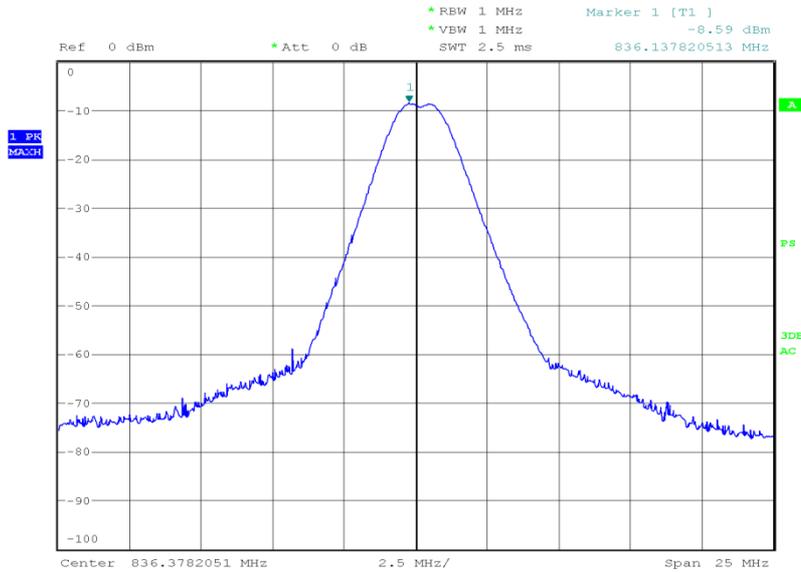
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Product Service

836.52 MHz

Result (dBm)	Result (W)
25.00	0.316



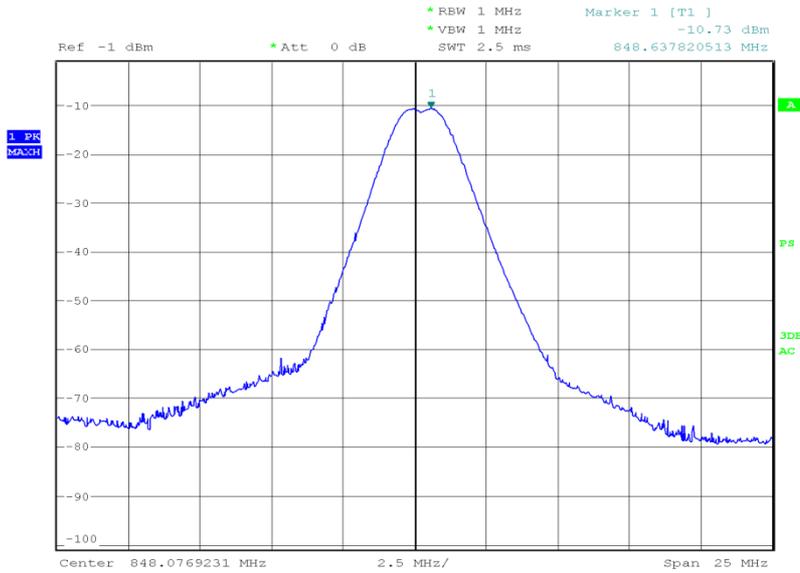
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Product Service

848.31 MHz

Result (dBm)	Result (W)
22.49	0.177



Date: 22.APR.2012 08:16:57

Limit Clause

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



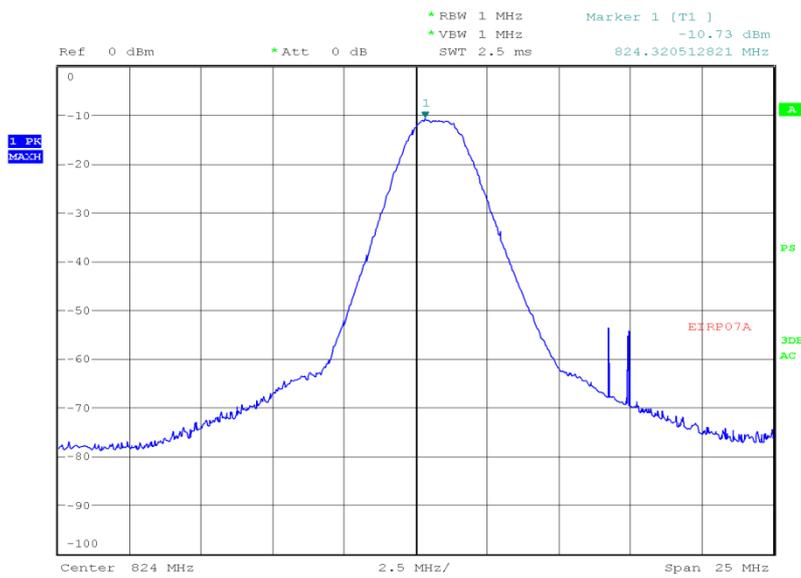
Product Service

CDMA 2000 - Test Data Service

4.0 V DC Supply

824.70 MHz

Result (dBm)	Result (W)
21.72	0.149



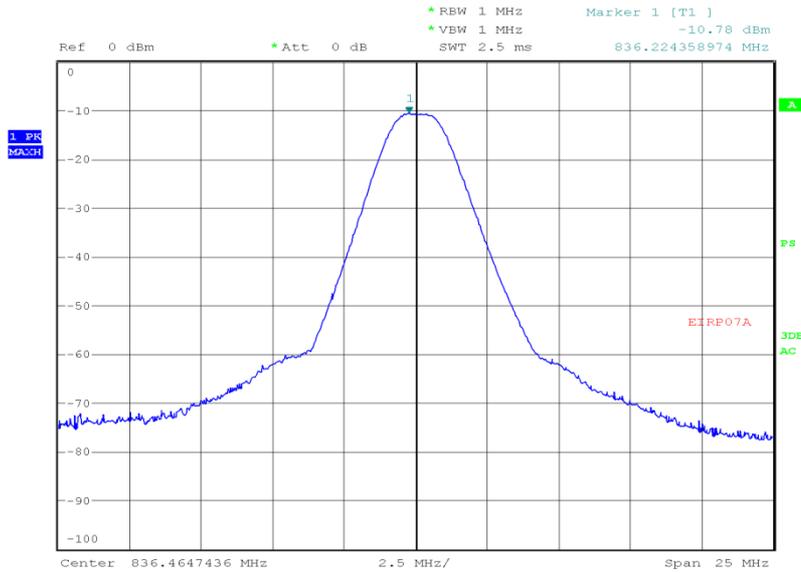
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Product Service

836.52 MHz

Result (dBm)	Result (W)
21.78	0.151



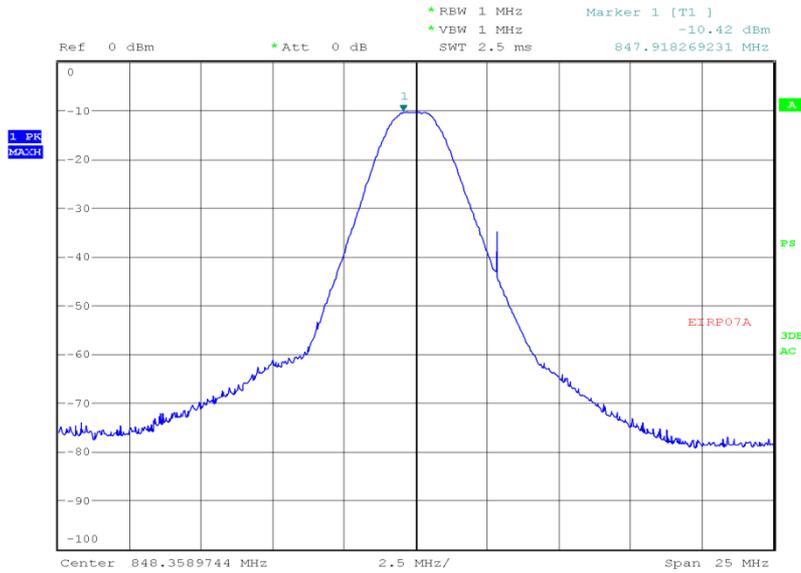
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Product Service

848.31 MHz

Result (dBm)	Result (W)
21.81	0.152



Date: 24.APR.2012 21:25:35

Limit Clause

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



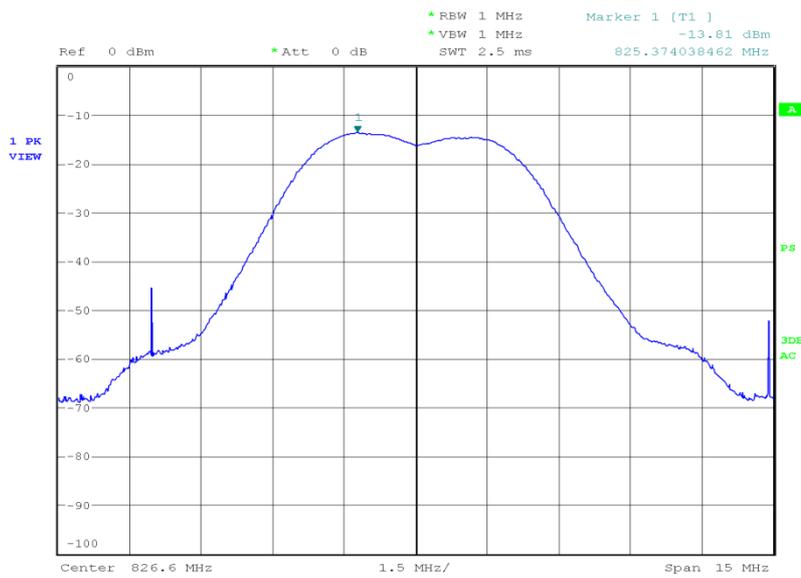
Product Service

WCDMA FDD V

4.0 V DC Supply

826.6 MHz

Result (dBm)	Result (W)
18.52	0.071

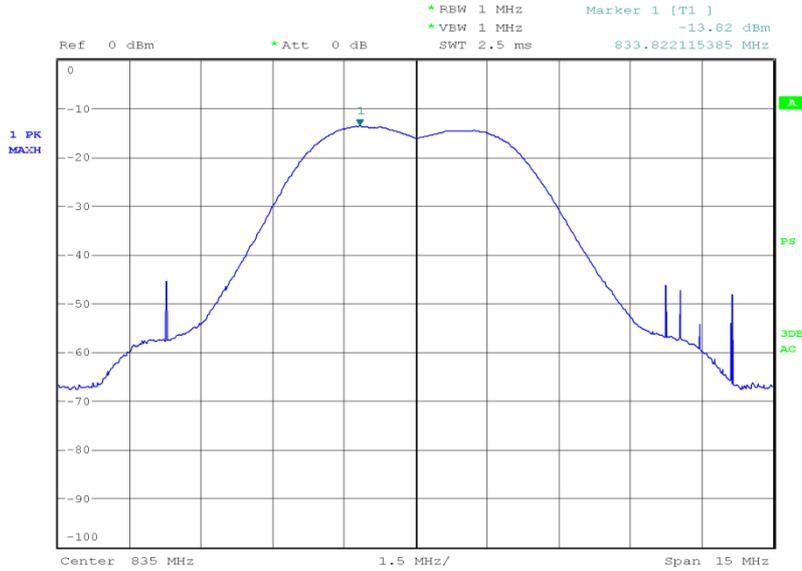


Date: 25.APR.2012 20:36:11



835.0 MHz

Result (dBm)	Result (W)
18.02	0.063



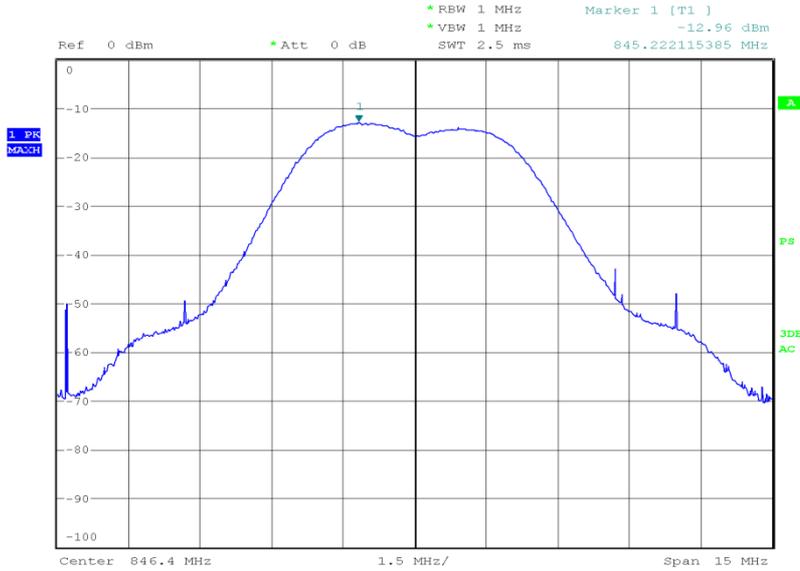
Date: 25.APR.2012 20:27:20



Product Service

846.4 MHz

Result (dBm)	Result (W)
18.57	0.072



Date: 25.APR.2012 19:36:50

Limit Clause

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



Product Service

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

Sharp CDMA SHI16 S/N: IMEI 004401113852533 - Modification State 0
Sharp CDMA SHI16 S/N: IMEI 004401113852566 - Modification State 0

2.3.3 Date of Test

27 April 2012 & 11 May 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 FDD band 5.

The EUT supports CDMA 2000 and was tested in two modes of operation. There were loopback service – SO55, RC1 with 64-Ray orthogonal modulation and Test Data Service – TD5032, FCH+SCH with BPSK modulation.

The bottom, middle and top channels were tested at maximum power in all modes.

2.3.6 Environmental Conditions

Ambient Temperature	21.7 - 23.7°C
Relative Humidity	31.1 - 43.0%



Product Service

2.3.7 Test Results

CDMA 2000 - Loopback Service

4.0 V DC Supply

824.70 MHz

Mode	Result (dBm)	Result (W)
SO55, RC1	+28.69	0.740

836.52 MHz

Mode	Result (dBm)	Result (W)
SO55, RC1	+28.59	0.723

848.31 MHz

Mode	Result (dBm)	Result (W)
SO55, RC1	+28.59	0.723

Limit Clause

Mobile – 7 W or 38.45 dBm

Base Stations – 500 W or 57 dBm



Product Service

CDMA 2000 - Test Data Service

4.0 V DC Supply

824.70 MHz

Mode	Result (dBm)	Result (W)
SO55, RC1	+28.69	0.740

836.52 MHz

Mode	Result (dBm)	Result (W)
SO55, RC1	+28.53	0.713

848.31 MHz

Mode	Result (dBm)	Result (W)
SO55, RC1	+28.50	0.708

Limit Clause

Mobile – 7 W or 38.45 dBm

Base Stations – 500 W or 57 dBm



Product Service

WCDMA FDD V

4.0 V DC Supply

826.6 MHz

Mode	Result (dBm)	Result (W)
N/A	26.49	0.446

835.0 MHz

Mode	Result (dBm)	Result (W)
N/A	26.44	0.437

846.4 MHz

Mode	Result (dBm)	Result (W)
N/A	26.26	0.423

Limit Clause

Mobile – 7 W or 38.45 dBm

Base Stations – 500 W or 57 dBm



Product Service

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 SHI16 S/N: IMEI 004401113852723 - Modification State 0
CDMA SHI16 S/N: IMEI 004401113852566 - Modification State 0

2.4.3 Date of Test

22 April 2012, 24 April 2012 & 25 April 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	18.4 - 19.2°C
Relative Humidity	34.0 - 39.0%



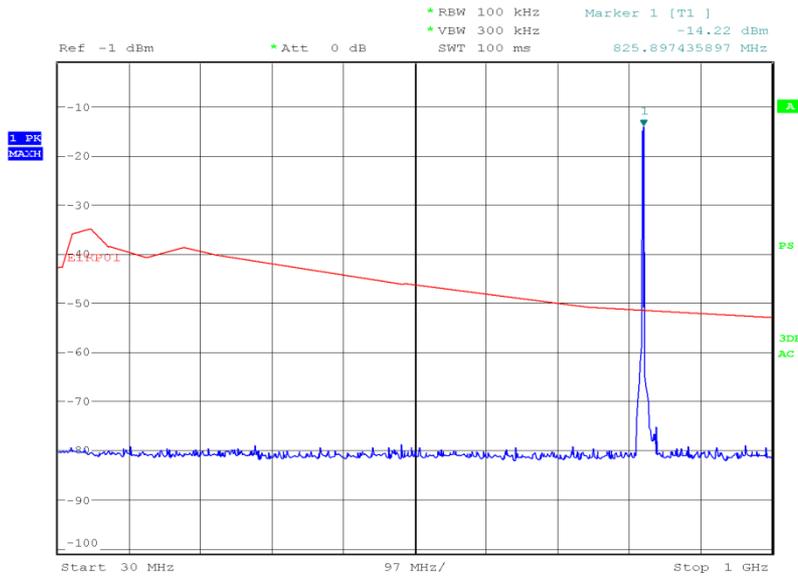
Product Service

2.4.7 Test Results

CDMA 2000 - Loopback Service

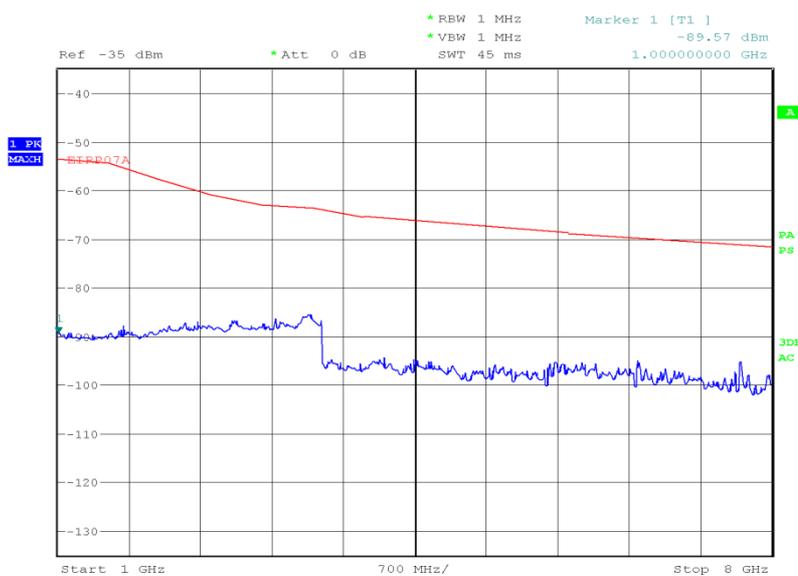
824.70 MHz

30 MHz to 1 GHz



Date: 24.APR.2012 19:51:38

1 GHz to 8 GHz

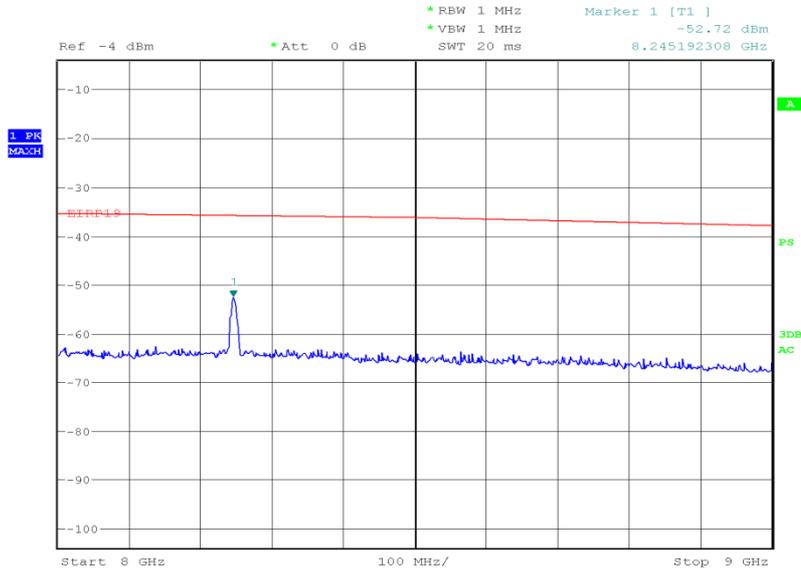


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Product Service

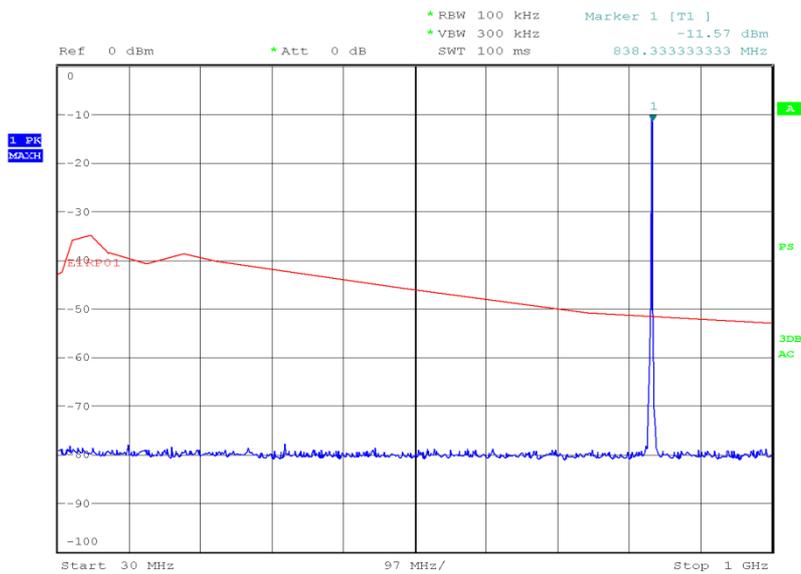
8 GHz to 9 GHz



Date: 24.APR.2012 22:21:02

836.52 MHz

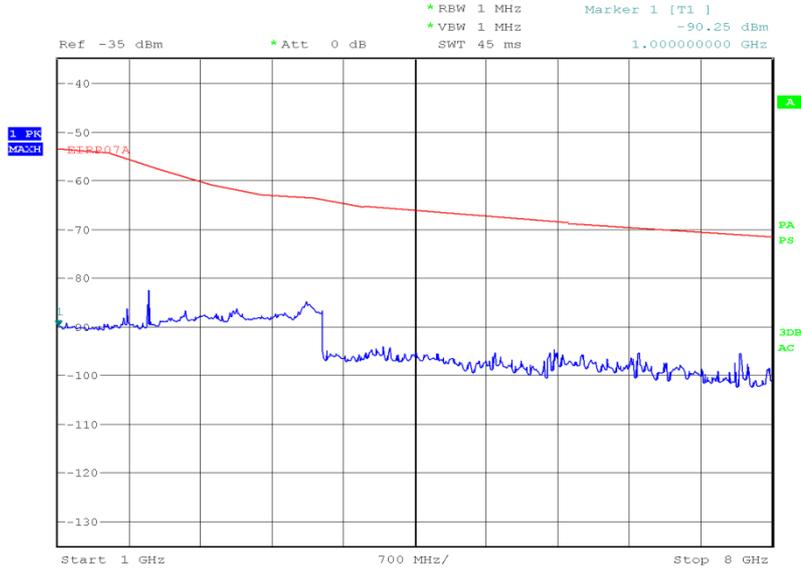
30 MHz to 1 GHz



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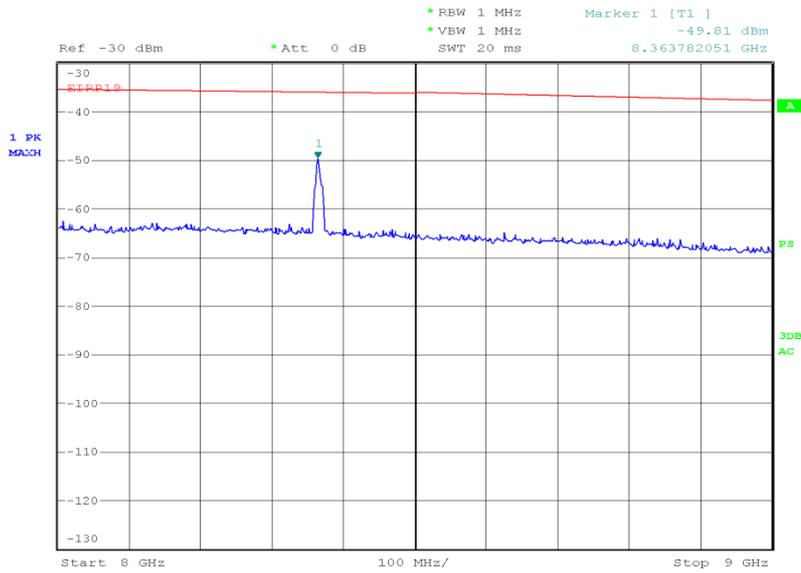


1 GHz to 8 GHz



Date: 22.APR.2012 10:22:52

8 GHz to 9 GHz



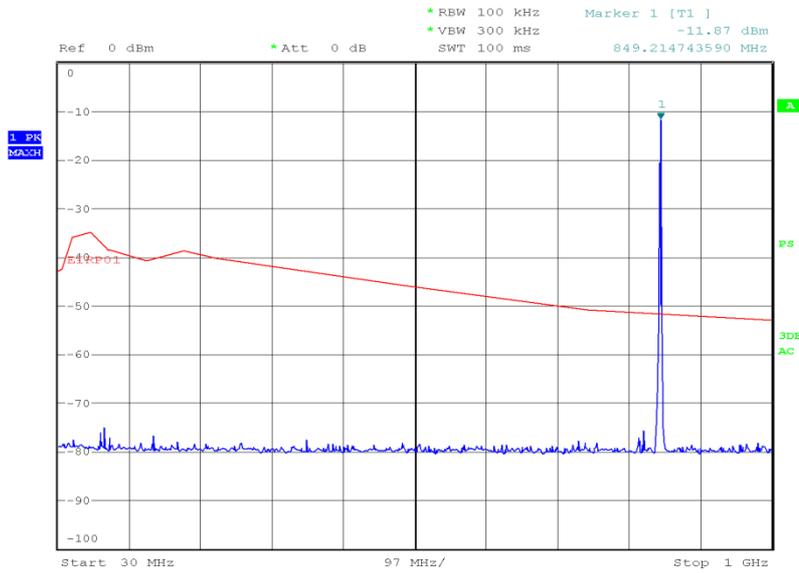
Date: 22.APR.2012 10:51:06



Product Service

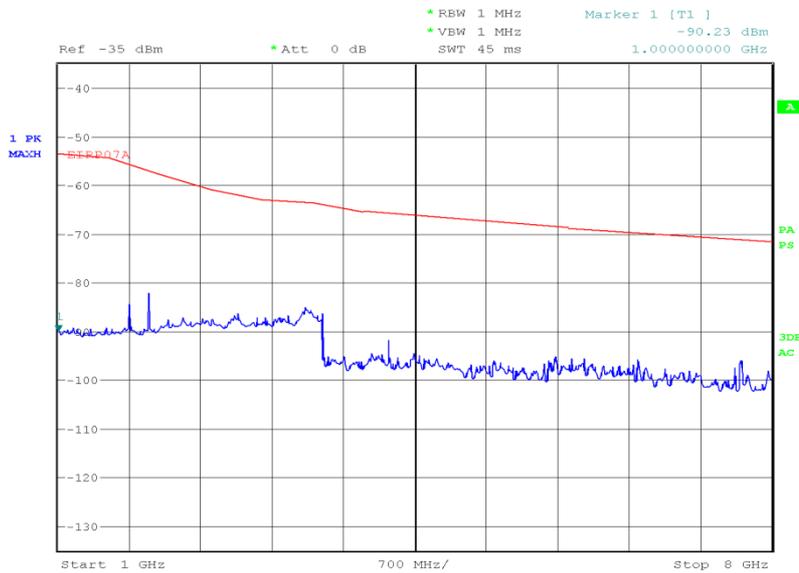
848.31 MHz

30 MHz to 1 GHz



Date: 22.APR.2012 12:39:26

1 GHz to 8 GHz

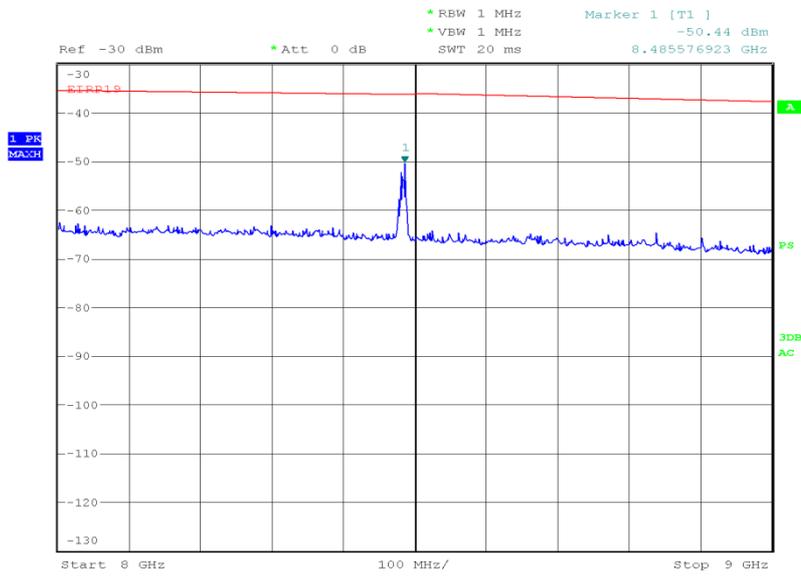


Date: 22.APR.2012 09:45:09



Product Service

8 GHz to 9 GHz



Date: 22.APR.2012 10:38:14

Limit Clause

43+10log(P) or -13 dBm

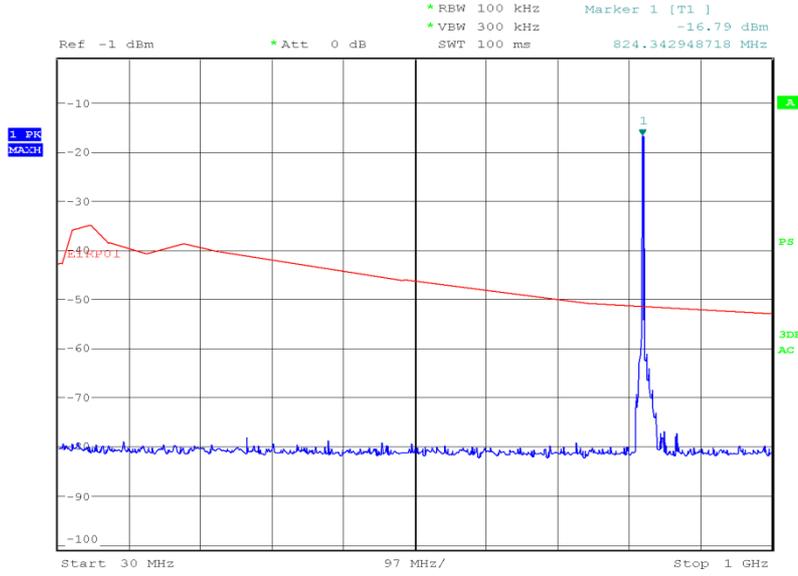


Product Service

CDMA 2000 - Test Data Service

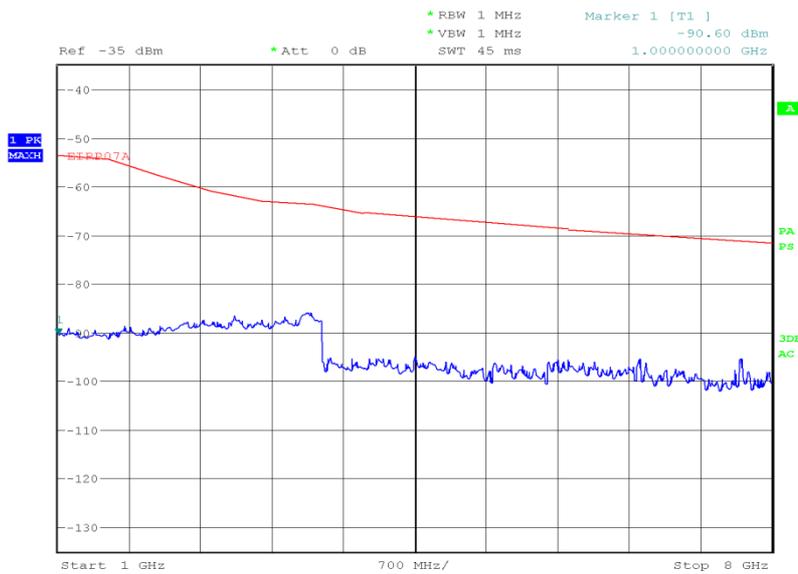
824.70 MHz

30 MHz to 1 GHz



Date: 24.APR.2012 19:45:28

1 GHz to 8 GHz

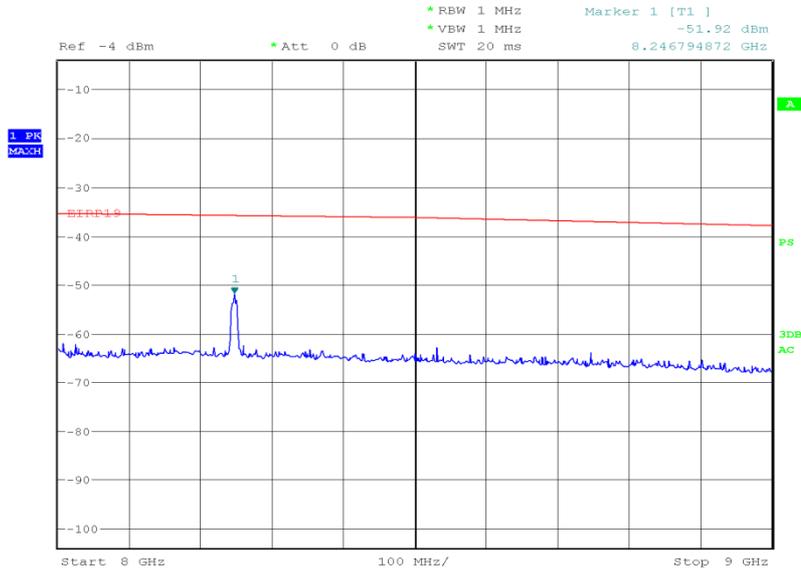


Date: 24.APR.2012 20:35:19



Product Service

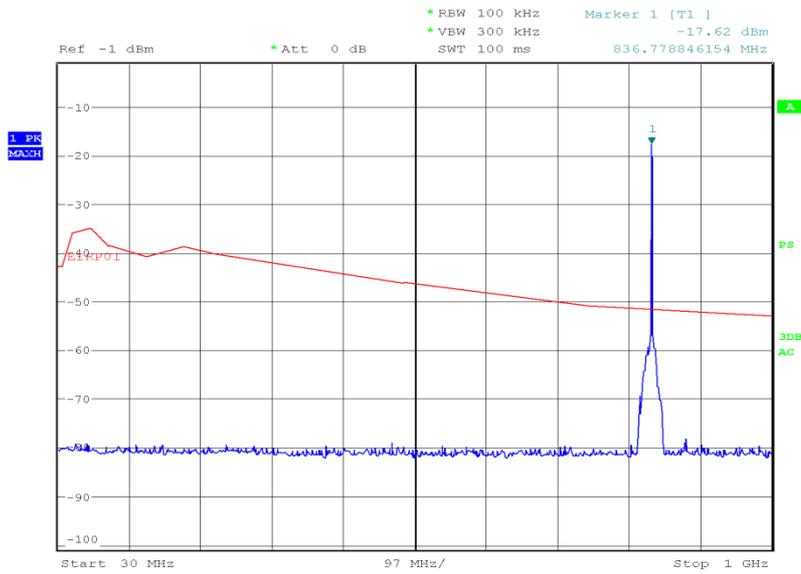
8 GHz to 9 GHz



Date: 24.APR.2012 22:23:29

836.52 MHz

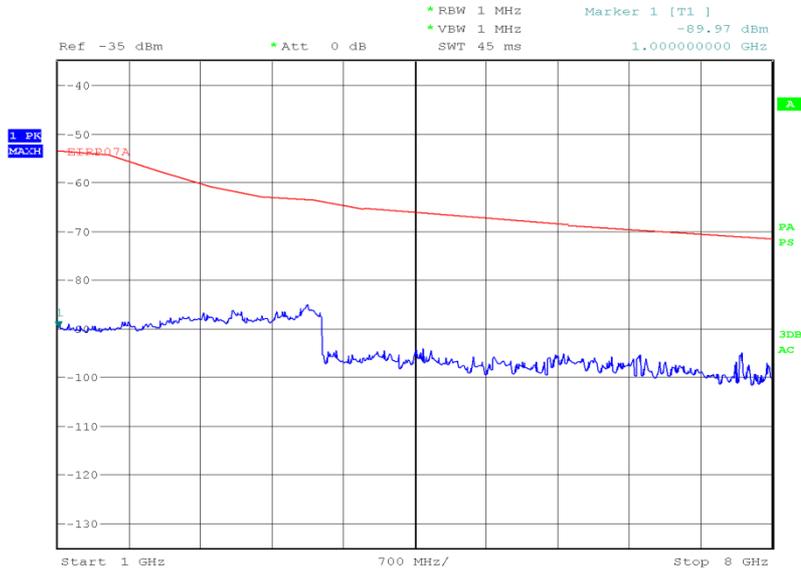
30 MHz to 1 GHz



Date: 24.APR.2012 19:47:28

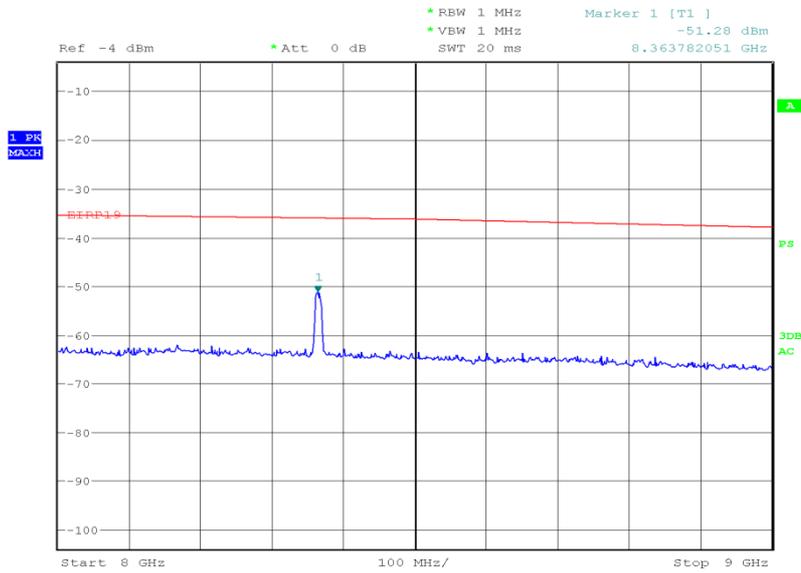


1 GHz to 8 GHz



Date: 24.APR.2012 20:39:01

8 GHz to 9 GHz



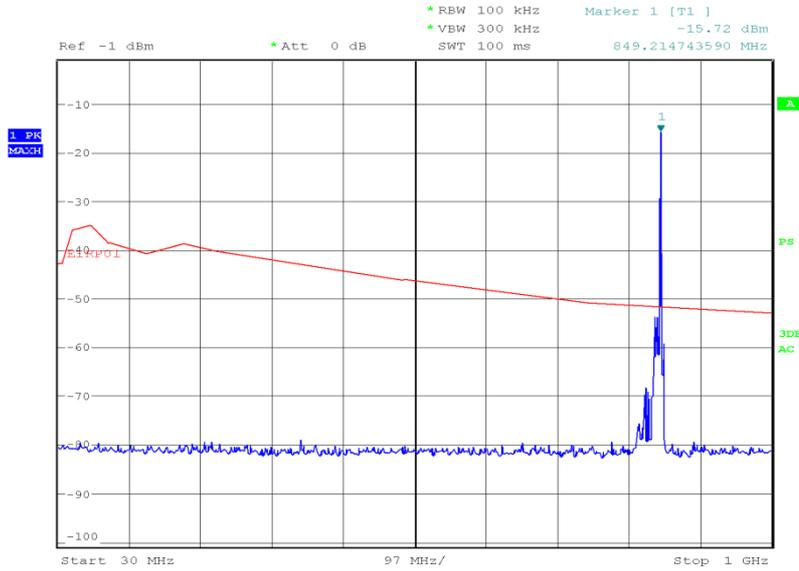
Date: 24.APR.2012 22:32:20



Product Service

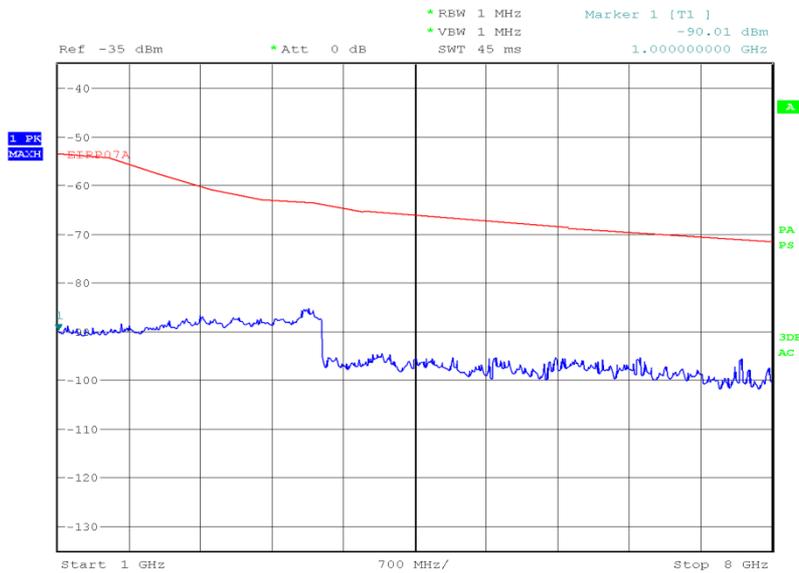
848.31 MHz

30 MHz to 1 GHz



Date: 24.APR.2012 19:48:31

1 GHz to 8 GHz

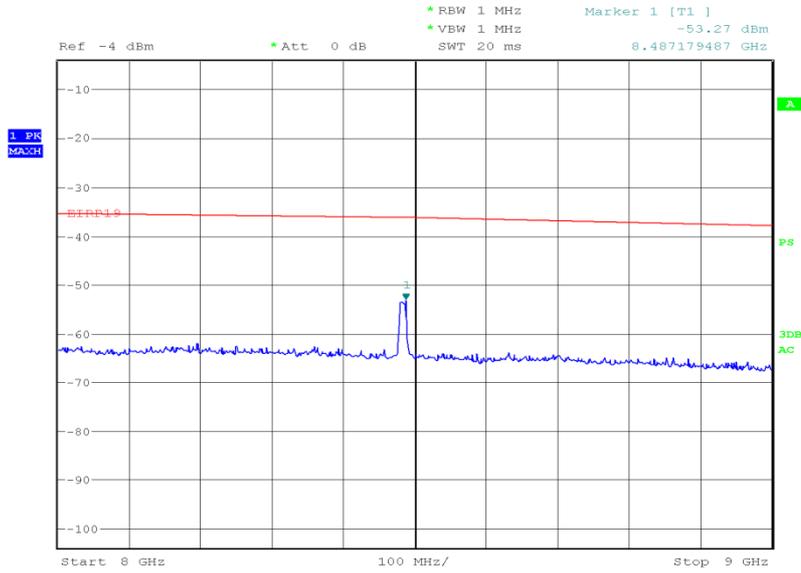


Date: 24.APR.2012 21:29:28



Product Service

8 GHz to 9 GHz



Date: 24.APR.2012 22:43:45

Limit Clause

43+10log(P) or -13 dBm

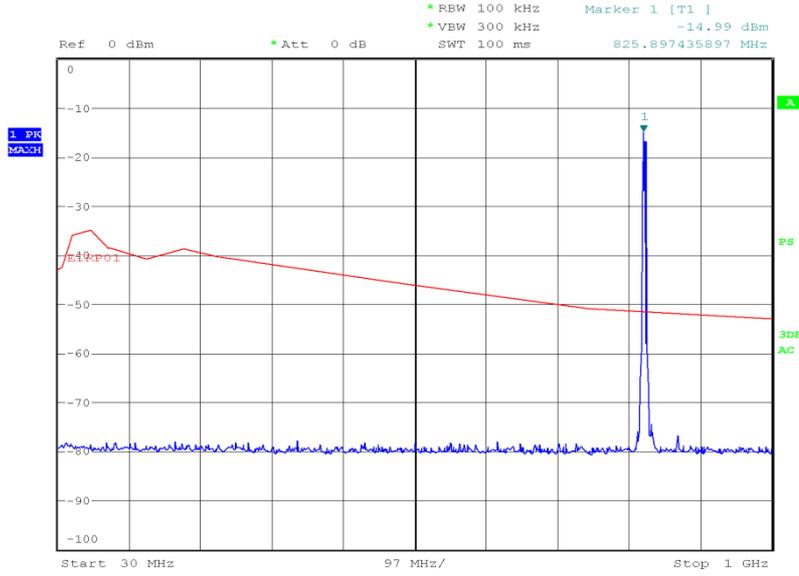


Product Service

WCDMA FDD V

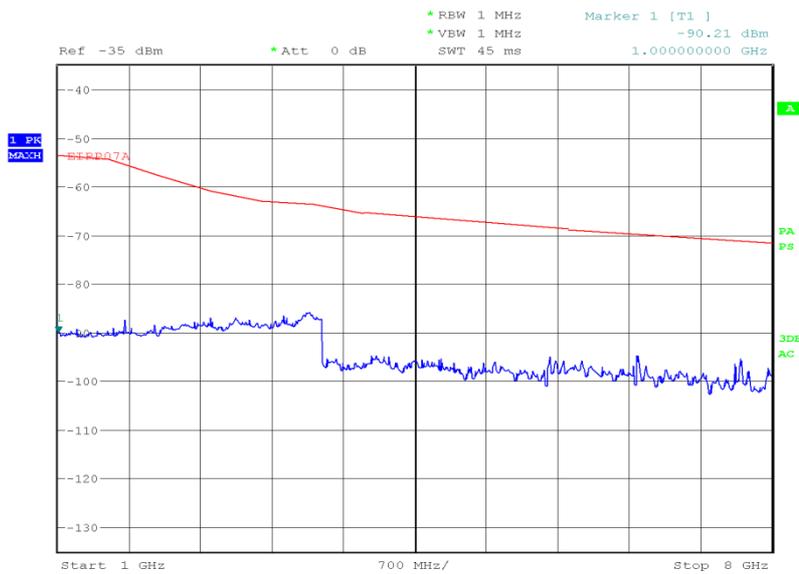
826.6 MHz

30 MHz to 1 GHz



Date: 25.APR.2012 18:33:16

1 GHz to 8 GHz

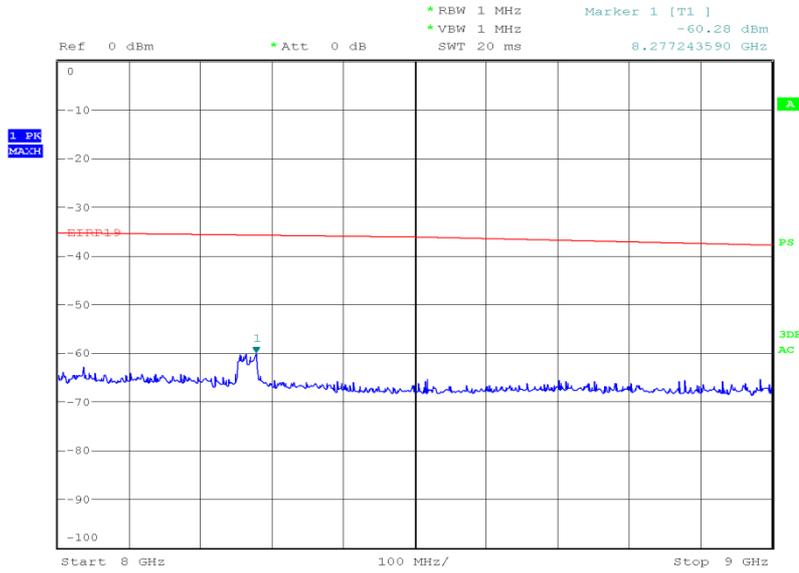


Date: 25.APR.2012 19:06:01



Product Service

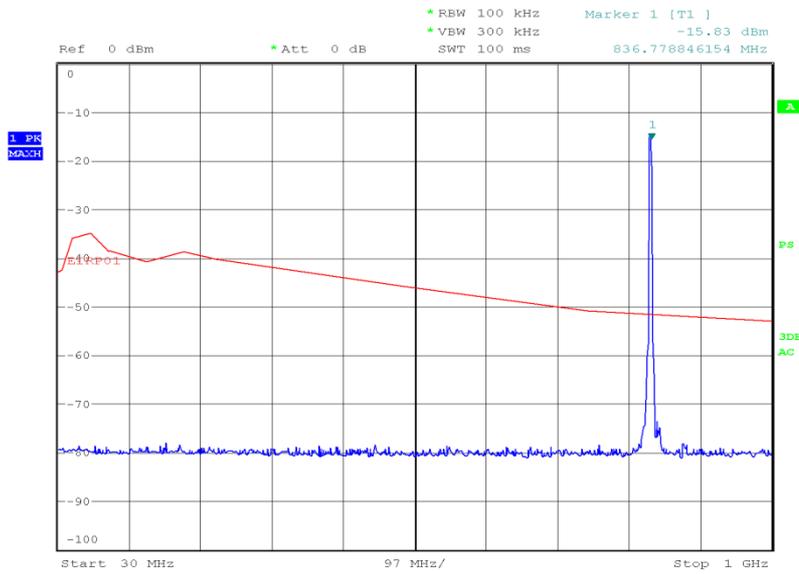
8 GHz to 9 GHz



Date: 25.APR.2012 21:53:04

835.0 MHz

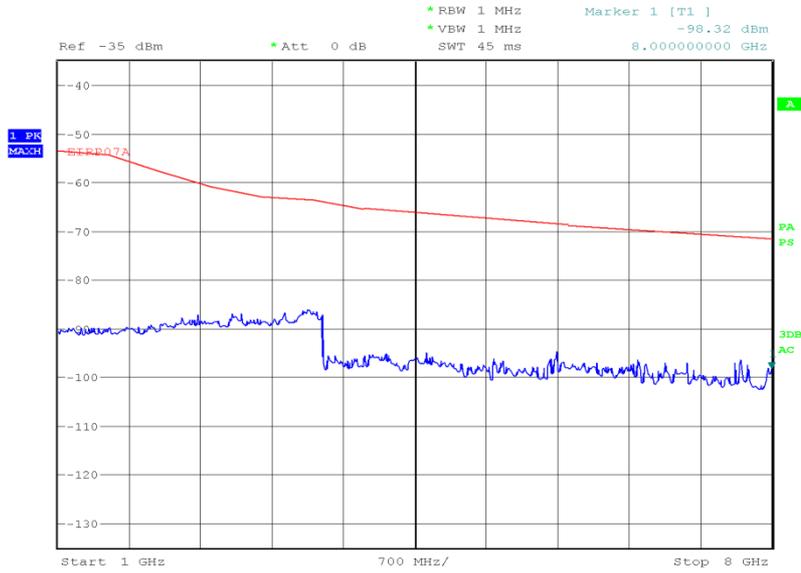
30 MHz to 1 GHz



Date: 25.APR.2012 18:22:31

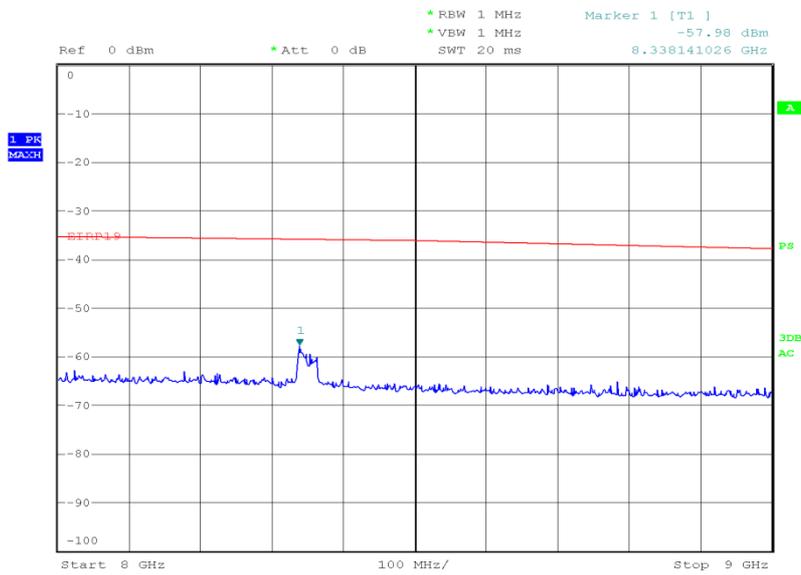


1 GHz to 8 GHz



Date: 25.APR.2012 19:08:11

8 GHz to 9 GHz



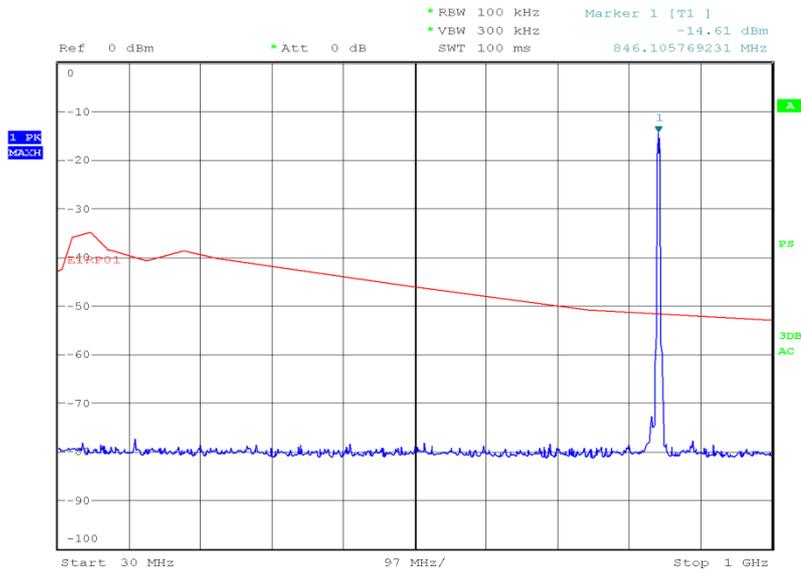
Date: 25.APR.2012 21:52:01



Product Service

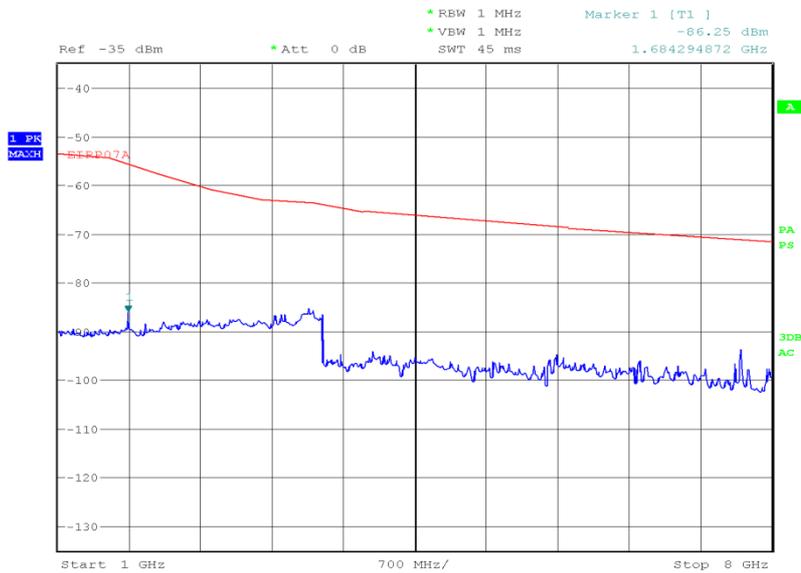
846.4 MHz

30 MHz to 1 GHz



Date: 25.APR.2012 18:20:26

1 GHz to 8 GHz

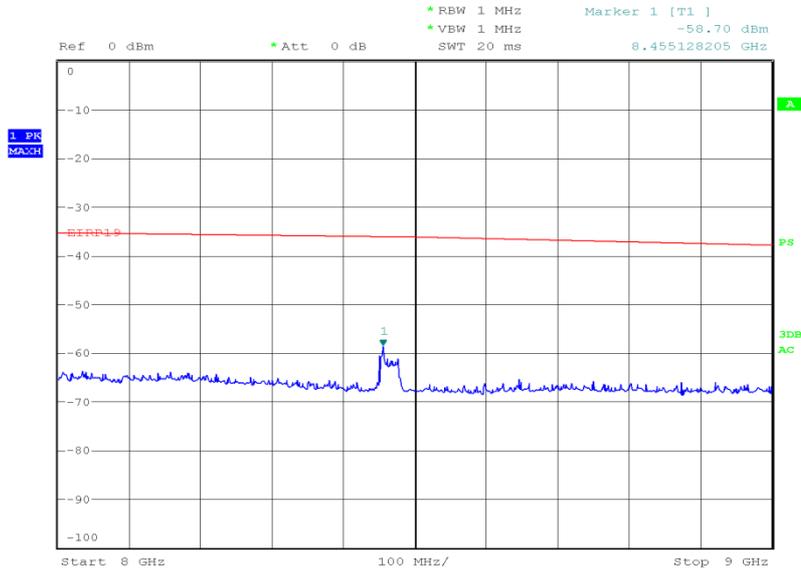


Date: 25.APR.2012 19:11:32



Product Service

8 GHz to 9 GHz



Date: 25.APR.2012 21:54:13

Limit Clause

43+10log(P) or -13 dBm



Product Service

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 SHI16 S/N: IMEI 004401113852533 - Modification State 0
CDMA SHI16 S/N: IMEI 004401113852566 - Modification State 0

2.5.3 Date of Test

27 April 2012 & 14 May 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	21.7 - 23.7°C
Relative Humidity	31.1 - 34.9%



Product Service

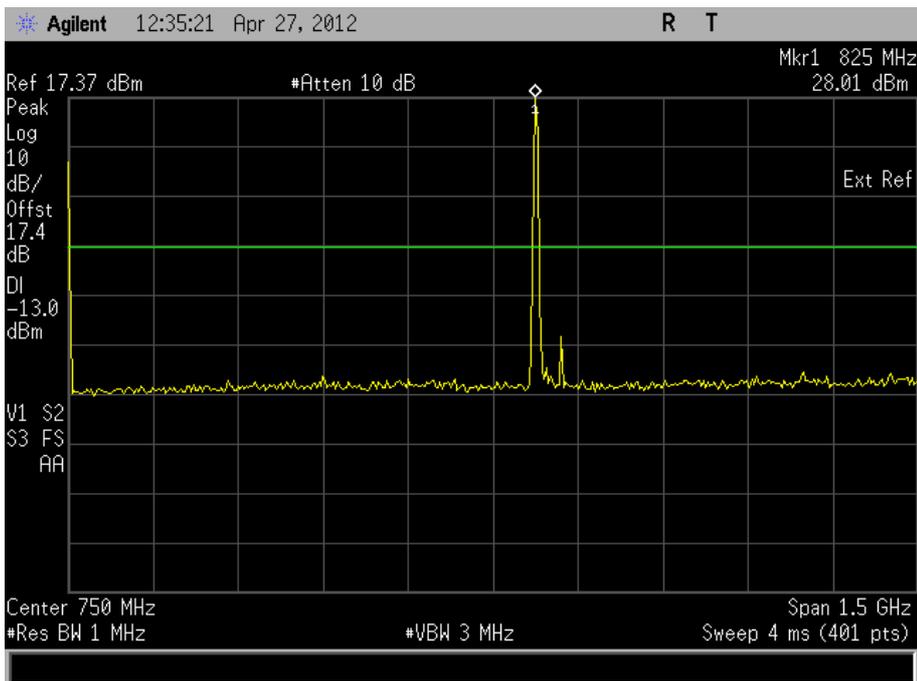
2.5.7 Test Results

CDMA 2000 - Loopback Service

4.0 V DC Supply

824.70 MHz

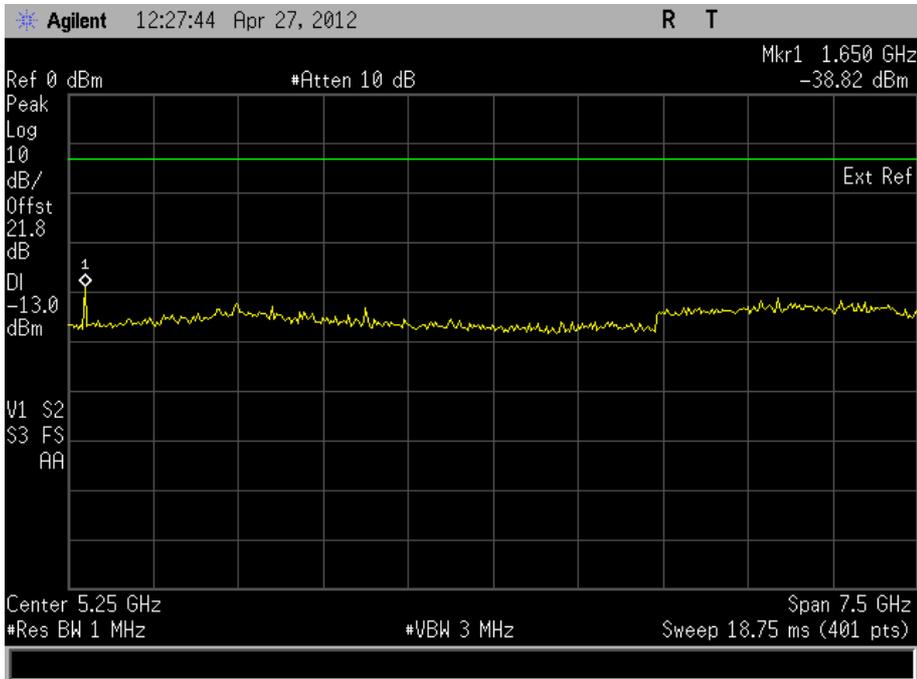
9 kHz to 1.5 GHz





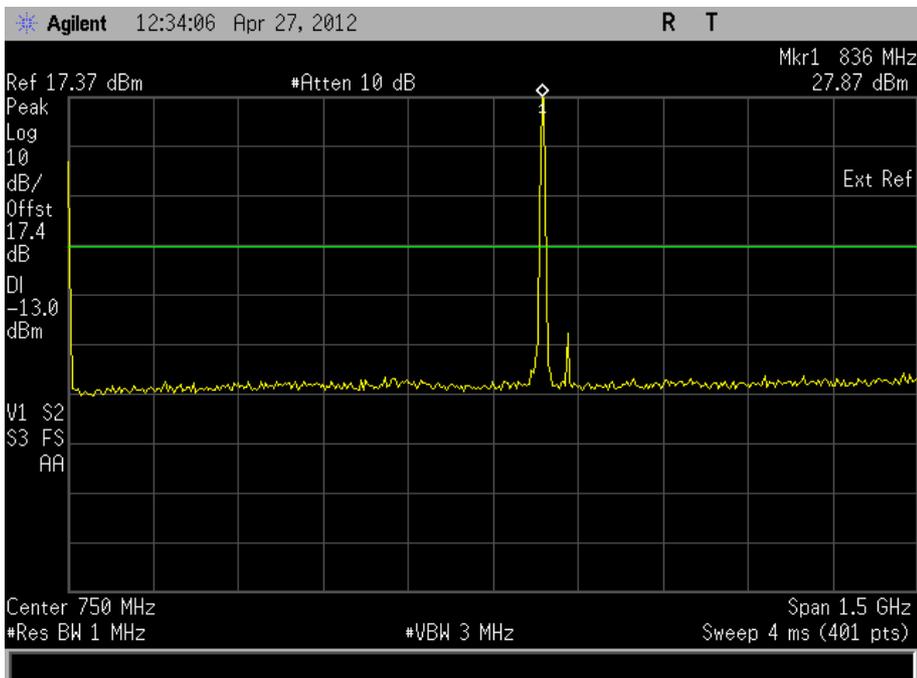
Product Service

1.5 GHz to 9 GHz



836.52 MHz

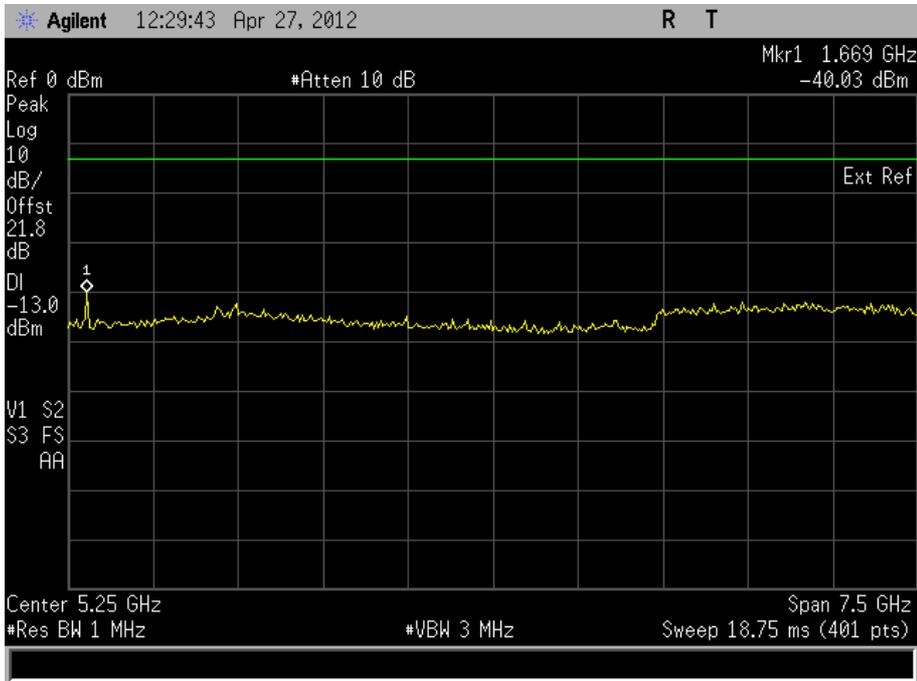
9 kHz to 1.5 GHz





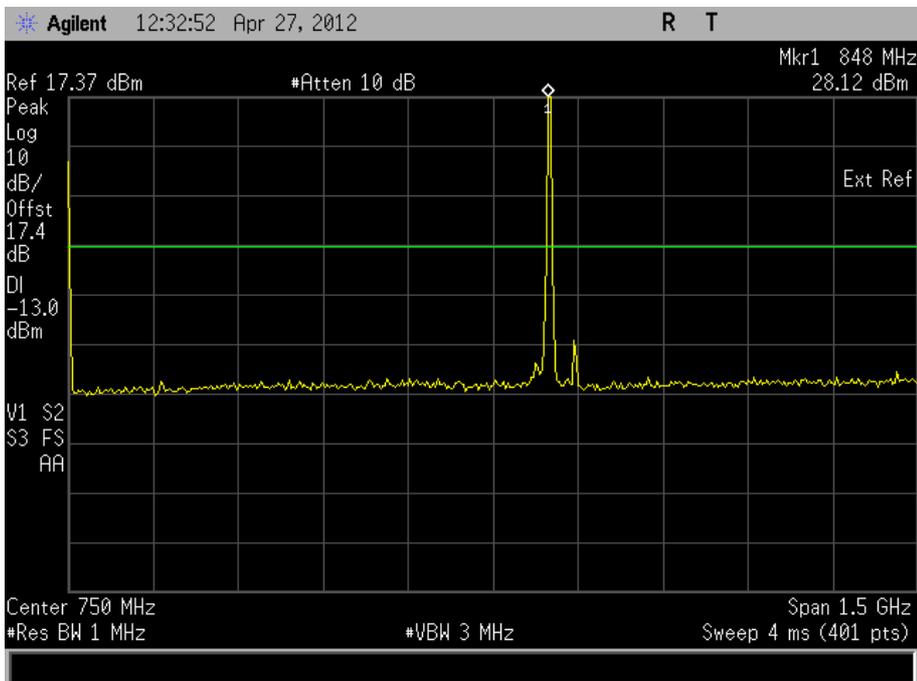
Product Service

1.5 GHz to 9 GHz



848.31 MHz

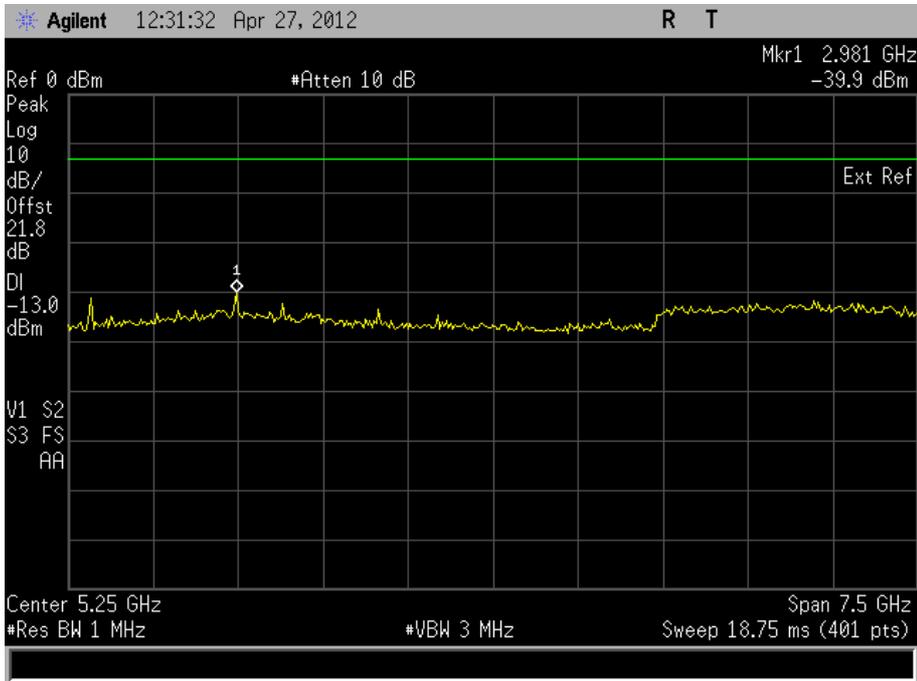
9 kHz to 1.5 GHz





Product Service

1.5 GHz to 9 GHz



Limit Clause

43+10log(P) or -13 dBm



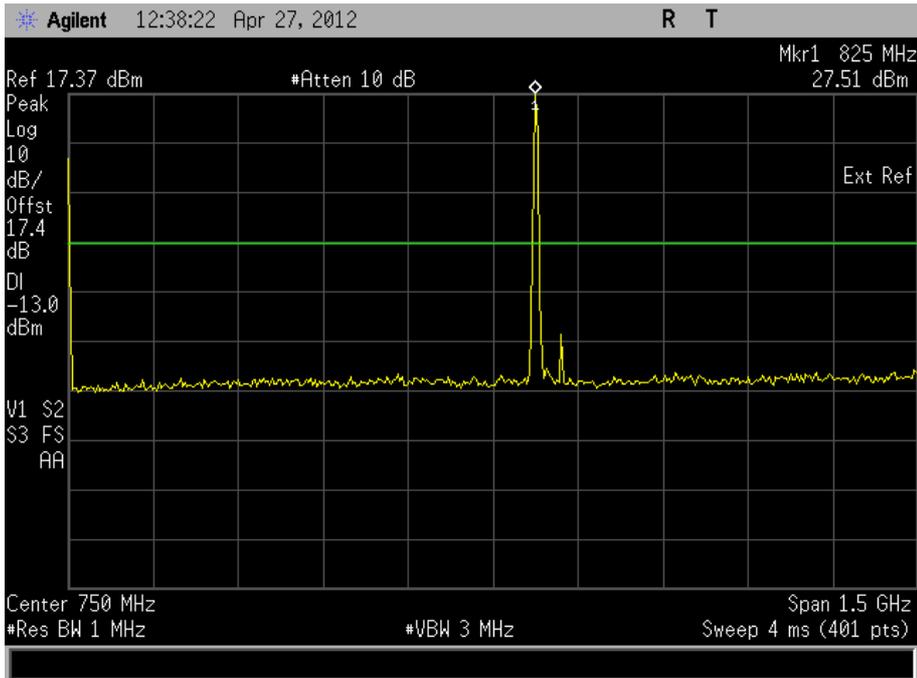
Product Service

CDMA 2000 - Test Data Service

4.0 V DC Supply

824.70 MHz

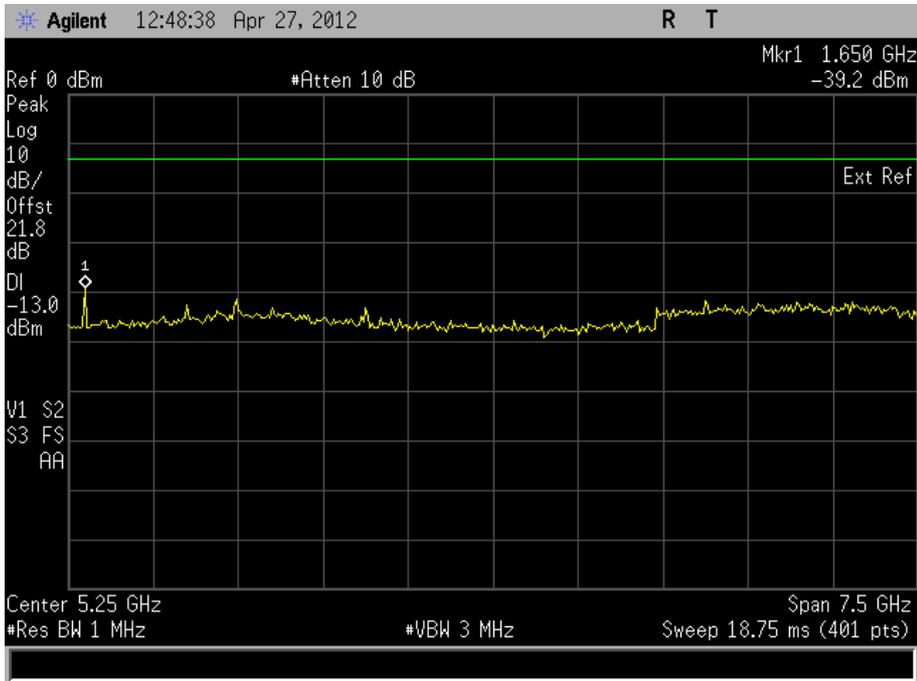
9 kHz to 1.5 GHz





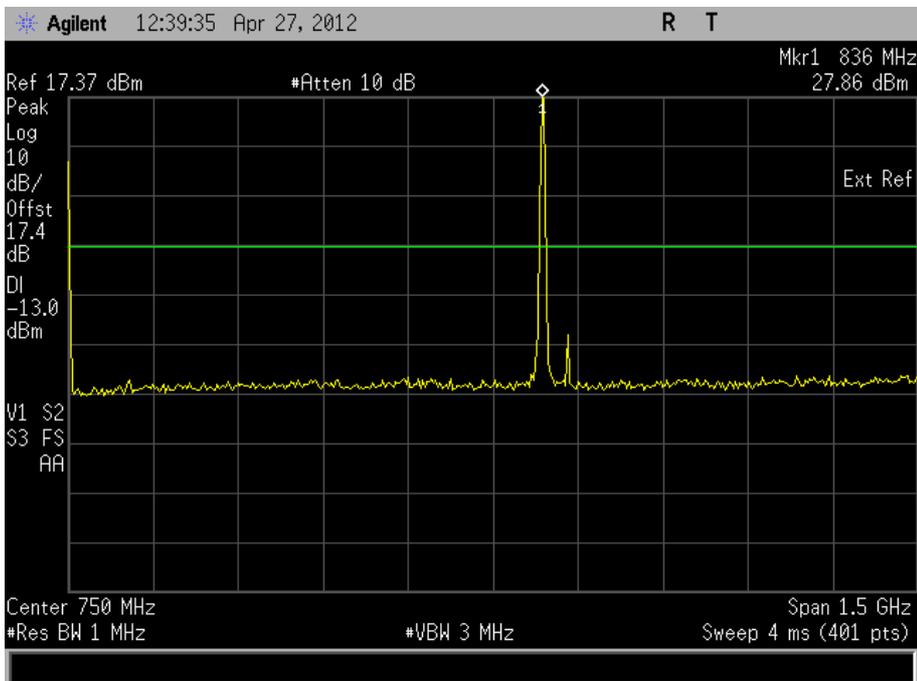
Product Service

1.5 GHz to 9 GHz



836.52 MHz

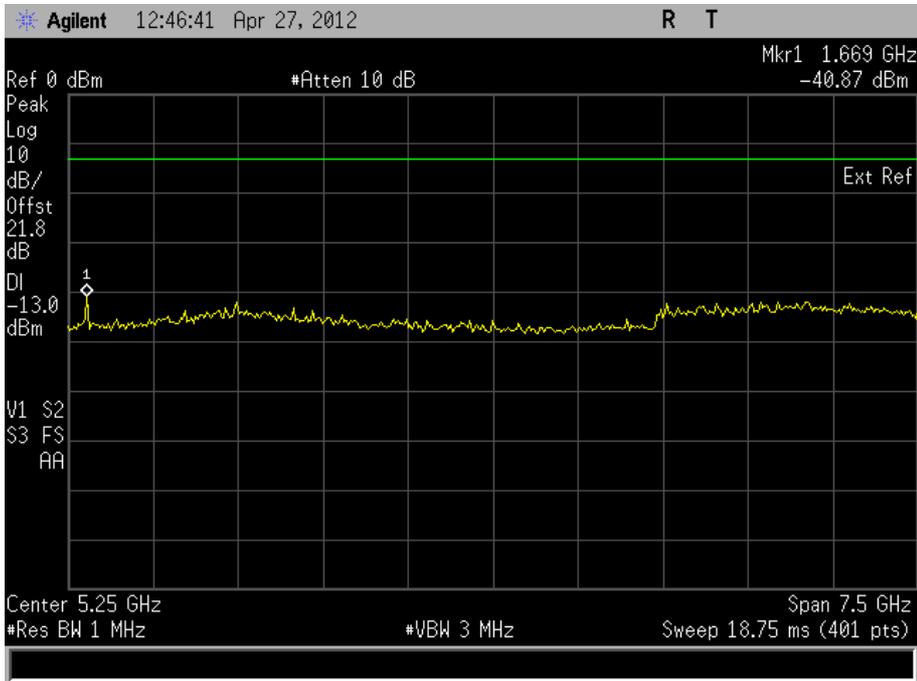
9 kHz to 1.5 GHz





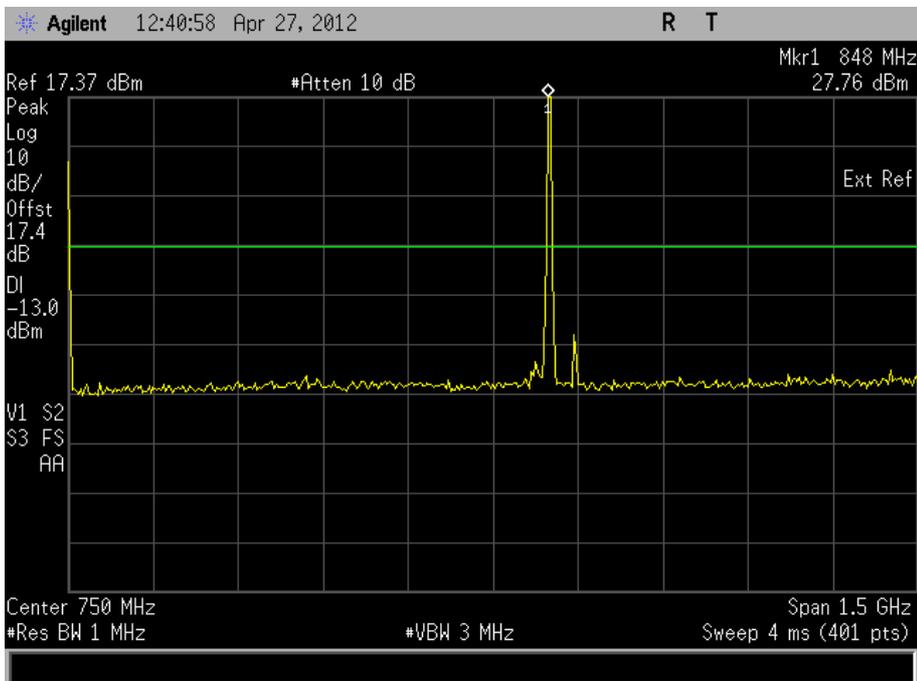
Product Service

1.5 GHz to 9 GHz



848.31 MHz

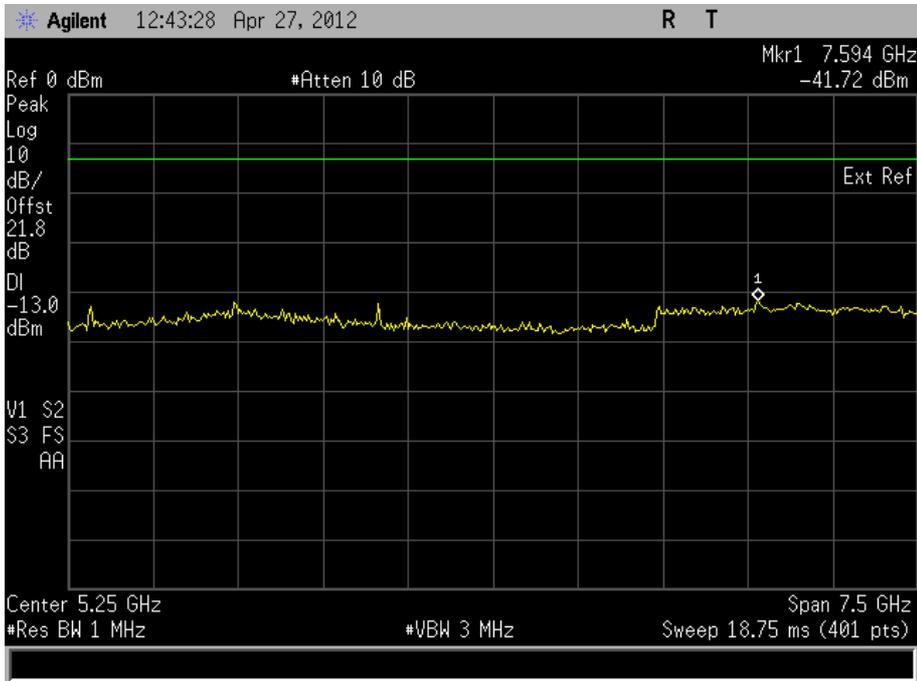
9 kHz to 1.5 GHz





Product Service

1.5 GHz to 9 GHz



Limit Clause

43+10log(P) or -13 dBm



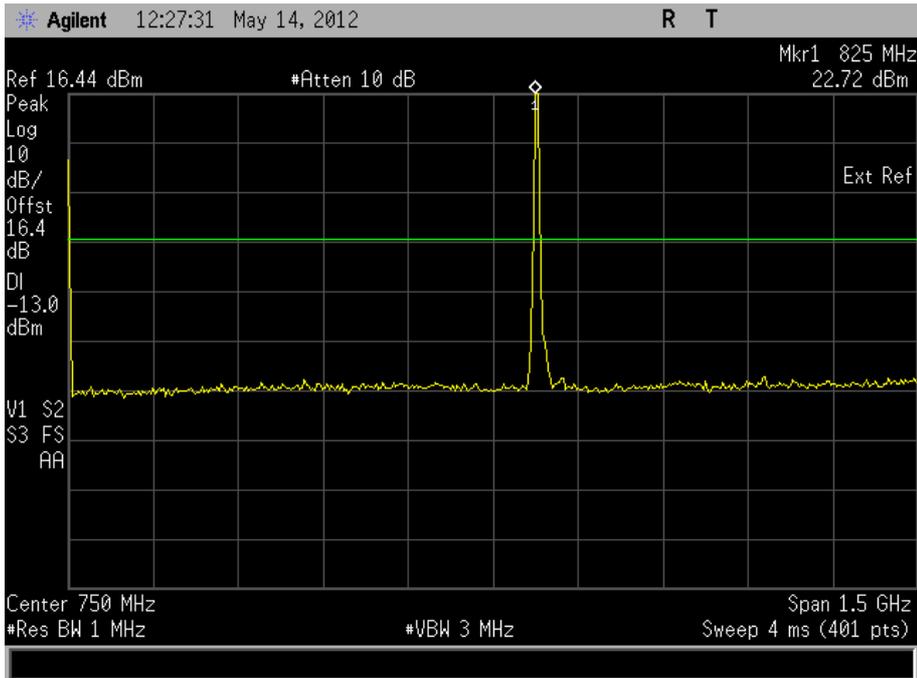
Product Service

WCDMA FDD V

4.0 V DC Supply

826.6 MHz

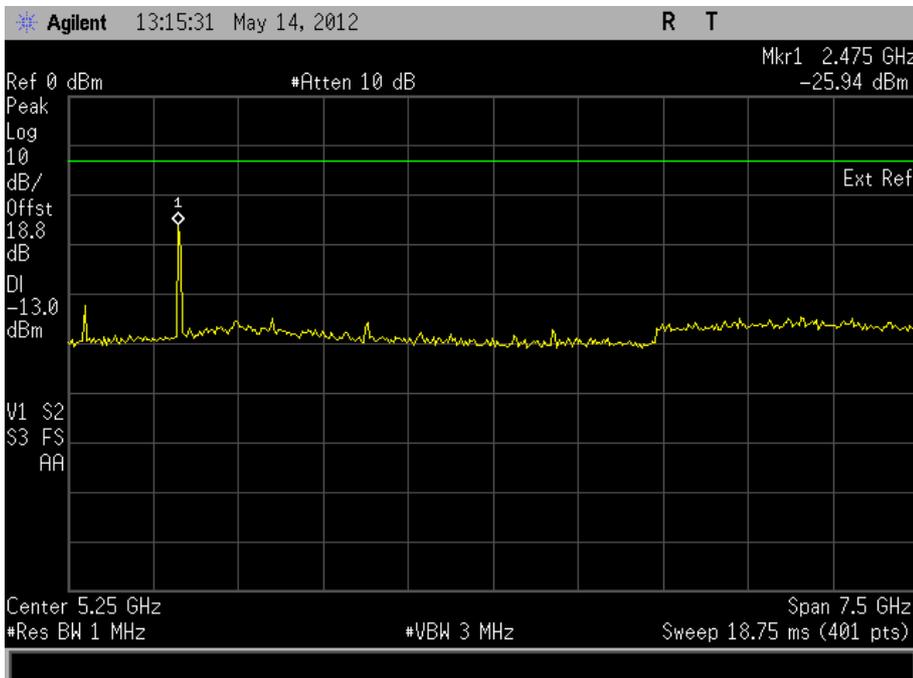
9 kHz to 1.5 GHz





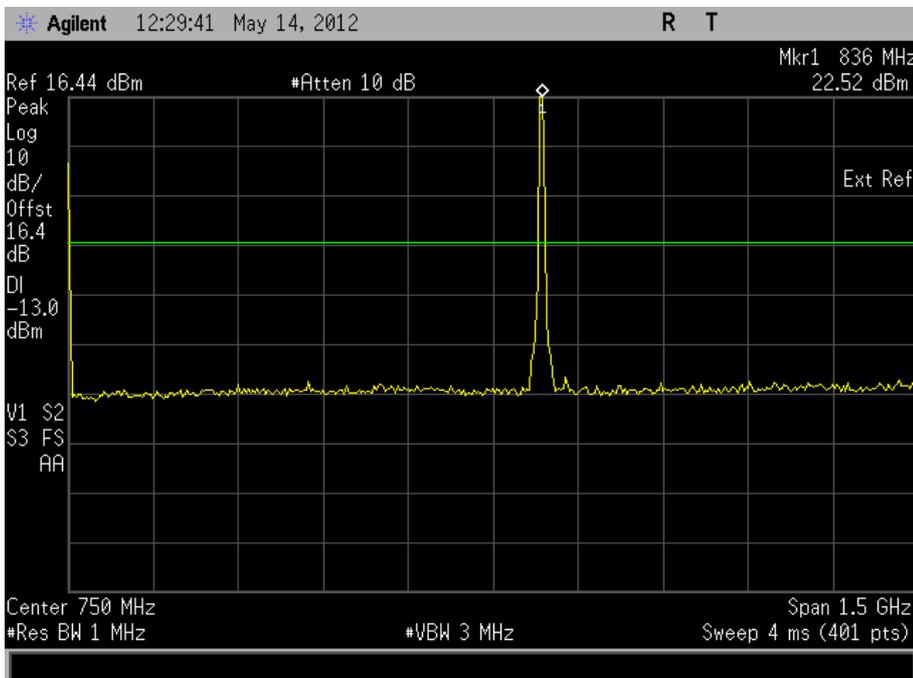
Product Service

1.5 GHz to 9 GHz



835.0 MHz

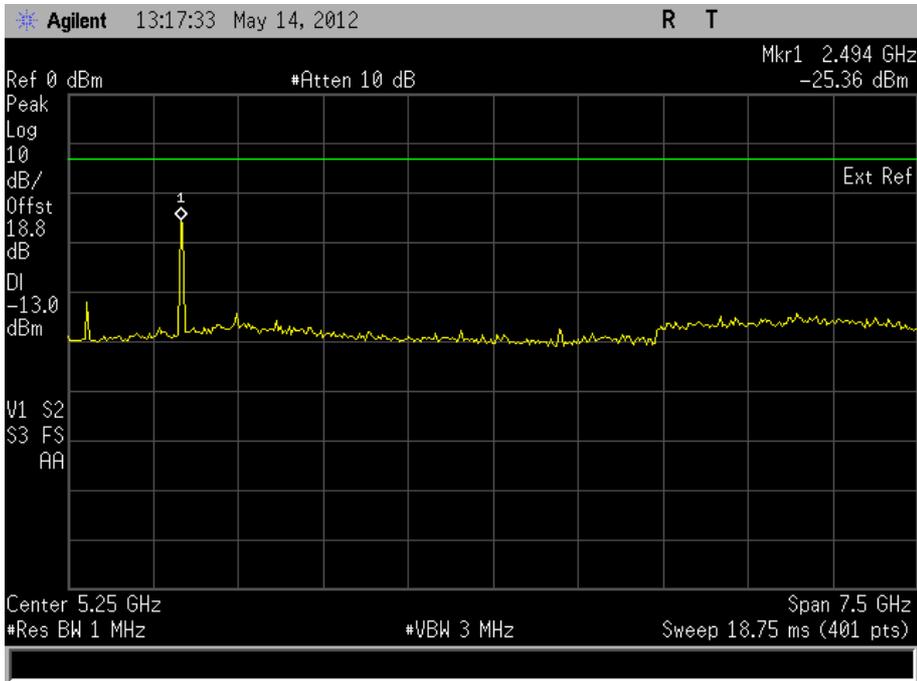
9 kHz to 1.5 GHz





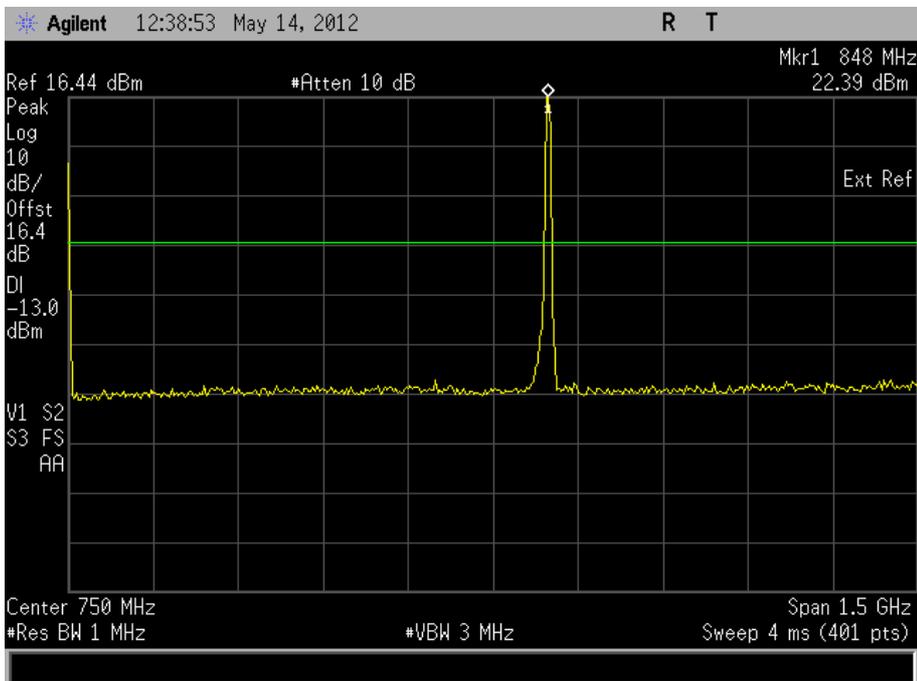
Product Service

1.5 GHz to 9 GHz



846.4 MHz

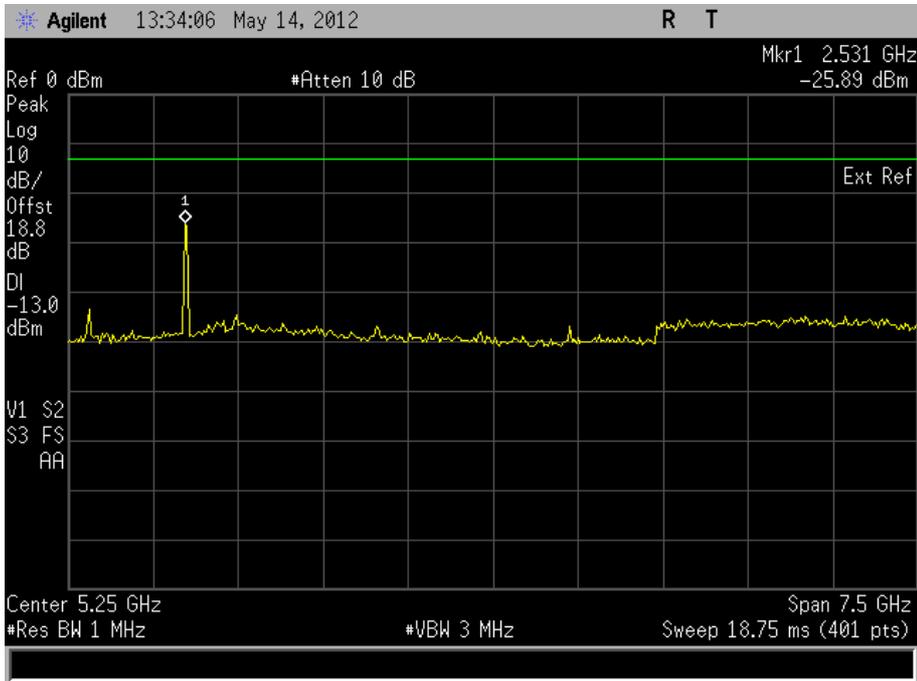
9 kHz to 1.5 GHz





Product Service

1.5 GHz to 9 GHz



Limit Clause

43+10log(P) or -13 dBm



Product Service

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 SHI16 S/N: IMEI 004401113852533 - Modification State 0
CDMA SHI16 S/N: IMEI 004401113852566 - Modification State 0

2.6.3 Date of Test

27 April 2012 & 14 May 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	21.7 - 23.7°C
Relative Humidity	31.1 - 43.0%



Product Service

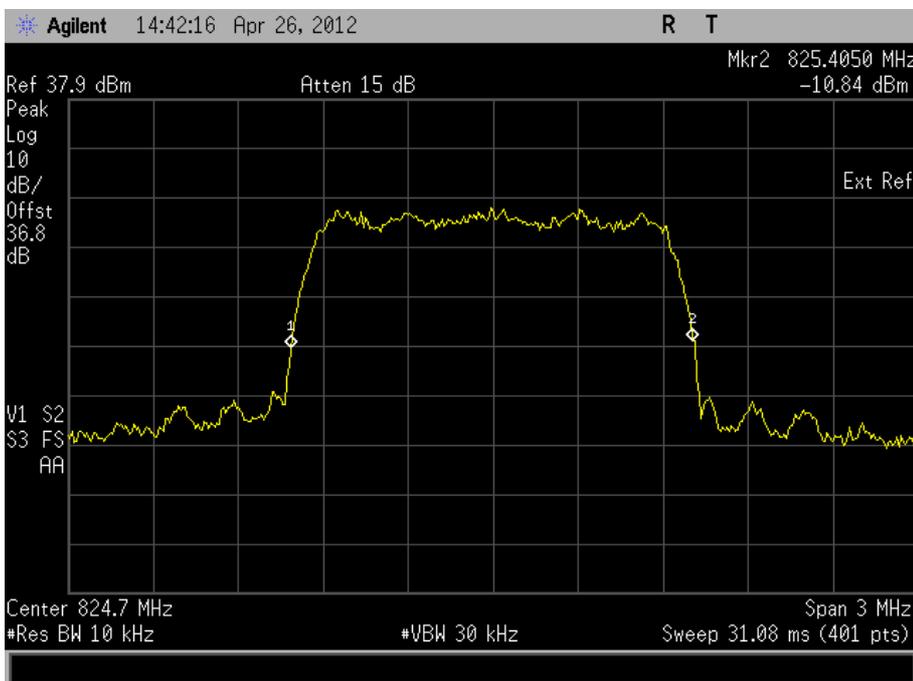
2.6.7 Test Results

CDMA 2000 - Loopback Service

4.0 V DC Supply

824.70 MHz

Mode	Occupied Bandwidth (kHz)
SO55, RC1	1417.5

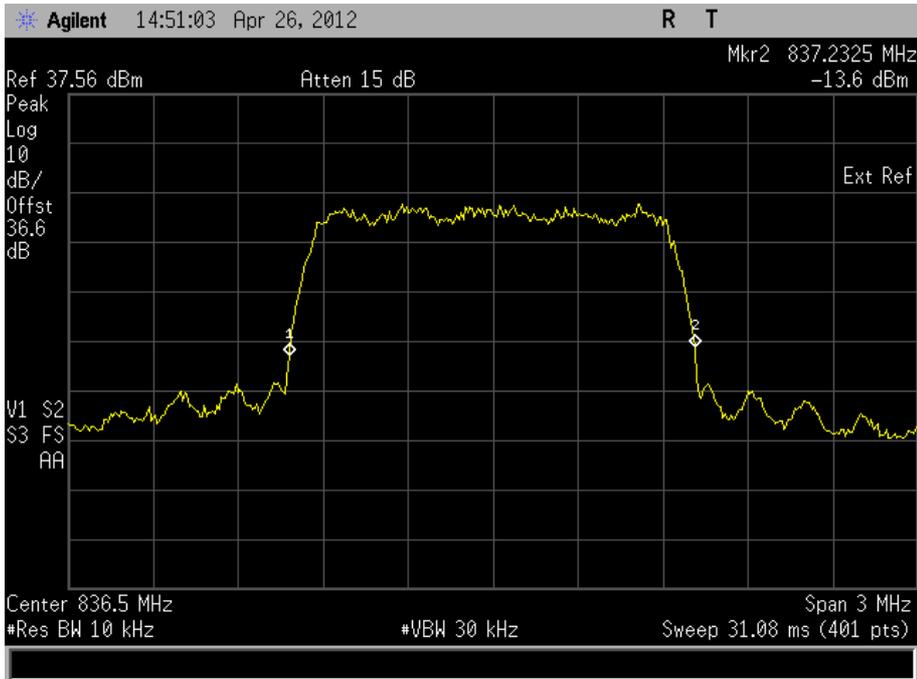




Product Service

836.52 MHz

Mode	Occupied Bandwidth (kHz)
SO55, RC1	1432.5

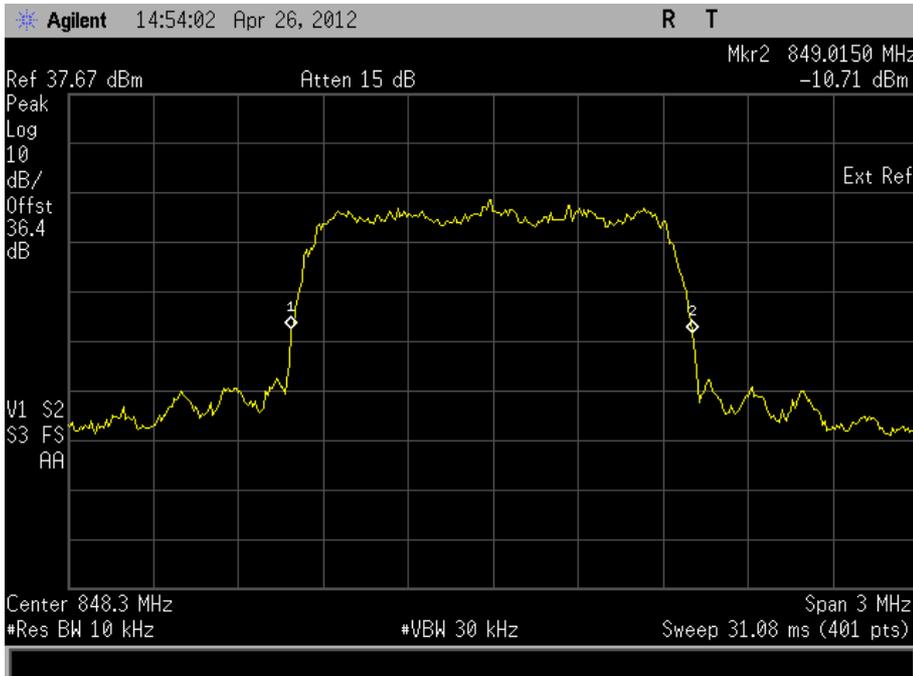




Product Service

848.31 MHz

Mode	Occupied Bandwidth (kHz)
SO55, RC1	1417.5



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

CDMA 2000 - Test Data Service

4.0 V DC Supply

824.70 MHz

Mode	Occupied Bandwidth (kHz)
SO55, RC1	1417.5

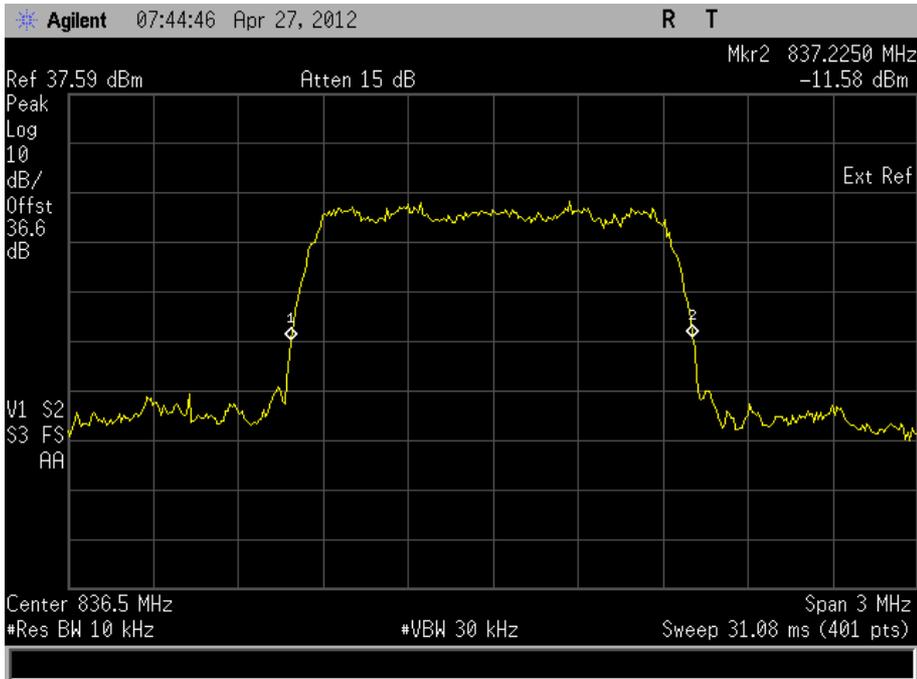




Product Service

836.52 MHz

Mode	Occupied Bandwidth (kHz)
SO55, RC1	1417.5

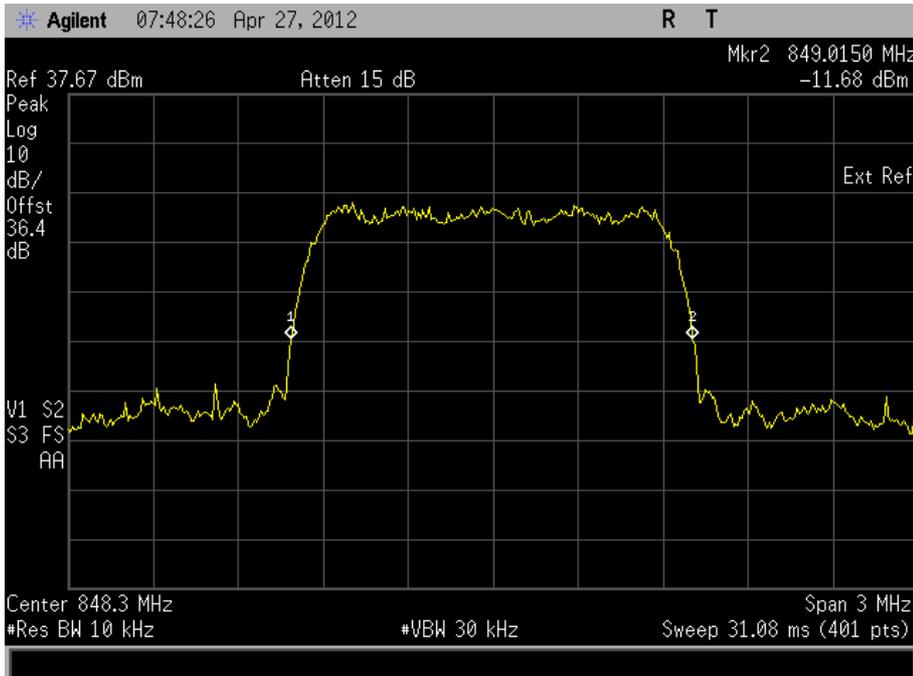




Product Service

848.31 MHz

Mode	Occupied Bandwidth (kHz)
SO55, RC1	1417.5



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.



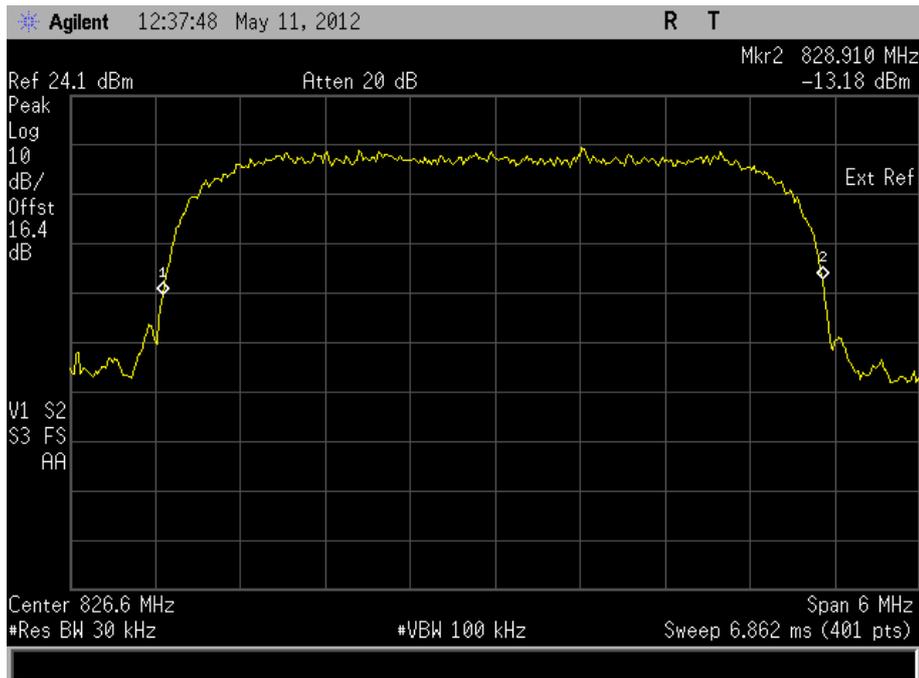
Product Service

WCDMA FDD V

4.0 V DC Supply

826.6 MHz

Mode	Occupied Bandwidth (kHz)
N/A	4650

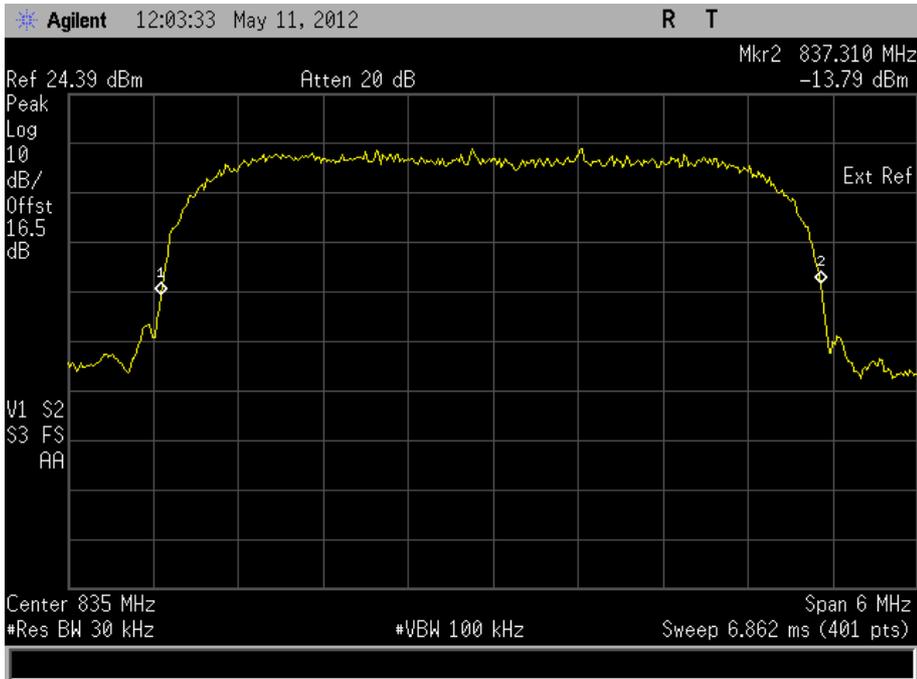




Product Service

835.0 MHz

Mode	Occupied Bandwidth (kHz)
N/A	4650

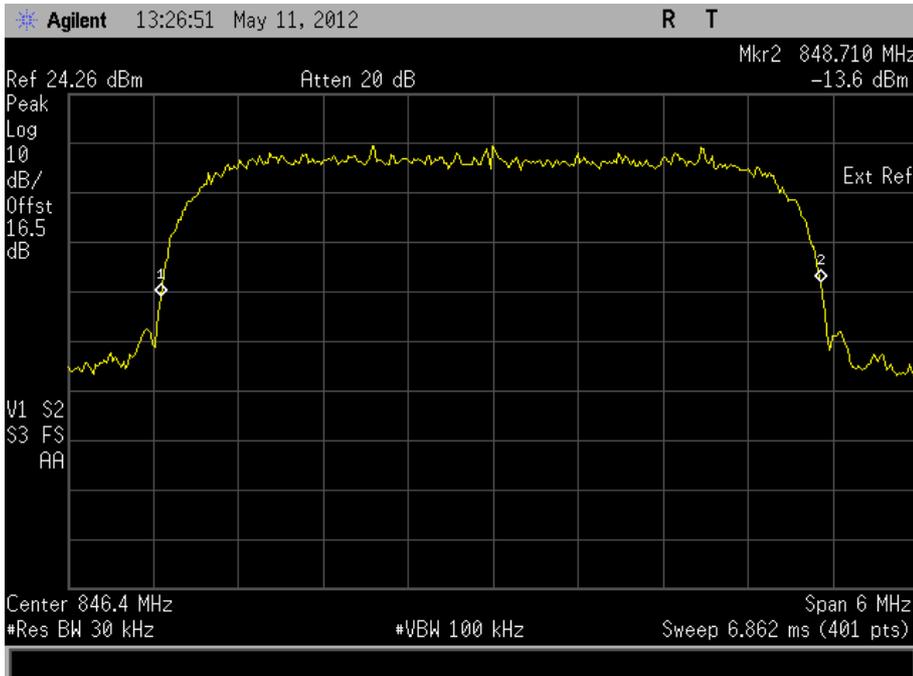




Product Service

846.4 MHz

Mode	Occupied Bandwidth (kHz)
N/A	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 FREQUENCY STABILITY

2.7.1 Specification Reference

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

2.7.2 Equipment Under Test and Modification State

CDMA SHI16 S/N: IMEI 004401113852533 - Modification State 0

2.7.3 Date of Test

23 May 2012 & 14 June 2012

2.7.4 Test Equipment Used

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

2.7.5 Test Procedure

The EUT was set to transmit on maximum power with modulation. A CMU200 Communications 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.

2.7.6 Environmental Conditions

Ambient Temperature	19.5 - 22.2°C
Relative Humidity	34.6 - 43.8%



Product Service

2.7.7 Test Results

CDMA 2000 - Loopback Service

4.0 V DC Supply

Under Temperature Variations

836.52 MHz

Temperature Interval (°C)	Mode	Modulation	Deviation (ppm)
-30	SO55, RC1	64-Ray Orthogonal	+0.016
-20	SO55, RC1	64-Ray Orthogonal	+0.0267
-10	SO55, RC1	64-Ray Orthogonal	+0.0312
0	SO55, RC1	64-Ray Orthogonal	+0.0257
+10	SO55, RC1	64-Ray Orthogonal	+0.0258
+20	SO55, RC1	64-Ray Orthogonal	-0.0249
+30	SO55, RC1	64-Ray Orthogonal	+0.0238
+40	SO55, RC1	64-Ray Orthogonal	+0.0115
+50	SO55, RC1	64-Ray Orthogonal	+0.0108

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	-	-



Product Service

Under Voltage Variations

836.52 MHz

DC Voltage (V)	Mode	Modulation	Deviation (ppm)
4.0 V DC	SO55, RC1	64-Ray Orthogonal	+0.0267
3.8 V DC	SO55, RC1	64-Ray Orthogonal	+0.012

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

CDMA 2000 - Test Data Service

4.0 V DC Supply

Under Temperature Variations836.52 MHz

Temperature Interval (°C)	Mode	Modulation	Deviation (ppm)
-30	SO55, RC1	64-Ray Orthogonal	+0.0096
-20	SO55, RC1	64-Ray Orthogonal	+0.0122
-10	SO55, RC1	64-Ray Orthogonal	+0.0146
0	SO55, RC1	64-Ray Orthogonal	+0.0127
+10	SO55, RC1	64-Ray Orthogonal	+0.0136
+20	SO55, RC1	64-Ray Orthogonal	+0.0120
+30	SO55, RC1	64-Ray Orthogonal	+0.0142
+40	SO55, RC1	64-Ray Orthogonal	+0.0281
+50	SO55, RC1	64-Ray Orthogonal	+0.0307

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	-	-



Product Service

Under Voltage Variations

836.52 MHz

DC Voltage (V)	Mode	Modulation	Deviation (ppm)
4.0 V DC	SO55, RC1	64-Ray Orthogonal	+0.0120
3.8 V DC	SO55, RC1	64-Ray Orthogonal	+0.0060

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

CDMA FDD V

4.0 V DC Supply

Under Temperature Variations

835.0 MHz

Temperature Interval (°C)	Deviation (ppm)
-30	-0.0311
-20	+0.0287
-10	-0.0347
0	-0.0299
+10	-0.0311
+20	-0.0443
+30	-0.0443
+40	-0.0299
+50	-0.0275

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	-	-



Product Service

Under Voltage Variations

836.52 MHz

DC Voltage (V)	Deviation (ppm)
4.0 V DC	-0.0443
3.8 V DC	-0.0443

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



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					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Multimeter	Iso-tech	IDM-101	466	12	5-Mar-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Attenuator (10dB)	Weinschel	47-10-34	481	12	27-Mar-2013
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	21-Sep-2012
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Power Divider	Weinschel	1506A	604	12	19-Mar-2013
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	12	13-Sep-2012
Hygrometer	Rotronic	A1	2677	12	7-Feb-2013
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	7-Oct-2012
Power Supply	Farnell	ET30/2	3423	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2013
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2013
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	20-Sep-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	13-Mar-2013
Turntable	EMCO	1060-04	3693	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3696	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	12-Jan-2013
DC - 8 GHz Attenuator	Lucas Weinschel	24-30-33	3963	12	24-Jun-2012
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
True RMS Multimeter	Fluke	179	4007	12	16-Feb-2013
Temperature Humidity Meter	Radio Spares	1260	4020	12	23-Nov-2012
Radio Communications Test Set	Rohde & Schwars	CMU200	-	-	TU



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.2 – Effective Radiated Power					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	9-Dec-2012
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
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	29-Jul-2012
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	23-Feb-2013
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	24-May-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
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
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	mature GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	mature GmbH	NCD	3917	-	TU
Section 2.3 - Maximum Peak Output Power – Conducted					
Antenna (Double Ridge Guide)	EMCO	3115	34	12	22-Jul-2012
Spectrum Analyser	Rohde & Schwarz	FSEM	37	12	17-May-2013
Power Meter	Hewlett Packard	436A	94	12	12-Oct-2012
Multimeter	Iso-tech	IDM-101	466	12	5-Mar-2013
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Power Sensor	Hewlett Packard	8481A	1338	12	20-Dec-2012
Screened Room (8)	Rainford	Rainford	1548	-	TU
Hygrometer	Rotronic	I-1000	2882	12	5-Aug-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Power Supply	Farnell	ET30/2	3423	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2013
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	12-Jan-2013
DC - 8 GHz Attenuator	Lucas Weinschel	24-30-33	3963	12	24-Jun-2012
Radio Communications Test Set	Rohde & Schwarz	CMU200	-	-	TU



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 – Emission Limitations fro Cellular Equipment					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	9-Dec-2012
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	13-Sep-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
Attenuator 20dB 5W	Marconi	56534-904H	377	12	8-May-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	29-Jul-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
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	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Attenuator (20dB, 20W)	Weinschel	1	3032	-	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	27-May-2012
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-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
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
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
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	12	8-Jul-2012



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - Conducted Spurious Emissions					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Multimeter	Iso-tech	IDM-101	466	12	5-Mar-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Attenuator (10dB)	Weinschel	47-10-34	481	12	27-Mar-2013
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	21-Sep-2012
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Power Divider	Weinschel	1506A	604	12	19-Mar-2013
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	12	13-Sep-2012
Rubidium Standard	Rohde & Schwarz	XSRM	1316	12	13-Sep-2012
Hygrometer	Rotronic	A1	2677	12	7-Feb-2013
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
Attenuator (20dB, 20W)	Weinschel	1	3032	-	TU
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	7-Oct-2012
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Power Supply	Farnell	ET30/2	3423	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Charge Amplifier	Endevco	133	3478	12	15-Jul-2012
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2013
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2013
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	20-Sep-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	13-Mar-2013
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3696	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	12-Jan-2013
DC - 8 GHz Attenuator	Lucas Weinschel	24-30-33	3963	12	24-Jun-2012
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
True RMS Multimeter	Fluke	179	4007	12	16-Feb-2013
Temperature Humidy Meter	Radio Spares	1260	4020	12	23-Nov-2012
Radio Communications Test Set	Rohde & Schwars	CMU200	-	-	TU
Section 2.6 – Occupied Bandwidth					
Multimeter	Iso-tech	IDM-101	466	12	5-Mar-2013
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Hygrometer	Rotronic	A1	2677	12	7-Feb-2013
Power Supply	Farnell	ET30/2	3423	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2013
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	12-Jan-2013
DC - 8 GHz Attenuator	Lucas Weinschel	24-30-33	3963	12	24-Jun-2012

Instrument	Manufacturer	Type No.	TE No.	Calibration	Calibration Due
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Product Service

				Period (months)	
Section 2.7 - Frequency Stability					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Digital Temperature Indicator + T/C	Fluke	51	412	12	6-Jan-2013
Dual programable power supply	Thurlby	T-1000	418	-	TU
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Attenuator: 10dB/20W	Narda	766-10	480	12	21-Jul-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	12	13-Sep-2012
Rubidium Standard	Rohde & Schwarz	XSRM	1316	12	13-Sep-2012
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	8-Jun-2013
Thermocouple Thermometer	Fluke	51	3172	12	23-Jul-2012
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
True RMS Multimeter	Fluke	179	4007	12	16-Feb-2013
Temperature Humidity Meter	Radio Spares	1260	4020	12	23-Nov-2012

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



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
Frequency Stability	± 46.70 Hz



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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

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