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# Report On

FCC Testing of the  
Sharp 204SH Quad-band WCDMA (FDD I / FDD V / FDD VIII / FDD XI)  
Cellular Phone with Bluetooth, WLAN and GPS  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22  
(WCDMA)

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00188

Document 75921586 Report 08 Issue 1

March 2013



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COMMERCIAL-IN-CONFIDENCE

**REPORT ON**

FCC Testing of the  
Sharp 204SH Quad-band WCDMA (FDD I / FDD V / FDD VIII / FDD  
XI) Cellular Phone with Bluetooth, WLAN and GPS  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22  
(WCDMA)

Document 75921586 Report 08 Issue 1

March 2013

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**DATED**

26 March 2013

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**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);

S Milliken

G Lawler



R Henley



## CONTENTS

Section	Page No
<b>1</b>	<b>REPORT SUMMARY ..... 3</b>
1.1	Introduction ..... 4
1.2	Brief Summary of Results ..... 5
1.3	Product Technical Description ..... 6
1.4	Product Information ..... 6
1.5	Test Conditions ..... 6
1.6	Deviations from the Standard ..... 6
1.7	Modification Record ..... 6
<b>2</b>	<b>TEST DETAILS ..... 7</b>
2.1	Spurious Emissions at Band Edge ..... 8
2.2	Effective Radiated Power ..... 11
2.3	Maximum Peak Output Power - Conducted ..... 15
2.4	Emission Limitations for Cellular Equipment ..... 17
2.5	Conducted Spurious Emissions ..... 24
2.6	Occupied Bandwidth ..... 28
2.7	Modulation Characteristics ..... 32
2.8	Frequency Stability ..... 34
<b>3</b>	<b>TEST EQUIPMENT USED ..... 37</b>
3.1	Test Equipment Used ..... 38
3.2	Measurement Uncertainty ..... 41
<b>4</b>	<b>ACCREDITATION, DISCLAIMERS AND COPYRIGHT ..... 42</b>
4.1	Accreditation, Disclaimers and Copyright ..... 43



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## **SECTION 1**

### **REPORT SUMMARY**

FCC Testing of the  
Sharp 204SH Quad-band WCDMA (FDD I / FDD V / FDD VIII / FDD XI) Cellular Phone with  
Bluetooth, WLAN and GPS  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA)



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## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Sharp 204SH Quad-band WCDMA (FDD I / FDD V / FDD VIII / FDD XI) Cellular Phone with Bluetooth, WLAN 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)	204SH
Serial Number(s)	IMEI 004401114727361 IMEI 004401114727387
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2012) FCC CFR 47 Part 22 (2012)
Disposal	Held Pending Disposal
Reference Number	Not Applicable
Date	Not Applicable
Order Number	9557
Date	27 February 2013
Start of Test	27 February 2013
Finish of Test	12 March 2013
Name of Engineer(s)	S Milliken G Lawler R Henley
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 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	Pass	
2.8	2.1055	22.355	Frequency Stability	Pass	



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### **1.3 PRODUCT TECHNICAL DESCRIPTION**

Please refer to the 204SH Model Description Form.

### **1.4 PRODUCT INFORMATION**

#### **1.4.1 Technical Description**

The Equipment Under Test (EUT) was a Sharp 204SH Quad-band WCDMA (FDD I / FDD V / FDD VIII / FDD XI) Cellular Phone with Bluetooth, WLAN 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 were made during testing.

### **1.7 MODIFICATION RECORD**

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



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## **SECTION 2**

### **TEST DETAILS**

FCC Testing of the  
Sharp 204SH Quad-band WCDMA (FDD I / FDD V / FDD VIII / FDD XI) Cellular Phone with  
Bluetooth, WLAN and GPS  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA)



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## 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

204SH S/N: IMEI 004401114727361 - Modification State 0

### 2.1.3 Date of Test

11 March 2013

### 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  $\pm 1$  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 WCDMA modulation schemes.

### 2.1.6 Environmental Conditions

Ambient Temperature	23.1°C
Relative Humidity	19.7%



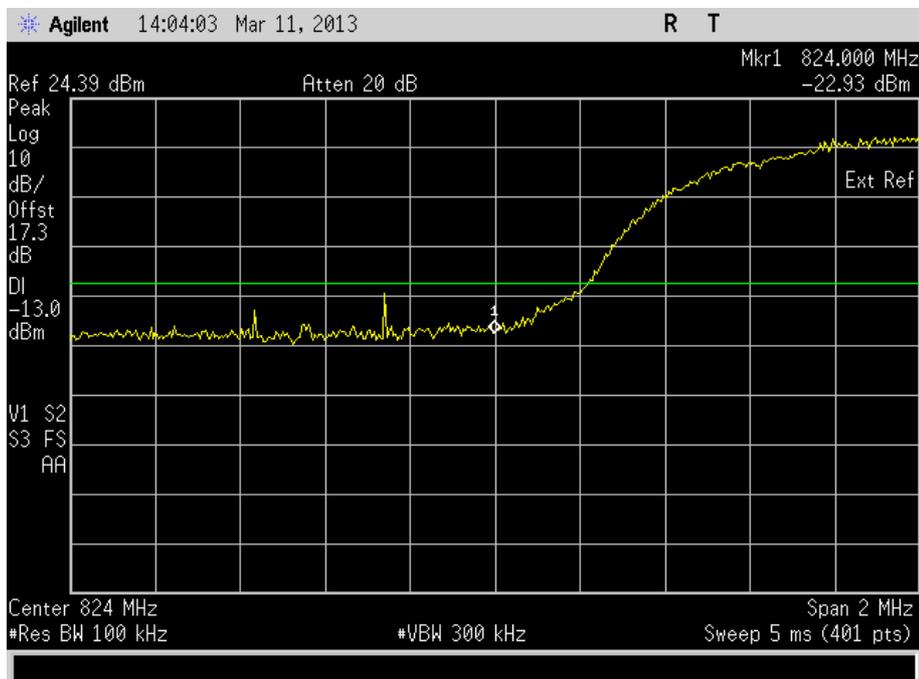
Product Service

2.1.7 Test Results

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 : 846.4 MHz

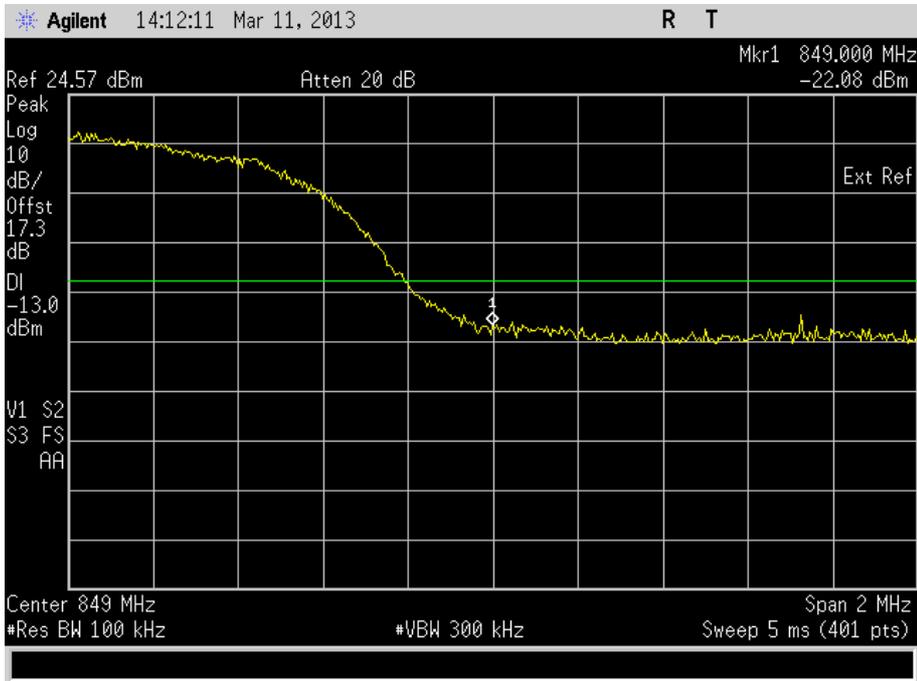
Frequency Block A





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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**

204SH S/N: IMEI 004401114727361 - Modification State 0

### **2.2.3 Date of Test**

27 February 2013

### **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	27.0%

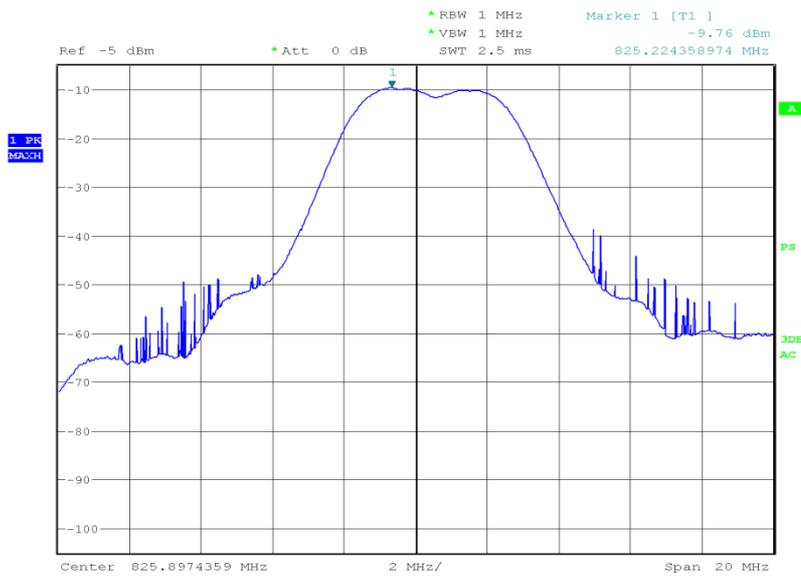


Product Service

2.2.7 Test Results

826.600 MHz

Result (dBm)	Result (W)
21.97	0.157



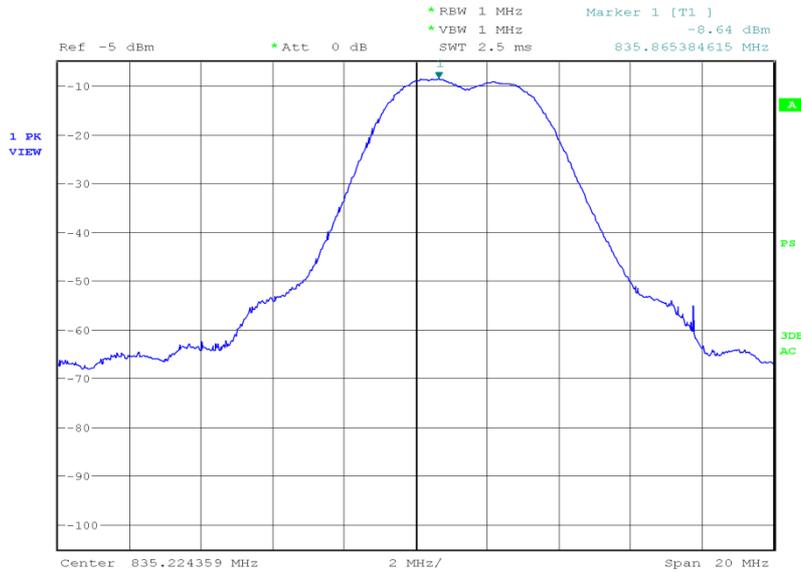
Date: 27.FEB.2013 18:10:34



Product Service

835.000 MHz

Result (dBm)	Result (W)
23.13	0.206



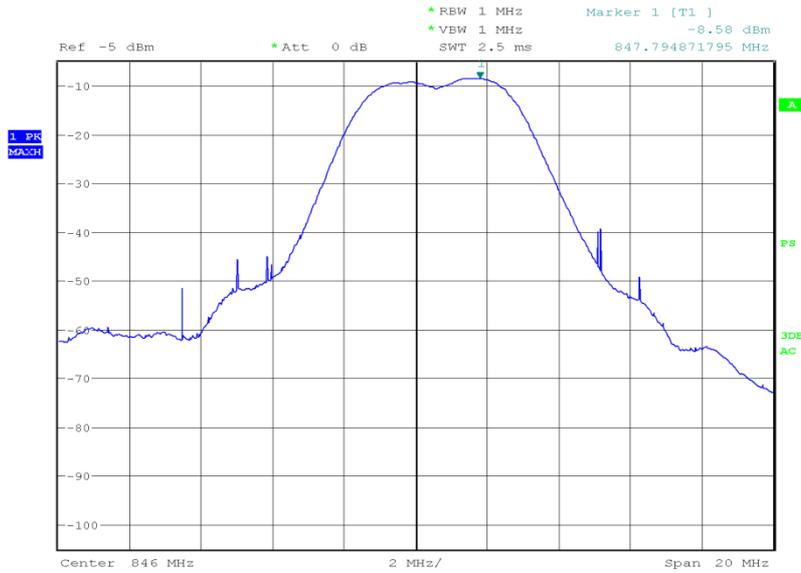
Date: 27.FEB.2013 18:18:51



Product Service

**846.400 MHz**

Result (dBm)	Result (W)
23.59	0.229



Date: 27.FEB.2013 18:22:31

**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**

204SH S/N: IMEI 004401114727387 - Modification State 0

### **2.3.3 Date of Test**

1 March 2013

### **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	22.8°C
Relative Humidity	28.2%



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**2.3.7 Test Results**

4.0 V DC Supply

826.600 MHz

Result (dBm)	Result (W)
26.82	0.481

835.000 MHz

Result (dBm)	Result (W)
28.65	0.733

846.400 MHz

Result (dBm)	Result (W)
28.06	0.640

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

204SH S/N: IMEI 004401114727361 - Modification State 0

### 2.4.3 Date of Test

27 February 2013

### 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

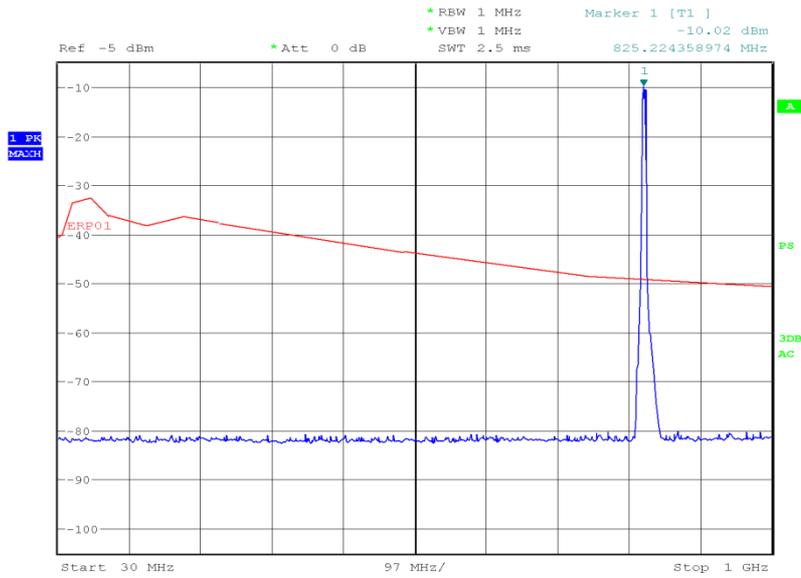
Ambient Temperature	19.3°C
Relative Humidity	27.0%



### 2.4.7 Test Results

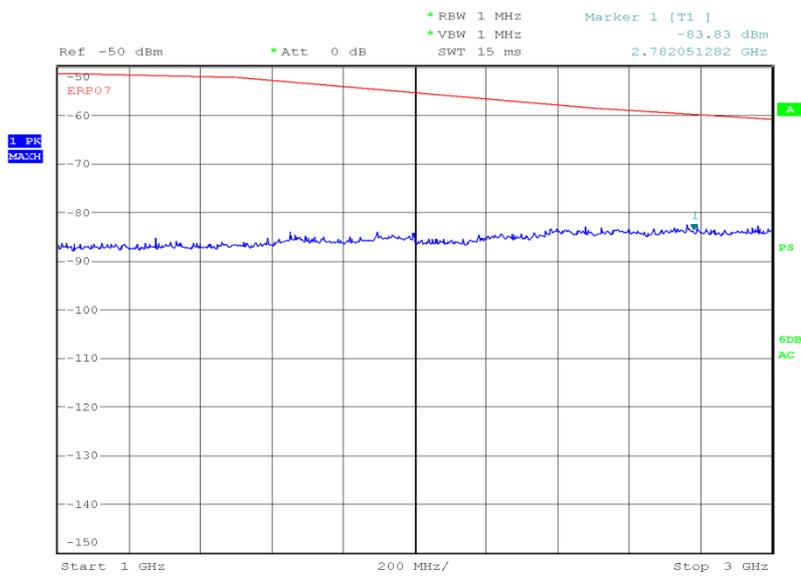
826.600 MHz

30 MHz to 1 GHz



Date: 27.FEB.2013 18:13:03

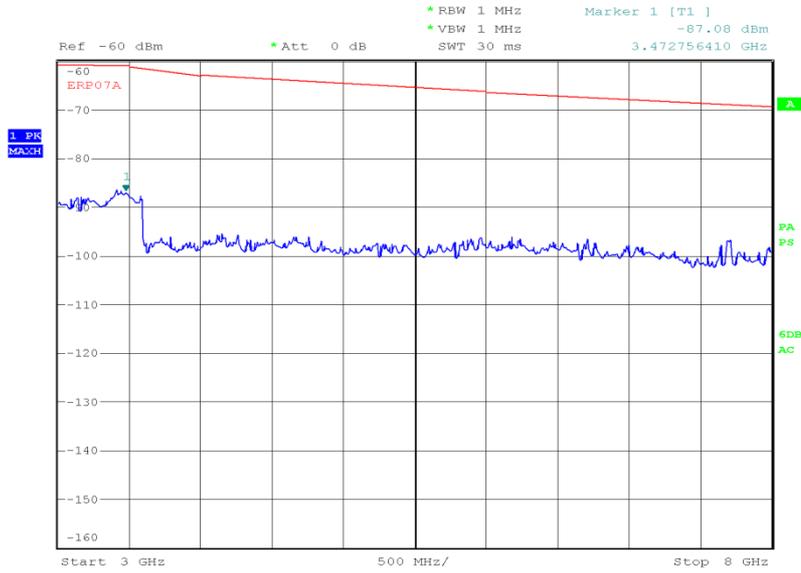
1GHz to 3GHz



Date: 27.FEB.2013 19:10:42

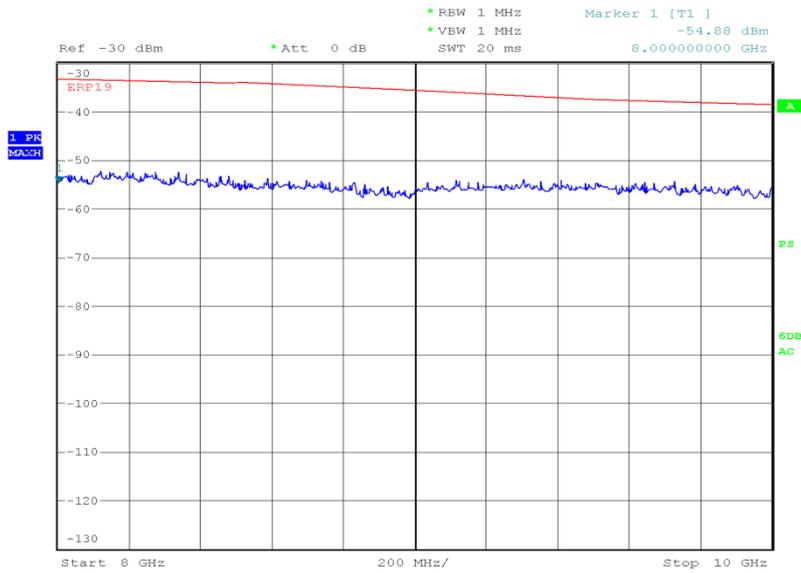


3GHz to 8GHz



Date: 27.FEB.2013 19:22:46

8GHz to 10 GHz

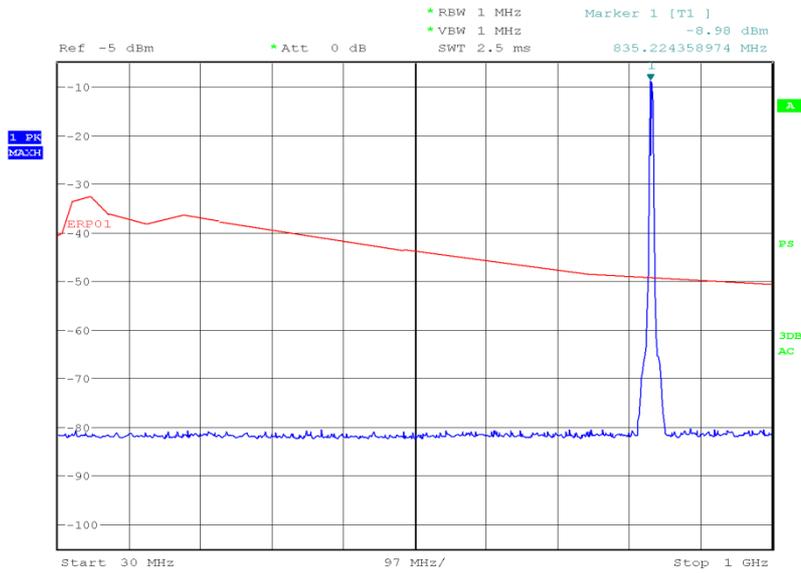


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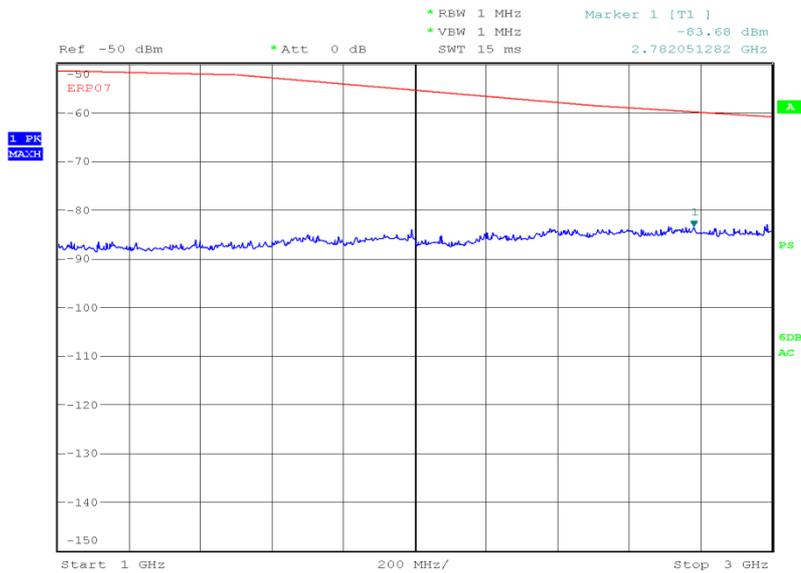
835.000 MHz

30 MHz to 1 GHz



Date: 27.FEB.2013 18:15:41

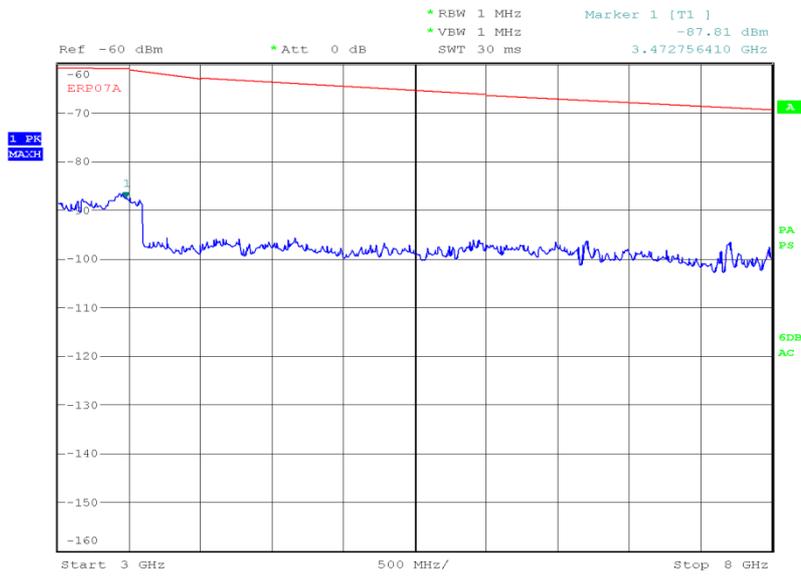
1GHz to 3GHz



Date: 27.FEB.2013 19:12:51

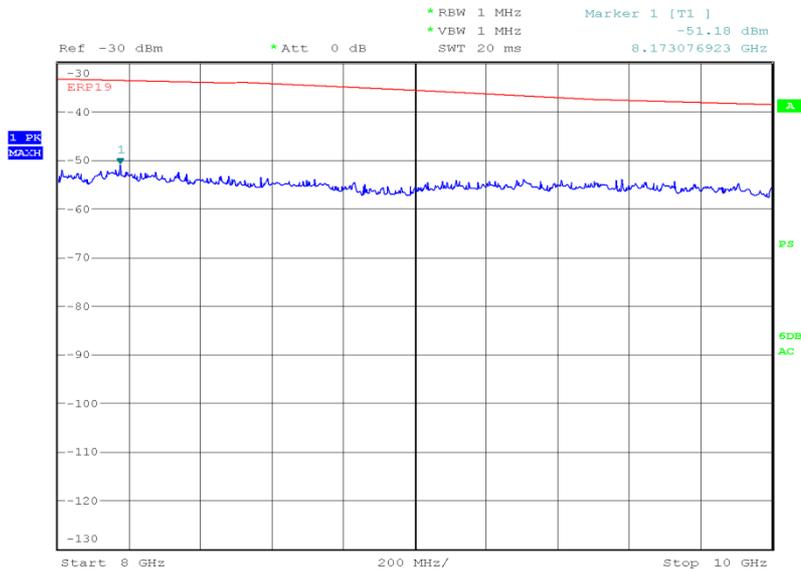


3GHz to 8GHz



Date: 27.FEB.2013 19:26:21

8GHz to 10 GHz

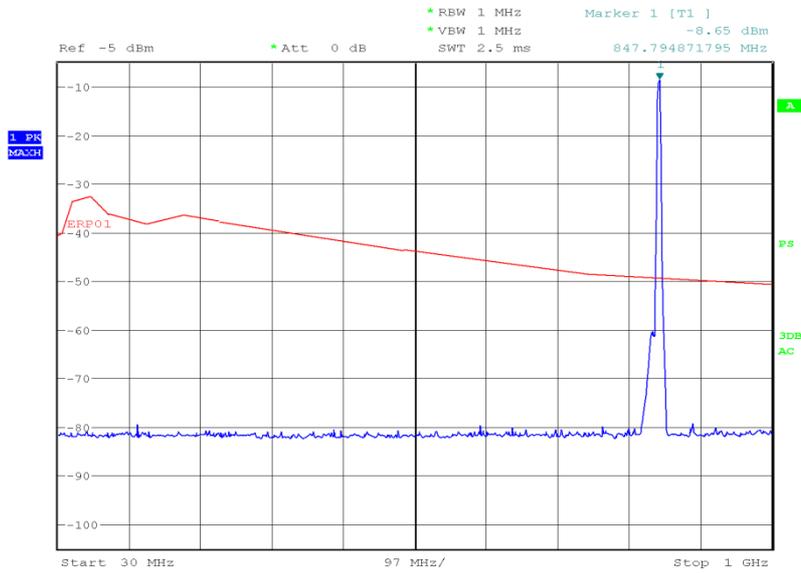


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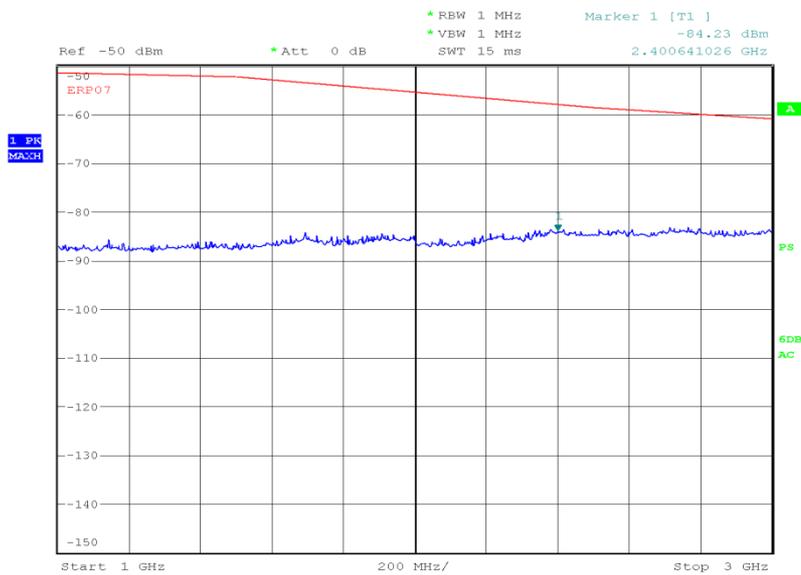
846.400 MHz

30 MHz to 1 GHz



Date: 27.FEB.2013 18:25:36

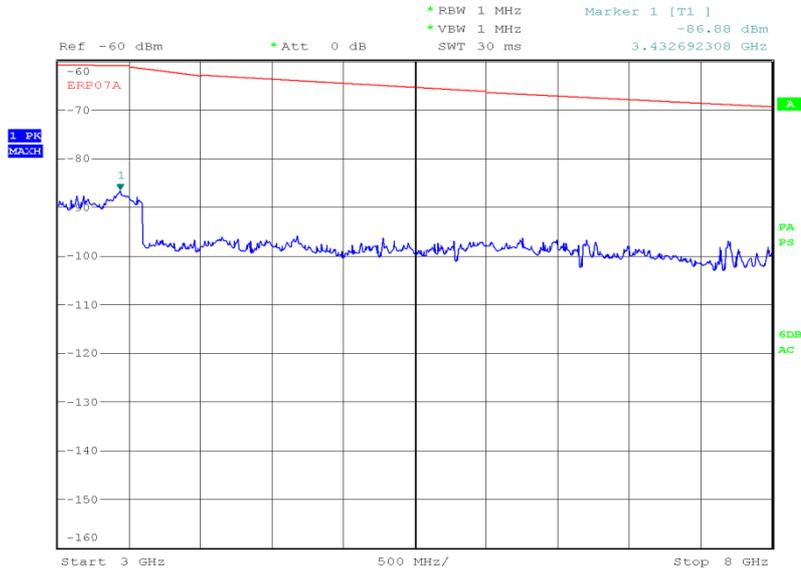
1GHz to 3GHz



Date: 27.FEB.2013 19:16:23

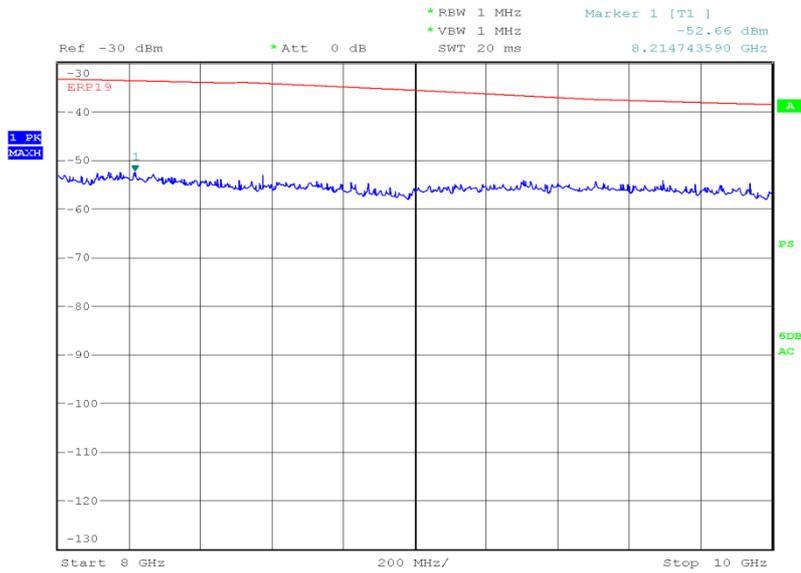


3GHz to 8GHz



Date: 27.FEB.2013 19:28:16

8GHz to 10 GHz



Date: 27.FEB.2013 19:46:44

Limit Clause

43+10log(P) or -13 dBm



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## **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**

204SH S/N: IMEI 004401114727361 - Modification State 0

### **2.5.3 Date of Test**

11 March 2013

### **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	23.1°C
Relative Humidity	19.7%

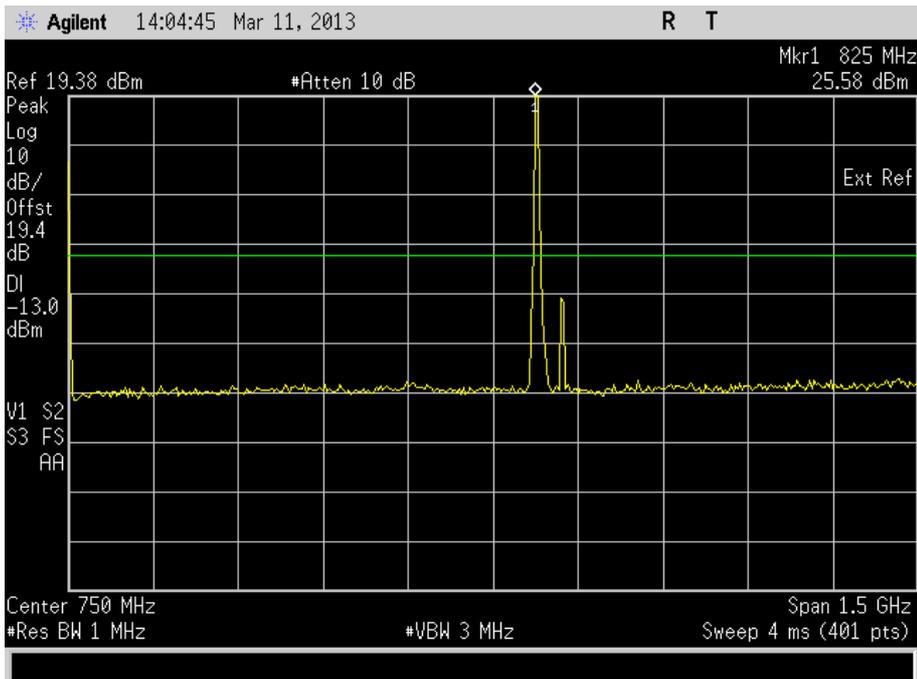


Product Service

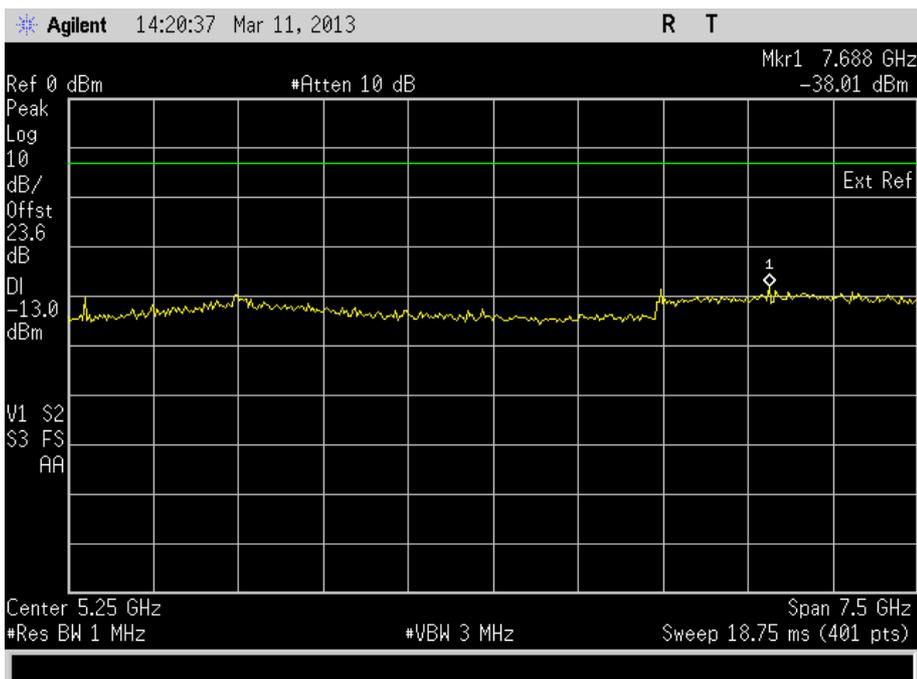
2.5.7 Test Results

826.600 MHz

9 kHz to 1.5 GHz



1.5 GHz to 9 GHz

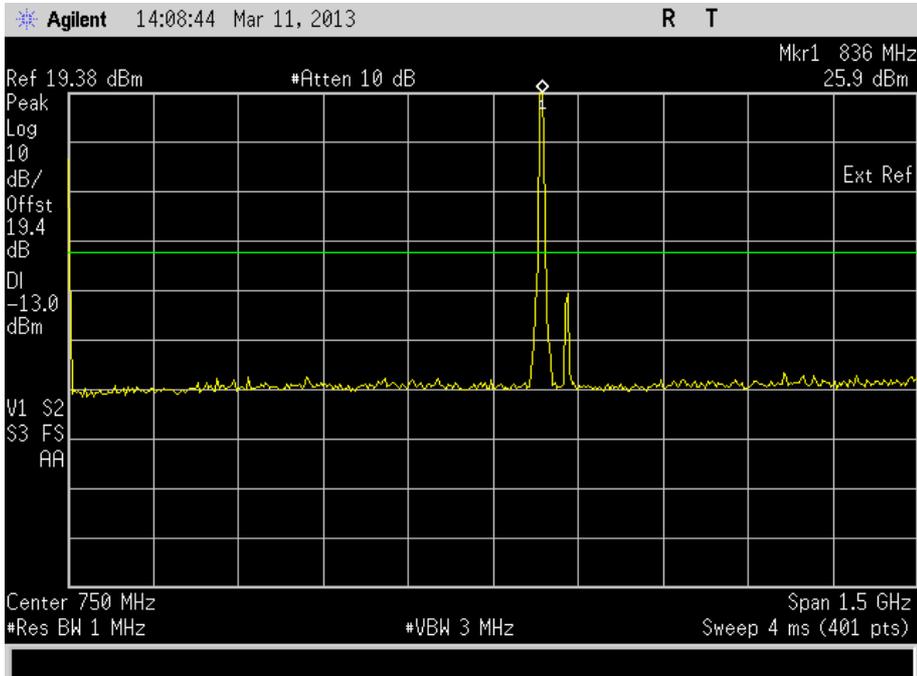




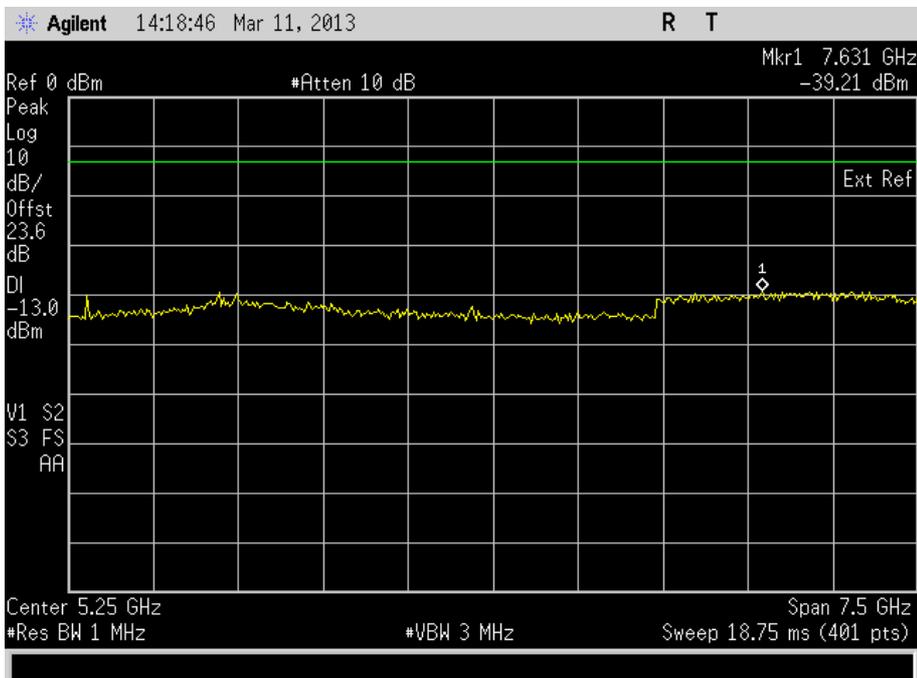
Product Service

835.000 MHz

9 kHz to 1.5 GHz



1.5 GHz to 9 GHz

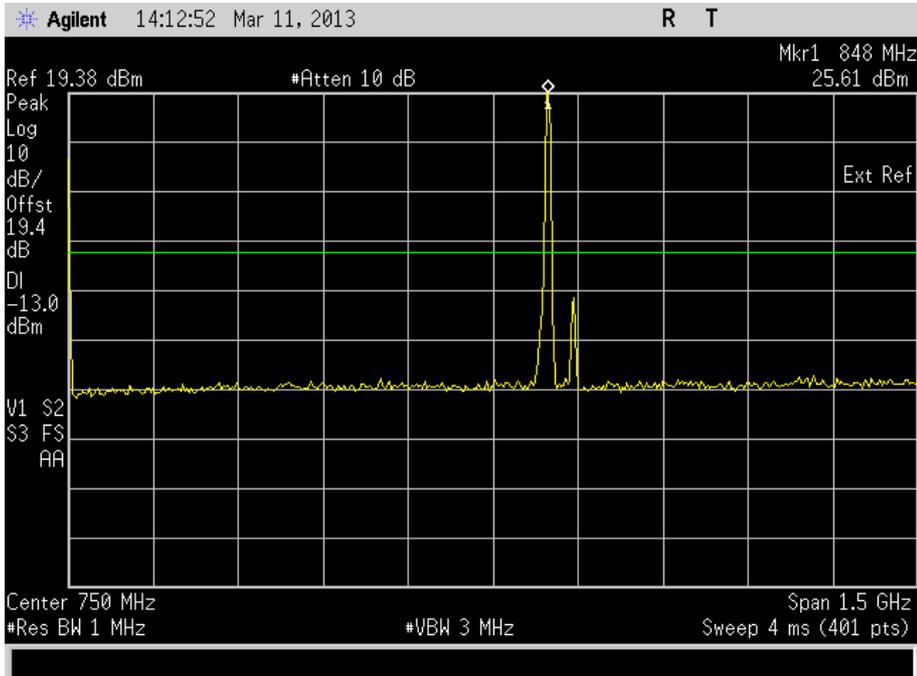




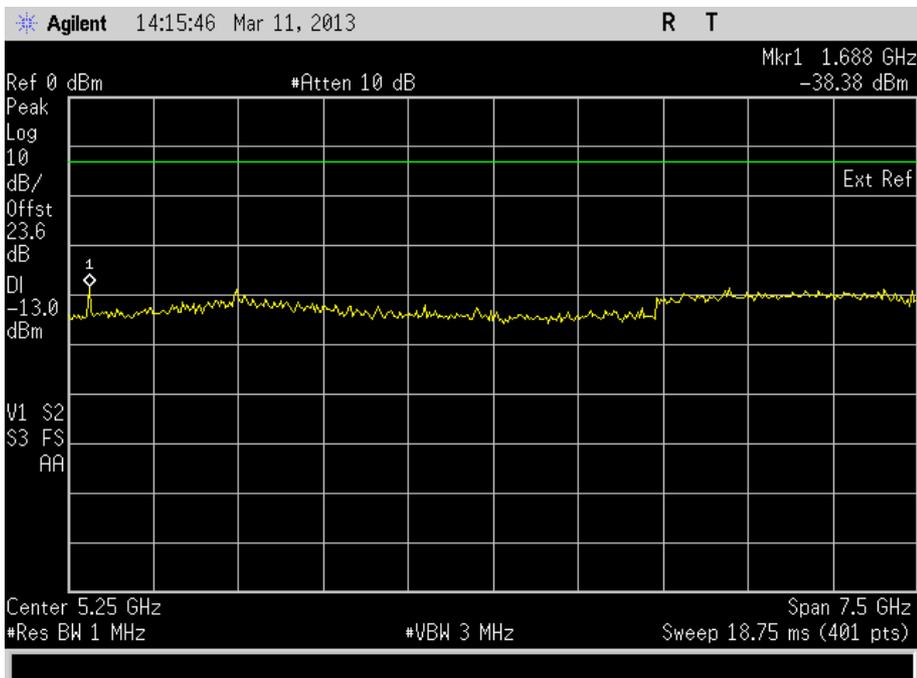
Product Service

846.400 MHz

9 kHz to 1.5 GHz



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

204SH S/N: IMEI 004401114727361 - Modification State 0

### 2.6.3 Date of Test

11 March 2013

### 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	23.1°C
Relative Humidity	19.7%



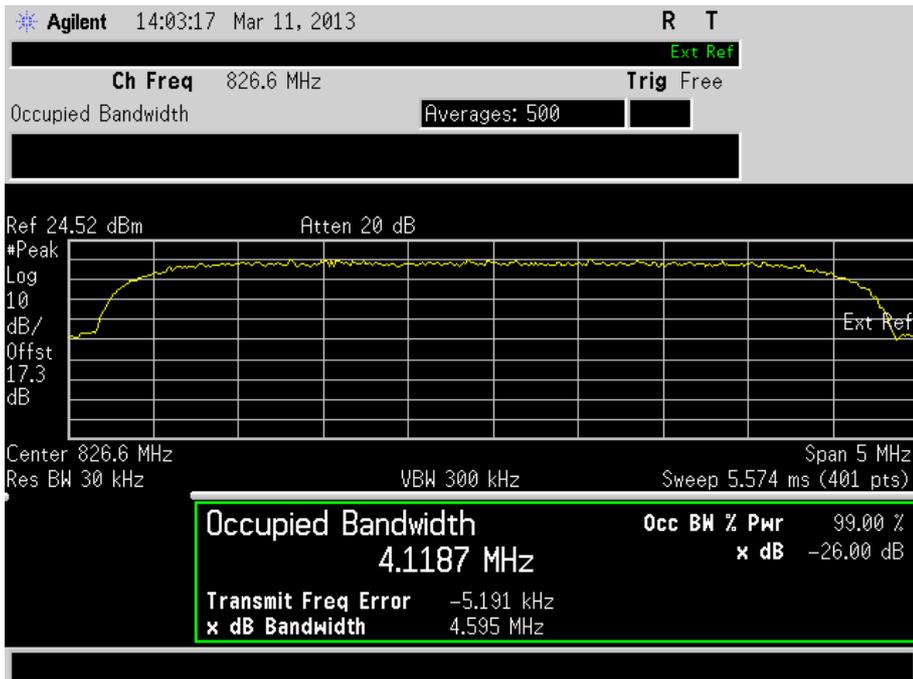
Product Service

**2.6.7 Test Results**

4.0 V DC Supply

826.600 MHz

Occupied Bandwidth (kHz)
4118.656

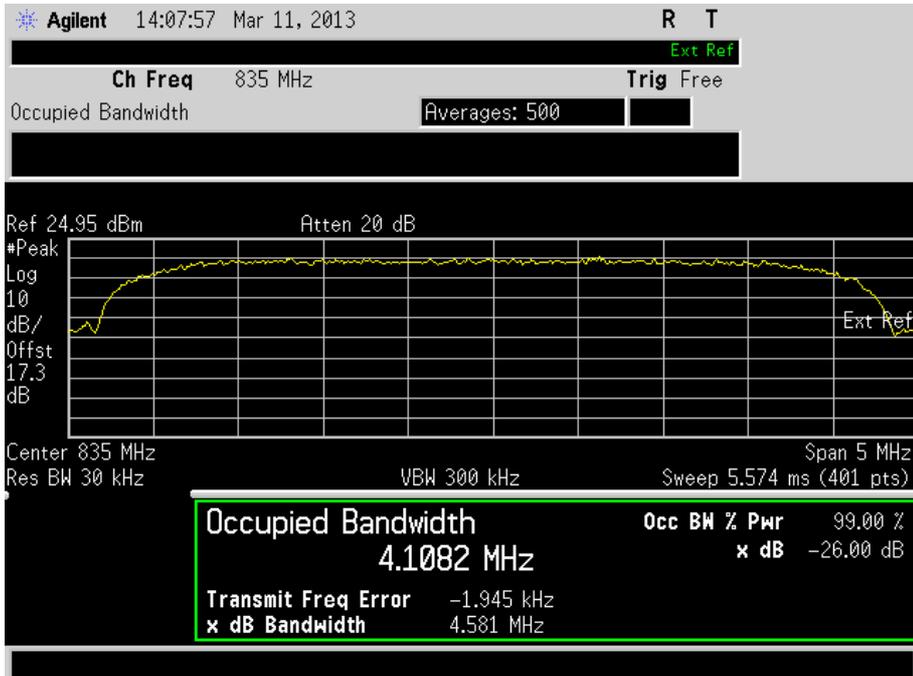




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835.000 MHz

Occupied Bandwidth (kHz)
4108.198

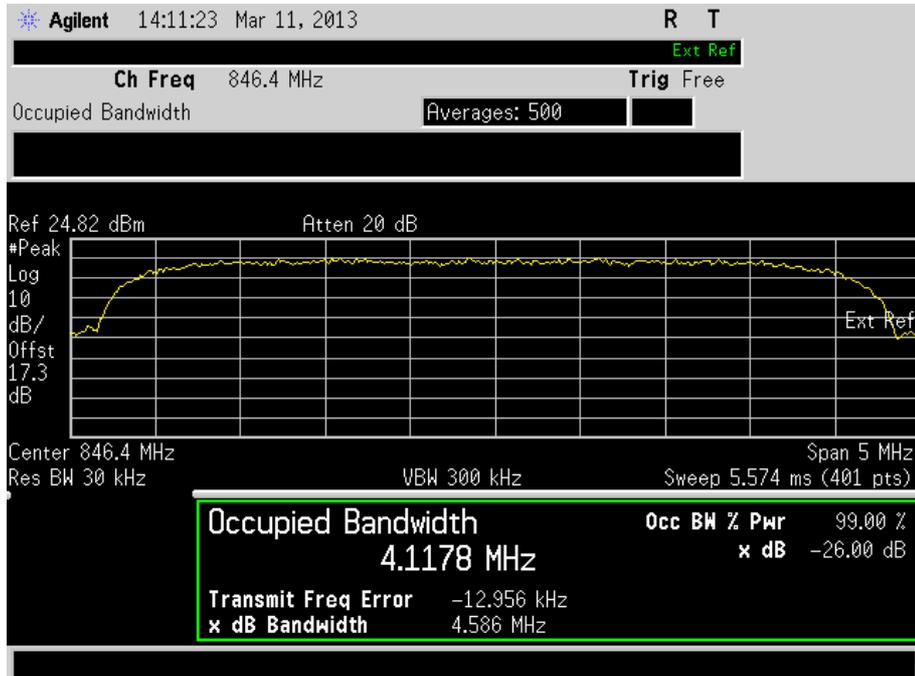




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846.400 MHz

Occupied Bandwidth (kHz)
4117.831



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.



**2.7 MODULATION CHARACTERISTICS**

**2.7.1 Specification Reference**

FCC CFR 47 Part 2, Clause 2.1047 (d)

**2.7.2 Equipment Under Test**

204SH

**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**

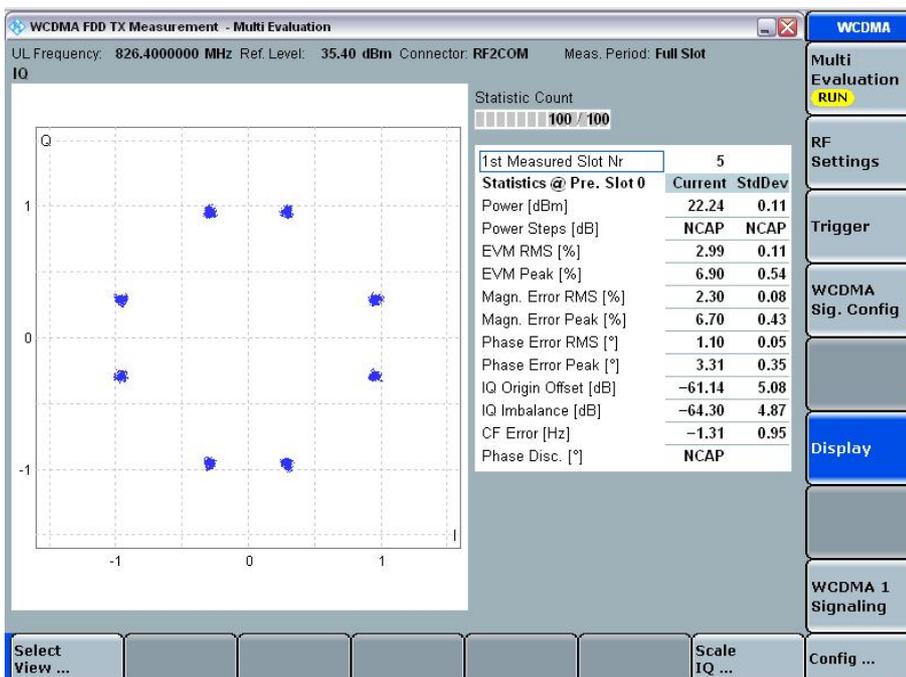
For the period of test the EUT met the requirements of FCC CFR 47 Part 2 for Modulation Characteristics.

The test results are shown below.

4.0 V DC Supply

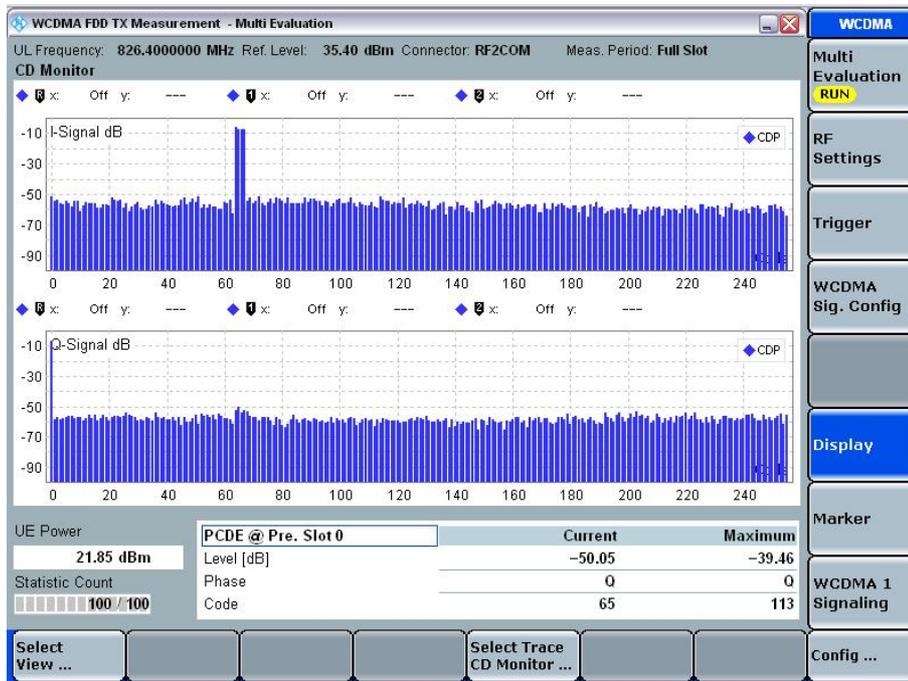
QPSK

Constellation Diagram

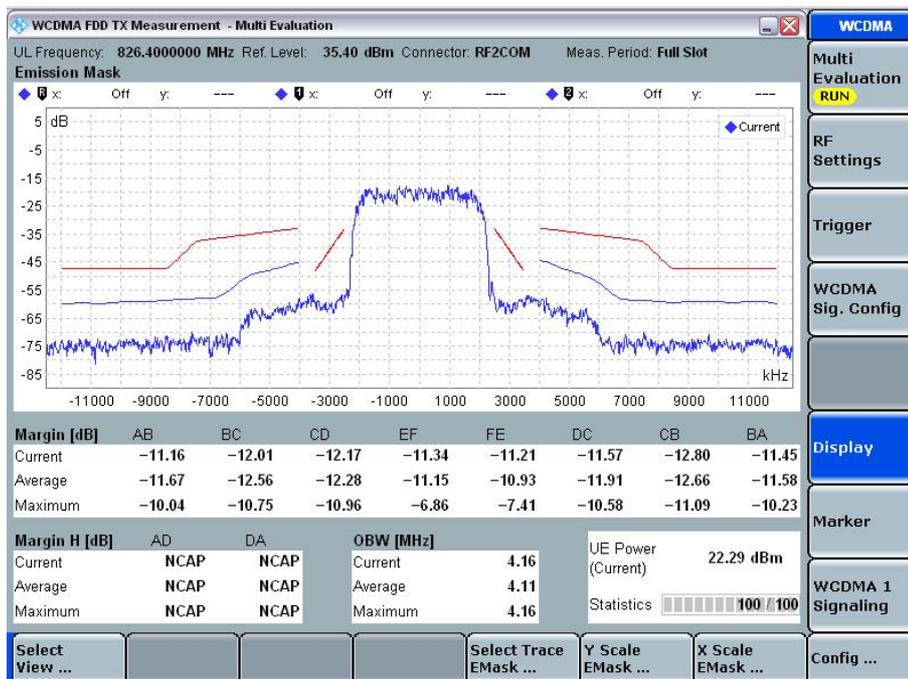




I and Q Code Domain



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.



Product Service

## **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**

204SH S/N: IMEI 004401114727361 - Modification State 0

### **2.8.3 Date of Test**

11 March 2013

### **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	18.0°C
Relative Humidity	22.2%



Product Service

**2.8.7 Test Results**

Temperature Interval (°C)	Deviation (ppm)
-30	-0.0204
-20	-0.0240
-10	-0.0323
0	-0.0323
+10	-0.0323
+20	-0.0311
+30	-0.0275
+40	-0.0287
+50	-0.0323

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

835.000 MHz

DC Voltage (V)	Deviation (ppm)
4.0 V DC	-0.0311
3.7 V DC	-0.0299
4.0 V DC	-0.0311

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
<b>Section 2.1 – Spurious Emissions at Band Edge</b>					
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Communications Tester	Rohde & Schwarz	CMU 200	442	12	1-Nov-2013
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	23-Jul-2013
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	11-Dec-2013
Combiner/Splitter	Weinschel	1506A	3877	12	19-Mar-2013
<b>Section 2.2 – Effective Radiated Power</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	9-Nov-2013
Communications Tester	Rohde & Schwarz	CMU 200	442	12	1-Nov-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	24-May-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	1-Feb-2014
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	24-Aug-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	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
<b>Section 2.3 – Maximum Peak Output Power - Conducted</b>					
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Communications Tester	Rohde & Schwarz	CMU 200	442	12	1-Nov-2013
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
Multimeter	Isotech	IDM101	2424	12	10-Sep-2013
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	11-Dec-2013
Combiner/Splitter	Weinschel	1506A	3877	12	19-Mar-2013
2 Meter N Type Cable	Rhophase	NPS-1601A-2000- NPS	4109	12	01-Jun-2013



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.4- Emission Limitations for Cellular Equipment</b>					
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	9-Nov-2013
Communications Tester	Rohde & Schwarz	CMU 200	442	12	1-Nov-2013
Pre-Amplifier	Phase One	PSO4-0087	1534	12	28-Sep-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	10-Jul-2013
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	10-Jul-2013
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	29-May-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	1-Feb-2014
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	1-Feb-2014
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
1 metre, SMA to SMA	Suhner	Sucoflex armoured cable	4048	-	O/P Mon
<b>Section 2.5 - Conducted Spurious Emissions</b>					
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Communications Tester	Rohde & Schwarz	CMU 200	442	12	1-Nov-2013
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	18-Oct-2013
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	23-Jul-2013
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	30-Nov-2013
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	1-Feb-2014
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	11-Dec-2013
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	31-Aug-2013
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3694	12	25-Oct-2013
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3695	12	15-Oct-2013
Combiner/Splitter	Weinschel	1506A	3877	12	19-Mar-2013
1 Metre K Type Cable	Rhophase	KPS-1501A-1000-KPS	4106	12	25-Oct-2013
<b>Section 2.6- Occupied Bandwidth</b>					
Multimeter	White Gold	WG022	190	12	30-Oct-2013
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Communications Tester	Rohde & Schwarz	CMU 200	442	12	1-Nov-2013
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	18-Oct-2013
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	23-Jul-2013
Programmable Power Supply	Iso-tech	IPS 2010	2436	-	TU
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	11-Dec-2013
Power Divider	Weinschel	1506A	3345	12	8-May-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	31-Aug-2013
Combiner/Splitter	Weinschel	1506A	3877	12	19-Mar-2013
P-Series Power Meter	Agilent	N1911A	3980	12	17-Sep-2013
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	17-Sep-2013
1 Metre K Type Cable	Rhophase	KPS-1501A-1000-KPS	4106	12	25-Oct-2013
2 Metre N Type Cable	Rhophase	NPS-1601A-2000-NPS	4110	12	1-Jun-2013



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.7 – Frequency Stability</b>					
Communications Tester	Rohde & Schwarz	CMU 200	442	12	1-Nov-2013
Temperature Chamber	Montford	2F3	467	-	O/P Mon

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



Product Service

## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



Product Service

#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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