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## Report On

FCC Testing of the Sharp Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDDI, FDDV) & Tri-band LTE (B1, B11, B26) multi mode cellular phone with Bluetooth, WLAN, SRD (FeliCa) and GPS  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA FDD V)

COMMERCIAL-IN-CONFIDENCE  
FCC ID: APYHRO00215

Document 75928270 Report 10 Issue 1

January 2015



Product Service

TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,  
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COMMERCIAL-IN-CONFIDENCE

**REPORT ON**

FCC Testing of the Sharp Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDDI, FDDV) & Tri-band LTE (B1, B11, B26) multi mode cellular phone with Bluetooth, WLAN, SRD (FeliCa) and GPS  
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Document 75928270 Report 10 Issue 1

January 2015

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Authorised Signatory

**DATED**

14 January 2015

**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);

G Lawler

M Russell

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## **SECTION 1**

### **REPORT SUMMARY**

FCC Testing of the  
Sharp Dual-band CDMA (BC0, BC6) & Quad-band GSM  
(GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDDI, FDDV) & Tri-band LTE  
(B1, B11, B26) multi mode cellular phone with Bluetooth, WLAN, SRD (FeliCa) and GPS  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA FDD V)



Product Service

## 1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the Sharp Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDDI, FDDV) & Tri-band LTE (B1, B11, B26) multi mode cellular phone with Bluetooth, WLAN, SRD (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
Serial Number(s)	IMEI 004401115346682 IMEI 004401115348555
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2013) FCC CFR 47 Part 22 (2013)
Disposal	Held Pending Disposal
Reference Number	Not Applicable
Date	Not Applicable
Order Number	10330
Date	20 October 2014
Start of Test	5 December 2014
Finish of Test	21 December 2014
Name of Engineer(s)	G Lawler M Russell
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)	Emission Bandwidth	Pass	
2.7	2.1047 (d)	-	Modulation Characteristics	-	Customer Declaration
2.8	2.1055	22.355	Frequency Stability	Pass	



Product Service

### **1.3 PRODUCT TECHNICAL DESCRIPTION**

Please refer to the Model Description Form, reference FCC ID: APYHRO00215.

### **1.4 PRODUCT INFORMATION**

#### **1.4.1 Technical Description**

The Equipment Under Test (EUT) was a Sharp Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDDI, FDDV) & Tri-band LTE (B1, B11, B26) multi mode cellular phone with Bluetooth, WLAN, SRD (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 Measurement Facility Registration Number  
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 Dual-band CDMA (BC0, BC6) & Quad-band GSM  
(GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDDI, FDDV) & Tri-band LTE  
(B1, B11, B26) multi mode cellular phone with Bluetooth, WLAN, SRD (FeliCa) and GPS  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA FDD V)





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**

S/N: IMEI 004401115346682 - Modification State 0

### **2.1.3 Date of Test**

17 December 2014

### **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**

Measurements were performed in accordance with KDB 971168 v02r02 clause 6.

The EUT was connected to a spectrum analyser via a cable, combiner and attenuator. The other port of the combiner was connected to a communications test set which was configured with a 12.2 kbps RMC connection at maximum output power. The path loss was calibrated using a vector network analyser and was entered as a reference level offset on the spectrum analyser. Using a peak detector and max hold with an RBW not less than 1% of the emission bandwidth, it was verified that all emissions within the first 1 MHz immediately adjacent to the authorized bandwidth were below  $43 + 10 \log(P)$ .

### **2.1.6 Environmental Conditions**

Ambient Temperature	23.3°C
Relative Humidity	36.2%

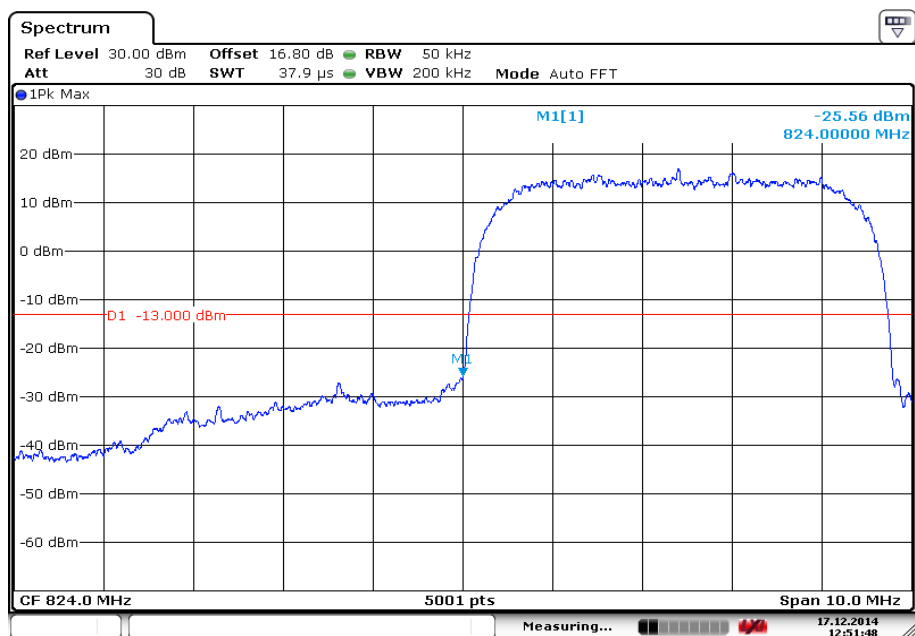


## 2.1.7 Test Results

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)	WCDMA	Channel : 4132 Frequency : 826.4 MHz	N/A
B : (846.5 – 849.0)	WCDMA	N/A	Channel : 4233 Frequency : 846.6 MHz

### Frequency Block A

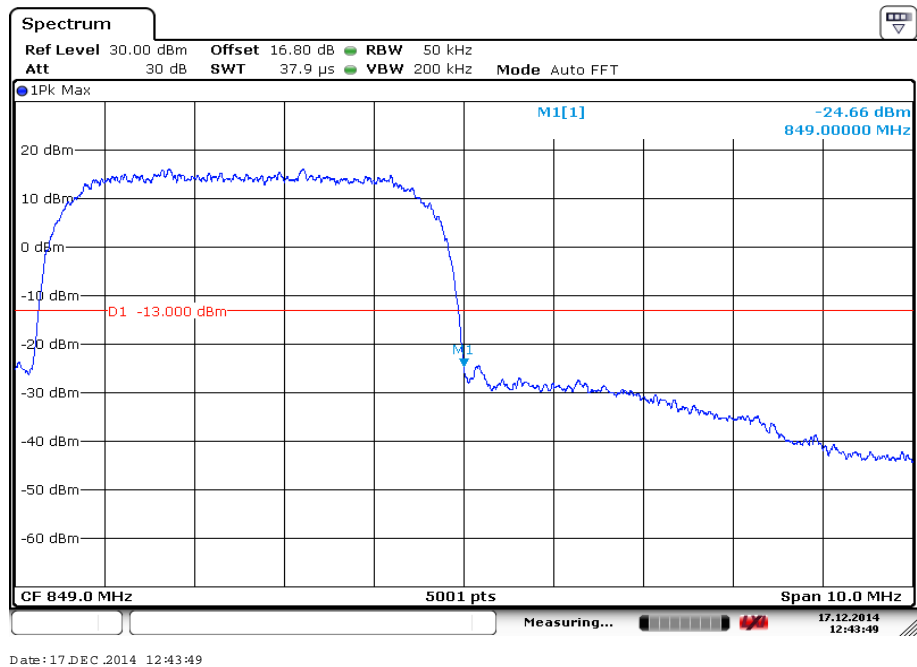


Date: 17 DEC 2014 12:51:48



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**

S/N: IMEI 004401115348555 - Modification State 0

### **2.2.3 Date of Test**

21 December 2014

### **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	20.8°C
Relative Humidity	33.0%



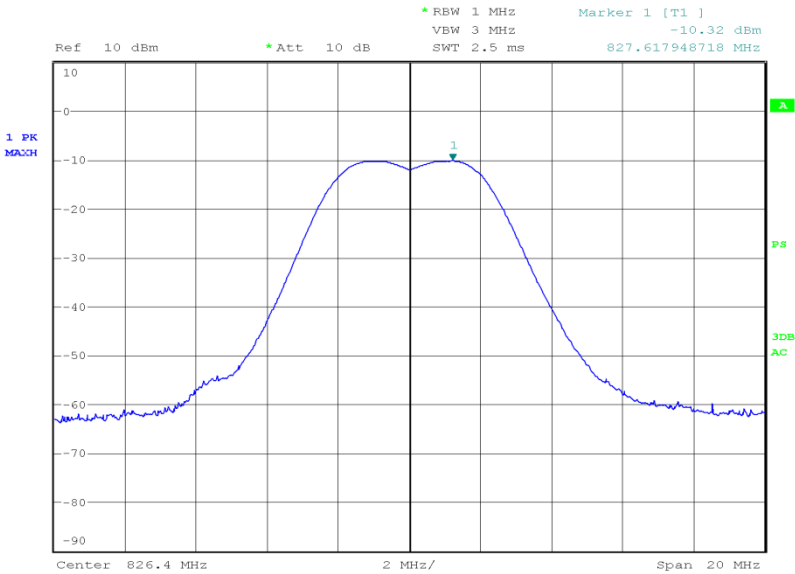
Product Service

2.2.7 Test Results

4.0 V DC Supply

826.40 MHz

Result (dBm)	Result (W)
24.59	0.288



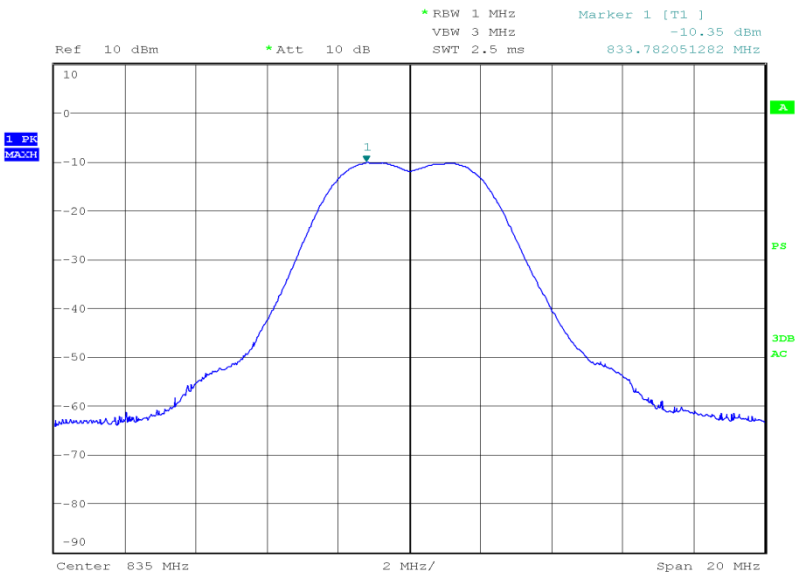
Date: 21.DEC.2014 12:11:59



Product Service

835.00 MHz

Result (dBm)	Result (W)
24.30	0.269



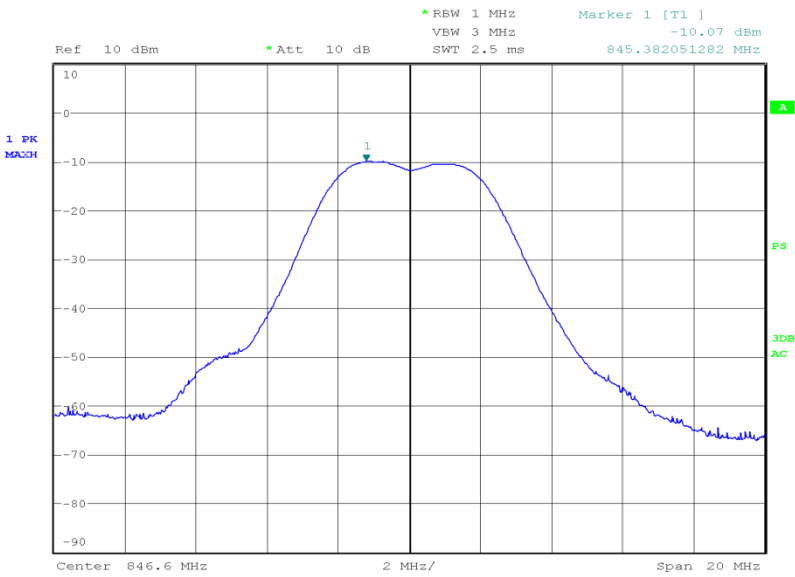
Date: 21.DEC.2014 12:26:44



Product Service

846.60 MHz

Result (dBm)	Result (W)
24.42	0.277



Date: 21.DEC.2014 12:29:52

Limit Clause

Mobile – 7 W or 38.45 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**

S/N: IMEI 004401115346682 - Modification State 0

### **2.3.3 Date of Test**

5 December 2014

### **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**

This test was performed with the test method requirements as stated in KDB 971168 D01 v02r01 clause 5.1.2.

The EUT was connected to a broadband peak power meter via a cable, combiner and attenuator. The other port of the combiner was connected to a communications test set which was configured with a 12.2 kbps RMC at maximum output power. The path loss was calibrated using a vector network analyser and was entered as an offset on the power meter. The peak power was then recorded as shown in the table below.

### **2.3.6 Environmental Conditions**

Ambient Temperature	22.5°C
Relative Humidity	30.1%





Product Service

**2.3.7 Test Results**

4.0 V DC Supply

826.40 MHz

Mode	Result (dBm)	Result (W)
WCDMA	26.85	0.484

835.00 MHz

Mode	Result (dBm)	Result (W)
WCDMA	26.41	0.438

846.60 MHz

Mode	Result (dBm)	Result (W)
WCDMA	26.39	0.436

Limit Clause

Mobile – 7 W or 38.45 dBm



Product Service

## **2.4 EMISSION LIMITATIONS FOR CELLULAR EQUIPMENT**

### **2.4.1 Specification Reference**

FCC CFR 47 Part 2 and FCC CFR 47 Part 22, Clause 22.917

### **2.4.2 Equipment Under Test and Modification State**

S/N: IMEI 004401115348555 - Modification State 0

### **2.4.3 Date of Test**

21 December 2014

### **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 on the bottom, middle and top channels.

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	20.8°C
Relative Humidity	33.0%

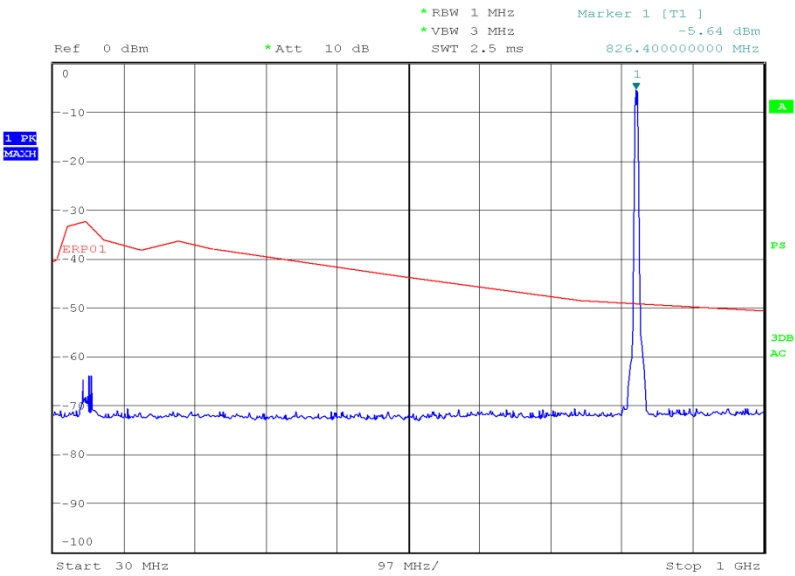


Product Service

2.4.7 Test Results

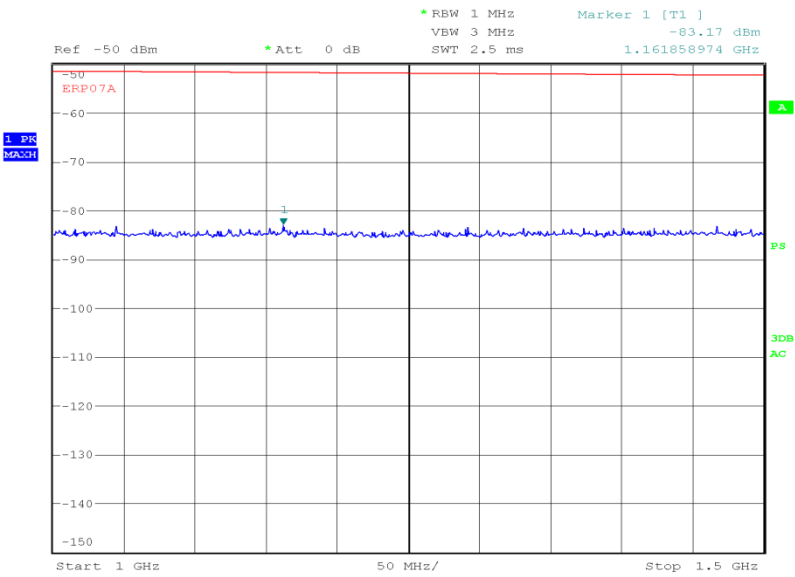
826.40 MHz

30 MHz to 1 GHz



Date: 21.DEC.2014 15:17:34

1 GHz to 1.5 GHz

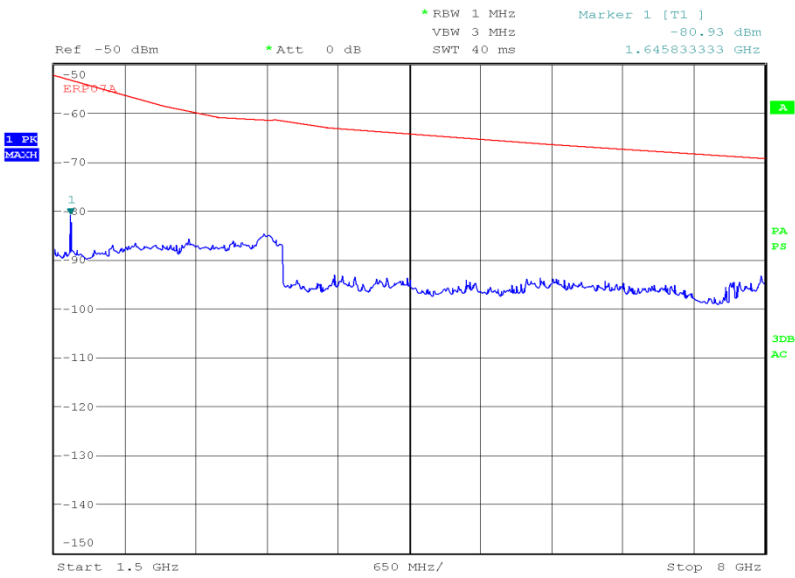


Date: 21.DEC.2014 12:37:54



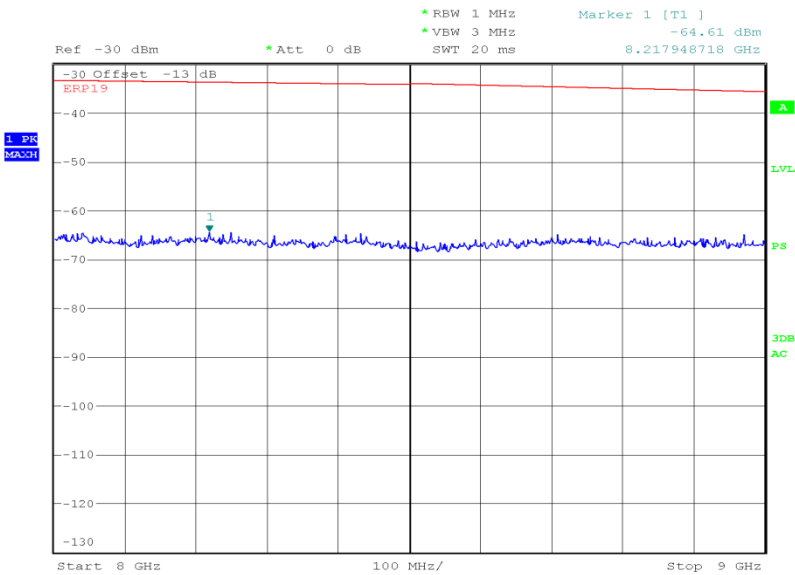
Product Service

1.5 GHz to 8 GHz



Date: 21.DEC.2014 12:39:58

8 GHz to 9 GHz



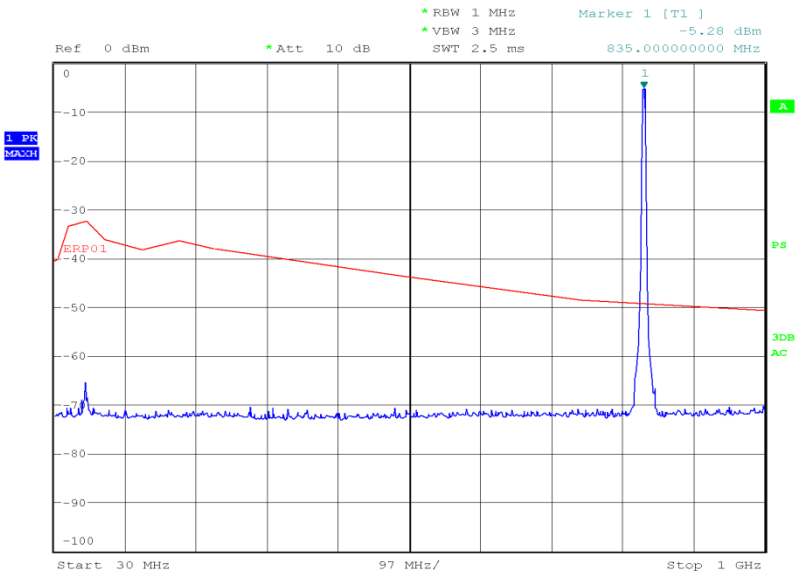
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Product Service

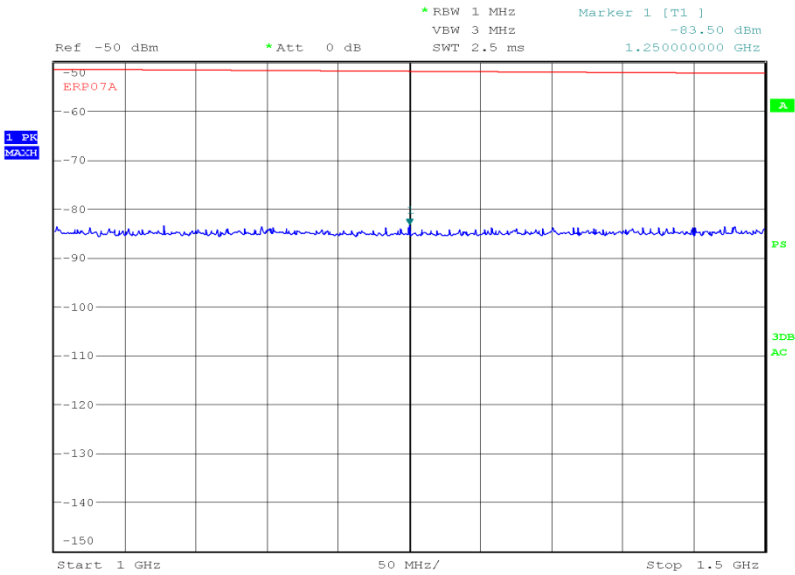
835.00 MHz

30 MHz to 1 GHz



Date: 21.DEC.2014 15:19:27

1 GHz to 1.5 GHz



Date: 21.DEC.2014 12:35:06

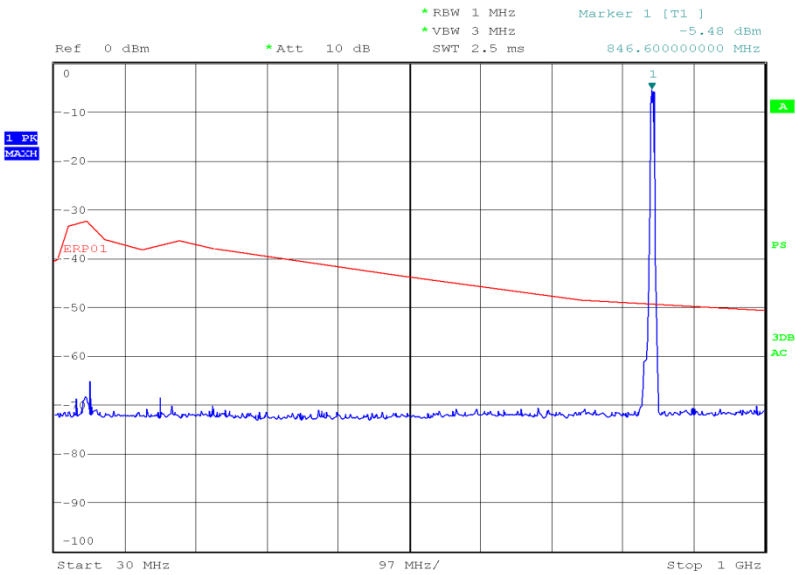




Product Service

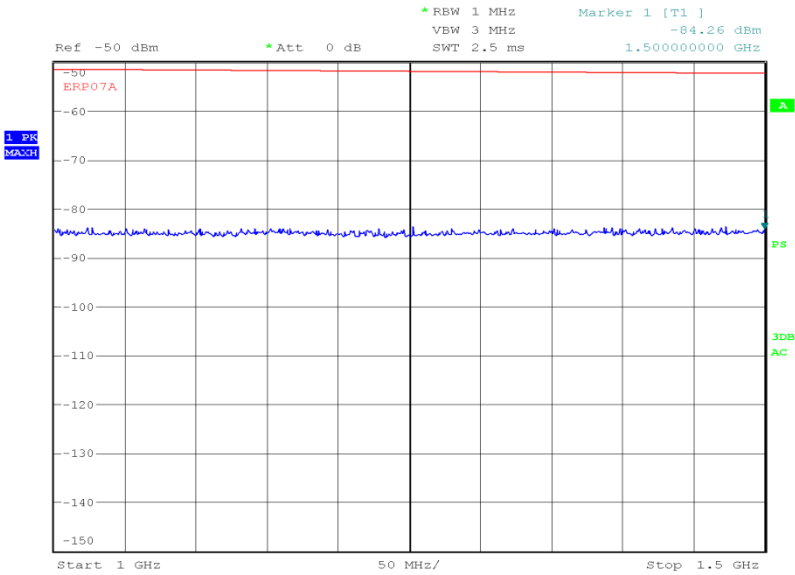
846.60 MHz

30 MHz to 1 GHz



Date: 21.DEC.2014 15:21:47

1 GHz to 1.5 GHz

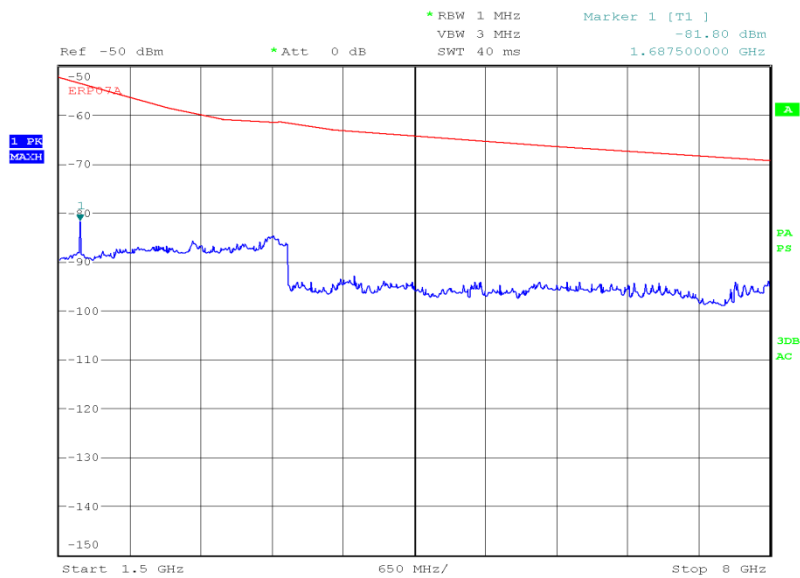


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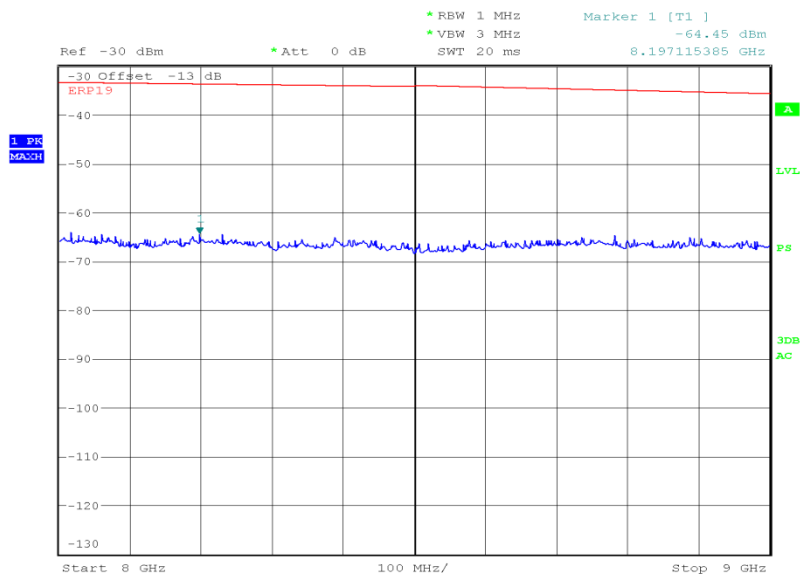
Product Service

### 1.5 GHz to 8 GHz



Date: 21.DEC.2014 12:44:26

### 8 GHz to 9 GHz



Date: 21.DEC.2014 15:34:54

### 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**

S/N: IMEI 004401115346682 - Modification State 0

### **2.5.3 Date of Test**

17 December 2014

### **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**

Measurements were performed in accordance with KDB 971168 v02r02 clause 6.

The EUT was connected to a spectrum analyser via a cable, combiner and attenuator, additionally between 1.5GHz and 9GHz a 1.5GHz high pass filter was used. The other port of the combiner was connected to a communications test set which was configured with a 12.2 kbps RMC connection at maximum output power. The path loss was calibrated using a vector network analyser and the value with the highest loss for the frequency range of interest was entered as a reference level offset on the spectrum analyser. The RBW was configured with an RBW of 100 kHz using a peak detector and max hold trace.

### **2.5.6 Environmental Conditions**

Ambient Temperature	23.3°C
Relative Humidity	36.8%



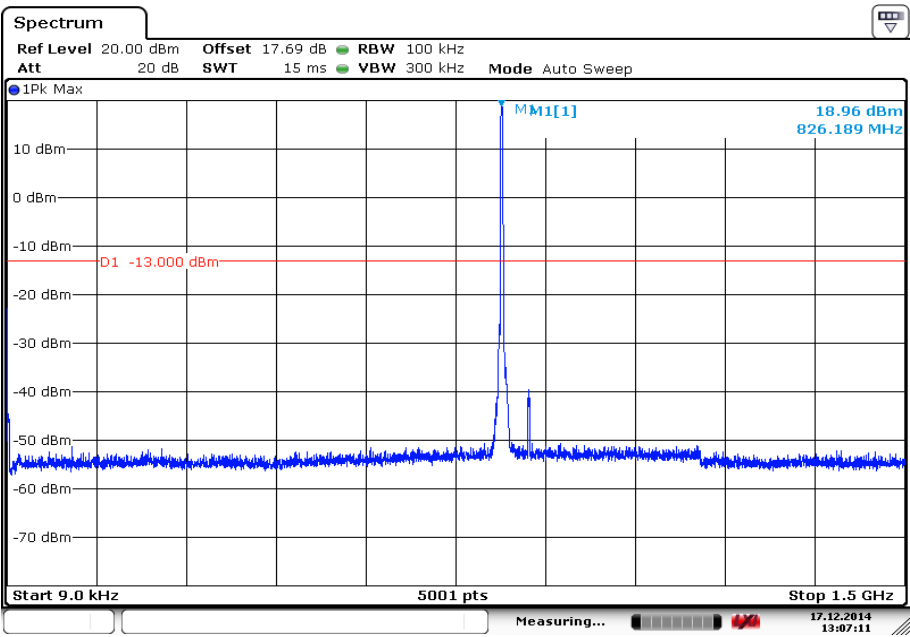
Product Service

2.5.7 Test Results

4.0 V DC Supply

826.40 MHz

9 kHz to 1.5 GHz

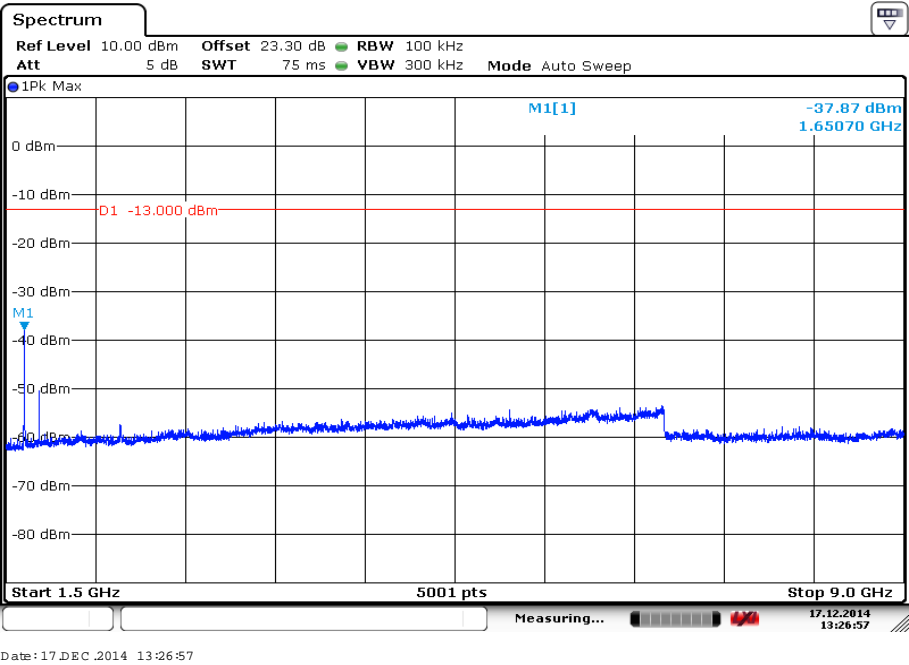


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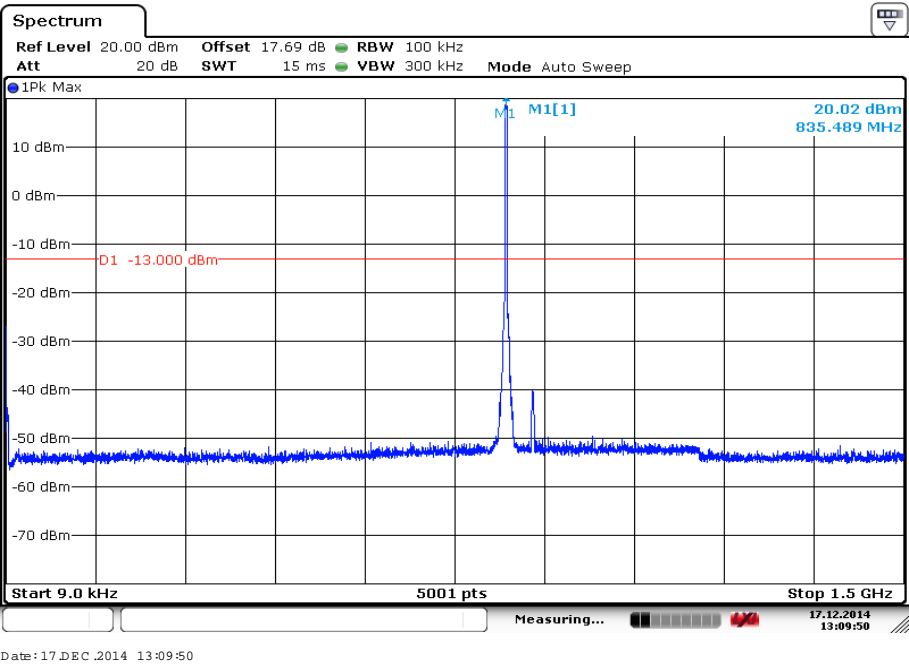
Product Service

1.5 GHz to 9 GHz



835.00 MHz

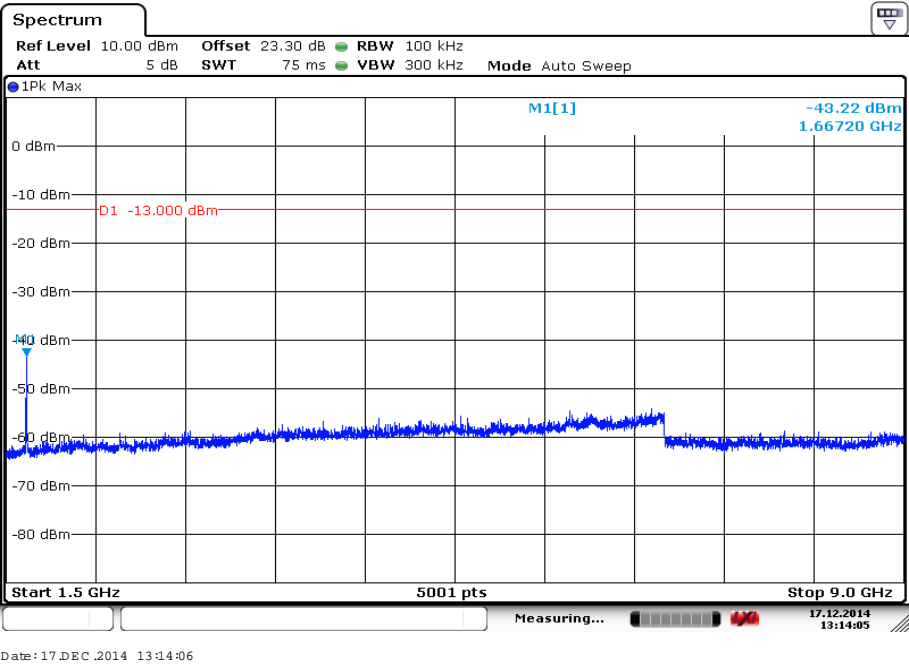
9 kHz to 1.5 GHz





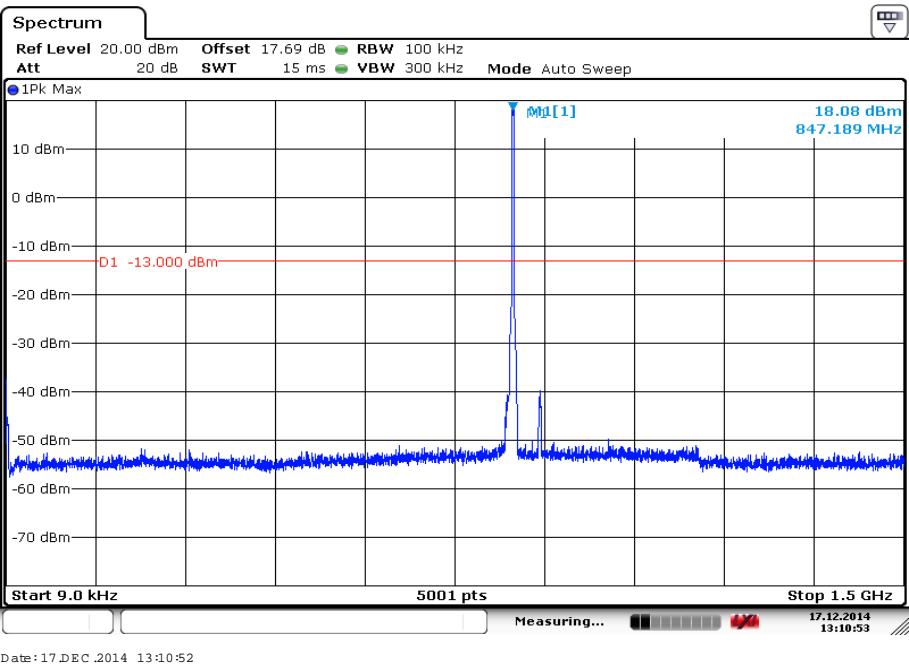
Product Service

1.5 GHz to 9 GHz



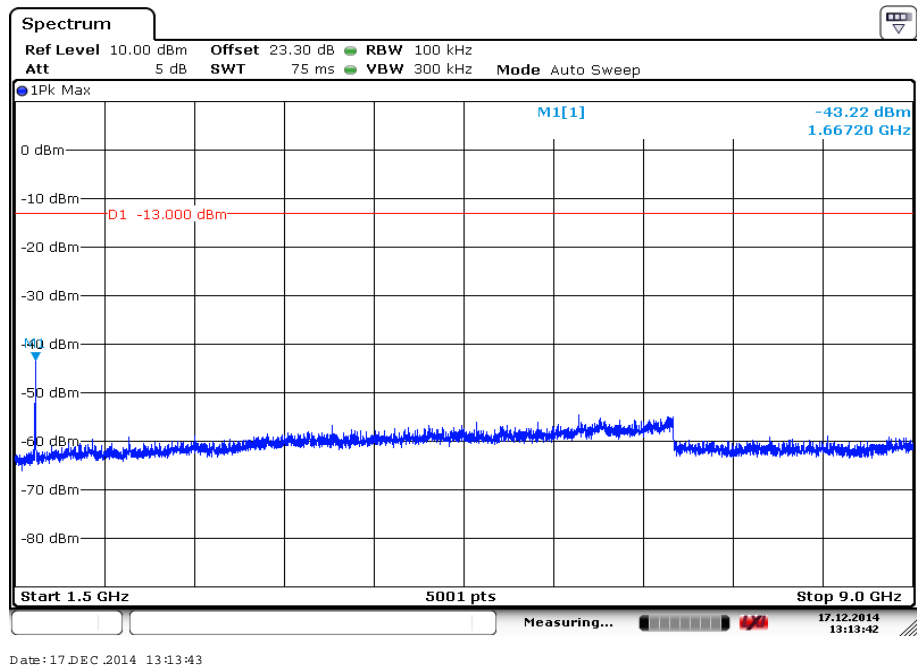
846.60 MHz

9 kHz to 1.5 GHz





Product Service

1.5 GHz to 9 GHzLimit Clause $43 + 10\log(P)$  or -13 dBm



Product Service

## **2.6 EMISSION 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**

S/N: IMEI 004401115346682 - Modification State 0

### **2.6.3 Date of Test**

17 December 2014

### **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**

Measurements were performed in accordance with KDB 971168 v02r02 clause 4.1.

The EUT was connected to a spectrum analyser via a cable, combiner and attenuator. The other port of the combiner was connected to a communications test set which was configured with 12.2 kbps RMC connection call at maximum output power. The path loss was calibrated using a vector network analyser and was entered as a reference level offset on the spectrum analyser. The spectrum analyser was configured with a peak detector and trace set to max hold. The peak point of the emission was determined and the markers were adjusted to the -26 dB points either side of this.

### **2.6.6 Environmental Conditions**

Ambient Temperature	23.3°C
Relative Humidity	36.8%



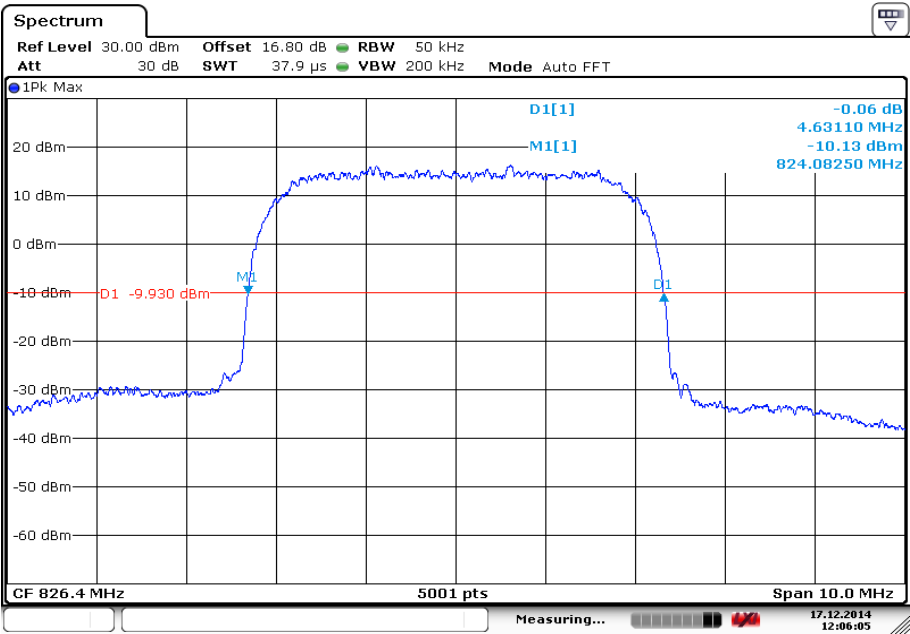
Product Service

2.6.7 Test Results

4.0 V DC Supply

826.40 MHz

Mode	Occupied Bandwidth (kHz)
WCDMA	4631.10



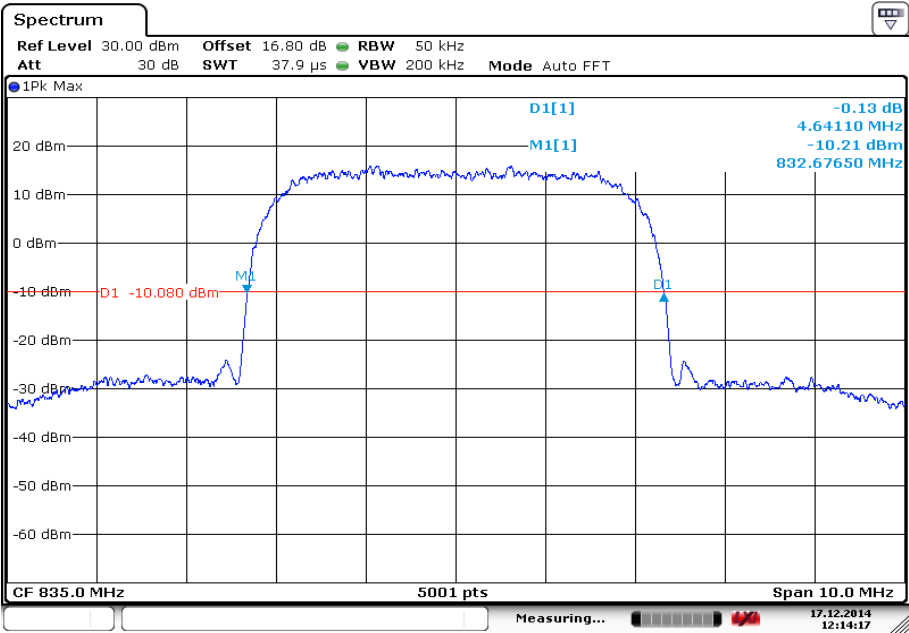
Date: 17 DEC 2014 12:06:06



Product Service

835.00 MHz

Mode	Occupied Bandwidth (kHz)
WCDMA	4641.10



Date: 17 DEC 2014 12:14:16

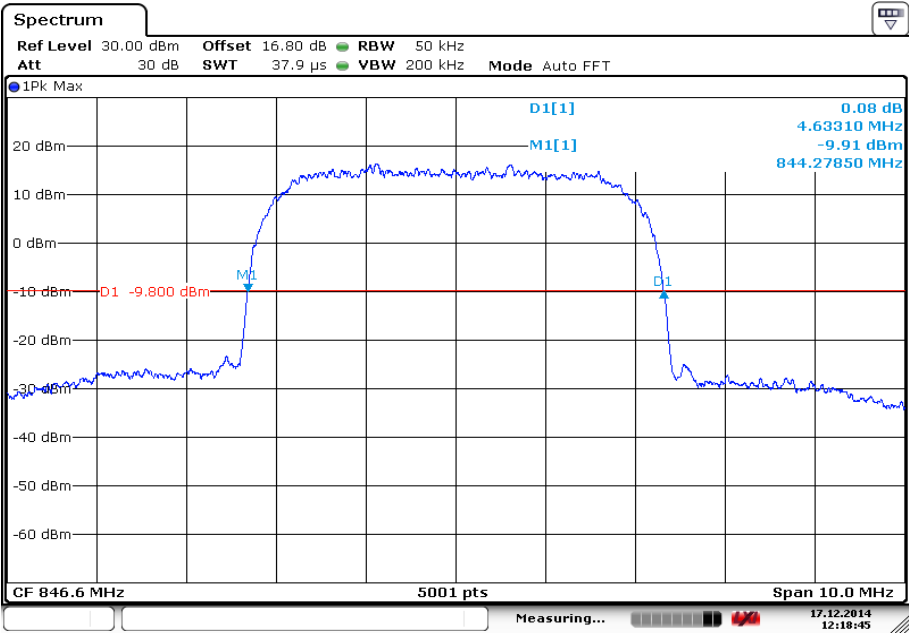




Product Service

846.60 MHz

Mode	Occupied Bandwidth (kHz)
WCDMA	4633.10



Date: 17.DEC.2014 12:18:45

Limit

None specified.



## 2.7 MODULATION CHARACTERISTICS

### 2.7.1 Specification Reference

FCC CFR 47 Part 2 and FCC CFR 47 Part 22, Clause 2.1047 (d)

### 2.7.2 Test Results

#### Customer Description

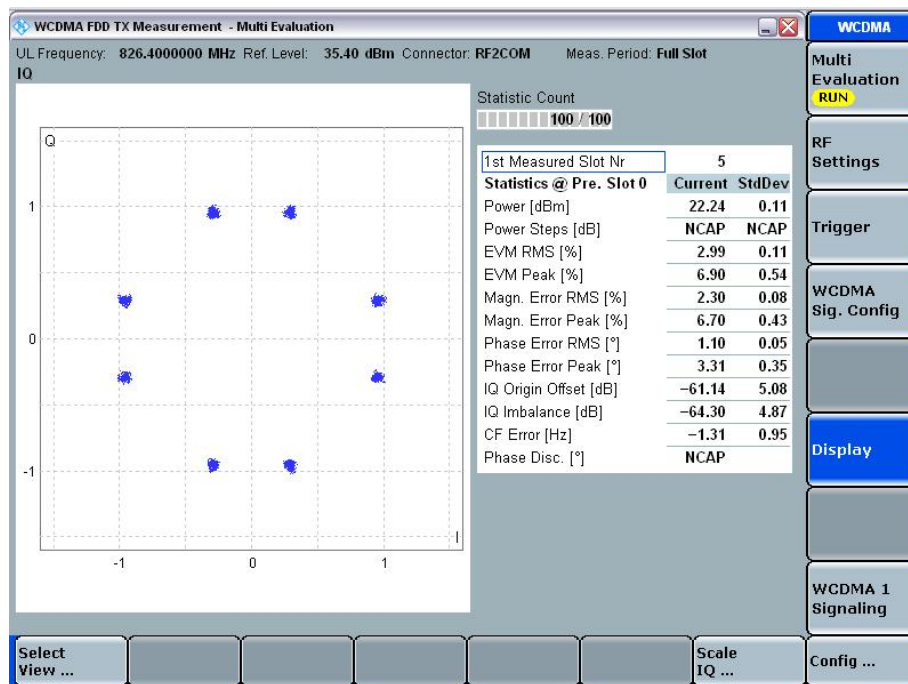
For the period of test the EUT met the requirements of FCC CFR 47 Part 2 for Modulation Characteristics.

The test results are shown below.

4.0 V DC Supply

QPSK

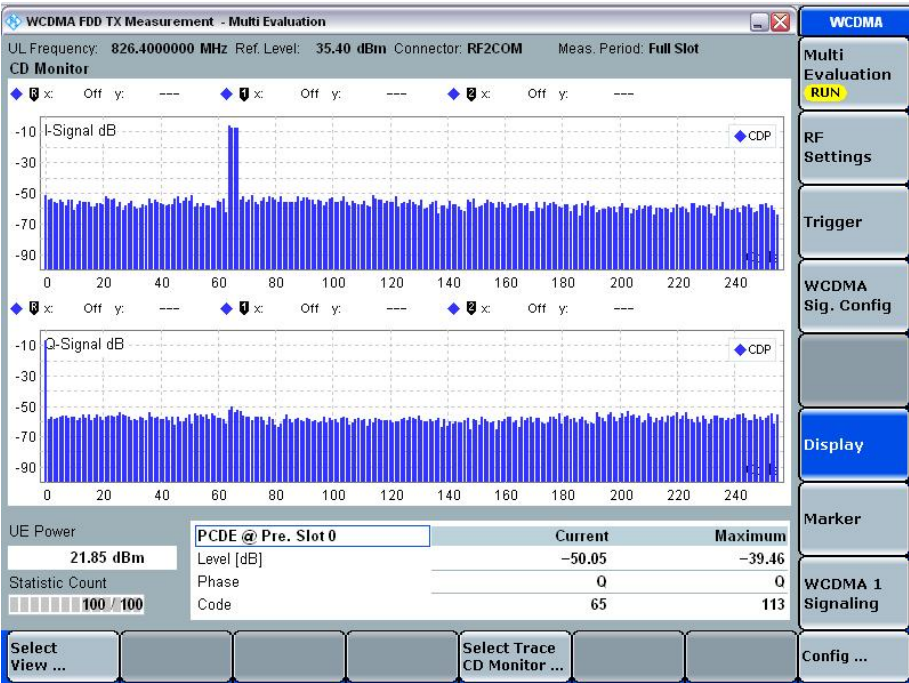
#### Constellation Diagram



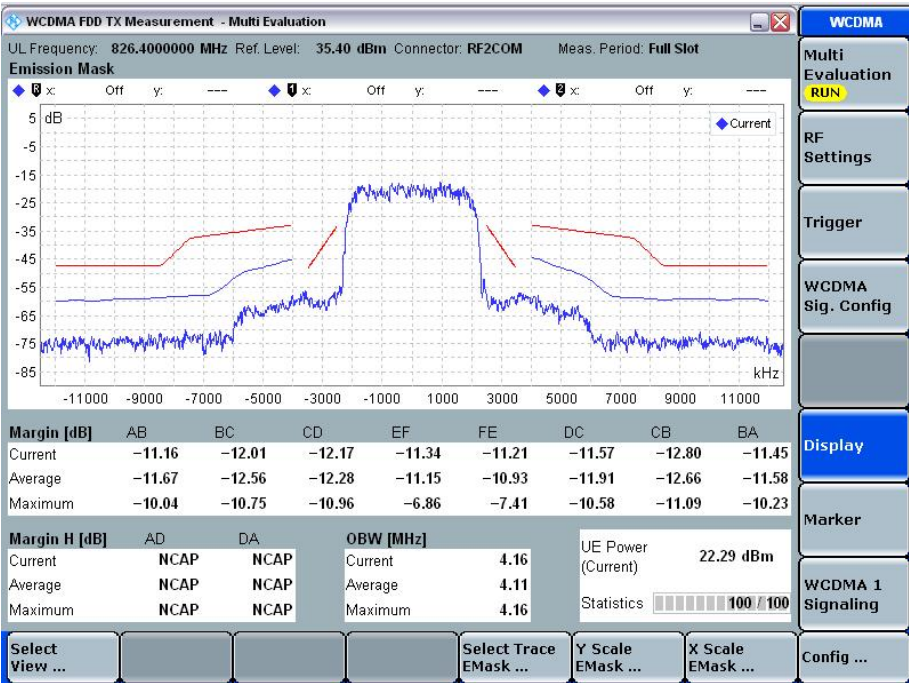


Product Service

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**

S/N: IMEI 004401115346682 - Modification State 0

### **2.8.3 Date of Test**

18 December 2014

### **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 test was applied in accordance with the test method requirements of FCC CFR 47 Part 2.1055.

The EUT was connected via an attenuator and cable to a communications test set. A 12.2 kbps RMC data connection at maximum output power on the middle channel. The communications test set was connected to an external 10 MHz rubidium frequency standard to increase accuracy of the measurement. The Tx measurement function of the communications tester was then used and the maximum frequency error was then recorded.

Measurements were repeated over the temperature range of +50°C to -30°C in 10°C steps and at +20°C the voltage was varied to the maximum and minimum end point voltages as declared by the manufacturer.

### **2.8.6 Environmental Conditions**

Ambient Temperature	22.9°C
Relative Humidity	48.5%



## 2.8.7 Test Results

4.0 V DC Supply

Under Temperature Variations

835.00 MHz

Temperature Interval (°C)	Mode	Modulation	Deviation (ppm)
-30	WCDMA	QPSK	0.007
-20	WCDMA	QPSK	0.008
-10	WCDMA	QPSK	-0.007
0	WCDMA	QPSK	-0.004
+10	WCDMA	QPSK	-0.004
+20	WCDMA	QPSK	-0.003
+30	WCDMA	QPSK	-0.003
+40	WCDMA	QPSK	-0.003
+50	WCDMA	QPSK	-0.003

Limit Clause

Frequency Range (MHz)	Base, Fixed (ppm)	Mobile $\leq$ 3 watts (ppm)	Mobile $\leq$ 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	-	-



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Under Voltage Variations835.00 MHz

DC Voltage (V)	Mode	Modulation	Deviation (ppm)
4.0 V DC	WCDMA	QPSK	-0.003
3.7 V DC	WCDMA	QPSK	-0.003
4.0 V DC	WCDMA	QPSK	-0.003

Limit Clause

Frequency Range (MHz)	Base, Fixed (ppm)	Mobile $\leq$ 3 watts (ppm)	Mobile $\leq$ 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>					
Power Supply Unit	Farnell	LT30-2	41	-	O/P Mon
Attenuator 10dB/25W	Weinschel	46-10-43	400	12	4-Jun-2015
Power Divider	Weinschel	1506A	603	12	28-May-2015
Multimeter	Fluke	79 Series III	611	12	1-Sep-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	18-Jan-2015
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	6-Nov-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	18-Jan-2015
<b>Section 2.2 - Effective Radiated Power</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	22	28-Nov-2015
Communications Tester	Rohde & Schwarz	CMU 200	442	-	TU*
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	24-Feb-2015
Screened Room (5)	Rainford	Rainford	1545	24	10-Jan-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	4-Feb-2015
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	11-Aug-2015
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	10-Feb-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Feb-2015
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	4143	12	29-Aug-2015
<b>Section 2.3 - Maximum Peak Output Power - Conducted</b>					
Power Supply Unit	Farnell	LT30-2	41	-	O/P Mon
Attenuator 10dB/25W	Weinschel	46-10-43	400	12	4-Jun-2015
Communications Tester	Rohde & Schwarz	CMU 200	442	-	TU*
Attenuator: 10dB/20W	Narda	766-10	480	12	3-Dec-2015
Multimeter	Fluke	79 Series III	611	12	1-Sep-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
P-Series Power Meter	Agilent Technologies	N1911A	3981	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3983	12	22-Sep-2015





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, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	22	28-Nov-2015
Communications Tester	Rohde & Schwarz	CMU 200	442	-	TU*
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	24-Feb-2015
Screened Room (5)	Rainford	Rainford	1545	24	10-Jan-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	4-Feb-2015
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	11-Aug-2015
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	10-Feb-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Feb-2015
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	4143	12	29-Aug-2015
<b>Section 2.5 - Conducted Spurious Emissions</b>					
Power Supply Unit	Farnell	LT30-2	41	-	O/P Mon
Attenuator 10dB/25W	Weinschel	46-10-43	400	12	4-Jun-2015
Power Divider	Weinschel	1506A	603	12	28-May-2015
Multimeter	Fluke	79 Series III	611	12	1-Sep-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	18-Jan-2015
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	4-Feb-2015
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	6-Nov-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4143	12	29-Aug-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	18-Jan-2015
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	27-Feb-2015
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	21-Mar-2015



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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.6 - Emission Bandwidth</b>					
Power Supply Unit	Farnell	LT30-2	41	-	O/P Mon
Attenuator 10dB/25W	Weinschel	46-10-43	400	12	4-Jun-2015
RF Coupler	TUV SUD Product Service	RFC1	414	-	TU
Power Divider	Weinschel	1506A	603	12	28-May-2015
Multimeter	Fluke	79 Series III	611	12	1-Sep-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	18-Jan-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
ESA-E Series Spectrum Analyser	Agilent Technologies	E4402B	3348	12	5-Sep-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4143	12	29-Aug-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	18-Jan-2015
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	27-Feb-2015
Signal Analyser	Rohde & Schwarz	FSV-40	S/N: 10-300333 310	12	14-Nov-2015
<b>Section 2.8 - Frequency Stability</b>					
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Attenuator: 10dB/20W	Narda	766-10	480	12	3-Dec-2015
Multimeter	Fluke	79 Series III	611	12	1-Sep-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	18-Jan-2015
Thermocouple Thermometer	Fluke	51	3174	12	4-Dec-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
2 Metre SMA Type Cable	Rhophase	3PS-1801A-2000-3PS	4111	12	7-Nov-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4143	12	29-Aug-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	18-Jan-2015

\* Not used for qualitative measurements

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



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## **SECTION 4**

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



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#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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