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Report On

FCC Testing of the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1,B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA FDD V)

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FCC ID: APYHRO00214

Document 75928148 Report 11 Issue 1

December 2014



Product Service

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COMMERCIAL-IN-CONFIDENCE

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FCC Testing of the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1,B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS
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December 2014

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DATED

23 December 2014

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);

M Russell

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T Guy



N Rousell

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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM
(GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1,B3, B17, B26) & AXGP
(TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22 (WCDMA FDD V)



1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1,B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (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)	SHV31
Serial Number(s)	IMEI 004401115315448 IMEI 004401115315869
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	10329
Date	20 October 2014
Start of Test	7 November 2014
Finish of Test	10 December 2014
Name of Engineer(s)	M Russell T Guy N Rousell
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 SHV31 Model Description Form.

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1,B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (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 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 SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM
(GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1,B3, B17, B26) & AXGP
(TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, 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

SHV31 S/N: IMEI 004401115315869 - Modification State 0

2.1.3 Date of Test

26 November 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 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 in the 1 MHz immediately adjacent to the authorized bandwidth were below $43 + 10 \log(P)$.

2.1.6 Environmental Conditions

Ambient Temperature	22.3°C
Relative Humidity	47.8%



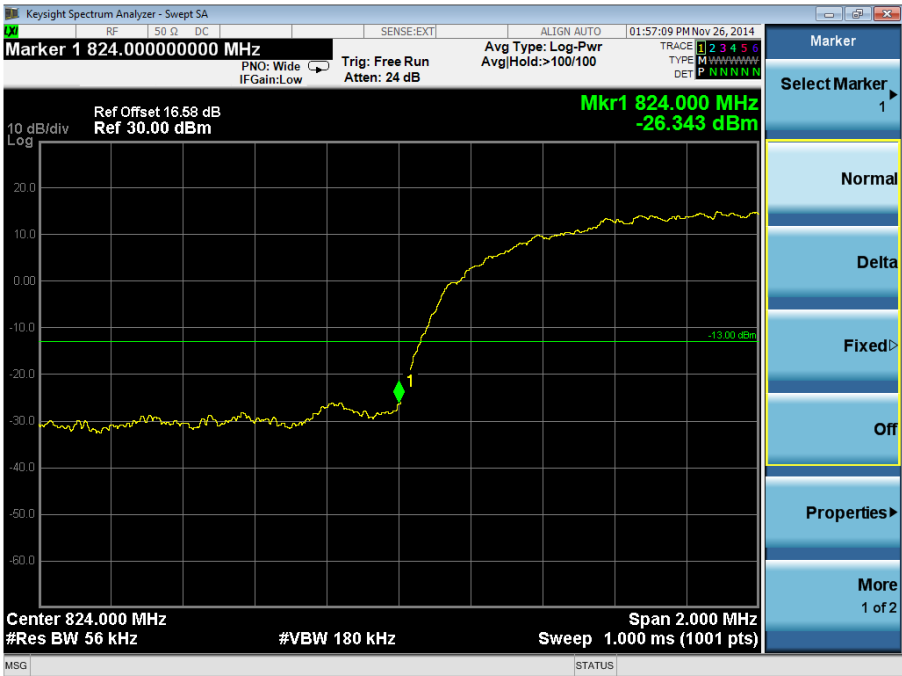
Product Service

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

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

SHV31 S/N: IMEI 004401115315448 - Modification State 0

2.2.3 Date of Test

10 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. A peak Power Meter was then used to record this maximum value.

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 peak Power Meter 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	19.5°C
Relative Humidity	62.4%



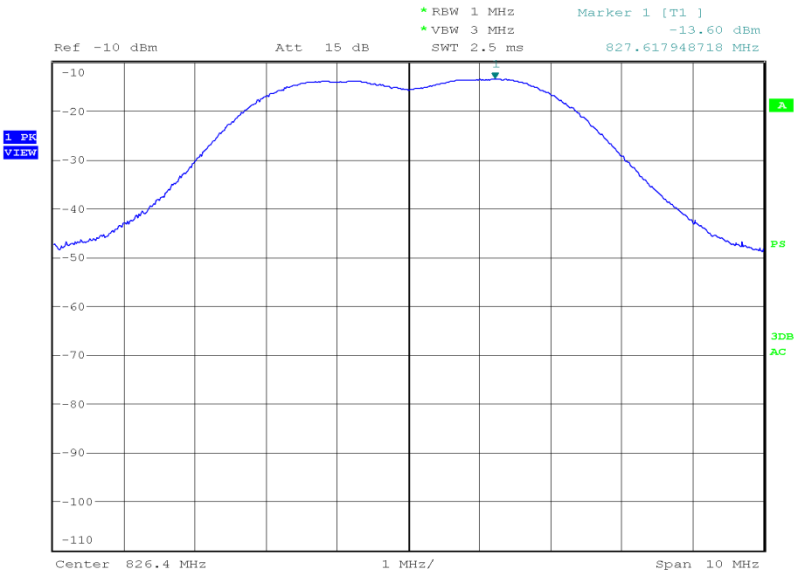
Product Service

2.2.7 Test Results

4.0 V DC Supply

826.60 MHz

Result (dBm)	Result (W)
21.39	0.138



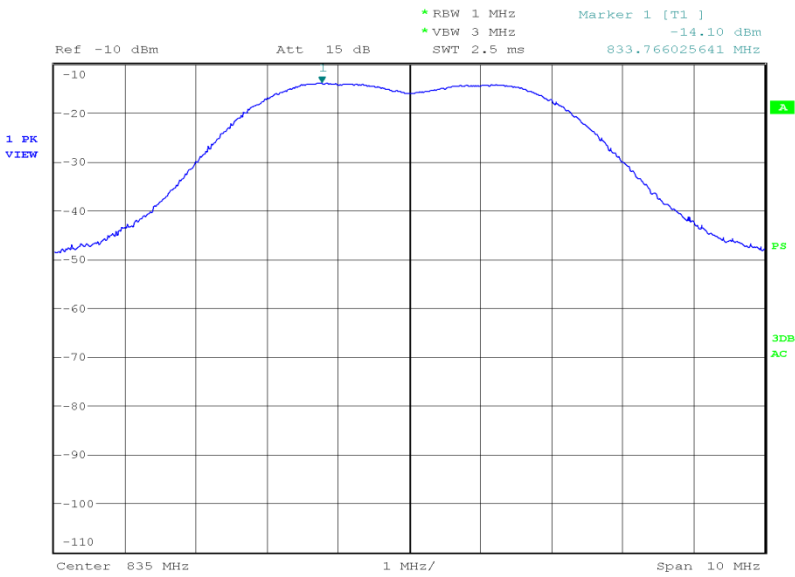
Date: 10.DEC.2014 22:57:23



Product Service

835.00 MHz

Result (dBm)	Result (W)
21.17	0.131



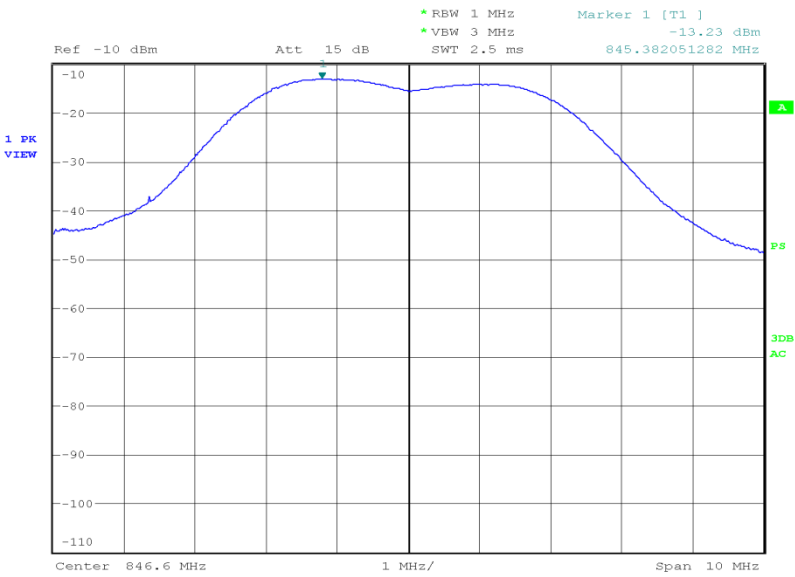
Date: 10.DEC.2014 22:45:17



Product Service

846.40 MHz

Result (dBm)	Result (W)
21.74	0.149



Date: 10.DEC.2014 23:07:37

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

SHV31 S/N: IMEI 004401115315869 - Modification State 0

2.3.3 Date of Test

7 November 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	23.3°C
Relative Humidity	35.0%



Product Service

2.3.7 Test Results

4.0 V DC Supply

826.40 MHz

Mode	Result (dBm)	Result (W)
WCDMA	26.68	0.466

835.00 MHz

Mode	Result (dBm)	Result (W)
WCDMA	26.74	0.472

846.60 MHz

Mode	Result (dBm)	Result (W)
WCDMA	25.70	0.372

Limit Clause

Mobile – 7 W or 38.45 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

SHV31 S/N: IMEI 004401115315448 - Modification State 0

2.4.3 Date of Test

16 November 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. 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	19.2°C
Relative Humidity	63.7%

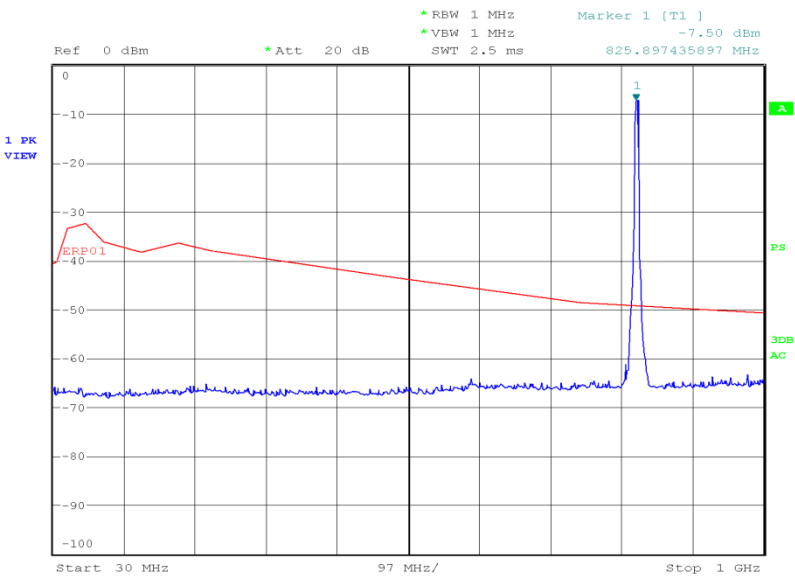


Product Service

2.4.7 Test Results

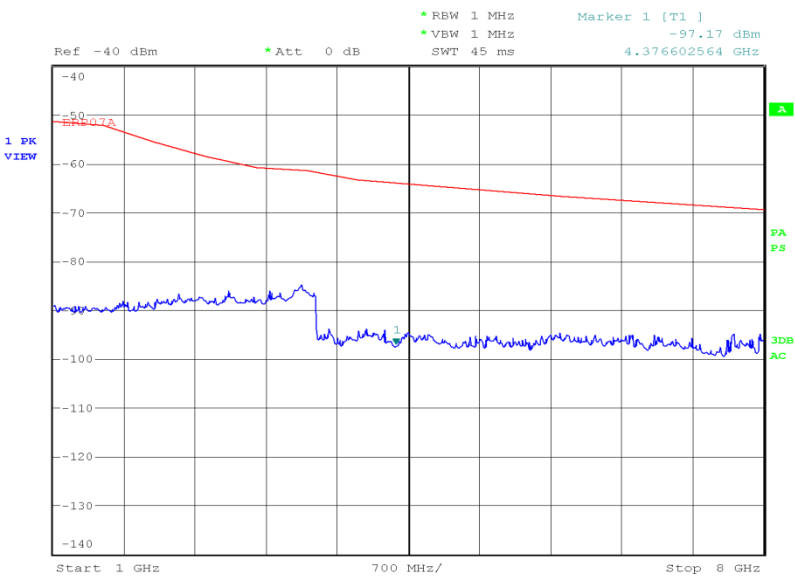
826.40 MHz

30 MHz to 1 GHz



Date: 16.NOV.2014 00:48:52

1 GHz to 8 GHz

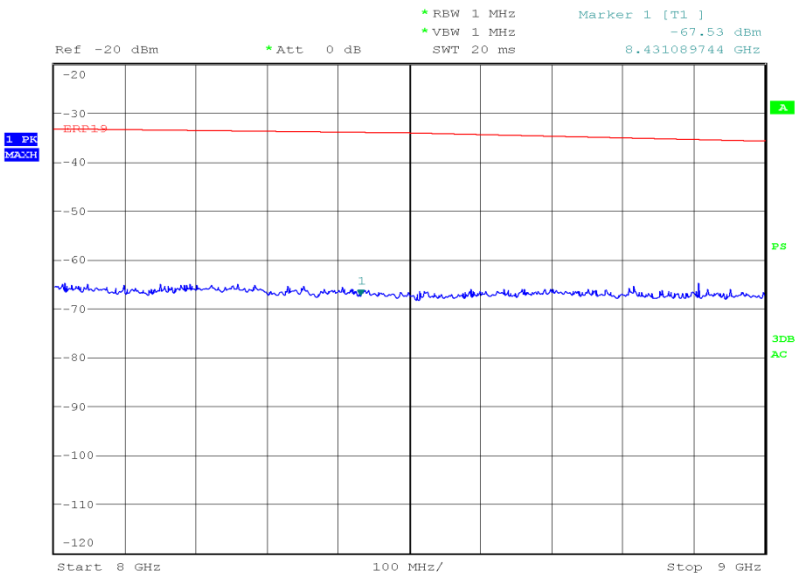


Date: 16.NOV.2014 01:46:41



Product Service

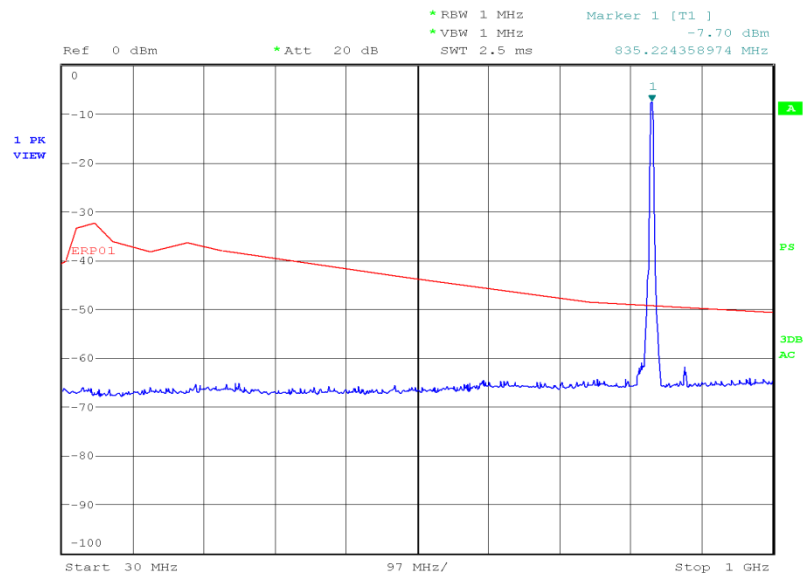
8 GHz to 9 GHz



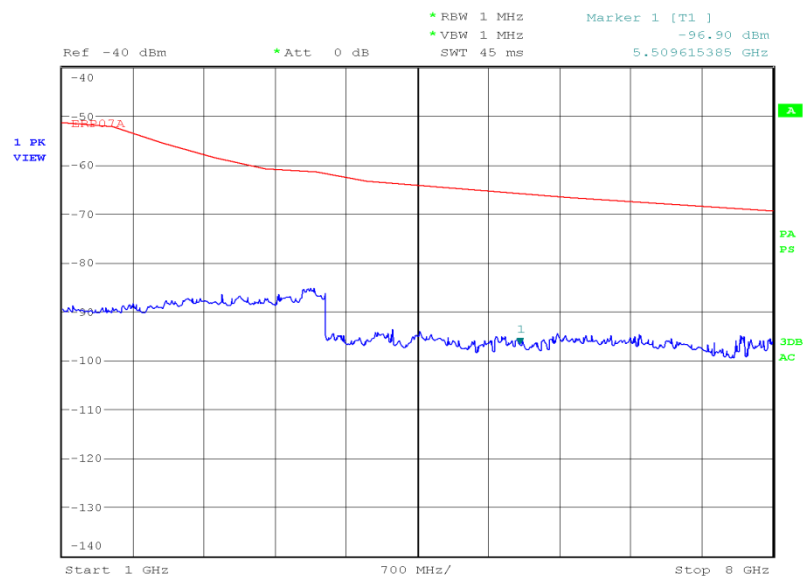
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Product Service

835.00 MHz30 MHz to 1 GHz

Date: 16.NOV.2014 01:02:55

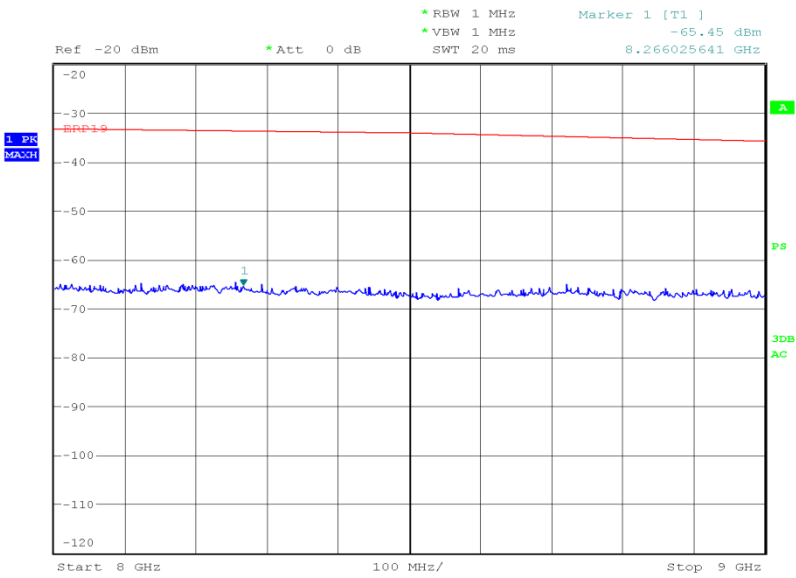
1 GHz to 8 GHz

Date: 16.NOV.2014 01:41:12



Product Service

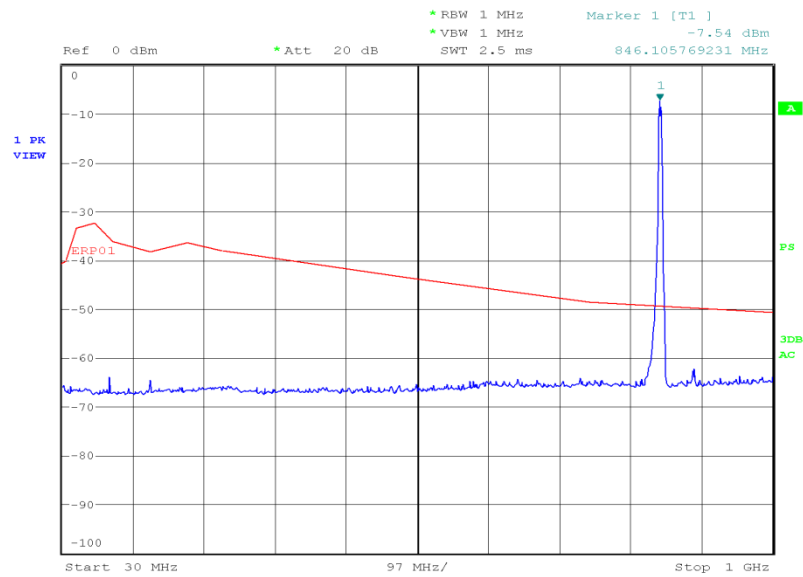
8 GHz to 9 GHz



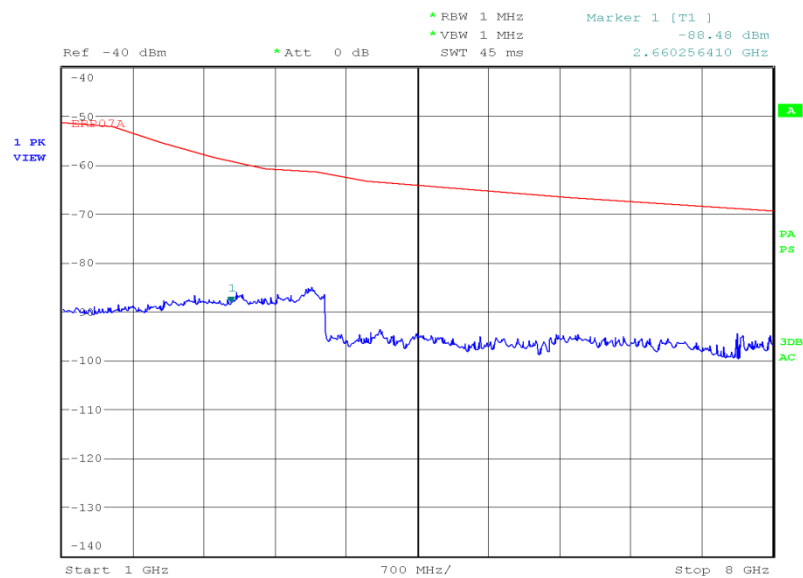
Date: 16.NOV.2014 03:45:20



Product Service

846.60 MHz30 MHz to 1 GHz

Date: 16.NOV.2014 01:20:09

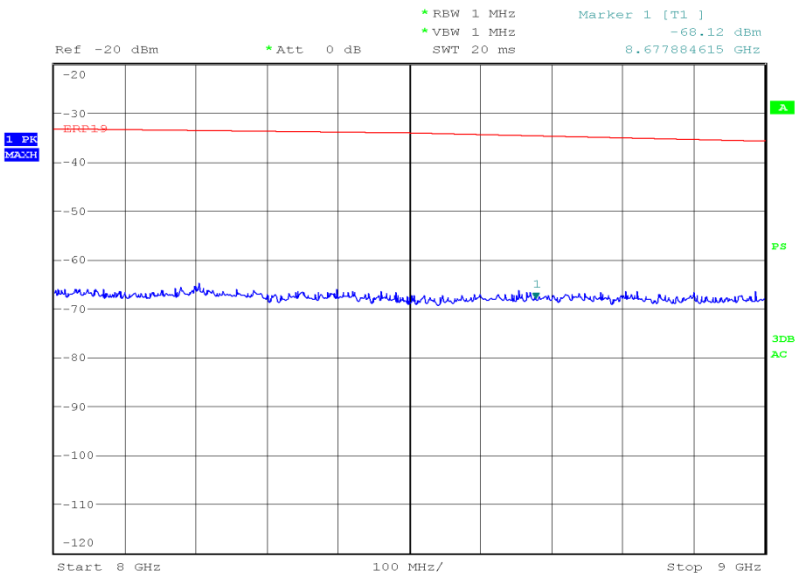
1 GHz to 8 GHz

Date: 16.NOV.2014 01:27:34



Product Service

8 GHz to 9 GHz



Date: 16.NOV.2014 04:07:23

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

SHV31 S/N: IMEI 004401115315869 - Modification State 0

2.5.3 Date of Test

14 November 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	40.7%



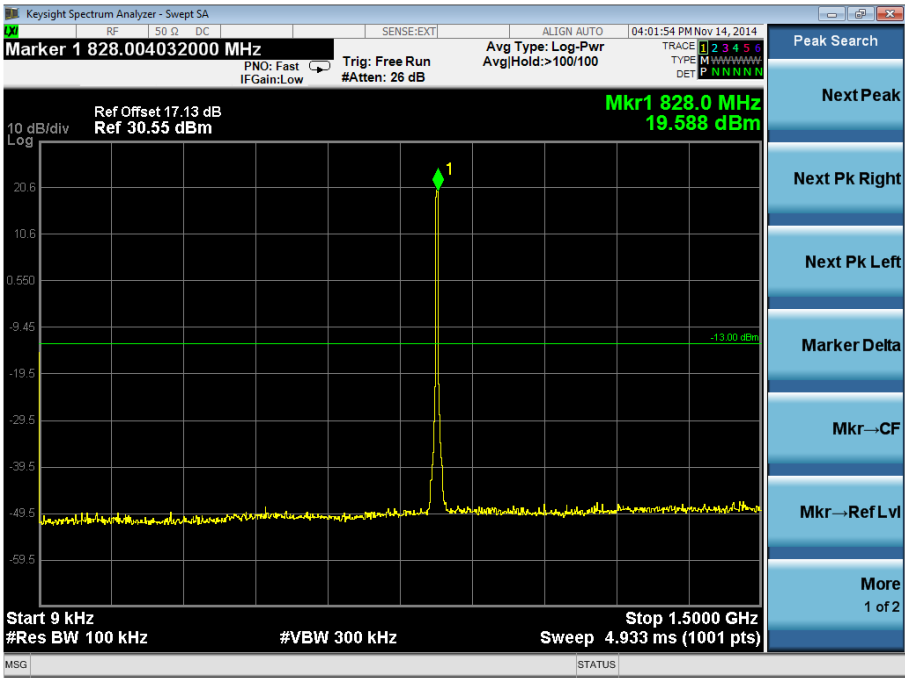
Product Service

2.5.7 Test Results

4.0 V DC Supply

826.40 MHz

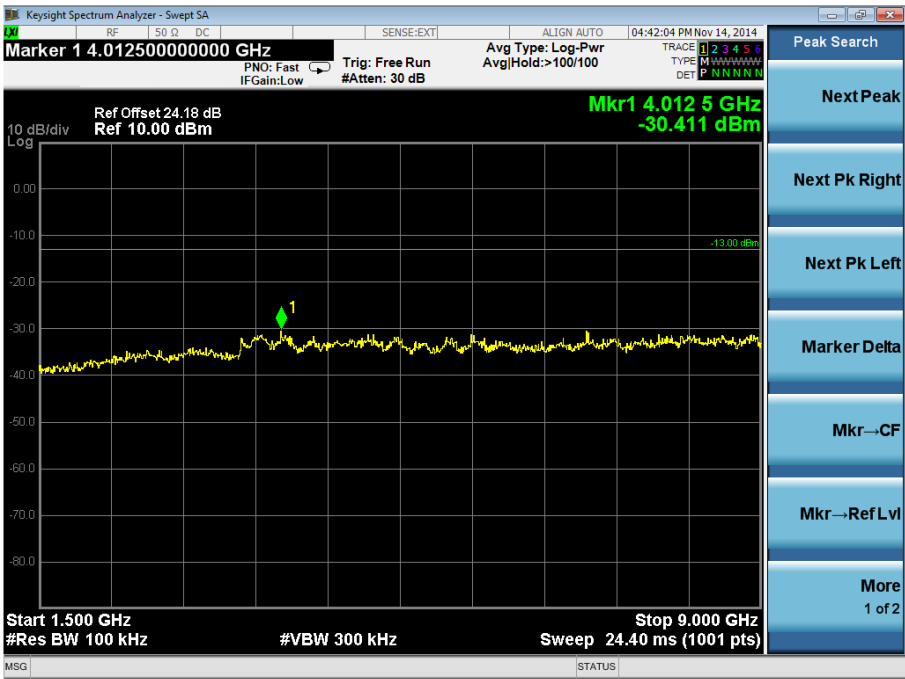
9 kHz to 1.5 GHz





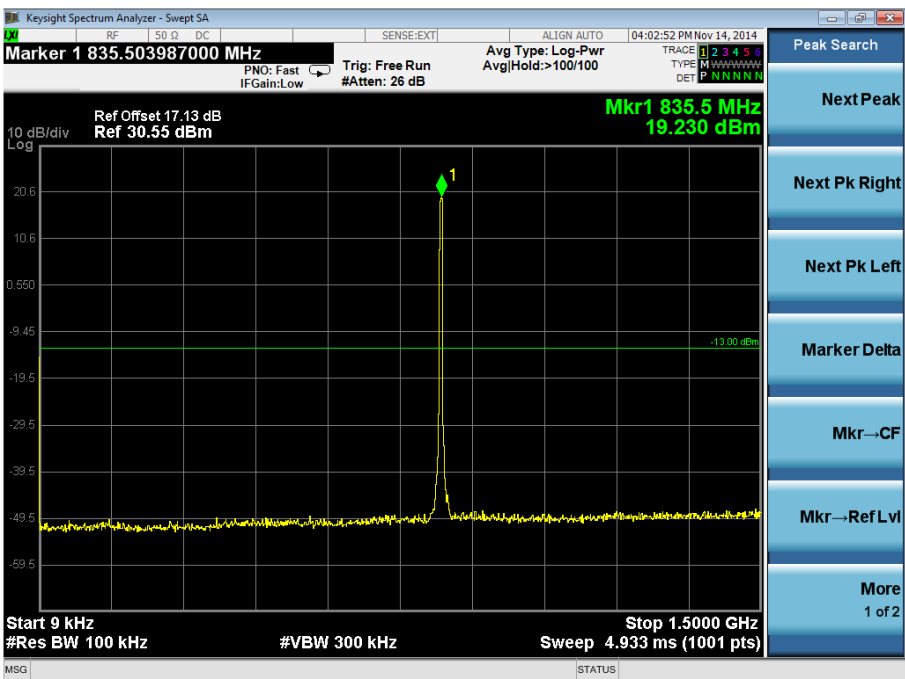
Product Service

1.5 GHz to 9 GHz



835.00 MHz

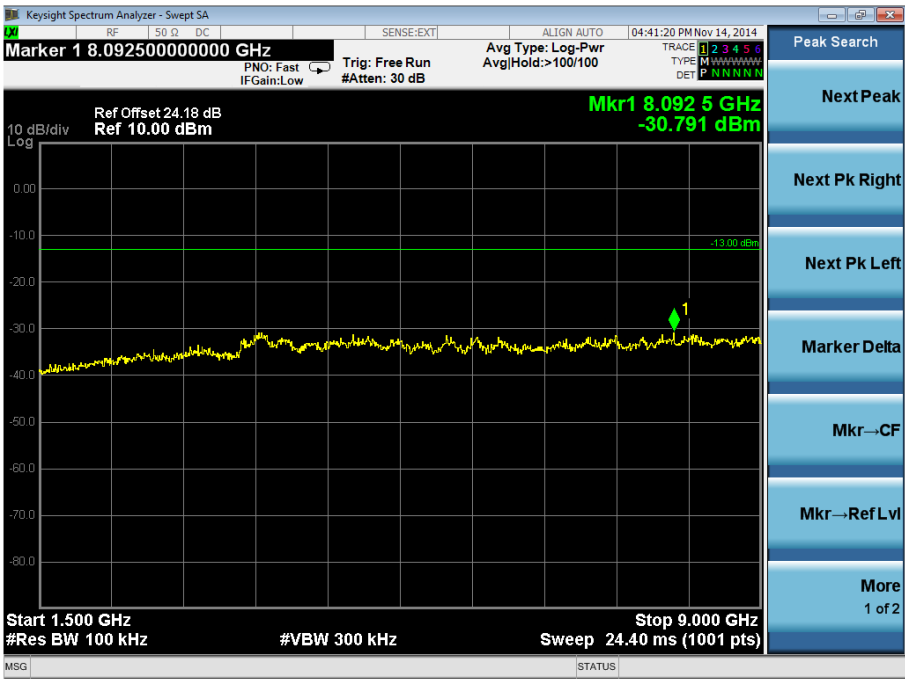
9 kHz to 1.5 GHz





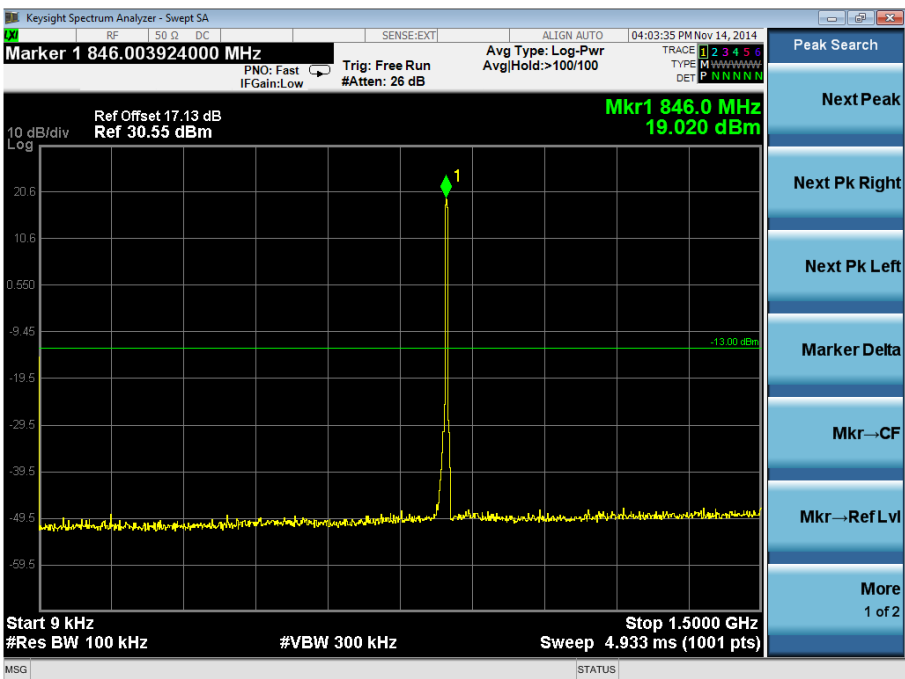
Product Service

1.5 GHz to 9 GHz



846.60 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 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

SHV31 S/N: IMEI 004401115315869 - Modification State 0

2.6.3 Date of Test

14 November 2014 & 26 November 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 occupied bandwidth measurement function of the spectrum analyser was used and the 26 dB bandwidth was recorded.

2.6.6 Environmental Conditions

Ambient Temperature	22.3°C
Relative Humidity	47.8%



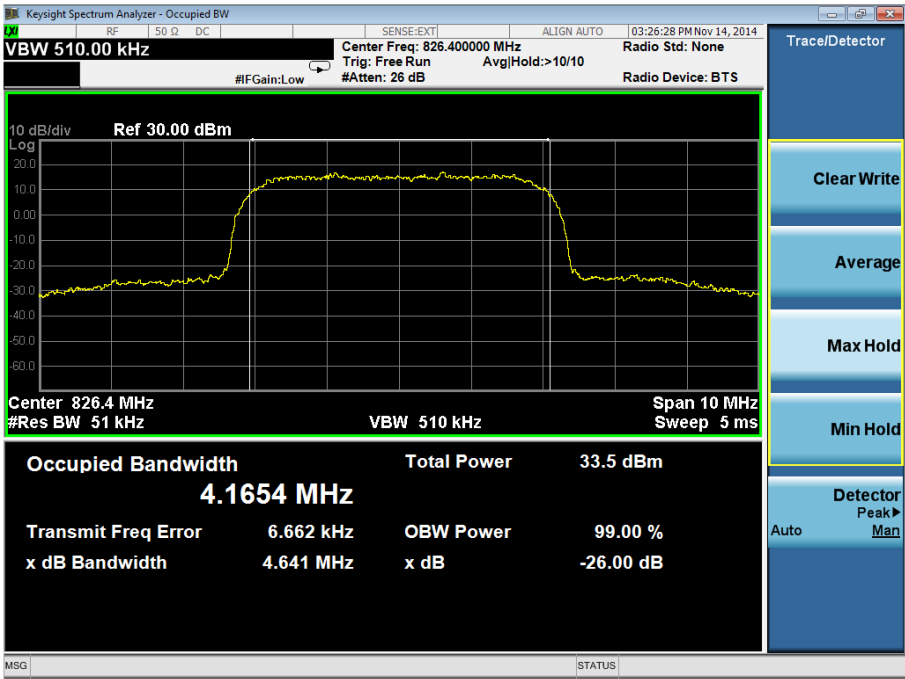
Product Service

2.6.7 Test Results

4.0 V DC Supply

826.40 MHz

Mode	Occupied Bandwidth (kHz)
WCDMA	4641.0

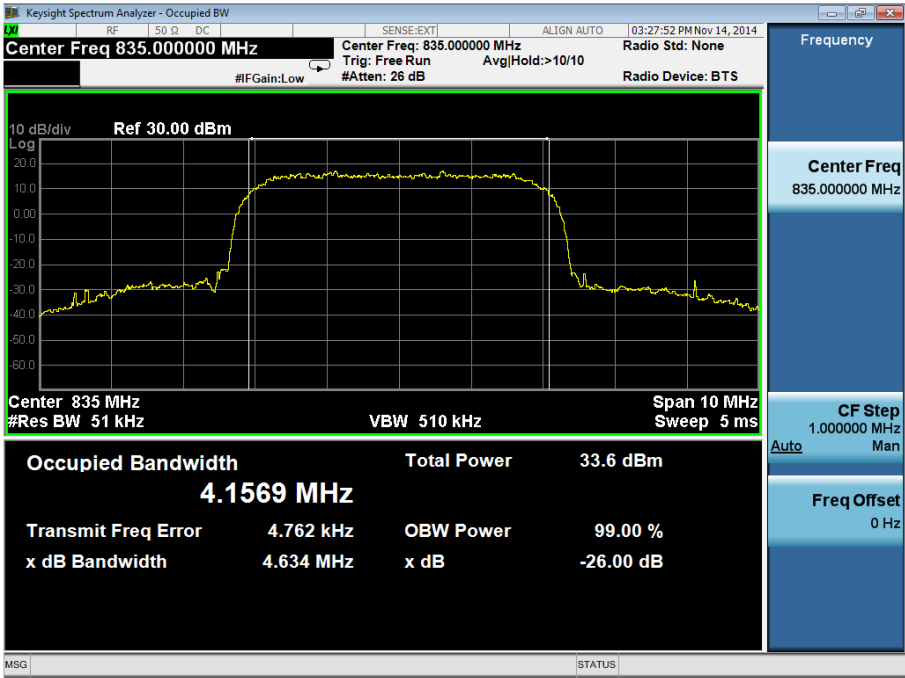




Product Service

835.00 MHz

Mode	Occupied Bandwidth (kHz)
WCDMA	4634.0

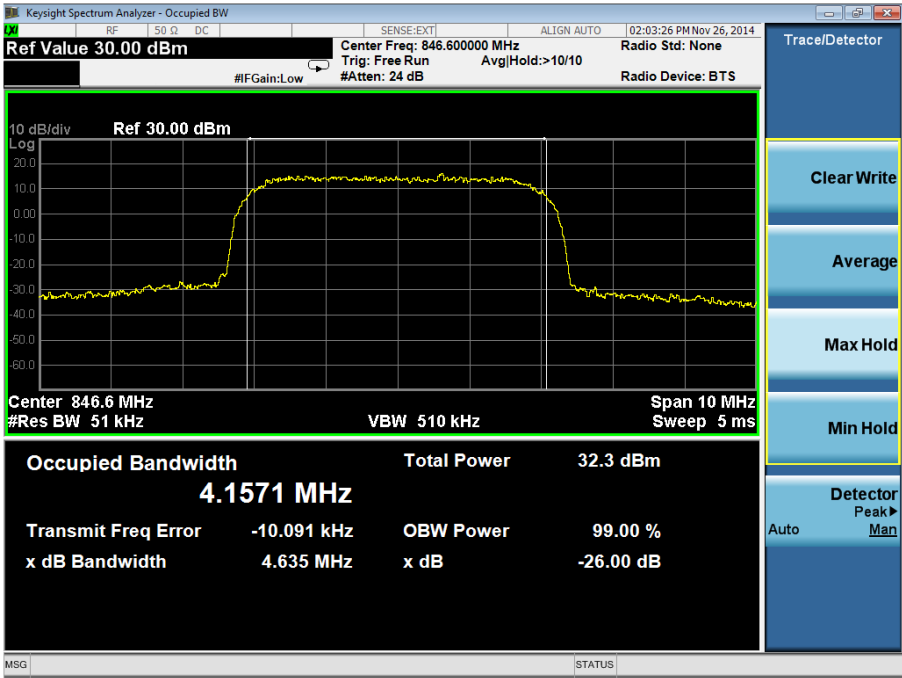




Product Service

846.60 MHz

Mode	Occupied Bandwidth (kHz)
WCDMA	4635.0



Limit

None specified.



2.7 MODULATION CHARACTERISTICS

2.7.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1047 (d)

2.7.2 Equipment Under Test

SHV31

2.7.3 Test Results

Customer Description

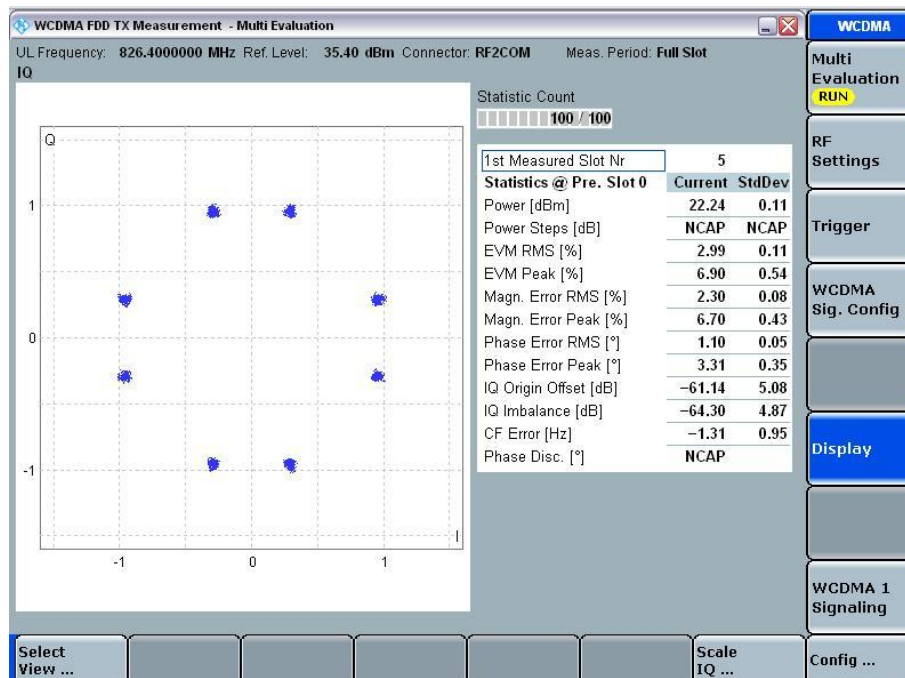
For the period of test the EUT met the requirements of FCC CFR 47 Part 2 for Modulation Characteristics.

The test results are shown below.

4.0 V DC Supply

QPSK

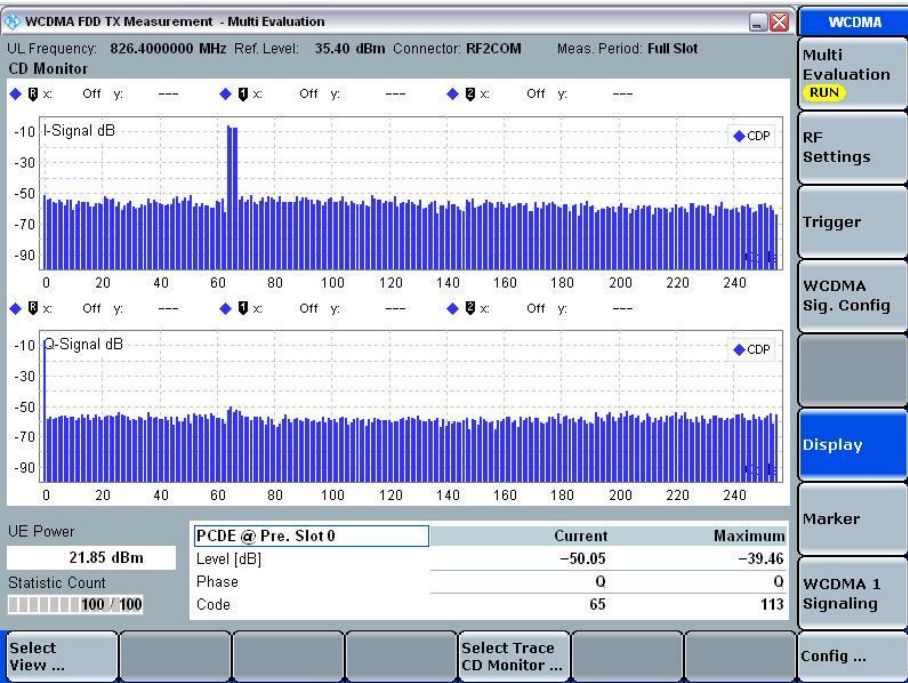
Constellation Diagram



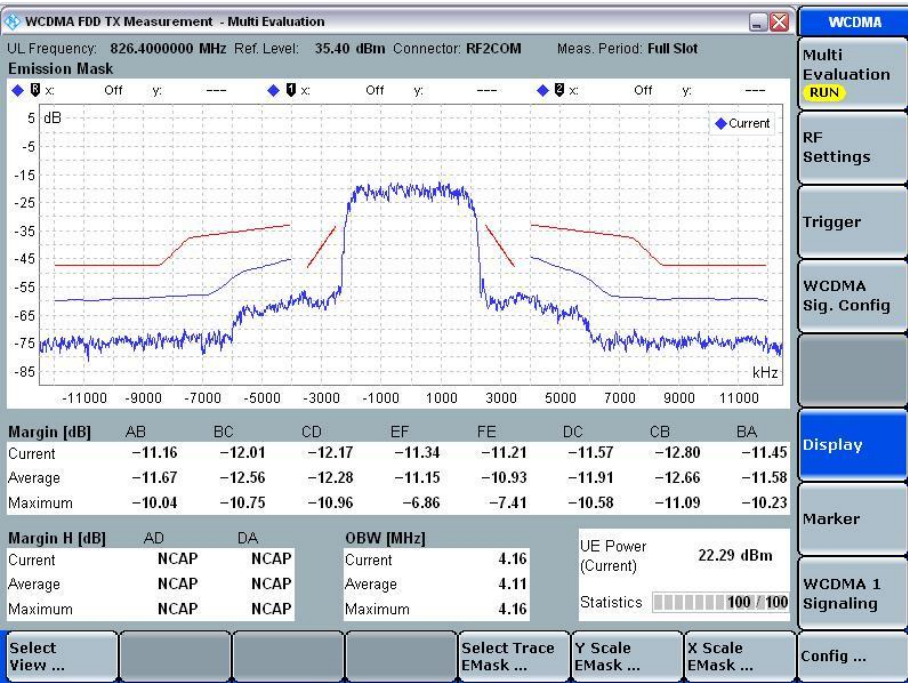


Product Service

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

SHV31 S/N: IMEI 004401115315869 - Modification State 0

2.8.3 Date of Test

24 November 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 was configured. 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	19.4°C
Relative Humidity	32.1%



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	0.007
-10	WCDMA	QPSK	0.008
0	WCDMA	QPSK	0.008
+10	WCDMA	QPSK	0.010
+20	WCDMA	QPSK	0.007
+30	WCDMA	QPSK	0.008
+40	WCDMA	QPSK	0.008
+50	WCDMA	QPSK	0.010

Limit Clause

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

Under Voltage Variations835.00 MHz

DC Voltage (V)	Mode	Modulation	Deviation (ppm)
4.0 V DC	WCDMA	QPSK	0.007
3.7 V DC	WCDMA	QPSK	0.010
4.0 V DC	WCDMA	QPSK	0.007

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
Section 2.1 - Spurious Emissions at Band Edge					
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Communications Tester	Rohde & Schwarz	CMU 200	442	12	8-Dec-2014
Attenuator (10dB)	Weinschel	47-10-34	481	12	28-Mar-2015
Multimeter	Iso-tech	IDM101	2419	12	7-Oct-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
Combiner/Splitter	Weinschel	1506A	3877	12	21-Mar-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	27-Feb-2015
Section 2.2 - Effective Radiated Power					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	10-Feb-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
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
Section 2.3 - Maximum Peak Output Power - Conducted					
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Communications Tester	Rohde & Schwarz	CMU 200	442	12	8-Dec-2014
Multimeter	Iso-tech	IDM101	2424	12	26-Sep-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2014
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
Combiner/Splitter	Weinschel	1506A	3877	12	21-Mar-2015
P-Series Power Meter	Agilent Technologies	N1911A	3980	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3982	12	22-Sep-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Section 2.4 - Emission Limitations for Cellular Equipment					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	22	30-Nov-2014
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	19-Sep-2015
Pre-Amplifier	Phase One	PS04-0086	1533	12	19-Dec-2014
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - Conducted Spurious Emissions					
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Communications Tester	Rohde & Schwarz	CMU 200	442	12	8-Dec-2014
Attenuator (10dB)	Weinschel	47-10-34	481	12	28-Mar-2015
Multimeter	Iso-tech	IDM101	2419	12	7-Oct-2015
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	4-Feb-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
Combiner/Splitter	Weinschel	1506A	3877	12	21-Mar-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-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
Section 2.6 - Emission Bandwidth					
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Communications Tester	Rohde & Schwarz	CMU 200	442	12	8-Dec-2014
Attenuator (10dB)	Weinschel	47-10-34	481	12	28-Mar-2015
Multimeter	Iso-tech	IDM101	2419	12	7-Oct-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Combiner/Splitter	Weinschel	1506A	3877	12	21-Mar-2015
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	27-Feb-2015
Section 2.8 - Frequency Stability					
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	12	8-Dec-2014
Multimeter	Fluke	75 Mk3	455	12	23-Jul-2015
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	18-Jan-2015
Digital Temperature Indicator	Fluke	51	2267	12	24-Sep-2015
Digital Thermometer	Digitron	T208	2831	12	31-Jul-2015
Hygrometer	Rotronic	I-1000	2891	12	16-Jul-2015
Power Supply	Farnell	LT30-2	2903	-	TU
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	6-Nov-2015
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	12-Dec-2014
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2014
True RMS Multimeter	Fluke	179	4007	12	31-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	4144	12	7-Nov-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	18-Jan-2015

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	± 46.70 Hz
Maximum Peak Output Power - Conducted	± 0.70 dB
Conducted Spurious Emissions	± 3.454 dB
Emission Limitations for Cellular Equipment	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Spurious Emissions at Band Edge	± 3.454 dB
Emission Bandwidth	± 93.71 kHz
Effective Radiated Power	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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