

TEST REPORT

FCC ID: 2AHYMMTB73G

Product: MID

Model No.: MTB-73G

Additional Model No.: GB-T3G, GB-TAB703G, GBL-73G, MU-T73G, MU-TAB703G,
OLP-73G

Trade Mark: MULTITECH, GLOBE, OLIMPO

Report No.: TCT160405E016

Issued Date: Apr. 26, 2016

Issued for:

Global China Link SA

Century tower, oficina 1304, Via ricardo J. Alfaro ciudad de Panama, Panama

Issued By:

Shenzhen Tongce Testing Lab.

1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

TEL: +86-755-27673339

FAX: +86-755-27673332

Note: This report shall not be reproduced except in full, without the written approval of Shenzhen Tongce Testing Lab.

This document may be altered or revised by Shenzhen Tongce Testing Lab. personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

TABLE OF CONTENTS

1. Test Certification	3
2. Test Result Summary	4
3. EUT Description.....	5
4. Genera Information.....	6
4.1. Test environment and mode	6
4.2. Test Mode	8
4.3. Description of Support Units	9
4.4. Configuration of Tested System	10
4.5. Measurement Results Explanation Example.....	10
5. Facilities and Accreditations	11
5.1. Facilities	11
5.2. Location	11
5.3. Measurement Uncertainty	11
6. Test Results and Measurement Data	12
6.1. Conducted Output Power Measurement.....	12
6.2. Peak to Average Ratio	14
6.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement.....	22
6.4. Band Edge and Conducted Spurious Emission Measurement.....	33
6.5. Test Specification.....	33
6.6. Effective Radiated Power and Effective Isotropic Radiated Power Measurement	49
6.7. Field Strength of Spurious Radiation Measurement	58
6.8. Frequency Stability Measurement	68

Appendix A: Photographs of Test Setup

Appendix B: Photographs of EUT

1. Test Certification

Product:	MID
Model No.:	MTB-73G
Additional Model No.:	GB-T3G, GB-TAB703G, GBL-73G, MU-T73G, MU-TAB703G, OLP-73G
Applicant:	Global China Link SA
Address:	Century tower, oficina 1304, Via ricardo J. Alfaro ciudad de Panama, Panama
Manufacturer:	Shenzhen Samtech Co., Ltd.
Address:	FL 1-3, No.3 building, Dingfeng Fubilun Industrial Park, Shubiankeng Road, Songgang, Baoan, Shenzhen, China
Date of Test:	Apr. 05 – Apr. 25, 2016
Applicable Standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part22 Subpart H FCC CFR Title 47 Part24 Subpart E

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

Neil Wong

Date: Apr. 25, 2016

Neil Wong

Reviewed By:

Zhou

Date: Apr. 26, 2016

Joe Zhou

Approved By:

Tomsin

Date: Apr. 26, 2016

Tomsin

2. Test Result Summary

Requirement	CFR 47 Section	Result
Conducted Output Power	§2.1046	PASS
Peak-to-Average Ratio	§24.232(d)	PASS
Effective Radiated Power	§22.913(a)(2)	PASS
Equivalent Isotropic Radiated Power	§24.232(c)	PASS
Occupied Bandwidth	§2.1049 §22.917(b) §24.238(b)	PASS
Band Edge	§2.1051 §22.917(a) §24.238(a)	PASS
Conducted Spurious Emission	§2.1051 §22.917(a) §24.238(a)	PASS
Field Strength of Spurious Radiation	§2.1053 §22.917(a) §24.238(a)	PASS
Frequency Stability for Temperature & Voltage	§2.1055 §22.355 §24.235	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product Name:	MID
Model :	MTB-73G
Additional Model:	GB-T3G, GB-TAB703G, GBL-73G, MU-T73G, MU-TAB703G, OLP-73G
Trade Mark:	MULTITECH, GLOBE, OLIMPO
Hardware Version:	K03_V2.5
Software Version:	V1.1
Tx Frequency:	GSM/GPRS/EDGE 850: 824.2 MHz ~ 848.8 MHz GSM/GPRS/EDGE 1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
Rx Frequency:	GSM/GPRS/EDGE 850: 869.2 MHz ~ 893.8 MHz GSM/GPRS/EDGE 1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna:	GSM 850 : 32.53dBm GSM1900 : 30.11 dBm GPRS850 : 32.87dBm GPRS1900 : 30.16 dBm EDGE850 : 27.82dBm EDGE1900 : 25.48dBm WCDMA Band V : 22.96 dBm WCDMA Band II : 22.83 dBm
Type of Modulation:	GSM/GPRS: GMSK EDGE: 8PSK WCDMA: QPSK
Antenna Type:	Integral Antenna
Antenna Gain:	GSM850/WCDMA Band V: 0.6dBi PCS1900 /WCDMA Band II : 0.9dBi
Power Supply:	DC 3.7V
Remark:	All models above are identical in interior structure, electrical circuits and components, and just model names are different for the marketing requirement.

4. General Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Operation mode:	Keep the EUT in communication with CMU200 and select channel with modulation
Remark: This product has a built-in rechargeable battery, so in an independent test, the EUT battery was fully-charged.	
The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

Description Operation Frequency

GSM 850		PCS1900	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
....
189	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
...
250	848.60	809	1909.60
251	848.80	810	1909.80
WCDMA Band V		WCDMA Band II	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
4132	826.40	9262	1852.40
4133	826.60	9263	1852.60
....
4182	836.40	9399	1879.80
4183	836.60	9400	1880.00
4184	836.80	9401	1880.20
...
4232	846.40	9537	1907.40
4233	846.60	9538	1907.60

4.2. Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power. Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 10000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 20000 MHz for PCS1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Mode		
Band	Radiated TCs	Conducted TCs
GSM 850	GPRS class 8 Link EDGE class 8 Link	GPRS class 8 Link EDGE class 8 Link
PCS 1900	GPRS class 8 Link EDGE class 8 Link	GPRS class 8 Link EDGE class 8 Link
WCDMA Band V	RMC 12.2Kbps Link	RMC 12.2Kbps Link
WCDMA Band II	RMC 12.2Kbps Link	RMC 12.2Kbps Link

Note: The maximum power levels are chosen to test as the worst case configuration as follows:

GPRS multi-slot class 8 mode for GMSK modulation, EDGE multi-slot class 8 mode for 8PSK modulation.
RMC 12.2Kbps mode for WCDMA band V and WCDMA band II, only these modes were used for all tests. In addition to above worst-case test, below investigating on all data rates and all modes are compliance with each FCC test case which has specific test limits. For spurious emissions at antenna port, the EUT was investigated the band edges on low and high channels, and the unwanted spurious emissions on middle channel for all modes, the results are PASS, then only the worst-results were reported in the test report. The Radiated Spurious emissions for GPRS and EDGE modes were investigated on the middle channel and the PASSED results were not worst than those data tested from the highest power channels.



4.3. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

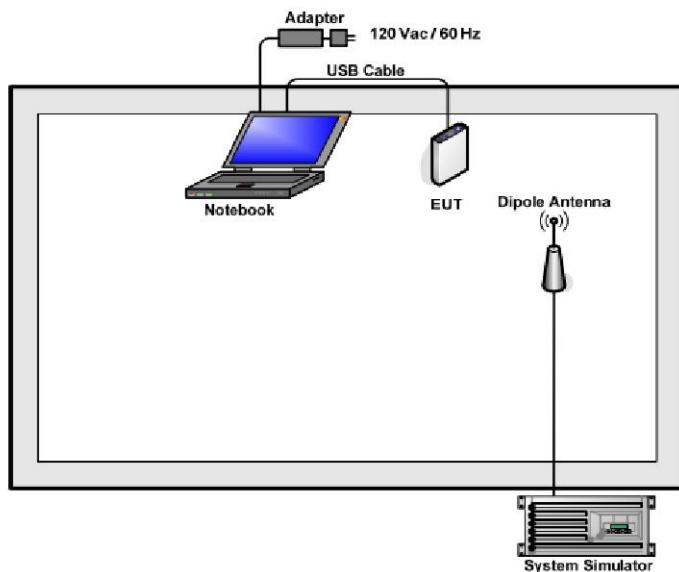
Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



4.4. Configuration of Tested System



4.5. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level. The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
 $\text{Offset} = \text{RF cable loss} + \text{attenuator factor}$.

The following shows an offset computation example with RF cable loss 3 dB and a 5dB attenuator.

Example: $\text{Offset(dB)} = \text{RF cable loss(dB)} + \text{attenuator factor(dB)}$.
 $= 8(\text{dB})$

5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 572331

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- CNAS - Registration No.: CNAS L6165

Shenzhen TCT Testing Technology Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6165.

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

Tel: 86-755-36638142

5.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$

6. Test Results and Measurement Data

6.1. Conducted Output Power Measurement

6.1.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1046
Operation mode:	Refer to item 4.1
Limits:	GSM 850 7W PCS 1900 2W WCDMA Band V: 7W WCDMA Band II: 2W
Test Setup:	<p style="text-align: center;">System Simulator EUT</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The transmitter output port was connected to the system simulator. 2. Set EUT at maximum power through system simulator. 3. Select lowest, middle, and highest channels for each band and different modulation. 4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.
Test Result:	PASS

6.1.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 11, 2016
RF cable	TCT	RE-06	N/A	Sep. 12, 2016
Antenna Connector	TCT	RFC-01	N/A	Sep. 12, 2016
Power sensor	Agilent	E9031A	MY41497725	Sep. 11, 2016
Power meter	Agilent	E4418B	GB43312526	Sep. 11, 2016

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.1.3. Test data

Conducted Power Measurement Results:

Average Conducted Power (*Unit: dBm)						
Band	GSM850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM	31.37	32.32	32.53	29.31	29.63	30.11
GPRS class8	31.74	32.68	32.87	29.76	29.48	30.16
GPRS class10	30.09	31.02	31.31	27.72	27.75	28.32
GPRS class11	28.27	29.18	29.44	26.21	26.25	26.90
GPRS class12	26.35	27.29	27.58	24.22	24.30	24.95
EDGE class8	27.54	27.51	27.82	25.12	25.48	25.36
EDGE class10	26.42	26.84	26.37	24.84	24.38	24.53
EDGE class11	25.58	25.69	25.72	23.72	23.49	23.45
EDGE class12	24.37	24.84	24.51	22.19	23.12	23.08
Average Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4183	4233	9262	9400	9538
Frequency(MHz)	826.4	836.6	846.6	1852.4	1880.0	1907.6
WCDMA RMC 12.2K	22.35	22.46	22.54	22.63	22.70	22.25
HSDPA Subtest-1	22.70	22.49	22.47	22.61	22.58	21.76
HSDPA Subtest-2	22.61	22.37	22.32	21.63	21.46	21.70
HSDPA Subtest-3	22.24	21.97	21.84	21.37	21.08	21.48
HSDPA Subtest-4	21.95	21.72	21.62	21.28	21.35	21.32

6.2. Peak to Average Ratio

6.2.1. Test Specification

Test Requirement:	FCC Part24.232
Test Method:	FCC KDB 971168 v02r02 Section 5.7.1
Operation mode:	Refer to item 4.1
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	<p>System Simulator</p> <p>Spectrum Analyzer</p> <p>Power Divider</p> <p>EUT</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1. 2. The EUT was connected to spectrum analyzer and system simulator via a power divider. 3. Set EUT to transmit at maximum output power. 4. For GSM/EGPRS operating modes, signal gating is implemented on the spectrum analyzer by triggering from the system simulator. 5. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. 6. Record the maximum PAPR level associated with a probability of 0.1%.
Test Result:	PASS

6.2.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 11, 2016
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 12, 2016
RF cable	TCT	RE-06	N/A	Sep. 12, 2016
Antenna Connector	TCT	RFC-01	N/A	Sep. 12, 2016

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test Data

Cellular Band									
Mode	GSM850 (GSM)			GSM850 (EDGE class 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128	190	251	128	190	251	4132	4183	4233
Frequency (MHz)	824.2	836.6	848.8	824.2	836.6	848.8	826.4	836.6	846.8
Peak-to-Average Ratio (dB)	2.63	2.62	2.62	2.62	2.62	2.62	3.38	3.67	3.46

PCS Band									
Mode	GSM 1900 (GSM)			GSM 1900 (EDGE class 8)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512	661	810	512	661	810	9262	9400	9538
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Peak-to-Average Ratio (dB)	2.64	2.64	2.63	2.64	2.64	2.63	4.58	3.91	3.66

Test plots as follows:



Peak-to-Average Ratio on Channel 128



Peak-to-Average Ratio on Channel 190



Peak-to-Average Ratio on Channel 251



Peak-to-Average Ratio on Channel 512



Peak-to-Average Ratio on Channel 661



Peak-to-Average Ratio on Channel 810



Peak-to-Average Ratio on Channel 128



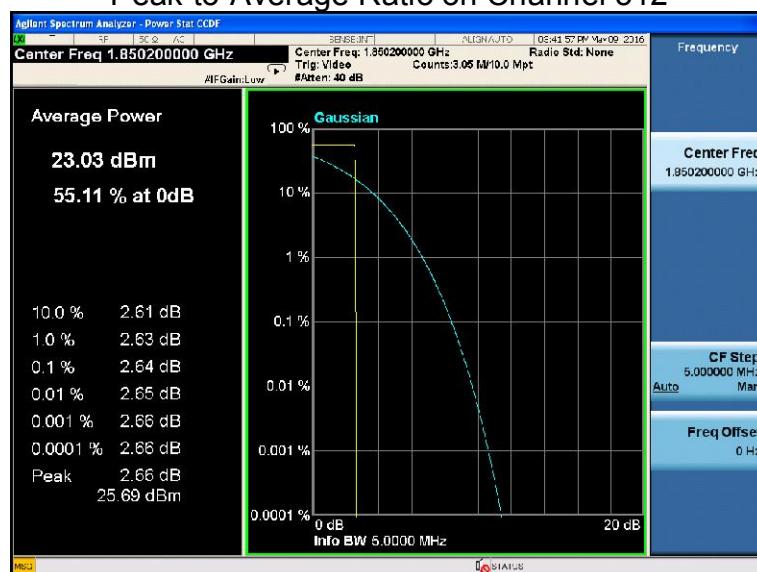
Peak-to-Average Ratio on Channel 190



Peak-to-Average Ratio on Channel 251



Peak-to-Average Ratio on Channel 512



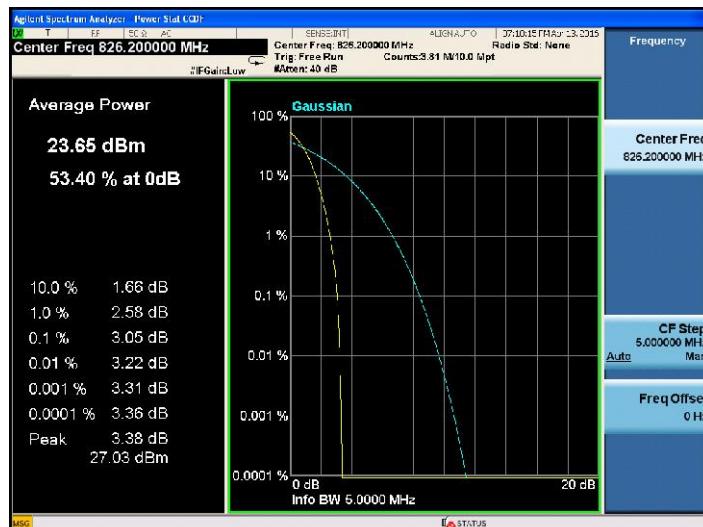
Peak-to-Average Ratio on Channel 661



Peak-to-Average Ratio on Channel 810



Peak-to-Average Ratio on Channel 4132



Peak-to-Average Ratio on Channel 4183



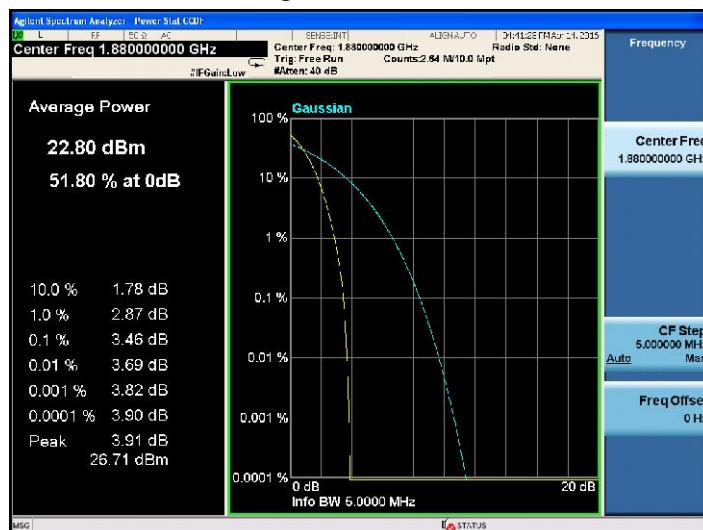
Peak-to-Average Ratio on Channel 4233



Peak-to-Average Ratio on Channel 9262



Peak-to-Average Ratio on Channel 9400



Peak-to-Average Ratio on Channel 9538



6.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement

6.3.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1049
Operation mode:	Refer to item 4.1
Limit:	N/A
Test Setup:	<p>The diagram illustrates the test setup. A purple box labeled "System Simulator" is connected to a black "Power Divider". The power divider has two outputs: one leading to a green box labeled "Spectrum Analyzer" and another leading to a yellow box labeled "EUT".</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 v02r02 Section 4.2. 2. The EUT was connected to the spectrum analyzer and system simulator via a power divider. 3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold. 5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.
Test Result:	PASS

6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 11, 2016
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 12, 2016
RF cable	TCT	RE-06	N/A	Sep. 12, 2016
Antenna Connector	TCT	RFC-01	N/A	Sep. 12, 2016

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.3.3. Test data

Cellular Band						
Mode	GSM850 (GSM)			GSM 850 (GPRS)		
Channel	128	190	251	128	190	251
Frequency (MHz)	824.2	836.6	848.8	824.2	836.6	848.8
99% OBW (kHz)	248.25	247.79	247.34	247.13	244.99	244.63
26dB BW (kHz)	315.6	312.4	315.9	313.3	320.8	316.8

Cellular Band						
Mode	GSM1900 (GSM)			GSM 1900 (GPRS)		
Channel	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8	1850.2	1880.0	1909.8
99% OBW (kHz)	246.73	249.43	247.03	246.41	245.49	248.64
26dB BW (kHz)	314.4	320.3	312.5	319.6	319.0	308.9

Cellular Band						
Mode	GSM 850 (EDGE)			GSM 1900 (EDGE)		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
99% OBW (kHz)	250.17	242.68	245.28	246.58	245.69	245.28
26dB BW (kHz)	319.0	316.7	317.4	318.6	315.8	316.0

Cellular Band			
Mode	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132	4183	4233
Frequency (MHz)	826.4	836.6	846.6
99% OBW (kHz)	4101.2	4092.0	4103.1
26dB BW (kHz)	4648	4662	4637

PCS Band			
Mode	WCDMA Band II (RMC 12.2Kbps)		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880	1907.6
99% OBW (kHz)	4089.0	4090.2	4087.0
26dB BW (kHz)	4611	4600	4605

Test plots as follows:



Band:

GSM850

Test Mode:

GSM

Occupied Bandwidth Plot on Channel 128



Occupied Bandwidth Plot on Channel 190



Occupied Bandwidth Plot on Channel 251



Band:

GSM 1900

Test Mode:

GSM

Occupied Bandwidth Plot on Channel 512



Occupied Bandwidth Plot on Channel 661



Occupied Bandwidth Plot on Channel 810



Band:

GPRS850

Test Mode:

 GPRS Class 8 Link
(GMSK)

Occupied Bandwidth Plot on Channel 128



Occupied Bandwidth Plot on Channel 190



Occupied Bandwidth Plot on Channel 251



Band:

GPRS 1900

Test Mode:

 GPRS Class 8 Link
(GMSK)

Occupied Bandwidth Plot on Channel 512



Occupied Bandwidth Plot on Channel 661



Occupied Bandwidth Plot on Channel 810



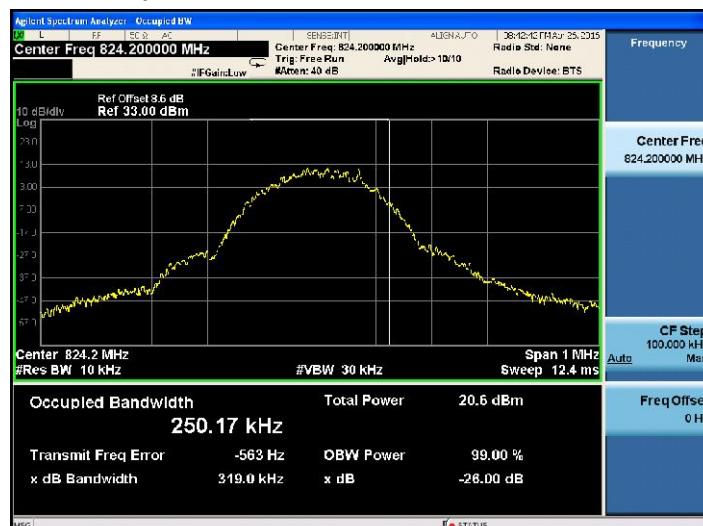
Band:

GSM850

Test Mode:

 EDGE Class 8 Link
(8PSK)

Occupied Bandwidth Plot on Channel 128



Occupied Bandwidth Plot on Channel 190



Occupied Bandwidth Plot on Channel 251



Band:

GPRS 1900

Test Mode:

 EDGE Class 8 Link
(8PSK)

Occupied Bandwidth Plot on Channel 512



Occupied Bandwidth Plot on Channel 661



Occupied Bandwidth Plot on Channel 810



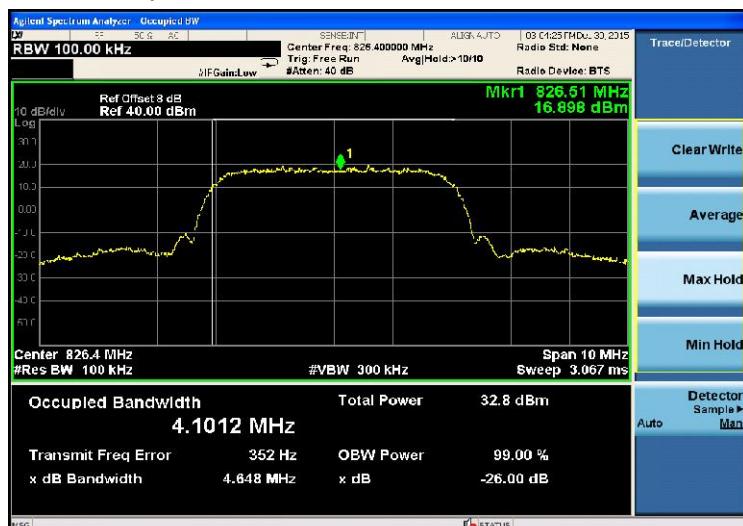
Band:

WCDMA Band V

Test Mode:

 RMC 12.2Kbps Link
(QPSK)

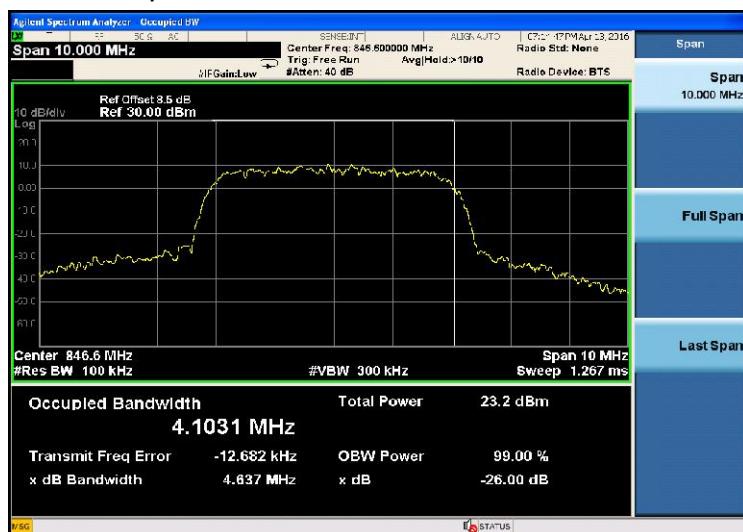
Occupied Bandwidth Plot on Channel 4132



Occupied Bandwidth Plot on Channel 4183



Occupied Bandwidth Plot on Channel 4233



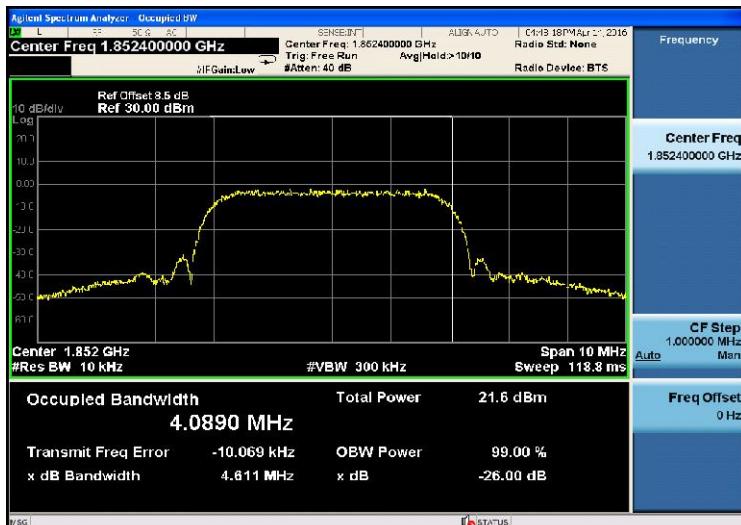
Band:

WCDMA Band II

Test Mode:

 RMC 12.2Kbps Link
(QPSK)

Occupied Bandwidth Plot on Channel 9262



Occupied Bandwidth Plot on Channel 9400



Occupied Bandwidth Plot on Channel 9538

