

TEST REPORT

of

FCC Part 22 Subpart H, Part 24 Subpart E and Part 27 Subpart C
FCC ID: ZNFDM01G

Equipment Under Test : Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Smart Phone
Model Name : DM-01G
Applicant : LG Electronics MobileComm U.S.A., Inc.
Manufacturer : LG Electronics MobileComm U.S.A., Inc.
Date of Test(s) : 2015.02.05 ~ 2015.03.06
Date of Issue : 2015.03.09

In the configuration tested, the EUT complied with the standards specified above.

Tested By:

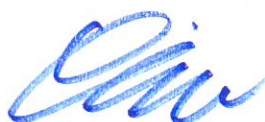


Wonjun Sim

Date:

2015.03.09

Approved By:



Hyunchoe You

Date:

2015.03.09

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

INDEX

<u>TABLE OF CONTENTS</u>	Page
1. General Information -----	3
2. RF radiated output power & spurious radiated emission -----	7
3. Occupied Bandwidth 99 % -----	28
4. Peak-Average Ratio -----	44
5. Spurious Emissions At Antenna Terminal -----	48
6. Band Edge -----	65
7. Frequency Stability -----	74

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1. General information

1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-837

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Telephone : +82 31 428 5700

FAX : +82 31 427 2370

1.2. Details of applicant

Applicant : LG Electronics MobileComm U.S.A., Inc.

Address : 10101 Old Grove Road, San Diego, CA 92131

Contact Person : An, Hee-Ju

Phone No. : +82 2 2033 1103

1.3. Description of EUT

Kind of Product	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Smart Phone
Model Name	DM-01G
Power Supply	DC 3.8 V
Rated Power	GSM850: 33.2 dB m GSM1900: 30.2 dB m WCDMA850: 24.7 dB m LTE Band 17: 23.7 dB m
Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1 850.2 MHz ~ 1 909.8 MHz WCDMA850: 826.4 MHz ~ 846.6 MHz LTE Band 17 (5 MHz): 706.5 MHz ~ 713.5 MHz LTE Band 17 (10 MHz): 709.0 MHz ~ 711.0 MHz
Class of GPRS	Class 12, Class B
Emission Designator	GSM850: 249KGXW GSM1900: 244KGXW WCDMA850: 4M16F9W LTE Band 17 (5 MHz): 4M52G7D (QPSK) / 4M51W7D (16QAM) LTE Band 17 (10 MHz): 8M98G7D (QPSK) / 8M98W7D (16QAM)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1.4. Sample calculation for offset

Where relevant, the following sample calculation is provided:

1.4.1. Conducted test

Offset value (dB) = Directional Coupler (dB) + Attenuator (dB) + Cable loss (dB)

1.4.2. Radiation test

E.R.P. & E.I.R.P. = [S.G level + Amp.](dB m) - Cable loss(dB) + Ant. gain (dB d/dB i)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1.5. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due.
Signal Generator	R&S	SMBV100A	259067	Jun. 25, 2014	Annual	Jun. 25, 2015
Signal Generator	R&S	SMR40	100272	Jul. 18, 2014	Annual	Jul. 18, 2015
Spectrum Analyzer	Agilent	N9030A	US51350132	Sep. 24, 2014	Annual	Sep. 24, 2015
Spectrum Analyzer	R&S	FSV30	103210	Dec. 29, 2014	Annual	Dec. 29, 2015
Mobile Test Unit	R&S	CMW500	144035	Mar. 03, 2015	Annual	Mar. 03, 2016
Directional Coupler	KRYTAR	152613	122660	Jun. 10, 2014	Annual	Jun. 10, 2015
Temperature Chamber	Hangil Tech.	HGTP-4050	HGTP-4050-04-01	Jun. 26, 2014	Annual	Jun. 26, 2015
High Pass Filter	Wainwright	WHK3.0/18G-6SS	4	Jul. 02, 2014	Annual	Jul. 02, 2015
High Pass Filter	Wainwright	WHK1.5/15G-6SS	4	Mar. 18, 2014	Annual	Mar. 18, 2015
High Pass Filter	Wainwright	WHK7.5/26.5G-6SS	15	Jun. 02, 2014	Annual	Jun. 02, 2015
DC Power Supply	Agilent	6553A	MY40000695	Jun. 26, 2014	Annual	Jun. 26, 2015
Preamplifier	H.P.	8447F	2944A03909	Aug. 27, 2014	Annual	Aug. 27, 2015
Preamplifier	R&S	SCU 18	10117	Dec. 26, 2014	Annual	Dec. 26, 2015
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	Apr. 28, 2014	Annual	Apr. 28, 2015
Test Receiver	R&S	ESU26	100109	Mar. 03, 2015	Annual	Mar. 03, 2016
Bilog Antenna	SCHWARZBECK	VULB9163	396	Jun. 07, 2013	Biennial	Jun. 07, 2015
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170431	May 15, 2014	Biennial	May 15, 2016
Horn Antenna	R&S	HF906	100326	Dec. 10, 2013	Biennial	Dec. 10, 2015
Dipole Antenna	SCHWARZBECK MESSELEKTRONIK	VHA 9103	9103-2817	May 09, 2013	Biennial	May 09, 2015
Dipole Antenna	SCHWARZBECK MESSELEKTRONIK	UHA 9105	9105-2514	May 09, 2013	Biennial	May 09, 2015
Antenna Master	INNCO	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INNCO	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.4 m)	N/A	N.C.R.	N/A	N.C.R.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1.6. Summary of test results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22, 24 and 27		
Section in FCC part	Test Item	Result
§2.1046 §22.913(a)(2) §24.232(c) §27.50(c)(10)	RF Radiated Output Power	Complied
§2.1053 §22.917(a) §24.238(a) §27.53(g)	Spurious Radiated Emission	Complied
§2.1046	Conducted Output Power	See SAR Report
§2.1049	Occupied Bandwidth	Complied
§24.232(d)	Peak-Average Ratio	Complied
§2.1051 §22.917(a) §24.238(a) §27.53(g)	Spurious Emission at Antenna Terminal	Complied
§22.917(a) §24.238(a) §27.53(g)	Band Edge	Complied
§2.1055 §22.355 §24.235 §27.54	Frequency Stability	Complied

1.7. Test report revision

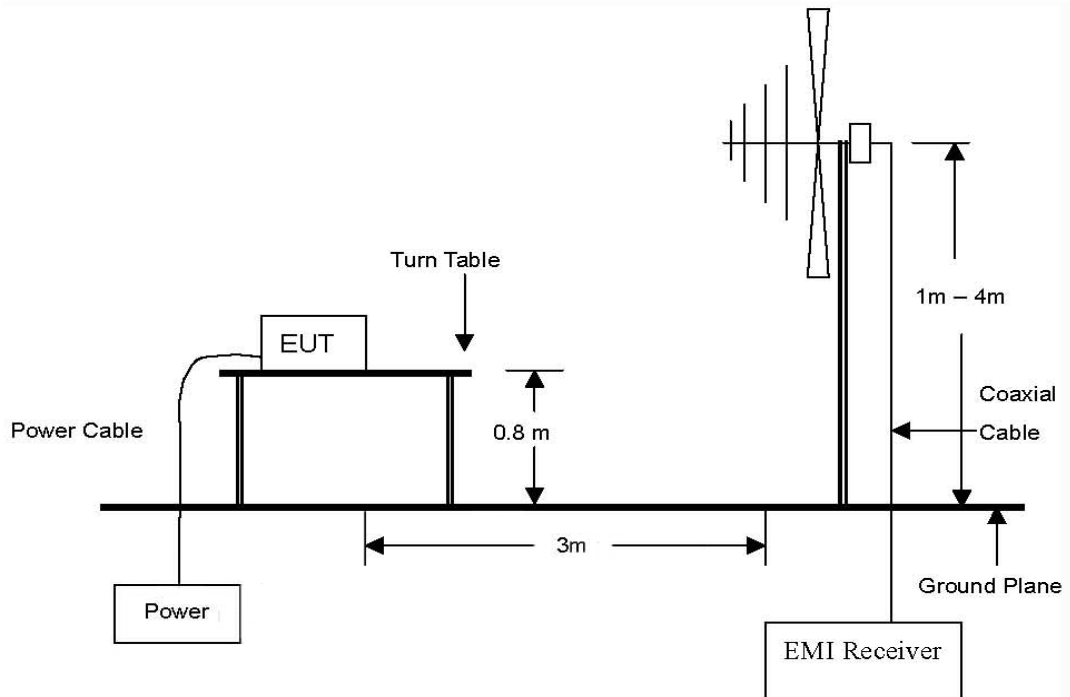
Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL008485	2015.03.09	Initial

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

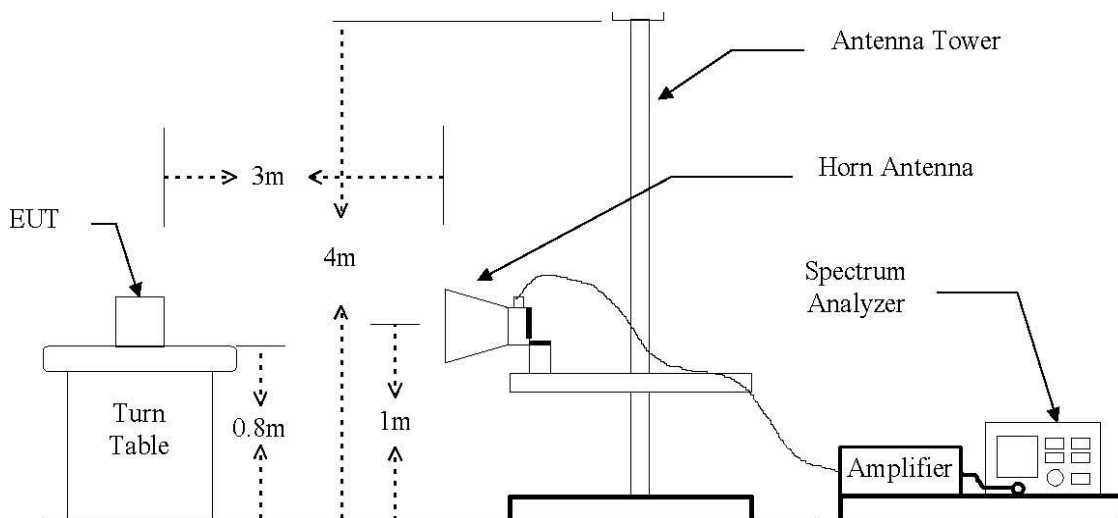
2. RF radiated output power & spurious radiated emission

2.1. Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.

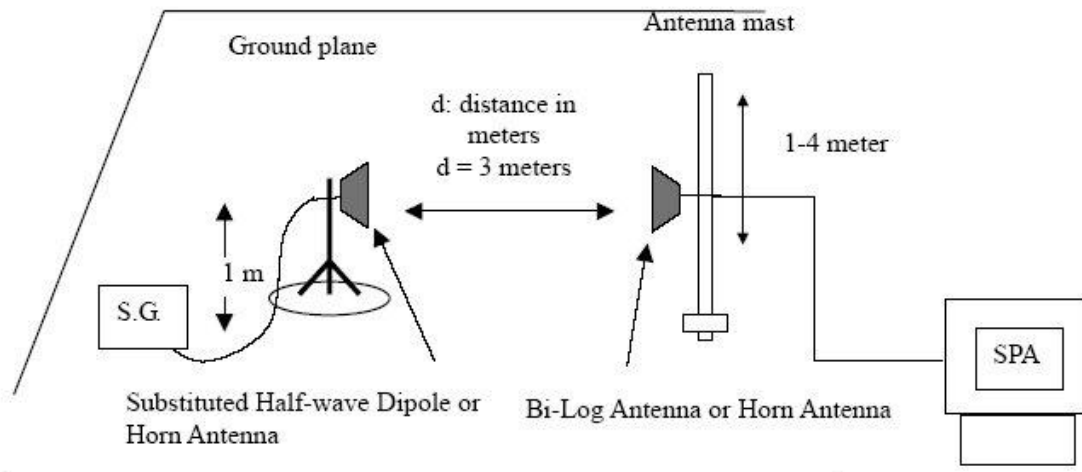


The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 20 GHz Emissions.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

The diagram below shows the test setup for substituted method.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

2.2. Limit

2.2.1. Limit of radiated output power

FCC §22.913(a)(2), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.
 FCC §24.232(c), Mobile and portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.
 FCC §27.50(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

2.2.2. Limit of spurious radiated emission

FCC §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.
 FCC §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
 FCC §27.53(g), For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

2.3. Test procedure: Based on ANSI/TIA 603C: 2004

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions occupied bandwidth, RBW = 1-5 % of the OBW (not to exceed 1 MHz), VBW $\geq 3 \times$ RBW, Detector = RMS, sweep time = auto, trace average at least 100 traces in power averaging(i.e., RMS) mode, per the guidelines of KDB 971168 v02r02.
5. Radiated spurious emissions measurement method was set as follows:
RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz, VBW $\geq 3 \times$ RBW, Detector = Peak, trace mode = max hold, per the guidelines of KDB 971168 v02r02.
6. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
7. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
8. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
9. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
10. The maximum signal level detected by the measuring receiver shall be noted.
11. The EUT was replaced by half-wave dipole (1 GHz below) or horn antenna (1 GHz above) connected to a signal generator.
12. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dB m, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

2.4. Test result for RF radiated output power

Ambient temperature : (24 ± 1) °C
Relative humidity : 47 % R.H.

GSM850

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
824.2	V	36.55	3.42	-2.82	30.31	1074.36
824.2	H	36.63	3.42	-2.82	30.39	1094.19
836.6	V	38.59	3.44	-3.04	32.11	1626.67
836.6	H	37.38	3.44	-3.04	30.90	1229.71
848.8	V	39.39	3.49	-3.27	32.63	1831.64
848.8	H	38.07	3.49	-3.27	31.31	1353.21

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
824.2	V	36.74	3.42	-2.82	30.50	1122.41
824.2	H	36.66	3.42	-2.82	30.42	1101.78
836.6	V	38.59	3.44	-3.04	32.11	1626.67
836.6	H	37.30	3.44	-3.04	30.82	1207.26
848.8	V	39.58	3.49	-3.27	32.82	1913.55
848.8	H	37.55	3.49	-3.27	30.79	1200.51

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

GSM1900
-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 850.2	V	26.93	5.03	7.88	29.78	951.23
1 850.2	H	28.03	5.03	7.88	30.88	1225.27
1 880.0	V	26.32	5.11	7.86	29.07	807.56
1 880.0	H	27.94	5.11	7.86	30.69	1173.06
1 909.8	V	26.75	5.17	7.84	29.42	875.63
1 909.8	H	28.53	5.17	7.84	31.20	1319.45

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 850.2	V	25.80	5.03	7.88	28.65	733.30
1 850.2	H	28.02	5.03	7.88	30.87	1222.45
1 880.0	V	26.18	5.11	7.86	28.93	781.94
1 880.0	H	27.97	5.11	7.86	30.72	1181.19
1 909.8	V	26.73	5.17	7.84	29.40	871.61
1 909.8	H	28.36	5.17	7.84	31.03	1268.80

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

WCDMA850
-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
826.4	V	29.70	3.42	-2.86	23.42	219.63
826.4	H	28.60	3.42	-2.86	22.32	170.44
836.6	V	30.51	3.44	-3.04	24.03	253.10
836.6	H	29.78	3.44	-3.04	23.30	213.70
846.6	V	30.54	3.48	-3.23	23.83	241.54
846.6	H	29.92	3.48	-3.27	23.17	207.55

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
826.4	V	29.74	3.42	-2.86	23.46	221.66
826.4	H	28.60	3.42	-2.86	22.32	170.44
836.6	V	30.55	3.44	-3.04	24.07	255.45
836.6	H	29.64	3.44	-3.04	23.16	206.92
846.6	V	30.68	3.48	-3.27	23.93	247.14
846.6	H	29.72	3.48	-3.27	22.97	198.21

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 (5 MHz – QPSK)
-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
706.5	V	28.16	2.95	-2.74	22.47	176.61
706.5	H	26.94	2.95	-2.74	21.25	133.31
710.0	V	29.84	2.96	-2.72	24.16	260.69
710.0	H	28.99	2.96	-2.72	23.31	214.35
713.5	V	30.56	2.97	-2.71	24.88	307.82
713.5	H	27.48	2.97	-2.71	21.80	151.41

* 5 BW 1RB size / 0 Offset for B17

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
706.5	V	28.34	2.95	-2.74	22.65	184.08
706.5	H	27.06	2.95	-2.74	21.37	137.04
710.0	V	29.82	2.96	-2.72	24.14	259.49
710.0	H	28.79	2.96	-2.72	23.11	204.71
713.5	V	30.72	2.97	-2.71	25.04	319.37
713.5	H	27.37	2.97	-2.71	21.69	147.62

* 5 BW 1RB size / 0 Offset for B17

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 (5 MHz – 16QAM)
-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
706.5	V	28.81	2.95	-2.74	23.12	205.12
706.5	H	28.09	2.95	-2.74	22.40	173.72
710.0	V	28.52	2.96	-2.72	22.84	192.36
710.0	H	29.06	2.96	-2.72	23.38	217.84
713.5	V	28.77	2.97	-2.71	23.09	203.84
713.5	H	28.76	2.97	-2.71	23.08	203.30

* 5 BW 1RB size / 0 Offset for B17

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
706.5	V	28.59	2.95	-2.74	22.90	194.99
706.5	H	27.79	2.95	-2.74	22.10	162.13
710.0	V	28.44	2.96	-2.72	22.76	188.85
710.0	H	28.81	2.96	-2.72	23.13	205.65
713.5	V	28.64	2.97	-2.71	22.96	28.64
713.5	H	28.90	2.97	-2.71	23.22	209.96

* 5 BW 1RB size / 0 Offset for B17

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 (10 MHz – QPSK)
-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
709.0	V	28.97	2.96	-2.73	23.28	213.00
709.0	H	29.82	2.96	-2.73	24.13	258.68
710.0	V	29.18	2.96	-2.72	23.50	223.94
710.0	H	30.01	2.96	-2.72	24.33	271.10
711.0	V	29.72	2.96	-2.72	24.04	253.61
711.0	H	28.98	2.96	-2.72	23.30	213.93

* 10 BW 1RB size / 0 Offset for B17

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
709.0	V	28.84	2.96	-2.73	23.15	206.72
709.0	H	29.99	2.96	-2.73	24.30	269.01
710.0	V	29.34	2.96	-2.72	23.66	232.34
710.0	H	29.94	2.96	-2.72	24.26	266.77
711.0	V	29.85	2.96	-2.72	24.17	261.32
711.0	H	28.82	2.96	-2.72	23.14	206.20

* 10 BW 1RB size / 0 Offset for B17

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

SGS Korea Co., Ltd. (Gunpo Laboratory)

4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-040

<http://www.sgsgroup.kr>

RTT5041-20(2014.01.20)(2)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

LTE band 17 (10 MHz – 16QAM)
-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
709.0	V	28.55	2.96	-2.73	22.86	193.37
709.0	H	28.92	2.96	-2.73	23.23	210.27
710.0	V	28.60	2.96	-2.72	22.92	195.94
710.0	H	29.21	2.96	-2.72	23.53	225.49
711.0	V	28.55	2.96	-2.72	22.87	193.72
711.0	H	28.98	2.96	-2.72	23.30	213.93

* 10 BW 1RB size / 0 Offset for B17

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
709.0	V	28.63	2.96	-2.73	22.94	196.96
709.0	H	28.87	2.96	-2.73	23.18	207.86
710.0	V	28.40	2.96	-2.72	22.72	187.12
710.0	H	29.14	2.96	-2.72	23.46	221.89
711.0	V	28.44	2.96	-2.72	22.76	188.87
711.0	H	29.14	2.96	-2.72	23.46	221.96

* 10 BW 1RB size / 0 Offset for B17

Remark:

1. E.R.P. & E.I.R.P. = [S.G level + Amp.](dB m) - Cable loss(dB) + Ant. gain (dB d/dB i)
2. This device was tested under all bandwidths, and RB configurations, and modulations.
3. The data reported in the table above was measured in worst case.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

2.5. Spurious radiated emission

- Measured output Power: 32.82 dB m = 1.914 W
- Modulation Signal: GSM850
- Distance: 3 meters
- Limit: $43 + 10\log_{10}(W) = 45.82$ dB c

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel (824.2 MHz)							
1 648.41	V	-32.48	4.37	5.78	-31.07	63.89	18.07
1 648.43	H	-35.52	4.37	5.78	-34.11	66.93	21.11
2 472.60	V	-33.31	6.25	6.76	-32.80	65.62	19.80
2 472.54	H	-25.61	6.25	6.76	-25.10	57.92	12.10
Middle Channel (836.4 MHz)							
1 673.32	V	-32.98	4.45	5.78	-31.65	64.47	18.65
1 673.22	H	-35.48	4.45	5.78	-34.15	66.97	21.15
2 509.63	V	-28.60	6.31	6.83	-28.08	60.90	15.08
2 509.99	H	-23.14	6.31	6.83	-22.62	55.44	9.62
High Channel (848.8 MHz)							
1 697.79	V	-32.45	4.53	5.78	-31.20	64.02	18.20
1 697.55	H	-35.87	4.53	5.78	-34.62	67.44	21.62
2 546.53	V	-25.43	6.37	6.85	-24.95	57.77	11.95
2 546.55	H	-22.54	6.37	6.85	-22.06	54.88	9.06

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel (824.2 MHz)							
1 648.82	V	-32.29	4.37	5.78	-30.88	63.70	17.88
1 648.59	H	-35.39	4.37	5.78	-33.98	66.80	20.98
2 472.69	V	-33.10	6.25	6.76	-32.59	65.41	19.59
2 472.18	H	-25.40	6.25	6.76	-24.89	57.71	11.89
Middle Channel (836.4 MHz)							
1 672.70	V	-33.23	4.45	5.78	-31.90	64.72	18.90
1 673.22	H	-35.45	4.45	5.78	-34.12	66.94	21.12
2 510.04	V	-28.37	6.31	6.83	-27.85	60.67	14.85
2 509.87	H	-23.04	6.31	6.83	-22.52	55.34	9.52
High Channel (848.8 MHz)							
1 697.83	V	-32.59	4.53	5.78	-31.34	64.16	18.34
1 697.28	H	-35.87	4.53	5.78	-34.62	67.44	21.62
2 546.70	V	-25.33	6.37	6.85	-24.85	57.67	11.85
2 546.56	H	-22.71	6.37	6.85	-22.23	55.05	9.23

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

- Measured output Power: 31.20 dB m = 1.318 W
- Modulation Signal: GSM1900
- Distance: 3 meters
- Limit: $43 + 10\log_{10}(W) = 44.20$ dB c

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	dB c	Margin (dB)
Low Channel(1 850.2 MHz)							
3 700.69	V	-29.30	7.51	9.07	-27.74	58.94	14.74
3 700.21	H	-25.86	7.51	9.07	-24.30	55.50	11.30
9 250.95	V	-16.56	13.14	12.35	-17.35	48.55	4.35
9 251.39	H	-16.36	13.14	12.35	-17.15	48.35	4.15
Middle Channel(1 880.0 MHz)							
3 759.85	V	-28.23	7.56	9.10	-26.69	57.89	13.69
3 759.86	H	-24.54	7.56	9.10	-23.00	54.20	10.00
9 399.89	V	-18.48	13.22	12.44	-19.26	50.46	6.26
9 400.49	H	-16.13	13.22	12.44	-16.91	48.11	3.91
High Channel(1 909.8 MHz)							
3 819.19	V	-30.26	7.63	9.12	-28.77	59.97	15.77
3 819.29	H	-25.63	7.63	9.12	-24.14	55.34	11.14
9 548.63	V	-21.51	13.38	12.52	-22.37	53.57	9.37
9 549.18	H	-20.83	13.38	12.52	-21.69	52.89	8.69

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	dB c	Margin (dB)
Low Channel(1 850.2 MHz)							
3 700.10	V	-29.28	7.51	9.07	-27.72	58.92	14.72
3 700.35	H	-25.59	7.51	9.07	-24.03	55.23	11.03
9 250.79	V	-16.48	13.14	12.35	-17.27	48.47	4.27
9 251.08	H	-16.42	13.14	12.35	-17.21	48.41	4.21
Middle Channel(1 880.0 MHz)							
3 759.77	V	-28.24	7.56	9.10	-26.70	57.90	13.70
3 760.11	H	-24.70	7.56	9.10	-23.16	54.36	10.16
9 399.86	V	-18.68	13.22	12.44	-19.46	50.66	6.46
9 400.19	H	-16.20	13.22	12.44	-16.98	48.18	3.98
High Channel(1 909.8 MHz)							
3 819.39	V	-30.52	7.63	9.12	-29.03	60.23	16.03
3 819.80	H	-25.83	7.64	9.12	-24.35	55.55	11.35
9 548.62	V	-21.40	13.38	12.52	-22.26	53.46	9.26
9 548.97	H	-20.82	13.38	12.52	-21.68	52.88	8.68

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

- Measured output Power: 24.07 dB m = 0.255 W
- Modulation Signal: WCDMA850
- Distance: 3 meters
- Limit: $43 + 10\log_{10}(W) = 37.07$ dB c

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel (826.4 MHz)							
1 652.72	V	-42.94	4.38	5.78	-41.54	65.61	28.54
1 652.71	H	-45.93	4.38	5.78	-44.53	68.60	31.53
Middle Channel (836.6 MHz)							
1 673.43	V	-43.03	4.45	5.78	-41.70	65.77	28.70
1 672.94	H	-45.95	4.45	5.78	-44.62	68.69	31.62
High Channel (846.6 MHz)							
1 693.27	V	-42.09	4.52	5.78	-40.83	64.90	27.83
1 692.95	H	-46.10	4.52	5.78	-44.84	68.91	31.84

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel (826.4 MHz)							
1 652.73	V	-42.66	4.38	5.78	-41.26	65.33	28.26
1 652.97	H	-46.10	4.38	5.78	-44.70	68.77	31.70
Middle Channel (836.6 MHz)							
1 673.02	V	-42.96	4.45	5.78	-41.63	65.70	28.63
1 673.06	H	-45.94	4.45	5.78	-44.61	68.68	31.61
High Channel (846.6 MHz)							
1 693.29	V	-42.04	4.52	5.78	-40.78	64.85	27.78
1 693.29	H	-46.30	4.52	5.78	-45.04	69.11	32.04

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

- Measured output Power : 25.04 dB m = 0.319 W
- Modulation Signal : LTE band 17 (5 MHz - QPSK)
- Distance : 3 meters
- Limit : $43 + 10\log_{10}(W) = 38.04$ dB c

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(706.5 MHz)							
1 413.47	V	-29.46	3.84	5.43	-27.87	52.91	14.87
1 413.79	H	-25.74	3.84	5.43	-24.15	49.19	11.15
Middle Channel(710.0 MHz)							
1 415.43	V	-28.60	3.84	5.44	-27.00	52.04	14.00
1 415.86	H	-25.89	3.84	5.44	-24.29	49.33	11.29
High Channel(713.5 MHz)							
1 426.50	V	-27.66	3.85	5.48	-26.03	51.07	13.03
1 426.49	H	-26.13	3.85	5.48	-24.50	49.54	11.50

* 5 BW 1RB size / 0 Offset for B17

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(706.5 MHz)							
1 412.92	V	-29.38	3.84	5.43	-27.79	52.83	14.79
1 412.84	H	-25.94	3.84	5.43	-24.35	49.39	11.35
Middle Channel(710.0 MHz)							
1 420.25	V	-28.76	3.84	5.46	-27.14	52.18	14.14
1 419.74	H	-25.62	3.84	5.45	-24.01	49.05	11.01
High Channel(713.5 MHz)							
1 425.09	V	-27.86	3.85	5.47	-26.24	51.28	13.24
1 425.98	H	-25.95	3.85	5.48	-24.32	49.36	11.32

* 5 BW 1RB size / 0 Offset for B17

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

- Measured output Power : 24.33 dB m = 0.271 W
- Modulation Signal : LTE band 17 (10 MHz - QPSK)
- Distance : 3 meters
- Limit : $43 + 10\log_{10}(W) = 37.33$ dB c

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(709.0 MHz)							
1 413.72	V	-29.54	3.84	5.43	-27.95	52.28	14.95
1 413.51	H	-25.91	3.84	5.43	-24.32	48.65	11.32
Middle Channel(710.0 MHz)							
1 415.53	V	-28.59	3.84	5.44	-26.99	51.32	13.99
1 415.70	H	-25.65	3.84	5.44	-24.05	48.38	11.05
High Channel(711.0 MHz)							
1 417.64	V	-28.19	3.84	5.45	-26.58	50.91	13.58
1 417.30	H	-25.92	3.84	5.44	-24.32	48.65	11.32

* 10 BW 1RB size / 0 Offset for B17

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(709.0 MHz)							
1 417.87	V	-29.06	3.84	5.45	-27.45	51.78	14.45
1 417.56	H	-26.12	3.84	5.45	-24.51	48.84	11.51
Middle Channel(710.0 MHz)							
1 420.31	V	-29.01	3.84	5.46	-27.39	51.72	14.39
1 420.03	H	-25.92	3.84	5.45	-24.31	48.64	11.31
High Channel(711.0 MHz)							
1 429.12	V	-28.00	3.85	5.49	-26.36	50.69	13.36
1 429.10	H	-25.86	3.85	5.49	-24.22	48.55	11.22

* 10 BW 1RB size / 0 Offset for B17

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

- Measured output Power : 23.38 dB m = 0.218 W
- Modulation Signal : LTE band 17 (5 MHz - 16QAM)
- Distance : 3 meters
- Limit : $43 + 10\log_{10}(W) = 36.38$ dB c

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(706.5 MHz)							
1 413.20	V	-29.51	3.84	5.43	-27.92	51.30	14.92
1 413.50	H	-25.85	3.84	5.43	-24.26	47.64	11.26
Middle Channel(710.0 MHz)							
1 415.70	V	-28.74	3.84	5.44	-27.14	50.52	14.14
1 415.71	H	-25.80	3.84	5.44	-24.20	47.58	11.20
High Channel(713.5 MHz)							
1 417.49	V	-28.74	3.84	5.45	-27.13	50.51	14.13
1 417.63	H	-25.93	3.84	5.45	-24.32	47.70	11.32

* 5 BW 1RB size / 0 Offset for B17

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(706.5 MHz)							
1 418.20	V	-29.02	3.84	5.45	-27.41	50.79	14.41
1 417.97	H	-26.07	3.84	5.45	-24.46	47.84	11.46
Middle Channel(710.0 MHz)							
1 420.38	V	-29.13	3.84	5.46	-27.51	50.89	14.51
1 419.47	H	-26.27	3.84	5.45	-24.66	48.04	11.66
High Channel(713.5 MHz)							
1 428.82	V	-27.94	3.85	5.49	-26.30	49.68	13.30
1 428.68	H	-25.99	3.85	5.49	-24.35	47.73	11.35

* 5 BW 1RB size / 0 Offset for B17

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

- Measured output Power : 23.53 dB m = 0.225 W
- Modulation Signal : LTE band 17 (10 MHz - 16QAM)
- Distance : 3 meters
- Limit : $43 + 10\log_{10}(W) = 36.52$ dB c

-Normal Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(709.0 MHz)							
1 413.49	V	-29.44	3.84	5.43	-27.85	51.38	14.85
1 413.55	H	-26.13	3.84	5.43	-24.54	48.07	11.54
Middle Channel(710.0 MHz)							
1 415.13	V	-28.77	3.84	5.44	-27.17	50.70	14.17
1 415.83	H	-25.53	3.84	5.44	-23.93	47.46	10.93
High Channel(711.0 MHz)							
1 417.32	V	-29.01	3.84	5.44	-27.41	50.94	14.41
1 417.63	H	-25.88	3.84	5.45	-24.27	47.80	11.27

* 10 BW 1RB size / 0 Offset for B17

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

SGS Korea Co., Ltd. (Gunpo Laboratory)

4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-040

<http://www.sgsgroup.kr>

RTT5041-20(2014.01.20)(2)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

-Quick Cover

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	dB c	Margin (dB)
Low Channel(709.0 MHz)							
1 417.92	V	-29.06	3.84	5.45	-27.45	50.98	14.45
1 417.84	H	-25.99	3.84	5.45	-24.38	47.91	11.38
Middle Channel(710.0 MHz)							
1 420.25	V	-29.41	3.84	5.46	-27.79	51.32	14.79
1 419.74	H	-26.13	3.84	5.45	-24.52	48.05	11.52
High Channel(711.0 MHz)							
1 429.09	V	-28.00	3.85	5.49	-26.36	49.89	13.36
1 428.98	H	-25.73	3.85	5.49	-24.09	47.62	11.09

* 10 BW 1RB size / 0 Offset for B17

Remark:

1. E.R.P. & E.I.R.P. = [S.G level + Amp.](dB m) - Cable loss(dB) + Ant. gain (dB d/dB i)
2. This device was tested under all bandwidths, and RB configurations, and modulations.
3. The data reported in the table above was measured in worst case.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

3. Occupied Bandwidth 99 %

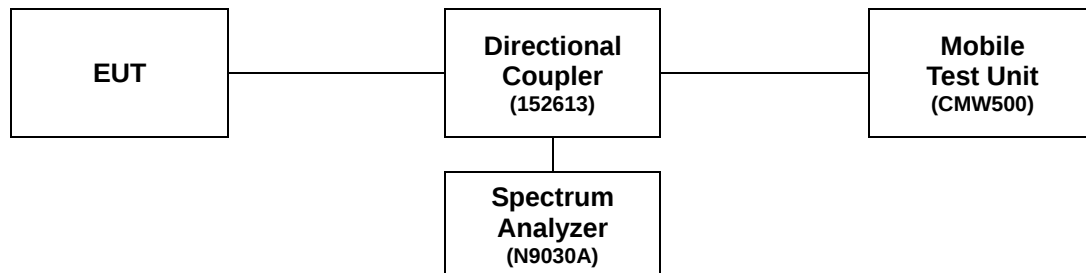
3.1. Limit

Requirements: CFR 47, Section §2.1049.

3.2. Test Procedure

The test follows section 4.2 of FCC KDB Publication 971168_v02r02.

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The spectrum analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

3.3 Test Results

Ambient temperature : (24 ± 1) °C
Relative humidity : 47 % R.H.

Band	Mode	Frequency (MHz)	Occupied Bandwidth (MHz)
GSM850	GSM Voice	824.2	0.249
		836.6	0.246
		848.8	0.247
GSM1900	GSM Voice	1 850.2	0.244
		1 880.0	0.242
		1 909.8	0.244
WCDMA850	12.2 kbps (RMC)	826.4	4.163
		836.6	4.145
		846.6	4.157
LTE 17 (5 MHz)	QPSK	706.5	4.515
		710.0	4.508
		713.5	4.514
LTE 17 (10 MHz)	QPSK	709.0	8.972
		710.0	8.970
		711.0	8.978
LTE 17 (5 MHz)	16QAM	706.5	4.509
		710.0	4.507
		713.5	4.508
LTE 17 (10 MHz)	16QAM	709.0	8.963
		710.0	8.975
		711.0	8.973

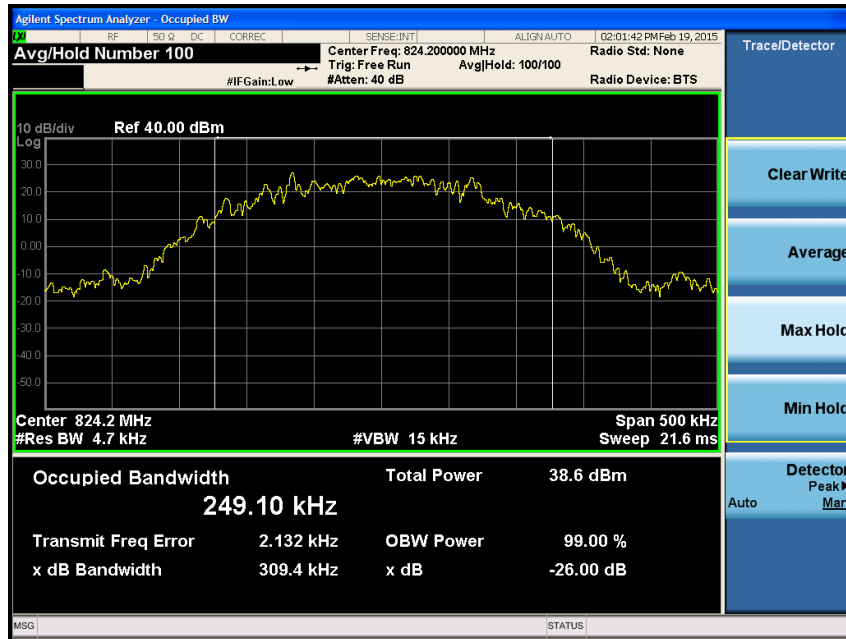
Please refer to the following plots.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

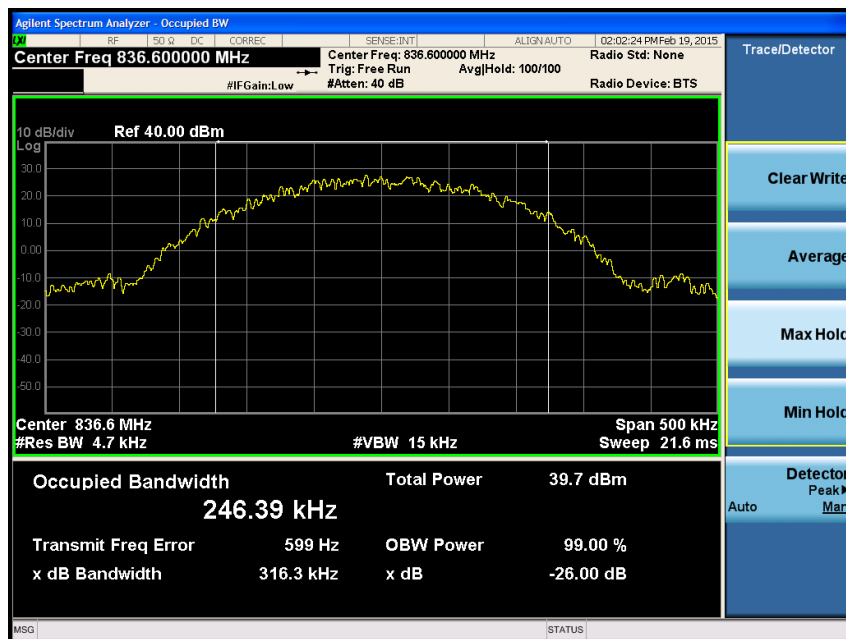
GSM850

99 %

Low Channel

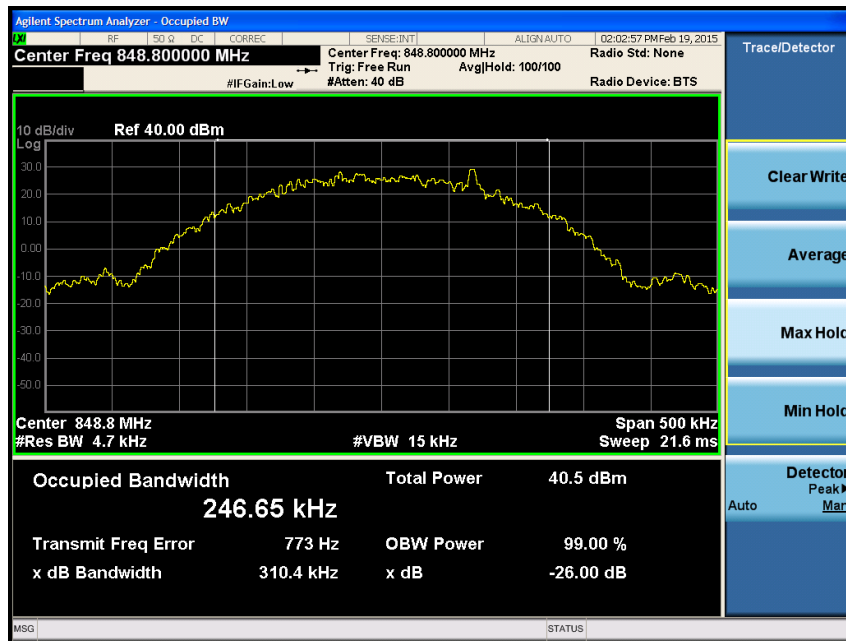


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel

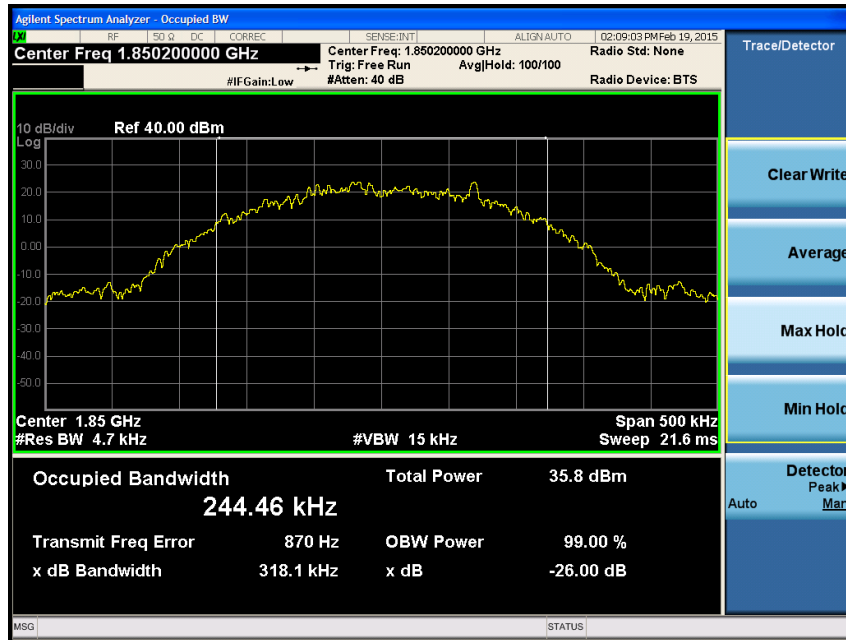


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

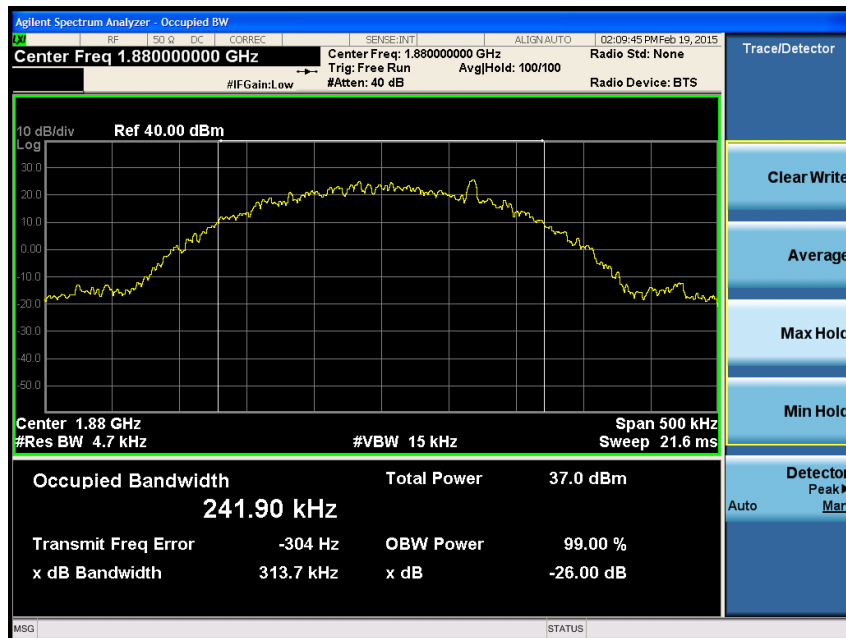
GSM1900

99 %

Low Channel

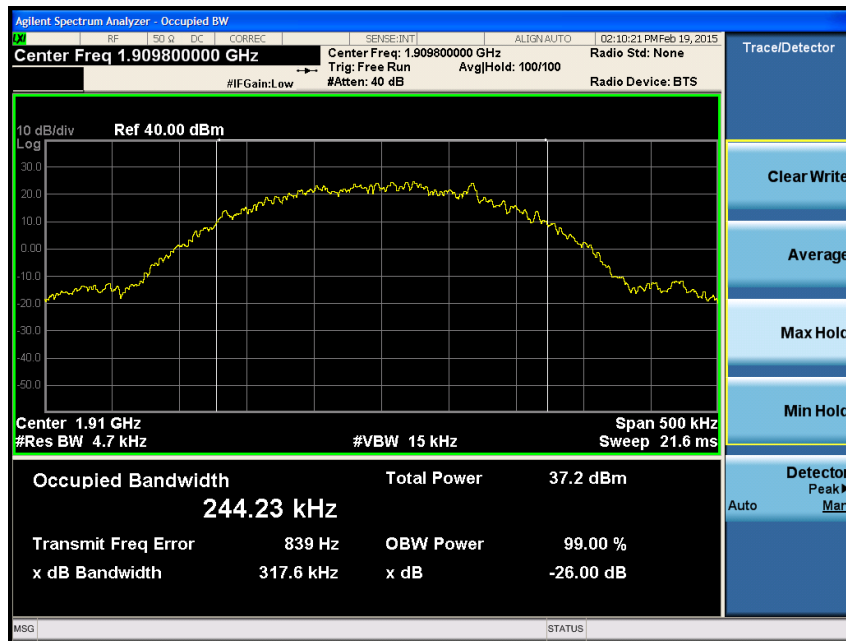


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel

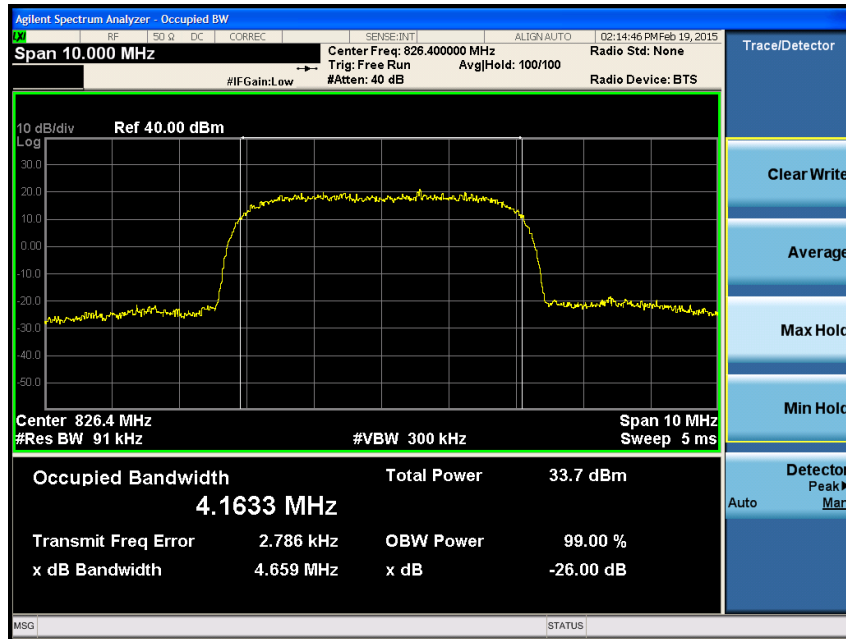


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

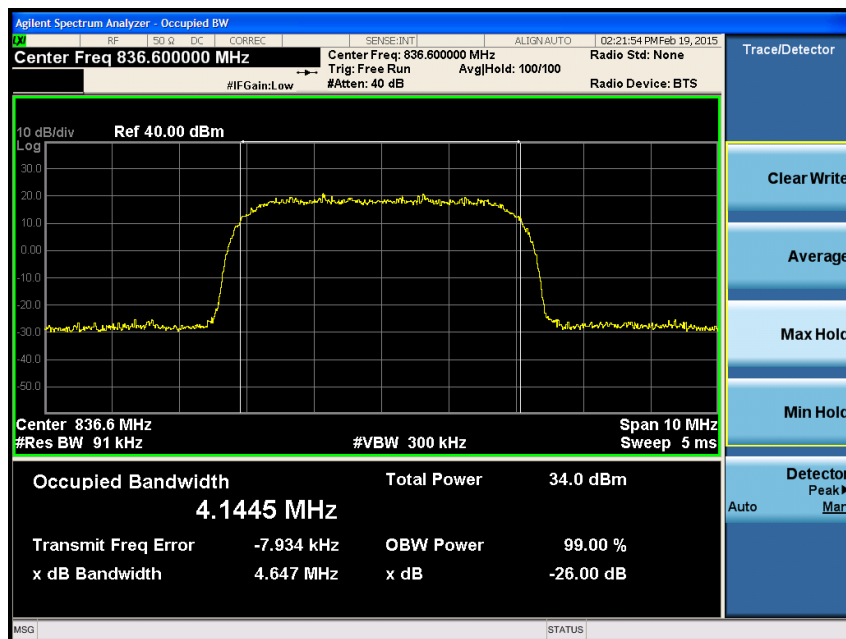
WCDMA850

99 %

Low Channel

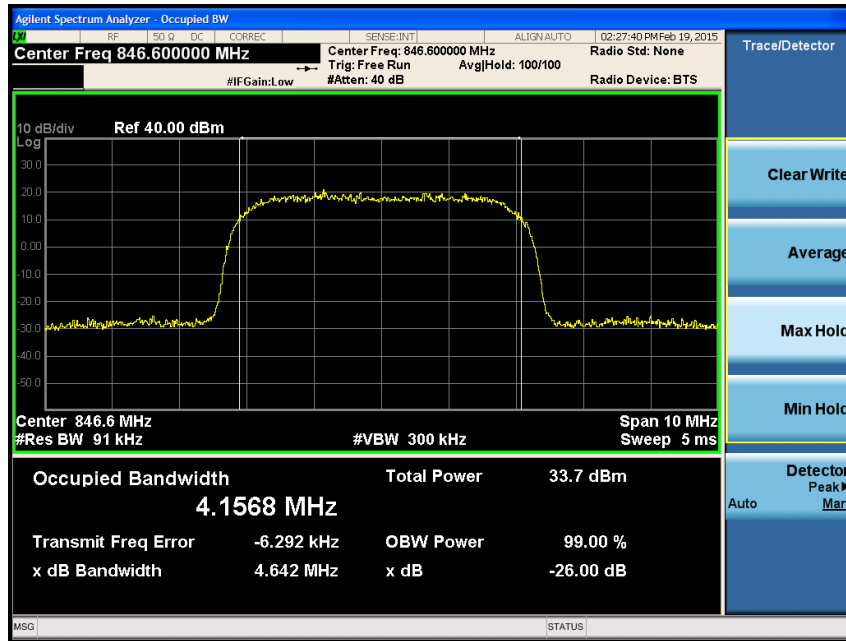


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel

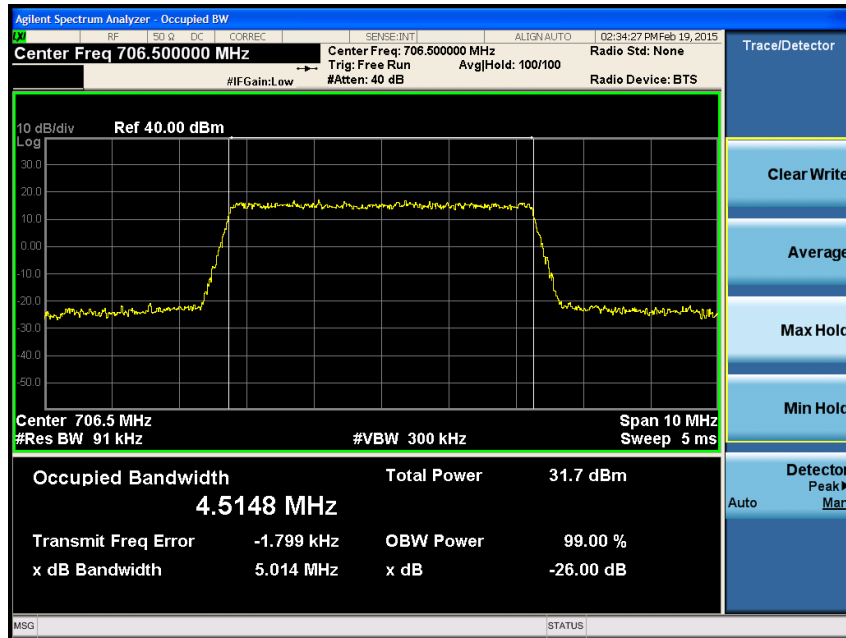


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

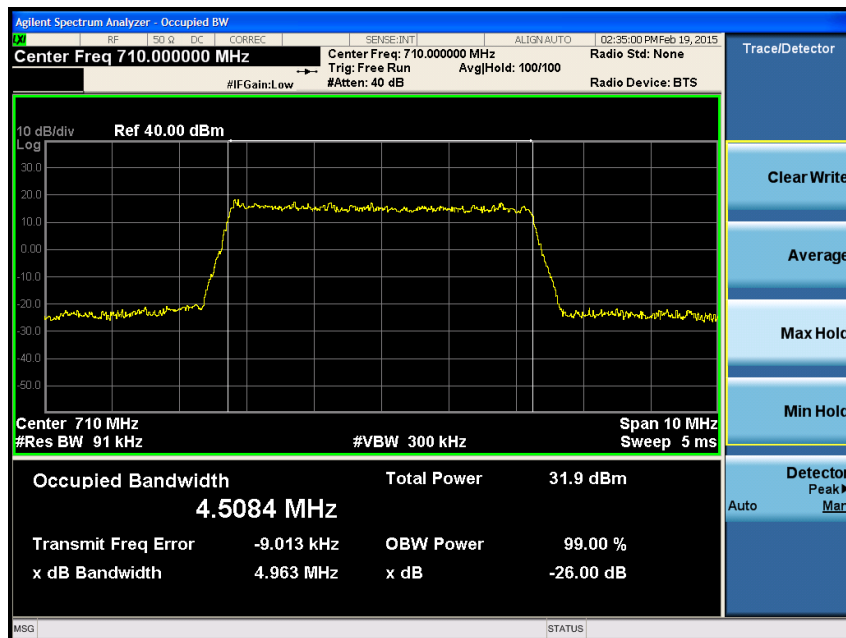
LTE band 17 (5 MHz – QPSK_RB 25)

99 %

Low Channel

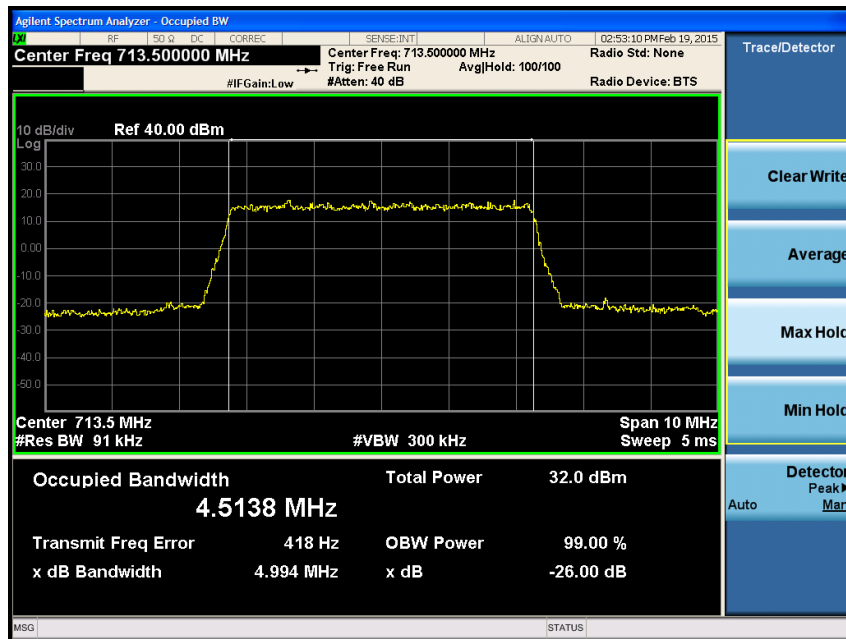


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel

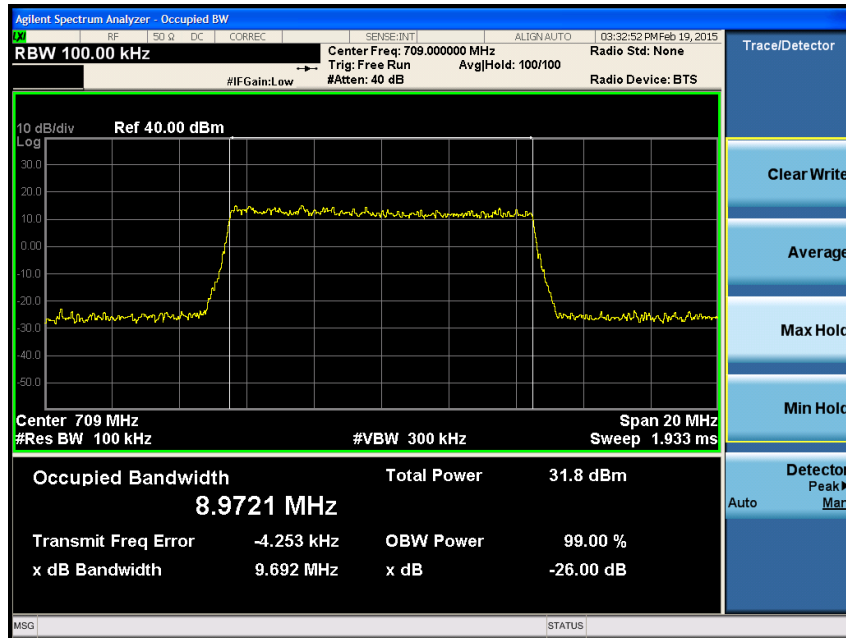


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

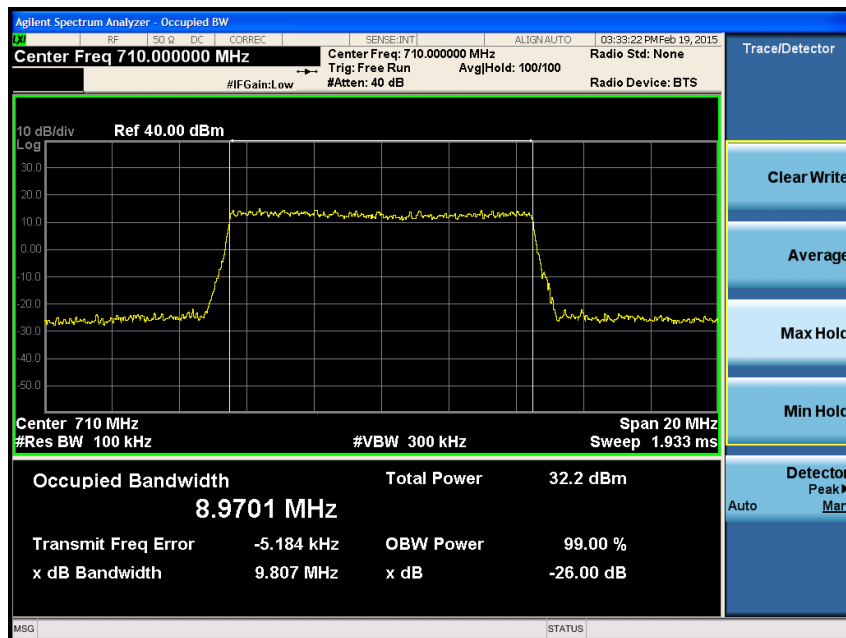
LTE band 17 (10 MHz – QPSK_RB 50)

99 %

Low Channel

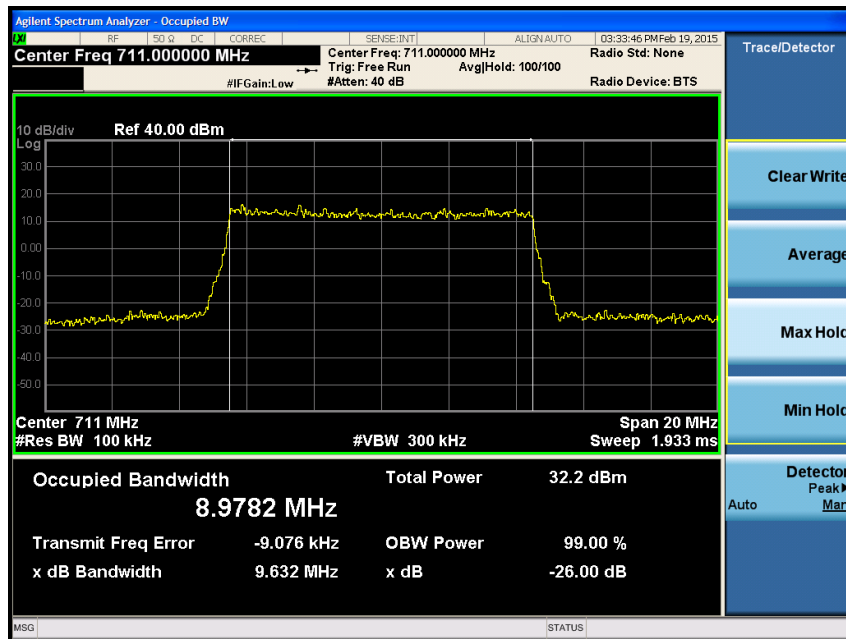


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel

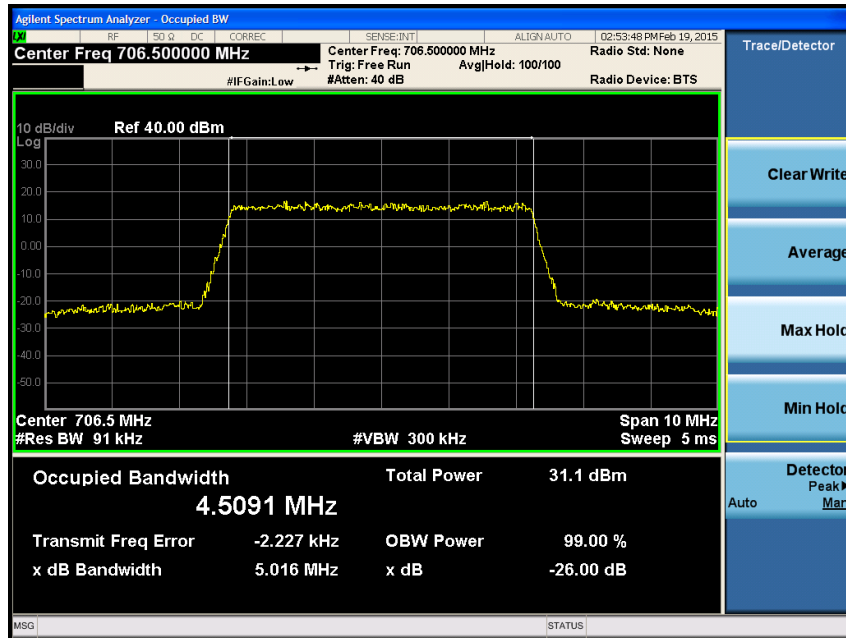


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

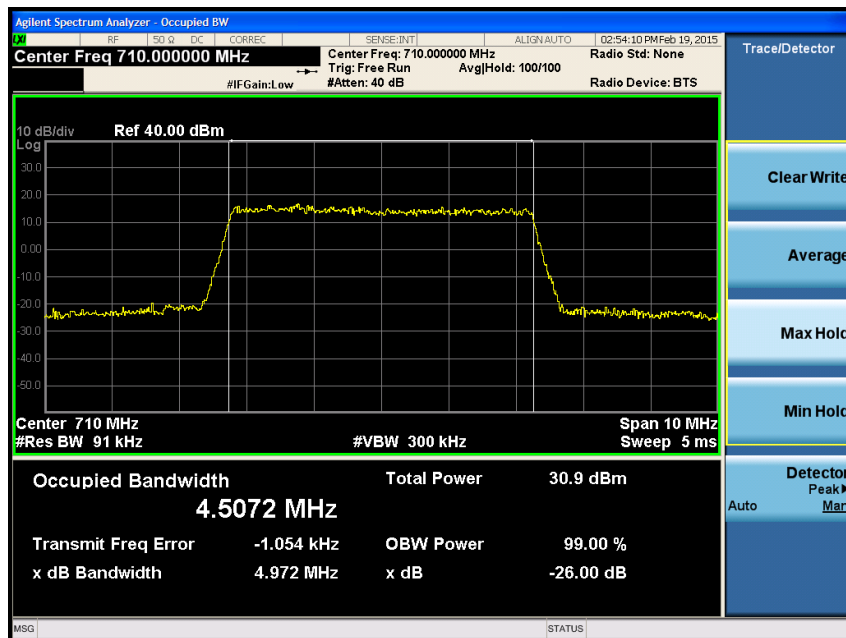
LTE band 17 (5 MHz – 16QAM_RB 25)

99 %

Low Channel

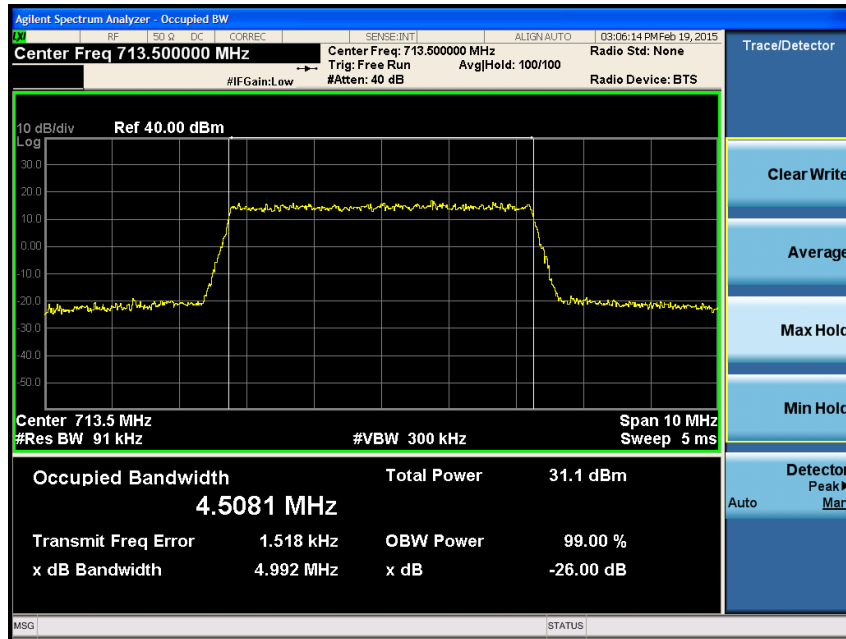


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel

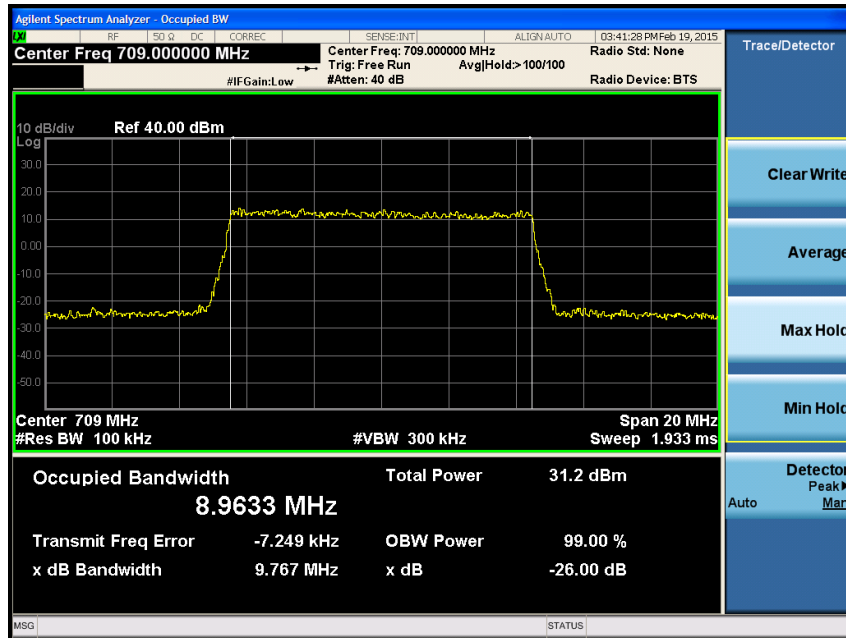


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

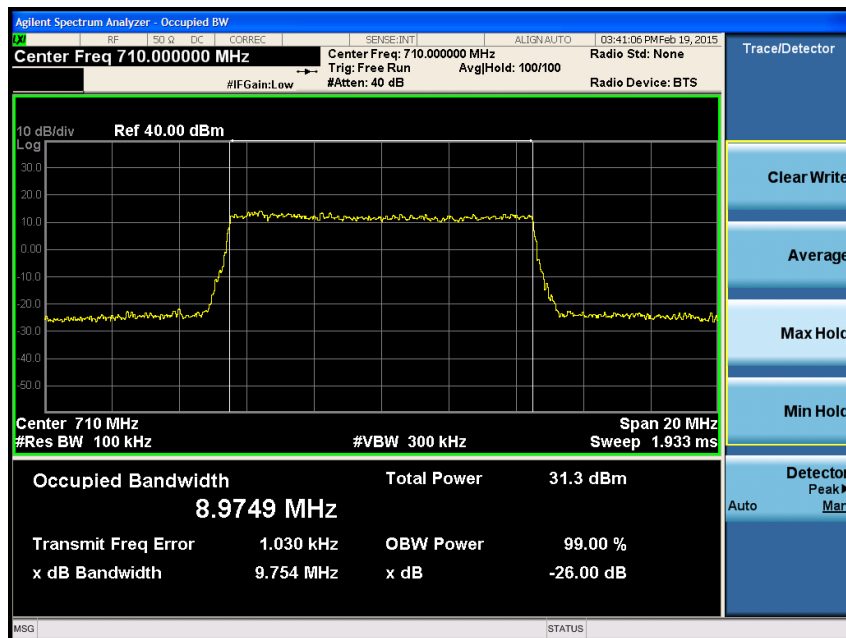
LTE band 17 (10 MHz – 16QAM_RB 50)

99 %

Low Channel

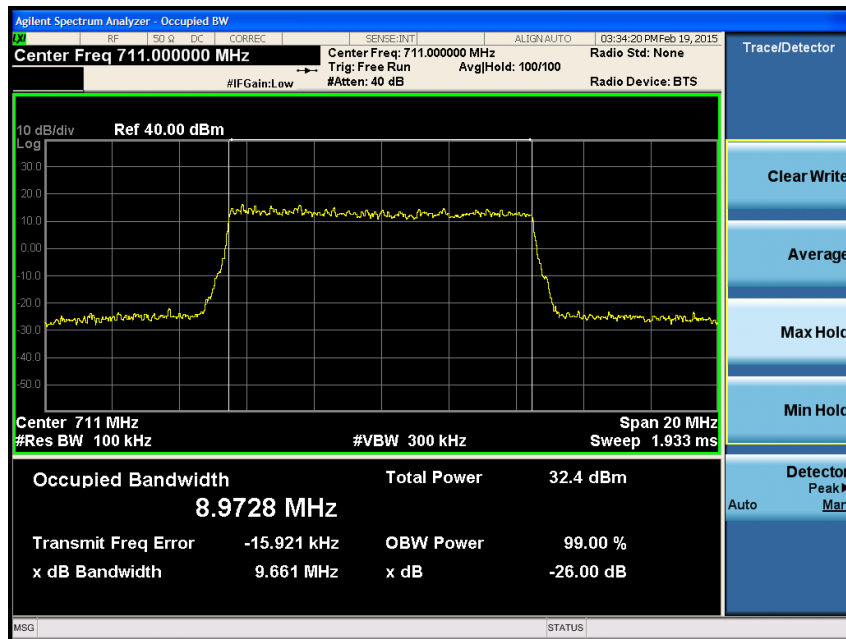


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

4. Peak-Average Ratio

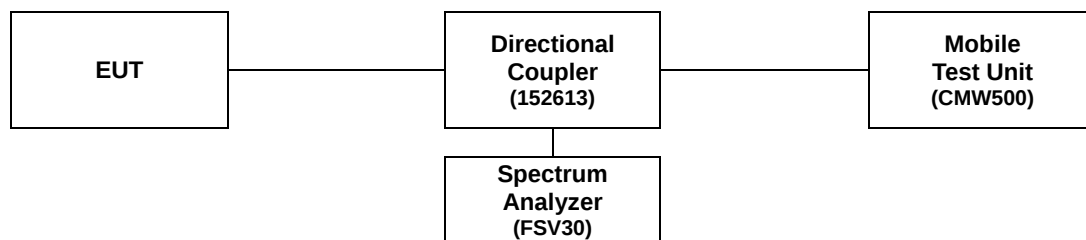
4.1. Limit

§24.232(d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.2. Test Procedure

The test follows section 5.7.1 of FCC KDB Publication 971168_v02r02.

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The CCDF function of the spectrum analyzer was set.
3. PAR was measured with spectrum analyzer for each channel.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

4.3 Test Results

Ambient temperature : (24 ± 1) °C
Relative humidity : 47 % R.H.

Please refer to the following plots.

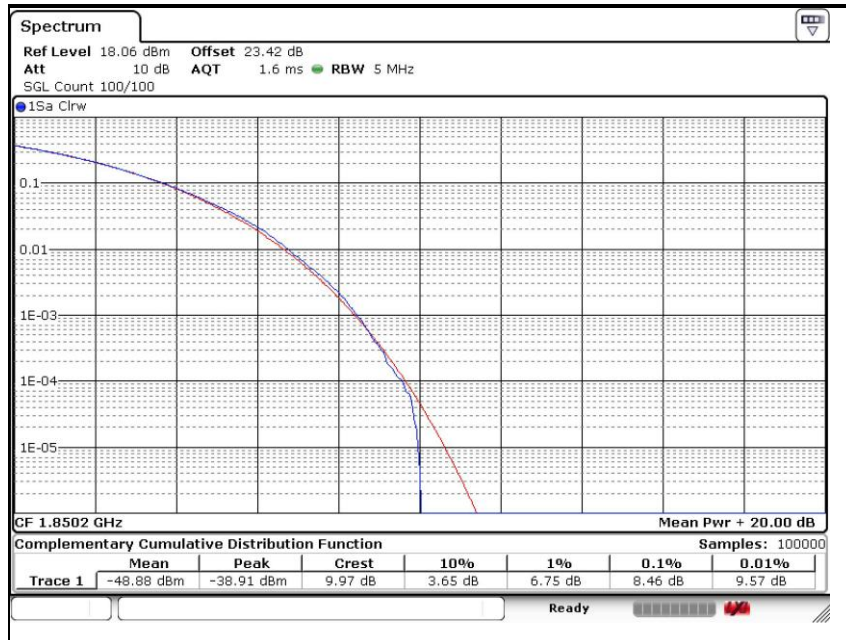
Band	Mode	Frequency (MHz)	PAR (dB)
GSM1900	GSM Voice	1 850.2	8.46
		1 880.0	8.52
		1 909.8	8.46

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

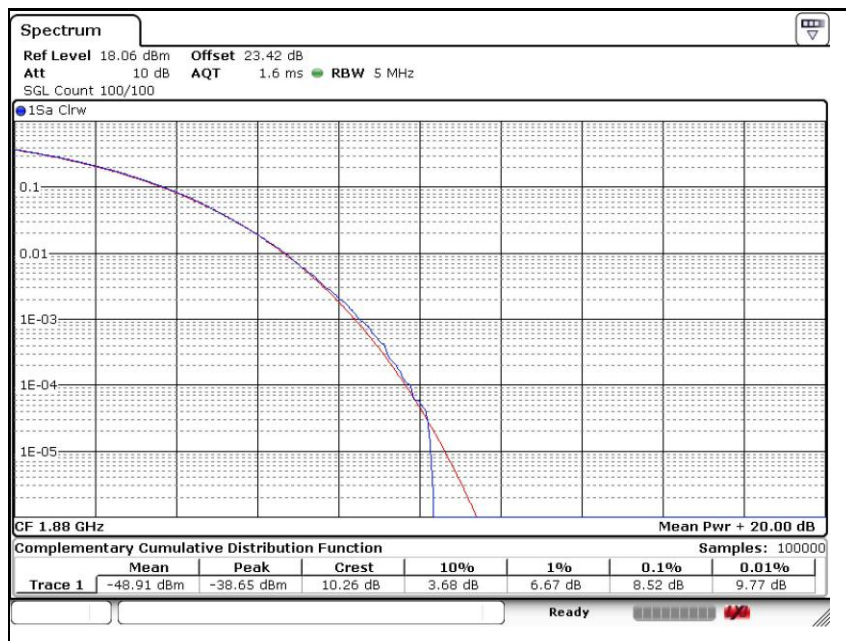
Peak-Average Ratio

GSM1900

Low Channel

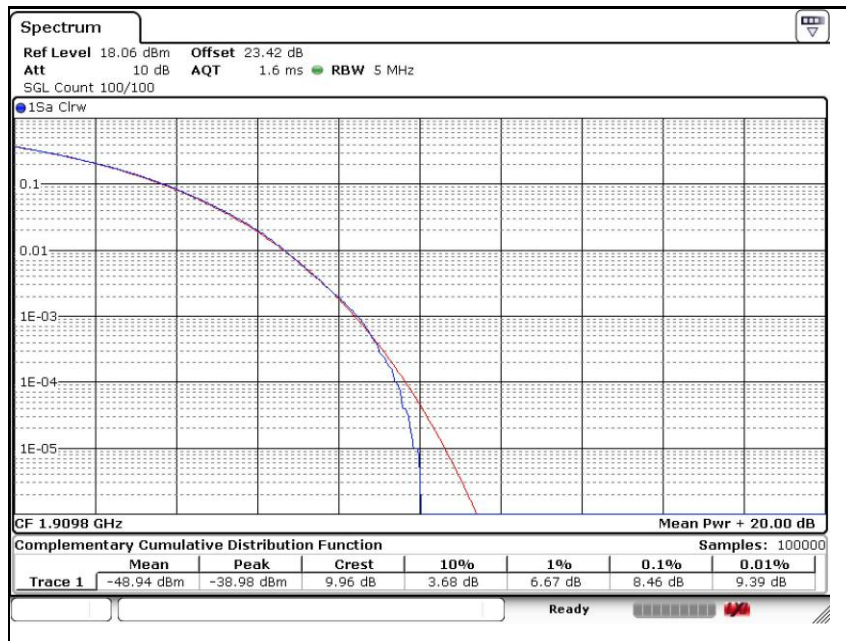


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

5. Spurious Emissions at Antenna Terminal

5.1. Limit

FCC §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

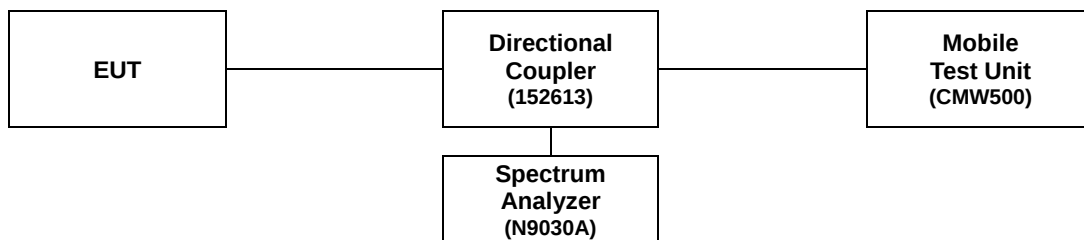
FCC §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

FCC §27.53(g), For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10\log(P)$ dB.

5.2. Test Procedure

The test follows section 6.0 of FCC KDB Publication 971168_v02r02.

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



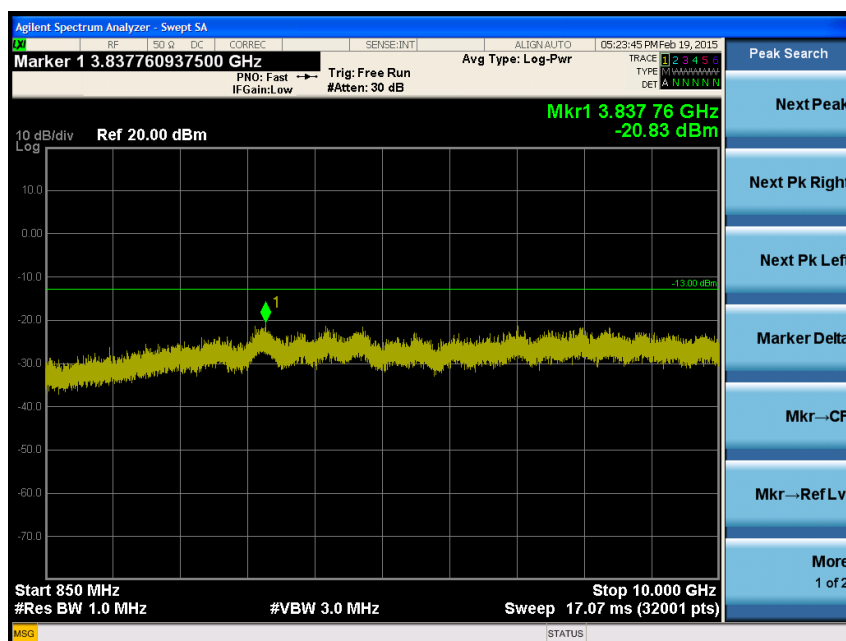
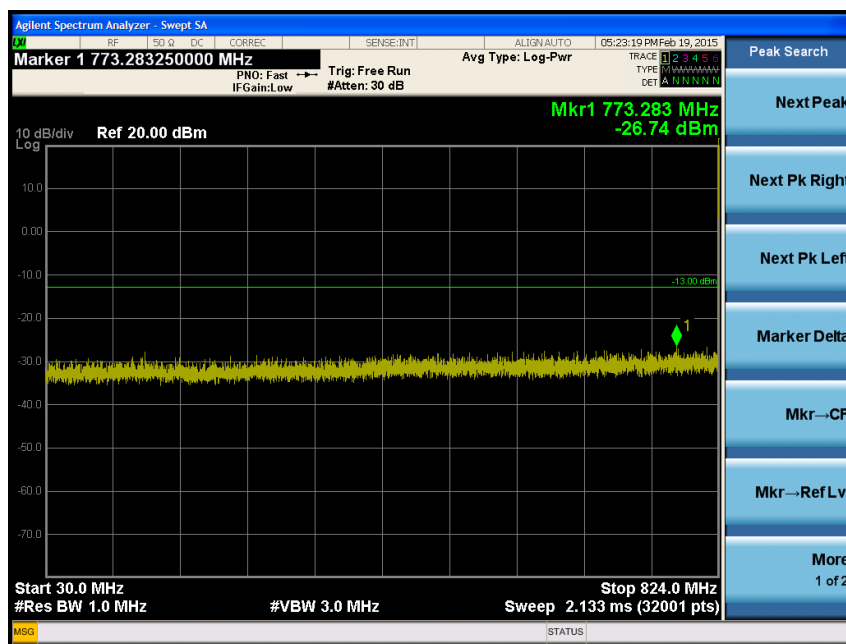
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

5.3. Test Results

Ambient temperature : (24 ± 1) °C
Relative humidity : 47 % R.H.

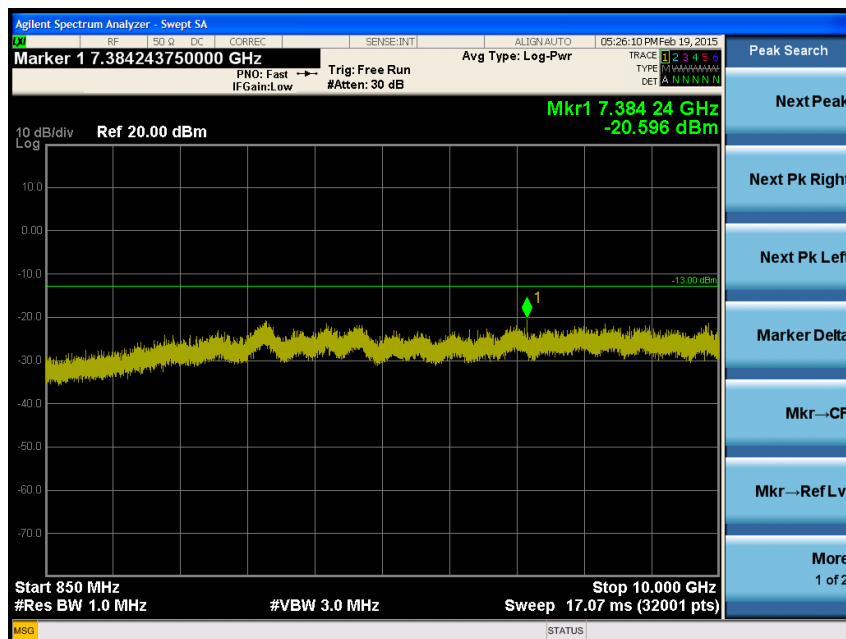
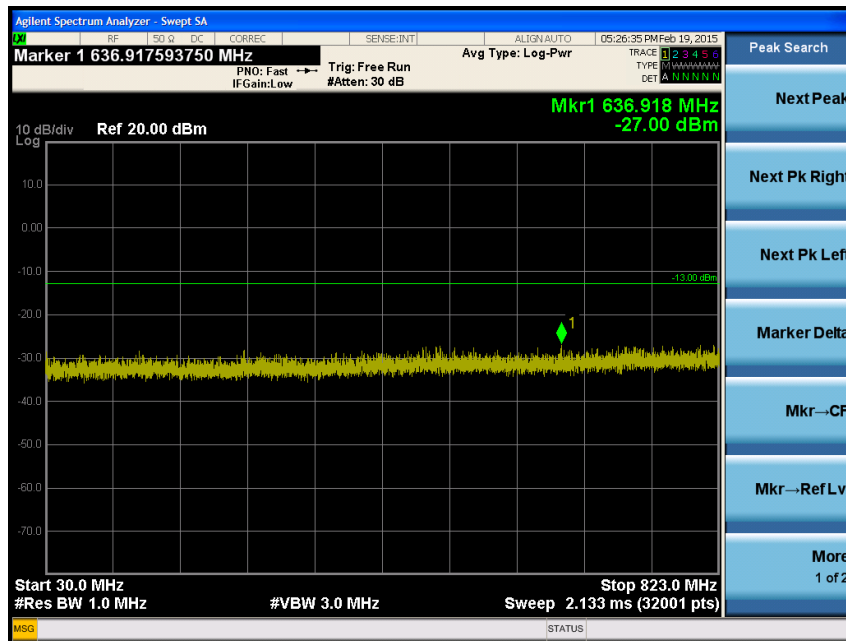
Please refer to the following plots.

GSM850 Low Channel



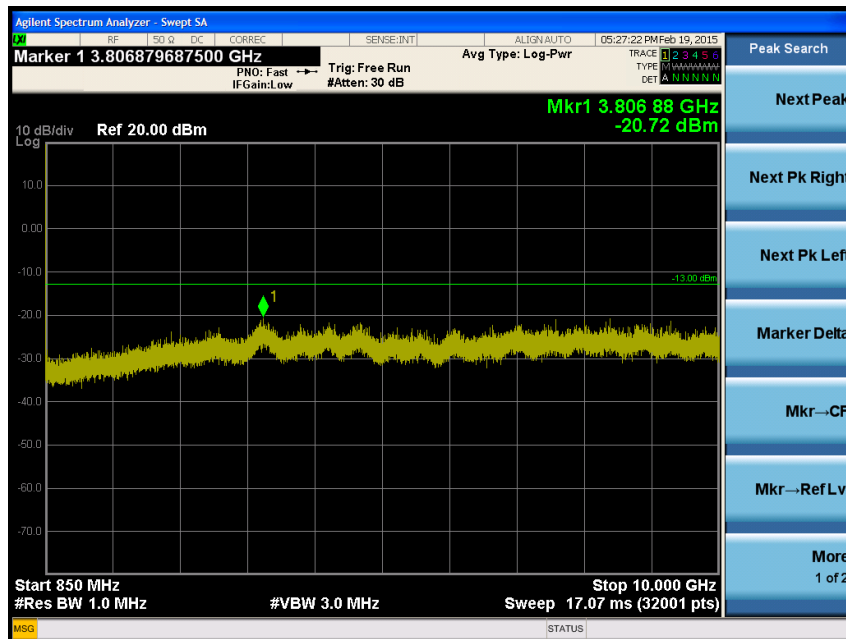
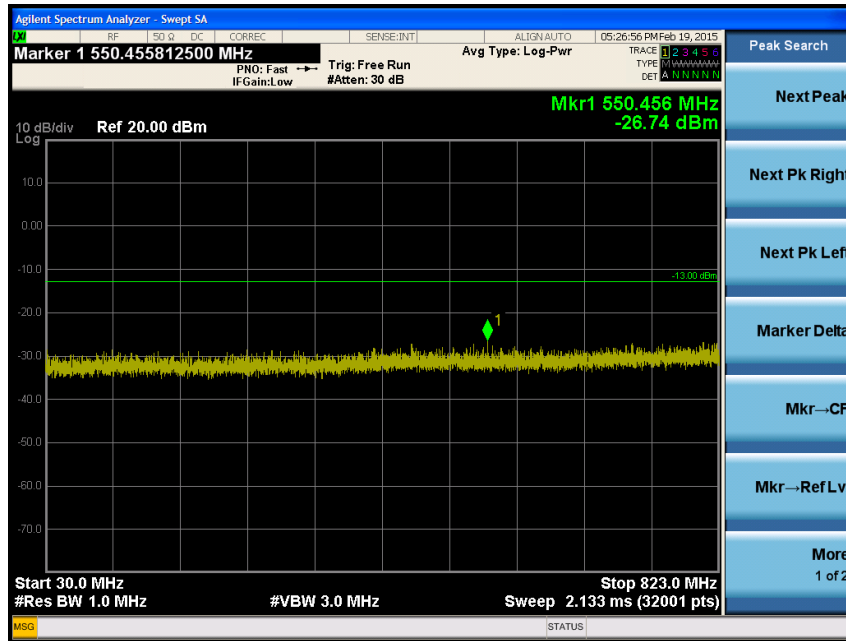
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Middle Channel



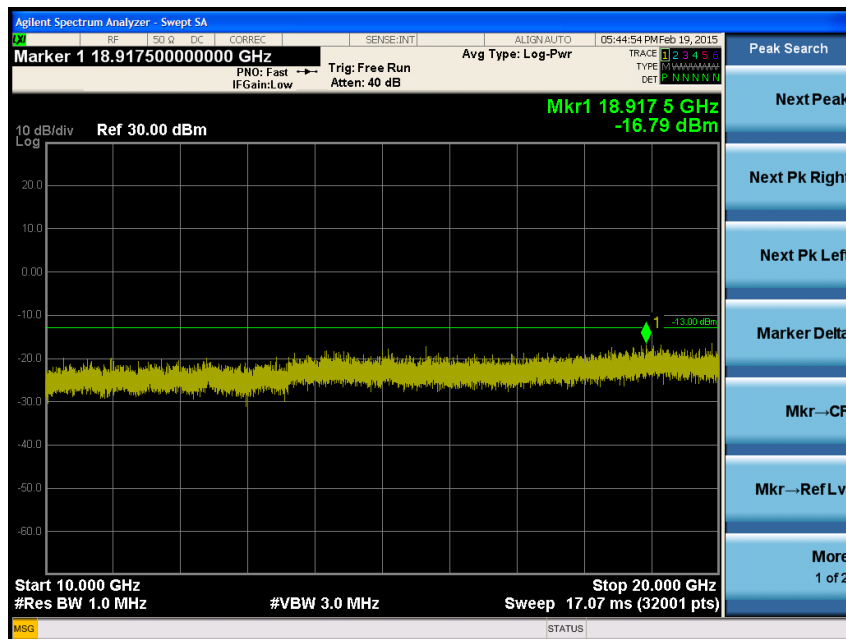
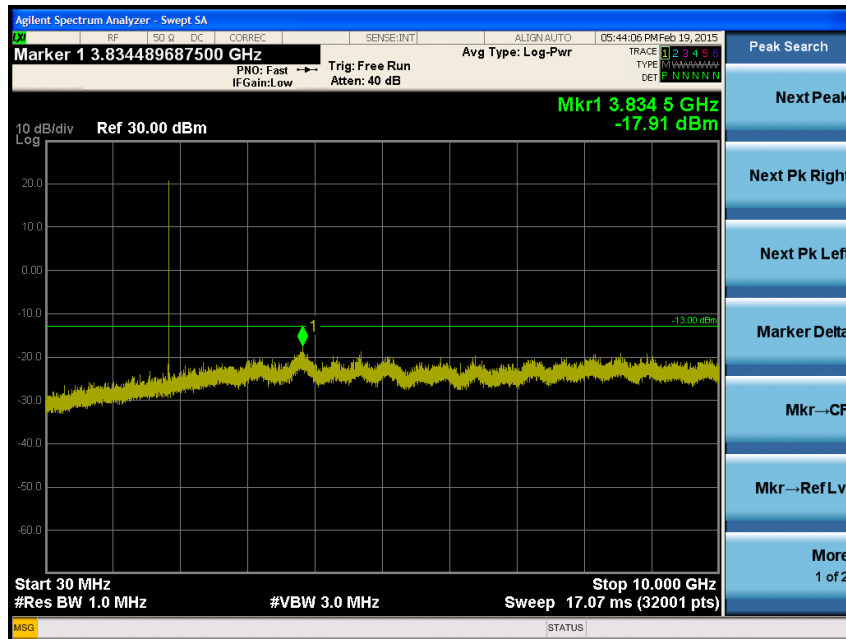
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



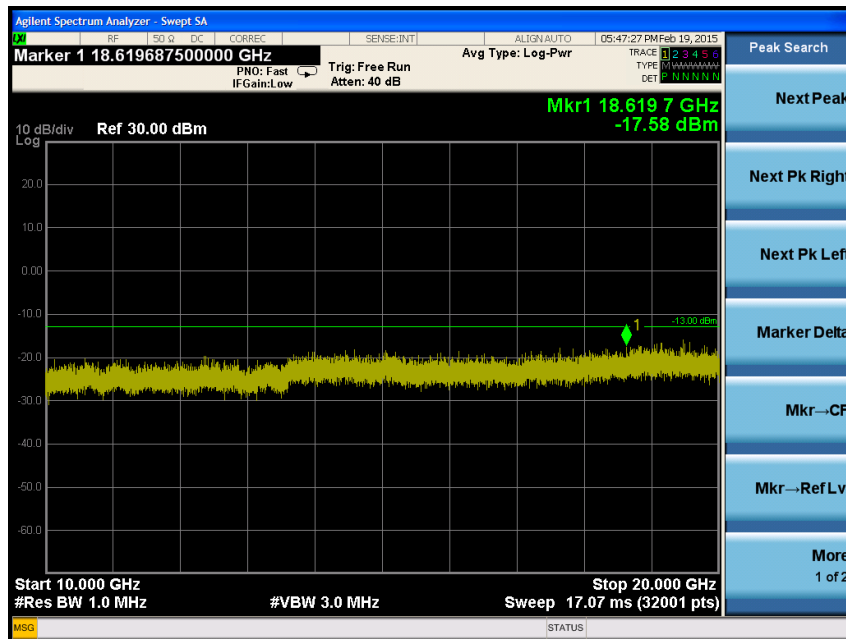
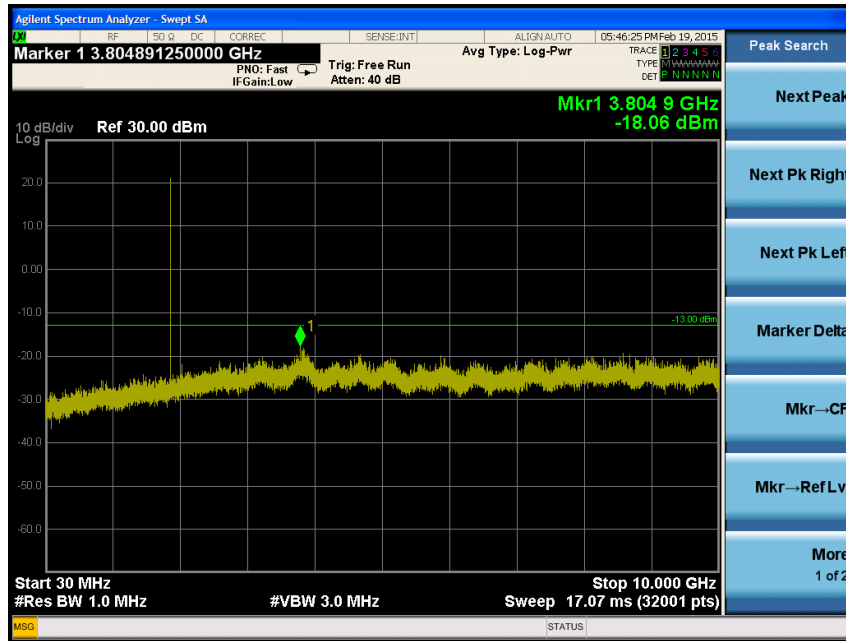
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

GSM1900 Low Channel



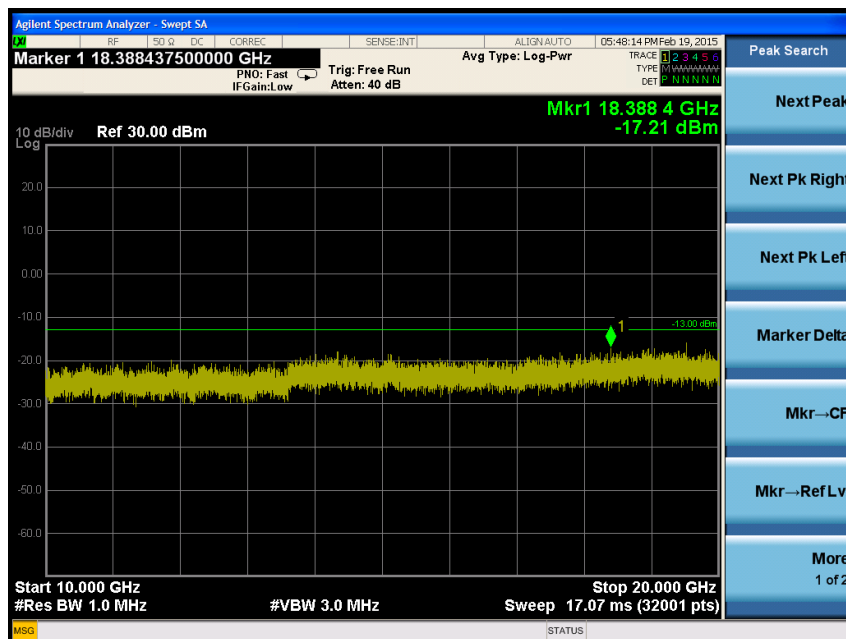
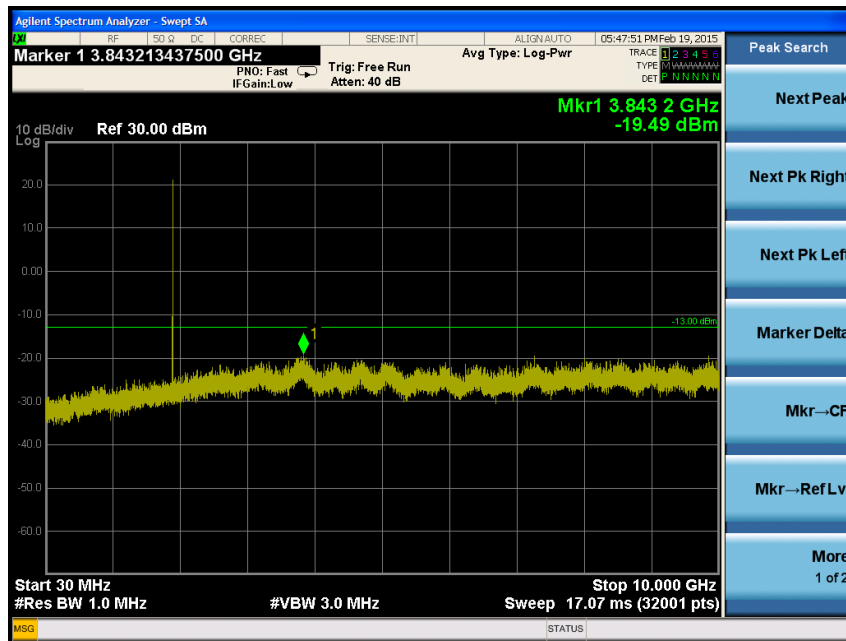
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Middle Channel



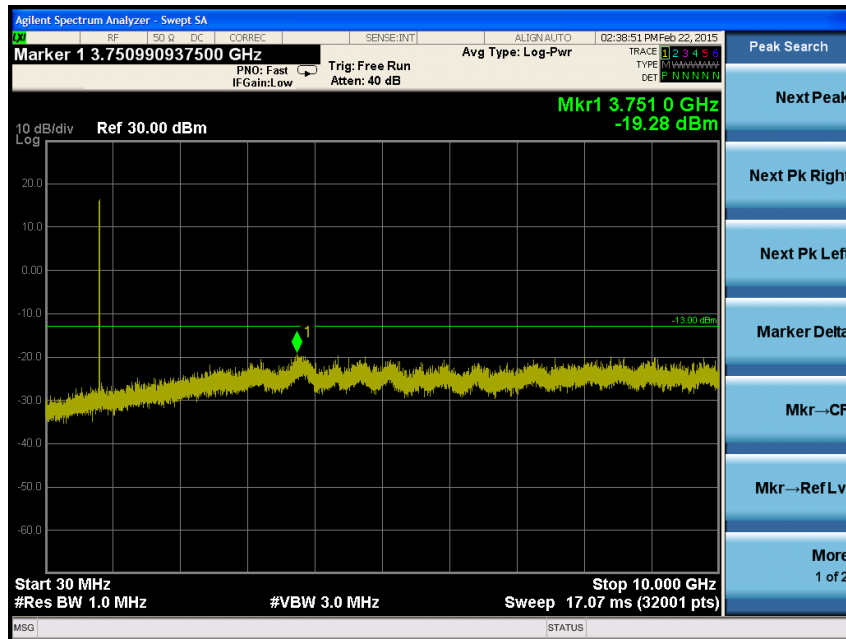
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel

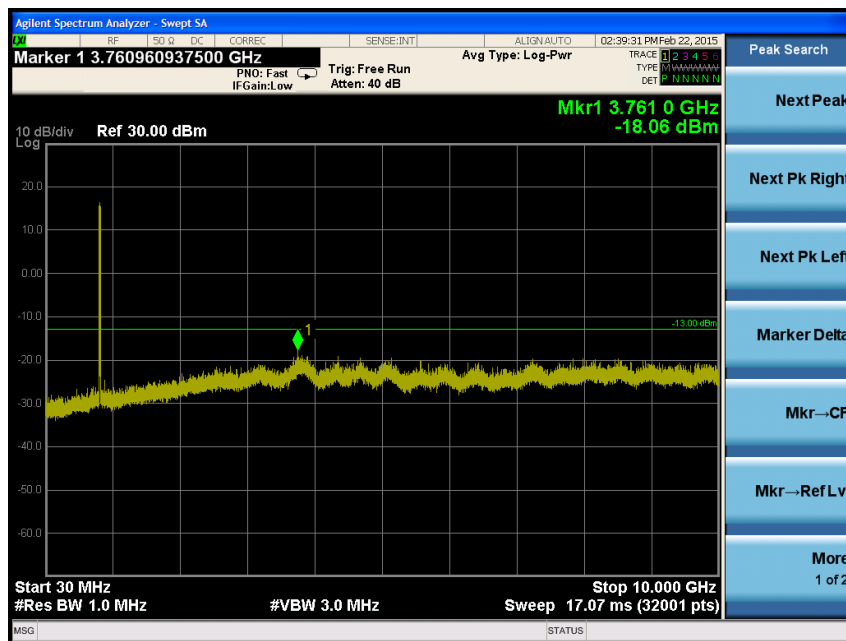


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

WCDMA850 Low Channel

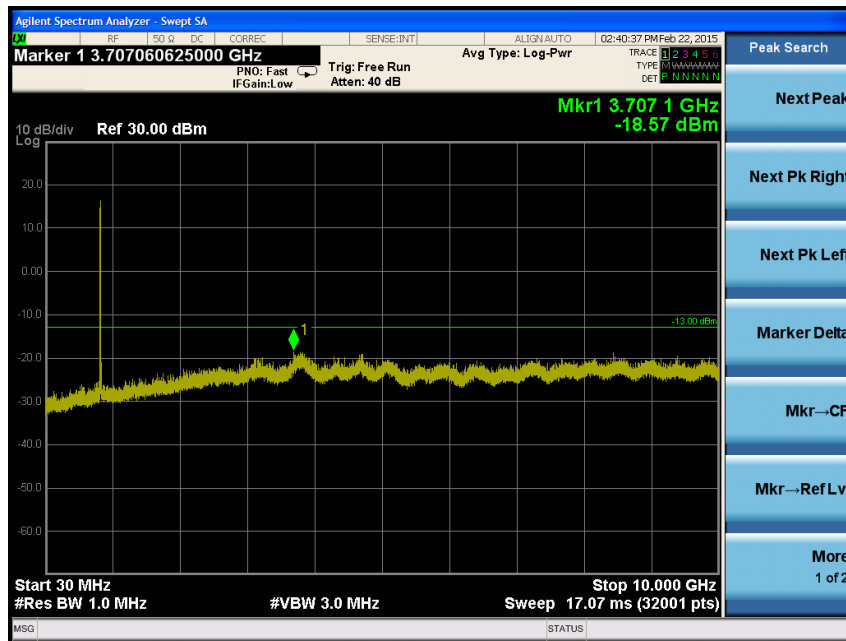


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

SGS Korea Co., Ltd. (Gunpo Laboratory)

4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-040

<http://www.sgsgroup.kr>

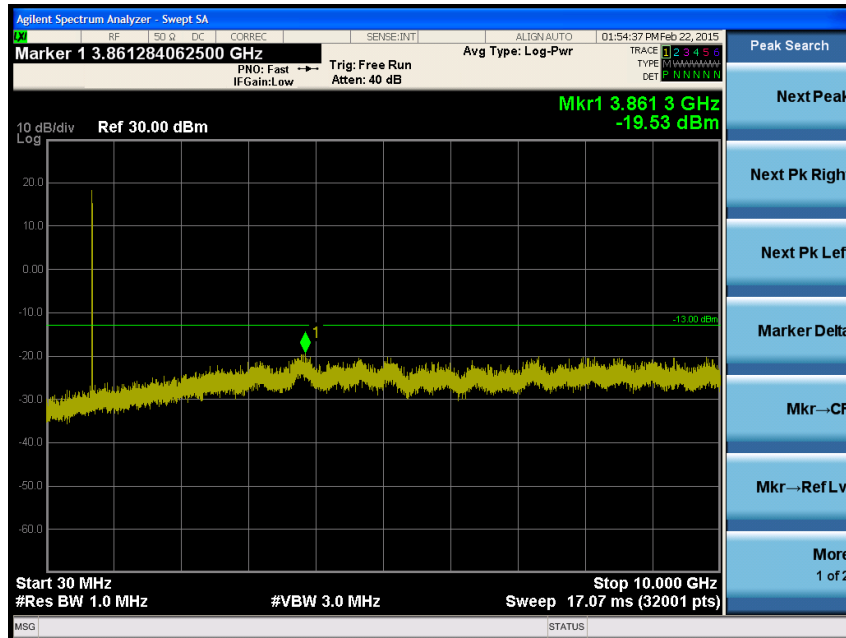
RTT5041-20(2014.01.20)(2)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

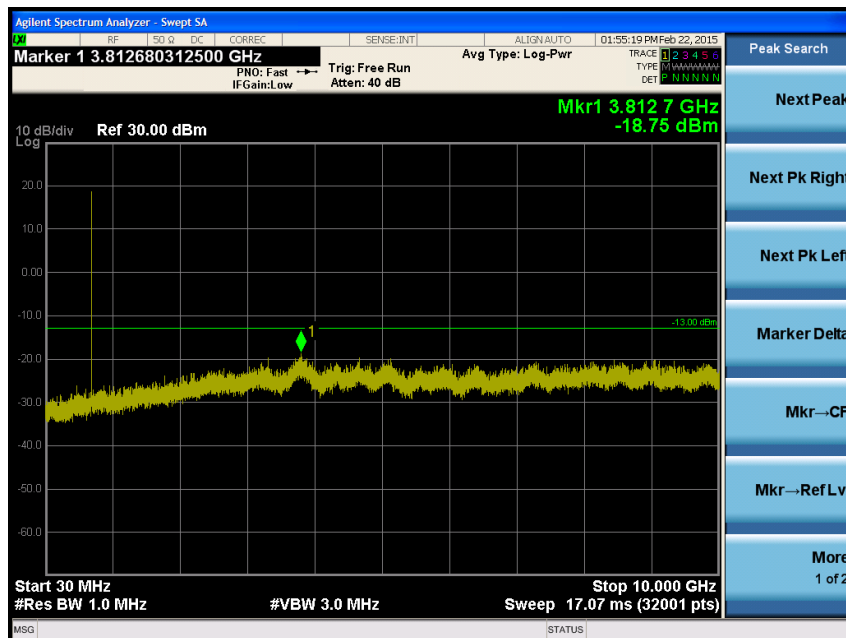
A4(210 mm x 297 mm)

LTE band 17 (5 MHz – QPSK_RB 1_Offset 0)

Low Channel

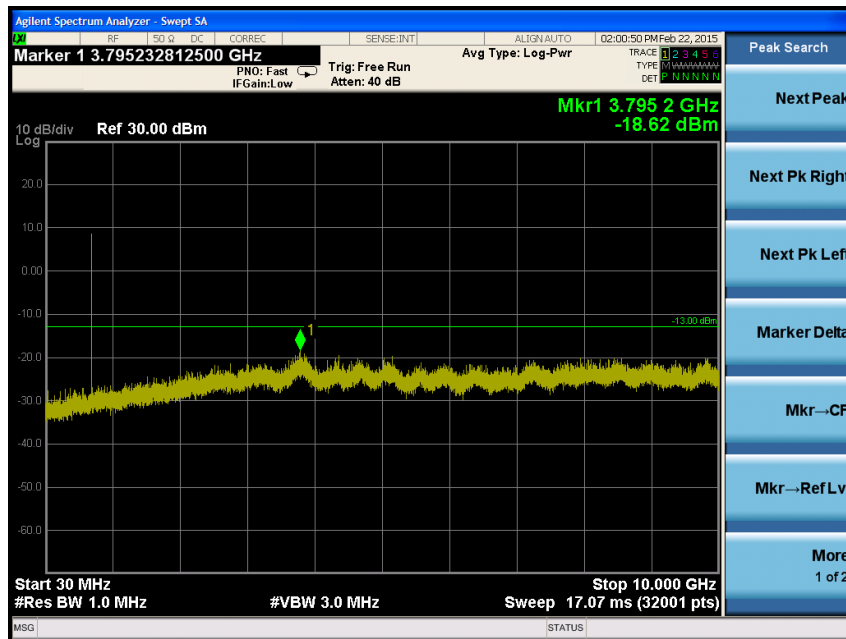


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

SGS Korea Co., Ltd. (Gunpo Laboratory)

4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-040

<http://www.sgsgroup.kr>

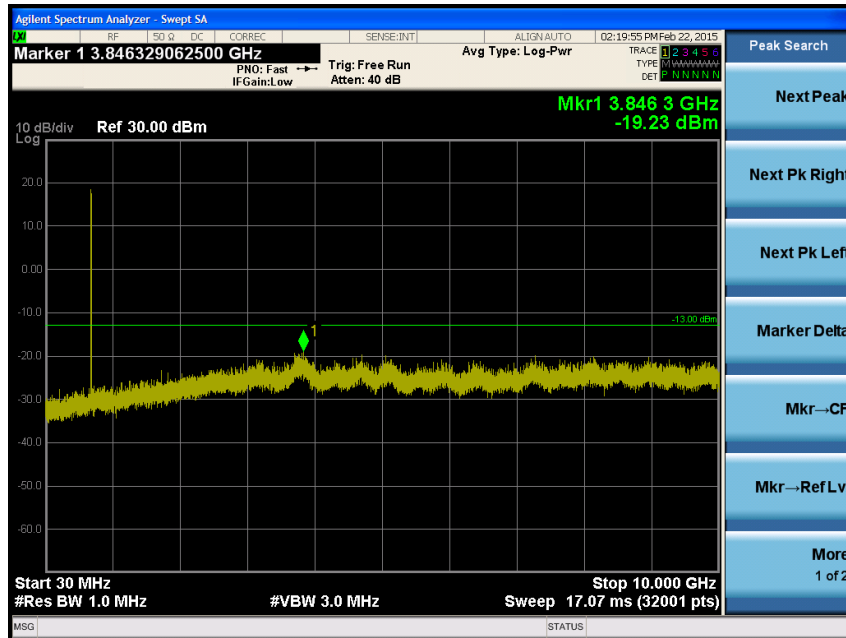
RTT5041-20(2014.01.20)(2)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

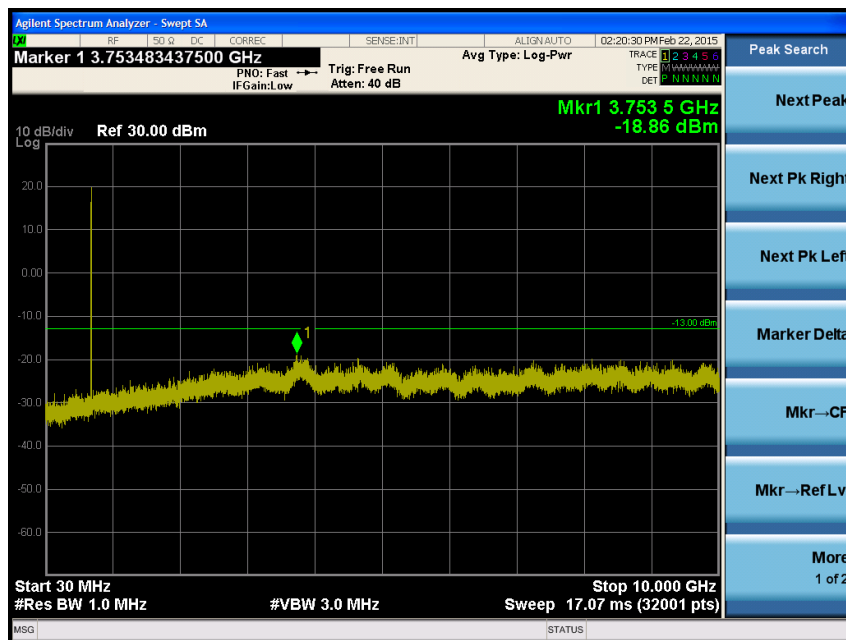
A4(210 mm x 297 mm)

LTE band 17 (10 MHz – QPSK_RB 1_Offset 0)

Low Channel

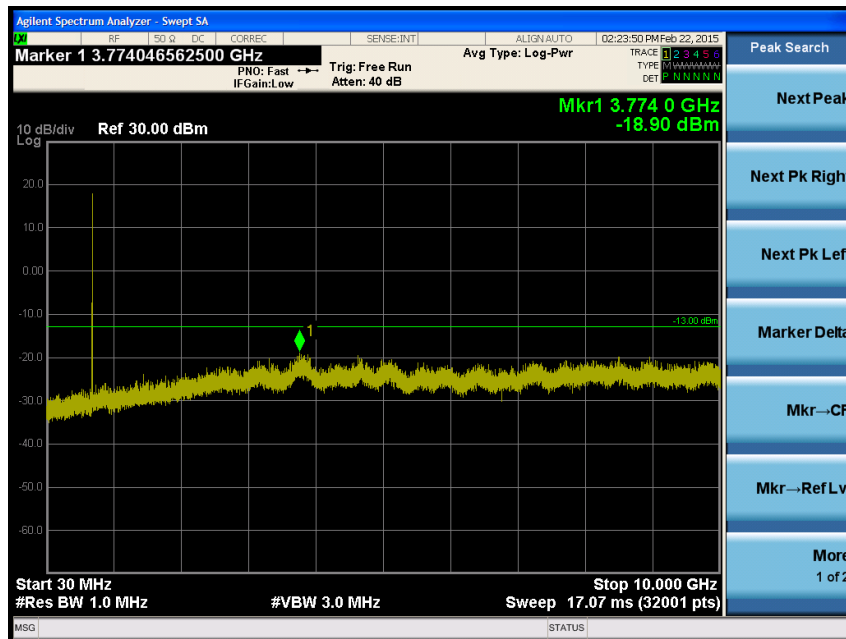


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

SGS Korea Co., Ltd. (Gunpo Laboratory)

4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-040

<http://www.sgsgroup.kr>

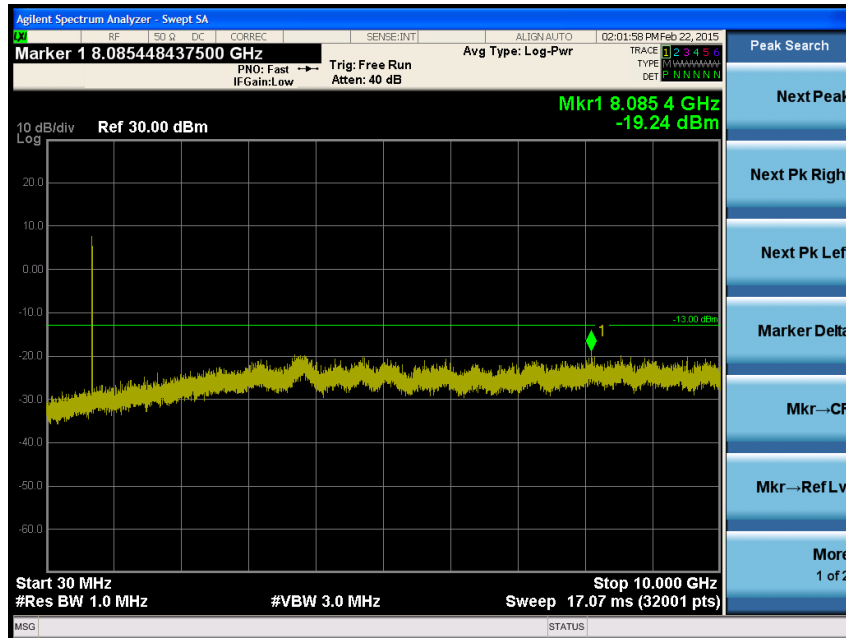
RTT5041-20(2014.01.20)(2)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

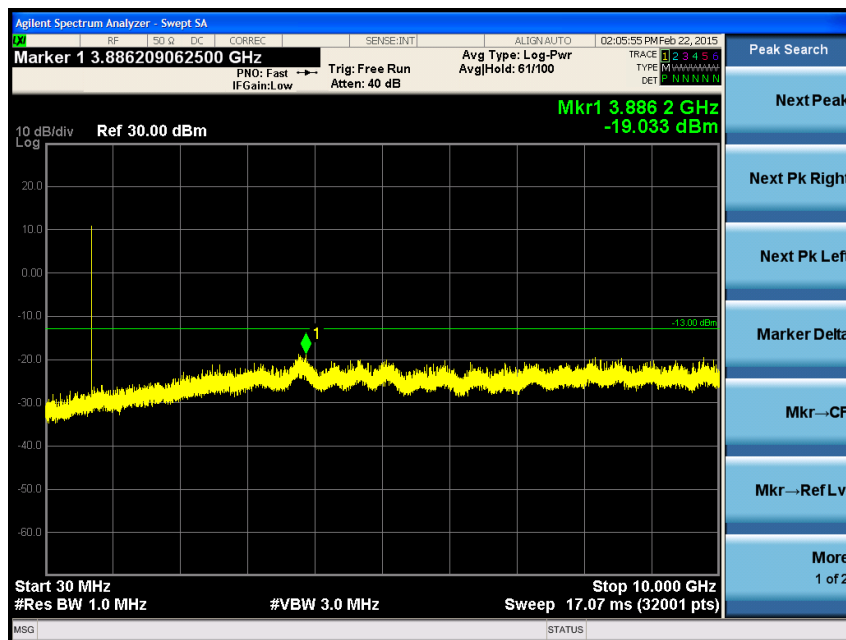
A4(210 mm x 297 mm)

LTE band 17 (5 MHz – 16QAM_RB 1_Offset 0)

Low Channel

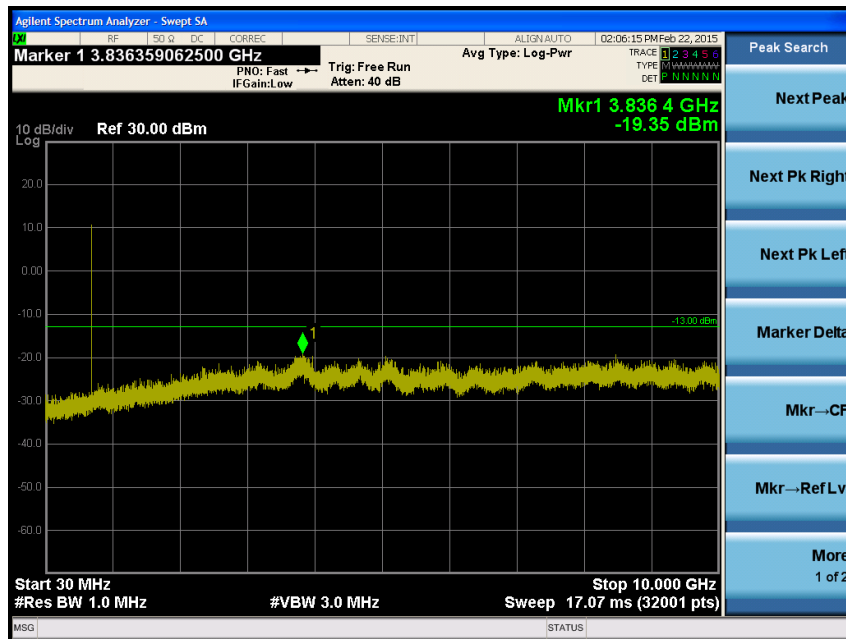


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

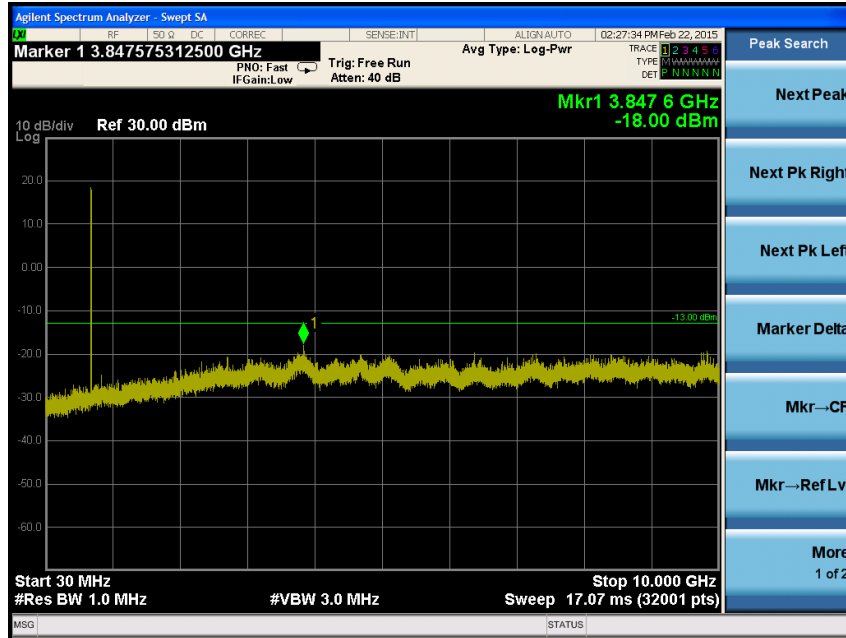
High Channel



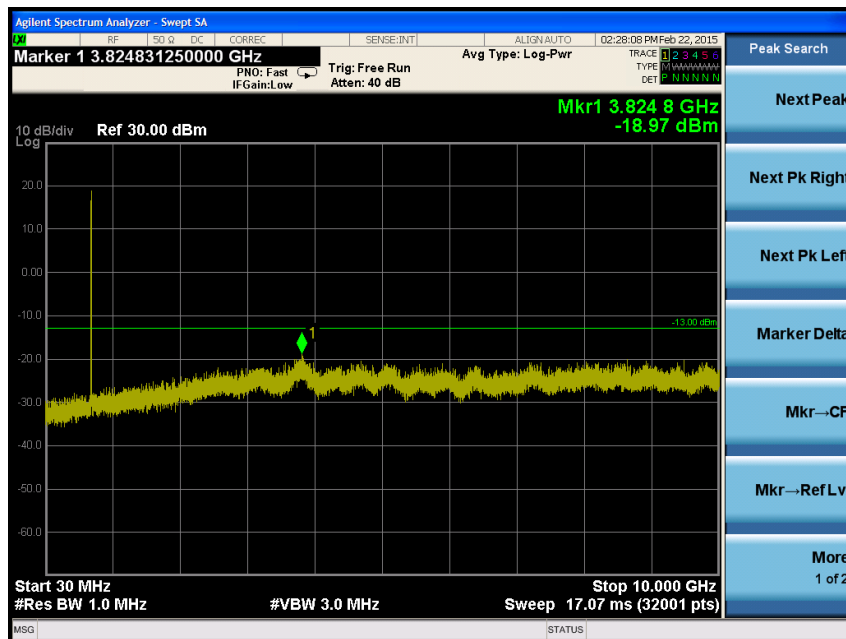
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 (10 MHz – 16QAM_RB 1_Offset 0)

Low Channel

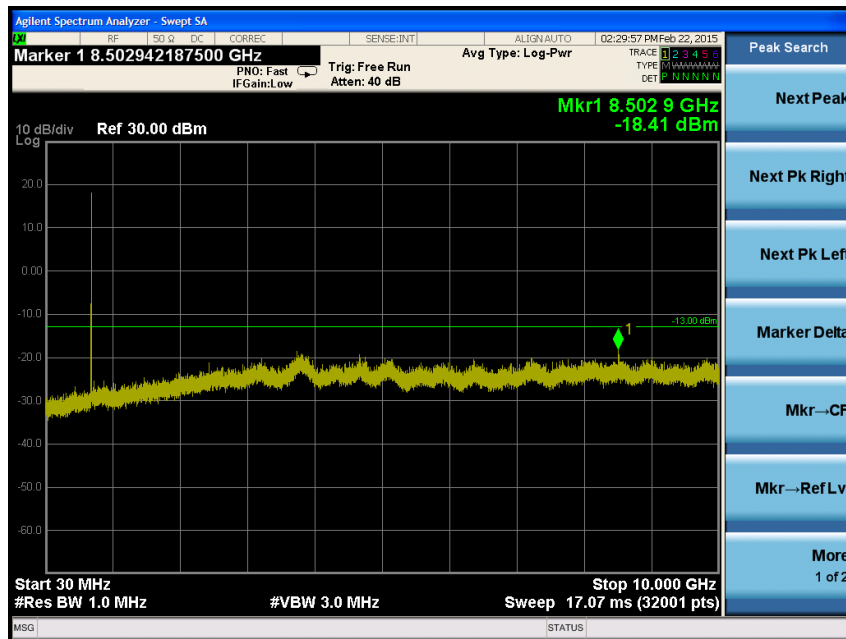


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

6. Band Edge

6.1. Limit

FCC §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

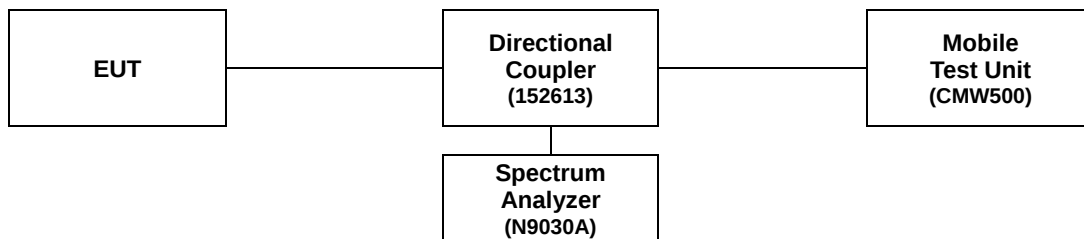
FCC §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

FCC §27.53(g), For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10\log(P)$ dB.

6.2. Test Procedure

The test follows section 6.0 of FCC KDB Publication 971168_v02r02.

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The center of the spectrum analyzer was set to block edge frequency.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

6.3. Test Results

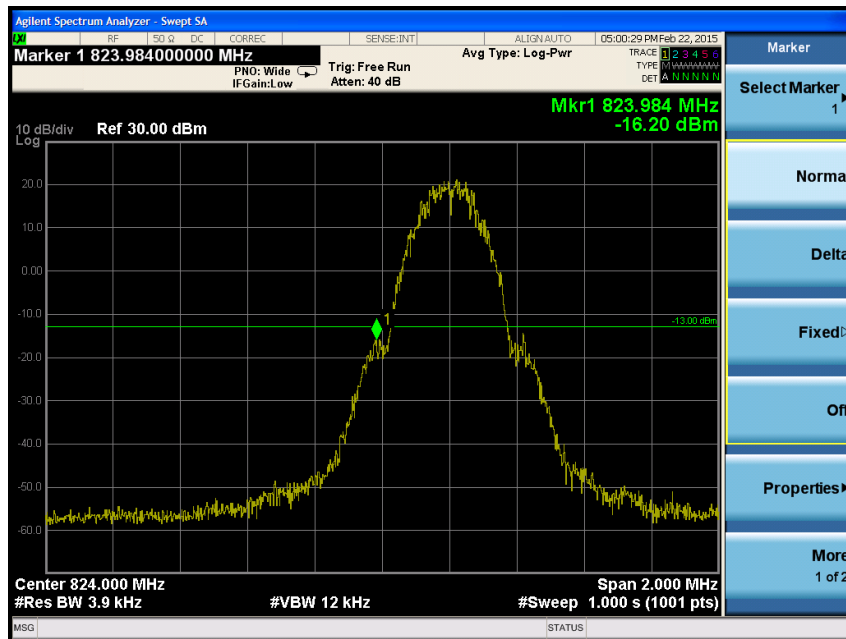
Ambient temperature : (24 ± 1) °C

Relative humidity : 47 % R.H.

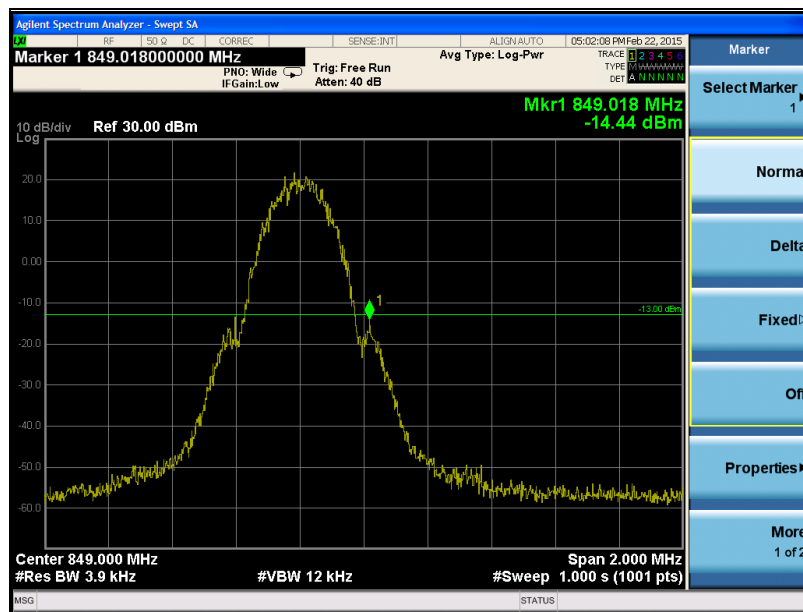
Please refer to the following plots.

Bandedge_GSM850

Low Channel



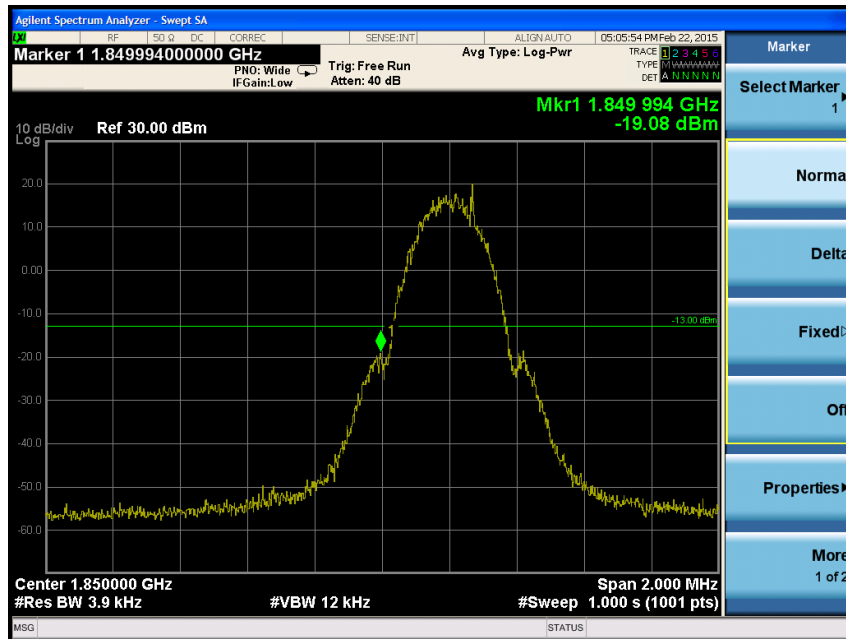
High Channel



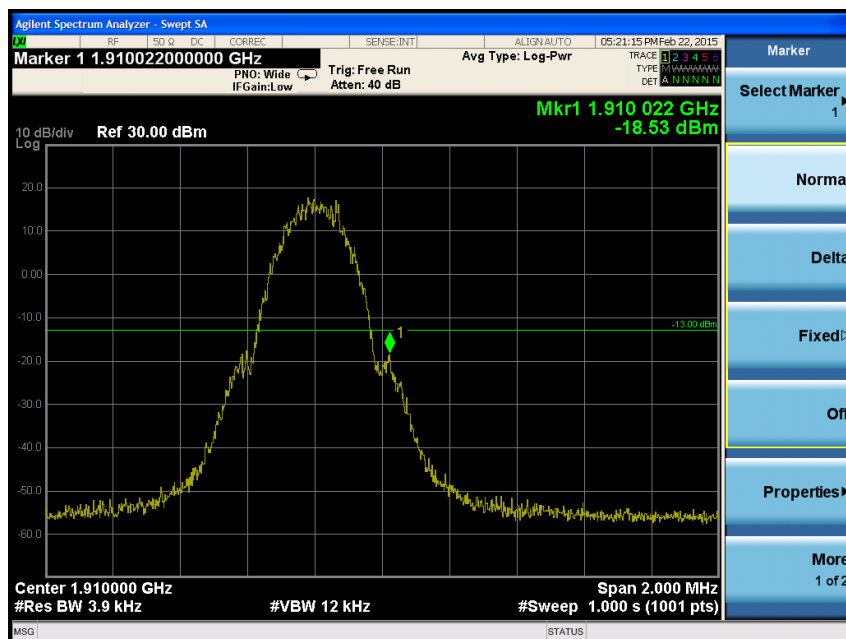
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Bandedge_GSM1900

Low Channel



High Channel



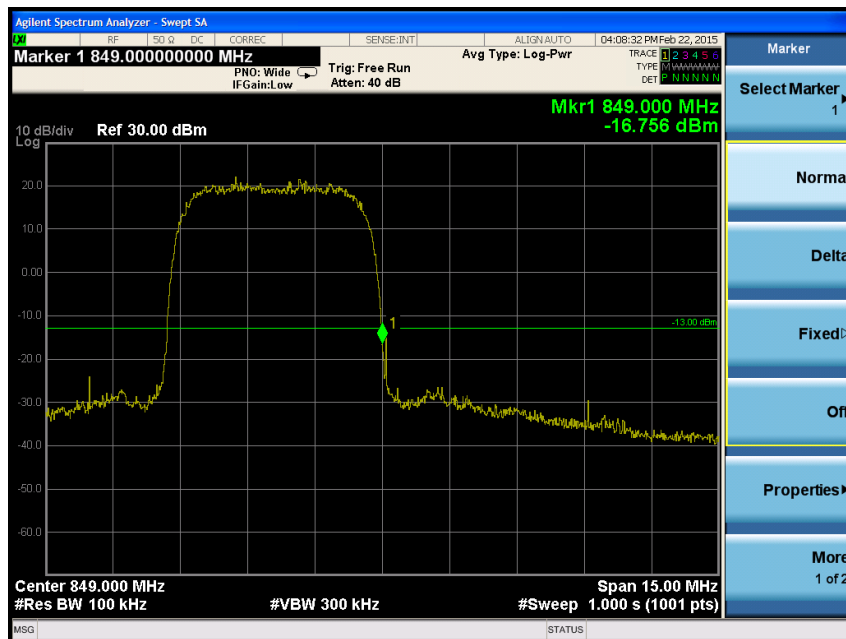
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Bandedge_WDCMA850

Low Channel



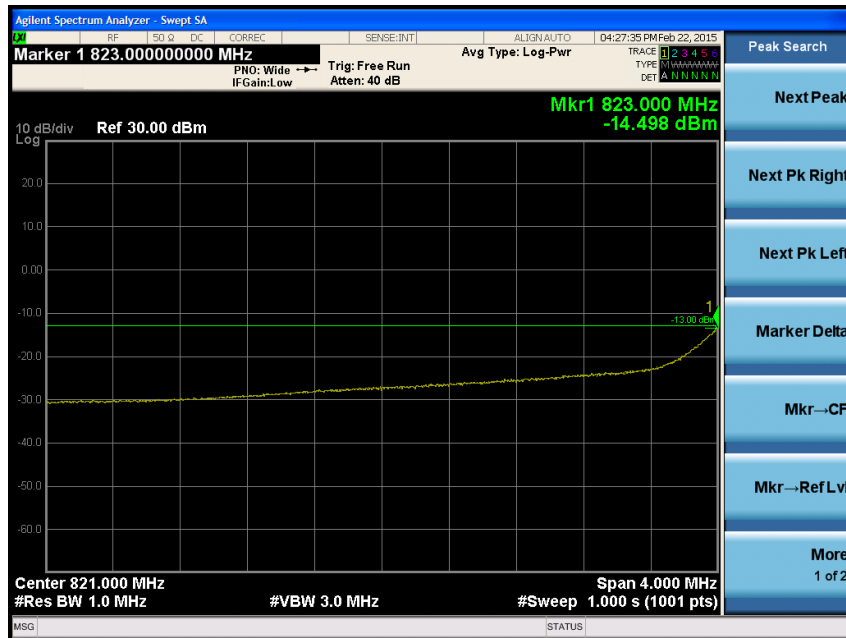
High Channel



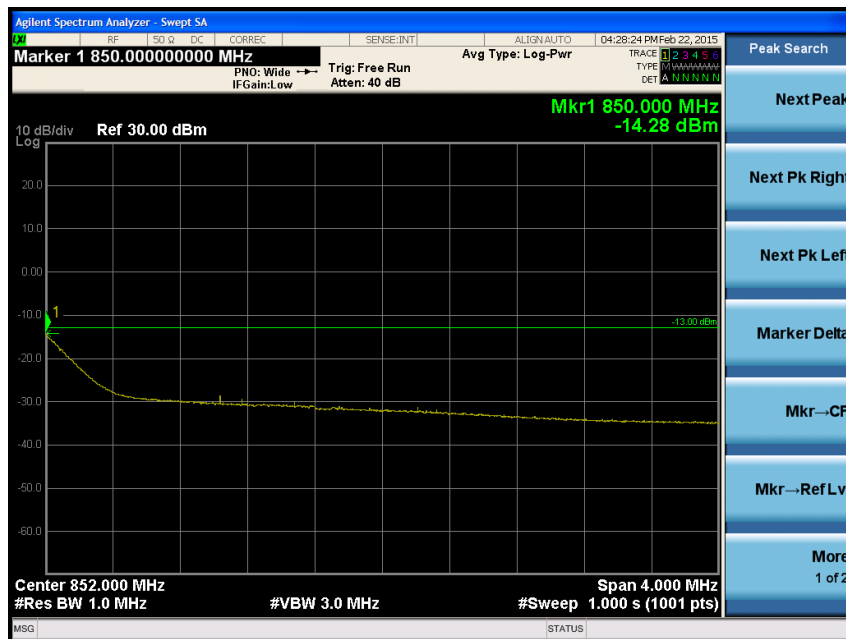
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

4 MHz span plot_WCDMA850

Low Channel



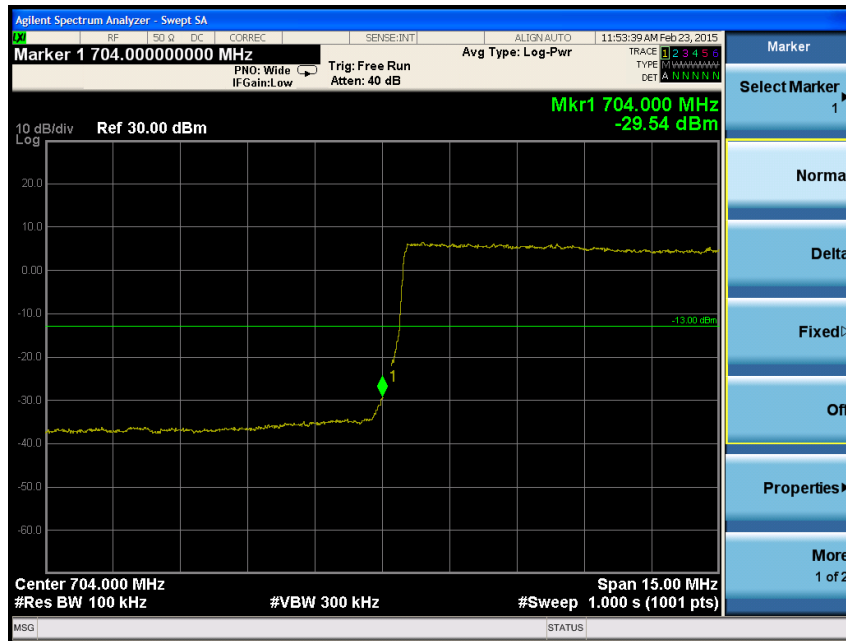
High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 (10 MHz – QPSK_RB 50)

Low Channel



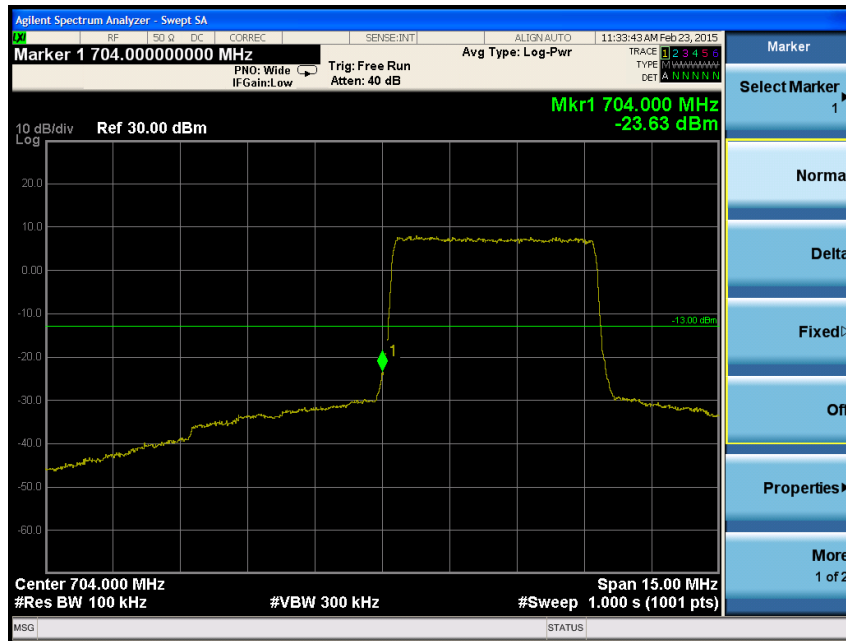
High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 (5 MHz – 16QAM_RB 25)

Low Channel



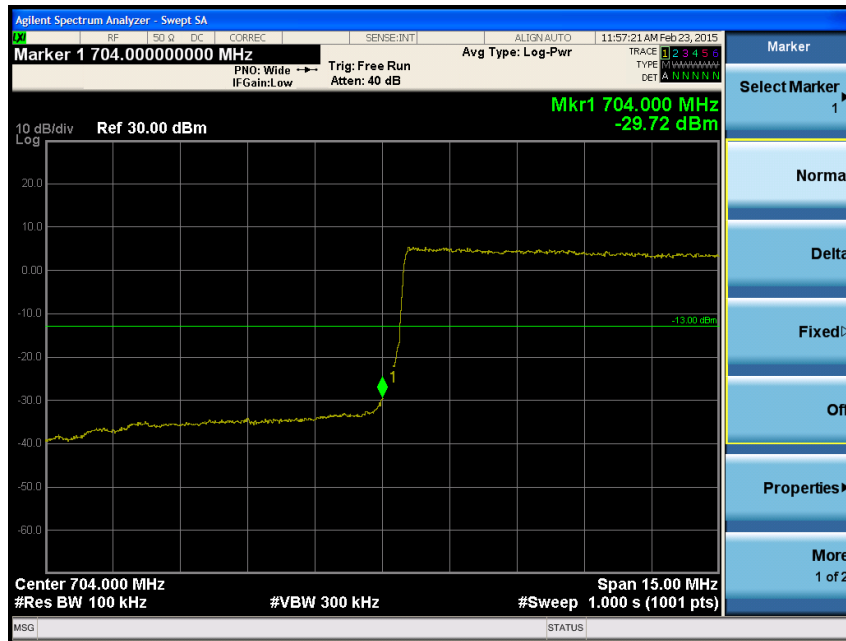
High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 (10 MHz – 16QAM_RB 50)

Low Channel



High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

7. Frequency Stability

7.1. Limit

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

FCC §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.

For Mobile devices operating in the 824 to 849 MHz band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

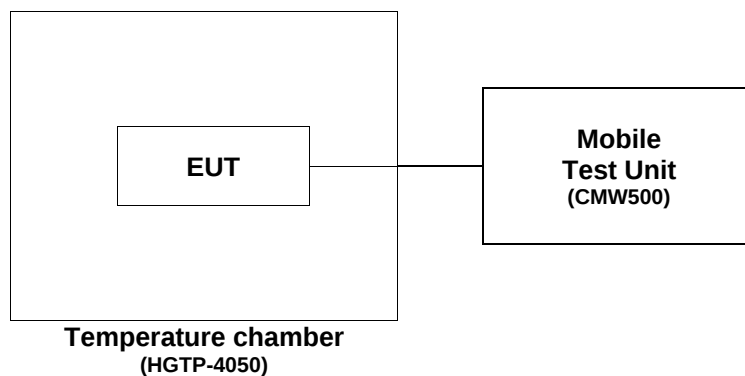
FCC §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

FCC §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

7.2. Test Procedure

The test follows ANSI/TIA-603-C-2004

1. Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Mobile Test Unit via feed-through attenuators.
2. The EUT was placed inside the temperature chamber.
3. After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from Mobile Test Unit.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

7.3. Test Results

Ambient temperature : (24 ± 1) °C
Relative humidity : 47 % R.H.

GSM850 mode at middle channel

Reference Frequency: 836.6 MHz, Limit: 2.5 ppm			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	3.80	6	0.003 586
40		5	0.002 391
30		5	0.002 391
24		3	Ref.
10		2	-0.001 195
0		0	-0.003 586
-10		2	-0.001 195
-20		4	0.001 195
-30		5	0.002 391
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	Ppm
24	4.37	4	0.001 195
	3.43(batt. End point)	9	0.007 172

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

GSM1900 mode at middle channel

Reference Frequency: 1 880.0 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	3.80	45	0.006 915
40		36	0.002 128
30		39	0.003 723
24		32	Ref.
10		27	-0.002 660
0		67	0.018 617
-10		42	0.005 319
-20		67	0.018 617
-30		62	0.015 957
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	Ppm
24	4.37	47	0.007 979
	3.43(batt. End point)	38	0.003 191

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

WCDMA850 mode at middle channel

Reference Frequency: 836.4 MHz, Limit: 2.5 ppm			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	Ppm
50	3.80	-3	-0.002 391
40		3	0.004 782
30		1	0.002 391
24		-1	Ref.
10		8	0.010 760
0		5	0.007 174
-10		-7	-0.007 174
-20		1	0.002 391
-30		1	0.002 391
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	Ppm
24	4.37	-5	-0.004 782
	3.43(batt. End point)	-7	-0.007 174

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

LTE band 17 at middle channel

Reference Frequency: 710.0 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	3.80	3	0.015 543
40		2	0.014 347
30		-11	-0.001 196
24		-10	Ref.
10		-7	0.003 587
0		-7	0.003 587
-10		-4	0.007 174
-20		-14	-0.004 782
-30		-7	0.003 587
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
24	4.37	-18	-0.009 565
	3.43(batt. End point)	-7	0.003 587

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band. When the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.