

# TEST REPORT

of

FCC Part 22 Subpart H, Part 24 Subpart E and Part 27 Subpart C  
FCC ID: ZNFD855

Equipment Under Test : Cellular/PCS GSM/GPRS/EDGE/WCDMA and LTE phone  
with Bluetooth, WLAN and RFID

Model Name : LG-D855

Alternative models : LGD855, D855, LG-D855k, LG-D855K, LGD855k,  
LGD855K, D855k, D855K

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

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

Date of Test(s) : 2014.04.21 ~ 2014.05.30

Date of Issue : 2014.05.30

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

Tested By:



Date:

2014.05.30

Harim Lee

Approved By:



Date:

2014.05.30

Feel Jeong

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## 1. General information

### 1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

-Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

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

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### 1.2. Details of applicant

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

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

Contact Person : Lee, Sang-Myung

Phone No. : +82 2 2033 4606

### 1.3. Description of EUT

<b>Kind of Product</b>	Cellular/PCS GSM/GPRS/EDGE/WCDMA and LTE phone with Bluetooth, WLAN and RFID
<b>Model Name</b>	LG-D855 (Alternative models: LGD855, D855, LG-D855k, LG-D855K, LGD855k, LGD855K, D855k, D855K)
<b>Power Supply</b>	DC 3.8 V
<b>Rated Power</b>	GSM850: 33.2 dB m GSM1900: 30.2 dB m WCDMA850: 23.2 dB m WCDMA1900: 23.2 dB m LTE Band 7 (5 MHz): 23.2 dB m LTE Band 7 (10 MHz): 23.2 dB m LTE Band 7 (15 MHz): 23.2 dB m LTE Band 7 (20 MHz): 23.2 dB m
<b>Frequency Range</b>	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1 850.2 MHz ~ 1 909.8 MHz WCDMA850: 826.4 MHz ~ 846.6 MHz WCDMA1900: 1 852.4 MHz ~ 1 907.6 MHz LTE Band 7 (5 MHz): 2 502.5 MHz ~ 2 567.5 MHz LTE Band 7 (10 MHz): 2 505.0 MHz ~ 2 565.0 MHz LTE Band 7 (15 MHz): 2 507.5 MHz ~ 2 562.5 MHz LTE Band 7 (20 MHz): 2 510.0 MHz ~ 2 560.0 MHz
<b>Class of GPRS</b>	Class 12, Class B
<b>Emission Designator</b>	GSM850: 249KGXW GSM850 EDGE : 245KG7W GSM1900: 243KGXW GSM1900 EDGE : 249KG7W WCDMA850: 4M17F9W WCDMA1900: 4M17F9W LTE Band 7 (5 MHz): 4M50G7D (QPSK) / 4M51W7D (16QAM) LTE Band 7 (10 MHz): 9M00G7D (QPSK) / 8M98W7D (16QAM) LTE Band 7 (15 MHz): 13M46G7D (QPSK) / 13M44W7D (16QAM) LTE Band 7 (20 MHz): 17M88G7D (QPSK) / 17M94W7D (16QAM)

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## 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)

## 1.5. Information of Alternative model

Model	Information
LG-D855	Basic model name.
LGD855	H/W and S/W are same to basic model. It is only different model name for marketing purpose
D855	H/W and S/W are same to basic model. It is only different model name for marketing purpose
LG-D855k	H/W and S/W are same to basic model. It is only different model name for marketing purpose
LG-D855K	H/W and S/W are same to basic model. It is only different model name for marketing purpose
LGD855k	H/W and S/W are same to basic model. It is only different model name for marketing purpose
LGD855K	H/W and S/W are same to basic model. It is only different model name for marketing purpose
D855k	H/W and S/W are same to basic model. It is only different model name for marketing purpose
D855K	H/W and S/W are same to basic model. It is only different model name for marketing purpose

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## 1.6. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due.
Signal Generator	Agilent	E8257d	MY51501169	Jul. 23, 2013	Annual	Jul. 23, 2014
Spectrum Analyzer	Agilent	N9030A	US51350132	Oct. 08, 2013	Annual	Oct. 08, 2014
Spectrum Analyzer	R&S	FSV30	100768	Mar. 27, 2014	Annual	Mar. 27, 2015
Mobile Test Unit	Agilent	E5515C	GB43345198	Mar. 28, 2014	Annual	Mar. 28, 2015
Mobile Test Unit	R&S	CMW500	144035	Mar. 03, 2014	Annual	Mar. 03, 2015
Power Meter	Anritsu	ML2495A	1223004	Jun. 13, 2013	Annual	Jun. 13, 2014
Power Sensor	Anritsu	MA2411B	1207272	Jun. 13, 2013	Annual	Jun. 13, 2014
Directional Coupler	KRYTAR	152613	140972	Jun. 07, 2013	Annual	Jun. 07, 2014
Attenuator	MCLI	FAS-12-10	1	Jun. 19, 2013	Annual	Jun. 19, 2014
Temperature Chamber	ENEX	TRUST2000	980111	Dec. 26, 2013	Annual	Dec. 26, 2014
Low Pass Filter	Mini circuits	NLP-1200+	V8979400903-2	Mar. 21, 2014	Annual	Mar. 21, 2015
High Pass Filter	Wainwright	WHK3.0/18G-10SS	344	Jun. 08, 2013	Annual	Jun. 08, 2014
High Pass Filter	Wainwright	WHKX1.5/15G-6SS	4	Mar. 18, 2014	Annual	Mar. 18, 2015
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 27, 2014	Annual	Mar. 27, 2015
Preamplifier	H.P.	8447F	2944A03909	Jun. 28, 2013	Annual	Jun. 28, 2014
Preamplifier	R&S	SCU 18	1391123	Sep. 30, 2013	Annual	Sep. 30, 2014
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	Jun. 13, 2013	Annual	Jun. 13, 2014
Test Receiver	R&S	ESU26	100109	Mar. 04, 2014	Annual	Mar. 04, 2015
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	396	Jun. 07, 2013	Biennial	Jun. 07, 2015
Horn Antenna	R&S	HF906	100326	Dec. 10, 2013	Biennial	Dec. 10, 2015
Horn Antenna	SCHWARZBECK MESSELEKTRONIK	BBHA9170	BBHA9170223	Aug. 24, 2012	Biennial	Aug. 24, 2014
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 x W x H (9.6 m x 6.4 m x 6.4 m)	N/A	N.C.R.	N/A	N.C.R.

**Note;**

- Mobile test unit(E5515C) is used to test for GSM 850 & 1900
- Mobile test unit(CMW500) is used to test for WCDMA 850 & 1900 and LTE band 7

► **Support equipment**

Description	Manufacturer	Model	Serial Number	FCC ID
Wireless Charger	LG Electronics	WCP-300	306HYN008023	BEJWCP300

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## 1.7. 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
§22.913(a)(2) §24.232(c) §27.50(h)(2)	RF Radiated Output Power	Complied
§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Spurious Radiated Emission	Complied
§2.1046	Conducted Output Power	Complied
§2.1049	Occupied Bandwidth	Complied
§24.232(d) §27.50(d)(5)	Peak-Average Ratio	Complied
§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Spurious Emission at Antenna Terminal	Complied
§2.1055 §22.355 §24.235 §27.54	Frequency Stability	Complied
§22.917(a) §24.238(a) §27.53(g) §27.53(h)	Band Edge	Complied

## 1.8. Test report revision

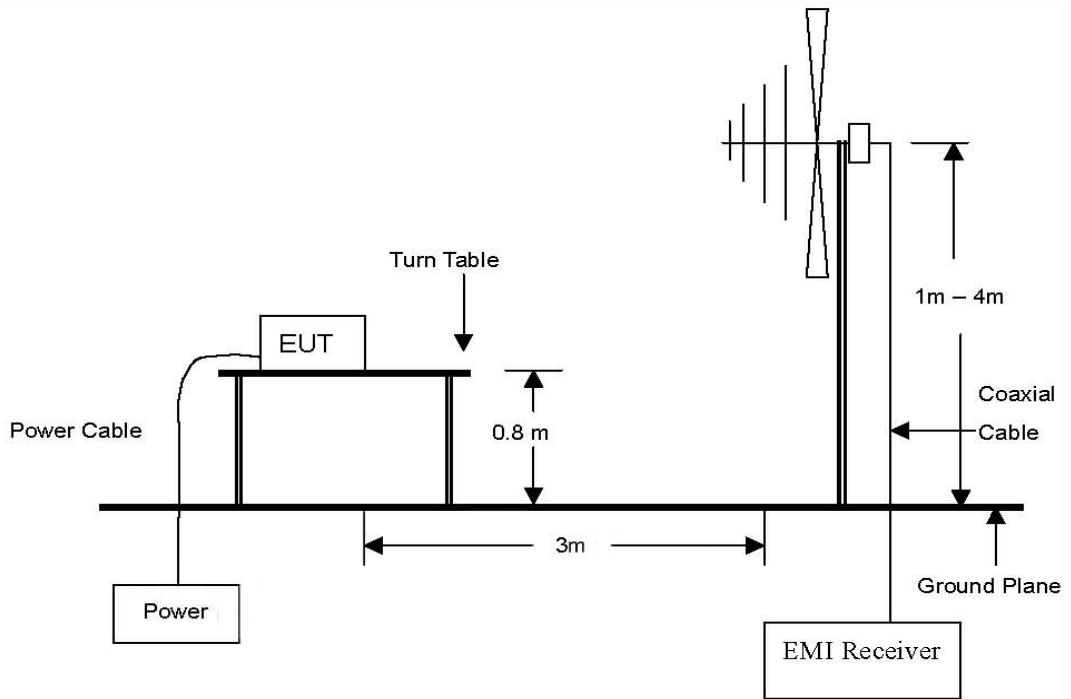
Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL007647	2014.05.19	Initial
1	F690501/RF-RTL007647-1	2014.05.27	Revised section 1. General information Improvement of PDF file image quality
2	F690501/RF-RTL007647-2	2014.05.30	Re-tested conducted output power Added actual test equipment list in each test result

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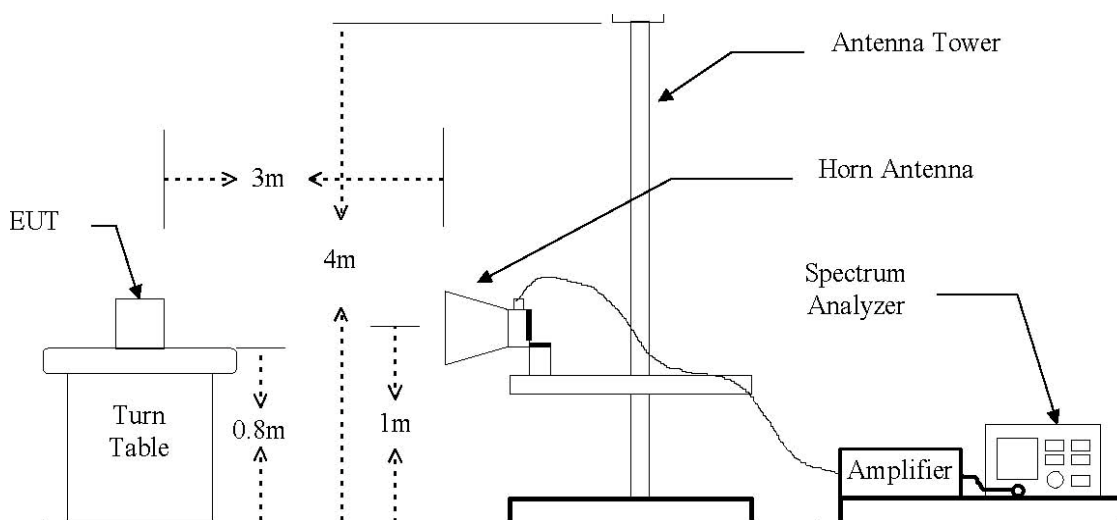
## 2. RF radiated output power & spurious radiated emission

### 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.



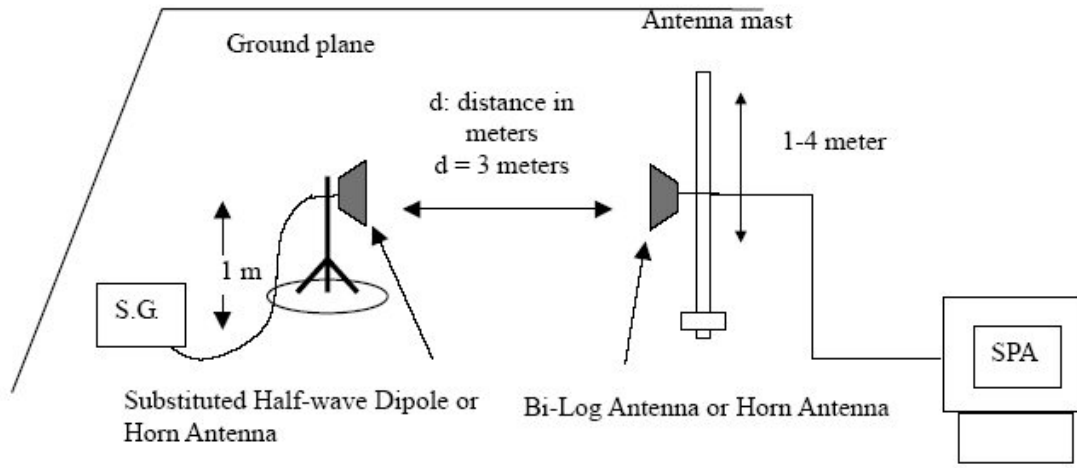
The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 20 GHz Emissions.



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The diagram below shows the test setup for substituted method.



### 2.1.1 Actual equipment used for RF radiated output power & spurious radiated emission

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due.
Signal Generator	Agilent	E8257d	MY51501169	Jul. 23, 2013	Annual	Jul. 23, 2014
Spectrum Analyzer	Agilent	N9030A	US51350132	Oct. 08, 2013	Annual	Oct. 08, 2014
Mobile Test Unit	Agilent	E5515C	GB43345198	Mar. 28, 2014	Annual	Mar. 28, 2015
Mobile Test Unit	R&S	CMW500	144035	Mar. 03, 2014	Annual	Mar. 03, 2015
Low Pass Filter	Mini circuits	NLP-1200+	V8979400903-2	Mar. 21, 2014	Annual	Mar. 21, 2015
High Pass Filter	Wainwright	WHK3.0/18G-10SS	344	Jun. 08, 2013	Annual	Jun. 08, 2014
High Pass Filter	Wainwright	WHKX1.5/15G-6SS	4	Mar. 18, 2014	Annual	Mar. 18, 2015
Preamplifier	H.P.	8447F	2944A03909	Jun. 28, 2013	Annual	Jun. 28, 2014
Preamplifier	R&S	SCU 18	1391123	Sep. 30, 2013	Annual	Sep. 30, 2014
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	Jun. 13, 2013	Annual	Jun. 13, 2014
Test Receiver	R&S	ESU26	100109	Mar. 04, 2014	Annual	Mar. 04, 2015
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	396	Jun. 07, 2013	Biennial	Jun. 07, 2015
Horn Antenna	R&S	HF906	100326	Dec. 10, 2013	Biennial	Dec. 10, 2015
Horn Antenna	SCHWARZBECK MESSELEKTRONIK	BBHA9170	BBHA9170223	Aug. 24, 2012	Biennial	Aug. 24, 2014
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 x W x H (9.6 m x 6.4 m x 6.4 m)	N/A	N.C.R.	N/A	N.C.R.

**Note;**

- Mobile test unit(E5515C) is used to test for GSM 850 & 1900
- Mobile test unit(CMW500) is used to test for WCDMA 850 & 1900 and LTE band 7

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## 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(h)(2), Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

### 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), except as otherwise specified below, for operations in the 1710-1755 MHz, 2110-2155 MHz, 2000-2020 MHz, 2180-2200 MHz, 1915-1920 MHz, and 1995-2000 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10\log_{10}(P)$  dB.

FCC §27.53(h), when an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

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### 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, a RMS detector, RBW = 100 kHz, VBW = 300 kHz and 1 second sweep time over a minimum of 10 sweeps, per the guideline of KDB 971168
5. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. 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.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. 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.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. The EUT was replaced by half-wave dipole (1 GHz below) or horn antenna (1 GHz above) connected to a signal generator.
11. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
13. 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.
14. 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.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

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## 2.4. Test result for RF radiated output power

Ambient temperature : (24 ± 2) °C  
 Relative humidity : 47 % R.H.

### GSM850

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	31.76	3.28	-0.95	27.53	566.05
824.2	H	33.48	3.28	-0.95	29.25	842.11
836.6	V	32.90	3.31	-0.95	28.64	730.40
836.6	H	34.41	3.31	-0.95	30.15	1 035.23
848.8	V	34.45	3.35	-0.94	30.16	1 038.21
848.8	H	37.80	3.35	-0.94	33.51	2 241.95

### GSM850 (EDGE)

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)
848.80	V	30.78	3.35	-0.94	26.49	445.33
848.80	H	33.69	3.35	-0.94	29.40	870.82

### GSM1900

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	26.70	5.90	7.88	28.68	738.71
1 850.2	H	29.95	5.90	7.88	31.93	1 558.04
1 880.0	V	25.79	5.83	7.86	27.82	605.06
1 880.0	H	29.46	5.83	7.86	31.49	1 408.93
1 909.8	V	25.44	5.77	7.84	27.51	563.56
1 909.8	H	29.03	5.77	7.84	31.10	1 289.62

### GSM1900 (EDGE)

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)
1 850.20	V	25.31	5.90	7.88	27.29	536.26
1 850.20	H	28.60	5.90	7.88	30.58	1 142.30

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**WCDMA850**

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	21.61	3.28	-0.95	17.38	54.76
826.4	H	22.57	3.28	-0.95	18.34	68.29
836.6	V	22.26	3.31	-0.95	18.00	63.13
836.6	H	23.56	3.31	-0.95	19.30	85.20
846.6	V	24.42	3.35	-0.94	20.13	103.00
846.6	H	27.38	3.35	-0.94	23.09	203.71

**WCDMA1900**

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)
1 852.4	V	20.12	5.90	7.87	22.09	161.93
1 852.4	H	23.79	5.90	7.87	25.76	376.30
1 880.0	V	19.20	5.83	7.86	21.23	132.65
1 880.0	H	22.96	5.83	7.86	24.99	315.86
1 907.6	V	18.35	5.77	7.84	20.42	110.11
1 907.6	H	21.35	5.77	7.84	23.42	219.94

**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 configurations and highest power is reported in GSM voice mode and WCDMA RMC mode at 12.2kbps.
3. The E.R.P. & E.I.R.P. was measured in three orthogonal EUT position(x-axis, y-axis and z-axis). Worst cases are z-axis for GSM850/WCDMA850 and x-axis for GSM1900/WCDMA1900.
4. The data reported in the table above was measured in worst case.

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**LTE band 7 (5 MHz - QPSK)**

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)
2 502.5	V	15.91	5.85	8.97	19.03	79.92
2 502.5	H	19.20	5.85	8.97	22.32	170.74
2 535.0	V	17.04	5.91	8.99	20.12	102.80
2 535.0	H	20.33	5.91	8.99	23.41	219.26
2 567.5	V	16.44	5.96	9.02	19.50	89.19
2 567.5	H	20.12	5.96	9.02	23.18	207.77

\* 5 BW 1RB size / 0 Offset for B7

**LTE band 7 (5 MHz - 16QAM)**

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)
2 502.5	V	15.83	5.85	8.97	18.95	78.46
2 502.5	H	19.11	5.85	8.97	22.23	167.24
2 535.0	V	17.18	5.91	8.99	20.26	106.17
2 535.0	H	19.76	5.91	8.99	22.84	192.29
2 567.5	V	16.69	5.96	9.02	19.75	94.47
2 567.5	H	19.90	5.96	9.02	22.96	197.50

\* 5 BW 1RB size / 0 Offset for B7

**LTE band 7 (10 MHz - QPSK)**

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)
2 505.0	V	16.15	5.85	8.97	19.27	84.48
2 505.0	H	19.49	5.85	8.97	22.61	182.55
2 535.0	V	17.40	5.91	8.99	20.48	111.69
2 535.0	H	20.21	5.91	8.99	23.29	213.28
2 565.0	V	16.46	5.96	9.01	19.51	89.37
2 565.0	H	20.03	5.96	9.01	23.08	203.02

\* 10 BW 1RB size / 0 Offset for B7

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**LTE band 7 (10 MHz – 16QAM)**

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)
2 505.0	V	16.19	5.85	8.97	19.31	85.27
2 505.0	H	19.33	5.85	8.97	22.45	175.95
2 535.0	V	16.66	5.91	8.99	19.74	94.19
2 535.0	H	20.70	5.91	8.99	23.78	238.76
2 565.0	V	16.50	5.96	9.01	19.55	90.20
2 565.0	H	19.39	5.96	9.01	22.44	175.20

\* 10 BW 1RB size / 0 Offset for B7

**LTE band 7 (15 MHz - QPSK)**

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)
2 507.5	V	16.32	5.86	8.97	19.43	87.68
2 507.5	H	19.37	5.86	8.97	22.48	177.19
2 535.0	V	17.99	5.91	8.99	21.07	127.94
2 535.0	H	19.88	5.91	8.99	22.96	197.77
2 562.5	V	15.24	5.96	9.01	18.29	67.47
2 562.5	H	19.42	5.96	9.01	22.47	176.80

\* 15 BW 1RB size / 0 Offset for B7

**LTE band 7 (15 MHz – 16QAM)**

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)
2 507.5	V	16.51	5.86	8.97	19.62	91.60
2 507.5	H	19.60	5.86	8.97	22.71	186.83
2 535.0	V	16.94	5.91	8.99	20.02	100.46
2 535.0	H	19.61	5.91	8.99	22.69	185.76
2 562.5	V	14.98	5.96	9.01	18.03	63.55
2 562.5	H	19.39	5.96	9.01	22.44	175.58

\* 15 BW 1RB size / 0 Offset for B7

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 7 (20 MHz - QPSK)**

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)
2 510.0	V	16.70	5.86	8.98	19.82	95.94
2 510.0	H	19.40	5.86	8.98	22.52	178.85
2 535.0	V	17.44	5.91	8.99	20.52	112.72
2 535.0	H	19.94	5.91	8.99	23.02	200.43
2 560.0	V	14.66	5.95	9.01	17.72	59.16
2 560.0	H	18.60	5.95	9.01	21.66	146.70

\* 20 BW 1RB size / 0 Offset for B7

**LTE band 7 (20 MHz – 16QAM)**

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)
2 510.0	V	16.95	5.86	8.98	20.07	101.62
2 510.0	H	18.96	5.86	8.98	22.08	161.62
2 535.0	V	17.79	5.91	8.99	20.87	122.18
2 535.0	H	19.74	5.91	8.99	22.82	191.41
2 560.0	V	14.40	5.95	9.01	17.46	55.72
2 560.0	H	18.22	5.95	9.01	21.28	134.41

\* 20 BW 1RB size / 0 Offset for B7

**Remark:**

1. 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 E.R.P. & E.I.R.P. was measured in three orthogonal EUT position (x-axis, y-axis and z-axis). Worst cases are z-axis for LTE (5 MHz, 10 MHz, 15 MHz, 20 MHz)
4. The data reported in the table above was measured in worst case.

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## 2.5. Spurious radiated emission

### 2.5.1. Battery Cover without charger

- Measured output Power: 33.51 dB m = 2.24 W
- Modulation Signal: GSM850
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 46.50$  dB c

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)							
1 648.56	V	-44.53	5.92	7.93	-42.52	76.03	29.53
1 648.43	H	-50.00	5.92	7.93	-47.99	81.50	35.00
3 296.93	V	-49.51	7.46	9.08	-47.89	81.40	34.90
3 296.61	H	-44.09	7.46	9.08	-42.47	75.98	29.48
Middle Channel (836.4 MHz)							
1 672.98	V	-44.99	6.01	7.93	-43.07	76.58	30.08
1 673.17	H	-51.13	6.01	7.93	-49.21	82.72	36.22
3 346.73	V	-48.82	7.54	9.06	-47.30	80.81	34.31
3 346.59	H	-42.79	7.54	9.06	-41.27	74.78	28.28
High Channel (848.8 MHz)							
1 697.68	V	-42.53	6.09	7.93	-40.69	74.20	27.70
1 697.55	H	-49.57	6.09	7.93	-47.73	81.24	34.74
3 395.46	V	-49.77	7.61	9.03	-48.35	81.86	35.36
3 395.11	H	-43.30	7.61	9.03	-41.88	75.39	28.89

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: 31.93 dB m = 1.56 W
- Modulation Signal: GSM1900
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 44.93$  dB c

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)							
3 700.44	V	-47.52	8.04	9.07	-46.49	78.42	33.49
3 700.35	H	-47.14	8.04	9.07	-46.11	78.04	33.11
Middle Channel(1 880.0 MHz)							
3 760.24	V	-47.01	8.32	9.10	-46.23	78.16	33.23
3 759.97	H	-44.75	8.32	9.10	-43.97	75.90	30.97
High Channel(1 909.8 MHz)							
3 819.70	V	-47.39	8.49	9.12	-46.76	78.69	33.76
3 819.63	H	-42.48	8.49	9.12	-41.85	73.78	28.85

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: 23.09 dB m = 0.20 W
- Modulation Signal: WCDMA850
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.01$  dB c

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)							
1 650.76	V	-48.16	5.93	7.93	-46.16	69.25	33.24
1 650.80	H	-51.89	5.93	7.93	-49.89	72.98	36.97
Middle Channel (836.6 MHz)							
1 671.00	V	-44.59	6.00	7.93	-42.66	65.75	29.74
1 671.24	H	-46.90	6.00	7.93	-44.97	68.06	32.05
High Channel (846.6 MHz)							
1 695.20	V	-50.43	6.08	7.93	-48.58	71.67	35.66
1 695.85	H	-52.08	6.09	7.93	-50.24	73.33	37.32

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: 25.76 dB m = 0.38 W
- Modulation Signal: WCDMA1900
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 38.80$  dB c

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(1 852.4 MHz)							
3 706.81	V	-39.01	8.07	9.08	-38.00	63.76	24.96
3 706.52	H	-35.34	8.07	9.08	-34.33	60.09	21.29
Middle Channel(1 880.0 MHz)							
3 761.99	V	-42.60	8.33	9.10	-41.83	67.59	28.79
3 761.54	H	-38.88	8.33	9.10	-38.11	63.87	25.07
High Channel(1 907.6 MHz)							
3 813.14	V	-42.65	8.50	9.12	-42.03	67.79	28.99
3 813.32	H	-36.51	8.50	9.12	-35.89	61.65	22.85

**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 configurations and highest power is reported in GSM voice mode and WCDMA RMC mode at 12.2kbps.
3. The E.R.P. & E.I.R.P. was measured in three orthogonal EUT position(x-axis, y-axis and z-axis). Worst cases are z-axis for GSM850/WCDMA850 and x-axis for GSM1900/WCDMA1900.
4. 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.*

- Measured output Power: 23.41 dB m = 0.22 W
- Modulation Signal: LTE band 7 (5 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.42$  dB c

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(2 502.5 MHz)							
5 000.74	V	-32.40	8.33	9.67	-31.06	54.47	18.05
5 000.71	H	-29.14	8.33	9.67	-27.80	51.21	14.79
7 501.08	V	-28.71	13.11	11.72	-30.10	53.51	17.09
7 500.98	H	-22.86	13.11	11.72	-24.25	47.66	11.24
Middle Channel(2 535.0 MHz)							
5 065.72	V	-29.17	8.39	9.77	-27.79	51.20	14.78
5 065.70	H	-24.93	8.39	9.77	-23.55	46.96	10.54
7 598.71	V	-25.11	11.95	11.78	-25.28	48.69	12.27
7 598.68	H	-18.98	11.95	11.78	-19.15	42.56	6.14
High Channel(2 567.5 MHz)							
5 130.73	V	-29.71	8.49	9.87	-28.33	51.74	15.32
5 130.65	H	-23.62	8.49	9.87	-22.24	45.65	9.23
7 695.97	V	-24.47	11.54	11.83	-24.18	47.59	11.17
7 695.88	H	-17.99	11.54	11.83	-17.70	41.11	4.69

\* 5 BW 1RB size / 0 Offset for B7

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: 23.78 dB m = 0.24 W
- Modulation Signal: LTE band 7 (10 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.80$  dB c

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(2 505.0 MHz)							
5 001.30	V	-32.25	8.33	9.67	-30.91	54.69	17.89
5 001.11	H	-27.93	8.33	9.67	-26.59	50.37	13.57
7 501.92	V	-28.23	13.10	11.72	-29.61	53.39	16.59
7 501.84	H	-21.01	13.10	11.72	-22.39	46.17	9.37
Middle Channel(2 535.0 MHz)							
5 061.03	V	-30.78	8.39	9.76	-29.41	53.19	16.39
5 061.22	H	-25.71	8.39	9.76	-24.34	48.12	11.32
7 591.74	V	-38.16	12.03	11.77	-38.42	62.20	25.40
7 591.81	H	-28.59	12.03	11.77	-28.85	52.63	15.83
High Channel(2 565.0 MHz)							
5 121.14	V	-31.59	8.47	9.85	-30.21	53.99	17.19
5 121.15	H	-24.81	8.47	9.85	-23.43	47.21	10.41
7 681.76	V	-32.66	11.60	11.82	-32.44	56.22	19.42
7 681.92	H	-30.22	11.60	11.82	-30.00	53.78	16.98

\* 10 BW 1RB size / 0 Offset for B7

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: 22.96 dB m = 0.20 W
- Modulation Signal: LTE band 7 (15 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.01$  dB c

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(2 507.5 MHz)							
5 001.69	V	-32.24	8.33	9.67	-30.90	53.86	17.85
5 001.51	H	-28.09	8.33	9.67	-26.75	49.71	13.70
7 502.71	V	-31.46	13.09	11.72	-32.83	55.79	19.78
7 502.61	H	-21.10	13.09	11.72	-22.47	45.43	9.42
Middle Channel(2 535.0 MHz)							
5 056.67	V	-31.79	8.39	9.76	-30.42	53.38	17.37
5 056.75	H	-26.37	8.39	9.76	-25.00	47.96	11.95
7 585.01	V	-39.02	12.11	11.77	-39.36	62.32	26.31
7 585.09	H	-26.01	12.11	11.77	-26.35	49.31	13.30
High Channel(2 562.5 MHz)							
5 111.68	V	-34.74	8.45	9.84	-33.35	56.31	20.30
5 111.62	H	-29.47	8.45	9.84	-28.08	51.04	15.03
7 667.66	V	-35.40	11.66	11.81	-35.25	58.21	22.20
7 667.46	H	-27.70	11.66	11.81	-27.55	50.51	14.50

\* 15 BW 1RB size / 0 Offset for B7

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: 23.02 dB m = 0.20 W
- Modulation Signal: LTE band 7 (20 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.01$  dB c

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(2510.0 MHz)							
5 002.18	V	-32.64	8.33	9.67	-31.30	54.32	18.31
5 002.20	H	-28.33	8.33	9.67	-26.99	50.01	14.00
7 503.36	V	-30.64	13.08	11.72	-32.00	55.02	19.01
7 503.32	H	-21.51	13.08	11.72	-22.87	45.89	9.88
Middle Channel(2 535.0 MHz)							
5 052.34	V	-32.37	8.38	9.75	-31.00	54.02	18.01
5 052.24	H	-28.34	8.38	9.75	-26.97	49.99	13.98
7 578.17	V	-35.21	12.19	11.76	-35.64	58.66	22.65
7 578.30	H	-25.08	12.19	11.76	-25.51	48.53	12.52
High Channel(2 560.0 MHz)							
5 102.22	V	-37.96	8.43	9.82	-36.57	59.59	23.58
5 102.28	H	-33.90	8.43	9.82	-32.51	55.53	19.52
7 653.30	V	-38.69	11.72	11.80	-38.61	61.63	25.62
7 653.25	H	-29.57	11.72	11.80	-29.49	52.51	16.50

\* 20 BW 1RB size / 0 Offset for B7

Remark:

1. 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 E.R.P. & E.I.R.P. was measured in three orthogonal EUT position (x-axis, y-axis and z-axis). Worst cases are z-axis for LTE (5 MHz, 10 MHz, 15 MHz, 20 MHz)
4. 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.

**2.5.2. Battery Cover with charger**

- Measured output Power: 33.51 dB m = 2.24 W
- Modulation Signal: GSM850
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 46.50$  dB c

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)							
1 648.24	V	-43.91	5.92	7.93	-41.90	75.41	28.91
1 648.35	H	-50.37	5.92	7.93	-48.36	81.87	35.37
3 296.93	V	-50.55	7.46	9.08	-48.93	82.44	35.94
3 296.61	H	-44.74	7.46	9.08	-43.12	76.63	30.13
Middle Channel (836.4 MHz)							
1 673.11	V	-45.46	6.01	7.93	-43.54	77.05	30.55
1 673.25	H	-51.06	6.01	7.93	-49.14	82.65	36.15
3 346.73	V	-49.13	7.54	9.06	-47.61	81.12	34.62
3 346.59	H	-43.07	7.54	9.06	-41.55	75.06	28.56
High Channel (848.8 MHz)							
1 697.48	V	-41.88	6.09	7.93	-40.04	73.55	27.05
1 697.59	H	-48.60	6.09	7.93	-46.76	80.27	33.77
3 395.46	V	-50.59	7.61	9.03	-49.17	82.68	36.18
3 395.11	H	-43.65	7.61	9.03	-42.23	75.74	29.24

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: 31.93 dB m = 1.56 W
- Modulation Signal: GSM1900
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 44.93$  dB c

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)							
3 700.25	V	-47.09	8.04	9.07	-46.06	77.99	33.06
3 700.14	H	-47.43	8.04	9.07	-46.40	78.33	33.40
Middle Channel(1 880.0 MHz)							
3 760.12	V	-46.75	8.32	9.10	-45.97	77.90	32.97
3 760.29	H	-44.53	8.32	9.10	-43.75	75.68	30.75
High Channel(1 909.8 MHz)							
3 819.78	V	-47.06	8.49	9.12	-46.43	78.36	33.43
3 819.57	H	-42.34	8.49	9.12	-41.71	73.64	28.71

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: 23.09 dB m = 0.20 W
- Modulation Signal: WCDMA850
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.01$  dB c

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)							
1 650.61	V	-48.24	5.93	7.93	-46.24	69.33	33.32
1 650.50	H	-52.36	5.93	7.93	-50.36	73.45	37.44
Middle Channel (836.6 MHz)							
1 671.44	V	-44.66	6.00	7.93	-42.73	65.82	29.81
1 671.55	H	-47.21	6.00	7.93	-45.28	68.37	32.36
High Channel (846.6 MHz)							
1 695.57	V	-50.47	6.08	7.93	-48.62	71.71	35.70
1 695.46	H	-52.41	6.08	7.93	-50.56	73.65	37.64

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: 25.76 dB m = 0.38 W
- Modulation Signal: WCDMA1900
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 38.80$  dB c

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(1 852.4 MHz)							
3 706.35	V	-38.47	8.07	9.08	-37.46	63.22	24.42
3 706.06	H	-35.71	8.07	9.08	-34.70	60.46	21.66
Middle Channel(1 880.0 MHz)							
3 762.21	V	-42.64	8.33	9.10	-41.87	67.63	28.83
3 761.27	H	-39.79	8.33	9.10	-39.02	64.78	25.98
High Channel(1 907.6 MHz)							
3 813.15	V	-43.21	8.50	9.12	-42.59	68.35	29.55
3 813.51	H	-37.04	8.50	9.12	-36.42	62.18	23.38

## 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 configurations and highest power is reported in GSM voice mode and WCDMA RMC mode at 12.2kbps.
3. The E.R.P. & E.I.R.P. was measured in three orthogonal EUT position(x-axis, y-axis and z-axis). Worst cases are z-axis for GSM850/WCDMA850 and x-axis for GSM1900/WCDMA1900.
4. The data reported in the table above was measured in worst case.

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- Measured output Power: 23.41 dB m = 0.22 W
- Modulation Signal: LTE band 7 (5 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.42$  dB c

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(2 502.5 MHz)							
5 000.72	V	-32.81	8.33	9.67	-31.47	54.88	18.46
5 000.75	H	-28.80	8.33	9.67	-27.46	50.87	14.45
7 501.32	V	-29.23	13.11	11.72	-30.62	54.03	17.61
7 501.21	H	-22.91	13.11	11.72	-24.30	47.71	11.29
Middle Channel(2 535.0 MHz)							
5 065.65	V	-28.81	8.39	9.77	-27.43	50.84	14.42
5 065.71	H	-24.78	8.39	9.77	-23.40	46.81	10.39
7 598.94	V	-34.97	11.95	11.78	-35.14	58.55	22.13
7 598.97	H	-28.12	11.95	11.78	-28.29	51.70	15.28
High Channel(2 567.5 MHz)							
5 130.64	V	-29.27	8.49	9.87	-27.89	51.30	14.88
5 130.71	H	-23.46	8.49	9.87	-22.08	45.49	9.07
7 696.19	V	-38.28	11.54	11.83	-37.99	61.40	24.98
7 695.88	H	-38.15	11.54	11.83	-37.86	61.27	24.85

\* 5 BW 1RB size / 0 Offset for B7

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: 23.78 dB m = 0.24 W
- Modulation Signal: LTE band 7 (10 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.80$  dB c

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(2 505.0 MHz)							
5 001.32	V	-32.07	8.33	9.67	-30.73	54.51	17.71
5 001.25	H	-28.00	8.33	9.67	-26.66	50.44	13.64
7 502.00	V	-28.70	13.10	11.72	-30.08	53.86	17.06
7 501.99	H	-21.03	13.10	11.72	-22.41	46.19	9.39
Middle Channel(2 535.0 MHz)							
5 061.08	V	-31.24	8.39	9.76	-29.87	53.65	16.85
5 061.14	H	-25.91	8.39	9.76	-24.54	48.32	11.52
7 591.80	V	-38.50	12.03	11.77	-38.76	62.54	25.74
7 592.05	H	-28.51	12.03	11.77	-28.77	52.55	15.75
High Channel(2 565.0 MHz)							
5 121.21	V	-31.24	8.47	9.85	-29.86	53.64	16.84
5 121.18	H	-24.90	8.47	9.85	-23.52	47.30	10.50
7 681.77	V	-32.48	11.60	11.82	-32.26	56.04	19.24
7 682.18	H	-30.49	11.60	11.82	-30.27	54.05	17.25

\* 10 BW 1RB size / 0 Offset for B7

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- Measured output Power: 22.96 dB m = 0.20 W
- Modulation Signal: LTE band 7 (15 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.01$  dB c

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(2 507.5 MHz)							
5 001.61	V	-31.82	8.33	9.67	-30.48	53.44	17.43
5 001.65	H	-28.43	8.33	9.67	-27.09	50.05	14.04
7 502.78	V	-31.64	13.09	11.72	-33.01	55.97	19.96
7 502.66	H	-21.32	13.09	11.72	-22.69	45.65	9.64
Middle Channel(2 535.0 MHz)							
5 056.54	V	-32.15	8.38	9.76	-30.77	53.73	17.72
5 056.72	H	-26.86	8.39	9.76	-25.49	48.45	12.44
7 585.30	V	-38.75	12.11	11.77	-39.09	62.05	26.04
7 585.23	H	-26.08	12.11	11.77	-26.42	49.38	13.37
High Channel(2 562.5 MHz)							
5 111.65	V	-34.59	8.45	9.84	-33.20	56.16	20.15
5 111.63	H	-28.97	8.45	9.84	-27.58	50.54	14.53
7 667.87	V	-35.22	11.66	11.81	-35.07	58.03	22.02
7 667.50	H	-28.12	11.66	11.81	-27.97	50.93	14.92

\* 15 BW 1RB size / 0 Offset for B7

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: 23.02 dB m = 0.20 W
- Modulation Signal: LTE band 7 (20 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 36.01$  dB c

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(2510.0 MHz)							
5 002.21	V	-32.39	8.33	9.67	-31.05	54.07	18.06
5 002.25	H	-27.87	8.33	9.67	-26.53	49.55	13.54
7 503.09	V	-30.96	13.09	11.72	-32.33	55.35	19.34
7 503.53	H	-21.91	13.08	11.72	-23.27	46.29	10.28
Middle Channel(2 535.0 MHz)							
5 052.34	V	-32.52	8.38	9.75	-31.15	54.17	18.16
5 052.24	H	-28.77	8.38	9.75	-27.40	50.42	14.41
7 578.06	V	-35.59	12.20	11.76	-36.03	59.05	23.04
7 578.32	H	-24.89	12.19	11.76	-25.32	48.34	12.33
High Channel(2 560.0 MHz)							
5 102.22	V	-37.80	8.43	9.82	-36.41	59.43	23.42
5 102.28	H	-33.44	8.43	9.82	-32.05	55.07	19.06
7 653.03	V	-38.73	11.72	11.80	-38.65	61.67	25.66
7 653.31	H	-29.73	11.72	11.80	-29.65	52.67	16.66

\* 20 BW 1RB size / 0 Offset for B7

Remark:

1. 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 E.R.P. & E.I.R.P. was measured in three orthogonal EUT position (x-axis, y-axis and z-axis). Worst cases are z-axis for LTE (5 MHz, 10 MHz, 15 MHz, 20 MHz)
4. The data reported in the table above was measured in worst case.

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### 3. Conducted Output Power

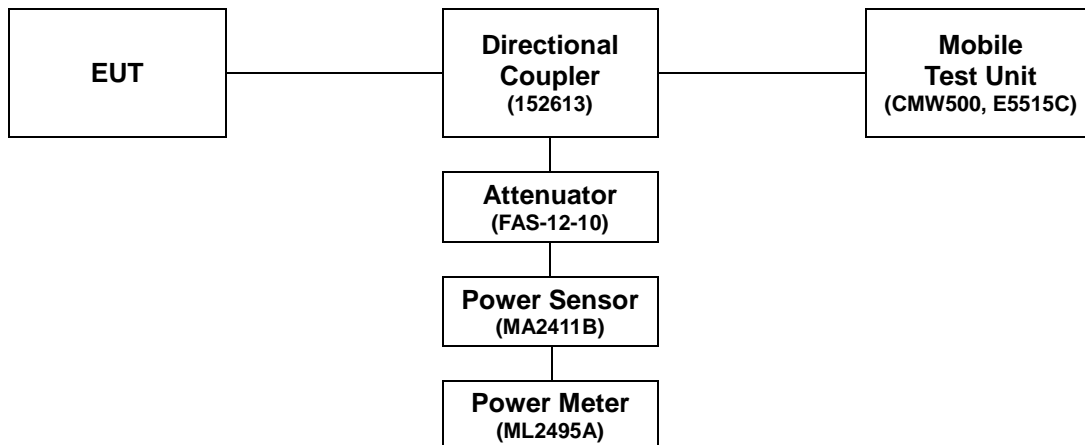
#### 3.1. Limit

Requirements: CFR 47, Section §2.1046

#### 3.2. Test Procedure

In compliance with §2.1046, power output shall be measured at the RF output terminals for all configurations.

1. The RF output of the transmitter was connected to the input of the mobile test unit (CMW500 and E5515C) in order to establish communication with the EUT.
2. The EUT was set up for the max. output power with pseudo random data modulation by using mobile test unit parameters.
3. The measurement performed using a wideband RF power meter.
4. This EUT was tested under all configurations and the highest power was investigated and reported.



#### 4.2.1 Actual equipment used for Conducted Output Power

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due.
Power Meter	Anritsu	ML2495A	1223004	Jun. 13, 2013	Annual	Jun. 13, 2014
Power Sensor	Anritsu	MA2411B	1207272	Jun. 13, 2013	Annual	Jun. 13, 2014
Mobile Test Unit	Agilent	E5515C	GB43345198	Mar. 28, 2014	Annual	Mar. 28, 2015
Mobile Test Unit	R&S	CMW500	144035	Mar. 03, 2014	Annual	Mar. 03, 2015
Directional Coupler	KRYTAR	152613	140972	Jun. 07, 2013	Annual	Jun. 07, 2014
Attenuator	MCLI	FAS-12-10	1	Jun. 19, 2013	Annual	Jun. 19, 2014
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 27, 2014	Annual	Mar. 27, 2015

**Note;**

- Mobile test unit(E5515C) is used to test for GSM 850 & 1900
- Mobile test unit(CMW500) is used to test for WCDMA 850 & 1900 and LTE band 7

*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 Result

Ambient temperature : (24 ± 2) °C

Relative humidity : 47 % R.H.

Band	Channel	Voice	GPRS Data			
		GSM	GPRS	GPRS	GPRS	GPRS
		(dB m)	1 TX Slot (dB m)	2 TX Slot (dB m)	3 TX Slot (dB m)	4 TX Slot (dB m)
GSM850	128	33.50	33.45	31.58	29.35	27.51
	190	33.62	33.60	31.50	29.24	27.63
	251	33.61	33.60	31.55	29.51	27.61
GSM1900	512	30.10	30.05	28.59	27.51	26.31
	661	30.41	30.18	28.61	27.55	26.51
	810	29.95	29.80	28.38	27.25	26.28

Band	Channel	EDGE Data			
		EDGE	EDGE	EDGE	EDGE
		1 TX Slot (dB m)	2 TX Slot (dB m)	3 TX Slot (dB m)	4 TX Slot (dB m)
GSM 850	128	27.10	27.05	26.31	25.29
	190	27.19	27.01	26.39	25.30
	251	27.35	27.24	26.59	25.41
GSM 1900	512	25.40	25.31	24.70	23.33
	661	25.82	25.68	25.06	23.85
	810	25.51	25.31	24.64	23.54

3GPP Release version	Mode	3GPP 34.121 Subtest	Cellular Band[dB m]			PCS Band[dB m]		
			4132	4183	4233	9262	9400	9538
99	WCDMA	12.2kbps RMC	23.34	23.40	23.42	23.20	23.48	23.33
5	HSDPA	Subtest1	23.32	23.47	23.44	23.21	23.44	23.29
5		Subtest2	23.30	23.42	23.40	23.20	23.40	23.28
5		Subtest3	23.00	23.11	23.11	22.85	23.07	23.05
5		Subtest4	23.02	23.12	23.05	22.83	23.05	23.05
6	HSUPA	Subtest1	23.05	23.13	23.12	22.59	22.83	22.65
6		Subtest2	21.03	21.15	21.21	21.22	21.37	21.27
6		Subtest3	21.85	21.95	21.85	22.15	22.45	22.37
6		Subtest4	21.02	21.24	21.14	21.17	21.37	21.08
6		Subtest5	22.90	23.33	23.22	23.20	23.44	23.18
HSPA+			22.85	23.12	23.15	22.66	22.85	22.87

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Band	Bandwidth (Mhz)	RB Size	RB Offset	LTE band 7 data (dB m)					
				QPSK			16QAM		
				20775	21100	21425	20775	21100	21425
LTE 7	5	1	0	23.15	23.17	23.18	22.18	22.19	22.27
	5	1	12	23.15	23.22	23.05	22.18	22.23	22.35
	5	1	24	23.13	23.20	23.07	22.06	22.18	22.33
	5	12	0	22.20	22.40	22.18	21.16	21.18	21.48
	5	12	6	22.18	22.37	22.15	21.15	21.17	21.47
	5	12	13	22.18	22.39	22.17	21.17	21.22	21.43
	5	25	0	22.15	22.30	22.20	21.16	21.20	21.32
	<b>Bandwidth (Mhz)</b>	<b>RB Size</b>	<b>RB Offset</b>	<b>20800</b>	<b>21100</b>	<b>21400</b>	<b>20800</b>	<b>21100</b>	<b>21400</b>
	10	1	0	23.05	23.14	23.13	22.10	22.17	22.21
	10	1	25	23.09	23.17	23.20	22.13	22.15	22.17
	10	1	49	23.12	23.15	23.17	22.07	22.17	22.17
	10	25	0	22.14	22.33	22.21	21.35	21.24	21.33
	10	25	12	22.17	22.35	22.17	21.27	21.23	21.33
	10	25	25	22.11	22.20	22.18	21.20	21.27	21.37
	10	50	0	22.13	22.33	22.21	21.20	21.30	21.25
	<b>Bandwidth (Mhz)</b>	<b>RB Size</b>	<b>RB Offset</b>	<b>20825</b>	<b>21100</b>	<b>21375</b>	<b>20825</b>	<b>21100</b>	<b>21375</b>
	15	1	0	23.15	23.10	23.21	22.23	22.37	22.24
	15	1	36	23.15	23.11	23.21	22.18	22.40	22.24
	15	1	74	23.11	23.17	23.17	22.23	22.43	22.25
	15	36	0	22.15	22.33	22.22	21.24	21.37	21.27
	15	36	18	22.18	22.29	22.21	21.20	21.33	21.23
	15	36	37	22.16	22.28	22.23	21.22	21.35	21.22
	15	75	0	22.19	22.19	22.22	21.27	21.37	21.25
	<b>Bandwidth (Mhz)</b>	<b>RB Size</b>	<b>RB Offset</b>	<b>20850</b>	<b>21100</b>	<b>21350</b>	<b>20850</b>	<b>21100</b>	<b>21350</b>
	20	1	0	23.10	23.14	23.35	22.24	22.37	22.37
	20	1	50	23.22	23.19	23.34	22.21	22.38	22.35
	20	1	99	23.20	23.14	23.29	22.21	22.40	22.36
	20	50	0	22.20	22.15	22.39	21.22	21.32	21.41
	20	50	25	22.15	22.14	22.35	21.21	21.35	21.37
	20	50	50	22.17	22.16	22.35	21.23	21.34	21.36
20	100	0	22.14	22.20	22.41	21.22	21.18	21.41	

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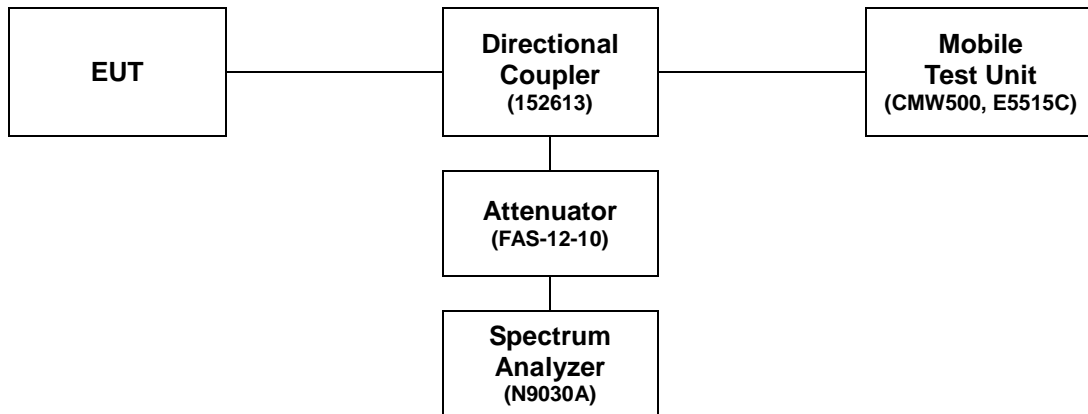
## 4. Occupied Bandwidth 99 %

### 4.1. Limit

Requirements: CFR 47, Section §2.1049.

### 4.2. Test Procedure

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.



#### 4.2.1 Actual equipment used for Occupied Bandwidth 99 %

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due.
Spectrum Analyzer	Agilent	N9030A	US51350132	Oct. 08, 2013	Annual	Oct. 08, 2014
Mobile Test Unit	Agilent	E5515C	GB43345198	Mar. 28, 2014	Annual	Mar. 28, 2015
Mobile Test Unit	R&S	CMW500	144035	Mar. 03, 2014	Annual	Mar. 03, 2015
Directional Coupler	KRYTAR	152613	140972	Jun. 07, 2013	Annual	Jun. 07, 2014
Attenuator	MCLI	FAS-12-10	1	Jun. 19, 2013	Annual	Jun. 19, 2014
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 27, 2014	Annual	Mar. 27, 2015

**Note;**

- Mobile test unit(E5515C) is used to test for GSM 850 & 1900
- Mobile test unit(CMW500) is used to test for WCDMA 850 & 1900 and LTE band 7

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### 4.3 Test Results

Ambient temperature : (24 ± 2) °C  
 Relative humidity : 47 % R.H.

Band	Mode	Frequency (MHz)	Occupied Bandwidth (MHz)
GSM850	GSM Voice	824.2	0.249
		836.6	0.248
		848.8	0.247
	EDGE	848.8	0.245
GSM1900	GSM Voice	1 850.2	0.243
		1 880.0	0.243
		1 909.8	0.242
	EDGE	1 850.2	0.249
WCDMA850	12.2 kbps (RMC)	826.4	4.164
		836.6	4.168
		848.6	4.159
WCDMA1900	12.2 kbps (RMC)	1 852.4	4.153
		1 880.0	4.166
		1 907.6	4.150
LTE 7 (5 MHz)	QPSK	2 502.5	4.497
		2 535.0	4.498
		2 567.5	4.504
LTE 7 (10 MHz)	QPSK	2 505.0	8.962
		2 535.0	9.000
		2 565.0	8.978
LTE 7 (15 MHz)	QPSK	2 507.5	13.461
		2 535.0	13.459
		2 562.5	13.425
LTE 7 (20 MHz)	QPSK	2 510.0	17.885
		2 535.0	17.888
		2 560.0	17.888
LTE 7 (5 MHz)	16QAM	2 502.5	4.502
		2 535.0	4.505
		2 567.5	4.492
LTE 7 (10 MHz)	16QAM	2 505.0	8.982
		2 535.0	8.963
		2 565.0	8.931
LTE 7 (15 MHz)	16QAM	2 507.5	13.424
		2 535.0	13.444
		2 562.5	13.430
LTE 7 (20 MHz)	16QAM	2 510.0	17.904
		2 535.0	17.939
		2 560.0	17.819

Please refer to the following plots.

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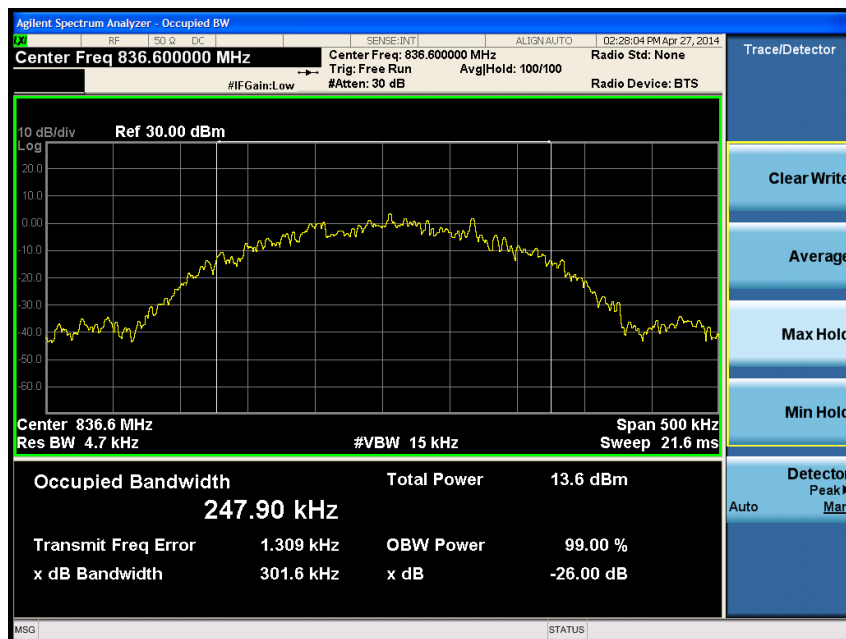
## GSM850

99 %

Low Channel



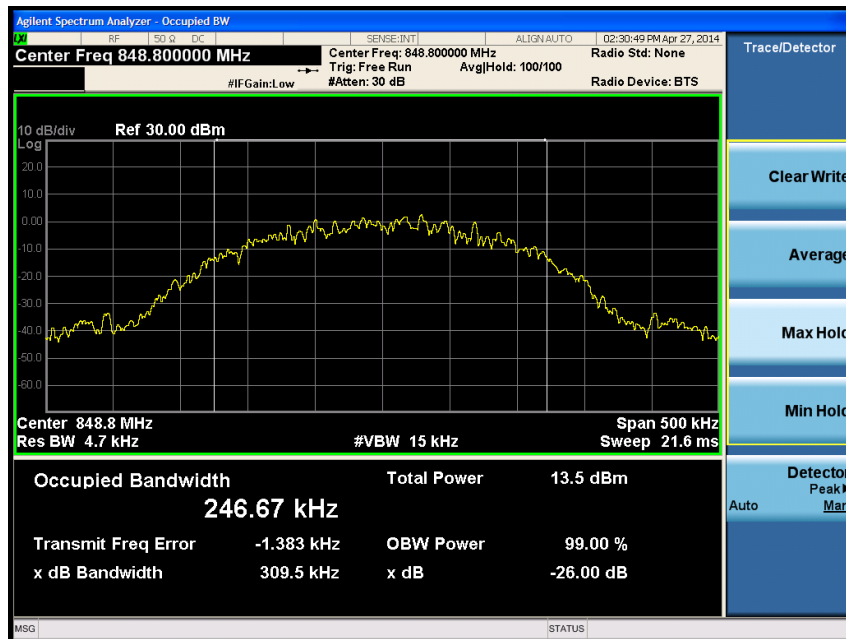
## Middle Channel



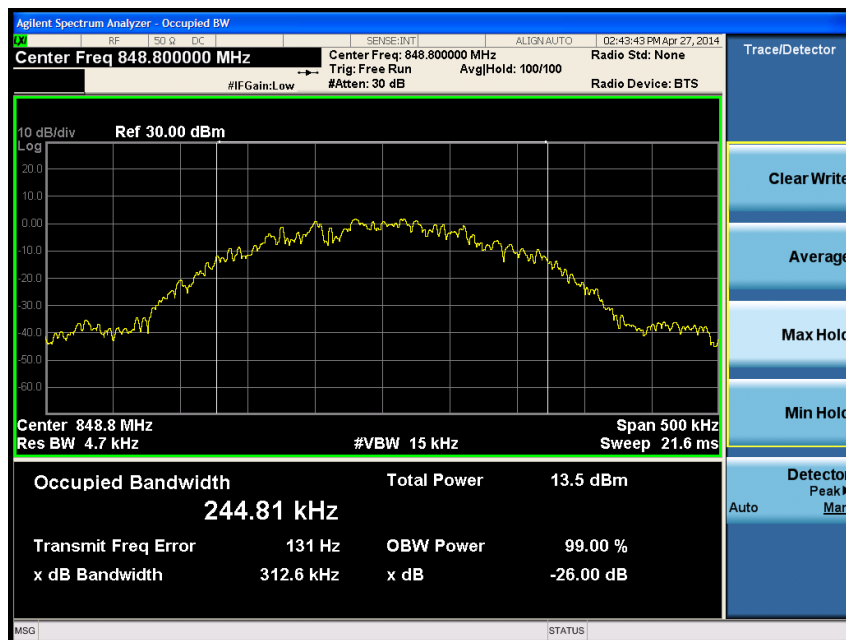
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High Channel

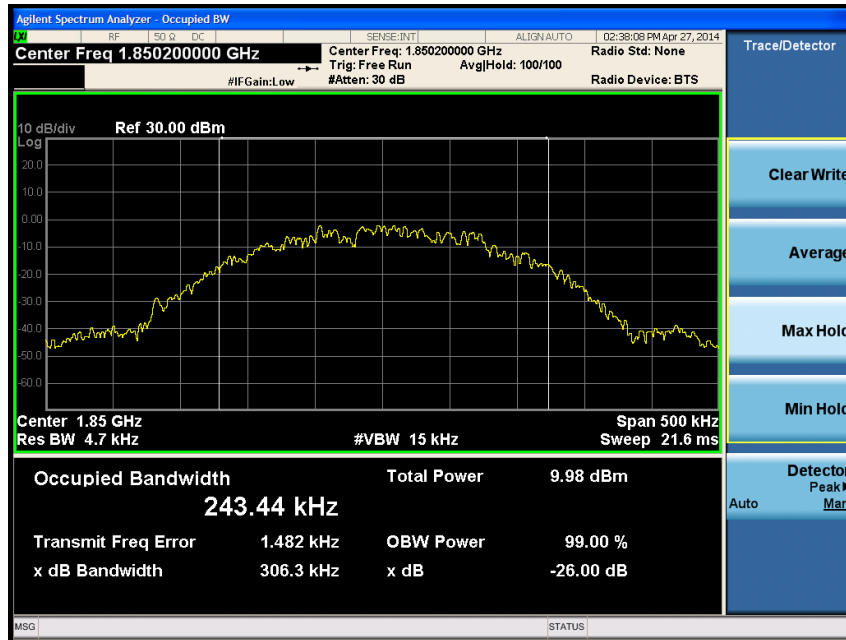


**GSM850 EDGE**  
99 %  
High Channel

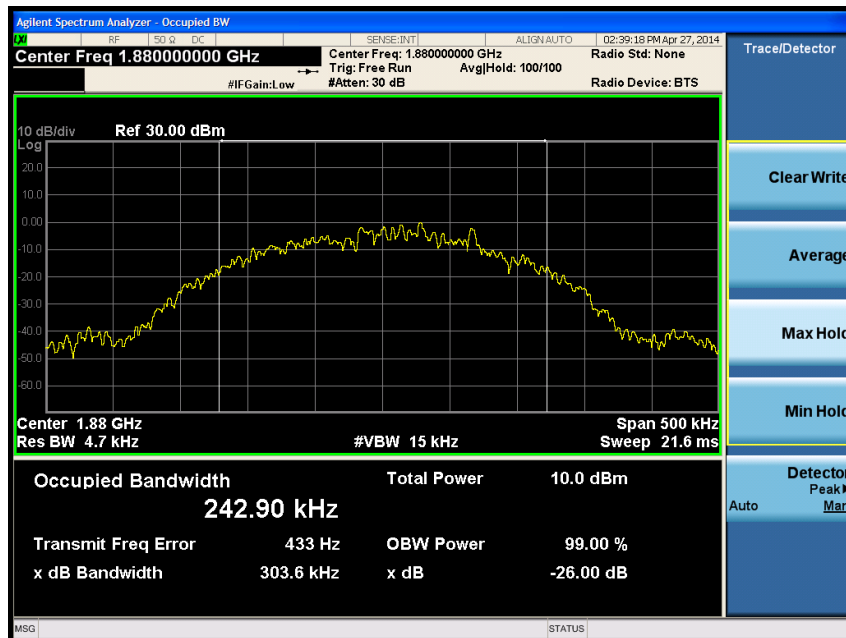


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**GSM1900**  
99 %  
Low Channel

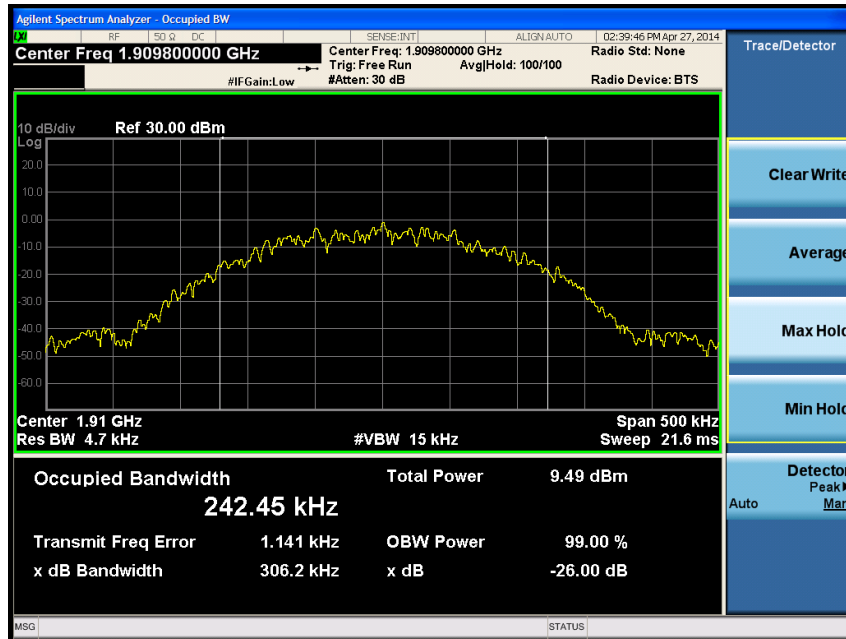


Middle Channel



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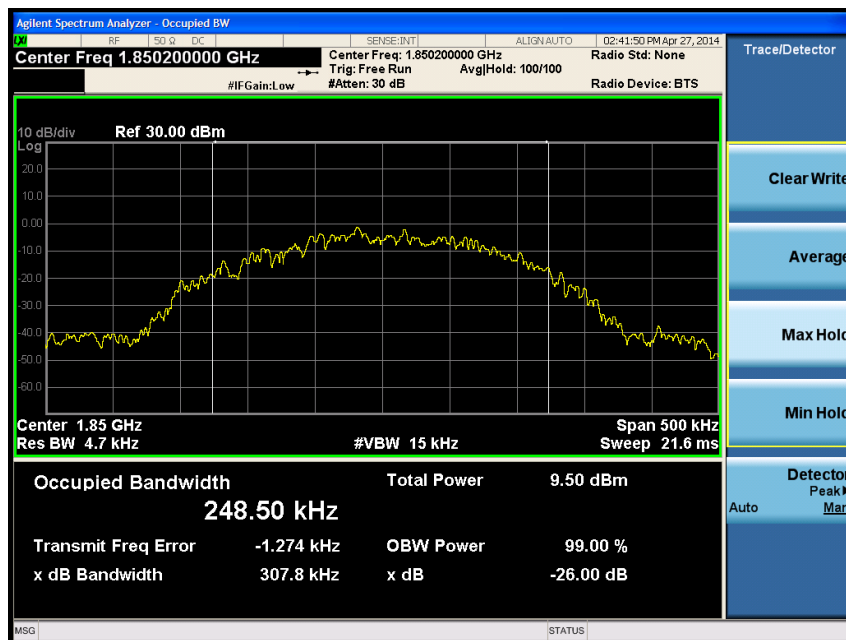
High Channel



GSM1900 EDGE

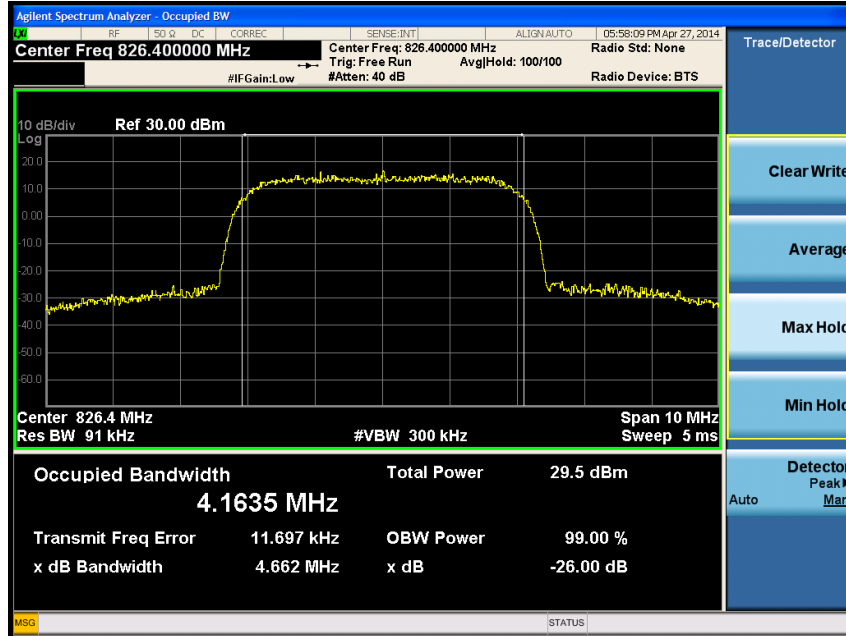
99 %

Low Channel

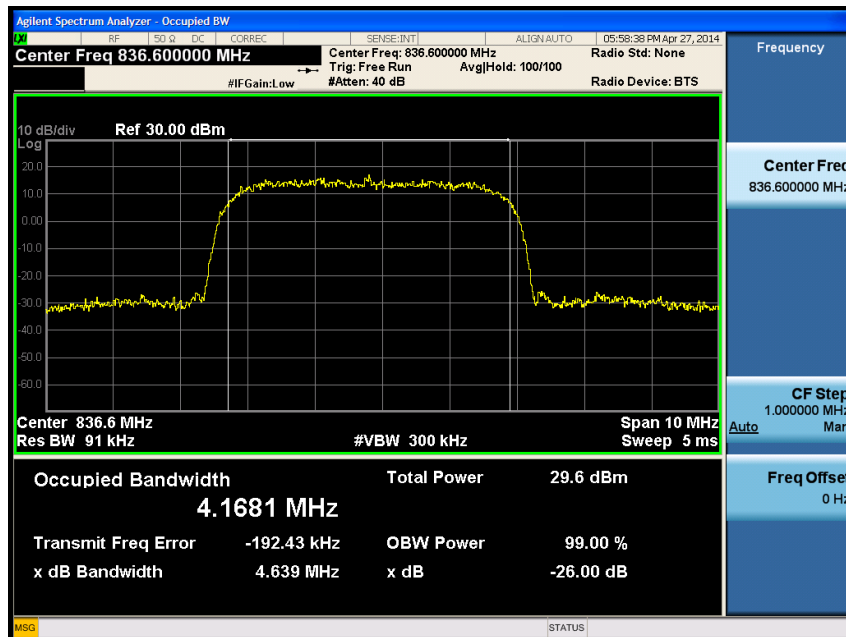


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**WCDMA850**  
99 %  
Low Channel

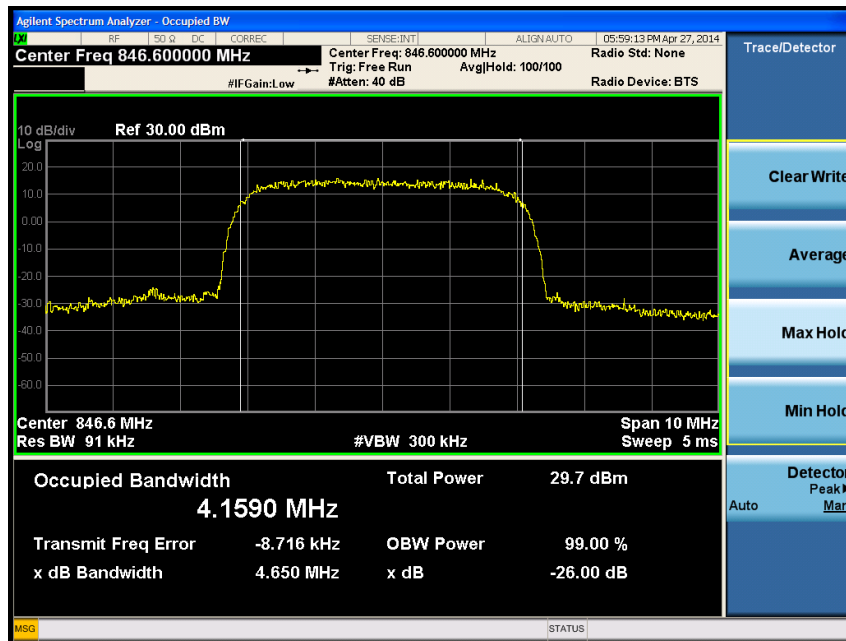


Middle Channel



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High Channel

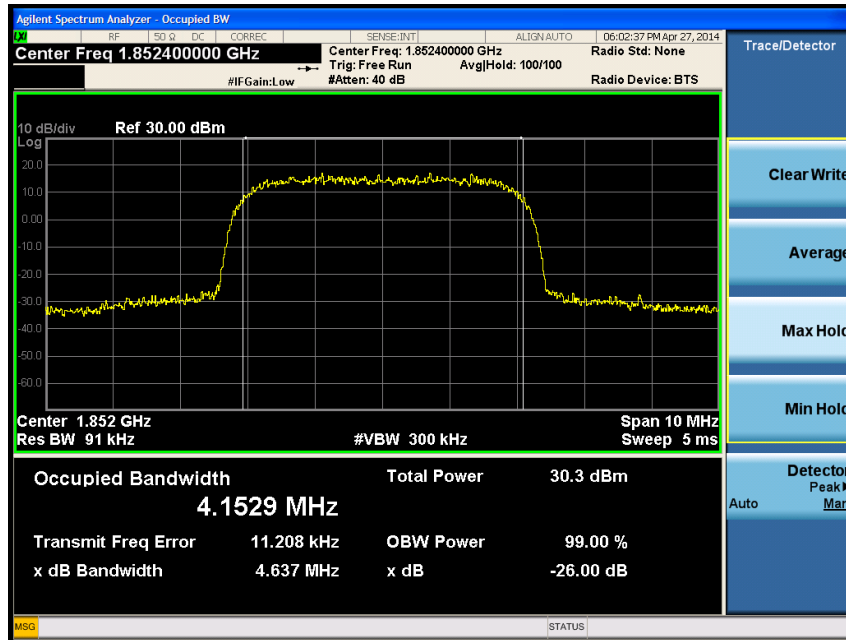


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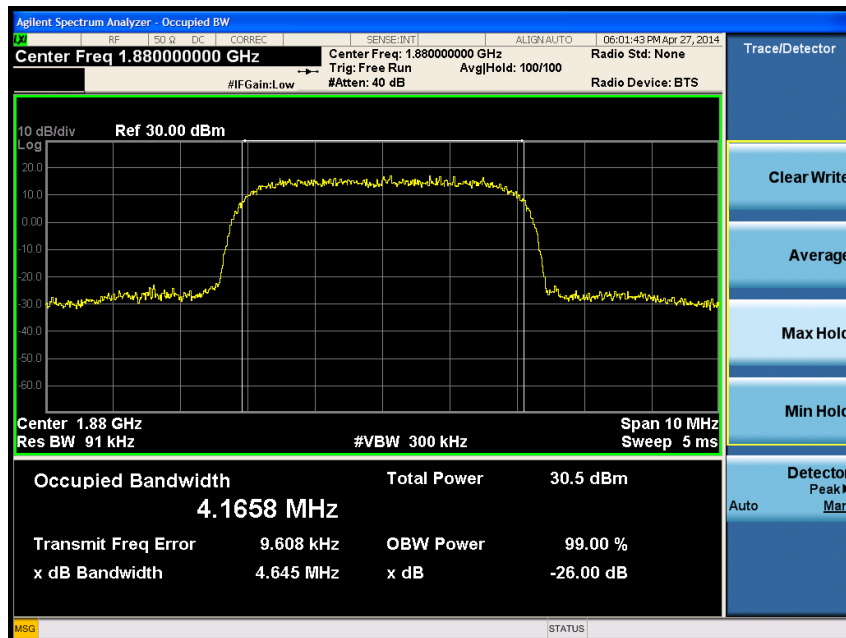
## WCDMA1900

99 %

Low Channel

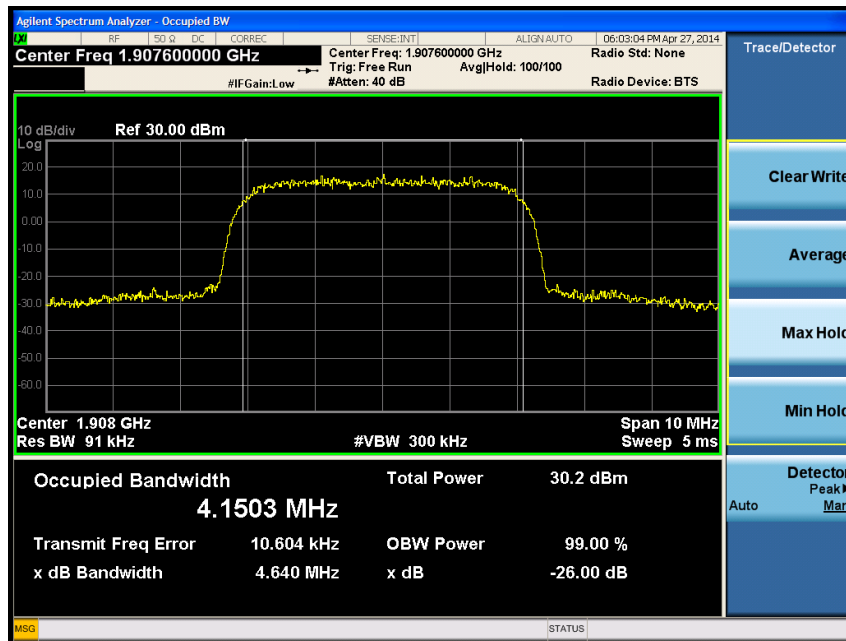


## Middle Channel



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High Channel

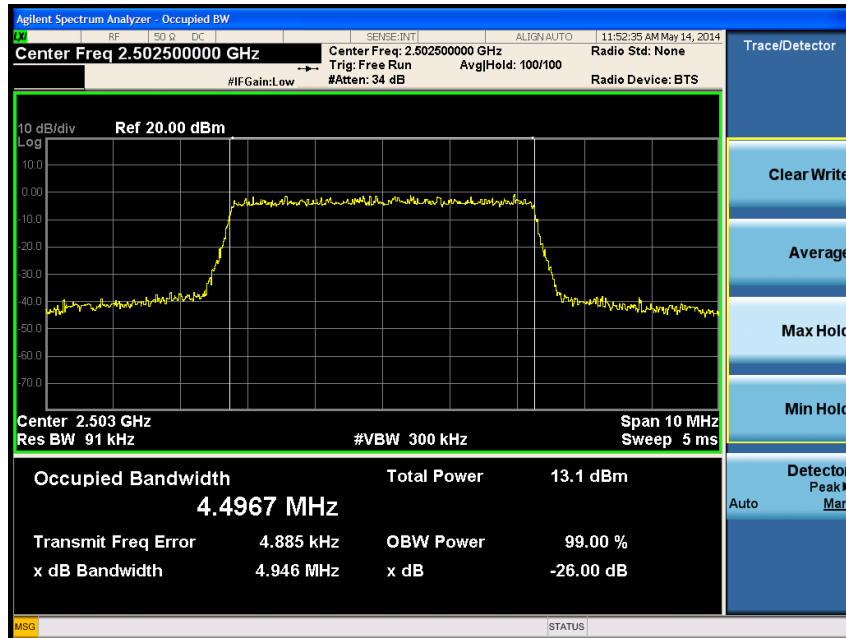


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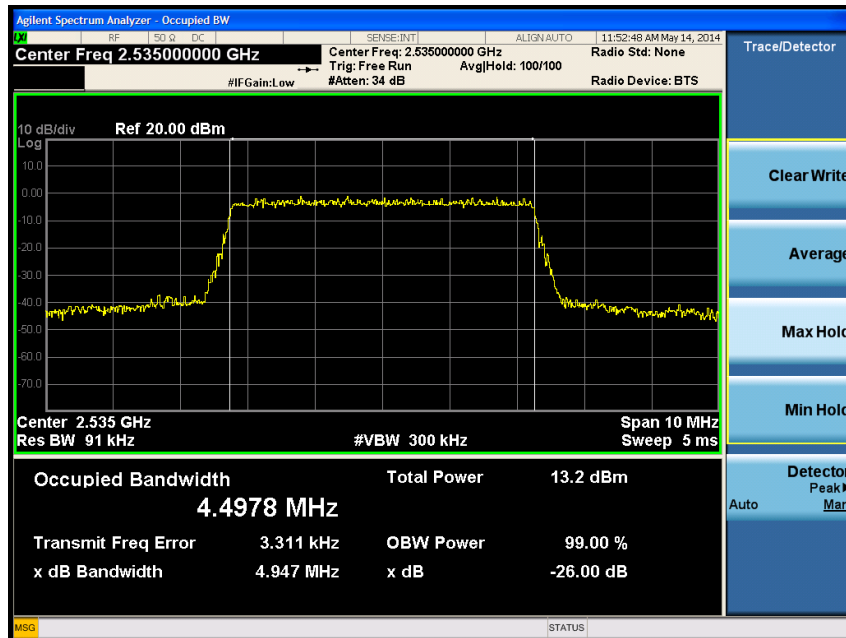
**LTE band 7 (5 MHz – QPSK\_RB 25)**

99 %

Low Channel



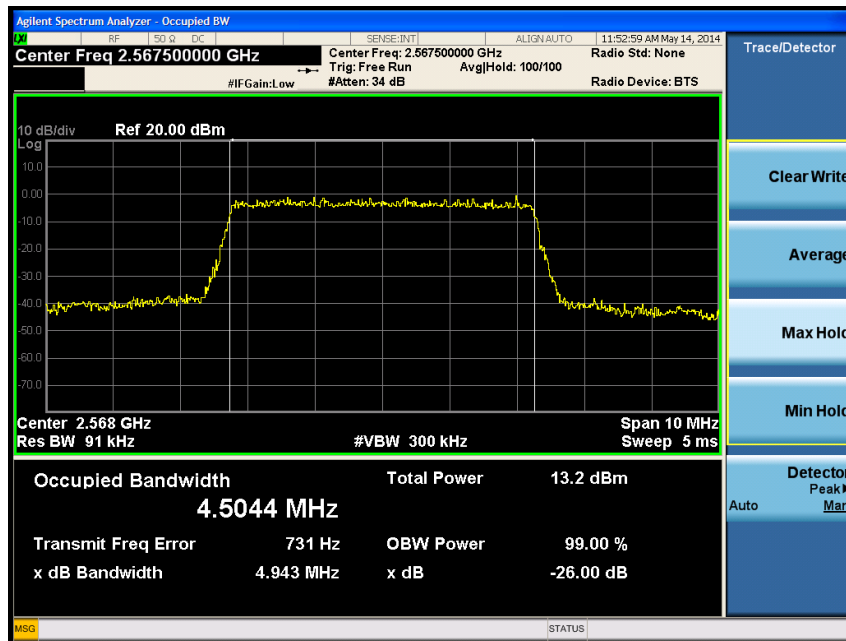
Middle Channel



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High Channel

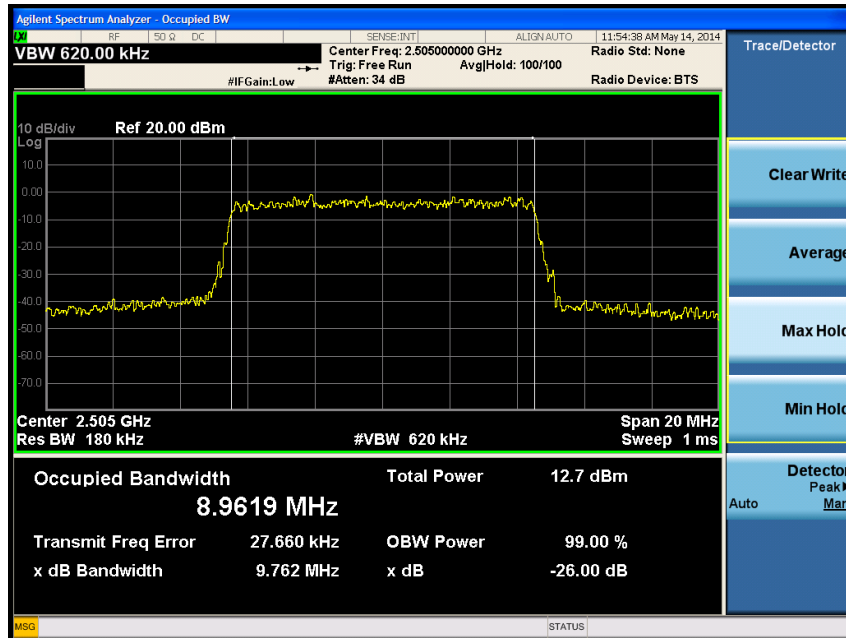


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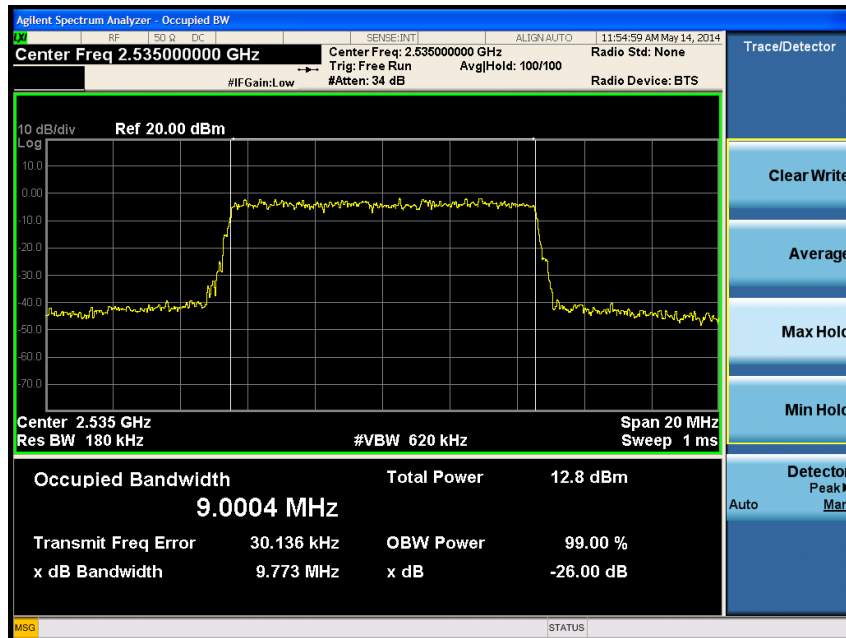
**LTE band 7 (10 MHz – QPSK\_RB 50)**

99 %

Low Channel

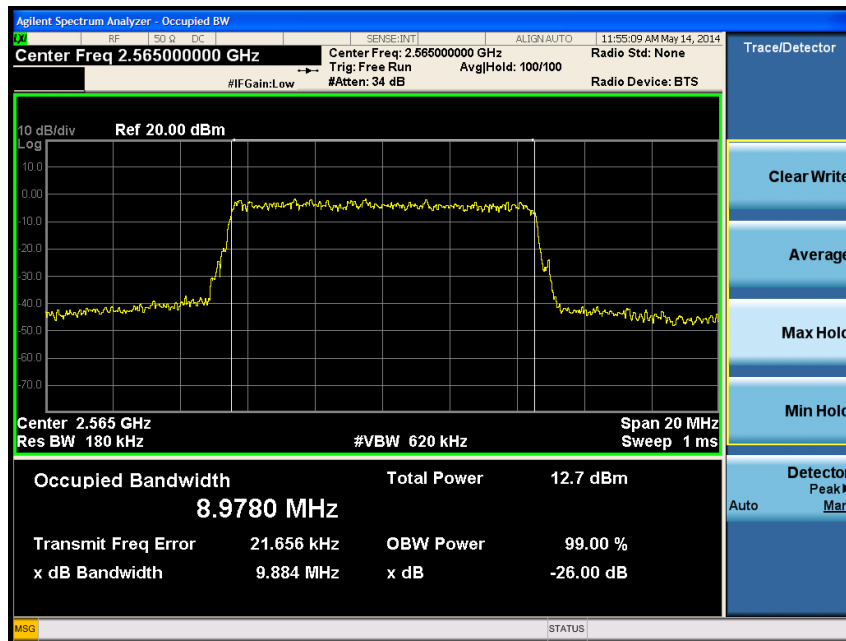


Middle Channel



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High Channel

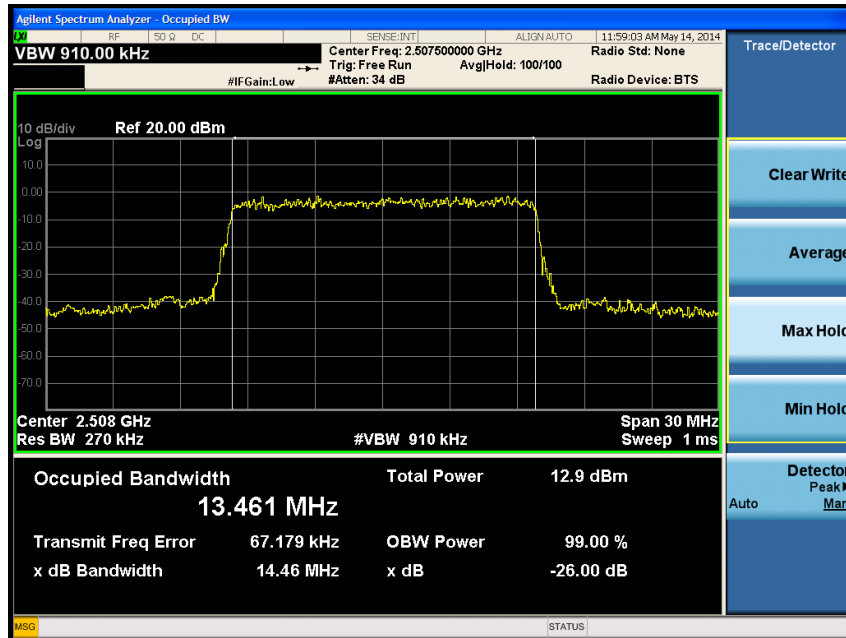


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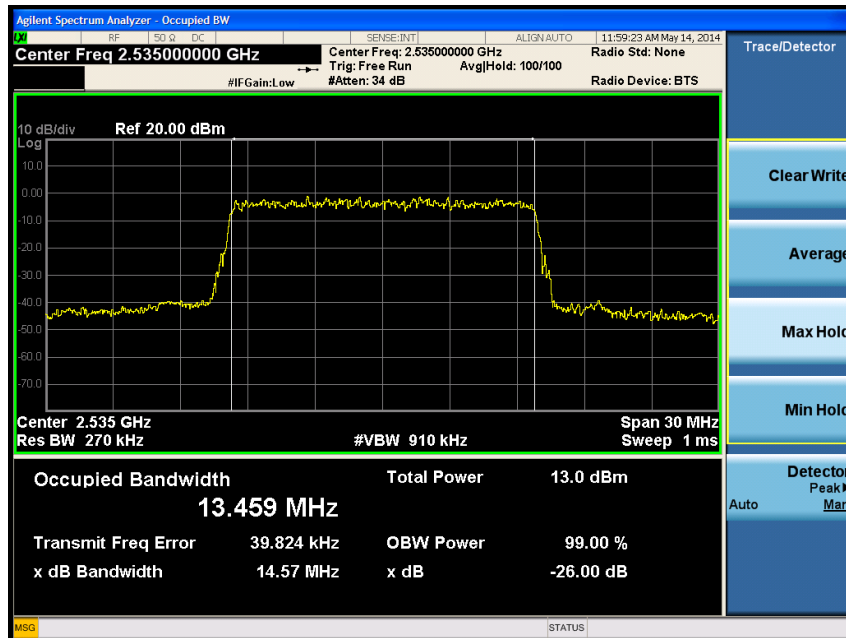
### LTE band 7 (15 MHz – QPSK\_RB 75)

99 %

Low Channel

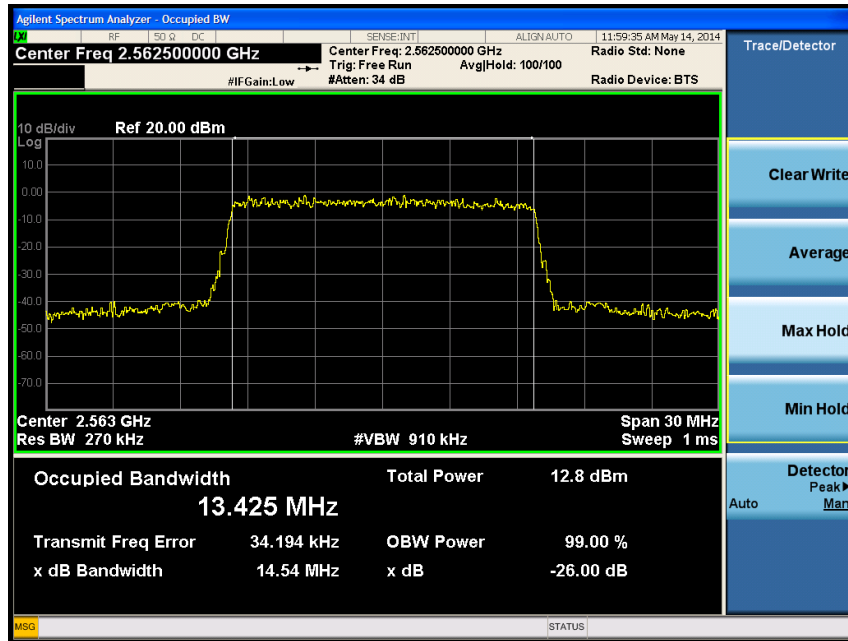


Middle Channel



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High Channel

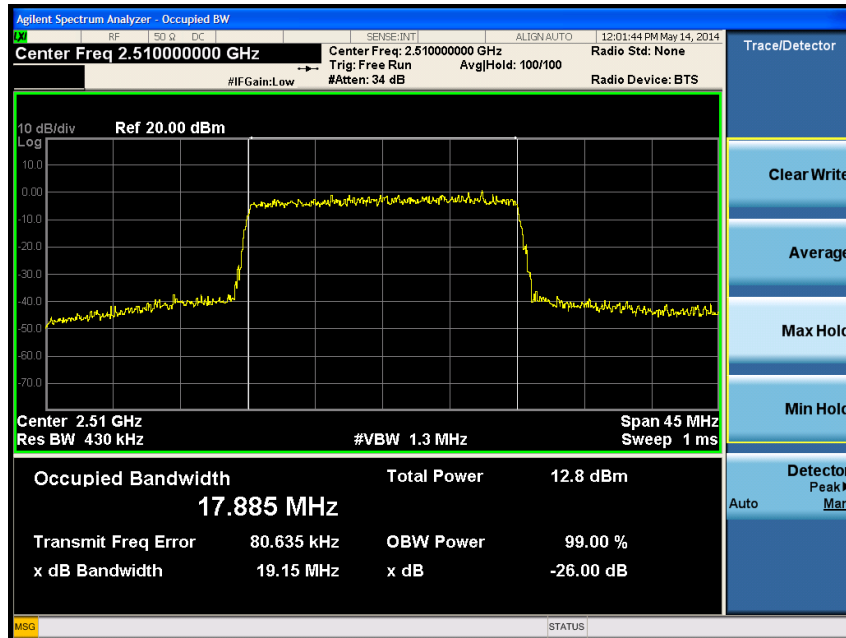


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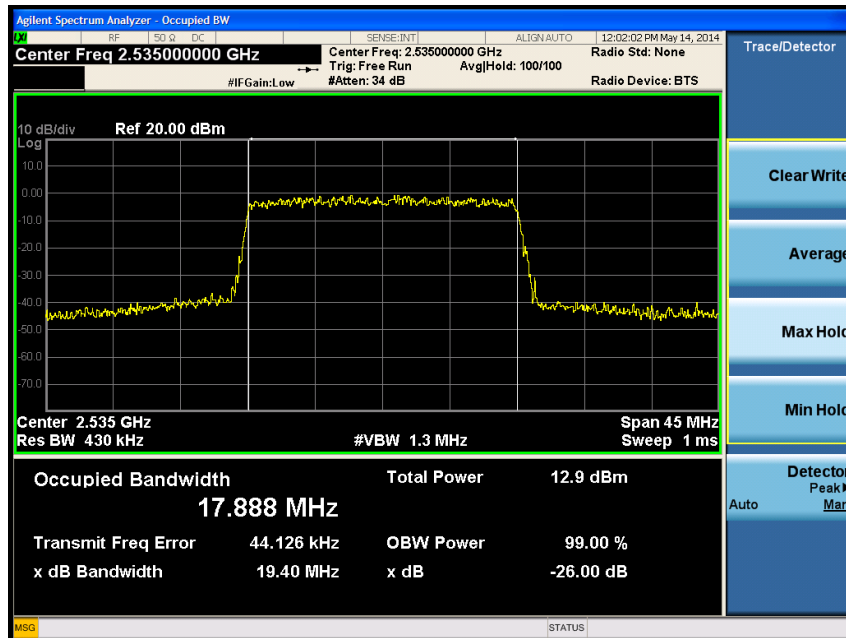
**LTE band 7 (20 MHz – QPSK\_RB 100)**

99 %

Low Channel

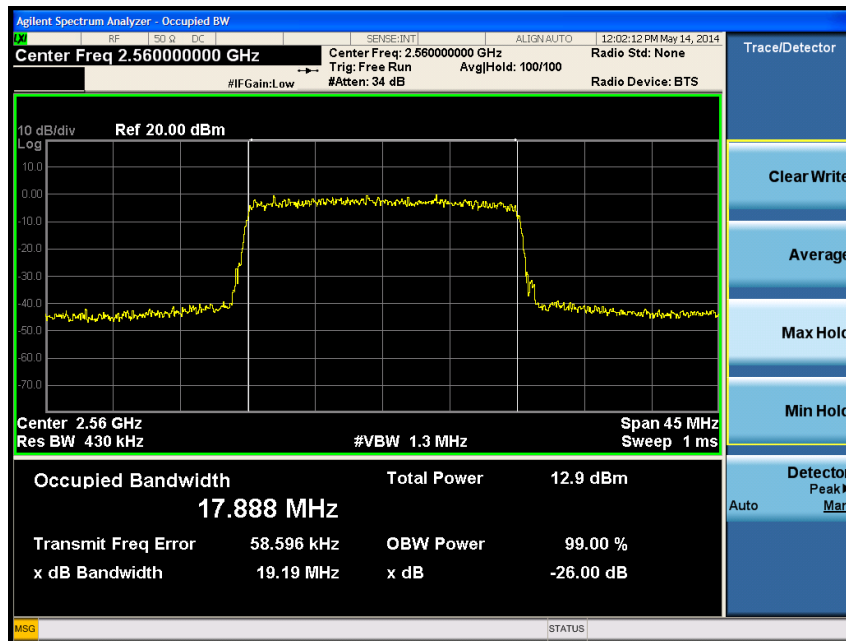


Middle Channel



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High Channel

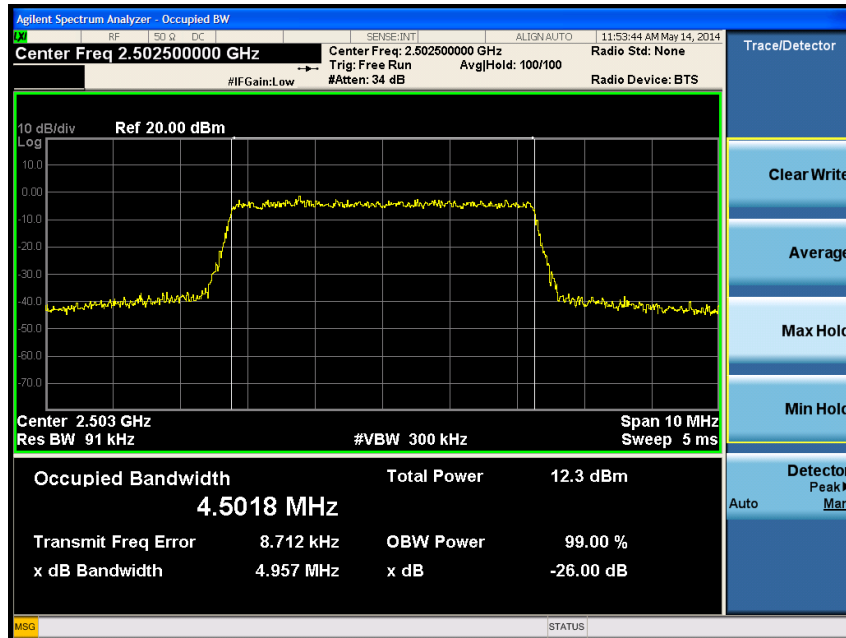


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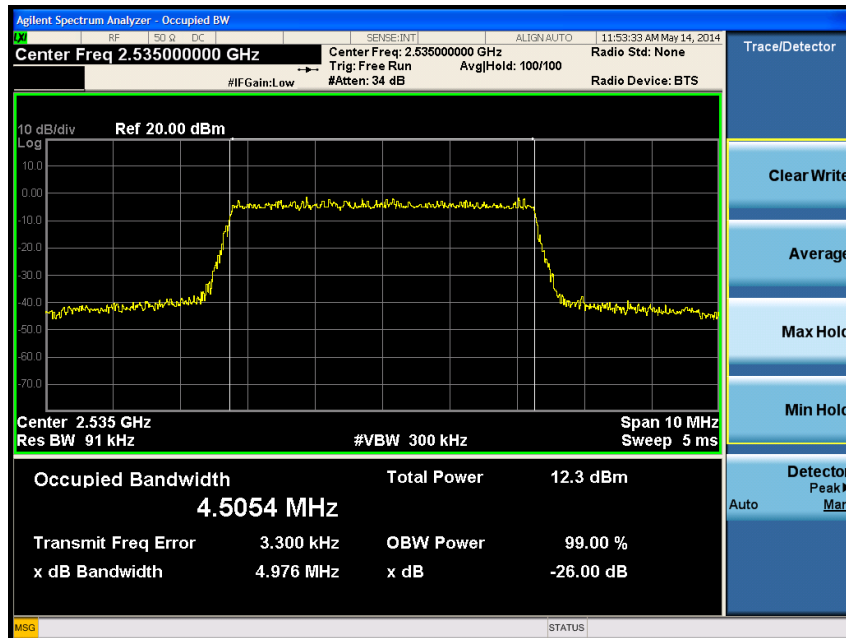
**LTE band 7 (5 MHz – 16QAM\_RB 25)**

99 %

Low Channel



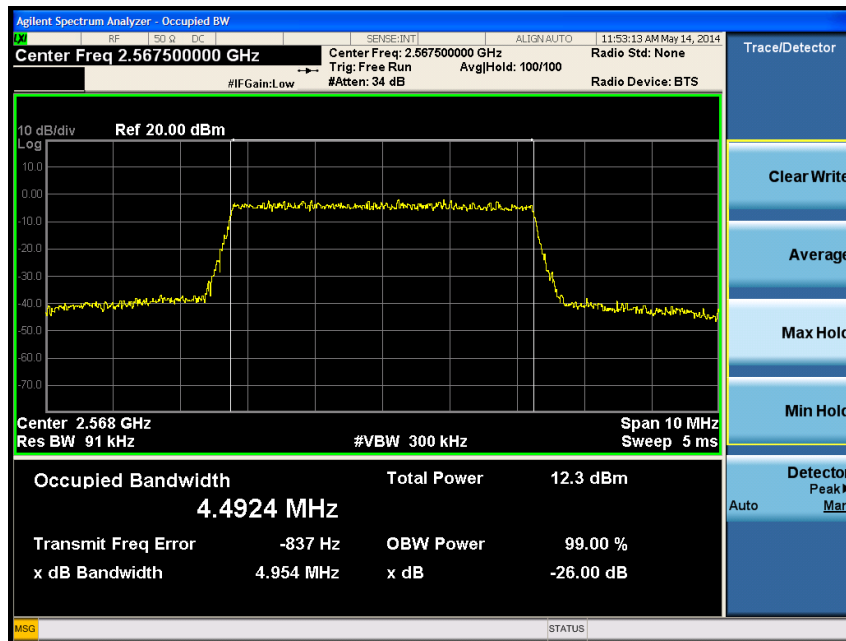
Middle Channel



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High Channel

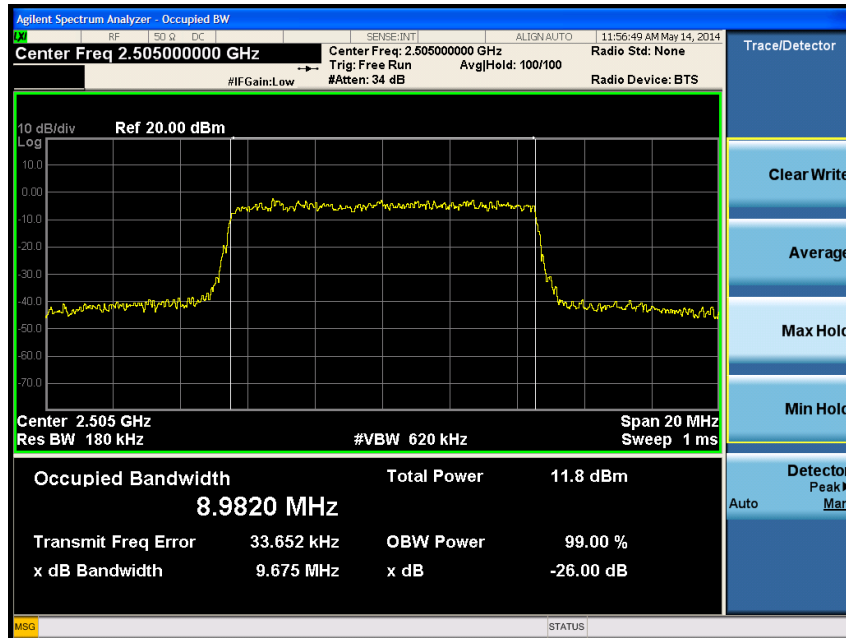


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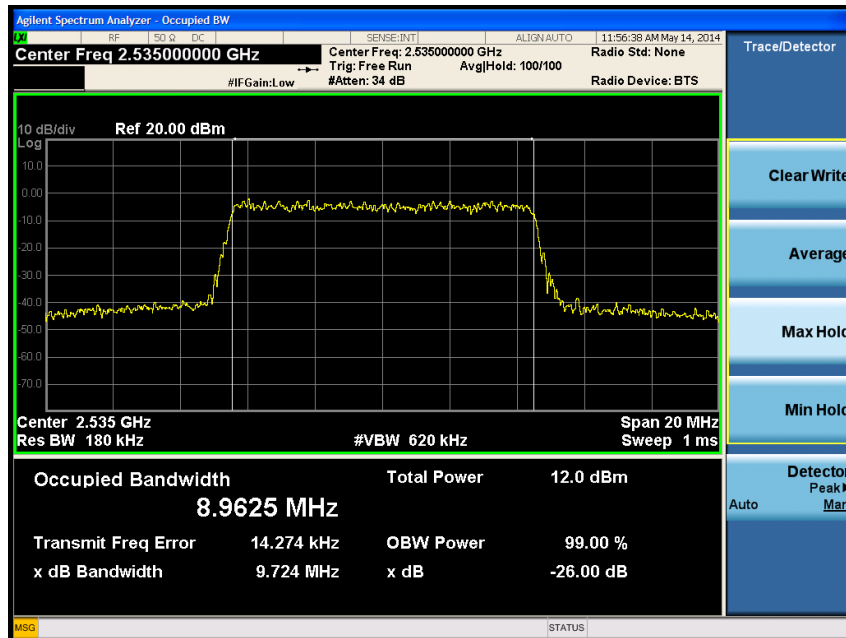
**LTE band 7 (10 MHz – 16QAM\_RB 50)**

99 %

Low Channel

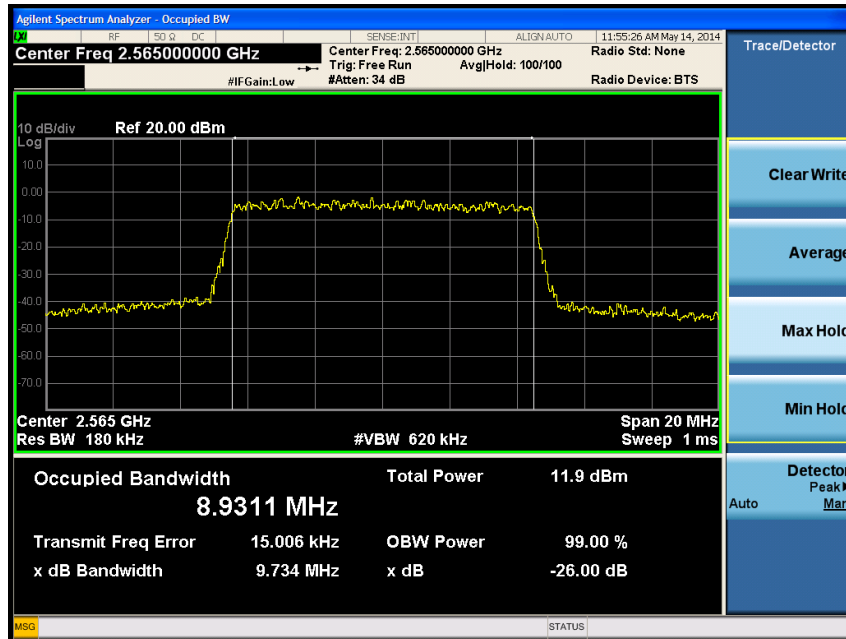


Middle Channel



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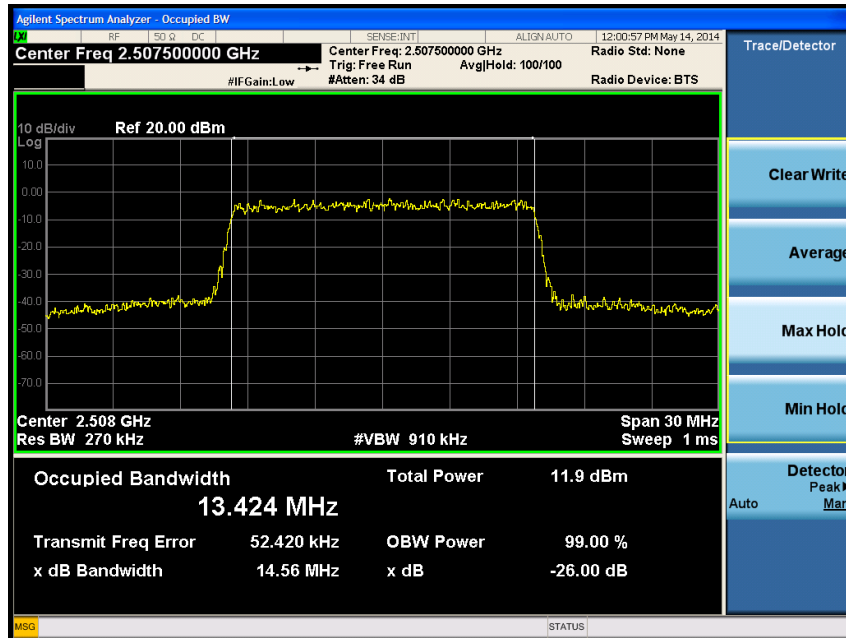
High Channel



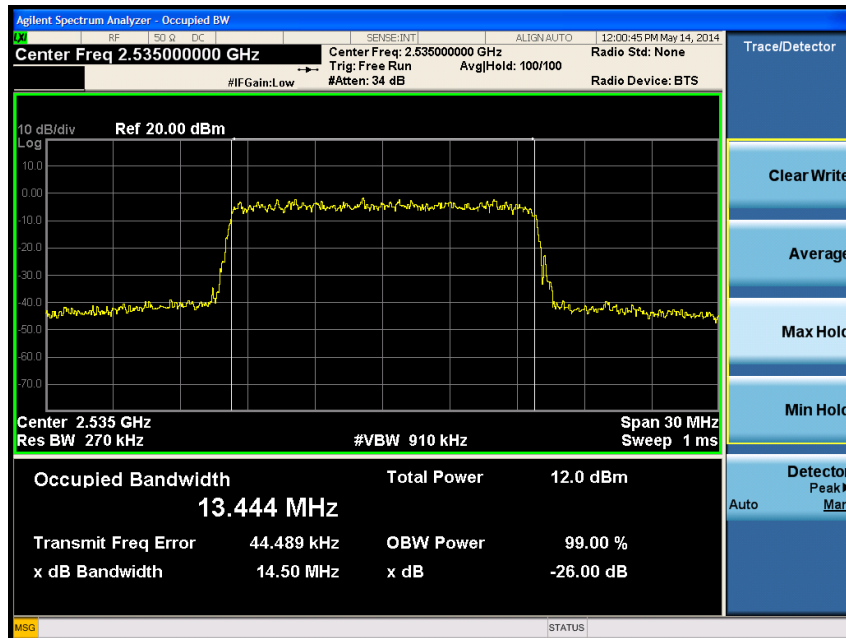
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**LTE band 7 (15 MHz – 16QAM\_RB 75)**

99 %  
Low Channel

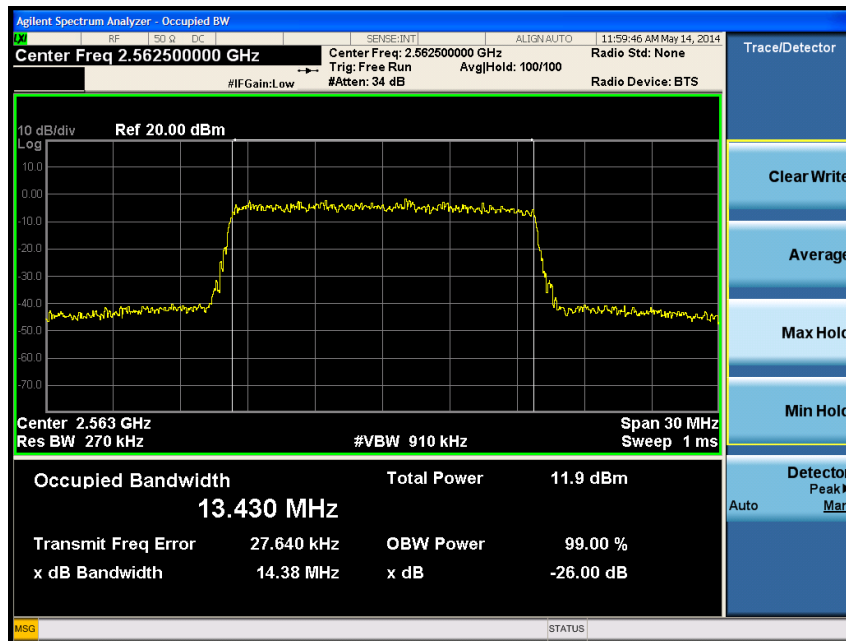


Middle Channel



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High Channel

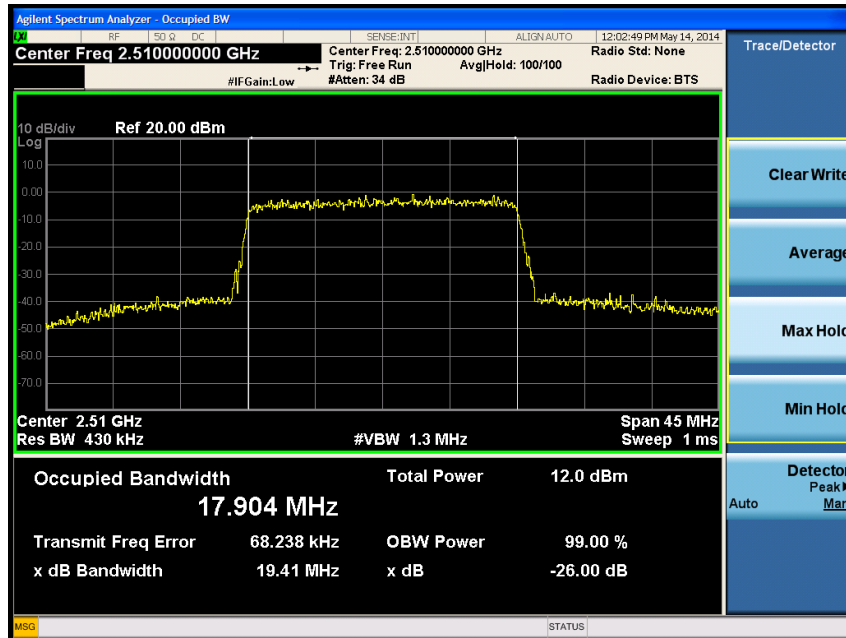


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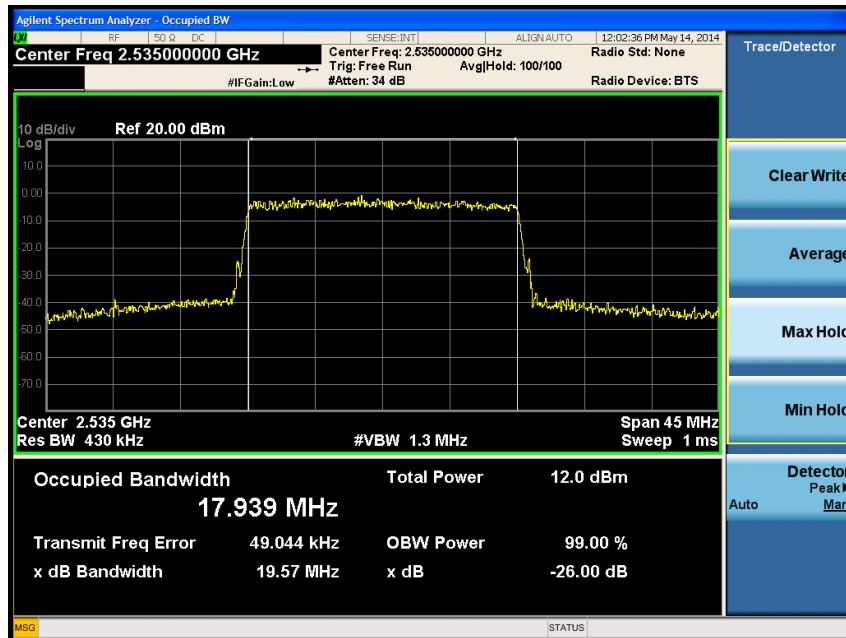
**LTE band 7 (20 MHz – 16QAM\_RB 100)**

99 %

Low Channel

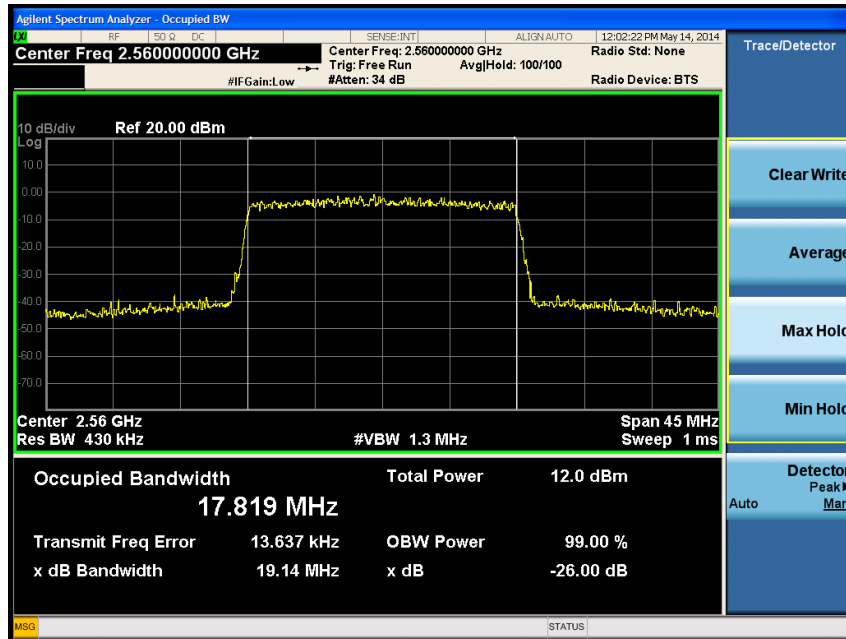


Middle Channel



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High Channel



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