FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E

TEST REPORT

For

4G/LTE Outdoor Router

Trade Name: Billion , BEC

Model: BiPAC 6200ZUL-R6, BEC 6800RUL-R6

Issued to

Billion Electric Co., Ltd.
8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Issued by

Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
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Issued Date: June 13, 2014

Testing Laboratory
1309

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Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		June 13, 2014		Initial Issue	ALL	Kelly Cheng

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APPENDIX 1 - PHOTOGRAPHS OF EUT

1. TEST RESULT CERTIFICATION

Applicant:	Billion Electric Co., Ltd. 8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)
Manufacturer:	Billion Electric Co., Ltd. 8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)
Equipment Under Test:	4G/LTE Outdoor Router
Trade Name:	Billion , BEC
Model Number:	BiPAC 6200ZUL-R6, BEC 6800RUL-R6
Date of Test:	May 6, 2014

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rule FCC PART 22 Subpart H and PART 24 Subpart E.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Miller Lee
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Angel Cheng
Section Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	4G/LTE Outdoor Router	
Trade Name	Billion , BEC	
Model Number	BiPAC 6200ZUL-R6, BEC 6800RUL-R6	
Model Discrepancy	All the specification and layout are identical except they come with different model numbers for marketing purposes.	
Received Date	May 19, 2014	
Power Supply	Powered form PoE. Model: PSE803 I/P: AC 100~240V, 50/60Hz O/P: DC 48V, 15.4W	
Frequency Range	LTE Band 2 Channel Bandwidth: 5MHz	1852.5MHz ~1907.5MHz
	LTE Band 2 Channel Bandwidth: 10MHz	1855MHz ~1905MHz
	LTE Band 2 Channel Bandwidth: 20MHz	1860MHz ~1900MHz
Modulation Technique	LTE Band 2	QPSK, 16QAM
Maximum ERP Power	LTE Band 2 Channel Bandwidth: 5MHz	QPSK: 31.86dBm 16QAM: 32.39dBm
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 30.40dBm 16QAM: 31.02dBm
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 29.64dBm 16QAM: 30.10dBm
Category	LTE: 3	
Antenna Specification	LTE Band 2: Patch Antenna / Gain: 7dBi	

Remark: *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures document on chapter 13 of ANSI C63.4: 2009, TIA/EIA-603-C: 2004 and FCC CFR 47, Part 2 and Part 22 Subpart H & Part 24 Subpart E.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2009.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2009.

DESCRIPTION OF TEST MODES

The EUT (model: BiPAC 6200ZUL-R6) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

LTE Band 2: 1850MHz ~ 1910MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	5MHz		10MHz		20MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	18625	1852.5	18650	1855	18700	1860
Middle channel (M)	18900	1880	18900	1880	18900	1880
High channel (H)	19175	1907.5	19150	1905	19100	1900

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: *Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.*

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/19/2015
Power Meter	Anritsu	ML2495A	1012009	06/04/2014
Power Sensor	Anritsu	MA2411A	0917072	06/04/2014

3M Semi Anechoic Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US42510268	11/05/2014
EMI Test Receiver	R&S	ESCI	100064	02/16/2015
Pre-Amplifier	Mini-Circults	ZFL-1000LN	SF350700823	01/11/2015
Bilog Antenna	Sunol Sciences	JB3	A030105	02/16/2015
Bilog Antenna	Sunol Sciences	JB3	A030205	10/01/2014
Horn Antenna	EMCO	3117	00055165	02/16/2015
Horn Antenna	EMCO	3117	00055167	01/27/2015
Horn Antenna	EMCO	3116	26370	01/06/2015
Loop Antenna	EMCO	6502	8905/2356	06/12/2014
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/21/2014
Test S/W	EZ-EMC (CCS-3A1RE)			

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

***Remark**: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.*

5. FACILITIES AND ACCREDITATIONS

5.1FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4: 2009 and CISPR Publication 22.

5.2EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.

5.4TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12,2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method –47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	IC 2324G-1 IC 2324G-2

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

Remark:

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

7. FCC PART 22 & 24 REQUIREMENTS

7.1 OUTPUT POWER MEASUREMENT

LIMITS

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz

band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 698–746 MHz band are limited

to 3 watts ERP

TEST PROCEDURES

EIRP / ERP MEASUREMENT:

1. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 10MHz for LTE.
2. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
3. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn
4. E.R.P = E.I.R.P- 2.15 dB

CONDUCTED POWER MEASUREMENT:

1. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
2. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

TEST RESULTS

LTE Band 2

Channel Bandwidth: 5MHz

Frequency (MHz)		CH	Peak Power (dBm)
QPSK 1 RB ALLOCATED AT THE LOWER EDGE	1852.50	18625	23.36
	1880.00	18900	23.34
	1907.50	19175	23.29
QPSK 1 RB ALLOCATED AT THE UPPER EDGE	1852.50	18625	23.81
	1880.00	18900	23.91
	1907.50	19175	23.38

Frequency (MHz)		CH	Peak Power (dBm)
QPSK 50% RB ALLOCATION CENTERED	1852.50	18625	23.23
	1880.00	18900	22.45
	1907.50	19175	23.82
QPSK 100% RB ALLOCATION CENTERED	1852.50	18625	22.15
	1880.00	18900	22.13
	1907.50	19175	22.19

Frequency (MHz)		CH	Peak Power (dBm)
16QAM 1 RB ALLOCATED AT THE LOWER EDGE	1852.50	18625	23.41
	1880.00	18900	23.27
	1907.50	19175	23.18
16QAM 1 RB ALLOCATED AT THE UPPER EDGE	1852.50	18625	23.67
	1880.00	18900	23.74
	1907.50	19175	23.41

Frequency (MHz)		CH	Peak Power (dBm)
16QAM 50% RB ALLOCATION CENTERED	1852.50	18625	23.25
	1880.00	18900	22.74
	1907.50	19175	23.61
16QAM 100% RB ALLOCATION CENTERED	1852.50	18625	22.23
	1880.00	18900	22.21
	1907.50	19175	22.17

Remarks:

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Attenuator.
3. The value in bold is the worst.

LTE Band 2

Channel Bandwidth: 10MHz

Frequency (MHz)		CH	Peak Power (dBm)
QPSK 1 RB ALLOCATED AT THE LOWER EDGE	1855.00	18650	23.64
	1880.00	18900	23.70
	1905.00	19150	23.65
QPSK 1 RB ALLOCATED AT THE UPPER EDGE	1855.00	18650	23.66
	1880.00	18900	23.57
	1905.00	19150	23.12

Frequency (MHz)		CH	Peak Power (dBm)
QPSK 50% RB ALLOCATION CENTERED	1855.00	18650	23.42
	1880.00	18900	22.83
	1905.00	19150	23.10
QPSK 100% RB ALLOCATION CENTERED	1855.00	18650	21.98
	1880.00	18900	21.89
	1905.00	19150	21.90

Frequency (MHz)		CH	Peak Power (dBm)
16QAM 1 RB ALLOCATED AT THE LOWER EDGE	1855.00	18650	23.51
	1880.00	18900	23.57
	1905.00	19150	23.59
16QAM 1 RB ALLOCATED AT THE UPPER EDGE	1855.00	18650	23.49
	1880.00	18900	23.51
	1905.00	19150	23.24

Frequency (MHz)		CH	Peak Power (dBm)
16QAM 50% RB ALLOCATION CENTERED	1855.00	18650	23.21
	1880.00	18900	22.97
	1905.00	19150	23.15
16QAM 100% RB ALLOCATION CENTERED	1855.00	18650	22.01
	1880.00	18900	21.97
	1905.00	19150	21.89

Remarks:

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Attenuator.
3. The value in bold is the worst.

LTE Band 2
Channel Bandwidth: 20MHz

Frequency (MHz)		CH	Peak Power (dBm)
QPSK 1 RB ALLOCATED AT THE LOWER EDGE	1860.00	18700	23.26
	1880.00	18900	23.12
	1900.00	19100	22.98
QPSK 1 RB ALLOCATED AT THE UPPER EDGE	1860.00	18700	23.13
	1880.00	18900	23.03
	1900.00	19100	23.37

Frequency (MHz)		CH	Peak Power (dBm)
QPSK 50% RB ALLOCATION CENTERED	1860.00	18700	21.93
	1880.00	18900	21.74
	1900.00	19100	21.92
QPSK 100% RB ALLOCATION CENTERED	1860.00	18700	21.97
	1880.00	18900	21.84
	1900.00	19100	21.83

Frequency (MHz)		CH	Peak Power (dBm)
16QAM 1 RB ALLOCATED AT THE LOWER EDGE	1860.00	18700	23.24
	1880.00	18900	23.19
	1900.00	19100	23.01
16QAM 1 RB ALLOCATED AT THE UPPER EDGE	1860.00	18700	23.08
	1880.00	18900	23.05
	1900.00	19100	23.17

Frequency (MHz)		CH	Peak Power (dBm)
16QAM 50% RB ALLOCATION CENTERED	1860.00	18700	22.01
	1880.00	18900	21.84
	1900.00	19100	21.81
16QAM 100% RB ALLOCATION CENTERED	1860.00	18700	21.95
	1880.00	18900	21.73
	1900.00	19100	21.88

Remarks:
1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Attenuator.
3. The value in bold is the worst.

7.2 ERP & EIRP MEASUREMENT

LIMIT

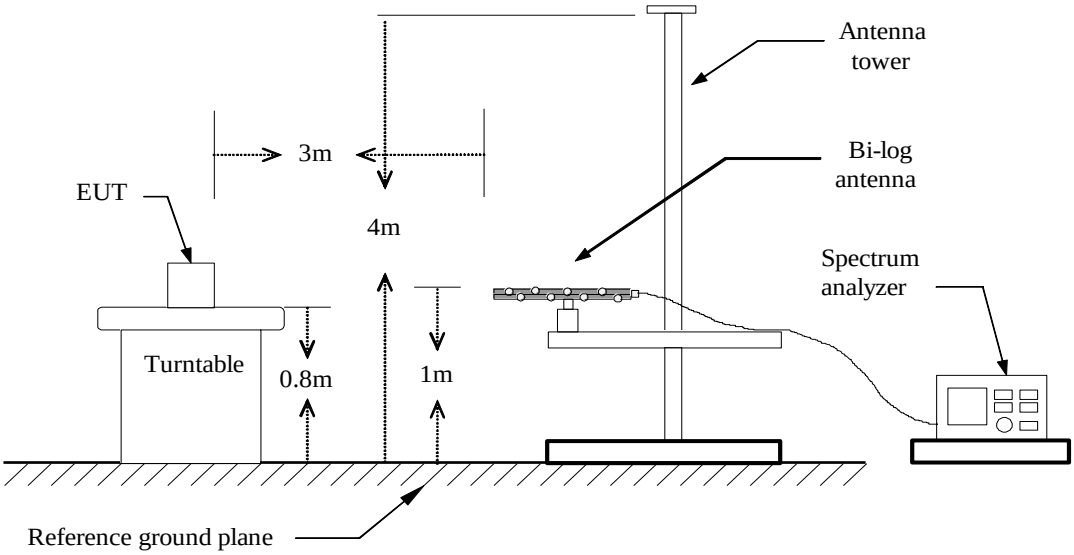
According to FCC §2.1046

FCC 22.913(b): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

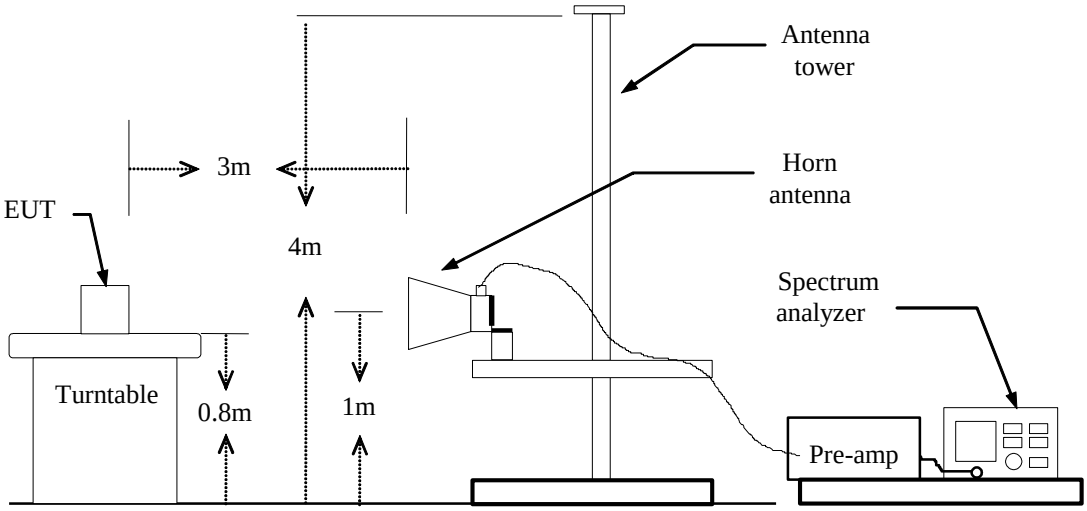
FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

Test Configuration

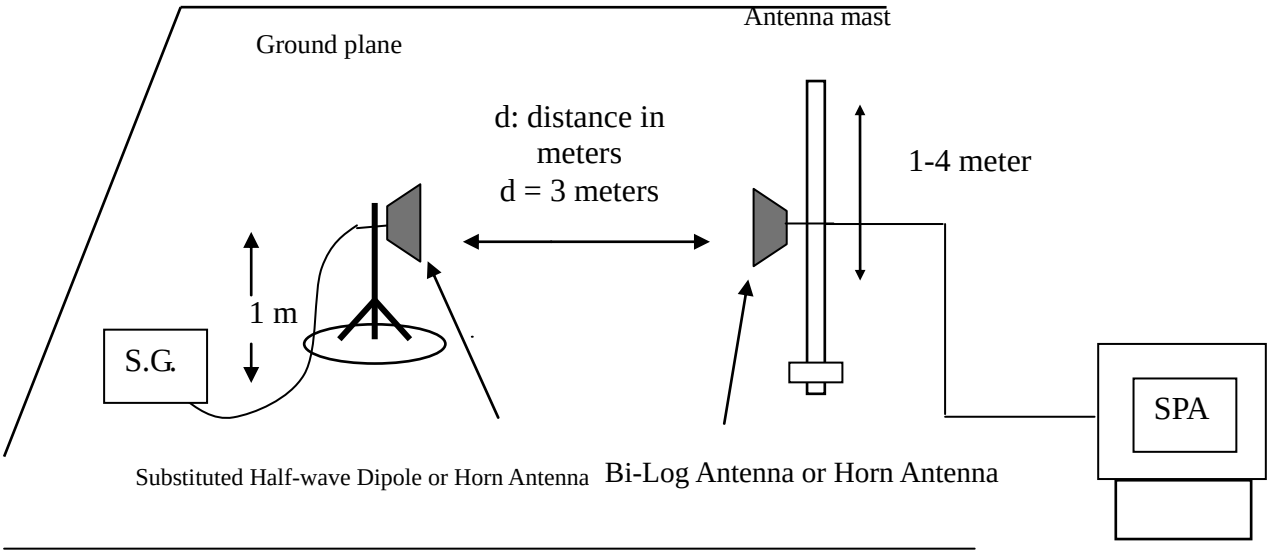
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



TEST PROCEDURE

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the resolution bandwidth was set to 5MHz and the average bandwidth was set to 50MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

ERP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)-2.15
EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

TEST RESULTS

No non-compliance noted.

LTE BAND 2

Channel Bandwidth: 5MHz / QPSK

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
18625	1853.04	V	31.33	5.38	5.66	31.61	33.00	-1.39
	1851.00	H	6.05	5.38	5.66	6.33	33.00	-26.67
18900	1878.60	V	31.54	5.42	5.61	31.73	33.00	-1.27
	1878.60	H	7.74	5.42	5.61	7.93	33.00	-25.07
19175	1905.72	V	31.77	5.47	5.56	***31.86**	33.00	-1.14
	1906.20	H	9.51	5.47	5.56	9.60	33.00	-23.40

Channel Bandwidth: 5MHz / 16QAM

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
18625	1853.76	V	31.97	5.38	5.66	32.25	33.00	-0.75
	1852.44	H	14.65	5.37	5.66	14.94	33.00	-18.06
18900	1878.84	V	32.11	5.38	5.66	***32.39**	33.00	-0.61
	1878.84	H	15.07	5.38	5.66	15.35	33.00	-17.65
19175	1906.20	V	32	5.47	5.56	32.09	33.00	-0.91
	1906.20	H	16.58	5.47	5.56	16.67	33.00	-16.33

Remark:

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = S.G Level + Gain of Substitution horn + TX cable loss.
3. The value in bold is the worst.

Channel Bandwidth: 10MHz / QPSK

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
18650	1852.08	V	29.92	5.38	5.65	30.19	33.00	-2.81
	1852.56	H	12.32	5.38	5.66	12.60	33.00	-20.40
18900	1877.40	V	30.13	5.38	5.65	***30.40**	33.00	-2.60
	1877.40	H	12.38	5.38	5.66	12.66	33.00	-20.34
19150	1907.52	V	29.94	5.45	5.58	30.07	33.00	-2.93
	1907.64	H	13.87	5.45	5.58	14.00	33.00	-19.00

Channel Bandwidth: 10MHz / 16QAM

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
18650	1852.92	V	30.74	5.38	5.66	***31.02**	33.00	-1.98
	1854.84	H	13.01	5.38	5.66	13.29	33.00	-19.71
18900	1877.40	V	30.76	5.46	5.58	30.88	33.00	-2.12
	1879.44	H	14.91	5.46	5.58	15.03	33.00	-17.97
19150	1904.64	V	30.63	5.46	5.58	30.75	33.00	-2.25
	1904.52	H	14.64	5.45	5.58	14.77	33.00	-18.23

Remark:

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = S.G Level + Gain of Substitution horn + TX cable loss.
3. The value in bold is the worst.

Channel Bandwidth: 20MHz / QPSK

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
18700	1852.68	V	28.8	5.39	5.65	29.06	33.00	-3.94
	1852.20	H	10.29	5.39	5.65	10.55	33.00	-22.45
18900	1872.96	V	29.02	5.43	5.6	29.19	33.00	-3.81
	1879.08	H	11.57	5.43	5.6	11.74	33.00	-21.26
19100	1906.32	V	29.49	5.44	5.59	***29.64**	33.00	-3.36
	1904.16	H	13.05	5.44	5.59	13.20	33.00	-19.80

Channel bandwidth: 20MHz / 16QAM

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
18700	1853.88	V	28.97	5.39	5.65	29.23	33.00	-3.77
	1852.56	H	12.28	5.39	5.65	12.54	33.00	-20.46
18900	1874.04	V	29.05	5.38	5.65	29.32	33.00	-3.68
	1879.92	H	12.07	5.39	5.65	12.33	33.00	-20.67
19100	1905.84	V	29.95	5.44	5.59	***30.10**	33.00	-2.90
	1904.64	H	13.8	5.45	5.58	13.93	33.00	-19.07

Remark:

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = S.G Level + Gain of Substitution horn + TX cable loss.
3. The value in bold is the worst.

7.3FREQUENCY STABILITY MEASUREMENT

LIMIT

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 1055(a)(1) –30℃~50℃.

TEST PROCEDURE

1. Because of the measure the carrier frequency under the condition of the AFC lock, it shall be used the mobile station in the LTE link mode. This is accomplished with the use of the communication simulator station. The oven room could control the temperatures and humidity.
2. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
3. Laptop pc is connected the external power supply to control the AC input power. The various Volts from the minimum 126.5 Volts to 93.5 Volts. Each step shall be record the frequency error rate.
4. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing.
5. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: *The frequency error was recorded frequency error from the communication simulator.*

TEST RESULTS

LTE BAND 2

Reference Frequency: LTE Band 2 1800 MHz @ 20°C								
Limit: ± 2.5 ppm = 4700Hz								
Power Supply Vdc	Environment Temperature (℃)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	20M Frequency (Hz)	Delta (Hz)	Limit (Hz)
48	50	1879999993	-11	1879999994	-11	1879999995	-10	4700
48	40	1879999995	-9	1879999995	-10	1879999998	-7	
48	30	1879999997	-7	1879999999	-6	1879999999	-6	
48	20	1880000004	0	1880000005	0	1880000005	0	
48	10	1879999996	-8	1879999995	-10	1879999995	-10	
48	0	1879999995	-9	1879999996	-9	1879999991	-14	
48	-10	1879999994	-10	1879999993	-12	1879999996	-9	
48	-20	1879999991	-13	1879999992	-13	1879999998	-7	
48	-30	1879999992	-12	1879999995	-10	1879999998	-7	

LTE BAND 2

Reference Frequency: LTE Band 2 1800 MHz @ 20°C								
Limit: ± 2.5 ppm = 4700Hz								
Power Supply Vdc	Environment Temperature (℃)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	20M Frequency (Hz)	Delta (Hz)	Limit (Hz)
52.8	20	1880000005	1	1880000006	1	1880000009	4	4700
48		1880000004	0	1880000005	0	1880000005	0	
40.8		1880000005	1	1880000008	3	1880000004	-1	

7.4OCCUPIED BANDWIDTH MEASUREMENT

LIMITS

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

TEST PROCEDURES

1. The EUT makes a phone call to the communication simulator. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels. (low, middle and high operational frequency range.)
2. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
3. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

TEST RESULTS

LTE BAND 2

CHANNEL BANDWIDTH: 5MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1712.5	4.5202
Mid	1732.5	4.5243
High	1752.5	4.5226

CHANNEL BANDWIDTH: 5MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1712.5	4.5242
Mid	1732.5	4.5192
High	1752.5	4.5365

CHANNEL BANDWIDTH: 10MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1715.0	8.9297
Mid	1732.5	8.9566
High	1750.0	8.9687

CHANNEL BANDWIDTH: 10MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1715.0	8.9461
Mid	1732.5	8.9682
High	1750.0	8.9773

CHANNEL BANDWIDTH: 20MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1715.0	17.7574
Mid	1732.5	17.9016
High	1750.0	17.8456

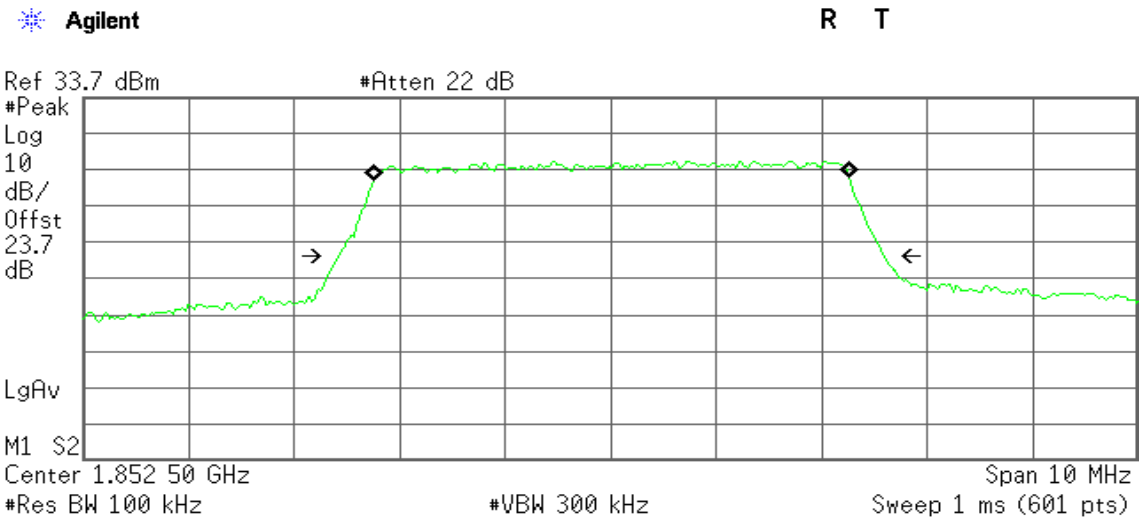
CHANNEL BANDWIDTH: 20MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1715.0	17.7420
Mid	1732.5	17.9062
High	1750.0	17.8552

LTE BAND 2

CHANNEL BANDWIDTH: 5MHZ / QPSK

CH Low

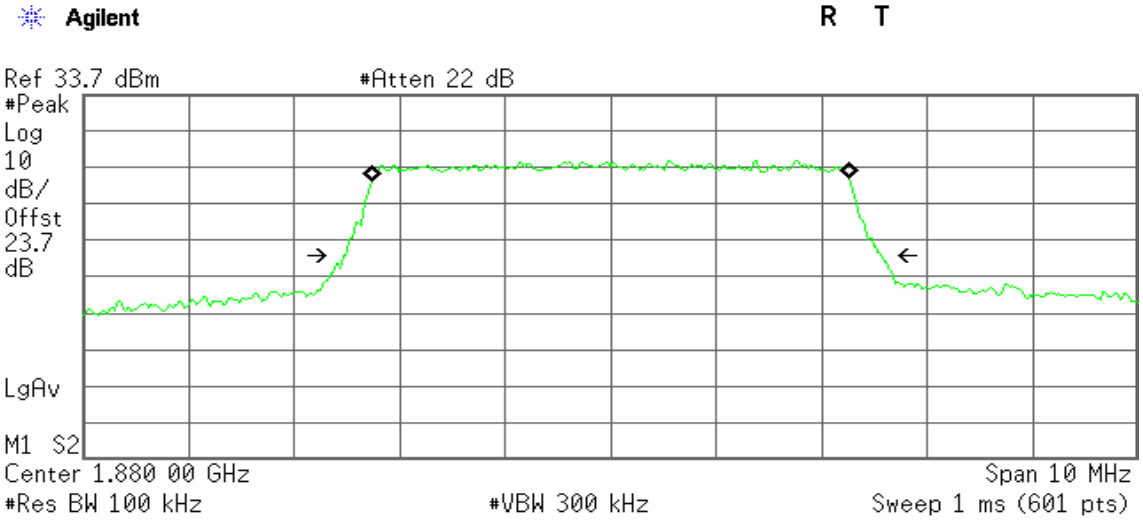


Occupied Bandwidth
4.5202 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 11.019 kHz
x dB Bandwidth 5.176 MHz

CH Mid

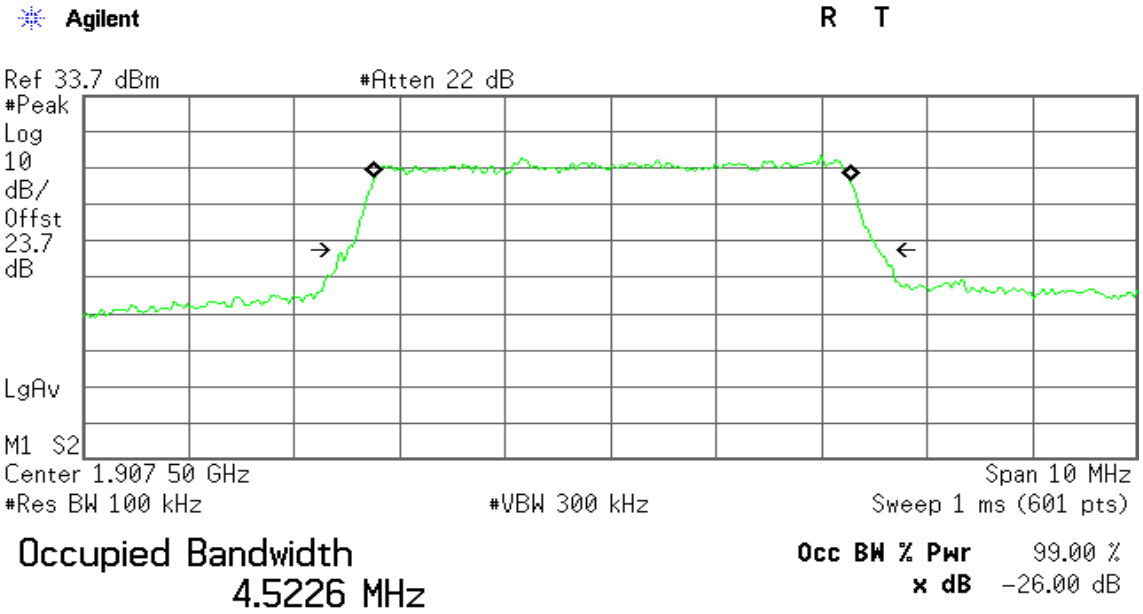


Occupied Bandwidth
4.5243 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.305 kHz
x dB Bandwidth 5.098 MHz

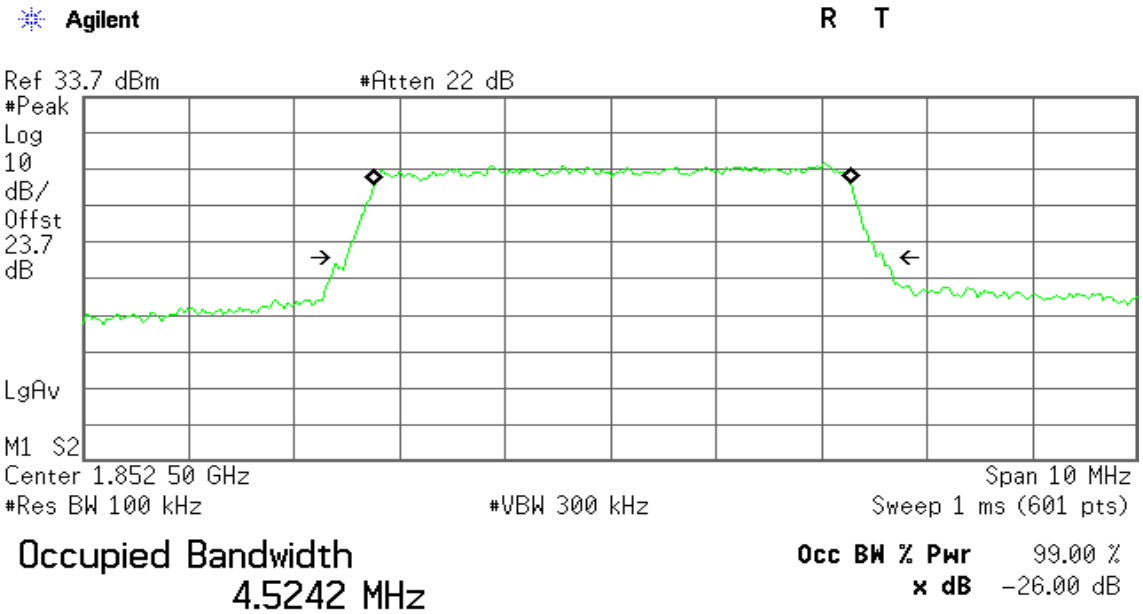
CH High



Transmit Freq Error 14.144 kHz
x dB Bandwidth 5.038 MHz

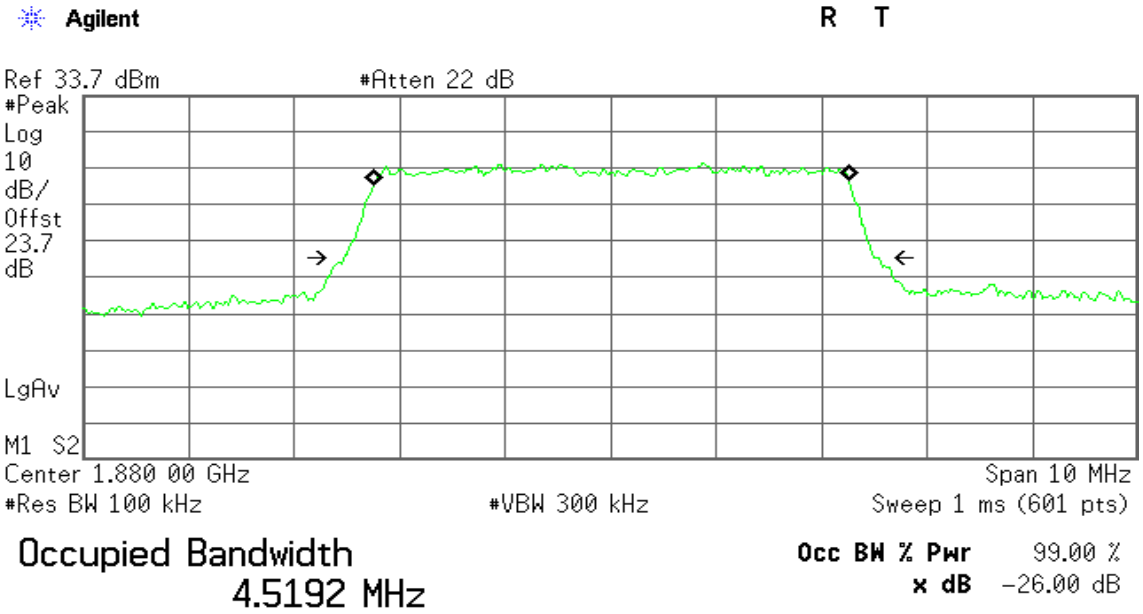
CHANNEL BANDWIDTH: 5MHZ / 16QAM

CH Low



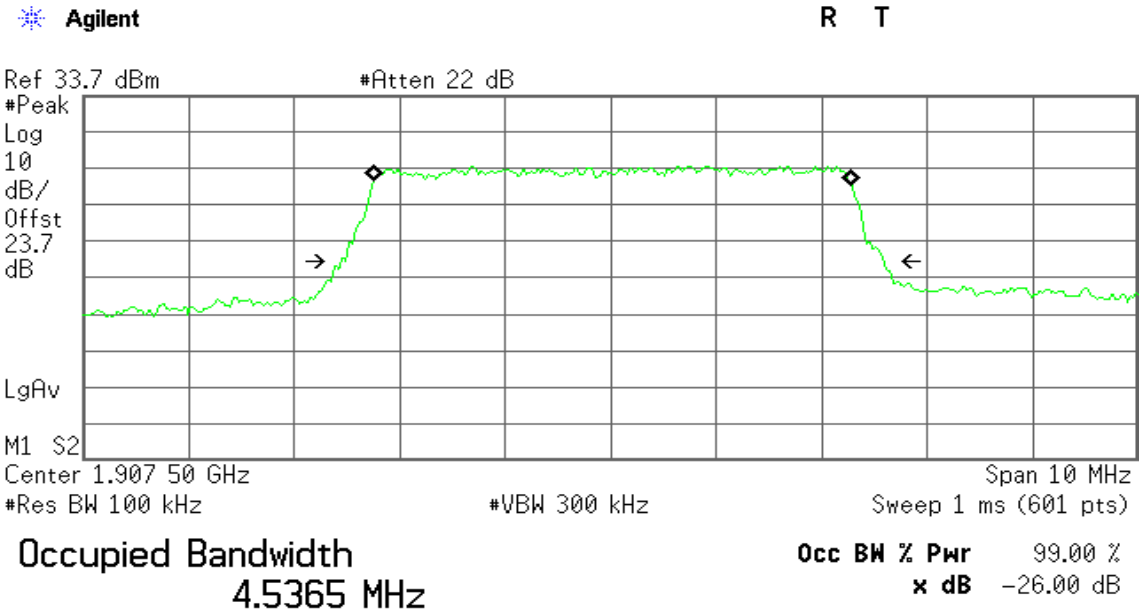
Transmit Freq Error 15.270 kHz
x dB Bandwidth 5.096 MHz

CH Mid



Transmit Freq Error 7.611 kHz
x dB Bandwidth 5.069 MHz

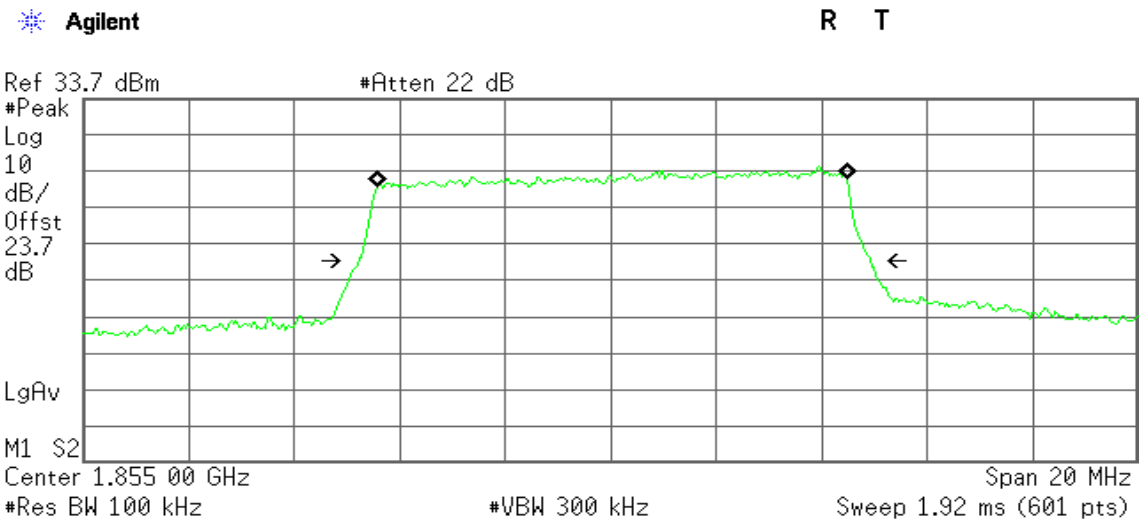
CH High



Transmit Freq Error 16.093 kHz
x dB Bandwidth 5.150 MHz

CHANNEL BANDWIDTH: 10MHZ / QPSK

CH Low

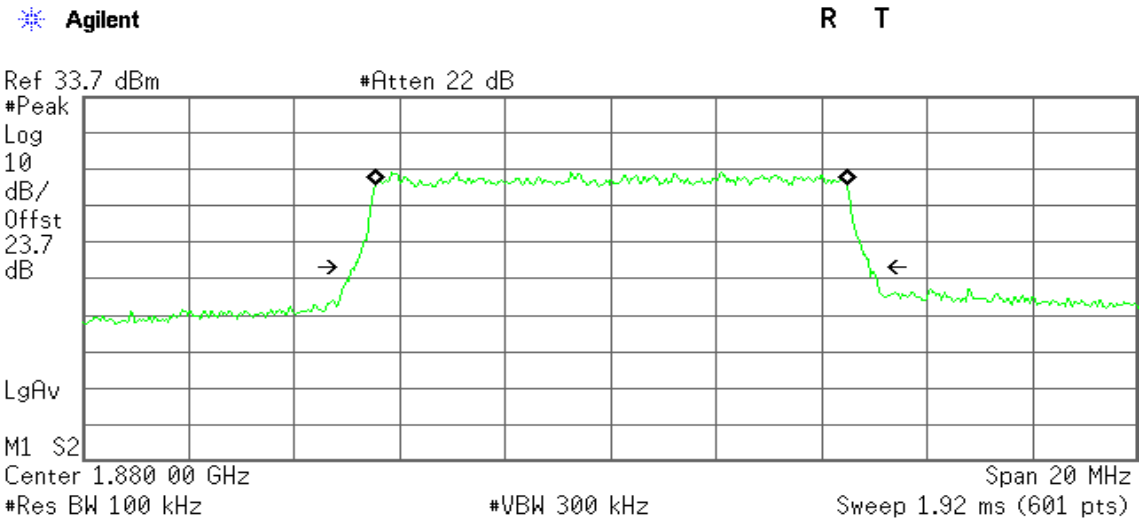


Occupied Bandwidth
8.9297 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 31.036 kHz
x dB Bandwidth 9.734 MHz

CH Mid

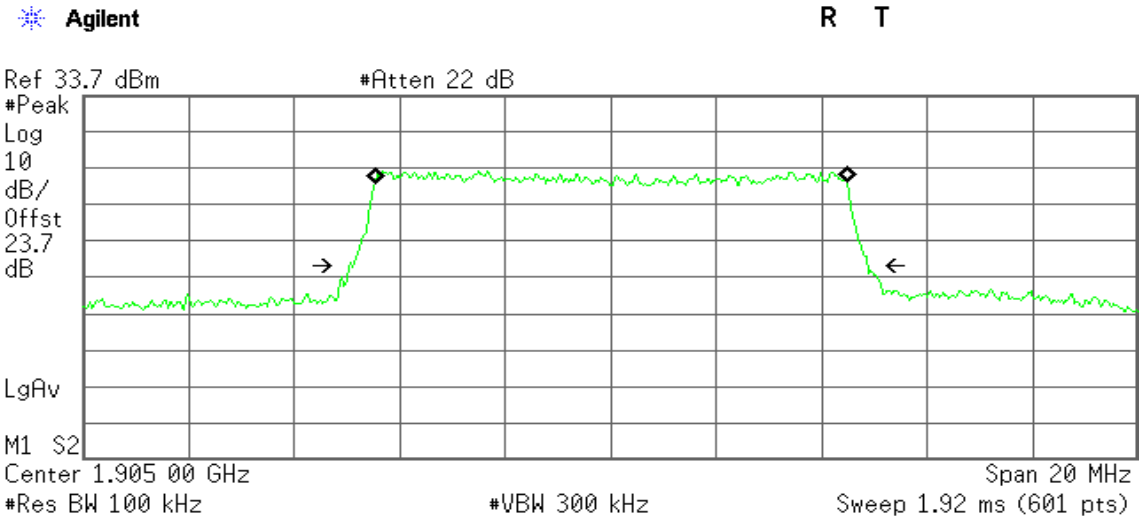


Occupied Bandwidth
8.9566 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 9.284 kHz
x dB Bandwidth 9.781 MHz

CH High



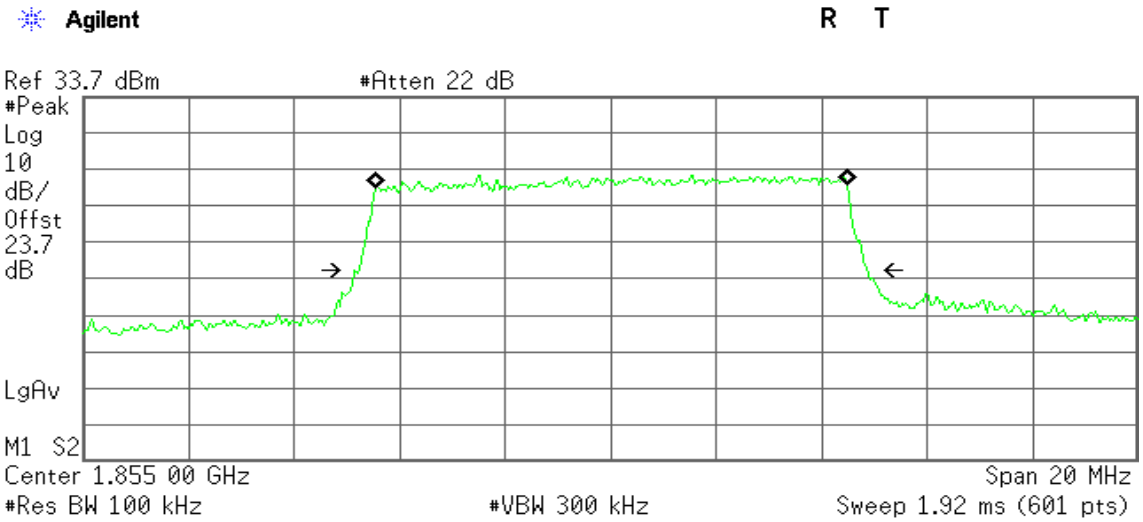
Occupied Bandwidth
8.9687 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.217 kHz
x dB Bandwidth 9.855 MHz

CHANNEL BANDWIDTH: 10MHZ / 16QAM

CH Low

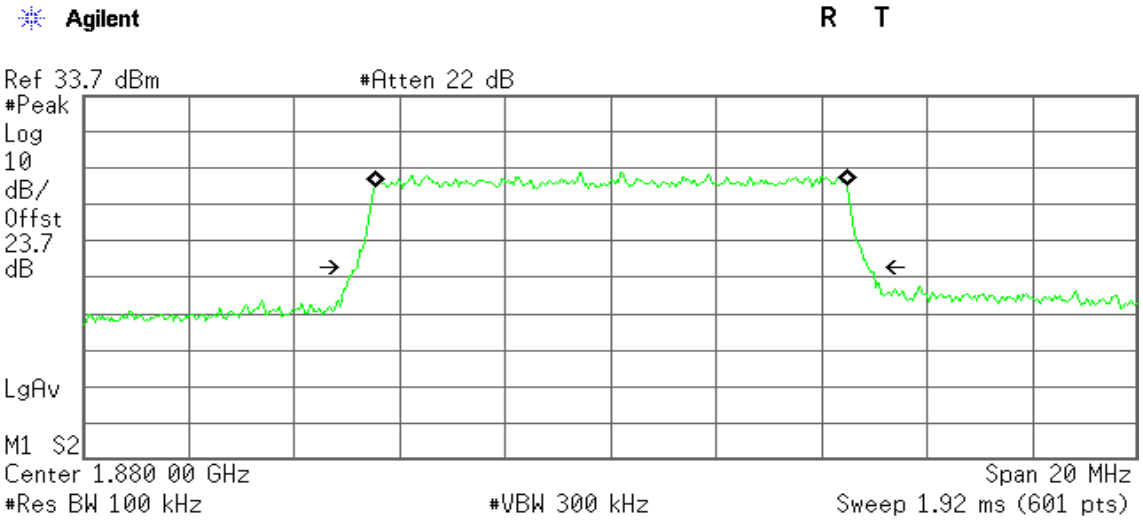


Occupied Bandwidth
8.9461 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 15.870 kHz
x dB Bandwidth 9.664 MHz

CH Mid

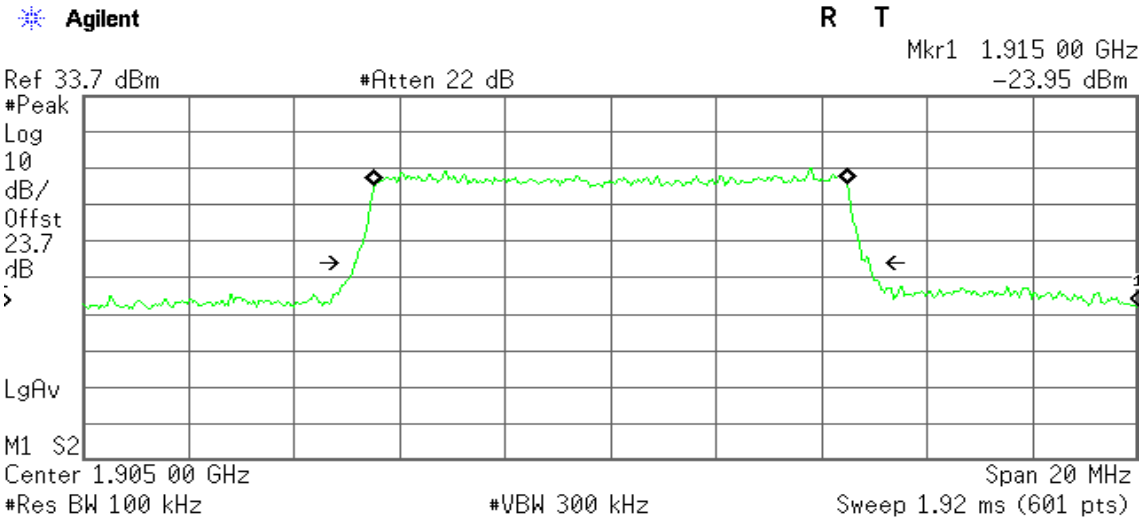


Occupied Bandwidth
8.9682 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.846 kHz
x dB Bandwidth 9.717 MHz

CH High



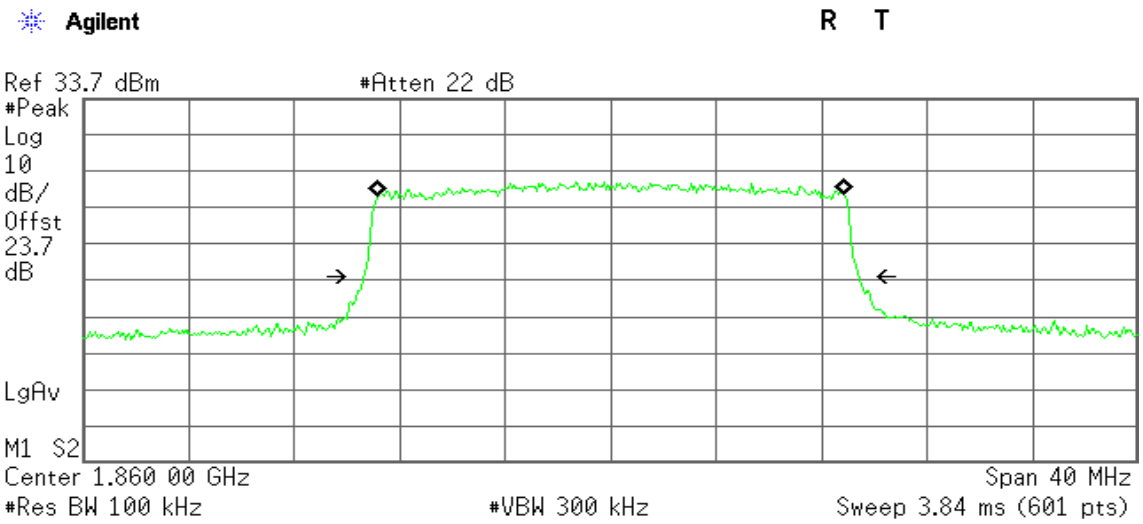
Occupied Bandwidth
8.9773 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 5.306 kHz
x dB Bandwidth 9.747 MHz

CHANNEL BANDWIDTH: 20MHZ / QPSK

CH Low

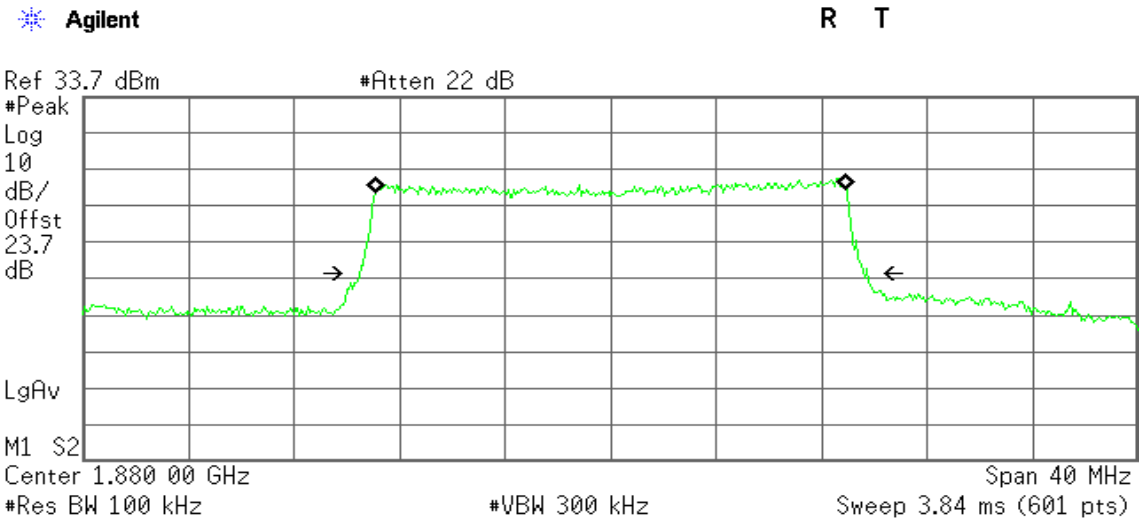


Occupied Bandwidth
17.7574 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 18.994 kHz
x dB Bandwidth 18.822 MHz

CH Mid

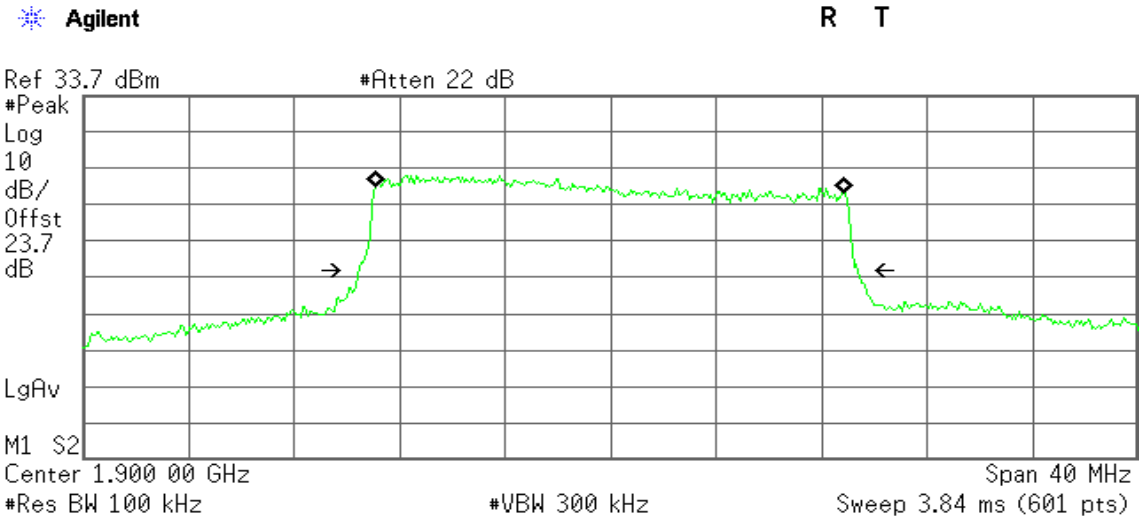


Occupied Bandwidth
17.9016 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 11.620 kHz
x dB Bandwidth 19.282 MHz

CH High



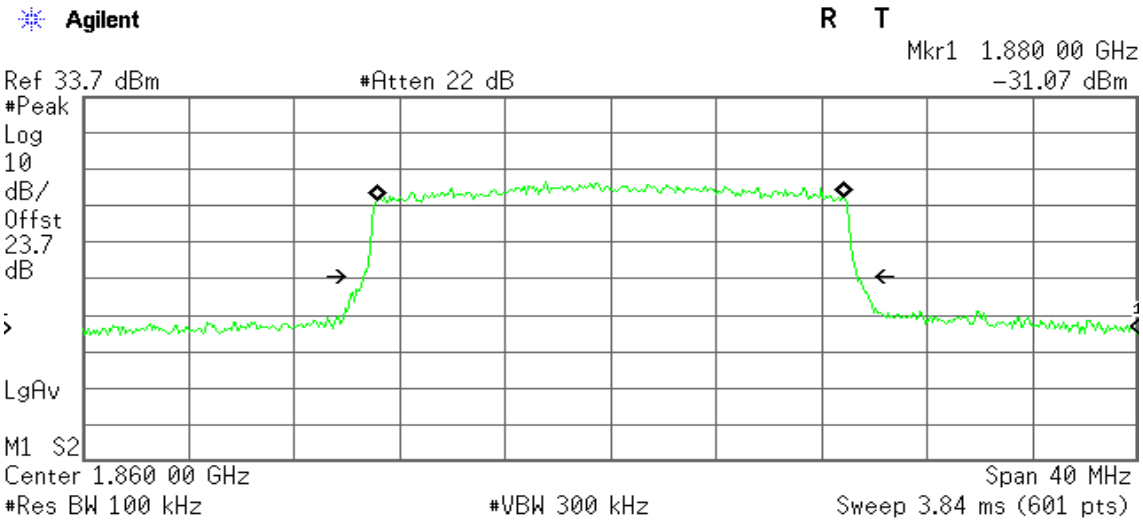
Occupied Bandwidth
17.8456 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -25.927 kHz
x dB Bandwidth 18.946 MHz

CHANNEL BANDWIDTH: 20MHZ / 16QAM

CH Low

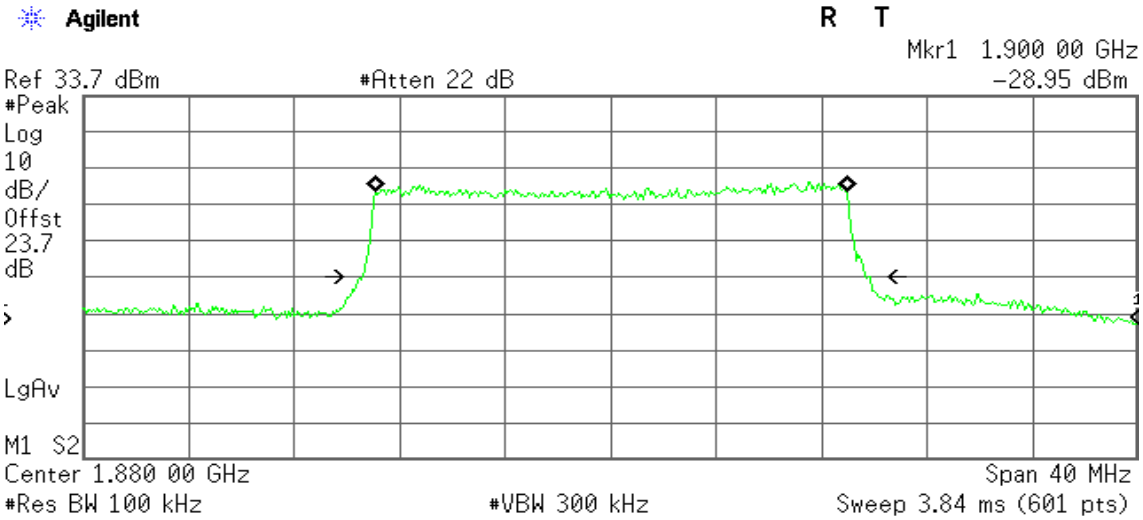


Occupied Bandwidth
17.7420 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 10.304 kHz
x dB Bandwidth 18.764 MHz

CH Mid

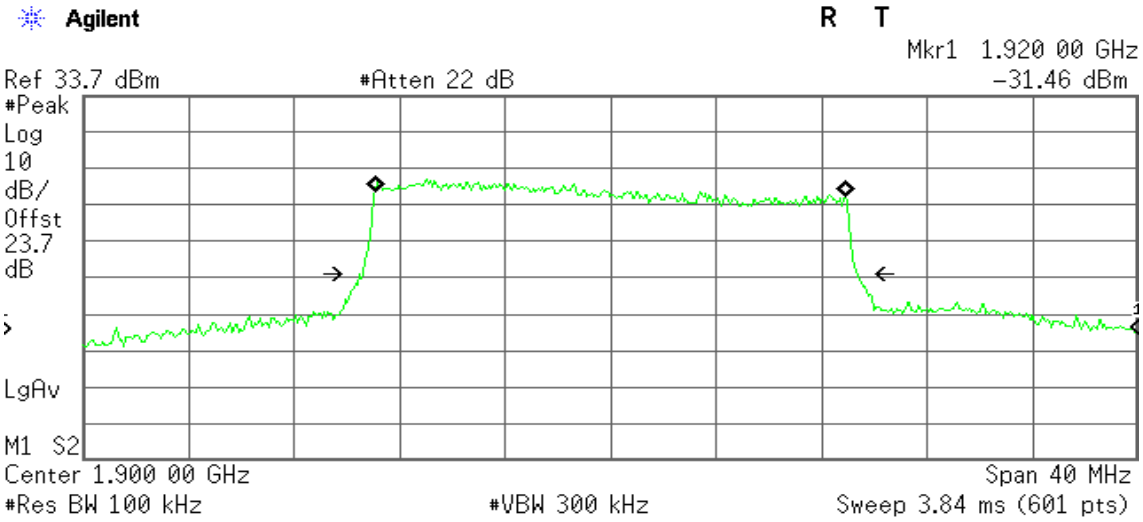


Occupied Bandwidth
17.9062 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 20.586 kHz
x dB Bandwidth 19.316 MHz

CH High



Occupied Bandwidth
17.8552 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -20.233 kHz
x dB Bandwidth 18.914 MHz

7.5PEAK TO AVERAGE RATIO

LIMIT

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.

TEST PROCEDURES

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1%.

TEST RESULTS

LTE Band 2

CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
Low	1712.5	6.62
Mid	1732.5	6.74
High	1752.5	6.66

CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
Low	1712.5	7.29
Mid	1732.5	6.99
High	1752.5	6.93

CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
Low	1715.0	4.95
Mid	1732.5	5.00
High	1750.0	5.74

CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
Low	1715.0	7.07
Mid	1732.5	6.86
High	1750.0	7.09

CHANNEL BANDWIDTH: 20MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
Low	1715.0	7.24
Mid	1732.5	7.50
High	1750.0	7.24

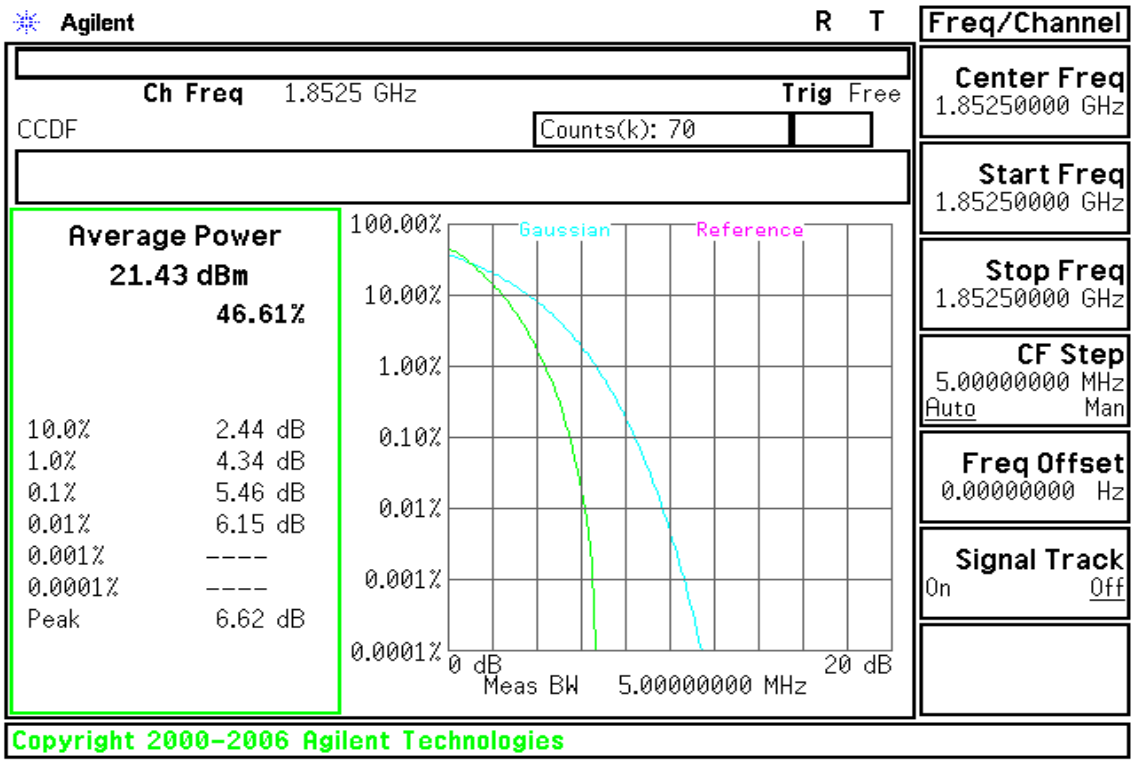
CHANNEL BANDWIDTH: 20MHz / 16QAM / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
Low	1715.0	8.30
Mid	1732.5	7.94
High	1750.0	8.27

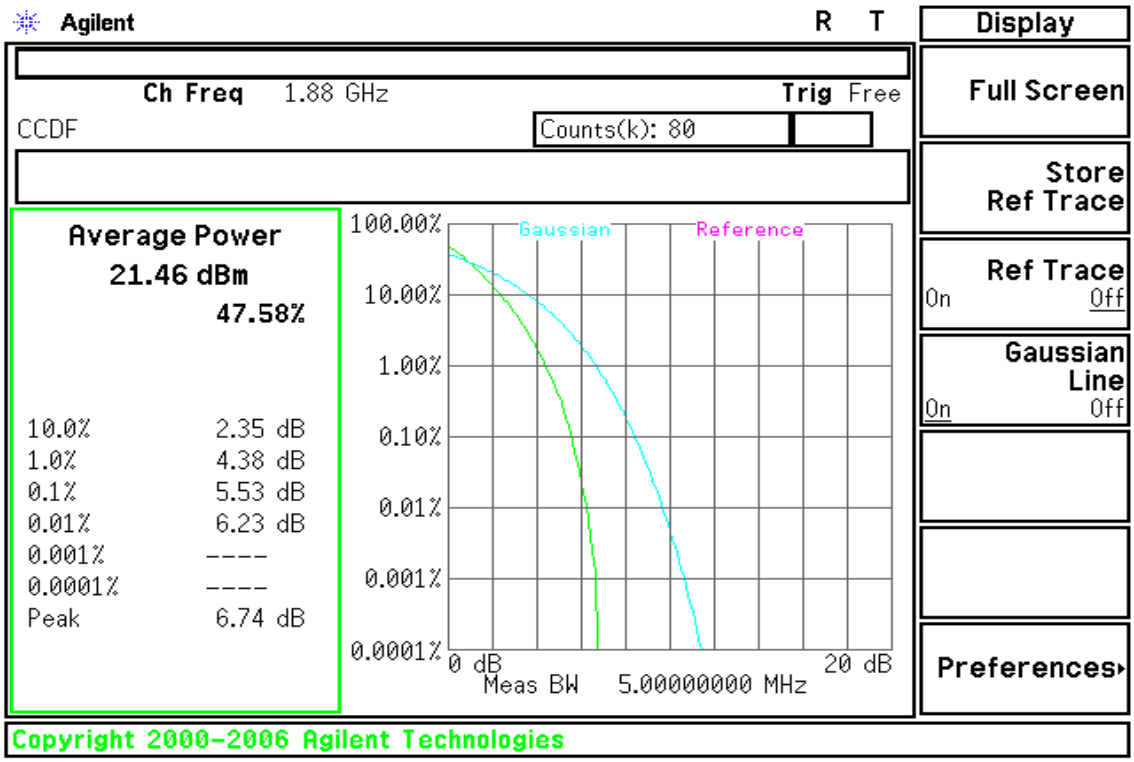
LTE Band 2

CHANNEL BANDWIDTH: 5MHZ / QPSK

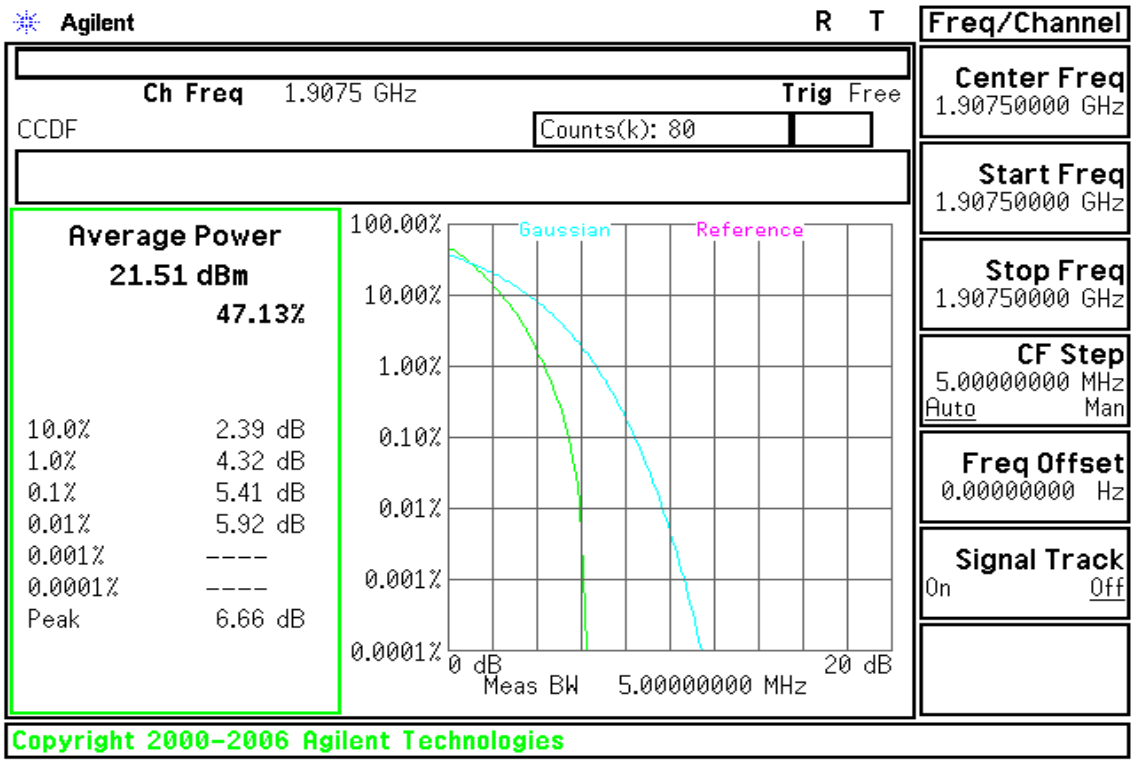
CH LOW



CH MID

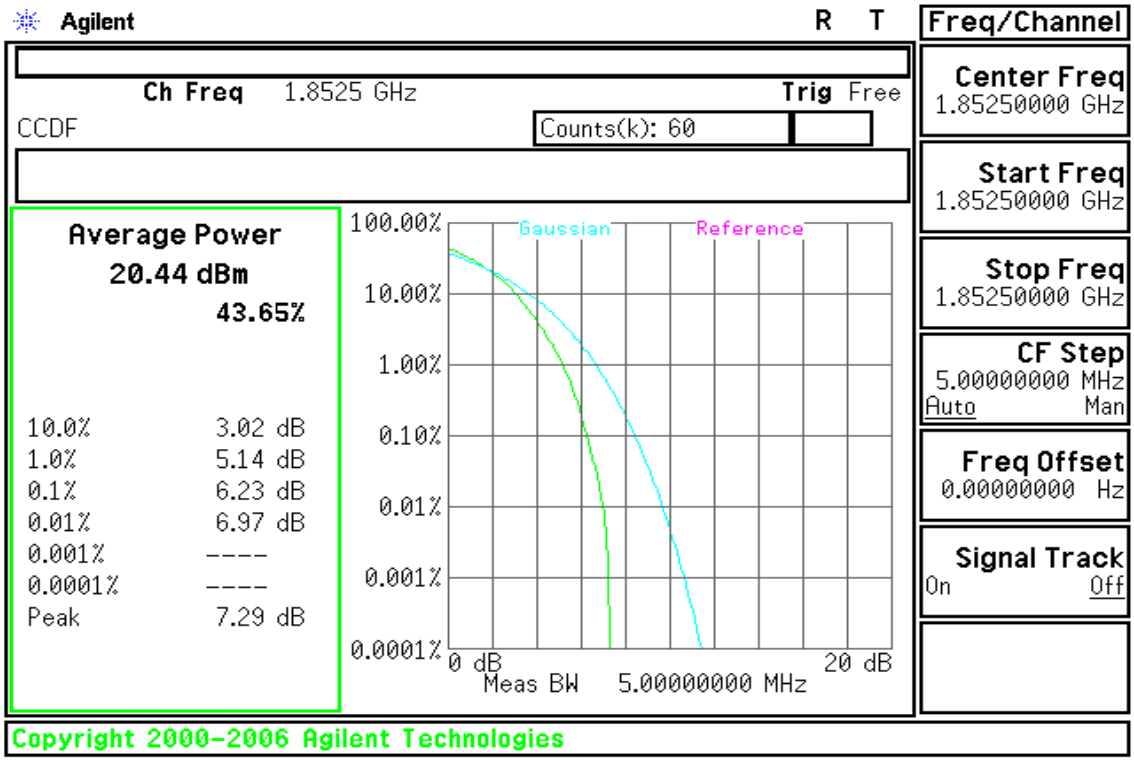


CH HIGH

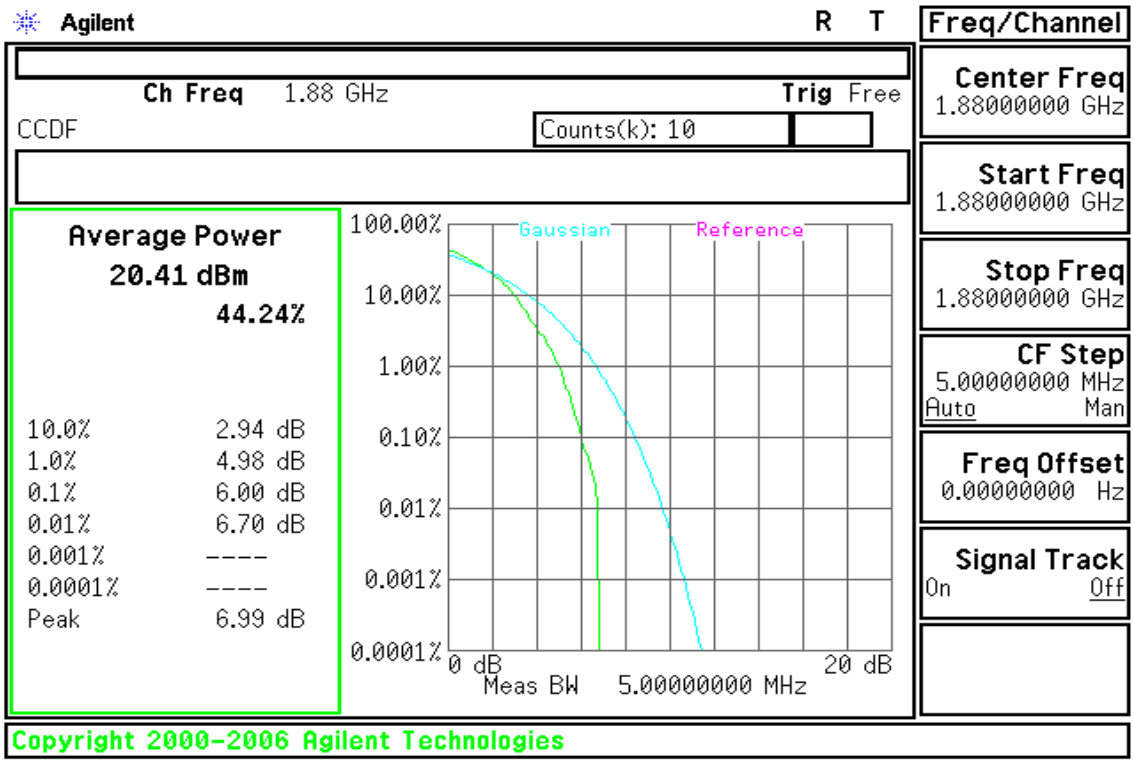


CHANNEL BANDWIDTH: 5MHZ / 16QAM

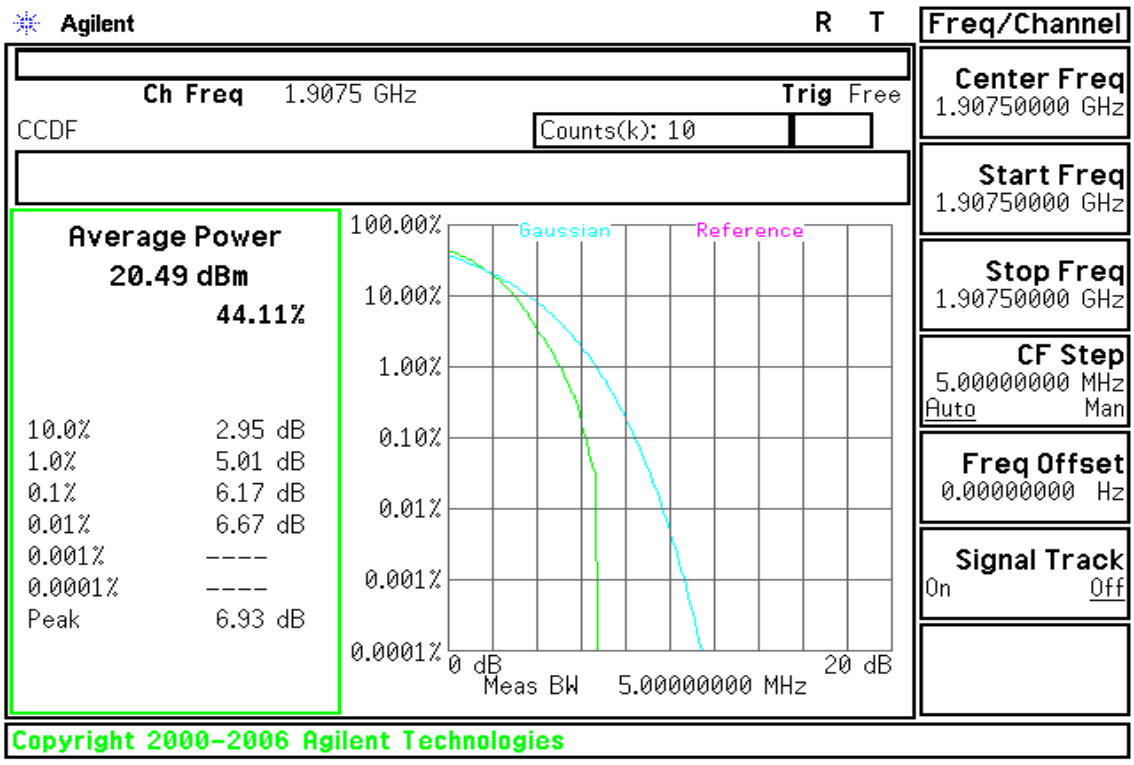
CH LOW



CH MID

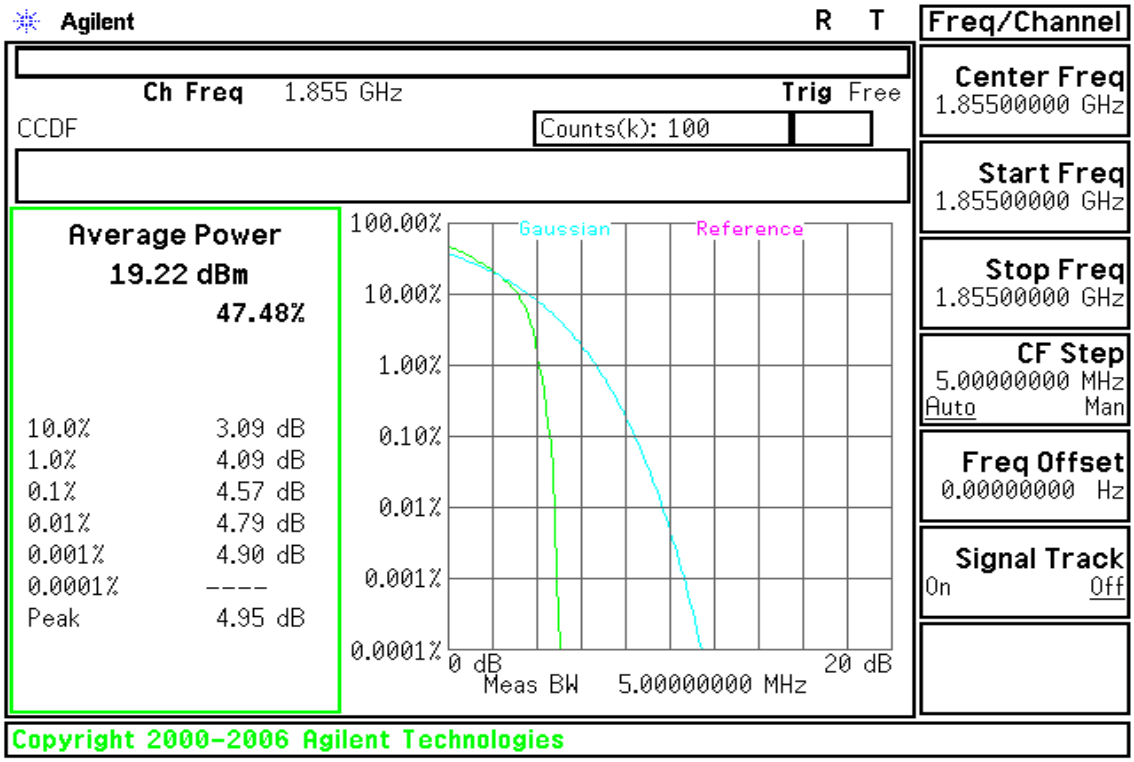


CH HIGH

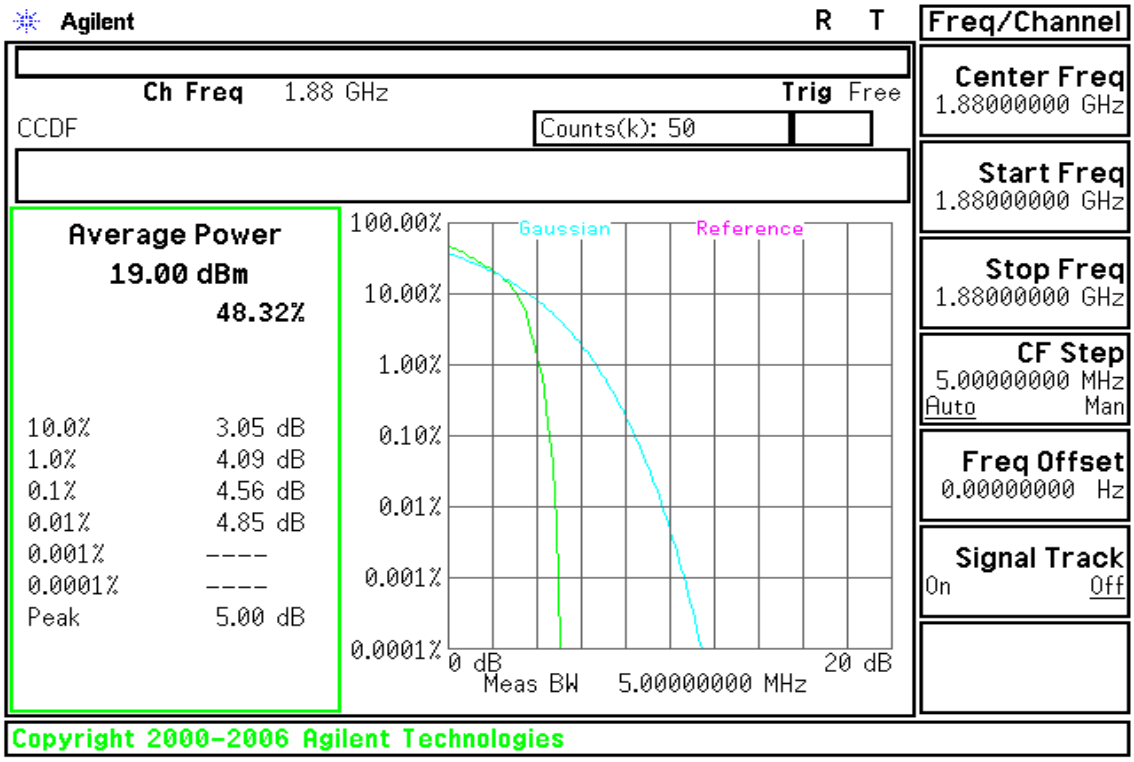


CHANNEL BANDWIDTH: 10MHZ / QPSK

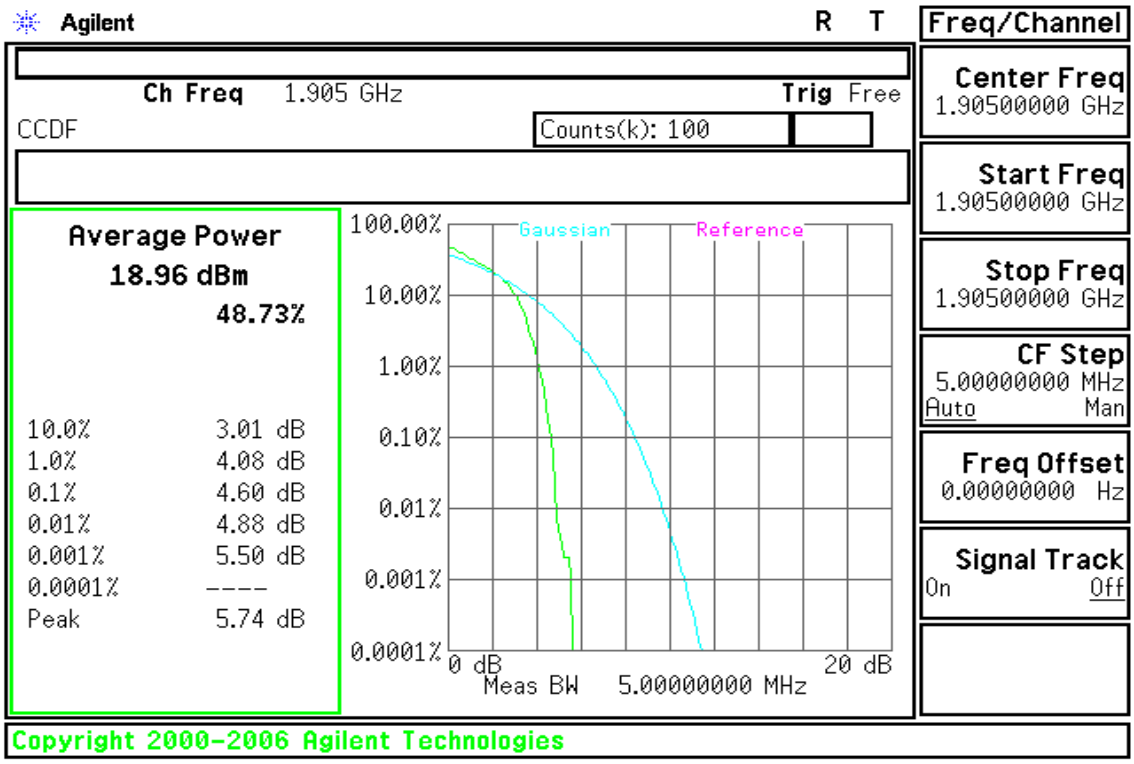
CH LOW



CH MID

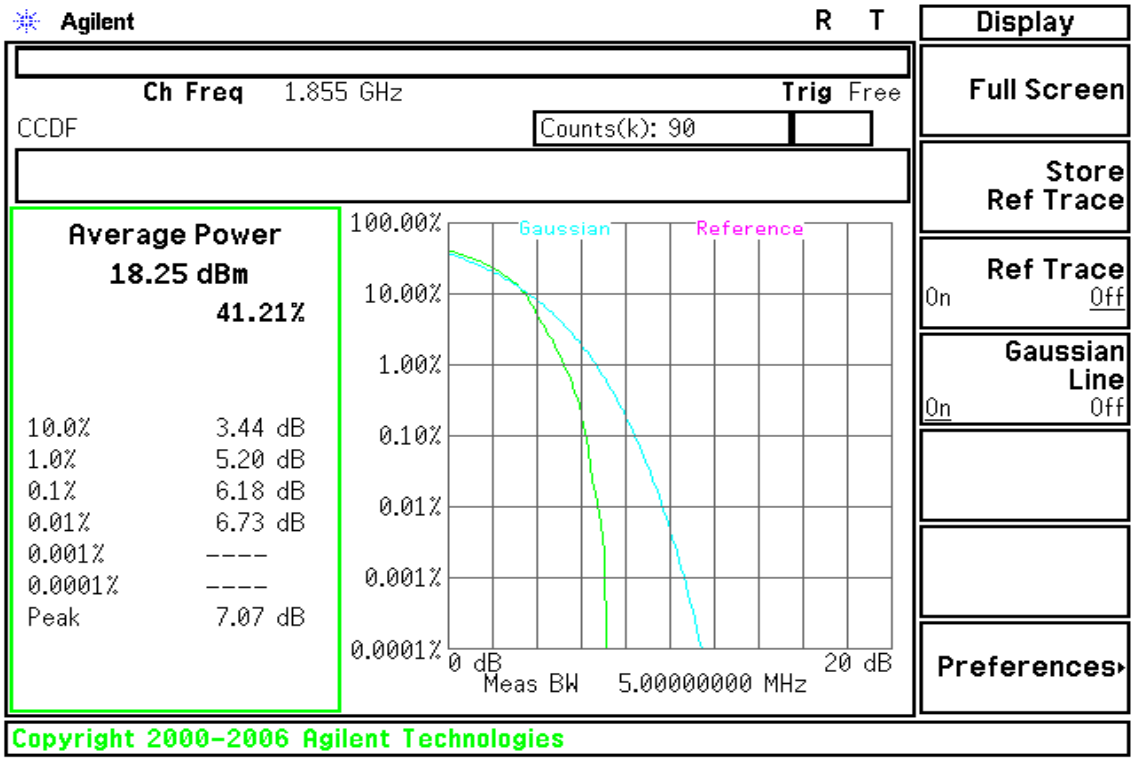


CH HIGH

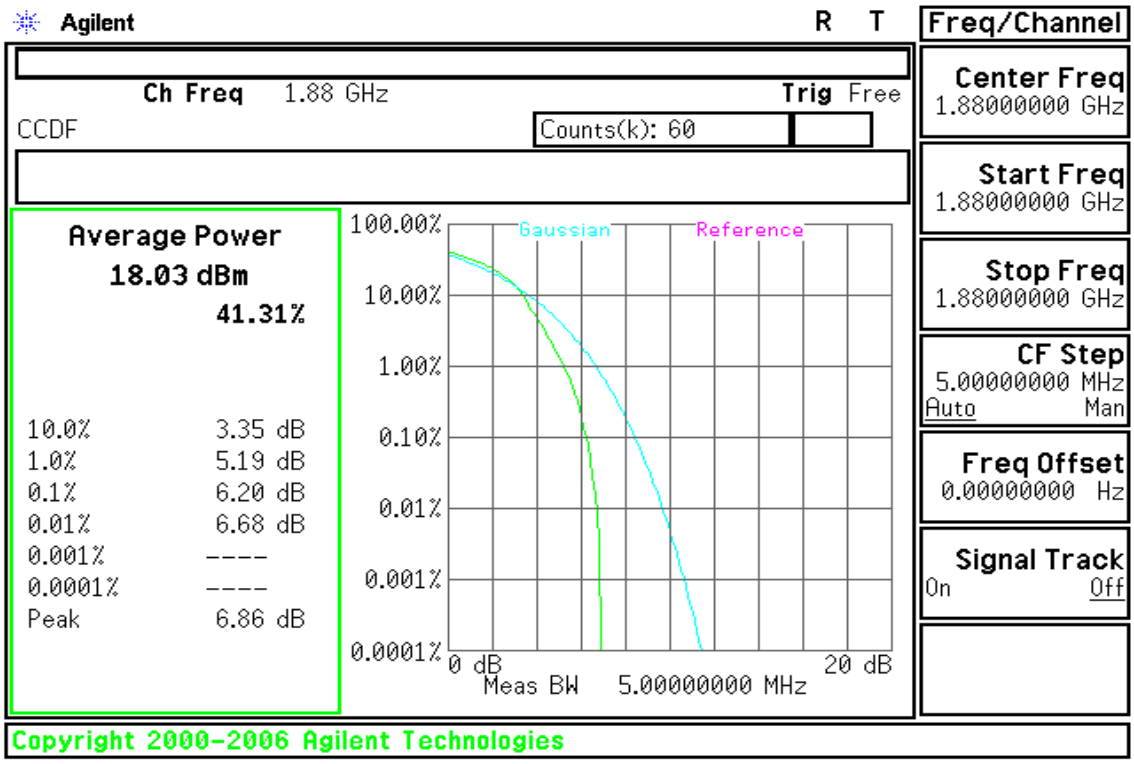


CHANNEL BANDWIDTH: 10MHZ / 16QAM

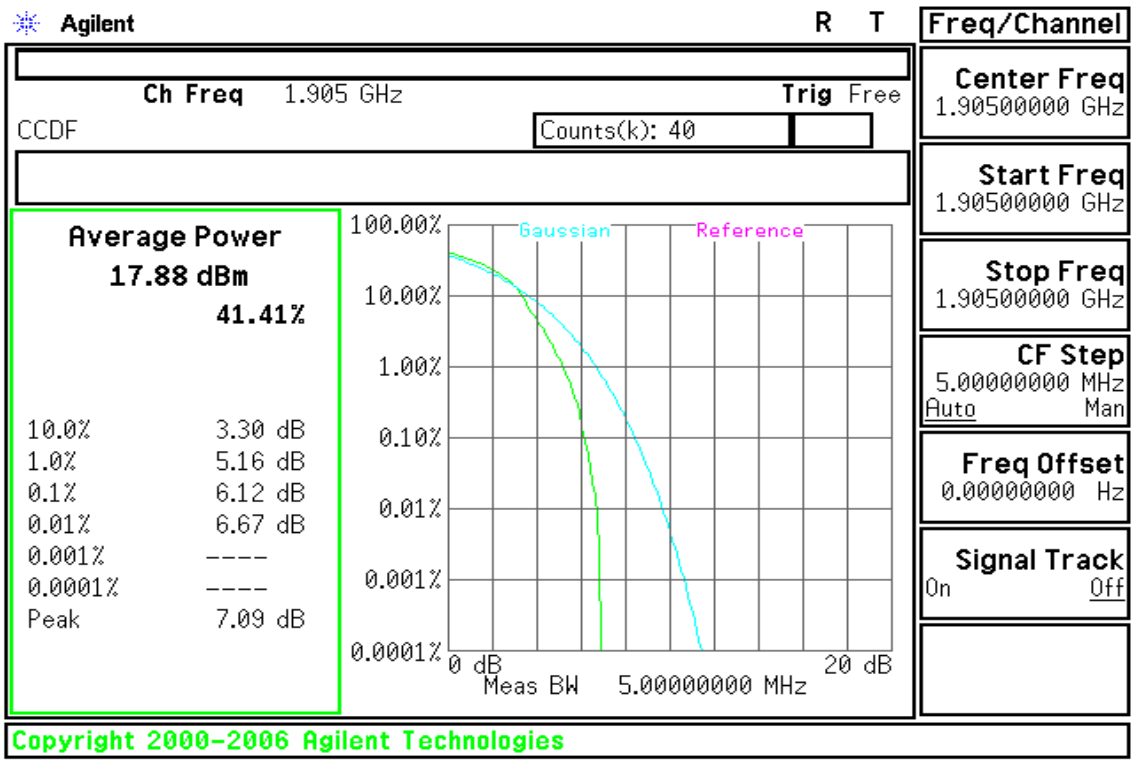
CH LOW



CH MID

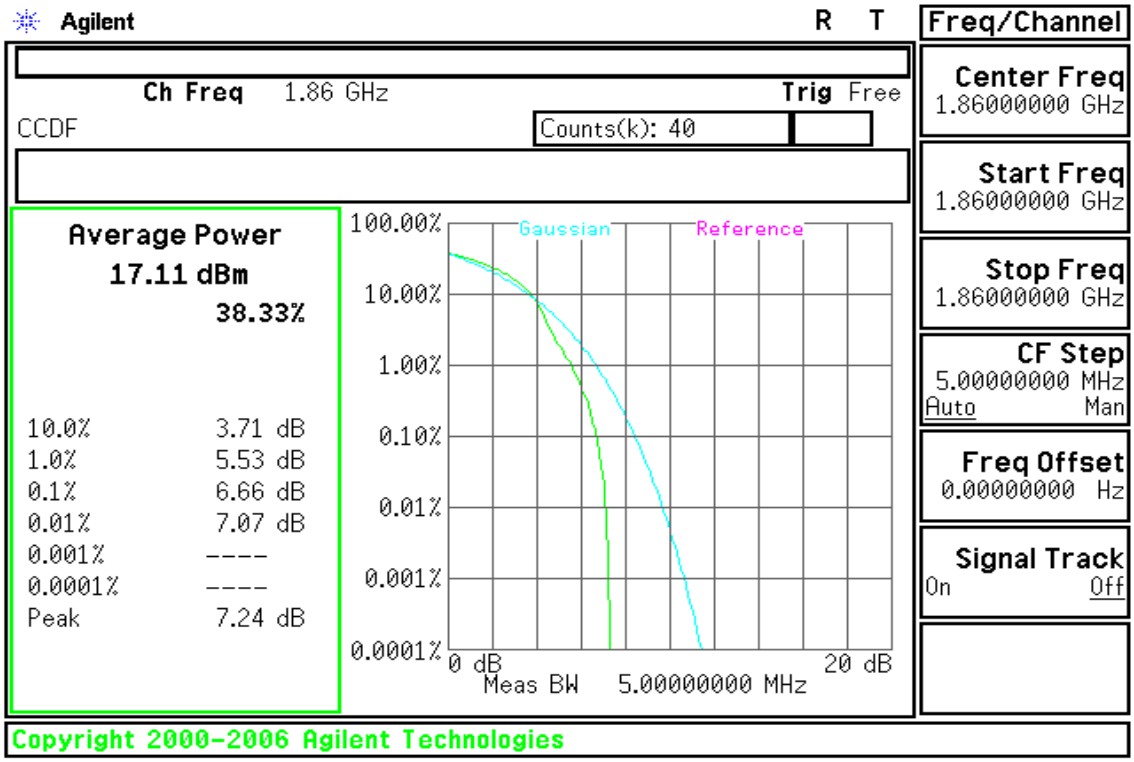


CH HIGH

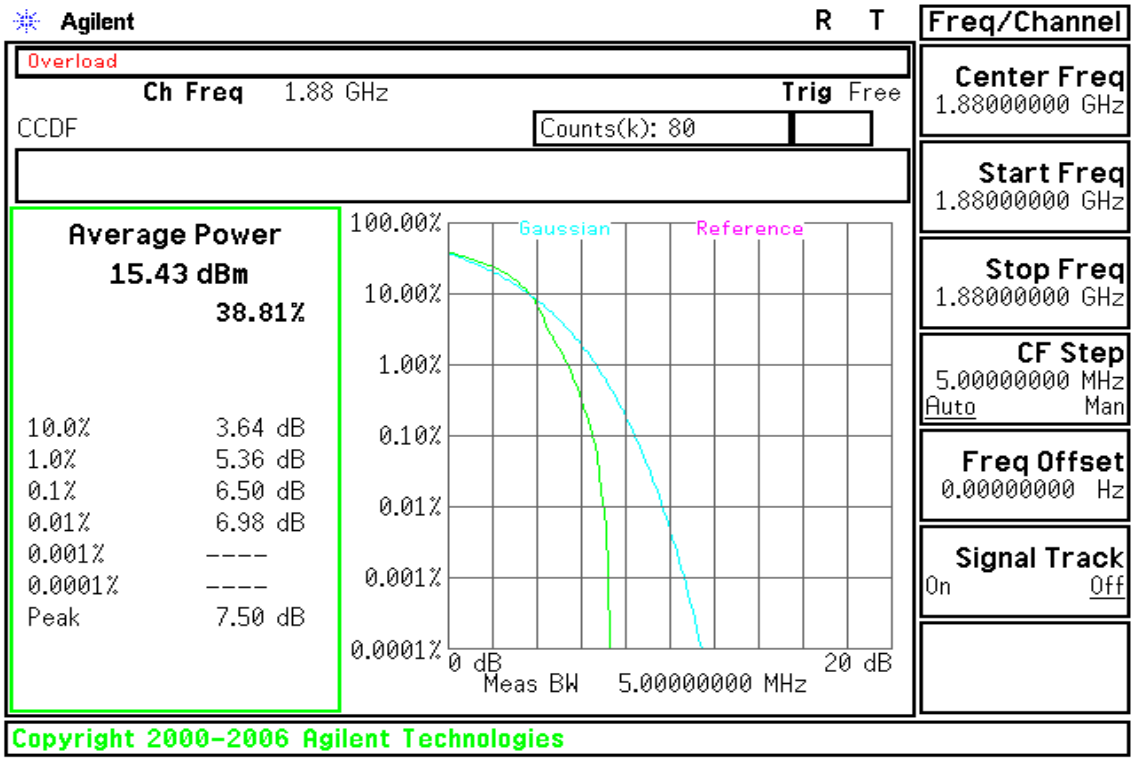


CHANNEL BANDWIDTH: 20MHZ / QPSK

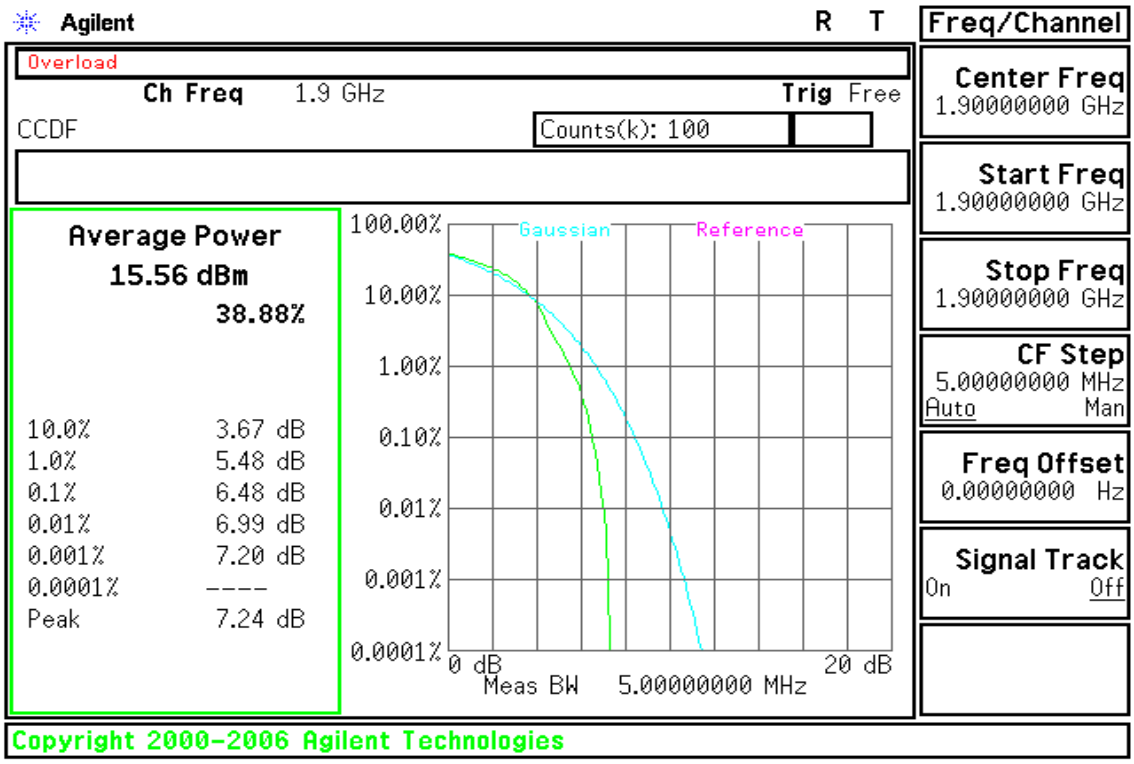
CH LOW



CH MID

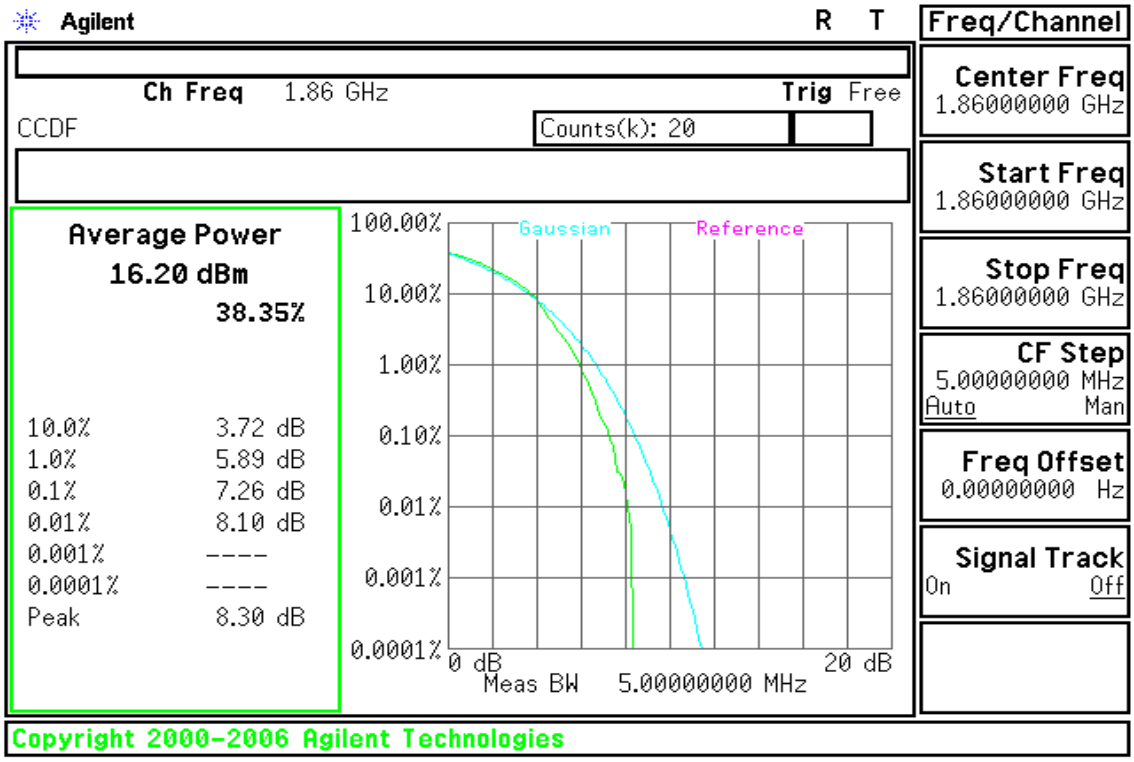


CH HIGH

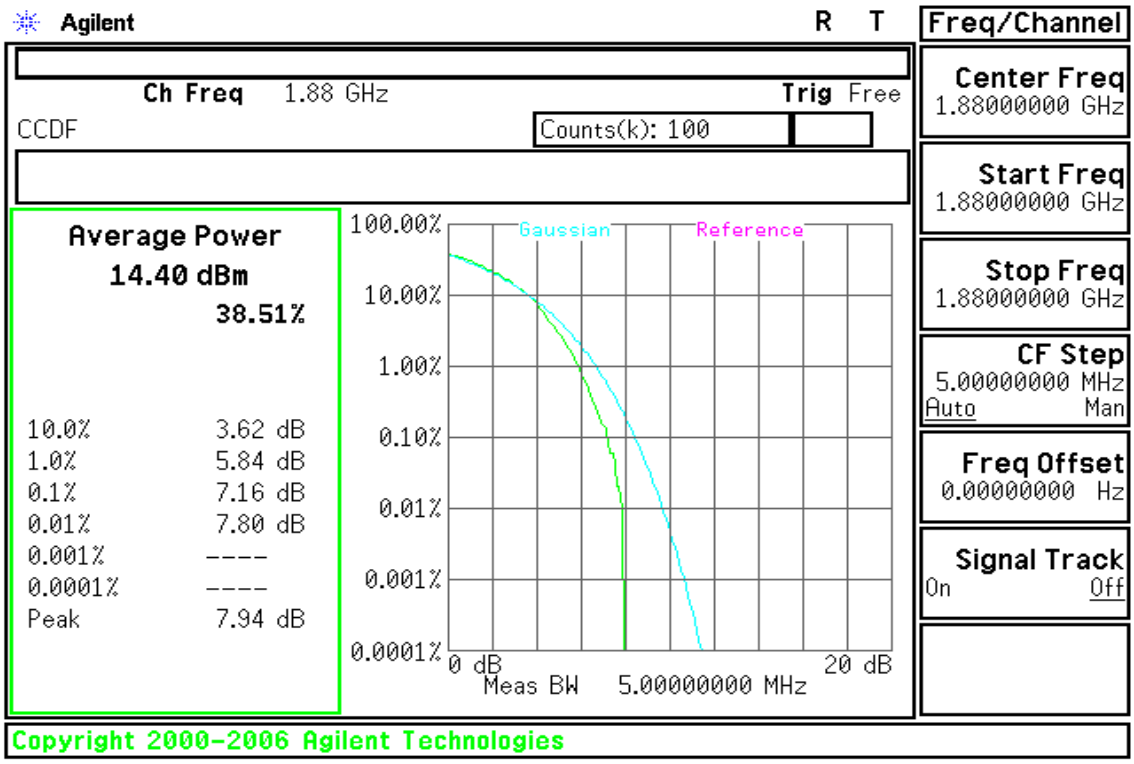


CHANNEL BANDWIDTH: 20MHZ / 16QAM

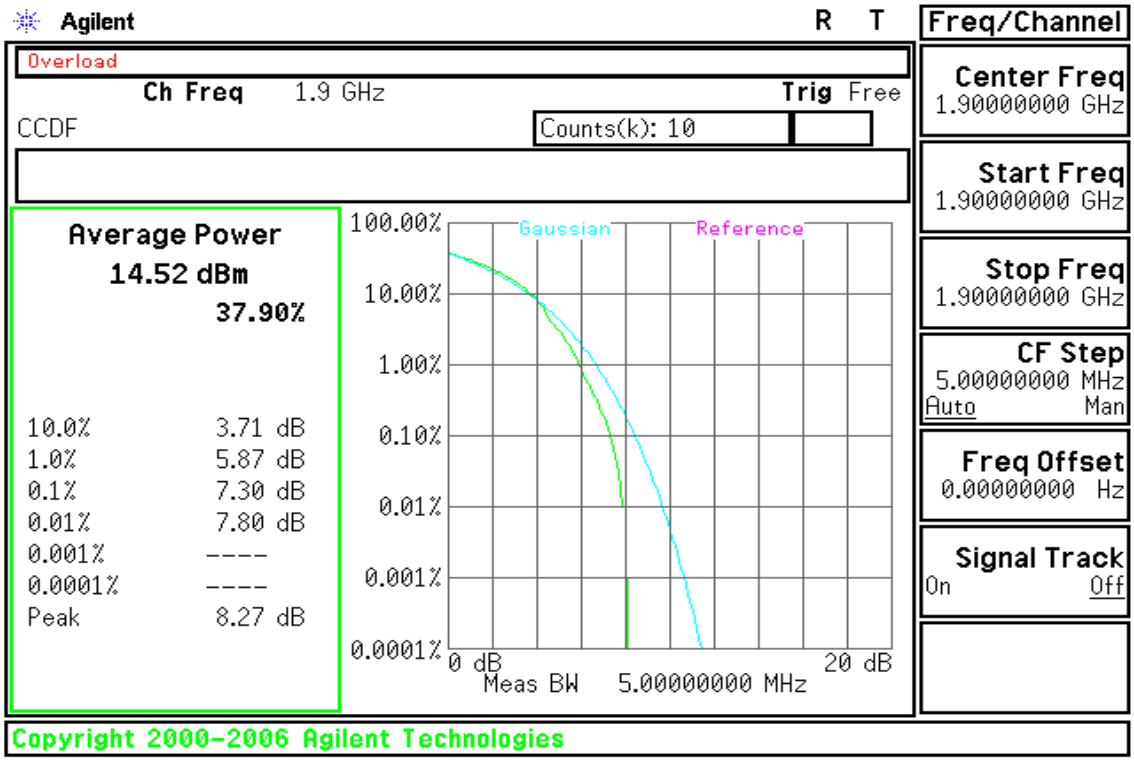
CH LOW



CH MID



CH HIGH



7.6BAND EDGE MEASUREMENT

LIMIT

For operations in 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. For operations in the 1710–1755 MHz and 2110–2155 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 log10(P) dB. The limit of emission equal to –13dBm.In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

TEST PROCEDURES

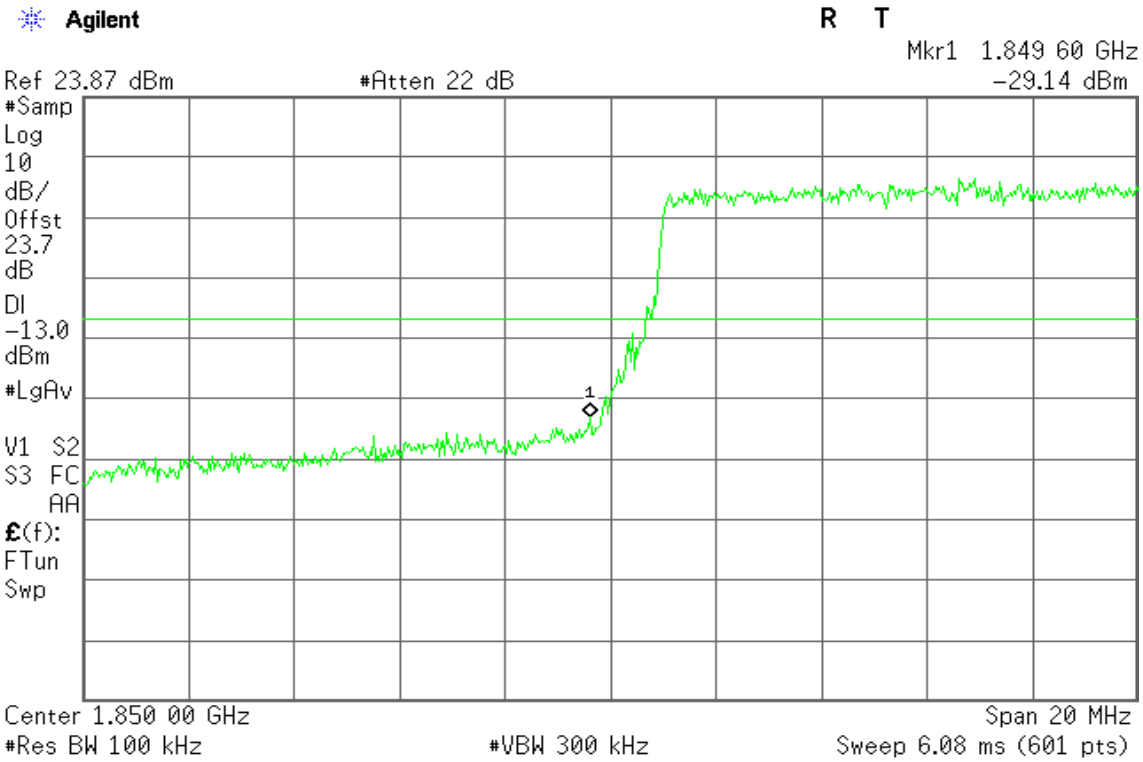
1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
2. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 7.2 dB in the transmitted path track.
3. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 50kHz and VB of the spectrum is 200kHz.
4. Record the max trace plot into the test report.

TEST RESULTS

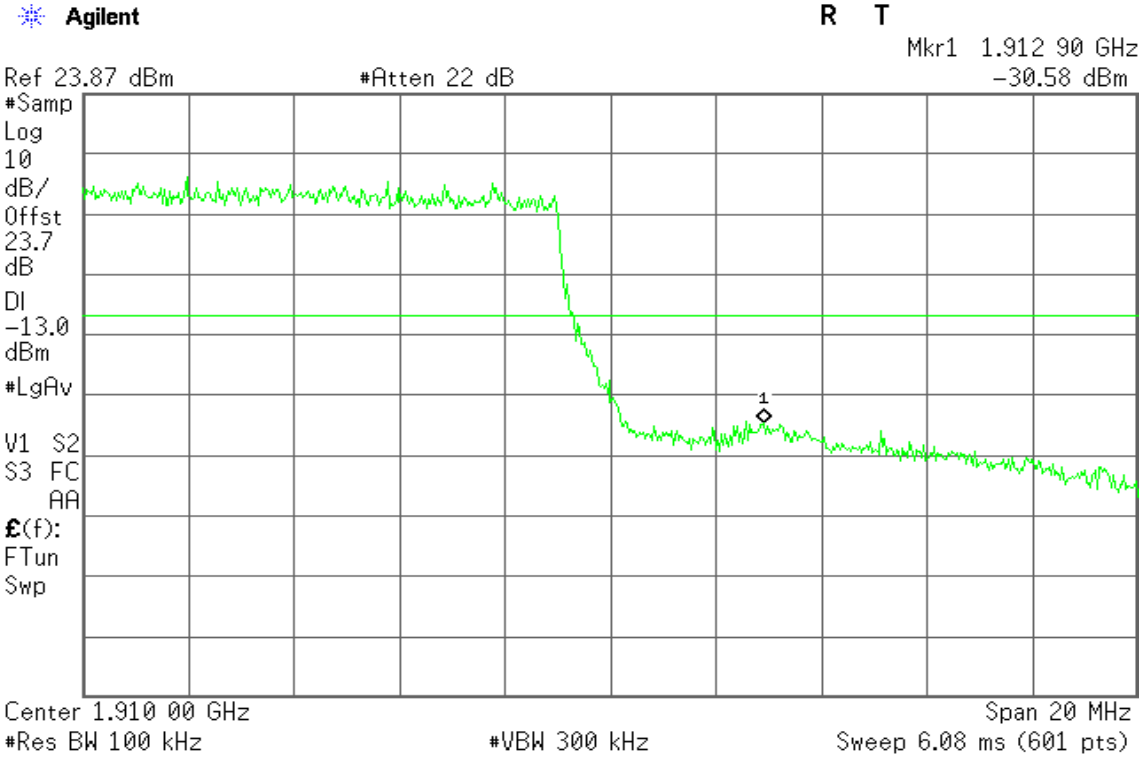
LTE Band 2

CHANNEL BANDWIDTH: 20MHZ / QPSK / FULL RB ALLOCATION

LOWER BAND EDGE

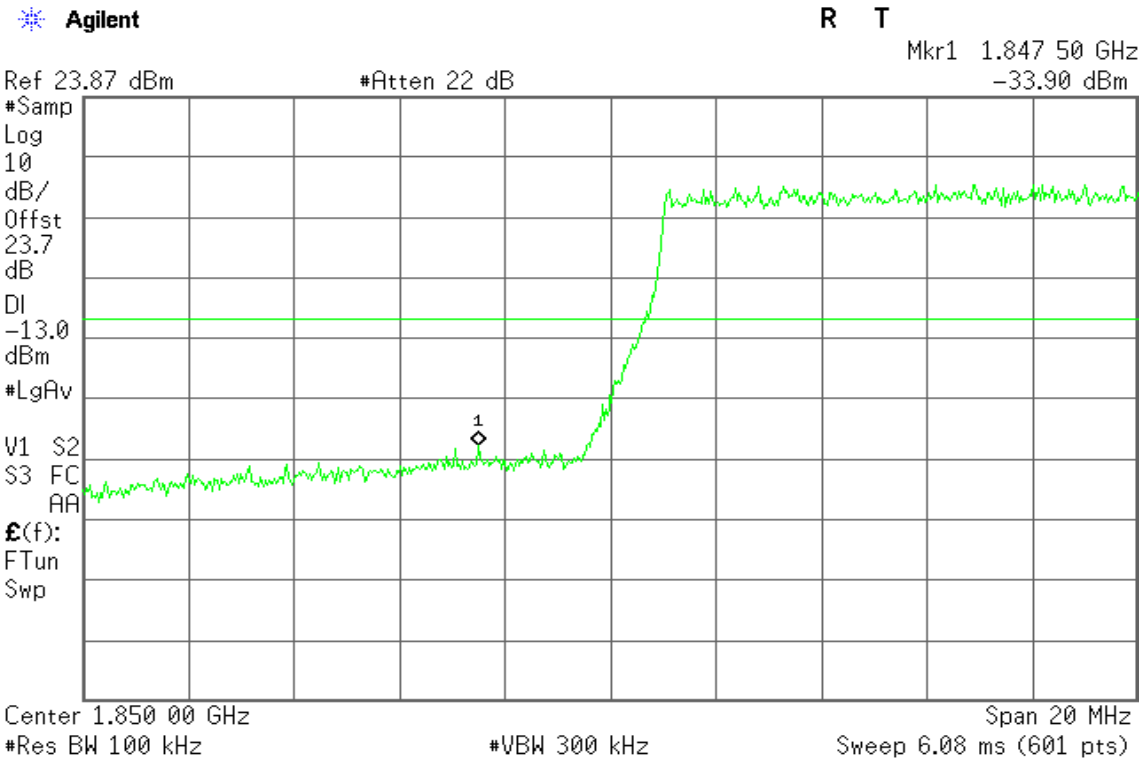


HIGHER BAND EDGE

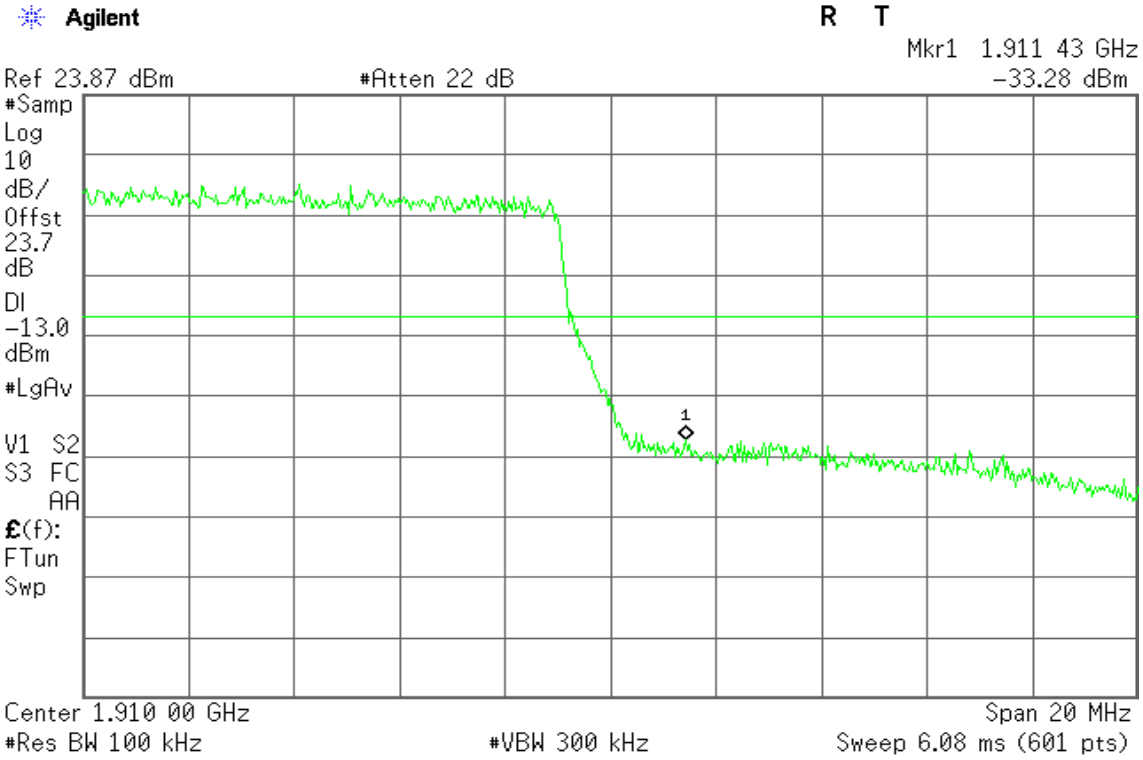


CHANNEL BANDWIDTH: 20MHZ / 16QAM / FULL RB ALLOCATION

LOWER BAND EDGE



HIGHER BAND EDGE



7.7CONDUCTED SPURIOUS EMISSIONS

LIMITS

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

TEST PROCEDURES

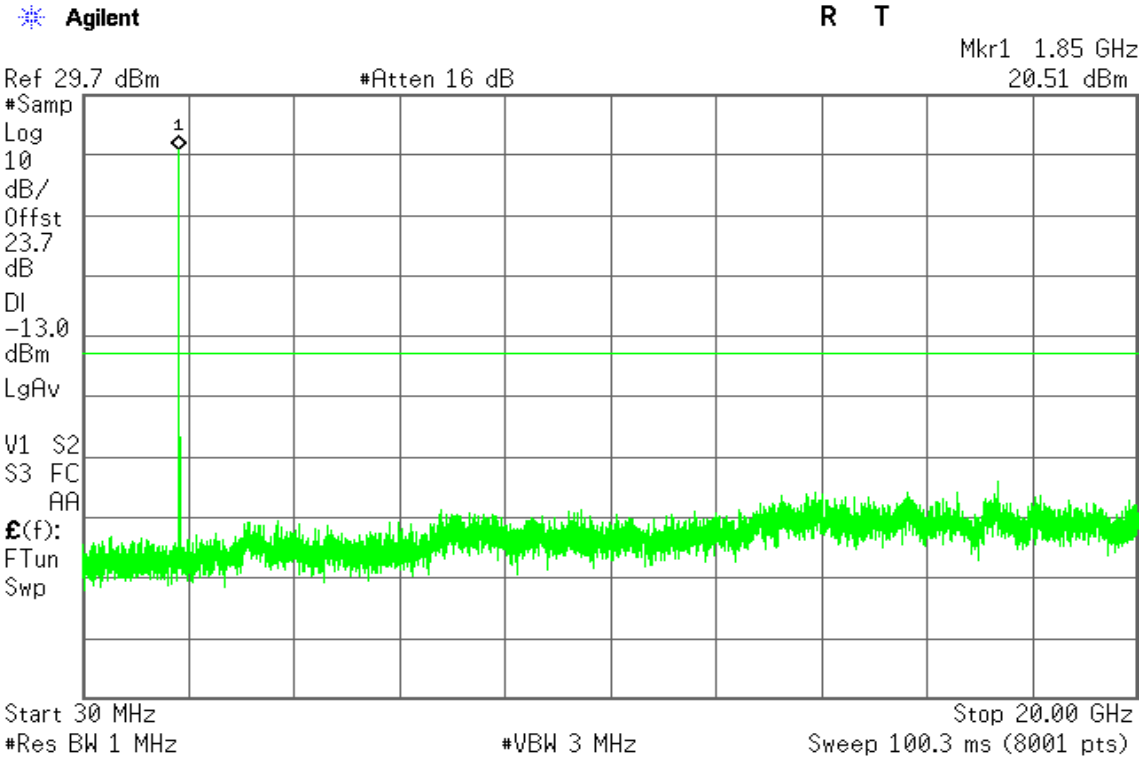
1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range.).
2. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
3. When the spectrum scanned from 30MHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.
4. When the spectrum scanned from 3GHz to 20GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.

TEST RESULTS

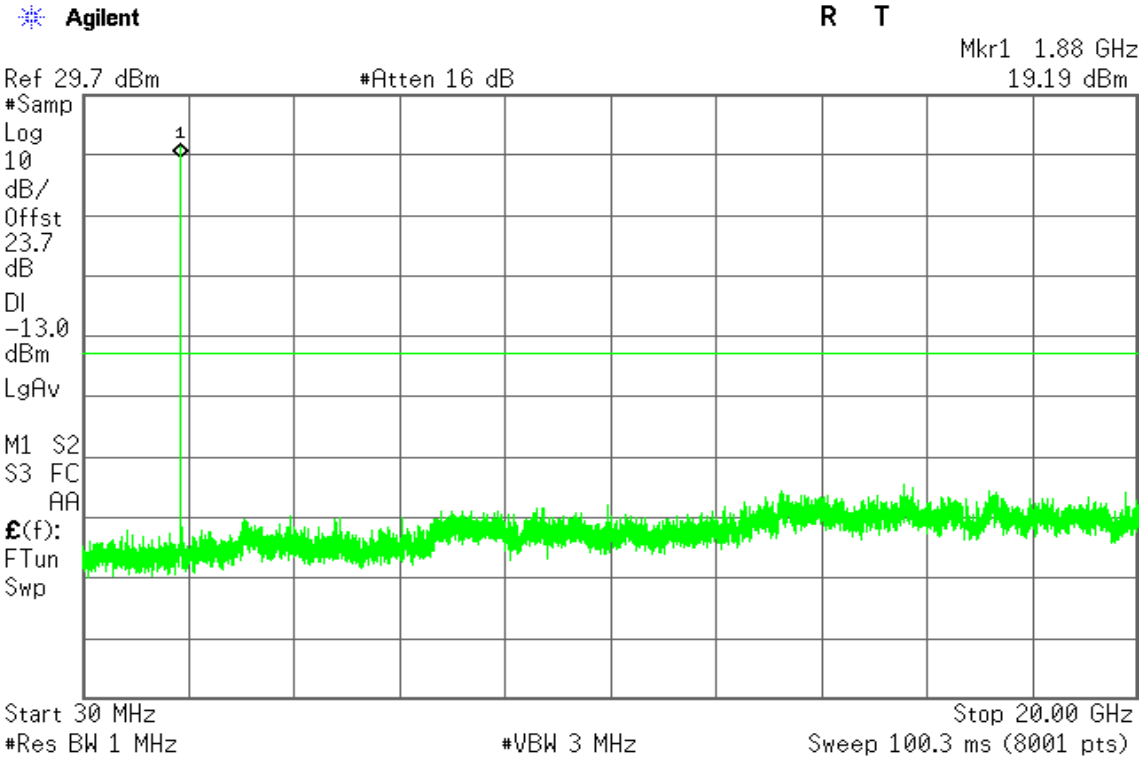
LTE Band 2

CHANNEL BANDWIDTH: 5MHZ / QPSK

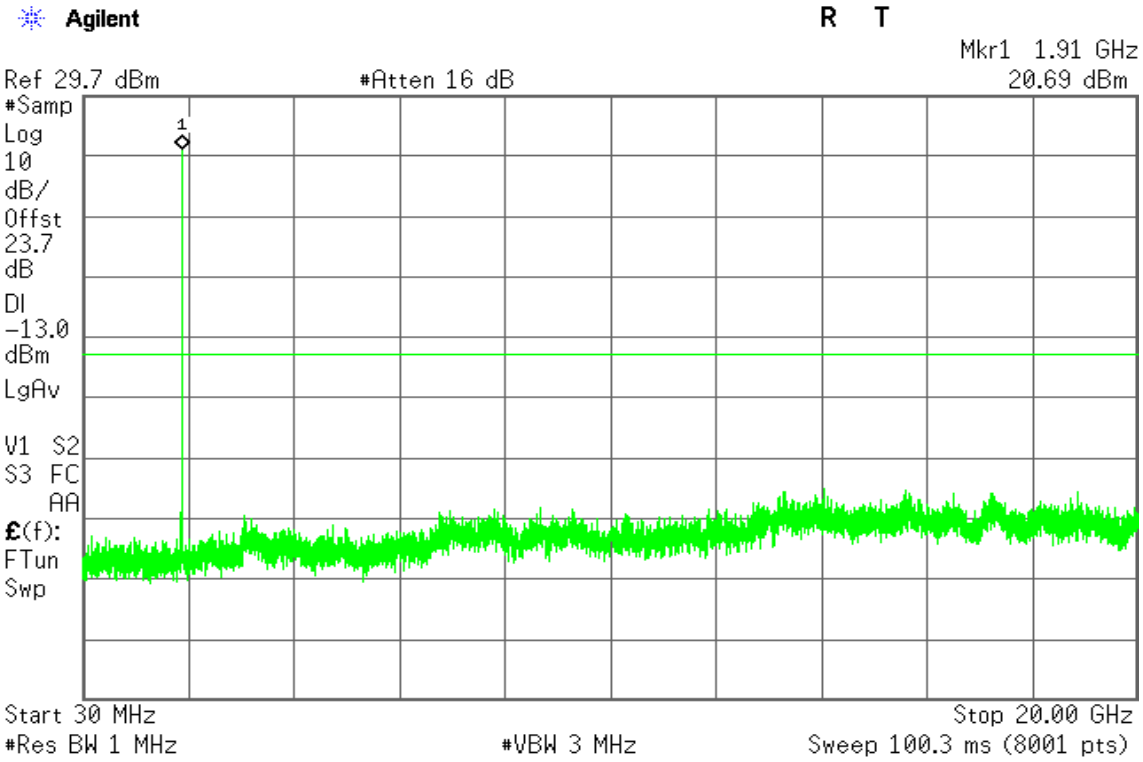
CH LOW



CH MID

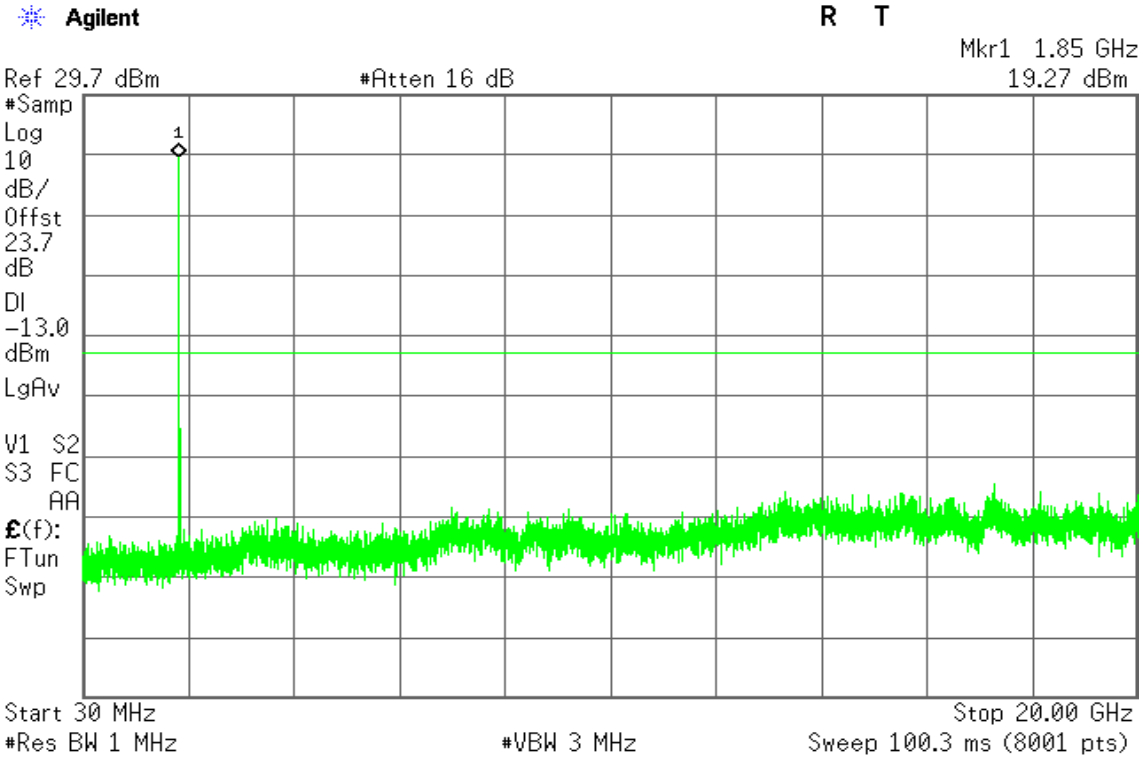


CH HIGH

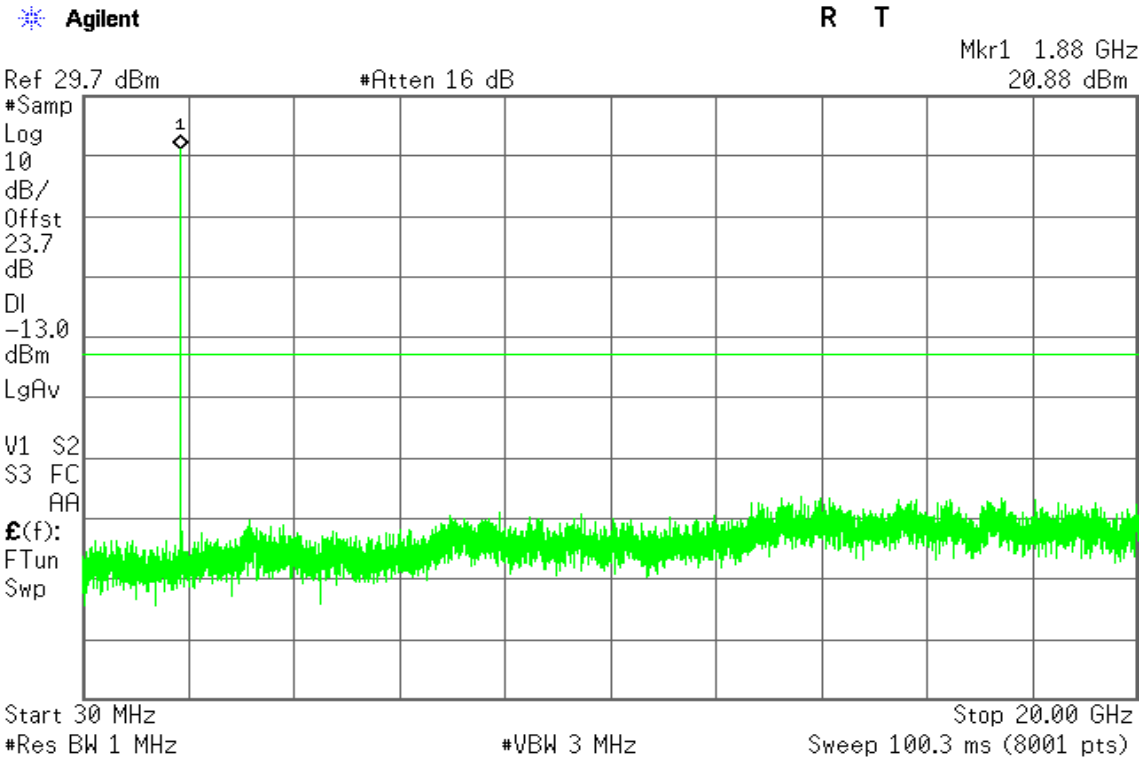


CHANNEL BANDWIDTH: 5MHZ / 16QAM

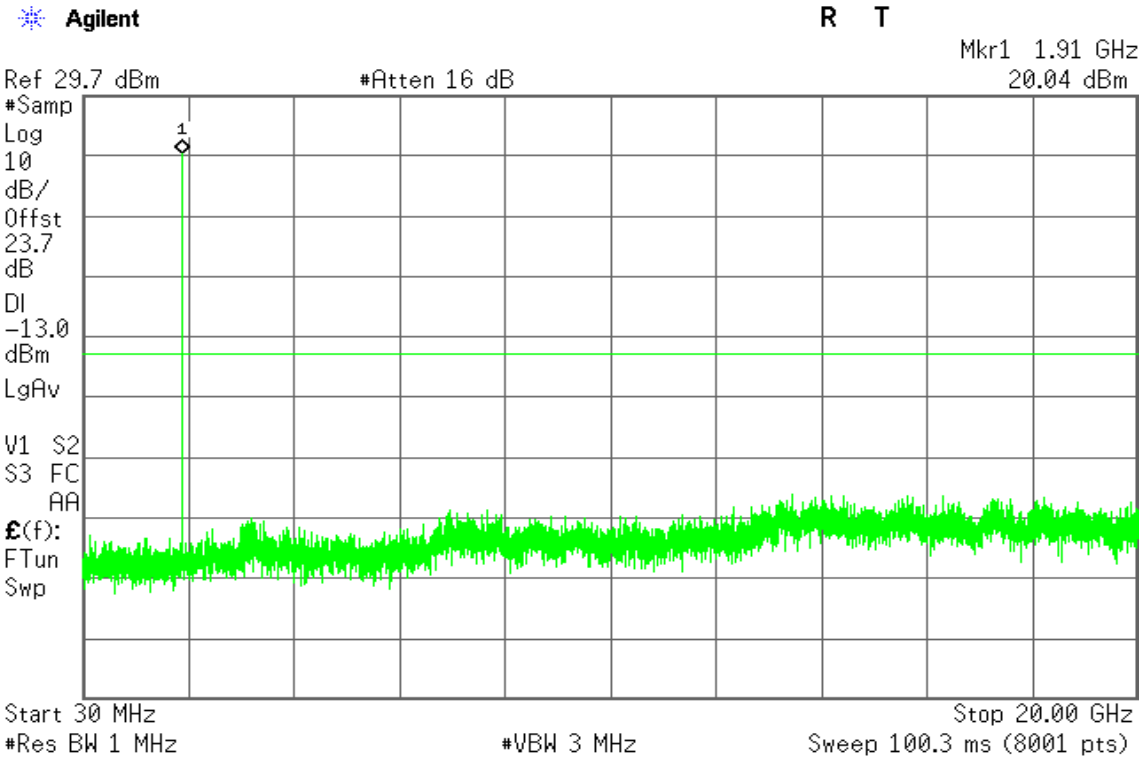
CH LOW



CH MID

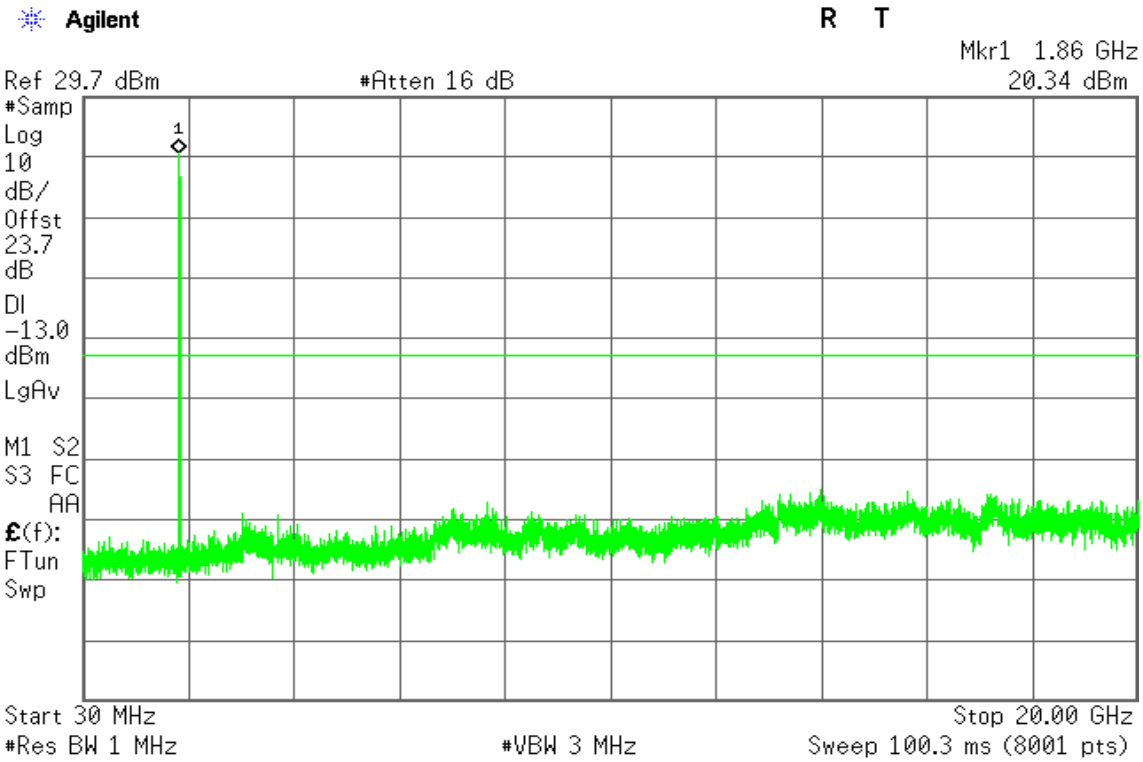


CH HIGH

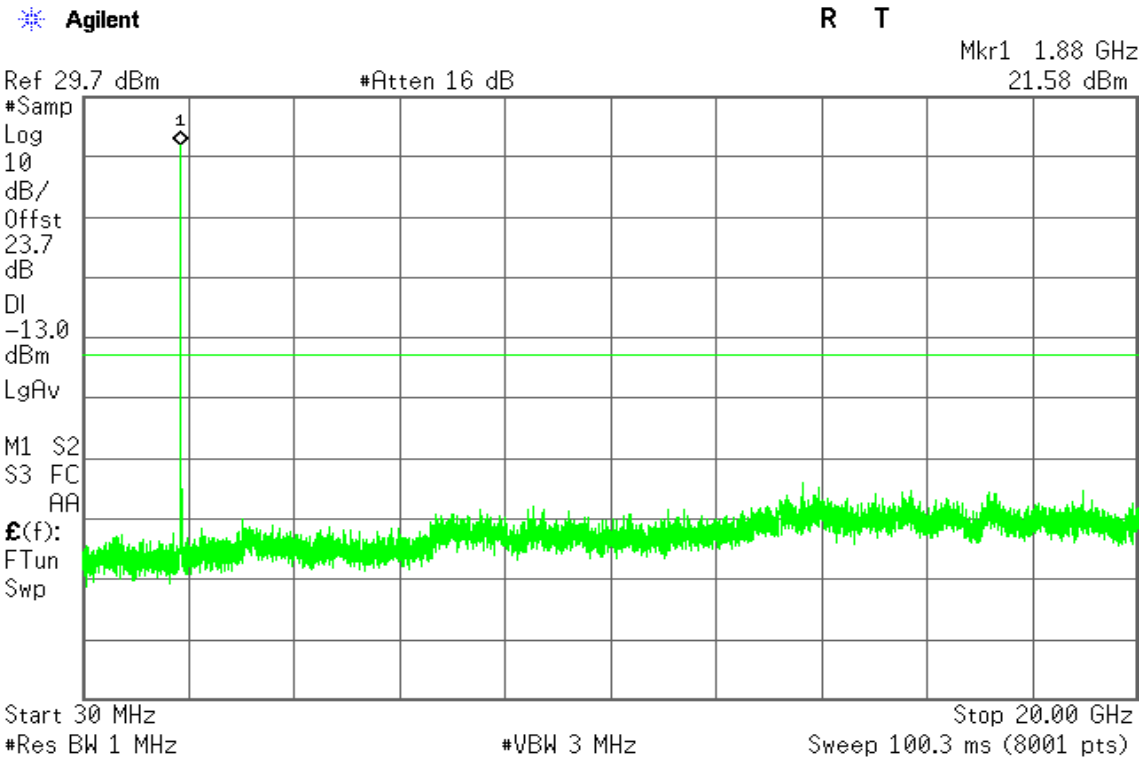


CHANNEL BANDWIDTH: 10MHZ / QPSK

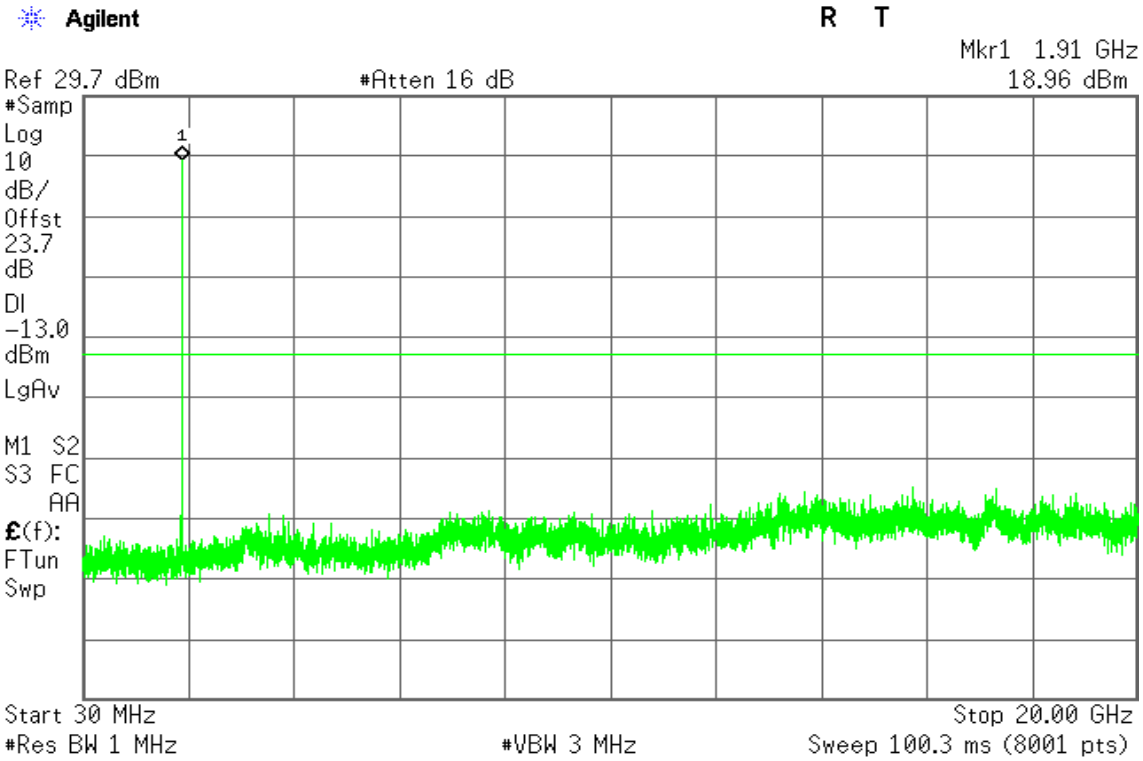
CH LOW



CH MID

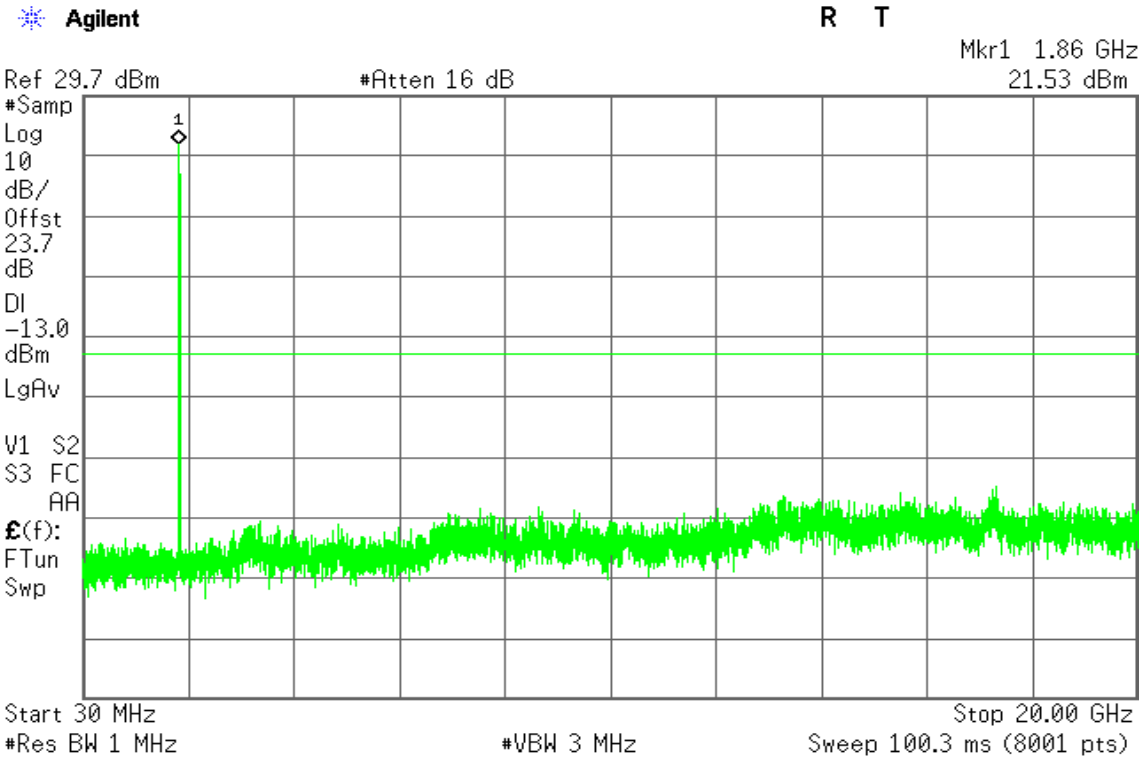


CH HIGH

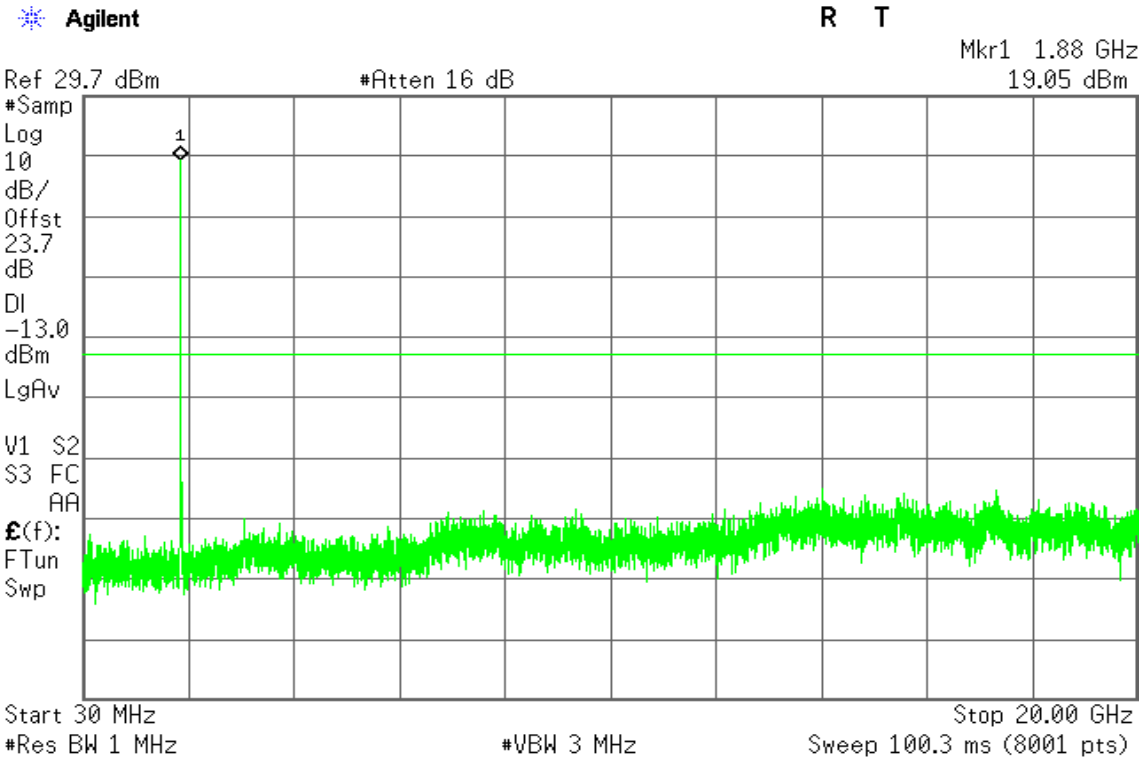


CHANNEL BANDWIDTH: 10MHZ / 16QAM

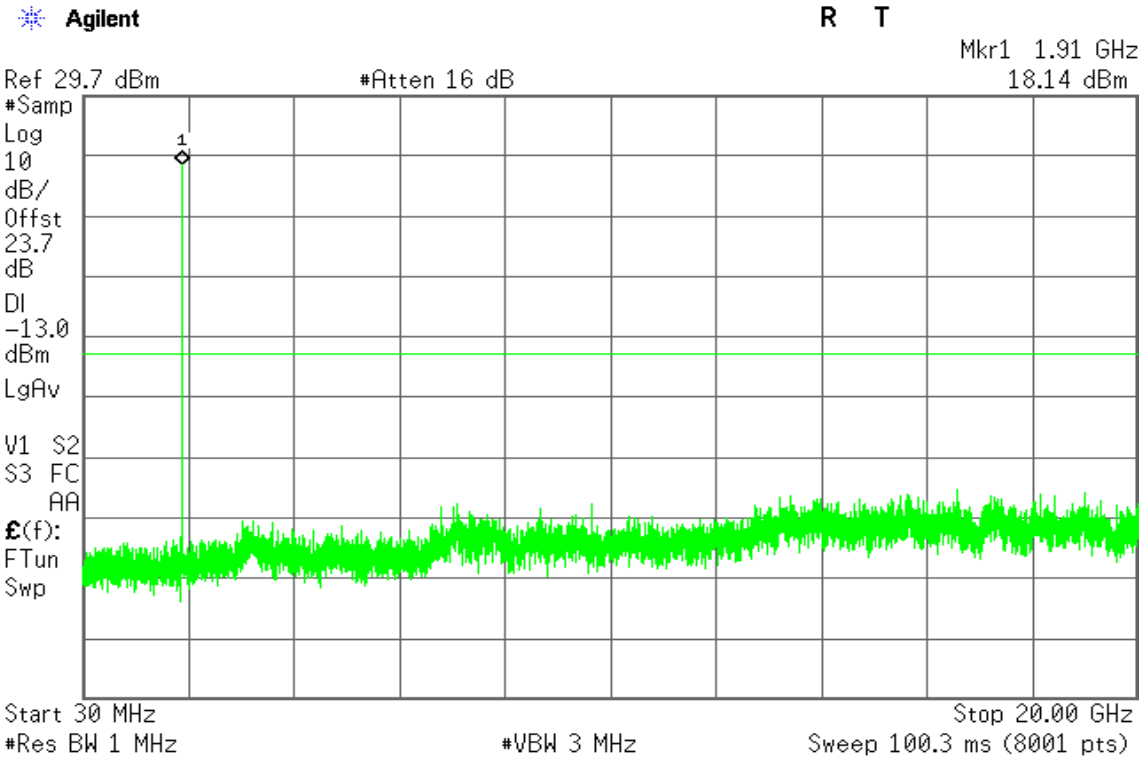
CH LOW



CH MID

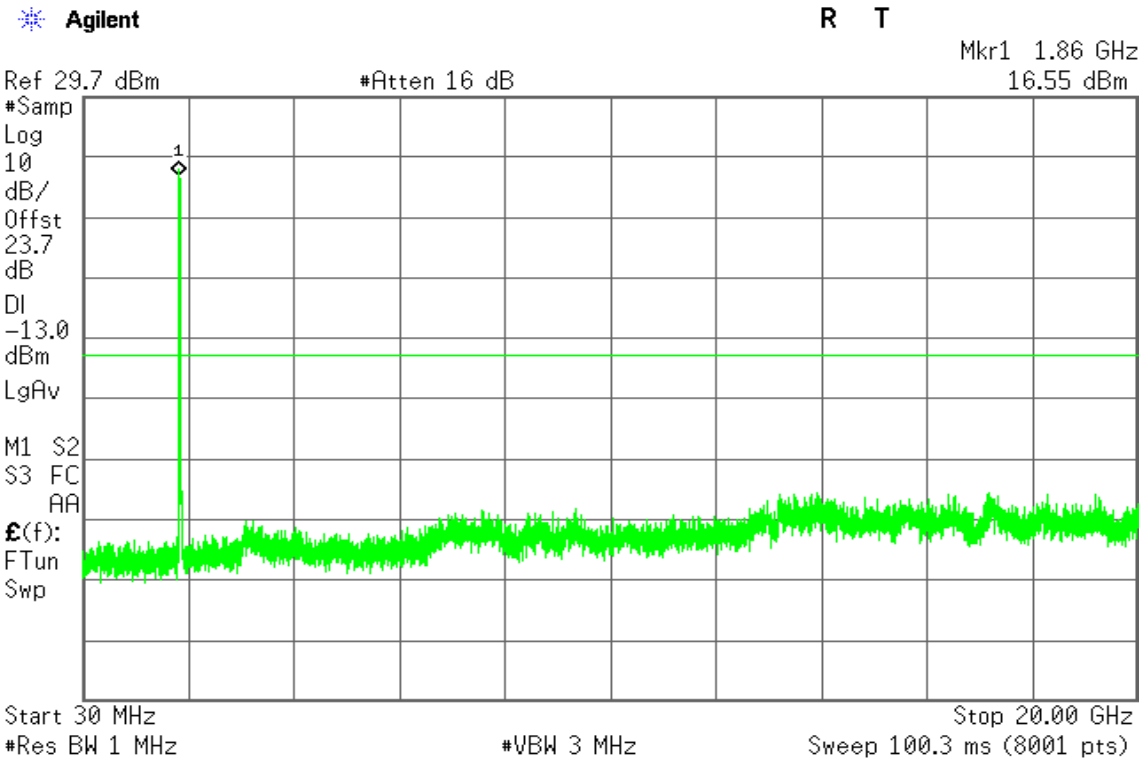


CH HIGH

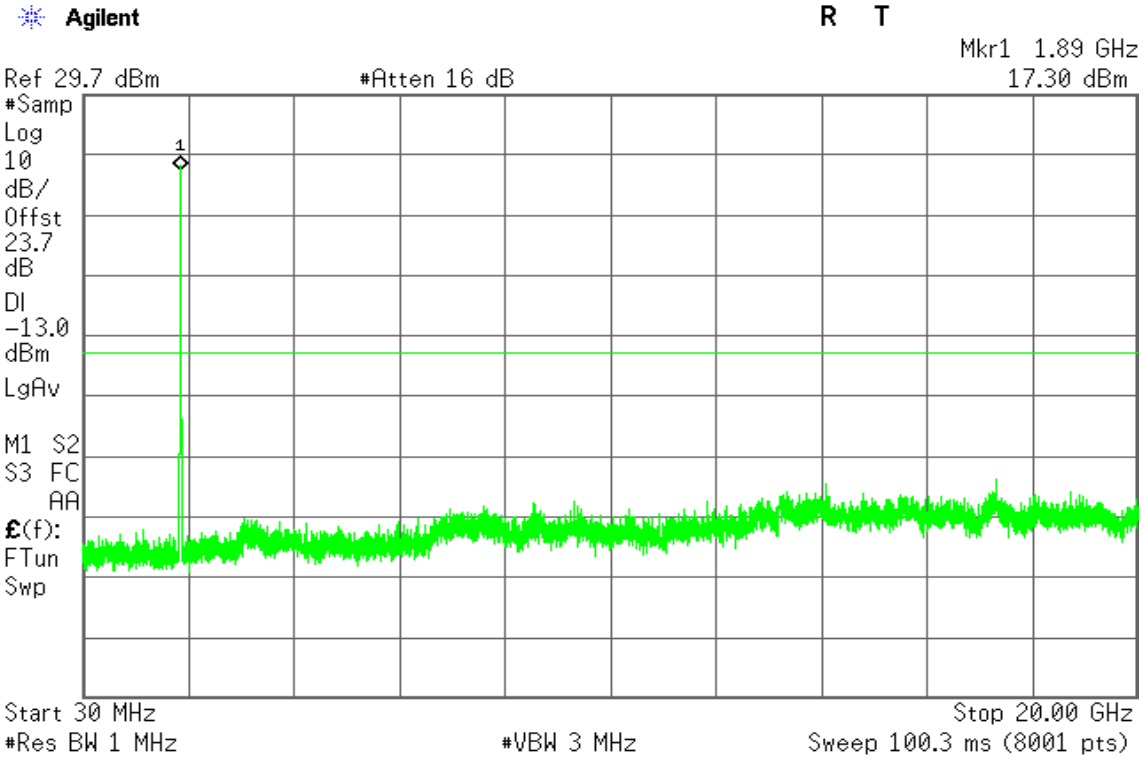


CHANNEL BANDWIDTH: 20MHZ / QPSK

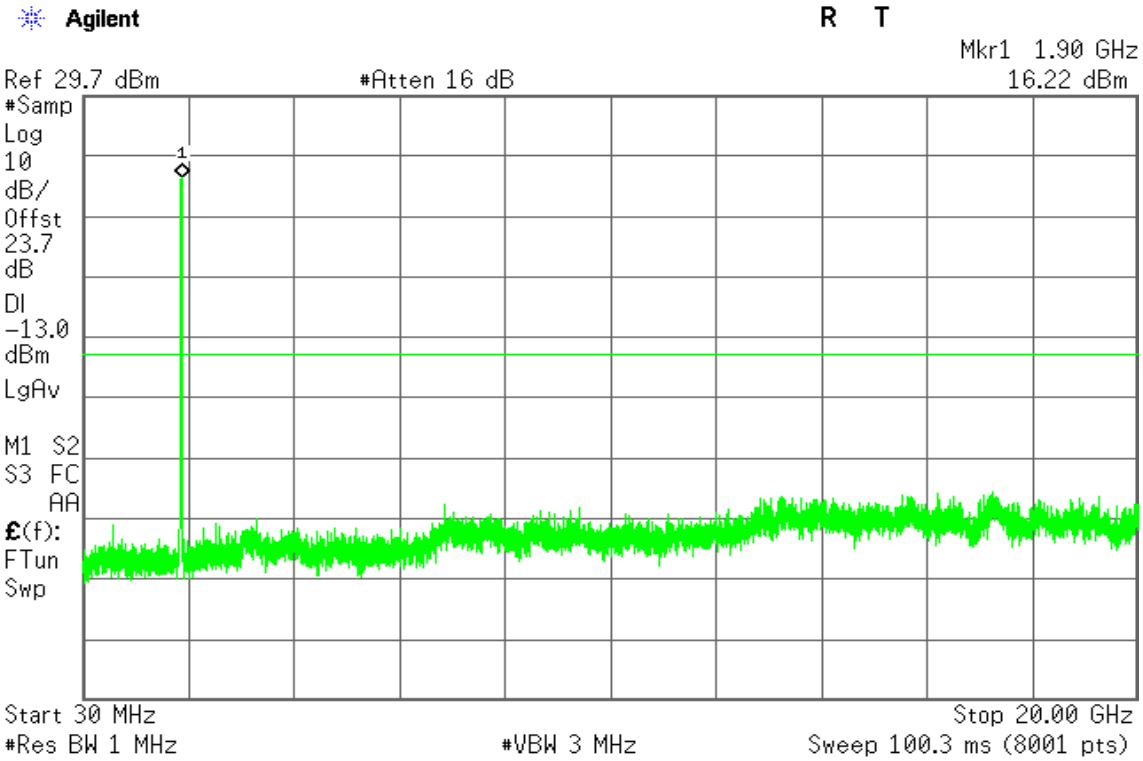
CH LOW



CH MID

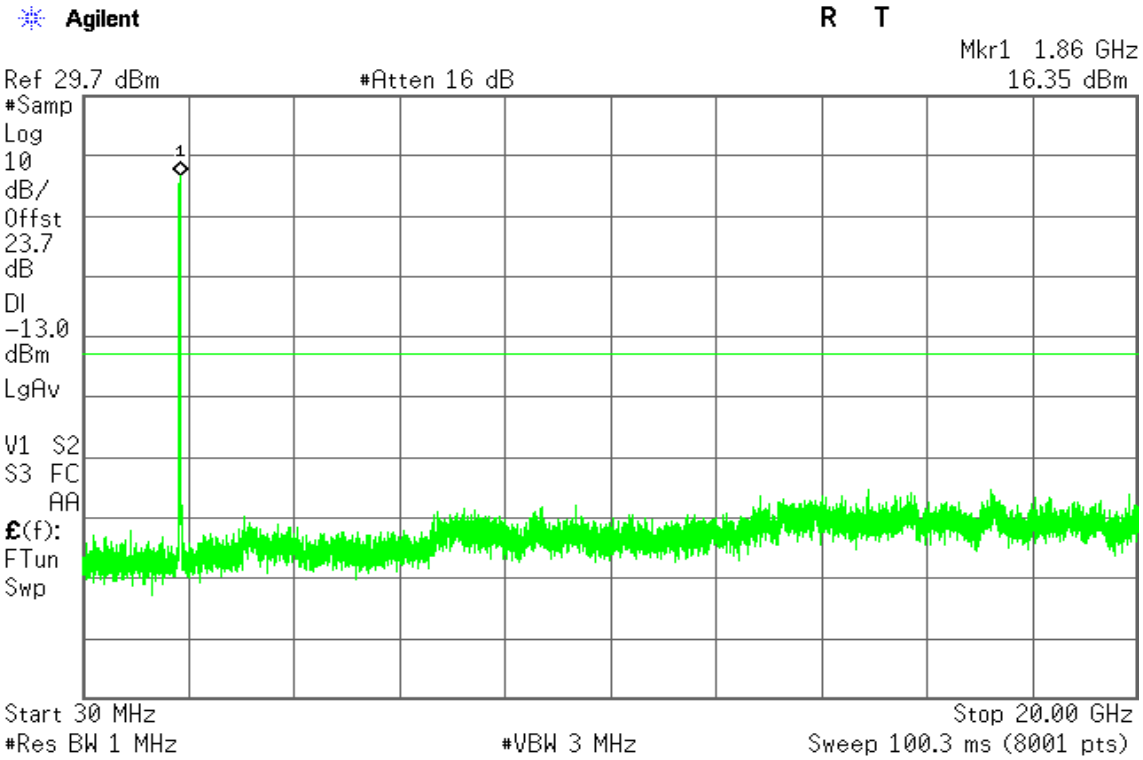


CH HIGH

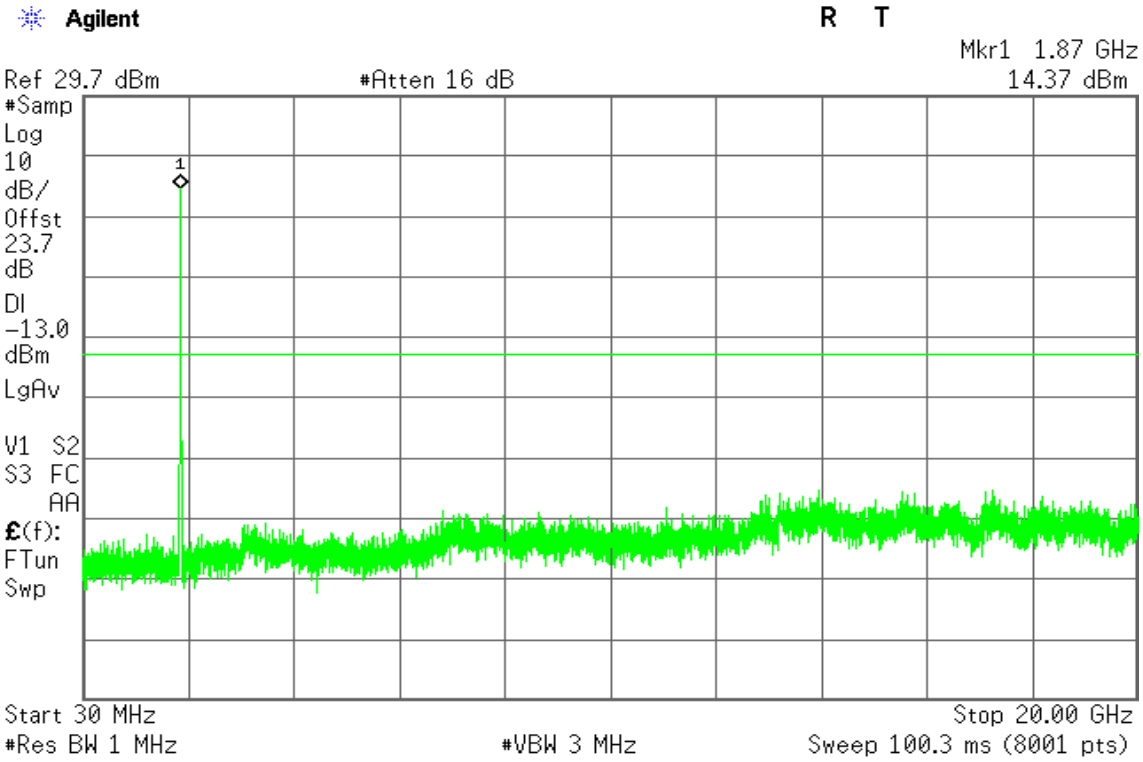


CHANNEL BANDWIDTH: 20MHZ / 16QAM

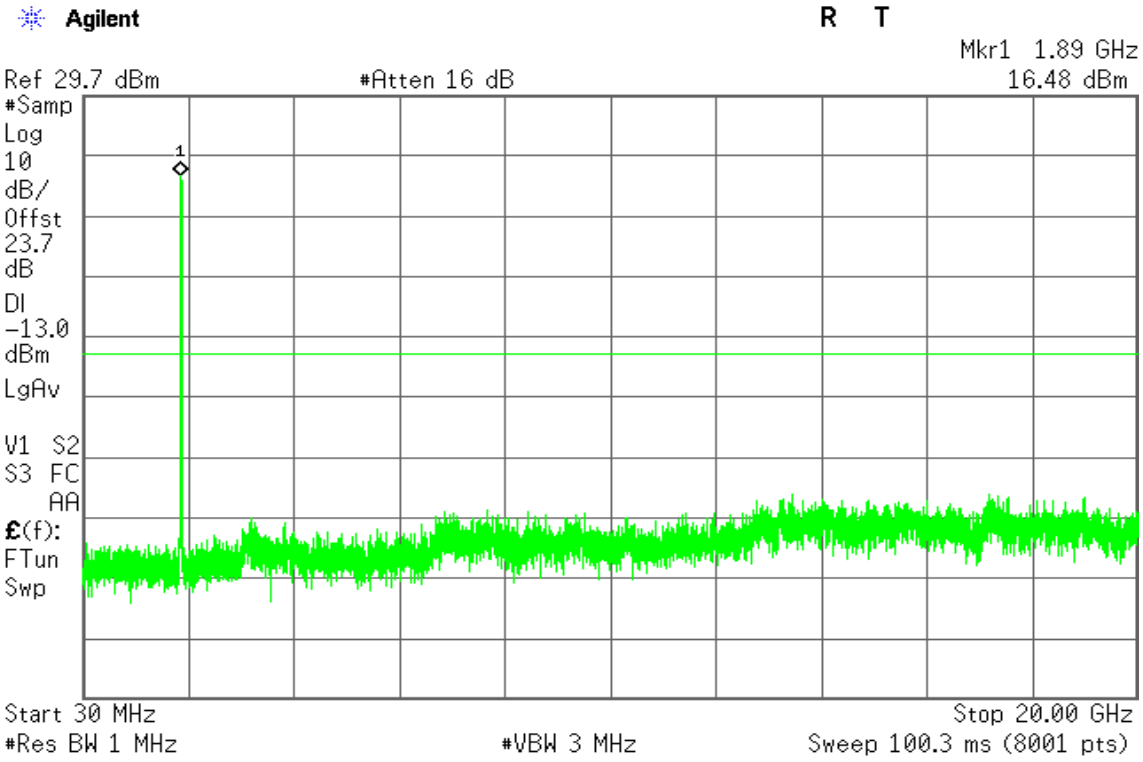
CH LOW



CH MID



CH HIGH



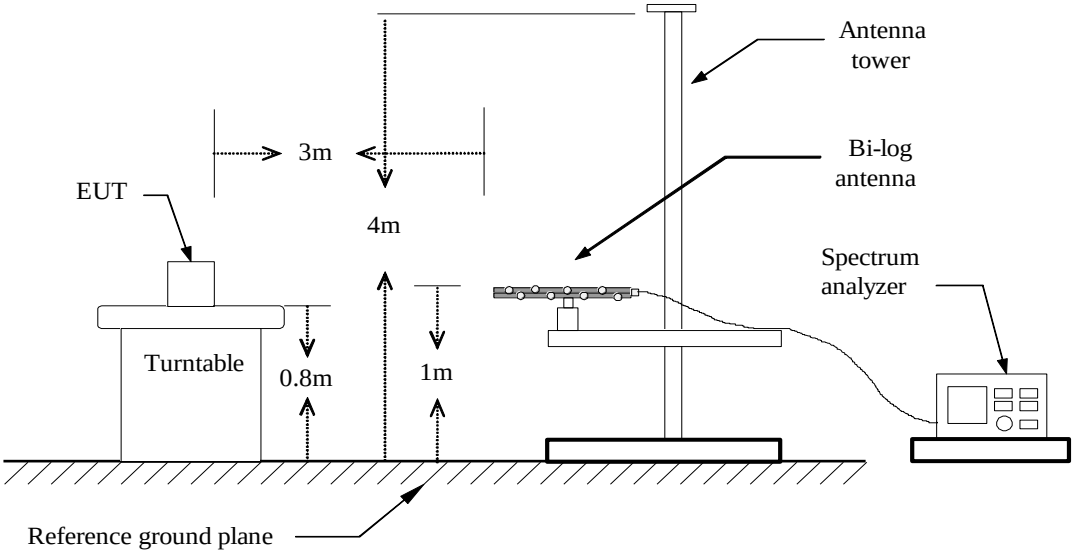
7.8FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

LIMIT

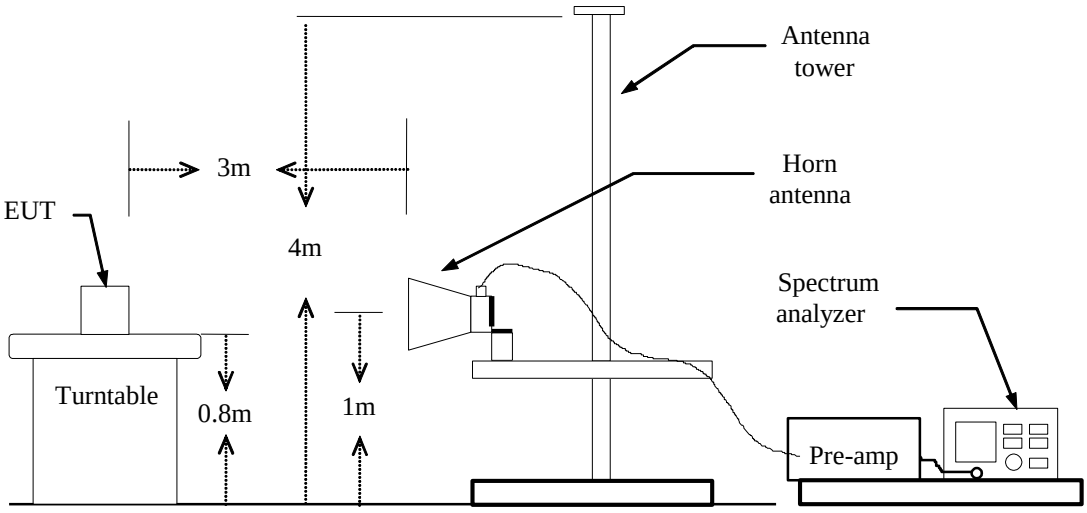
According to FCC §2.1053, RSS-132 (4.6) & RSS-133 (6.5).

Test Configuration

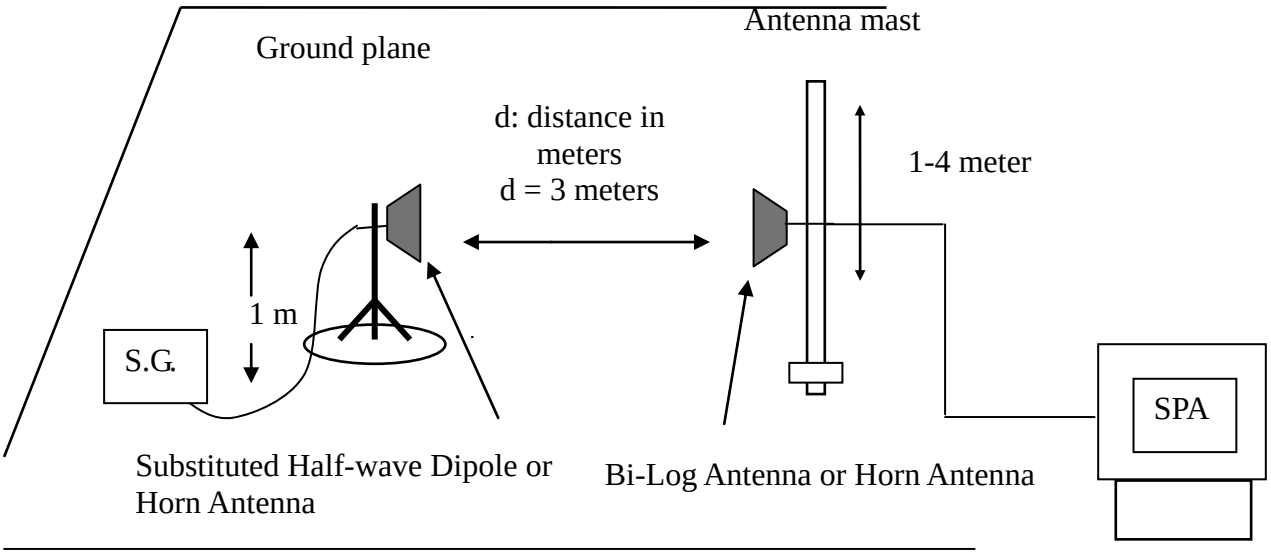
Below 1 GHz



Above 1 GHz



Substituted Method Test Set-up



TEST PROCEDURE

The EUT was placed on a non-conductive, the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

TEST RESULTS

Refer to the attached tabular data sheets.

Test Results

Below 1GHz

LTE Band 2 / channel bandwidth: 5MHz / QPSK

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26℃ **Tested by:** Dennis Li

Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
64.9200	-57	0.92	-1.98	-59.90	-13.00	-46.90	V
232.7300	-64.18	1.8	5.39	-60.59	-13.00	-47.59	V
299.6600	-65	2.09	5.59	-61.50	-13.00	-48.50	V
512.0900	-72.4	2.69	6.02	-69.07	-13.00	-56.07	V
624.6100	-74.27	2.96	6.15	-71.08	-13.00	-58.08	V
896.2100	-69.97	3.51	6.65	-66.83	-13.00	-53.83	V
98.8700	-47.42	1.14	-0.21	-48.77	-13.00	-35.77	H
232.7300	-61.61	1.8	5.39	-58.02	-13.00	-45.02	H
299.6600	-60.41	2.09	5.59	-56.91	-13.00	-43.91	H
384.0500	-64.81	2.31	5.99	-61.13	-13.00	-48.13	H
624.6100	-69.27	2.96	6.15	-66.08	-13.00	-53.08	H
896.2100	-63.17	3.51	6.65	-60.03	-13.00	-47.03	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
62.9800	-56.59	0.9	-2.06	-59.55	-13.00	-46.55	V
132.8200	-54.62	1.36	-1.07	-57.05	-13.00	-44.05	V
299.6600	-64.76	2.09	5.59	-61.26	-13.00	-48.26	V
512.0900	-69.38	2.69	6.02	-66.05	-13.00	-53.05	V
624.6100	-74.15	2.96	6.15	-70.96	-13.00	-57.96	V
896.2100	-69.5	3.51	6.65	-66.36	-13.00	-53.36	V
98.8700	-47.78	1.14	-0.21	-49.13	-13.00	-36.13	H
232.7300	-61.64	1.8	5.39	-58.05	-13.00	-45.05	H
299.6600	-60.29	2.09	5.59	-56.79	-13.00	-43.79	H
366.5900	-63.82	2.29	5.77	-60.34	-13.00	-47.34	H
624.6100	-69.19	2.96	6.15	-66.00	-13.00	-53.00	H
896.2100	-63.79	3.51	6.65	-60.65	-13.00	-47.65	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
63.9500	-56.02	0.91	-2.02	-58.95	-13.00	-45.95	V
132.8200	-55.37	1.36	-1.07	-57.80	-13.00	-44.80	V
299.6600	-65.24	2.09	5.59	-61.74	-13.00	-48.74	V
512.0900	-70.21	2.69	6.02	-66.88	-13.00	-53.88	V
640.1300	-74.2	3.01	6.13	-71.08	-13.00	-58.08	V
896.2100	-69.17	3.51	6.65	-66.03	-13.00	-53.03	V
98.8700	-48.38	1.14	-0.21	-49.73	-13.00	-36.73	H
232.7300	-60.28	1.8	5.39	-56.69	-13.00	-43.69	H
298.6900	-60.46	2.09	5.57	-56.98	-13.00	-43.98	H
366.5900	-64.44	2.29	5.77	-60.96	-13.00	-47.96	H
624.6100	-68.93	2.96	6.15	-65.74	-13.00	-52.74	H
896.2100	-62.5	3.51	6.65	-59.36	-13.00	-46.36	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 10MHz / QPSK

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
98.8700	-54.18	1.14	-0.21	-55.53	-13.00	-42.53	V
163.8600	-60.76	1.51	1.83	-60.44	-13.00	-47.44	V
266.6800	-66.19	1.96	5.27	-62.88	-13.00	-49.88	V
415.0900	-67.91	2.45	5.86	-64.50	-13.00	-51.50	V
512.0900	-67.95	2.69	6.02	-64.62	-13.00	-51.62	V
896.2100	-66.59	3.51	6.65	-63.45	-13.00	-50.45	V
99.8400	-53.57	1.15	-0.37	-55.09	-13.00	-42.09	H
163.8600	-55.96	1.51	1.83	-55.64	-13.00	-42.64	H
265.7100	-61.49	1.95	5.32	-58.12	-13.00	-45.12	H
366.5900	-64.08	2.29	5.77	-60.60	-13.00	-47.60	H
624.6100	-66.09	2.96	6.15	-62.90	-13.00	-49.90	H
896.2100	-65.87	3.51	6.65	-62.73	-13.00	-49.73	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
94.0200	-54.79	1.12	0.58	-55.33	-13.00	-42.33	V
160.9500	-60.95	1.49	1.5	-60.94	-13.00	-47.94	V
265.7100	-65.43	1.95	5.32	-62.06	-13.00	-49.06	V
347.1900	-67.14	2.21	5.8	-63.55	-13.00	-50.55	V
512.0900	-63.61	2.69	6.02	-60.28	-13.00	-47.28	V
896.2100	-66.03	3.51	6.65	-62.89	-13.00	-49.89	V
99.8400	-53.34	1.15	-0.37	-54.86	-13.00	-41.86	H
162.8900	-56.45	1.51	1.72	-56.24	-13.00	-43.24	H
299.6600	-61.91	2.09	5.59	-58.41	-13.00	-45.41	H
399.5700	-68.34	2.39	5.98	-64.75	-13.00	-51.75	H
624.6100	-65.57	2.96	6.15	-62.38	-13.00	-49.38	H
896.2100	-65.07	3.51	6.65	-61.93	-13.00	-48.93	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
94.0200	-54.26	1.12	0.58	-54.80	-13.00	-41.80	V
161.9200	-60.55	1.5	1.61	-60.44	-13.00	-47.44	V
331.6700	-68.2	2.16	5.72	-64.64	-13.00	-51.64	V
512.0900	-67.64	2.69	6.02	-64.31	-13.00	-51.31	V
624.6100	-70.78	2.96	6.15	-67.59	-13.00	-54.59	V
896.2100	-65.62	3.51	6.65	-62.48	-13.00	-49.48	V
90.1400	-55.05	1.11	1.07	-55.09	-13.00	-42.09	H
163.8600	-55.46	1.51	1.83	-55.14	-13.00	-42.14	H
299.6600	-61.28	2.09	5.59	-57.78	-13.00	-44.78	H
365.6200	-63.36	2.29	5.76	-59.89	-13.00	-46.89	H
624.6100	-66.01	2.96	6.15	-62.82	-13.00	-49.82	H
896.2100	-65.15	3.51	6.65	-62.01	-13.00	-49.01	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 20MHz / QPSK

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
62.9800	-55.79	0.9	-2.06	-58.75	-13.00	-45.75	V
132.8200	-54.34	1.36	-1.07	-56.77	-13.00	-43.77	V
232.7300	-62.37	1.8	5.39	-58.78	-13.00	-45.78	V
332.6400	-63.45	2.16	5.73	-59.88	-13.00	-46.88	V
512.0900	-69.96	2.69	6.02	-66.63	-13.00	-53.63	V
896.2100	-69.2	3.51	6.65	-66.06	-13.00	-53.06	V
98.8700	-47.22	1.14	-0.21	-48.57	-13.00	-35.57	H
232.7300	-61.34	1.8	5.39	-57.75	-13.00	-44.75	H
299.6600	-59.49	2.09	5.59	-55.99	-13.00	-42.99	H
364.6500	-63.45	2.28	5.75	-59.98	-13.00	-46.98	H
512.0900	-68.89	2.69	6.02	-65.56	-13.00	-52.56	H
624.6100	-68.7	2.96	6.15	-65.51	-13.00	-52.51	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
66.8600	-56.92	0.93	-1.89	-59.74	-13.00	-46.74	V
132.8200	-54.97	1.36	-1.07	-57.40	-13.00	-44.40	V
232.7300	-63.04	1.8	5.39	-59.45	-13.00	-46.45	V
332.6400	-65.78	2.16	5.73	-62.21	-13.00	-49.21	V
512.0900	-71.84	2.69	6.02	-68.51	-13.00	-55.51	V
624.6100	-73.26	2.96	6.15	-70.07	-13.00	-57.07	V
98.8700	-46.38	1.14	-0.21	-47.73	-13.00	-34.73	H
232.7300	-61.41	1.8	5.39	-57.82	-13.00	-44.82	H
299.6600	-59.77	2.09	5.59	-56.27	-13.00	-43.27	H
365.6200	-63.55	2.29	5.76	-60.08	-13.00	-47.08	H
512.0900	-68.54	2.69	6.02	-65.21	-13.00	-52.21	H
896.2100	-62.34	3.51	6.65	-59.20	-13.00	-46.20	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
65.8900	-54.71	0.93	-1.93	-57.57	-13.00	-44.57	V
132.8200	-53.79	1.36	-1.07	-56.22	-13.00	-43.22	V
232.7300	-61.56	1.8	5.39	-57.97	-13.00	-44.97	V
331.6700	-64.1	2.16	5.72	-60.54	-13.00	-47.54	V
512.0900	-68.14	2.69	6.02	-64.81	-13.00	-51.81	V
624.6100	-71.85	2.96	6.15	-68.66	-13.00	-55.66	V
98.8700	-46.16	1.14	-0.21	-47.51	-13.00	-34.51	H
232.7300	-58.98	1.8	5.39	-55.39	-13.00	-42.39	H
298.6900	-57.79	2.09	5.57	-54.31	-13.00	-41.31	H
365.6200	-62.17	2.29	5.76	-58.70	-13.00	-45.70	H
512.0900	-67.14	2.69	6.02	-63.81	-13.00	-50.81	H
640.1300	-63.59	3.01	6.13	-60.47	-13.00	-47.47	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 5MHz / 16QAM

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26℃ **Tested by:** Dennis Li

Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-54.86	1.36	-1.07	-57.29	-13.00	-44.29	V
298.6900	-65.82	2.09	5.57	-62.34	-13.00	-49.34	V
415.0900	-68.88	2.45	5.86	-65.47	-13.00	-52.47	V
512.0900	-64.78	2.69	6.02	-61.45	-13.00	-48.45	V
666.3200	-73.22	3.07	6.3	-69.99	-13.00	-56.99	V
896.2100	-69.14	3.51	6.65	-66.00	-13.00	-53.00	V
60.0700	-50.77	0.88	-2.19	-53.84	-13.00	-40.84	H
232.7300	-63.45	1.8	5.39	-59.86	-13.00	-46.86	H
348.1600	-67.22	2.22	5.8	-63.64	-13.00	-50.64	H
512.0900	-70.12	2.69	6.02	-66.79	-13.00	-53.79	H
640.1300	-66.6	3.01	6.13	-63.48	-13.00	-50.48	H
896.2100	-64.66	3.51	6.65	-61.52	-13.00	-48.52	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-54.52	1.36	-1.07	-56.95	-13.00	-43.95	V
212.3600	-68.36	1.7	5.41	-64.65	-13.00	-51.65	V
299.6600	-65.42	2.09	5.59	-61.92	-13.00	-48.92	V
512.0900	-65.44	2.69	6.02	-62.11	-13.00	-49.11	V
666.3200	-73.25	3.07	6.3	-70.02	-13.00	-57.02	V
896.2100	-69.76	3.51	6.65	-66.62	-13.00	-53.62	V
98.8700	-52.66	1.14	-0.21	-54.01	-13.00	-41.01	H
173.5600	-58.62	1.58	2.9	-57.30	-13.00	-44.30	H
255.0400	-59.43	1.87	5.65	-55.65	-13.00	-42.65	H
384.0500	-65.96	2.31	5.99	-62.28	-13.00	-49.28	H
640.1300	-66.5	3.01	6.13	-63.38	-13.00	-50.38	H
896.2100	-64.54	3.51	6.65	-61.40	-13.00	-48.40	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-54.17	1.36	-1.07	-56.60	-13.00	-43.60	V
299.6600	-65.73	2.09	5.59	-62.23	-13.00	-49.23	V
415.0900	-69.54	2.45	5.86	-66.13	-13.00	-53.13	V
512.0900	-62.45	2.69	6.02	-59.12	-13.00	-46.12	V
666.3200	-73.28	3.07	6.3	-70.05	-13.00	-57.05	V
896.2100	-69.57	3.51	6.65	-66.43	-13.00	-53.43	V
98.8700	-53.26	1.14	-0.21	-54.61	-13.00	-41.61	H
232.7300	-63.54	1.8	5.39	-59.95	-13.00	-46.95	H
298.6900	-63.87	2.09	5.57	-60.39	-13.00	-47.39	H
504.3300	-70.67	2.7	5.94	-67.43	-13.00	-54.43	H
640.1300	-66.86	3.01	6.13	-63.74	-13.00	-50.74	H
896.2100	-65.23	3.51	6.65	-62.09	-13.00	-49.09	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 10MHz / 16QAM

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-54.23	1.36	-1.07	-56.66	-13.00	-43.66	V
214.3000	-68.28	1.72	5.38	-64.62	-13.00	-51.62	V
299.6600	-65.89	2.09	5.59	-62.39	-13.00	-49.39	V
512.0900	-62.68	2.69	6.02	-59.35	-13.00	-46.35	V
624.6100	-72.08	2.96	6.15	-68.89	-13.00	-55.89	V
896.2100	-69.64	3.51	6.65	-66.50	-13.00	-53.50	V
98.8700	-52.18	1.14	-0.21	-53.53	-13.00	-40.53	H
232.7300	-63.21	1.8	5.39	-59.62	-13.00	-46.62	H
299.6600	-63.93	2.09	5.59	-60.43	-13.00	-47.43	H
353.9800	-67.32	2.25	5.76	-63.81	-13.00	-50.81	H
640.1300	-66.9	3.01	6.13	-63.78	-13.00	-50.78	H
896.2100	-64.9	3.51	6.65	-61.76	-13.00	-48.76	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-54.69	1.36	-1.07	-57.12	-13.00	-44.12	V
216.2400	-67.87	1.74	5.36	-64.25	-13.00	-51.25	V
299.6600	-66.05	2.09	5.59	-62.55	-13.00	-49.55	V
512.0900	-64.58	2.69	6.02	-61.25	-13.00	-48.25	V
663.4100	-73.22	3.06	6.3	-69.98	-13.00	-56.98	V
896.2100	-70	3.51	6.65	-66.86	-13.00	-53.86	V
98.8700	-52.93	1.14	-0.21	-54.28	-13.00	-41.28	H
232.7300	-63.44	1.8	5.39	-59.85	-13.00	-46.85	H
299.6600	-63.98	2.09	5.59	-60.48	-13.00	-47.48	H
504.3300	-70.12	2.7	5.94	-66.88	-13.00	-53.88	H
640.1300	-67.3	3.01	6.13	-64.18	-13.00	-51.18	H
896.2100	-64.98	3.51	6.65	-61.84	-13.00	-48.84	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-54.59	1.36	-1.07	-57.02	-13.00	-44.02	V
213.3300	-67.46	1.71	5.4	-63.77	-13.00	-50.77	V
299.6600	-65.45	2.09	5.59	-61.95	-13.00	-48.95	V
512.0900	-65.26	2.69	6.02	-61.93	-13.00	-48.93	V
663.4100	-73.42	3.06	6.3	-70.18	-13.00	-57.18	V
896.2100	-69.96	3.51	6.65	-66.82	-13.00	-53.82	V
98.8700	-53.09	1.14	-0.21	-54.44	-13.00	-41.44	H
232.7300	-63.38	1.8	5.39	-59.79	-13.00	-46.79	H
299.6600	-64.02	2.09	5.59	-60.52	-13.00	-47.52	H
512.0900	-69.42	2.69	6.02	-66.09	-13.00	-53.09	H
640.1300	-66.82	3.01	6.13	-63.70	-13.00	-50.70	H
896.2100	-64.24	3.51	6.65	-61.10	-13.00	-48.10	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 20MHz / 16QAM

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-53.9	1.36	-1.07	-56.33	-13.00	-43.33	V
250.1900	-69.15	1.84	5.68	-65.31	-13.00	-52.31	V
299.6600	-66.07	2.09	5.59	-62.57	-13.00	-49.57	V
512.0900	-65.35	2.69	6.02	-62.02	-13.00	-49.02	V
666.3200	-73.69	3.07	6.3	-70.46	-13.00	-57.46	V
896.2100	-69.63	3.51	6.65	-66.49	-13.00	-53.49	V
98.8700	-52.91	1.14	-0.21	-54.26	-13.00	-41.26	H
232.7300	-62.78	1.8	5.39	-59.19	-13.00	-46.19	H
298.6900	-64.47	2.09	5.57	-60.99	-13.00	-47.99	H
346.2200	-67.52	2.21	5.8	-63.93	-13.00	-50.93	H
640.1300	-67.47	3.01	6.13	-64.35	-13.00	-51.35	H
896.2100	-65.21	3.51	6.65	-62.07	-13.00	-49.07	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
132.8200	-54.43	1.36	-1.07	-56.86	-13.00	-43.86	V
299.6600	-65.8	2.09	5.59	-62.30	-13.00	-49.30	V
415.0900	-69.49	2.45	5.86	-66.08	-13.00	-53.08	V
512.0900	-63.87	2.69	6.02	-60.54	-13.00	-47.54	V
666.3200	-73.01	3.07	6.3	-69.78	-13.00	-56.78	V
896.2100	-69.45	3.51	6.65	-66.31	-13.00	-53.31	V
98.8700	-52.74	1.14	-0.21	-54.09	-13.00	-41.09	H
232.7300	-63.89	1.8	5.39	-60.30	-13.00	-47.30	H
299.6600	-64.16	2.09	5.59	-60.66	-13.00	-47.66	H
504.3300	-70.73	2.7	5.94	-67.49	-13.00	-54.49	H
640.1300	-66.67	3.01	6.13	-63.55	-13.00	-50.55	H
896.2100	-65.81	3.51	6.65	-62.67	-13.00	-49.67	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
98.8700	-58.48	1.14	-0.21	-59.83	-13.00	-46.83	V
299.6600	-66.42	2.09	5.59	-62.92	-13.00	-49.92	V
384.0500	-69.37	2.31	5.99	-65.69	-13.00	-52.69	V
512.0900	-65.6	2.69	6.02	-62.27	-13.00	-49.27	V
624.6100	-71.7	2.96	6.15	-68.51	-13.00	-55.51	V
896.2100	-69.43	3.51	6.65	-66.29	-13.00	-53.29	V
98.8700	-53.04	1.14	-0.21	-54.39	-13.00	-41.39	H
232.7300	-63.58	1.8	5.39	-59.99	-13.00	-46.99	H
299.6600	-63.84	2.09	5.59	-60.34	-13.00	-47.34	H
504.3300	-71.46	2.7	5.94	-68.22	-13.00	-55.22	H
640.1300	-67.04	3.01	6.13	-63.92	-13.00	-50.92	H
896.2100	-65.68	3.51	6.65	-62.54	-13.00	-49.54	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor*

Above 1GHz

LTE Band 2 / channel bandwidth: 5MHz / QPSK

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3702.000	-44.94	8.2	9.1	-44.04	-13.00	-31.04	V
5557.000	-48.55	10.08	10.81	-47.82	-13.00	-34.82	V
N/A							
3709.000	-43	8.21	9.11	-42.10	-13.00	-29.10	H
5557.000	-47.74	10.08	10.81	-47.01	-13.00	-34.01	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3765.000	-41.77	8.24	9.16	-40.85	-13.00	-27.85	V
5641.000	-51.95	10.18	10.83	-51.30	-13.00	-38.30	V
N/A							
3758.000	-41.23	8.23	9.16	-40.30	-13.00	-27.30	H
5641.000	-50.3	10.18	10.83	-49.65	-13.00	-36.65	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3814.000	-40.16	8.28	9.21	-39.23	-13.00	-26.23	V
5725.000	-52.13	10.22	10.84	-51.51	-13.00	-38.51	V
N/A							
3814.000	-40.21	8.28	9.21	-39.28	-13.00	-26.28	H
5725.000	-46.95	10.22	10.84	-46.33	-13.00	-33.33	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 10MHz / QPSK

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1406.000	-52.32	4.65	5.62	-51.35	-13.00	-38.35	V
3702.000	-48.75	8.2	9.1	-47.85	-13.00	-34.85	V
5564.000	-51.93	10.1	10.81	-51.22	-13.00	-38.22	V
N/A							
1406.000	-51.96	4.65	5.62	-50.99	-13.00	-37.99	H
3310.000	-51.79	7.47	8.33	-50.93	-13.00	-37.93	H
5571.000	-51.91	10.12	10.81	-51.22	-13.00	-38.22	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1406.000	-52.08	4.65	5.62	-51.11	-13.00	-38.11	V
3758.000	-47.67	8.23	9.16	-46.74	-13.00	-33.74	V
5634.000	-51.01	10.18	10.83	-50.36	-13.00	-37.36	V
N/A							
1406.000	-50.09	4.65	5.62	-49.12	-13.00	-36.12	H
3310.000	-51.28	7.47	8.33	-50.42	-13.00	-37.42	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1406.000	-53.36	4.65	5.62	-52.39	-13.00	-39.39	V
3807.000	-46.29	8.27	9.21	-45.35	-13.00	-32.35	V
5718.000	-52.86	10.21	10.84	-52.23	-13.00	-39.23	V
N/A							
1406.000	-51.67	4.65	5.62	-50.70	-13.00	-37.70	H
3814.000	-50.73	8.28	9.21	-49.80	-13.00	-36.80	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 20MHz / QPSK

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3723.000	-48.6	8.21	9.12	-47.69	-13.00	-34.69	V
5578.000	-53.01	10.13	10.82	-52.32	-13.00	-39.32	V
N/A							
3723.000	-47.57	8.21	9.12	-46.66	-13.00	-33.66	H
5578.000	-52.32	10.13	10.82	-51.63	-13.00	-38.63	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3772.000	-46.1	8.24	9.17	-45.17	-13.00	-32.17	V
5627.000	-54.54	10.18	10.83	-53.89	-13.00	-40.89	V
N/A							
3758.000	-46.38	8.23	9.16	-45.45	-13.00	-32.45	H
5627.000	-53.89	10.18	10.83	-53.24	-13.00	-40.24	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3800.000	-46.08	8.26	9.2	-45.14	-13.00	-32.14	V
5515.000	-56.25	9.98	10.8	-55.43	-13.00	-42.43	V
N/A							
3800.000	-46.96	8.26	9.2	-46.02	-13.00	-33.02	H
5718.000	-53.8	10.21	10.84	-53.17	-13.00	-40.17	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 5MHz / 16QAM

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3702.000	-45.78	8.2	9.1	-44.88	-13.00	-31.88	V
5557.000	-49.57	10.08	10.81	-48.84	-13.00	-35.84	V
N/A							
3702.000	-44.26	8.2	9.1	-43.36	-13.00	-30.36	H
5557.000	-47.34	10.08	10.81	-46.61	-13.00	-33.61	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3758.000	-42.79	8.23	9.16	-41.86	-13.00	-28.86	V
5641.000	-52.68	10.18	10.83	-52.03	-13.00	-39.03	V
N/A							
3758.000	-42.72	8.23	9.16	-41.79	-13.00	-28.79	H
5641.000	-50.64	10.18	10.83	-49.99	-13.00	-36.99	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3814.000	-39.54	8.28	9.21	-38.61	-13.00	-25.61	V
5725.000	-52.36	10.22	10.84	-51.74	-13.00	-38.74	V
N/A							
3814.000	-40.74	8.28	9.21	-39.81	-13.00	-26.81	H
5718.000	-47.77	10.21	10.84	-47.14	-13.00	-34.14	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 10MHz / 16QAM

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3709.000	-48.79	8.21	9.11	-47.89	-13.00	-34.89	V
5564.000	-52.41	10.1	10.81	-51.70	-13.00	-38.70	V
N/A							
3709.000	-47.08	8.21	9.11	-46.18	-13.00	-33.18	H
5564.000	-49.32	10.1	10.81	-48.61	-13.00	-35.61	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3765.000	-45.13	8.24	9.16	-44.21	-13.00	-31.21	V
5634.000	-55.12	10.18	10.83	-54.47	-13.00	-41.47	V
N/A							
3758.000	-44.6	8.23	9.16	-43.67	-13.00	-30.67	H
5648.000	-53.97	10.18	10.83	-53.32	-13.00	-40.32	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3807.000	-44.09	8.27	9.21	-43.15	-13.00	-30.15	V
5711.000	-55.33	10.19	10.84	-54.68	-13.00	-41.68	V
N/A							
3814.000	-42.86	8.28	9.21	-41.93	-13.00	-28.93	H
5711.000	-51.09	10.19	10.84	-50.44	-13.00	-37.44	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

LTE Band 2 / channel bandwidth: 20MHz / 16QAM

Operation Mode: Tx / Low channel **Test Date:** May 6, 2014

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3723.000	-50.96	8.21	9.12	-50.05	-13.00	-37.05	V
5571.000	-52.46	10.12	10.81	-51.77	-13.00	-38.77	V
N/A							
3716.000	-49.4	8.21	9.12	-48.49	-13.00	-35.49	H
5571.000	-54.07	10.12	10.81	-53.38	-13.00	-40.38	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / Middle channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1406.000	-55.05	4.65	5.62	-54.08	-13.00	-41.08	V
3758.000	-48.03	8.23	9.16	-47.10	-13.00	-34.10	V
N/A							
3751.000	-47.46	8.23	9.15	-46.54	-13.00	-33.54	H
5648.000	-55.23	10.18	10.83	-54.58	-13.00	-41.58	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

Operation Mode: Tx / High channel **Test Date:** May 6, 2014
Temperature: 26°C **Tested by:** Dennis Li
Humidity: 60 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3800.000	-48	8.26	9.2	-47.06	-13.00	-34.06	V
5144.000	-56.27	9.5	10.66	-55.11	-13.00	-42.11	V
N/A							
3800.000	-48.55	8.26	9.2	-47.61	-13.00	-34.61	H
5704.000	-55.11	10.17	10.84	-54.44	-13.00	-41.44	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*