ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 24 SUBPART E, PART27 SUBPART C & SUBPART L REQUIREMENT

OF

Product Name:	**SM4401**
Brand Name:	**Novatel Wireless**
Model No.:	**SM4401**
Model Difference:	**N/A**
FCC ID:	**PKRNVWSM4401**
Report No.:	**ER/2016/30071**
Issue Date:	**Apr. 28, 2016**
FCC Rule Part:	**2 , 24E, 27C & L**
Prepared for:	**Novatel Wireless, Inc. 9645 Scranton Road, San Diego, CA. 92121, USA**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803**

VERIFICATION OF COMPLIANCE

Applicant:	Novatel Wireless, Inc. 9645 Scranton Road, San Diego, CA. 92121, USA
Product Name:	SM4401
Brand Name:	Novatel Wireless
Model No.:	SM4401
Model Difference:	N/A
FCC ID:	PKRNVWSM4401
Report Number:	ER/2016/30071
Date of test:	Mar. 21, 2016 ~ Apr. 28, 2016
Date of EUT Received:	Mar. 21, 2016

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory 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-D-2010 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

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

Test By:	Louis Chen	***Date:***	Apr. 28, 2016
	Louis Chen / Engineer		
Prepared By:	Allen Tsai	***Date:***	Apr. 28, 2016
	Allen Tsai / Engineer		
Approved By:	Jim Chang	***Date:***	Apr. 28, 2016
	Jim Chang / Asst. Manager		

Revision History

Report Number	Revision	Description	Issue Date
ER/2016/30071	Rev.00	Initial creation of document	Apr. 28, 2016

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1. GENERAL PRODUCT INFORMATION

1.1. Product Description

General:

Product Name:	SM4401
Brand Name:	Novatel Wireless
Model No.:	SM4401
Model Difference:	N/A
Product SW version:	N/A
Product HW version:	P3
Power Supply:	5 Vdc from AC/DC power supply.
IMEI:	990006365000780

LTE:

	Operating Frequency		Rated Power
Cellular Phone Standards Frequency Range and Power	LTE-Band 2 (Bandwidth 5MHz)	1852.5MHz – 1907.5MHz	23dBm
	LTE-Band 2 (Bandwidth 10MHz)	1855.0MHz – 1905.0MHz	23dBm
	LTE-Band 2 (Bandwidth 15MHz)	1857.5MHz – 1902.5MHz	23dBm
	LTE-Band 2 (Bandwidth 20MHz)	1860.0MHz – 1900.0MHz	23dBm
	LTE-Band 4 (Bandwidth 5MHz)	1712.5MHz – 1752.5MHz	23dBm
	LTE-Band 4 (Bandwidth 10MHz)	1715.0MHz – 1750.0MHz	23dBm
	LTE-Band 4 (Bandwidth 15MHz)	1717.5MHz – 1747.5MHz	23dBm
	LTE-Band 4 (Bandwidth 20MHz)	1720.0MHz – 1745.0MHz	23dBm
	LTE-Band 13 (Bandwidth 5MHz)	779.5MHz – 784.5MHz	23 dBm
	LTE-Band 13 (Bandwidth 10MHz)	782.0MHz – 782.0MHz	23 dBm

Type of Emission

LTE Band	BW (MHz)	Modulation	Type of Emission
LTE Band 2	5	QPSK	4M51G7D
LTE Band 2	5	16QAM	4M50D7W
LTE Band 2	10	QPSK	9M00G7D
LTE Band 2	10	16QAM	8M99D7W
LTE Band 2	15	QPSK	13M5G7D
LTE Band 2	15	16QAM	13M5D7W
LTE Band 2	20	QPSK	18M0G7D
LTE Band 2	20	16QAM	18M0D7W
LTE Band 4	5	QPSK	4M51G7D
LTE Band 4	5	16QAM	4M49D7W
LTE Band 4	10	QPSK	9M00G7D
LTE Band 4	10	16QAM	9M00D7W
LTE Band 4	15	QPSK	13M5G7D
LTE Band 4	15	16QAM	13M5D7W
LTE Band 4	20	QPSK	18M0G7D
LTE Band 4	20	16QAM	18M0D7W
LTE Band 13	5	QPSK	4M50G7D
LTE Band 13	5	16QAM	4M51D7W
LTE Band 13	10	QPSK	8M99G7D
LTE Band 13	10	16QAM	8M94D7W

Max ERP/EIRP measurement result:

LTE Band	Bandwidth	Modulation	(dBm)	ERP / EIRP	(W)
LTE Band 2	5MHz	QPSK	24.22	EIRP	0.264
LTE Band 2	5MHz	16QAM	24.15	EIRP	0.260
LTE Band 2	10MHz	QPSK	24.51	EIRP	0.282
LTE Band 2	10MHz	16QAM	25.28	EIRP	0.337
LTE Band 2	15MHz	QPSK	26.03	EIRP	0.401
LTE Band 2	15MHz	16QAM	26.06	EIRP	0.404
LTE Band 2	20MHz	QPSK	24.42	EIRP	0.277
LTE Band 2	20MHz	16QAM	23.96	EIRP	0.249
LTE Band 4	5MHz	QPSK	27.59	EIRP	0.574
LTE Band 4	5MHz	16QAM	27.59	EIRP	0.574
LTE Band 4	10MHz	QPSK	27.57	EIRP	0.571
LTE Band 4	10MHz	16QAM	27.64	EIRP	0.581
LTE Band 4	15MHz	QPSK	27.08	EIRP	0.511
LTE Band 4	15MHz	16QAM	27.00	EIRP	0.501
LTE Band 4	20MHz	QPSK	26.63	EIRP	0.460
LTE Band 4	20MHz	16QAM	26.58	EIRP	0.455
LTE Band 13	5MHz	QPSK	23.01	ERP	0.200
LTE Band 13	5MHz	16QAM	22.97	ERP	0.198
LTE Band 13	10MHz	QPSK	21.78	ERP	0.151
LTE Band 13	10MHz	16QAM	22.11	ERP	0.163

1.2. Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) is supporting LTE features, and below is details of information.

Product Feature	
Product Name:	SM4401
Brand Name:	Novatel Wireless
Model No.:	SM4401
Model Difference:	N/A
FCC ID:	PKRNVWSM4401
LTE Operating Band(s)	FCC Band 2 / 4 / 13
LTE Rel. Version	Rel.9

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.3. Test Methodology of Applied Standards

FCC 47 CFR Part 2, 24, 27.

ANSI / TIA / EIA 603D-2010

KDB971168 D01 Power Meas license Digital System

TS 151 010-1 is used to set, and measure the output power.

Note:

1. All test items have been performed and record as per the above standards.
2. The composite system is compliance with FCC Subpart B is authorized under the certification procedure.

1.4. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803, (TAF code 0513)

FCC Registration Numbers are: 509634

1.5. Special Accessories

No special accessories were used during testing.

1.6. Equipment Modifications

There were no modifications incorporated into the EUT.

2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Measurement at Antenna Port

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

According to measurement procured TIA/EIA 603C, The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table 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 max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

2.4. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation example with cable loss and attenuator.

Low Band: Offset = RF cable loss (1dB) + splitter (3.2dB) + attenuator (10dB) = 14.2(dB)

High Band: Offset = RF cable loss (1.5dB) + splitter (3.2dB) + attenuator (10dB) = 14.7(dB)

2.5. Final Amplifier Voltage and Current Information:

Test mode	DC voltage (V)	DC current (mA)
LTE Band 2_5M QPSK	5 Vdc	537
LTE Band 2_5M 16QAM	5 Vdc	543
LTE Band 2_10M QPSK	5 Vdc	533
LTE Band 2_10M 16QAM	5 Vdc	531
LTE Band 2_15M QPSK	5 Vdc	567
LTE Band 2_15M 16QAM	5 Vdc	559
LTE Band 2_20M QPSK	5 Vdc	573
LTE Band 2_20M 16QAM	5 Vdc	567
LTE Band 4_5M QPSK	5 Vdc	503
LTE Band 4_5M 16QAM	5 Vdc	511
LTE Band 4_10M QPSK	5 Vdc	512
LTE Band 4_10M 16QAM	5 Vdc	524
LTE Band 4_15M QPSK	5 Vdc	546
LTE Band 4_15M 16QAM	5 Vdc	541
LTE Band 4_20M QPSK	5 Vdc	538
LTE Band 4_20M 16QAM	5 Vdc	548
LTE Band 13_5M QPSK	5 Vdc	476
LTE Band 13_5M 16QAM	5 Vdc	462
LTE Band 13_10M QPSK	5 Vdc	463
LTE Band 13_10M 16QAM	5 Vdc	454

2.6. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)

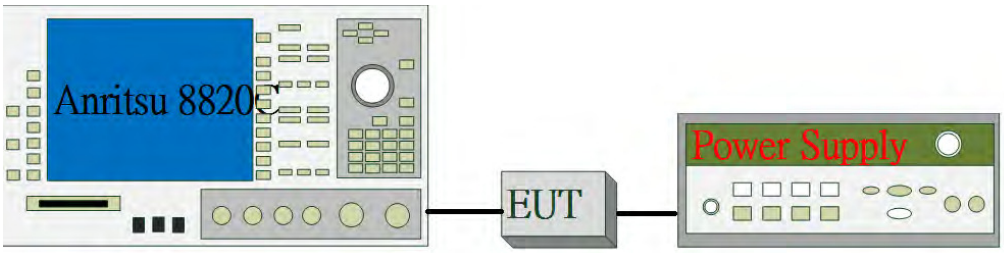
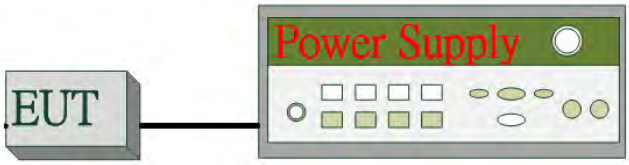


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side

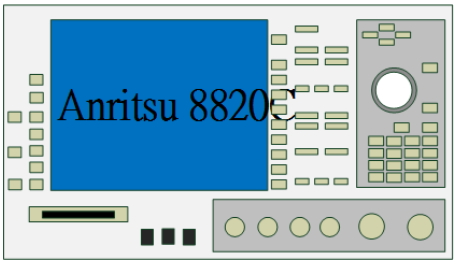


Table 2-1 Equipment Used in

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyzer	Anritsu	8820C	6201107337	shielded	Un-shielded
2.	DC Power Supply	Agilent	E3640A	MY53140006	shielded	Un-shielded
3.	Test Software	N/A	N/A	N/A	N/A	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §24.232(c) §27.50(b)(9) §27.50(d)(4)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051 §24.238(a) §27.53(c)(2), §27.53(c)(4), §27.53(c)(5), §27.53(h)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1051 §24.238(a) §27.53(c)(2), §27.53(c)(4), §27.53(c)(5), §27.53(h)	Field Strength of Spurious Radiation	Compliant
§24.232(d) §27.53(d) (5) §27.50(i) (B)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §24.235 §27.54	Frequency Stability	Compliant

4. DESCRIPTION OF TEST MODES

4.1. The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

BAND	ERP/EIRP	RADIATED EMISSION
LTE Band 2 / 4 / 13	E2-plan	E2-plan

LTE Band 2 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1 RB/ 0,49 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1 RB/ 0,74 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1 RB/ 0,99 RB Offest
FREQUENCY STABILITY	18650 to 19150	18900	10MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	Full RB
PEAK TO AV-ERAGE RATIO	18625 to 19175	18625, 18900, 19175	5MHz	16QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	16QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	16QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	16QAM	Full RB
BAND EDGE	18625 to 19175	18625, 19175	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
	18650 to 19150	18650, 19150	10MHz	QPSK,	1 RB/ 0,49 RB Offest Full RB
	18675 to 19125	18675, 19125	15MHz	QPSK,	1 RB/ 0,74 RB Offest Full RB
	18700 to 19100	18700, 19100	20MHz	QPSK,	1 RB/ 0,99 RB Offest Full RB
CONDCUDETED EMISSION	18625 to 19175	18625, 18900, 19175	5MHz	QPSK,	1 RB, 0 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK,	1 RB, 0 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK,	1 RB, 0 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMISSION	18675 to 19125	18675, 18900, 19125	15MHz	16QAM	1 RB, 0 RB Offest

LTE Band 4 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Off-set
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB/ 0,49 RB Off-set
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB/ 0,74 RB Off-set
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB/ 0,99 RB Off-set
FREQUENCY STABILITY	20000 to 20350	20175	10MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	Full RB
PEAK TO AV-ERAGE RATIO	19975 to 20375	19975, 20175, 20375	5MHz	16QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	16QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	16QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	16QAM	Full RB
BAND EDGE	19975 to 20375	19975, 20375	5MHz	QPSK,	1 RB/ 0,24 RB Off-set Full RB
	20000 to 20350	20000, 20350	10MHz	QPSK,	1 RB/ 0,49 RB Off-set Full RB
	20025 to 20325	20025, 20325	15MHz	QPSK,	1 RB/ 0,74 RB Off-set Full RB
	20050 to 20300	20050, 20300	20MHz	QPSK,	1 RB/ 0,99 RB Off-set Full RB
CONDUCTED EMISSION	19975 to 20375	19975, 20175, 20375	5MHz	QPSK,	1 RB, 0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK,	1 RB, 0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK,	1 RB, 0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK,	1 RB, 0 RB Offset
RADIATED EMISSION	20000 to 20350	20000, 20175, 20350	10MHz	16QAM,	1 RB/ 0 RB Offset

LTE Band 13 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Offset
	23230	23230	10MHz	QPSK, 16QAM	1 RB/ 0,49 RB Offset
FREQUENCY STABILITY	23230	23230	10MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	Full RB
	23230	23230	10MHz	QPSK, 16QAM	Full RB
PEAK TO AV-ERAGE RATIO	23205 to 23255	23205, 23230, 23255	5MHz	16QAM	Full RB
	23230	23230	10MHz	16QAM	Full RB
BAND EDGE	23205 to 23255	23205, 23255	5MHz	QPSK,	1 RB/ 0,24 RB Offset Full RB
	23230	23230	10MHz	QPSK,	1 RB/ 0,49 RB Offset Full RB
CONDCUDETED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,	1 RB, 0 RB Offset
	23230	23230	10MHz	QPSK,	1 RB, 0 RB Offset
RADIATED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK	1 RB, 0 RB Offset

5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1.10 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 4.74dB Horizontal Polarization =+/- 4.62dB
99% Occupied Bandwidth	+/- 5.19 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.70 dB
Peak to Average Ratio	+/- 0.70 dB
Frequency Stability vs. Temperature	+/- 5.19 Hz
Frequency Stability vs. Voltage	+/- 5.19 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : **Vertical**)	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : **Horizontal**)	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

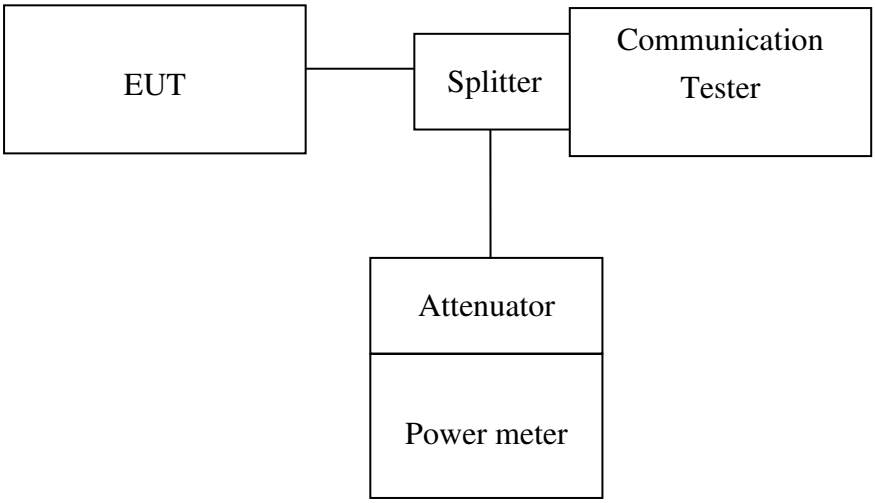
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

6. RF CONDUCTED OUTPUT POWER MEASUREMENT

6.1. Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

6.2. Test Set-up



Note: *Measurement setup for testing on Antenna connector*

6.3. Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results

6.4. Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	09/25/2015	09/24/2016
DC Power Supply	Agilent	E3640A	MY52410006	11/05/2015	11/04/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
CCA,USB-4432	NI	198755E-02L	18F909F	03/03/2016	03/02/2017
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	01/02/2016	01/01/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/06/2015	05/05/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2016	01/01/2017

6.5. Measurement Result

LTE Band 2

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)						
			QPSK			16QAM			
			Channel(Low) 18625	Channel(Mid) 18900	Channel(High) 19175	Channel(Low) 18625	Channel(Mid) 18900	Channel(High) 19175
5	1	0	23.61	**24.09**	23.78	22.21	22.89	22.69
	1	24	23.98	23.95	23.72	22.63	**22.91**	22.21
	12	6	22.94	22.91	23.05	22.01	22.15	21.95
	25	0	22.97	22.85	22.81	22.14	22.04	21.86

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)						
			QPSK			16QAM			
			Channel(Low) 18650	Channel(Mid) 18900	Channel(High) 19150	Channel(Low) 18650	Channel(Mid) 18900	Channel(High) 19150
10	1	0	23.73	24.11	23.71	22.31	**22.93**	22.69
	1	49	**24.15**	23.98	23.77	22.67	22.91	22.26
	25	12	22.81	22.94	23.00	22.01	22.16	21.86
	50	0	23.00	22.87	22.73	22.07	22.03	21.85

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)						
			QPSK			16QAM			
			Channel(Low) 18675	Channel(Mid) 18900	Channel(High) 19125	Channel(Low) 18675	Channel(Mid) 18900	Channel(High) 19125
15	1	0	24.08	**24.59**	24.21	22.35	**22.96**	22.76
	1	74	24.37	24.41	24.02	22.75	**22.96**	22.36
	36	19	23.13	23.06	22.96	22.09	22.25	21.90
	75	0	22.89	23.00	22.90	22.10	22.12	21.87

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)						
			QPSK			16QAM			
			Channel(Low) 18700	Channel(Mid) 18900	Channel(High) 19100	Channel(Low) 18700	Channel(Mid) 18900	Channel(High) 19100
20	1	0	24.12	24.47	**24.57**	22.53	22.75	**23.03**
	1	99	**24.57**	24.51	24.23	22.69	22.84	22.62
	50	25	23.03	23.09	22.82	22.13	22.31	21.82
	100	0	22.67	22.32	22.28	22.11	22.21	21.89

LTE Band 4

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz								
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)					
			QPSK			16QAM		
			Channel(Low) 19975	Channel(Mid) 20175	Channel(High) 20375	Channel(Low) 19975	Channel(Mid) 20175	Channel(High) 20375
5	1	0	23.61	23.90	**24.19**	22.37	**22.50**	22.47
	1	24	23.92	23.50	23.74	22.41	22.35	21.57
	12	6	22.87	22.18	22.85	21.77	21.76	21.57
	25	0	22.61	22.23	22.65	21.56	21.71	21.59

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz								
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)					
			QPSK			16QAM		
			Channel(Low) 20000	Channel(Mid) 20175	Channel(High) 20350	Channel(Low) 20000	Channel(Mid) 20175	Channel(High) 20350
10	1	0	23.72	24.08	24.11	22.48	22.71	22.45
	1	49	**24.25**	23.99	23.70	22.27	**22.80**	22.24
	25	12	23.02	22.55	22.99	21.53	21.75	21.72
	50	0	22.86	22.66	22.69	21.49	21.76	21.64

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz								
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)					
			QPSK			16QAM		
			Channel(Low) 20025	Channel(Mid) 20175	Channel(High) 20325	Channel(Low) 20025	Channel(Mid) 20175	Channel(High) 20325
15	1	0	24.18	24.28	24.27	22.16	**22.55**	21.96
	1	74	23.97	**24.32**	23.75	22.16	22.34	22.28
	36	19	22.79	22.83	22.77	21.85	21.89	21.93
	75	0	22.77	22.76	22.67	21.81	21.98	22.12

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz								
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)					
			QPSK			16QAM		
			Channel(Low) 20050	Channel(Mid) 20175	Channel(High) 20300	Channel(Low) 20050	Channel(Mid) 20175	Channel(High) 20300
20	1	0	22.96	23.38	**24.28**	22.62	**22.69**	22.63
	1	99	23.50	23.77	23.93	22.63	22.59	22.26
	50	25	22.05	22.61	23.04	21.68	21.84	21.88
	100	0	22.35	22.99	22.33	21.56	21.65	21.76

LTE Band 13

LTE Band 13_Uplink frequency band : 777 to 787 MHz								
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)					
			QPSK			16QAM		
			Channel(Low) 23205	Channel(Mid) 23230	Channel(High) 23255	Channel(Low) 23205	Channel(Mid) 23230	Channel(High) 23255
5	1	0	23.67	23.60	23.61	22.99	22.99	22.79
	1	24	23.62	**24.02**	23.37	22.83	**23.44**	22.46
	12	6	22.81	22.87	23.26	21.91	22.06	22.39
	25	0	22.72	22.93	23.04	22.00	22.08	22.13

LTE Band 13_Uplink frequency band : 777 to 787 MHz								
BW (MHz)	RB Size	RB Offset	Conducted power(dBm)					
			QPSK			16QAM		
			Channel(Low)	Channel(Mid) 23230	Channel(High)	Channel(Low)	Channel(Mid) 23230	Channel(High)
10	1	0		**23.41**			**22.65**	
	1	49		23.28			**22.65**	
	25	12		22.93			22.07	
	50	0		22.79			22.04	

7. EFFECTIVE RADIATED POWER AND EQUIVALENT ISOTROPIC RADIATED POWER MEASUREMENT

7.1. Standard Applicable

According to FCC §2.1046

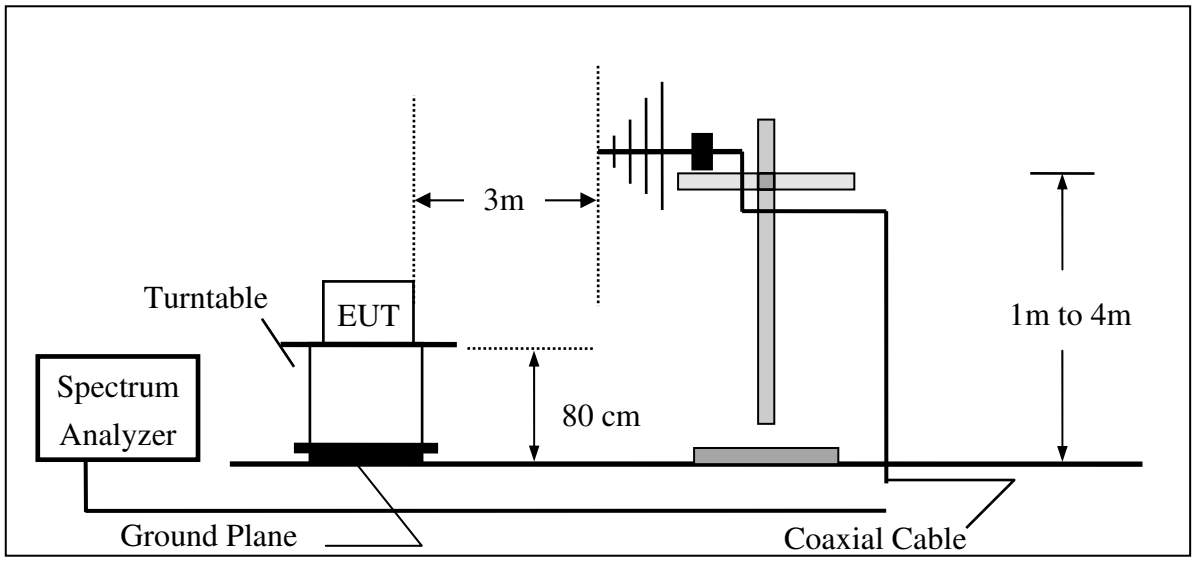
FCC 24.232(c) Mobile and portable stations are limited to 2 W EIRP.

FCC 27, 50(b)(9) Control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 30 watts ERP.

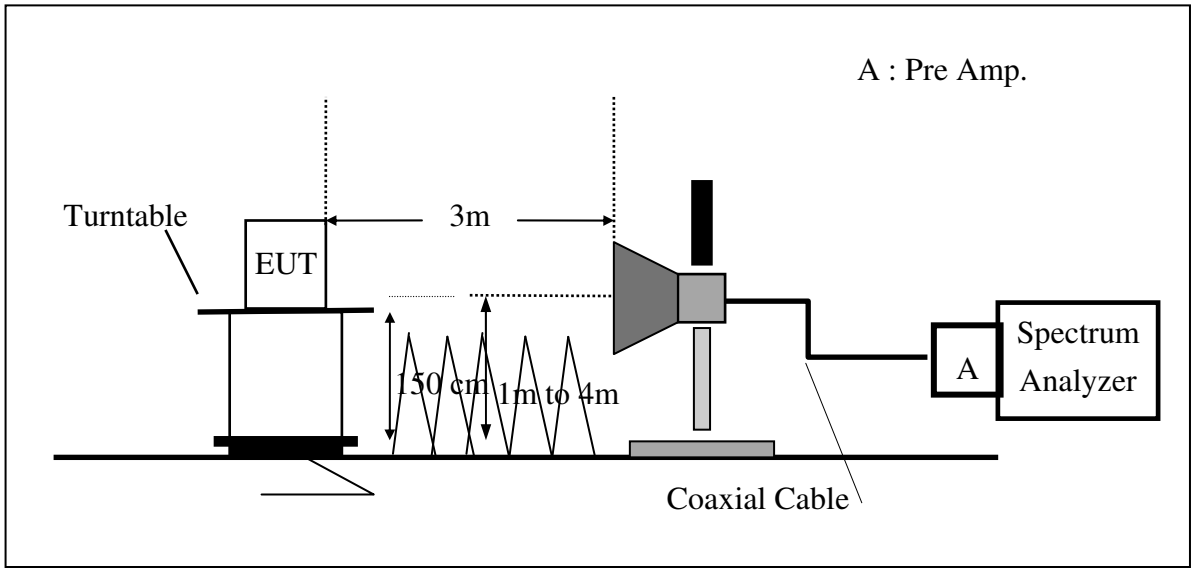
FCC 27, 50(d)(4) Fixed, mobile, and portable (hand-held) stations are limited to 1W.

7.2. Test SET-UP

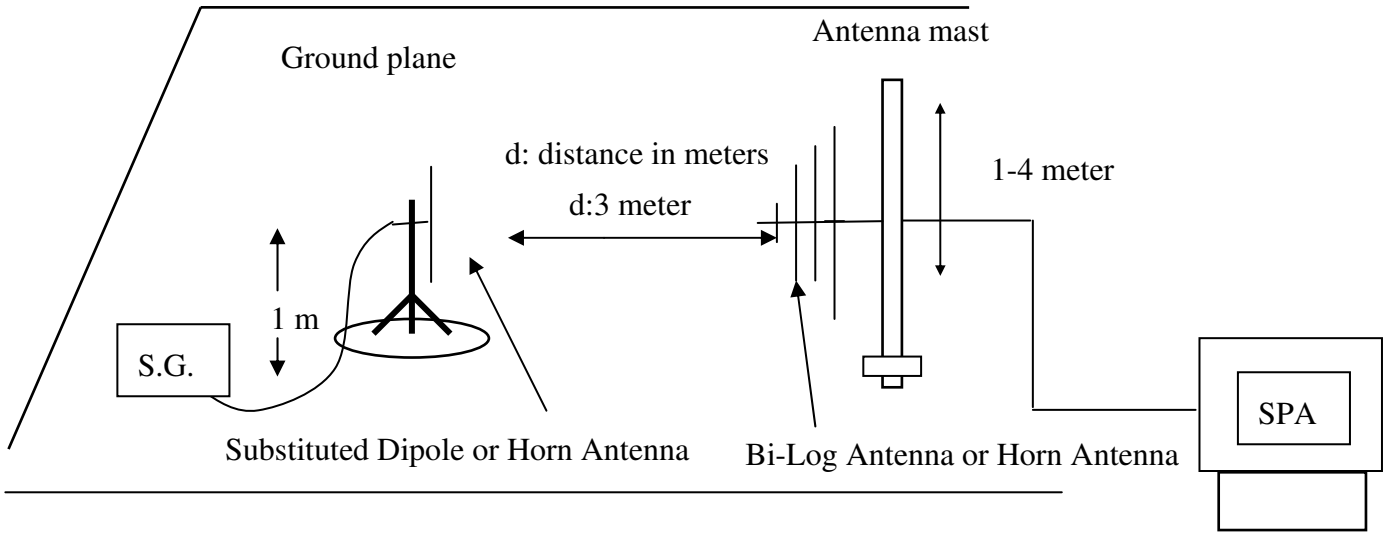
(A) Radiated Power Test Set-Up, Frequency Below 1000MHz



(B) Radiated Power Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



7.3. Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 971168 D01
2. The EUT was placed on a 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.
3. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated
4. The testing follows the Measurement Procedure of FCC KDB 971168 D01
5. 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 b. Record the power level of S.G.
6. ERP = S.G. output (dBm) + Antenna Gain (dBd) + Cable Loss (dB)
7. EIRP = S.G. output (dBm) + Antenna Gain (dBi) + Cable Loss (dB)
8. Spectrum setting:

   (1) Detector = Peak, marker the highest value of the detector by maximum hold, set RBW wide enough to capture the entire signal of emission, and VBW > =3xRBW.

   (2) KDB 971168 D01 is adopted, and the procedure as lists under item 4, Measurement of the Average Power over the Fundamental Signal Bandwidth, is followed to set correspondingly for the acquisition of proper measurement data.

   Set frequency = nominal signal center frequency;

   Set span = 2 X occupied BW;

   Set RBW ≈ 1~5% of the span, not to exceed 1 MHz

   Set VBW = 3 x RBW;

   Select average power (RMS) detector

   Set sweep time and number of measurement points to achieve a minimum of 1 millisecond/pt

   integration time (ex. Point = 601points, then sweet time = 601*10^-3 = 6s.

   Activate trace averaging routine over a minimum of 10 sweeps;

   Activate marker/span pair and set span = signal or channel bandwidth;

   Activate the band/interval power marker function;

   Record the band power level;

   Record adjusted value as the average signal power level. Then activate the occupied bandwidth measurement function.

   The proper adjustment due to limitation of spectrum capability is given compensated to spectrum with conversion factor of 10*log (TBW/RBW), where TBW is the transmission of UE exceeding the maximum BW UE can extends, and RBW is the resolution BW in UE.

7.4. Measurement Equipment Used

SGS SAC-III					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Bi-log Antenna	SCHWAZBECK	VULB9160	9160-3158	10/26/2015	10/25/2016
Bi-log Antenna	SCHWAZBECK	VULB9168	300	12/12/2015	12/11/2016
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2015	12/11/2016
Horn Antenna	Schwarzbeck	BBHA9170	185	07/25/2015	07/24/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	09/25/2015	09/24/2016
Pre-Amplifier	HP	8447F	3113A06892	01/02/2016	01/01/2017
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017
Filter 800-1000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
Filter 1800-2000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	01/02/2016	01/01/2017
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	3	01/02/2016	01/01/2017
Low Loss Cable	Huber Suhner	966 TX	1	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
3m Site NSA	SGS	966 chamber	N/A	07/02/2015	07/01/2016

7.5. Measurement Result: (Peak) –using option of peak measurement

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 2 BW: 5M QPSK RB: 1,0	1852.5	19975	V	18.20	9.95	-4.46	**23.68**	33.01
			H	13.24	9.95	-4.46	18.72	33.01
	1880.0	18900	V	17.94	10.04	-4.51	23.47	33.01
			H	14.64	10.04	-4.51	20.17	33.01
	1907.5	20375	V	16.95	10.11	-4.54	22.52	33.01
			H	14.29	10.12	-4.55	19.87	33.01
BAND 2 BW: 5M QPSK RB: 1,24	1852.5	19975	V	18.74	9.95	-4.46	**24.22**	33.01
			H	13.70	9.95	-4.46	19.18	33.01
	1880.0	18900	V	17.45	10.03	-4.51	22.98	33.01
			H	14.05	10.03	-4.51	19.58	33.01
	1907.5	20375	V	16.89	10.12	-4.55	22.46	33.01
			H	13.54	10.12	-4.55	19.11	33.01
BAND 2 BW: 5M 16QAM RB: 1,0	1852.5	19975	V	18.63	9.95	-4.46	**24.12**	33.01
			H	14.39	9.95	-4.46	19.87	33.01
	1880.0	18900	V	17.92	10.03	-4.51	23.45	33.01
			H	14.37	10.03	-4.51	19.89	33.01
	1907.5	20375	V	6.94	10.11	-4.54	12.51	33.01
			H	14.74	10.11	-4.54	20.31	33.01
BAND 2 BW: 5M 16QAM RB: 1,24	1852.5	19975	V	18.66	9.95	-4.46	**24.15**	33.01
			H	14.38	9.95	-4.46	19.87	33.01
	1880.0	18900	V	17.42	10.03	-4.51	22.95	33.01
			H	13.95	10.03	-4.51	19.47	33.01
	1907.5	20375	V	16.86	10.12	-4.55	22.43	33.01
			H	13.71	10.12	-4.55	19.28	33.01

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 2 BW: 10M QPSK RB: 1,0	1855.0	18650	V	17.91	9.95	-4.47	23.39	33.01
			H	13.39	9.95	-4.47	18.88	33.01
	1880.0	18900	V	18.96	10.03	-4.51	**24.48**	33.01
			H	14.44	10.01	-4.50	19.96	33.01
	1905.0	19150	V	16.97	10.11	-4.54	22.53	33.01
			H	12.35	10.11	-4.54	17.92	33.01
BAND 2 BW: 10M QPSK RB: 1,49	1855.0	18650	V	18.49	9.96	-4.47	23.98	33.01
			H	14.11	9.96	-4.47	19.60	33.01
	1880.0	18900	V	18.99	10.04	-4.51	**24.51**	33.01
			H	13.94	10.04	-4.51	19.47	33.01
	1905.0	19150	V	17.49	10.11	-4.55	23.06	33.01
			H	13.27	10.12	-4.55	18.84	33.01
BAND 2 BW: 10M 16QAM RB: 1,0	1855.0	18650	V	18.35	9.95	-4.47	23.83	33.01
			H	14.35	9.95	-4.47	19.84	33.01
	1880.0	18900	V	19.76	10.03	-4.51	**25.28**	33.01
			H	14.74	10.02	-4.50	20.26	33.01
	1905.0	19150	V	17.90	10.11	-4.54	23.47	33.01
			H	13.31	10.11	-4.54	18.87	33.01
BAND 2 BW: 10M 16QAM RB: 1,49	1855.0	18650	V	18.57	9.96	-4.47	24.06	33.01
			H	14.48	9.96	-4.47	19.97	33.01
	1880.0	18900	V	19.02	10.04	-4.51	**24.55**	33.01
			H	13.86	10.04	-4.51	19.38	33.01
	1905.0	19150	V	17.84	10.12	-4.55	23.41	33.01
			H	13.60	10.12	-4.55	19.17	33.01

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 2 BW: 15M QPSK RB: 1,0	1857.5	18675	V	19.10	9.95	-4.47	24.58	33.01
			H	15.83	9.95	-4.47	21.32	33.01
	1880.0	18900	V	20.51	10.02	-4.50	**26.03**	33.01
			H	16.92	10.02	-4.50	22.45	33.01
	1902.5	19125	V	18.09	10.09	-4.54	23.65	33.01
			H	14.98	10.09	-4.54	20.53	33.01
BAND 2 BW: 15M QPSK RB: 1,74	1857.5	18675	V	18.79	9.98	-4.48	24.29	33.01
			H	15.06	9.98	-4.48	20.55	33.01
	1880.0	18900	V	20.11	10.05	-4.52	**25.64**	33.01
			H	15.70	10.05	-4.52	21.24	33.01
	1902.5	19125	V	18.39	10.12	-4.55	23.96	33.01
			H	14.91	10.12	-4.55	20.48	33.01
BAND 2 BW: 15M 16QAM RB: 1,0	1857.5	18675	V	19.09	9.95	-4.47	24.58	33.01
			H	16.06	9.95	-4.47	21.54	33.01
	1880.0	18900	V	20.54	10.02	-4.50	**26.06**	33.01
			H	16.73	10.02	-4.50	22.25	33.01
	1902.5	19125	V	18.17	10.08	-4.53	23.72	33.01
			H	14.41	10.09	-4.54	19.97	33.01
BAND 2 BW: 15M 16QAM RB: 1,74	1857.5	18675	V	19.24	9.98	-4.48	24.73	33.01
			H	15.48	9.98	-4.48	20.98	33.01
	1880.0	18900	V	20.40	10.05	-4.52	**25.93**	33.01
			H	16.02	10.05	-4.52	21.55	33.01
	1902.5	19125	V	18.94	10.12	-4.55	24.51	33.01
			H	14.89	10.12	-4.55	20.46	33.01

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 2 BW: 20M QPSK RB: 1,0	1860.0	18700	V	18.00	9.95	-4.47	23.49	33.01
			H	15.61	9.95	-4.47	21.09	33.01
	1880.0	18900	V	18.91	10.02	-4.50	**24.42**	33.01
			H	15.44	10.02	-4.50	20.96	33.01
	1900.0	19100	V	16.74	10.07	-4.52	22.29	33.01
			H	14.66	10.08	-4.53	20.21	33.01
BAND 2 BW: 20M QPSK RB: 1,99	1860.0	18700	V	18.00	9.99	-4.49	**23.50**	33.01
			H	15.57	9.99	-4.49	21.08	33.01
	1880.0	18900	V	17.82	10.05	-4.52	23.36	33.01
			H	15.77	10.05	-4.52	21.30	33.01
	1900.0	19100	V	17.84	10.12	-4.55	23.41	33.01
			H	15.06	10.12	-4.55	20.63	33.01
BAND 2 BW: 20M 16QAM RB: 1,0	1860.0	18700	V	18.25	9.95	-4.47	23.74	33.01
			H	15.55	9.95	-4.47	21.04	33.01
	1880.0	18900	V	18.44	10.02	-4.50	**23.96**	33.01
			H	16.23	10.02	-4.50	21.75	33.01
	1900.0	19100	V	17.26	10.07	-4.52	22.80	33.01
			H	15.11	10.07	-4.52	20.65	33.01
BAND 2 BW: 20M 16QAM RB: 1,99	1860.0	18700	V	18.37	9.99	-4.49	**23.88**	33.01
			H	15.43	9.99	-4.49	20.94	33.01
	1880.0	18900	V	17.46	10.05	-4.52	23.00	33.01
			H	15.64	10.05	-4.52	21.17	33.01
	1900.0	19100	V	17.83	10.12	-4.55	23.40	33.01
			H	15.04	10.12	-4.55	20.61	33.01

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 4 BW: 5M QPSK RB: 1,0	1712.5	19975	V	22.11	9.48	-4.31	27.29	30.00
			H	16.14	9.48	-4.31	21.32	30.00
	1732.5	20175	V	22.35	9.55	-4.31	**27.59**	30.00
			H	17.76	9.55	-4.31	23.00	30.00
	1752.5	20375	V	22.02	9.62	-4.33	27.31	30.00
			H	16.75	9.62	-4.34	22.04	30.00
BAND 4 BW: 5M QPSK RB: 1,24	1712.5	19975	V	22.12	9.48	-4.31	**27.29**	30.00
			H	16.01	9.48	-4.31	21.18	30.00
	1732.5	20175	V	22.00	9.55	-4.31	27.24	30.00
			H	17.10	9.55	-4.31	22.34	30.00
	1752.5	20375	V	21.37	9.62	-4.34	26.65	30.00
			H	15.58	9.62	-4.34	20.86	30.00
BAND 4 BW: 5M 16QAM RB: 1,0	1712.5	19975	V	21.99	9.48	-4.31	27.17	30.00
			H	15.78	9.48	-4.31	20.95	30.00
	1732.5	20175	V	22.35	9.55	-4.31	**27.59**	30.00
			H	17.37	9.55	-4.31	22.61	30.00
	1752.5	20375	V	21.81	9.62	-4.34	27.09	30.00
			H	16.36	9.62	-4.34	21.64	30.00
BAND 4 BW: 5M 16QAM RB: 1,24	1712.5	19975	V	22.16	9.48	-4.31	27.34	30.00
			H	15.99	9.48	-4.31	21.16	30.00
	1732.5	20175	V	22.22	9.55	-4.31	**27.46**	30.00
			H	17.14	9.55	-4.31	22.38	30.00
	1752.5	20375	V	21.62	9.62	-4.34	26.91	30.00
			H	16.25	9.62	-4.34	21.54	30.00

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 4 BW: 10M QPSK RB: 1,0	1715.0	20000	V	21.79	9.49	-4.31	26.97	30.00
			H	16.91	9.49	-4.31	22.08	30.00
	1732.0	20175	V	22.04	9.55	-4.31	**27.28**	30.00
			H	17.86	9.53	-4.31	23.09	30.00
	1750.0	20350	V	21.29	9.61	-4.33	26.57	30.00
			H	16.23	9.59	-4.32	21.50	30.00
BAND 4 BW: 10M QPSK RB: 1,49	1715.0	20000	V	22.38	9.50	-4.31	**27.57**	30.00
			H	18.43	9.50	-4.31	23.62	30.00
	1732.0	20175	V	22.09	9.56	-4.31	27.34	30.00
			H	17.11	9.56	-4.31	22.36	30.00
	1750.0	20350	V	21.56	9.62	-4.33	26.85	30.00
			H	17.05	9.62	-4.34	22.33	30.00
BAND 4 BW: 10M 16QAM RB: 1,0	1715.0	20000	V	21.96	9.49	-4.31	27.14	30.00
			H	17.48	9.49	-4.31	22.65	30.00
	1732.0	20175	V	22.40	9.54	-4.31	**27.64**	30.00
			H	17.81	9.54	-4.31	23.04	30.00
	1750.0	20350	V	21.76	9.60	-4.33	27.03	30.00
			H	16.94	9.60	-4.33	22.22	30.00
BAND 4 BW: 10M 16QAM RB: 1,49	1715.0	20000	V	22.35	9.50	-4.31	**27.54**	30.00
			H	18.10	9.50	-4.31	23.29	30.00
	1732.0	20175	V	21.84	9.56	-4.31	27.09	30.00
			H	16.97	9.56	-4.31	22.22	30.00
	1750.0	20350	V	21.51	9.62	-4.33	26.79	30.00
			H	16.99	9.62	-4.33	22.27	30.00

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 4 BW: 15M QPSK RB: 1,0	1717.5	20025	V	21.10	9.49	-4.31	26.27	30.00
			H	15.05	9.49	-4.31	20.22	30.00
	1732.5	20175	V	21.85	9.54	-4.31	**27.08**	30.00
			H	14.96	9.54	-4.31	20.19	30.00
	1747.5	20325	V	21.01	9.59	-4.32	26.28	30.00
			H	15.42	9.59	-4.32	20.69	30.00
BAND 4 BW: 15M QPSK RB: 1,74	1717.5	20025	V	21.78	9.52	-4.31	**26.99**	30.00
			H	16.32	9.52	-4.31	21.53	30.00
	1732.5	20175	V	21.00	9.57	-4.31	26.25	30.00
			H	14.75	9.57	-4.31	20.01	30.00
	1747.5	20325	V	20.43	9.62	-4.33	25.71	30.00
			H	14.99	9.62	-4.33	20.28	30.00
BAND 4 BW: 15M 16QAM RB: 1,0	1717.5	20025	V	21.37	9.49	-4.31	26.55	30.00
			H	15.09	9.49	-4.31	20.27	30.00
	1732.5	20175	V	21.77	9.54	-4.31	**27.00**	30.00
			H	16.50	9.54	-4.31	21.73	30.00
	1747.5	20325	V	21.06	9.59	-4.32	26.32	30.00
			H	14.80	9.59	-4.32	20.07	30.00
BAND 4 BW: 15M 16QAM RB: 1,74	1717.5	20025	V	21.75	9.52	-4.31	**26.95**	30.00
			H	16.33	9.52	-4.31	21.54	30.00
	1732.5	20175	V	21.04	9.57	-4.31	26.30	30.00
			H	15.97	9.57	-4.31	21.23	30.00
	1747.5	20325	V	20.65	9.62	-4.33	25.93	30.00
			H	14.96	9.62	-4.33	20.24	30.00

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
BAND 4 BW: 20M QPSK RB: 1,0	1720.0	20050	V	20.59	9.48	-4.31	25.75	30.00
			H	16.69	9.49	-4.31	21.87	30.00
	1732.5	20175	V	21.41	9.52	-4.31	**26.63**	30.00
			H	18.20	9.53	-4.31	23.42	30.00
	1745.0	20300	V	21.01	9.56	-4.31	26.26	30.00
			H	16.47	9.56	-4.31	21.73	30.00
BAND 4 BW: 20M QPSK RB: 1,99	1720.0	20050	V	21.33	9.54	-4.31	**26.56**	30.00
			H	18.10	9.53	-4.31	23.32	30.00
	1732.5	20175	V	20.88	9.57	-4.31	26.14	30.00
			H	16.73	9.57	-4.31	21.99	30.00
	1745.0	20300	V	20.47	9.62	-4.33	25.75	30.00
			H	16.84	9.62	-4.33	22.12	30.00
BAND 4 BW: 20M 16QAM RB: 1,0	1720.0	20050	V	20.91	9.49	-4.31	26.08	30.00
			H	17.37	9.48	-4.31	22.55	30.00
	1732.5	20175	V	21.36	9.53	-4.31	**26.58**	30.00
			H	17.94	9.53	-4.31	23.16	30.00
	1745.0	20300	V	21.02	9.57	-4.31	26.28	30.00
			H	16.47	9.57	-4.31	21.73	30.00
BAND 4 BW: 15M 16QAM RB: 1,99	1720.0	20050	V	20.88	9.53	-4.31	**26.10**	30.00
			H	18.14	9.53	-4.31	23.36	30.00
	1732.5	20175	V	20.61	9.57	-4.31	25.88	30.00
			H	16.45	9.57	-4.31	21.72	30.00
	1745.0	20300	V	20.64	9.62	-4.33	25.92	30.00
			H	16.67	9.62	-4.33	21.95	30.00

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
BAND 13 BW: 5M QPSK RB: 1,0	779.5	23205	V	22.64	3.28	-2.91	**23.01**	44.77
			H	17.20	3.28	-2.91	17.57	44.77
	782.0	23230	V	22.27	3.29	-2.91	22.65	44.77
			H	19.35	3.29	-2.91	19.73	44.77
	784.5	23255	V	20.96	3.29	-2.91	21.35	44.77
			H	16.40	3.29	-2.91	16.78	44.77
BAND 13 BW: 5M QPSK RB: 1,24	779.5	23205	V	21.41	3.28	-2.91	**21.78**	44.77
			H	17.39	3.28	-2.91	17.76	44.77
	782.0	23230	V	21.08	3.29	-2.91	21.46	44.77
			H	17.65	3.30	-2.90	18.05	44.77
	784.5	23255	V	21.31	3.29	-2.91	21.70	44.77
			H	17.29	3.29	-2.91	17.68	44.77
BAND 13 BW: 5M 16QAM RB: 1,0	779.5	23205	V	22.61	3.28	-2.91	**22.97**	44.77
			H	16.97	3.28	-2.91	17.34	44.77
	782.0	23230	V	22.16	3.29	-2.91	22.55	44.77
			H	18.94	3.29	-2.91	19.31	44.77
	784.5	23255	V	21.32	3.29	-2.91	21.71	44.77
			H	15.75	3.29	-2.91	16.13	44.77
BAND 13 BW: 5M 16QAM RB: 1,24	779.5	23205	V	21.80	3.28	-2.91	22.17	44.77
			H	18.10	3.28	-2.91	18.47	44.77
	782.0	23230	V	21.87	3.29	-2.91	**22.25**	44.77
			H	18.42	3.29	-2.91	18.80	44.77
	784.5	23255	V	20.94	3.29	-2.91	21.33	44.77
			H	17.53	3.29	-2.91	17.92	44.77

Remark

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
BAND 13 BW: 10M QPSK RB: 1,0	782.0	23230	V	20.29	3.28	-2.91	**20.66**	44.77
			H	19.73	0.00	-2.91	16.83	44.77
BAND 13 BW: 10M QPSK RB: 1,49	782.0	23230	V	21.40	3.29	-2.91	**21.78**	44.77
			H	17.18	3.29	-2.91	17.57	44.77
BAND 13 BW: 10M 16QAM RB: 1,0	782.0	23230	V	20.60	3.28	-2.91	**20.97**	44.77
			H	16.66	3.28	-2.91	17.04	44.77
BAND 13 BW: 10M 16QAM RB: 1,49	782.0	23230	V	21.72	3.29	-2.91	**22.11**	44.77
			H	17.30	3.29	-2.91	17.69	44.77

Remark

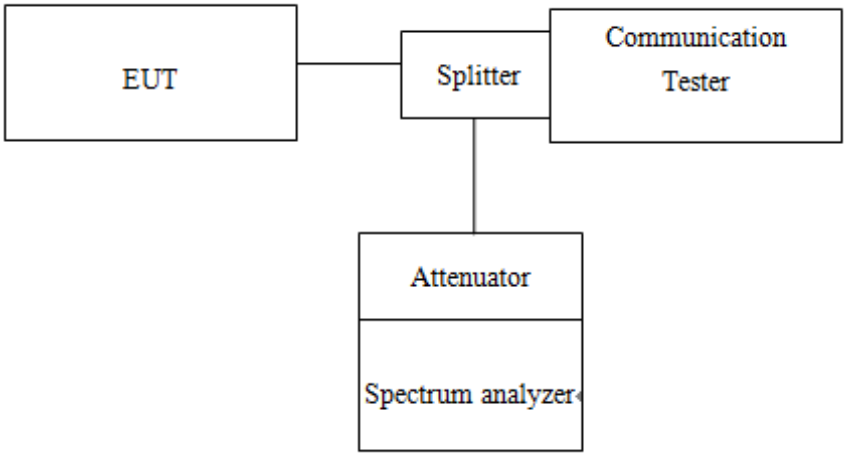
8. OCCUPIED BANDWIDTH MEASUREMENT

8.1. Standard Applicable

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

According to §FCC 2.1049 (99%)

8.2. Test Set-up



8.3. Measurement Procedure

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display arrow was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

NOTE: For the plot of bandwidth measurement, the marker of the 99% bandwidth is diamond-shape while the marker of the 20dB BW is arrow-mark

8.4. Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Radio Communica-tion Analyzer	Anritsu	MT8820C	6200995019	09/25/2015	09/24/2016
DC Power Supply	Agilent	E3640A	MY52410006	11/05/2015	11/04/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
CCA,USB-4432	NI	198755E-02L	18F909F	03/03/2016	03/02/2017
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	01/02/2016	01/01/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/06/2015	05/05/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2016	01/01/2017

8.5. Measurement Result

99% Bandwidth

LTE BAND 2							
Channel bandwidth: 5MHz				**Channel bandwidth: 10MHz**			
Frequency (MHz)	**CH**	**99% Bandwidth (MHz)**		**Frequency (MHz)**	**CH**	**99% Bandwidth (MHz)**	
		QPSK	16QAM			QPSK	16QAM
1852.5	18625	**4.5060**	**4.4912**	1855.0	18650	**9.0029**	8.9806
1880.0	18900	4.4966	4.4733	1880.0	18900	8.9725	8.9488
1907.5	19175	4.4889	4.4850	1905.0	19150	8.9849	**8.9870**

LTE BAND 2							
Channel bandwidth: 15MHz				Channel bandwidth: 20MHz			
Frequency (MHz)	CH	99% Bandwidth (MHz)		Frequency (MHz)	CH	99% Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
1857.5	18675	**13.5057**	**13.5140**	1860.0	18700	**17.9931**	**17.9902**
1880.0	18900	13.4577	13.4790	1880.0	18900	17.8520	17.8806
1902.5	19125	13.4608	13.4906	1900.0	19100	17.8667	17.9728

LTE BAND 4							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	99% Bandwidth (MHz)		Frequency (MHz)	CH	99% Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
1712.5	19957	**4.5139**	**4.4932**	1715.0	20000	**8.9989**	8.9848
1732.5	20175	4.5078	4.4926	1732.5	20175	8.9551	8.9570
1752.5	20375	4.4996	4.4829	1750.0	20350	8.9393	**8.9880**

LTE BAND 4							
Channel bandwidth: 15MHz				Channel bandwidth: 20MHz			
Frequency (MHz)	CH	99% Bandwidth (MHz)		Frequency (MHz)	CH	99% Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
1717.5	20025	**13.5234**	**13.5371**	1720.0	20050	**17.9909**	**17.9978**
1732.5	20175	13.4405	13.4627	1732.5	20175	17.8477	17.9299
1747.5	20325	13.4607	13.4863	1745.0	20300	17.9146	17.8924

LTE BAND 13							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	99% Bandwidth (MHz)		Frequency (MHz)	CH	99% Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
779.5	23205	4.4778	4.4944	23230	782	**8.9881**	**8.9447**
782.0	23230	**4.5014**	**4.5054**				
784.5	23255	4.4620	4.4624				

26dB Bandwidth

LTE BAND 2							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	26 Bandwidth (MHz)		Frequency (MHz)	CH	26 Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
1852.5	18625	**4.917**	**4.885**	1855.0	18650	9.811	9.720
1880.0	18900	4.908	4.859	1880.0	18900	9.806	**9.780**
1907.5	19175	4.845	4.864	1905.0	19150	**9.823**	9.682

LTE BAND 2							
Channel bandwidth: 15MHz				Channel bandwidth: 20MHz			
Frequency (MHz)	CH	26 Bandwidth (MHz)		Frequency (MHz)	CH	26 Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
1857.5	18675	**14.676**	**14.602**	1860.0	18700	**19.526**	**19.501**
1880.0	18900	14.630	14.455	1880.0	18900	19.311	19.283
1902.5	19125	14.416	14.486	1900.0	19100	19.282	19.128

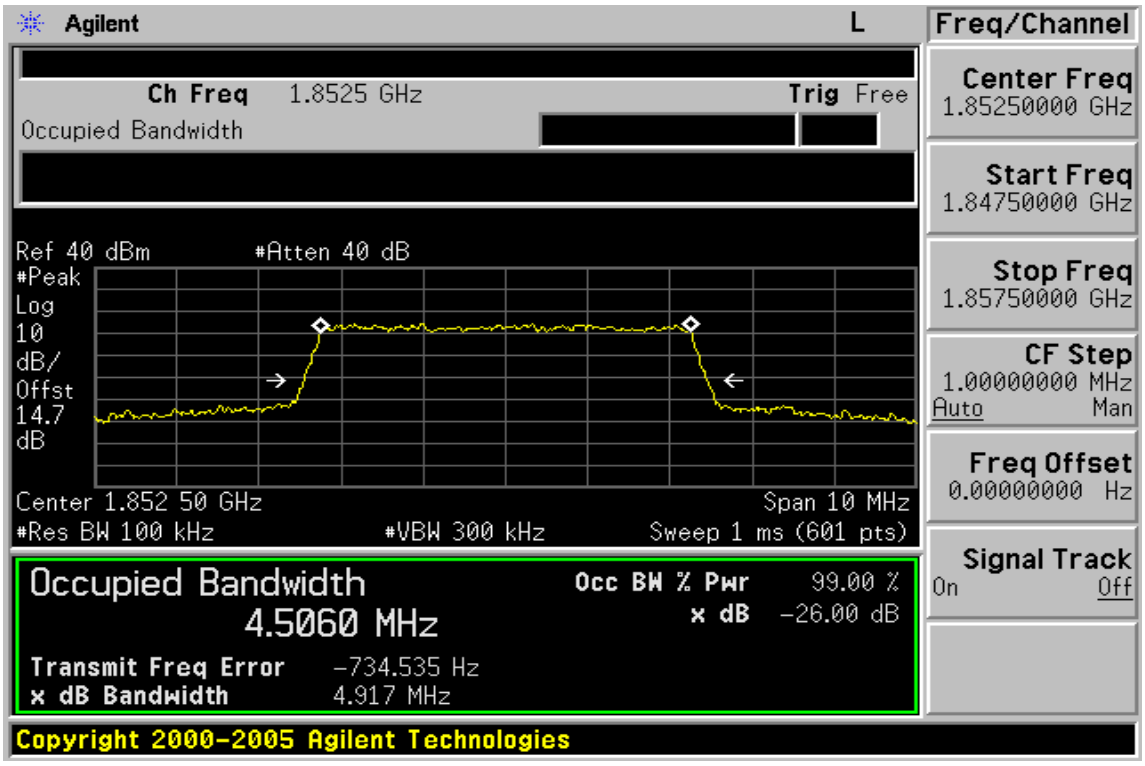
LTE BAND 4							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	26 Bandwidth (MHz)		Frequency (MHz)	CH	26 Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
1712.5	19957	**4.898**	4.884	1715.0	20000	**9.783**	**9.760**
1732.5	20175	4.876	**4.914**	1732.5	20175	9.661	9.755
1752.5	20375	4.793	4.843	1750.0	20350	9.719	9.718

LTE BAND 4							
Channel bandwidth: 15MHz				Channel bandwidth: 20MHz			
Frequency (MHz)	CH	26 Bandwidth (MHz)		Frequency (MHz)	CH	26 Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
1717.5	20025	**14.740**	**14.899**	1720.0	20050	**19.375**	**19.324**
1732.5	20175	14.512	14.703	1732.5	20175	19.240	19.153
1747.5	20325	14.346	14.521	1745.0	20300	19.237	19.248

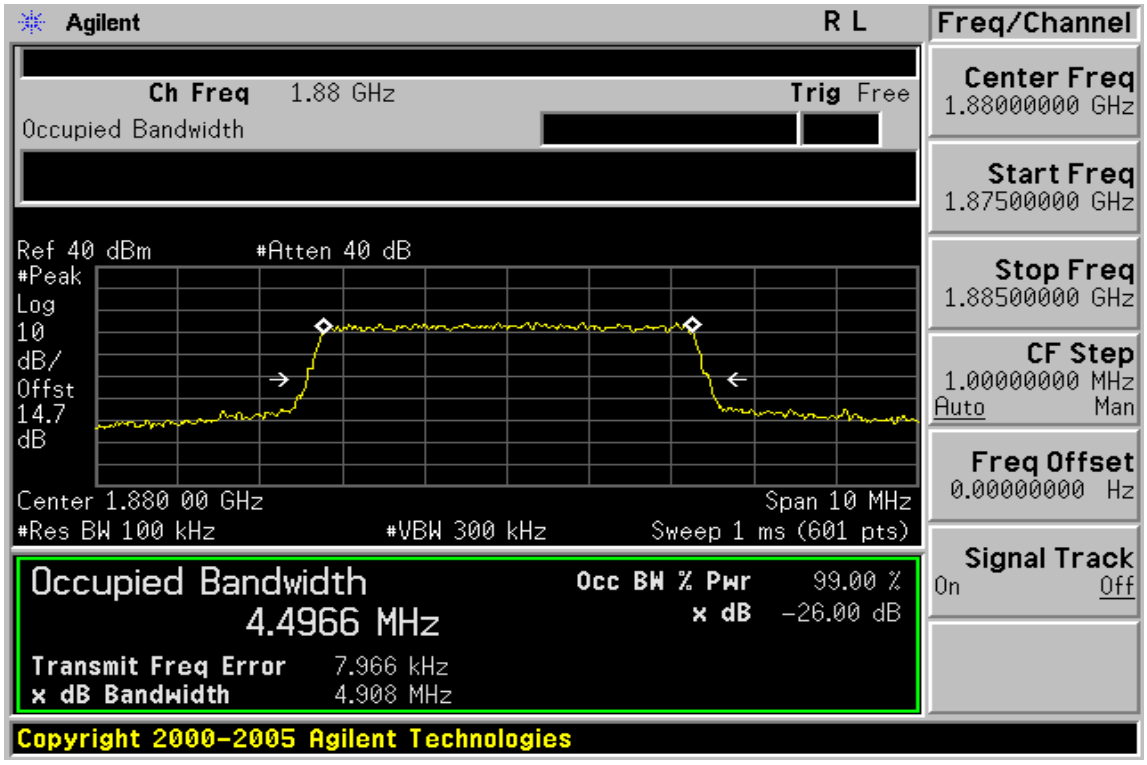
LTE BAND 13							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	26 Bandwidth (MHz)		Frequency (MHz)	CH	26 Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
779.5	23205	**4.873**	**4.901**	23230	782	**9.579**	**9.710**
782.0	23230	4.847	4.894				
784.5	23255	4.740	4.758				

99% & 26dB Bandwidth Test Data

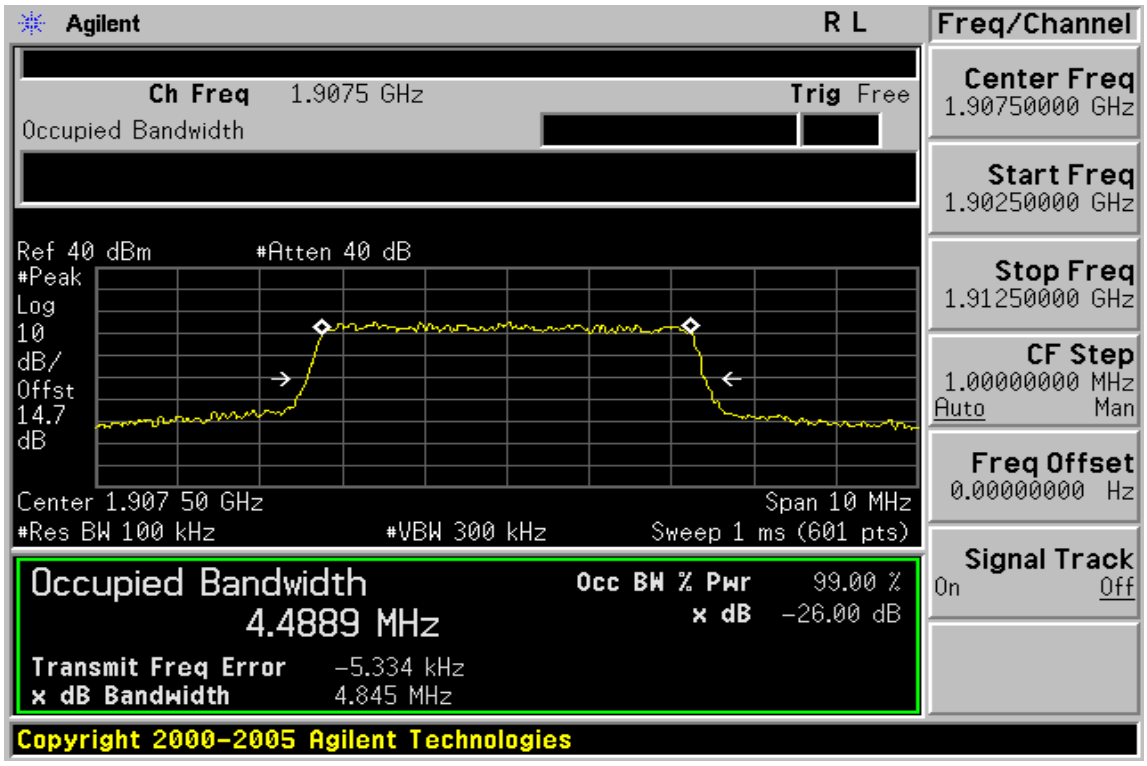
5MHz BW LTE-Band 2 QPSK Channel Low



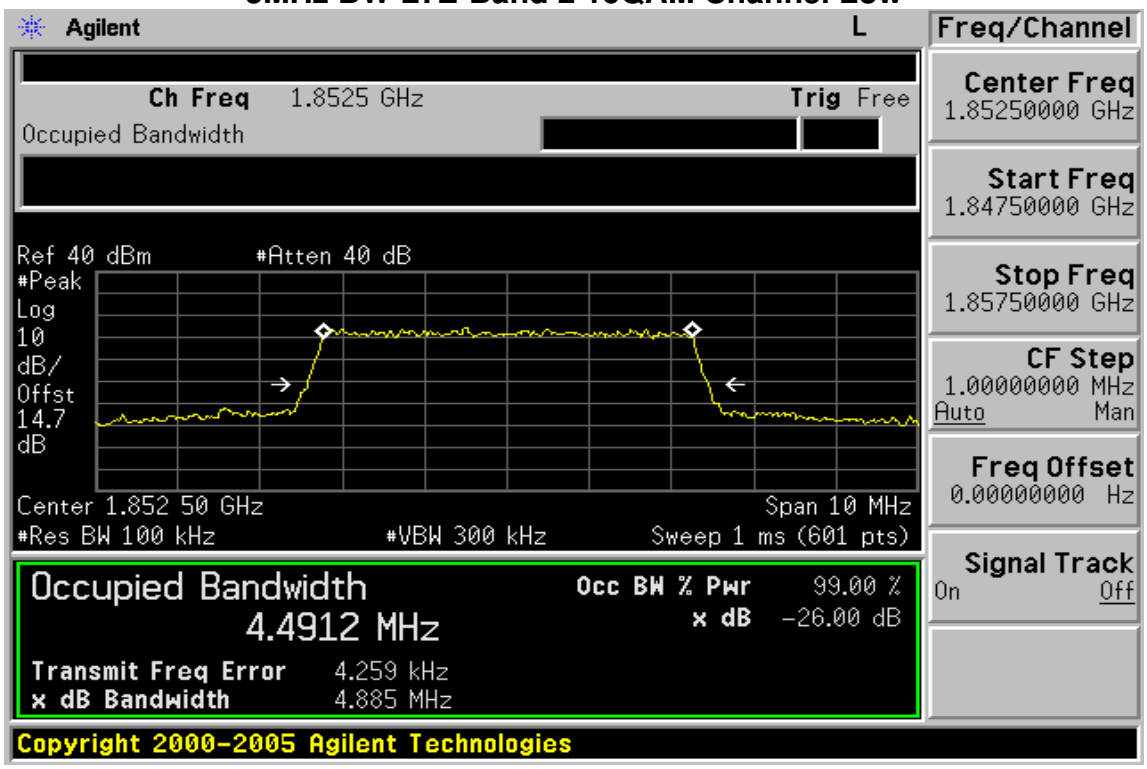
5MHz BW LTE-Band 2 QPSK Channel Mid



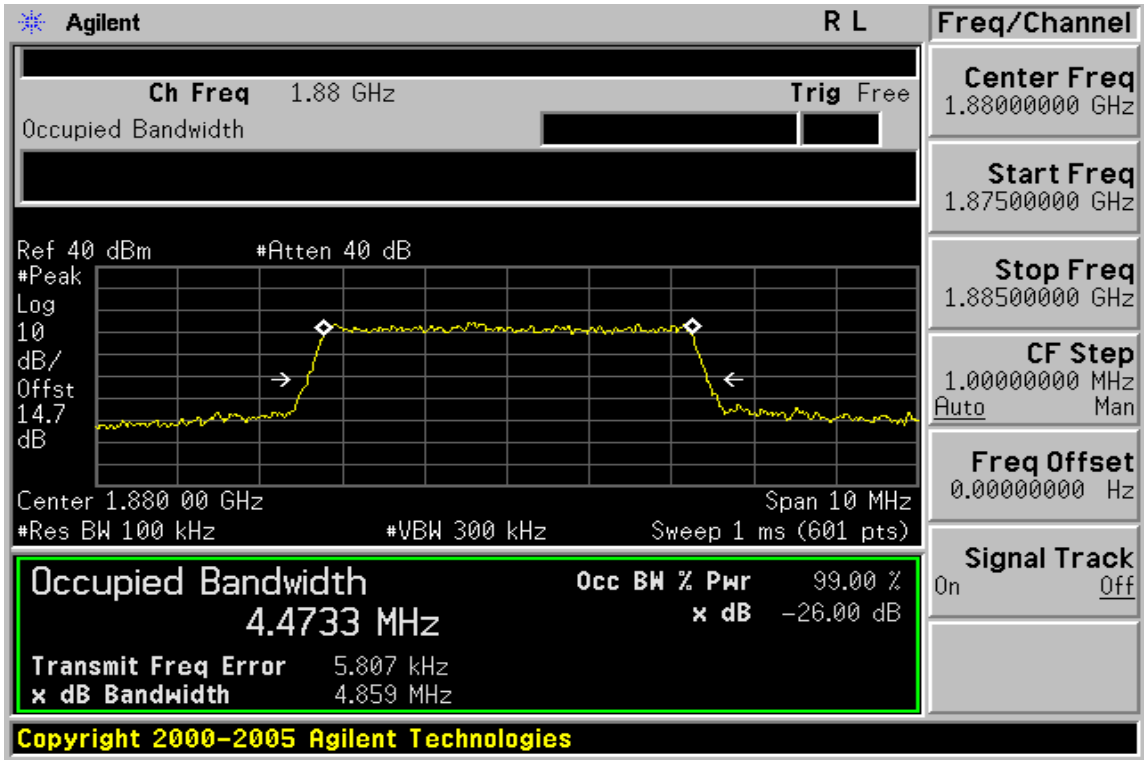
5MHz BW LTE-Band 2 QPSK Channel High



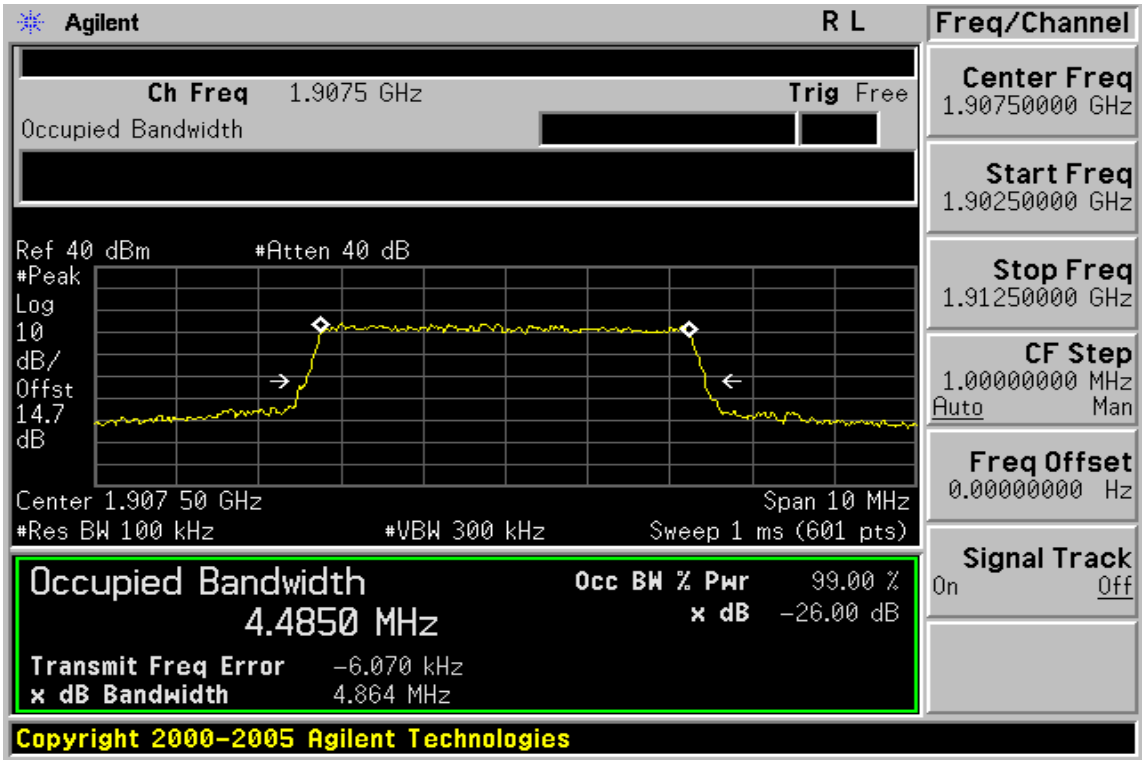
5MHz BW LTE-Band 2 16QAM Channel Low



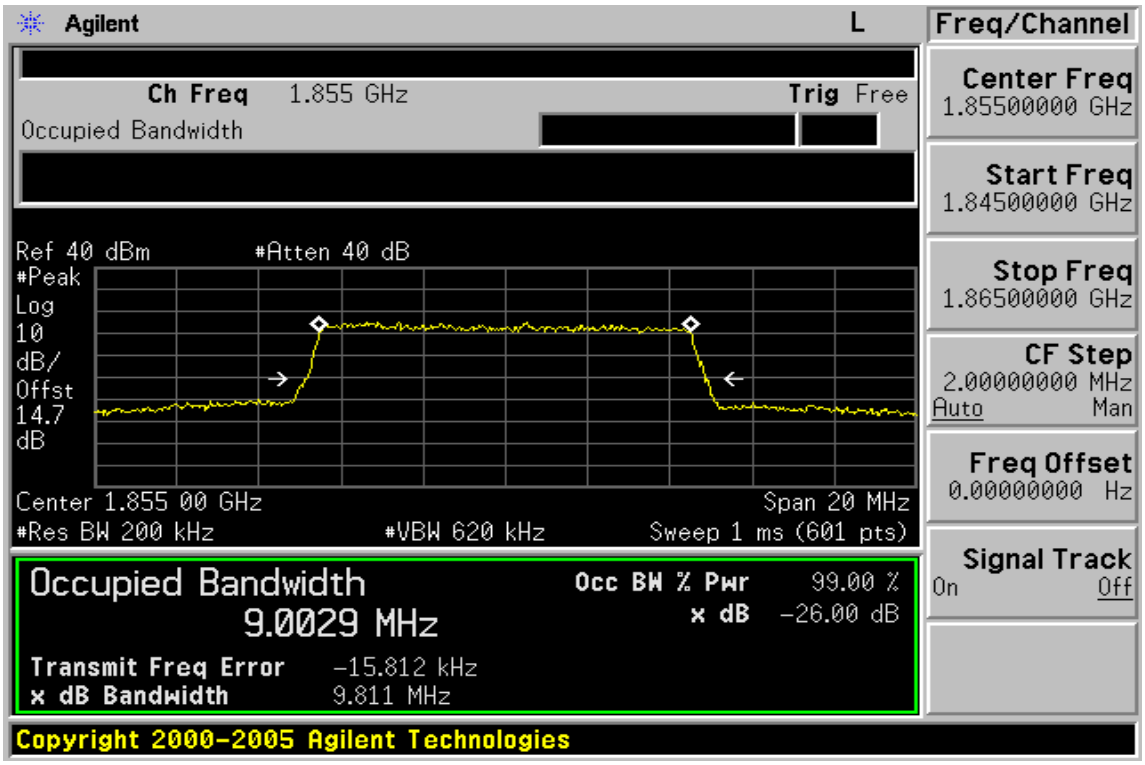
5MHz BW LTE-Band 2 16QAM Channel Mid



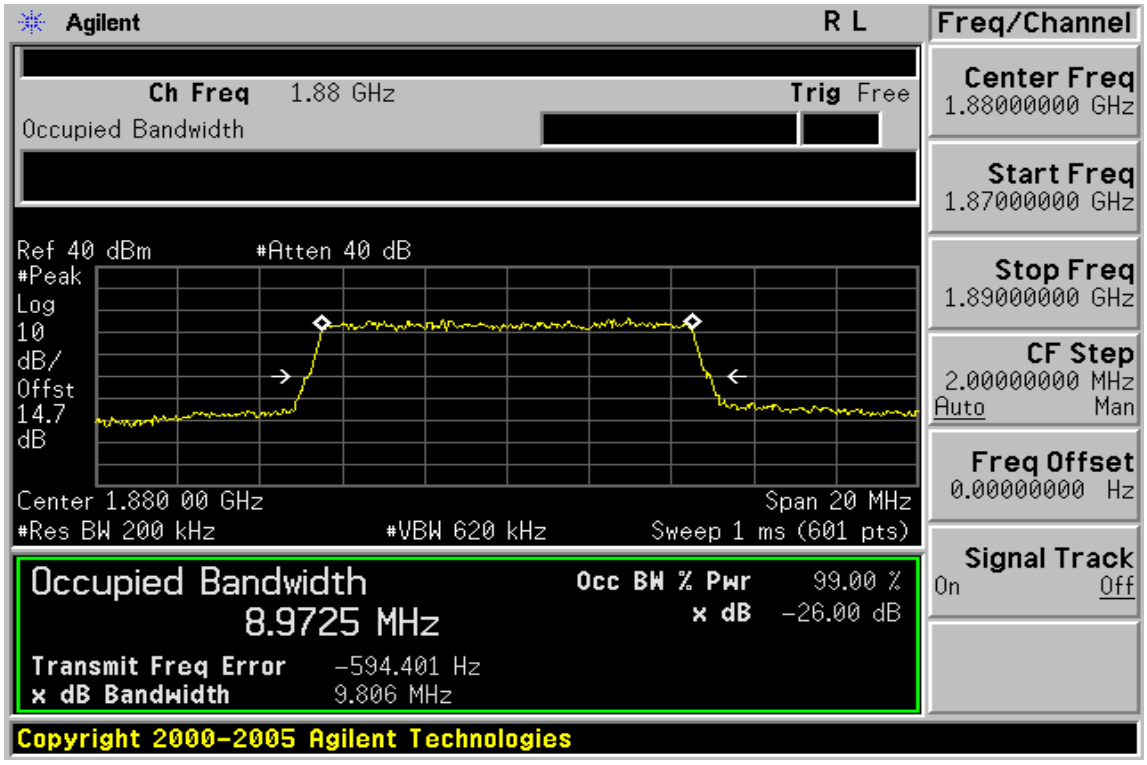
5MHz BW LTE-Band 2 16QAM Channel High



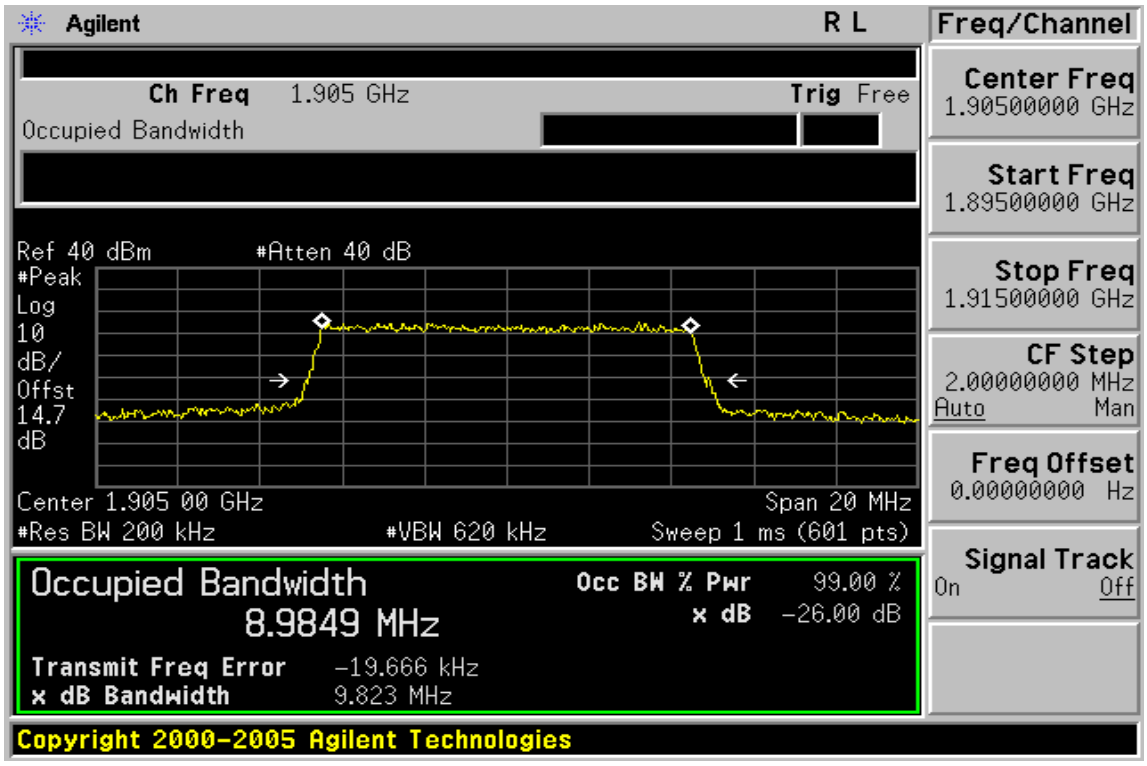
10MHz BW LTE-Band 2 QPSK Channel Low



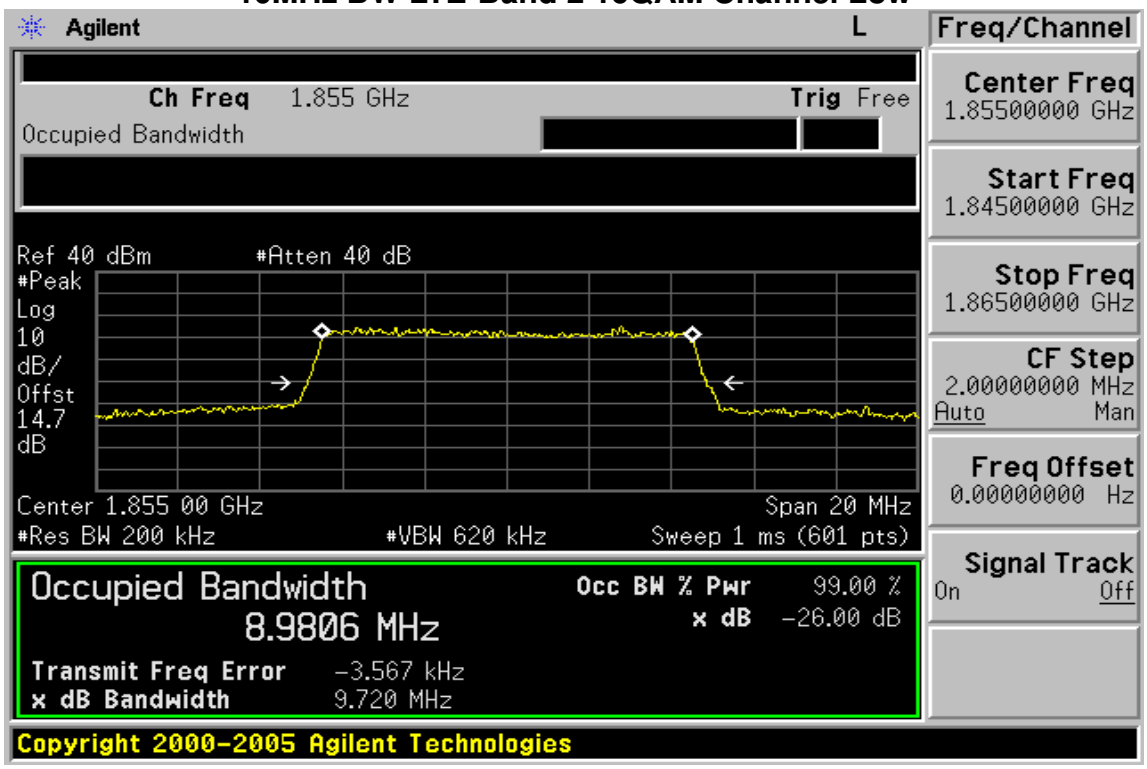
10MHz BW LTE-Band 2 QPSK Channel Mid



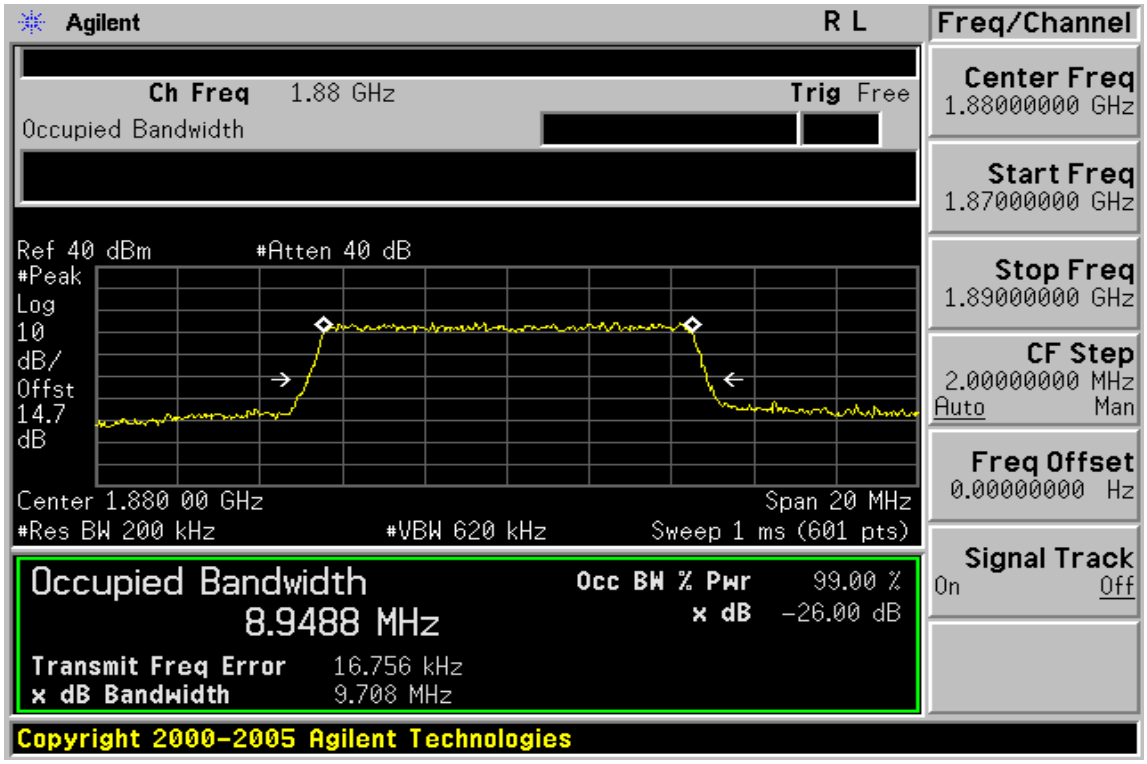
10MHz BW LTE-Band 2 QPSK Channel High



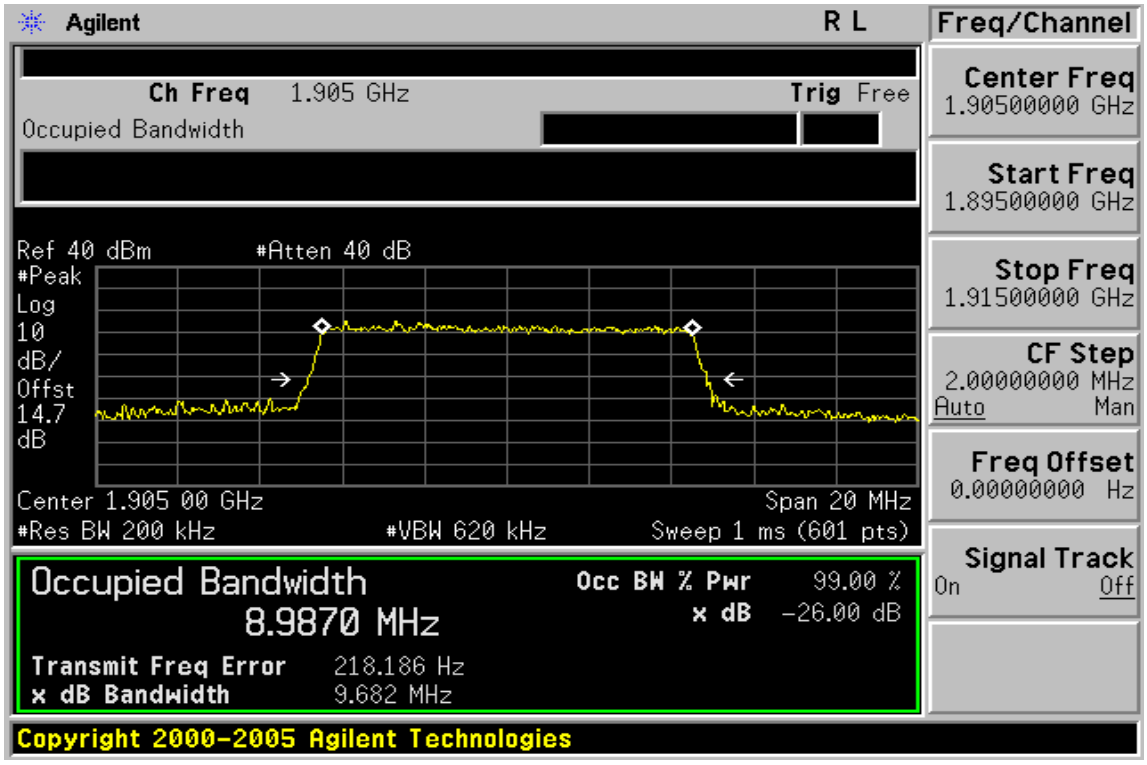
10MHz BW LTE-Band 2 16QAM Channel Low



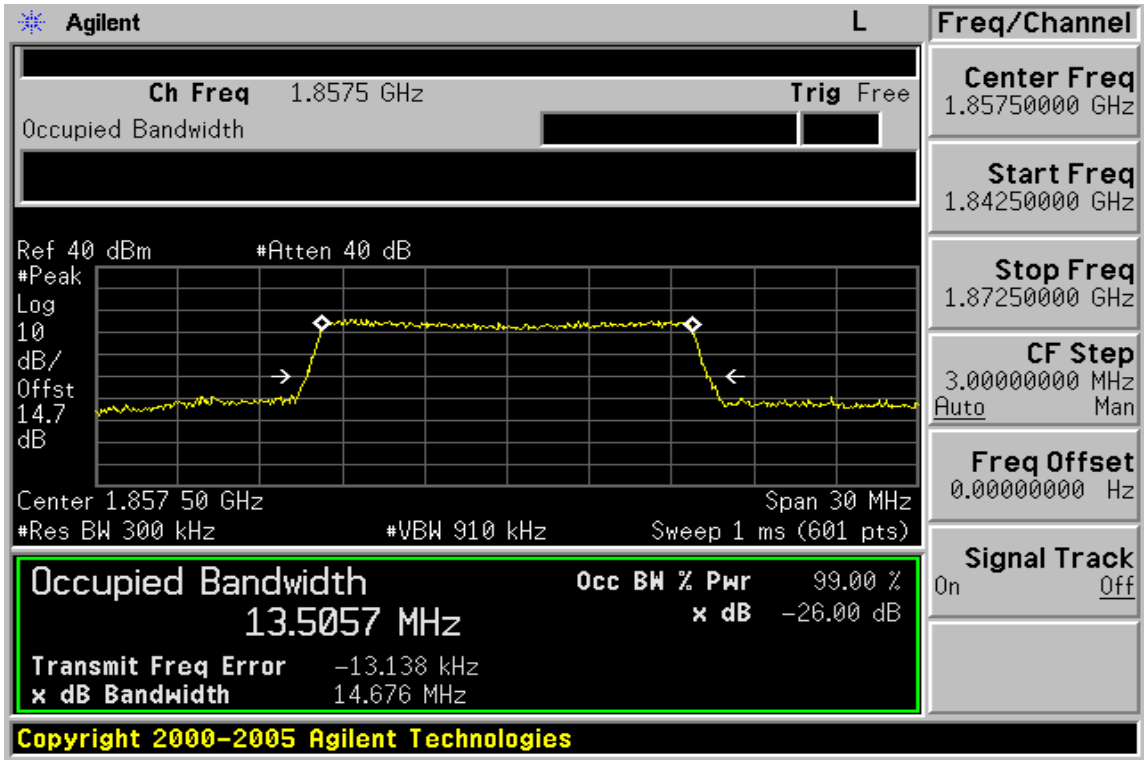
10MHz BW LTE-Band 2 16QAM Channel Mid



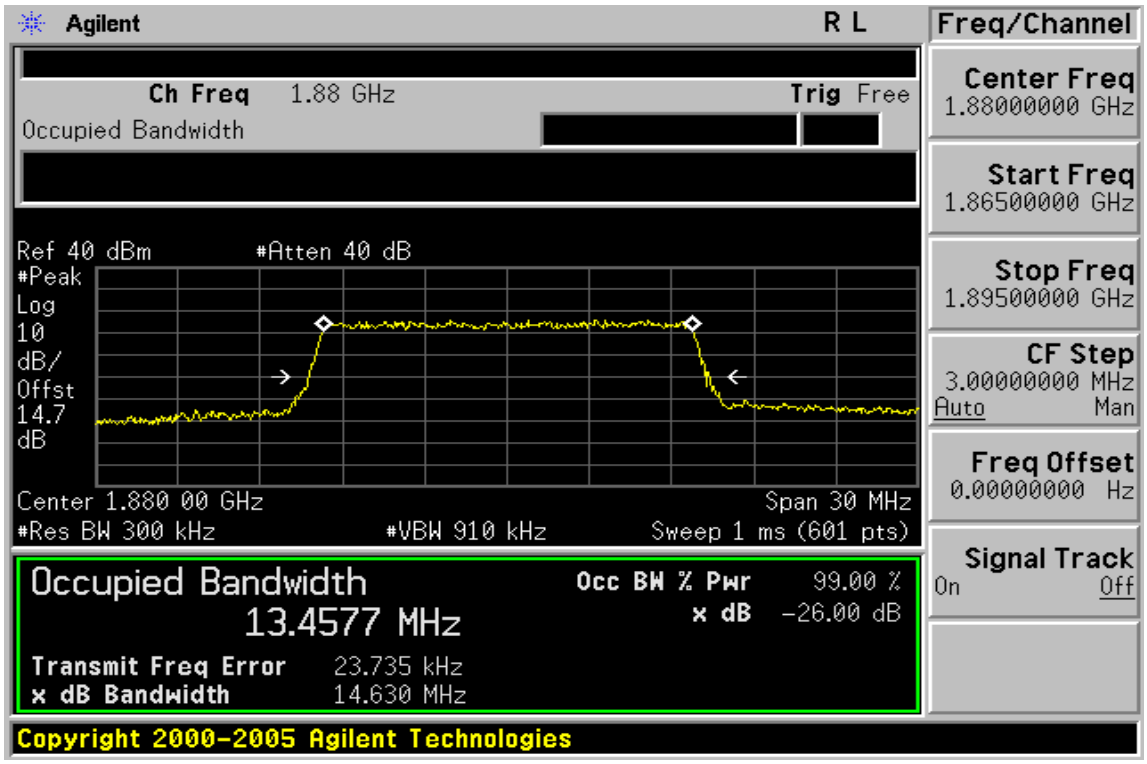
10MHz BW LTE-Band 2 16QAM Channel High



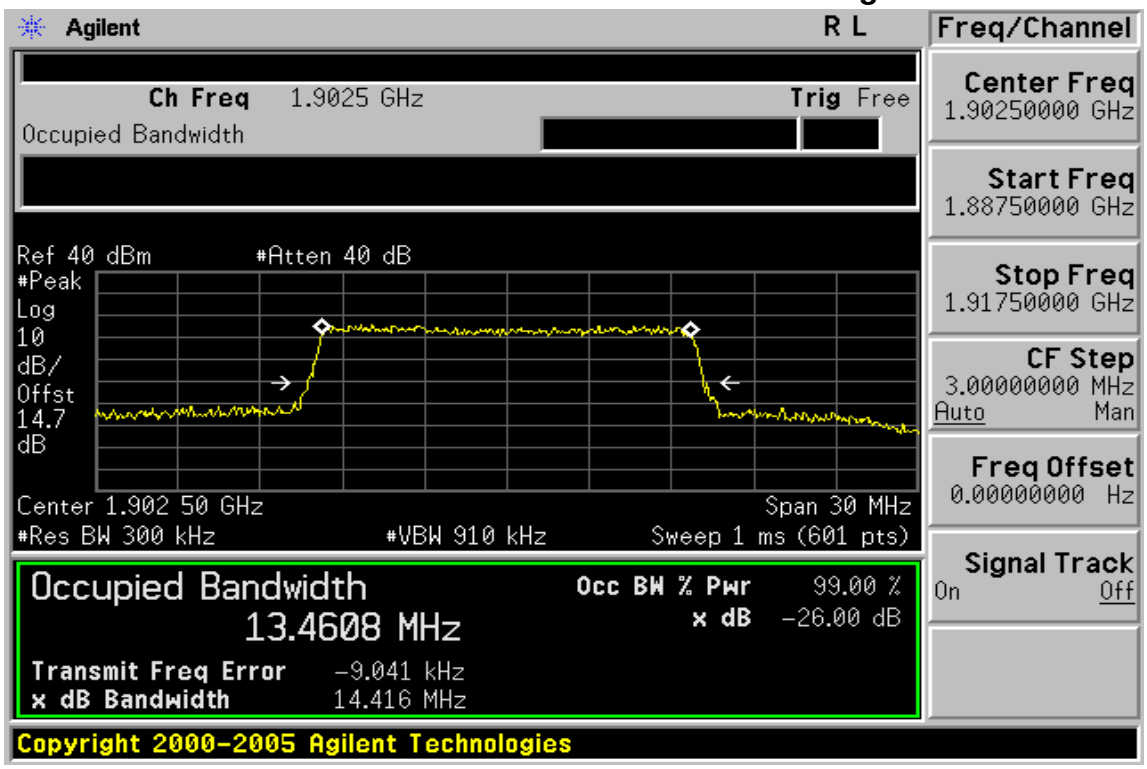
15MHz BW LTE-Band 2 QPSK Channel Low



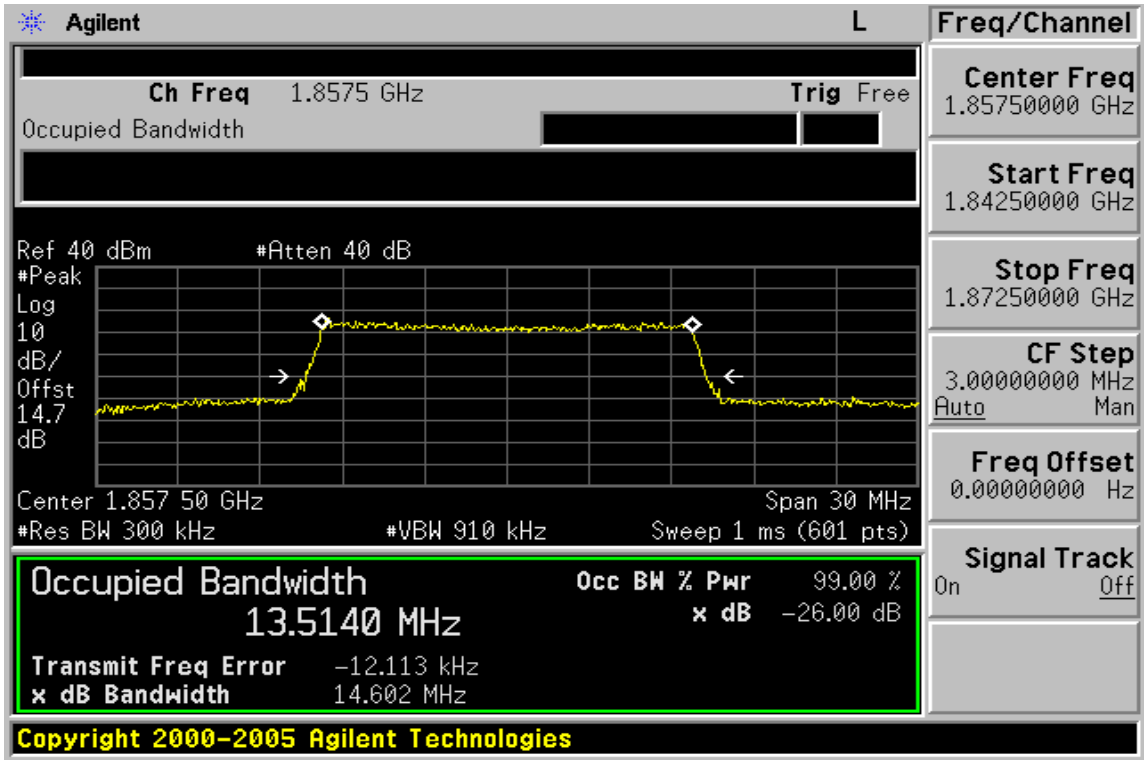
15MHz BW LTE-Band 2 QPSK Channel Mid



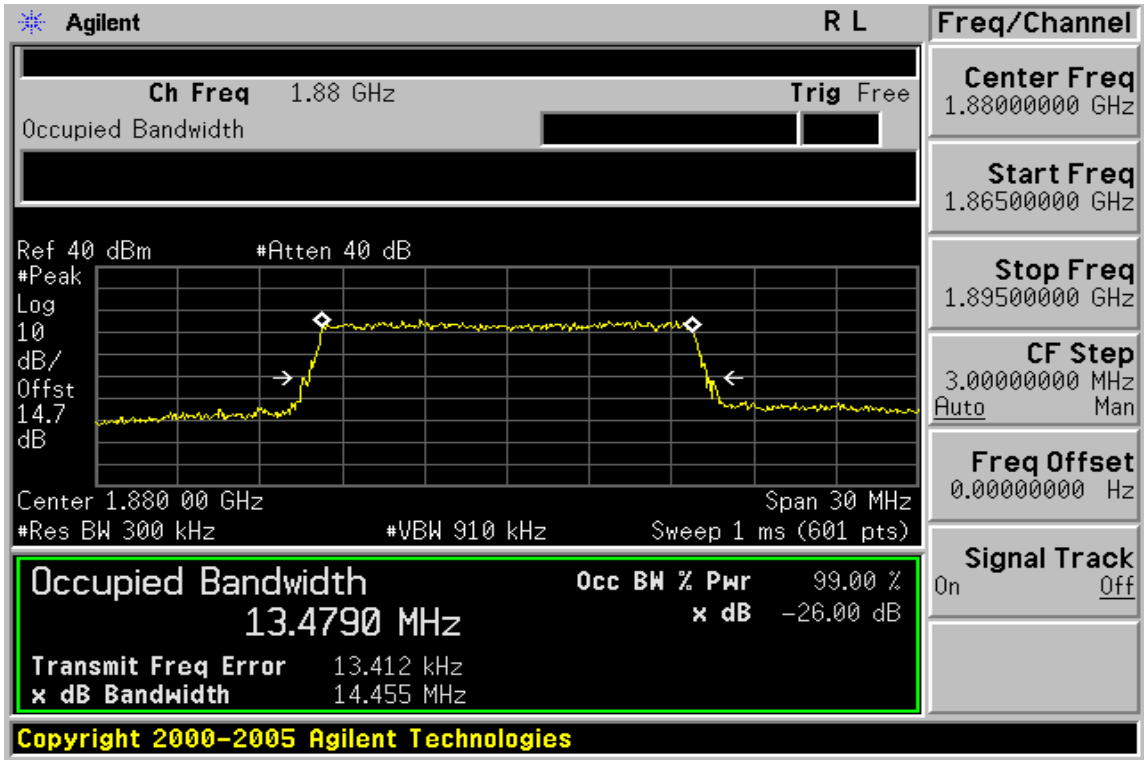
15MHz BW LTE-Band 2 QPSK Channel High



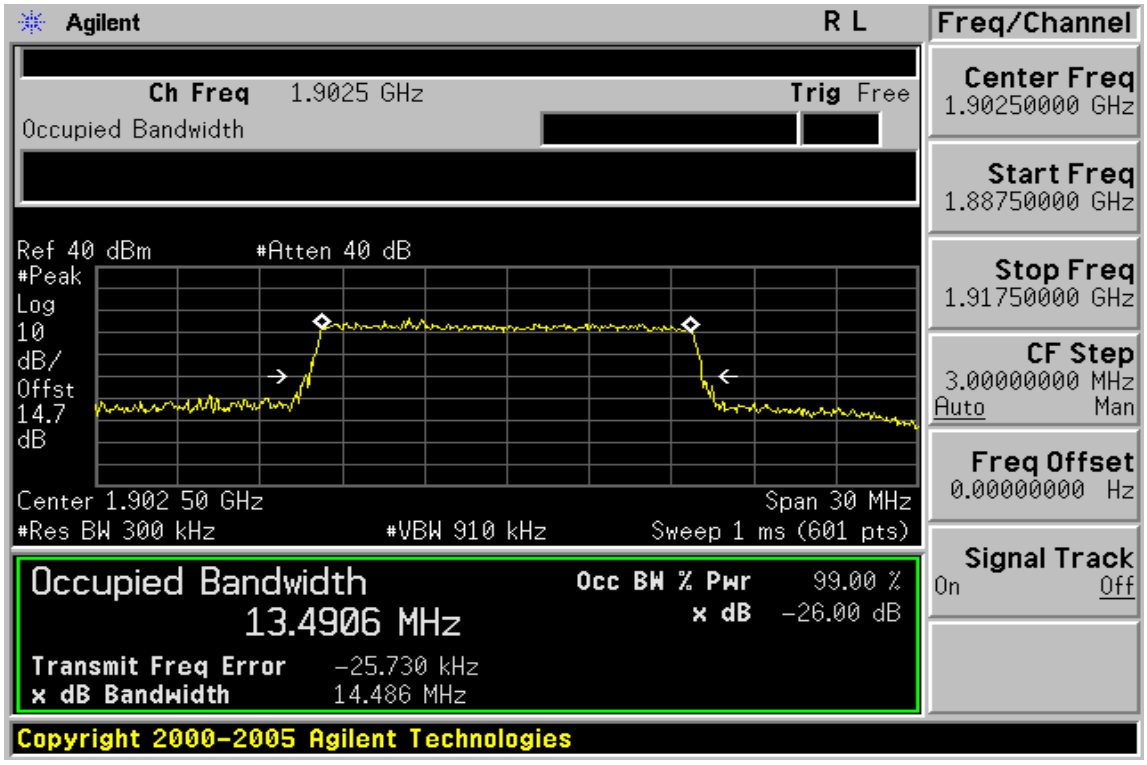
15MHz BW LTE-Band 2 16QAM Channel Low



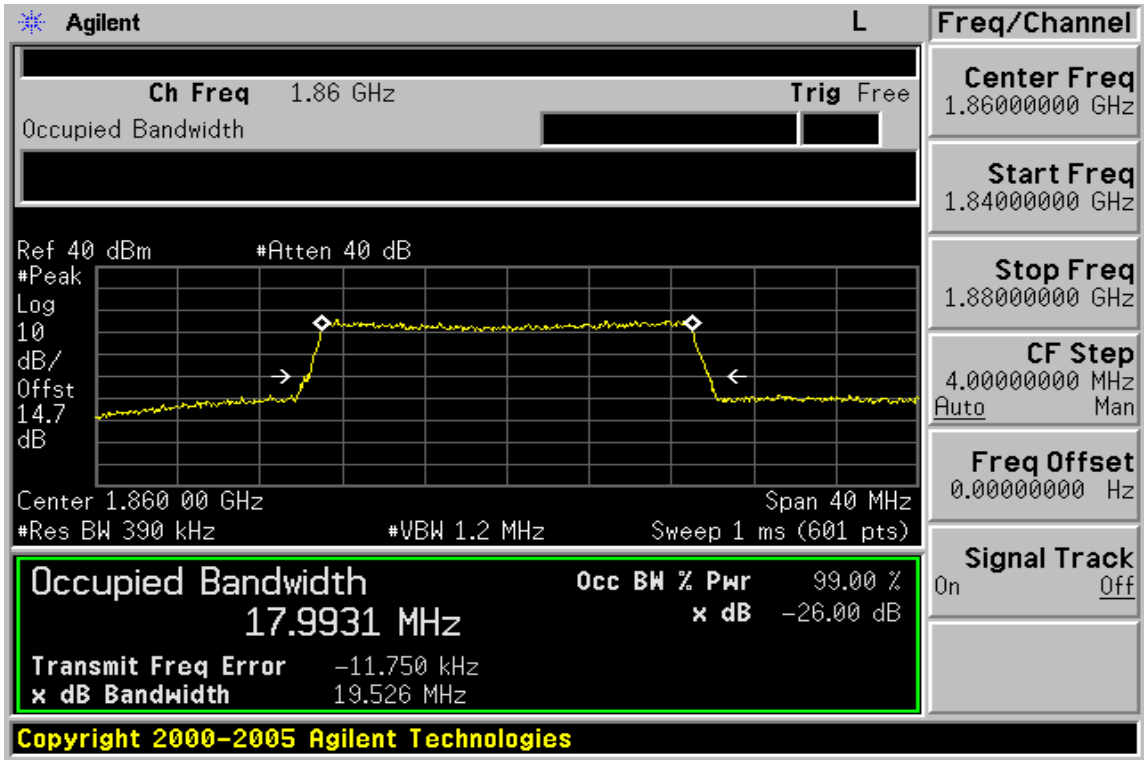
15MHz BW LTE-Band 2 16QAM Channel Mid



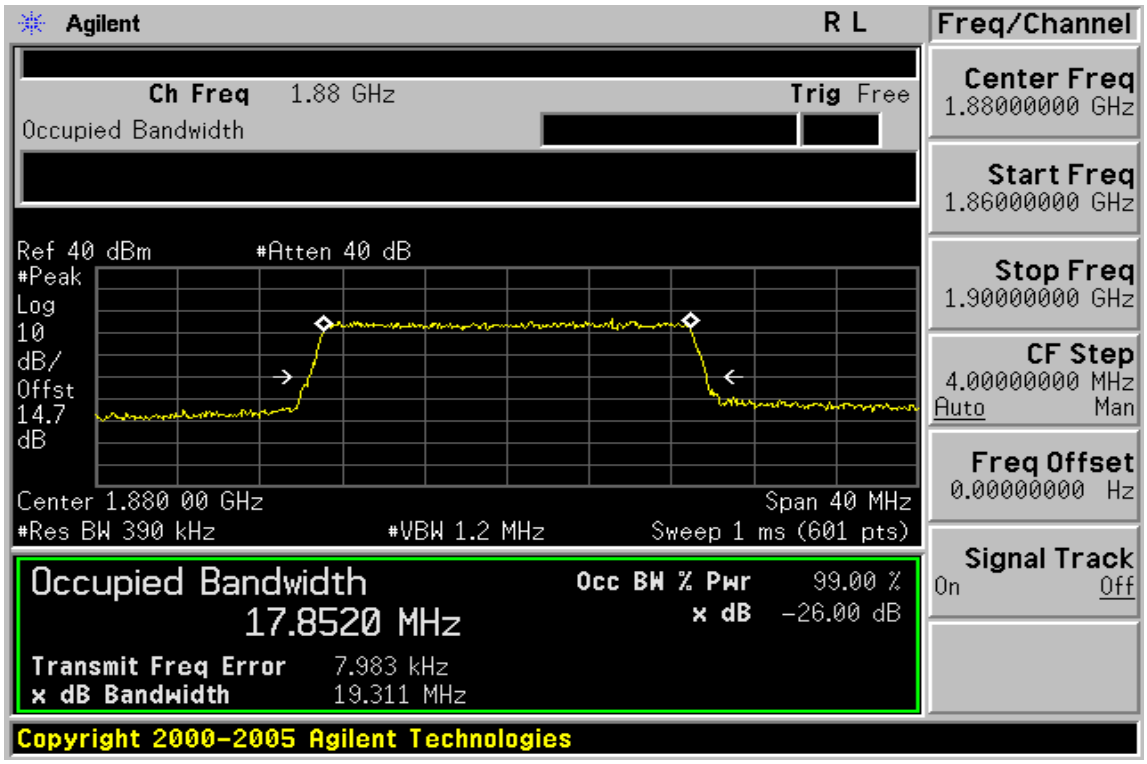
15MHz BW LTE-Band 2 16QAM Channel High



20MHz BW LTE-Band 2 QPSK Channel Low



20MHz BW LTE-Band 2 QPSK Channel Mid



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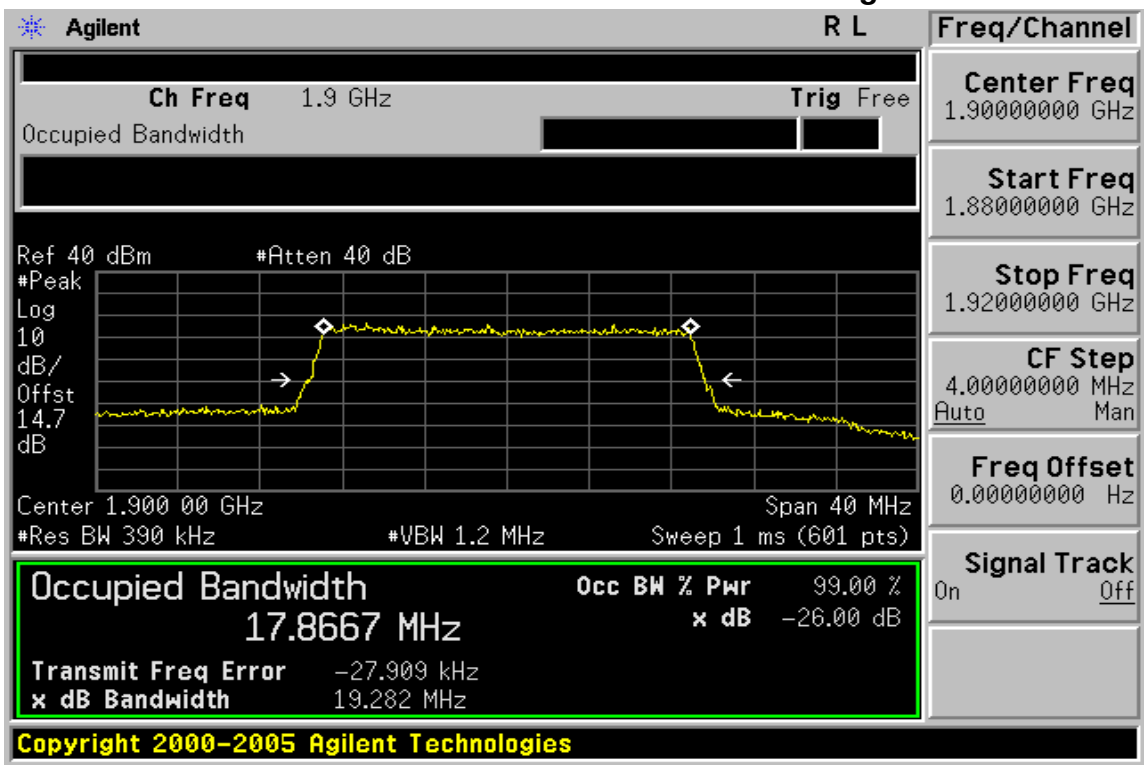

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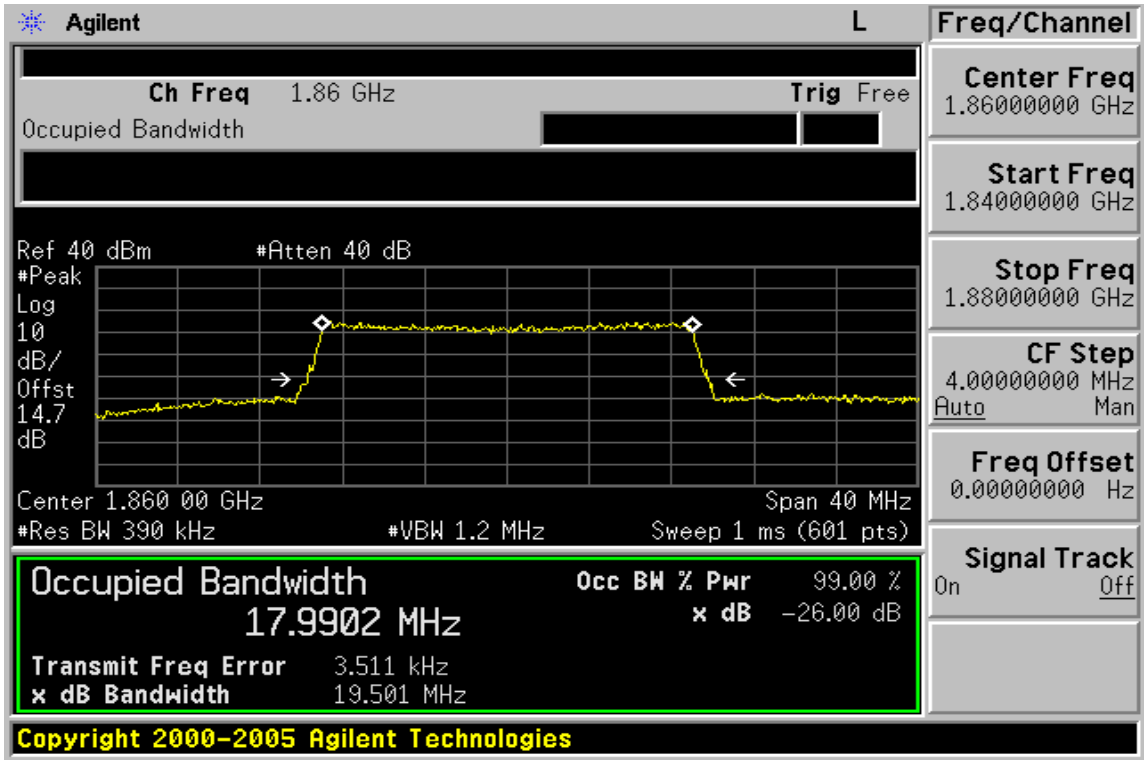

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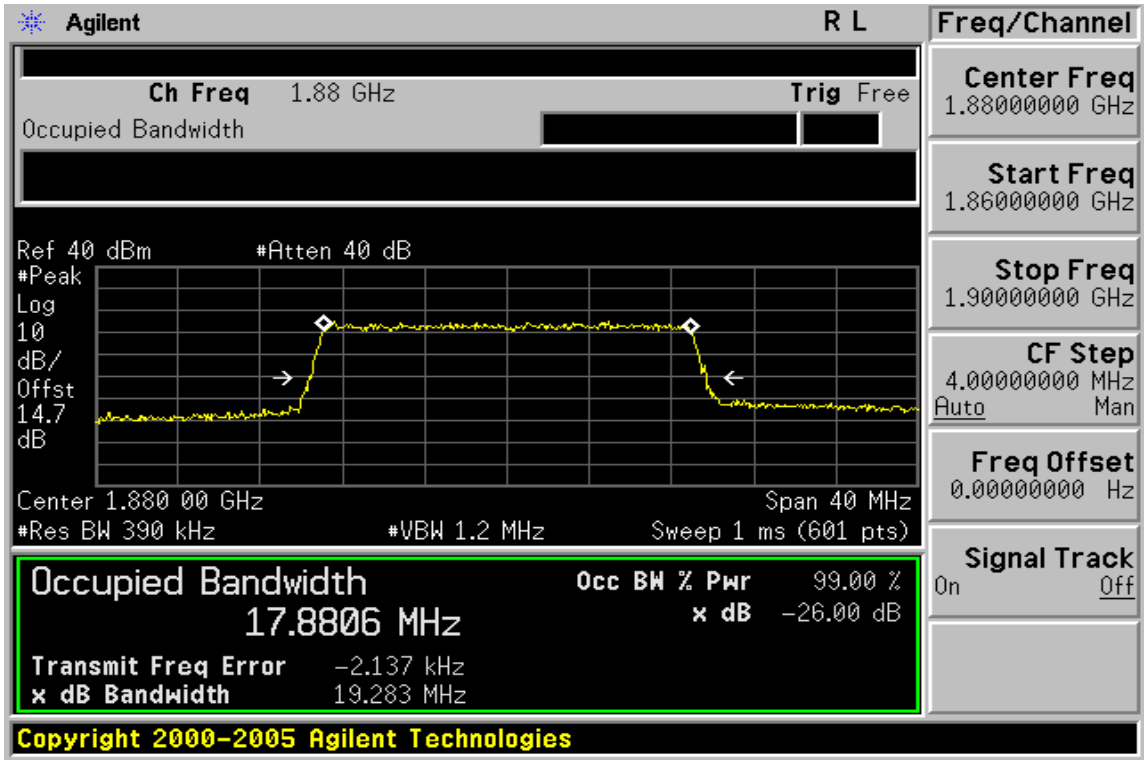

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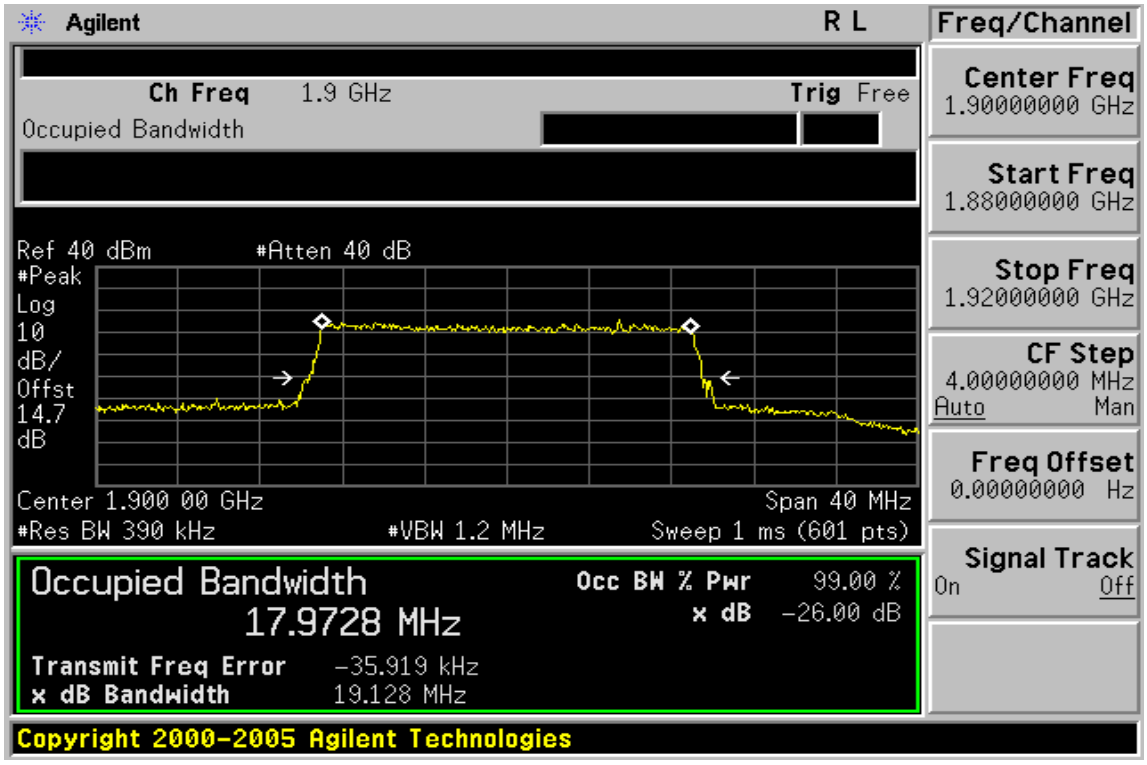
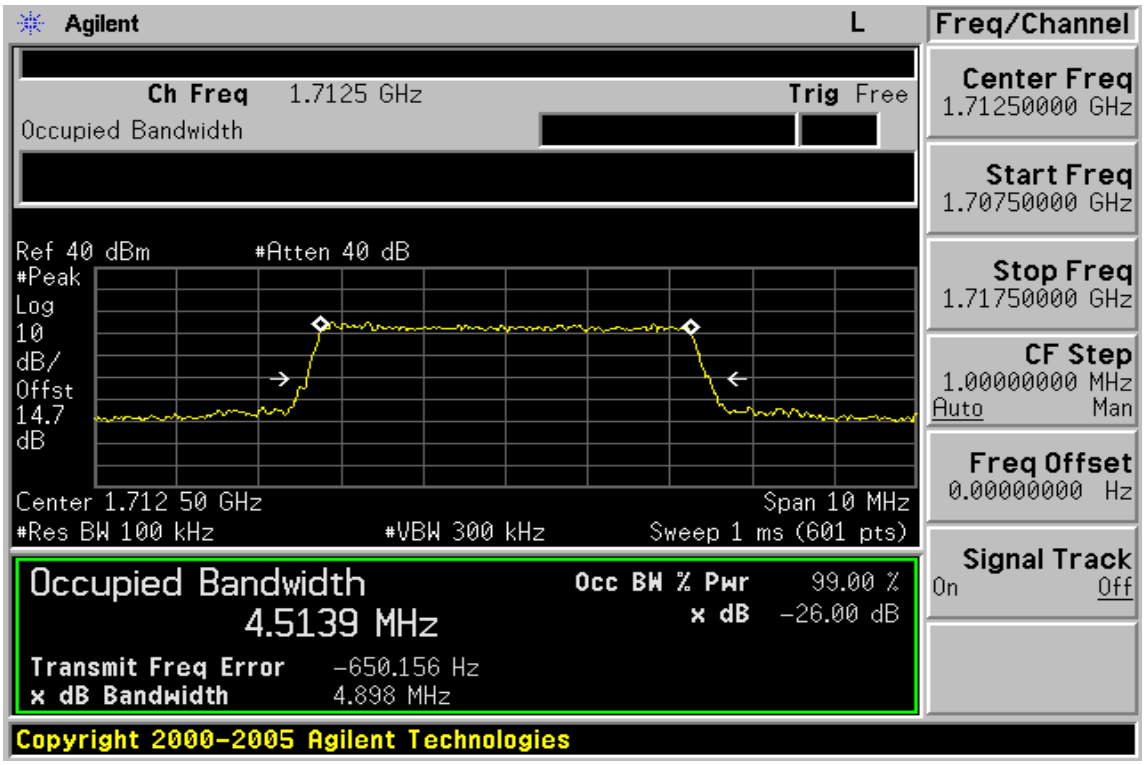


5MHz BW LTE-Band 4 QPSK Channel Low



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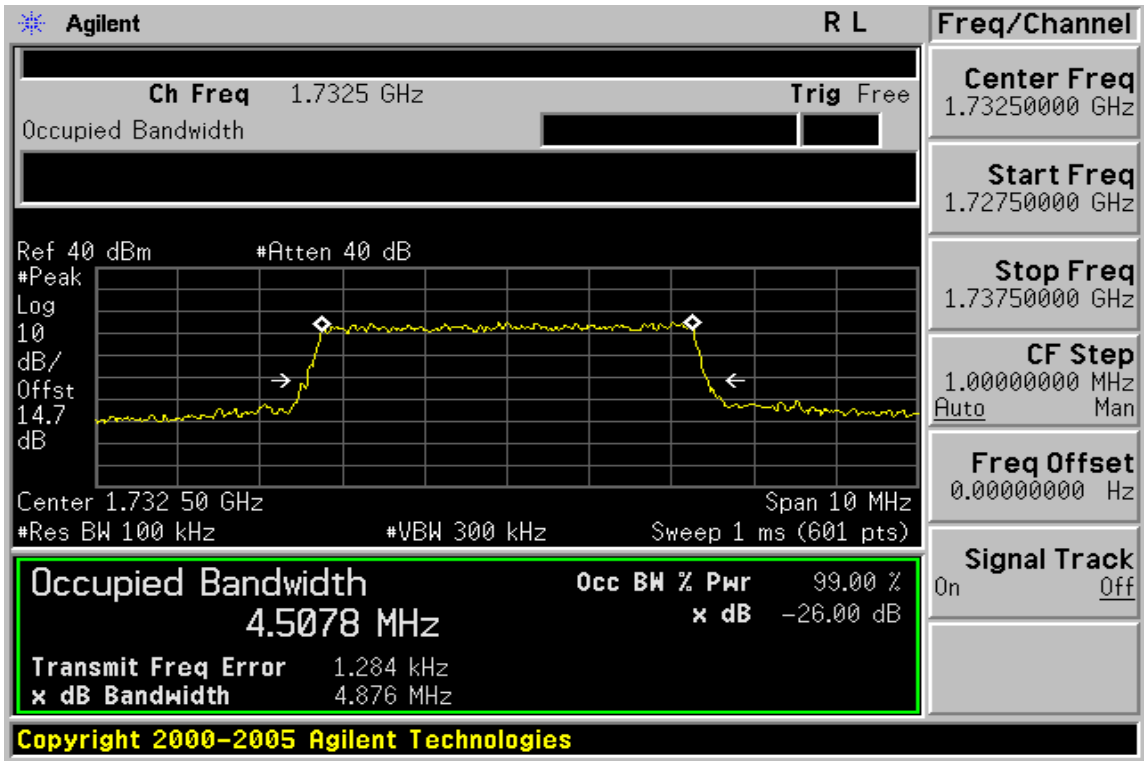
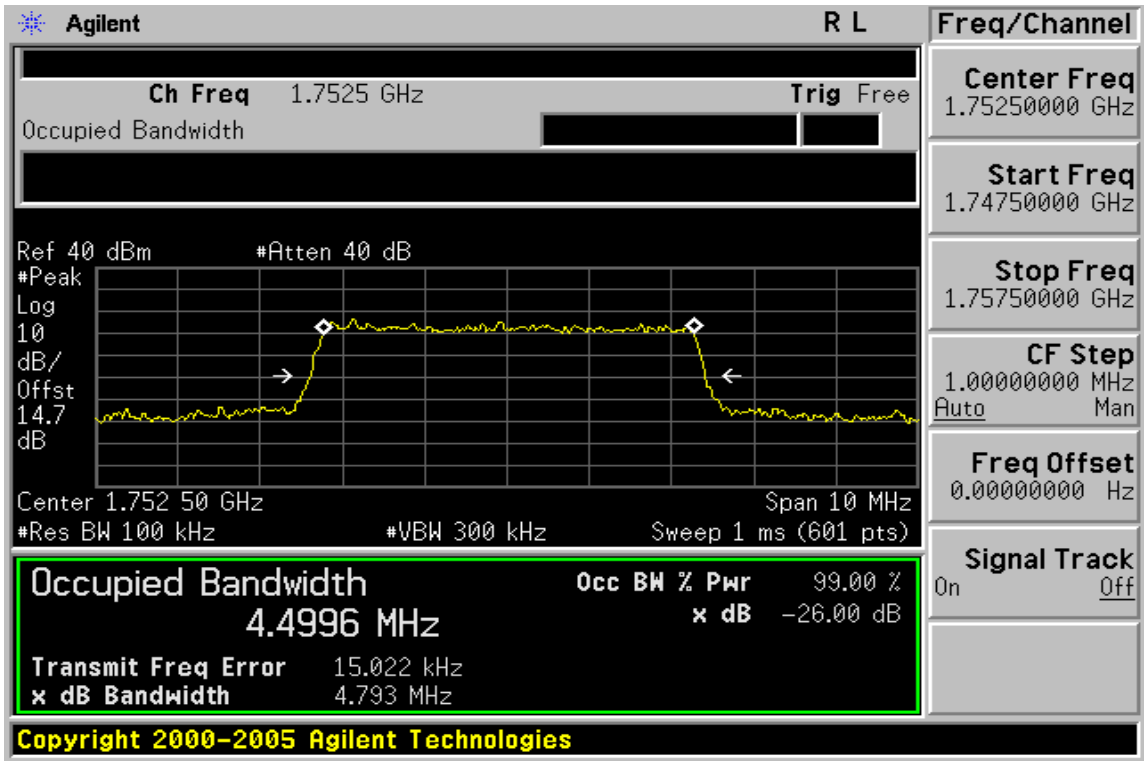


5MHz BW LTE-Band 4 QPSK Channel High



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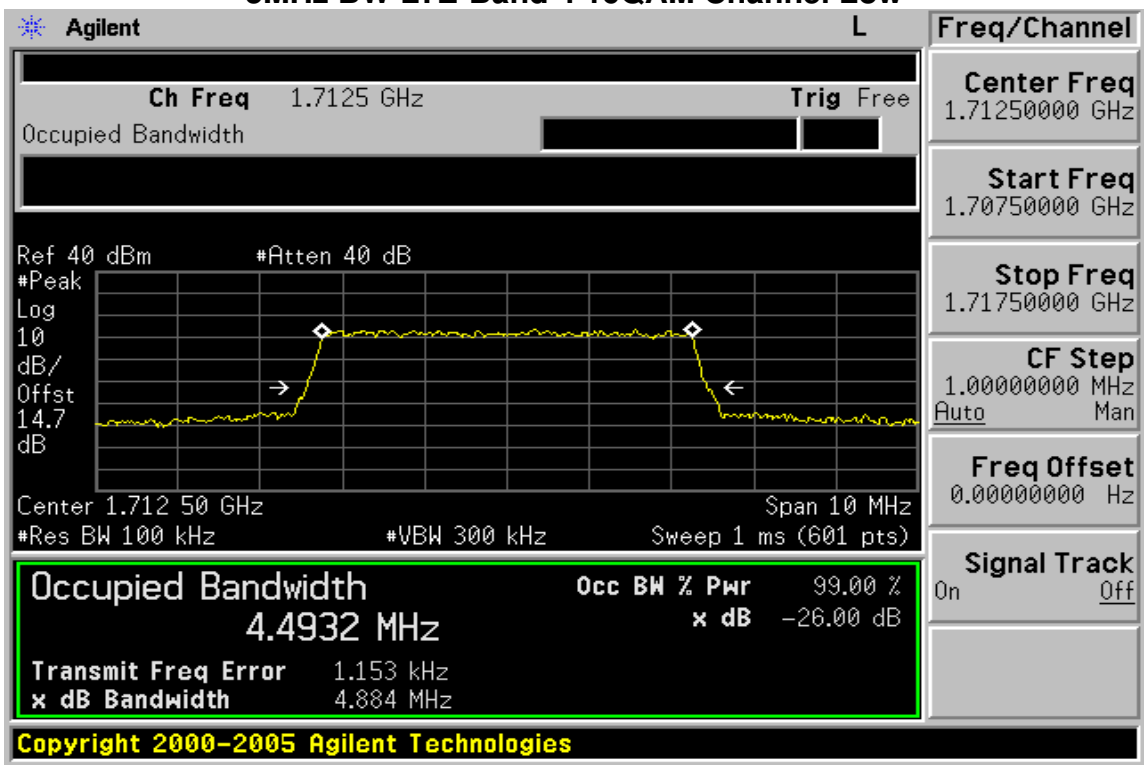

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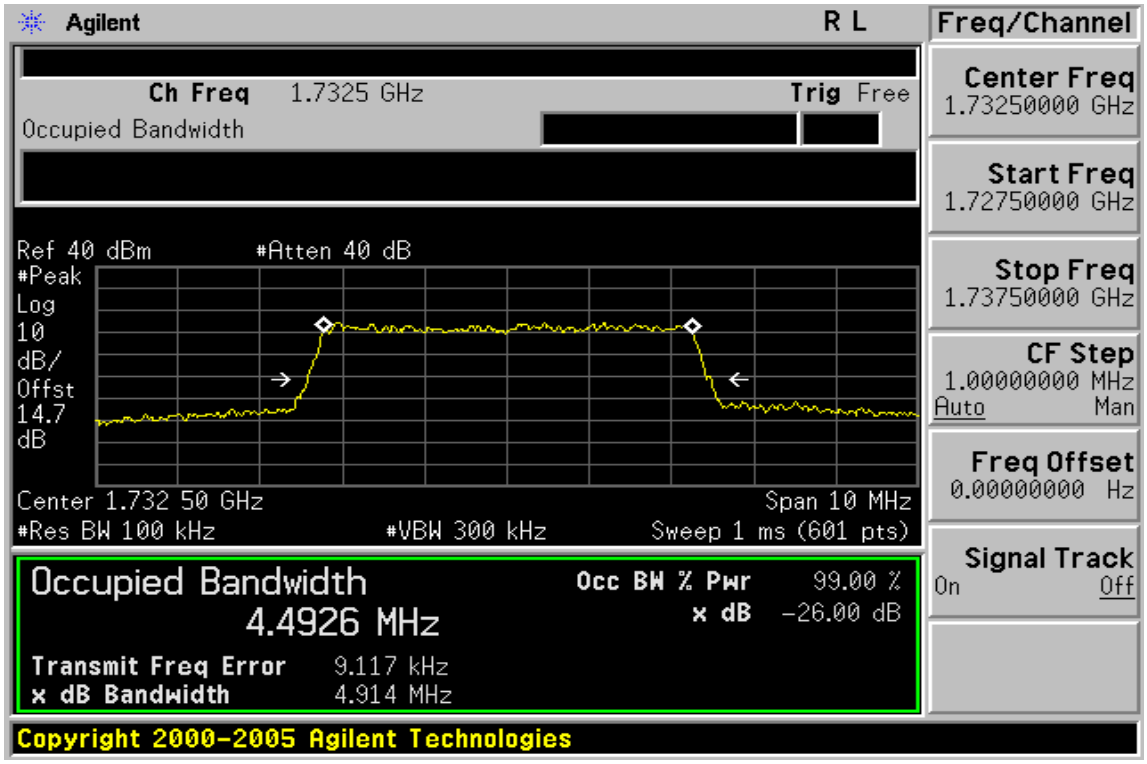

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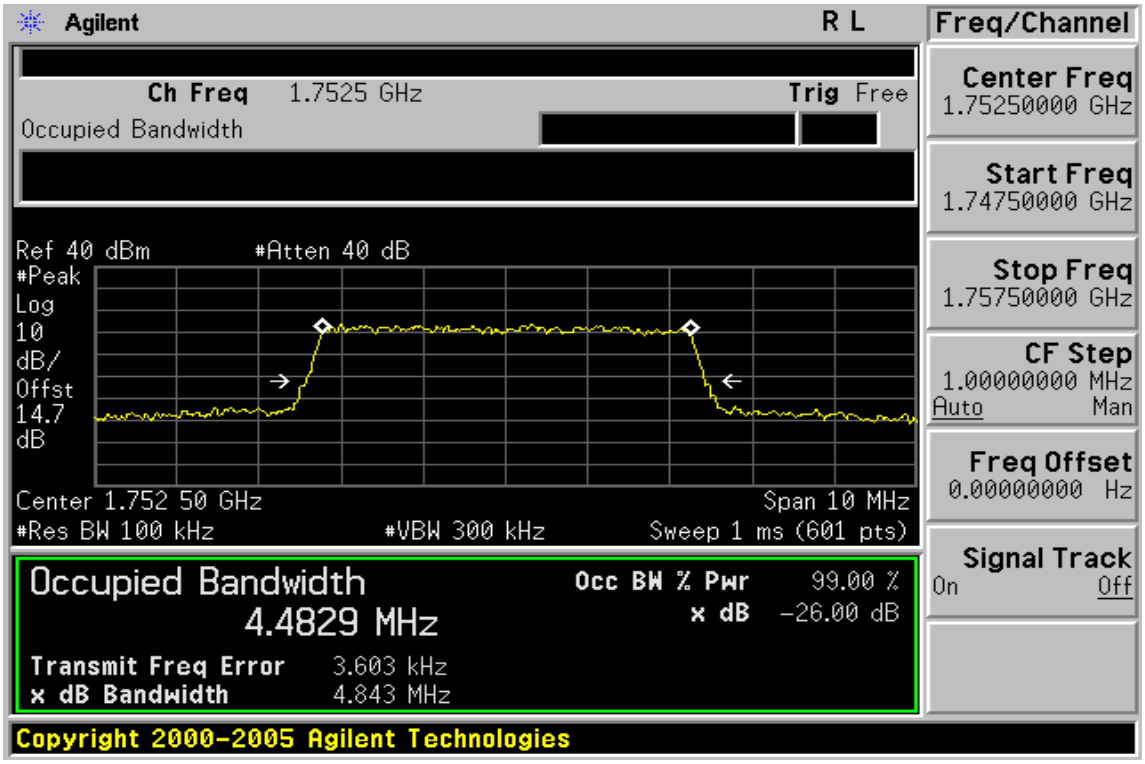
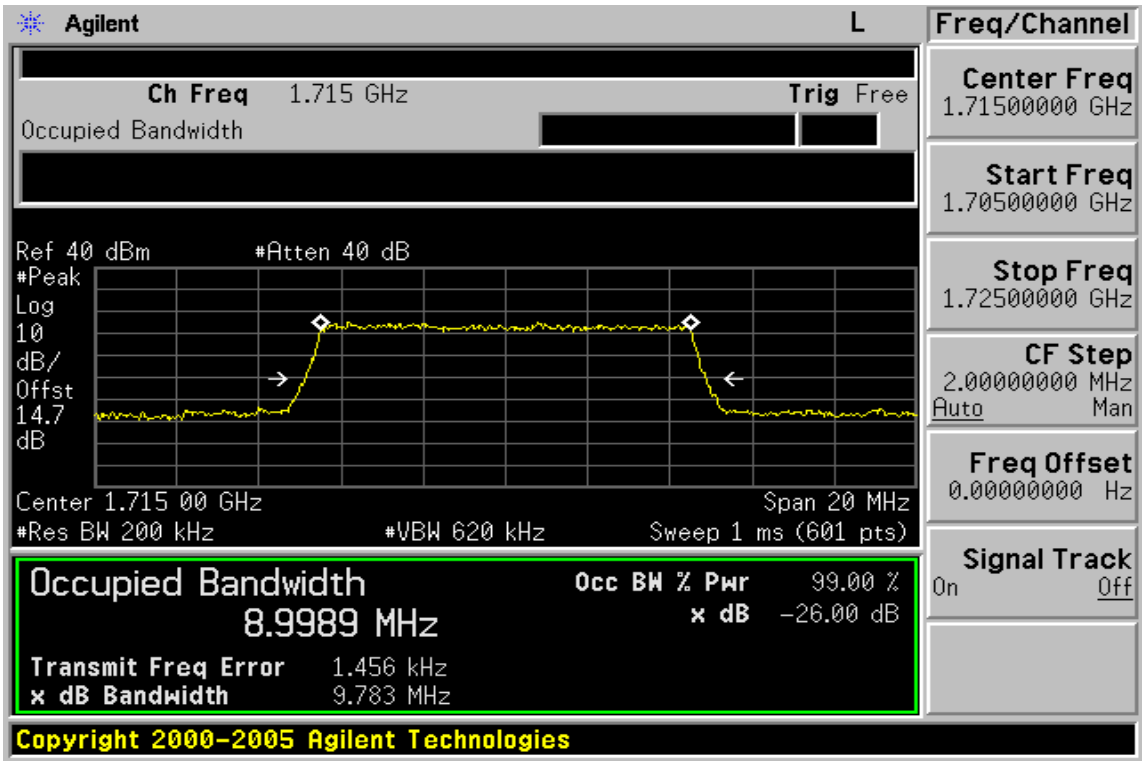
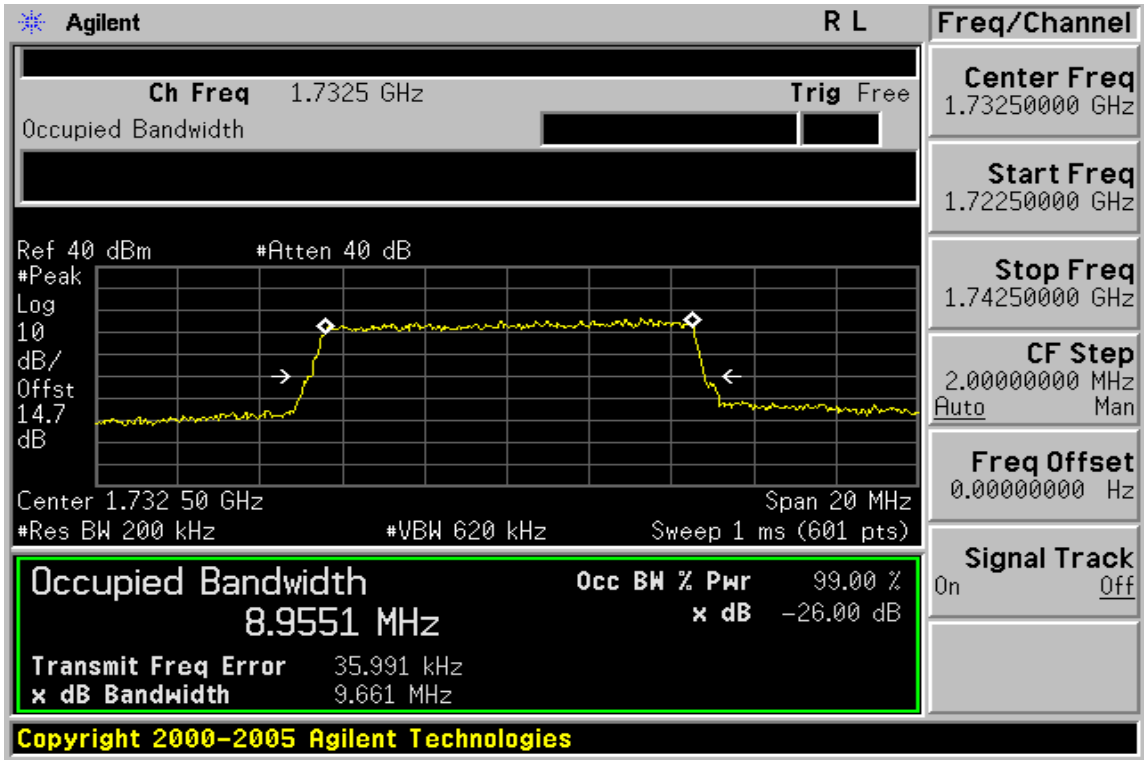


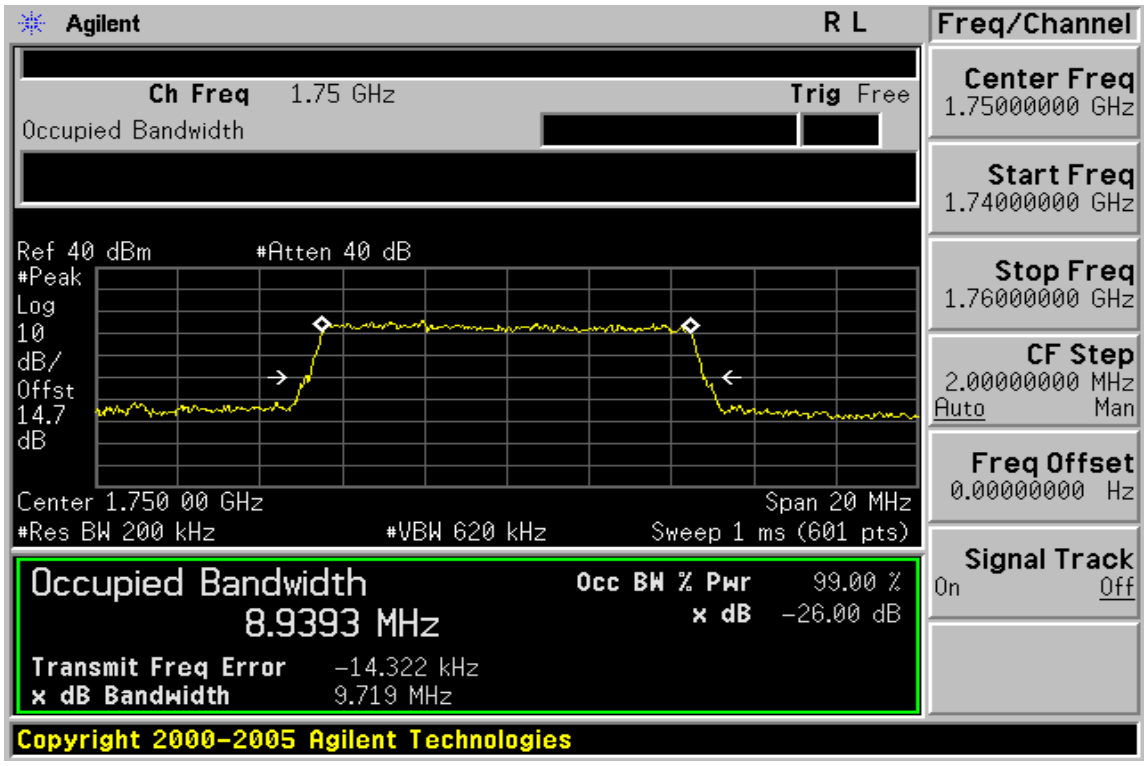
10MHz BW LTE-Band 4 QPSK Channel Low



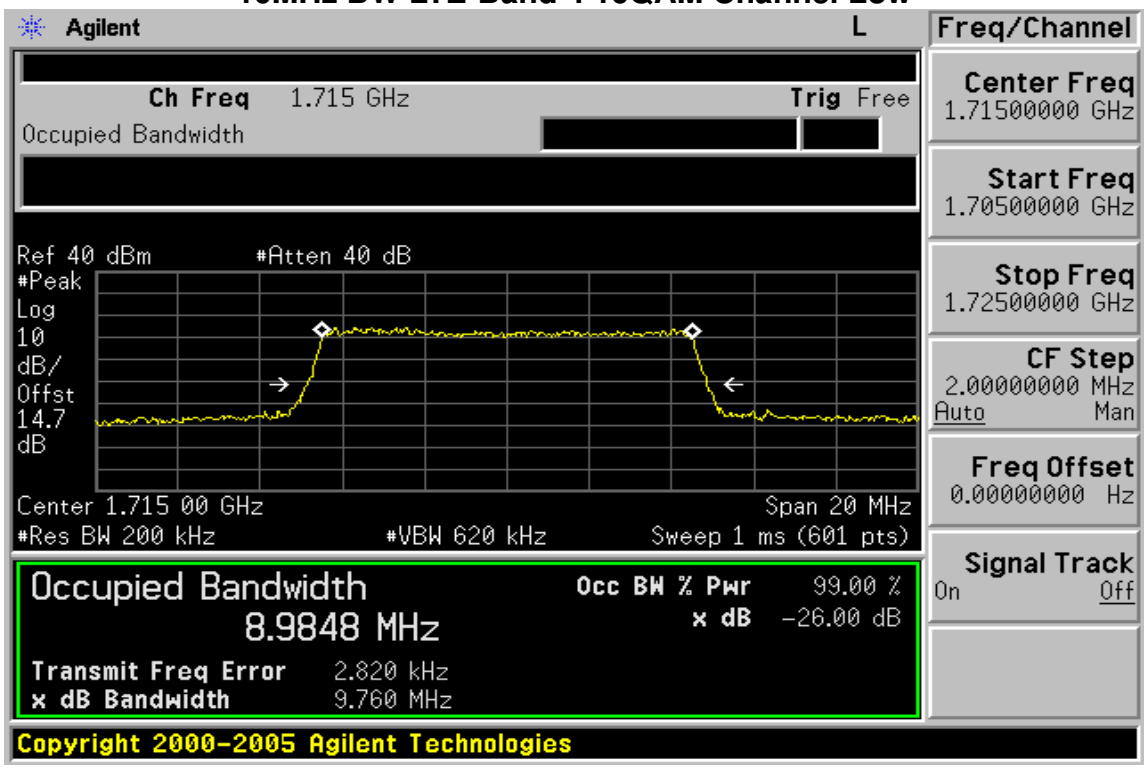
10MHz BW LTE-Band 4 QPSK Channel Mid



10MHz BW LTE-Band 4 QPSK Channel High



10MHz BW LTE-Band 4 16QAM Channel Low



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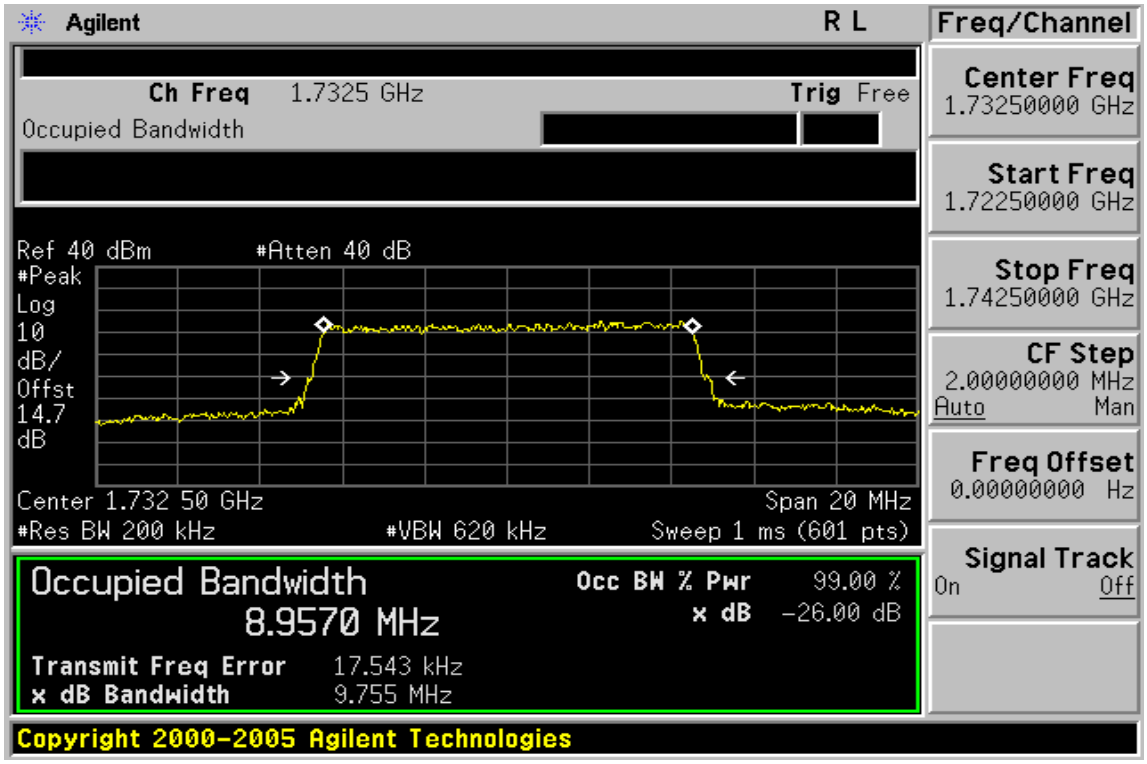

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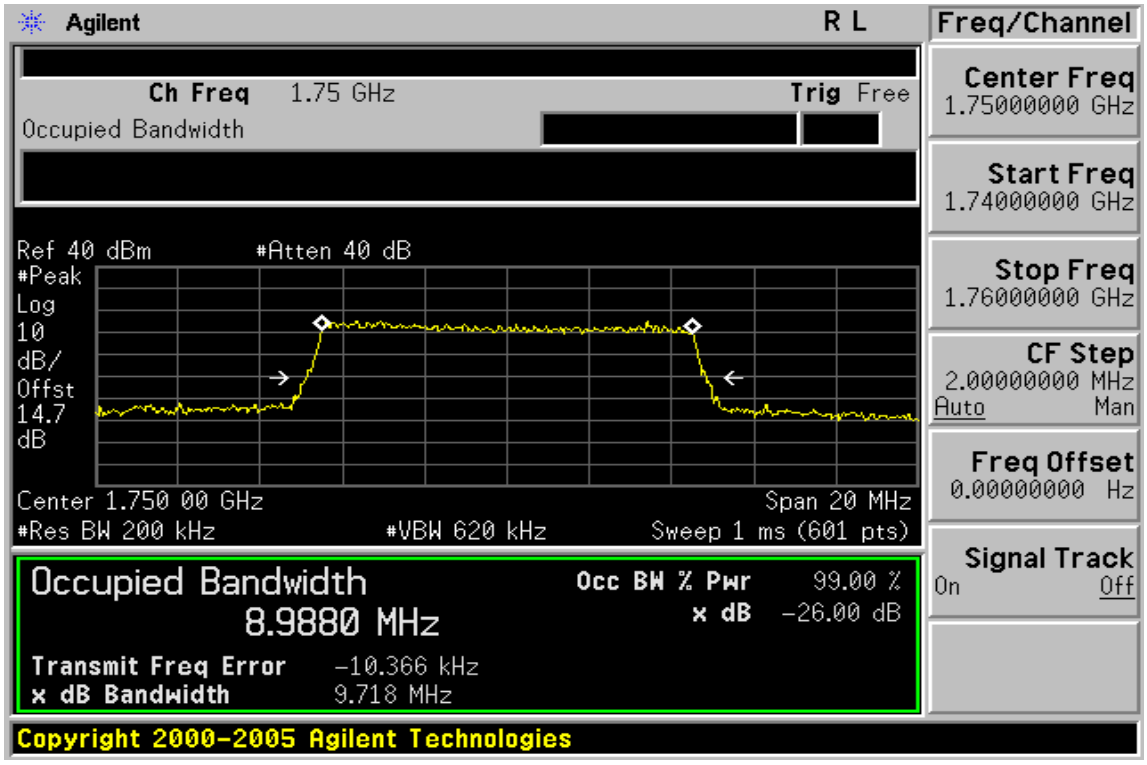
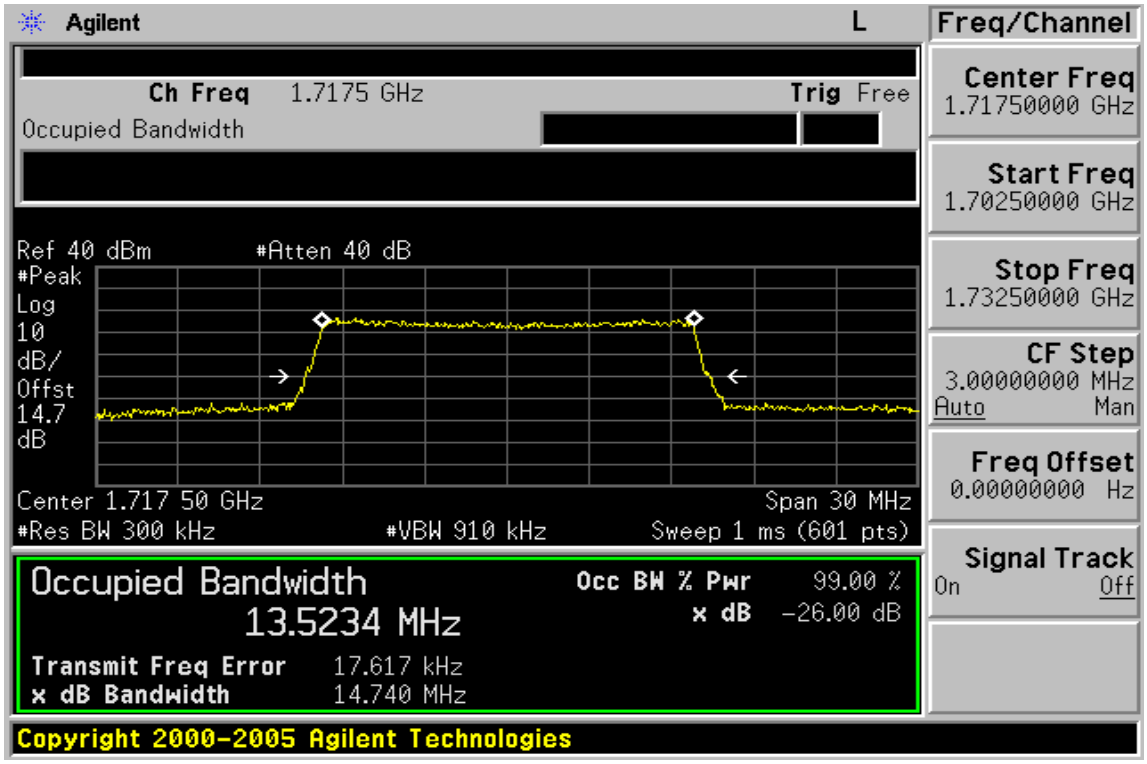


15MHz BW LTE-Band 4 QPSK Channel Low



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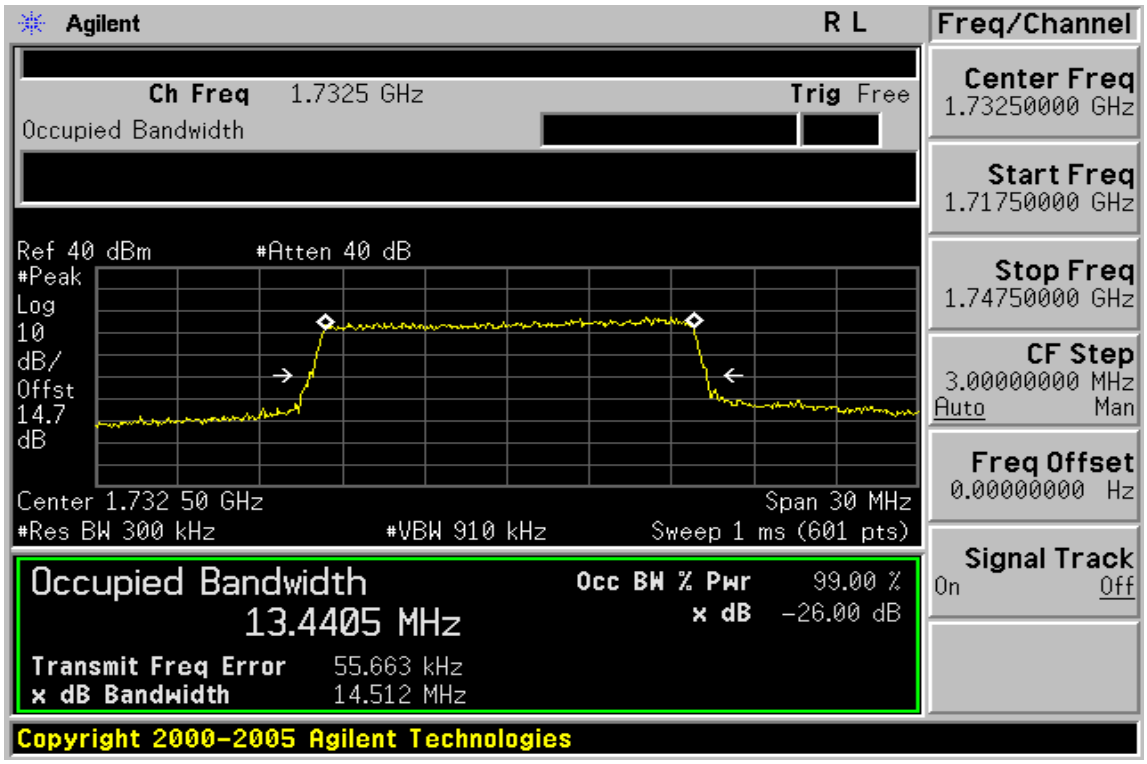

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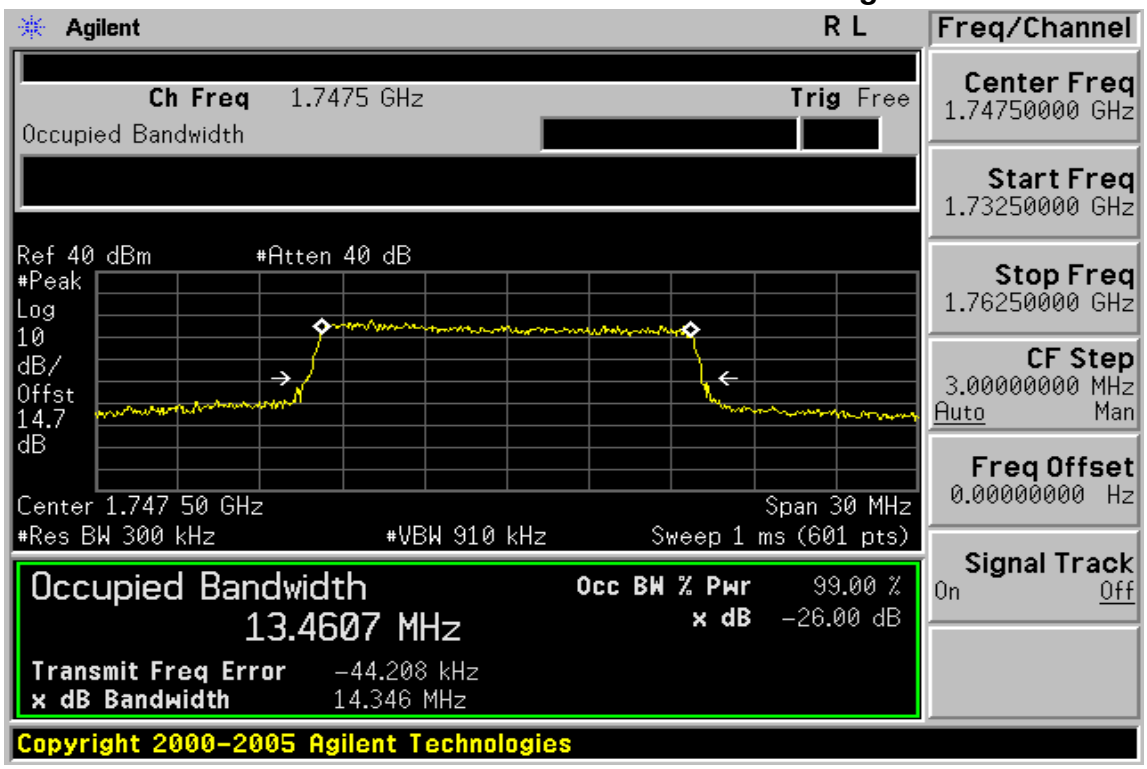

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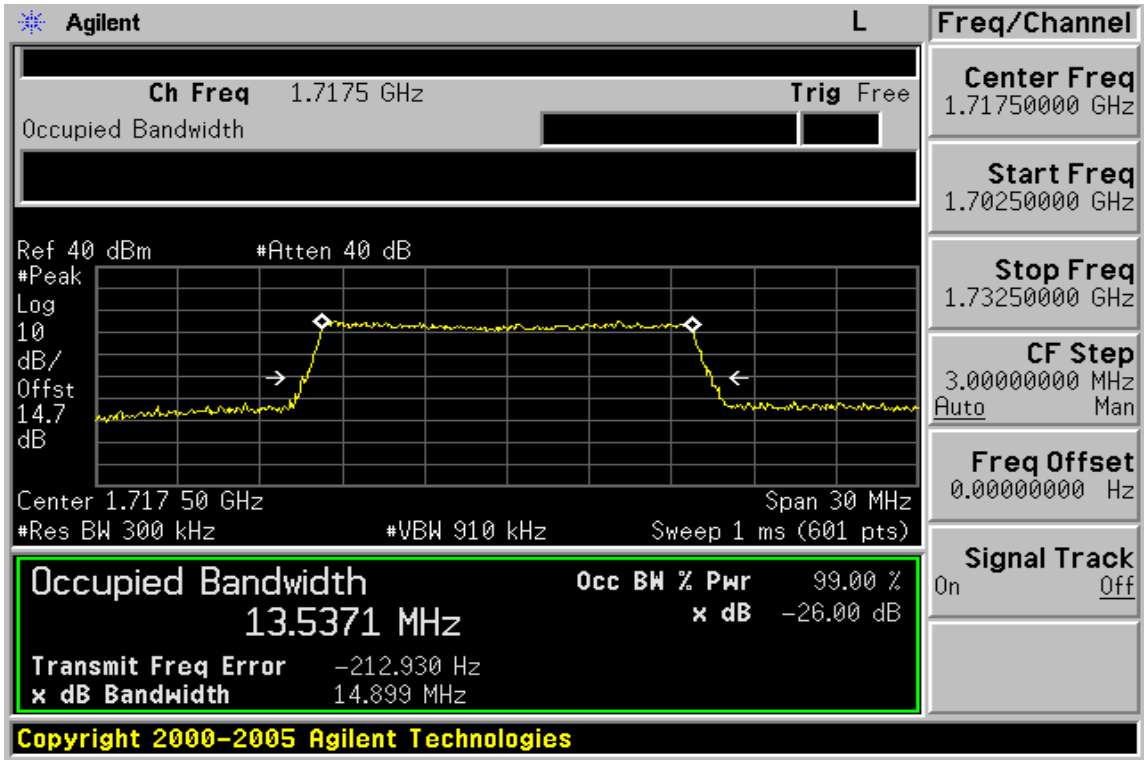
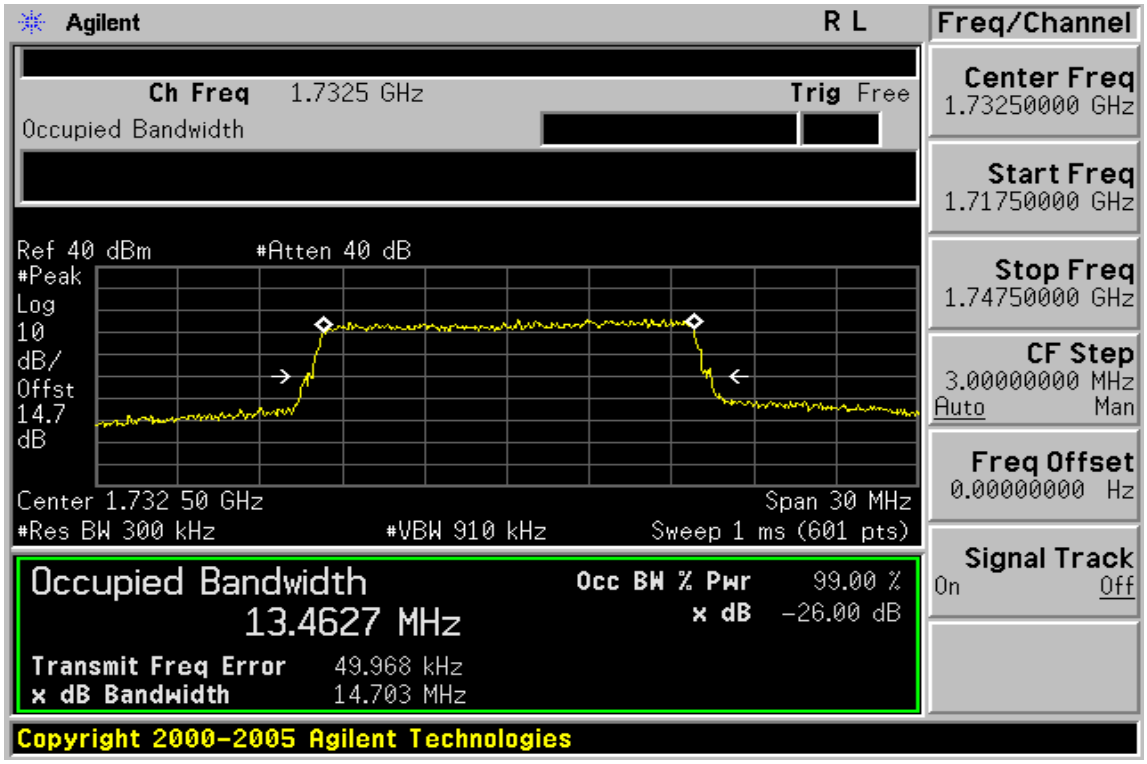
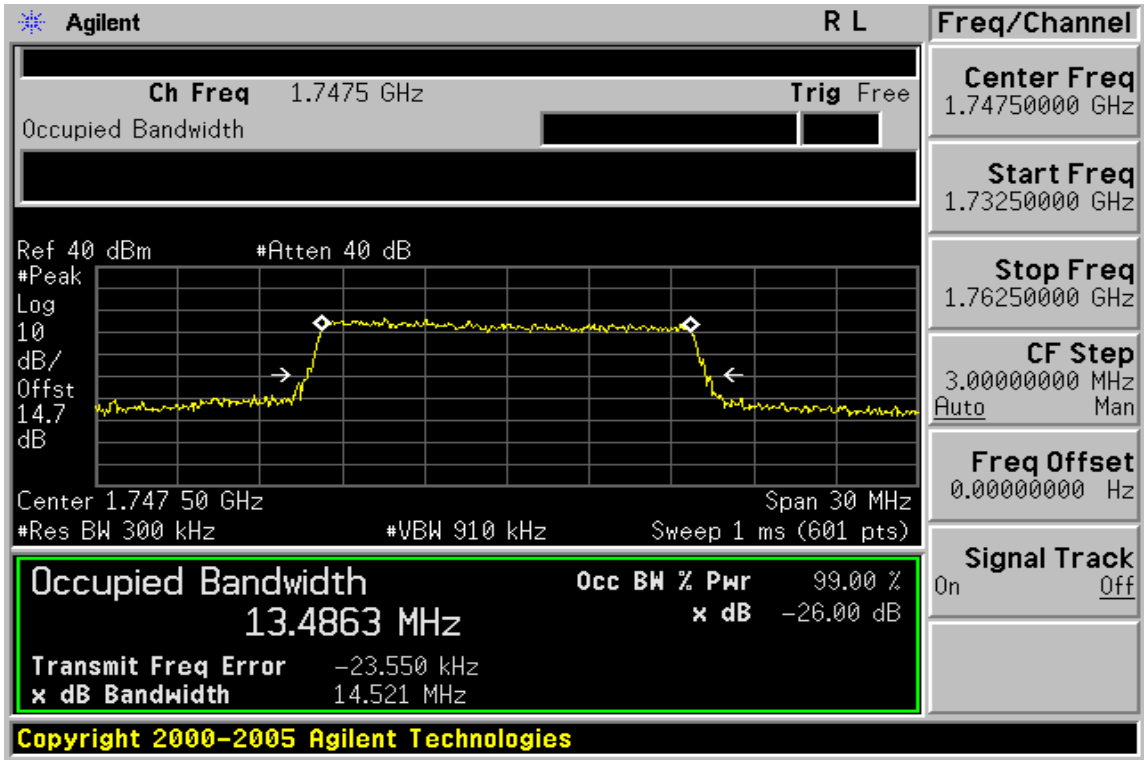


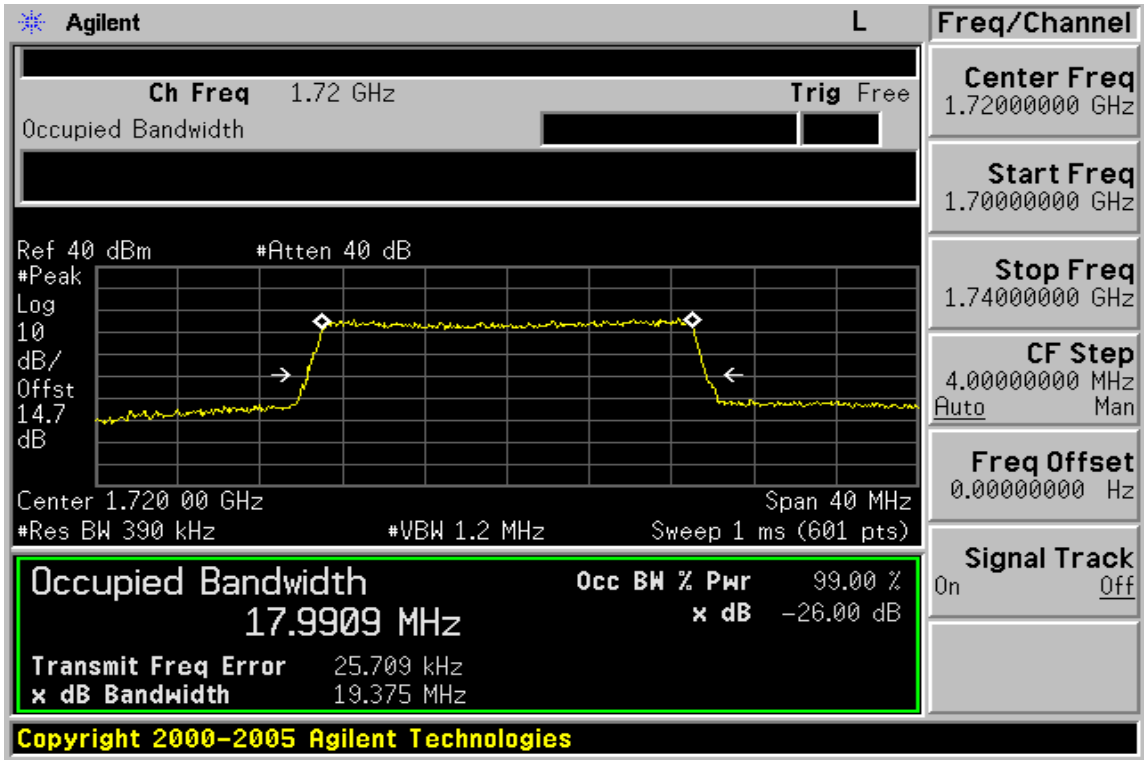
15MHz BW LTE-Band 4 16QAM Channel Mid



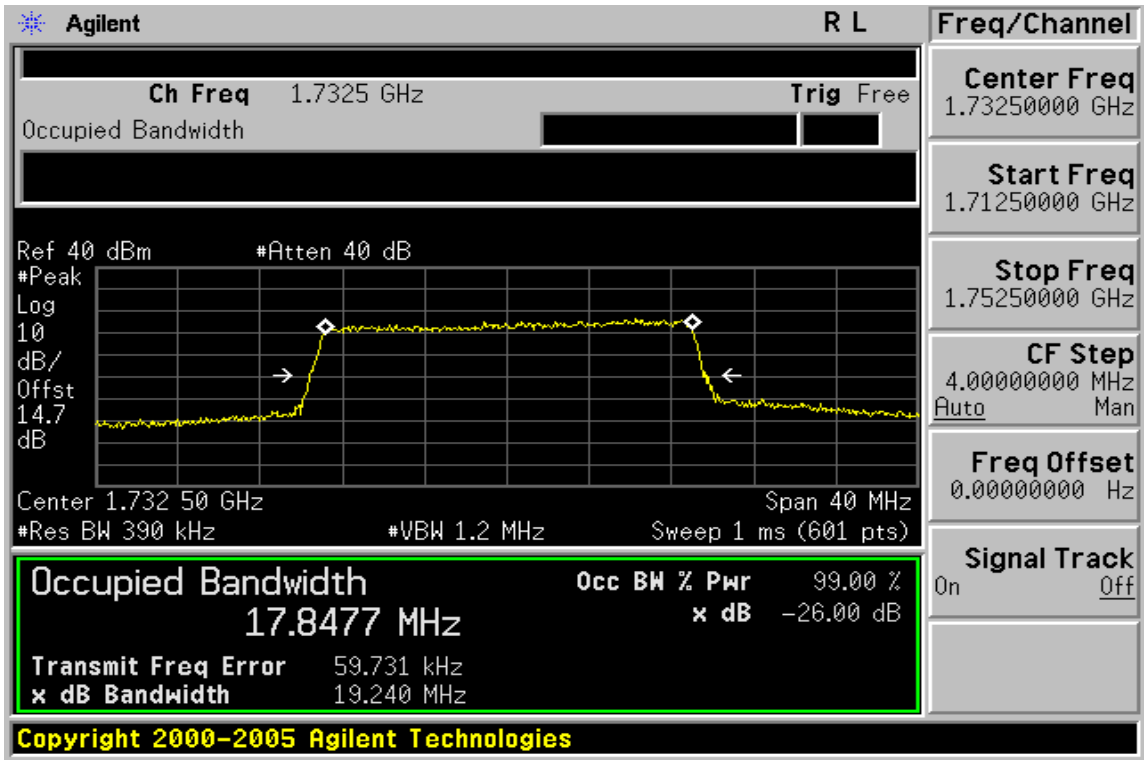
15MHz BW LTE-Band 4 16QAM Channel High



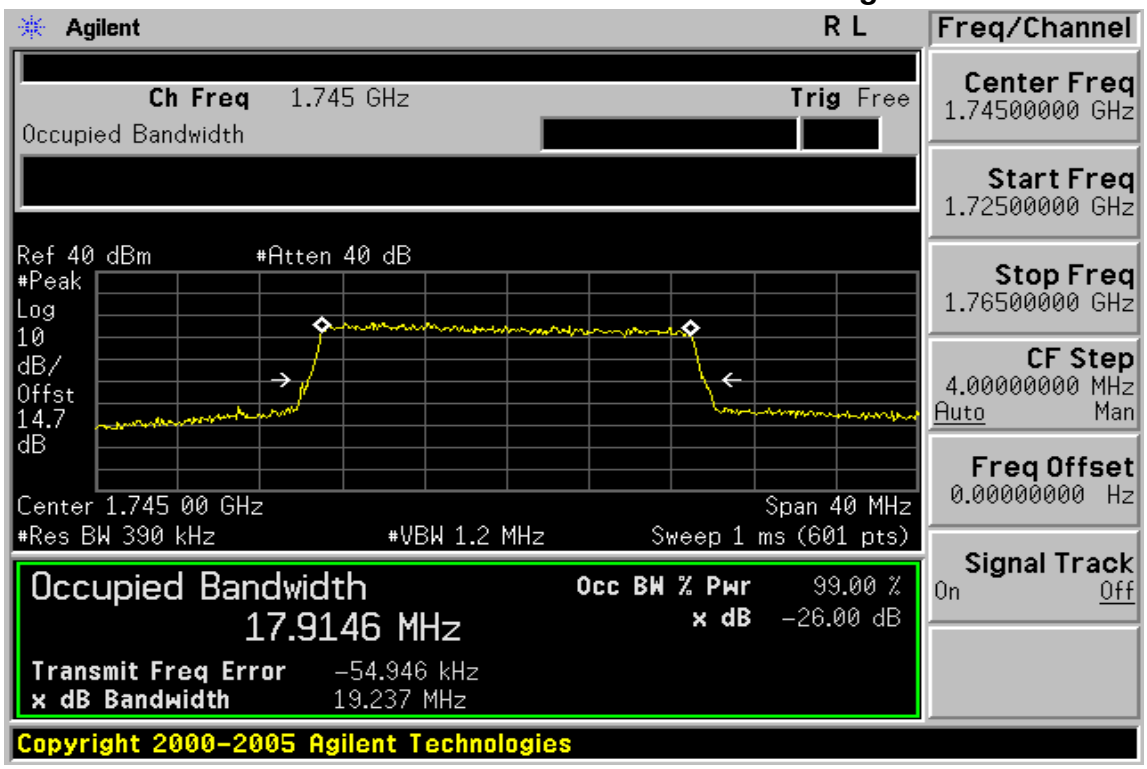
20MHz BW LTE-Band 4 QPSK Channel Low



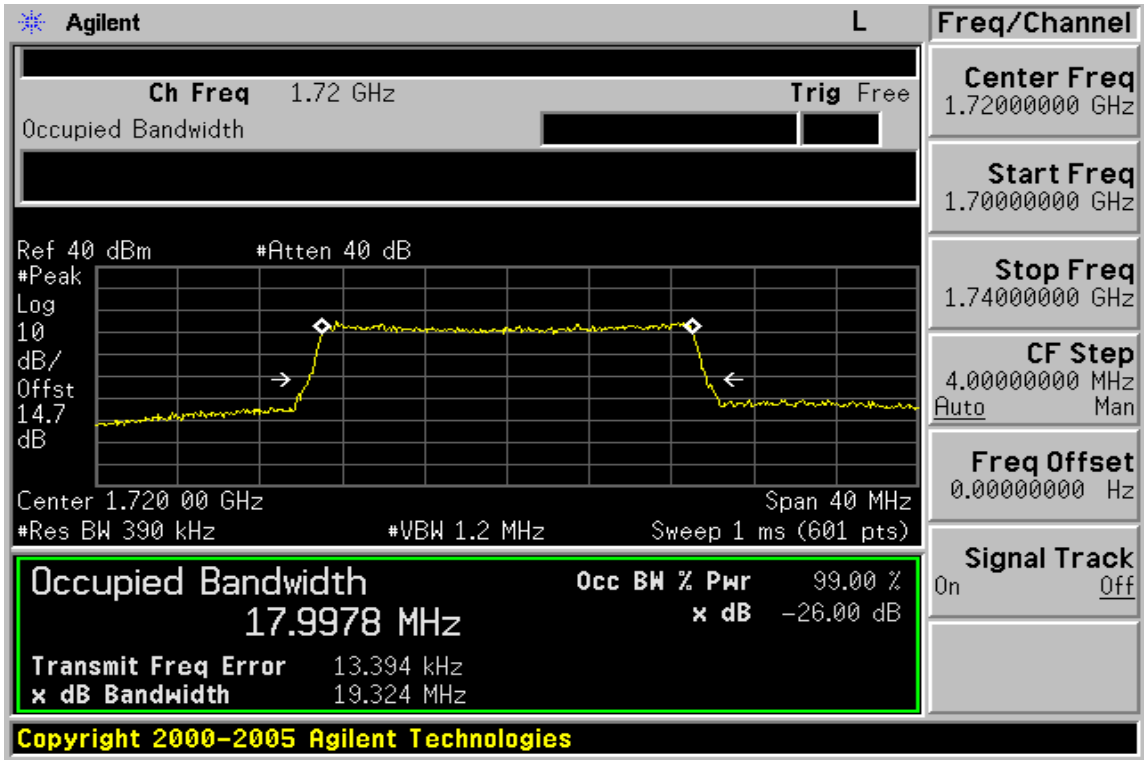
20MHz BW LTE-Band 4 QPSK Channel Mid



20MHz BW LTE-Band 4 QPSK Channel High



20MHz BW LTE-Band 4 16QAM Channel Low



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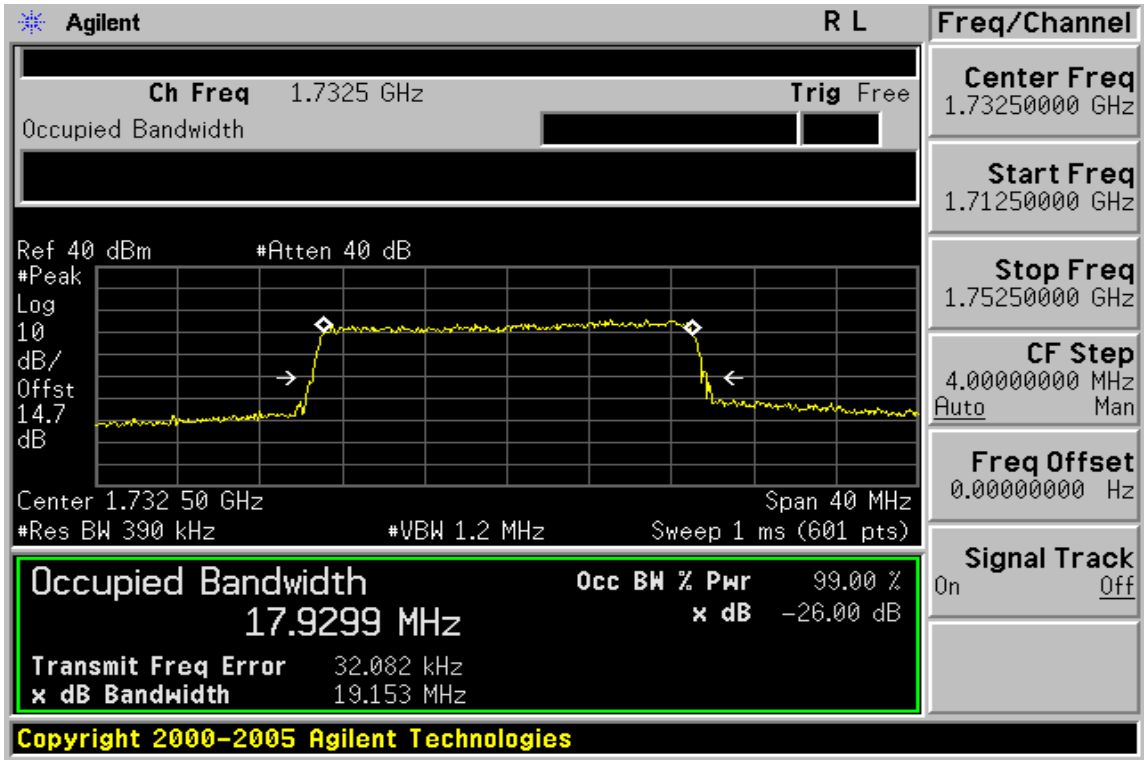
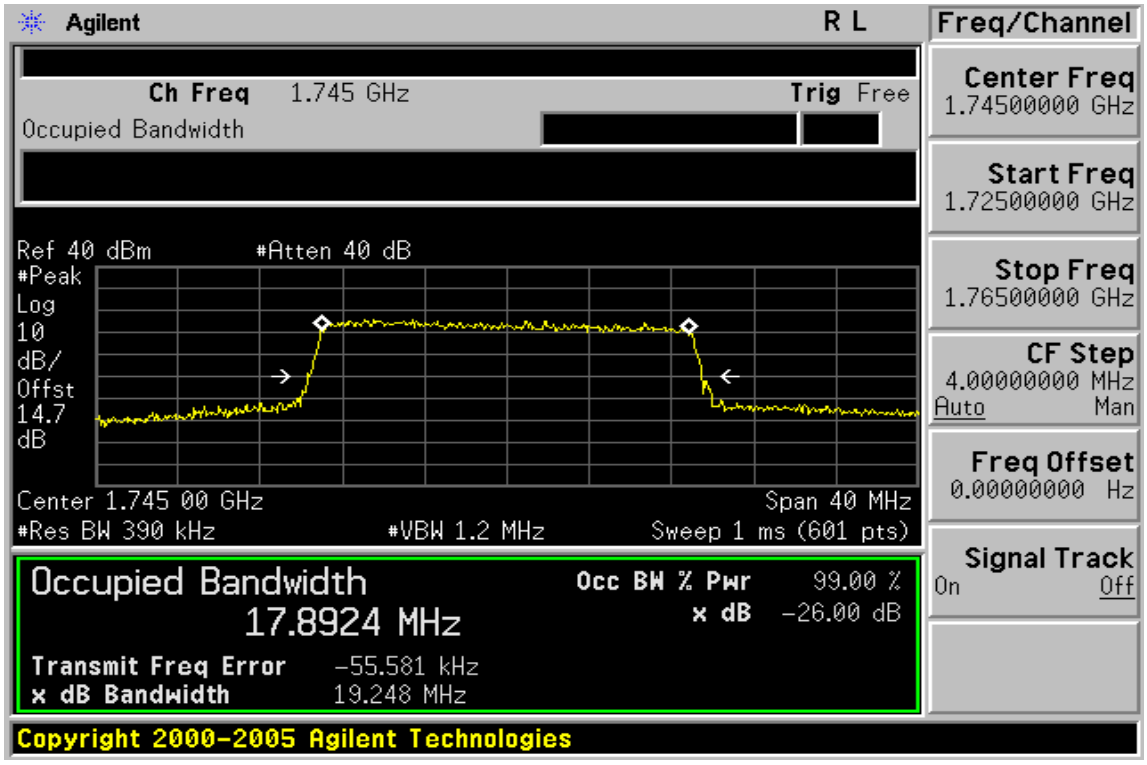
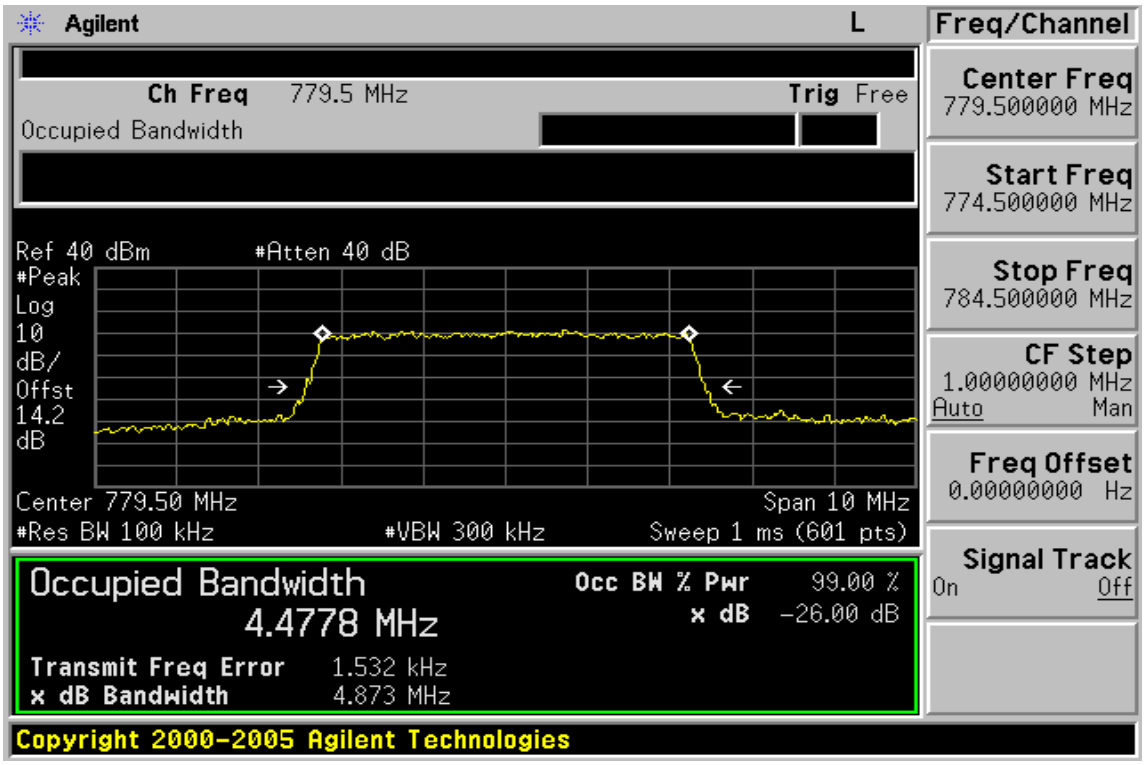


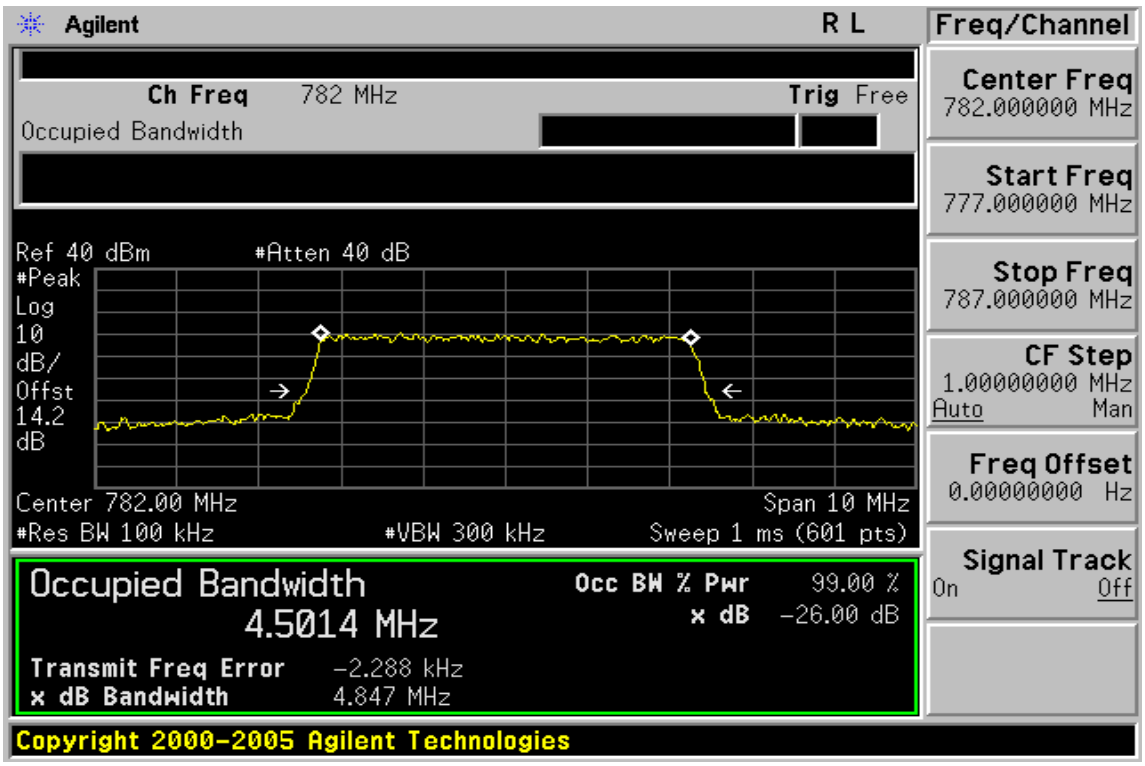
20MHz BW LTE-Band 4 16QAM Channel High



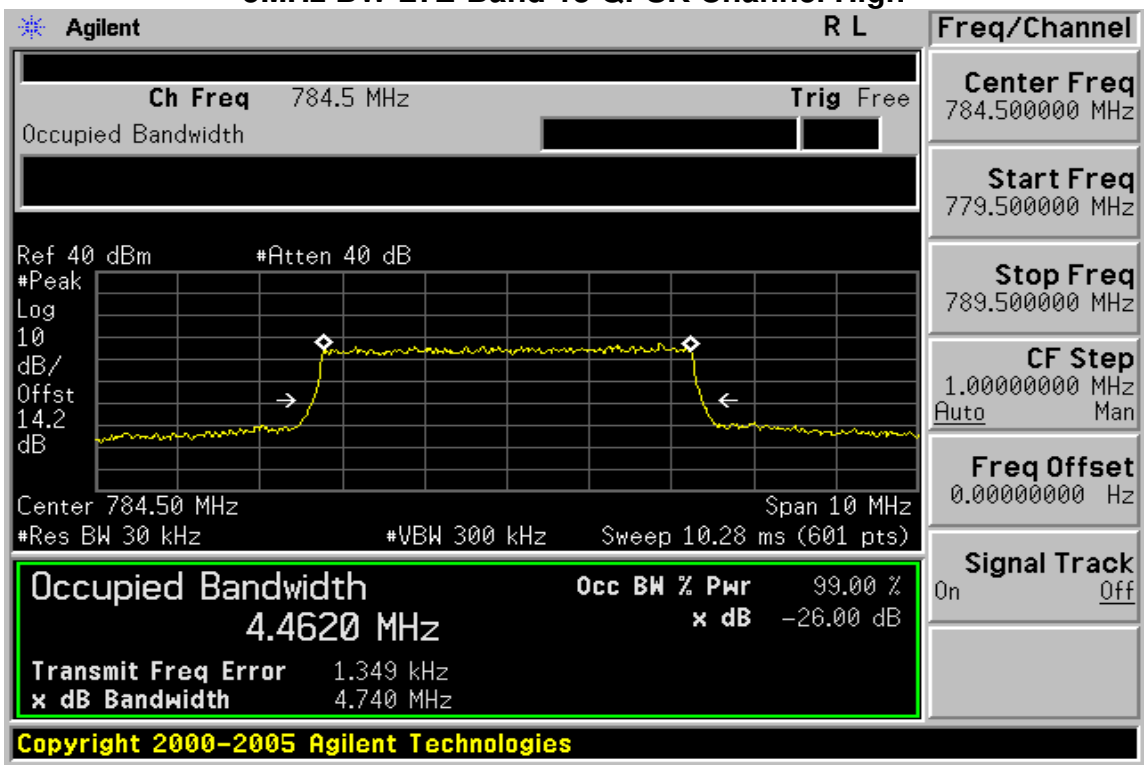
5MHz BW LTE-Band 13 QPSK Channel Low



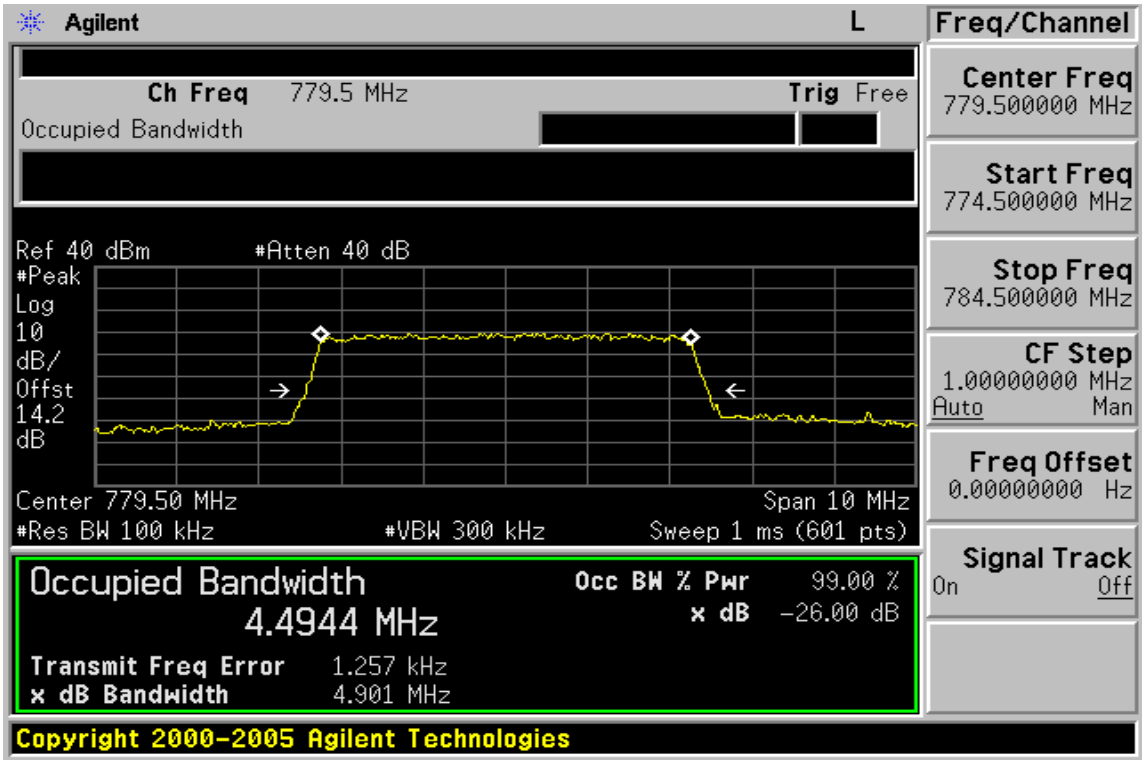
5MHz BW LTE-Band 13 QPSK Channel Mid



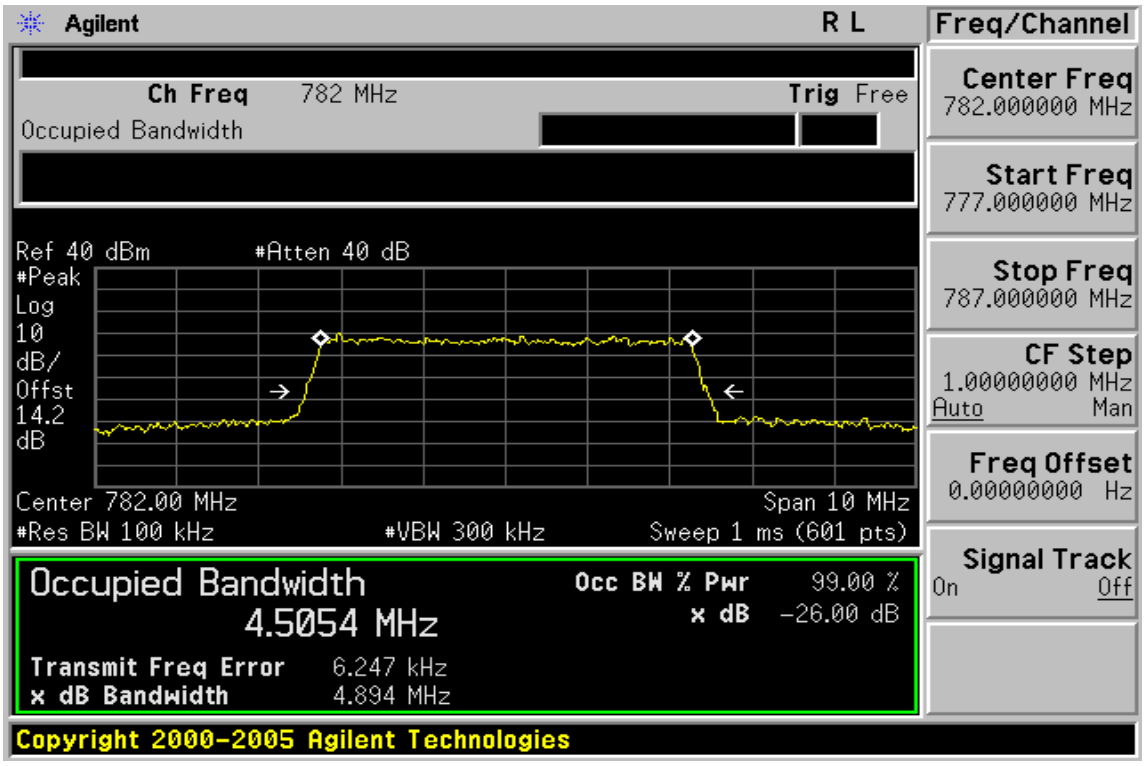
5MHz BW LTE-Band 13 QPSK Channel High



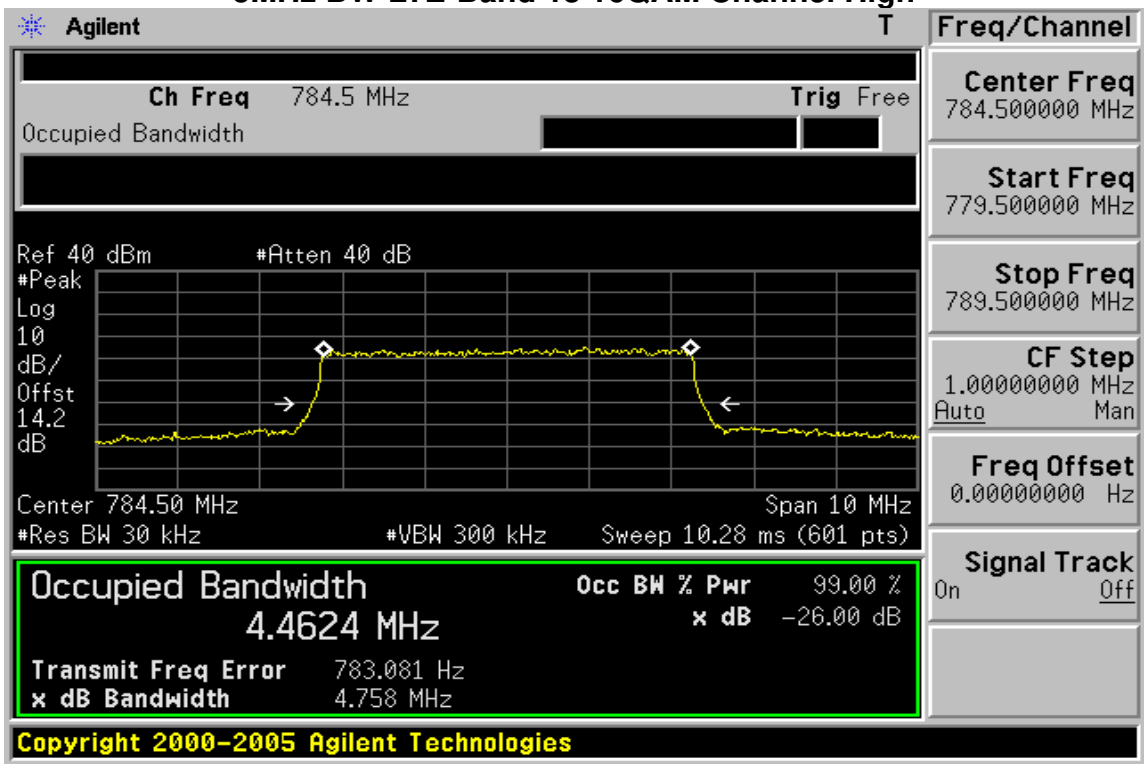
5MHz BW LTE-Band 13 16QAM Channel Low



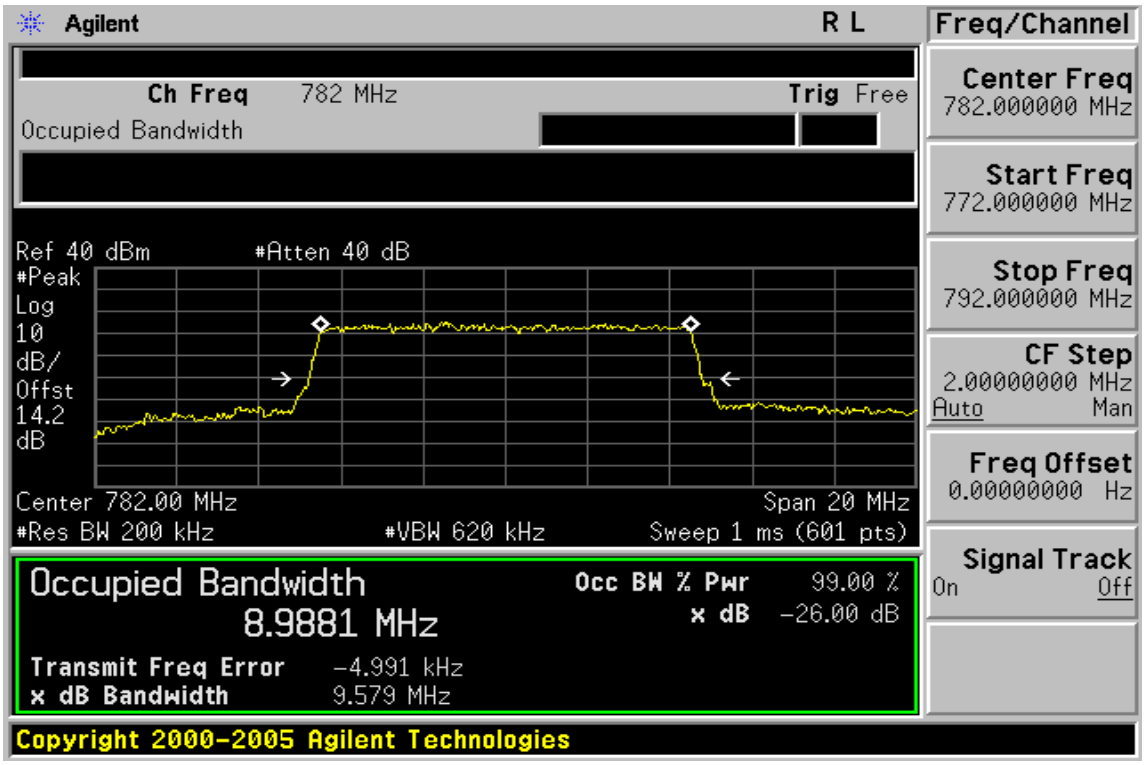
5MHz BW LTE-Band 13 16QAM Channel Mid



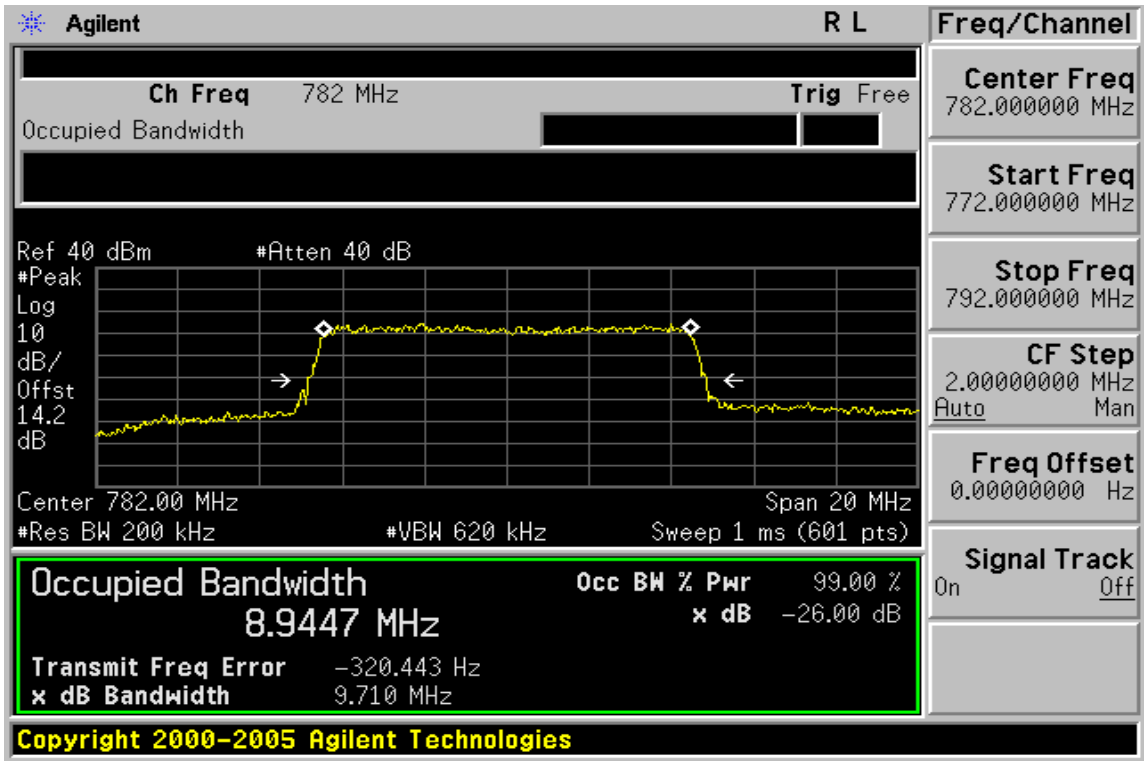
5MHz BW LTE-Band 13 16QAM Channel High



10MHz BW LTE-Band 13 QPSK Channel Mid



10MHz BW LTE-Band 13 16QAM Channel Mid



9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

9.1. Standard Applicable

FCC §27.53(h), §24.238(a), §27.53(c)(2) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

FCC §27.53(c) (4)

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following:

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

Band Edge Measurement:

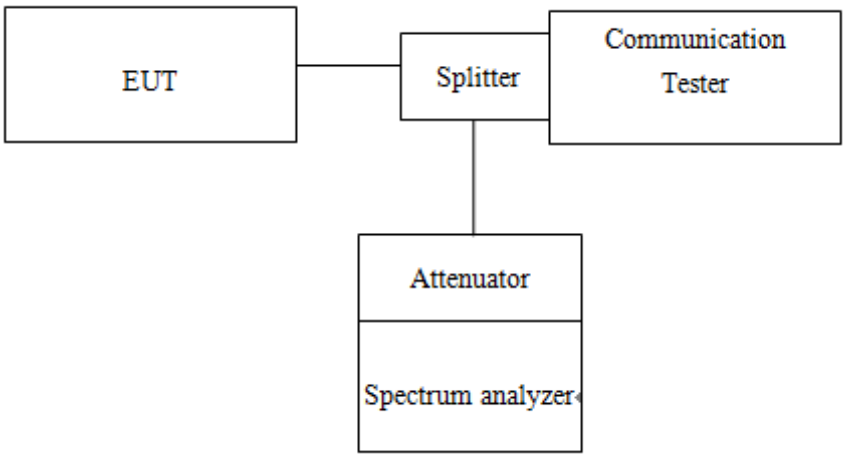
FCC §27.53(c) (5)

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.

FCC §27.53(h)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

9.2. Test SET-UP



9.3. Measurement Procedure

Conducted Emission

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

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

9.4. Measurement Equipment Used

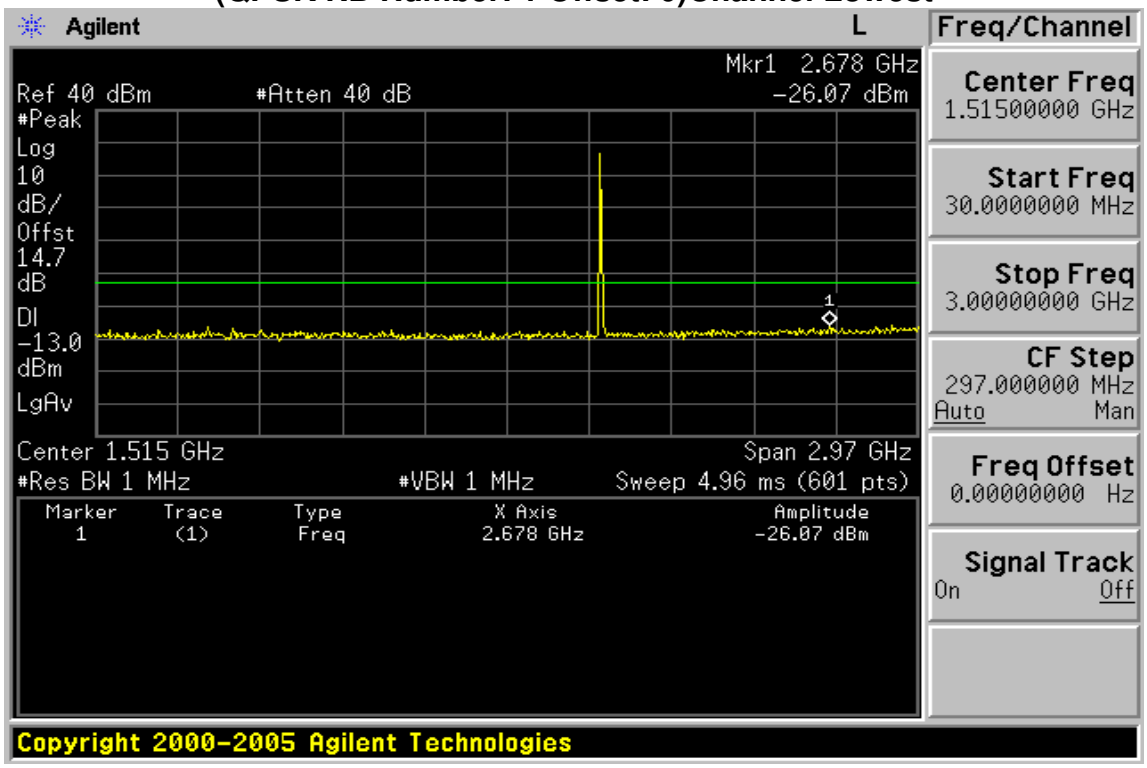
SGS Conducted Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	09/25/2015	09/24/2016
DC Power Supply	Agilent	E3640A	MY52410006	11/05/2015	11/04/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
CCA,USB-4432	NI	198755E-02L	18F909F	03/03/2016	03/02/2017
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	01/02/2016	01/01/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/06/2015	05/05/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2016	01/01/2017

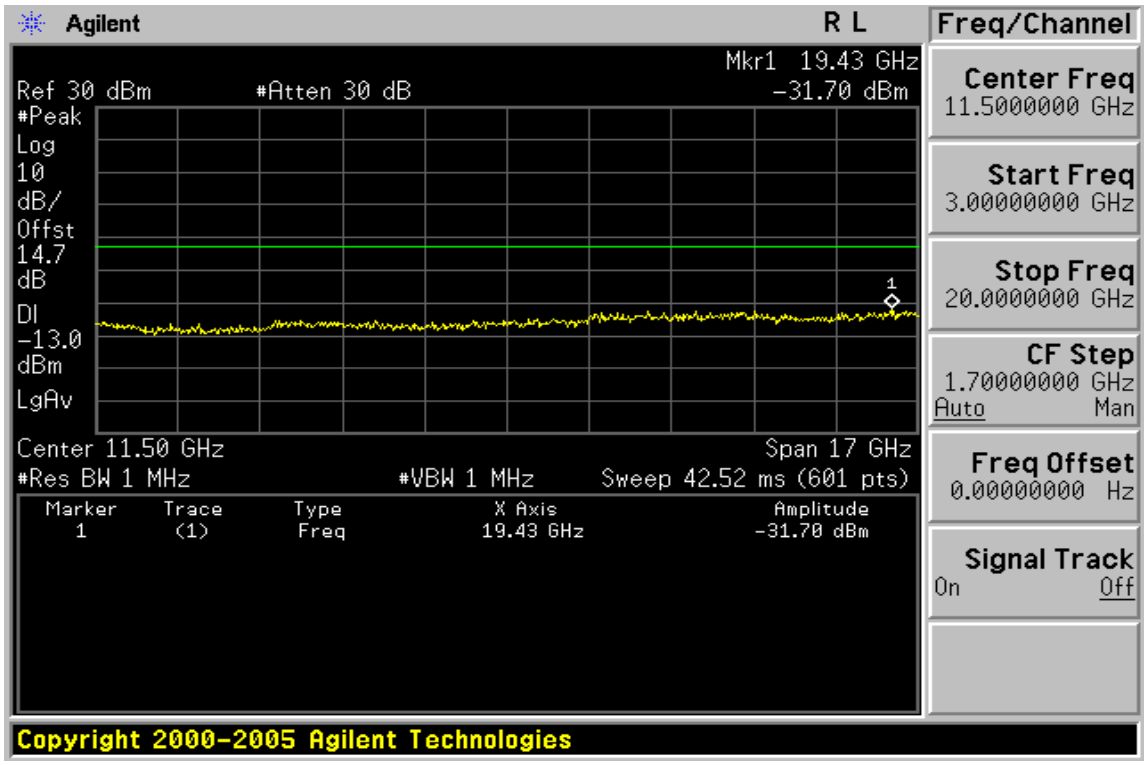
9.5. Measurement Result:

Refer to next pages.

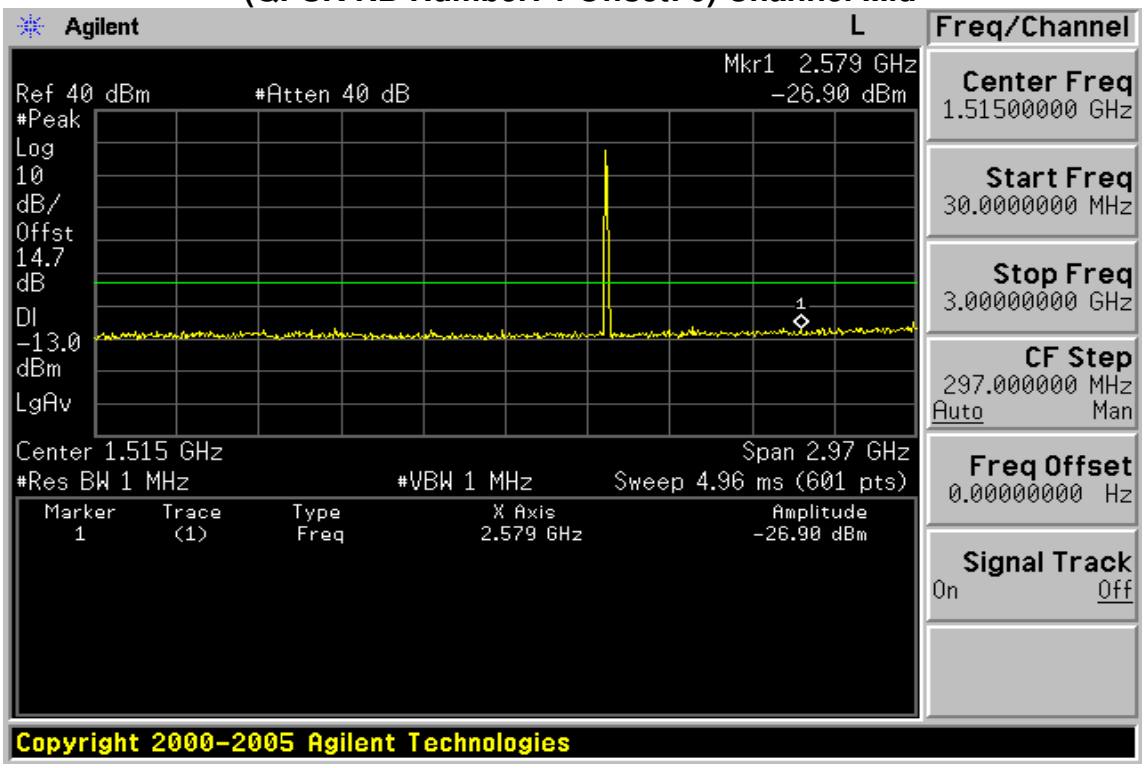
NOTE: The occurrence of the spike on the conducted emission is the signal of the fundamental emission.

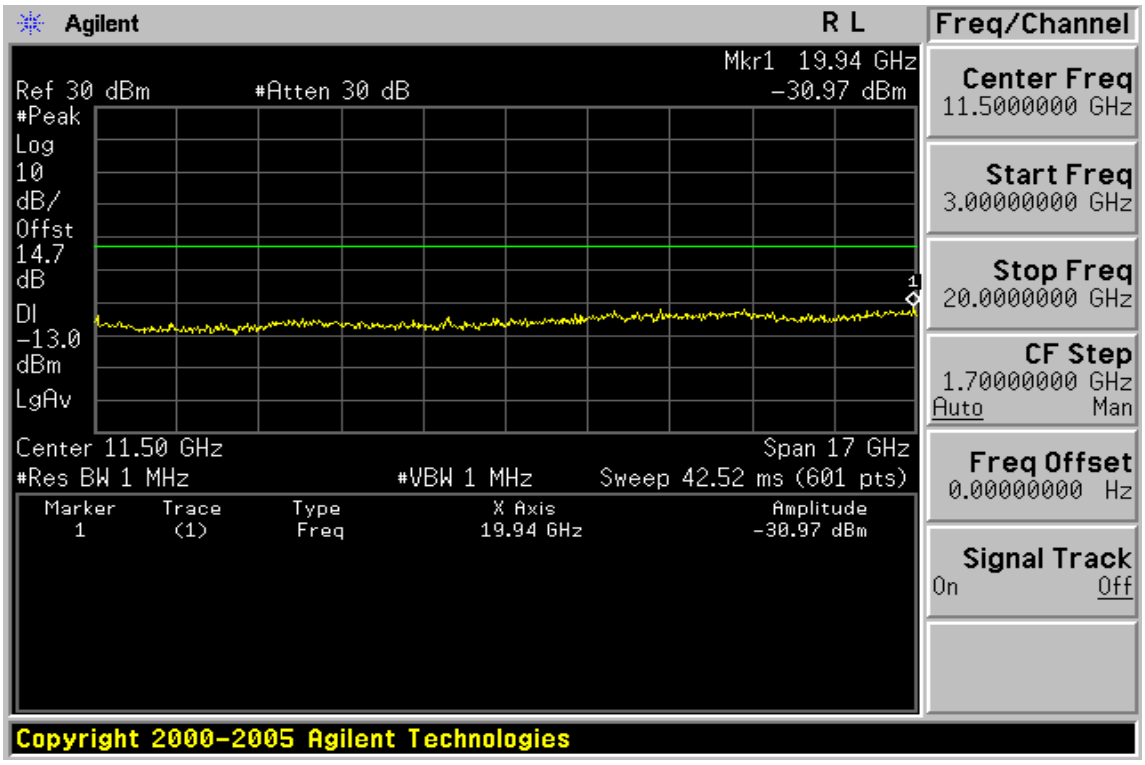
Out of Band emission at antenna terminals–5MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0)Channel Lowest



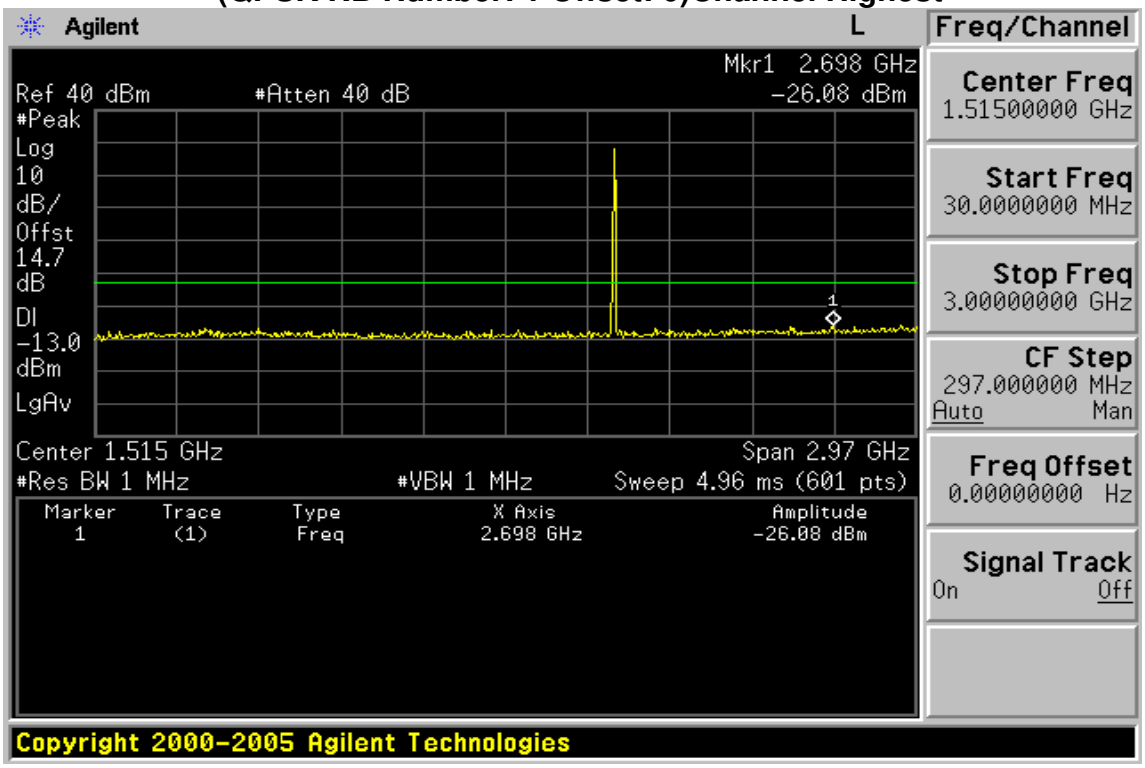


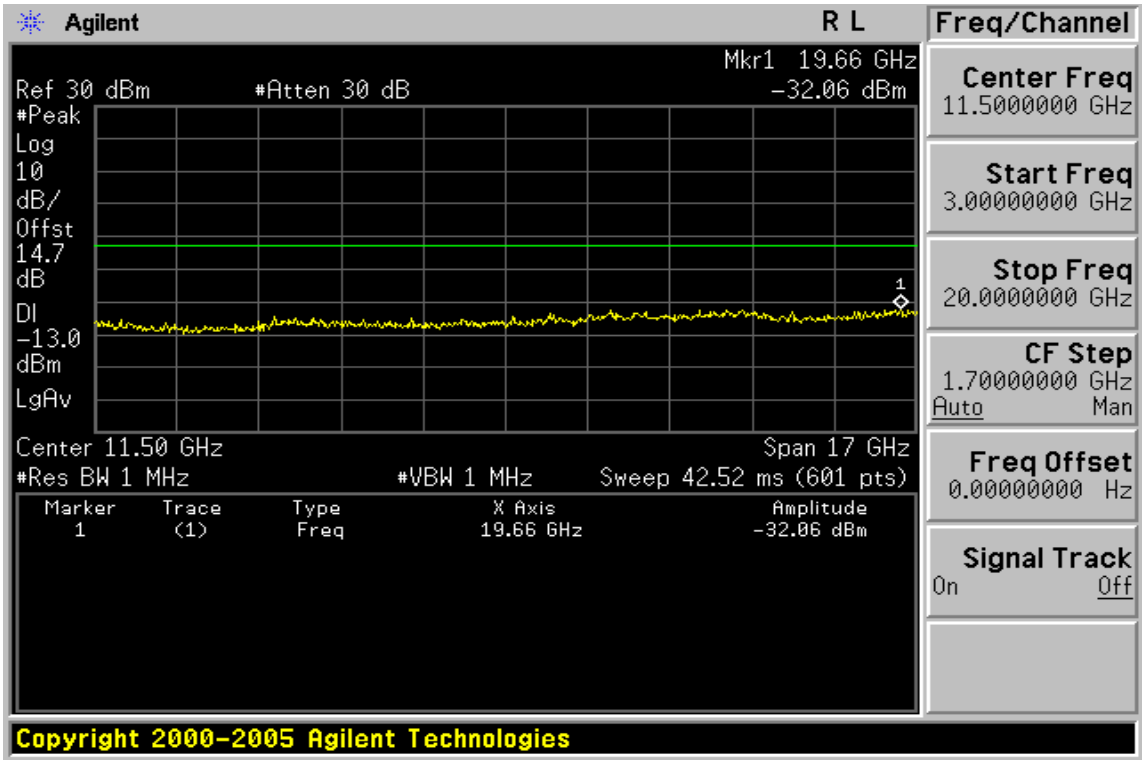
Out of Band emission at antenna terminals –5MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0) Channel Mid



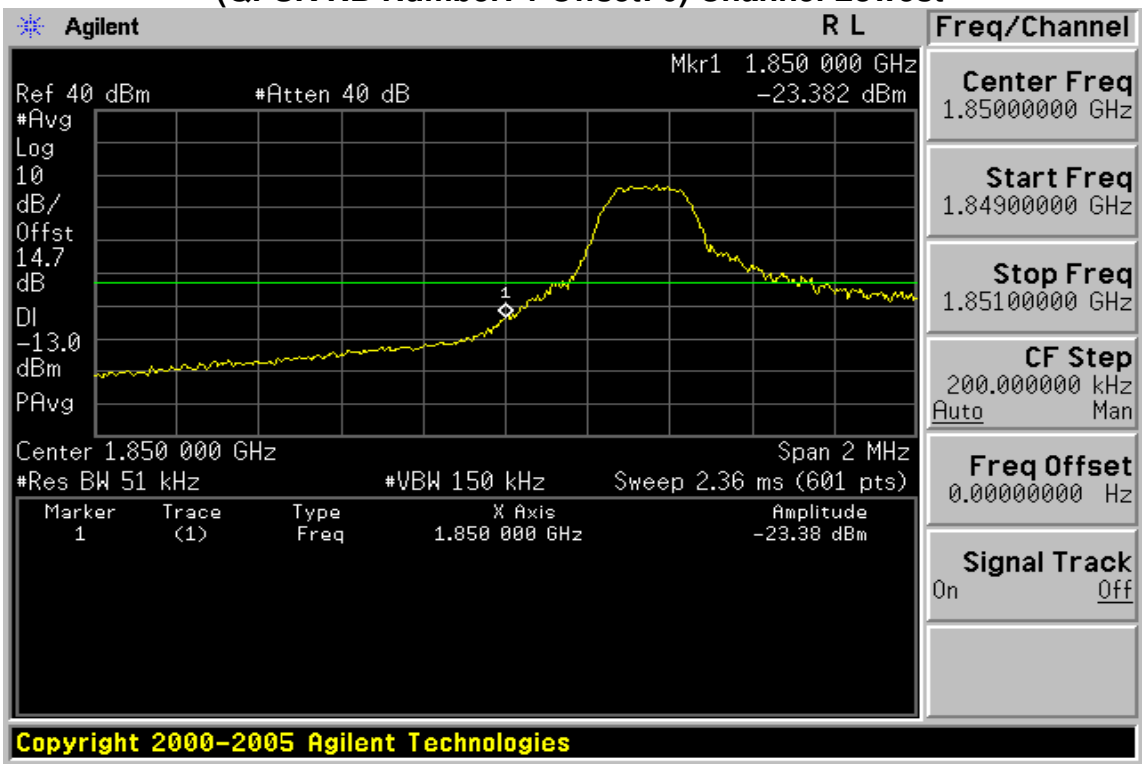


Out of Band emission at antenna terminals–5MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0)Channel Highest

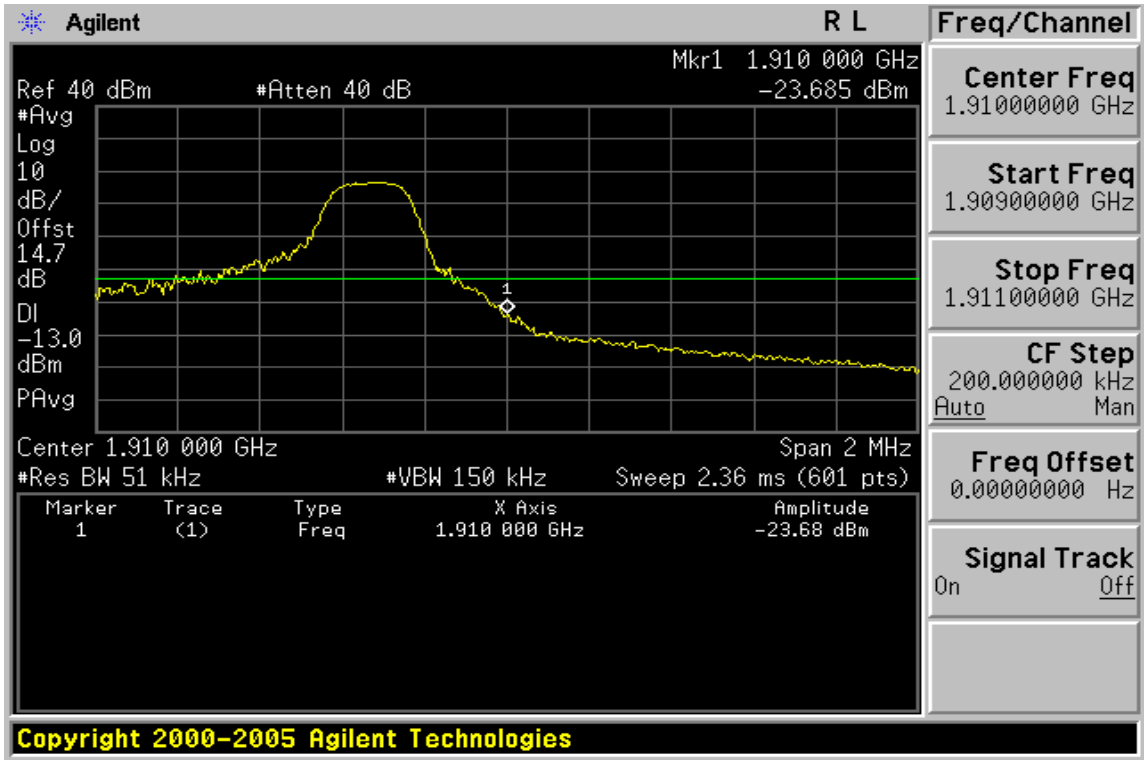




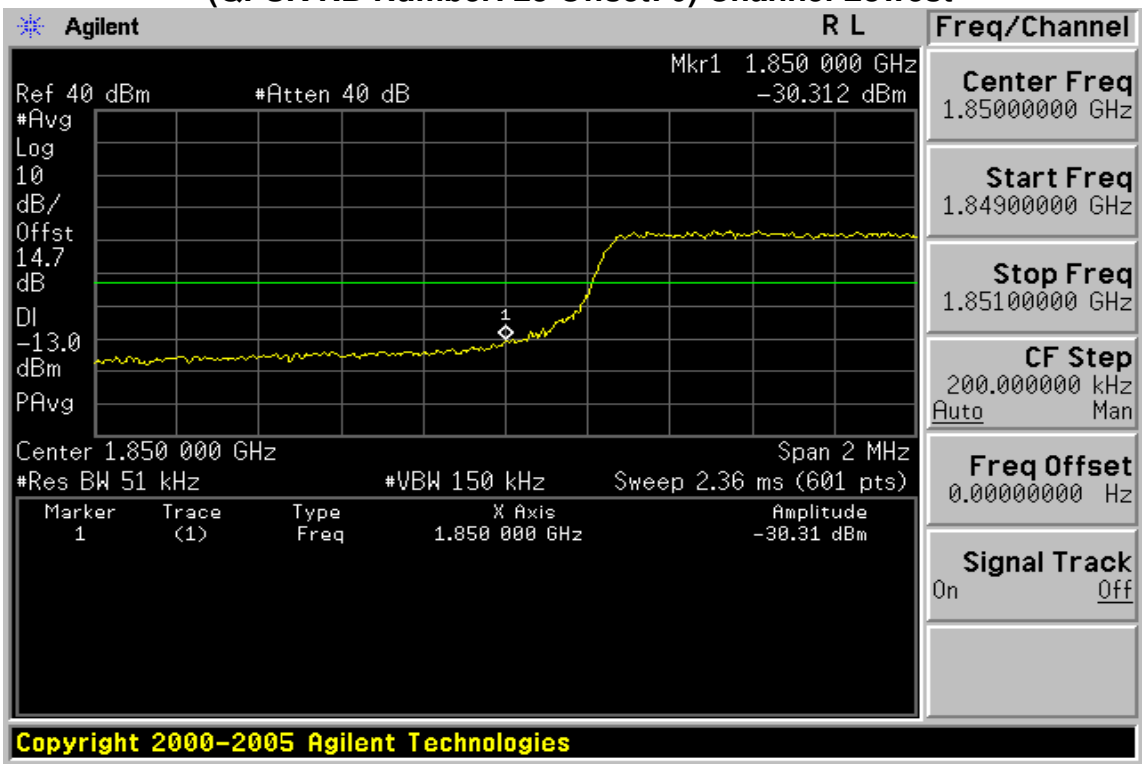
Band edge emission at antenna terminals –5MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0) Channel Lowest



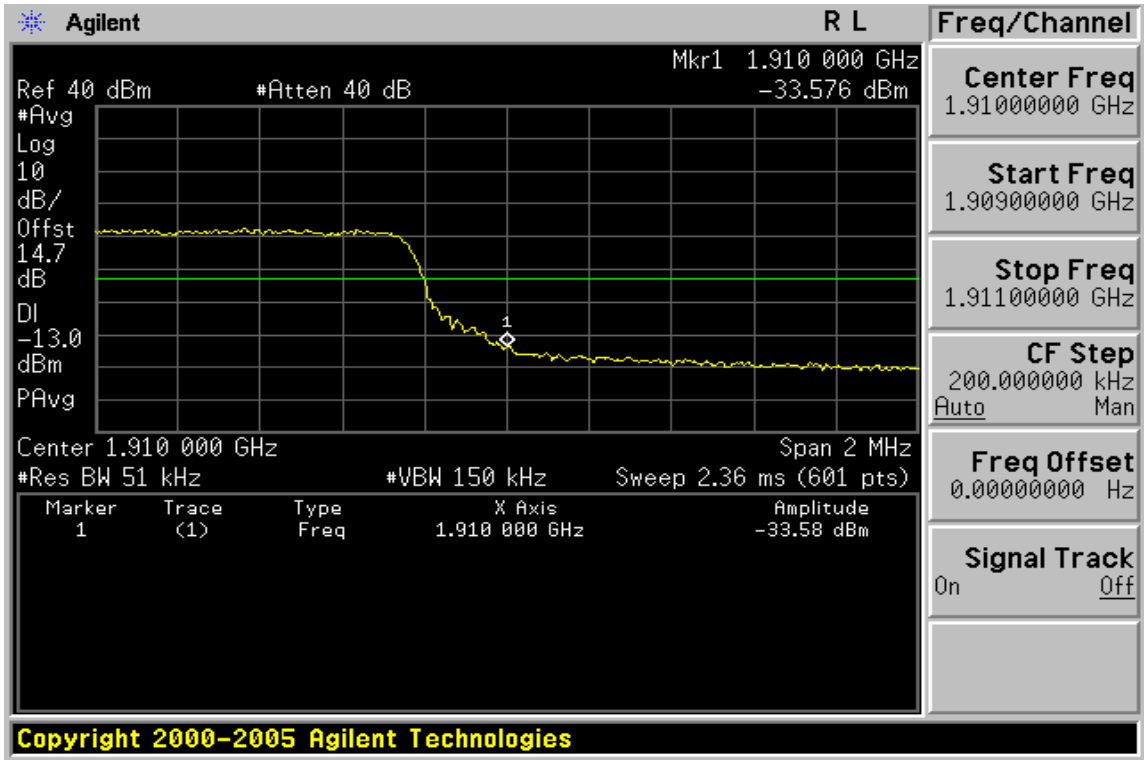
Band edge emission at antenna terminals –5MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 24) Channel Highest



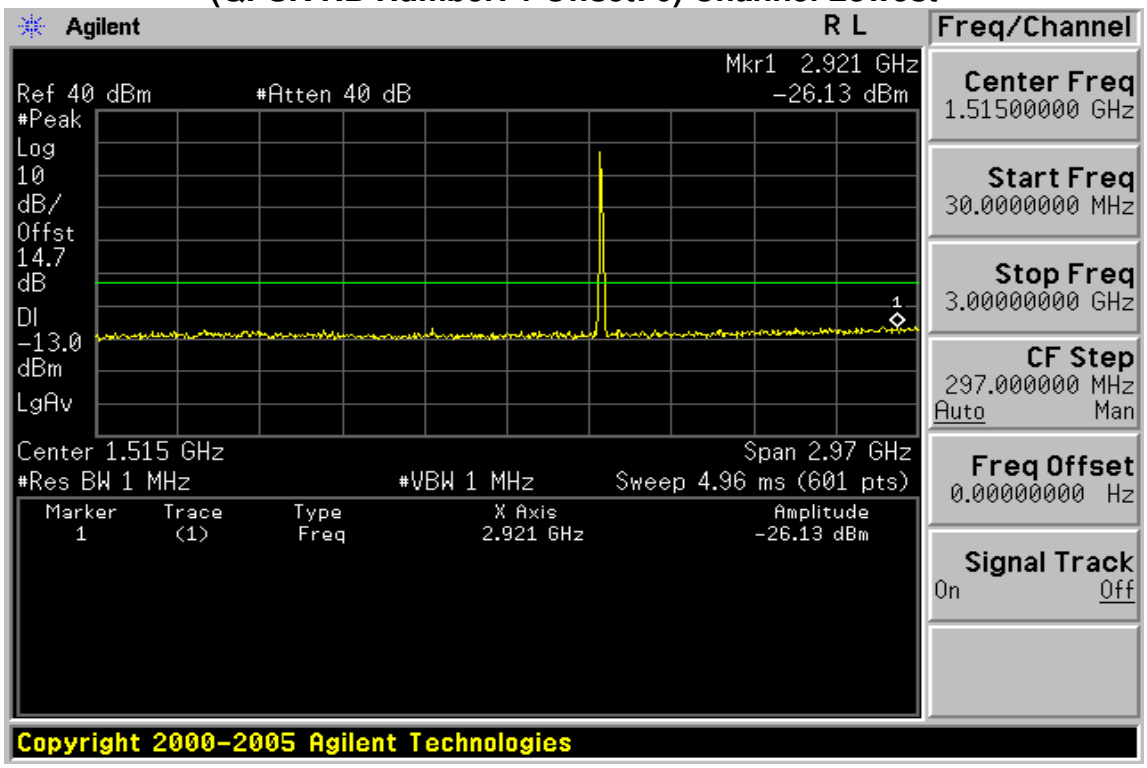
Band edge emission at antenna terminals –5MHz BW LTE-Band 2 (QPSK RB Number: 25 Offset: 0) Channel Lowest

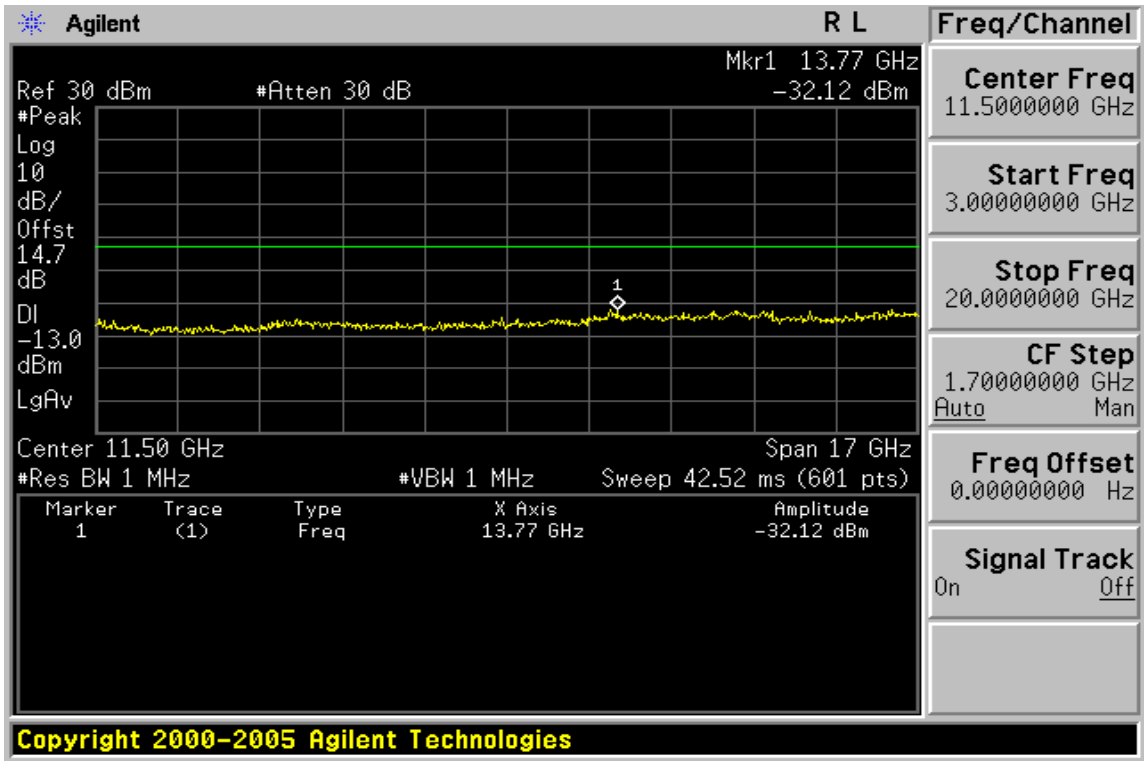


Band edge emission at antenna terminals –5MHz BW LTE-Band 2 (QPSK RB Number: 25 Offset: 0) Channel Highest

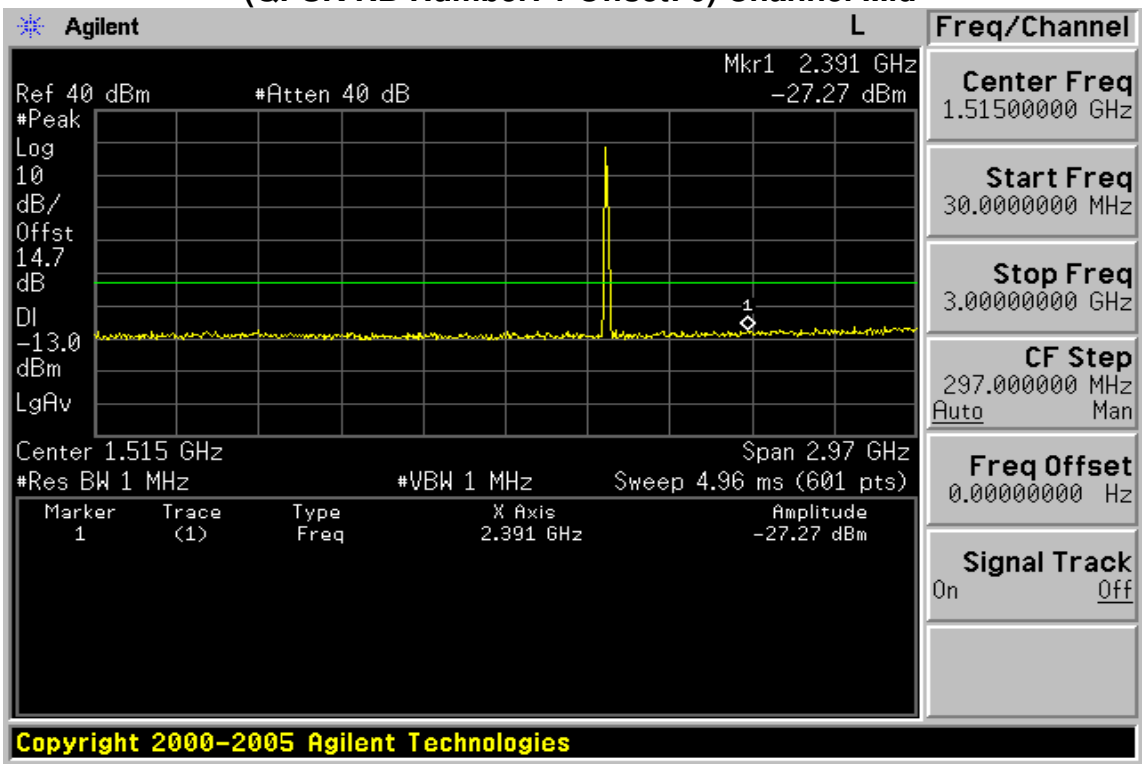


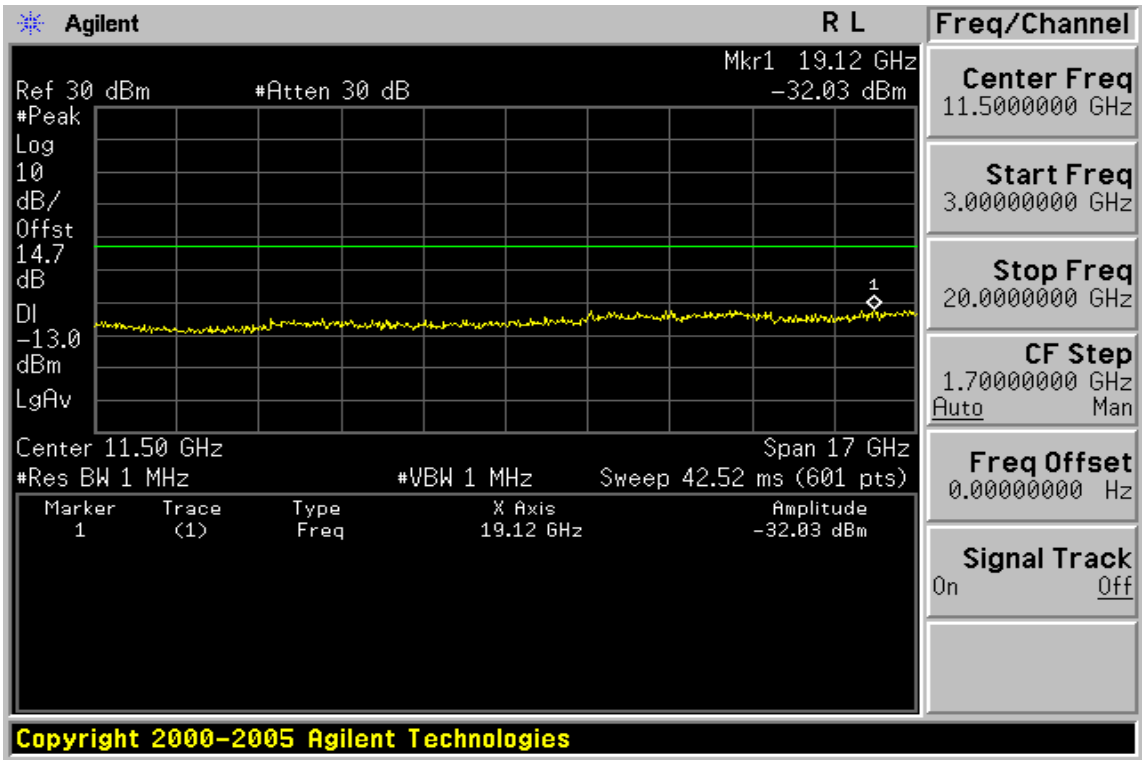
Out of Band emission at antenna terminals–10MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0) Channel Lowest



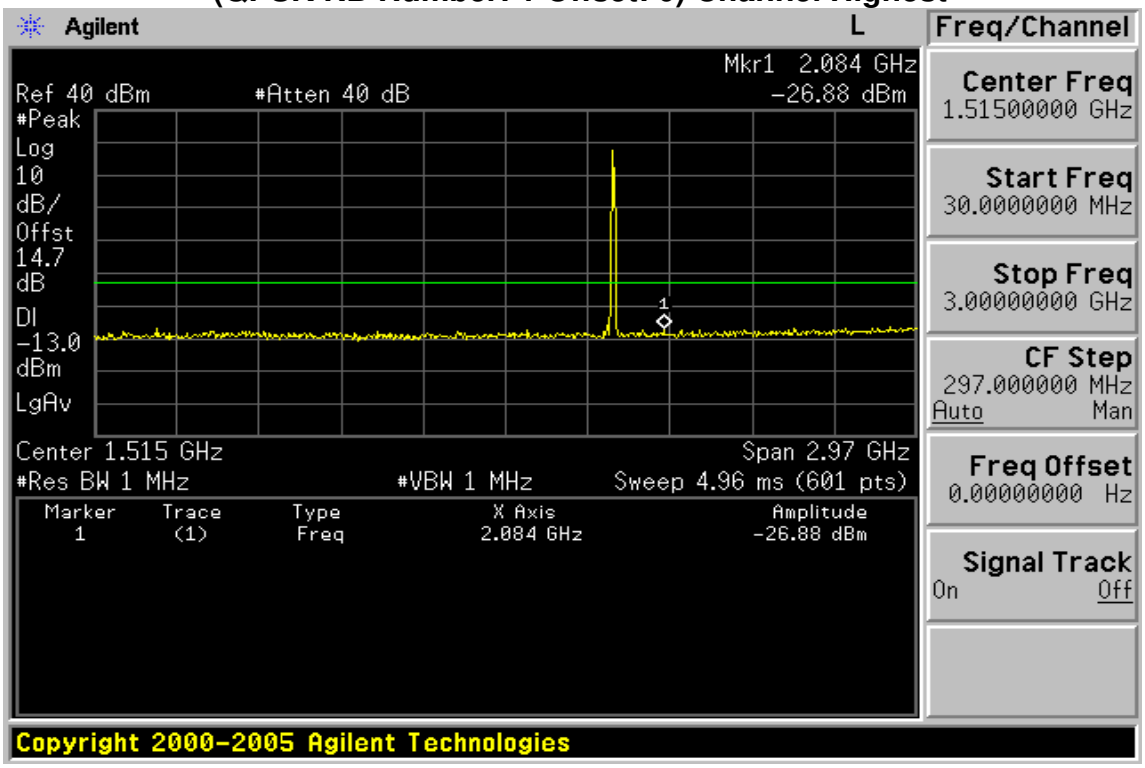


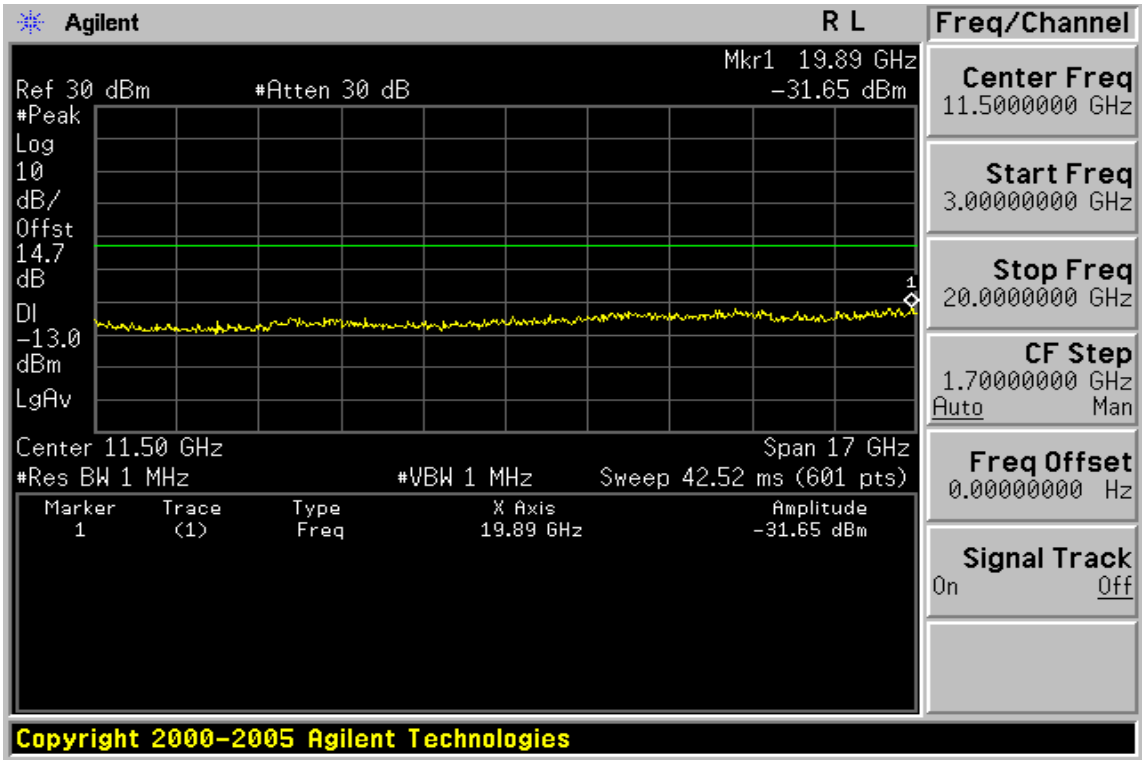
Out of Band emission at antenna terminals –10MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0) Channel Mid



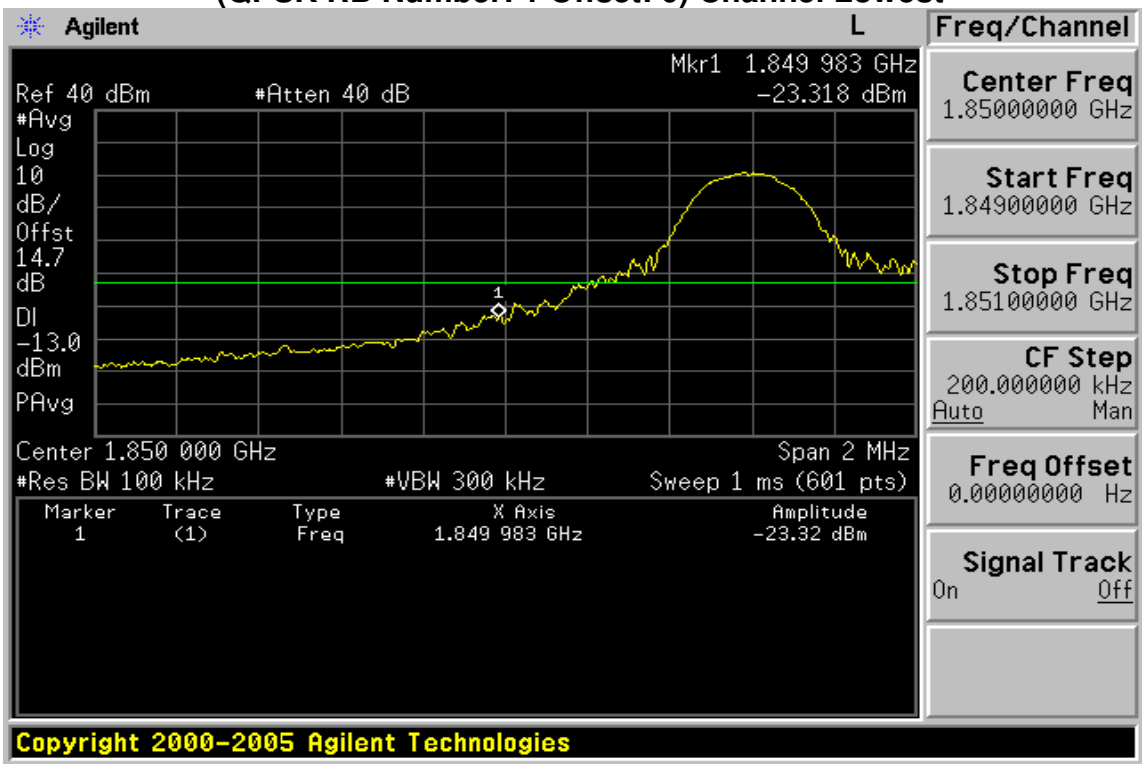


Out of Band emission at antenna terminals–10MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0) Channel Highest

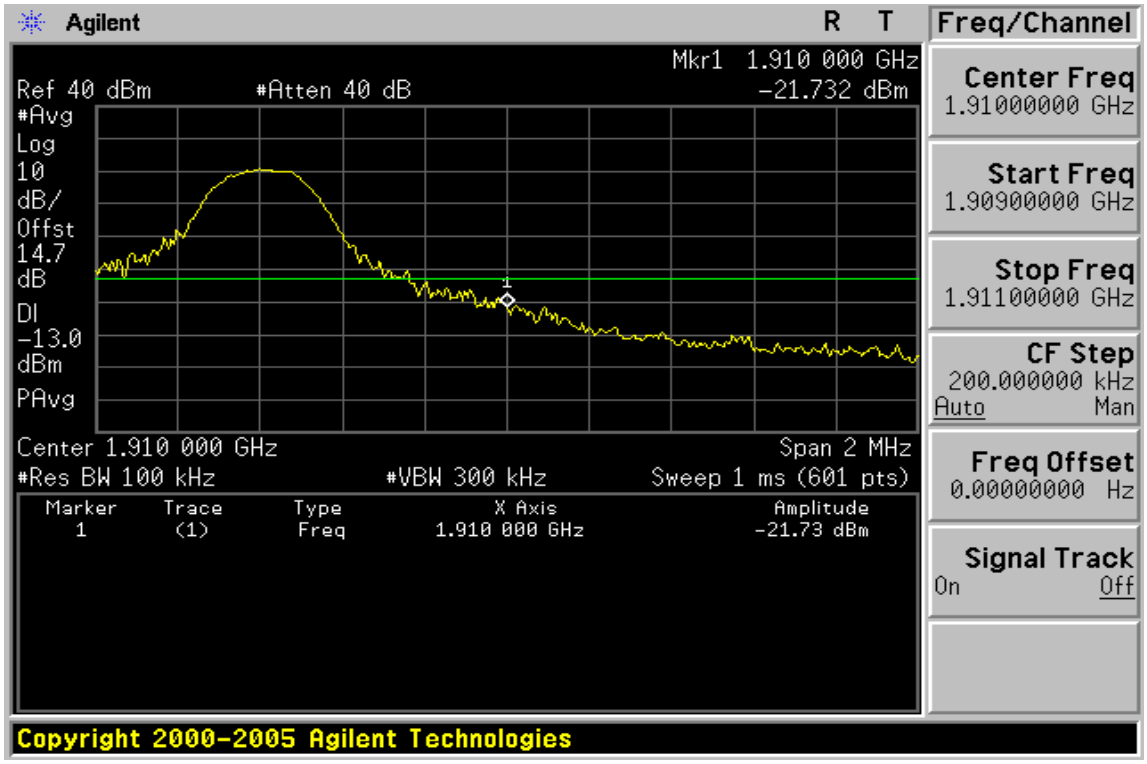




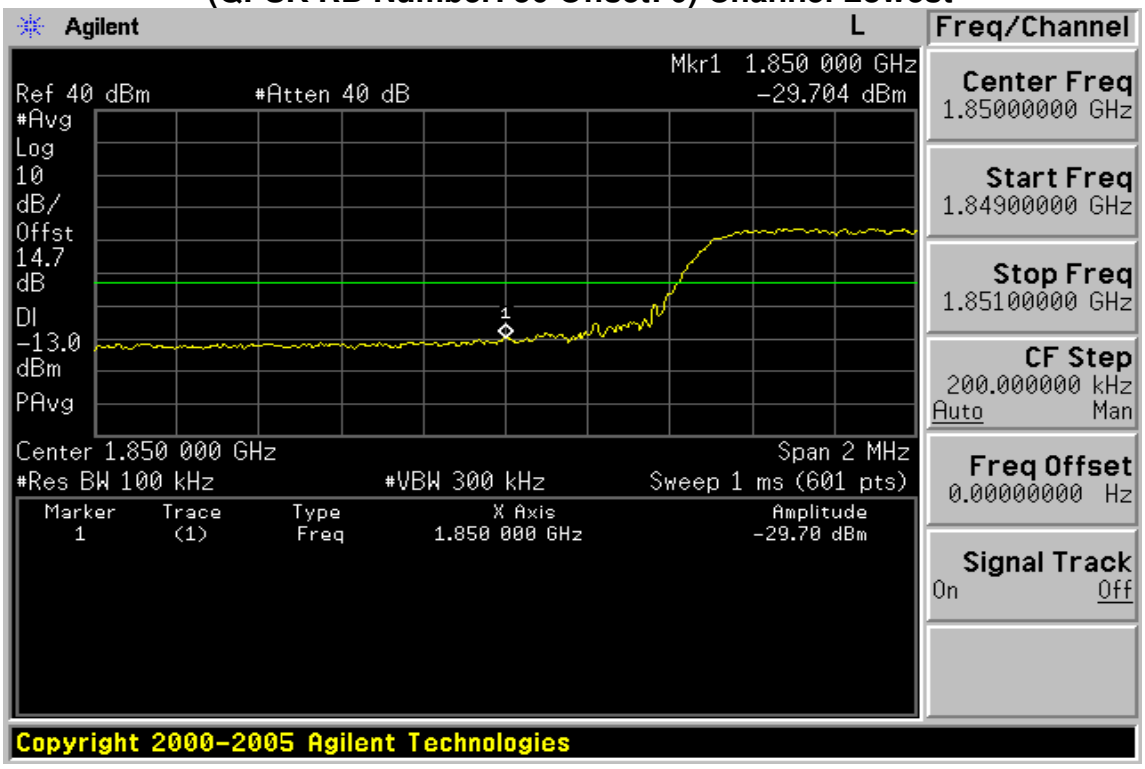
Band edge emission at antenna terminals –10MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0) Channel Lowest



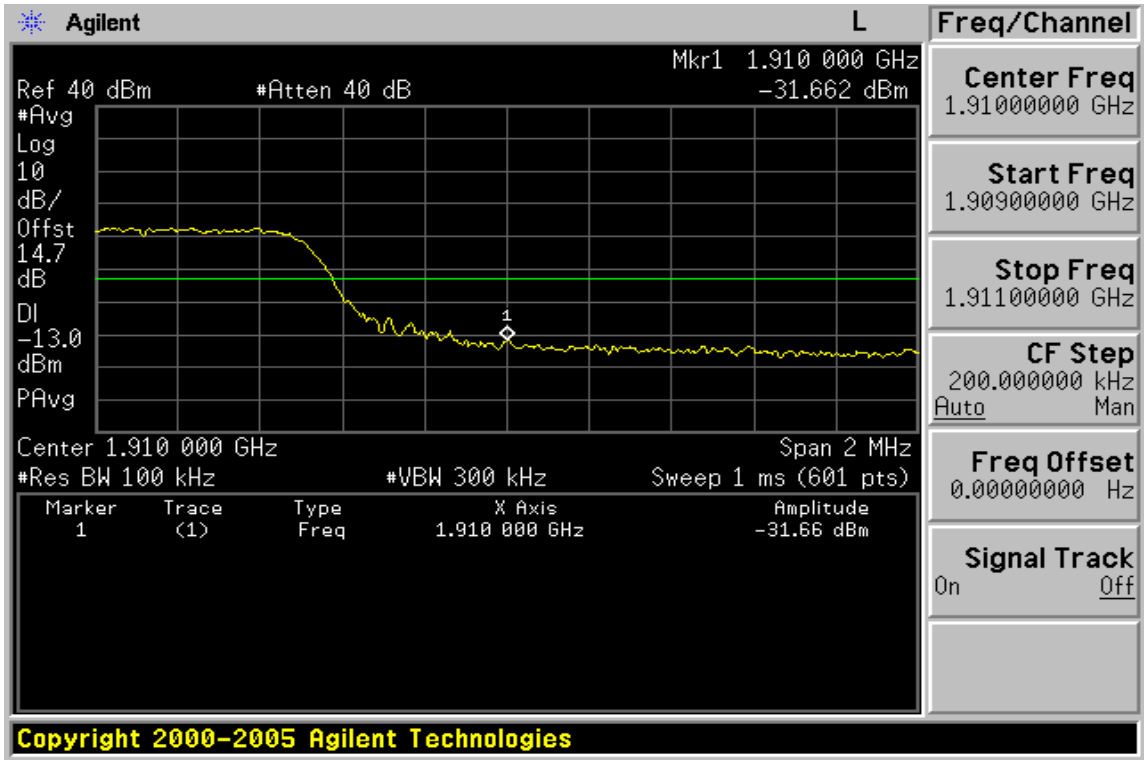
Band edge emission at antenna terminals –10MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 49) Channel Highest



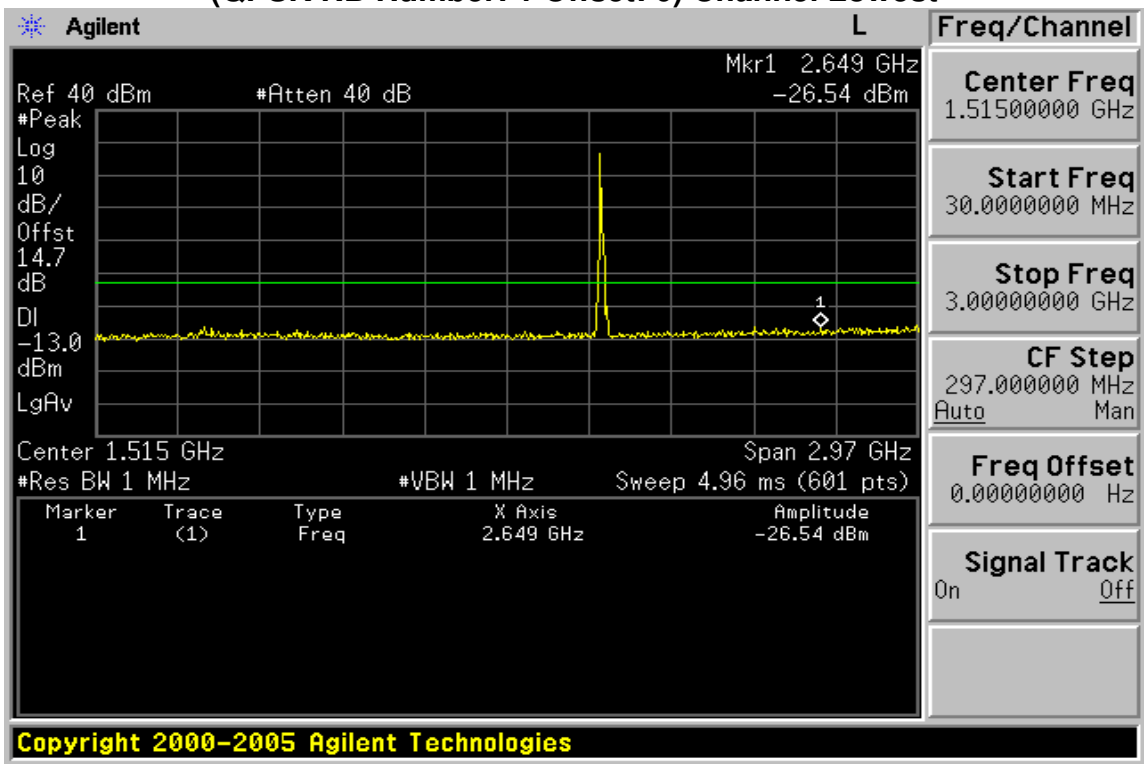
Band edge emission at antenna terminals –10MHz BW LTE-Band 2
(QPSK RB Number: 50 Offset: 0) Channel Lowest

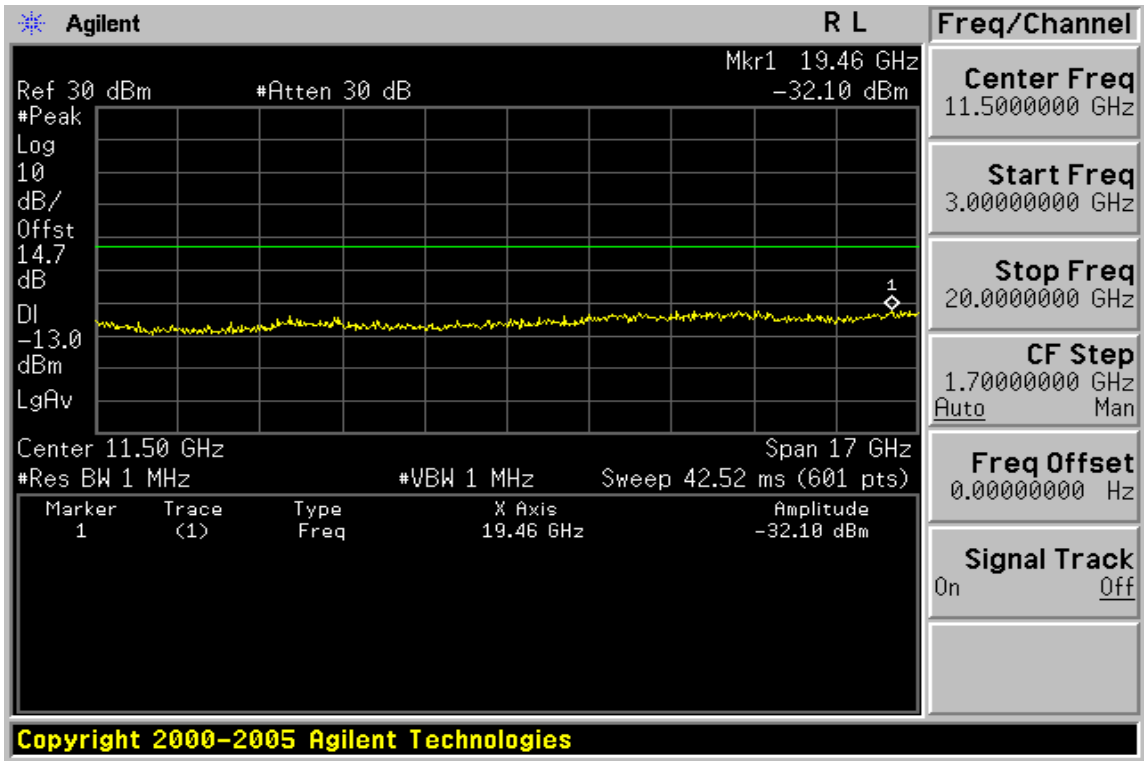


Band edge emission at antenna terminals –10MHz BW LTE-Band 2
(QPSK RB Number: 50 Offset:) Channel Highest

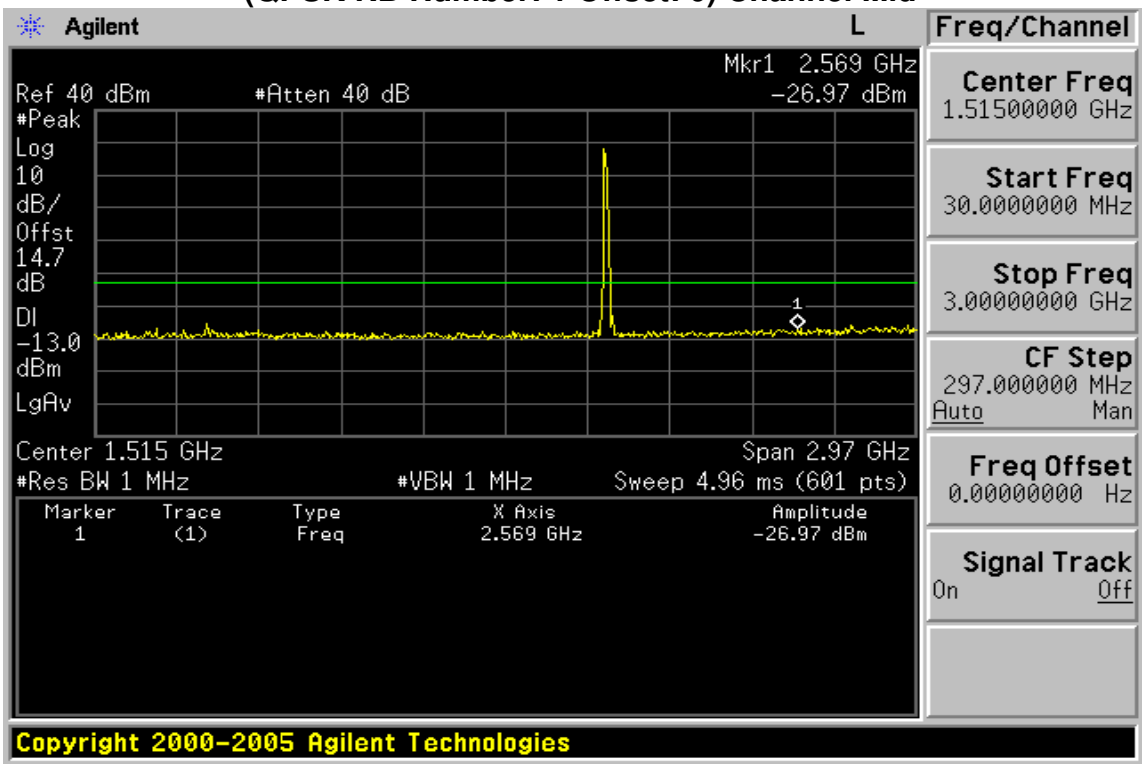


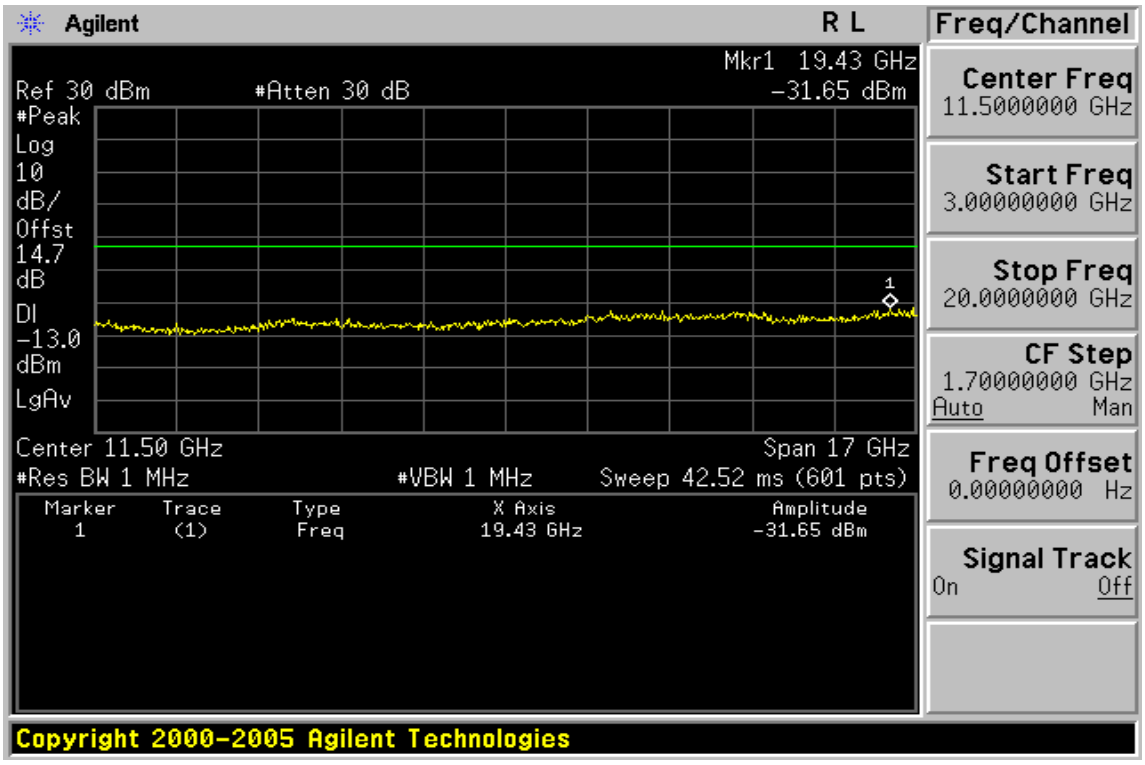
Out of Band emission at antenna terminals–15MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0) Channel Lowest



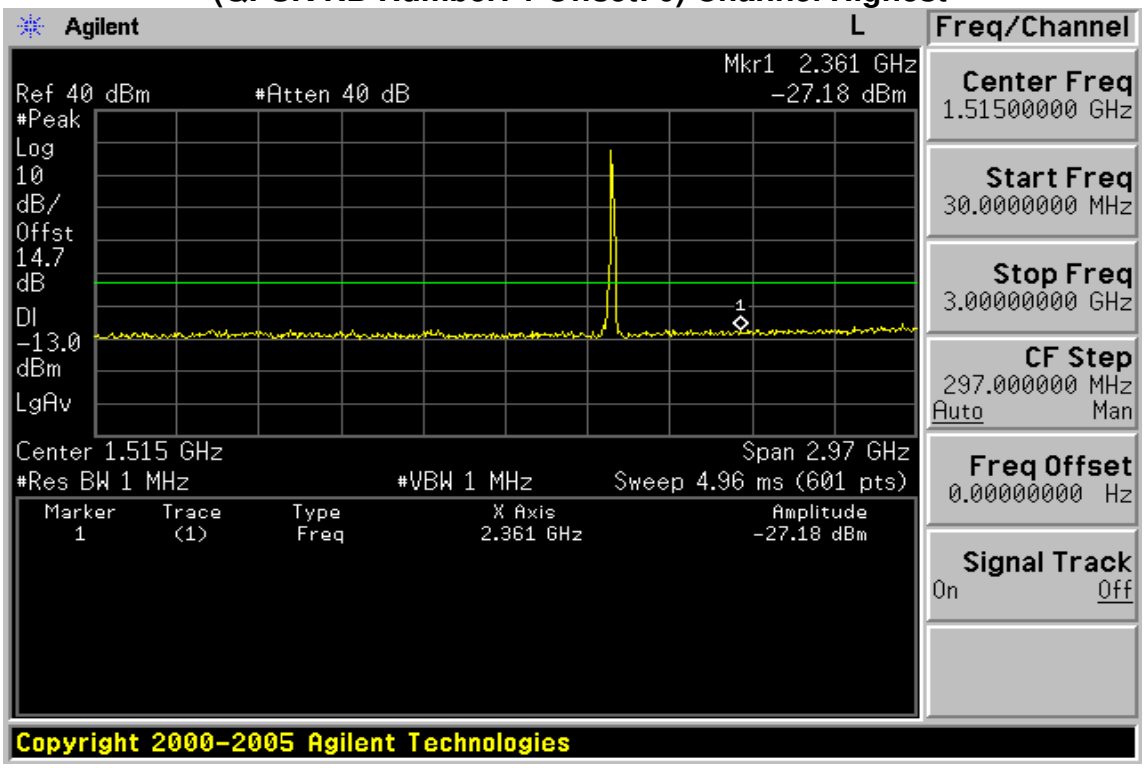


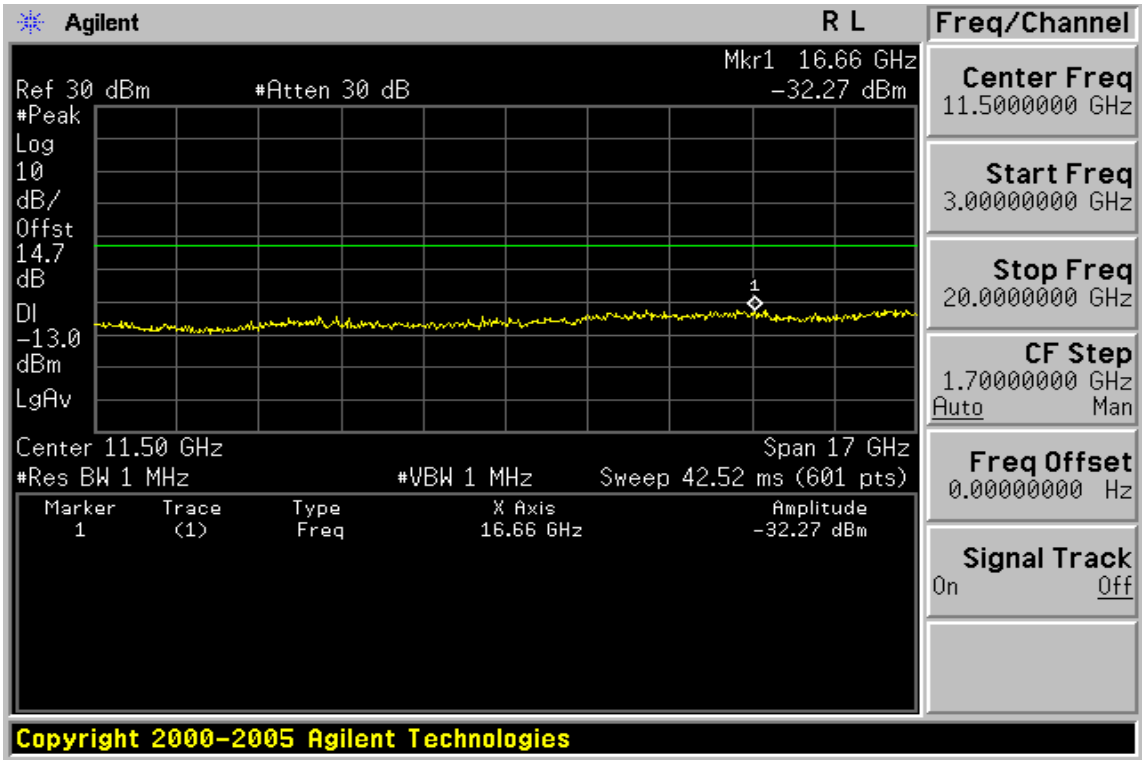
Out of Band emission at antenna terminals –15MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0) Channel Mid



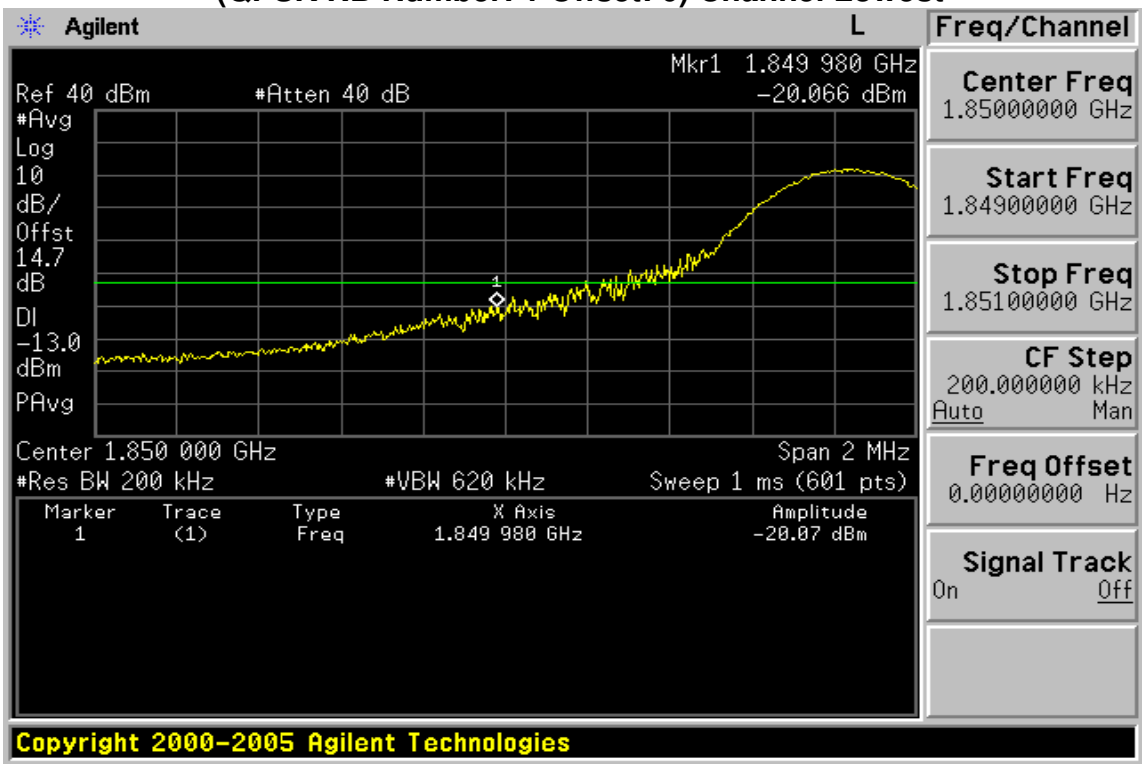


Out of Band emission at antenna terminals–15MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0) Channel Highest

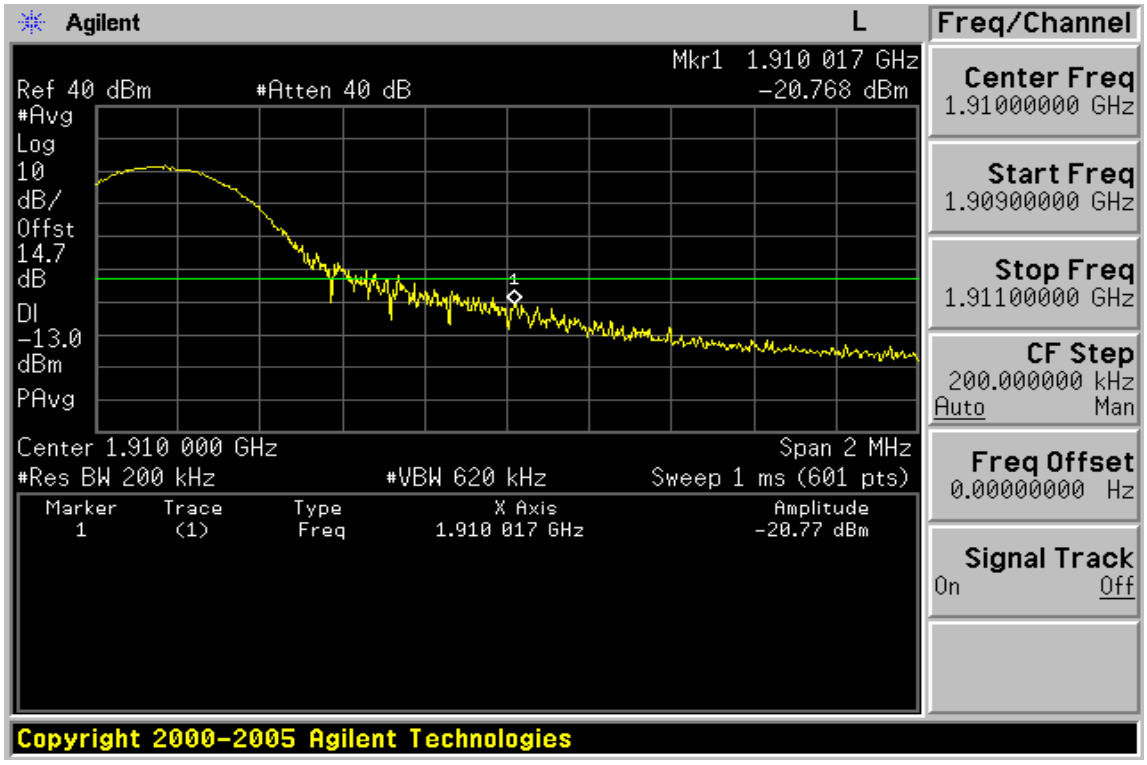




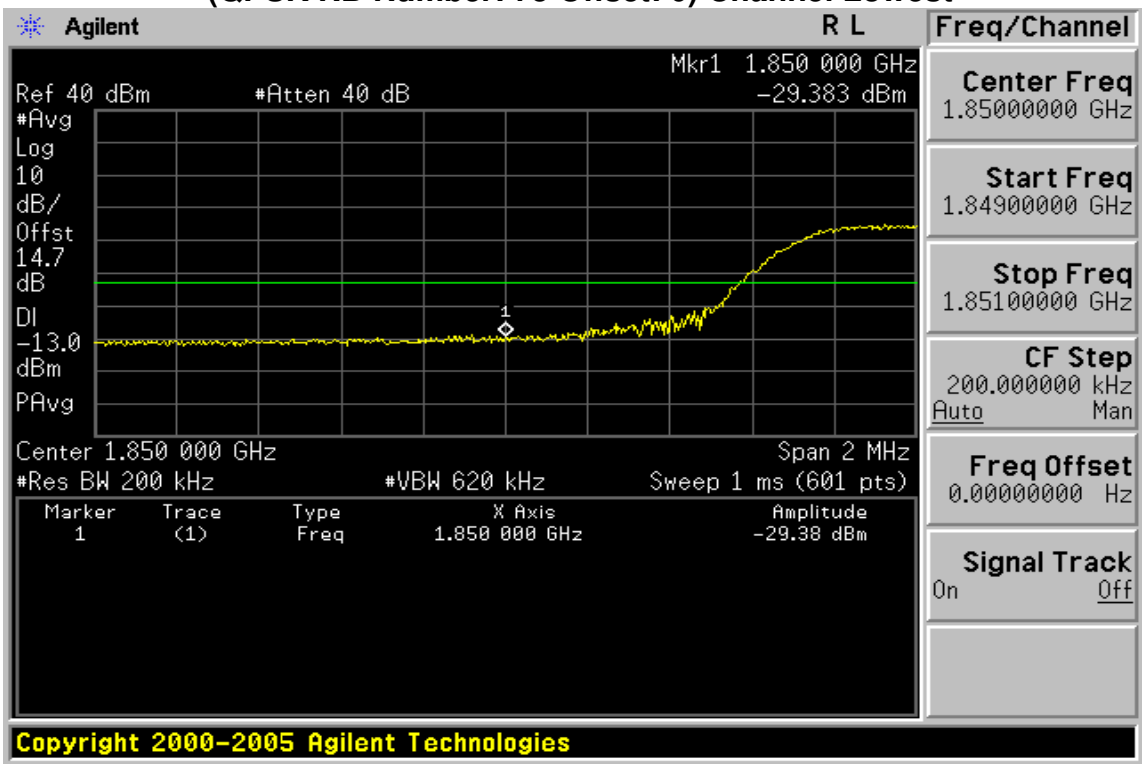
Band edge emission at antenna terminals –15MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0) Channel Lowest



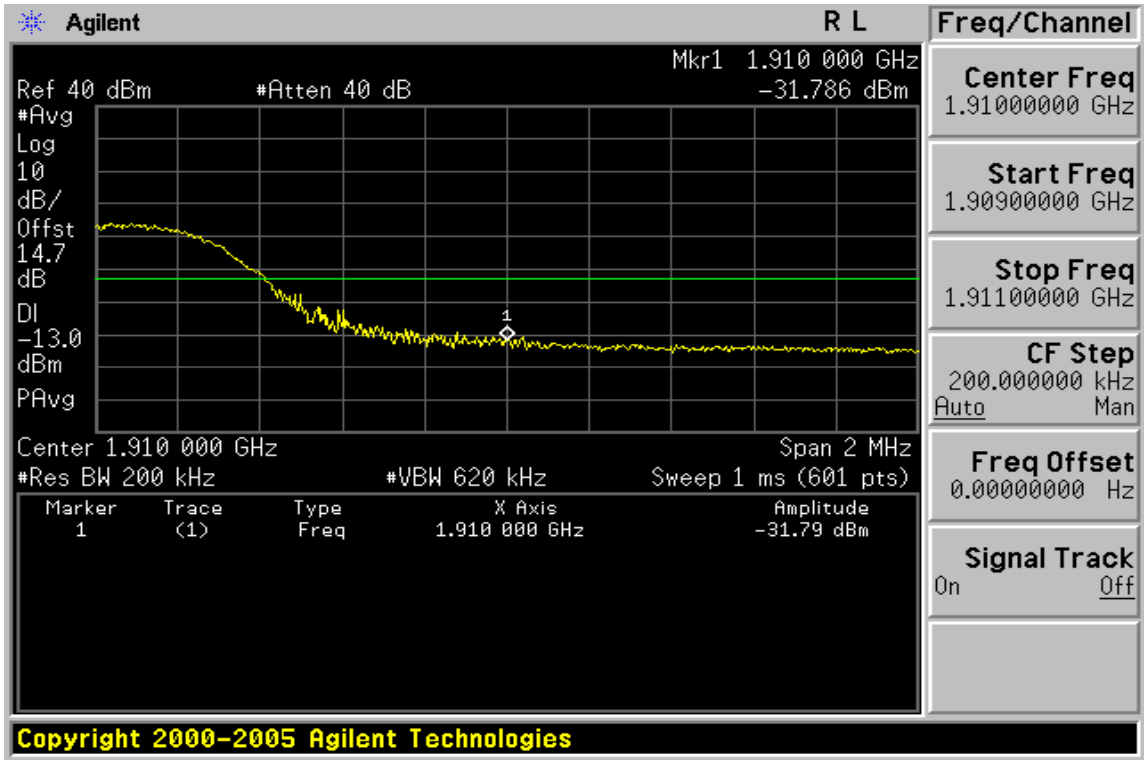
Band edge emission at antenna terminals –15MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 74) Channel Highest



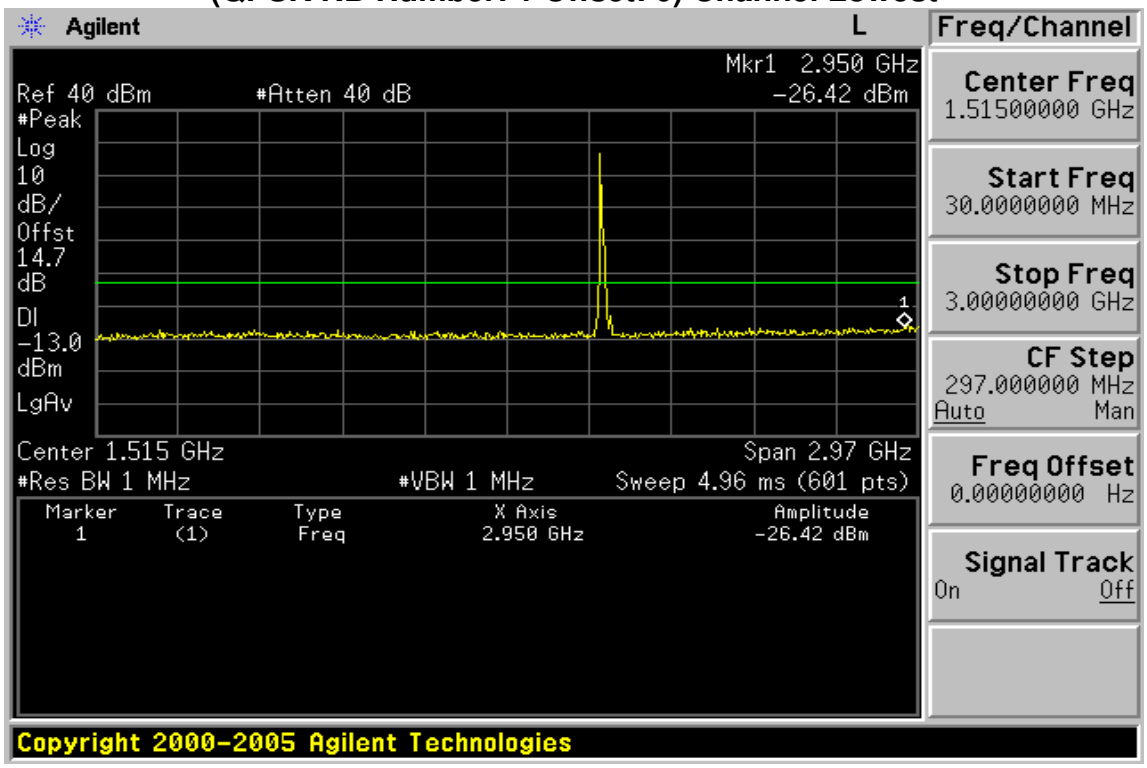
Band edge emission at antenna terminals –15MHz BW LTE-Band 2 (QPSK RB Number: 75 Offset: 0) Channel Lowest

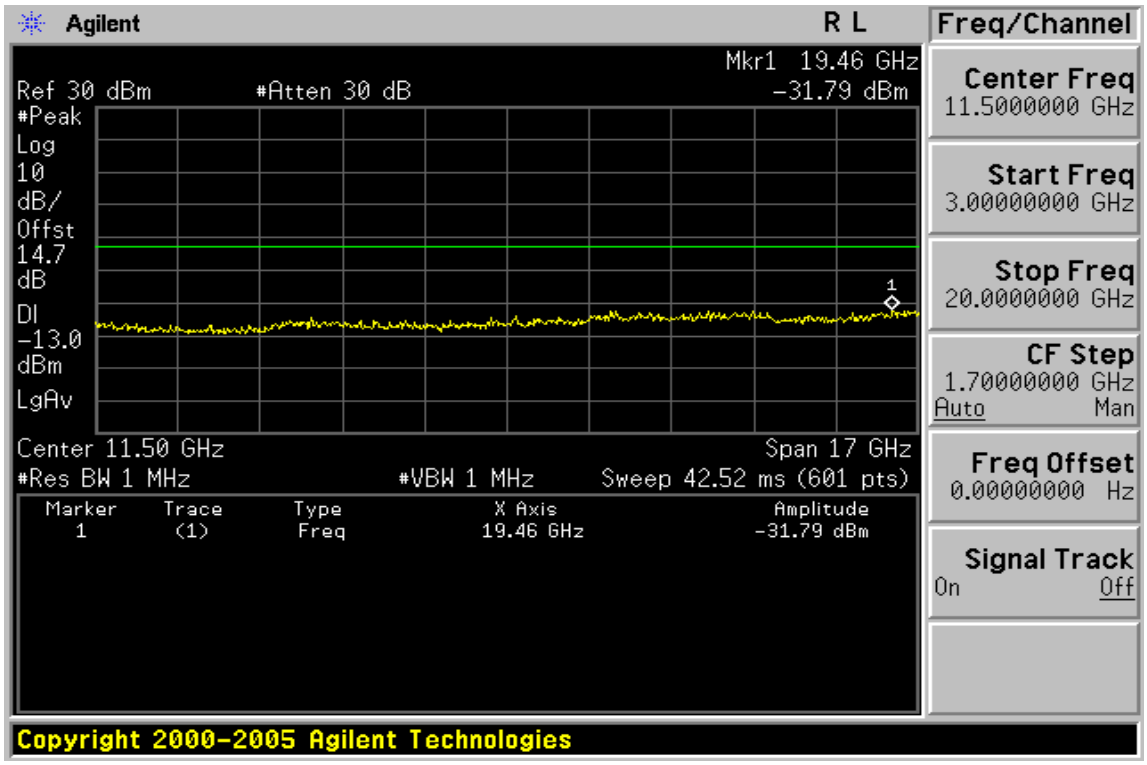


Band edge emission at antenna terminals –15MHz BW LTE-Band 2 (QPSK RB Number: 75 Offset: 0) Channel Highest

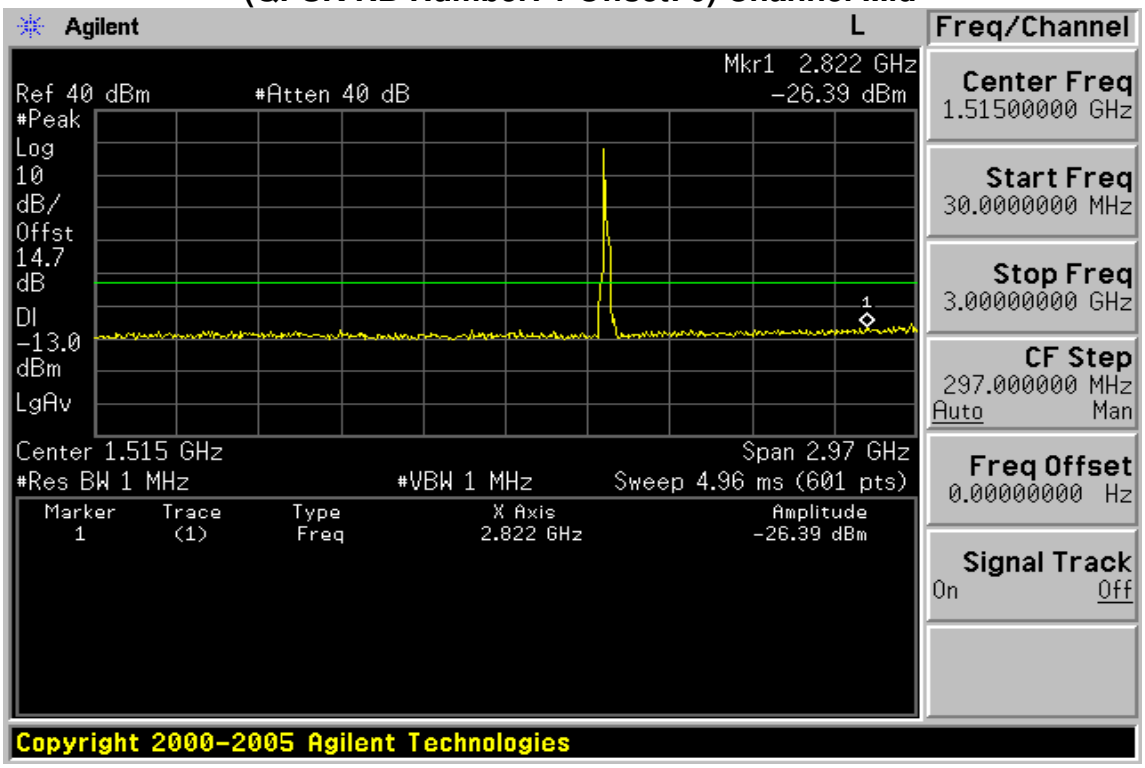


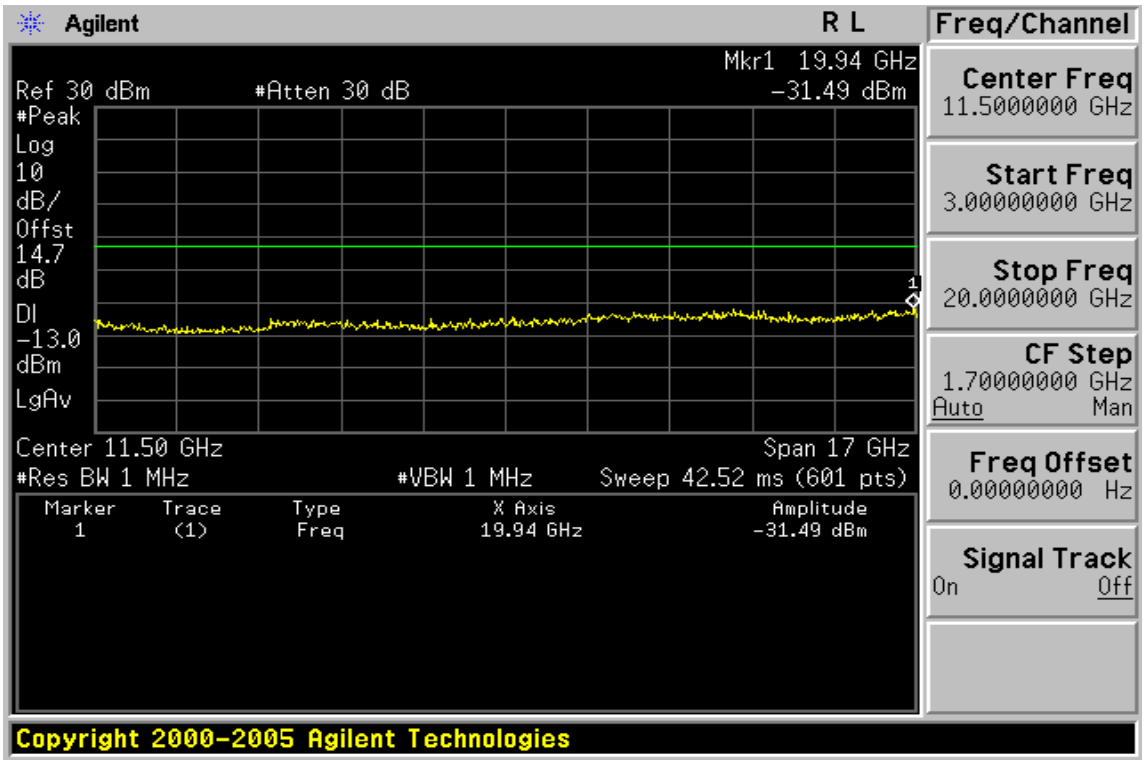
Out of Band emission at antenna terminals–20MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0) Channel Lowest



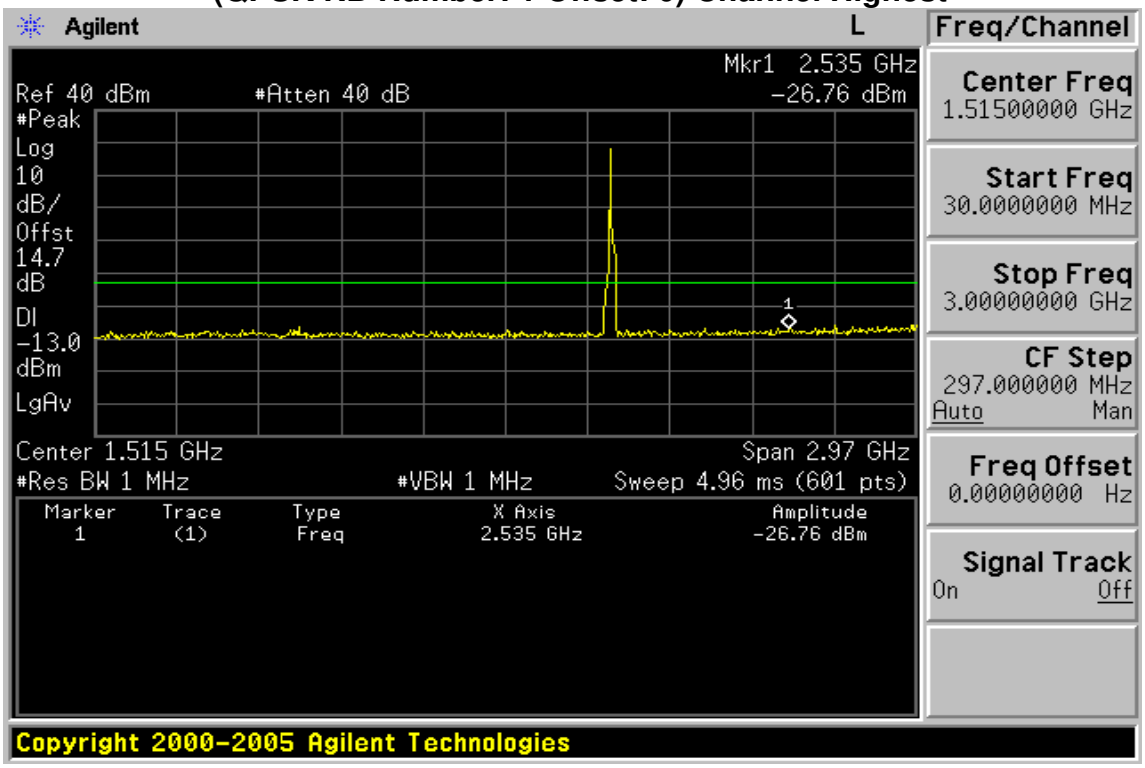


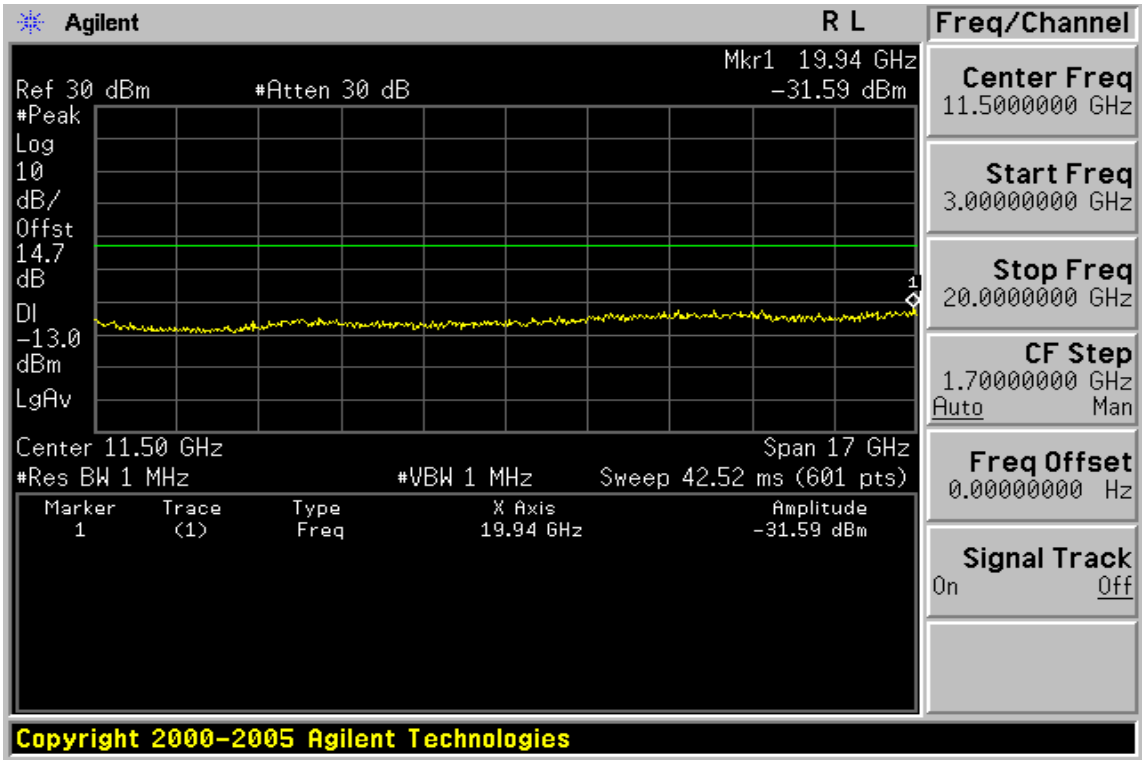
Out of Band emission at antenna terminals –20MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0) Channel Mid



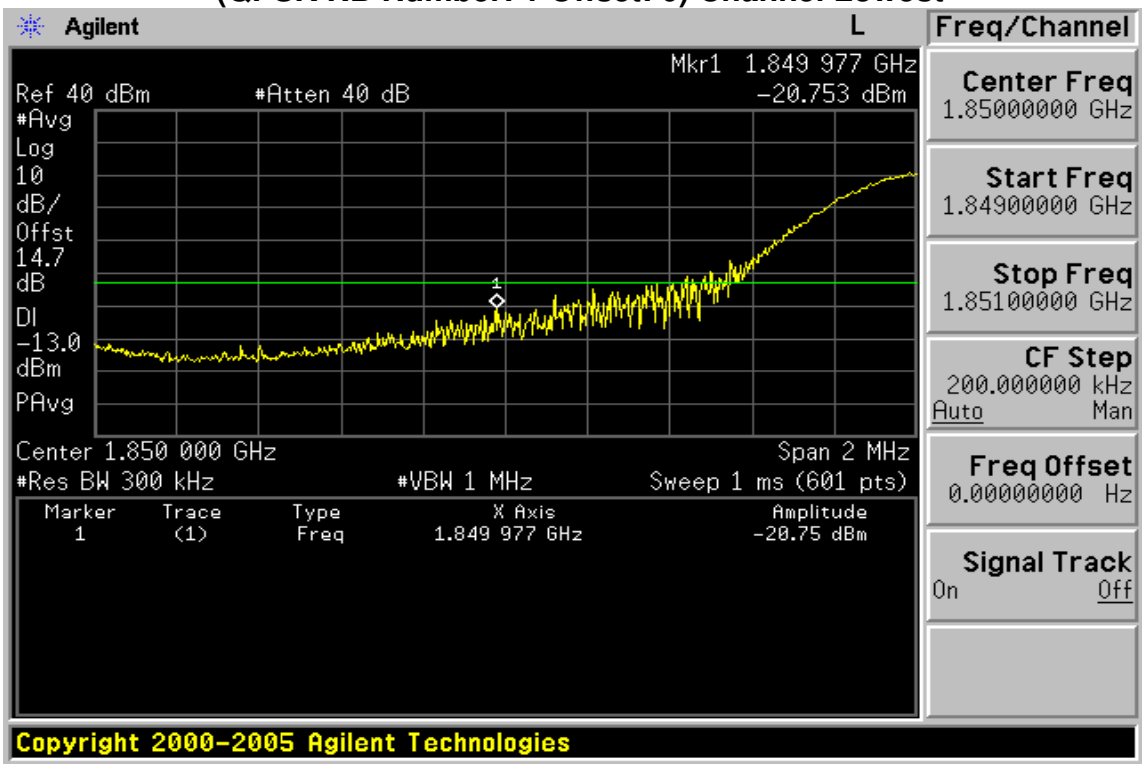


Out of Band emission at antenna terminals–20MHz BW LTE-Band 2 (QPSK RB Number: 1 Offset: 0) Channel Highest

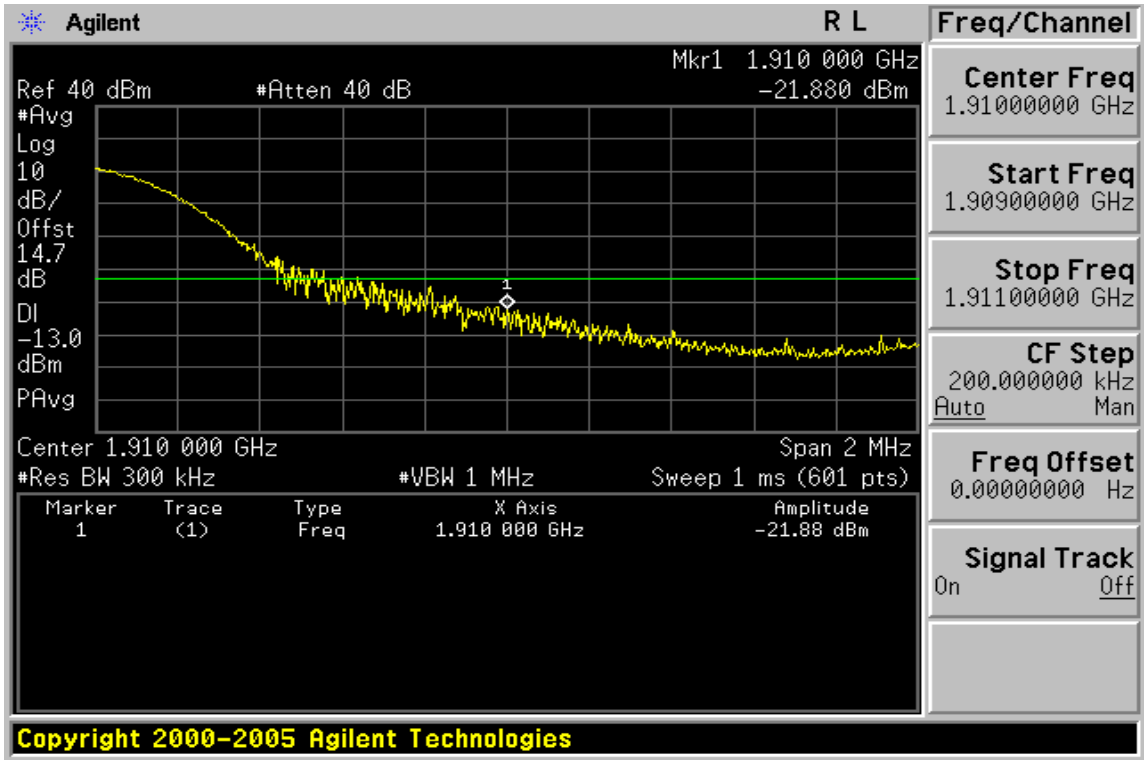




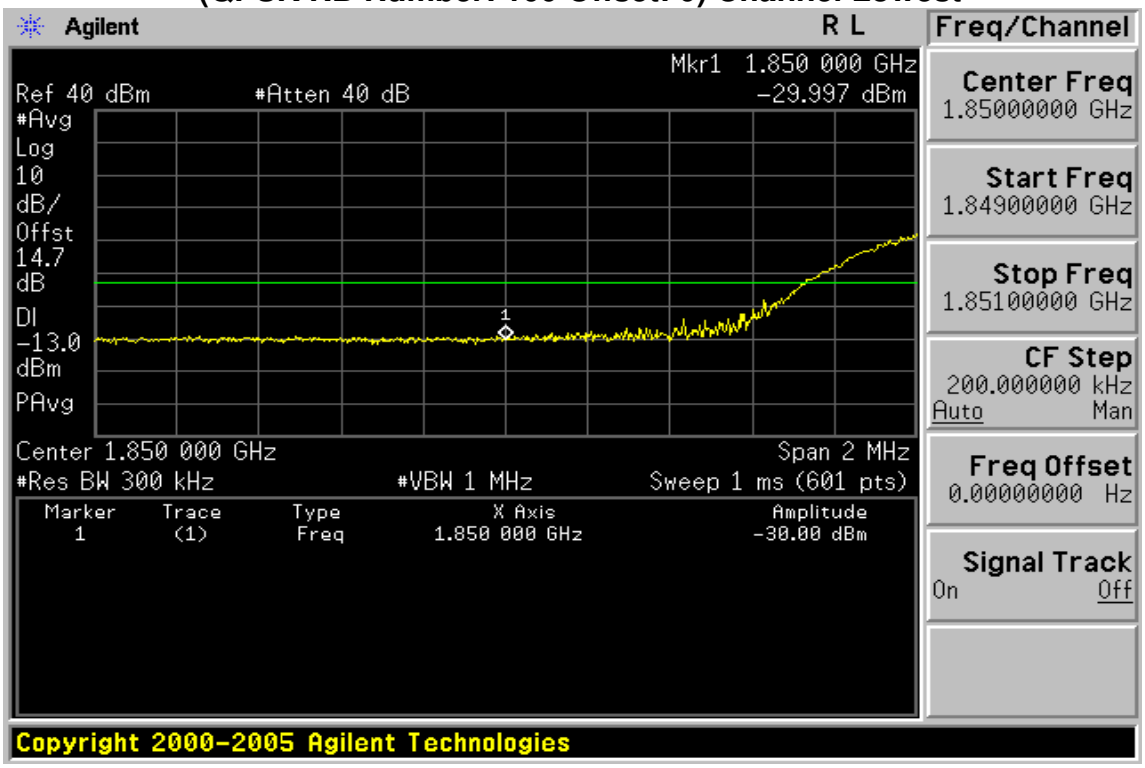
Band edge emission at antenna terminals –20MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 0) Channel Lowest



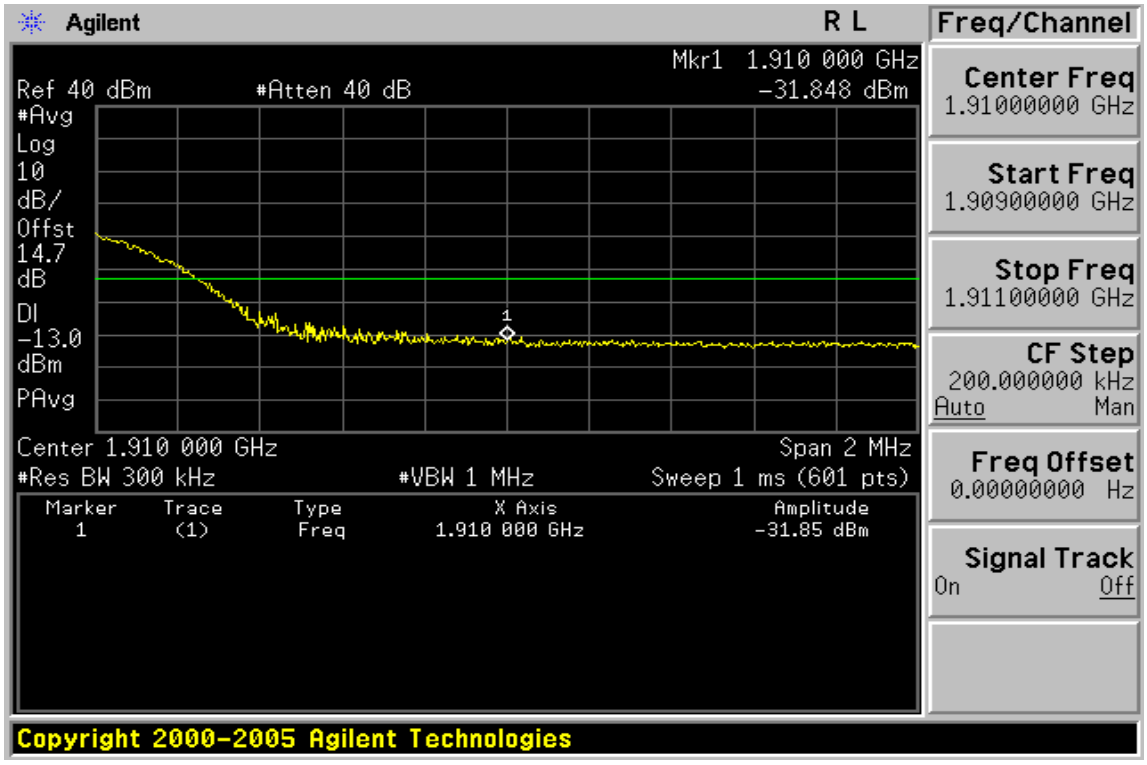
Band edge emission at antenna terminals –20MHz BW LTE-Band 2
(QPSK RB Number: 1 Offset: 99) Channel Highest



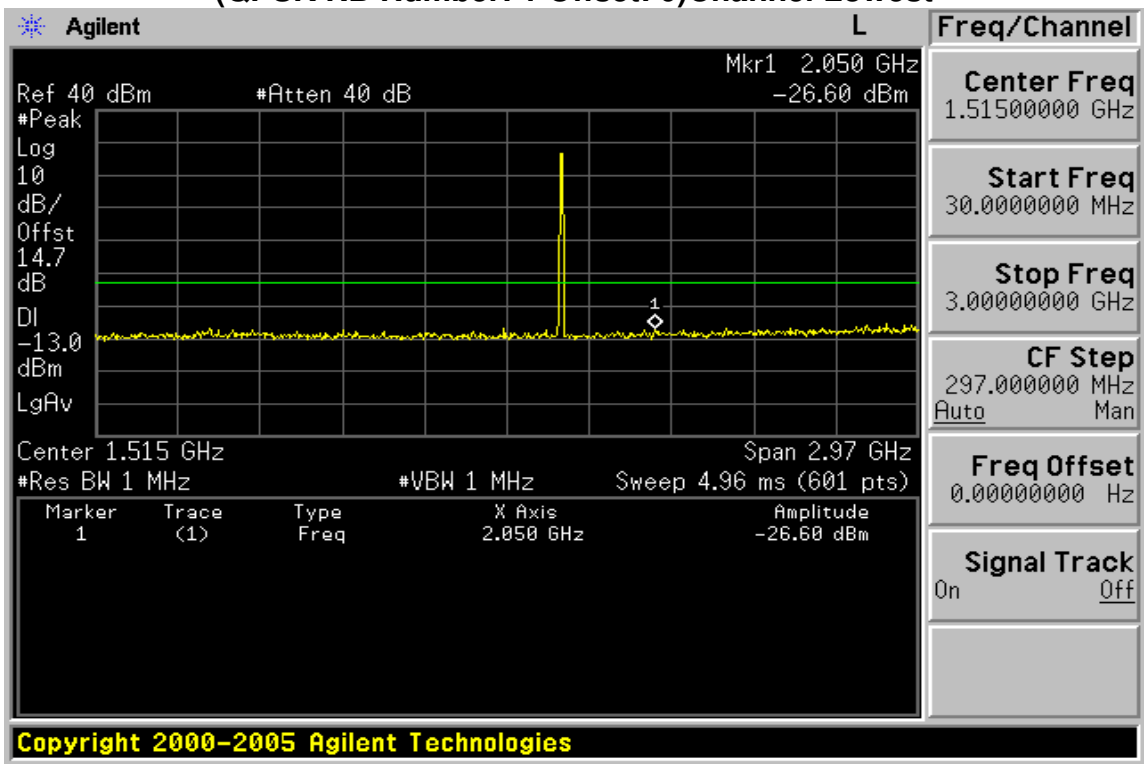
Band edge emission at antenna terminals –20MHz BW LTE-Band 2
(QPSK RB Number: 100 Offset: 0) Channel Lowest

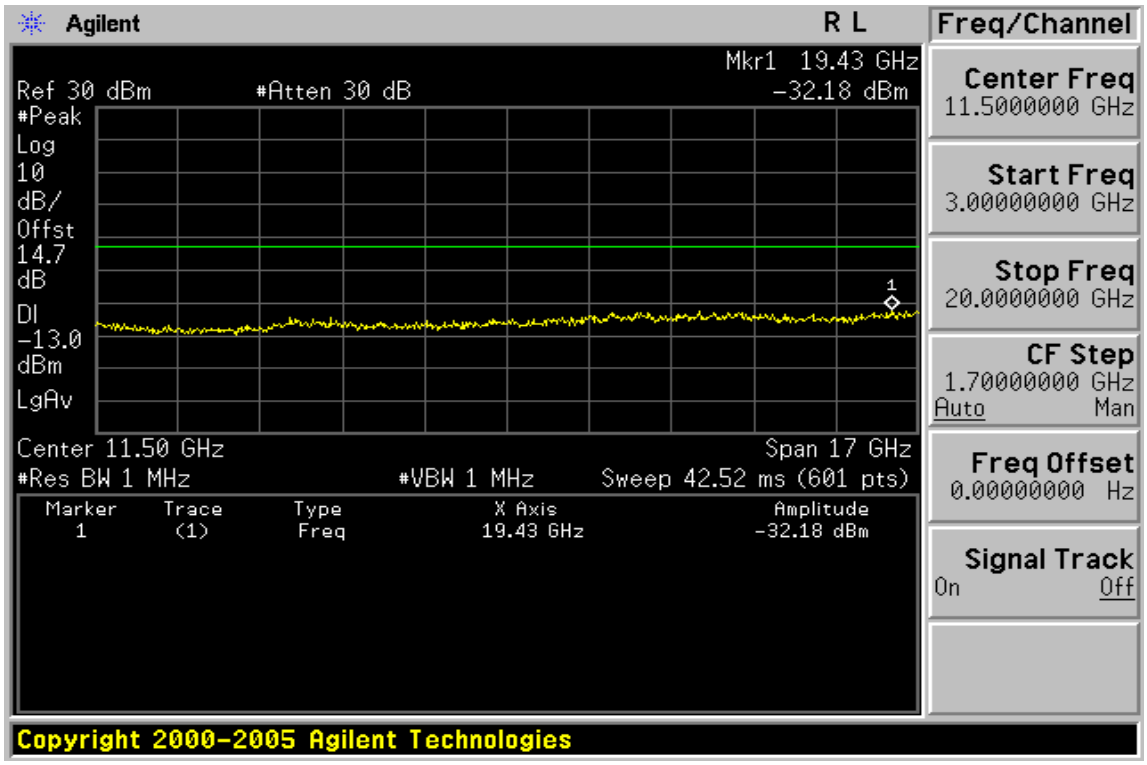


Band edge emission at antenna terminals –20MHz BW LTE-Band 2
(QPSK RB Number: 100 Offset: 0) Channel Highest

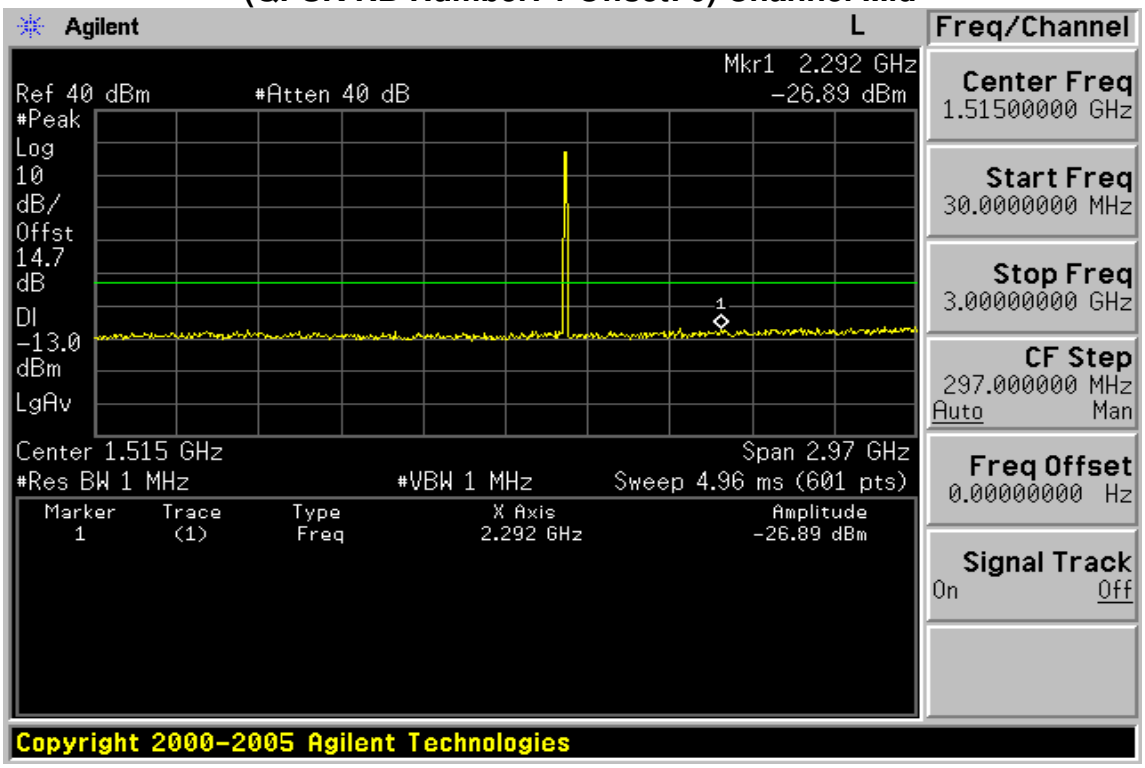


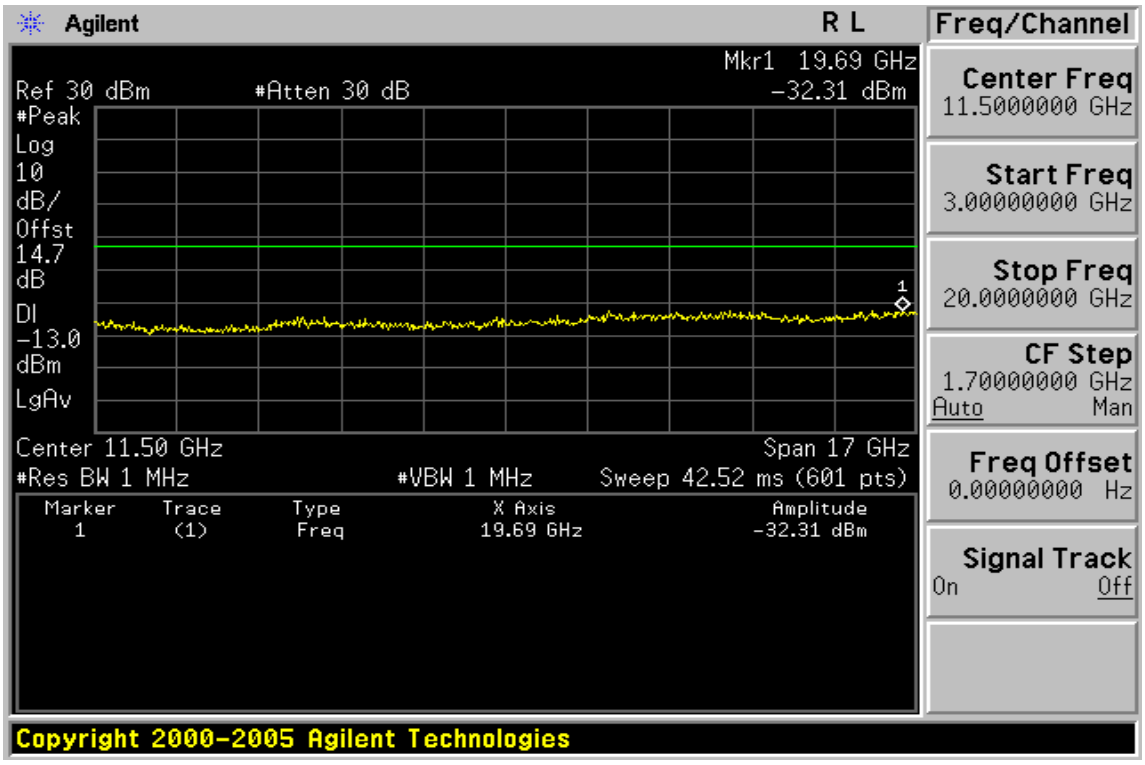
Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0)Channel Lowest



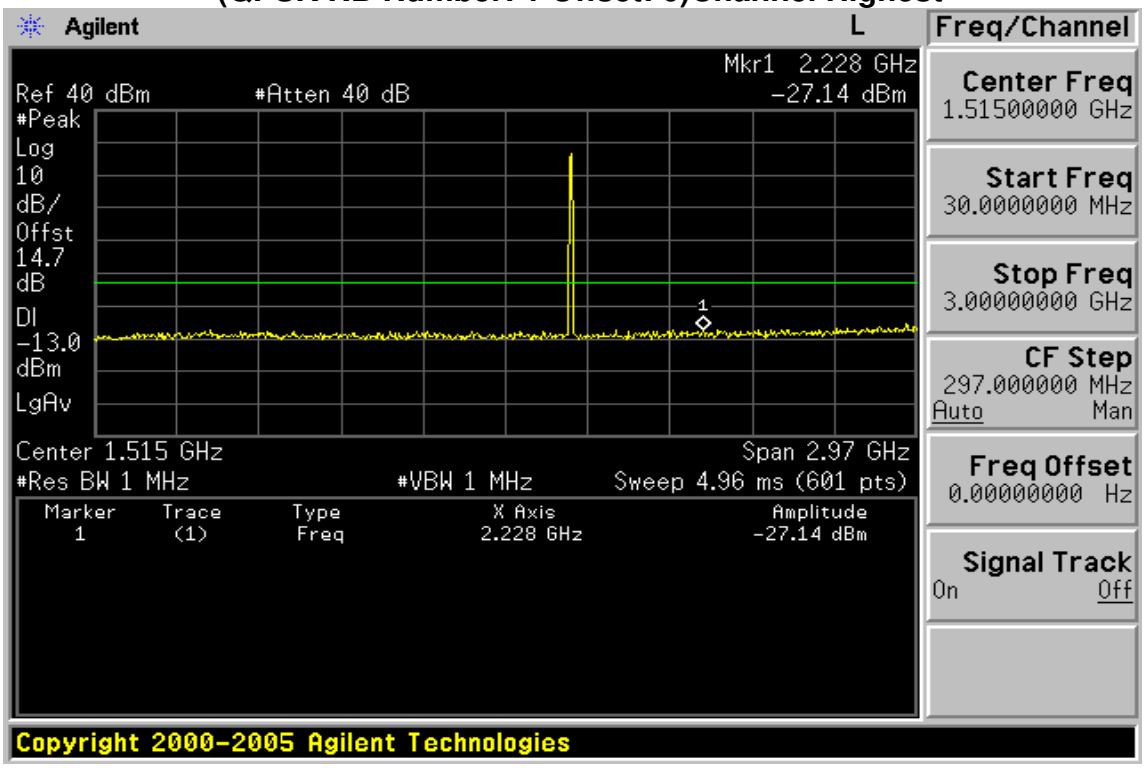


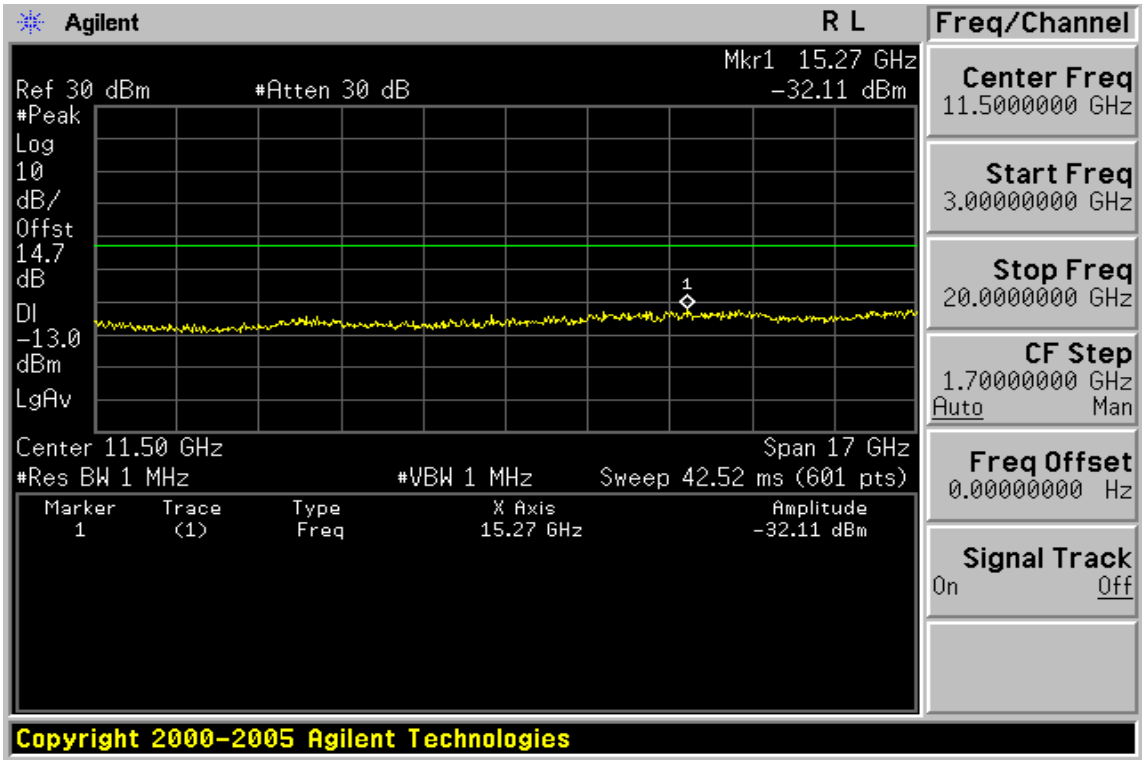
Out of Band emission at antenna terminals –5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid



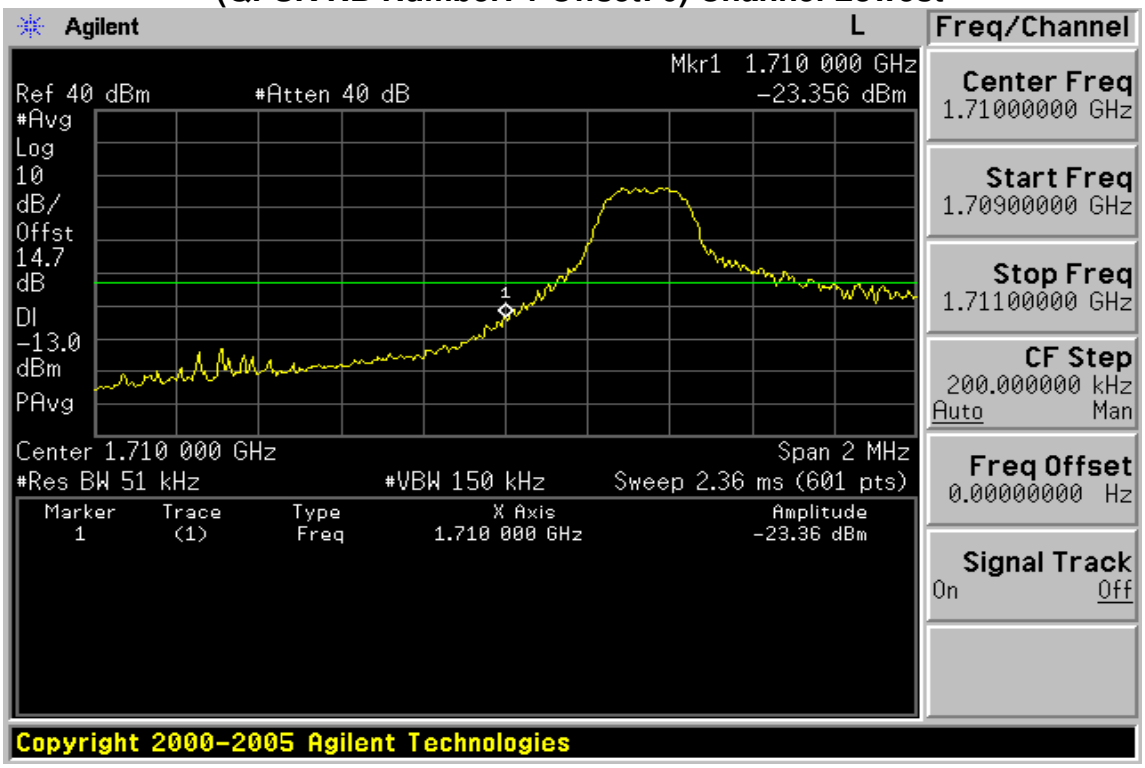


Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0)Channel Highest

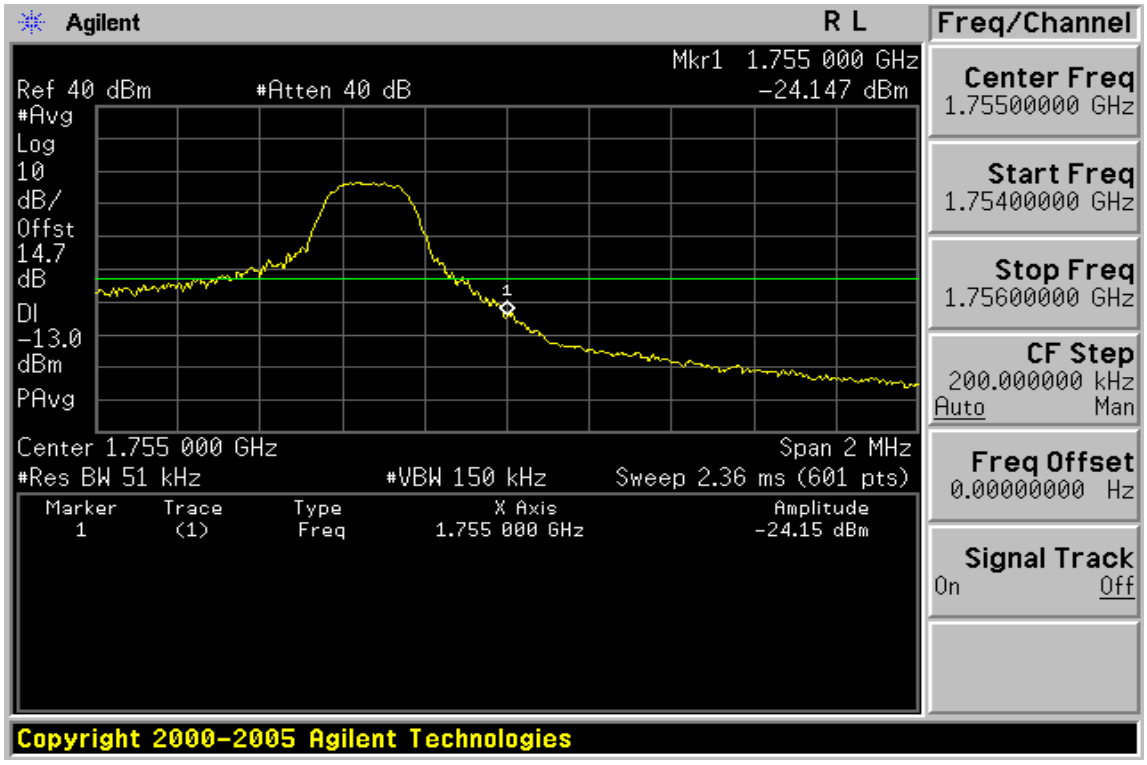




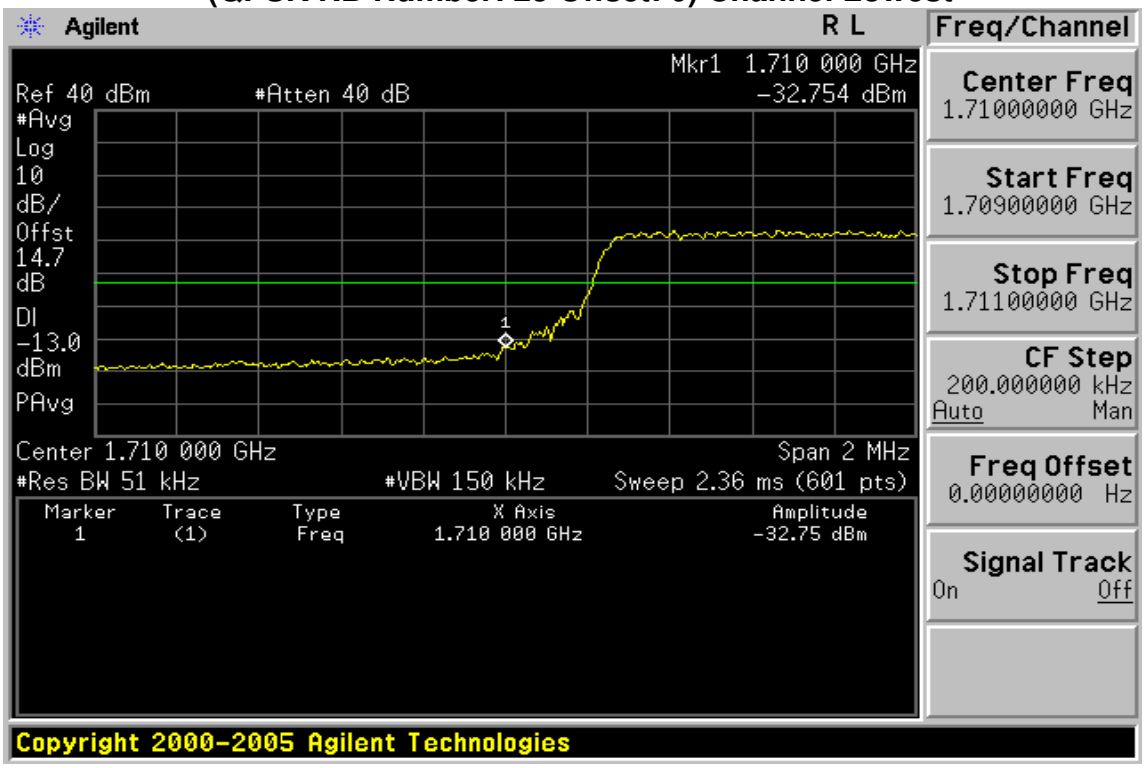
Band edge emission at antenna terminals –5MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Lowest



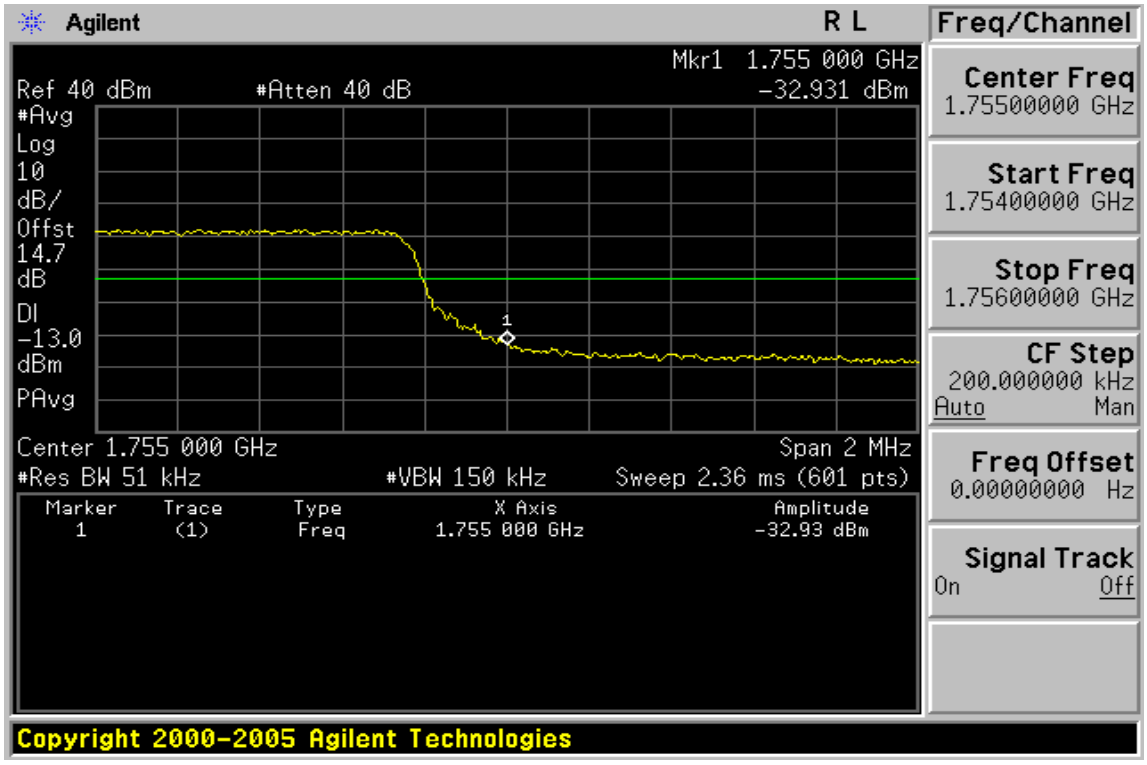
Band edge emission at antenna terminals –5MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 24) Channel Highest



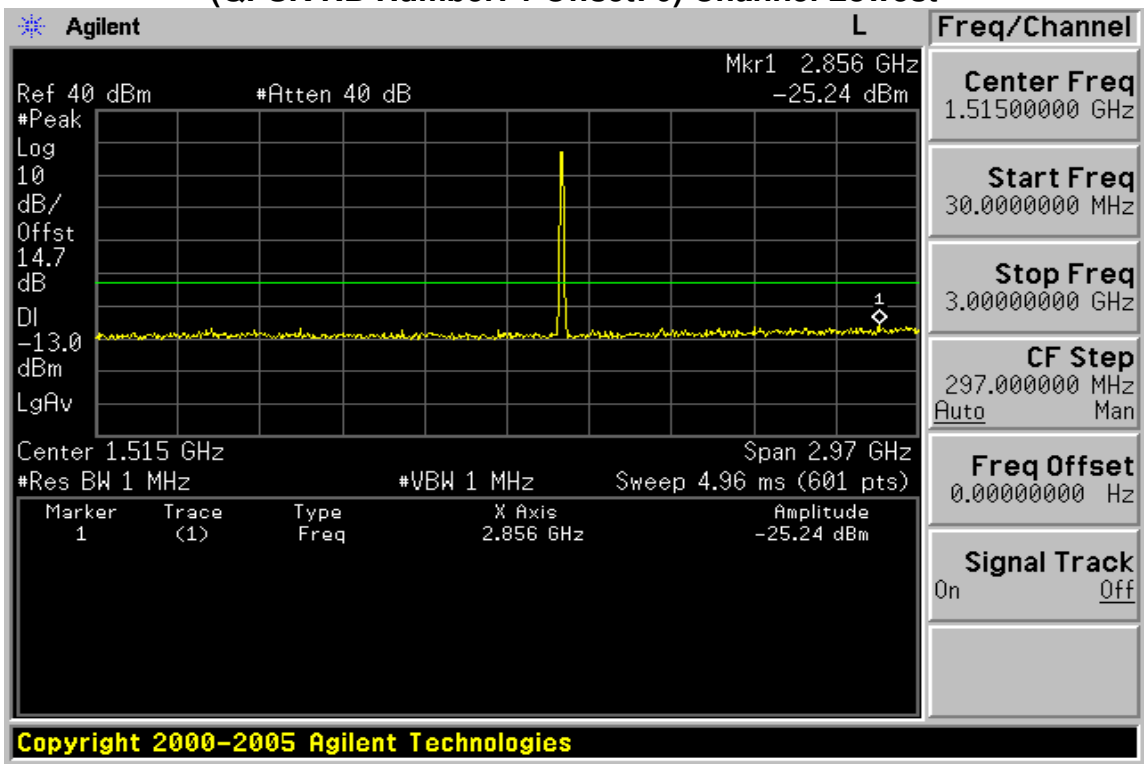
Band edge emission at antenna terminals –5MHz BW LTE-Band 4 (QPSK RB Number: 25 Offset: 0) Channel Lowest

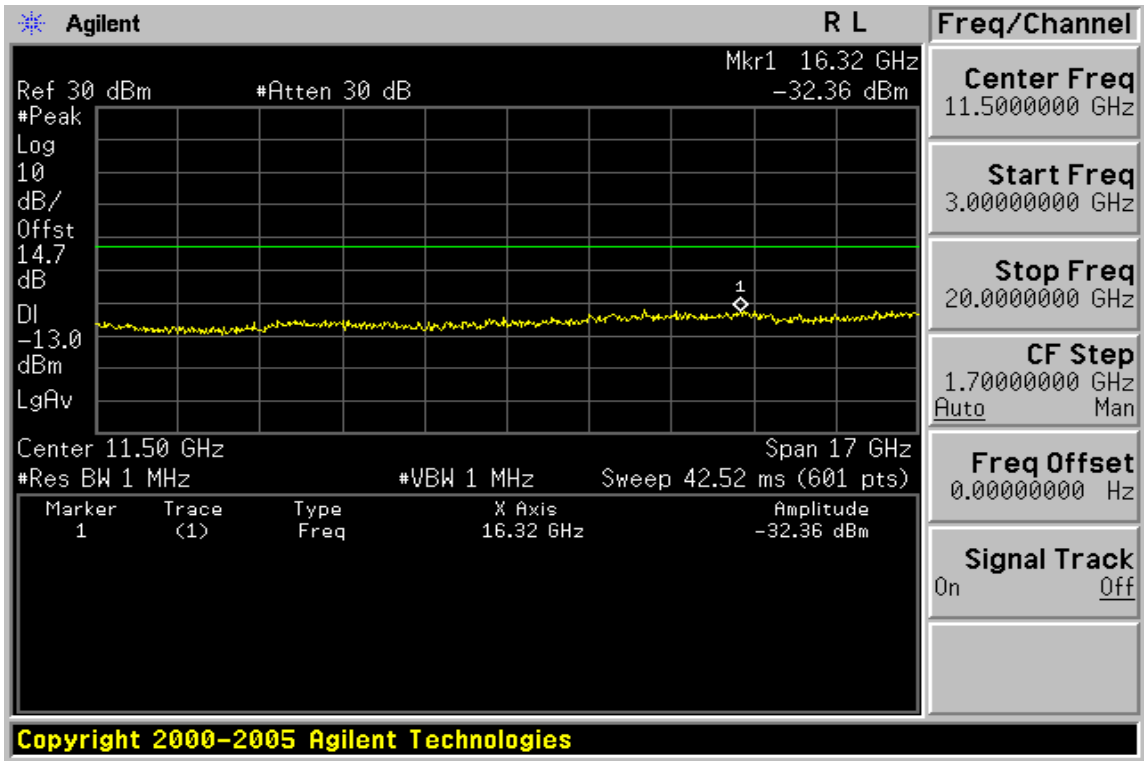


Band edge emission at antenna terminals –5MHz BW LTE-Band 4 (QPSK RB Number: 25 Offset: 0) Channel Highest

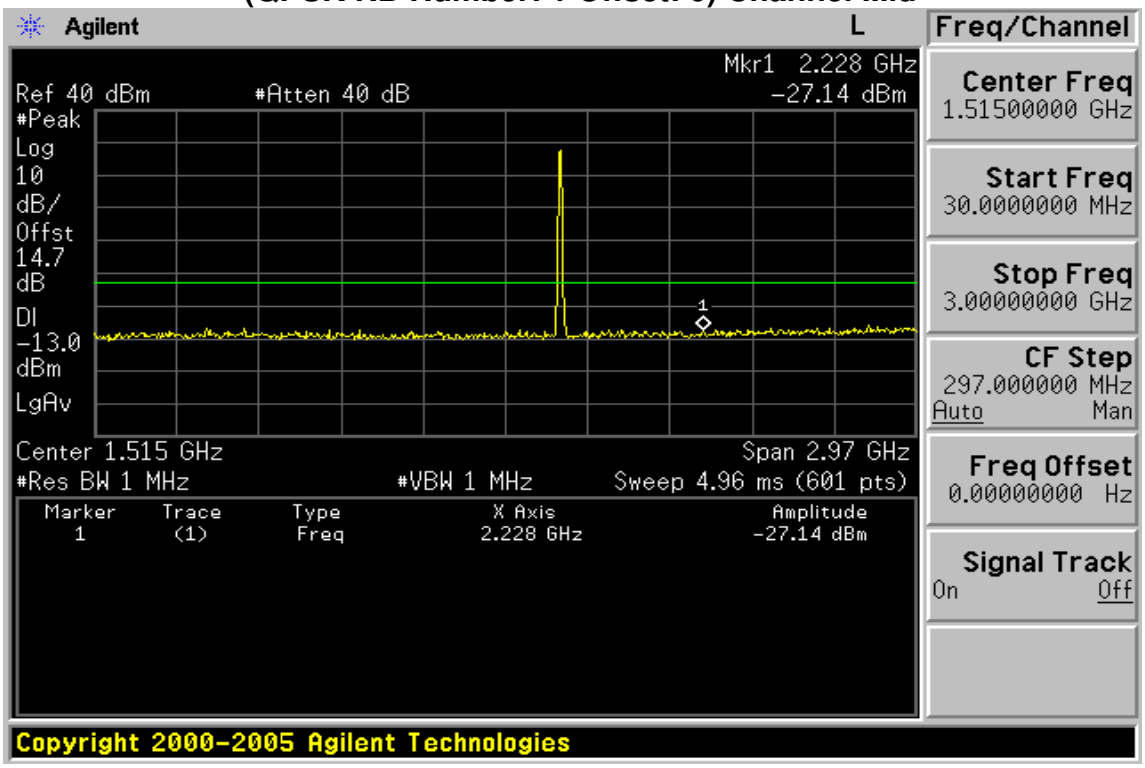


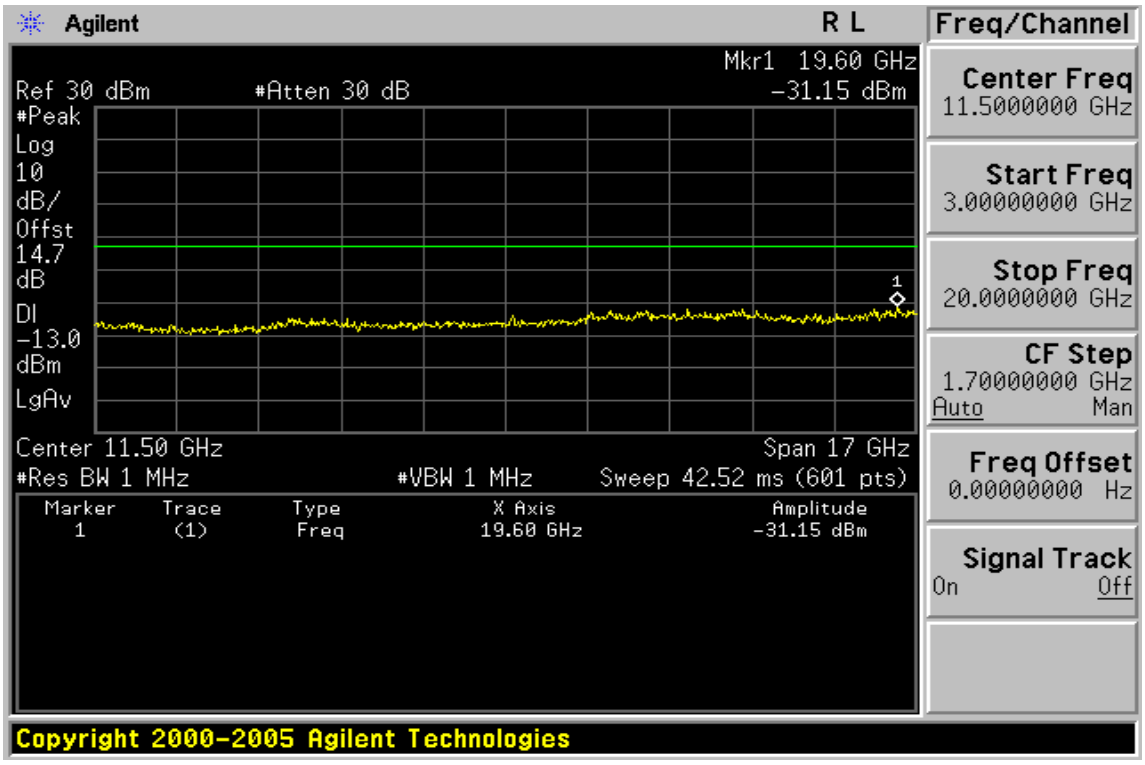
Out of Band emission at antenna terminals–10MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Lowest



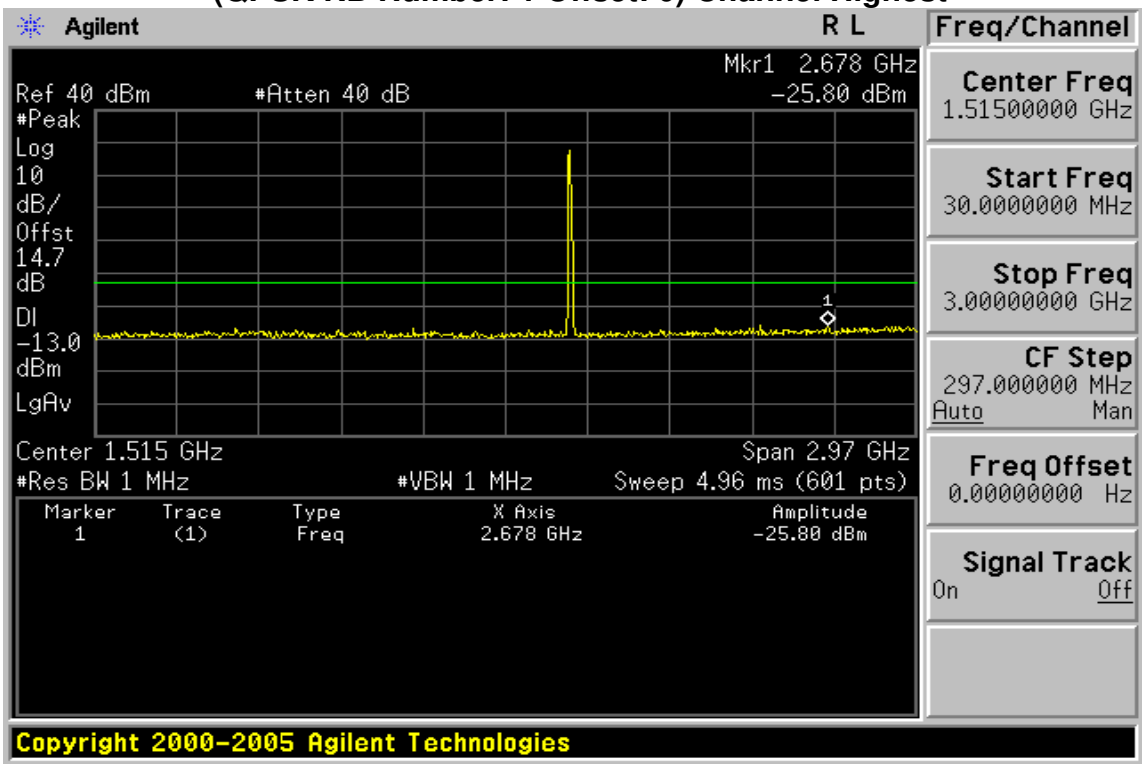


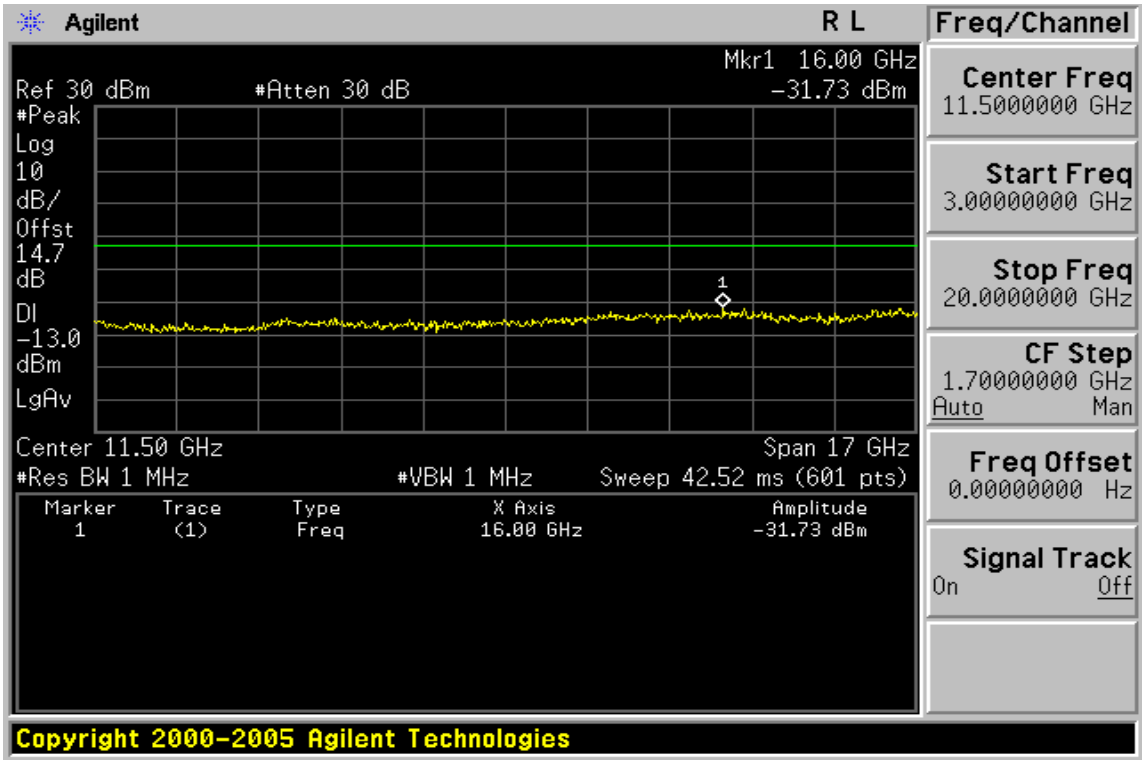
Out of Band emission at antenna terminals –10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid



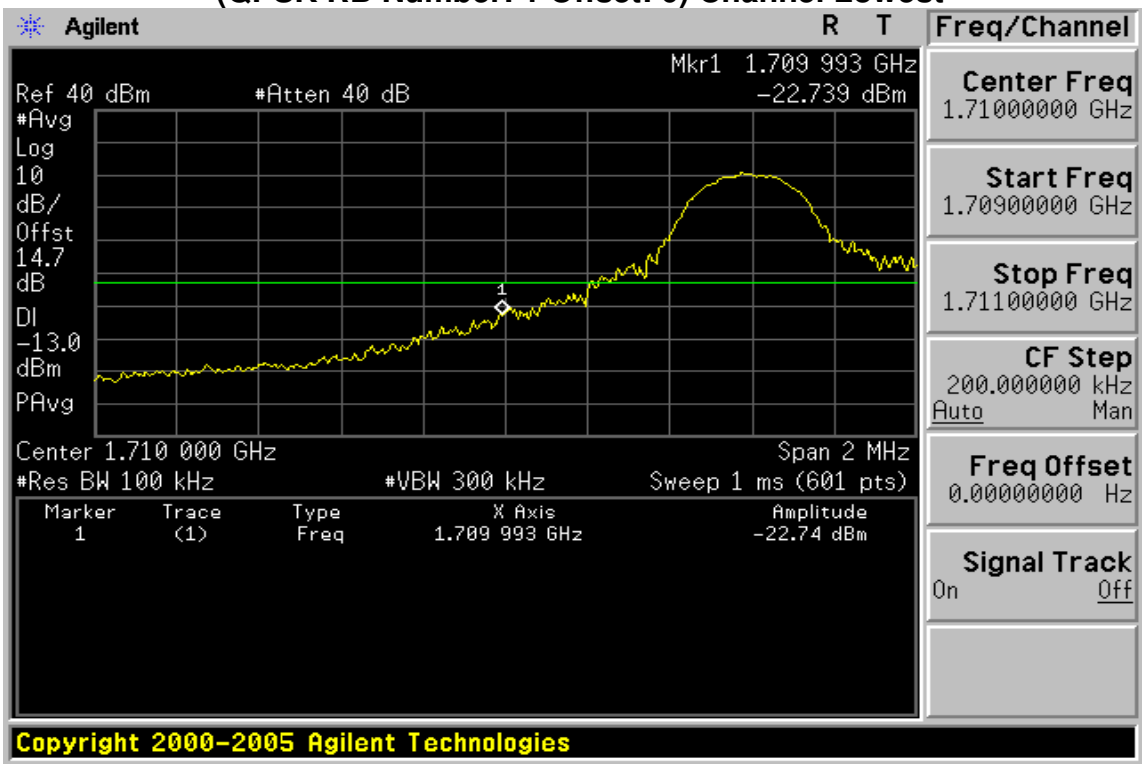


Out of Band emission at antenna terminals–10MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Highest

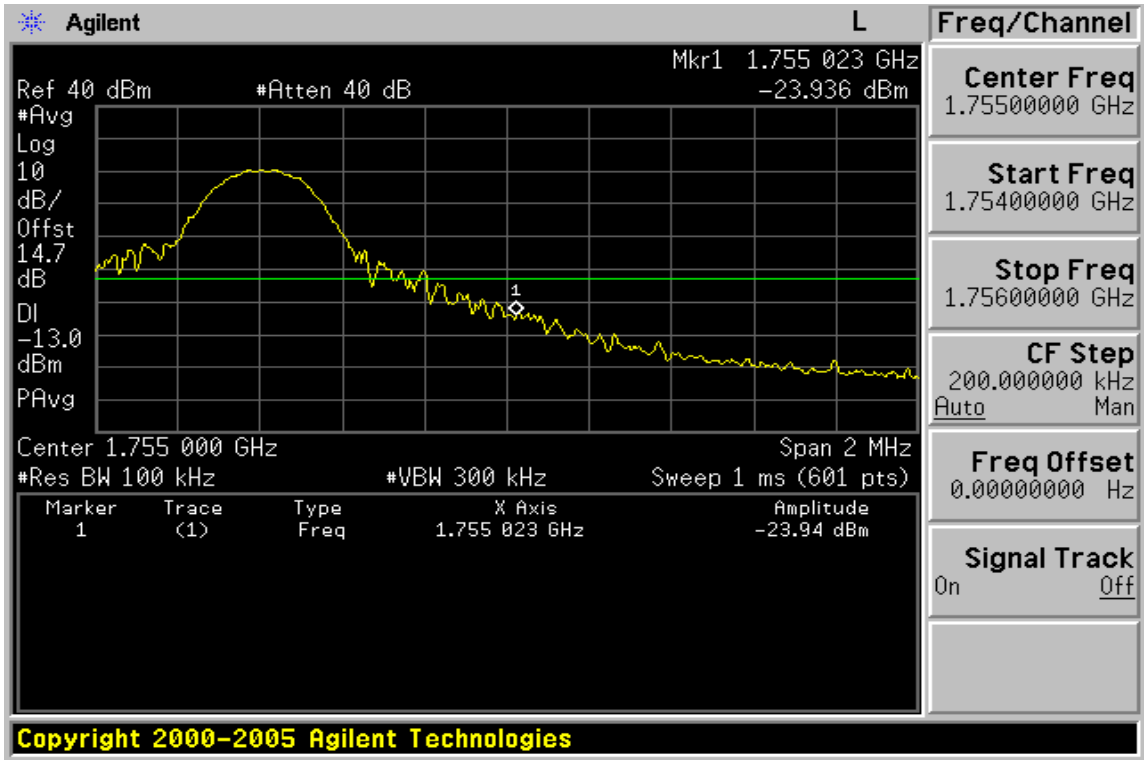




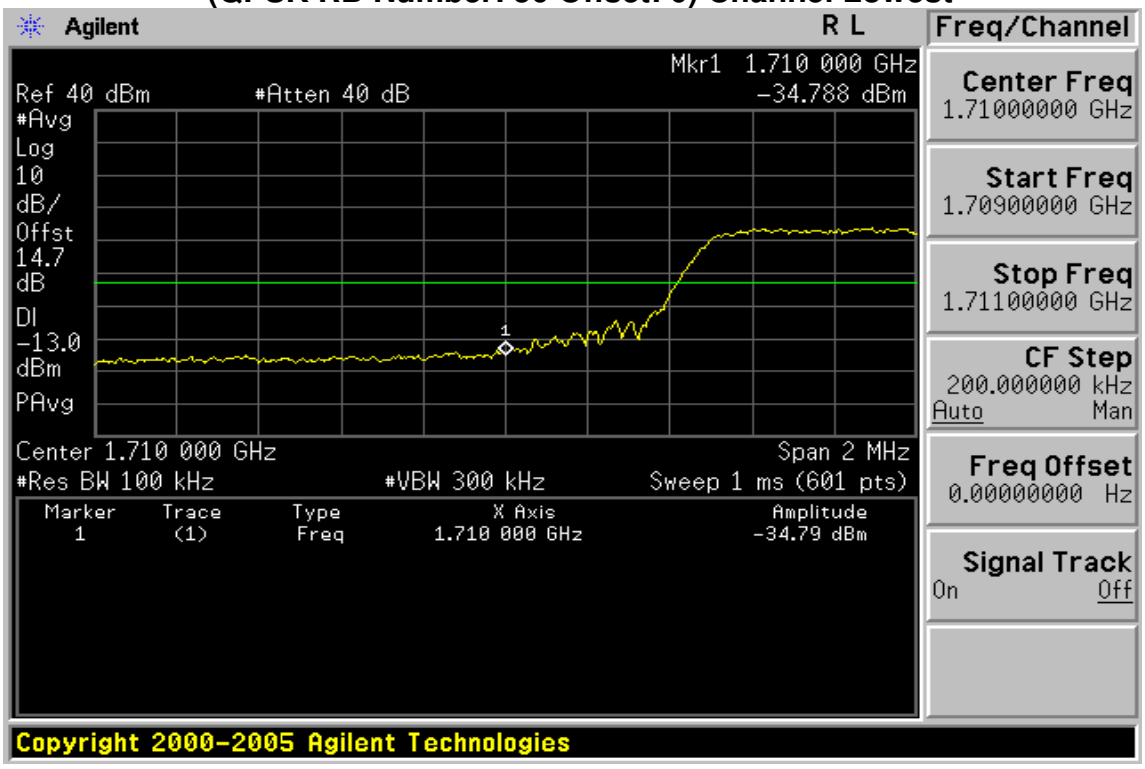
Band edge emission at antenna terminals –10MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Lowest



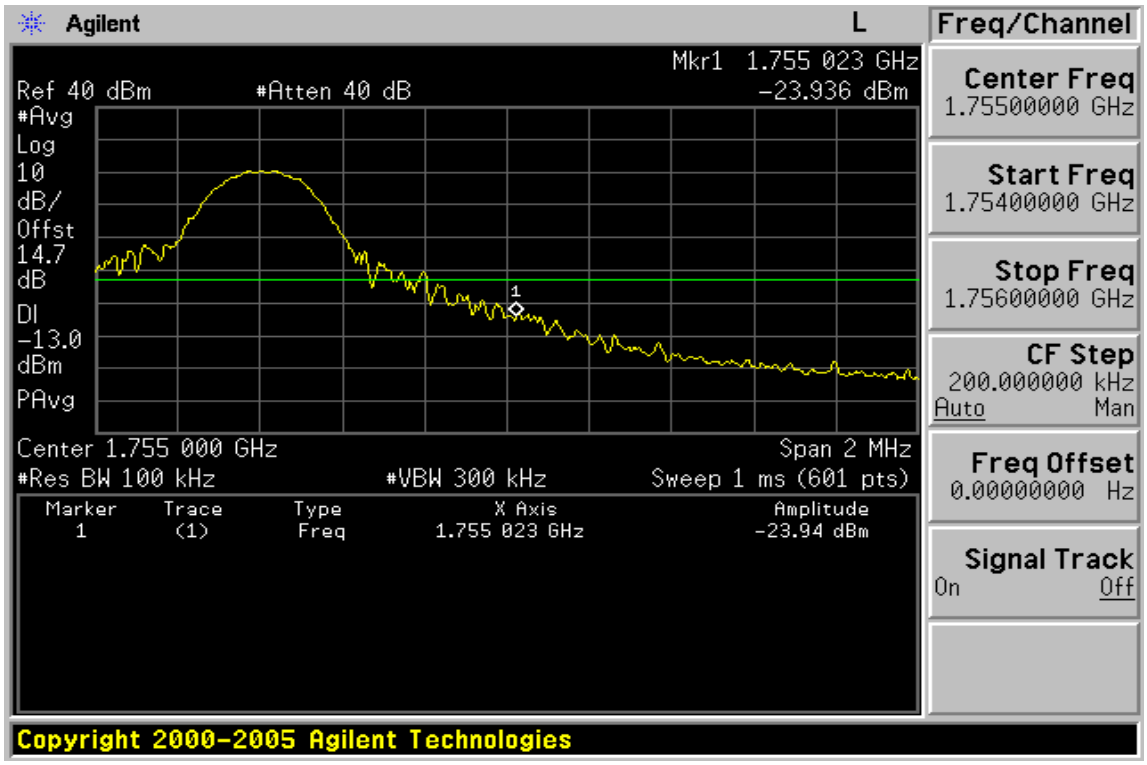
Band edge emission at antenna terminals –10MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 49) Channel Highest



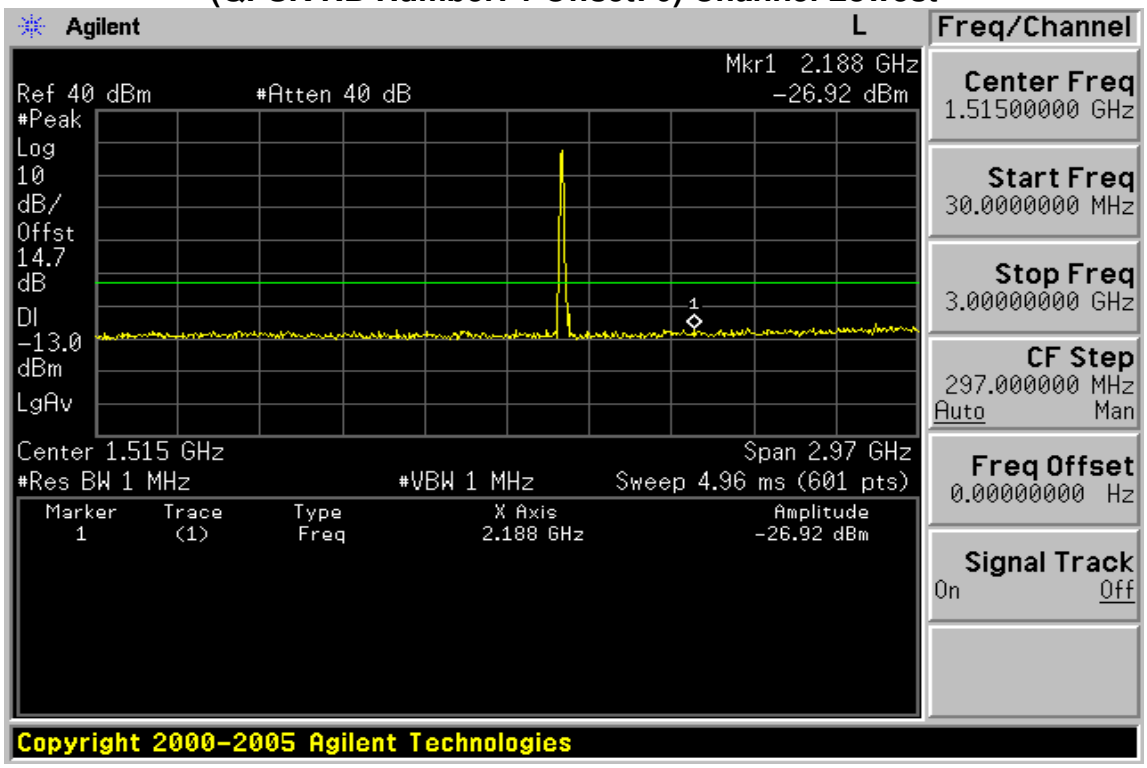
Band edge emission at antenna terminals –10MHz BW LTE-Band 4
(QPSK RB Number: 50 Offset: 0) Channel Lowest

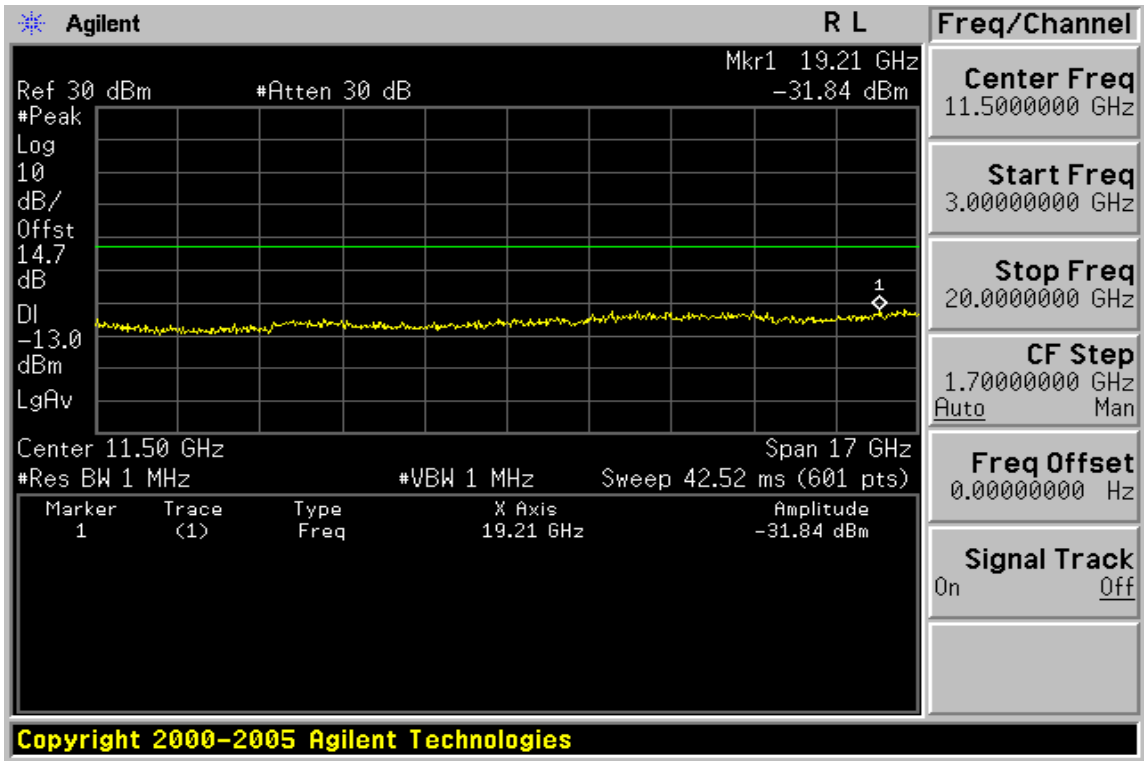


Band edge emission at antenna terminals –10MHz BW LTE-Band 4
(QPSK RB Number: 50 Offset:) Channel Highest

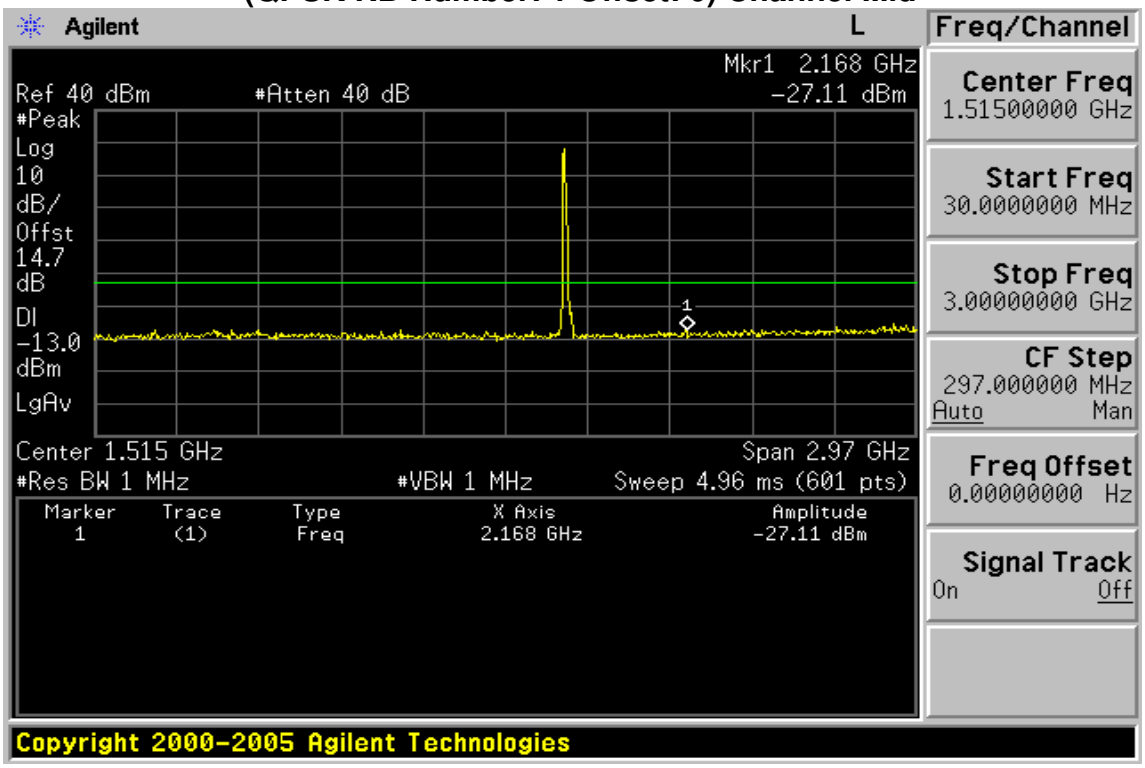


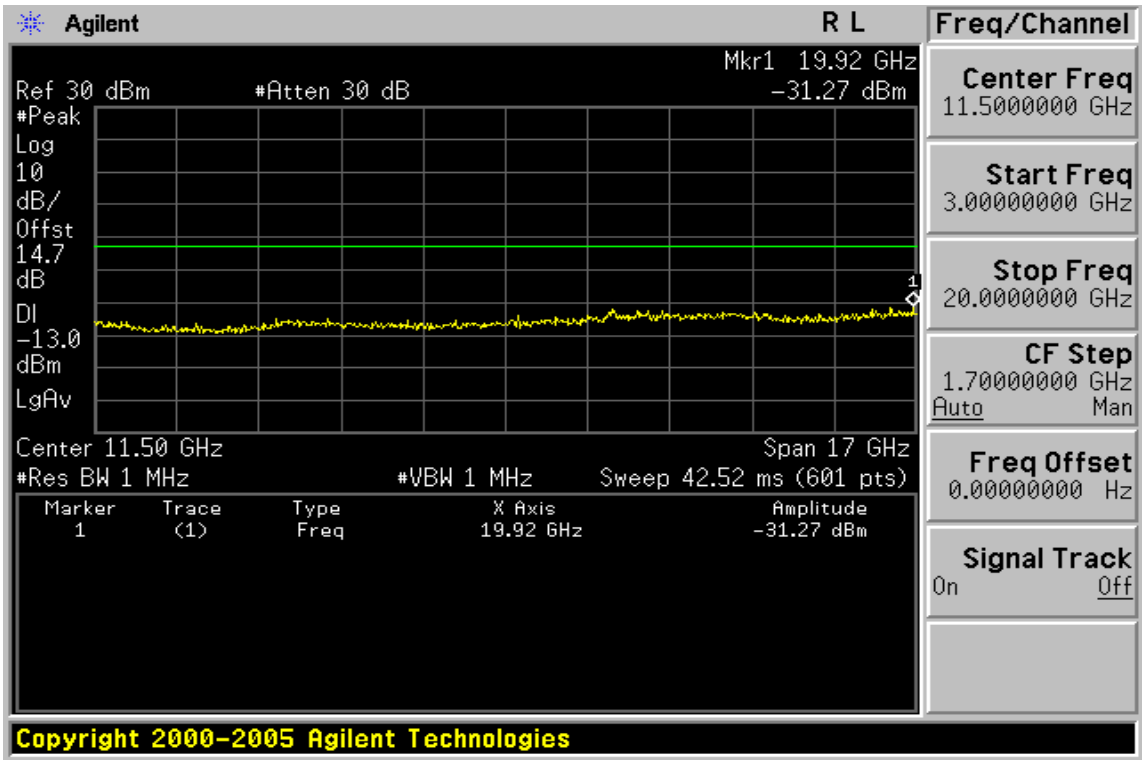
Out of Band emission at antenna terminals–15MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Lowest



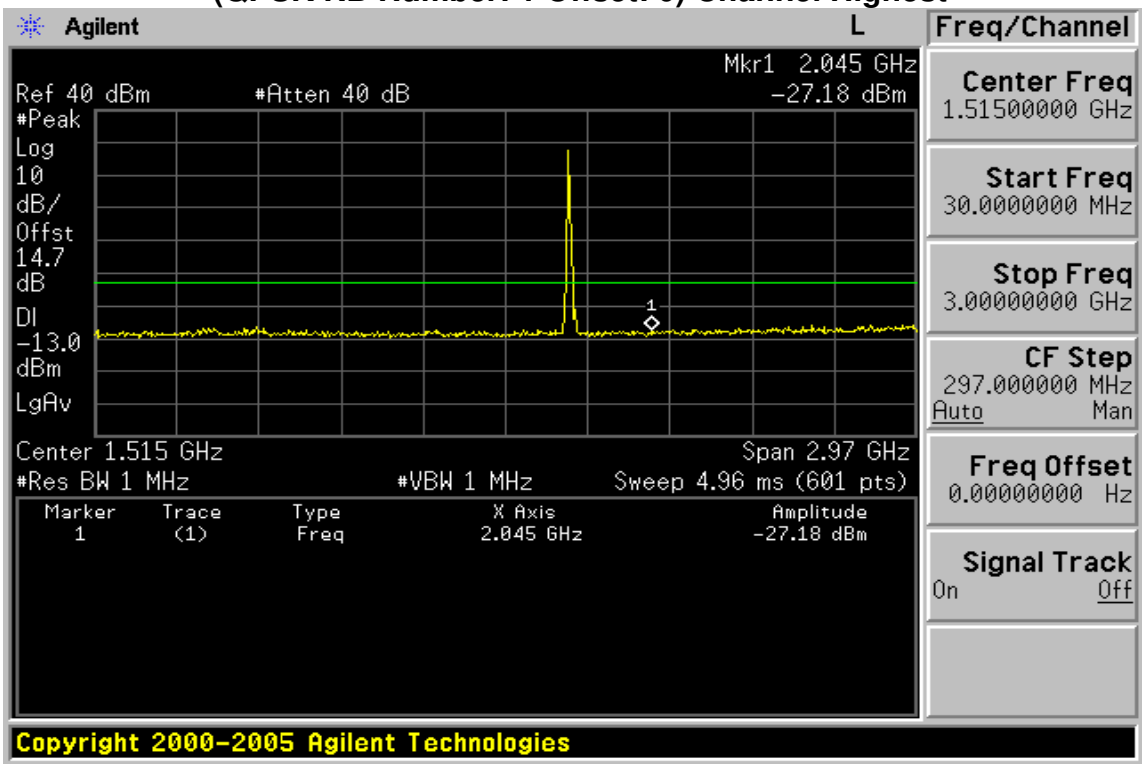


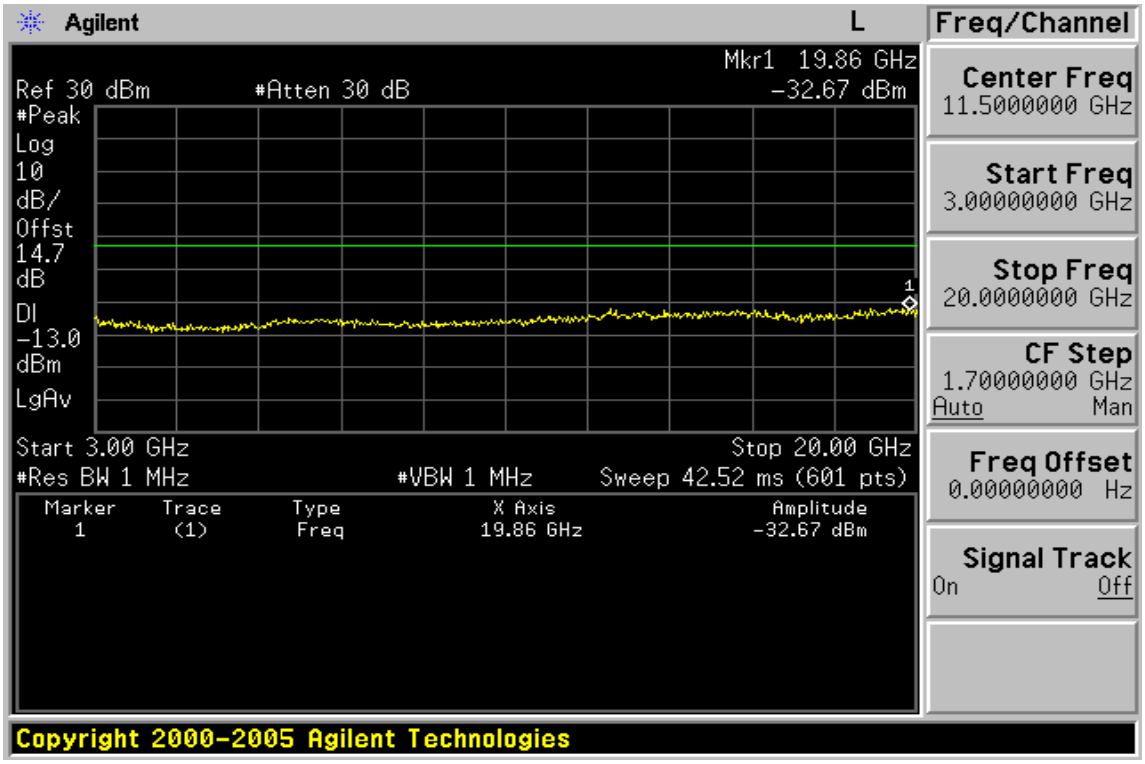
Out of Band emission at antenna terminals –15MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid



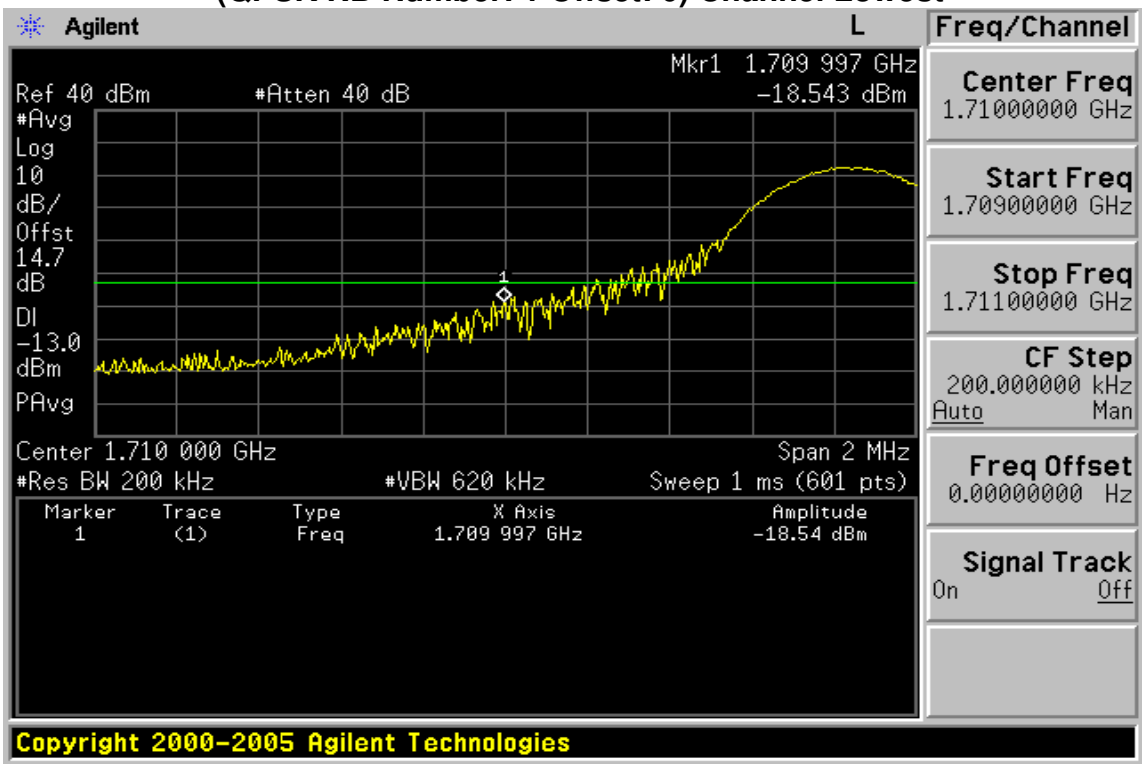


Out of Band emission at antenna terminals–15MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest

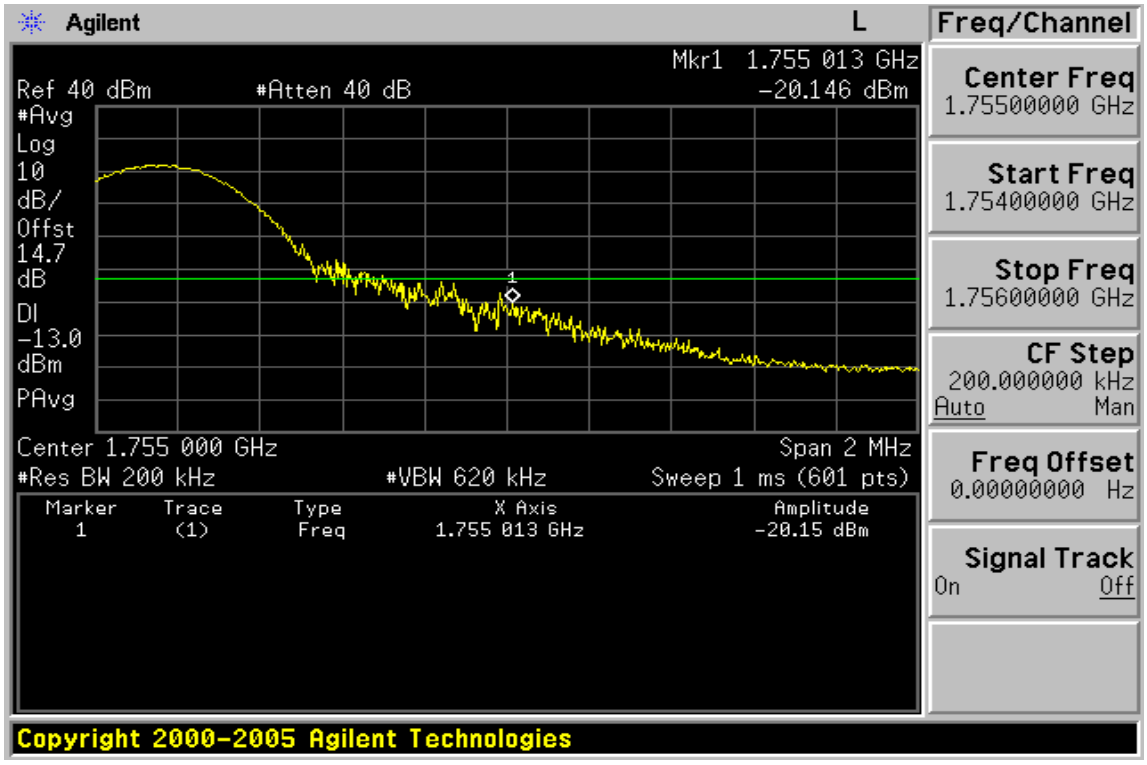




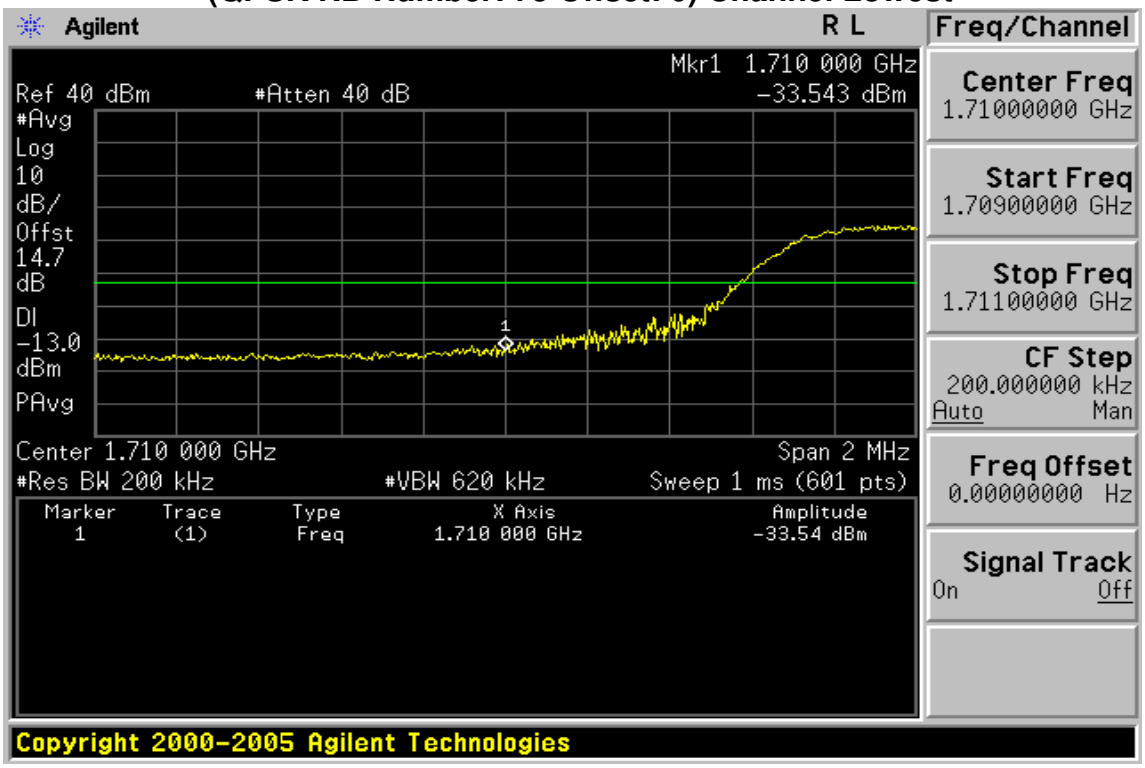
Band edge emission at antenna terminals –15MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Lowest



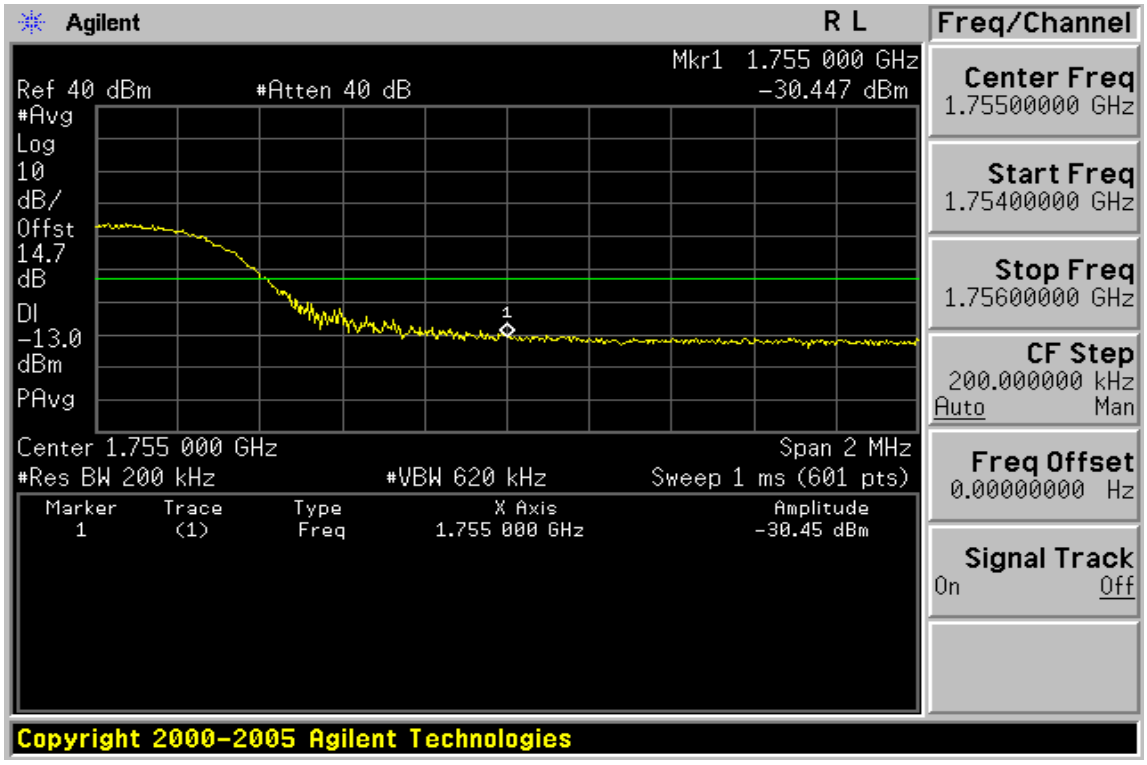
Band edge emission at antenna terminals –15MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 74) Channel Highest



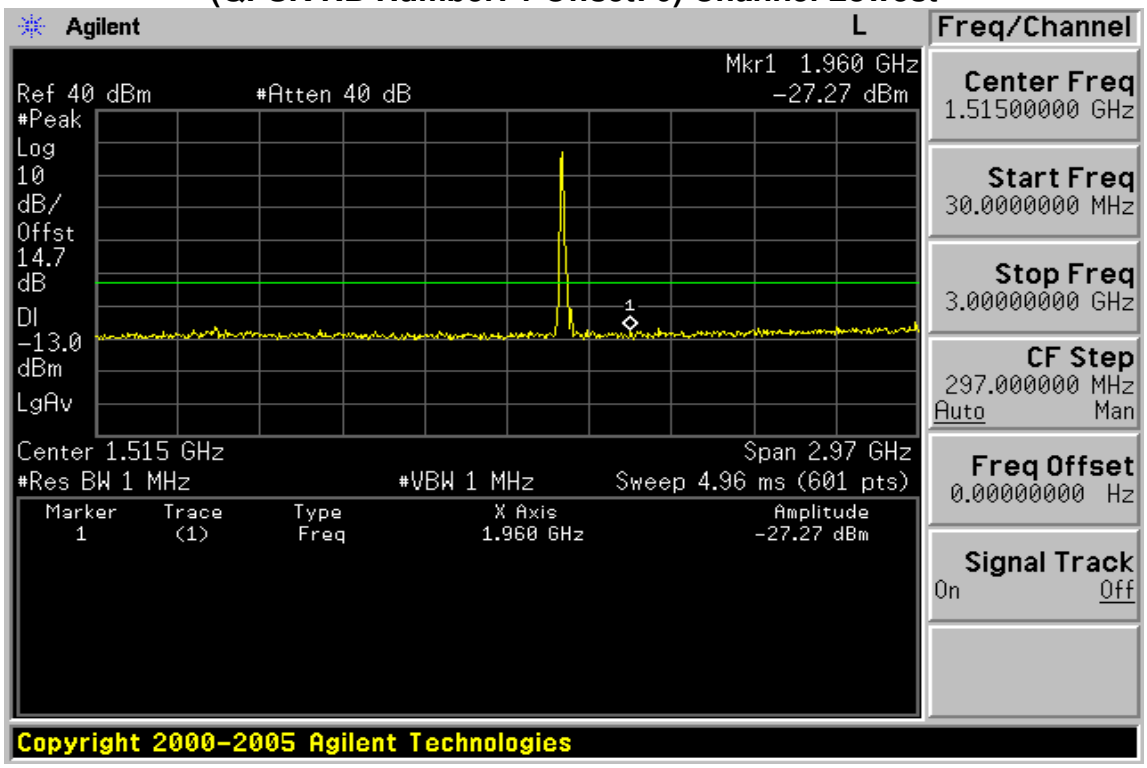
Band edge emission at antenna terminals –15MHz BW LTE-Band 4 (QPSK RB Number: 75 Offset: 0) Channel Lowest

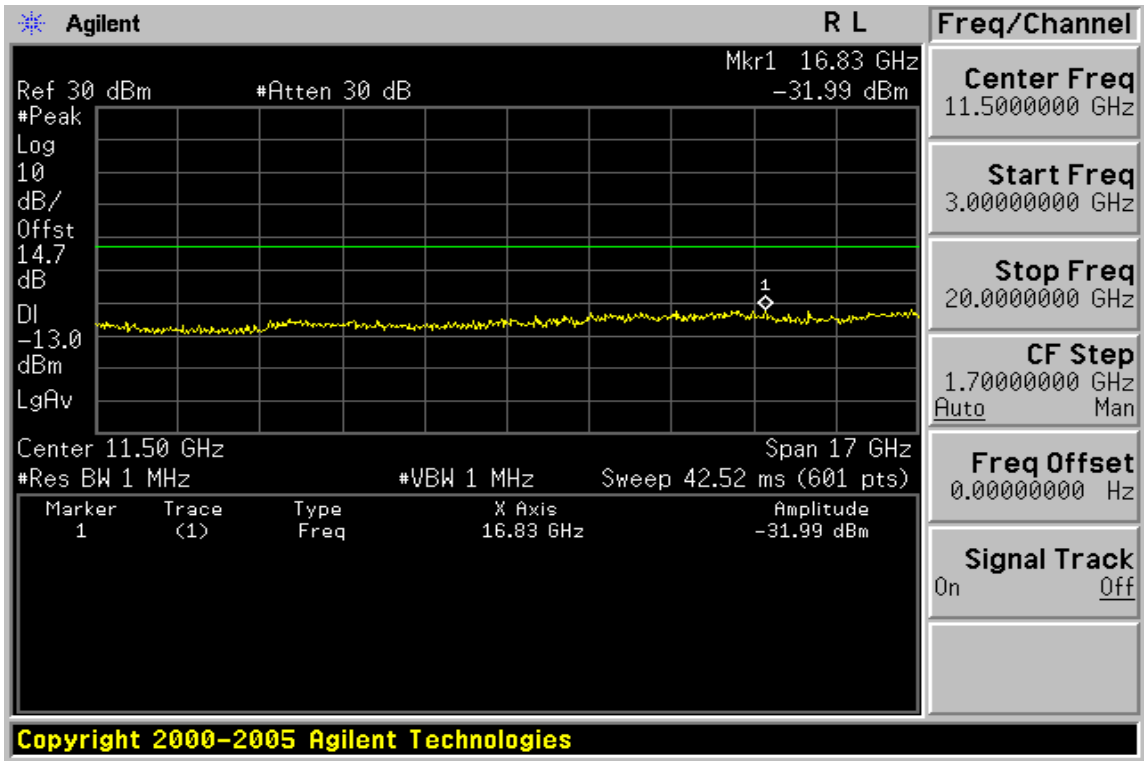


Band edge emission at antenna terminals –15MHz BW LTE-Band 4 (QPSK RB Number: 75 Offset: 0) Channel Highest

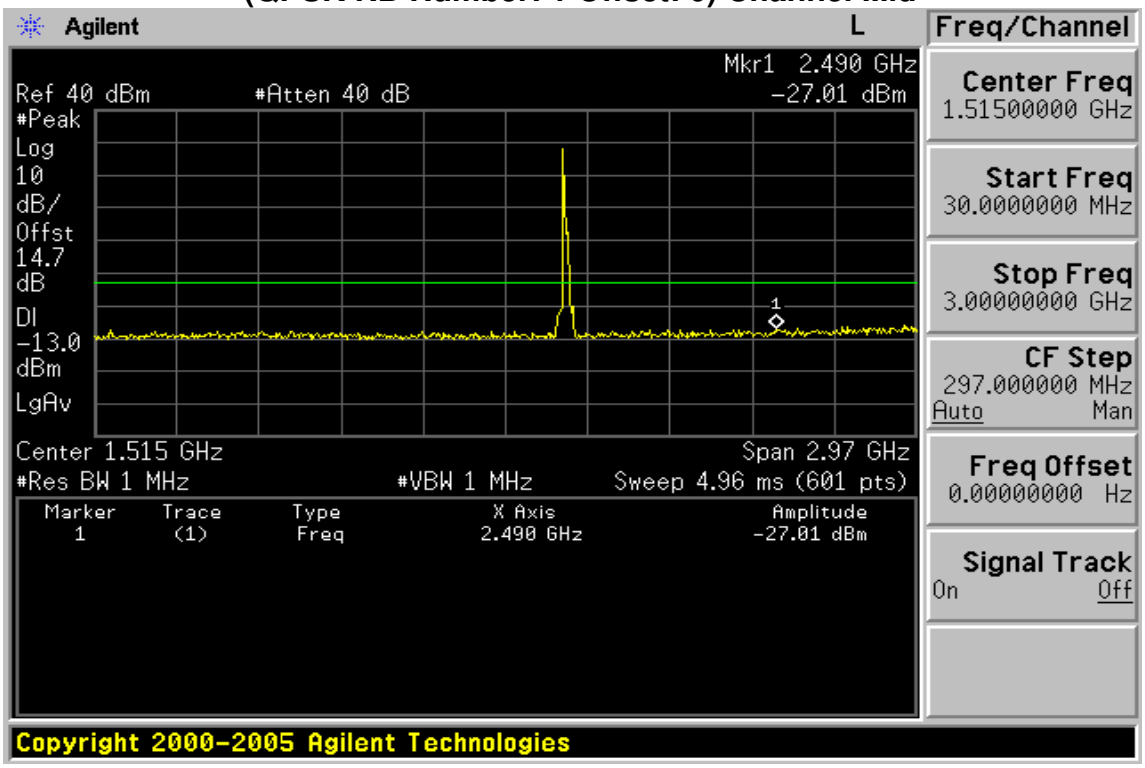


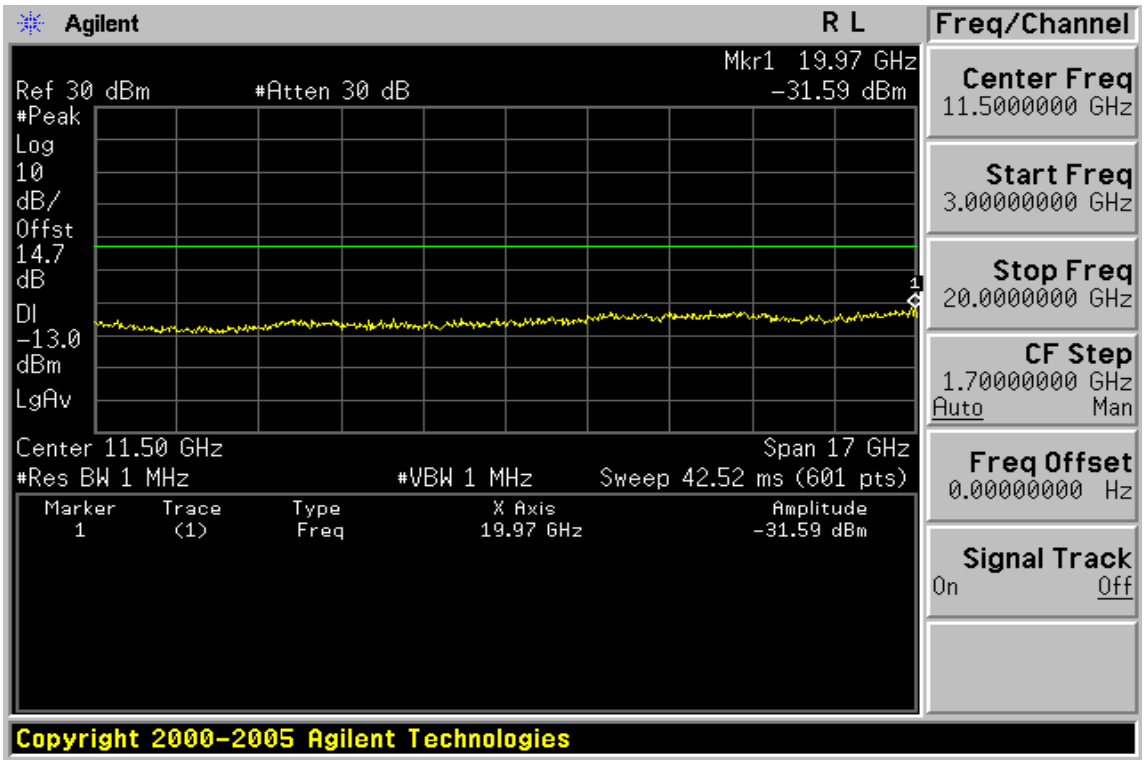
Out of Band emission at antenna terminals–20MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Lowest



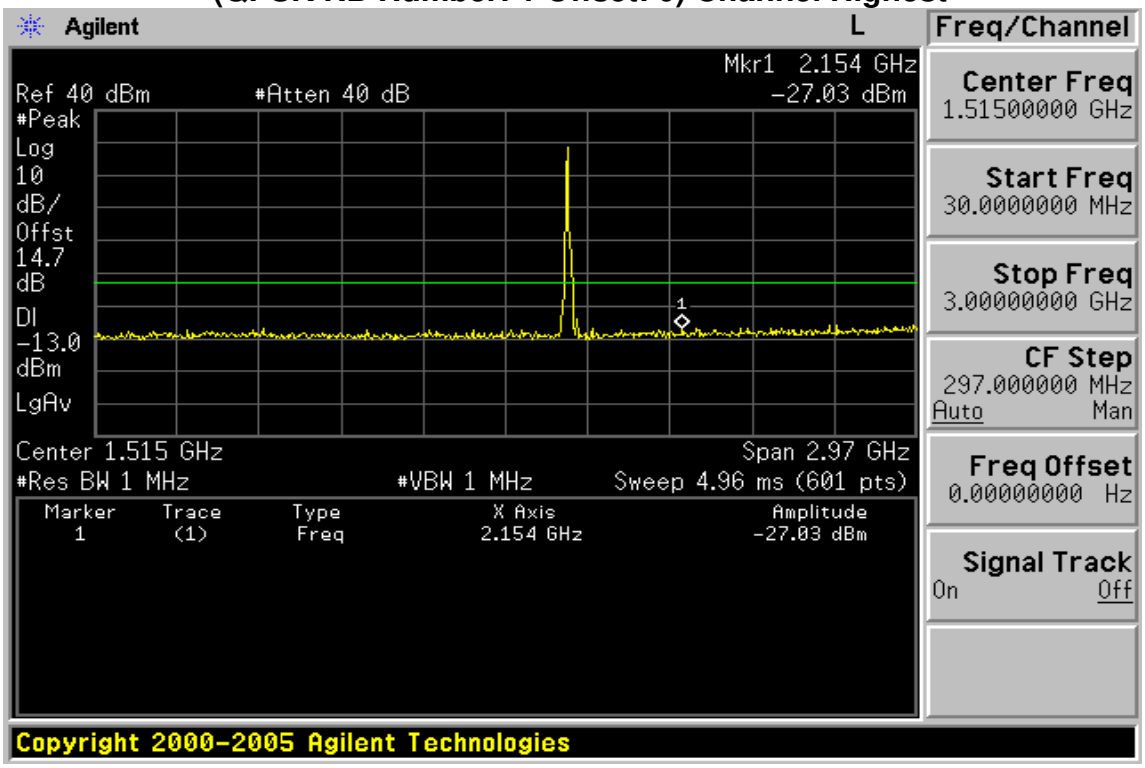


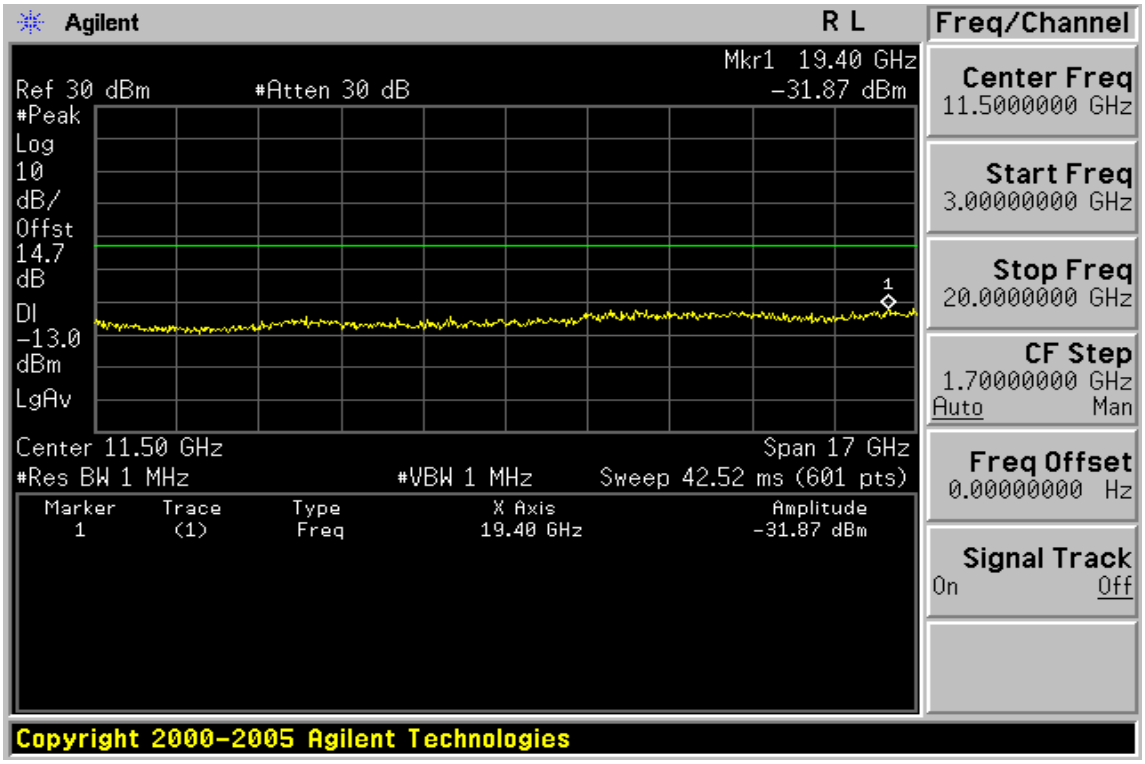
Out of Band emission at antenna terminals –20MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid



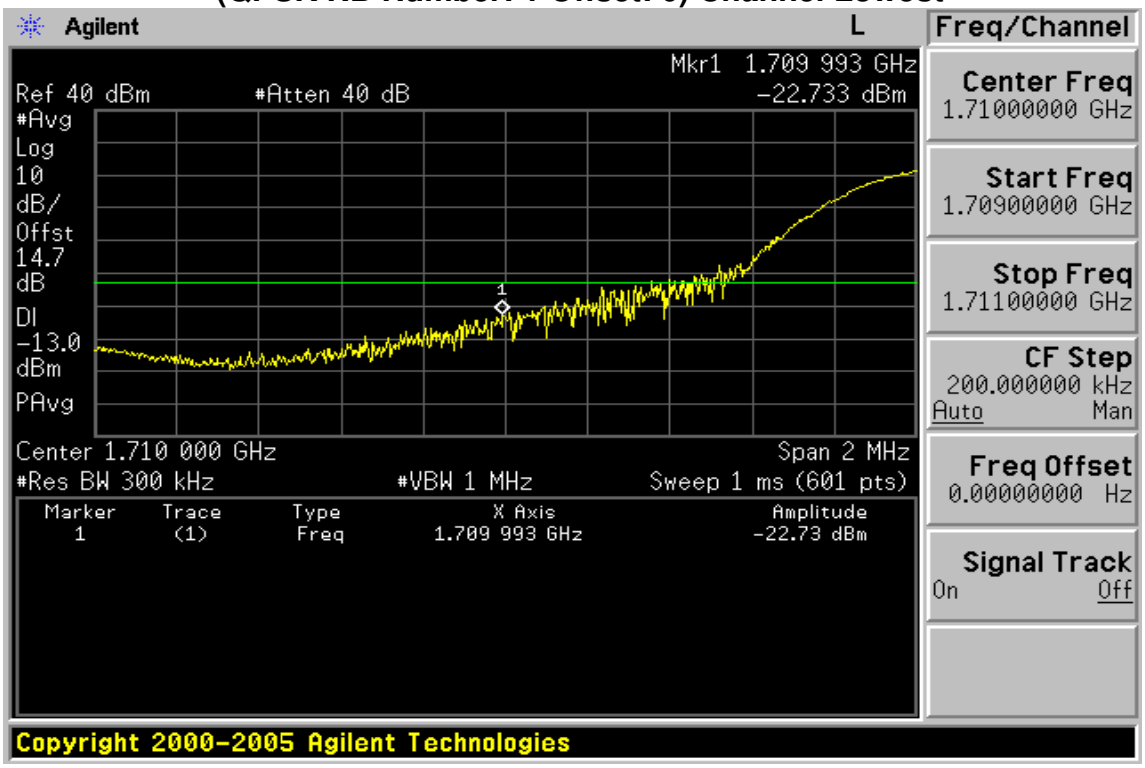


Out of Band emission at antenna terminals–20MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest

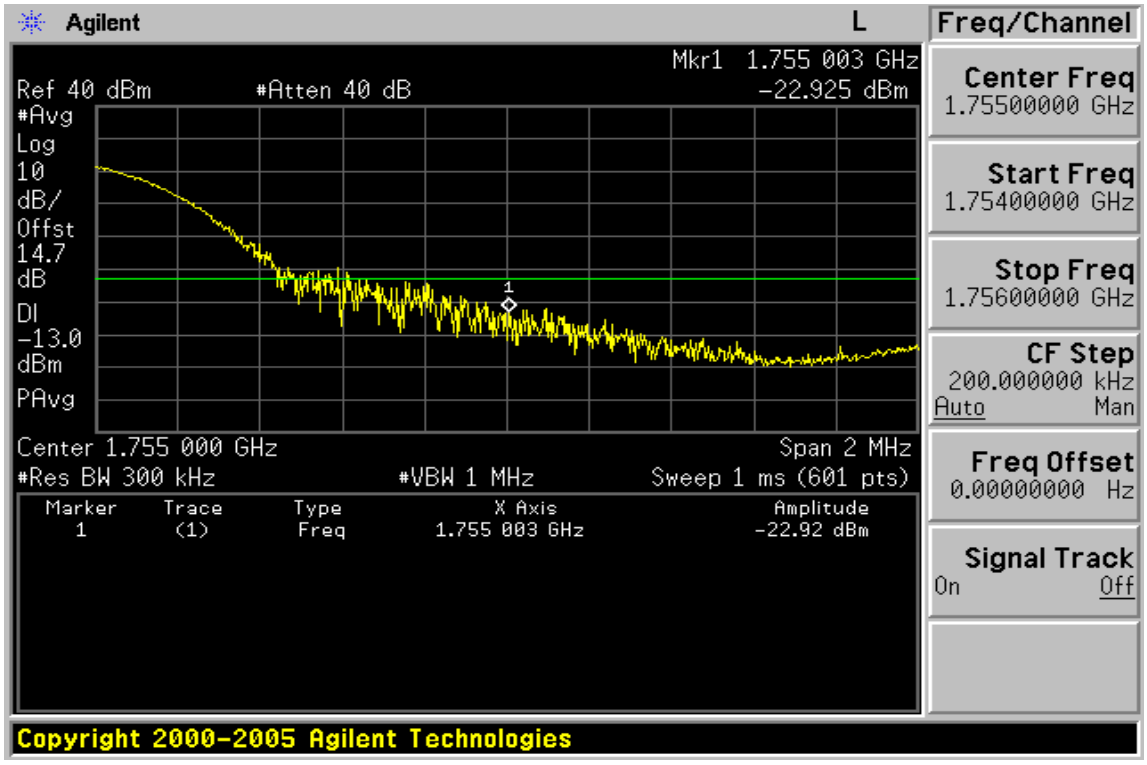




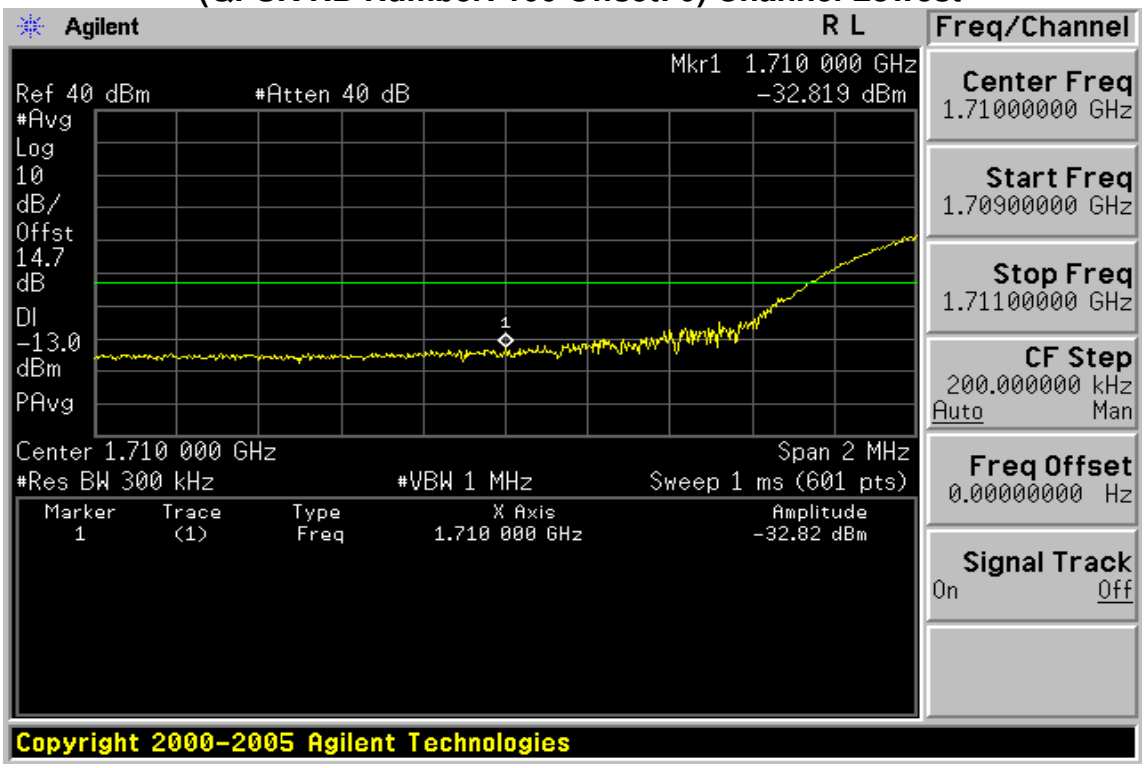
Band edge emission at antenna terminals –20MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 0) Channel Lowest



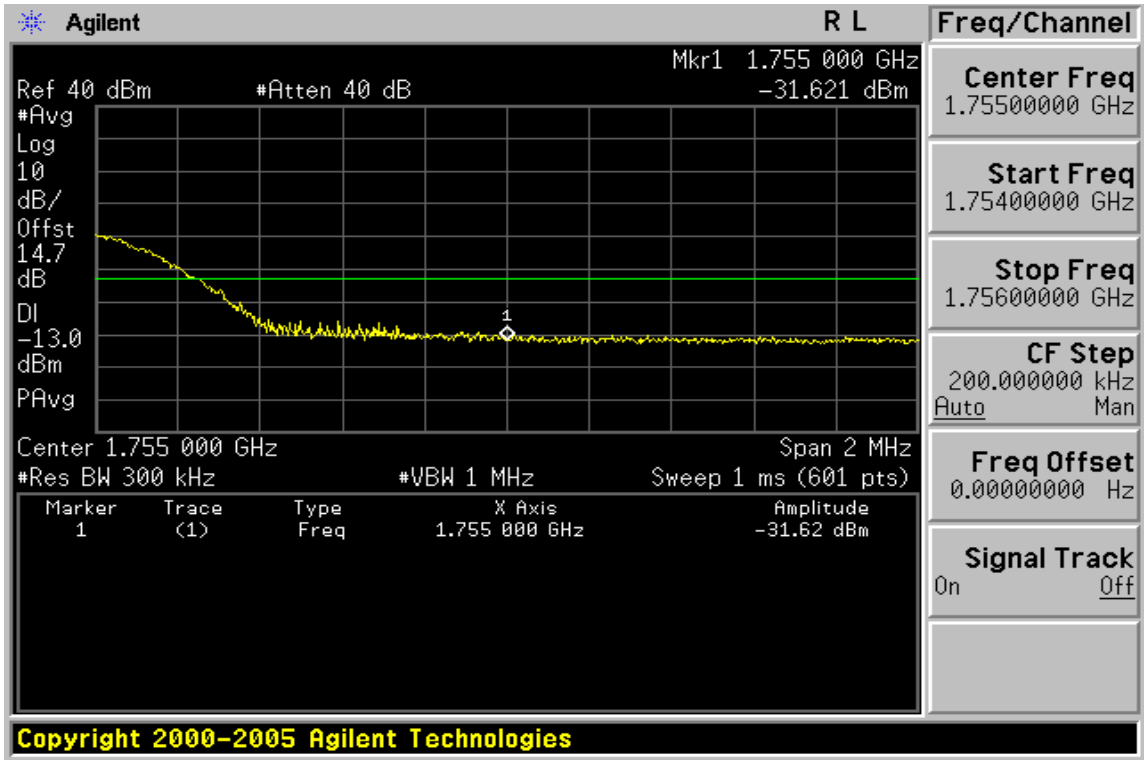
Band edge emission at antenna terminals –20MHz BW LTE-Band 4
(QPSK RB Number: 1 Offset: 99) Channel Highest



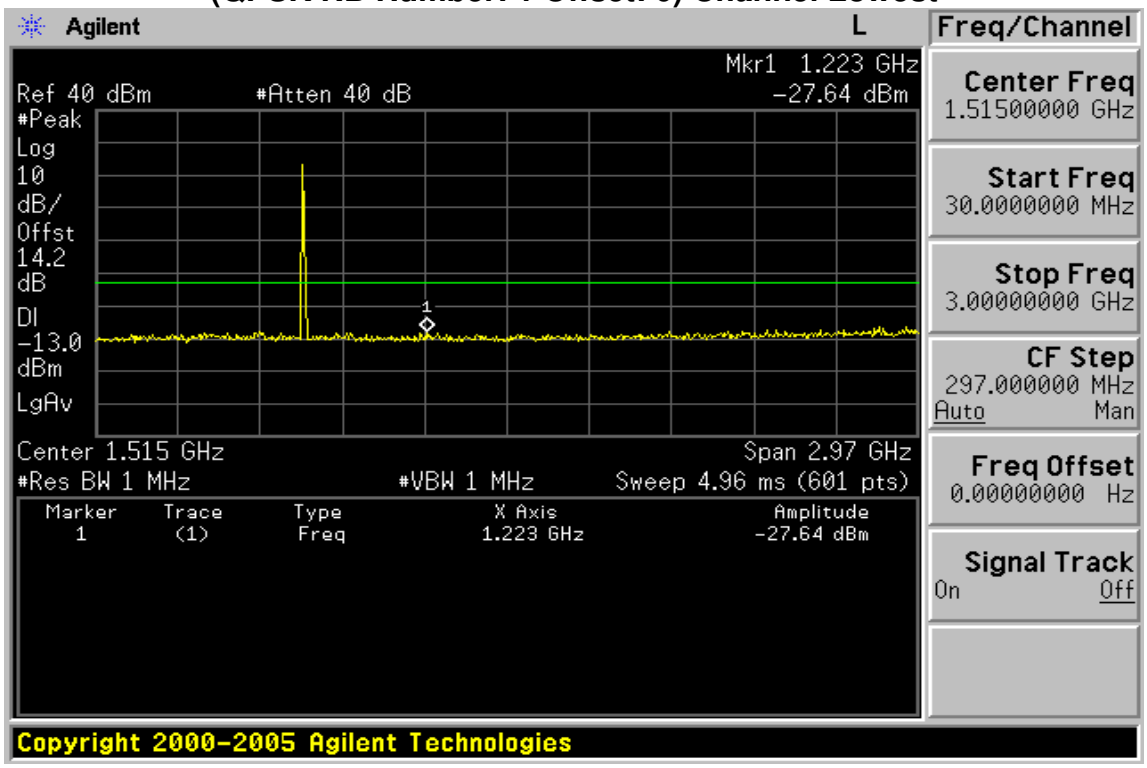
Band edge emission at antenna terminals –20MHz BW LTE-Band 4 (QPSK RB Number: 100 Offset: 0) Channel Lowest

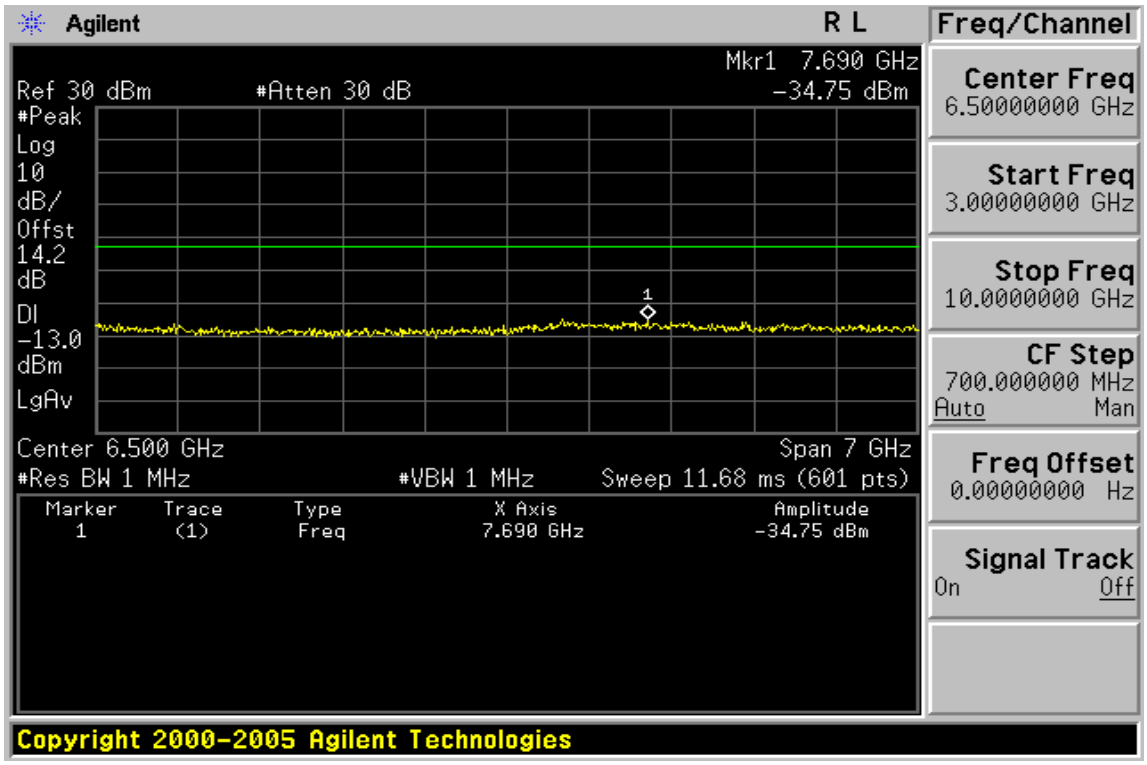


Band edge emission at antenna terminals –20MHz BW LTE-Band 4 (QPSK RB Number: 100 Offset: 0) Channel Highest

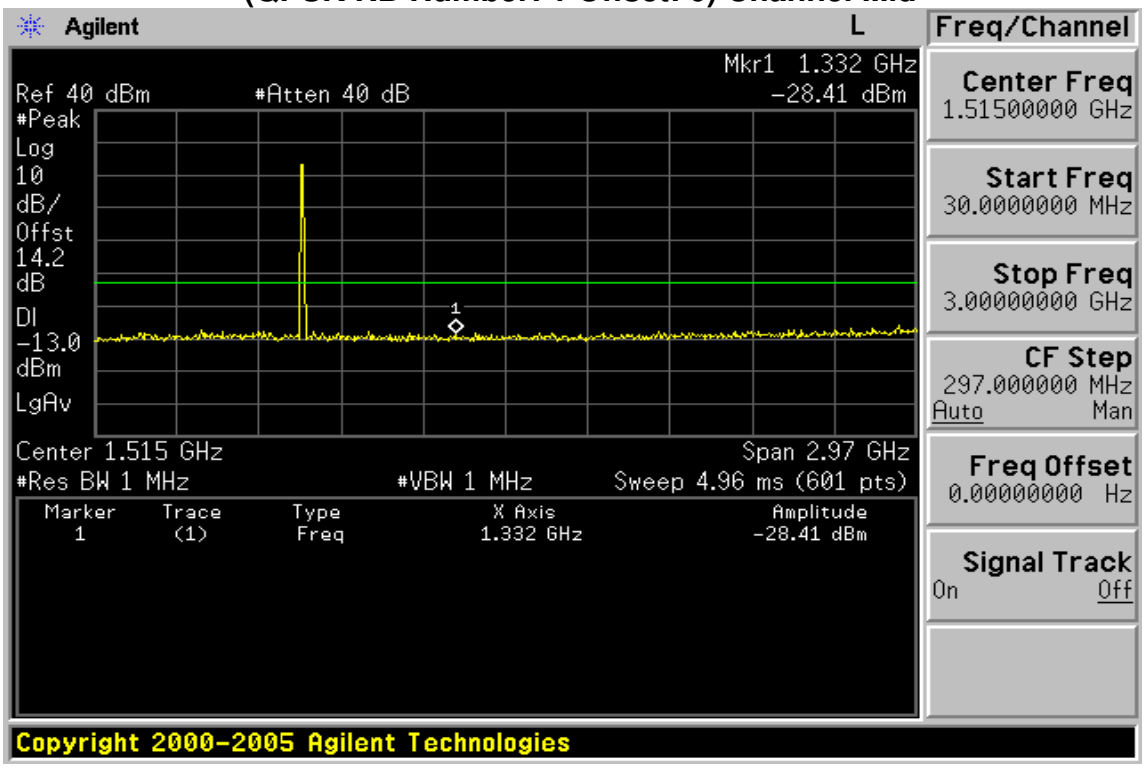


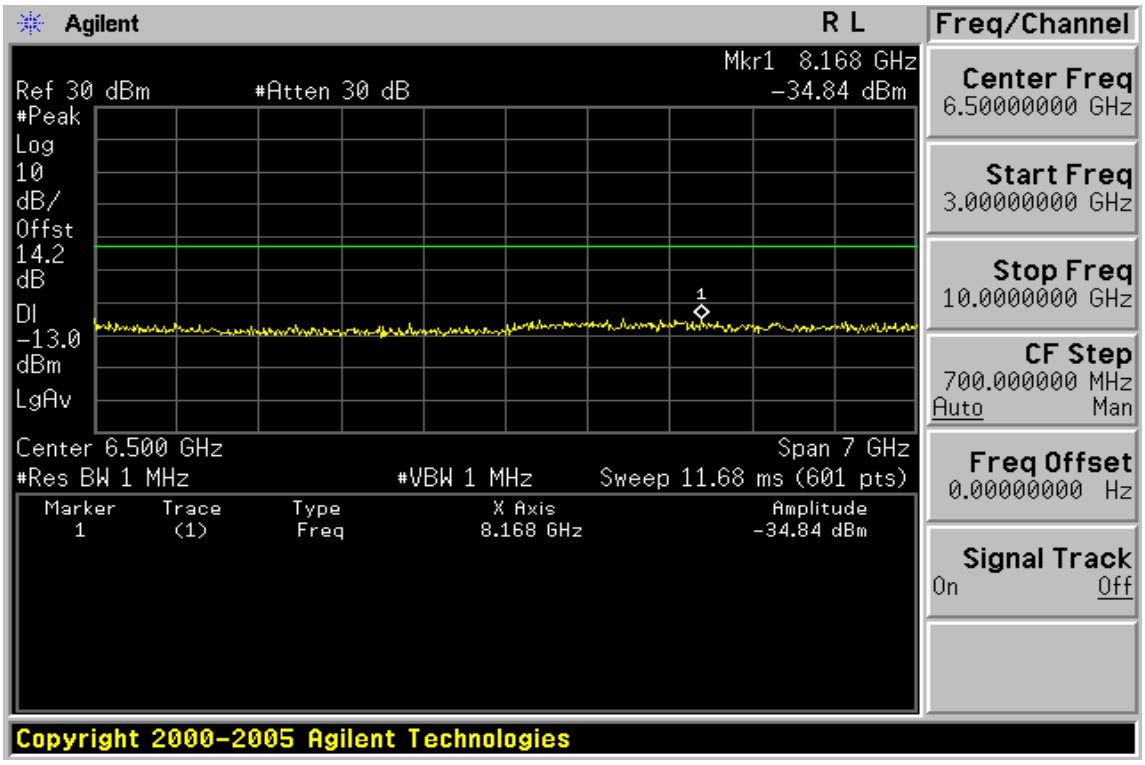
Out of Band emission at antenna terminals–5MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Lowest



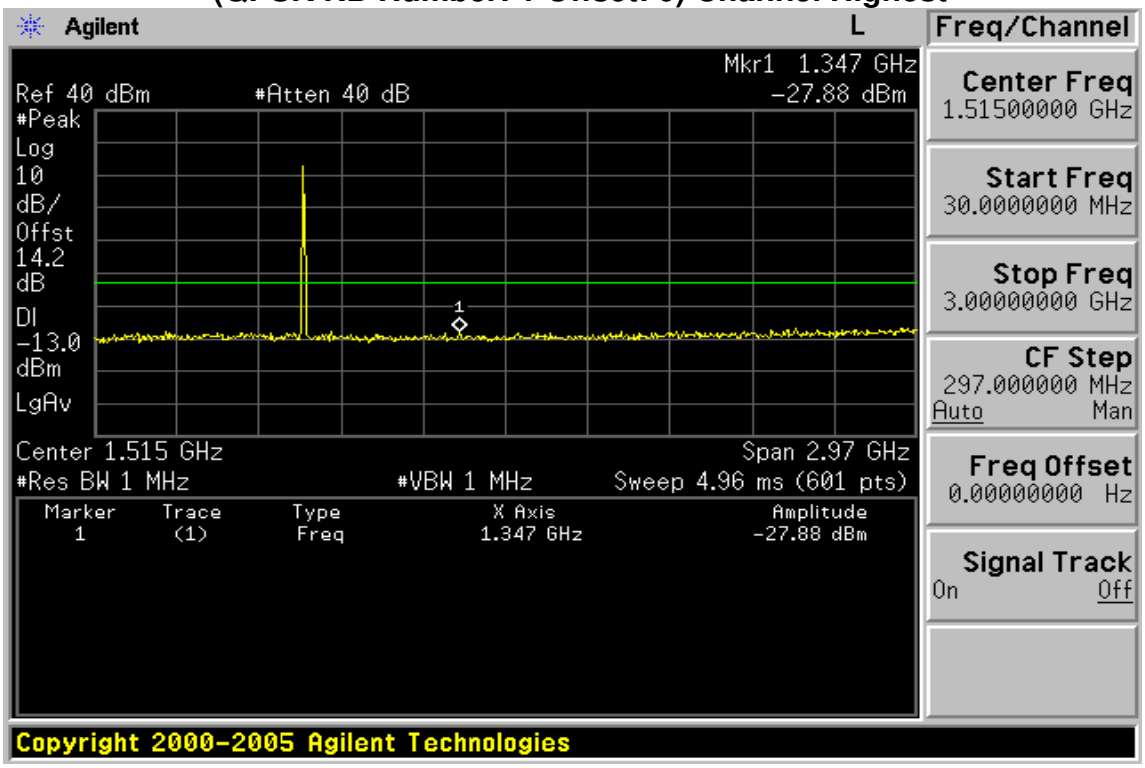


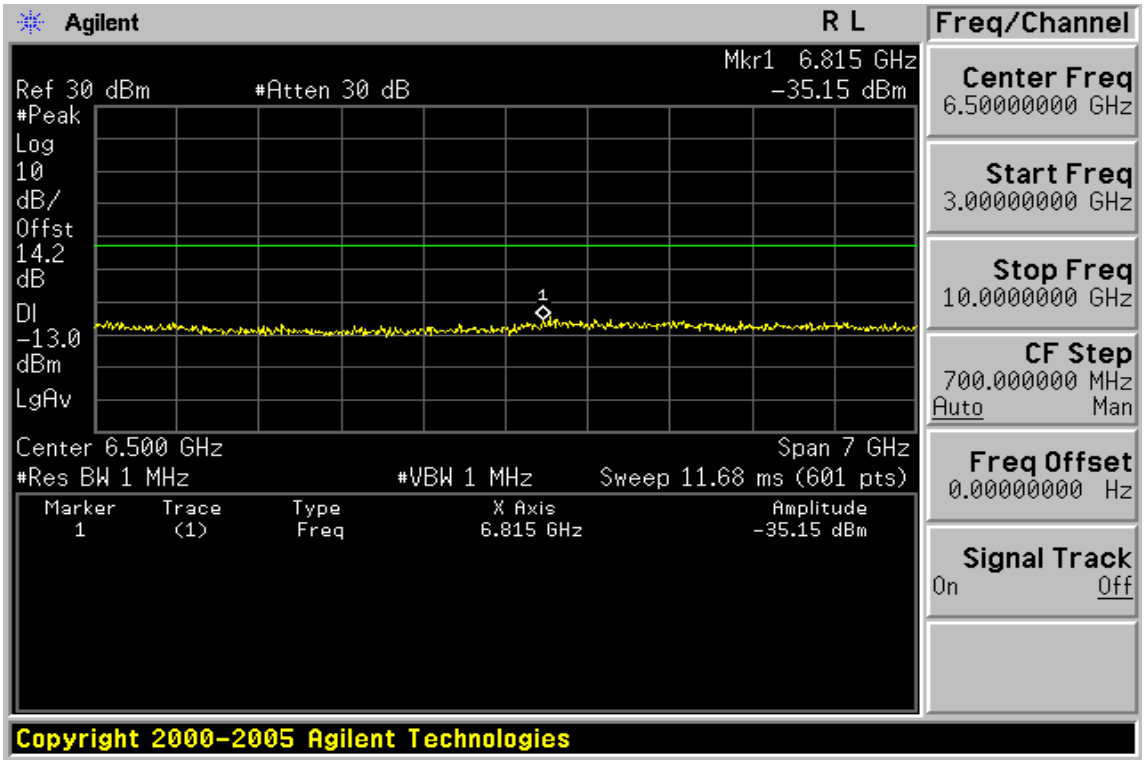
Out of Band emission at antenna terminals –5MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Mid



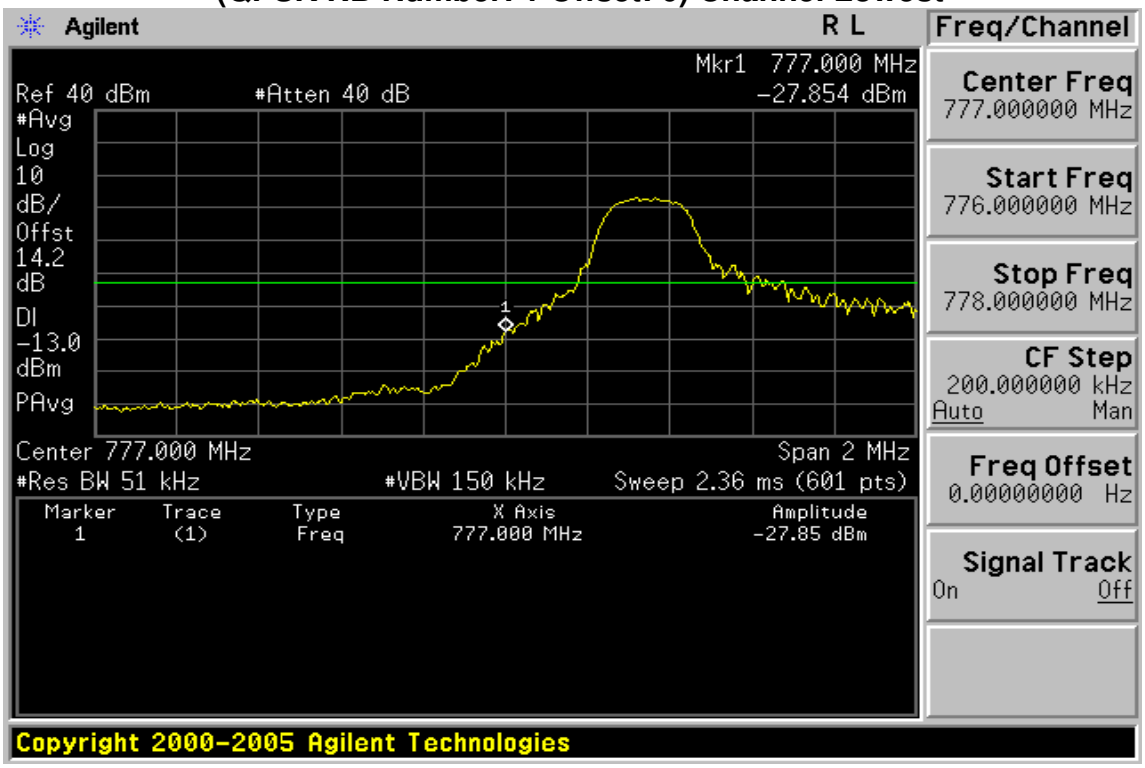


Out of Band emission at antenna terminals–5MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Highest

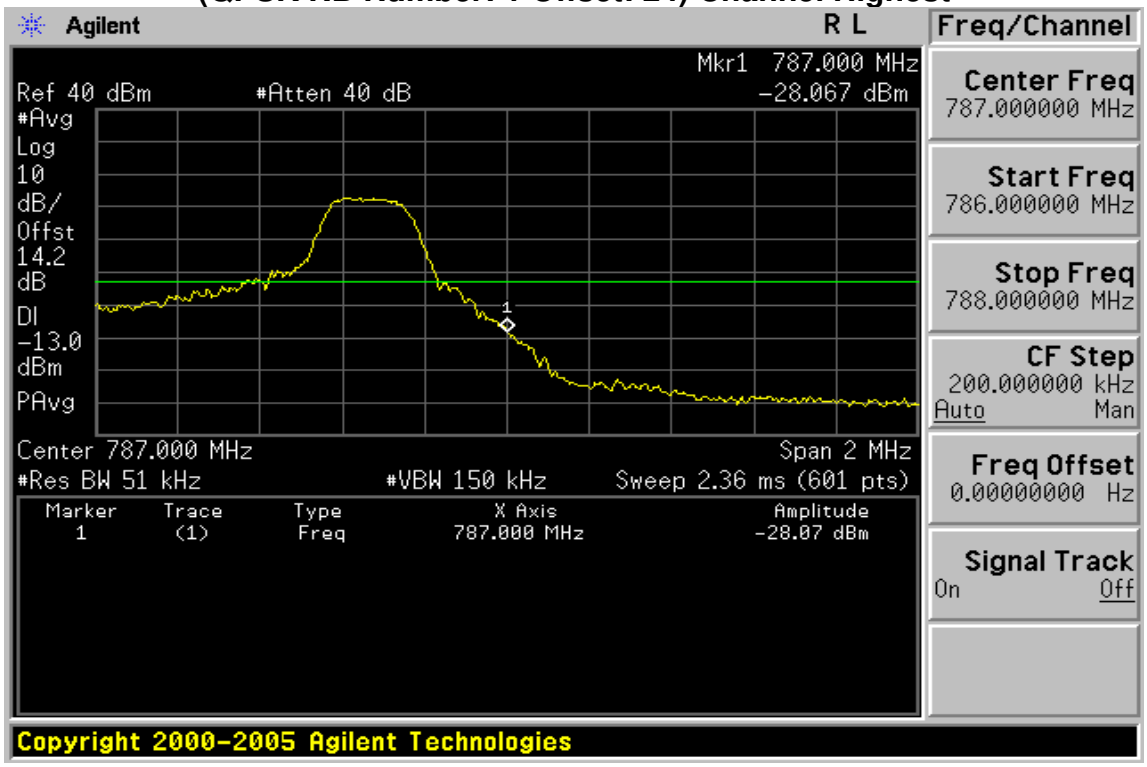




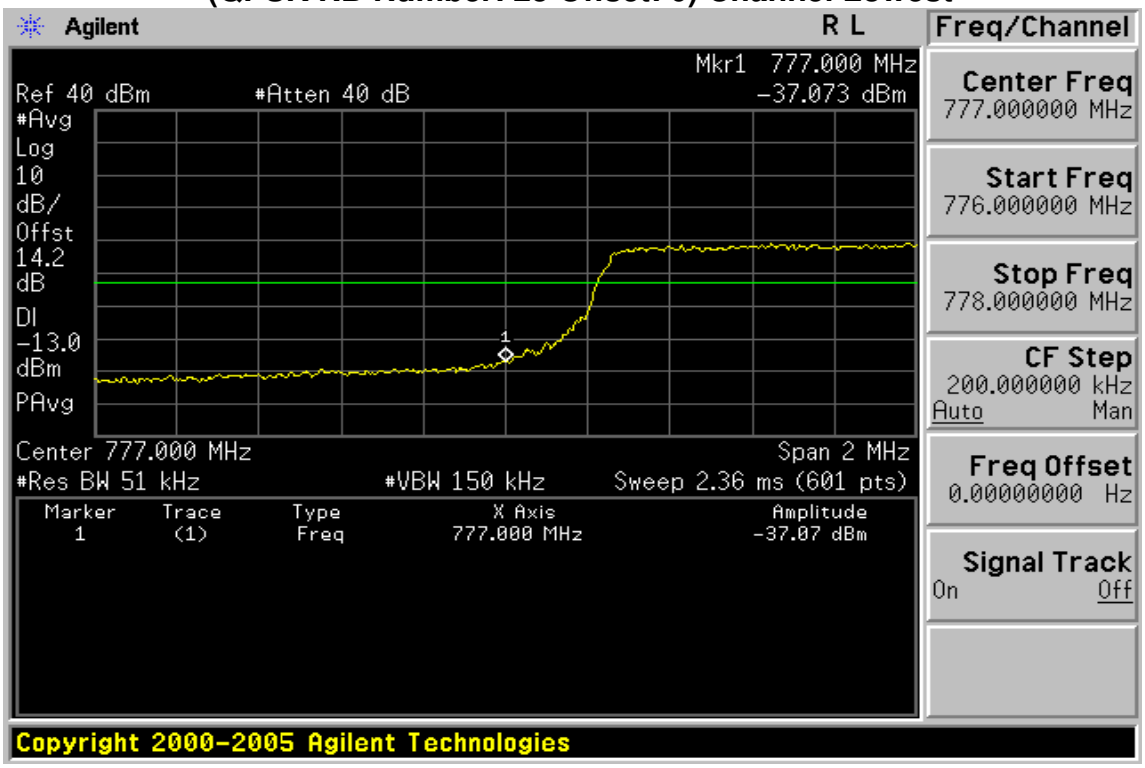
Band edge emission at antenna terminals –5MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Lowest



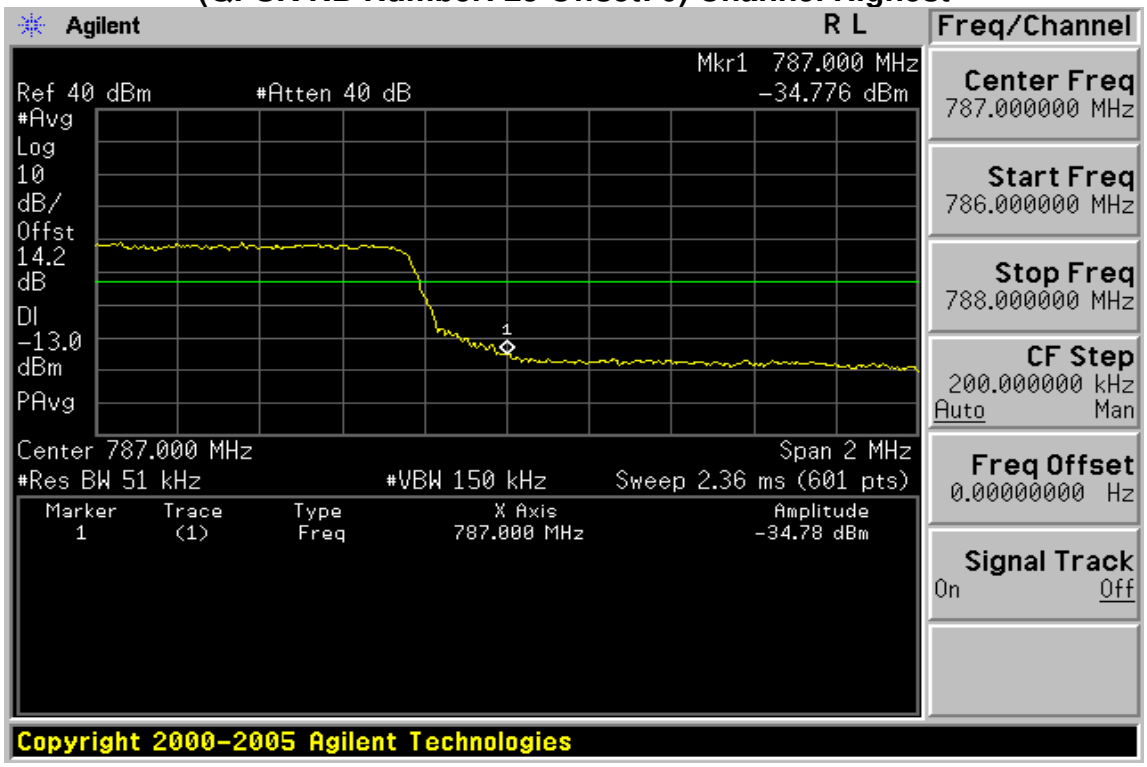
Band edge emission at antenna terminals –5MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 24) Channel Highest



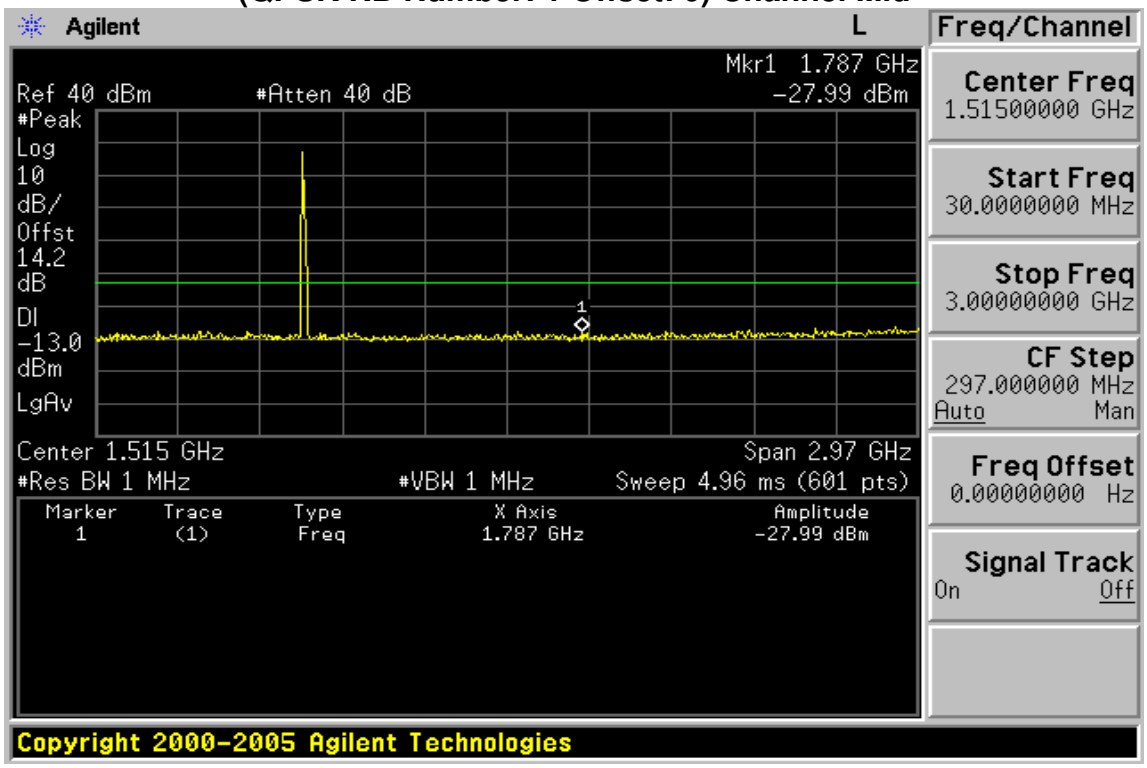
Band edge emission at antenna terminals –5MHz BW LTE-Band 13 (QPSK RB Number: 25 Offset: 0) Channel Lowest

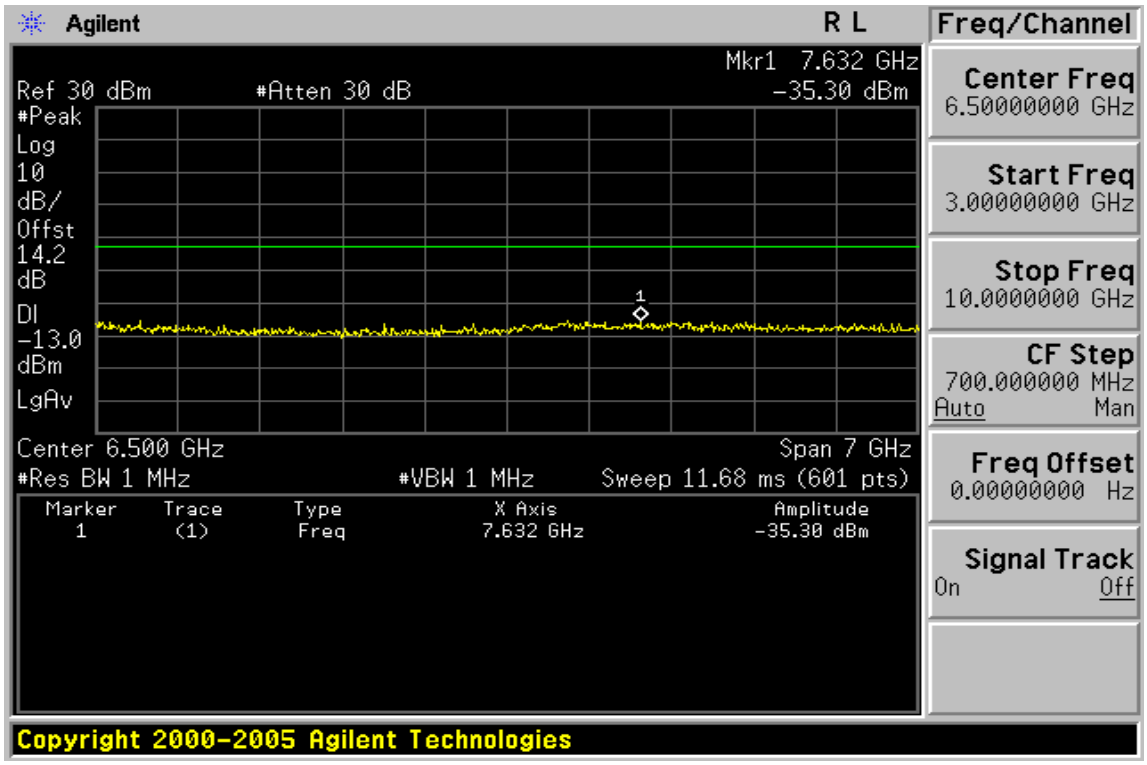


Band edge emission at antenna terminals –5MHz BW LTE-Band 13 (QPSK RB Number: 25 Offset: 0) Channel Highest

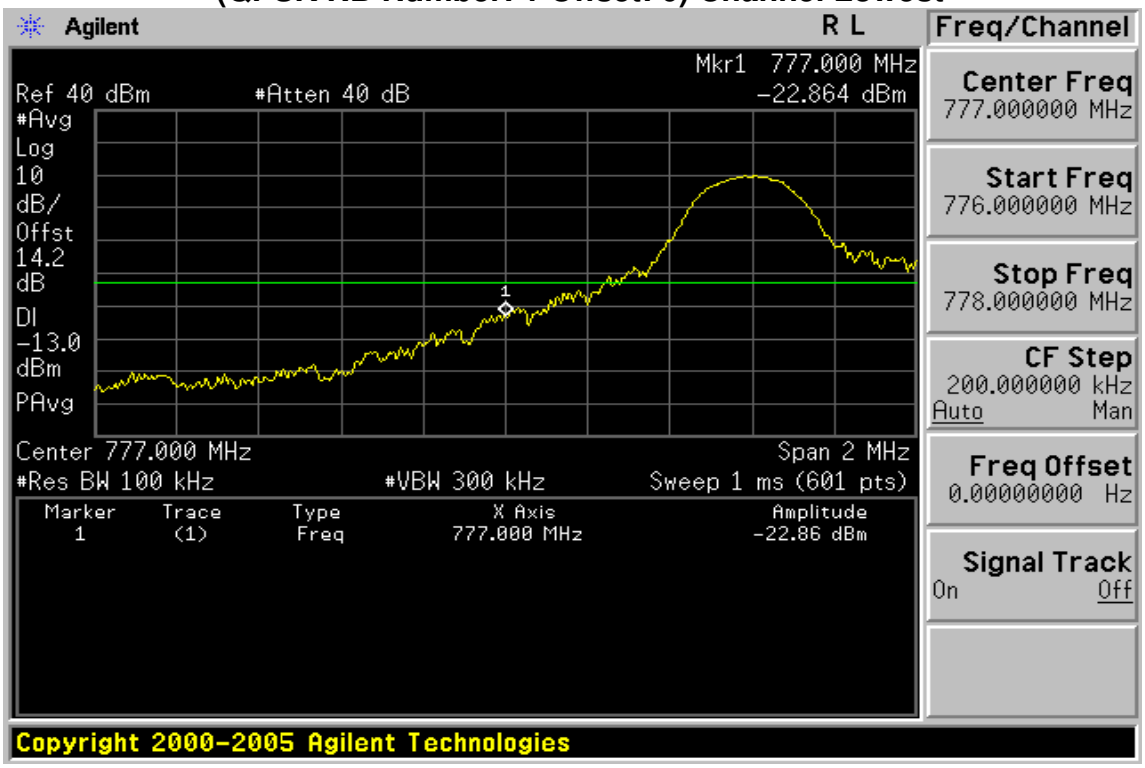


Out of Band emission at antenna terminals–10MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Mid



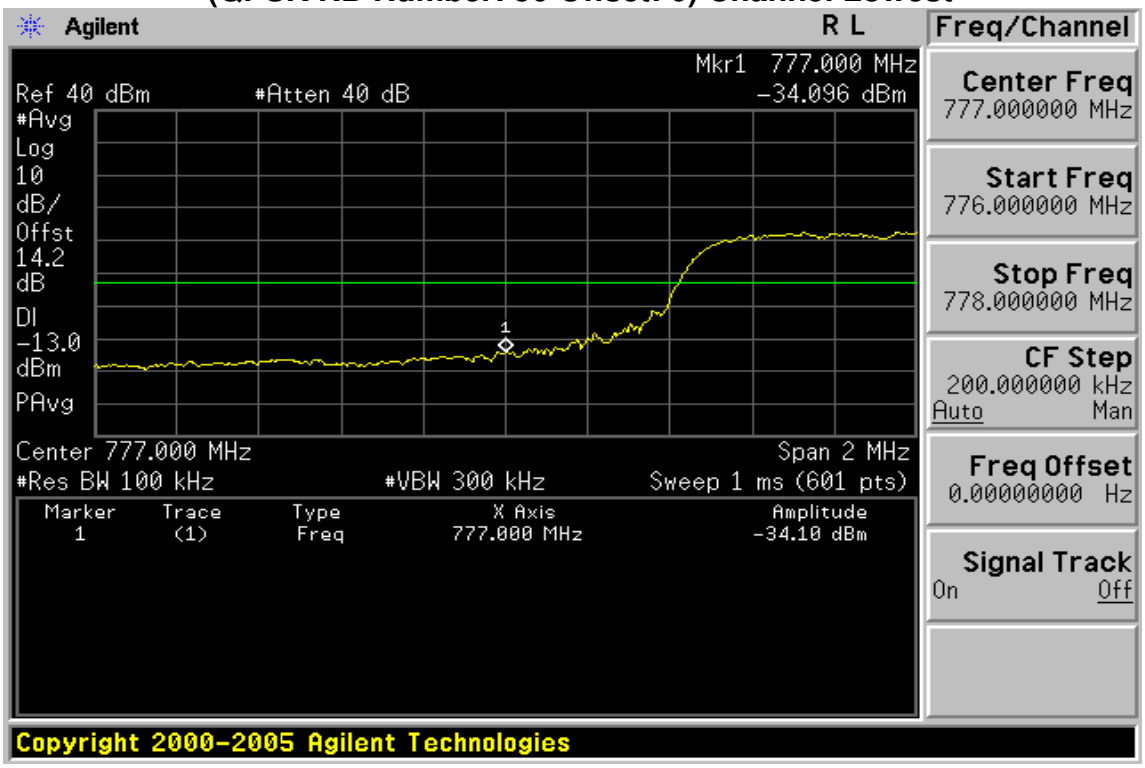


Band edge emission at antenna terminals –10MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Lowest



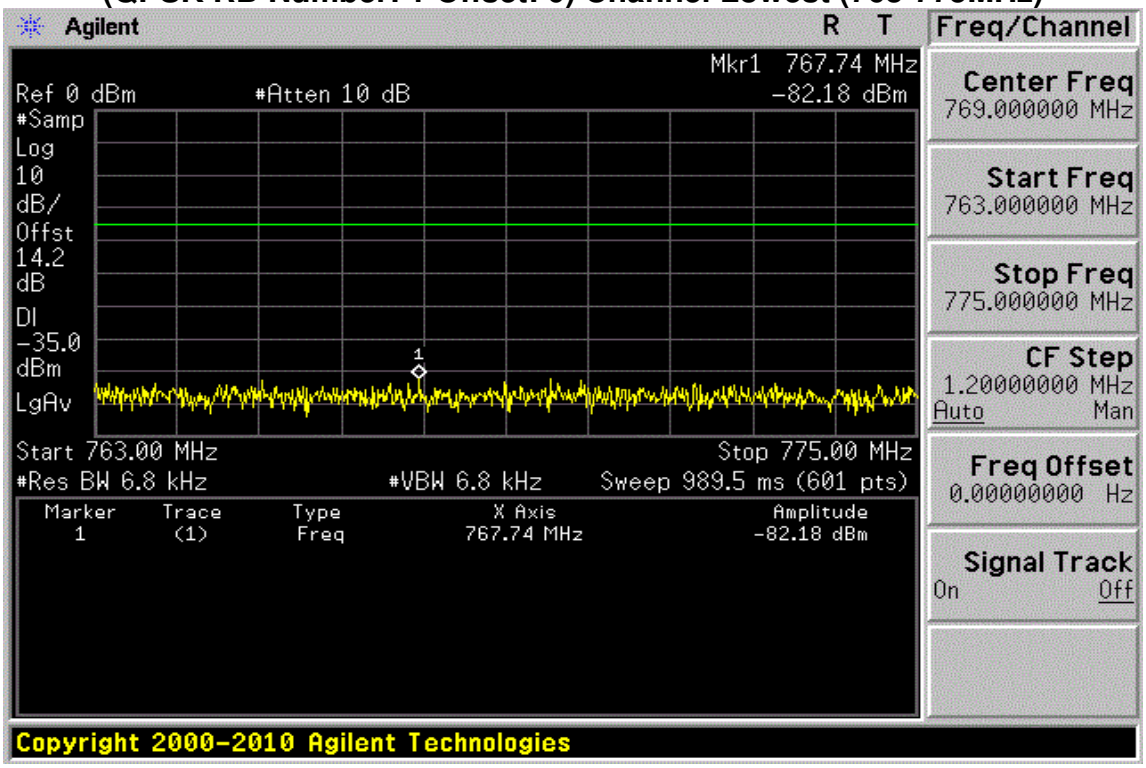
Band edge emission at antenna terminals –10MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 49) Channel Highest

Band edge emission at antenna terminals –10MHz BW LTE-Band 13 (QPSK RB Number: 50 Offset: 0) Channel Lowest

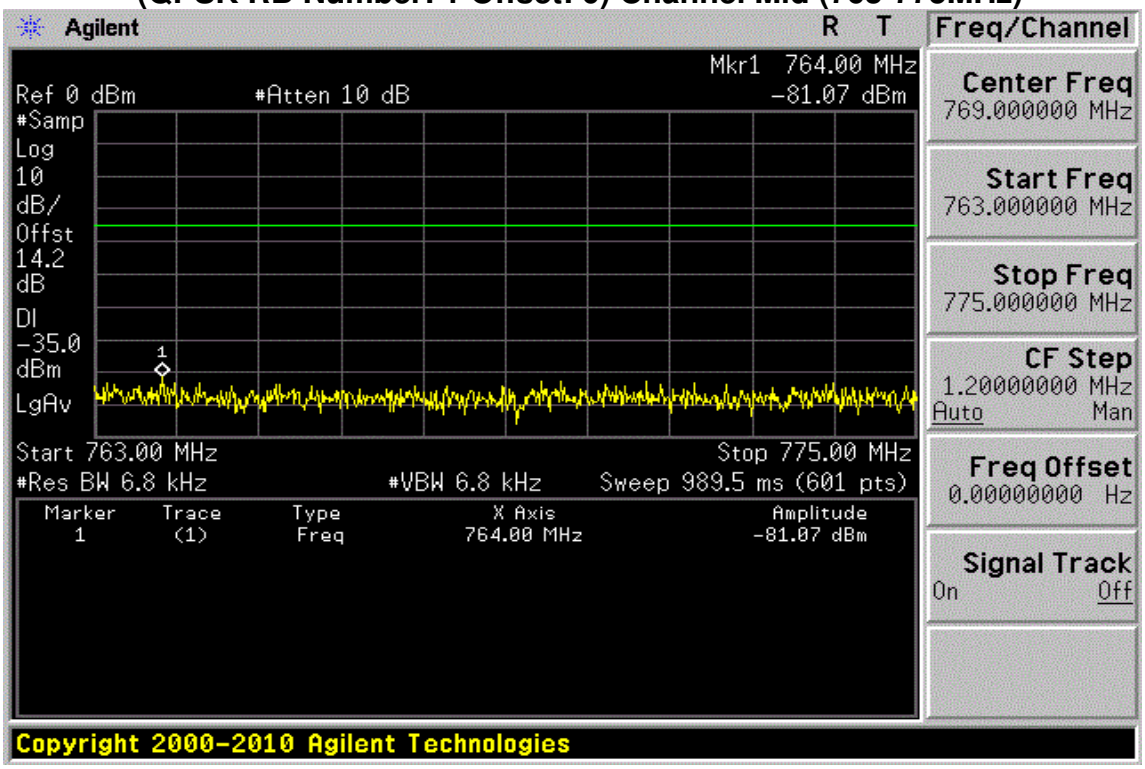


Band edge emission at antenna terminals –10MHz BW LTE-Band 13 (QPSK RB Number: 50 Offset: 0) Channel Highest

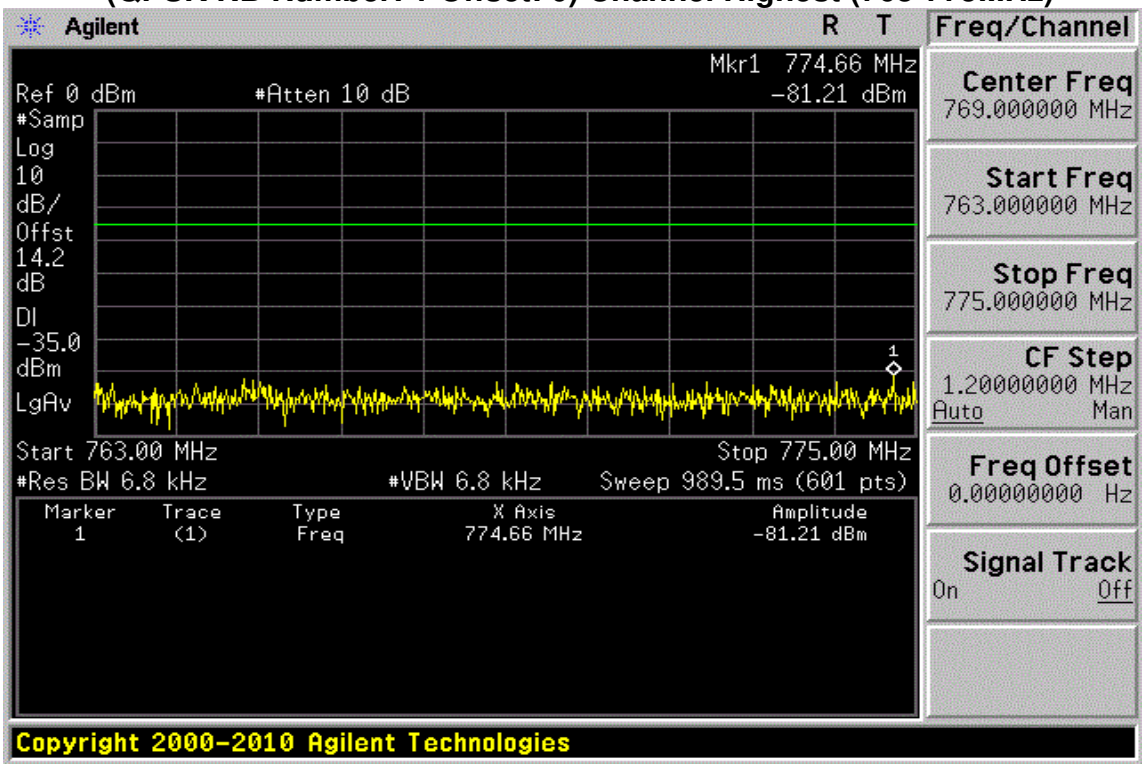
Out of Band emission at antenna terminals–5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Lowest (763-775MHz)



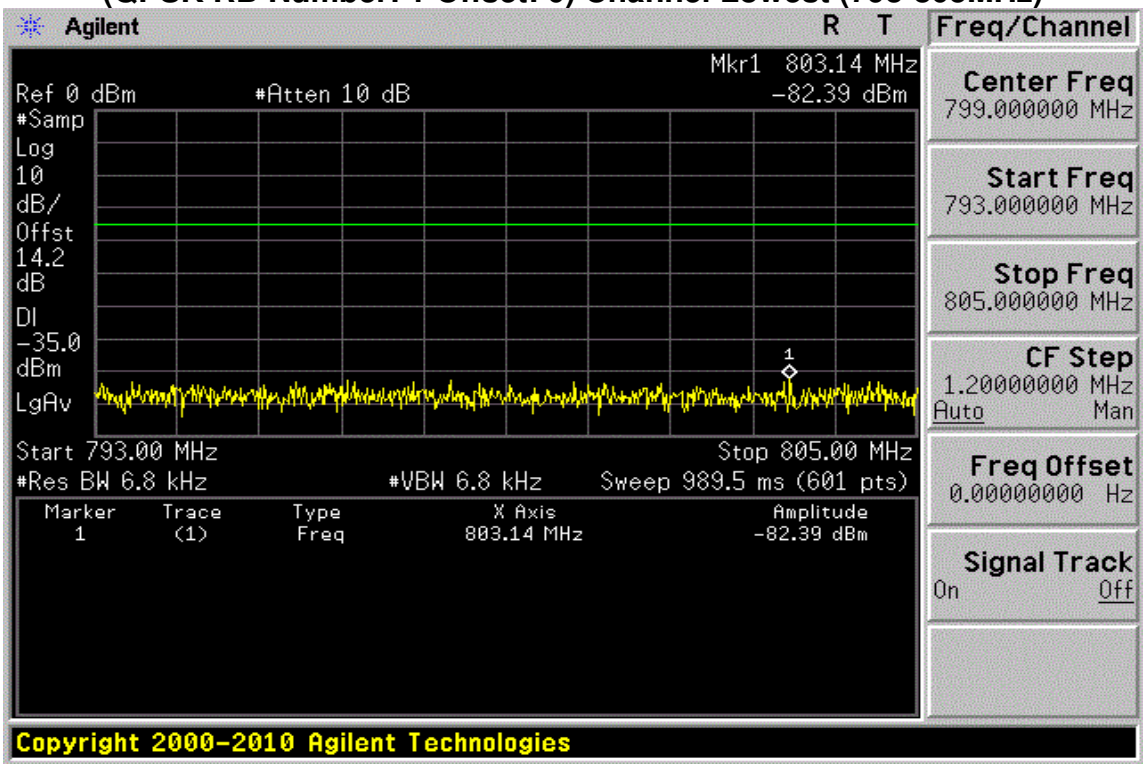
Out of Band emission at antenna terminals –5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Mid (763-775MHz)



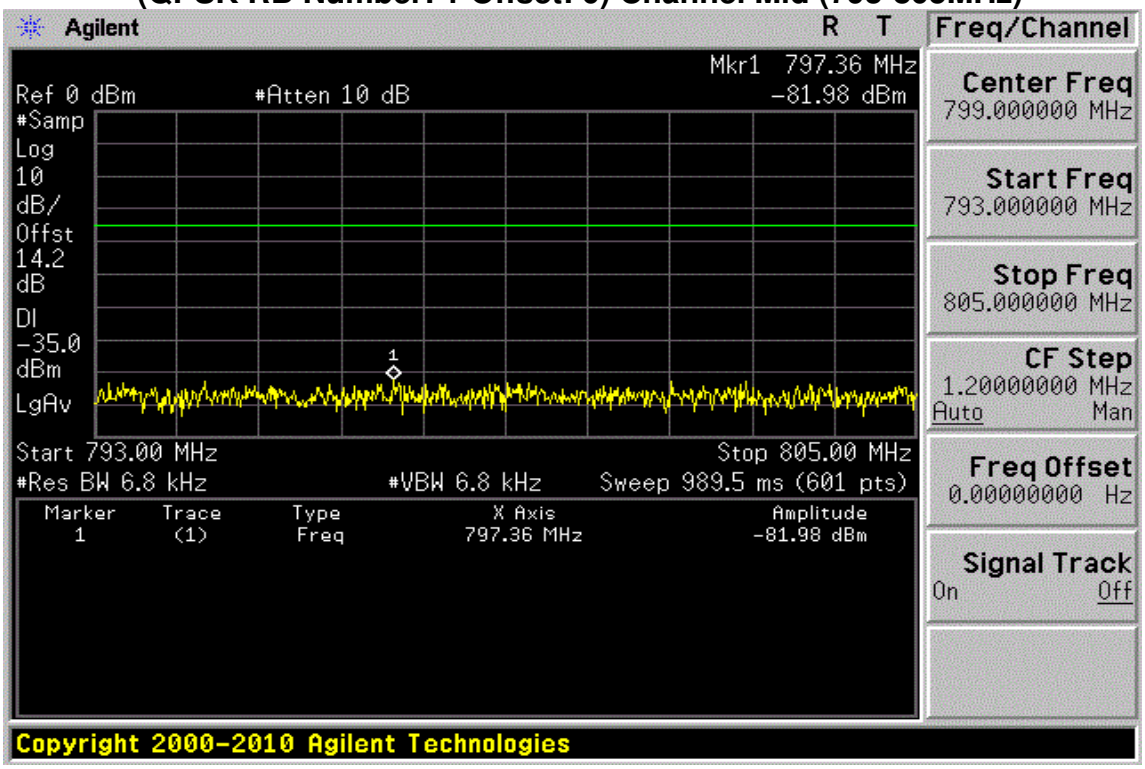
Out of Band emission at antenna terminals–5MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Highest (763-775MHz)



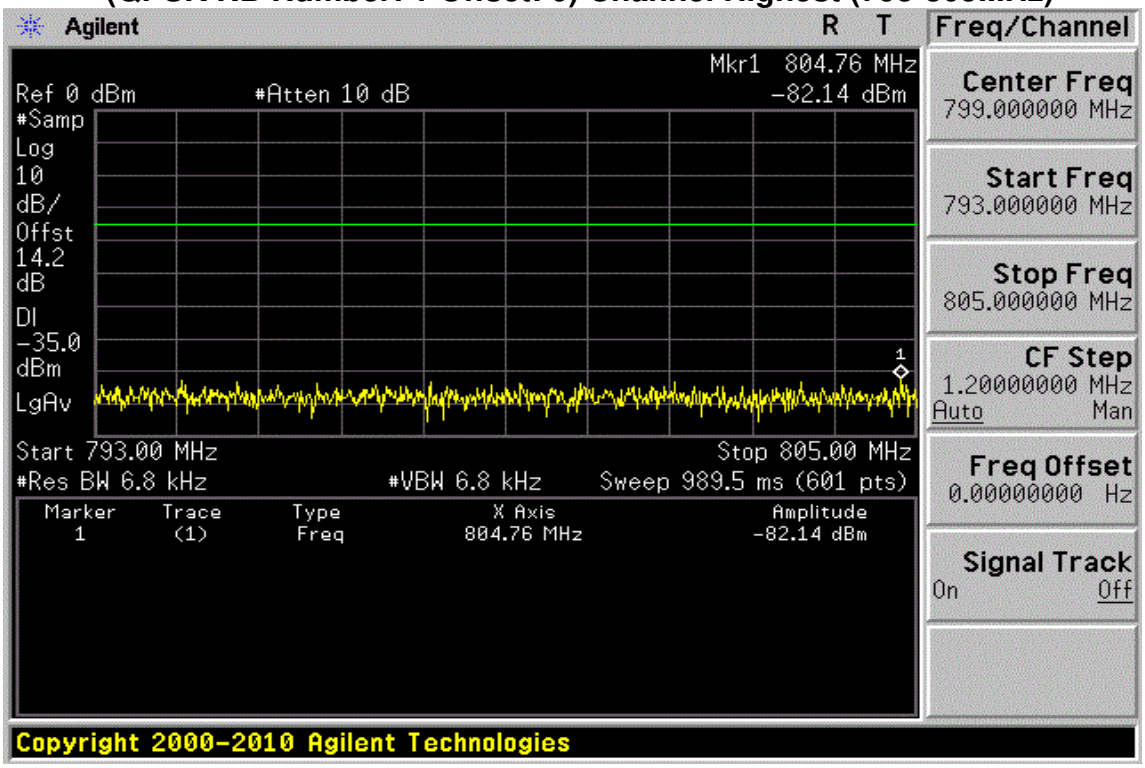
Out of Band emission at antenna terminals–5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Lowest (793-805MHz)



Out of Band emission at antenna terminals –5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Mid (793-805MHz)



Out of Band emission at antenna terminals–5MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Highest (793-805MHz)



10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

10.1. Standard Applicable

According to FCC §2.1053,

FCC §27.53(h), §24.238(a), §27.53(c)(2) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

FCC §27.53(c) (4)

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following:

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

Band Edge Measurement:

FCC §27.53(c) (5)

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.

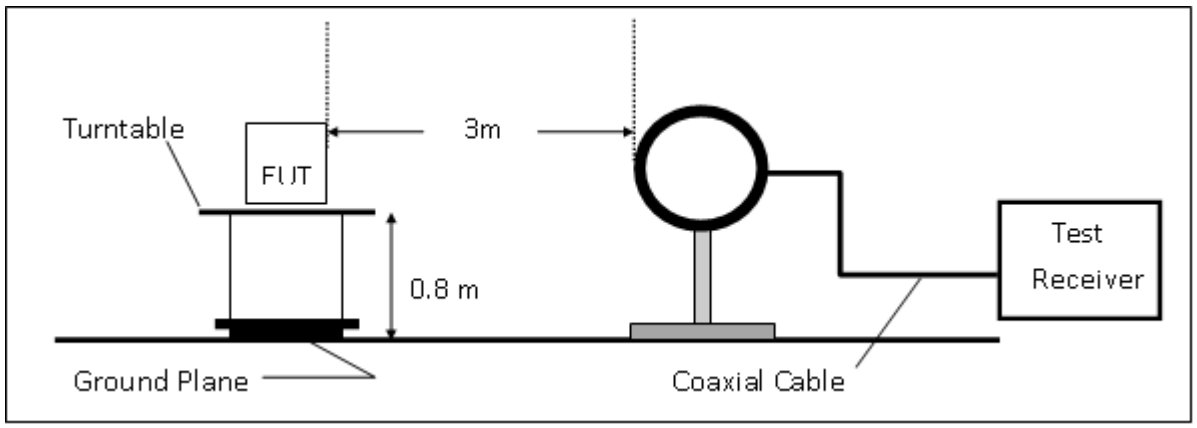
FCC §27.53(h)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

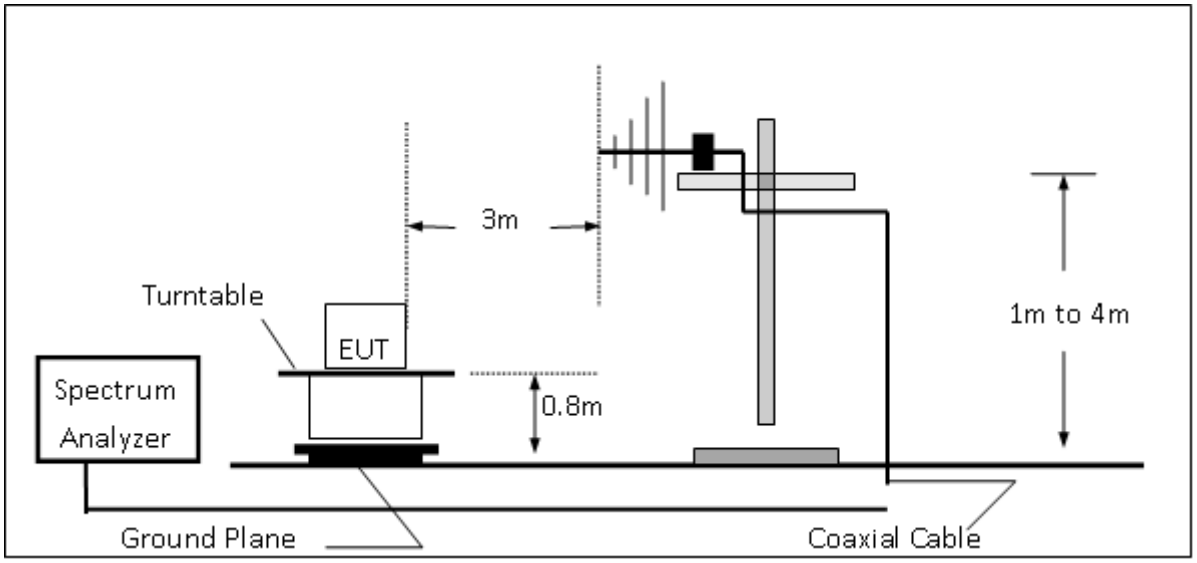
FCC §27.53 (f)

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.EUT Setup

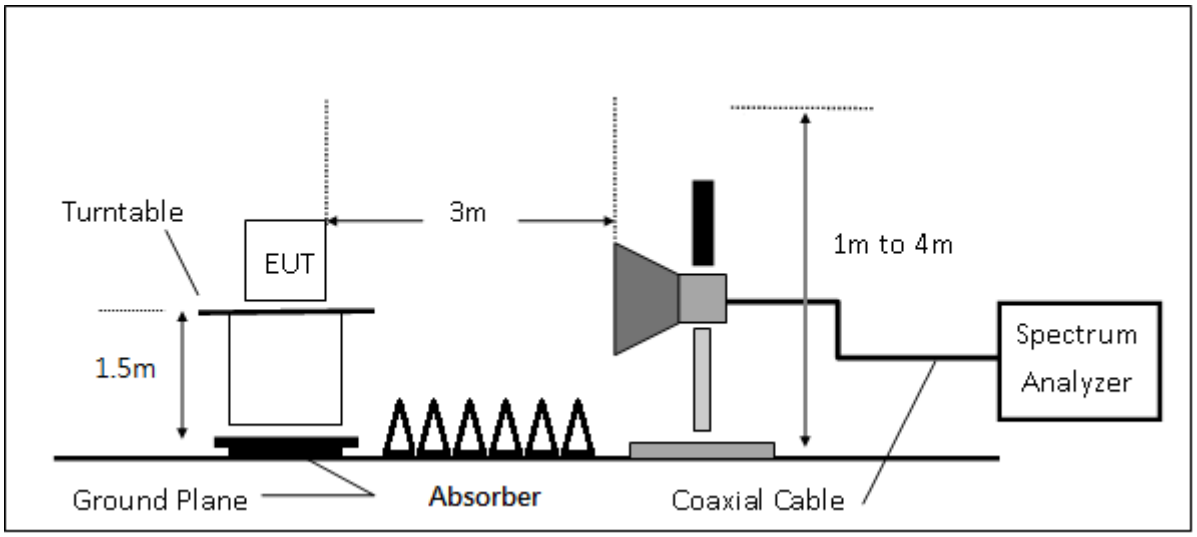
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



10.2. Measurement 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 frequencies (low, middle and high channels). Once spurious emission was 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= SG Level (dBm) + Antenna Gain (dBd) + Cable Loss (dB)

EIRP = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.
“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.
“---“ : denotes Noise Floor.

10.3. Measurement Equipment Used:

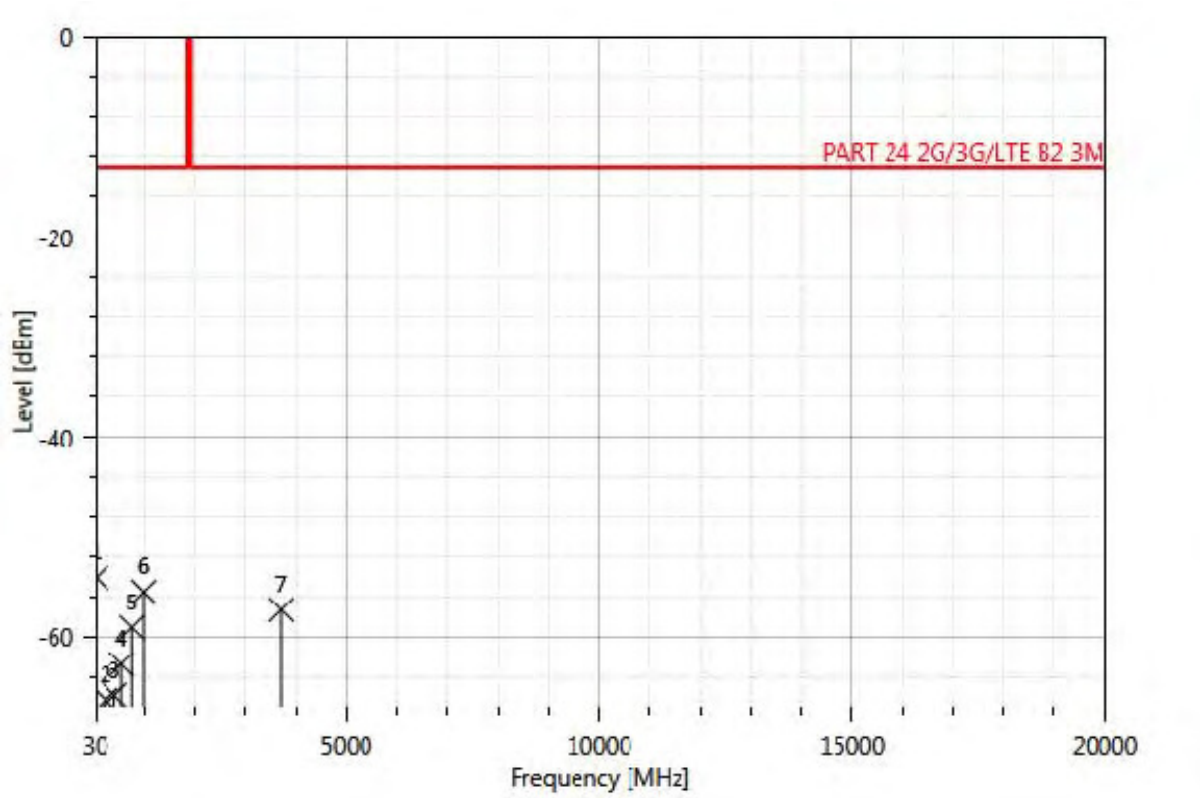
SGS SAC-III					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Bi-log Antenna	SCHWAZBECK	VULB9160	9160-3158	10/26/2015	10/25/2016
Bi-log Antenna	SCHWAZBECK	VULB9168	300	12/12/2015	12/11/2016
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2015	12/11/2016
Horn Antenna	Schwarzbeck	BBHA9170	185	07/25/2015	07/24/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	09/25/2015	09/24/2016
Pre-Amplifier	HP	8447F	3113A06892	01/02/2016	01/01/2017
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017
Filter 800-1000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
Filter 1800-2000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	01/02/2016	01/01/2017
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	3	01/02/2016	01/01/2017
Low Loss Cable	Huber Suhner	966 TX	1	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
3m Site NSA	SGS	966 chamber	N/A	07/02/2015	07/01/2016

10.4. Measurement Result:

Radiated Spurious Emission Measurement Result: 15MHz BW LTE-Band 2 (The Worst Case)

LTE Band 2: 16 QAM BW 15 RB 1,0

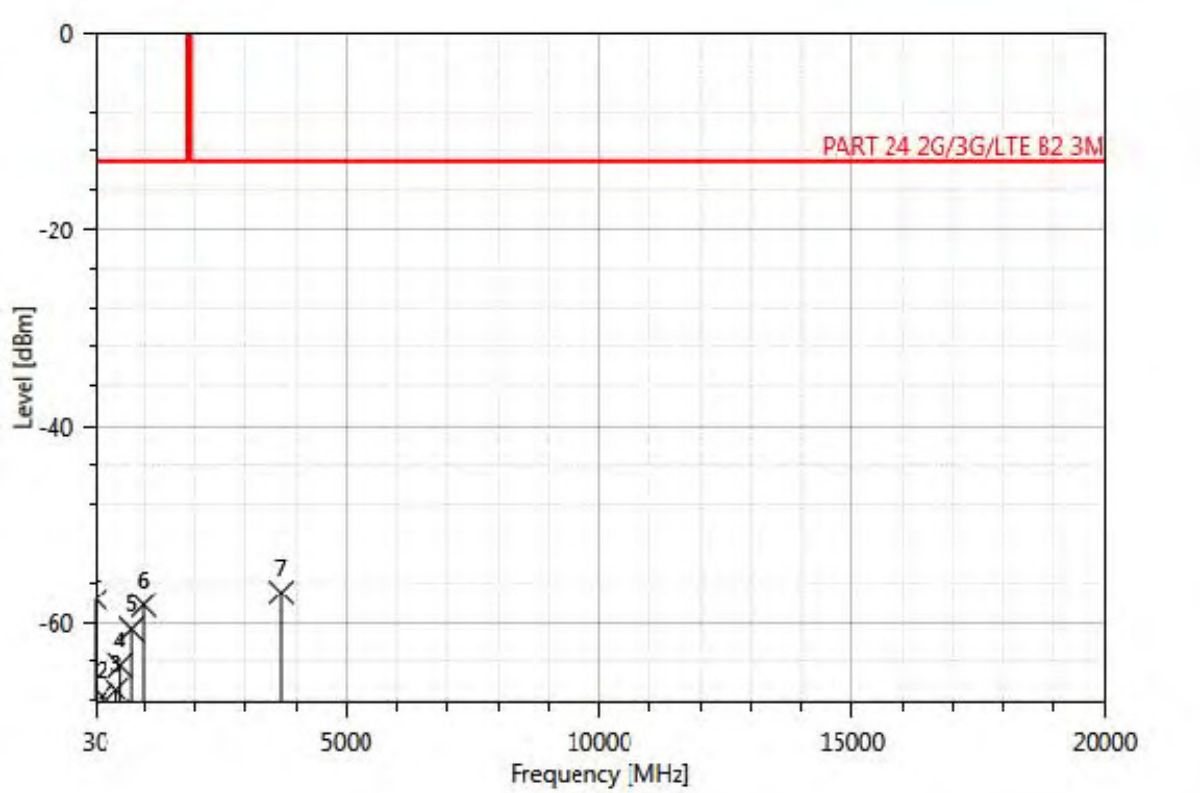
Operation Mode :	LTE B2	Test Date :	03/29/2016 21:09:34
Fundamental Frequency :	1857 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
47.46	S	-54.06	-43.34	-9.69	-1.03	-13.00	-41.06
234.67	S	-66.25	-69.86	5.34	-1.73	-13.00	-53.25
409.27	S	-65.77	-69.30	5.94	-2.40	-13.00	-52.77
548.95	S	-62.69	-65.74	5.74	-2.69	-13.00	-49.69
752.65	S	-59.02	-61.30	5.34	-3.06	-13.00	-46.02
980.60	S	-55.47	-58.08	5.81	-3.20	-13.00	-42.47
3714.00	H	-57.27	-63.13	12.44	-6.58	-13.00	-44.27

LTE Band 2: 16 QAM BW 15 RB 1,0

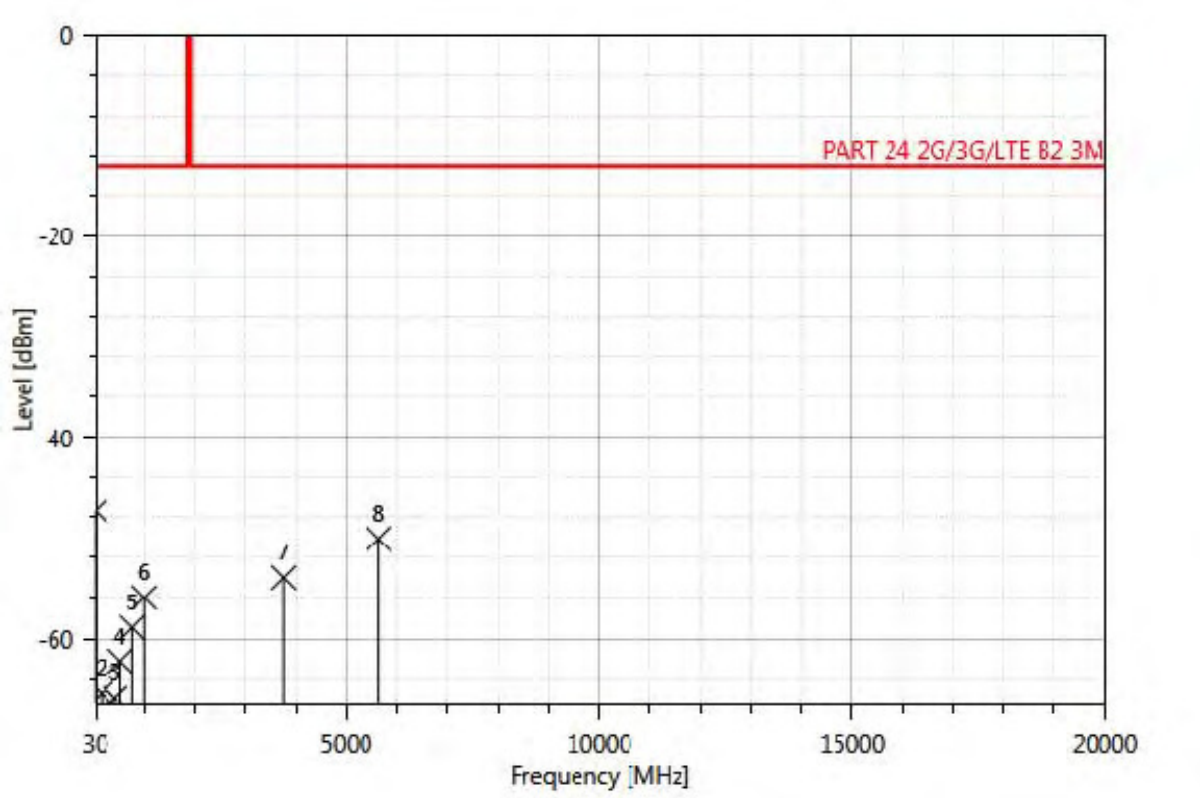
Operation Mode :	LTE B2	Test Date :	03/29/2016 21:09:46
Fundamental Frequency :	1857 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
30.97	S	-57.66	-44.31	-12.39	-0.96	-13.00	-44.66
155.13	S	-67.44	-66.28	0.29	-1.45	-13.00	-54.44
448.07	S	-66.82	-70.44	5.80	-2.19	-13.00	-53.82
527.61	S	-64.40	-67.79	5.86	-2.47	-13.00	-51.40
747.80	S	-60.65	-62.88	5.33	-3.09	-13.00	-47.65
978.66	S	-58.23	-60.81	5.77	-3.19	-13.00	-45.23
3714.00	H	-56.96	-62.82	12.44	-6.58	-13.00	-43.96

LTE Band 2: 16 QAM BW 15 RB 1,0

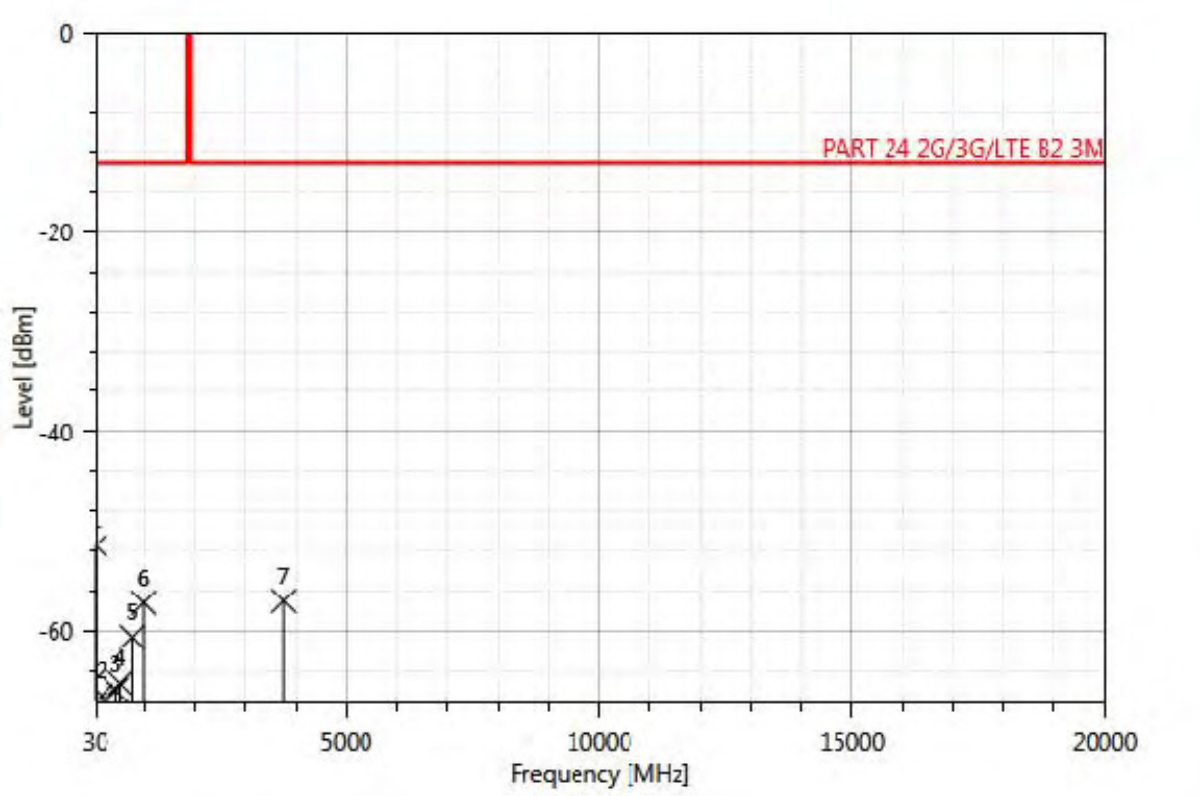
Operation Mode :	LTE B2	Test Date :	03/29/2016 21:09:59
Fundamental Frequency :	1880 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
31.94	S	-47.34	-34.21	-12.16	-0.96	-13.00	-34.34
151.25	S	-65.42	-64.10	0.11	-1.44	-13.00	-52.42
418.97	S	-65.89	-69.45	5.90	-2.34	-13.00	-52.89
521.79	S	-62.36	-65.84	5.89	-2.41	-13.00	-49.36
756.53	S	-58.89	-61.21	5.35	-3.04	-13.00	-45.89
987.39	S	-55.94	-58.67	5.95	-3.23	-13.00	-42.94
3760.00	H	-53.95	-59.80	12.45	-6.60	-13.00	-40.95
5640.00	H	-50.11	-54.64	12.90	-8.36	-13.00	-37.11

LTE Band 2: 16 QAM BW 15 RB 1,0

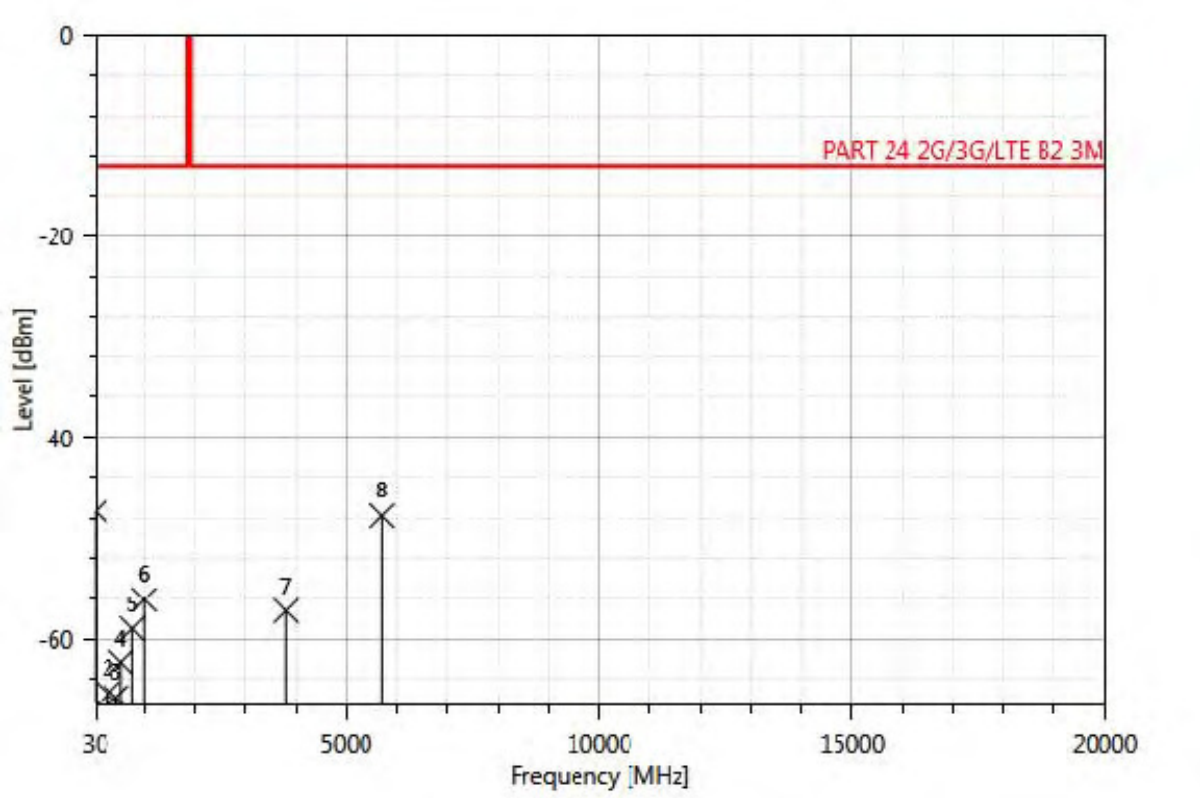
Operation Mode :	LTE B2	Test Date :	03/29/2016 21:10:11
Fundamental Frequency :	1880 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
30.97	S	-51.46	-38.10	-12.39	-0.96	-13.00	-38.46
151.25	S	-66.51	-65.18	0.11	-1.44	-13.00	-53.51
438.37	S	-65.97	-69.58	5.83	-2.22	-13.00	-52.97
525.67	S	-65.25	-68.67	5.87	-2.45	-13.00	-52.25
760.41	S	-60.63	-62.99	5.37	-3.01	-13.00	-47.63
977.69	S	-57.21	-59.77	5.75	-3.19	-13.00	-44.21
3760.00	H	-57.02	-62.87	12.45	-6.60	-13.00	-44.02

LTE Band 2: 16 QAM BW 15 RB 1,0

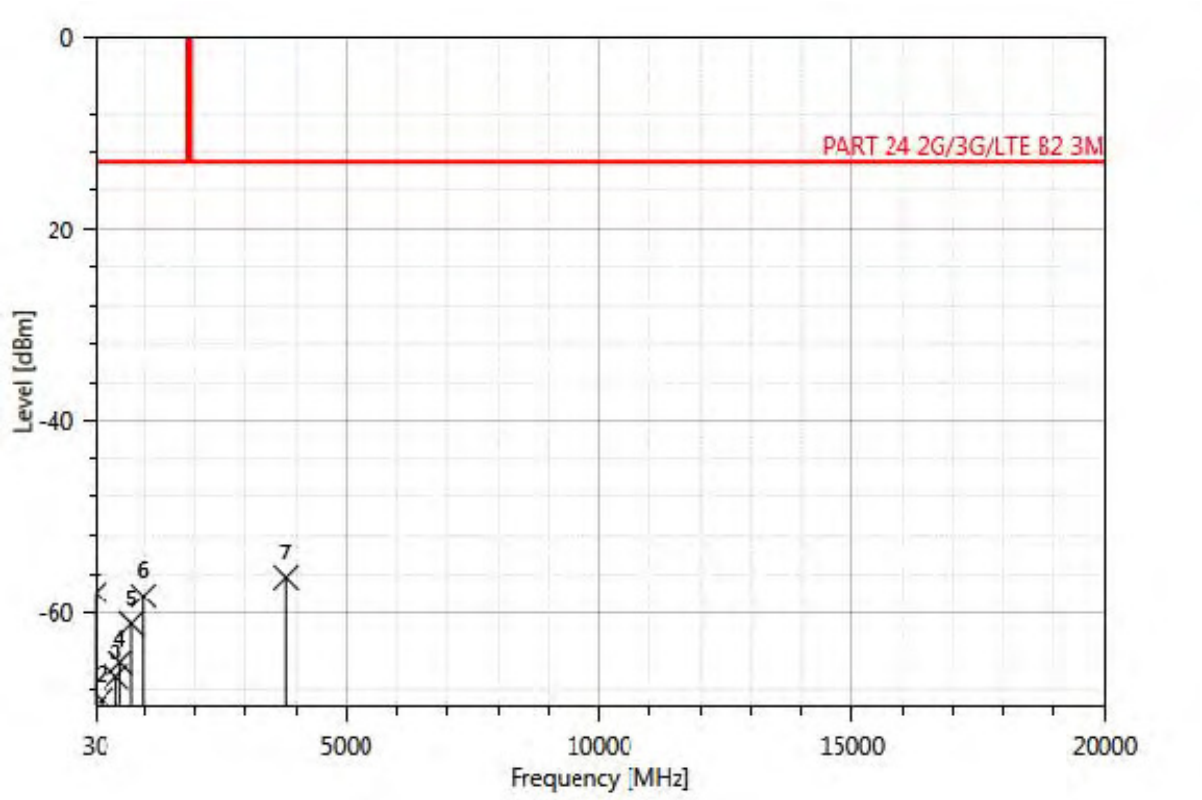
Operation Mode :	LTE B2	Test Date :	03/29/2016 21:10:24
Fundamental Frequency :	1902.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
31.94	S	-47.35	-34.22	-12.16	-0.96	-13.00	-34.35
279.29	S	-65.50	-69.21	5.58	-1.87	-13.00	-52.50
442.25	S	-65.86	-69.49	5.82	-2.19	-13.00	-52.86
539.25	S	-62.42	-65.62	5.79	-2.59	-13.00	-49.42
758.47	S	-58.98	-61.31	5.36	-3.02	-13.00	-45.98
990.30	S	-56.13	-58.90	6.01	-3.24	-13.00	-43.13
3805.00	H	-57.24	-63.08	12.46	-6.62	-13.00	-44.24
5707.50	H	-47.79	-52.34	12.90	-8.36	-13.00	-34.79

LTE Band 2: 16 QAM BW 15 RB 1,0

Operation Mode :	LTE B2	Test Date :	03/29/2016 21:10:37
Fundamental Frequency :	1902.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL

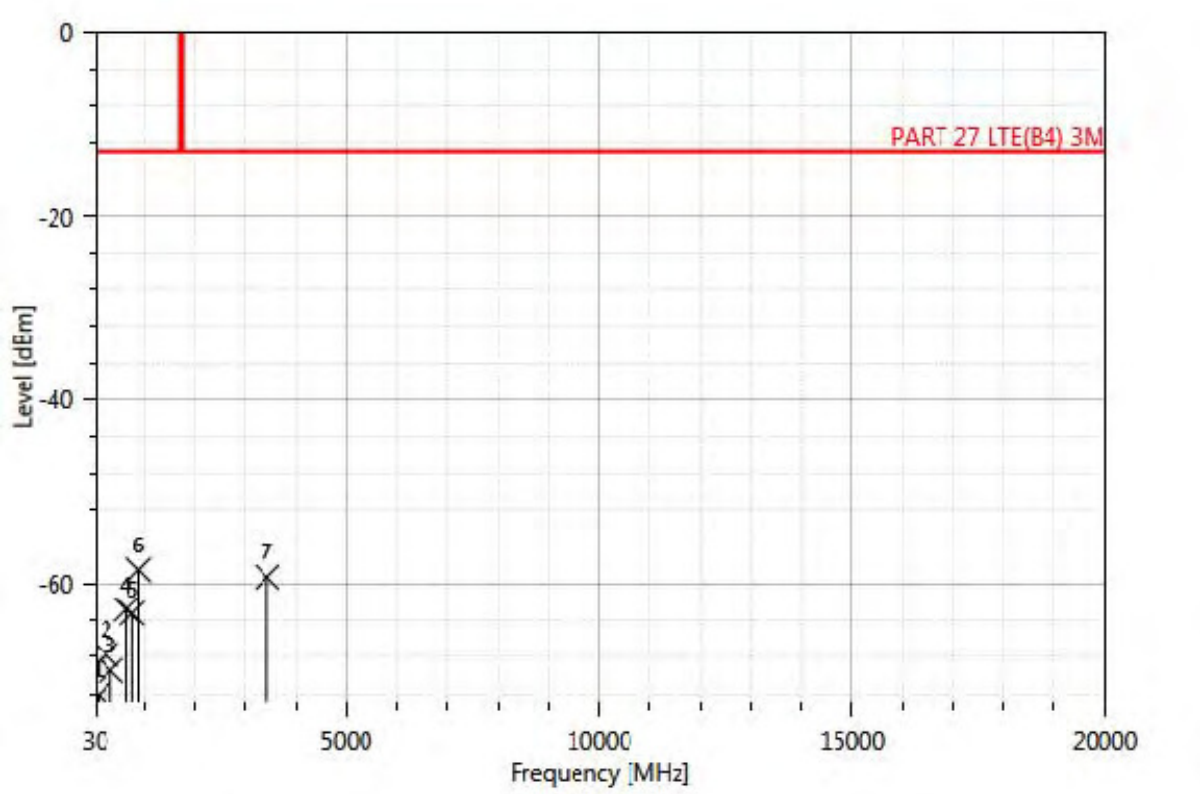


Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
31.94	S	-57.92	-44.79	-12.16	-0.96	-13.00	-44.92
150.28	S	-69.08	-67.71	0.07	-1.43	-13.00	-56.08
440.31	S	-66.71	-70.33	5.83	-2.20	-13.00	-53.71
520.82	S	-65.24	-68.73	5.89	-2.40	-13.00	-52.24
742.95	S	-61.16	-63.35	5.32	-3.12	-13.00	-48.16
971.87	S	-58.27	-60.74	5.64	-3.17	-13.00	-45.27
3805.00	H	-56.36	-62.20	12.46	-6.62	-13.00	-43.36

Radiated Spurious Emission Measurement Result: 10MHz BW LTE-Band 4 (The Worst Case)

LTE Band 4: 16 QAM BW 10 RB 1,0

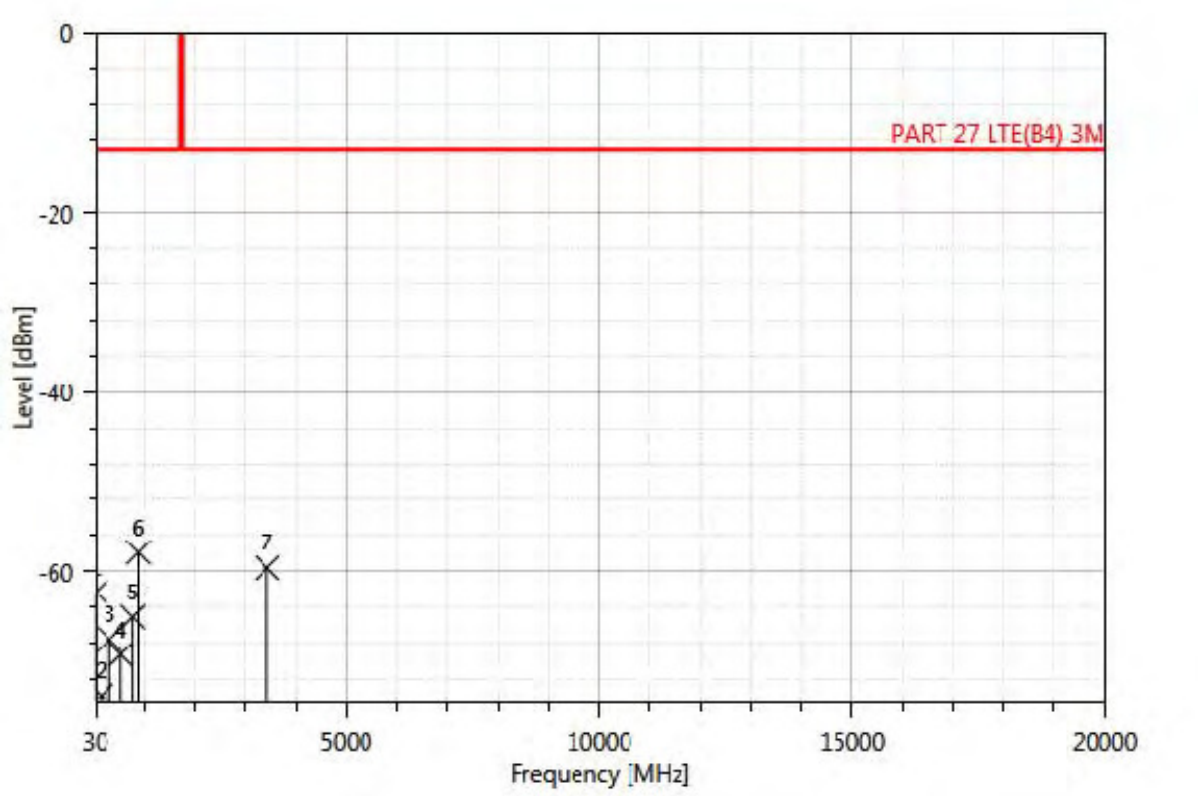
Operation Mode :	LTE B4	Test Date :	03/29/2016 21:05:04
Fundamental Frequency :	1715 MHz	Temp. / Humi. :	24 deg_C / 59 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
89.17	S	-72.15	-72.32	1.36	-1.18	-13.00	-59.15
242.43	S	-67.77	-71.63	5.54	-1.68	-13.00	-54.77
334.58	S	-69.51	-73.71	6.15	-1.95	-13.00	-56.51
644.01	S	-62.87	-66.22	6.03	-2.68	-13.00	-49.87
757.50	S	-63.29	-66.30	5.87	-2.86	-13.00	-50.29
878.75	S	-58.56	-61.26	5.90	-3.20	-13.00	-45.56
3430.00	H	-59.35	-65.40	12.28	-6.23	-13.00	-46.35

LTE Band 4: 16 QAM BW 10 RB 1,0

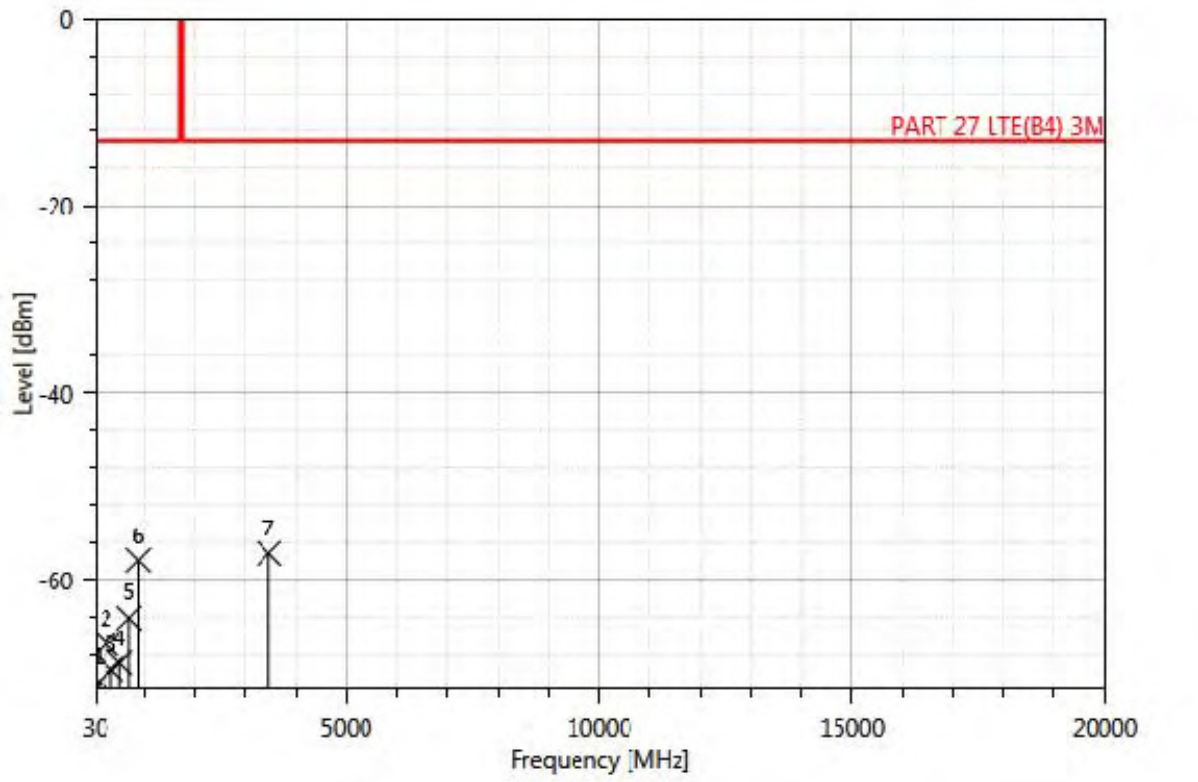
Operation Mode :	LTE B4	Test Date :	03/29/2016 21:05:13
Fundamental Frequency :	1715 MHz	Temp. / Humi. :	24 deg_C / 59 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
36.79	S	-62.30	-48.96	-12.54	-0.80	-13.00	-49.30
145.43	S	-73.82	-72.07	-0.37	-1.37	-13.00	-60.82
314.21	S	-67.55	-71.58	5.93	-1.90	-13.00	-54.55
536.34	S	-69.24	-72.79	6.01	-2.45	-13.00	-56.24
768.17	S	-65.06	-68.10	5.93	-2.89	-13.00	-52.06
878.75	S	-57.86	-60.56	5.90	-3.20	-13.00	-44.86
3430.00	H	-59.60	-65.65	12.28	-6.23	-13.00	-46.60

LTE Band 4: 16 QAM BW 10 RB 1,0

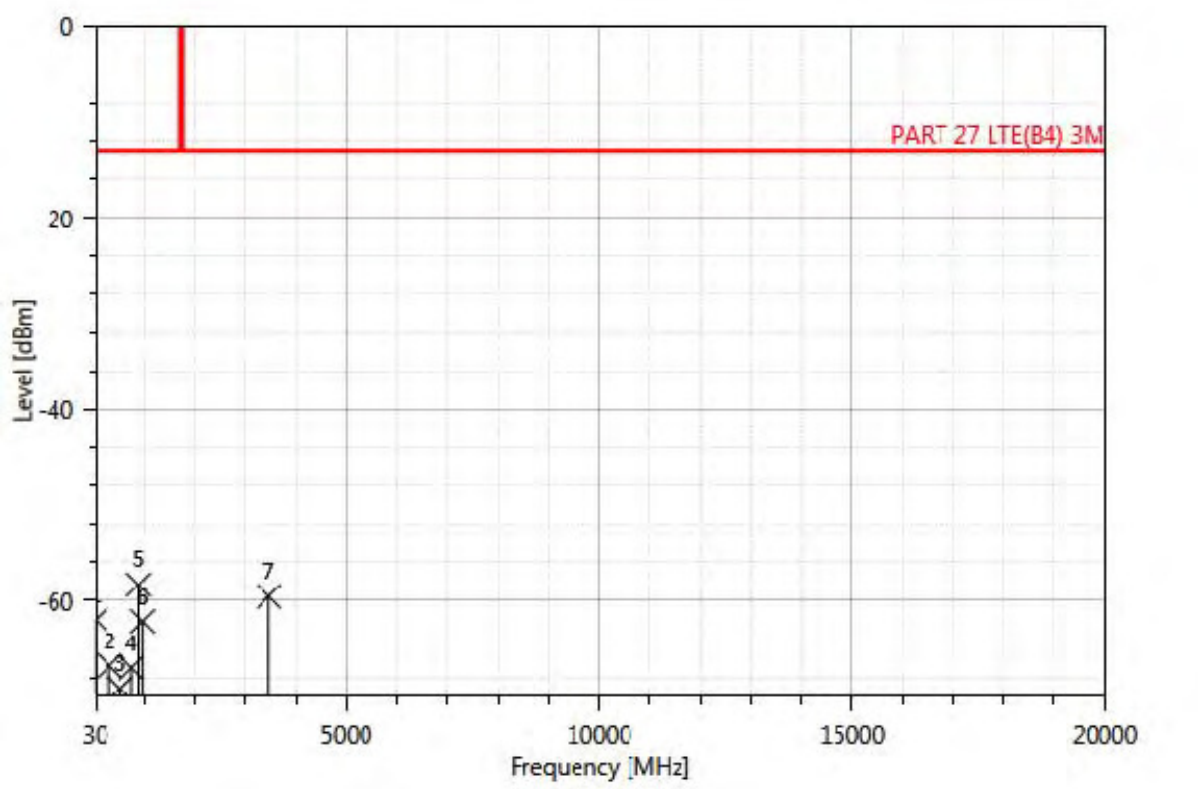
Operation Mode :	LTE B4	Test Date :	03/29/2016 21:05:23
Fundamental Frequency :	1732.5 MHz	Temp. / Humi. :	24 deg_C / 59 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
100.81	S	-70.86	-70.60	0.94	-1.20	-13.00	-57.86
240.49	S	-66.79	-70.65	5.53	-1.67	-13.00	-53.79
344.28	S	-69.52	-73.81	6.25	-1.97	-13.00	-56.52
515.00	S	-68.85	-72.41	5.95	-2.39	-13.00	-55.85
696.39	S	-64.06	-67.36	6.03	-2.74	-13.00	-51.06
878.75	S	-57.88	-60.58	5.90	-3.20	-13.00	-44.88
3465.00	H	-57.16	-63.25	12.34	-6.25	-13.00	-44.16

LTE Band 4: 16 QAM BW 10 RB 1,0

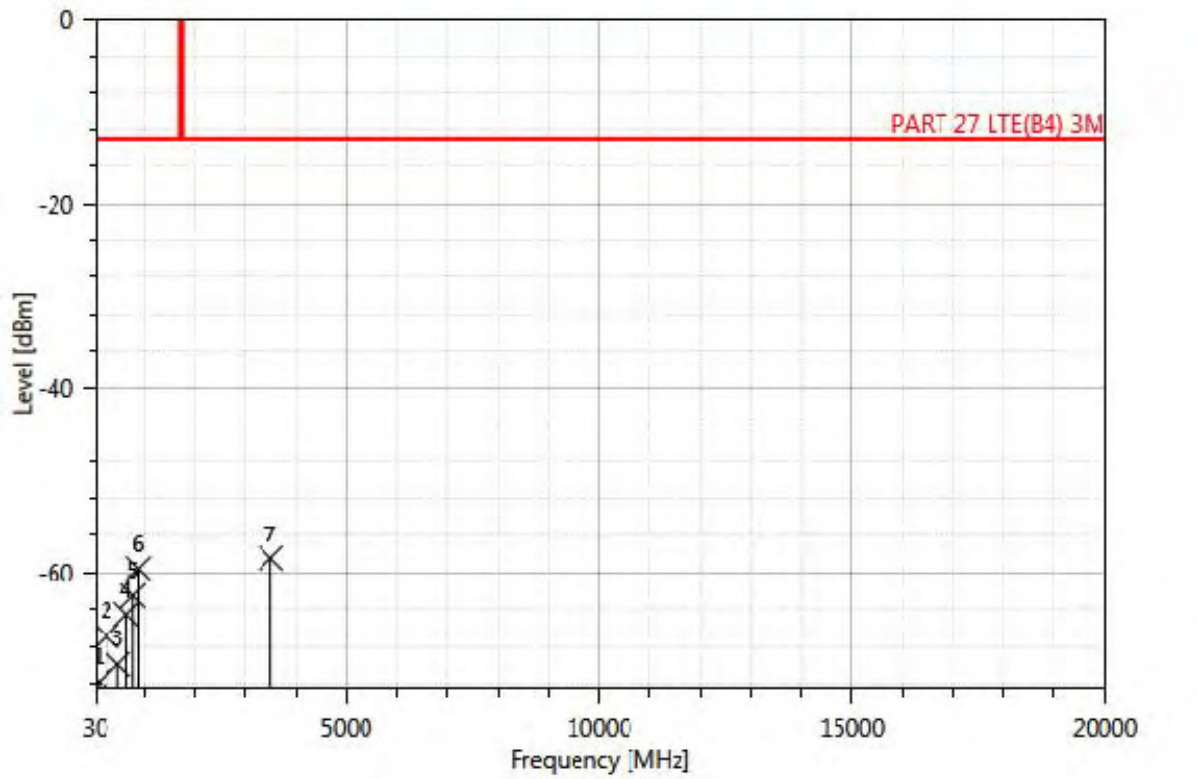
Operation Mode :	LTE B4	Test Date :	03/29/2016 21:05:32
Fundamental Frequency :	1732.5 MHz	Temp. / Humi. :	24 deg_C / 59 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
36.79	S	-61.96	-48.62	-12.54	-0.80	-13.00	-48.96
312.27	S	-66.75	-70.76	5.91	-1.90	-13.00	-53.75
521.79	S	-69.14	-72.69	5.97	-2.41	-13.00	-56.14
741.98	S	-66.97	-70.00	5.86	-2.83	-13.00	-53.97
878.75	S	-58.30	-61.00	5.90	-3.20	-13.00	-45.30
957.32	S	-62.11	-64.05	5.29	-3.35	-13.00	-49.11
3465.00	H	-59.51	-65.61	12.34	-6.25	-13.00	-46.51

LTE Band 4: 16 QAM BW 10 RB 1,0

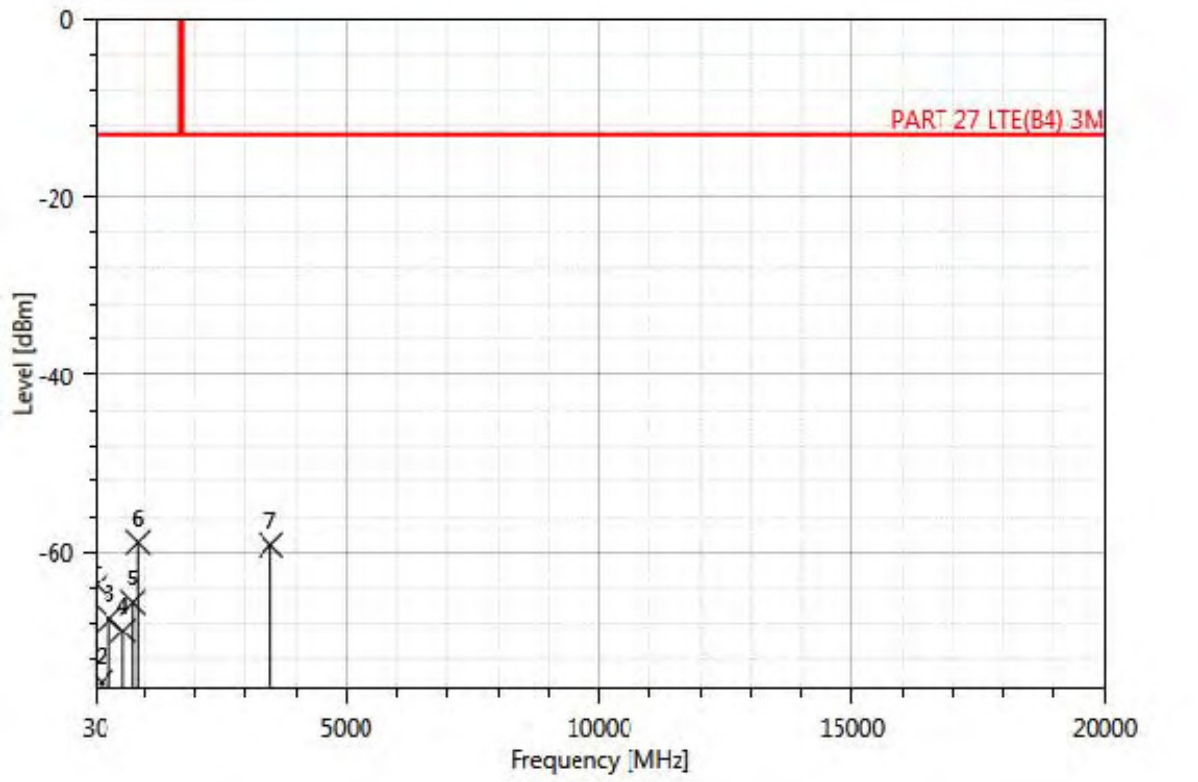
Operation Mode :	LTE B4	Test Date :	03/29/2016 21:05:42
Fundamental Frequency :	1750 MHz	Temp. / Humi. :	24 deg_C / 59 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
100.81	S	-71.83	-71.57	0.94	-1.20	-13.00	-58.83
249.22	S	-66.91	-70.79	5.59	-1.71	-13.00	-53.91
473.29	S	-69.94	-73.45	5.80	-2.28	-13.00	-56.94
643.04	S	-64.54	-67.89	6.02	-2.67	-13.00	-51.54
772.05	S	-62.54	-65.59	5.95	-2.89	-13.00	-49.54
878.75	S	-59.58	-62.28	5.90	-3.20	-13.00	-46.58
3500.00	H	-58.44	-64.42	12.40	-6.43	-13.00	-45.44

LTE Band 4: 16 QAM BW 10 RB 1,0

Operation Mode :	LTE B4	Test Date :	03/29/2016 21:05:51
Fundamental Frequency :	1750 MHz	Temp. / Humi. :	24 deg_C / 59 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL

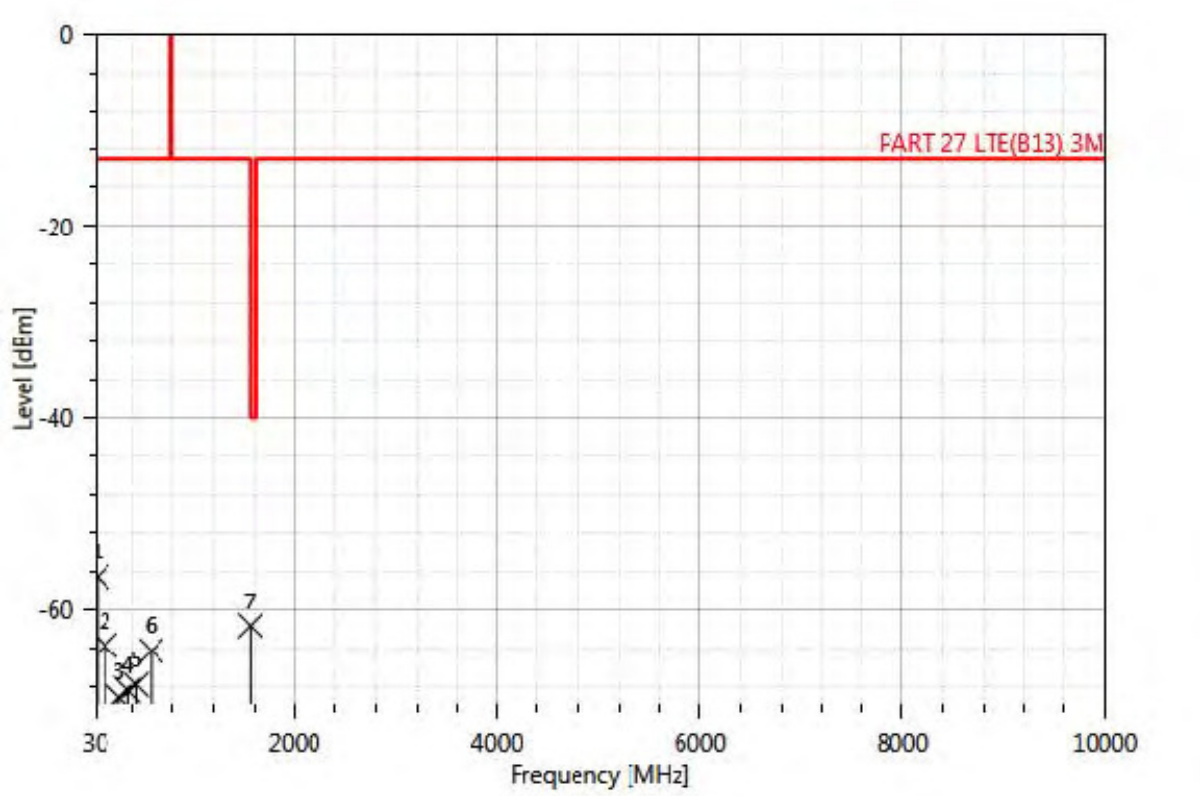


Freq.	Note	EIRP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
43.58	S	-63.63	-51.22	-11.53	-0.88	-13.00	-50.63
147.37	S	-74.47	-72.82	-0.28	-1.37	-13.00	-61.47
310.33	S	-67.39	-71.39	5.89	-1.89	-13.00	-54.39
580.96	S	-68.76	-71.95	5.76	-2.57	-13.00	-55.76
772.05	S	-65.61	-68.66	5.95	-2.89	-13.00	-52.61
872.93	S	-58.88	-61.63	5.92	-3.18	-13.00	-45.88
3500.00	H	-59.17	-65.14	12.40	-6.43	-13.00	-46.17

Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13 (The Worst Case)

LTE Band 13: QPSK BW 5 RB1,0

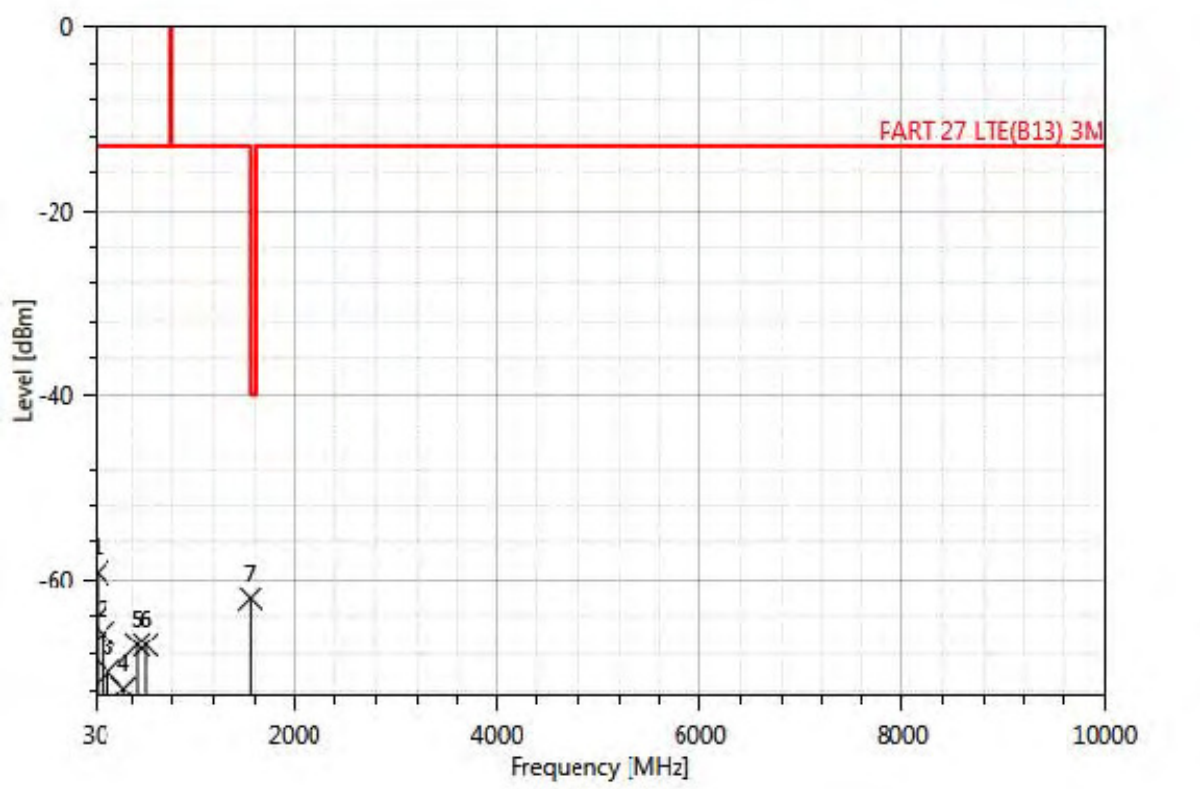
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:13:27
Fundamental Frequency :	779.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
47.46	S	-56.59	-43.72	-11.84	-1.03	-13.00	-43.59
125.06	S	-63.73	-59.85	-2.54	-1.34	-13.00	-50.73
264.74	S	-69.08	-70.88	3.60	-1.80	-13.00	-56.08
353.01	S	-68.38	-70.17	3.86	-2.07	-13.00	-55.38
432.55	S	-67.78	-69.23	3.70	-2.25	-13.00	-54.78
581.93	S	-64.29	-64.86	3.36	-2.79	-13.00	-51.29
1559.00	H	-61.70	-64.36	6.78	-4.12	-40.00	-21.70

LTE Band 13: QPSK BW 5 RB1,0

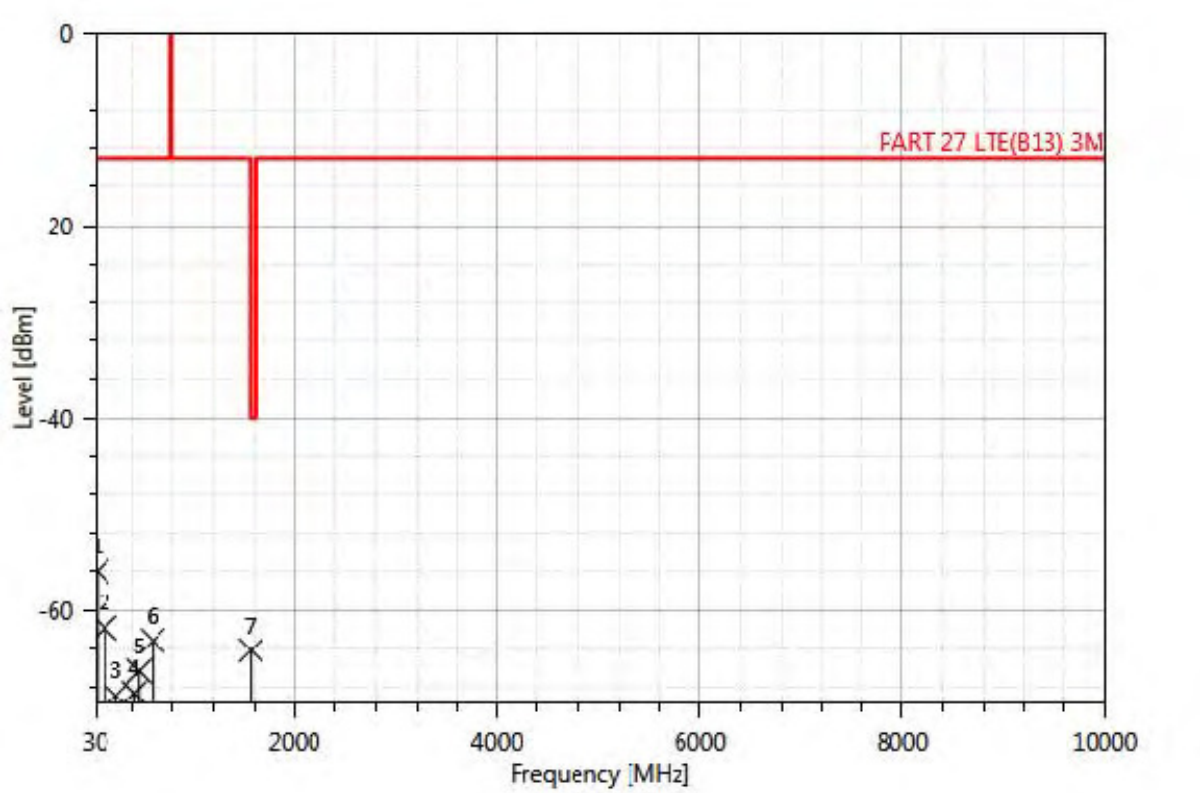
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:13:34
Fundamental Frequency :	779.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
48.43	S	-59.23	-46.54	-11.65	-1.04	-13.00	-46.23
100.81	S	-65.86	-62.91	-1.69	-1.25	-13.00	-52.86
157.07	S	-69.98	-66.75	-1.77	-1.46	-13.00	-56.98
309.36	S	-71.82	-73.55	3.67	-1.94	-13.00	-58.82
445.16	S	-67.07	-68.55	3.66	-2.18	-13.00	-54.07
523.73	S	-67.09	-68.39	3.73	-2.43	-13.00	-54.09
1559.00	H	-62.09	-64.75	6.78	-4.12	-40.00	-22.09

LTE Band 13: QPSK BW 5 RB1,0

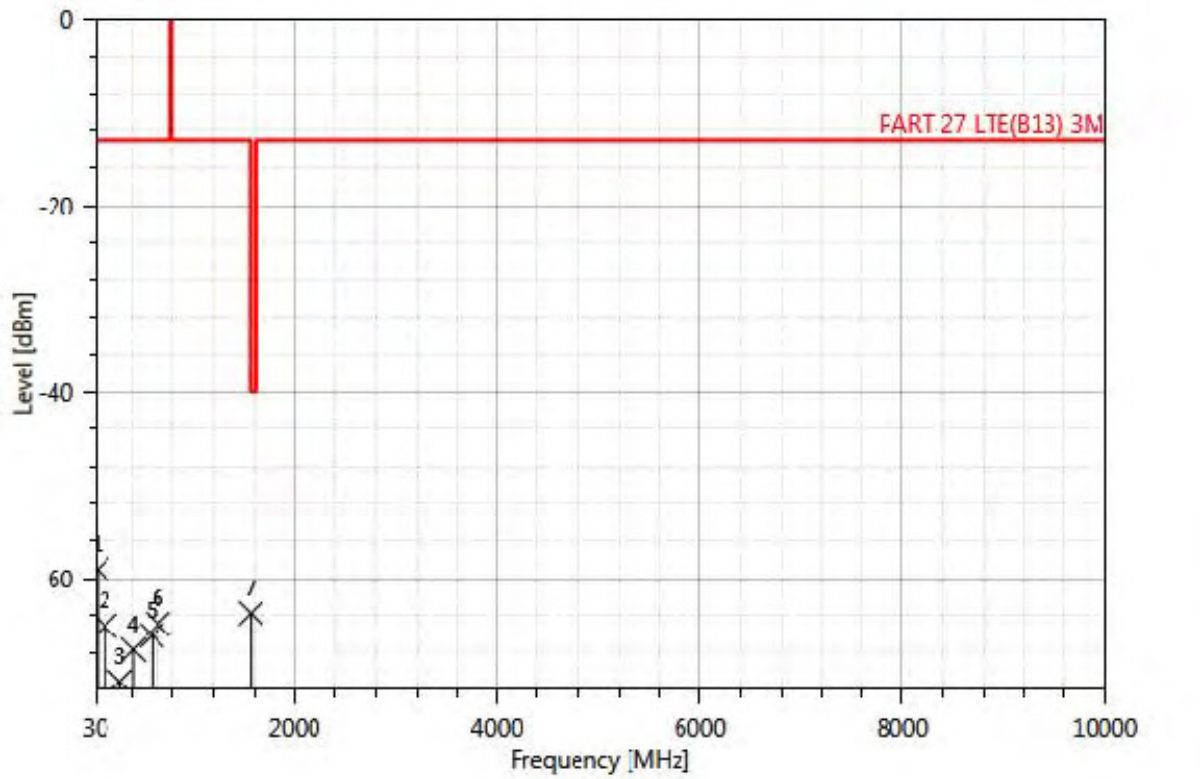
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:13:40
Fundamental Frequency :	782 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
47.46	S	-55.93	-43.06	-11.84	-1.03	-13.00	-42.93
122.15	S	-61.83	-58.01	-2.48	-1.33	-13.00	-48.83
234.67	S	-68.86	-70.32	3.19	-1.73	-13.00	-55.86
413.15	S	-68.60	-69.99	3.77	-2.38	-13.00	-55.60
460.68	S	-66.31	-67.79	3.69	-2.21	-13.00	-53.31
596.48	S	-63.14	-63.64	3.27	-2.76	-13.00	-50.14
1564.00	H	-64.16	-66.82	6.80	-4.13	-40.00	-24.16

LTE Band 13: QPSK BW 5 RB1,0

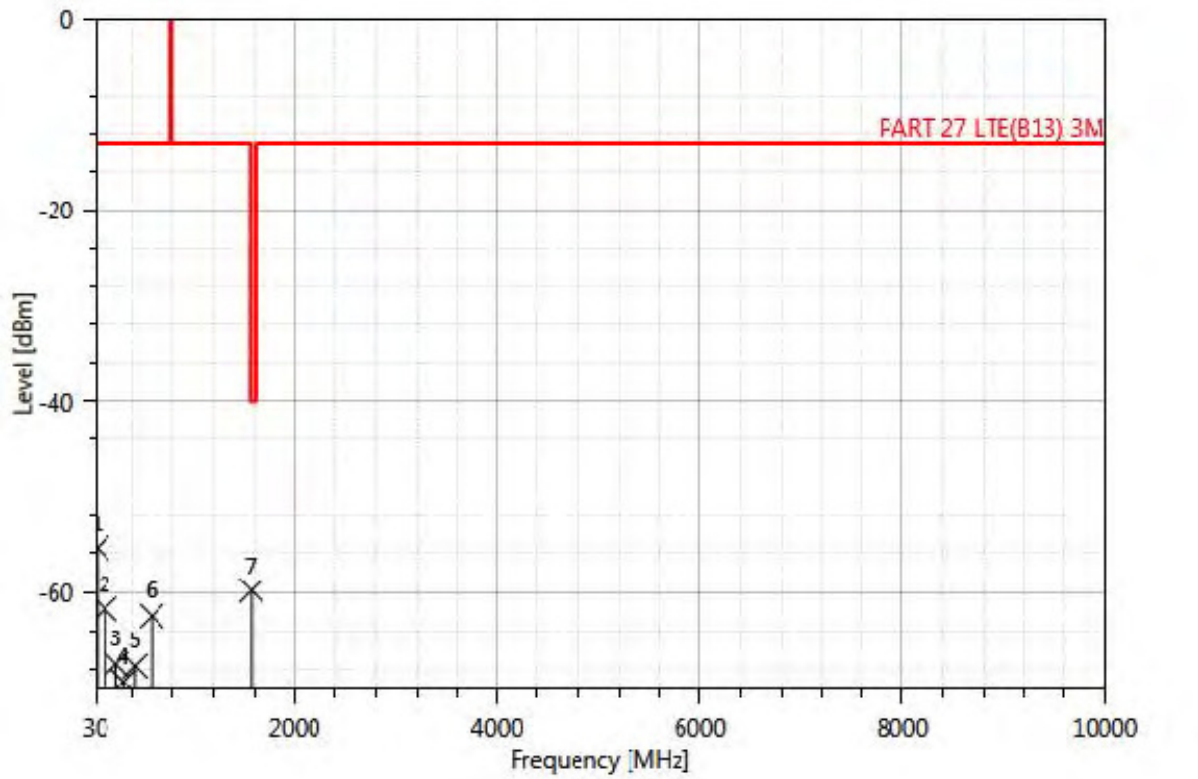
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:13:47
Fundamental Frequency :	782 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
48.43	S	-59.07	-46.39	-11.65	-1.04	-13.00	-46.07
123.12	S	-65.14	-61.30	-2.50	-1.34	-13.00	-52.14
273.47	S	-71.11	-72.75	3.48	-1.84	-13.00	-58.11
405.39	S	-67.70	-69.09	3.80	-2.41	-13.00	-54.70
589.69	S	-66.15	-66.67	3.31	-2.80	-13.00	-53.15
648.86	S	-64.94	-65.67	3.14	-2.41	-13.00	-51.94
1564.00	H	-63.78	-66.45	6.80	-4.13	-40.00	-23.78

LTE Band 13: QPSK BW 5 RB1,0

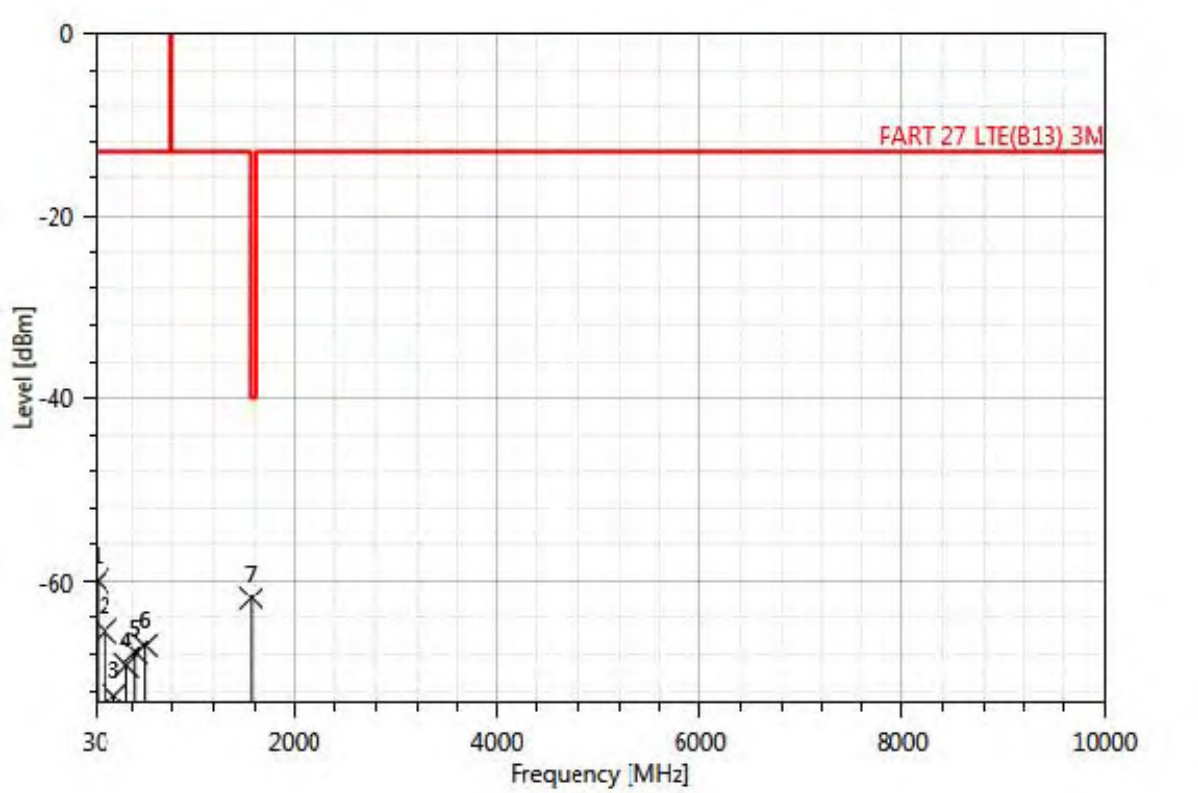
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:13:54
Fundamental Frequency :	784.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
47.46	S	-55.43	-42.55	-11.84	-1.03	-13.00	-42.43
123.12	S	-61.75	-57.91	-2.50	-1.34	-13.00	-48.75
235.64	S	-67.52	-68.99	3.21	-1.73	-13.00	-54.52
310.33	S	-69.37	-71.11	3.67	-1.93	-13.00	-56.37
422.85	S	-67.73	-69.15	3.74	-2.31	-13.00	-54.73
586.78	S	-62.49	-63.03	3.33	-2.79	-13.00	-49.49
1569.00	H	-59.85	-62.53	6.82	-4.14	-40.00	-19.85

LTE Band 13: QPSK BW 5 RB1,0

Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:00
Fundamental Frequency :	784.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL

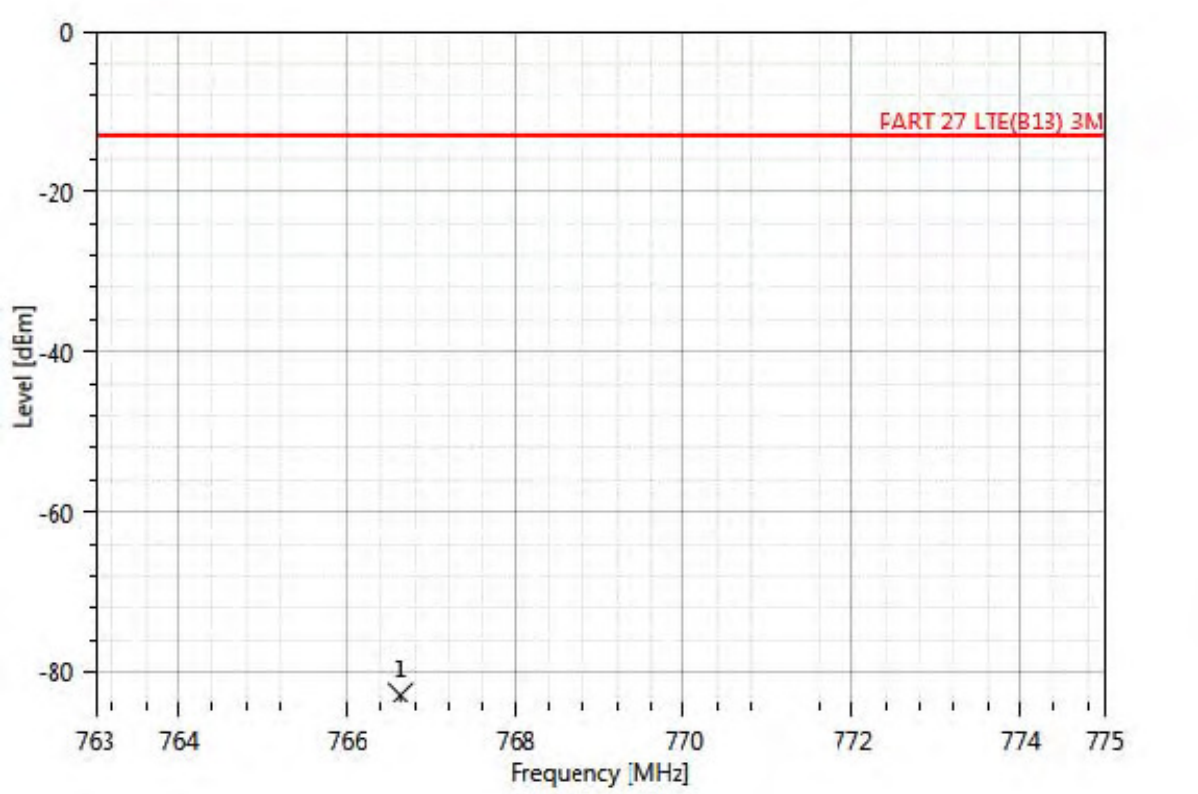


Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
48.43	S	-59.94	-47.25	-11.65	-1.04	-13.00	-46.94
123.12	S	-65.45	-61.61	-2.50	-1.34	-13.00	-52.45
216.24	S	-72.53	-74.24	3.40	-1.69	-13.00	-59.53
336.52	S	-69.26	-71.12	3.80	-1.94	-13.00	-56.26
419.94	S	-67.81	-69.22	3.75	-2.33	-13.00	-54.81
515.97	S	-67.06	-68.47	3.77	-2.36	-13.00	-54.06
1569.00	H	-61.89	-64.57	6.82	-4.14	-40.00	-21.89

Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13(763MHz-755MHz)

LTE Band 13: QPSK BW 5 RB1,0 (763MHz ~ 775MHz)

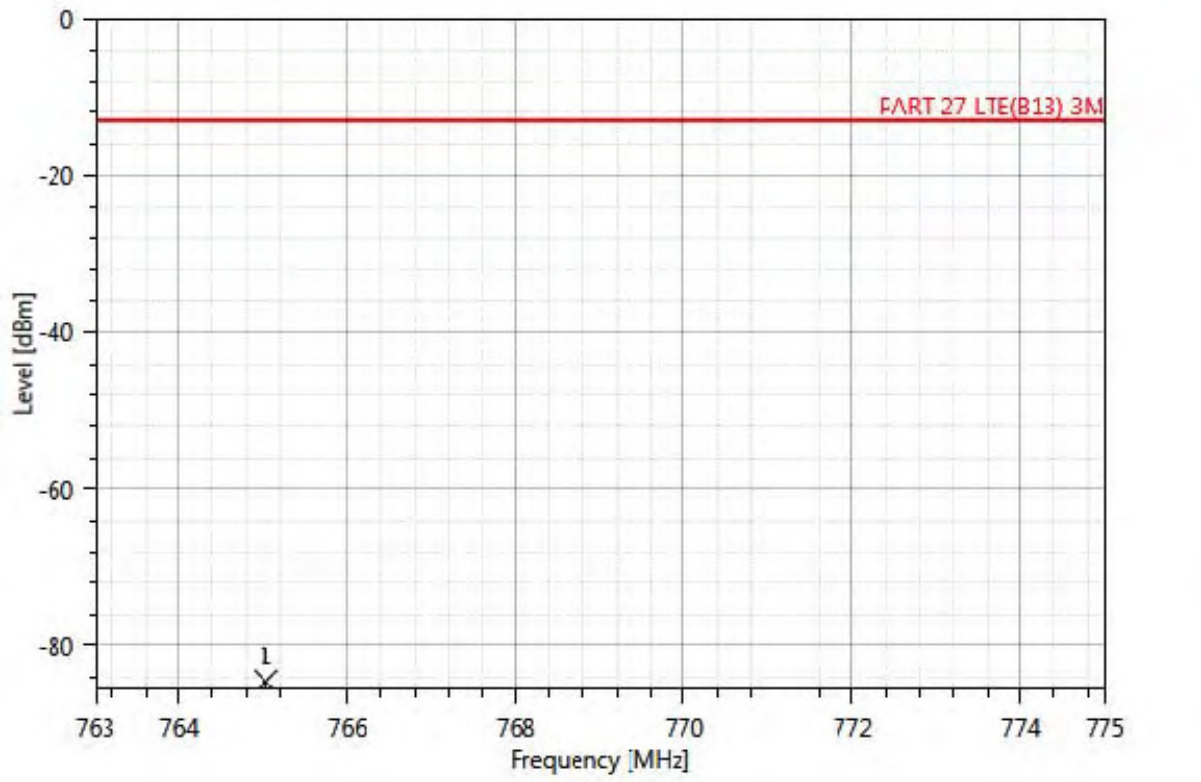
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:06
Fundamental Frequency :	779.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
766.62	S	-82.83	-83.09	3.24	-2.97	-13.00	-69.83

LTE Band 13: QPSK BW 5 RB1,0 (763MHz ~ 775MHz)

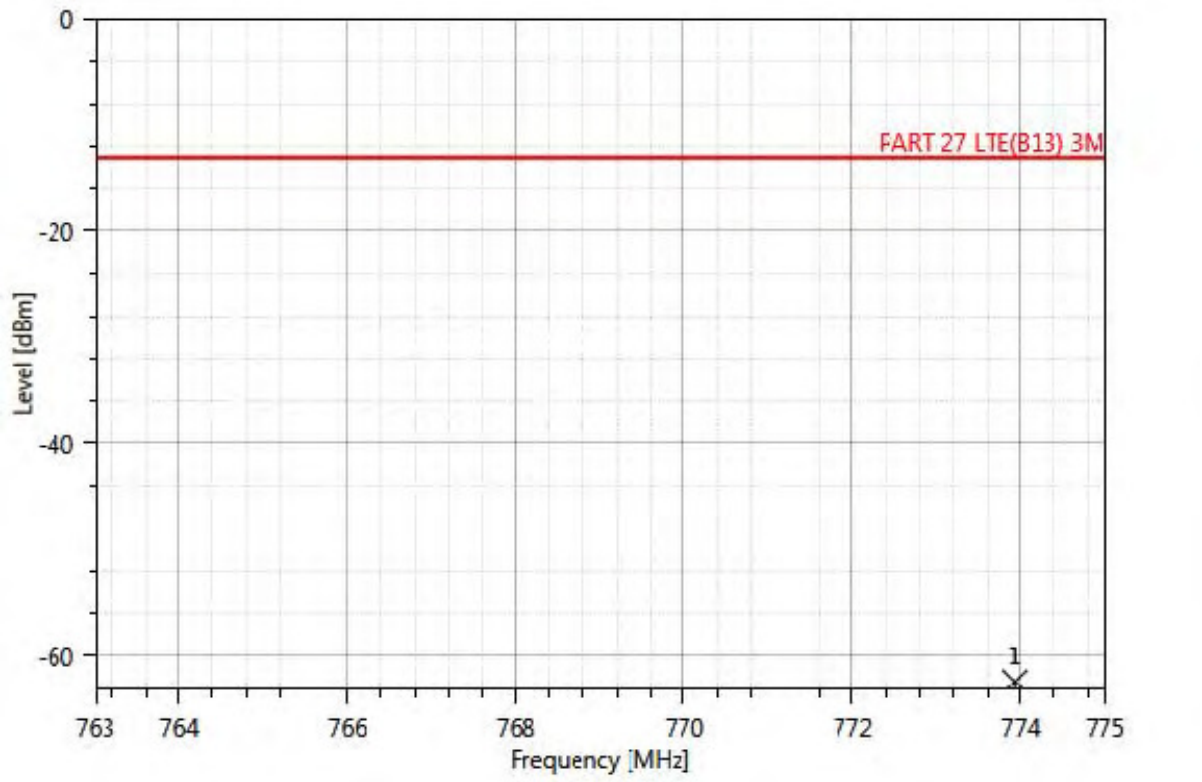
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:09
Fundamental Frequency :	779.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
765.03	S	-84.53	-84.78	3.23	-2.98	-13.00	-71.53

LTE Band 13: QPSK BW 5 RB1,0 (763MHz ~ 775MHz)

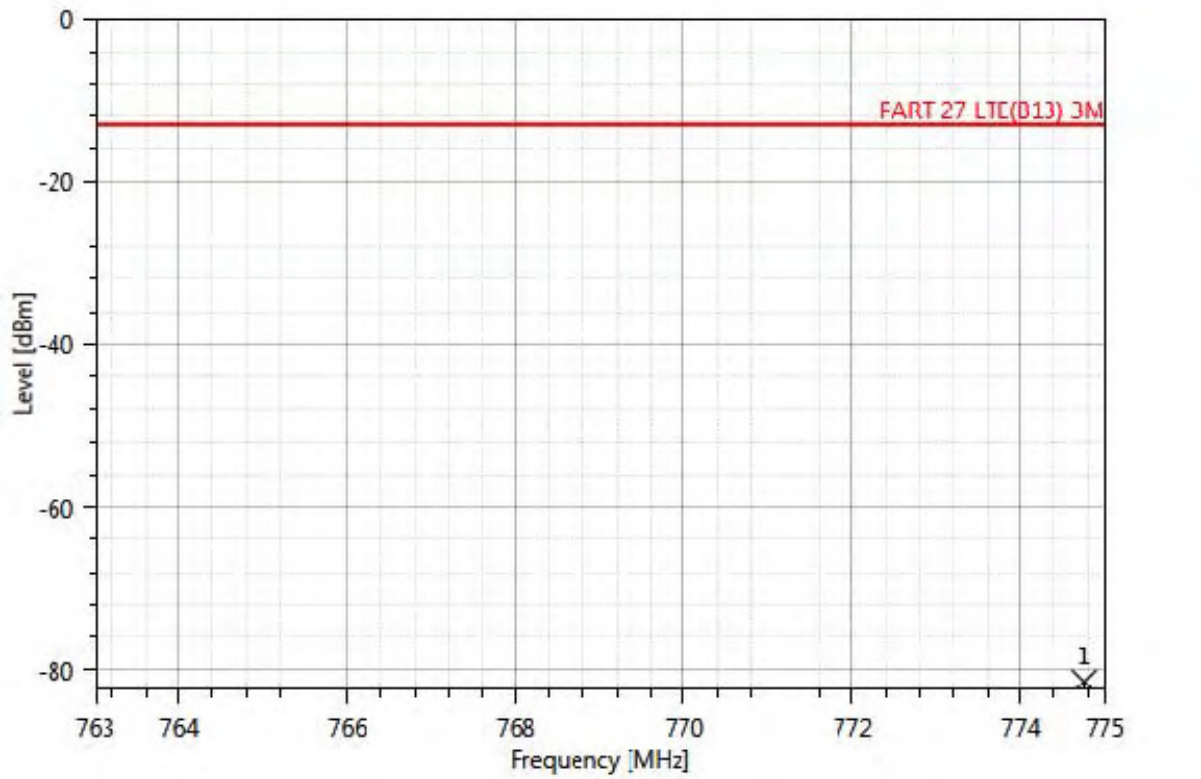
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:12
Fundamental Frequency :	782 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
773.93	S	-62.44	-62.77	3.26	-2.93	-13.00	-49.44

LTE Band 13: QPSK BW 5 RB1,0 (763MHz ~ 775MHz)

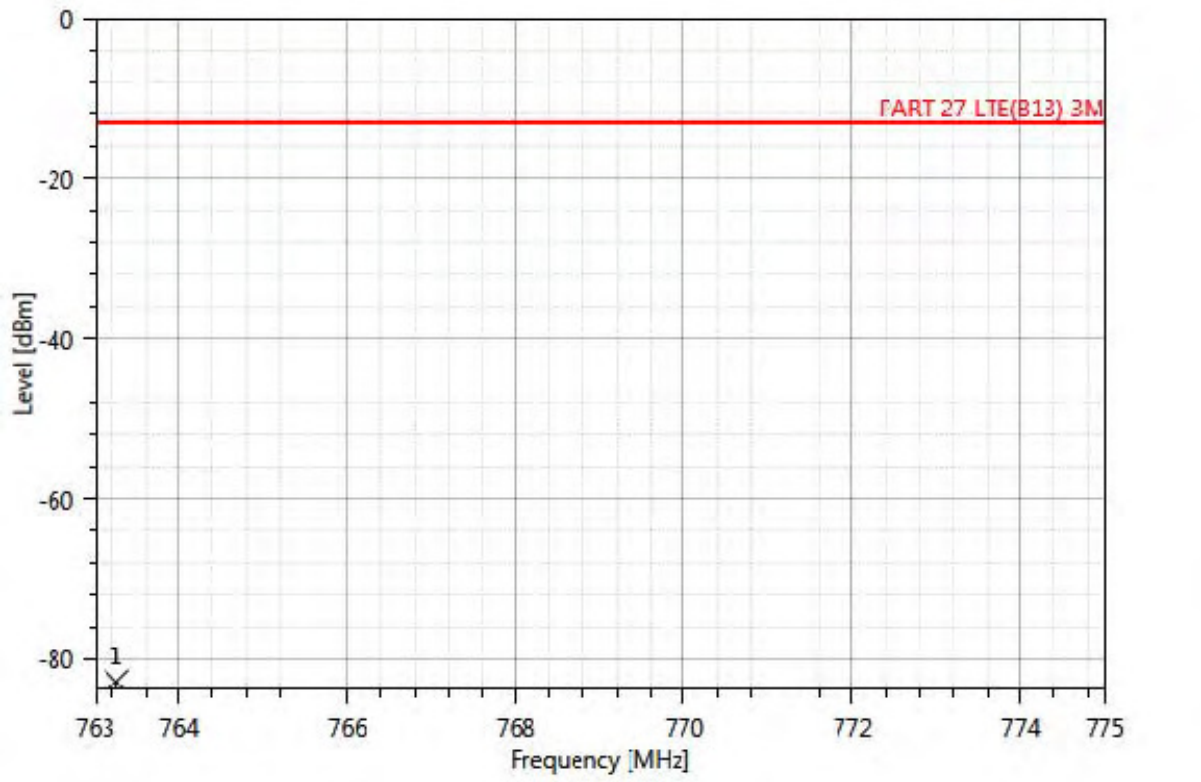
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:15
Fundamental Frequency :	782 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
774.75	S	-81.42	-81.76	3.26	-2.92	-13.00	-68.42

LTE Band 13: QPSK BW 5 RB1,0 (763MHz ~ 775MHz)

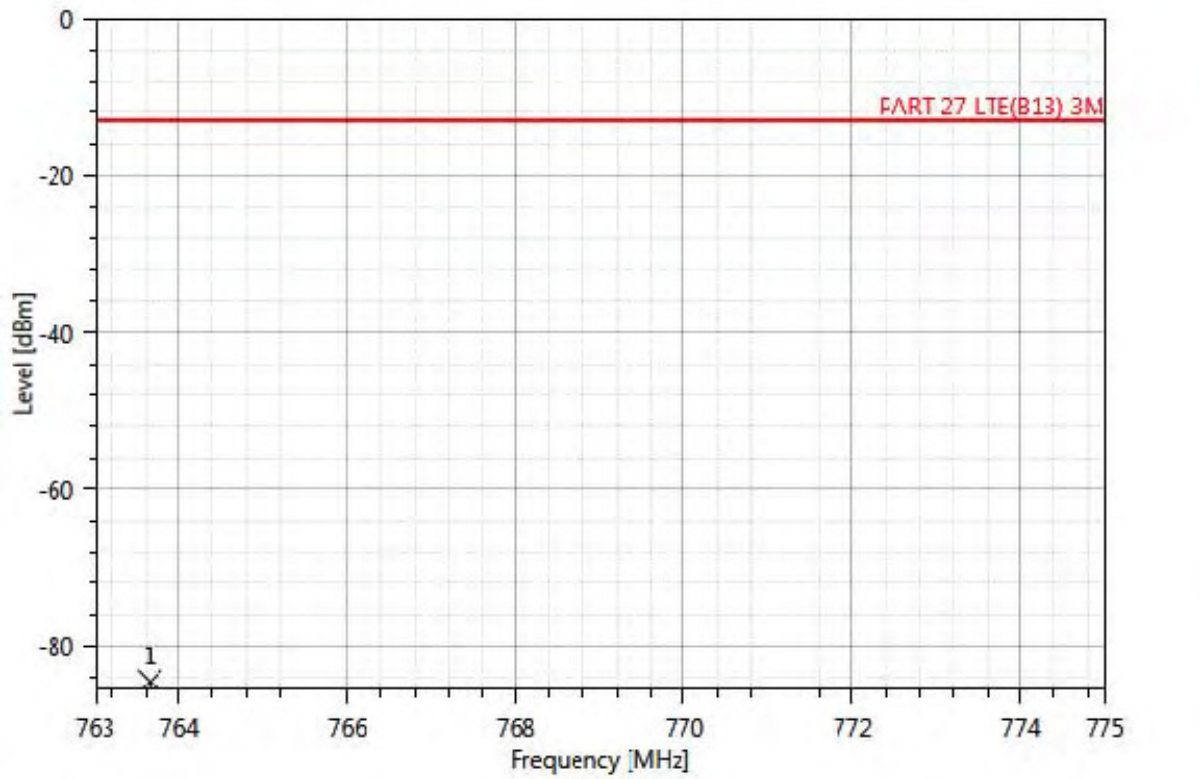
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:18
Fundamental Frequency :	784.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
763.25	S	-82.83	-83.06	3.22	-2.99	-13.00	-69.83

LTE Band 13: QPSK BW 5 RB1,0 (763MHz ~ 775MHz)

Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:21
Fundamental Frequency :	784.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL

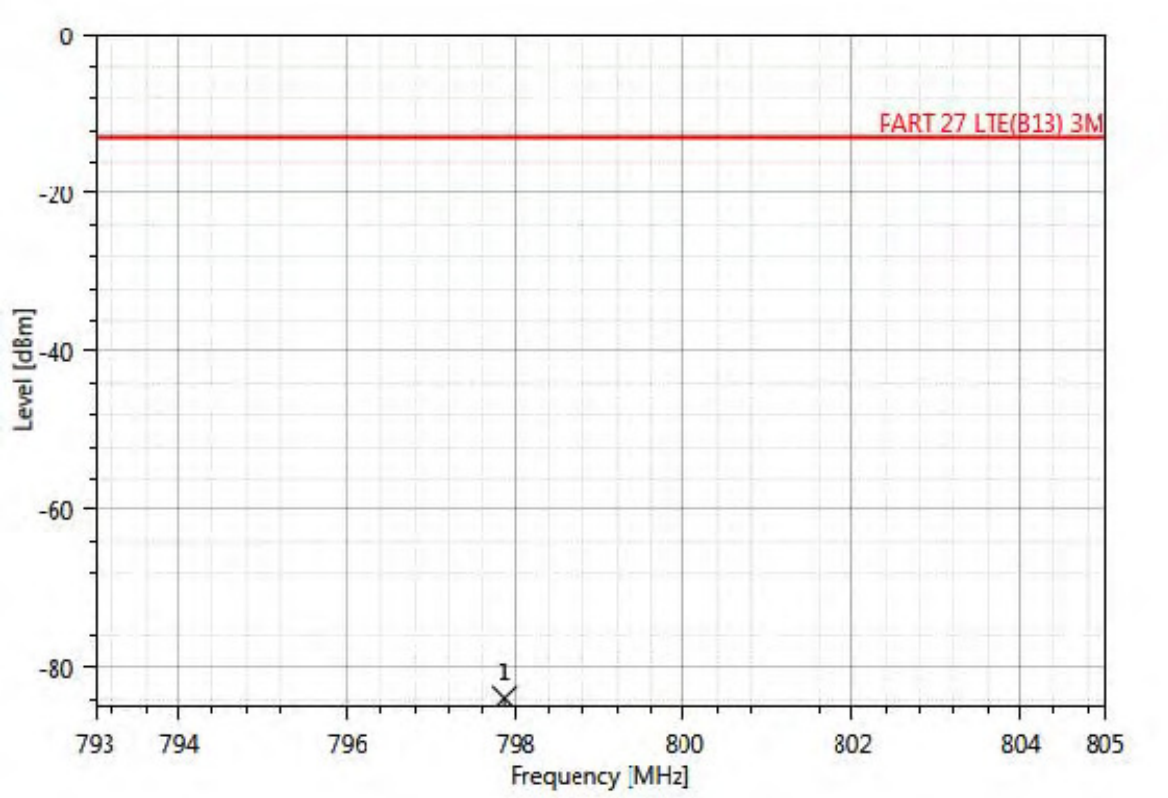


Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
763.65	S	-84.48	-84.72	3.23	-2.99	-13.00	-71.48

Radiated Spurious Emission Measurement Result: 10MHz BW LTE-Band 13(793MHz-805MHz)

LTE Band 13: QPSK BW 5 RB1,0 (793MHz ~ 805MHz)

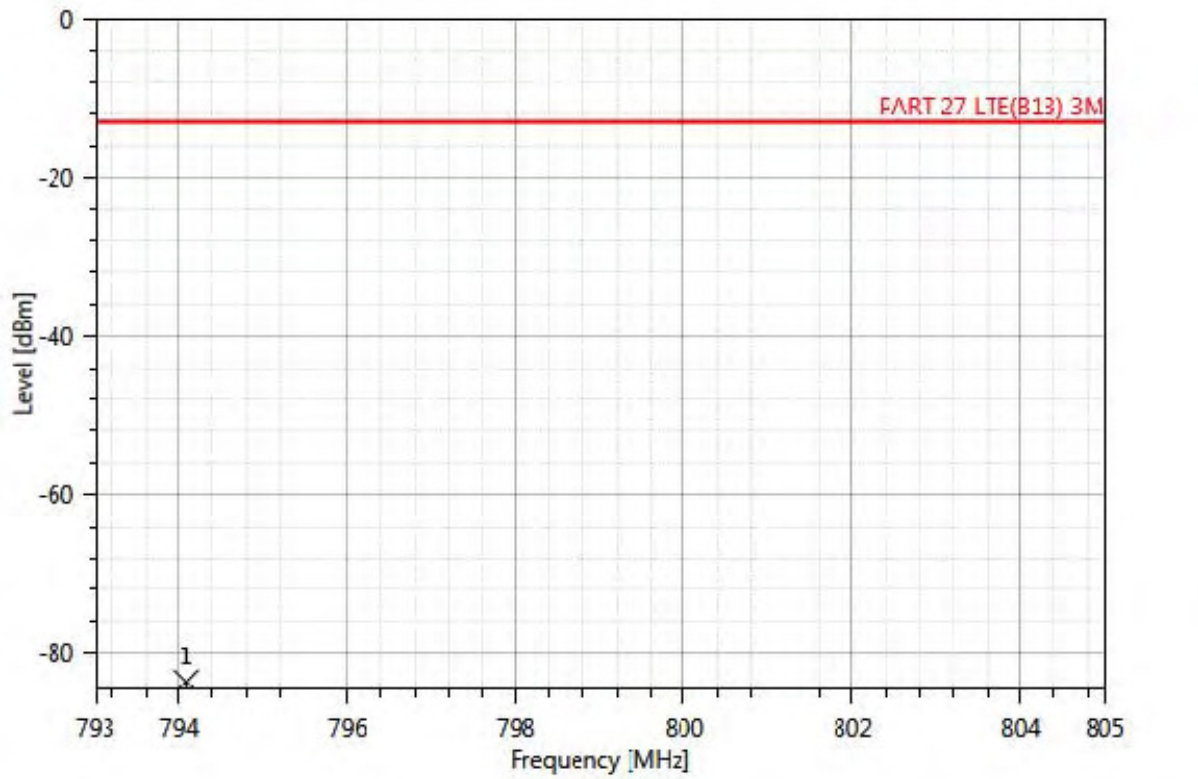
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:24
Fundamental Frequency :	779.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
797.86	S	-83.79	-84.23	3.34	-2.90	-13.00	-70.79

LTE Band 13: QPSK BW 5 RB1,0 (793MHz ~ 805MHz)

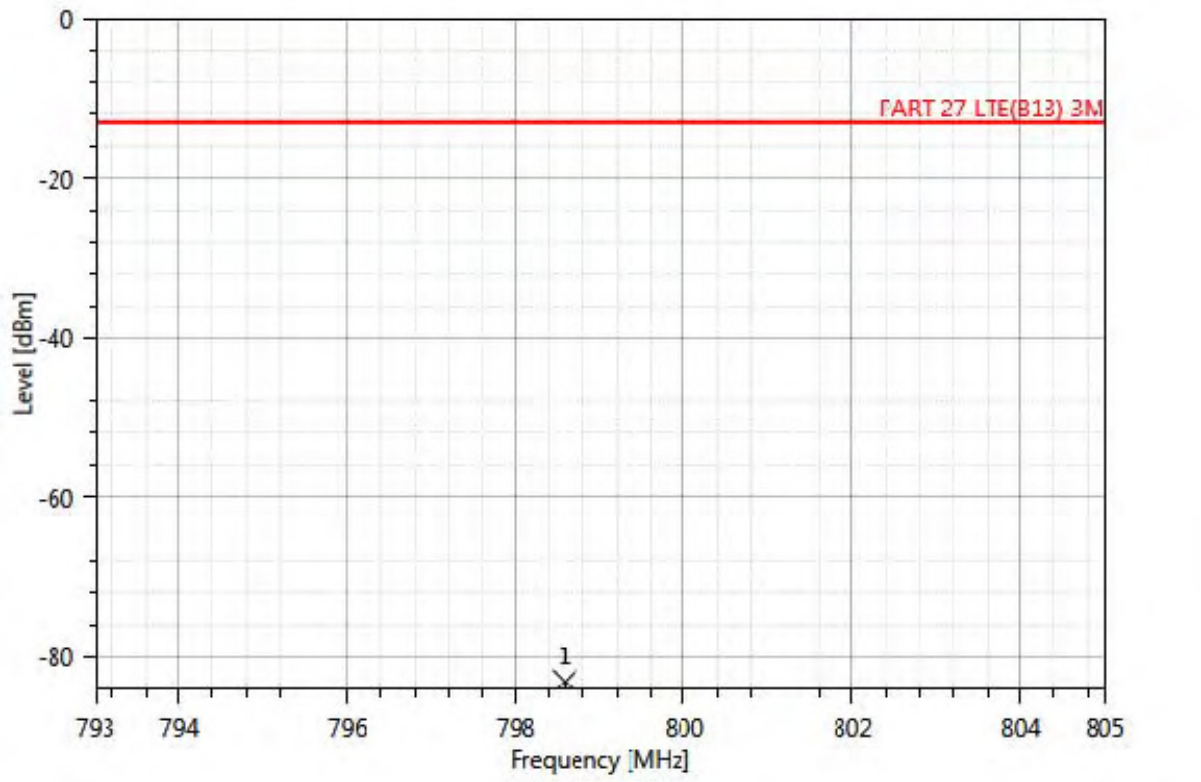
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:27
Fundamental Frequency :	779.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH LOW	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
794.08	S	-83.59	-84.02	3.32	-2.90	-13.00	-70.59

LTE Band 13: QPSK BW 5 RB1,0 (793MHz ~ 805MHz)

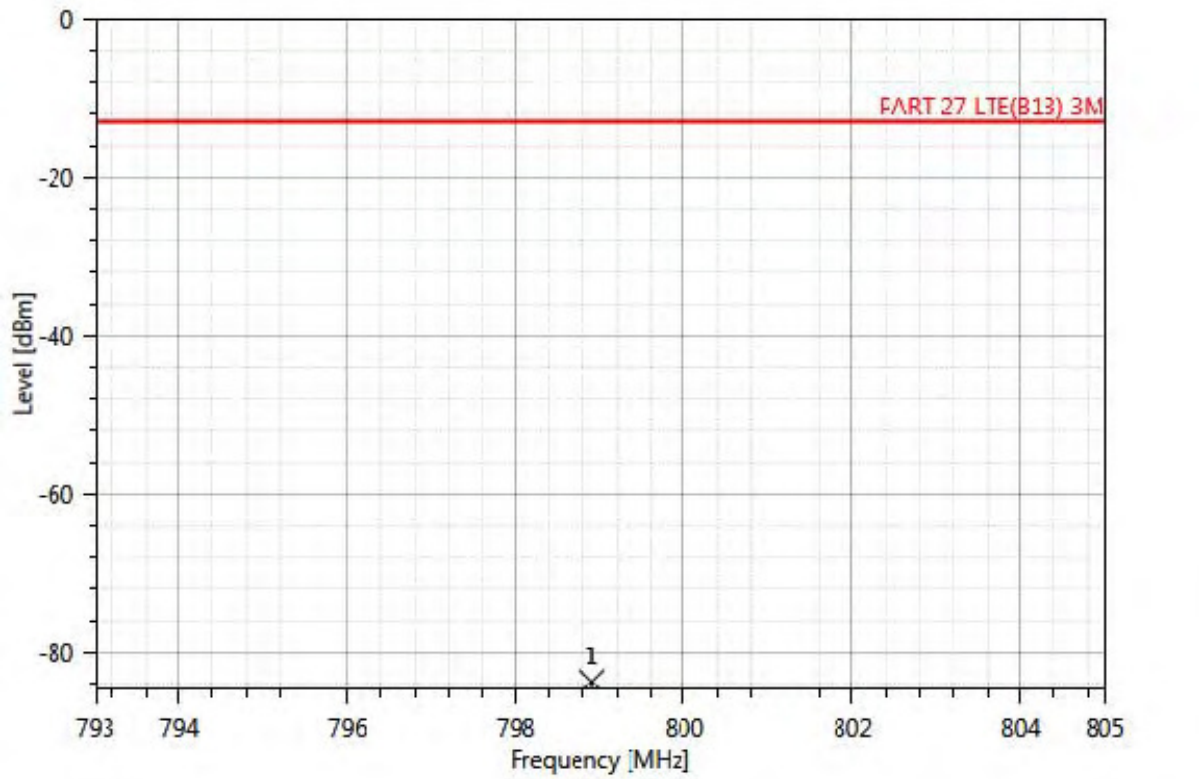
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:30
Fundamental Frequency :	782 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
798.58	S	-83.12	-83.56	3.34	-2.90	-13.00	-70.12

LTE Band 13: QPSK BW 5 RB1,0 (793MHz ~ 805MHz)

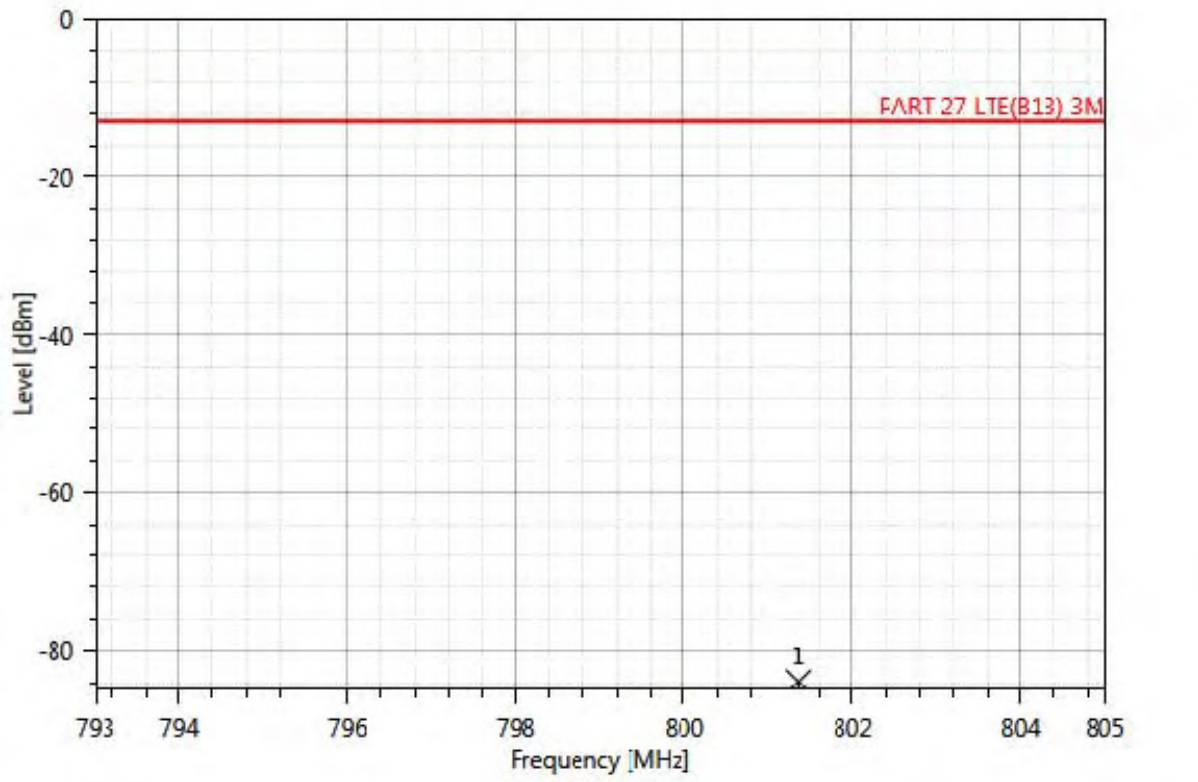
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:33
Fundamental Frequency :	782 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH MID	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
798.90	S	-83.68	-84.12	3.34	-2.90	-13.00	-70.68

LTE Band 13: QPSK BW 5 RB1,0 (793MHz ~ 805MHz)

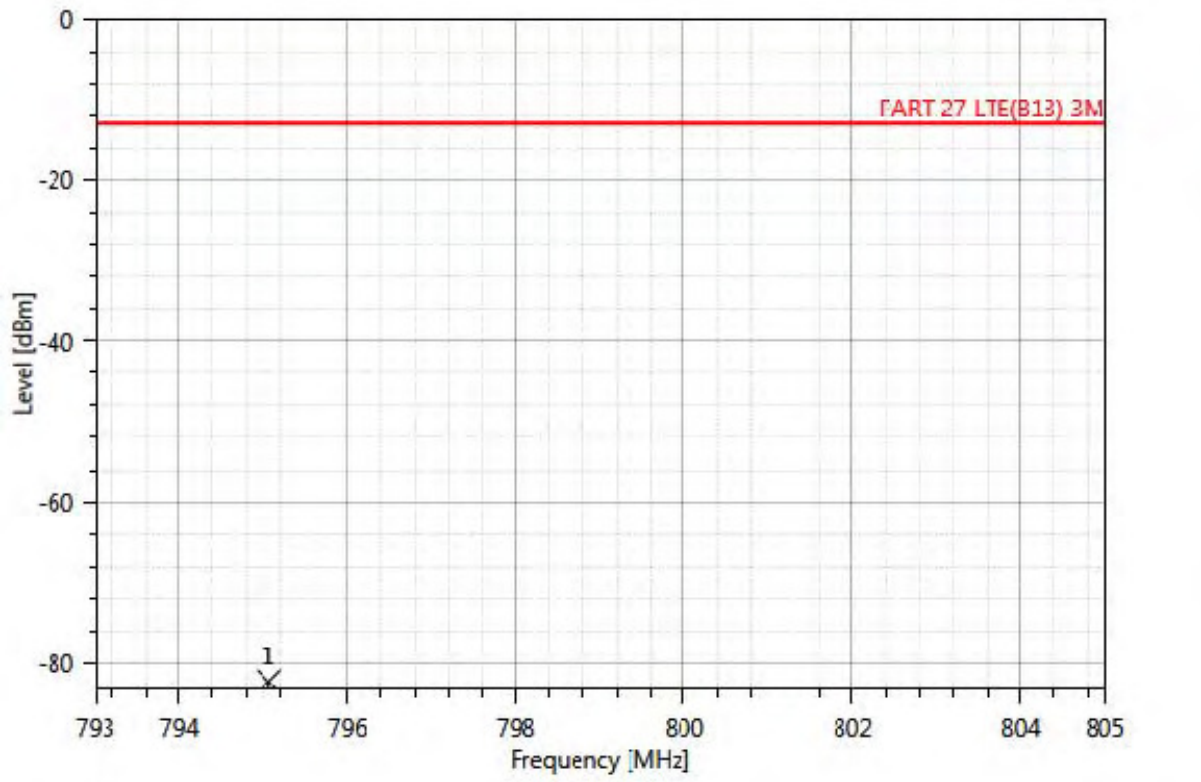
Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:36
Fundamental Frequency :	784.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
801.36	S	-83.92	-84.36	3.34	-2.90	-13.00	-70.92

LTE Band 13: QPSK BW 5 RB1,0 (793MHz ~ 805MHz)

Operation Mode :	LTE B13	Test Date :	03/29/2016 21:14:39
Fundamental Frequency :	784.5 MHz	Temp. / Humi. :	23 deg_C / 64 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Edward
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	ERP Level	SG Output Level	Antenna Gain	Cable Loss	Limit @3m	Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
795.06	S	-82.30	-82.73	3.33	-2.90	-13.00	-69.30

11. REQUENCY STABILITY MEASUREMENT

11.1. Standard Applicable:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

11.2. Test Set-up:

Note: Measurement setup for testing on Antenna connector

11.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25

11.4. Measurement Equipment Used:

SGS Conducted Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Radio Communica-tion Analyzer	Anritsu	MT8820C	6200995019	09/25/2015	09/24/2016
DC Power Supply	Agilent	E3640A	MY52410006	11/05/2015	11/04/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
CCA,USB-4432	NI	198755E-02L	18F909F	04/02/2016	03/02/2017
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	01/02/2016	01/01/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/06/2015	05/05/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2016	01/01/2017

11.5. Measurement Result:

FREQUENCY ERROR vs. VOLTAGE

Reference Frequency:		LTE B2 Mid Channel	1880.0	MHz 10M QPSK CH 18900
Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency		
Vdc	Temperature (		Delta (Hz)	Limit (Hz)

FREQUENCY ERROR vs. VOLTAGE

Reference Frequency:		LTE B4 Mid Channel	1732.5	MHz 10M QPSK CH 20175
		Limit: +/- 2.5 ppm =	Hz	
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (			

FREQUENCY ERROR vs. VOLTAGE

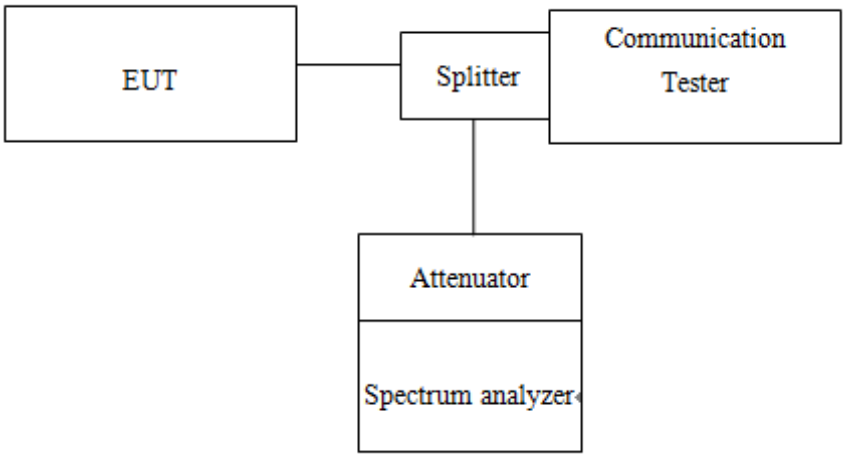
Reference Frequency:		LTE B13 Mid Channel	782.0	MHz 10M QPSK CH 23230
Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency		
Vdc	Temperature (		Delta (Hz)	Limit (Hz)

12. PEAK TO AVERAGE RATIO

12.1. Standard Applicable

The peak-to-average ration (PAR) of the transmission may not exceed 13dB.

12.2. Test SET-UP



12.3. Measurement Procedure

1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth; & internal =1ms
3. Set the number of counts to a value that stabilizes the measured CCDF curve.

12.4. Measurement

SGS Conducted Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Radio Communica-tion Analyzer	Anritsu	MT8820C	6200995019	09/25/2015	09/24/2016
DC Power Supply	Agilent	E3640A	MY52410006	11/05/2015	11/04/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
CCA,USB-4432	NI	198755E-02L	18F909F	04/02/2016	03/02/2017
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	01/02/2016	01/01/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/06/2015	05/05/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2016	01/01/2017

12.5. Measurement Result

Tabular Results:

LTE BAND 2							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	Peak-to-Average Ratio (dB)		Frequency (MHz)	CH	Peak-to-Average Ratio (dB)	
		16QAM	LIMIT			16QAM	LIMIT
1852.5	18625	6.40	13	1855.0	18650	6.46	13
1880.0	18900	6.37	13	1880.0	18900	5.47	13
1907.5	19175	6.47	13	1905.0	19150	5.30	13

LTE BAND 2							
Channel bandwidth: 15MHz				Channel bandwidth: 20MHz			
Frequency (MHz)	CH	Peak-to-Average Ratio (dB)		Frequency (MHz)	CH	Peak-to-Average Ratio (dB)	
		16QAM	LIMIT			16QAM	LIMIT
1857.5	18675	6.72	13	1860.0	18700	7.17	13
1880.0	18900	6.67	13	1880.0	18900	7.06	13
1902.5	19125	5.56	13	1900.0	19100	7.08	13

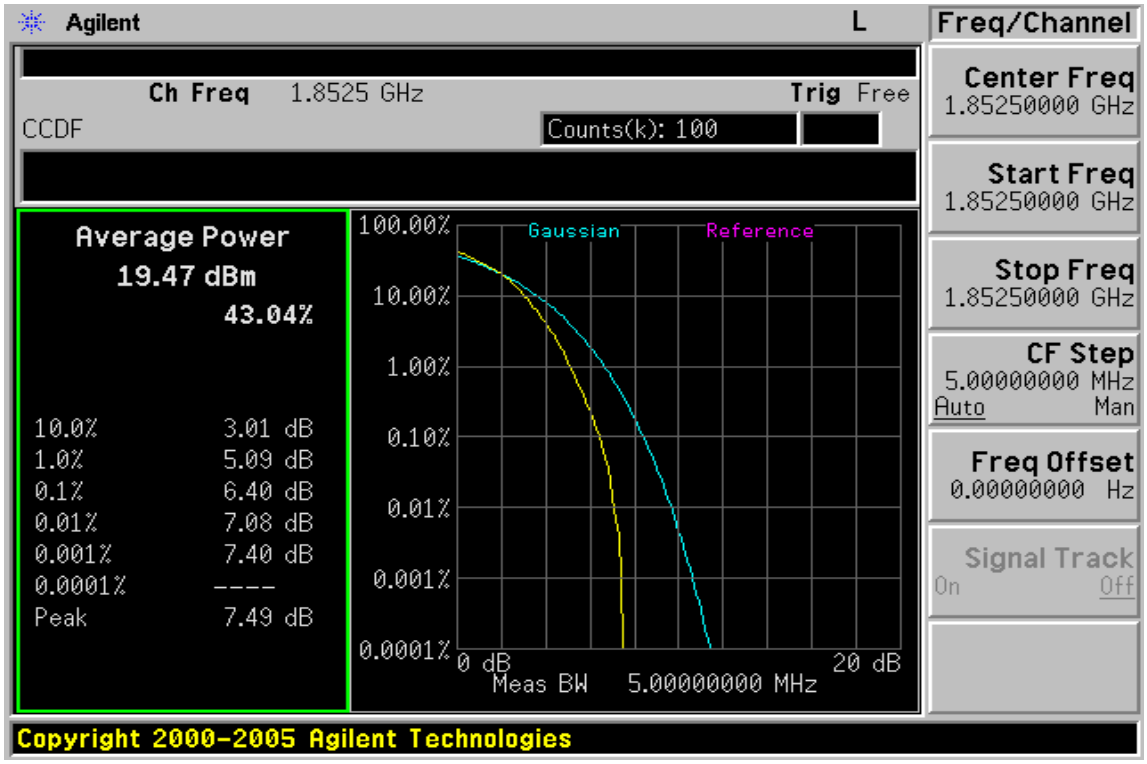
LTE BAND 4							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	Peak-to-Average Ratio (dB)		Frequency (MHz)	CH	Peak-to-Average Ratio (dB)	
		16QAM	LIMIT			16QAM	LIMIT
1712.5	19957	6.44	13	1715.0	20000	6.31	13
1732.5	20175	5.65	13	1732.5	20175	6.29	13
1752.5	20375	5.66	13	1750.0	20350	5.27	13

LTE BAND 4							
Channel bandwidth: 15MHz				Channel bandwidth: 20MHz			
Frequency (MHz)	CH	Peak-to-Average Ratio (dB)		Frequency (MHz)	CH	Peak-to-Average Ratio (dB)	
		16QAM	LIMIT			16QAM	LIMIT
1717.5	20025	6.70	13	1720.0	20050	6.98	13
1732.5	20175	6.65	13	1732.5	20175	6.97	13
1747.5	20325	6.55	13	1745.0	20300	7.03	13

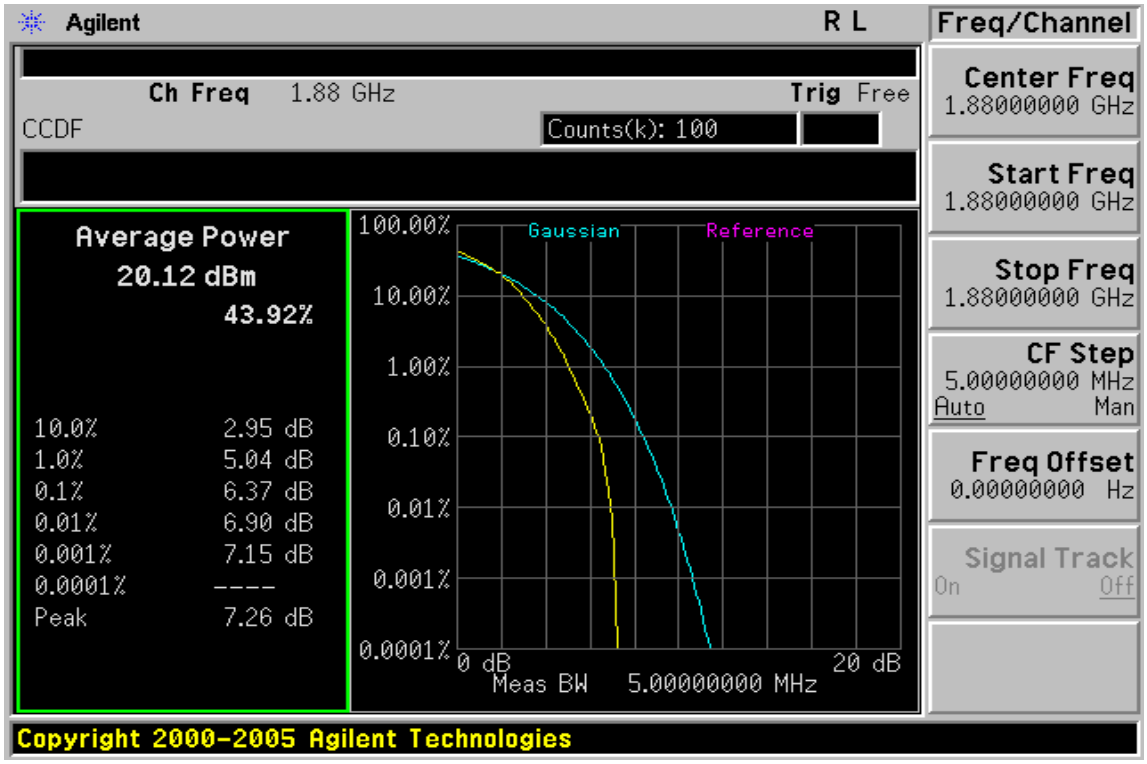
LTE BAND 13							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Frequency (MHz)	CH	Peak-to-Average Ratio (dB)		Frequency (MHz)	CH	Peak-to-Average Ratio (dB)	
		16QAM	LIMIT			16QAM	LIMIT
779.5	23205	6.10	13	23230	782	6.33	13
782.0	23230	6.16	13				
782.0	23255	6.27	13				

Measurement Results:

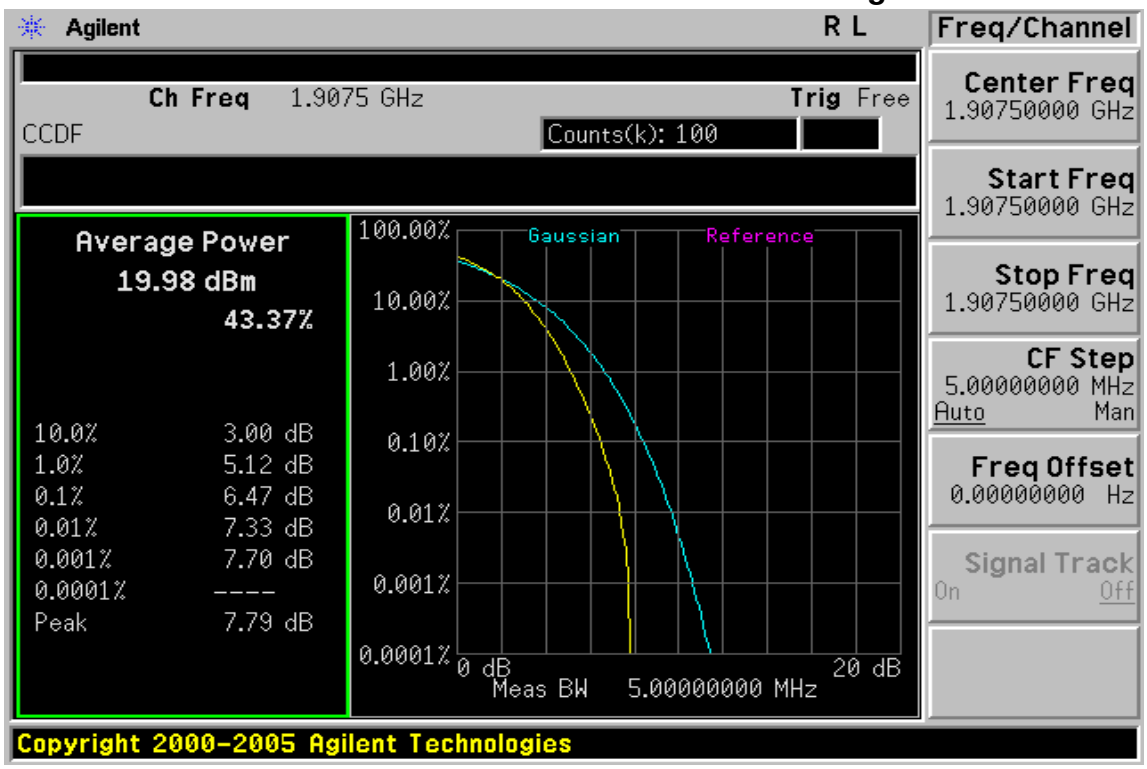
5MHz BW LTE-Band 2 16QAM Channel Low



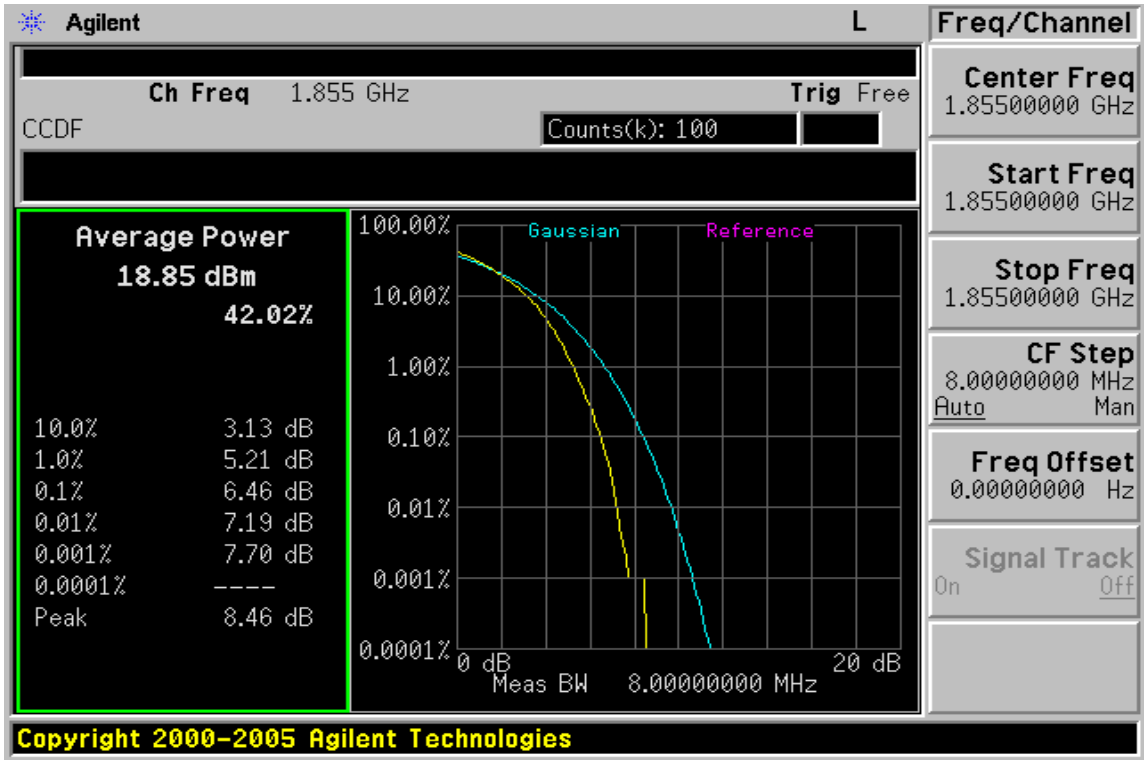
5MHz BW LTE-Band 2 16QAM Channel Mid



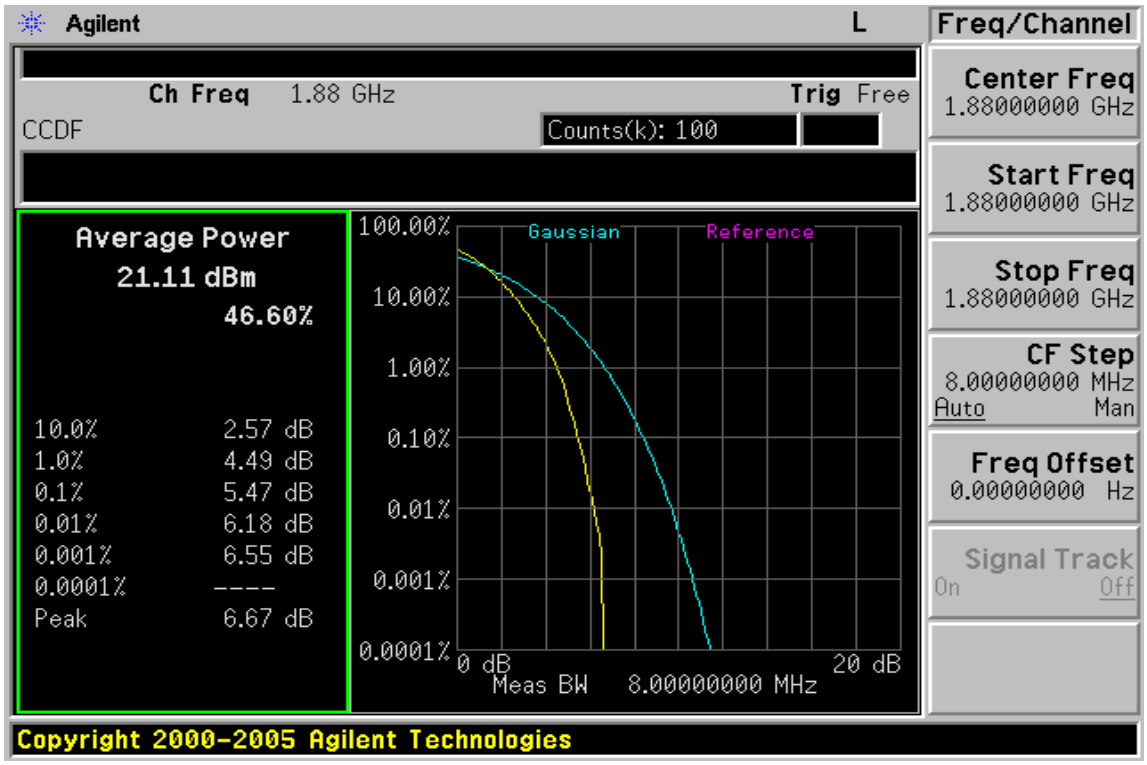
5MHz BW LTE-Band 2 16QAM Channel High



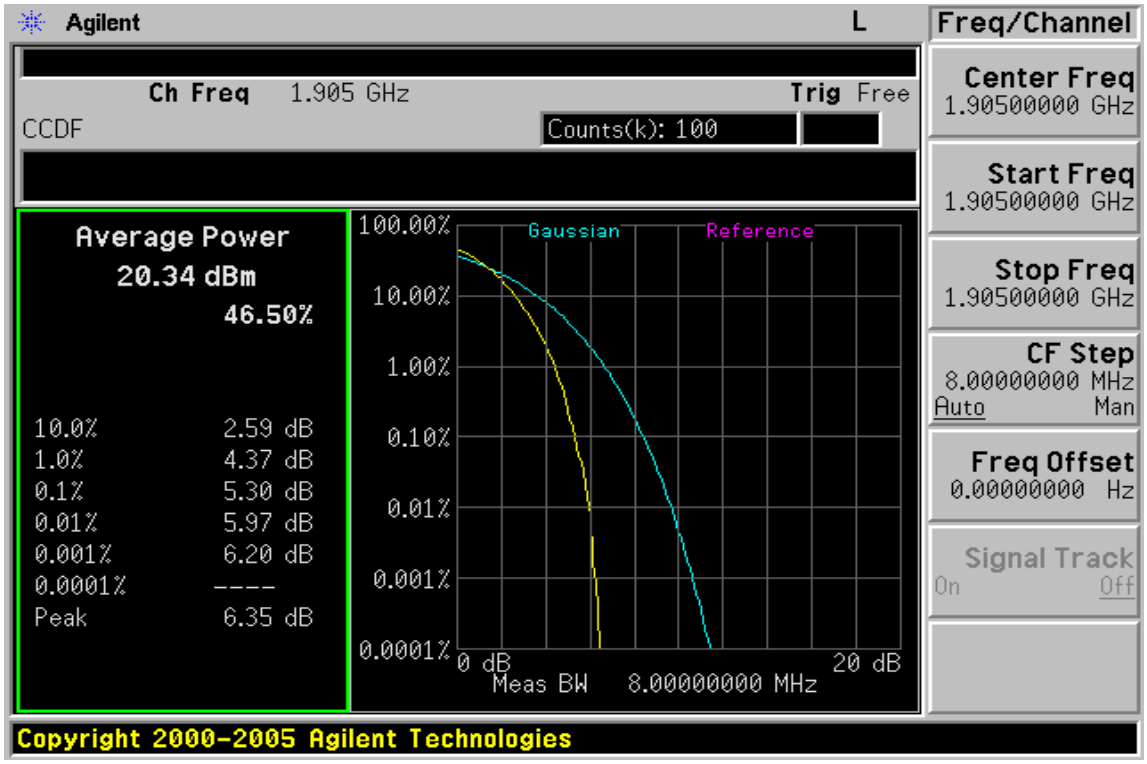
10MHz BW LTE-Band 2 16QAM Channel Low



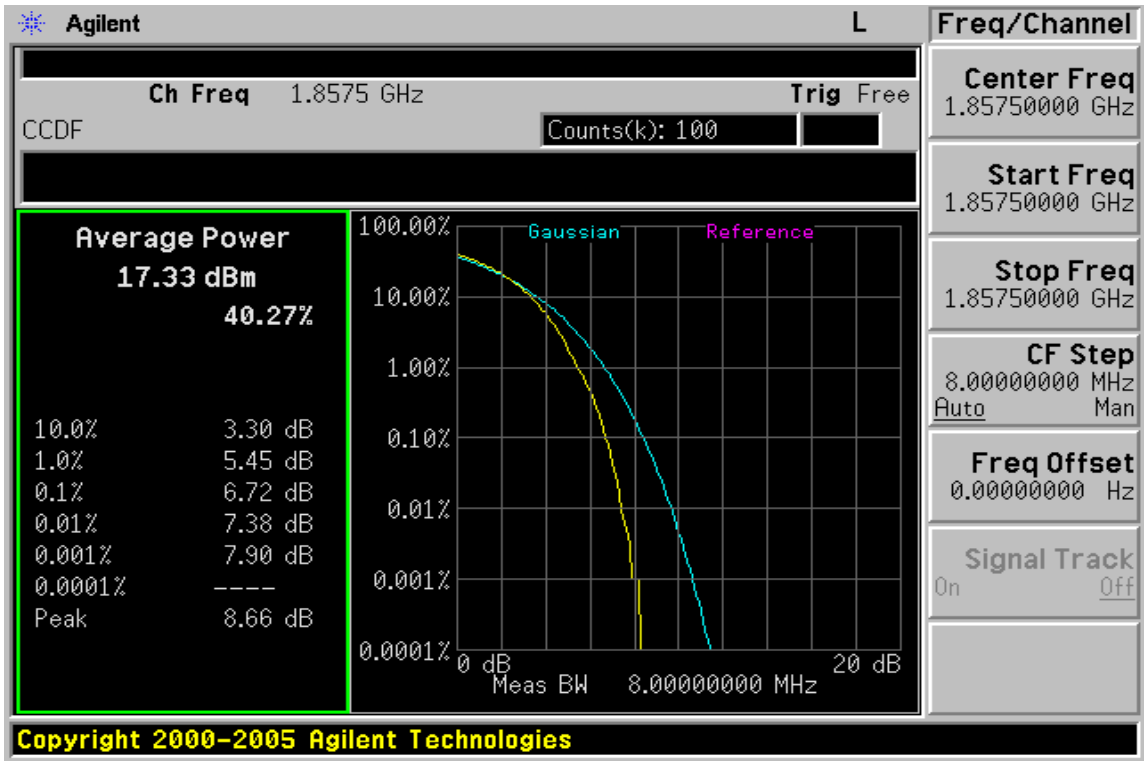
10MHz BW LTE-Band 2 16QAM Channel Mid



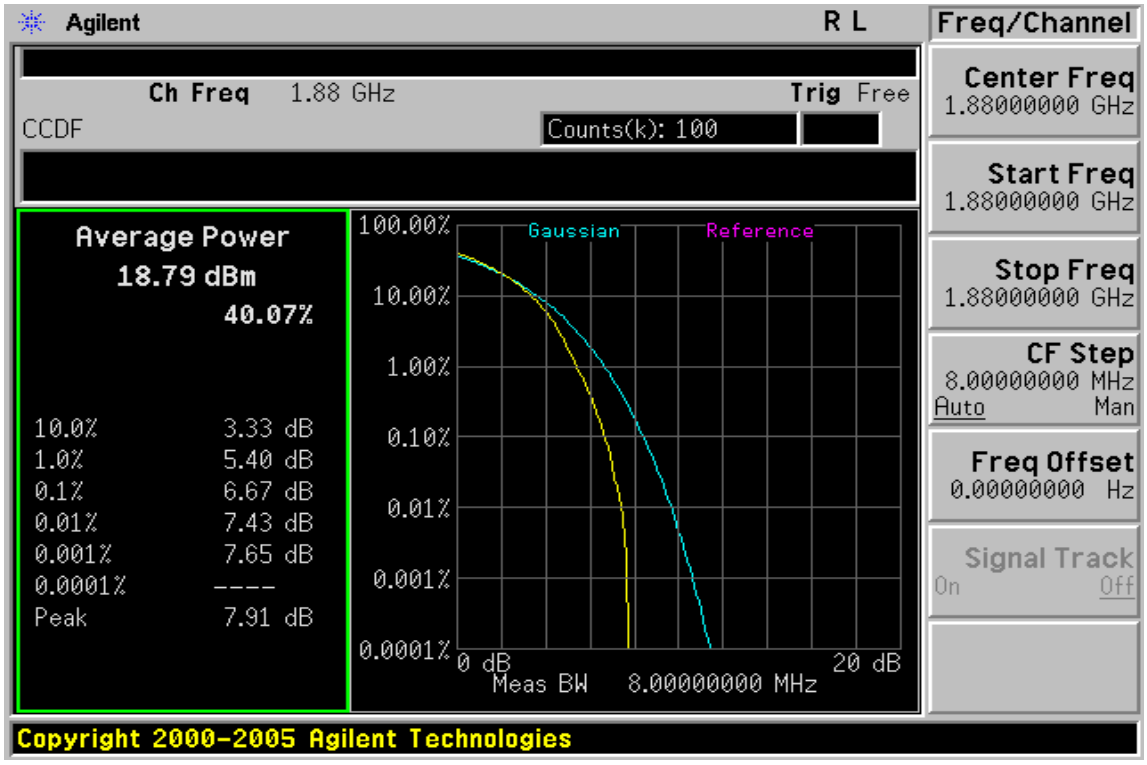
10MHz BW LTE-Band 2 16QAM Channel High



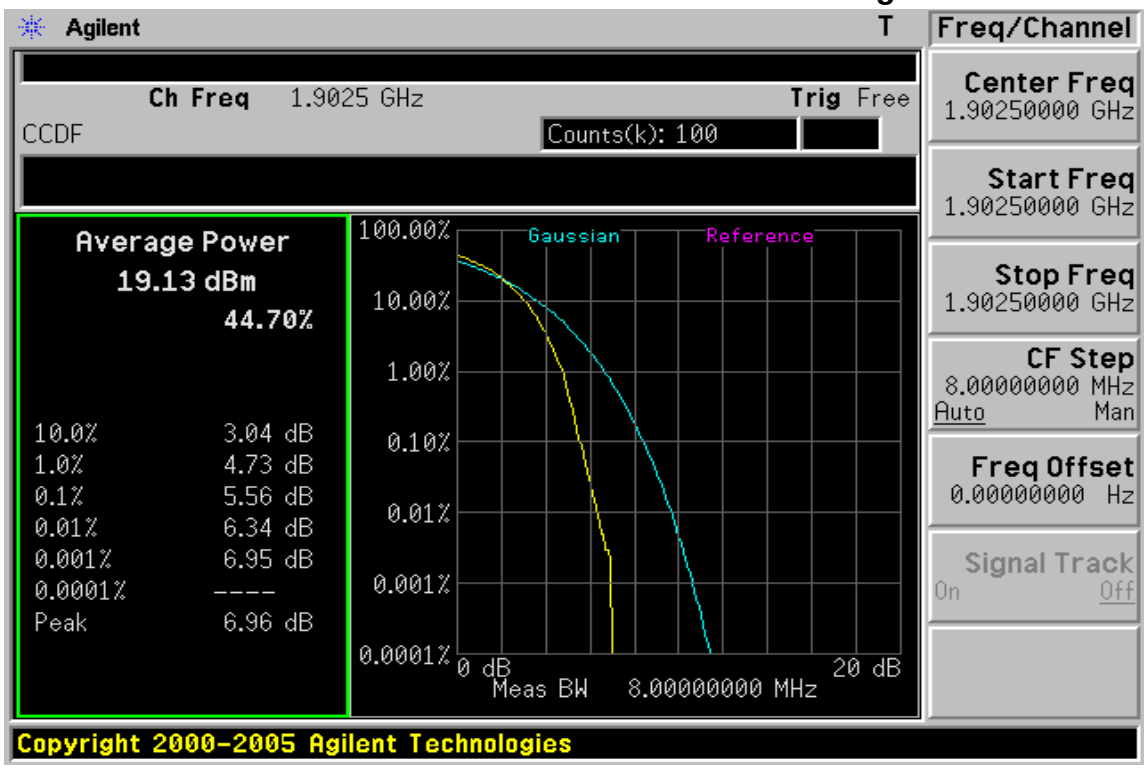
15MHz BW LTE-Band 2 16QAM Channel Low



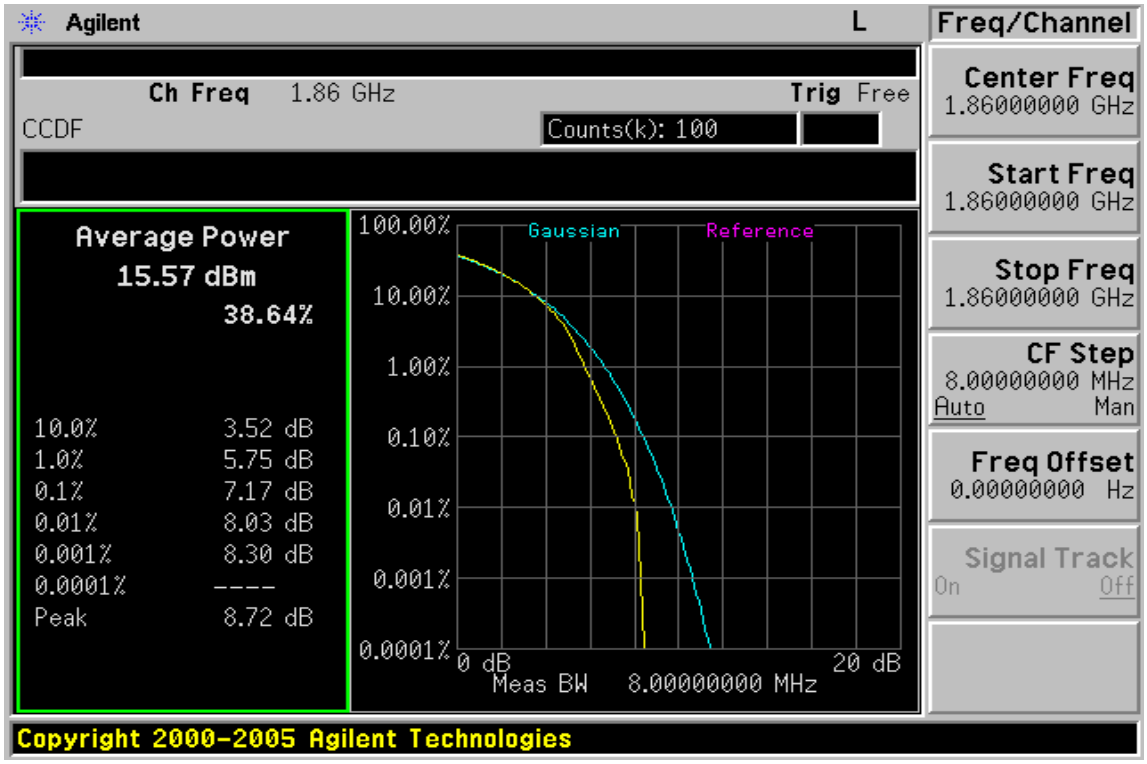
15MHz BW LTE-Band 2 16QAM Channel Mid



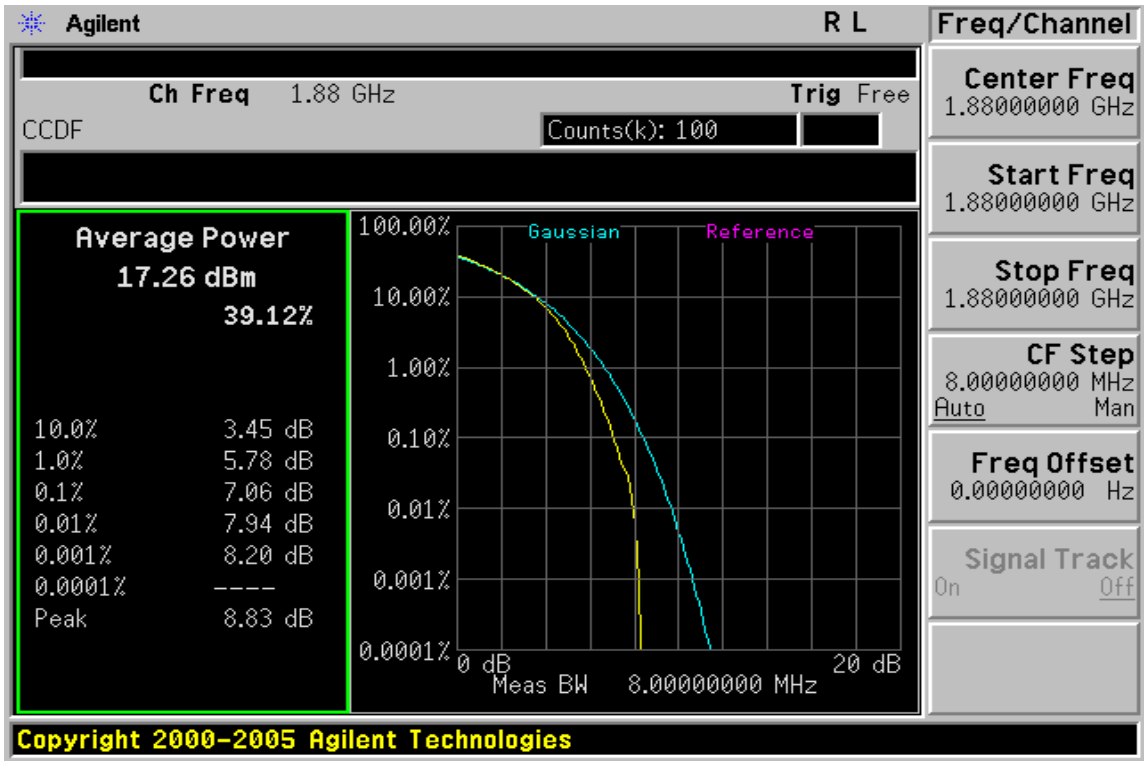
15MHz BW LTE-Band 2 16QAM Channel High



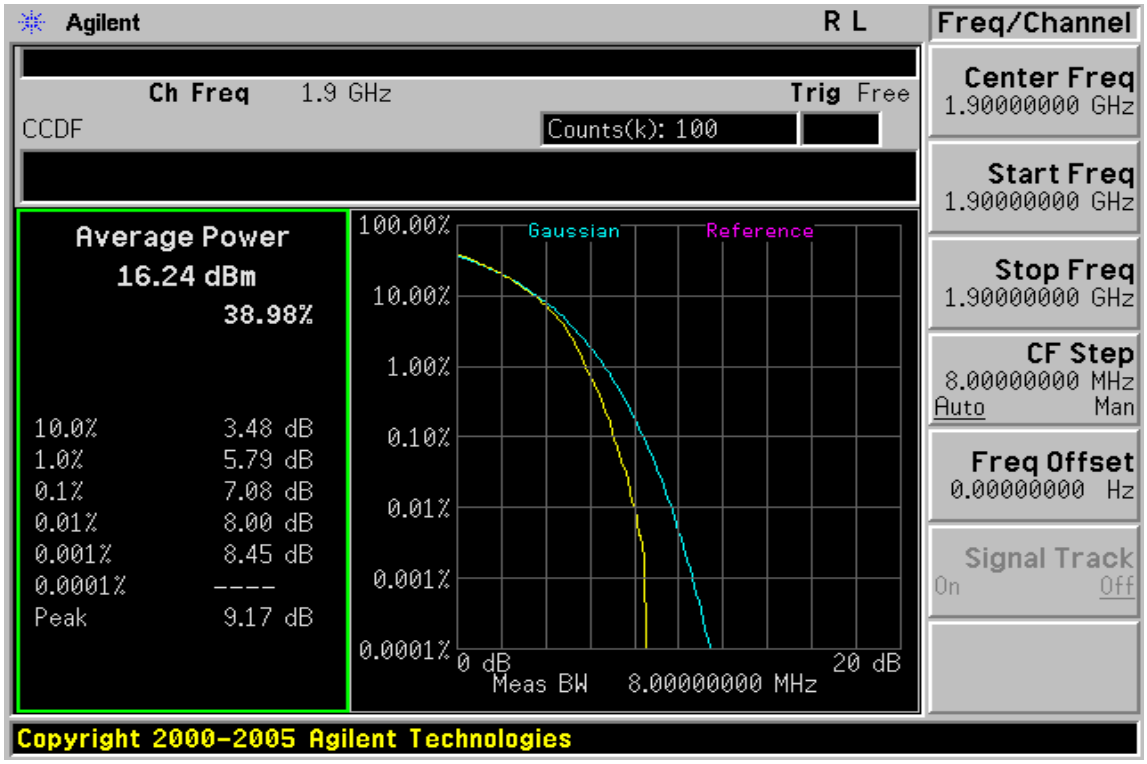
20MHz BW LTE-Band 2 16QAM Channel Low



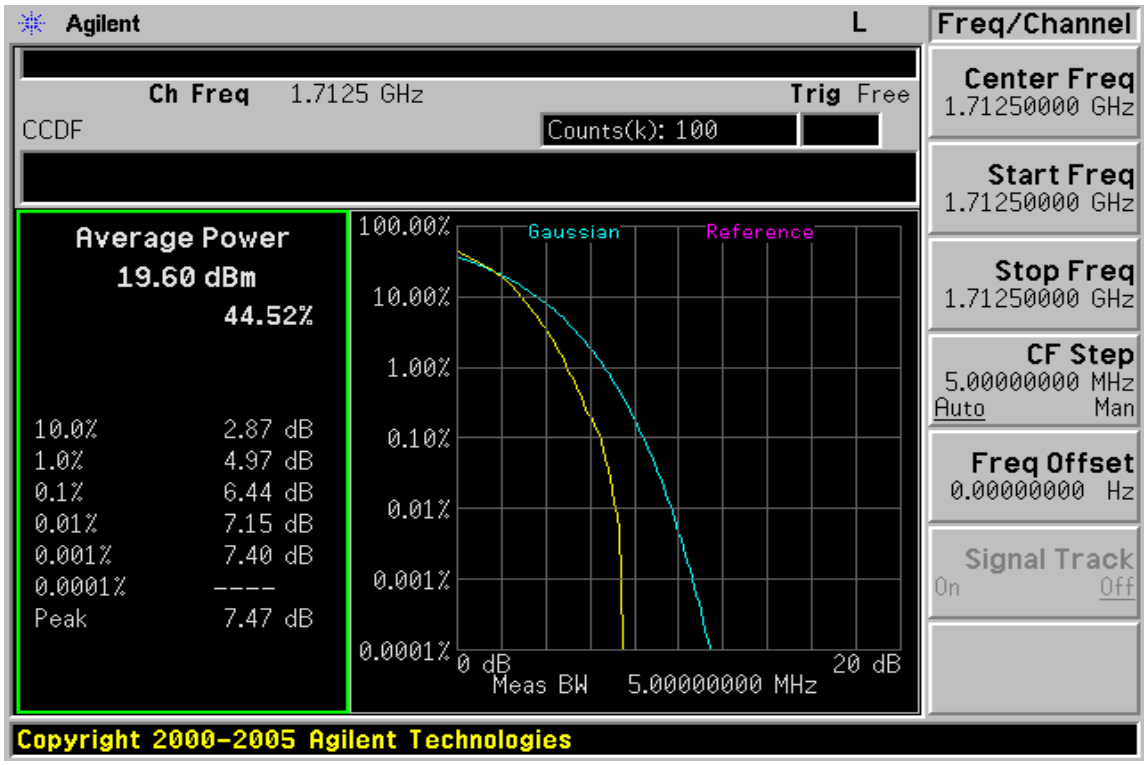
20MHz BW LTE-Band 2 16QAM Channel Mid



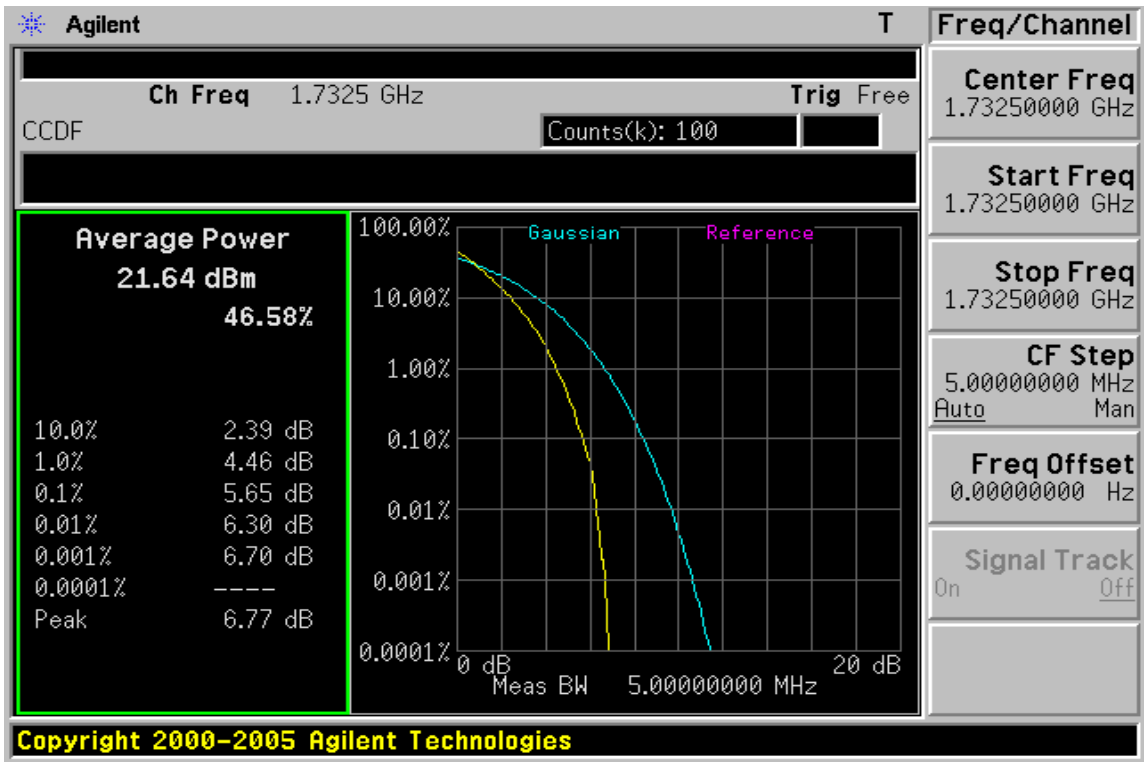
20MHz BW LTE-Band 2 16QAM Channel High



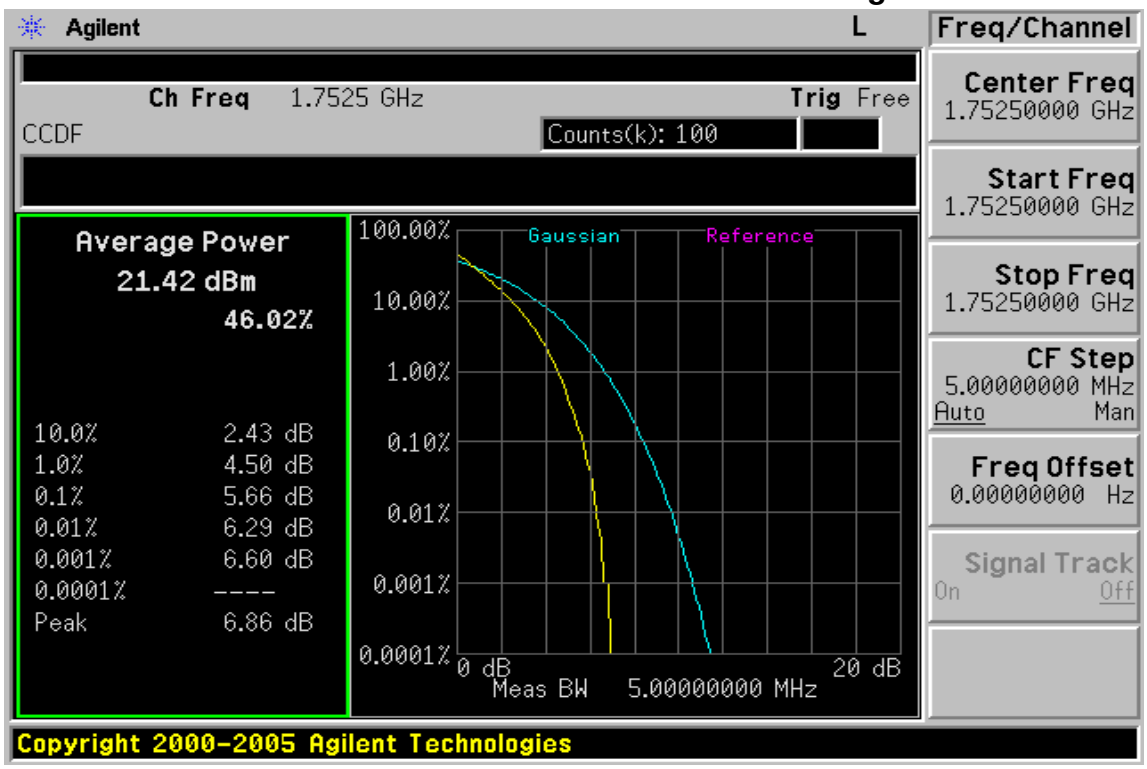
5MHz BW LTE-Band 4 16QAM Channel Low



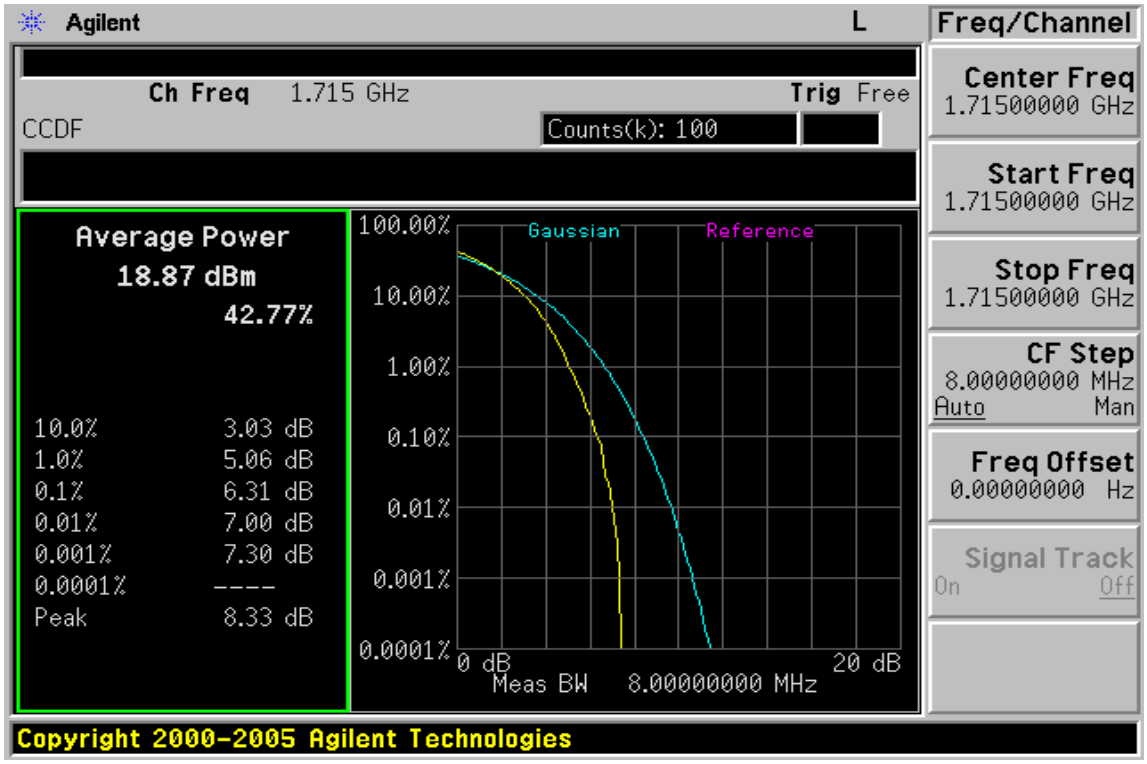
5MHz BW LTE-Band 4 16QAM Channel Mid



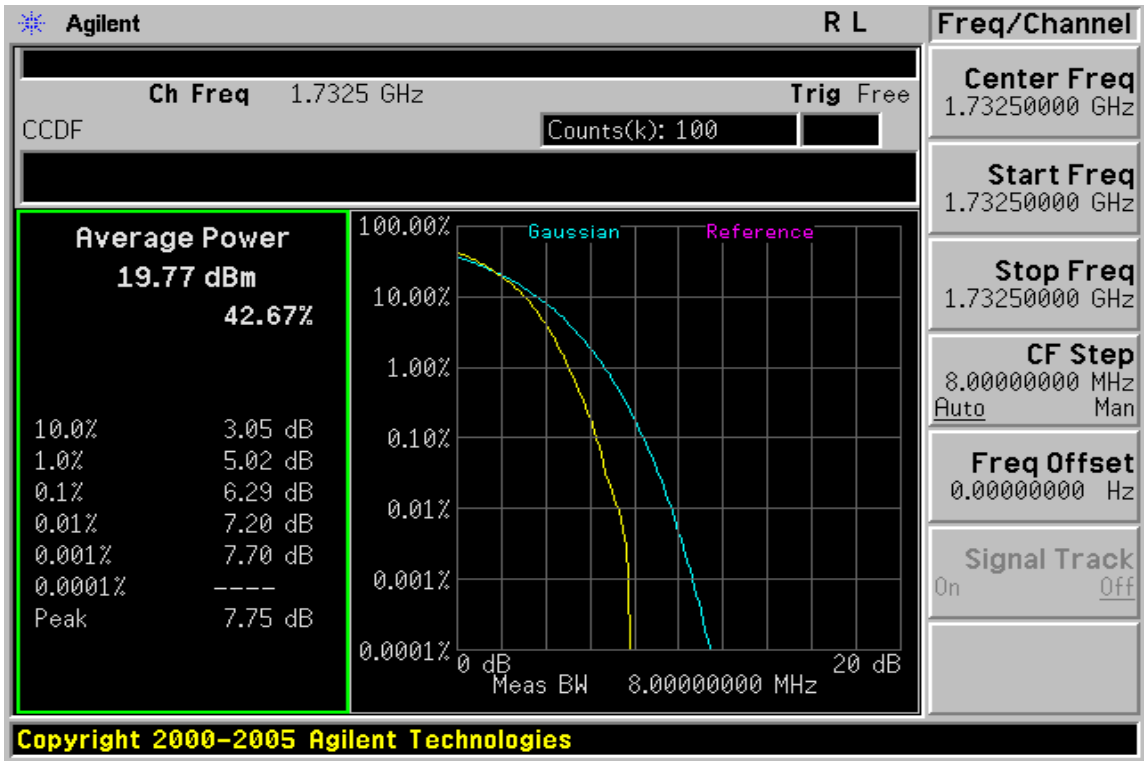
5MHz BW LTE-Band 4 16QAM Channel High



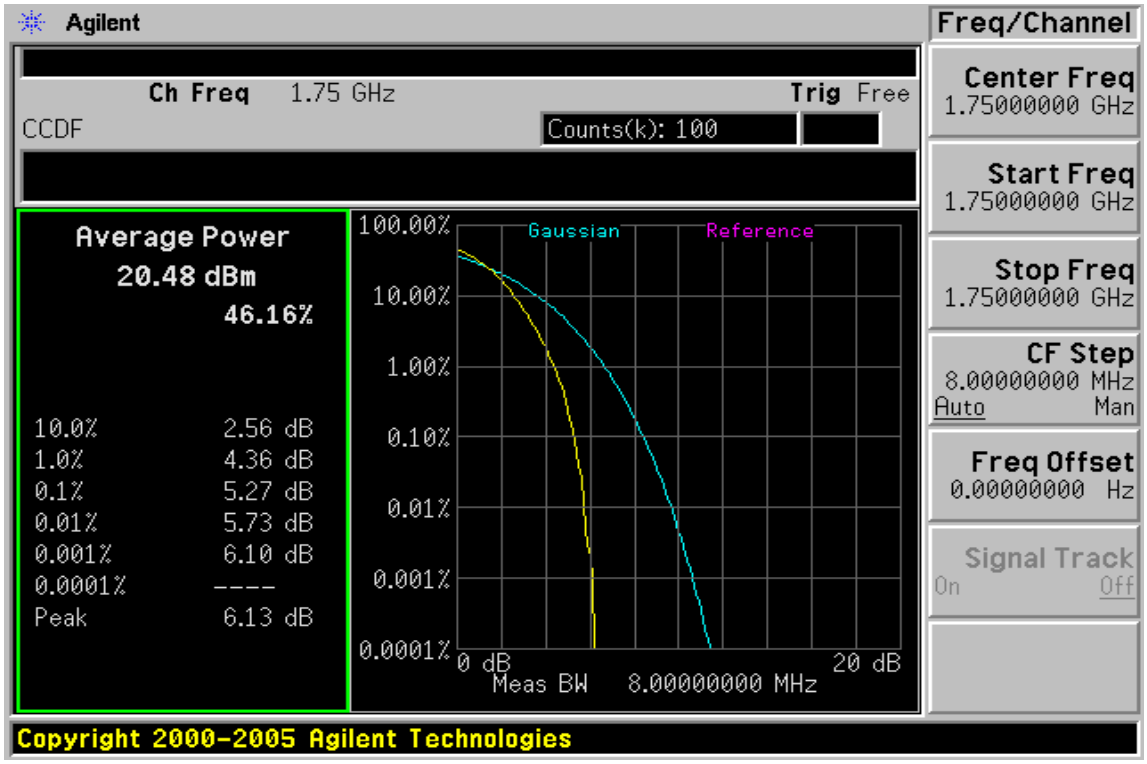
10MHz BW LTE-Band 4 16QAM Channel Low



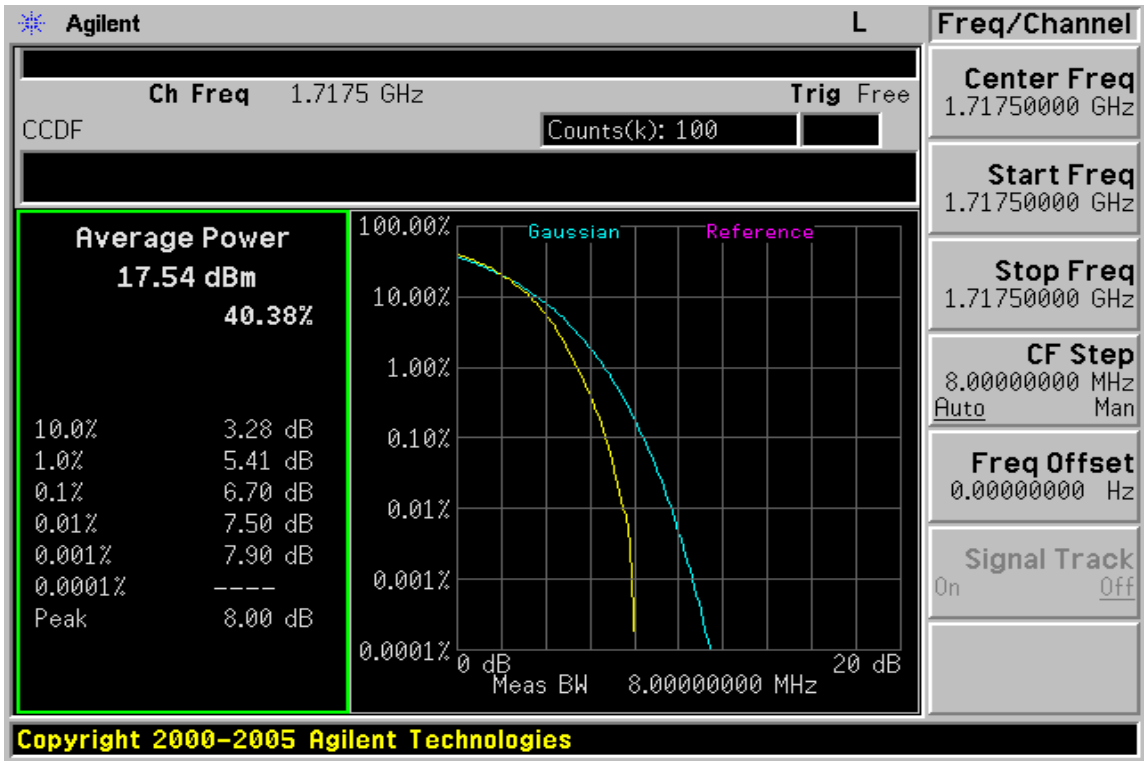
10MHz BW LTE-Band 4 16QAM Channel Mid



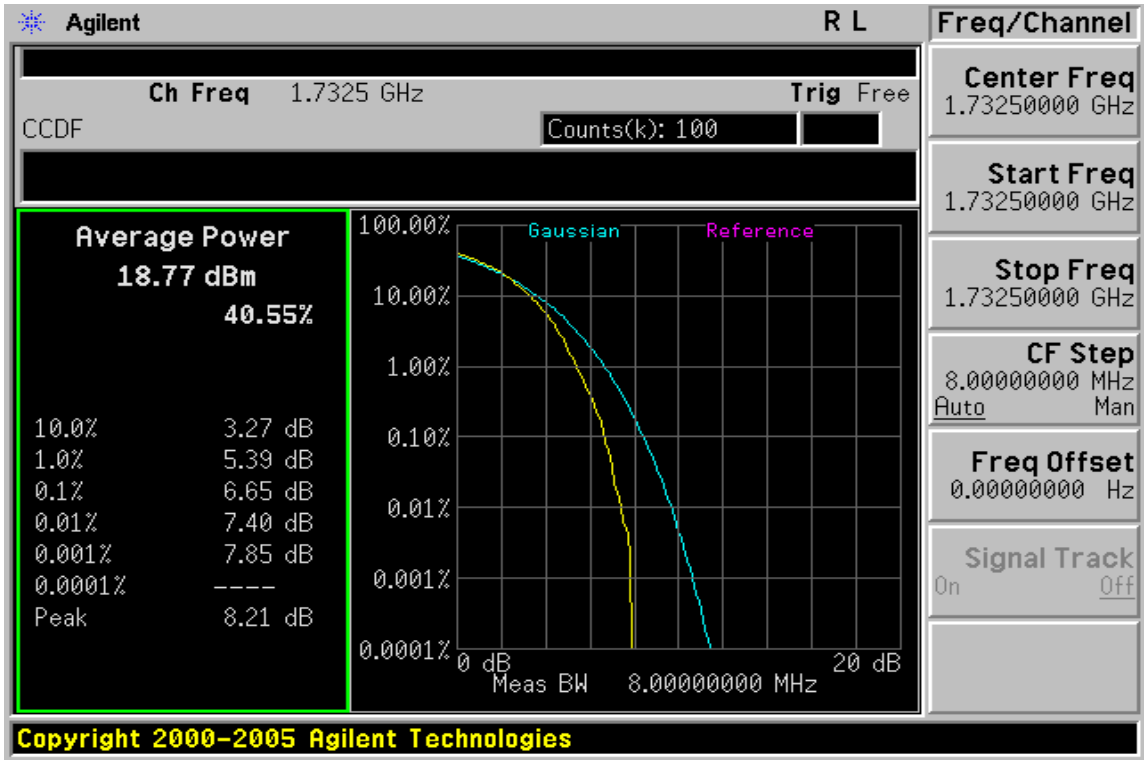
10MHz BW LTE-Band 4 16QAM Channel High



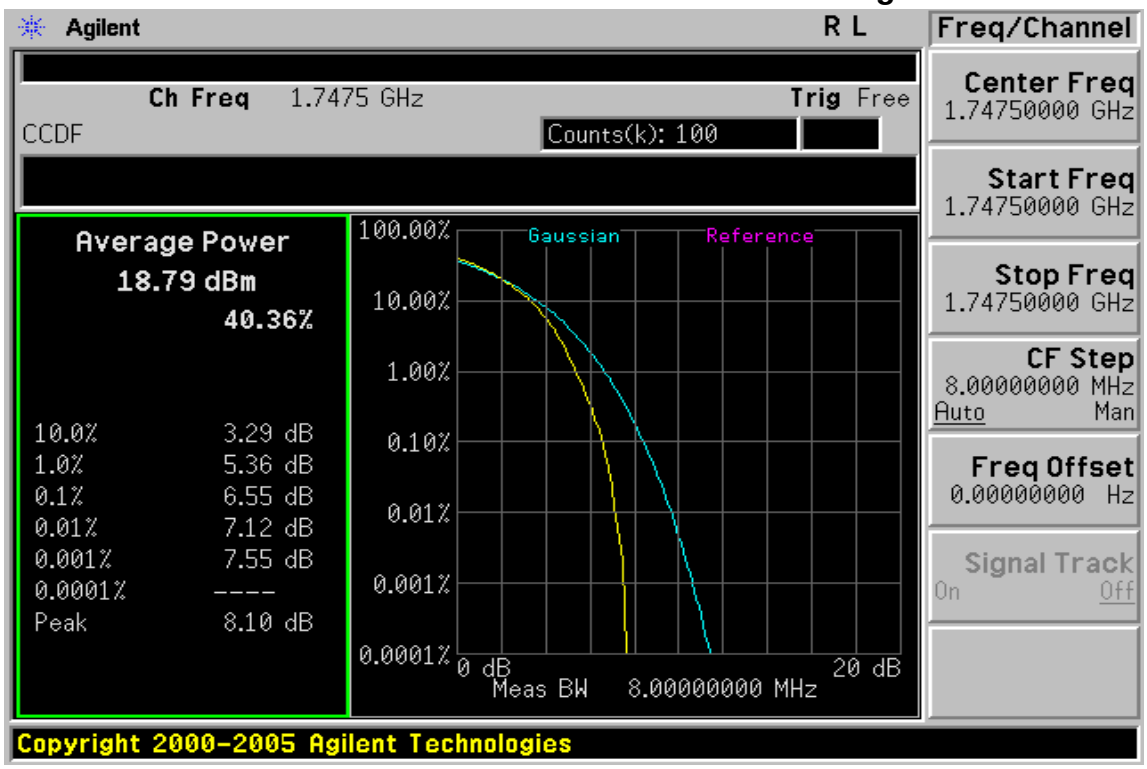
15MHz BW LTE-Band 4 16QAM Channel Low



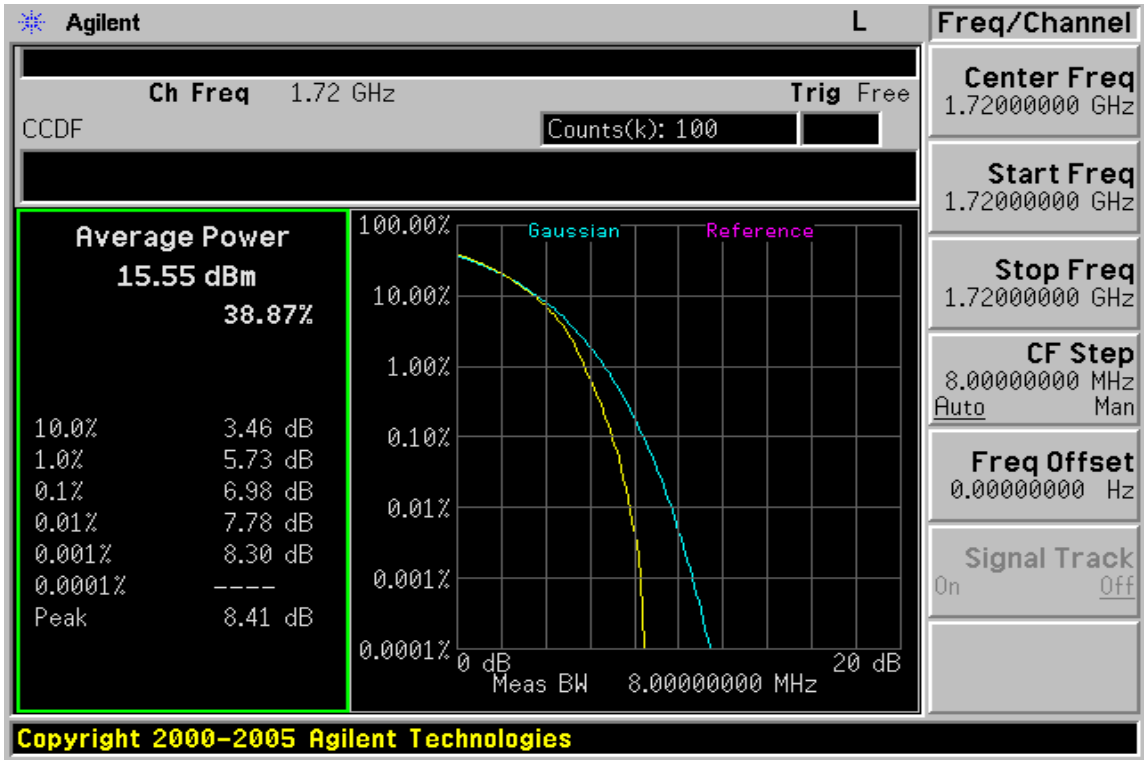
15MHz BW LTE-Band 4 16QAM Channel Mid



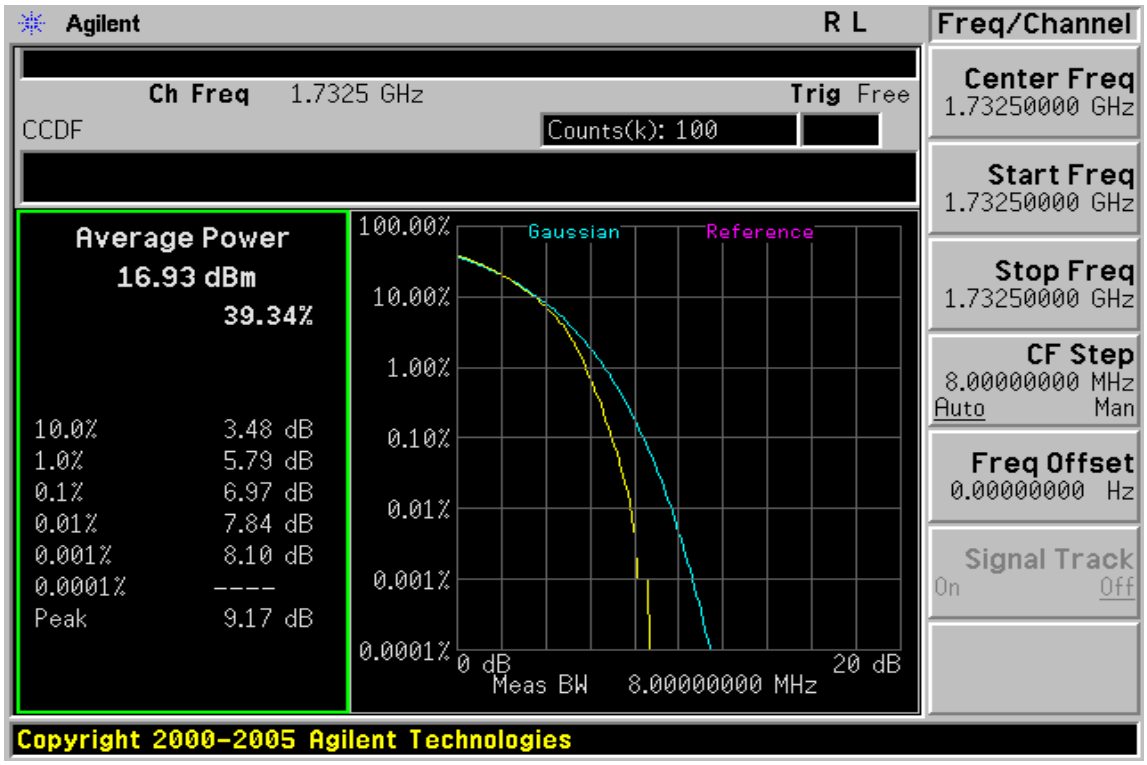
15MHz BW LTE-Band 4 16QAM Channel High



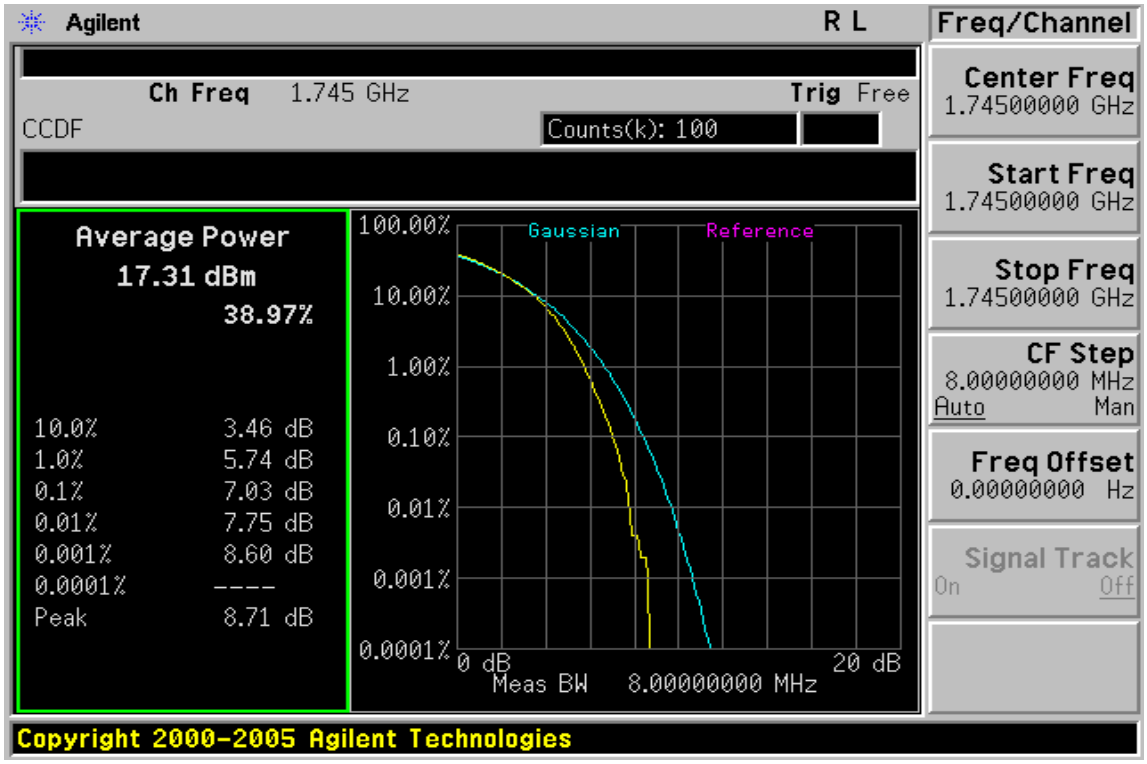
20MHz BW LTE-Band 4 16QAM Channel Low



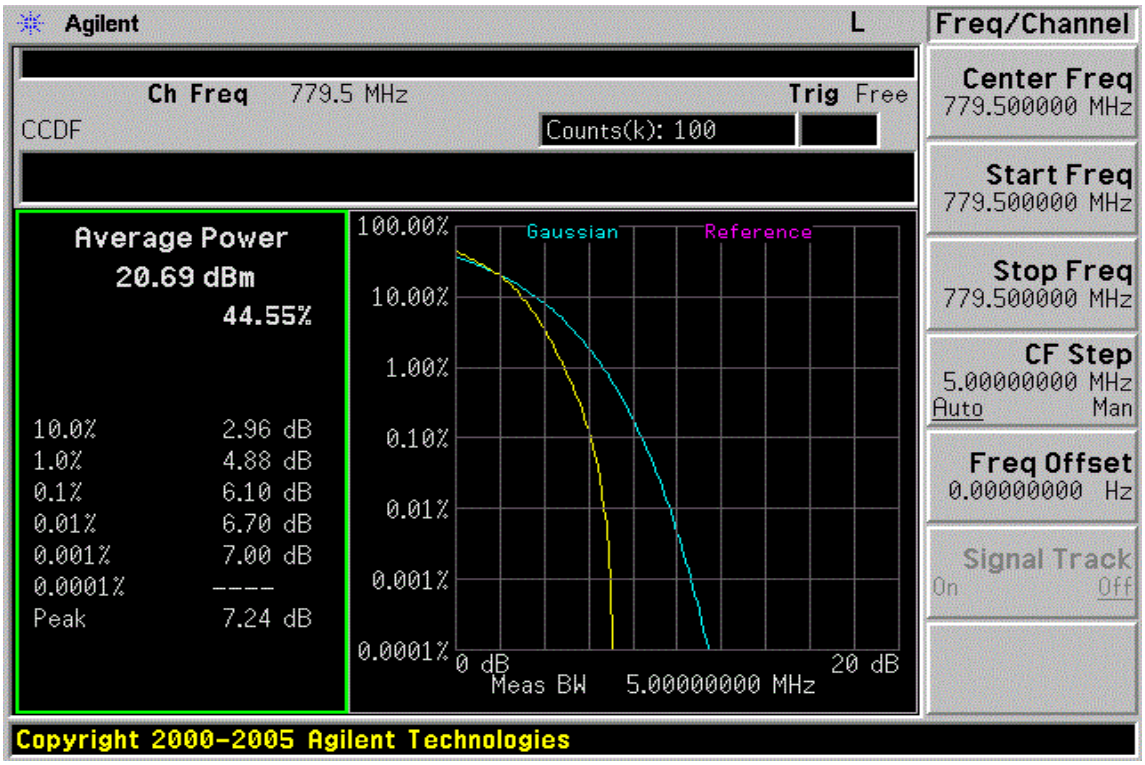
20MHz BW LTE-Band 4 16QAM Channel Mid



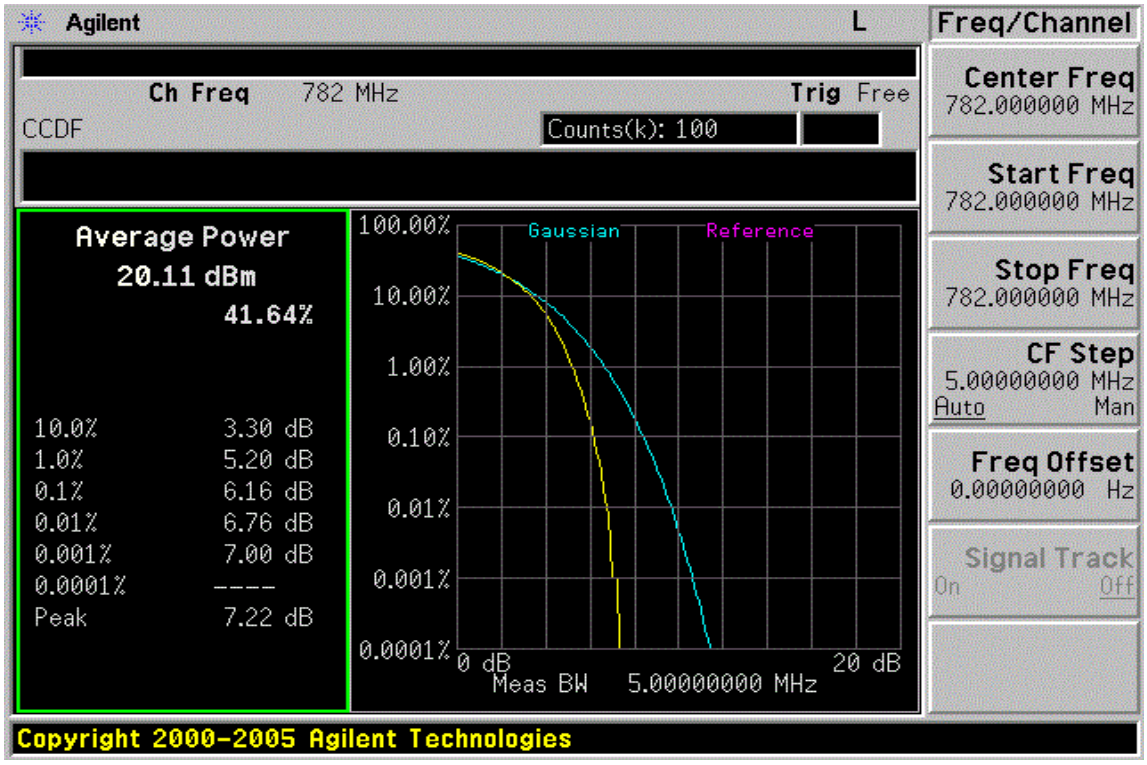
20MHz BW LTE-Band 4 16QAM Channel High



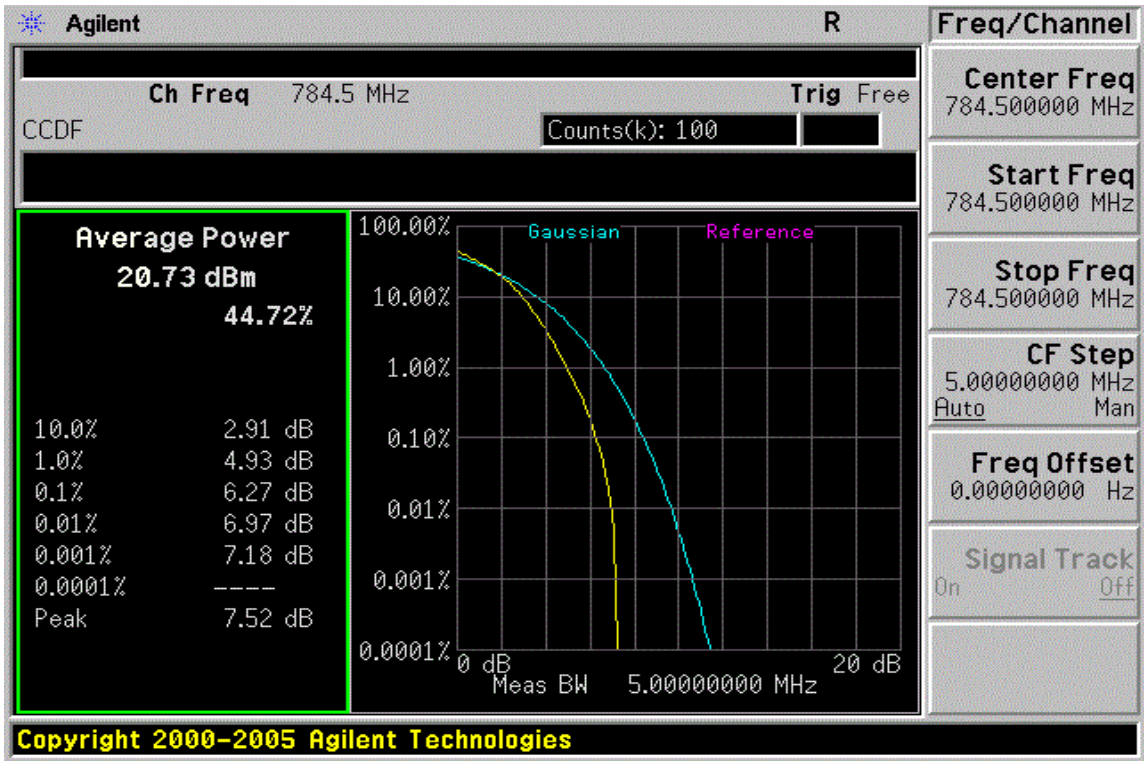
5MHz BW LTE-Band 13 16QAM Channel Low



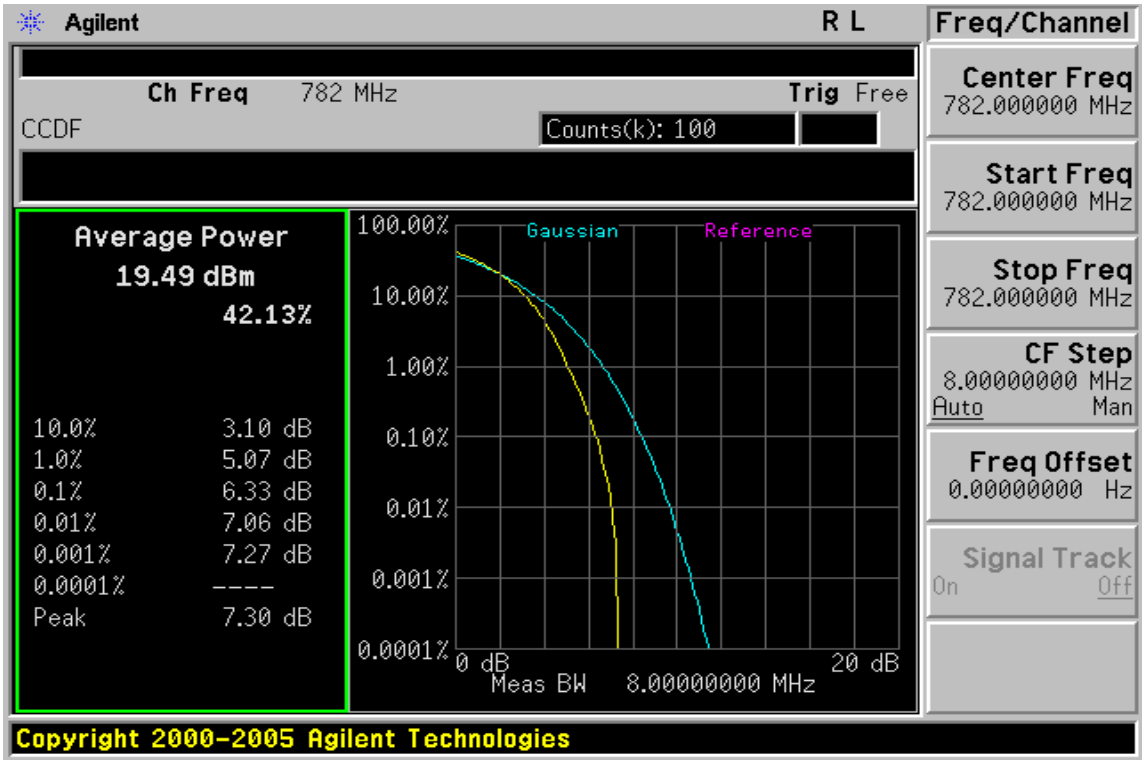
5MHz BW LTE-Band 13 16QAM Channel Mid



5MHz BW LTE-Band 13 16QAM Channel High



10MHz BW LTE-Band 13 16QAM Channel Mid



~ End of Report ~