

FCC Test Report

(Part 22&24)

Product Name : LTE Router
Model No : WLD71-T3
FCC ID : NKR-WLD71-T3A

Applicant : Wistron NeWeb Corporation

Address : 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

Date of Receipt : 2016/10/28
Issued Date : 2017/03/07
Report No. : 1720437R-HPUSP17V00
Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issued Date : 2017/03/07

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Product Name : LTE Router

Applicant : Wistron NeWeb Corporation

Address : 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

Manufacturer : WNC

Trade Name : WNC

Model No. : WLD71-T3

EUT Rated Voltage : DC 12V

EUT Test Voltage : AC 120V/60Hz

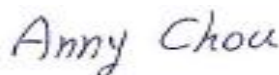
Measurement Standard : FCC CFR Title 47 Part 2 22 24

Measurement : TIA/EIA 603-D 2010

Reference : KDB 971168 D01V02r02

Test Result : Complied

Documented By :



(Adm. Specialist / Anny Chou)

Tested By :



(Senior Engineer / Vorana Chen)

Approved By :



(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	LTE Router
Model No.	WLD71-T3
Trade Name	WNC
IMEI No.	35526808
FCC ID	NKR-WLD71-T3A
TX Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band 2: 1852.4 MHz ~ 1907.6 MHz WCDMA Band 5: 826.4 MHz ~ 846.6 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band 2: 1932.4 MHz ~ 1987.6 MHz WCDMA Band 5: 871.4 MHz ~ 891.6 MHz
Type of modulation	GPRS: GMSK; EGPRS: GMSK / 8PSK WCDMA: QPSK (Uplink); HSDPA: QPSK (Uplink); HSUPA: QPSK (Uplink)
HW Version	48WLD711.0GAPAL
SW Version	AR_WLD71-T3_v2.0 MPSS:M18QW_v07.05
Antenna Type	Inverted-F Antenna (Internal Antenna) Dipole Antenna (External Antenna)

1.2. Antenna List

No	Manufacturer	Part No	Antenna Type	Peak Gain
1	WNC	3AWLD7501S1-111 (WWAN Main)	Inverted-F Antenna (Internal Antenna)	1.90 dBi for 824-894 MHz 3.10 dBi for 1710-2170 MHz
2	WNC	3AWLD7501S1-111 (WWAN Diversity)	Inverted-F Antenna (Internal Antenna)	1.50 dBi for 824-894 MHz 3.00 dBi for 1710-2170 MHz
3	WIESON	GY115HT0330-027 (WWAN Main)	Dipole Antenna (External Antenna)	2.78 dBi for 698-960 MHz 2.16 dBi for 1710-2170 MHz
4	WIESON	GY115HT0330-027 (WWAN Diversity)	Dipole Antenna (External Antenna)	2.78 dBi for 698-960 MHz 2.16 dBi for 1710-2170 MHz

1.3. Operational Description

The information contained within this report is intended to show verification of compliance of the 850/1900MHz to the requirements of FCC 47 CFR Part 2, 22, 24

The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator.

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined

as:

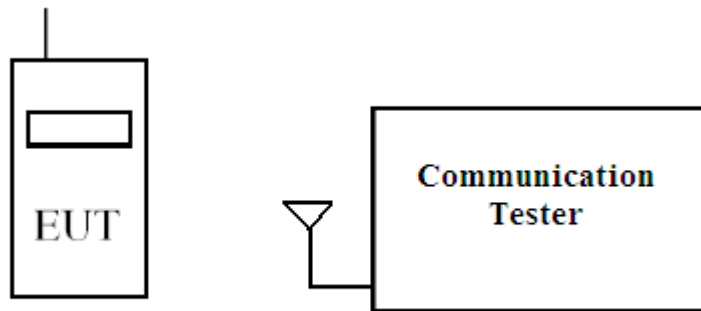
Test Mode:	GSM 850 VOICE
	GSM 850 GPRS
	GSM 850 EGPRS
	PCS 1900 VOICE
	PCS 1900 GPRS
	PCS 1900 EGPRS
	WCDMA BAND 2 (VOICE/RMC/HSDPA/HSUPA)
	WCDMA BAND 5 (VOICE/RMC/HSDPA/HSUPA)

Note:

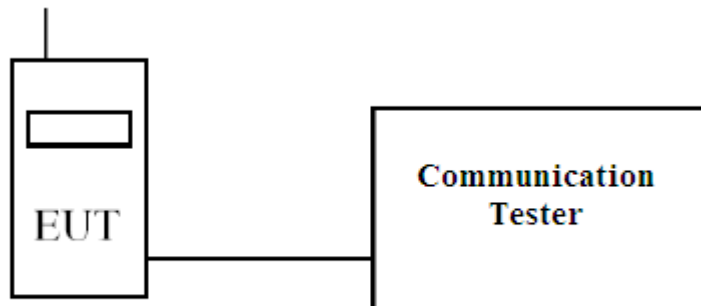
The maximum power levels are GPRS class8 mode for GSM 850/1900, EGPRS class8 mode for GSM 850/1900, RMC 12.2K mode for WCDMA Band 2/5, only these modes were used for all tests.

1.4. Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.5. EUT Setup Procedures

- (1) Setup the EUT and simulators as shown on 1.3
- (2) Turn on the power of all equipments.
- (3) The EUT was set to communicate with communication tester.
- (4) Repeat the above procedure (3).

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	22.7
Humidity (%RH)	25-75	48
Barometric pressure (mbar)	860-1060	982

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
FCC Registration Number :92195

Site Name: DEKRA Testing and Certification Co., Ltd

Lin Kou Laboratory:
No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW1014

1.7. Type of Emission

System	Type of modulation	Emission Designator
GSM850 GPRS class 12	GMSK	251KGXW
GSM850 EGPRS class 12	8PSK	250KG7W
GSM1900 GPRS class 12	GMSK	244KGXW
GSM1900 EGPRS class 12	8PSK	246KG7W
WCDMA Band 2 RMC 12.2kbps	QPSK	4M14F9W
WCDMA Band 5 RMC 12.2kbps	QPSK	4M15F9W

1.8. Voltages and DC currents

GSM 850 GPRS	
EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.072A
EUT Standby :	AC voltage : 120V , AC current : 0.032A
GSM 850 EGPRS	
EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.046A
EUT Standby :	AC voltage : 120V , AC current : 0.032A
PCS 1900 GPRS	
EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.070A
EUT Standby :	AC voltage : 120V , AC current : 0.032A
PCS 1900 EGPRS	
EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.042A
EUT Standby :	AC voltage : 120V , AC current : 0.032A
WCDMA Band 2 RMC 12.2K	
EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.095A
EUT Standby :	AC voltage : 120V , AC current : 0.033A
WCDMA Band 5 RMC 12.2K	
EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.086A
EUT Standby :	AC voltage : 120V , AC current : 0.032A

2. Technical Test

2.1. Summary of test result

Standard	Test Item	Result	Note
2.1046	Conducted Output Power	Pass	
22.913(a)			
24.232(c)			
2.1049	Occupied Bandwidth	Pass	
22.917(a)			
24.238(b)			
2.1051	Spurious Emission at Antenna Terminals	Pass	
22.917(a)			
24.238(a)			
2.1051	Conducted Emission	Pass	
22.917(a)			
24.238(a)			
2.1053	Field Strength of Spurious Radiation	Pass	
22.917(a)			
24.238(a)			
2.1055	Frequency Stability for Temperature & Voltage	Pass	
22.355			
24.235			
24.232	Peak to Average Ratio	Pass	

2.2. List of test Equipment

Conducted /CTR

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY52220597	2016/02/18
Directional coupler	Agilent	87300C	MY44300353	2016/12/04
Directional coupler	Agilent	778D-012	50550	2016/11/08
Standard Temperature & Humidity Chamber	WIT	TH-1S-B	EQ-201-00146	2016/11/28
DC power supply	Agilent	E3610A	MY40009845	2016/07/14
Communication Tester	R&S	CMU200	104846	2016/07/07

Radiated / Site3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2707	2016/05/25
Horn Antenna	R&S	9120D	867	2016/04/14
Pre-Amplifier	Agilent	87405C	MY47010653	2016/08/11
Spectrum Analyzer	Agilent	N9010A	MY54510357	2016/04/13
Communication Tester	R&S	CMU200	104846	2016/07/07

2.3. Measurement Uncertainty

Conducted Emission

The measurement uncertainty of confidence of 95% is evaluated as ± 1.52 dB

Radiated Emission (Below 1GHz)

The measurement uncertainty of confidence of 95% is evaluated as ± 3.44 dB .

Radiated Emission (Above 1GHz)

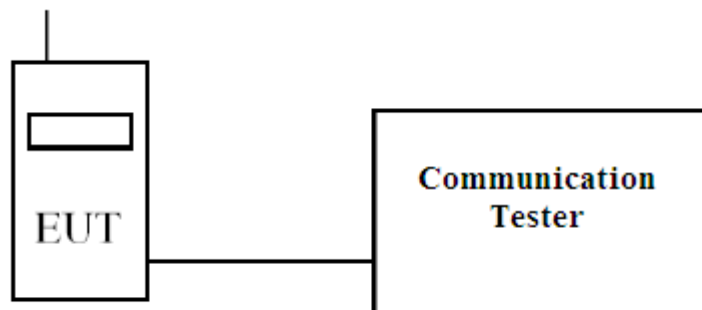
The measurement uncertainty of confidence of 95% is evaluated as ± 4.08 dB

3. Conducted Output Power Measurement

3.1. Test Specification

According to Part 2.1046, 22.913, 24.232

3.2. Test Setup



3.3. Limits

Band	Limit
850	<7W
1900	<2W
AWS(1700)	<1W

3.4. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the output power was measured at the antenna terminals of the EUT.

3.5. Test Result of Maximum Power Output

Product	LTE Router		
Test Mode	RF Output Power (Conducted)		
Date of Test	2016/12/03	Test Site	CTR

Band	GSM 850				GSM 1900			
CHANNEL	128	189	251		512	661	810	
VOICE	32.26	32.40	32.42		29.88	29.87	29.52	
GPRS Class 8	32.26	32.36	32.43		29.89	29.83	29.58	
GPRS Class 10	32.14	32.20	32.25		29.64	29.60	29.61	
GPRS Class 11	31.97	32.07	32.05		29.77	29.68	29.43	
GPRS Class 12	31.81	32.39	32.36		29.47	29.39	29.02	
EGPRS Class 8	26.16	26.16	26.17		25.54	25.46	25.29	
EGPRS Class 10	26.07	26.02	26.09		25.52	25.34	25.21	
EGPRS Class 11	26.00	26.00	26.01		25.37	25.33	25.04	
EGPRS Class 12	25.89	25.92	25.96		25.28	25.10	24.97	
Maximum Power	GPRS	32.43	EGPRS	26.17	GPRS	29.89	EGPRS	25.54
Antenna Gain	2.78 dBi				3.10 dBi			
ERP/EIRP (W)	GPRS	2.0230	EGPRS	0.4786	GPRS	1.9907	EGPRS	0.7311
Note: Unit : dBm 2. ERP/EIRP(W)= Conducted Power + Antenna Gain								

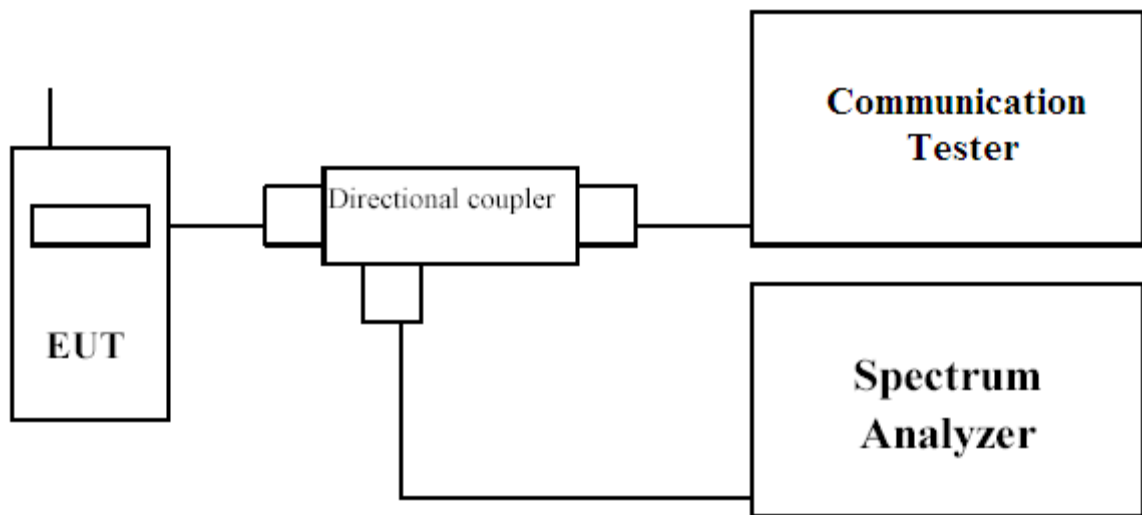
Band	WCDMA Band 2			WCDMA Band 5		
CHANNEL	9262	9400	9538	4132	4183	4233
VOICE	23.14	23.17	23.35	23.03	22.90	22.87
RMC	23.41	23.12	23.19	23.14	22.76	22.71
HSDPA Set 1	22.55	22.31	22.42	21.98	21.88	21.85
HSDPA Set 2	22.15	21.83	22.09	21.76	21.51	21.47
HSDPA Set 3	22.05	21.83	22.05	21.72	21.64	21.67
HSDPA Set 4	22.03	21.83	22.05	21.78	21.53	21.60
HSUPA Set 1	21.55	21.72	22.27	22.04	21.89	21.36
HSUPA Set 2	21.24	21.15	20.76	20.89	20.78	20.74
HSUPA Set 3	20.96	20.75	20.64	21.03	20.93	20.59
HSUPA Set 4	21.37	21.37	21.11	21.04	20.95	21.28
HSUPA Set 5	21.57	21.30	21.82	21.96	21.13	21.22
Maximum Power	23.41	23.17	23.35	23.14	22.90	22.87
Antenna Gain	3.10 dBi			2.78 dBi		
ERP/EIRP (W)	0.4477	0.4236	0.4416	0.2382	0.2254	0.2239
Note: Unit : dBm 2. ERP/EIRP(W)= Conducted Power + Antenna Gain						

4. Occupied Bandwidth

4.1. Test Specification

According to Part 2.1049, 22.917, 24.238

4.2. Test Setup



4.3. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the occupied bandwidth was measured at the antenna terminals of the EUT.

The Resolution BW of the analyzer is set to 1 % of the emission bandwidth. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The plots below show the resultant display from the Spectrum Analyzer.

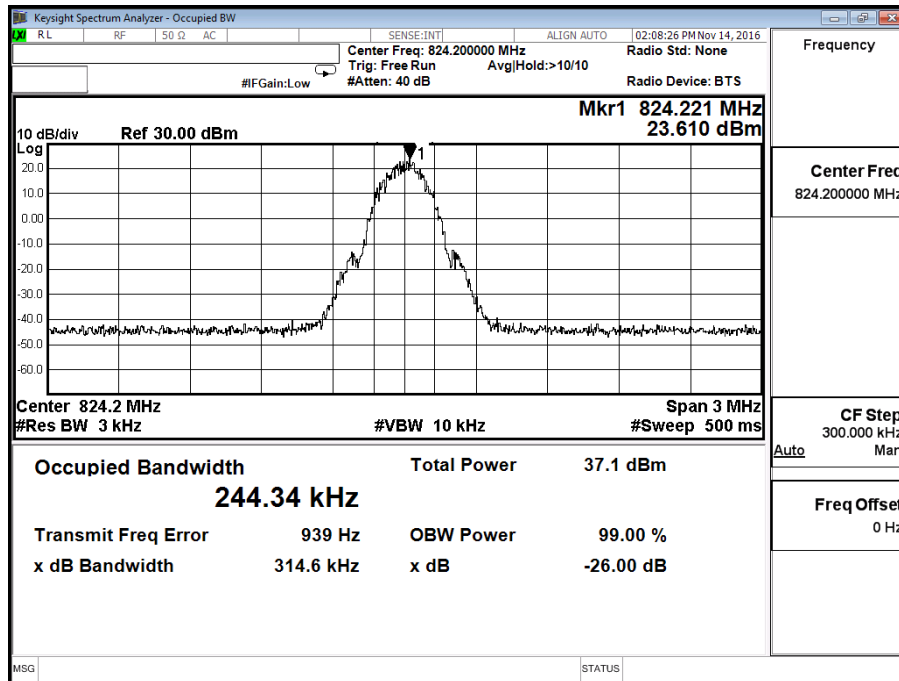
4.4. Test Result of Occupied Bandwidth

Product	LTE Router
Test Mode	Occupied Bandwidth
Test Site	CTR

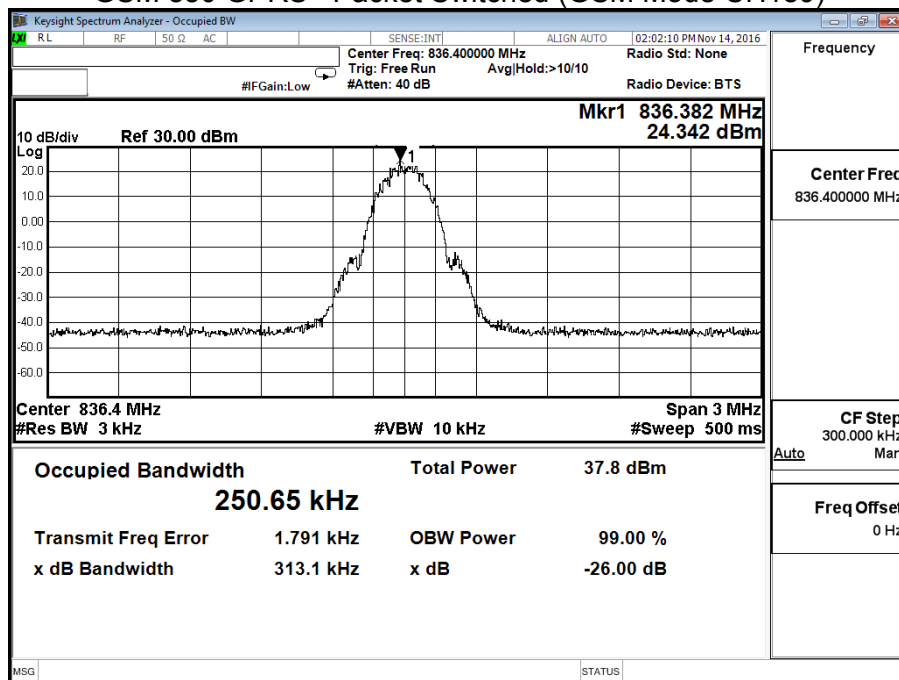
Test Mode	Channel & TX Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB bandwidth (kHz)	Required Limit (kHz)	Result
GSM 850 GPRS	128(824.2)	244.34	314.6	N/A	Pass
	189(836.4)	250.65	313.1	N/A	Pass
	251(848.8)	244.58	318.2	N/A	Pass
GSM 850 EGPRS	128(824.2)	245.19	311.1	N/A	Pass
	189(836.4)	250.12	303.6	N/A	Pass
	251(848.8)	244.89	307.5	N/A	Pass
PCS 1900 GPRS	512(1850.2)	243.64	317.0	N/A	Pass
	661(1880)	243.57	321.5	N/A	Pass
	810(1909.8)	242.06	314.9	N/A	Pass
PCS 1900 EGPRS	512(1850.2)	245.92	310.3	N/A	Pass
	661(1880)	245.04	313.1	N/A	Pass
	810(1909.8)	244.34	313.8	N/A	Pass
Test Mode	Channel & TX Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB bandwidth (MHz)	Required Limit (MHz)	Result
WCDMA Band 2	9262(1852.4)	4.1430	4.738	N/A	Pass
	9400(1880)	4.1229	4.727	N/A	Pass
	9538(1907.6)	4.1273	4.729	N/A	Pass
WCDMA Band 5	4132(826.4)	4.1194	4.705	N/A	Pass
	4183(836.6)	4.1542	4.722	N/A	Pass
	4233(846.6)	4.1276	4.708	N/A	Pass

Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	GSM 850 GPRS		

GSM 850 GPRS - Packet Switched (GSM Mode CH 128)

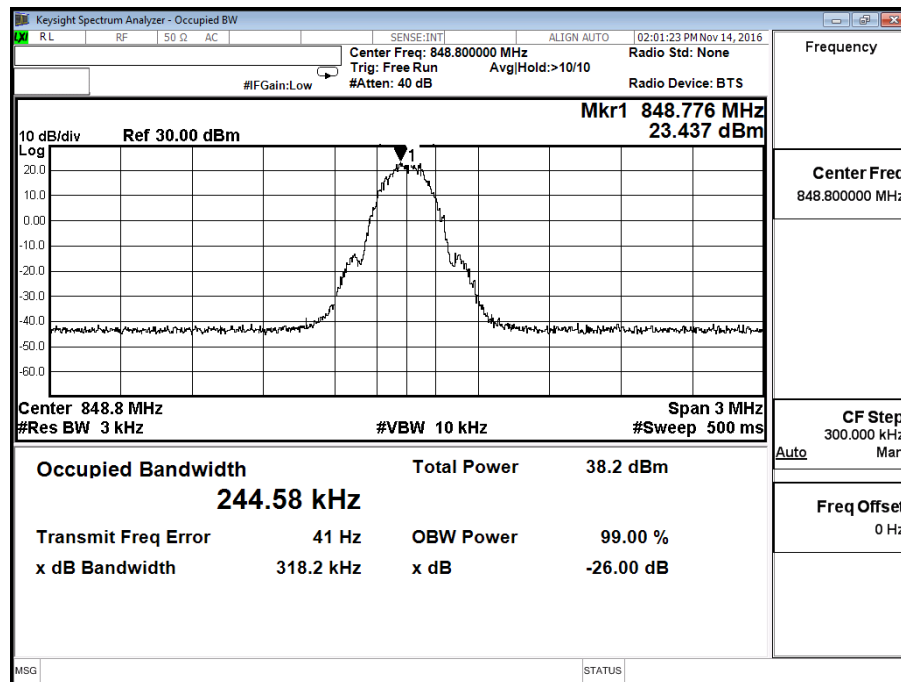


GSM 850 GPRS - Packet Switched (GSM Mode CH189)



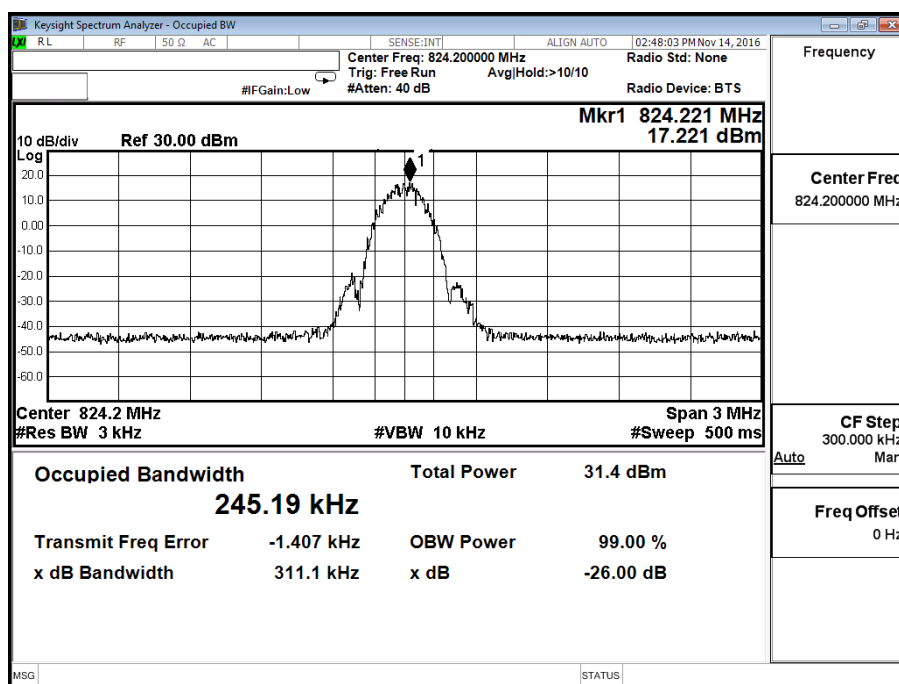
Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	GSM 850 GPRS		

GSM 850 GPRS - Packet Switched (GSM Mode CH 251)

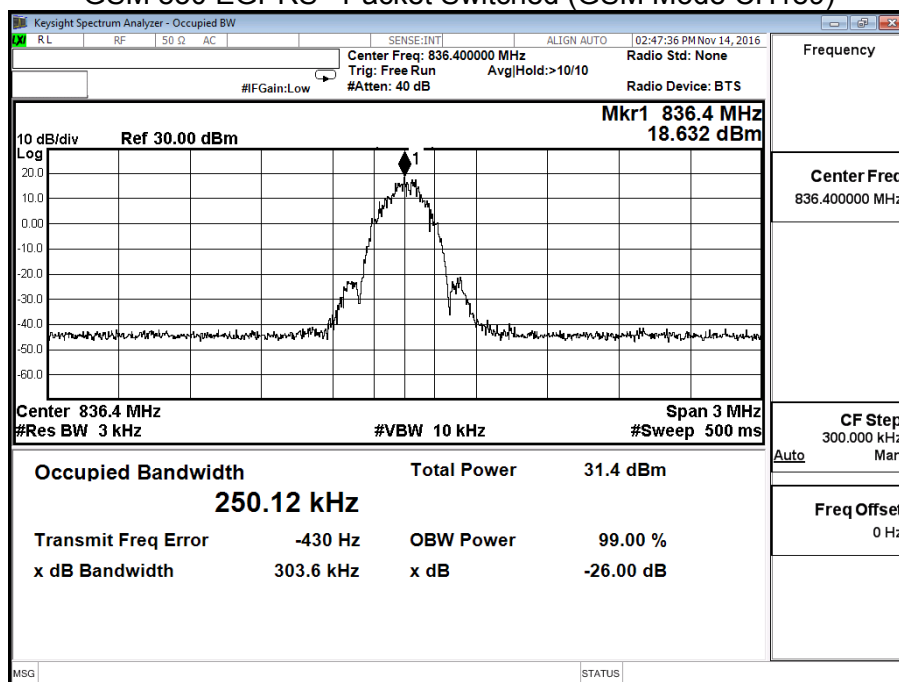


Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	GSM 850 EGPRS		

GSM 850 EGPRS - Packet Switched (GSM Mode CH 128)

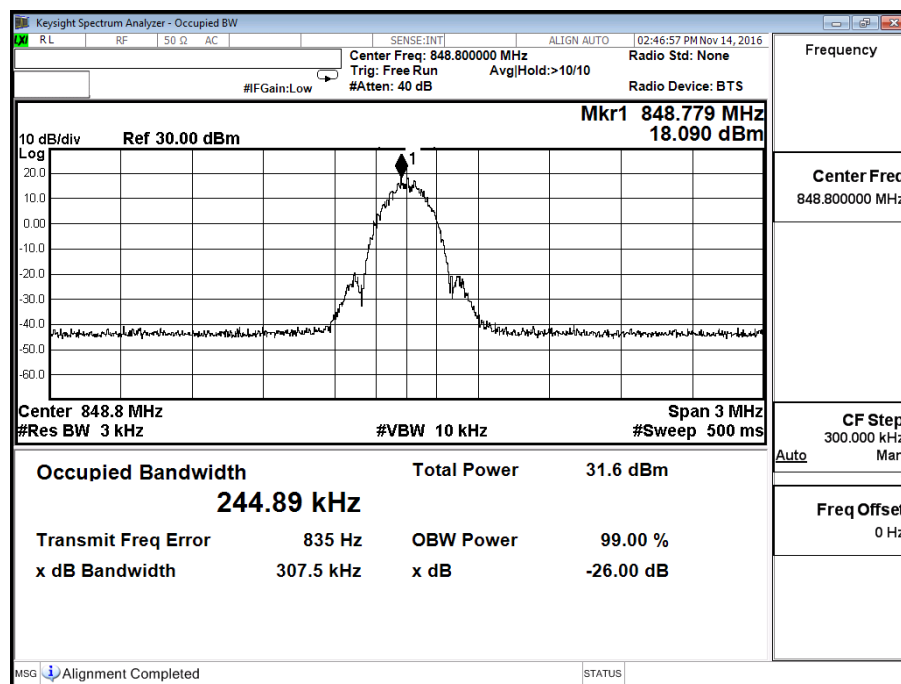


GSM 850 EGPRS - Packet Switched (GSM Mode CH189)



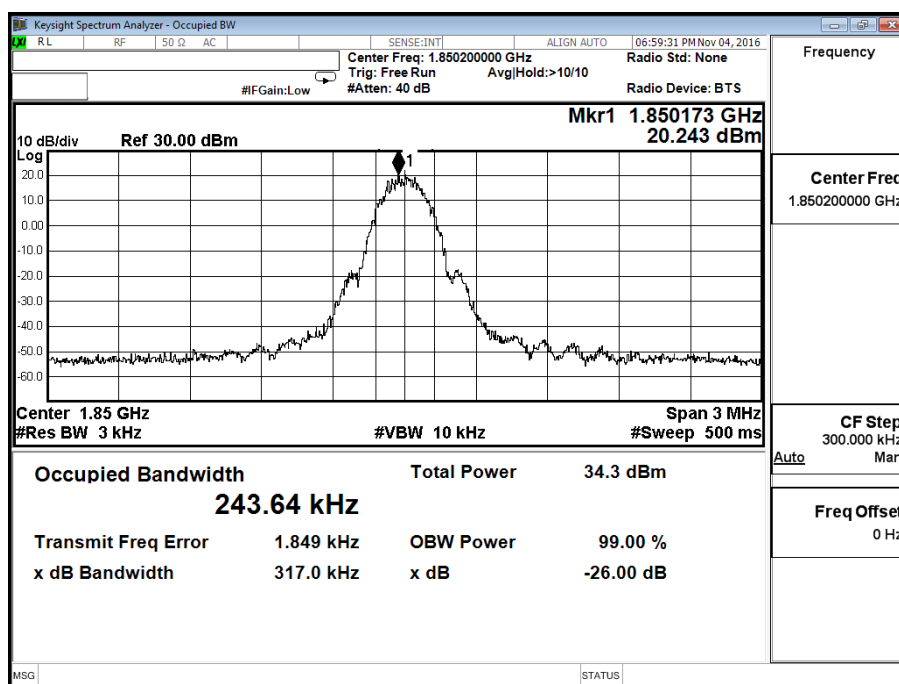
Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	GSM 850 EGPRS		

GSM 850 EGPRS - Packet Switched (GSM Mode CH 251)

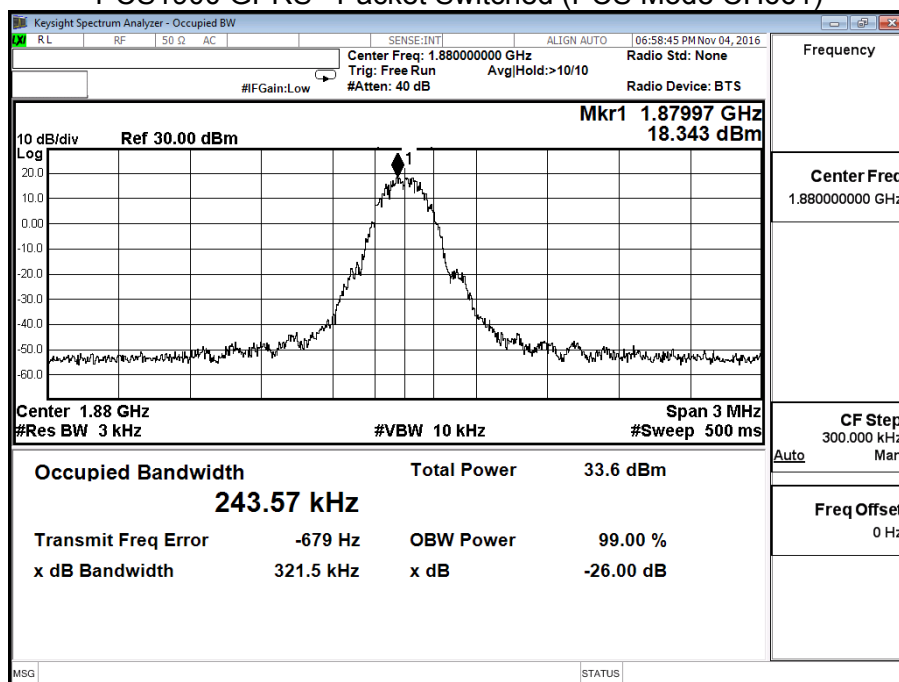


Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 512)

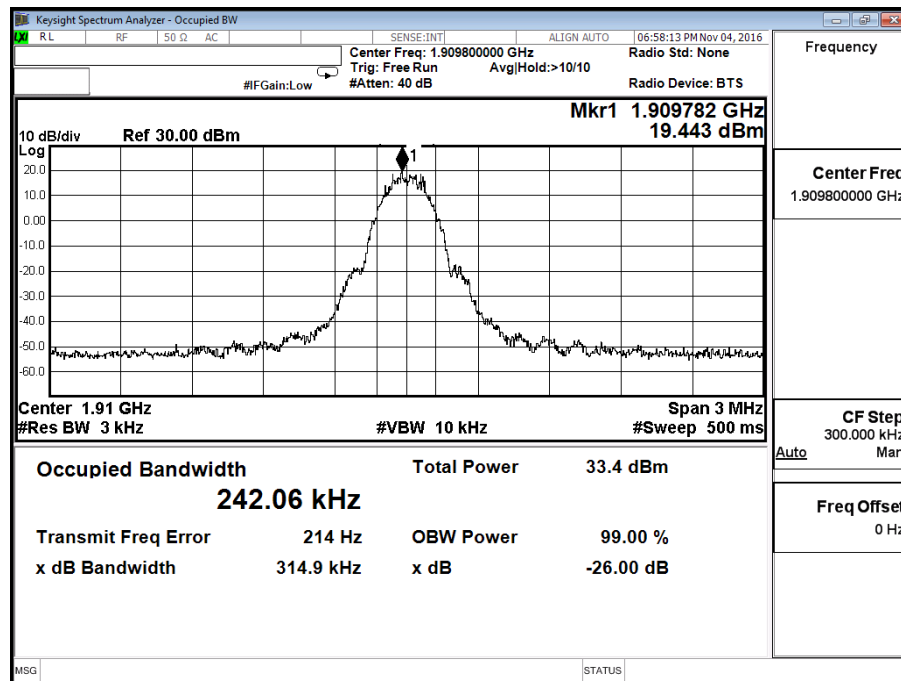


PCS1900 GPRS - Packet Switched (PCS Mode CH661)



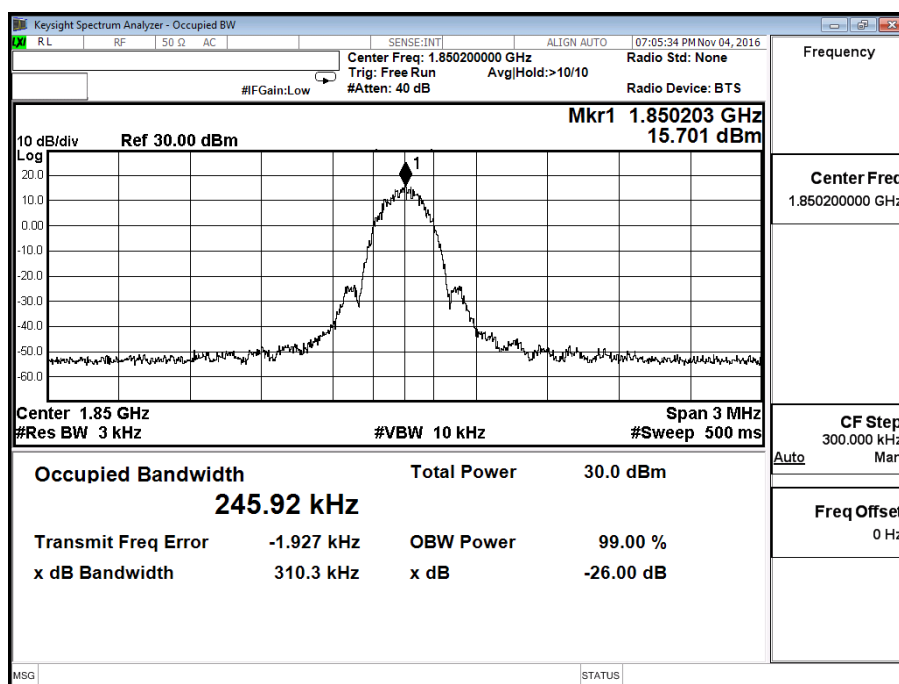
Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 810)

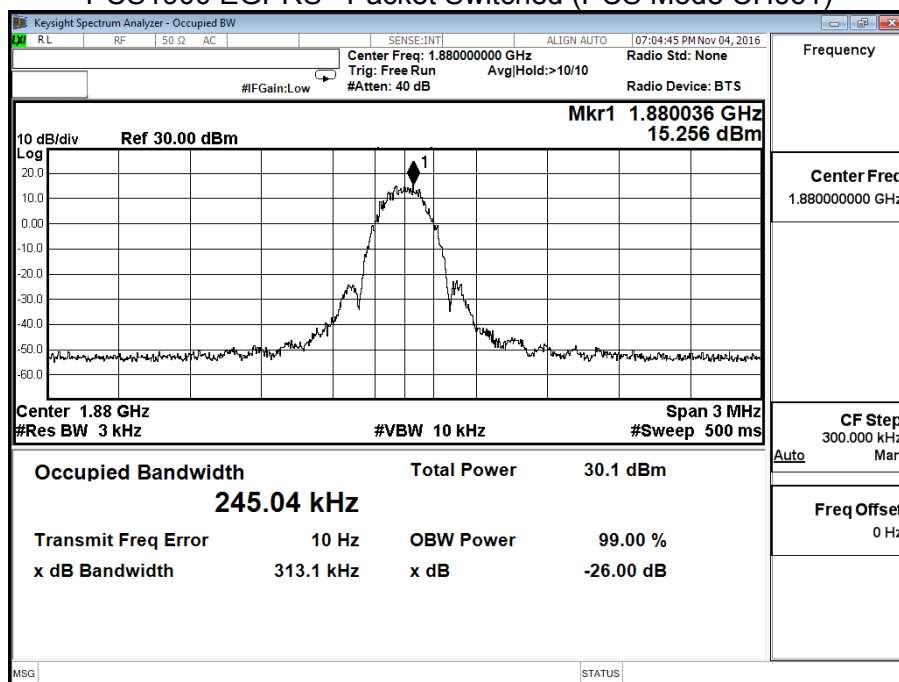


Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	PCS1900 EGPRS		

PCS1900 EGPRS - Packet Switched (PCS Mode CH 512)

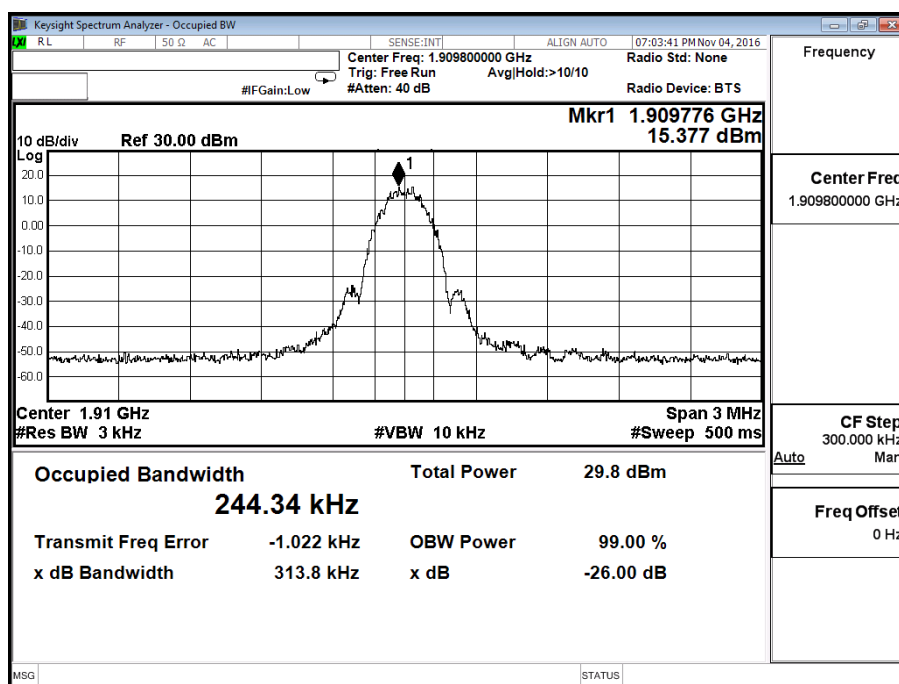


PCS1900 EGPRS - Packet Switched (PCS Mode CH661)



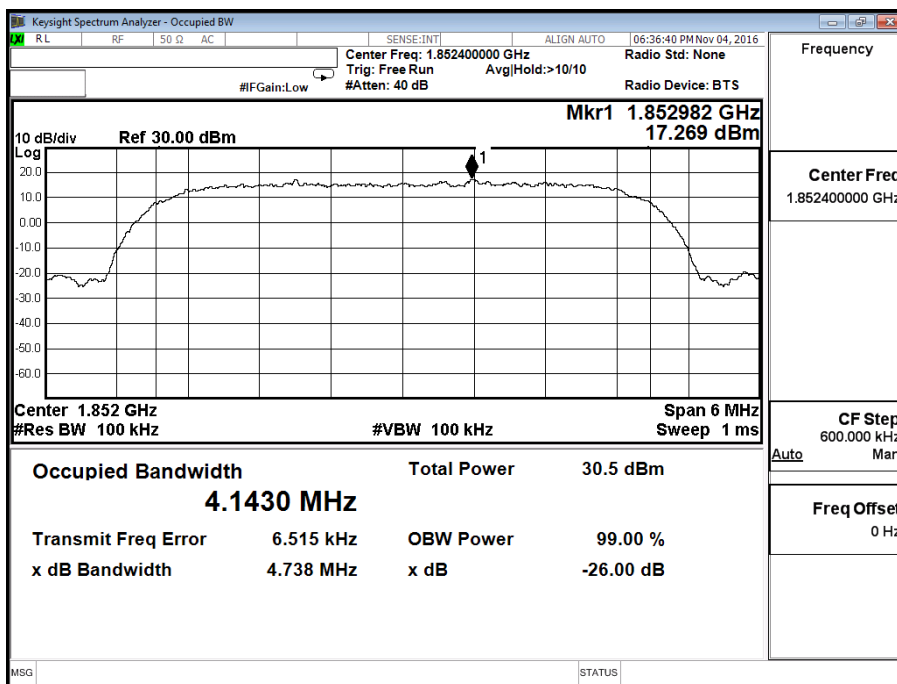
Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	PCS1900 EGPRS		

PCS1900 EGPRS - Packet Switched (PCS Mode CH 810)

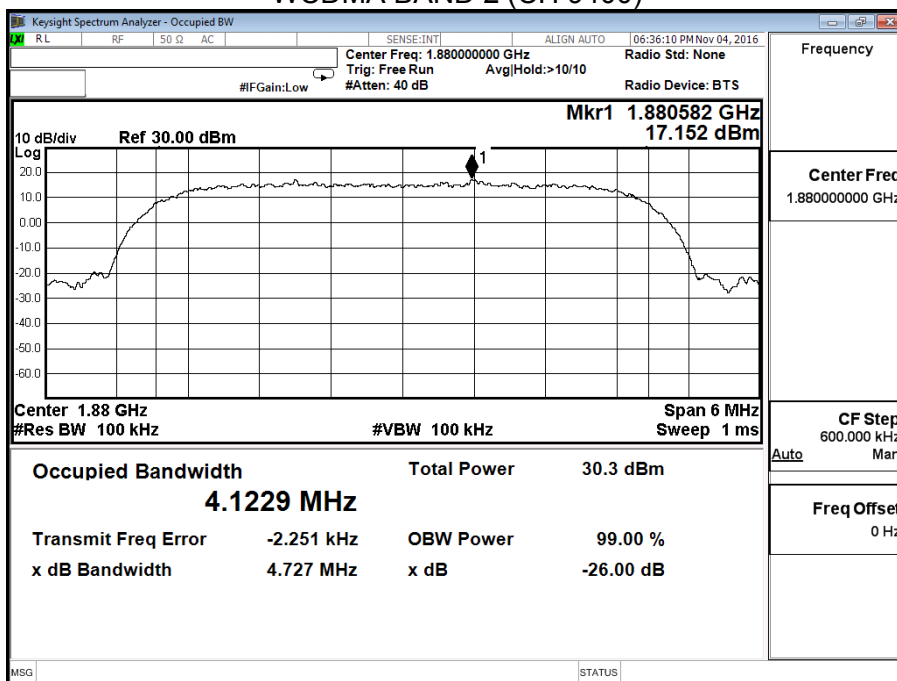


Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	WCDMA BAND 2		

WCDMA BAND 2 (CH 9262)

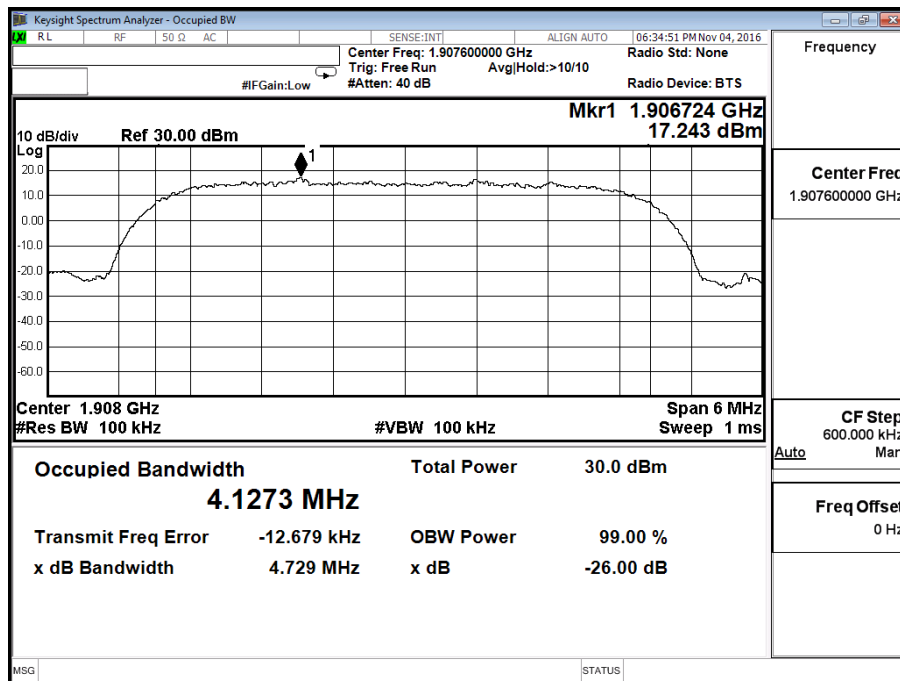


WCDMA BAND 2 (CH 9400)



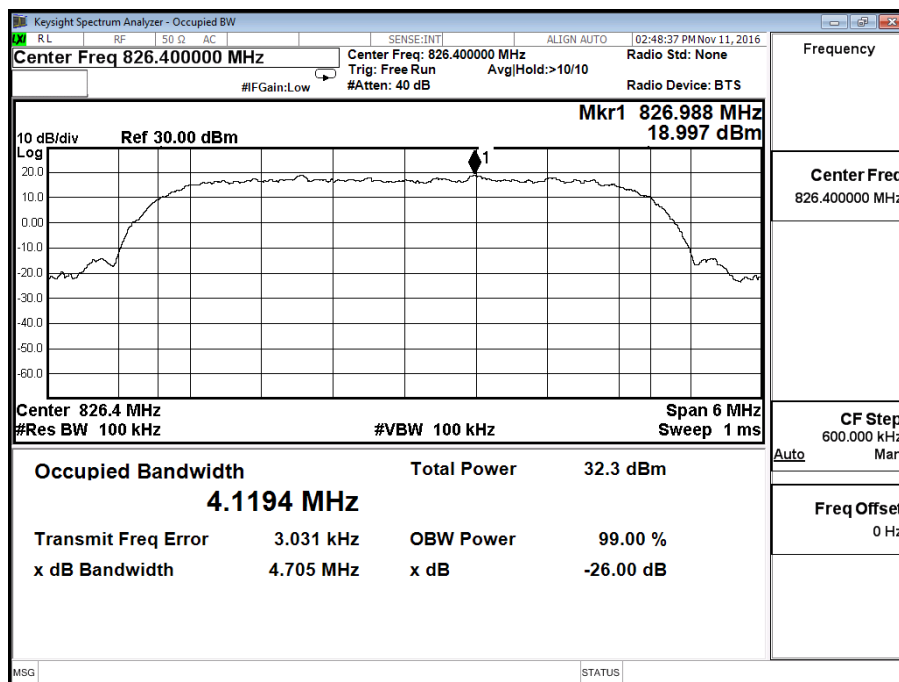
Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	WCDMA BAND 2		

WCDMA BAND 2 (CH 9538)

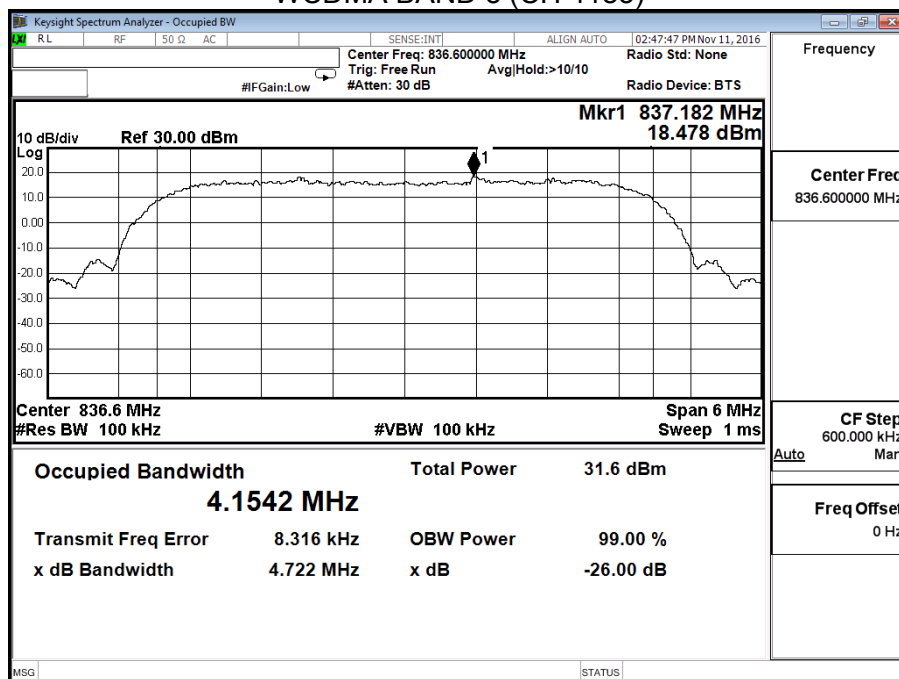


Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	WCDMA BAND 5		

WCDMA BAND 5 (CH 4132)

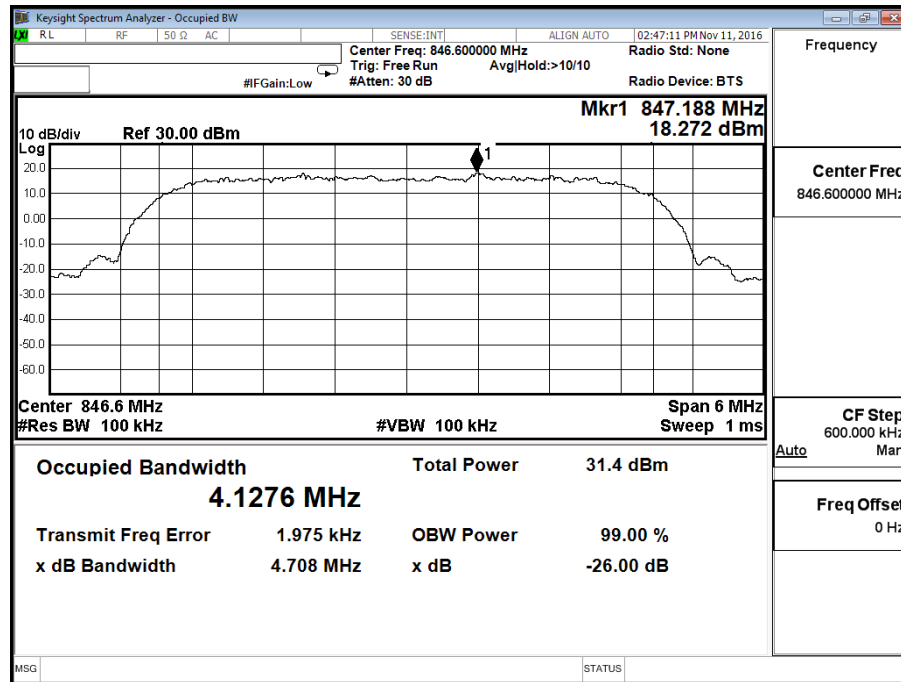


WCDMA BAND 5 (CH 4183)



Product	LTE Router		
Test Mode	Occupied Bandwidth		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	WCDMA BAND 5		

WCDMA BAND 5 (CH 4233)

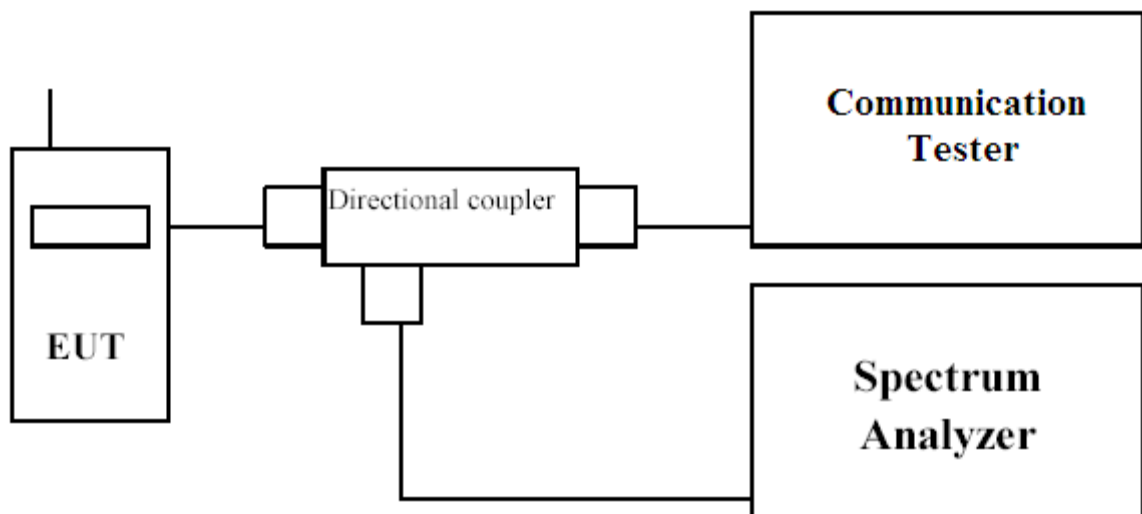


5. Spurious Emission At Antenna Terminals (+/-1MHz)

5.1. Test Specification

According to Part 2.1049, 22.917, 24.238

5.2. Setup



5.3. Limits

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

5.4. Test Procedure

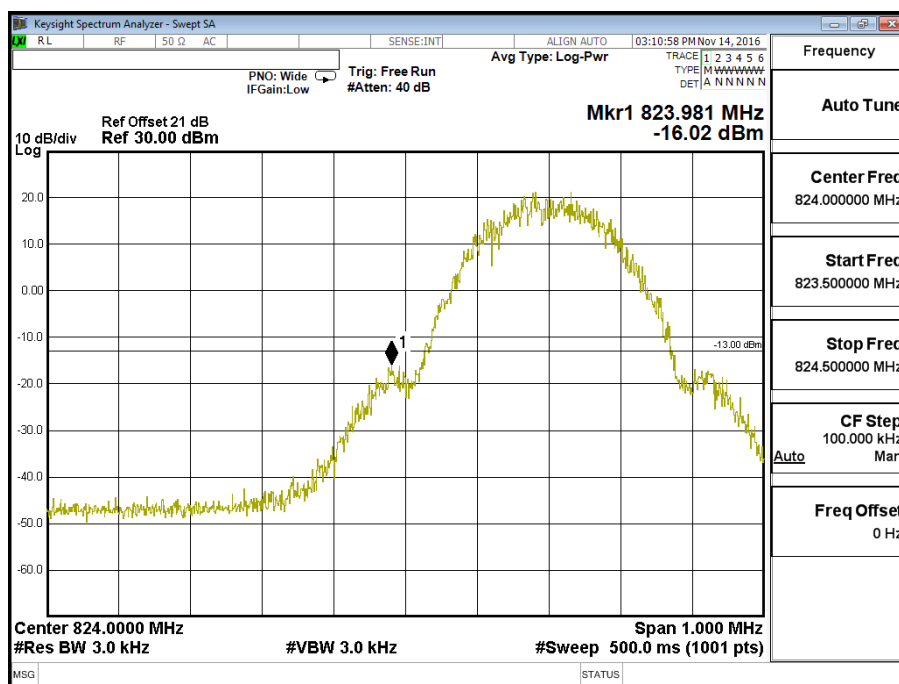
In accordance with Part 22.917, 24.238, at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were set 3 x RBW.

The reference power and path losses of all channels used for testing in each frequency block were measured.

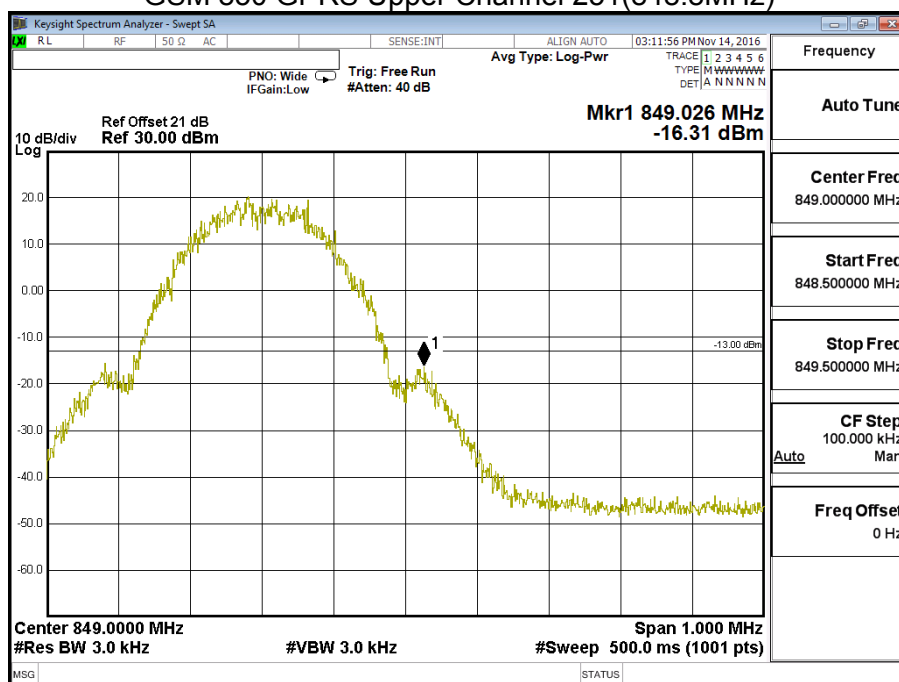
5.5. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

Product	LTE Router		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 GPRS)		

GSM 850 GPRS Lower Channel 128 (824.2MHz)

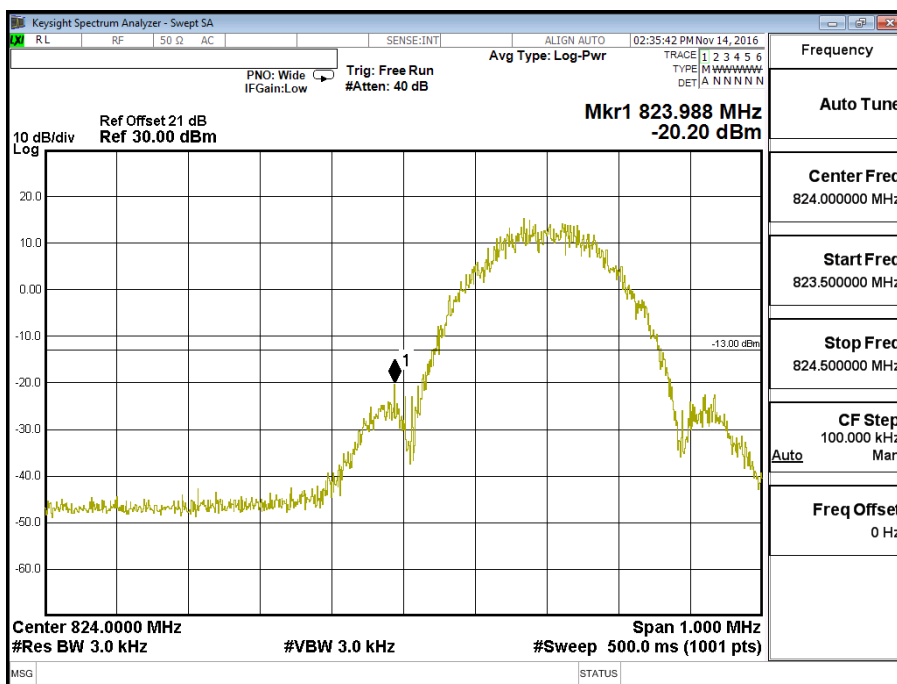


GSM 850 GPRS Upper Channel 251 (848.8MHz)

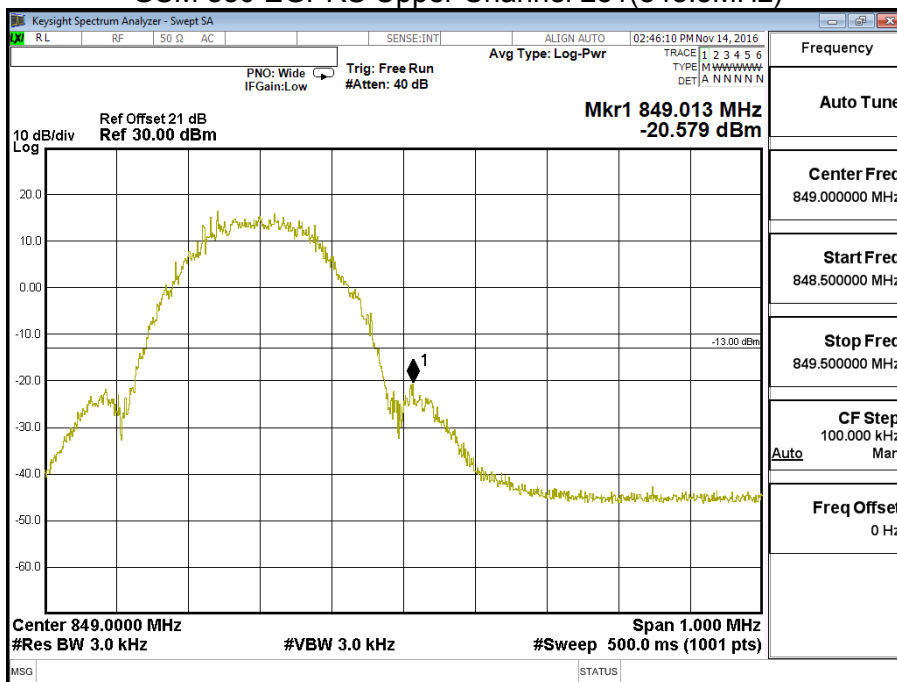


Product	LTE Router		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 EGPRS)		

GSM 850 EGPRS Lower Channel 128 (824.2MHz)

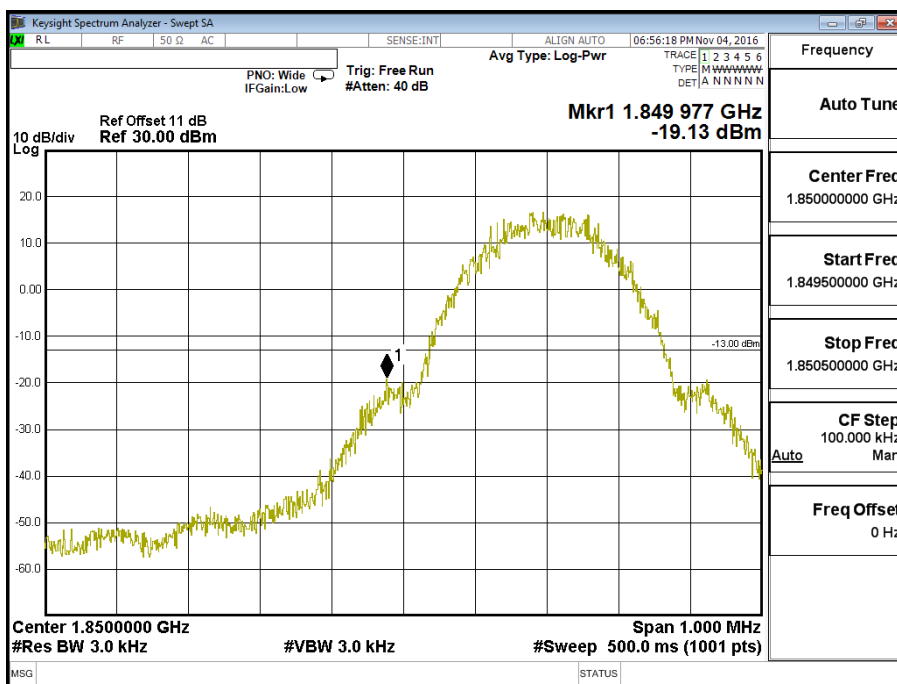


GSM 850 EGPRS Upper Channel 251(848.8MHz)

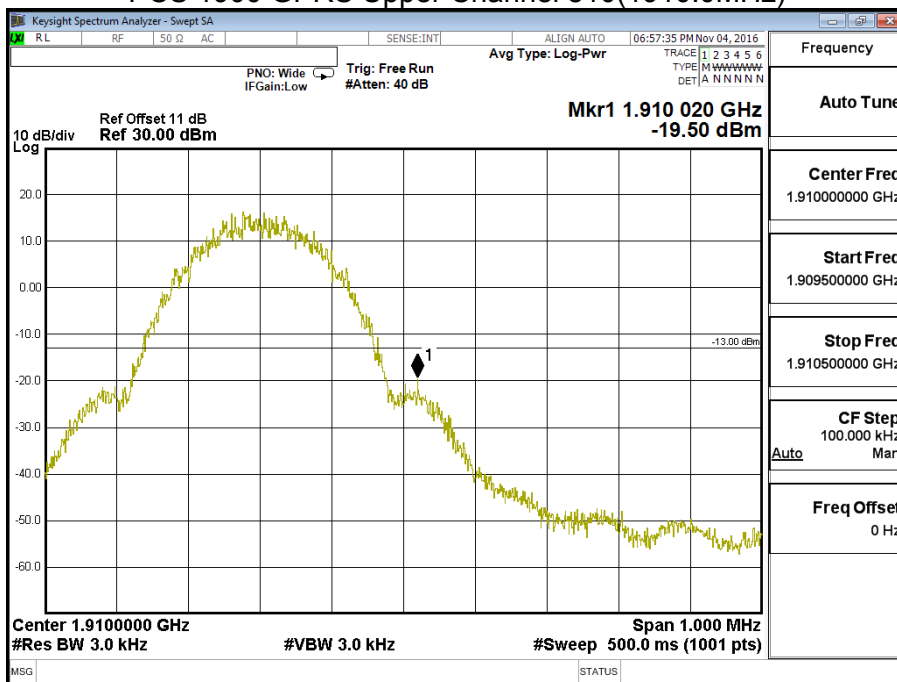


Product	LTE Router		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 GPRS)		

PCS 1900 GPRS Lower Channel 512 (1850.2MHz)

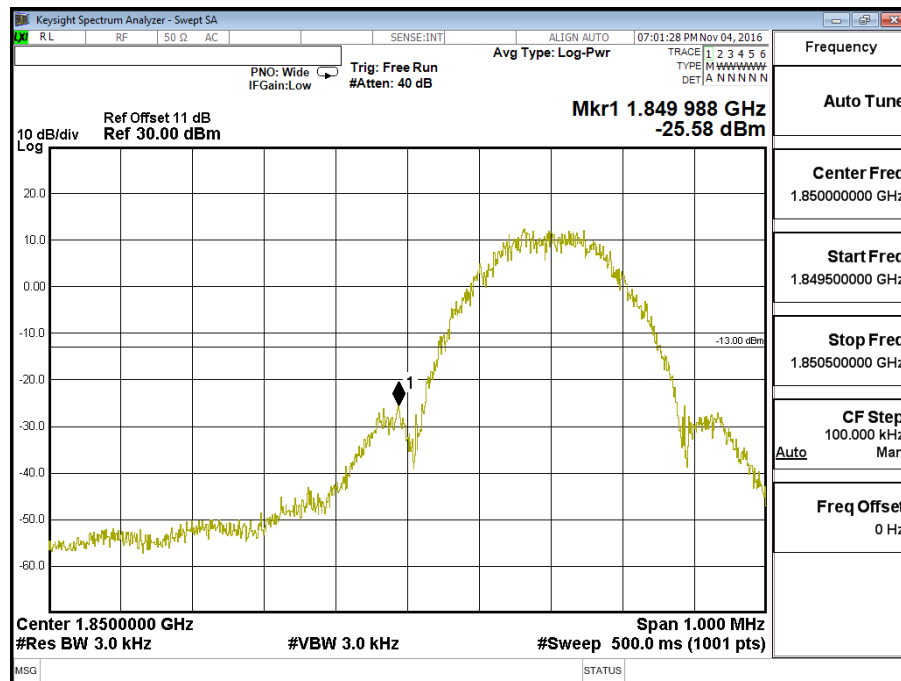


PCS 1900 GPRS Upper Channel 810(1910.0MHz)

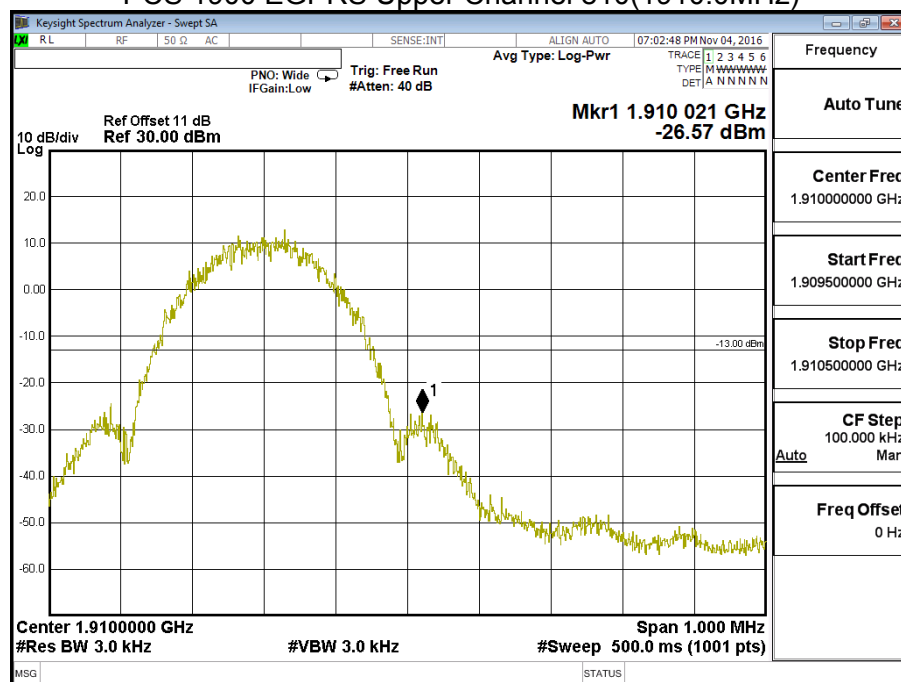


Product	LTE Router		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 EGPRS)		

PCS 1900 EGPRS Lower Channel 512 (1850.2MHz)

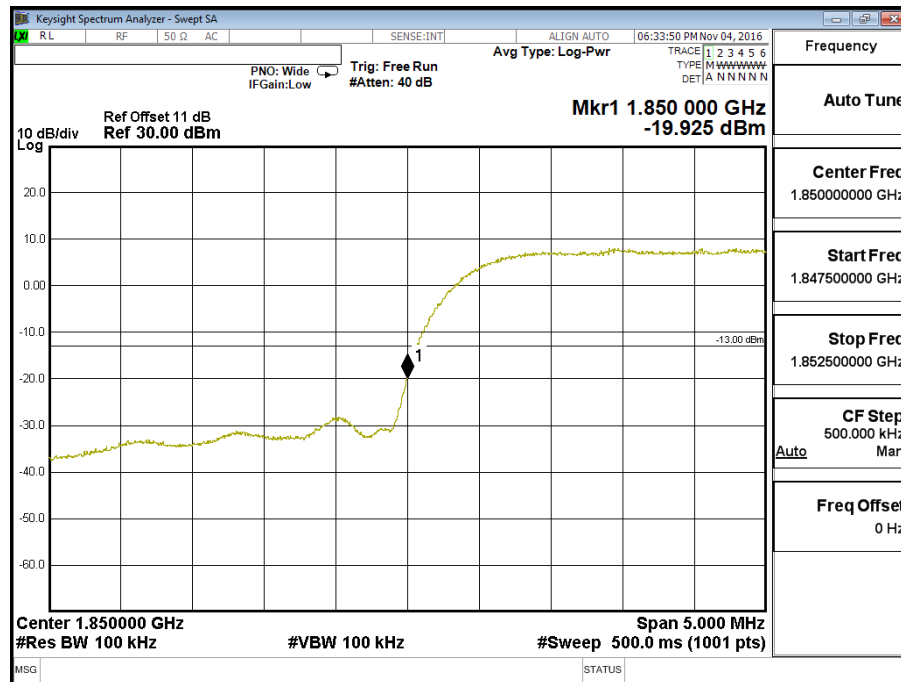


PCS 1900 EGPRS Upper Channel 810(1910.0MHz)

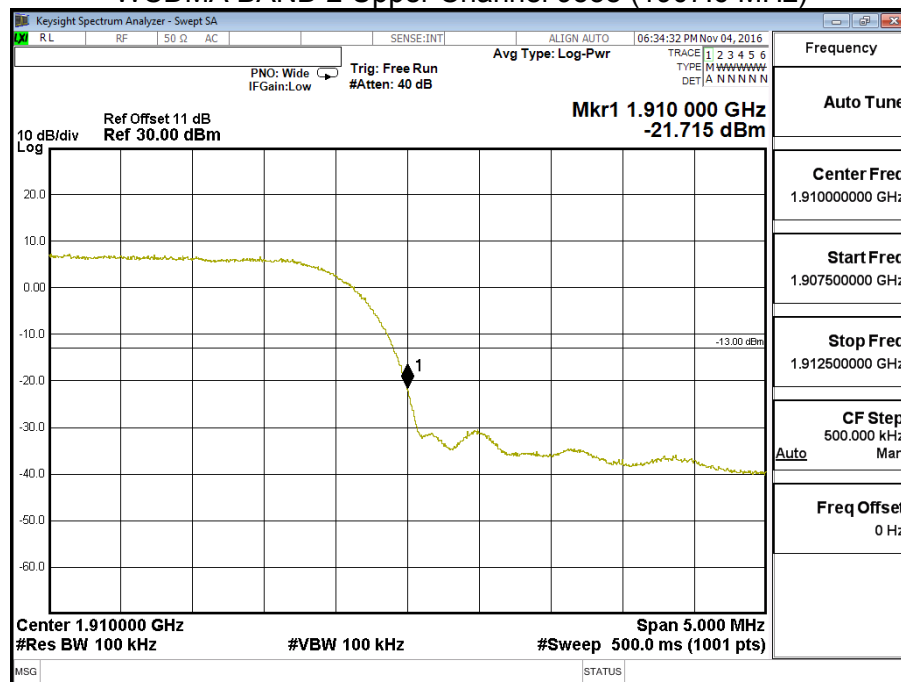


Product	LTE Router		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND 2)		

WCDMA BAND 2 Lower Channel 9262 (1852.4MHz)

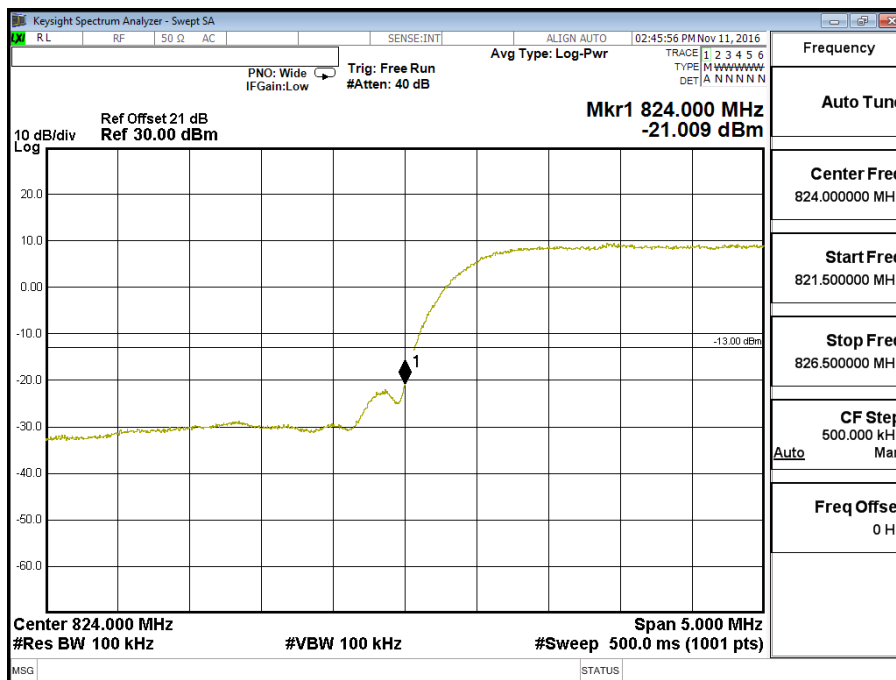


WCDMA BAND 2 Upper Channel 9538 (1907.6 MHz)

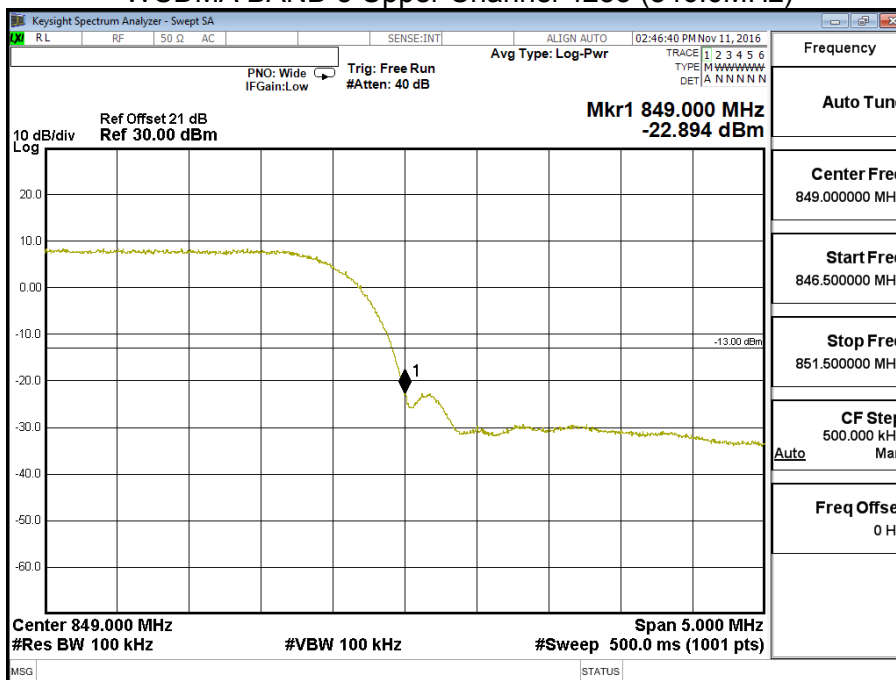


Product	LTE Router		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND 5)		

WCDMA BAND 5 Lower Channel 4132 (826.4MHz)



WCDMA BAND 5 Upper Channel 4233 (846.6MHz)



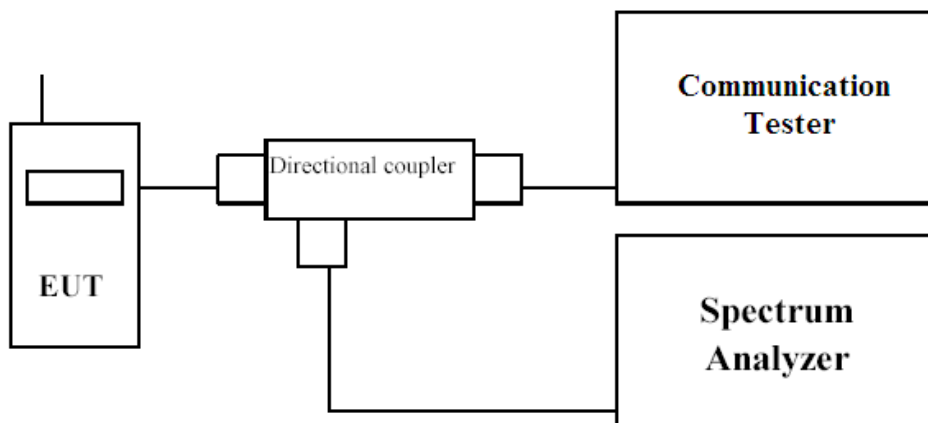
6. Spurious Emission

6.1. Test Specification

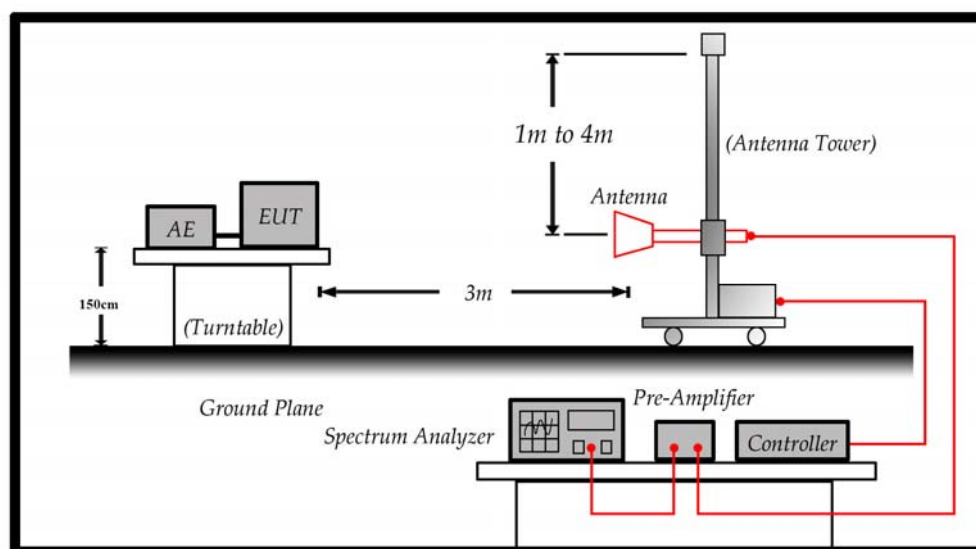
According to Part 2.1051, 2.1053, 22.917(a), 24.238(a).

6.2. Test Setup

6.1.1 Spurious emissions at antenna terminals.



6.1.2 Field strength of spurious radiation.



6.3. Limits

Limit	<-13dBm
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$43 + 10\log(P)$ down on the carrier where P is the power in Watts.

6.4. Test Procedure

In accordance with Part 2.1051/2.1053, the spurious emissions from the EUT were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 30MHz to 20GHz. The EUT was set to transmit on full power. The resolution and video bandwidth was set to 1MHz and 3 x RBW. in accordance with Part 22.917 & 24.238. The spectrum analyzer detector was set to Max Hold. In addition, measurements were made up to the 10th harmonic of the fundamental. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.

- (1) The EUT is tested with maximum rated TX power via the Base Station simulator.
- (2) The EUT is tested in three orthogonal planes; The worst case test configuration was record on report.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

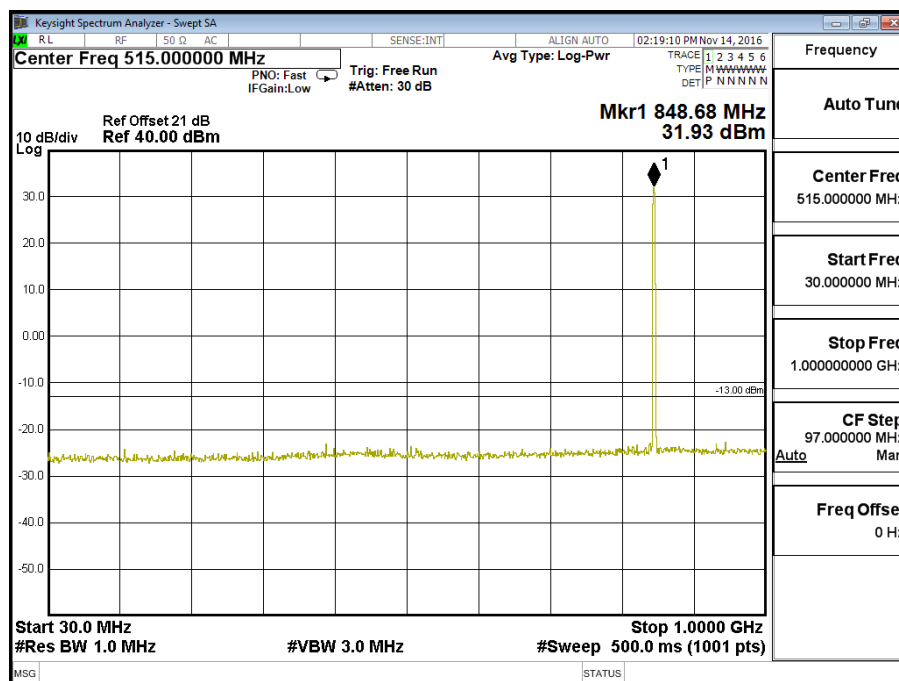
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to TIA/EIA 603-D on radiated measurement.

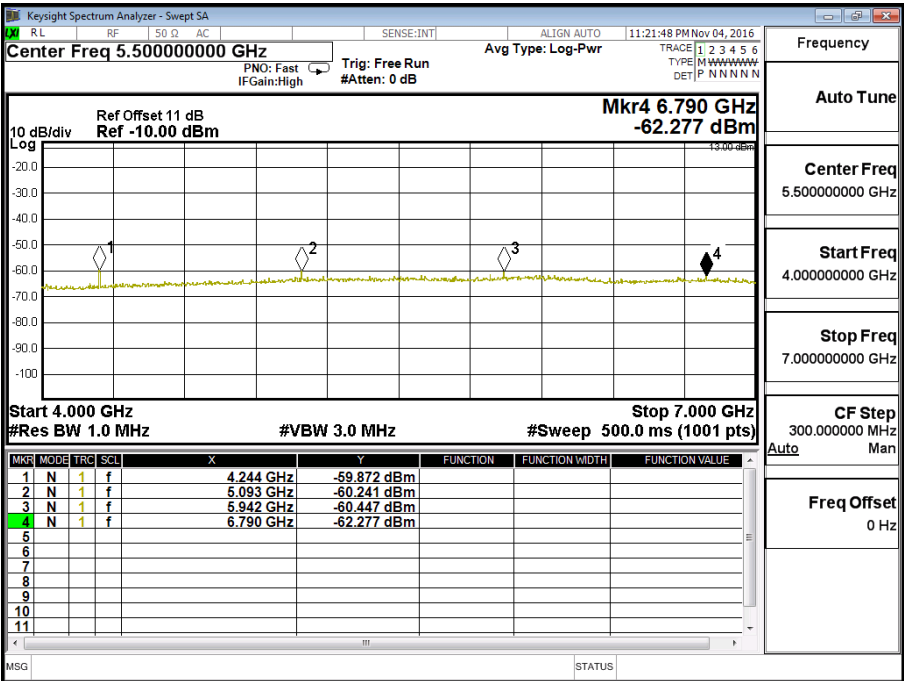
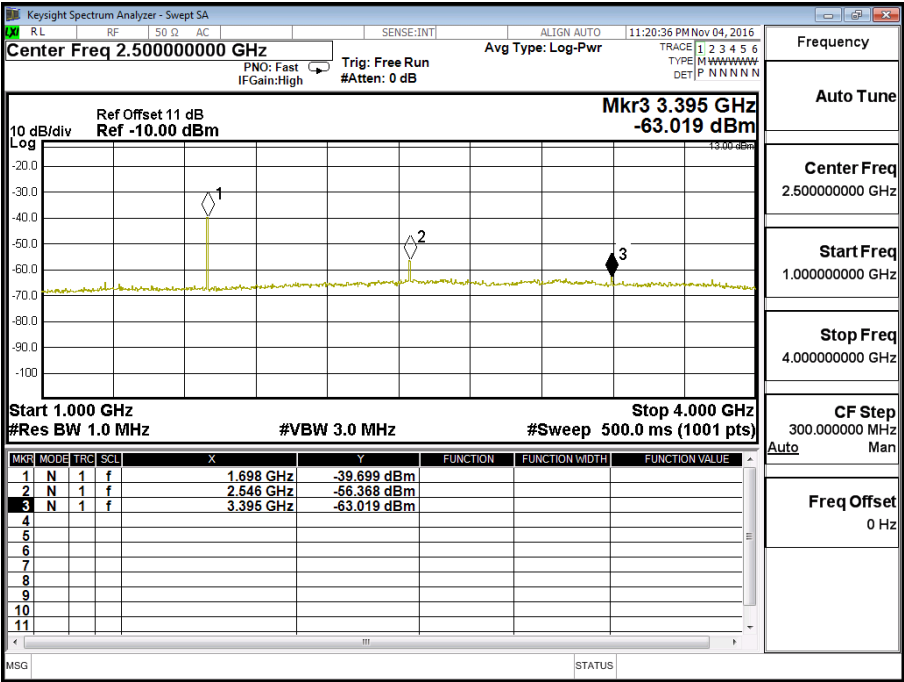
6.5. Test Result of Spurious Emission

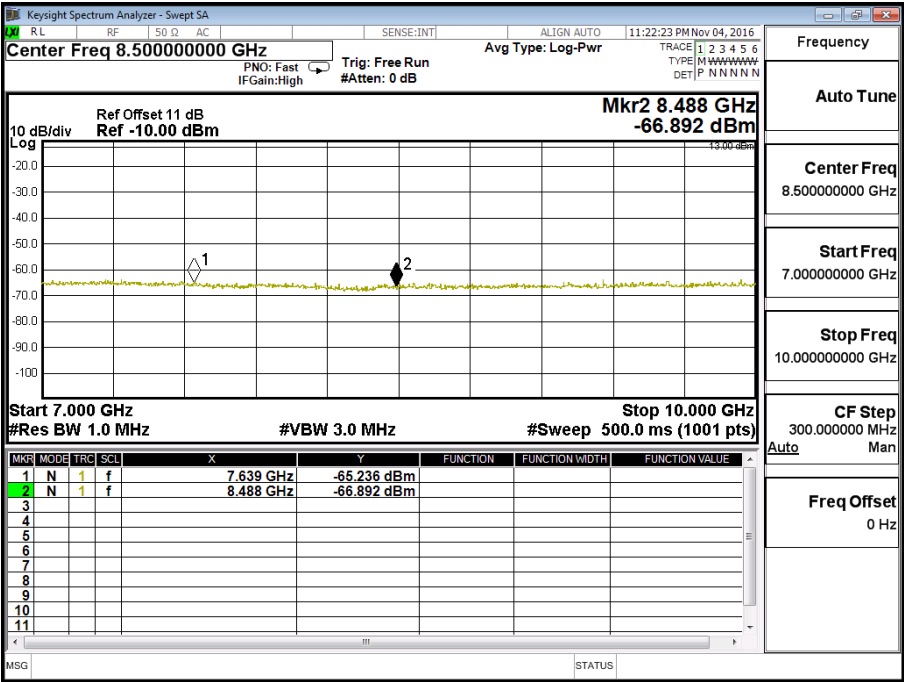
Product	LTE Router		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	GSM 850 GPRS	Test Range	30MHz~10GHz

GSM 850 GPRS Mid-Channel 251

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1698	-39.699	0.58	-39.119	-13
2546	-56.368	0.7	-55.668	-13
3395	-63.019	1.01	-62.009	-13
4244	-59.872	1.18	-58.692	-13
5093	-60.241	1.23	-59.011	-13
5942	-60.447	1.45	-58.997	-13
6790	-62.277	1.56	-60.717	-13
7639	-65.236	1.59	-63.646	-13
8488	-66.892	1.82	-65.072	-13



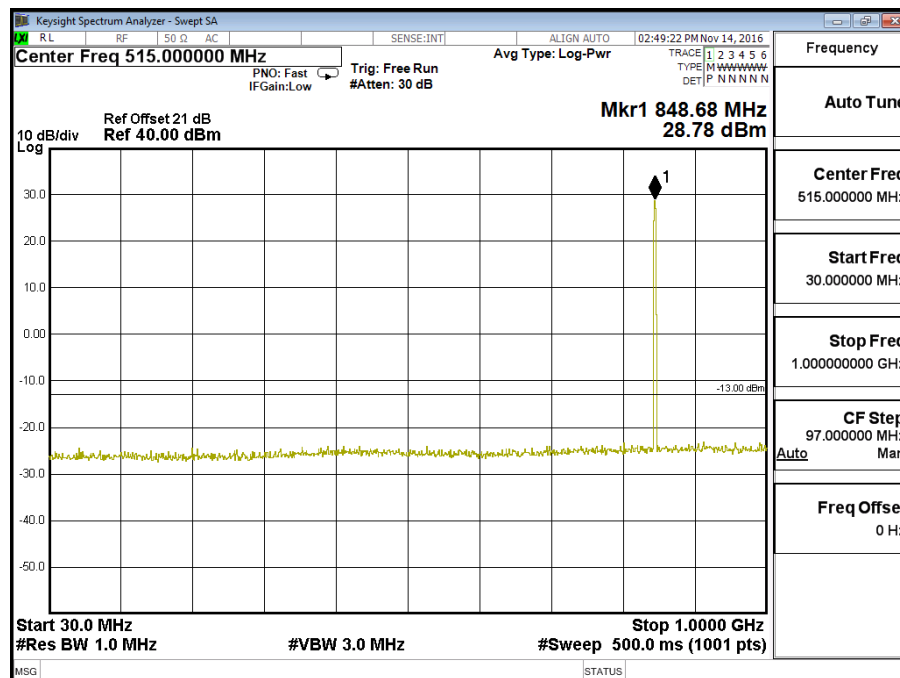


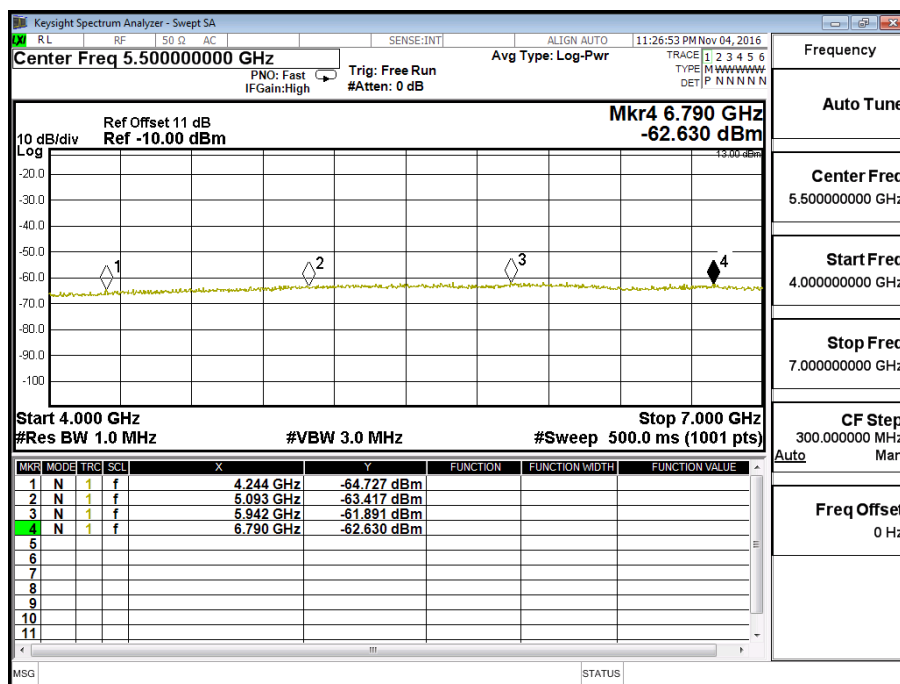
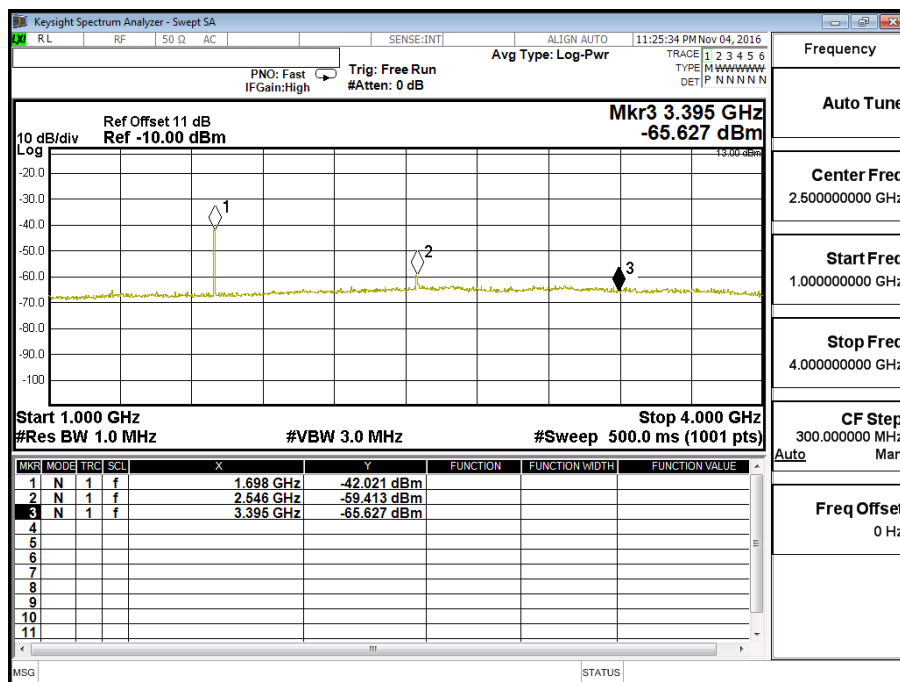


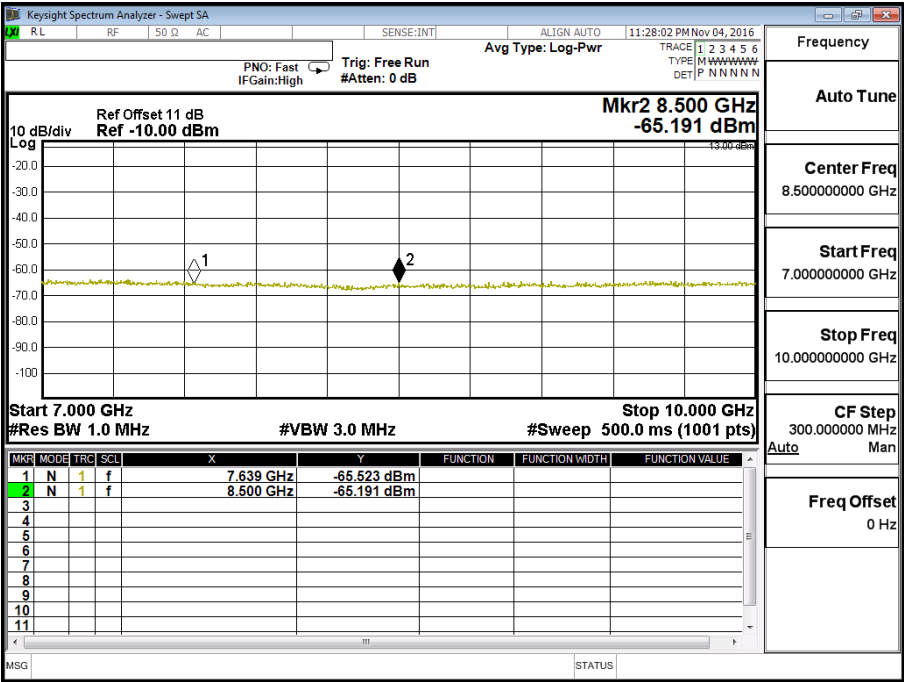
Product	LTE Router		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	GSM 850 EGPRS	Test Range	30MHz~10GHz

GSM 850 EGPRS Mid-Channel 251

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1698	-42.021	0.58	-41.441	-13
2546	-59.413	0.7	-58.713	-13
3395	-65.627	1.01	-64.617	-13
4244	-64.727	1.18	-63.547	-13
5093	-63.417	1.23	-62.187	-13
5942	-61.891	1.45	-60.441	-13
6790	-62.630	1.56	-61.070	-13
7639	-65.523	1.59	-63.933	-13
8500	-65.191	1.82	-63.371	-13



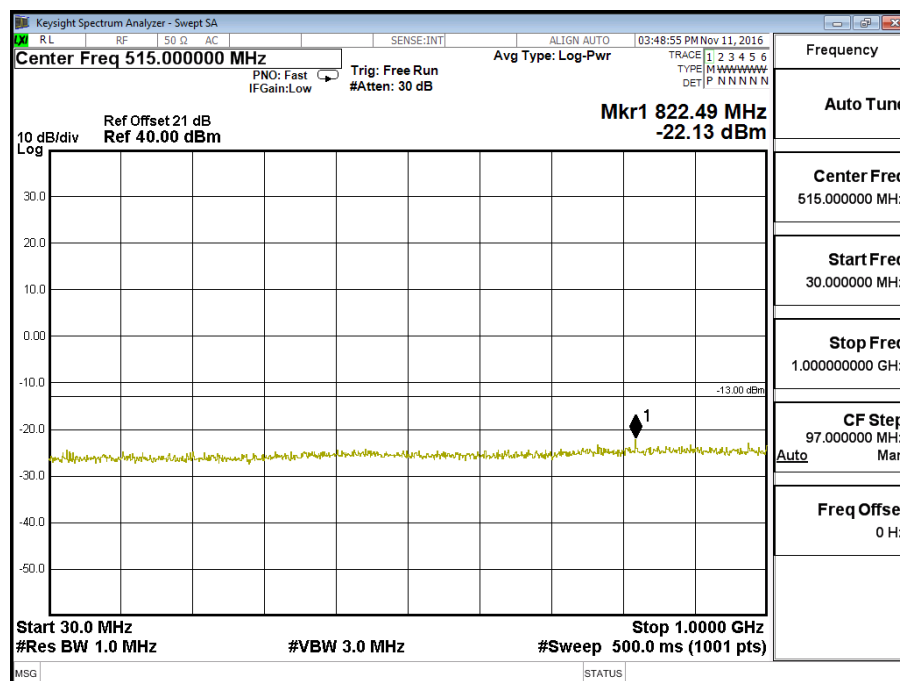


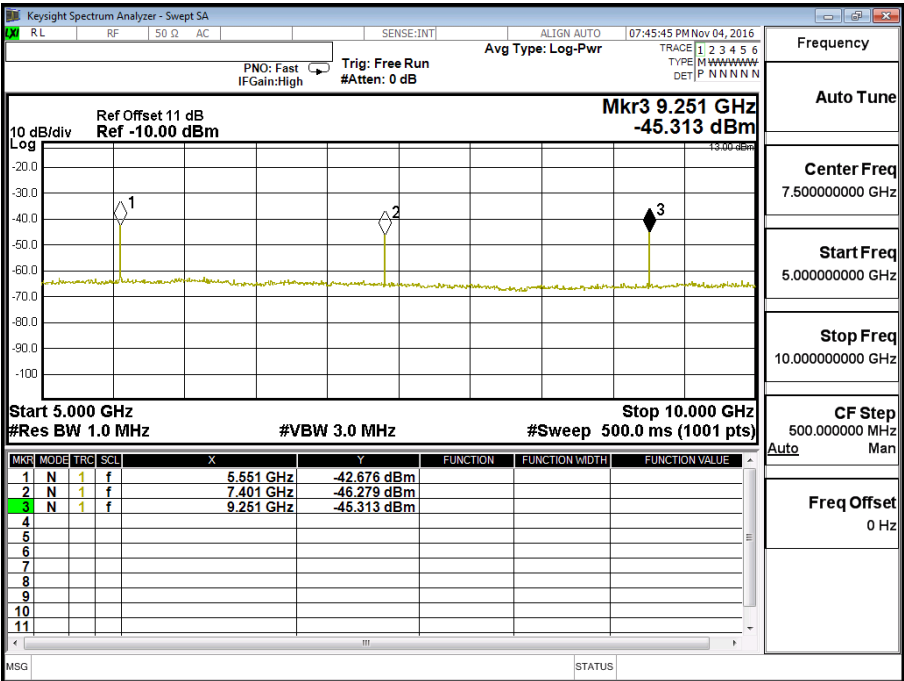
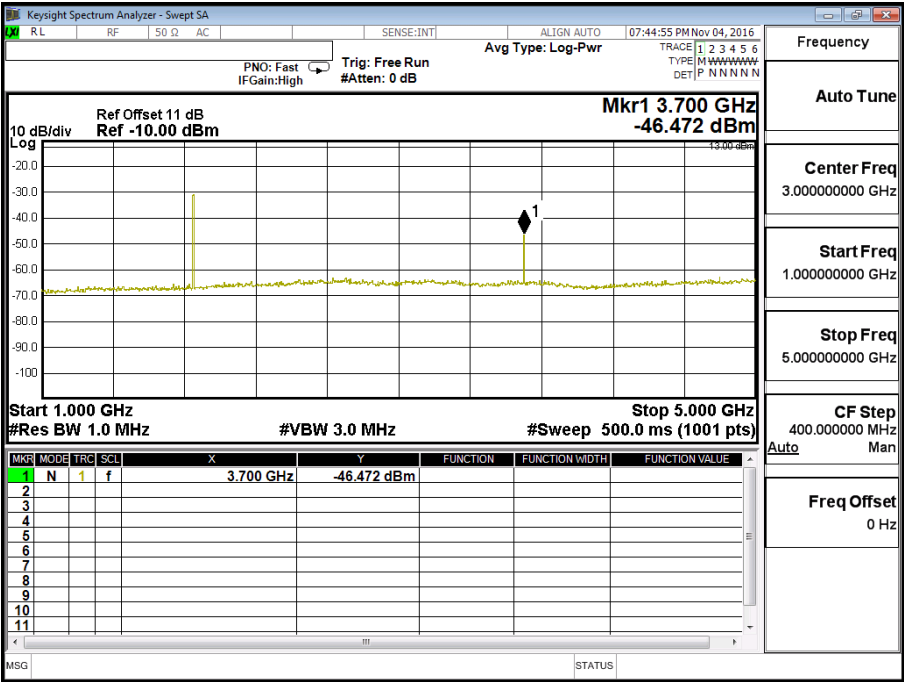


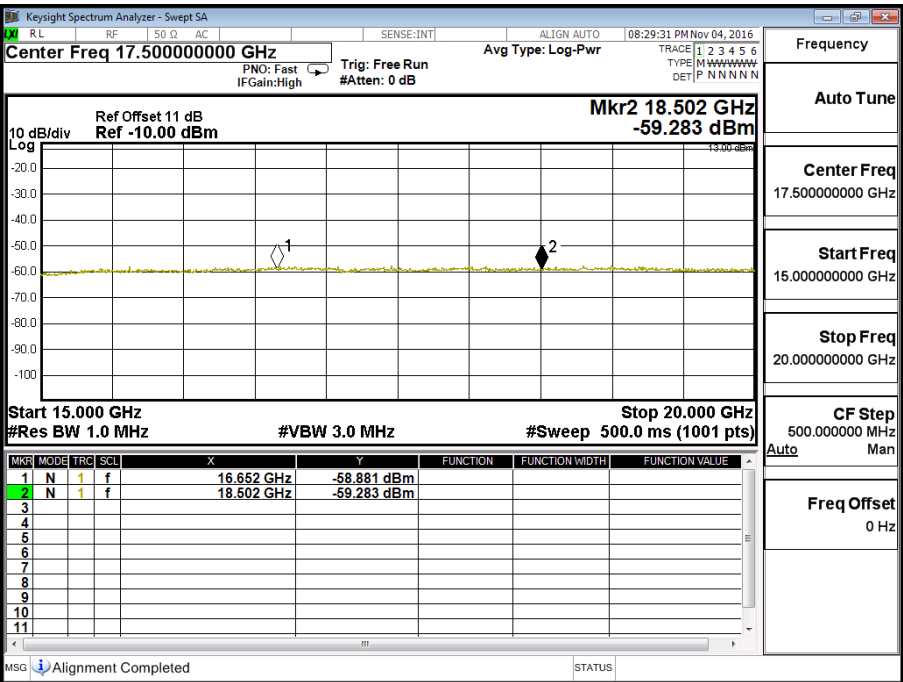
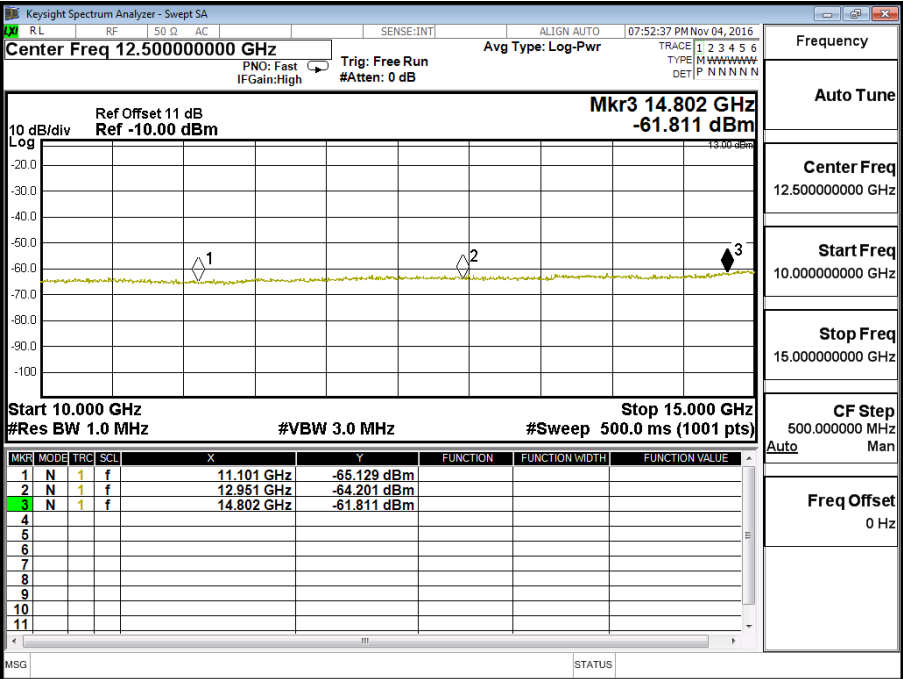
Product	LTE Router		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	PCS 1900 GPRS	Test Range	30MHz~20GHz

PCS 1900 GPRS Mid-Channel 512

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3700	-46.472	1.1	-45.372	-13
5551	-42.676	1.23	-41.446	-13
7401	-46.279	1.59	-44.689	-13
9251	-45.313	1.89	-43.423	-13
11101	-65.129	2.07	-63.059	-13
12951	-64.201	2.26	-61.941	-13
14802	-61.811	2.64	-59.171	-13
16652	-58.881	3.5	-55.381	-13
18502	-59.283	3.7	-55.583	-13



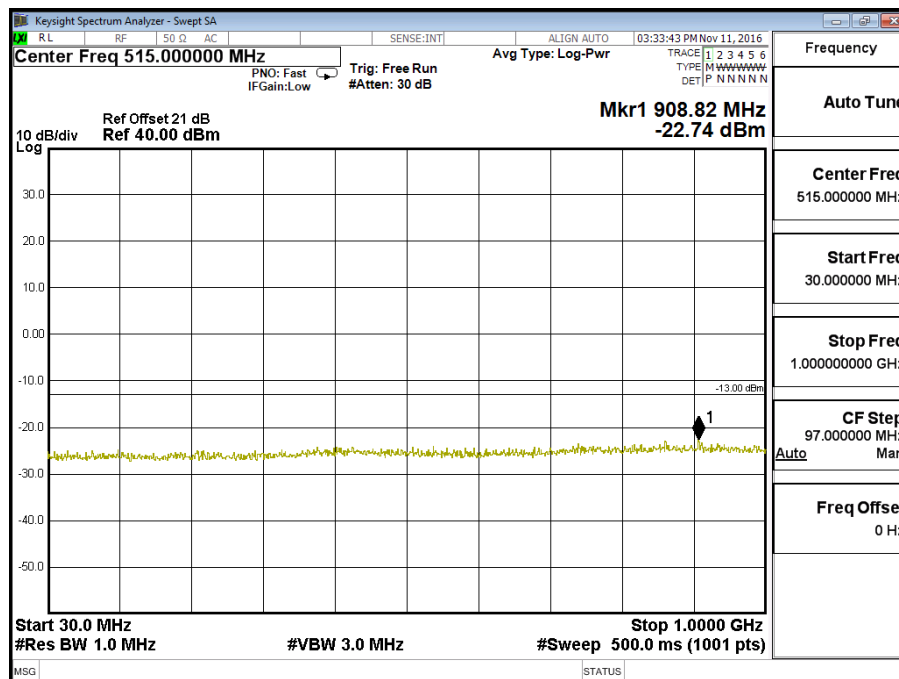


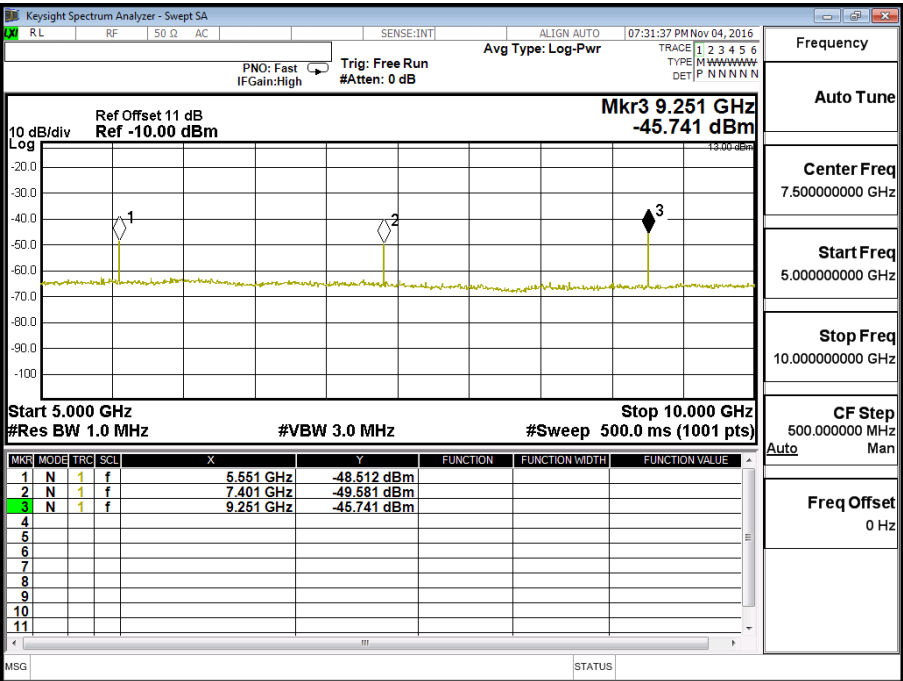
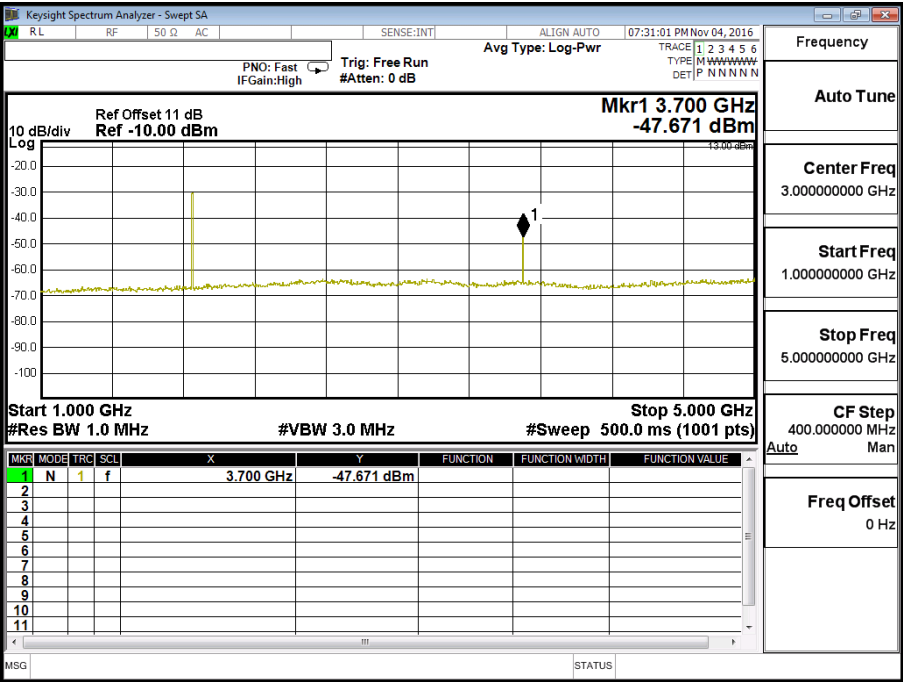


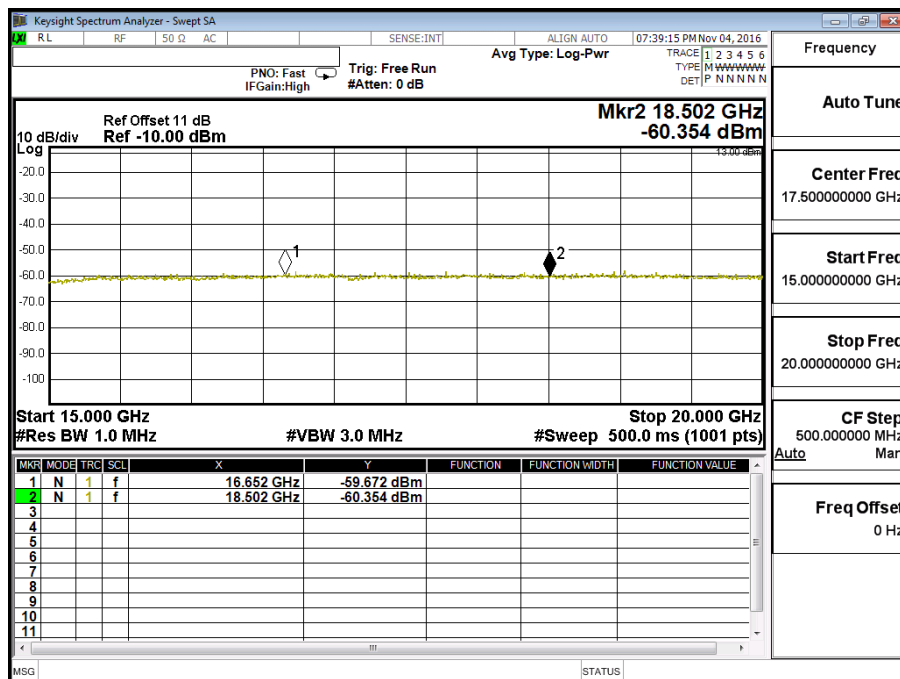
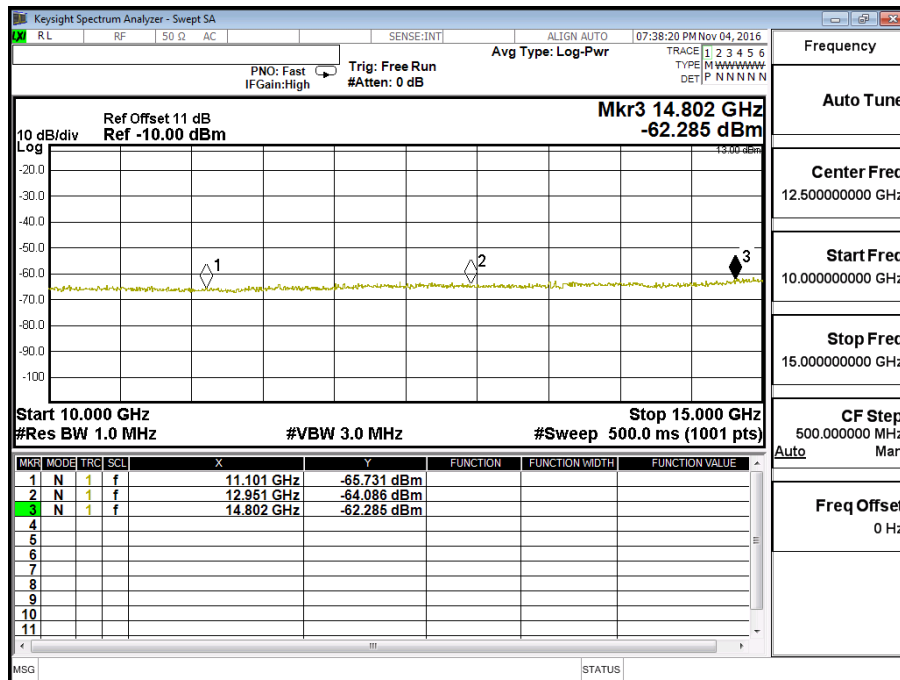
Product	LTE Router		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	PCS 1900 EGPRS	Test Range	30MHz~20GHz

PCS 1900 EGPRS Mid-Channel 512

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3700	-47.671	1.1	-46.571	-13
5551	-48.512	1.23	-47.282	-13
7401	-49.581	1.59	-47.991	-13
9251	-45.741	1.89	-43.851	-13
11101	-65.731	2.07	-63.661	-13
12951	-64.086	2.26	-61.826	-13
14802	-62.285	2.64	-59.645	-13
16652	-59.672	3.5	-56.172	-13
18502	-60.354	3.7	-56.654	-13



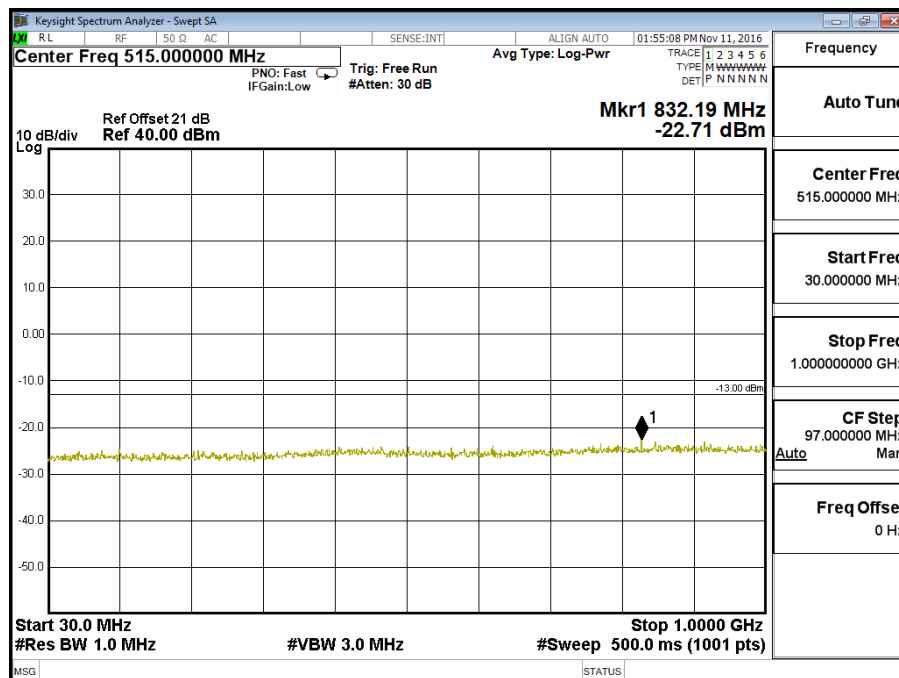


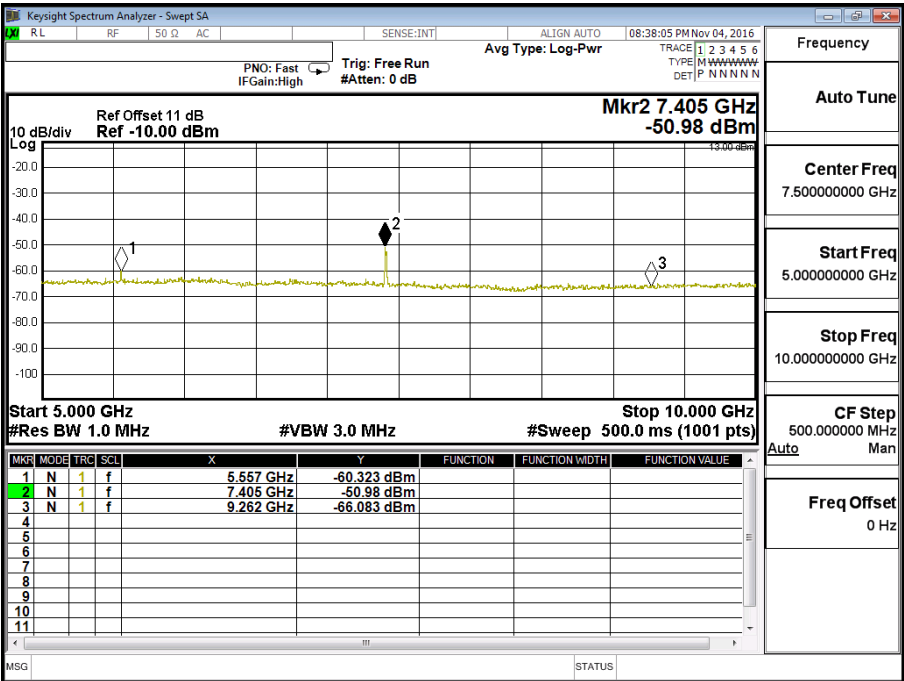
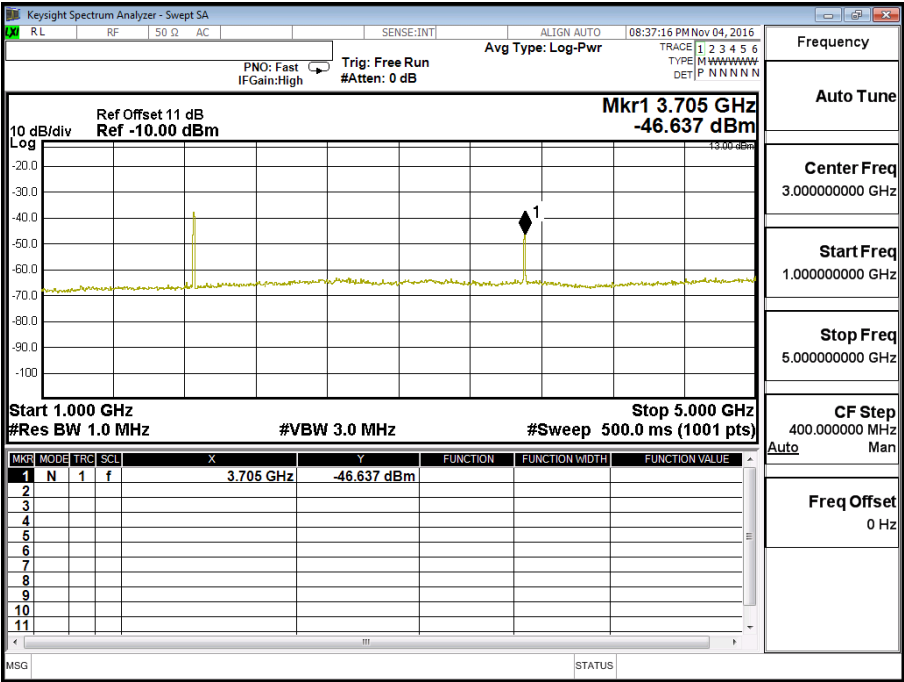


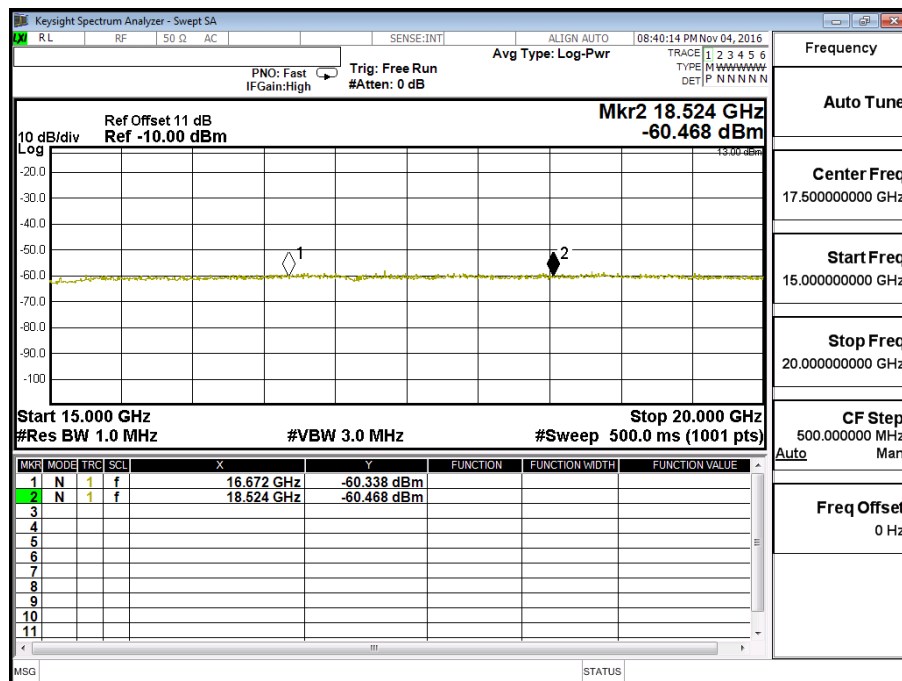
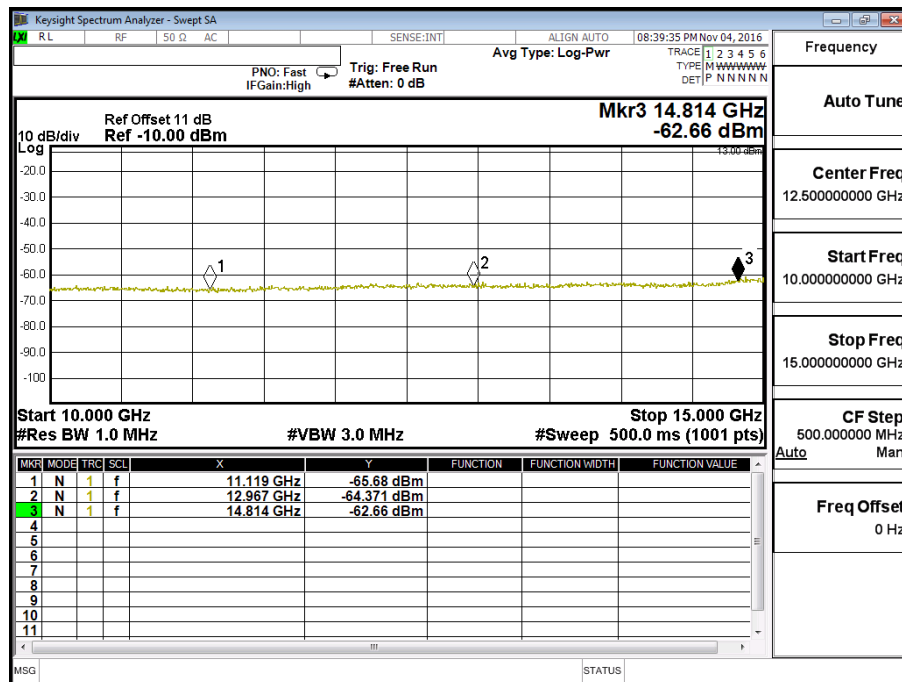
Product	LTE Router		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	WCDMA BAND 2	Test Range	30MHz~20GHz

WCDMA BAND 2 Mid-Channel 9262

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3705	-46.637	1.1	-45.537	-13
5557	-60.323	1.23	-59.093	-13
7405	-50.980	1.59	-49.390	-13
9262	-66.083	1.89	-64.193	-13
11119	-65.680	2.07	-63.610	-13
12967	-64.371	2.26	-62.111	-13
14814	-62.660	2.64	-60.020	-13
16672	-60.338	3.5	-56.838	-13
18524	-60.468	3.7	-56.768	-13



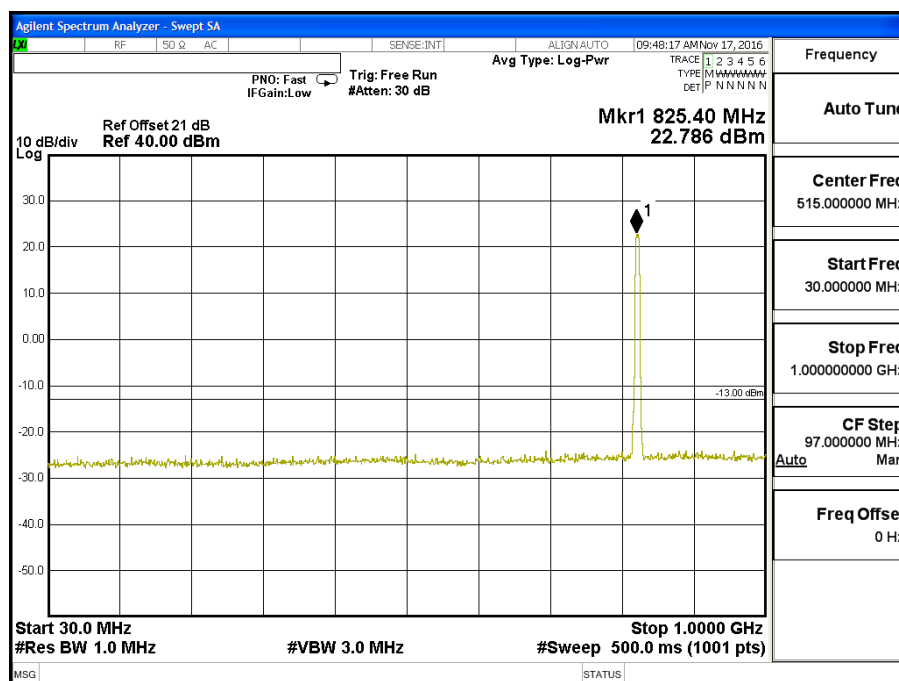


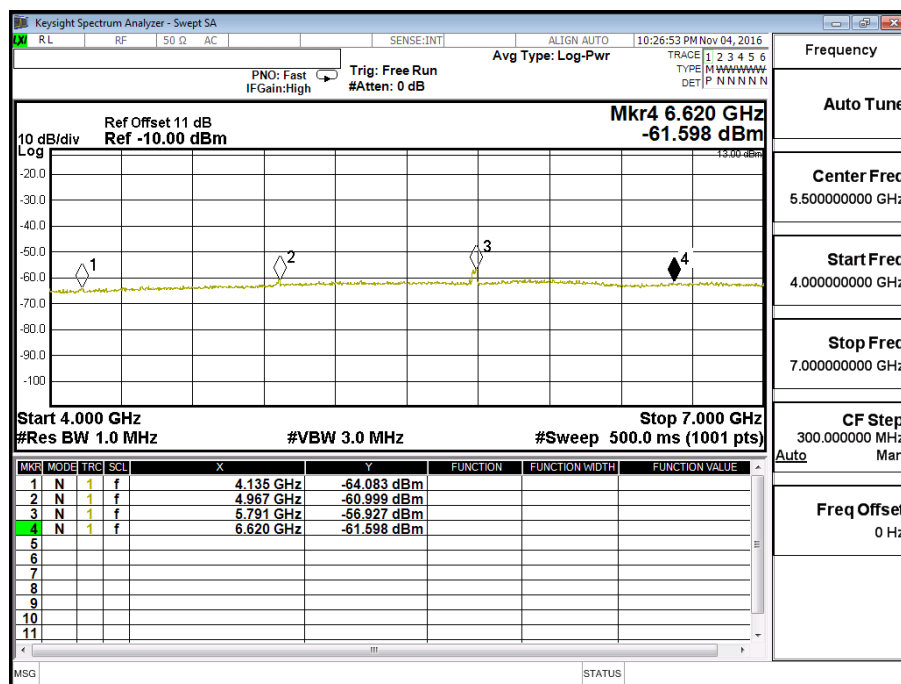
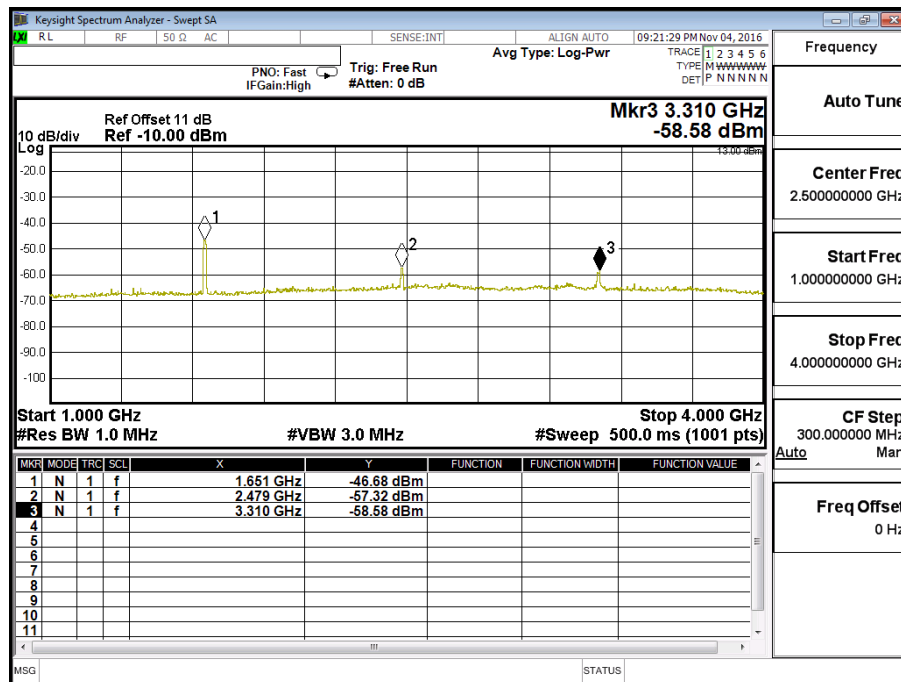


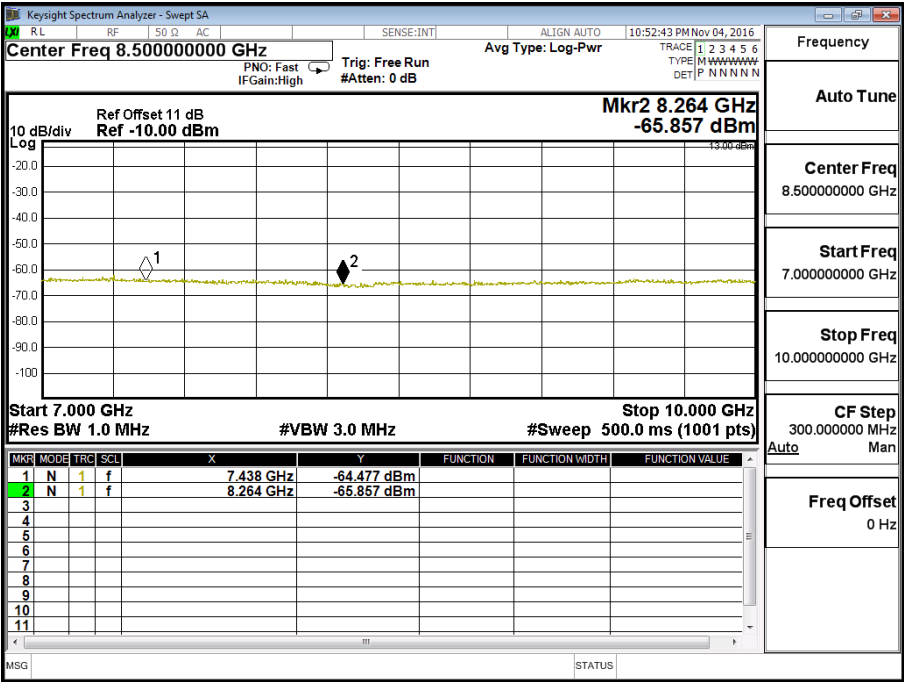
Product	LTE Router		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2016/12/04	Test Site	CTR
Test Condition	WCDMA BAND 5	Test Range	30MHz~10GHz

WCDMA BAND 5 High-Channel 4132

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1651	-46.680	0.58	-46.100	-13
2497	-57.320	0.7	-56.620	-13
3310	-58.580	1.01	-57.570	-13
4135	-64.083	1.18	-62.903	-13
4967	-60.999	1.23	-59.769	-13
5791	-56.927	1.45	-55.477	-13
6620	-61.598	1.56	-60.038	-13
7438	-64.477	1.59	-62.887	-13
8264	-65.857	1.82	-64.037	-13







Product	LTE Router		
Test Mode	Spurious Emission (Radiated)- Internal Antenna		
Date of Test	2016/12/05	Test Site	Site3
Test Condition	Channel 251(GSM 850 GPRS)	Test Range	9kHz ~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1696	-49.325	-52.082	1.630	9.800	-43.912	-13
2548	-54.730	-55.583	2.100	10.600	-47.083	-13
3394	-60.310	-61.805	2.350	12.300	-51.855	-13
4246	-63.021	-61.274	2.700	12.600	-51.374	-13
5092	-63.178	-58.612	2.830	12.700	-48.742	-13
5944	-64.107	-59.876	3.200	13.000	-50.076	-13

Vertical Emissions

1696	-49.003	-51.336	1.630	9.800	-43.166	-13
2548	-53.295	-53.284	2.100	10.600	-44.784	-13
3394	-61.542	-61.930	2.350	12.300	-51.980	-13
4246	-62.409	-59.519	2.700	12.600	-49.619	-13
5092	-62.680	-57.833	2.830	12.700	-47.963	-13
5944	-64.524	-60.241	3.200	13.000	-50.441	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - Internal Antenna		
Date of Test	2016/12/05	Test Site	Site3
Test Condition	Channel 251 (GSM 850 EGPRS)	Test Range	9kHz ~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1696	-54.408	-57.165	1.630	9.800	-48.995	-13
2548	-61.597	-62.450	2.100	10.600	-53.950	-13
3394	-61.442	-62.937	2.350	12.300	-52.987	-13
4246	-62.455	-60.709	2.700	12.600	-50.809	-13
5092	-63.645	-59.078	2.830	12.700	-49.208	-13
5944	-64.377	-60.146	3.200	13.000	-50.346	-13

Vertical Emissions

1696	-53.763	-56.096	1.630	9.800	-47.926	-13
2548	-61.539	-61.527	2.100	10.600	-53.027	-13
3394	-61.125	-61.513	2.350	12.300	-51.563	-13
4246	-61.987	-59.098	2.700	12.600	-49.198	-13
5092	-63.329	-58.483	2.830	12.700	-48.613	-13
5944	-64.412	-60.128	3.200	13.000	-50.328	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated)- Internal Antenna		
Date of Test	2016/12/05	Test Site	Site3
Test Condition	Channel 512 (PCS1900 GPRS)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3704	-56.730	-57.341	2.530	12.600	-47.271	-13
5550	-55.004	-51.620	3.050	13.100	-41.570	-13
7400	-60.161	-45.479	3.650	11.500	-37.629	-13
9250	-61.024	-46.192	3.850	12.000	-38.042	-13
11100	-64.541	-46.992	4.580	12.000	-39.572	-13
12950	-63.317	-43.388	4.800	13.300	-34.888	-13

Vertical Emissions

3704	-53.515	-51.880	2.530	12.600	-41.810	-13
5550	-60.148	-56.163	3.050	13.100	-46.113	-13
7400	-60.733	-45.653	3.650	11.500	-37.803	-13
9250	-61.169	-45.749	3.850	12.000	-37.599	-13
11100	-64.478	-46.727	4.580	12.000	-39.307	-13
12950	-63.877	-44.242	4.800	13.300	-35.742	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated)- Internal Antenna		
Date of Test	2016/12/05	Test Site	Site3
Test Condition	Channel 512 (PCS1900 EGPRS)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3704	-58.075	-58.686	2.530	12.600	-48.616	-13
5550	-61.178	-57.794	3.050	13.100	-47.744	-13
7400	-62.342	-47.660	3.650	11.500	-39.810	-13
9250	-62.435	-47.604	3.850	12.000	-39.454	-13
11100	-64.479	-46.930	4.580	12.000	-39.510	-13
12950	-64.319	-44.390	4.800	13.300	-35.89	-13

Vertical Emissions

3704	-55.501	-53.866	2.530	12.600	-43.796	-13
5550	-62.66	-58.674	3.050	13.100	-48.624	-13
7400	-62.635	-47.554	3.650	11.500	-39.704	-13
9250	-62.765	-47.345	3.850	12.000	-39.195	-13
11100	-64.129	-46.378	4.580	12.000	-38.958	-13
12950	-63.727	-44.092	4.800	13.300	-35.592	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - Internal Antenna		
Date of Test	2016/12/05	Test Site	OATS 3
Test Condition	Channel 9262 (WCDMA BAND 2)	Test Range	30MHz~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3704	-57.584	-58.195	2.530	12.600	-48.125	-13
5560	-63.341	-60.037	3.050	13.100	-49.987	-13
7410	-62.411	-47.757	3.650	11.500	-39.907	-13
9260	-62.989	-48.116	3.850	12.000	-39.966	-13
11110	-64.436	-46.945	4.580	12.000	-39.525	-13
12970	-64.220	-44.189	4.800	13.300	-35.689	-13

Vertical Emissions

3704	-51.173	-49.538	2.530	12.600	-39.468	-13
5560	-61.925	-57.999	3.050	13.100	-47.949	-13
7410	-62.542	-47.455	3.650	11.500	-39.605	-13
9260	-62.151	-46.676	3.850	12.000	-38.526	-13
11110	-64.616	-46.954	4.580	12.000	-39.534	-13
12970	-64.317	-44.624	4.800	13.300	-36.124	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - Internal Antenna		
Date of Test	2016/12/05	Test Site	OATS 1
Test Condition	Channel 4132 (WCDMA BAND 5)	Test Range	30MHz~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1648	-48.048	-51.443	1.630	9.800	-43.273	-13
2482	-61.492	-61.843	2.100	10.600	-53.343	-13
3304	-59.443	-61.121	2.350	12.300	-51.171	-13
4132	-61.195	-60.231	2.700	12.600	-50.331	-13
4960	-63.902	-59.761	2.830	12.700	-49.891	-13
5782	-63.975	-61.926	3.200	13.000	-52.126	-13

Vertical Emissions

1648	-49.633	-52.720	1.630	9.800	-44.550	-13
2482	-64.407	-64.480	2.100	10.600	-55.980	-13
3304	-59.872	-60.499	2.350	12.300	-50.549	-13
4132	-60.920	-58.270	2.700	12.600	-48.370	-13
4960	-63.795	-59.047	2.830	12.700	-49.177	-13
5782	-63.808	-61.701	3.200	13.000	-51.901	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - External Antenna		
Date of Test	2017/02/16	Test Site	Site3
Test Condition	Channel 251(GSM 850 GPRS)	Test Range	9kHz ~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1696	-44.954	-47.711	1.630	9.800	-39.541	-13
2548	-31.240	-32.093	2.100	10.600	-23.593	-13
3394	-62.416	-63.910	2.350	12.300	-53.960	-13
4246	-62.897	-61.151	2.700	12.600	-51.251	-13
5092	-64.108	-59.542	2.830	12.700	-49.672	-13
5944	-64.930	-60.699	3.200	13.000	-50.899	-13

Vertical Emissions

1696	-33.548	-35.880	1.630	9.800	-27.710	-13
2548	-29.324	-29.313	2.100	10.600	-20.813	-13
3394	-61.454	-61.842	2.350	12.300	-51.892	-13
4246	-62.777	-59.888	2.700	12.600	-49.988	-13
5092	-63.939	-59.093	2.830	12.700	-49.223	-13
5944	-64.167	-59.883	3.200	13.000	-50.083	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - External Antenna		
Date of Test	2017/02/16	Test Site	Site3
Test Condition	Channel 251 (GSM 850 EGPRS)	Test Range	9kHz ~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1696	-46.811	-49.567	1.630	9.800	-41.397	-13
2548	-42.211	-43.064	2.100	10.600	-34.564	-13
3394	-62.389	-63.884	2.350	12.300	-53.934	-13
4246	-62.792	-61.045	2.700	12.600	-51.145	-13
5092	-63.768	-59.202	2.830	12.700	-49.332	-13
5944	-64.583	-60.352	3.200	13.000	-50.552	-13

Vertical Emissions

1696	-39.159	-41.492	1.630	9.800	-33.322	-13
2548	-40.132	-40.120	2.100	10.600	-31.620	-13
3394	-62.055	-62.443	2.350	12.300	-52.493	-13
4246	-62.264	-59.375	2.700	12.600	-49.475	-13
5092	-63.925	-59.079	2.830	12.700	-49.209	-13
5944	-64.139	-59.855	3.200	13.000	-50.055	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - External Antenna		
Date of Test	2017/02/17	Test Site	Site3
Test Condition	Channel 512 (PCS1900 GPRS)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3704	-59.008	-59.619	2.530	12.600	-49.549	-13
5550	-53.639	-50.255	3.050	13.100	-40.205	-13
7400	-60.853	-46.170	3.650	11.500	-38.320	-13
9250	-62.990	-48.159	3.850	12.000	-40.009	-13
11100	-64.698	-47.149	4.580	12.000	-39.729	-13
12950	-64.793	-44.864	4.800	13.300	-36.364	-13

Vertical Emissions

3704	-56.253	-54.618	2.530	12.600	-44.548	-13
5550	-53.198	-49.213	3.050	13.100	-39.163	-13
7400	-60.125	-45.044	3.650	11.500	-37.194	-13
9250	-63.779	-48.359	3.850	12.000	-40.209	-13
11100	-64.252	-46.500	4.580	12.000	-39.080	-13
12950	-64.454	-44.819	4.800	13.300	-36.319	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - External Antenna		
Date of Test	2017/02/17	Test Site	Site3
Test Condition	Channel 512 (PCS1900 EGPRS)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3704	-60.905	-61.516	2.530	12.600	-51.446	-13
5550	-63.008	-59.624	3.050	13.100	-49.574	-13
7400	-64.340	-49.658	3.650	11.500	-41.808	-13
9250	-61.868	-47.036	3.850	12.000	-38.886	-13
11100	-65.239	-47.690	4.580	12.000	-40.270	-13
12950	-65.035	-45.106	4.800	13.300	-36.606	-13

Vertical Emissions

3704	-58.168	-56.533	2.530	12.600	-46.463	-13
5550	-62.009	-58.024	3.050	13.100	-47.974	-13
7400	-64.401	-49.321	3.650	11.500	-41.471	-13
9250	-61.418	-46.052	3.850	12.000	-37.902	-13
11100	-64.943	-47.192	4.580	12.000	-39.772	-13
12950	-64.885	-45.250	4.800	13.300	-36.750	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - External Antenna		
Date of Test	2017/02/16	Test Site	OATS 3
Test Condition	Channel 9262 (WCDMA BAND 2)	Test Range	30MHz~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3712	-56.293	-56.867	2.530	12.600	-46.797	-13
5560	-63.198	-60.132	3.050	13.100	-50.082	-13
7410	-63.133	-48.479	3.650	11.500	-40.629	-13
9260	-63.120	-48.246	3.850	12.000	-40.096	-13
11110	-64.173	-46.683	4.580	12.000	-39.263	-13
12970	-64.871	-44.840	4.800	13.300	-36.340	-13

Vertical Emissions

3704	-53.903	-52.268	2.530	12.600	-42.198	-13
5560	-63.105	-59.446	3.050	13.100	-49.396	-13
7410	-61.495	-46.408	3.650	11.500	-38.558	-13
9260	-62.753	-47.279	3.850	12.000	-39.129	-13
11110	-64.106	-46.355	4.580	12.000	-38.935	-13
12970	-64.671	-44.978	4.800	13.300	-36.478	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Router		
Test Mode	Spurious Emission (Radiated) - External Antenna		
Date of Test	2017/02/16	Test Site	OATS 1
Test Condition	Channel 4132 (WCDMA BAND 5)	Test Range	30MHz~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1648	-51.637	-55.032	1.630	9.800	-46.862	-13
2476	-56.145	-56.489	2.100	10.600	-47.989	-13
3304	-59.610	-61.288	2.350	12.300	-51.338	-13
4132	-63.041	-62.077	2.700	12.600	-52.177	-13
4960	-63.455	-59.314	2.830	12.700	-49.444	-13
5782	-62.387	-60.242	3.200	13.000	-50.442	-13

Vertical Emissions

1648	-45.154	-48.241	1.630	9.800	-40.071	-13
2482	-55.562	-55.639	2.100	10.600	-47.139	-13
3304	-59.682	-60.308	2.350	12.300	-50.358	-13
4132	-62.321	-59.671	2.700	12.600	-49.771	-13
4960	-63.653	-58.906	2.830	12.700	-49.036	-13
5782	-62.940	-60.763	3.200	13.000	-50.963	-13

Note:

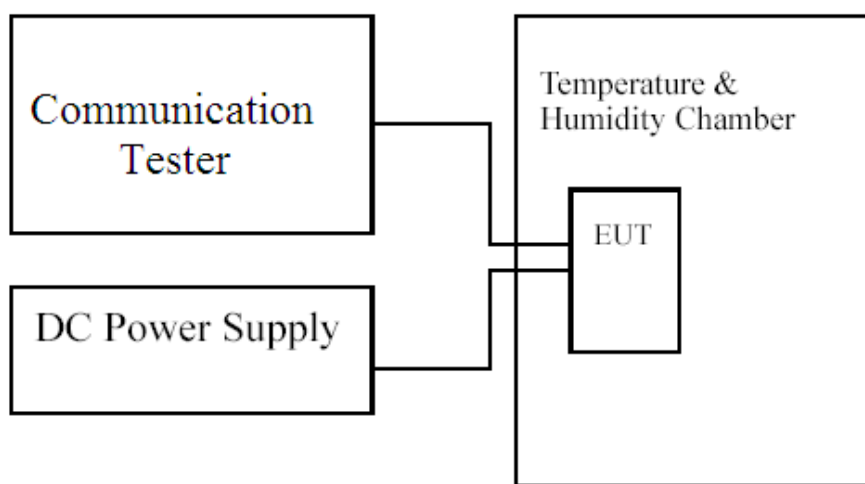
1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

7. Frequency Stability Under Temperature & Voltage Variations

7.1. Test Specification

According to Part 2.1055, 22.355, 24.235

7.2. Test Setup



7.3. Limits

Limit	$\leq \pm 2.5 \text{ ppm}$
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7.4. Test Procedure

The frequency stability of transmitter is measured by:

- Temperature: The temperature is varied from -30°C to 50°C in 10°C increment using a standard temperature & Humidity chamber.
- Primary Supply Voltage: The primary supply voltage is varied 85% to 115% of the nominal value for non hand-carried equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating endpoint which shall be specified by the manufacturer.

The EUT was connected via the base station simulator. Universal Radio Communication Tester, was used to measure The Frequency Error. The maximum result of measurements was recorded.

7.5. Test Result of Frequency Stability Under Temperature Variations

Product	LTE Router		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2016/12/13	Test Site	CTR
Test Condition	GSM 850 GPRS / Channel 189	Test Range	0°C~+35°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
-30	0.8364	-0.022	±2.09
-20	0.8364	-0.032	±2.09
-10	0.8364	-0.025	±2.09
0	0.8364	-0.030	±2.09
10	0.8364	-0.025	±2.09
20	0.8364	0.022	±2.09
35	0.8364	0.022	±2.09
40	0.8364	0.019	±2.09
50	0.8364	0.024	±2.09

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
138	0.8364	0.021	±2.09
120	0.8364	0.022	±2.09
102	0.8364	0.022	±2.09

Product	LTE Router		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2016/12/13	Test Site	CTR
Test Condition	GSM 850 EGPRS / Channel 189	Test Range	0°C~+35°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
-30	0.8364	-0.028	±2.09
-20	0.8364	-0.034	±2.09
-10	0.8364	-0.029	±2.09
0	0.8364	-0.033	±2.09
10	0.8364	-0.028	±2.09
20	0.8364	0.019	±2.09
35	0.8364	0.020	±2.09
40	0.8364	0.016	±2.09
50	0.8364	0.021	±2.09

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
138	0.8364	0.018	±2.09
120	0.8364	0.019	±2.09
102	0.8364	0.017	±2.09

Product	LTE Router		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2016/12/13	Test Site	CTR
Test Condition	PCS 1900 GPRS / Channel 661	Test Range	0°C~+35°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
-30	1.88	0.030	±4.7
-20	1.88	-0.026	±4.7
-10	1.88	0.024	±4.7
0	1.88	0.016	±4.7
10	1.88	0.018	±4.7
20	1.88	0.020	±4.7
35	1.88	0.033	±4.7
40	1.88	0.016	±4.7
50	1.88	0.022	±4.7

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
138	1.88	0.019	±4.7
120	1.88	0.020	±4.7
102	1.88	0.019	±4.7

Product	LTE Router		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2016/12/13	Test Site	CTR
Test Condition	PCS 1900 EGPRS / Channel 661	Test Range	0°C~+35°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
-30	1.88	0.013	±4.7
-20	1.88	0.021	±4.7
-10	1.88	0.024	±4.7
0	1.88	-0.039	±4.7
10	1.88	0.017	±4.7
20	1.88	0.038	±4.7
35	1.88	0.019	±4.7
40	1.88	-0.013	±4.7
50	1.88	0.016	±4.7

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
138	1.88	0.032	±4.7
120	1.88	0.038	±4.7
102	1.88	0.023	±4.7

Product	LTE Router		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2016/12/13	Test Site	CTR
Test Condition	WCDMA BAND 2 / Channel 9400	Test Range	0°C~+35°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
-30	1.88	-0.008	±4.7
-20	1.88	0.009	±4.7
-10	1.88	0.008	±4.7
0	1.88	-0.011	±4.7
10	1.88	-0.009	±4.7
20	1.88	-0.007	±4.7
35	1.88	-0.009	±4.7
40	1.88	-0.007	±4.7
50	1.88	-0.010	±4.7

Note : Test Temperature specified by the manufacturer .

Voltage Variations

AC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
138	1.88	-0.009	±4.7
120	1.88	-0.007	±4.7
102	1.88	-0.009	±4.7

Product	LTE Router		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2016/12/13	Test Site	CTR
Test Condition	WCDMA BAND 5 / Channel 4183	Test Range	0°C~+35°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
-30	0.8366	-0.005	±2.09
-20	0.8366	-0.006	±2.09
-10	0.8366	-0.009	±2.09
0	0.8366	-0.006	±2.09
10	0.8366	-0.005	±2.09
20	0.8366	-0.006	±2.09
33	0.8366	-0.005	±2.09
40	0.8366	-0.008	±2.09
50	0.8366	-0.009	±2.09

Note : Test Temperature specified by the manufacturer .

Voltage Variations

AC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
138	0.8366	-0.008	±2.09
120	0.8366	-0.006	±2.09
102	0.8366	-0.005	±2.09

7. EMI Reduction Method During Compliance Testing

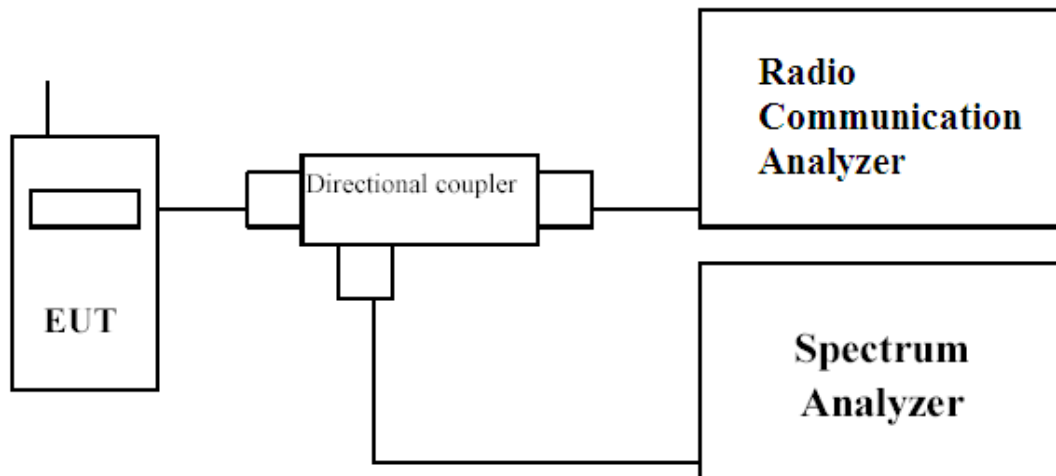
No modification was made during testing.

8. Peak to Average Ratio

8.1 Test Specification

According to Part 24.232.

8.2 Test Setup



8.3 Limits

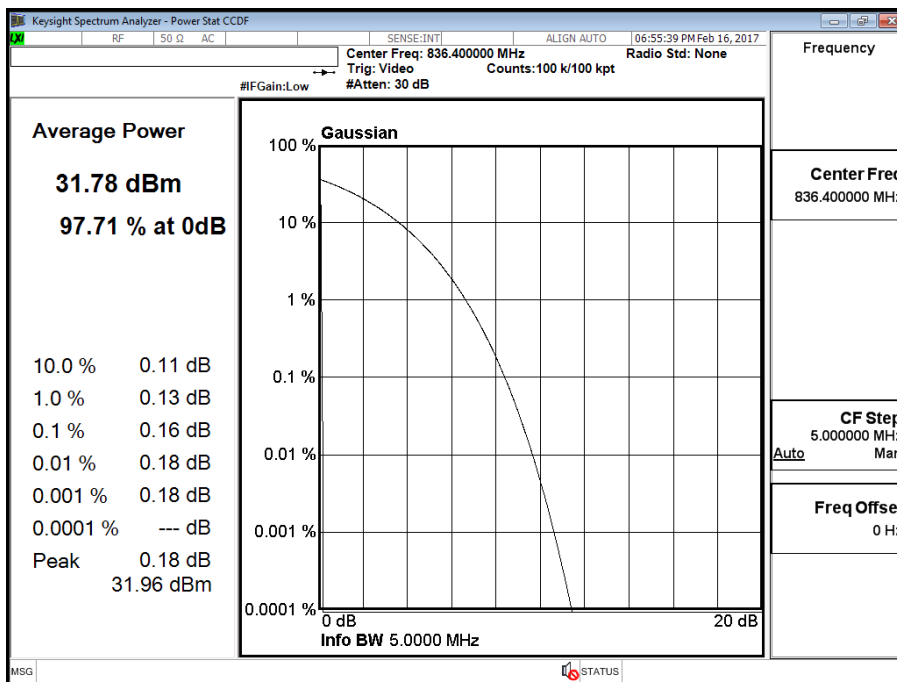
The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure.

8.4 Test Procedure

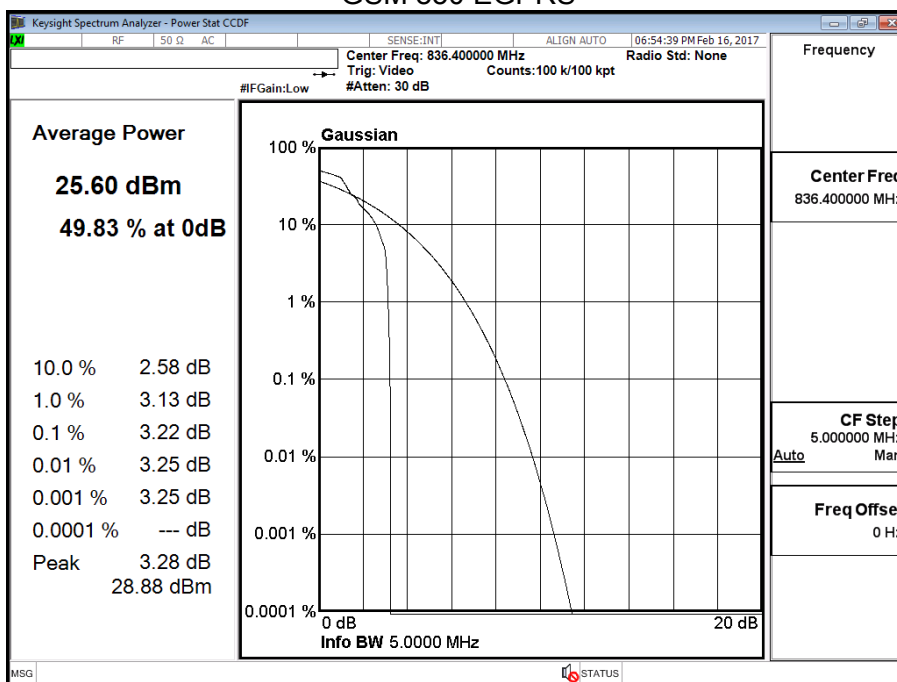
- a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- b) Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- c) Set the number of counts to a value that stabilizes the measured CCDF curve;
- d) Set the measurement interval as follows:
 - 1) for continuous transmissions, set to 1 ms,
 - 2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
- e) Record the maximum PAPR level associated with a probability of 0.1%.

Product	LTE Router		
Test Mode	Peak to Average Ratio		
Date of Test	2017/02/08	Test Site	CTR
Test Condition	GSM 850		

GSM 850 GPRS

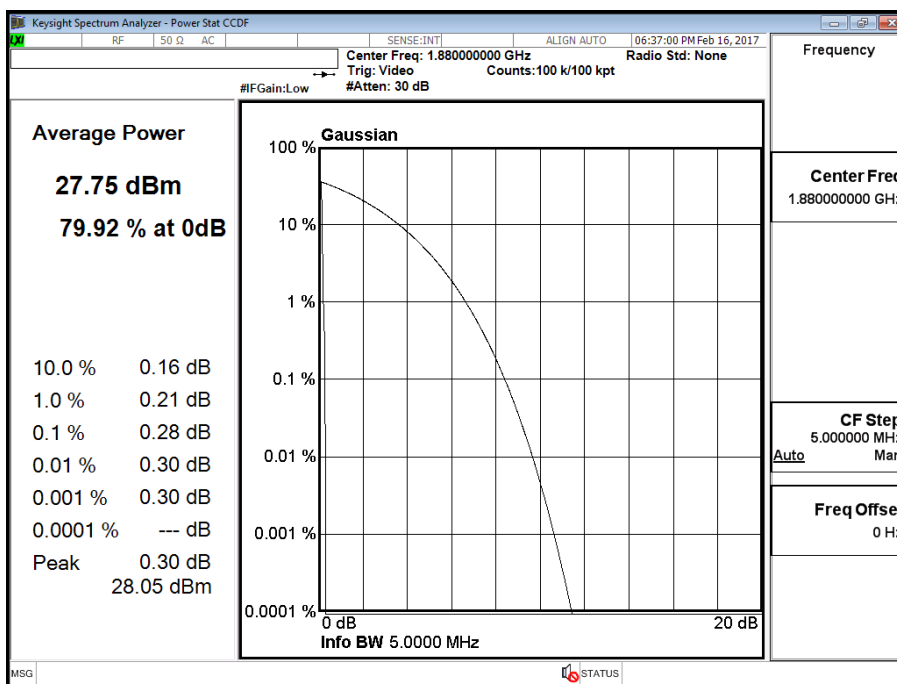


GSM 850 EGPRS

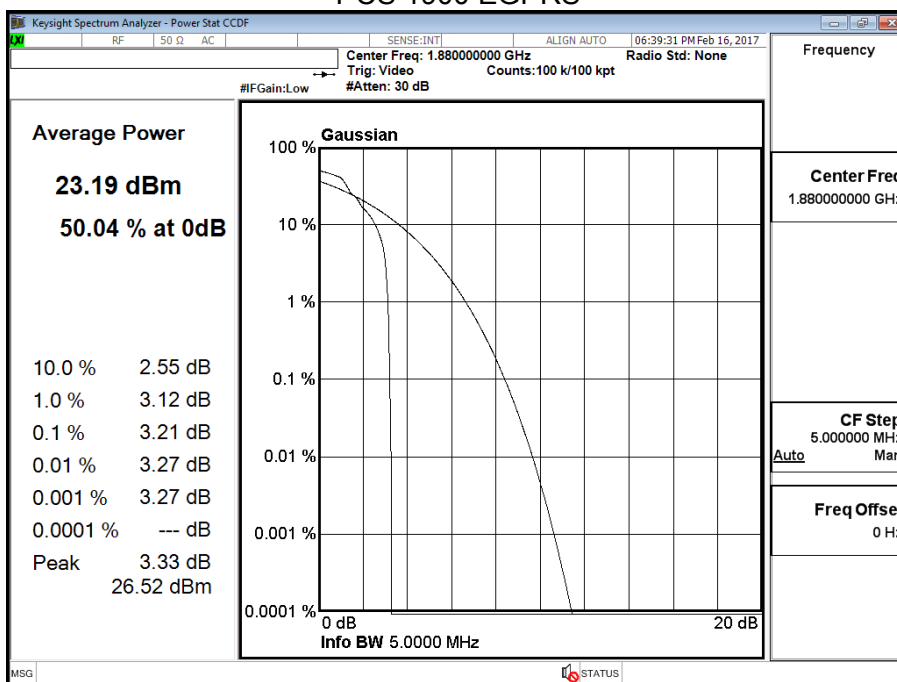


Product	LTE Router		
Test Mode	Peak to Average Ratio		
Date of Test	2017/02/08	Test Site	CTR
Test Condition	PCS 1900		

PCS 1900 GPRS

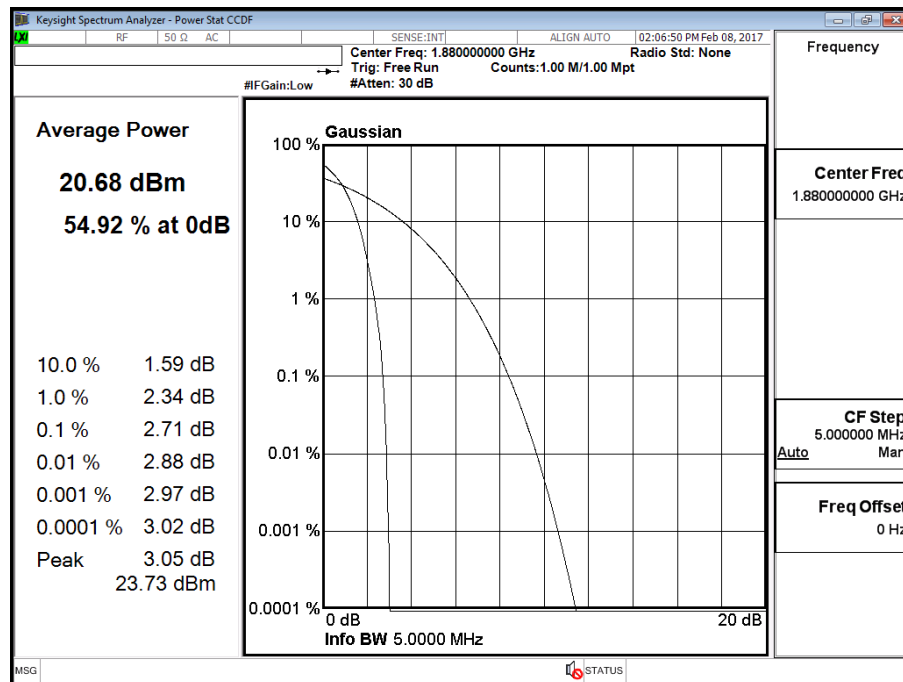


PCS 1900 EGPRS



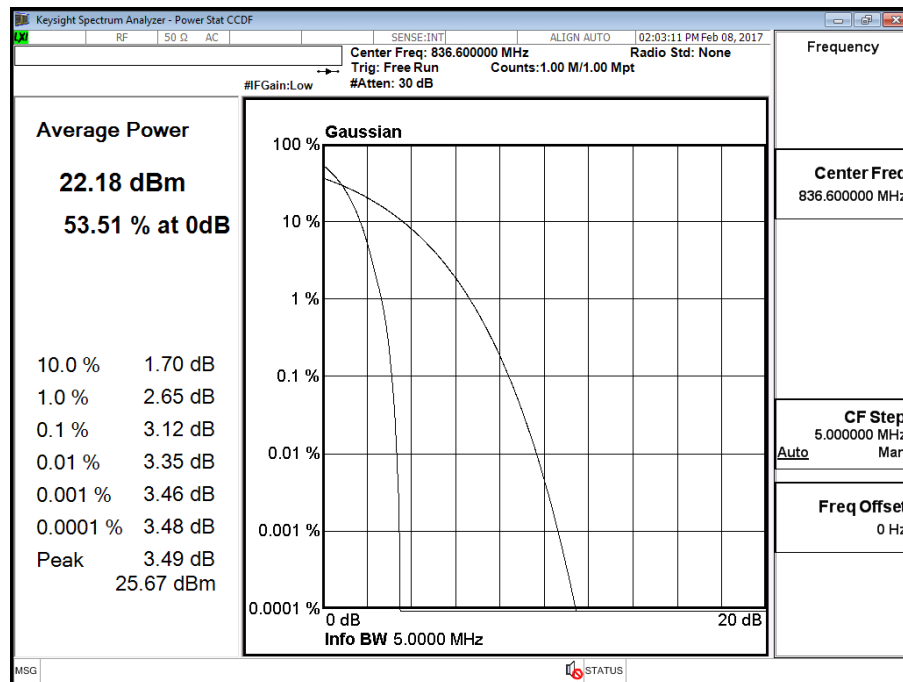
Product	LTE Router		
Test Mode	Peak to Average Ratio		
Date of Test	2017/02/08	Test Site	CTR
Test Condition	WCDMA BAND 2		

WCDMA BAND 2



Product	LTE Router		
Test Mode	Peak to Average Ratio		
Date of Test	2017/02/08	Test Site	CTR
Test Condition	WCDMA BAND 5		

WCDMA BAND 5



Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs