TESTING
No. L2264

Part 27

TEST REPORT

Product Name	Tablet
Model Name	P1988
FCC ID	VOB-P1988
Client	NVIDIA CORPORATION
Manufacturer	NVIDIA CORPORATION
Date of issue	March 31, 2014

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Reference Standard(s)	**FCC CFR47 Part 2 (2013)** Frequency Allocations And Radio Treaty Matters; General Rules And Regulations **FCC CFR47 Part 27C (2013)** MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES **ANSI/TIA-603-C(2004)** Land mobile FM or PM Communications Equipment Measurements and Performance Standards. **KDB 971168 D01 Power Meas License Digital Systems v02r01** Measurement Guidance for Certification of Licensed Digital Transmitters
Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards. General Judgment: **Pass**
Comment	The test result only responds to the measured sample.

Approved by Weizhong Yang
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Director

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RF Manager

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1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 428261.

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 8510A.

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report alone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electronic report is inconsistent with the printed one, it should be subject to the latter.

1.2. Testing laboratory

Company:	TA Technology (Shanghai) Co., Ltd.
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1.3. Applicant Information

Company:	NVIDIA CORPORATION
Address:	2701 SAN TOMAS EXPRESSWAY,SANTA CLARA,CALIFORNIA 95050,UNITED STATES OF AMERICA

1.4. Manufacturer Information

Company:	NVIDIA CORPORATION
Address:	2701 SAN TOMAS EXPRESSWAY,SANTA CLARA,CALIFORNIA 95050,UNITED STATES OF AMERICA

1.5. Information of EUT

General information

Product IMEI:	4402351228600		
Hardware Version:	A00		
Software Version:	4.4.2		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Operating Mode(s):	LTE Band 4/7/17 :（tested）;		
Bandwidth(s):	LTE Band 4: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 17: 5 MHz, 10 MHz		
Test Modulation:	QPSK, 16QAM		
Maximum E.I.R.P.	LTE Band 4: 22.93 dBm LTE Band 7: 24.12 dBm LTE Band 17: 19.56 dBm		
Power Supply:	Battery or Charger		
Rated Power Supply Voltage:	3.7V		
Extreme Voltage:	Minimum: 3.5V Maximum: 4.2V		
Extreme Temperature:	Lowest: 0°C Highest: 40°C		
Test Channel: (Low - Middle - High)	19957-20175-20393 (LTE Band 4, 1.4M) 19965-20175-20385 (LTE Band 4, 3M) 19975-20175-20375 (LTE Band 4, 5M) 20000-20175-20350 (LTE Band 4, 10M) 20025-20175-20325 (LTE Band 4, 15M) 20050-20175-20300 (LTE Band 4, 20M) 20775 – 21100 - 21425 (LTE Band 7, 5M) 20800 – 21100 - 21400 (LTE Band 7, 10M) 20825 – 21100 - 21375 (LTE Band 7, 15M) 20850 – 21100 - 21350 (LTE Band 7, 20M) 23755 – 23790 – 23825 (LTE Band 17, 5M) 23780 – 23790 – 23800 (LTE Band 17, 10M)		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 4(1.4MHz)	1710.7 ~1754.3	2110.7~2154.3
	LTE Band 4(3MHz)	1711.5~1753.5	2111.5~2153.5

	LTE Band 4(5MHz)	1712.5~1752.5	2112.5~2152.5
	LTE Band 4(10 MHz)	1715.0~1750.0	2115~2150
	LTE Band 4(15MHz)	1717.5 ~ 1747.5	2117.5 ~ 2147.5
	LTE Band 4(20MHz)	1720 ~ 1745	2120 ~ 2145
	LTE Band 7(5MHz)	2502.5 ~ 2567.5	2622.5 ~ 2687.5
	LTE Band 7(10MHz)	2505 ~ 2565	2625 ~ 2685
	LTE Band 7(15MHz)	2507.5 ~ 2562.5	2627.5 ~ 2682.5
	LTE Band 7(20MHz)	2510 ~ 2560	2630 ~ 2680
	LTE Band 17(5MHz)	706.5 ~ 713.5	736.5 ~ 743.5
	LTE Band 17(10MHz)	709 ~ 711	739 ~ 741
	LTE Band 7(5MHz)	2502.5 ~ 2567.5	2622.5 ~ 2687.5
	LTE Band 7(10MHz)	2505 ~ 2565	2625 ~ 2685
	LTE Band 7(15MHz)	2507.5 ~ 2562.5	2627.5 ~ 2682.5
	LTE Band 7(20MHz)	2510 ~ 2560	2630 ~ 2680
	LTE Band 17(5MHz)	706.5 ~ 713.5	736.5 ~ 743.5
	LTE Band 17(10MHz)	709 ~ 711	739 ~ 741

Equipment Under Test (EUT) is tested LTE Band 4/7/17 in this report.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test is performed from March 20, 2014 to March 27, 2014.

2. Test Information

2.1. Summary of test results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	27.50	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53	PASS
5	Peak-to-Average Power Ratio	KDB 971168 D01(5.7)	PASS
6	Frequency Stability	2.1055 / 27.54	PASS
7	Spurious Emissions at Antenna Terminals	2.1051 / 27.53(c)(2)	PASS
8	Radiates Spurious Emission	2.1053 /27.53	PASS

2.2. RF Power Output

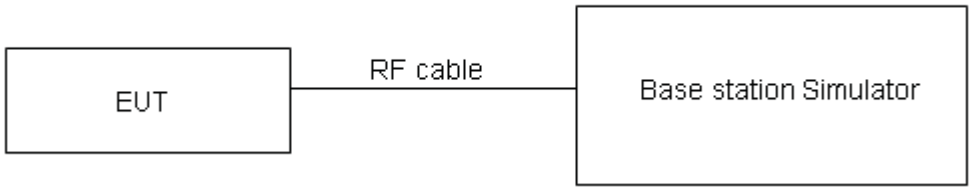
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure proper test configuration.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.4 dB.

Test Results

LTE Band 4				Average Conducted Power (dBm)		
Bandwidth	Modulation	RB	RB Start	Channel 19957	Channel 20175	Channel 20393
1.4MHz	QPSK	1	0	22.127	22.33	22.258
		1	2	22.121	22.35	22.167
		1	5	22.176	22.327	22.169
		3	0	22.202	22.315	22.178
		3	2	22.021	22.219	22.143
		3	3	22.167	22.32	22.281
		6	0	21.108	21.293	21.147
	16QAM	1	0	21.392	21.296	21.493
		1	2	21.677	21.745	21.858
		1	5	21.354	21.555	21.758
		3	0	21.871	21.855	21.901
		3	2	21.858	22.003	22.274
		3	3	21.889	21.947	22.003
		6	0	20.801	20.497	20.791
Bandwidth	Modulation	RB	RB Start	Channel 19965	Channel 20175	Channel 20383
3MHz	QPSK	1	0	22.426	22.317	22.148
		1	7	22.396	22.46	22.236
		1	14	22.385	22.309	22.307
		8	0	21.138	21.287	21.032
		8	4	21.126	21.309	21.181
		8	7	21.098	21.194	21.184
		15	0	21.124	21.341	21.053
	16QAM	1	0	22.435	21.577	21.051
		1	7	22.123	22.116	21.054
		1	14	22.215	21.717	21.295
		8	0	20.362	20.333	20.429
		8	4	20.182	20.413	20.448
		8	7	20.357	20.384	20.377
		15	0	20.223	20.297	19.953
Bandwidth	Modulation	RB	RB Start	Channel 19975	Channel 20175	Channel 20375
5MHz	QPSK	1	0	22.079	22.563	22.558
		1	13	22.039	22.552	22.542
		1	24	21.971	22.269	22.58
		12	0	21.049	21.289	21.171
		12	6	21.122	21.254	21.151
		12	13	21.053	21.335	21.203
		25	0	21.062	21.206	21.187
	16QAM	1	0	22.081	21.059	21.925

		1	13	21.372	20.881	21.944
		1	24	21.85	21.26	22.171
		12	0	20.171	20.33	20.162
		12	6	20.139	20.552	20.127
		12	13	20.115	20.454	20.129
		25	0	20.012	20.36	20.207
Bandwidth	Modulation	RB	RB Start	Channel 20000	Channel 20175	Channel 20350
10MHz	QPSK	1	0	22.168	22.457	22.356
		1	25	22.441	22.506	22.54
		1	49	22.174	21.257	22.508
		25	0	21.008	21.221	21.043
		25	13	21.123	21.382	20.852
		25	25	21.129	21.525	20.897
		50	0	21.057	21.309	21.103
	16QAM	1	0	21.302	21.926	21.789
		1	25	21.31	22.09	21.948
		1	49	21.114	22.045	21.702
		25	0	20.167	20.478	20.117
		25	13	20.165	20.415	20.036
		25	25	20.193	20.364	20.119
		50	0	19.936	20.268	19.98
Bandwidth	Modulation	RB	RB Start	Channel 20025	Channel 20175	Channel 20325
15MHz	QPSK	1	0	21.992	22.268	22.397
		1	38	21.956	22.567	22.501
		1	74	22.212	22.072	22.378
		36	0	21.001	21.148	20.956
		36	18	21.081	21.183	20.895
		36	39	21.181	21.147	20.923
		75	0	20.094	21.226	20.927
	16QAM	1	0	21.618	21.833	21.77
		1	38	21.396	22.22	21.75
		1	74	21.751	22.264	22.022
		36	0	20.089	20.291	19.974
		36	18	20.094	20.336	20.011
		36	39	20.076	20.367	19.976
		75	0	20.085	20.058	19.838
Bandwidth	Modulation	RB	RB Start	Channel 20050	Channel 20175	Channel 20300
20MHz	QPSK	1	0	22.142	22.362	22.267
		1	50	22.242	22.372	22.311
		1	99	22.149	22.343	22.424
		50	0	20.975	21.117	20.945

		50	25	21.104	21.244	20.865
		50	50	21.338	21.234	20.897
		100	0	21.218	21.151	20.936
	16QAM	1	0	21.95	20.717	22.544
		1	50	22.235	21.192	22.534
		1	99	21.894	21.499	22.586
		50	0	20.194	20.062	19.997
		50	25	20.164	20.193	19.888
		50	50	20.15	20.025	19.877
		100	0	20.069	20.149	19.918

LTE Band 7				Average Conducted Power (dBm)		
Bandwidth	Modulation	RB	RB Start	Channel 20775	Channel 21100	Channel 21425
5MHz	QPSK	1	0	21.08	21.62	22.013
		1	13	21.649	21.62	22.115
		1	24	21.367	21.7	21.975
		12	0	20.504	20.46	20.469
		12	6	20.448	20.43	20.465
		12	13	20.611	20.48	20.456
		25	0	20.534	20.46	20.467
	16QAM	1	0	20.356	20.84	21.216
		1	13	20.416	20.88	20.721
		1	24	20.264	20.86	20.648
		12	0	19.539	19.55	19.524
		12	6	19.527	19.55	19.37
		12	13	19.374	19.59	19.424
		25	0	19.446	19.46	19.299
Bandwidth	Modulation	RB	RB Start	Channel 20800	Channel 21100	Channel 21400
10MHz	QPSK	1	0	21.798	21.72	21.571
		1	25	21.429	21.5	21.37
		1	49	21.643	21.53	21.272
		25	0	20.715	20.5	20.289
		25	13	20.753	20.51	20.252
		25	25	20.618	20.53	20.25
		50	0	20.871	20.49	20.376
	16QAM	1	0	21.615	21.05	21.197
		1	25	21.556	21.01	21.307
		1	49	21.497	20.95	20.895
		25	0	19.375	19.61	19.581
		25	13	19.569	19.61	19.381
		25	25	19.392	19.61	19.527
		50	0	19.439	19.43	19.135

Bandwidth	Modulation	RB	RB Start	Channel 20825	Channel 21100	Channel 21375
15MHz	QPSK	1	0	21.724	21.55	21.524
		1	38	21.606	21.47	21.447
		1	74	21.541	21.217	21.336
		36	0	20.388	20.137	20.292
		36	18	20.256	20.024	20.319
		36	39	20.132	20.049	20.204
		75	0	20.512	20.245	20.103
	16QAM	1	0	21.372	21.414	21.331
		1	38	21.887	21.872	20.768
		1	74	21.725	21.44	20.863
		36	0	19.332	19.119	19.33
		36	18	19.316	19.109	19.21
		36	39	19.244	19.093	19.194
		75	0	19.164	19.141	19.174
Bandwidth	Modulation	RB	RB Start	Channel 20050	Channel 20175	Channel 20300
20MHz	QPSK	1	0	21.558	21.554	21.519
		1	50	21.37	21.305	21.305
		1	99	21.204	21.214	21.283
		50	0	20.408	20.173	20.244
		50	25	20.238	20.244	20.169
		50	50	20.22	20.203	20.188
		100	0	20.428	20.1	20.185
	16QAM	1	0	20.821	20.469	21.165
		1	50	20.681	20.766	21.182
		1	99	20.192	20.755	21.179
		50	0	19.326	19.003	19.236
		50	25	19.267	19.017	19.172
		50	50	19.192	19.132	19.109
		100	0	19.324	19.113	19.267

LTE Band 17				Average Conducted Power (dBm)		
Bandwidth	Modulation	RB	RB Start	Channel 23755	Channel 23790	Channel 23825
5MHz	QPSK	1	0	22.92	22.93	22.62
		1	13	22.87	22.92	22.68
		1	24	22.91	22.83	22.62
		12	0	21.8	21.78	21.72
		12	6	21.78	21.78	21.74
		12	13	21.79	21.76	21.71
		25	0	21.76	21.8	21.68
	16QAM	1	0	22.64	21.62	22.33

		1	13	22.56	21.63	22.3
		1	24	22.54	21.65	22.3
		12	0	20.85	20.82	20.66
		12	6	20.88	20.8	20.68
		12	13	20.86	20.89	20.75
		25	0	20.92	20.7	20.61
Bandwidth	Modulation	RB	RB Start	Channel 23780	Channel 23790	Channel 23800
10MHz	QPSK	1	0	22.99	22.987	22.69
		1	25	22.92	22.903	22.64
		1	49	22.97	22.975	22.65
		25	0	21.69	21.685	21.65
		25	13	21.67	21.76	21.66
		25	25	21.62	21.68	21.62
		50	0	21.6	21.74	21.65
	16QAM	1	0	22.99	21.74	22.64
		1	25	22.9	21.74	22.56
		1	49	22.95	21.76	22.57
		25	0	20.69	20.84	20.73
		25	13	20.64	20.84	20.78
		25	25	20.67	20.77	20.72
		50	0	20.49	20.65	20.64

2.3. Effective Isotropic Radiated Power

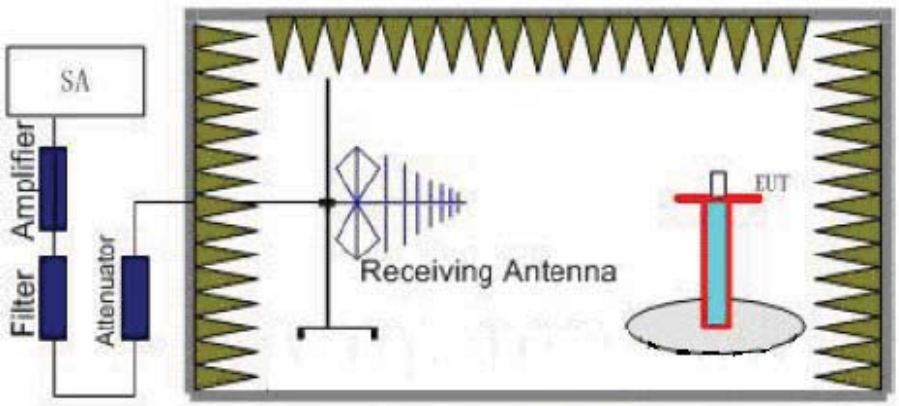
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Methods of Measurement

The measurement procedures in TIA- 603C are used.
1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
Ps (dBm)：Input power to substitution antenna.
Gs (dBi or dBd)：Substitution antenna Gain.
Et = Rt + AF
Es = Rs + AF
AF (dB/m)：Receive antenna factor
Rt：The highest received signal in spectrum analyzer for EUT.
Rs：The highest received signal in spectrum analyzer for substitution antenna.

Test Setup



Limits

Rule Part 27.50(d)(4) specifies that " Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP" and Rule Part 27.50(d)(6) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage".

Limit (EIRP)	⩽ 1 W (30 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 1.19 dB

Test Results:Pass

LTE Band 4 QPSK

LTE Band 4 Radiated Power EIRP(1.4M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1710	-32.26	-53.50	0	1.44	22.68	0.1854
1732.5	-32.60	-53.39	0	1.57	22.36	0.1722
1754.3	-33.69	-53.32	0	1.66	21.29	0.1346
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1710	-33.08	-53.95	0	1.44	22.31	0.1702
1732.5	-33.48	-53.82	0	1.57	21.91	0.1552
1754.3	-33.70	-53.75	0	1.66	21.71	0.1483
LTE Band 4 Radiated Power EIRP(3M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1711.5	-32.14	-53.50	0	1.44	22.8	0.1905
1732.5	-32.48	-53.39	0	1.57	22.48	0.1770
1753.5	-33.57	-53.32	0	1.66	21.41	0.1384
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1711.5	-32.96	-53.95	0	1.44	22.43	0.1750
1732.5	-33.36	-53.82	0	1.57	22.03	0.1596
1753.5	-33.58	-53.75	0	1.66	21.83	0.1524
LTE Band 4 Radiated Power EIRP(5M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1712.5	-32.36	-53.50	0	1.44	22.58	0.1811
1732.5	-32.70	-53.39	0	1.57	22.26	0.1683
1752.5	-33.79	-53.32	0	1.66	21.19	0.1315
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1712.5	-33.18	-53.95	0	1.44	22.21	0.1663
1732.5	-33.58	-53.82	0	1.57	21.81	0.1517

1752.5	-33.80	-53.75	0	1.66	21.61	0.1449
LTE Band 4 Radiated Power EIRP(10M)						
Horizontal Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
1715	-32.01	-53.50	0	1.44	22.93	0.1963
1732.5	-32.35	-53.39	0	1.57	22.61	0.1824
1750	-33.44	-53.32	0	1.66	21.54	0.1426
Vertical Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
1715	-32.83	-53.95	0	1.44	22.56	0.1803
1732.5	-33.23	-53.82	0	1.57	22.16	0.1644
1750	-33.45	-53.75	0	1.66	21.96	0.1570
LTE Band 4 Radiated Power EIRP(15M)						
Horizontal Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
1717.5	-32.28	-53.50	0	1.44	22.66	0.1845
1732.5	-32.62	-53.39	0	1.57	22.34	0.1714
1747.5	-33.67	-53.32	0	1.62	21.27	0.1340
Vertical Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
1717.5	-33.10	-53.95	0	1.44	22.29	0.1694
1732.5	-33.50	-53.82	0	1.57	21.89	0.1545
1747.5	-33.68	-53.75	0	1.62	21.69	0.1476
LTE Band 4 Radiated Power EIRP(20M)						
Horizontal Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
1720	-32.14	-53.50	0	1.44	22.8	0.1905
1732.5	-32.48	-53.39	0	1.57	22.48	0.1770
1745	-33.53	-53.32	0	1.62	21.41	0.1384
Vertical Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
1720	-32.96	-53.95	0	1.44	22.43	0.1750
1732.5	-33.36	-53.82	0	1.57	22.03	0.1596
1745	-33.54	-53.75	0	1.62	21.83	0.1524

LTE Band 4 16QAM

LTE Band 4 Radiated Power EIRP(1.4M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1710	-33.00	-53.50	0	1.44	21.945	0.1565
1732.5	-33.63	-53.39	0	1.57	21.326	0.1357
1754.3	-34.46	-53.32	0	1.66	20.525	0.1128
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1710	-33.82	-53.95	0	1.44	21.575	0.1437
1732.5	-34.51	-53.82	0	1.57	20.876	0.1223
1754.3	-34.47	-53.75	0	1.66	20.945	0.1243
LTE Band 4 Radiated Power EIRP(3M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1711.5	-32.13	-53.50	0	1.44	22.809	0.1909
1732.5	-33.22	-53.39	0	1.57	21.74	0.1493
1753.5	-34.67	-53.32	0	1.66	20.313	0.1075
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1711.5	-32.95	-53.95	0	1.44	22.439	0.1753
1732.5	-34.10	-53.82	0	1.57	21.29	0.1346
1753.5	-34.68	-53.75	0	1.66	20.733	0.1184
LTE Band 4 Radiated Power EIRP(5M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1712.5	-32.36	-53.50	0	1.44	22.582	0.1812
1732.5	-33.90	-53.39	0	1.57	21.056	0.1275
1752.5	-34.12	-53.32	0	1.66	20.857	0.1218
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1712.5	-33.18	-53.95	0	1.44	22.212	0.1664
1732.5	-34.78	-53.82	0	1.57	20.606	0.1150
1752.5	-34.13	-53.75	0	1.66	21.277	0.1342

LTE Band 4 Radiated Power EIRP(10M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1715	-32.88	-53.50	0	1.44	22.064	0.1608
1732.5	-32.58	-53.39	0	1.57	22.379	0.1729
1750	-34.01	-53.32	0	1.66	20.973	0.1251
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1715	-33.70	-53.95	0	1.44	21.694	0.1477
1732.5	-33.46	-53.82	0	1.57	21.929	0.1559
1750	-34.02	-53.75	0	1.66	21.393	0.1378
LTE Band 4 Radiated Power EIRP(15M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1717.5	-32.65	-53.50	0	1.44	22.286	0.1693
1732.5	-33.06	-53.39	0	1.57	21.905	0.1551
1747.5	-34.30	-53.32	0	1.62	20.643	0.1160
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1717.5	-33.47	-53.95	0	1.44	21.916	0.1555
1732.5	-33.94	-53.82	0	1.57	21.455	0.1398
1747.5	-34.31	-53.75	0	1.62	21.063	0.1277
LTE Band 4 Radiated Power EIRP(20M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1720	-32.43	-53.50	0	1.44	22.508	0.1782
1732.5	-34.13	-53.39	0	1.57	20.835	0.1212
1745	-34.25	-53.32	0	1.62	20.687	0.1171
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
1720	-33.25	-53.95	0	1.44	22.138	0.1636
1732.5	-35.01	-53.82	0	1.57	20.385	0.1093
1745	-34.26	-53.75	0	1.62	21.107	0.1290

LTE Band 7 QPSK

LTE BAND7 Radiated Power EIRP(5M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2502.5	-35.11	-57.46	0	1.77	24.12	0.2582
2535	-35.65	-57.77	0	1.81	23.93	0.2472
2567.5	-36.56	-57.76	0	1.82	23.02	0.2004
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2502.5	-37.61	-57.42	0	1.77	21.58	0.1439
2535	-37.04	-57.58	0	1.81	22.35	0.1718
2567.5	-37.05	-57.84	0	1.82	22.61	0.1824
LTE BAND7 Radiated Power EIRP(10M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2505	-35.34	-57.46	0	1.77	23.89	0.2449
2535	-35.88	-57.77	0	1.81	23.7	0.2344
2565	-36.79	-57.76	0	1.82	22.79	0.1901
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2505	-37.84	-57.42	0	1.77	21.35	0.1365
2535	-37.27	-57.58	0	1.81	22.12	0.1629
2565	-37.28	-57.84	0	1.82	22.38	0.1730
LTE BAND7 Radiated Power EIRP(15M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2507.5	-35.46	-57.46	0	1.77	23.77	0.2382
2535	-36.00	-57.77	0	1.81	23.58	0.2280
2562.5	-36.91	-57.76	0	1.82	22.67	0.1849
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2507.5	-37.96	-57.42	0	1.77	21.23	0.1327
2535	-37.39	-57.58	0	1.81	22	0.1585
2562.5	-37.40	-57.84	0	1.82	22.26	0.1683

LTE BAND7 Radiated Power EIRP(20M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2510	-35.55	-57.46	0	1.77	23.68	0.2333
2535	-36.09	-57.77	0	1.81	23.49	0.2234
2560	-37.00	-57.76	0	1.82	22.58	0.1811
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2510	-38.05	-57.42	0	1.77	21.14	0.1300
2535	-37.48	-57.58	0	1.81	21.91	0.1552
2560	-37.49	-57.84	0	1.82	22.17	0.1648

LTE Band 7 16QAM

LTE BAND7 Radiated Power EIRP(5M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2502.5	-35.83	-57.46	0	1.77	23.396	0.2186
2535	-36.43	-57.77	0	1.81	23.15	0.2065
2567.5	-37.36	-57.76	0	1.82	22.223	0.1668
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2502.5	-38.33	-57.42	0	1.77	20.856	0.1218
2535	-37.82	-57.58	0	1.81	21.57	0.1435
2567.5	-37.85	-57.84	0	1.82	21.813	0.1518
LTE BAND7 Radiated Power EIRP(10M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
2505	-35.52	-57.46	0	1.77	23.707	0.2348
2535	-36.55	-57.77	0	1.81	23.03	0.2009
2565	-37.16	-57.76	0	1.82	22.416	0.1744
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)

2505	-38.02	-57.42	0	1.77	21.167	0.1308
2535	-37.94	-57.58	0	1.81	21.45	0.1396
2565	-37.65	-57.84	0	1.82	22.006	0.1587
LTE BAND7 Radiated Power EIRP(15M)						
Horizontal Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
2507.5	-35.81	-57.46	0	1.77	23.418	0.2197
2535	-36.14	-57.77	0	1.81	23.444	0.2210
2562.5	-37.10	-57.76	0	1.82	22.477	0.1769
Vertical Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
2507.5	-38.31	-57.42	0	1.77	20.878	0.1224
2535	-37.53	-57.58	0	1.81	21.864	0.1536
2562.5	-37.59	-57.84	0	1.82	22.067	0.1610
LTE BAND7 Radiated Power EIRP(20M)						
Horizontal Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
2510	-36.29	-57.46	0	1.77	22.943	0.1969
2535	-37.18	-57.77	0	1.81	22.405	0.1740
2560	-37.35	-57.76	0	1.82	22.226	0.1670
Vertical Polarization						
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBi)**	**EIRP(dBm)**	**RIRP(W)**
2510	-38.79	-57.42	0	1.77	20.403	0.1097
2535	-38.57	-57.58	0	1.81	20.825	0.1209
2560	-37.84	-57.84	0	1.82	21.816	0.1519

LTE Band 17 QPSK

LTE BAND17 Radiated Power EIRP(5M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
706.5	-27.74	-45.27	0	2.03	19.56	0.0904
710	-28.19	-45.33	0	2.04	19.18	0.0828
713.5	-28.17	-45.41	0	2.04	19.28	0.0847
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
706.5	-28.03	-45.09	0	2.03	19.09	0.0811
710	-28.24	-45.12	0	2.04	18.92	0.0780
713.5	-28.13	-45.17	0	2.04	19.08	0.0809
LTE BAND17 Radiated Power EIRP(10M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
709	-27.97	-45.27	0	2.03	19.33	0.0857
710	-28.42	-45.33	0	2.04	18.95	0.0785
711	-28.40	-45.41	0	2.04	19.05	0.0804
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
709	-28.24	-45.09	0	2.03	18.88	0.0773
710	-28.45	-45.12	0	2.04	18.71	0.0743
711	-28.34	-45.17	0	2.04	18.87	0.0771

LTE Band 17 16QAM

LTE BAND17 Radiated Power EIRP(5M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
706.5	-28.02	-45.27	0	2.03	19.28	0.0847
710	-29.50	-45.33	0	2.04	17.87	0.0612
713.5	-28.46	-45.41	0	2.04	18.99	0.0793
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
706.5	-28.31	-45.09	0	2.03	18.81	0.0760
710	-29.55	-45.12	0	2.04	17.61	0.0577
713.5	-28.42	-45.17	0	2.04	18.79	0.0757
LTE BAND17 Radiated Power EIRP(10M)						
Horizontal Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
709	-27.97	-45.27	0	2.03	19.33	0.0857
710	-29.67	-45.33	0	2.04	17.703	0.0589
711	-28.45	-45.41	0	2.04	19	0.0794
Vertical Polarization						
Frequency(MHz)	Rt(dBm)	Rs(dBm)	Ps(dBm)	Gs(dBi)	EIRP(dBm)	RIRP(W)
709	-28.24	-45.09	0	2.03	18.88	0.0773
710	-29.70	-45.12	0	2.04	17.463	0.0558
711	-28.39	-45.17	0	2.04	18.82	0.0762

2.4. Occupied Bandwidth

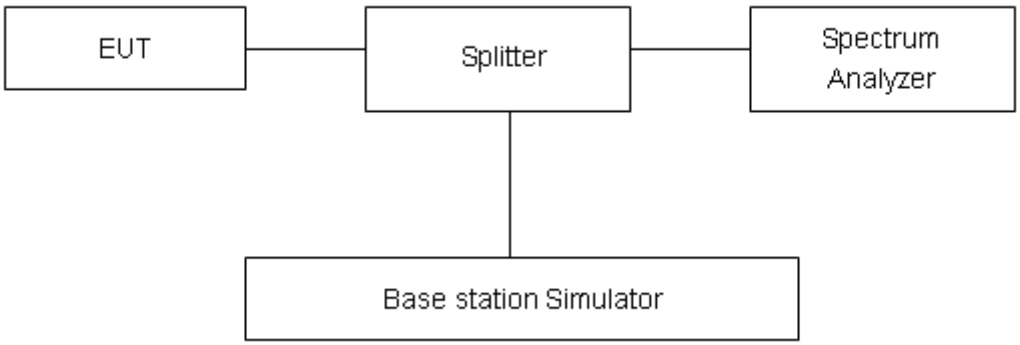
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer. The RBW is set larger than 1% of 26dB bandwidth. 99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

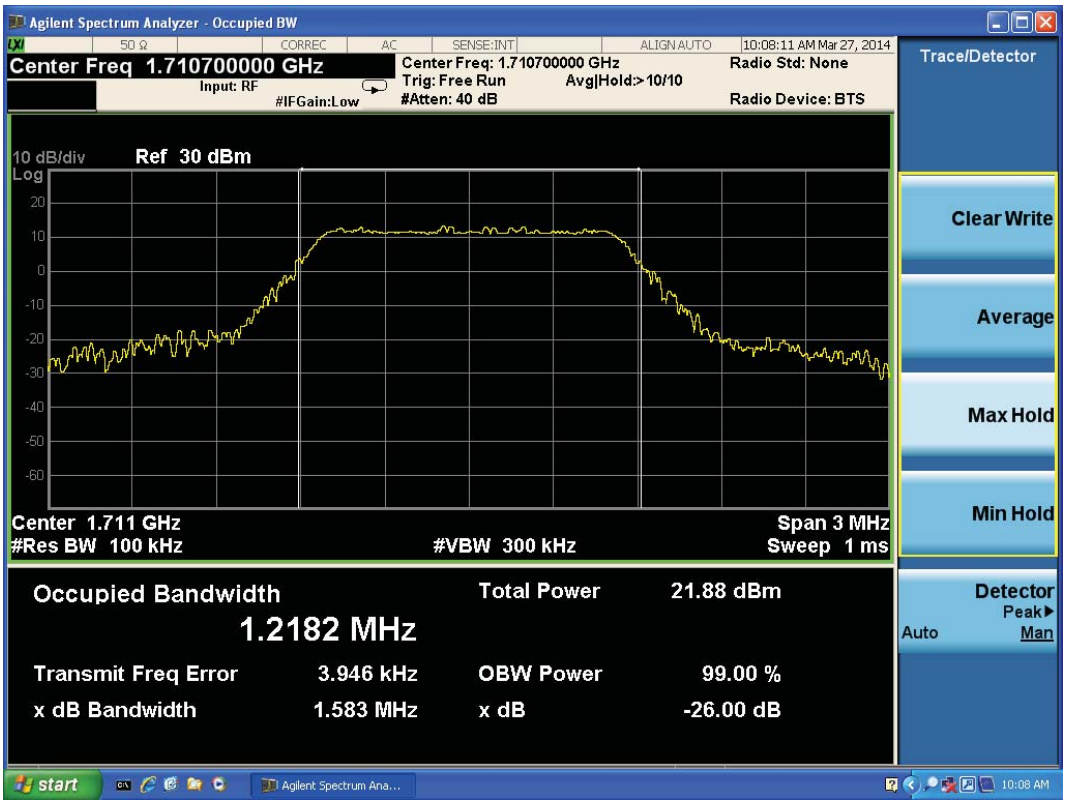
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 624Hz.

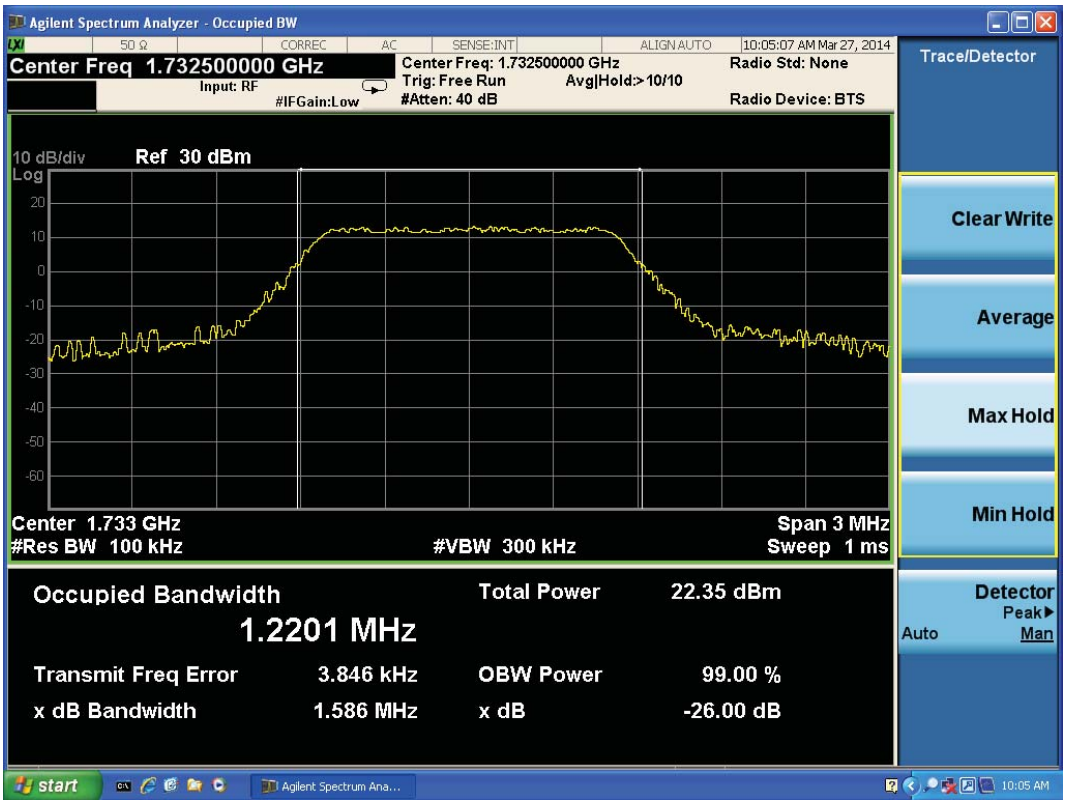
Test Result

LTE Band 4						
RB	**Modulation**	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth (kHz)**	**-26dBc Bandwidth(kHz)**
100%	QPSK	1.4	19957	1710.7	1.2182	1.583
			20175	1732.5	1.2201	1.586
			20393	1754.3	1.1978	1.586
		3	19965	1711.5	2.7484	3.187
			20175	1732.5	2.7442	3.157
			20385	1753.5	2.7518	3.180
		5	19975	1712.5	4.5289	5.094
			20175	1732.5	4.5028	5.021
			20375	1752.5	4.5153	5.069
		10	20000	1715	9.0607	10.20
			20175	1732.5	9.0613	10.24
			20350	1750	9.0601	10.22
		15	20025	1717.5	13.528	15.58
			20175	1732.5	13.496	16.78
			20325	1747.5	13.496	15.57
		20	20050	1720	17.924	19.81
			20175	1732.5	17.889	19.48
			20300	1745	17.935	19.57
	16QAM	1.4	19957	1710.7	1.1969	1.581
			20175	1732.5	1.2319	1.579
			20393	1754.3	1.2282	1.546
		3	19965	1711.5	2.7553	3.172
			20175	1732.5	2.7430	3.216
			20385	1753.5	2.7415	3.141
		5	19975	1712.5	4.5279	5.066
			20175	1732.5	4.5178	5.016
			20375	1752.5	4.5136	5.104

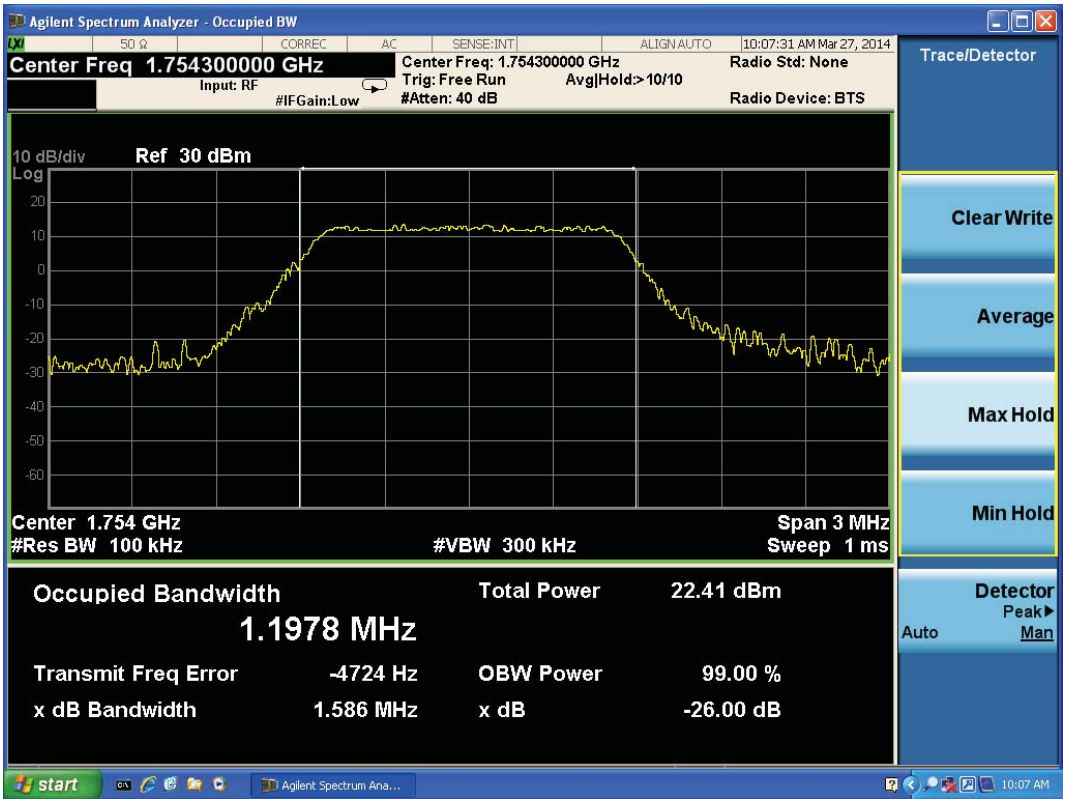
		10	20000	1715	9.0470	10.21
			20175	1732.5	9.0482	10.23
			20350	1750	9.0555	10.17
		15	20025	1717.5	13.524	15.39
			20175	1732.5	13.472	15.46
			20325	1747.5	13.491	15.54
		20	20050	1720	17.956	19.53
			20175	1732.5	17.863	19.29
			20300	1745	17.955	19.69



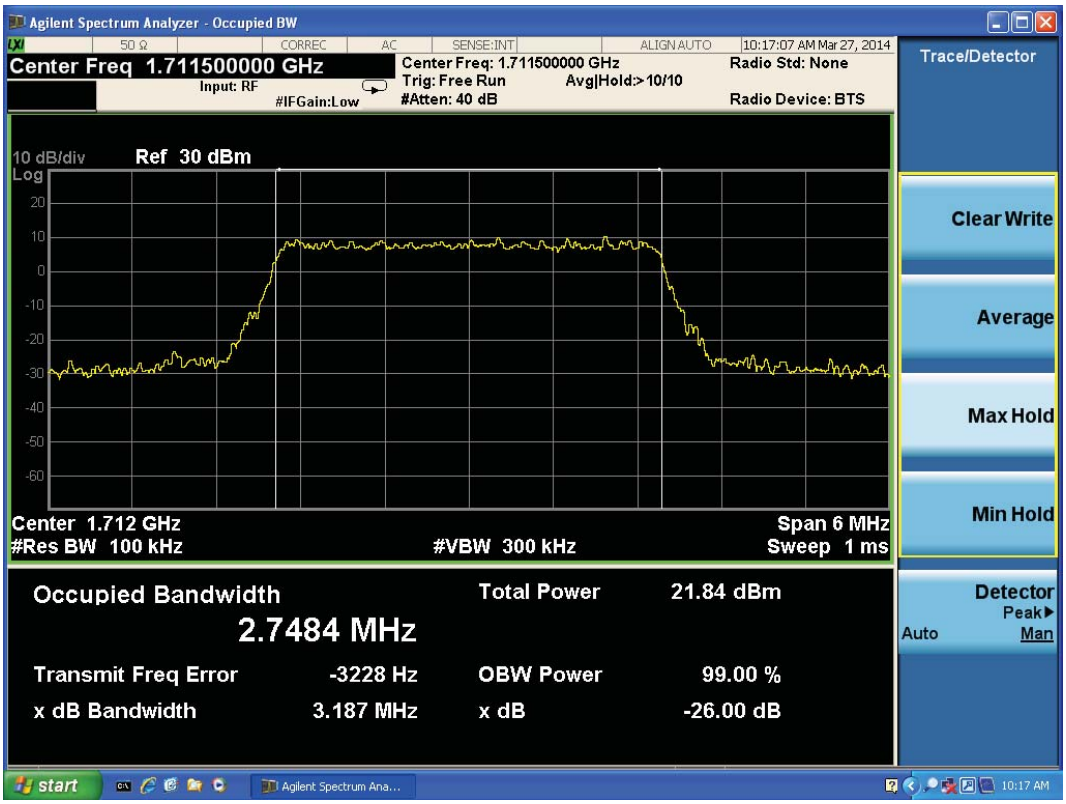
LTE Band 4 QPSK Bandwidth = 1.4MHz CH19957 Occupied Bandwidth



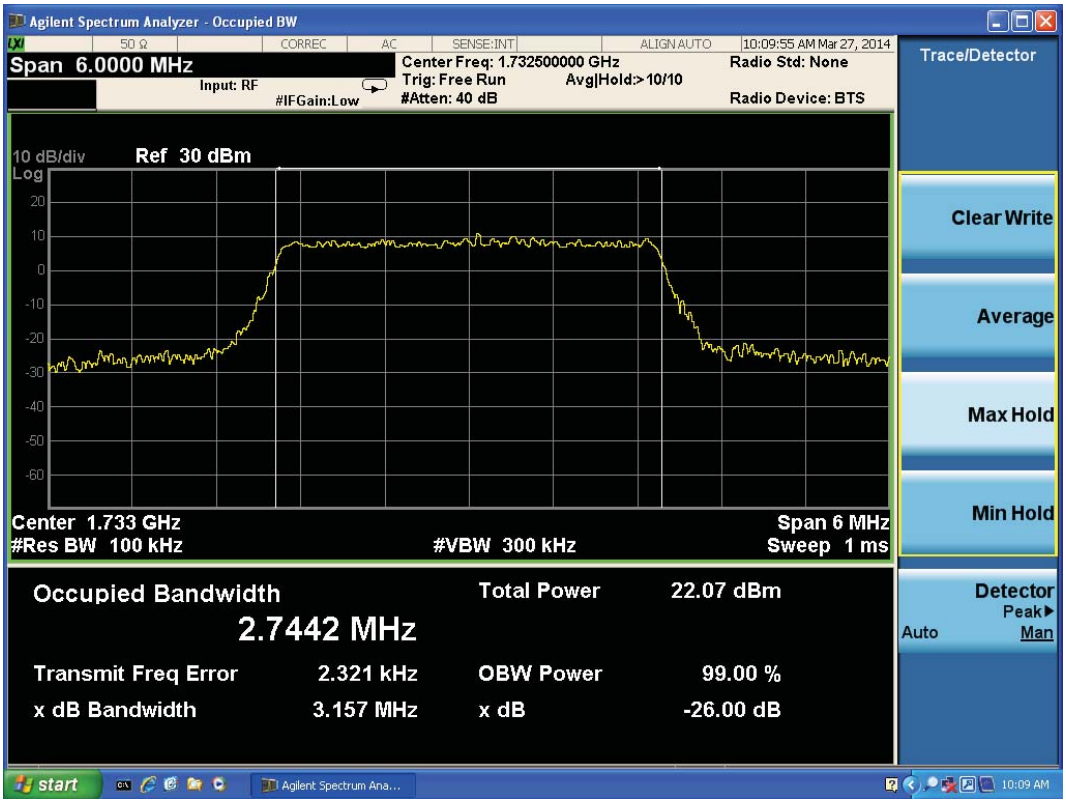
LTE Band 4 QPSK Bandwidth = 1.4MHz CH20175 Occupied Bandwidth



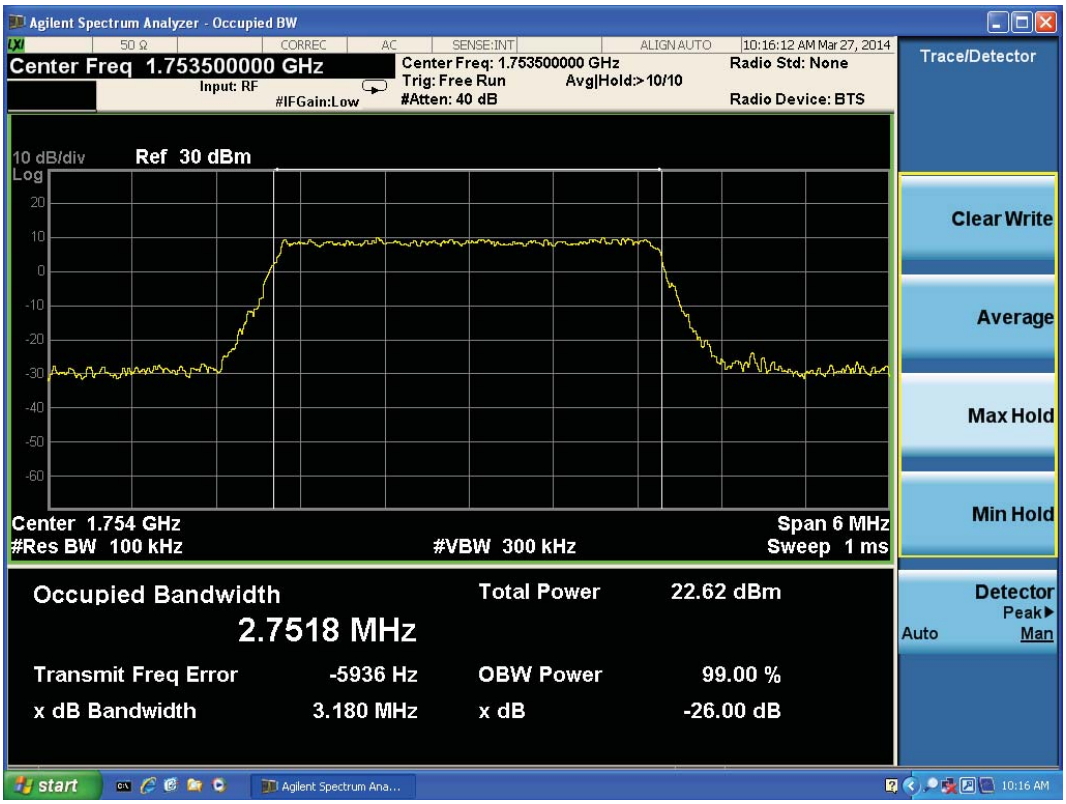
LTE Band 4 QPSK Bandwidth = 1.4MHz CH20393 Occupied Bandwidth



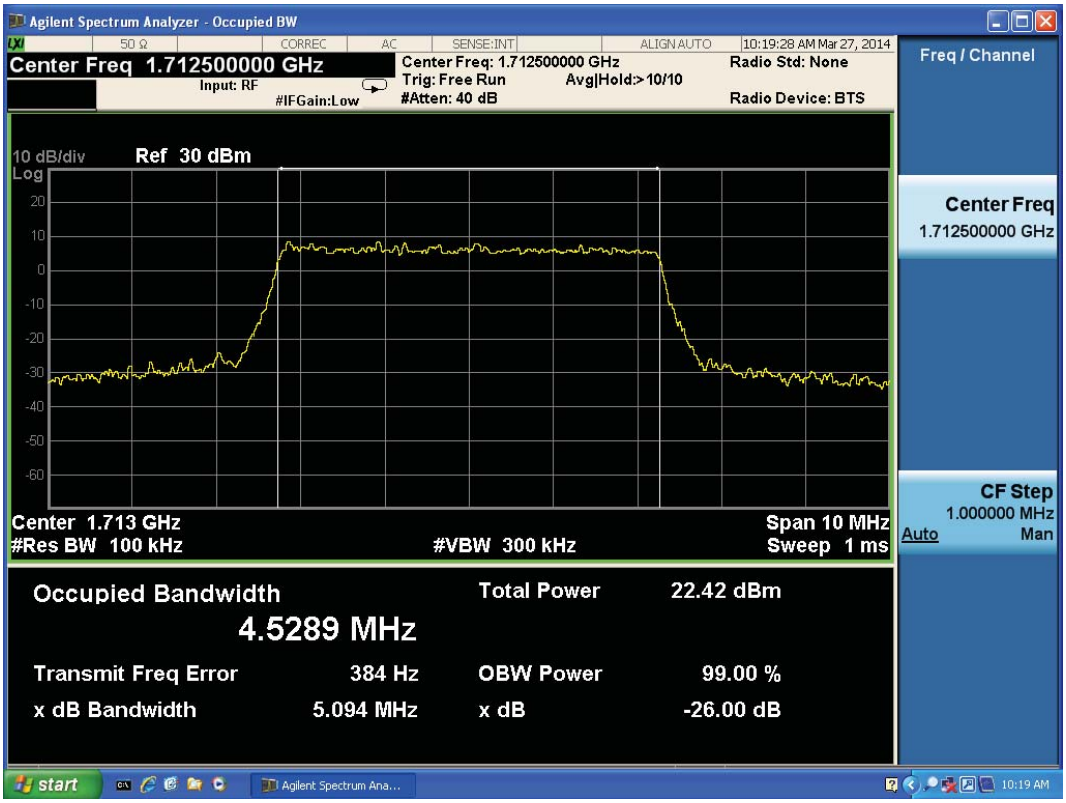
LTE Band 4 QPSK Bandwidth = 3MHz CH19965 Occupied Bandwidth



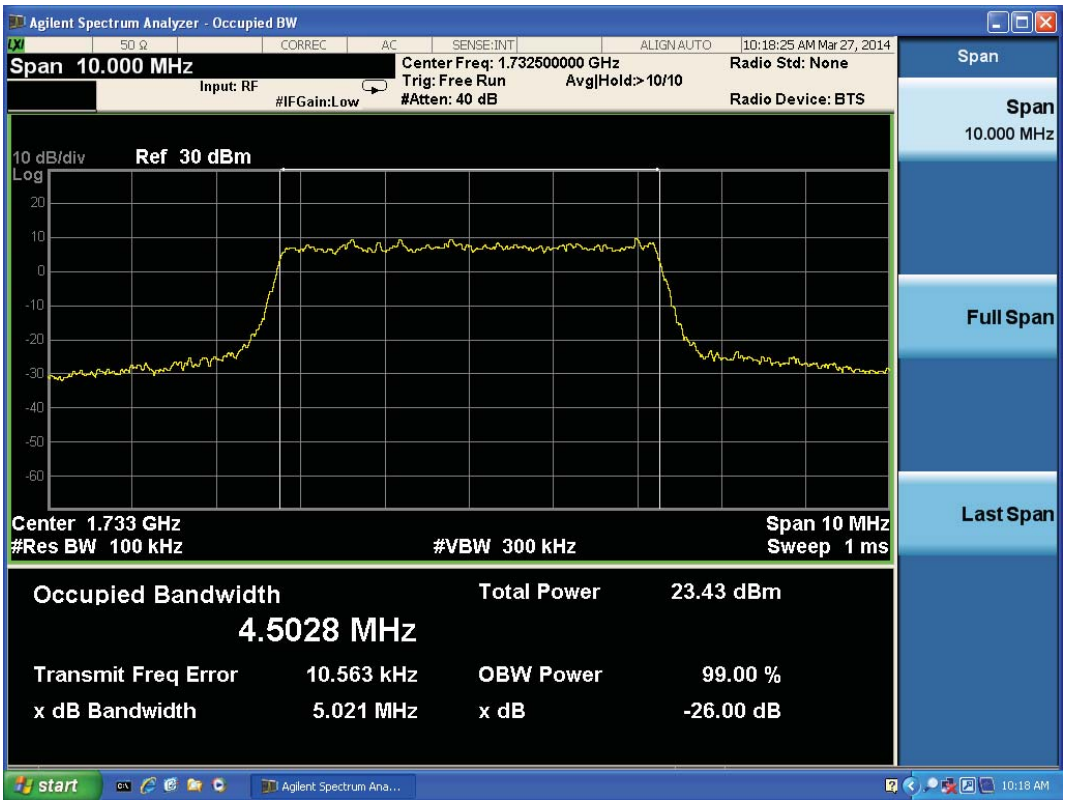
LTE Band 4 QPSK Bandwidth = 3MHz CH20175 Occupied Bandwidth



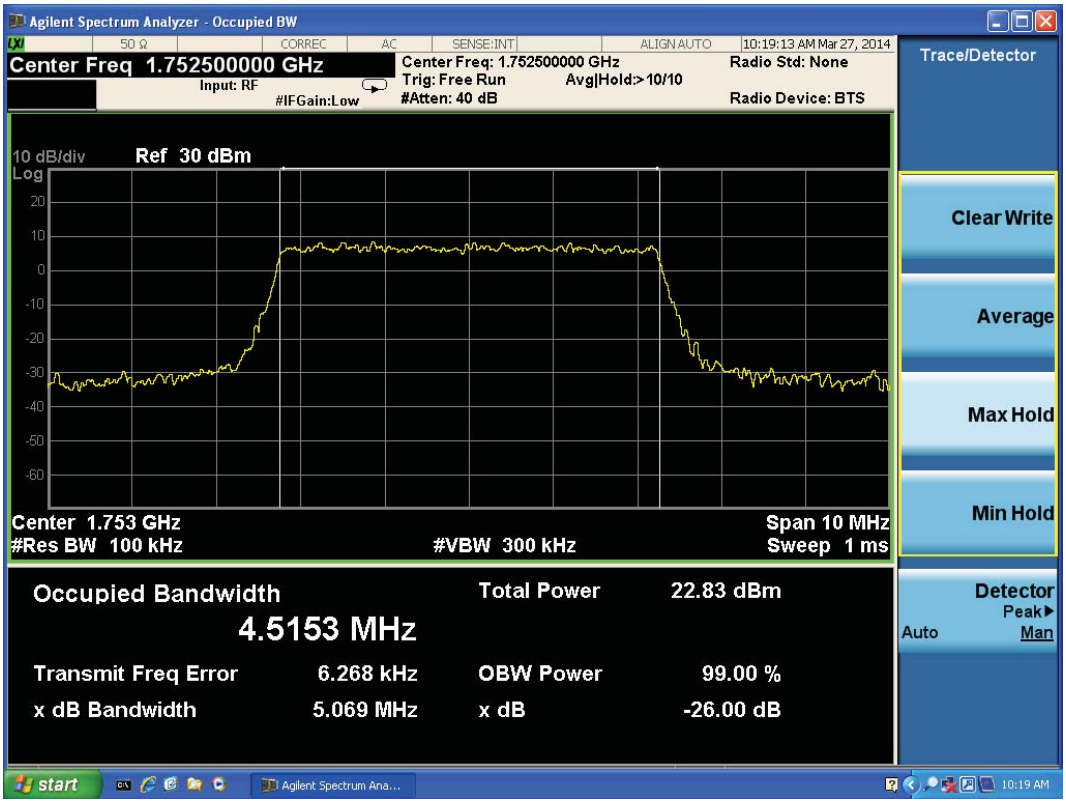
LTE Band 4 QPSK Bandwidth = 3MHz CH20385 Occupied Bandwidth



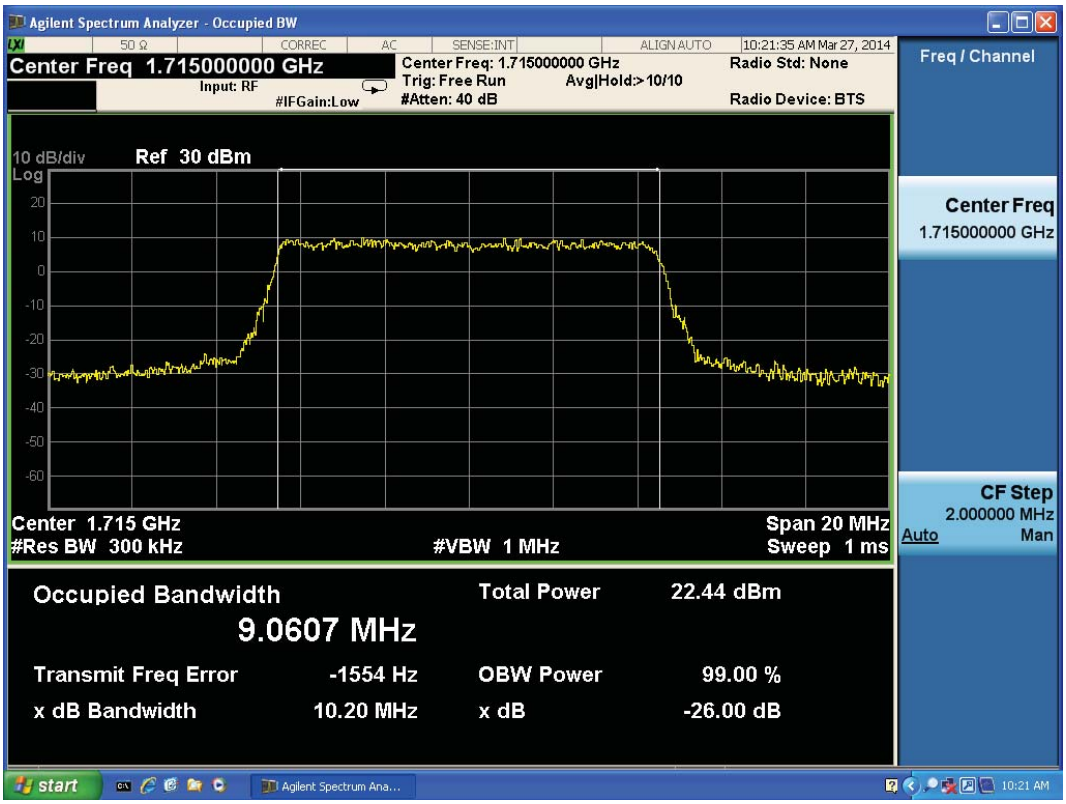
LTE Band 4 QPSK Bandwidth = 5MHz CH19975 Occupied Bandwidth



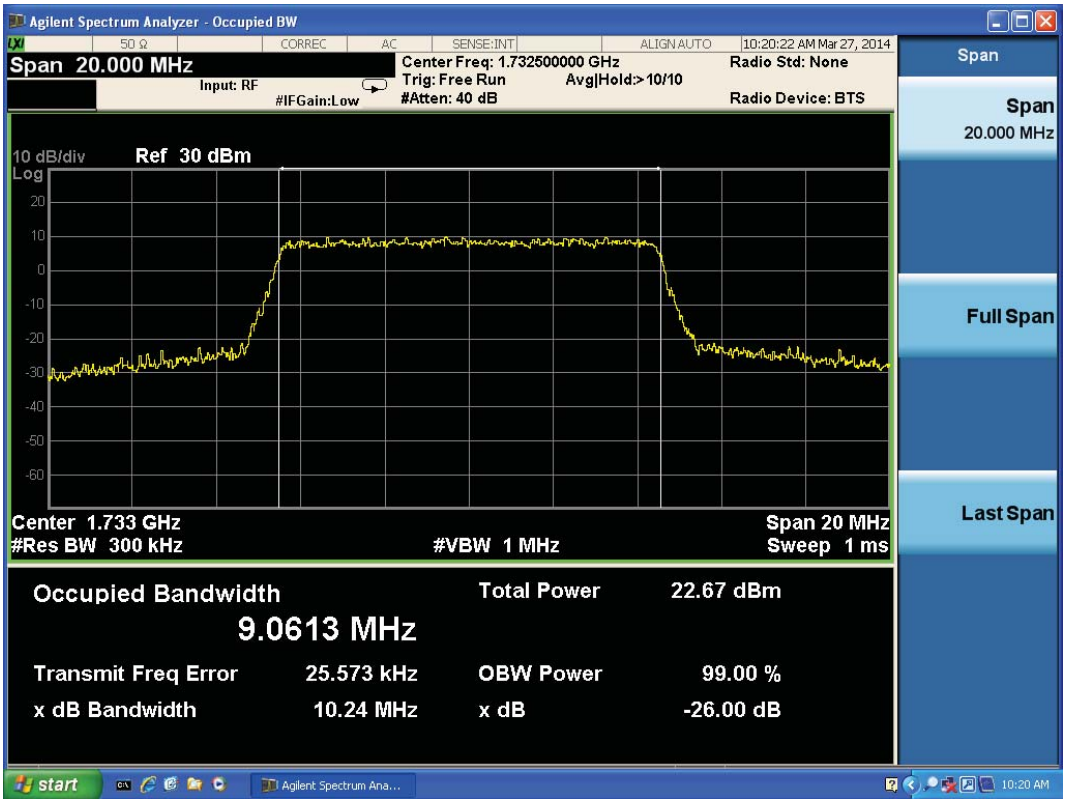
LTE Band 4 QPSK Bandwidth = 5MHz CH20175 Occupied Bandwidth



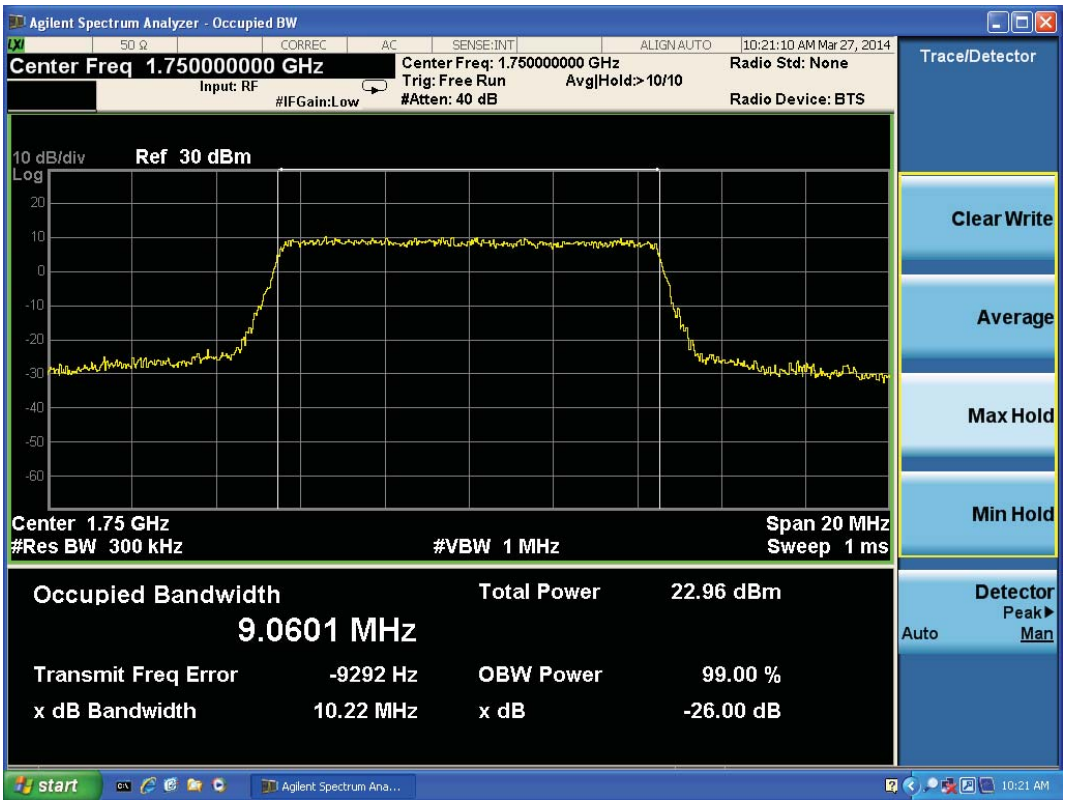
LTE Band 4 QPSK Bandwidth = 5MHz CH20375 Occupied Bandwidth



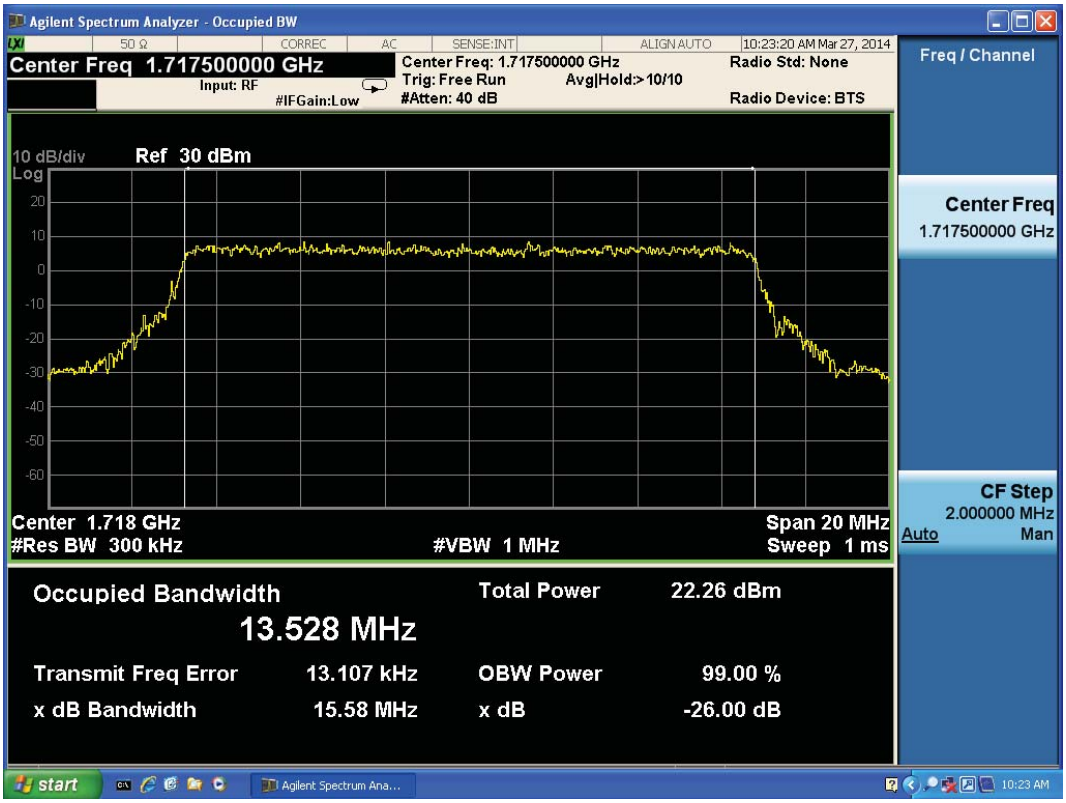
LTE Band 4 QPSK Bandwidth = 10MHz CH20000 Occupied Bandwidth



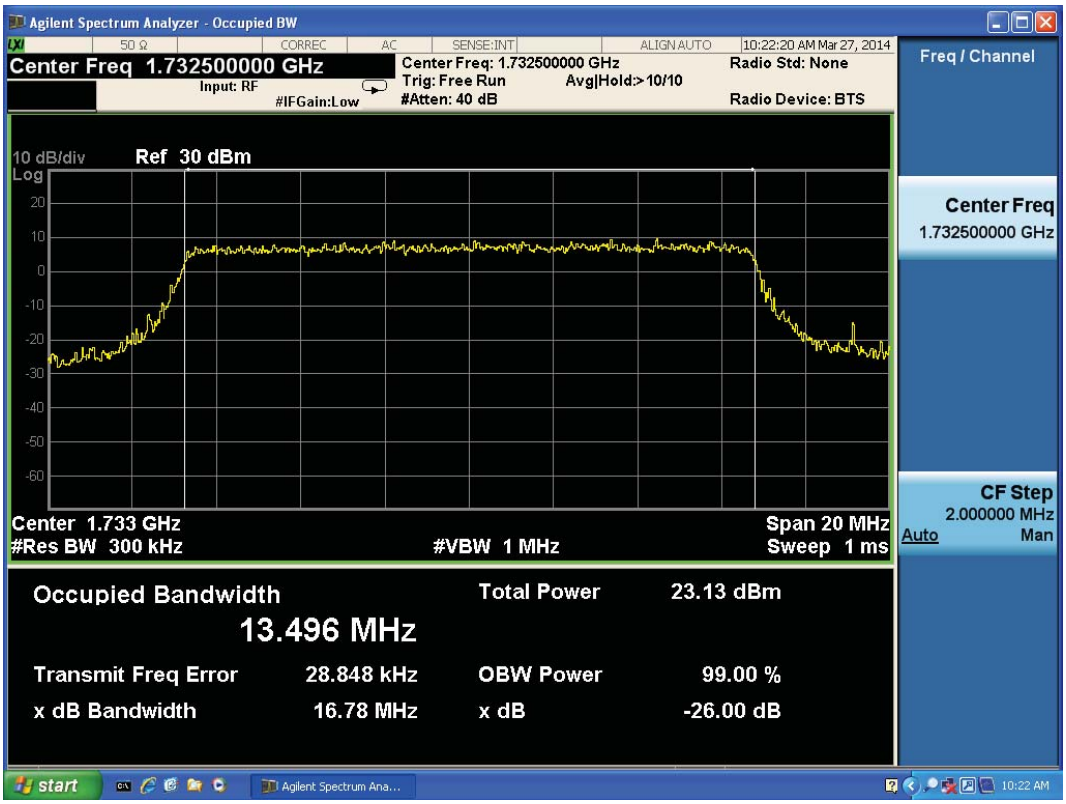
LTE Band 4 QPSK Bandwidth = 10MHz CH20175 Occupied Bandwidth



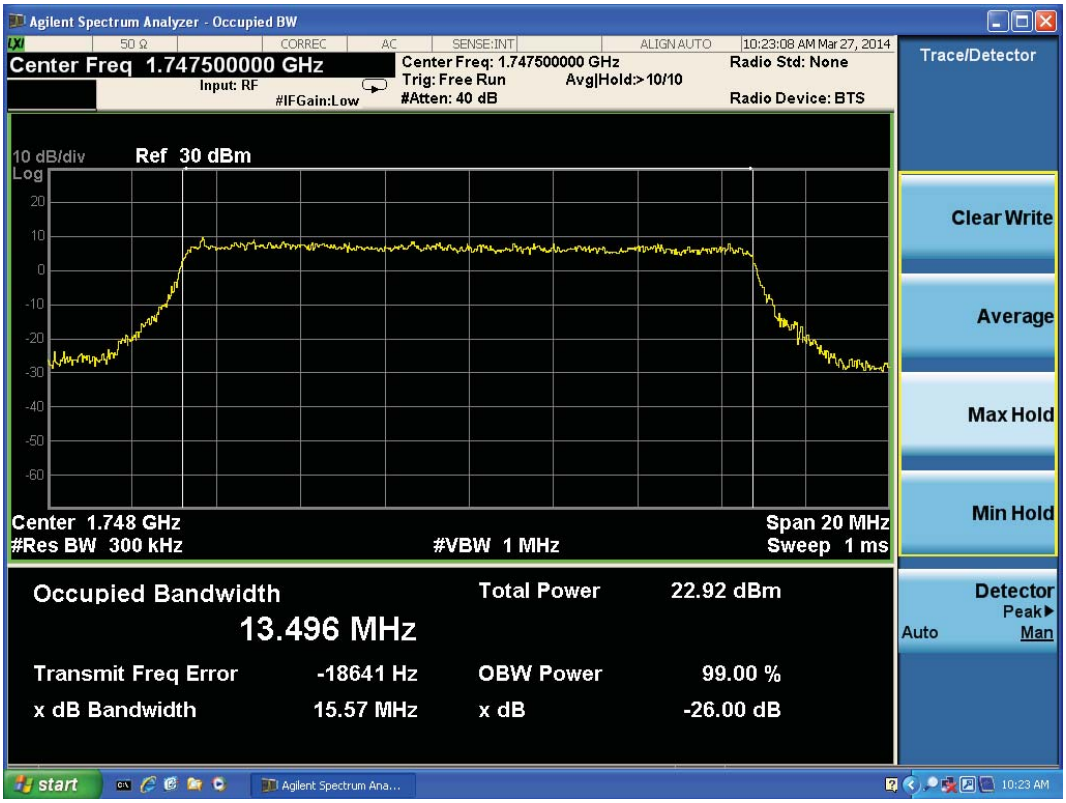
LTE Band 4 QPSK Bandwidth = 10MHz CH20350 Occupied Bandwidth



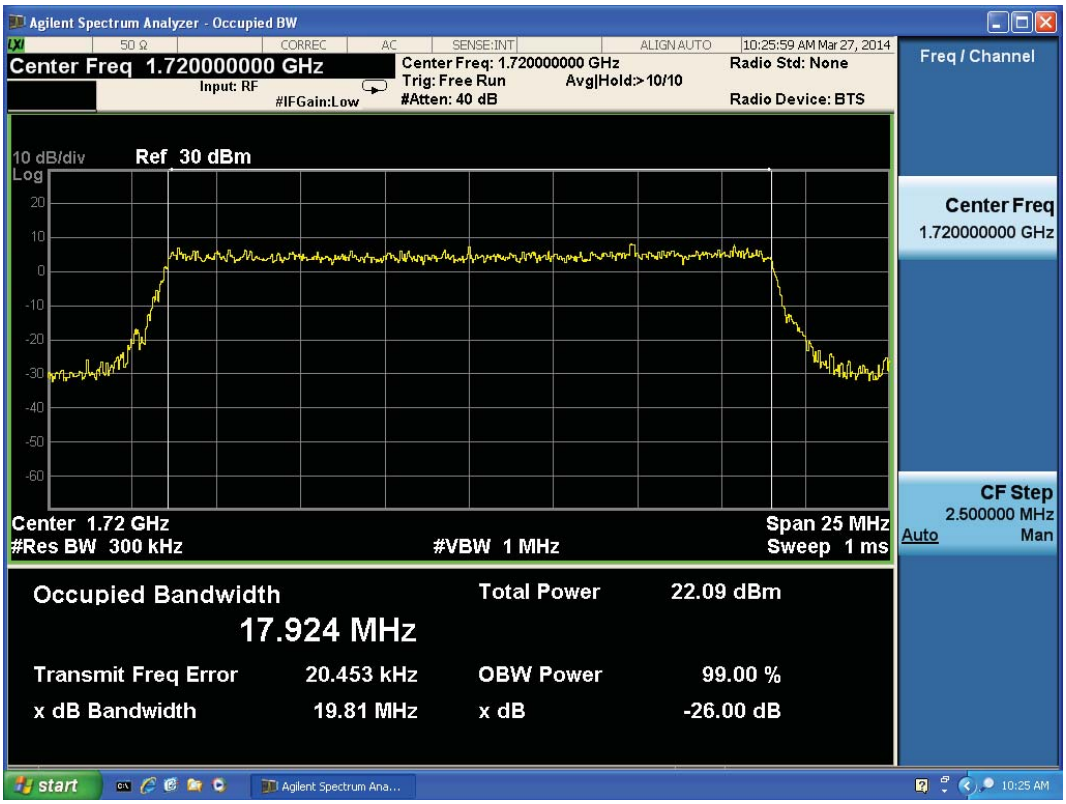
LTE Band 4 QPSK Bandwidth = 15MHz CH20025 Occupied Bandwidth



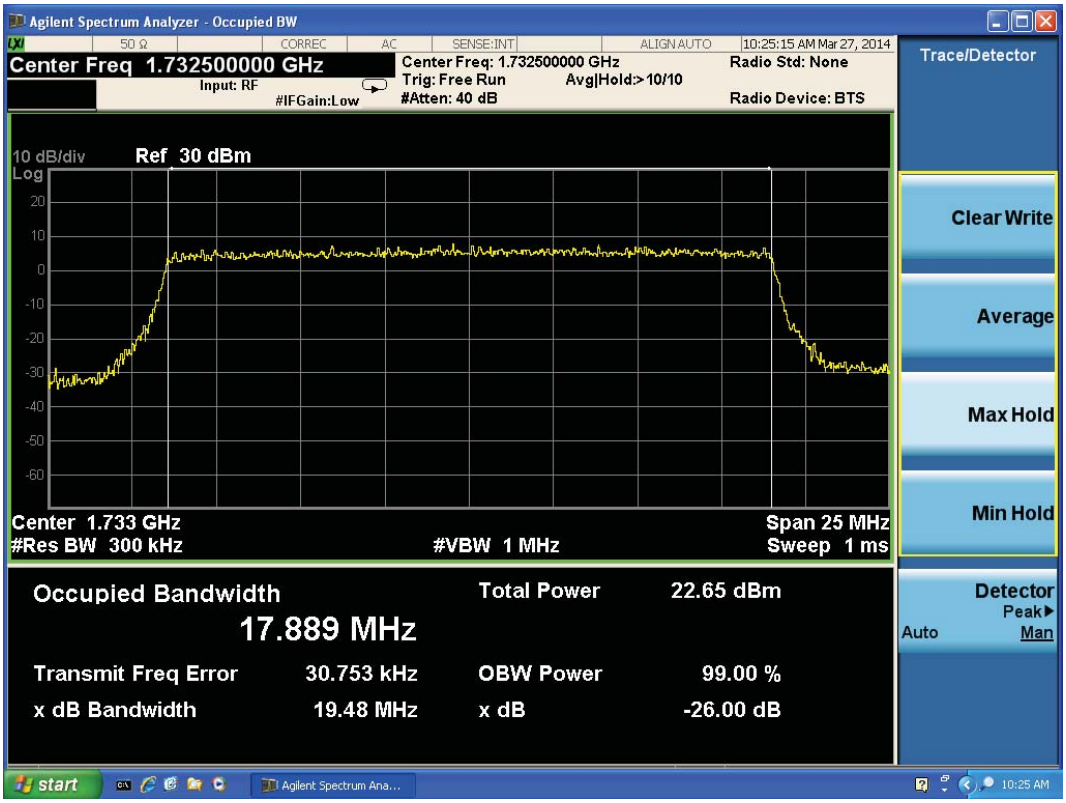
LTE Band 4 QPSK Bandwidth = 15MHz CH20175 Occupied Bandwidth



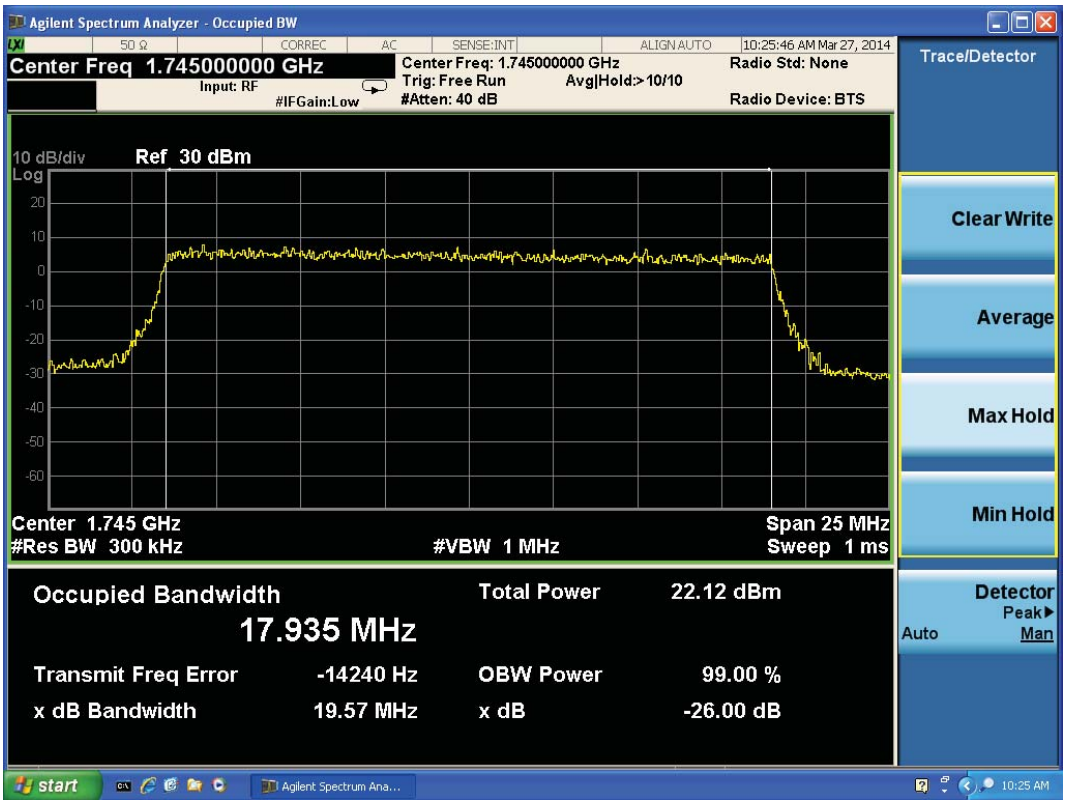
LTE Band 4 QPSK Bandwidth = 15MHz CH20325 Occupied Bandwidth



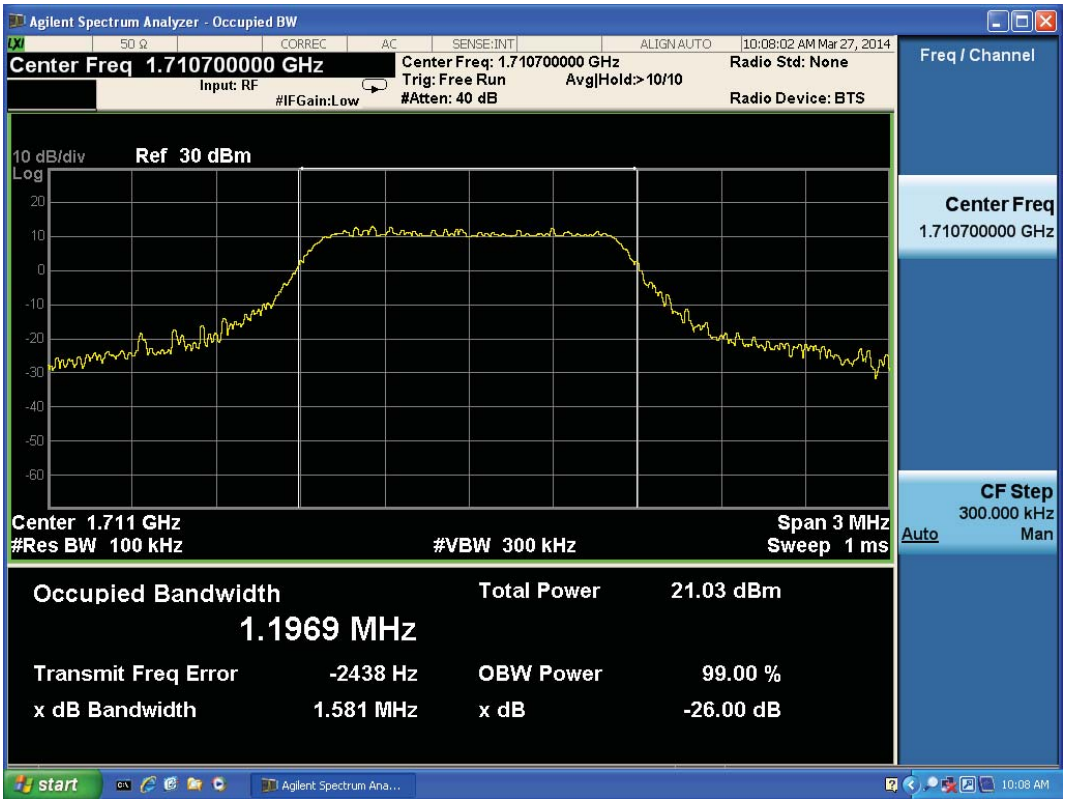
LTE Band 4 QPSK Bandwidth = 20MHz CH20050 Occupied Bandwidth



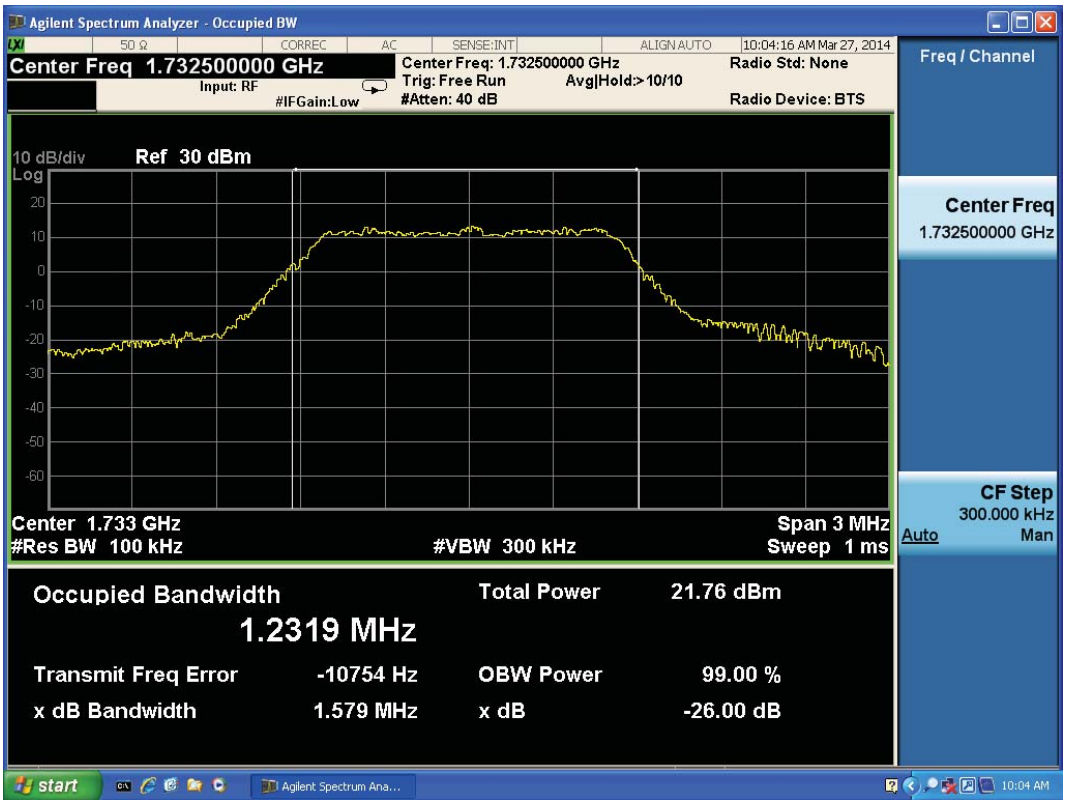
LTE Band 4 QPSK Bandwidth = 20MHz CH20175 Occupied Bandwidth



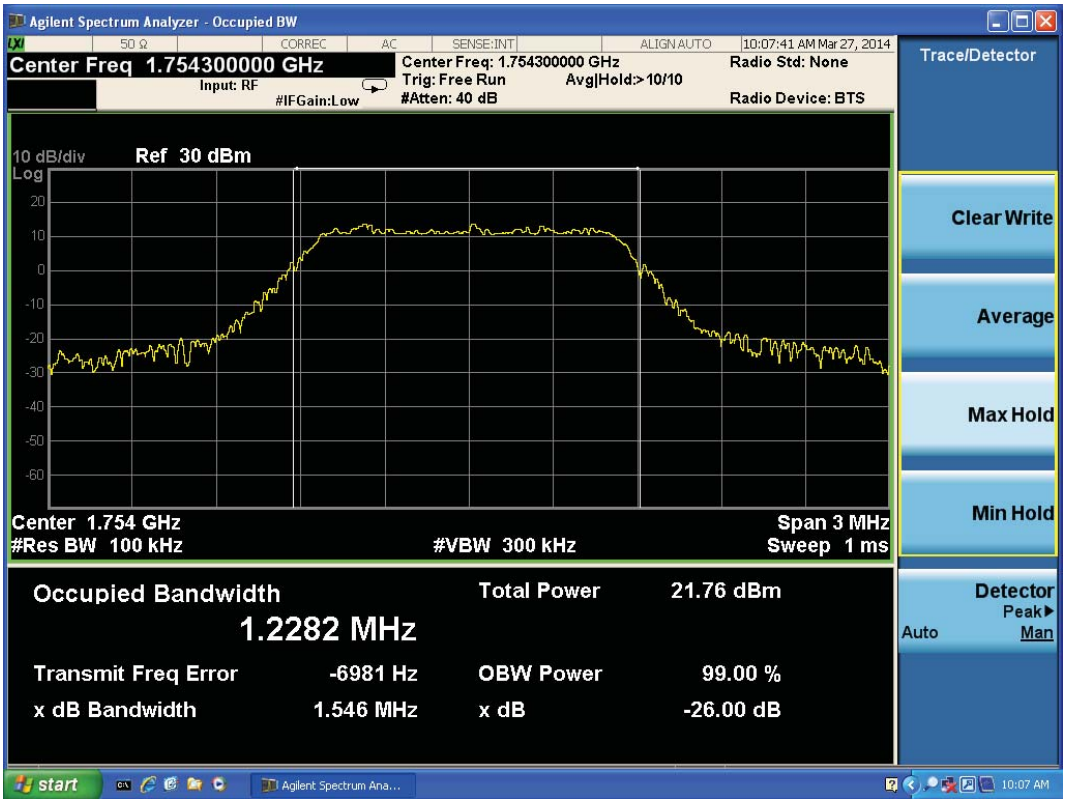
LTE Band 4 QPSK Bandwidth = 20MHz CH20300 Occupied Bandwidth



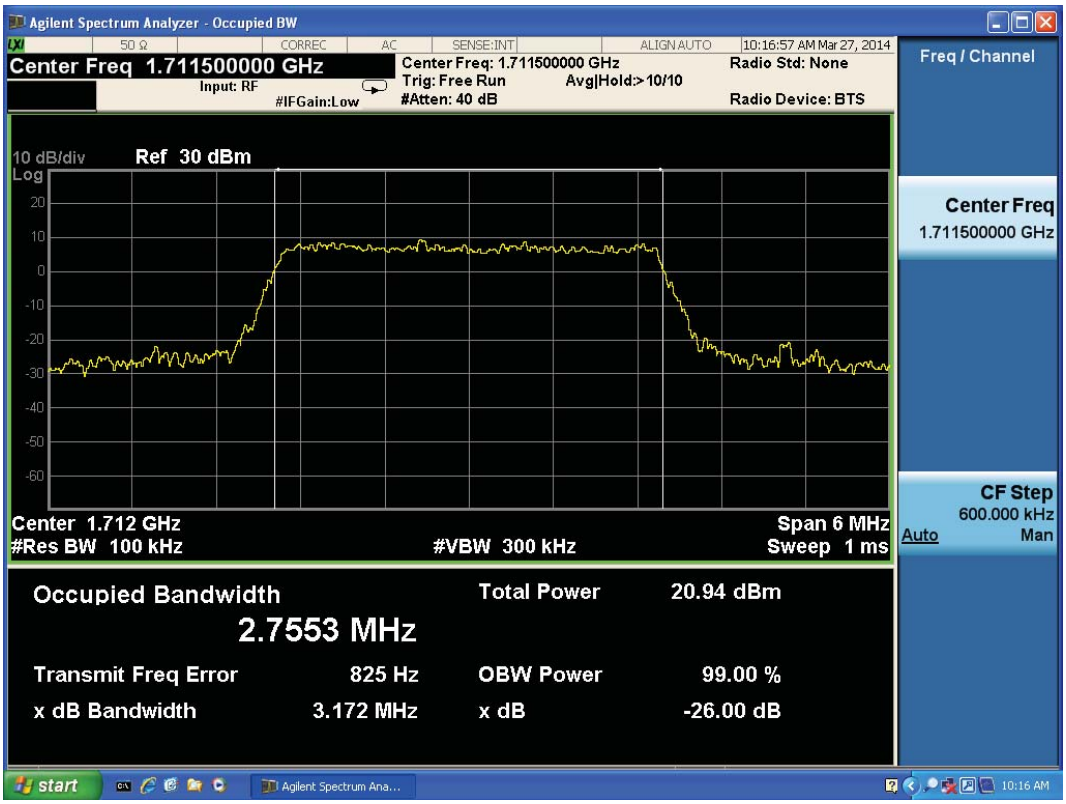
LTE Band 4 16QAM Bandwidth = 1.4MHz CH19957 Occupied Bandwidth



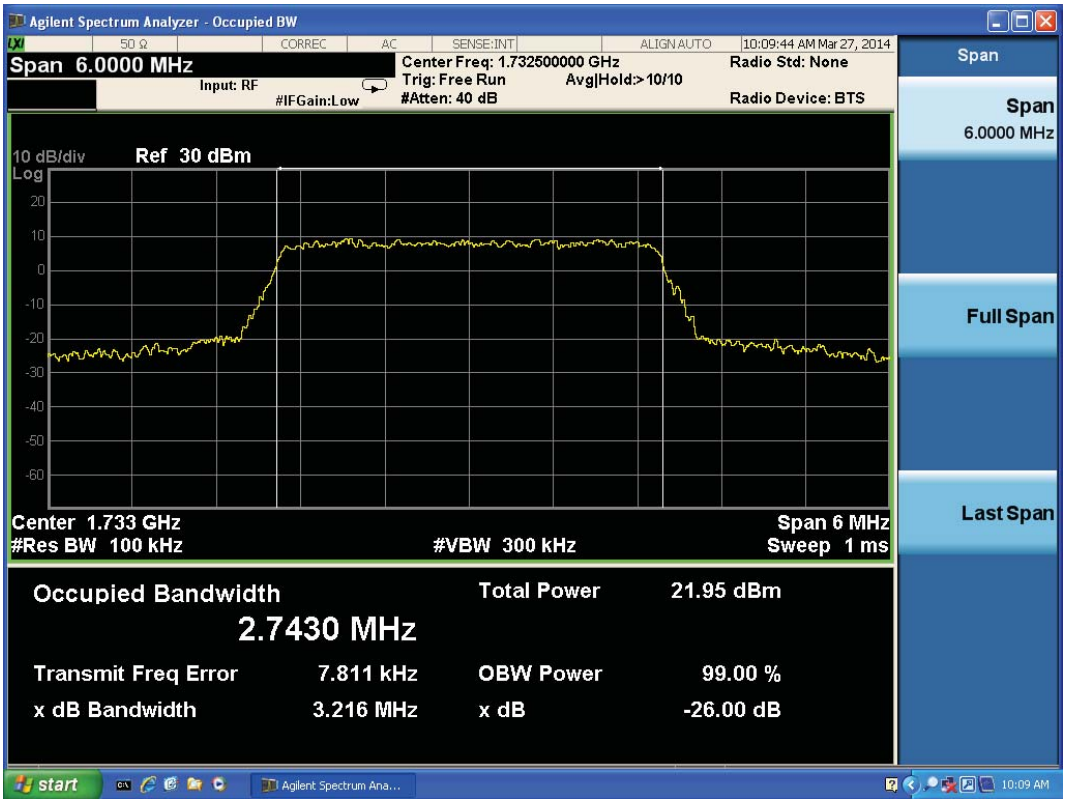
LTE Band 4 16QAM Bandwidth = 1.4MHz CH20175 Occupied Bandwidth



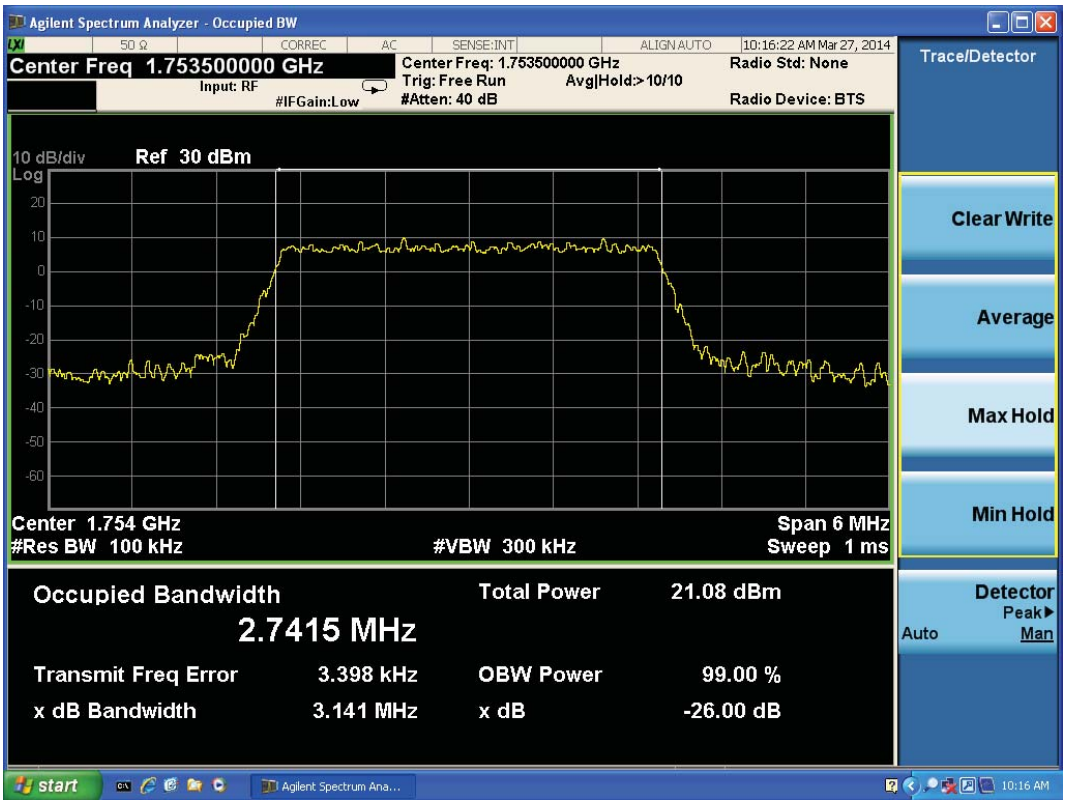
LTE Band 4 16QAM Bandwidth = 1.4MHz CH20393 Occupied Bandwidth



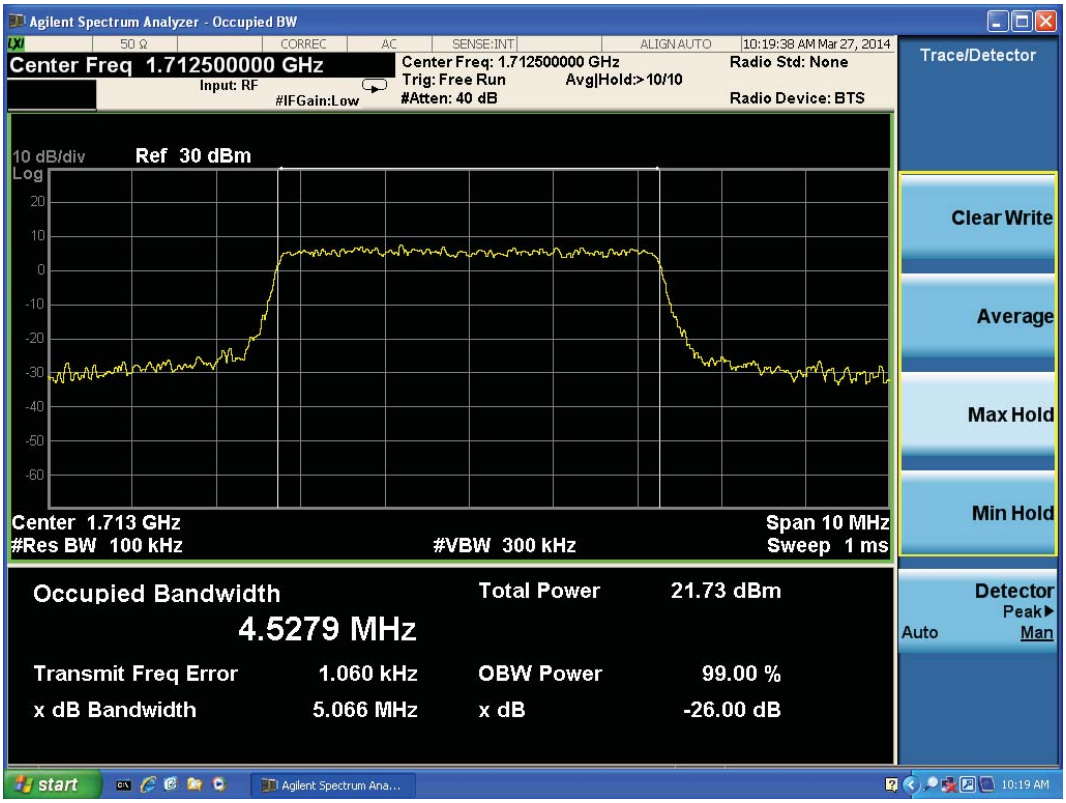
LTE Band 4 16QAM Bandwidth = 3MHz CH19965 Occupied Bandwidth



LTE Band 4 16QAM Bandwidth = 3MHz CH20175 Occupied Bandwidth



LTE Band 4 16QAM Bandwidth = 3MHz CH20385 Occupied Bandwidth



LTE Band 4 16QAM Bandwidth = 5MHz CH19975 Occupied Bandwidth