



RF TEST REPORT

Applicant Huawei Technologies Co., Ltd.
FCC ID QISMAR-LX1AM
Product Smart Phone
Model MAR-LX1Am
Report No. R1905H0093-R3
Issue Date May 20, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2018)/ FCC CFR47 Part 27C (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Table of Contents

1	Test Laboratory.....	4
1.1	Notes of the Test Report	4
1.2	Test facility	4
1.3	Testing Location.....	5
2	General Description of Equipment under Test.....	6
3	Applied Standards	9
4	Test Configuration	10
5	Test Case Results	12
5.1	RF Power Output	12
5.2	Effective Isotropic Radiated Power	22
5.3	Occupied Bandwidth	29
5.4	Band Edge Compliance	56
5.5	Peak-to-Average Power Ratio (PAPR)	87
5.6	Frequency Stability.....	92
5.7	Spurious Emissions at Antenna Terminals	101
5.8	Radiates Spurious Emission	126
6	Main Test Instruments	137

Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	27.50(d)(4)/27.50(h)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h)/27.53(m)	PASS
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
6	Frequency Stability	2.1055 / 27.54	PASS
7	Spurious Emissions at Antenna Terminals	2.1051/27.53(h)/27.53(m)	PASS
8	Radiates Spurious Emission	2.1051/27.53(h)/27.53(m)	PASS
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			
Date of Testing: May 7, 2019 ~ May 20, 2019			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number: L2264)

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

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

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

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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2 General Description of Equipment under Test

Client Information

Applicant	Huawei Technologies Co., Ltd.
Applicant address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen 518129 P.R.China
Manufacturer	Huawei Technologies Co., Ltd.
Manufacturer address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen 518129 P.R.China

General information

EUT Description			
Model	MAR-LX1Am		
SN	76YDU19415000080		
Hardware Version	HL4MARLM		
Software Version	9.0.1.152(SP2C900E140R1P6)		
Power Supply	Battery/AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	WCDMA Band IV:-1.00dBi LTE Band 4: -1dBi LTE Band 7: 0.9dBi LTE Band 38: 0.9dBi		
Test Mode(s)	WCDMA Band IV; LTE Band 4; LTE Band 7, LTE Band 38;		
Test Modulation	(WCDMA) BPSK, QPSK,16QAM (LTE)QPSK 16QAM 64QAM;		
HSDPA UE Category	24		
HSUPA UE Category	6		
LTE Rel	12		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV:	18.17dBm	
	LTE Band 4:	19.13dBm	
	LTE Band 7:	19.46dBm	
	LTE Band 38:	20.46dBm	
Rated Power Supply Voltage:	3.8V		
Extreme Voltage	Minimum: 3.6V Maximum: 4.35V		
Extreme Temperature	Lowest: 0°C Highest: +35°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	WCDMA Band IV	1710 ~ 1755	2110 ~ 2155
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 7	2500 ~ 2570	2620 ~ 2690

	LTE Band 38	2570 ~2620	2570 ~2620
EUT Accessory			
Adapter 1	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-090200EH0		
Adapter 2	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-090200BH0		
Adapter 3	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-090200AH0		
Adapter 4	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-090200UH0		
Adapter 5	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-059200EHQ		
Adapter 6	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-090200UH1		
Adapter 7	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-090200IH0		
Battery 1	Manufacturer: Huawei Technologies Co., Ltd. (Sunwoda Electronic CO., LTD) Model: HB356687ECW		
Battery 2	Manufacturer: Huawei Technologies Co., Ltd. (Huizhou Desay Battcry Co., Ltd) Model: HB356687ECW		
Battery 3	Manufacturer: Huawei Technologies Co., Ltd. (SCUD (FUJIAN) Electronics Co., Ltd) Model: HB356687ECW		
Earphone 1	Manufacturer: Jiangxi Lianchuang Hongsheng Electronic Co., LTD. Model: MEND1532B528A02		
Earphone 2	Manufacturer: Boluo County Quancheng Electronic Co., Ltd. Model: 1293-3283-3.5mm-322		
Earphone 3	Manufacturer: FOXCONN INTERCONNECT TECHNOLOGY LIMITED Model: EPAB542-2WH05-DH		
Earphone 4	Manufacturer: Jiangxi Lianchuang Hongsheng Electronic Co., LTD. Model: MEND1532B528B00		
Earphone 5	Manufacturer: Boluo County Quancheng Electronic Co., Ltd. Model: 1293-3283-3.5mm-336		
Earphone 6	Manufacturer: Hong Fu Jin Precision Industry (Shenzhen) Co., LTD. Model: EPAB542-2WH06-DH		
USB Cable 1	Manufacturer: HUIZHOU DEHONG TECHNOLOGY CO.,LTD. Model: 330-50507		
USB Cable 2	Manufacturer: FOXCONN INTERCONNECT TECHNOLOGY		



	LIMITED Model: CUDU01B-HC295-EH
USB Cable 3	Manufacturer: NingBo Broad Telecommunication Co.,Ltd. Model: WA0020
USB Cable 4	Manufacturer: LUXSHARE Precision Industry Co., Ltd. Model: L99UC131-CS-H
USB Cable 5	Manufacturer: Freeport Resources Enterprises (Jiangxi) Co.,Ltd Model: 18-93C2CHO-001HF
USB Cable 6	Manufacturer: Dongguan Mingji Electronics Technology Group Co.,Ltd Model: 203-1572-0
Note: 1. The information of the EUT is declared by the manufacturer. 2. There is more than one Adapter, one USB cable, one Battery and Earphone, each one should be applied throughout the compliance test respectively, and however, only the worst case (Adapter 1, USB cable 3/ Battery 1/ Earphone 2) will be recorded in this report.	

3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC CFR47 Part 2 (2018)

FCC CFR47 Part 27C (2018)

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4 Test Configuration

There is more than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in WCDMA/LTE is set based on the maximum RF Output Power.

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for WCDMA Band IV:

Test items	Modes/Modulation
	WCDMA Band IV
RF power output	RMC HSDPA/HSUPA DC-HSDPA
Effective Isotropic Radiated power	RMC
Occupied Bandwidth	RMC
Band Edge Compliance	RMC
Peak-to-Average Power Ratio	RMC
Frequency Stability	RMC
Spurious Emissions at Antenna Terminals	RMC
Radiates Spurious Emission	RMC



Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/7/38:

Test items	Modes	Bandwidth (MHz)						Modulation			RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	50%	100%	L	M	H
RF power output	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 38	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 38	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	LTE 4	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 38	-	-	O	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	LTE 4	O	O	O	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 7	-	-	O	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 38	-	-	O	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	LTE 4	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 38	-	-	O	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 38	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O
Spurious Emissions at Antenna Terminals	LTE 4	O	O	O	O	O	O	O	-	-	O	-	-	O	O	O
	LTE 7	-	-	O	O	O	O	O	-	-	O	-	-	O	O	O
	LTE 38	-	-	O	O	O	O	O	-	-	O	-	-	O	O	O
Radiates Spurious Emission	LTE 4	O	-	O	-	-	O	O	-	-	O	-	-	-	O	-
	LTE 7	-	-	O	-	-	O	O	-	-	O	-	-	-	O	-
	LTE 38	-	-	O	-	-	O	O	-	-	O	-	-	-	O	-
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.															

5 Test Case Results

5.1 RF Power Output

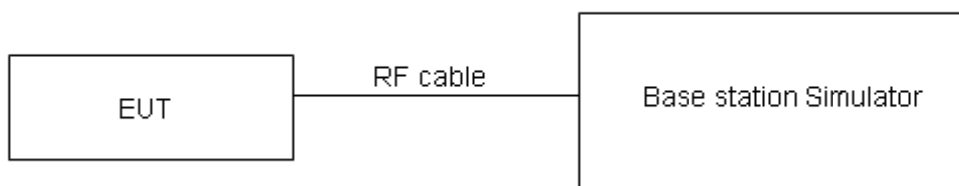
Ambient condition

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 max power transmission and proper modulation.

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

WCDMA Band IV		Conducted Power(dBm)		
		Channel 1312	Channel 1413	Channel 1513
		1712.4 (MHz)	1732.6 (MHz)	1752.6(MHz)
RMC		22.65	22.53	22.44
HSDPA	Sub - Test 1	22.07	21.95	21.86
	Sub - Test 2	22.06	21.94	21.85
	Sub - Test 3	21.55	21.43	21.34
	Sub - Test 4	21.54	21.42	21.33
HSUPA	Sub - Test 1	21.15	21.06	21.04
	Sub - Test 2	21.02	20.90	20.81
	Sub - Test 3	21.50	21.39	21.30
	Sub - Test 4	20.99	20.88	20.79
	Sub - Test 5	21.98	21.87	21.78
DC-HSDPA	Sub - Test 1	21.79	21.69	21.58
	Sub - Test 2	21.78	21.68	21.57
	Sub - Test 3	21.36	21.17	21.08
	Sub - Test 4	21.35	21.16	21.07

LTE Band 4				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
1.4MHz	QPSK	1	0	22.62	22.61	22.78
		1	2	22.45	22.56	22.44
		1	5	22.50	22.57	22.60
		3	0	21.81	21.75	21.74
		3	2	21.76	21.79	21.74
		3	3	21.63	21.72	21.70
		6	0	21.67	21.85	21.77
	16QAM	1	0	22.03	22.13	22.13
		1	2	21.86	21.90	21.87
		1	5	21.93	21.88	21.94
		3	0	20.77	20.78	20.78
		3	2	20.77	20.68	20.70
		3	3	20.76	20.77	20.69
		6	0	20.66	20.53	20.66
	64QAM	1	0	20.70	20.76	20.78
		1	2	20.59	20.67	20.64
		1	5	20.63	20.79	20.71
		3	0	19.48	19.57	19.53
		3	2	19.44	19.54	19.58
		3	3	19.39	19.46	19.40
		6	0	19.33	19.43	19.46
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	22.64	22.65	22.81
		1	7	22.48	22.61	22.48
		1	14	22.53	22.62	22.64
		8	0	21.89	21.85	21.85
		8	4	21.86	21.87	21.84
		8	7	21.71	21.81	21.78
		15	0	21.70	21.89	21.80
		15	7	21.70	21.89	21.80
	16QAM	1	0	22.06	22.15	22.16
		1	7	21.89	21.95	21.91
		1	14	21.95	21.92	21.97
		8	0	20.86	20.89	20.88
		8	4	20.86	20.79	20.80
		8	7	20.84	20.87	20.80
		15	0	20.69	20.57	20.69
		15	7	20.69	20.57	20.69
	64QAM	1	0	20.73	20.78	20.81
		1	7	20.62	20.72	20.68



		1	14	20.65	20.83	20.74
		8	0	19.57	19.68	19.63
		8	4	19.53	19.65	19.68
		8	7	19.47	19.56	19.51
		15	0	19.36	19.47	19.49
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.61	22.63	22.77
		1	13	22.46	22.57	22.45
		1	24	22.50	22.57	22.60
		12	0	21.86	21.80	21.81
		12	6	21.84	21.83	21.79
		12	13	21.69	21.79	21.74
		25	0	21.68	21.88	21.78
	16QAM	1	0	22.03	22.11	22.13
		1	13	21.86	21.93	21.88
		1	24	21.92	21.90	21.93
		12	0	20.84	20.85	20.85
		12	6	20.83	20.74	20.76
		12	13	20.81	20.82	20.76
		25	0	20.67	20.53	20.64
	64QAM	1	0	20.70	20.74	20.78
		1	13	20.59	20.70	20.65
		1	24	20.62	20.81	20.70
		12	0	19.55	19.64	19.60
		12	6	19.50	19.60	19.64
		12	13	19.44	19.51	19.47
		25	0	19.34	19.43	19.44
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	22.63	22.64	22.80
		1	25	22.49	22.62	22.49
		1	49	22.52	22.61	22.63
		25	0	21.89	21.85	21.85
		25	13	21.87	21.88	21.83
		25	25	21.71	21.83	21.79
		50	0	21.76	21.90	21.82
	16QAM	1	0	22.05	22.14	22.15
		1	25	21.89	21.97	21.91
		1	49	21.95	21.92	21.96
		25	0	20.87	20.90	20.89
		25	13	20.85	20.78	20.79
		25	25	20.84	20.87	20.80



	64QAM	50	0	20.70	20.58	20.68
		1	0	20.72	20.77	20.80
		1	25	20.62	20.74	20.68
		1	49	20.65	20.83	20.73
		25	0	19.58	19.69	19.64
		25	13	19.52	19.64	19.67
		25	25	19.47	19.56	19.51
		50	0	19.37	19.48	19.48
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	22.62	22.60	22.78
		1	38	22.47	22.61	22.46
		1	74	22.49	22.56	22.59
		36	0	21.87	21.81	21.82
		36	18	21.84	21.83	21.79
		36	39	21.68	21.80	21.75
		75	0	21.74	21.86	21.77
		75	0	21.74	21.86	21.77
	16QAM	1	0	22.00	22.12	22.13
		1	38	21.87	21.94	21.89
		1	74	21.92	21.88	21.93
		36	0	20.84	20.88	20.86
		36	18	20.82	20.73	20.75
		36	39	20.82	20.83	20.77
		75	0	20.67	20.53	20.64
		75	0	20.67	20.53	20.64
	64QAM	1	0	20.67	20.75	20.78
		1	38	20.60	20.71	20.66
		1	74	20.62	20.79	20.70
		36	0	19.55	19.67	19.61
		36	18	19.49	19.59	19.63
		36	39	19.45	19.52	19.48
		75	0	19.34	19.43	19.44
		75	0	19.34	19.43	19.44
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	22.59	22.56	22.75
		1	50	22.46	22.57	22.44
		1	99	22.47	22.55	22.56
		50	0	21.84	21.76	21.78
		50	25	21.82	21.79	21.76
		50	50	21.65	21.75	21.71
		100	0	21.71	21.81	21.73
		100	0	21.71	21.81	21.73
	16QAM	1	0	21.98	22.08	22.08
		1	50	21.83	21.92	21.85
		1	99	21.90	21.85	21.91



		50	0	20.81	20.84	20.83
		50	25	20.79	20.71	20.72
		50	50	20.79	20.78	20.73
		100	0	20.65	20.49	20.61
	64QAM	1	0	20.65	20.71	20.73
		1	50	20.56	20.69	20.62
		1	99	20.60	20.76	20.68
		50	0	19.52	19.63	19.58
		50	25	19.46	19.57	19.60
		50	50	19.42	19.47	19.44
		100	0	19.32	19.39	19.41

LTE Band 7				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20775/2502.5	21100/2535	21425/2567.5
5MHz	QPSK	1	0	23.53	23.56	23.54
		1	13	23.66	23.61	23.58
		1	24	23.58	23.48	23.58
		12	0	22.89	22.99	22.82
		12	6	22.86	23.01	22.74
		12	13	22.97	23.00	22.81
		25	0	22.88	23.04	22.80
	16QAM	1	0	22.77	22.84	22.82
		1	13	22.90	22.85	22.81
		1	24	22.74	22.91	22.85
		12	0	21.95	21.97	21.93
		12	6	21.92	21.96	21.82
		12	13	21.89	21.99	21.85
		25	0	21.86	21.98	21.88
	64QAM	1	0	21.92	22.74	22.77
		1	13	22.69	22.63	22.67
		1	24	22.65	22.70	22.64
		12	0	20.69	20.55	20.54
		12	6	20.67	20.48	20.65
		12	13	20.67	20.42	20.59
		25	0	20.69	20.57	20.58
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	23.55	23.57	23.57
		1	25	23.69	23.66	23.62
		1	49	23.60	23.52	23.61
		25	0	22.92	23.04	22.86



		25	13	22.89	23.06	22.78
		25	25	22.99	23.04	22.86
		50	0	22.96	23.06	22.84
	16QAM	1	0	22.79	22.87	22.84
		1	25	22.93	22.89	22.84
		1	49	22.77	22.93	22.88
		25	0	21.98	22.02	21.97
		25	13	21.94	22.00	21.85
		25	25	21.92	22.04	21.89
		50	0	21.89	22.03	21.92
	64QAM	1	0	21.94	22.77	22.79
		1	25	22.72	22.67	22.70
		1	49	22.68	22.72	22.67
		25	0	20.72	20.60	20.58
		25	13	20.69	20.52	20.68
		25	25	20.70	20.47	20.63
		50	0	20.72	20.62	20.62
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20825/2507.5	21100/2535	21375/2562.5
15MHz	QPSK	1	0	23.54	23.53	23.55
		1	38	23.67	23.65	23.59
		1	74	23.57	23.47	23.57
		36	0	22.90	23.00	22.83
		36	18	22.86	23.01	22.74
		36	39	22.96	23.01	22.82
		75	0	22.94	23.02	22.79
	16QAM	1	0	22.74	22.85	22.82
		1	38	22.91	22.86	22.82
		1	74	22.74	22.89	22.85
		36	0	21.95	22.00	21.94
		36	18	21.91	21.95	21.81
		36	39	21.90	22.00	21.86
		75	0	21.86	21.98	21.88
	64QAM	1	0	21.89	22.75	22.77
		1	38	22.70	22.64	22.68
		1	74	22.65	22.68	22.64
		36	0	20.69	20.58	20.55
		36	18	20.66	20.47	20.64
		36	39	20.68	20.43	20.60
		75	0	20.69	20.57	20.58
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20850/2510	21100/2535	21350/2560
20MHz	QPSK	1	0	23.51	23.49	23.52



		1	50	23.66	23.61	23.57
		1	99	23.55	23.46	23.54
		50	0	22.87	22.95	22.79
		50	25	22.84	22.97	22.71
		50	50	22.93	22.96	22.78
		100	0	22.91	22.97	22.75
		100	0	22.91	22.97	22.75
	16QAM	1	0	22.72	22.81	22.77
		1	50	22.87	22.84	22.78
		1	99	22.72	22.86	22.83
		50	0	21.92	21.96	21.91
		50	25	21.88	21.93	21.78
		50	50	21.87	21.95	21.82
		100	0	21.84	21.94	21.85
	64QAM	1	0	21.87	22.71	22.72
		1	50	22.66	22.62	22.64
		1	99	22.63	22.65	22.62
		50	0	20.66	20.54	20.52
		50	25	20.63	20.45	20.61
		50	50	20.65	20.38	20.56
		100	0	20.67	20.53	20.55

LTE Band 38				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37775/2572.5	38000/2595	38225/2617.5
5MHz	QPSK	1	0	23.26	23.46	23.31
		1	13	23.07	23.16	23.13
		1	24	23.35	23.40	23.35
		12	0	22.31	22.37	22.32
		12	6	22.20	22.43	22.27
		12	13	22.25	22.41	22.30
		25	0	22.23	22.38	22.30
	16QAM	1	0	22.53	22.50	22.67
		1	13	22.43	22.55	22.57
		1	24	22.48	22.57	22.59
		12	0	21.31	21.36	21.25
		12	6	21.31	21.32	21.25
		12	13	21.31	21.38	21.27
		25	0	21.20	21.33	21.24
	64QAM	1	0	21.25	21.29	21.32
		1	13	21.28	21.23	21.27
		1	24	21.25	21.28	21.23
		12	0	20.24	20.25	20.19
		12	6	20.20	20.22	20.16



		12	13	20.14	20.19	20.18
		25	0	20.06	20.14	20.16
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37800/2575	38000/2595	38200/2615
10MHz	QPSK	1	0	23.28	23.47	23.34
		1	25	23.10	23.21	23.17
		1	49	23.37	23.44	23.38
		25	0	22.34	22.42	22.36
		25	13	22.23	22.48	22.31
		25	25	22.27	22.45	22.35
		50	0	22.31	22.40	22.34
	16QAM	1	0	22.55	22.53	22.69
		1	25	22.46	22.59	22.60
		1	49	22.51	22.59	22.62
		25	0	21.34	21.41	21.29
		25	13	21.33	21.36	21.28
		25	25	21.34	21.43	21.31
		50	0	21.23	21.38	21.28
	64QAM	1	0	21.27	21.32	21.34
		1	25	21.31	21.27	21.30
		1	49	21.28	21.30	21.26
		25	0	20.27	20.30	20.23
		25	13	20.22	20.26	20.19
		25	25	20.17	20.24	20.22
		50	0	20.09	20.19	20.20
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37825/2577.5	38000/2595	38175/2612.5
15MHz	QPSK	1	0	23.27	23.43	23.32
		1	38	23.08	23.20	23.14
		1	74	23.34	23.39	23.34
		36	0	22.32	22.38	22.33
		36	18	22.20	22.43	22.27
		36	39	22.24	22.42	22.31
		75	0	22.29	22.36	22.29
	16QAM	1	0	22.50	22.51	22.67
		1	38	22.44	22.56	22.58
		1	74	22.48	22.55	22.59
		36	0	21.31	21.39	21.26
		36	18	21.30	21.31	21.24
		36	39	21.32	21.39	21.28
		75	0	21.20	21.33	21.24
	64QAM	1	0	21.22	21.30	21.32
		1	38	21.29	21.24	21.28



		1	74	21.25	21.26	21.23
		36	0	20.24	20.28	20.20
		36	18	20.19	20.21	20.15
		36	39	20.15	20.20	20.19
		75	0	20.06	20.14	20.16
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37850/2580	38000/2595	38150/2610
20MHz	QPSK	1	0	23.24	23.39	23.29
		1	50	23.07	23.16	23.12
		1	99	23.32	23.38	23.31
		50	0	22.29	22.33	22.29
		50	25	22.18	22.39	22.24
		50	50	22.21	22.37	22.27
		100	0	22.26	22.31	22.25
	16QAM	1	0	22.48	22.47	22.62
		1	50	22.40	22.54	22.54
		1	99	22.46	22.52	22.57
		50	0	21.28	21.35	21.23
		50	25	21.27	21.29	21.21
		50	50	21.29	21.34	21.24
		100	0	21.18	21.29	21.21
	64QAM	1	0	21.20	21.26	21.27
		1	50	21.25	21.22	21.24
		1	99	21.23	21.23	21.21
		50	0	20.21	20.24	20.17
		50	25	20.16	20.19	20.12
		50	50	20.12	20.15	20.15
		100	0	20.04	20.10	20.13

5.2 Effective Isotropic Radiated Power

Ambient condition

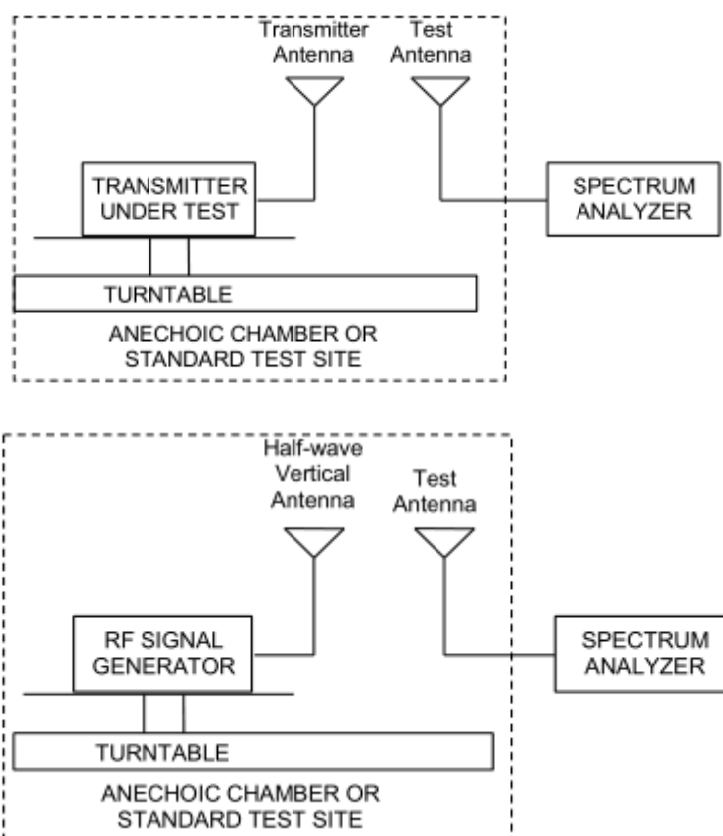
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
 - a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
 - b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
 - c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
 - d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
 - e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation: $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
 - f) The maximum ERP is the maximum value determined in the preceding step.
 - g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:
 $EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$
 where: dBd refers to gain relative to an ideal dipole.
 $EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

The RB allocation refers to section 5.1, using the maximum output power configuration.

Test setup



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

**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”

Rule Part 27.50(h) (2) specifies that “Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.”

Part 27.50(d)(4)Limit	$\leq 1 \text{ W}$ (30 dBm)
Part 27.50(h)(2) Limit	$\leq 2 \text{ W}$ (33 dBm)

Measurement Uncertainty

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

Test Results

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

Mode	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
WCDMA Band IV	Low	1712.4	Horizontal	18.17	30	Pass
	Mid	1732.6	Horizontal	18.15	30	Pass
	High	1752.6	Horizontal	18.07	30	Pass

LTE Band 4						
Bandwidth	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.7	Horizontal	18.98	30	Pass
	Mid	1732.5	Horizontal	18.87	30	Pass
	High	1754.3	Horizontal	18.91	30	Pass
3 MHz (QPSK)	Low	1711.5	Horizontal	18.65	30	Pass
	Mid	1732.5	Horizontal	18.76	30	Pass
	High	1753.5	Horizontal	18.89	30	Pass
5 MHz (QPSK)	Low	1712.5	Horizontal	18.87	30	Pass
	Mid	1732.5	Horizontal	18.65	30	Pass
	High	1752.5	Horizontal	19.02	30	Pass
10 MHz (QPSK)	Low	1715	Horizontal	18.73	30	Pass
	Mid	1732.5	Horizontal	18.70	30	Pass
	High	1750	Horizontal	19.08	30	Pass
15 MHz (QPSK)	Low	1717.5	Horizontal	18.65	30	Pass
	Mid	1732.5	Horizontal	18.86	30	Pass
	High	1747.5	Horizontal	19.13	30	Pass
20 MHz (QPSK)	Low	1720	Horizontal	19.02	30	Pass
	Mid	1732.5	Horizontal	19.13	30	Pass
	High	1745	Horizontal	19.11	30	Pass
1.4 MHz (16QAM)	Low	1710.7	Horizontal	18.35	30	Pass
	Mid	1732.5	Horizontal	18.42	30	Pass
	High	1754.3	Horizontal	18.51	30	Pass
3 MHz (16QAM)	Low	1711.5	Horizontal	18.24	30	Pass
	Mid	1732.5	Horizontal	18.16	30	Pass
	High	1753.5	Horizontal	18.37	30	Pass
5 MHz (16QAM)	Low	1712.5	Horizontal	18.19	30	Pass
	Mid	1732.5	Horizontal	17.98	30	Pass
	High	1752.5	Horizontal	18.43	30	Pass
10 MHz (16QAM)	Low	1715	Horizontal	18.17	30	Pass
	Mid	1732.5	Horizontal	18.24	30	Pass
	High	1750	Horizontal	18.53	30	Pass



15 MHz (16QAM)	Low	1717.5	Horizontal	18.02	30	Pass
	Mid	1732.5	Horizontal	18.17	30	Pass
	High	1747.5	Horizontal	18.73	30	Pass
20 MHz (16QAM)	Low	1720	Horizontal	18.42	30	Pass
	Mid	1732.5	Horizontal	18.39	30	Pass
	High	1745	Horizontal	18.25	30	Pass
1.4 MHz (64QAM)	Low	1710.7	Horizontal	17.67	30	Pass
	Mid	1732.5	Horizontal	17.86	30	Pass
	High	1754.3	Horizontal	17.97	30	Pass
3 MHz (64QAM)	Low	1711.5	Horizontal	17.57	30	Pass
	Mid	1732.5	Horizontal	17.54	30	Pass
	High	1753.5	Horizontal	17.86	30	Pass
5 MHz (64QAM)	Low	1712.5	Horizontal	17.70	30	Pass
	Mid	1732.5	Horizontal	17.36	30	Pass
	High	1752.5	Horizontal	17.98	30	Pass
10 MHz (64QAM)	Low	1715	Horizontal	17.59	30	Pass
	Mid	1732.5	Horizontal	17.74	30	Pass
	High	1750	Horizontal	17.91	30	Pass
15 MHz (64QAM)	Low	1717.5	Horizontal	17.59	30	Pass
	Mid	1732.5	Horizontal	17.69	30	Pass
	High	1747.5	Horizontal	18.16	30	Pass
20 MHz (64QAM)	Low	1720	Horizontal	17.95	30	Pass
	Mid	1732.5	Horizontal	17.88	30	Pass
	High	1745	Horizontal	17.63	30	Pass

LTE Band 7						
Band width	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
5 MHz (QPSK)	Low	2502.5	Horizontal	19.13	33	Pass
	Mid	2535	Horizontal	18.43	33	Pass
	High	2567.5	Horizontal	18.69	33	Pass
10 MHz (QPSK)	Low	2505	Horizontal	19.46	33	Pass
	Mid	2535	Horizontal	18.20	33	Pass
	High	2565	Horizontal	18.78	33	Pass
15 MHz (QPSK)	Low	2507.5	Horizontal	18.67	33	Pass
	Mid	2535	Horizontal	18.58	33	Pass
	High	2562.5	Horizontal	18.76	33	Pass
20 MHz (QPSK)	Low	2510	Horizontal	18.89	33	Pass
	Mid	2535	Horizontal	18.67	33	Pass
	High	2560	Horizontal	18.35	33	Pass
5 MHz (16QAM)	Low	2502.5	Horizontal	18.51	33	Pass
	Mid	2535	Horizontal	17.92	33	Pass



	High	2567.5	Horizontal	18.20	33	Pass
10 MHz (16QAM)	Low	2505	Horizontal	18.84	33	Pass
	Mid	2535	Horizontal	17.75	33	Pass
	High	2565	Horizontal	18.20	33	Pass
15 MHz (16QAM)	Low	2507.5	Horizontal	18.17	33	Pass
	Mid	2535	Horizontal	17.96	33	Pass
	High	2562.5	Horizontal	18.33	33	Pass
20 MHz (16QAM)	Low	2510	Horizontal	18.41	33	Pass
	Mid	2535	Horizontal	18.10	33	Pass
	High	2560	Horizontal	17.88	33	Pass
5 MHz (64QAM)	Low	2502.5	Horizontal	17.93	33	Pass
	Mid	2535	Horizontal	17.21	33	Pass
	High	2567.5	Horizontal	17.66	33	Pass
10 MHz (64QAM)	Low	2505	Horizontal	18.17	33	Pass
	Mid	2535	Horizontal	17.16	33	Pass
	High	2565	Horizontal	17.49	33	Pass
15 MHz (64QAM)	Low	2507.5	Horizontal	17.65	33	Pass
	Mid	2535	Horizontal	17.39	33	Pass
	High	2562.5	Horizontal	17.67	33	Pass
20 MHz (64QAM)	Low	2510	Horizontal	17.85	33	Pass
	Mid	2535	Horizontal	17.50	33	Pass
	High	2560	Horizontal	17.17	33	Pass

LTE Band 38						
Band width	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
5 MHz (QPSK)	Low	2572.5	Horizontal	20.16	33	Pass
	Mid	2595	Horizontal	20.25	33	Pass
	High	2617.5	Horizontal	20.34	33	Pass
10 MHz (QPSK)	Low	2575	Horizontal	20.32	33	Pass
	Mid	2595	Horizontal	20.13	33	Pass
	High	2615	Horizontal	20.35	33	Pass
15 MHz (QPSK)	Low	2577.5	Horizontal	20.27	33	Pass
	Mid	2595	Horizontal	20.35	33	Pass
	High	2612.5	Horizontal	20.24	33	Pass
20 MHz (QPSK)	Low	2580	Horizontal	20.37	33	Pass
	Mid	2595	Horizontal	20.44	33	Pass
	High	2610	Horizontal	20.46	33	Pass
5 MHz (16QAM)	Low	2572.5	Horizontal	19.39	33	Pass
	Mid	2595	Horizontal	19.60	33	Pass
	High	2617.5	Horizontal	19.71	33	Pass
10 MHz (16QAM)	Low	2575	Horizontal	19.56	33	Pass
	Mid	2595	Horizontal	19.42	33	Pass



	High	2615	Horizontal	19.75	33	Pass
15 MHz (16QAM)	Low	2577.5	Horizontal	19.69	33	Pass
	Mid	2595	Horizontal	19.64	33	Pass
	High	2612.5	Horizontal	19.70	33	Pass
20 MHz (16QAM)	Low	2580	Horizontal	19.70	33	Pass
	Mid	2595	Horizontal	19.85	33	Pass
	High	2610	Horizontal	19.75	33	Pass
5 MHz (64QAM)	Low	2572.5	Horizontal	18.90	33	Pass
	Mid	2595	Horizontal	18.98	33	Pass
	High	2617.5	Horizontal	19.26	33	Pass
10 MHz (64QAM)	Low	2575	Horizontal	18.98	33	Pass
	Mid	2595	Horizontal	18.92	33	Pass
	High	2615	Horizontal	19.13	33	Pass
15 MHz (64QAM)	Low	2577.5	Horizontal	19.26	33	Pass
	Mid	2595	Horizontal	19.16	33	Pass
	High	2612.5	Horizontal	19.13	33	Pass
20 MHz (64QAM)	Low	2580	Horizontal	19.23	33	Pass
	Mid	2595	Horizontal	19.34	33	Pass
	High	2610	Horizontal	19.13	33	Pass

Note: 1. EIRP= E.R.P+2.15

5.3 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.

RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.

RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4 (1.4MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4 (3MHz).

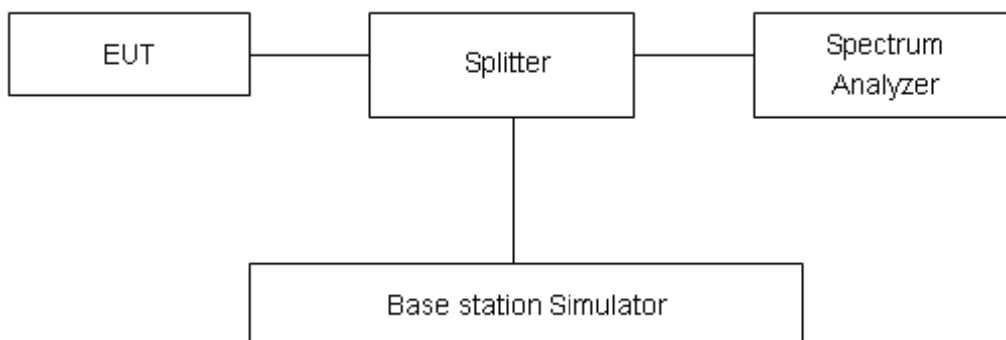
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7/38 (5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/38 (10MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/38(15MHz/20MHz).

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 $k = 2$, $U=624\text{Hz}$.

Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
WCDMA Band IV (RMC)	1312	1712.4	4.1659	4.703
	1413	1732.6	4.1936	4.723
	1513	1752.6	4.1793	4.686

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1202	1.296
			20175	1732.5	1.1212	1.287
			20393	1754.3	1.1303	1.288
		3	19965	1711.5	2.7410	3.045
			20175	1732.5	2.7394	3.052
			20385	1753.5	2.7479	3.045
		5	19975	1712.5	4.5360	5.028
			20175	1732.5	4.5281	5.002
			20375	1752.5	4.5234	4.982
		10	20000	1715	9.0970	10.090
			20175	1732.5	9.1084	10.020
			20350	1750	9.0599	9.973
		15	20025	1717.5	13.5060	14.950
			20175	1732.5	13.5240	14.940
			20325	1747.5	13.5840	15.020
		20	20050	1720	17.9280	19.640
			20175	1732.5	17.9950	19.660
			20300	1745	17.9570	19.660
	16QAM	1.4	19957	1710.7	1.1242	1.285
			20175	1732.5	1.1227	1.279
			20393	1754.3	1.1078	1.275
		3	19965	1711.5	2.7496	3.072
			20175	1732.5	2.7456	3.015
			20385	1753.5	2.7378	3.032
		5	19975	1712.5	4.5218	4.971
			20175	1732.5	4.5379	5.016
			20375	1752.5	4.5229	4.964
		10	20000	1715	9.0484	9.982
			20175	1732.5	9.1008	10.040



		15	20350	1750	9.0672	9.978
			20025	1717.5	13.4910	14.860
			20175	1732.5	13.5540	14.960
			20325	1747.5	13.5510	14.920
		20	20050	1720	17.9870	19.620
			20175	1732.5	17.9690	19.490
			20300	1745	17.9870	19.620
	64QAM	1.4	19957	1710.7	1.1307	1.272
			20175	1732.5	1.1244	1.291
			20393	1754.3	1.1238	1.284
		3	19965	1711.5	2.7350	3.054
			20175	1732.5	2.7518	3.050
			20385	1753.5	2.7386	3.021
		5	19975	1712.5	4.5164	4.981
			20175	1732.5	4.5287	4.950
			20375	1752.5	4.5255	4.995
		10	20000	1715	9.0585	10.030
			20175	1732.5	9.0810	10.010
			20350	1750	9.0610	10.070
		15	20025	1717.5	13.5260	14.950
			20175	1732.5	13.5220	15.070
			20325	1747.5	13.5080	15.030
		20	20050	1720	17.9100	19.710
			20175	1732.5	17.9760	19.750
			20300	1745	17.9590	19.640

LTE Band 7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	20775	2502.5	4.5359	4.965
			21100	2535	4.5337	5.004
			21425	2567.5	4.5184	4.969
		10	20800	2505	9.0466	9.990
			21100	2535	9.0634	9.994
			21400	2565	9.0548	10.040
		15	20825	2507.5	13.5160	14.920
			21100	2535	13.5440	14.980
			21375	2562.5	13.5160	14.870
		20	20850	2510	17.9710	19.580
			21100	2535	17.9680	19.640



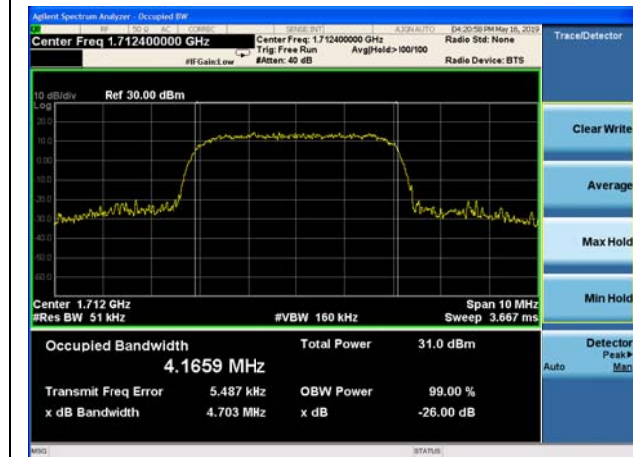
	16QAM	5	21350	2560	17.9540	19.620
			20775	2502.5	4.5296	5.011
			21100	2535	4.5163	4.967
		10	21425	2567.5	4.5182	4.968
			20800	2505	9.0459	9.992
			21100	2535	9.0498	10.020
		15	21400	2565	9.0539	9.987
			20825	2507.5	13.5260	15.000
			21100	2535	13.5140	14.940
		20	21375	2562.5	13.4650	14.740
			20850	2510	17.9440	19.580
			21100	2535	17.9310	19.570
	64QAM	5	21350	2560	17.9600	19.680
			20775	2502.5	4.5288	4.985
			21100	2535	4.5131	4.959
		10	21425	2567.5	4.5363	4.976
			20800	2505	9.0528	10.030
			21100	2535	9.0485	9.993
		15	21400	2565	9.0686	10.090
			20825	2507.5	13.5040	14.890
			21100	2535	13.5650	14.930
		20	21375	2562.5	13.4900	14.950
			20850	2510	17.9270	19.670
			21100	2535	17.9530	19.640
			21350	2560	17.9700	19.570

LTE Band 38						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	37775	2572.5	4.5162	5.048
			38000	2595	4.5096	4.925
			38225	2617.5	4.5152	5.027
		10	37800	2575	9.1105	10.220
			38000	2595	9.0464	9.912
			38200	2615	9.0961	10.070
		15	37825	2577.5	13.5040	14.850
			38000	2595	13.4770	14.960
			38175	2612.5	13.4920	14.820
		20	37850	2580	17.9690	19.630
			38000	2595	17.9190	19.520

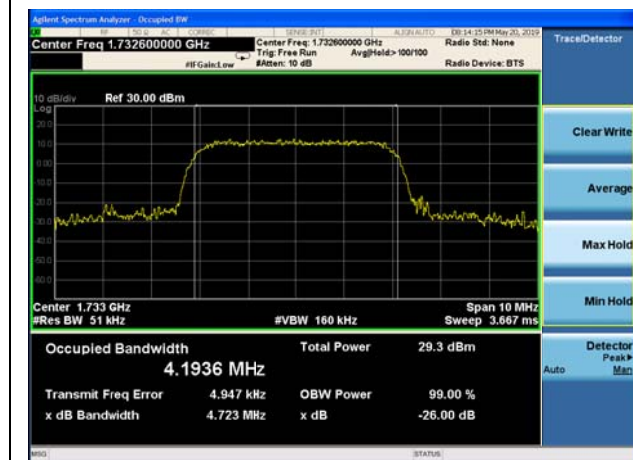


	16QAM	5	38150	2610	18.0120	19.360
			37775	2572.5	4.5183	4.961
			38000	2595	4.5160	5.046
		10	38225	2617.5	4.5197	4.941
			37800	2575	9.0213	10.190
			38000	2595	9.0535	10.000
		15	38200	2615	9.0479	9.921
			37825	2577.5	13.4570	14.830
			38000	2595	13.5150	14.600
		20	38175	2612.5	13.4880	14.700
			37850	2580	17.9720	19.660
			38000	2595	17.9170	19.330
	64QAM	5	38150	2610	17.9190	19.570
			37775	2572.5	4.5118	4.975
			38000	2595	4.5118	4.967
		10	38225	2617.5	4.5371	4.949
			37800	2575	9.0595	10.050
			38000	2595	9.0464	9.956
		15	38200	2615	9.0860	10.000
			37825	2577.5	13.5240	15.150
			38000	2595	13.4900	14.740
		20	38175	2612.5	13.4820	14.760
			37850	2580	17.9810	19.500
			38000	2595	17.9340	19.750
			38150	2610	17.9740	19.570

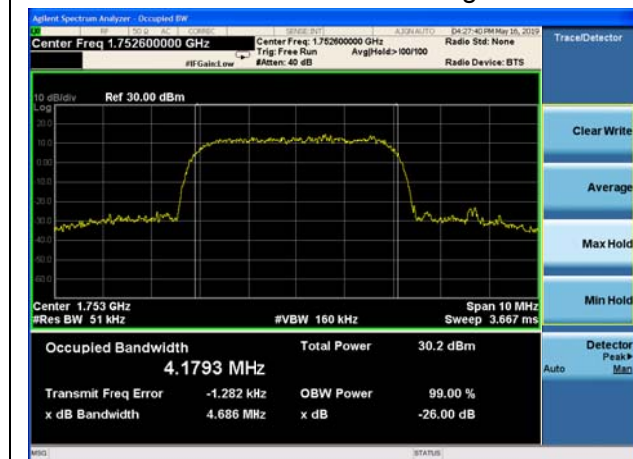
WCDMA Band IV CH-Low



WCDMA Band IV CH Middle

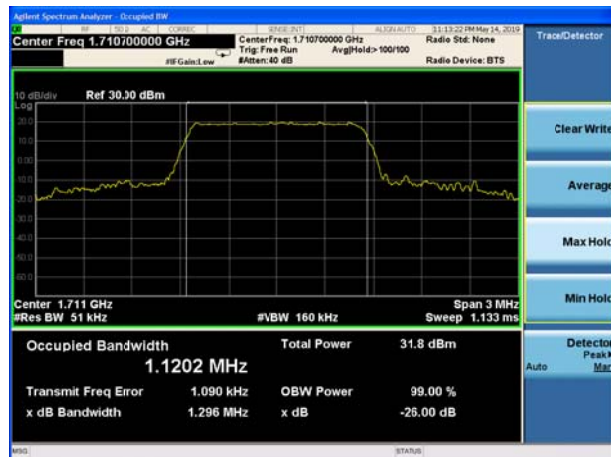


WCDMA Band IV CH High

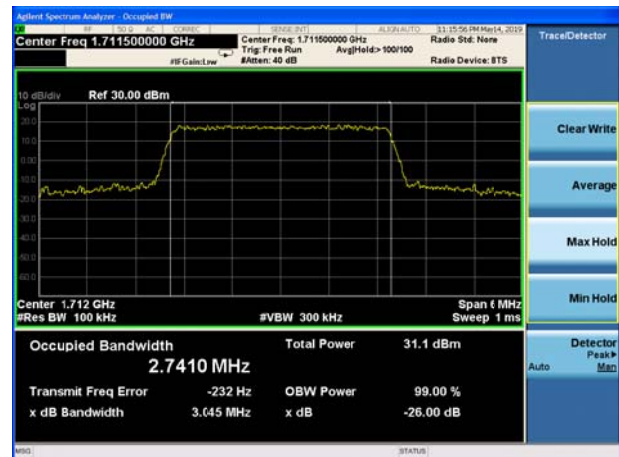




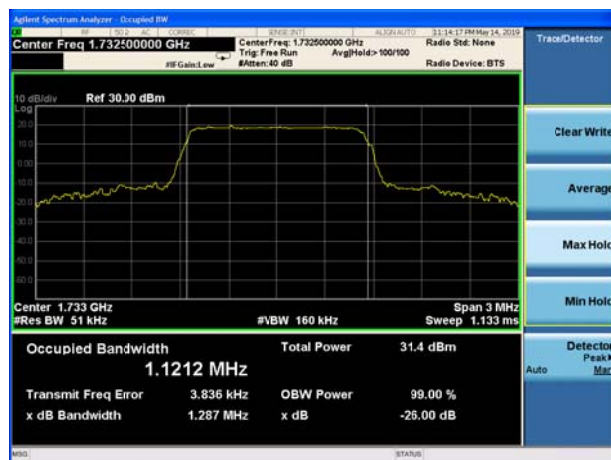
LTE Band 4 QPSK 1.4MHz CH-Low



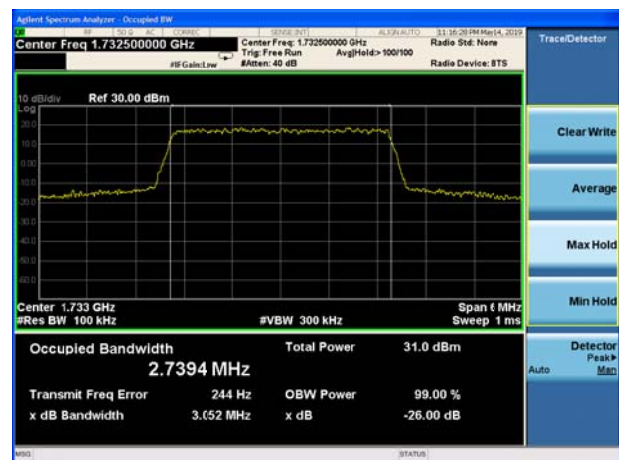
LTE Band 4 QPSK 3MHz CH-Low



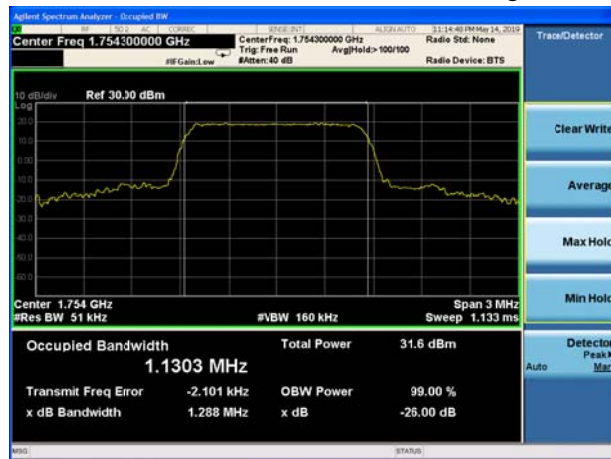
LTE Band 4 QPSK 1.4MHz CH-Middle



LTE Band 4 QPSK 3MHz CH-Middle



LTE Band 4 QPSK 1.4MHz CH-High

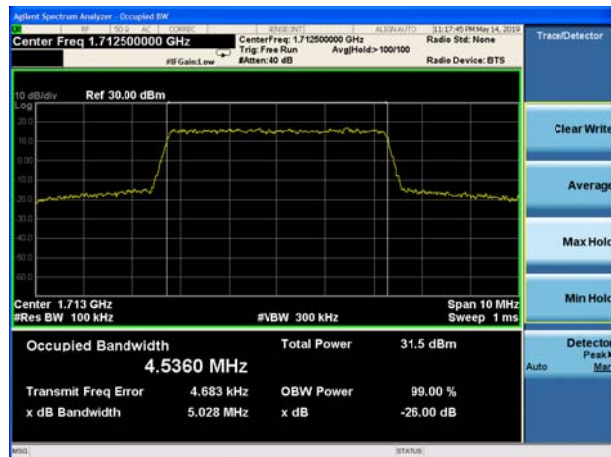


LTE Band 4 QPSK 3MHz CH-High





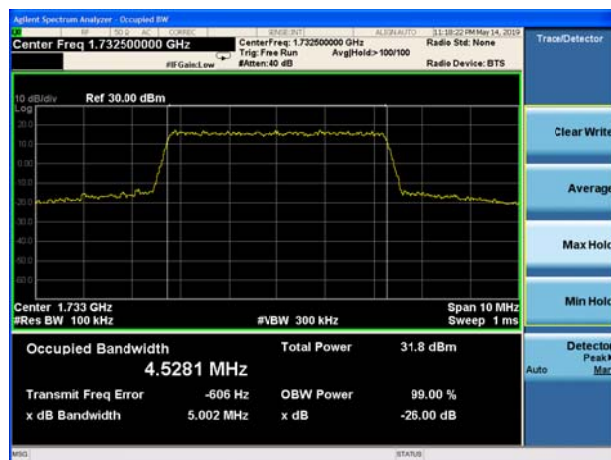
LTE Band 4 QPSK 5MHz CH-Low



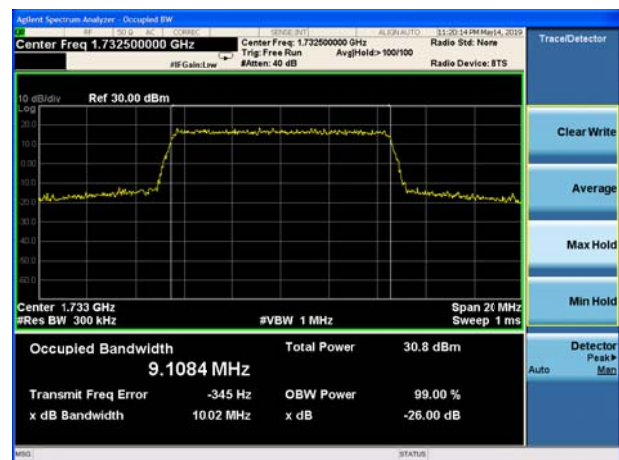
LTE Band 4 QPSK 10MHz CH-Low



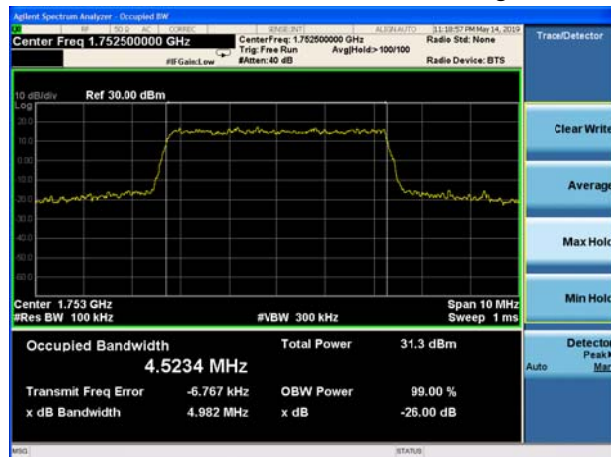
LTE Band 4 QPSK 5MHz CH-Middle



LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 QPSK 5MHz CH-High

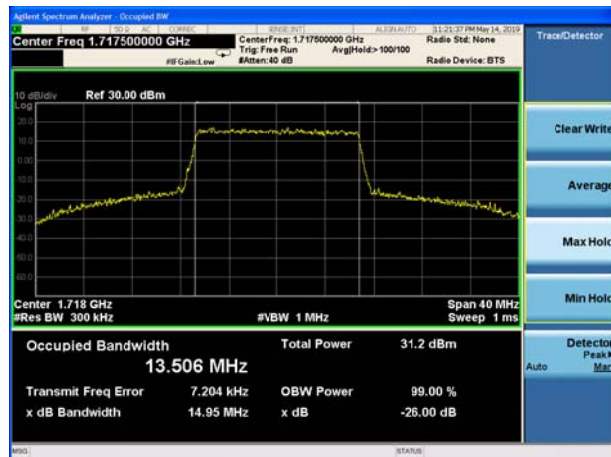


LTE Band 4 QPSK 10MHz CH-High

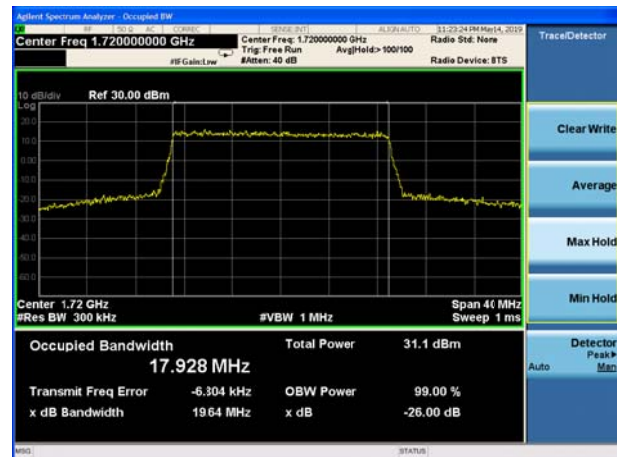




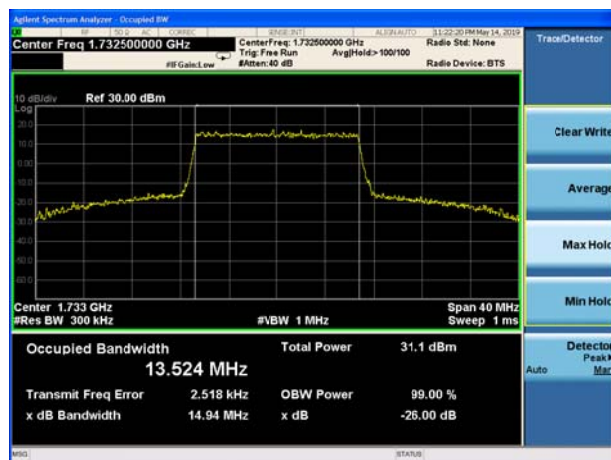
LTE Band 4 QPSK 15MHz CH-Low



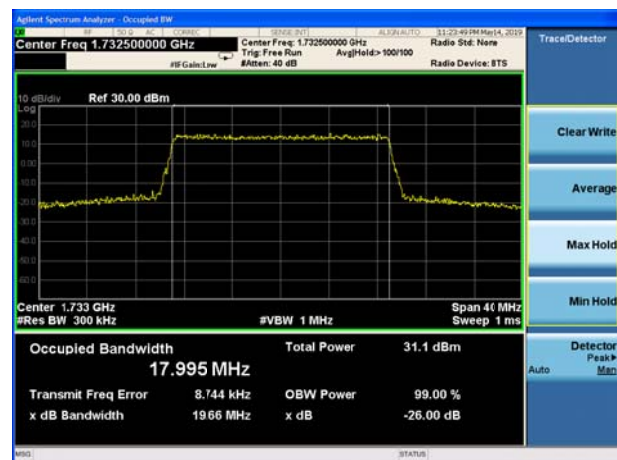
LTE Band 4 QPSK 20MHz CH-Low



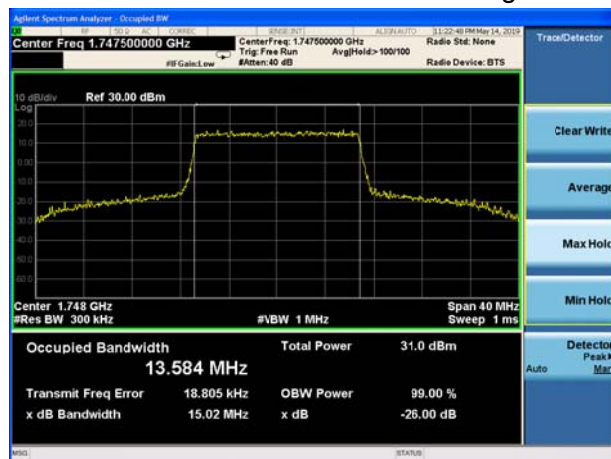
LTE Band 4 QPSK 15MHz CH-Middle



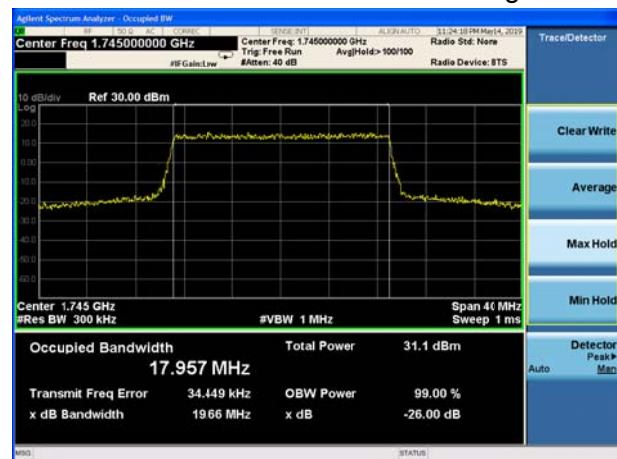
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LTE Band 4 QPSK 15MHz CH-High

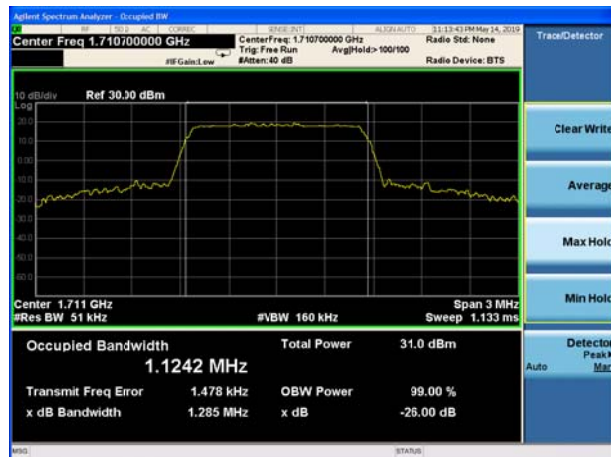


LTE Band 4 QPSK 20MHz CH-High

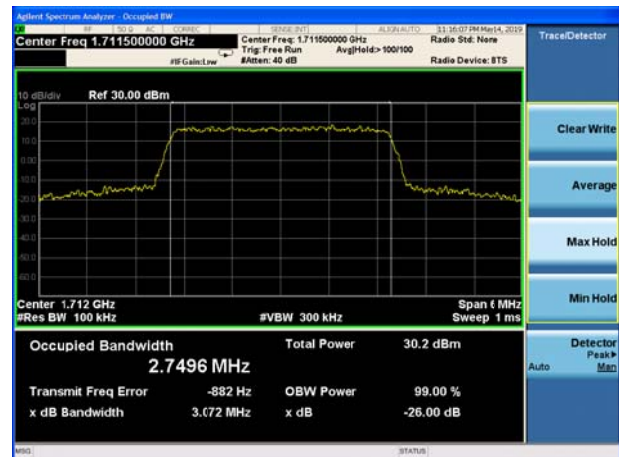




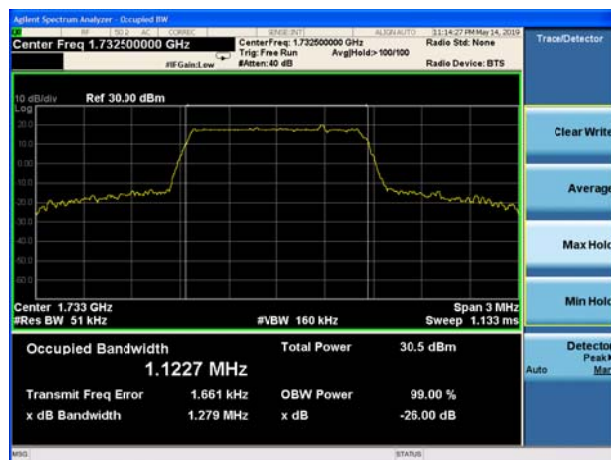
LTE Band 4 16QAM 1.4MHz CH-Low



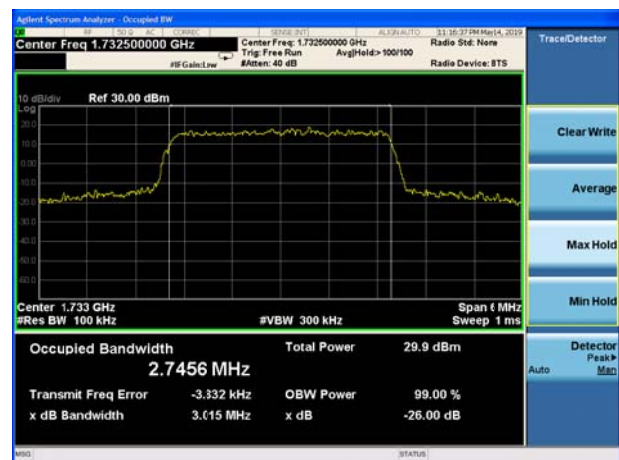
LTE Band 4 16QAM 3MHz CH-Low



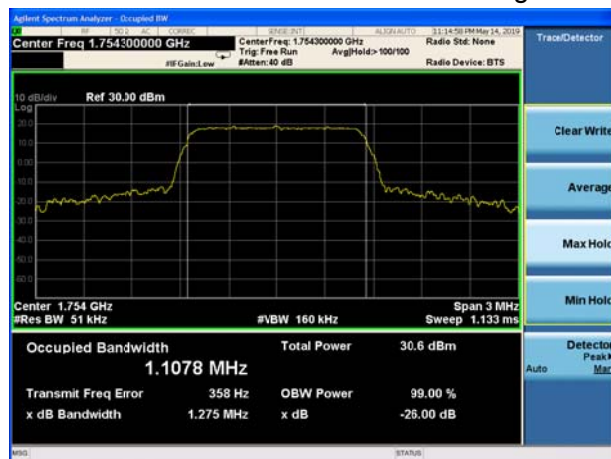
LTE Band 4 16QAM 1.4MHz CH-Middle



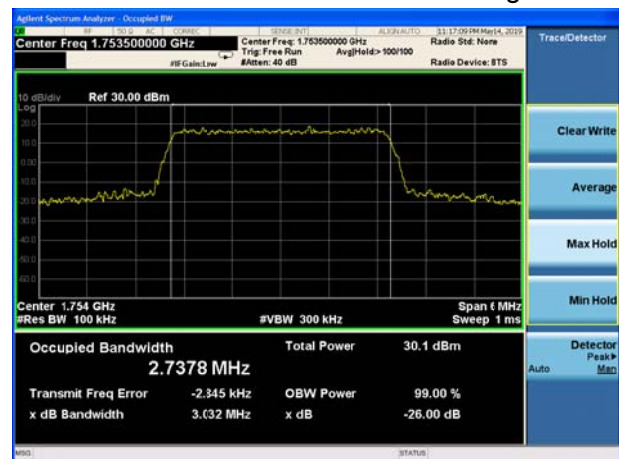
LTE Band 4 16QAM 3MHz CH-Middle



LTE Band 4 16QAM 1.4MHz CH-High

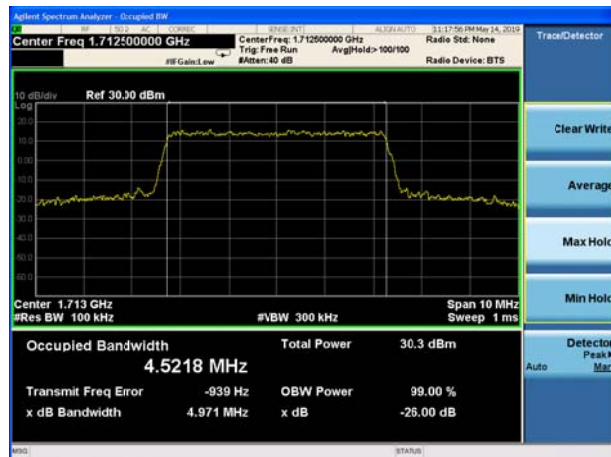


LTE Band 4 16QAM 3MHz CH-High





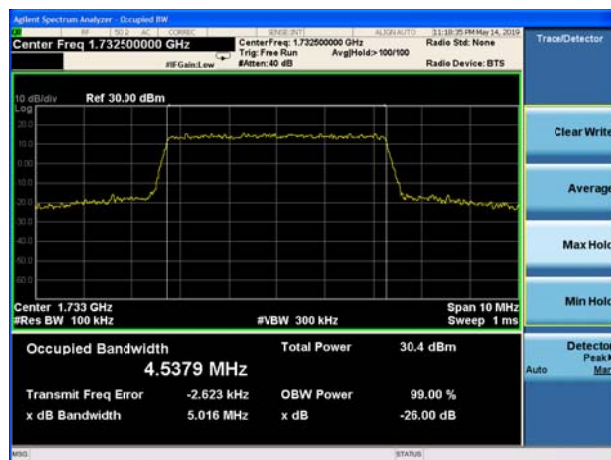
LTE Band 4 16QAM 5MHz CH-Low



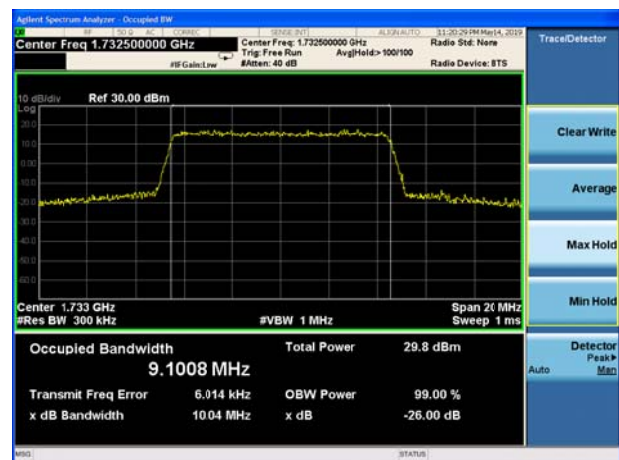
LTE Band 4 16QAM 10MHz CH-Low



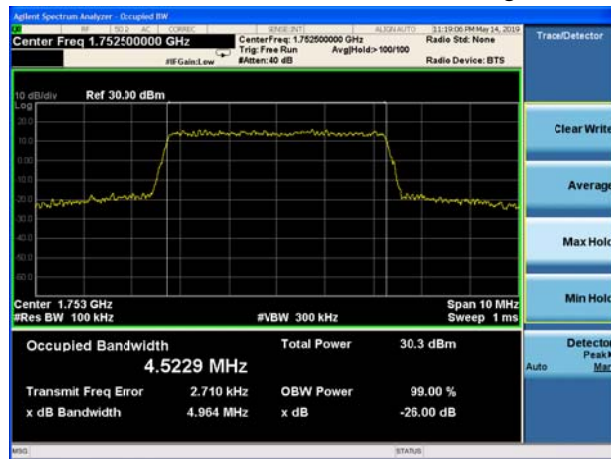
LTE Band 4 16QAM 5MHz CH-Middle



LTE Band 4 16QAM 10MHz CH-Middle



LTE Band 4 16QAM 5MHz CH-High

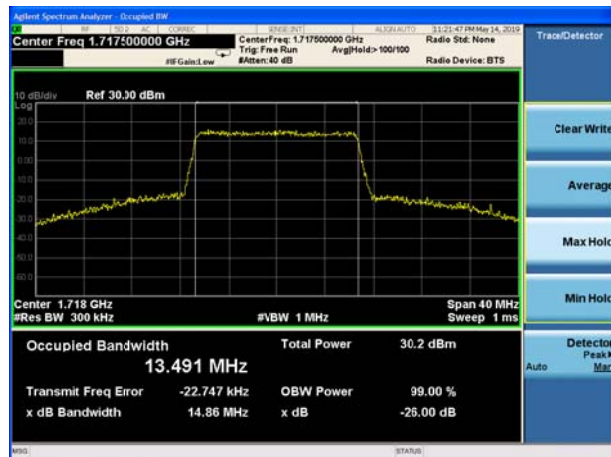


LTE Band 4 16QAM 10MHz CH-High

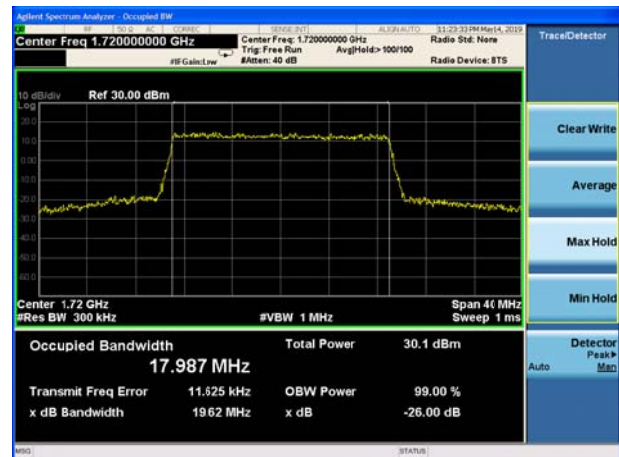




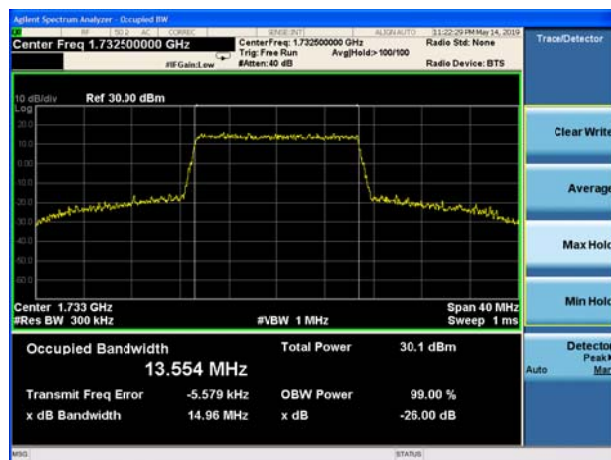
LTE Band 4 16QAM 15MHz CH-Low



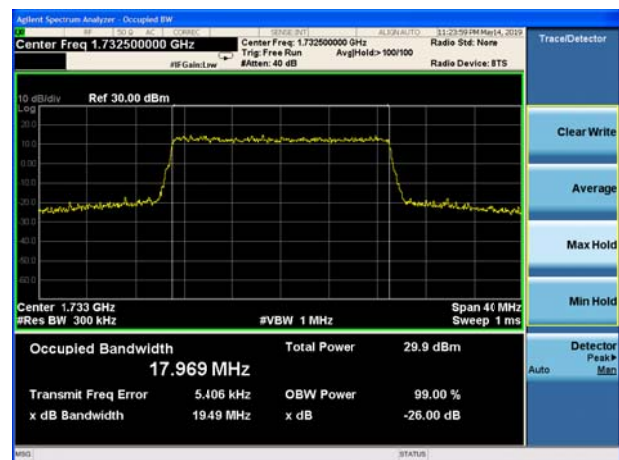
LTE Band 4 16QAM 20MHz CH-Low



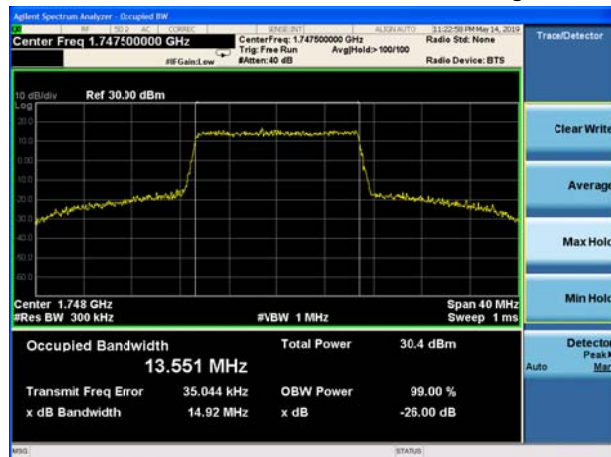
LTE Band 4 16QAM 15MHz CH-Middle



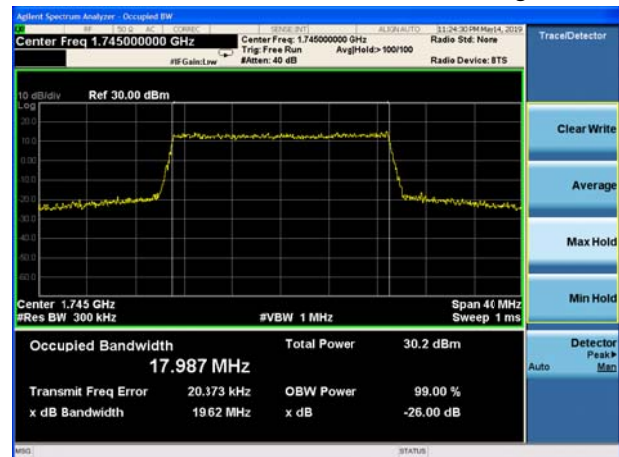
LTE Band 4 16QAM 20MHz CH-Middle



LTE Band 4 16QAM 15MHz CH-High

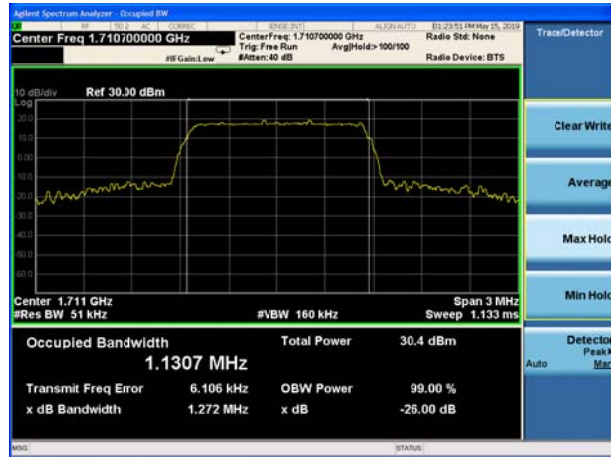


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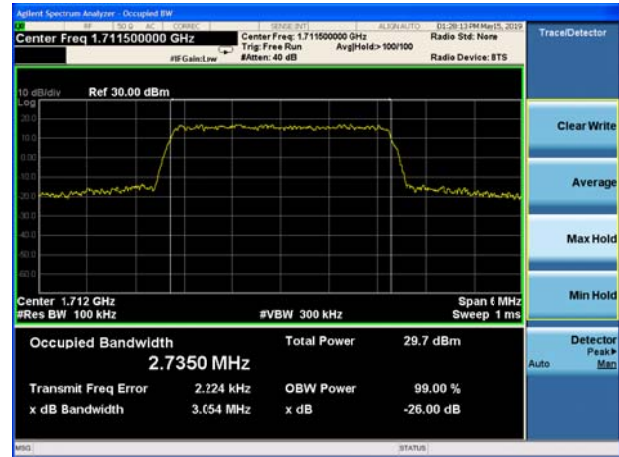




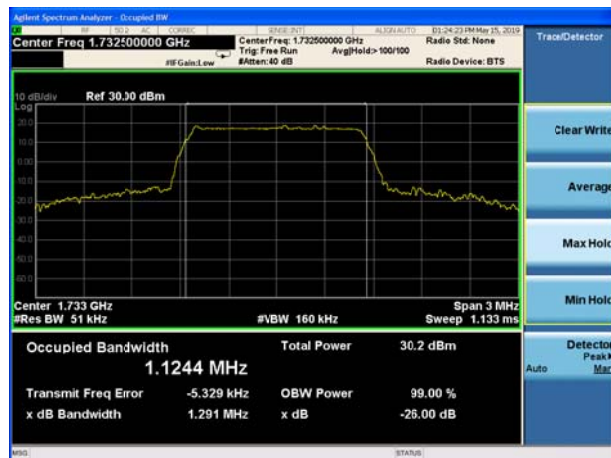
LTE Band 4 64QAM 1.4MHz CH-Low



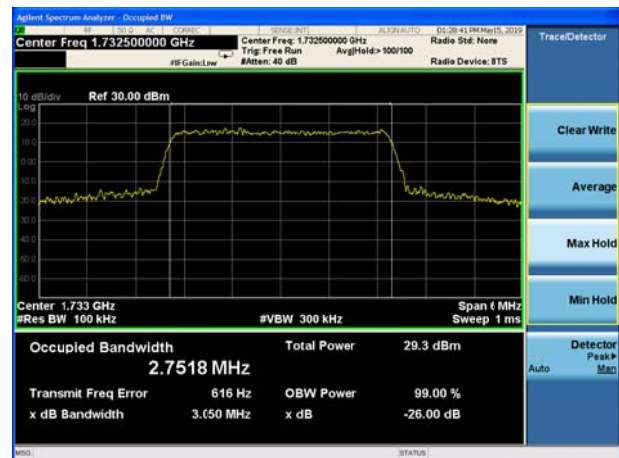
LTE Band 4 64QAM 3MHz CH-Low



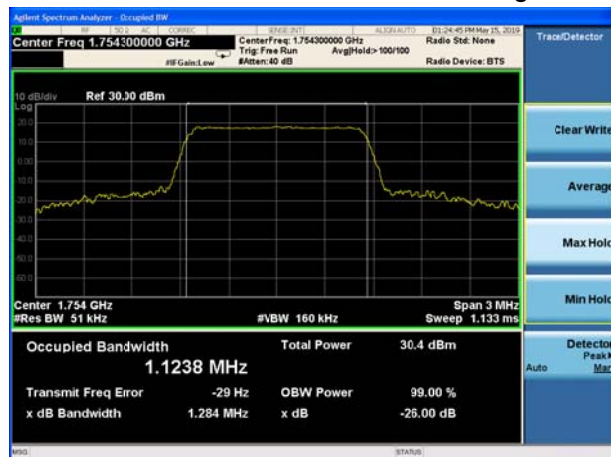
LTE Band 4 64QAM 1.4MHz CH-Middle



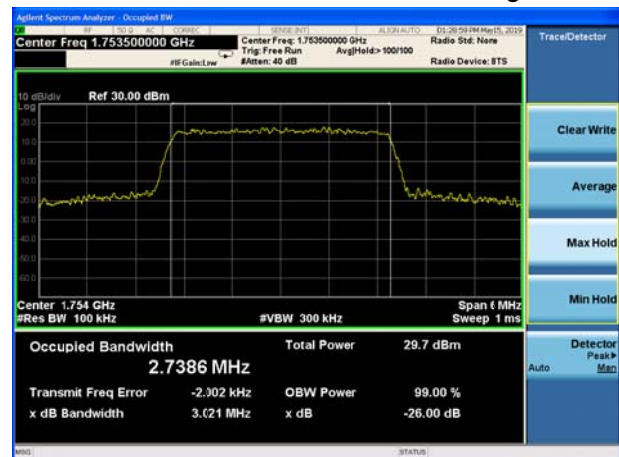
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LTE Band 4 64QAM 1.4MHz CH-High

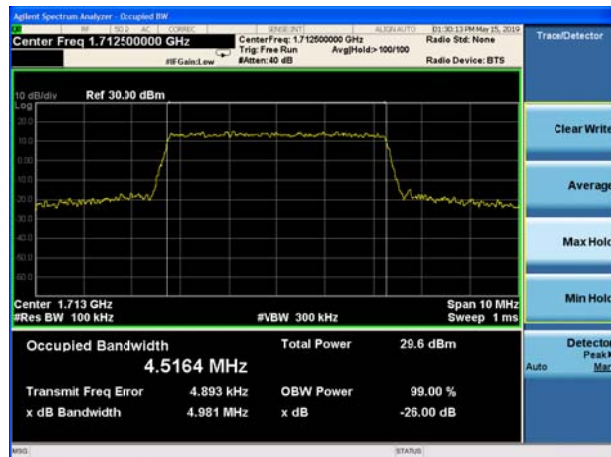


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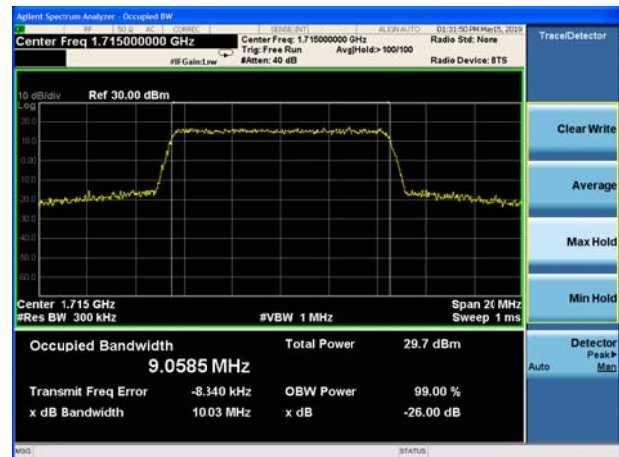




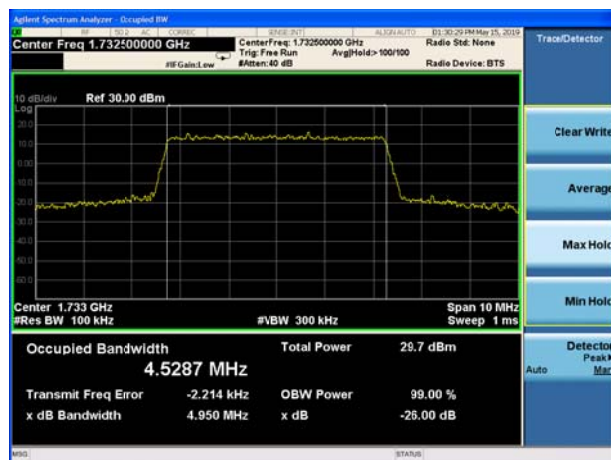
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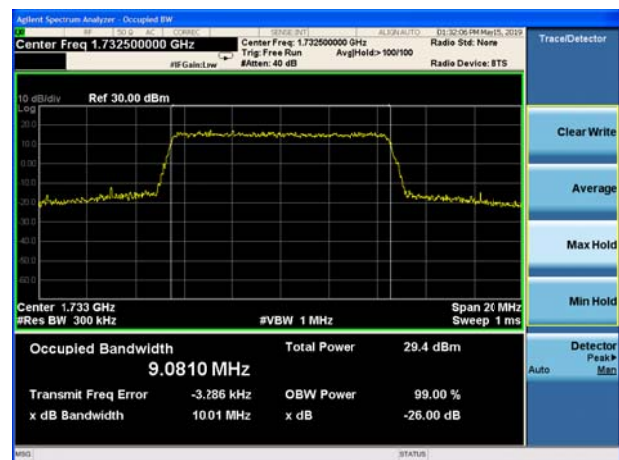
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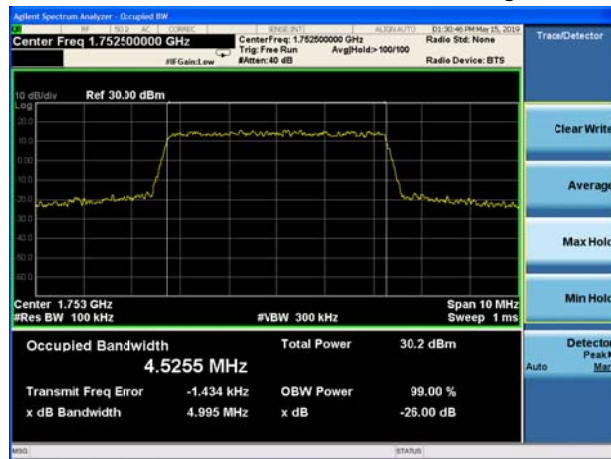
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LTE Band 4 64QAM 10MHz CH-Middle



LTE Band 4 64QAM 5MHz CH-High

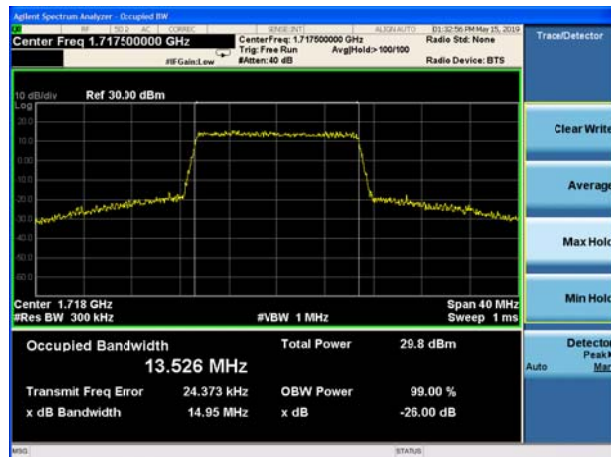


LTE Band 4 64QAM 10MHz CH-High

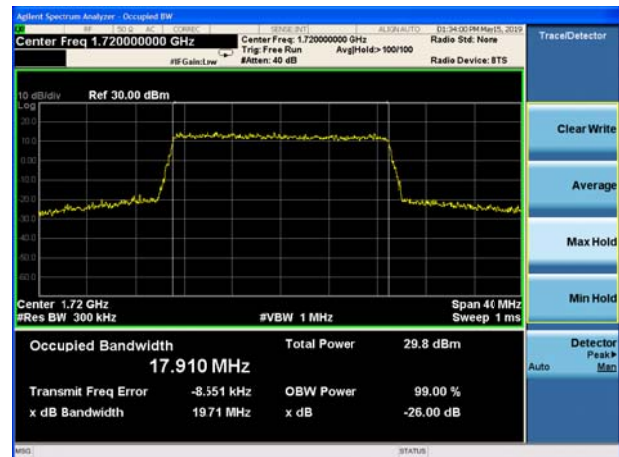




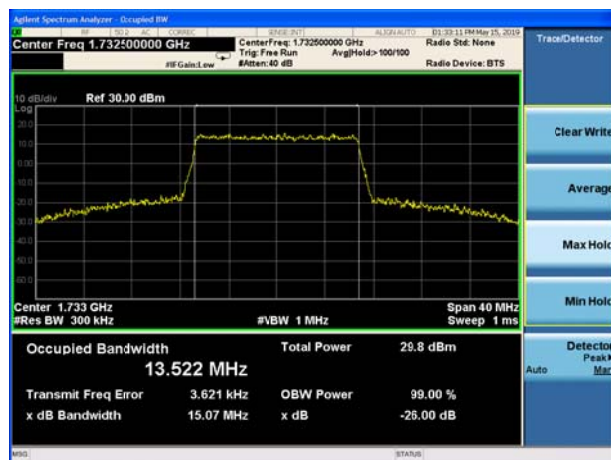
LTE Band 4 64QAM 15MHz CH-Low



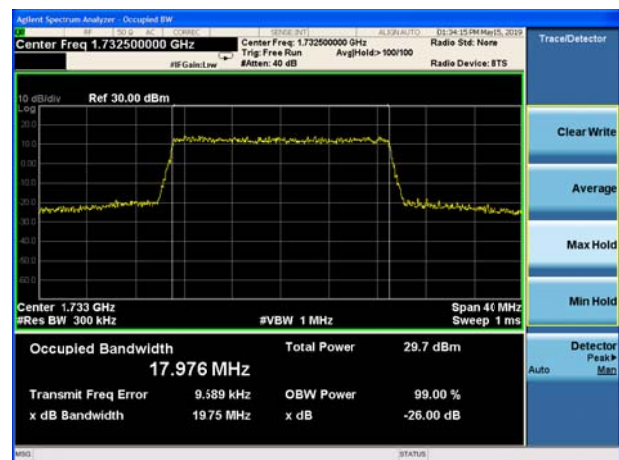
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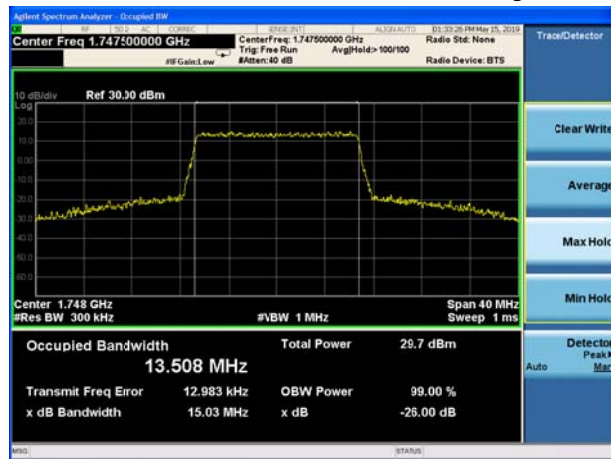
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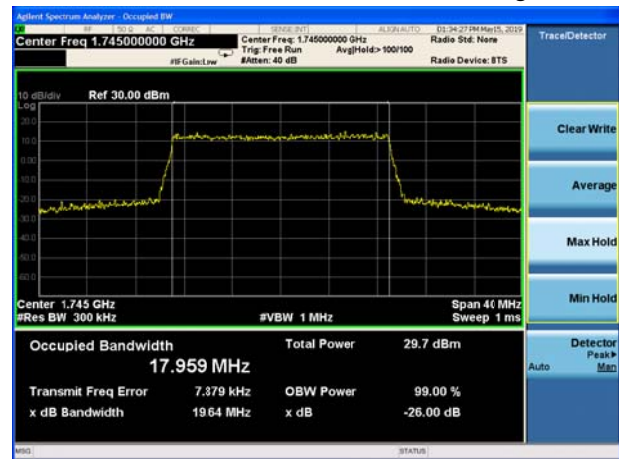
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LTE Band 4 64QAM 15MHz CH-High

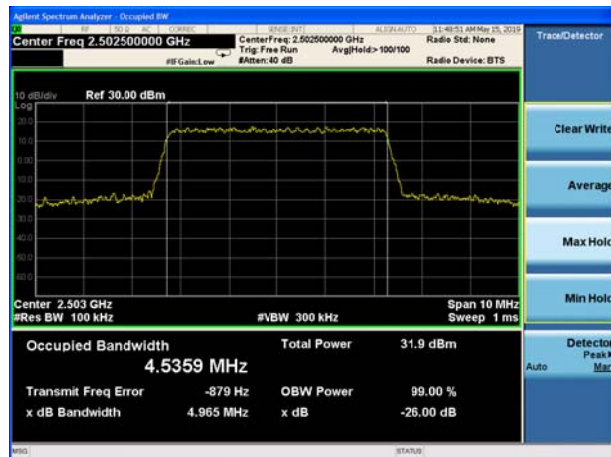


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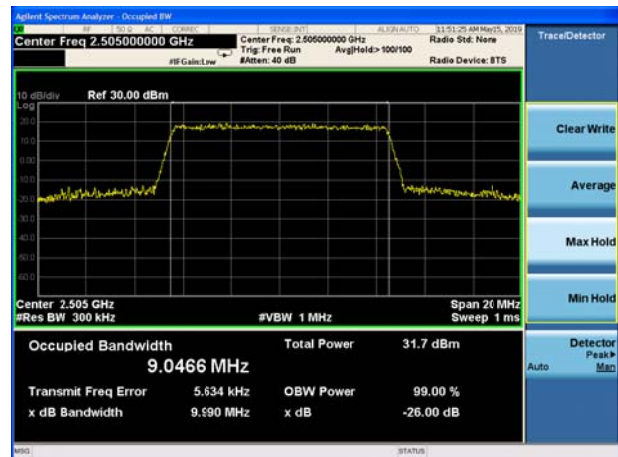




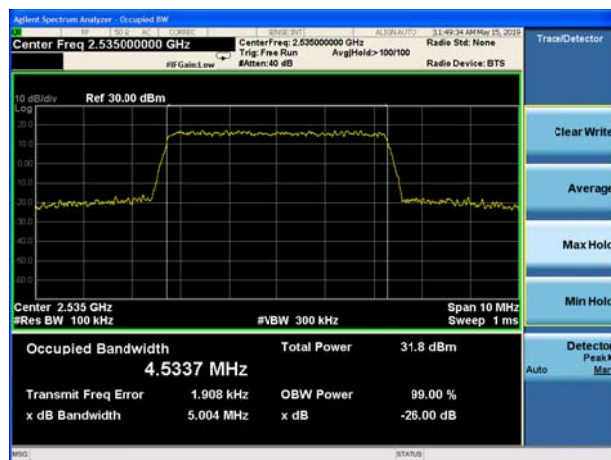
LTE Band 7 QPSK 5MHz CH-Low



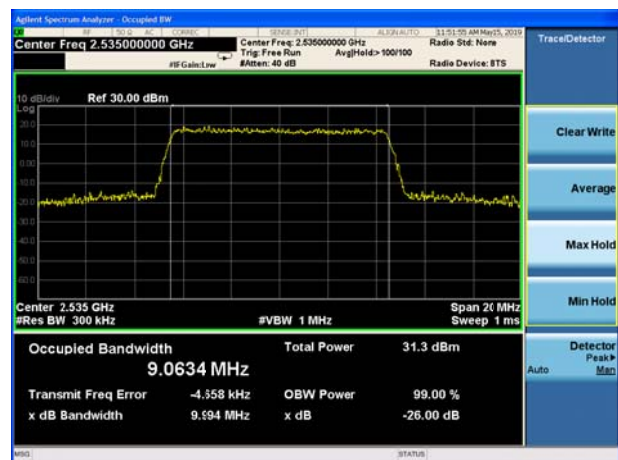
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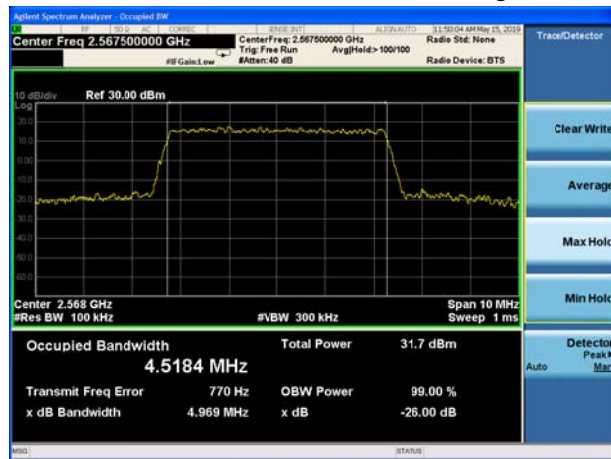
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LTE Band 7 QPSK 10MHz CH-Middle



LTE Band 7 QPSK 5MHz CH-High

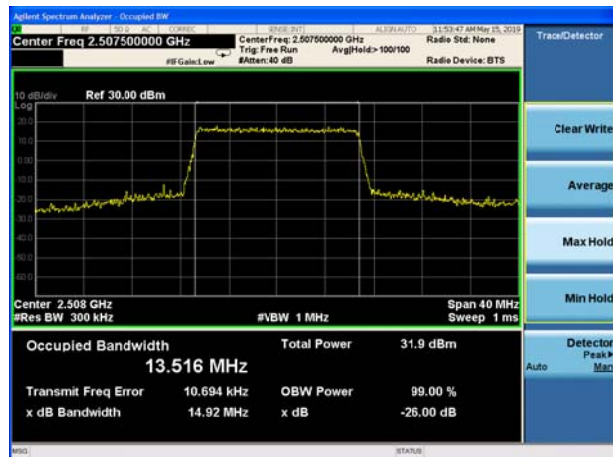


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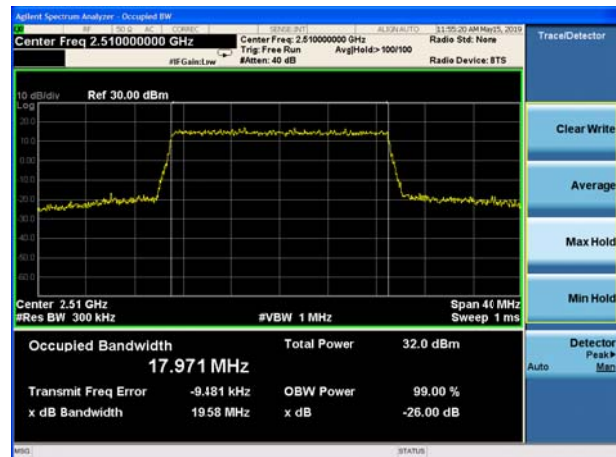




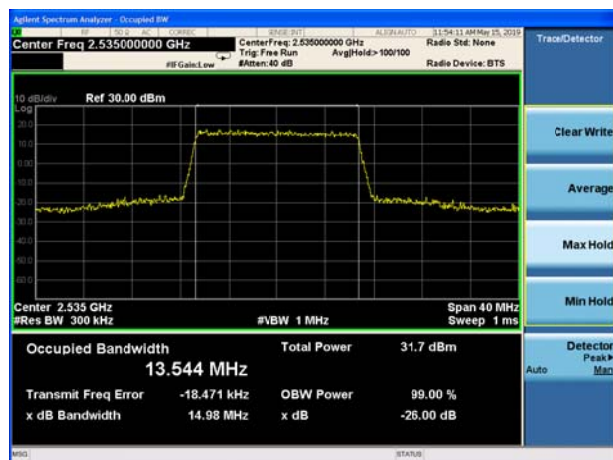
LTE Band 7 QPSK 15MHz CH-Low



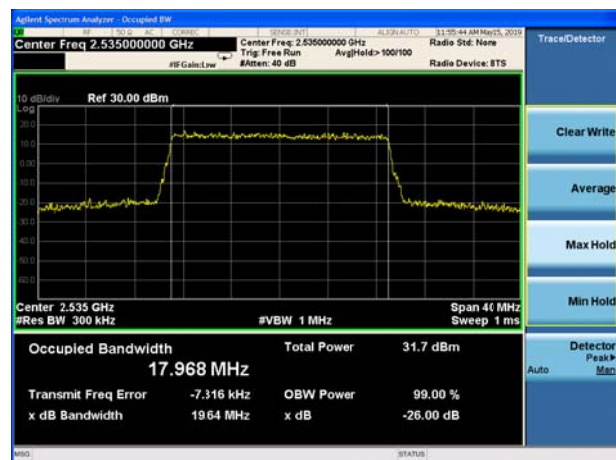
LTE Band 7 QPSK 20MHz CH-Low



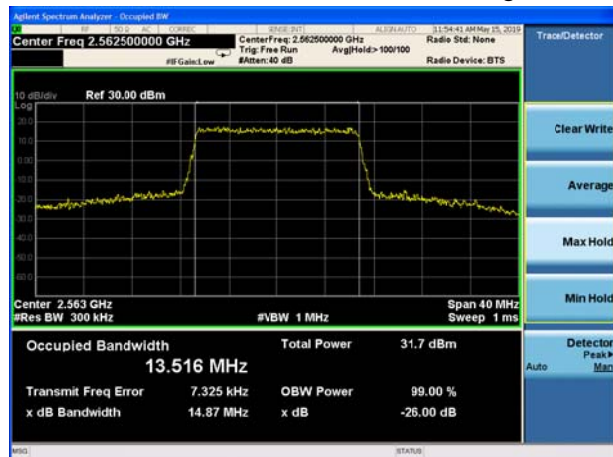
LTE Band 7 QPSK 15MHz CH-Middle



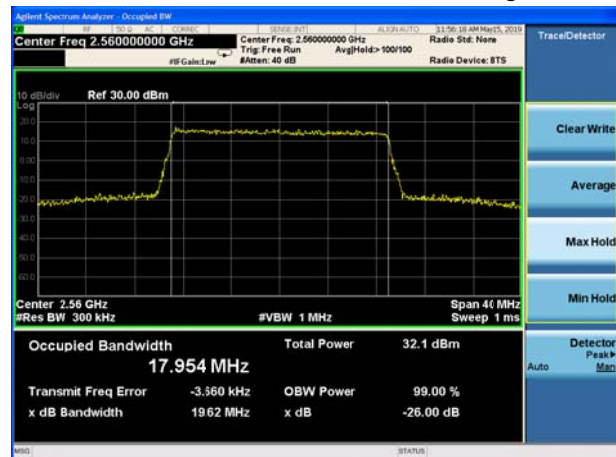
LTE Band 7 QPSK 20MHz CH-Middle



LTE Band 7 QPSK 15MHz CH-High

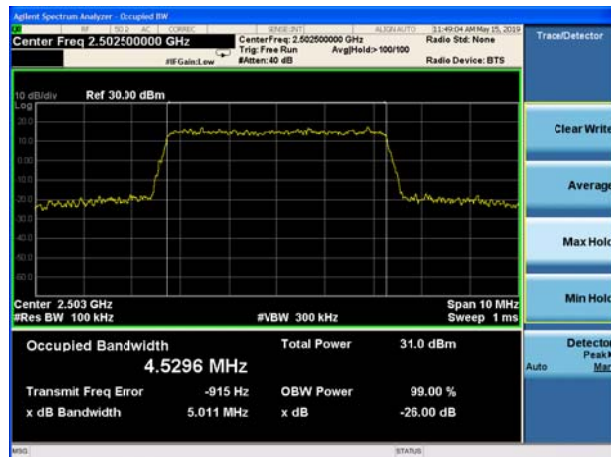


LTE Band 7 QPSK 20MHz CH-High

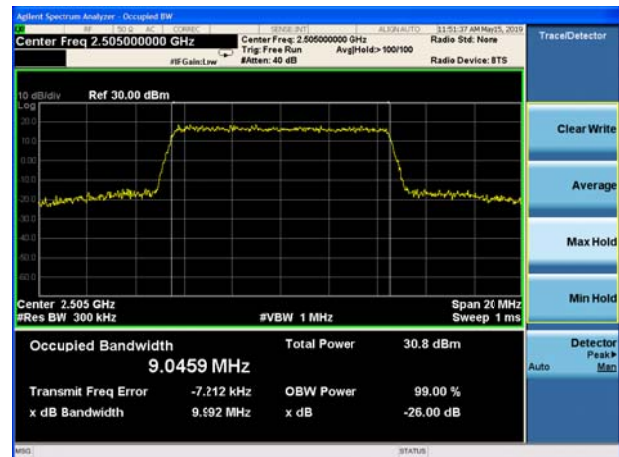




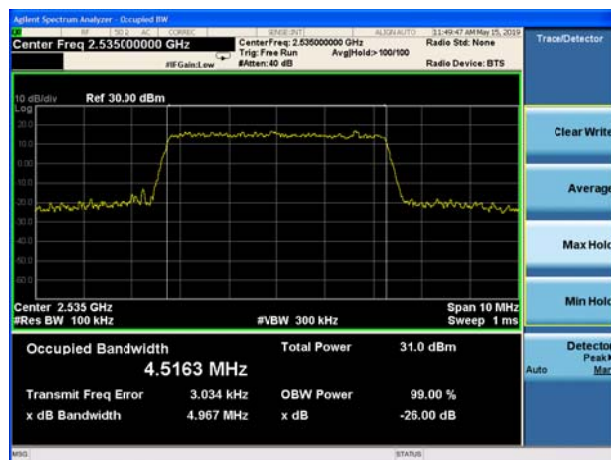
LTE Band 7 16QAM 5MHz CH-Low



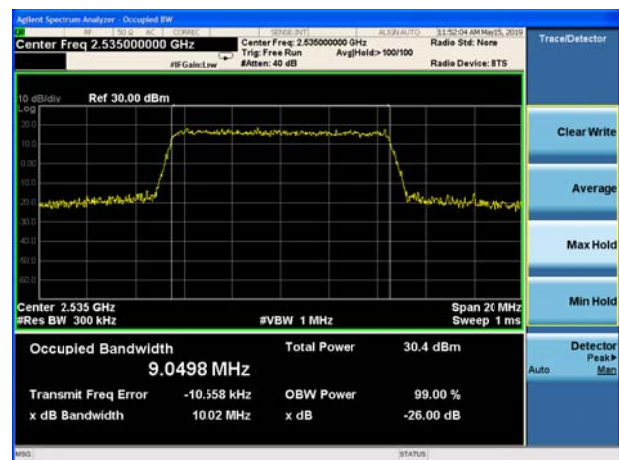
LTE Band 7 16QAM 10MHz CH-Low



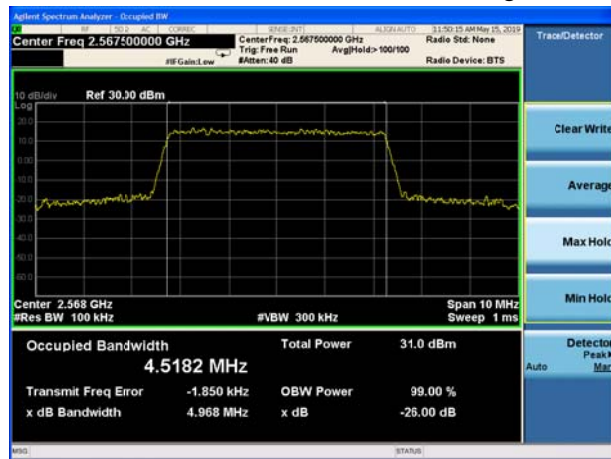
LTE Band 7 16QAM 5MHz CH-Middle



LTE Band 7 16QAM 10MHz CH-Middle



LTE Band 7 16QAM 5MHz CH-High

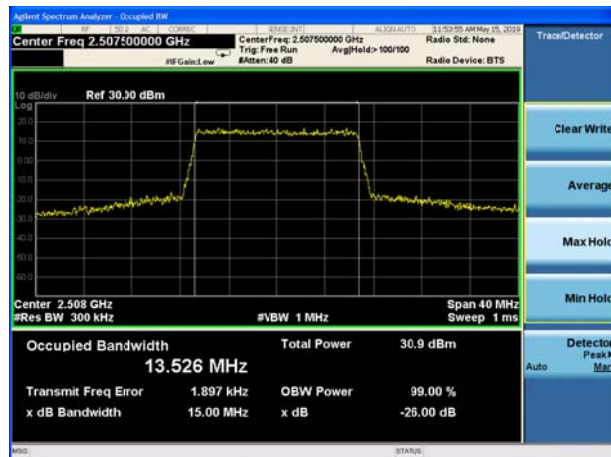


LTE Band 7 16QAM 10MHz CH-High

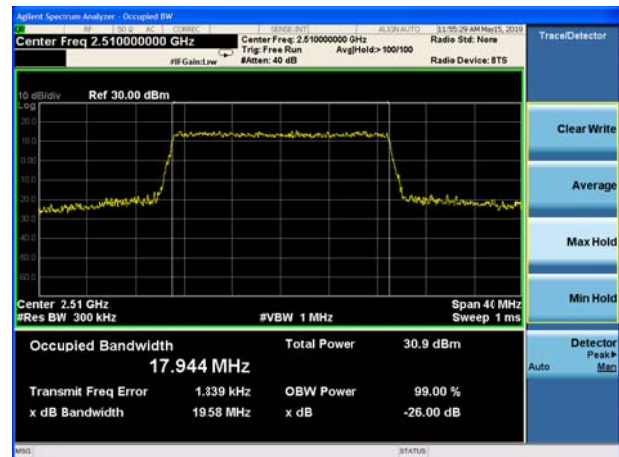




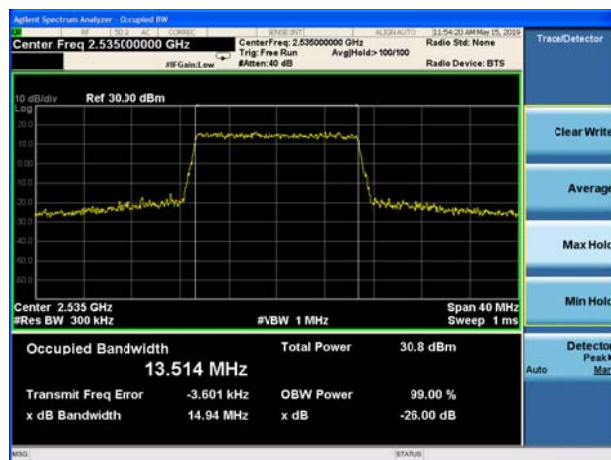
LTE Band 7 16QAM 15MHz CH-Low



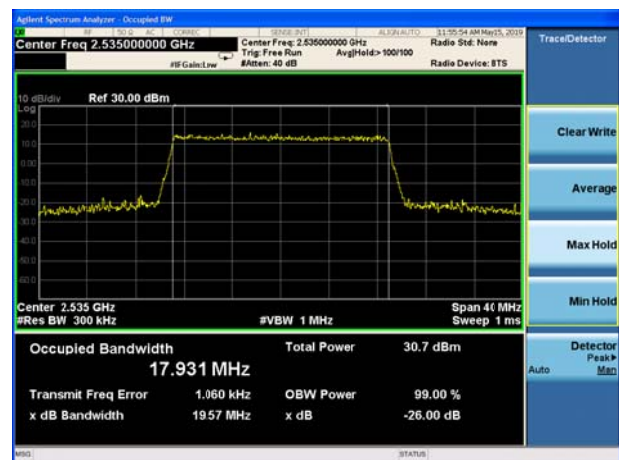
LTE Band 7 16QAM 20MHz CH-Low



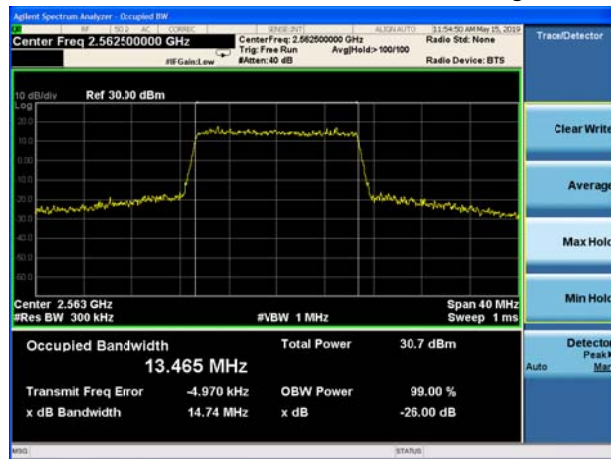
LTE Band 7 16QAM 15MHz CH-Middle



LTE Band 7 16QAM 20MHz CH-Middle



LTE Band 7 16QAM 15MHz CH-High

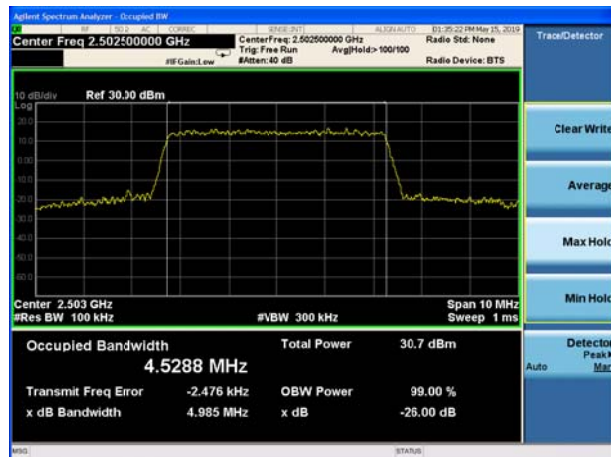


LTE Band 7 16QAM 20MHz CH-High





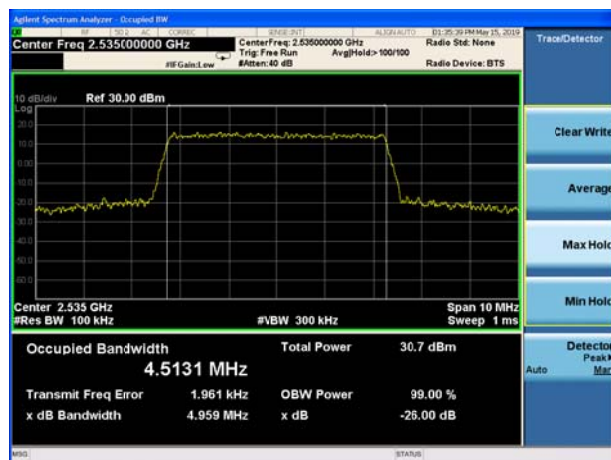
LTE Band 7 64QAM 5MHz CH-Low



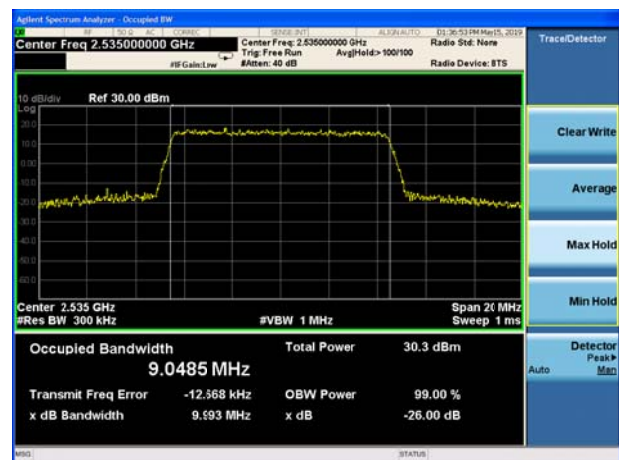
LTE Band 7 64QAM 10MHz CH-Low



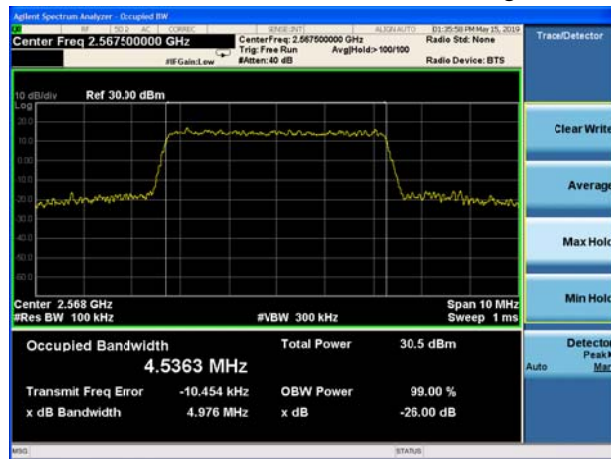
LTE Band 7 64QAM 5MHz CH-Middle



LTE Band 7 64QAM 10MHz CH-Middle



LTE Band 7 64QAM 5MHz CH-High

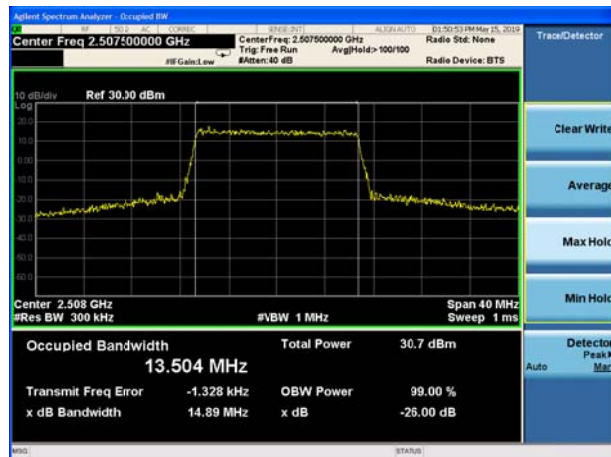


LTE Band 7 64QAM 10MHz CH-High

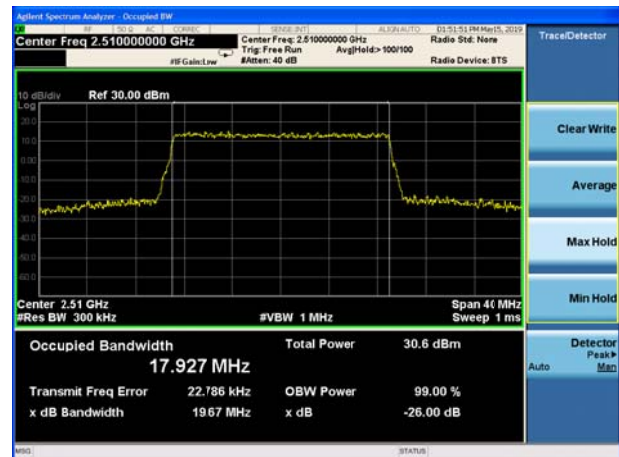




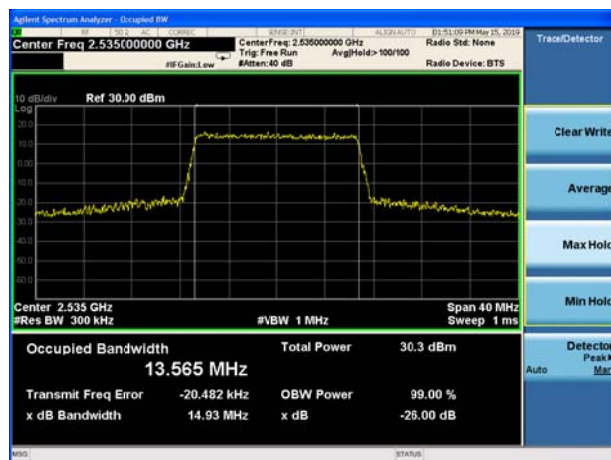
LTE Band 7 64QAM 15MHz CH-Low



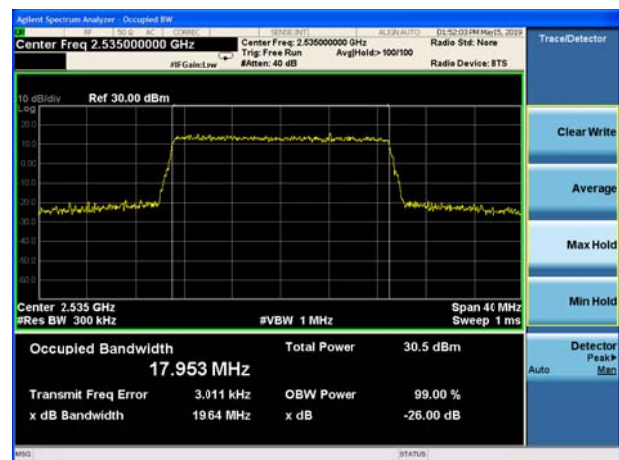
LTE Band 7 64QAM 20MHz CH-Low



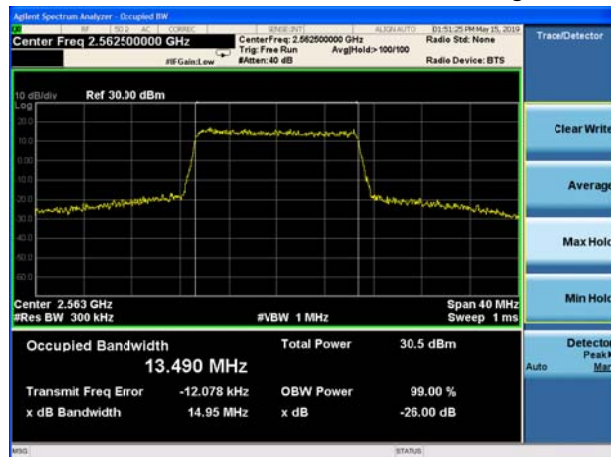
LTE Band 7 64QAM 15MHz CH-Middle



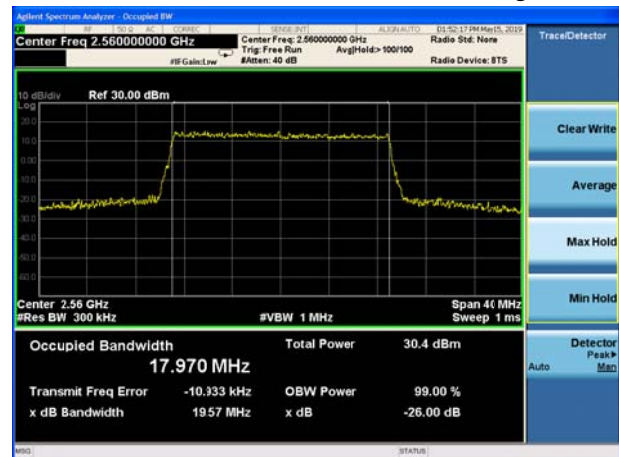
LTE Band 7 64QAM 20MHz CH-Middle



LTE Band 7 64QAM 15MHz CH-High

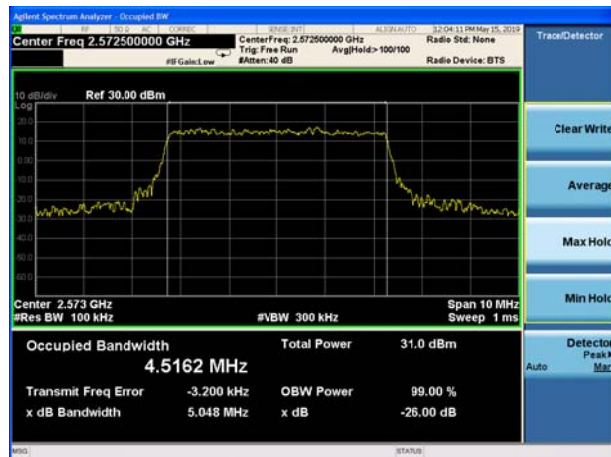


LTE Band 7 64QAM 20MHz CH-High

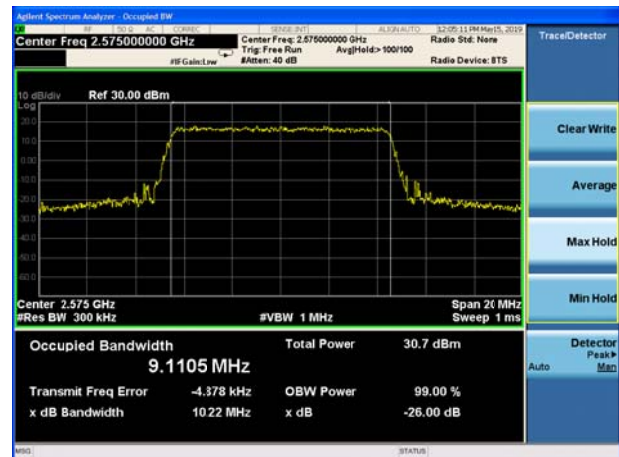




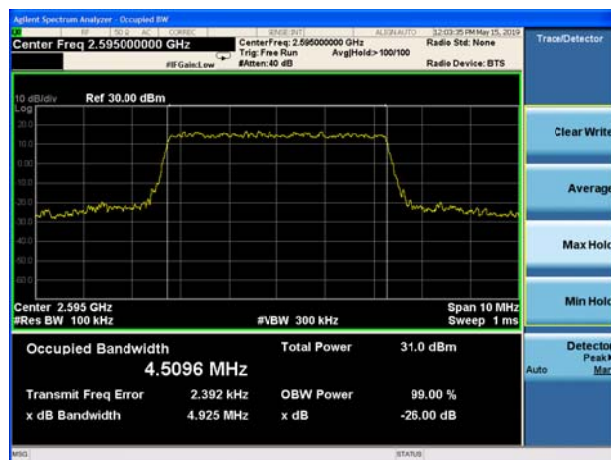
LTE Band 38 QPSK 5MHz CH-Low



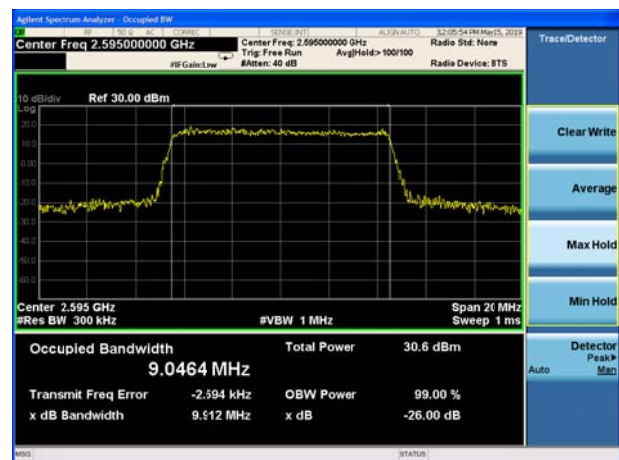
LTE Band 38 QPSK 10MHz CH-Low



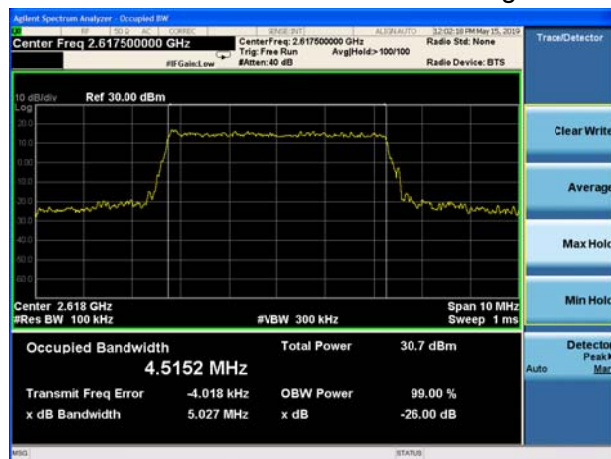
LTE Band 38 QPSK 5MHz CH-Middle



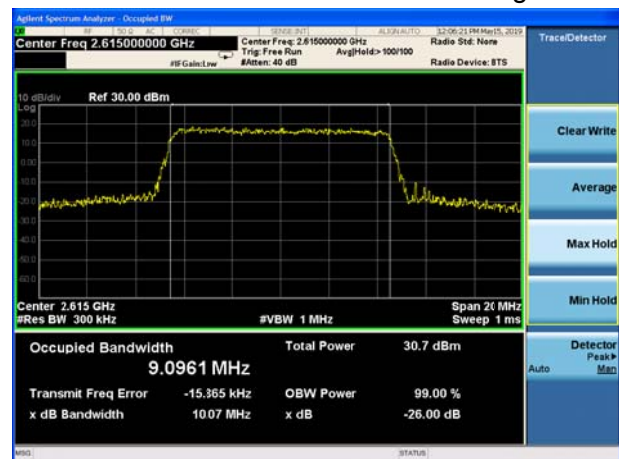
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LTE Band 38 QPSK 5MHz CH-High

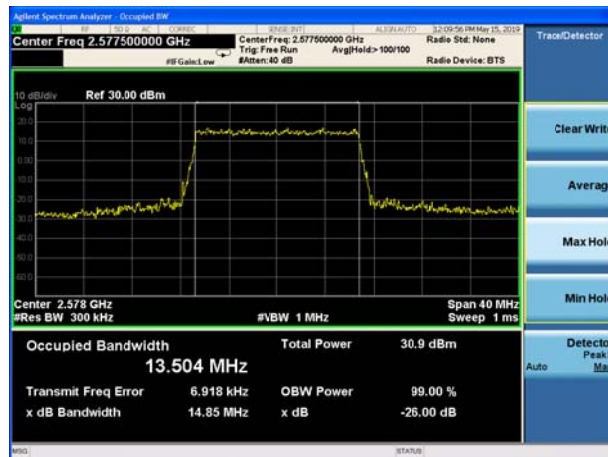


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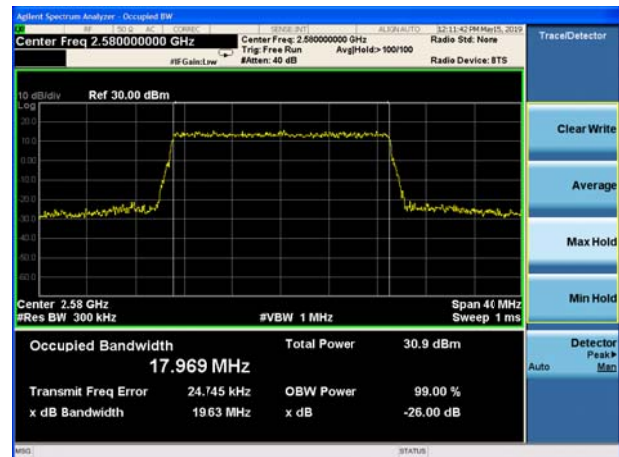




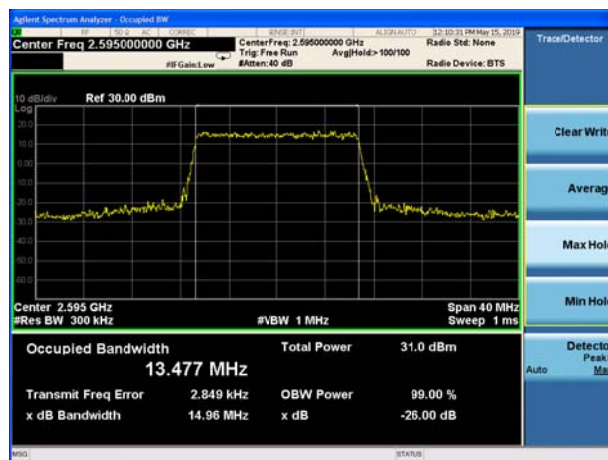
LTE Band 38 QPSK 15MHz CH-Low



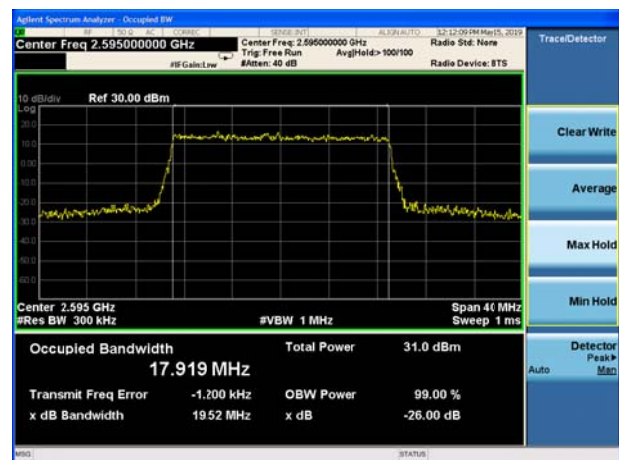
LTE Band 38 QPSK 20MHz CH-Low



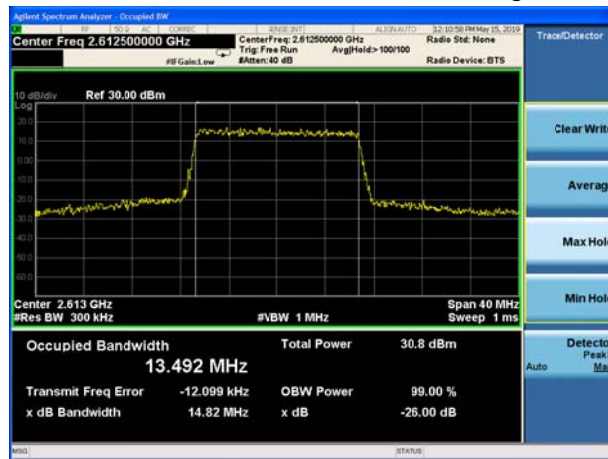
LTE Band 38 QPSK 15MHz CH-Middle



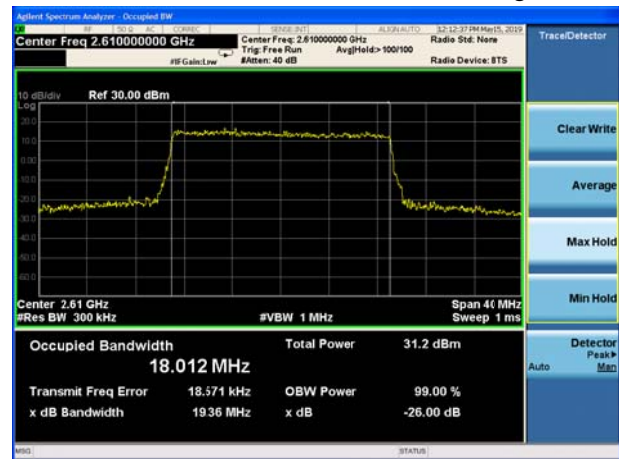
LTE Band 38 QPSK 20MHz CH-Middle



LTE Band 38 QPSK 15MHz CH-High

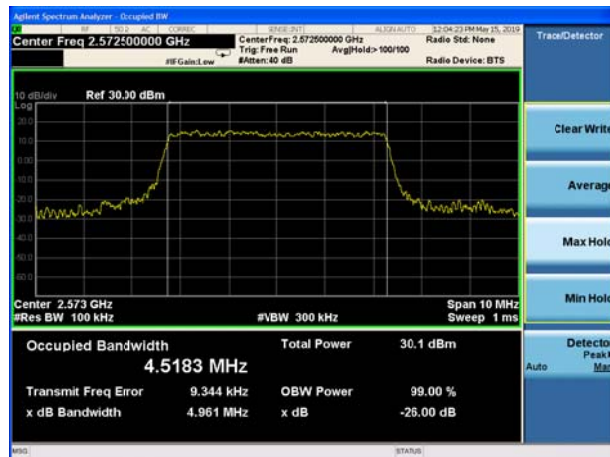


LTE Band 38 QPSK 20MHz CH-High

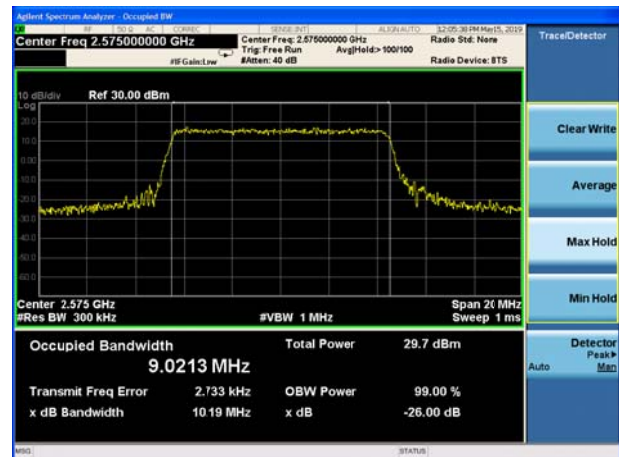




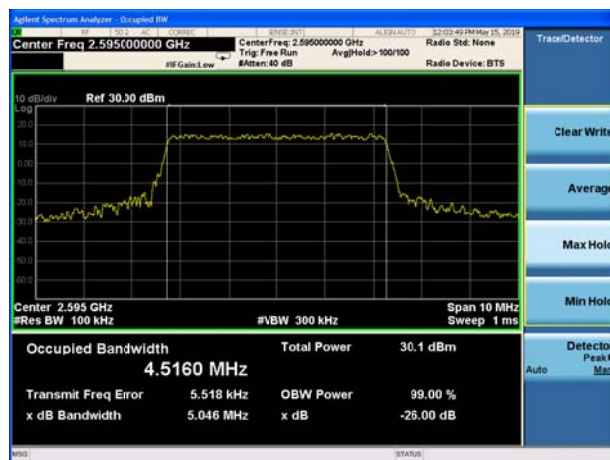
LTE Band 38 16QAM 5MHz CH-Low



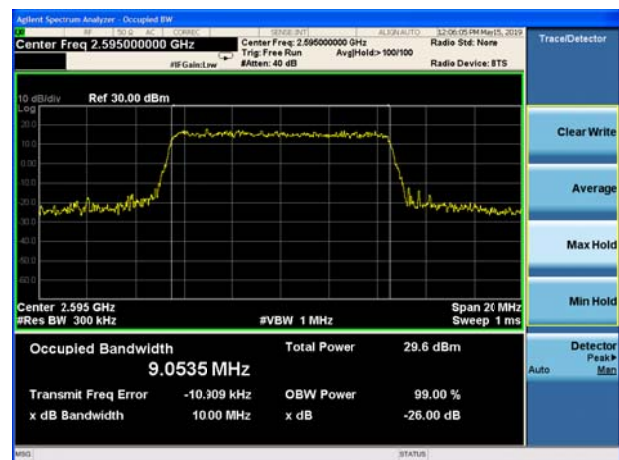
LTE Band 38 16QAM 10MHz CH-Low



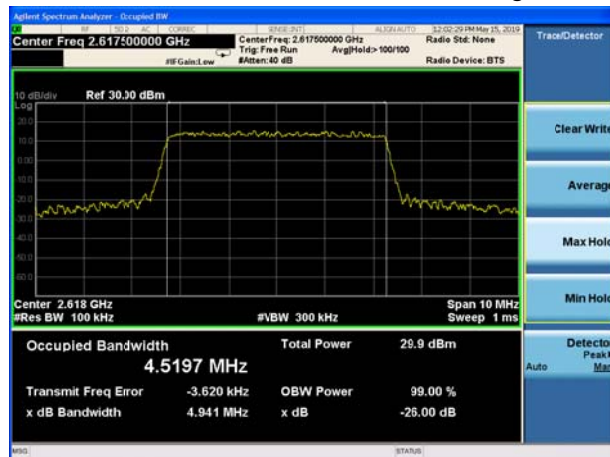
LTE Band 38 16QAM 5MHz CH-Middle



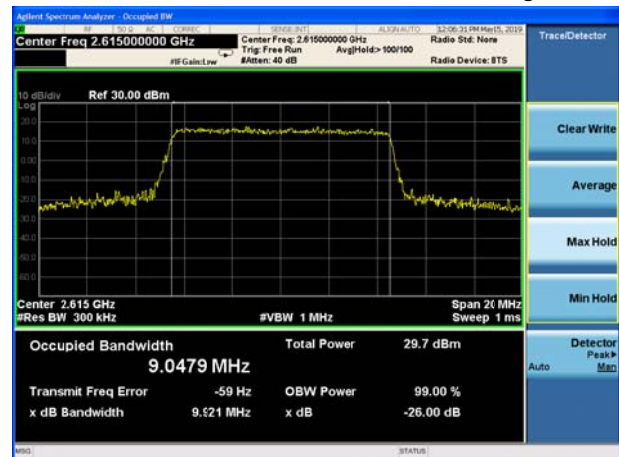
LTE Band 38 16QAM 10MHz CH-Middle



LTE Band 38 16QAM 5MHz CH-High

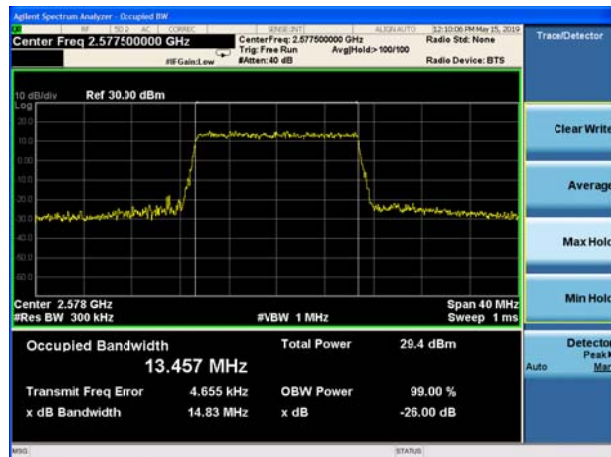


LTE Band 38 16QAM 10MHz CH-High

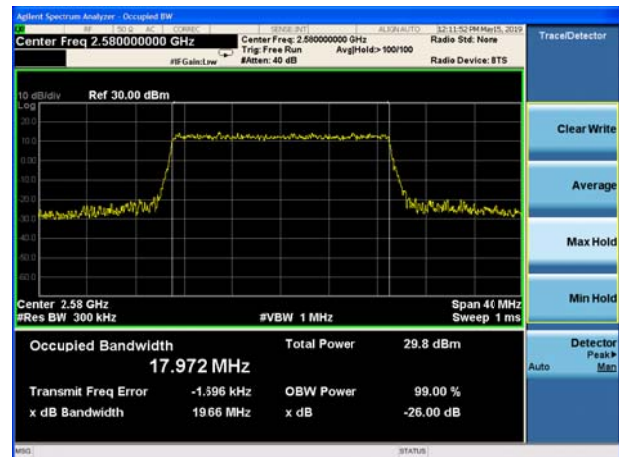




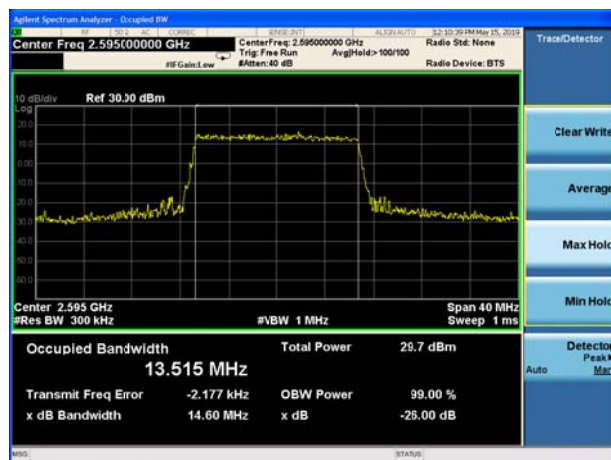
LTE Band 38 16QAM 15MHz CH-Low



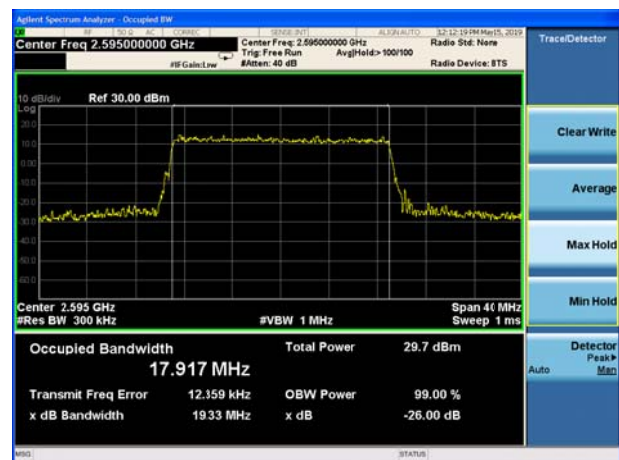
LTE Band 38 16QAM 20MHz CH-Low



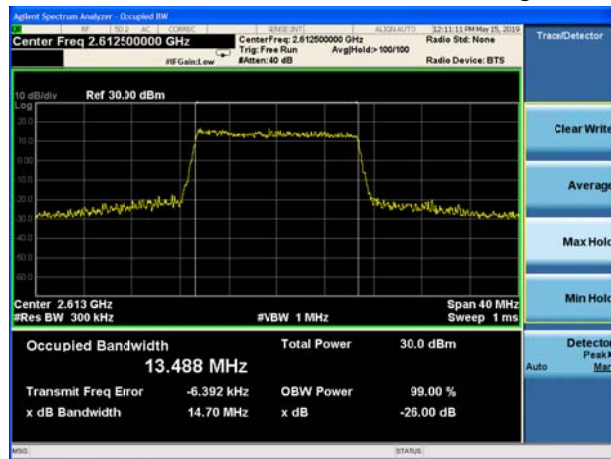
LTE Band 38 16QAM 15MHz CH-Middle



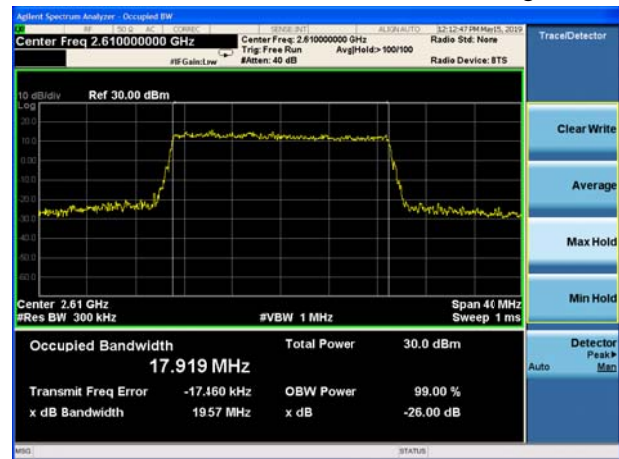
LTE Band 38 16QAM 20MHz CH-Middle



LTE Band 38 16QAM 15MHz CH-High

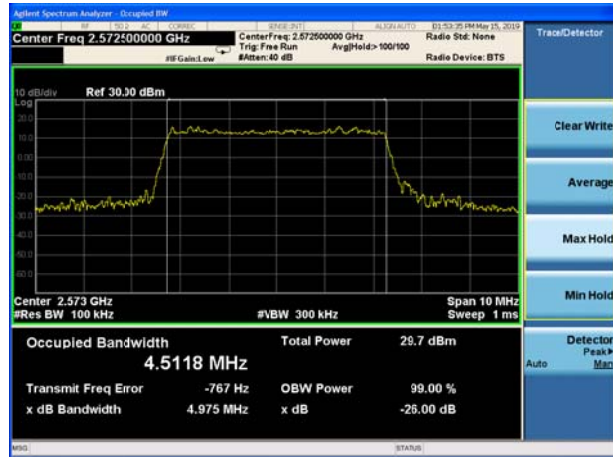


LTE Band 38 16QAM 20MHz CH-High

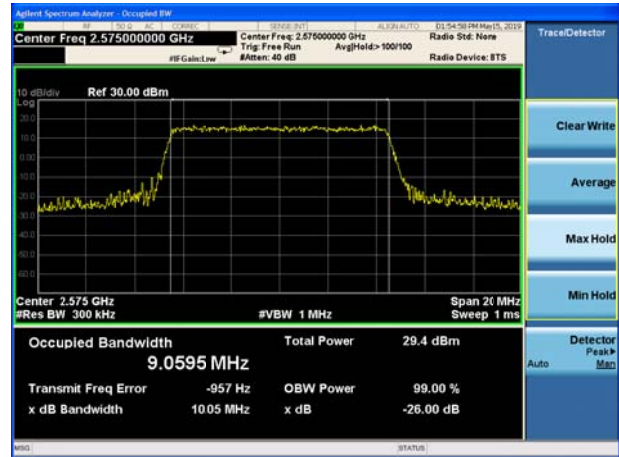




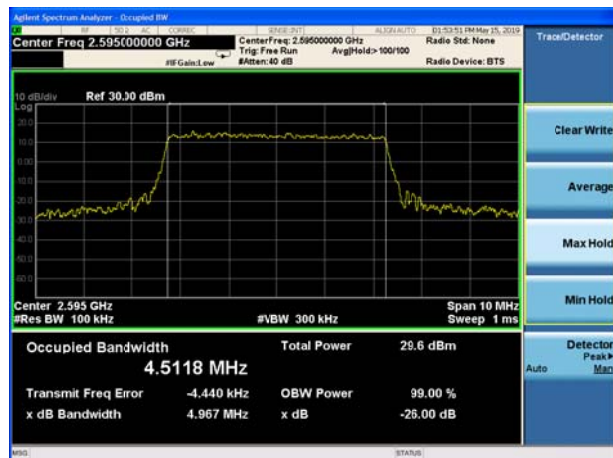
LTE Band 38 64QAM 5MHz CH-Low



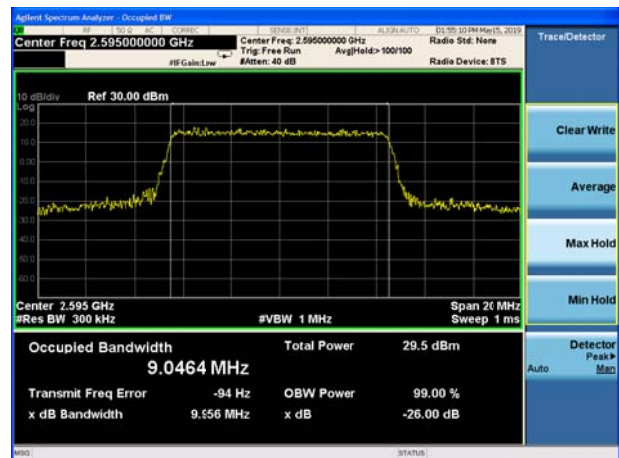
LTE Band 38 64QAM 10MHz CH-Low



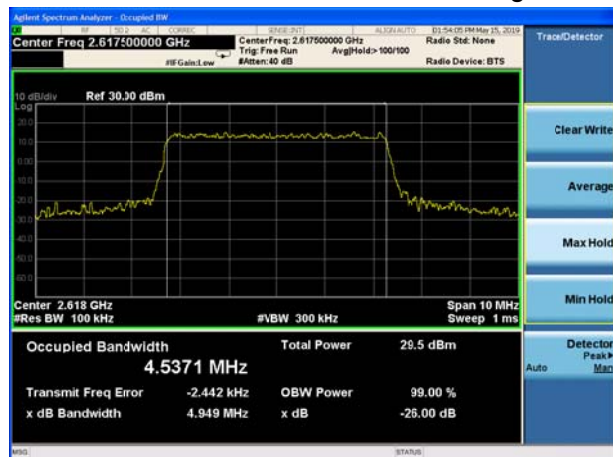
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LTE Band 38 64QAM 10MHz CH-Middle



LTE Band 38 64QAM 5MHz CH-High

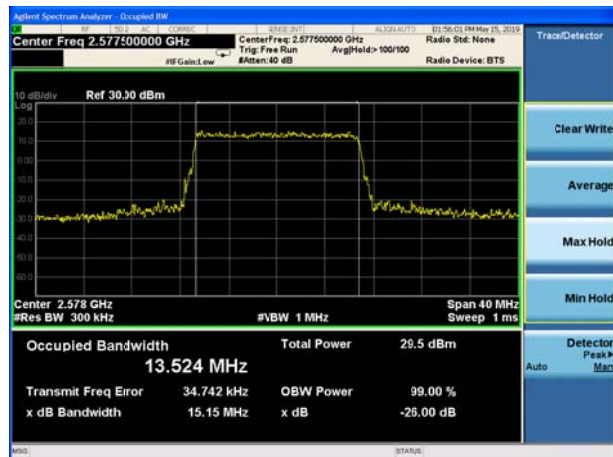


LTE Band 38 64QAM 10MHz CH-High

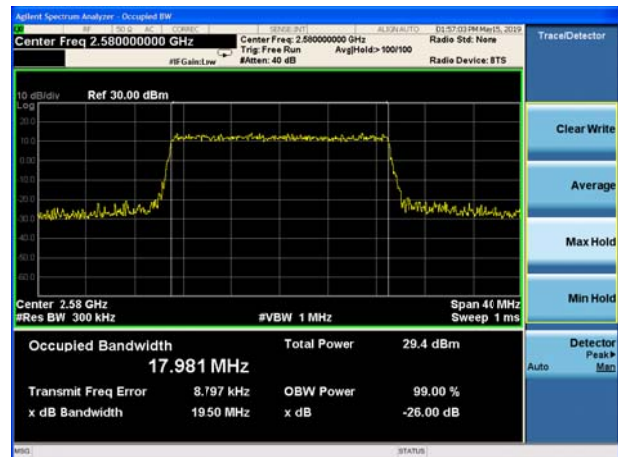




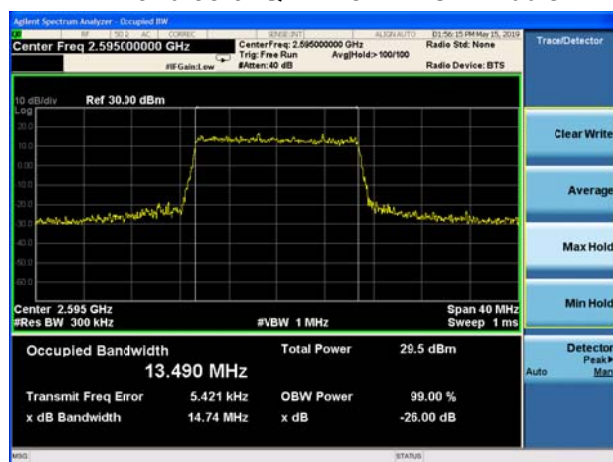
LTE Band 38 64QAM 15MHz CH-Low



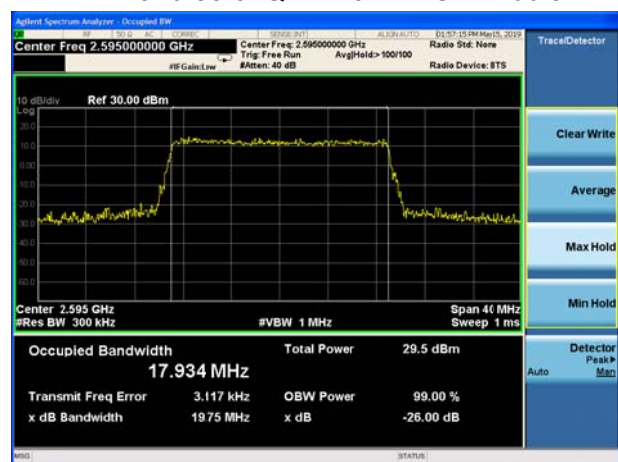
LTE Band 38 64QAM 20MHz CH-Low



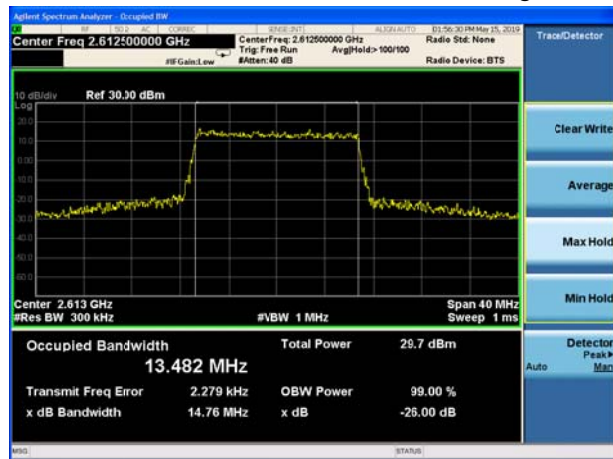
LTE Band 38 64QAM 15MHz CH-Middle



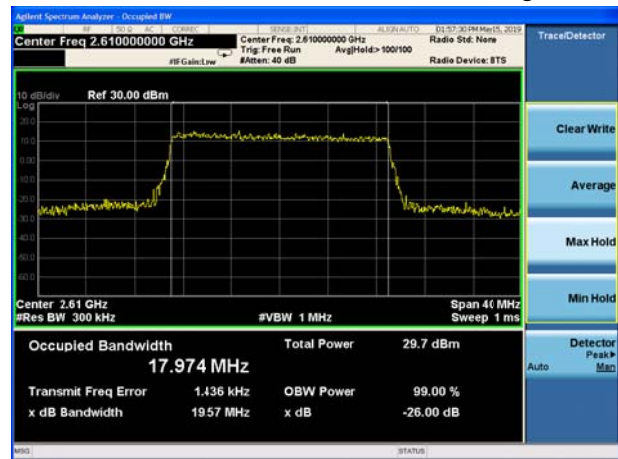
LTE Band 38 64QAM 20MHz CH-Middle



LTE Band 38 64QAM 15MHz CH-High



LTE Band 38 64QAM 20MHz CH-High



5.4 Band Edge Compliance

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 band edge of the lowest and highest channels were measured.

The testing follows KDB 971168 D01 v03r01 Section 6.0

The EUT was connected to spectrum analyzer and system simulator via a power divider.

The band edges of low and high channels for the highest RF powers were measured.

RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.

RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 4 (1.4MHz).

RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4 (3MHz).

RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4 (5MHz).

RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4 (10MHz).

RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4 (15MHz).

RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4 (20MHz)

RBW is set to 50 kHz, VBW is set to 200 kHz for LTE Band 7/38 (5MHz).

RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 7/38 (10MHz).

RBW is set to 200 kHz, VBW is set to 1MHz for LTE Band 7/38 (15MHz/20MHz).

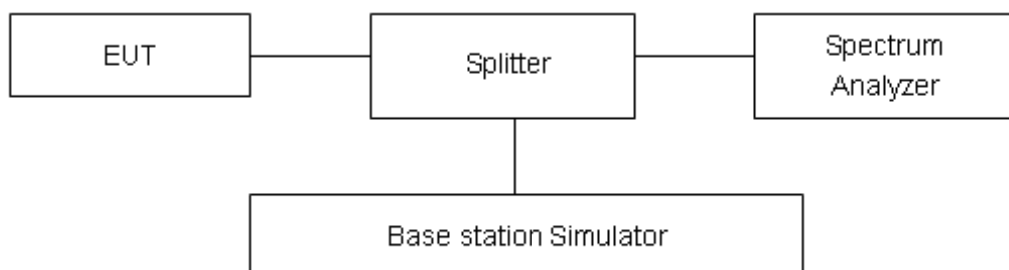
on spectrum analyzer.

Set spectrum analyzer with RMS detector.

The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Checked that all the results comply with the emission limit line.

Test Setup



Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB”

Rule Part 27.53(m) (4) specifies that “for BRS and EBS stations. For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Example:

The limit line is derived from $43 + 10 \log (P)$ dB below the transmitter power P(Watts)

= P(W)- $[43 + 10 \log (P)]$ (dB)

= $[30 + 10 \log (P)]$ (dBm) - $[43 + 10 \log (P)]$ (dB) = -13dBm.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684$ dB.



Test Result

All the test traces in the plots shows the test results clearly.

