



RF TEST REPORT

Applicant Xiaomi Communications Co., Ltd.
FCC ID 2AFZZ-RMSDG1
Product Mobile Phone
Brand MI
Model MDG1
Report No. RXA1710-0339RF08R1
Issue Date November 29, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2017)/ FCC CFR47 Part 27C (2017)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Jiang peng Lan

Performed by: Jiangpeng Lan

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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	2.1053 /27.53(h) /27.53(m)	PASS
Date of Testing: October 31, 2017~ November 13, 2017			
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.			

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. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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	Xiaomi Communications Co., Ltd.
Applicant address	The Rainbow City of China Resources,NO.68,Qinghe Middle Street,Haidian District,Beijing,China
Manufacturer	Xiaomi Communications Co., Ltd.
Manufacturer address	The Rainbow City of China Resources,NO.68,Qinghe Middle Street,Haidian District,Beijing,China

General information

EUT Description			
Model	MDG1		
IMEI	SIM 1:865498030064281 SIM 2:865498030064828		
Hardware Version	P2		
Software Version	MIUI 9		
Power Supply	Battery/AC adapter		
Antenna Type	Internal Antenna		
Test Mode(s)	LTE Band 4; LTE Band 7, LTE Band 38;		
Test Modulation	(LTE)QPSK 16QAM;		
HSDPA UE Category	24		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
LTE Category	4		
Maximum E.I.R.P	LTE Band 4:	20.06dBm	
	LTE Band 7:	22.73dBm	
	LTE Band 38:	23.25dBm	
Rated Power Supply Voltage:	3.85V		
Extreme Voltage	Minimum: 3.6V Maximum: 4.35V		
Extreme Temperature	Lowest: -10°C Highest: +55°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
	LTE Band 38	2570 ~ 2620	2570 ~ 2620
EUT Accessory			
Adapter-US	Manufacturer: Dongguan Aohai Power Technology Co., Ltd. Model: MDY-08-EZ		



Battery	Manufacturer: SCUD (Fujian) Electronics Co., LTD Model: BN35
USB Cable 1	Manufacturer: KeLi Model: KLC-2639, 82cm
USB Cable 2	Manufacturer: BROAD Model: 0US231XI0015, 82cm
Note: 1. The information of the EUT is declared by the manufacturer.	

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 (2017)

FCC CFR47 Part 27C (2017)

ANSI/TIA-603-D (2010)

KDB 971168 D01 Power Meas License Digital Systems v02r02

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 (Z 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 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 items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output	LTE 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LTE 7	-	-	0	0	0	0	0	0	0	0	0	0	0	0
	LTE 38	-	-	0	0	0	0	0	0	0	0	0	0	0	0
Effective Isotropic Radiated power	LTE 4	0	0	0	0	0	0	0	0	-	-	0	0	0	0
	LTE 7	-	-	0	0	0	0	0	0	-	-	0	0	0	0
	LTE 38	-	-	0	0	0	0	0	0	-	-	0	0	0	0
Occupied Bandwidth	LTE 4	0	0	0	0	0	0	0	0	-	-	0	0	0	0
	LTE 7	-	-	0	0	0	0	0	0	-	-	0	0	0	0
	LTE 38	-	-	0	0	0	0	0	0	-	-	0	0	0	0
Band Edge Compliance	LTE 4	0	0	0	0	0	0	0	0	0	-	0	0	-	0
	LTE 7	-	-	0	0	0	0	0	0	0	-	0	0	-	0
	LTE 38	-	-	0	0	0	0	0	0	0	-	0	0	-	0
Peak-to-Average Power Ratio	LTE 4	0	0	0	0	0	0	0	0	-	-	0	0	0	0
	LTE 7	-	-	0	0	0	0	0	0	-	-	0	0	0	0
	LTE 38	-	-	0	0	0	0	0	0	-	-	0	0	0	0
Frequency Stability	LTE 4	0	0	0	0	0	0	0	0	-	-	0	-	0	-
	LTE 7	-	-	0	0	0	0	0	0	-	-	0	-	0	-
	LTE 38	-	-	0	0	0	0	0	0	-	-	0	-	0	-
Spurious Emissions at Antenna Terminals	LTE 4	0	0	0	0	0	0	0	-	0	-	-	0	0	0
	LTE 7	-	-	0	0	0	0	0	-	0	-	-	0	0	0
	LTE 38	-	-	0	0	0	0	0	-	0	-	-	0	0	0
Radiates	LTE 4	0	0	0	0	0	0	0	-	0	-	-	0	0	0



Spurious Emission	LTE 7	-	-	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 38	-	-	O	O	O	O	O	-	O	-	-	O	O	O
Note	<p>1. The mark "O" means that this configuration is chosen for testing.</p> <p>2. The mark "-" means that this configuration is not testing.</p>														

5 Test Case Results

5.1 RF Power Output

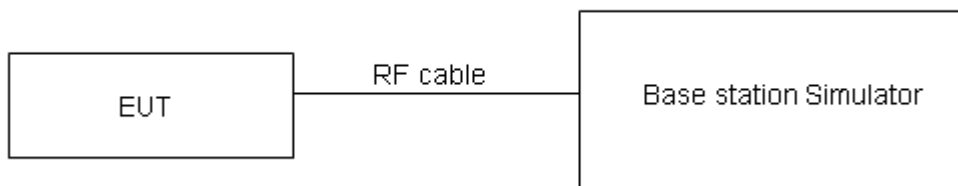
Ambient condition

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

LTE Band 4				AV 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	22.60	22.76	22.87
		1	2	22.78	22.68	22.81
		1	5	22.50	22.63	22.73
		3	0	22.53	22.47	22.71
		3	2	22.40	22.69	22.77
		3	3	22.55	22.49	22.65
		6	0	21.61	21.73	21.87
	16QAM	1	0	21.66	21.68	21.71
		1	2	21.59	21.64	21.74
		1	5	21.62	21.67	21.70
		3	0	21.40	21.64	21.74
		3	2	21.50	21.65	21.79
		3	3	21.60	21.43	21.61
		6	0	20.58	20.60	20.78
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	22.62	22.80	22.90
		1	7	22.81	22.73	22.85
		1	14	22.53	22.68	22.77
		8	0	21.63	21.59	21.84
		8	4	21.52	21.79	21.89
		8	7	21.65	21.60	21.75
		15	0	21.64	21.77	21.90
	16QAM	1	0	21.69	21.70	21.74
		1	7	21.62	21.69	21.78
		1	14	21.64	21.71	21.73
		8	0	20.51	20.77	20.86
		8	4	20.61	20.78	20.91
		8	7	20.70	20.55	20.74
		15	0	20.61	20.64	20.81
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.59	22.78	22.86
		1	13	22.79	22.69	22.82
		1	24	22.50	22.63	22.73
		12	0	21.60	21.54	21.80
		12	6	21.50	21.75	21.84
		12	13	21.63	21.58	21.71
		25	0	21.62	21.76	21.88



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
	16QAM	1	0	21.66	21.66	21.71
		1	13	21.59	21.67	21.75
		1	24	21.61	21.69	21.69
		12	0	20.49	20.73	20.83
		12	6	20.58	20.73	20.87
		12	13	20.67	20.50	20.70
		25	0	20.59	20.60	20.76
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
10MHz	QPSK	1	0	22.61	22.79	22.89
		1	25	22.82	22.74	22.86
		1	49	22.52	22.67	22.76
		25	0	21.63	21.59	21.84
		25	13	21.53	21.80	21.88
		25	25	21.65	21.62	21.76
		50	0	21.70	21.78	21.92
	16QAM	1	0	21.68	21.69	21.73
		1	25	21.62	21.71	21.78
		1	49	21.64	21.71	21.72
		25	0	20.52	20.78	20.87
		25	13	20.60	20.77	20.90
		25	25	20.70	20.55	20.74
		50	0	20.62	20.65	20.80
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
15MHz	QPSK	1	0	22.60	22.75	22.87
		1	38	22.80	22.73	22.83
		1	74	22.49	22.62	22.72
		36	0	21.61	21.55	21.81
		36	18	21.50	21.75	21.84
		36	39	21.62	21.59	21.72
		75	0	21.68	21.74	21.87
	16QAM	1	0	21.63	21.67	21.71
		1	38	21.60	21.68	21.76
		1	74	21.61	21.67	21.69
		36	0	20.49	20.76	20.84
		36	18	20.57	20.72	20.86
		36	39	20.68	20.51	20.71
		75	0	20.59	20.60	20.76
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	22.57	22.71	22.84
		1	50	22.79	22.69	22.81



		1	99	22.47	22.61	22.69
		50	0	21.58	21.50	21.77
		50	25	21.48	21.71	21.81
		50	50	21.59	21.54	21.68
		100	0	21.65	21.69	21.83
	16QAM	1	0	21.61	21.63	21.66
		1	50	21.56	21.66	21.72
		1	99	21.59	21.64	21.67
		50	0	20.46	20.72	20.81
		50	25	20.54	20.70	20.83
		50	50	20.65	20.46	20.67
		100	0	20.57	20.56	20.73

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	22.39	22.64	22.42
		1	13	22.55	22.70	22.52
		1	24	22.42	22.51	22.43
		12	0	21.41	21.50	21.34
		12	6	21.42	21.41	21.41
		12	13	21.38	21.38	21.38
		25	0	21.23	21.56	21.37
	16QAM	1	0	21.30	21.47	21.35
		1	13	21.41	21.24	21.46
		1	24	21.29	21.32	21.31
		12	0	20.24	20.42	20.25
		12	6	20.34	20.49	20.40
		12	13	20.31	20.26	20.35
		25	0	20.22	20.43	20.24
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	22.41	22.65	22.45
		1	25	22.58	22.75	22.56
		1	49	22.44	22.55	22.46
		25	0	21.44	21.55	21.38
		25	13	21.45	21.46	21.45
		25	25	21.40	21.42	21.43
		50	0	21.31	21.58	21.41
	16QAM	1	0	21.32	21.50	21.37
		1	25	21.44	21.28	21.49
		1	49	21.32	21.34	21.34



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				20825/2507.5	21100/2535	21375/2562.5	
		25	0	20.27	20.47	20.29	
		25	13	20.36	20.53	20.43	
		25	25	20.34	20.31	20.39	
		50	0	20.25	20.48	20.28	
15MHz	QPSK	1	0	22.40	22.61	22.43	
		1	38	22.56	22.74	22.53	
1		74	22.41	22.50	22.42		
36		0	21.42	21.51	21.35		
36		18	21.42	21.41	21.41		
36		39	21.37	21.39	21.39		
75		0	21.29	21.54	21.36		
15MHz	16QAM	1	0	21.27	21.48	21.35	
		1	38	21.42	21.25	21.47	
		1	74	21.29	21.30	21.31	
		36	0	20.24	20.45	20.26	
		36	18	20.33	20.48	20.39	
		36	39	20.32	20.27	20.36	
		75	0	20.22	20.43	20.24	
20MHz		Channel/Frequency (MHz)					
		20850/2510	21100/2535	21350/2560			
20MHz	QPSK	1	0	22.37	22.57	22.40	
		1	50	22.55	22.70	22.51	
		1	99	22.39	22.49	22.39	
		50	0	21.39	21.56	21.31	
		50	25	21.40	21.37	21.38	
		50	50	21.34	21.34	21.35	
		100	0	21.26	21.49	21.32	
	20MHz	16QAM	1	0	21.25	21.44	21.30
			1	50	21.38	21.23	21.43
			1	99	21.27	21.27	21.29
			50	0	20.21	20.41	20.23
			50	25	20.30	20.46	20.36
			50	50	20.29	20.22	20.32
			100	0	20.20	20.39	20.21

LTE Band 38				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37775/2572.5	38000/2595	38225/2617.5
5MHz	QPSK	1	0	22.48	22.49	22.34
		1	13	22.55	22.47	22.50
		1	24	22.42	22.52	22.47
		12	0	21.58	21.52	21.49
		12	6	21.59	21.75	21.82
		12	13	21.59	21.66	21.58
		25	0	21.48	21.70	21.52
	16QAM	1	0	21.15	21.26	21.00
		1	13	21.38	21.10	20.97
		1	24	21.32	20.81	21.22
		12	0	20.41	20.49	21.48
		12	6	20.58	20.50	20.54
		12	13	20.55	20.50	20.47
		25	0	20.54	20.43	20.55
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37800/2575	38000/2595	38200/2615
10MHz	QPSK	1	0	22.50	22.50	22.37
		1	25	22.58	22.52	22.54
		1	49	22.44	22.56	22.50
		25	0	21.61	21.57	21.53
		25	13	21.62	21.80	21.86
		25	25	21.61	21.70	21.63
		50	0	21.56	21.72	21.56
	16QAM	1	0	21.17	21.29	21.02
		1	25	21.41	21.14	21.00
		1	49	21.35	20.83	21.25
		25	0	20.44	20.54	20.52
		25	13	20.60	20.54	20.57
		25	25	20.58	20.55	20.51
		50	0	20.57	20.48	20.59
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37825/2577.5	38000/2595	38175/2612.5
15MHz	QPSK	1	0	22.49	22.46	22.35
		1	38	22.56	22.51	22.51
		1	74	22.41	22.51	22.46
		36	0	21.59	21.53	21.50



		36	18	21.59	21.75	21.82
		36	39	21.58	21.67	21.59
		75	0	21.54	21.68	21.51
	16QAM	1	0	21.12	21.27	21.00
		1	38	21.39	21.11	20.98
		1	74	21.32	20.79	21.22
		36	0	20.41	20.52	20.49
		36	18	20.57	20.49	20.53
		36	39	20.56	20.51	20.48
		75	0	20.54	20.43	20.55
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				37850/2580	38000/2595	38150/2610
20MHz	QPSK	1	0	22.46	22.42	22.32
		1	50	22.55	22.47	22.49
		1	99	22.39	22.50	22.43
		50	0	21.56	21.48	21.46
		50	25	21.57	21.71	21.79
		50	50	21.55	21.62	21.55
		100	0	21.51	21.63	21.47
	16QAM	1	0	21.10	21.23	20.95
		1	50	21.35	21.09	20.94
		1	99	21.30	20.76	21.20
		50	0	20.38	20.48	20.46
		50	25	20.54	20.47	20.50
		50	50	20.53	20.46	20.44
		100	0	20.52	20.39	20.52

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 v02r02 Section 5.8 and ANSI/TIA-603-D-2010.

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.

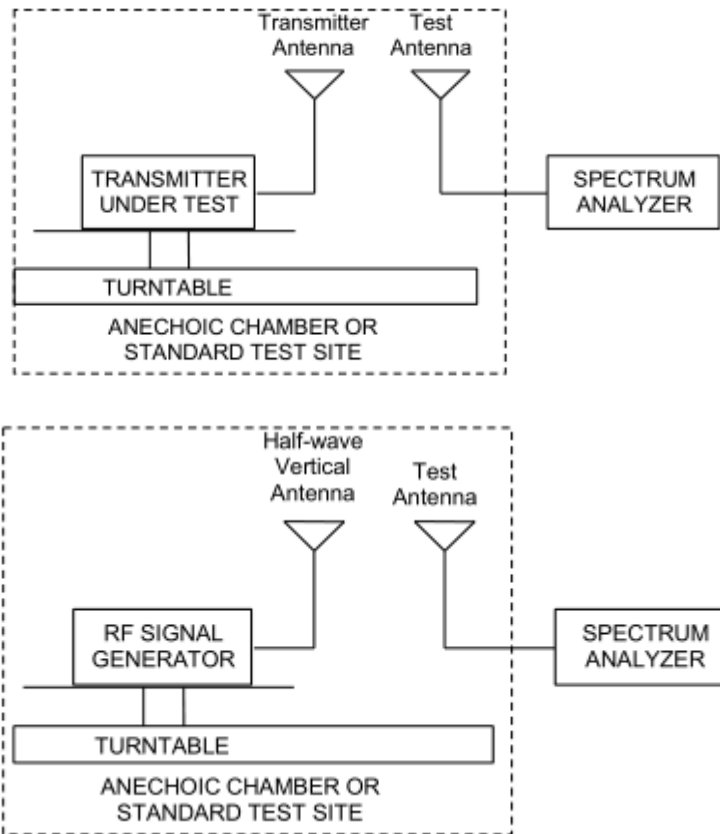
g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:

$$ERP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBd)}$$

where: dBd refers to gain relative to an ideal dipole.

$$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$$

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 (EIRP)	$\leq 1 \text{ W}$ (30 dBm)
Part 27.50(h)(2) Limit (EIRP)	$\leq 2 \text{ W}$ (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.

LTE Band 4								
Bandwidth	Channel	Frequency (MHz)	Polarization	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.7	Horizontal	-36.72	-54.30	1.44	19.02	Pass
	Mid	1732.5	Horizontal	-37.16	-54.32	1.57	18.72	Pass
	High	1754.3	Horizontal	-36.99	-54.10	1.72	18.83	Pass
3 MHz (QPSK)	Low	1711.5	Horizontal	-36.96	-54.33	1.44	18.82	Pass
	Mid	1732.5	Horizontal	-37.50	-54.32	1.57	18.38	Pass
	High	1753.5	Horizontal	-37.22	-54.11	1.72	18.60	Pass
5 MHz (QPSK)	Low	1712.5	Horizontal	-36.01	-54.34	1.44	19.77	Pass
	Mid	1732.5	Horizontal	-36.36	-54.32	1.57	19.52	Pass
	High	1752.5	Horizontal	-35.92	-54.13	1.72	19.93	Pass
10 MHz (QPSK)	Low	1715	Horizontal	-35.82	-54.33	1.44	19.95	Pass
	Mid	1732.5	Horizontal	-36.32	-54.32	1.57	19.57	Pass
	High	1750	Horizontal	-35.77	-54.12	1.66	20.01	Pass
15 MHz (QPSK)	Low	1717.5	Horizontal	-36.16	-54.35	1.49	19.67	Pass
	Mid	1732.5	Horizontal	-36.40	-54.32	1.57	19.49	Pass
	High	1747.5	Horizontal	-36.04	-54.17	1.66	19.79	Pass
20 MHz (QPSK)	Low	1720	Horizontal	-35.79	-54.37	1.49	20.06	Pass
	Mid	1732.5	Horizontal	-36.43	-54.32	1.57	19.45	Pass
	High	1745	Horizontal	-36.43	-54.23	1.63	19.43	Pass
1.4 MHz (16QAM)	Low	1710.7	Horizontal	-36.91	-54.35	1.44	18.88	Pass
	Mid	1732.5	Horizontal	-37.47	-54.41	1.57	18.51	Pass
	High	1754.3	Horizontal	-37.72	-54.52	1.72	18.52	Pass
3 MHz (16QAM)	Low	1711.5	Horizontal	-37.29	-54.35	1.44	18.50	Pass
	Mid	1732.5	Horizontal	-37.83	-54.41	1.57	18.15	Pass
	High	1753.5	Horizontal	-37.75	-54.48	1.72	18.45	Pass
5 MHz (16QAM)	Low	1712.5	Horizontal	-36.37	-54.38	1.44	19.45	Pass
	Mid	1732.5	Horizontal	-36.77	-54.41	1.57	19.21	Pass
	High	1752.5	Horizontal	-36.58	-54.47	1.72	19.61	Pass
10 MHz (16QAM)	Low	1715	Horizontal	-36.16	-54.32	1.44	19.60	Pass
	Mid	1732.5	Horizontal	-36.73	-54.41	1.57	19.25	Pass
	High	1750	Horizontal	-36.43	-54.52	1.66	19.75	Pass
15 MHz (16QAM)	Low	1717.5	Horizontal	-36.53	-54.39	1.49	19.35	Pass
	Mid	1732.5	Horizontal	-36.83	-54.41	1.57	19.15	Pass
	High	1747.5	Horizontal	-36.72	-54.51	1.66	19.45	Pass
20 MHz (16QAM)	Low	1720	Horizontal	-36.18	-54.44	1.49	19.75	Pass
	Mid	1732.5	Horizontal	-36.87	-54.41	1.57	19.11	Pass
	High	1745	Horizontal	-37.12	-54.59	1.63	19.10	Pass

LTE Band 7								
Band width	Channel	Frequency (MHz)	Polarization	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Conclusion
5 MHz (QPSK)	Low	2502.5	Horizontal	-39.29	-59.31	1.81	21.83	Pass
	Mid	2535	Horizontal	-39.23	-59.11	1.81	21.69	Pass
	High	2567.5	Horizontal	-38.69	-59.59	1.83	22.73	Pass
10 MHz (QPSK)	Low	2505	Horizontal	-38.99	-59.33	1.82	22.16	Pass
	Mid	2535	Horizontal	-39.01	-59.11	1.81	21.91	Pass
	High	2565	Horizontal	-38.88	-59.59	1.81	22.52	Pass
15 MHz (QPSK)	Low	2507.5	Horizontal	-38.97	-59.29	1.80	22.12	Pass
	Mid	2535	Horizontal	-39.83	-59.72	1.81	21.70	Pass
	High	2562.5	Horizontal	-38.68	-59.46	1.82	22.60	Pass
20 MHz (QPSK)	Low	2510	Horizontal	-38.90	-59.09	1.77	21.96	Pass
	Mid	2535	Horizontal	-39.52	-59.72	1.81	22.01	Pass
	High	2560	Horizontal	-38.85	-59.52	1.82	22.49	Pass
5 MHz (16QAM)	Low	2502.5	Horizontal	-39.90	-59.64	1.81	21.55	Pass
	Mid	2535	Horizontal	-40.28	-59.72	1.81	21.25	Pass
	High	2567.5	Horizontal	-39.02	-59.59	1.83	22.40	Pass
10 MHz (16QAM)	Low	2505	Horizontal	-39.32	-59.33	1.82	21.83	Pass
	Mid	2535	Horizontal	-39.32	-59.11	1.81	21.60	Pass
	High	2565	Horizontal	-39.25	-59.59	1.81	22.15	Pass
15 MHz (16QAM)	Low	2507.5	Horizontal	-39.24	-59.29	1.80	21.85	Pass
	Mid	2535	Horizontal	-40.20	-59.72	1.81	21.33	Pass
	High	2562.5	Horizontal	-39.02	-59.46	1.82	22.26	Pass
20 MHz (16QAM)	Low	2510	Horizontal	-39.22	-59.09	1.77	21.64	Pass
	Mid	2535	Horizontal	-39.78	-59.72	1.81	21.75	Pass
	High	2560	Horizontal	-39.23	-59.52	1.82	22.11	Pass

LTE Band 38								
Band width	Channel	Frequency (MHz)	Polarization	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Conclusion
5 MHz (QPSK)	Low	2572.5	Horizontal	-40.82	-58.66	2.14	19.98	Pass
	Mid	2595	Horizontal	-41.26	-58.46	2.13	19.33	Pass
	High	2617.5	Horizontal	-41.56	-58.94	2.09	19.47	Pass
10 MHz (QPSK)	Low	2575	Horizontal	-42.53	-58.96	2.14	18.57	Pass
	Mid	2595	Horizontal	-43.20	-59.07	2.13	18.00	Pass
	High	2615	Horizontal	-42.62	-58.94	2.10	18.42	Pass
15 MHz (QPSK)	Low	2577.5	Horizontal	-38.26	-59.06	2.14	22.94	Pass
	Mid	2595	Horizontal	-38.58	-59.07	2.13	22.62	Pass
	High	2612.5	Horizontal	-39.02	-59.43	2.10	22.50	Pass
20 MHz (QPSK)	Low	2580	Horizontal	-37.33	-58.44	2.14	23.25	Pass
	Mid	2595	Horizontal	-38.61	-59.07	2.13	22.59	Pass
	High	2610	Horizontal	-38.42	-58.87	2.11	22.55	Pass
5 MHz (16QAM)	Low	2572.5	Horizontal	-41.47	-58.99	2.14	19.66	Pass
	Mid	2595	Horizontal	-42.19	-59.07	2.13	19.01	Pass
	High	2617.5	Horizontal	-42.33	-59.33	2.12	19.11	Pass
10 MHz (16QAM)	Low	2575	Horizontal	-42.86	-58.96	2.14	18.24	Pass
	Mid	2595	Horizontal	-43.54	-59.07	2.13	17.66	Pass
	High	2615	Horizontal	-43.38	-59.37	2.12	18.10	Pass
15 MHz (16QAM)	Low	2577.5	Horizontal	-38.08	-58.64	2.04	22.60	Pass
	Mid	2595	Horizontal	-38.85	-59.07	2.03	22.25	Pass
	High	2612.5	Horizontal	-38.64	-58.81	2.02	22.18	Pass
20 MHz (16QAM)	Low	2580	Horizontal	-37.46	-58.44	2.04	23.02	Pass
	Mid	2595	Horizontal	-38.85	-59.07	2.03	22.25	Pass
	High	2610	Horizontal	-38.57	-58.87	2.02	22.31	Pass

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 LTE Band 4 (1.4MHz).

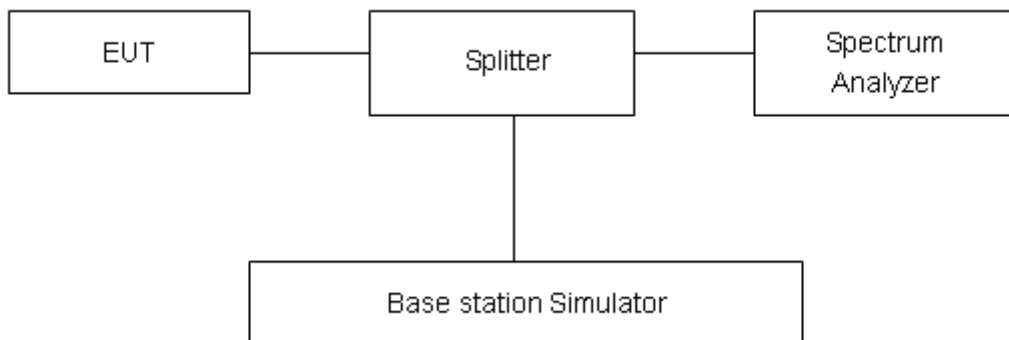
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4 (3MHz).

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/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

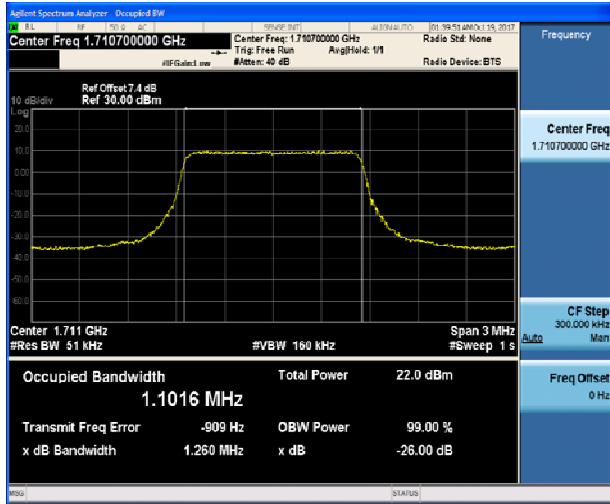
LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1016	1.260
			20175	1732.5	1.1025	1.266
			20393	1754.3	1.1026	1.276
		3	19965	1711.5	2.7161	2.959
			20175	1732.5	2.7160	2.969
			20385	1753.5	2.7170	2.960
		5	19975	1712.5	4.4761	4.784
			20175	1732.5	4.4815	4.812
			20375	1752.5	4.4807	4.787
		10	20000	1715	9.0008	9.704
			20175	1732.5	8.9924	9.074
			20350	1750	9.0042	9.708
		15	20025	1717.5	13.4110	14.220
			20175	1732.5	13.3810	14.210
			20325	1747.5	13.4300	14.240
		20	20050	1720	17.8350	18.720
			20175	1732.5	17.7900	18.700
			20300	1745	17.8470	18.720
	16QAM	1.4	19957	1710.7	1.1009	1.275
			20175	1732.5	1.1024	1.267
			20393	1754.3	1.1019	1.266
		3	19965	1711.5	2.7187	2.961
			20175	1732.5	2.7168	2.960
			20385	1753.5	2.7194	2.961
		5	19975	1712.5	4.4786	4.796
			20175	1732.5	4.4786	4.781
			20375	1752.5	4.4832	4.811
		10	20000	1715	8.9965	9.693
			20175	1732.5	8.9922	9.697
			20350	1750	9.0030	9.704
15		20025	1717.5	13.4020	14.210	
		20175	1732.5	13.3830	14.200	
		20325	1747.5	13.4150	14.230	
20		20050	1720	17.8380	18.720	
		20175	1732.5	17.7950	18.710	
		20300	1745	17.8490	18.730	

LTE Band 7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	20775	2502.5	4.4781	4.808
			21100	2535	4.4747	4.813
			21425	2567.5	4.4734	4.810
		10	20800	2505	9.0030	9.703
			21100	2535	9.0063	9.694
			21400	2565	8.9932	9.702
		15	20825	2507.5	13.4280	14.230
			21100	2535	13.4250	14.230
			21375	2562.5	13.0399	14.230
		20	20850	2510	17.8320	18.720
			21100	2535	17.8620	18.740
			21350	2560	17.8060	18.730
	16QAM	5	20775	2502.5	4.4801	4.788
			21100	2535	4.4792	4.800
			21425	2567.5	4.4741	4.817
		10	20800	2505	8.9990	9.694
			21100	2535	9.0027	9.702
			21400	2565	8.9873	9.692
		15	20825	2507.5	13.4200	14.230
			21100	2535	13.4200	14.230
			21375	2562.5	13.3810	14.200
		20	20850	2510	17.8410	18.730
			21100	2535	17.8650	18.750
			21350	2560	17.8000	18.730

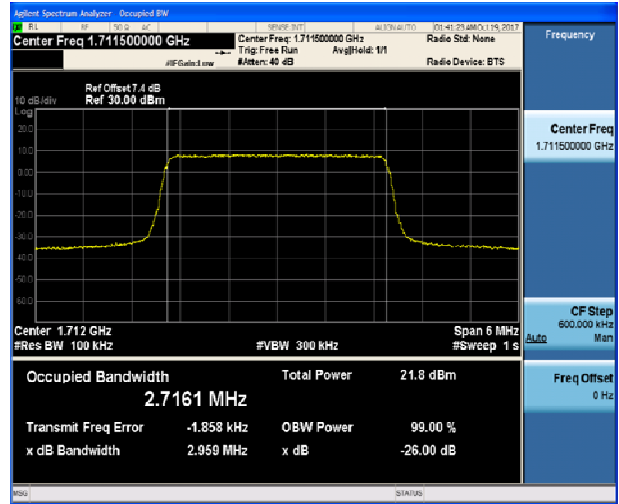
LTE Band 38						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	37775	2572.5	4.5015	4.819
			38000	2595	4.4946	4.795
			38225	2617.5	4.4956	4.789
		10	37800	2575	9.0364	9.726
			38000	2595	9.0257	9.716
			38200	2615	9.0291	9.731
		15	37825	2577.5	13.4300	14.220
			38000	2595	13.4410	14.280
			38175	2612.5	13.4440	14.310
		20	37850	2580	17.8610	18.780
			38000	2595	17.8640	18.760
			38150	2610	17.8610	18.760
	16QAM	5	37775	2572.5	4.4886	4.834
			38000	2595	4.4850	4.840
			38225	2617.5	4.4885	4.840
		10	37800	2575	9.0122	9.701
			38000	2595	9.0266	9.741
			38200	2615	9.0136	9.703
		15	37825	2577.5	13.4420	14.250
			38000	2595	13.4360	14.280
			38175	2612.5	13.4400	14.280
		20	37850	2580	17.8580	18.730
			38000	2595	17.8470	18.710
			38150	2610	17.8630	18.750



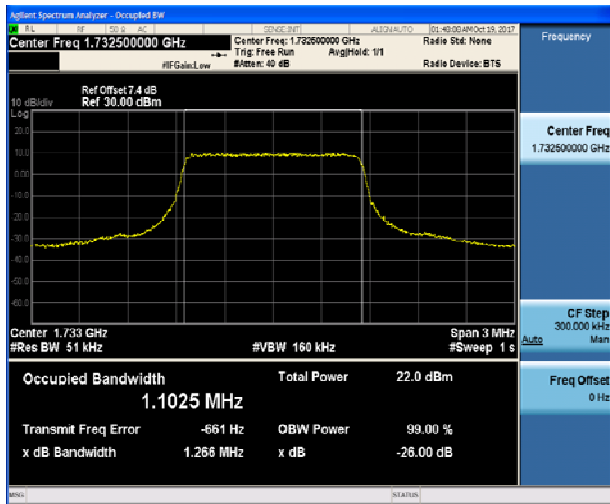
LTE Band 4 QPSK 1.4MHz CH-Low



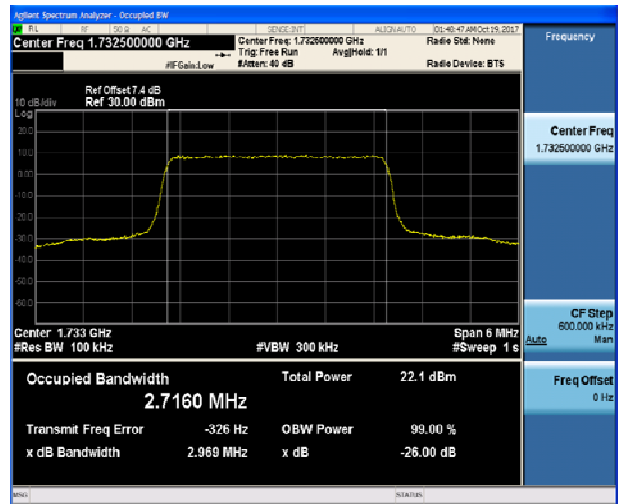
LTE Band 4 QPSK 3MHz CH-Low



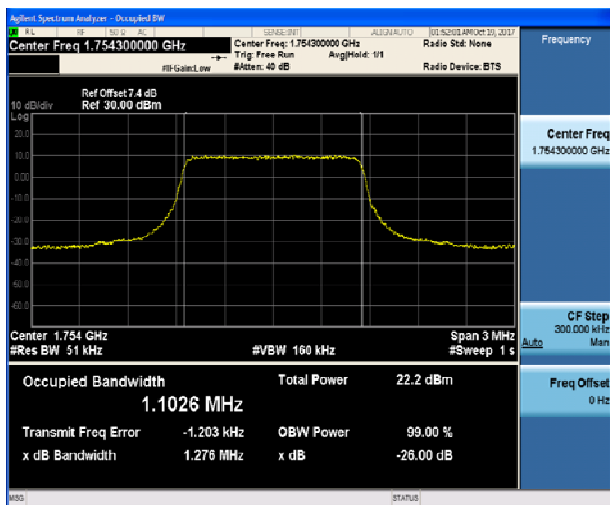
LTE Band 4 QPSK 1.4MHz CH-Middle



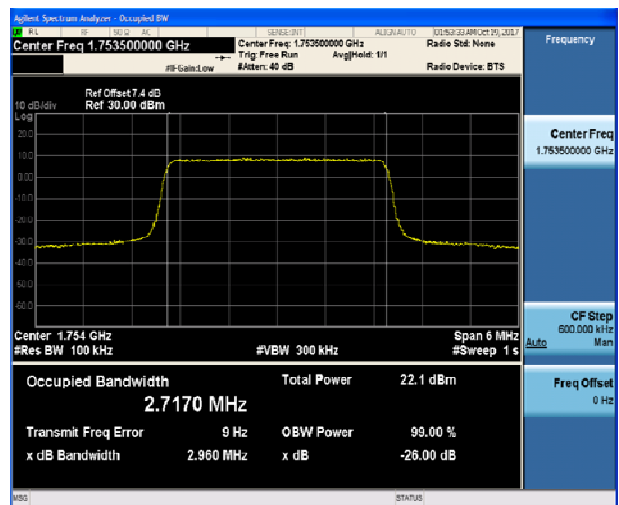
LTE Band 4 QPSK 3MHz CH-Middle



LTE Band 4 QPSK 1.4MHz CH-High

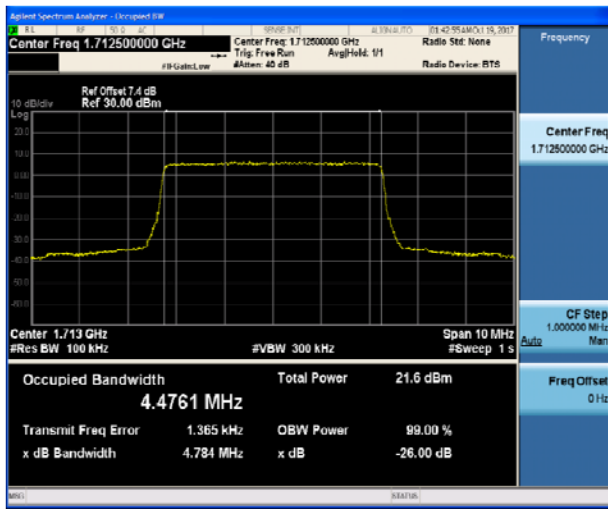


LTE Band 4 QPSK 3MHz CH-High

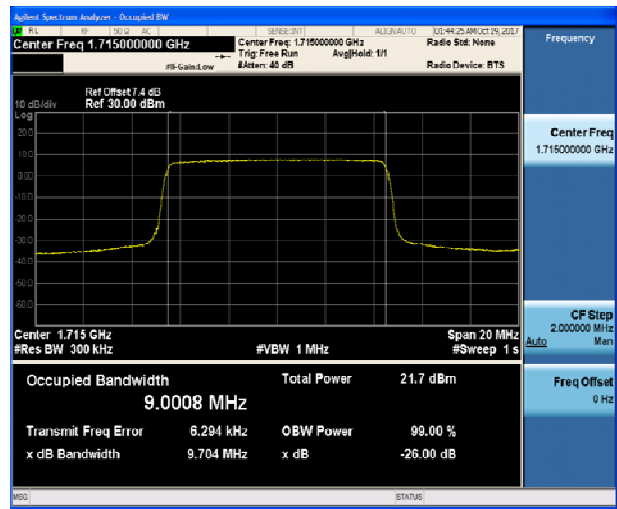




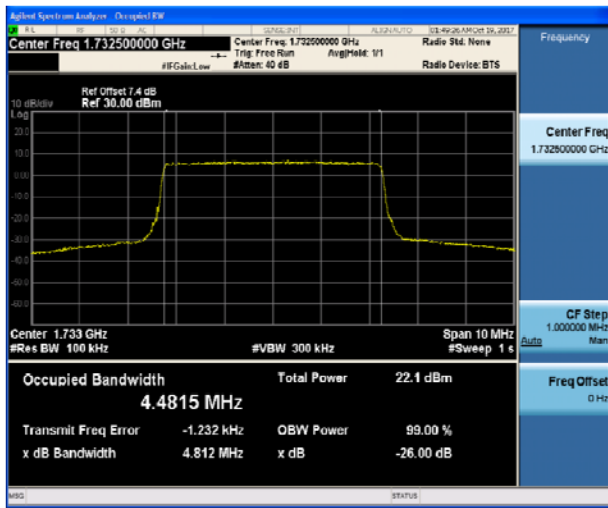
LTE Band 4 QPSK 5MHz CH-Low



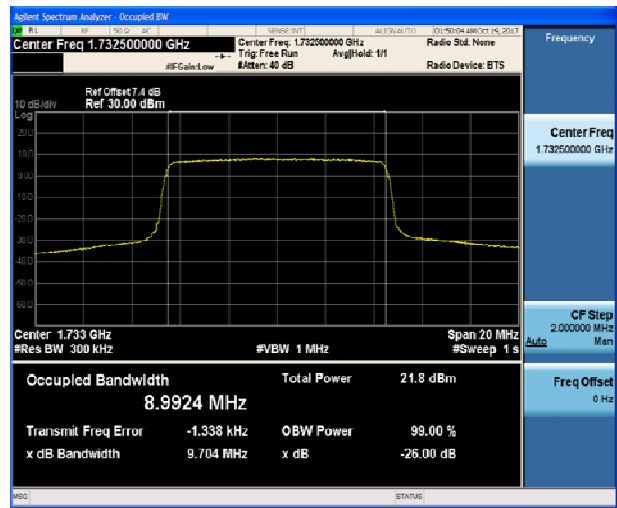
LTE Band 4 QPSK 10MHz CH-Low



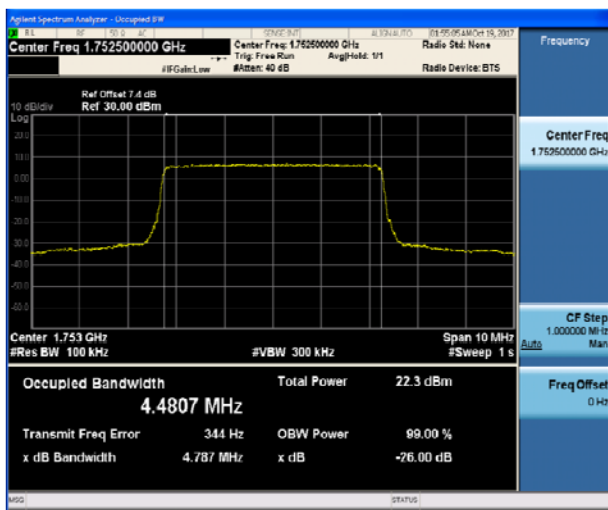
LTE Band 4 QPSK 5MHz CH-Middle



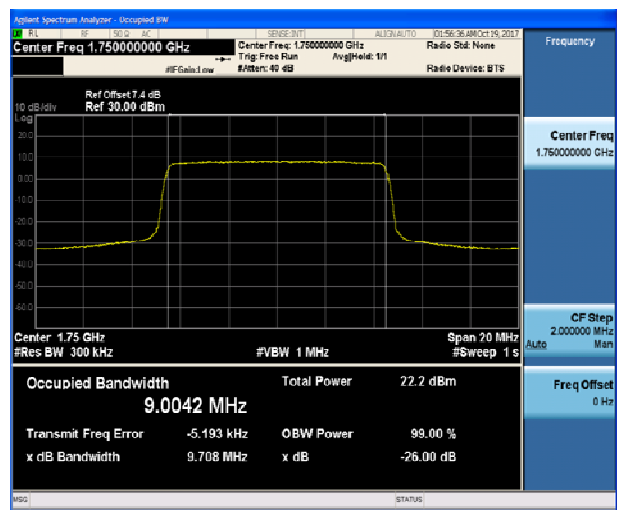
LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 QPSK 5MHz CH-High

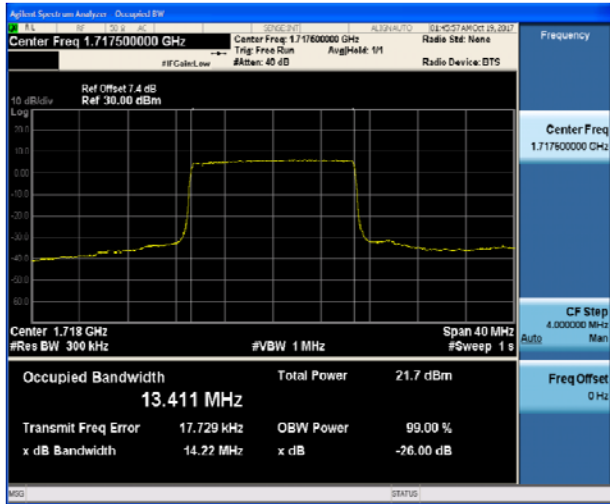


LTE Band 4 QPSK 10MHz CH-High

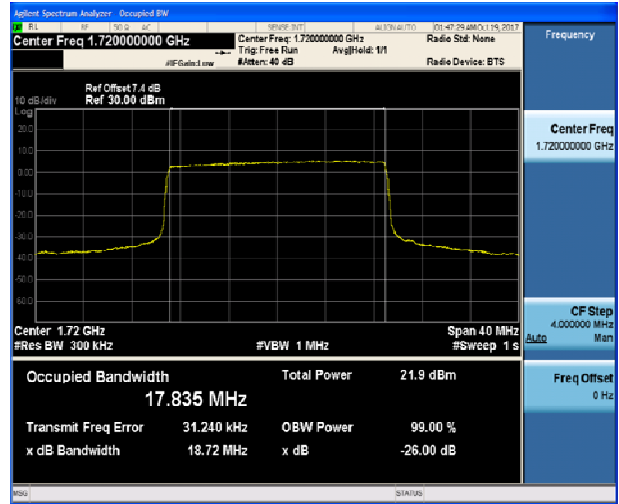




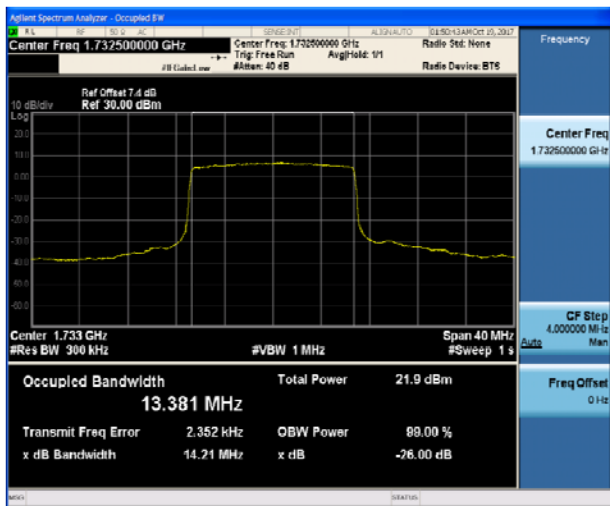
LTE Band 4 QPSK 15MHz CH-Low



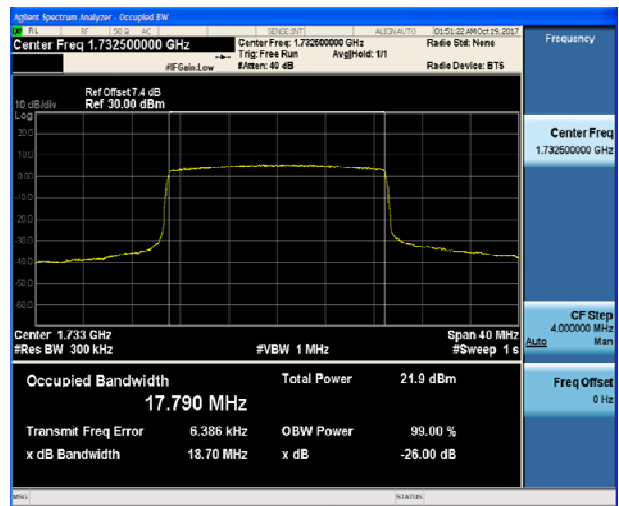
LTE Band 4 QPSK 20MHz CH-Low



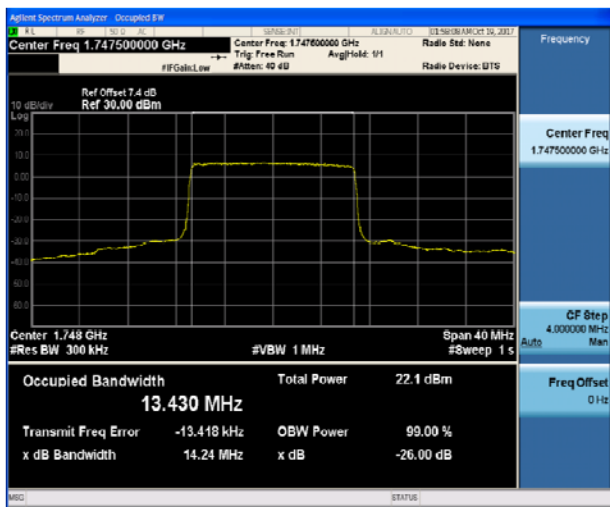
LTE Band 4 QPSK 15MHz CH-Middle



LTE Band 4 QPSK 20MHz CH-Middle



LTE Band 4 QPSK 15MHz CH-High



LTE Band 4 QPSK 20MHz CH-High

