RF TEST REPORT

Applicant	ecom instruments GmbH
FCC ID	XAM500080GR01
Product	Featurephone
Brand	ecom
Model	Ex-Handy 10
Report No.	R1901H0001-R7
Issue Date	July 5, 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.

Peng Tao

Performed by: Peng Tao

Kai Xu

Approved by: Kai Xu

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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(b)(10) /27.50(c)(10) /27.50(h)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h) /27.53(g) /27.53(f) /27.53(c) /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(g) /27.53(f) /27.53(m)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h) /27.53(g) /27.53(m) /27.53(f)	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 21, 2019 ~June 14, 2019			

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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.

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1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
Country:	P. R. China
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2 General Description of Equipment under Test

Client Information

Applicant	ecom instruments GmbH
Applicant address	Industriestrasse 2, 97959 Assamstadt, Germany
Manufacturer	Pepperl+Fuchs GmbH
Manufacturer address	Lilienthalstrasse 200, 68307 Mannheim, Germany

General information

EUT Description			
Model	Ex-Handy 10		
IMEI	004403100004516		
Hardware Version	HW3		
Software Version	SAIPH_ROW_M_018_260219		
Power Supply	Battery/AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	WCDMA Band IV: 0dBi LTE Band 4/7/41/66:0 dBi LTE Band 12/13/71:-3 dBi		
Test Mode(s)	WCDMA Band IV; LTE Band 4/7/12/13/41/66/71		
Test Modulation	(WCDMA) BPSK, QPSK,16QAM; (LTE)QPSK 16QAM;		
HSDPA UE Category	10		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
HSPA+ UE Category	14		
LTE Category	4		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV:	24387dBm	
	LTE Band 4:	24.35dBm	
	LTE Band 7:	20.96dBm	
	LTE Band 12:	15.60dBm	
	LTE Band 13:	14.69dBm	
	LTE Band 41:	24.29dBm	
	LTE Band 66:	24.82dBm	
	LTE Band 71	17.17dBm	
Rated Power Supply Voltage:	3.7V		
Extreme Voltage	Minimum: 3.5V Maximum: 4.2V		
Extreme Temperature	Lowest: -10°C Highest: +45°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)

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	WCDMA Band IV	1710 ~ 1755	2110 ~ 2155
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
	LTE Band 12	699 ~ 716	729 ~ 746
	LTE Band 13	777 ~ 787	746 ~ 756
	LTE Band 41	2496 ~ 2690	2496 ~ 2690
	LTE Band 66	1710 ~ 1780	2110 ~ 2200
	LTE Band 71	663 ~ 698	617 ~ 652
EUT Accessory			
Adapter	Manufacturer: TEN PAO INTERNATIONAL LTD. Model: S008ACM0500200		
Battery	Manufacturer: ecom instruments GmbH Model: EX-BP H10C		
USB Cable	Manufacturer: Dongguan YongGu Electronics Prouduction Co., Ltd. 120cm Cable, Shielded		
Note: 1. The information of the EUT is declared by the manufacturer.			

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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

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4 Test Configuration

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.

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/ HSPA+
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

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Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/7/12/13/41/66/71:

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	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
	LTE 12	O	O	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 41	-	-	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 66	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 71	-	-	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
	LTE 7	-	-	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 41	-	-	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 66	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 71	-	-	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
	LTE 7	-	-	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O			O	O	O	O
	LTE 41	-	-	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 66	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 71	-	-	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
	LTE 7	-	-	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 12	O	O	O	O	-	-	O	O	O	-	O	O	-	O
	LTE 13	-	-	O	O	-	-	O	O	O	-	O	O	-	O
	LTE 41	-	-	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 66	O	O	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 71	-	-	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
	LTE 7	-	-	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 41	-	-	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 66	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 71	-	-	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
	LTE 7	-	-	O	O	O	O	O	O	O	O	O	O	O	O

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	LTE 12	O	O	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 41	-	-	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 66	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 71	-	-	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 12	O	O	O	O	-	-	O	-	O	-	-	O	O	O
	LTE 13	-	-	O	O	-	-	O	-	O	-	-	O	O	O
	LTE 41	-	-	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 66	O	O	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 71	-	-	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	O
	LTE 12	-	-	-	O	-	-	O	-	O	-	-	O	O	O
	LTE 13	-	-	-	O	-	-	O	-	O	-	-	O	O	O
	LTE 41	-	-	-	-	-	O	O	-	O	-	-	O	O	O
	LTE 66	-	-	-	-	-	O	O	-	O	-	-	O	O	O
	LTE 71	-	-	-	-	-	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.														

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5 Test Case Results

5.1 RF Power Output

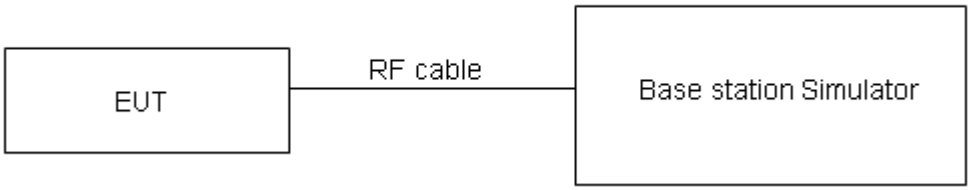
Ambient condition

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.

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Test Results

WCDMA Band IV		AV Conducted Power(dBm)		
		Channel 1312	Channel 1413	Channel 1513
		1712.4 (MHz)	1732.6 (MHz)	1752.6(MHz)
RMC		23.54	23.51	23.58
HSDPA	Sub - Test 1	23.00	22.93	23.02
	Sub - Test 2	22.99	22.95	22.99
	Sub - Test 3	22.46	22.45	22.51
	Sub - Test 4	22.47	22.46	22.49
HSUPA	Sub - Test 1	22.96	22.92	22.97
	Sub - Test 2	21.95	21.90	21.96
	Sub - Test 3	22.42	22.38	22.45
	Sub - Test 4	21.88	21.87	21.93
	Sub - Test 5	22.89	22.85	22.91
DC-HSDPA	Sub - Test 1	22.88	22.87	22.92
	Sub - Test 2	22.87	22.86	22.91
	Sub - Test 3	22.45	22.35	22.42
	Sub - Test 4	22.44	22.34	22.41
HSPA+	16QAM	22.43	22.42	22.48

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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	22.29	22.61	22.36
		1	2	22.51	22.65	22.60
		1	5	22.16	22.60	22.32
		3	0	22.27	22.08	22.17
		3	2	22.11	22.00	22.05
		3	3	22.02	21.87	22.08
		6	0	21.23	21.01	21.07
	16QAM	1	0	21.27	21.17	21.11
		1	2	21.25	20.94	21.05
		1	5	20.92	20.93	21.22
		3	0	21.23	21.04	20.96
		3	2	21.32	21.01	21.01
		3	3	21.19	20.99	20.97
		6	0	20.19	20.08	20.17
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	22.31	22.65	22.39
		1	7	22.49	22.68	22.64
		1	14	22.19	22.65	22.36
		8	0	21.37	21.20	21.30
		8	4	21.23	21.10	21.17
		8	7	21.12	20.98	21.18
		15	0	21.23	21.05	21.10
	16QAM	1	0	21.30	21.19	21.14
		1	7	21.28	20.94	21.09
		1	14	20.94	20.97	21.25
		8	0	20.34	20.17	20.08
		8	4	20.43	20.14	20.13
		8	7	20.29	20.11	20.10
		15	0	20.22	20.12	20.20
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.28	22.63	22.35
		1	13	22.47	22.64	22.61
		1	24	22.16	22.60	22.32
		12	0	21.34	21.15	21.26
		12	6	21.21	21.06	21.12
		12	13	21.10	20.96	21.14
		25	0	21.23	21.04	21.08

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	16QAM	1	0	21.27	21.15	21.11
		1	13	21.25	20.92	21.06
		1	24	20.91	20.95	21.21
		12	0	20.32	20.13	20.05
		12	6	20.40	20.09	20.09
		12	13	20.26	20.06	20.06
		25	0	20.20	20.08	20.15
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	22.30	22.64	22.38
		1	25	22.50	22.69	22.65
		1	49	22.18	22.64	22.35
		25	0	21.37	21.20	21.30
		25	13	21.24	21.11	21.16
		25	25	21.12	21.00	21.19
		50	0	21.27	21.06	21.12
	16QAM	1	0	21.29	21.18	21.13
		1	25	21.28	20.96	21.09
		1	49	20.94	20.97	21.24
		25	0	20.35	20.18	20.09
		25	13	20.42	20.13	20.12
		25	25	20.29	20.11	20.10
		50	0	20.23	20.13	20.19
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	22.29	22.60	22.36
		1	38	22.48	22.68	22.62
		1	74	22.15	22.59	22.31
		36	0	21.35	21.16	21.27
		36	18	21.21	21.06	21.12
		36	39	21.09	20.97	21.15
		75	0	21.25	21.02	21.07
	16QAM	1	0	21.24	21.16	21.11
		1	38	21.26	20.93	21.07
		1	74	20.91	20.93	21.21
		36	0	20.32	20.16	20.06
		36	18	20.39	20.08	20.08
		36	39	20.27	20.07	20.07
		75	0	20.20	20.08	20.15
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	22.26	22.56	22.33
		1	50	22.47	22.64	22.60

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		1	99	22.13	22.58	22.28
		50	0	21.32	21.11	21.23
		50	25	21.19	21.02	21.09
		50	50	21.06	20.92	21.11
		100	0	21.22	20.97	21.03
	16QAM	1	0	21.08	21.12	21.06
		1	50	21.22	20.91	21.03
		1	99	20.89	20.90	21.19
		50	0	20.29	20.12	20.03
		50	25	20.36	20.06	20.05
		50	50	20.24	20.02	20.03
		100	0	20.18	20.04	20.12

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	21.96	21.93	21.89
		1	13	22.37	22.03	22.40
		1	24	22.11	22.00	21.86
		12	0	20.97	20.90	21.02
		12	6	21.05	20.99	21.09
		12	13	20.90	21.08	20.96
		25	0	20.98	21.05	21.07
	16QAM	1	0	20.57	20.47	20.40
		1	13	20.55	20.50	20.35
		1	24	20.61	20.40	20.35
		12	0	20.11	20.06	20.13
		12	6	20.21	20.26	20.13
		12	13	20.12	20.17	20.04
		25	0	20.05	20.03	20.05
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	21.98	21.94	21.92
		1	25	22.40	22.08	22.44
		1	49	22.13	22.04	21.89
		25	0	21.00	20.95	21.06
		25	13	21.08	21.04	21.13
		25	25	20.92	21.12	21.01
		50	0	21.02	21.07	21.11
	16QAM	1	0	20.59	20.50	20.42
		1	25	20.58	20.54	20.38
		1	49	20.64	20.42	20.38

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		25	0	20.14	20.11	20.17
		25	13	20.23	20.30	20.16
		25	25	20.15	20.22	20.08
		50	0	20.08	20.08	20.09
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20825/2507.5	21100/2535	21375/2562.5
15MHz	QPSK	1	0	21.97	21.90	21.90
		1	38	22.38	22.07	22.41
		1	74	22.10	21.99	21.85
		36	0	20.98	20.91	21.03
		36	18	21.05	20.99	21.09
		36	39	20.89	21.09	20.97
		75	0	21.00	21.03	21.06
	16QAM	1	0	20.54	20.48	20.40
		1	38	20.56	20.51	20.36
		1	74	20.61	20.38	20.35
		36	0	20.11	20.09	20.14
		36	18	20.20	20.25	20.12
		36	39	20.13	20.18	20.05
		75	0	20.05	20.03	20.05
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20850/2510	21100/2535	21350/2560
20MHz	QPSK	1	0	21.94	21.86	21.87
		1	50	22.37	22.03	22.39
		1	99	22.08	21.98	21.82
		50	0	20.95	20.86	20.99
		50	25	21.03	20.95	21.06
		50	50	20.86	21.04	20.93
		100	0	20.97	20.98	21.02
	16QAM	1	0	20.54	20.44	20.35
		1	50	20.52	20.49	20.32
		1	99	20.59	20.35	20.33
		50	0	20.08	20.05	20.11
		50	25	20.17	20.23	20.09
		50	50	20.10	20.13	20.01
		100	0	20.03	19.99	20.02

LTE Band 12				**AV Conducted Power(dBm)**		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23017/699.7	23095/707.5	23173/715.3
1.4MHz	QPSK	1	0	21.92	22.17	22.13
		1	2	22.25	22.51	22.66

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		1	5	22.23	22.05	22.08
		3	0	20.99	20.93	21.10
		3	2	20.92	21.10	21.11
		3	3	20.99	21.01	21.02
		6	0	21.13	21.10	21.09
	16QAM	1	0	20.77	20.66	20.69
		1	2	20.75	20.79	20.91
		1	5	20.58	20.99	20.64
		3	0	20.11	20.02	20.08
		3	2	20.16	21.07	20.28
		3	3	20.05	20.15	20.15
		6	0	20.02	20.11	20.13
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23025/700.5	23095/707.5	23165/714.5
3MHz	QPSK	1	0	21.94	22.18	22.16
		1	7	22.28	22.56	22.70
		1	14	22.25	22.09	22.11
		8	0	21.02	20.98	21.14
		8	4	20.95	21.15	21.15
		8	7	21.01	21.05	21.07
		15	0	21.17	21.12	21.13
	16QAM	1	0	20.79	20.69	20.71
		1	7	20.78	20.83	20.94
		1	14	20.61	21.01	20.67
		8	0	20.14	20.07	20.12
		8	4	20.18	21.11	20.31
		8	7	20.08	20.20	20.19
		15	0	20.05	20.16	20.17
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23035/701.5	23095/707.5	23155/713.5
5MHz	QPSK	1	0	21.93	22.14	22.14
		1	13	22.26	22.55	22.67
		1	24	22.22	22.04	22.07
		12	0	21.00	20.94	21.11
		12	6	20.92	21.10	21.11
		12	13	20.98	21.02	21.03
		25	0	21.15	21.08	21.08
	16QAM	1	0	20.74	20.67	20.69
		1	13	20.76	20.80	20.92
		1	24	20.58	20.97	20.64
		12	0	20.11	20.05	20.09
		12	6	20.15	21.06	20.27
		12	13	20.06	20.16	20.16

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		25	0	20.02	20.11	20.13
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23060/704	23095/707.5	23130/711
10MHz	QPSK	1	0	21.90	22.10	22.11
		1	25	22.25	22.51	22.65
		1	49	22.20	22.03	22.04
		25	0	20.97	20.89	21.07
		25	13	20.90	21.06	21.08
		25	25	20.95	20.97	20.99
		50	0	21.12	21.03	21.04
	16QAM	1	0	20.61	20.63	20.64
		1	25	20.72	20.78	20.88
		1	49	20.56	20.94	20.62
		25	0	20.08	20.01	20.06
		25	13	20.12	21.04	20.24
		25	25	20.03	20.11	20.12
		50	0	20.00	20.07	20.10

LTE Band 13				**AV Conducted Power(dBm)**		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23205/779.5	23230/782	23255/784.5
5MHz	QPSK	1	0	22.51	22.24	21.59
		1	13	22.34	22.37	21.41
		1	24	22.22	22.37	21.40
		12	0	22.28	21.34	21.51
		12	6	22.20	21.15	21.42
		12	13	22.18	21.16	21.35
		25	0	22.22	21.33	21.37
	16QAM	1	0	21.76	21.00	21.67
		1	13	21.77	21.08	21.48
		1	24	21.69	21.04	21.42
		12	0	20.33	20.32	20.23
		12	6	20.32	20.09	20.25
		12	13	20.22	20.05	20.19
		25	0	20.29	20.17	20.35
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				/	23230/782	/
10MHz	QPSK	1	0	/	22.17	/
		1	25	/	22.37	/
		1	49	/	22.35	/
		25	0	/	21.30	/
		25	13	/	21.11	/
		25	25	/	21.12	/

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		50	0	/	21.26	/
	16QAM	1	0	/	20.97	/
		1	25	/	21.07	/
		1	49	/	20.99	/
		25	0	/	20.31	/
		25	13	/	20.06	/
		25	25	/	20.01	/
		50	0	/	20.13	/

LTE Band 41				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				39675/2498.5	40620/2593	41565/2687.5
5MHz	QPSK	1	0	22.93	23.16	23.46
		1	13	23.13	23.42	23.67
		1	24	23.15	23.17	23.49
		12	0	22.33	22.28	22.49
		12	6	22.15	22.27	22.35
		12	13	22.07	22.25	22.28
		25	0	22.08	22.31	22.36
	16QAM	1	0	22.11	21.89	22.18
		1	13	22.09	22.18	22.41
		1	24	21.60	21.87	21.94
		12	0	21.19	21.22	21.45
		12	6	21.18	21.41	21.55
		12	13	21.04	21.27	21.37
		25	0	21.05	21.30	21.39
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				39700/2501	40620/2593	41540/2685
10MHz	QPSK	1	0	22.95	23.17	23.49
		1	25	23.16	23.47	23.71
		1	49	23.17	23.21	23.52
		25	0	22.36	22.33	22.53
		25	13	22.18	22.32	22.39
		25	25	22.09	22.29	22.33
		50	0	22.12	22.33	22.40
	16QAM	1	0	22.13	21.92	22.20
		1	25	22.12	22.22	22.44
		1	49	21.63	21.89	21.97
		25	0	21.22	21.27	21.49

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		25	13	21.20	21.45	21.58
		25	25	21.07	21.32	21.41
		50	0	21.08	21.35	21.43
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				39725/2503.5	40620/2593	41515/2682.5
15MHz	QPSK	1	0	22.94	23.13	23.47
		1	38	23.14	23.46	23.68
		1	74	23.14	23.16	23.48
		36	0	22.34	22.29	22.50
		36	18	22.15	22.27	22.35
		36	39	22.06	22.26	22.29
		75	0	22.10	22.29	22.35
	16QAM	1	0	22.08	21.90	22.18
		1	38	22.10	22.19	22.42
		1	74	21.60	21.85	21.94
		36	0	21.19	21.25	21.46
		36	18	21.17	21.40	21.54
		36	39	21.05	21.28	21.38
		75	0	21.05	21.30	21.39
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				39750/2506	40620/2593	41490/2680
20MHz	QPSK	1	0	22.91	23.09	23.44
		1	50	23.13	23.42	23.66
		1	99	23.12	23.15	23.45
		50	0	22.31	22.24	22.46
		50	25	22.13	22.23	22.32
		50	50	22.03	22.21	22.25
		100	0	22.07	22.24	22.31
	16QAM	1	0	21.70	21.86	22.13
		1	50	22.06	22.17	22.38
		1	99	21.58	21.82	21.92
		50	0	21.16	21.21	21.43
		50	25	21.14	21.38	21.51
		50	50	21.02	21.23	21.34
		100	0	21.03	21.26	21.36

LTE Band 66				**AV Conducted Power(dBm)**		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				131979/1710.7	132322/1745	132665/1779.3

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1.4MHz	QPSK	1	0	22.71	22.81	22.91
		1	2	22.98	22.90	23.11
		1	5	22.65	22.66	22.97
		3	0	22.81	22.84	22.82
		3	2	22.85	22.87	22.77
		3	3	22.97	22.86	22.73
		6	0	21.92	21.87	21.89
	16QAM	1	0	21.76	22.03	21.87
		1	2	21.74	22.00	21.75
		1	5	22.36	21.99	21.93
		3	0	21.92	21.85	21.88
		3	2	22.01	21.98	21.90
		3	3	22.08	21.84	21.79
		6	0	21.03	21.01	20.95
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				131987/1711.5	132322/1745	132657/1778.5
3MHz	QPSK	1	0	22.73	22.85	22.94
		1	7	22.96	22.93	23.15
		1	14	22.68	22.71	23.01
		8	0	21.91	21.96	21.95
		8	4	21.97	21.97	21.89
		8	7	22.07	21.97	21.83
		15	0	21.92	21.91	21.92
	16QAM	1	0	21.79	22.05	21.90
		1	7	21.77	22.00	21.79
		1	14	22.38	22.03	21.96
		8	0	21.03	20.98	21.00
		8	4	21.12	21.11	21.02
		8	7	21.18	20.96	20.92
		15	0	21.06	21.05	20.98
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				131997/1712.5	132322/1745	132647/1777.5
5MHz	QPSK	1	0	22.70	22.83	22.90
		1	13	22.94	22.89	23.12
		1	24	22.65	22.66	22.97
		12	0	21.88	21.91	21.91
		12	6	21.95	21.93	21.84
		12	13	22.05	21.95	21.79
		25	0	21.92	21.90	21.90
	16QAM	1	0	21.76	22.01	21.87
		1	13	21.74	21.98	21.76
		1	24	22.35	22.01	21.92
		12	0	21.01	20.94	20.97

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		12	6	21.09	21.06	20.98
		12	13	21.15	20.91	20.88
		25	0	21.04	21.01	20.93
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				132022/1715	132322/1745	132622/1775
10MHz	QPSK	1	0	22.72	22.84	22.93
		1	25	22.97	22.94	23.16
		1	49	22.67	22.70	23.00
		25	0	21.91	21.96	21.95
		25	13	21.98	21.98	21.88
		25	25	22.07	21.99	21.84
		50	0	21.96	21.92	21.94
	16QAM	1	0	21.78	22.04	21.89
		1	25	21.77	22.02	21.79
		1	49	22.38	22.03	21.95
		25	0	21.04	20.99	21.01
		25	13	21.11	21.10	21.01
		25	25	21.18	20.96	20.92
		50	0	21.07	21.06	20.97
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				132047/1717.5	132322/1745	132597/1772.5
15MHz	QPSK	1	0	22.71	22.80	22.91
		1	38	22.95	22.93	23.13
		1	74	22.64	22.65	22.96
		36	0	21.89	21.92	21.92
		36	18	21.95	21.93	21.84
		36	39	22.04	21.96	21.80
		75	0	21.94	21.88	21.89
	16QAM	1	0	21.73	22.02	21.87
		1	38	21.75	21.99	21.77
		1	74	22.35	21.99	21.92
		36	0	21.01	20.97	20.98
		36	18	21.08	21.05	20.97
		36	39	21.16	20.92	20.89
		75	0	21.04	21.01	20.93
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				132072/1720	132322/1745	132572/1770
20MHz	QPSK	1	0	22.68	22.76	22.88
		1	50	22.94	22.89	23.11
		1	99	22.62	22.64	22.93
		50	0	21.86	21.87	21.88
		50	25	21.93	21.89	21.81
		50	50	22.01	21.91	21.76

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		100	0	21.91	21.83	21.85
	16QAM	1	0	22.30	21.98	21.82
		1	50	21.71	21.97	21.73
		1	99	22.33	21.96	21.90
		50	0	20.98	20.93	20.95
		50	25	21.05	21.03	20.94
		50	50	21.13	20.87	20.85
		100	0	21.02	20.97	20.90

LTE Band 71				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				133147/665.5	133297/680.5	133447/695.5
5MHz	QPSK	1	0	22.54	22.78	22.68
		1	13	22.81	23.10	22.86
		1	24	22.61	23.02	22.65
		12	0	21.63	21.72	21.77
		12	6	21.71	21.74	21.84
		12	13	21.83	21.76	21.89
		25	0	21.71	21.85	21.84
	16QAM	1	0	22.33	21.57	21.77
		1	13	22.31	21.74	21.68
		1	24	22.16	21.64	21.71
		12	0	20.70	20.83	20.79
		12	6	20.76	20.80	20.89
		12	13	20.83	20.78	21.02
		25	0	20.79	20.85	20.89
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				133172/668	133297/680.5	133422/693
10MHz	QPSK	1	0	22.56	22.79	22.71
		1	25	22.84	23.15	22.90
		1	49	22.63	23.06	22.68
		25	0	21.66	21.77	21.81
		25	13	21.74	21.79	21.88
		25	25	21.85	21.80	21.94
		50	0	21.75	21.87	21.88
	16QAM	1	0	22.35	21.60	21.79
		1	25	22.34	21.78	21.71
		1	49	22.19	21.66	21.74
		25	0	20.73	20.88	20.83
		25	13	20.78	20.84	20.92
		25	25	20.86	20.83	21.06
		50	0	20.82	20.90	20.93

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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				133197/670.5	133297/680.5	133397/690.5
15MHz	QPSK	1	0	22.55	22.75	22.69
		1	38	22.82	23.14	22.87
		1	74	22.60	23.01	22.64
		36	0	21.64	21.73	21.78
		36	18	21.71	21.74	21.84
		36	39	21.82	21.77	21.90
		75	0	21.73	21.83	21.83
	16QAM	1	0	22.30	21.58	21.77
		1	38	22.32	21.75	21.69
		1	74	22.16	21.62	21.71
		36	0	20.70	20.86	20.80
		36	18	20.75	20.79	20.88
		36	39	20.84	20.79	21.03
		75	0	20.79	20.85	20.89
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				133222/673	133322/683	133372/688
20MHz	QPSK	1	0	22.52	22.71	22.66
		1	50	22.81	23.10	22.85
		1	99	22.58	23.00	22.61
		50	0	21.61	21.68	21.74
		50	25	21.69	21.70	21.81
		50	50	21.79	21.72	21.86
		100	0	21.70	21.78	21.79
	16QAM	1	0	22.39	21.54	21.72
		1	50	22.28	21.73	21.65
		1	99	22.14	21.59	21.69
		50	0	20.67	20.82	20.77
		50	25	20.72	20.77	20.85
		50	50	20.81	20.74	20.99
		100	0	20.77	20.81	20.86

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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 = Generator Output Power (dBm) – 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 (dBm) = LVL (dBm) + LOSS (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 (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBi)

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

EIRP (dBm) = ERP (dBm) + 2.15 (dB.)

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

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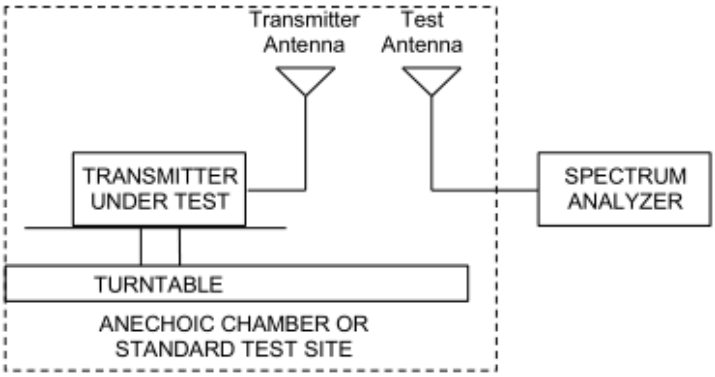
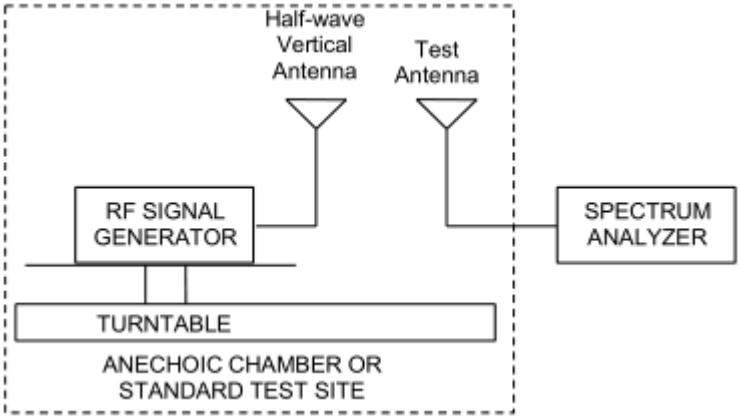
Test setup





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.

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Limits

Rule Part 27.50(b) (10) specifies that “Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP”

Rule Part 27.50(c) (10) specifies that “Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP”

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(b)(10)Limit	⩽ 3 W (34.77 dBm)
Part 27.50(c)(10)Limit	⩽ 3 W (34.77 dBm)
Part 27.50(d)(4)Limit	⩽ 1 W (30 dBm)
Part 27.50(h)(2) Limit	⩽ 2 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 dB

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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	24.62	30	Pass
	Mid	1732.6	Horizontal	24.79	30	Pass
	High	1752.6	Horizontal	24.87	30	Pass

LTE Band 4						
Bandwidth	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.7	Horizontal	22.72	30	Pass
	Mid	1732.5	Horizontal	23.44	30	Pass
	High	1754.3	Horizontal	23.76	30	Pass
3 MHz (QPSK)	Low	1711.5	Horizontal	22.76	30	Pass
	Mid	1732.5	Horizontal	23.10	30	Pass
	High	1753.5	Horizontal	23.61	30	Pass
5 MHz (QPSK)	Low	1712.5	Horizontal	22.98	30	Pass
	Mid	1732.5	Horizontal	23.41	30	Pass
	High	1752.5	Horizontal	23.98	30	Pass
10 MHz (QPSK)	Low	1715	Horizontal	22.88	30	Pass
	Mid	1732.5	Horizontal	23.38	30	Pass
	High	1750	Horizontal	24.35	30	Pass
15 MHz (QPSK)	Low	1717.5	Horizontal	23.05	30	Pass
	Mid	1732.5	Horizontal	23.16	30	Pass
	High	1747.5	Horizontal	23.74	30	Pass
20 MHz (QPSK)	Low	1720	Horizontal	22.79	30	Pass
	Mid	1732.5	Horizontal	23.13	30	Pass
	High	1745	Horizontal	23.88	30	Pass
1.4 MHz (16QAM)	Low	1710.7	Horizontal	22.21	30	Pass
	Mid	1732.5	Horizontal	22.95	30	Pass
	High	1754.3	Horizontal	23.29	30	Pass
3 MHz (16QAM)	Low	1711.5	Horizontal	22.14	30	Pass
	Mid	1732.5	Horizontal	22.53	30	Pass
	High	1753.5	Horizontal	23.00	30	Pass
5 MHz (16QAM)	Low	1712.5	Horizontal	22.44	30	Pass
	Mid	1732.5	Horizontal	22.95	30	Pass
	High	1752.5	Horizontal	23.48	30	Pass
10 MHz (16QAM)	Low	1715	Horizontal	22.39	30	Pass
	Mid	1732.5	Horizontal	22.81	30	Pass
	High	1750	Horizontal	23.76	30	Pass

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15 MHz (16QAM)	Low	1717.5	Horizontal	22.41	30	Pass
	Mid	1732.5	Horizontal	22.54	30	Pass
	High	1747.5	Horizontal	23.16	30	Pass
20 MHz (16QAM)	Low	1720	Horizontal	22.34	30	Pass
	Mid	1732.5	Horizontal	22.64	30	Pass
	High	1745	Horizontal	23.23	30	Pass

LTE Band 7						
Band width	**Channel**	**Frequency (MHz)**	**Polarization**	**EIRP (dBm)**	**Limit (dBm)**	**Conclusion**
5 MHz (QPSK)	Low	2502.5	Horizontal	20.67	33	Pass
	Mid	2535	Horizontal	20.75	33	Pass
	High	2567.5	Horizontal	20.54	33	Pass
10 MHz (QPSK)	Low	2505	Horizontal	20.83	33	Pass
	Mid	2535	Horizontal	20.41	33	Pass
	High	2565	Horizontal	20.78	33	Pass
15 MHz (QPSK)	Low	2507.5	Horizontal	20.77	33	Pass
	Mid	2535	Horizontal	20.69	33	Pass
	High	2562.5	Horizontal	20.81	33	Pass
20 MHz (QPSK)	Low	2510	Horizontal	20.72	33	Pass
	Mid	2535	Horizontal	20.19	33	Pass
	High	2560	Horizontal	20.96	33	Pass
5 MHz (16QAM)	Low	2502.5	Horizontal	20.18	33	Pass
	Mid	2535	Horizontal	20.28	33	Pass
	High	2567.5	Horizontal	19.92	33	Pass
10 MHz (16QAM)	Low	2505	Horizontal	20.26	33	Pass
	Mid	2535	Horizontal	19.80	33	Pass
	High	2565	Horizontal	20.24	33	Pass
15 MHz (16QAM)	Low	2507.5	Horizontal	20.31	33	Pass
	Mid	2535	Horizontal	20.19	33	Pass
	High	2562.5	Horizontal	20.32	33	Pass
20 MHz (16QAM)	Low	2510	Horizontal	20.15	33	Pass
	Mid	2535	Horizontal	19.60	33	Pass
	High	2560	Horizontal	20.32	33	Pass

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LTE Band 12						
Bandwidth	**Channel**	**Frequency (MHz)**	**Polarization**	**ERP (dBm)**	**Limit (dBm)**	**Conclusion**
1.4 MHz (QPSK)	Low	699.7	Horizontal	14.91	34.77	Pass
	Mid	707.5	Horizontal	15.39	34.77	Pass
	High	715.3	Horizontal	15.60	34.77	Pass
3 MHz (QPSK)	Low	700.5	Horizontal	14.83	34.77	Pass
	Mid	707.5	Horizontal	14.98	34.77	Pass
	High	714.5	Horizontal	15.06	34.77	Pass
5 MHz (QPSK)	Low	701.5	Horizontal	14.82	34.77	Pass
	Mid	707.5	Horizontal	14.90	34.77	Pass
	High	713.5	Horizontal	15.01	34.77	Pass
10 MHz (QPSK)	Low	704	Horizontal	14.72	34.77	Pass
	Mid	707.5	Horizontal	14.63	34.77	Pass
	High	711	Horizontal	15.26	34.77	Pass
1.4 MHz (16QAM)	Low	699.7	Horizontal	14.44	34.77	Pass
	Mid	707.5	Horizontal	14.77	34.77	Pass
	High	715.3	Horizontal	15.03	34.77	Pass
3 MHz (16QAM)	Low	700.5	Horizontal	14.22	34.77	Pass
	Mid	707.5	Horizontal	14.44	34.77	Pass
	High	714.5	Horizontal	14.60	34.77	Pass
5 MHz (16QAM)	Low	701.5	Horizontal	14.32	34.77	Pass
	Mid	707.5	Horizontal	14.41	34.77	Pass
	High	713.5	Horizontal	14.44	34.77	Pass
10 MHz (16QAM)	Low	704	Horizontal	14.13	34.77	Pass
	Mid	707.5	Horizontal	13.99	34.77	Pass
	High	711	Horizontal	14.64	34.77	Pass

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LTE Band 13						
Bandwidth	Channel	Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Conclusion
5MHz (QPSK)	Low	779.5	Horizontal	14.49	34.77	Pass
	Mid	782	Horizontal	14.42	34.77	Pass
	High	784.5	Horizontal	14.69	34.77	Pass
10MHz (QPSK)	Mid	782	Horizontal	14.53	34.77	Pass
5MHz (16QAM)	Low	779.5	Horizontal	13.85	34.77	Pass
	Mid	782	Horizontal	13.80	34.77	Pass
	High	784.5	Horizontal	14.11	34.77	Pass
10MHz (16QAM)	Mid	782	Horizontal	14.08	34.77	Pass

LTE Band 41						
Band width	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
5 MHz (QPSK)	Low	2498.5	Horizontal	23.68	33	Pass
	Mid	2593	Horizontal	23.54	33	Pass
	High	2687.5	Horizontal	23.37	33	Pass
10 MHz (QPSK)	Low	2501	Horizontal	23.41	33	Pass
	Mid	2593	Horizontal	23.89	33	Pass
	High	2685	Horizontal	23.44	33	Pass
15 MHz (QPSK)	Low	2503.5	Horizontal	23.69	33	Pass
	Mid	2593	Horizontal	23.81	33	Pass
	High	2682.5	Horizontal	23.26	33	Pass
20 MHz (QPSK)	Low	2506	Horizontal	23.43	33	Pass
	Mid	2593	Horizontal	24.29	33	Pass
	High	2680	Horizontal	23.45	33	Pass
5 MHz (16QAM)	Low	2498.5	Horizontal	23.07	33	Pass
	Mid	2593	Horizontal	23.00	33	Pass
	High	2687.5	Horizontal	22.91	33	Pass
10 MHz (16QAM)	Low	2501	Horizontal	22.91	33	Pass
	Mid	2593	Horizontal	23.40	33	Pass
	High	2685	Horizontal	22.87	33	Pass
15 MHz (16QAM)	Low	2503.5	Horizontal	23.10	33	Pass
	Mid	2593	Horizontal	23.17	33	Pass
	High	2682.5	Horizontal	22.64	33	Pass
20 MHz (16QAM)	Low	2506	Horizontal	22.85	33	Pass
	Mid	2593	Horizontal	23.84	33	Pass

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	High	2680	Horizontal	22.96	33	Pass

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

LTE Band 66						
Band width	**Channel**	**Frequency (MHz)**	**Polarization**	**EIRP (dBm)**	**Limit (dBm)**	**Conclusion**
1.4 MHz (QPSK)	Low	1710.70	Horizontal	24.16	30	Pass
	Mid	1745.00	Horizontal	24.23	30	Pass
	High	1779.30	Horizontal	24.27	30	Pass
3 MHz (QPSK)	Low	1711.50	Horizontal	24.19	30	Pass
	Mid	1745.00	Horizontal	24.10	30	Pass
	High	1778.50	Horizontal	24.09	30	Pass
5 MHz (QPSK)	Low	1712.50	Horizontal	24.13	30	Pass
	Mid	1745.00	Horizontal	24.09	30	Pass
	High	1777.50	Horizontal	24.25	30	Pass
10 MHz (QPSK)	Low	1715.00	Horizontal	24.17	30	Pass
	Mid	1745.00	Horizontal	24.82	30	Pass
	High	1775.00	Horizontal	24.52	30	Pass
15 MHz (QPSK)	Low	1717.50	Horizontal	24.35	30	Pass
	Mid	1745.00	Horizontal	24.64	30	Pass
	High	1772.50	Horizontal	24.31	30	Pass
20 MHz (QPSK)	Low	1720.00	Horizontal	24.23	30	Pass
	Mid	1745.00	Horizontal	24.12	30	Pass
	High	1770.00	Horizontal	24.38	30	Pass
1.4 MHz (16QAM)	Low	1710.70	Horizontal	23.64	30	Pass
	Mid	1745.00	Horizontal	23.72	30	Pass
	High	1779.30	Horizontal	23.78	30	Pass
3 MHz (16QAM)	Low	1711.50	Horizontal	23.72	30	Pass
	Mid	1745.00	Horizontal	23.48	30	Pass
	High	1778.50	Horizontal	23.52	30	Pass
5 MHz (16QAM)	Low	1712.50	Horizontal	23.52	30	Pass
	Mid	1745.00	Horizontal	23.55	30	Pass
	High	1777.50	Horizontal	23.79	30	Pass
10 MHz (16QAM)	Low	1715.00	Horizontal	23.67	30	Pass
	Mid	1745.00	Horizontal	24.33	30	Pass
	High	1775.00	Horizontal	23.95	30	Pass
15 MHz (16QAM)	Low	1717.50	Horizontal	23.76	30	Pass
	Mid	1745.00	Horizontal	24.00	30	Pass
	High	1772.50	Horizontal	23.69	30	Pass
20 MHz (16QAM)	Low	1720.00	Horizontal	23.65	30	Pass
	Mid	1745.00	Horizontal	23.67	30	Pass
	High	1770.00	Horizontal	23.89	30	Pass

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LTE Band 71						
Bandwidth	**Channel**	**Frequency (MHz)**	**Polarization**	**ERP (dBm)**	**Limit (dBm)**	**Conclusion**
5 MHz (QPSK)	Low	665.5	Horizontal	15.81	34.77	Pass
	Mid	680.5	Horizontal	15.38	34.77	Pass
	High	695.5	Horizontal	16.64	34.77	Pass
10 MHz (QPSK)	Low	668	Horizontal	15.87	34.77	Pass
	Mid	680.5	Horizontal	15.06	34.77	Pass
	High	693	Horizontal	17.17	34.77	Pass
15 MHz (QPSK)	Low	670.5	Horizontal	15.98	34.77	Pass
	Mid	680.5	Horizontal	15.59	34.77	Pass
	High	690.5	Horizontal	16.88	34.77	Pass
20 MHz (QPSK)	Low	673	Horizontal	15.87	34.77	Pass
	Mid	683	Horizontal	15.39	34.77	Pass
	High	688	Horizontal	16.19	34.77	Pass
5 MHz (16QAM)	Low	665.5	Horizontal	15.20	34.77	Pass
	Mid	680.5	Horizontal	14.84	34.77	Pass
	High	695.5	Horizontal	16.18	34.77	Pass
10 MHz (16QAM)	Low	668	Horizontal	15.37	34.77	Pass
	Mid	680.5	Horizontal	14.57	34.77	Pass
	High	693	Horizontal	16.60	34.77	Pass
15 MHz (16QAM)	Low	670.5	Horizontal	15.39	34.77	Pass
	Mid	680.5	Horizontal	14.95	34.77	Pass
	High	690.5	Horizontal	16.26	34.77	Pass
20 MHz (16QAM)	Low	673	Horizontal	15.29	34.77	Pass
	Mid	683	Horizontal	14.94	34.77	Pass
	High	688	Horizontal	15.70	34.77	Pass

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5.3 Occupied Bandwidth

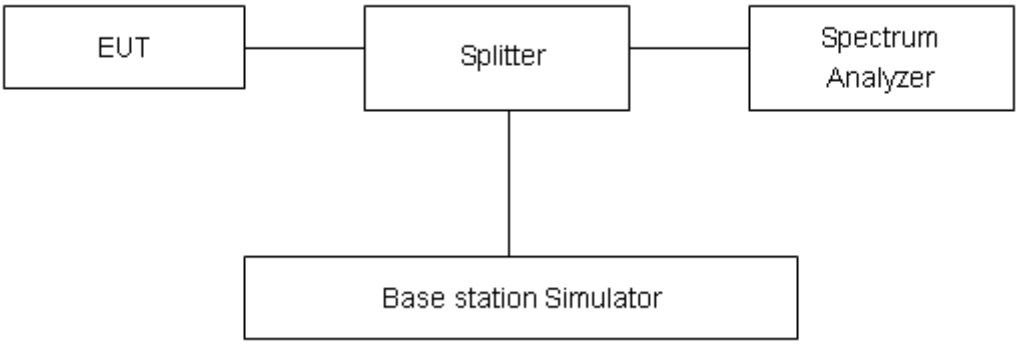
Ambient condition

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 4/12/66 (1.4MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/12/66 (3MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7/12/13/41/66/71 (5MHz).
RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/12/13/41/66//71 (10MHz).
RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/41/66/71 (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=624Hz.

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Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
WCDMA Band IV (RMC)	1312	1712.4	4.1345	4.688
	1413	1732.6	4.1293	4.693
	1513	1752.6	4.1329	4.693

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1296	1.384
			20175	1732.5	1.1139	1.349
			20393	1754.3	1.1182	1.451
		3	19965	1711.5	2.7343	3.010
			20175	1732.5	2.7359	3.019
			20385	1753.5	2.7479	3.058
		5	19975	1712.5	4.5008	5.060
			20175	1732.5	4.5101	4.987
			20375	1752.5	4.5107	4.977
		10	20000	1715	9.0291	9.916
			20175	1732.5	9.0644	9.958
			20350	1750	9.0408	9.916
		15	20025	1717.5	13.4400	14.510
			20175	1732.5	13.4820	14.810
			20325	1747.5	13.4800	14.460
		20	20050	1720	17.8100	18.990
			20175	1732.5	17.9090	19.410
			20300	1745	17.8770	19.040
	16QAM	1.4	19957	1710.7	1.1228	1.377
			20175	1732.5	1.1152	1.341
			20393	1754.3	1.1186	1.338
		3	19965	1711.5	2.7363	3.007
			20175	1732.5	2.7354	3.027
			20385	1753.5	2.7441	3.014
		5	19975	1712.5	4.5288	5.055
			20175	1732.5	4.5095	4.948
			20375	1752.5	4.5149	4.957
		10	20000	1715	9.0491	9.847
			20175	1732.5	9.0443	9.874

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			20350	1750	9.0529	9.845
		15	20025	1717.5	13.4400	14.490
			20175	1732.5	13.4730	14.500
			20325	1747.5	13.4700	14.440
		20	20050	1720	17.8360	18.890
			20175	1732.5	17.8960	19.120
			20300	1745	17.9070	19.030

LTE Band 7						
RB	**Modulation**	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
100%	QPSK	5	20775	2502.5	4.5112	4.937
			21100	2535	4.5090	4.911
			21425	2567.5	4.5173	4.919
		10	20800	2505	9.0494	9.811
			21100	2535	9.0748	9.843
			21400	2565	9.0606	9.844
		15	20825	2507.5	13.4750	14.260
			21100	2535	13.5070	15.730
			21375	2562.5	13.5030	15.160
		20	20850	2510	17.8560	18.840
			21100	2535	17.9240	18.880
			21350	2560	17.8830	18.850
	16QAM	5	20775	2502.5	4.5063	4.895
			21100	2535	4.5078	4.865
			21425	2567.5	4.5166	4.898
		10	20800	2505	9.0557	9.779
			21100	2535	9.0467	9.769
			21400	2565	9.0647	9.795
		15	20825	2507.5	13.4620	14.290
			21100	2535	13.4910	14.340
			21375	2562.5	13.4910	14.350
		20	20850	2510	17.8560	18.820
			21100	2535	17.9100	18.850
			21350	2560	17.9040	18.890

LTE Band 12						
RB	**Modulation**	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
100%	QPSK	1.4	23017	699.7	1.1186	1.287
			23095	707.5	1.1103	1.293

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			23173	715.3	1.1129	1.287
		3	23025	700.5	2.7334	2.995
			23095	707.5	2.7301	2.977
			23165	714.5	2.7408	2.990
		5	23035	701.5	4.5012	4.827
			23095	707.5	4.5035	4.917
			23155	713.5	4.5007	4.837
		10	23060	704	9.0489	9.730
			23095	707.5	9.0653	9.773
			23130	711	9.0006	9.713
	16QAM	1.4	23017	699.7	1.1118	1.288
			23095	707.5	1.1111	1.294
			23173	715.3	1.1134	1.280
		3	23025	700.5	2.7321	2.969
			23095	707.5	2.7303	2.991
			23165	714.5	2.7387	2.980
		5	23035	701.5	4.4969	4.842
			23095	707.5	4.5042	4.867
			23155	713.5	4.5036	4.851
		10	23060	704	9.0500	9.757
			23095	707.5	9.0458	9.735
			23130	711	9.0029	9.709

LTE Band 13						
RB	**Modulation**	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
100%	QPSK	5	23205	779.5	4.4911	4.898
			23230	782	4.5002	4.915
			23255	784.5	4.5082	4.888
		10	23230	782	9.0172	9.751
	16QAM	5	23205	779.5	4.4880	4.850
			23230	782	4.5037	4.874
			23255	784.5	4.5114	4.896
		10	23230	782	8.9906	9.701

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LTE Band 41						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	39675	2498.5	4.5022	4.837
			40620	2593	4.4980	4.891
			41565	2687.5	4.5059	4.817
		10	39700	2501	9.0318	9.737
			40620	2593	9.0401	9.745
			41540	2685	9.0375	9.763
		15	39725	2503.5	13.4470	14.230
			40620	2593	13.4830	14.330
			41515	2682.5	13.4510	14.270
		20	39750	2506	17.8670	18.760
			40620	2593	17.8750	18.800
			41490	2680	17.8650	18.790
	16QAM	5	39675	2498.5	4.4951	4.831
			40620	2593	4.4961	4.870
			41565	2687.5	4.4959	4.871
		10	39700	2501	9.0266	9.702
			40620	2593	9.0462	9.757
			41540	2685	9.0230	9.716
		15	39725	2503.5	13.4510	14.260
			40620	2593	13.4680	14.320
			41515	2682.5	13.4670	14.280
		20	39750	2506	17.8690	18.750
			40620	2593	17.8710	18.760
			41490	2680	17.8690	18.760

LTE Band 66						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	131979	1710.7	1.1263	1.367
			132322	1745	1.1314	1.365
			132665	1779.3	1.1237	1.345
		3	131987	1711.5	2.7483	3.072
			132322	1745	2.7508	3.032
			132657	1778.5	2.7517	3.068
		5	131997	1712.5	4.5415	5.014
			132322	1745	4.5189	4.994
			132647	1777.5	4.5143	5.026

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		10	132022	1715	9.0372	10.130
			132322	1745	9.0397	10.060
			132622	1775	9.0392	9.998
		15	132047	1717.5	13.4600	14.750
			132322	1745	13.4660	14.680
			132597	1772.5	13.4850	14.790
		20	132072	1720	17.8360	19.120
			132322	1745	17.9060	19.310
			132572	1770	17.9470	19.730
	16QAM	1.4	131979	1710.7	1.1306	1.347
			132322	1745	1.1103	1.332
			132665	1779.3	1.1192	1.344
		3	131987	1711.5	2.7548	3.037
			132322	1745	2.7403	3.058
			132657	1778.5	2.7453	3.066
		5	131997	1712.5	4.5292	5.057
			132322	1745	4.5133	5.025
			132647	1777.5	4.5368	5.051
		10	132022	1715	9.0527	9.973
			132322	1745	9.0283	9.938
			132622	1775	9.0131	10.030
		15	132047	1717.5	13.4200	14.650
			132322	1745	13.4850	14.680
			132597	1772.5	13.4800	14.670
		20	132072	1720	17.8310	19.130
			132322	1745	17.9250	19.360
			132572	1770	17.9720	23.880

LTE Band 71						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
		5	133147	665.5	4.4994	5.069
			133297	680.5	4.5233	5.024
			133447	695.5	4.5174	5.062
		10	133172	668	9.0851	10.270
			133297	680.5	8.9857	10.050
			133422	693	9.0202	10.020
		15	133197	670.5	13.5390	14.890
			133297	680.5	13.3880	14.740
			133397	690.5	13.5050	14.960

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		20	133222	673	17.8740	19.100
			133322	683	17.8140	19.070
			133372	688	17.9400	19.270
		5	133147	665.5	4.5177	5.040
			133297	680.5	4.5198	5.044
			133447	695.5	4.5344	5.005
		10	133172	668	9.0842	10.090
			133297	680.5	9.0025	9.922
			133422	693	9.0288	9.968
		15	133197	670.5	13.5300	14.710
			133297	680.5	13.3970	14.610
			133397	690.5	13.4700	14.680
		20	133222	673	17.8580	19.270
			133322	683	17.8000	19.280
			133372	688	17.9690	19.430

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WCDMA Band IV CH-Low

WCDMA Band IV CH Middle

WCDMA Band IV CH High

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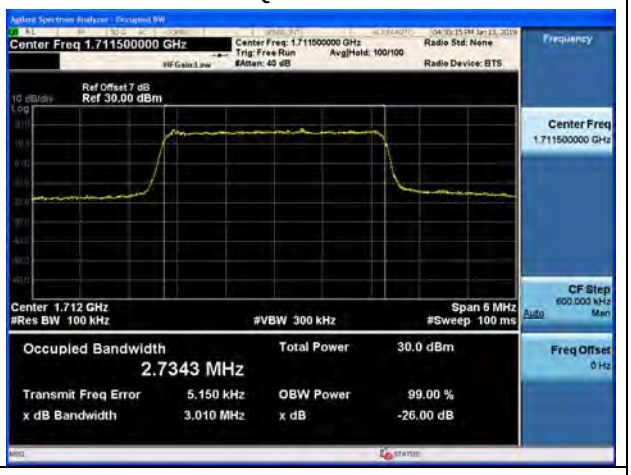
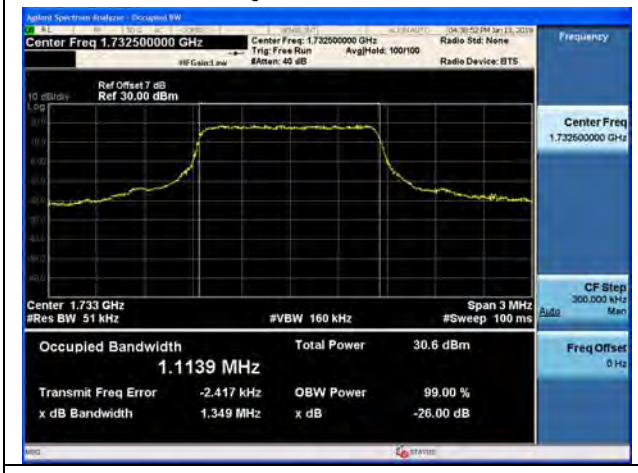
LTE Band 4 QPSK 1.4MHz CH-Low

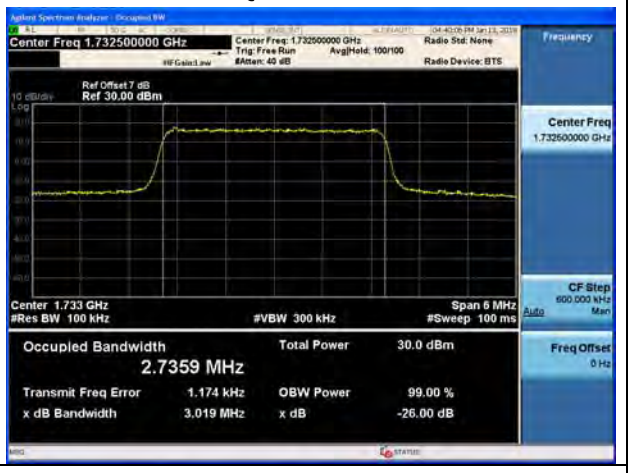
LTE Band 4 QPSK 3MHz CH-Low



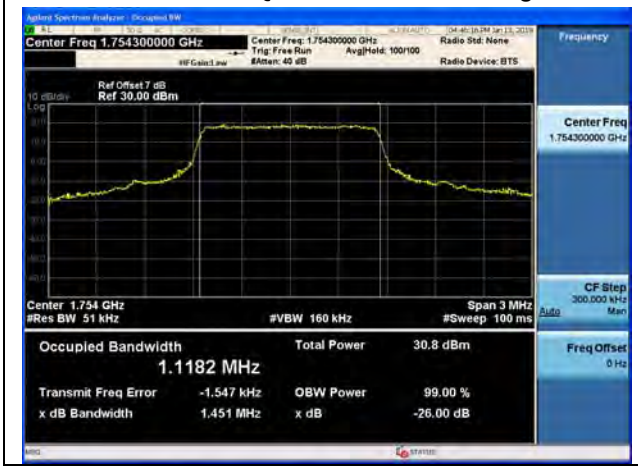
LTE Band 4 QPSK 1.4MHz CH-Middle



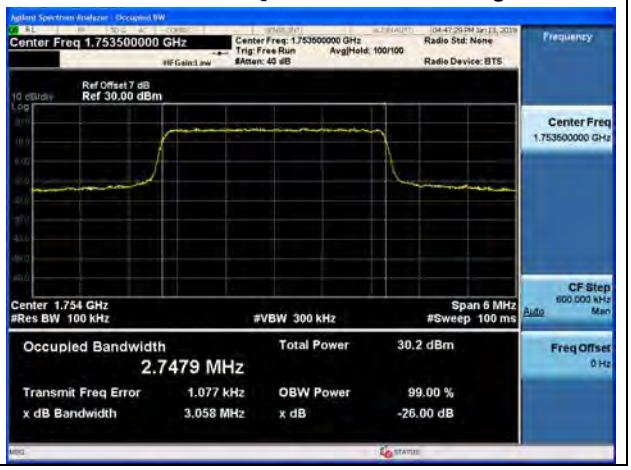
LTE Band 4 QPSK 3MHz CH-Middle



LTE Band 4 QPSK 1.4MHz CH-High



LTE Band 4 QPSK 3MHz CH-High



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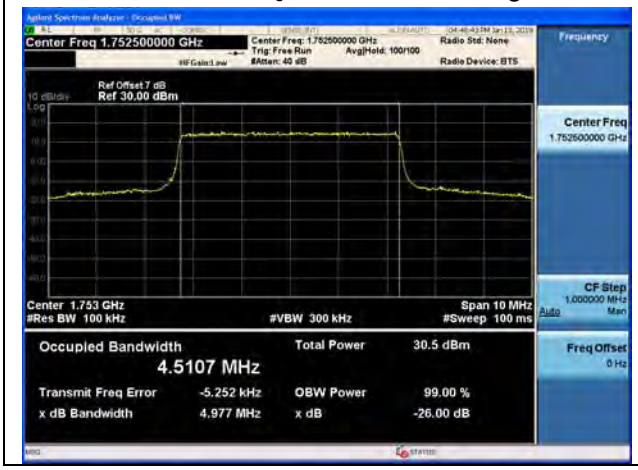
LTE Band 4 QPSK 5MHz CH-Low

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

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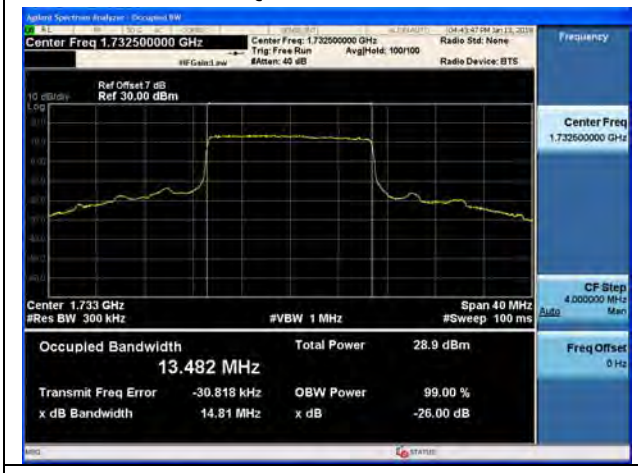
LTE Band 4 QPSK 15MHz CH-Low

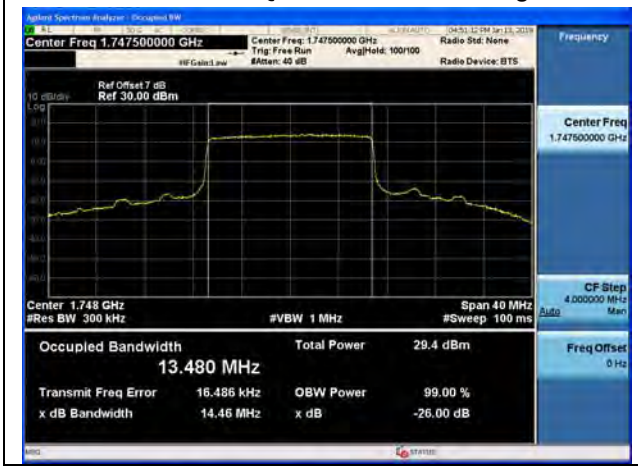
LTE Band 4 QPSK 20MHz CH-Low

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

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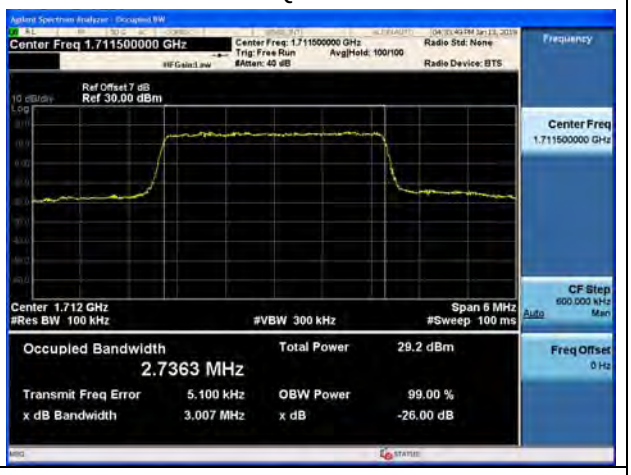
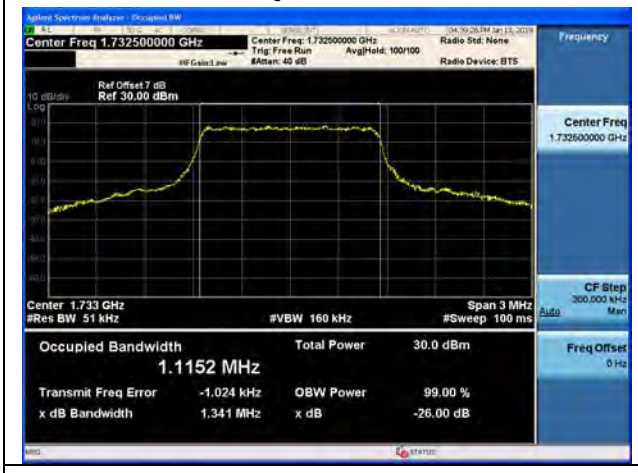
LTE Band 4 16QAM 1.4MHz CH-Low

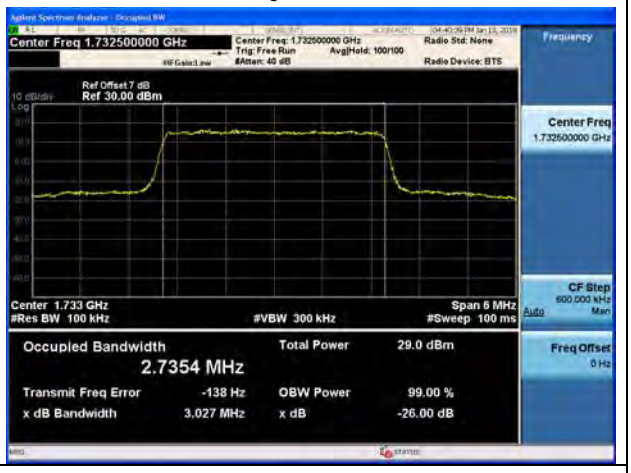
LTE Band 4 16QAM 3MHz CH-Low



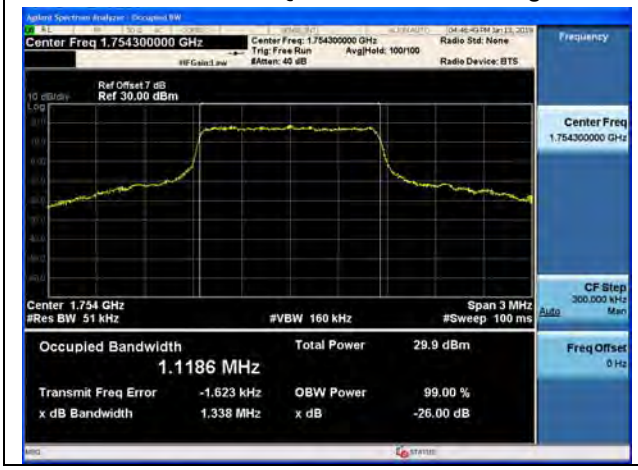
LTE Band 4 16QAM 1.4MHz CH-Middle



LTE Band 4 16QAM 3MHz CH-Middle



LTE Band 4 16QAM 1.4MHz CH-High



LTE Band 4 16QAM 3MHz CH-High

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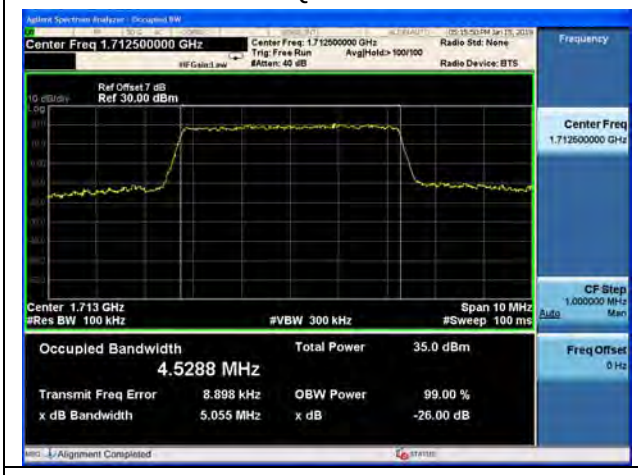
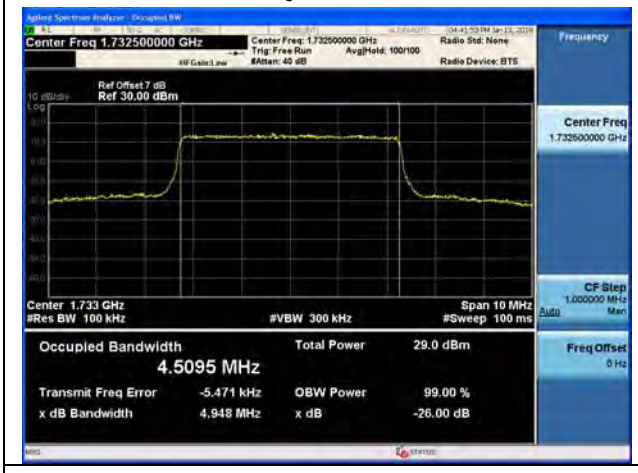
LTE Band 4 16QAM 5MHz CH-Low



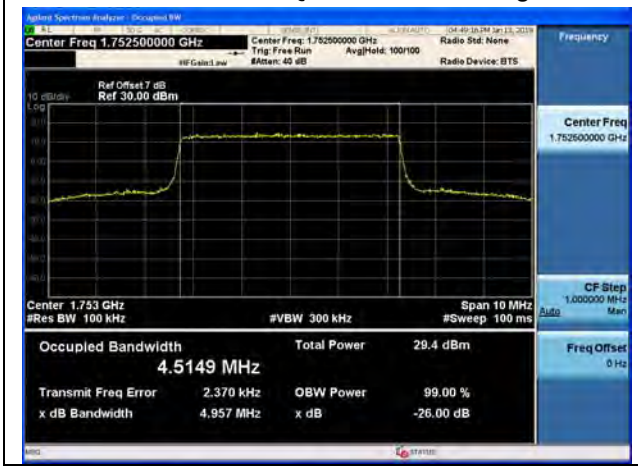
LTE Band 4 16QAM 10MHz CH-Low

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

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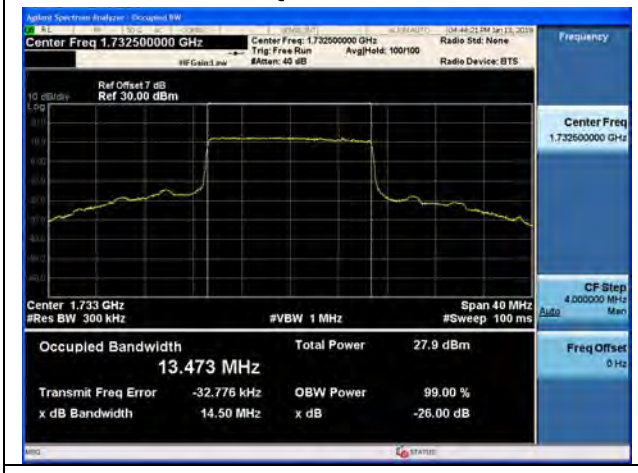
LTE Band 4 16QAM 15MHz CH-Low

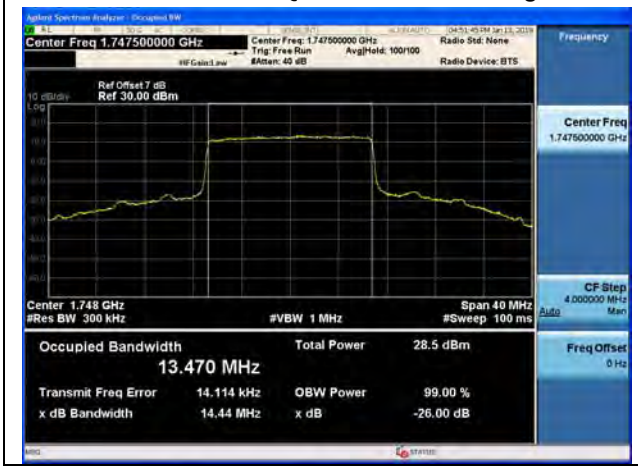
LTE Band 4 16QAM 20MHz CH-Low

LTE Band 4 16QAM 15MHz CH-Middle



LTE Band 4 16QAM 20MHz CH-Middle

LTE Band 4 16QAM 15MHz CH-High



LTE Band 4 16QAM 20MHz CH-High

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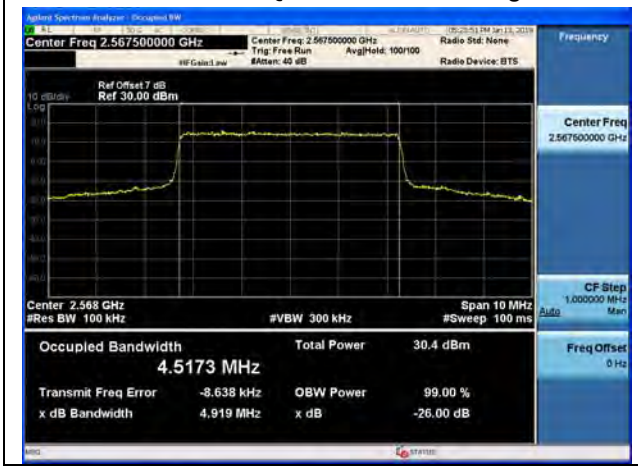
LTE Band 7 QPSK 5MHz CH-Low

LTE Band 7 QPSK 10MHz CH-Low

LTE Band 7 QPSK 5MHz CH-Middle

LTE Band 7 QPSK 10MHz CH-Middle

LTE Band 7 QPSK 5MHz CH-High



LTE Band 7 QPSK 10MHz 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

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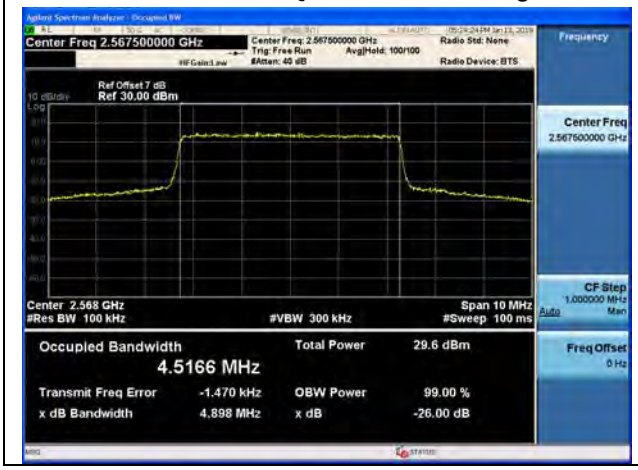
LTE Band 7 16QAM 5MHz CH-Low

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

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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

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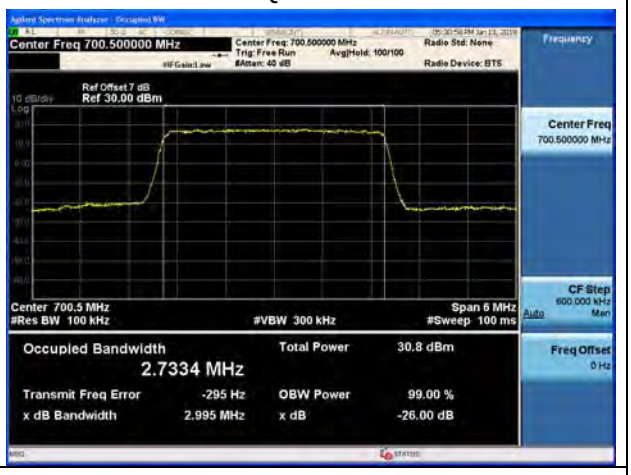
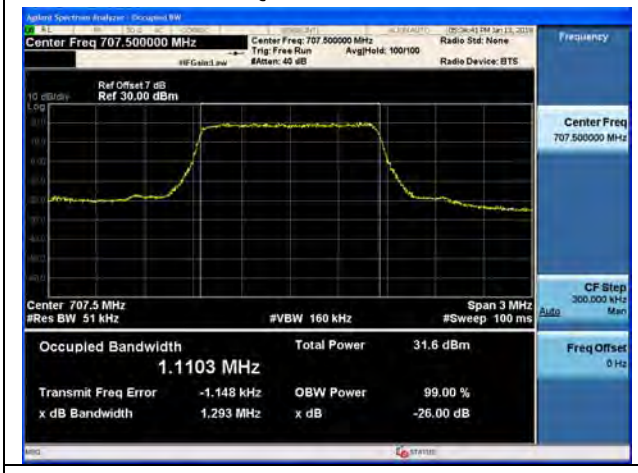
LTE Band 12 QPSK 1.4MHz CH-Low

LTE Band 12 QPSK 3MHz CH-Low

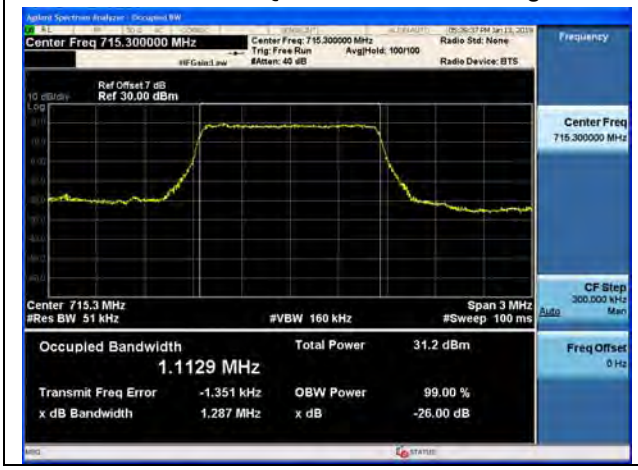


LTE Band 12 QPSK 1.4MHz CH-Middle



LTE Band 12 QPSK 3MHz CH-Middle

LTE Band 12 QPSK 1.4MHz CH-High



LTE Band 12 QPSK 3MHz CH-High

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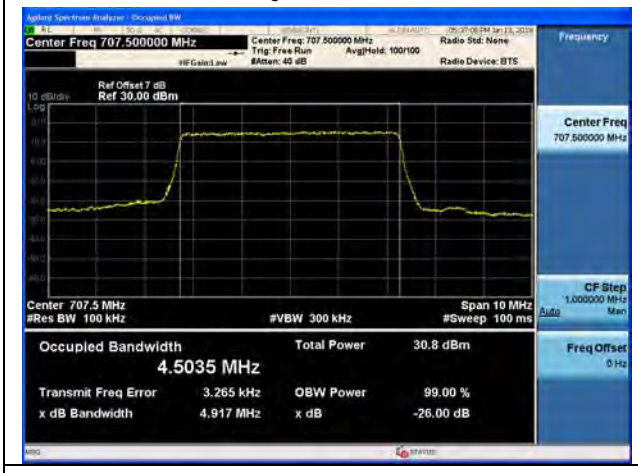
LTE Band 12 QPSK 5MHz CH-Low

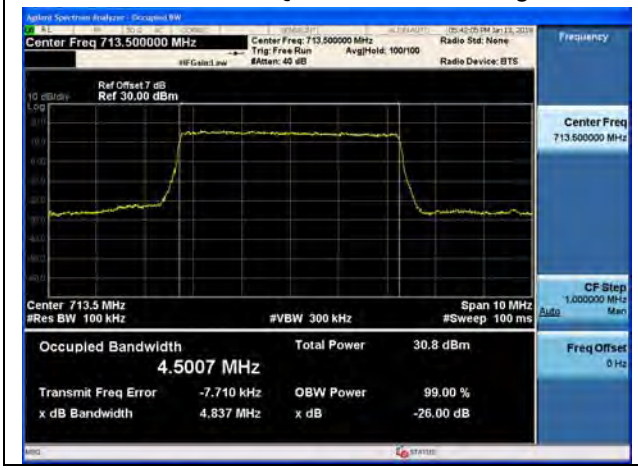
LTE Band 12 QPSK 10MHz CH-Low

LTE Band 12 QPSK 5MHz CH-Middle



LTE Band 12 QPSK 10MHz CH-Middle

LTE Band 12 QPSK 5MHz CH-High



LTE Band 12 QPSK 10MHz CH-High

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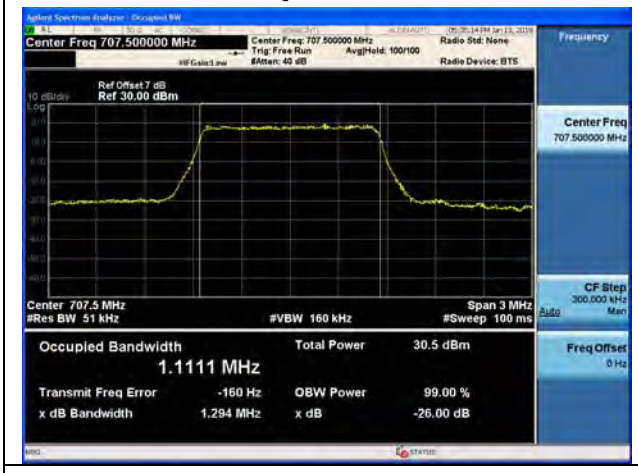
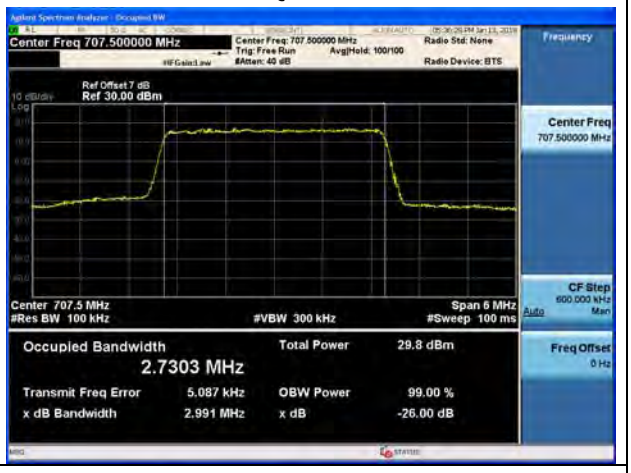
LTE Band 12 16QAM 1.4MHz CH-Low

LTE Band 12 16QAM 3MHz CH-Low

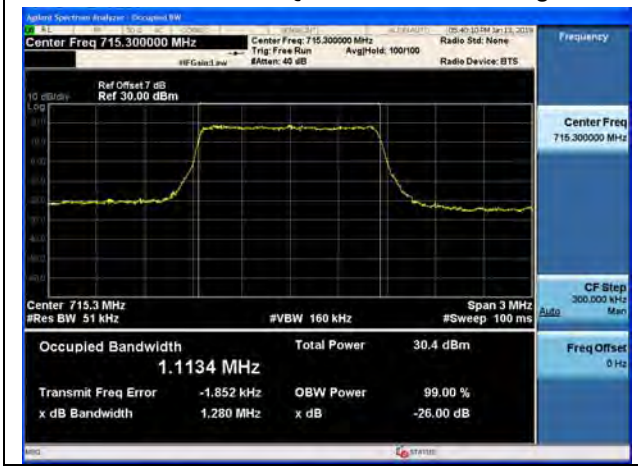
LTE Band 12 16QAM 1.4MHz CH-Middle



LTE Band 12 16QAM 3MHz CH-Middle



LTE Band 12 16QAM 1.4MHz CH-High



LTE Band 12 16QAM 3MHz CH-High

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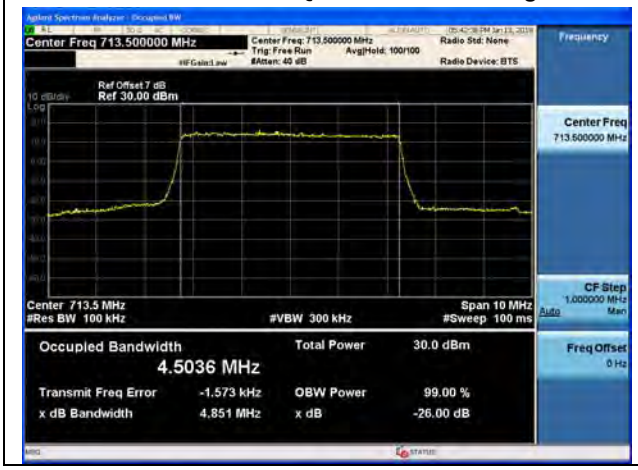
LTE Band 12 16QAM 5MHz CH-Low

LTE Band 12 16QAM 10MHz CH-Low

LTE Band 12 16QAM 5MHz CH-Middle

LTE Band 12 16QAM 10MHz CH-Middle

LTE Band 12 16QAM 5MHz CH-High



LTE Band 12 16QAM 10MHz CH-High

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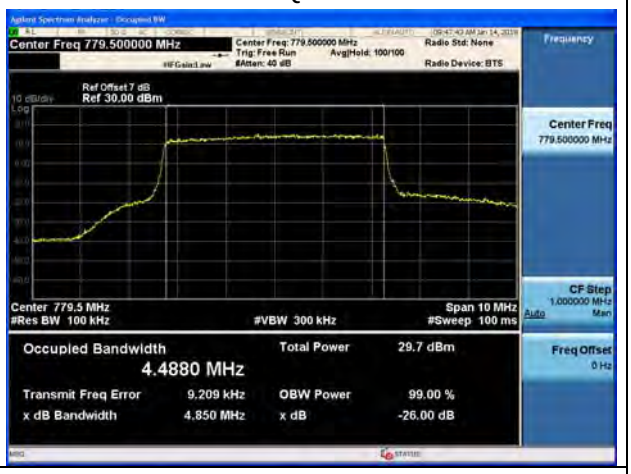
LTE Band 13 QPSK 5MHz CH-Low

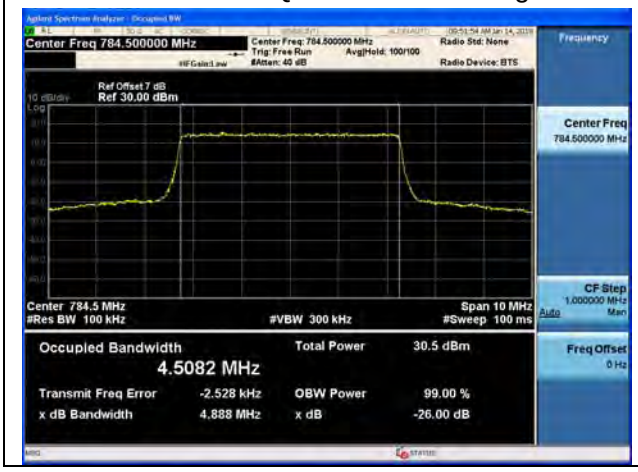
LTE Band 13 16QAM 5MHz CH-Low



LTE Band 13 QPSK 5MHz CH-Middle

LTE Band 13 16QAM 5MHz CH-Middle

LTE Band 13 QPSK 5MHz CH-High



LTE Band 13 16QAM 5MHz CH-High

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LTE Band 13 QPSK 10MHz CH-Middle	LTE Band 13 16QAM 10MHz CH-Middle

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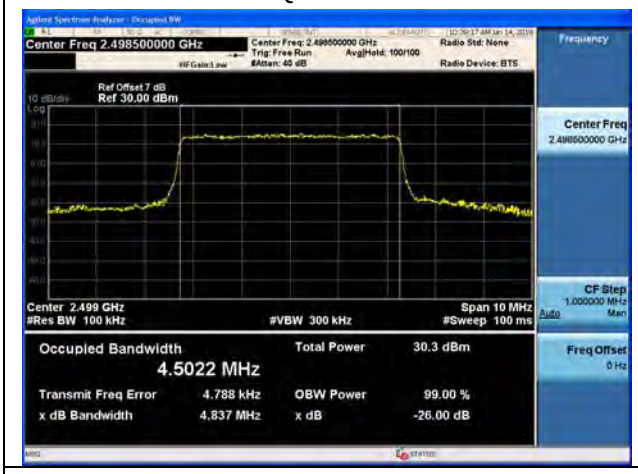
LTE Band 41 QPSK 5MHz CH-Low



LTE Band 41 QPSK 10MHz CH-Low

LTE Band 41 QPSK 5MHz CH-Middle

LTE Band 41 QPSK 10MHz CH-Middle

LTE Band 41 QPSK 5MHz CH-High

LTE Band 41 QPSK 10MHz CH-High

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

LTE Band 41 QPSK 15MHz CH-Low

LTE Band 41 QPSK 20MHz CH-Low

LTE Band 41 QPSK 15MHz CH-Middle

LTE Band 41 QPSK 20MHz CH-Middle

LTE Band 41 QPSK 15MHz CH-High

LTE Band 41 QPSK 20MHz CH-High

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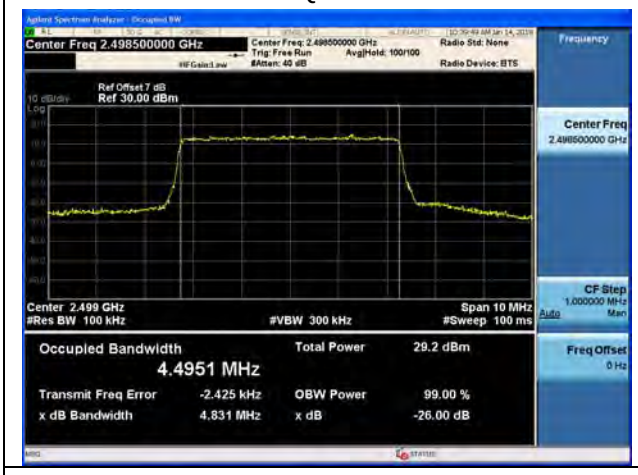
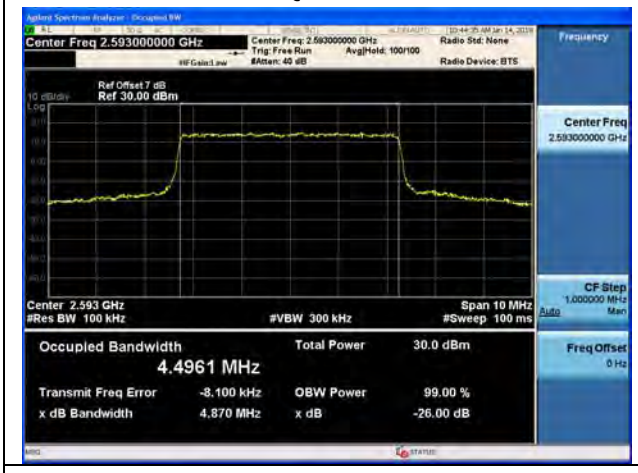
LTE Band 41 16QAM 5MHz CH-Low



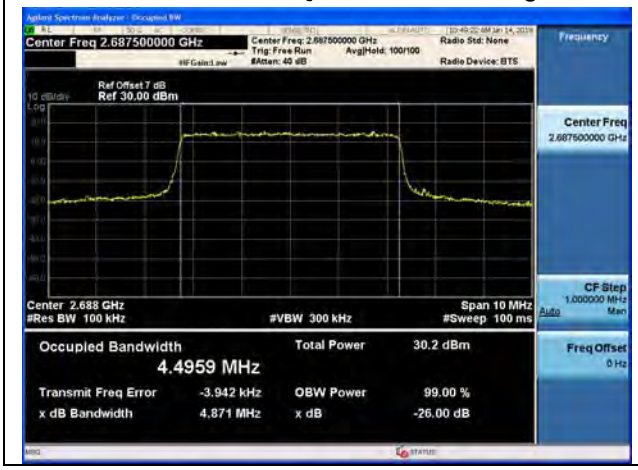
LTE Band 41 16QAM 10MHz CH-Low

LTE Band 41 16QAM 5MHz CH-Middle



LTE Band 41 16QAM 10MHz CH-Middle

LTE Band 41 16QAM 5MHz CH-High



LTE Band 41 16QAM 10MHz CH-High

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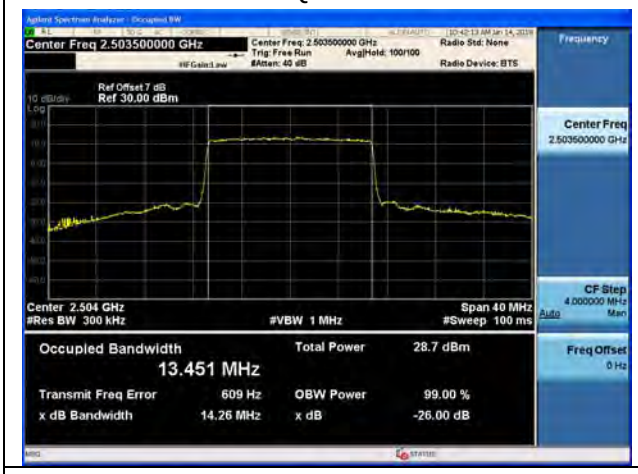
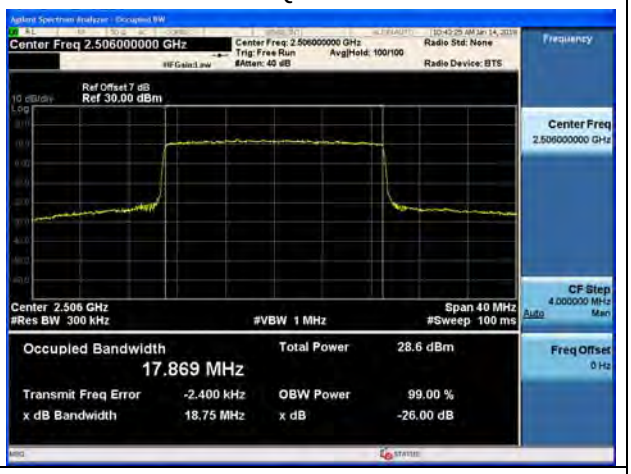
LTE Band 41 16QAM 15MHz CH-Low



LTE Band 41 16QAM 20MHz CH-Low



LTE Band 41 16QAM 15MHz CH-Middle

LTE Band 41 16QAM 20MHz CH-Middle

LTE Band 41 16QAM 15MHz CH-High

LTE Band 41 16QAM 20MHz CH-High

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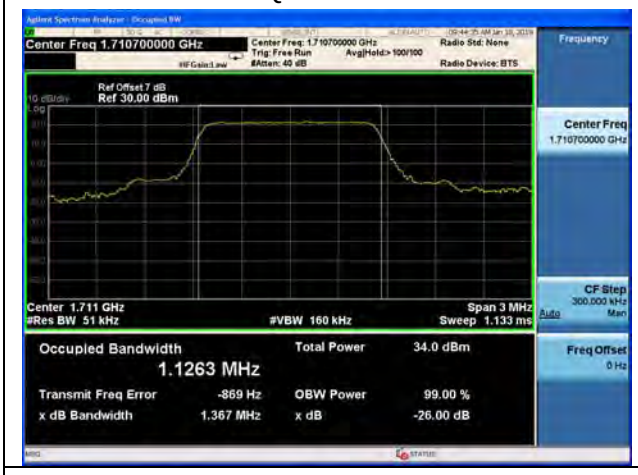
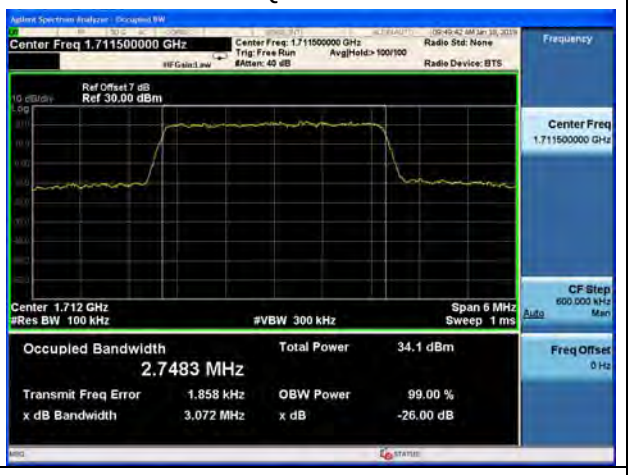
LTE Band 66 QPSK 1.4MHz CH-Low



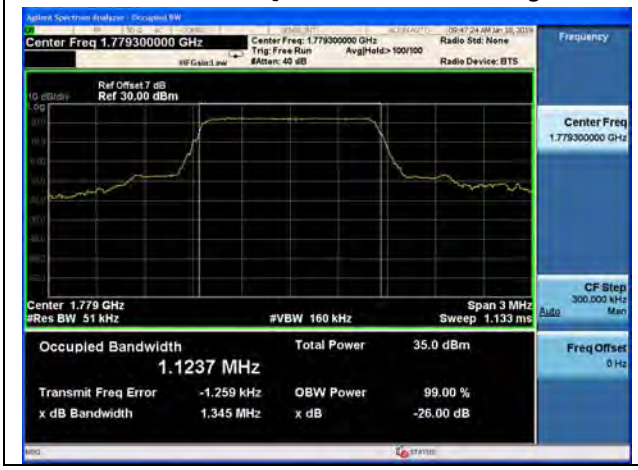
LTE Band 66 QPSK 3MHz CH-Low



LTE Band 66 QPSK 1.4MHz CH-Middle

LTE Band 66 QPSK 3MHz CH-Middle

LTE Band 66 QPSK 1.4MHz CH-High



LTE Band 66 QPSK 3MHz CH-High

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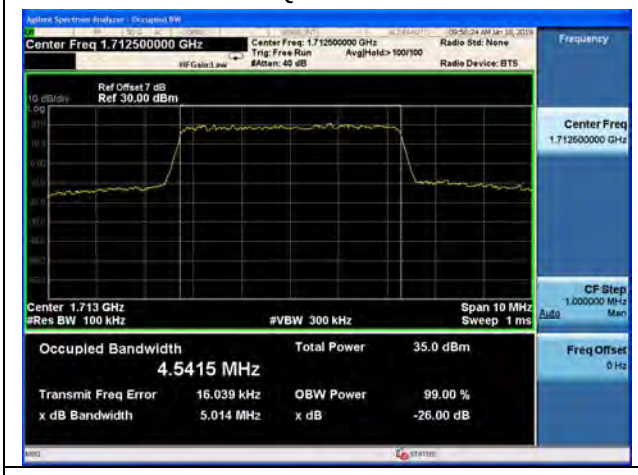
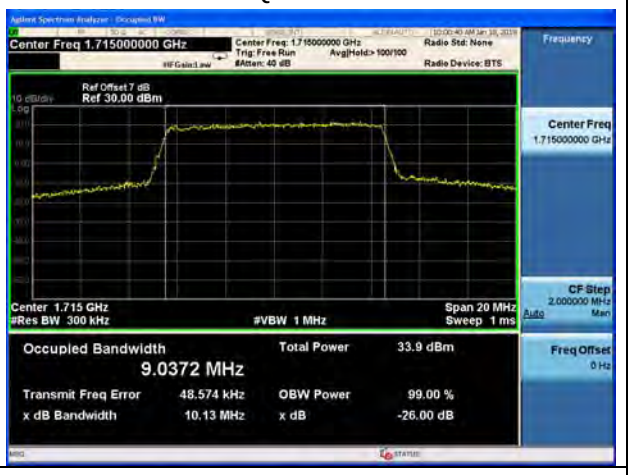
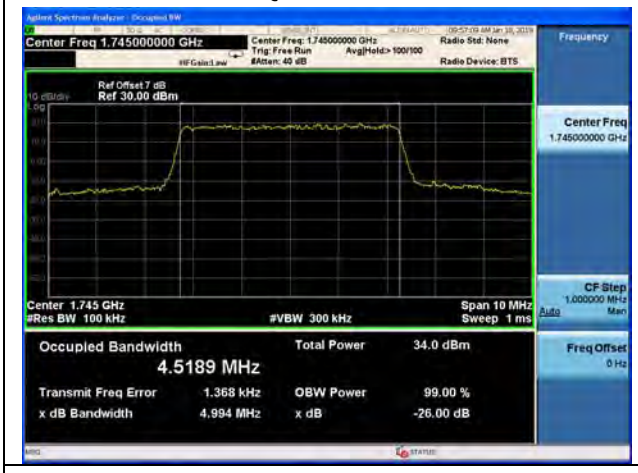
LTE Band 66 QPSK 5MHz CH-Low



LTE Band 66 QPSK 10MHz CH-Low

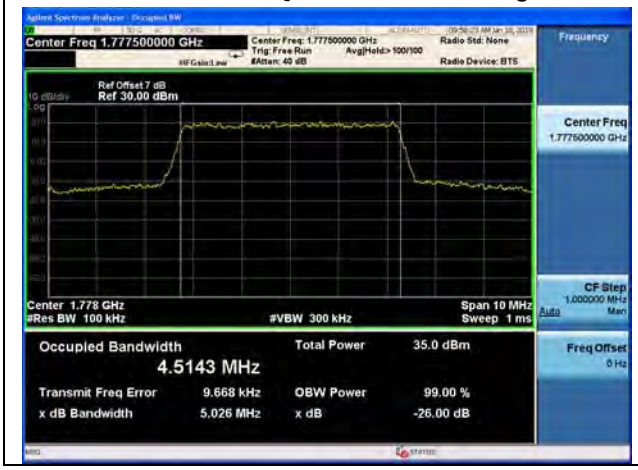


LTE Band 66 QPSK 5MHz CH-Middle



LTE Band 66 QPSK 10MHz CH-Middle

LTE Band 66 QPSK 5MHz CH-High



LTE Band 66 QPSK 10MHz CH-High

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LTE Band 66 QPSK 15MHz CH-Low

LTE Band 66 QPSK 20MHz CH-Low

LTE Band 66 QPSK 15MHz CH-Middle

LTE Band 66 QPSK 20MHz CH-Middle

LTE Band 66 QPSK 15MHz CH-High

LTE Band 66 QPSK 20MHz CH-High

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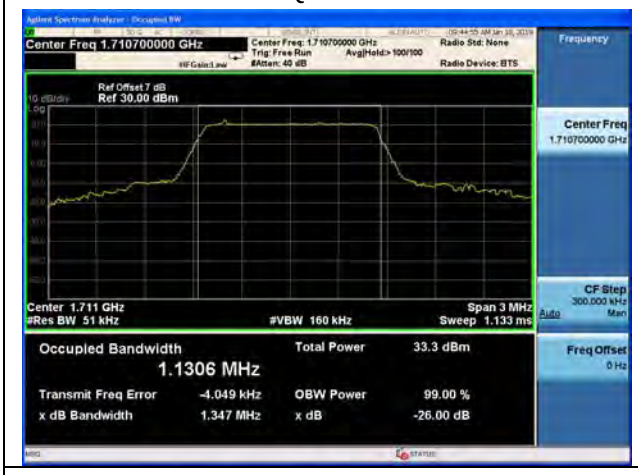
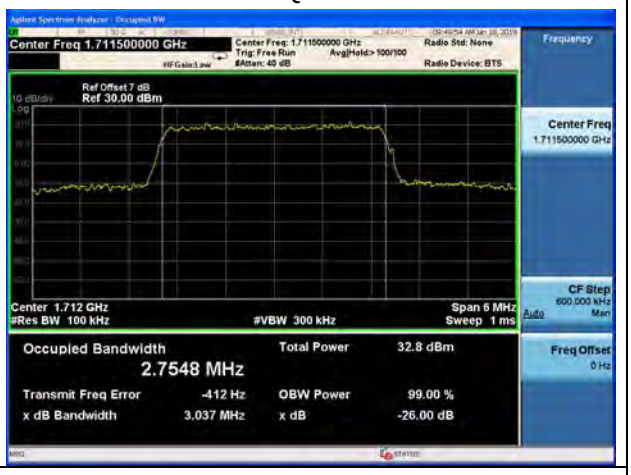
LTE Band 66 16QAM 1.4MHz CH-Low



LTE Band 66 16QAM 3MHz CH-Low



LTE Band 66 16QAM 1.4MHz CH-Middle

LTE Band 66 16QAM 3MHz CH-Middle

LTE Band 66 16QAM 1.4MHz CH-High

LTE Band 66 16QAM 3MHz CH-High

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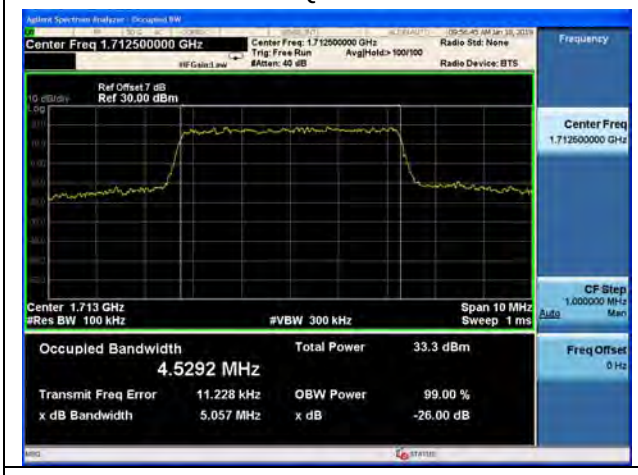
LTE Band 66 16QAM 5MHz CH-Low



LTE Band 66 16QAM 10MHz CH-Low

LTE Band 66 16QAM 5MHz CH-Middle

LTE Band 66 16QAM 10MHz CH-Middle

LTE Band 66 16QAM 5MHz CH-High

LTE Band 66 16QAM 10MHz CH-High

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LTE Band 66 16QAM 15MHz CH-Low

LTE Band 66 16QAM 20MHz CH-Low

LTE Band 66 16QAM 15MHz CH-Middle

LTE Band 66 16QAM 20MHz CH-Middle

LTE Band 66 16QAM 15MHz CH-High

LTE Band 66 16QAM 20MHz CH-High

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

LTE Band 71 QPSK 5MHz CH-Low

LTE Band 71 QPSK 10MHz CH-Low

LTE Band 71 QPSK 5MHz CH-Middle

LTE Band 71 QPSK 10MHz CH-Middle

LTE Band 71 QPSK 5MHz CH-High

LTE Band 71 QPSK 10MHz CH-High

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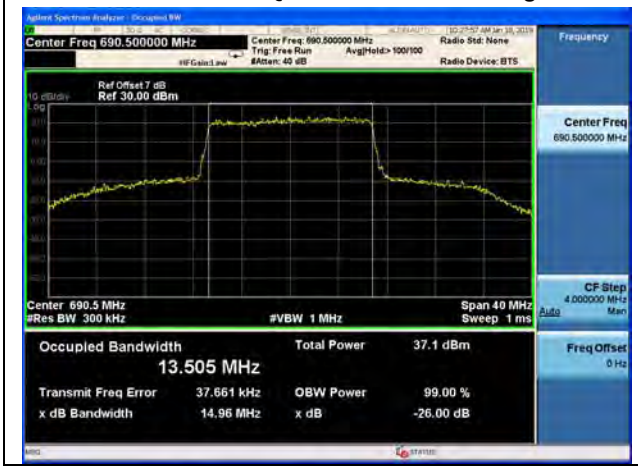
LTE Band 71 QPSK 15MHz CH-Low

LTE Band 71 QPSK 20MHz CH-Low

LTE Band 71 QPSK 15MHz CH-Middle

LTE Band 71 QPSK 20MHz CH-Middle

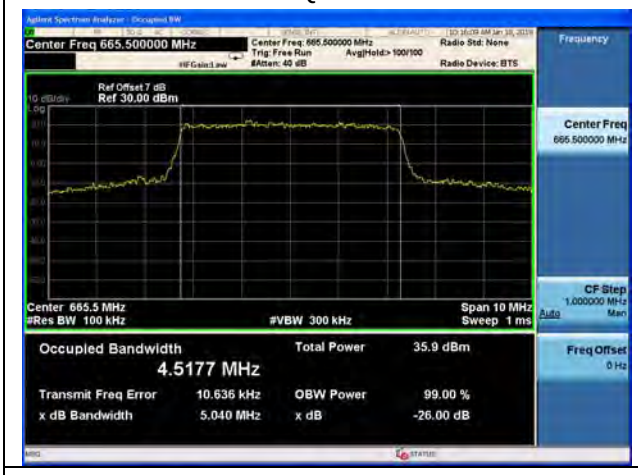
LTE Band 71 QPSK 15MHz CH-High



LTE Band 71 QPSK 20MHz CH-High

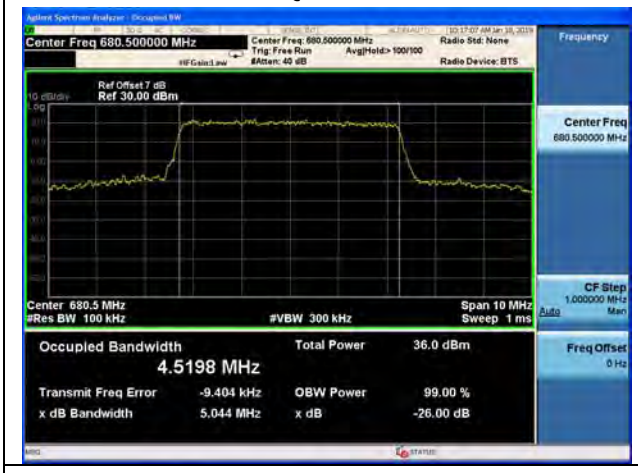
This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

LTE Band 71 16QAM 5MHz CH-Low



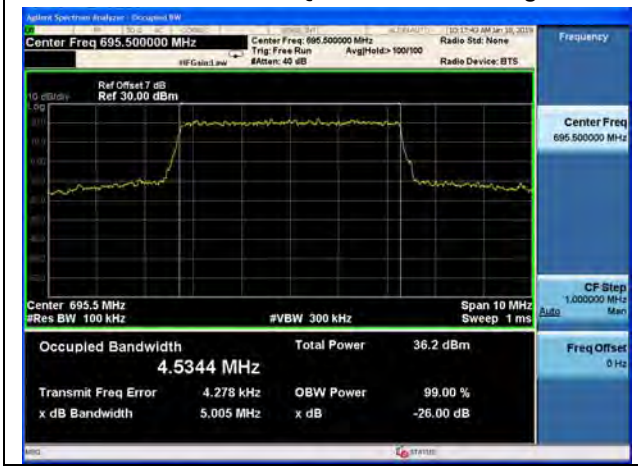
LTE Band 71 16QAM 10MHz CH-Low

LTE Band 71 16QAM 5MHz CH-Middle



LTE Band 71 16QAM 10MHz CH-Middle

LTE Band 71 16QAM 5MHz CH-High



LTE Band 71 16QAM 10MHz CH-High

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LTE Band 71 16QAM 15MHz CH-Low

LTE Band 71 16QAM 20MHz CH-Low

LTE Band 71 16QAM 15MHz CH-Middle

LTE Band 71 16QAM 20MHz CH-Middle

LTE Band 71 16QAM 15MHz CH-High

LTE Band 71 16QAM 20MHz CH-High

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5.4 Band Edge Compliance

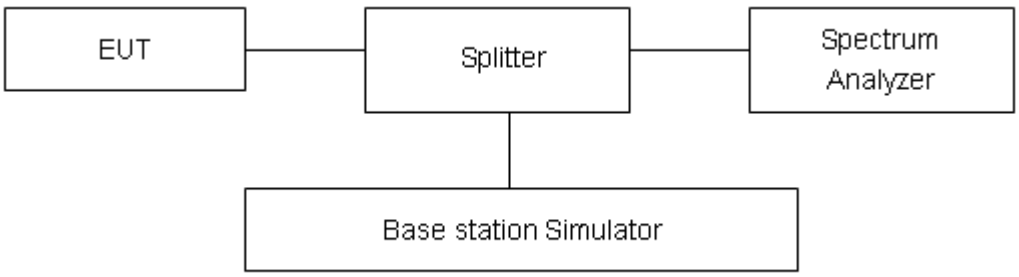
Ambient condition

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.
For LTE Band 41 Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
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 4/12/66 (1.4MHz).
RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4/12/66 (3MHz).
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/12/13/66/71 (5MHz).
RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/12/13/66//71 (10MHz).
RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4/66/71 (15MHz).
RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4/66/71 (20MHz)
RBW is set to 50 kHz, VBW is set to 200 kHz for LTE Band 7/41 (5MHz)
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 7/41 (10MHz)
RBW is set to 200 kHz, VBW is set to 1MHz for LTE Band 7/41 (15MHz/20MHz)
RBW is set to 10 kHz, VBW is set to 30 kHz for LTE Band 13 (763MHz~775MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 13 (775MHz~777MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 13 (787MHz~793MHz).
RBW is set to 10 kHz, VBW is set to 30 kHz for LTE Band 13 (793MHz~805MHz).
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



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Limits

Rule Part 27.53(i) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz.

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(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

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 that 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 + 10log (P) dB below the transmitter power P(Watts)
= P(W)- [43 + 10log(P)] (dB)
= [30 + 10log (P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Rule Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

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(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;
(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;
(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

Measurement Uncertainty

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

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Test Result

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

WCDMA Band IV CH-Low	WCDMA Band IV CH-High

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LTE Band 4 QPSK 1.4MHz CH-Low, 1 RB

LTE Band 4 QPSK 1.4MHz CH-High, 1 RB

LTE Band 4 QPSK 1.4MHz CH-Low, 100%RB

LTE Band 4 QPSK 1.4MHz CH-High, 100%RB

LTE Band 4 QPSK 3MHz CH-Low, 1 RB

LTE Band 4 QPSK 3MHz CH-High, 1 RB

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LTE Band 4 QPSK 3MHz CH-Low, 100%RB

LTE Band 4 QPSK 3MHz CH-High, 100%RB

LTE Band 4 QPSK 5MHz CH-Low, 1 RB

LTE Band 4 QPSK 5MHz CH-High, 1 RB

LTE Band 4 QPSK 5MHz CH-Low, 100%RB

LTE Band 4 QPSK 5MHz CH-High, 100%RB

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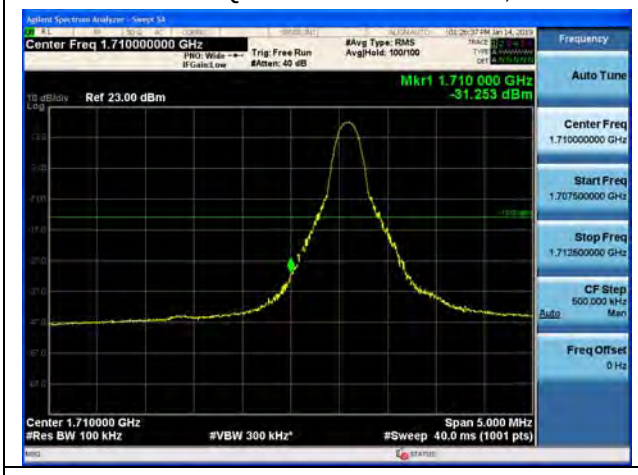
LTE Band 4 QPSK 10MHz CH-Low, 1 RB



LTE Band 4 QPSK 10MHz CH-High, 1 RB

LTE Band 4 QPSK 10MHz CH-Low, 100%RB

LTE Band 4 QPSK 10MHz CH-High, 100%RB

LTE Band 4 QPSK 15MHz CH-Low, 1 RB

LTE Band 4 QPSK 15MHz CH-High, 1 RB

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LTE Band 4 QPSK 15MHz CH-Low, 100%RB

LTE Band 4 QPSK 15MHz CH-High, 100%RB

LTE Band 4 QPSK 20MHz CH-Low, 1 RB

LTE Band 4 QPSK 20MHz CH-High, 1 RB

LTE Band 4 QPSK 20MHz CH-Low, 100%RB

LTE Band 4 QPSK 20MHz CH-High, 100%RB

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LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB

LTE Band 4 16QAM 1.4MHz CH-High, 1 RB

LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB

LTE Band 4 16QAM 1.4MHz CH-High, 100%RB

LTE Band 4 16QAM 3MHz CH-Low, 1 RB

LTE Band 4 16QAM 3MHz CH-High, 1 RB

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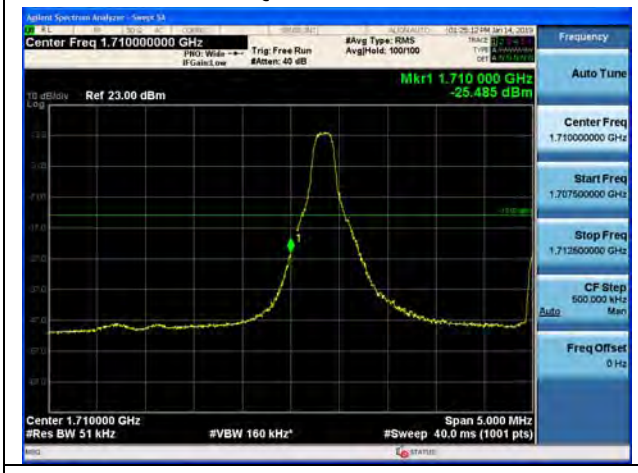
LTE Band 4 16QAM 3MHz CH-Low, 100%RB

LTE Band 4 16QAM 3MHz CH-High, 100%RB

LTE Band 4 16QAM 5MHz CH-Low, 1 RB



LTE Band 4 16QAM 5MHz CH-High, 1 RB

LTE Band 4 16QAM 5MHz CH-Low, 100%RB

LTE Band 4 16QAM 5MHz CH-High, 100%RB

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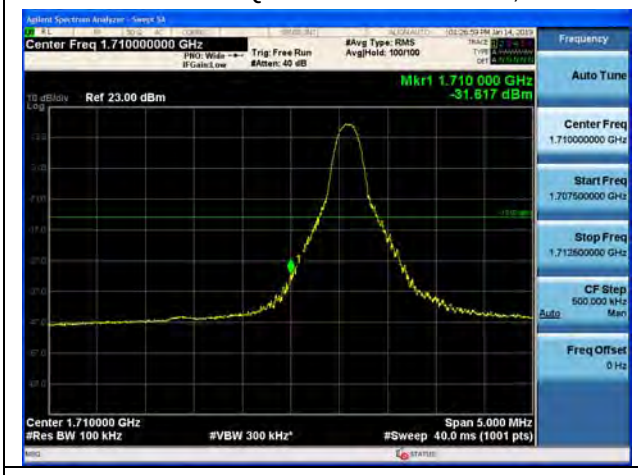
LTE Band 4 16QAM 10MHz CH-Low, 1 RB



LTE Band 4 16QAM 10MHz CH-High, 1 RB

LTE Band 4 16QAM 10MHz CH-Low, 100%RB

LTE Band 4 16QAM 10MHz CH-High, 100%RB

LTE Band 4 16QAM 15MHz CH-Low, 1 RB

LTE Band 4 16QAM 15MHz CH-High, 1 RB

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LTE Band 4 16QAM 15MHz CH-Low, 100%RB

LTE Band 4 16QAM 15MHz CH-High, 100%RB

LTE Band 4 16QAM 20MHz CH-Low, 1 RB

LTE Band 4 16QAM 20MHz CH-High, 1 RB

LTE Band 4 16QAM 20MHz CH-Low, 100%RB

LTE Band 4 16QAM 20MHz CH-High, 100%RB

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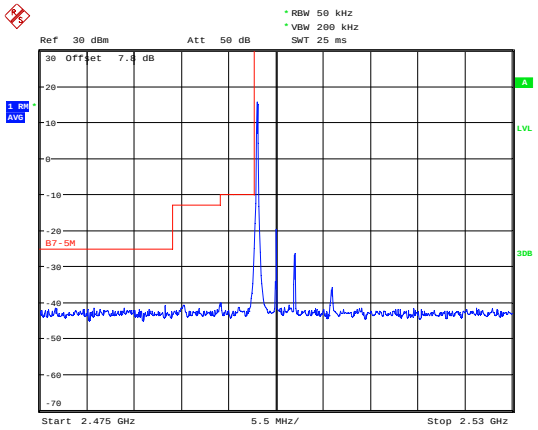
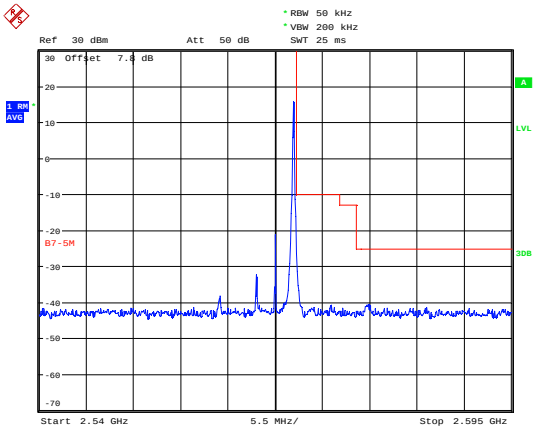
LTE Band 7 QPSK 5MHz CH-Low, 1 RB



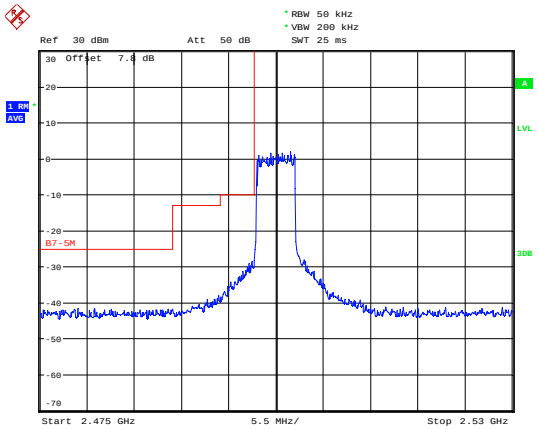
Date: 19.JAN.2019 12:47:11

LTE Band 7 QPSK 5MHz CH-High, 1 RB



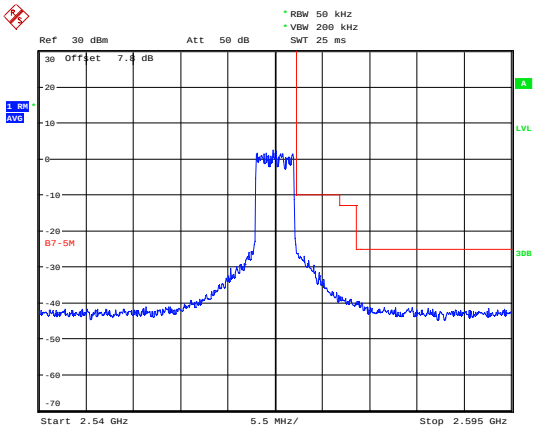
Date: 19.JAN.2019 13:55:04

LTE Band 7 QPSK 5MHz CH-Low, 100%RB



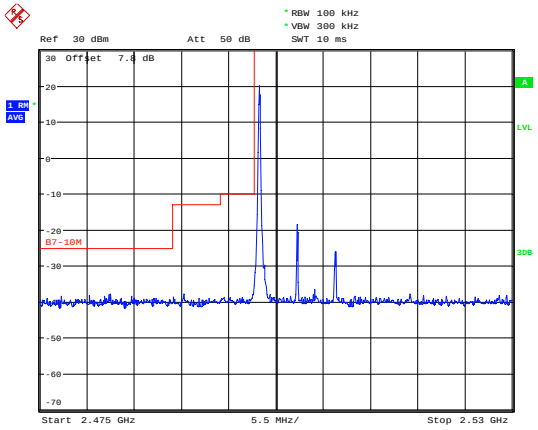
Date: 19.JAN.2019 12:47:35

LTE Band 7 QPSK 5MHz CH-High, 100%RB



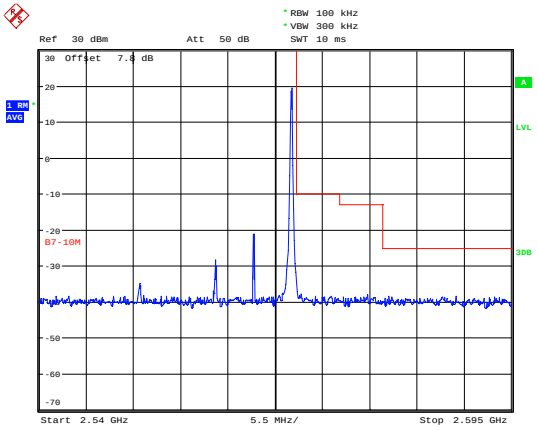
Date: 19.JAN.2019 13:55:26

LTE Band 7 QPSK 10MHz CH-Low, 1 RB



Date: 19.JAN.2019 12:48:57

LTE Band 7 QPSK 10MHz CH-High, 1 RB



Date: 19.JAN.2019 14:02:56

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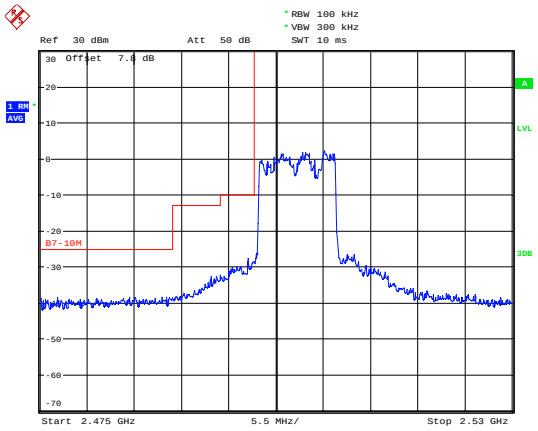
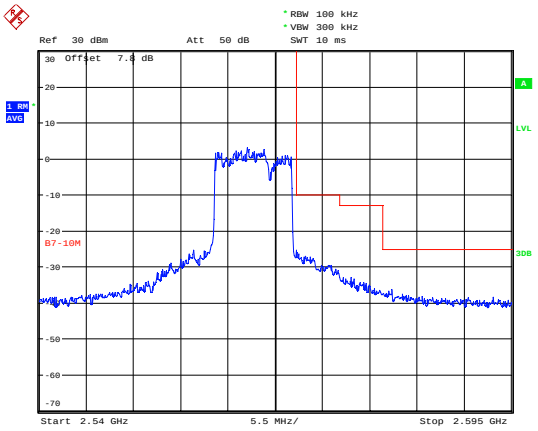
LTE Band 7 QPSK 10MHz CH-Low, 100%RB



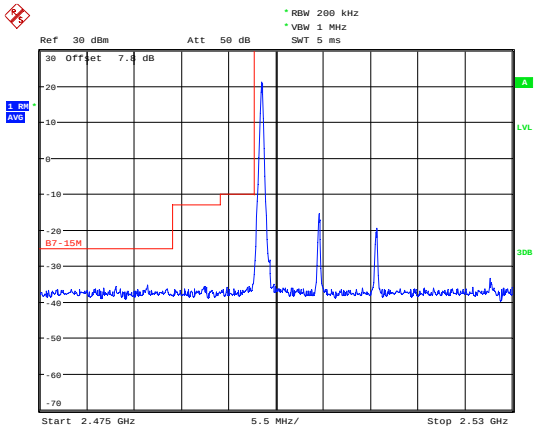
Date: 19.JAN.2019 12:49:18

LTE Band 7 QPSK 10MHz CH-High, 100%RB



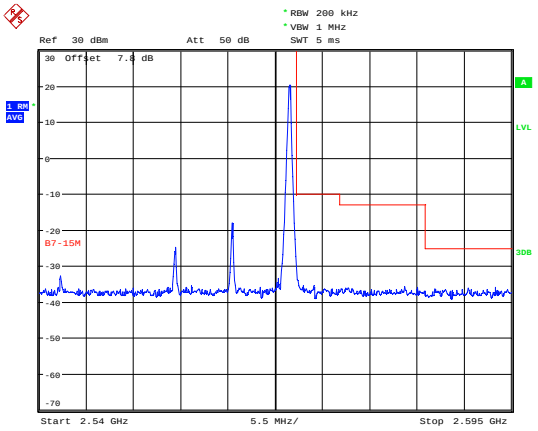
Date: 19.JAN.2019 14:03:13

LTE Band 7 QPSK 15MHz CH-Low, 1 RB



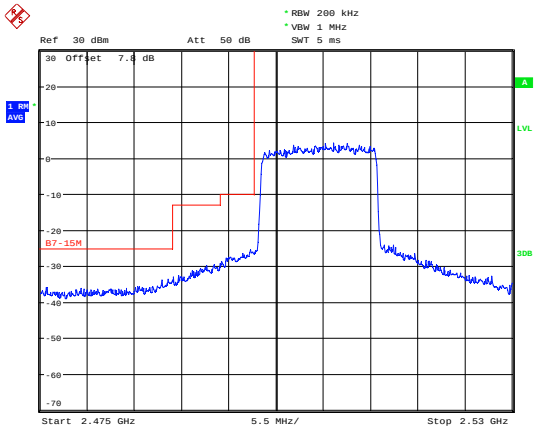
Date: 19.JAN.2019 12:51:06

LTE Band 7 QPSK 15MHz CH-High, 1 RB



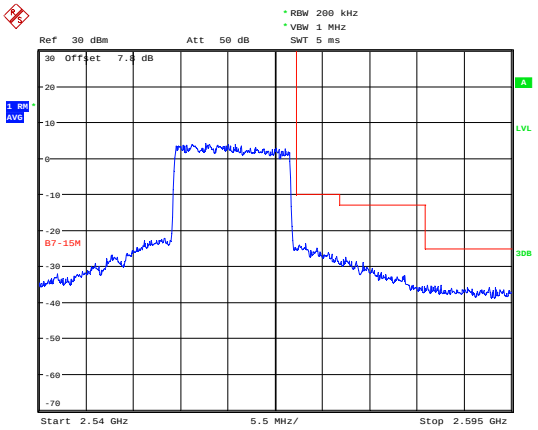
Date: 19.JAN.2019 14:01:39

LTE Band 7 QPSK 15MHz CH-Low, 100%RB



Date: 19.JAN.2019 12:51:27

LTE Band 7 QPSK 15MHz CH-High, 100%RB



Date: 19.JAN.2019 14:02:04

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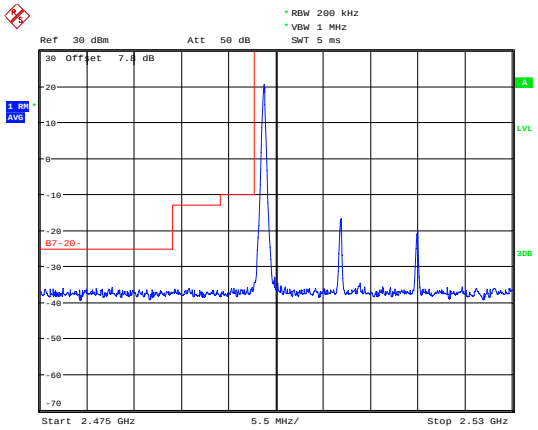
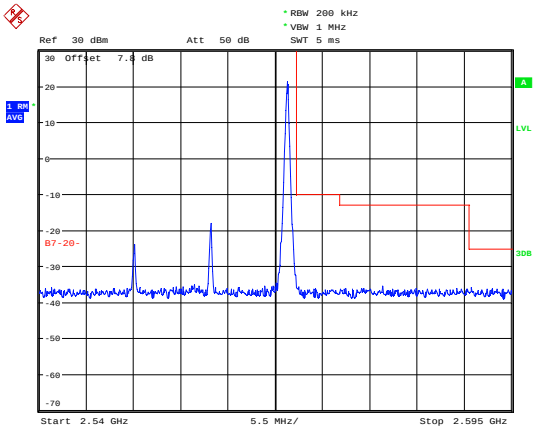
LTE Band 7 QPSK 20MHz CH-Low, 1 RB



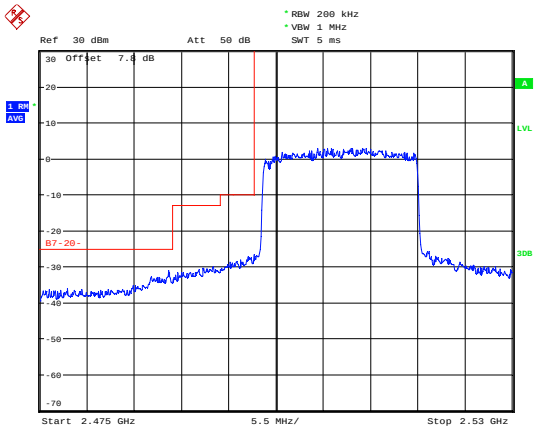
Date: 19.JAN.2019 12:52:17

LTE Band 7 QPSK 20MHz CH-High, 1 RB



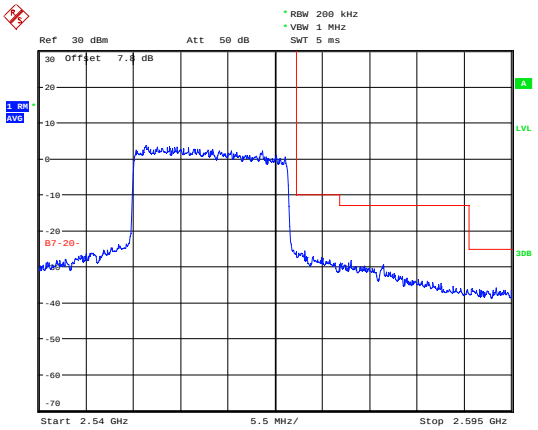
Date: 19.JAN.2019 14:04:00

LTE Band 7 QPSK 20MHz CH-Low, 100%RB



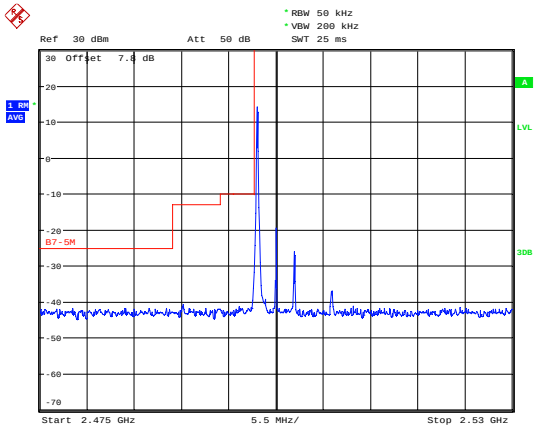
Date: 19.JAN.2019 12:52:37

LTE Band 7 QPSK 20MHz CH-High, 100%RB



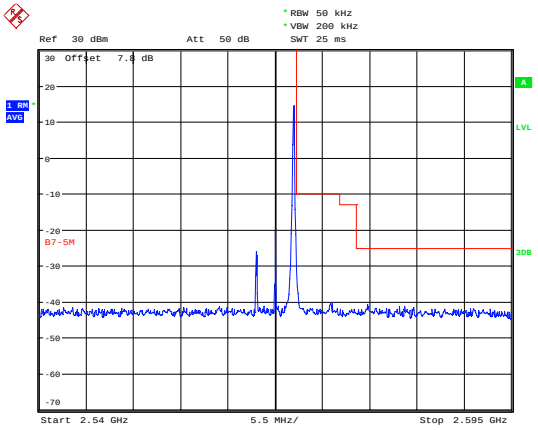
Date: 19.JAN.2019 14:04:33

LTE Band 7 16QAM 5MHz CH-Low, 1 RB



Date: 19.JAN.2019 12:47:22

LTE Band 7 16QAM 5MHz CH-High, 1 RB



Date: 19.JAN.2019 13:55:14

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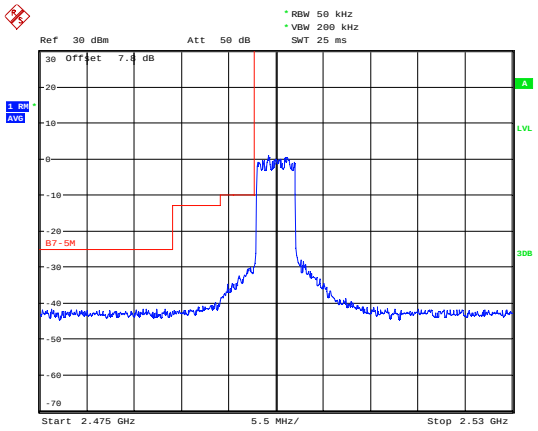
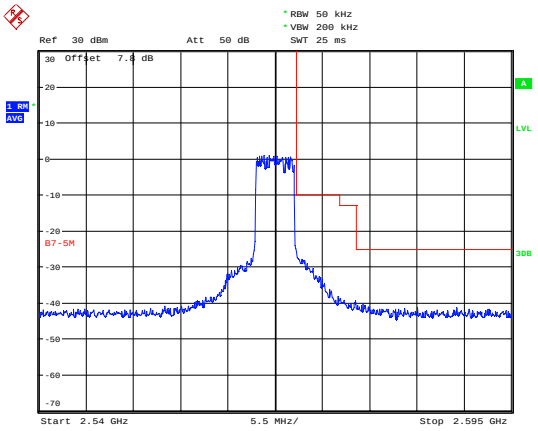
LTE Band 7 16QAM 5MHz CH-Low, 100%RB



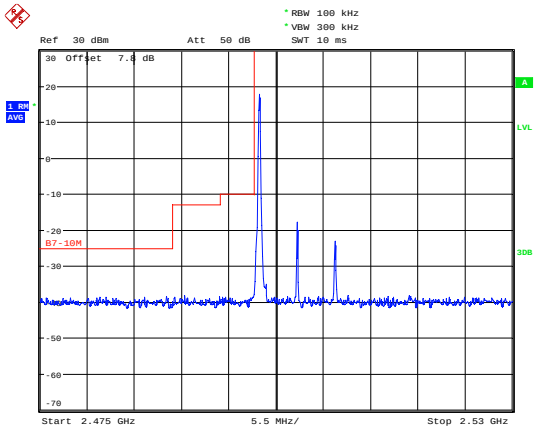
Date: 19.JAN.2019 12:47:46

LTE Band 7 16QAM 5MHz CH-High, 100%RB



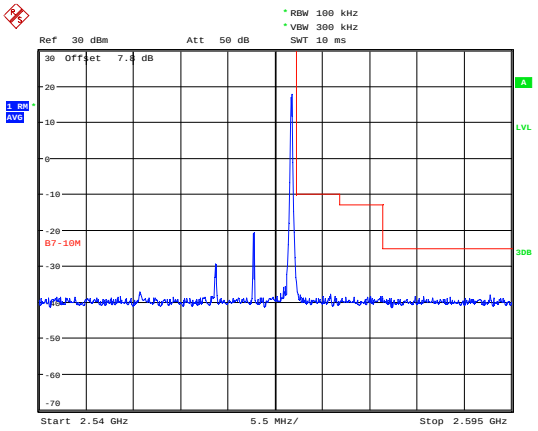
Date: 19.JAN.2019 13:55:34

LTE Band 7 16QAM 10MHz CH-Low, 1 RB



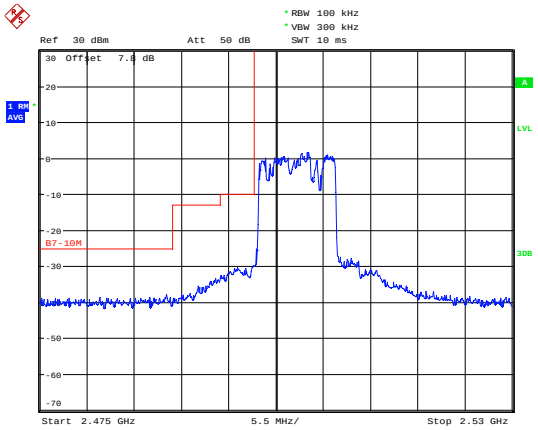
Date: 19.JAN.2019 12:49:06

LTE Band 7 16QAM 10MHz CH-High, 1 RB



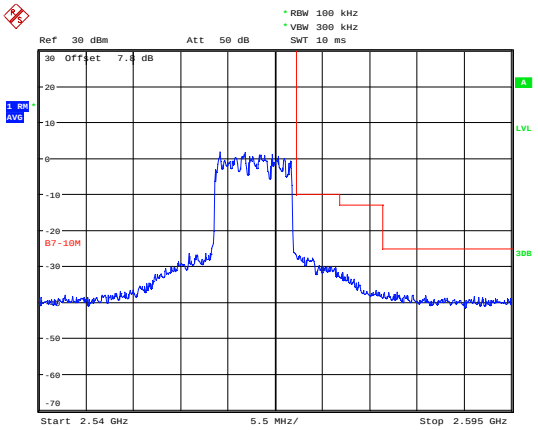
Date: 19.JAN.2019 14:03:03

LTE Band 7 16QAM 10MHz CH-Low, 100%RB



Date: 19.JAN.2019 12:49:27

LTE Band 7 16QAM 10MHz CH-High, 100%RB



Date: 19.JAN.2019 14:03:21

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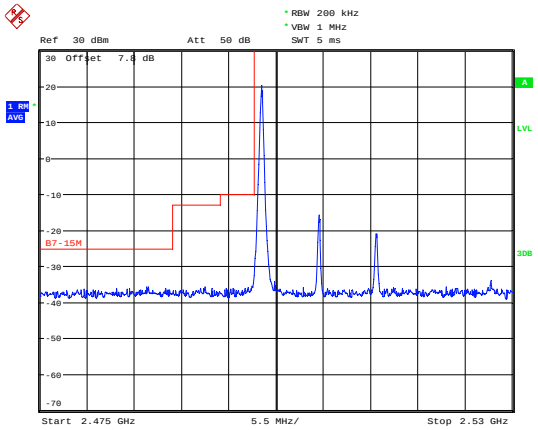
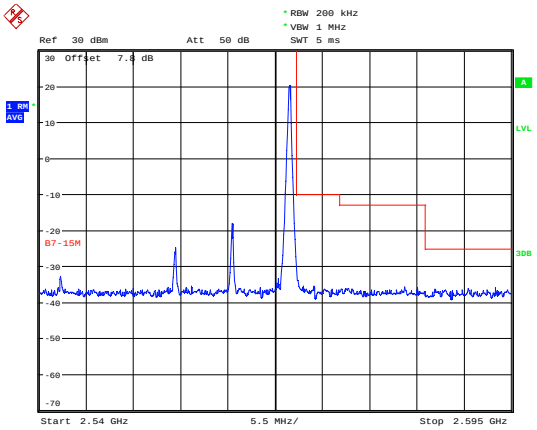
LTE Band 7 16QAM 15MHz CH-Low, 1 RB



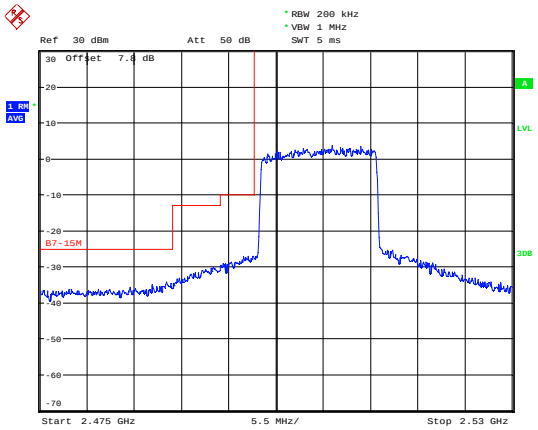
Date: 19.JAN.2019 12:51:16

LTE Band 7 16QAM 15MHz CH-High, 1 RB



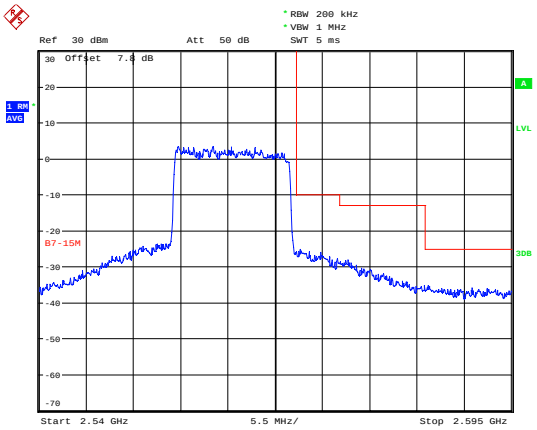
Date: 19.JAN.2019 14:01:39

LTE Band 7 16QAM 15MHz CH-Low, 100%RB



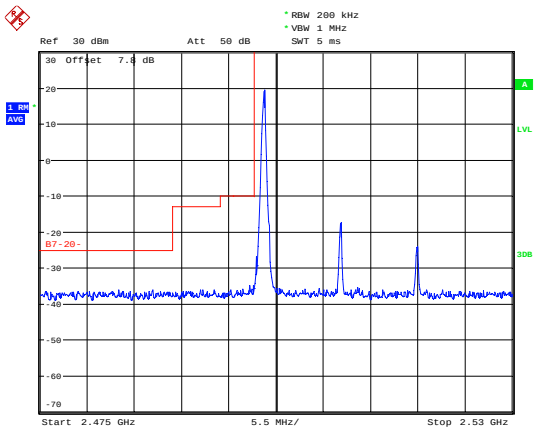
Date: 19.JAN.2019 12:51:37

LTE Band 7 16QAM 15MHz CH-High, 100%RB



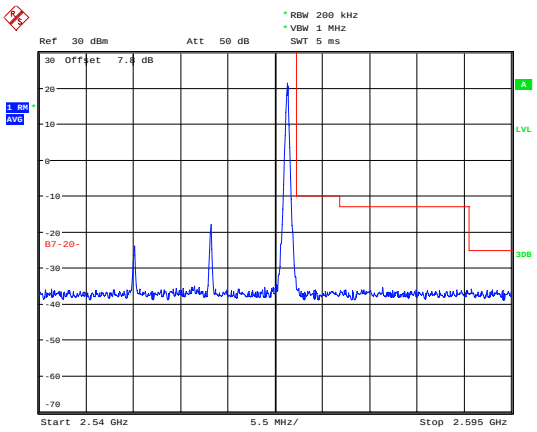
Date: 19.JAN.2019 14:02:11

LTE Band 7 16QAM 20MHz CH-Low, 1 RB



Date: 19.JAN.2019 12:52:25

LTE Band 7 16QAM 20MHz CH-High, 1 RB



Date: 19.JAN.2019 14:04:00

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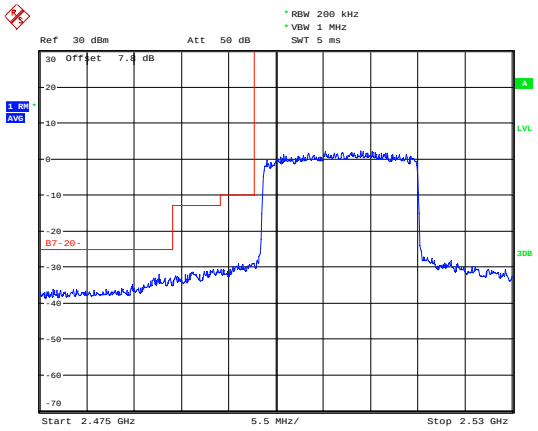
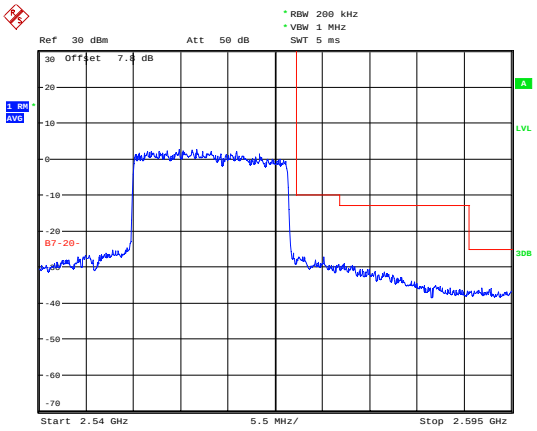
LTE Band 7 16QAM 20MHz CH-Low, 100%RB	LTE Band 7 16QAM 20MHz CH-High, 100%RB
	
Date: 19.JAN.2019 12:52:49	Date: 19.JAN.2019 14:04:40

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LTE Band 12 QPSK 1.4MHz CH-Low, 1 RB

LTE Band 12 QPSK 1.4MHz CH-High, 1 RB

LTE Band 12 QPSK 1.4MHz CH-Low, 100%RB

LTE Band 12 QPSK 1.4MHz CH-High, 100%RB

LTE Band 12 QPSK 3MHz CH-Low, 1 RB

LTE Band 12 QPSK 3MHz CH-High, 1 RB

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LTE Band 12 QPSK 3MHz CH-Low, 100%RB

LTE Band 12 QPSK 3MHz CH-High, 100%RB

LTE Band 12 QPSK 5MHz CH-Low, 1 RB

LTE Band 12 QPSK 5MHz CH-High, 1 RB

LTE Band 12 QPSK 5MHz CH-Low, 100%RB

LTE Band 12 QPSK 5MHz CH-High, 100%RB

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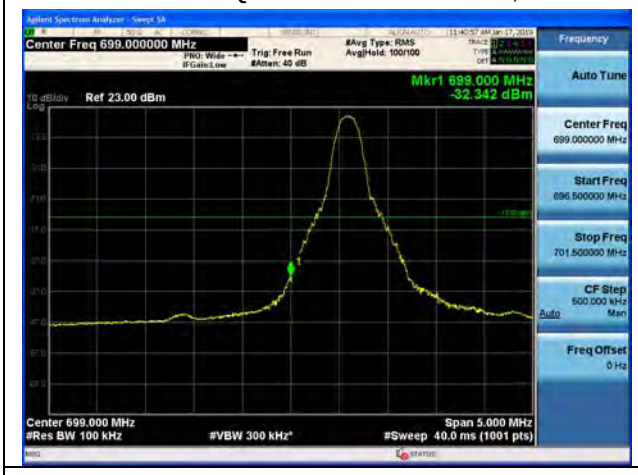
LTE Band 12 QPSK 10MHz CH-Low, 1 RB



LTE Band 12 QPSK 10MHz CH-High, 1 RB

LTE Band 12 QPSK 10MHz CH-Low, 100%RB

LTE Band 12 QPSK 10MHz CH-High, 100%RB

LTE Band 12 16QAM 1.4MHz CH-Low, 1 RB

LTE Band 12 16QAM 1.4MHz CH-High, 1 RB

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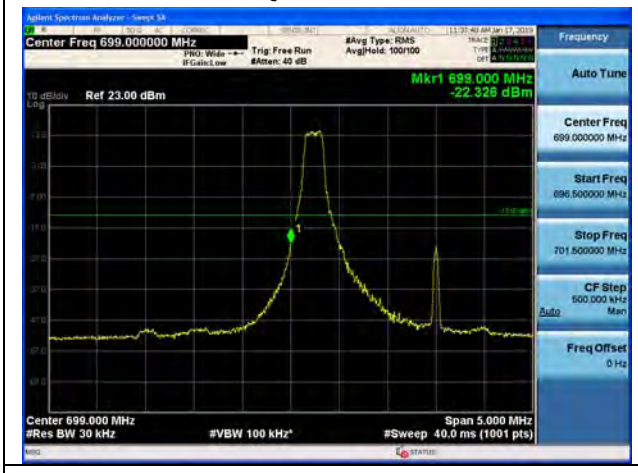
LTE Band 12 16QAM 1.4MHz CH-Low, 100%RB

LTE Band 12 16QAM 1.4MHz CH-High, 100%RB

LTE Band 12 16QAM 3MHz CH-Low, 1 RB



LTE Band 12 16QAM 3MHz CH-High, 1 RB

LTE Band 12 16QAM 3MHz CH-Low, 100%RB

LTE Band 12 16QAM 3MHz CH-High, 100%RB

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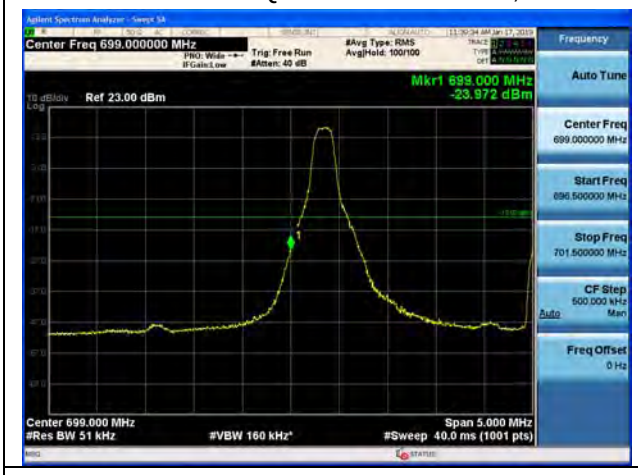
LTE Band 12 16QAM 5MHz CH-Low, 1 RB



LTE Band 12 16QAM 5MHz CH-High, 1 RB

LTE Band 12 16QAM 5MHz CH-Low, 100%RB

LTE Band 12 16QAM 5MHz CH-High, 100%RB

LTE Band 12 16QAM 10MHz CH-Low, 1 RB

LTE Band 12 16QAM 10MHz CH-High, 1 RB

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LTE Band 12 16QAM 10MHz CH-Low, 100%RB

LTE Band 12 16QAM 10MHz CH-High, 100%RB

LTE Band 13 QPSK 5MHz CH-Low, 1 RB (763MHz ~775MHz)

LTE Band 13 QPSK 5MHz CH-Low, 1 RB (775MHz ~777MHz)

LTE Band 13 QPSK 5MHz CH-High, 1 RB (787MHz ~793MHz)

LTE Band 13 QPSK 5MHz CH-High, 1 RB (793MHz ~805MHz)

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LTE Band 13 QPSK 5MHz CH-Low, 100%RB (763MHz ~775MHz)

LTE Band 13 QPSK 5MHz CH-Low, 100%RB (775MHz ~777MHz)

LTE Band 13 QPSK 5MHz CH-High, 100%RB (787MHz ~793MHz)

LTE Band 13 QPSK 5MHz CH-High, 100%RB (793MHz ~805MHz)

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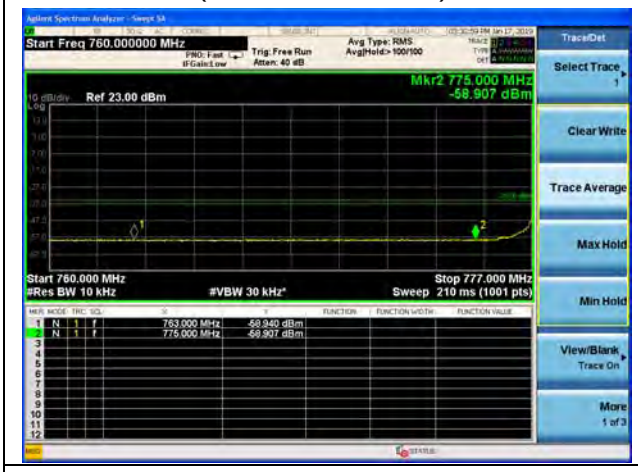
LTE Band 13 QPSK 10MHz CH-Low, 1 RB (763MHz ~775MHz)



LTE Band 13 QPSK 10MHz CH-Low, 1 RB (775MHz ~777MHz)

LTE Band 13 QPSK 10MHz CH-High, 1 RB (787MHz ~793MHz)

LTE Band 13 QPSK 10MHz CH-High, 1 RB (793MHz ~805MHz)

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LTE Band 13 QPSK 10MHz CH-Low, 100%RB (763MHz ~775MHz)

LTE Band 13 QPSK 10MHz CH-Low, 100%RB (775MHz ~777MHz)

LTE Band 13 QPSK 10MHz CH-High, 100%RB (787MHz ~793MHz)

LTE Band 13 QPSK 10MHz CH-High, 100%RB (793MHz ~805MHz)

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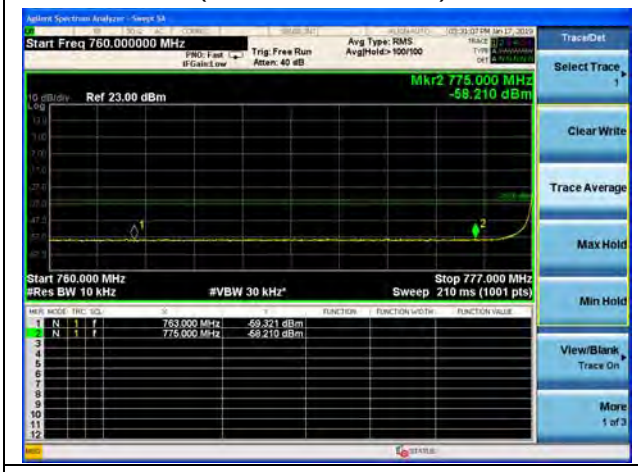
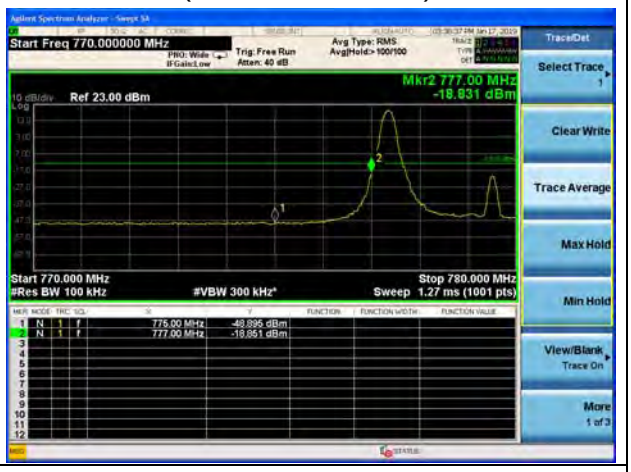
LTE Band 13 16QAM 5MHz CH-Low, 1 RB (763MHz ~775MHz)



LTE Band 13 16QAM 5MHz CH-Low, 1 RB (775MHz ~777MHz)



LTE Band 13 16QAM 5MHz CH-High, 1 RB (787MHz ~793MHz)

LTE Band 13 16QAM 5MHz CH-High, 1 RB (793MHz ~805MHz)

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