RF TEST REPORT

SIEMIC
GLOBAL TESTING & CERTIFICATIONS
YOUR CHOICE FOR- TCB FCB CB NB CAB RCB

Report No.: 15070892-FCC-R5

Supersede Report No.: N/A

Applicant	SENMAX INC.
Product Name	LTE Phone
Model No.	Carbon
Serial No.	N/A
Test Standard	FCC Part 22(H), FCC Part 24(E), FCC Part 27: 2014; ANSI/TIA C603 D: 2010
Test Date	October 10 to October 31, 2015
Issue Date	October 31, 2015
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Winnie Zhang	David Huang	
Winnie Zhang Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
15070892-FCC-R5	NONE	Original	October 31, 2015

2. Customer information

Applicant Name	SENMAX INC.
Applicant Add	2300 GRAYSON DR # 1611 GRAPEVINE, TX 76051
Manufacturer	SENMAX INC.
Manufacturer Add	2300 GRAYSON DR # 1611 GRAPEVINE, TX 76051

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	LTE Phone
Main Model:	Carbon
Serial Model:	N/A
Date EUT received:	October 09, 2015
Test Date(s):	October 10 to October 31, 2015
Equipment Category：	PCE
Antenna Gain:	GSM850: -7.22 dBi PCS1900: -2.93 dBi UMTS-FDD Band V: -7.22 dBi UMTS-FDD Band IV: -2.55 dBi UMTS-FDD Band II:-2.93 dBi Bluetooth/BLE:-2.94 dBi WIFI:-2.94 dBi LTE Band 2: -3.96 dBi LTE Band 4: -2.33 dBi LTE Band 7: -2.54 dBi LTE Band 17: -8.25 dBi GPS:-3.56 dBi
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK, 8PSK UMTS-FDD: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK LTE Band: QPSK, 16QAM GPS:BPSK
Port:	Power Port, Earphone Port, USB Port

Maximum Conducted AV Power to Antenna:	LTE Band 2: 23.59 dBm LTE Band 4: 22.65 dBm LTE Band 7: 22.65 dBm LTE Band 17: 24.09 dBm
ERP/EIRP:	LTE Band 2: 19.56 dBm / EIRP LTE Band 4: 19.38 dBm / EIRP LTE Band 7: 20.05 dBm / EIRP LTE Band 17: 18.62 dBm / ERP
Input Power:	Battery: Spec:3.8V,2850mAh Adapter: Model:TPA-955100UU Input: 100-240V; 50/60Hz; 150mA Output: DC 5.0V,1000mA
Trade Name :	Ojji
GPRS/EGPRS Multi-slot class	8/10/12
FCC ID:	2AF99CARBON

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§ 1.1307; § 2.1093	RF Exposure (SAR)	Compliance
§2.1046; § 22.913(a); § 24.232(c); § 27.50(c.10); § 27.50(d.4)	RF Output Power	Compliance
§ 24.232 (d); § 27.50(d)	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	Compliance
§ 2.1049; § 22.905; § 22.917; § 24.238; § 27.53(a.5)	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 22.917(a); § 24.238(a); § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917(a); § 24.238(a); § 27.53(h)	Field Strength of Spurious Radiation	Compliance
§ 22.917(a); § 24.238(a);	Out of band emission, Band Edge	Compliance
§ 27.53(m)	Band Edge 27.53(m)	Compliance
§ 2.1055; § 22.355; § 24.235; § 27.5(h); § 27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

Measurement Uncertainty

Emissions		
Test Item	**Description**	**Uncertainty**
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

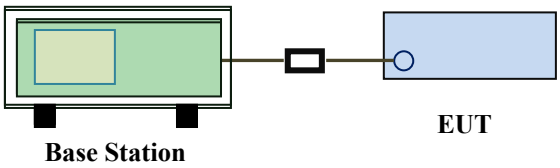
Test Result: Pass

The EUT is a portable device, thus requires SAR evaluation;
Please refer to RF Exposure Evaluation Report: 15070892-FCC-H.

6.2 RF Output Power

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	October 15, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	☑
§24.232 (c)	b)	EIRP:33dBm	☑
§27.50 (c)	c)	EIRP: 30dBm	☑
Test Setup			
Test Procedure	For Conducted Power: - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. For ERP/EIRP: - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. - The frequency range up to tenth harmonic of the fundamental frequency was investigated.		

	- Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. - Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level - Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Conducted Power

LTE Band 2:

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
20MHz	18700	1860.0	QPSK	1	0	0	**23.49**	23±1
				1	49	0	23.46	23±1
				1	99	0	23.43	23±1
				50	0	1	22.47	23±1
				50	24	1	22.43	23±1
				50	49	1	22.41	23±1
				100	0	1	22.45	23±1
			16QAM	1	0	1	22.90	22±1
				1	49	1	22.94	22±1
				1	99	1	22.93	22±1
				50	0	2	21.65	22±1
				50	24	2	21.63	22±1
				50	49	2	21.68	22±1
				100	0	2	21.70	22±1
	18900	1880.0	QPSK	1	0	0	23.50	23±1
				1	49	0	23.54	23±1
				1	99	0	23.59	23±1
				50	0	1	22.38	23±1
				50	24	1	22.36	23±1
				50	49	1	22.34	23±1
				100	0	1	22.35	23±1
			16QAM	1	0	1	22.44	22±1
				1	49	1	22.46	22±1
				1	99	1	22.48	22±1
				50	0	2	21.53	22±1
				50	24	2	21.56	22±1
				50	49	2	21.51	22±1
				100	0	2	21.44	22±1
	19100	1900.0	QPSK	1	0	0	23.17	23±1
				1	49	0	23.16	23±1
				1	99	0	23.14	23±1
				50	0	1	22.59	23±1
				50	24	1	22.56	23±1
				50	49	1	22.51	23±1
				100	0	1	22.53	23±1
			16QAM	1	0	1	22.58	22±1
				1	49	1	22.56	22±1
				1	99	1	22.53	22±1
				50	0	2	21.71	22±1
				50	24	2	21.75	22±1
				50	49	2	21.73	22±1
				100	0	2	21.68	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
15MHz	18675	1857.5	QPSK	1	0	0	23.34	23±1
				1	37	0	23.36	23±1
				1	74	0	23.31	23±1
				36	0	1	22.54	23±1
				36	16	1	22.56	23±1
				36	35	1	22.58	23±1
				75	0	1	22.58	23±1
			16QAM	1	0	1	22.90	22±1
				1	37	1	22.91	22±1
				1	74	1	22.93	22±1
				36	0	2	21.65	22±1
				36	16	2	21.68	22±1
				36	35	2	21.64	22±1
				75	0	2	21.61	22±1
	18900	1880.0	QPSK	1	0	0	23.24	23±1
				1	37	0	23.26	23±1
				1	74	0	23.29	23±1
				36	0	1	22.11	23±1
				36	16	1	22.13	23±1
				36	35	1	22.16	23±1
				75	0	1	22.14	23±1
			16QAM	1	0	1	22.31	22±1
				1	37	1	22.35	22±1
				1	74	1	22.39	22±1
				36	0	2	21.29	22±1
				36	16	2	21.28	22±1
				36	35	2	21.30	22±1
				75	0	2	21.26	22±1
	19125	1902.5	QPSK	1	0	0	22.55	23±1
				1	37	0	22.53	23±1
				1	74	0	22.56	23±1
				36	0	1	22.26	23±1
				36	16	1	22.29	23±1
				36	35	1	22.28	23±1
				75	0	1	22.62	23±1
			16QAM	1	0	1	22.21	22±1
				1	37	1	22.23	22±1
				1	74	1	22.20	22±1
				36	0	2	21.76	22±1
				36	16	2	21.73	22±1
				36	35	2	21.75	22±1
				75	0	2	21.81	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
10MHz	18650	1855	QPSK	1	0	0	23.42	23±1
				1	24	0	23.45	23±1
				1	49	0	23.46	23±1
				25	0	1	22.47	23±1
				25	12	1	22.49	23±1
				25	24	1	22.43	23±1
				50	0	1	22.46	23±1
			16QAM	1	0	1	22.93	22±1
				1	24	1	22.96	22±1
				1	49	1	22.91	22±1
				25	0	2	21.65	22±1
				25	12	2	21.68	22±1
				25	24	2	21.69	22±1
				50	0	2	21.64	22±1
	18900	1880.0	QPSK	1	0	0	23.42	23±1
				1	24	0	23.46	23±1
				1	49	0	23.44	23±1
				25	0	1	22.47	23±1
				25	12	1	22.49	23±1
				25	24	1	22.43	23±1
				50	0	1	22.46	23±1
			16QAM	1	0	1	22.93	22±1
				1	24	1	22.95	22±1
				1	49	1	22.91	22±1
				25	0	2	21.72	22±1
				25	12	2	21.75	22±1
				25	24	2	21.74	22±1
				50	0	2	21.32	22±1
	19150	1905	QPSK	1	0	0	23.51	23±1
				1	24	0	23.56	23±1
				1	49	0	**23.59**	23±1
				25	0	1	22.59	23±1
				25	12	1	22.53	23±1
				25	24	1	22.54	23±1
				50	0	1	22.44	23±1
			16QAM	1	0	1	22.51	22±1
				1	24	1	22.53	22±1
				1	49	1	21.56	22±1
				25	0	2	21.32	22±1
				25	12	2	21.35	22±1
				25	24	2	21.34	22±1
				50	0	2	21.54	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
5MHz	18625	1852.5	QPSK	1	0	0	23.47	23±1
				1	12	0	23.45	23±1
				1	24	0	23.44	23±1
				12	0	1	22.53	23±1
				12	6	1	22.56	23±1
				12	11	1	22.58	23±1
				25	0	1	22.48	23±1
			16QAM	1	0	1	22.45	22±1
				1	12	1	22.43	22±1
				1	24	1	22.49	22±1
				12	0	2	21.76	22±1
				12	6	2	21.73	22±1
				12	11	2	21.75	22±1
				25	0	2	21.60	22±1
	18900	1880.0	QPSK	1	0	0	23.37	23±1
				1	12	0	23.35	23±1
				1	24	0	23.33	23±1
				12	0	1	22.21	23±1
				12	6	1	22.26	23±1
				12	11	1	22.28	23±1
				25	0	1	22.11	23±1
			16QAM	1	0	1	22.85	22±1
				1	12	1	22.86	22±1
				1	24	1	22.81	22±1
				12	0	2	21.23	22±1
				12	6	2	21.25	22±1
				12	11	2	21.24	22±1
				25	0	2	21.15	22±1
	19175	1907.5	QPSK	1	0	0	22.65	22±1
				1	12	0	22.69	22±1
				1	24	0	22.63	22±1
				12	0	1	22.04	22±1
				12	6	1	22.03	22±1
				12	11	1	22.09	22±1
				25	0	1	22.24	22±1
			16QAM	1	0	1	21.85	22±1
				1	12	1	21.82	22±1
				1	24	1	21.83	22±1
				12	0	2	21.63	22±1
				12	6	2	21.65	22±1
				12	11	2	21.64	22±1
				25	0	2	21.40	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
3MHz	18625	1852.5	QPSK	1	0	0	23.24	23±1
				1	7	0	23.26	23±1
				1	14	0	23.25	23±1
				8	0	1	22.40	23±1
				8	4	1	22.43	23±1
				8	7	1	22.45	23±1
				15	0	1	22.46	23±1
			16QAM	1	0	1	22.75	22±1
				1	7	1	22.69	22±1
				1	14	1	22.68	22±1
				8	0	2	21.38	22±1
				8	4	2	21.35	22±1
				8	7	2	21.39	22±1
				15	0	2	21.58	22±1
	18900	1880.0	QPSK	1	0	0	23.36	23±1
				1	7	0	23.38	23±1
				1	14	0	23.39	23±1
				8	0	1	22.36	23±1
				8	4	1	22.35	23±1
				8	7	1	22.33	23±1
				15	0	1	22.43	23±1
			16QAM	1	0	1	22.23	22±1
				1	7	1	22.26	22±1
				1	14	1	22.21	22±1
				8	0	2	21.35	22±1
				8	4	2	21.39	22±1
				8	7	2	21.34	22±1
				15	0	2	21.43	22±1
	19175	1907.5	QPSK	1	0	0	22.81	22±1
				1	7	0	22.89	22±1
				1	14	0	22.85	22±1
				8	0	1	22.12	22±1
				8	4	1	22.19	22±1
				8	7	1	22.20	22±1
				15	0	1	22.40	22±1
			16QAM	1	0	1	22.03	22±1
				1	7	1	22.04	22±1
				1	14	1	22.01	22±1
				8	0	2	21.15	22±1
				8	4	2	21.13	22±1
				8	7	2	21.18	22±1
				15	0	2	21.55	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
1.4MHz	18607	1850.7	QPSK	1	0	0	23.47	23±1
				1	2	0	23.49	23±1
				1	5	0	23.43	23±1
				3	0	0	23.51	23±1
				3	1	0	23.56	23±1
				3	2	0	23.52	23±1
				6	0	1	22.46	23±1
			16QAM	1	0	1	22.31	22±1
				1	2	1	22.42	22±1
				1	5	1	22.35	22±1
				3	0	1	22.15	22±1
				3	1	1	22.16	22±1
				3	2	1	22.19	22±1
				6	0	2	21.41	22±1
	18900	1880.0	QPSK	1	0	0	23.38	23±1
				1	2	0	23.36	23±1
				1	5	0	23.41	23±1
				3	0	0	23.42	23±1
				3	1	0	23.46	23±1
				3	2	0	23.41	23±1
				6	0	1	22.37	23±1
			16QAM	1	0	1	22.37	22±1
				1	2	1	22.36	22±1
				1	5	1	22.43	22±1
				3	0	1	22.41	22±1
				3	1	1	22.43	22±1
				3	2	1	22.46	22±1
				6	0	2	22.23	22±1
	19193	1909.3	QPSK	1	0	0	22.98	22±1
				1	2	0	22.86	22±1
				1	5	0	22.95	22±1
				3	0	0	22.92	22±1
				3	1	0	22.93	22±1
				3	2	0	22.95	22±1
				6	0	1	22.07	22±1
			16QAM	1	0	1	21.94	22±1
				1	2	1	21.96	22±1
				1	5	1	21.93	22±1
				3	0	1	21.43	22±1
				3	1	1	21.45	22±1
				3	2	1	21.42	22±1
				6	0	2	21.22	22±1

LTE Band 4:

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
20MHz	20050	1720.0	QPSK	1	0	0	21.70	22±1
				1	49	0	21.73	22±1
				1	99	0	21.75	22±1
				50	0	1	21.35	22±1
				50	24	1	21.36	22±1
				50	49	1	21.39	22±1
				100	0	1	21.60	22±1
			16QAM	1	0	1	21.91	22±1
				1	49	1	21.95	22±1
				1	99	1	21.93	22±1
				50	0	2	21.36	22±1
				50	24	2	21.38	22±1
				50	49	2	21.39	22±1
				100	0	2	21.53	22±1
	20175	1732.5	QPSK	1	0	0	21.48	22±1
				1	49	0	21.46	22±1
				1	99	0	21.43	22±1
				50	0	1	21.72	22±1
				50	24	1	21.73	22±1
				50	49	1	21.76	22±1
				100	0	1	22.17	22±1
			16QAM	1	0	1	21.40	22±1
				1	49	1	21.43	22±1
				1	99	1	21.46	22±1
				50	0	2	22.56	22±1
				50	24	2	22.54	22±1
				50	49	2	22.43	22±1
				100	0	2	22.16	22±1
	20300	1745.0	QPSK	1	0	0	22.16	22±1
				1	49	0	22.19	22±1
				1	99	0	22.12	22±1
				50	0	1	22.35	22±1
				50	24	1	22.39	22±1
				50	49	1	22.37	22±1
				100	0	1	22.44	22±1
			16QAM	1	0	1	22.41	22±1
				1	49	1	22.46	22±1
				1	99	1	**22.48**	22±1
				50	0	2	22.45	22±1
				50	24	2	22.46	22±1
				50	49	2	22.41	22±1
				100	0	2	22.44	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
15MHz	20025	1717.5	QPSK	1	0	0	21.45	22±1
				1	37	0	21.43	22±1
				1	74	0	21.42	22±1
				36	0	1	21.06	22±1
				36	16	1	21.09	22±1
				36	35	1	21.01	22±1
				75	0	1	21.11	22±1
			16QAM	1	0	1	22.09	22±1
				1	37	1	22.08	22±1
				1	74	1	21.96	22±1
				36	0	2	21.03	22±1
				36	16	2	21.09	22±1
				36	35	2	21.09	22±1
				75	0	2	21.16	22±1
	20175	1732.5	QPSK	1	0	0	22.34	22±1
				1	37	0	22.38	22±1
				1	74	0	22.39	22±1
				36	0	1	22.26	22±1
				36	16	1	22.25	22±1
				36	35	1	22.23	22±1
				75	0	1	22.18	22±1
			16QAM	1	0	1	22.17	22±1
				1	37	1	22.13	22±1
				1	74	1	22.16	22±1
				36	0	2	22.34	22±1
				36	16	2	22.36	22±1
				36	35	2	22.31	22±1
				75	0	2	22.24	22±1
	20325	1747.5	QPSK	1	0	0	21.04	22±1
				1	37	0	21.06	22±1
				1	74	0	21.09	22±1
				36	0	1	21.92	22±1
				36	16	1	21.93	22±1
				36	35	1	21.95	22±1
				75	0	1	22.60	22±1
			16QAM	1	0	1	21.13	22±1
				1	37	1	21.19	22±1
				1	74	1	21.15	22±1
				36	0	2	22.53	22±1
				36	16	2	22.54	22±1
				36	35	2	**22.59**	22±1
				75	0	2	22.51	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
10MHz	20000	1715.0	QPSK	1	0	0	21.61	22±1
				1	24	0	21.66	22±1
				1	49	0	21.63	22±1
				25	0	1	21.35	22±1
				25	12	1	21.36	22±1
				25	24	1	21.39	22±1
				50	0	1	21.33	22±1
			16QAM	1	0	1	22.03	22±1
				1	24	1	22.06	22±1
				1	49	1	22.09	22±1
				25	0	2	21.13	22±1
				25	12	2	21.19	22±1
				25	24	2	21.14	22±1
				50	0	2	21.25	22±1
	20175	1732.5	QPSK	1	0	0	21.49	22±1
				1	24	0	21.43	22±1
				1	49	0	21.46	22±1
				25	0	1	21.86	22±1
				25	12	1	21.82	22±1
				25	24	1	21.83	22±1
				50	0	1	22.17	22±1
			16QAM	1	0	1	22.05	22±1
				1	24	1	22.09	22±1
				1	49	1	22.08	22±1
				25	0	2	22.15	22±1
				25	12	2	22.16	22±1
				25	24	2	22.14	22±1
				50	0	2	22.18	22±1
	20350	1750.0	QPSK	1	0	0	22.54	22±1
				1	24	0	22.56	22±1
				1	49	0	22.53	22±1
				25	0	1	22.52	22±1
				25	12	1	22.54	22±1
				25	24	1	22.56	22±1
				50	0	1	22.61	22±1
			16QAM	1	0	1	22.29	22±1
				1	24	1	22.23	22±1
				1	49	1	22.25	22±1
				25	0	2	22.45	22±1
				25	12	2	22.48	22±1
				25	24	2	22.43	22±1
				50	0	2	22.51	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
5MHz	20000	1715.0	QPSK	1	0	0	21.38	22±1
				1	12	0	21.36	22±1
				1	24	0	21.39	22±1
				12	0	1	21.29	22±1
				12	6	1	21.26	22±1
				12	11	1	21.23	22±1
				25	0	1	21.41	22±1
			16QAM	1	0	1	21.34	22±1
				1	12	1	21.36	22±1
				1	24	1	21.31	22±1
				12	0	2	21.23	22±1
				12	6	2	21.29	22±1
				12	11	2	21.21	22±1
				25	0	2	21.35	22±1
	20175	1732.5	QPSK	1	0	0	22.15	22±1
				1	12	0	22.13	22±1
				1	24	0	22.16	22±1
				12	0	1	22.22	22±1
				12	6	1	22.21	22±1
				12	11	1	22.24	22±1
				25	0	1	22.17	22±1
			16QAM	1	0	1	22.54	22±1
				1	12	1	22.56	22±1
				1	24	1	22.53	22±1
				12	0	2	22.12	22±1
				12	6	2	22.13	22±1
				12	11	2	22.12	22±1
				25	0	2	22.14	22±1
	20350	1750.0	QPSK	1	0	0	22.12	22±1
				1	12	0	22.16	22±1
				1	24	0	22.18	22±1
				12	0	1	22.21	22±1
				12	6	1	22.23	22±1
				12	11	1	22.26	22±1
				25	0	1	22.27	22±1
			16QAM	1	0	1	22.03	22±1
				1	12	1	22.06	22±1
				1	24	1	22.09	22±1
				12	0	2	22.12	22±1
				12	6	2	22.13	22±1
				12	11	2	22.16	22±1
				25	0	2	22.25	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
3MHz	19965	1711.5	QPSK	1	0	0	21.59	22±1
				1	7	0	21.56	22±1
				1	14	0	21.53	22±1
				8	0	1	21.78	22±1
				8	4	1	21.76	22±1
				8	7	1	21.74	22±1
				15	0	1	21.62	22±1
			16QAM	1	0	1	21.93	22±1
				1	7	1	21.95	22±1
				1	14	1	21.96	22±1
				8	0	2	21.63	22±1
				8	4	2	21.65	22±1
				8	7	2	21.68	22±1
				15	0	2	21.58	22±1
	20175	1732.5	QPSK	1	0	0	22.17	22±1
				1	7	0	22.16	22±1
				1	14	0	22.13	22±1
				8	0	1	22.15	22±1
				8	4	1	22.13	22±1
				8	7	1	22.19	22±1
				15	0	1	22.19	22±1
			16QAM	1	0	1	21.99	22±1
				1	7	1	21.95	22±1
				1	14	1	21.93	22±1
				8	0	2	22.13	22±1
				8	4	2	22.15	22±1
				8	7	2	22.16	22±1
				15	0	2	22.13	22±1
	20385	1753.5	QPSK	1	0	0	22.29	22±1
				1	7	0	22.26	22±1
				1	14	0	22.23	22±1
				8	0	1	22.51	22±1
				8	4	1	22.56	22±1
				8	7	1	22.58	22±1
				15	0	1	**22.65**	22±1
			16QAM	1	0	1	22.25	22±1
				1	7	1	22.23	22±1
				1	14	1	22.29	22±1
				8	0	2	22.25	22±1
				8	4	2	22.23	22±1
				8	7	2	22.25	22±1
				15	0	2	22.61	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
1.4MHz	19957	1710.7	QPSK	1	0	0	21.56	22±1
				1	2	0	21.53	22±1
				1	5	0	21.54	22±1
				3	0	0	21.63	22±1
				3	1	0	21.60	22±1
				3	2	0	21.65	22±1
				6	0	1	21.68	22±1
			16QAM	1	0	1	21.21	22±1
				1	2	1	21.23	22±1
				1	5	1	21.26	22±1
				3	0	1	21.45	22±1
				3	1	1	21.43	22±1
				3	2	1	21.45	22±1
				6	0	2	21.48	22±1
	20175	1732.5	QPSK	1	0	0	22.17	22±1
				1	2	0	22.13	22±1
				1	5	0	22.16	22±1
				3	0	0	22.24	22±1
				3	1	0	22.23	22±1
				3	2	0	22.29	22±1
				6	0	1	22.16	22±1
			16QAM	1	0	1	21.99	22±1
				1	2	1	21.92	22±1
				1	5	1	21.93	22±1
				3	0	1	21.53	22±1
				3	1	1	21.56	22±1
				3	2	1	21.58	22±1
				6	0	2	22.11	22±1
	20393	1754.3	QPSK	1	0	0	22.61	22±1
				1	2	0	22.63	22±1
				1	5	0	22.65	22±1
				3	0	0	22.48	22±1
				3	1	0	22.46	22±1
				3	2	0	22.43	22±1
				6	0	1	22.44	22±1
			16QAM	1	0	1	22.52	22±1
				1	2	1	22.53	22±1
				1	5	1	22.56	22±1
				3	0	1	22.13	22±1
				3	1	1	22.16	22±1
				3	2	1	22.14	22±1
				6	0	2	22.11	22±1

LTE Band 7:

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
20MHz	20850	2510	QPSK	1	0	0	**22.09**	21.3±1
				1	49	0	22.06	21.3±1
				1	99	0	22.05	21.3±1
				50	0	1	21.32	21.3±1
				50	24	1	21.35	21.3±1
				50	49	1	21.36	21.3±1
				100	0	1	21.39	21.3±1
			16QAM	1	0	1	21.89	21.3±1
				1	49	1	21.86	21.3±1
				1	99	1	21.83	21.3±1
				50	0	2	20.72	21.3±1
				50	24	2	20.75	21.3±1
				50	49	2	20.73	21.3±1
				100	0	2	20.65	21.3±1
	21100	2535	QPSK	1	0	0	21.98	21.3±1
				1	49	0	21.96	21.3±1
				1	99	0	21.93	21.3±1
				50	0	1	20.96	21.3±1
				50	24	1	20.93	21.3±1
				50	49	1	20.92	21.3±1
				100	0	1	20.92	21.3±1
			16QAM	1	0	1	21.11	21.3±1
				1	49	1	21.16	21.3±1
				1	99	1	21.15	21.3±1
				50	0	2	20.53	21.3±1
				50	24	2	20.52	21.3±1
				50	49	2	20.56	21.3±1
				100	0	2	20.33	21.3±1
	21350	2560	QPSK	1	0	0	21.92	21.3±1
				1	49	0	21.93	21.3±1
				1	99	0	21.93	21.3±1
				50	0	1	21.27	21.3±1
				50	24	1	21.26	21.3±1
				50	49	1	21.23	21.3±1
				100	0	1	20.90	21.3±1
			16QAM	1	0	1	21.42	21.3±1
				1	49	1	21.45	21.3±1
				1	99	1	21.43	21.3±1
				50	0	2	21.13	21.3±1
				50	24	2	21.16	21.3±1
				50	49	2	21.15	21.3±1
				100	0	2	20.43	21.3±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
15MHz	20825	1717.5	QPSK	1	0	0	22.61	22±1
				1	37	0	**22.65**	22±1
				1	74	0	22.63	22±1
				36	0	1	21.81	22±1
				36	16	1	21.83	22±1
				36	35	1	21.83	22±1
				75	0	1	21.63	22±1
			16QAM	1	0	1	22.55	22±1
				1	37	1	22.53	22±1
				1	74	1	22.56	22±1
				36	0	2	20.87	21.3±1
				36	16	2	20.83	21.3±1
				36	35	2	20.85	21.3±1
				75	0	2	20.79	21.3±1
	21100	1732.5	QPSK	1	0	0	21.52	21.3±1
				1	37	0	21.53	21.3±1
				1	74	0	21.59	21.3±1
				36	0	1	20.78	21.3±1
				36	16	1	20.76	21.3±1
				36	35	1	20.73	21.3±1
				75	0	1	21.06	21.3±1
			16QAM	1	0	1	20.64	21.3±1
				1	37	1	20.63	21.3±1
				1	74	1	20.65	21.3±1
				36	0	2	20.52	21.3±1
				36	16	2	20.53	21.3±1
				36	35	2	20.59	21.3±1
				75	0	2	20.36	21.3±1
	21375	1747.5	QPSK	1	0	0	20.49	21.3±1
				1	37	0	20.46	21.3±1
				1	74	0	20.49	21.3±1
				36	0	1	20.37	21.3±1
				36	16	1	20.36	21.3±1
				36	35	1	20.30	21.3±1
				75	0	1	20.78	21.3±1
			16QAM	1	0	1	20.32	21.3±1
				1	37	1	20.35	21.3±1
				1	74	1	20.38	21.3±1
				36	0	2	20.35	21.3±1
				36	16	2	20.36	21.3±1
				36	35	2	20.33	21.3±1
				75	0	2	20.35	21.3±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
10MHz	20800	2502	QPSK	1	0	0	22.20	21.3±1
				1	24	0	22.23	21.3±1
				1	49	0	22.26	21.3±1
				25	0	1	21.70	21.3±1
				25	12	1	21.76	21.3±1
				25	24	1	21.73	21.3±1
				50	0	1	21.68	21.3±1
			16QAM	1	0	1	21.94	21.3±1
				1	24	1	21.93	21.3±1
				1	49	1	21.97	21.3±1
				25	0	2	21.25	21.3±1
				25	12	2	21.23	21.3±1
				25	24	2	21.24	21.3±1
				50	0	2	20.92	21.3±1
	21100	2535	QPSK	1	0	0	21.92	21.3±1
				1	24	0	21.93	21.3±1
				1	49	0	21.93	21.3±1
				25	0	1	21.11	21.3±1
				25	12	1	21.16	21.3±1
				25	24	1	21.18	21.3±1
				50	0	1	21.00	21.3±1
			16QAM	1	0	1	21.07	21.3±1
				1	24	1	21.06	21.3±1
				1	49	1	21.03	21.3±1
				25	0	2	20.51	21.3±1
				25	12	2	20.53	21.3±1
				25	24	2	20.56	21.3±1
				50	0	2	20.41	21.3±1
	21400	2565	QPSK	1	0	0	21.67	21.3±1
				1	24	0	21.63	21.3±1
				1	49	0	21.69	21.3±1
				25	0	1	20.80	21.3±1
				25	12	1	20.86	21.3±1
				25	24	1	20.83	21.3±1
				50	0	1	20.51	21.3±1
			16QAM	1	0	1	20.90	21.3±1
				1	24	1	20.93	21.3±1
				1	49	1	20.94	21.3±1
				25	0	2	20.36	21.3±1
				25	12	2	20.35	21.3±1
				25	24	2	20.39	21.3±1
				50	0	2	20.31	21.3±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
5MHz	19975	1712.5	QPSK	1	0	0	22.36	22±1
				1	12	0	22.38	22±1
				1	24	0	22.39	22±1
				12	0	1	21.42	21.3±1
				12	6	1	21.46	21.3±1
				12	11	1	21.49	21.3±1
				25	0	1	21.38	21.3±1
			16QAM	1	0	1	21.50	21.3±1
				1	12	1	21.56	21.3±1
				1	24	1	21.59	21.3±1
				12	0	2	20.73	21.3±1
				12	6	2	20.75	21.3±1
				12	11	2	20.71	21.3±1
				25	0	2	20.64	21.3±1
	20175	1732.5	QPSK	1	0	0	21.83	21.3±1
				1	12	0	21.86	21.3±1
				1	24	0	21.82	21.3±1
				12	0	1	20.76	21.3±1
				12	6	1	20.73	21.3±1
				12	11	1	20.75	21.3±1
				25	0	1	20.77	21.3±1
			16QAM	1	0	1	21.46	21.3±1
				1	12	1	21.43	21.3±1
				1	24	1	21.49	21.3±1
				12	0	2	20.35	21.3±1
				12	6	2	20.36	21.3±1
				12	11	2	20.38	21.3±1
				25	0	2	20.33	21.3±1
	20375	1752.5	QPSK	1	0	0	20.72	21.3±1
				1	12	0	20.76	21.3±1
				1	24	0	20.75	21.3±1
				12	0	1	20.54	21.3±1
				12	6	1	20.56	21.3±1
				12	11	1	20.59	21.3±1
				25	0	1	20.59	21.3±1
			16QAM	1	0	1	20.52	21.3±1
				1	12	1	20.56	21.3±1
				1	24	1	20.51	21.3±1
				12	0	2	20.41	21.3±1
				12	6	2	20.42	21.3±1
				12	11	2	20.39	21.3±1
				25	0	2	20.31	21.3±1

LTE Band 17:

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
10MHz	23780	709.0	QPSK	1	0	0	**23.96**	23±1
				1	24	0	23.96	23±1
				1	49	0	23.91	23±1
				25	0	1	23.10	23±1
				25	12	1	23.16	23±1
				25	24	1	23.15	23±1
				50	0	1	23.14	23±1
			16QAM	1	0	1	23.71	23±1
				1	24	1	23.75	23±1
				1	49	1	23.76	23±1
				25	0	2	22.23	23±1
				25	12	2	22.26	23±1
				25	24	2	22.25	23±1
				50	0	2	22.24	23±1
	23790	701.0	QPSK	1	0	0	23.53	23±1
				1	24	0	23.56	23±1
				1	49	0	23.51	23±1
				25	0	1	22.62	23±1
				25	12	1	22.63	23±1
				25	24	1	22.68	23±1
				50	0	1	22.64	23±1
			16QAM	1	0	1	22.61	22±1
				1	24	1	22.65	22±1
				1	49	1	22.63	22±1
				25	0	2	21.86	22±1
				25	12	2	21.83	22±1
				25	24	2	21.81	22±1
				50	0	2	21.71	22±1
	23800	711.0	QPSK	1	0	0	23.58	23±1
				1	24	0	23.53	23±1
				1	49	0	23.54	23±1
				25	0	1	22.60	23±1
				25	12	1	22.63	23±1
				25	24	1	22.69	23±1
				50	0	1	22.63	23±1
			16QAM	1	0	1	22.60	22±1
				1	24	1	22.64	22±1
				1	49	1	22.61	22±1
				25	0	2	21.81	22±1
				25	12	2	21.83	22±1
				25	24	2	21.82	22±1
				50	0	2	21.70	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
5MHz	23755	706.5	QPSK	1	0	0	24.03	23.1±1
				1	12	0	24.06	23.1±1
				1	24	0	24.05	23.1±1
				12	0	1	23.15	23.1±1
				12	6	1	23.13	23.1±1
				12	11	1	23.14	23.1±1
				25	0	1	23.13	23.1±1
			16QAM	1	0	1	23.06	23.1±1
				1	12	1	23.03	23.1±1
				1	24	1	23.05	23.1±1
				12	0	2	22.23	23.1±1
				12	6	2	22.26	23.1±1
				12	11	2	22.25	23.1±1
				25	0	2	22.28	23.1±1
	23790	710.0	QPSK	1	0	0	24.05	23.1±1
				1	12	0	24.03	23.1±1
				1	24	0	**24.09**	23.1±1
				12	0	1	23.04	23.1±1
				12	6	1	23.06	23.1±1
				12	11	1	23.05	23.1±1
				25	0	1	23.14	23.1±1
			16QAM	1	0	1	22.86	23.1±1
				1	12	1	22.89	23.1±1
				1	24	1	22.87	23.1±1
				12	0	2	22.13	23.1±1
				12	6	2	22.15	23.1±1
				12	11	2	22.12	23.1±1
				25	0	2	22.20	23.1±1
	23825	713.5	QPSK	1	0	0	23.84	23.1±1
				1	12	0	23.85	23.1±1
				1	24	0	23.81	23.1±1
				12	0	1	23.05	23.1±1
				12	6	1	23.02	23.1±1
				12	11	1	23.08	23.1±1
				25	0	1	23.08	23.1±1
			16QAM	1	0	1	22.94	23.1±1
				1	12	1	22.93	23.1±1
				1	24	1	22.96	23.1±1
				12	0	2	22.23	23.1±1
				12	6	2	22.26	23.1±1
				12	11	2	22.25	23.1±1
				25	0	2	22.20	23.1±1

ERP & EIRP

EIRP for LTE Band 2 (Part 24E)

Frequency (MHz)	BW (MHz)	Modulation	RB Size/Offset	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1850.7	1.4	QPSK	1/0	12.49	V	7.88	0.85	19.52	33.01
1880	1.4	QPSK	1/0	12.53	V	7.88	0.85	**19.56**	33.01
1909.3	1.4	QPSK	1/0	12.48	V	7.88	0.85	19.51	33.01
1850.7	1.4	QPSK	1/0	11.71	H	7.88	0.85	18.74	33.01
1880	1.4	QPSK	1/0	11.68	H	7.88	0.85	18.71	33.01
1909.3	1.4	QPSK	1/0	11.65	H	7.88	0.85	18.68	33.01
1850.7	1.4	16-QAM	1/0	11.74	V	7.88	0.85	18.77	33.01
1880	1.4	16-QAM	1/0	11.68	V	7.88	0.85	18.71	33.01
1909.3	1.4	16-QAM	1/0	11.72	V	7.88	0.85	18.75	33.01
1850.7	1.4	16-QAM	1/0	10.95	H	7.88	0.85	17.98	33.01
1880	1.4	16-QAM	1/0	10.91	H	7.88	0.85	17.94	33.01
1909.3	1.4	16-QAM	1/0	10.89	H	7.88	0.85	17.92	33.01
1851.5	3	QPSK	1/0	12.33	V	7.88	0.85	19.36	33.01
1880	3	QPSK	1/0	12.31	V	7.88	0.85	19.34	33.01
1908.5	3	QPSK	1/0	12.25	V	7.88	0.85	19.28	33.01
1851.5	3	QPSK	1/0	11.59	H	7.88	0.85	18.62	33.01
1880	3	QPSK	1/0	11.52	H	7.88	0.85	18.55	33.01
1908.5	3	QPSK	1/0	11.47	H	7.88	0.85	18.50	33.01
1851.5	3	16-QAM	1/0	11.16	V	7.88	0.85	18.19	33.01
1880	3	16-QAM	1/0	11.22	V	7.88	0.85	18.25	33.01
1908.5	3	16-QAM	1/0	11.19	V	7.88	0.85	18.22	33.01
1851.5	3	16-QAM	1/0	10.73	H	7.88	0.85	17.76	33.01
1880	3	16-QAM	1/0	10.68	H	7.88	0.85	17.71	33.01
1908.5	3	16-QAM	1/0	10.51	H	7.88	0.85	17.54	33.01
1852.5	5	QPSK	1/24	12.36	V	7.88	0.85	19.39	33.01
1880	5	QPSK	1/0	12.34	V	7.88	0.85	19.37	33.01
1907.5	5	QPSK	1/24	12.28	V	7.88	0.85	19.31	33.01
1852.5	5	QPSK	1/24	11.43	H	7.88	0.85	18.46	33.01
1880	5	QPSK	1/0	11.38	H	7.88	0.85	18.41	33.01
1907.5	5	QPSK	1/24	11.31	H	7.88	0.85	18.34	33.01
1852.5	5	16-QAM	1/24	11.53	V	7.88	0.85	18.56	33.01
1880	5	16-QAM	1/0	11.48	V	7.88	0.85	18.51	33.01

1907.5	5	16-QAM	1/24	11.32	V	7.88	0.85	18.35	33.01
1852.5	5	16-QAM	1/24	10.39	H	7.88	0.85	17.42	33.01
1880	5	16-QAM	1/0	10.42	H	7.88	0.85	17.45	33.01
1907.5	5	16-QAM	1/24	10.26	H	7.88	0.85	17.29	33.01
1855	10	QPSK	1/0	12.42	V	7.88	0.85	19.45	33.01
1880	10	QPSK	1/0	12.38	V	7.88	0.85	19.41	33.01
1905	10	QPSK	1/49	12.45	V	7.88	0.85	19.48	33.01
1855	10	QPSK	1/0	11.61	H	7.88	0.85	18.64	33.01
1880	10	QPSK	1/0	11.58	H	7.88	0.85	18.61	33.01
1905	10	QPSK	1/49	11.65	H	7.88	0.85	18.68	33.01
1855	10	16-QAM	1/0	11.83	V	7.88	0.85	18.86	33.01
1880	10	16-QAM	1/0	11.75	V	7.88	0.85	18.78	33.01
1905	10	16-QAM	1/49	11.63	V	7.88	0.85	18.66	33.01
1855	10	16-QAM	1/0	10.53	H	7.88	0.85	17.56	33.01
1880	10	16-QAM	1/0	10.51	H	7.88	0.85	17.54	33.01
1905	10	16-QAM	1/49	10.47	H	7.88	0.85	17.50	33.01
1857.5	15	QPSK	1/0	12.26	V	7.88	0.85	19.29	33.01
1880	15	QPSK	1/0	12.22	V	7.88	0.85	19.25	33.01
1902.5	15	QPSK	1/0	12.25	V	7.88	0.85	19.28	33.01
1857.5	15	QPSK	1/0	11.59	H	7.88	0.85	18.62	33.01
1880	15	QPSK	1/0	11.62	H	7.88	0.85	18.65	33.01
1902.5	15	QPSK	1/0	11.58	H	7.88	0.85	18.61	33.01
1857.5	15	16-QAM	1/0	11.73	V	7.88	0.85	18.76	33.01
1880	15	16-QAM	1/0	11.65	V	7.88	0.85	18.68	33.01
1902.5	15	16-QAM	1/0	11.73	V	7.88	0.85	18.76	33.01
1857.5	15	16-QAM	1/0	10.82	H	7.88	0.85	17.85	33.01
1880	15	16-QAM	1/0	10.86	H	7.88	0.85	17.89	33.01
1902.5	15	16-QAM	1/0	10.95	H	7.88	0.85	17.98	33.01
1860	20	QPSK	1/0	12.35	V	7.88	0.85	19.38	33.01
1880	20	QPSK	1/0	12.31	V	7.88	0.85	19.34	33.01
1900	20	QPSK	1/0	12.39	V	7.88	0.85	19.42	33.01
1860	20	QPSK	1/0	11.64	H	7.88	0.85	18.67	33.01
1880	20	QPSK	1/0	11.59	H	7.88	0.85	18.62	33.01
1900	20	QPSK	1/0	11.53	H	7.88	0.85	18.56	33.01
1860	20	16-QAM	1/0	11.73	V	7.88	0.85	18.76	33.01
1880	20	16-QAM	1/0	11.68	V	7.88	0.85	18.71	33.01
1900	20	16-QAM	1/0	11.59	V	7.88	0.85	18.62	33.01
1860	20	16-QAM	1/0	10.82	H	7.88	0.85	17.85	33.01

1880	20	16-QAM	1/0	10.79	H	7.88	0.85	17.82	33.01
1900	20	16-QAM	1/0	10.85	H	7.88	0.85	17.88	33.01

EIRP for LTE Band 4 (Part 27)

Frequency (MHz)	BW (MHz)	Modulation	RB Size/Offset	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1710.7	1.4	QPSK	1/0	11.86	V	7.95	0.79	19.02	30
1732.5	1.4	QPSK	1/0	11.92	V	7.95	0.79	19.08	30
1754.3	1.4	QPSK	1/0	11.96	V	7.95	0.79	19.12	30
1710.7	1.4	QPSK	1/0	10.58	H	7.95	0.79	17.74	30
1732.5	1.4	QPSK	1/0	10.61	H	7.95	0.79	17.77	30
1754.3	1.4	QPSK	1/0	10.66	H	7.95	0.79	17.82	30
1710.7	1.4	16-QAM	1/5	11.75	V	7.95	0.79	18.91	30
1732.5	1.4	16-QAM	1/0	11.78	V	7.95	0.79	18.94	30
1754.3	1.4	16-QAM	1/0	11.83	V	7.95	0.79	18.99	30
1710.7	1.4	16-QAM	1/5	10.58	H	7.95	0.79	17.74	30
1732.5	1.4	16-QAM	1/0	10.62	H	7.95	0.79	17.78	30
1754.3	1.4	16-QAM	1/0	10.67	H	7.95	0.79	17.83	30
1711.5	3	QPSK	1/0	11.95	V	7.95	0.79	19.11	30
1732.5	3	QPSK	1/0	12.05	V	7.95	0.79	19.21	30
1753.5	3	QPSK	1/0	12.11	V	7.95	0.79	**19.27**	30
1711.5	3	QPSK	1/0	10.83	H	7.95	0.79	17.99	30
1732.5	3	QPSK	1/0	10.91	H	7.95	0.79	18.07	30
1753.5	3	QPSK	1/0	10.99	H	7.95	0.79	18.15	30
1711.5	3	16-QAM	1/0	11.83	V	7.95	0.79	18.99	30
1732.5	3	16-QAM	1/0	11.96	V	7.95	0.79	19.12	30
1753.5	3	16-QAM	1/0	12.04	V	7.95	0.79	19.20	30
1711.5	3	16-QAM	1/0	10.75	H	7.95	0.79	17.91	30
1732.5	3	16-QAM	1/0	10.81	H	7.95	0.79	17.97	30
1753.5	3	16-QAM	1/0	10.88	H	7.95	0.79	18.04	30
1712.5	5	QPSK	1/0	11.86	V	7.95	0.79	19.02	30
1732.5	5	QPSK	1/0	11.93	V	7.95	0.79	19.09	30
1752.5	5	QPSK	1/24	11.98	V	7.95	0.79	19.14	30
1712.5	5	QPSK	1/0	10.82	H	7.95	0.79	17.98	30
1732.5	5	QPSK	1/0	10.87	H	7.95	0.79	18.03	30
1752.5	5	QPSK	1/24	10.96	H	7.95	0.79	18.12	30
1712.5	5	16-QAM	1/0	11.77	V	7.95	0.79	18.93	30
1732.5	5	16-QAM	1/0	11.83	V	7.95	0.79	18.99	30
1752.5	5	16-QAM	1/24	11.89	V	7.95	0.79	19.05	30

1712.5	5	16-QAM	1/0	10.71	H	7.95	0.79	17.87	30
1732.5	5	16-QAM	1/0	10.79	H	7.95	0.79	17.95	30
1752.5	5	16-QAM	1/24	10.82	H	7.95	0.79	17.98	30
1715	10	QPSK	1/0	11.92	V	7.95	0.79	19.08	30
1732.5	10	QPSK	1/49	11.98	V	7.95	0.79	19.14	30
1750	10	QPSK	1/0	12.06	V	7.95	0.79	19.22	30
1715	10	QPSK	1/0	10.68	H	7.95	0.79	17.84	30
1732.5	10	QPSK	1/49	10.75	H	7.95	0.79	17.91	30
1750	10	QPSK	1/0	10.81	H	7.95	0.79	17.97	30
1715	10	16-QAM	1/0	11.86	V	7.95	0.79	19.02	30
1732.5	10	16-QAM	1/49	11.95	V	7.95	0.79	19.11	30
1750	10	16-QAM	1/0	12.02	V	7.95	0.79	19.18	30
1715	10	16-QAM	1/0	10.65	H	7.95	0.79	17.81	30
1732.5	10	16-QAM	1/49	10.68	H	7.95	0.79	17.84	30
1750	10	16-QAM	1/0	10.79	H	7.95	0.79	17.95	30
1717.5	15	QPSK	1/0	11.85	V	7.95	0.79	19.01	30
1732.5	15	QPSK	1/74	12.22	V	7.95	0.79	**19.38**	30
1747.5	15	QPSK	1/0	11.97	V	7.95	0.79	19.13	30
1717.5	15	QPSK	1/0	10.76	H	7.95	0.79	17.92	30
1732.5	15	QPSK	1/74	10.91	H	7.95	0.79	18.07	30
1747.5	15	QPSK	1/0	10.85	H	7.95	0.79	18.01	30
1717.5	15	16-QAM	1/0	11.77	V	7.95	0.79	18.93	30
1732.5	15	16-QAM	1/74	12.13	V	7.95	0.79	19.29	30
1747.5	15	16-QAM	1/0	11.95	V	7.95	0.79	19.11	30
1717.5	15	16-QAM	1/0	10.71	H	7.95	0.79	17.87	30
1732.5	15	16-QAM	1/74	10.86	H	7.95	0.79	18.02	30
1747.5	15	16-QAM	1/0	10.79	H	7.95	0.79	17.95	30
1720	20	QPSK	1/99	11.92	V	7.95	0.79	19.08	30
1732.5	20	QPSK	1/99	11.96	V	7.95	0.79	19.12	30
1745	20	QPSK	1/0	12.17	V	7.95	0.79	19.33	30
1720	20	QPSK	1/99	10.84	H	7.95	0.79	18.00	30
1732.5	20	QPSK	1/99	10.89	H	7.95	0.79	18.05	30
1745	20	QPSK	1/0	11.02	H	7.95	0.79	18.18	30
1720	20	16-QAM	1/99	11.86	V	7.95	0.79	19.02	30
1732.5	20	16-QAM	1/99	11.79	V	7.95	0.79	18.95	30
1745	20	16-QAM	1/0	12.01	V	7.95	0.79	19.17	30
1720	20	16-QAM	1/99	10.77	H	7.95	0.79	17.93	30
1732.5	20	16-QAM	1/99	10.85	H	7.95	0.79	18.01	30

1745	20	16-QAM	1/0	10.96	H	7.95	0.79	18.12	30

ERP for LTE Band 7 (Part 27)

Frequency (MHz)	BW (MHz)	Modulation	RB Size/Offset	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
2502.5	5	QPSK	1/0	11.24	V	8.93	0.83	19.34	30
2535	5	QPSK	1/0	11.21	V	8.93	0.83	19.31	30
2567.5	5	QPSK	1/24	11.15	V	8.93	0.83	19.25	30
2502.5	5	QPSK	1/0	10.69	H	8.93	0.83	18.79	30
2535	5	QPSK	1/0	10.64	H	8.93	0.83	18.74	30
2567.5	5	QPSK	1/24	10.51	H	8.93	0.83	18.61	30
2502.5	5	16-QAM	1/0	11.19	V	8.93	0.83	19.29	30
2535	5	16-QAM	1/0	11.15	V	8.93	0.83	19.25	30
2567.5	5	16-QAM	1/24	11.06	V	8.93	0.83	19.16	30
2502.5	5	16-QAM	1/0	10.28	H	8.93	0.83	18.38	30
2535	5	16-QAM	1/0	10.34	H	8.93	0.83	18.44	30
2567.5	5	16-QAM	1/24	10.21	H	8.93	0.83	18.31	30
2505	10	QPSK	1/0	11.43	V	8.93	0.83	19.53	30
2535	10	QPSK	1/49	11.32	V	8.93	0.83	19.42	30
2565	10	QPSK	1/0	11.26	V	8.93	0.83	19.36	30
2505	10	QPSK	1/0	10.77	H	8.93	0.83	18.87	30
2535	10	QPSK	1/49	10.68	H	8.93	0.83	18.78	30
2565	10	QPSK	1/0	10.65	H	8.93	0.83	18.75	30
2505	10	16-QAM	1/0	11.26	V	8.93	0.83	19.36	30
2535	10	16-QAM	1/49	11.19	V	8.93	0.83	19.29	30
2565	10	16-QAM	1/0	11.21	V	8.93	0.83	19.31	30
2505	10	16-QAM	1/0	10.79	H	8.93	0.83	18.89	30
2535	10	16-QAM	1/49	10.82	H	8.93	0.83	18.92	30
2565	10	16-QAM	1/0	10.73	H	8.93	0.83	18.83	30
2507.5	15	QPSK	1/0	11.95	V	8.93	0.83	**20.05**	30
2535	15	QPSK	1/74	11.36	V	8.93	0.83	19.46	30
2562.5	15	QPSK	1/0	10.69	V	8.93	0.83	18.79	30
2507.5	15	QPSK	1/0	11.13	H	8.93	0.83	19.23	30
2535	15	QPSK	1/74	10.78	H	8.93	0.83	18.88	30
2562.5	15	QPSK	1/0	9.82	H	8.93	0.83	17.92	30
2507.5	15	16-QAM	1/0	11.88	V	8.93	0.83	19.98	30
2535	15	16-QAM	1/74	11.25	V	8.93	0.83	19.35	30
2562.5	15	16-QAM	1/0	10.53	V	8.93	0.83	18.63	30

2507.5	15	16-QAM	1/0	11.02	H	8.93	0.83	19.12	30
2535	15	16-QAM	1/74	10.57	H	8.93	0.83	18.67	30
2562.5	15	16-QAM	1/0	9.74	H	8.93	0.83	17.84	30
2510	20	QPSK	1/99	11.28	V	8.93	0.83	19.38	30
2535	20	QPSK	1/99	11.32	V	8.93	0.83	19.42	30
2560	20	QPSK	1/0	11.23	V	8.93	0.83	19.33	30
2510	20	QPSK	1/99	10.85	H	8.93	0.83	18.95	30
2535	20	QPSK	1/99	10.83	H	8.93	0.83	18.93	30
2560	20	QPSK	1/0	10.81	H	8.93	0.83	18.91	30
2510	20	16-QAM	1/99	10.65	V	8.93	0.83	18.75	30
2535	20	16-QAM	1/99	10.59	V	8.93	0.83	18.69	30
2560	20	16-QAM	1/0	10.62	V	8.93	0.83	18.72	30
2510	20	16-QAM	1/99	9.86	H	8.93	0.83	17.96	30
2535	20	16-QAM	1/99	9.83	H	8.93	0.83	17.93	30
2560	20	16-QAM	1/0	9.81	H	8.93	0.83	17.91	30

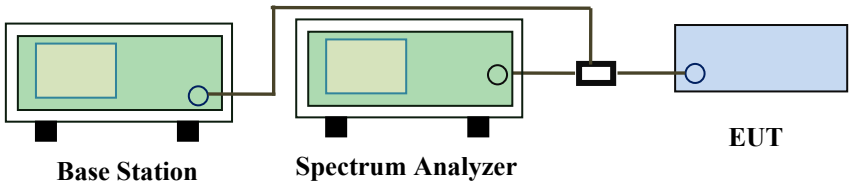
ERP for LTE Band 17 (Part 27)

Frequency (MHz)	BW (MHz)	Modulation	RB Size/Offset	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
706.5	5	QPSK	1/0	12.24	V	6.8	0.42	**18.62**	34.77
710	5	QPSK	1/0	12.21	V	6.8	0.42	18.59	34.77
713.5	5	QPSK	1/0	12.19	V	6.8	0.42	18.57	34.77
706.5	5	QPSK	1/0	10.68	H	6.8	0.42	17.06	34.77
710	5	QPSK	1/0	10.62	H	6.8	0.42	17.00	34.77
713.5	5	QPSK	1/0	10.67	H	6.8	0.42	17.05	34.77
706.5	5	16-QAM	1/0	12.13	V	6.8	0.42	18.51	34.77
710	5	16-QAM	1/0	12.11	V	6.8	0.42	18.49	34.77
713.5	5	16-QAM	1/0	12.03	V	6.8	0.42	18.41	34.77
706.5	5	16-QAM	1/0	10.52	H	6.8	0.42	16.90	34.77
710	5	16-QAM	1/0	10.48	H	6.8	0.42	16.86	34.77
713.5	5	16-QAM	1/0	10.53	H	6.8	0.42	16.91	34.77
709	10	QPSK	1/0	12.22	V	6.8	0.42	18.60	34.77
710	10	QPSK	1/0	12.18	V	6.8	0.42	18.56	34.77
711	10	QPSK	1/0	12.16	V	6.8	0.42	18.54	34.77
709	10	QPSK	1/0	10.73	H	6.8	0.42	17.11	34.77
710	10	QPSK	1/0	10.68	H	6.8	0.42	17.06	34.77
711	10	QPSK	1/0	10.72	H	6.8	0.42	17.10	34.77
709	10	16-QAM	1/0	12.16	V	6.8	0.42	18.54	34.77
710	10	16-QAM	1/0	12.13	V	6.8	0.42	18.51	34.77
711	10	16-QAM	1/0	12.08	V	6.8	0.42	18.46	34.77
709	10	16-QAM	1/0	10.65	H	6.8	0.42	17.03	34.77
710	10	16-QAM	1/0	10.62	H	6.8	0.42	17.00	34.77
711	10	16-QAM	1/0	10.69	H	6.8	0.42	17.07	34.77

6.3 Peak-Average Ratio

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	October 15, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§24.232(d) § 27.50(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	☑
Test Setup			
Test Procedure	According with KDB 971168 1. The signal analyzer' s CCDF measurement profile is enabled 2. Frequency = carrier center frequency 3. Measurement BW > Emission bandwidth of signal 4. The signal analyzer was set to collect one million samples to generate the CCDF curve 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

LTE Band 2 (part 24E)

BW(MHz)	Frequency (MHz)	Mode	Modulation	Conducted Power (dBm)		Peak-Average Ratio (PAR)
				Peak	Average	
1.4	1880	RB 1/0	QPSK	25.68	23.38	2.3
			16QAM	24.68	22.37	2.31
3	1880	RB 1/0	QPSK	25.13	23.36	1.77
			16QAM	25.26	22.23	3.03
5	1880	RB 1/0	QPSK	25.38	23.37	2.01
			16QAM	25.56	22.85	2.71
10	1880	RB 1/0	QPSK	25.46	23.24	2.22
			16QAM	25.67	22.15	3.52
15	1880	RB 1/0	QPSK	25.61	23.24	2.37
			16QAM	25.68	22.31	3.37
20	1880	RB 1/0	QPSK	25.53	23.5	2.03
			16QAM	25.61	22.44	3.17

LTE Band 4 (part 27)

BW(MHz)	Frequency (MHz)	Mode	Modulation	Conducted Power (dBm)		Peak-Average Ratio (PAR)
				Peak	Average	
1.4	1732.5	RB 1/0	QPSK	25.13	22.17	2.96
			16QAM	25.43	21.99	3.44
3	1732.5	RB 1/0	QPSK	25.23	22.17	3.06
			16QAM	25.36	21.99	3.37
5	1732.5	RB 1/0	QPSK	25.38	22.15	3.23
			16QAM	25.29	22.54	2.75
10	1732.5	RB 1/0	QPSK	25.34	21.49	3.85
			16QAM	25.27	22.05	3.22
15	1732.5	RB 1/0	QPSK	25.24	22.34	2.9
			16QAM	25.34	22.17	3.17
20	1732.5	RB 1/0	QPSK	25.34	21.48	3.86
			16QAM	25.38	21.4	3.98

LTE Band 7 (part 27)

BW(MHz)	Frequency (MHz)	Mode	Modulation	Conducted Power (dBm)		Peak-Average Ratio (PAR)
				Peak	Average	
5	1880	RB 1/0	QPSK	25.48	21.83	3.65
			16QAM	25.46	21.46	4
10	1880	RB 1/0	QPSK	25.43	21.91	3.52
			16QAM	25.16	21.07	4.09
15	1880	RB 1/0	QPSK	25.69	21.52	4.17
			16QAM	24.86	20.64	4.22
20	1880	RB 1/0	QPSK	25.31	21.98	3.33
			16QAM	25.08	21.11	3.97

LTE Band 17 (part 27)

BW(MHz)	Frequency (MHz)	Mode	Modulation	Conducted Power (dBm)		Peak-Average Ratio (PAR)
				Peak	Average	
5	710	RB 1/0	QPSK	25.68	24.05	1.63
			16QAM	25.46	22.61	2.85
10	710	RB 1/0	QPSK	25.67	23.53	2.14
			16QAM	25.56	22.61	2.95

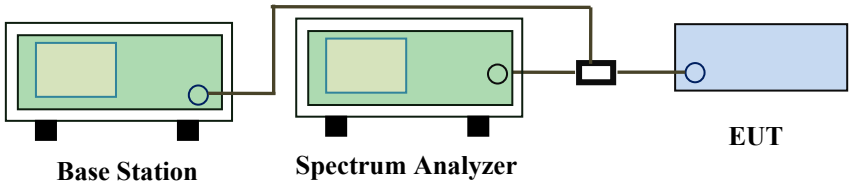
6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H&24E& Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6.5 Occupied Bandwidth

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	October 15, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §22.917, §22.905 §24.238 §27.53(a)	a)	99% Occupied Bandwidth(kHz)	☑
	b)	26 dB Bandwidth(kHz)	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

LTE Band 2 (Part 24E)

BW(MHz)	Channel	Frequency (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1.4	18607	1850.7	16QAM	1.0951	1.268
			QPSK	1.0927	1.274
1.4	18900	1880	16QAM	1.0946	1.271
			QPSK	1.0929	1.274
1.4	19193	1909.3	16QAM	2.7415	3.053
			QPSK	2.7517	3.080
3.0463	18615	1851.5	16QAM	2.7379	3.052
			QPSK	2.7395	3.084
3	18900	1880	16QAM	2.7331	3.085
			QPSK	2.7268	3.081
3	19185	1908.5	16QAM	2.7430	3.094
			QPSK	2.7425	3.110
5	18625	1852.5	16QAM	4.5100	5.017
			QPSK	4.5157	5.051
5	18900	1880	16QAM	4.5297	5.009
			QPSK	13.4443	15.003
5	19175	1907.5	16QAM	4.5147	5.031
			QPSK	4.5214	5.121
10	18650	1855	16QAM	9.0656	10.058
			QPSK	9.0497	10.062
10	18900	1880	16QAM	9.0642	10.147
			QPSK	9.0593	10.032
10	19150	1905	16QAM	9.0555	10.038
			QPSK	9.0620	10.148
15	18675	1857.5	16QAM	13.4863	14.845
			QPSK	13.4657	14.804
15	18900	1880	16QAM	13.4719	14.902
			QPSK	13.4902	14.825
15	19125	1902.5	16QAM	13.4577	14.726
			QPSK	13.4585	14.794

20	18700	1860	16QAM	17.9127	19.390
			QPSK	17.9265	19.249
20	18900	1880	16QAM	19.9022	19.427
			QPSK	17.8838	19.280
20	19100	1900	16QAM	17.9327	19.177
			QPSK	17.8844	19.369

LTE Band 4 (Part 27)

BW(MHz)	Channel	Frequency (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1.4	19957	1710.7	16QAM	1.0959	1.321
			QPSK	1.0993	1.293
1.4	20175	1732.5	16QAM	1.0951	1.267
			QPSK	1.0931	1.267
1.4	20393	1754.3	16QAM	1.1424	2.139
			QPSK	1.1417	2.297
3	19965	1711.5	16QAM	2.7492	3.310
			QPSK	2.7438	3.115
3	20175	1732.5	16QAM	2.7346	3.076
			QPSK	2.7406	3.058
3	20385	1753.5	16QAM	2.8167	4.671
			QPSK	2.8087	5.727
5	19975	1712.5	16QAM	4.5265	5.110
			QPSK	4.5273	5.261
5	20175	1732.5	16QAM	4.5231	5.041
			QPSK	4.5264	5.058
5	20375	1752.5	16QAM	4.6017	8.245
			QPSK	4.5687	7.788
10	20000	1715	16QAM	9.0865	10.510
			QPSK	9.0580	10.066
10	20175	1732.5	16QAM	9.0672	10.030
			QPSK	9.0680	10.113
10	20350	1750	16QAM	9.1172	11.148
			QPSK	9.0693	11.907

15	20025	1717.5	16QAM	13.5041	14.786
			QPSK	13.5010	15.965
15	20175	1732.5	16QAM	13.5138	14.775
			QPSK	14.4686	14.731
15	20325	1747.5	16QAM	13.4612	15.596
			QPSK	13.4851	16.289
20	20050	1720	16QAM	17.8899	19.234
			QPSK	17.9234	19.077
20	20175	1732.5	16QAM	17.9416	19.317
			QPSK	17.9647	19.364
20	20300	1745	16QAM	17.7841	19.407
			QPSK	17.7889	19.177

LTE Band 7 (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
5	20775	2502.5	16QAM	4.5346	5.020
			QPSK	4.5194	5.081
5	21100	2535	16QAM	4.5238	5.026
			QPSK	4.5324	5.074
5	21425	2567.5	16QAM	4.5228	5.075
			QPSK	4.5083	4.981
10	20800	2505	16QAM	9.0642	10.036
			QPSK	9.0724	9.991
10	21100	2535	16QAM	9.0845	10.165
			QPSK	9.0635	10.028
10	21400	2562.5	16QAM	9.0791	10.185
			QPSK	9.0776	10.246
15	20825	2507.5	16QAM	13.4982	14.747
			QPSK	13.4512	16.633
15	21100	2535	16QAM	13.5053	14.743
			QPSK	13.4928	14.569
15	21400	2562.5	16QAM	13.4796	14.511
			QPSK	13.4700	14.623

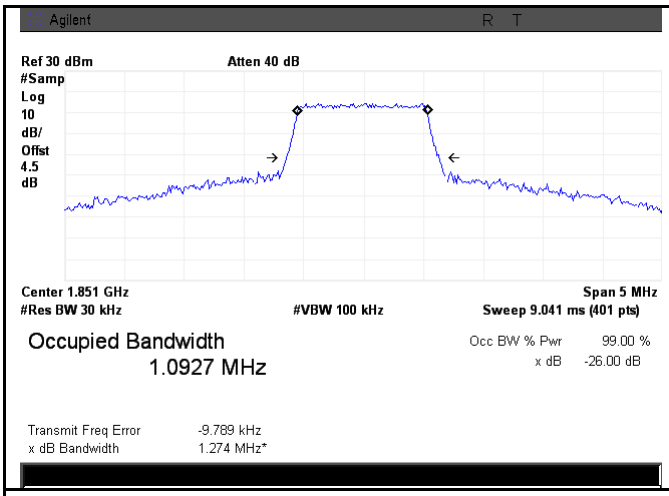
20	20850	2510	16QAM	17.8518	19.297
			QPSK	17.9183	19.270
20	21100	2535	16QAM	17.9068	19.374
			QPSK	17.9326	19.563
20	21350	2560	16QAM	17.8574	19.241
			QPSK	17.8699	19.199

LTE Band 17 (Part 27)

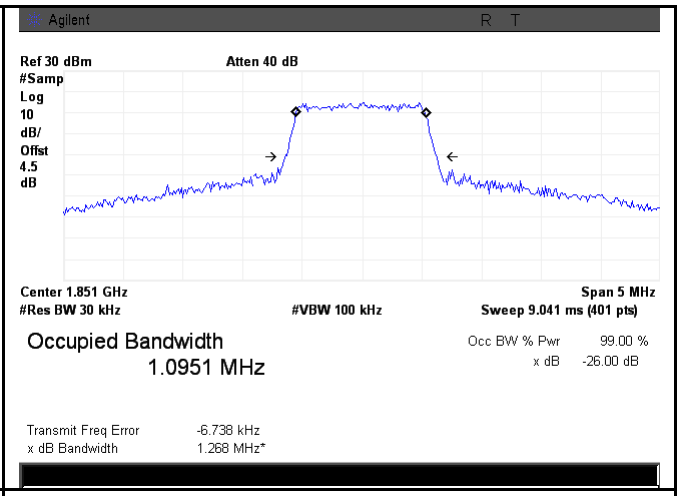
BW(MHz)	Channel	Frequency (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
5	23755	706.5	16QAM	4.5071	5.044
			QPSK	4.5118	5.059
5	23790	710	16QAM	4.5536	4.994
			QPSK	4.5438	5.114
5	23825	713.5	16QAM	4.5461	5.076
			QPSK	4.5394	5.058
10	23780	709	16QAM	9.0627	10.112
			QPSK	9.0642	10.047
10	23790	710	16QAM	9.0945	10.248
			QPSK	9.0836	10.047
10	23800	711	16QAM	9.0861	10.165
			QPSK	9.0835	10.082

Test Plots

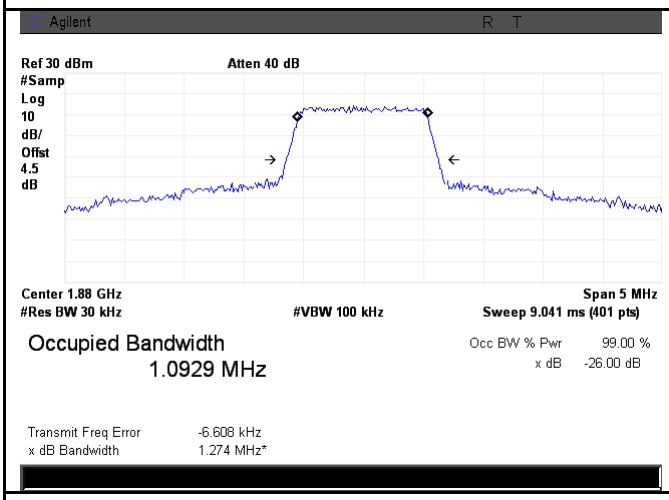
LTE Band 2 (Part 24E)



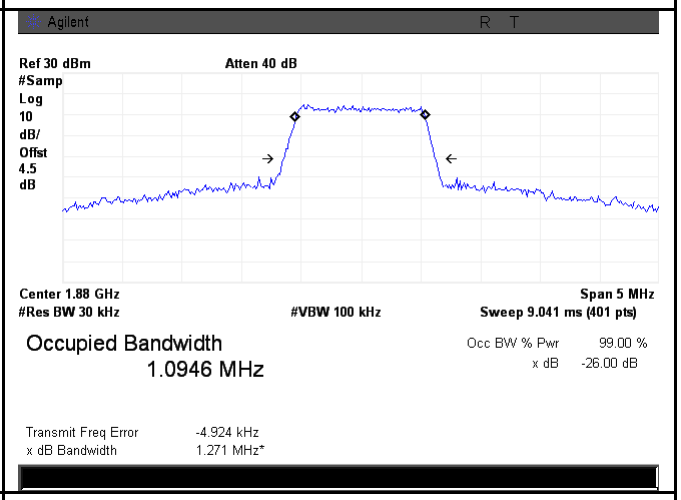
LTE band 2 - Low CH QPSK-1.4



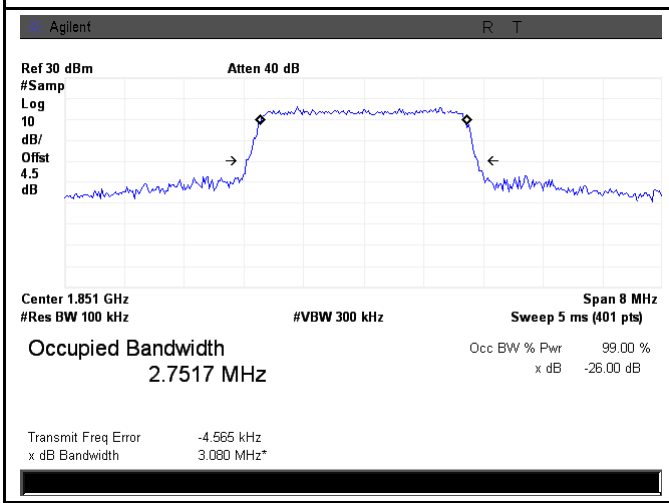
LTE band 2 - Low CH 16QAM-1.4



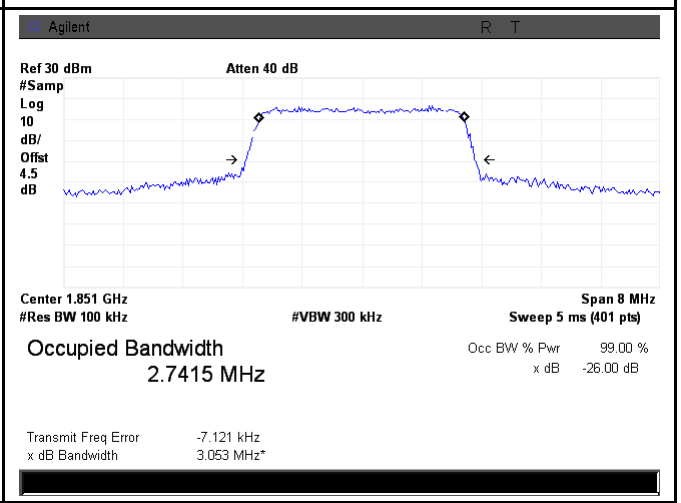
LTE band 2 - Middle CH QPSK-1.4



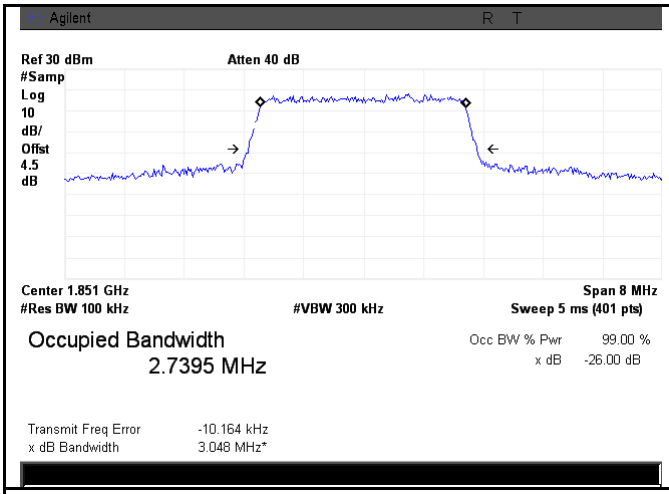
LTE band 2 - Middle CH 16QAM-1.4



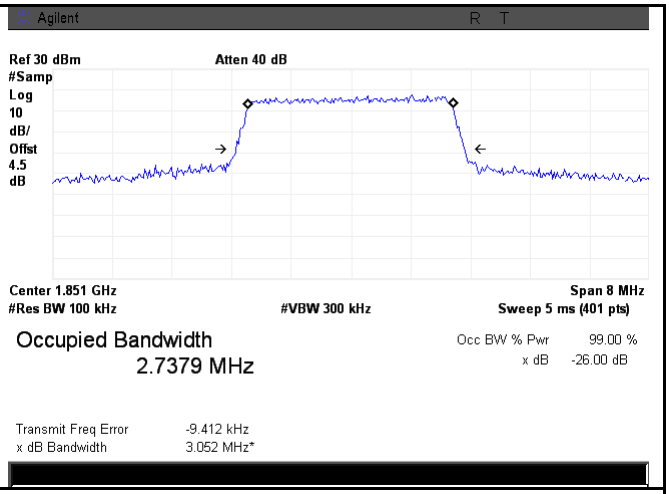
LTE band 2 - High CH QPSK-1.4



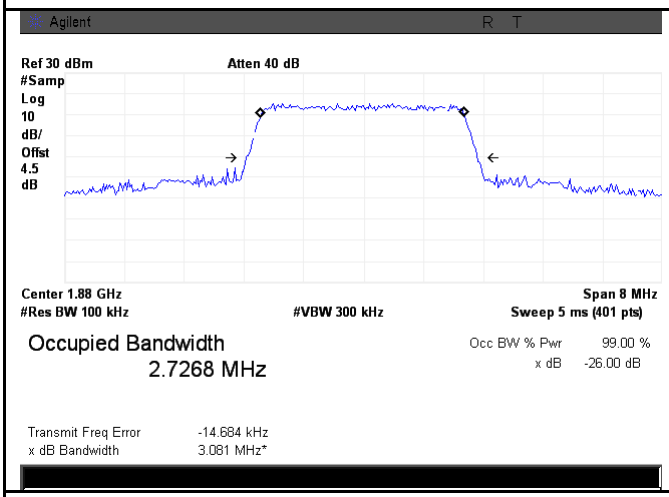
LTE band 2 - High CH 16QAM-1.4



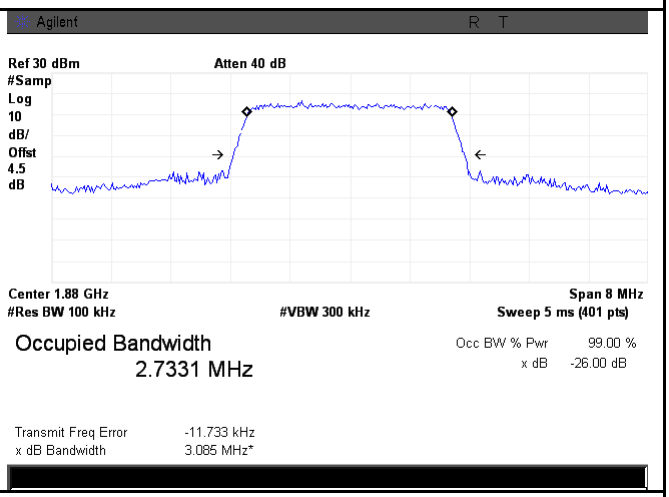
LTE band 2 - Low CH QPSK-3



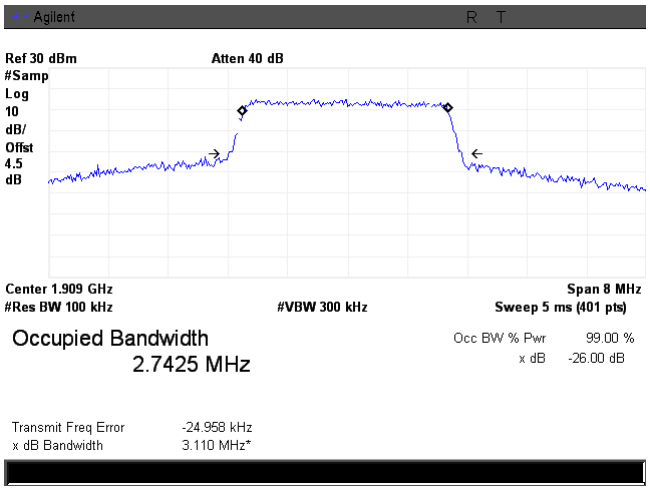
LTE band 2 - Low CH 16QAM-3



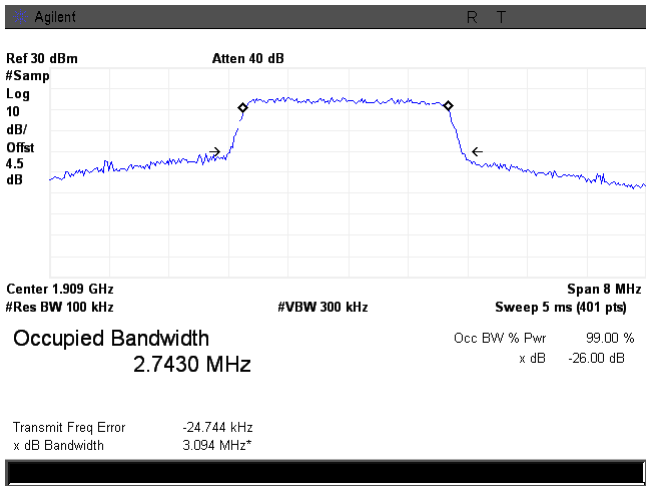
LTE band 2 - Middle CH QPSK-3



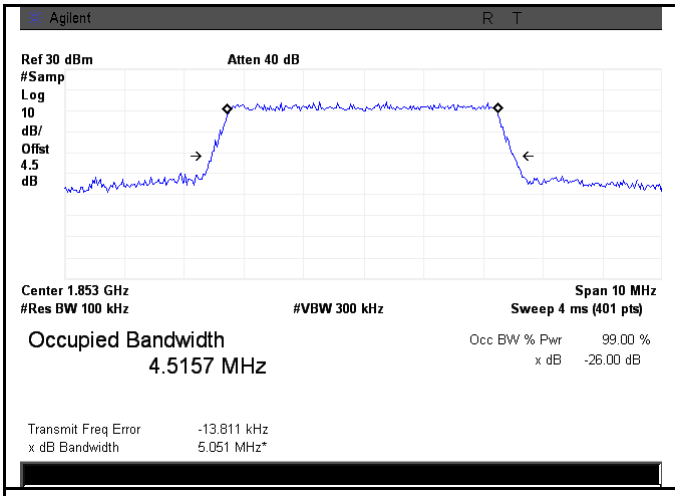
LTE band 2 - Middle CH 16QAM-3



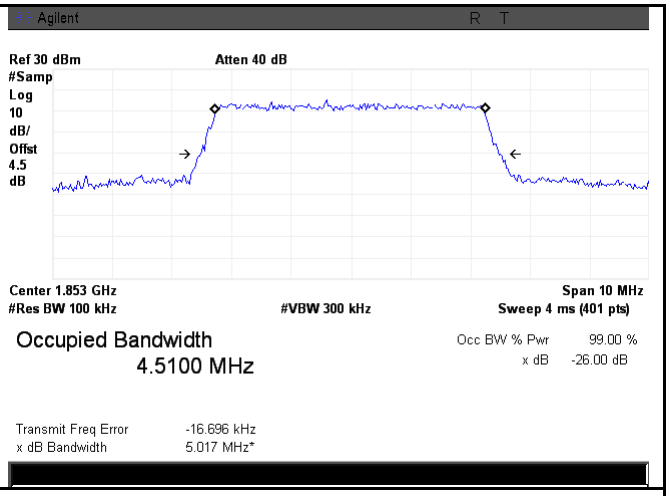
LTE band 2 - High CH QPSK-3



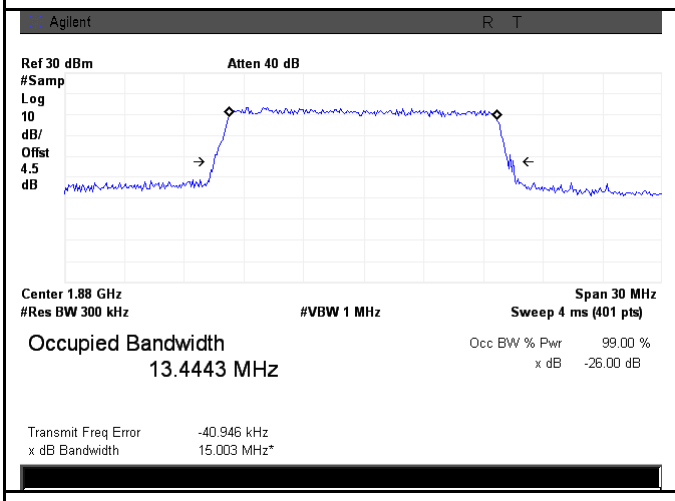
LTE band 2 - High CH 16QAM-3



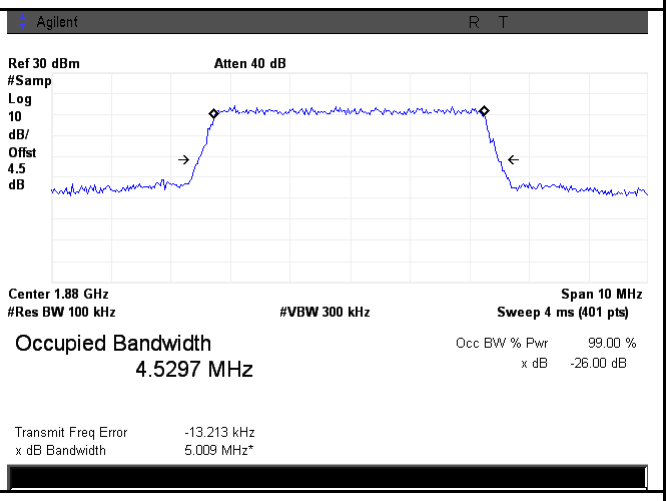
LTE band 2 - Low CH QPSK-5



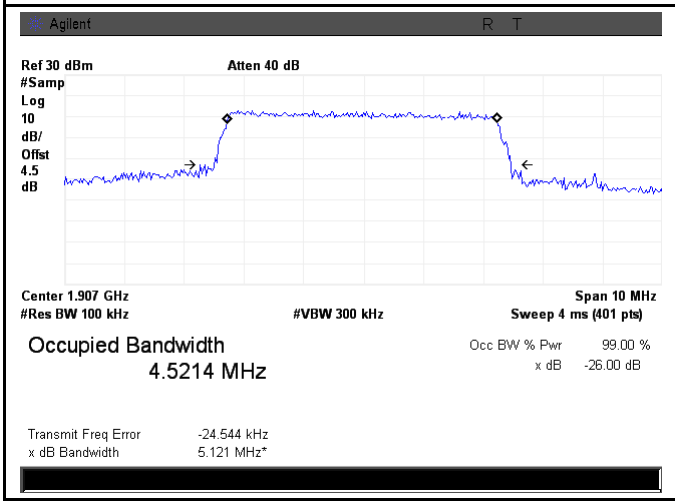
LTE band 2 - Low CH 16QAM-5



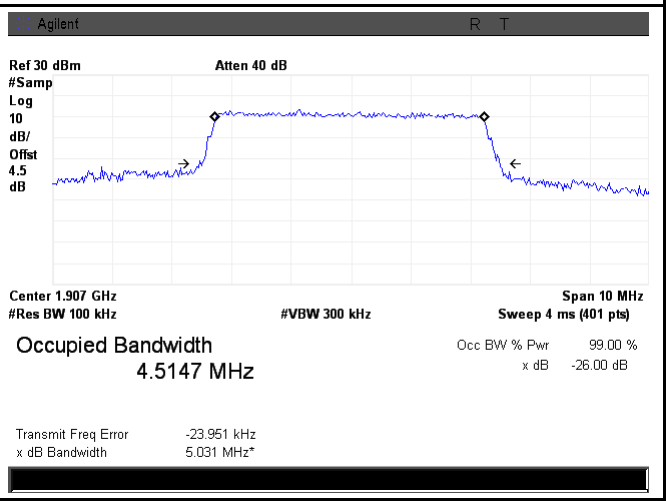
LTE band 2 - Middle CH QPSK-5



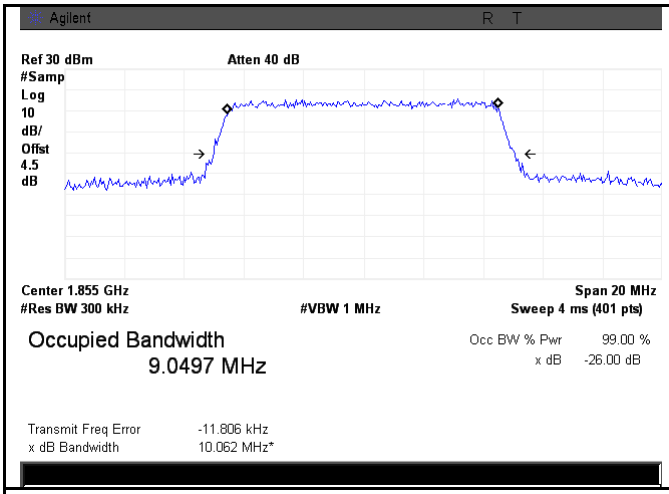
LTE band 2 - Middle CH 16QAM-5



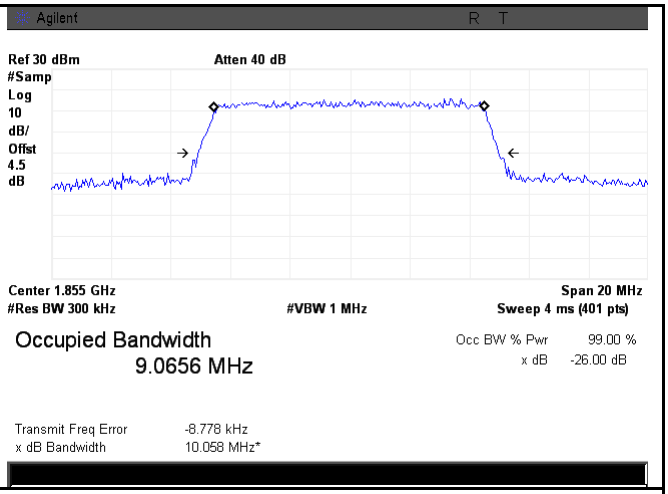
LTE band 2 - High CH QPSK-5



LTE band 2 - High CH 16QAM-5



LTE band 2 - Low CH QPSK-10



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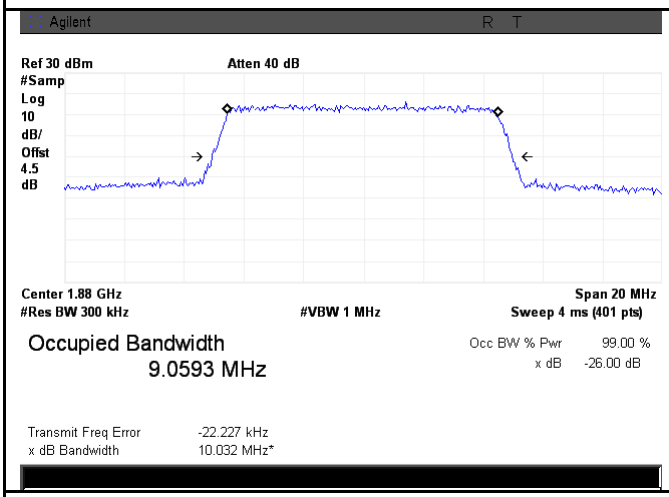
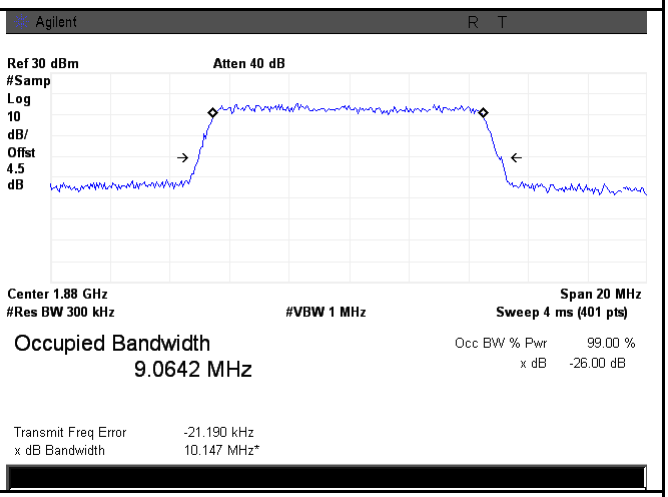
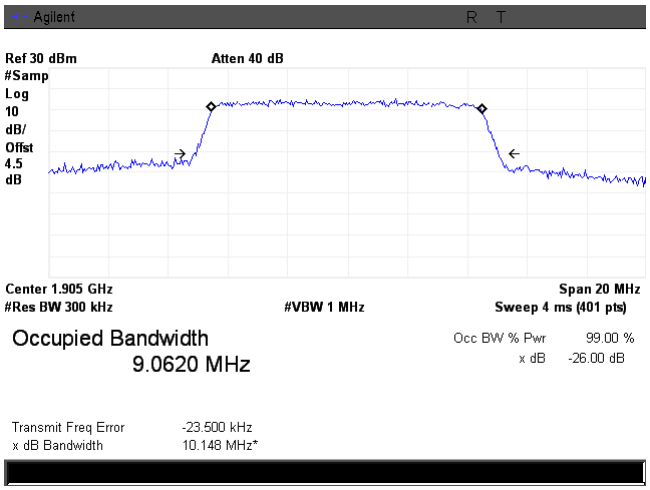


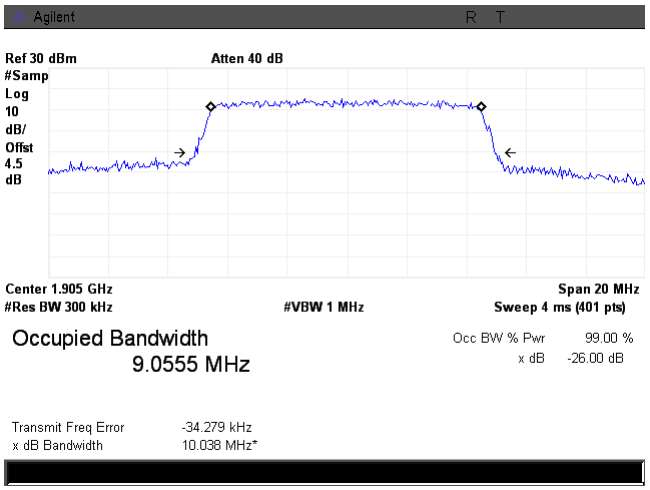
LTE band 2 - Middle CH QPSK-10



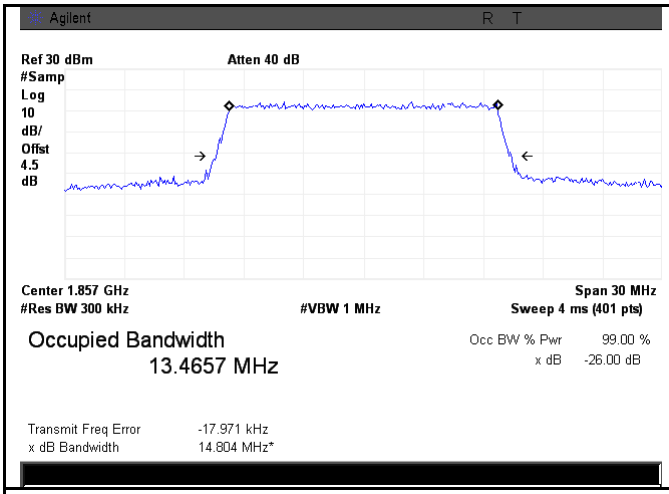
LTE band 2 - Middle CH 16QAM-10



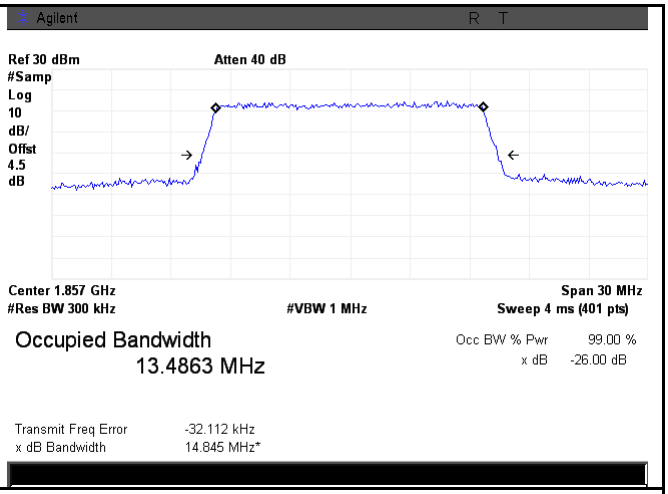
LTE band 2 - High CH QPSK-10



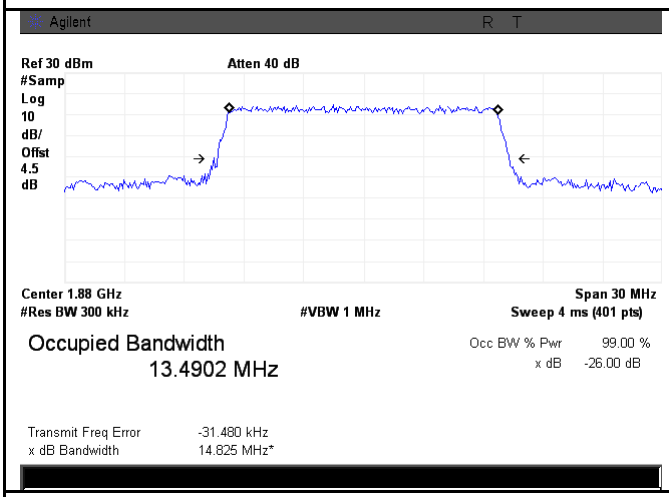
LTE band 2 - High CH 16QAM-10



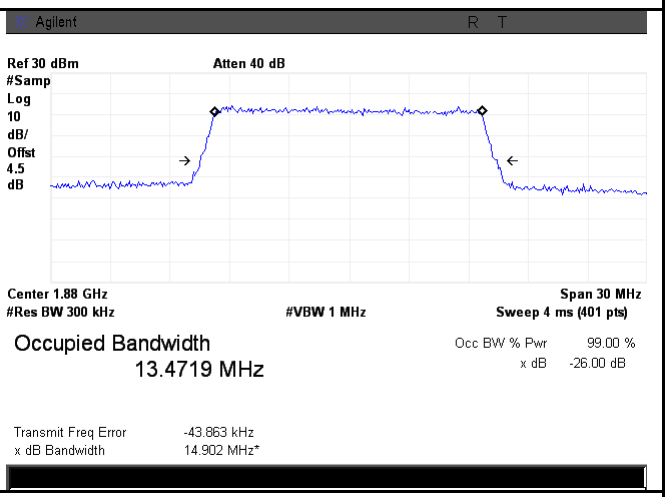
LTE band 2 - Low CH QPSK-15



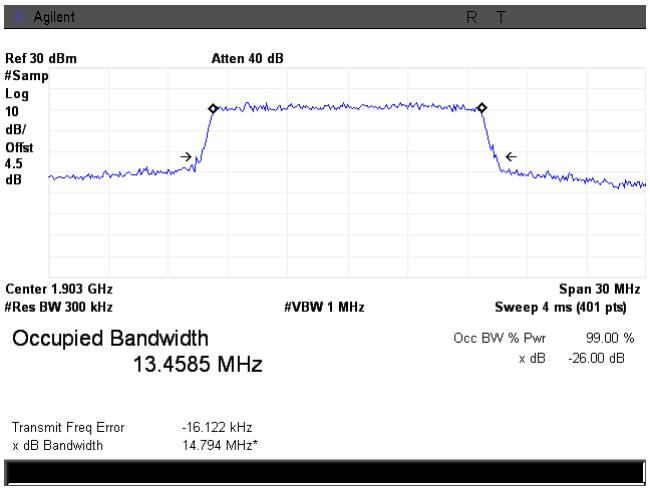
LTE band 2 - Low CH 16QAM-15



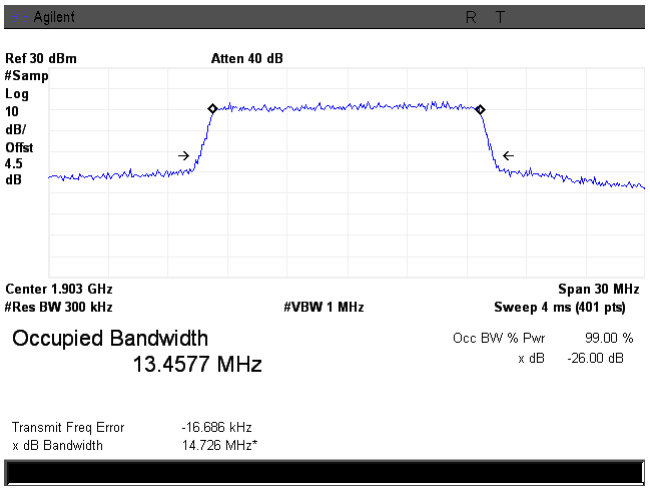
LTE band 2 - Middle CH QPSK-15



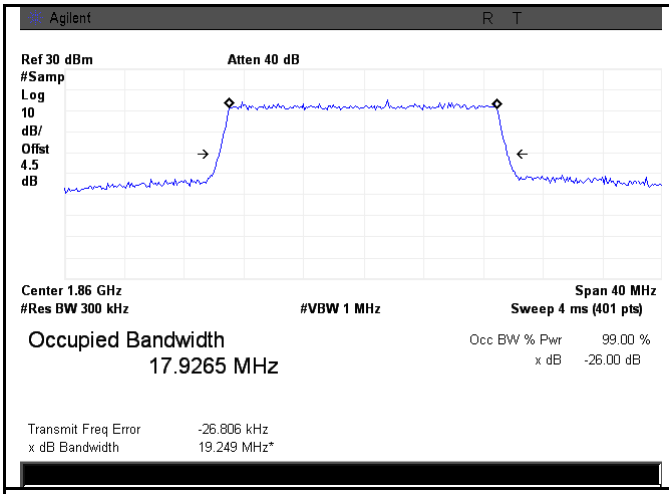
LTE band 2 - Middle CH 16QAM-15



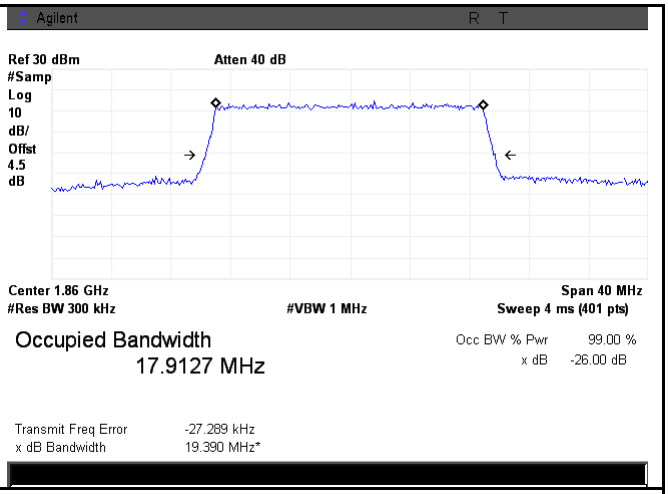
LTE band 2 - High CH QPSK-15



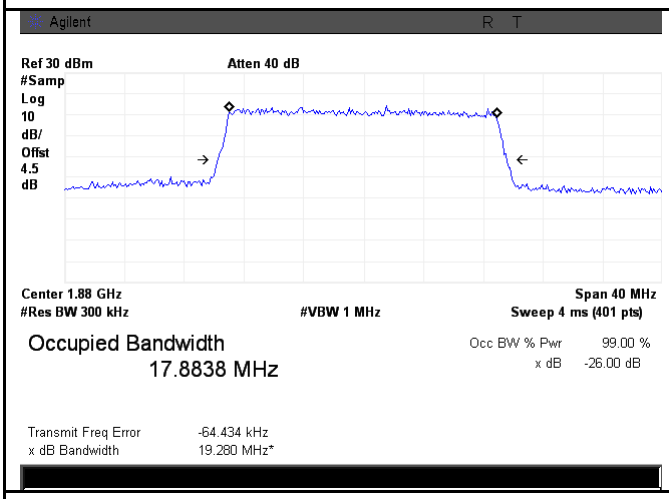
LTE band 2 - High CH 16QAM-15



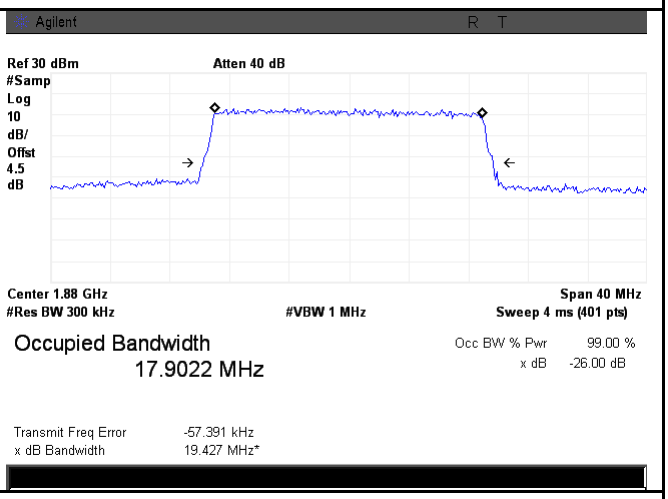
LTE band 2 - Low CH QPSK-20



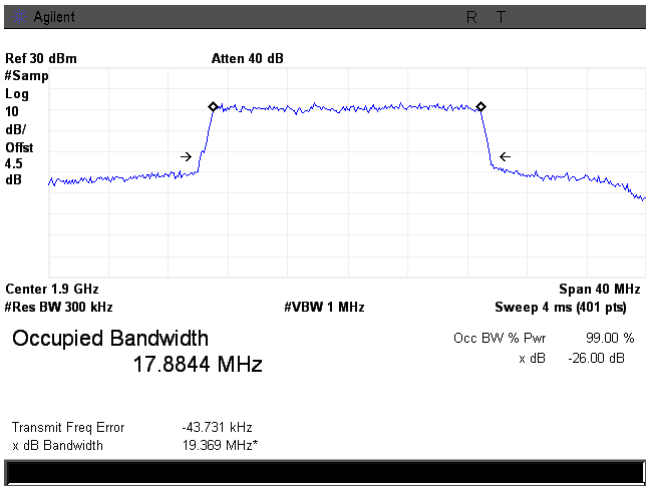
LTE band 2 - Low CH 16QAM-20



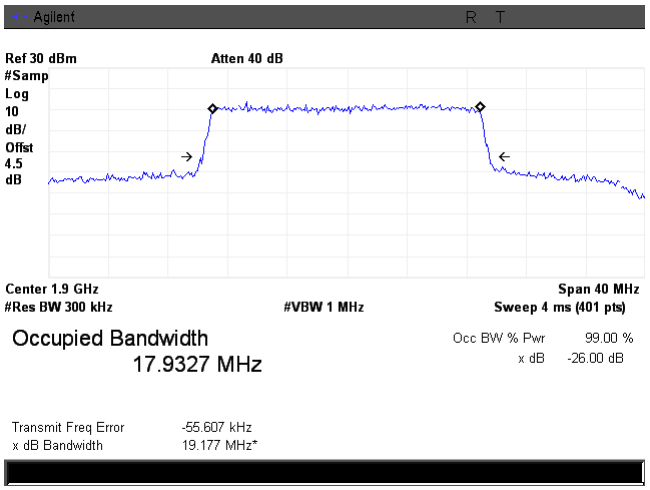
LTE band 2 - Middle CH QPSK-20



LTE band 2 - Middle CH 16QAM-20

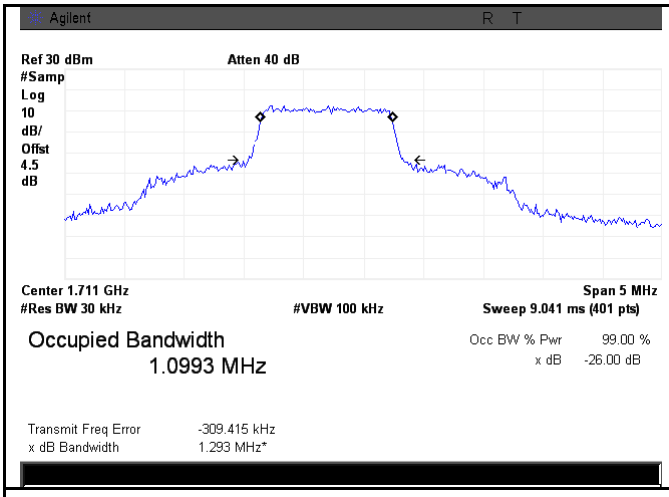


LTE band 2 - High CH QPSK-20

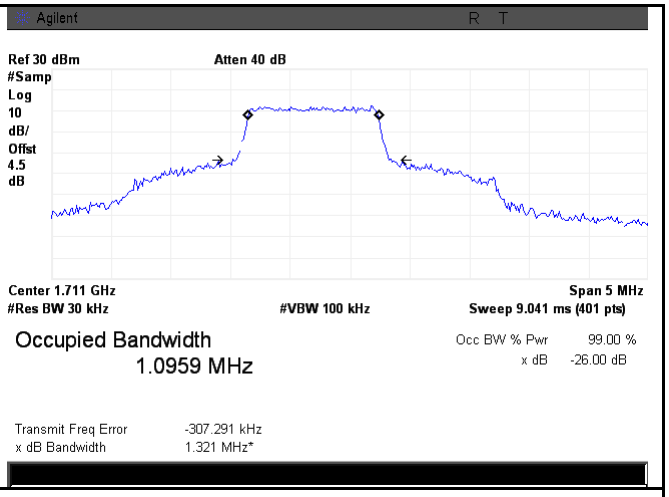


LTE band 2 - High CH 16QAM-20

LTE Band 4 (Part 27)



LTE band 4 - Low CH QPSK-1.4



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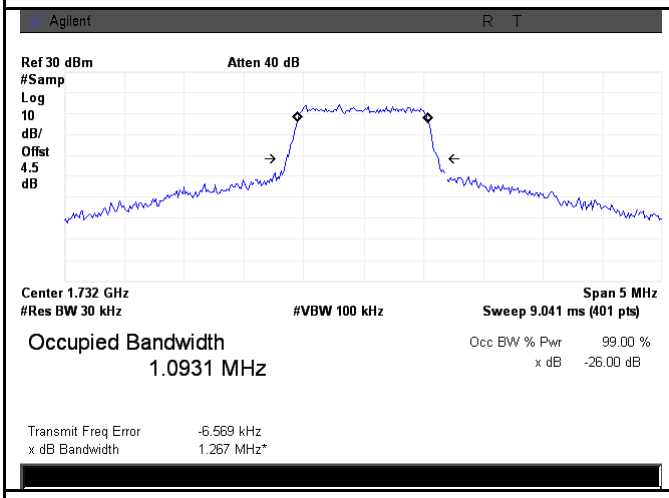

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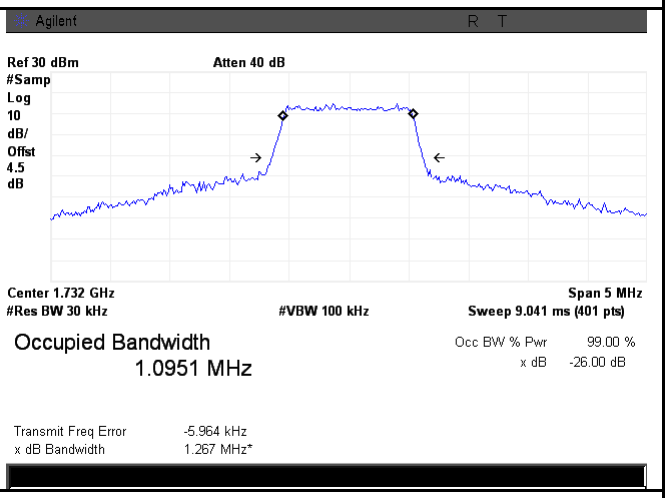

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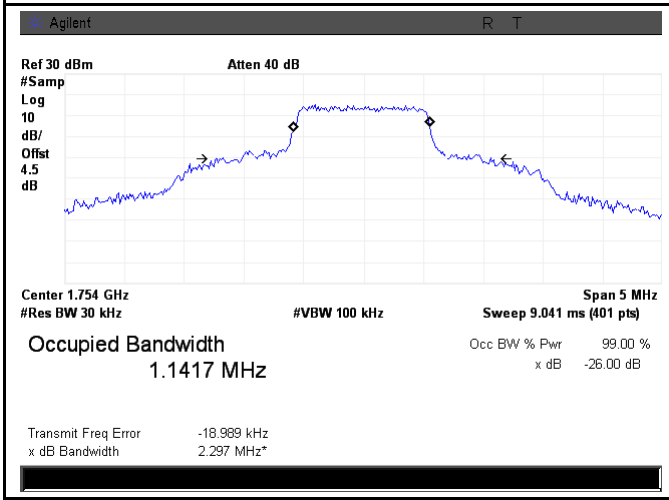

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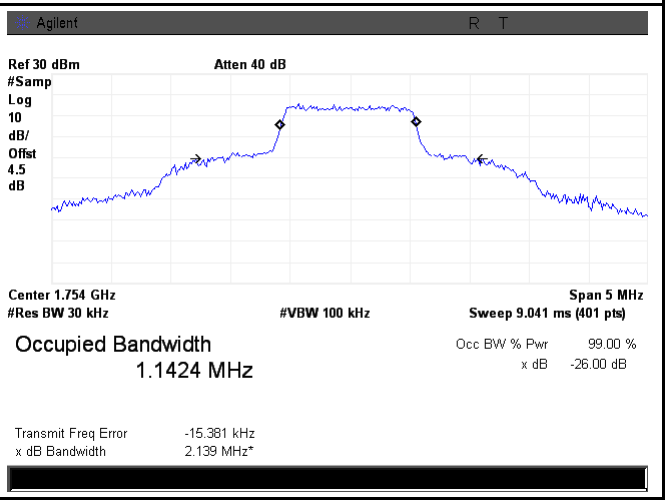

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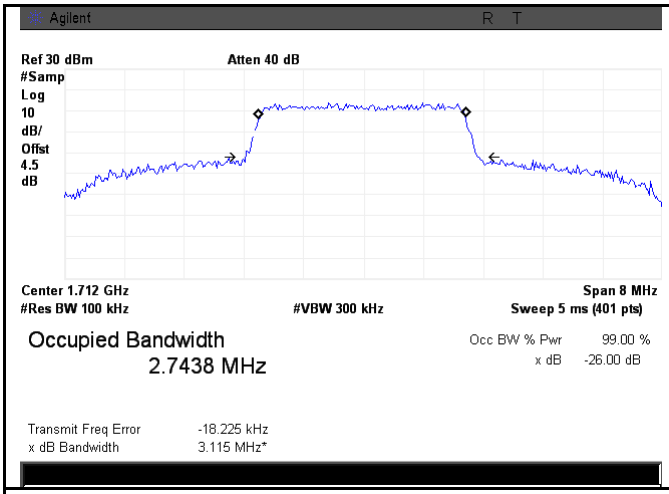
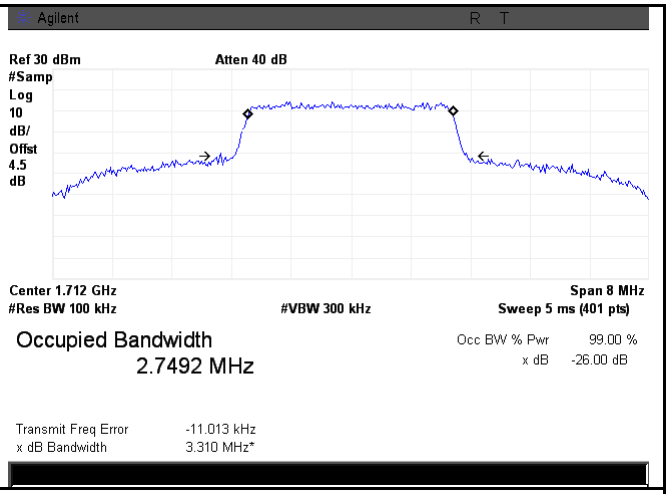
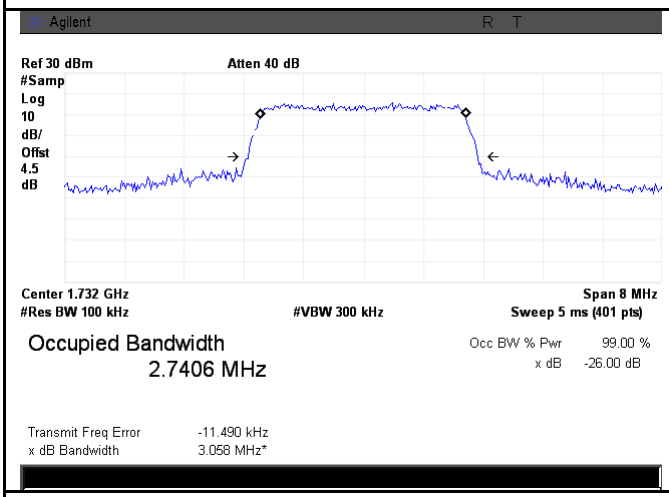


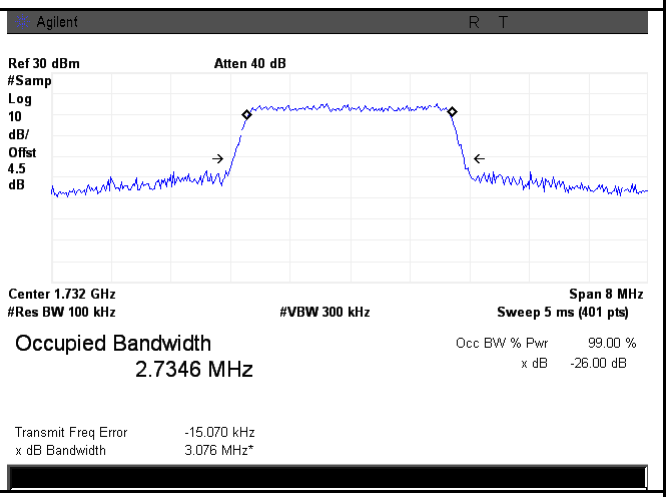
LTE band 4 - Low CH QPSK-3



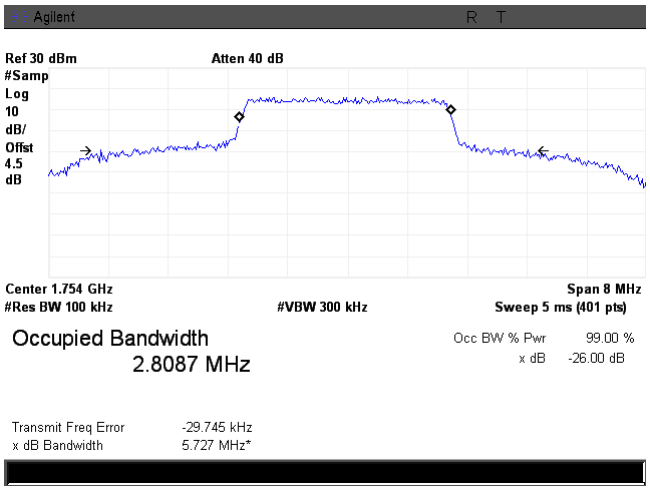
LTE band 4 - Low CH 16QAM-3



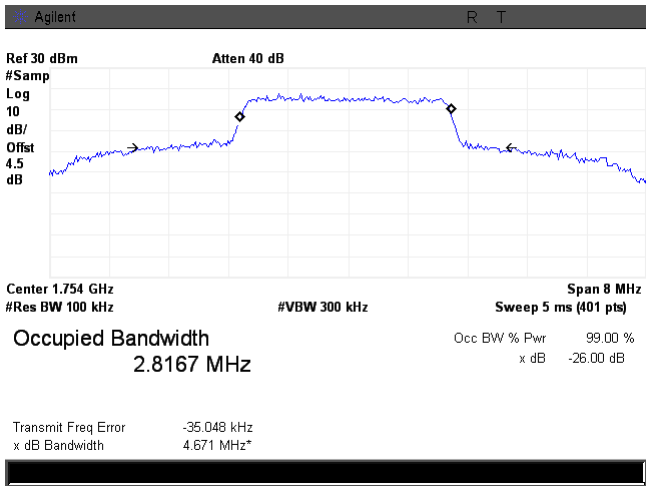
LTE band 4 - Middle CH QPSK-3



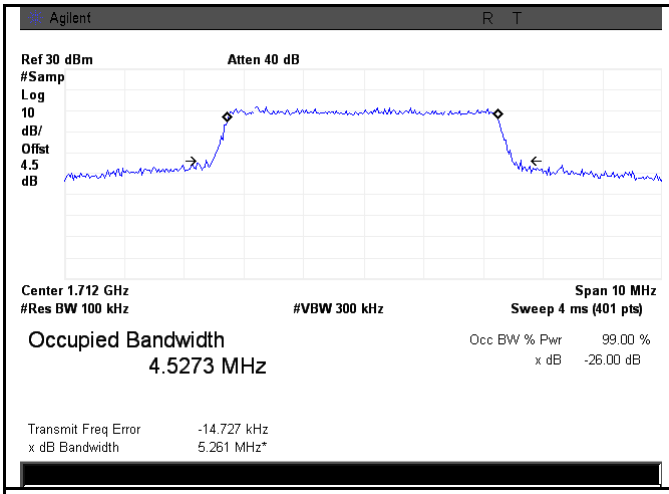
LTE band 4 - Middle CH 16QAM-3



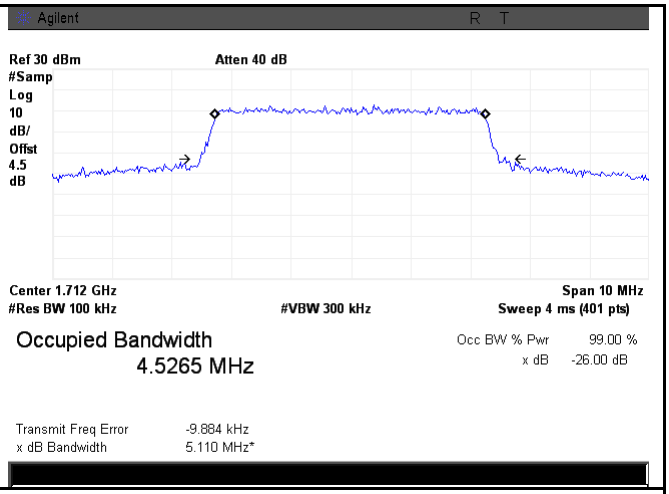
LTE band 4 - High CH QPSK-3



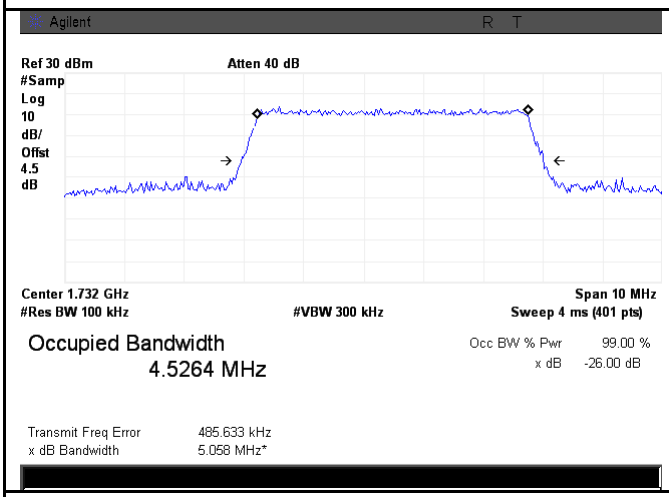
LTE band 4 - High CH 16QAM-3



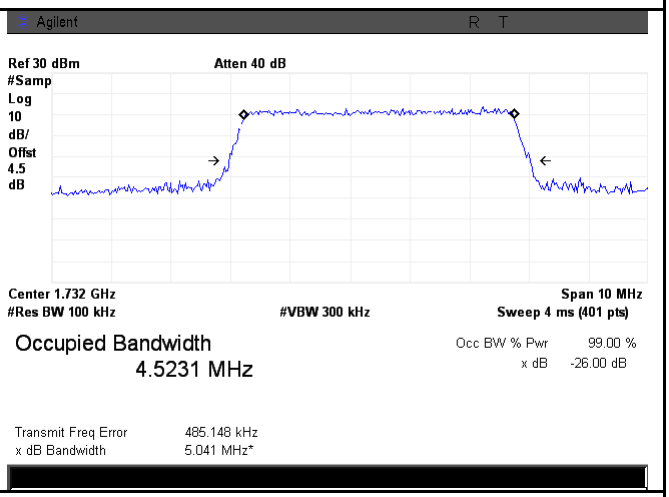
LTE band 4 - Low CH QPSK-5



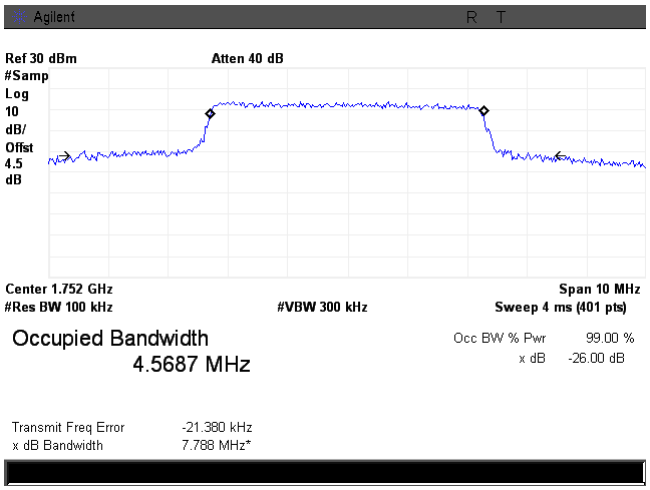
LTE band 4 - Low CH 16QAM-5



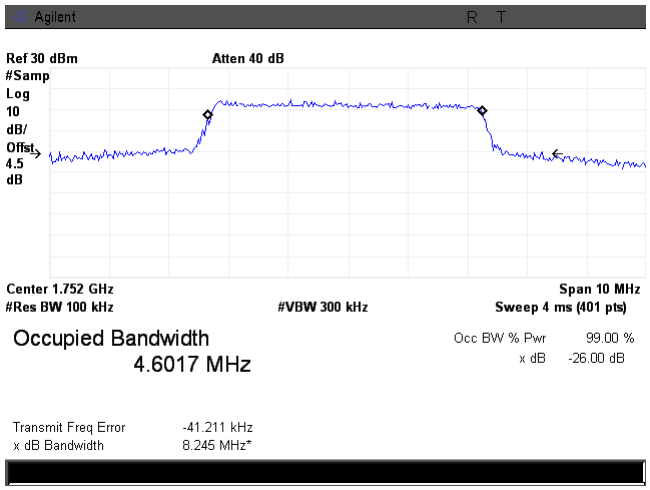
LTE band 4 - Middle CH QPSK-5



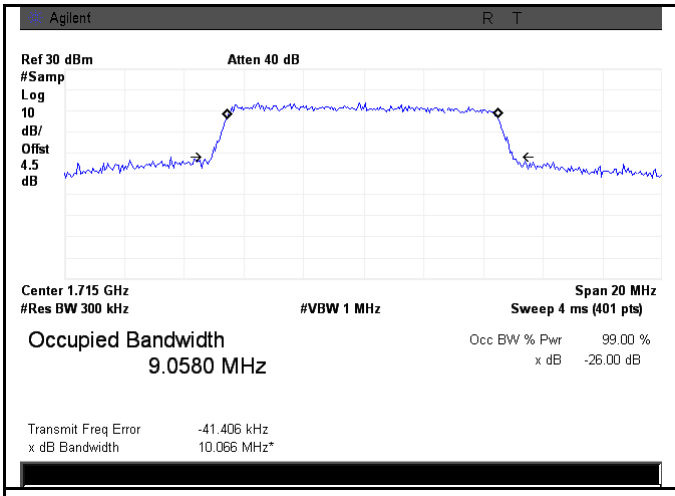
LTE band 4 - Middle CH 16QAM-5



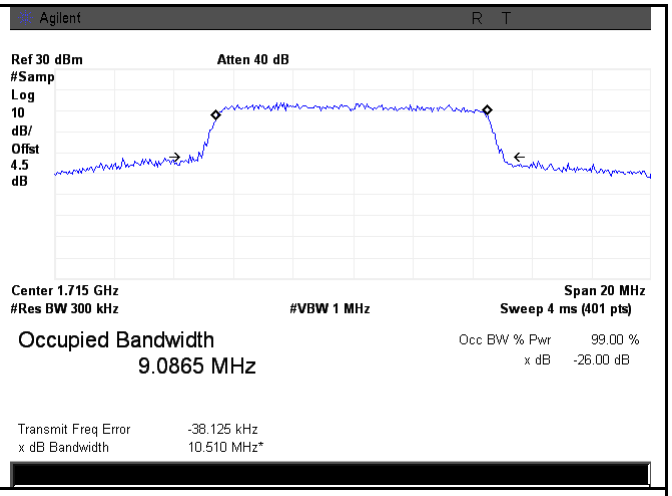
LTE band 4 - High CH QPSK-5



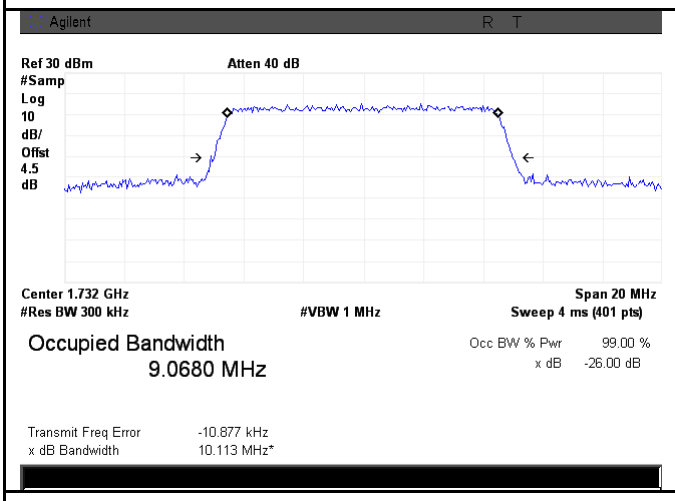
LTE band 4 - High CH 16QAM-5



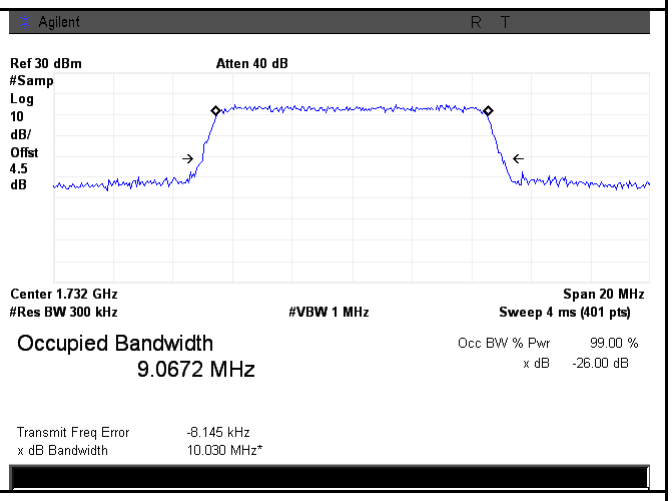
LTE band 4 - Low CH QPSK-10



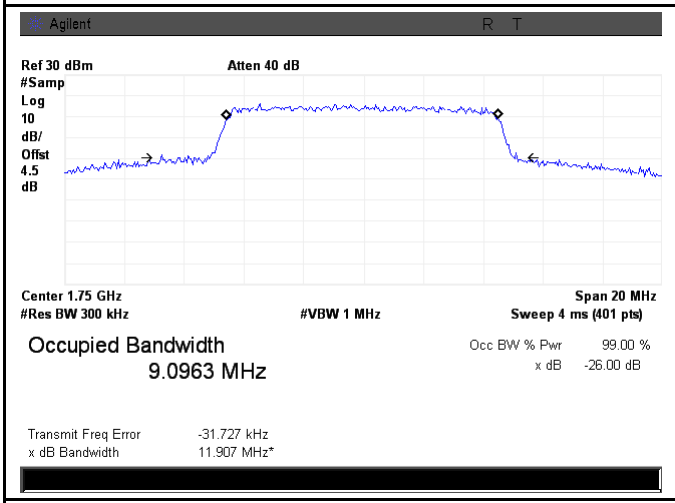
LTE band 4 - Low CH 16QAM-10



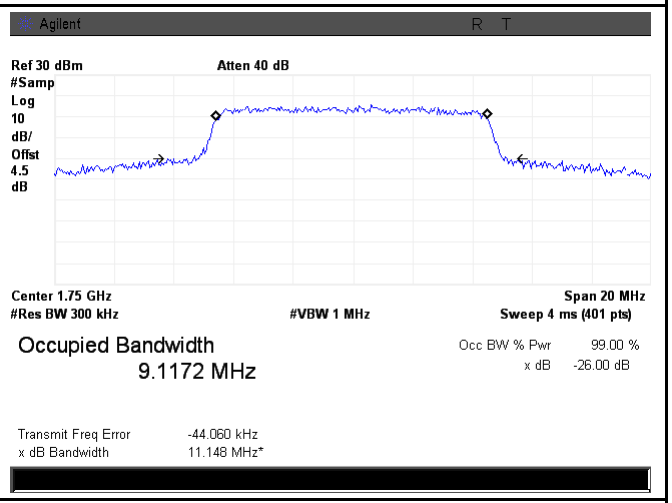
LTE band 4 - Middle CH QPSK-10



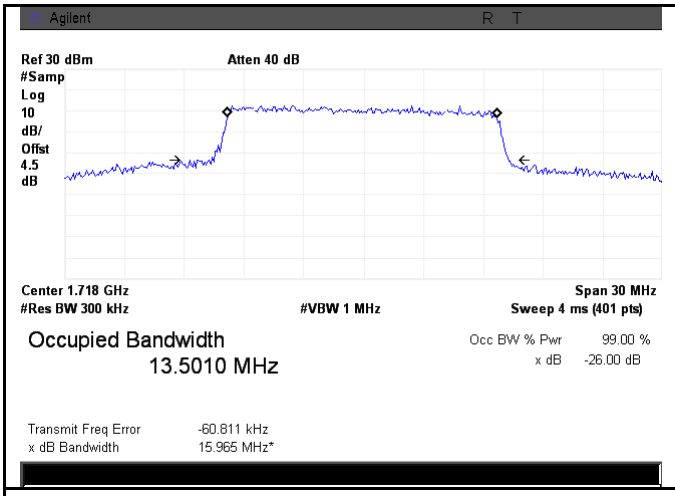
LTE band 4 - Middle CH 16QAM-10



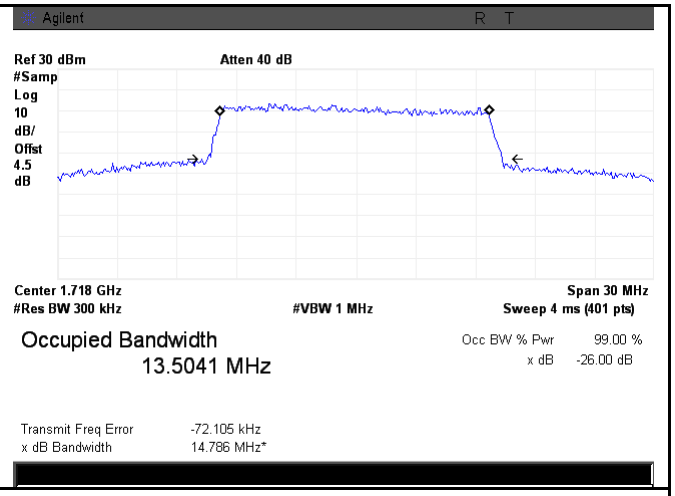
LTE band 4 - High CH QPSK-10



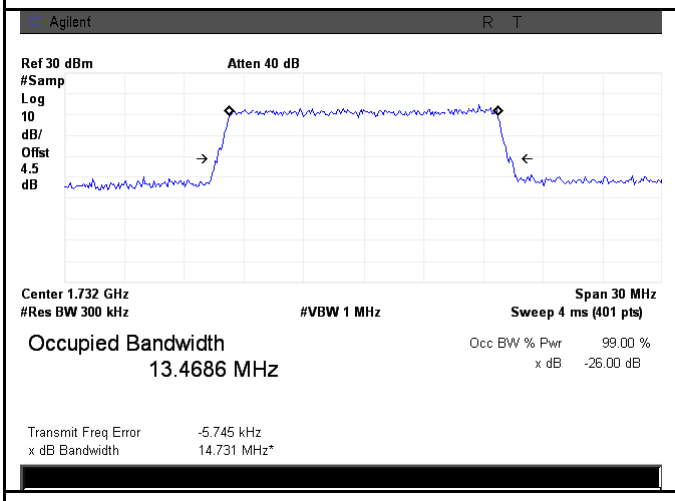
LTE band 4 - High CH 16QAM-10



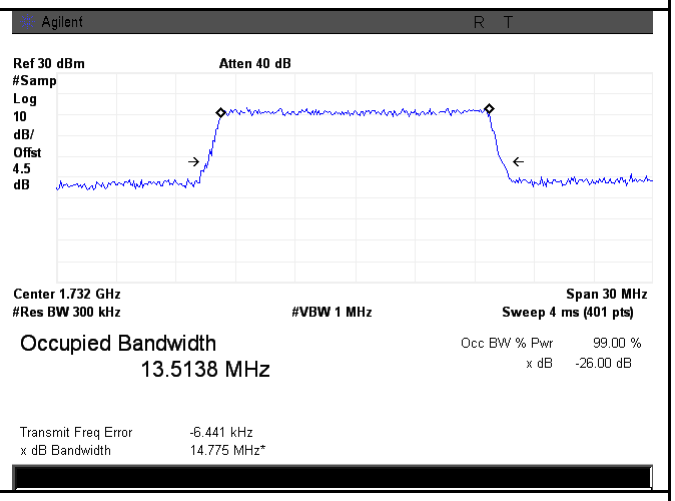
LTE band 4 - Low CH QPSK-15



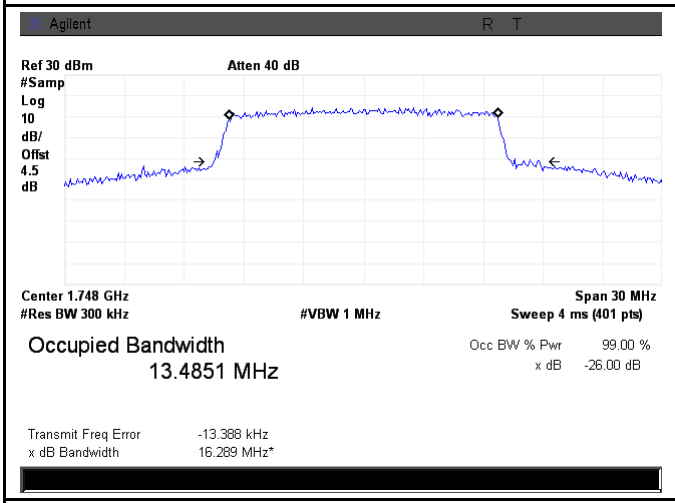
LTE band 4 - Low CH 16QAM-15



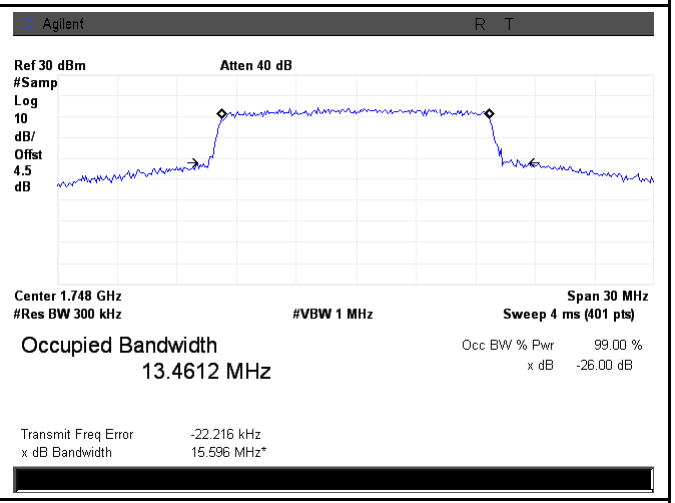
LTE band 4 - Middle CH QPSK-15



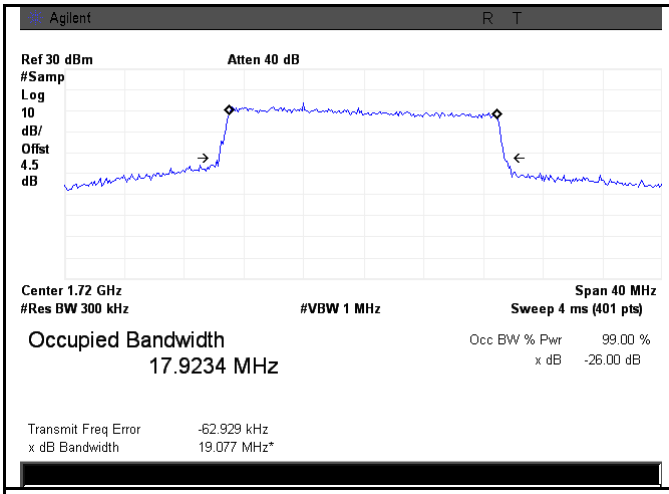
LTE band 4 - Middle CH 16QAM-15



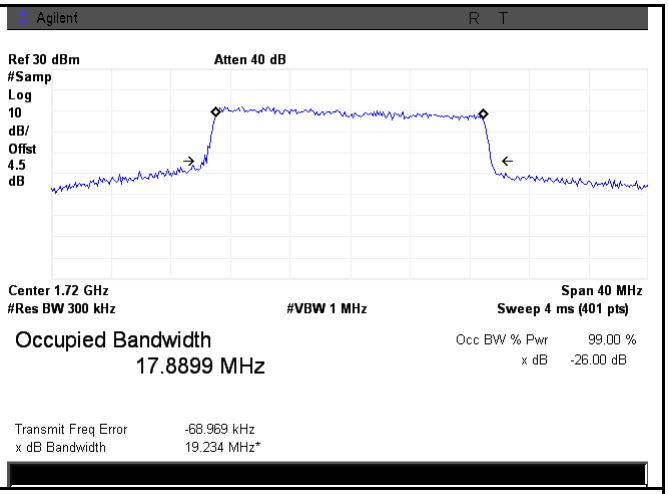
LTE band 4 - High CH QPSK-15



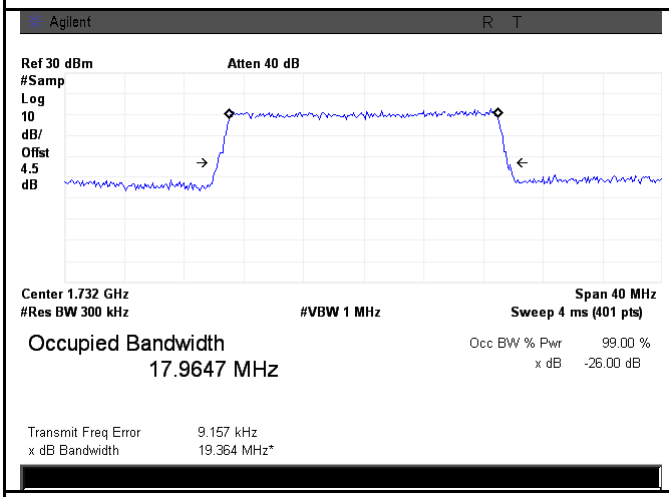
LTE band 4 - High CH 16QAM-15



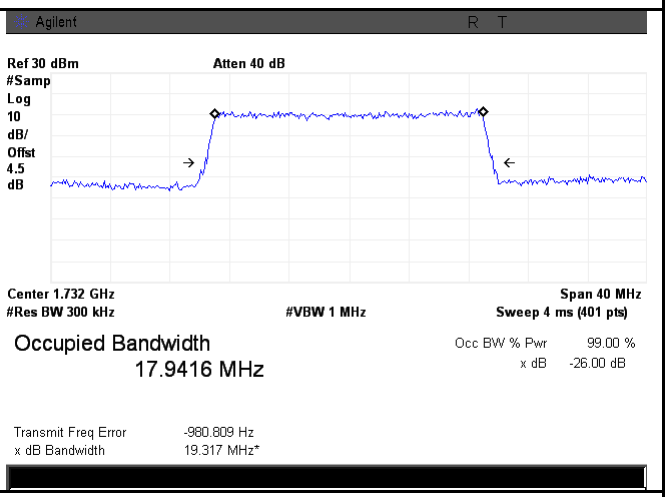
LTE band 4 - Low CH QPSK-20



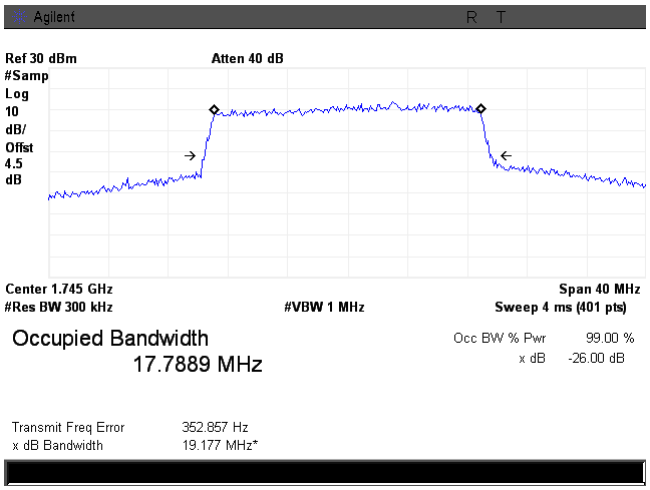
LTE band 4 - Low CH 16QAM-20



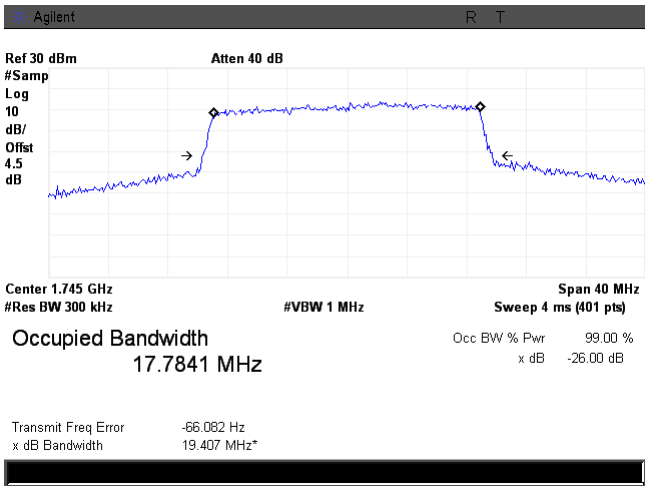
LTE band 4 - Middle CH QPSK-20



LTE band 4 - Middle CH 16QAM-20

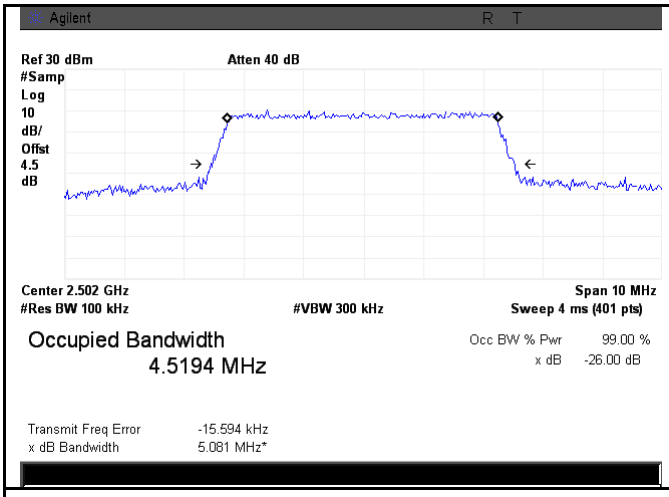


LTE band 4 - High CH QPSK-20

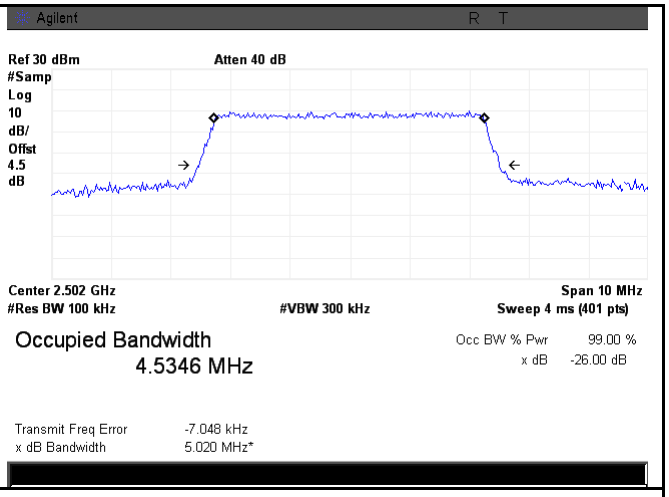


LTE band 4 - High CH 16QAM-20

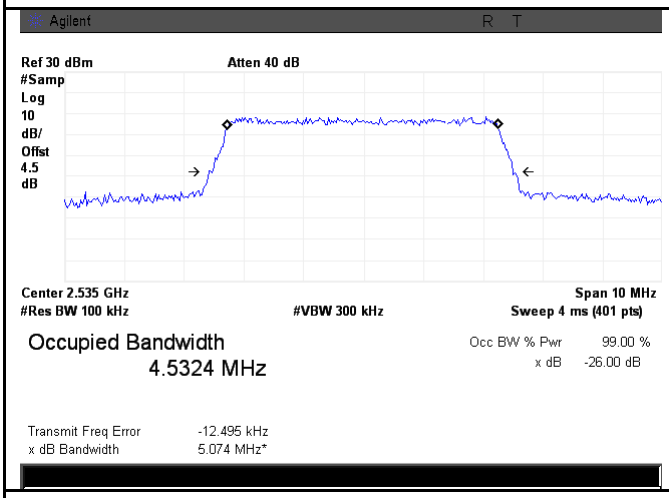
LTE Band 7 (Part 27)



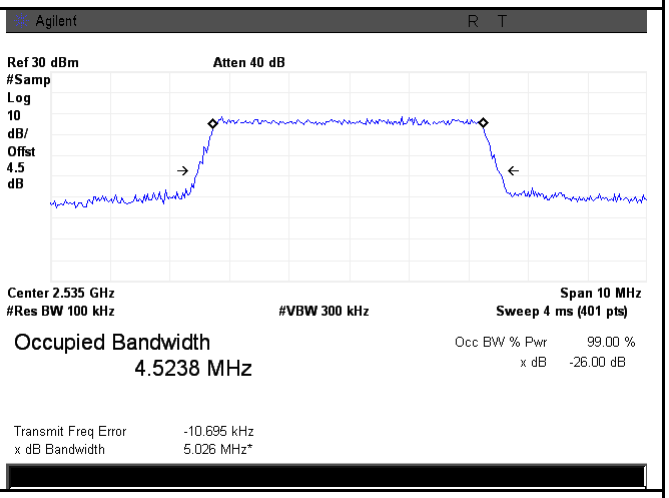
LTE band 7 - Low CH QPSK-5



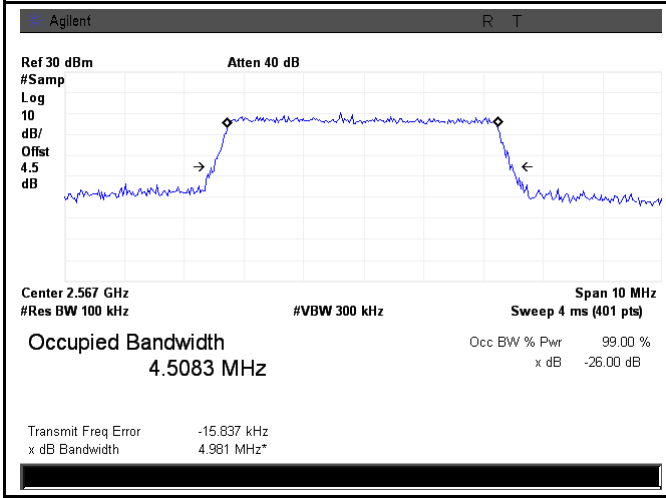
LTE band 7 - Low CH 16QAM-5



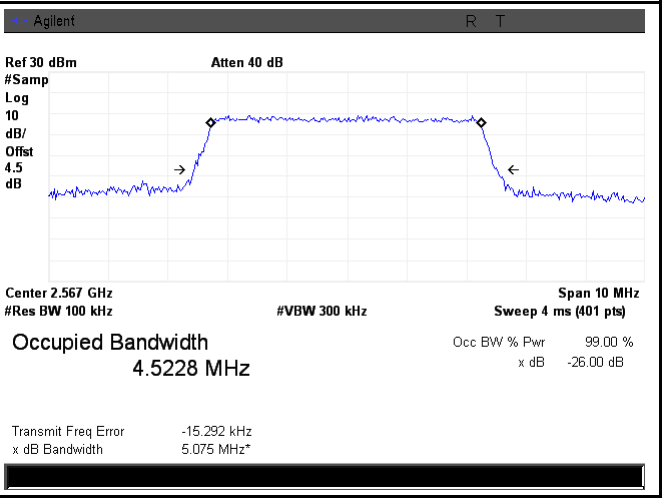
LTE band 7 - Middle CH QPSK-5



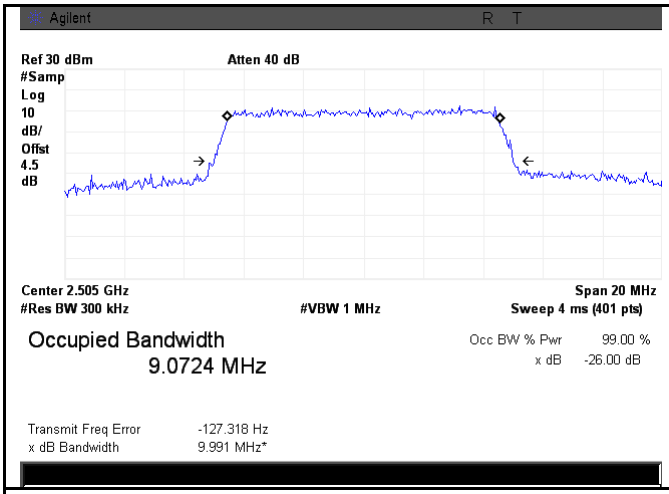
LTE band 7 - Middle CH 16QAM-5



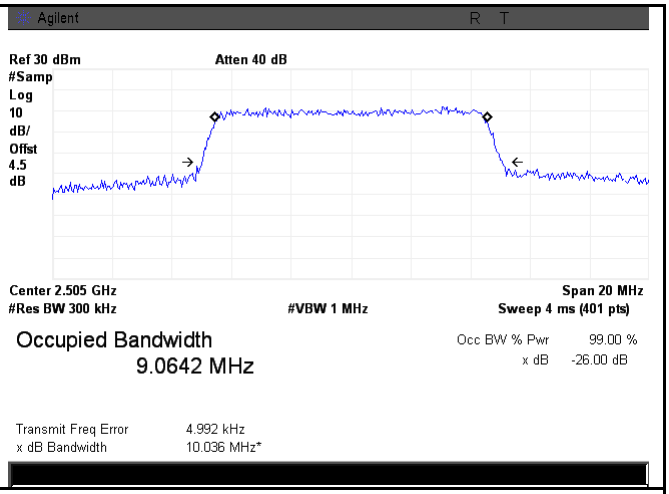
LTE band 7 - High CH QPSK-5



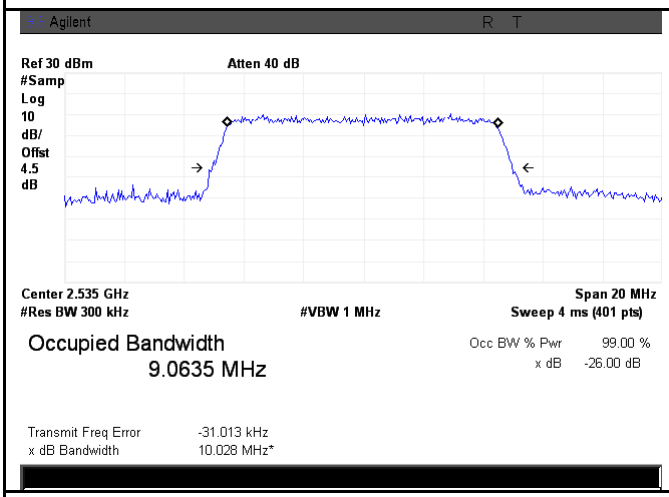
LTE band 7 - High CH 16QAM-5



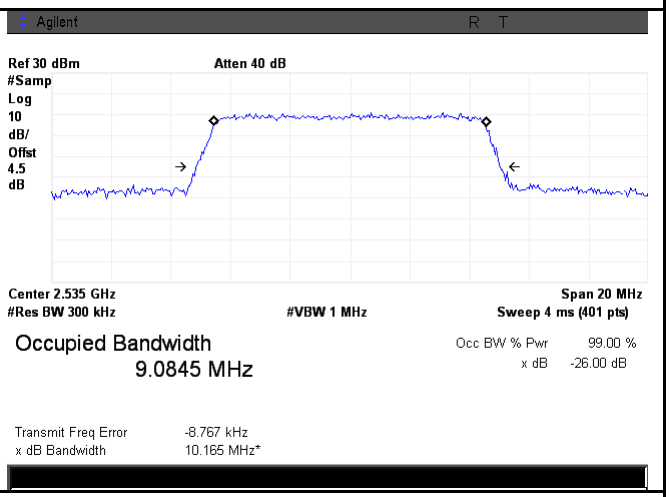
LTE band 7 - Low CH QPSK-10



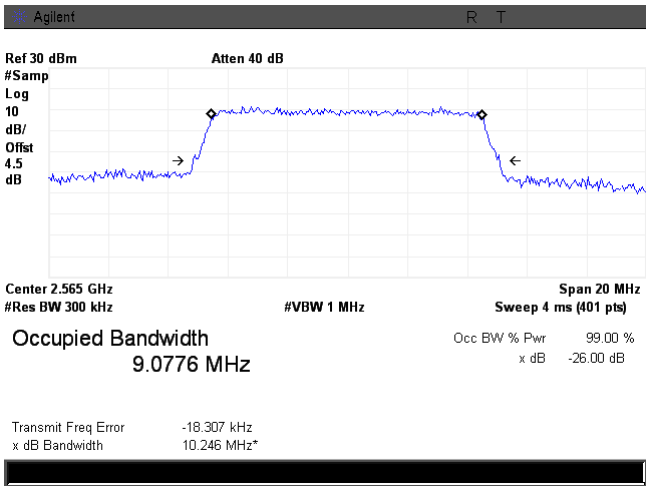
LTE band 7 - Low CH 16QAM-10



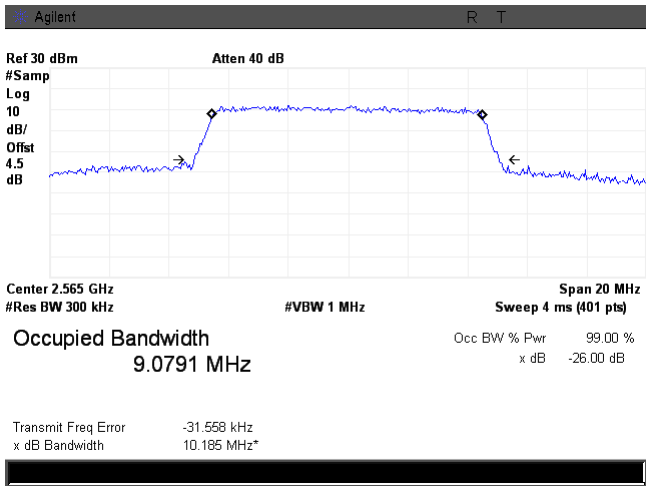
LTE band 7 - Middle CH QPSK-10



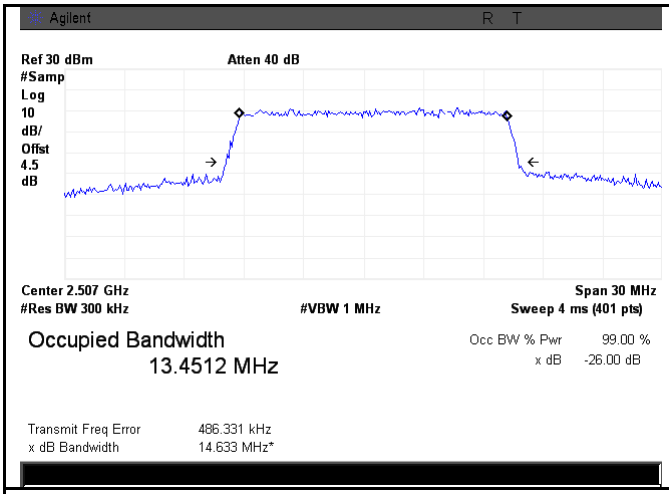
LTE band 7 - Middle CH 16QAM-10



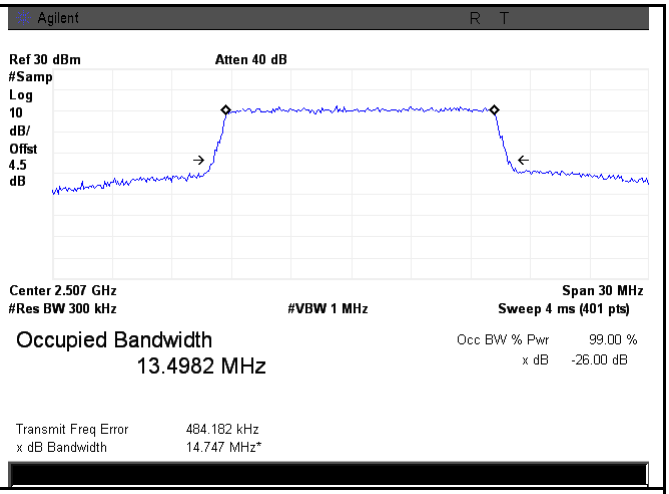
LTE band 7 - High CH QPSK-10



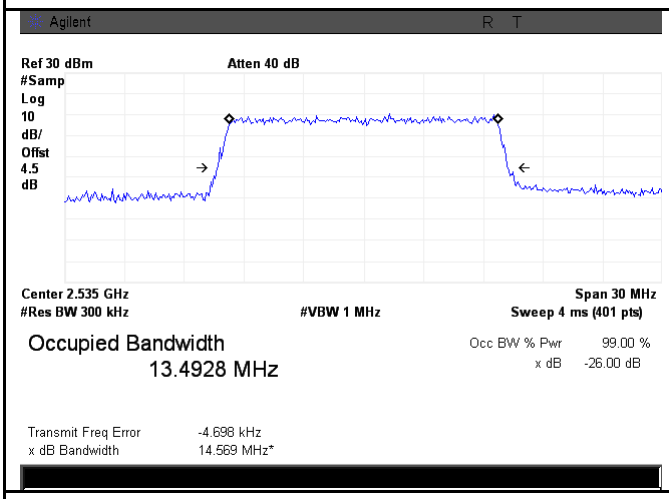
LTE band 7 - High CH 16QAM-10



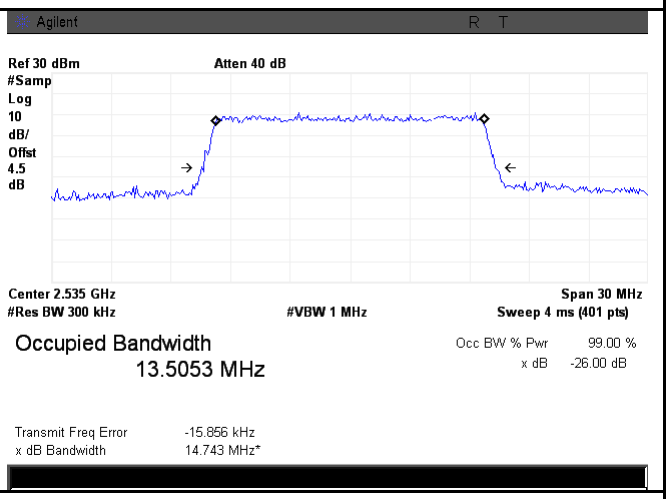
LTE band 7 - Low CH QPSK-15



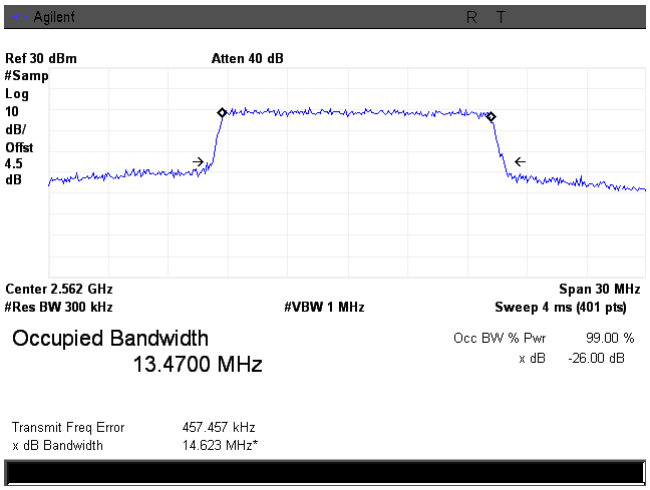
LTE band 7 - Low CH 16QAM-15



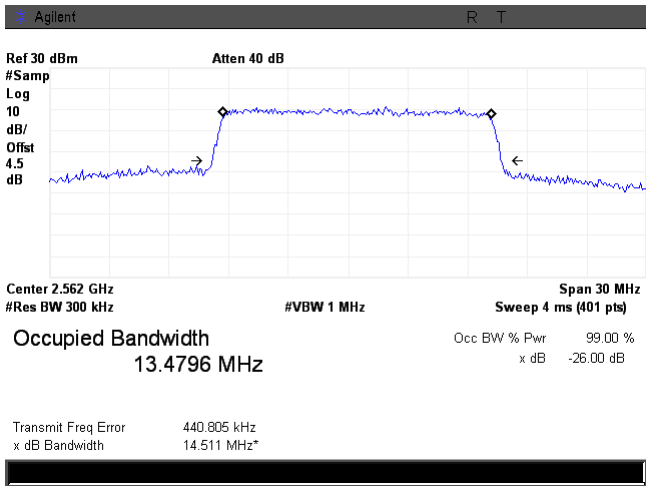
LTE band 7 - Middle CH QPSK-15



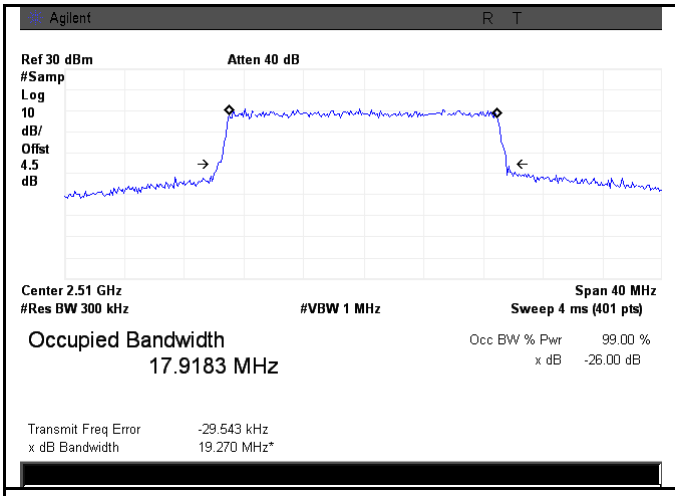
LTE band 7 - Middle CH 16QAM-15



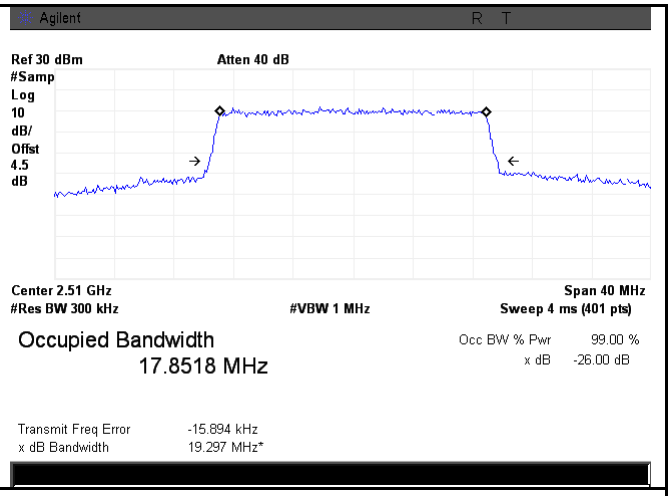
LTE band 7 - High CH QPSK-15



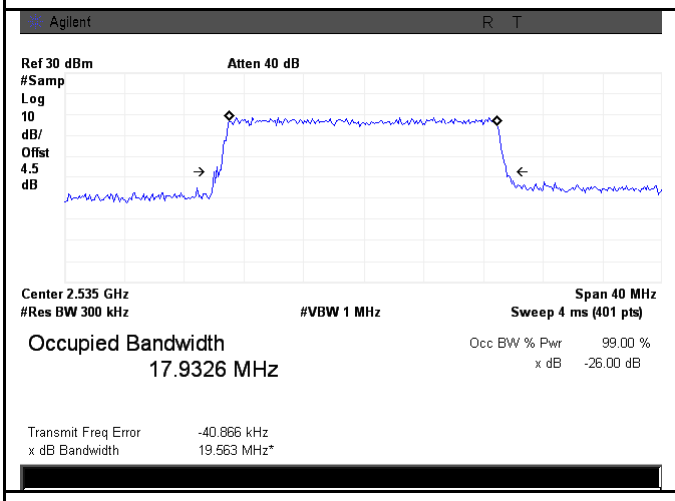
LTE band 7 - High CH 16QAM-15



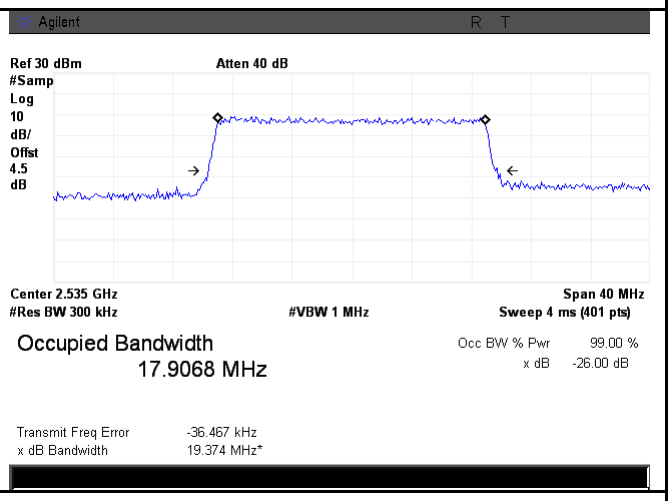
LTE band 7 - Low CH QPSK-20



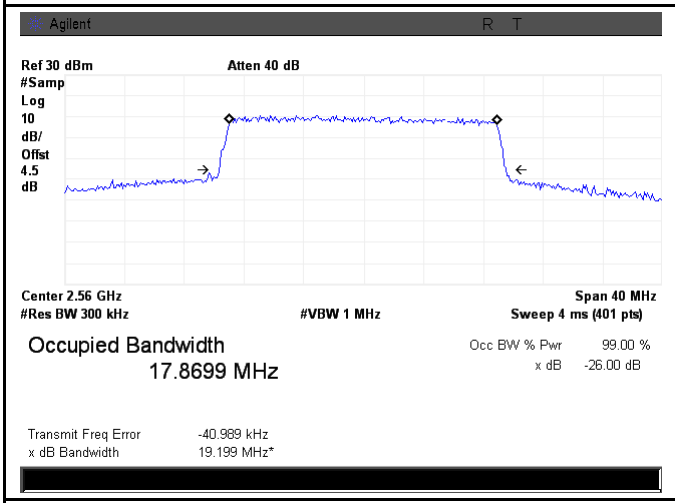
LTE band 7 - Low CH 16QAM-20



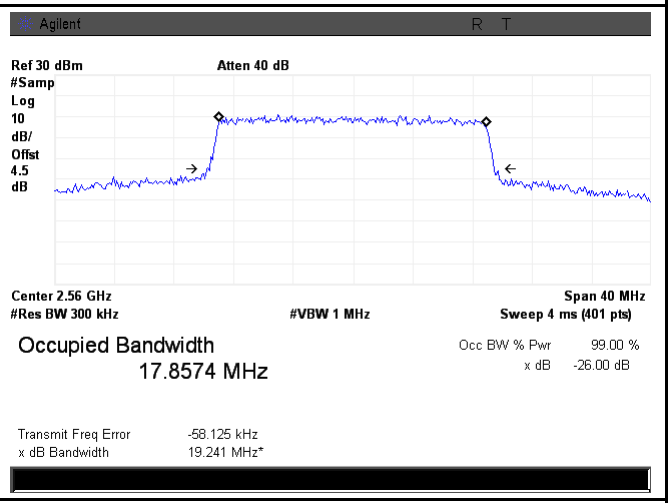
LTE band 7 - Middle CH QPSK-20



LTE band 7 - Middle CH 16QAM-20

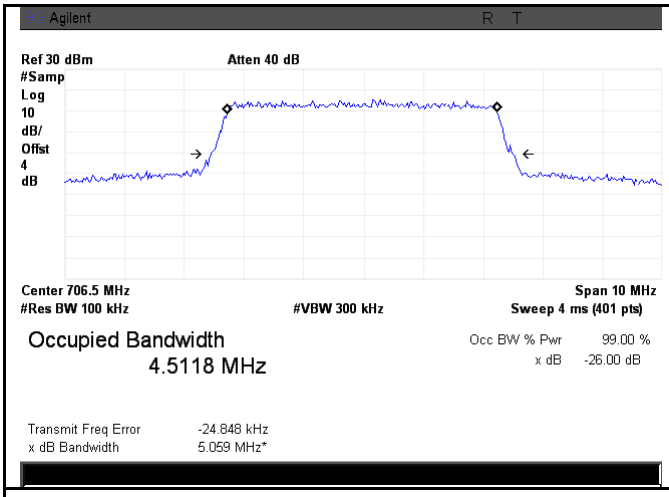


LTE band 7 - High CH QPSK-20

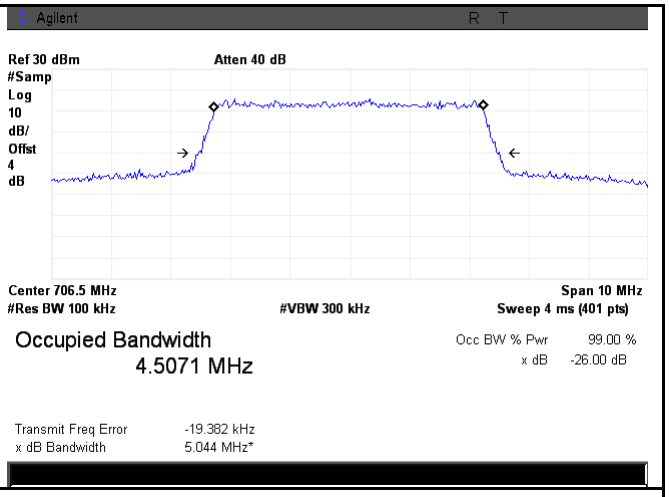


LTE band 7 - High CH 16QAM-20

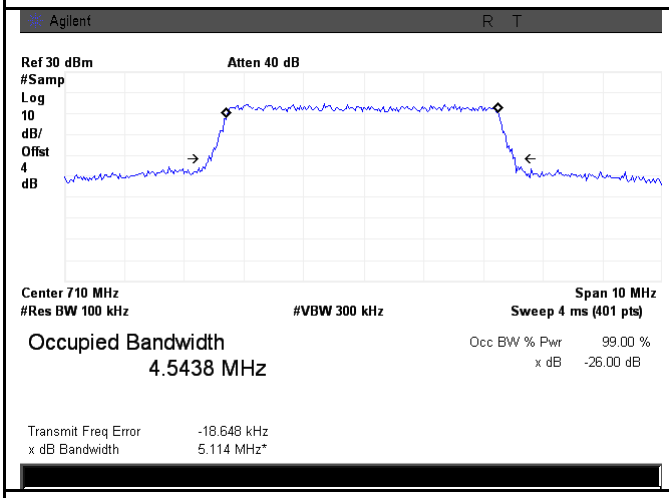
LTE Band 17 (Part 27)



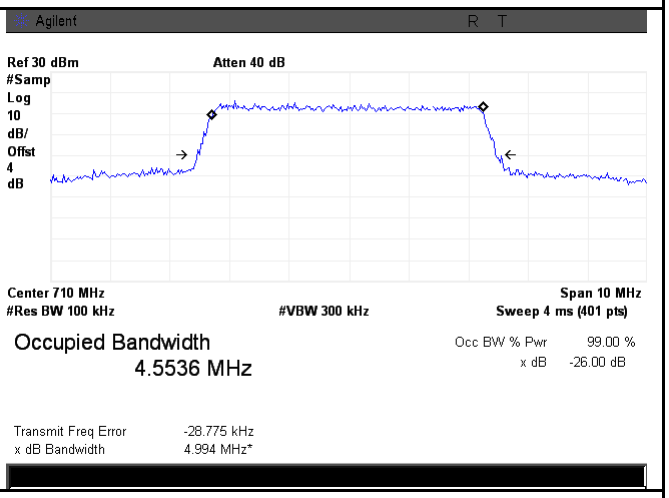
LTE band 17 - Low CH QPSK-5



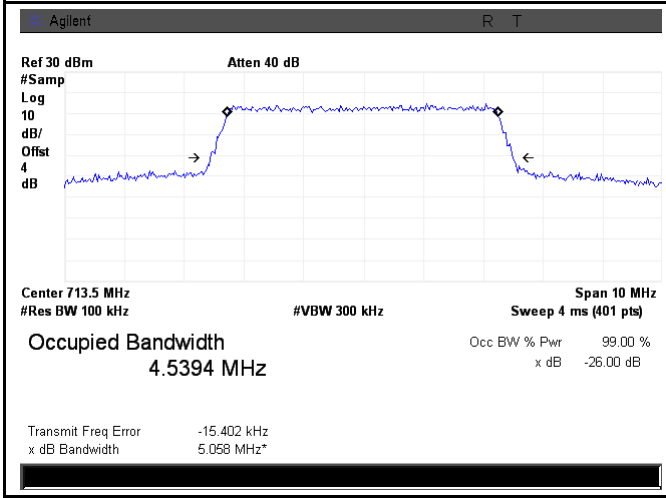
LTE band 17 - Low CH 16QAM-5



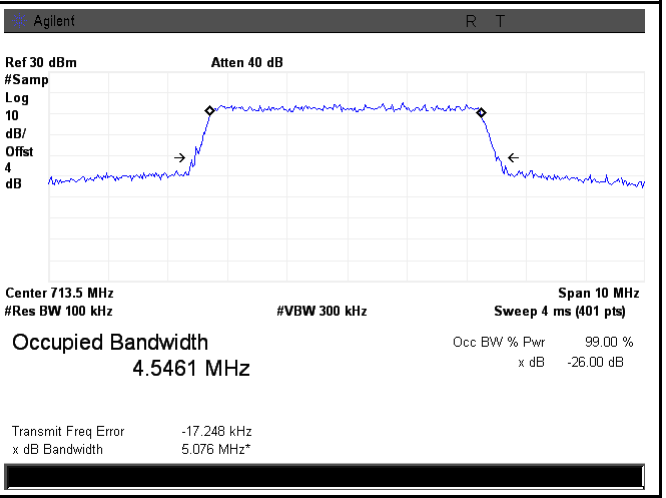
LTE band 17 - Middle CH QPSK-5



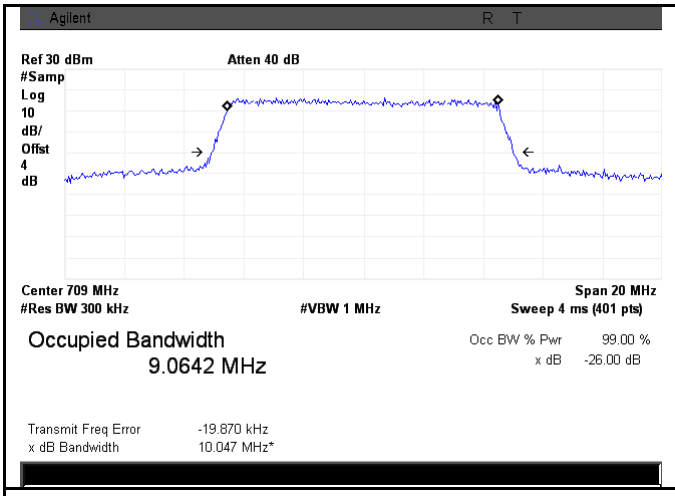
LTE band 17 - Middle CH 16QAM-5



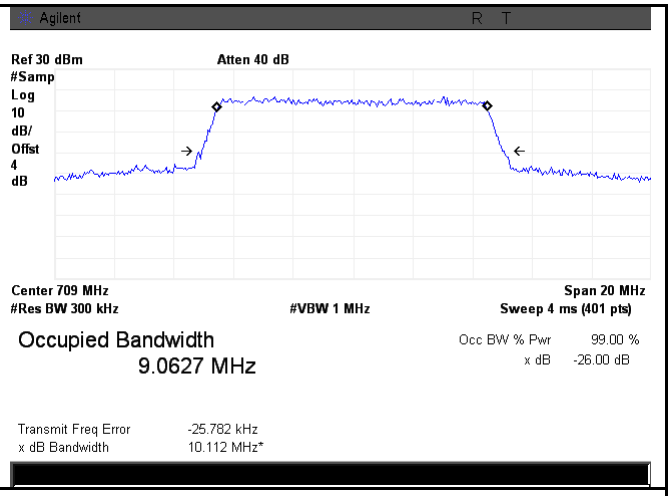
LTE band 17 - High CH QPSK-5



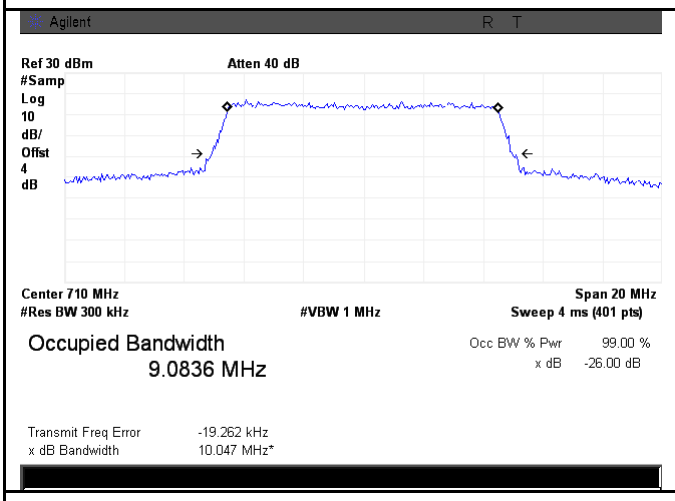
LTE band 17 - High CH 16QAM-5



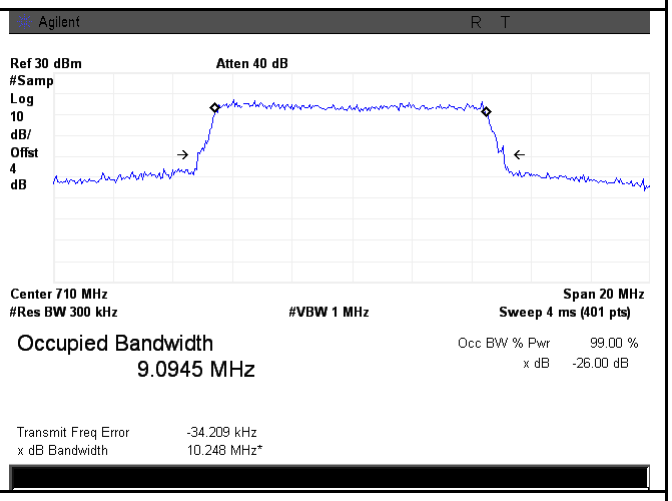
LTE band 17 - Low CH QPSK-10



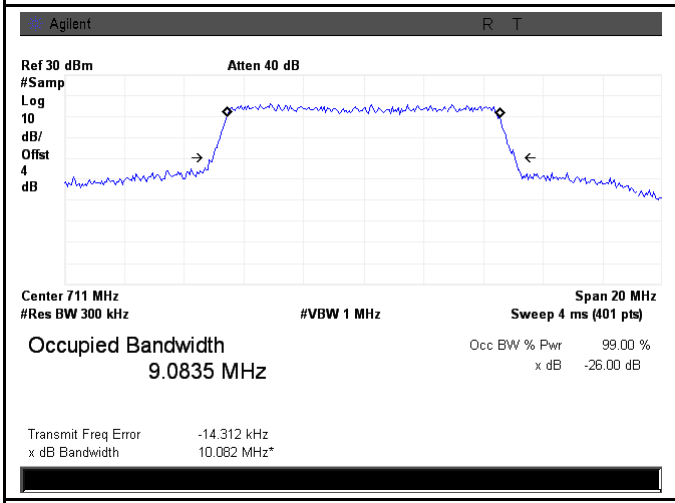
LTE band 17 - Low CH 16QAM-10



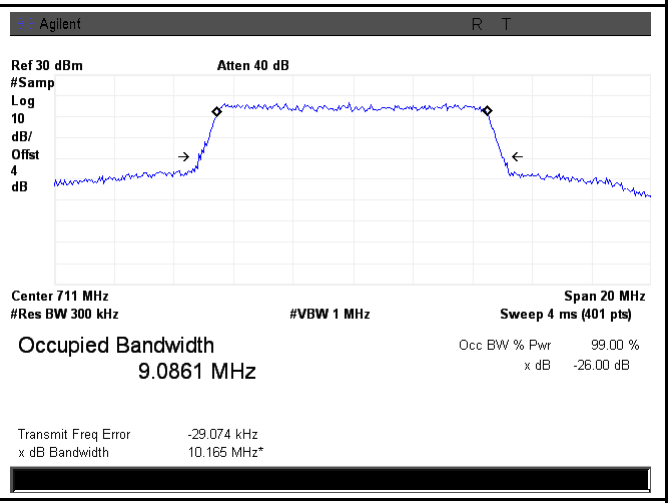
LTE band 17 - Middle CH QPSK-10



LTE band 17 - Middle CH 16QAM-10



LTE band 17 - High CH QPSK-10

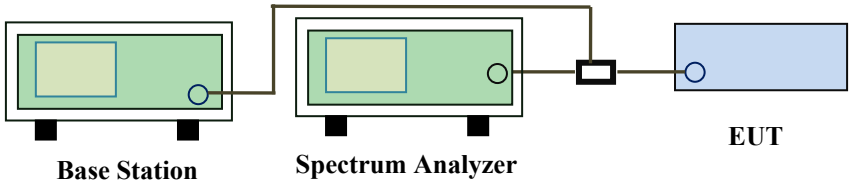


LTE band 17 - High CH 16QAM-10

6.6 Spurious Emissions at Antenna Terminals

Temperature	25℃
Relative Humidity	58%
Atmospheric Pressure	1016mbar
Test date :	October 16, 2015
Tested By :	Winnie Zhang

Requirement(s):

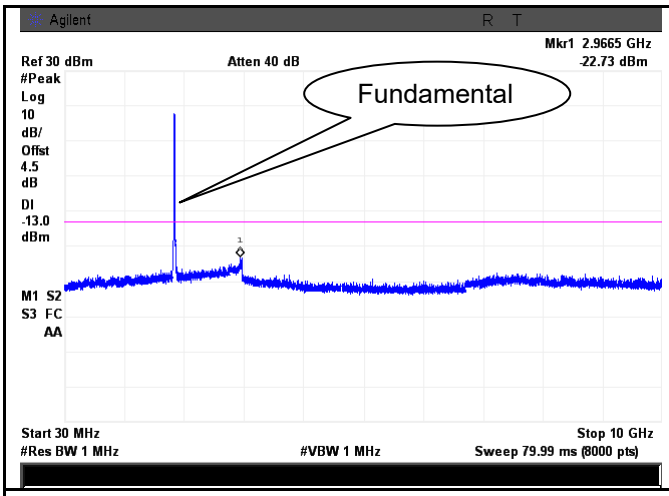
Spec	Item	Requirement	Applicable
§2.1051, §22.917(a)& §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

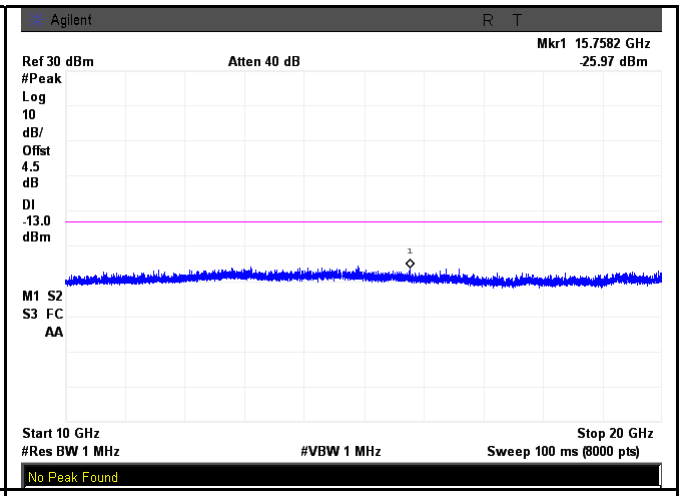
Test Plot ☑ Yes (See below) ☐ N/A

Test Plots 30MHz-5GHz

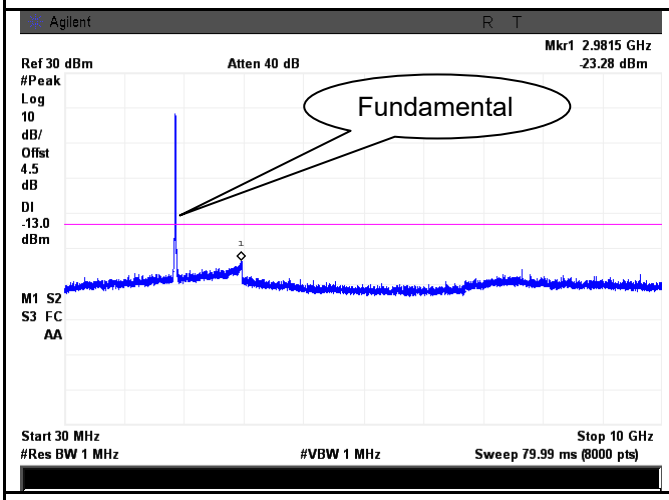
LTE Band 2 (Part 24E)



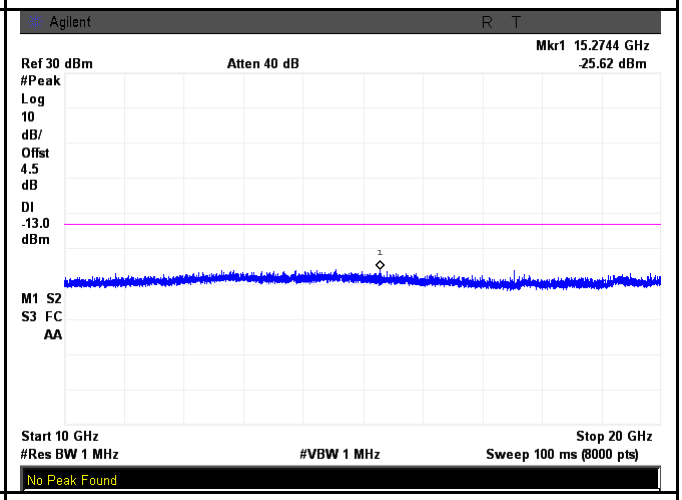
LTE Band 2 - Low Channel-1



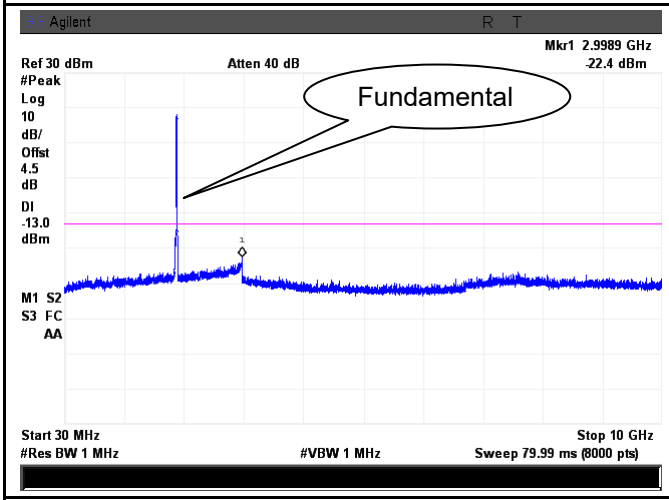
LTE Band 2 - Low Channel-2



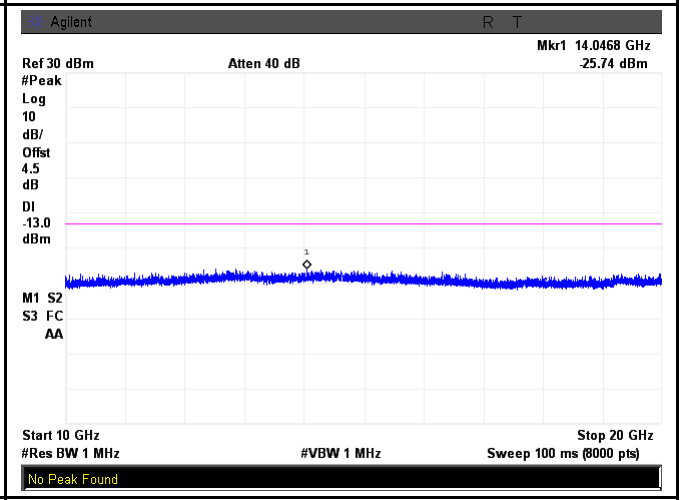
LTE Band 2 Middle Channel-1



LTE Band 2 Middle Channel-2

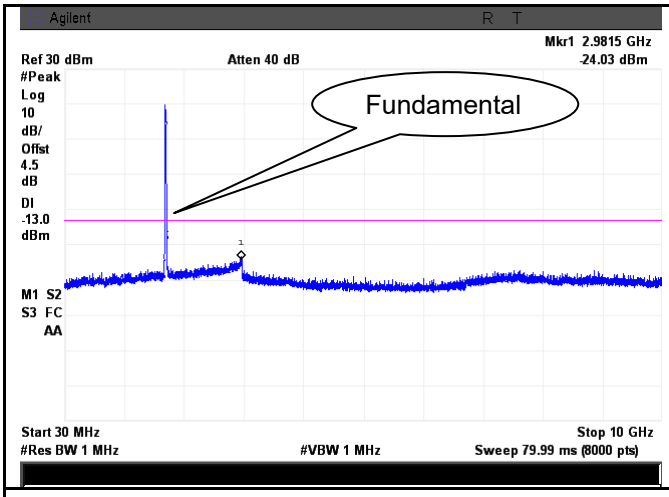


LTE Band 2 - High Channel-1

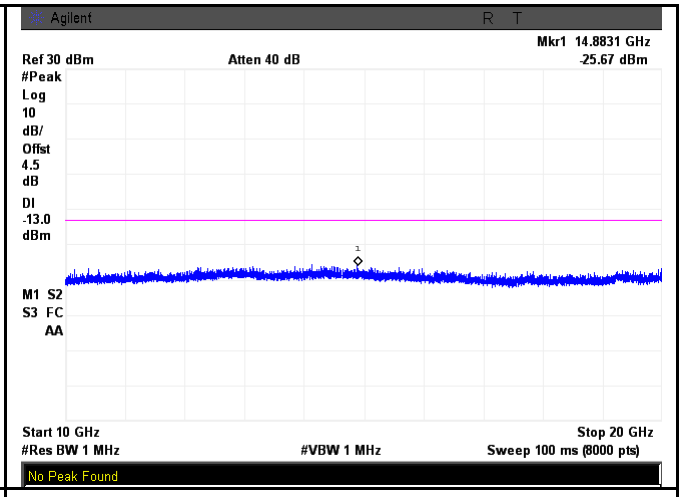


LTE Band 2 - High Channel-2

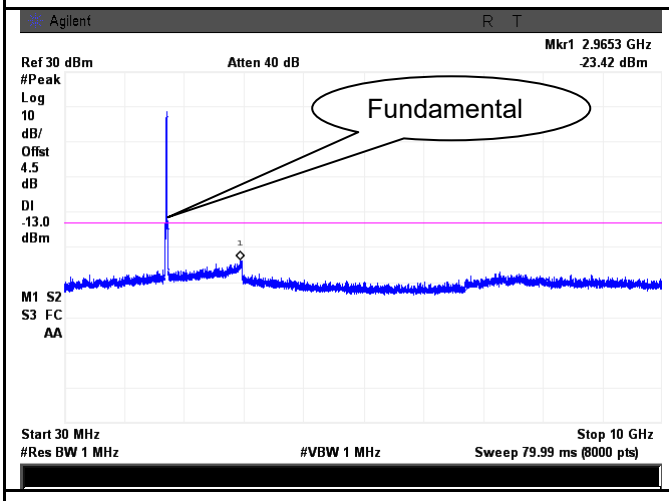
LTE Band 4 (Part27) result



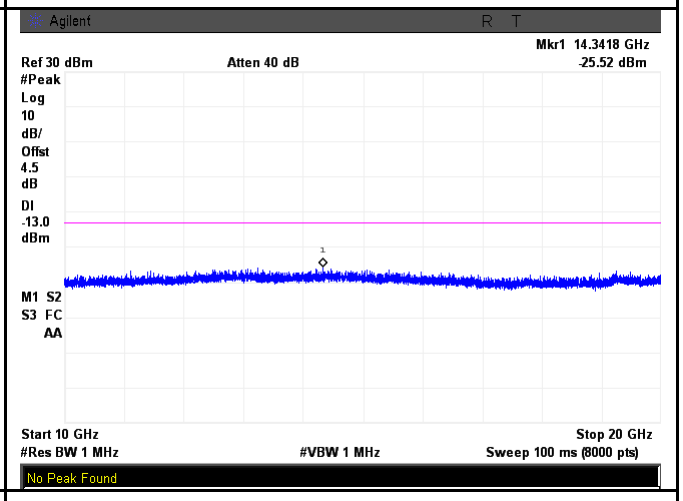
LTE Band 4 - Low Channel-1



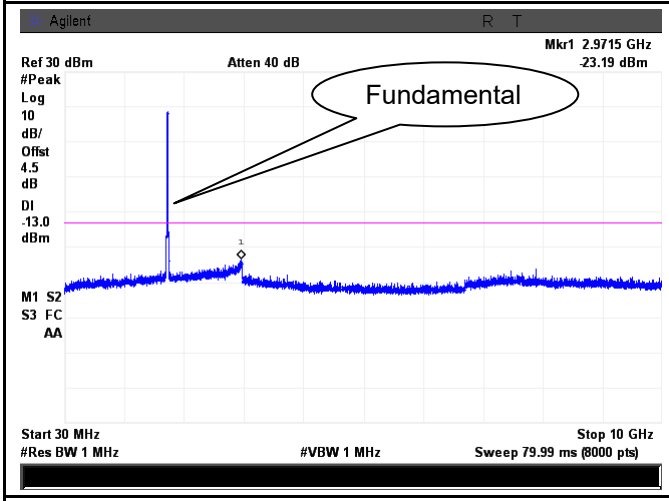
LTE Band 4 - Low Channel-2



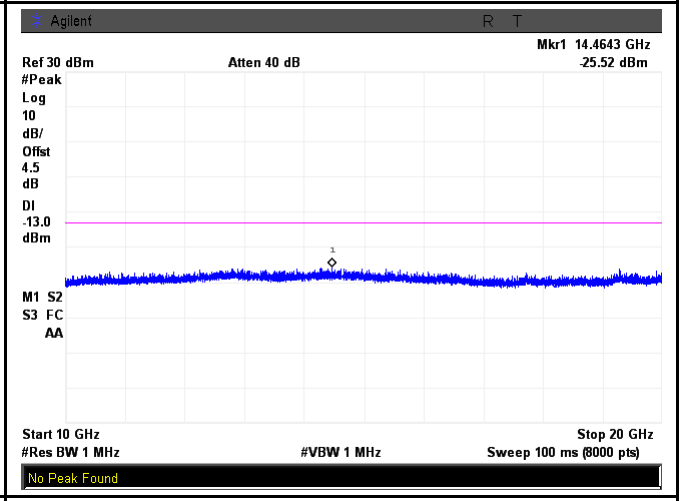
LTE Band 4 - Middle Channel-1



LTE Band 4 - Middle Channel-2

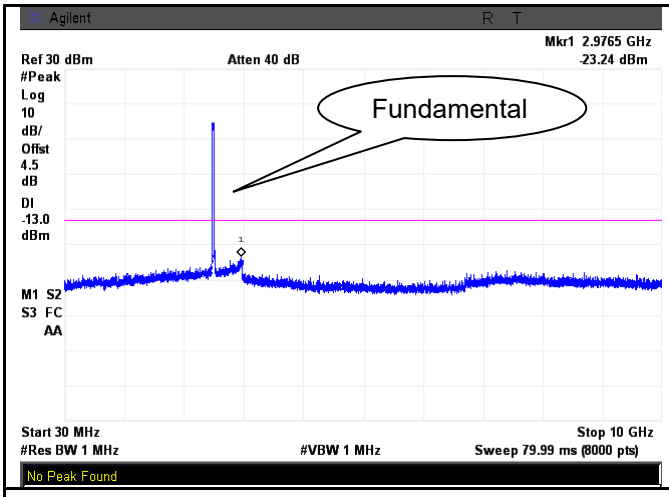


LTE Band 4 - High Channel-1

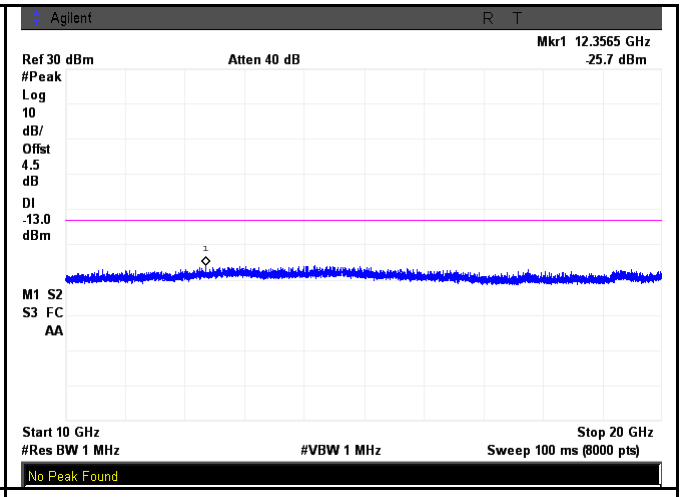


LTE Band 4 - High Channel-2

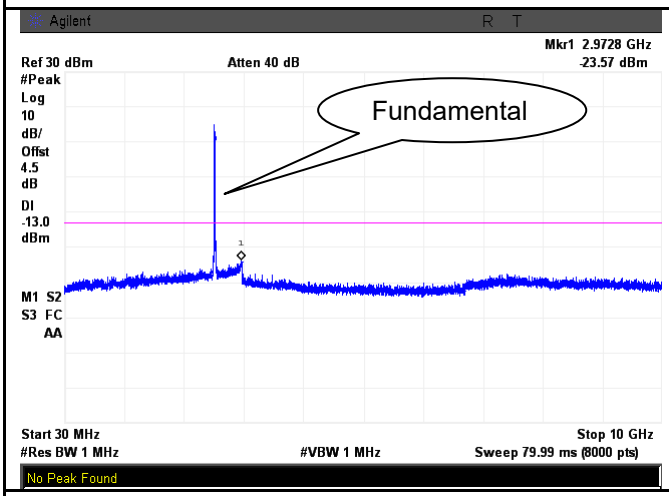
LTE Band 7 (Part 27)



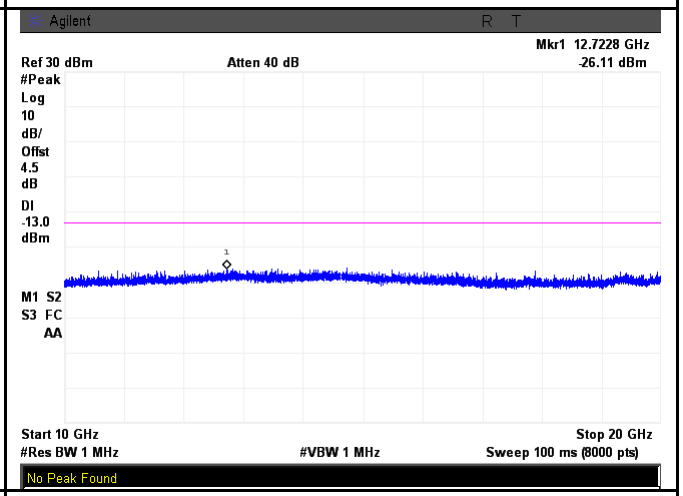
LTE Band 7 - Low Channel-1



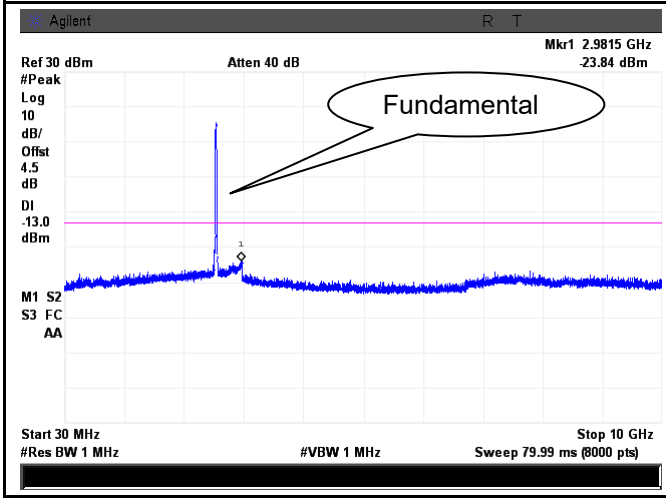
LTE Band 7 - Low Channel-2



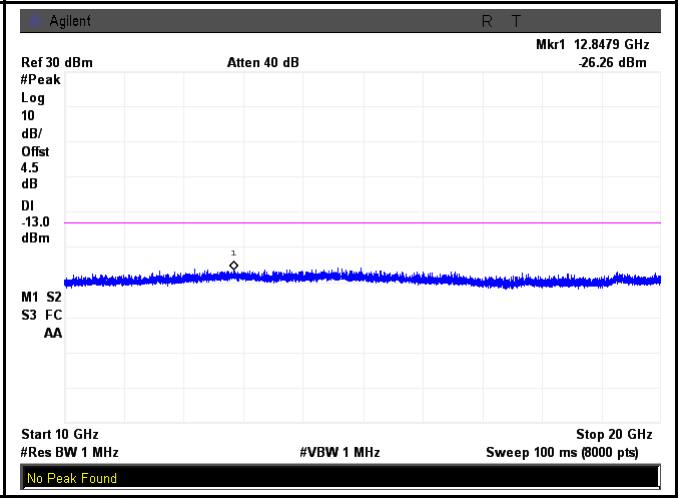
LTE Band 7- Middle Channel-1



LTE Band 7 - Middle Channel-2

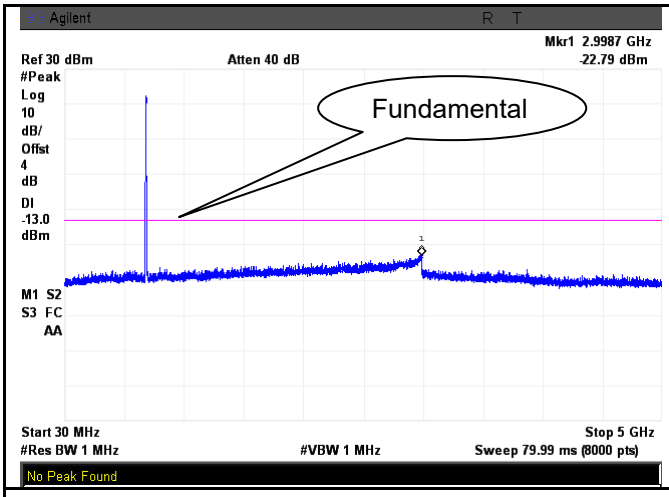


LTE Band 7 - High Channel-1

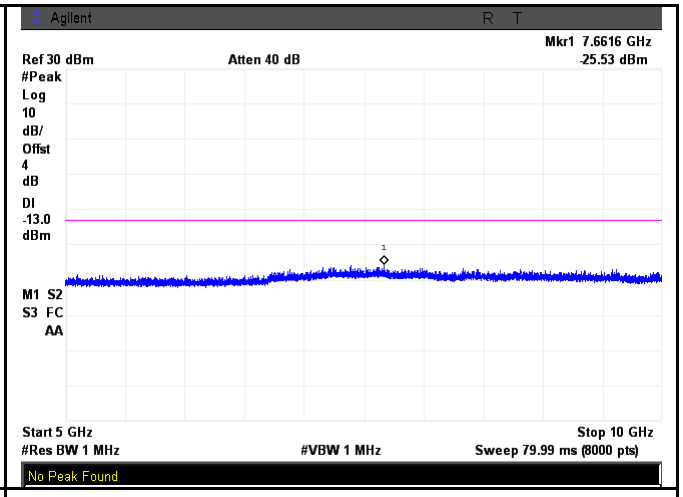


LTE Band 7 - High Channel-2

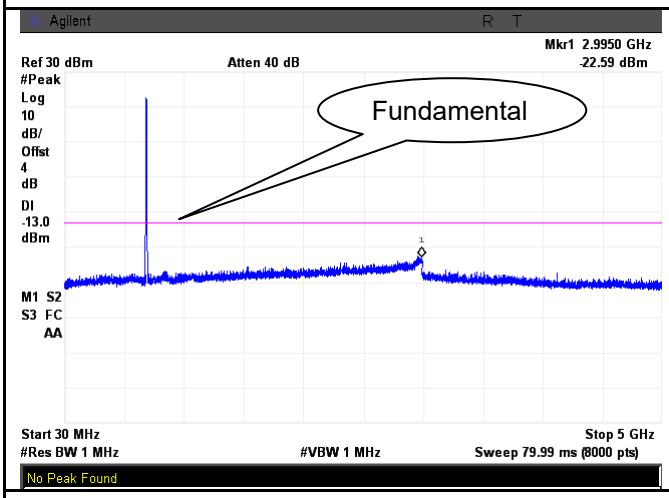
LTE Band 17 (Part 27)



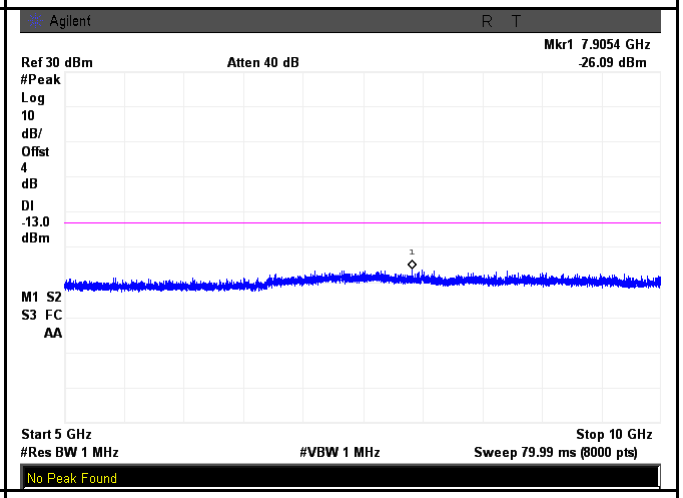
LTE Band 17 - Low Channel-1



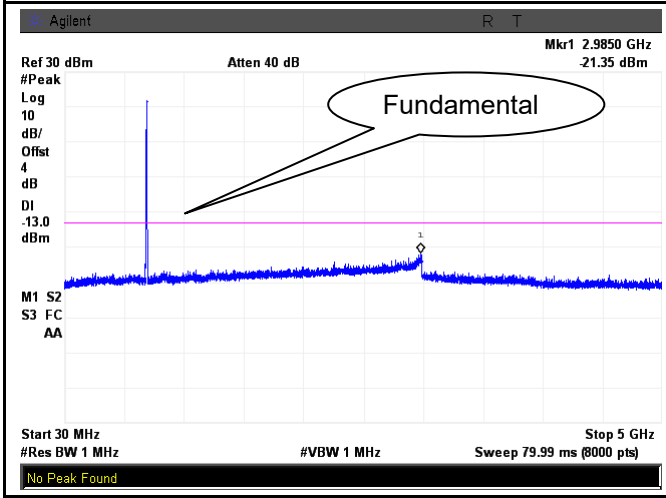
LTE Band 17 - Low Channel-2



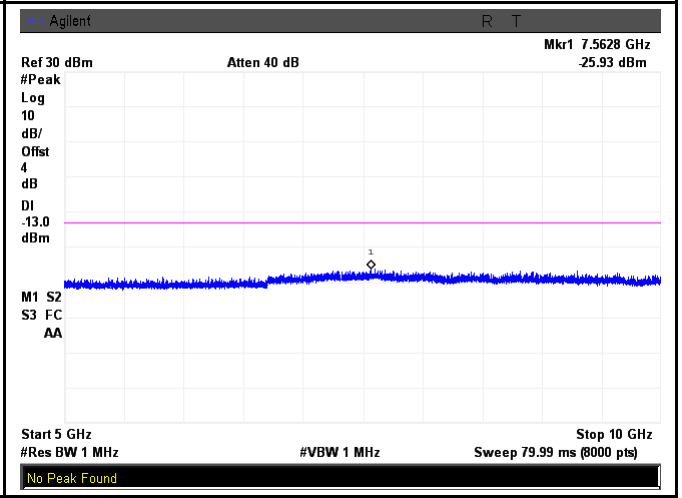
LTE Band 17- Middle Channel-1



LTE Band 17 - Middle Channel-2



LTE Band 17 - High Channel-1

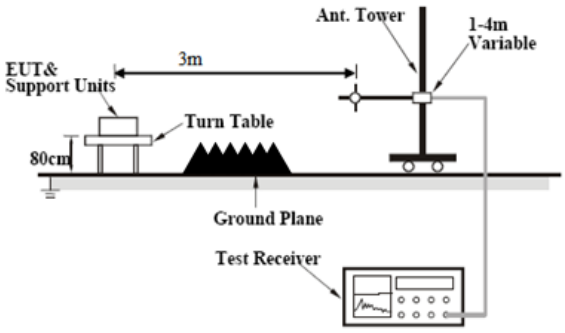


LTE Band 17 - High Channel-2

6.7 Spurious Radiated Emissions

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1031mbar
Test date :	October 31, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, §22.917 & §24.238 § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.	☑
Test setup			
Test Procedure	1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. 3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

LTE Band 2 (Part 24E) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3720	-45.93	V	10.25	2.73	-38.41	-13	-25.41
3720	-46.68	H	10.25	2.73	-39.16	-13	-26.16
45.3	-38.22	V	-4.2	0.11	-42.53	-13	-29.53
186.7	-46.87	H	4.6	0.18	-42.45	-13	-29.45

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-45.88	V	10.25	2.73	-38.36	-13	-25.36
3760	-46.65	H	10.25	2.73	-39.13	-13	-26.13
45.1	-38.41	V	-4.2	0.11	-42.72	-13	-29.72
186.5	-46.96	H	4.6	0.18	-42.54	-13	-29.54

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3800	-45.91	V	10.36	2.73	-38.28	-13	-25.28
3800	-46.59	H	10.36	2.73	-38.96	-13	-25.96
45.6	-38.35	V	-4.2	0.11	-42.66	-13	-29.66
186.2	-46.92	H	4.6	0.18	-42.50	-13	-29.50

LTE Band 4(Part27) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3440	-46.12	V	10.06	2.52	-38.58	-13	-25.58
3440	-46.83	H	10.06	2.52	-39.29	-13	-26.29
46.1	-39.07	V	-4.2	0.11	-43.38	-13	-30.38
185.9	-48.22	H	4.6	0.18	-43.8	-13	-30.80

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3465	-45.96	V	10.09	2.52	-38.39	-13	-25.39
3465	-46.53	H	10.09	2.52	-38.96	-13	-25.96
46.5	-39.02	V	-4.2	0.11	-43.33	-13	-30.33
185.6	-48.17	H	4.6	0.18	-43.75	-13	-30.75

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3490	-45.88	V	10.09	2.52	-38.31	-13	-25.31
3490	-46.49	H	10.09	2.52	-38.92	-13	-25.92
46.4	-38.95	V	-4.2	0.11	-43.26	-13	-30.26
185.7	-47.99	H	4.6	0.18	-43.57	-13	-30.57

LTE Band 7(Part27) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5020	-48.73	V	10.29	0.98	-39.42	-13	-26.42
5020	-48.59	H	10.29	0.98	-39.28	-13	-26.28
45.8	-39.26	V	-4.2	0.11	-43.57	-13	-30.57
186.2	-48.12	H	4.6	0.18	-43.7	-13	-30.7

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5070	-48.69	V	10.3	0.99	-39.38	-13	-26.38
5070	-48.55	H	10.3	0.99	-39.24	-13	-26.24
45.7	-39.18	V	-4.2	0.11	-43.49	-13	-30.49
186.3	-48.06	H	4.6	0.18	-43.64	-13	-30.64

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5120	-48.63	V	10.32	1	-39.31	-13	-26.31
5120	-48.51	H	10.32	1	-39.19	-13	-26.19
45.1	-39.17	V	-4.2	0.11	-43.48	-13	-30.48
186.7	-48.02	H	4.6	0.18	-43.6	-13	-30.60

LTE Band 17(Part27) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1418	-44.38	V	7.65	0.75	-37.48	-13	-24.48
1418	-44.63	H	7.65	0.75	-37.73	-13	-24.73
44.9	-38.76	V	-4.2	0.11	-43.07	-13	-30.07
187.3	-47.22	H	4.6	0.18	-42.8	-13	-29.80

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1420	-44.29	V	7.65	0.75	-37.39	-13	-24.39
1420	-44.57	H	7.65	0.75	-37.67	-13	-24.67
44.5	-38.71	V	-4.2	0.11	-43.02	-13	-30.02
187.1	-47.16	H	4.6	0.18	-42.74	-13	-29.74

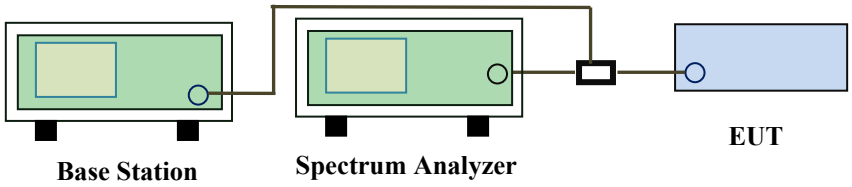
High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1422	-44.25	V	7.65	0.75	-37.35	-13	-24.35
1422	-44.61	H	7.65	0.75	-37.71	-13	-24.71
44.6	-38.59	V	-4.2	0.11	-42.9	-13	-29.90
187.4	-47.05	H	4.6	0.18	-42.63	-13	-29.63

6.8 Band Edge

Temperature	25℃
Relative Humidity	58%
Atmospheric Pressure	1016mbar
Test date :	October 16, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§22.917(a) §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.	☑
Test setup			
Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

LTE Band 2 (Part 24E) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	18607	1850.7	QPSK	-20.16	-13
			16QAM	-23.85	-13
1.4	18900	1909.3	QPSK	-18.05	-13
			16QAM	-17.40	-13
3	18615	1851.5	QPSK	-20.13	-13
			16QAM	-20.66	-13
3	19185	1908.5	QPSK	-20.06	-13
			16QAM	-18.09	-13
5	18625	1852.5	QPSK	-18.45	-13
			16QAM	-17.47	-13
5	19175	1907.5	QPSK	-18.30	-13
			16QAM	-19.07	-13
10	18650	1855	QPSK	-27.97	-13
			16QAM	-28.26	-13
10	19150	1905	QPSK	-28.41	-13
			16QAM	-28.41	-13
15	18675	1857.5	QPSK	-20.89	-13
			16QAM	-22.07	-13
15	19125	1902.5	QPSK	-21.63	-13
			16QAM	-21.98	-13
20	18700	1860	QPSK	-23.80	-13
			16QAM	-24.41	-13
20	19100	1900	QPSK	-20.21	-13
			16QAM	-18.86	-13

LTE Band 4 (Part 27) result

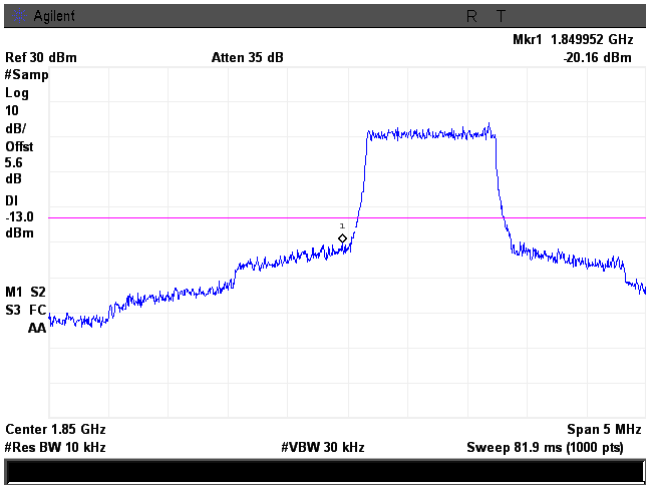
BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	19957	1710.7	QPSK	-18.37	-13
			16QAM	-19.36	-13
1.4	20393	1754.3	QPSK	-14.67	-13
			16QAM	-16.73	-13
3	19965	1711.5	QPSK	-18.00	-13
			16QAM	-17.96	-13
3	20385	1753.5	QPSK	-14.65	-13
			16QAM	-13.53	-13
5	19975	1712.5	QPSK	-17.08	-13
			16QAM	-17.13	-13
5	20375	1752.5	QPSK	-15.29	-13
			16QAM	-15.46	-13
10	20000	1715	QPSK	-17.73	-13
			16QAM	-17.73	-13
10	20350	1750	QPSK	-16.14	-13
			16QAM	-17.81	-13
15	20025	1717.5	QPSK	-15.79	-13
			16QAM	-16.44	-13
15	20325	1747.5	QPSK	-16.92	-13
			16QAM	-16.86	-13
20	20050	1720	QPSK	-18.86	-13
			16QAM	-18.62	-13
20	20300	1745	QPSK	-21.24	-13
			16QAM	-19.68	-13

LTE Band 17 (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	23755	706.5	QPSK	-14.16	-13
			16QAM	-15.28	-13
5	23825	713.5	QPSK	-14.27	-13
			16QAM	-15.26	-13
10	23780	709	QPSK	-16.82	-13
			16QAM	-17.37	-13
10	23800	711	QPSK	-15.27	-13
			16QAM	-16.84	-13

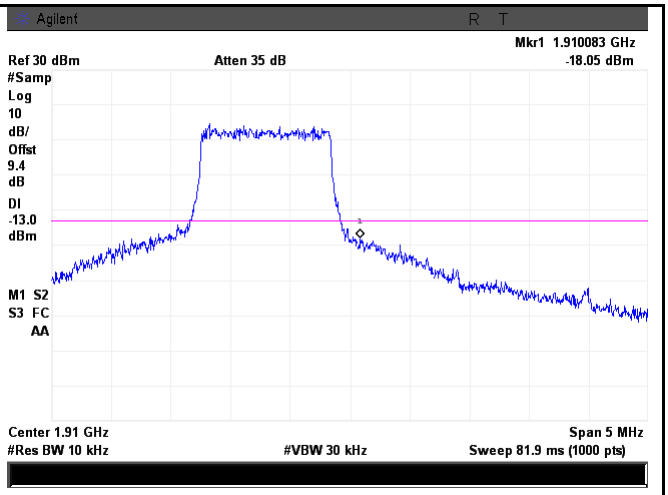
Test Plots

LTE Band 2 (Part 24E)



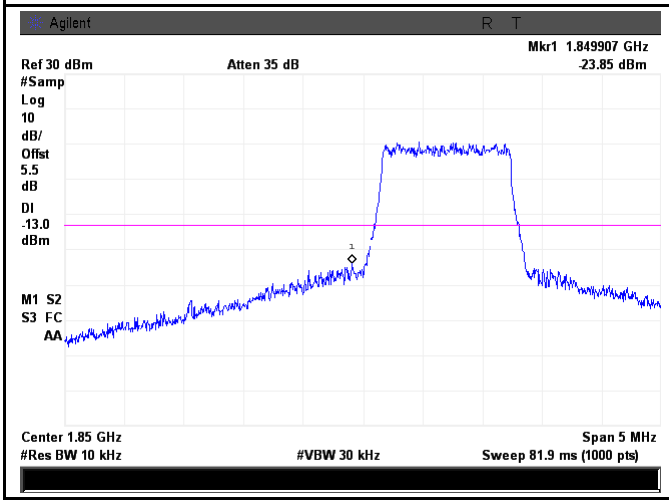
LTE Band 2 - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log (12.74/10)=4.5+1.1=5.6 dB



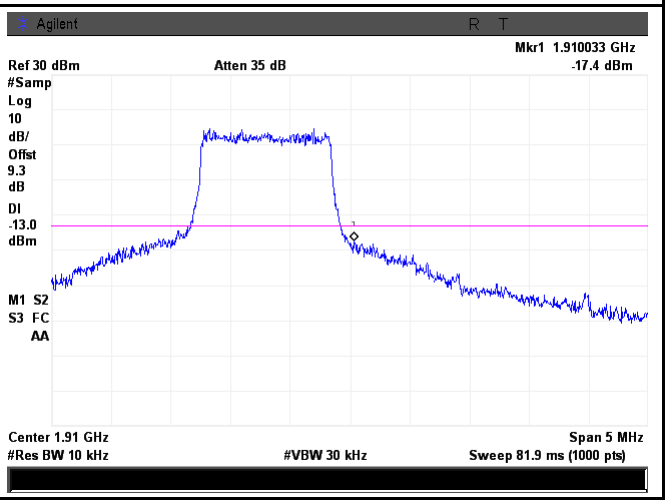
LTE Band 2 - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log (30.53/10)=4.5+4.9=9.4 dB



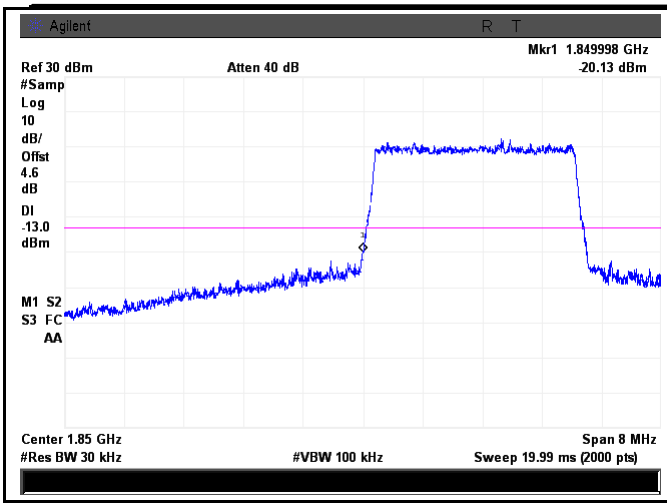
LTE Band 2 - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log (12.68/10)=4.5+1.0=5.5 dB



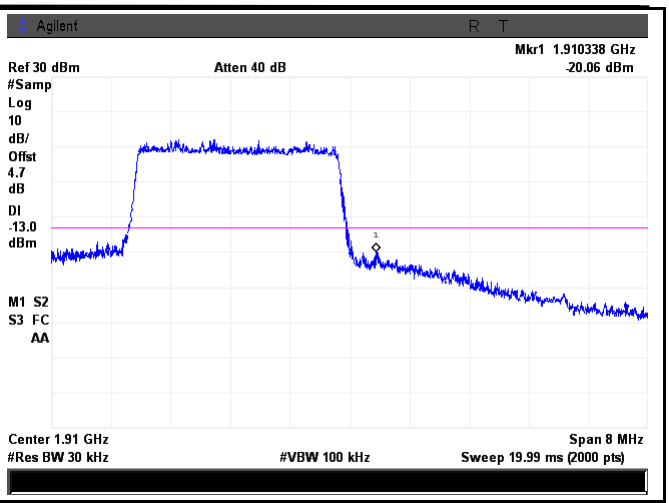
LTE Band 2 - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log (30.53/10)=4.5+4.8=9.3dB



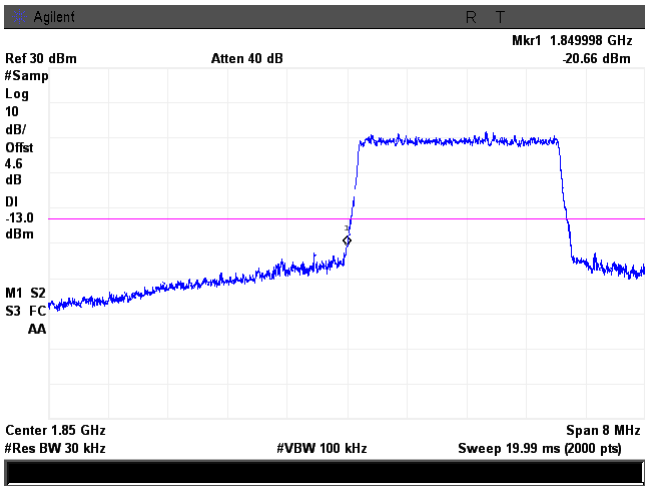
LTE Band 2 - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log (30.84/30)=4.5+0.1=4.6 dB



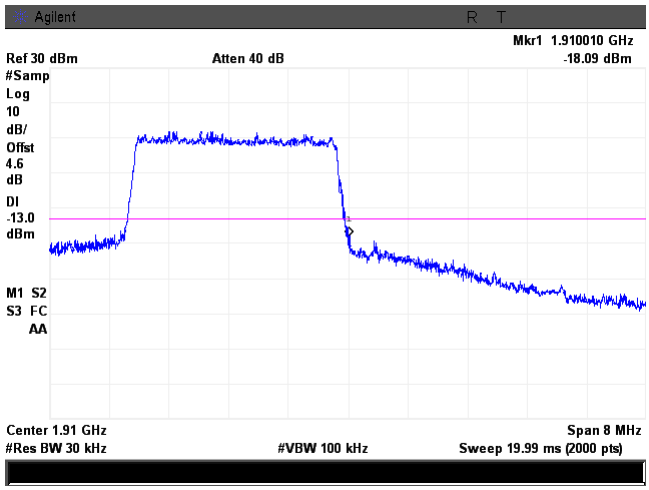
LTE Band 2 - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log (31.10/30)=4.5+0.2=4.7 dB



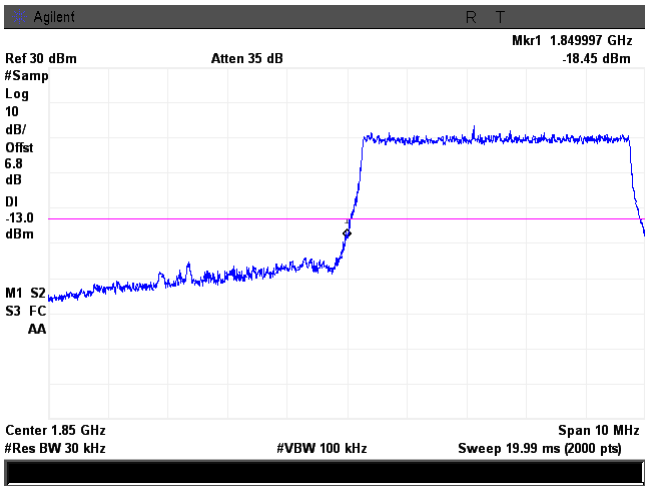
LTE Band 2 - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log (30.52/30)=4.5+0.1=4.6 dB



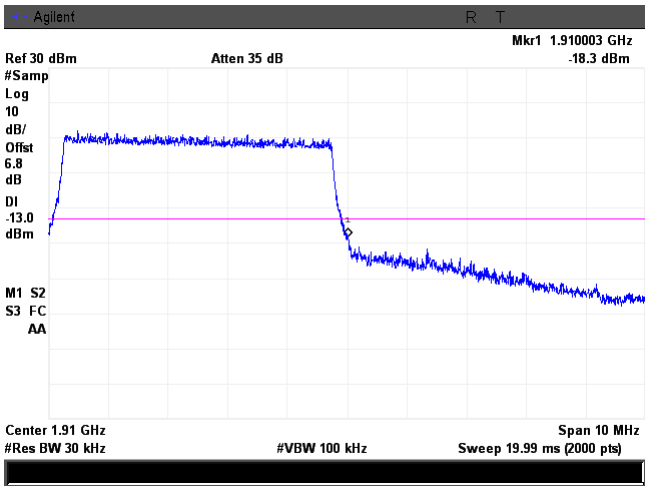
LTE Band 2 - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log (30.94/30)=4.5+0.1=4.6 dB



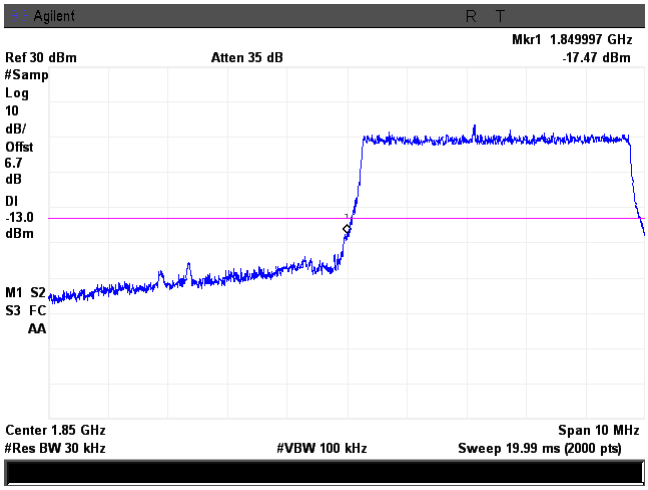
LTE Band 2 - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (50.51/30)=4.5+2.3=6.8 dB



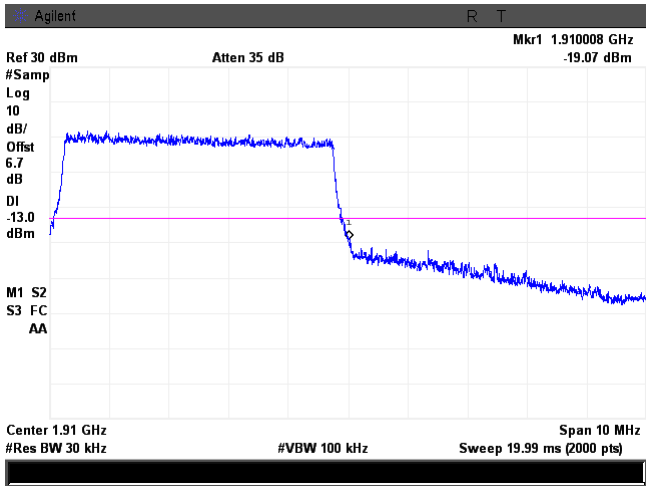
LTE Band 2 - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (51.21/30)=4.5+2.3=6.8 dB



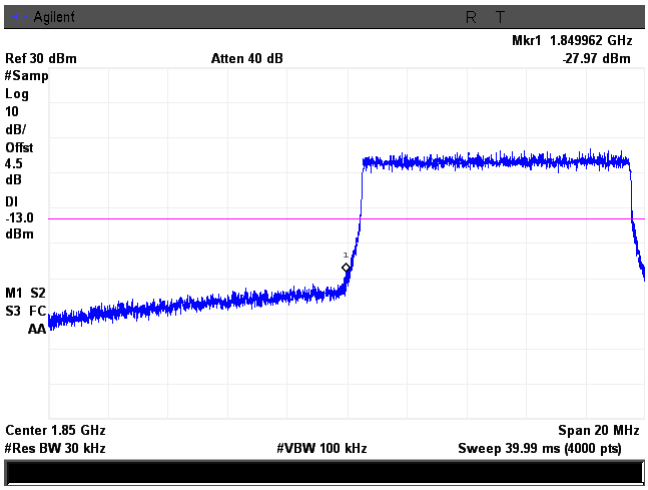
LTE Band 2 - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log (50.17/30)=4.5+2.2=6.7 dB

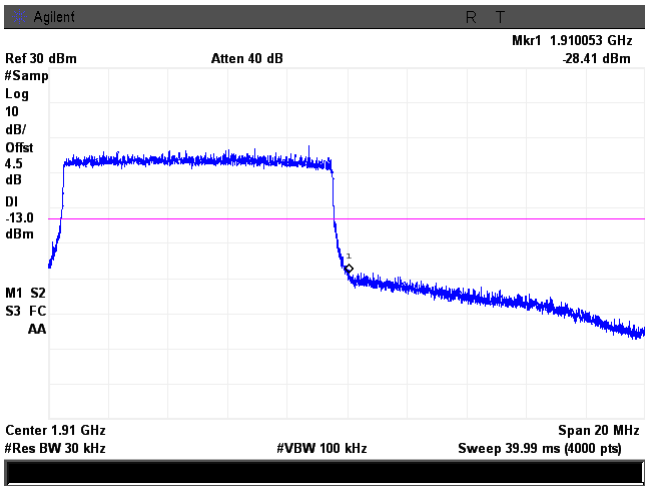


LTE Band 2 - High Channel 16QAM-5

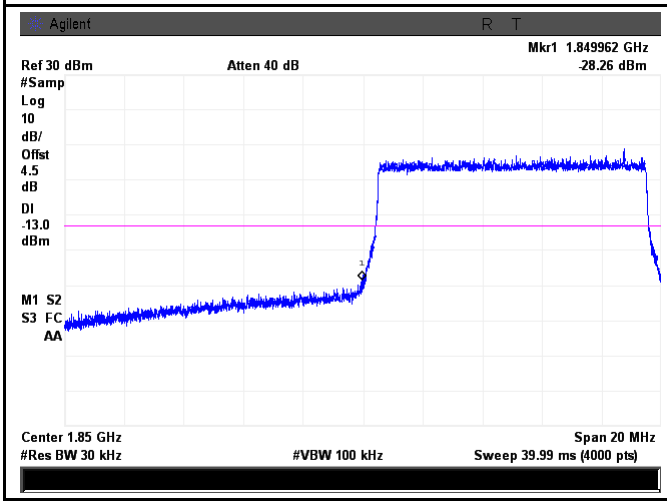
Note: Offset=Cable loss (4.5) + 10log (50.31/30)=4.5+2.2=6.7 dB



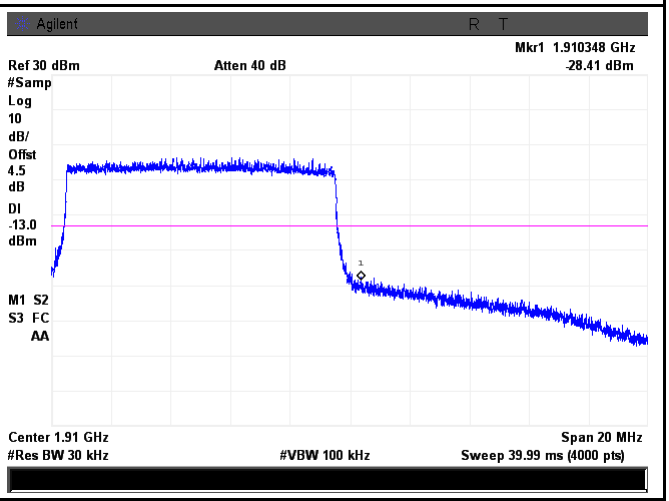
LTE Band 2 - Low Channel QPSK-10



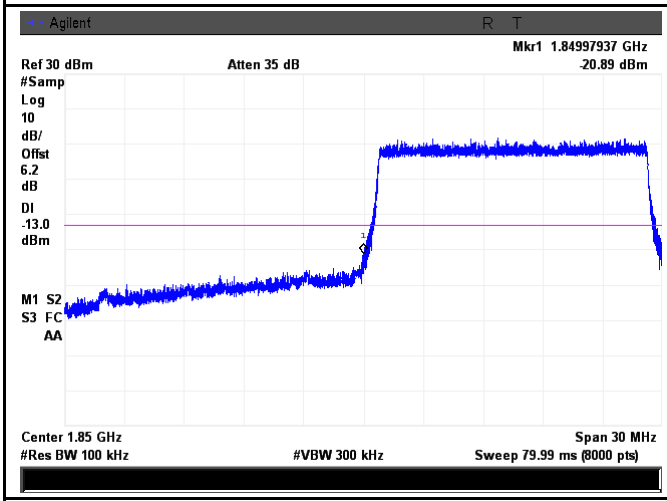
LTE Band 2 - High Channel QPSK-10



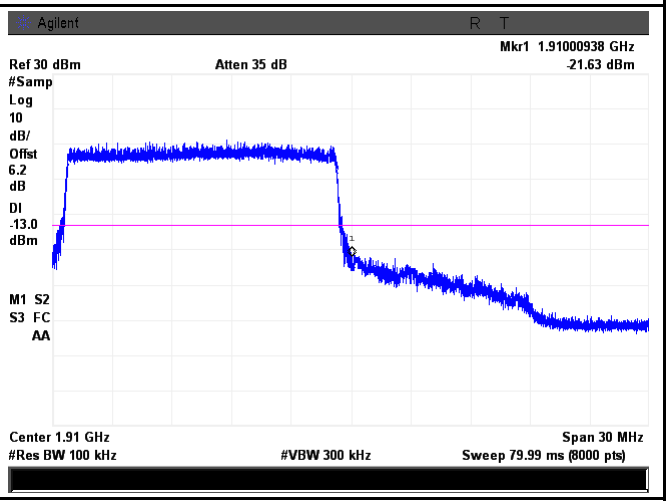
LTE Band 2 - Low Channel 16QAM-10



LTE Band 2 - High Channel 16QAM-10



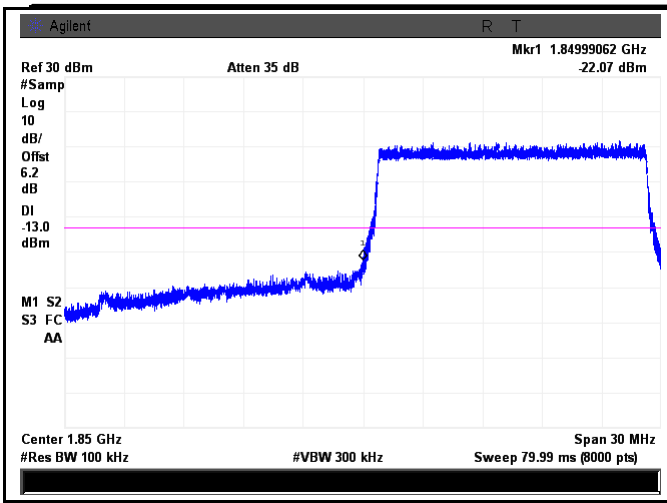
LTE Band 2 - Low Channel QPSK-15



LTE Band 2 - High Channel QPSK-15

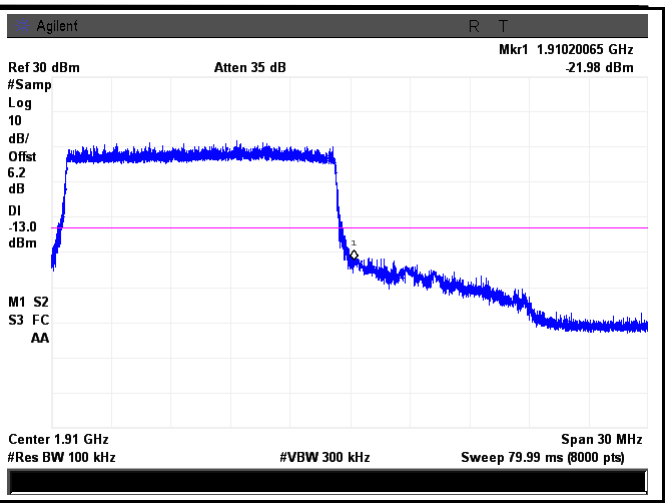
Note: Offset=Cable loss (4.5) + 10log (148.04/100)=4.5+1.7=6.2dB

Note: Offset=Cable loss (4.5) + 10log (147.94/100)=4.5+1.7=6.2 dB



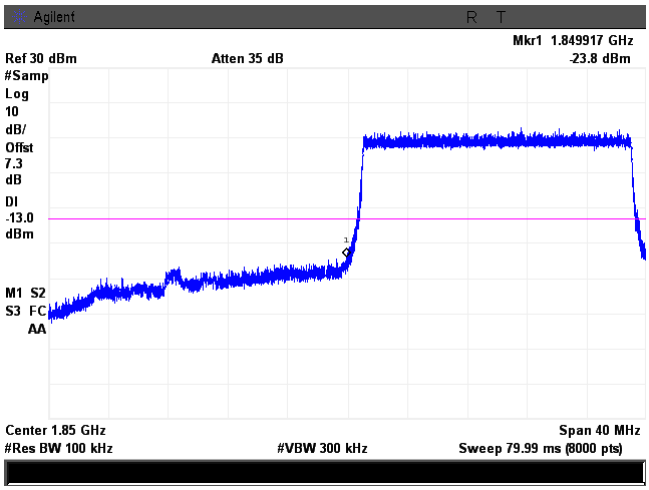
LTE Band 2 - Low Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (148.45/100)=4.5+1.7=6.2 dB



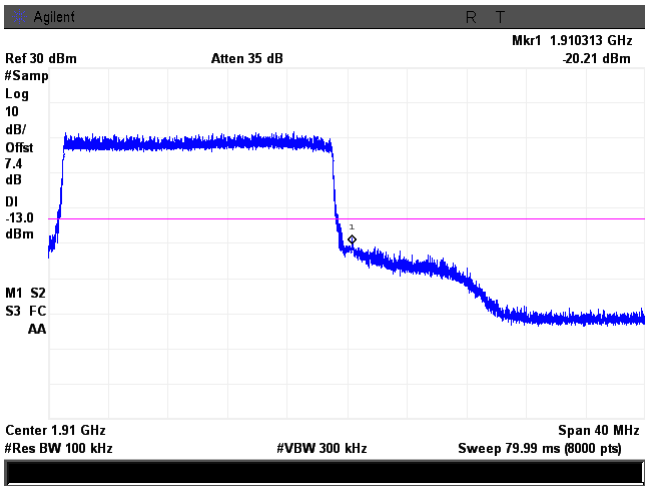
LTE Band 2 - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (147.26/100)=4.5+1.7=6.2 dB



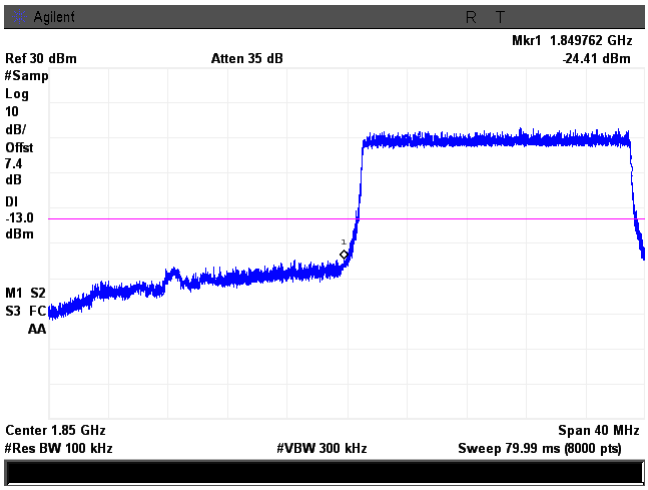
LTE Band 2 - Low Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (192.49/100)=4.5+2.8=7.3dB



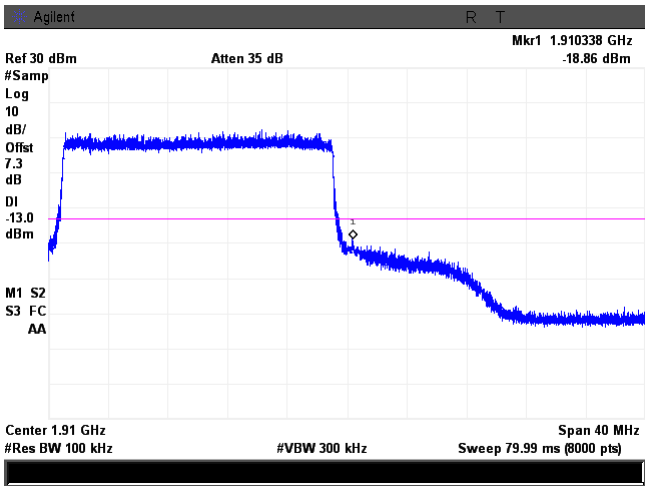
LTE Band 2 - High Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (193.69/100)=4.5+2.9=7.4 dB



LTE Band 2 - Low Channel 16QAM-20

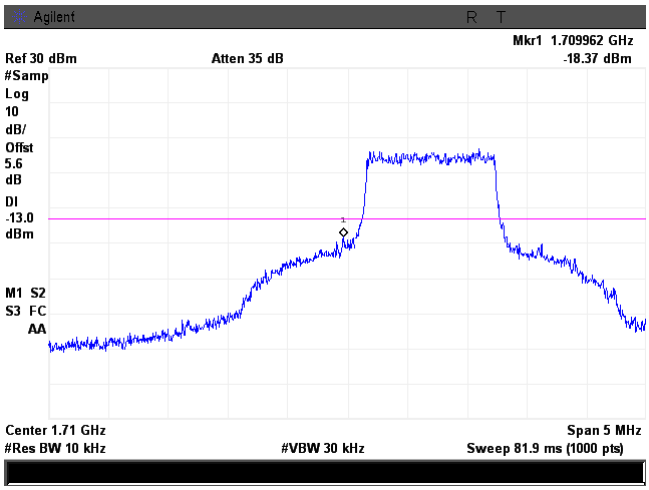
Note: Offset=Cable loss (4.5) + 10log (193.9/100)=4.5+2.9=7.4 dB



LTE Band 2 - High Channel 16QAM-20

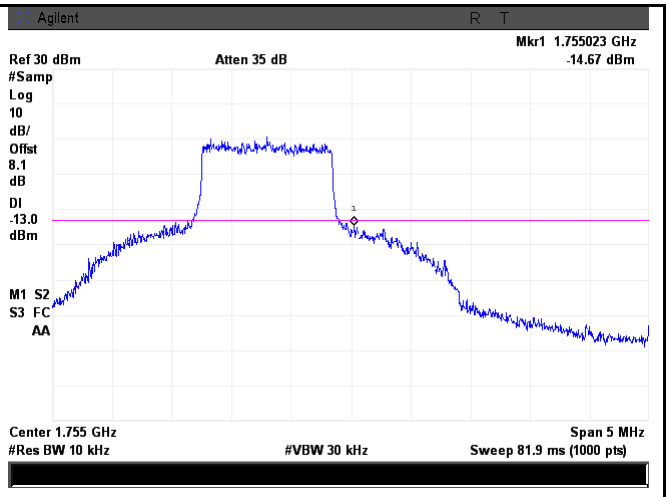
Note: Offset=Cable loss (4.5) + 10log (191.77/100)=4.5+2.8=7.3 dB

LTE Band 4 (Part 27)



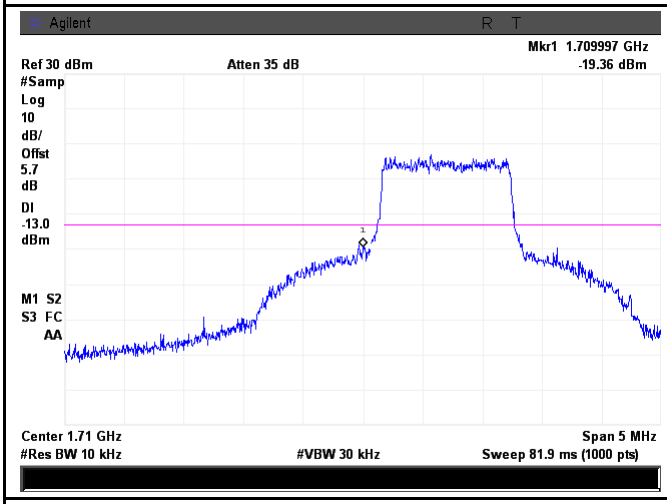
LTE Band 4 - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log (12.93/10)=4.5+1.1=5.6 dB



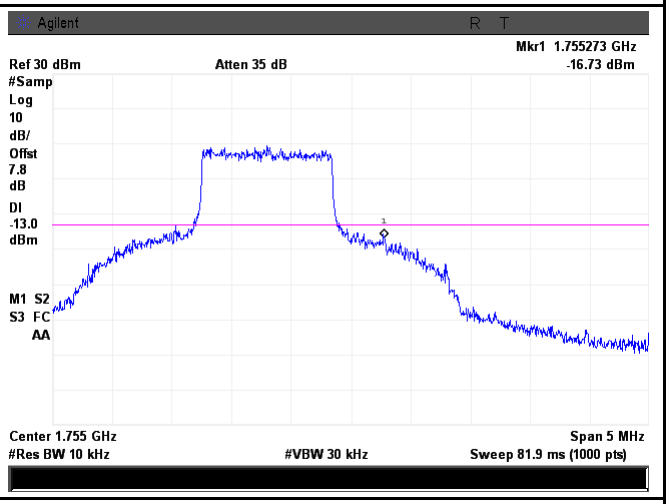
LTE Band 4 - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log (22.97/10)=4.5+3.6=8.1 dB



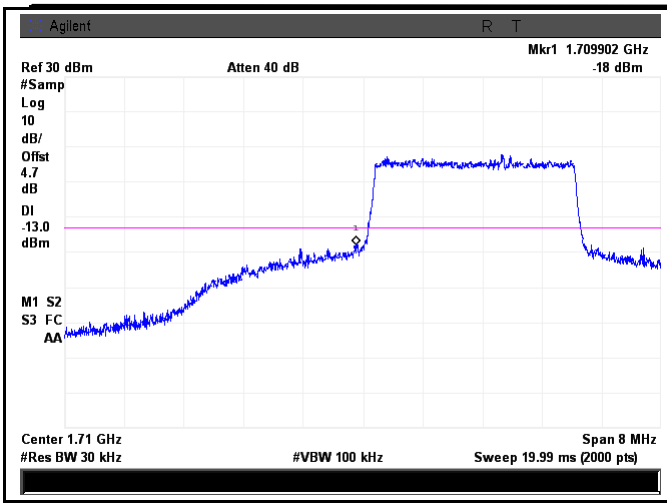
LTE Band 4 - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log (13.21/10)=4.5+1.2=5.7 dB



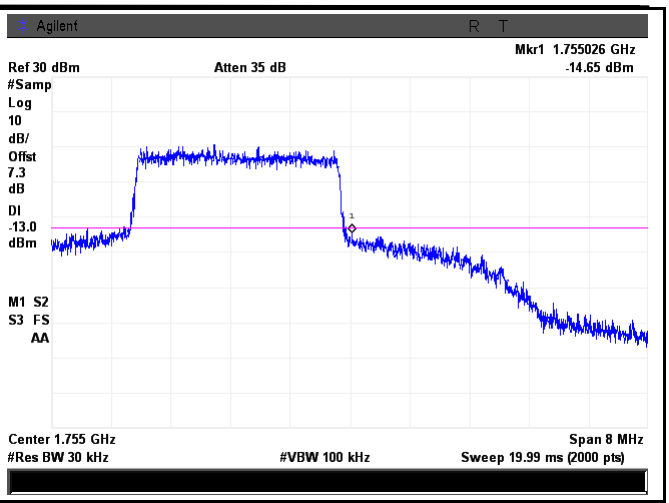
LTE Band 4 - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log (21.39/10)=4.5+3.3=7.8 dB



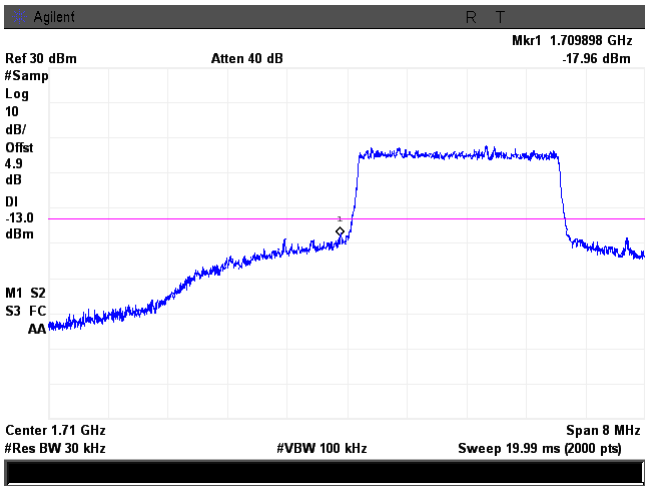
LTE Band 4 - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log (31.15/30)=4.5+0.2=4.7 dB



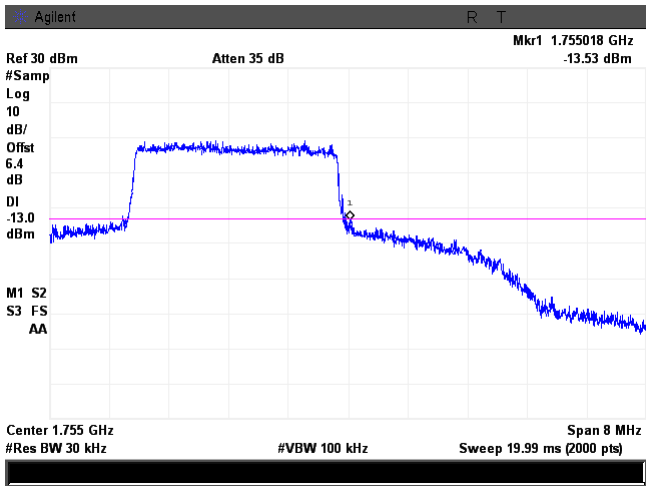
LTE Band 4 - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log (57.27/30)=4.5+2.8=7.3 dB



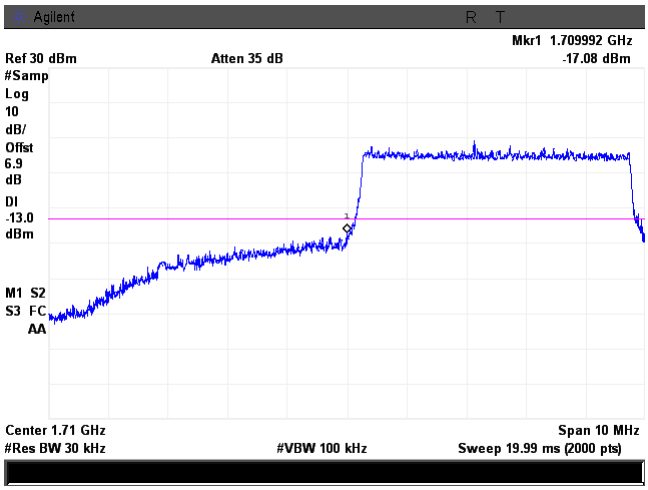
LTE Band 4 - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log (33.10/30)=4.5+0.4=4.9 dB



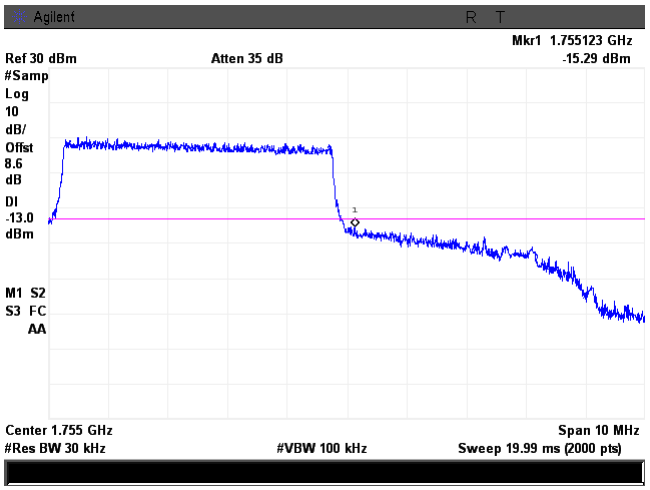
LTE Band 4 - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log (46.71/30)=4.5+1.9=6.4 dB



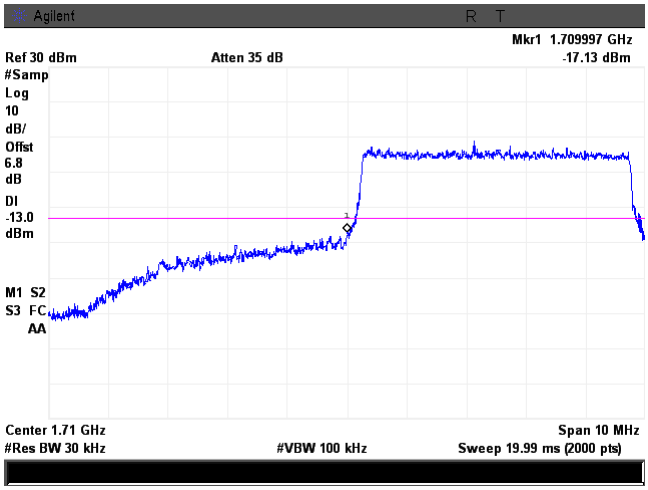
LTE Band 4 - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (52.61/30)=4.5+2.4=6.9 dB



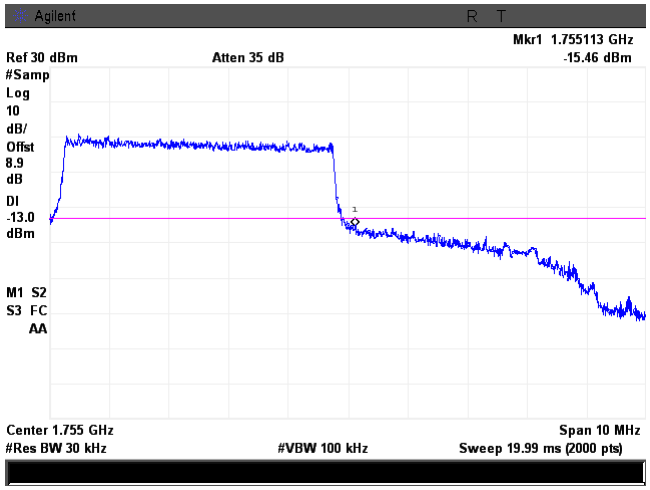
LTE Band 4 - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (77.88/30)=4.5+4.1=8.6 dB



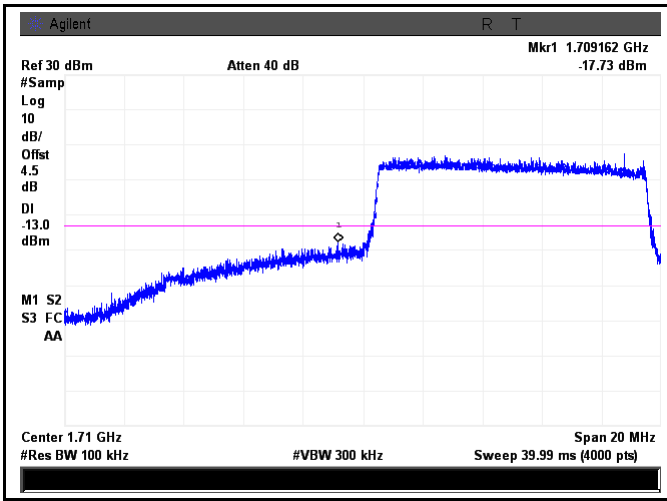
LTE Band 4 - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log (51.10/30)=4.5+2.3=6.8 dB

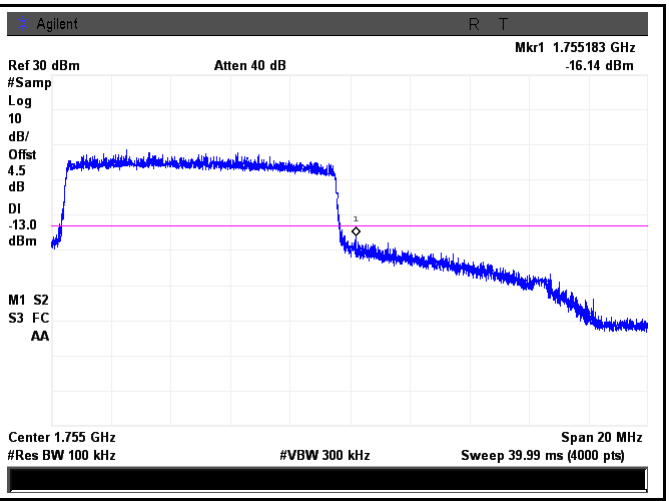


LTE Band 4 - High Channel 16QAM-5

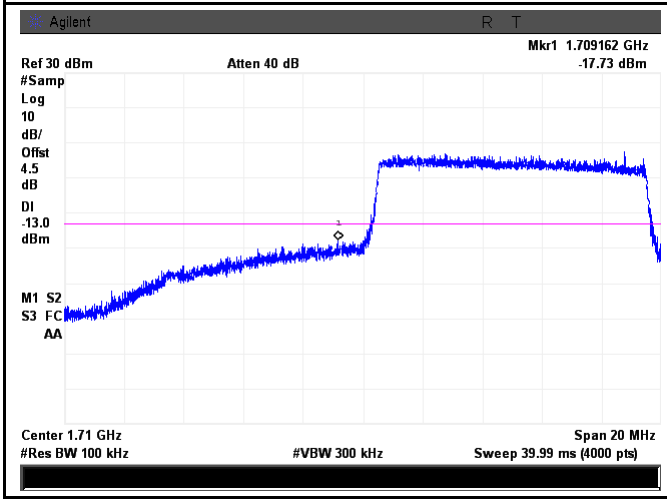
Note: Offset=Cable loss (4.5) + 10log (82.45/30)=4.5+4.4=8.9 dB



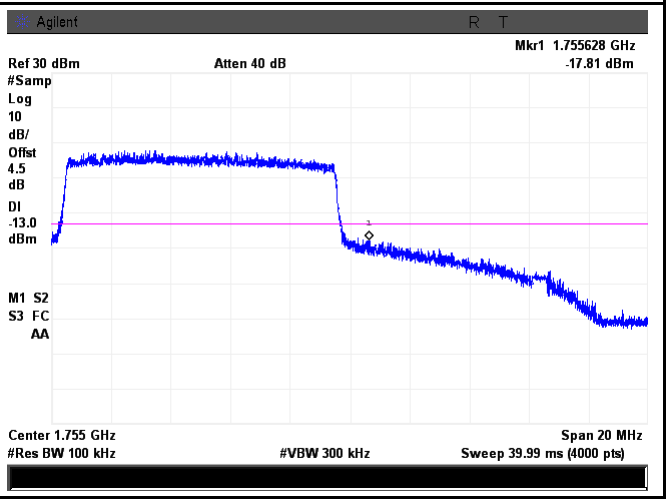
LTE Band 4 - Low Channel QPSK-10



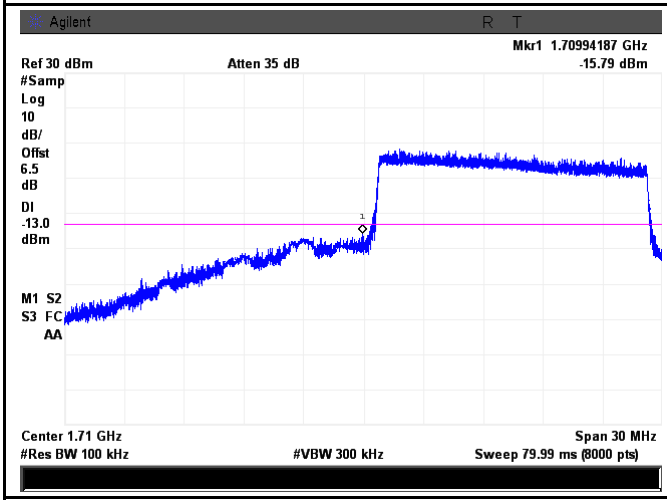
LTE Band 4 - High Channel QPSK-10



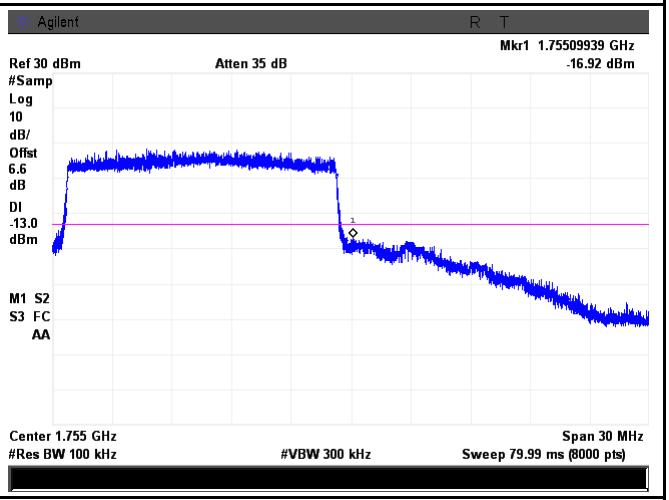
LTE Band 4 - Low Channel 16QAM-10



LTE Band 4 - High Channel 16QAM-10



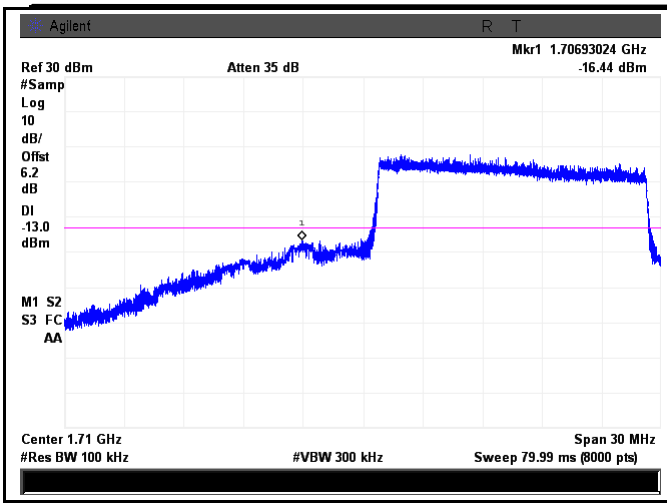
LTE Band 4 - Low Channel QPSK-15



LTE Band 4 - High Channel QPSK-15

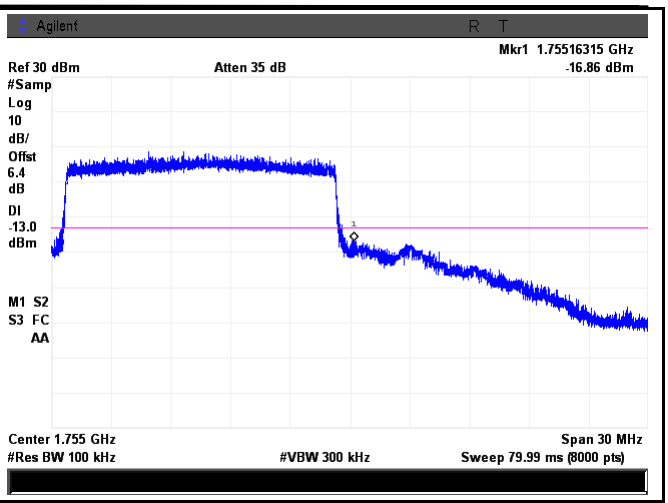
Note: Offset=Cable loss (4.5) + 10log (159.65/100)=4.5+2.0=6.5 dB

Note: Offset=Cable loss (4.5) + 10log (162.89/100)=4.5+2.1=6.6 dB



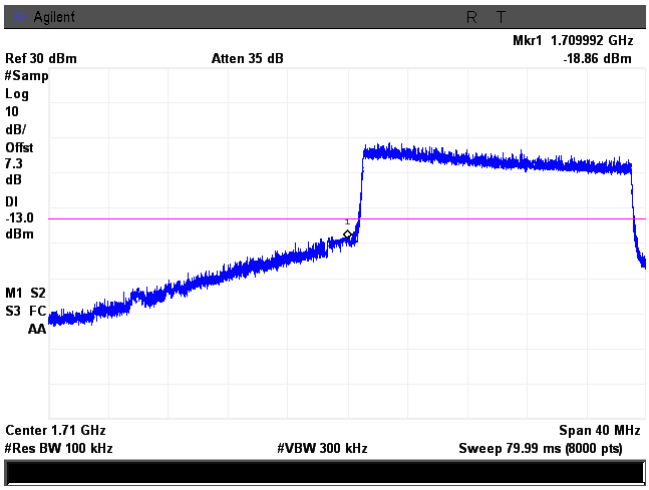
LTE Band 4 - Low Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (147.86/100)=4.5+1.7=6.2 dB



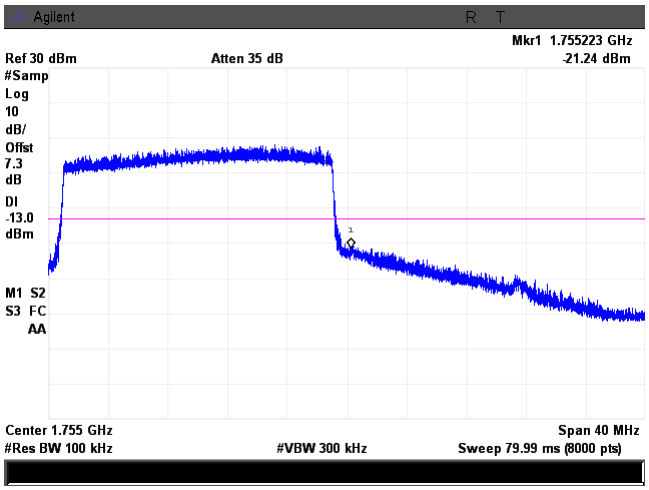
LTE Band 4 - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (155.96/100)=4.5+1.9=6.4 dB



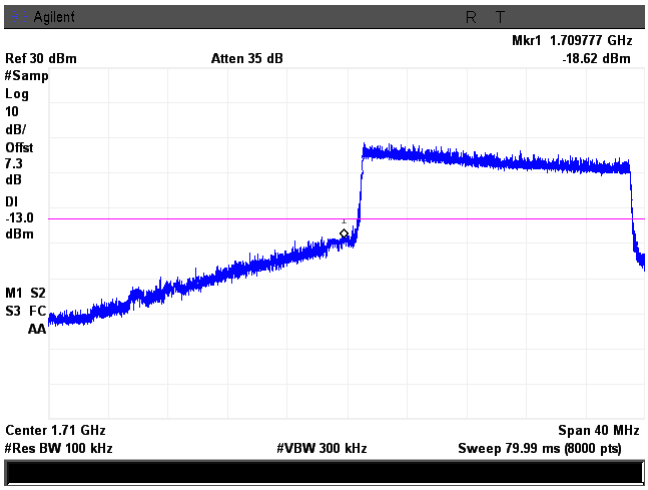
LTE Band 4 - Low Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (190.77/100)=4.5+2.8=7.3 dB



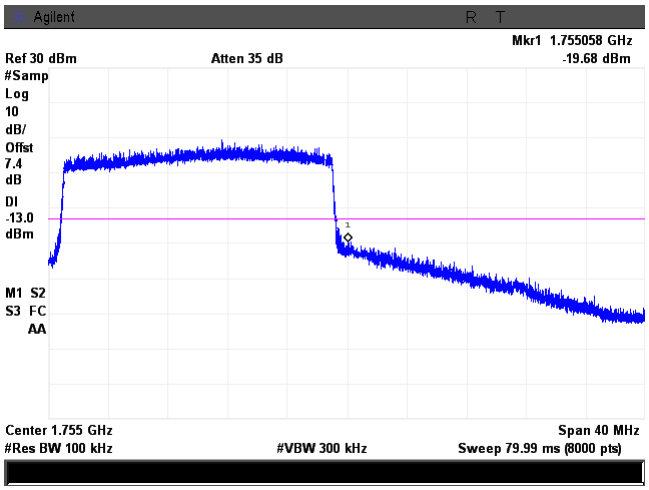
LTE Band 4 - High Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (191.77/100)=4.5+2.8=7.3 dB



LTE Band 4 - Low Channel 16QAM-20

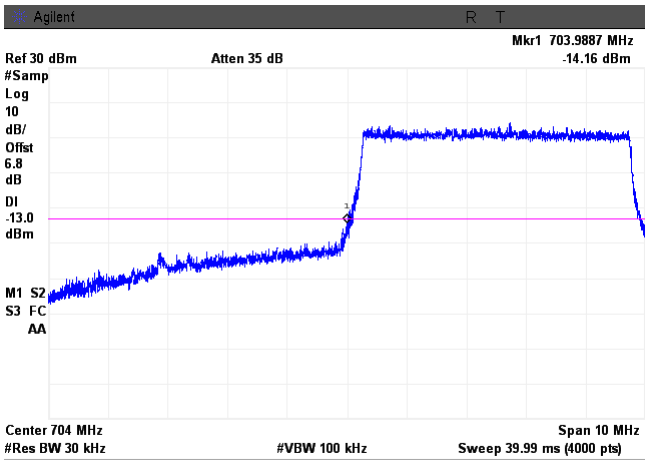
Note: Offset=Cable loss (4.5) + 10log (192.34/100)=4.5+2.8=73 dB



LTE Band 4 - High Channel 16QAM-20

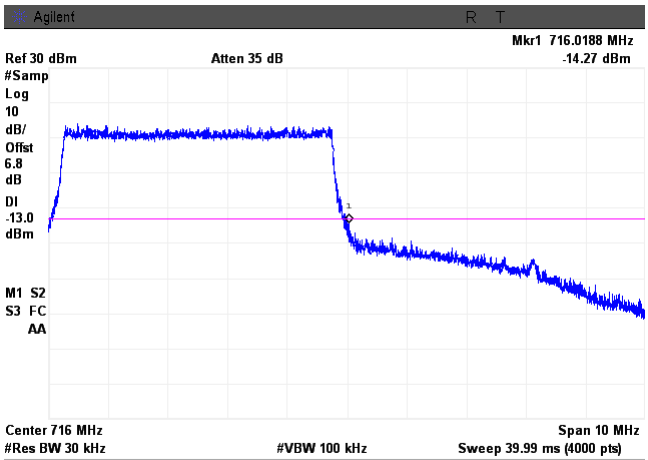
Note: Offset=Cable loss (4.5) + 10log (194.07/100)=4.5+2.9=7.4 dB

LTE Band 17 (Part 27)



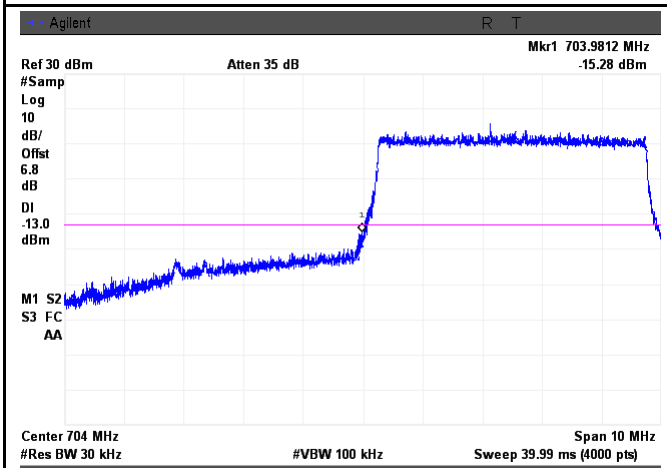
LTE Band 17 - Low Channel QPSK-5

Note: Offset=Cable loss (4.0) + 10log (50.59/30)=4.5+2.3=6.7 dB



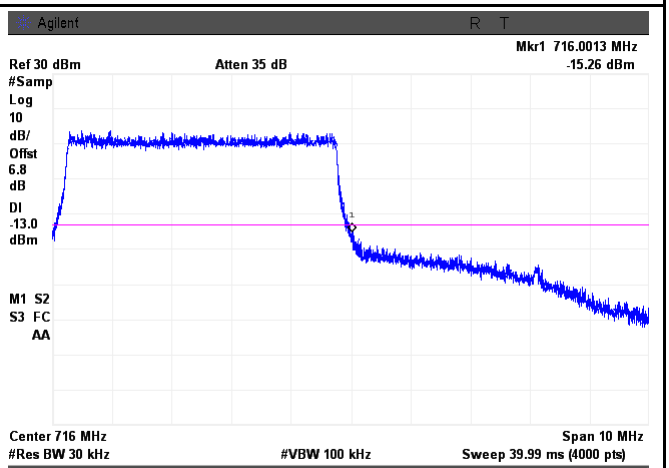
LTE Band 17 - High Channel QPSK-5

Note: Offset=Cable loss (4.0) + 10log (50.58/30)=4.5+2.3=6.8 dB



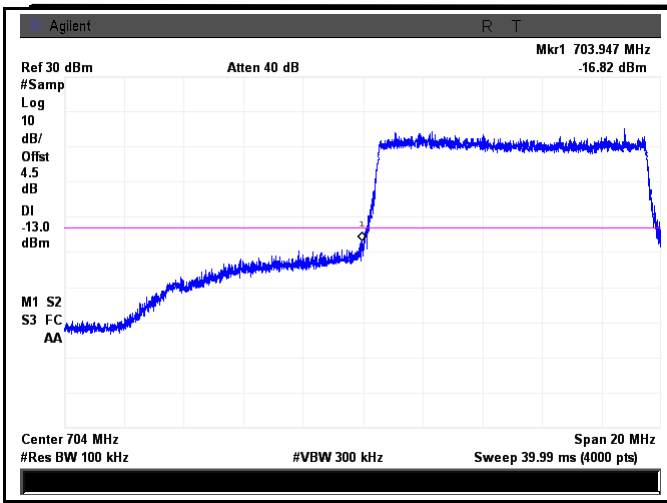
LTE Band 17 - Low Channel 16QAM-5

Note: Offset=Cable loss (4.0) + 10log (50.44/30)=4.5+2.3=6.8 dB

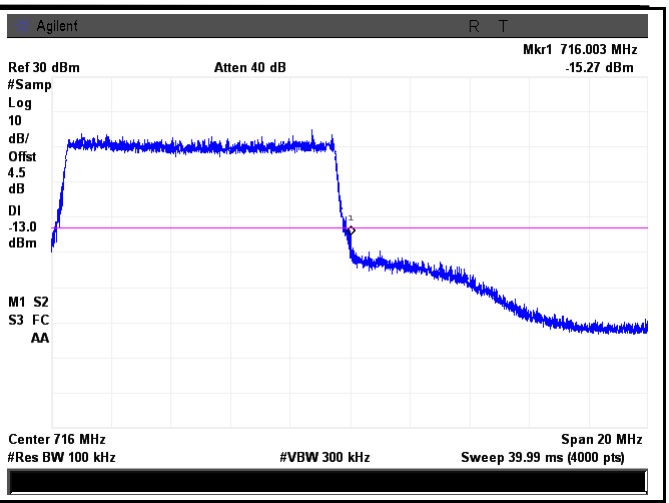


LTE Band 17 - High Channel 16QAM-5

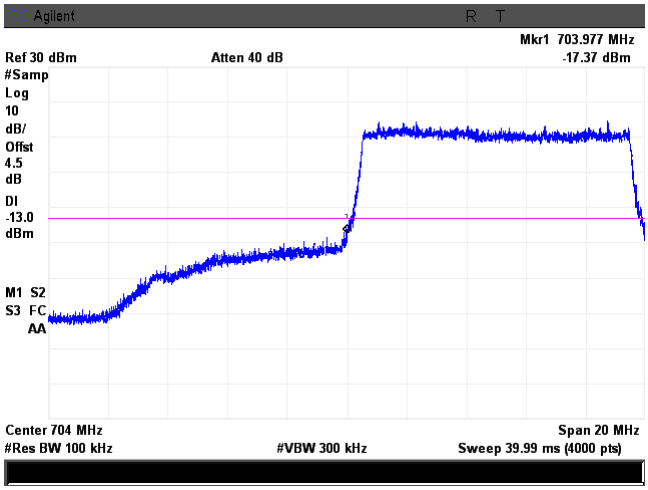
Note: Offset=Cable loss (4.0) + 10log (50.76/30)=4.5+2.2=6.7 dB



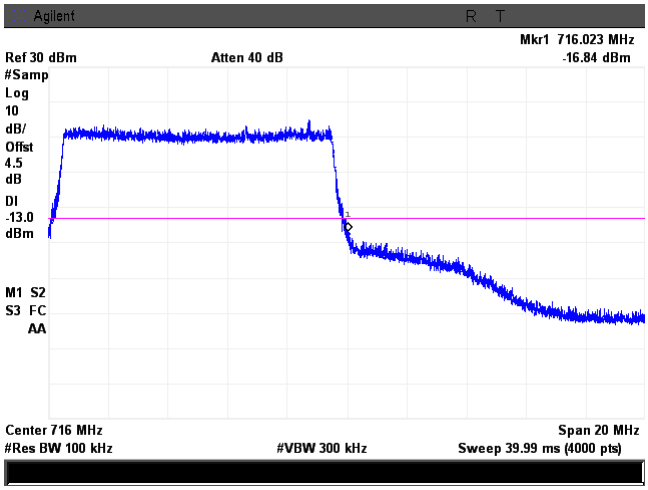
LTE Band 17 - Low Channel QPSK-10



LTE Band 17 - High Channel QPSK-10



LTE Band 17 - Low Channel 16QAM-10

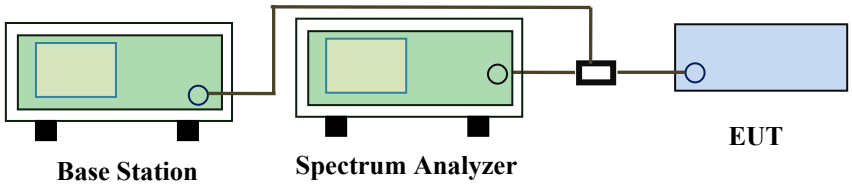


LTE Band 17 - High Channel 16QAM-10

6.9 Band Edge 27.53(m)

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1031mbar
Test date :	October 31, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Requirement	Applicable
§27.53(m)	According to FCC 27.53(m)(4) specified that power of any emmission ouutside of the channel edge must be attenuated below the transmitting power(P) by a factor shall be not less than 43+10log (P)dB at the channel edge, the limit of emission equal to -13dBm. And 55+10log (P)dB at 5.5MHz from the channel edges, the limit of emission equal to -25dBm. In the 1MHz bands immediately outside and adjacent to the frenqency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.	☑
Test Setup		
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.	
Remark		
Result	☑ Pass ☐ Fail	

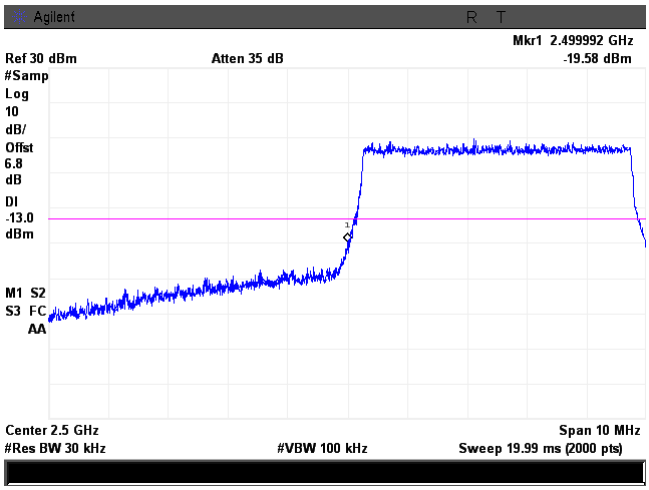
Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

LTE Band 7 (Part 27) result

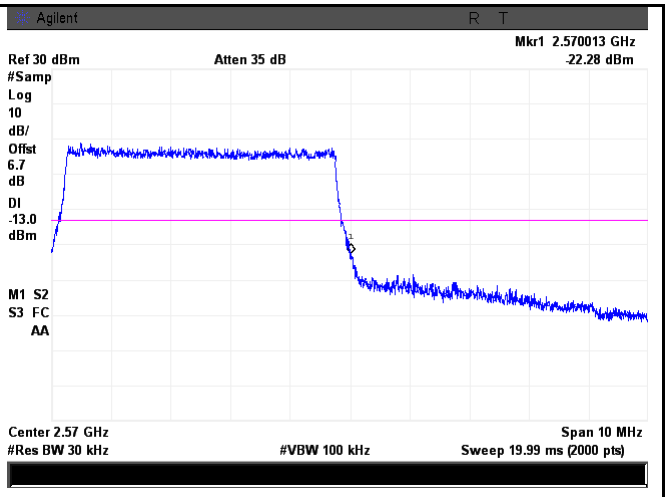
BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	20775	2502.5	QPSK	-19.58	-13
			16QAM	-19.04	-13
5	21425	2567.5	QPSK	-22.28	-13
			16QAM	-22.52	-13
10	20800	2505	QPSK	-22.05	-13
			16QAM	-21.08	-13
10	21400	2562.5	QPSK	-21.64	-13
			16QAM	-22.29	-13
15	20825	2507.5	QPSK	-24.58	-13
			16QAM	-24.49	-13
15	21400	2562.5	QPSK	-22.15	-13
			16QAM	-21.40	-13
20	20850	2510	QPSK	-24.05	-13
			16QAM	-23.91	-13
20	21350	2560	QPSK	-21.61	-13
			16QAM	-21.38	-13

LTE Band 7 (Part 27)



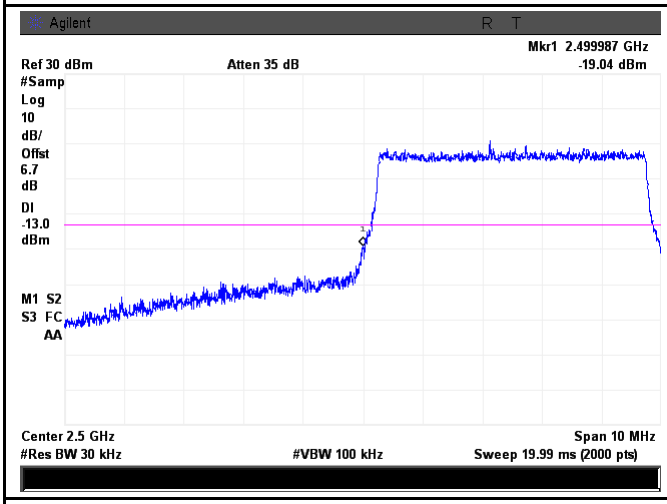
LTE Band 7 - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (50.81/30)=4.5+2.3=6.8 dB



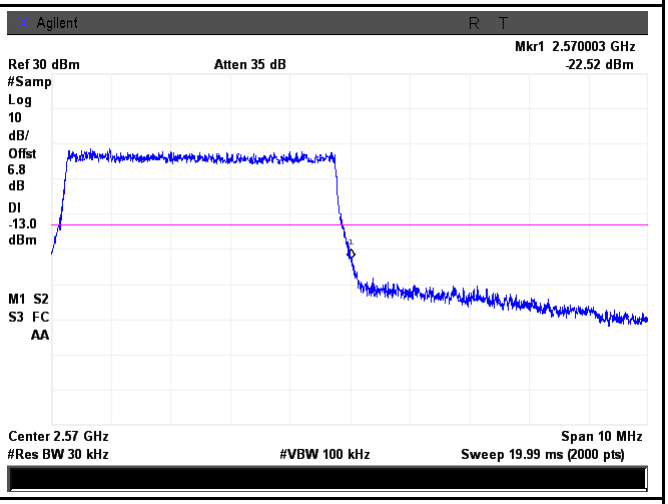
LTE Band 7 - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (49.81/30)=4.5+2.2=6.7 dB



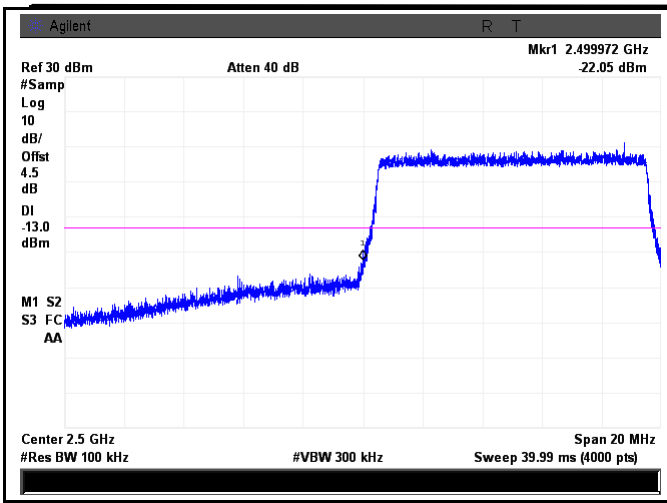
LTE Band 7 - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log (50.20/30)=4.5+2.2=6.7 dB

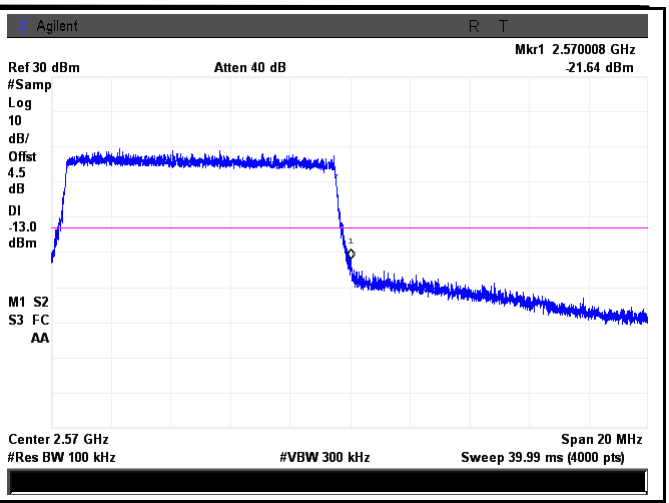


LTE Band 7 - High Channel 16QAM-5

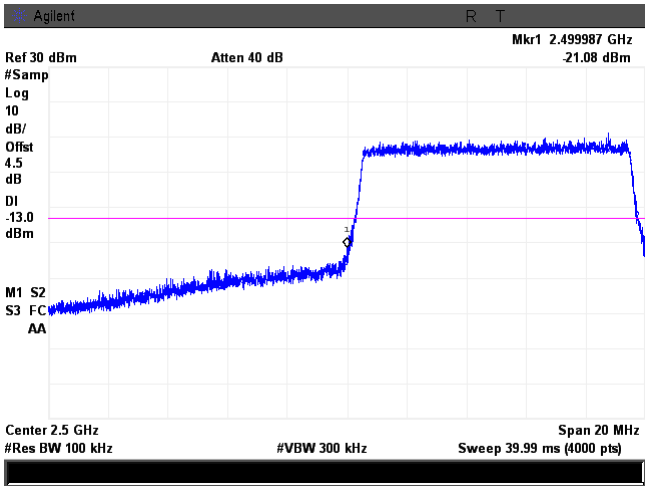
Note: Offset=Cable loss (4.5) + 10log (50.75/30)=4.5+2.3=6.8 dB



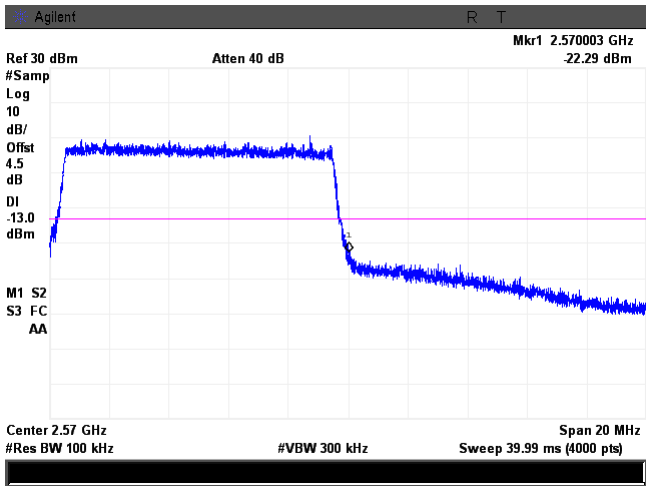
LTE Band 7 - Low Channel QPSK-10



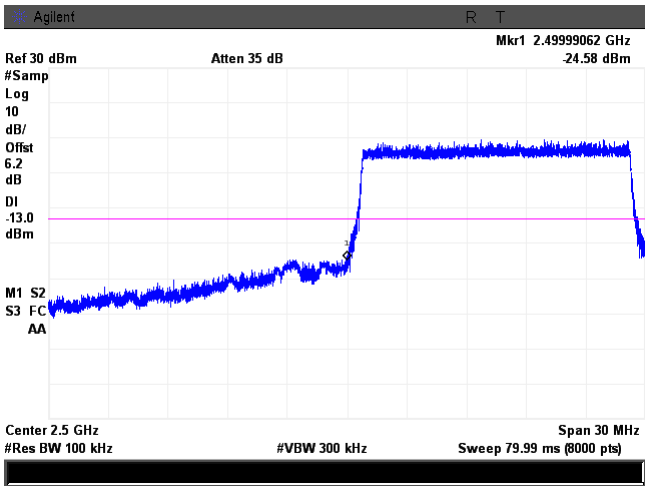
LTE Band 7 - High Channel QPSK-10



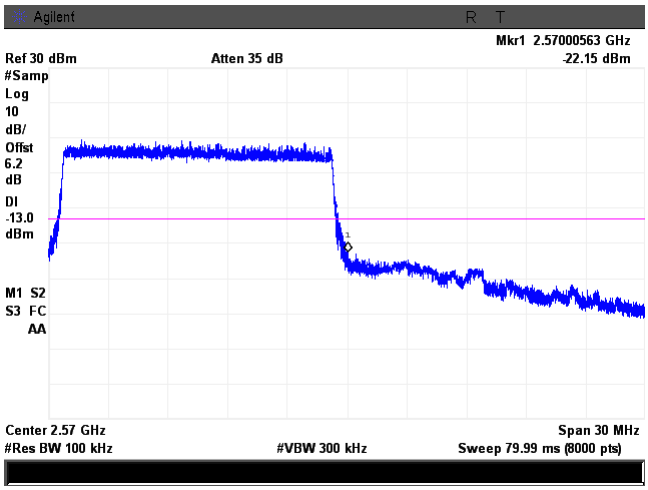
LTE Band 7 - Low Channel 16QAM-10



LTE Band 7 - High Channel 16QAM-10



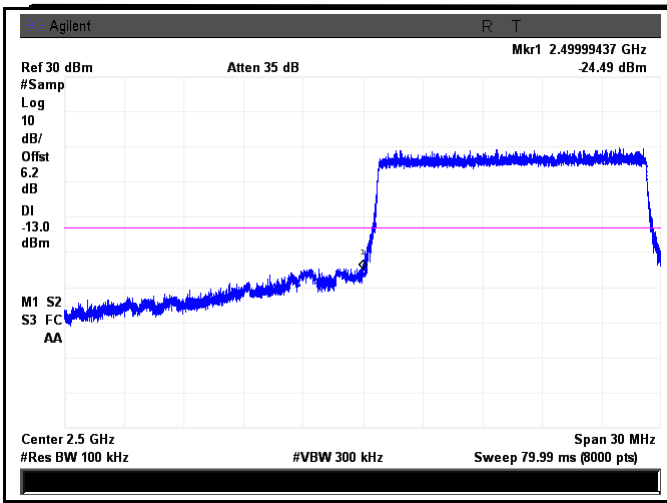
LTE Band 7 - Low Channel QPSK-15



LTE Band 7 - High Channel QPSK-15

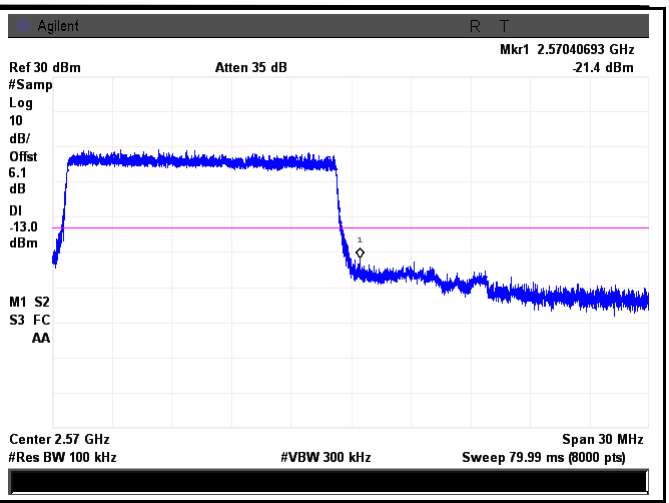
Note: Offset=Cable loss (4.5) + 10log (166.33/100)=4.0+2.2=6.2 dB

Note: Offset=Cable loss (4.5) + 10log (146.23/100)=4.5+1.7=6.2 dB



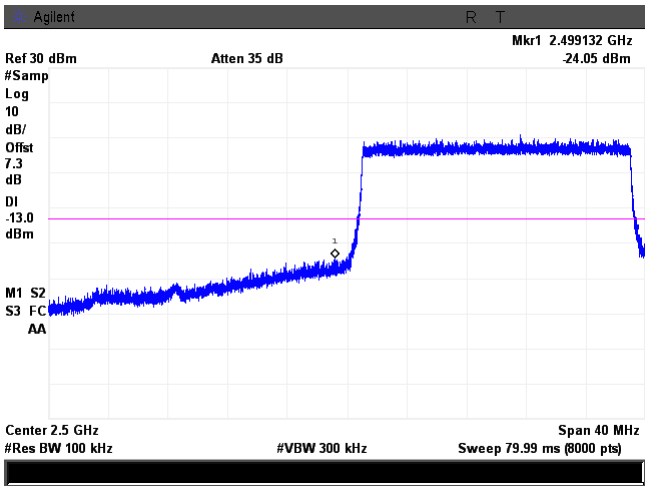
LTE Band 7 - Low Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (147.47/100)=4.5+1.7=6.2 dB



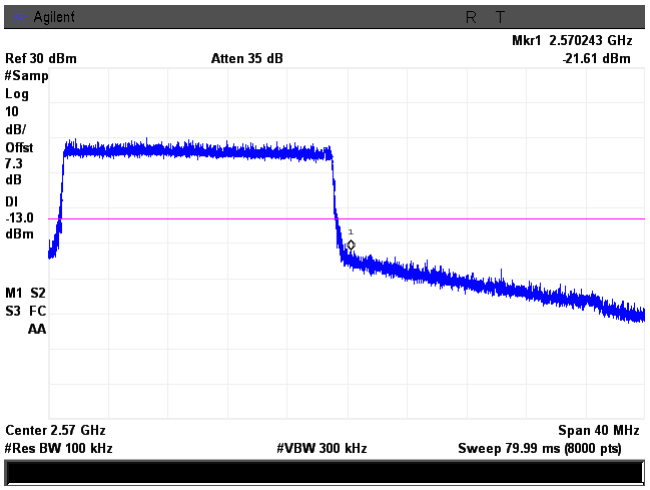
LTE Band 7 - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (145.11/100)=4.5+1.6=6.1 dB



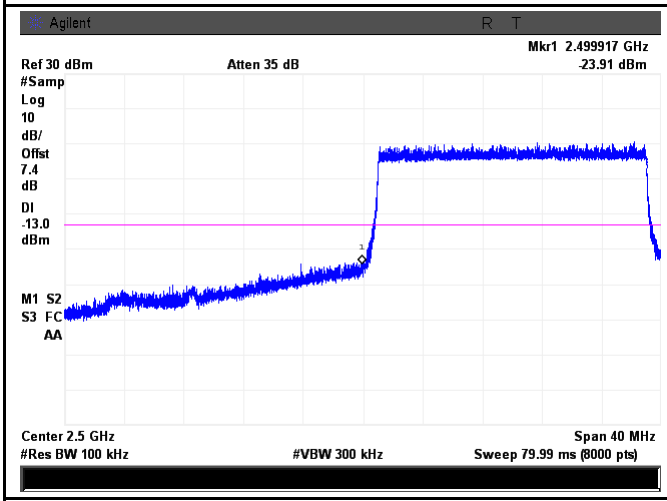
LTE Band 7 - Low Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (192.70/100)=4.5+2.8=7.3dB

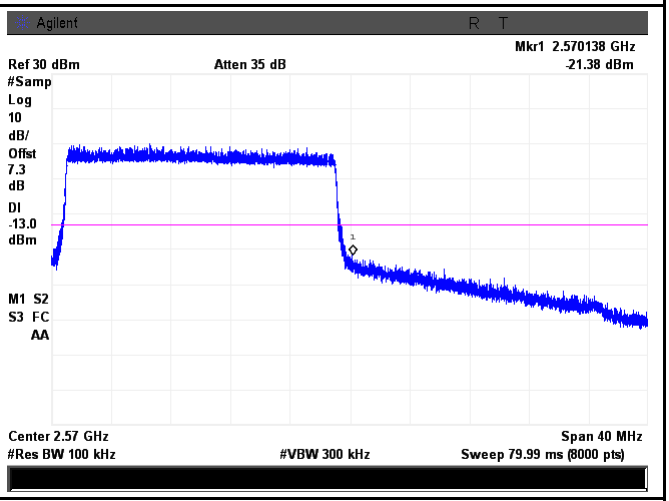


LTE Band 7 - High Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (191.99/100)=4.5+2.8=7.3 dB



LTE Band 7 - Low Channel 16QAM-20



LTE Band 7 - High Channel 16QAM-20

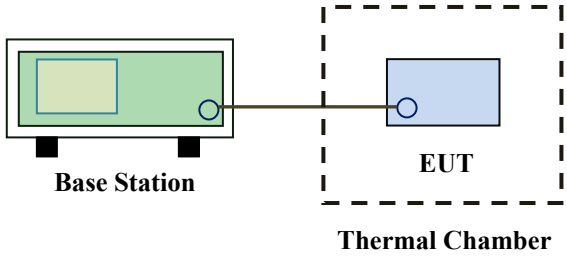
Note: Offset=Cable loss (4.5) + 10log (192.97/100)=4.5+2.9=7.4 dB	Note: Offset=Cable loss (4.5) + 10log (192.41/100)=4.5+2.8=7.8 dB

6.10 Frequency Stability

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	October 15, 2015
Tested By :	Winnie Zhang

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§2.1055, §22.355 & §24.235 § 27.5(h); § 27.54</td><td>a)</td><td>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:
Frequency Tolerance for Transmitters in the Public Mobile Services
<table>
<tr><th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr>
<tr><td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr>
<tr><td>to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr>
<tr><td>450 to 512</td><td>2.5</td><td>5.0</td><td>5 0</td></tr>
<tr><td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr>
<tr><td>928 to 929.</td><td>5.0</td><td>N/A</td><td>N/A</td></tr>
<tr><td>929 to 960.</td><td>1.5</td><td>N/A</td><td>N/A</td></tr>
<tr><td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr>
</table>
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.
According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</td><td>☑</td></tr>
</table>

Test setup	
Procedure	A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage. Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.
Remark	Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within 2.5ppm of the operating frequency over a temperature variation of -10ºC to +55ºC at normal supply voltage.
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

LTE Band 2 (Part 24E) result

Middle Channel, f_o = 1880 MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-5	0.0027	2.5
0		-11	0.0059	2.5
10		-7	0.0037	2.5
20		-10	0.0053	2.5
30		-12	0.0064	2.5
40		-9	0.0048	2.5
50		-12	0.0064	2.5
55		-6	0.0032	2.5
25	4.2	-11	0.0059	2.5
	3.5	-10	0.0053	2.5

LTE Band 4 (Part 27) result

Middle Channel, f_o = 1732.5 MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-15	0.0087	2.5
0		-16	0.0092	2.5
10		-11	0.0063	2.5
20		-11	0.0063	2.5
30		-10	0.0058	2.5
40		-12	0.0069	2.5
50		-13	0.0075	2.5
55		-12	0.0069	2.5
25	4.2	-15	0.0087	2.5
	3.5	-16	0.0092	2.5

LTE Band 7 (Part 27) result

Middle Channel, f_o = 2535 MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-11	0.0059	2.5
0		-9	0.0048	2.5
10		-10	0.0053	2.5
20		-11	0.0059	2.5
30		-10	0.0053	2.5
40		-8	0.0043	2.5
50		-11	0.0059	2.5
55		-10	0.0053	2.5
25	4.2	-11	0.0059	2.5
	3.5	-12	0.0064	2.5

LTE Band 17 (Part 27) result

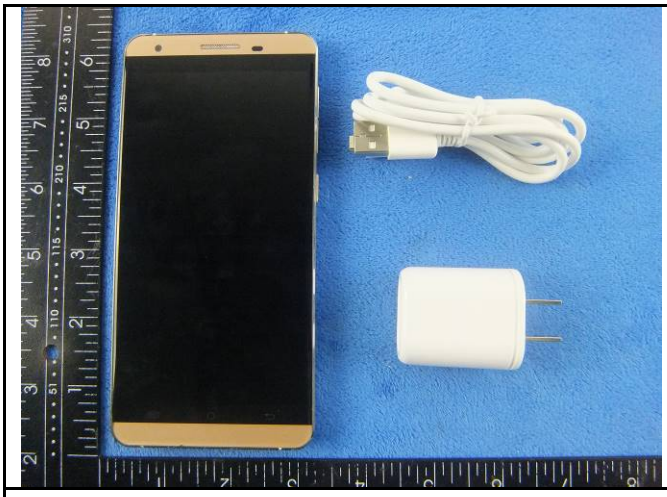
Middle Channel, f_o = 710 MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	7	0.0099	2.5
0		7	0.0099	2.5
10		3	0.0042	2.5
20		6	0.0085	2.5
30		4	0.0056	2.5
40		5	0.0070	2.5
50		11	0.0155	2.5
55		8	0.0113	2.5
25	4.2	9	0.0127	2.5
	3.5	11	0.0155	2.5

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/17/2015	09/16/2016	☑
Power Splitter	1#	1#	09/01/2015	08/31/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/24/2016	☑
Wideband Radio Communication Tester	CMW500	120906	03/29/2015	03/28/2016	☑
Temperature/Humidity Chamber	UHL-270	001	10/09/2015	10/08/2018	☑
DC Power Supply	E3640A	MY40004013	09/17/2015	09/16/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (0.5 ~ 18GHz)	PAM-118	443008	09/01/2015	08/31/2016	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/24/2015	09/23/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/17/2015	09/16/2016	☑
Tunable Notch Filter	3NF-800/1000-S	AA4	09/01/2015	08/31/2016	☑
Tunable Notch Filter	3NF-1000/2000-S	AM 4	09/01/2015	08/31/2016	☑

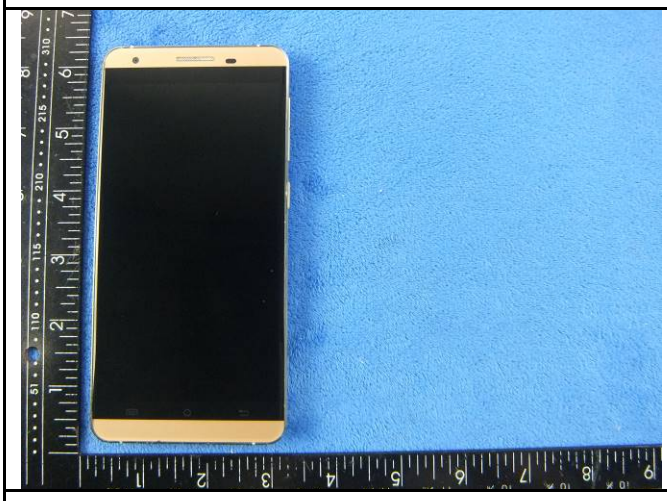
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo



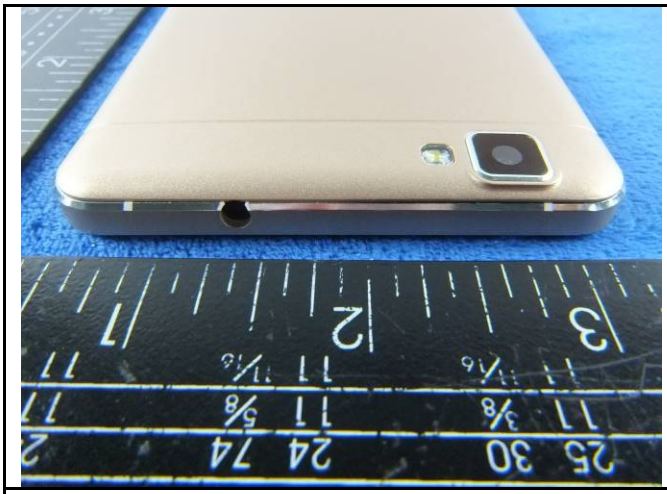
Whole Package - Top View

Adapter - Front View

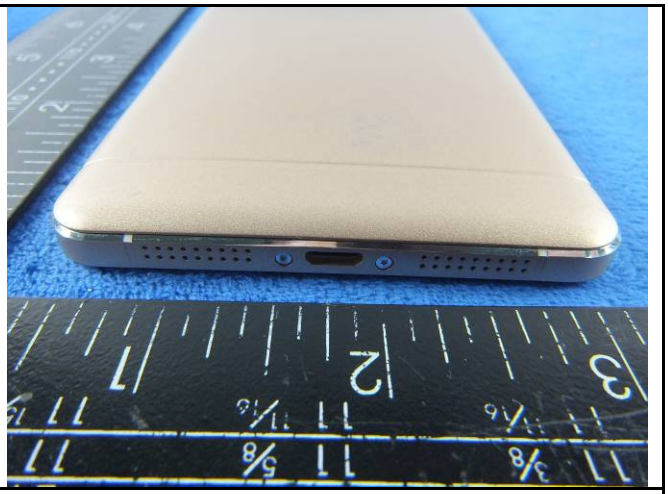


EUT - Front View

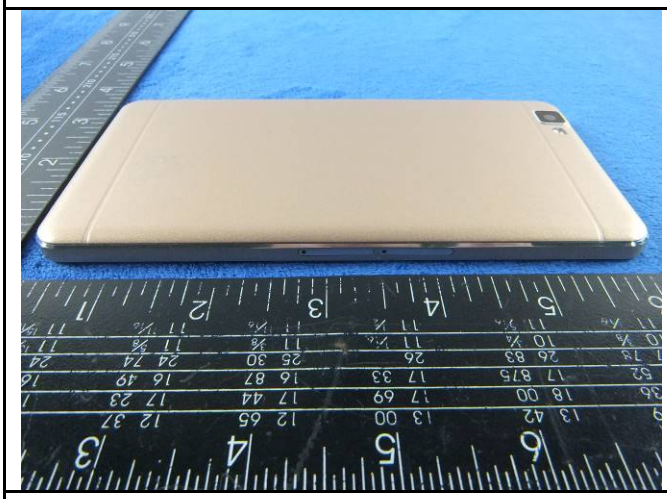
EUT - Rear View



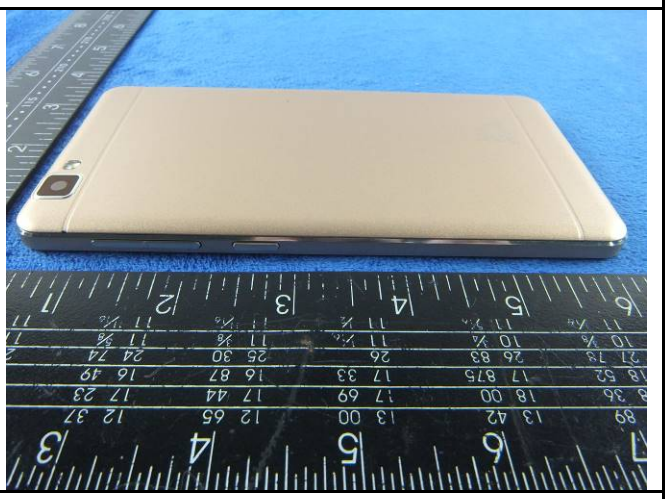
EUT - Top View



EUT - Bottom View

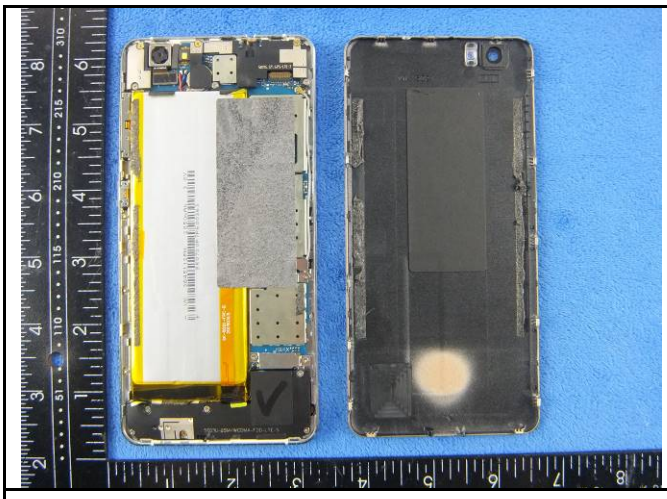


EUT - Left View



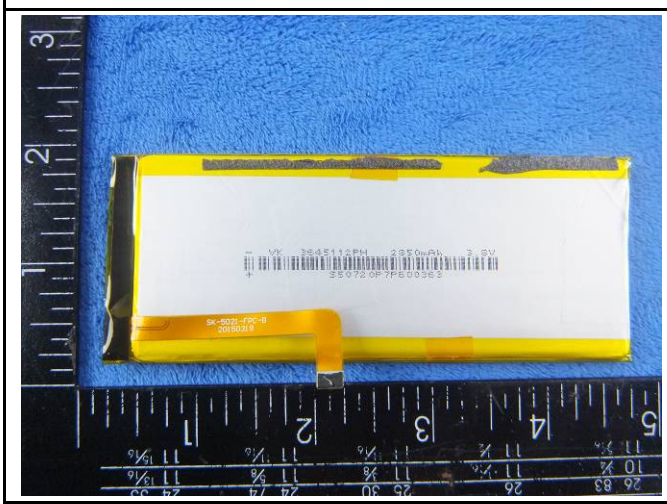
EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

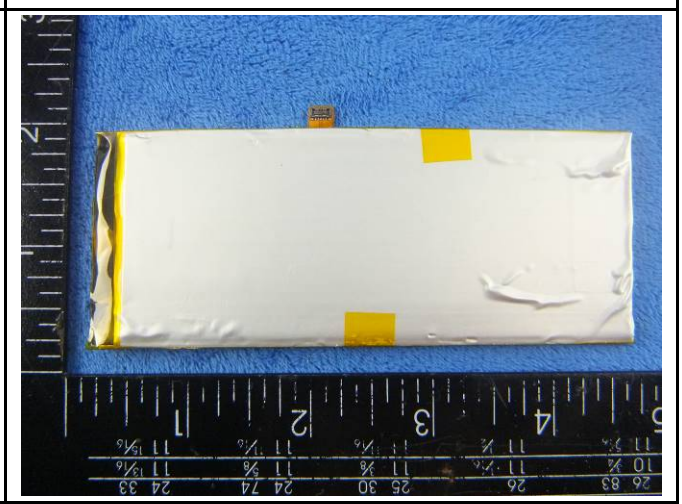


Cover Off - Top View 1

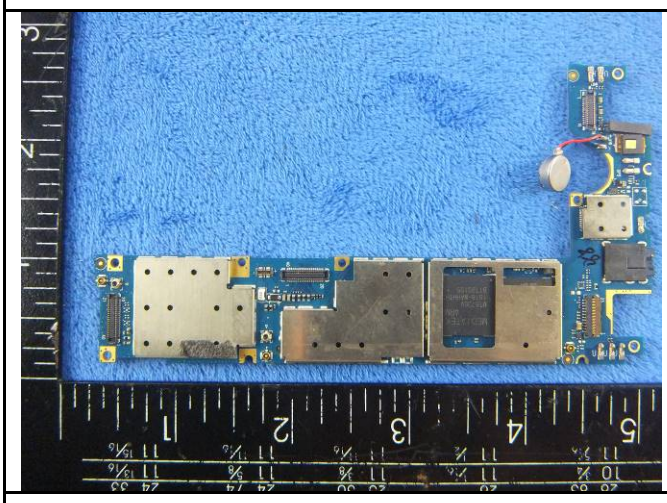
Cover Off - Top View 2



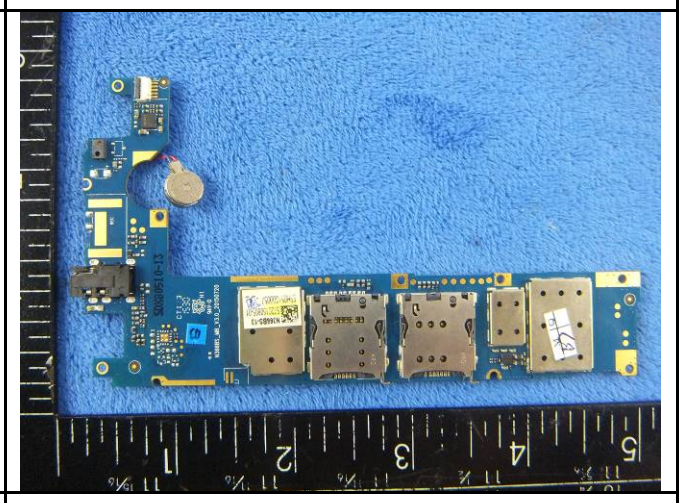
Battery - Top View



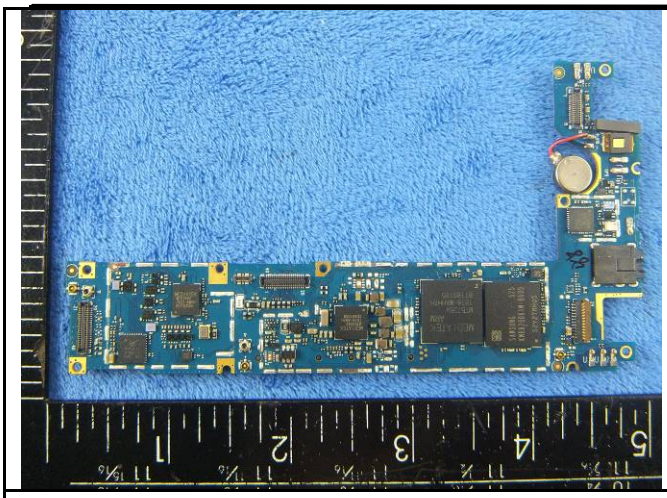
Battery - Bottom View



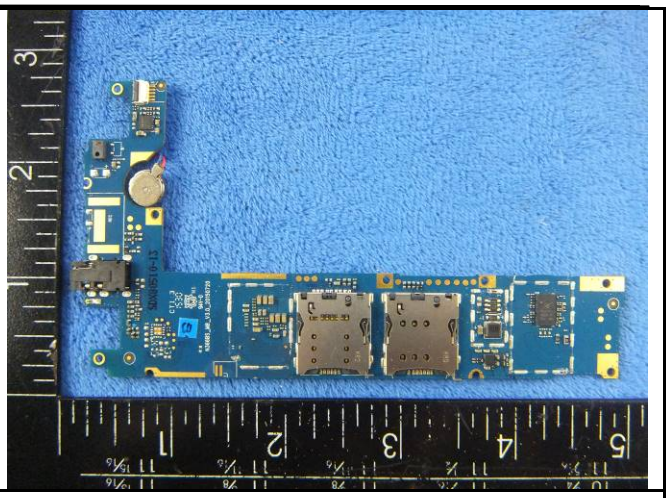
Mainborad With Shielding - Front View



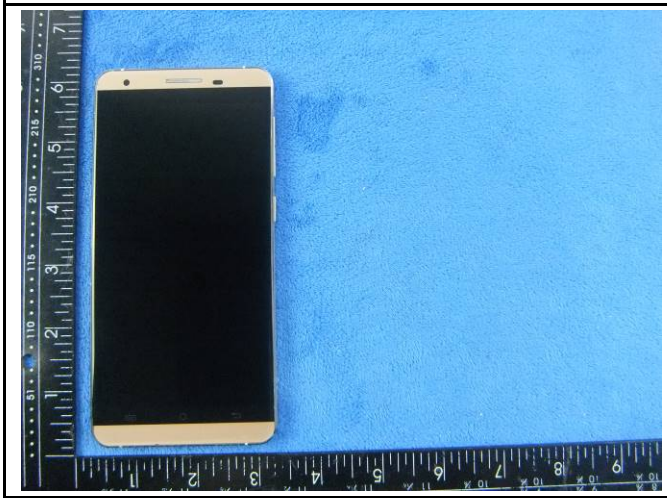
Mainborad With Shielding - Rear View



Mainborad Without Shielding - Front View



Mainborad Without Shielding - Rear View

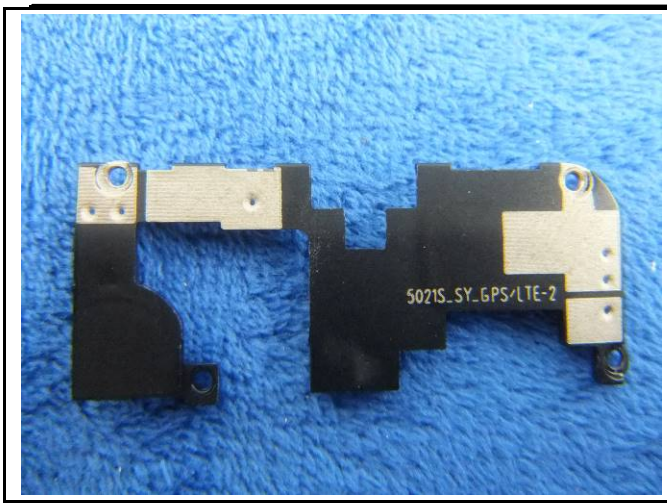


LCD – Front View

LCD – Rear View

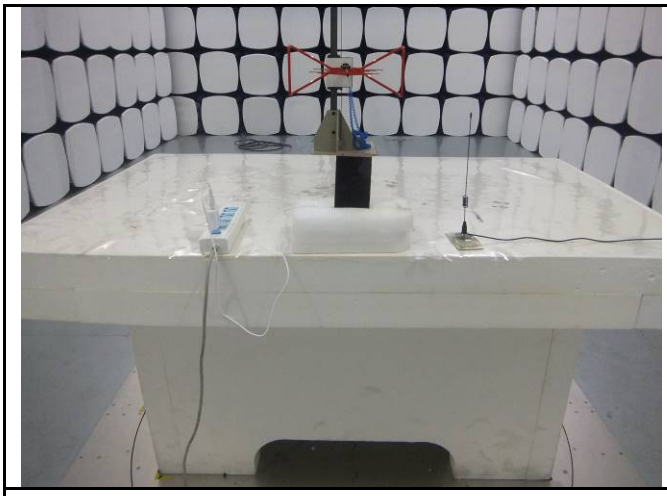
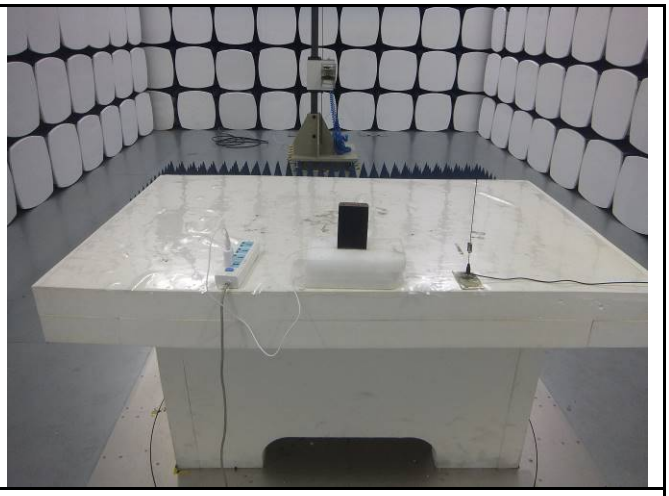
GSM/PCS/UMTS-FDD Antenna View

WIFI/BT/BLE - Antenna View



GPS/LTE - Antenna View

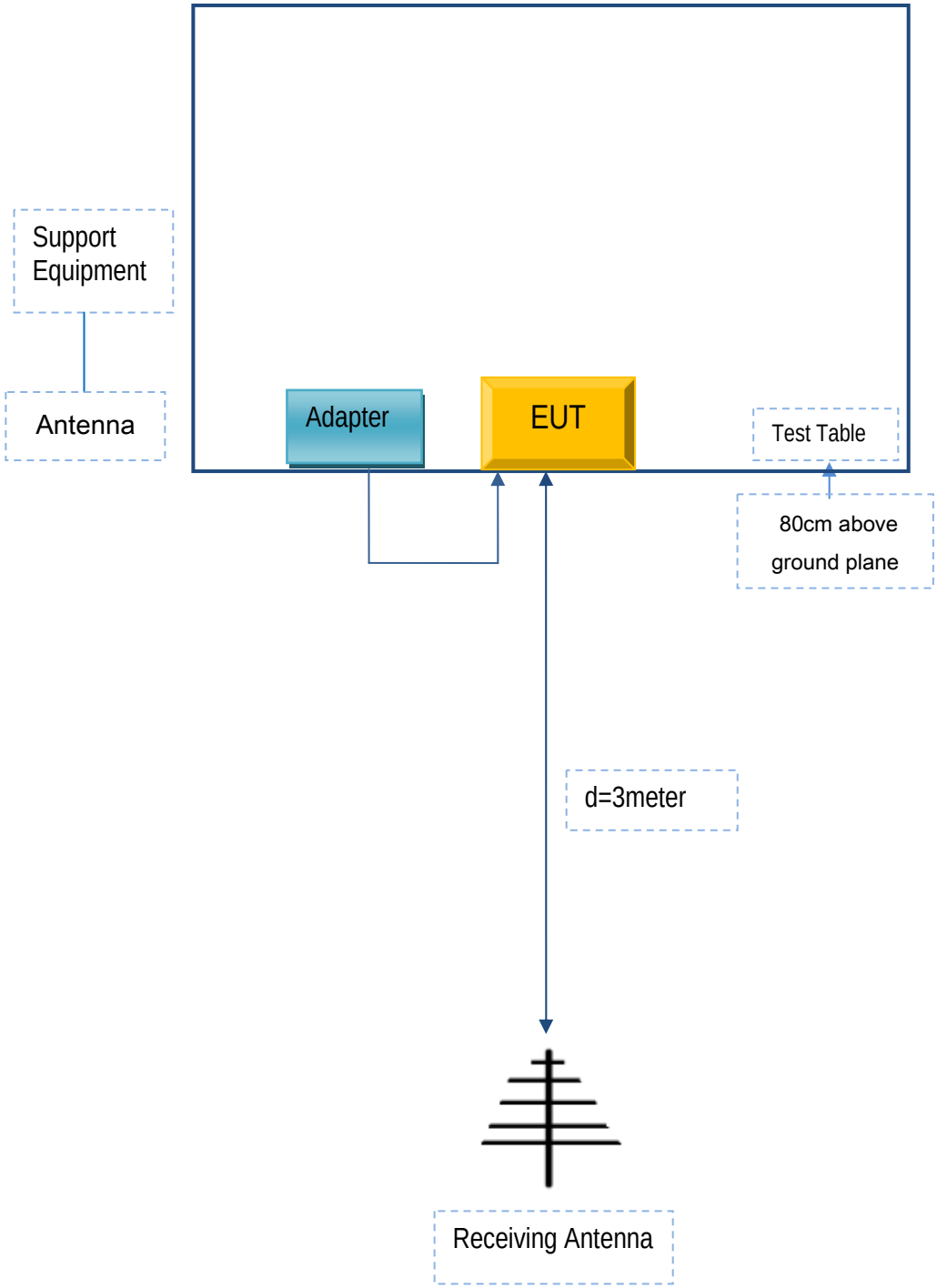
Annex B.iii. Photograph: Test Setup Photo

	
Radiated Spurious Emissions Test Setup Below 1GHz	Radiated Spurious Emissions Test Setup Above 1GHz

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
N/A	N/A	N/A	N/A	N/A

Annex C.ii. EUT OPERATING CONKITIONS

N/A

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

Annex E. DECLARATION OF SIMILARITY

N/A