

TEST REPORT

Reference No...... : WTS15S1240188-4E
FCC ID : 2ADTU-ELEMENT
Applicant..... : Acegame S.A
Address..... : Gorriti 4539 - C.A.B.A. - Buenos Aires - Argentina
Manufacturer : SHENZHEN GOTRON ELECTRONIC CO.,LTD.
Address..... : 518, 5F, R&D building, Tsinghua Hi-Tech park(North) Nanshan district, Shenzhen 518057 P.R.China
Product Name..... : mobile phone
Model No..... : Zen Element 2nd Gen
Brand..... : X-VIEW
Standards..... : FCC CFR47 Part 27: 2015
Date of Receipt sample : Dec. 23, 2015
Date of Test : Dec. 24, 2015 – Jan. 09, 2016
Date of Issue..... : Jan. 11, 2016
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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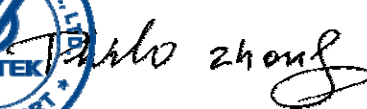
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Compiled by:



Zero Zhou / Test Engineer

Approved by:



Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
RF Output Power	2.1046 27.50(c) 27.50(d)	PASS
Peak-to-Average Ratio	27.50(d)	PASS
Bandwidth	2.1049 27.53(a)	PASS
Spurious Emissions at Antenna Terminal	2.1051 27.53(h)	PASS
Field Strength of Spurious Radiation	2.1053 27.53(h)	PASS
Out of band emission	27.53(h)	PASS
Frequency Stability	2.1055 27.5(h) 27.54	PASS
Maximum Permissible Exposure (SAR)	1.1307 2.1093	PASS

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4 General Information

4.1 General Description of E.U.T.

Product Name	:mobile phone
Model No.	:Zen Element 2nd Gen
Model Description	: N/A
GSM Band(s)	: GSM 850/900/1800/1900MHz
GPRS Class	: 12
WCDMA Band(s)	: FDD Band II/IV/V
LTE Bnad(s)	: LTE Band 4
Wi-Fi Specification	: 2.4G: 802.11b/g/n HT20/n HT40 5G Band I: 802.11a/ n HT20/ n HT40
Bluetooth Version	: Bluetooth v4.0 with BLE
GPS	: Support
NFC	: N/A
Hardware Version	: S511 v1.2
Software Version	: c228_v35m_gq3022BH_20151019

4.2 Details of E.U.T.

Operation Frequency	: GSM/GPRS 850: 824~849MHz PCS/GPRS1900: 1850~1910MHz WCDMA Band II: 1850~1910MHz WCDMA Band V: 824~849MHz WCDMA Band IV:1710~1755MHz LTE Band 4: 1710~1755MHz WiFi: 802.11b/g/n HT20: 2412~2462MHz 802.11n HT40: 2422~2452MHz 802.11a/ n(HT20/40): 5150MHz~5250MHz Bluetooth: 2402~2480MHz
Max. RF output power	: GSM 850: 32.26dBm PCS1900:29.77dBm WCDMA Band II: 22.85dBm WCDMA Band IV: 22.56dBm WCDMA Band V: 22.58dBm LTE Band 4: 24.46dBm WiFi(2.4G): 8.27dBm WiFi(5G): 7.73dBm Bluetooth: 2.48dBm
Type of Modulation	: GSM,GPRS: GMSK WCDMA: BPSK

	LTE: QPSK, 16QAM WiFi: CCK, OFDM Bluetooth: GFSK, Pi/4 DQPSK, 8DPSK
Antenna installation	: GSM/WCDMA/LTE: internal permanent antenna WiFi/Bluetooth: internal permanent antenna
Antenna Gain	GSM 850: 0.5dBi PCS1900: 0.8dBi WCDMA Band II: 0.8dBi WCDMA Band IV: 0.5dBi WCDMA Band V: 0.7dBi LTE Band 4: 0.5dBi WiFi(2.4G): -1.1dBi WiF(5G)i: -1.0dBi Bluetooth: -1.1dBi
Technical Data	:Battery DC 3.8V, 2550mAh DC 5V, 1000mA, Charging form adapter (Adapter Input: 100-240V~50/60Hz)
Adapter	:Manufacture: SHENZHEN XINJIAXUN ELECTRONIC SO., LTD. Model: XJX-CE1000U
Type of Emission	:LTE Band 4 1.4MHz: 1M16G7D(QPSK), 1M16W7D(16QAM) LTE Band 4 3MHz: 2M73G7D(QPSK), 2M72W7D(16QAM) LTE Band 4 5MHz: 4M50G7D(QPSK), 4M50W7D(16QAM) LTE Band 4 10 MHz: 8M92G7D(QPSK), 8M92W7D(16QAM) LTE Band 4 15MHz: 13M4G7D(QPSK), 13M4W7D(16QAM) LTE Band 4 20MHz: 17M9G7D(QPSK), 17M9W7D(16QAM)

4.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Support Band	Test Mode BW(MHz)	Channel Frequency	Channel Number
LTE Band 4	1.4	1710.7 MHz	19957
		1732.5 MHz	20175
		1754.3 MHz	20393
	3	1711.5 MHz	19965
		1732.5 MHz	20175
		1753.5 MHz	20385
	5	1712.5 MHz	19975
		1732.5 MHz	20175
		1752.5 MHz	20375
	10	1715.0 MHz	20000
		1732.5 MHz	20175
		1750.0 MHz	20350
	15	1717.5 MHz	20025
		1732.5 MHz	20175
		1747.5 MHz	20325
	20	1720.0 MHz	20050
		1732.5 MHz	20175
		1745.0 MHz	20300
Remark: All mode(s) were tested and the worst data was recorded.			

Note:

Bandwidth (MHz)	RB Number	RB Position	RB Offset	Bandwidth (MHz)	RB Number	RB Position	RB Offset
1.4	1	Low	0	10	1	Low	0
	1	Mid	3		1	Mid	25
	1	High	5		1	High	49
	3	Low	0		25	Low	0
	3	Mid	2		25	Mid	13
	3	High	3		25	High	25
	6	Low/Mid/High	0		50	Low/Mid/High	0
3	1	Low	0	15	1	Low	0
	1	Mid	8		1	Mid	38
	1	High	14		1	High	74
	8	Low	0		36	Low	0
	8	Mid	4		36	Mid	20
	8	High	7		36	High	39
	15	Low/Mid/High	0		75	Low/Mid/High	0
5	1	Low	0	20	1	Low	0
	1	Mid	13		1	Mid	50
	1	High	24		1	High	99
	12	Low	0		50	Low	0
	12	Mid	7		50	Mid	26
	12	High	13		50	High	50
	25	Low/Mid/High	0		100	Low/Mid/High	0

4.4 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2015.

- **FCC Test Site 1#– Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipments List

RF Conducted Test						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Aug.15,2015	Aug.14,2016
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Aug.15,2015	Aug.14,2016
3.	Humidity Chamber	GF	GTH-225-40-1P	IAA061213	Aug.15,2015	Aug.14,2016
4.	Universal Radio Communication Tester	R&S	CMU 200	112461	Apr.10,2015	Apr.09,2016
3m Semi-anechoic Chamber for Radiated Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2015	Sep.14,2016
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2015	Sep.14,2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.18,2015	Apr.17,2016
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2015	Sep.14,2016
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.18,2015	Apr.17,2016
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	669	Apr.18,2015	Apr.17,2016
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2015	Mar.16,2016
8	Coaxial Cable (above 1GHz)	Top	1000MHZ- 25GHz	EW02014-7	Apr.09,2015	Apr.08,2016
9	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Sep.15,2015	Sep.14,2016
10	Universal Radio Communication Tester	R&S	CMU 200	112461	Apr.10,2015	Apr.09,2016
11	Signal Generator	R&S	SMR20	100046	Sep.15,2015	Sep.14,2016

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 RF OUTPUT POWER

Test Requirement:	FCC Part 2.1046, 27.50(c),27.50(d)
Test Method:	ANSI C63.4:2009, TIA/EIA-603-D:2010
Test Mode:	Transmitting

6.1 EUT Operation

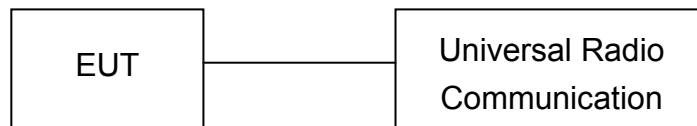
Operating Environment :

Temperature:	22.5 °C
Humidity:	52.1 % RH
Atmospheric Pressure:	101.2kPa

6.2 Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

1. The setup of EUT is according with per TIA/EIA Standard 603D:2010 and ANSI C63.4-2009 measurement procedure.
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. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. 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.

6.3 Test Result

Conducted Power

LTE Band 4:

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
19957	1.4	QPSK	1	LOW	0	0	30	23.65	Pass
19957	1.4	QPSK	1	MID	3	0	30	23.33	Pass
19957	1.4	QPSK	1	HIGH	5	0	30	23.34	Pass
19957	1.4	QPSK	3	LOW	0	0	30	23.47	Pass
19957	1.4	QPSK	3	MID	2	0	30	23.59	Pass
19957	1.4	QPSK	3	HIGH	3	0	30	23.62	Pass
19957	1.4	QPSK	6	LOW	0	0	30	23.36	Pass
19957	1.4	Q16AM	1	LOW	0	0	30	23.71	Pass
19957	1.4	Q16AM	1	MID	3	0	30	23.63	Pass
19957	1.4	Q16AM	1	HIGH	5	0	30	23.44	Pass
19957	1.4	Q16AM	3	LOW	0	0	30	23.56	Pass
19957	1.4	Q16AM	3	MID	2	0	30	23.81	Pass
19957	1.4	Q16AM	3	HIGH	3	0	30	24.11	Pass
19957	1.4	Q16AM	6	LOW	0	0	30	23.69	Pass
20175	1.4	QPSK	1	LOW	0	0	30	24	Pass
20175	1.4	QPSK	1	MID	3	0	30	24.03	Pass
20175	1.4	QPSK	1	HIGH	5	0	30	24.04	Pass
20175	1.4	QPSK	3	LOW	0	0	30	24.08	Pass
20175	1.4	QPSK	3	MID	2	0	30	24.07	Pass
20175	1.4	QPSK	3	HIGH	3	0	30	24.07	Pass
20175	1.4	QPSK	6	LOW	0	0	30	22.98	Pass
20175	1.4	Q16AM	1	LOW	0	0	30	23.4	Pass
20175	1.4	Q16AM	1	MID	3	0	30	23.44	Pass
20175	1.4	Q16AM	1	HIGH	5	0	30	23.41	Pass
20175	1.4	Q16AM	3	LOW	0	0	30	23.31	Pass
20175	1.4	Q16AM	3	MID	2	0	30	23.23	Pass
20175	1.4	Q16AM	3	HIGH	3	0	30	23.28	Pass
20175	1.4	Q16AM	6	LOW	0	0	30	21.93	Pass

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
20393	1.4	QPSK	1	LOW	0	0	30	24.31	Pass
20393	1.4	QPSK	1	MID	3	0	30	24.33	Pass
20393	1.4	QPSK	1	HIGH	5	0	30	24.28	Pass
20393	1.4	QPSK	3	LOW	0	0	30	24.41	Pass
20393	1.4	QPSK	3	MID	2	0	30	24.41	Pass
20393	1.4	QPSK	3	HIGH	3	0	30	24.44	Pass
20393	1.4	QPSK	6	LOW	0	0	30	23.33	Pass
20393	1.4	Q16AM	1	LOW	0	0	30	23.37	Pass
20393	1.4	Q16AM	1	MID	3	0	30	23.42	Pass
20393	1.4	Q16AM	1	HIGH	5	0	30	23.42	Pass
20393	1.4	Q16AM	3	LOW	0	0	30	23.63	Pass
20393	1.4	Q16AM	3	MID	2	0	30	23.62	Pass
20393	1.4	Q16AM	3	HIGH	3	0	30	23.62	Pass
20393	1.4	Q16AM	6	LOW	0	0	30	22.52	Pass
19965	3	QPSK	1	LOW	0	0	30	23.29	Pass
19965	3	QPSK	1	MID	8	0	30	23.34	Pass
19965	3	QPSK	1	HIGH	14	0	30	23.62	Pass
19965	3	QPSK	8	LOW	0	0	30	22.74	Pass
19965	3	QPSK	8	MID	4	0	30	23.41	Pass
19965	3	QPSK	8	HIGH	7	0	30	23.30	Pass
19965	3	QPSK	15	LOW	0	0	30	23.66	Pass
19965	3	Q16AM	1	LOW	0	0	30	22.75	Pass
19965	3	Q16AM	1	MID	8	0	30	23.59	Pass
19965	3	Q16AM	1	HIGH	14	0	30	23.37	Pass
19965	3	Q16AM	8	LOW	0	0	30	23.22	Pass
19965	3	Q16AM	8	MID	4	0	30	22.76	Pass
19965	3	Q16AM	8	HIGH	7	0	30	23.42	Pass
19965	3	Q16AM	15	LOW	0	0	30	23.28	Pass
20175	3	QPSK	1	LOW	0	0	30	23.99	Pass
20175	3	QPSK	1	MID	8	0	30	24.05	Pass
20175	3	QPSK	1	HIGH	14	0	30	24.04	Pass
20175	3	QPSK	8	LOW	0	0	30	23.04	Pass
20175	3	QPSK	8	MID	4	0	30	23.07	Pass

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
20175	3	QPSK	8	HIGH	7	0	30	23.11	Pass
20175	3	QPSK	15	LOW	0	0	30	23.05	Pass
20175	3	Q16AM	1	LOW	0	0	30	23.35	Pass
20175	3	Q16AM	1	MID	8	0	30	23.45	Pass
20175	3	Q16AM	1	HIGH	14	0	30	23.45	Pass
20175	3	Q16AM	8	LOW	0	0	30	22.14	Pass
20175	3	Q16AM	8	MID	4	0	30	22.19	Pass
20175	3	Q16AM	8	HIGH	7	0	30	22.22	Pass
20175	3	Q16AM	15	LOW	0	0	30	22.12	Pass
20385	3	QPSK	1	LOW	0	0	30	24.29	Pass
20385	3	QPSK	1	MID	8	0	30	24.3	Pass
20385	3	QPSK	1	HIGH	14	0	30	24.23	Pass
20385	3	QPSK	8	LOW	0	0	30	23.41	Pass
20385	3	QPSK	8	MID	4	0	30	23.38	Pass
20385	3	QPSK	8	HIGH	7	0	30	23.36	Pass
20385	3	QPSK	15	LOW	0	0	30	23.39	Pass
20385	3	Q16AM	1	LOW	0	0	30	23.43	Pass
20385	3	Q16AM	1	MID	8	0	30	23.41	Pass
20385	3	Q16AM	1	HIGH	14	0	30	23.33	Pass
20385	3	Q16AM	8	LOW	0	0	30	22.47	Pass
20385	3	Q16AM	8	MID	4	0	30	22.44	Pass
20385	3	Q16AM	8	HIGH	7	0	30	22.42	Pass
20385	3	Q16AM	15	LOW	0	0	30	22.36	Pass
19975	5	QPSK	1	LOW	0	0	30	23.4	Pass
19975	5	QPSK	1	MID	13	0	30	23.45	Pass
19975	5	QPSK	1	HIGH	24	0	30	23.45	Pass
19975	5	QPSK	12	LOW	0	0	30	22.45	Pass
19975	5	QPSK	12	MID	7	0	30	22.46	Pass
19975	5	QPSK	12	HIGH	13	0	30	22.47	Pass
19975	5	QPSK	25	LOW	0	0	30	22.42	Pass
19975	5	Q16AM	1	LOW	0	0	30	22.59	Pass
19975	5	Q16AM	1	MID	13	0	30	22.63	Pass
19975	5	Q16AM	1	HIGH	24	0	30	22.65	Pass

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
19975	5	Q16AM	12	LOW	0	0	30	21.52	Pass
19975	5	Q16AM	12	MID	7	0	30	21.55	Pass
19975	5	Q16AM	12	HIGH	13	0	30	21.55	Pass
19975	5	Q16AM	25	LOW	0	0	30	21.45	Pass
20175	5	QPSK	1	LOW	0	0	30	24	Pass
20175	5	QPSK	1	MID	13	0	30	24.08	Pass
20175	5	QPSK	1	HIGH	24	0	30	24.11	Pass
20175	5	QPSK	12	LOW	0	0	30	23.07	Pass
20175	5	QPSK	12	MID	7	0	30	23.1	Pass
20175	5	QPSK	12	HIGH	13	0	30	23.17	Pass
20175	5	QPSK	25	LOW	0	0	30	23.08	Pass
20175	5	Q16AM	1	LOW	0	0	30	23.55	Pass
20175	5	Q16AM	1	MID	13	0	30	23.62	Pass
20175	5	Q16AM	1	HIGH	24	0	30	23.65	Pass
20175	5	Q16AM	12	LOW	0	0	30	22.22	Pass
20175	5	Q16AM	12	MID	7	0	30	22.25	Pass
20175	5	Q16AM	12	HIGH	13	0	30	22.32	Pass
20175	5	Q16AM	25	LOW	0	0	30	22.16	Pass
20375	5	QPSK	1	LOW	0	0	30	24.42	Pass
20375	5	QPSK	1	MID	13	0	30	24.46	Pass
20375	5	QPSK	1	HIGH	24	0	30	24.37	Pass
20375	5	QPSK	12	LOW	0	0	30	23.49	Pass
20375	5	QPSK	12	MID	7	0	30	23.47	Pass
20375	5	QPSK	12	HIGH	13	0	30	23.42	Pass
20375	5	QPSK	25	LOW	0	0	30	23.42	Pass
20375	5	Q16AM	1	LOW	0	0	30	23.6	Pass
20375	5	Q16AM	1	MID	13	0	30	23.57	Pass
20375	5	Q16AM	1	HIGH	24	0	30	23.48	Pass
20375	5	Q16AM	12	LOW	0	0	30	22.56	Pass
20375	5	Q16AM	12	MID	7	0	30	22.55	Pass
20375	5	Q16AM	12	HIGH	13	0	30	22.52	Pass
20375	5	Q16AM	25	LOW	0	0	30	22.39	Pass
20000	10	QPSK	1	LOW	0	0	30	23.46	Pass

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
20000	10	QPSK	1	MID	25	0	30	23.51	Pass
20000	10	QPSK	1	HIGH	49	0	30	22.56	Pass
20000	10	QPSK	25	LOW	0	0	30	24.18	Pass
20000	10	QPSK	25	MID	13	0	30	23.24	Pass
20000	10	QPSK	25	HIGH	25	0	30	23.32	Pass
20000	10	QPSK	50	LOW	0	0	30	22.68	Pass
20000	10	Q16AM	1	LOW	0	0	30	23.47	Pass
20000	10	Q16AM	1	MID	25	0	30	23.15	Pass
20000	10	Q16AM	1	HIGH	49	0	30	23.26	Pass
20000	10	Q16AM	25	LOW	0	0	30	23.25	Pass
20000	10	Q16AM	25	MID	13	0	30	22.80	Pass
20000	10	Q16AM	25	HIGH	25	0	30	22.93	Pass
20000	10	Q16AM	50	LOW	0	0	30	23.43	Pass
20175	10	QPSK	1	LOW	0	0	30	23.96	Pass
20175	10	QPSK	1	MID	25	0	30	24.13	Pass
20175	10	QPSK	1	HIGH	49	0	30	24.26	Pass
20175	10	QPSK	25	LOW	0	0	30	23.01	Pass
20175	10	QPSK	25	MID	13	0	30	23.07	Pass
20175	10	QPSK	25	HIGH	25	0	30	23.18	Pass
20175	10	QPSK	50	LOW	0	0	30	23.11	Pass
20175	10	Q16AM	1	LOW	0	0	30	23.31	Pass
20175	10	Q16AM	1	MID	25	0	30	23.5	Pass
20175	10	Q16AM	1	HIGH	49	0	30	23.62	Pass
20175	10	Q16AM	25	LOW	0	0	30	22.05	Pass
20175	10	Q16AM	25	MID	13	0	30	22.13	Pass
20175	10	Q16AM	25	HIGH	25	0	30	22.24	Pass
20175	10	Q16AM	50	LOW	0	0	30	22.16	Pass
20350	10	QPSK	1	LOW	0	0	30	24.25	Pass
20350	10	QPSK	1	MID	25	0	30	24.31	Pass
20350	10	QPSK	1	HIGH	49	0	30	24.26	Pass
20350	10	QPSK	25	LOW	0	0	30	23.31	Pass
20350	10	QPSK	25	MID	13	0	30	23.34	Pass
20350	10	QPSK	25	HIGH	25	0	30	23.32	Pass

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
20350	10	QPSK	50	LOW	0	0	30	23.34	Pass
20350	10	Q16AM	1	LOW	0	0	30	23.35	Pass
20350	10	Q16AM	1	MID	25	0	30	23.42	Pass
20350	10	Q16AM	1	HIGH	49	0	30	23.34	Pass
20350	10	Q16AM	25	LOW	0	0	30	22.43	Pass
20350	10	Q16AM	25	MID	13	0	30	22.46	Pass
20350	10	Q16AM	25	HIGH	25	0	30	22.43	Pass
20350	10	Q16AM	50	LOW	0	0	30	22.39	Pass
20025	15	QPSK	1	LOW	0	0	30	23.47	Pass
20025	15	QPSK	1	MID	38	0	30	23.66	Pass
20025	15	QPSK	1	HIGH	74	0	30	23.85	Pass
20025	15	QPSK	36	LOW	0	0	30	22.57	Pass
20025	15	QPSK	36	MID	20	0	30	22.68	Pass
20025	15	QPSK	36	HIGH	39	0	30	22.79	Pass
20025	15	QPSK	75	LOW	0	0	30	22.67	Pass
20025	15	Q16AM	1	LOW	0	0	30	22.41	Pass
20025	15	Q16AM	1	MID	38	0	30	22.63	Pass
20025	15	Q16AM	1	HIGH	74	0	30	22.79	Pass
20025	15	Q16AM	36	LOW	0	0	30	21.56	Pass
20025	15	Q16AM	36	MID	20	0	30	21.67	Pass
20025	15	Q16AM	36	HIGH	39	0	30	21.81	Pass
20025	15	Q16AM	75	LOW	0	0	30	21.66	Pass
20175	15	QPSK	1	LOW	0	0	30	23.91	Pass
20175	15	QPSK	1	MID	38	0	30	24.15	Pass
20175	15	QPSK	1	HIGH	74	0	30	24.34	Pass
20175	15	QPSK	36	LOW	0	0	30	22.97	Pass
20175	15	QPSK	36	MID	20	0	30	23.11	Pass
20175	15	QPSK	36	HIGH	39	0	30	23.24	Pass
20175	15	QPSK	75	LOW	0	0	30	23.09	Pass
20175	15	Q16AM	1	LOW	0	0	30	23.25	Pass
20175	15	Q16AM	1	MID	38	0	30	23.52	Pass
20175	15	Q16AM	1	HIGH	74	0	30	23.7	Pass
20175	15	Q16AM	36	LOW	0	0	30	22.03	Pass

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
20175	15	Q16AM	36	MID	20	0	30	22.18	Pass
20175	15	Q16AM	36	HIGH	39	0	30	22.31	Pass
20175	15	Q16AM	75	LOW	0	0	30	22.14	Pass
20325	15	QPSK	1	LOW	0	0	30	24.33	Pass
20325	15	QPSK	1	MID	38	0	30	24.34	Pass
20325	15	QPSK	1	HIGH	74	0	30	24.33	Pass
20325	15	QPSK	36	LOW	0	0	30	23.31	Pass
20325	15	QPSK	36	MID	20	0	30	23.35	Pass
20325	15	QPSK	36	HIGH	39	0	30	23.37	Pass
20325	15	QPSK	75	LOW	0	0	30	23.35	Pass
20325	15	Q16AM	1	LOW	0	0	30	23.77	Pass
20325	15	Q16AM	1	MID	38	0	30	23.8	Pass
20325	15	Q16AM	1	HIGH	74	0	30	23.75	Pass
20325	15	Q16AM	36	LOW	0	0	30	22.29	Pass
20325	15	Q16AM	36	MID	20	0	30	22.34	Pass
20325	15	Q16AM	36	HIGH	39	0	30	22.34	Pass
20325	15	Q16AM	75	LOW	0	0	30	22.36	Pass
20050	20	QPSK	1	LOW	0	0	30	23.53	Pass
20050	20	QPSK	1	MID	50	0	30	23.76	Pass
20050	20	QPSK	1	HIGH	99	0	30	24.08	Pass
20050	20	QPSK	50	LOW	0	0	30	22.67	Pass
20050	20	QPSK	50	MID	26	0	30	22.81	Pass
20050	20	QPSK	50	HIGH	50	0	30	22.97	Pass
20050	20	QPSK	100	LOW	0	0	30	22.79	Pass
20050	20	Q16AM	1	LOW	0	0	30	23.07	Pass
20050	20	Q16AM	1	MID	50	0	30	23.35	Pass
20050	20	Q16AM	1	HIGH	99	0	30	23.63	Pass
20050	20	Q16AM	50	LOW	0	0	30	21.71	Pass
20050	20	Q16AM	50	MID	26	0	30	21.86	Pass
20050	20	Q16AM	50	HIGH	50	0	30	22.03	Pass
20050	20	Q16AM	100	LOW	0	0	30	21.84	Pass
20175	20	QPSK	1	LOW	0	0	30	23.84	Pass
20175	20	QPSK	1	MID	50	0	30	24.14	Pass

UL Channel	Bandwidth (MHz)	UL Modulation	UL RB Number/ Size	UL RB Position	UL RB offset	Lower Limit (dBm)	Upper Limit (dBm)	Measured (dBm)	Verdict
20175	20	QPSK	1	HIGH	99	0	30	24.37	Pass
20175	20	QPSK	50	LOW	0	0	30	22.98	Pass
20175	20	QPSK	50	MID	26	0	30	23.13	Pass
20175	20	QPSK	50	HIGH	50	0	30	23.28	Pass
20175	20	QPSK	100	LOW	0	0	30	23.12	Pass
20175	20	Q16AM	1	LOW	0	0	30	23.32	Pass
20175	20	Q16AM	1	MID	50	0	30	23.63	Pass
20175	20	Q16AM	1	HIGH	99	0	30	23.89	Pass
20175	20	Q16AM	50	LOW	0	0	30	22.04	Pass
20175	20	Q16AM	50	MID	26	0	30	22.17	Pass
20175	20	Q16AM	50	HIGH	50	0	30	22.33	Pass
20175	20	Q16AM	100	LOW	0	0	30	22.14	Pass
20300	20	QPSK	1	LOW	0	0	30	24.29	Pass
20300	20	QPSK	1	MID	50	0	30	24.36	Pass
20300	20	QPSK	1	HIGH	99	0	30	24.42	Pass
20300	20	QPSK	50	LOW	0	0	30	23.38	Pass
20300	20	QPSK	50	MID	26	0	30	23.41	Pass
20300	20	QPSK	50	HIGH	50	0	30	23.45	Pass
20300	20	QPSK	100	LOW	0	0	30	23.4	Pass
20300	20	Q16AM	1	LOW	0	0	30	23.74	Pass
20300	20	Q16AM	1	MID	50	0	30	23.82	Pass
20300	20	Q16AM	1	HIGH	99	0	30	23.82	Pass
20300	20	Q16AM	50	LOW	0	0	30	22.39	Pass
20300	20	Q16AM	50	MID	26	0	30	22.42	Pass
20300	20	Q16AM	50	HIGH	50	0	30	22.49	Pass
20300	20	Q16AM	100	LOW	0	0	30	22.44	Pass

Radiated Power(Measured at max. conducted power channel)

ERP and EIRP

LTE Band 4 (Part 27)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Part 27	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
LTE Band 4 Channel 19957 – 1.4MHz – QPSK										
1710.70	78.44	188	1.1	H	4.33	0.31	10.40	14.42	30	-15.58
1710.70	84.41	66	1.1	V	10.88	0.31	10.40	20.97	30	-9.03
LTE Band 4 Channel 20175 – 1.4MHz – QPSK										
1732.50	76.07	227	2.4	H	1.96	0.31	10.40	12.05	30	-17.95
1732.50	84.03	346	2.1	V	10.50	0.31	10.40	20.59	30	-9.41
LTE Band 4 Channel 20393 – 1.4MHz – QPSK										
1754.30	77.60	116	1.6	H	3.49	0.32	10.40	13.57	30	-16.43
1754.30	84.86	7	2.5	V	11.33	0.32	10.40	21.41	30	-8.59
LTE Band 4 Channel 19957 – 1.4MHz – 16QAM										
1710.70	76.85	85	2.0	H	2.74	0.31	10.40	12.83	30	-17.17
1710.70	84.47	350	2.2	V	10.94	0.31	10.40	21.03	30	-8.97
LTE Band 4 Channel 20175 – 1.4MHz – 16QAM										
1732.50	76.74	144	1.1	H	2.63	0.31	10.40	12.72	30	-17.28
1732.50	84.95	172	1.7	V	11.42	0.31	10.40	21.51	30	-8.49
LTE Band 4 Channel 20393 – 1.4MHz – 16QAM										
1754.30	78.23	88	1.1	H	4.12	0.32	10.40	14.20	30	-15.80
1754.30	84.83	45	2.1	V	11.30	0.32	10.40	21.38	30	-8.62
LTE Band 4 Channel 19965 – 3MHz – QPSK										
1711.50	78.73	188	1.7	H	4.62	0.31	10.40	14.71	30	-15.29
1711.50	84.18	146	1.5	V	10.65	0.31	10.40	20.74	30	-9.26
LTE Band 4 Channel 20175 – 3MHz – QPSK										
1732.50	78.90	84	2.0	H	4.79	0.31	10.40	14.88	30	-15.12
1732.50	84.23	199	1.1	V	10.70	0.31	10.40	20.79	30	-9.21
LTE Band 4 Channel 20385 – 3MHz – QPSK										
1753.50	77.26	30	1.2	H	3.15	0.32	10.40	13.23	30	-16.77
1753.50	84.82	231	1.9	V	11.29	0.32	10.40	21.37	30	-8.63
LTE Band 4 Channel 19965 – 3MHz – 16QAM										
1711.50	77.12	217	1.7	H	3.01	0.31	10.40	13.10	30	-16.90
1711.50	84.72	4	2.0	V	11.19	0.31	10.40	21.28	30	-8.72
LTE Band 4 Channel 20175 – 3MHz – 16QAM										
1732.50	78.93	234	1.6	H	4.82	0.31	10.40	14.91	30	-15.09
1732.50	84.39	100	1.4	V	10.86	0.31	10.40	20.95	30	-9.05
LTE Band 4 Channel 20383 – 3MHz – 16QAM										
1753.50	77.57	35	2.4	H	3.46	0.32	10.40	13.54	30	-16.46
1753.50	84.83	311	1.9	V	11.30	0.32	10.40	21.38	30	-8.62
LTE Band 4 Channel 19975 – 5MHz – QPSK										
1712.50	76.04	215	1.4	H	1.93	0.31	10.40	12.02	30	-17.98

1712.50	84.46	66	1.2	V	10.93	0.31	10.40	21.02	30	-8.98
LTE Band 4 Channel 20175 – 5MHz – QPSK										
1732.50	76.44	149	1.3	H	2.33	0.31	10.40	12.42	30	-17.58
1732.50	84.24	163	2.4	V	10.71	0.31	10.40	20.80	30	-9.20
LTE Band 4 Channel 20375 – 5MHz – QPSK										
1752.50	78.59	317	1.0	H	4.48	0.32	10.40	14.56	30	-15.44
1752.50	84.92	261	2.4	V	11.39	0.32	10.40	21.47	30	-8.53
LTE Band 4 Channel 19975 – 5MHz – 16QAM										
1712.50	77.19	49	1.8	H	3.08	0.31	10.40	13.17	30	-16.83
1712.50	84.24	290	1.5	V	10.71	0.31	10.40	20.80	30	-9.20
LTE Band 4 Channel 20175 – 5MHz – 16QAM										
1732.50	79.39	98	2.4	H	5.28	0.31	10.40	15.37	30	-14.63
1732.50	84.50	71	2.3	V	10.97	0.31	10.40	21.06	30	-8.94
LTE Band 4 Channel 20375 – 5MHz – 16QAM										
1752.50	76.86	165	1.0	H	2.75	0.32	10.40	12.83	30	-17.17
1752.50	84.31	224	1.2	V	10.78	0.32	10.40	20.86	30	-9.14
LTE Band 4 Channel 20000 – 10MHz – QPSK										
1715.00	78.51	80	1.1	H	4.40	0.31	10.40	14.49	30	-15.51
1715.00	84.00	285	1.0	V	10.47	0.31	10.40	20.56	30	-9.44
LTE Band 4 Channel 20175 – 10MHz – QPSK										
1732.50	76.19	296	1.6	H	2.08	0.31	10.40	12.17	30	-17.83
1732.50	84.14	136	2.0	V	10.61	0.31	10.40	20.70	30	-9.30
LTE Band 4 Channel 20350 – 10MHz – QPSK										
1750.00	79.06	308	1.8	H	4.95	0.32	10.40	15.03	30	-14.97
1750.00	84.17	52	1.9	V	10.64	0.32	10.40	20.72	30	-9.28
LTE Band 4 Channel 20000 – 10MHz – 16QAM										
1715.00	79.90	330	1.2	H	5.79	0.31	10.40	15.88	30	-14.12
1715.00	84.41	235	2.0	V	10.88	0.31	10.40	20.97	30	-9.03
LTE Band 4 Channel 20175 – 10MHz – 16QAM										
1732.50	79.80	278	2.0	H	5.69	0.31	10.40	15.78	30	-14.22
1732.50	84.51	297	1.6	V	10.98	0.31	10.40	21.07	30	-8.93
LTE Band 4 Channel 20350 – 10MHz – 16QAM										
1750.00	77.60	45	1.6	H	3.49	0.32	10.40	13.57	30	-16.43
1750.00	84.31	201	1.9	V	10.78	0.32	10.40	20.86	30	-9.14
LTE Band 4 Channel 20025 – 15MHz – QPSK										
1717.50	77.58	110	2.4	H	3.47	0.31	10.40	13.56	30	-16.44
1717.50	84.98	228	1.1	V	11.45	0.31	10.40	21.54	30	-8.46
LTE Band 4 Channel 20175 – 15MHz – QPSK										
1732.50	76.35	116	1.9	H	2.24	0.31	10.40	12.33	30	-17.67
1732.50	84.00	81	1.8	V	10.47	0.31	10.40	20.56	30	-9.44
LTE Band 4 Channel 20325 – 15MHz – QPSK										
1747.50	77.71	307	1.4	H	3.60	0.32	10.40	13.68	30	-16.32
1747.50	84.09	306	1.4	V	10.56	0.32	10.40	20.64	30	-9.36
LTE Band 4 Channel 20025 – 15MHz – 16QAM										
1717.50	77.00	214	2.1	H	2.89	0.31	10.40	12.98	30	-17.02
1717.50	84.38	42	2.3	V	10.85	0.31	10.40	20.94	30	-9.06
LTE Band 4 Channel 20175 – 15MHz – 16QAM										
1732.50	78.82	273	1.0	H	4.71	0.31	10.40	14.80	30	-15.20

1732.50	84.54	280	1.9	V	11.01	0.31	10.40	21.10	30	-8.90
LTE Band 4 Channel 20350 – 15MHz – 16QAM										
1747.50	76.75	237	1.8	H	2.64	0.32	10.40	12.72	30	-17.28
1747.50	84.84	101	1.1	V	11.31	0.32	10.40	21.39	30	-8.61
LTE Band 4 Channel 20050 – 20MHz – QPSK										
1720.00	78.74	278	2.3	H	4.63	0.31	10.40	14.72	30	-15.28
1720.00	84.30	177	2.1	V	10.77	0.31	10.40	20.86	30	-9.14
LTE Band 4 Channel 20175 – 20MHz – QPSK										
1732.50	77.34	112	1.5	H	3.23	0.31	10.40	13.32	30	-16.68
1732.50	84.18	318	1.5	V	10.65	0.31	10.40	20.74	30	-9.26
LTE Band 4 Channel 20300 – 20MHz – QPSK										
1745.00	78.34	320	1.3	H	4.23	0.32	10.40	14.31	30	-15.69
1745.00	84.94	211	1.6	V	11.41	0.32	10.40	21.49	30	-8.51
LTE Band 4 Channel 20035 – 20MHz – 16QAM										
1720.00	77.42	243	2.0	H	3.31	0.31	10.40	13.40	30	-16.60
1720.00	84.06	199	2.1	V	10.53	0.31	10.40	20.62	30	-9.38
LTE Band 4 Channel 20175 – 20MHz – 16QAM										
1732.50	77.25	141	1.4	H	3.14	0.31	10.40	13.23	30	-16.77
1732.50	84.42	59	1.4	V	10.89	0.31	10.40	20.98	30	-9.02
LTE Band 4 Channel 20300 – 20MHz – 16QAM										
1745.00	76.38	249	2.0	H	2.27	0.32	10.40	12.35	30	-17.65
1745.00	84.71	256	1.4	V	11.18	0.32	10.40	21.26	30	-8.74

(note: above ERP or EIRP base on the worst case of conducted power)

7 Peak-to-Average Ratio

Test Requirement:	27.50(d)
Test Method:	N/A
Test Mode:	Transmitting

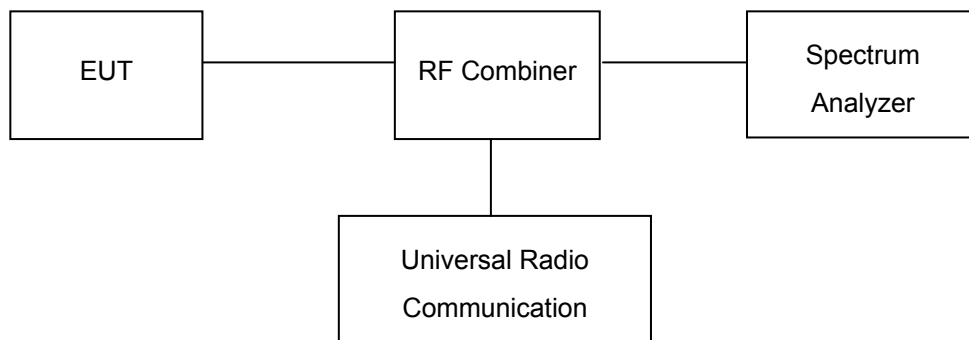
7.1 EUT Operation

Operating Environment :

Temperature:	22.5 °C
Humidity:	52.3% RH
Atmospheric Pressure:	101.2kPa

7.2 Test Procedure

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.



7.3 Test Result

PASS

LTE Band 4 (part 27)

Please refer to the Appendix Band 4 LTE Peak to Average Ratio.

8 BANDWIDTH

Test Requirement:	FCC Part 2.1049, 27.53(a)
Test Method:	ANSI C63.4:2009, TIA/EIA-603-D:2010
Test Mode:	Transmitting

8.1 EUT Operation

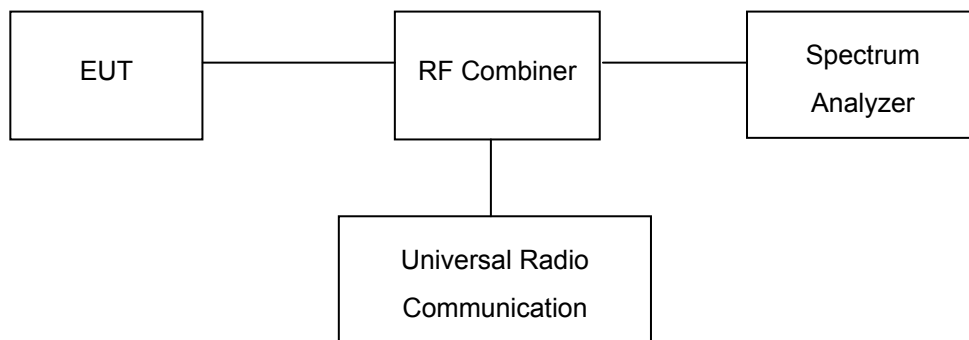
Operating Environment :

Temperature:	22.5 °C
Humidity:	52.3% RH
Atmospheric Pressure:	101.2kPa

8.2 Test Procedure

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 3 kHz (Cellular /PCS) and the 26 dB & 99%bandwidth was recorded.



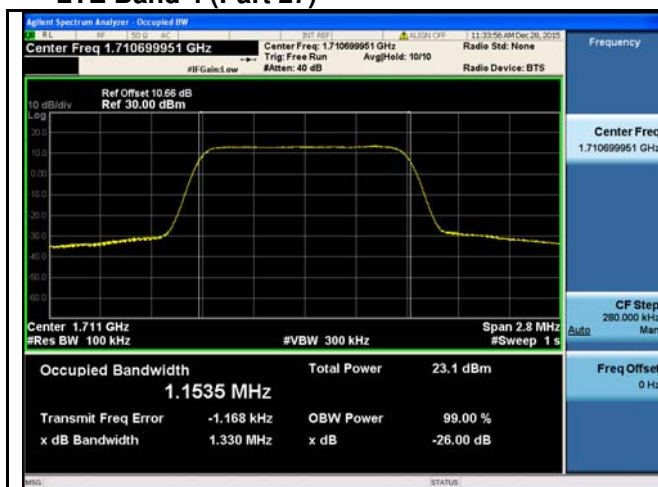
8.3 Test Result

LTE Band 4 (Part 27):

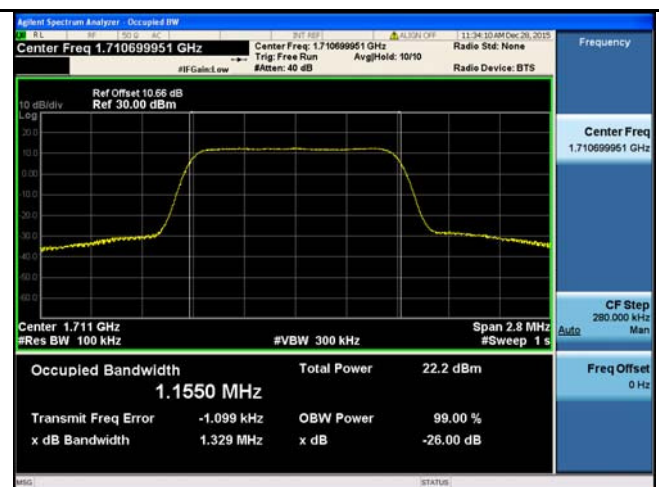
BW(MHz)	Channel	Frequency (MHz)	RB offset	Modulation	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1.4	19957	1710.7	0	QPSK	1.1535	1.330
			0	16QAM	1.1550	1.329
1.4	20175	1732.5	0	QPSK	1.1577	1.335
			0	16QAM	1.1508	1.333
1.4	20393	1754.3	0	QPSK	1.1506	1.329
			0	16QAM	1.1507	1.331
3	19965	1711.5	0	QPSK	2.7157	2.952
			0	16QAM	2.7168	2.953
3	20175	1732.5	0	QPSK	2.7250	2.960
			0	16QAM	2.7245	2.952
3	20385	1753.5	0	QPSK	2.7262	2.959
			0	16QAM	2.7197	2.961
5	19975	1712.5	0	QPSK	4.4959	4.854
			0	16QAM	4.4950	4.817
5	20175	1732.5	0	QPSK	4.4981	4.854
			0	16QAM	4.4984	4.838
5	20375	1752.5	0	QPSK	4.4911	4.830
			0	16QAM	4.4945	4.850
10	20000	1715	0	QPSK	8.9207	9.358
			0	16QAM	8.9125	8.363
10	20175	1732.5	0	QPSK	8.9191	9.0338
			0	16QAM	8.9191	9.330
10	20350	1750	0	QPSK	8.9181	9.360
			0	16QAM	8.9096	9.334
15	20025	1717.5	0	QPSK	13.371	13.89
			0	16QAM	13.367	13.88
15	20175	1732.5	0	QPSK	13.389	13.92

			0	16QAM	13.384	13.95
15	20325	1747.5	0	QPSK	13.359	13.92
			0	16QAM	13.362	13.90
20	20050	1720	0	QPSK	17.838	18.38
			0	16QAM	17.829	18.40
20	20175	1732.5	0	QPSK	17.856	18.43
			0	16QAM	17.858	18.44
20	20300	1745	0	QPSK	17.808	18.44
			0	16QAM	17.812	18.45

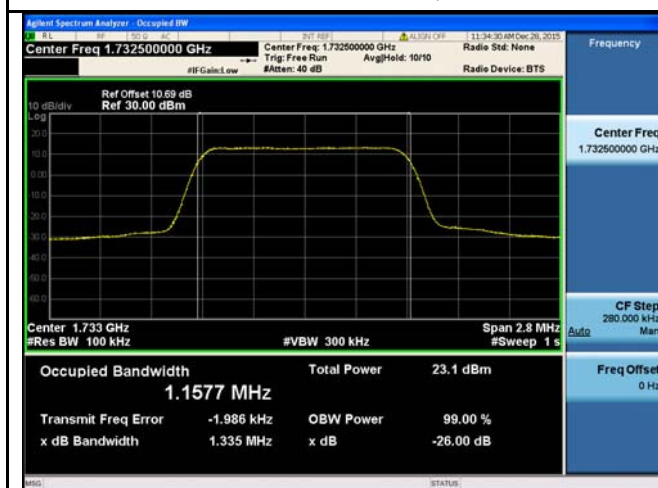
LTE Band 4 (Part 27)



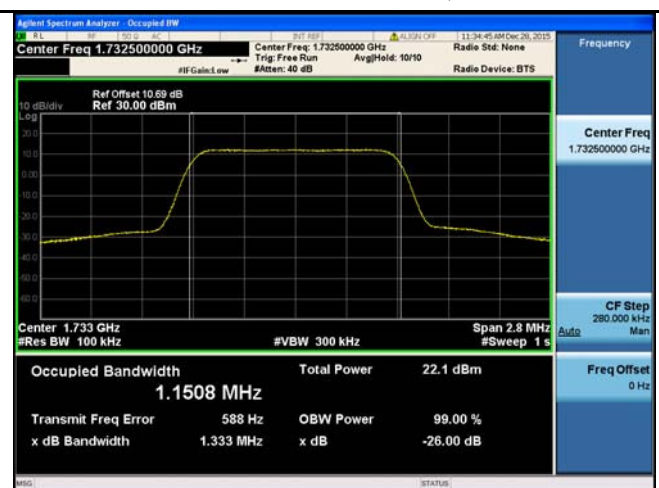
LTE band 4 - Low CH QPSK-1.4



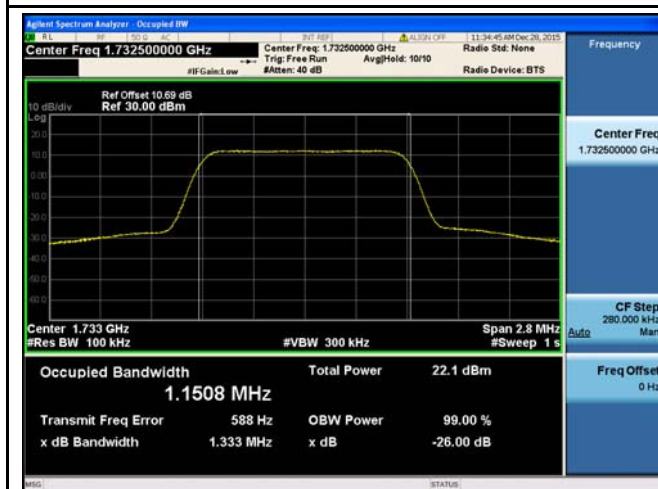
LTE band 4 - Low CH 16QAM-1.4



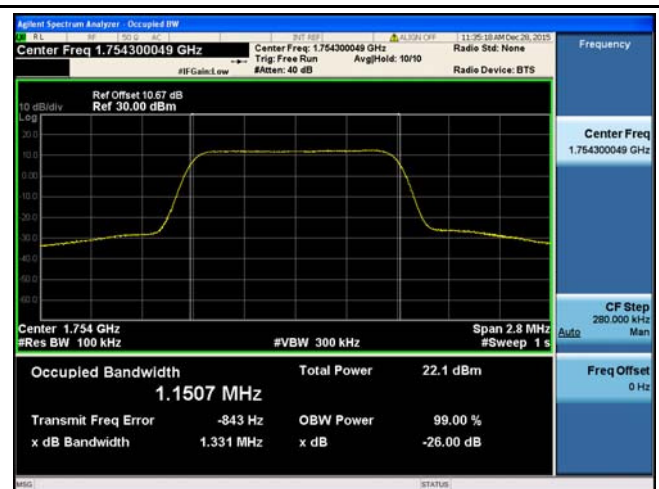
LTE band 4 - Middle CH QPSK-1.4



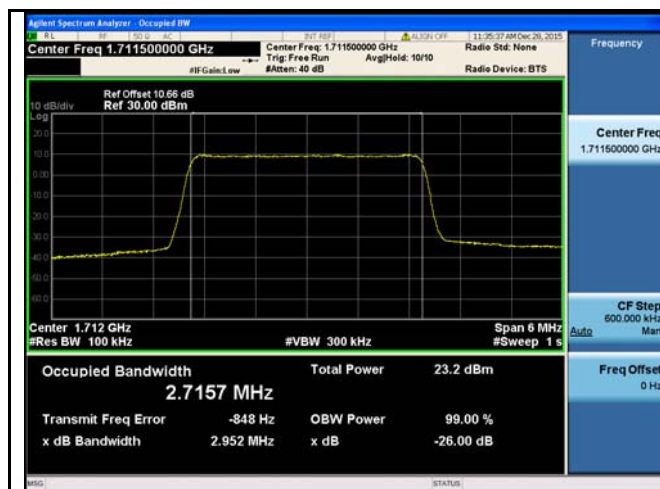
LTE band 4 - Middle CH 16QAM-1.4



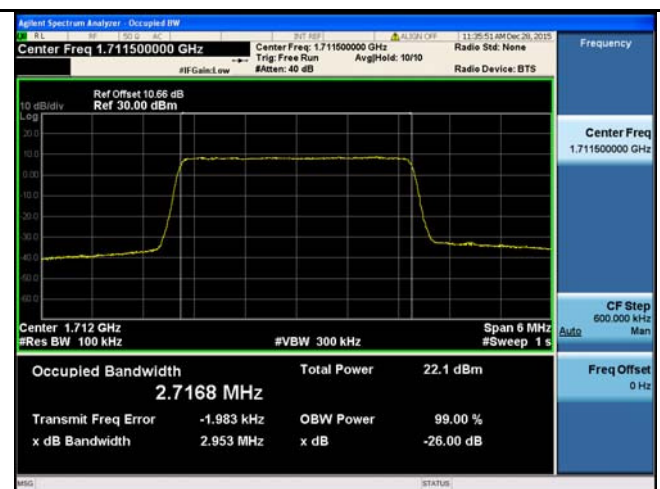
LTE band 4 - High CH QPSK-1.4



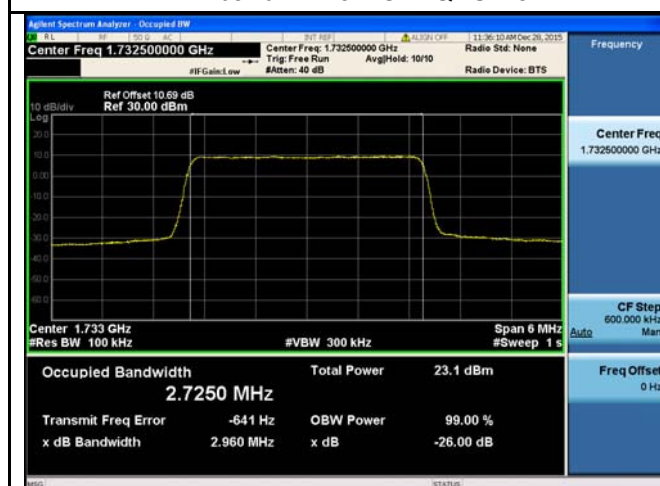
LTE band 4 - High CH 16QAM-1.4



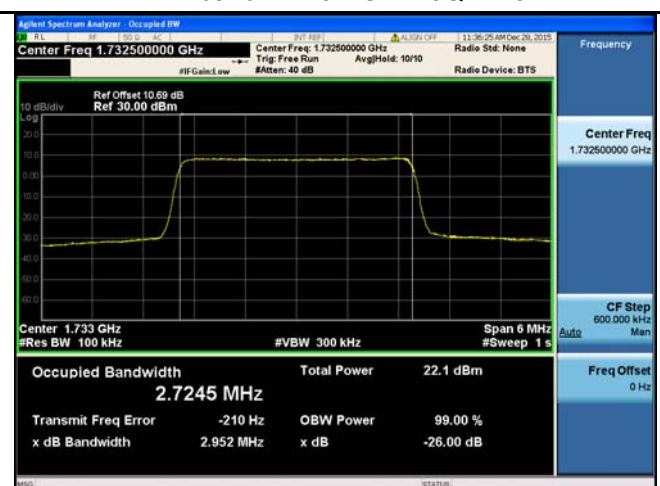
LTE band 4 - Low CH QPSK-3



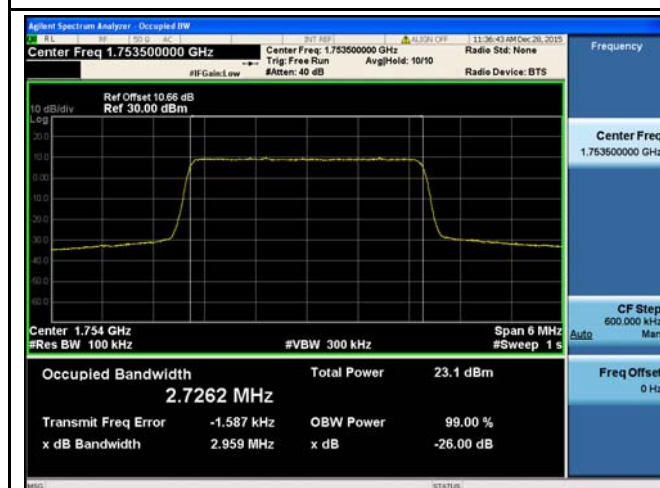
LTE band 4 - Low CH 16QAM-3



LTE band 4 - Middle CH QPSK-3



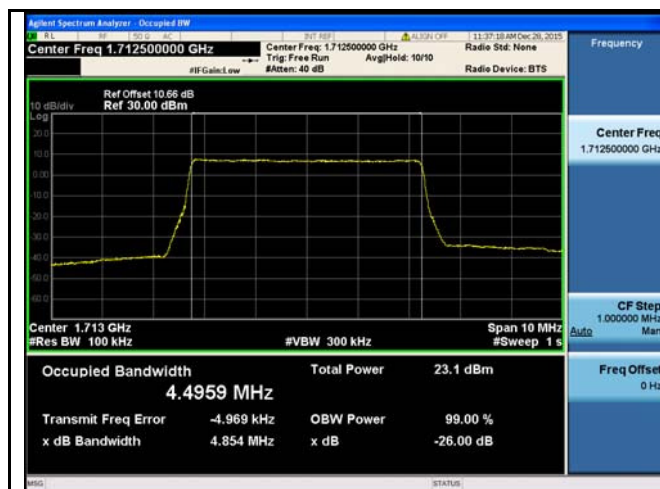
LTE band 4 - Middle CH 16QAM-3



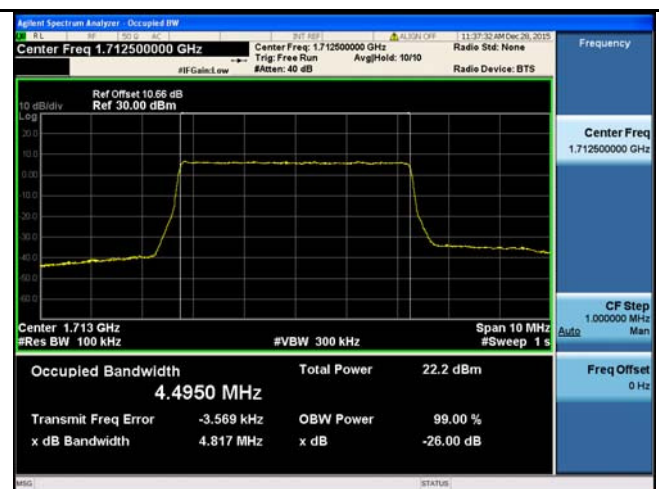
LTE band 4 - High CH QPSK-3



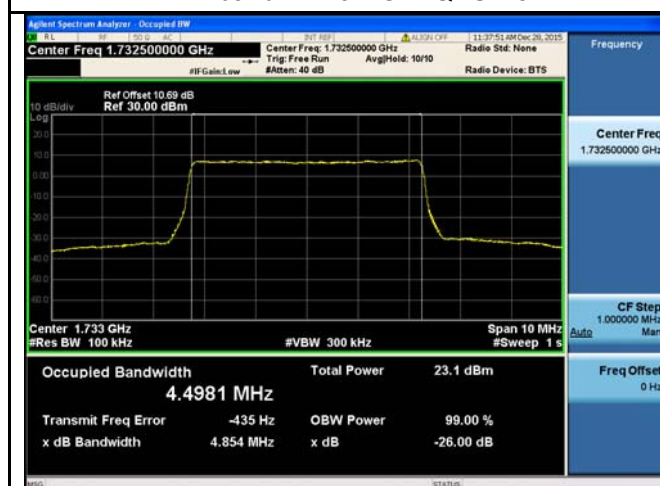
LTE band 4 - High CH 16QAM-3



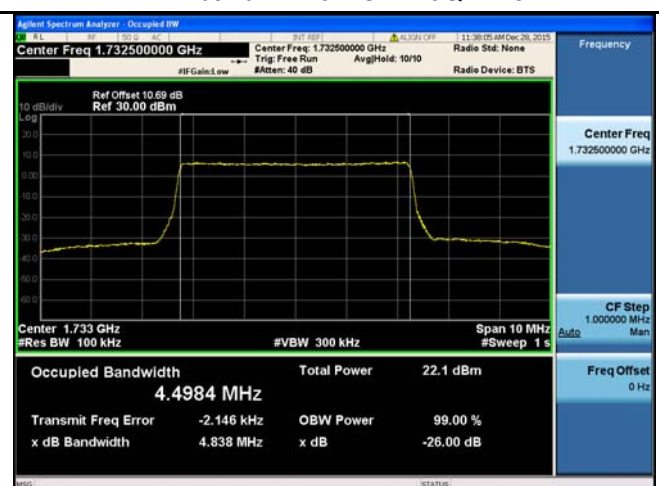
LTE band 4 - Low CH QPSK-5



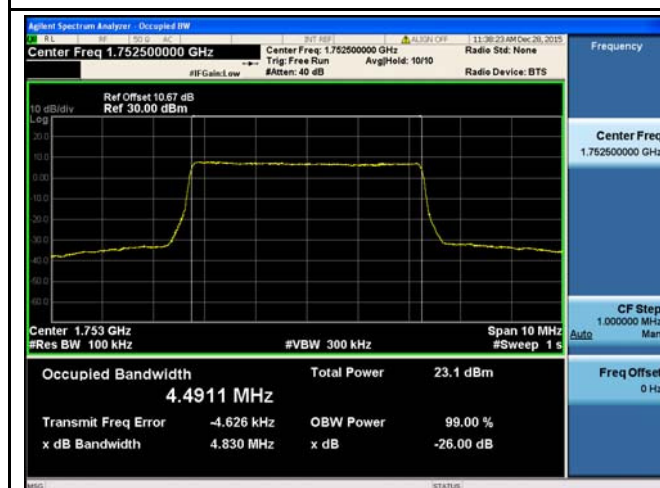
LTE band 4 - Low CH 16QAM-5



LTE band 4 - Middle CH QPSK-5



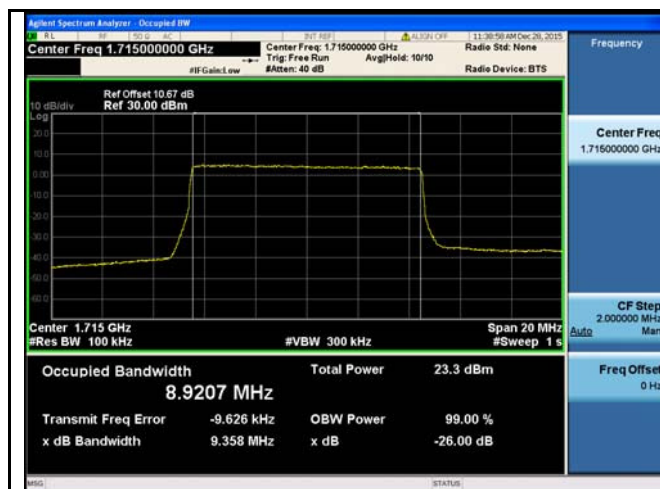
LTE band 4 - Middle CH 16QAM-5



LTE band 4 - High CH QPSK-5



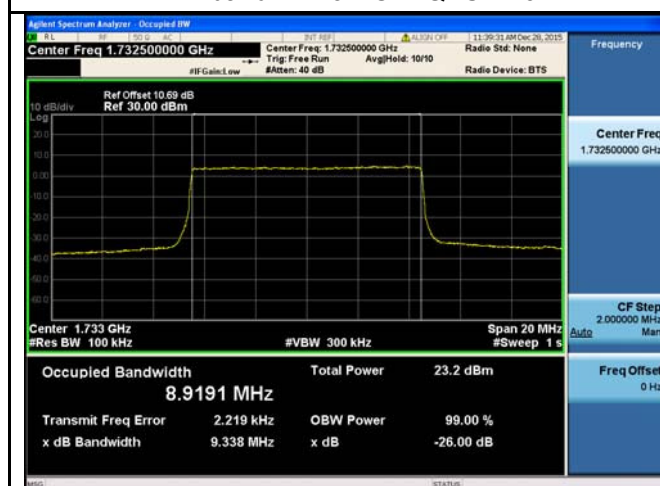
LTE band 4 - High CH 16QAM-5



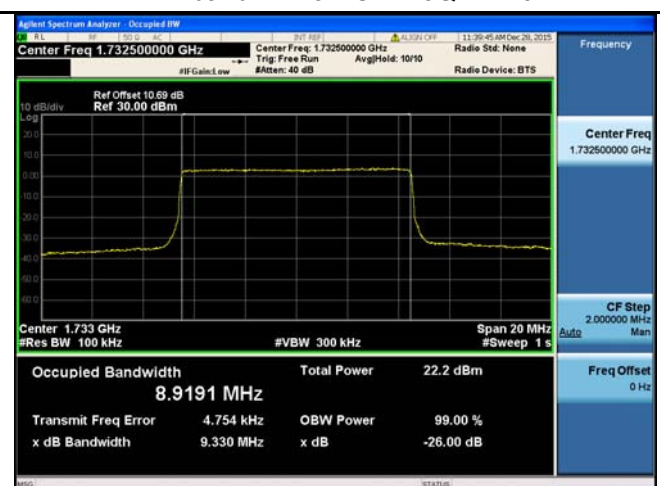
LTE band 4 - Low CH QPSK-10



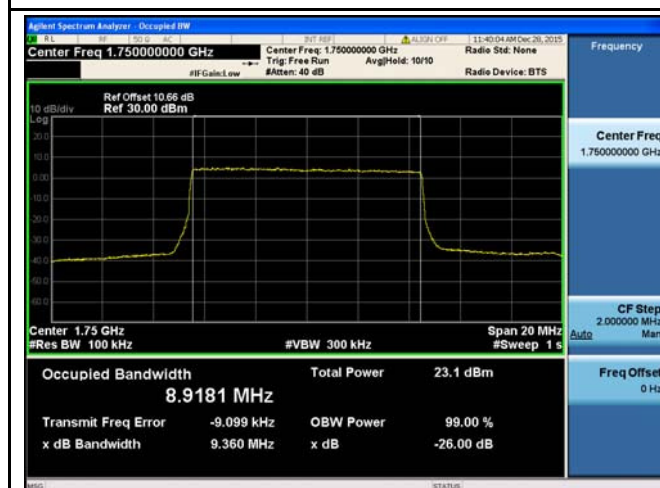
LTE band 4 - Low CH 16QAM-10



LTE band 4 - Middle CH QPSK-10



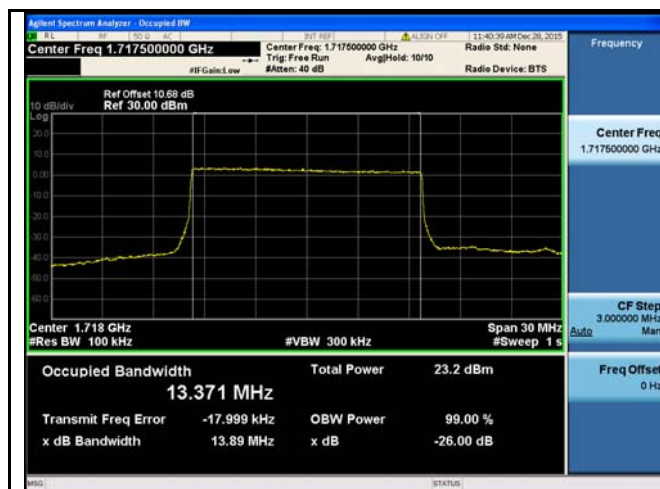
LTE band 4 - Middle CH 16QAM-10



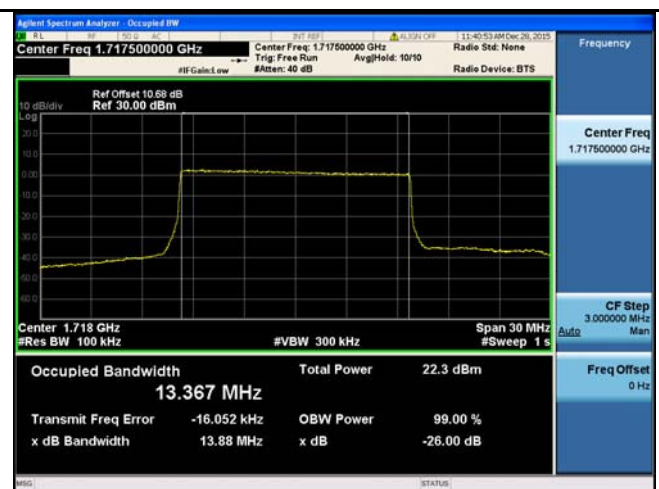
LTE band 4 - High CH QPSK-10



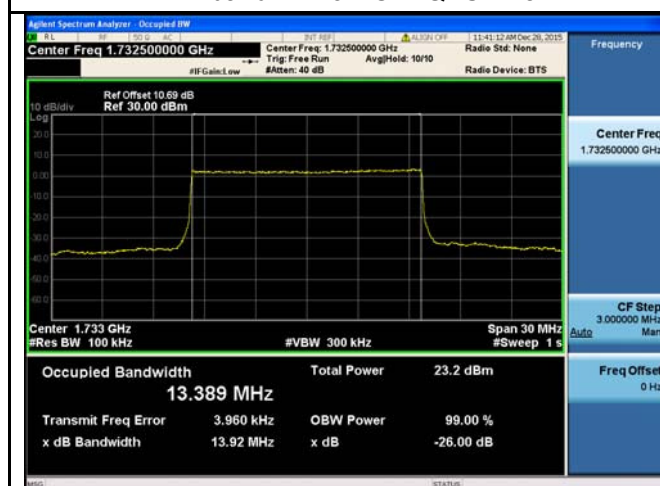
LTE band 4 - High CH 16QAM-10



LTE band 4 - Low CH QPSK-15



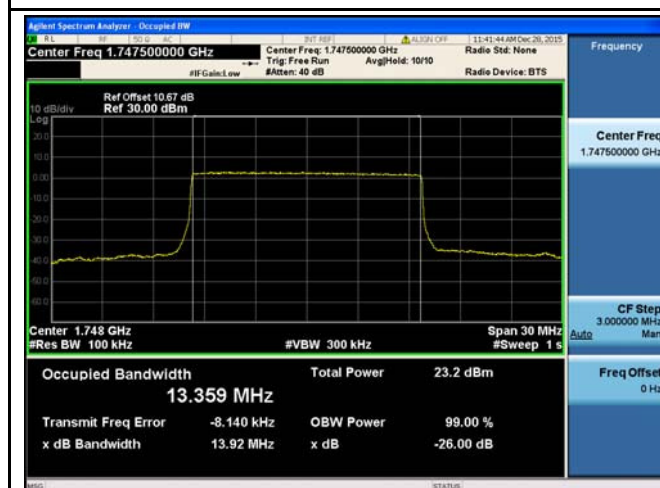
LTE band 4 - Low CH 16QAM-15



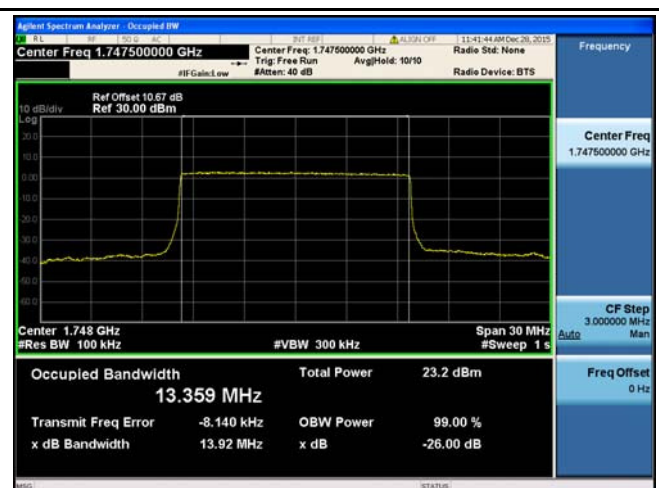
LTE band 4 - Middle CH QPSK-15



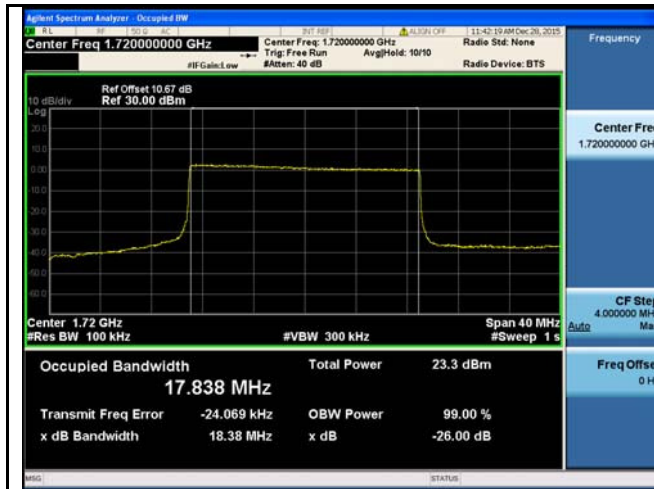
LTE band 4 - Middle CH 16QAM-15



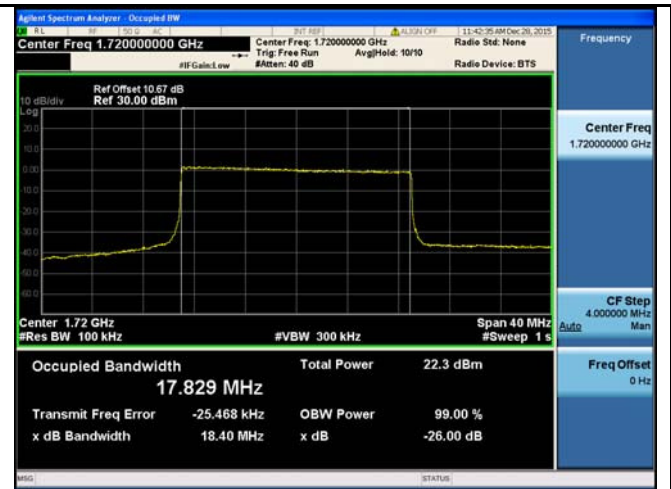
LTE band 4 - High CH QPSK-15



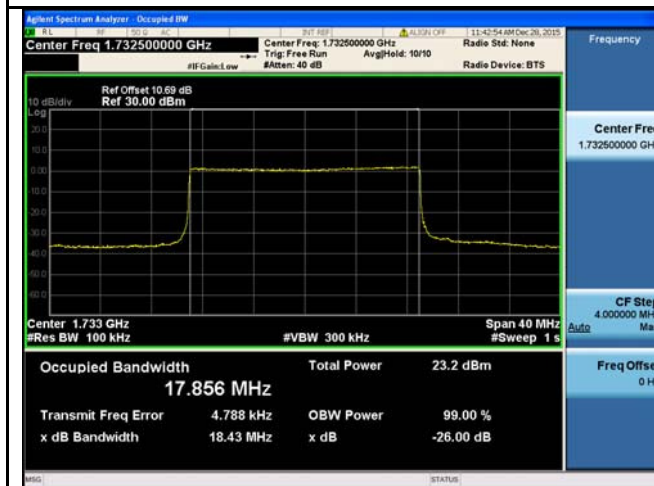
LTE band 4 - High CH 16QAM-15



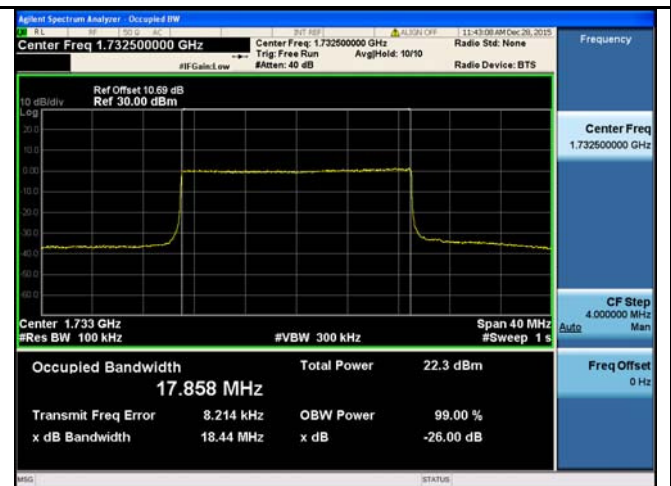
LTE band 4 - Low CH QPSK-20



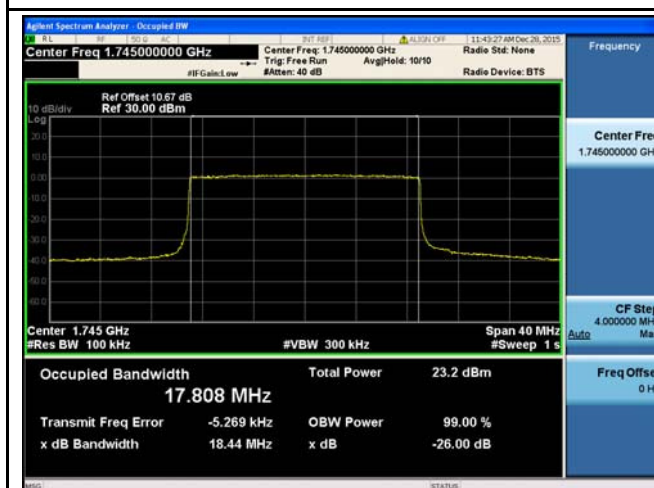
LTE band 4 - Low CH 16QAM-20



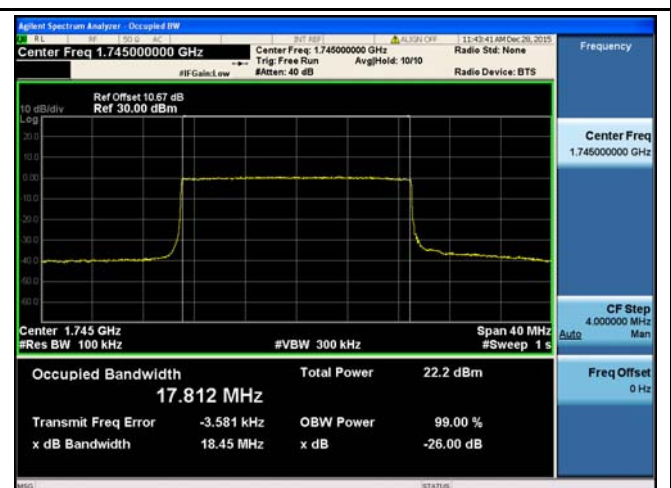
LTE band 4 - Middle CH QPSK-20



LTE band 4 - Middle CH 16QAM-20



LTE band 4 - High CH QPSK-20



LTE band 4 - High CH 16QAM-20

9 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Test Requirement:	FCC Part 2.1051, 27.53(h)
Test Method:	ANSI C63.4:2009, TIA/EIA-603-D:2010
Test Mode:	Transmitting

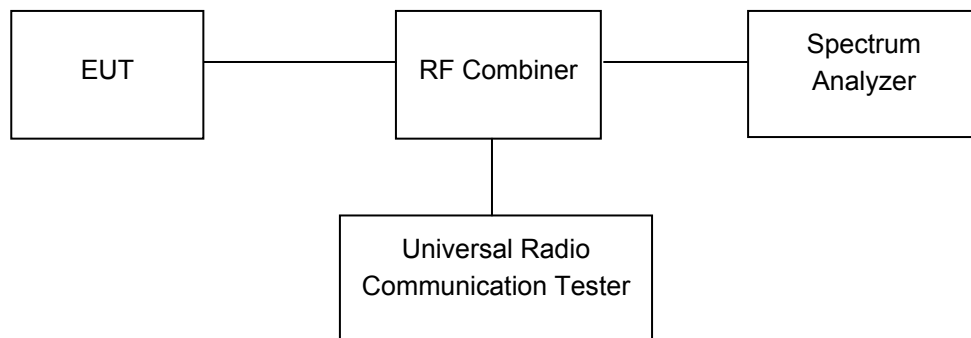
9.1 EUT Operation

Operating Environment :

Temperature:	23.5 °C
Humidity:	52.1 % RH
Atmospheric Pressure:	101.3kPa

9.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.



9.3 Test Result

PASS

LTE Band 4 (part 27)

Please refer to the Appendix Band 4 LTE Transmitter Spurious Emissions.

10 SPURIOUS RADIATED EMISSIONS

Test Requirement:	FCC Part 2.1053, 27.53(h)
Test Method:	ANSI C63.4:2009, TIA/EIA-603-D:2010
Test Mode:	Transmitting

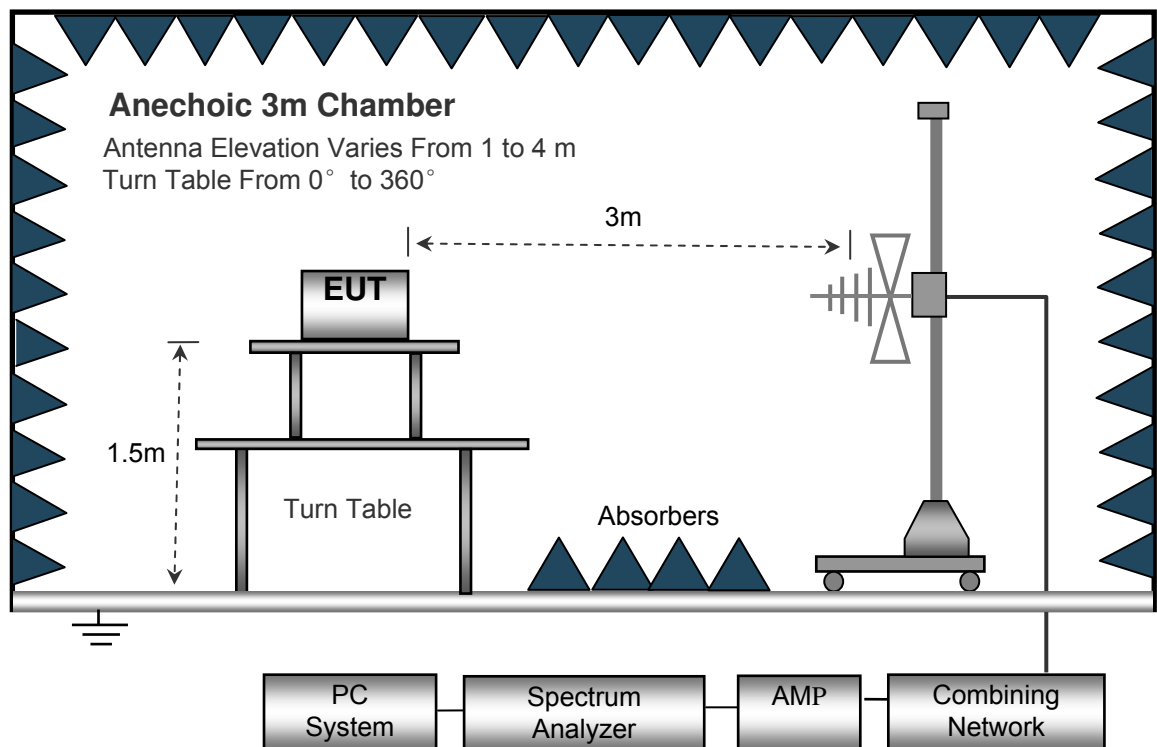
10.1 EUT Operation

Operating Environment :

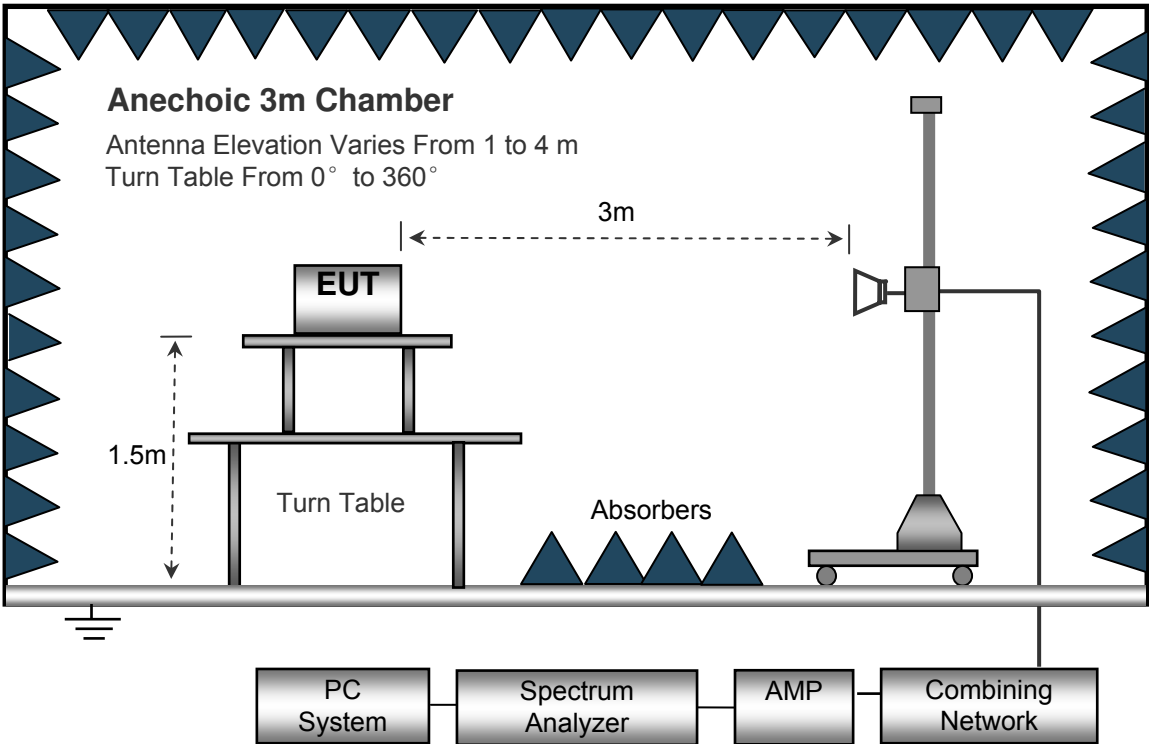
Temperature:	23.5 °C
Humidity:	52.1 % RH
Atmospheric Pressure:	101.2kPa

10.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2009.
The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



10.3 Spectrum Analyzer Setup

30MHz ~ 1GHz

Sweep Speed Auto
Detector PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed Auto
Detector PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

10.4 Test Procedure

1. The EUT is placed on a turntable, which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from 30MHz up to the tenth harmonic of the highest fundamental frequency.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
7. 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 = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level
Spurious attenuation limit in dB = $43 + 10 \lg (\text{power out in Watts})$
8. Repeat above procedures until the measurements for all frequencies are completed.

10.5 Summary of Test Results

Remark: Test performed from 30MHz to 10th harmonics with low/middle/high channels, only the worst data were recorded.

LTE Band 4 (Part 27)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
LTE Band 4 Channel 20025(1717.5MHz)										
201.33	39.00	275	1.6	H	-71.51	0.15	0.00	-71.66	-13.00	-58.66
201.33	31.57	88	1.2	V	-76.02	0.15	0.00	-76.17	-13.00	-63.17
3435.00	65.95	319	1.3	H	-47.10	2.34	12.40	-37.04	-13.00	-24.04
3435.00	59.98	187	1.0	V	-51.17	2.34	12.40	-41.11	-13.00	-28.11
5152.50	53.58	248	1.9	H	-55.83	2.79	12.70	-45.92	-13.00	-32.92
5152.50	44.73	132	1.3	V	-64.04	2.79	12.70	-54.13	-13.00	-41.13

Note: 1) Absolute Level = SG Level - Cable loss + Antenna Gain

2) Margin = Limit- Absolute Level

11 Band Edge Measurement

Test Requirement:	FCC Part 2.1051, 27.53(h)
Test Method:	ANSI C63.4:2009, TIA/EIA-603-D:2010
Test Mode:	Transmitting

11.1 EUT Operation

Operating Environment :

Temperature:	23.5 °C
Humidity:	52.3 % RH
Atmospheric Pressure:	101.3kPa

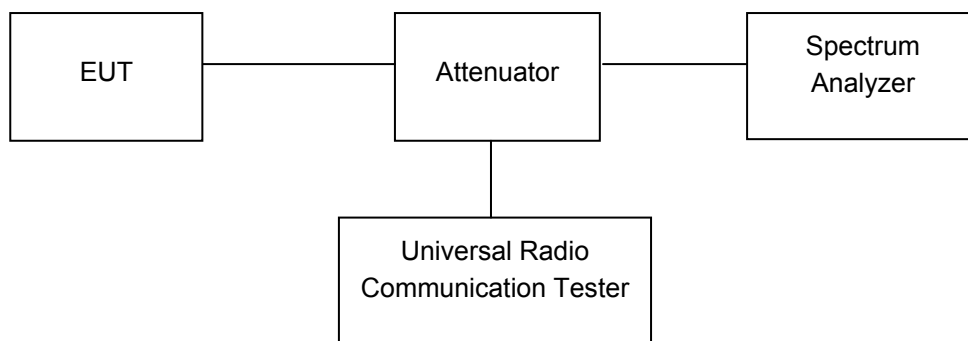
11.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

According to FCC Part 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC Part 24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

The center of the spectrum analyzer was set to block edge frequency



11.3 Test Result

PASS

LTE Band 4 (part 27)

Please refer to the Appendix Band 4 LTE Band Edge.

12 FREQUENCY STABILITY

Test Requirement:	FCC Part 2.1055, 24.235, 27.5(h),27.54
Test Method:	ANSI C63.4:2009, TIA/EIA-603-D:2010
Test Mode:	Transmitting

12.1 EUT Operation

Operating Environment :

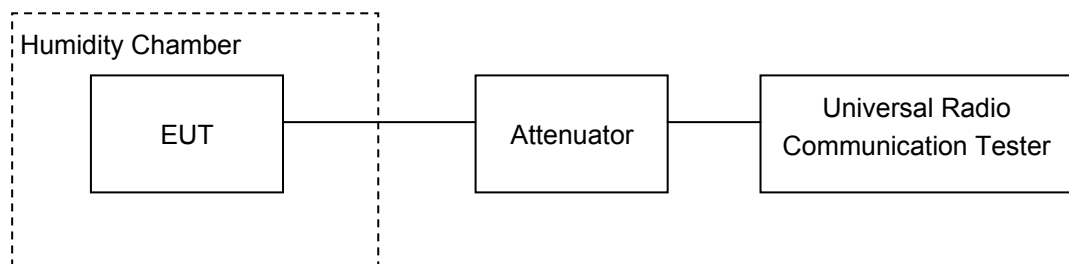
Temperature:	22.9 °C
Humidity:	52.0 % RH
Atmospheric Pressure:	101.3kPa

12.2 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



12.3 Test Result

LTE Band 4 (Part 27)

Test Frequency:1732.5MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	6	0.0035	2.5
40		-1	-0.0006	2.5
30		-3	-0.0017	2.5
20		3	0.0017	2.5
10		1	0.0006	2.5
0		12	0.0069	2.5
-10		4	0.0023	2.5
-20		6	0.0035	2.5
-30		7	0.0040	2.5
20	3.3	9	0.0052	2.5
20	4.2	-6	-0.0035	2.5

Test Frequency:1732.5MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	4	0.0023	2.5
40		-2	-0.0012	2.5
30		5	0.0029	2.5
20		2	0.0012	2.5
10		1	0.0006	2.5
0		-2	-0.0012	2.5
-10		9	0.0052	2.5
-20		0	0.0000	2.5
-30		-7	-0.0040	2.5
20	3.3	-4	-0.0023	2.5
20	4.2	-5	-0.0029	2.5

LTE Band 4 (Part 27)

Test Frequency:1732.5MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	9	0.0052	2.5
40		8	0.0046	2.5
30		9	0.0052	2.5
20		5	0.0029	2.5
10		9	0.0052	2.5
0		-1	-0.0006	2.5
-10		1	0.0006	2.5
-20		-1	-0.0006	2.5
-30		-1	-0.0006	2.5
20	3.3	13	0.0075	2.5
20	4.2	-3	-0.0017	2.5

Test Frequency:1732.5MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	10	0.0058	2.5
40		2	0.0012	2.5
30		4	0.0023	2.5
20		2	0.0012	2.5
10		3	0.0017	2.5
0		-2	-0.0012	2.5
-10		6	0.0035	2.5
-20		2	0.0012	2.5
-30		-5	-0.0029	2.5
20	3.3	-2	-0.0012	2.5
20	4.2	0	0.0000	2.5

LTE Band 4 (Part 27)

Test Frequency:1732.5MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	2	0.0011	2.5
40		-8	-0.0043	2.5
30		-1	-0.0005	2.5
20		1	0.0005	2.5
10		-1	-0.0005	2.5
0		3	0.0016	2.5
-10		4	0.0021	2.5
-20		10	0.0053	2.5
-30		1	0.0005	2.5
20	3.3	-5	-0.0027	2.5
20	4.2	-4	-0.0021	2.5

Test Frequency:1732.5MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	5	0.0020	2.5
40		-2	-0.0008	2.5
30		3	0.0012	2.5
20		3	0.0012	2.5
10		11	0.0043	2.5
0		7	0.0028	2.5
-10		-1	-0.0004	2.5
-20		-2	-0.0008	2.5
-30		10	0.0039	2.5
20	3.3	11	0.0043	2.5
20	4.2	-2	-0.0008	2.5

LTE Band 4 (Part 27)

Test Frequency:1732.5MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	5	0.0029	2.5
40		10	0.0058	2.5
30		6	0.0035	2.5
20		6	0.0035	2.5
10		2	0.0012	2.5
0		10	0.0058	2.5
-10		10	0.0058	2.5
-20		10	0.0058	2.5
-30		9	0.0052	2.5
20	3.3	-1	-0.0006	2.5
20	4.2	5	0.0029	2.5

Test Frequency:1732.5MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-1	-0.0006	2.5
40		-5	-0.0029	2.5
30		11	0.0063	2.5
20		3	0.0017	2.5
10		-3	-0.0017	2.5
0		9	0.0052	2.5
-10		-5	-0.0029	2.5
-20		-3	-0.0017	2.5
-30		0	0.0000	2.5
20	3.3	1	0.0006	2.5
20	4.2	-3	-0.0017	2.5

LTE Band 4 (Part 27)

Test Frequency:1732.5MHz QPSK 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0040	2.5
40		1	0.0006	2.5
30		3	0.0017	2.5
20		8	0.0046	2.5
10		0	0.0000	2.5
0		9	0.0052	2.5
-10		8	0.0046	2.5
-20		15	0.0087	2.5
-30		-1	-0.0006	2.5
20	3.3	7	0.0040	2.5
20	4.2	1	0.0006	2.5

Test Frequency:1732.5MHz 16QAM 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	2	0.0012	2.5
40		13	0.0075	2.5
30		13	0.0075	2.5
20		6	0.0035	2.5
10		4	0.0023	2.5
0		14	0.0081	2.5
-10		8	0.0046	2.5
-20		8	0.0046	2.5
-30		11	0.0063	2.5
20	3.3	4	0.0023	2.5
20	4.2	9	0.0052	2.5

LTE Band 4 (Part 27)

Test Frequency:1732.5MHz QPSK 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-3	-0.0017	2.5
40		-1	-0.0006	2.5
30		-2	-0.0012	2.5
20		2	0.0010	2.5
10		-5	-0.0029	2.5
0		0	0.0000	2.5
-10		-5	-0.0029	2.5
-20		-1	-0.0006	2.5
-30		-4	-0.0023	2.5
20	3.3	-2	-0.0012	2.5
20	4.2	-7	-0.0040	2.5

Test Frequency:1732.5MHz 16QAM 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0040	2.5
40		9	0.0052	2.5
30		7	0.0040	2.5
20		3	0.0017	2.5
10		10	0.0058	2.5
0		6	0.0035	2.5
-10		0	0.0000	2.5
-20		6	0.0035	2.5
-30		1	0.0006	2.5
20	3.3	12	0.0069	2.5
20	4.2	3	0.0017	2.5

13 RF Exposure

Remark: refer to SAR test report: WTS15S1240185E

===== End of Report =====