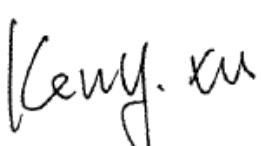


TEST REPORT

Application No.: SZEM2006004502CR
Applicant: BTI Wireless
Address of Applicant: 6185 Phyllis Drive #D, Cypress, California 90630, United States
Manufacturer: Bravo Tech Inc
Address of Manufacturer: 14600 INDUSTRY CIRCLE LA MIRADA, CA 90638
Factory: Bravo Tech Inc
Address of Factory: 14600 INDUSTRY CIRCLE LA MIRADA, CA 90638
Equipment Under Test (EUT):
EUT Name: LTE Outdoor CPE
Model No.: CP880-B
FCC ID: WBKCP880-B
Standard(s) : 47 CFR Part 2
47 CFR Part 96
Date of Receipt: 2020-06-02
Date of Test: 2020-06-08 to 2020-07-13
Date of Issue: 2020-07-16

Test Result:	Pass
---------------------	-------------

* In the configuration tested, the EUT complied with the standards specified above.


Keny Xu

EMC Laboratory Manager



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Revision Record

Version	Chapter	Date	Modifier	Remark
01		2020-07-16		Original

Authorized for issue by:

		 _____ Jacky Li /Project Engineer	
		 _____ Eric Fu /Reviewer	

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2 Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §96.41	EIRP≤ 47dBm/10MHz PSD≤ 37dBm/MHz (LTE Band 48)	PASS
Peak-Average Ratio	§96.41	≤13dB	PASS
Modulation Characteristics	§2.1047	Digital modulation	PASS
Bandwidth	§96.41	OBW: No limit EBW: No limit	PASS
Band Edge Compliance	§2.1051, §96.41	0-10 MHz: -13 dBm; 10-operating band edge MHz: -25 dBm; other: -40 dBm	PASS
Spurious emissions at antenna terminals	§2.1051, §96.41	≤ -40dBm (LTE Band 48)	PASS
Field strength of spurious radiation	§2.1051, §96.41	≤ -40dBm (LTE Band 48)	PASS
Frequency stability	§2.1055,	Fundamental emission stays within authorized frequency block	PASS

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3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	6
4.1 Details of E.U.T	6
4.2 Test Frequency	7
4.3 Test Environment	7
4.4 Description of Support Units	7
4.5 Measurement Uncertainty	8
4.6 Test Location	9
4.7 Test Facility	9
4.8 Deviation from Standards	9
4.9 Abnormalities from Standard Conditions	9
5 EQUIPMENT LIST	10
6 RADIO SPECTRUM MATTER TEST RESULTS	12
6.1 Effective (Isotropic) Radiated Power Output Data	12
6.1.1 E.U.T. Operation	12
6.1.2 Test Setup Diagram	12
6.1.3 Measurement Data	12
6.2 Peak-Average Ratio	13
6.2.1 E.U.T. Operation	13
6.2.2 Test Setup Diagram	13
6.2.3 Measurement Data	13
6.3 Bandwidth	14
6.3.1 E.U.T. Operation	14
6.3.2 Test Setup Diagram	14
6.3.3 Measurement Data	14
6.4 Band Edge Compliance	15
6.4.1 E.U.T. Operation	15
6.4.2 Test Setup Diagram	16
6.4.3 Measurement Data	16
6.5 Spurious emissions at antenna terminals	17
6.5.1 E.U.T. Operation	17
6.5.2 Test Setup Diagram	18
6.5.3 Measurement Data	18
6.6 Field strength of spurious radiation	19
6.6.1 E.U.T. Operation	19
6.6.2 Test Setup Diagram	19
6.6.3 Measurement Procedure and Data	20

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6.7	<i>Frequency stability</i>	26
6.7.1	<i>E.U.T. Operation</i>	26
6.7.2	<i>Test Setup Diagram</i>	26
6.7.3	<i>Measurement Data</i>	26
6.8	<i>Modulation Characteristics</i>	27
6.8.1	<i>E.U.T. Operation</i>	27
6.8.2	<i>Test Setup Diagram</i>	27
6.8.3	<i>Measurement Data</i>	27
7	PHOTOGRAPHS	28
7.1	<i>Setup photo</i>	28
7.2	<i>EUT Constructional Details (EUT Photos)</i>	28
8	APPENDIX F	29
8.1	<i>Frequency stability</i>	29
8.2	<i>Modulation Characteristics</i>	34-38



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4 General Information

4.1 Details of E.U.T.

Power supply:	Adapter Model NO.: ASSA107A-240050 Input: 100-240V~50/60Hz, 0.45A Output: 24.0V, 0.5A POE Model NO.: GRT-HCQ-1000
Test voltage:	AC 120V, 60Hz
Cable:	RJ45 Cable: 100cm DC cable: 148cm unshielded
Sample Type:	Mobile production
LTE Operation Frequency Band:	48
Frequency range:	3550-3700 MHz
Modulation Type:	UL: QPSK, 16QAM, 64QAM DL: QPSK, 16QAM, 64QAM, 256QAM
LTE Release Version:	R11
LTE Power Class:	Level 3
CA Capability:	DL 2CA 4x4 MIMO DL 4CA 2x2 MIMO UL 2CA Support Intra-band contiguous CA and not support UL MIMO
MIMO:	DL 2x2 (4CA 256QAM) DL 4x4 (2CA 64QAM)
Antenna Type:	Panel Antenna Ant 1: TX & RX(SISO & UL CA) Ant 3: TX & RX(UL CA) Ant 2 & 4: RX
Antenna Gain:	14dBi
SIM Card:	This device has only one SIM Card sockets.
Extreme temp. Tolerance:	-30 °C to +50 °C
Extreme vol. Limits:	20.4VDC to 27.6VDC (nominal: 24.0VDC)

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4.2 Test Frequency

Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE TDD Band 48	5	3552.5	3625.0	3697.5
	10	3550.0	3625.0	3695.0
	15	3557.5	3625.0	3692.5
	20	3560	3625.0	3690.0

4.3 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1015Pa	
Temperature:	TN	25 °C
Voltage:	VL	20.4 V
	VN	24.0 V
	VH	27.6 V

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

TN= normal temperature

4.4 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No. SEA1800

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4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power	$\pm 0.75\text{dB}$
5	RF power density	$\pm 2.84\text{dB}$
6	Conducted Spurious emissions	$\pm 0.75\text{dB}$
7	RF Radiated power	$\pm 4.5\text{dB}$ (below 1GHz) $\pm 4.8\text{dB}$ (above 1GHz)
8	Radiated Spurious emission test	$\pm 4.5\text{dB}$ (Below 1GHz) $\pm 4.8\text{dB}$ (Above 1GHz)
9	Temperature test	$\pm 1\text{ }^{\circ}\text{C}$
10	Humidity test	$\pm 3\%$
11	Supply voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

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4.6 Test Location

All tests were performed at:

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518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None

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5 Equipment List

RF test system					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
MXA Signal Analyzer (10Hz-26.5GHz)	KEYSIGHT	N9020A	SEM004-17	2020-05-21	2021-05-20
Signal Generator (9kHz-40GHz)	KEYSIGHT	N5173B	SEM006-05	2019-09-28	2020-09-27
MXG Vector Signal Generator	KEYSIGHT	N5182A	SEM006-14	2020-03-23	2021-03-22
ESG Vector Signal Generator	KEYSIGHT	E4438C	SEM006-15	2019-09-24	2020-09-23
DC Power Supply	Rohde & Schwarz	NGSM 32/10	SEM011-04	2020-03-24	2021-03-23
Manual Step Attenuator	KEYSIGHT	8494B	SEM021-05	2020-04-09	2021-04-08
Manual Step Attenuator	KEYSIGHT	8496B	SEM021-06	2020-04-09	2021-04-08
Power Sensor	KEYSIGHT	U2021XA	SEM009-20	2020-05-21	2021-05-20
Power Sensor	KEYSIGHT	U2021XA	SEM009-21	2020-05-21	2021-05-20
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2020-03-25	2021-03-24
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2020-04-01	2021-03-31
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-03	2020-07-10	2021-07-09
				2019-07-10	2020-07-09

RE in Chamber (Above 1GHz)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies Inc	N9010A	SEM004-12	2020-04-09	2021-04-08
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
				2020-06-27	2023-06-26
Horn Antenna (800MHz-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Amplifier	HP	8447D	SEM005-02	2019-09-24	2020-09-23

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Report No.: SZEM200600450202
Page: 11 of 38

(0.1-1300MHz)					
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2019-09-24	2020-09-23
Pre-amplifier (26-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2020-04-01	2021-03-31
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2020-07-10	2021-07-09
				2019-07-10	2020-07-09
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2020-04-01	2021-03-31

RE in Chamber (Below 1GHz)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
MXE EMI receiver (3Hz-3.6GHz)	KEYSIGHT	N9038A	SEM004-15	2019-12-16	2020-12-15
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09
				2019-07-10	2020-07-09
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2020-04-01	2021-03-31

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2019-09-26	2020-09-25
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06

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6 Radio Spectrum Matter Test Results

6.1 Effective (Isotropic) Radiated Power Output Data

Test Requirement: §2.1046, §96.41

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: EIRP≤ 47dBm/10MHz, PSD≤ 37dBm/MHz (LTE Band 48)

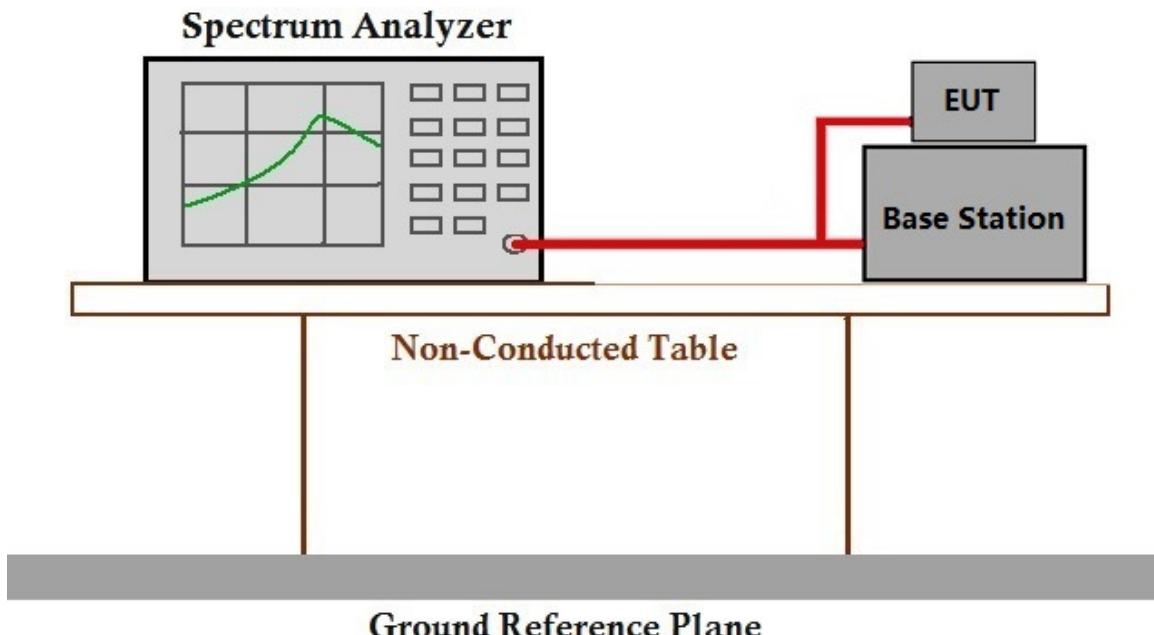
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Test mode: m: Tx mode, Keep the EUT in transmitting mode.

6.1.2 Test Setup Diagram



6.1.3 Measurement Data

Please refer to Appendix A-Output power

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6.2 Peak-Average Ratio

Test Requirement: §96.41

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤13dB

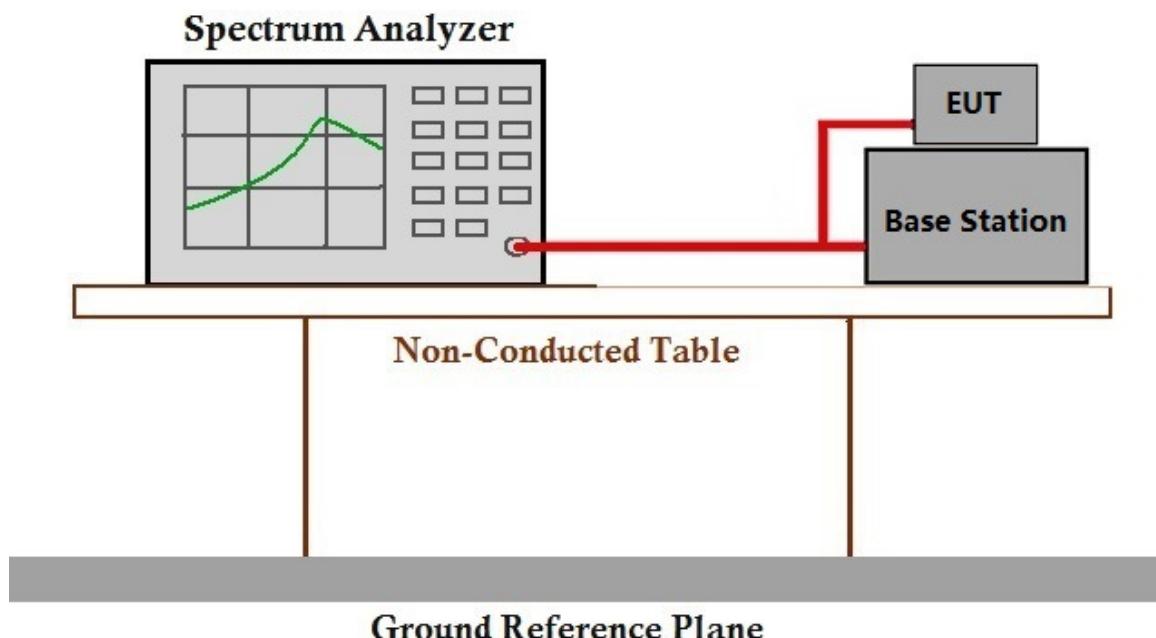
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Test mode: m: Tx mode, Keep the EUT in transmitting mode.

6.2.2 Test Setup Diagram



6.2.3 Measurement Data

Please refer to Appendix B- Peak-Average Ratio

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6.3 Bandwidth

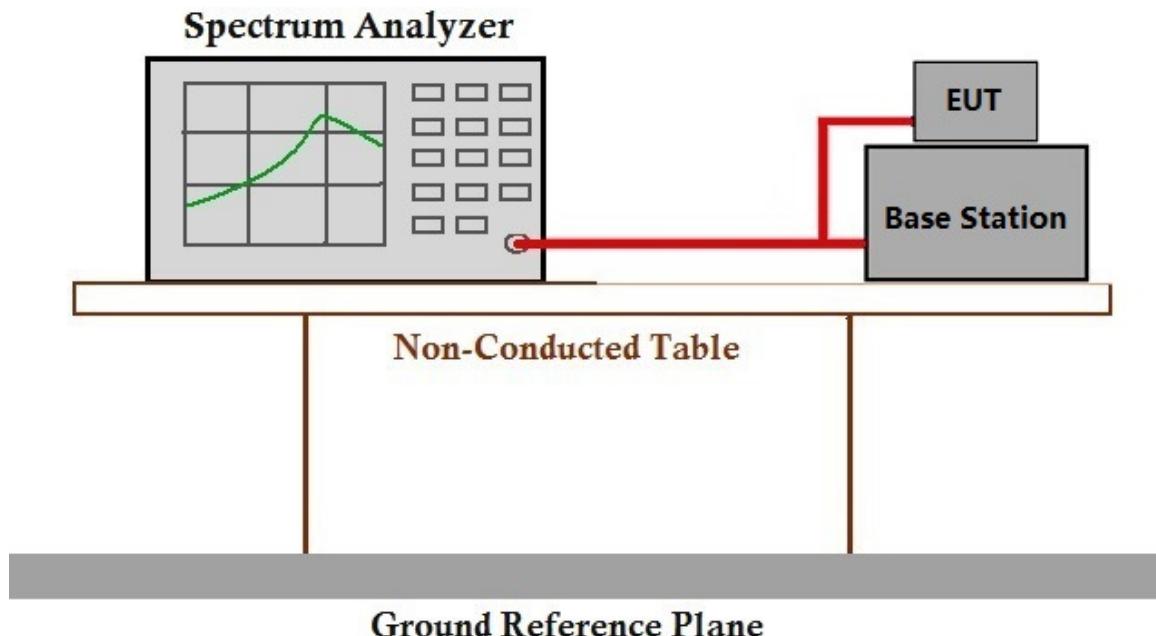
Test Requirement: §2.1049(h)
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: OBW: No limit
EBW: No limit

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar
Test mode: m: Tx mode, Keep the EUT in transmitting mode.

6.3.2 Test Setup Diagram



6.3.3 Measurement Data

Please refer to Appendix C- Bandwidth

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6.4 Band Edge Compliance

Test Requirement: §2.1051, §96.41

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Test mode: m: Tx mode, Keep the EUT in transmitting mode.

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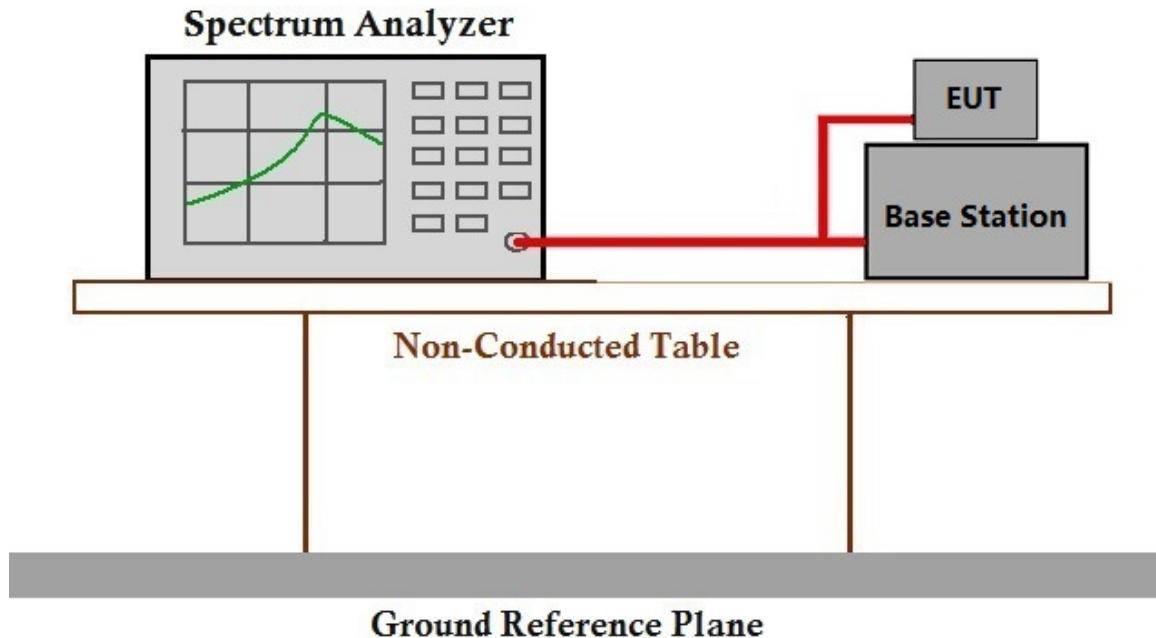
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6.4.2 Test Setup Diagram



6.4.3 Measurement Data

Please refer to Appendix D- Band Edge

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6.5 Spurious emissions at antenna terminals

Test Requirement: §2.1051, §96.41

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Test mode: m: Tx mode, Keep the EUT in transmitting mode.

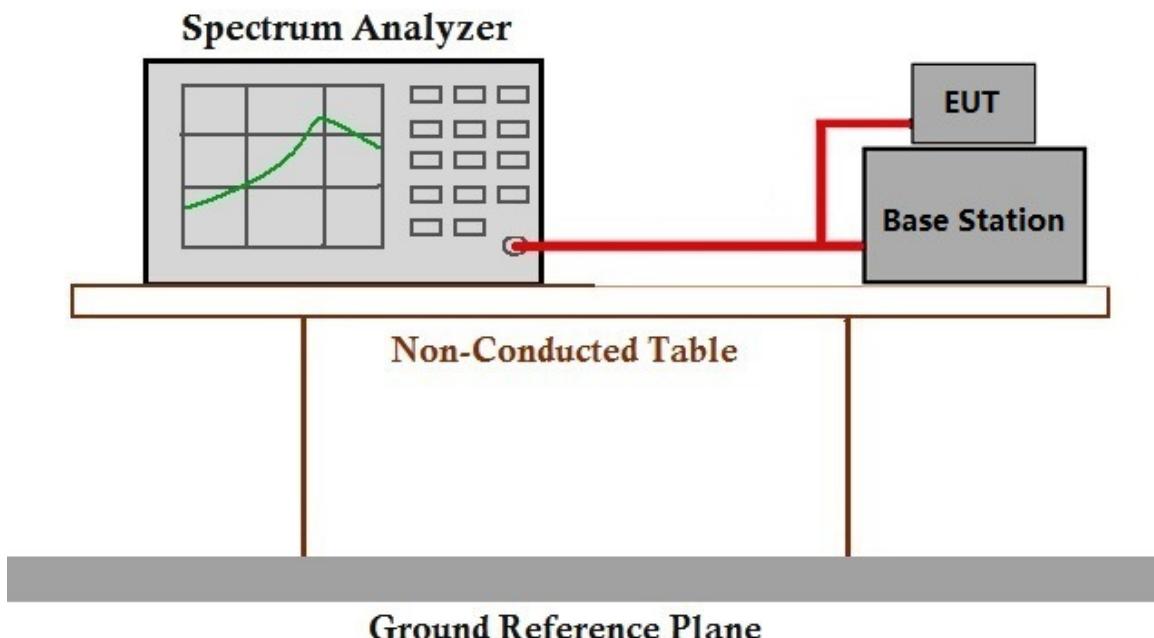
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6.5.2 Test Setup Diagram



6.5.3 Measurement Data

Please refer to Appendix D- Spurious emissions at antenna terminals

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6.6 Field strength of spurious radiation

Test Requirement: §2.1051, §96.41

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

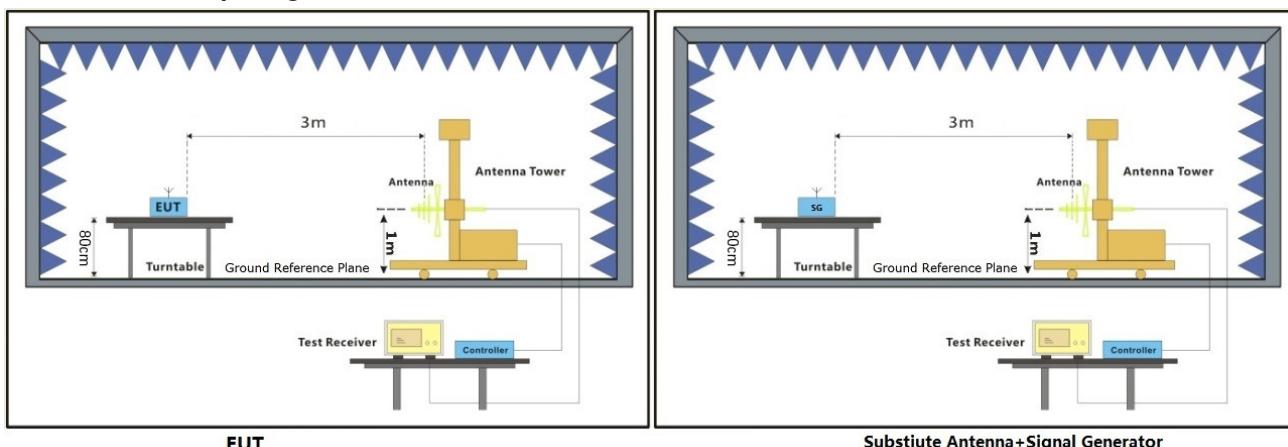
6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Test mode: m: Tx mode, Keep the EUT in transmitting mode.

6.6.2 Test Setup Diagram



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6.6.3 Measurement Procedure and Data**Test Procedure:**

- (1)On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- (2)The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- (3)The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- (4)The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- (5)The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- (6)The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- (7)The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- (8)The maximum signal level detected by the measuring receiver shall be noted.
- (9)The measurement shall be repeated with the test antenna set to horizontal polarization.
- (10) Replace the antenna with a proper Antenna (substitution antenna).
- (11)The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- (12)The substitution antenna shall be connected to a calibrated signal generator.
- (13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- (14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- (15)The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- (16)The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- (17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

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Report No.: SZEM200600450202
Page: 21 of 38

SISO Ant 1

LTE Band 48_QPSK_5MHz_Low Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7105	-53.89	1	12.9	-41.99	-40	-1.99	Horizontal	Pass
10657.5	-53.66	1.49	13.5	-41.65	-40	-1.65	Horizontal	Pass
14210	-54.54	1.67	13.6	-42.61	-40	-2.61	Horizontal	Pass
7105	-53.06	1	12.9	-41.16	-40	-1.16	Vertical	Pass
10657.5	-54.56	1.49	13.5	-42.55	-40	-2.55	Vertical	Pass
14210	-53.76	1.67	13.6	-41.83	-40	-1.83	Vertical	Pass

LTE Band 48_QPSK_5MHz_Middle Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7250	-53.36	1	12.9	-41.46	-40	-1.99	Horizontal	Pass
10875	-54.11	1.49	13.5	-42.1	-40	-1.65	Horizontal	Pass
14500	-53.33	1.37	12.4	-42.3	-40	-2.61	Horizontal	Pass
7250	-52.93	1	12.9	-41.03	-40	-1.16	Vertical	Pass
10875	-53.26	1.49	13.5	-41.25	-40	-2.55	Vertical	Pass
14500	-52.93	1.37	12.4	-41.9	-40	-1.83	Vertical	Pass

LTE Band 48_QPSK_5MHz_High Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7395	-53.37	1	12.9	-41.47	-40	-1.47	Horizontal	Pass
11092.5	-54.37	1.59	13.6	-42.36	-40	-2.36	Horizontal	Pass
14790	-53.93	1.37	12.4	-42.9	-40	-2.9	Horizontal	Pass
7395	-53.18	1	12.9	-41.28	-40	-1.28	Vertical	Pass
11092.5	-54.02	1.59	13.6	-42.01	-40	-2.01	Vertical	Pass
14790	-53.24	1.37	12.4	-42.21	-40	-2.21	Vertical	Pass

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LTE Band 48_QPSK_10MHz_Low Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7110	-53.34	1	12.9	-41.44	-40	-1.44	Horizontal	Pass
10665	-54.5	1.49	13.5	-42.49	-40	-2.49	Horizontal	Pass
14220	-54.67	1.67	13.6	-42.74	-40	-2.74	Horizontal	Pass
7110	-54.13	1	12.9	-42.23	-40	-2.23	Vertical	Pass
10665	-54.32	1.49	13.5	-42.31	-40	-2.31	Vertical	Pass
14220	-54.08	1.67	13.6	-42.15	-40	-2.15	Vertical	Pass

LTE Band 48_QPSK_10MHz_Middle Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7250	-53.53	1	12.9	-41.63	-40	-1.63	Horizontal	Pass
10875	-54.93	1.49	13.5	-42.92	-40	-2.92	Horizontal	Pass
14500	-52.87	1.37	12.4	-41.84	-40	-1.84	Horizontal	Pass
7250	-53.93	1	12.9	-42.03	-40	-2.03	Vertical	Pass
10875	-53.37	1.49	13.5	-41.36	-40	-1.36	Vertical	Pass
14500	-53.6	1.37	12.4	-42.57	-40	-2.57	Vertical	Pass

LTE Band 48_QPSK_10MHz_High Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7390	-53.76	1	12.9	-41.86	-40	-1.86	Horizontal	Pass
11085	-54.92	1.59	13.6	-42.91	-40	-2.91	Horizontal	Pass
14780	-52.61	1.37	12.4	-41.58	-40	-1.58	Horizontal	Pass
7390	-53.75	1	12.9	-41.85	-40	-1.85	Vertical	Pass
11085	-54.7	1.59	13.6	-42.69	-40	-2.69	Vertical	Pass
14780	-53.09	1.37	12.4	-42.06	-40	-2.06	Vertical	Pass

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LTE Band 48_QPSK_15MHz_Low Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7115	-53.97	1	12.9	-42.07	-40	-2.07	Horizontal	Pass
10672.5	-54.38	1.49	13.5	-42.37	-40	-2.37	Horizontal	Pass
14230	-54.04	1.67	13.6	-42.11	-40	-2.11	Horizontal	Pass
7115	-54.43	1	12.9	-42.53	-40	-2.53	Vertical	Pass
10672.5	-54.58	1.49	13.5	-42.57	-40	-2.57	Vertical	Pass
14230	-54.65	1.67	13.6	-42.72	-40	-2.72	Vertical	Pass

LTE Band 48_QPSK_15MHz_Middle Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7250	-54.14	1	12.9	-42.24	-40	-2.24	Horizontal	Pass
10875	-54.9	1.49	13.5	-42.89	-40	-2.89	Horizontal	Pass
14500	-52.94	1.37	12.4	-41.91	-40	-1.91	Horizontal	Pass
7250	-53.33	1	12.9	-41.43	-40	-1.43	Vertical	Pass
10875	-53.76	1.49	13.5	-41.75	-40	-1.75	Vertical	Pass
14500	-53.4	1.37	12.4	-42.37	-40	-2.37	Vertical	Pass

LTE Band 48_QPSK_15MHz_High Channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7385	-53.55	1	12.9	-41.65	-40	-1.65	Horizontal	Pass
11077.5	-54.22	1.59	13.6	-42.21	-40	-2.21	Horizontal	Pass
14770	-52.45	1.37	12.4	-41.42	-40	-1.42	Horizontal	Pass
7385	-54.13	1	12.9	-42.23	-40	-2.23	Vertical	Pass
11077.5	-53.48	1.59	13.6	-41.47	-40	-1.47	Vertical	Pass
14770	-52.84	1.37	12.4	-41.81	-40	-1.81	Vertical	Pass

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LTE Band 48_QPSK_20MHz_Low Channel

Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7120	-54.08	1	12.9	-42.18	-40	-2.18	Horizontal	Pass
10680	-53.97	1.49	13.5	-41.96	-40	-1.96	Horizontal	Pass
14240	-53.42	1.67	13.6	-41.49	-40	-1.49	Horizontal	Pass
7120	-53.82	1	12.9	-41.92	-40	-1.92	Vertical	Pass
10680	-54.97	1.49	13.5	-42.96	-40	-2.96	Vertical	Pass
14240	-55.19	1.67	13.6	-43.26	-40	-3.26	Vertical	Pass

LTE Band 48_QPSK_20MHz_Middle Channel

Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7250	-54.94	1	12.9	-43.04	-40	-3.04	Horizontal	Pass
10875	-54.72	1.49	13.5	-42.71	-40	-2.71	Horizontal	Pass
14500	-53.17	1.37	12.4	-42.14	-40	-2.14	Horizontal	Pass
7250	-54.13	1	12.9	-42.23	-40	-2.23	Vertical	Pass
10875	-54.42	1.49	13.5	-42.41	-40	-2.41	Vertical	Pass
14500	-52.67	1.37	12.4	-41.64	-40	-1.64	Vertical	Pass

LTE Band 48_QPSK_20MHz_High Channel

Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7380	-54.43	1	12.9	-42.53	-40	-2.53	Horizontal	Pass
11070	-54.24	1.59	13.6	-42.23	-40	-2.23	Horizontal	Pass
14760	-52.59	1.37	12.4	-41.56	-40	-1.56	Horizontal	Pass
7380	-53.76	1	12.9	-41.86	-40	-1.86	Vertical	Pass
11070	-54.18	1.59	13.6	-42.17	-40	-2.17	Vertical	Pass
14760	-52.5	1.37	12.4	-41.47	-40	-1.47	Vertical	Pass

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Report No.: SZEM200600450202
Page: 25 of 38

LTE Band 48_QPSK_Intra-band CA continuous_5+5 MHz								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
7105	-53.9	1	12.9	-42	-40	-2	Horizontal	Pass
10657.5	-54.23	1.49	13.5	-42.22	-40	-2.22	Horizontal	Pass
14210	-53.72	1.67	13.6	-41.79	-40	-1.79	Horizontal	Pass
7105	-54.25	1	12.9	-42.35	-40	-2.35	Vertical	Pass
10657.5	-54.2	1.49	13.5	-42.19	-40	-2.19	Vertical	Pass
14210	-53.9	1.67	13.6	-41.97	-40	-1.97	Vertical	Pass

Remark:

- 1) Pretest with normal and extreme conditions, only the worst case data was showed in the test report.
- 2) We have tested all modulation and all Channel, but only the worst case data displayed in this report.

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6.7 Frequency stability

Test Requirement: §2.1055

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: Fundamental emission stays within authorized frequency block

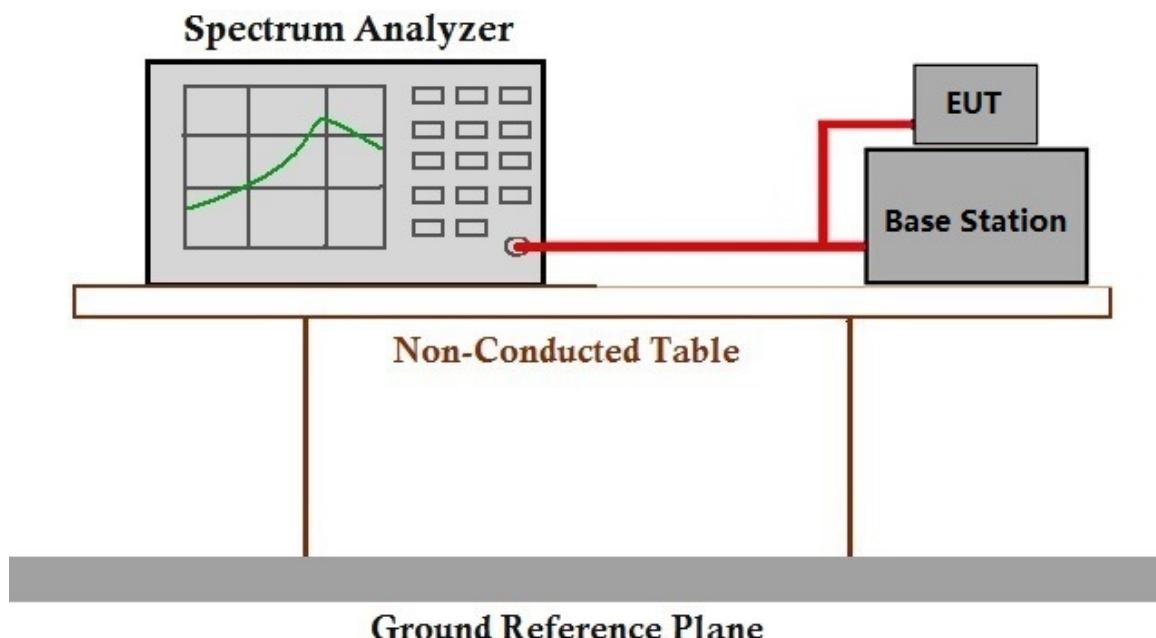
6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Test mode: m: Tx mode, Keep the EUT in transmitting mode.

6.7.2 Test Setup Diagram



6.7.3 Measurement Data

Please refer to Appendix F

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6.8 Modulation Characteristics

Test Requirement: §2.1047

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: Digital modulation

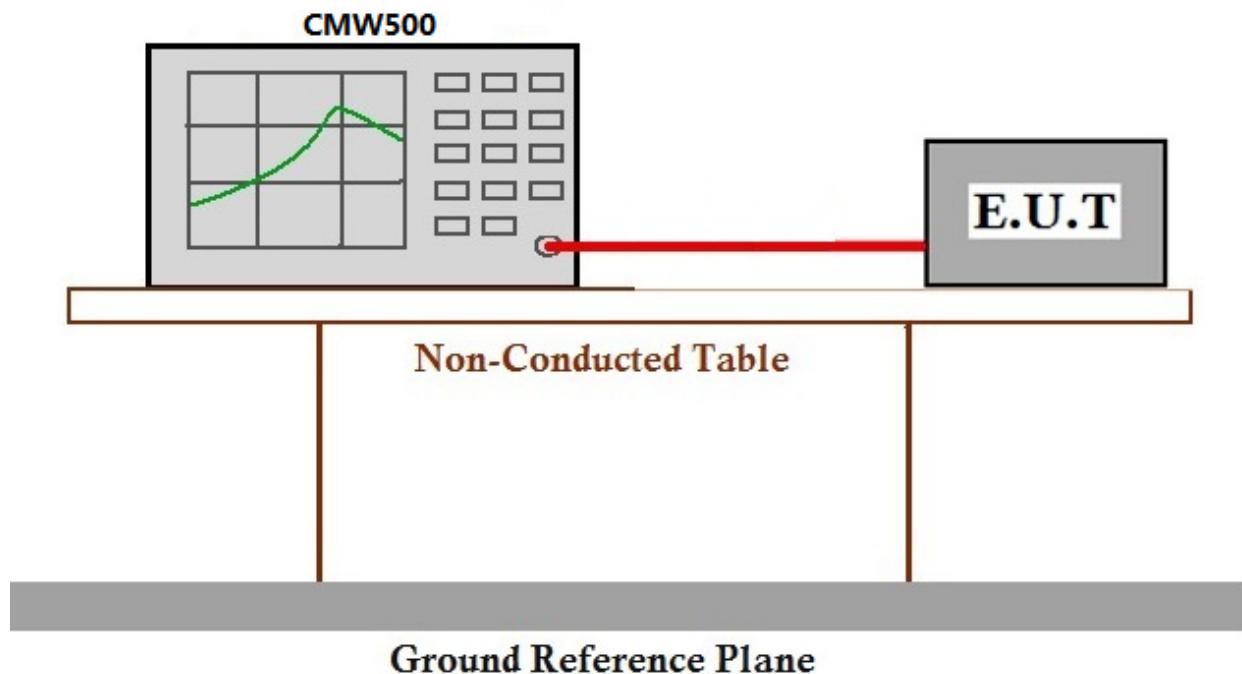
6.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Test mode: m: Tx mode, Keep the EUT in transmitting mode.

6.8.2 Test Setup Diagram



6.8.3 Measurement Data

Please refer to Appendix F

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7 Photographs

7.1 Setup photo

Please refer to setup photos.

7.2 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

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8 Appendix F

8.1 Frequency stability

Test Band: 48 _ 5MHz Bandwidth (Frequency Error VS. Voltage)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
64QAM	25	0	NT	LV	6	9	4	0.0017	0.0025	0.0011	2.50	PASS
				NV	4	3	8	0.0011	0.0008	0.0022	2.50	PASS
				HV	1	6	2	0.0003	0.0017	0.0005	2.50	PASS
16QAM	25	0	NT	LV	5	-9	6	0.0014	-0.0025	0.0016	2.50	PASS
				NV	9	3	8	0.0025	0.0008	0.0022	2.50	PASS
				HV	1	0	6	0.0003	0.0000	0.0016	2.50	PASS
QPSK	25	0	NT	LV	10	-2	5	0.0028	-0.0006	0.0014	2.50	PASS
				NV	5	1	-1	0.0014	0.0003	-0.0003	2.50	PASS
				HV	0	0	9	0.0000	0.0000	0.0024	2.50	PASS

Test Band: 48 _ 5MHz Bandwidth (Frequency Error VS. Temperature)													
Test Mode	RB Allocation		Test Volt.	Test Temp.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict	
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH			
64QAM	25	0	NV	-30.00	0	5	-5	0.0000	0.0014	-0.0014	2.50	PASS	
				-20.00	-3	9	-7	-0.0008	0.0025	-0.0019	2.50	PASS	
				-10.00	-6	6	1	-0.0017	0.0017	0.0003	2.50	PASS	
				0.00	3	9	7	0.0008	0.0025	0.0019	2.50	PASS	
				10.00	-10	1	10	-0.0028	0.0003	0.0027	2.50	PASS	
				20.00	-9	0	2	-0.0025	0.0000	0.0005	2.50	PASS	
				30.00	9	-3	-8	0.0025	-0.0008	-0.0022	2.50	PASS	
				40.00	-9	-1	2	-0.0025	-0.0003	0.0005	2.50	PASS	
				50.00	4	-2	3	0.0011	-0.0006	0.0008	2.50	PASS	
				16QAM	-30.00	4	-9	-8	0.0011	-0.0025	-0.0022	2.50	PASS
					-20.00	-8	9	-6	-0.0023	0.0025	-0.0016	2.50	PASS
					-10.00	3	-5	5	0.0008	-0.0014	0.0014	2.50	PASS
					0.00	10	-10	3	0.0028	-0.0028	0.0008	2.50	PASS
					10.00	-4	6	-3	-0.0011	0.0017	-0.0008	2.50	PASS
					20.00	-6	8	4	-0.0017	0.0022	0.0011	2.50	PASS
					30.00	-1	6	-4	-0.0003	0.0017	-0.0011	2.50	PASS
					40.00	7	5	9	0.0020	0.0014	0.0024	2.50	PASS
					50.00	1	9	3	0.0003	0.0025	0.0008	2.50	PASS

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Report No.: SZEM200600450202
Page: 30 of 38

QPSK	25	0	NV	-30.00	6	-3	-9	0.0017	-0.0008	-0.0024	2.50	PASS
				-20.00	9	8	-4	0.0025	0.0022	-0.0011	2.50	PASS
				-10.00	-6	8	3	-0.0017	0.0022	0.0008	2.50	PASS
				0.00	2	-5	5	0.0006	-0.0014	0.0014	2.50	PASS
				10.00	-10	5	1	-0.0028	0.0014	0.0003	2.50	PASS
				20.00	-7	0	-2	-0.0020	0.0000	-0.0005	2.50	PASS
				30.00	6	-10	6	0.0017	-0.0028	0.0016	2.50	PASS
				40.00	3	-5	-1	0.0008	-0.0014	-0.0003	2.50	PASS
				50.00	-3	-5	-1	-0.0008	-0.0014	-0.0003	2.50	PASS

Test Band: 48 _ 10MHz Bandwidth (Frequency Error VS. Voltage)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
64QAM	50	0	NT	LV	-9	-8	-10	-0.0025	-0.0022	-0.0027	2.50	PASS
				NV	-7	9	-8	-0.0020	0.0025	-0.0022	2.50	PASS
				HV	7	5	9	0.0020	0.0014	0.0024	2.50	PASS
16QAM	50	0	NT	LV	-10	4	-4	-0.0028	0.0011	-0.0011	2.50	PASS
				NV	2	4	5	0.0006	0.0011	0.0014	2.50	PASS
				HV	2	-6	10	0.0006	-0.0017	0.0027	2.50	PASS
QPSK	50	0	NT	LV	5	9	5	0.0014	0.0025	0.0014	2.50	PASS
				NV	-7	-7	-2	-0.0020	-0.0019	-0.0005	2.50	PASS
				HV	1	10	9	0.0003	0.0028	0.0024	2.50	PASS

Test Band: 48 _ 10MHz Bandwidth (Frequency Error VS. Temperature)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
64QAM	50	0	NV	-30.00	-1	3	-9	-0.0003	0.0008	-0.0024	2.50	PASS
				-20.00	-9	-1	-7	-0.0025	-0.0003	-0.0019	2.50	PASS
				-10.00	2	4	-8	0.0006	0.0011	-0.0022	2.50	PASS
				0.00	-3	6	7	-0.0008	0.0017	0.0019	2.50	PASS
				10.00	1	8	-1	0.0003	0.0022	-0.0003	2.50	PASS
				20.00	1	-7	4	0.0003	-0.0019	0.0011	2.50	PASS
				30.00	-2	1	9	-0.0006	0.0003	0.0024	2.50	PASS
				40.00	6	-5	5	0.0017	-0.0014	0.0014	2.50	PASS
				50.00	-8	-1	0	-0.0023	-0.0003	0.0000	2.50	PASS
16QAM	50	0	NV	-30.00	-1	10	8	-0.0003	0.0028	0.0022	2.50	PASS
				-20.00	-8	1	0	-0.0023	0.0003	0.0000	2.50	PASS
				-10.00	10	-1	-10	0.0028	-0.0003	-0.0027	2.50	PASS
				0.00	-6	-5	9	-0.0017	-0.0014	0.0024	2.50	PASS

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				10.00	9	-1	-9	0.0025	-0.0003	-0.0024	2.50	PASS
				20.00	7	-4	4	0.0020	-0.0011	0.0011	2.50	PASS
				30.00	5	8	1	0.0014	0.0022	0.0003	2.50	PASS
				40.00	-5	-3	9	-0.0014	-0.0008	0.0024	2.50	PASS
				50.00	8	-2	7	0.0023	-0.0006	0.0019	2.50	PASS
QPSK	50	0	NV	-30.00	4	-5	-1	0.0011	-0.0014	-0.0003	2.50	PASS
				-20.00	10	0	-2	0.0028	0.0000	-0.0005	2.50	PASS
				-10.00	1	-7	9	0.0003	-0.0019	0.0024	2.50	PASS
				0.00	7	5	9	0.0020	0.0014	0.0024	2.50	PASS
				10.00	5	3	2	0.0014	0.0008	0.0005	2.50	PASS
				20.00	7	8	1	0.0020	0.0022	0.0003	2.50	PASS
				30.00	-5	6	3	-0.0014	0.0017	0.0008	2.50	PASS
				40.00	-6	-8	-8	-0.0017	-0.0022	-0.0022	2.50	PASS
				50.00	5	10	0	0.0014	0.0028	0.0000	2.50	PASS

Test Band: 48 _ 15MHz Bandwidth (Frequency Error VS. Voltage)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
64QAM	75	0	NT	LV	-5	0	-8	-0.0014	0.0000	-0.0022	2.50	PASS
				NV	9	10	-2	0.0025	0.0028	-0.0005	2.50	PASS
				HV	5	4	-4	0.0014	0.0011	-0.0011	2.50	PASS
16QAM	75	0	NT	LV	9	0	1	0.0025	0.0000	0.0003	2.50	PASS
				NV	-6	-3	8	-0.0017	-0.0008	0.0022	2.50	PASS
				HV	-2	-4	6	-0.0006	-0.0011	0.0016	2.50	PASS
QPSK	75	0	NT	LV	5	-2	-10	0.0014	-0.0006	-0.0027	2.50	PASS
				NV	10	7	8	0.0028	0.0019	0.0022	2.50	PASS
				HV	-3	-10	9	-0.0008	-0.0028	0.0024	2.50	PASS

Test Band: 48 _ 15MHz Bandwidth (Frequency Error VS. Temperature)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
64QAM	75	0	NV	-30.00	-3	-7	-1	-0.0008	-0.0019	-0.0003	2.50	PASS
				-20.00	10	4	9	0.0028	0.0011	0.0024	2.50	PASS
				-10.00	0	7	-6	0.0000	0.0019	-0.0016	2.50	PASS
				0.00	6	2	9	0.0017	0.0006	0.0024	2.50	PASS
				10.00	-6	2	10	-0.0017	0.0006	0.0027	2.50	PASS
				20.00	10	-6	8	0.0028	-0.0017	0.0022	2.50	PASS
				30.00	-7	-5	9	-0.0020	-0.0014	0.0024	2.50	PASS
				40.00	-6	-9	-1	-0.0017	-0.0025	-0.0003	2.50	PASS

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				50.00	-9	-10	-5	-0.0025	-0.0028	-0.0014	2.50	PASS
16QAM	75	0	NV	-30.00	8	1	-6	0.0022	0.0003	-0.0016	2.50	PASS
				-20.00	10	7	10	0.0028	0.0019	0.0027	2.50	PASS
				-10.00	4	4	3	0.0011	0.0011	0.0008	2.50	PASS
				0.00	5	4	-1	0.0014	0.0011	-0.0003	2.50	PASS
				10.00	-5	-7	-9	-0.0014	-0.0019	-0.0024	2.50	PASS
				20.00	1	8	-6	0.0003	0.0022	-0.0016	2.50	PASS
				30.00	-3	-6	-3	-0.0008	-0.0017	-0.0008	2.50	PASS
				40.00	-7	-6	0	-0.0020	-0.0017	0.0000	2.50	PASS
				50.00	-9	3	7	-0.0025	0.0008	0.0019	2.50	PASS
				-30.00	-4	-2	10	-0.0011	-0.0006	0.0027	2.50	PASS
QPSK	75	0	NV	-20.00	2	0	6	0.0006	0.0000	0.0016	2.50	PASS
				-10.00	-6	4	6	-0.0017	0.0011	0.0016	2.50	PASS
				0.00	8	1	6	0.0022	0.0003	0.0016	2.50	PASS
				10.00	7	-3	6	0.0020	-0.0008	0.0016	2.50	PASS
				20.00	5	-1	0	0.0014	-0.0003	0.0000	2.50	PASS
				30.00	-2	10	-2	-0.0006	0.0028	-0.0005	2.50	PASS
				40.00	1	6	6	0.0003	0.0017	0.0016	2.50	PASS
				50.00	-4	-5	5	-0.0011	-0.0014	0.0014	2.50	PASS

Test Band: 48 _ 20MHz Bandwidth (Frequency Error VS. Voltage)													
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict	
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH			
64QAM	100	0	NT	NT	LV	9	0	7	0.0025	0.0000	0.0019	2.50	PASS
				NV	-8	6	-1	-0.0022	0.0017	-0.0003	2.50	PASS	
				HV	-3	-8	3	-0.0008	-0.0022	0.0008	2.50	PASS	
16QAM	100	0	NT	LV	9	1	10	0.0025	0.0003	0.0027	2.50	PASS	
				NV	9	-9	1	0.0025	-0.0025	0.0003	2.50	PASS	
				HV	2	7	10	0.0006	0.0019	0.0027	2.50	PASS	
QPSK	100	0	NT	LV	7	7	2	0.0020	0.0019	0.0005	2.50	PASS	
				NV	-5	-10	5	-0.0014	-0.0028	0.0014	2.50	PASS	
				HV	6	5	-10	0.0017	0.0014	-0.0027	2.50	PASS	

Test Band: 48 _ 20MHz Bandwidth (Frequency Error VS. Temperature)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
64QAM	100	0	NV	-30.00	1	10	-8	0.0003	0.0028	-0.0022	2.50	PASS
				-20.00	2	1	-6	0.0006	0.0003	-0.0016	2.50	PASS
				-10.00	1	-2	6	0.0003	-0.0006	0.0016	2.50	PASS

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Report No.: SZEM200600450202
Page: 33 of 38

				0.00	7	7	-7	0.0020	0.0019	-0.0019	2.50	PASS
				10.00	-4	5	10	-0.0011	0.0014	0.0027	2.50	PASS
				20.00	-7	-8	0	-0.0020	-0.0022	0.0000	2.50	PASS
				30.00	-10	-4	6	-0.0028	-0.0011	0.0016	2.50	PASS
				40.00	4	9	-5	0.0011	0.0025	-0.0014	2.50	PASS
				50.00	7	-8	9	0.0020	-0.0022	0.0024	2.50	PASS
16QAM	100	0	NV	-30.00	-4	6	-4	-0.0011	0.0017	-0.0011	2.50	PASS
				-20.00	3	1	1	0.0008	0.0003	0.0003	2.50	PASS
				-10.00	9	3	2	0.0025	0.0008	0.0005	2.50	PASS
				0.00	0	8	7	0.0000	0.0022	0.0019	2.50	PASS
				10.00	-9	-7	4	-0.0025	-0.0019	0.0011	2.50	PASS
				20.00	-8	-10	1	-0.0022	-0.0028	0.0003	2.50	PASS
				30.00	-5	-9	-8	-0.0014	-0.0025	-0.0022	2.50	PASS
				40.00	1	0	9	0.0003	0.0000	0.0024	2.50	PASS
				50.00	9	-8	-7	0.0025	-0.0022	-0.0019	2.50	PASS
				-30.00	7	-2	8	0.0020	-0.0006	0.0022	2.50	PASS
QPSK	100	0	NV	-20.00	-2	-2	-2	-0.0006	-0.0006	-0.0005	2.50	PASS
				-10.00	-4	8	-4	-0.0011	0.0022	-0.0011	2.50	PASS
				0.00	-7	-9	3	-0.0020	-0.0025	0.0008	2.50	PASS
				10.00	0	-3	-10	0.0000	-0.0008	-0.0027	2.50	PASS
				20.00	-5	-1	-2	-0.0014	-0.0003	-0.0005	2.50	PASS
				30.00	-2	-8	7	-0.0006	-0.0022	0.0019	2.50	PASS
				40.00	-8	-6	-1	-0.0022	-0.0017	-0.0003	2.50	PASS
				50.00	7	1	-7	0.0020	0.0003	-0.0019	2.50	PASS

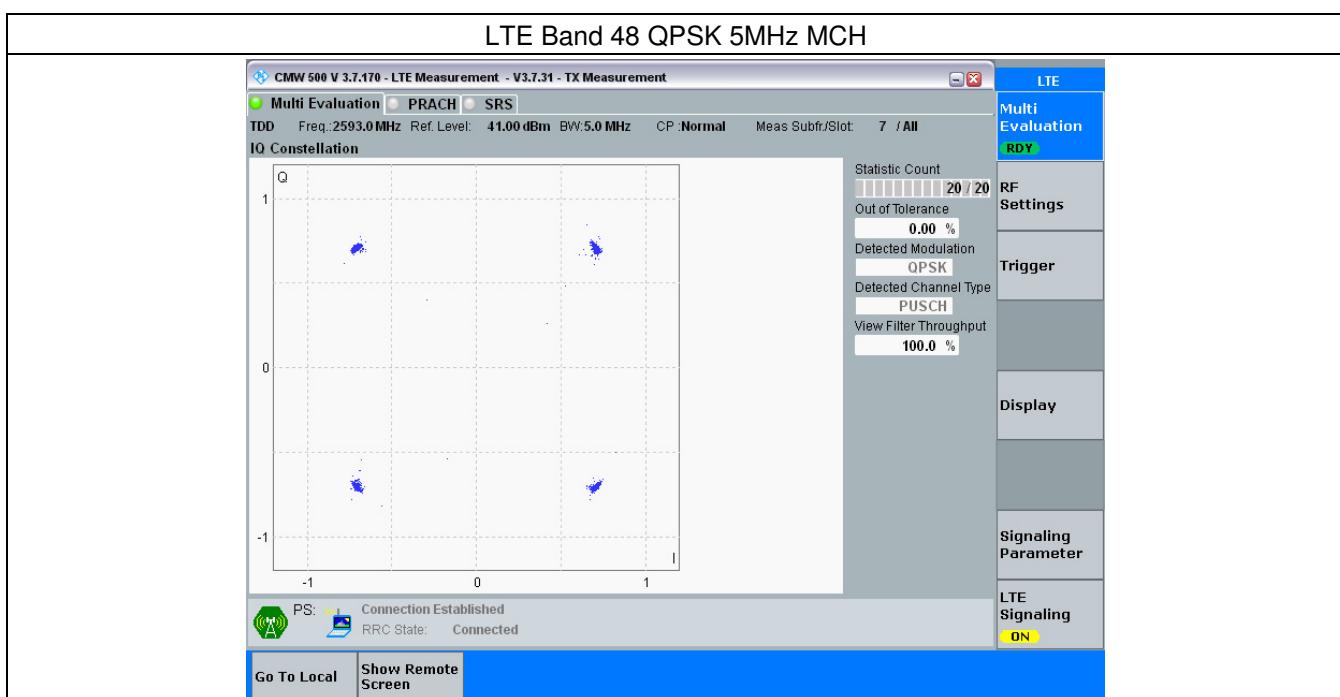
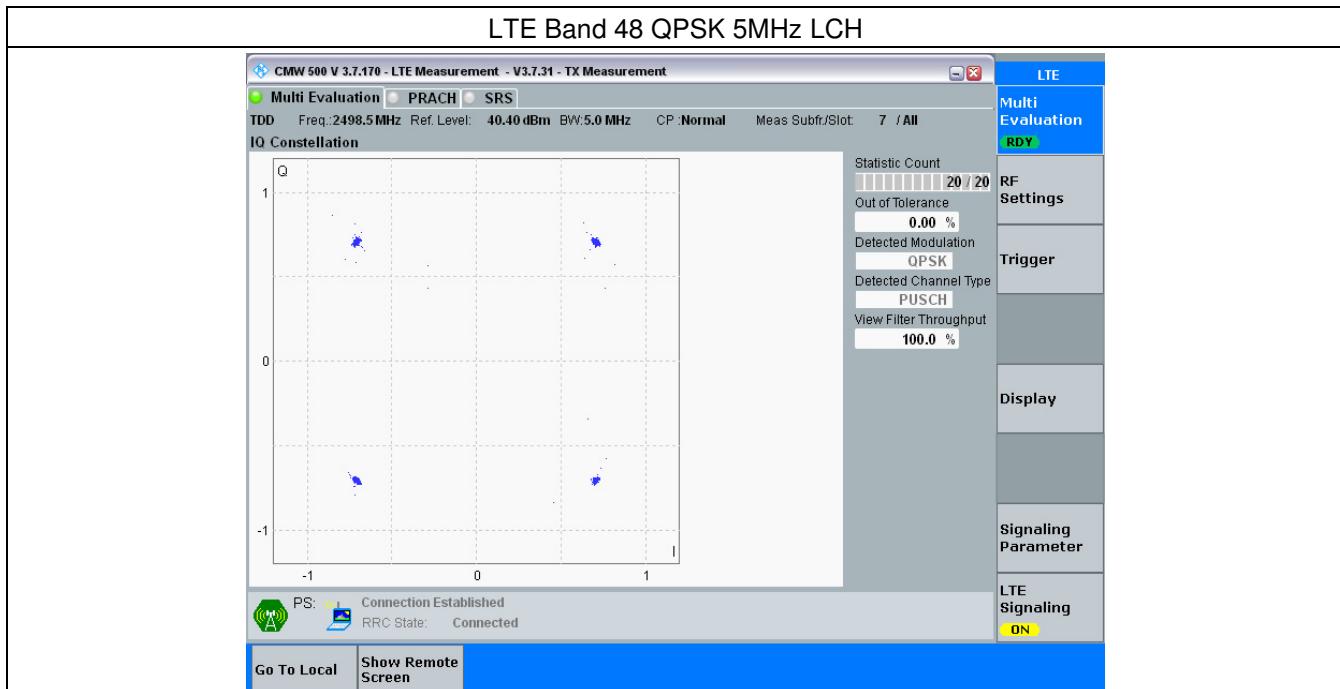
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8.2 Modulation Characteristics

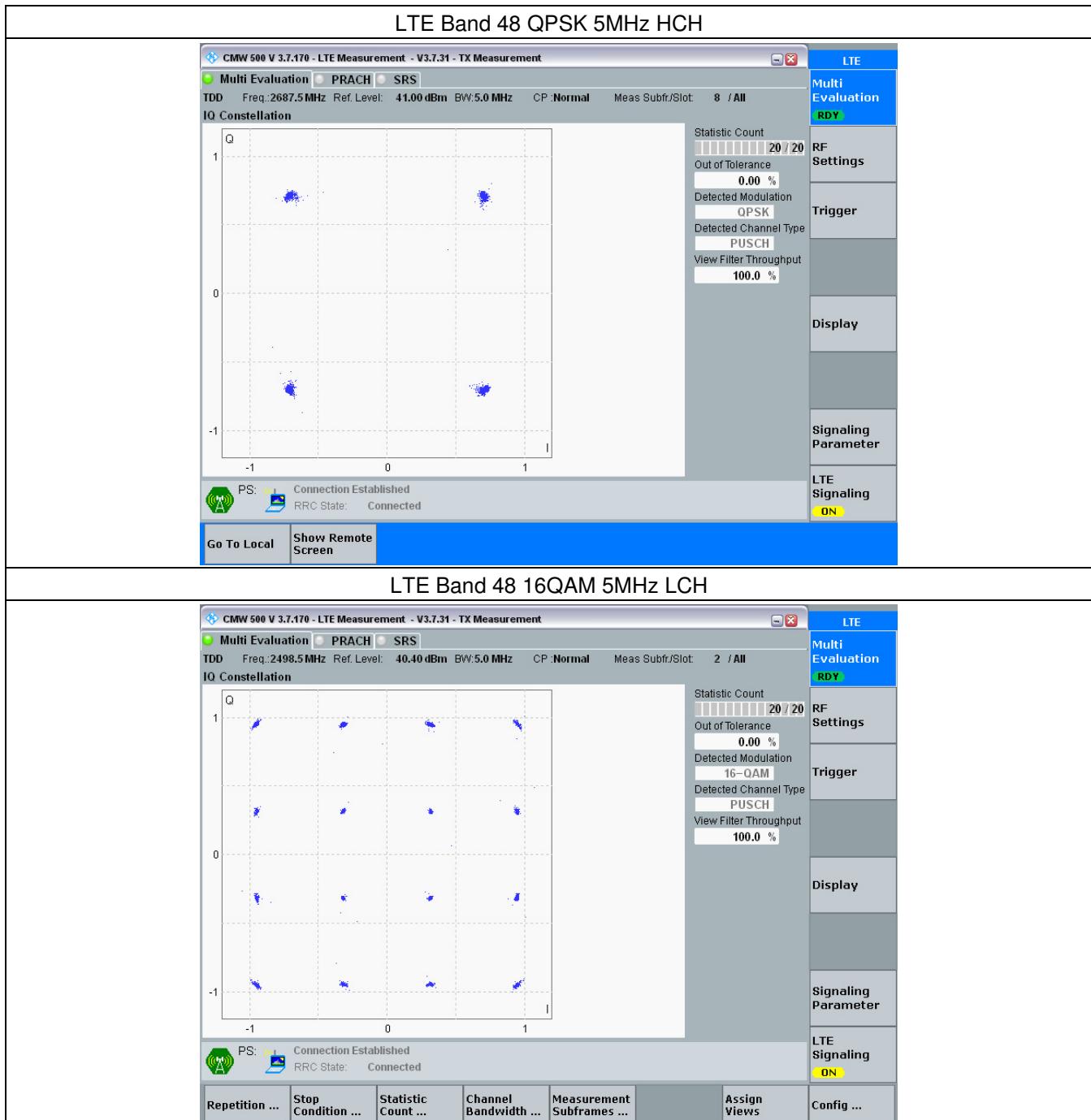


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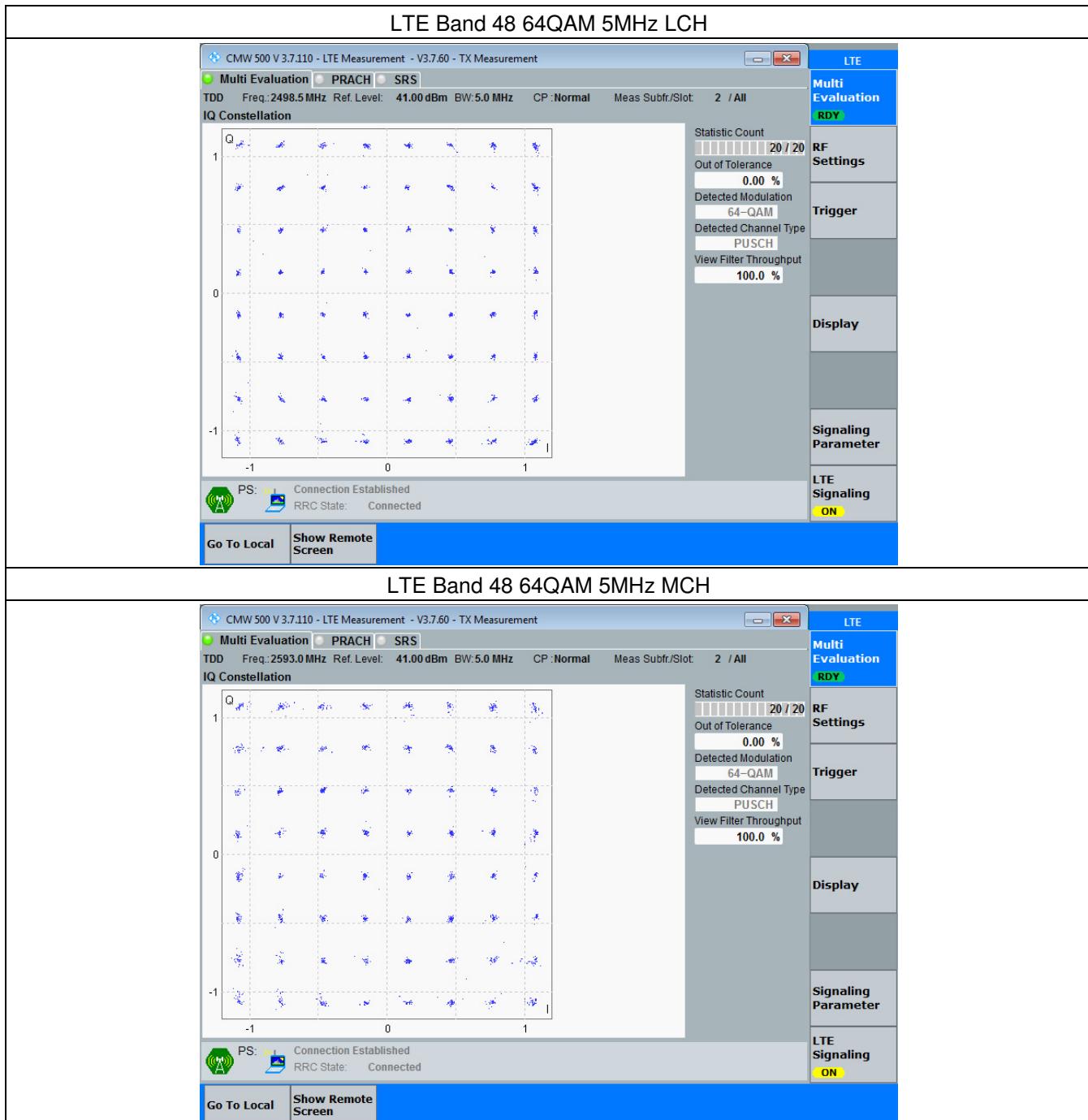
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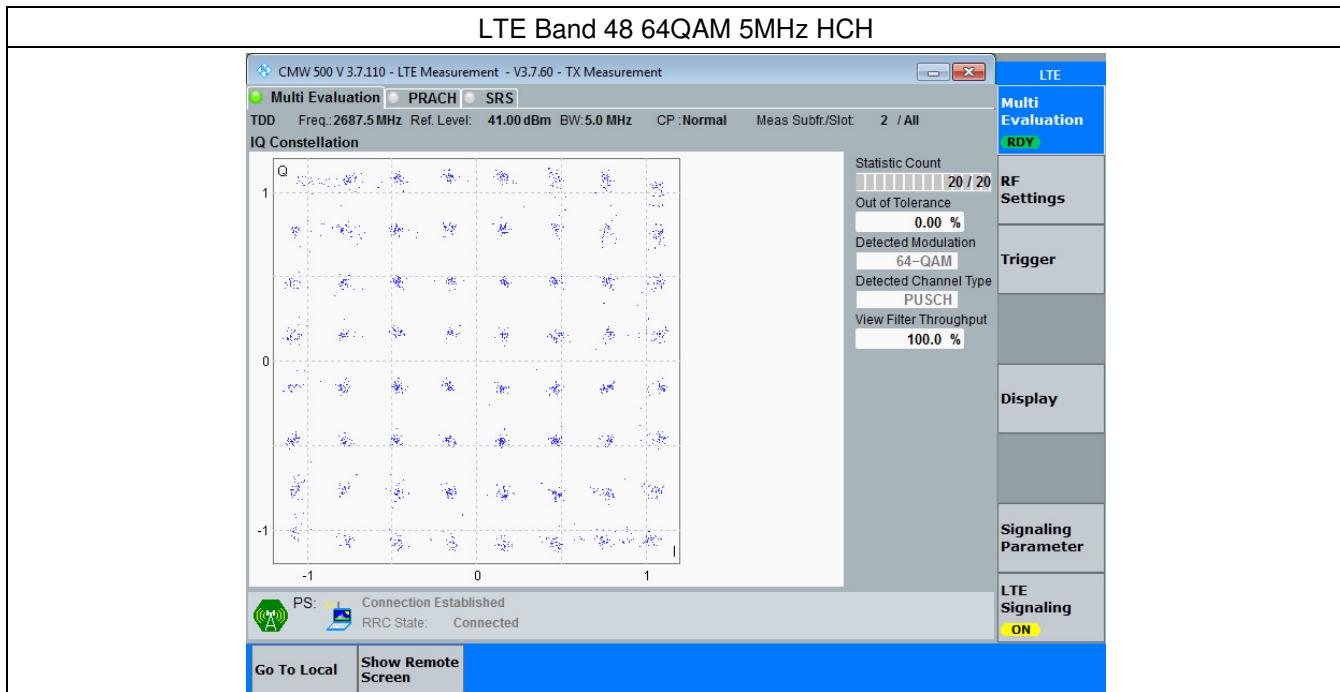
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