

**FCC RF Test Report** 

APPLICANT : Telrad Networks Ltd

EQUIPMENT : CPE-12300HG-PRO-1D-3.x

BRAND NAME : Telrad MODEL NAME : 735350

FCC ID : ARA-CPE12300HG STANDARD : 47 CFR Part 2, 96

CLASSIFICATION : Citizens Band Category A and B Devices (CBD)

**EQUIPMENT TYPE**: CBSD (Category B)

The product was received on Jul. 23, 2020 and completely tested on Aug. 31, 2020. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Reviewed by: Jason Jia / Supervisor

JasonJia

Approved by: James Huang / Manager

#### Sporton International (Kunshan) Inc.

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

Sporton International (Kunshan) Inc.

TEL: +86-512-57900158 FAX: +86-512-57900958 FCC ID: ARA-CPE12300HG Page Number : 1 of 23 Issued Date : Dec. 08, 2020

Report No.: FG072303

Report Version : 01

Cert #5145.02

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### History of this test report

Report No.	Version	Description	Issued Date
FG072303	01	Initial issue of report	Dec. 08, 2020

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### **Summary of Test Result**

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
3.3	§96.41	Peak-to-Average Ratio	Pass	-
0.4	§96.41	Maximum E.I.R.P	Pass	-
3.4	§90.41	Maximum Power Spectral Density	Pass	
3.5	§2.1049 §96.41	Occupied Bandwidth	Reporting only	-
3.6	§2.1051 §96.41	Conducted Band Edge Measurement	Pass	-
3.7	§2.1051		Pass	
3.8	§2.1055	Frequency Stability for Temperature & Voltage	Pass	-
4.4	§2.1051		Pass	-

#### Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

#### **Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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### 1 General Description

### 1.1 Applicant

#### **Telrad Networks Ltd**

Industrial Center PO Box 6118 Lod, 711600 Israel

#### 1.2 Manufacturer

#### **Asiatelco**

No.68 Huatuo Road, Building-8, Zhangjiang Hi-Tech Park, Pudong, Shanghai, PRC

### 1.3 Feature of Equipment Under Test

	Product Feature						
Equipment	CPE-12300HG-PRO-1D-3.x						
Brand Name	Telrad						
Model Name	735350						
FCC ID	ARA-CPE12300HG						
	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz						
Tx Frequency	LTE Band 42 : 3552.5 MHz ~ 3597.5 MHz						
	LTE Band 43 : 3602.5 MHz ~ 3697.5 MHz						
	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz						
Rx Frequency	LTE Band 42 : 3552.5 MHz ~ 3597.5 MHz						
	LTE Band 43 : 3602.5 MHz ~ 3697.5 MHz						
Bandwidth	5MHz / 10MHz / 15MHz / 20MHz						
Time of Madulation	QPSK / 16QAM / 64QAM (Uplink)						
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM (Downlink)						
Antenna Type / Gain	Fixed Internal Antenna with gain 17.0dBi						
IMEL Code	Conducted: N/A						
IMEI Code	Radiation: 863867028225660						
HW Version	P1						
SW Version	KT2A_OTE30_TRD_1.0.0.1						
EUT Stage	Identical Prototype						

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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1.4 Maximum EIRP Power, Frequency Tolerance, and Emission Designator

Ľ	TE Band 48		QPSK		16QAM				
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP (W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP (W)		
5	3552.5~3697.5	4M55G7D	-	6.6374	4M57W7D	-	6.4863		
10	3555~3695	9M07G7D	107G7D 0.0017		9M11W7D	-	6.8865		
15	3557.5~3692.5	13M5G7D -		8.1470	13M5W7D	-	6.7920		
20	3560~3690	18M0G7D	-	7.3282	17M9W7D	-	6.9343		
Ľ	TE Band 48	64QAM							
BW (MHz)	Frequency Range (MHz)		Designator OBW)		y Tolerance pm)	EI	mum RP V)		
5	3552.5~3697.5	4M56	SW7D		-	5.0466			
10	3555~3695	9M03	BW7D	-		5.1050			
15	3557.5~3692.5	13M5	5W7D	-		6.6374			
20	3560~3690	17M9	W7D		-	6.5464			

### 1.5 Testing Site

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International (Kunshan) Inc.						
	No. 1098, Pengxi North Road, Kunshan Economic Development Zone						
Test Site Location	Jiangsu Province 215300 People's Republic of China						
Test Site Location	TEL: +86-512-57900158						
	FAX: +86-512-57900958						
	Sporton Site No.	FCC Designation No.	FCC Test Firm				
Test Site No.	Sporton Site No.	rec besignation No.	Registration No.				
	03CH04-KS TH01-KS	CN1257	314309				

#### 1.6 Test Software

Item	Site	Manufacture	Name	Version	
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a	

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#### 1.7 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- + ANSI C63.26-2015
- ANSI / TIA-603-E
- 47 CFR Part 2, 96
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 940660 D01 Part 96 CBRS v02
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

#### Remark:

- **1.** All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

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### 2 Test Configuration of Equipment Under Test

#### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

	recorde															
			Bandwidth (MHz)					Modulation		RB#			Test Channel			
Test Items	Band	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	М	н
Max. Output Power	48	-	-	v	>	v	v	٧	v	v			v	٧	>	v
EIRP Density	48	-	-	v	v	v	v	v	v	v			v	v	v	v
26dB and 99% Bandwidth	48	-	-	v	٧	v	v	V	v	v			v	٧	٧	v
Conducted Band Edge	48	-	-	v	v	v	v	٧	v	v			v	v		v
Peak-to-Aver age Ratio	48	-	-				v	v	v	v			v	v	v	v
Conducted Spurious Emission	48	-	-	v	٧	v	v	٧	V	v			v	٧	٧	v
E.R.P / E.I.R.P	48	-	-	v	٧	v	v	v	v	v			v	v	v	v
Frequency Stability	48	•	-		٧			٧					v		٧	
Radiated Spurious Emission	Spurious 48 Worst Case							v								
Remark	<ol> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.</li> <li>All the radiated test cases were performed with Adapter.</li> <li>Only full RB is support by manufacturer declared.</li> <li>LTE Band 48 overlaps the entire frequency range of LTE Band 42/43. Therefore, the test results provided in this report covers Band 48 as well as Band 42/43.</li> </ol>															

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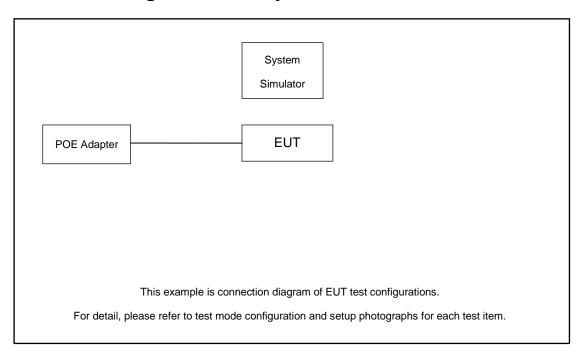
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### 2.2 Connection Diagram of Test System



#### 2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m

### 2.4 Measurement Results Explanation Example

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.7 dB.

Example:

 $Offset(dB) = RF \ cable \ loss(dB).$ 

= 5.7 (dB)

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2.5 Frequency List of Low/Middle/High Channels

LTE Band 48 Channel and Frequency List									
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest					
20	Channel	55340	55990	56640					
20	Frequency	3560.0	3625.0	3690.0					
45	Channel	55315	55990	56665					
15	Frequency	3557.5	3625.0	3692.5					
40	Channel	55290	55990	56690					
10	Frequency	3555.0	3625.0	3695.0					
E	Channel	55265	55990	56715					
5	Frequency	3552.5	3625.0	3697.5					

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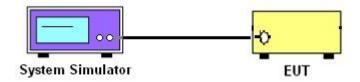
#### 3 Conducted Test Items

### 3.1 Measuring Instruments

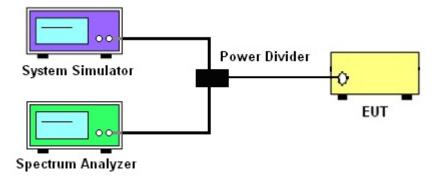
See list of measuring instruments of this test report.

#### 3.1.1 Test Setup

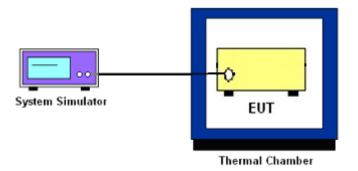
#### 3.1.2 Conducted Output Power



# 3.1.3 EIRP, Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission



#### 3.1.4 Frequency Stability



#### 3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

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#### 3.2 Conducted Output Power

#### 3.2.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

#### 3.2.2 Test Procedures

- The transmitter output port was connected to the system simulator.
- 2. Set EUT at maximum power through the system simulator.
- 3. Select lowest, middle, and highest channels for each band and different modulation.
- 4. Measure and record the power level from the system simulator.

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#### 3.3 Peak-to-Average Ratio

#### 3.3.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

#### 3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

- The EUT was connected to spectrum and system simulator via a power divider.
- 2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- 3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
- 4. Record the deviation as Peak to Average Ratio

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#### 3.4 EIRP and PSD

#### 3.4.1 Description of the EIRP Measurement

EIRP and PSD limits for CBRS equipment as below table:

De	evice	Maximum EIRP	Maximum PSD
		(dBm/10 MHz)	(dBm/MHz)
	End User Device	23	n/a
	Category A CBSD	30	20
V	Category B CBSD	47	37

#### Remark:

- 1. Maximum PSD values are radiated. Measurements can be done conducted and add antenna gain back in.
- 2. This device is Category B CBSD.

#### 3.4.2 Test Procedures for EIRP

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

 $EIRP = P_T + G_T - L_C$ , where

 $P_T$  = transmitter output power in dBm

G<sub>T</sub> = gain of the transmitting antenna in dBi

 $L_C$  = signal attenuation in the connecting cable between the transmitter and antenna in dB

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#### 3.4.3 Test Procedures for EIRP PSD

- 1. Set instrument center frequency to OBW center frequency.
- 2. Set span to at least 2 times the OBW.
- 3. Set the RBW to the specified reference bandwidth (often 1 MHz).
- 4. Set VBW ≥ 3 x RBW.
- 5. Detector = RMS (power averaging).
- 6. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
- 7. Sweep time = auto couple.
- 8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- 9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
- 10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.
- 11. Add 10 log (1/duty cycle) to the measured power level to compute the average power during continuous transmission.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

 $EIRP = P_T + G_T - L_C$ , where

 $P_T$  = transmitter output power in dBm

 $G_T$  = gain of the transmitting antenna in dBi

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

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3.5 Occupied Bandwidth

3.5.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the

total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and

one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB

below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit

bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of

the emission bandwidth.

3.5.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.

2. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.

The span range for the spectrum analyzer shall be between two and five times the anticipated

OBW.

3. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated

OBW, and the VBW shall be at least 3 times the RBW.

4. Set the detection mode to peak, and the trace mode to max hold.

5. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to

stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.

(this is the reference value)

6. Determine the "-26 dB down amplitude" as equal to (Reference Value – X).

7. Place two markers, one at the lowest and the other at the highest frequency of the envelope of

the spectral display such that each marker is at or slightly below the "-X dB down amplitude"

determined in step 6. If a marker is below this "-X dB down amplitude" value it shall be placed

as close as possible to this value. The OBW is the positive frequency difference between the

two markers.

8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured

bandwidth.

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#### 3.6 Conducted Band Edge

#### 3.6.1 Description of Conducted Band Edge Measurement

Part 96.41 (e) (1) (i)

For CBSD the emission limits outside the fundamental are as follows:

Within 0 MHz to 10 MHz above and below the assigned channel ≤ −13 dBm/MHz

Greater than 10 MHz above and below the assigned channel ≤ -25 dBm/MHz

Part 96.41 (e) (1) (ii)

For End User Devices the emission limits outside the fundamental are as follows:

Within 0 MHz to B MHz above and below the assigned channel ≤ −13 dBm/MHz

Greater than B MHz above and below the assigned channel ≤ -25 dBm/MHz

where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device.

Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

Part 96.41 (e) (2)

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

#### 3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- 2. The band edges of low and high channels for the highest RF powers were measured.
- 3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
- 4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used
- 5. Offset has included the duty factor for LTE Band 48. Duty factor =10 log (1/x), where x is the measured duty cycle.
- 6. Set spectrum analyzer with RMS detector.
- 7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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## 3.7 Conducted Spurious Emission

#### 3.7.1 Description of Conducted Spurious Emission Measurement

96.41 (e)(2)

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

#### 3.7.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
   The path loss was compensated to the results for each measurement.
- 3. The middle channel for the highest RF power within the transmitting frequency was measured.
- 4. The conducted spurious emission for the whole frequency range was taken.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
- 6. Set spectrum analyzer with RMS detector.
- 7. Taking the record of maximum spurious emission.
- 8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 9. The limit line is -40dBm/MHz.

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#### 3.8 Frequency Stability

#### 3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency

#### 3.8.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

- 1. The EUT was set up in the thermal chamber and connected with the system simulator.
- 2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
- 3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

#### 3.8.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

- The EUT was placed in a temperature chamber at 25±5° C and connected with the system 1. simulator.
- 2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
- 3. The variation in frequency was measured for the worst case.

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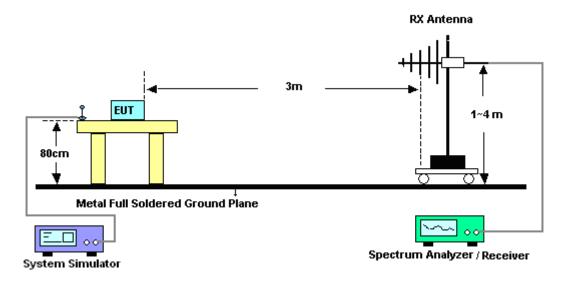
#### 4 Radiated Test Items

### 4.1 Measuring Instruments

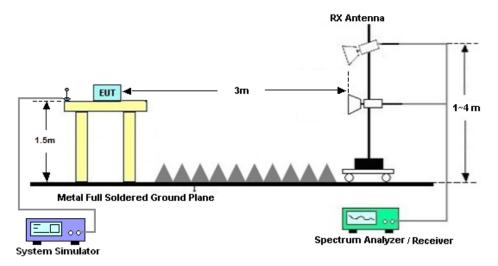
See list of measuring instruments of this test report.

### 4.2 Test Setup

For radiated emissions from 30MHz to 1GHz



#### For radiated emissions above 1GHz



#### 4.3 Test Result of Radiated Test

Please refer to Appendix B.

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#### 4.4 Radiated Spurious Emission

#### 4.4.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E.

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 -40dBm / MHz.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

#### 4.4.2 Test Procedures

- The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
- 2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- 4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
- 6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
- 7. A horn antenna was substituted in place of the EUT and was driven by a signal generator. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

EIRP (dBm) = S.G. Power - Tx Cable Loss + Tx Antenna Gain ERP (dBm) = EIRP - 2.15

8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is -40dBm/MHz

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### 5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Nov. 02, 2019	Aug. 31, 2020	Nov. 01, 2020	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-9605 02	-40~+150°C	Oct. 28, 2019	Aug. 31, 2020	Oct. 27, 2020	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY551502 44	10Hz-44G,MAX 30dB	Apr. 15, 2020	Aug. 31, 2020	Apr. 14, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jan. 03, 2020	Aug. 31, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 20, 2020	Aug. 31, 2020	Apr. 19, 2021	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Aug. 31, 2020	Nov. 09, 2020	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 03, 2020	Aug. 31, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GG A	060728	18~40GHz	Jan. 08, 2020	Aug. 31, 2020	Jan. 07, 2021	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	2025788	1Ghz-18Ghz	Jan. 03, 2020	Aug. 31, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY572801 06	500MHz~26.5G Hz	Oct. 14, 2019	Aug. 31, 2020	Oct. 13, 2020	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F1040900 04	N/A	NCR	Aug. 31, 2020	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Aug. 31, 2020	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Aug. 31, 2020	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

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### FCC RF Test Report

### 6 Uncertainty of Evaluation

#### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of	3.3dB
Confidence of 95% (U = 2Uc(y))	3.3UB

#### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of	2.8dB
Confidence of 95% (U = 2Uc(y))	2.005

#### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of	2.8dB
Confidence of 95% (U = 2Uc(y))	2.000

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### **Appendix A. Test Results of Conducted Test**

## Conducted Output Power(Average power)

#### LTE Band 48:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	
	Cha	nnel		55340	55990	56640	
	Frequen	cy (MHz)	3560	3625	3690		
20	QPSK	100	0	21.65	21.25	21.44	
20	16QAM	100	0	21.25	21.24	21.41	
20	64QAM	100	0	20.01	21.16	20.16	
	Cha	nnel		55315	55990	56665	
	Frequen	cy (MHz)		3557.5	3625	3692.5	
15	QPSK	75	0	21.44	22.11	21.22	
15	16QAM	75	0	20.84	21.32	20.05	
15	64QAM	75	0	19.69	20.11	21.22	
	Cha	nnel		55290	55990	56690	
	Frequen	cy (MHz)		3555	3625	3695	
10	QPSK	50	0	20.85	21.06	21.28	
10	16QAM	50	0	20.91	20.95	21.38	
10	64QAM	50	0	19.85	20.06	20.08	
	Cha	nnel		55265	55990	56715	
	Frequen	cy (MHz)	3552.5	3625	3697.5		
5	QPSK	25	0	20.77	21.22	20.83	
5	16QAM	25	0	20.65	21.12	20.91	
5	64QAM	25	0	19.67	20.03	19.79	

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**EIRP** 

	LTE Band 48 (GT - LC = 17.0 dB) QPSK										
Bandwidth		5M									
Channel	55265	55990	56715								
Channel	(Low)	(Mid)	(High)								
Frequency	3552.5	3625	3697.5								
(MHz)	3332.3	3023	3097.3								
Conducted Power (dBm)	20.77	21.22	20.83								
Conducted Power (Watts)	0.1194	0.1324	0.1211								
EIRP(dBm)	37.77	38.22	37.83								
EIRP(Watts)	5.9841	6.6374	6.0674								

	LTE Band 48 (GT - LC = 17.0 dB) QPSK											
Bandwidth		10M			15M			20M				
Channel	55290	55990	56690	55315	55990	56665	55340 55990 566					
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)			
Frequency	3555	3625	3695	3557.5	3625	3692.5	3560	3625	3690			
(MHz)	3333	3023	3093	3337.3	3023	3092.3	3300	3023	3090			
Conducted Power (dBm)	20.85	21.06	21.28	21.44	22.11	21.22	21.65	21.25	21.44			
Conducted Power (Watts)	0.1216	0.1276	0.1343	0.1393	0.1626	0.1324	0.1462	0.1334	0.1393			
EIRP(dBm)	37.85	38.06	38.28	38.44	39.11	38.22	38.65	38.25	38.44			
EIRP(Watts)	6.0954	6.3973	6.7298	6.9823	8.1470	6.6374	7.3282	6.6834	6.9823			

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	LTE Band 48	G(GT - LC = 17.0 dB) 16QAM									
Bandwidth		5M									
Channel	55265	55990	56715								
Channel	(Low)	(Mid)	(High)								
Frequency	3552.5	3625	3697.5								
(MHz)	3332.3	3023	3097.5								
Conducted Power (dBm)	20.65	21.12	20.91								
Conducted Power (Watts)	0.1161	0.1294	0.1233								
EIRP(dBm)	37.65	38.12	37.91								
EIRP(Watts)	5.8210	6.4863	6.1802								

	LTE Band 48 (GT - LC = 17.0 dB) 16QAM											
Bandwidth		10M			15M		20M					
Channel	55290	55990	56690	55315	55990	56665	55340	55990	56640			
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)			
Frequency	3555	3625	3695	3557.5	3625	3692.5	3560	3625	3690			
(MHz)	3333	3023	3093	3337.3	3023	3092.3	3300	3023	3090			
Conducted Power (dBm)	20.91	20.95	21.38	20.84	21.32	20.05	21.25	21.24	21.41			
Conducted Power (Watts)	0.1233	0.1245	0.1374	0.1213	0.1355	0.1012	0.1334	0.1330	0.1384			
EIRP(dBm)	37.91	37.95	38.38	37.84	38.32	37.05	38.25	38.24	38.41			
EIRP(Watts)	6.1802	6.2373	6.8865	6.0814	6.7920	5.0699	6.6834	6.6681	6.9343			

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	LTE Band 48 (GT - LC = 17.0 dB) 64QAM										
Bandwidth	5M										
Channel	55265	55990	56715								
Channel	(Low)	(Mid)	(High)								
Frequency	3552.5	3625	3697.5								
(MHz)	3552.5	3023	3097.5								
Conducted Power (dBm)	19.67	20.03	19.79								
Conducted Power (Watts)	0.0927	0.1007	0.0953								
EIRP(dBm)	36.67	37.03	36.79								
EIRP(Watts)	4.6452	5.0466	4.7753								

	LTE Band 48 (GT - LC = 17.0 dB) 64QAM											
Bandwidth		10M			15M		20M					
Channel	55290	55990	56690	55315	55990	56665	55340	55990	56640			
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)			
Frequency	3555	3625	3695	3557.5	3625	3692.5	3560	3625	3690			
(MHz)	3333	3023	3093	3337.3	3023	3092.3	3300	3023	3090			
Conducted Power (dBm)	19.85	20.06	20.08	19.69	20.11	21.22	20.01	21.16	20.16			
Conducted Power (Watts)	0.0966	0.1014	0.1019	0.0931	0.1026	0.1324	0.1002	0.1306	0.1038			
EIRP(dBm)	36.85	37.06	37.08	36.69	37.11	38.22	37.01	38.16	37.16			
EIRP(Watts)	4.8417	5.0816	5.1050	4.6666	5.1404	6.6374	5.0234	6.5464	5.2000			

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### LTE Band 48

### **EIRP Power Density**

## Full RB0

Mode		LTE Band 48 : Conducted Power Density (dBm/10MHz)										
BW	5MHz		MHz 10MHz		15MHz		20MHz		5MHz	10MHz	15MHz	20MHz
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	64QAM	64QAM	64QAM	64QAM
Lowest CH	31.79	31.94	29.08	29.08	27.5	27.43	26.83	26.53	30.54	28.01	26.34	25.59
Middle CH	31.9	31.95	29.11	29.44	27.5	27.62	26.61	26.82	30.73	28.16	26.47	25.46
Highest CH	31.56	31.76	29.23	29.29	27.42	27.46	26.58	26.23	30.6	27.77	26.5	25.19
Limit		37dBm /MHz										
Result						Pa	ss					

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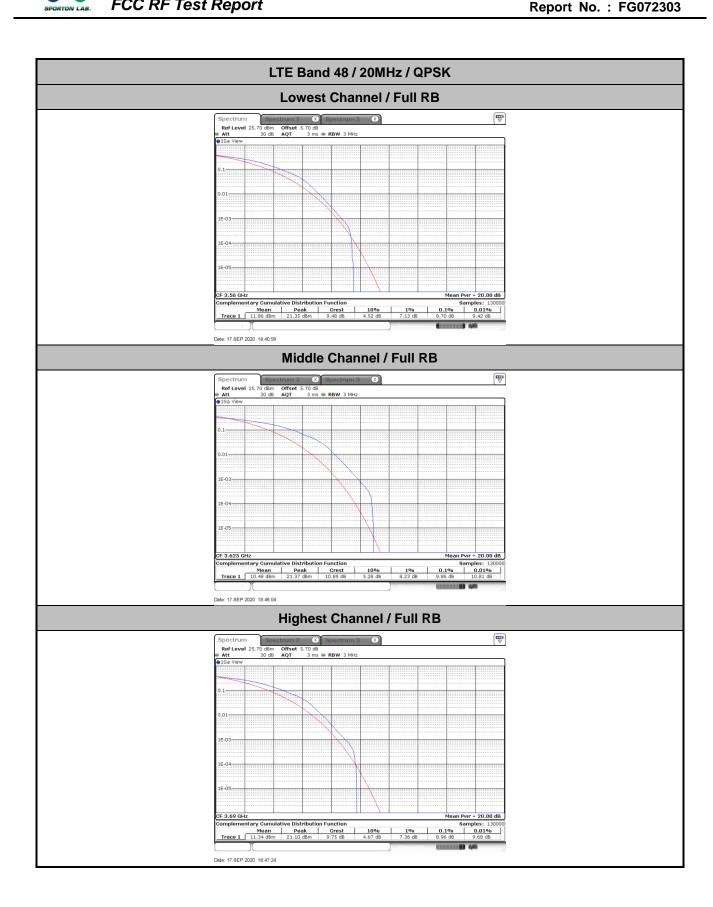
Peak-to-Average Ratio

Mode						
Mod.	QF	PSK	160	Limit: 13dB		
RB Size	-	Full RB	-	Full RB	Result	
Lowest CH	-	8.70	-	8.93		
Middle CH	-	9.86	-	8.96	PASS	
Highest CH	-	8.96	-	9.16		
Mode						
Mod.	640	QAM		Limit: 13dB		
RB Size	-	Full RB	-	-	Result	
Lowest CH	-	8.99	-	-		
Middle CH	-	9.42	-	-	PASS	
Highest CH	_	9.04	_	_		

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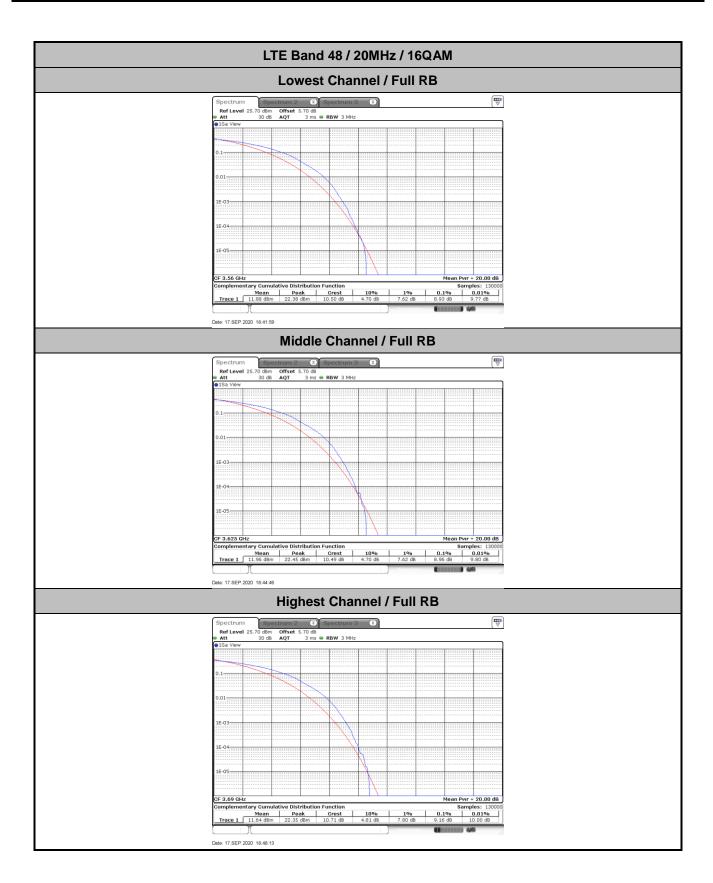
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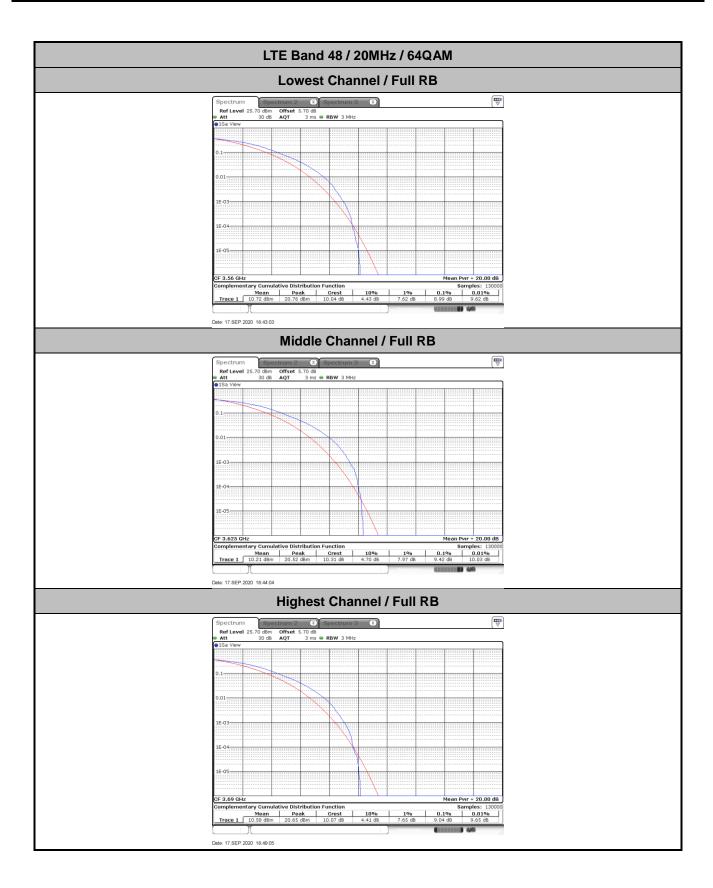




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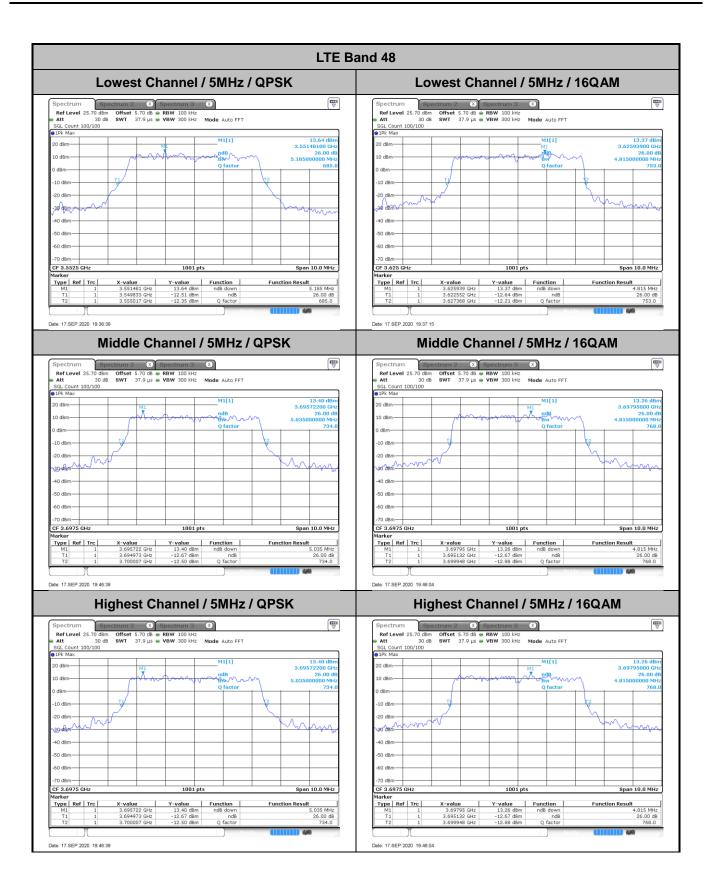
## 26dB Bandwidth

Mode	LTE Band 48 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	5.19	5.22	9.83	9.97	14.15	14.30	18.66	18.66
Middle CH	-	-	-	-	4.82	4.85	9.89	9.61	14.21	14.30	18.66	18.86
Highest CH	-	-	-	-	5.04	4.82	9.69	9.79	14.39	14.18	18.82	18.94
Mode	LTE Band 48 : 26dB BW(MHz)											
BW	1.4MHz 3MHz		lHz	5MHz		10MHz		15MHz		20MHz		
Mod.	64QAM	-	64QAM		64QAM	-	64QAM	-	64QAM	-	64QAM	-
Lowest CH	-	-	-	-	5.05	-	10.07	-	14.39	-	18.86	-
Middle CH	-	-	-	-	4.99	-	9.67	-	14.39	-	18.86	-
Highest CH	-	-	-	-	5.16	-	9.81	-	14.33	-	18.66	-

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LTE Band 48 Lowest Channel / 10MHz / QPSK Lowest Channel / 10MHz / 16QAM Ref Level 25.70 dbm Offset 5.70 db RBW 300 kHz
Att 30 db SWT 19.9 ps VBW 1 MHz Mode Auto FFT
SGL Count 100/100
GJF Max 
 Ref Level
 25.70 dBm
 Offset
 5.70 dB
 ■ RBW
 300 kHz

 Att
 30 dB
 SWT
 18.9 µs
 ■ VBW
 1 MHz
 Mode
 Auto FFT

 SGL Count 100/100
 100/100
 Mode
 Auto FFT
 Mode
 Auto FFT
 14.92 dBm 3.5545800 GHz 26.00 dE 9.830000000 MHz 14.66 dBr 14.66 dBi 3.5593160 GF 26.00 d 9.970000000 MF 20 dBm-20 dBn -30 dBm 50 dBm CF 3.555 GHz Marker 1001 pts Span 20.0 MHz Span 20.0 MHz Type Ref Trc Function Result Type Ref Trc -11.16 dBm -11.49 dBm Date: 17 SEP 2020 19:30:15 Date: 17 SEP 2020 19:29:48 Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM 0 dBm Offset 5.70 dB • RBW 300 kHz 30 dB SWT 18.9 µs • VBW 1 MHz Mode Auto FFT <sup>10</sup> dBm Offset 5.70 dB ⊜ RBW 300 kHz 30 dB SWT 18.9 µs ⊜ VBW 1 MHz Mode Auto FFT 14.79 dE 3.6260790 C 10 dBm -10 dBm-10 dBm CF 3.625 GH Span 20.0 MHz Span 20.0 MHz CF 3.625 GHz 1001 pts Type Ref Trc Y-value 15.54 dBm -9.56 dBm -10.92 dBm Function ndB down Type Ref Trc Function ndB down **Function Result** Function Result Date: 17.SEP.2020 19:32:23 Date: 17.SEP.2020 19:31:58 Highest Channel / 10MHz / QPSK Highest Channel / 10MHz / 16QAM Ref Level 25.70 dBm Offset 5.70 dB ⊕ RBW 300 HHz

Att 2011 Att 20 Ref Level 25.7 Att 14.30 dBs 3.6947000 GF 15.26 dB 3.6946000 G 40 dBm -50 dBn 
 X-value
 Y-value
 Function

 3.6946 GHz
 15.26 dBm
 ndB down

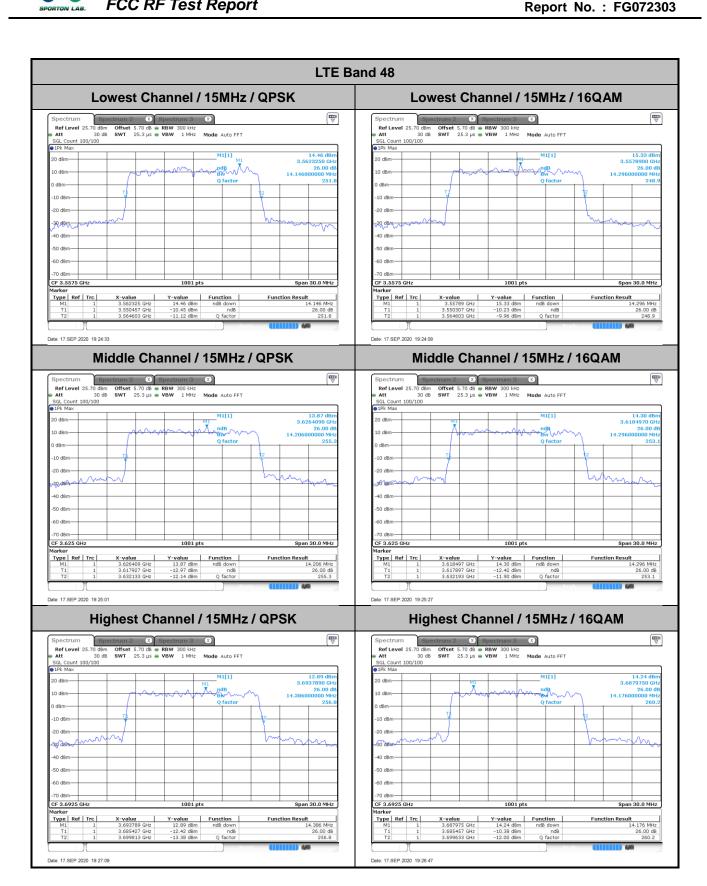
 3.690185 GHz
 -11.30 dBm
 ndB

 3.699875 GHz
 -10.54 dBm
 Q factor
 Marker Type Ref Trc Type Ref Trc Function ndB down

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LTE Band 48 Lowest Channel / 20MHz / QPSK Lowest Channel / 20MHz / 16QAM Ref Level 25.70 dbm Offset 5.70 db RBW 300 kHz
Att 30 db SWT 37.8 μs VBW 1 MHz Mode Auto FFT
SGL Count 100/100
GPF Max Ref Level 25.70 dBm Offset 5.70 dB ● RBW 300 kHz
Att 30 dB SWT 37.8 µs ● VBW 1 MHz Mode Auto FFT
SGL Count 100/100 11.75 dBn 3.5548050 GH 11.77 dBn 3.5615980 GH ...3 d. 26.00 26.00 18.661000000 20 dBm-26.00 d 18.66100000P 20 dBm -30, dBm/ -50 dBm Span 40.0 MHz 1001 Span 40.0 MHz 1001 pts Type Ref Trc Type Ref Trc Date: 17 SEP 2020 18:41:18 Date: 17 SEP 2020 18:42:18 Middle Channel / 20MHz / QPSK Middle Channel / 20MHz / 16QAM 0 dBm Offset 5.70 dB • RBW 300 kHz 30 dB SWT 37.8 µs • VBW 1 MHz Mode Auto FFT <sup>10</sup> dBm Offset 5.70 dB ⊜ RBW 300 kHz 30 dB SWT 37.8 µs ⊜ VBW 1 MHz Mode Auto FFT 12.97 dE 3.6179670 -10 dBm 10 dBm 50 dBm CF 3.625 GH Span 40.0 MHz Span 40.0 MHz CF 3.625 GHz 1001 pts Function Result 18.661 MHz 26.00 dB 193.9 Function Result 18.861 MHz 26.00 dB 192.2 Type Ref Trc Function and down Type Ref Trc Y-value 13.07 dBn Function ndB down Date: 17.SEP.2020 18:45:08 Date: 17.SEP.2020 18:46:23 Highest Channel / 20MHz / 16QAM Highest Channel / 20MHz / QPSK Ref Level 25.7 Att 11.95 dB 3.6862040 GF 11.68 dBs 3.6935160 GF 40 dBm 50 dBn X-value Y-value Function
3.686204 GHz 11.95 dBm ndB down
3.689049 GHz -15.79 dBm ndB
3.699471 GHz -14.38 dBm O faster Marker Type Ref Trc Type Ref Trc Function ndB down

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LTE Band 48 Lowest Channel / 5MHz / 64QAM Lowest Channel / 10MHz / 64QAM **T** Ref Level 25.70 dbm Offset 5.70 db RBW 300 kHz
Att 30 db SWT 19.9 ps VBW 1 MHz Mode Auto FFT
SGL Count 100/100
GJF Max Ref Level 25.70 dBm Offset 5.70 dB ● RBW 100 kHz
Att 30 dB SWT 37.9 µs ● VBW 300 kHz Mode Auto FFT
SGL Count 100/100 11.95 dBr 13.56 dBr 13.56 dB 3.5557990 GF 26.00 d 10.070000000 MF 20 dBm-20 dBm -30 dBm 50 dBm Span 10.0 MHz 1001 pts Span 20.0 MHz Function Result
5.045 MHz
26.00 dB
704.6 Type Ref Trc Type Ref Trc Date: 17 SEP 2020 19:35:46 Date: 17 SEP 2020, 19:30:50 Middle Channel / 5MHz / 64QAM Middle Channel / 10MHz / 64QAM 0 dBm Offset 5.70 dB • RBW 100 kHz 30 dB SWT 37.9 µs • VBW 300 kHz Mode Auto FFT <sup>10</sup> dBm Offset 5.70 dB ⊜ RBW 300 kHz 30 dB SWT 18.9 µs ⊜ VBW 1 MHz Mode Auto FFT 11.16 dB 3.62455000 C 20 dBm 10 dBm -10 dBm-10 dBm CF 3.625 GH Function Result
4.985 MHz
26.00 dB
727.1 Span 10.0 MHz Span 20.0 MHz CF 3.625 GHz 1001 pts Type Ref Trc Y-value 12.88 dBm -13.46 dBm -14.03 dBm Function and down Type Ref Trc Function ndB down Function Result Date: 17.SEP.2020 19:39:05 Date: 17.SEP.2020 19:31:29 Highest Channel / 5MHz / 64QAM Highest Channel / 10MHz / 64QAM Ref Level 25.70 dBm Offset 5.70 dB ⊕ RBW 300 HHz

Att 2011 Att 20 Ref Level 25.7 Att 12.87 dBi 3.6950200 13.56 dB 3.5557990 GF 40 dBm -50 dBn Marker Type Ref Trc Type Ref Trc 
 X-value
 Y-value
 Function

 3.555799 GHz
 13.56 dBm
 ndB down
 Function ndB down

#### Sporton International (Kunshan) Inc.

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Report No.: FG072303

Report No.: FG072303 LTE Band 48 Lowest Channel / 15MHz / 64QAM Lowest Channel / 20MHz / 64QAM 0 dBm Offset 5.70 dB • RBW 300 kHz 30 dB SWT 37.8 µs • VBW 1 MHz Mode Auto FFT 12.00 dBr 3.5571230 CF 10 dBm 10 dBm -10 dBm 30 dBm Span 30.0 MHz 1001 pts 1001 pts Span 40.0 MHz CF 3.5575 GHz CF 3.56 GH Function Result 14.386 MH Type Ref Trc Type Ref Trc Function ndB down Function Result Date: 17.SEP.2020 19:23:40 Date: 17.SEP.2020 18:43:21 Middle Channel / 20MHz / 64QAM Middle Channel / 15MHz / 64QAM Ref Level 25.70 dBm Offset 5.70 dB @ RBW 300 Hz

Att 30 dB SWT 37.8 µs @ VBW 1 MHz

SGL Count 100/100

DF Max 12.04 dB 3.6291960 GF 26.00 d 11.65 dBr 3.6271180 GF 20 dBm 40 dBm -50 dBm CF 3.625 GHz Span 40.0 MHz CF 3.625 GHz Span 30.0 MHz Y-value 11.65 dBm -14.84 dBm -14.95 dBm Type Ref Trc Type Ref Trc Highest Channel / 15MHz / 64QAM Highest Channel / 20MHz / 64QAM ctrum 2 X Spectrum 3 X Ref Level 25.70 dBm Offset 5.70 dB RBW 300 kHz
Att 30 db SWT 25.3 µs VBW 1 MHz Mode Auto FFT
61Pk Max 11.60 dBn 3.6913610 GH 26.00 dl 14.326000000 MH M1[1] M1[1] 0 dBm-20 dBm--50 dBm CF 3.6925 GHz 1001 pts Span 30.0 MHz CF 3.69 GH; 1001 pts Function Result 18.661 MHz 26.00 dB 197.6 Span 40.0 MHz Function Result 14.326 Mi 26.00

Type Ref Trc

Date: 17.SEP.2020 18:49:23

3.680649 GHz 3.699311 GHz

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Date: 17.SEP.2020 19:26:23

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## **Occupied Bandwidth**

Mode	LTE Band 48 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	4.49	4.49	9.01	9.03	13.43	13.46	17.90	17.82
Middle CH	-	-	-	-	4.48	4.51	9.07	9.09	13.40	13.46	17.98	17.86
Highest CH	-	-	-	-	4.55	4.57	9.01	9.11	13.52	13.46	17.94	17.86
Mode	LTE Band 48 : 99%OBW(MHz)											
BW	1.4MHz 3MHz			lHz	5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM	-	64QAM	-	64QAM	-	64QAM	-	64QAM	-	64QAM	-
Lowest CH	-	-	-	-	4.53	-	9.03	-	13.40	-	17.90	-
Middle CH	-	-	-	-	4.49	-	8.95	-	13.37	-	17.74	-
Highest CH	-	-	-	-	4.56	-	9.03	-	13.49	-	17.82	-

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Report No.: FG072303

LTE Band 48 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM Ref Level 25,70 d8m Offset 5,70 d8 © RBW 100 kHz

Att 30 d8 SWT 37,9 µs © VBW 300 kHz Mode Auto FFT

SGL Count 100/100

1Pk Max Ref Level 25.70 d8m Offset 5.70 d8 RBW 100 kHz

Att and 100,100
GUE Mark
GUE Count 100,100
GUE Mark 12.52 dBn 3.55113100 GH 4.485514486 MH 13.21 dBr 3.55109100 GH 4.485514486 MH M1[1] M1[1] 20 dBm--30 dBm--36\dBm/△ 50 dBm -50 dBm CF 3.5525 GHz 1001 pts 1001 pts CF 3.5525 GHz Marker Y-value Function

12.52 dBm

6.42 dBm Occ Bw

7.15 dBm Function Result X-value 3.551091 GHz 3.5502622 GHz 3.5547478 GHz Type Ref Trc Type Ref Trc 4.485514486 MHz 4.485514486 MHz Date: 17 SEP 2020 19:36:28 Date: 17 SEP 2020 19:36:01 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM 0 dBm Offset 5.70 dB • RBW 100 kHz 30 dB SWT 37.9 µs • VBW 300 kHz Mode Auto FFT SGL Count 100/100 SGL Count 100/100 20 dBm-10 dBm -10 dBm--10 dBm GordBm^ -40 dBm -50 dBm 60 dBm CF 3.625 GHz 1001 pts Span 10.0 MHz 1001 pts Span 10.0 MHz CF 3.625 GHz | Y-value | Function |
| 2 | 13.56 dBm | |
| 2 | 8.66 dBm | | Occ Bw |
| 3 | 2 | 8.21 dBm | Type Ref Trc Function Y-value 12.89 dBn Function Result Function Result 4.475524476 MHz Occ Bw 4.505494505 MHz Date: 17.SEP.2020 19:37:05 Date: 17.SEP.2020 19:37:34 Highest Channel / 5MHz / 16QAM Highest Channel / 5MHz / QPSK Spectrum 2 X Spectrum 3 X Spectrum 2 × Spectrum 3 × Ref Level 25.70 dBm Offset 5.70 dB @ RBW 100 HHz
Att 2 30 dB SWT 37.9 µs @ VBW 300 HHz Mode Auto FFT
SGL Count 100/100 Ref Level 25.7 Att 13.08 dBi 3.69539200 GF 13.65 dB 3.69648100 GF 4.545454545 MF 10 dBm 20 dBm 40 dBm -50 dBm Span 10.0 MHz Type Ref Trc 
 X-value
 Y-value
 Function

 3.695392 GHz
 13.08 dBm
 Type Ref Trc 
 X-value
 Y-value
 Function

 3.696481 GHz
 13.65 dBm
 Occ Bw Occ Bw

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LTE Band 48 Lowest Channel / 10MHz / QPSK Lowest Channel / 10MHz / 16QAM Ref Level 25.70 d8m Offset 5.70 d8 RBW 300 kHz

Att and 100,100
GIR Mar. 19.9 µs VBW 1 MHz Mode Auto FFT
GIR Count 100,100 15.51 dBr 3.5543210 GH M1[1] 14.24 dBn 3.5550400 GH M1[1] 20 dBm-9.010989011 MH 20 dBm 30 dBm 50 dBm -50 dBm 1001 pts CF 3.555 GHz Marker 1001 pts Y-value Function

15.51 dBm

7.45 dBm Occ Bw

8.76 dBm X-value 3.554321 GHz 3.5505045 GHz 3.5595355 GHz Type Ref Trc Function Result Type Ref Trc 9.010989011 MHz 9.030969031 MHz Date: 17 SEP 2020 19:30:05 Date: 17 SEP 2020 19:29:39 Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM 0 dBm Offset 5.70 dB • RBW 300 kHz 30 dB SWT 18.9 µs • VBW 1 MHz Mode Auto FFT SGL Count 100/100 SGL Count 100/100 20 dBm-10 dBm -10 dBm--10 dBm -40 dBm -50 dBm 60 dBm CF 3.625 GHz 1001 pts Span 20.0 MHz 1001 pts Span 20.0 MHz CF 3.625 GHz | Y-value | Function |
| 2 | 13.78 dBm | |
| 2 | 9.38 dBm | | Occ Bw |
| 2 | 9.08 dBm | Type Ref Trc Y-value 15.32 dBm 8.82 dBm 9.14 dBm Function Function Result Function Result 9.070929071 MHz Occ Bw 9.090909091 MHz Date: 17.SEP.2020 19:31:48 Date: 17.SEP.2020 19:32:13 Highest Channel / 10MHz / QPSK Highest Channel / 10MHz / 16QAM Spectrum 2 X Spectrum 3 X Ref Level 25.70 dBm Offset 5.70 dB ⊕ RBW 300 HHz

Att 2010 100 100 SWT 18.9 µs ⊕ VBW 1 MHz Mode Auto FFT
SGL Count 100/100 Ref Level 25.7 Att 9011 MH 9.110889111 M 10 dBm 10 dBm 20 dBm 40 dBm -50 dBm Span 20.0 MHz 
 X-value
 Y-value
 Function

 3.693262 GHz
 13.82 dBm
 3.6934645 GHz

 3.6994755 GHz
 7.93 dBm
 Occ Bw

 X-value
 Y-value
 Function

 3.694201 GHz
 15.29 dBm
 Occ Bw

 3.6904446 GHz
 8.83 dBm
 Occ Bw

 3.6995554 GHz
 9.57 dBm
 Type Ref Trc Type Ref Trc 9.010989011 MHz 9.110889111 MHz

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Report No.: FG072303

LTE Band 48 Lowest Channel / 15MHz / QPSK Lowest Channel / 15MHz / 16QAM Ref Level 25.70 d8m Offset 5.70 d8 RBW 300 kHz

Att and 100,100

GUE Mark

GUE Mark

Att ount 100,100

GUE Mark 13.34 dBn 3.5539940 14.32 dBr 3.5582190 GH 13.426573427 MH M1[1] 20 dBm-20 dBm 30 dBm--40 dBm -50 dBm CF 3.5575 GHz 1001 pts 1001 pts CF 3.5575 GHz Marker Y-value Function
14.32 dBm
7.51 dBm Occ Bw
7.73 dBm Function Result X-value 3.553994 GHz 3.5507567 GHz 3.5642133 GHz Type Ref Trc Type Ref Trc 13.426573427 MHz 8.26 dBm 6.91 dBm Date: 17 SEP 2020 19:24:25 Date: 17 SEP 2020 19:24:00 Middle Channel / 15MHz / QPSK Middle Channel / 15MHz / 16QAM 0 dBm Offset 5.70 dB ● RBW 300 kHz 30 dB SWT 25.3 µs ● VBW 1 MHz Mode Auto FFT SGL Count 100/100 SGL Count 100/100 20 dBm 10 dBm -10 dBm--10 dBm 50 dBm 60 dBm CF 3.625 GHz 1001 pts Span 30.0 MHz 1001 pts Span 30.0 MHz CF 3.625 GHz | Y-value | Function |
| 2 | 13.13 dBm |
| 2 | 8.70 dBm | Occ Bw |
| 2 | 7.44 dBm | Type Ref Trc Y-value 12,58 dBn Function Function Result **Function Result** 13.396603397 MHz Occ Bw 13.456543457 MHz Date: 17.SEP.2020 19:25:19 Date: 17.SEP.2020 19:24:53 Highest Channel / 15MHz / QPSK Highest Channel / 15MHz / 16QAM Spectrum 2 X Spectrum 3 X Spectrum 2 X Spectrum 3 Ref Level 25.70 dBm Offset 5.70 dB ⊕ RBW 300 HHz

Att 25.3 μs ⊕ VBW 1 MHz Mode Auto FFT

SGL Count 100/100 Ref Level 25.7 Att 13.516483516 MF 10 dBm 10 dBm 20 dBm 40 dBm -50 dBm 60 dBn Span 30.0 MHz 
 X-value
 Y-value
 Function

 3.691841 GHz
 12.22 dBm

 3.6959968 GHz
 8.27 dBm
 Occ Bw

 3.6992133 GHz
 7.86 dBm

 X-value
 Y-value
 Function

 3.699113 GHz
 12.97 dBm
 Occ Bw

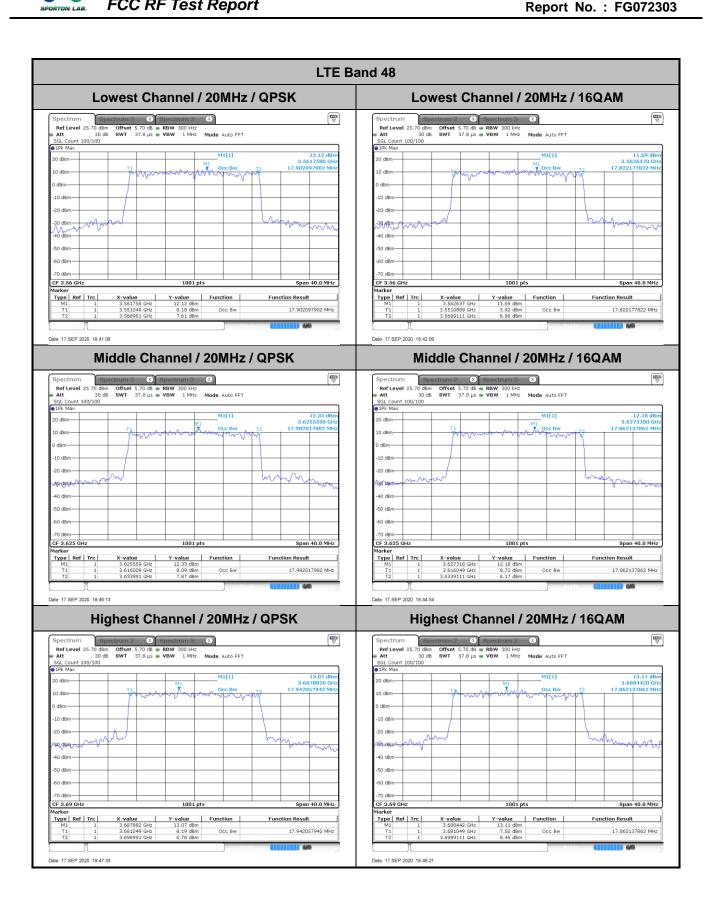
 3.6957268 GHz
 8.94 dBm
 Occ Bw

 3.6991833 GHz
 7.45 dBm
 Type Ref Trc Type Ref Trc 13.516483516 MHz 13.456543457 MHz

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LTE Band 48 Lowest Channel / 5MHz / 64QAM Lowest Channel / 10MHz / 64QAM Ref Level 25.70 d8m Offset 5.70 d8 RBW 100 Hz

att 30 d8 SWT 37.9 µs VBW 300 kHz Mode Auto FFT

50L Count 100/100

1Pk Max 11.24 dBi 3.55136100 GH 4.525474525 MH 12.88 dBr 3.5543610 GH M1[1] 20 dBm-20 dBm -30 dBm 50 dBm -50 dBm CF 3.5525 GHz 1001 pts 1001 pts Span 10.0 MHz CF 3.555 GHz Marker Y-value Function
11.24 dBm
5.80 dBm Occ Bw
5.37 dBm Y-value Function

12.88 dBm

7.36 dBm Occ Bw

7.13 dBm Function Result X-value 3.554361 GHz 3.5504845 GHz 3.5595155 GHz Type Ref Trc Type Ref Trc 4.525474525 MHz 9.030969031 MHz Date: 17 SEP 2020 19:35:36 Date: 17 SEP 2020 19:30:38 Middle Channel / 5MHz / 64QAM Middle Channel / 10MHz / 64QAM 0 dBm Offset 5.70 dB • RBW 100 kHz 30 dB SWT 37.9 µs • VBW 300 kHz Mode Auto FFT SGL Count 100/100 SGL Count 100/100 1Pk Max 20 dBm-10 dBm -10 dBm--10 dBm--40 dBm 50 dBm 60 dBm CF 3.625 GHz 1001 pts Span 10.0 MHz 1001 pts Span 20.0 MHz CF 3.625 GHz Type Ref Trc Y-value Function Y-value 14,78 dBn Function Function Result **Function Result** Occ Bw 4.485514486 MHz Occ Bw 8.951048951 MHz Date: 17.SEP.2020 19:31:21 Date: 17.SEP.2020 19:38:56 Highest Channel / 10MHz / 64QAM Highest Channel / 5MHz / 64QAM Spectrum 2 X Spectrum 3 X Ref Level 25.70 dBm Offset 5.70 dB ⊕ RBW 300 HHz

Att 2010 100 100 SWT 18.9 µs ⊕ VBW 1 MHz Mode Auto FFT
SGL Count 100/100 Ref Level 25.7 Att 13.32 dB 3.69873900 GF 14.05 dB: 3.6945200 GF 4.555444555 MF 10 dBm 10 dBm 20 dBm 40 dBm -50 dBm 60 dBn Span 20.0 MHz 
 X-value
 Y-value
 Function

 3.69452 GHz
 14.05 dBm

 3.6904446 GHz
 7.81 dBm
 Occ Bw

 3.6994755 GHz
 6.86 dBm
 Type Ref Trc Type Ref Trc 
 X-value
 Y-value
 Function

 3.698739 GHz
 13.32 dBm
 Occ Bw 4.555444555 MHz 9.030969031 MHz

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LTE Band 48 Lowest Channel / 15MHz / 64QAM Lowest Channel / 20MHz / 64QAM SGL Count 100/100 0 dBm-20 dBm-10 dBm 10 dBm-10 dBm -10 dBm 20 dBm -30 dBm--30 dBm\_-60 dBm 1001 pts Span 30.0 MHz 1001 pts Span 40.0 MHz CF 3.5575 GHz CF 3.56 GH Y-value Function
11.97 d8m
6.25 d8m Occ Bw
6.46 d8m Type Ref Trc Y-value Function Function Result Type Ref Trc Function Result 13.396603397 MHz Occ Bw 17.902097902 MHz Date: 17.SEP.2020 19:23:31 Date: 17.SEP.2020 18:43:12 Middle Channel / 15MHz / 64QAM Middle Channel / 20MHz / 64QAM Ref Level 25.70 dBm Offset 5.70 dB RBW 300 kHz

att 30 dB SWT 37.8 µs VBW 1 MHz Mode Auto FFT SGL Count 100/100

1Pk Max 12.41 dBi 3.6238810 GF 17.742257742 MF 13.33 dBr 3.6312940 GH 20 dBm dBm-20 dBm -40 dBm -50 dBm CF 3.625 GHz Span 40.0 MHz CF 3.625 GHz 1001 pts 1001 pts 
 X-value
 Y-value
 Function

 3.631294 GHz
 13.33 dBm
 3.6189167 GHz

 3.6189167 GHz
 7.85 dBm
 Occ Bw

 3.6316893 GHz
 7.11 dBm
 X-value 3.623881 GHz Type Ref Trc Function Result Type Ref Trc 13.366633367 MHz 17.742257742 MHz Highest Channel / 15MHz / 64QAM Highest Channel / 20MHz / 64QAM Spectrum 2 X Spectrum 3 X Spectrum 2 X Spectrum 3 X M1[1] M1[1] 20 dBm-20 dBmdBm-10 dBm an dem-30,dBm/ -50 dBm -50 dBm CF 3.6925 GHz 1001 pts Span 30.0 MHz CF 3.69 GH; 1001 pts Span 40.0 MHz Type Ref Trc Function Function Result Function **Function Result** Occ Bw 13.486513487 MHz Occ Bw 17.822177822 MHz 3.681049 GHz 3.6988711 GHz T1 T2

Date: 17.SEP.2020 18:49:14

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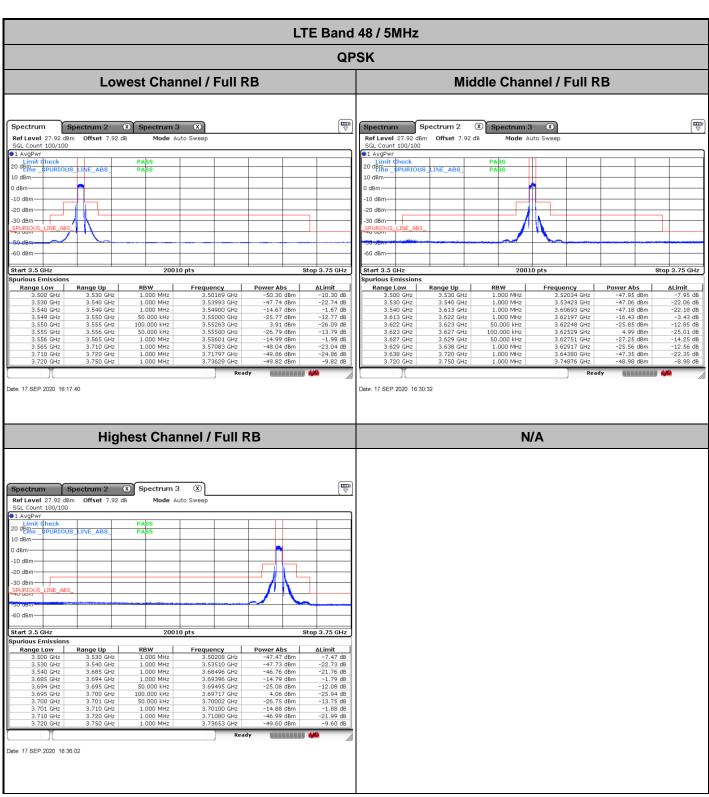
Date: 17.SEP.2020 19:26:15

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### **Conducted Band Edge**



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