



FCC RADIO TEST REPORT

FCC ID : A4RG020J

Equipment : Phone Model Name : G020J

Applicant : Google LLC

1600 Amphitheatre Parkway,

Mountain View, California, 94043 USA

Standard : 47 CFR Part 2, 96

The product was received on Nov. 07, 2018 and testing was started from Apr. 07, 2019 and completed on Jun. 27, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai

Ince/sus

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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Report Template No.: BU5-FGLTE96 Version 2.4

Page Number : 2 of 25

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Report No. : FG8N0620-05F

Report Version : 01

History of this test report

Report No.: FG8N0620-05F

Report No.	Version	Description	Issued Date
FG8N0620-05F	01	Initial issue of report	Jun. 28, 2019

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Summary of Test Result

Report No.: FG8N0620-05F

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	
3.4	§96.41	Effective Isotropic Radiated Power	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 §96.41	Conducted Spurious Emission	Pass	
3.8	§2.1055	Frequency Stability for Temperature & Voltage	Pass	-
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	Under limit 3.01 dB at 21696.000 MHz

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.

Reviewed by: Wii Chang
Report Producer: Yimin Ho

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1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature							
Equipment	Phone						
Model Name	G020J						
FCC ID	A4RG020J						
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC/GNSS/WPC WLAN 11b/g/n HT20/VHT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE 60 GHz Low Power Transmitter						
EUT Stage	Identical Prototype						

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Remark: The above EUT's information was declared by manufacturer.

	EUT Information List									
No.	S/N									
#1	92UBA06699									
#2	958BA00AJH									

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard						
Tx Frequency	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz					
Rx Frequency	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz					
Bandwidth	LTE Band 48: 5 MHz / 10 MHz / 15 MHz / 20 MHz					
Maximum Output Power to Antenna	LTE Band 48: 22.35 dBm					
	<ant. 1=""></ant.>					
Antenna Type	LTE Band 48: IFA Antenna type with gain -1.0 dBi					
Antenna Type	<ant. 6=""></ant.>					
	LTE Band 48: IFA Antenna type with gain 0.6 dBi					
Type of Modulation	QPSK / 16QAM / 64QAM					

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

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1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory				
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978				
Test Site No.	Sporton Site No.				
rest Site No.	TH05-HY				
Test Engineer	George Chen				
Temperature	22-25 ℃				
Relative Humidity	52-55%				

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Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications					
	Laboratory					
	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist.,					
Test Site Location	Taoyuan City, Taiwan (R.O.C.)					
lest site Location	TEL: +886-3-327-0868					
	FAX: +886-3-327-0855					
Test Site No.	Sporton Site No.					
rest site No.	03CH12-HY					
Test Engineer	Jack Cheng, Lance Chiang, Chuan Chu					
Temperature	22-26℃					
Relative Humidity	54-60%					

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW0007

1.5 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 414788 D01 Radiated Test Site v01r01.
- FCC KDB 940660 D01 Part 96 CBRS Eqpt 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.

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For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z with Accessory (Earphone or Adapter).

<Adapter Mode>

LTE Band 48
Y plane for Ant. 1
Z plane for Ant. 6
Y plane with WPC Charging Mode

			Ва	andwid	lth (MH	lz)		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	v	v	v	v	v	v	v	v	v	v
EIRP Power	48	•	-	٧	٧	٧	٧	v	v	v	٧		٧	٧	٧	٧
26dB and 99% Bandwidth	48	•	•	٧	٧	v	v	v	v	v			v	٧	٧	v
Conducted Band Edge	48	•	•	v	v	v	v	v	v	v	٧		v	v		v
Peak-to-Aver age Ratio	48	-	-				v	v	v	v	v		v	v	v	v
Conducted Spurious Emission	48	-	•	v	v	v	v	v	v	v	v		v	v	v	v
E.R.P / E.I.R.P	48	•	•	٧	٧	v	v	v	v	v	٧			٧	v	v
Frequency Stability	48	•	•		٧			v	v	v	٧			٧	v	v
Radiated Spurious Emission	48	Worst Case v v								v	v					
1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. All the radiated test cases were performed with Adapter 1.							nder									

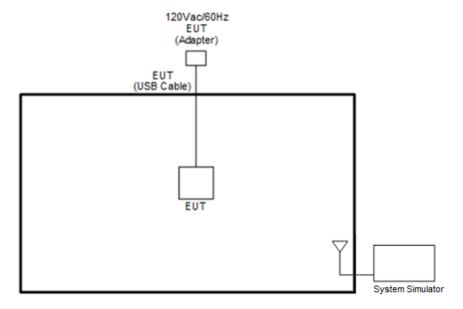
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Test Items	Band		Bandwidth (MHz)										Modulation			RB#			Test Channel		
rest items		20+20	20+15	15+20	20+10	10+20	20+5	5+20	15+15	15+10	10+15	QPSK	16QAM	64QAM	1	Half	Full	L	М	н	
Max. Output Power	48_CA	v	v	v	v	v	v	v	-	-		v	v	٧	٧	>	٧	v	v	٧	
26dB and 99% Bandwidth	48_CA	v	v	v	v	v	v	v	-	-	-	v	v	v			v	v	v	v	
Conducted Band Edge	48_CA	v	v	v	v	>	>	v	-	•	-	٧	v	v	٧		>	٧		v	
Conducted Spurious Emission	48_CA	v	v	v	v	٧	٧	v	-	•	-	٧	v	v	٧			٧	٧	v	
E.I.R.P.	48_CA	v	v	v	v	٧	٧	v	-	•	-	٧	v	v	٧			٧	٧	v	
Radiated Spurious Emission	48_CA	_CA Worst Case v								>	v										
Remark	 The mark "v" means that this configuration is chosen for testing The mark "-" means that this bandwidth is not supported. 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. All the radiated test cases were performed with Adapter 1. 																				

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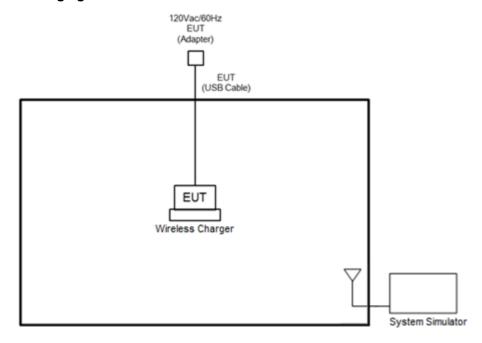
2.2 Connection Diagram of Test System

<For Adapter Mode>



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<For WPC Charging Mode>



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2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord	
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m	

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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 and attenuator factor 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 and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example:

Offset(dB) = RF cable loss(dB) + attenuator factor(dB). = 4.2 + 10 = 14.2 (dB)

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					
10	Channel	55290	55990	56690					
10	Frequency	3555.0	3625.0	3695.0					
5	Channel	55265	55990	56715					
5	Frequency	3552.5	3625.0	3697.5					

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	LTE Ba	nd 48 Carrier Aggre	gation Channel an	nd Frequency List	
	D00	Channel	55340	55891	56442
	PCC	Frequency	3560.0	3615.1	3670.2
20 + 20	000	Channel	55538	56089	56640
	SCC	Frequency	3579.8	3634.9	3690.0
	PCC	Channel	55340	55916	56491
20 + 15	PCC	Frequency	3560.0	3617.6	3675.1
20 + 15	SCC	Channel	55511	56087	56662
	300	Frequency	3577.1	3634.7	3692.2
	PCC	Channel	55318	55893	56469
15 + 20	1 100	Frequency	3557.8	3615.3	3672.9
15 + 20	SCC	Channel	55489	56064	56640
	SCC	Frequency	3574.9	3632.4	3690.0
	PCC	Channel	55340	55941	56541
20 + 10		Frequency	3560.0	3620.1	3680.1
20 + 10	SCC	Channel	55484	56085	56685
		Frequency	3574.4	3634.5	3694.5
	PCC	Channel	55295	55896	56496
10 + 20	PCC	Frequency	3555.5	3615.6	3675.6
10 + 20	SCC	Channel	55439	56040	56640
	300	Frequency	3569.9	3630.0	3690.0
	PCC	Channel	55340	55965	56590
20 + 5	FOC	Frequency	3560.0	3622.5	3685.0
20+3	SCC	Channel	55457	56082	56707
	300	Frequency	3571.7	3634.2	3696.7
	PCC	Channel	55273	55898	56523
5 + 20		Frequency	3553.3	3615.8	3678.3
3 + 20	SCC	Channel	55390	56015	56640
	300	Frequency	3565.0	3627.5	3690.0

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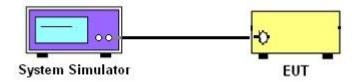
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

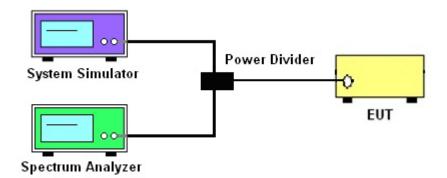
3.1.1 Test Setup

3.1.2 Conducted Output Power

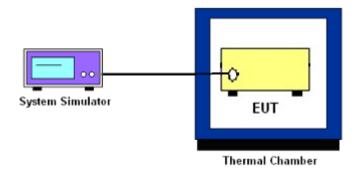


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3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission



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.

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3.2.2 Test Procedures

The transmitter output port was connected to the system simulator.

Set EUT at maximum power through the system simulator.

Select lowest, middle, and highest channels for each band and different modulation.

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.

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3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

- 1. 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 Power

3.4.1 Description of the EIRP Power

The EIRP of mobile transmitters must not exceed 23 dBm /10 megahertz for LTE Band 48.

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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

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

EIRP for CBRS equipment as below tabel:

Device	Maximum EIRP
201100	(dBm/10 MHz)
End User Device	23
Category A CBSD	30
Category B CBSD	47

3.4.2 Test Procedures

The testing follows procedure in Section 5.2 of ANSI C63.26-2015 and KDB 940660 D01 Part 96 Eqpt v02 Section 3.2(b)(2)

Determine the EIRP by adding the effective antenna gain to the measured average conducted power level.

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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

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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

The conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

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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. Set spectrum analyzer with RMS detector.
- 6. 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

Emission and interference limits: the device satisfies the emission limits specified in Section FCC Part 96.41 e) 1) ii) & e) 2) at the lowest and highest edges of the band, and in the middle of the band.

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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

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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.
- 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.

- 1. The EUT was placed in a temperature chamber at 25±5° C and connected with the system 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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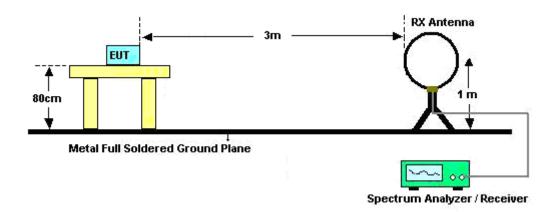
4 Radiated Test Items

4.1 Measuring Instruments

See list of measuring instruments of this test report.

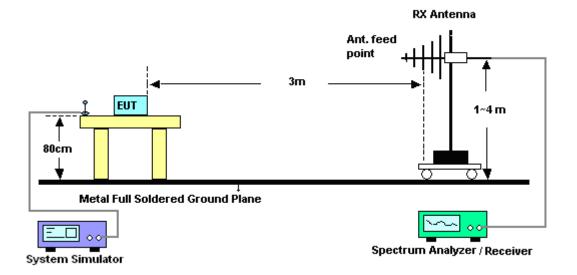
4.2 Test Setup

For radiated emissions below 30MHz



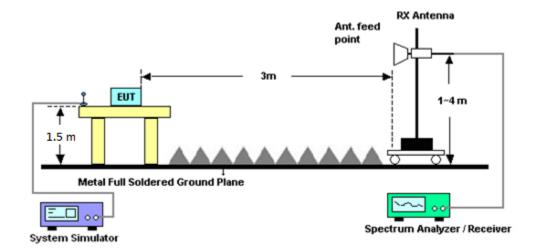
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For radiated emissions from 30MHz to 1GHz



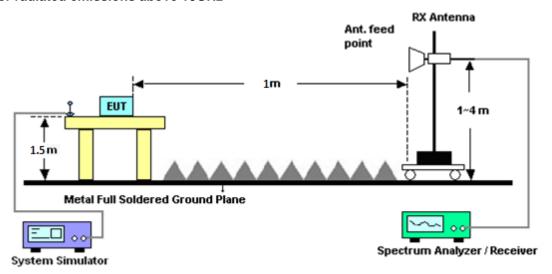
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For radiated emissions from 1GHz to 18GHz



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For radiated emissions above 18GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

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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.

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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 testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

- 1. 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.
- 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<math>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
Base Station (Measure)	Anritsu	MT8821C	6201664755	GSM / GPRS /WCDMA / LTE FDD/TDD with 44) /LTE-3CC DLCA,2CC ULCA	Mar. 03, 2019	Apr. 07, 2019~ Jun. 27, 2019	Mar. 02, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 13, 2018	Apr. 07, 2019~ Jun. 27, 2019	Nov. 12, 2019	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40°C~90°C	Aug. 29, 2018	Apr. 07, 2019~ Jun. 27, 2019	Aug. 28, 2019	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 02, 2018	Apr. 07, 2019~ Jun. 27, 2019	Oct. 01, 2019	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SM A Directional Coupler	#A	1-18GHz	Jan. 14, 2019	Apr. 07, 2019~ Jun. 27, 2019	Jan. 13, 2020	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	May 28, 2019~ Jun. 20, 2019	Jan. 06, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802N 1D01N-06	47020&06	30MHz to 1GHz	Oct. 13, 2018	May 28, 2019~ Jun. 20, 2019	Oct. 12, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-1212	1GHz ~ 18GHz	Oct. 19, 2018	May 28, 2019~ Jun. 20, 2019	Oct. 18, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-1326	1GHz ~ 18GHz	Oct. 30, 2018	May 28, 2019~ Jun. 20, 2019	Oct. 29, 2019	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917058 4	18GHz ~ 40GHz	Dec. 05, 2018	May 28, 2019~ Jun. 20, 2019	Dec. 04, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2019	May 28, 2019~ Jun. 20, 2019	Mar. 24, 2020	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5Ghz	May. 28, 2018	May 28, 2019~ Jun. 20, 2019	May. 26, 2020	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-303	17100018000 55007	1GHz~18GHz	Apr. 01, 2019	May 28, 2019~ Jun. 20, 2019	Mar. 31, 2020	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	May 28, 2019~ Jun. 20, 2019	Dec. 05, 2019	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 26, 2018	May 28, 2019~ Jun. 20, 2019	Dec. 25, 2019	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Dec. 19, 2018	May 28, 2019~ Jun. 20, 2019	Dec. 18, 2019	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP161243	N/A	May. 11, 2019	May 28, 2019~ Jun. 20, 2019	May. 10, 2020	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	175727	100kHz~40GHz	Dec. 23, 2018	May 28, 2019~ Jun. 20, 2019	Dec. 23, 2019	Radiation (03CH12-HY)

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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Filter	Wainwright	WLK4-1000-153 0-6000-40SS	SN11	1 GHz Lowpass	Sep. 16, 2018	May 28, 2019~ Jun. 20, 2019	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-1080- 1200-1500-60S S	SN2	1.2G High Pass	Sep. 16, 2018	May 28, 2019~ Jun. 20, 2019	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700- 3000-18000-60 ST	SN2	3GHz High Pass	Mar. 20, 2019	May 28, 2019~ Jun. 20, 2019	Mar. 19, 2020	Radiation (03CH12-HY)
Notch Filter	EWT	EWT-14-0041	D1	DCS 1800	Nov. 01, 2018	May 28, 2019~ Jun. 20, 2019	Oct. 31, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCT698/798- 10/40 8SSK	SN1	AWS Band	Nov. 01, 2018	May 28, 2019~ Jun. 20, 2019	Oct. 31, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCG824/849- 40/8SS	SN35	CDMA 850	Nov. 07, 2018	May 28, 2019~ Jun. 20, 2019	Nov. 06, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 13, 2019	May 28, 2019~ Jun. 20, 2019	Mar. 12, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	May 28, 2019~ Jun. 20, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 16, 2018	May 28, 2019~ Jun. 20, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	May 28, 2019~ Jun. 20, 2019	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	May 28, 2019~ Jun. 20, 2019	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 28, 2019~ Jun. 20, 2019	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	May 28, 2019~ Jun. 20, 2019	N/A	Radiation (03CH12-HY)

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6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	3.36
Confidence of 95% (U = 2Uc(y))	3.30

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

	-
Measuring Uncertainty for a Level of	3.70
Confidence of 95% (U = 2Uc(y))	3.70

<u>Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)</u>

Measuring Uncertainty for a Level of	3.98
Confidence of 95% (U = 2Uc(y))	3.90

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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 48 Maximum Average Power [dBm]									
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest			
20	1	0		22.22	22.21	22.35			
20	1	49		22.21	22.21	22.23			
20	1	99		22.04	21.96	22.01			
20	50	0	QPSK	21.22	21.34	21.49			
20	50	24		21.21	21.26	21.30			
20	50	50		21.18	21.24	21.21			
20	100	0		21.24	21.32	21.35			
20	1	0		21.31	21.26	21.44			
20	1	49		21.32	21.27	21.31			
20	1	99		21.15	21.19	21.26			
20	50	0	16-QAM	20.28	20.36	20.38			
20	50	24		20.30	20.36	20.41			
20	50	50		20.26	20.28	20.27			
20	100	0		20.33	20.32	20.31			
20	1	0		20.07	20.14	20.11			
20	1	49		20.08	20.07	20.04			
20	1	99		19.90	19.90	19.93			
20	50	0	64-QAM	19.46	19.37	19.47			
20	50	24		19.48	19.39	19.40			
20	50	50		19.36	19.27	19.32			
20	100	0		19.41	19.33	19.33			
15	1	0		22.06	22.16	22.29			
15	1	37		22.19	22.01	22.10			
15	1	74		22.07	22.17	22.12			
15	36	0	QPSK	21.11	21.33	21.33			
15	36	20		21.21	21.31	21.33			
15	36	39		21.12	21.22	21.23			
15	75	0		21.22	21.27	21.33			
15	1	0		21.21	21.36	21.43			
15	1	37		21.24	21.10	21.15			
15	1	74		21.11	21.19	21.28			
15	36	0	16-QAM	20.19	20.25	20.33			
15	36	20		20.27	20.23	20.41			
15	36	39		20.08	20.16	20.27			
15	75	0		20.22	20.33	20.44			
15	1	0		19.97	20.02	20.20			
15	1	37		19.82	20.12	20.21			
15	1	74		19.89	20.03	20.05			
15	36	0	64-QAM	19.23	19.35	19.47			
15	36	20		19.20	19.22	19.37			
15	36	39		19.25	19.27	19.30			
15	75	0		19.22	19.32	19.35			



	LTE Band 48 Maximum Average Power [dBm]									
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest				
10	1	0		21.86	21.97	22.13				
10	1	25		21.95	22.15	22.04				
10	1	49		21.93	22.03	22.02				
10	25	0	QPSK	20.93	21.14	21.18				
10	25	12		21.01	21.19	21.23				
10	25	25		21.00	21.19	21.18				
10	50	0		21.02	21.14	21.18				
10	1	0		21.06	21.03	21.14				
10	1	25		21.04	21.23	21.31				
10	1	49		20.87	20.95	21.06				
10	25	0	16-QAM	19.95	20.14	20.23				
10	25	12		20.03	20.24	20.25				
10	25	25		20.00	20.21	20.22				
10	50	0		20.03	20.15	20.19				
10	1	0		19.83	19.91	20.01				
10	1	25		19.69	20.01	20.00				
10	1	49		19.64	19.75	19.86				
10	25	0	64-QAM	19.09	19.20	19.35				
10	25	12		19.17	19.28	19.33				
10	25	25		19.14	19.15	19.36				
10	50	0		19.04	19.14	19.21				
5	1	0		21.89	21.99	22.01				
5	1	12		21.89	22.00	22.19				
5	1	24		21.92	22.05	22.04				
5	12	0	QPSK	20.98	21.13	21.21				
5	12	7		21.11	21.24	21.32				
5	12	13		21.10	21.12	21.30				
5	25	0		21.01	21.23	21.19				
5	1	0		20.94	21.05	21.24				
5	1	12		21.04	21.17	21.23				
5	1	24		21.05	21.15	21.21				
5	12	0	16-QAM	19.98	20.20	20.28				
5	12	7		20.06	20.18	20.28				
5	12	13		20.06	20.18	20.24				
5	25	0		20.12	20.25	20.32				
5	1	0		19.73	19.85	19.94				
5	1	12		19.83	19.94	20.03				
5	1	24		19.81	19.94	20.02				
5	12	0	64-QAM	19.02	19.23	19.34				
5	12	7		19.11	19.24	19.33				
5	12	13		19.11	19.24	19.32				
5	25	0		19.13	19.26	19.37				



		LTE B	and 48C_0	CA Maximu	ım Average	Power [dBm	1]	
	P	CC	S	CC				
BW [MHz]	RB Size	RB Offset	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20+20	1	0	1	0		19.89	19.96	19.85
20+20	1	99	1	0	QPSK	9.71	9.66	9.76
20+20	0	0	1	99		21.30	21.19	21.20
20+20	1	0	1	0		19.50	19.55	19.42
20+20	1	99	1	0	16-QAM	9.94	9.87	9.94
20+20	0	0	1	99		20.30	20.28	20.36
20+20	1	0	1	0		19.68	19.59	19.71
20+20	1	99	1	0	64-QAM	9.56	9.59	9.63
20+20	0	0	1	99		19.16	19.11	19.15
20+15	100	0	75	0		19.86	20.00	19.81
20+15	1	0	1	74	QPSK	9.79	9.61	9.68
20+15	1	74	1	0		21.28	21.29	21.15
20+15	100	0	75	0		19.58	19.63	19.51
20+15	1	0	1	74	16-QAM	9.87	9.92	9.85
20+15	1	74	1	0		20.32	20.18	20.45
20+15	100	0	75	0		19.74	19.60	19.72
20+15	1	0	1	74	64-QAM	9.50	9.61	9.59
20+15	1	74	1	0		19.18	19.20	19.23
15+20	75	0	100	0		19.93	19.96	19.82
15+20	1	0	1	99	QPSK	9.73	9.70	9.73
15+20	1	74	1	0		21.37	21.22	21.28
15+20	75	0	100	0		19.45	19.62	19.39
15+20	1	0	1	99	16-QAM	9.96	9.90	9.91
15+20	1	74	1	0		20.27	20.26	20.27
15+20	75	0	100	0		19.73	19.53	19.81
15+20	1	0	1	99	64-QAM	9.50	9.52	9.60
15+20	1	74	1	0		19.07	19.18	19.09



	LTE Band 48C_CA Maximum Average Power [dBm]									
	P	CC	S	CC		-				
BW [MHz]	RB Size	RB Offset	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
20+10	100	0	50	0		19.97	20.06	19.76		
20+10	1	0	1	49	QPSK	9.67	9.68	9.78		
20+10	1	99	1	0		21.29	21.19	21.15		
20+10	100	0	50	0		19.60	19.58	19.38		
20+10	1	0	1	49	16-QAM	9.93	9.89	9.92		
20+10	1	99	1	0		20.27	20.35	20.39		
20+10	100	0	50	0		19.67	19.62	19.74		
20+10	1	0	1	49	64-QAM	9.52	9.58	9.65		
20+10	1	99	1	0		19.22	19.17	19.11		
10+20	50	0	100	0		19.93	19.89	19.91		
10+20	1	0	1	99	QPSK	9.67	9.59	9.82		
10+20	1	49	1	0		21.39	21.27	21.25		
10+20	50	0	100	0		19.44	19.54	19.44		
10+20	1	0	1	99	16-QAM	9.97	9.81	9.99		
10+20	1	49	1	0		20.23	20.23	20.38		
10+20	50	0	100	0		19.75	19.64	19.71		
10+20	1	0	1	99	64-QAM	9.56	9.55	9.67		
10+20	1	49	1	0	•	19.09	19.19	19.25		
20+5	100	0	25	0		19.88	19.98	19.75		
20+5	1	0	1	24	QPSK	9.76	9.74	9.83		
20+5	1	99	1	0		21.31	21.11	21.26		
20+5	100	0	25	0		19.51	19.61	19.36		
20+5	1	0	1	24	16-QAM	9.99	9.79	9.89		
20+5	1	99	1	0		20.37	20.22	20.46		
20+5	100	0	25	0		19.63	19.61	19.71		
20+5	1	0	1	24	64-QAM	9.56	9.61	9.65		
20+5	1	99	1	0	•	19.09	19.21	19.22		
5+20	25	0	100	0		19.88	19.98	19.82		
5+20	1	0	1	99	QPSK	9.69	9.61	9.67		
5+20	1	24	1	0		21.34	21.18	21.13		
5+20	25	0	100	0		19.47	19.55	19.39		
5+20	1	0	1	99	16-QAM	9.92	9.92	9.98		
5+20	1	24	1	0		20.36	20.29	20.32		
5+20	25	0	100	0		19.72	19.51	19.66		
5+20	1	0	1	99	64-QAM	9.54	9.58	9.71		
5+20	1	24	1	0		19.09	19.11	19.17		

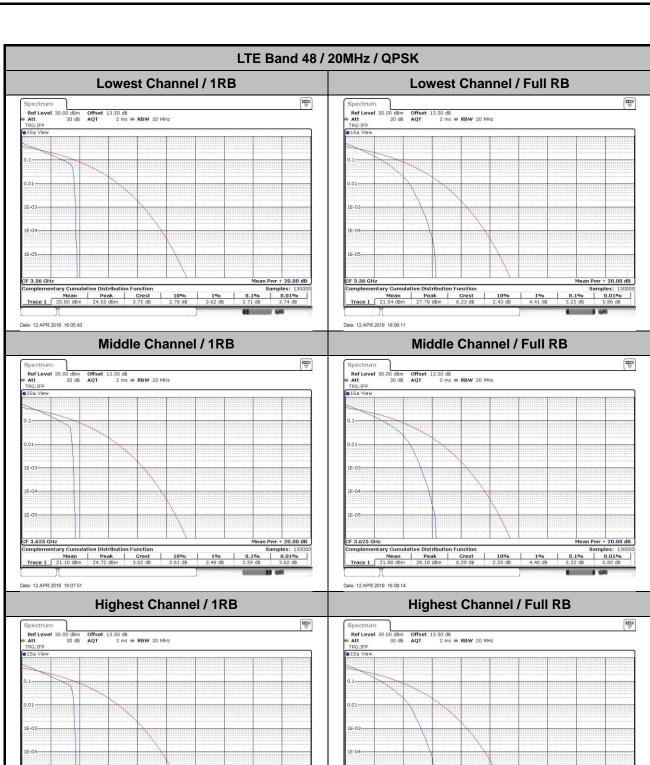
LTE Band 48

Peak-to-Average Ratio

Mode					
Mod.	QP	SK	160	Limit: 13dB	
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	3.71	5.25	4.55	6.14	
Middle CH	3.59	5.22	4.52	6.09	PASS
Highest CH	3.68	5.22	4.29	6.09	1
Mode					
Mod.	64C	AM		Limit: 13dB	
RB Size	1RB	Full RB			Result
Lowest CH	5.28	6.64	-	-	
Middle CH	5.16	6.67	-	-	PASS
Highest CH	5.19	6.64	-	-	

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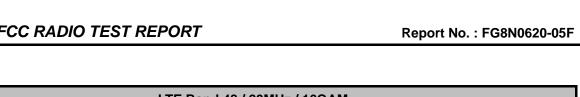
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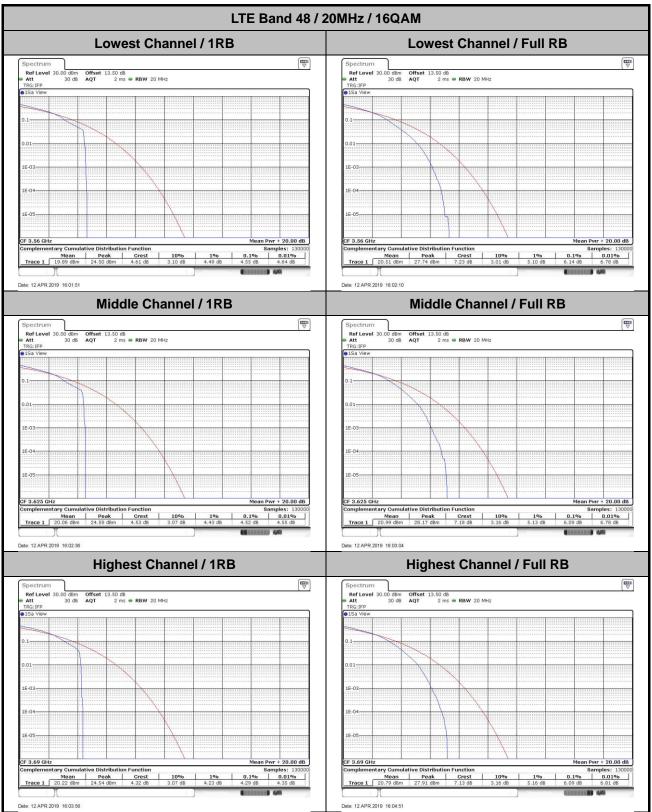


Samples: 130000 0.1% 0.01% 5.22 db 5.88 db

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Samples: 130000 0.1% 0.01% 3.68 dB 3.74 dB





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LTE Band 48 / 20MHz / 64QAM Lowest Channel / 1RB Lowest Channel / Full RB 8amples: 13000 0.1% 0.01% 5.28 d8 5.20 dB Date: 12.APR.2019 15:55:48 Date: 12.APR.2019 15:56:42 Middle Channel / 1RB Middle Channel / Full RB 13.50 dB 2 ms • RBW 20 MHz Date: 12.APR 2019 15:57:03 Date: 12 APR 2019 15:58:11 **Highest Channel / 1RB Highest Channel / Full RB**

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Samples: 130000 0.1% 0.01% 6.64 dB 7.59 dB

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| Samples: 130000 | 0.1% | 0.01% | | 5.19 dB | 5.25 dB |

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	-	-	-	-	4.82	4.80	9.81	9.63	14.51	14.27	19.14	18.78
Middle CH	-	-	-	-	4.87	4.84	9.77	9.65	14.27	14.12	18.70	19.02
Highest CH	-	-	-	-	4.92	4.83	9.65	9.77	14.24	14.48	18.90	18.86
Mode	LTE Band 48 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	-	-	-	-	4.82	-	9.61	-	14.30	-	18.62	-
Middle CH	-	-	-	-	4.86	-	9.87	-	14.12	-	18.66	-
Highest CH	-	-	-	-	4.83	-	9.67	-	14.54	-	19.02	-

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Type | Ref | Trc |

FAX: 886-3-328-4978

LTE Band 48 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 13.50 dB RBW 100 kHz

Att 30 dB SWT 19 με VBW 300 kHz Mode Auto FFT

SGL Count 100/100

1Pk Max 15.06 dB M1[1] 13.55 dBr 3.55200000 GH 26.00 d 4.815000000 MH 10 dBm 737 739. -10 dBm--30 dBgf 46 dBm 40 dBm -50 dBm
 X-value
 Y-value
 Function

 3.552 GHz
 15.06 dBm
 nd8 down

 3.55082 GHz
 10.77 dBm
 nd8

 3.55082 GHz
 -10.80 dBm
 Q factor

 X-value
 Y-value
 Function

 3.554278 GHz
 13.55 dBm
 ndb down

 3.550072 GHz
 -12.44 dBm
 ndb

 3.554978 GHz
 -12.47 dBm
 Q factor
 Type | Ref | Trc | Date: 12.APR.2019 15:33:02 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM **□** 15.65 dBi 3.62592900 GF 26.00 d 4.865000000 MF 3.62409100 GH: 26.00 dE 4.845000000 MH: 748.0 745 -20 dBm -20 dBm-246 dBm^ CF 3.625 GH Span 10.0 MHz Y-value 2 14.09 dBm 2 -11.90 dBm 2 -12.22 dBm Type | Ref | Trc | Function m nd8 down Date: 12 APR 2019 15:33:37 Date: 12.APR 2019 15:33:49 Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM 00 dBm Offset 30 dB SWT .50 dB **RBW** 100 kHz 19 µs **WBW** 300 kHz **Mode** Auto FFT SGL Count 100/100 14.16 dBm 3.69776000 M1[1] 15.21 dBn 3.69816900 GH M1[1] 26.00 dE 4.825000000 MH dBm--20 dBm 246 dBm MAA -50 d8m 50 dBm CF 3.6975 GHz Function Result 4.825 MHz 26.00 db 766.3
 X-value
 Y-value
 Function

 3.698169 GHz
 15.21 dBm
 nd8 down

 3.695062 GHz
 -10.77 dBm
 nd8

 3.699988 GHz
 -10.73 dBm
 Q factor
 Function Result 4.925 MHz
 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 3.69776 GHz
 14.16 dbm
 nd8 dbm

 T1
 1
 3.6999092 GHz
 -11.92 dbm
 nd8

 T2
 1
 3.699918 GHz
 -12.26 dbm
 Q factor

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Date: 12.APR.2019 15:34:38

Report No.: FG8N0620-05F LTE Band 48 Lowest Channel / 10MHz / QPSK Lowest Channel / 10MHz / 16QAM Ref Level 30.00 dBm Offset 13.50 dB RBW 300 kHz

Att 30 dB SWT 12.6 μs VBW 1 MHz Mode Auto FFT

SGL Count 100/100

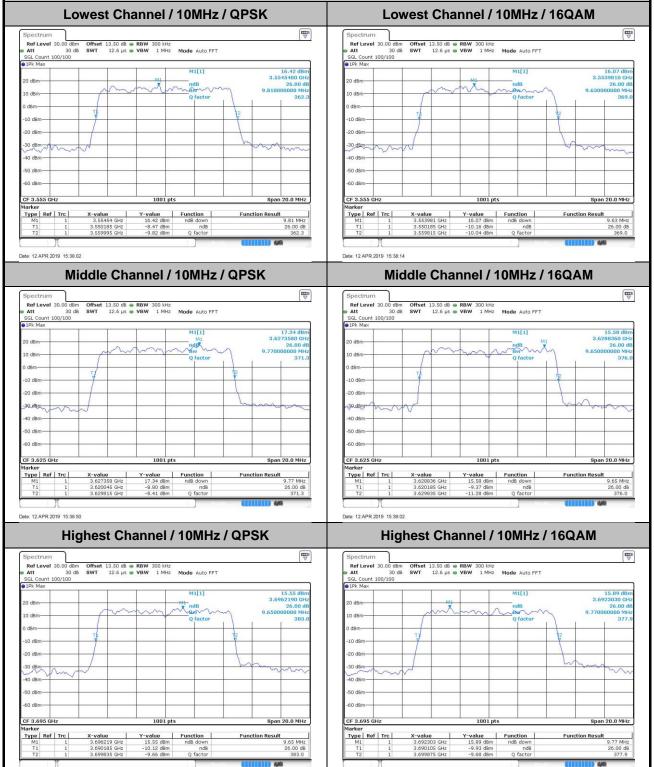
1Pk Max 16.42 dB M1[1] 16.07 dBn 3.5545400 GH 26.00 d 9.810000000 MH 10 dBm 362 369. -10 dBm--30 dBm-40 d8m--50 dBm -60 dBm | X-value | Y-value | Function | 3.553981 GHz | 16.07 dBm | ndB down | 3.550185 GHz | -10.16 dBm | ndB | 3.559815 GHz | -10.04 dBm | Q factor |
 X-value
 Y-value
 Function

 3.55454 GHz
 16.42 dBm
 ndB down
 Date: 12.APR 2019 15:38:14 Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM **□** 17.34 dBn 3.6273580 GH 26.00 df 9.770000000 MH 371.3 376. -20 dBm -20 dBm-40 dBm CF 3.625 GH Span 20.0 MHz Span 20.0 MHz
 Y-value
 Function

 2
 17.34 dBm
 ndB down

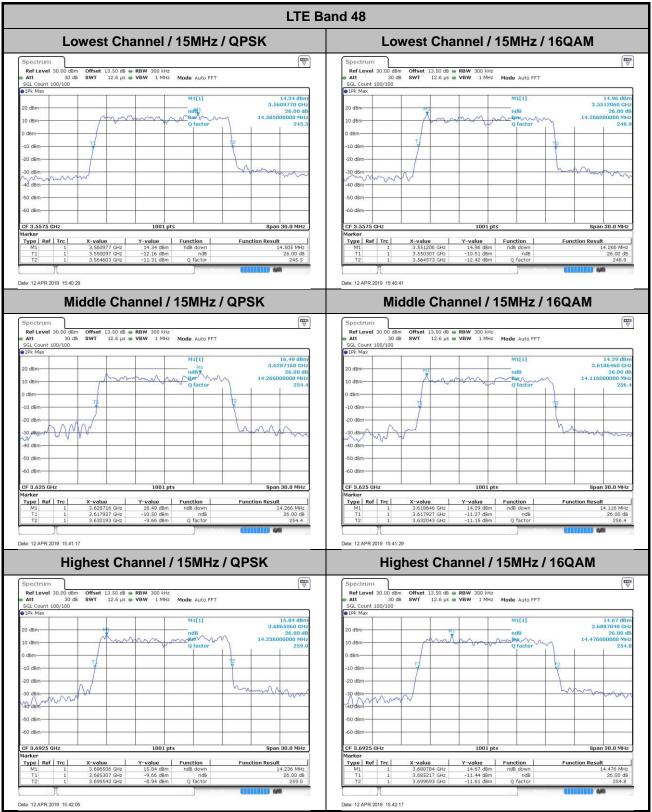
 2
 -8.80 dBm
 ndB

 z
 -8.41 dBm
 Q factor
 Type | Ref | Trc | Date: 12 APR 2019 15:38:50 Date: 12 APR 2019 15:39:02 Highest Channel / 10MHz / QPSK Highest Channel / 10MHz / 16QAM SGL Count 100/100 00 dBm Offset 30 dB SWT 13.50 dB • RBW 300 kHz 12.6 µs • VBW 1 MHz Mode Auto FFT 13.50 dB **RBW** 300 kHz 12.6 µs **VBW** 1 MHz **Mode** Auto FFT 15.89 dBm 3.6923030 cm 15.55 dBn 3.6962190 GH: 26.00 dE 9.650000000 MH: 383. M1[1] M1[1] 20 dBm 26.00 dl 9.770000000 MH 377. dBm--10 dBm

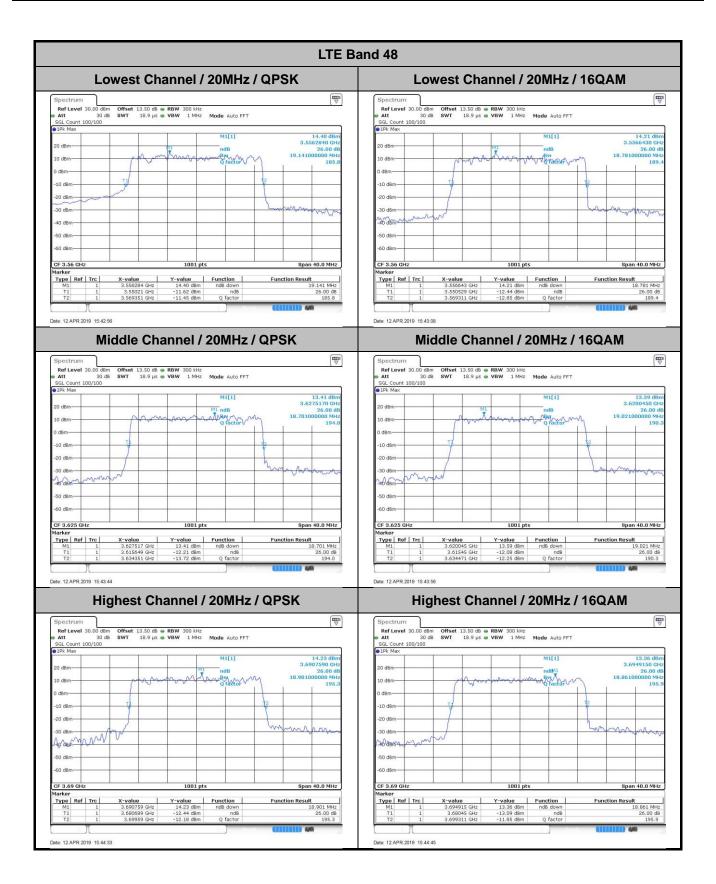


Date: 12.APR.2019 15:39:51

FCC RADIO TEST REPORT **Report No.: FG8N0620-05F** LTE Band 48



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LTE Band 48 Lowest Channel / 5MHz / 64QAM Lowest Channel / 10MHz / 64QAM 14.72 dBr M1[1] 13.85 dB 3.55227000 GH 26.00 d 4.815000000 MH 10 dBm 737 370. -10 dBm-Mondon -30 dBay -50 d8m-
 X-value
 Y-value
 Function

 3.55227 GHz
 13.95 dBm
 nd8 down

 3.550082 GHz
 -11.99 dBm
 nd8

 3.554898 GHz
 -12.44 dBm
 Q factor

 X-value
 Y-value
 Function

 3.559157 GHz
 14.72 dBm
 ndb down

 3.550185 GHz
 -10.44 dBm
 ndb

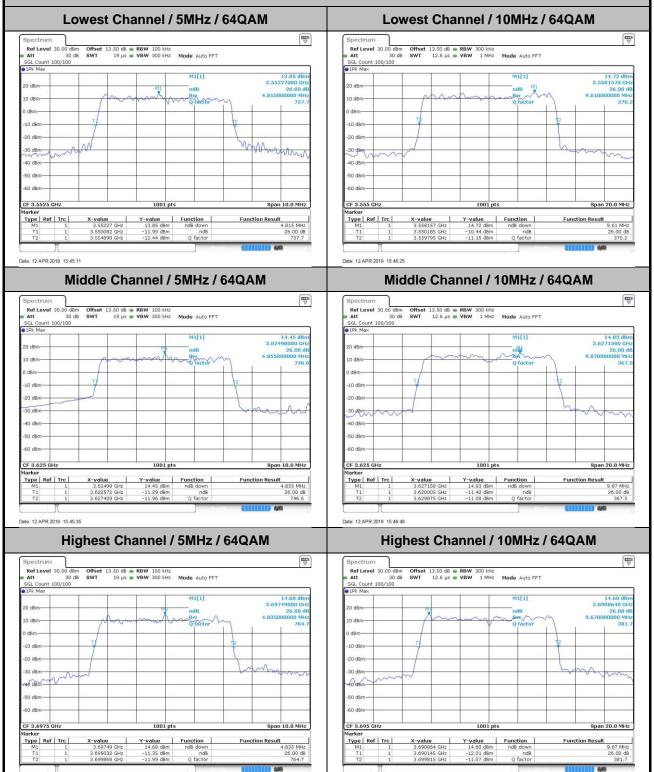
 3.559795 GHz
 -11.15 dBm
 Q factor
 Type | Ref | Trc | Type | Ref | Trc | Date: 12.APR.2019 15:46:25 Middle Channel / 5MHz / 64QAM Middle Channel / 10MHz / 64QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100
Pk Max 14.45 dBi 3.62498000 C 3.62498000 G 26.00 4.855000000 M 746 -20 dBm-40 dBm CF 3.625 GH Span 10.0 MHz Span 20.0 MHz Type | Ref | Trc |
 Y-value
 Function

 2
 14.45 dBm
 ndB down

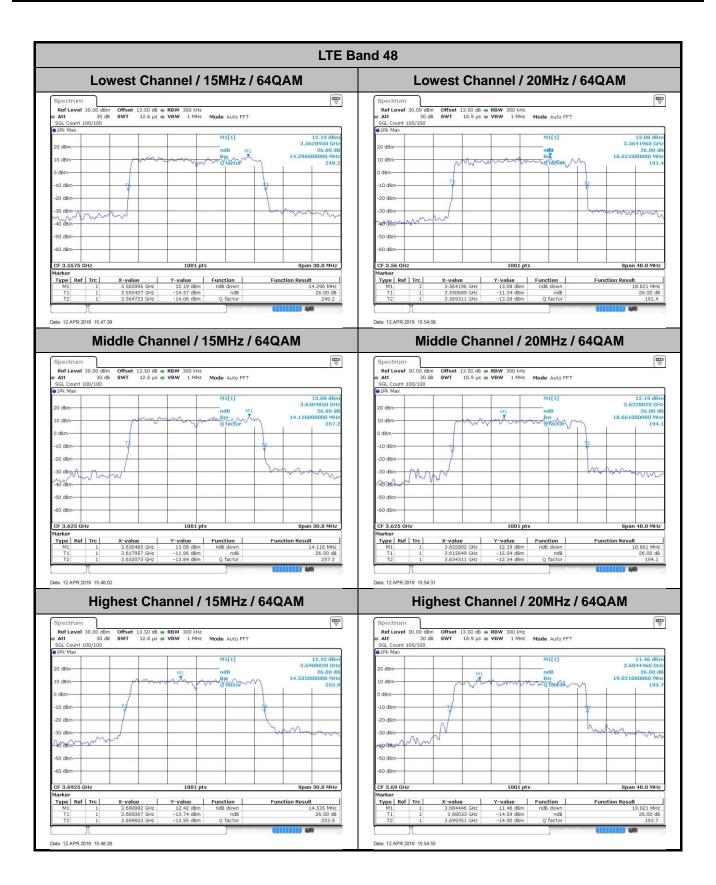
 2
 -11.29 dBm
 ndB

 z
 -11.96 dBm
 Q factor
 Date: 12 APR 2019 15:45:35 Date: 12.APR 2019 15:46:49 Highest Channel / 5MHz / 64QAM Highest Channel / 10MHz / 64QAM SGL Count 100/100 00 dBm Offset 30 dB SWT 13.50 dB • RBW 100 kHz 19 µs • VBW 300 kHz Mode Auto FFT 13.50 dB **RBW** 300 kHz 12.6 µs **VBW** 1 MHz **Mode** Auto FFT 14.68 dBn 3.69749000 GH M1[1] M1[1] 14.60 dBn 3.69 3.69749000 GH 26.00 d 4.835000000 MH 764. 26.00 dl 9.670000000 MH 381. dBm-

Report No.: FG8N0620-05F



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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	-	-	-	-	4.51	4.47	9.01	9.05	13.40	13.52	17.94	17.82
Middle CH	-	-	-	-	4.53	4.50	9.05	9.11	13.46	13.40	17.94	17.90
Highest CH	-	-	-	-	4.49	4.46	9.05	9.05	13.46	13.43	17.94	17.90
Mode		LTE Band 48 : 99%OBW(MHz)										
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	-	-	-	-	4.47	-	9.01	-	13.43	-	17.82	-
Middle CH	-	-	-	-	4.53	-	8.99	-	13.37	-	17.90	-
Highest CH	-	-	-	-	4.48	-	9.05	-	13.46	-	17.90	-

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LTE Band 48 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 13.50 dB = RBW 100 kHz

Att 30 dB SWT 19 µs = VBW 300 kHz

Mode Auto FFT

SGL Count 100/100

PP: Max 14.74 dB 13.76 dBn M1[1] 10 dBm--10 dBm--20 dBm-40 dBm 40 dBm 50 d8m--50 d8m--60 dBm
 X-value
 Y-value
 Function
 Function Result

 3.55294 GHz
 14.74 dbm
 Occ Bw
 4.51549

 3.5502432 GHz
 10.06 dbm
 Occ Bw
 4.51549

 3.5547577 GHz
 9.86 dbm
 Occ Bw
 4.51549
 X-value Y-value Function
3.550752 GHz 13.76 dBm
3.5507222 GHz 8.67 dBm Occ Bw
3.5547378 GHz 8.98 dBm Type | Ref | Trc | Type Ref Trc Date: 12.APR.2019 15:32:38 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 13.50 dB RBW 100 kHz Att 30 db SWT 19 µs VBW 300 kHz Mode Auto FFT SGL Count 100/100 SGL Count 100/100 1Pk Max 16.55 dBi 3.62531000 GF 4.525474525 MF 10 dBmdBm--20 dBm--20 dBm-240 dem -50 d8m -50 d8m CF 3.625 GHz 1001 pts Span 10.0 MHz
 X-value
 Y-value
 Function

 3.62531 GHz
 16.55 dBm
 3.622723 GHz

 3.6227233 GHz
 9.36 dBm
 Occ Bw

 3.6272478 GHz
 10.41 dBm
 | Type | Ref | Trc | X-value | Y-value | Function | M1 | 1 | 3.622872 GHz | 14.39 GBm | T1 | 1 | 3.622872 GHz | 8.81 GBm | Occ Bw | T2 | 1 | 3.6272478 GHz | 9.87 GBm | Occ Bw | Type | Ref | Trc | **Function Result Function Result** 4.525474525 MHz 4.495504496 MHz Date: 12 APR 2019 15:33:14 Date: 12 APR 2019 15:33:26 Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM Ref Level 30.00 SGL Count 100/100 SGL Count 100/100 91Pk Max 13.54 dBm 3.69941800 GHz 4.455544456 MHz 15.15 dBn 3.69895900 GH 4.485514486 MH M1[1] M1[1] 20 dBm dBm--10 dBm--20 dBm -20 dBm 40-8Bm -50 dBm-50 dBm-CF 3.6975 GHz Span 10.0 MHz
 Marker
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 3.099959 GHz
 15.15 dbm
 Function
 4.485514

 T1
 1
 3.059252 GHz
 9.04 dbm
 Occ Bw
 4.485514

 T2
 1
 3.6997478 GHz
 8.62 dbm
 0cc Bw
 4.485514

 Marker
 Type
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 3.699418 GHz
 13.54 dbm
 Text
 Text

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4.455544456 MHz

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4.485514486 MHz

 Marker
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 3.691543 GHz
 17.51 dbm
 Function
 9.050945

 T1
 1
 3.690446 GHz
 10.92 dbm
 Occ 8w
 9.050945

 T2
 1
 3.6994955 GHz
 9.70 dbm
 Occ 8w
 9.050946

FAX: 886-3-328-4978

LTE Band 48 Lowest Channel / 10MHz / QPSK Lowest Channel / 10MHz / 16QAM 16.97 dBr 15.88 dBn 3.5544210 GH; 050949051 MH; 10 dBm--10 dBm--10 dBm -20 dBm--30 dBm-50 d8m -50 d8m--60 dBm
 X-value
 Y-value
 Function
 Function Result

 3.5556998 GHz
 16.97 dBm
 Tool Bm
 Occ Bw
 9.01098

 3.559528 GHz
 10.69 dBm
 Occ Bw
 9.01098
 X-value Y-value Function
3.554421 GHz 15.88 dBm
3.5504456 GHz 10.15 dBm Occ Bw
3.5595155 GHz 10.52 dBm Type | Ref | Trc | Date: 12.APR.2019 15:37:50 Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM 14.98 dBm 3.6253600 GHz 9.110889111 MHz m -20 dBm--20 dBm 40 dBm -40 dBm--50 dBm 50 dBm CF 3.625 GHz 1001 pts Span 20.0 MHz Type | Ref | Trc |
 X-value
 Y-value
 Function

 3.625939 GHz
 15.98 dBm
 3.6204645 GHz
 10.59 dBm
 Occ Bw

 3.6295155 GHz
 9.67 dBm
 Occ Bw
 Function Result Function Result 9.050949051 MHz 9.110889111 MHz Date: 12 APR 2019 15:38:27 Date: 12 APR 2019 15:38:38 Highest Channel / 10MHz / QPSK Highest Channel / 10MHz / 16QAM Ref Level 30.00 dBm Offset 13.50 dB • RBW 300 kHz Att 30 dB • SWT 12.6 µs • VBW 1 MHz Mode Auto FFT SGL Count 100/100 16.40 dBm 3.6934020 GHz 9.050949051 MHz M1[1] 17.51 dBn 3.6915430 GH 9.050949051 MH 20 dBm dBm--10 dBm--20 dBm--20 dBn -50 d8m 50 dBm-CF 3.695 GHz Span 20.0 MHz

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9.050949051 MHz

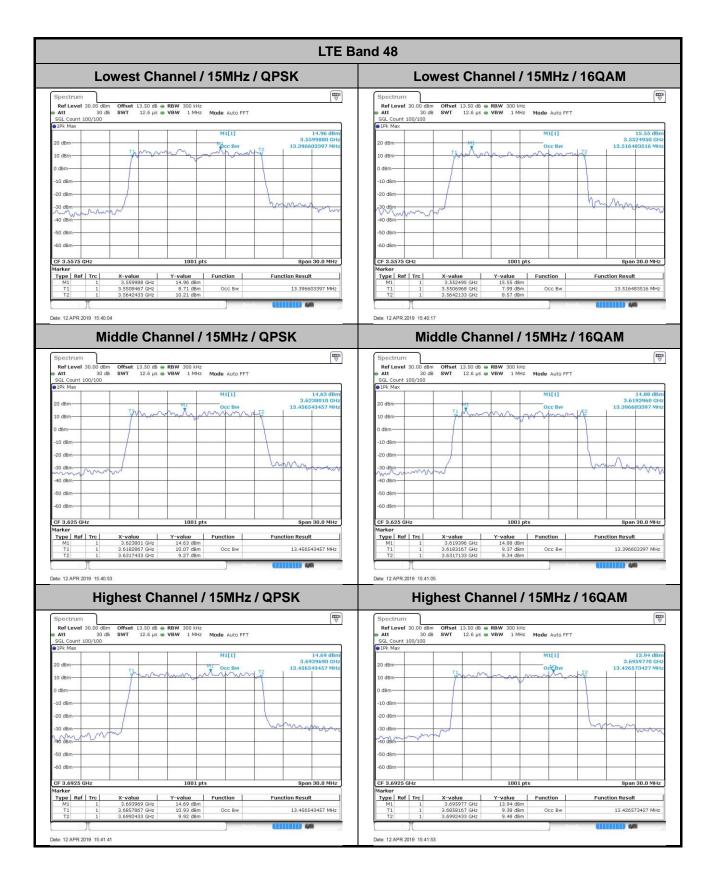
 Marker
 Trpe
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 3.699402 GHz
 16.40 dBm
 Punction
 1.00 dBm
 Punction
 9.050949

 T1
 1
 3.699448 GHz
 8.91 dBm
 Occ BW
 9.050949

 T2
 1
 3.6995355 GHz
 9.09 dBm
 Occ BW
 9.050949

9.050949051 MHz

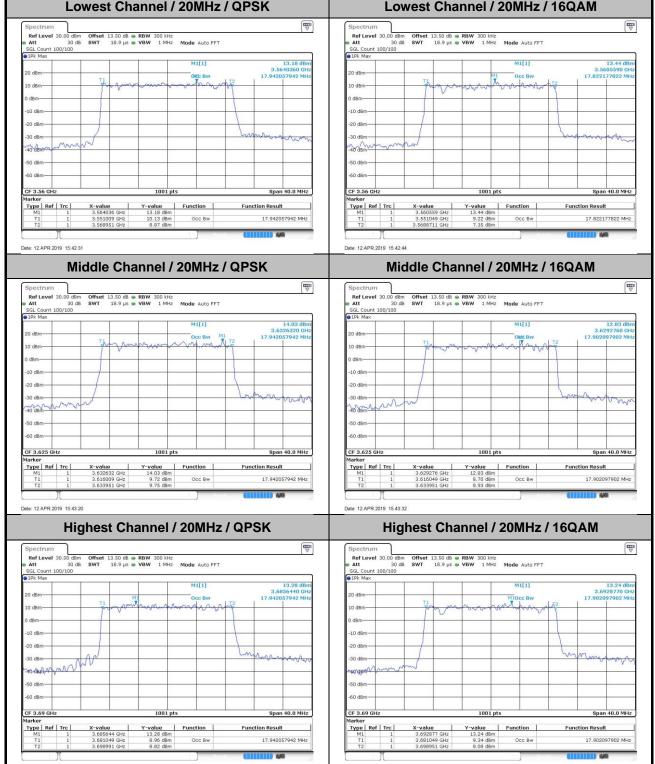


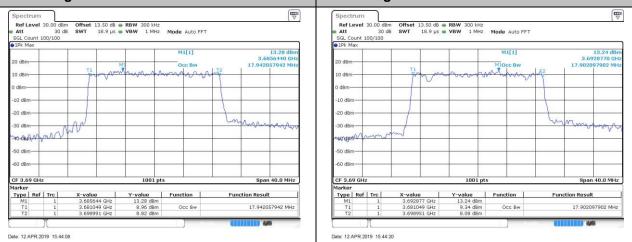
TEL: 886-3-327-3456 : A48-15 of 91 Page Number

FCC RADIO TEST REPORT **Report No.: FG8N0620-05F** LTE Band 48 Lowest Channel / 20MHz / QPSK Lowest Channel / 20MHz / 16QAM 13.18 dB M1[1] M1[1] 13,44 dBn 10 dBm--10 dBm--20 dBm-40 dBm -50 d8m-X-value Y-value Function
3,564036 GHz 13.18 dBm Date: 12.APR.2019 15:42:44 Middle Channel / 20MHz / QPSK Middle Channel / 20MHz / 16QAM Ref Level 30.00 dBm Offset 13.50 dB RBW 300 kHz
Att 30 db SWT 18.9 µs VBW 1 MHz Mode Auto FFT

5GL Count 100/100

1Pk Max





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