

Report No.: FG090125-01C



FCC RADIO TEST REPORT

FCC ID : PKRISGMD2000 Equipment : Wireless Module

Brand Name : Inseego Model Name : MD2000

Applicant : Inseego Corporation

9710 Scranton Road Suite 200, San Diego, CA 92121

Manufacturer : Inseego Corporation

9710 Scranton Road Suite 200, San Diego, CA 92121

Standard : FCC 47 CFR Part 2, 96

The product was received on Sep. 11, 2020 and testing was started from Sep. 24, 2020 and completed on Nov. 01, 2020. 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 test results in this variant 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: Louis Wu

Louis Win

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 Version : 01

History of this test report

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Report No.	Version	Description	Issued Date
FG090125-01C	01	Initial issue of report	Nov. 03, 2020

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Summary of Test Result

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Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.3	§2.1046	Conducted Output Power	Reporting only	-
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 5.06 dB at 22074.000 MHz

Remark: This is a variant report by enable LTE CA Band via SW. All the test cases were performed on original report which can be referred to Sporton Report Number FG090125G.

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: Dara Chiu

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1 General Description

1.1 Product Feature of Equipment Under Test

WCDMA/LTE/5G NR, Wi-Fi 2.4GHz 802.11b/g/n/ac/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, and GNSS.

Product Specification subjective to this standard					
	WWAN: Monopole Antenna				
	WLAN				
Antenna Type <ant. 0="">: Monopole Antenna</ant.>					
	<ant. 1="">: Monopole Antenna</ant.>				
	GPS / Glonass / BDS / Galileo: Monopole Antenna				

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1.2 Modification of EUT

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

1.3 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	Benjamin Lin and Sherry Wu				
Temperature $22.3 \sim 24.5^{\circ}$ C					
Relative Humidity 48.9 ~ 50.2%					

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory					
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) 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 and Chuan Chu					
Temperature	24.3 ~ 26.4℃					
Relative Humidity 58 ~ 66%						

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

FCC Designation No.: TW1190 and TW0007

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1.4 Applied Standards

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

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- ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 96
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 940660 D01 Part 96 CBRS Eqpt v02
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 414788 D01 Radiated Test Site 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.
- 3. The TAF code is not including all the FCC KDB listed without accreditation.

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Test Configuration of Equipment Under Test 2

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.

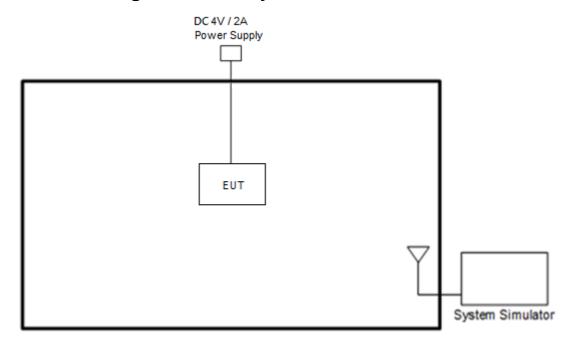
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For radiated measurement, pre-scanned in two angles antenna (Ant. Horizontal and Ant. Vertical), the worst cases (Ant. Horizontal) were recorded in this report.

Test Items	Band		Bandwidth (MHz)					Modulation		on	RB#		ŧ	Test Channel						
root nome		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	v	v	v	v	v	v	v
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	٧	v	٧	٧	٧	-	•	•	V	v	v	٧		٧	٧		v
Conducted Spurious Emission	48_CA	v	v	>	٧	٧	>	>	-	•	•	>	v	>	>			>	>	v
E.I.R.P.	48_CA	v	>	٧	>	٧	٧	٧	-	•		٧	v	~	٧			v	v	v
Radiated Spurious Emission	48_CA		Worst Case						٧	٧	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. 																			

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2.2 Connection Diagram of Test System



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2.3 Support Unit used in test configuration

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord	
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m	
2.	Power Supply	GW Instek	GPE-2323	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 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)

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2.5 Frequency List of Low/Middle/High Channels

LTE Band 48_CA Channel and Frequency List							
BW [MHz]	Channel	/Frequency(MHz)	Lowest	Middle	Highest		
	D00	Channel	3560	3615.1	3670.2		
00 - 00	PCC	Frequency	55340	55891	56442		
20 + 20	000	Channel	3579.8	3634.9	3690		
	SCC	Frequency	55538	56089	56640		
	PCC	Channel	3560	3617.6	3675.1		
20 . 45	PCC	Frequency	55340	55916	56491		
20 + 15	SCC	Channel	3577.1	3634.7	3692.2		
	SCC	Frequency	55511	56087	56662		
	PCC	Channel	3557.8	3615.3	3672.9		
45 . 00	PCC	Frequency	55318	55893	56469		
15 + 20	SCC	Channel	3574.9	3632.4	3690		
		Frequency	55489	56064	56640		
	PCC	Channel	3560	3620.1	3680.1		
00 . 40		Frequency	55340	55941	56541		
20 + 10	SCC	Channel	3574.4	3634.5	3694.5		
	SCC	Frequency	55484	56085	56685		
	PCC	Channel	3555.5	3615.6	3675.6		
40 . 00	PCC	Frequency	55295	55896	56496		
10 + 20	200	Channel	3569.9	3630	3690		
	SCC	Frequency	55439	56040	56640		
	DCC	Channel	3560	3622.5	3685		
00 . 5	PCC	Frequency	55340	55965	56590		
20 + 5	000	Channel	3571.7	3634.2	3696.7		
	SCC	Frequency	55457	56082	56707		
	DCC	Channel	3553.3	3615.8	3678.3		
F . 20	PCC	Frequency	55273	55898	56523		
5 + 20	200	Channel	3565	3627.5	3690		
	SCC	Frequency	55390	56015	56640		

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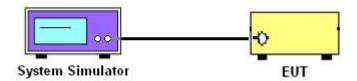
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

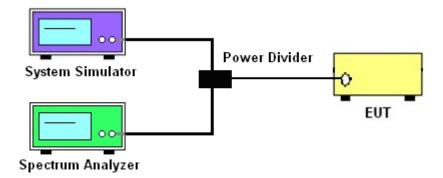
3.2 Test Setup

3.2.1 Conducted Output Power



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3.2.2 EIRP, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission



3.2.3 Test Result of Conducted Test

Please refer to Appendix A.

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3.3 Conducted Output Power

3.3.1 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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3.3.2 Test Procedures

- 1. 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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3.4 EIRP

3.4.1 Description of the EIRP Measurement

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

Device	Maximum EIRP (dBm/10 MHz)				
End User Device	23				

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 total mean transmitted power.

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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.
- 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.
- 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.

For Adjacent Channel Leakage Ratio (ACLR) measurement,

- The Adjacent Channel Leakage Ratio (ACLR) is the ratio of the average power in the assigned aggregated channel bandwidth to the average power over the equivalent adjacent channel bandwidth.
- 2. The option ACLR of spectrum analyzer is used and measures the ACLR ratio by setting equivalent channel bandwidth.
- 3. The measured ACLR ratio shall be at least 30 dB.

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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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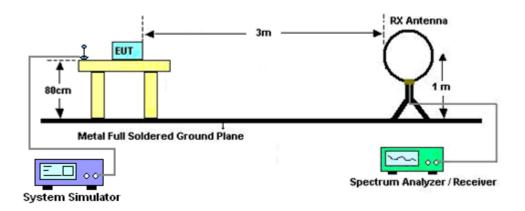
4 Radiated Test Items

4.1 Measuring Instruments

See list of measuring instruments of this test report.

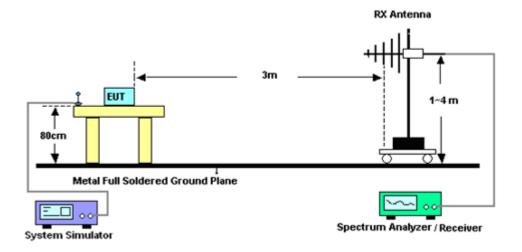
4.2 Test Setup

For radiated emissions below 30MHz



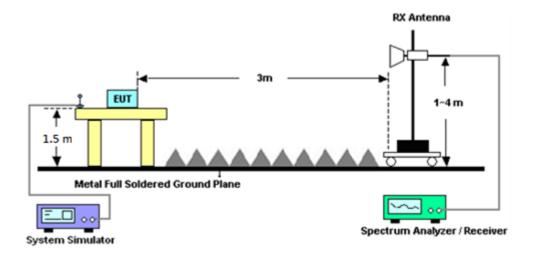
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For radiated emissions from 30MHz to 1GHz



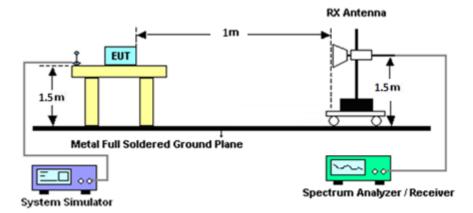
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For radiated emissions from 1GHz to 18GHz



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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	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Base Station (Measure)	Anritsu	MT8821C	6262025280	GSM / GPRS /WCDMA / LTE FDD/TDD with 44) /LTE-3CC DLCA,2CC ULCA	Oct. 05, 2020	Oct. 28, 2020 ~ Nov. 01, 2020	Oct. 04, 2021	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101908	10Hz~40GHz	May 13, 2020	Oct. 28, 2020 ~ Nov. 01, 2020	May 12, 2021	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#A	1-18GHz	Jan. 13, 2020	Oct. 28, 2020 ~ Nov. 01, 2020	Jan. 12, 2021	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Sep. 24, 2020 ~ Oct. 15, 2020	Dec. 25, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	40103 & 07	30MHz~1GHz	Apr. 29, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Apr. 28, 2021	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 14, 2019	Sep. 24, 2020 ~ Oct. 15, 2020	Nov. 13, 2020	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-1241	1GHz ~ 18GHz	Jul. 15, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Jul. 14, 2021	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917058 4	18GHz~40GHz	Dec. 10, 2019	Sep. 24, 2020 ~ Oct. 15, 2020	Dec. 09, 2020	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917098 0	18GHz ~ 40GHz	Jan. 10, 2019	Sep. 24, 2020 ~ Oct. 15, 2020	Jan. 09, 2021	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Mar. 24, 2021	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY57280120	1GHz~26.5GHz	Jul. 20, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Jul. 19, 2021	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-30 3K	17100018000 54002	1GHz~18GHz	Feb. 07, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Feb. 06, 2021	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 13, 2019	Sep. 24, 2020 ~ Oct. 15, 2020	Dec. 12, 2020	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY54200485	10Hz~44GHz	Feb. 10, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Feb. 09, 2021	Radiation (03CH12-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Feb. 15, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Feb. 14, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 12, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Mar. 11, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 12, 2019	Sep. 24, 2020 ~ Oct. 15, 2020	Dec. 11, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 25, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Feb. 24, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 25, 2020	Sep. 24, 2020 ~ Oct. 15, 2020	Feb. 24, 2021	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Oct. 25, 2019	Sep. 24, 2020 ~ Oct. 15, 2020	Oct. 24, 2020	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Sep. 24, 2020 ~ Oct. 15, 2020	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Sep. 24, 2020 ~ Oct. 15, 2020	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Sep. 24, 2020 ~ Oct. 15, 2020	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Sep. 24, 2020 ~ Oct. 15, 2020	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	2.07
Confidence of 95% (U = 2Uc(y))	3.07

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

Measuring Uncertainty for a Level of	3.21
Confidence of 95% (U = 2Uc(y))	3.21

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

Measuring Uncertainty for a Level of	3.80
Confidence of 95% (U = 2Uc(y))	3.80

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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

	LTE Band 48C_CA Maximum Average Power [dBm]							
DVA CANTI-1	PCC SCC				Mad			
BW [MHz]	RB Size	RB Offset	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20+20	100	0	100	0		12.32	11.98	12.38
20+20	1	0	1	99	QPSK	5.32	5.06	5.31
20+20	1	99	1	0		18.95	18.67	19.07
20+20	100	0	100	0		12.33	12.00	12.38
20+20	1	0	1	99	16-QAM	5.41	5.21	5.44
20+20	1	99	1	0		18.34	17.91	18.27
20+20	100	0	100	0		12.34	12.04	12.38
20+20	1	0	1	99	64-QAM	5.08	4.79	5.07
20+20	1	99	1	0		16.86	16.44	16.87
20+20	100	0	100	0		12.38	12.04	12.40
20+20	1	0	1	99	256-QAM	5.30	5.05	5.30
20+20	1	99	1	0		14.03	13.67	14.11
20+15	100	0	75	0		12.68	12.10	12.36
20+15	1	0	1	74	QPSK	5.84	5.17	5.34
20+15	1	74	1	0		19.38	18.81	19.18
20+15	100	0	75	0		12.74	12.06	12.35
20+15	1	0	1	74	16-QAM	6.38	5.69	5.87
20+15	1	74	1	0		18.95	18.34	18.72
20+15	100	0	75	0		12.74	12.12	12.36
20+15	1	0	1	74	64-QAM	6.00	5.34	5.55
20+15	1	74	1	0		17.56	17.00	17.30
20+15	100	0	75	0		12.73	12.11	12.40
20+15	1	0	1	74	256-QAM	6.08	5.39	5.56
20+15	1	74	1	0		14.61	14.05	14.36
15+20	75	0	100	0		12.69	11.58	11.90
15+20	1	0	1	99	QPSK	5.70	4.56	4.84
15+20	1	74	1	0		19.31	18.21	18.57
15+20	75	0	100	0		12.67	11.60	11.92
15+20	1	0	1	99	16-QAM	6.18	5.22	5.37
15+20	1	74	1	0		18.88	17.87	18.17
15+20	75	0	100	0		12.69	11.60	11.92
15+20	1	0	1	99	64-QAM	5.88	4.85	5.02
15+20	1	74	1	0		17.55	16.50	16.85
15+20	75	0	100	0		12.71	11.64	11.95
15+20	1	0	1	99	256-QAM	5.96	4.81	5.06
15+20	1	74	1	0		14.62	13.48	13.82



FCC RADIO TEST REPORT

	LTE Band 48C_CA Maximum Average Power [dBm]							
	P	CC		CC				
BW [MHz]	RB Size	RB Offset	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20+10	100	0	50	0		12.19	11.65	11.86
20+10	1	0	1	49	QPSK	5.26	4.70	4.83
20+10	1	99	1	0		18.84	18.36	18.64
20+10	100	0	50	0		12.17	11.63	11.85
20+10	1	0	1	49	16-QAM	5.80	5.29	5.38
20+10	1	99	1	0		18.45	17.96	18.24
20+10	100	0	50	0		12.23	11.70	11.92
20+10	1	0	1	49	64-QAM	5.50	4.93	5.12
20+10	1	99	1	0		17.11	16.60	16.87
20+10	100	0	50	0		12.24	11.71	11.94
20+10	1	0	1	49	256-QAM	5.54	4.96	5.10
20+10	1	99	1	0		14.15	13.63	13.95
10+20	50	0	100	0		12.28	11.74	11.94
10+20	1	0	1	99	QPSK	5.27	4.76	4.91
10+20	1	49	1	0		18.99	18.46	18.70
10+20	50	0	100	0		12.31	11.77	11.98
10+20	1	0	1	99	16-QAM	5.79	5.33	5.41
10+20	1	49	1	0		18.64	18.07	18.36
10+20	50	0	100	0		12.34	11.82	12.05
10+20	1	0	1	99	64-QAM	5.48	4.98	5.09
10+20	1	49	1	0		17.28	16.67	16.96
10+20	50	0	100	0		12.33	11.85	12.06
10+20	1	0	1	99	256-QAM	5.52	4.98	5.18
10+20	1	49	1	0		14.27	13.73	13.97
20+5	100	0	25	0		12.34	11.68	11.84
20+5	1	0	1	24	QPSK	5.40	4.73	4.83
20+5	1	99	1	0		18.96	18.42	18.66
20+5	100	0	25	0		12.34	11.73	11.87
20+5	1	0	1	24	16-QAM	5.98	5.32	5.43
20+5	1	99	1	0		18.63	18.01	18.28
20+5	100	0	25	0		12.36	11.74	11.91
20+5	1	0	1	24	64-QAM	5.64	5.01	5.10
20+5	1	99	1	0		17.23	16.71	16.94
20+5	100	0	25	0		12.41	11.75	11.89
20+5	1	0	1	24	256-QAM	5.70	5.00	5.11
20+5	1	99	1	0		14.32	13.74	13.94

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	LTE Band 48C_CA Maximum Average Power [dBm]							
BW [MHz]	PCC SCC Mod							
DVV [IVITIZ]	RB Size	RB Offset	RB Size	RB Offset	IVIOU	Lowest	Middle	Highest
5+20	25	0	100	0		12.28	11.71	11.95
5+20	1	0	1	99	QPSK	5.16	4.62	4.83
5+20	1	24	1	0		19.04	18.39	18.73
5+20	25	0	100	0		12.36	11.75	11.99
5+20	1	0	1	99	16-QAM	5.81	5.14	5.40
5+20	1	24	1	0		18.75	18.07	18.36
5+20	25	0	100	0		12.35	11.73	11.96
5+20	1	0	1	99	64-QAM	5.43	4.90	5.08
5+20	1	24	1	0		17.40	16.82	17.00
5+20	25	0	100	0		12.42	11.77	12.02
5+20	1	0	1	99	256-QAM	5.51	4.92	5.17
5+20	1	24	1	0		14.39	13.77	14.03

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LTE Band 48C

26dB Bandwidth

Mode	LTE Band 48C : 26dB BW(MHz)							
QPSK								
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz				
Lowest CH	24.73	29.79	34.90	24.98				
Middle CH	24.73	29.85	34.90	24.88				
Highest CH	24.63	29.91	34.90	24.98				
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A				
Lowest CH	30.03	34.97	39.80	-				
Middle CH	29.91	34.90	39.88	-				
Highest CH	30.09	34.97	39.88	-				

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Mode	LTE Band 48C : 26dB BW(MHz)							
16QAM								
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz				
Lowest CH	24.83	29.79	34.76	24.88				
Middle CH	24.78	30.09	34.76	24.93				
Highest CH	24.73	29.85	34.76	24.88				
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A				
Lowest CH	29.97	34.90	39.88	-				
Middle CH	30.09	34.83	39.88	-				
Highest CH	30.03	34.83	39.96	-				

Mode	LTE Band 48C : 26dB BW(MHz)						
64QAM							
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz			
Lowest CH	24.73	29.79	34.83	24.93			
Middle CH	24.88	29.85	34.90	24.98			
Highest CH	24.78	29.85	34.83	24.93			
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A			
Lowest CH	30.09	34.97	39.96	-			
Middle CH	30.15	34.76	39.80	-			
Highest CH	29.91	34.83	39.88	-			

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Mode	LTE Band 48C : 26dB BW(MHz)						
256QAM							
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz			
Lowest CH	24.68	29.85	34.90	24.83			
Middle CH	24.58	29.79	34.83	24.88			
Highest CH	24.78	29.85	34.83	24.78			
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A			
Lowest CH	30.03	34.83	39.88	-			
Middle CH	29.91	34.83	39.88	-			
Highest CH	29.97	34.97	39.88	-			

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LTE Band 48C **QPSK** Lowest Channel / 5MHz+20MHz Lowest Channel / 10MHz+20MHz 3.55 -50 dBm-CF 3.562525 GHz CF 3.56495 GHz
 X-value
 Y-value
 Function

 3.555032 GHz
 10.88 dBm
 ndB down

 3.549988 GHz
 -15.87 dBm
 ndB

 3.574713 GHz
 -15.09 dBm
 Q factor
 Function Result 24.725 MHz
 X-value
 Y-value
 Function

 3.554161 GHz
 8.22 dBm
 ndB down

 3.549965 GHz
 -17.08 dBm
 ndB

 3.579755 GHz
 -17.89 dBm
 Q factor
 Type | Ref | Trc | **Function Result** Middle Channel / 5MHz+20MHz Middle Channel / 10MHz+20MHz 10.09 dB 3.6143860 GF 26.00 c 24.725000000 MF 10 dBm 146 121. -10 dBm -20 dBm 40 dBm Span 50.0 MHz Span 60.0 MHz Type Ref Trc Date: 30.0CT.2020 17:30:25 Highest Channel / 10MHz+20MHz Highest Channel / 5MHz+20MHz 10.04 dBi 3.6793830 GF 26.00 d 24.625000000 MF 149 0 dBm--20 dBm -SO dBm CF 3.687525 GH: CF 3.68505 GHz Function Result 24.625 26.1 Type | Ref | Trc | Function m ndB down Function n ndB down

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LTE Band 48C **QPSK** Lowest Channel / 15MHz+20MHz Lowest Channel / 20MHz+5MHz -50 dBm-CF 3.567475 GHz CF 3.562475 GHz Function Result

24.975 MHz

26.00 dB

142.4
 X-value
 Y-value
 Function

 3.55223 GHz
 7.77 dBm
 ndB down

 3.549923 GHz
 -19.01 dBm
 ndB

 3.584918 GHz
 -18.49 dBm
 Q factor
 Function Result 34.895 MHz
 X-value
 Y-value
 Function

 3.555882 GHz
 7.93 dBm
 ndB down

 3.55087 GHz
 -18.45 dBm
 ndB

 3.575062 GHz
 -17.90 dBm
 Q factor
 Type | Ref | Trc | Middle Channel / 15MHz+20MHz Middle Channel / 20MHz+5MHz 10 dBm 146. 103 -10 dBm -20 dBm-40 dBm--40 dBm-70.0 MHz Span 50.0 MHz Type Ref Trc Date: 30.0CT.2020 21:04:14 Highest Channel / 20MHz+5MHz Highest Channel / 15MHz+20MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 7.5 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.5 μs ● VBW
 3 MHz
 Mode
 Auto FFT
 0 dBm--20 dBm -SO dBm Function Result

34.895 MHz

26.00 dB

105.2 CF 3.687475 GHz Type | Ref | Trc | Function m ndB down Y-value 6.60 dBm -19.56 dBm -20.31 dBm Function n ndB down

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LTE Band 48C **QPSK** Lowest Channel / 20MHz+10MHz Lowest Channel / 20MHz+15MHz | Ref Level 30.00 dBm | Offset 12.90 dB @ RBW 1 MHz | Att | 30 dB | SWT | 9.5 ps @ VBW 3 MHz | SUL Count 100/100 | 1Pk Max | Mode Auto FFT CF 3.56495 GHz CF 3.567425 GHz
 X-value
 Y-value
 Function

 3.576938 GHz
 6.78 dBm
 nd8 down

 3.549905 GHz
 -19.03 dbm
 nd8

 3.579935 GHz
 -18.71 dBm
 0 factor
 Function Result

34.965 MHz

26.00 dB

101.8 Function Result 30.03 MHz Type Ref Trc
 X-value
 Y-value
 Function

 3.558054 GHz
 6.37 dBm
 ndB down
 Type | Ref | Trc | Middle Channel / 20MHz+10MHz Middle Channel / 20MHz+15MHz 10 dBm 120 -10 dBm -20 dBm--40 dBm-40 dBm-Span 60.0 MHz Span 70.0 MHz Type Ref Trc Date: 29.0CT.2020 23:30:38 Highest Channel / 20MHz+10MHz Highest Channel / 20MHz+15MHz Ref Level 30.00 dBm Offset
Att 30 dB SWT
SGL Count 100/100

1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.4 μs ● VBW
 3 MHz
 Mode Auto FFT
 12.90 dB • RBW 1 MHz 9.5 µs • VBW 3 MHz Mode Auto FFT 0 dBm--20 dBm -50 dBm-CF 3.682525 GHz Type | Ref | Trc | X-value 3.682533 GHz 3.670065 GHz 3.700155 GHz Function m ndB down Function n ndB down **Function Result** -21.59 dBm -21.21 dBm

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 X-value
 Y-value
 Function

 3.552557 GHz
 4.89 dBm
 nd8 down

 3.55 GHz
 -20.01 dBm
 nd8

 3.5898 GHz
 -20.44 dBm
 Q factor
 Type Ref Trc Function Result Middle Channel / 20MHz+20MHz N/A Span 80.0 MHz Highest Channel / 20MHz+20MHz N/A Function m ndB down

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LTE Band 48C 16QAM Lowest Channel / 5MHz+20MHz Lowest Channel / 10MHz+20MHz M1[1] 10.81 dBr 3.5521350 GF -50 dBm-CF 3.562525 GHz CF 3.56495 GHz
 X-value
 Y-value
 Function

 3.552135 GHz
 10.81 dBm
 ndB down

 3.549938 GHz
 -15.48 dBm
 ndB

 3.574763 GHz
 -15.02 dBm
 Q factor
 Function Result 24.825 MHz
 X-value
 Y-value
 Function

 3.552962 GHz
 9.24 dBm
 ndB down

 3.549905 GHz
 -16.51 dBm
 ndB

 3.579695 GHz
 -16.36 dBm
 Q factor
 Type | Ref | Trc | **Function Result** Middle Channel / 5MHz+20MHz Middle Channel / 10MHz+20MHz 10 dBm 120. 145 -10 dBm -20 dBm 40 dBm--40 dBm Span 50.0 MHz Span 60.0 MHz Y-value 7.18 dBm -18.96 dBm -19.33 dBm Type Ref Trc Date: 30.0CT.2020 17:30:02 Highest Channel / 10MHz+20MHz Highest Channel / 5MHz+20MHz
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 7.5 μs ● VBW
 3 MHz
 Mode
 Auto FFT
 10.62 dBr 3.6787840 GH 26.00 d 24.725000000 MH 148. 0 dBm--SO dBm CF 3.687525 GH: CF 3.68505 GHz Type | Ref | Trc | X-value 3.678784 GHz 3.674988 GHz 3.699713 GHz Function m ndB down Function n ndB down Function Result

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LTE Band 48C 16QAM Lowest Channel / 15MHz+20MHz Lowest Channel / 20MHz+5MHz CF 3.567475 GHz CF 3.562475 GHz Function Result

24.875 MHz

26.00 dB

143.5 Function Result 34.755 MHz
 X-value
 Y-value
 Function

 3.557895 GHz
 7.59 dBm
 nd8 down

 3.549992 GHz
 -17.30 dBm
 nd8

 3.584748 GHz
 -18.50 dBm
 Q factor
 Type | Ref | Trc |
 X-value
 Y-value
 Function

 3.570067 GHz
 8.30 dBm
 ndB down
 Middle Channel / 15MHz+20MHz Middle Channel / 20MHz+5MHz 10 dBm 145. 104 -10 dBm -20 dBm-40 dBm--40 dBm-70.0 MHz Span 50.0 MHz Type Ref Trc Highest Channel / 20MHz+5MHz Highest Channel / 15MHz+20MHz Ref Level 30.00 dBm Offset
Att 30 dB SWT
SGL Count 100/100

1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.5 μs ● VBW
 3 MHz
 Mode
 Auto FFT
 12.90 dB • RBW 1 MHz 7.5 µs • VBW 3 MHz Mode Auto FFT 8.31 dBi 3.6774000 GF 26.00 d 34.755000000 MF 0 dBm--20 dBm -SO dBm CF 3.687475 GHz Type | Ref | Trc | Function m ndB down Function n ndB down Function Result

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LTE Band 48C 16QAM Lowest Channel / 20MHz+10MHz Lowest Channel / 20MHz+15MHz Mode Auto FFT CF 3.56495 GHz Span 60.0 MHz CF 3.567425 GHz Function Result

34.895 MHz
26.00 dB
101.9
 X-value
 Y-value
 Function

 3.569508 GHz
 6.51 dBm
 nd8 down

 3.549965 GHz
 -18.95 dBm
 nd8

 3.579935 GHz
 -19.28 dBm
 Q factor
 Function Result 29.97 MHz
 X-value
 Y-value
 Function

 3.557075 GHz
 7.17 dBm
 ndB down

 3.549942 GHz
 -19.82 dBm
 ndB

 3.594938 GHz
 -17.81 dBm
 Q factor
 Type Ref Trc Type | Ref | Trc | Middle Channel / 20MHz+10MHz Middle Channel / 20MHz+15MHz 10 dBm 104. 120 -10 dBm -20 dBm 40 dBm-40 dBm= Span 60.0 MHz Span 70.0 MHz Type Ref Trc Date: 29.0CT.2020 23:30:15 Highest Channel / 20MHz+10MHz Highest Channel / 20MHz+15MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 9.5 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.4 μs ● VBW
 3 MHz
 Mode Auto FFT
 0 dBm--20 dBm -SO dBm CF 3.682525 GHz Span 60.0 MHz Type | Ref | Trc | X-value 3.695779 GHz 3.670005 GHz 3.700035 GHz Function m ndB down Function n ndB down **Function Result**

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 X-value
 Y-value
 Function

 3.500629 GHz
 4.64 dBm
 ndB down

 3.55 GHz
 -20.79 dBm
 ndB

 3.58988 GHz
 -21.82 dBm
 Q factor
 Type Ref Trc Middle Channel / 20MHz+20MHz N/A 40 dBm-Span 80.0 MHz Highest Channel / 20MHz+20MHz N/A

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Type Ref Trc

Function m ndB down

LTE Band 48C 64QAM Lowest Channel / 5MHz+20MHz Lowest Channel / 10MHz+20MHz Ref Level 30.00 dBm Offset 12.90 dB • RBW 1 MHz

att 30 dB SWT 9.4 µs • VBW 3 MHz

SGL Count 100/100

1Pk Max 11.65 dBi 3.5542330 CF 8.94 dBn 3.5581170 GH 26.00 dl CF 3.562525 GHz CF 3.56495 GHz
 X-value
 Y-value
 Function

 3.554233 GHz
 11.65 dBm
 ndB down

 3.550037 GHz
 -13.57 dBm
 ndB

 3.574763 GHz
 -14.61 dBm
 Q factor
 Function Result 24.725 MHz Type Ref Trc Type | Ref | Trc |
 X-value
 Y-value
 Function

 3.558117 GHz
 8.94 dBm
 ndB down
 Function Result Middle Channel / 5MHz+20MHz Middle Channel / 10MHz+20MHz 11.06 dB 3.6139360 GP 26.00 c 24.875000000 MP 10 dBm 145 121. -10 dBm -20 dBm 40 dBm--40 dBm Span 50.0 MHz Span 60.0 MHz Date: 30.0CT.2020 17:29:40 Highest Channel / 10MHz+20MHz Highest Channel / 5MHz+20MHz
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 7.5 μs ● VBW
 3 MHz
 Mode
 Auto FFT
 11.09 dBi 3.6772850 GF 26.00 d 24.775000000 MF 0 dBm--SO dBm CF 3.687525 GH: CF 3.68505 GHz Type | Ref | Trc | Function m ndB down Y-value 9.28 dBm -17.59 dBm -17.38 dBm Function n ndB down Function Result

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LTE Band 48C 64QAM Lowest Channel / 15MHz+20MHz Lowest Channel / 20MHz+5MHz 7.84 dBr 3.5577550 GH -50 dBm-CF 3.567475 GHz CF 3.562475 GHz Function Result

24.925 MHz

26.00 dB

143.2
 X-value
 Y-value
 Function

 3.557755 GHz
 7.84 dBm
 nd8 down

 3.549992 GHz
 -18.40 dBm
 nd8

 3.594918 GHz
 -18.70 dBm
 Q factor
 Function Result 34.825 MHz Type | Ref | Trc |
 X-value
 Y-value
 Function

 3.570067 GHz
 8.86 dBm
 ndB down
 Middle Channel / 15MHz+20MHz Middle Channel / 20MHz+5MHz 10 dBm 145. 103 -10 dBm -20 dBm 40 dBm-40 dBm-70.0 MHz Span 50.0 MHz Y-value 7.79 dBm -18.48 dBm -18.97 dBm Type Ref Trc Date: 30.0CT.2020 21:03:29 Highest Channel / 20MHz+5MHz Highest Channel / 15MHz+20MHz
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.5 μs ● VBW
 3 MHz
 Mode
 Auto FFT
 8.95 dBi 3.6778900 GF 26.00 d 34.825000000 MF 0 dBm--20 dBm -SO dBm CF 3.687475 GHz Type | Ref | Trc | Function m ndB down Function n ndB down Function Result 34.82 -18.29 dBm -18.83 dBm

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LTE Band 48C 64QAM Lowest Channel / 20MHz+10MHz Lowest Channel / 20MHz+15MHz Mode Auto FFT 6.12 dBn 3.5551870 GH: 26.00 dE -50 dBm-Span 60.0 MHz CF 3.567425 GHz Function Result

34.965 MHz
26.00 dB
101.7
 X-value
 Y-value
 Function

 3.57508 GHz
 6.88 dBm
 nd8 down

 3.549845 GHz
 -19.84 dBm
 nd8

 3.579935 GHz
 -18.27 dBm
 Q factor
 Function Result 30.09 MHz Type Ref Trc
 X-value
 Y-value
 Function

 3.555187 GHz
 6.12 dBm
 ndB down
 Type | Ref | Trc | Middle Channel / 20MHz+10MHz Middle Channel / 20MHz+15MHz 10 dBm 104. 120 -10 dBm -20 dBm 40 dBm-40 dBm-Span 60.0 MHz Span 70.0 MHz Type Ref Trc Date: 29.0CT.2020 23:29:53 Highest Channel / 20MHz+10MHz Highest Channel / 20MHz+15MHz Ref Level 30.00 dBm Offset
Att 30 dB SWT
SGL Count 100/100

1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.4 µs ● VBW
 3 MHz
 Mode
 Auto FFT
 12.90 dB • RBW 1 MHz 9.5 µs • VBW 3 MHz Mode Auto FFT 0 dBm--20 dBm -SO dBm CF 3.682525 GHz Span 60.0 MHz Function Result
29.91
26. Type | Ref | Trc | Function m ndB down Function n ndB down -18.29 dBm -18.90 dBm

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Report No.: FG090125-01C LTE Band 48C 64QAM Lowest Channel / 20MHz+20MHz N/A Function Result 39.96 MHz 26.00 dB 89.4
 X-value
 Y-value
 Function

 3.571898 GHz
 4.90 dBm
 ndB down

 3.54992 GHz
 -21.26 dBm
 ndB

 3.58988 GHz
 -21.70 dBm
 Q factor
 Type Ref Trc Middle Channel / 20MHz+20MHz N/A -40 dBm-Span 80.0 MHz Highest Channel / 20MHz+20MHz N/A
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW 1 MHz
 RBW 2 MHz
 Att
 Auto FFT

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LTE Band 48C 256QAM Lowest Channel / 5MHz+20MHz Lowest Channel / 10MHz+20MHz M1[1] 3.55 CF 3.562525 GHz CF 3.56495 GHz Function Result

29.85 MHz
26.00 dB
119.2
 X-value
 Y-value
 Function

 3.553584 GHz
 12.02 d8m
 nd8 down

 3.550037 GHz
 -13.82 d8m
 nd8

 3.574713 GHz
 -13.39 d8m
 Q factor
 Function Result 24.675 MHz
 X-value
 Y-value
 Function

 3.557398 GHz
 9.52 dBm
 ndB down

 3.549905 GHz
 -16.43 dBm
 ndB

 3.579755 GHz
 -15.86 dBm
 Q factor
 Type Ref Trc Type | Ref | Trc | Middle Channel / 5MHz+20MHz Middle Channel / 10MHz+20MHz 12.41 dB 3.6145350 GF 26.00 c 24.575000000 MF 10 dBm 147 121. -10 dBm 40 dBm-Span 50.0 MHz Span 60.0 MHz Date: 30.0CT.2020 17:29:18 Highest Channel / 10MHz+20MHz Highest Channel / 5MHz+20MHz
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 7.5 μs ● VBW
 3 MHz
 Mode
 Auto FFT
 0 dBm--SO dBm CF 3.687525 GH: CF 3.68505 GHz Type | Ref | Trc | Function m ndB down Y-value 8.85 dBm -17.62 dBm -17.59 dBm Function n ndB down Function Result

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LTE Band 48C 256QAM Lowest Channel / 15MHz+20MHz Lowest Channel / 20MHz+5MHz -50 dBm-CF 3.567475 GHz CF 3.562475 GHz Function Result

24.825 MHz

26.00 dB

143.8
 X-value
 Y-value
 Function

 3.558594 GHz
 6.56 dBm
 nd8 down

 3.549923 GHz
 -19.41 dBm
 nd8

 3.584818 GHz
 -19.80 dBm
 Q factor
 Function Result 34.895 MHz
 X-value
 Y-value
 Function

 3.570917 GHz
 9.76 dBm
 ndB down

 3.550087 GHz
 -16.62 dBm
 ndB

 3.574913 GHz
 -15.56 dBm
 Q factor
 Type | Ref | Trc | Middle Channel / 15MHz+20MHz Middle Channel / 20MHz+5MHz 7.34 dB 3.6207090 GF 26.00 c 34.825000000 MF 10 dBm 146. 104 -10 dBm -10 dBn -20 dBm 40 dBm--40 dBm 70.0 MHz Span 50.0 MHz Type Ref Trc Highest Channel / 20MHz+5MHz Highest Channel / 15MHz+20MHz Ref Level 30.00 dBm Offset
Att 30 dB SWT
SGL Count 100/100

1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.5 μs ● VBW
 3 MHz
 Mode
 Auto FFT
 12.90 dB • RBW 1 MHz 7.5 µs • VBW 3 MHz Mode Auto FFT 7.32 dBi 3.6732040 GF 26.00 d 34.825000000 MF 0 dBm--20 dBm -SO dBm CF 3.687475 GHz Type | Ref | Trc | Function m ndB down Function n ndB down Function Result -17.94 dBm -19.16 dBm

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LTE Band 48C 256QAM Lowest Channel / 20MHz+10MHz Lowest Channel / 20MHz+15MHz Mode Auto FFT -50 dBm-CF 3.56495 GHz Span 60.0 MHz CF 3.567425 GHz Function Result

34.825 MHz
26.00 dB
102.4
 X-value
 Y-value
 Function

 3.556379 GHz
 7.07 dBm
 ndB down

 3.549965 GHz
 -18.25 dBm
 ndB

 3.579995 GHz
 -18.90 dBm
 Q factor
 Function Result 30.03 MHz Type Ref Trc
 X-value
 Y-value
 Function

 3.567635 GHz
 7.10 dBm
 ndB down
 Type | Ref | Trc | Middle Channel / 20MHz+10MHz Middle Channel / 20MHz+15MHz 10 dBm 121 103 -10 dBm -20 dBm 40 dBm 40 dBm-Span 60.0 MHz Span 70.0 MHz Y-value 6.57 dBm -18.19 dBm -18.74 dBm Type Ref Trc Date: 29.0CT.2020 23:29:30 Highest Channel / 20MHz+10MHz Highest Channel / 20MHz+15MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 9.5 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 9.4 μs ● VBW
 3 MHz
 Mode Auto FFT
 0 dBm--20 dBm -SO dBm Function Result 29,97 MHz 26,00 dB 122.8 CF 3.682525 GHz Span 60.0 MHz Type | Ref | Trc | Function m ndB down Function n ndB down

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Report No.: FG090125-01C LTE Band 48C 256QAM Lowest Channel / 20MHz+20MHz N/A
 X-value
 Y-value
 Function

 3.557822 GHz
 5.21 dBm
 ndB down

 3.55 GHz
 -20.27 dBm
 ndB

 3.58988 GHz
 -20.70 dBm
 Q factor
 Function Result
39.88 MHz Type | Ref | Trc | Middle Channel / 20MHz+20MHz N/A Span 80.0 MHz Highest Channel / 20MHz+20MHz N/A
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW 1 MHz
 RBW 2 MHz
 Att
 Auto FFT

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Occupied Bandwidth

Mode	LTE Band 48C : 99%OBW(MHz)				
QPSK					
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz	
Lowest CH	23.08	27.93	32.80	23.08	
Middle CH	23.28	27.99	32.73	23.28	
Highest CH	23.18	27.69	32.73	23.13	
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A	
Lowest CH	28.05	32.94	37.88	-	
Middle CH	27.63	32.59	37.64	-	
Highest CH	27.99	32.94	37.80	-	

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Mode	LTE Band 48C : 99%OBW(MHz)				
16QAM					
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz	
Lowest CH	22.88	27.57	32.59	23.28	
Middle CH	23.33	28.05	32.73	23.38	
Highest CH	23.38	27.93	32.31	23.28	
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A	
Lowest CH	28.05	32.73	37.72	-	
Middle CH	27.75	32.94	37.56	-	
Highest CH	27.81	32.66	37.80	-	

Mode	LTE Band 48C : 99%OBW(MHz)				
64QAM					
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz	
Lowest CH	22.98	27.81	32.94	23.08	
Middle CH	23.18	27.75	32.59	23.28	
Highest CH	22.98	27.45	32.66	23.13	
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A	
Lowest CH	27.87	32.73	37.56	-	
Middle CH	27.99	32.59	37.72	-	
Highest CH	28.05	32.87	37.88	-	

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Mode	LTE Band 48C : 99%OBW(MHz)				
256QAM					
BW	5MHz+20MHz	10MHz+20MHz	15MHz+20MHz	20MHz+5MHz	
Lowest CH	23.23	27.93	32.80	23.03	
Middle CH	22.93	27.87	32.94	23.08	
Highest CH	23.08	28.29	32.94	22.98	
BW	20MHz+10MHz	20MHz+15MHz	20MHz+20MHz	N/A	
Lowest CH	27.87	32.52	37.88	-	
Middle CH	27.81	32.80	37.64	-	
Highest CH	27.75	33.01	37.72	-	

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LTE Band 48C **QPSK** Lowest Channel / 5MHz+20MHz Lowest Channel / 10MHz+20MHz RefLevel 30.00 dBm Offset 12.90 dB • RBW 1 MHz
• Att 30 dB • SWT 9.4 µs • VBW 3 MHz Mode Auto FFT
• SSL Count 100/100
• 19k Max M1[1] M1[1] -10 dBm--30 dBm -30 dBm -50 dBm-Span 50.0 MHz CF 3.562525 GHz CF 3.56495 GHz Span 60.0 MHz X-value Y-value Function

3.554783 GHz 10.67 dBm

3.5507369 GHz 1.81 dBm Occ BW

3.5738137 GHz -1.88 dBm Type Ref Trc Type | Ref | Trc | Function Result Function Result 3.553022 GHz 8.78 dBm 3.5507442 GHz 0.56 dBm Occ Bw 3.5786763 GHz -1.30 dBm 23.076923077 MHz 27.932067932 MHz Middle Channel / 5MHz+20MHz Middle Channel / 10MHz+20MHz Spectrum

Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 7.51 dBn 3.6172580 GH 27.992007992 MH 10 dBm--10 dBm -10 dBm -20 dBm-40 dBm= 40 dBm -60 dBm-1001 pts Span 50.0 MHz CF 3.62505 GHz 1001 pts Span 60.0 MHz
 X-value
 Y-value

 3.617033 GHz
 10.36 dBm

 3.6130869 GHz
 2.02 dBm

 3.6363637 GHz
 -1.15 dBm
 Type Ref Trc Function Function Result Type Ref Trc Date: 30.0CT.2020 17:27:48 Highest Channel / 5MHz+20MHz Highest Channel / 10MHz+20MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 9.4 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max 10.42 dBi 3.6798830 GF 23.176823177 MF 20 dBm 0 dBm--20 dBm-40 dBm--50 d8m -50 d8m-CF 3.687525 GHz CF 3.68505 GHz Type Ref Trc X-value 3.679883 GHz 3.6755869 GHz 3.6987638 GHz X-value 3.672822 GHz 3.6707243 GHz 3.6984166 GHz Function Result **Function Result** 23.176823177 MHz 27.692307692 MHz

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LTE Band 48C **QPSK** Lowest Channel / 15MHz+20MHz Lowest Channel / 20MHz+5MHz RefLevel 30.00 dBm Offset 12.90 dB • RBW 1 MHz
• Att 30 dB • SWT 7.5 µs • VBW 3 MHz Mode Auto FFT
61Pk Max M1[1] M1[1] -10 dBm -30 dBm -50 dBm-Span 70.0 MHz CF 3.567475 GHz CF 3.562475 GHz Span 50.0 MHz
 X-value
 Y-value
 Function
 Function Result

 3.587995 GHz
 7.52 dbm
 3.580816 GHz
 3.27972027

 3.5808316 GHz
 1.27 dbm
 Occ Bw
 32.7972027

 3.5808368 GHz
 -1.78 dbm
 Occ Bw
 32.7972027
 Type Ref Trc Type | Ref | Trc | Function Result 3.572915 GHz 8.85 dBm 3.5509365 GHz 0.98 dBm Occ Bw 3.5740135 GHz 1.22 dBm 32.797202797 MHz 23.076923077 MHz Middle Channel / 15MHz+20MHz Middle Channel / 20MHz+5MHz Spectrum

Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 10 dBm--10 dBm--10 dBm -20 dBm-40 dBm--40 dBm--60 dBm-1001 pts Span 70.0 MHz CF 3.624975 GHz 1001 pts Span 50.0 MHz Y-value 2 8.24 dBm 2 0.20 dBm 2 0.46 dBm Type Ref Trc Function Function Result Type Ref Trc Date: 30.0CT.2020 21:01:37 Highest Channel / 15MHz+20MHz Highest Channel / 20MHz+5MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 7.5 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB
 RBW
 1 MHz
 Mode
 Auto FFT

 Att
 30 dB
 SWT
 9.5 µs
 VBW
 3 MHz
 Mode
 Auto FFT
 8.20 dB 3.6782390 GF 32.7272727 MF 20 dBm 0 dBm--20 dBm-40 dBm--50 d8m -50 d8m-CF 3.682575 GHz CF 3.687475 GHz Type | Ref | Trc | X-value 3.678239 GHz 3.6660016 GHz 3.6987288 GHz X-value 3.695417 GHz 3.6759365 GHz 3.6990634 GHz **Function Result Function Result** 32.727272727 MHz 23.126873127 MHz

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LTE Band 48C **QPSK** Lowest Channel / 20MHz+10MHz Lowest Channel / 20MHz+15MHz RefLevel 30.00 dBm Offset 12.90 dB • RBW 1 MHz
• Att 30 dB • SWT 9.5 µs • VBW 3 MHz Mode Auto FFT
• SQL Count 100/100
• 19k Max M1[1] -10 dBm -20 dBm--30 dBm -50 dBm-Span 60.0 MHz CF 3.56495 GHz CF 3.567425 GHz 1001 pts Span 70.0 MHz
 X-value
 Y-value
 Function
 Function Result

 3.561354 GHz
 7.23 dsm
 7.23 dsm
 7.23 dsm

 3.550926 GHz
 0.41 dsm
 Occ Bw
 28.0519460

 3.578976 GHz
 1.44 dsm
 Occ Bw
 28.0519480
 Type | Ref | Trc |
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 3.563159 GHz
 6.70 dBm
 Function Result 3.563159 GHz 6.70 dBm 3.5507816 GHz 0.31 dBm Occ Bw 3.5837187 GHz -0.90 dBm 28.051948052 MHz 32.937062937 MHz Middle Channel / 20MHz+10MHz Middle Channel / 20MHz+15MHz Spectrum

Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 10 dBm--10 dBm -10 dBm -20 dBm--40 dBm--40 dBm--60 dBm-1001 pts Span 60.0 MHz CF 3.625025 GHz 1001 pts Span 70.0 MHz
 X-value
 Y-value

 3.621459 GHz
 5.53 dBm

 3.6085914 GHz
 -1.33 dBm

 3.6411788 GHz
 -4.13 dBm
 Type Ref Trc Function Function Result Type Ref Trc Date: 29.0CT.2020 23:28:01 Highest Channel / 20MHz+10MHz Highest Channel / 20MHz+15MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 9.5 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max Count 100/100 6.59 dBi 3.6904450 GF 27.992007992 MF 7.00 dBn 3.6825250 GH 32.937062937 MH 20 dBm 0 dBm--20 dBm -20 dBm-40 dBm--50 d8m -50 d8m-CF 3.68505 GHz CF 3.682525 GHz Span 60.0 MHz
 X-value
 Y-value
 Function

 3.682225 GHz
 7.00 dBm
 3.6560215 GHz

 3.6560215 GHz
 0.01 dBm
 Occ Bw

 3.6999586 GHz
 -0.94 dBm
 Type Ref Trc X-value 3.690445 GHz 3.6711439 GHz 3.6991359 GHz Function Result **Function Result** 27.992007992 MHz 32.937062937 MHz

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 X-value
 Y-value
 Function

 3.632912 GHz
 4.22 dBm

 3.6060589 GHz
 -0.75 dBm
 Occ Bw

 3.6437013 GHz
 -1.76 dBm
 Type Ref Trc Highest Channel / 20MHz+20MHz N/A
 Ref Level
 30.00 dBm
 Offset
 12.90 dB ● RBW 1 MHz
 RBW 2 MHz
 Att
 Auto FFT

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Function Result 37.802197802 MHz

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CF 3.6801 GHz

Type Ref Trc

 X-value
 Y-value
 Function

 3.694166 GHz
 4.11 dBm
 3.6612389 GHz
 -0.55 dBm
 Occ BW

 3.6990411 GHz
 -0.63 dBm
 -0.63 dBm
 Occ BW

LTE Band 48C **16QAM** Lowest Channel / 5MHz+20MHz Lowest Channel / 10MHz+20MHz RefLevel 30.00 dBm Offset 12.90 dB • RBW 1 MHz
• Att 30 dB • SWT 9.4 µs • VBW 3 MHz Mode Auto FFT
• SSL Count 100/100
• 19k Max M1[1] -10 dBm--30 dBm -50 dBm-Span 50.0 MHz CF 3.562525 GHz CF 3.56495 GHz Span 60.0 MHz
 X-value
 Y-value
 Function

 3.552135 GHz
 12.37 dBm
 0.552135 GHz

 3.5506868 GHz
 3.18 dBm
 0cc Bw

 3.573564 GHz
 -2.33 dBm
 Type Ref Trc Type | Ref | Trc | Function Result Function Result 3.556678 GHz 10.83 dBm 3.5507442 GHz 2.48 dBm Occ Bw 3.5783166 GHz -0.93 dBm 22.877122877 MHz 27.572427572 MHz Middle Channel / 5MHz+20MHz Middle Channel / 10MHz+20MHz Spectrum

Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 8.01 dBn 3.6182770 GH 28.051948052 ML 10 dBm--10 dBm -10 dBm -20 dBm-40 dBm--40 dBm -60 dBm-1001 pts Span 50.0 MHz CF 3.62505 GHz 1001 pts Span 60.0 MHz Type Ref Trc Function Function Result Type Ref Trc Date: 30.0CT.2020 17:28:11 Highest Channel / 10MHz+20MHz Highest Channel / 5MHz+20MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 9.4 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max 20 dBm 0 dBm--20 dBm-40 dBm--50 d8m -50 d8m-CF 3.687525 GHz CF 3.68505 GHz
 X-value
 Y-value
 Function

 3.679595 GHz
 10.17 dBm
 3.670944 GHz

 3.6709442 GHz
 1.47 dBm
 Occ Bw

 3.6987763 GHz
 0.90 dBm
 Type Ref Trc X-value 3.676636 GHz 3.6756369 GHz 3.6990135 GHz **Function Result Function Result** 23.376623377 MHz 27.932067932 MHz

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LTE Band 48C **16QAM** Lowest Channel / 15MHz+20MHz Lowest Channel / 20MHz+5MHz RefLevel 30.00 dBm Offset 12.90 dB • RBW 1 MHz
• Att 30 dB • SWT 7.5 µs • VBW 3 MHz Mode Auto FFT
61Pk Max M1[1] M1[1] -10 dBm -30 dBm--50 dBm-Span 70.0 MHz CF 3.567475 GHz CF 3.562475 GHz Span 50.0 MHz
 X-value
 Y-value
 Function

 3.5523 GHz
 8.39 dBm
 Type Ref Trc
 X-value
 Y-value
 Function

 3.570017 GHz
 8.06 dBm
 Type | Ref | Trc | Function Result Function Result 3.570017 GHz 8.06 dBm 3.5509365 GHz 0.93 dBm Occ Bw 3.5742133 GHz 1.85 dBm 3.5523 GHz 8.39 dBm 3.5509016 GHz 1.45 dBm Occ Bw 3.583489 GHz -1.61 dBm 32.587412587 MHz 23.276723277 MHz Middle Channel / 15MHz+20MHz Middle Channel / 20MHz+5MHz Spectrum

Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 10 dBm--10 dBm -10 dBm -20 dBm-40 dBm-40 dBm--60 dBm-1001 pts Span 70.0 MHz CF 3.624975 GHz 1001 pts Span 50.0 MHz Y-value Z 6.90 dBm Z 0.01 dBm Z 1.33 dBm Type Ref Trc Function Function Result Type Ref Trc Highest Channel / 15MHz+20MHz Highest Channel / 20MHz+5MHz Ref Lavel 30.00 dBm Offset 12.90 dB ■ RBW 1 MHz ■ Att 30 dB SWT 7.5 μs ■ VBW 3 MHz Mode Auto FFT SGL Count 100/100 ■ 1Pk Max
 Ref Level
 30.00 dBm
 Offset
 12.90 dB
 RBW
 1 MHz
 Mode
 Auto FFT

 Att
 30 dB
 SWT
 9.5 µs
 VBW
 3 MHz
 Mode
 Auto FFT
 7.27 dB 3.6743930 GF 32.307692308 MF 7.54 dBr 3.6959670 GH 23.276723277 MH 20 dBm 0 dBm--20 dBm-40 dBm--50 d8m-CF 3.682575 GHz CF 3.687475 GHz Span 70.0 MHz
 X-value
 Y-value
 Function

 3.695967 GHz
 7.54 dBm
 3.6760346 GHz
 -1.10 dBm
 Occ Bw

 3.67933132 GHz
 2.34 dBm
 -2.34 dBm
 Occ Bw
 Type | Ref | Trc | X-value 3.674393 GHz 3.6660016 GHz 3.6983093 GHz Function Result **Function Result** 32.307692308 MHz 23.276723277 MHz

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