

October 09, 2023

Trackonomy Systems

214 Devcon Drive  
San Jose, CA 95112

Dear Saurabh Sanghai

Enclosed is the RF Wireless test report for compliance testing of the Trackonomy Systems, Multifunctional IoT Platform Sensor as tested to the requirements of the

FCC Part §2.1053, §22.917(a), §24.238(a), §27.53(a)(4), §27.53(c)(2), §27.53(f), §27.53(g), § 90.691  
RSS-GEN Issue 5, April 2018 + Amendment 1 (March 2019) + Amendment 2 (February 2021)  
RSS-130 Issue 2 February 2019  
RSS-132 Issue 4, January 2023  
RSS-133 Issue 6 January 2018  
RSS-139 Issue 4 September 2022

Sincerely yours,



Documentation Department  
Eurofins Electrical and Electronic Testing NA, Inc.



FCC Test Site(s) Reg #:US1123  
IC Test Site(s) Reg. #: 2043C

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## **FCC/ ISED Test Report**

**Applicant name: Trackonomy Systems**

**Manufacturer name: Trackonomy Systems**

**Product: Multifunctional IoT Platform Sensor**

**Report: WIR128169-Track\_FCC\_ISED\_LTE\_CAT-M\_NB-IOT**

**Applicant Address:**

**214 Devcon Drive  
San Jose, CA 95112**

**Manufacturer Address:**

**214 Devcon Drive  
San Jose, CA 95112**

**Prepared By:  
Eurofins Electrical and Electronic Testing NA, Inc.  
3162 Belick St.  
Santa Clara CA, 95054**

## FCC/ ISED Test Report

**Applicant name: Trackonomy Systems**

**Product: Multifunctional IoT Platform Sensor**

**Standard**

**47 CFR Part 2, 22, 24, 27, 90**

**RSS-GEN Issue 5, April 2018 + Amendment 1 (March 2019) + Amendment 2 (February 2021)**

**RSS-130 Issue 2 February 2019**

**RSS-132 Issue 4, January 2023**

**RSS-133 Issue 6, January 2018**

**RSS-139 Issue 4 September 2022**

*Richard Dollente*  
Richard Dollente

Test Engineer, Wireless Laboratory

**Engineering Statement:** The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of FCC and ISED Rules under normal use and maintenance.

*Gary Chou*

Gary Chou

Wireless Engineering Manager, Wireless Laboratory

## Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	October 09, 2023	Initial Issue.

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## I. Executive Summary

### A. Purpose of Test

An WIRELESS evaluation was performed to determine compliance of the Trackonomy Systems., Multifunctional IoT Platform Sensor / FBO-2001, with the requirements of 47 CFR FCC CFR Part 2, 22, 24, 27, 90 RSS-GEN Issue 5 April 2018 + Amendment 1 (March 2019) + Amendment 2 (February 2021), RSS-130 Issue 2 February 2019, RSS-132 Issue 4 January 31, 2023, RSS-133 Issue 6 January 2018, RSS-139 Issue 4 September 2022. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with PVG-04 technical requirements.

### B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with 47 CFR FCC CFR Part 2, 22, 24, 27, RSS-Gen Issue 5 2018, RSS-130 Issue 2 February 2019, RSS-132 Issue 4 January 31 2023, RSS-133 Issue 6 January 2018, RSS-139 Issue 4 September 2022. All tests were conducted using measurement procedure.

FCC ISED Clause	Description	Compliance
§2.1053 §22.917(a) §24.238 §27.53(l)(4)(6) § 90.691	Radiated Spurious Emissions	Compliant
RSS-132§5.5 RSS-133§6.5 RSS-130§4.6 RSS-139§6.6	Radiated Spurious Emissions	Compliant

Note: Refer to RF module Report FCC ID : 2ANPO00NRF9160, RF module report, ISED ID : 24529-NRF9160

**Rationale:**

Per KDB 996369 D04 “Modular Transmitter Integration Guide – Guidance for Host Product Manufacturers” only spot checks are reported in this filing.

Per ANSI C63.26: 2015 section 5.1.2.2, the results include worst case modulation only.

## II. Equipment Information

### A. Equipment Overview and Test Configuration

<b>Product:</b>	Multifunctional IoT Platform Sensor		
<b>Brand:</b>	Trackonomy Systems		
<b>EUT Specifications:</b>	Input Power:	3.6 Vdc/ Rechargeable Battery powered	
	Type of Modulations:	QPSK, 16QAM, 8PSK, GMSK	
	Technology:	LTE CAT-M / NB-IOT	
	Operating Frequency :	Band 2:	1850 MHz ~ 1910 MHz
		Band 4:	1710 MHz ~ 1755 MHz
		Band 5:	824 MHz ~ 849 MHz
		Band 12:	699 MHz ~ 716 MHz
		Band 13:	777 MHz ~ 787 MHz
Band 17:		704 MHz ~ 716 MHz	
Band 25:		1850 MHz ~ 1915 MHz	
Band 26 :	814 MHz ~ 849 MHz		
Band 66:	1710 MHz ~ 1780 MHz		
Model:	FBO-2001		
FCC ID:	2AXA8-FBO-2001		
ISED ID:	27299-FBO2001		
<b>Antenna Type:</b>	PCB Antenna		
	Antenna Manufacturer/ Model	TAOGLAS/ FXP14.24.0100B	
<b>Antenna Gain:</b>	850 MHz: 2 dBi		
	900 MHz: 1.5 dBi		
	1700 MHz: 3 dBi		
	1800 MHz: 2.5 dBi		
	1900 MHz: 2 dBi		
<b>Antenna Port:</b>	IPEX		
	2100 MHz: 2.5 dBi		
<b>Analysis:</b>	The results obtained relate only to the item(s) tested.		
<b>Environmental Test Conditions:</b>	Temperature: 15-35° C		
	Relative Humidity: 30-60%		
	Richard Dollente		
<b>Evaluated by:</b>	September 12, 2023		
<b>Date(s):</b>	October 09, 2023		

## B. General Description of Applied Standards

### References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

- FCC 47 CFR Part 2
- FCC 47 CFR Part 22(H)
- FCC 47 CFR Part 24(E)
- FCC 47 CFR Part 27
- FCC 47 CFR Part 90
- RSS-GEN Issue 5, April 2018 + Amendment 1 (March 2019) + Amendment 2 (February 2021)
- RSS-130 Issue 2, February 2019
- RSS-132 Issue 4, January 31, 2023
- RSS-133 Issue 6, January 2018
- ANSI/TIA/EIA-603-E 2016
- ANSI 63.26 2015

## C. Test Site

All testing was performed at Eurofins Electrical and Electronic Testing NA, Inc., 3162 Belick St. Santa Clara, CA 95054. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Eurofins Electrical and Electronic Testing NA, Inc. has been accredited by the American Association for Laboratory Accreditation (A2LA) (Certificate #: 0591.02) in accordance with ISO/IEC 17025:2017.

Eurofins Electrical and Electronic Testing NA, Inc. is part of the Eurofins Electrical & Electronics (E&E) global compliance network.

FCC Test Site(s) Reg #:US1123  
 IC Test Site(s) Reg. #: 2043C

## D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
RF Frequencies	±4.52 Hz	2	95%
RF Power Conducted Emissions	±2.32 dB	2	95%
RF Power Conducted Spurious Emissions	±2.25 dB	2	95%
RF Power Radiated Emissions	±3.01 dB	2	95%

Uncertainty Calculations Summary



**E. Modifications****a) Modifications to EUT**

No modifications were made to the EUT.

**b) Modifications to Test Standard**

No modifications were made to the test standard.

**F. Disposition of EUT**

The test sample including all support equipment (if any), submitted to the Electromagnetic Compatibility Lab for testing was returned to Trackonomy Systems. upon completion of testing.

### III. Electromagnetic Compatibility Criteria for Intentional Radiators

#### Radiated Emission Measurement

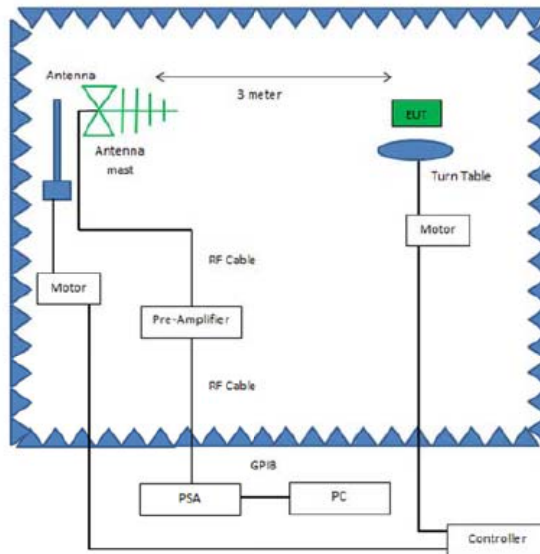
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission equal to  $-13\text{dBm}$

#### Test Procedures:

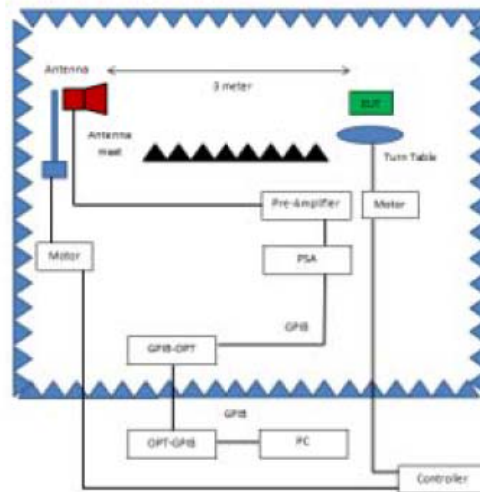
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
- c.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi.}$

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

Deviation from Test Standard  
No deviation.



**Radiated Emissions, Below 1GHz, Test Setup**



**Radiated Emissions, Above 1GHz, Test Setup**

**Test Engineer:** Richard Dollente

**Test Date(s):** September 26, 2023

**Note:** The test data only shows worst cast result

**Test Result:**

**LTE CAT-M Band 2 Bandwidth 10 MHz**

<b>Frequency Range</b>	30 MHz ~ 1GHz	<b>Operating Channel</b>	Mid Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
55.22	V	-61.72	-13	-47.77
104.69	V	-62.91	-13	-43.27
250.19	V	-72.00	-13	-43.55
191.02	H	-71.11	-13	-50.53
256.98	H	-70.10	-13	-48.18
668.26	H	-69.34	-13	-53.42

**LTE CAT-M Band 2 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3700.375	Vertical	-55.27	-13	-42.27
3700.375	Horizontal	-54.34	-13	-41.34
5548.875	Vertical	-55.52	-13	-42.52
5548.875	Horizontal	-54.37	-13	-41.37

**LTE CAT-M Band 2 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3700.375	Vertical	-54.55	-13	-41.55
3700.375	Horizontal	-55.2	-13	-42.2
5548.875	Vertical	-55.06	-13	-42.06
5548.875	Horizontal	-54.12	-13	-41.12

**LTE CAT-M Band 2 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3698.25	V	-53.1	-13	-40.1
3700.375	V	-54.71	-13	-41.71
5551	H	-55.77	-13	-42.77
5551	H	-53.52	-13	-40.52

**LTE CAT-M Band 2 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3698.25	Vertical	-52.8	-13	-39.8
3698.25	Horizontal	-53.07	-13	-40.07
5546.75	Horizontal	-54.54	-13	-41.54
5548.875	Vertical	-53.95	-13	-40.95

**LTE CAT-M Band 2 Bandwidth 15 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3696.125	Vertical	-53.91	-13	-40.91
3702.5	Horizontal	-53.36	-13	-40.36
5548.875	Vertical	-54.01	-13	-41.01
5553.125	Horizontal	-54.2	-13	-41.2

**LTE CAT-M Band 2 Bandwidth 20 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3694	Vertical	-53.02	-13	-40.02
3696.125	Horizontal	-54	-13	-41
5548.875	Vertical	-53.75	-13	-40.75
5551	Horizontal	-54.02	-13	-41.02

**LTE CAT-M Band 2 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3760.375	Vertical	-53.584	-13	-40.584
3760.375	Horizontal	-53.69	-13	-40.69
5638.875	Vertical	-54.358	-13	-41.358
5638.875	Horizontal	-53.758	-13	-40.758

**LTE CAT-M Band 2 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3760.375	Vertical	-53.075	-13	-40.075
3760.375	Horizontal	-53.059	-13	-40.059
5638.875	Vertical	-54.548	-13	-41.548
5638.875	Horizontal	-53.485	-13	-40.485

**LTE CAT-M Band 2 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3760.375	V	-51.524	-13	-38.524
3760.375	V	-52.798	-13	-39.798
5638.875	H	-54.516	-13	-41.516
5641	H	-53.977	-13	-40.977

**LTE CAT-M Band 2 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3760.375	Vertical	-52.297	-13	-39.297
3764.625	Horizontal	-52.762	-13	-39.762
5638.875	Horizontal	-53.436	-13	-40.436
5641	Vertical	-52.069	-13	-39.069

**LTE CAT-M Band 2 Bandwidth 15 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3762.5	Vertical	-52.279	-13	-39.279
3764.625	Horizontal	-53.252	-13	-40.252
5632.5	Vertical	-53.044	-13	-40.044
5641	Horizontal	-53.701	-13	-40.701

**LTE CAT-M Band 2 Bandwidth 20 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3754	Vertical	-52.035	-13	-39.035
3754	Horizontal	-52.022	-13	-39.022
5638.875	Vertical	-53.329	-13	-40.329
5643.125	Horizontal	-52.88	-13	-39.88



**LTE CAT-M Band 2 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3700.375	Vertical	-55.29	-13	-42.29
3700.375	Horizontal	-54.35	-13	-41.35
5578.875	Vertical	-55.4	-13	-42.4
5578.875	Horizontal	-54.51	-13	-41.51

**LTE CAT-M Band 2 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3700.375	Vertical	-54.57	-13	-41.57
3700.375	Horizontal	-55.21	-13	-42.21
5578.875	Vertical	-54.94	-13	-41.94
5578.875	Horizontal	-54.26	-13	-41.26

**LTE CAT-M Band 2 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3698.25	V	-53.12	-13	-40.12
3700.375	V	-54.72	-13	-41.72
5581	H	-55.65	-13	-42.65
5581	H	-53.66	-13	-40.66

**LTE CAT-M Band 2 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3698.25	Vertical	-52.82	-13	-39.82
3698.25	Horizontal	-53.08	-13	-40.08
5576.75	Horizontal	-54.42	-13	-41.42
5578.875	Vertical	-54.09	-13	-41.09

**LTE CAT-M Band 2 Bandwidth 15 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3696.125	Vertical	-53.93	-13	-40.93
3702.5	Horizontal	-53.37	-13	-40.37
5578.875	Vertical	-53.89	-13	-40.89
5583.125	Horizontal	-54.34	-13	-41.34

**LTE CAT-M Band 2 Bandwidth 20 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3694	Vertical	-53.04	-13	-40.04
3696.125	Horizontal	-54.01	-13	-41.01
5578.875	Vertical	-53.63	-13	-40.63
5581	Horizontal	-54.16	-13	-41.16

**LTE CAT-M Band 4 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3420	Vertical	-54.5	-13	-41.5
3420	Horizontal	-53.91	-13	-40.91
5129.375	Vertical	-52.72	-13	-39.72
5129.375	Horizontal	-52.37	-13	-39.37

**LTE CAT-M Band 4 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3420	Vertical	-54.81	-13	-41.81
3420	Horizontal	-55.3	-13	-42.3
5131.5	Vertical	-51.13	-13	-38.13
5131.5	Horizontal	-53.03	-13	-40.03

**LTE CAT-M Band 4 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3417.875	V	-54.98	-13	-41.98
3417.875	V	-54.93	-13	-41.93
5131.5	H	-53.15	-13	-40.15
5129.375	H	-52.5	-13	-39.5

**LTE CAT-M Band 4 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3417.875	Vertical	-54.89	-13	-41.89
3415.75	Horizontal	-53.33	-13	-40.33
5133.625	Horizontal	-53.86	-13	-40.86
5133.625	Vertical	-53.01	-13	-40.01

**LTE CAT-M Band 4 Bandwidth 15 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3415.75	Vertical	-54.55	-13	-41.55
3420	Horizontal	-53.42	-13	-40.42
5131.5	Vertical	-52.11	-13	-39.11
5131.5	Horizontal	-52.96	-13	-39.96

**LTE CAT-M Band 4 Bandwidth 20 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3415.75	Vertical	-54.39	-13	-41.39
3426.375	Horizontal	-54.53	-13	-41.53
5133.625	Vertical	-50.86	-13	-37.86
5133.625	Horizontal	-50.62	-13	-37.62

**LTE CAT-M Band 4 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3465	Vertical	-54.859	-13	-41.859
3465	Horizontal	-55.038	-13	-42.038
5196.875	Vertical	-54.861	-13	-41.861
5196.875	Horizontal	-54.815	-13	-41.815

**LTE CAT-M Band 4 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3462.875	Vertical	-53.786	-13	-40.786
3467.125	Horizontal	-53.658	-13	-40.658
5199	Vertical	-52.274	-13	-39.274
5199	Horizontal	-52.285	-13	-39.285

**LTE CAT-M Band 4 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3465	Vertical	-54.125	-13	-41.125
3465	Horizontal	-54.115	-13	-41.115
5199	Vertical	-52.925	-13	-39.925
5199	Horizontal	-52.936	-13	-39.936

**LTE CAT-M Band 4 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3462.875	Vertical	-53.722	-13	-40.722
3465	Horizontal	-53.842	-13	-40.842
5196.875	Vertical	-52.21	-13	-39.21
5201.125	Horizontal	-53.102	-13	-40.102

**LTE CAT-M Band 4 Bandwidth 15 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3460.75	Vertical	-54.54	-13	-41.54
3465	Horizontal	-53.13	-13	-40.13
5199	Vertical	-52.07	-13	-39.07
5199	Horizontal	-53.17	-13	-40.17

**LTE CAT-M Band 4 Bandwidth 20 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3456.5	V	-53.427	-13	-40.427
3465	V	-53.574	-13	-40.574
5205.375	H	-50.616	-13	-37.616
5205.375	H	-52.1	-13	-39.1

**LTE CAT-M Band 4 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3510	Vertical	-54.52	-13	-41.52
3510	Horizontal	-53.92	-13	-40.92
5264.375	Vertical	-52.6	-13	-39.6
5264.375	Horizontal	-52.51	-13	-39.51

**LTE CAT-M Band 4 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3507.875	V	-55	-13	-42
3507.875	V	-54.94	-13	-41.94
5266.5	H	-53.03	-13	-40.03
5264.375	H	-52.64	-13	-39.64

**LTE CAT-M Band 4 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
3505.75	Vertical	-54.57	-13	-41.57
3510	Horizontal	-53.43	-13	-40.43
5266.5	Vertical	-51.99	-13	-38.99
5266.5	Horizontal	-53.1	-13	-40.1

**LTE CAT-M Band 4 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3507.875	Vertical	-54.91	-13	-41.91
3505.75	Horizontal	-53.34	-13	-40.34
5268.625	Horizontal	-53.74	-13	-40.74
5268.625	Vertical	-53.15	-13	-40.15

**LTE CAT-M Band 4 Bandwidth 15 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3505.75	Vertical	-54.57	-13	-41.57
3510	Horizontal	-53.43	-13	-40.43
5266.5	Vertical	-51.99	-13	-38.99
5266.5	Horizontal	-53.1	-13	-40.1

**LTE CAT-M Band 4 Bandwidth 20 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3505.75	Vertical	-54.41	-13	-41.41
3516.375	Horizontal	-54.54	-13	-41.54
5268.625	Vertical	-50.74	-13	-37.74
5268.625	Horizontal	-50.76	-13	-37.76



**LTE CAT-M Band 5 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1646.5	Vertical	-55.36	-13	-42.36
1646.5	Horizontal	-55.69	-13	-42.69
2471.25	Vertical	-55.61	-13	-42.61
2471.25	Horizontal	-55.3	-13	-42.3

**LTE CAT-M Band 5 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1648.625	Vertical	-56.51	-13	-43.51
1648.625	Horizontal	-56.85	-13	-43.85
2473.375	Vertical	-54.66	-13	-41.66
2471.25	Horizontal	-54.46	-13	-41.46

**LTE CAT-M Band 5 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1646.5	Vertical	-56.48	-13	-43.48
1646.5	Horizontal	-57.67	-13	-44.67
2471.25	Vertical	-54.87	-13	-41.87
2471.25	Horizontal	-54.09	-13	-41.09

**LTE CAT-M Band 5 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1644.375	Vertical	-57.53	-13	-44.53
1650.75	Horizontal	-57.28	-13	-44.28
2475.5	Vertical	-54.94	-13	-41.94
2469.125	Horizontal	-54.66	-13	-41.66

**LTE CAT-M Band 5 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1673.625	Vertical	-57.47	-13	-44.47
1673.625	Horizontal	-57.507	-13	-44.507
2510.875	Vertical	-55.041	-13	-42.041
2510.875	Horizontal	-53.466	-13	-40.466

**LTE CAT-M Band 5 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1673.625	Vertical	-57.379	-13	-44.379
1673.625	Horizontal	-57.345	-13	-44.345
2510.875	Vertical	-54.576	-13	-41.576
2510.875	Horizontal	-54.555	-13	-41.555

**LTE CAT-M Band 5 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1671.5	Vertical	-56.876	-13	-43.876
1673.625	Horizontal	-57.726	-13	-44.726
2508.75	Vertical	-54.462	-13	-41.462
2508.75	Horizontal	-53.885	-13	-40.885

**LTE CAT-M Band 5 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1675.75	Vertical	-56.855	-13	-43.855
1675.75	Horizontal	-56.897	-13	-43.897
2513	Vertical	-53.896	-13	-40.896
2513	Horizontal	-53.597	-13	-40.597

**LTE CAT-M Band 5 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1696.5	Vertical	-55.24	-13	-42.24
1696.5	Horizontal	-55.66	-13	-42.66
2573.25	Vertical	-55.63	-13	-42.63
2573.25	Horizontal	-55.22	-13	-42.22

**LTE CAT-M Band 5 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1698.625	Vertical	-56.39	-13	-43.39
1698.625	Horizontal	-56.82	-13	-43.82
2575.375	Vertical	-54.68	-13	-41.68
2573.25	Horizontal	-54.38	-13	-41.38

**LTE CAT-M Band 5 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1696.5	Vertical	-56.36	-13	-43.36
1696.5	Horizontal	-57.64	-13	-44.64
2573.25	Vertical	-54.89	-13	-41.89
2573.25	Horizontal	-54.01	-13	-41.01

**LTE CAT-M Band 5 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1694.375	Vertical	-57.41	-13	-44.41
1700.75	Horizontal	-57.25	-13	-44.25
2577.5	Vertical	-54.96	-13	-41.96
2571.125	Horizontal	-54.58	-13	-41.58

**LTE CAT-M Band 12 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1397.375	Vertical	-59.02	-13	-46.02
1397.375	Horizontal	-58.67	-13	-45.67
2097	Vertical	-54.61	-13	-41.61
2097	Horizontal	-54.52	-13	-41.52

**LTE CAT-M Band 12 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1399.5	Vertical	-57.89	-13	-44.89
1399.5	Horizontal	-56.13	-13	-43.13
2097	Vertical	-53.58	-13	-40.58
2097	Horizontal	-55.09	-13	-42.09

**LTE CAT-M Band 12 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1399.5	Vertical	-57.7	-13	-44.7
1399.5	Horizontal	-57.85	-13	-44.85
2097	Vertical	-55.04	-13	-42.04
2099.125	Horizontal	-54.75	-13	-41.75

**LTE CAT-M Band 12 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1393.125	Vertical	-57.42	-13	-44.42
1393.125	Horizontal	-57.82	-13	-44.82
2099.125	Vertical	-55.05	-13	-42.05
2092.75	Horizontal	-53.99	-13	-40.99

**LTE CAT-M Band 12 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1414.375	Vertical	-58.281	-13	-45.281
1414.375	Horizontal	-51.356	-13	-38.356
2122	Vertical	-55.054	-13	-42.054
2122	Horizontal	-55.082	-13	-42.082

**LTE CAT-M Band 12 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1416.5	Vertical	-57.793	-13	-44.793
1416.5	Horizontal	-57.681	-13	-44.681
2122	Vertical	-54.578	-13	-41.578
2122	Horizontal	-54.606	-13	-41.606

**LTE CAT-M Band 12 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1416.5	Vertical	-57.713	-13	-44.713
1416.5	Horizontal	-57.642	-13	-44.642
2124.125	Vertical	-54.237	-13	-41.237
2124.125	Horizontal	-54.263	-13	-41.263

**LTE CAT-M Band 12 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1416.5	Vertical	-58.079	-13	-45.079
1416.5	Horizontal	-58.008	-13	-45.008
2117.75	Vertical	-55.047	-13	-42.047
2126.25	Horizontal	-54.9	-13	-41.9

**LTE CAT-M Band 12 Bandwidth 1.4 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1431.375	Vertical	-58.9	-13	-45.9
1431.375	Horizontal	-58.64	-13	-45.64
2147.5	Vertical	-54.63	-13	-41.63
2147.5	Horizontal	-54.44	-13	-41.44

**LTE CAT-M Band 12 Bandwidth 3 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1433.5	Vertical	-57.77	-13	-44.77
1433.5	Horizontal	-56.1	-13	-43.1
2147.5	Vertical	-53.6	-13	-40.6
2147.5	Horizontal	-55.01	-13	-42.01



**LTE CAT-M Band 12 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1433.5	Vertical	-57.58	-13	-44.58
1433.5	Horizontal	-57.82	-13	-44.82
2147.5	Vertical	-55.06	-13	-42.06
2149.625	Horizontal	-54.67	-13	-41.67

**LTE CAT-M Band 12 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	High Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1427.125	Vertical	-57.3	-13	-44.3
1427.125	Horizontal	-57.79	-13	-44.79
2149.625	Vertical	-55.07	-13	-42.07
2143.25	Horizontal	-53.91	-13	-40.91

**LTE CAT-M Band 13 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1553.125	Vertical	-58.38	-13	-45.38
1555.25	Horizontal	-58.62	-13	-45.62
2332.25	Vertical	-54.13	-13	-41.13
2332.25	Horizontal	-54.27	-13	-41.27

**LTE CAT-M Band 13 Bandwidth 10 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Low Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1557.375	Vertical	-57.24	-13	-44.24
1557.375	Horizontal	-57.48	-13	-44.48
2332.25	Vertical	-53.96	-13	-40.96
2332.25	Horizontal	-53.71	-13	-40.71

**LTE CAT-M Band 13 Bandwidth 5 MHz**

<b>Frequency Range</b>	1GHz ~ 26.5GHz	<b>Operating Channel</b>	Mid Channel
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<b>SPURIOUS EMISSION LEVEL</b>				
<b>Frequency (MHz)</b>	<b>Antenna Polarization</b>	<b>Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1565.25	Vertical	-57.727	-13	-44.727
1565.25	Horizontal	-57.717	-13	-44.717
2347.25	Vertical	-54.604	-13	-41.604
2347.25	Horizontal	-54.476	-13	-41.476