HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

July 14, 2020

Mobilogix, Inc.
5500 Trabuco Rd, Suite 150
Irvine, California 92620

Dear Ramy Mourad,

Enclosed is the EMC Wireless test report for compliance testing of the Mobilogix, Inc. , Mobilogix Global Asset Tracker (GAT) as tested to the requirements of the FCC Certification rules under Title 47 of the CFR Part 27 Subpart L for Broadband Radio Service (BRS) Devices.

Thank you for using the services of Eurofins E&E North America. If you have any questions regarding these results or if MET can be of further service to you, please contact me.

Sincerely yours,
EUROFINS E&E NORTH AMERICA

Jennifer Warnell
Documentation Department

Reference: (\Mobilogix, Inc. \WIRS108597-FCC27 Rev. 2)

ACCREDITED
TESTINGCERT #0591.02

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Electromagnetic Compatibility Criteria
Test Report

for the

Mobilogix, Inc.
Model Mobilogix Global Asset Tracker (GAT)

Tested under
FCC Certification Rules
Title 47 of the CFR, Part 27 Subpart L

Report: WIRS108597-FCC27 Rev. 2

July 14, 2020

Prepared For:

Mobilogix, Inc.
5500 Trabuco Rd, Suite 150
Irvine, California 92620

Prepared By:
Eurofins E&E North America
3162 Belick St.
Santa Clara, CA 95054

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Title 47 of the CFR, Part 27 Subpart L

Arsalan Hasan
Project Engineer, Electromagnetic Compatibility Lab

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 Part 27 L of the FCC Rules under normal use and maintenance.

Sandeep Brar,
Manager, Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	July 9, 2020	Initial Issue.
1	July 10, 2020	Corrected customer company name to manufacturer.
2	July 14, 2020	TCB Review Updates.

Table of Contents

List of Tables

List of Figures

List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**er**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**er**z**
kPa	**k**ilo**pa**scal
kV	**k**ilo**v**olt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µH	**microh**enry
µ	**microf**arad
µs	**micros**econds
NEBS	**N**etwork **E**quipment-**B**uilding **S**ystem
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Mobilogix, Inc. Mobilogix Global Asset Tracker (GAT), with the requirements of Part 27. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the Mobilogix Global Asset Tracker (GAT). Mobilogix, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Mobilogix Global Asset Tracker (GAT), has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 27, in accordance with Mobilogix, Inc. , purchase order number MOB2012-1.

Reference	Description	Compliance
§2.1046; §27.50(d)	Radiated Output Power	Compliant
§2.1049	Occupied Bandwidth	Data valid from module original certification FCC-ID: XMR201707BG96
§27.50	Peak to Average Ration	Data valid from module original certification FCC-ID: XMR201707BG96
§2.1051; §27.53(m)	Spurious Emissions at Antenna Terminals	Data valid from module original certification FCC-ID: XMR201707BG96
§2.1053(g): §2.1053(h)	Radiated Spurious Emissions	Compliant
§2.1055	Frequency Stability	Data valid from module original certification FCC-ID: XMR201707BG96

Table 1. Executive Summary of EMC ComplianceTesting

Rationale: Per KDB KDB 996369 D04 “Modular Transmitter Integration Guide – Guidance for Host Product Manufacturers” only worst-case radiated measurements are reported in this filing.

II. Equipment Configuration

A. Overview

Eurofins E&E North America was contracted by Mobilogix, Inc. to perform testing on the Mobilogix Global Asset Tracker (GAT), under Mobilogix, Inc. 's purchase order number MOB2012-1.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Mobilogix, Inc. , Mobilogix Global Asset Tracker (GAT).

The results obtained relate only to the item(s) tested.

Model(s) Tested:	Mobilogix Global Asset Tracker (GAT)		
Model(s) Covered:	Mobilogix Global Asset Tracker (GAT)		
Filing Status:	Original		
EUT Specifications:	Primary Power: 3.8V DC		
	FCC ID: 2AH4HVZGATCM1		
	Module Original Report Number(s): RXA1706-0199RF03R1		
	Type of Modulations:	QPSK, 16QAM	
	Equipment Code:	PCB	
	Technology	Frequency Range	RF Power Output
	LTE CAT-M1 Band 4	1710 – 1755 MHz	28.34 dBm EIRP
	LTE CAT-M1 Band 12	699 – 716 MHz	26.14 dBm ERP
	LTE CAT-M1 Band 13	777 – 787 MHz	25.85 dBm ERP
Analysis:	The results obtained relate only to the item(s) tested.		
Environmental Test Conditions:	Temperature: 15-35º C		
	Relative Humidity: 30-60%		
	Barometric Pressure: 860-1060 mbar		
Evaluated by:	Arsalan Hasan		
Date(s):	July 14, 2020		

Table 2. EUT Summary Table

Rationale: LTE CAT-M1 bands were chosen over NB-IoT since CAT-M1 has higher output powers and presents itself as the worst case for testing purposes.

B. References

CFR 47, Part 27	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 27: Rules and Regulations for Advanced Wireless Services
KDB 996369 D04	Modular Transmitter Integration Guide – Guidance For Host Product Manufacturers
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.26: 2015	Compliance Testing of Transmitters Used in Licensed Radio Services
ISO/IEC 17025:2017	General Requirements for the Competence of Testing and Calibration Laboratories
EIA/TIA-603-A-2001	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards
KDB 971168 v02r02	Measurement Guidance For Certification Of Licensed Digital Transmitters

Table 3. Standard References

C. Test Site

All testing was performed at Eurofins E&E North America, 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.

Radiated Emissions measurements were performed in a 5 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

MET Laboratories is a ISO/IEC 17025 accredited site by A2LA, California #0591.02.

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%
Radiated Emissions, (30 MHz – 1 GHz)	±3.24	2	95%
Radiated Emissions, (1 - 6 GHz)	±3.92	2	95%
Conducted Emission	±3.53	2	95%
CEV Telecom Port	±2.44	2	95%

Table 4. Uncertainty Calculations Summary

E. Description of Test Sample

The Mobilogix Global Asset Tracker (GAT), Equipment Under Test (EUT), is a multi-purpose LTE CAT-M1 / NB1 and 2G (GSM/GPRS/EDGE), IP67 rated mobile asset tracking and monitoring device with various onboard sensors including temperature, pressure, humidity, light, a 3-axis IMU/Gyroscope, and GNSS/GPS. It also boasts WIFI LAAS and BLE (Bluetooth Low-Energy) connectivity. It is designed for applications such as critical asset tracking and cold-chain, with the ability to periodically report sensor data and location data per configurable intervals, and report near-real-time events or alarms, based on configurable intervals and configurable thresholds.

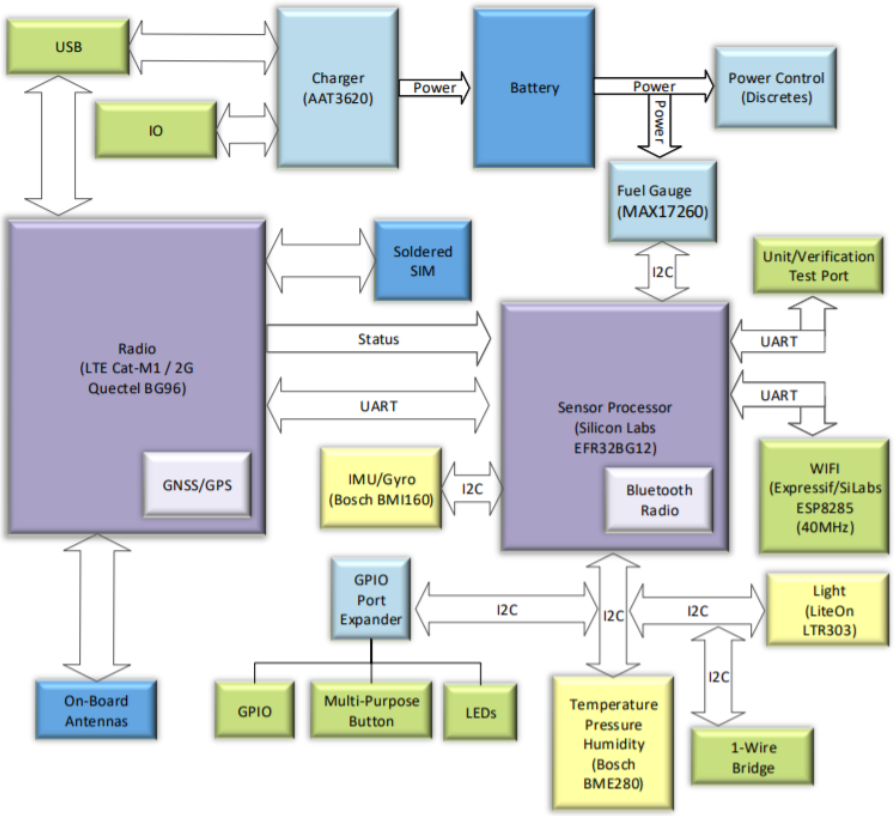

Figure 1. Block Diagram of Equipment Configuration

F. Equipment Configuration

Ref. ID	Slot #	Name / Description	Model Number	Part Number	Serial Number	Rev. #
1	NA	Global Asset Tracker	VZGAT-CM1-001	ATD210S	A210S202400036S	NA
2	NA	AC/DC Adapter	ASUC62a-050200	NA	NA	NA

Table 5. Equipment Configuration

G. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
3	USB Power Port	USB Power Cable	1	1	1	N	NA

Table 6. Ports and Cabling Information

H. Mode of Operation

In Normal Mode, the default GAT profile periodically monitors and provides sensor reports for temperature, humidity, pressure, light, accelerometer, tilt/orientation, battery-level, location, and LTE signal strength (RSRP). A user may disable or decrease the reporting frequency (granularity) of any sensor for which the use case does not apply. Furthermore, alarms can be enabled for near real-time detection and reporting of environmental excursions, motion or tilt alarms.

The GAT supports indoor location using Wi-Fi access points and RSSI trilateration, in addition to location based on enhanced cell ID (eCID), in scenarios where visibility to the sky for GNSS location is compromised or not possible.

The GAT can be configured as a cellular gateway or scanner of remote Bluetooth environmental sensors, such as the Mobilogix BTM250.

I. Method of Monitoring EUT Operation

A CMW500 will connect to the Asset Tracker on a desired GSM / LTE band over the air. CMW500 will be monitored for any dropped calls.

RADIO LEDs
Slow short blinks → Attempting to register on network.
Slow long blinks →Registered and Idle.
Rapid blink →Data transfer in progress.

The Radio LED will not blink while GAT is not performing its intended functions

The Radio LED will blink when GAT is performing its intended functions

J. 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.

K. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Mobilogix, Inc. upon completion of testing.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 27.50 Radiated Output Power

Test Requirement(s): **§27.50 (b)(10):** Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

§27.50 (b)(10): Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

§27.50 (d)(4): Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

Test Procedures: The EUT was tested according to the average power integration procedures of ANSI C63.26 (2015) 5.5.3.

Radiated measurements shall be performed using the test arrangement shown in Figure . After a direct field strength measurement of the maximum emission amplitude level (maximized as described previously), a signal generator and transmit antenna are substituted in place of the EUT, as shown in Figure 7. The output power of the signal generator is adjusted to replicate the maximized signal amplitude measured in the direct field strength measurement. The signal generator power setting is then used to determine the ERP or EIRP of the EUT spurious emission(s). These measurements shall be performed in accordance with the common requirements specified in 5.5.2 and the specific requirements provided in this subclause.

A step-by-step procedure is as follows.

a) Place the EUT in the center of the turntable. The EUT shall be configured to transmit into the standard non-radiating load (for measuring radiated spurious emissions), connected with cables of minimal length unless specified otherwise. If the EUT uses an adjustable antenna, the antenna shall be positioned to the length that produces the worst case emission at the fundamental operating frequency.

b) Each emission under consideration shall be evaluated:

1) Raise and lower the measurement antenna in accordance 5.5.2, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.
2) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.
3) Return the turntable to the azimuth where the highest emission amplitude level was observed.
4) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.
5) Record the measured emission amplitude level and frequency using the appropriate RBW.

c) Repeat step b) for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.

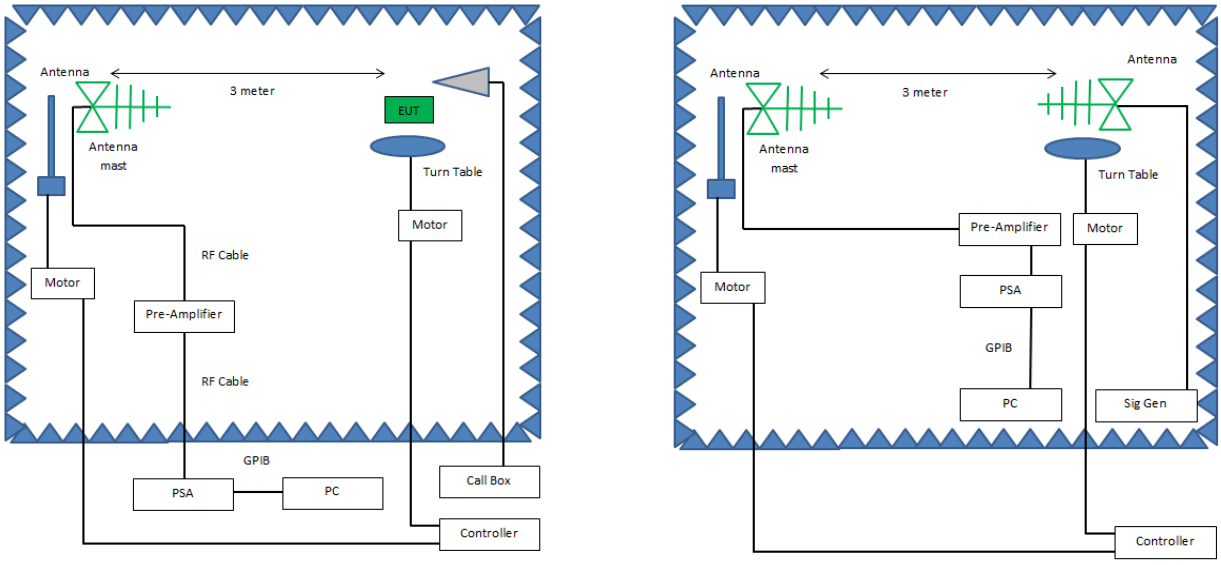

Figure 2. ERP / EIRP, Block Diagram, Test Setup Below 1GHz

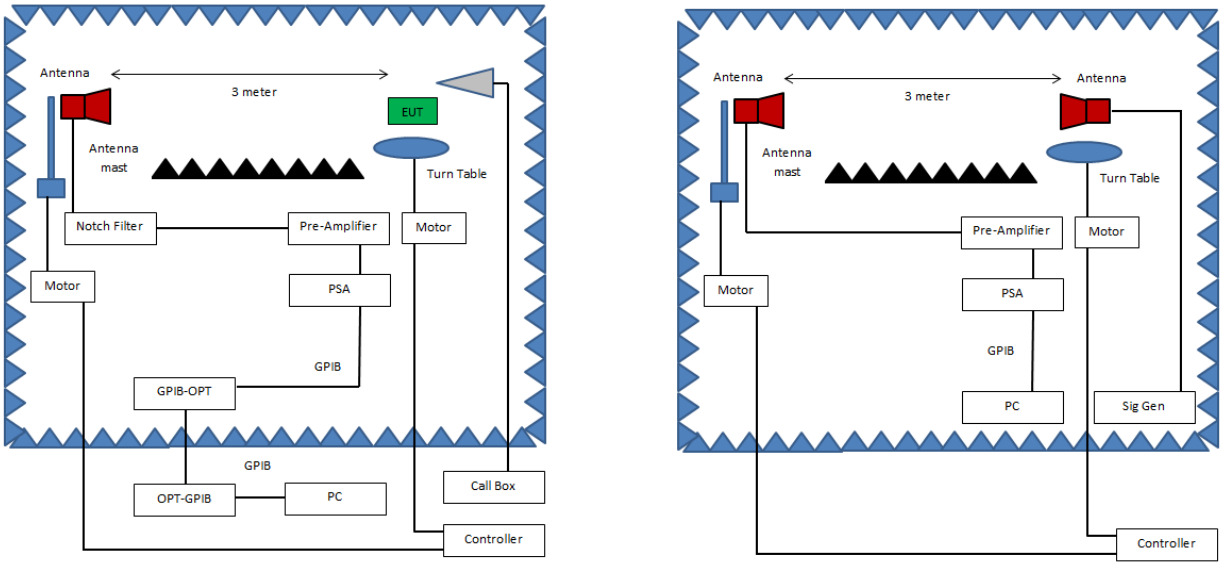

Figure 3. ERP / EIRP, Block Diagram, Test Setup Above 1GHz

d) Set-up the substitution measurement with the reference point of the substitution a antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement.

e) Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.

f) Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.

g) For each emission that was detected and measured in the initial test [i.e., in step b) and step c)]:

1) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.
2) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step b) and step c).
3) Record the output power level of the signal generator when equivalence is achieved in step 2).

h) Repeat step e) through step g) with the measurement antenna oriented in the opposite polarization.

i) Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:

Pe = Ps(dBm) - cable loss (dB) + antenna gain (dBd)

where
Pe = equivalent emission power in dBm
Ps = source (signal generator) power in dBm

NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.

j) Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from: gain (dBd) = gain (dBi) - 2.15 dB. If necessary, the antenna gain can be calculated from calibrated antenna factor information

Test Results: The EUT was found compliant with the requirements of this section.

Test Engineer(s): Felix Huang, Arsalan Hasan

Test Date(s): 07/03/2020, 07/14/2020

Test Results

Mode	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Result
LTE Band 4	Low	1715	Vertical	28.34	30.00	Pass

Table 7. ERP, Test Results, Part 27, LTE Band 4

Mode	Channel	Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Result
LTE Band 12	High	714.5	Vertical	26.14	34.77	Pass
LTE Band 13	Mid	782.0	Vertical	25.85	34.77	Pass

Table 8. ERP, Test Results, Part 27, LTE Band 12 and LTE Band 13

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1053 Radiated Spurious Emissions

Test Requirement(s): **§ 2.1053 Field strength of spurious radiation.**

§ 2.1053 (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.

§ 2.1053 (b): The measurements specified in paragraph (a) of this section shall be made for the following equipment:

(1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

(2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

§ 27.53(h): For operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}$ (P) dB.

§ 27.53(g): For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

§ 27.53(f): For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Test Procedures:

The EUT was tested according to the average power integration procedures of ANSI C63.26 (2015) 5.5.3.

Radiated measurements shall be performed using the test arrangement shown in Figure. After a direct field strength measurement of the maximum emission amplitude level (maximized as described previously), a signal generator and transmit antenna are substituted in place of the EUT, as shown in Figure 7. The output power of the signal generator is adjusted to replicate the maximized signal amplitude measured in the direct field strength measurement. The signal generator power setting is then used to determine the ERP or EIRP of the EUT spurious emission(s). These measurements shall be performed in accordance with the common requirements specified in 5.5.2 and the specific requirements provided in this subclause.

A step-by-step procedure is as follows.

k) Place the EUT in the center of the turntable. The EUT shall be configured to transmit into the standard non-radiating load (for measuring radiated spurious emissions), connected with cables of minimal length unless specified otherwise. If the EUT uses an adjustable antenna, the antenna shall be positioned to the length that produces the worst case emission at the fundamental operating frequency.

l) Each emission under consideration shall be evaluated:

6) Raise and lower the measurement antenna in accordance 5.5.2, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.
7) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.
8) Return the turntable to the azimuth where the highest emission amplitude level was observed.
9) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.
10) Record the measured emission amplitude level and frequency using the appropriate RBW.

m) Repeat step b) for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.

n) Set-up the substitution measurement with the reference point of the substitution a antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement.

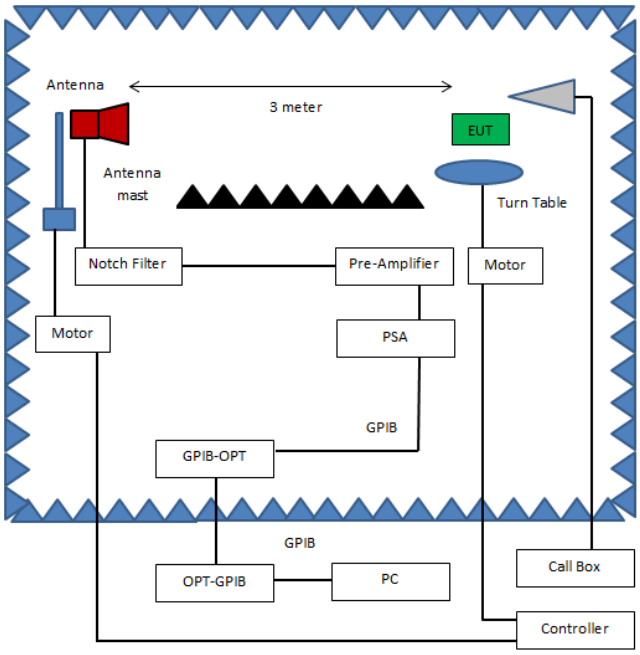

Figure 4. Radiated Spurious Emissions, Block Diagram, Test Setup

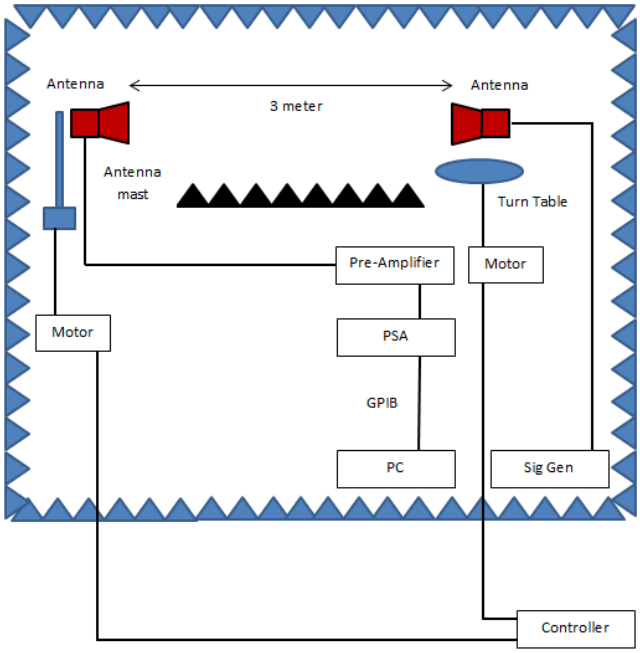

Figure 5. Radiated Spurious Emissions, Block Diagram, Test Setup

o) Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.

p) Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.

q) For each emission that was detected and measured in the initial test [i.e., in step b) and step c)]:

4) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.
5) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step b) and step c).
6) Record the output power level of the signal generator when equivalence is achieved in step 2).

r) Repeat step e) through step g) with the measurement antenna oriented in the opposite polarization.

s) Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:

Pe = Ps(dBm) - cable loss (dB) + antenna gain (dBd)

where
Pe = equivalent emission power in dBm
Ps = source (signal generator) power in dBm

NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.

t) Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from: gain (dBd) = gain (dBi) - 2.15 dB. If necessary, the antenna gain can be calculated from calibrated antenna factor information

Test Results: The EUT was found compliant with the requirements of this section.

Measurements were made in each configuration. Data is presented for the worse case configuration.

Test Engineer: Felix Huang, Arsalan Hasan

Test Date(s): 07/04/2020, 07/14/2020

Radiated Spurious Emissions Test Results,

LTE Band 4								
Harmonic	**Freq. (MHz)**	**SG (dBm)**	**Cable Loss (dB)**	**Gain (dBi)**	**Ant. Pol.**	**ERP Level (dBm)**	**Limit (dBm)**	**Margin**
2	3430	-62	1.80171	32.552	Vertical	-33.3997	-13	20.4
3	5145	-61	2.43194	34.092	Vertical	-31.4899	-13	18.49
4	6860	-60	3.01176	35.412	Vertical	-29.7498	-13	16.75
5	8575	-59	3.50764	35.872	Vertical	-28.7856	-13	15.786
6	10290	-60	3.87028	37.405	Vertical	-28.6153	-13	15.615
7	12005	-61	4.13973	38.67	Vertical	-28.6197	-13	15.62
8	13720	-60	4.65352	38.657	Vertical	-28.1465	-13	15.147
9	15435	-59	4.39593	40.497	Vertical	-25.0489	-13	12.049
10	17150	-59	4.87376	41.439	Vertical	-24.5848	-13	11.585

Table 9. Radiated Spurious Emissions, Test Results, Part 27, LTE Band 4

LTE Band 12								
Harmonic	**Freq. (MHz)**	**SG (dBm)**	**Cable Loss (dB)**	**Gain (dBi)**	**Ant. Pol.**	**ERP Level (dBm)**	**Limit (dBm)**	**Margin**
2	1429	-65	1.15035	28.769	Vertical	-39.5314	-13	26.531
3	2143.5	-64	1.44751	31.782	Vertical	-35.8155	-13	22.816
4	2858	-64	1.67935	32.295	Vertical	-35.5344	-13	22.534
5	3572.5	-63	1.83727	32.824	Vertical	-34.1633	-13	21.163
6	4287	-62	2.05398	33.139	Vertical	-33.0650	-13	20.065
7	5001.5	-61	2.49483	33.895	Vertical	-31.7498	-13	18.75
8	5716	-61	2.69918	34.619	Vertical	-31.2302	-13	18.23
9	6430.5	-60	2.7516	35.496	Vertical	-29.4056	-13	16.406
10	7145	-60	3.07422	35.569	Vertical	-29.6552	-13	16.655

Table 10. Radiated Spurious Emissions, Test Results, Part 27, LTE Band 12

LTE Band 13								
Harmonic	**Freq. (MHz)**	**SG (dBm)**	**Cable Loss (dB)**	**Gain (dBi)**	**Ant. Pol.**	**ERP Level (dBm)**	**Limit (dBm)**	**Margin**
2	1564.0	-71	1.26	28.57	Vertical	-45.84	-40	5.84
3	2346.0	-70	1.48	32.53	Vertical	-41.10	-13	28.10
4	3128.0	-71	1.71	33.29	Vertical	-41.57	-13	28.57
5	3910.0	-70	1.91	33.85	Vertical	-40.21	-13	27.21
6	4692.0	-67	2.20	34.52	Vertical	-36.83	-13	23.83
7	5474.0	-73	2.69	35.03	Vertical	-42.81	-13	29.81
8	6256.0	-73	2.73	36.05	Vertical	-41.83	-13	28.83
9	7038.0	-71	3.03	35.95	Vertical	-40.23	-13	27.23
10	7820.0	-71	3.38	36.08	Vertical	-40.45	-13	27.45

Table 11. Radiated Spurious Emissions, Test Results, Part 27, LTE Band 13

IV. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1S4075	RADIO COMMUNICATION TESTER	ROHDE & SCHWARZ	CMW500	09/18/2018	09/18/2020
1S2399	TURNTABLE/MAST CONTROLLER	SUNOL SCIENCES	SC99V	SEE NOTE 1	
1S2600	BILOG ANTENNA	TESEQ	CBL6112D	03/19/2019	03/19/2021
1S3826	DRG HORN ANTENNA	ETS-LINDGREN	3117	12/03/2018	12/03/2020
1S2000	SPECTRUM ANALYZER	AGILENT	E4448A	11/06/2019	11/06/2020
1S2587	PRE AMPLIFIER	AML COMMUNICATIONS	AML0126L3801	SEE NOTE 1	
1S2653	AMPLIFIER	SONOMA INSTRUMENT	310 N	SEE NOTE 1	
1S2486	5 METER CHAMBER	PANASHIELD - ETS	5M	SEE NOTE 2	
1S3824	SIGNAL GENERATOR	ROHDE & SCHWARZ	SMA100B	11/06/2019	05/06/2021

Table 12. Test Equipment List

Note 1: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.
Note 2: Latest NSA and VSWR data available upon request.

End of Report