

TEST REPORT

Applicant: Particle Industries, Inc.

EUT Description: M-SoM LTE-M/2G/Satellite + Wi-Fi for Global

Model: M635e

Brand: Particle

Standards: ETSI EN 301 908-13 V13.3.1
ETSI TS 136 521-1 V17.7.0

Date of Receipt: 2026/05/14

Date of Test: 2026/05/14 to 2026/06/11

Date of Issue: 2026/06/11

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



Jim Huang
Approved By:



Carey Chen
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2026/06/11	Original	Carey Chen

Summary of Test Results

Cat M1			
Test Item	Test Requirement	Test Method	Result
	ETSI EN 301 908-13	ETSI TS 136 521-1	
Transmitter output power for UE category M1	Clause 4.2.2.5	Clause 6.2.2EA	Reference report SZCR240600219903
Transmitter Minimum Output Power for UE category M1	N/A	Clause6.3.2.1EA	
Spectrum Emission Mask for UE category M1	N/A	Clause6.6.2.1EA	
Adjacent Channel Leakage power Ratio for UE category M1	N/A	Clause6.6.2.3EA	
Transmitter Spurious emissions for UE category M1	N/A	Clause6.6.3EA.1	
Additional spurious emissions for UE category M1	N/A	Clause6.6.3EA.3	
Reference sensitivity level for UE category M1	Clause4.2.12.5	Clause7.3EA	
Adjacent Channel Selectivity (ACS) for UE category M1	N/A	Clause7.5EA	
In-band blocking for UE category M1	N/A	Clause7.6.1EA	
Out-of-band blocking for UE category M1	N/A	Clause7.6.2EA	
Narrow band blocking for UE category M1	N/A	Clause7.6.3EA	
Spurious response for UE category M1	N/A	Clause7.7EA	
Receiver Intermodulation Characteristics for Single Carrier for UE category M1	N/A	Clause7.8.1EA	
Receiver Spurious emissions for UE category M1	N/A	Clause7.9EA	
Spurious emission band UE co-existence for UE category M1	N/A	Clause6.6.3EA.2	Pass
Remark: 1. Pass: Meet the requirement. 2. The EUT and test equipment were configured for testing according to ETSI EN 301 908-13 and ETSI TS 136 521-1.			

Remark:

Review this report and original report, this report also updates the following standard:

Original report standard:	The newest report standard:
ETSI EN 301 908-13 V13.2.1 ETSI TS 136 521-1 V16.9.0	ETSI EN 301 908-13 V13.3.1 ETSI TS 136 521-1 V17.7.0

So, only Spurious emission band UE co-existence of all frequency bands were retested, and other items data please refer to the previous report with report number SZCR240600219903 issued by SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch.

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1 General Description

1.1 Lab Information

1.1.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China.

Tel.: +86-755-27212361

Contact Email: info@towewireless.com

1.1.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory.

Test Firm Registration Number: 684095

Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0152

Company Number: 31000

1.2 Client Information

1.2.1 Applicant

Applicant:	Particle Industries, Inc.
Address:	548 Market St, PMB 34833, San Francisco, CA 94104, USA

1.2.2 Manufacturer

Manufacturer:	Particle Industries, Inc.
Address:	548 Market St, PMB 34833, San Francisco, CA 94104, USA

1.3 Product Information

EUT Description:	M-SoM LTE-M/2G/Satellite + Wi-Fi for Global		
Model:	M635e		
Brand:	Particle		
Hardware Version:	v0.2		
Software Version:	v6.4.1		
IMEI:	862063070037473		
Frequency Bands:	Band	TX Frequency	RX Frequency
	LTE Cat M1 Band 1	1920MHz - 1980MHz	2110MHz - 2170MHz
	LTE Cat M1 Band 3	1710MHz - 1785MHz	1805MHz - 1880MHz
	LTE Cat M1 Band 5	824MHz ~ 849MHz	869MHz ~ 894MHz
	LTE Cat M1 Band 8	880MHz - 915MHz	925MHz - 960MHz
	LTE Cat M1 Band 20	832MHz - 862MHz	791MHz - 821MHz
	LTE Cat M1 Band 28	703MHz - 748MHz	758MHz - 803MHz
LTE Cat M1 Modulation Type:	UL: QPSK,16QAM		
Power Class:	Class 3: All Frequency Bands		
Antenna Type:	Internal: Dipole Antenna External: Omnidirectional Antenna		
Antenna Gain:	Band	Ant1 Internal (dBi)	Ant4 External (dBi)
	LTE Cat M1 Band 1	5.23	1.8
	LTE Cat M1 Band 3	4.12	1.14
	LTE Cat M1 Band 5	1.78	2.01
	LTE Cat M1 Band 8	1.91	2.25
	LTE Cat M1 Band 20	1.64	2.01
	LTE Cat M1 Band 28	2.5	1.83
Remark: The above EUT's information was declared by applicant, please refer to the specifications or user's manual for more detailed description.			

2 Test Configuration

2.1 Standards Specification

No.	Reference Standards	Standards Title
1	ETSI EN 301 908-13 V13.3.1	IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)
2	ETSI TS 136 521-1 V17.7.0	LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing (3GPP TS 36.521-1 version 17.7.0 Release 17)

2.2 Test Channel and Bandwidth

Cat M1 Band 1					
Range	Bandwidth [MHz]	Uplink		Downlink	
		Channel	Frequency[MHz]	Channel	Frequency[MHz]
Low	5	18025	1922.5	25	2112.5
	10	18050	1925.0	50	2115.0
	15	18075	1927.5	75	2117.5
	20	18100	1930.0	100	2120.0
Mid	5/10/15/20	18300	1950.0	300	2140.0
High	5	18575	1977.5	575	2167.5
	10	18550	1975.0	550	2165.0
	15	18525	1972.5	525	2162.5
	20	18500	1970.0	500	2160

Cat M1 Band 3					
Range	Bandwidth [MHz]	Uplink		Downlink	
		Channel	Frequency[MHz]	Channel	Frequency[MHz]
Low	1.4	19207	1710.7	1207	1805.7
	3	19215	1711.5	1215	1806.5
	5	19225	1712.5	1225	1807.5
	10	19250	1715.0	1250	1810.0
	15	19275	1717.5	1275	1812.5
	20	19300	1720.0	1300	1815.0
Mid	1.4/3/5/10/15/20	19575	1747.5	1575	1842.5
High	1.4	19943	1784.3	1943	1879.3
	3	19935	1783.5	1935	1878.5
	5	19925	1782.5.0	1925	1877.5
	10	19900	1780	1900	1875.0
	15	19875	1777.5	1875	1872.5
	20	19850	1775.0	1850	1870.0

Cat M1 Band 5					
Range	Bandwidth [MHz]	Uplink		Downlink	
		Channel	Frequency[MHz]	Channel	Frequency[MHz]
Low	1.4	20407	824.7	2407	869.7
	3	20415	825.5	2415	870.5
	5	20425	826.5	2425	871.5
	10	20450	829.0	2450	874.0
Mid	1.4/3/5/10	20525	836.5	2525	881.5
High	1.4	20643	848.3	2643	893.3
	3	20635	847.5	2635	892.5
	5	20625	846.5	2625	891.5
	10	20600	844.0	2600	889.0

Cat M1 Band 8					
Range	Bandwidth [MHz]	Uplink		Downlink	
		Channel	Frequency[MHz]	Channel	Frequency[MHz]
Low	1.4	21457	880.7	3457	925.7
	3	21465	881.5	3465	926.5
	5	21475	882.5	3475	927.5
	10	21500	885.0	3500	930.0
Mid	1.4/3/5/10	21625	897.5	3625	942.5
High	1.4	21793	914.3	3793	959.3
	3	21785	913.5	3785	958.5
	5	21775	912.5	3775	957.5
	10	21750	910.0	3750	955.0

Cat M1 Band 20					
Range	Bandwidth [MHz]	Uplink		Downlink	
		Channel	Frequency[MHz]	Channel	Frequency[MHz]
Low	5	24175	834.5	6175	793.5
	10	24200	837.0	6200	796.0
	15	24225	839.5	6225	798.5
	20	24250	842.0	6250	801.0
Mid	5/10/15/20	24300	847.0	6300	806.0
High	5	24425	859.5	6425	818.5
	10	24400	857.0	6400	816.0
	15	24375	854.5	6375	813.5
	20	24350	852.0	6350	811.0

Cat M1 Band 28					
Range	Bandwidth [MHz]	Uplink		Downlink	
		Channel	Frequency[MHz]	Channel	Frequency[MHz]
Low	3	27225	704.5	9225	759.5
	5	27235	705.5	9235	760.5
	10	27260	708.0	9260	763.0
	15	27285	710.5	9285	765.5
	20	27310	713.0	9310	768.0
Mid	3	27375	719.5	9375	774.5
	5	27385	720.5	9385	775.5
	10	27410	723.0	9410	778.0
	15	27435	725.5	9435	780.5
	20	27460	728.0	9460	783.0
High	3	24645	746.5	9645	801.5
	5	27635	745.5	9635	800.5
	10	27610	743.0	9610	798.0
	15	27585	740.5	9585	795.5
	20	27560	738.0	9560	793.0

2.3 Test Mode

Modulation Type		Description
Cat M1	TM 1 mode:	Keep the EUT communication with simulated station in QPSK mode
	TM 2 mode:	Keep the EUT communication with simulated station in 16QAM mode

2.4 Test Environment

Relative Humidity	45-56 % RH Ambient	
Condition	Temperature(°C)	Voltage(V)
NTNV	25	3.8
Remark:		
NTNV Normal Temperature, Normal Voltage		

2.5 Support Unit used in test

The EUT has been tested as an independent unit.

2.6 Test RF Cable

For all conducted test items: The offset level is set spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

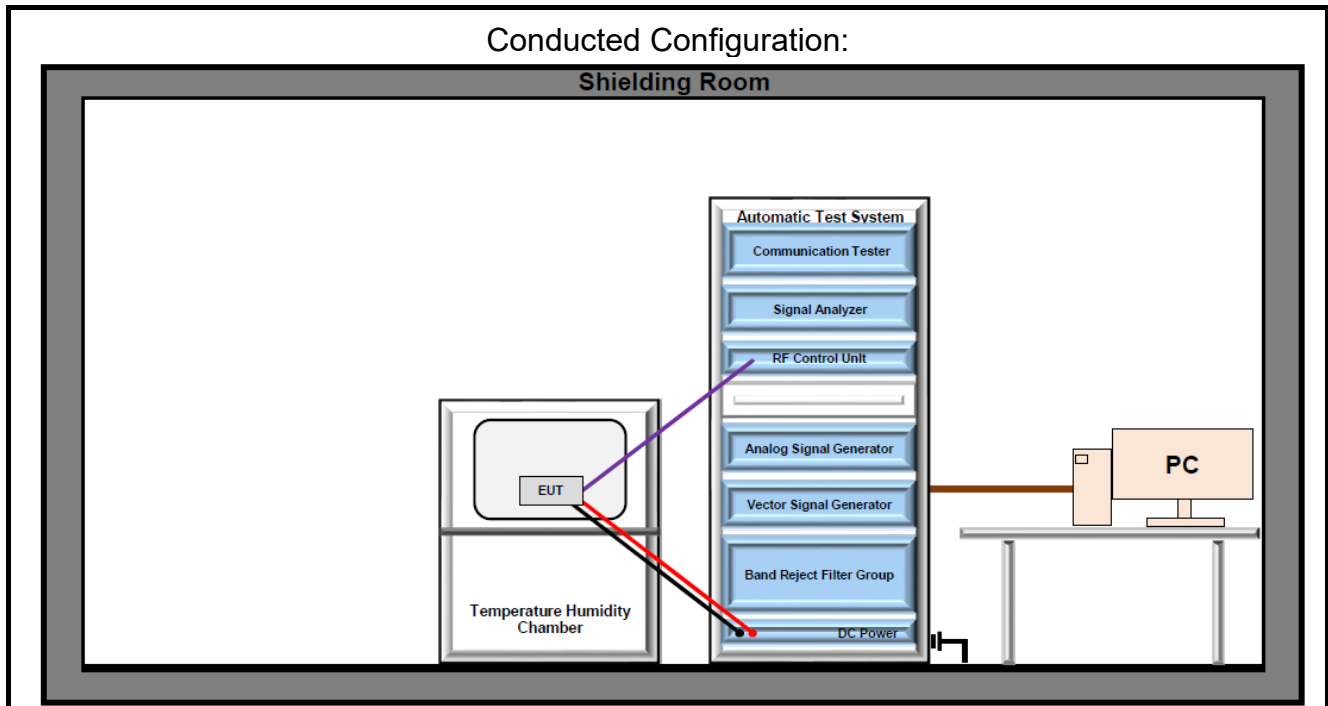
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

2.7 Modifications

No modifications were made during testing.

2.8 Test Setup Diagram



3 Equipment and Measurement Uncertainty

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, whichever is less, and where applicable is traceable to recognized national standards.

3.1 Test Equipment List

RF Conducted 04					
Description	Manufacturer	Model	S.N.	Last Due	Cal Due
Radio Communication Analyzer	Anritsu	MT8821C	6262170436	2026/03/05	2027/03/04
Signal Analyzer	Keysight	N9020A	US46220152	2026/03/05	2027/03/04
Signal Generator	Keysight	N5182A	MY49060761	2026/03/05	2027/03/04
Signal Generator	R&S	SMR20	101691	2026/03/05	2027/03/04
Hygrometer	BingYu	HTC-1	N/A	2025/05/29	2027/05/28
Band Reject Filter Group	Tonscend	JS0806-F	23B806F0662	N/A	N/A
RF Control Unit	Tonscend	JS0806-1	22L8060650	N/A	N/A
Measurement Software	Tonscend	TS1120 V3.1.46	10770	N/A	N/A

3.2 Measurement Uncertainty

Parameter	U _{lab}
Conducted spurious emissions	2.24dB

Uncertainty figures are valid to a confidence level of 95%

4 Test Results

4.1 Test Results Summary

ETSI EN 301 908-13	ETSI TS 136 521-1	Testing Condition	Result						
			Test Items	LTE Cat M1					
				1	3	5	8	20	28
N/A	6.6.3EA.2	NTNV	Spurious emission band UE co-existence for UE category M1	PASS	PASS	PASS	PASS	PASS	PASS

~The End~