

FCC PART 15B
MEASUREMENT AND TEST REPORT

For

Micron Electronics LLC.

1001 Yamato Road, Suite 400, Boca Raton, Florida 33431 United States

FCC ID: ZKQ-MBLTA

Report Type: Original Report	Product Type: Tracker
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Report Number: RSHA190910003-00A	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Micron Electronics LLC.
Test Model	Bolt Mini 2A
Product	Tracker
Rate Voltage	DC 6V from Battery (AA size Batteries × 4)
Dimension	77.8mm(L)*44 mm(W)*22mm(H)
Highest operation frequency	2480MHz

**All measurement and test data in this report was gathered from production sample serial number: 20190910003.
(Assigned by the BACL. The EUT supplied by the applicant was received on 2019-09-10)*

Objective

This report is prepared on behalf of *Micron Electronics LLC.* in accordance with Part 2-Subpart J, and Part 15-Subparts A and B of the Federal Communication Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15, Class B device.

Related Submittal(s)/Grant(s)

Part 15.231 DSC and FCC Part 15.247 DTS submissions with FCC ID: ZKQ-MBLTA.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Test mode : GPS on

EUT Exercise Software

No exercise software was used to test.

Special Accessories

No special accessory was used.

Equipment Modifications

No modification was made to the EUT tested.

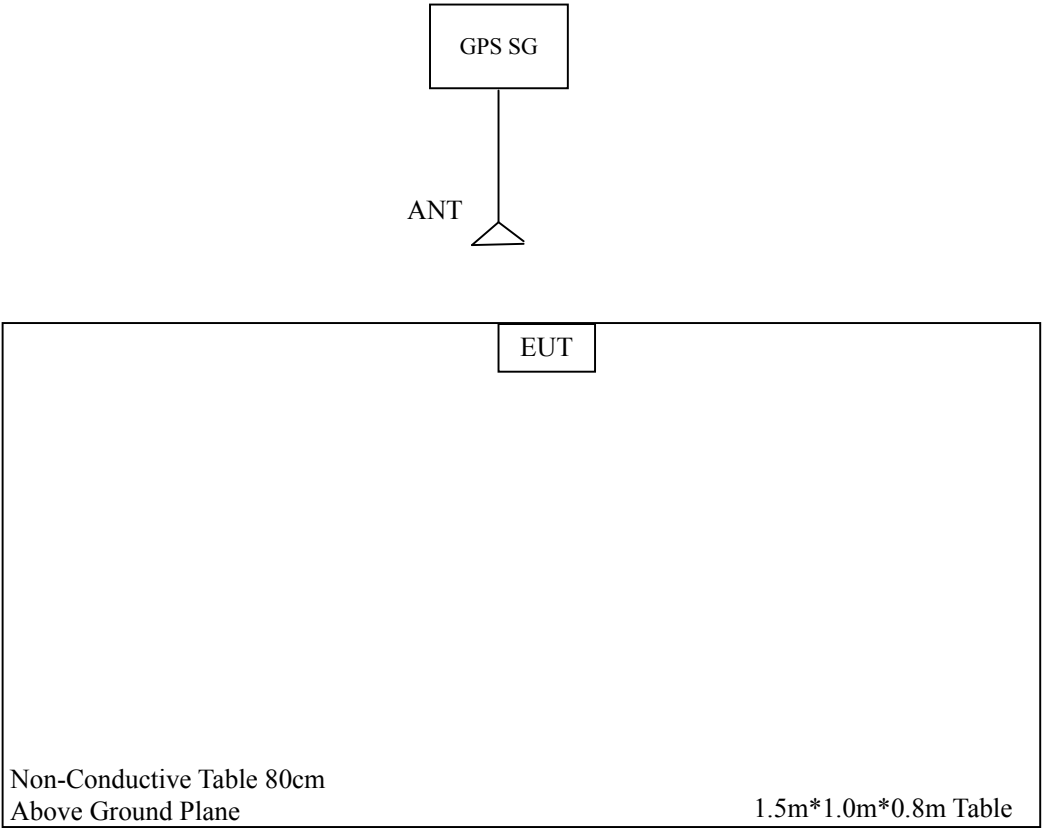
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
MEGURO	GPS SG	MSG-2050	/
ETS-LINDGREN	Horn Antenna	3115	6229

External I/O Cable

Cable Description	Length (m)	From/Port	To
/	/	/	/

Configuration of Radiation Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Not Applicable
§15.109	Radiated Emissions	Compliant

FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

FCC §15.109

Measurement Uncertainty

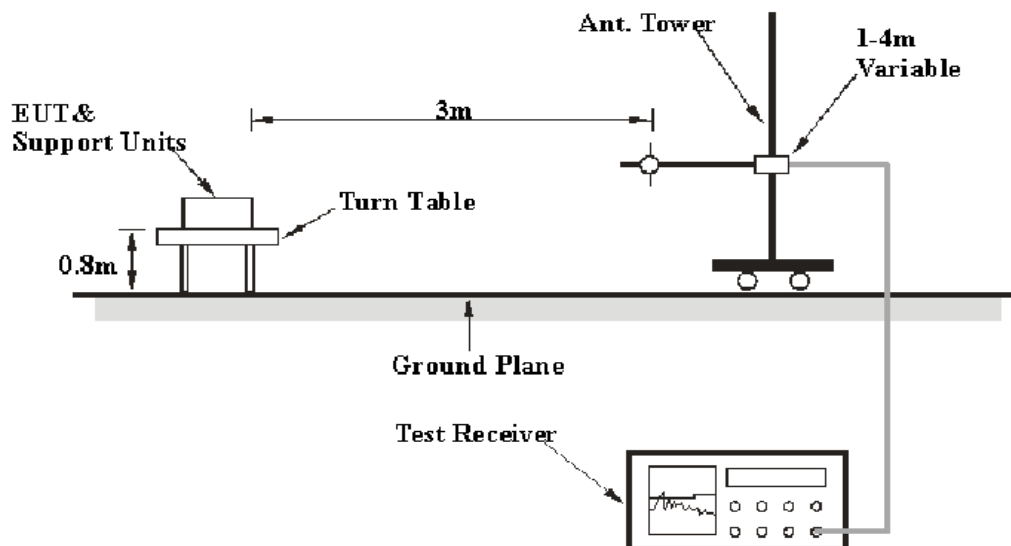
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average) and system repeatability.

Item		Measurement Uncertainty	U_{cispr}
Radiated Emission	30MHz~1GHz	6.11dB	6.3 dB
	1GHz~6GHz	4.45dB	5.2 dB
	6 GHz ~18 GHz	5.23dB	5.5 dB

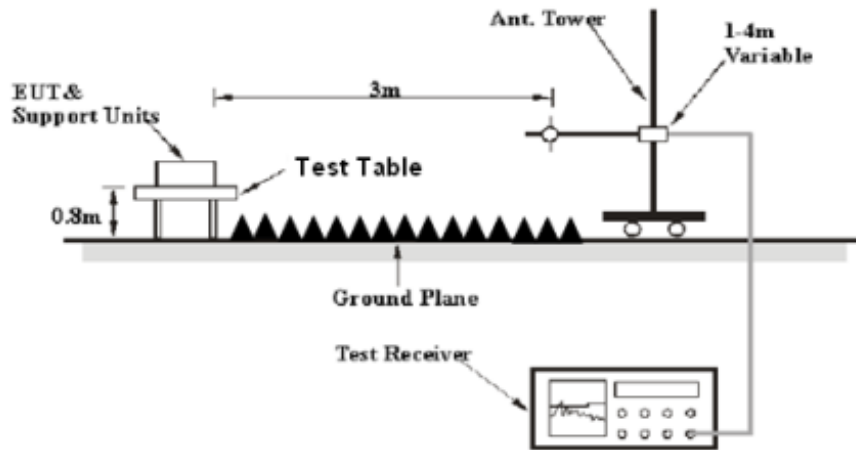
Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 18 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	Peak
	1MHz	3 MHz	1MHz	AVG

If the maximized peak measured value complies with under the QP limit more than 6dB, then it is unnecessary to perform an QP measurement.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrument	Amplifier	310N	185700	2019-08-14	2020-08-13
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03 -101746-zn	2019-08-05	2020-08-04
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Champrotek	Chamber	Chamber A	T-KSEMC049	-	-
Champrotek	Chamber	Chamber B	T-KSEMC080	-	-
Audix	Test Software	e3	V9	-	-
R&S	Auto test Software	EMC32	100361	-	-
ETS	Horn Antenna	3115	6229	2016-12-12	2019-12-11
Rohde & Schwarz	EMI Receiver	ESU40	100207	2018-05-30	2020-05-29
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-4	004	2018-12-12	2019-12-11
MICRO-COAX	Coaxial Cable	Cable-5	005	2018-12-12	2019-12-11

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Factor & Over Limit Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of 7 dB means the emission is 7 dB above the limit. The equation for over limit calculation is as follows:

$$\text{Over Limit (dB)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} - \text{Limit (dB}\mu\text{V)}$$

Test Data**Environmental Conditions**

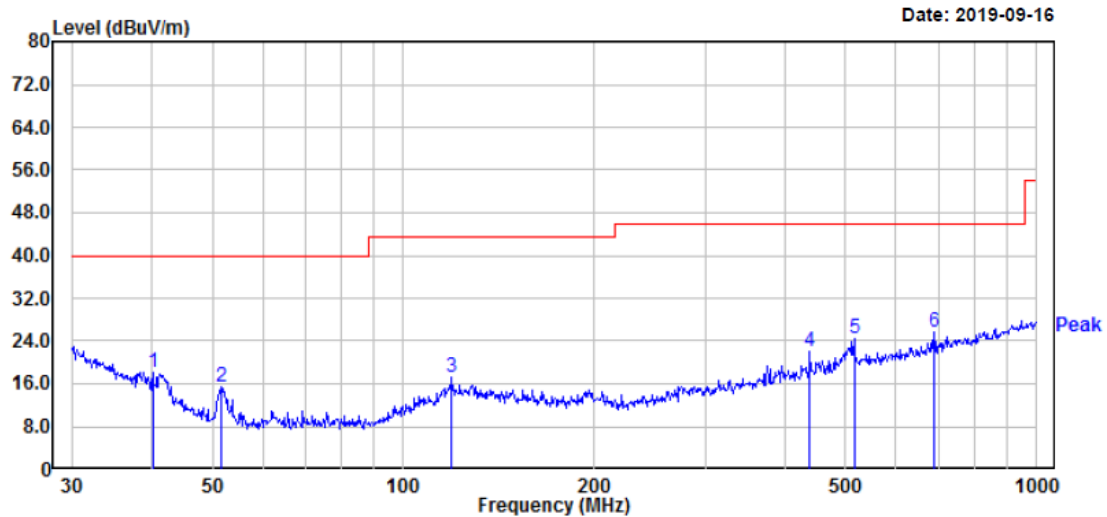
Temperature:	20.2 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by CK Huang on 2019-09-16.

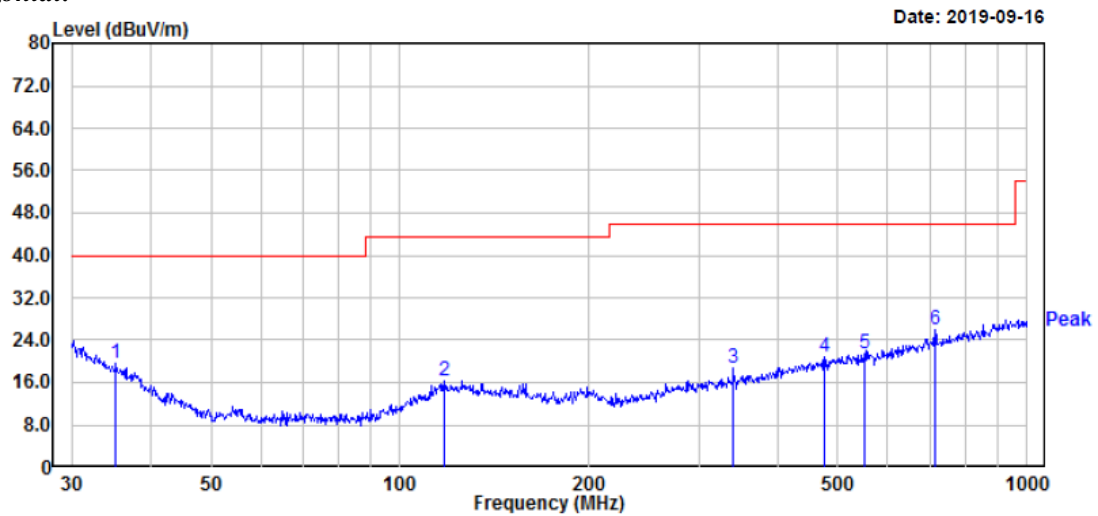
Test mode : GPS on

1) Below 1GHz:

Vertical:



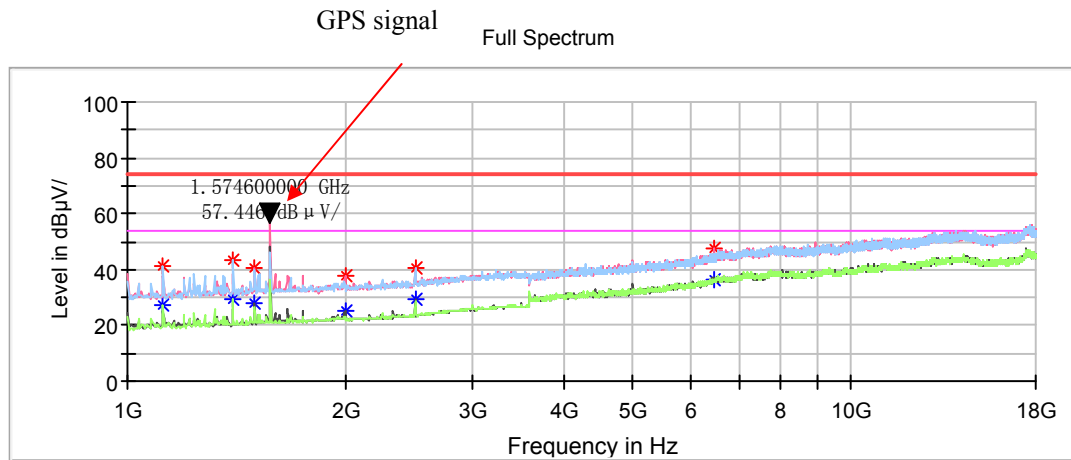
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	40.28	29.59	-11.60	17.99	40.00	-22.01	100	3	Peak
2	51.48	32.34	-17.03	15.31	40.00	-24.69	100	172	Peak
3	119.44	28.00	-10.76	17.24	43.50	-26.26	100	19	Peak
4	438.66	28.75	-6.85	21.90	46.00	-24.10	200	155	Peak
5	515.44	29.74	-5.26	24.48	46.00	-21.52	100	3	Peak
6	689.57	28.05	-2.28	25.77	46.00	-20.23	100	3	Peak

Horizontal:

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	35.25	27.12	-7.50	19.62	40.00	-20.38	200	232	Peak
2	117.77	27.36	-11.08	16.28	43.50	-27.22	200	226	Peak
3	340.78	27.89	-9.32	18.57	46.00	-27.43	200	332	Peak
4	475.50	27.01	-6.04	20.97	46.00	-25.03	200	332	Peak
5	550.95	26.20	-4.76	21.44	46.00	-24.56	200	332	Peak
6	714.17	27.76	-1.88	25.88	46.00	-20.12	200	349	Peak

Note:

- 1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
- 2) Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

Above 1 GHz:

Frequency (MHz)	Max Peak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1119.000000	---	27.43	54.00	26.57	100.0	H	300.0	-12.0
1119.000000	41.46	---	74.00	32.54	100.0	H	300.0	-12.0
1397.800000	---	29.26	54.00	24.74	100.0	H	347.0	-10.5
1397.800000	43.19	---	74.00	30.81	100.0	H	347.0	-10.5
1499.800000	---	28.17	54.00	25.83	100.0	V	186.0	-9.9
1499.800000	40.52	---	74.00	33.48	100.0	V	186.0	-9.9
1999.600000	---	25.00	54.00	29.00	100.0	V	196.0	-8.2
1999.600000	37.69	---	74.00	36.31	100.0	V	196.0	-8.2
2499.400000	---	29.12	54.00	24.88	100.0	V	168.0	-6.9
2499.400000	40.83	---	74.00	33.17	100.0	V	168.0	-6.9
6484.200000	---	36.18	54.00	17.82	100.0	V	0.0	4.3
6484.200000	47.37	---	74.00	26.63	100.0	V	0.0	4.3

*******END OF REPORT*******