

RF EXPOSURE REPORT



Report No.: 16050003-FCC-H

Applicant	Micron Electronics LLC.	
Product Name	Tracker	
Model No.	AT PLUS(CDMA)	
Serial No.	N/A	
Test Standard	FCC 2.1091.2014	
Test Date	January 16 to March 04 , 2016	
Issue Date	March 05, 2016	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification <input checked="" type="checkbox"/>		
Equipment did not comply with the specification <input type="checkbox"/>		
<i>Winnie Zhang</i>	<i>David Huang</i>	
Winnie Zhang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
16050003-FCC-H	NONE	Original	March 05, 2016

2. Customer information

Applicant Name	Micron Electronics LLC.
Applicant Add	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA
Manufacturer	Micron Electronics LLC.
Manufacturer Add	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Labview of SIEMIC version 2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Tracker
Main Model:	AT PLUS(CDMA)
Serial Model:	N/A
Date EUT received:	January 15 , 2016
Test Date(s):	January 16 to March 04 , 2016
Antenna Gain:	Cellular CDMA:0dBi PCS CDMA:1.8dBi WIFI: 1.8dBi GPS: 1dBi
Input Power:	Adapter: Model:JT100-0502000 Input: AC 100-240V; 50/60Hz;0.3A Output: DC 5.0V,2A Battery: Model:P21-2000 Capacity: 3.7V,2000mAh,7.4Wh
Trade Name :	Prime
FCC ID:	ZKQ-PLC
Type of Modulation:	CDMA: QPSK WIFI: 802.11b/g/n: DSSS, OFDM GPS: BPSK
RF Operating Frequency (ies):	Cellular CDMA TX: 824.7 ~ 848.37 MHz; RX: 869.7 ~ 893.37 MHz PCS CDMA TX: 1851.25 ~ 1908.75 MHz; RX: 1931.25 ~ 1988.75 MHz WIFI:802.11b/g/n(20M): 2412-2462 MHz WIFI:802.11n(40M): 2422-2452 MHz GPS RX:1575.42 MHz

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Port:

USB Port

5. FCC §2.1091 - Maximum Permissible exposure (MPE)

6.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission' s guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

6.2 Test Result

WIFI Mode:

Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
802.11b	Low	2412	9.03	8.65±1
	Mid	2437	9.64	8.65±1
	High	2462	9.25	8.65±1
802.11g	Low	2412	9.22	8.7±1
	Mid	2437	9.66	8.7±1
	High	2462	9.11	8.7±1
802.11n (20M)	Low	2412	9.14	8.5±1
	Mid	2437	9.49	8.5±1
	High	2462	9.21	8.5±1
802.11n (40M)	Low	2422	9.32	8.5±1
	Mid	2437	8.97	8.5±1
	High	2452	9.34	8.5±1

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 9.7(dBm)

Maximum output power at antenna input terminal: 9.333(mW)

Prediction distance: >20 (cm)

Predication frequency: 2412 (MHz) High frequency

Antenna Gain (typical): 1.8 (dBi)

Antenna Gain (typical): 1.514 (mW)

The worst case is power density at predication frequency at 20 cm: 0.0022(mW/cm²)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

0.0022 (mW/cm²) < 1.0 (mW/cm²)

1x RTT Mode:

Burst Average Power (dBm);								
Band	Cellular				PCS			
Channel	1013	384	779	Tune up Power tolerant	25	600	1175	Tune up Power tolerant
Frequency (MHz)	824.7	836.5	848.37	/	1851.25	1880	1908.75	/
1x RTT	22.60	23.21	23.60	23±1	21.46	21.47	20.51	21.3±1

Cellular

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 23.6dBm)

Maximum output power at antenna input terminal: 229.09mW)

Prediction distance: >20 (cm)

Predication frequency: 848.37 MHz) Low frequency

Antenna Gain (typical): 0(dBi)

Antenna Gain (typical): 1 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.05(mW/cm²)

MPE limit for general population exposure at prediction frequency: 0.57(mW/cm²)

0.05(mW/cm²) < 0.57 (mW/cm²)

PCS

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 21.5dBm

Maximum output power at antenna input terminal: 141.25(mW)

Prediction distance: >20 (cm)

Predication frequency: 1880(MHz) High frequency

Antenna Gain (typical): 1.8 (dBi)

Antenna Gain (typical): 1.514 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.43(mW/cm²)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

0.43(mW/cm²) < 1.0 (mW/cm²)

The worst case is simultaneous transmission between the Unlicensed and Licensed portions of this device in both 850 and 1900 MHz band.

So the worst case power density at predication frequency at 20 cm = Power density at predication frequency at 20 cm in PCS mode /Limit at PCS frequency + Power density at predication frequency at 20 cm in WIFI mode/Limit at WIFI Frequency =(0.43/1+0.0022/1)=0.4322

Result: Pass