



Test Report No.: SAP20120027



RF EXPOSURE REPORT

Applicant:	Particle Industries, Inc
Address:	126 Post St,4th floor, San Francisco, CA 94108 USA

Manufacturer or Supplier:	Particle Industries, Inc
Address:	126 Post St,4th floor, San Francisco, CA 94108 USA
Product:	E Series 2G/3G Global
Brand Name:	Particle
Model Name:	E310, E314
FCC ID:	XPY1CGM5NNN
Date of tests:	Oct. 17, 2019 ~ Nov. 27, 2019

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

- IEEE C95.1
- FCC Part 2.1091**
- KDB 447498 D01 General RF Exposure Guidance v06**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Remark : This test report is for internal customer use only, not as a final certification test report.

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Date: Dec. 23, 2020	Date: Dec. 23, 2020

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA191017W003	Original release, This test report is for internal customer use only, not as a final certification test report.	Dec. 09, 2019
SAP20120027	Based on the original product add one model name. In this report, All test data is copied from the original test report SA191017W003.	Dec. 23, 2020



1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

EUT	E Series 2G/3G Global	
BRAND NAME	Particle	
MODEL NAME	E310, E314	
POWER SUPPLY	DC 5V from Host Uint or DC 3.7V from Li-ion battery	
OPERATING TEMPERATURE RANGE	-20 ~ 60°C	
MODULATION TYPE	GSM/GPRS	GMSK
	WCDMA	BPSK, QPSK
OPERATING FREQUENCY	GSM/GPRS	824.2MHz ~ 848.8MHz (For GSM850) 1850.2MHz ~ 1909.8MHz (For GSM1900)
	WCDMA	1854.2MHz ~ 1907.6MHz (For WCDMA II) 826.4MHz ~ 846.6MHz (For WCDMA V)
ANTENNA TYPE	Fixed External Antenna with 1.42dBi gain (GSM850/ WCDMA V)	
	Fixed External Antenna with 3.77dBi gain (GSM1900/ WCDMA II)	
HW VERSION	V005	
SW VERSION	V1.4.0	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. The schematic and PCB of the E314 is completely the same with E310, and these two models of HW&SW is the same. Because changing the MVNO's E-SIM card (embedded SIM card) provider from Kore to Twilio, so we plan to use different model name to sell it in market. The differences are as follows:E310 uses eSIM of Kore.E314 uses eSIM of Twilio.
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.



2 RF EXPOSURE

2.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = Frequency in MHz

2.2 MPE CALCULATION FORMULA

$$Pd = (Pout * G) / (4 * Pi * R^2)$$

where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm



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2.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.



2.4 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER\

GSM

Mode	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	Conducted Time Average Power(dBm)	Tune-up Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
GSM850	824-849	GPRS12	1.42	32.5	23.5	223.87	0.0618	0.55	PASS
GSM1900	1850-1910	GPRS12	3.77	29.5	20.5	112.20	0.0532	1.00	PASS

WCDMA

Mode	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	Tune-up Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
WCDMA II	1850-1910	RMC12.2K	3.77	23.0	199.53	0.0946	1.00	PASS
WCDMA V	824-849	RMC12.2K	1.42	23.5	223.87	0.0618	0.55	PASS

--END--