

## Variant RF Exposure Report

**Report No.:** SA171114D13A R1

**FCC ID:** P27-TPM10

**Test Model:** TPM10

**Received Date:** May 23, 2018

**Date of Evaluation:** Jun. 14, 2018

**Issued Date:** Aug. 20, 2018

**Applicant:** Sercomm Corp.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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**Test Location:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)

**FCC Registration /  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
SA171114D13A	Original Release	Jun. 22, 2018
SA171114D13A R1	Revise EPR/EIRP power	Aug. 20, 2018

## 1 Certificate of Conformity

**Product:** Cat-M1 Module

**Brand:** Sercomm

**Test Model:** TPM10

**Sample Status:** Identical Prototype

**Applicant:** Sercomm Corp.

**Date of Evaluation:** Jun. 14, 2018

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

**Prepared by :** Gina Liu , **Date:** Aug. 20, 2018  
Gina Liu / Specialist

**Approved by :** Dylan Chiou , **Date:** Aug. 20, 2018  
Dylan Chiou / Project Engineer

## 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 <sup>2</sup> )	Average Time (minutes)
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 <sup>2</sup> )*	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

### 2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

### 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 Antenna Gain

Antenna Type	LTE Band 2	Monopole Antenna with 1.96 dBi
	LTE Band 4	Monopole Antenna with 3.41 dBi
	LTE Band 12	Monopole Antenna with 0.18 dBi

## 2.5 Calculation Result of Maximum Conducted Power

Band	Frequency Band (MHz)	EIRP Power (dBm)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
LTE 2	1850-1910	21.43	20	0.028	1.00
LTE 4	1710-1755	23.41	20	0.044	1.00
LTE 12	699-716	19.38	20	0.017	0.47

### Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

LTE Band 2=  $0.028 / 1.00 = 0.028$

LTE Band 4=  $0.044 / 1.00 = 0.044$

LTE Band 12=  $0.017 / 0.47 = 0.036$

**Therefore the maximum calculations of above situations are less than the "1" limit.**

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