RF Exposure Report

Report No.:	SA181123D01
FCC ID:	P27-TPM540
Test Model:	TPM540; TPM540G
Received Date:	Nov. 23, 2018
Date of Evaluation:	Jan. 09, 2019
Issued Date:	Jan. 10, 2019
Applicant:	Sercomm Corp.
Address:	8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C. (NanKang Software Park)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
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
SA181123D01	Original Release	Jan. 10, 2019

1 Certificate of Conformity

Product:	Cat-M1 Module
Brand:	Sercomm
Test Model:	TPM540; TPM540G
Sample Status:	Engineering Sample
Applicant:	Sercomm Corp.
Date of Evaluation:	Jan. 09, 2019
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:** Jan. 10, 2019

Gina Liu / Specialist

Approved by : , **Date:** Jan. 10, 2019

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^2)	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	($180/f^2$)*	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

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

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

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

The antennas information is listed as below.

Antenna Type	Antenna Gain (dBi)			
	LTE Band 2	LTE Band 4	LTE Band 12	LTE Band 13
Monopole (PCB)	4.18	4.68	2.04	2.22

2.5 Calculation Result of Maximum Conducted Power

Band	Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
LTE 2	1850-1910	23.71	4.18	20	0.122	1.00
LTE 4	1710-1755	23.92	4.68	20	0.144	1.00
LTE 12	699-716	23.14	2.04	20	0.066	0.47
LTE 13	777-787	21.49	2.22	20	0.047	0.52

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

LTE Band 2= 0.122 / 1= 0.122

LTE Band 4= 0.144 / 1= 0.144

LTE Band 12= 0.066 / 0.47= 0.140

LTE Band 13= 0.047 / 0.52= 0.090

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

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