Variant RF Exposure Report

Report No.:	SA181123D01D
FCC ID:	P27-TPM540
Test Model:	TPM540; TPM540M; TPM540S; TPM540MS
Received Date:	Jan. 17, 2020
Date of Evaluation:	Mar. 03, 2020
Issued Date:	Mar. 06, 2020
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 Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
SA181123D01D	Original Release	Mar. 06, 2020

1 Certificate of Conformity

Product:	Cat-M1 Module
Brand:	Sercomm
Test Model:	TPM540; TPM540M; TPM540S; TPM540MS
Sample Status:	Engineering Sample
Applicant:	Sercomm Corp.
Date of Evaluation:	Mar. 03, 2020
Standards:	FCC Part 2 (Section 2.1091)
References Test Guidance :	KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.3 -2002

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:** Mar. 06, 2020

Gina Liu / Specialist

Approved by : , **Date:** Mar. 06, 2020

Dylan Chiou / Senior Project Engineer

2 GENERAL INFORMATION

This report is issued as a supplementary report to BV CPS report no. SA181123D01B. The difference compared with original report is adding LTE Band 25 and LTE Band 26.

3 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**.

3.1 Antenna Gain

The antennas information is listed as below.

Antenna Type	Antenna Gain (dBi)	
	LTE Band 25	LTE Band 26
	1850 ~ 1915 MHz	814 ~ 849 MHz
Monopole (PCB)	4.18	2.41

2.4 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 25	1850-1915	23.99	4.18	20	0.131	1.00
LTE 26	814-849	24.82	2.41	20	0.105	0.54

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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 25 = 0.131/1 = 0.131

LTE Band 26 = 0.105/0.54 = 0.194

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

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