RF Exposure Report

Report No.:	SABDTL-WTW-P21060469-1
FCC ID:	VUI-TANG
Test Model:	84945296C
Received Date:	Feb. 15, 2022
Test Date:	Mar. 15 ~ Apr. 13, 2022
Issued Date:	May 18, 2022
Applicant:	PEGATRON CORPORATION
Address:	5F, NO. 76, LIGONG ST., BEITOU DISTRICT, TAIPEI CITY 112, TAIWAN
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
SABDTL-WTW-P21060469-1	Original release	May 18, 2022

1 Certificate of Conformity

Product:	Telematics & Network Gateway (TANG)
Brand:	gm
Test Model:	84945296C
Sample Status:	DV
Applicant:	PEGATRON CORPORATION
Test Date:	Mar. 15 ~ Apr. 13, 2022
Standards:	FCC Part 2 (Section 2.1091)
References Test Guidance:	KDB 447498 D01 General RF Exposure Guidance v06

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 : Pettie Chen , **Date:** May 18, 2022

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** May 18, 2022

Jeremy Lin / 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				
300-1500	…	…	F/1500	30
1500-100,000	…	…	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/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 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Average Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN					
2412-2462	16.29	4.71	20	0.025	1
5180-5240	14.49	4.81	20	0.017	1
5260-5320	14.21	5.71	20	0.020	1
5500-5720	14.65	5.41	20	0.020	1
5745-5825	14.07	4.51	20	0.014	1

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

For WWAN module (Brand: Quectel, Model: AG521R-NA, FCC ID: VUI-DAV001)

Band	ERP Power (dBm)	EIRP Power (dBm)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
Module 1					
LTE B2	-	23.24	20	0.042	1.00
LTE B4	-	23.18	20	0.041	1.00
LTE B5	22.2	24.35	20	0.054	0.54
LTE B7	-	23.28	20	0.042	1.00
LTE B12	20.41	22.56	20	0.036	0.46
LTE B13	20.25	22.40	20	0.035	0.52
LTE B14	21.21	23.36	20	0.043	0.53
LTE B25	-	23.28	20	0.042	1.00
LTE B26 (Part 22)	22.31	24.46	20	0.056	0.54
LTE B26 (Part 90)	22.38	24.53	20	0.056	0.54
LTE B66	-	23.23	20	0.042	1.00
LTE B71	20.91	23.06	20	0.040	0.44

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. EIRP = ERP + 2.15dB

Band	ERP Power (dBm)	EIRP Power (dBm)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
Module 2					
LTE B2	-	23.23	20	0.042	1.00
LTE B4	-	23.44	20	0.044	1.00
LTE B5	22.33	24.48	20	0.056	0.54
LTE B7	-	23.20	20	0.042	1.00
LTE B12	20.29	22.44	20	0.035	0.46
LTE B13	20.35	22.50	20	0.035	0.52
LTE B14	21.48	23.63	20	0.046	0.53
LTE B25	-	23.17	20	0.041	1.00
LTE B26 (Part 22)	22.64	24.79	20	0.060	0.54
LTE B26 (Part 90)	22.41	24.56	20	0.057	0.54
LTE B66	-	23.27	20	0.042	1.00
LTE B71	20.87	23.02	20	0.040	0.44
Module 3					
LTE B2	-	23.22	20	0.042	1.00
LTE B4	-	23.29	20	0.042	1.00
LTE B5	22.10	24.25	20	0.053	0.54
LTE B7	-	23.18	20	0.041	1.00
LTE B12	20.38	22.53	20	0.036	0.46
LTE B13	19.62	21.77	20	0.030	0.52
LTE B14	20.90	23.05	20	0.040	0.53
LTE B25	-	23.21	20	0.042	1.00
LTE B26 (Part 22)	22.00	24.15	20	0.052	0.54
LTE B26 (Part 90)	21.72	23.87	20	0.048	0.54
LTE B66	-	23.44	20	0.044	1.00
LTE B71	20.67	22.82	20	0.038	0.44

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. EIRP = ERP + 2.15dB

Note:
1. Directional gain:
   2412-2462MHz: Directional Gain = 1.7dBi + 10log(2) = 4.71dBi
   5180-5240MHz: Directional Gain = 1.8dBi + 10log(2) = 4.81dBi
   5260-5320MHz: Directional Gain = 2.7dBi + 10log(2) = 5.71dBi
   5500-5720MHz: Directional Gain = 2.4dBi + 10log(2) = 5.41dBi
   5745-5825MHz: Directional Gain = 1.5dBi + 10log(2) = 4.51dBi
2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

The simultaneous operation mode was determined by client.

WLAN 2.4GHz + WWAN (module 1) + WWAN (module 2) + WWAN (module 3)

= 0.025/1 + 0.056/0.54 + 0.060/0.54 + 0.053/0.54 = 0.3380

WLAN 5GHz + WWAN (module 1) + WWAN (module 2) + WWAN (module 3)

= 0.020/1 + 0.056/0.54 + 0.060/0.54 + 0.056/0.54 = 0.3385

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

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