

RF Exposure Report

Report No.: SA200424C06

FCC ID: 2ARXKVHE09-4GL

Contains module FCC ID: 2ATM8EC25A

Test Model: VHE09-4GL

Series Model: VHE09XXXXX (X=A-Z, 0-9, blank or "-")

Received Date: Apr. 24, 2020

Test Date: Jun. 02 ~ Jun. 11, 2020

Issued Date: Jun. 17, 2020

Applicant: Veea Inc

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
SA200424C06	Original release.	Jun. 17, 2020

1 Certificate of Conformity

Product: veeaHub

Brand: veeaHub™

Test Model: VHE09-4GL

Series Model: VHE09XXXXX (X=A-Z, 0-9, blank or "-")

Sample Status: Engineering sample

Applicant: Veea Inc

Test Date: Jun. 02 ~ Jun. 11, 2020

Standards: FCC Part 2 (Section 2.1091)

References Test KDB 447498 D01 General RF Exposure Guidance v06

Guidance:
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 : Polly Chien, **Date:** Jun. 17, 2020
Polly Chien / Specialist

Approved by : Bruce Chen, **Date:** Jun. 17, 2020
Bruce Chen / Senior 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

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

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 29cm 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 AV Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 2412~2462	27.13	6.21	29	0.204	1
WLAN 5180~5240	28.94	8.12	29	0.481	1
WLAN 5260~5320	23.36	8.12	29	0.133	1
WLAN 5500~5720	23.63	8.12	29	0.142	1
WLAN 5745~5825	29.65	8.12	29	0.566	1
Zigbee 2405~2475	16.76	3.2	29	0.009	1
BT LE 2402~2480	-5.33	6.0	29	0.0001	1
BT EDR 2402~2480	0.03	6.0	29	0.0004	1
LoRa 923.3 MHz – 927.5 MHz	24.71	5.0	29	0.089	0.616

For WLAN 2.4GHz Band: Directional gain = 3.2dBi + 10log(2) = 6.21dBi

For WLAN 5.0GHz Band: Directional gain = 2.1dBi + 10log(4) = 8.12dBi

For Zigbee: antenna gain = 3.2dBi

For BT: max. antenna gain = 6.0dBi

For LoRa: antenna gain = 5.0dBi

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WWAN (module model: EC25-A)					
WCDMA Band 2 1850.2-1909.8MHz	23.50	1.50	29	0.030	1
WCDMA Band 4 1712.4-1752.6MHz	23.50	1.50	29	0.030	1
WCDMA Band 5 826.4-846.6MHz	23.50	-1.60	29	0.015	0.549
LTE Band 2 1850.7-1909.3MHz	24.00	1.50	29	0.034	1
LTE Band 4 1710.7-1754.3MHz	24.00	1.50	29	0.034	1
LTE Band 12 699.7-715.3MHz	24.00	-1.60	29	0.016	0.466

Note:

1. WLAN, WWAN, zigbee, Bluetooth and LoRa technology can transmit at same time.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
3. 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:

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

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4G + WLAN 5G + Zigbee + Bluetooth + LoRa + WWAN (module model: EC25-A) =
 $0.204/1 + 0.566/1 + 0.009/1 + 0.0004/1 + 0.089/0.616 + 0.016/0.466 = 0.9574$

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

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