

MPE TEST REPORT

Applicant	ID TECH
FCC ID	WQJ-VP6825L
Product	VP6825
Brand	ID TECH
Model	VP6825-8100; VP6825-8100D
Report No.	R2210A0932-M1V1
Issue Date	May 29, 2023

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	May 22, 2023
Rev.1	Update information.	May 29, 2023
Note: This revised report (Report No.: R2210A0932-M1V1) supersedes and replaces the previously issued report (Report No.: R2210A0932-M1). Please discard or destroy the previously issued report and dispose of it accordingly.		

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test Facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.

Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China

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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2 Description of Equipment Under Test

Client Information

Applicant	ID TECH
Applicant address	10721 Walker Street, Cypress, California 90630, United States
Manufacturer	ID TECH TAIWAN
Manufacturer address	No. 16, Lane 22, GaoQing Rd., YanMei Dist., TaoYuan City 326, Taiwan

General Technologies

Model	VP6825-8100; VP6825-8100D
SN	226K000755
Hardware Version	Rev.A
Software Version	v1.00
Date of Sample Received	October 13, 2022
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. 3. VP6825-8100 and VP6825-8100D are the same except for different models, and this report only tests VP6825-8100.	

3 Maximum Tune Up and Antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by

$$\text{Numeric gain (G)} = 10^{(\text{antenna gain}/10)}$$

Band	Maximum Tune Up Power		Antenna Gain (dBi)	Numeric Gain
	(dBm)	(mW)		
WCDMA Band 2	24.000	251.189	0.30	1.072
WCDMA Band 4	24.000	251.189	-1.10	0.776
WCDMA Band 5	24.000	251.189	0.60	1.148
LTE Band 2	24.500	281.838	0.30	1.072
LTE Band 4	24.500	281.838	-1.10	0.776
LTE Band 5	24.500	281.838	0.60	1.148
LTE Band 12	24.500	281.838	-0.30	0.933
LTE Band 13	24.500	281.838	0.50	1.122
LTE Band 25	25.000	316.228	0.30	1.072
LTE Band 26	25.000	316.228	0.60	1.148
Wi-Fi 2.4G	18.000	63.096	1.80	1.514
Wi-Fi 5G	15.000	31.623	1.50	1.413
Bluetooth	10.000	10.000	1.80	1.514

4 Test Result

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following.

TABLE 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)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) 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

Note1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 300~1500 MHz is $f/1500$, for 1500~100,000MHz is 1.0. So

Band	The Maximum Permissible Exposure (mW/cm ²)
WCDMA Band 2	1.000
WCDMA Band 4	1.000
WCDMA Band 5	0.549
LTE Band 2	1.000
LTE Band 4	1.000
LTE Band 5	0.549
LTE Band 12	0.466
LTE Band 13	0.518
LTE Band 25	1.000
LTE Band 26	0.543
Wi-Fi 2.4GHz	1.000
Wi-Fi 5GHz	1.000
Bluetooth	1.000

The Electric Field Strength for 1.34 ~ 300 MHz is $824/f$. So

Band	E-field Strength Limit (V/m)
NFC	60.767

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

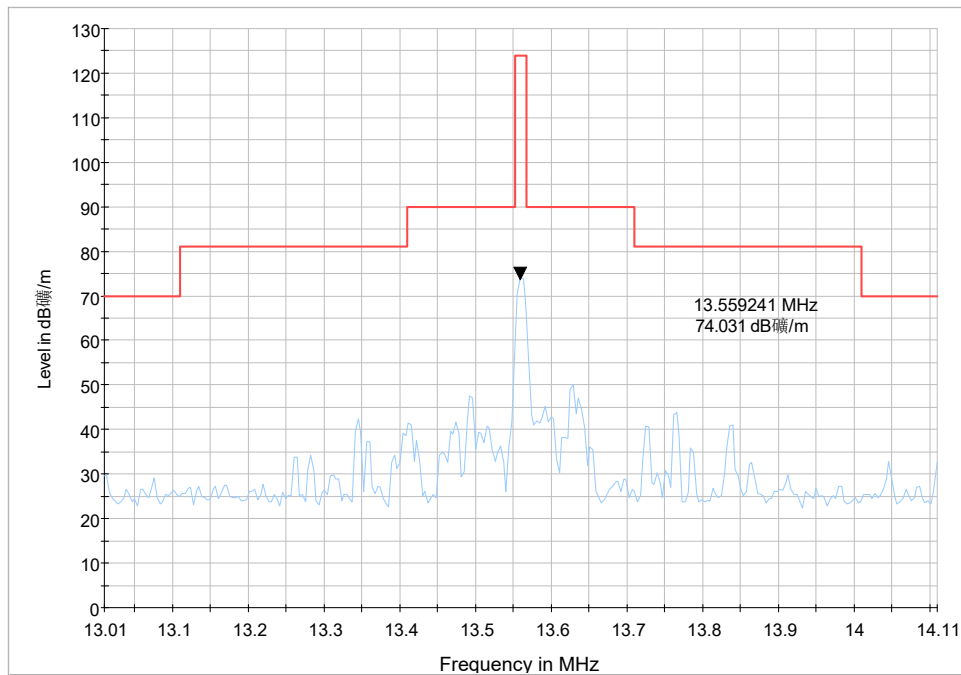
P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	Maximum Tune up (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	PG (mW)	Test Result (mW/cm ²)	Limit Value (mW/cm ²)	The MPE ratio
WCDMA Band 2	24.000	0.30	24.300	269.153	0.054	1.000	0.054
WCDMA Band 4	24.000	-1.10	22.900	194.984	0.039	1.000	0.039
WCDMA Band 5	24.000	0.60	24.600	288.403	0.057	0.549	0.105
LTE Band 2	24.500	0.30	24.800	301.995	0.060	1.000	0.060
LTE Band 4	24.500	-1.10	23.400	218.776	0.044	1.000	0.044
LTE Band 5	24.500	0.60	25.100	323.594	0.064	0.549	0.117
LTE Band 12	24.500	-0.30	24.200	263.027	0.052	0.466	0.112
LTE Band 13	24.500	0.50	25.000	316.228	0.063	0.518	0.121
LTE Band 25	25.000	0.30	25.300	338.844	0.067	1.000	0.067
LTE Band 26	25.000	0.60	25.600	363.078	0.072	0.543	0.133
Wi-Fi 2.4GHz	18.000	1.80	19.800	95.499	0.019	1.000	0.019
Wi-Fi 5GHz	15.000	1.50	16.500	44.668	0.009	1.000	0.009
Bluetooth	10.000	1.80	11.800	15.136	0.003	1.000	0.003
Note: R = 20cm $\pi = 3.1416$ The MPE ratio = Mac Test Result ÷ Limit Value							

A symbol (dBμV/m) in the test plot below means (dBμV/m)



Note: Test data comes from RF report and please refer to the RF report for testing related information.

Test Frequency (MHz)	Max. E-field Strength @ 3m (dBμV/m)	Max. E-field Strength @ 20cm (dBμV/m)	Max. E-field Strength @ 20cm (V/m)	E-field Strength Limit (V/m)	Conclusion
13.559	74.031	97.553	0.0754	60.767	Pass

Note: Max. E-field Strength @ 20cm = Max. E-field Strength @ 3m + 20log (3m/0.2m)
 $V/m = 10^{((dB\mu V/m) - 120)/20}$

So the simultaneous transmitting antenna pairs as below:

$\sum$ of MPE ratios = Main Antenna + Wi-Fi Antenna + Bluetooth = 0.133 + 0.019 + 0.003 = 0.155 < 1
 NFC Antenna and WWAN Antenna / Bluetooth/Wi-Fi Antenna can't transmit simultaneously.

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

*****END OF REPORT *****

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.