

RF EXPOSURE REPORT



FCC Applicant: Honeywell International Inc.
9680 Old Bailes Rd, Fort Mill, SC 29707, USA
Manufacturer: Honeywell International Inc.
9680 Old Bailes Rd, Fort Mill, SC 29707, USA
Product Name: Vehicle Mount Computer
Brand Name: Honeywell
Model No.: VM1A-L0N
Model Difference: N/A
Report Number: TESA2212000601ES
FCC ID HD5-VM1AL0N
Issue Date: March 15, 2023

Approved By

John Yeh

We hereby certify that:

The above equipment was evaluated by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC KDB 447498 D01v06.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TESA2212000601ES	00	Original.	March 15, 2023	Tiffany Kao	

Note:

- 1、The remark "" indicates modification of the report upon requests from certification body.

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	Vehicle Mount Computer
Brand Name:	Honeywell
Model No.:	VM1A-L0N
Model Difference:	N/A
Hardware Version:	VM1A-REF MAIN BOARD Rev:2.2
Firmware Version:	85.00.00-1171
EUT Series No.:	2231461110
Power Supply:	15V

1.2 Evaluation site

Laboratory		Site Address	FCC Designation number	ISED Company Number	CAB Identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	☒	No. 134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, 24803, Taiwan.	TW0027	4620A	TW3702
	☐	No. 2, Keji 1st Rd., Guishan Township, Taoyuan County, 333 Taiwan.	TW0028	4620E	
	☐	1F, No. 8, Alley 15, Lane 120, Sec. 1, Nei Hu Road, Neihu District, Taipei City, 222 Taiwan.	TW0029	23862	

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1.3 Antenna Information:

The antenna information is provided by the applicant.

1.3.1 BT / WLAN 2.4GHz

Supplier	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
LAIRD	2400~2500	2.10	V
LARSEN	2400~2500	1.60	
Honeywell	2400~2500	1.10	
Honeywell	2400~2500	2.70	V

1.3.2 WLAN 5GHz

Supplier	Frequency (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
LAIRD	5150~5250	2.60	
	5250~5350	2.60	
	5470~5725	2.60	
	5725~5850	3.40	
LARSEN	5150~5250	5.00	V
	5250~5350	5.00	
	5470~5725	5.00	
	5725~5850	5.00	
Honeywell	5150~5250	4.70	
	5250~5350	4.60	
	5470~5725	4.80	
	5725~5850	4.70	
	5150~5250	4.40	
	5250~5350	4.70	
	5470~5725	4.90	
	5725~5850	3.40	

Note: Antenna information is provided by the applicant.

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2 FCC MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1 FCC Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

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 (minute)
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
1500-100000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equipment power density

Prediction of MPE limit at a given distance

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

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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2.2 Power Density Calculation (Worst Case)

FCC Standalone MPE

Operation Mode	Evaluation Frequency (MHz)	Operation Distance (cm)	Max. Output Power Include Tolerance (dBm)	Antenna Gain (dBi)	Max. EIRP (mW)	Power Density (PD) (mW/cm ²)	Limit (mW/cm ²)	Pass / Fail	Power Density / Limit	Collocated MPE
BT	2480.00	20	4	2.10	4.07	0.0008	1.000	Pass	0.001	V
WLAN 2.4G	2442.00	20	23	2.70	371.54	0.074	1.000	Pass	0.074	V
WLAN 5G	5180.00	20	21	5.00	398.11	0.079	1.000	Pass	0.079	V

NFC

Frequency (MHz)	E-FIELD dBuV/m	Test Distance (m)	EIRP (dBm)	EIRP (mW)
13.56	34.25	30	-11.43515	0.0718596

Note:

$$\text{EIRP (dBm)} = (\text{E-FIELD (dBuV/m)} + 40 \log(d(\text{m})) - 104.77)$$

$$\text{EIRP (mW)} = (10^{(\text{EIRP (dBm)})/10})$$

Note: For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band.

2.3 Collocated Power Density Calculation

FCC Collocated MPE

Operation Mode	Power Density / Limit	Σ (Power Density / Limit)
BT	0.001	0.154
WLAN 2.4G	0.074	
WLAN 5G	0.079	

Note:

1. $\Sigma(\text{Power Density / Limit})$: This is a summation of [(Power Density for each transmitter/antenna included in the simultaneous transmission) / (corresponding MPE limit)].
2. Considering the collocated transmitters, the aggregated (Power Density / limit) is smaller than 1, and MPE of collocated transmitters is compliant

~ End of Report ~

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