



Test Report - FCC Part 1.1310/ MPE

Applicant: VMware LLC

Signature: _____

A handwritten signature in black ink, appearing to read "Tim Royer", is written over a horizontal line.

Sr. EMC Engineer
EMC-003838-NE



Name & Title: _____ Tim Royer, EMC Engineer

Date of Signature _____ 9/11/2024

This test report relates only to the items tested as identified and is not valid for any subsequent changes or modifications made to the equipment under test.

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1. Applicant Information

Applicant: VMware LLC
Address: 3401 Hillview Avenue
Palo Alto, CA 94304

2. Location of Testing

2.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at IIA's permanent laboratory located at 13146 NW 86th Drive, Suite 400, Alachua, Florida 32615.

FCC test firm # 578780
FCC Designation # US1070
FCC site registration is under A2LA certificate # 0955.01
ISED Canada test site registration # 2056A
EU Notified Body # 1177
For all designations see A2LA scope # 0955.01

3. Test Sample(s) (EUT/DUT)

The test sample was received: 8/15/2024

Dates of Testing: 9/11/2024

3.1 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

Identification	
FCC ID:	2BKLH-EDG7105G
Certified Module FCC ID:	U2M-PCE21310M
Certified Module FCC ID:	RI7FN990A28
Model(s) #	Edge 710-5G
Software version	N/A
Serial Number	N/A

Technical Characteristics	
Frequency Range	2412 – 2462 MHz
Frequency Range	5745 – 5825 MHz
Frequency Range	828 - 844 MHz 1860 – 1900 MHz
Voltage Rating (AC or Batt.)	DC

Antenna Characteristics			
Antenna	Frequency Range	Mode / BW	Antenna Gain
External	2412 – 2462 MHz	n/a	2.07 dBi
External	5745 – 5825 MHz	n/a	2.46 dBi
External	828 - 844 MHz	n/a	2.26 dBi
External	1860 – 1900 MHz	n/a	2.26 dBi

- Note: Information such as antenna gain, firmware/software numbers are provided by manufacturer and cannot be validated by the test lab.

4. Test methods & Applicable Regulatory Limits

4.1 Test methods/Standards/Guidance:

The following guidance FCC KDB 447498 D01 General RF Exposure Guidance v06 was used for RF exposure evaluation as per FCC Part 1.1310 and FCC Part 2.1091 and part 2.1093. Full test results are available in this report.

4.1.1 FCC 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 Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			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
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

4.2 Equations

POWER DENSITY

$$E(V/m) = \text{SQRT} (30 * P * G) / d$$

$$Pd(W/m^2) = E^2 / 377$$

$$S = \text{EIRP} / (4 * \text{Pi} * D^2v)$$

Where:

S = Power density, in mW/cm²

EIRP = Equivalent Isotropic Radiated Power, in mW

D = Separation distance in cm

Power density is converted from units of mW/cm² to units of W/m² by multiplying by 10.

DISTANCE

$$D = \text{SQRT} (\text{EIRP} / (4 * \text{Pi} * S))$$

Where:

D = Separation distance in cm

EIRP = Equivalent Isotropic Radiated Power, in mW

S = Power density in mW/cm²

SOURCE-BASED DUTY CYCLE (When applicable (for example, multi-slot mobile phone applications) A duty cycle factor may be applied.)

$$\text{Source-based time-average EIRP} = (DC / 100) * \text{EIRP}$$

Where:

DC = Duty Cycle in % as applicable.

EIRP = Equivalent Isotropic radiated Power, in mW

5. RF Exposure Results

Telit Module

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
1710-1710 MHz	20	24.50	0.00	100%	0.2818	0.056 mW/cm ²	1 mW/cm ²	5 mW/cm ²	20.00

RESULT: Pass at DISTANCE 20 cm

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
1850-1850 MHz	20	24.50	0.00	100%	0.2818	0.056 mW/cm ²	1 mW/cm ²	5 mW/cm ²	20.00

RESULT: Pass at DISTANCE 20 cm

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
824-824 MHz	20	24.50	0.00	100%	0.2818	0.056 mW/cm ²	0.55 mW/cm ²	2.75 mW/cm ²	20.00

RESULT: Pass at DISTANCE 20 cm

Senao Module

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
5180-5240 MHz	20	24.63	0.00	100%	0.2904	0.058 mW/cm ²	1 mW/cm ²	5 mW/cm ²	20.00

RESULT: Pass at DISTANCE 20 cm

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
2410-2482 MHz	20	24.50	0.00	100%	0.2818	0.056 mW/cm ²	1 mW/cm ²	5 mW/cm ²	20.00

RESULT: Pass at DISTANCE 20 cm

6. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_15541-24_FCC 1.1310/ MPE _	1	Initial release	11/1/2024

END OF TEST REPORT
