Vista Labs
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MPE Report

Test Report Number	PFE-22030421-LC-FCC-IC-MPE
FCC ID	N4TWMC915R1
IC	3196A-WMC915R1
Applicant	Phase IV Engineering Inc.
Applicant Address	2820 Wilderness Place Suite C, Boulder, CO 80301
Product Name	WIKA Module
Model (s)	44-100358-00
Date of Receipt	04/08/2022
Date of Test	04/08/2022- 05/24/2022
Report Issue Date	06/24/2022
Test Standards	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 5: Feb 2021
Test Result	**PASS**

Issued by:

Vista Compliance Laboratories
1261 Puerta Del Sol, San Clemente, CA 92673 USA
www.vista-compliance.com

Devin Tai (Test Technician)

David Zhang (Technical Manager)

REVISION HISTORY

Report Number	Version	Description	Issued Date
PFE-22030421-LC-FCC-IC-MPE	01	Initial report	06/24/2022

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1 General Information

1.1 Applicant

Applicant	Phase IV Engineering Inc.
Applicant address	2820 Wilderness Place Suite C, Boulder, CO 80301
Manufacturer	Phase IV Engineering Inc.
Manufacturer Address	2820 Wilderness Place Suite C, Boulder, CO 80301

1.2 Product information

Product Name	WIKA Module
Product Description	WIKA Module
Model Number	44-100358-00
Family Models	N/A
Serial Number	FCC1
Frequency Band	906 – 924 MHz
Type of modulation	OQPSK (DSSS)
Equipment Class	DTS
Antenna Information	Antenna#1 - Mag mount vertical whip antenna with a gain of 2.82 dBi (Model: NMO5T900B) Antenna#2 - Short monopole with a gain of 2.7 dBi (Model: FW.95.B.SMA.M) Antenna#3 - Short monopole with a gain of 2 dBi (Model: S1551AH-915S)
Clock Frequencies	N/A
Input Power	DC 3.3V
Power Adapter Manufacturer/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Simultaneous Transmission	N/A
Additional Info	N/A

1.3 Test standard and method

Test standard	47 CFR §1.1307(b), 47 CFR §1.1310 47 CFR §2.1093 RSS-102 Issue 5: Feb 2021
Test method	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 5: Feb 2021

2 Test Site Information

Lab performing tests	Vista Laboratories, Inc.
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.vista-compliance.com

3 FCC RF Exposure

3.1 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

3.2 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

3.3 Classification

This device is a module that can be integrated into a host product. It uses externa antenna. This device is evaluated as a Mobile Device with a least 20 cm separation distance to users during operation.

3.4 Antenna Gain

The antenna type is external antenna.

Antenna peak gain:

Antenna#1 - Mag mount vertical whip antenna with a gain of 2.82 dBi (Model: NMO5T900B)

Antenna#2 - Short monopole with a gain of 2.7 dBi (Model: FW.95.B.SMA.M)

Antenna#3 - Short monopole with a gain of 2 dBi (Model: S1551AH-915S)

3.5 Evaluation Results

Radio	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	Separation distance (cm)	Power Density (mW/ cm^2)	MPE Limit (mW/ cm^2)
900MHz	906	25.44	2.82	20	0.133	0.604
900MHz	915	25.47	2.82	20	0.134	0.61
900MHz	924	25.50	2.82	20	0.135	0.616

Conclusion:

The above results show that the device complies with the MPE requirement.

4 ISED RF Exposure Exemption Evaluation

4.1 Limits for Maximum Permissible Exposure (MPE)

RF Exposure Requirements:	RSS-102 Issue 5: Feb 2021
RF Radiation Exposure Limits:	RSS-102 Issue 5: Feb 2021
RF Radiation Exposure Guidelines:	RSS-102 Issue 5: Feb 2021
Limits for General Population/Uncontrolled Exposure in the band of:	**3**00 - 6,000 MHz
Exemption limit for Routine Evaluation:	$1.31 \times 10^{-2} f^{0.6834}$ W

4.2 Classification

This device is a module that can be integrated into a host product. It uses externa antenna. This device is evaluated as a Mobile Device with a least 20 cm separation distance to users during operation.

4.3 Antenna Gain

The antenna type is external antenna.

Antenna peak gain:

Antenna#1 - Mag mount vertical whip antenna with a gain of 2.82 dBi (Model: NMO5T900B)

Antenna#2 - Short monopole with a gain of 2.7 dBi (Model: FW.95.B.SMA.M)

Antenna#3 - Short monopole with a gain of 2 dBi (Model: S1551AH-915S)

4.4 Evaluation Results

Radio	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	Higher of Max E.I.R.P and Conducted Power (W)	Exemption limit (W/m2)
900MHz	906	25.44	2.82	0.670	1.3746
900MHz	915	25.47	2.82	0.675	1.3839
900MHz	924	25.50	2.82	0.679	1.3932

Conclusion:

The above results show that the E.I.R.P of this device is below the exemption limit for Routine Evaluation.

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