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RADIOFREQUENCY RADIATION EXPOSURE EVALUATION: MOBILE DEVICES

REPORT NUMBER: M2005023-5

TEST STANDARD: 47 CFR PART 2.1091

CLIENT: MINETEC

**DEVICE: WIFI WASP BRIDGE
TRANSMITTER**

MODEL: M1011062

FCC ID: 2AVQP-M1011050

DATE OF ISSUE: 3 FEBRUARY 2021

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Front of Device



Inside the Device



REVISION TABLE

Version	Sec/Para Changed	Change Made	Date
1		Initial issue of document	3/02/2021



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RADIOFREQUENCY RADIATION EXPOSURE EVALUATION

Device:	WiFi WASP Bridge Transmitter
Model Number:	M1011062
MAC Address:	C493000FA332
Part Number:	N/A
FCC ID:	2AVQP-M1011050
Manufacturer:	Minetec
Tested for:	Minetec
Address:	Unit 2, Wellard Street, Bibra Lake, WA 6163
Phone Number:	+ 61 8 9259 4955
Contact:	Craig Wroth
Email:	Craig.wroth@minetec.com.au
Standards:	47 CFR Part 2.1091 "Radiofrequency radiation exposure evaluation: mobile devices" 47 CFR 1.1310 "Radiofrequency radiation exposure limits" KDB 447498 D01 General RF Exposure Guidance v06 "RF exposure procedures and equipment authorization policies for mobile and portable devices".

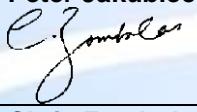
Result: Based on an assessment of the documentation provided the WiFi WASP Bridge Transmitter, model M1011062 complies with the RF exposure requirements of 47 CFR Part 2.1091, however an exclusion zone of 20 cm in front of the radiating elements applies, elsewhere the exposure level was below the MPE limits. Refer to Report M2005023-5 for full details

Assessment Date: 11 June 2020

Issue Date: 3 February 2021



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1 INTRODUCTION

This report is intended to demonstrate compliance of the WiFi WASP Bridge Transmitter, model M1011062 with the RF exposure requirements of 47 CFR Part 2.1091. Evaluation was performed in accordance with FCC KDB 447498 D01.

The product sample was provided by the Client. The conclusion herein is based on the information provided by the client.

1.1 Laboratory Overview

EMC Technologies Pty. Ltd. is an independently owned Australian company that is NATA accredited to ISO 17025 for both testing and calibration and ISO 17020 for Inspection. – **Accreditation Number 5292.**

1.2 Test Laboratory/Accreditations

Measurements were performed at EMC Technologies' laboratory in Keilor Park, Victoria Australia.

Table 1-1: Accreditations for Conformity Assessment

Country/Region	Body	
Australia/New Zealand	NATA	Accreditation Number: 5292
Europe	European Union	Notified Body Number: 0819
USA	FCC	Designation Number: AU0001 (Melb)
Canada	ISED Canada	Company Number: 3569B(Melb)
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R



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2 DEVICE DETAILS

(Information supplied by the Client)

The WiFi WASP Bridge Transmitter, model M1011062 has two RF modules 2.45 MHz WLAN 8devices Lima and integral WASP 5.8 GHz both connected to individual Omnidirectional antennas.

Manufacturer: Minetec
Test Sample: WiFi WASP Bridge Transmitter
Model Number: M1011062
MAC Address: C493000FA332
FCC ID: 2AVQP-M1011050

Transmit parameters were provided by the customer and are shown below:

Table 2-1: Transmitter Parameters

Transmitter 1	Technology	Wi-Fi
	Brand	8 devices
	Model	Lima
	Frequency Range	2412 to 2465 MHz
	Bands Supported	2.4 GHz
	RF Output power	20 dBm
	Antenna Details	Radome Omni,
	Antenna Type	W5030
Transmitter 2	Technology	WASP
	Brand	Integral part of device
	Model	Integral part of device
	Frequency Range	5734.375 - 5841.013 MHz
	Bands Supported	5.8GHz ISM
	RF Output power	13.1dBm
	Antenna Details	Pulse Electronics Omni
	Antenna Type	RO5805NM
	Peak Gain	6dBi



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3 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE), §1.1310

Table 3-1: Occupational and General Public MPE Limits

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

Where f = Frequency in MHz, * = Plane-wave power density

4 UNCERTAINTY

EMC Technologies has evaluated the tools and methods used to perform Radiated Electromagnetic Field predictions. The estimated measurement uncertainties for the calculation shown within this report are as follows:

Electromagnetic Modelling;

30 MHz to 100GHz ±2.8 dB

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

5 ASSUMPTIONS IN THIS ASSESSMENT

This assessment does not include accumulated RF fields from nearby sites/antennas or possible radio signal reflections or attenuation due to buildings or the general environment.

Antenna Parameters and power settings were supplied by the customer.

A 100% duty cycle is assumed.

The aperture of the radiating element assumed to be a point source in free space and far field conditions.

Power tolerance added to the nominal output power.



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6 EVALUATION RESULT

The MPE was evaluated at 20 cm to show compliance with the power density listed in table 2,

The following formula was used to calculate the power density at 20 cm

$$S = \frac{P * G}{4\pi R^2}$$

$$S = \frac{EIRP}{4\pi R^2}$$

Where:

(S): Power density (mW/cm^2)

(P): Output power at antenna terminal (mW)

(G): Gain (ratio)

(R): Minimum test separation distance (20 cm)

Table 6-1: Evaluation Result

Technology	Frequency Band (MHz)	Power	Gain	Duty Cycle	EIRP	EIRP	Flux Density at 20 cm	Flux Density limit	Percentage of the limit
		<i>dBm</i>	<i>dBi</i>	%	<i>dBm</i>	<i>mW</i>	<i>mW/cm²</i>	<i>mW/cm²</i>	%
WASP	5841	13.1	6	100%	19.10	81.28	0.0162	1.00	1.62%
WLAN	2462	20	4	100%	24.00	251.19	0.0500	1.00	5.00%
Total percentage of the limit at 20 cm (Worst Case)								6.62%	

7 CONCLUSION

Based on an assessment of the documentation provided the WiFi WASP Bridge Transmitter, model M1011062 complies with the RF exposure requirements of 47 CFR Part 2.1091. An exclusion zone of 20 cm in front of the radiating elements applies, elsewhere the exposure level was below the MPE limits.



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8 APPENDIX A

Referenced Documents

Document	Comments
W5030-L184	Antenna datasheet
Pulse Electronics RO5805NM	Antenna datasheet
lima_datasheet	WLAN datasheet (peak power)
RE WiFi WASP Bridge M2005023 (client email)	WASP peak power information



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