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RF Exposure Evaluation Report

Report No.: CQASZ20210300361E-02
Applicant: FUZHOU EMAX ELECTRONIC CO., LTD.
Address of Applicant: Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China.
Equipment Under Test (EUT):
EUT Name: Remote In/Out Thermometer
Model No.: TX09
Brand Name: N/A
FCC ID: WEC-2102
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2021-3-25
Date of Test: 2021-3-25 to 2021-5-6
Date of Issue: 2021-5-6
Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Jun Li

(Jun Li)

Approved By:

Sheek, Luo

(Sheek Luo)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210300361E-02	Rev.01	Initial report	2021-5-6

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3 General Information

3.1 Client Information

Applicant:	FUZHOU EMAX ELECTRONIC CO., LTD.
Address of Applicant:	Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China.
Manufacturer:	FUZHOU EMAX ELECTRONIC CO., LTD.
Address of Manufacturer:	Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China.
Factory:	FUZHOU EMAX ELECTRONIC CO., LTD.
Address of Factory:	Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China.

3.2 General Description of 2.4G

Frequency Range:	433.92
Modulation Type:	FSK
Number of Channels:	1
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Antenna Type:	Spring antenna
Antenna Gain:	0dBi
Power Supply:	EUT is powered by 2*AA size batteries

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone MPE test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.1.3 EUT RF Exposure

1) EUT RF Exposure

$$e_{irp} = p_t \times g_t = (E \times d)^2 / 30$$

where:

p_t = transmitter output power in watts,

g_t = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, $10^{((dB_{\mu V/m})/20)/10^6}$,

d = measurement distance in meters (m)---3m,

$$\text{So } p_t = (E \times d)^2 / 30 / g_t$$

The worst case (refer to report CQASZ20201001281E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
433.92	82.93	Peak
433.92	56.83	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
433.92	82.79	Peak
433.92	56.79	Average

For 433.92MHz wireless:

Field strength = 82.93 dB μ V/m @3m

Ant. gain 0dBi; so Ant numeric gain=1.0

$$\text{So } p_t = \{ [10^{(82.93/20)/10^6} \times 3]^2 / 30 / 1.0 \} \times 1000 \text{mW} = 1.40 \text{mW}$$

$$\text{So } (1.40 \text{mW} / 5 \text{mm}) \times \sqrt{0.43392 \text{GHz}} = 0.184,$$

$$0.184 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.