

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200800934E-02	Rev.01	Initial report	2020-09-09

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3 General Information

3.1 Client Information

Applicant:	Huizhou Zhihang Technology Co.,Ltd.
Address of Applicant:	3/F,building a, Dabang Science Park, Yuechang village, Xinxu Town, Huiyang District, Huizhou City
Manufacturer:	Huizhou Zhihang Technology Co.,Ltd.
Address of Manufacturer:	3/F,building a, Dabang Science Park, Yuechang village, Xinxu Town, Huiyang District, Huizhou City
Factory:	Huizhou Zhihang Technology Co.,Ltd.
Address of Factory:	3/F,building a, Dabang Science Park, Yuechang village, Xinxu Town, Huiyang District, Huizhou City

3.2 General Description of EUT

Product Name:	dongle
Model No.:	TL-180
Trade Mark:	N/A
Hardware Version:	V7.0
Software Version:	V69
Frequency Range:	2402MHz ~ 2480MHz
Modulation Type:	GFSK
Number of Channels:	40 (declared by the client)
Sample Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	-2.36dBi
Power Supply:	DC 5V

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR 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:

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

$f(\text{GHz})$ 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

4.2 EUT RF Exposure Evaluation

1) For 2.4G

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

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 CQASZ20200700685E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
2402	87.03	Peak
2402	83.82	Average

For 2402MHz wireless:

Field strength = 87.03dBuV/m @3m

Ant. gain -2.36dBi; so Ant numeric gain=0.58

$$\text{So } p_t = \{ [10^{(87.31/20)/10^6} \times 3]^2 / 30 / 0.58 \} \times 1000 \text{mW} = 0.261 \text{mW}$$

$$\text{So } (0.261 \text{mW} / 5 \text{mm}^2) \times \sqrt{2.402 \text{GHz}} = 0.08$$

0.08 < 3.0 for 1-g SAR

So the SAR report is not required.