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RF Exposure Evaluation Report

Report No. : CQASZ20191101225E-03
Applicant: Zhejiang PDW Industrial Co., Ltd.
Address of Applicant: Quanxi Industrial Park, Wuyi County, Jinhua City, Zhejiang, P.R. China 321200
Equipment Under Test (EUT):
EUT Name: TPMS Bluetooth Adaptor
Model No.: 04.01.73, 04.01.75
Test Model No.: 04.01.73
Brand Name: PDW, PROCAST
FCC ID: 2ATWD-040173
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2019-11-28
Date of Test: 2019-11-28 to 2019-12-05
Date of Issue: 2019-12-05
Test Result : PASS*

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

Tested By:

Tom Chen

(Tom Chen)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20191101225E-03	Rev.01	Initial report	2019-12-05

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3 General Information

3.1 Client Information

Applicant:	Zhejiang PDW Industrial Co., Ltd.
Address of Applicant:	Quanxi Industrial Park, Wuyi County, Jinhua City, Zhejiang, P.R. China 321200
Manufacturer:	Zhejiang PDW Industrial Co., Ltd.
Address of Manufacturer:	Quanxi Industrial Park, Wuyi County, Jinhua City, Zhejiang, P.R. China 321200

3.2 General Description of EUT

Product Name:	TPMS Bluetooth Adaptor
Model No.:	04.01.73, 04.01.75
Test Model No.:	04.01.73
Trade Mark:	PDW, PROCAST
Hardware Version:	V05
Software Version:	V01
Bluetooth Version:	V4.2
Sample Type:	☐ Mobile ☒ Portable ☐ Fix Location
Power Supply:	DC5V

3.3 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Test Software of EUT:	Blue test 3 (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0dBi

3.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Modulation Type:	GFSK
Transfer Rate:	1Mbps/2Mbps
Number of Channel:	40
Test Software of EUT:	Blue test 3 (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0dBi

Remark: Model No.: 04.01.73, 04.01.75

Only the model 04.01.73 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being Trademarks and models.

4 SAR 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:

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

$f(\text{GHz})$ 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

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-0.120	0±1	1	1.259
Middle(2441MHz)	2.270	2±1	3	1.995
Highest(2480MHz)	3.150	3±1	4	2.512
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-2.500	-2±1	-1	0.794
Middle(2441MHz)	0.150	0±1	1	1.259
Highest(2480MHz)	1.000	1±1	2	1.585
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-2.000	-2±1	-1	0.794
Middle(2441MHz)	0.450	0±1	1	1.259
Highest(2480MHz)	1.480	1±1	2	1.585

Worst case: GFSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-0.120	0±1	1	1.259	0.39	3.0
Middle (2441MHz)	2.270	2±1	3	1.995	0.62	
Highest (2480MHz)	3.150	3±1	4	2.512	0.79	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20191101225E-01

2) For BLE

Measurement Data

GFSK(1Mbps) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	2.45	2±1	3	1.995
Middle(2440MHz)	4.28	4±1	5	3.162
Highest(2480MHz)	4.78	4±1	5	3.162

Worst case: GFSK(1Mbps)						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	2.45	2±1	3	1.995	0.62	3.0
Middle (2440MHz)	4.28	4±1	5	3.162	0.99	
Highest (2480MHz)	4.78	4±1	5	3.162	1.00	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20191101225E-02

BDR, EDR and BLE can not simultaneous transmitting at same time.