

RF EXPOSURE REPORT



Report No.: 17070315-FCC-H2

Supersede Report No.: N/A

| | | |
|--|---|---|
| Applicant | Advantech Co Ltd | |
| Product Name | Mobile Data Terminal | |
| Model No. | PWS-472 | |
| Serial No. | MICA-052, D300 | |
| Test Standard | FCC 2.1093:2016 | |
| Test Date | April 22 to May 04, 2017 | |
| Issue Date | May 05, 2017 | |
| Test Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | |
| Equipment complied with the specification <input checked="" type="checkbox"/> | | |
| Equipment did not comply with the specification <input type="checkbox"/> | | |
|  |  |  |
| Loren Luo Test Engineer | David Huang Checked By | |
| This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only | | |

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

| Country/Region | Scope |
|----------------|------------------------------------|
| USA | EMC, RF/Wireless, SAR, Telecom |
| Canada | EMC, RF/Wireless, SAR, Telecom |
| Taiwan | EMC, RF, Telecom, SAR, Safety |
| Hong Kong | RF/Wireless, SAR, Telecom |
| Australia | EMC, RF, Telecom, SAR, Safety |
| Korea | EMI, EMS, RF, SAR, Telecom, Safety |
| Japan | EMI, RF/Wireless, SAR, Telecom |
| Singapore | EMC, RF, SAR, Telecom |
| Europe | EMC, RF, SAR, Telecom, Safety |

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1. Report Revision History

| Report No. | Report Version | Description | Issue Date |
|-----------------|----------------|-------------|--------------|
| 17070315-FCC-H2 | NONE | Original | May 05, 2017 |
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2. Customer information

| | |
|------------------|---|
| Applicant Name | Advantech Co Ltd |
| Applicant Add | No. 1, Alley 20, Lane 26, Rueiguang Road , Neihu District, Taipei , Taiwan |
| Manufacturer | DOFUNTECH CO., LTD. |
| Manufacturer Add | A401, No.189 Xinjunhuan Rd., Pujiang Town, Minhang District, Shanghai, China. |

3. Test site information

| | |
|----------------------|--|
| Lab performing tests | SIEMIC (Shenzhen-China) LABORATORIES |
| Lab Address | Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108 |
| FCC Test Site No. | 718246 |
| IC Test Site No. | 4842E-1 |
| Test Software | Radiated Emission Program-To Shenzhen v2.0 |

4. Equipment under Test (EUT) Information

| | |
|-------------------------------|--|
| Description of EUT: | Mobile Data Terminal |
| Main Model: | PWS-472 |
| Serial Model: | MICA-052, D300 |
| Date EUT received: | April 21, 2017 |
| Test Date(s): | April 22 to May 04, 2017 |
| Antenna Gain: | BLE/Bluetooth(2.4G): 2.13dBi WIFI(2.4G): 2.13dBi WIFI(5150-5250MHz): 1.92dBi |
| Antenna Type: | PIFA antenna |
| Type of Modulation: | Bluetooth: GFSK, $\pi/4$ DQPSK, 8DPSK 802.11b: DSSS 802.11a/g/n20/n40: OFDM BLE: GFSK |
| RF Operating Frequency (ies): | Bluetooth/BLE: 2402-2480 MHz 802.11b/g: 2412-2462 MHz (TX/RX) 802.11n20: 2412-2462MHz ; (TX/RX) 802.11n40: 2422-2452 MHz (TX/RX); 802.11 a: 5150-5250 MHz; (TX/RX) |
| Number of Channels: | Bluetooth: 79CH WIFI :802.11b/g: 11CH WIFI :802.11a: 24CH WIFI :802.11n20: 11CH(2.4GHz); 24CH(5GHz) WIFI :802.11n40: 9CH(2.4GHz); 12CH(5GHz) BLE: 40CH |
| Port: | USB Port |

Adapter:

Model: JHD-AP013U-050200BB-A

Input: AC100-240V~50/60Hz,0.35A

Output: DC 5.0V,2000mA

Battery:

Model: LBP300A

Spec : 3.7V,3200mAh,11.84Wh

Maximum chargeable voltage: 4.2V

Input Power:

Trade Name :

ADVANTECH

FCC ID:

M82-PWS472

5. FCC §2.1093 - Radiofrequency radiation exposure evaluation: portable devices.

5.1 RF Exposure

Standard Requirement:

According to §15.247 (i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,¹⁶ 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.

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

$$\text{result} = P\sqrt{F} / D$$

P= Maximum turn-up power in mW

F= Channel frequency in GHz

D= Minimum test separation distance in mm

5.2 Test Result

Bluetooth Mode:

| Modulation | CH | Frequency (MHz) | Conducted Power (dBm) | Tune Up Power (dBm) | Max Tune Up Power (dBm) | Max Tune Up Power (mW) | Result | Limit |
|---------------|------|-----------------|-----------------------|---------------------|-------------------------|------------------------|--------|-------|
| GFSK | Low | 2402 | 2.678 | 2.5±1 | 3.5 | 2.239 | 0.69 | 3 |
| | Mid | 2441 | 3.454 | 2.5±1 | 3.5 | 2.239 | 0.70 | 3 |
| | High | 2480 | 2.754 | 2.5±1 | 3.5 | 2.239 | 0.71 | 3 |
| $\pi/4$ DQPSK | Low | 2402 | 1.841 | 2.5±1 | 3.5 | 2.239 | 0.69 | 3 |
| | Mid | 2441 | 2.677 | 2.5±1 | 3.5 | 2.239 | 0.70 | 3 |
| | High | 2480 | 1.903 | 2.5±1 | 3.5 | 2.239 | 0.71 | 3 |
| 8-DPSK | Low | 2402 | 1.985 | 2.5±1 | 3.5 | 2.239 | 0.69 | 3 |
| | Mid | 2441 | 2.868 | 2.5±1 | 3.5 | 2.239 | 0.70 | 3 |
| | High | 2480 | 2.046 | 2.5±1 | 3.5 | 2.239 | 0.71 | 3 |

BLE Mode:

| Modulation | CH | Freq (MHz) | Conducted Power (dBm) | Tune Up Power (dBm) | Max Tune Up Power (dBm) | Max Tune Up Power (mW) | Result | Limit |
|------------|------|------------|-----------------------|---------------------|-------------------------|------------------------|--------|-------|
| GFSK | Low | 2402 | -4.759 | -4.5±1 | -3.5 | 0.447 | 0.14 | 3 |
| | Mid | 2440 | -4.128 | -4.5±1 | -3.5 | 0.447 | 0.14 | 3 |
| | High | 2480 | -5.246 | -4.5±1 | -3.5 | 0.447 | 0.14 | 3 |

Result: Compliance

No SAR measurement is required.