




시험 성적서 TEST REPORT

페이지(page) : (1) / (총(Total) 8)

| | | | |
|---|------------------|--|------------|
| 성적서 번호 Report No. | | ICRT-TR-E222084-0A | |
| 신청자 Client | 기관명 Name | PITASOFT CO.,LTD. | |
| | 주소 Address | A4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea | |
| 시험대상품목 Sample description | | Car Dashcam | |
| 모델명 Type designation | | DR970X LTE | |
| 정격 Ratings | | DC 12.0 V / DC 24.0 V | |
| 시험장소 Place of test | | <input checked="" type="checkbox"/> 고정시험(Inside test) <input type="checkbox"/> 현장시험(Field test) 주소지(Address): 112, 113 Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea | |
| 시험기간 Date of test | | 31.May. 2022 ~ 08. Aug. 2022 | |
| 시험방법/항목 Test Method/Item | | FCC rule §1.1310 | |
| 시험결과 Test Results | | Refer to 3. Test Summary | |
| 확인 Affirmation | 작성자 Tested by | 기술책임자 Technical Manager | |
| | 성명 Name | Yeong-Hwan, Hong (서명) (Signature) | 성명 Name |
| <input type="checkbox"/> 위 성적서는 고객이 제공한 시료에 대한 시험결과입니다. The above test report is certified that the above mentioned products have been tested for the sample. | | | |
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경기도 김포시 양촌읍 황금3로7번길 112 / Tel: 02-6351-9001 ~ 6



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Revision History

| Issued Report No. | Issued Date | Revisions | Effect Section |
|--------------------|-------------|---------------|----------------|
| ICRT-TR-E222084-0A | 10-Aug-2022 | Initial Issue | All |
| | | | |
| | | | |



1. Applicant & Manufacturer & Test Laboratory Information

1.1 Applicant information

| | |
|----------------|--|
| Applicant | PITTASOFT CO.,LTD. |
| Address | A4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea |
| Contact Person | MINHO SHIN |
| Telephone No. | + 82-31-8039-7789 |
| Fax No. | + 82-31-8039-5260 |
| E-mail | shinmh@pittasoft.com |

1.2 Manufacturer Information

| | |
|----------------|--|
| Manufacturer 1 | PITTASOFT CO.,LTD. |
| Address | A4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea |

1.3 Test Laboratory Information

| | |
|-----------------------------------|---|
| Conducted tests were performed at | |
| Laboratory | ICR Co., Ltd. |
| Address | 112, Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea |
| Telephone No. | +82-2-6351-9002 |
| Fax No. | +82-2-6351-9007 |
| RRA No. | KR0165 |
| KOLAS No. | KT652 |
| Test Firm Registration Number | 490614 |



2. Equipment under Test(EUT) Information

2.1 General Information

| | |
|-----------------------|---|
| Product Name | Car Dashcam |
| Brand Name | - |
| Model Name | DR970X LTE |
| Additional Model Name | DR970X-1CH LTE, DR970X-2CH LTE, DR970X-2CH IR LTE, DR970X-2CH DMS LTE, DR970X-2CH Truck LTE, DR970X-2CH ELD LTE |
| FCC ID | YCK- DR970XLTE |
| Power Supply | DC 12.0 V / DC 24.0 V |

2.2 Additional Information

| | | |
|---------------------|--|--|
| Equipment Class | DTS-Digital Transmission System DSS - Frequency Hopping Spread Spectrum systems | |
| Device Type | Stand-alone | |
| Operating Frequency | 802.11b/g/n(HT20) | 2 412 MHz ~ 2 462 MHz |
| | 802.11n(HT40) | 2 422 MHz ~ 2 452 MHz |
| | 802.11a | 5 180 MHz ~ 5 240 MHz / 5 260 MHz ~ 5 320 MHz 5 500 MHz ~ 5 700 MHz / 5 745 MHz ~ 5 825 MHz |
| | 802.11n(HT20)/ac(VHT20) | |
| | 802.11n(HT40)/ac(VHT40) | |
| | 802.11ac(VHT80) | |
| | Bluetooth BDR/EDR/LE | 2 402 MHz ~ 2 480 MHz |
| RF Output Power | 802.11b | 11.52 dBm |
| | 802.11g | 15.61 dBm |
| | 802.11n(HT20) | 14.65 dBm |
| | 802.11n(HT40) | 14.45 dBm |
| | Bluetooth BDR | 8.67 dBm |
| | Bluetooth EDR | 11.58 dBm |
| | Bluetooth LE | 6.34 dBm |
| | 802.11a | 2.59 dBm |
| | 802.11n(HT20) | 2.68 dBm |
| | 802.11n(HT40) | 1.03 dBm |
| | 802.11ac(VHT20) | 2.73 dBm |
| | 802.11ac(VHT40) | 1.06 dBm |
| | 802.11ac(VHT80) | -0.17 dBm |



| | | |
|------------------------|---|----------|
| Number of Channel | 802.11b/g/n(HT20) | 11 |
| | 802.11n(HT40) | 7 |
| | Bluetooth BDR/EDR | 79 |
| | Bluetooth LE | 40 |
| | 802.11a/n(HT20)/ac(VHT20) | 25 |
| | 802.11n(HT40)/ac(VHT20) | 12 |
| | 802.11ac(VHT80) | 6 |
| Modulation Type | 802.11b: DSSS Modulation 802.11g/n(HT20/HT40)/ac(VHT20/VHT40/VHT80): OFDM Modulation | |
| Antenna Type | Chip Antenna | |
| Antenna Gain | 2.4 GHz | 1.88 dBi |
| | 5 GHz | 3.60 dBi |
| Antenna Operating Mode | Single Antenna Equipment with only one antenna | |

2.3 Mode of operation during the test

- The EUT is continuous transmission mode during the test with set to each of the Low Channel, Middle Channel, and High Channel at the worst case data rate. The worst case data rate for each modulation is determined WLAN & Bluetooth.

2.4 Modifications of EUT

- None

2.5 Reason of Additional Model Name

- The basic model, electrical specifications, structure, and circuit are the same, but simple wave life is added due to the seller.



3. Maximum Permissible Exposure

3.1 RF Exposure calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are $f/1500 \text{ mW/cm}^2$ for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm^2 for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm^2 exposure is calculated as follows:

$$E = \sqrt{(30 * P * G)} / d, \text{ and } S = E^2 / Z = E^2 / 377, \text{ because } 1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$$

Where

S = Power density in mW/cm^2 , Z = Impedance of free space, 377Ω

E = Electric field strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G)} / (377 * 10 S)$$

Changing to units of mW and cm , using $P (\text{mW}) = P (\text{W}) / 1 000$, $d (\text{cm}) = 0.01 * d (\text{m})$

$$d = 0.282 * \sqrt{(P * G)} / S$$

Where

d = distance in cm , P = Power in mW , G = Numeric antenna gain, and S = Power density in mW/cm^2



3.1 Result

According to above equation, the following result was obtained.

| Operating Mode | Frequency (MHz) | Target Power W / tolerance | Max tune up power | | Antenna Gain | | E.I.R.P (W) | Limit (W) |
|-----------------|-----------------|----------------------------|-------------------|--------|--------------|--------|-------------|-----------|
| | | | (dBm) | (mW) | Log | Linear | | |
| 802.11b | 2 462 MHz | 11.52 ± 1.0 | 12.52 | 17.86 | 1.88 | 1.54 | 0.0275 | 2.72 |
| 802.11g | 2 462 MHz | 15.61 ± 1.0 | 16.61 | 45.81 | | | 0.0706 | 2.72 |
| 802.11n(HT20) | 2 462 MHz | 14.65 ± 1.0 | 15.65 | 36.73 | | | 0.0566 | 2.72 |
| 802.11n(HT40) | 2 452 MHz | 14.45 ± 1.0 | 15.45 | 35.08 | | | 0.0541 | 2.71 |
| Bluetooth BDR | 2 480 MHz | 8.67 ± 1.0 | 9.67 | 9.27 | | | 0.0143 | 2.74 |
| Bluetooth EDR | 2 480 MHz | 11.58 ± 1.0 | 12.58 | 18.11 | | | 0.0279 | 2.74 |
| Bluetooth LE | 2 440 MHz | 6.34 ± 1.0 | 7.34 | 5.42 | | | 0.0084 | 2.71 |
| 802.11a | 5 280 MHz | 2.68 ± 1.0 | 3.68 | 2.33 | 3.6 | 2.29 | 0.0052 | 2.72 |
| 802.11n(HT20) | 5 190 MHz | 1.03 ± 1.0 | 2.03 | 1.60 | | | 0.0053 | 4.58 |
| 802.11n(HT40) | 5 200 MHz | 2.73 ± 1.0 | 3.73 | 2.36 | | | 0.0037 | 4.53 |
| 802.11ac(VHT20) | 5 190 MHz | 1.06 ± 1.0 | 2.06 | 1.61 | | | 0.0054 | 4.54 |
| 802.11ac(VHT40) | 5 210 MHz | -0.17 ± 1.0 | 0.83 | 1.21 | | | 0.0037 | 4.53 |
| 802.11ac(VHT80) | 5 280 MHz | 2.68 ± 1.0 | 3.68 | 2.33 | | | 0.0028 | 4.54 |
| LTE Band 2 | 1 850 MHz | 22. ± 1.0 | 23.0 | 199.53 | | | 4.00 | 2.51 |
| LTE Band 4 | 2 755 MHz | 22. ± 1.0 | 23.0 | 199.53 | 0.5012 | 2.94 | | |
| LTE Band 12 | 699 MHz | 22. ± 1.0 | 23.0 | 199.53 | 0.5012 | 1.15 | | |

For getting power density at 20 cm separation in above table, following formula was used.

$$S = P * G / (4\pi * R^2) = 199.53 * 17.38 / (4 * \pi * 20^2) = 0.6902$$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna



- Conclusion of Simultaneous Transmitter

| Operating Freq. Band | Operating Mode | Frequency (MHz) | Max tune up power | | Antenna Gain | | MPE (Ratio) | Calculated MPE | Limit |
|------------------------------------|----------------|-----------------|-------------------|--------|--------------|--------|-------------|----------------|-------|
| | | | (dBm) | (mW) | Log | Linear | | | |
| WLAN + Bluetooth + LTE | 802.11g | 2 462 MHz | 16.61 | 45.81 | 1.88 | 1.54 | 0.0260 | 0.472 | 1.00 |
| | Bluetooth EDR | 2 480 MHz | 12.58 | 18.11 | | | 0.0102 | | |
| | LTE Band 2 | 1 850 MHz | 23.00 | 199.53 | 4.00 | 2.51 | 0.4358 | | |

- END -