



A Test Lab Techno Corp.

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MPE Report

| | |
|--------------------|--|
| Applicant | : LANCOM Systems GmbH |
| Product Type | : Mini PCIe module |
| Trade Name | : LANCOM |
| Model Number | : EW-7955MAC |
| Received Date | : Feb. 18, 2019 |
| Test Period | : Mar. 13, 2019 |
| Issue Date | : Apr. 08, 2019 |
| Test Specification | : ANSI / IEEE Std.C95.1-1992 / IEEE Std. 1528-2013 |
| | 47 CFR § 2.1091 |
| | 47 CFR § 1.1310 |

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By : Edison Hu
(Edison Hu)

Tested By : Kris Pan
(Kris Pan)



Revision History

| Rev. | Issue Date | Revisions | Revised By |
|------|---------------|---------------|-------------|
| 00 | Apr. 08, 2019 | Initial Issue | Serene Yang |
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1. Description of Equipment under Test (EUT)

| | | | | |
|---------------------|---|----------------------|------------------|-----------------------|
| Applicant | LANCOM Systems GmbH Adenauerstr. 20/B2, Wuerselen, 52146, Germany | | | |
| Manufacturer | Edimax Technology Co., Ltd. No.278, Xinhua 1st Rd., Neihu Dist., Taipei City, Taiwan | | | |
| Product Type | Mini PCIe module | | | |
| Trade Name | LANCOM | | | |
| Model Number | EW-7955MAC | | | |
| FCC ID | U4Y-EW7955MAC | | | |
| Frequency Range | Operate Band | | | Frequency Range (MHz) |
| | IEEE 802.11a U-NII Band I | | | 5180 - 5240 |
| | IEEE 802.11ac / 802.11n 5 GHz 20 MHz U-NII Band I | | | 5180 - 5240 |
| | IEEE 802.11ac / 802.11n 5 GHz 40 MHz U-NII Band I | | | 5190 - 5230 |
| | IEEE 802.11ac 80 MHz U-NII Band I | | | 5210 |
| Antenna Information | ANT | Model | Type | Max. Gain (dBi) |
| | ANT-0/ANT-1/ANT-2/ANT-3 | AT-25-A80355-B32D083 | External Antenna | 5.00 |
| | ANT-0/ANT-1/ANT-2/ANT-3 | TE-2118837-2 | PIFA Antenna | 3.93 |
| Antenna Delivery | IEEE 802.11a: 4TX (CDD) IEEE 802.11ac 20 MHz / 40 MHz / 80 MHz: 4TX (CDD/Beamforming on) | | | |
| RF Evaluation | 0.223 mW/cm ² | | | |
| Temperature Range | 0 ~ +50°C | | | |

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 / 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties



2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. " This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: "IMPORTANT: To meet the FCC's RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna". Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a "mobile device" as defined in section § 2.1091 paragraph (b).

| Exposure evaluation |
|---|
| $S = \frac{PG}{4\pi R^2}$ <p>Where S: power density P: power input to the antenna G: power gain of the antenna in the direction of interest relative to an isotropic radiator. R: distance to the center of radiation of the antenna.</p> |



3. RF Output Power

The conducted power turn-up tolerance reference manufacturer specification.

| Band | Data Rate (Mbps) | Frequency (MHz) | Average Conducted power (dBm) | | | | |
|----------------------|------------------|-----------------|-------------------------------|-------|-------|-------|-------------|
| | | | ANT-0 | ANT-1 | ANT-2 | ANT-3 | ANT-0+1+2+3 |
| IEEE 802.11a | 6 | 5180.0 | 16.42 | 15.93 | 16.15 | 15.58 | 22.05 |
| | | 5200.0 | 16.50 | 16.11 | 16.36 | 15.41 | 22.14 |
| | | 5220.0 | 16.61 | 16.23 | 16.32 | 15.45 | 22.19 |
| | | 5240.0 | 16.73 | 16.36 | 16.55 | 15.51 | 22.33 |
| IEEE 802.11ac 20 MHz | 26 | 5180.0 | 17.14 | 16.71 | 16.76 | 16.18 | 22.73 |
| | | 5200.0 | 17.32 | 16.80 | 16.93 | 16.06 | 22.82 |
| | | 5220.0 | 17.41 | 16.98 | 16.96 | 16.13 | 22.91 |
| | | 5240.0 | 17.40 | 16.99 | 17.04 | 16.34 | 22.98 |
| IEEE 802.11ac 40 MHz | 54 | 5190.0 | 14.03 | 13.65 | 13.83 | 13.29 | 19.73 |
| | | 5230.0 | 19.61 | 18.89 | 19.04 | 18.35 | 25.02 |
| IEEE 802.11ac 80 MHz | 117.2 | 5210.0 | 11.20 | 10.71 | 10.91 | 10.37 | 16.83 |

Beamforming on

| Band | Data Rate (Mbps) | Frequency (MHz) | Average Conducted power (dBm) | | | | |
|----------------------|------------------|-----------------|-------------------------------|-------|-------|-------|-------------|
| | | | ANT-0 | ANT-1 | ANT-2 | ANT-3 | ANT-0+1+2+3 |
| IEEE 802.11ac 20 MHz | 26 | 5180.0 | 10.73 | 10.50 | 10.33 | 9.70 | 16.35 |
| | | 5200.0 | 10.88 | 10.39 | 10.62 | 9.61 | 16.42 |
| | | 5220.0 | 11.01 | 10.48 | 10.55 | 9.68 | 16.48 |
| | | 5240.0 | 11.05 | 10.55 | 10.81 | 9.97 | 16.63 |
| IEEE 802.11ac 40 MHz | 54 | 5190.0 | 7.89 | 7.31 | 7.03 | 7.07 | 13.36 |
| | | 5230.0 | 12.94 | 12.36 | 12.48 | 11.82 | 18.44 |
| IEEE 802.11ac 80 MHz | 117.2 | 5210.0 | 4.52 | 4.05 | 4.00 | 3.66 | 10.09 |

Note:1. The relevant measured result has the offset with cable loss already.

4. Test Results

| WLAN Antenna_CDD | | | | | | | | | | |
|----------------------|------------------|-----------------|------------|-------------------|---|----------------|------------------|------------|---------------------------------|---|
| Band | Data Rate (Mbps) | Frequency (MHz) | Limit (mw) | Distance [R] (cm) | Max tune-up Power (upper limit) [P] (dBm) | ANT Gain (dBi) | Numeric Gain [G] | Duty Cycle | Power with Duty cycle [TP] (mW) | Power Density [S] (mw/cm ²) |
| IEEE 802.11a | 6 | 5180.0 | 1 | 20 | 22.5 | 5.00 | 3.16 | 1 | 561.94 | 0.112 |
| | | 5200.0 | 1 | 20 | 22.5 | 5.00 | 3.16 | 1 | 561.94 | 0.112 |
| | | 5220.0 | 1 | 20 | 22.5 | 5.00 | 3.16 | 1 | 561.94 | 0.112 |
| | | 5240.0 | 1 | 20 | 22.5 | 5.00 | 3.16 | 1 | 561.94 | 0.112 |
| IEEE 802.11ac 20 MHz | 26 | 5180.0 | 1 | 20 | 23.5 | 5.00 | 3.16 | 1 | 707.44 | 0.141 |
| | | 5200.0 | 1 | 20 | 23.5 | 5.00 | 3.16 | 1 | 707.44 | 0.141 |
| | | 5220.0 | 1 | 20 | 23.5 | 5.00 | 3.16 | 1 | 707.44 | 0.141 |
| | | 5240.0 | 1 | 20 | 23.5 | 5.00 | 3.16 | 1 | 707.44 | 0.141 |
| IEEE 802.11ac 40 MHz | 54 | 5190.0 | 1 | 20 | 25.5 | 5.00 | 3.16 | 1 | 1121.21 | 0.223 |
| | | 5230.0 | 1 | 20 | 25.5 | 5.00 | 3.16 | 1 | 1121.21 | 0.223 |
| IEEE 802.11ac 80 MHz | 117.2 | 5210.0 | 1 | 20 | 17.0 | 5.00 | 3.16 | 1 | 158.38 | 0.032 |

| WLAN Antenna_Beamforming on | | | | | | | | | | |
|-----------------------------|------------------|-----------------|------------|-------------------|---|----------------|------------------|------------|---------------------------------|---|
| Band | Data Rate (Mbps) | Frequency (MHz) | Limit (mw) | Distance [R] (cm) | Max tune-up Power (upper limit) [P] (dBm) | ANT Gain (dBi) | Numeric Gain [G] | Duty Cycle | Power with Duty cycle [TP] (mW) | Power Density [S] (mw/cm ²) |
| IEEE 802.11ac 20 MHz | 19.5 | 5180.0 | 1 | 20 | 17 | 11.02 | 12.65 | 1 | 634.00 | 0.126 |
| | | 5200.0 | 1 | 20 | 17 | 11.02 | 12.65 | 1 | 634.00 | 0.126 |
| | | 5220.0 | 1 | 20 | 17 | 11.02 | 12.65 | 1 | 634.00 | 0.126 |
| | | 5240.0 | 1 | 20 | 17 | 11.02 | 12.65 | 1 | 634.00 | 0.126 |
| IEEE 802.11ac 40 MHz | 40.5 | 5190.0 | 1 | 20 | 19 | 11.02 | 12.65 | 1 | 1004.83 | 0.200 |
| | | 5230.0 | 1 | 20 | 19 | 11.02 | 12.65 | 1 | 1004.83 | 0.200 |
| IEEE 802.11ac 80 MHz | 87.9 | 5210.0 | 1 | 20 | 10.5 | 11.02 | 12.65 | 1 | 141.94 | 0.028 |

Note:

1. Mobile or fixed location transmitters, minimum separation distance is 20 cm, even if calculations indicate MPE distance is less.
2. The Numeric Gain calculated by $10^{(\text{ant. Gain(dBi)} / 10)}$.
3. Each band max power which perform MPE of any configurations.
4. The MPE results are evaluated by lowest data rate for WLAN.
5. The device operating IEEE 802.11 a mode is 4TX CDD.
6. The device operating IEEE 802.11 ac mode is 4TX MIMO / CDD.