



TESTING LABORATORY
CERTIFICATE#4323.01



FCC PART 15.245

TEST REPORT

For

PIONEER ELECTRONICS (USA) INC.

2050 W. 190th Street, Suite 100, Torrance, CA 90504 USA

FCC ID: IYASDA-BS100

| | |
|---|--|
| Report Type: Original Report | Product Type: Blind Spot Detection System/ Bar Type |
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| Report Number: PKS191120001-2 | |
| Report Date: 2020-01-08 | |
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

| | |
|--------------|---------------------------------------|
| Applicant | PIONEER ELECTRONICS (USA) INC. |
| Tested Model | SDA-BS100 |
| Product Type | Blind Spot Detection System/ Bar Type |
| Power Supply | DC 12V |

**All measurement and test data in this report was gathered from production sample serial number: 20191120001.
(Assigned by the BACL. The EUT supplied by the applicant was received on 2019-11-20)*

Objective

This type approval report is prepared on behalf of PIONEER ELECTRONICS (USA) INC. in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section, 15.205, 15.209 and 15.245 rules.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Lab Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

| Item | | Uncertainty |
|------------------------------------|------------|-------------|
| AC Power Lines Conducted Emissions | | 3.19dB |
| RF conducted test with spectrum | | 0.9dB |
| RF Output Power with Power meter | | 0.5dB |
| Radiated emission | 30MHz~1GHz | 6.11dB |
| | 1GHz~6GHz | 4.45dB |
| | 6GHz~18GHz | 5.23dB |
| Occupied Bandwidth | | 0.5kHz |
| Temperature | | 1.0°C |
| Humidity | | 6% |

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

All of the modules only support one channel as below:

| Channel | Frequency (GHz) |
|---------|-----------------|
| 1 | 24.09 |

EUT Exercise Software

N/A

Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|-------|---------------|
| / | / | / | / |

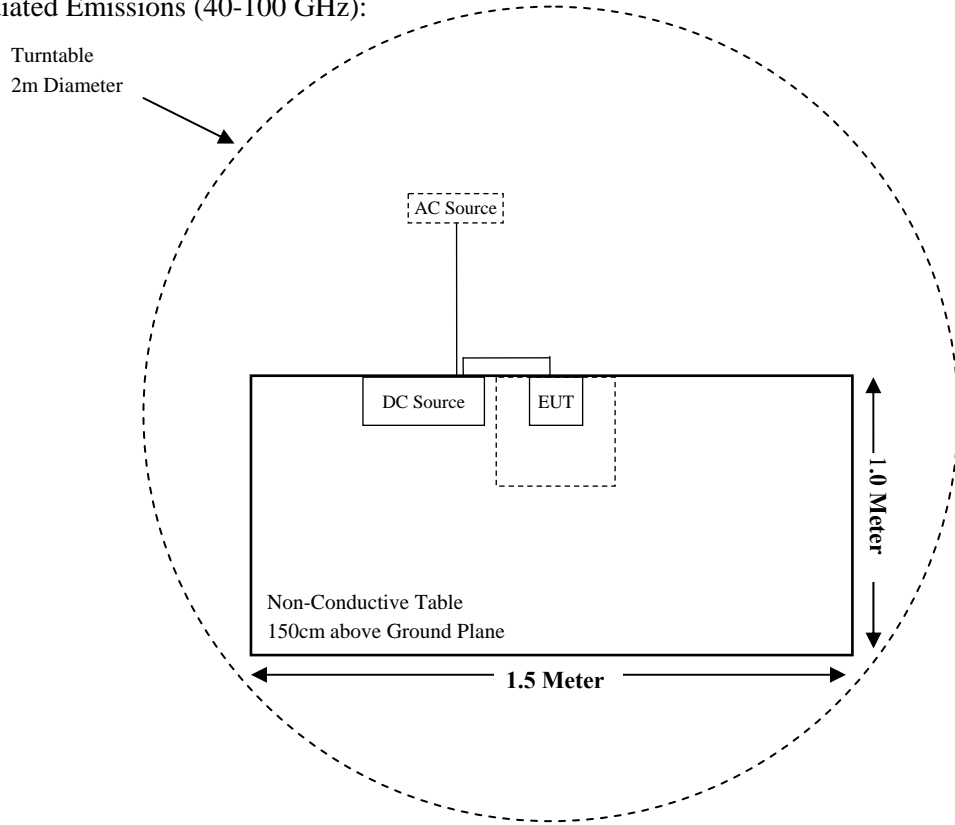
External I/O Cable

| Cable Description | Shielding Type | Length (m) | From Port | To |
|-------------------|----------------|------------|-----------|-------------|
| Power Cable | 2.0 | EUT | DC Source | Power Cable |

Block Diagram of Test Setup

For Conducted Emissions:

For Radiated Emissions (40-100 GHz):



SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|--------------------------|---------------------|-----------|
| 15.205, §15.209, §15.245 | Radiated Emissions | Compliant |

TEST EQUIPMENT LIST

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--|-------------------|-------------|---------------|------------------|----------------------|
| Radiated Emission Test (Chamber 2#) | | | | | |
| Agilent | Spectrum Analyzer | 8565E | 3442A0253 | 2019-10-25 | 2020-10-24 |
| OML | Harmonic Mixer | WR19/M19HWD | U60313-1 | 2019-10-14 | 2020-10-14 |
| OML | Horn Antenna | M19RH | 11648-01 | 2019-10-14 | 2020-10-14 |
| Agilent | Harmonic Mixer | 11970V | 2521A01767 | 2016-12-07 | 2019-12-07 |
| Flann Microwave | Horn Antenna | 861V/385 | 736 | 2016-12-07 | 2019-12-07 |
| OML | Harmonic Mixer | WR12/M12HWD | E60120-1 | 2019-10-19 | 2022-10-19 |
| OML | Horn Antenna | M12RH | E60120-2 | 2019-10-19 | 2022-10-19 |
| OML | Harmonic Mixer | WR08/M08HWD | F60313-1 | 2019-10-24 | 2022-10-24 |
| OML | Horn Antenna | M08RH | F60313-2 | 2019-10-24 | 2022-10-24 |
| HP | Coaxial Cable | 5061-5458 | 019 | 2019-08-15 | 2020-08-14 |
| HP | Coaxial Cable | 5061-5458 | 020 | 2019-08-15 | 2020-08-14 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.205, §15.209&§15.245- RADIATED EMISSIONS& OUT OF BAND EMISSION

Applicable Standard

According to FCC§15.245 (b), The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency (MHz) | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (millivolts/meter) |
|-----------------------------|--|--|
| 902-928 | 500 | 1.6 |
| 2435-2465 | 500 | 1.6 |
| 5785-5815 | 500 | 1.6 |
| 10500-10550 | 2500 | 25.0 |
| 24075-24175 | 2500 | 25.0 |

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in §15.205, shall not exceed the field strength limits shown in §15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For the second and third harmonics of field disturbance sensors operating in the 24075-24175 MHz band and for other field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.

(ii) For all other field disturbance sensors, 7.5 mV/m.

(iii) Field disturbance sensors designed to be used in motor vehicles or aircraft must include features to prevent continuous operation unless their emissions in the restricted bands, other than the second and third harmonics from devices operating in the 24075-24175 MHz band, fully comply with the limits given in §15.209. Continuous operation of field disturbance sensors designed to be used in farm equipment, vehicles such as fork lifts that are intended primarily for use indoors or for very specialized operations, or railroad locomotives, railroad cars and other equipment which travels on fixed tracks is permitted. A field disturbance sensor will be considered not to be operating in a continuous mode if its operation is limited to specific activities of limited duration (e.g., putting a vehicle into reverse gear, activating a turn signal, etc.).

(2), Field strength limits are specified at a distance of 3 meters.

(3) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

(4) The emission limits shown above are based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

EUT Setup

40-100GHz:

The antenna is scanned around the entire perimeter surface of the EUT, in both horizontal and vertical polarizations, at the distance of 1.0 m from 40 GHz to 100GHz.

Test Equipment Setup

The system was investigated from 40GHz to 100GHz.

During the radiated emission test, the EMI test receiver setup & Spectrum Analyzer Setup were set with the following configurations:

| Frequency Range | RBW | Video B/W | IF B/W | Detector |
|-----------------|------|-----------|--------|----------|
| 40 GHz -100 GHz | 1MHz | 3 MHz | / | PK |
| 40 GHz -100 GHz | 1MHz | 3 MHz | / | RMS |

Test Procedure

A Maximizing procedure was performed to ensure that the highest emissions from the EUT were actually measured in all of the Test Arrangements of the EUT and Local Support Equipment.

From 40 GHz to 100 GHz, all radiated emissions measurements were made using a Peak Detector.

According to C63.10 , the 40-100GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1m]}) \text{ dB} = 9.54 \text{ dB}$

All emissions under the average limit and under the noise floor have not recorded in the report.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected = Antenna Loss + Cable Loss- Amplifier Gain

Or

Corrected Amplitude = Antenna Loss + Cable Loss - Amplifier Gain- Distance extrapolation factor

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected}$$

$$\text{Margin} = \text{Limit} - \text{Result}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part15.245,15.209, 15.205

Test Data

Environmental Conditions

| | |
|---------------------------|----------|
| Temperature: | 20.1 °C |
| Relative Humidity: | 55% |
| ATM Pressure: | 102.1kPa |

The testing was performed by Stone Zhang on 2019-11-20

EUT operation mode: Transmitting

40GHz-100GHz:

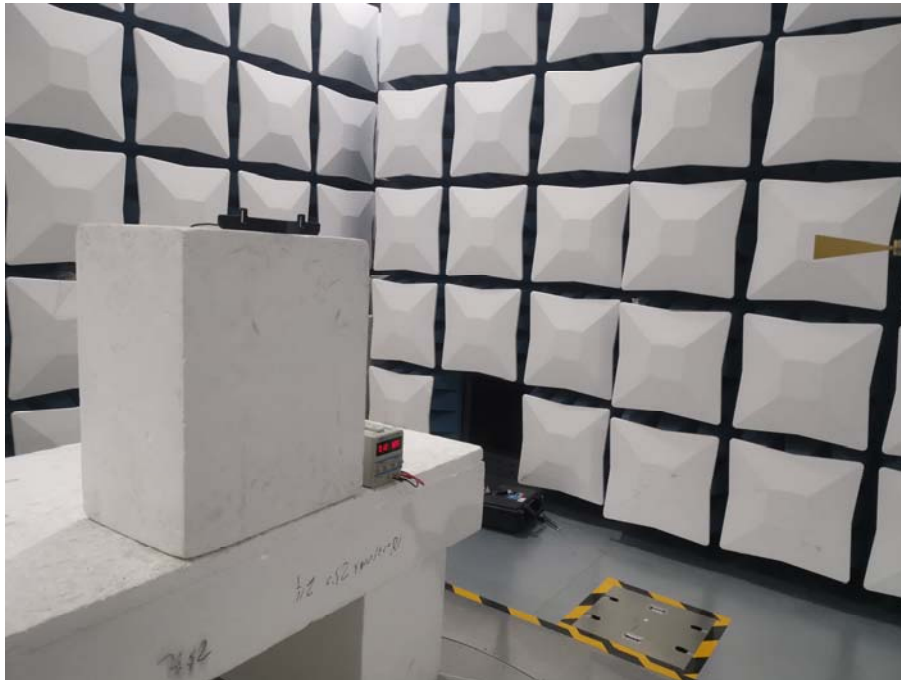
(Pre-Scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

| Frequency (GHz) | Corrected Amplitude | | Rx Antenna | | Turntable Degree | Corr. (dB) | Limit (dB μ V) | Margin (dB) |
|-----------------|-------------------------|-------------------------|-------------|-------------|------------------|------------|--------------------|-------------|
| | MaxPeak (dB μ V /m) | Average (dB μ V /m) | Height (cm) | Polar (H/V) | | | | |
| 48.18 | --- | 73.82 | 150 | V | 352 | 31.58 | 88 | 14.18 |
| 48.18 | 75.49 | --- | 150 | V | 352 | 31.58 | 108 | 32.51 |
| 48.18 | --- | 60.24 | 150 | H | 284 | 31.58 | 88 | 27.76 |
| 48.18 | 62.57 | --- | 150 | H | 284 | 31.58 | 108 | 45.43 |
| 72.27 | --- | 70.83 | 150 | V | 155 | 37.80 | 88 | 17.17 |
| 72.27 | 73.49 | --- | 150 | V | 155 | 37.80 | 108 | 34.51 |
| 72.27 | --- | 72.26 | 150 | H | 229 | 37.80 | 88 | 15.74 |
| 72.27 | 75.34 | --- | 150 | H | 229 | 37.80 | 108 | 32.66 |

There is no other emission have been found and the emission compliance with the general field strength limits specified in FCC Part15.209.

EXHIBIT A - TEST SETUP PHOTOGRAPHS

Radiated Spurious Emissions Test View (40-60GHz)



Radiated Spurious Emissions Test View (50-75GHz)



Radiated Spurious Emissions Test View (60-90GHz)



Radiated Spurious Emissions Test View (90-100GHz)



******* END OF REPORT *******