

FCC PART 15.245

TEST REPORT

For

PIONEER ELECTRONICS (USA) INC.

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

FCC ID: IYASDA-BS900

Report Type: Original Report	Product Type: Blind Spot Detection System/Lane Change Assist
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Report Number:	PKS191120001-1
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-BS900
Product Type	Blind Spot Detection System/Lane Change Assist
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	24.125

EUT Exercise Software

N/A

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

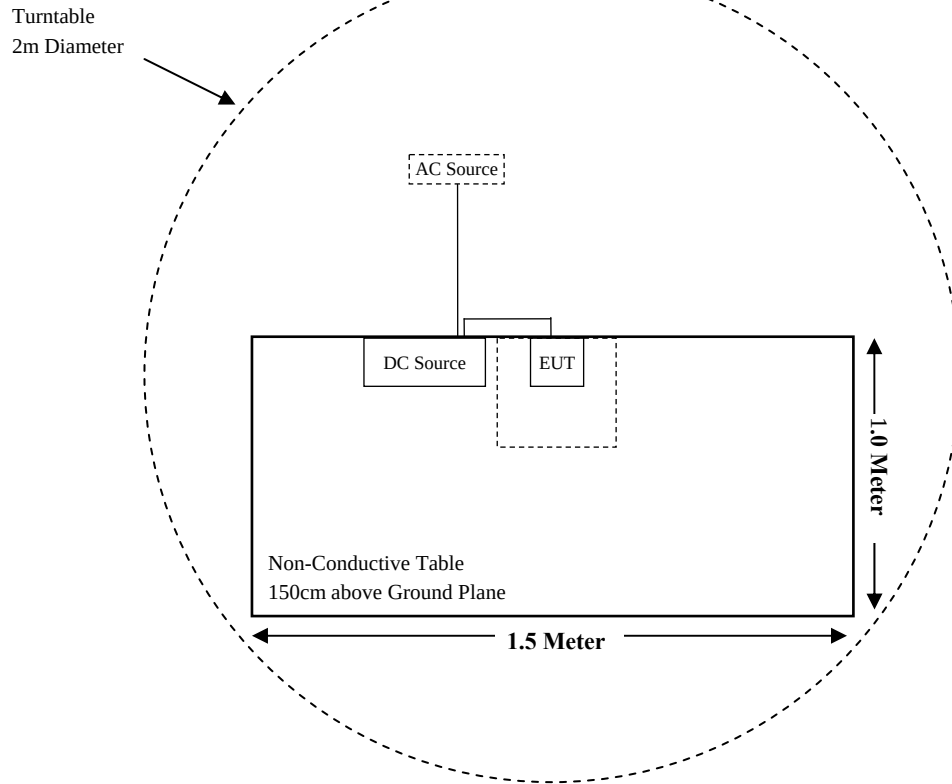
External I/O Cable

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 26.5-40GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1m]})$ dB= 9.54 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 (dBμV)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
48.25	---	73.17	150	V	352	31.60	88	14.83
48.25	76.55	---	150	V	352	31.60	108	31.45
48.25	---	67.39	150	H	284	31.60	88	20.61
48.25	69.42	---	150	H	284	31.60	108	38.58
72.38	---	70.24	150	V	155	37.81	88	17.76
72.38	72.65	---	150	V	155	37.81	108	35.35
72.38	---	69.47	150	H	229	37.81	88	18.53
72.38	72.62	---	150	H	229	37.81	108	35.38

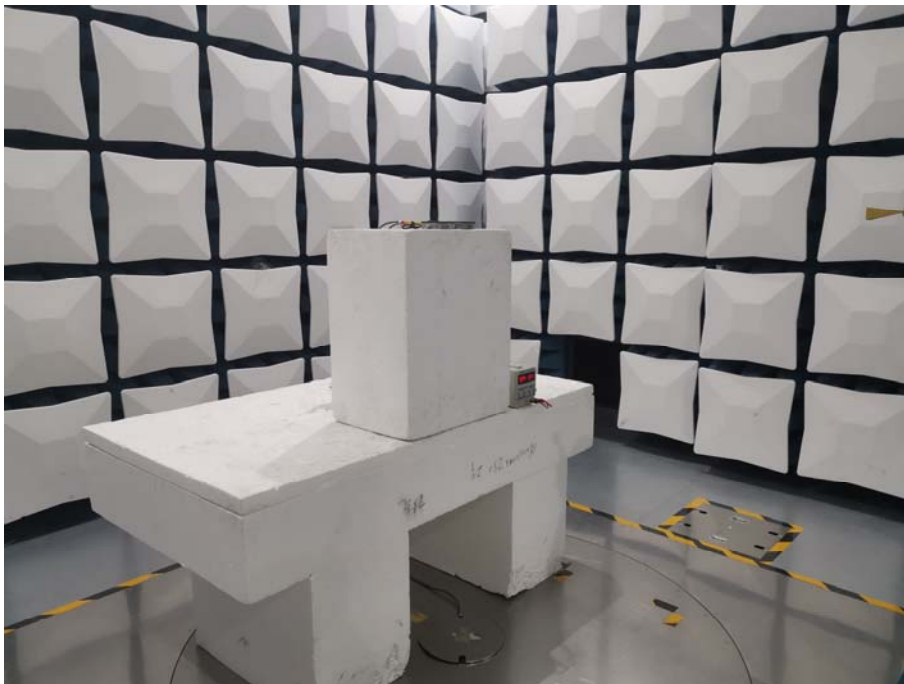
There is no other emission have been found and the emission compliance with the general field strength limits specified in FCC Part15.209.

EXHIBIT A - TEST SETUP PHOTOGRAPHS

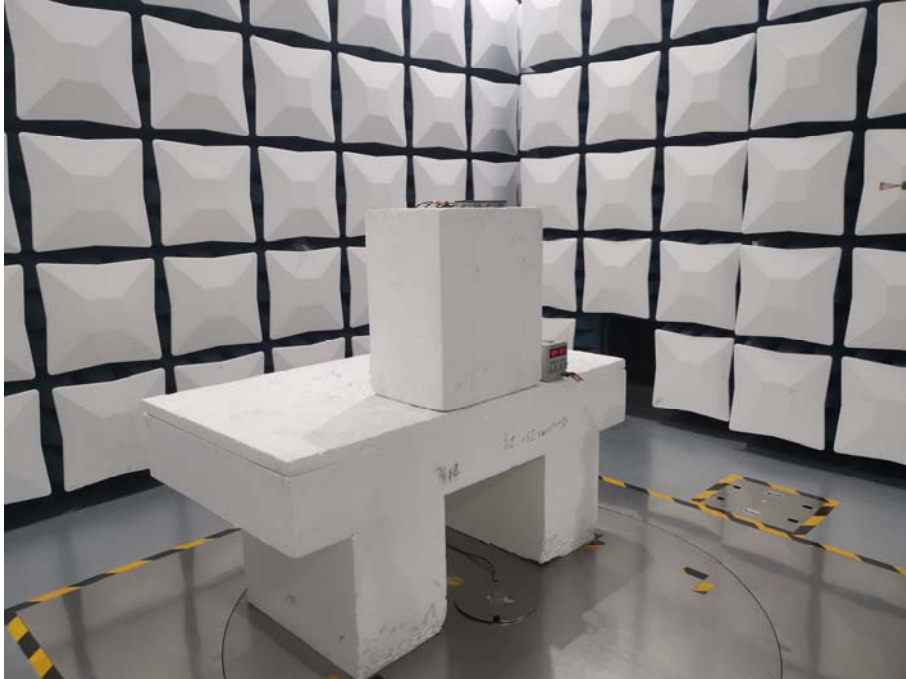
Radiated Spurious Emissions Test View (40-60GHz)



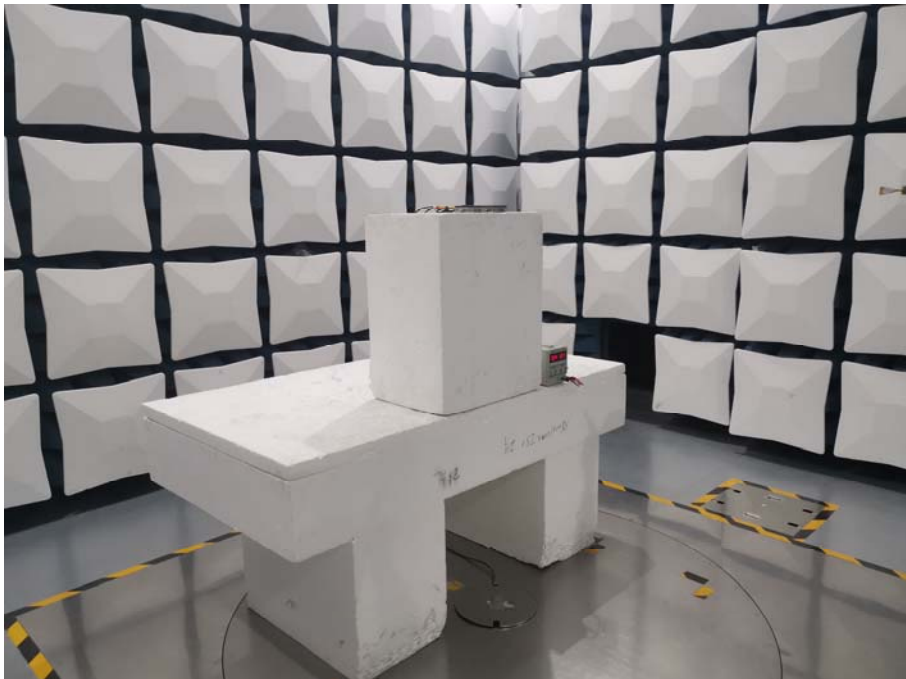
Radiated Spurious Emissions Test View (50-75GHz)



Radiated Spurious Emissions Test View (60-90GHz)



Radiated Spurious Emissions Test View (90-100GHz)



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