

# Test Report

## FCC-ID: IYASDA-BS900

|                  |                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:    | Blind Spot Detection/ Lane Change Assist System                                                                                                          |
| Trademark:       | Pioneer                                                                                                                                                  |
| Model Name :     | SDA-BS900<br>SDA-BS900D, SDA-BS901, SDA-BS9, SDA-BS900X,<br>ND-BS900                                                                                     |
| Prepared For :   | Pioneer Electronics (USA) Inc.                                                                                                                           |
| Address :        | 2050 W. 190th Street, Suite 100, Torrance, CA 90504, USA                                                                                                 |
| Prepared By :    | Shenzhen BCTC Testing Co., Ltd.                                                                                                                          |
| Address :        | BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan<br>1st Road, Qiaotou Community, Fuyong Street, Bao'an District,<br>Shenzhen, China |
| Test Date:       | Nov. 13, 2019 - Dec. 03, 2019                                                                                                                            |
| Date of Report : | Dec. 03, 2019                                                                                                                                            |
| Report No.:      | BCTC1911000888E                                                                                                                                          |

## CERTIFICATION

**Applicant's name** .....: Pioneer Electronics (USA) Inc.

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

**Manufacture's Name** .....: Pioneer Electronics (USA) Inc.

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

### Product description

**Product name** .....: Blind Spot Detection/ Lane Change Assist System

**Trademark:** Pioneer

SDA-BS900

**Model Name:** SDA-BS900D, SDA-BS901, SDA-BS9, SDA-BS900X,  
ND-BS900

**Test Standards:** FCC 47 CFR Part 15, Section 15.245  
ANSI C63.10-2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the IC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

**Test Result**.....: **Pass**

**Prepared by(Engineer):** Cai Fangzhong

*Cai Fang Zhong*

**Reviewer(Supervisor):** Eric Yang

*Eric Yang*

**Approved(Manager):** Zero Zhou



| Table of Contents                                           | Page      |
|-------------------------------------------------------------|-----------|
| <b>1 . SUMMARY OF TEST RESULTS</b>                          | <b>5</b>  |
| 1.1 TEST FACILITY                                           | 5         |
| 1.2 MEASUREMENT UNCERTAINTY                                 | 5         |
| <b>2 . GENERAL INFORMATION</b>                              | <b>6</b>  |
| 2.1 GENERAL DESCRIPTION OF EUT                              | 6         |
| 2.2 DESCRIPTION OF TEST MODES                               | 7         |
| 2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING            | 7         |
| 2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 7         |
| 2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)            | 8         |
| 2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS                      | 9         |
| <b>3 . EMC EMISSION TEST</b>                                | <b>10</b> |
| 3.1 CONDUCTED EMISSION MEASUREMENT                          | 10        |
| 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS                  | 10        |
| 3.1.2 TEST PROCEDURE                                        | 11        |
| 3.1.3 DEVIATION FROM TEST STANDARD                          | 11        |
| 3.1.4 TEST SETUP                                            | 11        |
| 3.1.5 EUT OPERATING CONDITIONS                              | 11        |
| 3.1.6 TEST RESULTS                                          | 11        |
| 3.2 RADIATED MEASUREMENT.                                   | 12        |
| 3.2.1 TEST PROCEDURE                                        | 12        |
| 3.2.2 DEVIATION FROM TEST STANDARD                          | 13        |
| 3.2.3 TEST SETUP                                            | 13        |
| 3.2.4 EUT OPERATING CONDITIONS                              | 14        |
| 3.2.5 TEST RESULTS                                          | 15        |
| <b>4 . 20DB BANDWIDTH TEST</b>                              | <b>21</b> |
| 4.1 APPLIED PROCEDURES / LIMIT                              | 21        |
| 4.1.1 TEST PROCEDURE                                        | 21        |
| 4.1.2 DEVIATION FROM STANDARD                               | 21        |
| 4.1.3 TEST SETUP                                            | 21        |
| 4.1.4 EUT OPERATION CONDITIONS                              | 21        |
| 4.1.5 TEST RESULTS                                          | 22        |
| <b>5 . ANTENNA REQUIREMENT</b>                              | <b>23</b> |
| 5.1 STANDARD REQUIREMENT                                    | 23        |

---

| <b>Table of Contents</b>     | <b>Page</b> |
|------------------------------|-------------|
| <b>5.2 EUT ANTENNA</b>       | <b>23</b>   |
| <b>6 . EUT TEST PHOTO</b>    | <b>24</b>   |
| <b>7 . PHOTOS OF THE EUT</b> | <b>26</b>   |

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC 47 CFR Part 15, Subpart C, Section 15.245 |                               |          |        |
|-----------------------------------------------|-------------------------------|----------|--------|
| Standard Section                              | Test Item                     | Judgment | Remark |
| 15.245 (b)                                    | Fundamental Radiated          | PASS     |        |
| 15.245 (b)                                    | Spurious Emission Measurement | PASS     |        |
| 15.215 (c)                                    | Bandwidth                     | PASS     |        |
| 15.205 (a)                                    | Band Edge Emission            | PASS     |        |

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

### 1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.

Add. : BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 712850

IC Registered No.: 23583

### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| No. | Item                          | Uncertainty               |
|-----|-------------------------------|---------------------------|
| 1   | Conducted Emission Test       | $\pm 1.38\text{dB}$       |
| 2   | RF power, conducted           | $\pm 0.16\text{dB}$       |
| 3   | Spurious emissions, conducted | $\pm 0.21\text{dB}$       |
| 4   | All emissions, radiated (<1G) | $\pm 4.68\text{dB}$       |
| 5   | All emissions, radiated (>1G) | $\pm 4.89\text{dB}$       |
| 6   | Temperature                   | $\pm 0.5^{\circ}\text{C}$ |
| 7   | Humidity                      | $\pm 2\%$                 |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      |          |                         |       |                   |     |                       |               |                      |                    |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------|-------------------------|-------|-------------------|-----|-----------------------|---------------|----------------------|--------------------|
| Equipment               | ADD-ON BLIND SPOT DETECTION SYSTEM WITH LANE CHANGE ASSIST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Trade Name              | Pioneer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Model Name              | SDA-BS900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Serial Model            | SDA-BS900D, SDA-BS901, SDA-BS9, SDA-BS900X, ND-BS900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Model Difference        | Consecutive Model Years and sales territories                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Product Description     | <table border="1"> <tr> <td>Operation Frequency:</td><td>24125MHz</td></tr> <tr> <td>Bit Rate of Transmitter</td><td>1Mbps</td></tr> <tr> <td>Number Of Channel</td><td>1CH</td></tr> <tr> <td>Max. RF Output Power:</td><td>104.59 dBuV/m</td></tr> <tr> <td>Antenna Designation:</td><td>Please see Note 3.</td></tr> </table> <p>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</p> | Operation Frequency: | 24125MHz | Bit Rate of Transmitter | 1Mbps | Number Of Channel | 1CH | Max. RF Output Power: | 104.59 dBuV/m | Antenna Designation: | Please see Note 3. |
| Operation Frequency:    | 24125MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Bit Rate of Transmitter | 1Mbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Number Of Channel       | 1CH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Max. RF Output Power:   | 104.59 dBuV/m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Antenna Designation:    | Please see Note 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Channel List            | Please refer to the Note 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Power Supply            | DC 12V 0.4A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Connecting I/O Port(s)  | Please refer to the User's Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Hardware Version:       | 20180920-v3.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Software Version:       | 19103116                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |          |                         |       |                   |     |                       |               |                      |                    |
| Power level set         | 10dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |          |                         |       |                   |     |                       |               |                      |                    |

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 

| Channel List |                 |         |                 |         |                 |
|--------------|-----------------|---------|-----------------|---------|-----------------|
| Channel      | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01           | 24125           | \       | \               | \       | \               |

#### 3. Table for Filed Antenna

| Ant. | Brand | Model Name | Antenna Type | Gain (dBi) | NOTE |
|------|-------|------------|--------------|------------|------|
| 1    | N/A   | N/A        | PCB Antenna  | 7.1        |      |

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| For Conducted & Radiated Emission |                   |
|-----------------------------------|-------------------|
| Final Test Mode                   | Description       |
| Mode 1                            | CH01 Transmitting |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) Fully-charged battery is used during the test

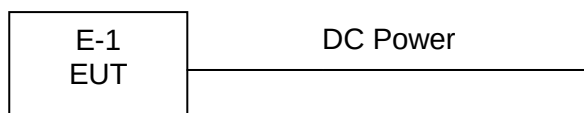
## 2.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

|           |           |
|-----------|-----------|
| Frequency | 24125 MHz |
| Channel   | 01        |

## 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission/Conducted Emission Test



## 2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment                                        | Mfr/Brand | Model/Type No. | Series No. | Note      |
|------|--------------------------------------------------|-----------|----------------|------------|-----------|
| E-1  | Blind Spot Detection System / Lane Change Assist | Pioneer   | SDA-BS900      | N/A        | EUT       |
| E-2  | DC Power                                         | N/A       | N/A            | N/A        | Auxiliary |
|      |                                                  |           |                |            |           |

| Item | Shielded Type | Ferrite Core | Length | Note                |
|------|---------------|--------------|--------|---------------------|
| C1   | NO            | NO           | 2.5M   | DC cable unshielded |
|      |               |              |        |                     |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

## 2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

| Item | Equipment                        | Manufacturer | Type No.       | Serial No.    | Last calibration | Calibrated until |
|------|----------------------------------|--------------|----------------|---------------|------------------|------------------|
| 1    | Spectrum Analyzer (9kHz-26.5GHz) | Agilent      | E4407B         | MY45109572    | 2019.06.13       | 2020.06.12       |
| 2    | Test Receiver (9kHz-7GHz)        | R&S          | ESR7           | 101154        | 2019.06.13       | 2020.06.12       |
| 3    | Bilog Antenna (30MHz-3GHz)       | SCHWARZBEC K | VULB9163       | VULB9163-942  | 2019.06.22       | 2020.06.21       |
| 4    | Horn Antenna (1GHz-18GHz)        | SCHWARZBEC K | BBHA9120D      | 1541          | 2019.06.22       | 2020.06.21       |
| 5    | Horn Antenna (18GHz-40GHz)       | SCHWARZBEC K | BBHA9170       | 822           | 2019.06.22       | 2020.06.21       |
| 6    | Amplifier (9KHz-6GHz)            | SCHWARZBEC K | BBV9744        | 9744-0037     | 2019.06.25       | 2020.06.24       |
| 7    | Amplifier (0.5GHz-18GHz)         | SCHWARZBEC K | BBV9718        | 9718-309      | 2019.06.25       | 2020.06.24       |
| 8    | Amplifier (18GHz-40GHz)          | MITEQ        | TTA1840-35-H G | 2034381       | 2019.06.17       | 2020.06.16       |
| 9    | Loop Antenna (9KHz-30MHz)        | SCHWARZBEC K | FMZB1519B      | 014           | 2019.06.25       | 2020.06.24       |
| 10   | RF cables1 (9kHz-30MHz)          | Huber+Suhnar | 9kHz-30MHz     | B1702988-0008 | 2019.06.25       | 2020.06.24       |
| 11   | RF cables2 (30MHz-1GHz)          | Huber+Suhnar | 30MHz-1GHz     | 1486150       | 2019.06.25       | 2020.06.24       |
| 12   | RF cables3 (1GHz-40GHz)          | Huber+Suhnar | 1GHz-40GHz     | 1607106       | 2019.06.25       | 2020.06.24       |
| 13   | Power Metter                     | Keysight     | E4419          | \             | 2019.06.17       | 2020.06.16       |
| 14   | Power Sensor (AV)                | Keysight     | E9 300A        | \             | 2019.06.17       | 2020.06.16       |
| 15   | Spectrum Analyzer 20kHz-26.5GHz  | KEYSIGHT     | N9020A         | MY49100060    | 2019.06.13       | 2020.06.12       |
| 16   | Spectrum Analyzer 9kHz-40GHz     | R&S          | FSP40          | 100363        | 2019.06.13       | 2020.06.12       |
| 17   | D.C. Power Supply                | LongWei      | TPR-6405D      | \             | \                | \                |
| 18   | Software                         | Frad         | EZ-EMC         | FA-03A2 RE    | \                | \                |

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Limit (dBuV) |           | Standard |
|-----------------|--------------|-----------|----------|
|                 | Quasi-peak   | Average   |          |
| 0.15 -0.5       | 66 - 56 *    | 56 - 46 * | FCC      |
| 0.50 -5.0       | 56.00        | 46.00     | FCC      |
| 5.0 -30.0       | 60.00        | 50.00     | FCC      |

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

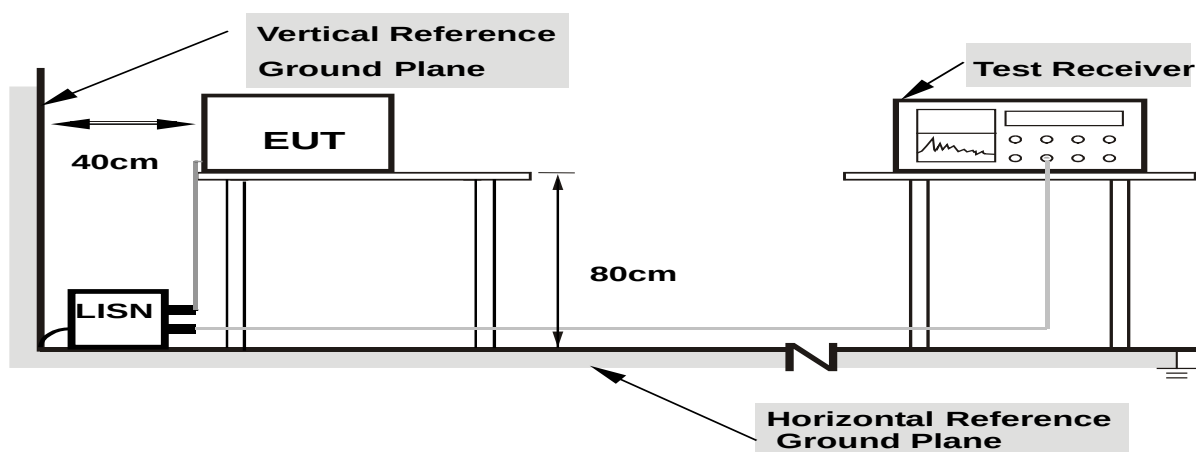
### 3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

### 3.1.6 TEST RESULTS

N/A

## 3.2 RADIATED MEASUREMENT.

### 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:

Table F1 — Field Strengths for Field Disturbance Sensors Operating at Different Frequencies

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

### 3.2.1 TEST PROCEDURE

- a. The EUT is placed on a turntable, which is 1.5 m above ground plane.
- b. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- c. In case from 9 kHz to 18 GHz, EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions. In case from 18 GHz to 40 GHz, EUT is set 1 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- f. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

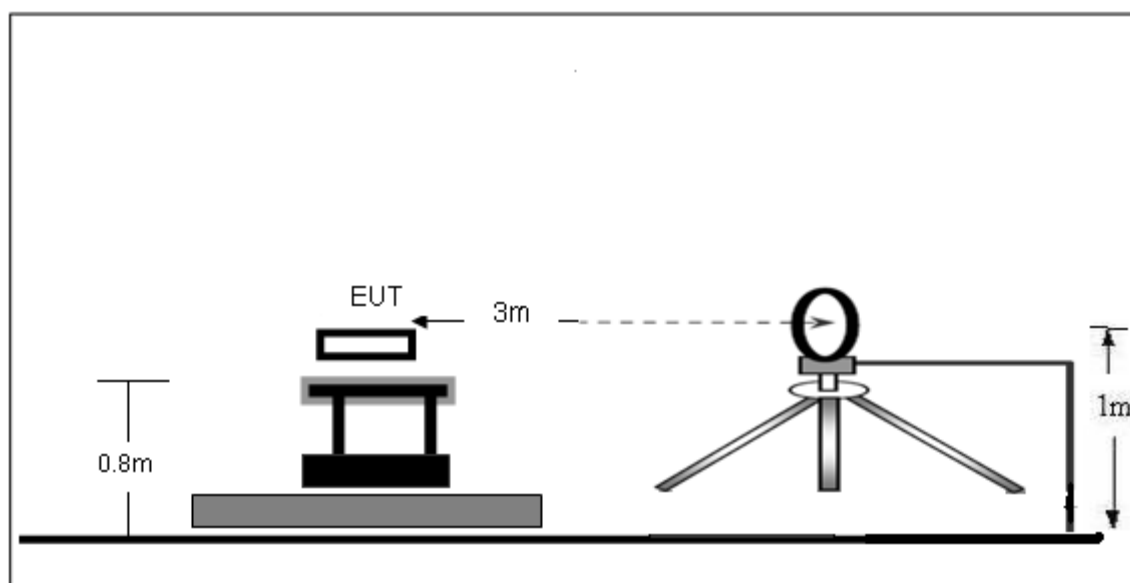
g. Repeat above procedures until the measurements for all frequencies are complete.

### 3.2.2 DEVIATION FROM TEST STANDARD

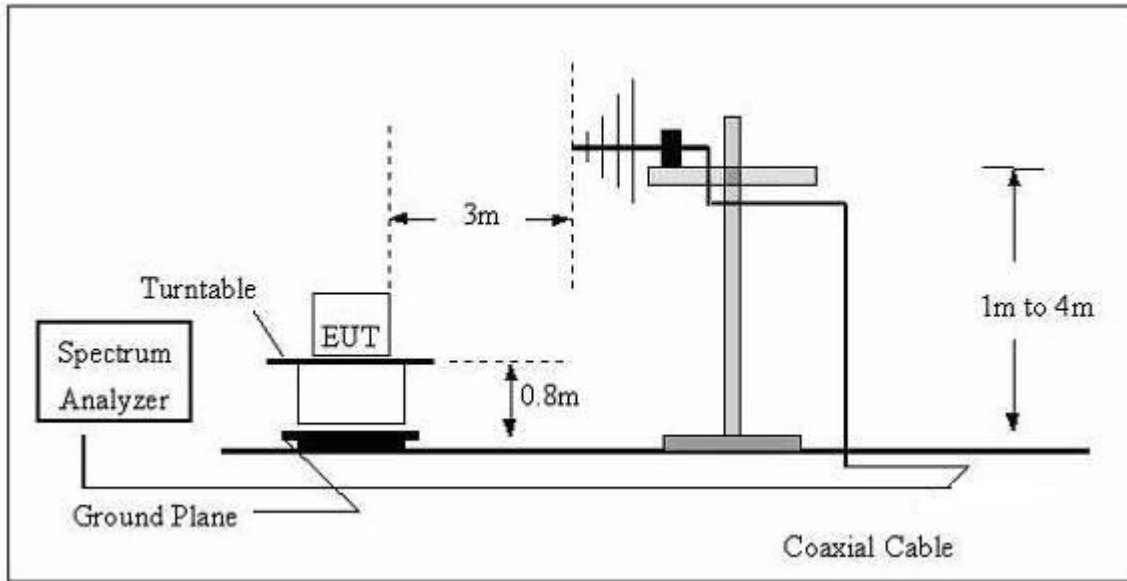
No deviation

### 3.2.3 TEST SETUP

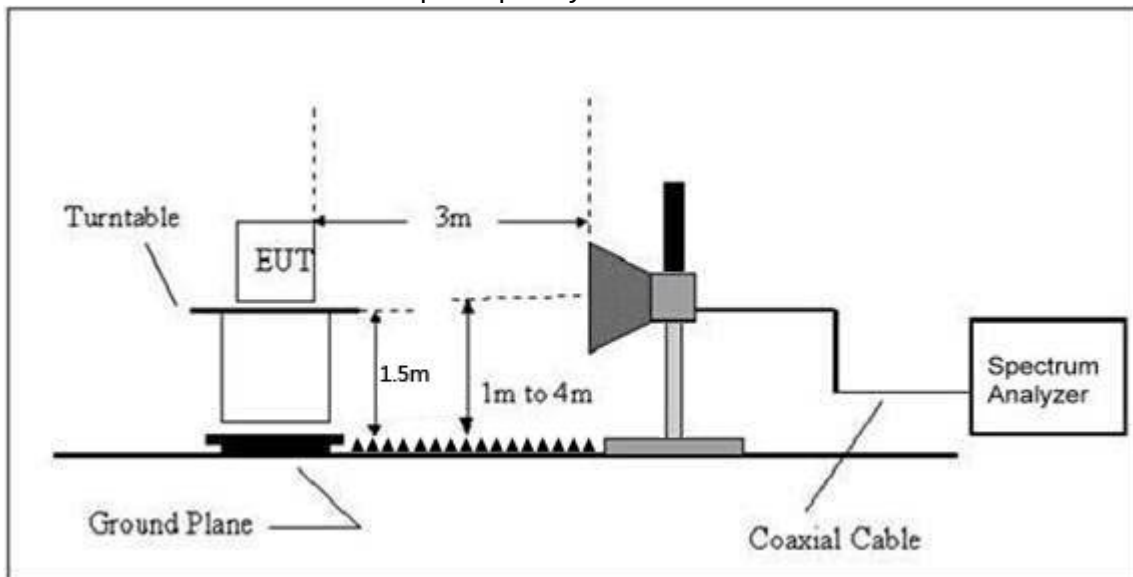
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



### 3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.2.5 TEST RESULTS

#### FIELD STRENGTH OF FUNDAMENTAL TEST RESULTS

| Polar<br>(H/V) | Frequency | Meter Reading | A.F+C.L | D.E.F | Total    | Limits   | Margin | Detector<br>Type |
|----------------|-----------|---------------|---------|-------|----------|----------|--------|------------------|
|                | (MHz)     | (dBuV)        | (dB)    | (dB)  | (dBuV/m) | (dBuV/m) | (dB)   |                  |
| V              | 24125     | 72.63         | 41.36   | -9.46 | 104.53   | 147.96   | -43.43 | PK               |
| V              | 24125     | 72.52         | 41.36   | -9.46 | 104.42   | 127.96   | -23.54 | AV               |
| H              | 24125     | 72.69         | 41.36   | -9.46 | 104.59   | 147.96   | -43.37 | PK               |
| H              | 24125     | 72.58         | 41.36   | -9.46 | 104.48   | 127.96   | -23.48 | AV               |

A·F: ANTENNA FACTOR

C·L: CABLE LOSS

Note :

1. Total = Reading Value + Antenna Factor + Cable Loss + Distance Factor
2. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

#### FIELD STRENGTH OF HARMONICS and RADIATED SPURIOUS EMISSIONS TEST RESULTS

Radiated Spurious Emission (Below 30MHz )

|                |                                                 |                     |           |
|----------------|-------------------------------------------------|---------------------|-----------|
| EUT :          | Blind Spot Detection/ Lane Change Assist System | Model Name :        | SDA-BS900 |
| Temperature :  | 20 °C                                           | Relative Humidity : | 48%       |
| Pressure :     | 1010 hPa                                        | Polarization :      | ---       |
| Test Voltage : | DC 12V                                          |                     |           |
| Test Mode :    | Mode 1                                          |                     |           |

| Freq. | Reading  | Limit    | Margin | State |
|-------|----------|----------|--------|-------|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB)   | P/F   |
| --    | --       | --       | --     | PASS  |
| --    | --       | --       | --     | PASS  |

#### NOTE:

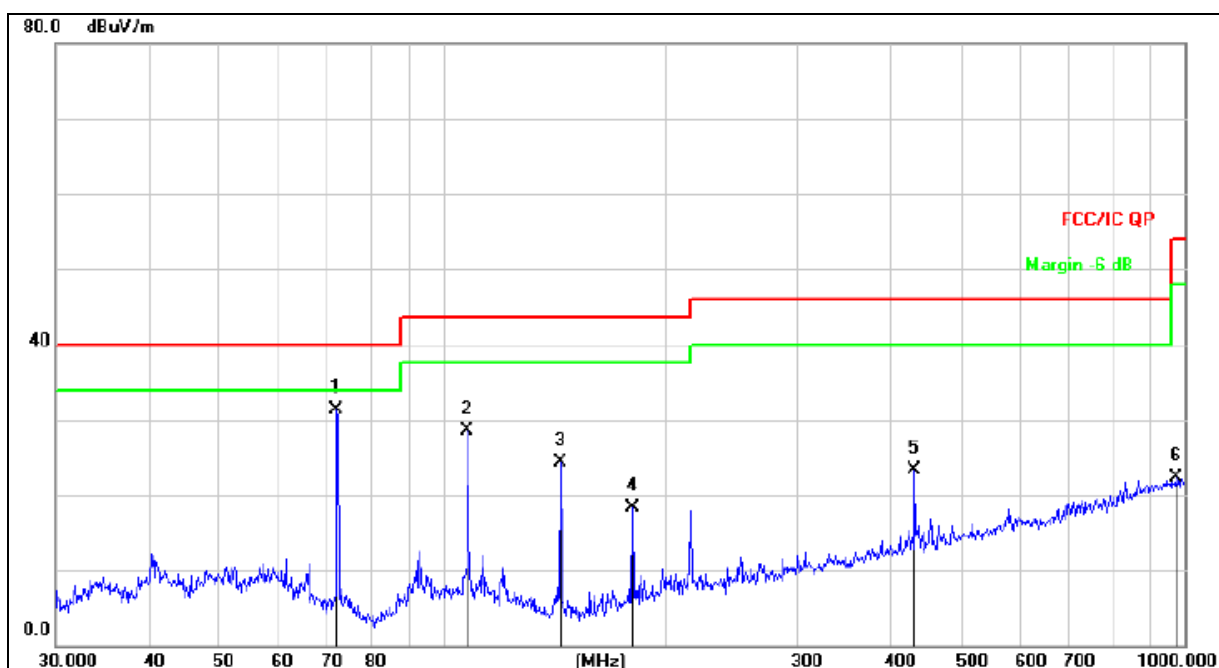
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.

## Radiated Spurious Emission (Between 30MHz – 1GHz)

|                |                                                 |                     |            |
|----------------|-------------------------------------------------|---------------------|------------|
| EUT :          | Blind Spot Detection/ Lane Change Assist System | Model Name :        | SDA-BS900  |
| Temperature :  | 25 °C                                           | Relative Humidity : | 55%        |
| Pressure :     | 101kPa                                          | Polarization :      | Horizontal |
| Test Voltage : | DC 12V                                          |                     |            |
| Test Mode :    | Model 1                                         |                     |            |



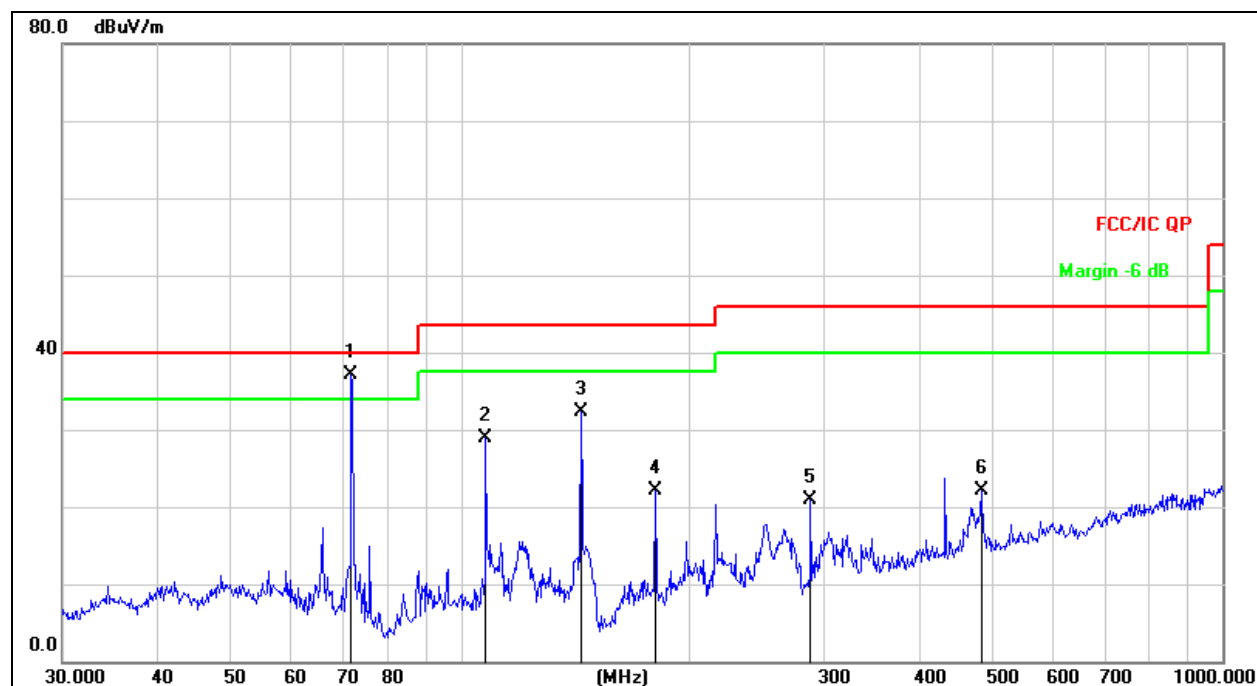
Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|---------------|------------|----------|
| 1   | *   | 71.8320      | 49.82                    | -18.60                  | 31.22                      | 40.00         | -8.78      | QP       |
| 2   |     | 107.8877     | 45.33                    | -16.79                  | 28.54                      | 43.50         | -14.96     | QP       |
| 3   |     | 143.8295     | 43.43                    | -19.10                  | 24.33                      | 43.50         | -19.17     | QP       |
| 4   |     | 180.0165     | 35.90                    | -17.58                  | 18.32                      | 43.50         | -25.18     | QP       |
| 5   |     | 432.5457     | 33.62                    | -10.36                  | 23.26                      | 46.00         | -22.74     | QP       |
| 6   |     | 972.3374     | 23.22                    | -0.98                   | 22.24                      | 54.00         | -31.76     | QP       |



|                |                                                 |                     |           |
|----------------|-------------------------------------------------|---------------------|-----------|
| EUT :          | Blind Spot Detection/ Lane Change Assist System | Model Name :        | SDA-BS900 |
| Temperature :  | 26 °C                                           | Relative Humidity : | 54%       |
| Pressure :     | 101kPa                                          | Polarization :      | Vertical  |
| Test Voltage : | DC 12V                                          |                     |           |
| Test Mode :    | Model 1                                         |                     |           |



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-ment | Limit | Over   |          |
|-----|-----|----------|---------------|----------------|--------------|-------|--------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m       | dB/m  | dB     | Detector |
| 1   | *   | 71.8320  | 55.65         | -18.60         | 37.05        | 40.00 | -2.95  | QP       |
| 2   |     | 107.8877 | 45.69         | -16.79         | 28.90        | 43.50 | -14.60 | QP       |
| 3   |     | 143.8295 | 51.45         | -19.10         | 32.35        | 43.50 | -11.15 | QP       |
| 4   |     | 180.0165 | 39.66         | -17.58         | 22.08        | 43.50 | -21.42 | QP       |
| 5   |     | 287.9904 | 34.81         | -13.97         | 20.84        | 46.00 | -25.16 | QP       |
| 6   |     | 482.2155 | 31.38         | -9.31          | 22.07        | 46.00 | -23.93 | QP       |

## Radiated Spurious Emission (Between 1GHz – 18GHz)

|                        |                                                 |                     |           |
|------------------------|-------------------------------------------------|---------------------|-----------|
| EUT :                  | Blind Spot Detection/ Lane Change Assist System | Model Name :        | SDA-BS900 |
| Temperature :          | 26 °C                                           | Relative Humidity : | 54%       |
| Pressure :             | 1010 hPa                                        | Polarization :      | Vertical  |
| Test Voltage :         | DC 12V (form adapter)                           |                     |           |
| Test Mode :<br>(Worst) | Mode 1                                          |                     |           |

## Between 1-25GHz

| Polar<br>(H/V)   | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-ampli<br>fier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Detector<br>Type |
|------------------|--------------------|----------------------------|---------------------------|-----------------------|---------------------------|-------------------------------|--------------------|----------------|------------------|
| Channel:24125MHz |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                | 1642.60            | 50.60                      | 39.55                     | 7.77                  | 25.66                     | 44.48                         | 74.00              | -29.52         | Pk               |
| V                | 1642.60            | 43.37                      | 39.55                     | 7.77                  | 25.66                     | 37.25                         | 54.00              | -16.75         | AV               |
| V                | 3199.80            | 50.71                      | 38.33                     | 7.3                   | 24.55                     | 44.23                         | 74.00              | -29.77         | Pk               |
| V                | 3199.80            | 43.60                      | 38.33                     | 7.3                   | 24.55                     | 37.12                         | 54.00              | -16.88         | AV               |
| H                | 5066.40            | 50.08                      | 38.78                     | 7.35                  | 24.54                     | 43.19                         | 74.00              | -30.81         | Pk               |
| H                | 5066.40            | 43.98                      | 38.78                     | 7.35                  | 24.54                     | 37.09                         | 54.00              | -16.91         | AV               |
| H                | 7164.20            | 50.97                      | 38.65                     | 7.15                  | 24.52                     | 43.99                         | 74.00              | -30.01         | Pk               |
| H                | 7164.20            | 43.43                      | 38.65                     | 7.15                  | 24.52                     | 36.45                         | 54.00              | -17.55         | AV               |
| H                | 10200.40           | 52.10                      | 36.68                     | 6.42                  | 26.47                     | 48.31                         | 74.00              | -25.69         | Pk               |
| H                | 10200.40           | 41.37                      | 36.68                     | 6.42                  | 26.47                     | 37.58                         | 54.00              | -16.42         | AV               |
| V                | 17510.40           | 54.62                      | 36.42                     | 8.62                  | 26.45                     | 53.27                         | 74.00              | -20.73         | Pk               |
| V                | 17510.40           | 44.69                      | 36.42                     | 8.62                  | 26.45                     | 43.34                         | 54.00              | -10.66         | AV               |

**NOTE:**

Distance extrapolation factor =  $20 \log (\text{specific distance/test distance})(\text{dB})$ ;

Limit line = specific limits(dBuV) + distance extrapolation factor.

## Radiated Spurious Emission (18GHz-40GHz)

| Polar<br>(H/V) | Frequency | Meter Reading | A.F+C.L | D.E.F | Total    | Limits   | Margin | Detector<br>Type |
|----------------|-----------|---------------|---------|-------|----------|----------|--------|------------------|
|                | (MHz)     | (dBuV)        | (dB)    | (dB)  | (dBuV/m) | (dBuV/m) | (dB)   |                  |
| V              | *24075    | 32.32         | 41.36   | -9.46 | 64.22    | 74       | -9.78  | PK               |
| V              | *24075    | 10.38         | 41.36   | -9.46 | 42.28    | 54       | -11.72 | AV               |
| V              | *24175    | 32.66         | 41.36   | -9.46 | 64.56    | 74       | -9.44  | PK               |
| V              | *24175    | 10.46         | 41.36   | -9.46 | 42.36    | 54       | -11.64 | AV               |

A·F: ANTENNA FACTOR

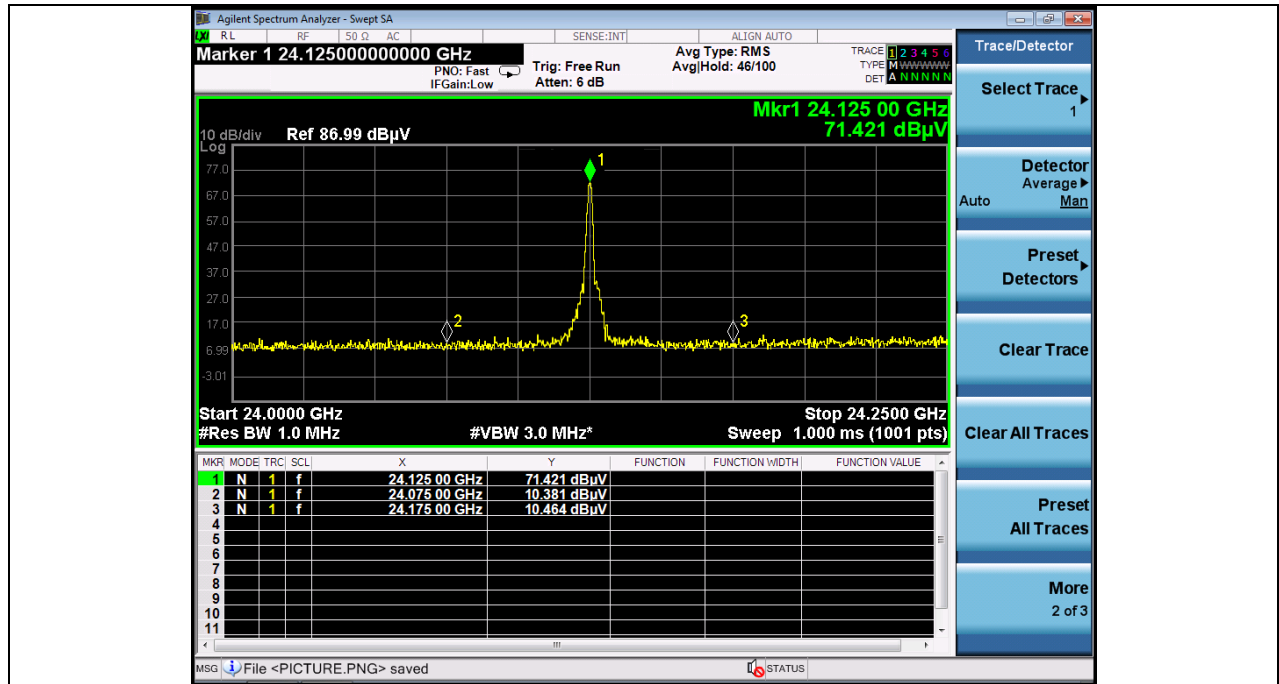
C·L: CABLE LOSS

Note :

1. Total = Reading Value + Antenna Factor + Cable Loss + Distance Factor
2. Distance extrapolation factor =  $20 \log (\text{test distance} / \text{specific distance})$  (dB)
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.  
Worst case is y plane and vertical polarization.
4. '\*' is band edge frequency.



### Band Edge Plot (Y-V)



## 4. BANDWIDTH TEST

### 4.1 APPLIED PROCEDURES / LIMIT

| RSS-210/RSS-GEN |           |                  |                       |        |
|-----------------|-----------|------------------|-----------------------|--------|
| Section         | Test Item | Limit            | Frequency Range (MHz) | Result |
| 15.205 (a)      | Bandwidth | (20dB bandwidth) | 24075-24175           | PASS   |

| Spectrum Parameter | Setting                                       |
|--------------------|-----------------------------------------------|
| Attenuation        | Auto                                          |
| Span Frequency     | > Measurement Bandwidth or Channel Separation |
| RB                 | 100KHz                                        |
| VB                 | $\geq$ RBW                                    |
| Detector           | Peak                                          |
| Trace              | Max Hold                                      |
| Sweep Time         | Auto                                          |

#### 4.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW $\geq$  RBW, Sweep time = Auto.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



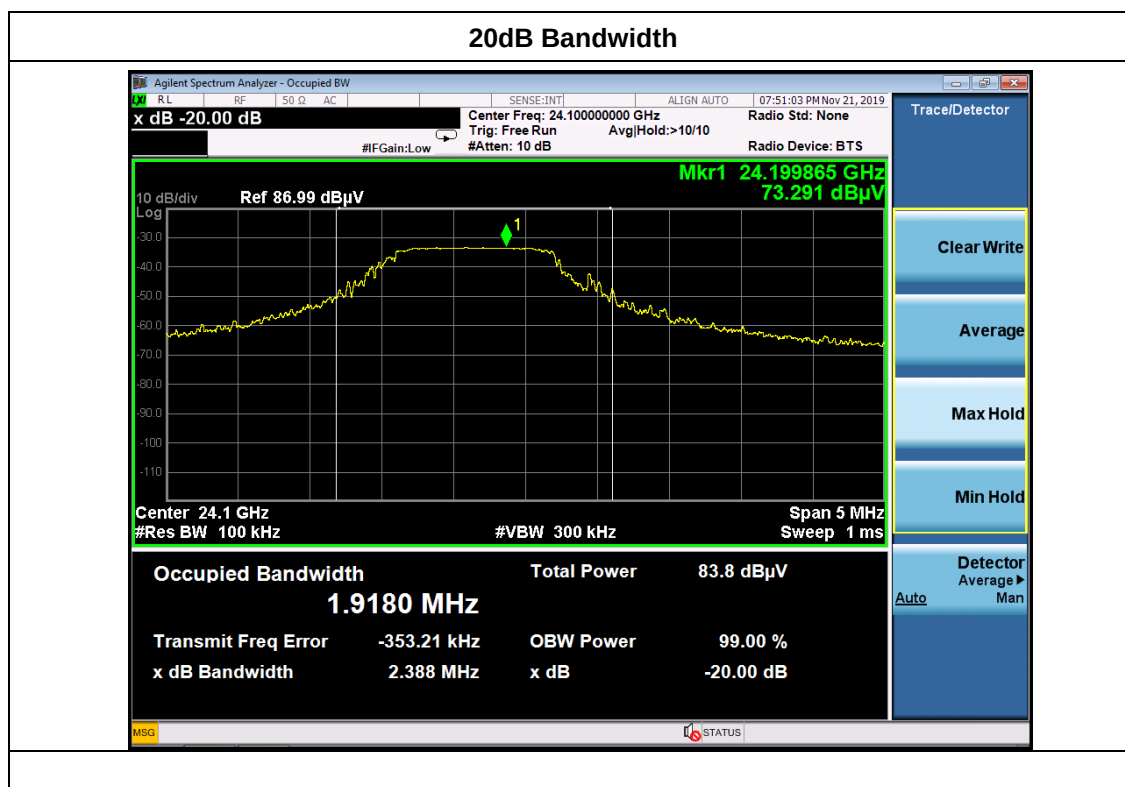
#### 4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.1.5 TEST RESULTS

|               |                                                 |                     |           |
|---------------|-------------------------------------------------|---------------------|-----------|
| EUT :         | Blind Spot Detection/ Lane Change Assist System | Model Name :        | SDA-BS900 |
| Temperature : | 25 °C                                           | Relative Humidity : | 55%       |
| Pressure :    | 1012 hPa                                        | Test Voltage :      | DC 12V    |
| Test Mode :   | CH01                                            |                     |           |

| Frequency | 20dB Bandwidth (MHz) | 99% Bandwidth (MHz) | Result |
|-----------|----------------------|---------------------|--------|
| 24125MHz  | 2.388                | 1.9180              | PASS   |



## **5. ANTENNA REQUIREMENT**

### **5.1 STANDARD REQUIREMENT**

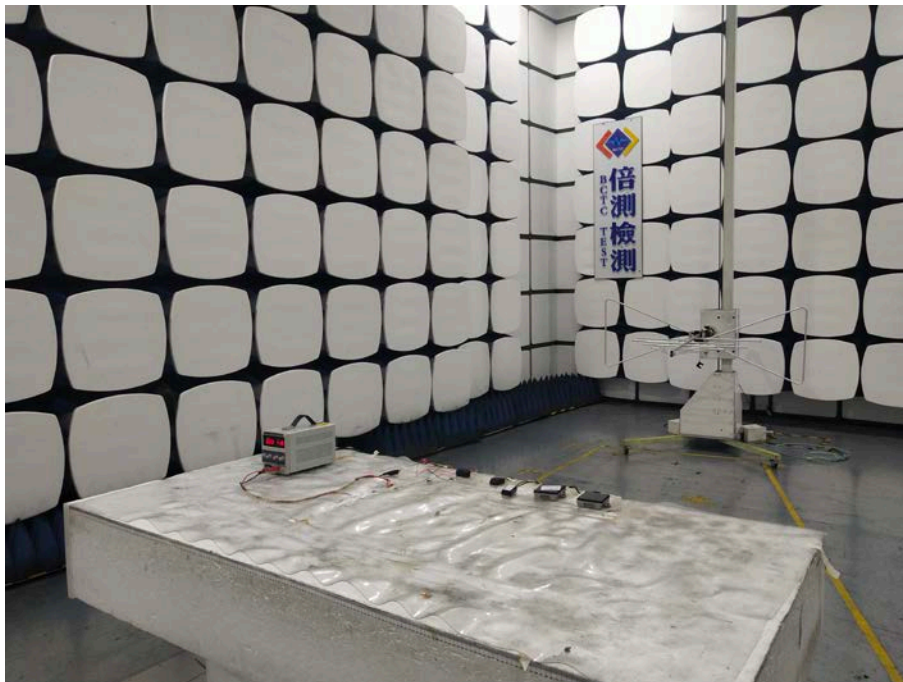
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **5.2 EUT ANTENNA**

The EUT antenna is Internal antenna, fulfill the requirement of this section.

## 6. EUT TEST PHOTO

### Radiated Measurement Photos 30-1GHz



### 1-18GHz



**18-40GHz**



## 7. PHOTOS OF THE EUT





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