MEASUREMENT REPORT

FCC PART95 Subpart M

FCC ID:	Q6WBSE151
APPLICANT:	Steelmate Co., Ltd.
Application Type:	Certification
Product:	Microwave Blind Spot Detection System
Model No.:	SBS-1
Serial Model No.:	SBS-2, SBS-3, MBS-1, PB-1, TBS-1
Brand Name:	STEEL MATE
FCC Classification:	Part 95 Vehicular Radar Systems
FCC Rule Part(s):	FCC Part 95, Subpart M
Test Procedure(s):	ANSI C63.10-2013
Test Date:	November 27 ~ December 21, 2018

Reviewed By: Sunny Sun
(Sunny Sun)

Approved By: Robin Wu
(Robin Wu)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1811RSU007-U1	Rev. 01	Initial Report	12-21-2018	Valid

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§2.1033 General Information

Applicant:	Steelmate Co., Ltd.
Applicant Address:	Steelmate Industrial Park, Heping Street, Dongfu Road, Dongfeng Town, Zhongshan City, Guangdong, P.R. China
Manufacturer:	Steelmate Co., Ltd.
Manufacturer Address:	Steelmate Industrial Park, Heping Street, Dongfu Road, Dongfeng Town, Zhongshan City, Guangdong, P.R. China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
FCC Registration No.:	893164
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Reg. No. 893164) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.**

Accredited Laboratory

A2LA has accredited

MRT TECHNOLOGY (SUZHOU) CO., LTD.

Suzhou, Jiangsu, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Presented this 24th day of July 2018.

President and CEO
For the Accreditation Council
Certificate Number 3628.01
Valid to August 31, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

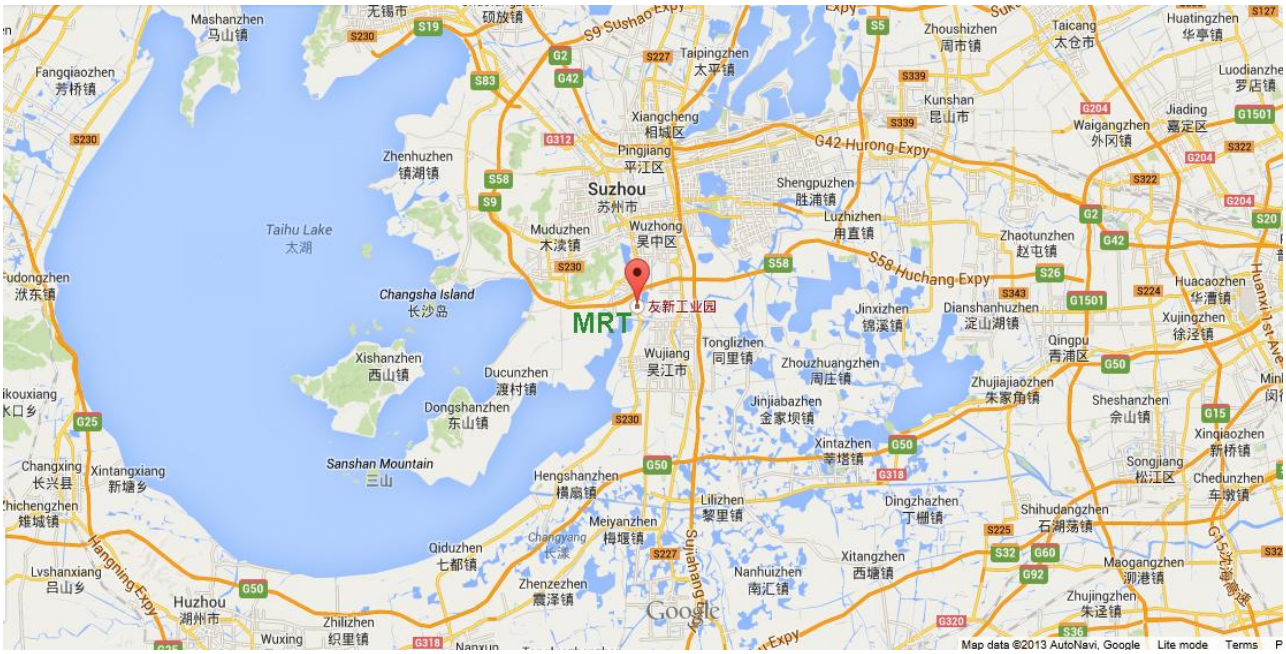
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Microwave Blind Spot Detection System
Brand Name	STEEL MATE
Model No.	SBS-1
Serial Model No.	SBS-2, SBS-3, MBS-1, PB-1, TBS-1
Frequency Range	77~81GHz
Type of Modulation	FMCW
Emission Designator	3G03N0N
Antenna Type	Integrated antenna

Note 1: The difference between models is only for marketing different client.

Note 2: The engineer test sample was provided by the manufacturer, it was configured into fixed frequency T_X status after power on.

2.2. Test Configuration

The device was tested per the guidance of FCC Part 95M and ANSI 63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.3. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.4. Labeling Requirements

Per 2.1074; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION of TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the requirement provided in FCC Part 95M were used in the measurement of the EUT.

Deviation from measurement procedure…….....None

3.2. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable

containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. TEST EQUIPMENT CALIBRATION DATA

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2019/08/14
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2019/04/20
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2019/07/20
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2019/11/09
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2019/10/20
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2018/11/18
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2018/12/14
Micro-Wave Antenna	MI-WWAVE	261U-25	MRTSUE06273	5 year	2021/12/26
Micro-Wave Antenna	MI-WWAVE	261E-25	MRTSUE06276	5 year	2021/12/26
Micro-Wave Antenna	MI-WWAVE	261F-25	MRTSUE06275	5 year	2021/12/26
Micro-Wave Antenna	MI-WWAVE	261G	MRTSUE06274	5 year	2021/12/26
Micro-Wave Antenna	VDI	WR3.4	MRTSUE06277	5 year	2021/12/26
Standard Gain Horn Antenna	A-INFOMW	LB-10-25-A	MRTSUE06410	5 year	2022/11/16
Standard Gain Horn Antenna	A-INFOMW	LB-15-25-A	MRTSUE06409	5 year	2022/11/16
Waveguide Harmonic Mixer	Keysight	M1970V	MRTSUE06271	5 year	2022/01/17
Waveguide Harmonic Mixer	Keysight	M1970W	MRTSUE06272	5 year	2021/12/07
RF Signal Generator	Keysight	E8257D	MRTSUE06453	5 year	2023/07/13
SA Extension Module	Keysight	N9029AV06	MRTSUE06368	5 year	2022/05/04
SA Extension Module	Keysight	N9029AV05	MRTSUE06367	5 year	2022/05/05
SA Extension Module	Keysight	N9029AV03	MRTSUE06366	5 year	2022/05/05
Millimeter wave signal source frequency expander	Keysight	E8257DV15	MRTSUE06456	5 year	2023/09/07
Millimeter wave signal source frequency expander	Keysight	E8257DV10	MRTSUE06458	5 year	2023/09/13
USB wideband power sensor	Keysight	U8489A	MRTSUE06448	1 year	2019/07/24
Oscilloscope	Agilent	DSO-X 6002A	MRTSUE06107	1 year	2019/04/20
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2019/11/16
Digitial Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2018/12/12
					2019/12/13
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2019/05/02

Software	Version	Function
e3	v 8.3.5	EMI Test Software

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 18GHz: 4.76dB

6. TEST RESULT

6.1. Summary

Company Name: **Steelmate Co., Ltd.**

FCC ID: **Q6WBSE151**

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
95.3367	EIRP	Peak EIRP < 55dBm/MHz Average EIRP < 50dBm/MHz	Radiated	Pass	Section 6.2
2.1049	Occupied bandwidth	N/A		Pass	Section 6.3
95.3379(a)	Unwanted Emissions	Refer to Section 6.4.1		Pass	Section 6.4
95.3379(b)	Frequency stability	Fall within the frequency band 76-81GHz		Pass	Section 6.5

Notes: The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case data is shown in the report.

6.2. EIRP

6.2.1. Test Limit

The fundamental radiated emission limits within the 76-81 GHz band are expressed in terms of Equivalent Isotropically Radiated Power (EIRP) and are as follows:

(a) The maximum power (EIRP) within the 76-81 GHz band shall not exceed 50 dBm based on measurements employing a power averaging detector with a 1 MHz Resolution Bandwidth (RBW).

(b) The maximum peak power (EIRP) within the 76-81 GHz band shall not exceed 55 dBm based on measurements employing a peak detector with a 1 MHz RBW.

6.2.2. Test Procedure used

ANSI C63.10 Section 9.10

Note: Far-field boundary calculation as below.

According to ANSI C63.10-2013, Clause 9, for mm-wave measurements, L >> λ and a more suitable formula for the far-field boundary distance: $R_{(Far\ Field)} = 2L^2/\lambda$

- L is the largest antenna dimension of the transmit antenna in m
- λ is the wavelength in m

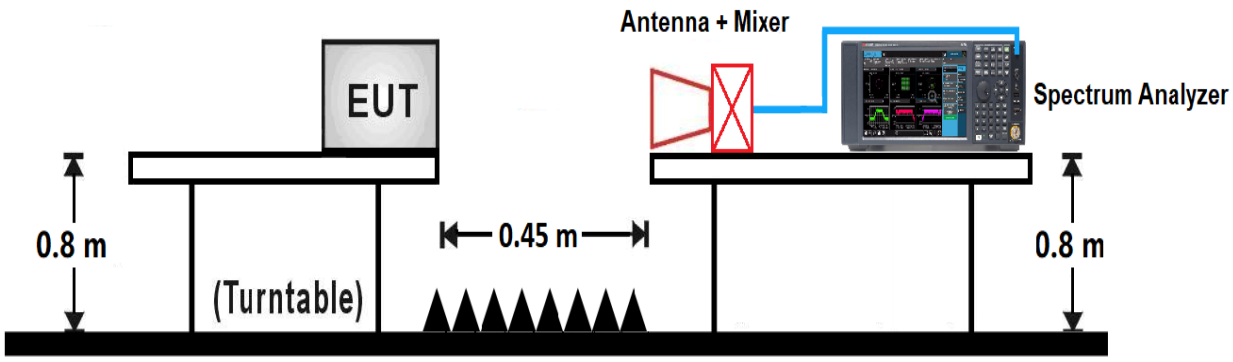
Far-field boundary calculation				
Channel No.	Frequency (GHz)	λ (m)	L (m)	$R_{(Far\ Field)}$ (m)
1	79	0.0038	0.0240	0.30

Our measurement is performed at a minimum distance of 0.45m > $R_{(Far\ Field)}$

6.2.3. Test Setting

1. Span = approximately two times to three times the EBW, centered on the carrier frequency
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector function = Peak for peak EIRP, Average for average EIRP.
5. Sweep time = auto
6. Trace mode = max hold.
7. Allow the trace to stabilize.
8. Use the peak search function to mark the max of the emission.

6.2.4. Test Setup

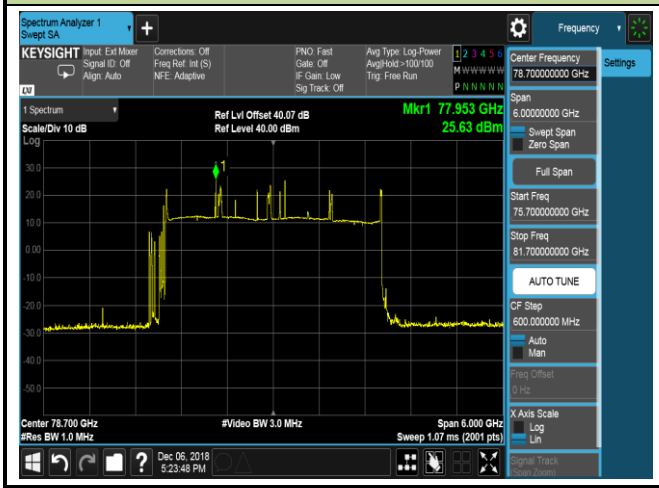


6.2.5. Test Result

Product	Microwave Blind Spot Detection System	Temperature	24°C
Test Engineer	Vincent Yu	Relative Humidity	54%
Test Site	AC2	Test Date	2018/12/06

EIRP (dBm)		EIRP Limit (dBm)		Result
Peak	Average	Peak	Average	
25.63	N/A (Note)	≤ 55	≤ 50	Pass

Note: Average EIRP measurement was not performed when the Peak EIRP level lower than average limit.

Peak EIRP	
	

6.3. Occupied bandwidth

6.3.1. Test Limit

N/A

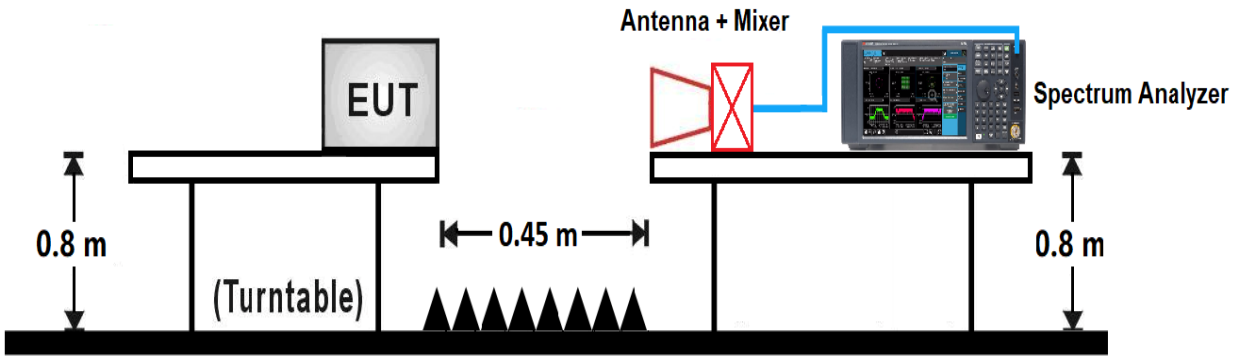
6.3.2. Test Procedure used

ANSI C63.10 Section 6.9.3

6.3.3. Test Setting

1. Span = approximately 1.5 times to 5 times the OBW, centered on the carrier frequency
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector function = Peak
5. Sweep time = auto
6. Trace mode = max hold.
7. The EUT shall be transmitting at its maximum data rate. Allow the trace to stabilize.
8. Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

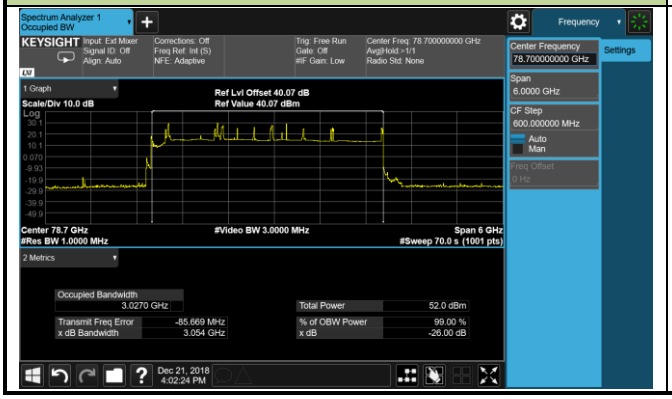
6.3.4. Test Setup



6.3.5. Test Result

Product	Microwave Blind Spot Detection System	Temperature	24°C
Test Engineer	Vincent Yu	Relative Humidity	54%
Test Site	AC2	Test Date	2018/12/21

99% Bandwidth (GHz)	26dB Bandwidth (GHz)	Result
3.027	3.054	Pass

99% & 26dB Occupied Bandwidth	
	

6.4. Unwanted Emissions

6.4.1.Test Limit

The power density of any emissions outside the 76-81 GHz band shall consist solely of spurious emissions and shall not exceed the following:

(1) Radiated emissions below 40 GHz shall not exceed the field strength as shown in the following emissions table.

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

(i) The tighter limit applies at the band edges.

(ii) The limits in the table are based on the frequency of the unwanted emissions and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(iii) The emissions limits shown in the table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9.0-90.0 kHz, 110.0-490.0 kHz, and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector with a 1 MHz RBW.

(2) The power density of radiated emissions outside the 76-81 GHz band above 40.0 GHz shall not exceed the following, based on measurements employing an average detector with a 1 MHz RBW:

(i) For radiated emissions between 40 GHz and 200 GHz: 600 pW/cm^2 at a distance of 3 meters from the exterior surface of the radiating structure.

(ii) For radiated emissions above 200 GHz: 1000 pW/cm^2 at a distance of 3 meters from the exterior surface of the radiating structure.

(3) For field disturbance sensors and radar systems operating in the 76-81 GHz band, the spectrum shall be investigated up to 231.0 GHz.

6.4.2.Test Procedure used

ANSI C63.10 Section 9.12 and Section 9.13

6.4.3.Test Procedure

Measurement of harmonic and spurious emissions above 40 GHz

1. Connect the test antenna covering the appropriate frequency range to a spectrum analyzer via an external mixer.
2. Set spectrum analyzer RBW = 1MHz, VBW = 3MHz, average detector.
3. Maximize all observed emissions. Note the maximum power indicated on the spectrum analyzer. Adjust this reading, if necessary, by the conversion loss of the external mixer used at the frequency under investigation and the external mixer IF cable loss.
4. Calculate the maximum field strength of the emission at the measurement distance.
5. Calculate the power density at the distance specified by the limit from the field strength at the distance specified by the limit.
6. Repeat the preceding sequence for every emission observed in the frequency band under investigation.

Measurement of harmonic and spurious emissions below 40 GHz

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3 x RBW
4. Detector = Peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 – RBW

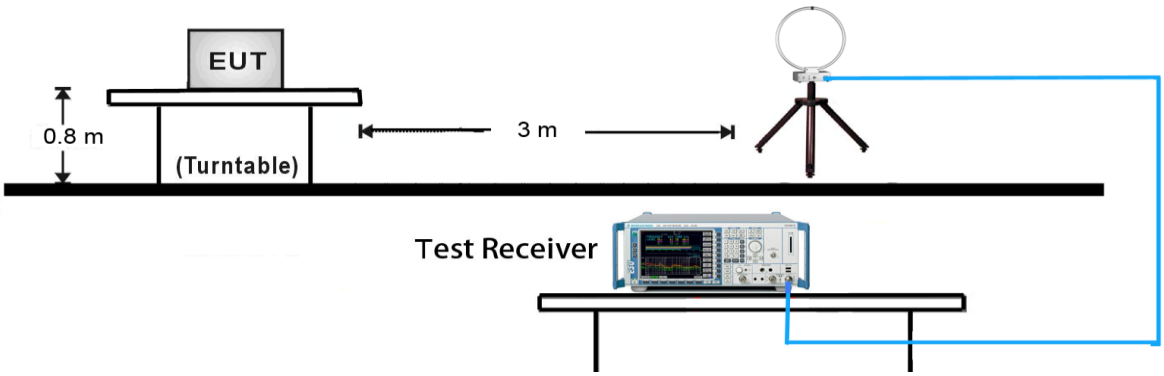
Frequency	RBW
9 ~ 90 kHz	1 MHz
90 ~ 110 kHz	200 Hz
110 ~ 490 kHz	1 MHz
0.49 ~ 30 MHz	9 kHz
30 ~ 1000 MHz	120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

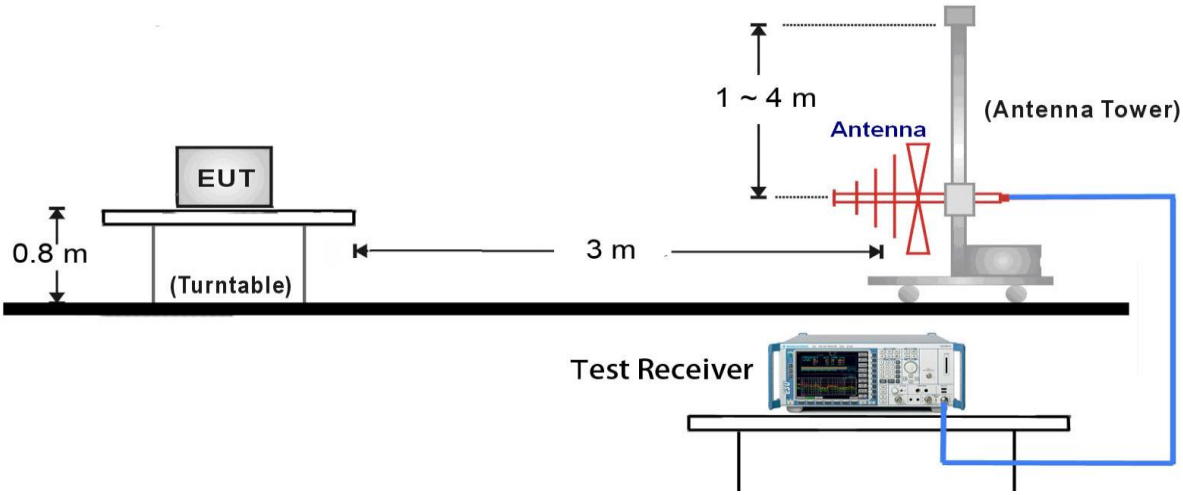
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.4.4.Test Setup

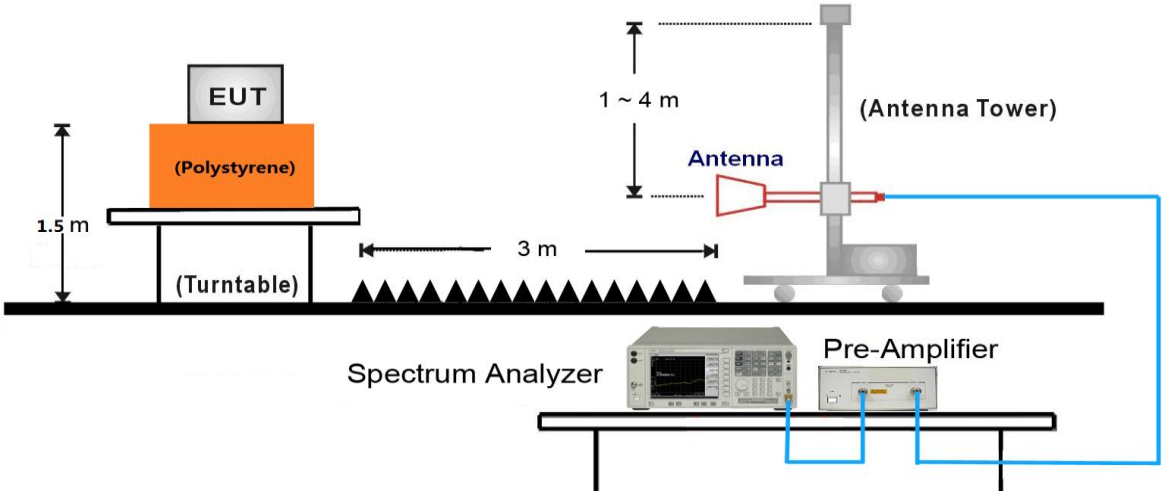
<u>9kHz ~ 30MHz Test Setup:</u>



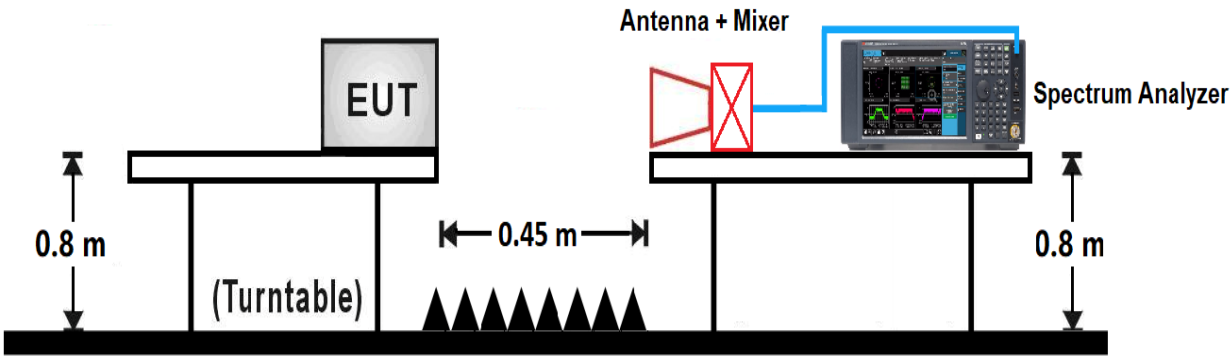
30MHz ~ 1GHz Test Setup:



1GHz ~ 40GHz Test Setup:



Above 40GHz Test Setup:



6.4.5.Test Results

Product	Microwave Blind Spot Detection System	Temperature	23°C
Test Engineer	Messiah Li	Relative Humidity	54%
Test Site	AC2	Test Date	2018/11/27
Test Range	Below 1GHz		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
32.0	4.5	13.8	18.3	40.0	-21.7	QP	Horizontal
63.9	11.1	12.7	23.8	40.0	-16.2	QP	Horizontal
137.8	3.9	14.4	18.3	43.5	-25.2	QP	Horizontal
176.4	12.0	13.4	25.4	43.5	-18.1	QP	Horizontal
202.7	12.9	11.3	24.2	43.5	-19.3	QP	Horizontal
208.5	13.1	11.4	24.5	43.5	-19.0	QP	Horizontal
63.0	23.8	12.9	36.7	40.0	-3.3	QP	Vertical
157.6	16.3	15.3	31.6	43.5	-11.9	QP	Vertical
168.8	17.3	14.5	31.8	43.5	-11.7	QP	Vertical
195.5	22.7	11.4	34.1	43.5	-9.4	QP	Vertical
202.7	23.1	11.3	34.4	43.5	-9.1	QP	Vertical
209.5	23.3	11.4	34.7	43.5	-8.8	QP	Vertical

Note:

1. Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)
   Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)
2. The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the limit (the test frequency range: 9kHz ~ 30MHz), therefore no data appear in the report.

Product	Microwave Blind Spot Detection System	Temperature	23°C
Test Engineer	Messiah Li	Relative Humidity	54%
Test Site	AC2	Test Date	2018/11/27
Test Range	1 ~ 40GHz		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
2224.0	36.8	0.1	36.9	74.0	-37.1	Peak	Horizontal
2980.5	38.3	0.1	38.4	74.0	-35.6	Peak	Horizontal
4672.0	35.3	5.4	40.7	74.0	-33.3	Peak	Horizontal
8080.5	31.9	14.8	46.7	74.0	-27.3	Peak	Horizontal
24369.0	38.9	10.7	49.6	74.0	-24.4	Peak	Horizontal
27955.0	38.9	12.2	51.1	74.0	-22.9	Peak	Horizontal
2198.5	37.8	0.1	37.9	74.0	-36.1	Peak	Vertical
4238.5	35.2	3.8	39.0	74.0	-35.0	Peak	Vertical
5930.0	33.7	8.1	41.8	74.0	-32.2	Peak	Vertical
7417.5	31.9	14.1	46.0	74.0	-28.0	Peak	Vertical
19540.0	41.5	8.0	49.5	74.0	-24.5	Peak	Vertical
29044.0	38.0	12.8	50.8	74.0	-23.2	Peak	Vertical

Note:

1. Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)
   Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)
2. Average measurement was not performed when the peak level lower than average limit

Product	Microwave Blind Spot Detection System	Temperature	23°C
Test Engineer	Vincent Yu	Relative Humidity	54%
Test Site	AC2	Test Date	2018/12/07
Test Range	Above 40GHz		

Frequency (MHz)	Reading Level @0.45m (dBμV)	Factor (dB)	Measure Level @0.45m (dBμV/m)	Measure Level @3m (dBμV/m)	Power Density (pW/cm^2)	Limit (pW/cm^2)	Result
40GHz ~ 231GHz							
47502.0	42.2	52.5	94.7	78.2	17.6	600	Pass
59778.8	34.7	58.4	93.1	76.6	12.2	600	Pass
75769.2	28.2	62.5	90.7	74.2	7.0	600	Pass
82171.6	28.8	65.2	94.0	77.5	15.0	600	Pass
139835.8	13.0	59.2	72.2	55.7	0.1	600	Pass
155909.8	26.0	62.0	88.0	71.5	3.8	600	Pass
203567.5	16.9	62.8	79.7	63.2	0.6	1000	Pass
219961.2	13.2	63.3	76.5	60.0	0.3	1000	Pass

Note:

1. Measure Level @0.45m = Reading Level @0.45m + Factor
   Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) + Mixer Conversion Loss (dB)
2. Measure Level @3m = Measure Level @0.45m + 20 * log(0.45m / 3m)
3. Power Density = $(10^8 / 377) * \{10^{[(\text{Measure Level @3m} -120) / 20]}\}^2$

6.5. Frequency Stability

6.5.1.Test Limit

Fundamental emissions must be contained within the frequency bands 76 - 81GHz during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

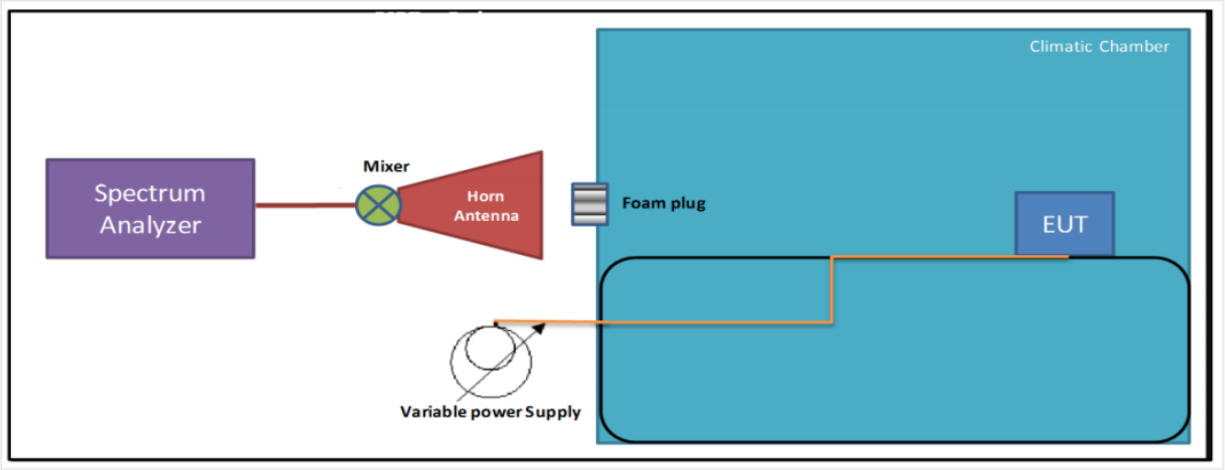
6.5.2.Test Procedure used

ANSI C63.10 Section 9.14

6.5.3.Test Procedure

1. Arrange EUT and test equipment according Section 6.5.4.
2. With the EUT at ambient temperature (20 °C) and voltage source set to the EUT nominal operating voltage (12VDC, 100%)
3. RBW = 1MHz, VBW = 3MHz
4. Detector = Peak
5. Trace Mode = Max Hold
6. Record the Low and high frequencies (f_L and f_H) of the fundamental frequency emission. The applicable spurious emissions limit 600pW/cm^2 (-1.61dBm) was used to define f_L and f_H.
7. Vary EUT power supply between 85% (10.2VDC) and 115% (13.8VDC) of nominal, record the f_L and f_H.
8. Set the power supply to 100% nominal setting, and raise EUT operating temperature to 50 °C.
9. Record the f_L and f_H of the fundamental frequency emission.
10. Repeat step 9 at each 10°C increment down to -20 °C.

6.5.4.Test Setup



6.5.5.Test Result

Test Engineer	Vincent Yu	Temperature	-20 ~ 50°C
Test Time	2018/12/05	Relative Humidity	52%RH
Test Mode	Mode 1	Test Site	TR3

Voltage (%)	Power (VDC)	Temp (℃)	f_L (GHz)	f_H (GHz)	Limit (GHz)	Result
100%	12.0	- 20	77.092	80.122	76 ~ 81	Pass
		- 10	77.059	80.122	76 ~ 81	Pass
		0	77.089	80.122	76 ~ 81	Pass
		+ 10	77.083	80.122	76 ~ 81	Pass
		+ 20 (Ref)	77.050	80.122	76 ~ 81	Pass
		+ 30	77.053	80.122	76 ~ 81	Pass
		+ 40	77.176	80.122	76 ~ 81	Pass
		+ 50	77.092	80.125	76 ~ 81	Pass
115%	13.8	+ 20	77.128	80.122	76 ~ 81	Pass
85%	10.2	+ 20	77.050	80.122	76 ~ 81	Pass

7. CONCLUSION

The data collected relate only the item(s) tested and show that the **Microwave Blind Spot Detection System** is in compliance with Part 95M of the FCC Rules.

The End

Appendix A - Test Setup Photograph

Refer to “1811RSU007-UT” file.

Appendix B - EUT Photograph

Refer to “1811RSU007-UE” file.