MEASUREMENT REPORT

FCC PART 15.249

FCC ID:	SVNITARD024MAH
APPLICANT:	Zhejiang Dahua Vision Technology Co., Ltd
Application Type:	Certification
Product:	Multi Target Bayonet Radar
Model No.:	DHI-ITARD-024MA-H
Serial Model No.:	ITARD-024MA-H
Brand Name:	alhua TECHNOLOGY
FCC Classification:	Part 15 Low Power Communication Device Transmitter (DXX)
FCC Rule Part(s):	FCC Part 15C (Section 15.249)
Test Procedure(s):	ANSI C63.10-2013
Test Date:	April 01 ~ July 21, 2020

Reviewed By: Kevin Guo
(Kevin Guo)

Approved By: Robin Wu
(Robin Wu)

ilac-MRA A2LA 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.

Revision History

Report No.	Version	Description	Issue Date	Note
2001RSU036-U1	Rev. 01	Initial Report	07-21-2020	Valid

CONTENTS

General Information

Applicant:	Zhejiang Dahua Vision Technology Co., Ltd
Applicant Address:	No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China
Manufacturer:	Zhejiang Dahua Vision Technology Co., Ltd
Manufacturer Address:	No.1199, Bin'an Road, Binjiang District, Hangzhou, 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
Test Device Serial No.:	☐ 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 Designation No. CN1166) 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.**

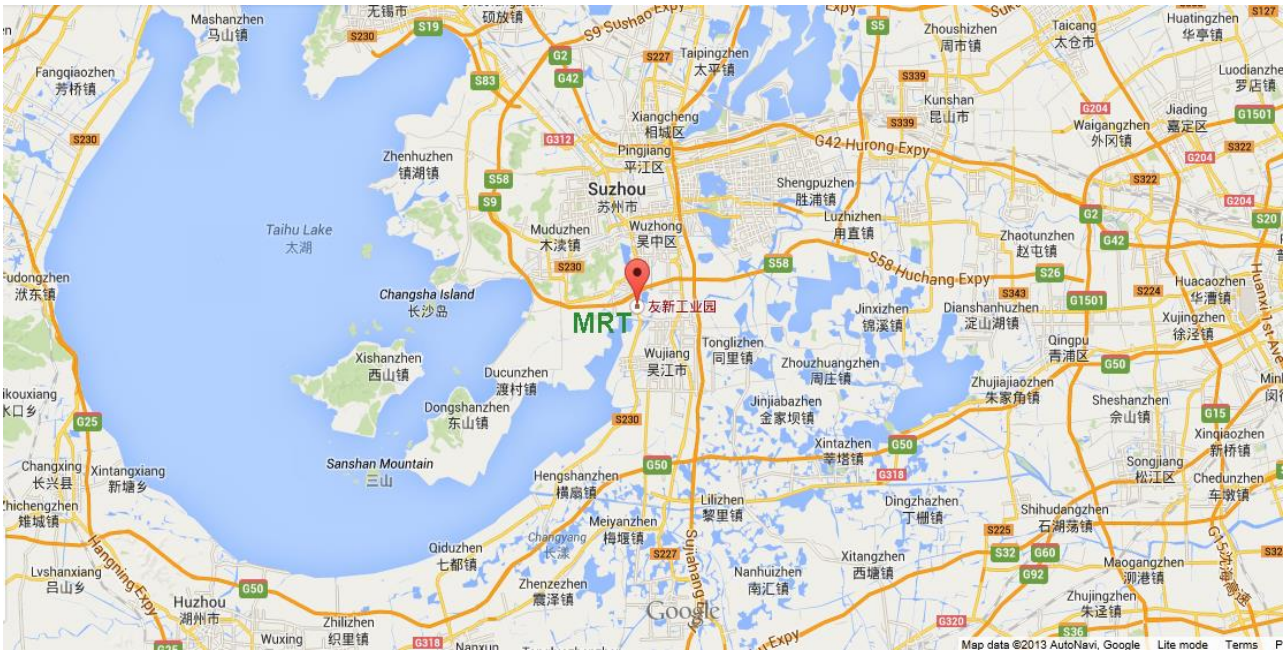
1. INTRODUCTION

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 Innovation, Science and Economic Development Canada and 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:	Multi Target Bayonet Radar
Model No.:	DHI-ITARD-024MA-H
Serial Model No.:	ITARD-024MA-H
Brand Name:	alhua TECHNOLOGY
Transmitting Frequency	24.15GHz
Modulation Type	FMCW

2.2. Test Configuration

The EUT was tested as described in this report is in compliance with the requirements limits of FCC Rules Part 15.207,15.209, 15.215 and 15.249. ANSI C63.10-2013 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 & 15.19; 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 15.207, 15.209, 15.215 and 15.249 were used in the measurement of the EUT.

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.
The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.
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 RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.
An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. 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. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antenna of the unit is **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2021/01/18
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2021/06/11
Thermal Hygrometer	testo	608-H1	MRTSUE06404	1 year	2020/08/08
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7 (9kHz~7GHz)	MRTSUE06001	1 year	2021/01/18
PXA Signal Analyzer	Keysight	N9030B (3Hz-50GHz)	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519 (9KHz~30MHz)	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9168 (30~1000MHz)	MRTSUE06172	1 year	2021/04/03
Horn Antenna	Schwarzbeck	BBHA 9120D (1~18GHz)	MRTSUE06023	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9170 (15~40GHz)	MRTSUE06597	1 year	2020/12/17
Micro-Wave Antenna	MI-WWAVE	261U-25 (40-60GHz)	MRTSUE06273	5 year	2021/12/26
Standard Gain Horn Antenna	A-INFOMW	LB-15-25-A (50~75GHz)	MRTSUE06409	5 year	2022/11/16
Standard Gain Horn Antenna	A-INFOMW	LB-10-25-A (75~110GHz)	MRTSUE06410	5 year	2022/11/16
Waveguide Harmonic Mixer	Keysight	M1970V (50~75GHz)	MRTSUE06271	5 year	2022/01/17
Waveguide Harmonic Mixer	Keysight	M1970W (75~110GHz)	MRTSUE06272	5 year	2021/12/07
Coaxial transmission line	Times Microwave Systems	SLU18-SMSM-01.00M (Serial #94197(TMC))	N/A	5 year	2022/01/17
Coaxial transmission line	Times Microwave Systems	SLU18-SMSM-01.00M (Serial #94198(TMC))	N/A	5 year	2021/12/07
Coaxial transmission line	UCWAVE	SPT67-1.85M1.85M-1.0M	N/A	5 year	2021/12/26
Microwave System Amplifier	Agilent	83017A (0.5~26.5GHz)	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721 (18~40GHz)	MRTSUE06121	1 year	2020/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2020/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A (20Hz~26.5GHz)	MRTSUE06125	1 year	2020/08/01
PXA Signal Analyzer	Keysight	N9030B (3Hz-50GHz)	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519 (9KHz~30MHz)	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9162 (30MHz~7GHz)	MRTSUE06022	1 year	2020/10/13
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D (1~18GHz)	MRTSUE06171	1 year	2020/10/27
Horn Antenna	Schwarzbeck	BBHA9170 (15~40GHz)	MRTSUE06597	1 year	2020/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718 (1~18GHz)	MRTSUE06176	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721 (18~40GHz)	MRTSUE06121	1 year	2020/06/11
Micro-Wave Antenna	MI-WWAVE	261U-25 (40-60GHz)	MRTSUE06273	5 year	2021/12/26
Standard Gain Horn Antenna	A-INFOMW	LB-15-25-A (50~75GHz)	MRTSUE06409	5 year	2022/11/16
Standard Gain Horn Antenna	A-INFOMW	LB-10-25-A (75~110GHz)	MRTSUE06410	5 year	2022/11/16
Waveguide Harmonic Mixer	Keysight	M1970V (50~75GHz)	MRTSUE06271	5 year	2022/01/17
Waveguide Harmonic Mixer	Keysight	M1970W (75~110GHz)	MRTSUE06272	5 year	2021/12/07
Coaxial transmission line	Times Microwave Systems	SLU18-SMSM-01.00M (Serial #94197(TMC))	N/A	5 year	2022/01/17
Coaxial transmission line	Times Microwave Systems	SLU18-SMSM-01.00M (Serial #94198(TMC))	N/A	5 year	2021/12/07
Coaxial transmission line	UCWAVE	SPT67-1.85M1.85M-1.0M	N/A	5 year	2021/12/26
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

Software	Version	Function
EMI Software	V3	EMI Test Software

6. 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.

Conducted Emission Measurement - SR2
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 3.84dB 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~300MHz: 4.07dB 300MHz~1GHz: 3.63dB 1GHz~18GHz: 4.16dB 18GHz~40GHz: 4.98dB Vertical: 30MHz~300MHz: 4.18dB 300MHz~1GHz: 3.60dB 1GHz~18GHz: 4.76dB 18GHz~40GHz: 5.63dB
Radiated Emission Measurement - AC2
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~300MHz: 3.75dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.28dB 18GHz~40GHz: 4.88dB Vertical: 30MHz~300MHz: 3.86dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.33dB 18GHz~40GHz: 5.06dB

7. TEST RESULT

7.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	N/A	Section 7.2
15.209 15.249	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 & clause 8.10	Radiated	Pass	Section 7.3 & 7.4
15.215(c)	20dB Spectrum Bandwidth	20 dB bandwidth of the emission in the specific band	Conducted	Pass	Section 7.5

Notes:

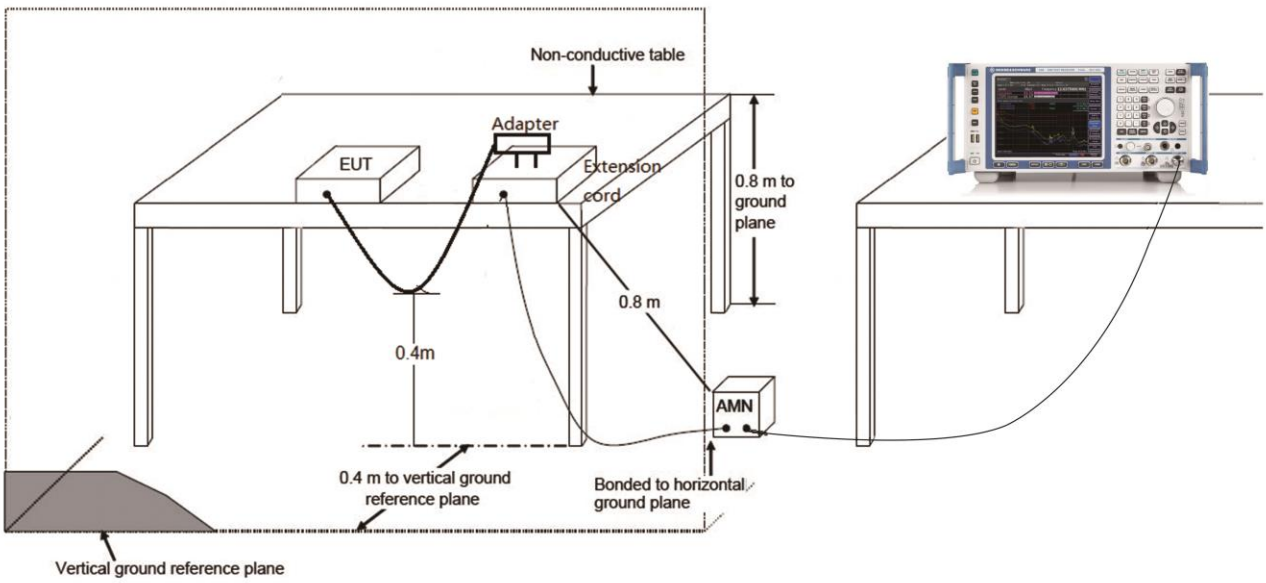
1. The test results shown in the following sections represent the worst-case emissions.
2. “N/A” means that this item is not applicable, and the detail information refer to relevant section.

7.2. AC Conducted Emissions Measurement

7.2.1.Test Limit

FCC 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 ~ 0.50	66 ~ 56	56 ~ 46
0.50 ~ 5.0	56	46
5.0 ~ 30	60	50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.		

7.2.2.Test Setup



7.2.3.Test Result

The device is powered by DC source, so this item is not applicable.

7.3. Radiated Emission

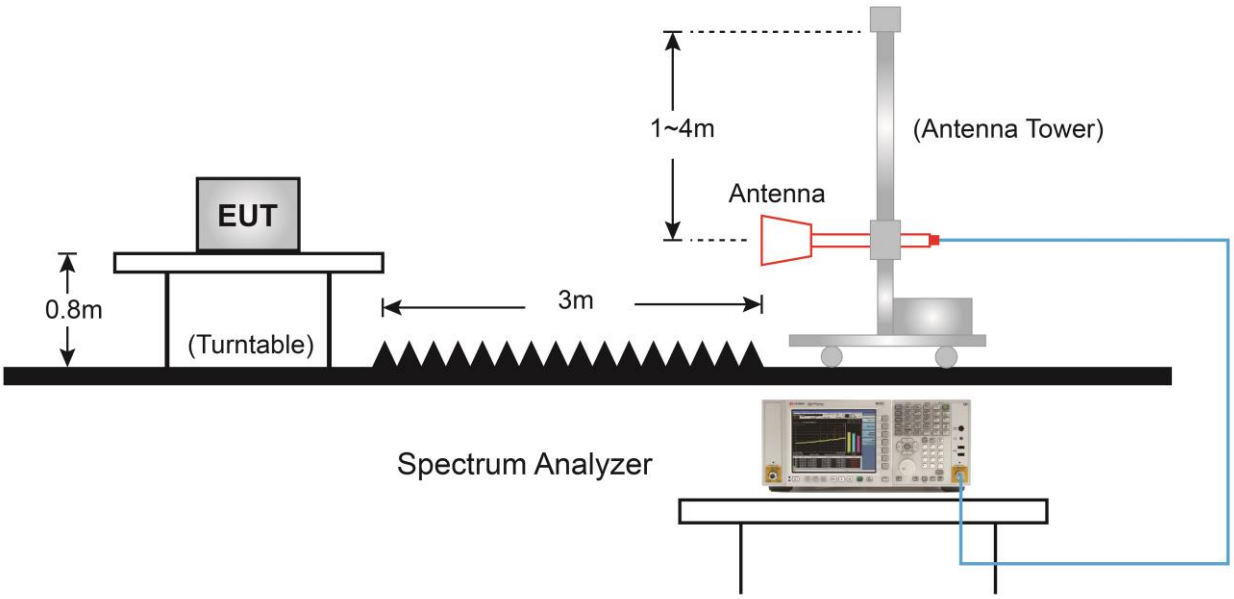
7.3.1.Test Limit

FCC Part 15 Subpart C Paragraph 15.249		
Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (uV/m)
902 ~ 908	50	500
2400 ~ 2483.5	50	500
5725 ~ 5875	50	500
24000 ~ 24250	250	2500
Note: FCC Part 15.249 (d), 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.		

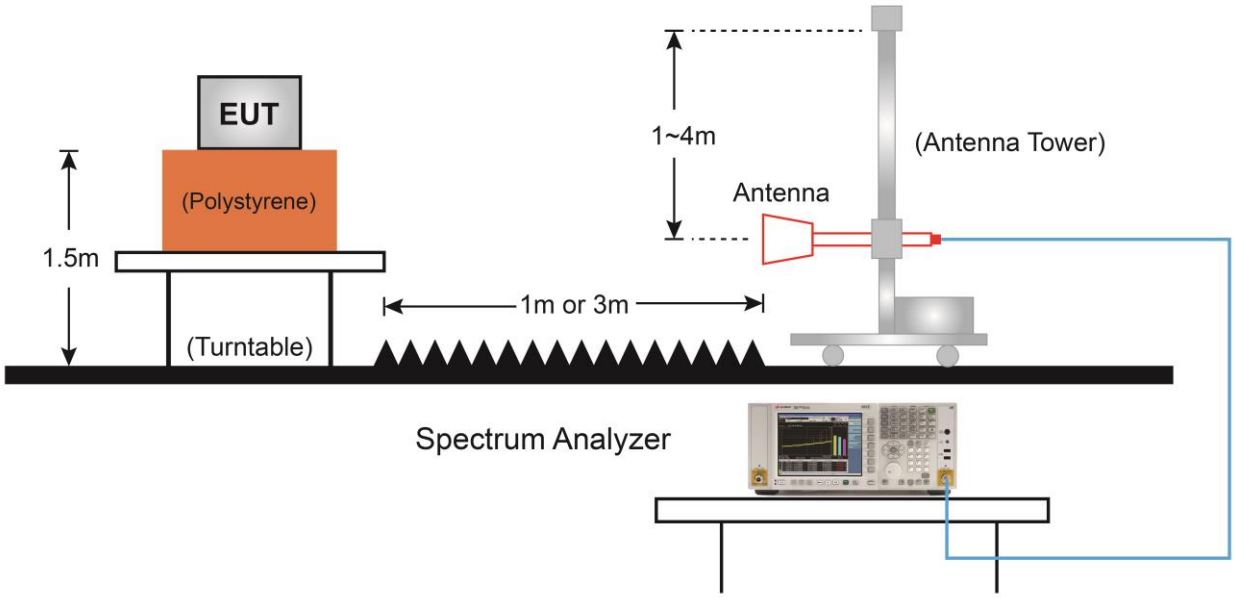
FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100**	3
88 ~ 216	150**	3
216 ~ 960	200**	3
Above 960	500	3
Note 1: The lower limit shall apply at the transition frequency. Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system. Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m).		

7.3.2.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



7.3.3.Test Result

Product	Multi Target Bayonet Radar	Temperature	26°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Site	AC2	Test Date	2020/05/06
Remark:	**Fundamental** Radiated Emission		

Frequency (GHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
24.15	118.2	-9.8	108.4	128.0	-19.6	Peak	Horizontal
	67.0	-9.8	57.2	108.0	-50.8	Average	Horizontal
	99.0	-9.8	89.2	128.0	-38.8	Peak	Vertical
	58.9	-9.8	49.1	108.0	-58.9	Average	Vertical

Note 1: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Note 2: Average Limit (dBμV/m) = 20 * log(250mV/m) = 108.0dBμV/m

Peak Limit (dBμV/m) = Average Limit (dBμV/m) + 20dB = 128.0 dBμV/m

Product	Multi Target Bayonet Radar	Temperature	25°C
Test Engineer	Milo Li	Relative Humidity	56%
Test Site	AC2	Test Date	2020/04/17
Remark:	**Harmonics** Radiated Emission		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Measurement Distance = 3m (1GHz ~ 18 GHz)								
	7188.0	32.2	11.9	44.1	74.0	-29.9	Peak	Horizontal
	9755.0	32.0	15.0	47.0	74.0	-27.0	Peak	Horizontal
	11285.0	30.1	19.0	49.1	74.0	-24.9	Peak	Horizontal
	11965.0	27.1	20.3	47.4	74.0	-26.6	Peak	Horizontal
	1484.5	45.9	-4.0	41.9	74.0	-32.1	Peak	Vertical
	6380.5	34.4	7.7	42.1	74.0	-31.9	Peak	Vertical
	7179.5	33.6	11.9	45.5	74.0	-28.5	Peak	Vertical
	10664.5	31.6	17.3	48.9	74.0	-25.1	Peak	Vertical
Measurement Distance = 3m (18 GHz ~ 40 GHz)								
	22972.0	65.5	-9.6	55.9	74.0	-18.1	Peak	Horizontal
	22972.6	52.9	-9.6	43.3	54.0	-10.7	Average	Horizontal
	28439.0	68.3	-9.8	58.5	74.0	-15.5	Peak	Horizontal
	28439.5	55.5	-9.8	45.7	54.0	-8.3	Average	Horizontal
	31607.0	68.4	-10.0	58.4	74.0	-15.6	Peak	Horizontal
	31607.0	54.4	-10.0	44.4	54.0	-9.6	Average	Horizontal
	22565.0	66.6	-10.0	56.6	74.0	-17.4	Peak	Vertical
	22565.6	54.1	-10.0	44.1	54.0	-9.9	Average	Vertical
	27119.0	67.0	-9.1	57.9	74.0	-16.1	Peak	Vertical
	27119.4	53.7	-9.1	44.6	54.0	-9.4	Average	Vertical
	31530.0	67.9	-10.0	57.9	74.0	-16.1	Peak	Vertical
	31531.1	54.3	-10.0	44.3	54.0	-9.7	Average	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)

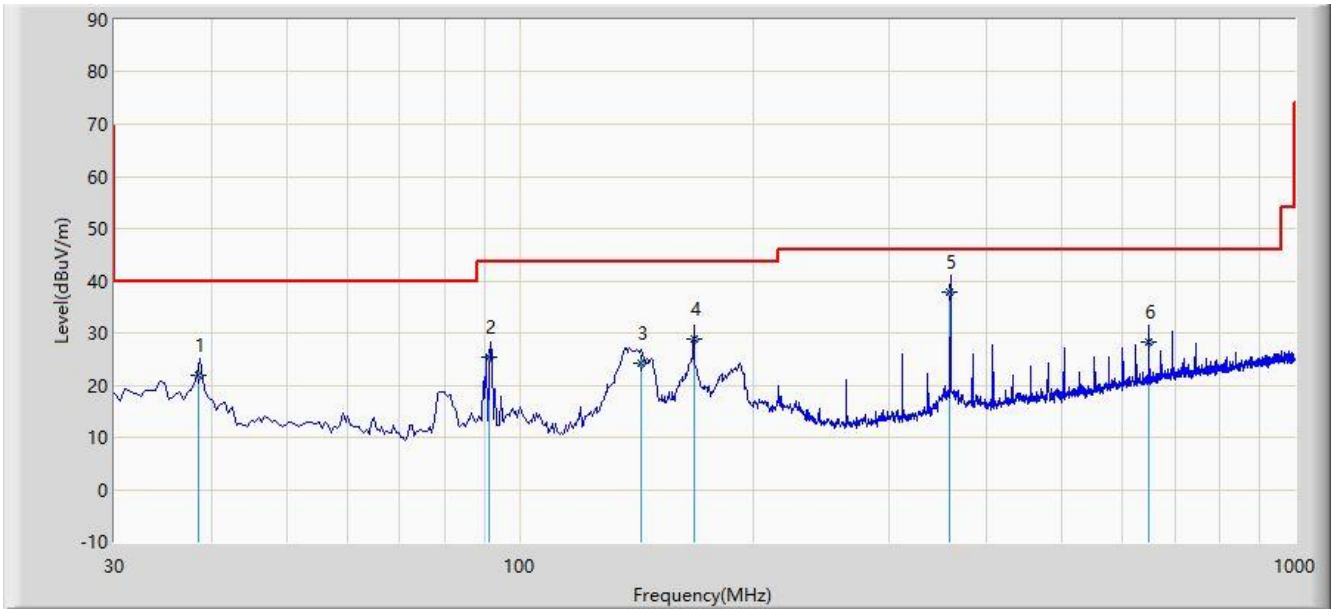
Note 2: Average measurement was not performed when the peak level lower than average limit.

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Measurement Distance = 1m (40GHz ~ 75GHz)								
	48300.0	25.7	46.0	71.7	97.5	-25.9	Peak	Horizontal
	48300.0	24.8	46.0	70.8	97.5	-26.7	Peak	Vertical
	72450.0	38.9	42.4	81.3	97.5	-16.2	Peak	Horizontal
	72450.0	24.8	42.4	67.2	77.5	-10.3	Average	Horizontal
	72450.0	37.6	42.4	80.0	97.5	-17.5	Peak	Vertical
	72450.0	24.7	42.4	67.1	77.5	-10.4	Average	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) Note 2: According to FCC Part 15.205(d)(9) and Part 15.249(a) requirements, Average Limit (dBμV/m) @1m = 20*log(2500μV/m) + 20 * log (3/1) = 77.5dBμV/m Peak Limit (dBμV/m) @1m = Average Limit (dBμV/m) + 20dB = 97.5 dBμV/m Note 3: Average measurement was not performed when the peak level lower than average limit.								

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Measurement Distance = 0.25m (75GHz ~ 100GHz)								
	96600.0	41.5	44.5	86.0	97.5	-11.5	Peak	Horizontal
	96600.0	28.4	44.5	72.9	77.5	-4.6	Average	Horizontal
	96600.0	42.3	44.5	86.8	97.5	-10.7	Peak	Vertical
	96600.0	28.1	44.5	72.6	77.5	-4.9	Average	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) Note 2: Average Limit (dBμV/m) @1m = 54dBμV/m + 20 * log (3/0.25) = 75.6dBμV/m Peak Limit (dBμV/m) @1m = Average Limit (dBμV/m) + 20dB = 95.6dBμV/m								

The worst case of Radiated Emission below 1GHz

Site: AC2	Time: 2020/04/15 - 18:35
Limit: FCC_Part15.209_RSE(3m)	Engineer: Tyler Yuan
Probe: AC2_VULB9162_0.03-7GHz	Polarity: Horizontal
EUT: Multi Target Bayonet Radar	Power: DC 12V
Note: Transmit at 24.15GHz	



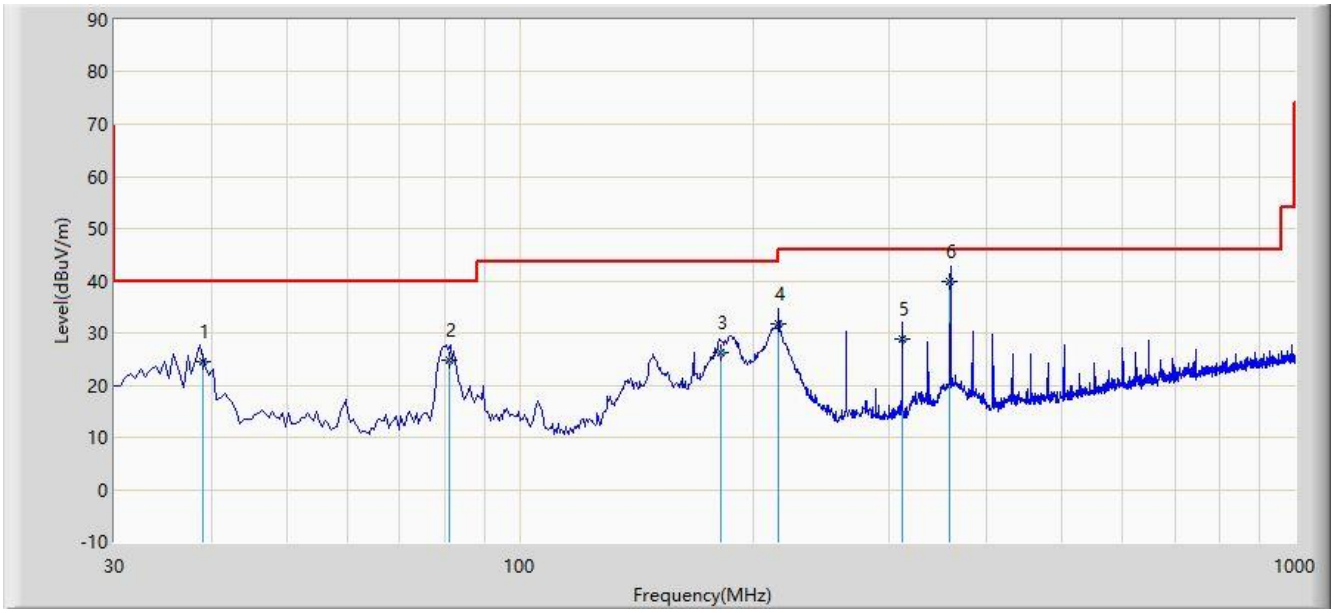
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			38.562	21.933	9.107	-18.067	40.000	12.825	QP
2			91.316	25.360	14.454	-18.140	43.500	10.905	QP
3			143.360	24.094	15.009	-19.406	43.500	9.085	QP
4			167.632	28.723	18.698	-14.777	43.500	10.025	QP
5		*	359.324	37.691	21.657	-8.309	46.000	16.034	QP
6			647.610	28.228	6.663	-17.772	46.000	21.565	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The amplitude of Radiated emissions (the test frequency range: 9kHz ~ 30MHz), is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Site: AC2	Time: 2020/04/15 - 18:39
Limit: FCC_Part15.209_RSE(3m)	Engineer: Tyler Yuan
Probe: AC2_VULB9162_0.03-7GHz	Polarity: Vertical
EUT: Multi Target Bayonet Radar	Power: DC 12V
Note: Transmit at 24.15GHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			38.954	24.589	11.646	-15.411	40.000	12.943	QP
2			81.060	24.734	16.538	-15.266	40.000	8.196	QP
3			181.626	26.267	15.374	-17.233	43.500	10.894	QP
4			215.694	31.625	19.115	-11.875	43.500	12.510	QP
5			311.326	28.720	13.584	-17.280	46.000	15.136	QP
6		*	359.240	39.719	23.688	-6.281	46.000	16.031	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The amplitude of Radiated emissions (the test frequency range: 9kHz ~ 30MHz), is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

7.4. Radiated Restricted Band Edge Measurement

7.4.1.Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

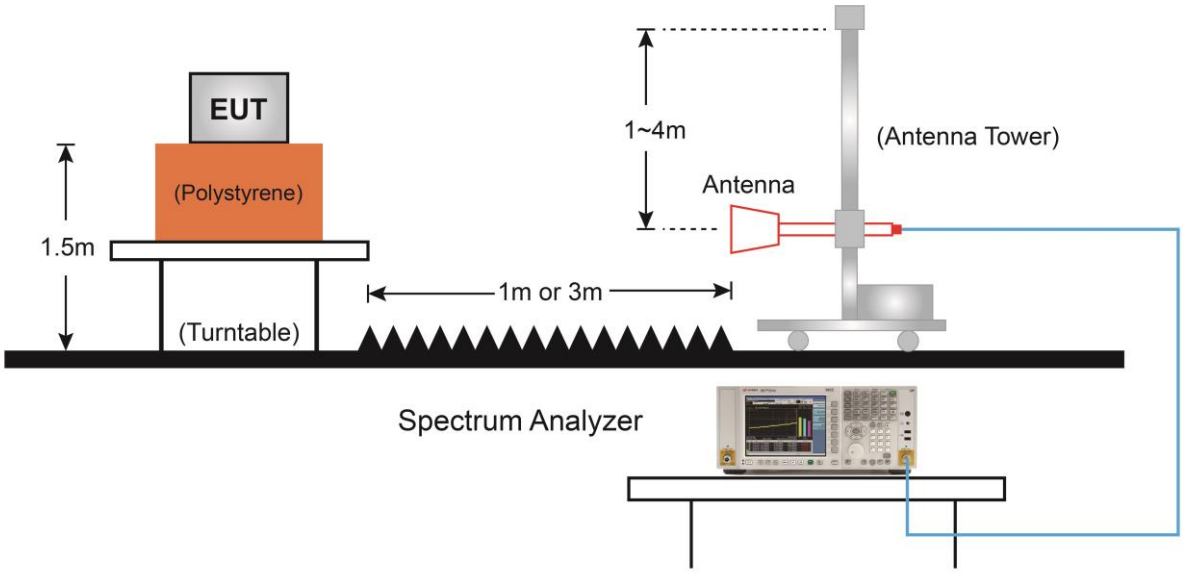
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1] 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 – 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meter]
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

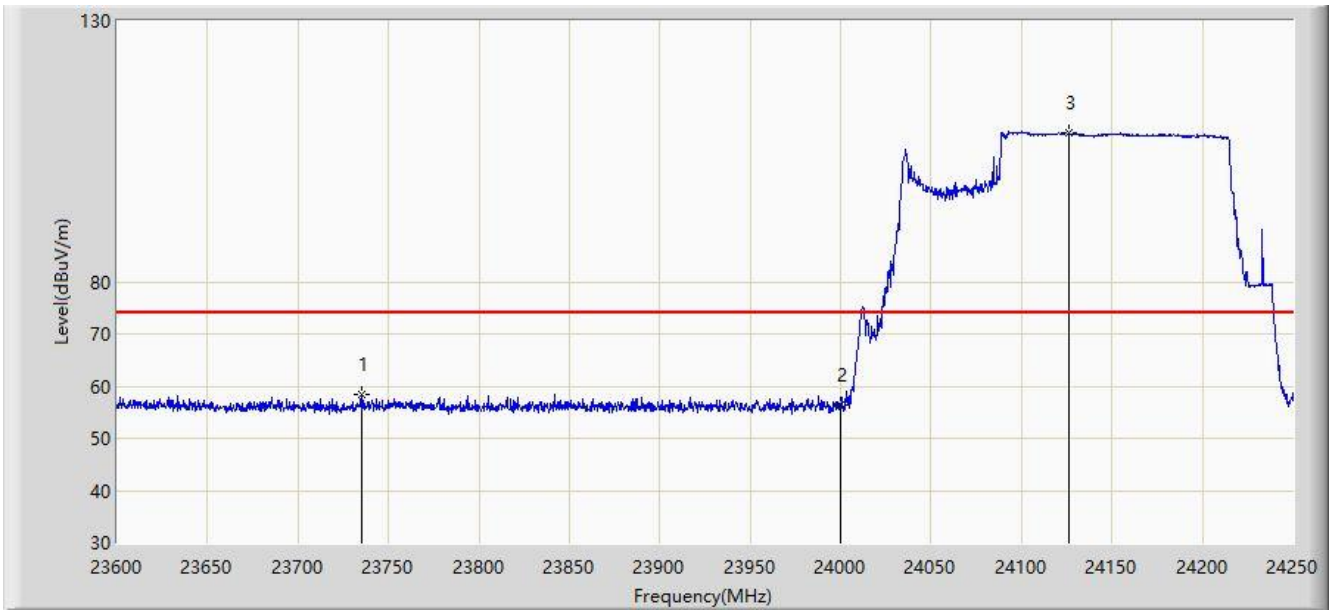
7.4.2.Test Setup

Above 1GHz Test Setup:



7.4.3.Test Result

Site: AC2	Time: 2020/05/06 - 18:34
Limit: FCC_Part15.249_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9170_18-40GHz	Polarity: Horizontal
EUT: Multi Target Bayonet Radar	Power: DC 12V
Note: Transmit at 24.15GHz	

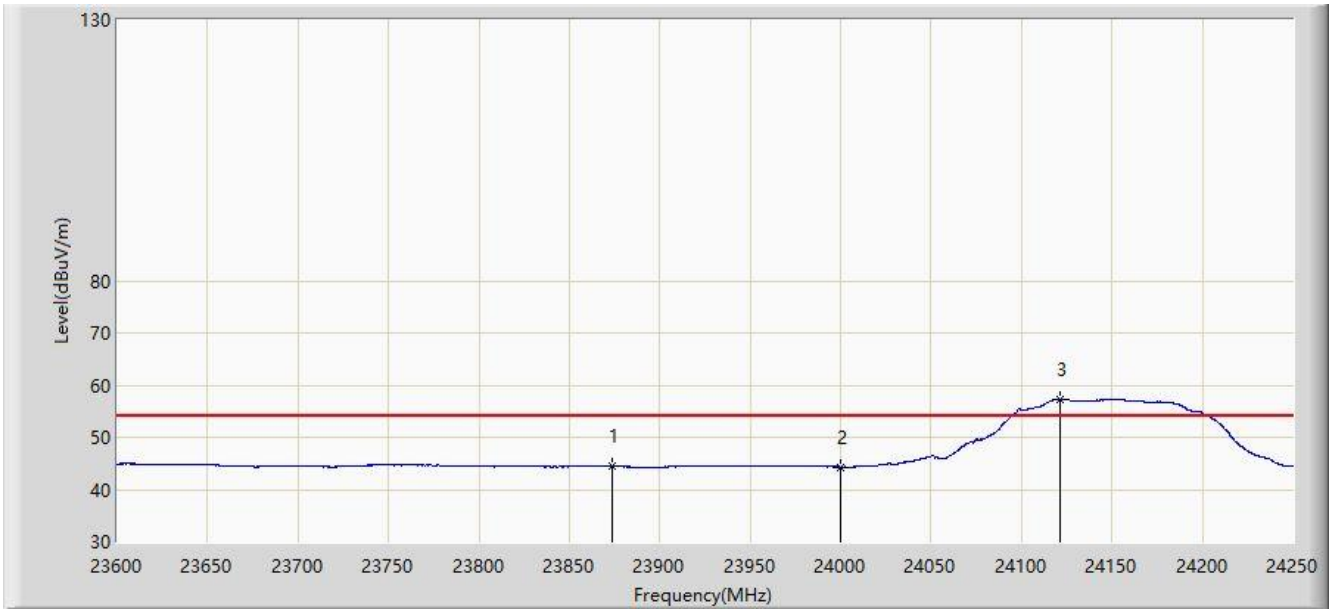


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			23734.875	58.546	68.234	-15.454	74.000	-9.689	PK
2			24000.000	56.373	66.175	-17.627	74.000	-9.803	PK
3		*	24126.176	108.458	118.235	N/A	N/A	-9.776	PK

Note: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Site: AC2	Time: 2020/05/06 - 19:34
Limit: FCC_Part15.249_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9170_18-40GHz	Polarity: Horizontal
EUT: Multi Target Bayonet Radar	Power: DC 12V
Note: Transmit at 24.15GHz	

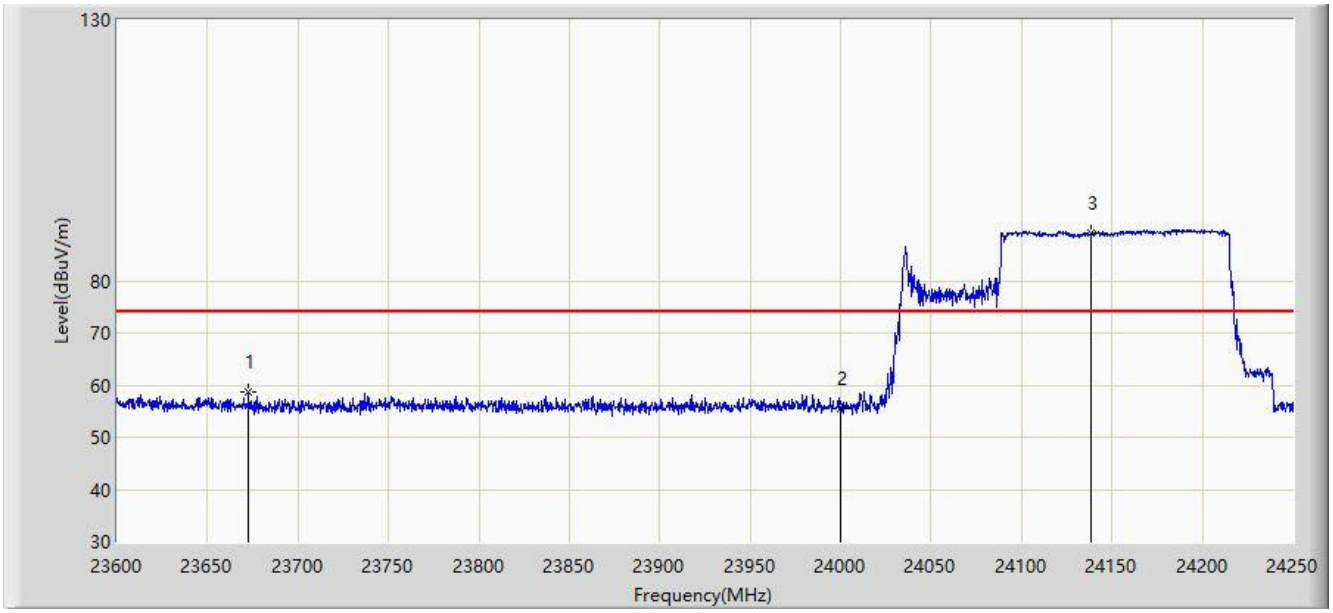


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			23873.650	44.475	54.031	-9.525	54.000	-9.556	AV
2			24000.000	44.319	54.121	-9.681	54.000	-9.803	AV
3		*	24121.301	57.268	67.046	N/A	N/A	-9.779	AV

Note: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Site: AC2	Time: 2020/05/06 - 19:36
Limit: FCC_Part15.249_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9170_18-40GHz	Polarity: Vertical
EUT: Multi Target Bayonet Radar	Power: DC 12V
Note: Transmit at 24.15GHz	

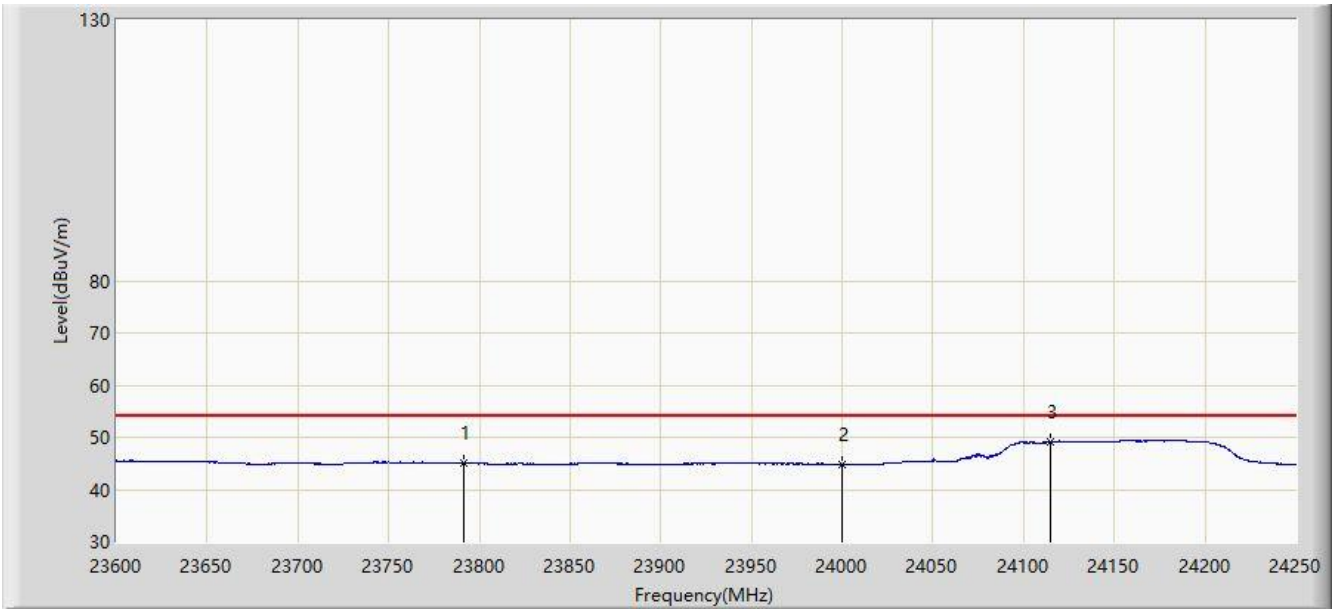


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			23672.475	58.669	66.848	-15.331	74.000	-8.179	PK
2			24000.000	55.602	64.028	-18.398	74.000	-8.426	PK
3		*	24138.199	89.268	99.043	N/A	N/A	-9.775	PK

Note: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Site: AC2	Time: 2020/05/06 - 19:37
Limit: FCC_Part15.249_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9170_18-40GHz	Polarity: Vertical
EUT: Multi Target Bayonet Radar	Power: DC 12V
Note: Transmit at 24.15GHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			23791.750	45.078	54.685	-8.922	54.000	-9.607	AV
2			24000.000	44.802	54.604	-9.198	54.000	-9.803	AV
3		*	24115.125	49.113	58.896	N/A	N/A	-9.783	AV

Note: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

7.5. Emission Bandwidth Measurement

7.5.1. Test Limit

20 dB bandwidth of the emission shall be contained within the frequency band 24.00 ~ 24.25 GHz.

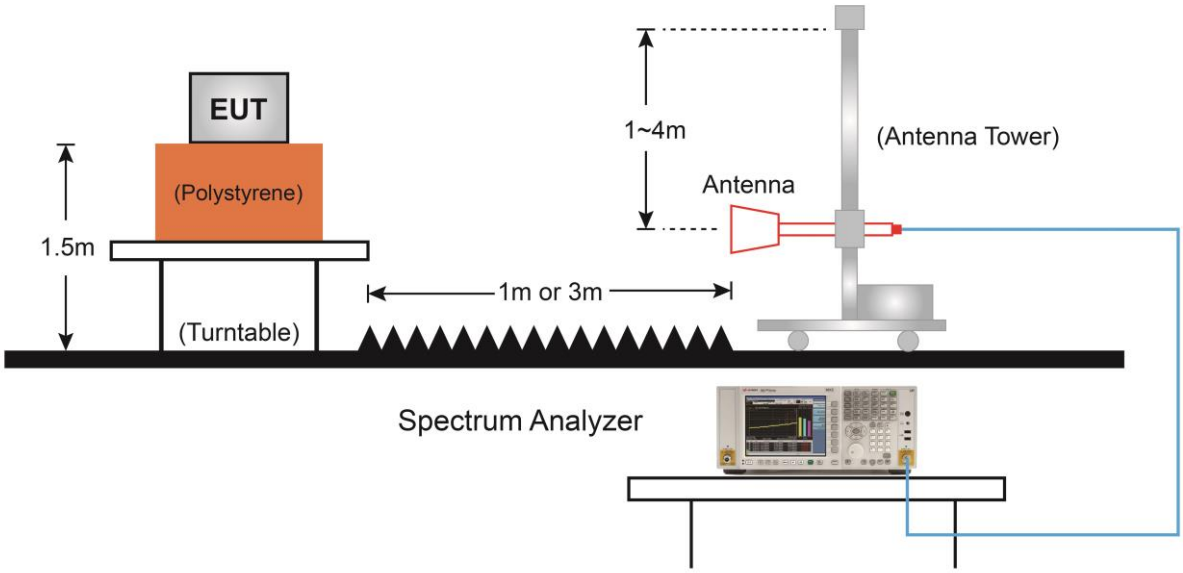
7.5.2. Test Procedure used

ANSI C63.10 Section 6.9.2 and Section 6.9.3

7.5.3. Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 99% or 20dB bandwidth measurement. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% to 5% of the OBW.
3. VBW ≥ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.

7.5.4. Test Setup

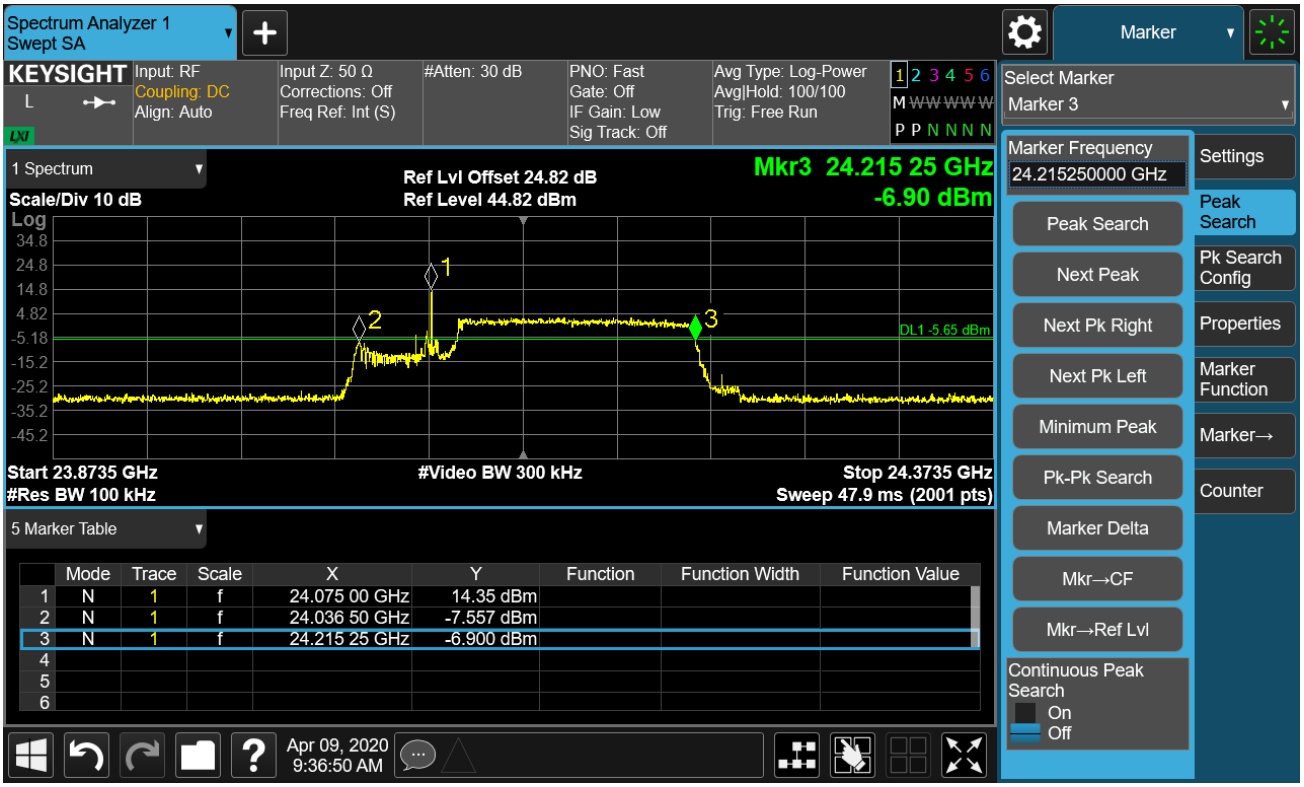


7.5.5. Test Result

Product	Multi Target Bayonet Radar	Temperature	25°C
Test Engineer	Milo Li	Relative Humidity	56%
Test Site	AC2	Test Date	2020/04/09

Frequency (MHz)	20dB Bandwidth (MHz)	Frequency Range (MHz)	Limit (MHz)	Result
24150	178.75	24036.50	> 24000	Pass
		24215.25	< 24250	Pass

Emission Bandwidth



8. CONCLUSION

The data collected relate only the item(s) tested and show that the unit is in compliance with Part 15C of the FCC Rules.

The End

Appendix A - Test Setup Photograph

Refer to “2001RSU036-UT” file.

Appendix B - EUT Photograph

Refer to “2001RSU036-UE” file.