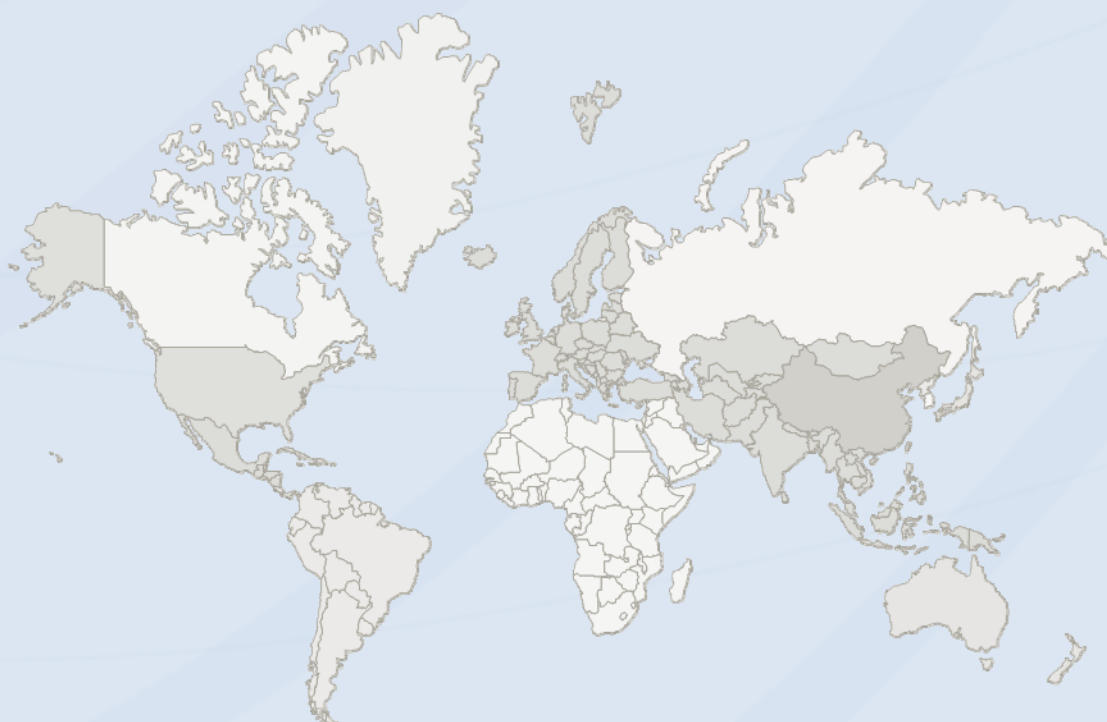


# TEST REPORT

**Report No.** ..... : NTC-ER2110019

**Applicant's name** ..... : Diecast Masters Company Limited

**Address** ..... : Room 1801-5, 18/F., King Palace Plaza, 52A Sha Tsui  
Road, Tsuen Wan, N.T., Hong Kong



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## TEST REPORT DECLARE

<b>IC ID</b>	: 25977-28008
<b>FCC ID</b>	: 2AUJF-28008
<b>Applicant</b>	: Diecast Masters Company Limited
<b>Address</b>	: Room 1801-5, 18/F., King Palace Plaza, 52A Sha Tsui Road, Tsuen Wan, N.T., Hong Kong
<b>Equipment under Test</b>	: 1/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)
<b>Model No</b>	: 28008
<b>Trade Mark</b>	: Diecast-Masters
<b>Manufacturer</b>	: Guang Dong Yu Lee Technology Corporation Limited
<b>Address</b>	: Jinlong Industrial District, Sanzhong Village, Qingxi Town, Dongguan City, Guangdong Province, China

**Test Standard Used:**

FCC Rules and Regulations Part 15 Subpart C: 2019, ANSI C63.10:2020.

RSS-210: Issue 10 December 2019, RSS-Gen: March 6, 2019.

**We Declare:**

The equipment described above is tested by Dongguan New Testing Centre Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan New Testing Centre Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

**After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above standards.**

<b>Report No.:</b>	NTC-ER2110019		
<b>Date of Test:</b>	Jul.24, 2021 to Oct.16, 2021	<b>Date of Report:</b>	Oct.19, 2021

**Prepared By:**

*Jack Liu*  
 \_\_\_\_\_  
**Jack Liu/Engineer**



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**Dave Gao/LAB Manager**

pNote: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan New Testing Centre Co., Ltd

## 1. Summary of test results

Description of Test Item	Standard	Results
-20dB Bandwidth and 99% occupied bandwidth	FCC Part 15 Subpart C:2019 ANSI C63.10:2020 RSS-210: April 2020. RSS-Gen Issu5: February 2021.	PASS
Conducted emission test	FCC Part 15 Subpart C:2019 ANSI C63.10:2020 RSS-210: April 2020. RSS-Gen Issu5: February 2021.	N/A
Radiated emission test	FCC Part 15 Subpart C:2019 ANSI C63.10:2020 RSS-210: April 2020. RSS-Gen Issu5: February 2021.	PASS
Antenna requirement	FCC 15.203; RSS-GEN	PASS
Restricted band and band-edge	FCC 15.249,15.209,15.205.; RSS-210,RSS-GEN	PASS

## 2. General test information

### 2.1. Description of EUT

EUT* Name	: 1/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)
Test model	: 28008
EUT function description	: Please reference user manual of this device
Power supply	: DC 3V (New battery is used; Battery AAA 1.5V * 2Pcs)
Trade mark	: Diecast-Masters
Operation frequency	: 2402-2478MHz
Modulation Type	: GFSK
Channel Space	: 1MHz
Channel Number	: 77
Antenna Type	: Wire antenna
Antenna Gain	: 0.17 dBi
Hardware Version	: V1.0
Software Version	: V1.0

Note: 1,EUT is the ab. of equipment under test.

**There are 77 channels provided to the EUT and Channel 01/37/77 were selected for testing.**

**Operation Frequency List :**

Channel	Frequency (MHz)
<b>01</b>	<b>2402</b>
02	2403
03	2404
04	2405
⋮	⋮
36	2438
<b>37</b>	<b>2439</b>
38	2440
⋮	⋮
74	2475
75	2476
76	2477
<b>77</b>	<b>2478</b>

Note: The line display in grey is the channel selected to perform test.

## 2.2. Description of test modes

The transmitter module was tested while in a continuous transmitter/receiver mode. The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all modes to determine worst case levels.

Entry test mode steps of transmitter:

1. At the same time, press and hold the demo + light button to start up, enter the test mode;
2. After entering the test mode, press the light button to select mode and frequency:  
 2402MHz (modulation) -- > 2439MHz (modulation) -- > 2478 MHz (modulation) -- > 2402 MHz (Un-modulation) -- > 2439 MHz (Un-modulation)-- > 2478 MHz (Un-modulation).

Test Software Version	950M V1.0		
Tx power	Fixed		
Test Frequency	2402MHz	2439MHz	2478MHz

## 2.3. Block diagram EUT configuration for test



## 2.4. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-24°C
Humidity range:	40-75%
Pressure range:	86-106kPa

## 2.5. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.44dB
Uncertainty for Radiation Emission test (30MHz – 1GHz)	3.14 dB (Polarize: V)
	3.16 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz – 26GHz)	4.27 dB (Polarize: V)
	4.51 dB (Polarize: H)
Uncertainty for Radiation Emission test (26GHz – 40GHz)	4.60 dB (Polarize: V)
	4.60 dB (Polarize: H)
Bandwidth	±1.2%
Stop Transmitting Time Test	±0.5%
Frequency error	$5.8 \times 10^{-8}$

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 3. Radiated emission test

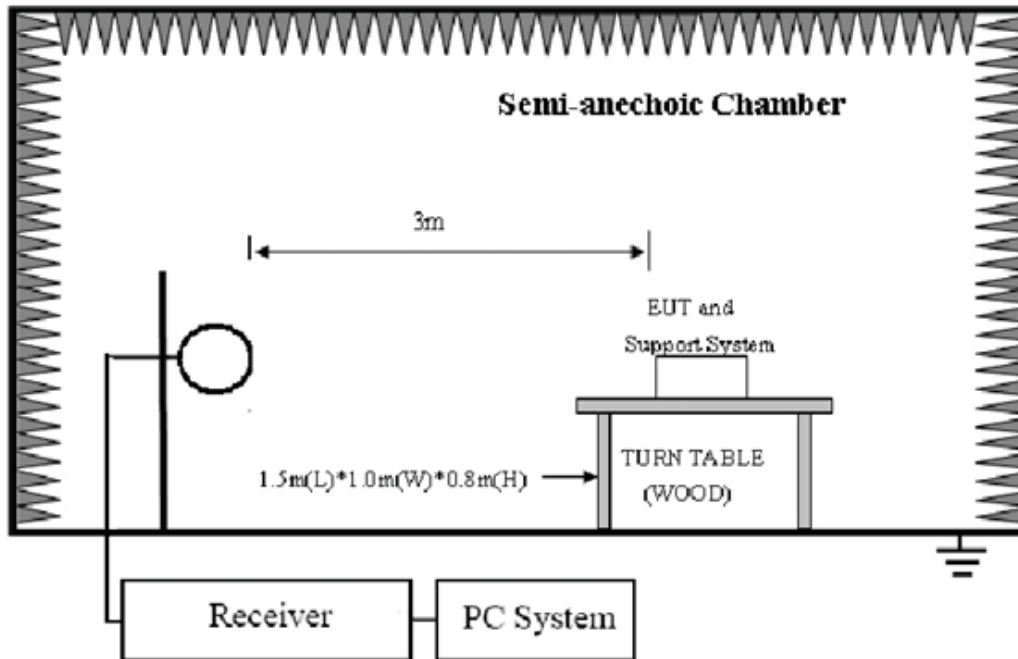
#### 3.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESR	7250-30406 7528	2021-05-21	1Year
2	Trilog Broadband Antenna	Schwarzbeck	VULB9168	00969	2021-01-10	2 Year
3	Horn antenna	Schwarzbeck	BBHA9120D	453	2021-05-21	2Year
4	Pre-amplifier	Agilent	8449B	3008A04721	2021-05-26	1Year
5	Double Ridged Horn Antenna	A.H. System	SAS-574	584	2021-05-21	1Year
6	Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	2021-05-21	1Year
7	Pre-amplifier	R&S	8447F	3113A04553	2021-05-21	1Year
8	RF Cable	GORE	OSQ01Q010 78.7	SN1545847 3	2021-05-21	2Year
9	RF Cable	ESCO	ETS-LINGR EN	RFC-SMS-1 00-SMS-340 -IN	2021-05-21	2Year
10	Measurement software	Farad	EZ-EMC(VE R:1.1.4.2)	N/A	N/A	N/A

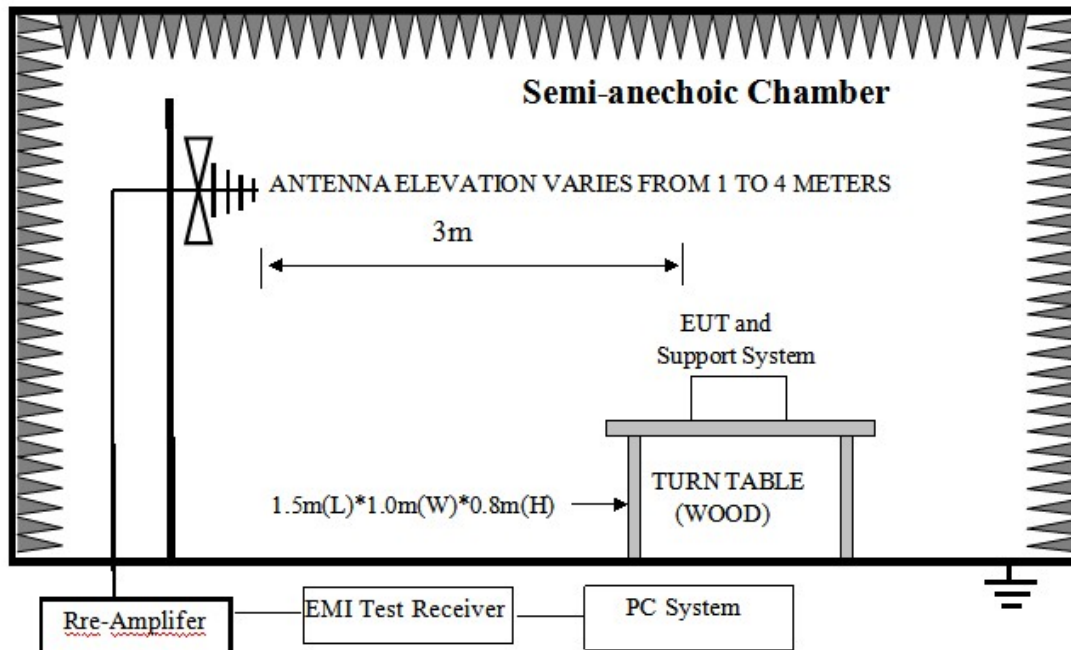


### 3.2. Block diagram of test setup

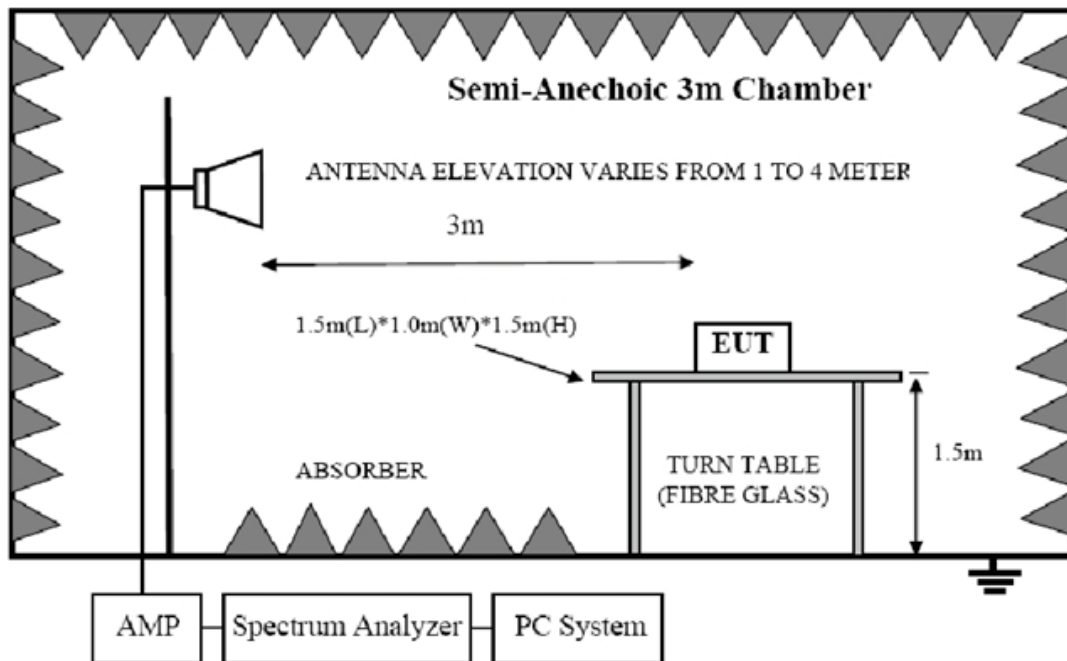
In 3m Anechoic Chamber Test Setup Diagram for 9KHz to 30MHz:



In 3m Anechoic Chamber Test Setup Diagram for 30MHz to 1GHz:



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz:



### 3.3. Limit

Rss-gen restricted frequency band:

**Table 6 – Restricted Frequency Bands\***

MHz	MHz	GHz
0.090-0.110	240-285	9.0-9.2
2.1735-2.1905	322-335.4	9.3-9.5
3.020-3.026	399.9-410	10.6-12.7
4.125-4.128	608-614	13.25-13.4
4.17725-4.17775	960-1427	14.47-14.5
4.20725-4.20775	1435-1626.5	15.35-16.2
5.677-5.683	1645.5-1646.5	17.7-21.4
6.215-6.218	1660-1710	22.01-23.12
6.26775-6.26825	1718.8-1722.2	23.6-24.0
6.31175-6.31225	2200-2300	31.2-31.8
8.291-8.294	2310-2390	36.43-36.5
8.362-8.366	2655-2900	Above 38.6
8.37625-8.38675	3260-3267	
8.41425-8.41475	3332-3339	
12.29-12.293	3345.8-3358	
12.51975-12.52025	3500-4400	
12.57675-12.57725	4500-5150	
13.36-13.41	5350-5460	
16.42-16.423	7250-7750	
16.69475-16.69525	8025-8500	
16.80425-16.80475		
25.5-25.67		
37.5-38.25		
73-74.6		
74.8-75.2		
108-138		
156.52475-156.52525		
156.7-156.9		

\* Certain frequency bands listed in Table 6 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300-series of RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

FCC 15.205 Restricted frequency band:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 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	( <sup>2</sup> )

FCC 15.209 and rss-gen table 4 Limit

Frequency (MHz)	Distance (Meters)	Field Strengths Limits dB(μV)/m
30--88	3	40.0
88--216	3	43.5
216--960	3	46.0
960--1000	3	54.0
Above 1GHz	3	Peak: 74.0
	3	Average:54.0

Note: (1) The smaller limit shall apply at the cross point between two frequency bands.

(2)Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(3)The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz.Radiated emissions limits in these three bands are based on measurements employing an average detector.

(4) At frequencies below 30MHz, measurement may be performed at a distance closer then that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit3m(dBuV/m)} = \text{Limit30m(dBuV/m)} + 40\text{Log}(30\text{m}/3\text{m})$$

(5)All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

### 3.4. Test Procedure

#### Procedure of Preliminary Test

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 4.2 of this report.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

EUT height should be 0.8m for below 1GHz and 1.5m for above 1GHz at ground with absorbers.

The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.10. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Analyzer / Receiver quickly scanned from 30MHz to 25GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The X, Y, Z three axial are tested and the report only the worst case.

The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW:

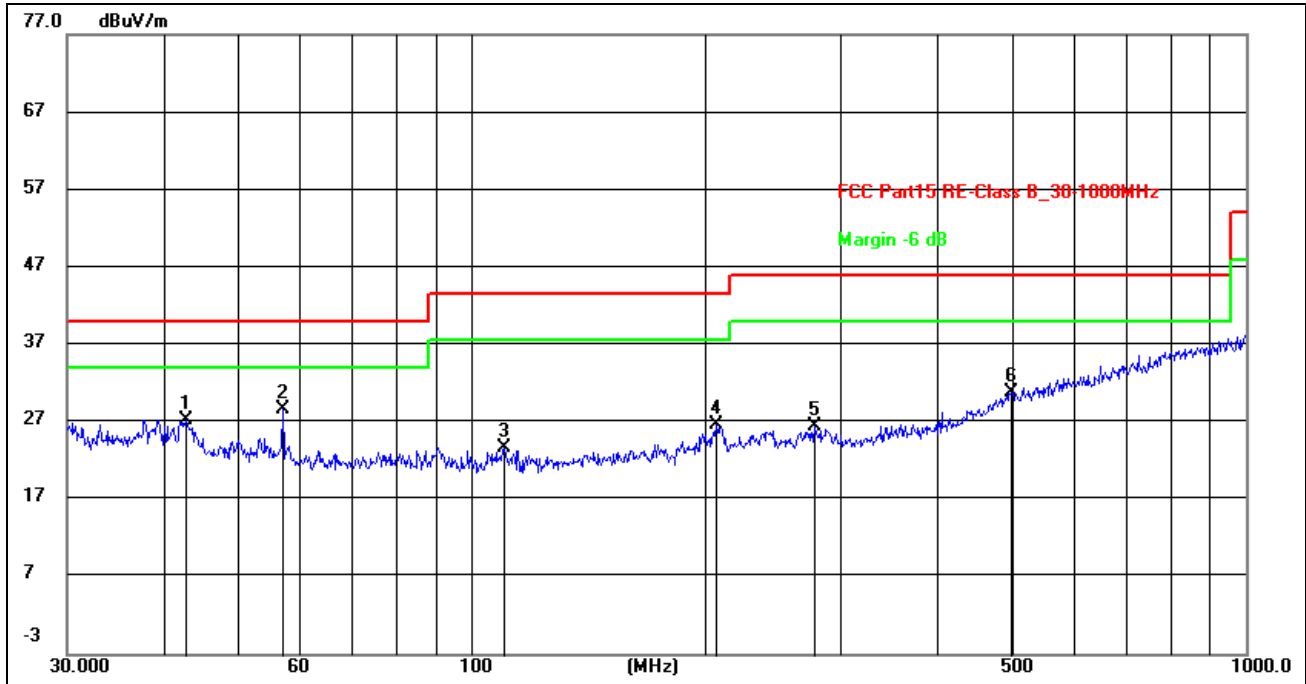
Frequency band	RBW
9KHz-150KHz	200Hz
150KHz-30MHz	9KHz
30MHz-1GHz	120KHz

For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RMS detector RBW 1MHz VBW 3MHz for Average measure.

### 3.5. Test result

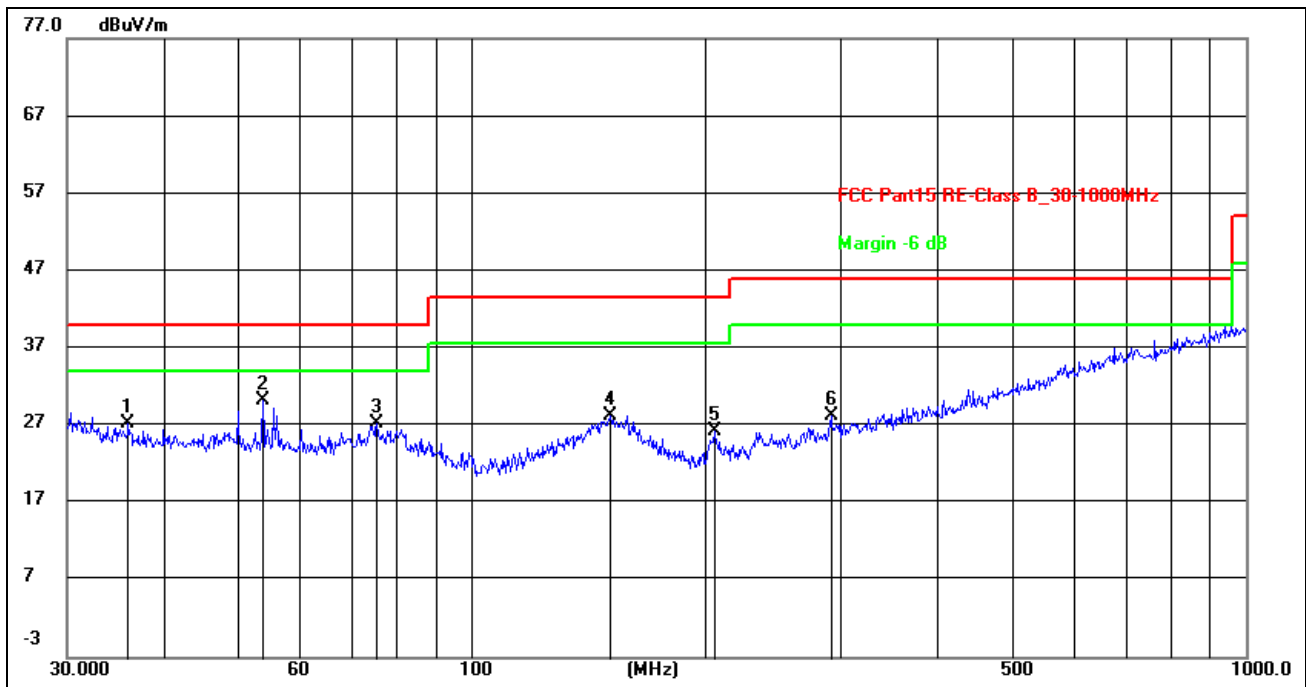
#### **PASS. (See below detailed test result)**

9K-30MHz: Emission detected are more than 20dB below the limit line.



<b>Site:</b>	966 LAB	<b>Antenna::</b>	Vertical	<b>Temperature(C):</b>	24(C)
<b>Limit:</b>	FCC Part15 RE-Class B_3m			<b>Humidity(%):</b>	60%
<b>EUT:</b>	1/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)	<b>Test Time:</b>		2021/10/9 15:02:53	
<b>M/N.:</b>	28008	<b>Power Rating:</b>	DC 3V		
<b>Mode:</b>	Tx mode	<b>Test Engineer:</b>	Taylor_Chen		
<b>Note:</b>					

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	42.7494	12.77	14.59	27.36	40.00	-12.64	peak	200	342	N/A
2	56.9911	15.73	13.01	28.74	40.00	-11.26	peak	100	3	N/A
3	110.1816	12.10	11.66	23.76	43.50	-19.74	peak	100	299	N/A
4	207.1225	12.98	13.78	26.76	43.50	-16.74	peak	100	236	N/A
5	277.0935	12.40	14.07	26.47	46.00	-19.53	peak	100	25	N/A
6*	497.6764	12.12	18.73	30.85	46.00	-15.15	peak	100	317	N/A



<b>Site:</b>	966 LAB	<b>Antenna::</b>	Horizontal	<b>Temperature(C):</b>	24(C)
<b>Limit:</b>	FCC Part15 RE-Class B_3m	<b>Test Time:</b>		<b>Humidity(%):</b>	60%
<b>EUT:</b>	11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)	<b>Power Rating:</b>		<b>2021/10/9 15:00:20</b>	
<b>M/N.:</b>	28008	<b>Test Engineer:</b>		<b>DC 3V</b>	
<b>Mode:</b>	Tx mode			<b>Taylor_Chen</b>	
<b>Note:</b>					

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	36.0007	10.40	16.84	27.24	40.00	-12.76	peak	200	31	N/A
2	53.6931	14.85	15.41	30.26	40.00	-9.74	peak	100	78	N/A
3	75.4463	14.37	12.81	27.18	40.00	-12.82	peak	200	3	N/A
4	151.0665	11.89	16.42	28.31	43.50	-15.19	peak	100	348	N/A
5	205.6750	13.78	12.52	26.30	43.50	-17.20	peak	200	184	N/A
6*	291.0358	12.88	15.32	28.20	46.00	-17.80	peak	200	123	N/A

<b>Site:</b>	<b>966 LAB</b>	<b>Antenna::H / V</b>	<b>Temperature(C):24(C)</b>
<b>Limit:</b>	<b>FCC Part 15.249</b>		<b>Humidity(%):60%</b>
<b>EUT:</b>	<b>11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)</b>	<b>Test Time:</b>	<b>2021/10/13 9:33:42</b>
<b>M/N.:</b>	<b>28008</b>	<b>Power Rating:</b>	<b>DC 3V</b>
<b>Mode:</b>	<b>Tx mode (2402MHz)</b>	<b>Test Engineer:</b>	
<b>Note:</b>			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre-amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarization
2402.00	89.36	26.37	40.19	8.51	84.05	114	-29.95	Peak	H
2402.00	80.87	26.37	40.19	8.51	75.56	94	-18.44	AVG	H
4804.00	57.98	31.00	40.19	9.53	58.32	74	-15.68	Peak	H
4804.00	45.65	31.00	40.19	9.53	45.99	54	-8.01	AVG	H
2402.00	88.55	26.37	40.19	8.51	83.24	114	-30.76	Peak	V
2402.00	81.85	26.37	40.19	8.51	76.54	94	-17.46	AVG	V
4804.00	51.96	31.00	40.19	9.53	52.30	74	-21.70	Peak	V
4804.00	45.93	31.00	40.19	9.53	46.27	54	-7.73	AVG	V

Note: 1. Result Level = Reading Level + Antenna Factor + Cable loss – Pre-amp Factor.

2. Antenna polarization: “H” means Horizontal, “V” means Vertical.



<b>Site:</b>	<b>966 LAB</b>	<b>Antenna::H / V</b>	<b>Temperature(C):24(C)</b>
<b>Limit:</b>	<b>FCC Part 15.249</b>		<b>Humidity(%):60%</b>
<b>EUT:</b>	<b>11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)</b>	<b>Test Time:</b>	<b>2021/10/13 9:41:35</b>
<b>M/N.:</b>	<b>28008</b>	<b>Power Rating:</b>	<b>DC 3V</b>
<b>Mode:</b>	<b>Tx mode (2439MHz)</b>	<b>Test Engineer:</b>	
<b>Note:</b>			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre-amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarization
2439.00	90.03	26.37	40.19	8.51	84.72	114	-29.28	Peak	H
2439.00	80.90	26.37	40.19	8.51	75.59	94	-18.41	AVG	H
4848.00	59.36	31.04	40.19	9.59	59.80	74	-14.20	Peak	H
4848.00	44.34	31.04	40.19	9.59	44.78	54	-9.22	AVG	H
2439.00	87.47	26.37	40.19	8.51	82.16	114	-31.84	Peak	V
2439.00	80.32	26.37	40.19	8.51	75.01	94	-18.99	AVG	V
4848.00	62.42	31.04	40.19	9.59	62.86	74	-11.14	Peak	V
4848.00	46.08	31.04	40.19	9.59	46.52	54	-7.48	AVG	V

Note: 1. Result Level = Reading Level + Antenna Factor + Cable loss – Pre-amp Factor.

2. Antenna polarization: “H” means Horizontal, “V” means Vertical.

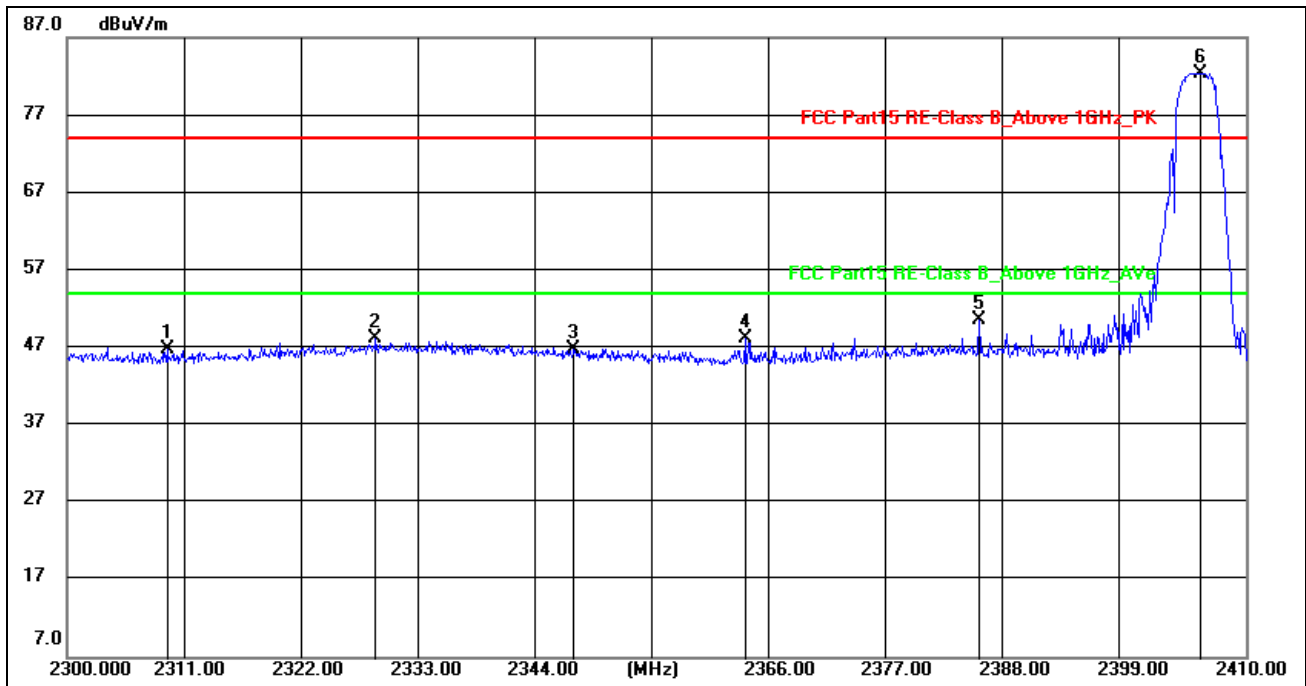
<b>Site:</b>	<b>966 LAB</b>	<b>Antenna::H / V</b>	<b>Temperature(C):24(C)</b>
<b>Limit:</b>	<b>FCC Part 15.249</b>		<b>Humidity(%):60%</b>
<b>EUT:</b>	<b>11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)</b>	<b>Test Time:</b>	<b>2021/10/13 9:49:12</b>
<b>M/N.:</b>	<b>28008</b>	<b>Power Rating:</b>	<b>DC 3V</b>
<b>Mode:</b>	<b>Tx mode (2478MHz)</b>	<b>Test Engineer:</b>	
<b>Note:</b>			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre-amp (dB)	Cable loss (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarization
2478.00	91.11	26.37	40.19	8.51	85.80	114	-28.20	Peak	H
2478.00	83.36	26.37	40.19	8.51	78.05	94	-15.95	AVG	H
4956.00	54.34	31.02	40.19	9.62	54.79	74	-19.21	Peak	H
4956.00	47.28	31.02	40.19	9.62	47.73	54	-6.27	AVG	H
2478.00	89.47	26.37	40.19	8.51	84.16	114	-29.84	Peak	V
2478.00	80.14	26.37	40.19	8.51	74.83	94	-19.17	AVG	V
4956.00	56.32	31.02	40.19	9.62	56.77	74	-17.23	Peak	V
4956.00	44.22	31.02	40.19	9.62	44.67	54	-9.33	AVG	V

Note: 1. Result Level = Reading Level + Antenna Factor + Cable loss – Pre-amp Factor.

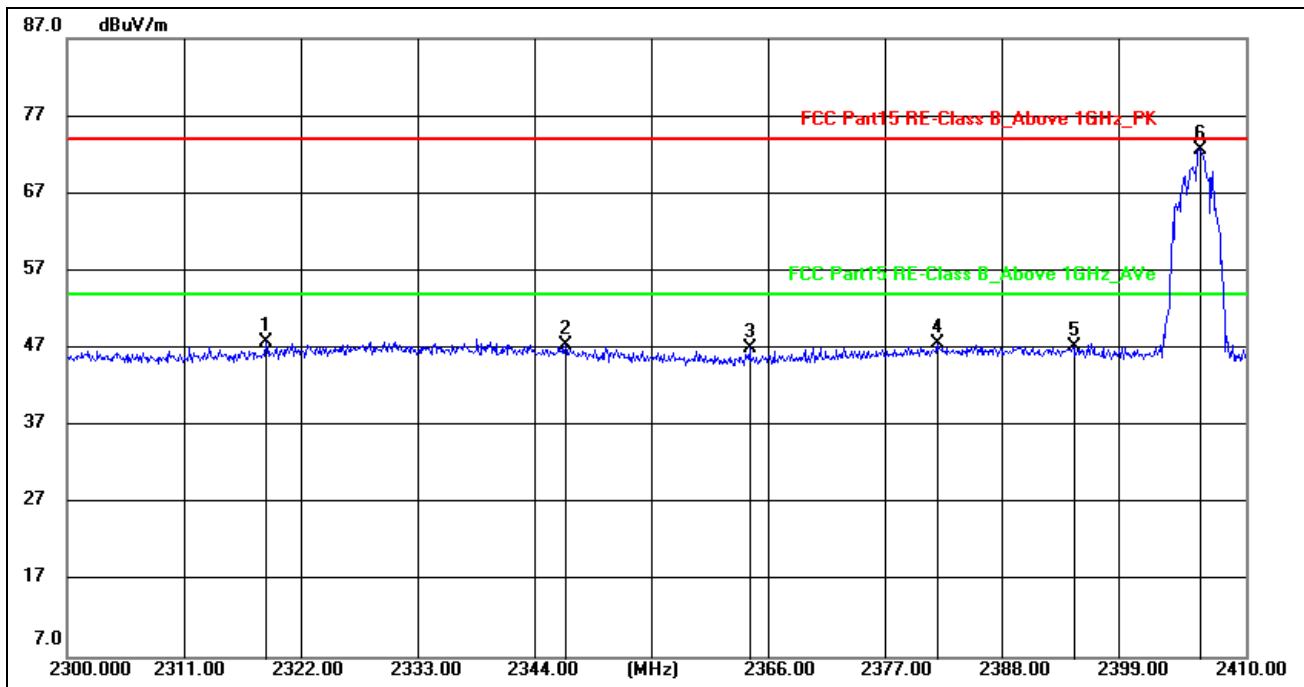
2. Antenna polarization: “H” means Horizontal, “V” means Vertical.

Test plots for band-edge



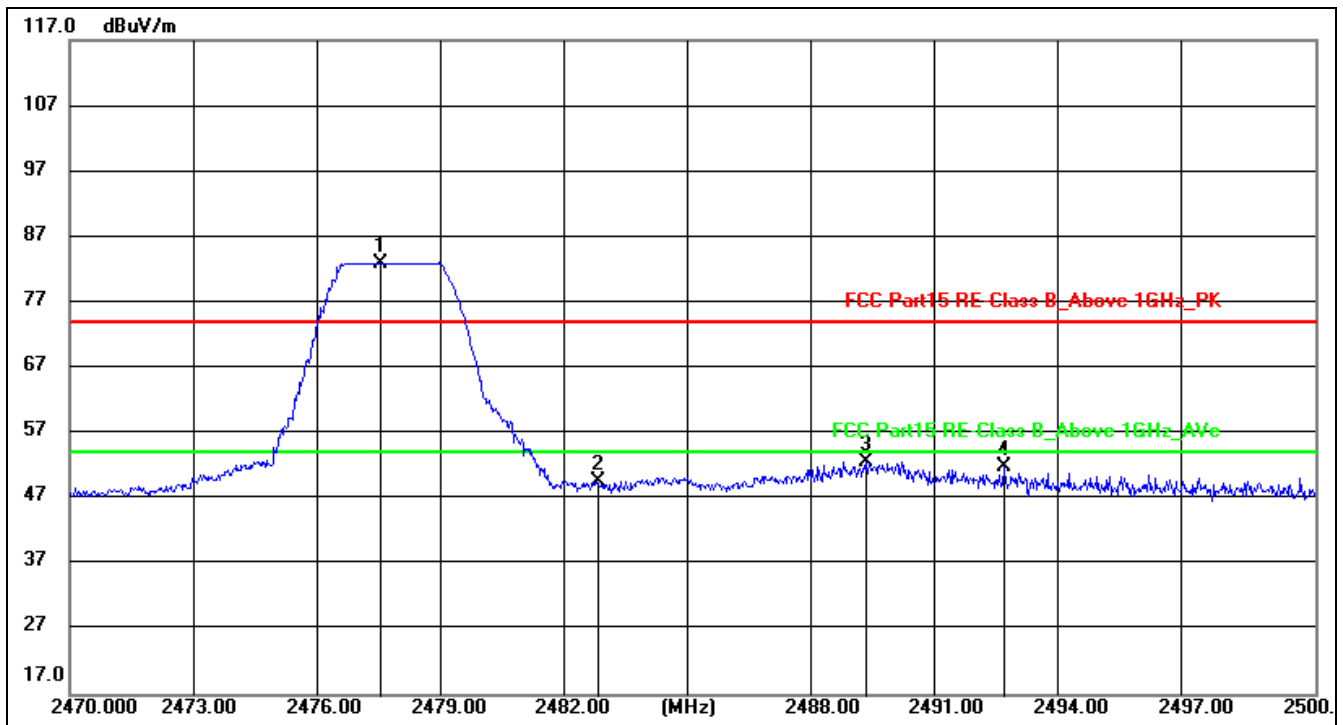
Site:		Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)	Test Time:	2021/10/13 9:39:36
M/N.:	28008	Power Rating:	DC 3V
Mode:	Tx mode (2402MHz)	Test Engineer:	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	2309.350	57.69	-10.85	46.84	74.00	-27.16	peak	200	131	N/A
2	2328.820	58.95	-10.83	48.12	74.00	-25.88	peak	100	221	N/A
3	2347.300	57.71	-10.81	46.90	74.00	-27.10	peak	100	356	N/A
4	2363.250	58.93	-10.80	48.13	74.00	-25.87	peak	200	68	N/A
5	2385.140	61.39	-10.78	50.61	74.00	-23.39	peak	100	83	N/A
6 *	2402.710	93.15	-10.76	82.39	114.00	-31.61	peak	200	3	N/A



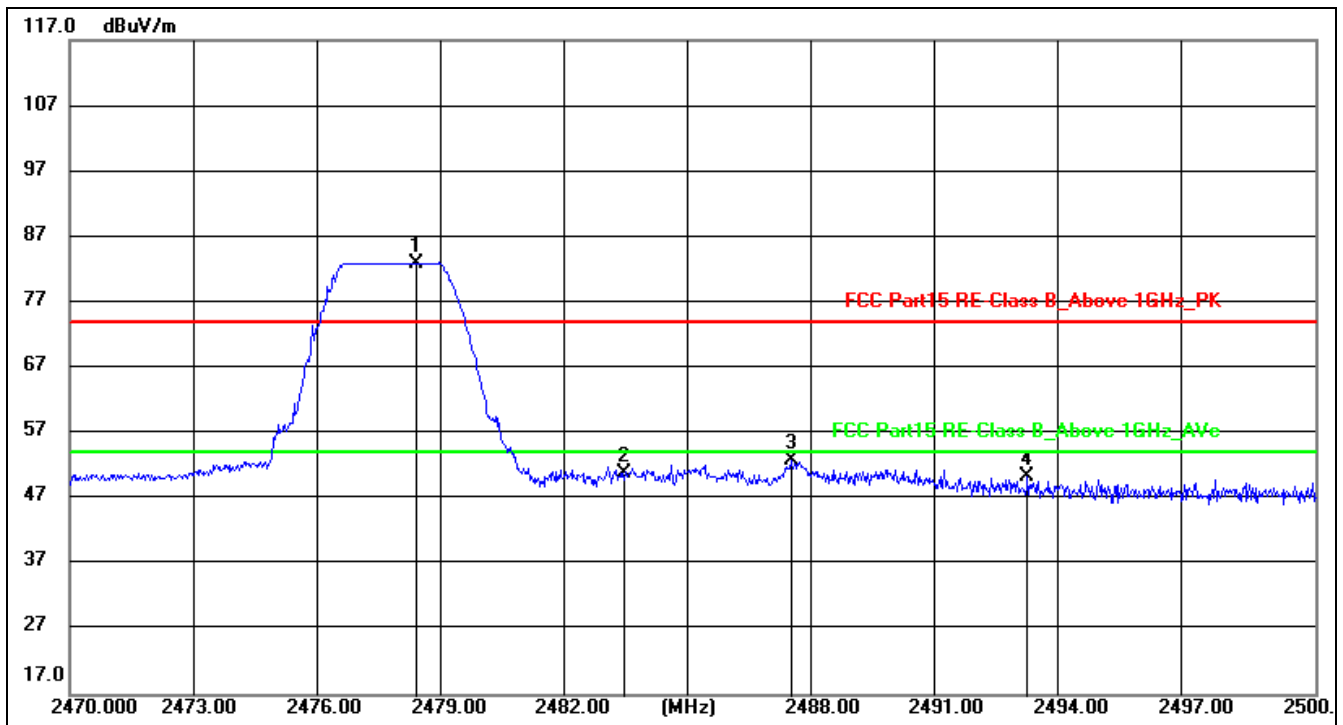
<b>Site:</b>		<b>Antenna::</b> Horizontal	<b>Temperature(C):</b> 24(C)
<b>Limit:</b>	FCC Part 15.249		<b>Humidity(%):</b> 60%
<b>EUT:</b>	11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)	<b>Test Time:</b>	2021/10/13 9:33:36
<b>M/N.:</b>	28008	<b>Power Rating:</b>	DC 3V
<b>Mode:</b>	Tx mode (2402MHz)	<b>Test Engineer:</b>	
<b>Note:</b>			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	2318.590	58.65	-10.85	47.80	74.00	-26.20	peak	100	4	N/A
2	2346.530	58.20	-10.82	47.38	74.00	-26.62	peak	200	356	N/A
3	2363.690	57.71	-10.80	46.91	74.00	-27.09	peak	200	175	N/A
4	2381.180	58.45	-10.78	47.67	74.00	-26.33	peak	300	92	N/A
5	2393.940	57.99	-10.77	47.22	74.00	-26.78	peak	200	268	N/A
6 *	2402.710	83.44	-10.76	72.68	114.00	-41.32	peak	300	103	N/A



<b>Site:</b>		<b>Antenna::</b> Vertical	<b>Temperature(C):</b> 24(C)
<b>Limit:</b>	<b>FCC Part 15.249</b>		<b>Humidity(%):</b> 60%
<b>EUT:</b>	<b>11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)</b>	<b>Test Time:</b>	<b>2021/10/13 9:38:14</b>
<b>M/N.:</b>	<b>28008</b>	<b>Power Rating:</b>	<b>DC 3V</b>
<b>Mode:</b>	<b>Tx mode (2478MHz)</b>	<b>Test Engineer:</b>	
<b>Note:</b>			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1 *	2477.500	93.66	-10.70	82.96	114.00	-31.04	peak	200	23	N/A
2	2482.720	65.39	-10.70	54.69	74.00	-19.31	peak	100	12	N/A
3	2489.170	63.41	-10.69	52.72	74.00	-21.28	peak	100	153	N/A
4	2492.500	62.63	-10.69	51.94	74.00	-22.06	peak	200	4	N/A



<b>Site:</b>		<b>Antenna::</b> Horizontal	<b>Temperature(C):</b> 24(C)
<b>Limit:</b>	FCC Part 15.249		<b>Humidity(%):</b> 60%
<b>EUT:</b>	11/16 Diecast Cat 297D2 Radio Control Multi Terrain Loader (include 4 interchangeable work tools - bucket, auger, forks, and broom)	<b>Test Time:</b>	2021/10/13 9:39:45
<b>M/N.:</b>	28008	<b>Power Rating:</b>	DC 3V
<b>Mode:</b>	Tx mode (2478MHz)	<b>Test Engineer:</b>	
<b>Note:</b>			

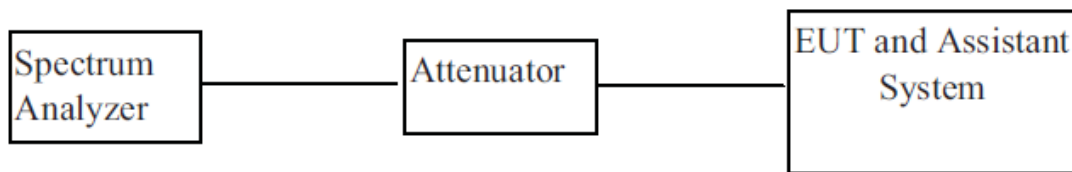
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1 *	2478.340	93.69	-10.70	82.99	114.00	-31.01	peak	100	246	N/A
2	2483.350	65.59	-10.70	54.89	74.00	-19.11	peak	200	125	N/A
3	2487.370	63.61	-10.69	52.92	74.00	-21.08	peak	200	156	N/A
4	2493.070	61.04	-10.69	50.35	74.00	-23.65	peak	200	201	N/A

## 4. -20dB & 99% Bandwidth

### 4.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Signal Analyzer	Agilent	N9020A	MY54510476	2021-05-21	1 Year

### 4.2. BLOCK DIAGRAM OF TEST SETUP



### 4.3. Limit

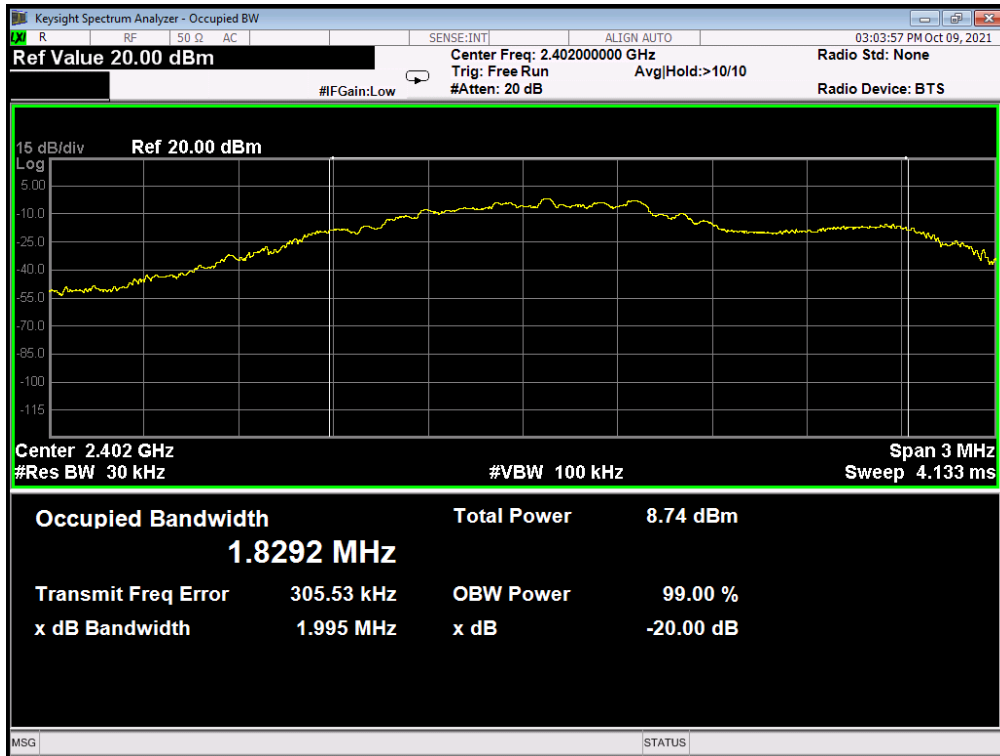
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 4.4. Test Procedure

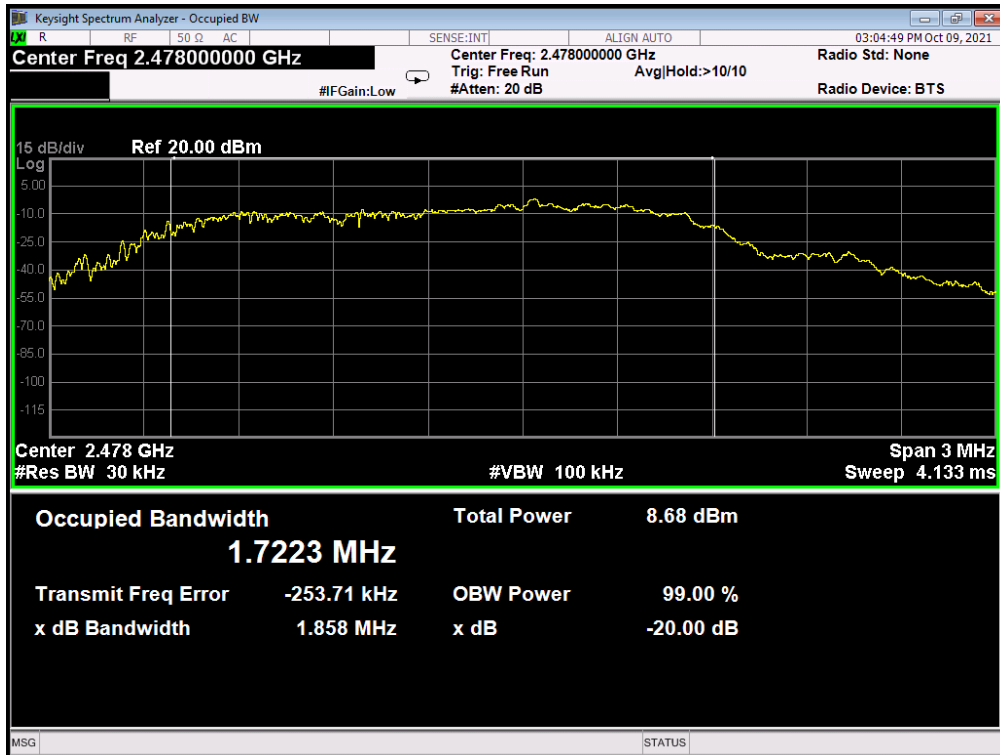
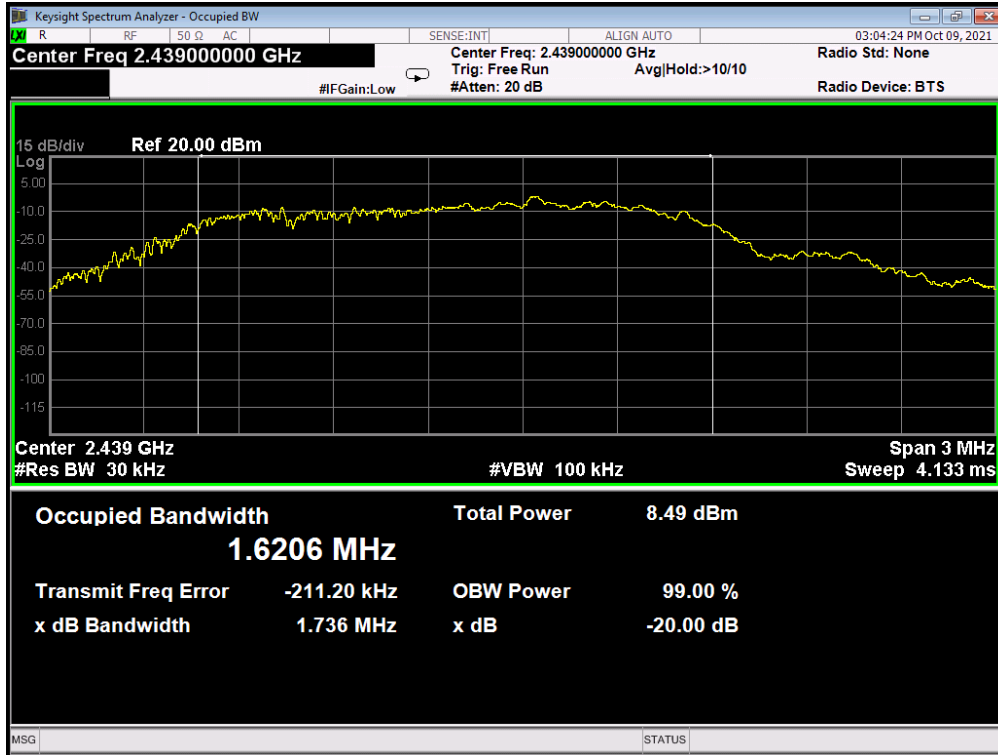
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

### 4.5. Test result

Frequency (MHz)	99% OBW (MHz)	-20 dB Bandwidth (MHz)	Verdict
2402	1.8292	1.995	Pass
2439	1.6206	1.736	Pass
2478	1.7223	1.858	Pass







## ANTENNA REQUIREMENTS

### 4.6. Limit

For intentional device, according to FCC 47 CFR Section 15.203 and RSS-GEN, 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. And according to FCC 47 CFR Section 15.249 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.7. Result

The EUT has an internal wire antenna permanently soldering on the printed circuit board, which complied with 15.203 and RSS-GEN, the maximum gain was 0.17 dBi.

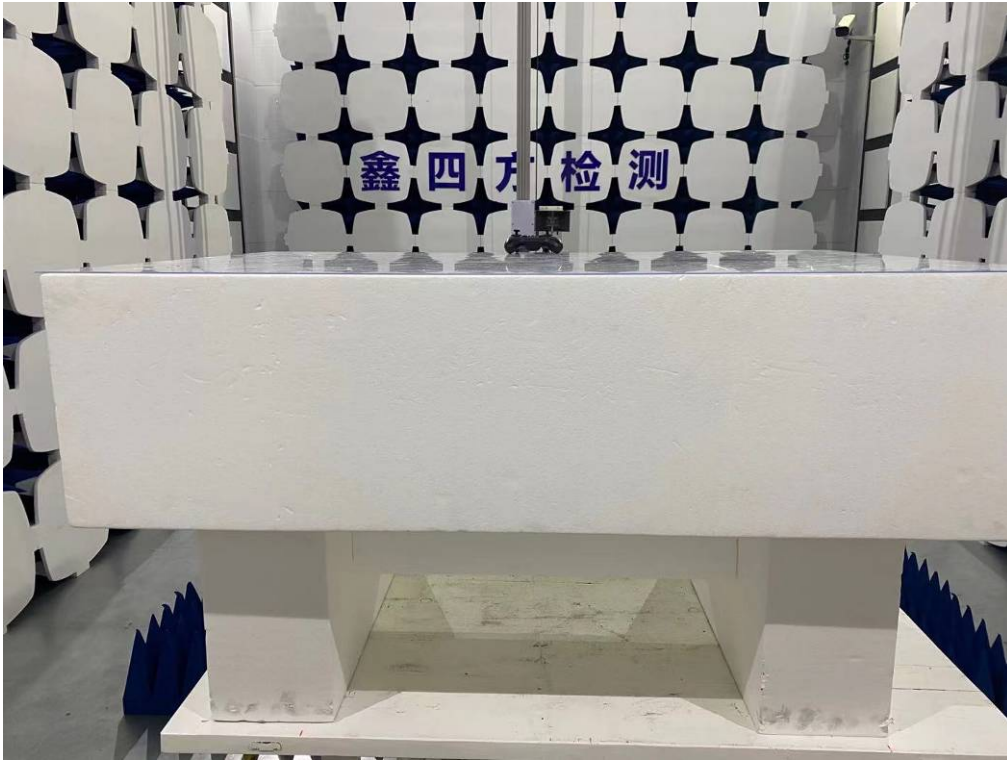
## 5. Test setup photograph

### 5.1. Photos of radiated emission test

30MHz – 1GHz



Above 1GHz

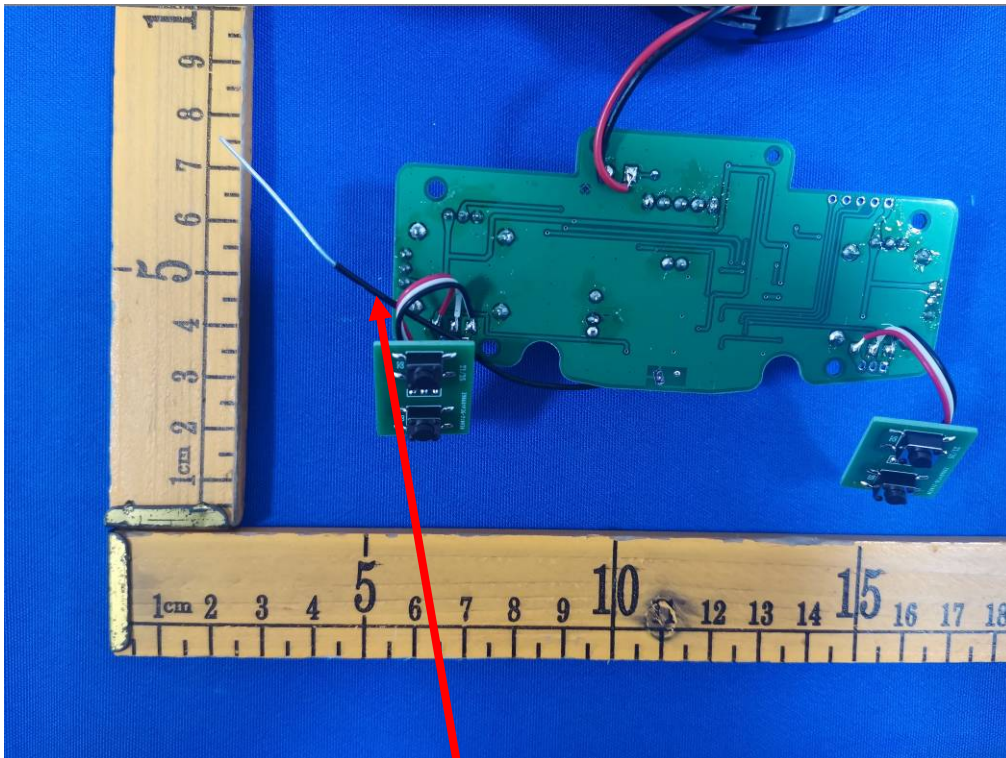
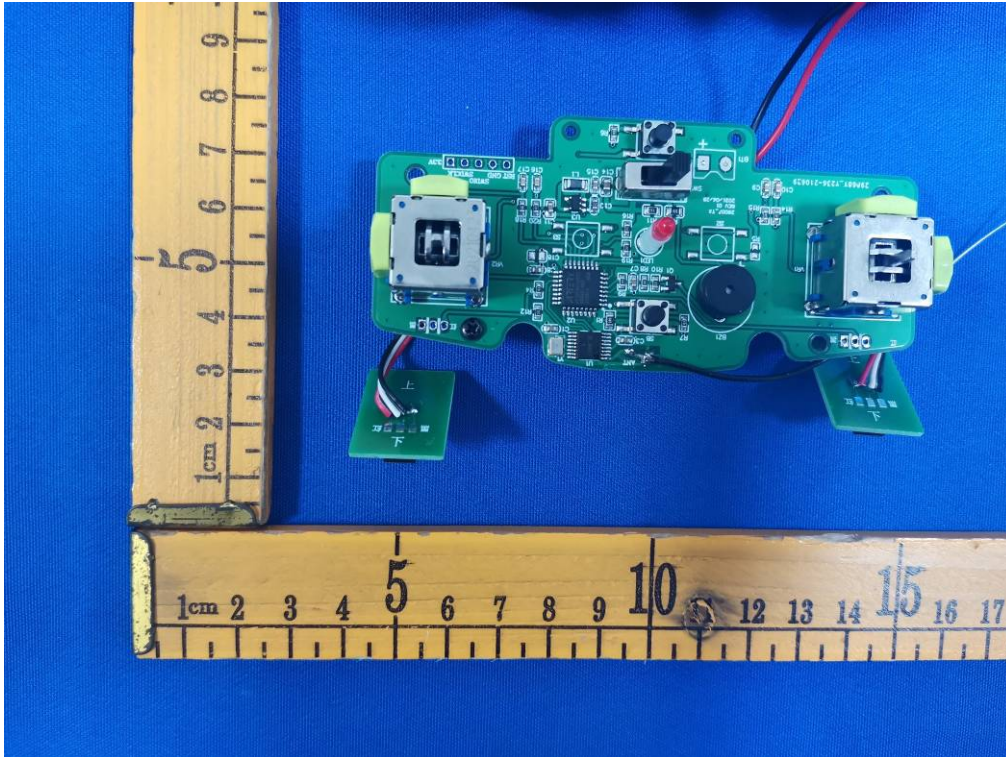


## 6. Photos of the EUT









**Antenna**

**--END OF REPORT--**