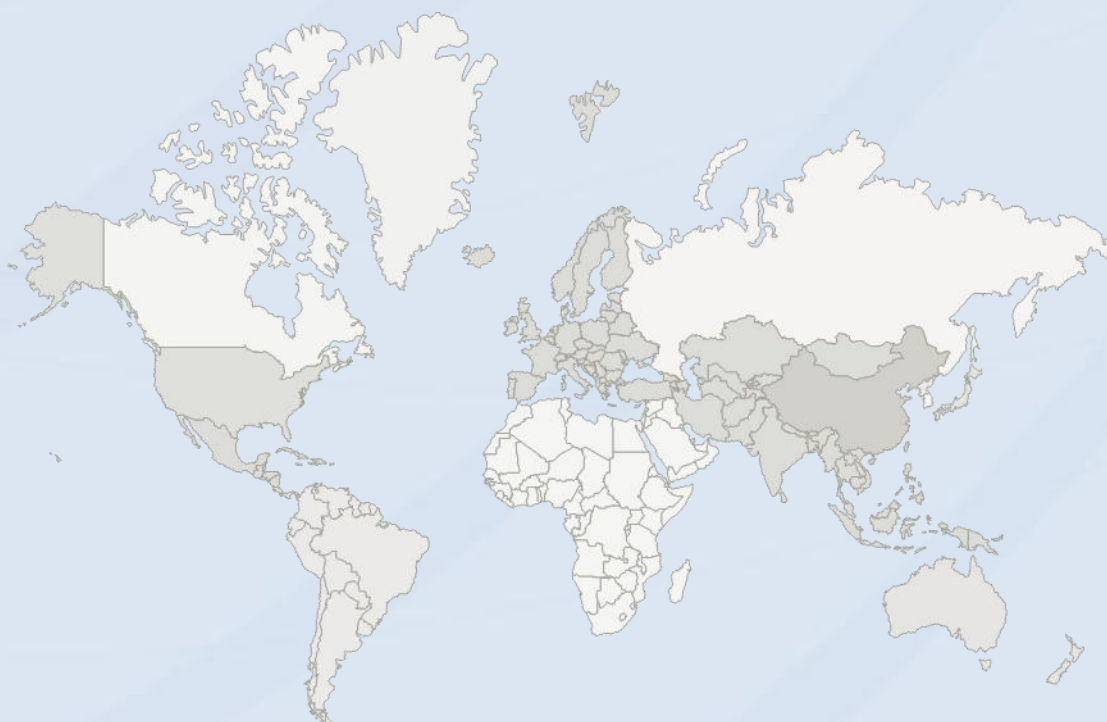


TEST REPORT

Report No..... : NTC-ER2109010

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



DONGGUAN NEW TESTING CENTRE CO., LTD

Address: 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China, 523808

Tel: +86-769-22212079

Web: <http://www.ntc-cert.com>

E-mail: dave@ntc-cert.com

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TEST REPORT DECLARE

IC ID	:	25977-28005
FCC ID	:	2AUJF-28005
Applicant	:	Diecast Masters Company Limited
Address	:	Room 1801-5, 18/F., King Palace Plaza, 52A Sha Tsui Road, Tsuen Wan, N.T., Hong Kong
Equipment under Test	:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer
Model No	:	28005
Trade Mark	:	Diecast-Masters
Manufacturer	:	Guang Dong Yu Lee Technology Corporation Limited
Address	:	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.

Report No.:	NTC-ER2109010		
Date of Test:	Jul.24, 2021 to Sept.16, 2021	Date of Report:	Sept.16, 2021

Prepared By:



Jack Liu/Engineer



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-210:2019; RSS-Gen:2019	PASS
Conducted emission test	FCC Part 15 Subpart C:2019 ANSI C63.10:2020 RSS-210:2019; RSS-Gen:2019	N/A
Radiated emission test	FCC Part 15 Subpart C:2019 ANSI C63.10:2020 RSS-210:2019; RSS-Gen:2019	PASS
Antenna requirement	FCC 15.203; RSS-GEN	PASS
Restricted band and band-edge	FCC 15.249,15.209; RSS-210,RSS-GEN	PASS

2. General test information

2.1. Description of EUT

EUT* Name	: 1/16 Cat 320 Radio Control Excavator with Grapple and Hammer
Test model	: 28005
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 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 04/59/74 were selected for testing.

Operation Frequency List :

Channel	Frequency (MHz)
01	2402
02	2403
03	2404
04	2405
⋮	⋮
59	2440
⋮	⋮
74	2475
75	2476
76	2477
77	2478

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:

2405MHz (modulation) -- > 2440 MHz (modulation) -- > 2475 MHz (modulation) -- > 2405 MHz

(Un-modulation) -- > 2440 MHz (Un-modulation)-- > 2475 MHz (Un-modulation).

Test Software Version	950M V1.0		
Tx power	Fixed		
Test Frequency	2405MHz	2440MHz	2475MHz

2.3. Block diagram EUT configuration for test

EUT

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	5.8×10^{-8}

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

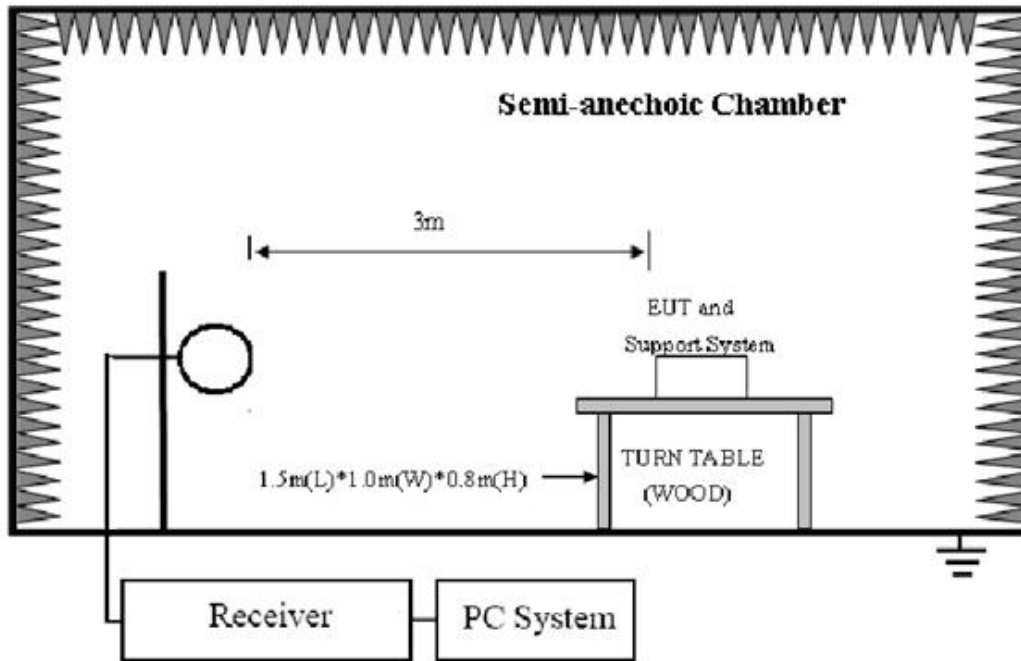
3. Radiated emission test

3.1. Test equipment

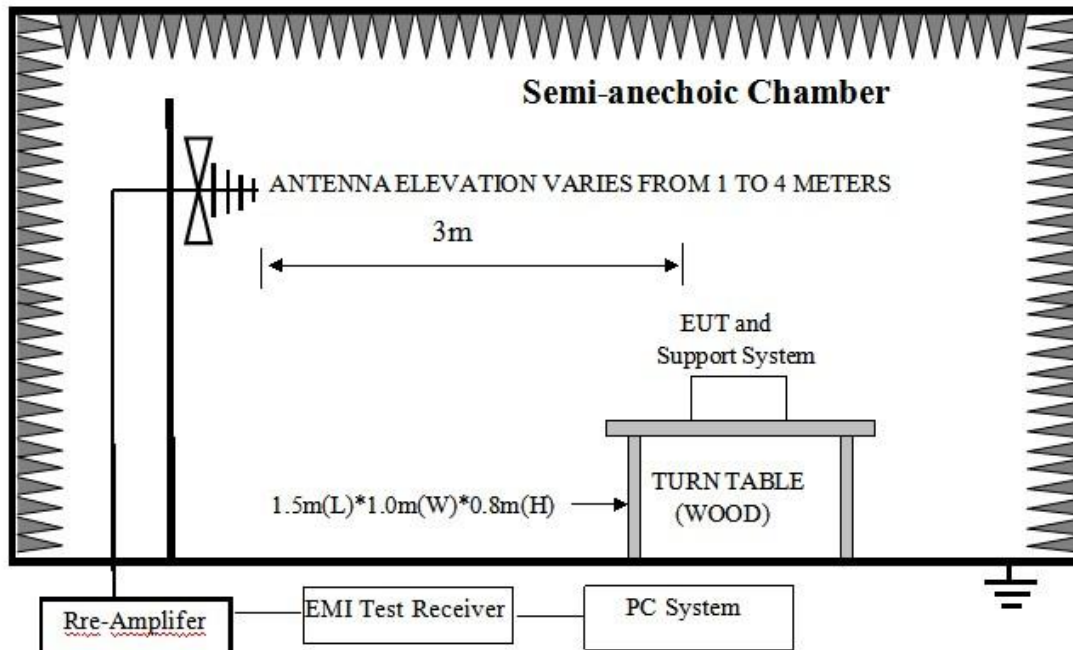
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESR	7250-30406 7528	2021-05-21	1Year
2	Trilog Broadband Antenna	Schwarzbeck	VULB9168	00969	2021-01-10	2 Year
3	Horn antenna	Schwarzbeck	BBHA9120D	453	2021-05-21	2Year
4	Pre-amplifier	Agilent	8449B	3008A04721	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

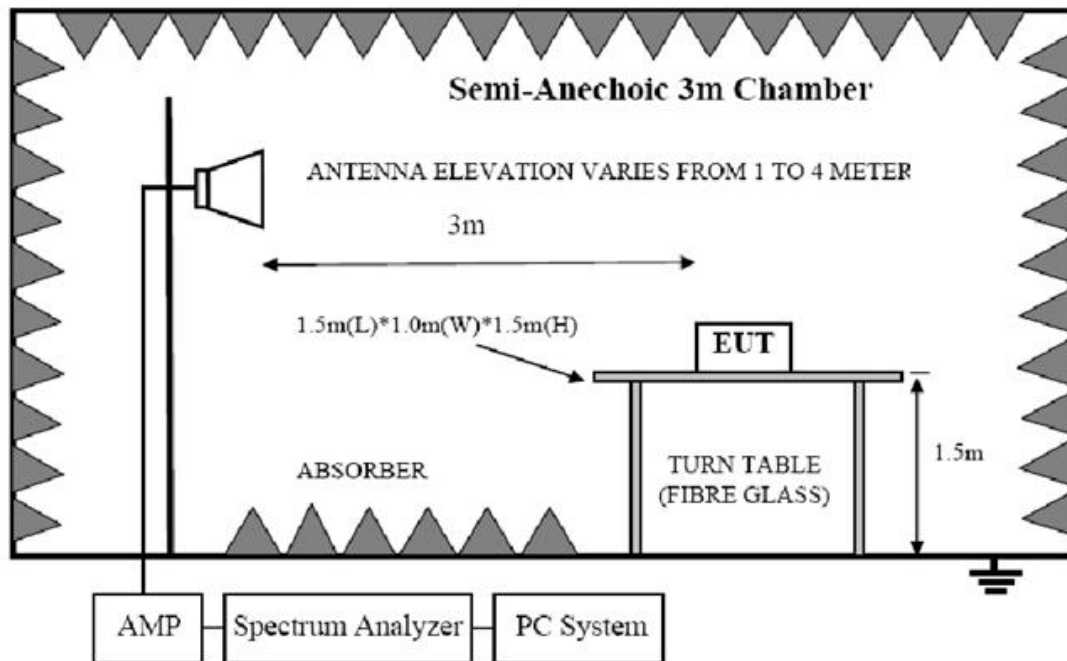
In 3m Anechoic Chamber Test Setup Diagram for 9KHz to 30MHz:



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
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)

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 than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V}/\text{m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V}/\text{m}) + 40\log(30\text{m}/3\text{m})$$

(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:

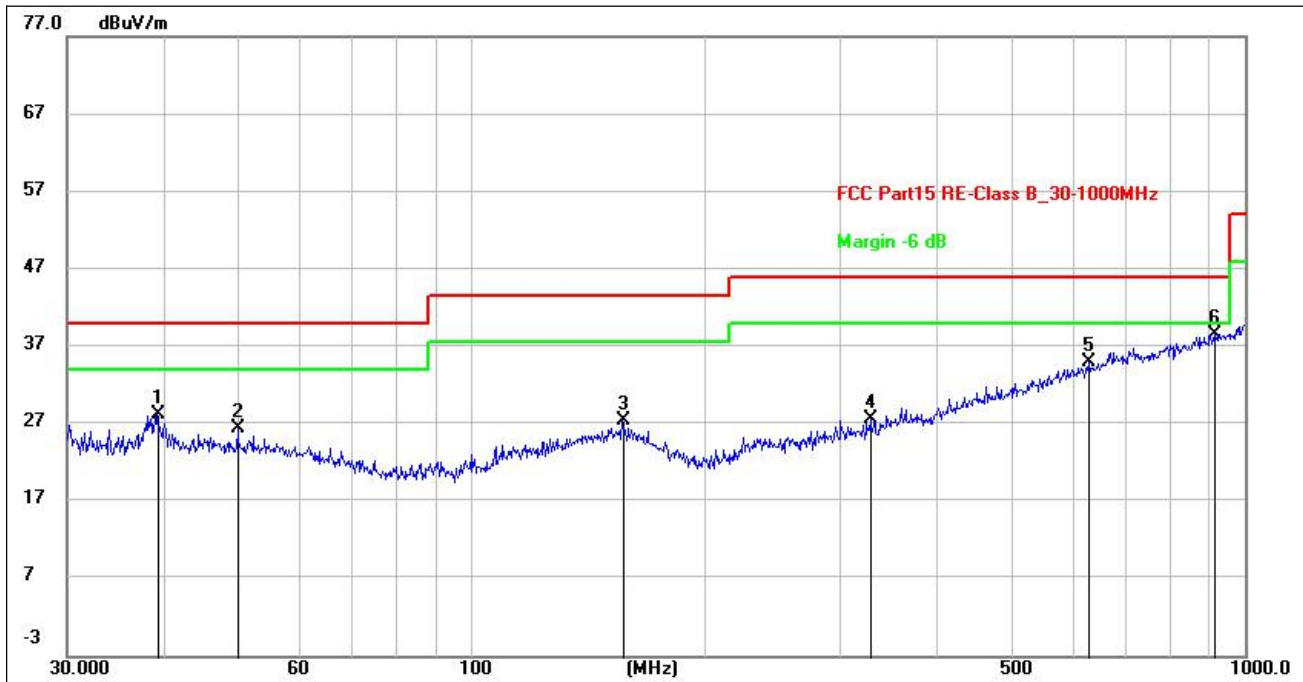
Frequency band	RBW
9KHz-150KHz	200Hz
150KHz-30MHz	9KHz
30MHz-1GHz	120KHz

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

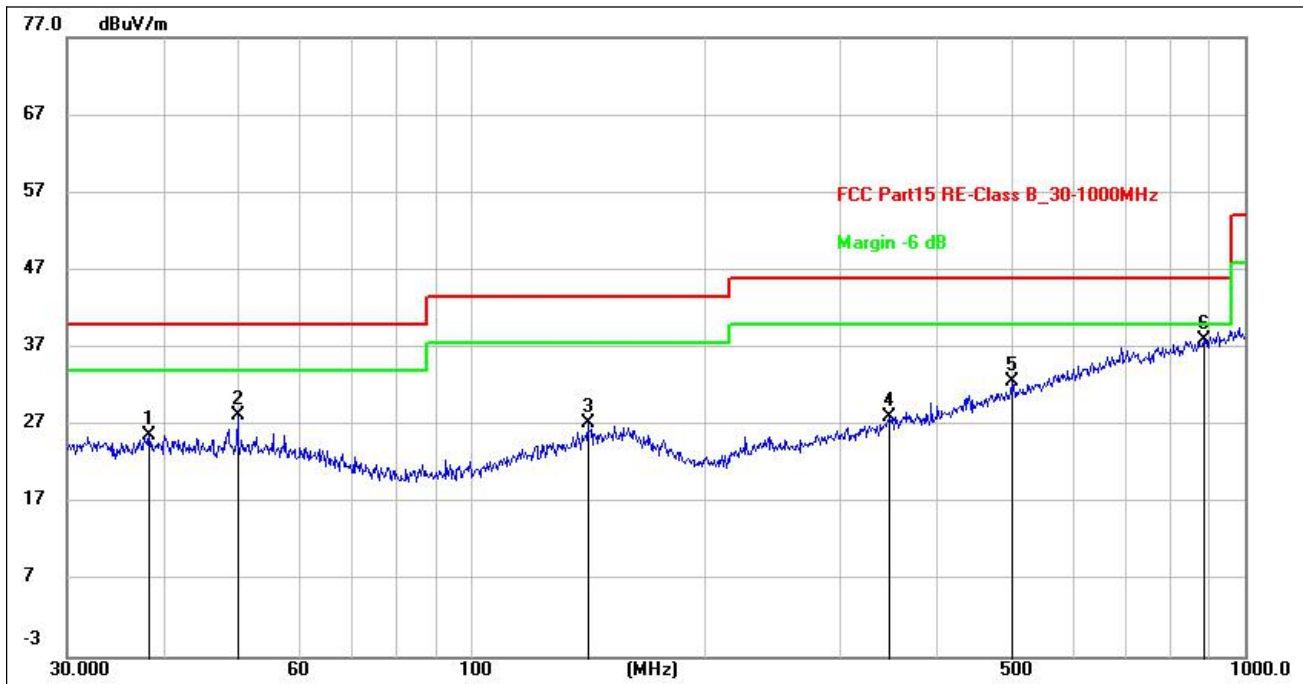
PASS. (See below detailed test result)

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



Site:	966 LAB	Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part15 RE-Class B_3m		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/8/11 9:18:16
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode	Test Engineer:	Taylor_Chen
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	39.1616	13.47	14.72	28.19	40.00	-11.81	peak	200	215	N/A
2	49.8814	12.18	14.34	26.52	40.00	-13.48	peak	100	3	N/A
3	156.4578	12.09	15.46	27.55	43.50	-15.95	peak	100	193	N/A
4	327.8873	12.43	15.26	27.69	46.00	-18.31	peak	100	3	N/A
5	629.4772	13.59	21.46	35.05	46.00	-10.95	peak	200	293	N/A
6 *	912.8620	13.54	24.99	38.53	46.00	-7.47	peak	200	78	N/A



Site:	966 LAB	Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part15 RE-Class B_3m		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/8/11 9:25:49
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode	Test Engineer:	Taylor_Chen
Note:			

No.	Frequenc y (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	38.3462	11.13	14.60	25.73	40.00	-14.27	peak	200	277	N/A
2	49.8814	13.84	14.34	28.18	40.00	-11.82	peak	200	3	N/A
3	141.3296	12.43	14.86	27.29	43.50	-16.21	peak	200	57	N/A
4	346.8092	12.53	15.59	28.12	46.00	-17.88	peak	200	3	N/A
5	499.4246	13.79	18.81	32.60	46.00	-13.40	peak	100	71	N/A
6 *	884.5028	13.51	24.56	38.07	46.00	-7.93	peak	100	114	N/A

Site:	966 LAB	Antenna::H / V	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/08/20
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode (2405MHz)	Test Engineer:	
Note:			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre- amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarizat ion
2405.00	98.77	26.37	40.19	8.51	93.46	114.00	-20.54	Peak	H
2405.00	88.18	26.37	40.19	8.51	82.87	94.00	-11.13	AVG	H
2390.00	58.55	26.33	40.23	8.46	53.11	74.00	-20.89	Peak	H
2390.00	50.20	26.33	40.23	8.46	44.76	54.00	-9.24	AVG	H
2400.00	56.42	26.38	40.20	8.49	51.09	74.00	-22.91	Peak	H
2400.00	39.71	26.38	40.20	8.49	34.38	54.00	-19.62	AVG	H
4810.00	57.74	31.00	40.19	9.53	58.08	74.00	-15.92	Peak	H
4810.00	46.50	31.00	40.19	9.53	46.84	54.00	-7.16	AVG	H
2405.00	89.72	26.37	40.19	8.51	84.41	114.00	-29.59	Peak	V
2405.00	81.41	26.37	40.21	8.51	76.10	94.00	-17.90	AVG	V
2390.00	47.85	26.33	40.23	8.46	42.41	74.00	-31.59	Peak	V
2390.00	39.84	26.33	40.23	8.46	34.40	54.00	-19.60	AVG	V
2400.00	47.72	26.38	40.20	8.49	42.39	74.00	-31.61	Peak	V
2400.00	47.79	26.38	40.20	8.49	42.46	54.00	-11.54	AVG	V
4810.00	51.99	31.00	40.19	9.53	52.33	74.00	-21.67	Peak	V
4810.00	45.86	31.00	40.19	9.53	46.20	54.00	-7.80	AVG	V

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

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

Site:	966 LAB	Antenna::H / V	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/08/20
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode (2440MHz)	Test Engineer:	
Note:			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre- amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarizat ion
2440.00	99.38	26.43	40.21	8.53	94.13	114.00	-19.87	Peak	H
2440.00	86.74	26.43	40.21	8.53	81.49	94.00	-12.51	AVG	H
4880.00	57.87	31.04	40.19	9.59	58.31	74.00	-15.69	Peak	H
4880.00	46.27	31.04	40.19	9.59	46.71	54.00	-7.29	AVG	H
2440.00	88.51	26.43	40.21	8.53	83.26	114.00	-30.74	Peak	V
2440.00	80.98	26.43	40.21	8.53	75.73	94.00	-18.27	AVG	V
4880.00	61.62	31.04	40.19	9.59	62.06	74.00	-11.94	Peak	V
4880.00	45.87	31.04	40.19	9.59	46.31	54.00	-7.69	AVG	V

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

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

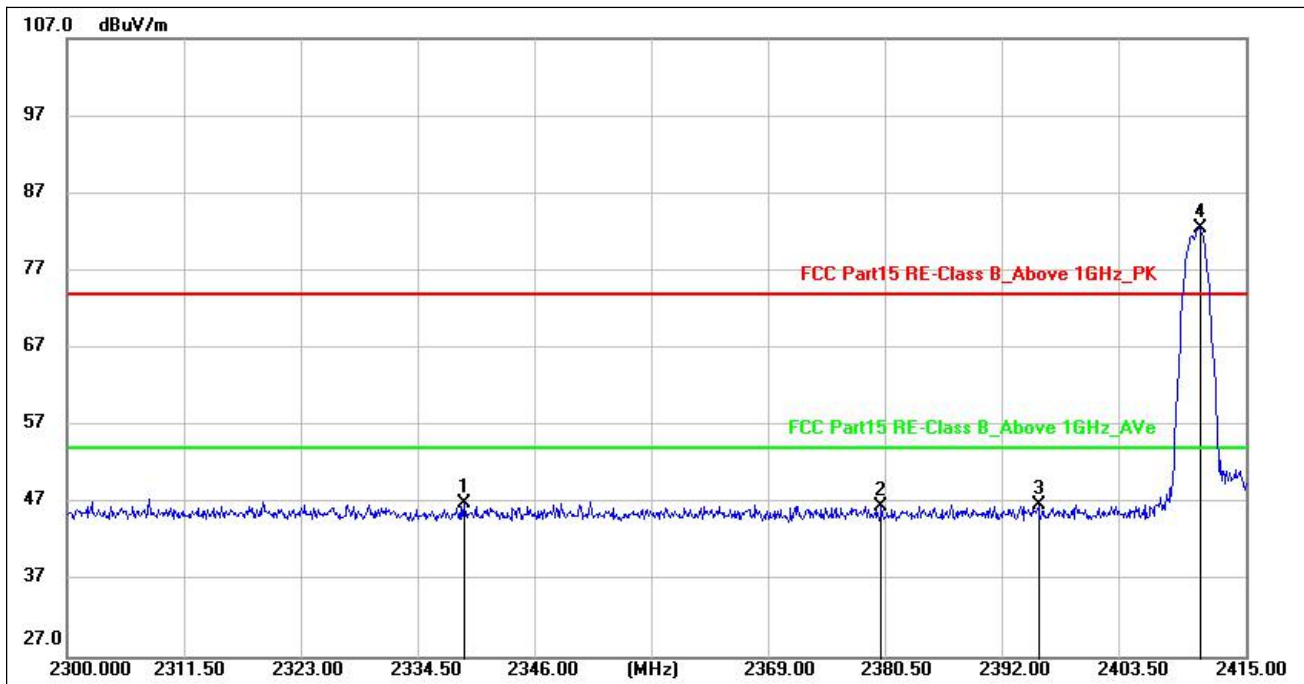
Site:	966 LAB	Antenna::H / V	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/08/20
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode (2475MHz)	Test Engineer:	
Note:			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre- amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarizat ion
2475.00	96.69	26.50	40.21	8.54	91.52	114.00	-22.48	Peak	H
2475.00	88.77	26.50	40.21	8.54	83.60	94.00	-10.40	AVG	H
2483.50	56.88	26.56	40.29	8.65	51.80	74.00	-22.20	Peak	H
2483.50	44.90	26.56	40.29	8.65	39.82	54.00	-14.18	AVG	H
4950.00	54.28	31.02	40.19	9.62	54.73	74.00	-19.27	Peak	H
4950.00	45.88	31.02	40.19	9.62	46.33	54.00	-7.67	AVG	H
2475.00	87.53	26.50	40.21	8.54	82.36	114.00	-31.64	Peak	V
2475.00	76.70	26.50	40.21	8.54	71.53	94.00	-22.47	AVG	V
2483.50	53.46	26.56	40.29	8.65	48.38	74.00	-25.62	Peak	V
2483.50	37.08	26.56	40.29	8.65	32.00	54.00	-22.00	AVG	V
4950.00	55.18	31.02	40.19	9.62	55.63	74.00	-18.37	Peak	V
4950.00	44.77	31.02	40.19	9.62	45.22	54.00	-8.78	AVG	V

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

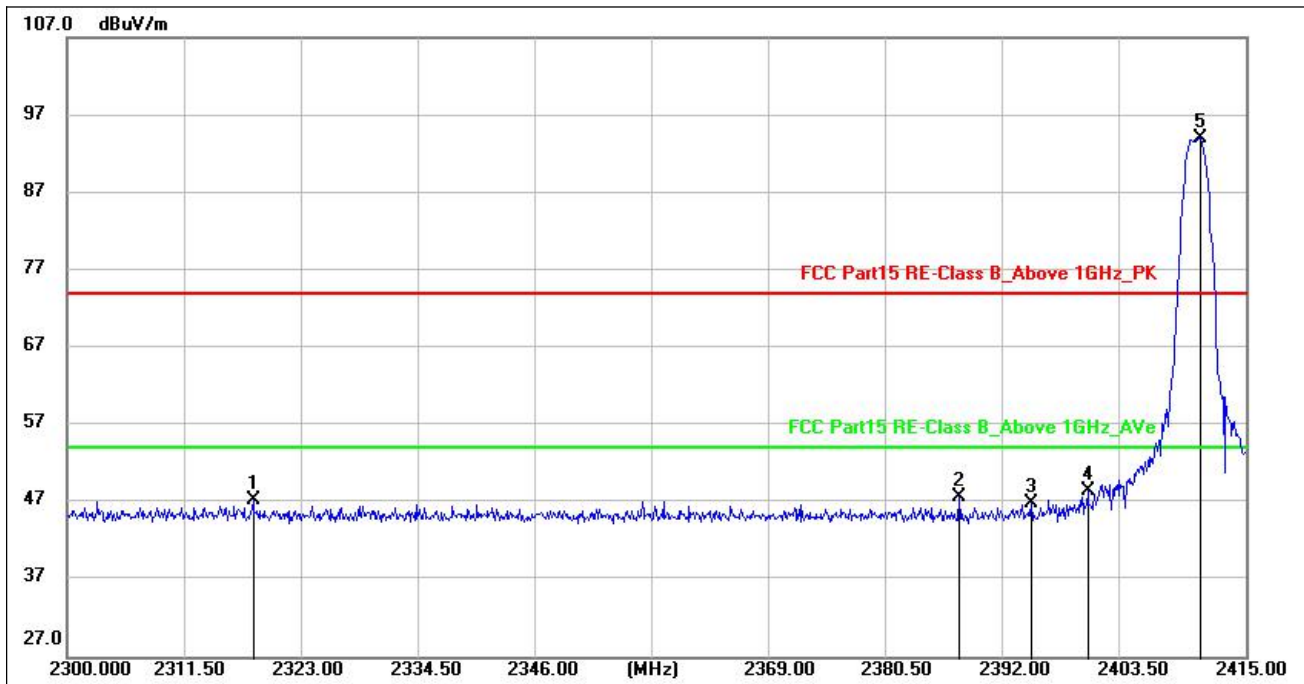
2. Antenna polarization: "H" means Horizontal, "V" means Vertical.

Test plots for band-edge



Site:		Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/9/14 18:39:23
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode (2405MHz)	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	2338.76	52.32	-5.30	47.02	74.00	-26.98	peak	200	356	N/A
2	2379.47	51.87	-5.30	46.57	74.00	-27.43	peak	200	175	N/A
3	2394.76	52.15	-5.30	46.85	74.00	-27.15	peak	300	92	N/A
4 *	2410.52	87.79	-5.31	82.48	114.00	-31.52	peak	200	268	N/A



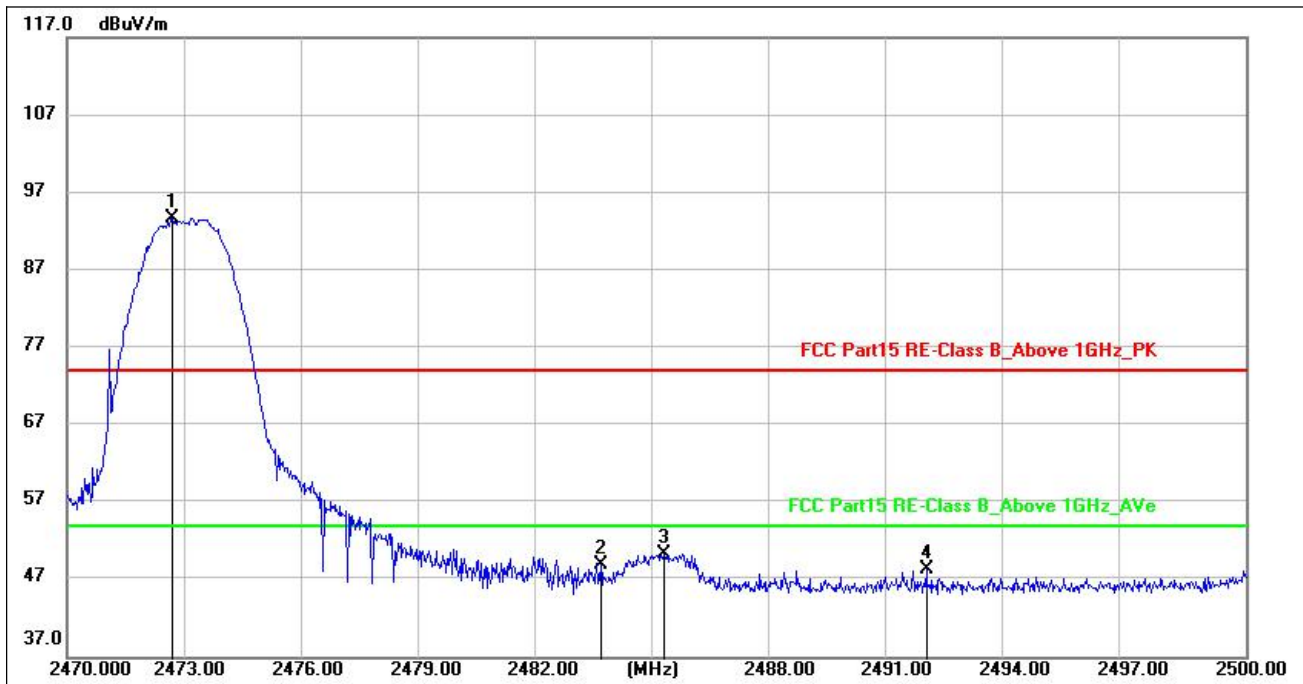
Site:		Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/9/14 18:53:17
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode (2405MHz)	Test Engineer:	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	2318.17	52.63	-5.30	47.33	74.00	-26.67	peak	200	131	N/A
2	2387.06	53.11	-5.30	47.81	74.00	-26.19	peak	100	221	N/A
3	2394.07	52.31	-5.30	47.01	74.00	-26.99	peak	100	356	N/A
4	2399.59	53.78	-5.30	48.48	74.00	-25.52	peak	200	68	N/A
5 *	2410.52	99.33	-5.31	94.02	114.00	-19.98	peak	200	131	N/A



Site:		Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/9/14 18:58:52
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode (2475MHz)	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 *	2473.01	92.25	-5.17	87.08	114.00	-26.92	peak	200	23	N/A
2	2483.56	51.56	-5.08	46.48	74.00	-27.52	peak	100	133	N/A
3	2485.39	55.45	-5.08	50.37	74.00	-23.63	peak	125	185	N/A
4	2497.78	52.93	-5.08	47.85	74.00	-26.15	peak	148	189	N/A



Site:		Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part 15.249		Humidity(%):60%
EUT:	1/16 Cat 320 Radio Control Excavator with Grapple and Hammer	Test Time:	2021/9/14 18:06:45
M/N.:	28005	Power Rating:	DC 3V
Mode:	Tx mode (2475MHz)	Test Engineer:	
Note:			

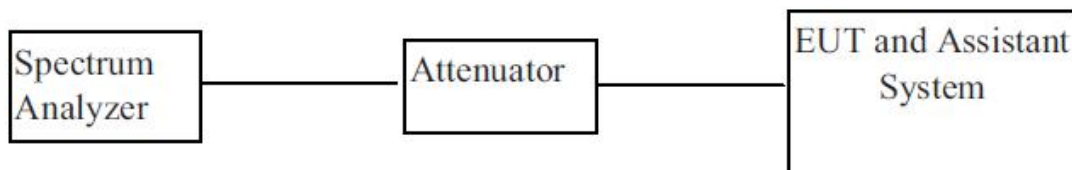
No	Frequenc y (MHz)	Readin g (dBuV)	Factor (dB/m)	Level (dBuV/ m)	Limit (dBuV/ m)	Margi n (dB)	Det.	Heigh t (cm)	Azimut h (deg)	Remar k
1 *	2472.67	98.85	-5.17	93.68	114.00	-20.32	pea k	100	246	N/A
2	2483.59	54.05	-5.08	48.97	74.00	-25.03	pea k	100	246	N/A
3	2485.18	55.50	-5.08	50.42	74.00	-23.58	pea k	100	254	N/A
4	2491.87	53.54	-5.08	48.46	74.00	-25.54	pea k	100	237	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

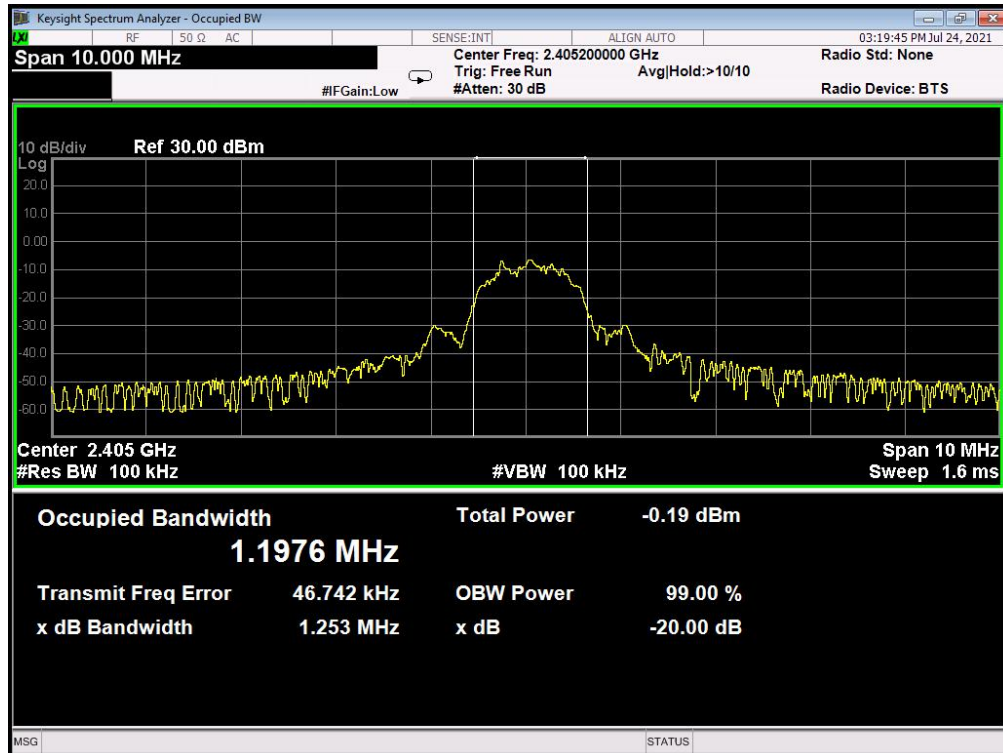
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific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

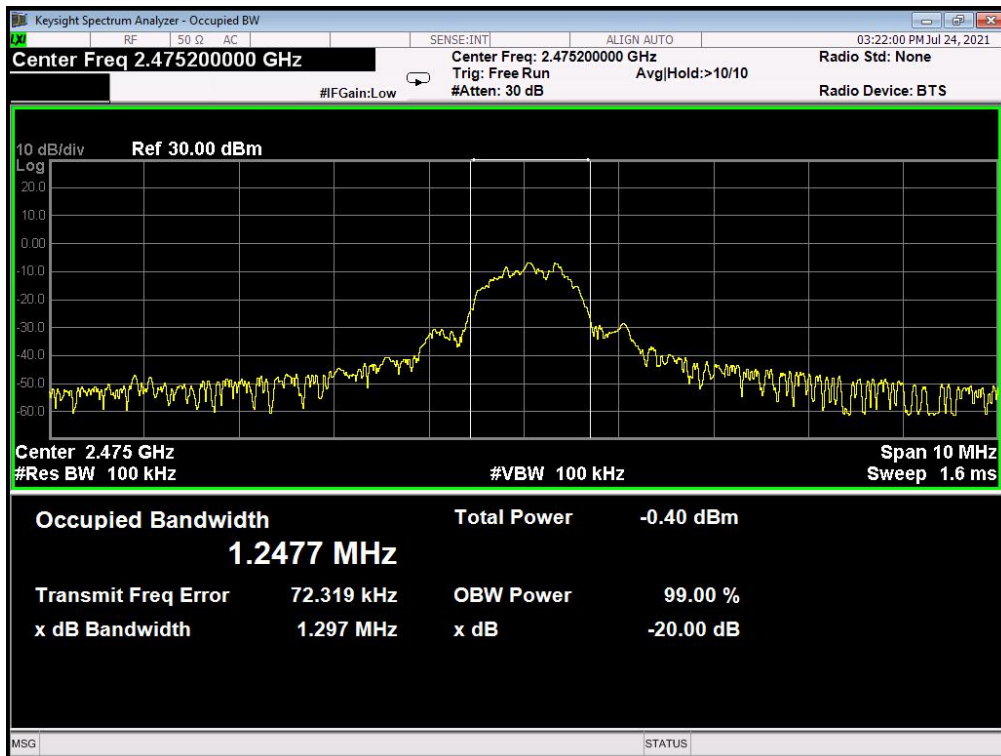
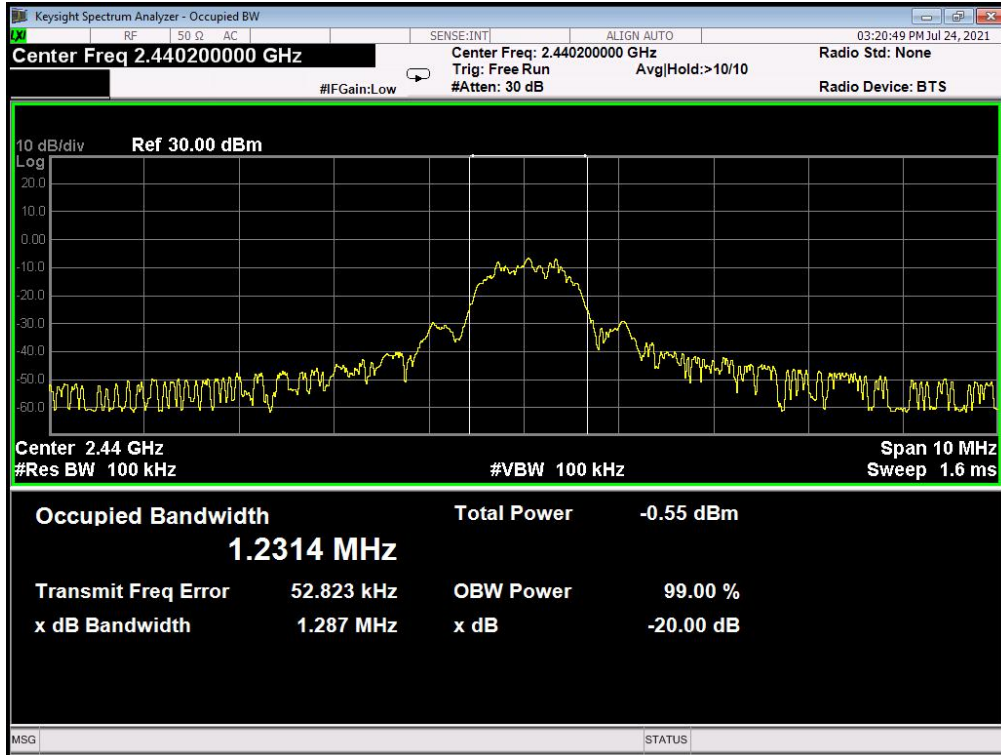
4.4. Test Procedure

- (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 51 kHz RBW and 510 kHz 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
2405	1.1976	1.253	Pass
2440	1.2314	1.287	Pass
2475	1.2477	1.297	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 dBi.

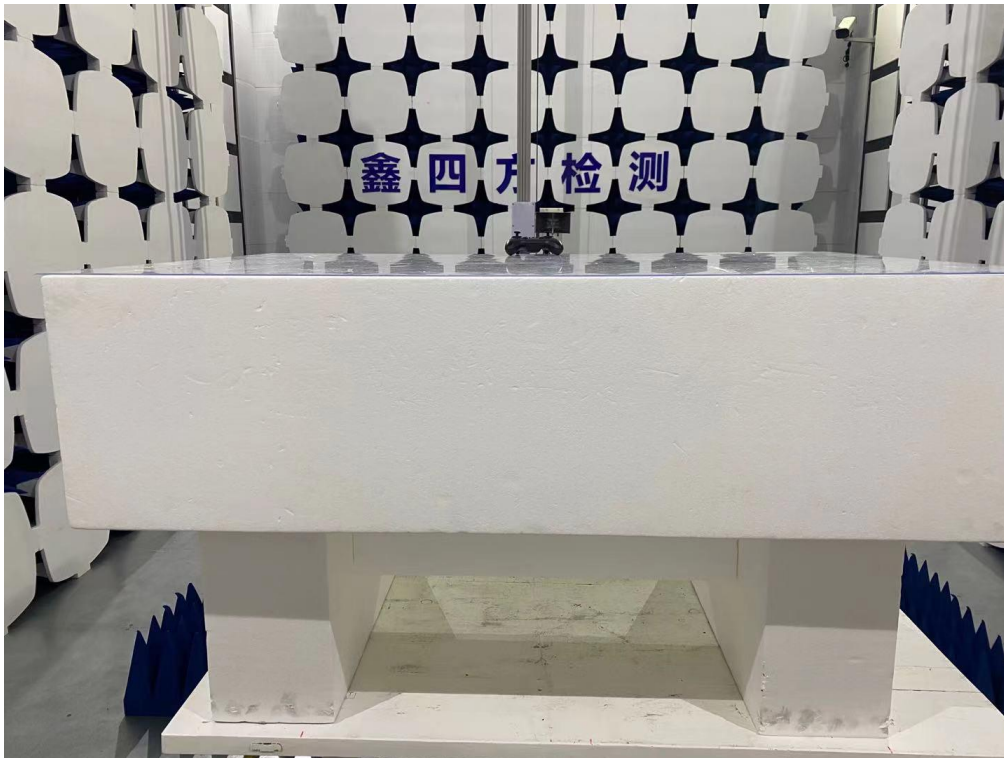
5. Test setup photograph

5.1. Photos of radiated emission test

30MHz – 1GHz

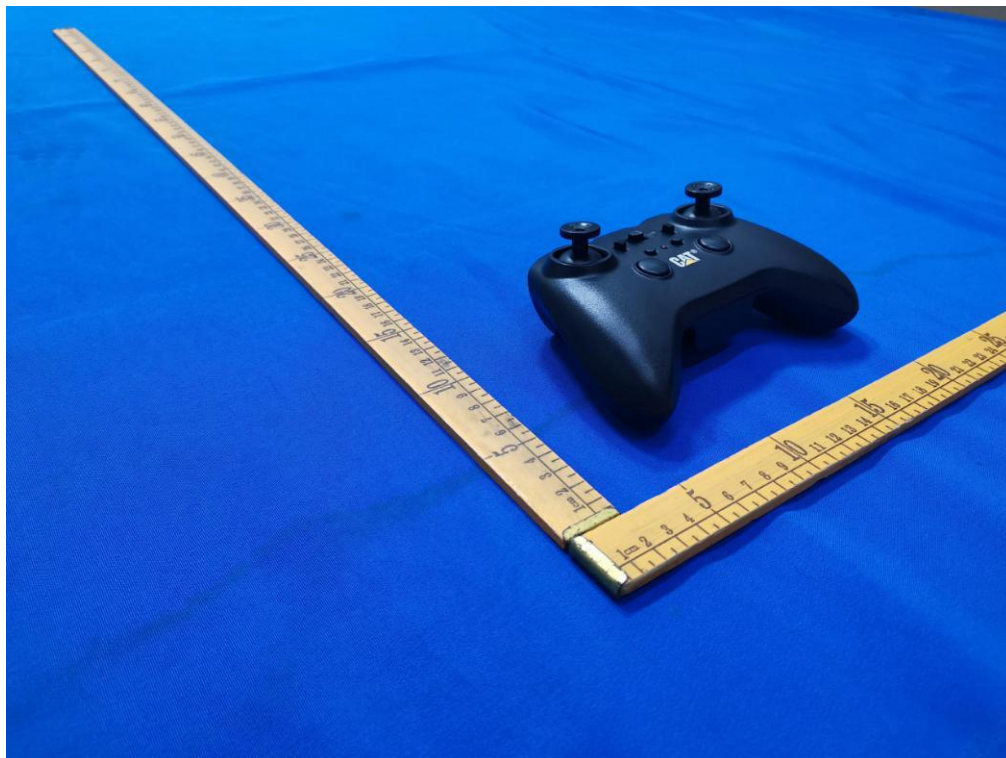


Above 1GHz

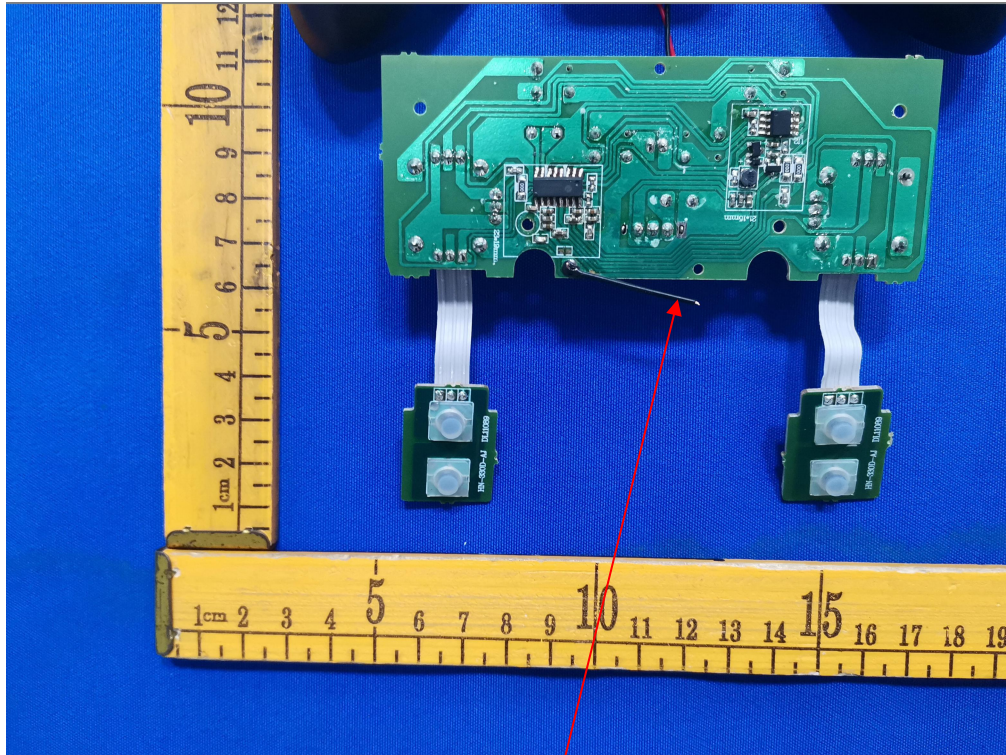


6. Photos of the EUT

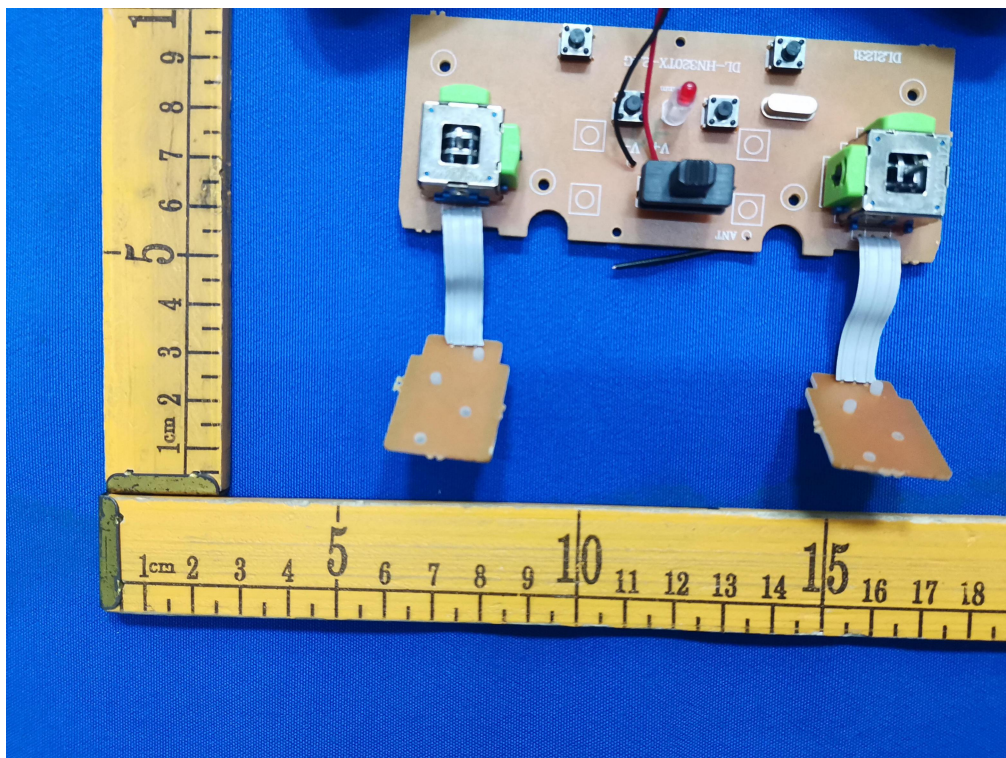








Antenna



--END OF REPORT--