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# FCC Test Report

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Report No.: AGC15705230830FR01

**FCC ID** : ZY3-HB-SC24-24  
**APPLICATION PURPOSE** : Original Equipment  
**PRODUCT DESIGNATION** : R/C TOYS  
**BRAND NAME** : N/A  
**MODEL NAME** : See page 4  
**APPLICANT** : HUANG BO TOYS FACTORY  
**DATE OF ISSUE** : Aug. 17, 2023  
**STANDARD(S)** : FCC Part 15 Subpart C §15.249  
**TEST PROCEDURE(S)**  
**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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**REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug. 17, 2023	Valid	Initial Release

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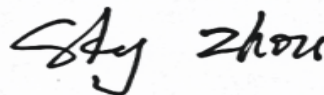
### 1. VERIFICATION OF CONFORMITY

<b>Applicant</b>	HUANG BO TOYS FACTORY
<b>Address</b>	25 4th Road, Dongguahu Industrial Area, Huaize, Lianx, Shantou, China
<b>Manufacturer</b>	HUANG BO TOYS FACTORY
<b>Address</b>	25 4th Road, Dongguahu Industrial Area, Huaize, Lianx, Shantou, China
<b>Factory</b>	HUANG BO TOYS FACTORY
<b>Address</b>	25 4th Road, Dongguahu Industrial Area, Huaize, Lianx, Shantou, China
<b>Product Designation</b>	R/C TOYS
<b>Brand Name</b>	N/A
<b>Test Model</b>	SC24A13-1
<b>Series Model</b>	See page 5
<b>Difference Description</b>	All the series models are the same as the test model except for the model names and the color of appearance.
<b>Date of receipt of test item</b>	Aug. 10, 2023
<b>Date of test</b>	Aug. 10, 2023 to Aug. 17, 2023
<b>Deviation</b>	No any deviation from the test method
<b>Condition of Test Sample</b>	Normal
<b>Test Result</b>	Pass
<b>Report Template</b>	AGCRT-US-SRD/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.249.

Prepared By



Sky Zhou  
(Project Engineer)

Aug. 17, 2023

Reviewed By



Calvin Liu  
(Reviewer)

Aug. 17, 2023

Approved By



Max Zhang  
(Authorized Officer)

Aug. 17, 2023

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## 2. GENERAL INFORMATION

### 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

<b>Operation Frequency</b>	2405MHz-2475MHz
<b>Maximum field strength</b>	85.33dBµV/m(Peak)@3m 78.23dBµV/m(Average)@3m
<b>Modulation</b>	GFSK
<b>Number of channels</b>	71 Channels
<b>Antenna Gain</b>	0dBi
<b>Antenna Designation</b>	Wire Antenna
<b>Hardware Version</b>	V1.0
<b>Software Version</b>	V1.2
<b>Power Supply</b>	DC 4.5V by battery

<b>Series Model</b>	DL16A01, DL16A02, DL16A03, DL16A04, DL16B01, DL16B02, DL16B03, DL16B04, DL16A01-1, DL16A02-1, DL16A03-1, DL16A04-1, DL16B01-1, DL16B02-1, DL16B03-1, DL16B04-1, SC16A01, SC16A02, SC16A03, SC16A04, SC16A05, SC16A06, SC16A07, SC16A08, SC16A01-1, SC16A02-1, SC16A03-1, SC16A04-1, SC16A05-1, SC16A06-1, SC16A07-1, SC16A08-1, SC16B01, SC16B02, SC16B03, SC16B04, SC16B05, SC16B06, SC16B07, SC16B08, SC16B01-1, SC16B02-1, SC16B03-1, SC16B04-1, SC16B05-1, SC16B06-1, SC16B07-1, SC16B08-1, SC24A01, SC24A02, SC24A03, SC24A04, SC24A05, SC24A06, SC24A07, SC24A08, SC24A09, SC24A10, SC24A11, SC24A12, SC24B01, SC24B02, SC24B03, SC24B04, SC24B05, SC24B06, SC24B07, SC24B08, SC24B09, SC24B10, SC24B11, SC24B12, SC24A01-1, SC24A02-1, SC24A03-1, SC24A04-1, SC24A05-1, SC24A06-1, SC24A07-1, SC24A08-1, SC24A09-1, SC24A10-1, SC24A11-1, SC24A12-1, SC24B01-1, SC24B02-1, SC24B03-1, SC24B04-1, SC24B05-1, SC24B06-1, SC24B07-1, SC24B08-1, SC24B09-1, SC24B10-1, SC24B11-1, SC24B12-1, SC24B13-1
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**2.2. TABLE OF CARRIER FREQUENCY**

Channel Number	Frequency (MHZ)	Channel Number	Frequency (MHZ)	Channel Number	Frequency (MHZ)
01	2405	25	2429	49	2453
02	2406	26	2430	50	2454
03	2407	27	2431	51	2455
04	2408	28	2432	52	2456
05	2409	29	2433	53	2457
06	2410	30	2434	54	2458
07	2411	31	2435	55	2459
08	2412	32	2436	56	2460
09	2413	33	2437	57	2461
10	2414	34	2438	58	2462
11	2415	35	2439	59	2463
12	2416	36	2440	60	2464
13	2417	37	2441	61	2465
14	2418	38	2442	62	2466
15	2419	39	2443	63	2467
16	2420	40	2444	64	2468
17	2421	41	2445	65	2469
18	2422	42	2446	66	2470
19	2423	43	2447	67	2471
20	2424	44	2448	68	2472
21	2425	45	2449	69	2473
22	2426	46	2450	70	2474
23	2427	47	2451	71	2475
24	2428	48	2452		

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### 2.3. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

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### 3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission,  $U_c = \pm 2.9$  dB
- Uncertainty of Radiated Emission below 1GHz,  $U_c = \pm 3.9$  dB
- Uncertainty of Radiated Emission above 1GHz,  $U_c = \pm 4.9$  dB
- Uncertainty of Occupied Channel Bandwidth:  $U_c = \pm 2$  %

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#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX_2405MHz_GFSK
2	Middle channel TX_2440MHz_GFSK
3	High channel TX_2475MHz_GFSK

Note:

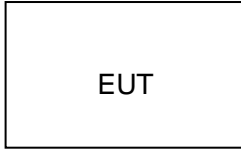
1. All the test modes can be supply by battery, only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. Set the EUT into the individual test modes by pressing the EUT buttons.
4. For battery operated equipment, the equipment tests are performed using a new battery.

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## 5. SYSTEM TEST CONFIGURATION

### 5.1. CONFIGURATION OF EUT SYSTEM

Configure:



### 5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	R/C TOYS	SC24A13-1	ZY3-HB-SC24-24	EUT

### 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249&15.209	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Not applicable

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

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## 6. TEST FACILITY

<b>Test Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
<b>Designation Number</b>	CN1259
<b>FCC Test Firm Registration Number</b>	975832
<b>A2LA Cert. No.</b>	5054.02
<b>Description</b>	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

## TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
Signal Analyzer	Aglient	N9020A	MY52090123	Jun. 01, 2023	May 31, 2024
EXA Signal Analyzer	Agilent	N9010A	MY53470504	Jun. 01, 2023	May 31, 2024
2.4GHz Filter	EM Electronics	N/A	N/A	Mar. 18, 2022	Mar. 19, 2024
Horn Antenna	SCHWARZBEC	BBHA9170	768	Oct. 31, 2021	Oct. 30, 2023
Active Loop Antenna (9K-30Mhz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
Double-Ridged Waveguide Horn	ETS	3117	00034609	Mar. 23, 2023	Mar. 22, 2024
Preamplifier	ETS	3117-PA	00246148	Aug. 04, 2022	Aug. 03, 2024
Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 05, 2023	Jan. 04, 2024
Test Software	Tonscend	4.0.0.0	N/A	N/A	N/A

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## 7. RADIATED EMISSION

### 7.1. TEST LIMIT

#### Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

#### Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		$\mu$ V/m	dB( $\mu$ V)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB( $\mu$ V)/m (Peak) 54.0 dB( $\mu$ V)/m (Average)	

Remark: (1) Emission level dB  $\mu$  V = 20 log Emission level  $\mu$  V/m.  
 (2) The smaller limit shall apply at the cross point between two frequency bands.  
 (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

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## 7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use minimum resolution bandwidth of 1 MHz. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

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The following table is the setting of spectrum analyzer and receiver.

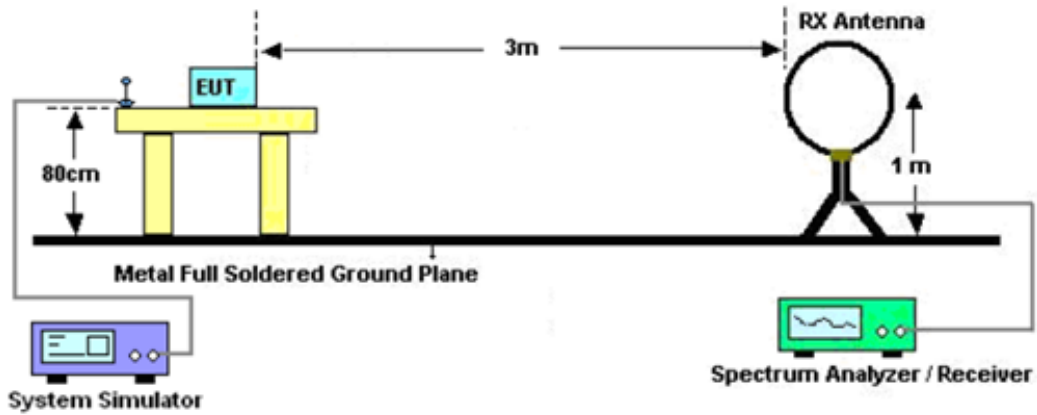
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz RBW 2.4MHz/ VBW 8MHz for Peak, RBW 2.4MHz/3MHz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

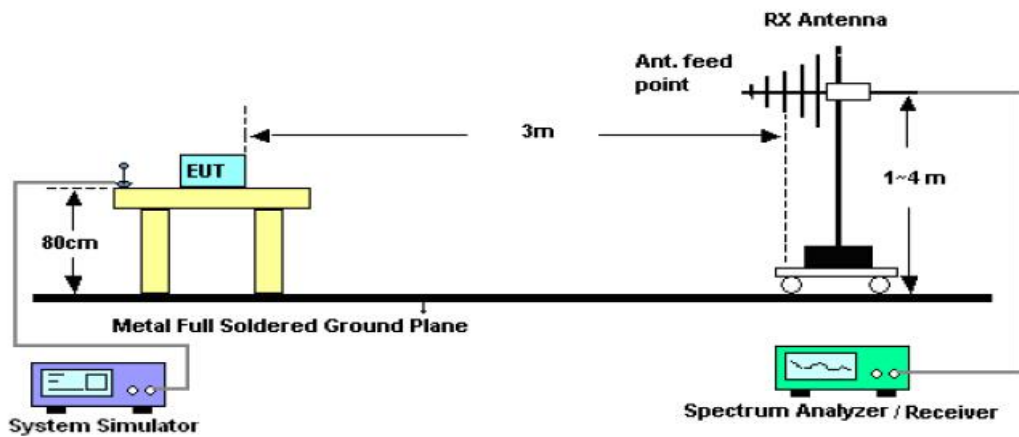
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### 7.3. TEST SETUP

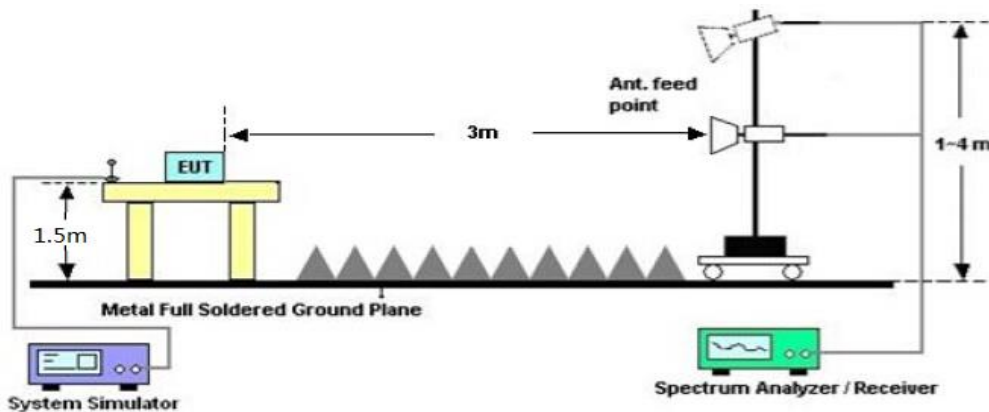
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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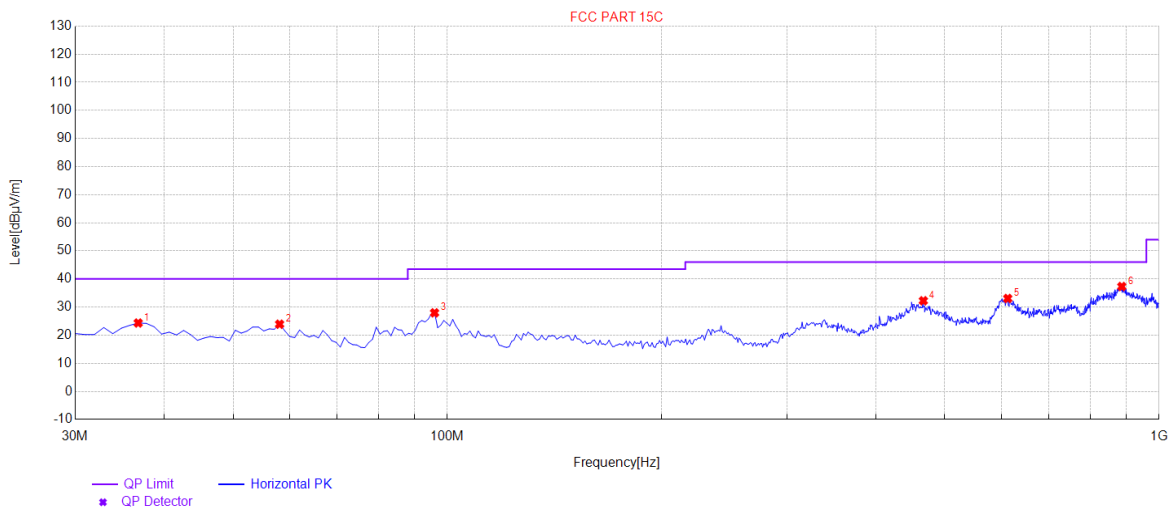
## 7.4. TEST RESULT

### RADIATED EMISSION BELOW 30MHZ

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

### RADIATED EMISSION 30MHZ- 1GHZ

<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 1	<b>Polarization</b>	Horizontal



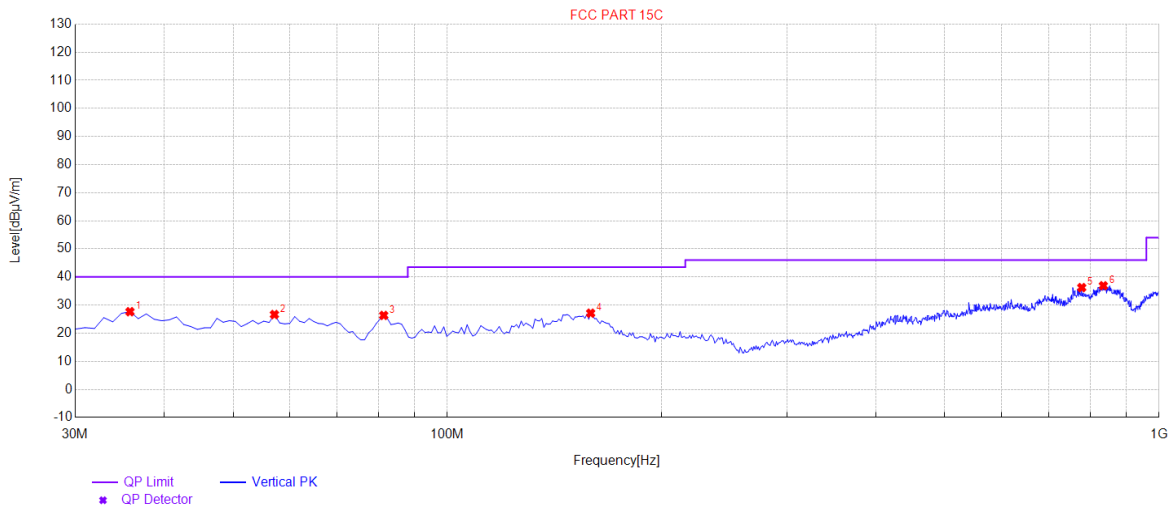
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.79	24.33	10.39	40.00	15.67	100	270	Horizontal
2	58.13	23.91	12.57	40.00	16.09	100	40	Horizontal
3	95.96	27.94	19.11	43.50	15.56	100	320	Horizontal
4	466.5	32.25	27.02	46.00	13.75	100	360	Horizontal
5	612.97	33.06	28.24	46.00	12.94	100	200	Horizontal
6	886.51	37.32	32.77	46.00	8.68	100	200	Horizontal

**RESULT: PASS**

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<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 1	<b>Polarization</b>	Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.82	27.64	10.94	40.00	12.36	100	250	Vertical
2	57.16	26.63	14.46	40.00	13.37	100	0	Vertical
3	81.41	26.33	12.20	40.00	13.67	100	120	Vertical
4	159.01	27.12	21.84	43.50	16.38	100	260	Vertical
5	778.84	36.23	30.94	46.00	9.77	100	200	Vertical
6	835.1	36.89	32.30	46.00	9.11	100	330	Vertical

## RESULT: PASS

**Note:** Factor=Antenna Factor + Cable loss, Margin=Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

All test modes had been tested. The mode 1 is the worst case and recorded in the report.

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Attestation of Global Compliance(Shenzhen)Co., Ltd  
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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/

**FIELD STRENGTH OF FUNDAMENTAL**

<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	24.3° C	<b>Relative Humidity</b>	56.7%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Modulation</b>	GFSK	<b>Polarization</b>	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2405	36.28	49.05	85.33	114.00	-28.67	peak
2405	29.18	49.05	78.23	94.00	-15.77	AVG
2440	33.05	49.12	82.17	114.00	-31.83	peak
2440	25.54	49.12	74.66	94.00	-19.34	AVG
2475	34.38	49.25	83.63	114.00	-30.37	peak
2475	28.73	49.25	77.98	94.00	-16.02	AVG
<b>Remark:</b>						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	24.3° C	<b>Relative Humidity</b>	56.7%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Modulation</b>	GFSK	<b>Polarization</b>	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2405	44.37	49.05	82.65	114.00	-31.35	peak
2405	29.51	49.05	76.41	94.00	-17.59	AVG
2440	45.31	49.12	80.36	114.00	-33.64	peak
2440	30.11	49.12	69.72	94.00	-24.28	AVG
2475	40.78	49.25	82.17	114.00	-31.83	peak
2475	30.48	49.25	70.85	94.00	-23.15	AVG
<b>Remark:</b>						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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**RADIATED EMISSION ABOVE 1GHZ**

<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 1	<b>Polarization</b>	Horizontal

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
4810	49.12	3.76	52.88	74.00	-21.12	peak
4810	38.25	3.76	42.01	54.00	-11.99	AVG
7215	47.11	8.17	55.28	74.00	-18.72	peak
7215	37.76	8.17	45.93	54.00	-8.07	AVG

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

<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 1	<b>Polarization</b>	Vertical

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
4810	48.95	3.76	52.71	74.00	-21.29	peak
4810	37.61	3.76	41.37	54.00	-12.63	AVG
7215	46.43	8.17	54.60	74.00	-19.40	peak
7215	35.94	8.17	44.11	54.00	-9.89	AVG

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

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<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 2	<b>Polarization</b>	Horizontal

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
4880	49.64	3.78	53.42	74.00	-20.58	peak
4880	37.00	3.78	40.78	54.00	-13.22	AVG
7320	46.54	8.23	54.77	74.00	-19.23	peak
7320	35.77	8.23	44.00	54.00	-10.00	AVG

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

<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 2	<b>Polarization</b>	Vertical

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
4880	47.25	3.78	51.03	74.00	-22.97	peak
4880	36.82	3.78	40.60	54.00	-13.40	AVG
7320	45.57	8.23	53.80	74.00	-20.20	peak
7320	35.00	8.23	43.23	54.00	-10.77	AVG

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

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<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 3	<b>Polarization</b>	Horizontal

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
4950	49.82	3.81	53.63	74.00	-20.37	peak
4950	39.52	3.81	43.33	54.00	-10.67	AVG
7425	47.10	8.27	55.37	74.00	-18.63	peak
7425	37.54	8.27	45.81	54.00	-8.19	AVG

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

<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	22.5° C	<b>Relative Humidity</b>	58.1%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 3	<b>Polarization</b>	Vertical

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
4950	46.73	3.81	50.54	74.00	-23.46	peak
4950	37.48	3.81	41.29	54.00	-12.71	AVG
7425	44.11	8.27	52.38	74.00	-21.62	peak
7425	35.83	8.27	44.10	54.00	-9.90	AVG

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

**RESULT: PASS**

**Note:** The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Emission Level-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

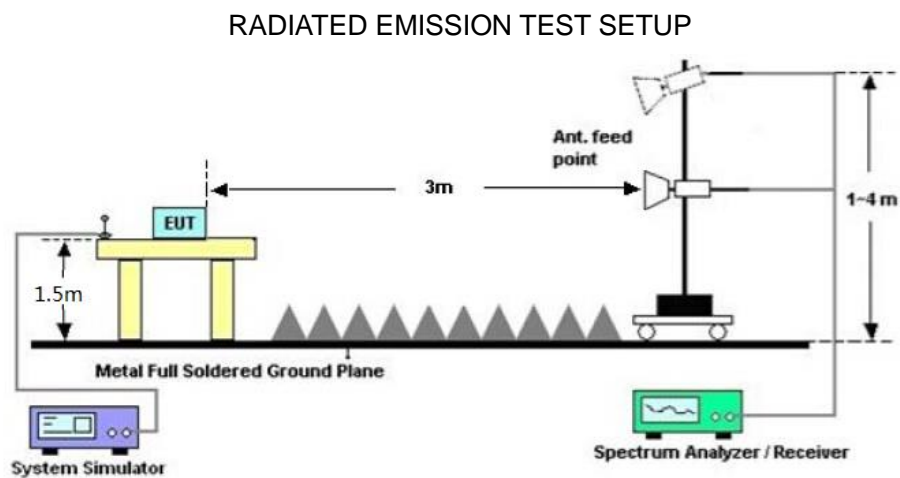
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## 8. BAND EDGE EMISSION

### 8.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz; VBW=3MHz / Sweep=AUTO
3. Other procedures refer to clause 7.2.

### 8.2. TEST SETUP



### 8.3 RADIATED TEST RESULT

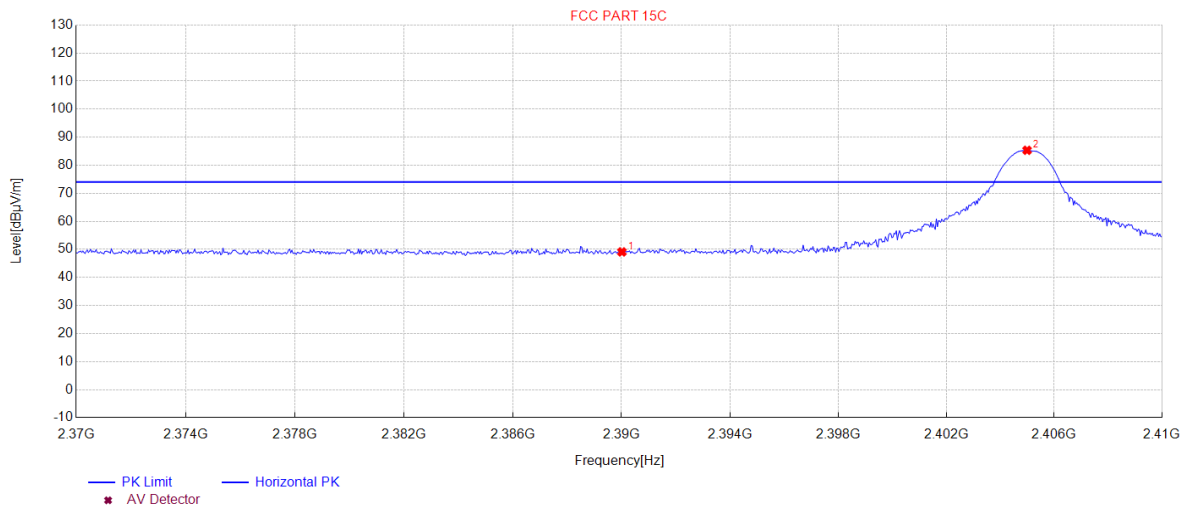
#### Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude. Use the F dB( $\mu$ V/m) to represent the Field Strength. So A=F.

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<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	24.3° C	<b>Relative Humidity</b>	56.7%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 1	<b>Polarization</b>	Horizontal

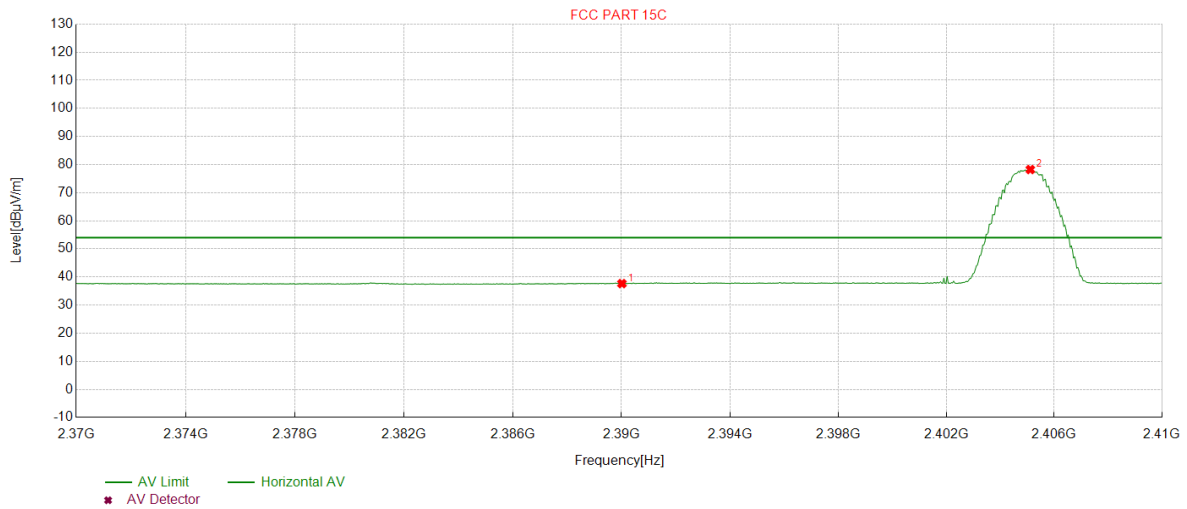
Peak Value



NO	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.02	49.10	33.57	74.00	24.90	150	200	Horizontal
2	2404.995	85.33	33.64	74.00	-11.33	150	221	Horizontal

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### Average Value



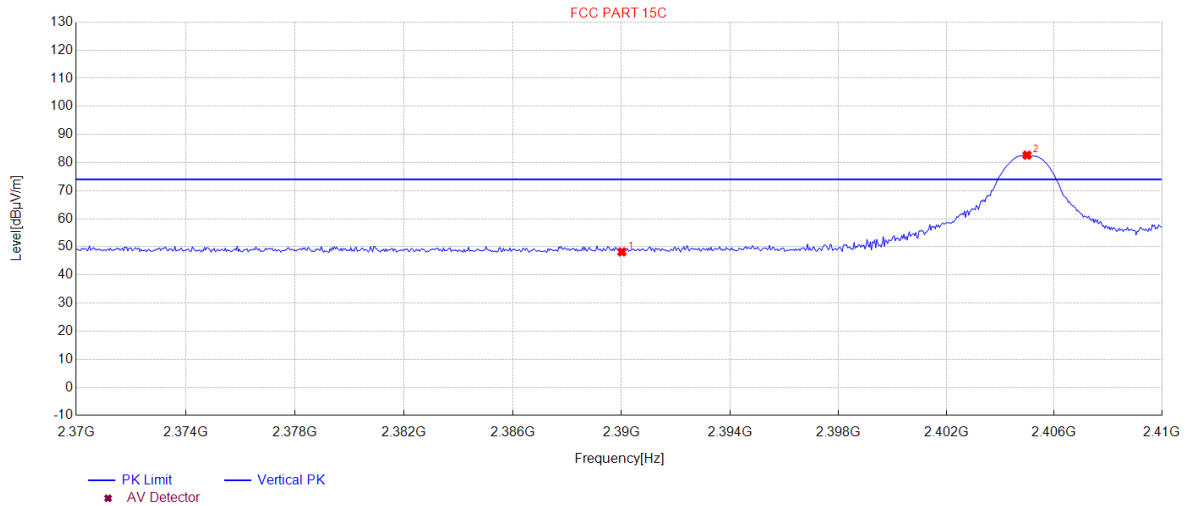
NO	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.02	37.64	33.57	54.00	16.36	150	124	Horizontal
2	2405.115	78.23	33.64	54.00	-24.23	150	45	Horizontal

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<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	24.3° C	<b>Relative Humidity</b>	56.7%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 1	<b>Polarization</b>	Vertical

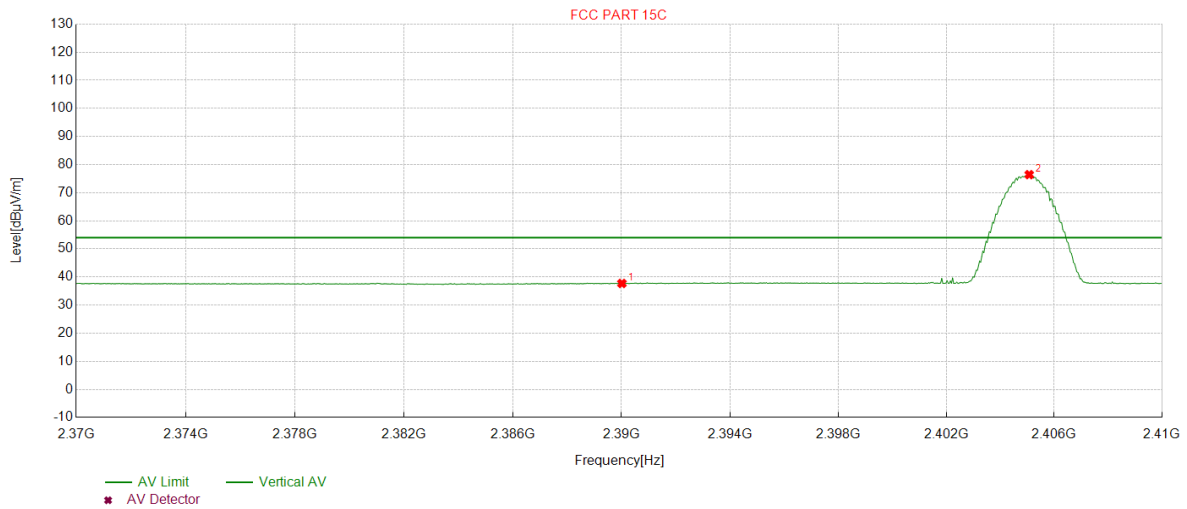
Peak Value



NO	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.02	48.20	33.57	74.00	25.80	150	359	Vertical
2	2404.995	82.65	33.64	74.00	-8.65	150	36	Vertical

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### Average Value

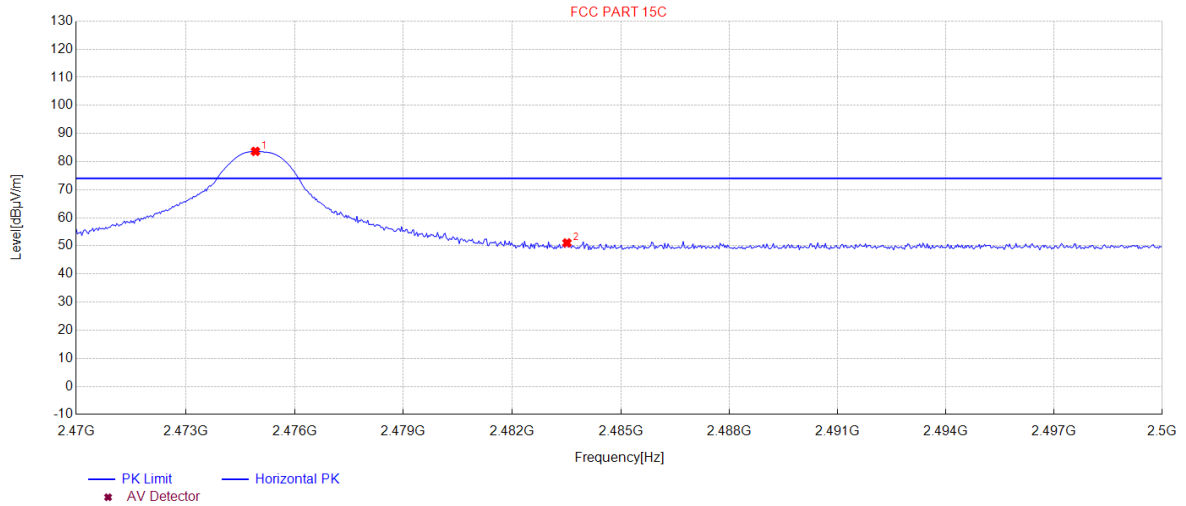


NO	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.02	37.70	33.57	54.00	16.30	150	3	Vertical
2	2405.075	76.41	33.64	54.00	-22.41	150	32	Vertical

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<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	24.3° C	<b>Relative Humidity</b>	56.7%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 3	<b>Polarization</b>	Horizontal

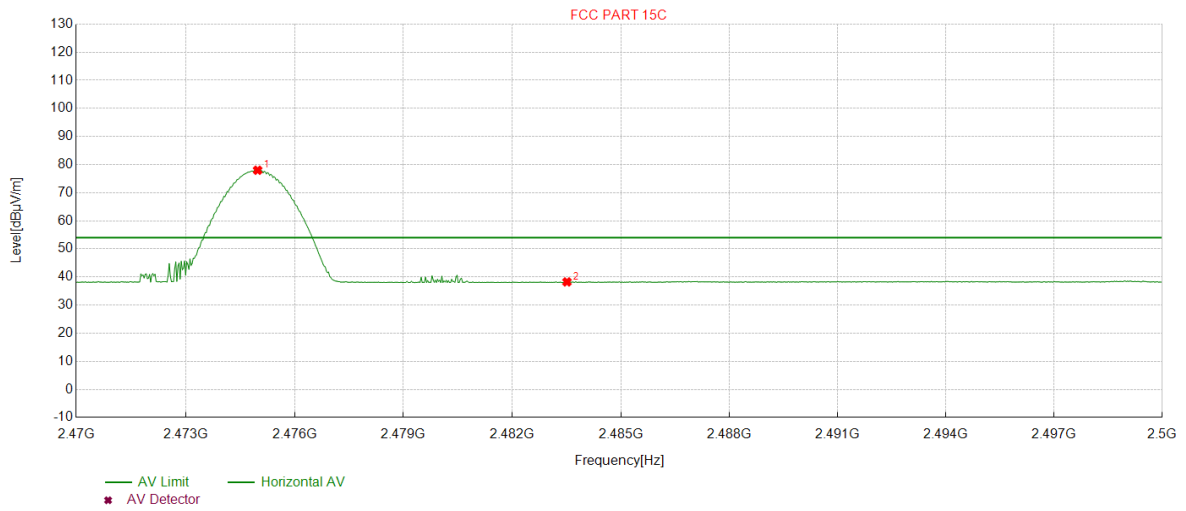
Peak Value



NO	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2474.924	83.63	33.96	74.00	-9.63	150	3	Horizontal
2	2483.513	51.06	34.00	74.00	22.94	150	98	Horizontal

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### Average Value

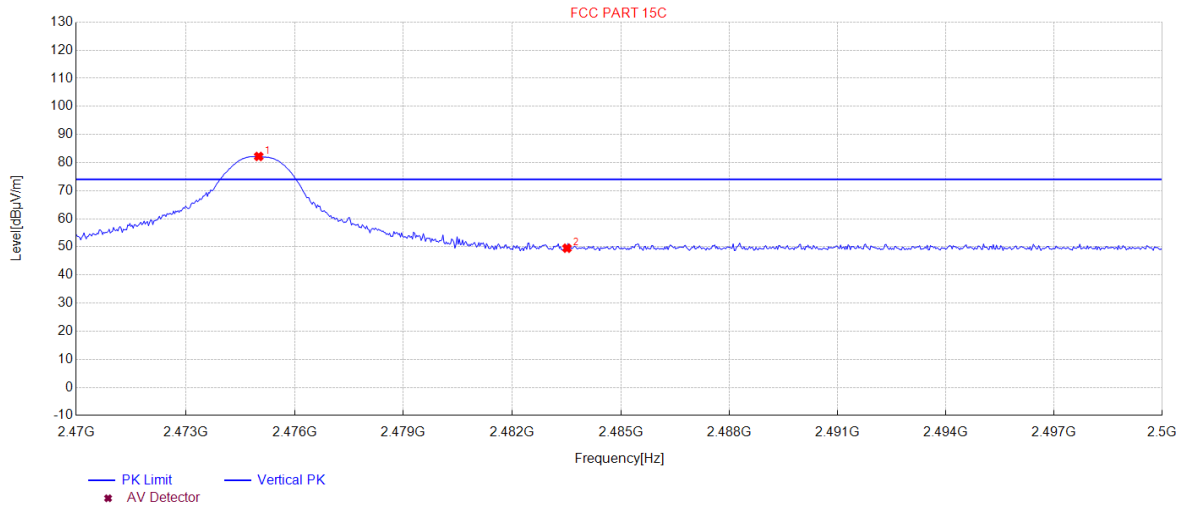


NO	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2474.985	77.98	33.96	54.00	-23.98	150	2	Horizontal
2	2483.513	38.24	34.00	54.00	15.76	150	278	Horizontal

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<b>EUT</b>	R/C TOYS	<b>Model Name</b>	SC24A13-1
<b>Temperature</b>	24.3° C	<b>Relative Humidity</b>	56.7%
<b>Pressure</b>	985kPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Mode 3	<b>Polarization</b>	Vertical

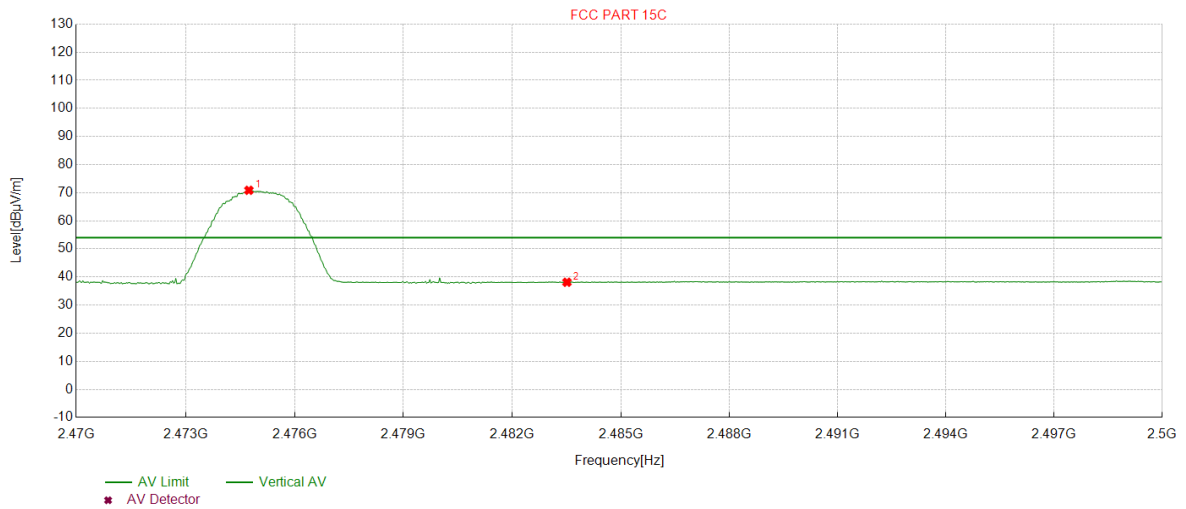
Peak Value



NO	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2475.015	82.17	33.97	74.00	-8.17	150	283	Vertical
2	2483.513	49.52	34.00	74.00	24.48	150	358	Vertical

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### Average Value



NO	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2474.744	70.85	33.96	54.00	-16.85	150	2	Vertical
2	2483.513	38.12	34.00	54.00	15.88	150	29	Vertical

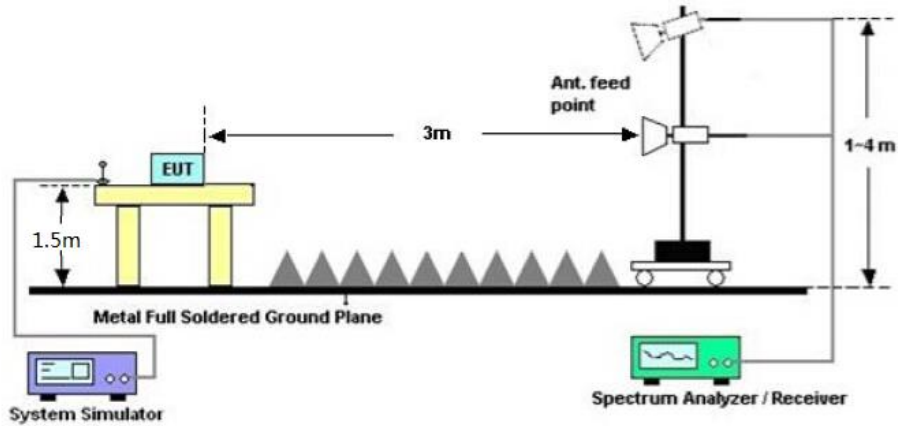
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## 9. 20DB BANDWIDTH

### 9.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
2. Set SPA Centre Frequency = Operation Frequency, RBW= 30kHz, VBW $\geq$ 3 $\times$ RBW.
3. Set SPA Trace 1 Max hold, then View.

### 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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### 9.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

Test Channel (MHz)	20DB BANDWIDTH (MHz)	99% BANDWIDTH (MHz)	Criteria
2405	1.155	1.0349	PASS
2440	1.151	1.0283	PASS
2475	1.150	1.0279	PASS

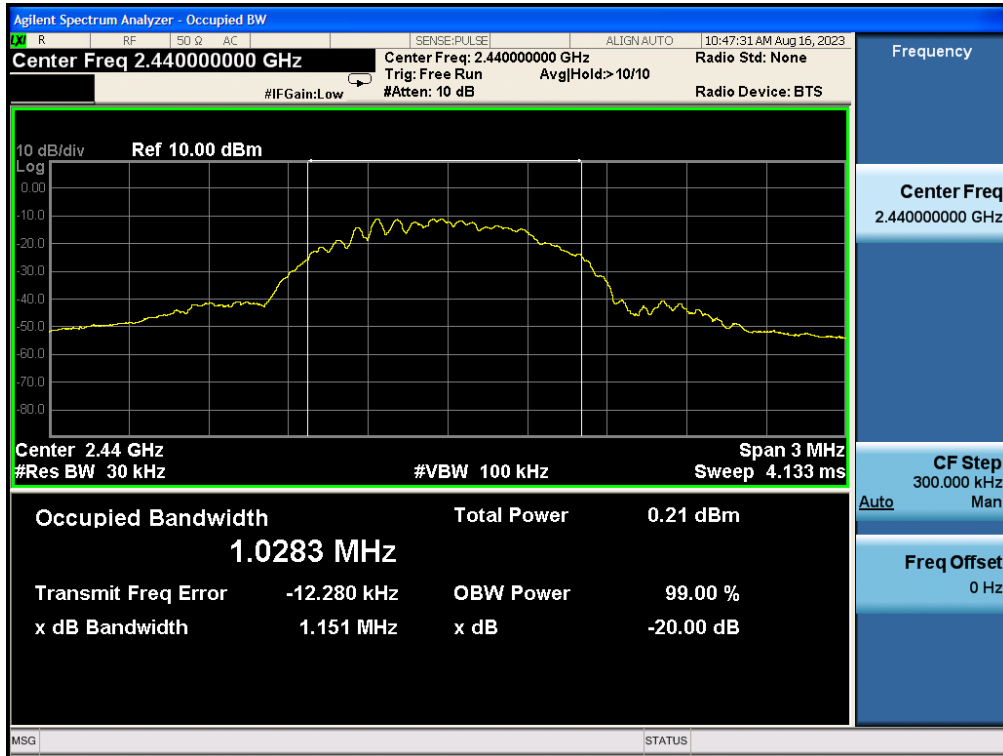
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



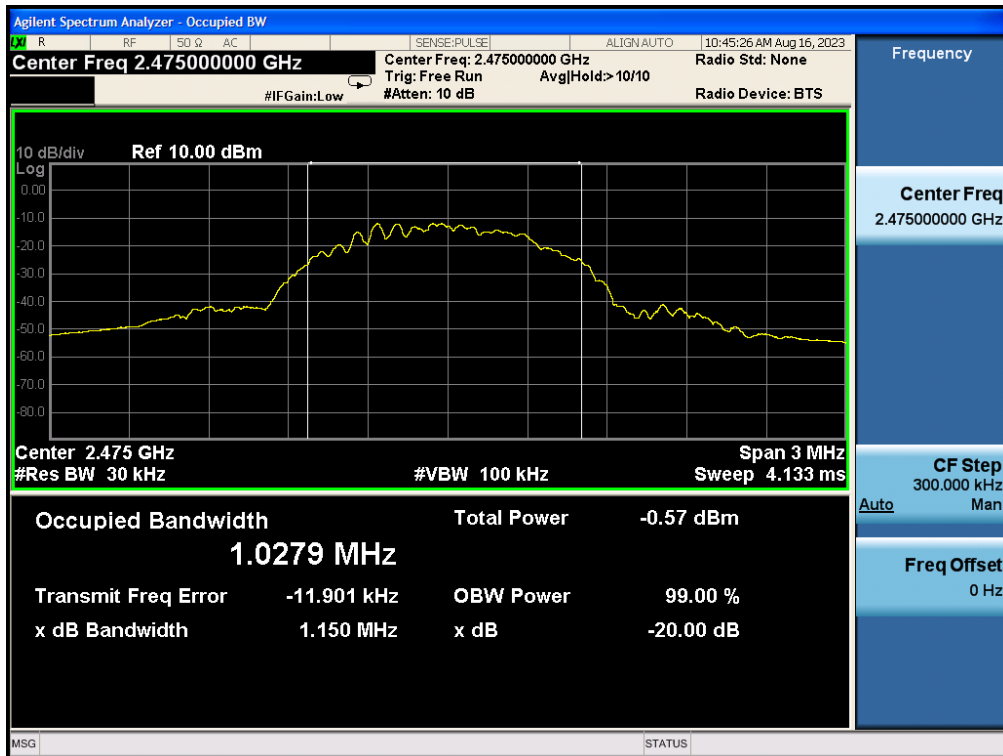
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### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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## 10. FCC LINE CONDUCTED EMISSION TEST

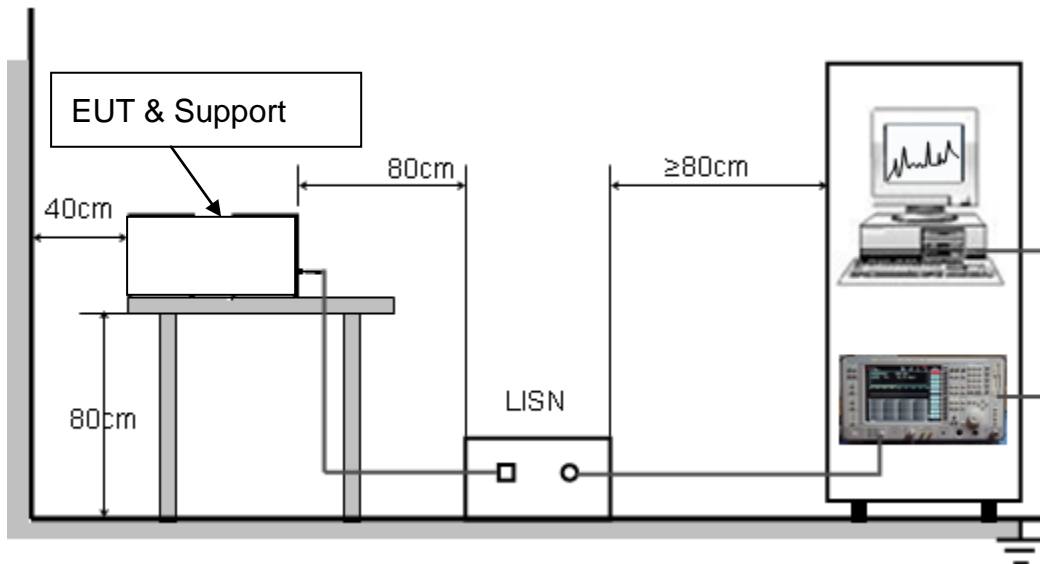
### 10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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### 10.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received AC120V/60Hz power from a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 10.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

### 10.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

**APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

Refer to the Report No.: AGC15705230830AP01

**APPENDIX B: PHOTOGRAPHS OF THE EUT**

Refer to the Report No.: AGC15705230830AP02

**----END OF REPORT----**

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