





# **FCC Test Report**

Report No.: AGC15705231128FR01

**FCC ID** : QV7-GC88710-23

APPLICATION PURPOSE **Original Equipment** 

PRODUCT DESIGNATION : R/C CAR

: REVOLT & SYMA **BRAND NAME** 

TG1023 **MODEL NAME** 

GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., **APPLICANT** 

**DATE OF ISSUE** Dec. 13, 2023

STANDARD(S)

FCC Part 15 Subpart C §15.249 **TEST PROCEDURE(S)** 

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



Page 2 of 37

## **Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 13, 2023	Valid	Initial Release



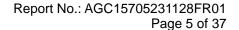
## **TABLE OF CONTENTS**

1. VERIFICATION OF CONFORMITY	5
2. GENERAL INFORMATION	6
2.1. PRODUCT DESCRIPTION	7
4. DESCRIPTION OF TEST MODES	10
5. SYSTEM TEST CONFIGURATION	11
5.1. CONFIGURATION OF EUT SYSTEM	11
6. TEST FACILITY	12
7. RADIATED EMISSION	13
7.1. TEST LIMIT	14 16
8. BAND EDGE EMISSION	23
8.1. MEASUREMENT PROCEDURE	23
9. 20DB BANDWIDTH	32
9.1. MEASUREMENT PROCEDURE	32
10. FCC LINE CONDUCTED EMISSION TEST	33
10.1. LIMITS OF LINE CONDUCTED EMISSION TEST	35
10.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	
10.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	30 36



Report No.: AGC15705231128FR01 Page 4 of 37

APPENDIX A: PHOTOGRAPHS OF TEST SETUP	37
APPENDIX B: PHOTOGRAPHS OF THE EUT	37





## 1. VERIFICATION OF CONFORMITY

Applicant GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD.			
Address	No. 2 West Xingye Road Laimei Industrial Area, Chenghai Shantou City,		
Address	Guangdong, China		
Manufacturer	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD.		
Address	No. 2 West Xingye Road Laimei Industrial Area, Chenghai Shantou City,		
Addiess	Guangdong, China		
Factory	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD.		
Address	No. 2 West Xingye Road Laimei Industrial Area, Chenghai Shantou City,		
Audiess	Guangdong, China		
Product Designation	R/C CAR		
Brand Name	REVOLT & SYMA		
Test Model	TG1023		
Series Model	N/A		
Difference Description	N/A		
Date of receipt of test item	Nov. 16, 2023		
Date of test	Nov. 16, 2023 to Dec. 13, 2023		
Deviation	No any deviation from the test method		
Condition of Test Sample	Normal		
Test Result	Pass		
Report Template	AGCRT-US-SRD/RF		

Note: The test results of this report relate only to the tested sample identified in this report.

Reviewed By

Cici Li
(Project Engineer)

Calvin Liu
(Reviewer)

Dec. 13, 2023

Approved By

Max Zhang
Authorized Officer

Dec. 13, 2023



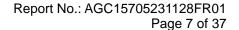
Page 6 of 37

## 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency 2420MHz-2461MHz	
Maximum field strength	102.19 dBµV/m(Peak)@3m 92.45dBµV/m(Average)@3m
Modulation	GFSK
Number of channels	42 Channels
Antenna Gain	2 dBi
Antenna Designation	Wire Antenna
Hardware Version	V1.0
Software Version	V1.0
Power Supply	DC 3V by battery





## 2.2. TABLE OF CARRIER FREQUENCY

Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	2420	22	2441
2	2421	23	2442
3	2422	24	2443
4	2423	25	2444
5	2424	26	2445
6	2425	27	2446
7	2426	28	2447
8	2427	29	2448
9	2428	30	2449
10	2429	31	2450
11	2430	32	2451
12	2431	33	2452
13	2432	34	2453
14	2433	35	2454
15	2434	36	2455
16	2435	37	2456
17	2436	38	2457
18	2437	39	2458
19	2438	40	2459
20	2439	41	2460
21	2440	42	2461



Page 8 of 37

#### 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.



Page 9 of 37

## 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, Uc = ±2.9 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.9 dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %



Page 10 of 37

## 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX_2420MHz_GFSK
2	Middle channel TX_2434MHz_GFSK
3	High channel TX_2461MHz_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.



Page 11 of 37

# 5. SYSTEM TEST CONFIGURATION 5.1. CONFIGURATION OF EUT SYSTEM

Configure:

EUT	

## **5.2 EQUIPMENT USED IN TESTED SYSTEM**

Item	Equipment	Model No.	ID or Specification	Remark
1	R/C CAR	TG1023	QV7-GC88710-23	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.



Page 12 of 37

## 6. TEST FACILITY

Test Site Attestation of Global Compliance (Shenzhen) Co., Ltd	
Location  1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Com Fuhai Street, Bao'an District, Shenzhen, Guangdong, China	
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	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
Attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024
Horn Antenna	SCHWARZBEC	BBHA9170	768	Sep. 24, 2023	Sep. 23, 2025
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
Preamplifer	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



Page 13 of 37

## 7. RADIATED EMISSION

#### 7.1. TEST LIMIT

#### Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental	Field Strength of Harmonics
	(millivolts/meter)	(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	Distance	Field Strengths Limit		
(MHz)	Meters	μ V/m	dB(μV)/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(µV)/m (Pea	k) 54.0 dB(μV)/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.



Page 14 of 37

#### 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.



Page 15 of 37

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

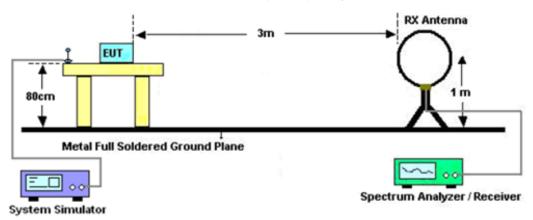
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
	1GHz~26.5GHz
Start ~Stop Frequency	RBW 2.4MHz/ VBW 8MHz for Peak,
	RBW 2.4MHz/3MHz for Average

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

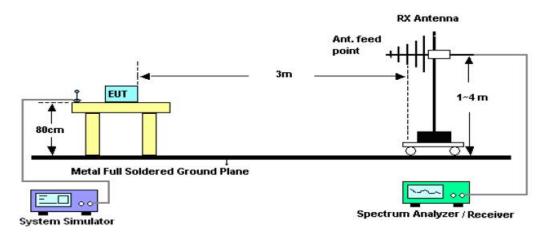


#### 7.3. TEST SETUP

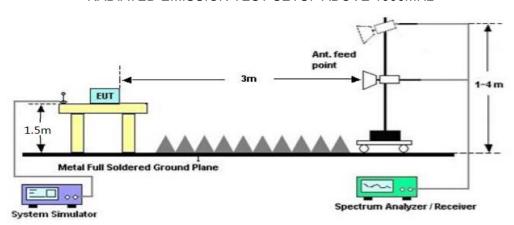
## Radiated Emission Test-Setup Frequency Below 30MHz



#### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



## RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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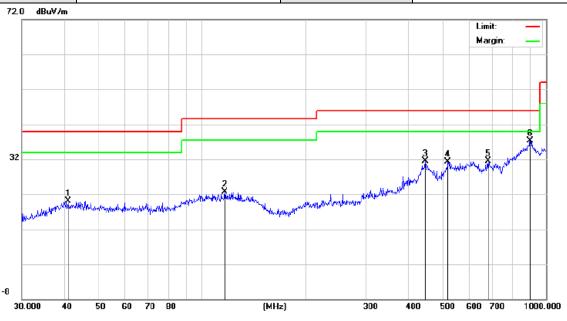
## 7.4. TEST RESULT

## **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**

EUT	R/C CAR	Model Name	TG1023
Temperature	23.7° C	Relative Humidity	59.4 %
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 3	Polarization	Horizontal

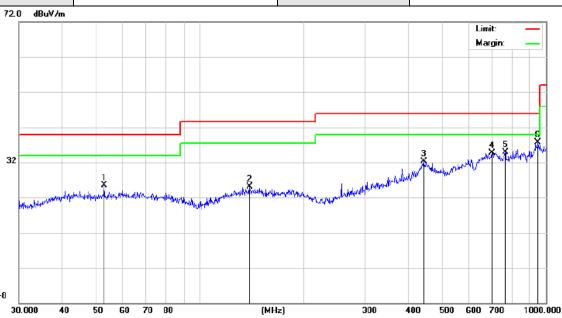


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dΒ	Detector
1		40.8445	6.23	13.84	20.07	40.00	-19.93	peak
2	,	116.5400	6.42	16.37	22.79	43.50	-20.71	peak
3	2	146.4141	6.60	24.88	31.48	46.00	-14.52	peak
4	5	519.0648	6.25	25.05	31.30	46.00	-14.70	peak
5	6	379.9600	6.81	24.70	31.51	46.00	-14.49	peak
6	* 9	300.1473	5.48	31.78	37.26	46.00	-8.74	peak

### **RESULT: PASS**



EUT	R/C CAR	Model Name	TG1023
Temperature	23.7° C	Relative Humidity	59.4 %
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 3	Polarization	Vertical



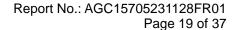
No. 1	Mk. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV/m	dB/m	dΒ	Detector
1	52.9453	8.40	17.03	25.43	40.00	-14.57	peak
2	139.3613	6.92	18.18	25.10	43.50	-18.40	peak
3	443.2943	6.28	25.95	32.23	46.00	-13.77	peak
4	699.3046	6.65	28.09	34.74	46.00	-11.26	peak
5	763.3757	6.88	28.06	34.94	46.00	-11.06	peak
6	* 948.7610	7.14	30.65	37.79	46.00	-8.21	peak

#### **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 3 is the worst case and recorded in the report.





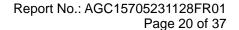
#### FIELD STRENGTH OF FUNDAMENTAL

EUT	R/C CAR	Model Name	TG1023
Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Modulation	GFSK	Polarization	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
2420	53.14	49.05	102.19	114.00	-11.81	peak
2420	43.40	49.05	92.45	94.00	-1.55	AVG
2434	52.63	49.12	101.75	114.00	-12.25	peak
2434	42.77	49.12	91.89	94.00	-2.11	AVG
2461	51.89	49.25	101.14	114.00	-12.86	peak
2461	42.52	49.25	91.77	94.00	-2.23	AVG
Remark:						
Factor = Anter	nna Factor + Cabl	e Loss – Pre-a	amplifier.			

EUT	R/C CAR	Model Name	TG1023
Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Modulation	GFSK	Polarization	Vertical

Meter Reading	Factor	Emission Level	Limits	Margin	Valua Traa
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Value Type
44.37	49.05	91.34	114.00	-22.66	peak
29.51	49.05	81.59	94.00	-12.41	AVG
45.31	49.12	90.63	114.00	-23.37	peak
30.11	49.12	80.19	94.00	-13.81	AVG
40.78	49.25	88.94	114.00	-25.06	peak
30.48	49.25	79.57	94.00	-14.43	AVG
	(dBµV) 44.37 29.51 45.31 30.11 40.78	(dBµV) (dB) 44.37 49.05 29.51 49.05 45.31 49.12 30.11 49.12 40.78 49.25	(dBμV)     (dB)     (dBμV/m)       44.37     49.05     91.34       29.51     49.05     81.59       45.31     49.12     90.63       30.11     49.12     80.19       40.78     49.25     88.94	(dBμV)     (dB)     (dBμV/m)     (dBμV/m)       44.37     49.05     91.34     114.00       29.51     49.05     81.59     94.00       45.31     49.12     90.63     114.00       30.11     49.12     80.19     94.00       40.78     49.25     88.94     114.00	(dBμV)     (dB)     (dBμV/m)     (dBμV/m)     (dBμV/m)       44.37     49.05     91.34     114.00     -22.66       29.51     49.05     81.59     94.00     -12.41       45.31     49.12     90.63     114.00     -23.37       30.11     49.12     80.19     94.00     -13.81       40.78     49.25     88.94     114.00     -25.06





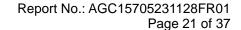
**RADIATED EMISSION ABOVE 1GHZ** 

EUT	R/C CAR	Model Name	TG1023
Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 1	Polarization	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4840	50.66	3.76	54.42	74.00	-19.58	peak
4840	38.73	3.76	42.49	54.00	-11.51	AVG
7260	47.54	8.17	55.71	74.00	-18.29	peak
7260 37.26 8.17 45.43 54.00 -8.57 AVG						
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	R/C CAR	Model Name	TG1023
Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 1	Polarization	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4840	48.18	3.76	51.94	74.00	-22.06	peak
4840	37.45	3.76	41.21	54.00	-12.79	AVG
7260	46.79	8.17	54.96	74.00	-19.04	peak
7260	7260 35.12 8.17 43.29 54.00 -10.71 AVG					
Remark:						
Factor = Ante	Factor = Antenna Factor + Cable Loss – Pre-amplifier.					



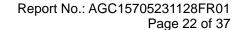


EUT	R/C CAR	Model Name	TG1023
Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 2	Polarization	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4868	49.66	3.78	53.44	74.00	-20.56	peak
4868	37.53	3.78	41.31	54.00	-12.69	AVG
7302	46.73	8.23	54.96	74.00	-19.04	peak
7302 35.46 8.23 43.69 54.00 -10.31 AVG						
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	R/C CAR	Model Name	TG1023
Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 2	Polarization	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4868	47.21	3.78	50.99	74.00	-23.01	peak
4868	36.03	3.78	39.81	54.00	-14.19	AVG
7302	45.74	8.23	53.97	74.00	-20.03	peak
7302	7302 35.25 8.23 43.48 54.00 -10.52 AVG					
Remark:						
Factor = Ante	Factor = Antenna Factor + Cable Loss – Pre-amplifier.					





EUT	R/C CAR	Model Name	TG1023
Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 3	Polarization	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Trac
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4922	49.91	3.81	53.72	74.00	-20.28	peak
4922	39.69	3.81	43.50	54.00	-10.50	AVG
7383	47.87	8.27	56.14	74.00	-17.86	peak
7383	7383 37.64 8.27 45.91 54.00 -8.09 AVG					
Remark:						
Factor = Antenna Factor + Cable Loss - Pre-amplifier.						

	R/C CAR	Model Name	TG1023
oraturo	24.5° C	Polative Humidity	57.6%

Temperature	24.5° C	Relative Humidity	57.6%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 3	Polarization	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Time	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type	
4922	46.51	3.81	50.32	74.00	-23.68	peak	
4922	37.34	3.81	41.15	54.00	-12.85	AVG	
7383	44.20	8.27	52.47	74.00	-21.53	peak	
7383	35.17	8.27	43.44	54.00	-10.56	AVG	
Remark:							
Factor = Anter	nna Factor + Cabl	e Loss – Pre-a	mplifier.				

## **RESULT: PASS**

EUT

**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.



Page 23 of 37

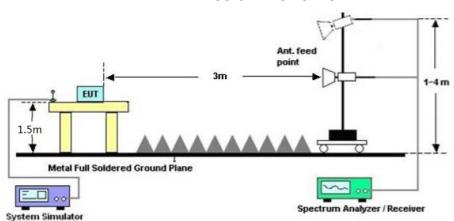
#### 8. BAND EDGE EMISSION

#### **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

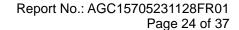
#### RADIATED EMISSION TEST SETUP



## 8.3 RADIATED TEST RESULT

#### Note:

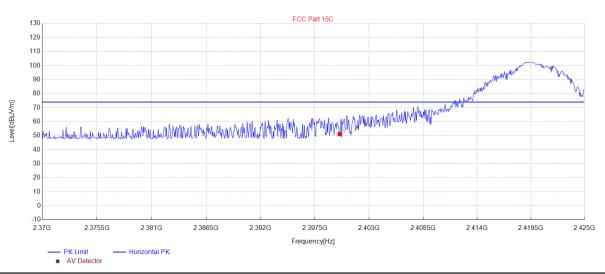
- 1. Factor=Antenna Factor + Cable loss Amplifier gain. Field Strength=Factor + Reading level
- 2. The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude.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





EUT	R/C CAR	Model Name	TG1023
Temperature	24.8° C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 1	Polarization	Horizontal

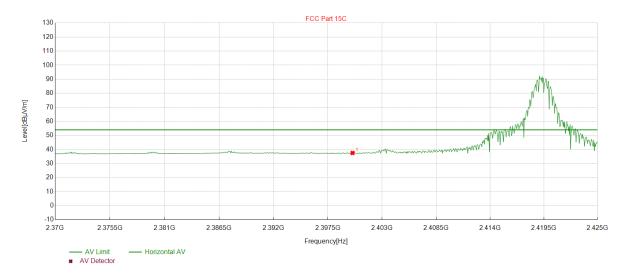
## Peak Value



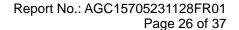
PK D	PK Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2400.005	51.10	34.43	74.00	22.90	150	217	Horizontal	



# Average Value



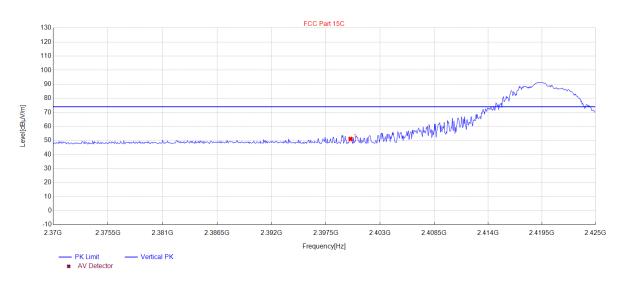
AV F	AV Final Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2400.005	37.53	34.43	54.00	16.47	150	246	Horizontal	





EUT	R/C CAR	Model Name	TG1023
Temperature	24.8° C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 1	Polarization	Vertical

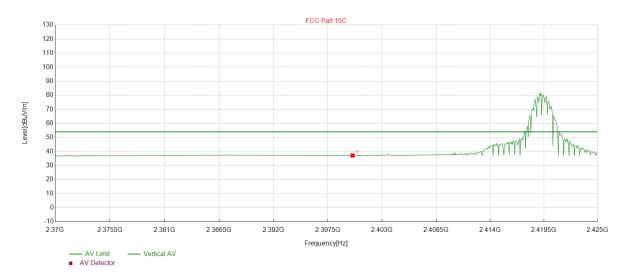
Peak Value



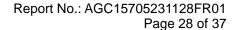
PK D	PK Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2400.005	51.08	34.43	74.00	22.92	150	84	Vertical	



# Average Value



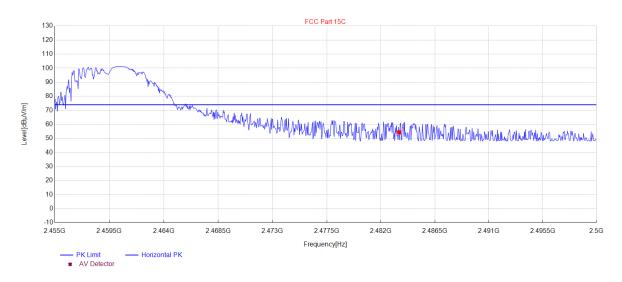
AV F	AV Final Data List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2400.005	37.11	34.43	54.00	16.89	150	51	Vertical		





EUT	R/C CAR	Model Name	TG1023
Temperature	24.8° C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 3	Polarization	Horizontal

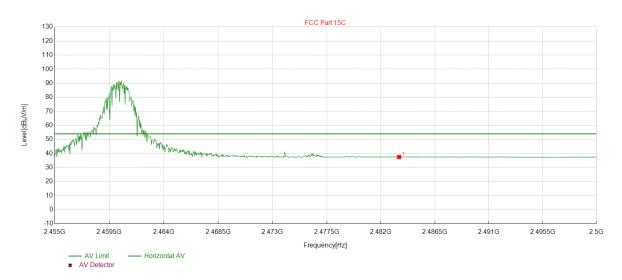
#### Peak Value



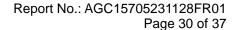
PK [	PK Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Polarity		
1	2483.5135	54.38	34.66	74.00	19.62	150	Horizontal		



# Average Value



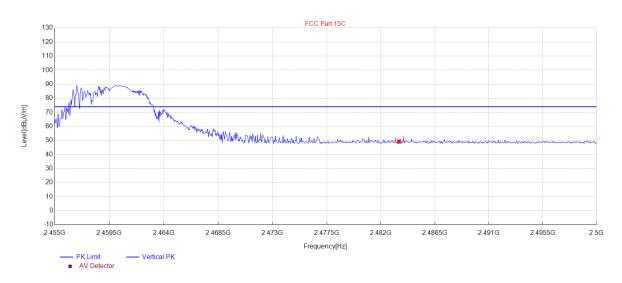
AV F	AV Final Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2483.5135	37.49	34.66	54.00	16.51	150	161	Horizontal	





EUT	R/C CAR	Model Name	TG1023
Temperature	24.8° C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3V by battery
Test Mode	Mode 3	Polarization	Vertical

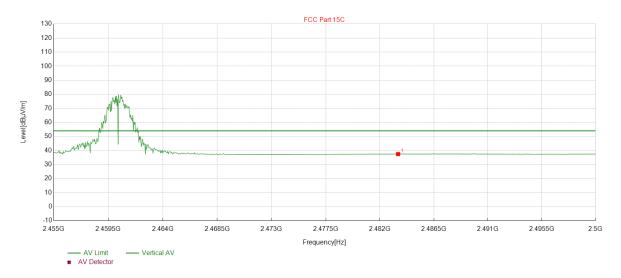
## Peak Value



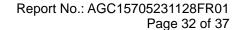
PK D	PK Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2483.5135	49.19	34.66	74.00	24.81	150	164	Vertical	



# Average Value



AV F	AV Final Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2483.5135	37.45	34.66	54.00	16.55	150	179	Vertical	



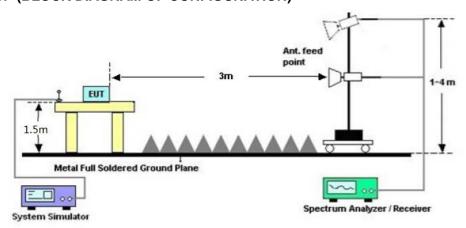


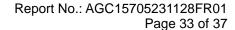
## 9. 20DB BANDWIDTH

## 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= 430kHz, VBW≥1 × RBW.
- 3. Set SPA Trace 1 Max hold, then View.

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





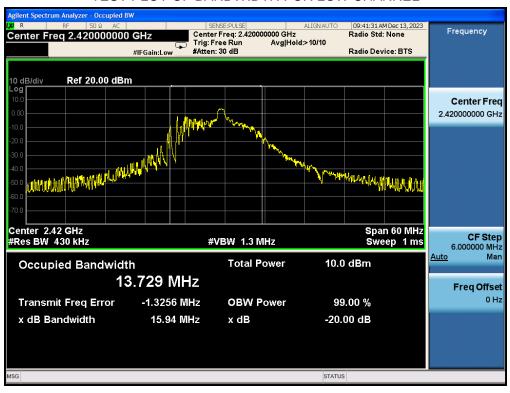


#### 9.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

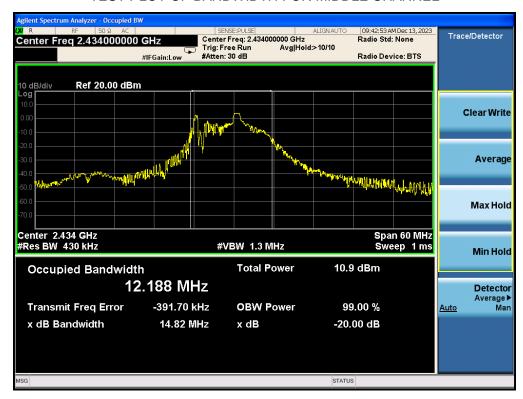
Test Channel (MHz)	20DB BANDWIDTH (MHz)	99% BANDWIDTH (MHz)	Criteria
2420	13.729	15.94	PASS
2434	12.188	14.82	PASS
2461	10.841	13.62	PASS

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

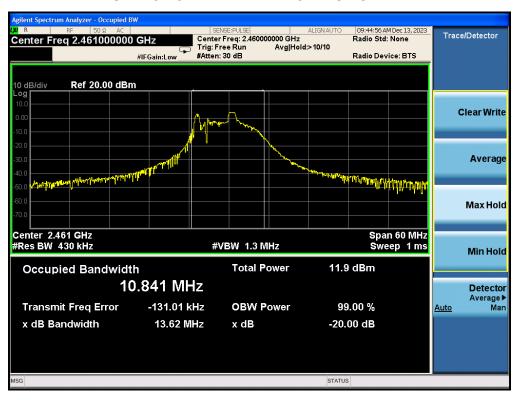




#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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## 10. FCC LINE CONDUCTED EMISSION TEST

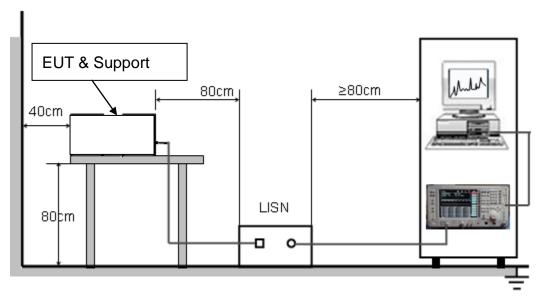
## 10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Francis	Maximum RF Line Voltage			
Frequency	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





Report No.: AGC15705231128FR01 Page 36 of 37

#### 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 DC 3V power from battery.
- 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.



Page 37 of 37

## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC15705231128AP02

## APPENDIX B: PHOTOGRAPHS OF THE EUT

Refer to the Report No.: AGC15705231128AP03

----END OF REPORT----



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- 3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
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- 8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
- 9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.