

FCC Test Report

Report No.: AGC12319220505FE02

FCC ID	:	QV7-GC88752-74
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Drone
BRAND NAME	:	/
MODEL NAME	:	Please see the page 6.
APPLICANT	:	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
DATE OF ISSUE	:	Jul. 04, 2022
STANDARD(S)	:	FCC Part 15.247
REPORT VERSION	:	V1.0
<u>Attestation of (</u>	<u>710</u>	brail Compliance (Shenzhen) Co., Ltd





REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 04, 2022	Valid	Initial Release



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1. VERIFICATION OF COMPLIANCE

Applicant	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD	
Address	NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENGHAI , Shantou, China	
Manufacturer	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD	
Address	NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENGHAI , Shantou, China	
Factory	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD	
Address	NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENGHAI , Shantou, China	
Product Designation	Drone	
Brand Name	N/A	
Test Model	X650	
Series Model	Please see the page 6.	
Declaration of Difference	Only the color of appearance is different, and others are consistent.	
Date of test	May 19, 2022 to Jul. 04, 2022	
Deviation	No any deviation from the test method	
Condition of Test Sample	Normal	
Test Result	Pass	
Report Template	AGCRT-US-BLE/RF	
MALE AND AND A CONTRACT OF A		

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 part 15.247.

an Duan Prepared By Alan Duan Jul. 04, 2022 (Project Engineer) **Reviewed By** Calvin Liu Jul. 04, 2022 (Reviewer) Approved By

Max Zhang (Authorized Officer)

Jul. 04, 2022



2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as a "Drone". It is designed by way of utilizing the GFSK technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.408 GHz to 2.478GHz	
RF Output Power	6.804dBm (Max)	
Modulation	GFSK	
Number of channels	71 Channels	
Antenna Designation	Internal Antenna (Comply with requirements of the FCC part 15.203)	
Antenna Gain	1dBi	
Hardware Version	1.0	
Software Version	1.0	
Power Supply	DC 3.7V by battery or DC 5V by adapter	

Test Model	X650
Series Model	X20, X300, X400, X500, X500PRO, X600, X600W, X700, X700W, TF1001, TG1001, X21W, X100, X800, X800W, X200, X200W, X110, X110W, X220, X220W, X330, X330W, X440, X440W, X550, X550W, X660, X660W, X770, X770W, X880, X880W, X990, X990W, X710W, X720W, X730W, X740W, X750W, X760W, X780W, X790W, X810W, X820W, X830W, X840W, X850W, X860W, X870W, X890W, X900W, X910W, X920W, X930W, X940W, X950W, X960W, X970W, X980W, S100, S107H-E, S39, S37, S40, S50H, S51H, S52H, S53H, S54H, S55H, S56H, S57H, S58H, S59H, S60H, S61H, S62H, S63H, S64H, S65H, Q7, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25



2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency	Channel Number	Frequency	Channel Number	Frequency
	1	2408	25	2432	49	2456
	2	2409	26	2433	50	2457
	3	2410	27	2434	51	2458
	4	2411	28	2435	52	2459
	5	2412	29	2436	53	2460
	6	2413	30	2437	54	2461
	7	2414	31	2438	55	2462
	8	2415	32	2439	56	2463
	9	2416	33	2440	57	2464
	10	2417	34	2441	58	2465
	11	2418	35	2442	59	2466
0400 0400 FMU	12	2419	36	2443	60	2467
2400~2483.5MHz	13	2420	37	2444	61	2468
	14	2421	38	2445	62	2469
	15	2422	39	2446	63	2470
	16	2423	40	2447	64	2471
	17	2424	41	2448	65	2472
	18	2425	42	2449	66	2473
	19	2426	43	2450	67	2474
	20	2427	44	2451	68	2475
	21	2428	45	2452	69	2476
	22	2429	46	2453	70	2477
	23	2430	47	2454	71	2478
	24	2431	48	2455		



2.3. RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for FCC ID: QV7-GC88752-74 filing to comply with the FCC Part 15.247 requirements.

2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7. 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.



3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y $\pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty	
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 3.1 \text{ dB}$	
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 4.0 \text{ dB}$	
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.8 \text{ dB}$	
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$	
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$	
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$	
Uncertainty of Occupied Channel Bandwidth	U _c = ±2 %	



4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX

Note:

1. 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. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

4. The fixed frequency mode is to press the key to trigger the frequency point without external software



5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF TESTED SYSTEM

Radiated Emission Configure:

EUT

Conducted Emission Configure:

EUT	AE

5.2. EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Drone	X650	QV7-GC88752-74	EUT
2	Adapter	K-T10E0502000E		AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.247 (b)(3)	Peak Output Power	Compliant
15.247 (a)(2)	6 dB Bandwidth	Compliant
15.247 (d)	Conducted Spurious Emission	Compliant
15.247 (e)	Maximum Conducted Output Power Density	Compliant
15.209	Radiated Emission	Compliant
15.207	Conducted Emission	Compliant



6. TEST FACILITY

Test software

Test Site	Attestation of G	Attestation of Global Compliance (Shenzhen) Co., Ltd					
Location		1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China					
Designation Number	CN1259						
FCC Test Firm Registration Number	975832	975832					
A2LA Cert. No.	5054.02						
Description	Attestation of G	Blobal Compliance (S	Shenzhen) Co., L	td is accredited t	by A2LA		
TEST EQUIPMENT OF	CONDUCTED E	MISSION TEST					
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due		
TEST RECEIVER	R&S	ESPI	101206	Mar. 28, 2022	Mar. 27, 2023		
LISN	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023		

ES-K1(Ver.V1.71)

N/A

N/A

N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

R&S

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Nov. 17, 2021	Nov. 16, 2022
2.4GHz Filter	EM Electronics	2400-2500MHz	N/A	Mar. 22, 2022	Mar. 21, 2024
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Oct. 31, 2021	Oct. 30, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 21, 2024
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2020	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A



7. PEAK OUTPUT POWER

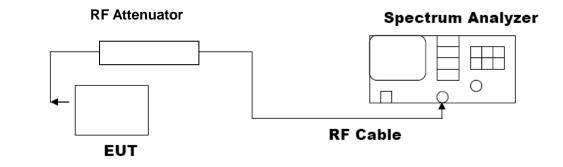
7.1. MEASUREMENT PROCEDURE

For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. RBW≥DTS bandwidth
- 3. VBW≥3*RBW.
- 4. SPAN≥VBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

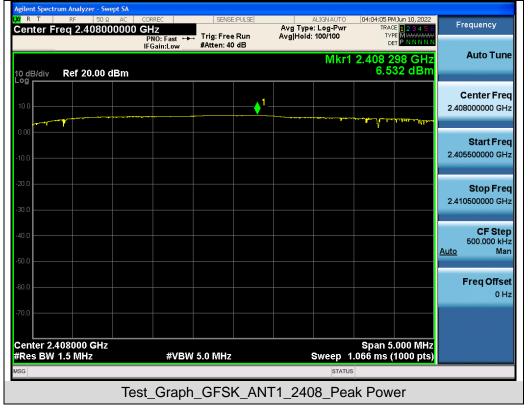
7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) PEAK POWER TEST SETUP





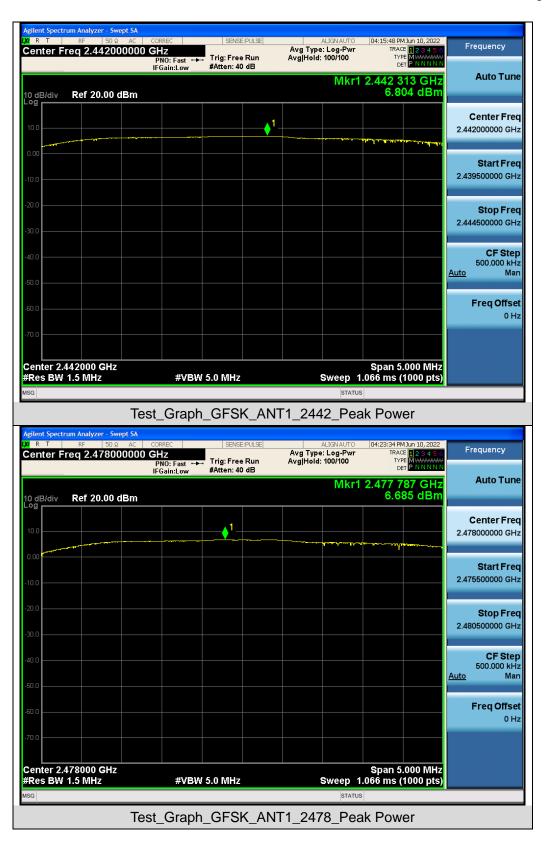
7.3. LIMITS AND MEASUREMENT RESULT

Test Data of Conducted Output Power					
Test Mode	Test Channel (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail	
	2408	6.532	≪30	Pass	
GFSK	2442	6.804	≪30	Pass	
	2478	6.685	≤30	Pass	



Test Graphs of Conducted Output Power







8. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

6dB bandwidth:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 kHz, VBW≥3×RBW.
- 4. Set SPA Trace 1 Max hold, then View.

Occupied bandwidth:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hoping channel The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

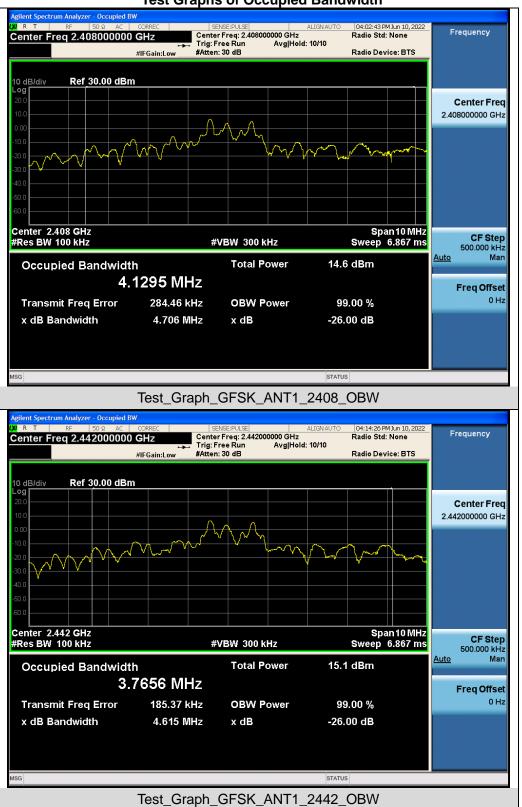
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 7.2.

8.3. LIMITS AND MEASUREMENT RESULTS

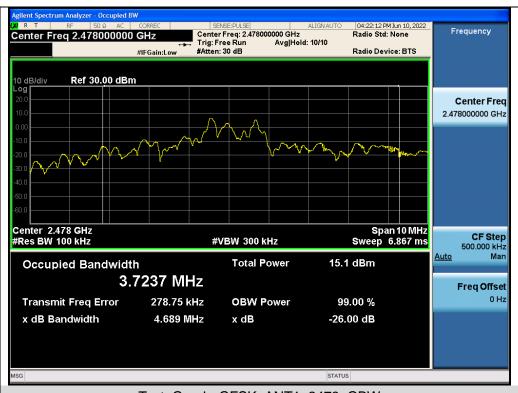
	Test Data of Occupied Bandwidth and DTS Bandwidth						
Test Mode	Test Channel (MHz)	Limits (MHz)	Pass or Fail				
	2408	4.130	0.716	≥0.5	Pass		
GFSK	2442	3.766	0.730	≥0.5	Pass		
	2478	3.724	1.013	≥0.5	Pass		



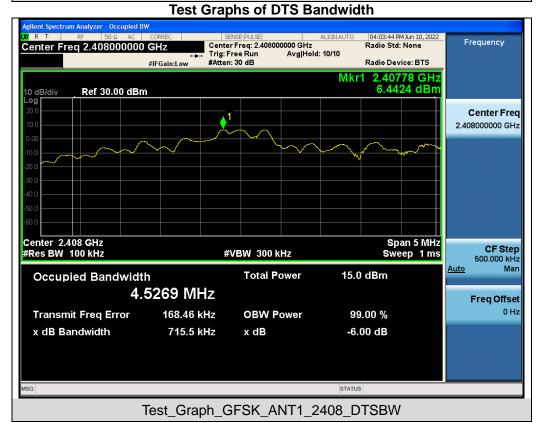


Test Graphs of Occupied Bandwidth

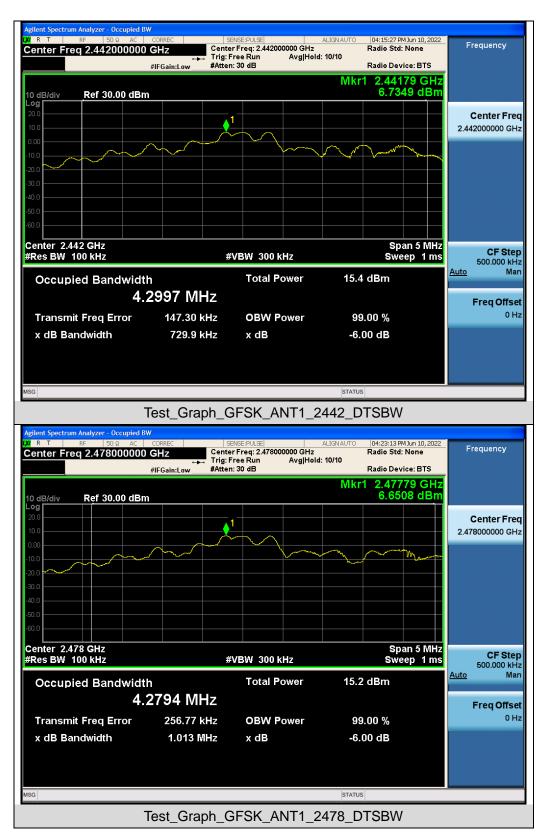




Test_Graph_GFSK_ANT1_2478_OBW









9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

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

The same as described in section 7.2.

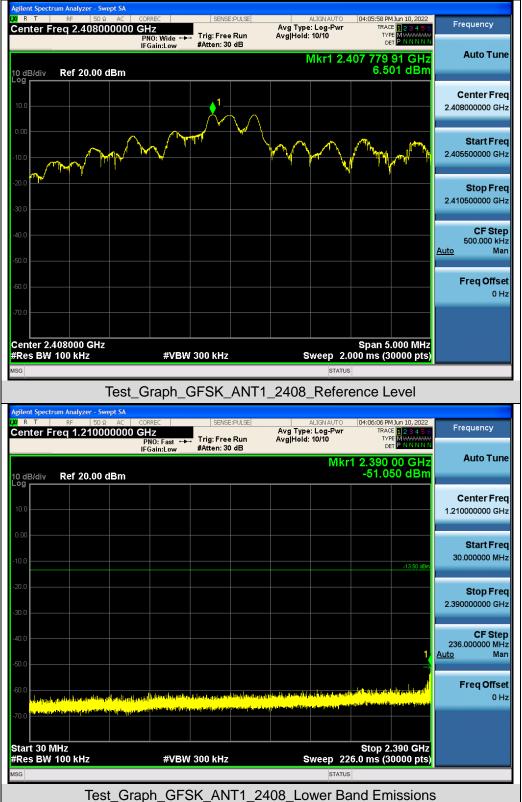
9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

9.4. LIMITS AND MEASUREMENT RESULT

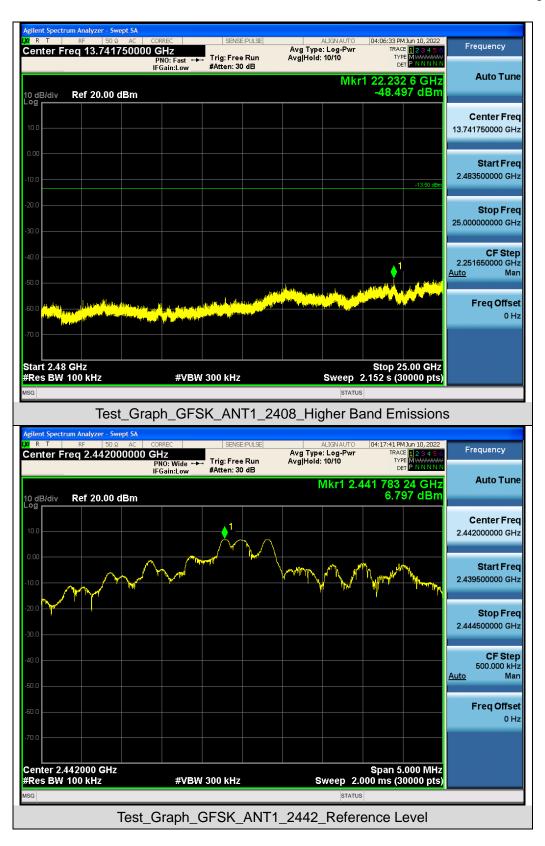
LIMITS AND MEASUREMENT RESULT					
Applieghte Limite	Measurement Result				
Applicable Limits	Test Data	Criteria			
In any 100 kHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.	At least -20dBc than the reference level	PASS			



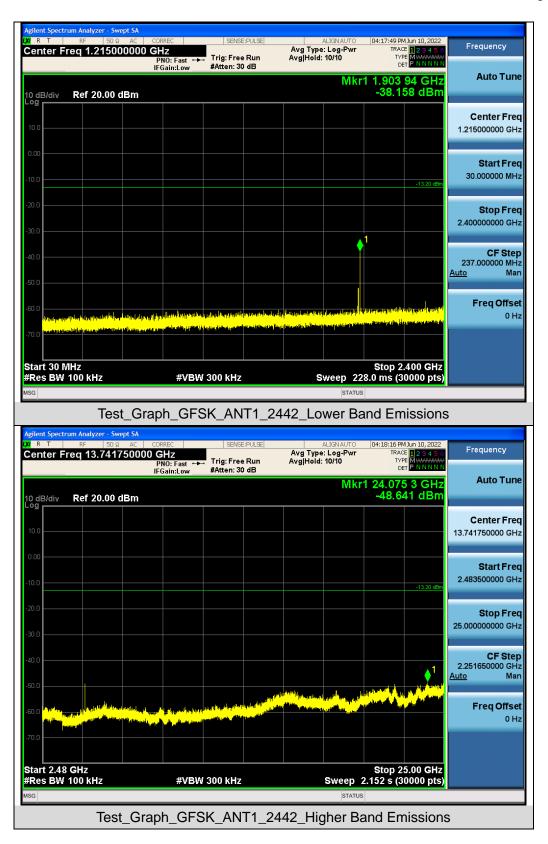


Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands

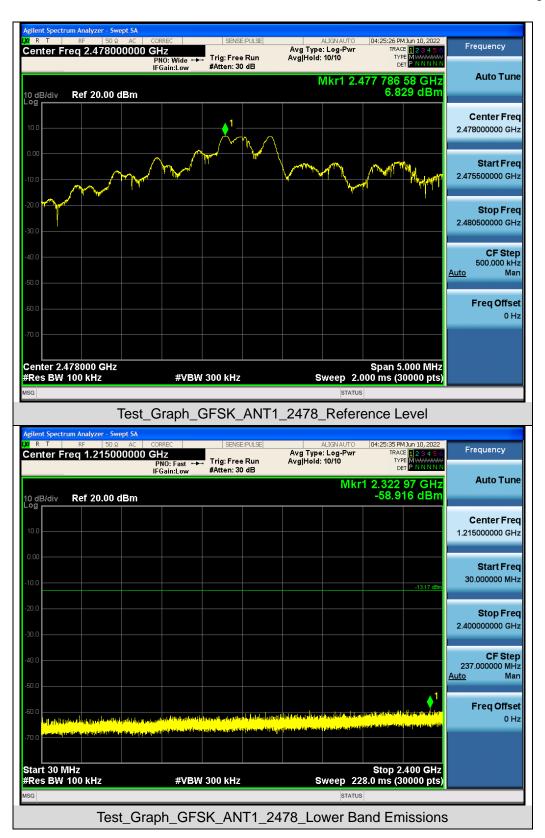




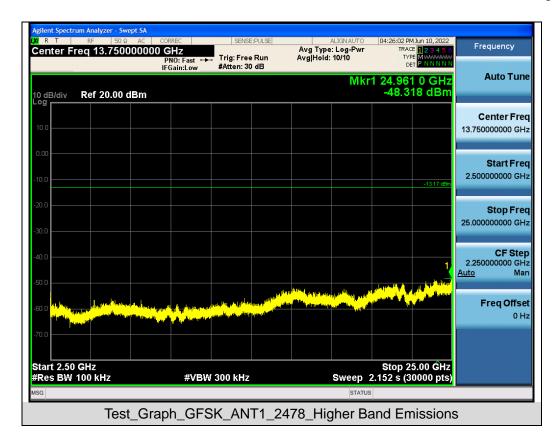




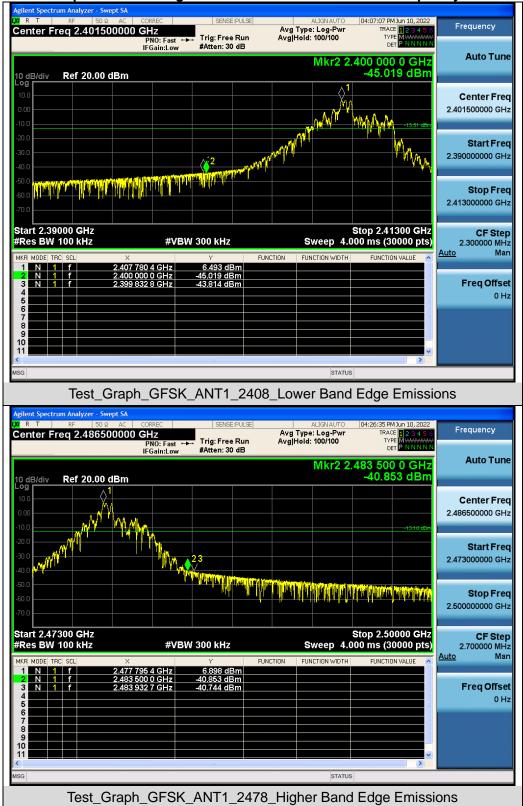












Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands



10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

10.1. MEASUREMENT PROCEDURE

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set the SPA Trace 1 Max hold, then View.

Note: The method of PKPSD in the KDB 558074 item 8.4 was used in this testing.

10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer to Section 7.2.

10.3. MEASUREMENT EQUIPMENT USED

Refer to Section 6.

10.4. LIMITS AND MEASUREMENT RESULT

	Test Data of Conducted Output Power Spectral Density						
Test Mode	Test Channel (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail			
	2408	4.290	≤8	Pass			
GFSK	2442	4.770	≪8	Pass			
	2478	2.849	≪8	Pass			

Test Graphs of Conducted Output Power Spectral Density









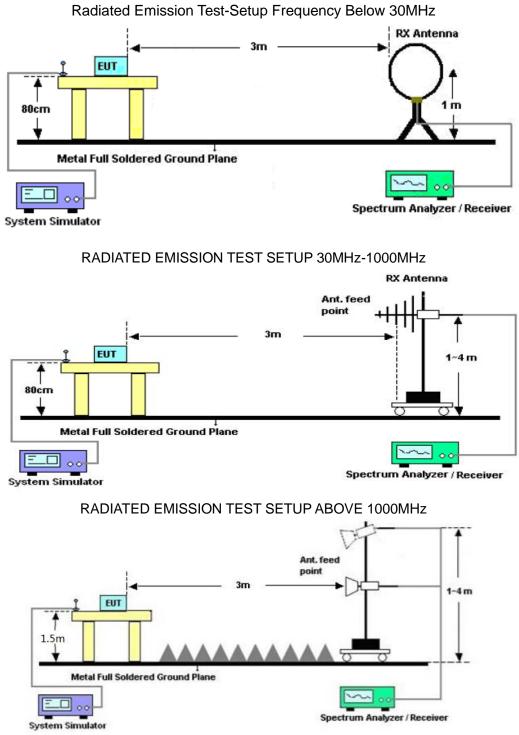
11. RADIATED EMISSION

11.1. 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 emission, 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 1MHz RBW and 3MHz VBW for peak reading. 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.



11.2. TEST SETUP





11.3. LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

11.4. 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.



EUT	Drone		Model Name	X650	
Temperature	25° C		Relative Humidit	y 55.4%	
Pressure	960hPa		Test Voltage	Norma	Voltage
Test Mode	Mode 2		Antenna	Horizor	ntal
72.0 dBuV/m				Limit	
				Margin:	_
		r			
		ſ			6
32		3 4	5		ulur Xurr
	energethersthere and a harder the beau	Wind Wind	5 manundaran marked	white the and the second	
prolonger of a second and a second and the	man alland and her the lower	Mantres and Manual In the	1 martin Ser		
-8					
30.000 40 50	0 60 70 90	(MHz)	300 400	500 600 700	1000.000
	Read		leasure-	0	
No. Mk.	Freq. Leve		ment Limit	Over	
	MHz dBu		lBuV/m dBuV/m		ector
1 6	7.6751 5.5	64 16.96	22.50 40.00	-17.50 pe	eak
2 12	9.9226 6.7	75 17.81	24.56 43.50	-18.94 pe	eak
3 19	5.1365 10.2	29 16.05	26.34 43.50	-17.16 pe	eak
4 22	0.6171 10.3	37 16.25	26.62 46.00	-19.38 pe	eak
5 30	0.3672 6.5	53 20.44	26.97 46.00	-19.03 pe	eak
6 * 93	5.5463 5.8	34 27.90	33.74 46.00	-12.26 pe	eak

Radiated emission from 30MHz to 1000MHz

RESULT: PASS



EUT	Drone		Model Name	X650	
Temperature	25° C		Relative Humidit	t y 55.4%	
Pressure	960hPa		Test Voltage	Normal Voltag	е
Test Mode	Mode 2		Antenna	Vertical	
72.0 dBuV/m				Limit: —	
				Margin:	
				han Super	
32		3 4	5	And and the and the state of th	
1	Martin Ball Martin Martal Language and Martin	mond y	Words Auguna Marine Marine Marine	-499 ···	
may had a general and a second der man and be	Mar	- With	·		
-8					
30.000 40 50		(MHz)	300 400	500 600 700 1000.00	0
No. Mk.	Reading Freq. Level	Correct M Factor	leasure- ment Limit	Over	
	MHz dBuV	dB	dBuV/m dBuV/m	dB Detector	
1 4	1.4215 5.98	14.85	20.83 40.00	-19.17 peak	
2 68	8.8721 6.05	17.08	23.13 40.00	-16.87 peak	
3 12	1.5486 5.79	17.99	23.78 43.50	-19.72 peak	
4 178	8.1327 9.52	17.04	26.56 43.50	-16.94 peak	
5 383	3.9318 7.15	19.06	26.21 46.00	-19.79 peak	
6 * 839	9.1818 6.19	27.50	33.69 46.00	-12.31 peak	

RESULT: PASS Note:

1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. All test modes had been tested. The mode 2 is the worst case and recorded in the report.



Radiated emission above 1GHz

EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
4816.000	46.23	0.08	46.31	74	-27.69	peak
4816.000	35.28	0.08	35.36	54	-18.64	AVG
7224.000	41.06	2.21	43.27	74	-30.73	peak
7224.000	32.49	2.21	34.7	54	-19.3	AVG
Remark:						
actor = Anter	na Factor + Cabl	e Loss – Pre-	amplifier.			

EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4816.000	45.63	0.08	45.71	74	-28.29	peak
4816.000	36.57	0.08	36.65	54	-17.35	AVG
7224.000	42.15	2.21	44.36	74	-29.64	peak
7224.000	33.49	2.21	35.7	54	-18.3	AVG
amarki						
Remark:			1.0			
actor = Anter	nna Factor + Cabl	e Loss – Pre-	amplifier.			



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EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4884.000	46.94	0.14	47.08	74	-26.92	peak
4884.000	38.51	0.14	38.65	54	-15.35	AVG
7326.000	41.08	2.36	43.44	74	-30.56	peak
7326.000	32.55	2.36	34.91	54	-19.09	AVG
emark:						

EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4884.000	45.98	0.14	46.12	74	-27.88	peak
4884.000	36.57	0.14	36.71	54	-17.29	AVG
7326.000	40.25	2.36	42.61	74	-31.39	peak
7326.000	32.46	2.36	34.82	54	-19.18	AVG
emark:						
actor = Anter	nna Factor + Cabl	e Loss – Pre-	amplifier.			



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EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4956.000	46.28	0.22	46.5	74	-27.5	peak
4956.000	37.25	0.22	37.47	54	-16.53	AVG
7434.000	41.26	2.64	43.9	74	-30.1	peak
7434.000	32.54	2.64	35.18	54	-18.82	AVG
emark:						

Factor = Antenna Factor + Cable Loss – Pre-ampliller.

EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4956.000	46.34	0.22	46.56	74	-27.44	peak
4956.000	35.28	0.22	35.5	54	-18.5	AVG
7434.000	42.16	2.64	44.8	74	-29.2	peak
7434.000	31.94	2.64	34.58	54	-19.42	AVG
om order						
emark:						

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, Over=Measure-Limit.

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



Test result for band edge	emission at restricted bands
---------------------------	------------------------------

EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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EUT	Drone	Model Name	X650
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

Note: The factor had been edited in the "Input Correction" of the Spectrum Analyzer.

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12. LINE CONDUCTED EMISSION TEST

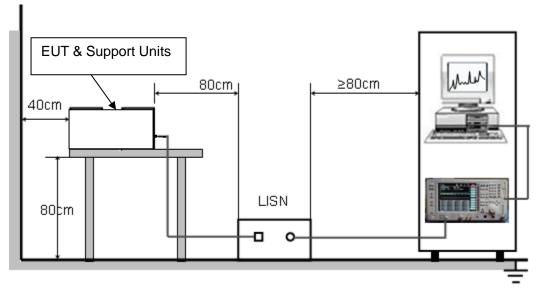
12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage				
Frequency	Q.P.(dBuV) Average(
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.

12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST





12.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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 5V power from adapter which 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.

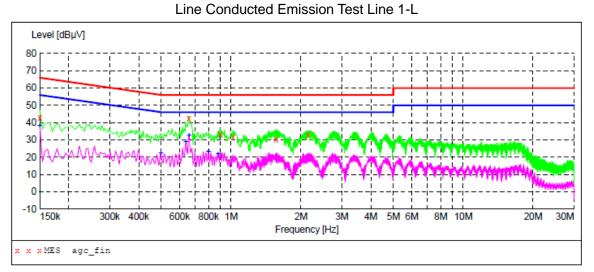
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

12.4. 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.
- 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.



12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST



MEASUREMENT RESULT: "agc_fin"

2022/5/24 20:30

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000 0.658000 0.898000 1.018000 1.562000 2.150000	42.90 42.20 33.30 31.70 30.20 32.90	6.9 5.4 5.4 5.5 6.1 6.5	66 56 56 56 56	23.1 13.8 22.7 24.3 25.8 23.1	QP QP QP	L1 L1 L1 L1 L1 L1

MEASUREMENT RESULT: "agc fin2"

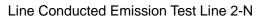
2022/5/24 2	20:30					
Frequency MH:	-	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.15000 0.49800 0.63800 0.65800 0.79800 0.87800	0 22.30 0 28.80 0 32.50 0 23.00	6.9 5.4 5.4 5.4 5.4 5.4 5.4	56 46 46 46 46	17.7 23.7 17.2 13.5 23.0 24.2	AV AV AV AV	L1 L1 L1 L1 L1 L1

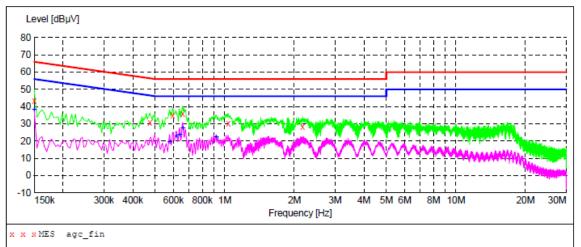
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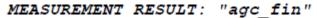
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2022/5/24 20:33

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	43.10	6.9	66	22.9	QP	N
0.474000	30.80	5.5	56	25.6	QP	N
0.594000	35.00	5.4	56	21.0	QP	N
0.658000	35.90	5.4	56	20.1	QP	N
1.034000	30.00	5.5	56	26.0	QP	N
2.170000	28.30	6.5	56	27.7	QP	Ν

MEASUREMENT RESULT: "agc_fin2"

2022/5/24 20	:33					
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	38.30	6.9	56	17.7	AV	N
0.578000	19.50	5.4	46	26.5	AV	N
0.618000	22.70	5.4	46	23.3	AV	N
0.638000	23.50	5.4	46	22.5	AV	N
0.658000	27.20	5.4	46	18.8	AV	N
0.918000	22.30	5.4	46	23.7	AV	N

RESULT: PASS

Note: All test modes had been pre-tested. The mode 2 is the worst case and recorded in the report.

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC12319220505AP01

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC12319220505AP02

----END OF REPORT----



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