FCC Test Report

Report No.: AGC15705230719FR01

FCC ID	:	2AZ6WHS2023
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Rc Car
BRAND NAME	:	N/A
MODEL NAME	:	See page 4
APPLICANT	:	SHANTOU HOSPEED TOYS FACTORY
DATE OF ISSUE	:	Aug. 10, 2023
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Subpart C §15.249
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. 10, 2023	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	SHANTOU HOSPEED TOYS FACTORY
Address	LIANXIA TOWN, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE
Manufacturer	SHANTOU HOSPEED TOYS FACTORY
Address	LIANXIA TOWN, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE
Factory	SHANTOU HOSPEED TOYS FACTORY
Address	LIANXIA TOWN, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE
Product Designation	Rc Car
Brand Name	N/A
Test Model	HS14331
Series Model	See page 5
Difference Description	The remote controls are the same except for the model name. The circuit of the cars are the same, only the appearance shape, appearance color and model name are different.
Date of receipt of test item	Aug. 02, 2023
Date of test	Aug. 02, 2023 to Aug. 10, 2023
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	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. 10, 2023
Reviewed By	Calvin Liu (Reviewer)	Aug. 10, 2023
Approved By	Max Zhang (Authorized Officer)	Aug. 10, 2023

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2410MHz-2473MHz
Maximum field strength	91.46dBµV/m(Peak)@3m 79.53dBµV/m(Average)@3m
Modulation	GFSK
Number of channels	32 Channels
Antenna Gain	0dBi
Antenna Designation	Wire Antenna
Hardware Version	V1.0
Software Version	V1.0
Power Supply	DC 4.5V by battery

Series Model	HS18301, HS18302, HS18303, HS18304, HS18311, HS18312, HS18313, HS18314, HS18321, HS18322, HS18323, HS18324, HS18325, HS18326, HS18327, HS18328, HS18331, HS18332, HS18333, HS18334, HS18341, HS18342, HS18401, HS18402, HS18411, HS18412, HS18421, HS18422, HS18423, HS18424, HS18425, HS18426, HS18431, HS18432, HS18433, HS18434, HS16351, HS16352, HS16353, HS16354, HS16355, HS16356, HS16357, HS16358, HS16451, HS16452, HS16453, HS16454, HS16455, HS16456, HS14301, HS14302, HS14303, HS14304, HS14311, HS14312, HS14313, HS14314, HS14321, HS14322, HS14323, HS14324, HS14332, HS14333, HS14334, HS14401, HS14402, HS14411, HS14412, HS14421, HS14422, HS14423, HS14424, HS14431, HS14432, HS14433, HS14434, HS12301, HS12302, HS12311, HS12312, HS12401, HS12402, HS12411, HS12412, HS12351, HS12352, HS12451, HS12452, HS10421, HS10422, HS10423, HS10424, HS10425, HS10426, HS10521, HS10522, HS10523, HS10524

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2.2. TABLE OF CARRIER FREQUENCY

Channel Number	Frequency (MHZ)	Channel Number	Frequency (MHZ)	Channel Number	Frequency (MHZ)
01	2410	12	2430	23	2454
02	2414	13	2431	24	2456
03	2415	14	2433	25	2458
04	2416	15	2434	26	2462
05	2417	16	2439	27	2464
06	2418	17	2441	28	2465
07	2419	18	2442	29	2466
08	2421	19	2444	30	2467
09	2426	20	2446	31	2469
10	2428	21	2450	32	2473
11	2429	22	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, 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 %

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4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX_2410MHz_GFSK
2	Middle channel TX_2442MHz_GFSK
3	High channel TX_2473MHz_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:

EUT

5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Rc Car	HS14331	2AZ6WHS2023	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

Test Site	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
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
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
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

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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	
		μV/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 (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level dB μV = 20 log Emission level μV/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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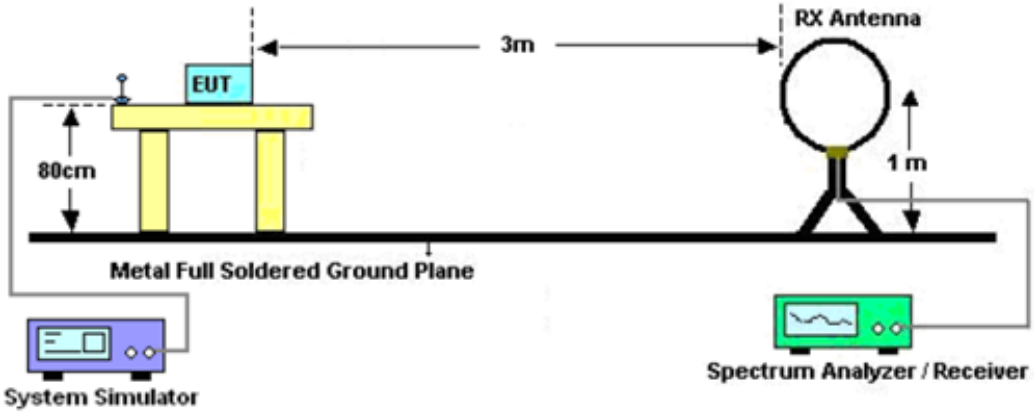
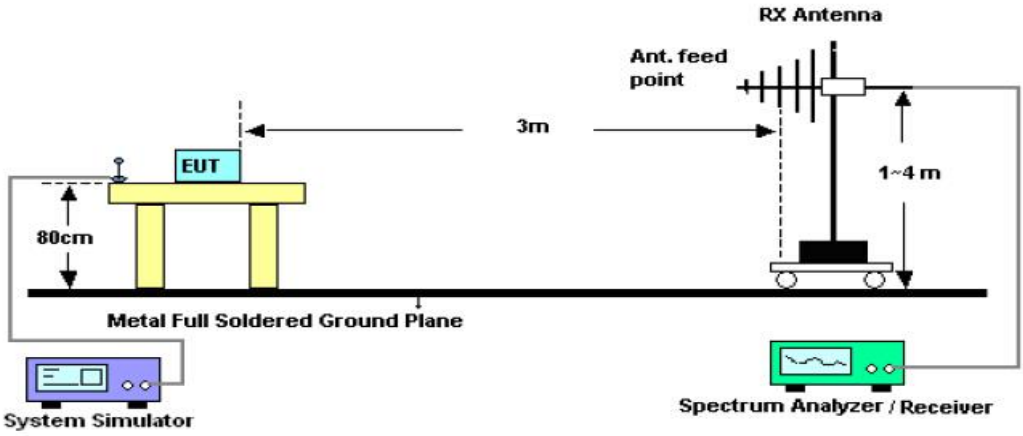
7.3. TEST SETUP

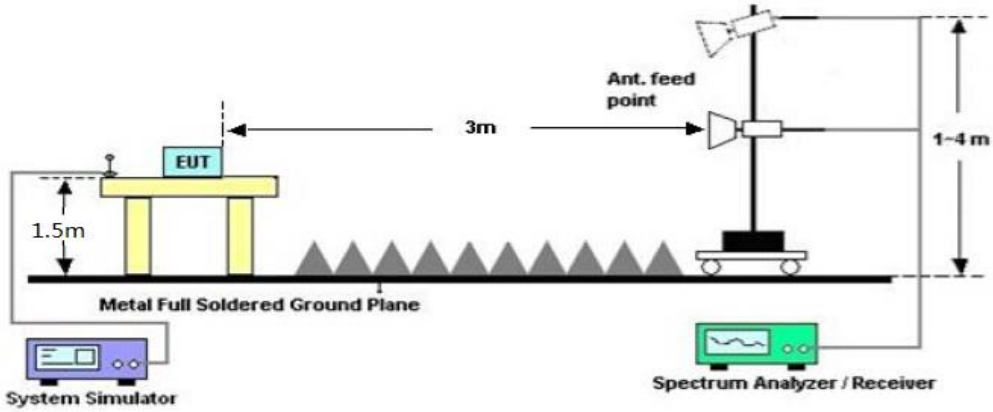
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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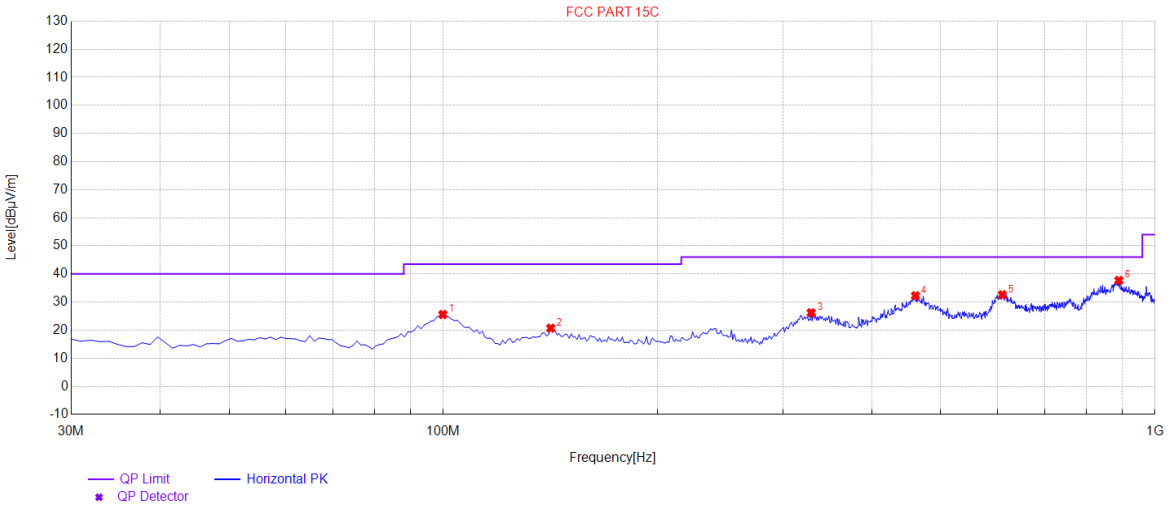
7.4. TEST RESULT

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

EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Polarization**	Horizontal



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	99.84	25.57	21.38	43.50	17.93	100	10	Horizontal
2	141.55	20.71	14.80	43.50	22.79	100	150	Horizontal
3	328.76	26.19	21.11	46.00	19.81	100	160	Horizontal
4	460.68	32.25	27.58	46.00	13.75	100	130	Horizontal
5	610.06	32.59	28.35	46.00	13.41	100	70	Horizontal
6	889.42	37.71	32.55	46.00	8.29	100	160	Horizontal

RESULT: PASS

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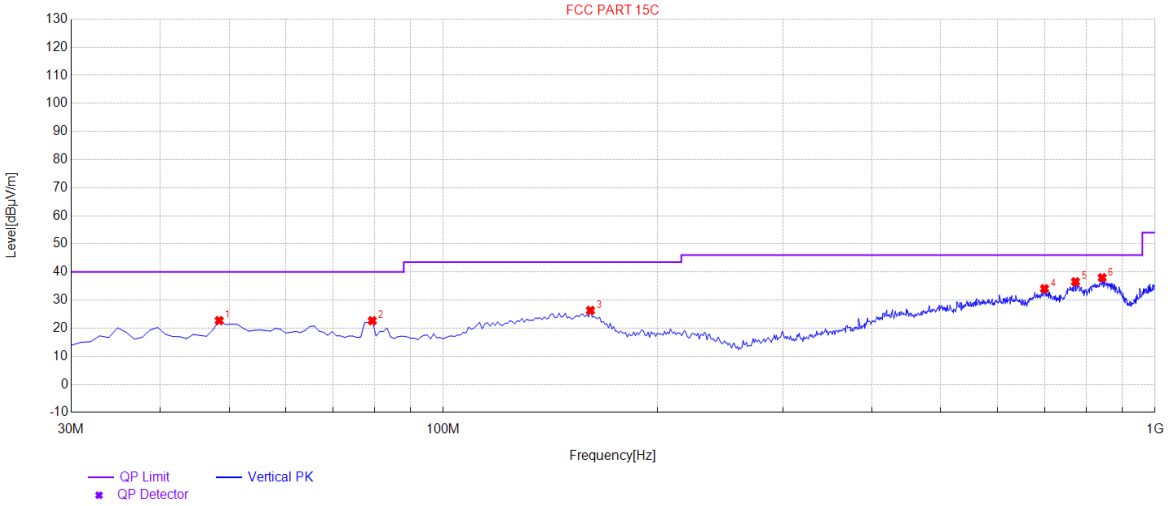
EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Polarization**	Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	48.43	22.70	13.07	40.00	17.30	100	250	Vertical
2	79.47	22.64	12.22	40.00	17.36	100	290	Vertical
3	160.95	26.31	21.61	43.50	17.19	100	310	Vertical
4	699.3	34.04	29.02	46.00	11.96	100	120	Vertical
5	773.02	36.51	30.79	46.00	9.49	100	190	Vertical
6	842.86	37.95	32.45	46.00	8.05	100	30	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 3 is the worst case and recorded in the report.

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FIELD STRENGTH OF FUNDAMENTAL

EUT	Rc Car	**Model Name**	HS14331
Temperature	22.9° C	**Relative Humidity**	57.3%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Modulation	GFSK	**Polarization**	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2410	36.90	49.05	85.95	114.00	-28.05	peak
2410	30.20	49.05	79.25	94.00	-14.75	AVG
2442	35.41	49.12	84.53	114.00	-29.47	peak
2442	26.14	49.12	75.26	94.00	-18.74	AVG
2473	39.33	49.25	88.58	114.00	-25.42	peak
2473	27.77	49.25	77.02	94.00	-16.98	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Rc Car	**Model Name**	HS14331
Temperature	22.9° C	**Relative Humidity**	57.3%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Modulation	GFSK	**Polarization**	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2410	44.37	49.05	90.03	114.00	-23.97	peak
2410	29.51	49.05	69.13	94.00	-24.87	AVG
2442	45.31	49.12	89.68	114.00	-24.32	peak
2442	30.11	49.12	68.35	94.00	-25.65	AVG
2473	40.78	49.25	91.46	114.00	-22.54	peak
2473	30.48	49.25	79.53	94.00	-14.47	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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RADIATED EMISSION ABOVE 1GHZ

EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 1	**Polarization**	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4820	50.05	3.76	53.81	74.00	-20.19	peak
4820	38.61	3.76	42.37	54.00	-11.63	AVG
7230	47.13	8.17	55.30	74.00	-18.70	peak
7230	37.79	8.17	45.96	54.00	-8.04	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 1	**Polarization**	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4820	48.96	3.76	52.72	74.00	-21.28	peak
4820	37.62	3.76	41.38	54.00	-12.62	AVG
7230	46.41	8.17	54.58	74.00	-19.42	peak
7230	35.97	8.17	44.14	54.00	-9.86	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 2	**Polarization**	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4884	49.62	3.78	53.40	74.00	-20.60	peak
4884	37.03	3.78	40.81	54.00	-13.19	AVG
7326	46.56	8.23	54.79	74.00	-19.21	peak
7326	35.78	8.23	44.01	54.00	-9.99	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 2	**Polarization**	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4884	47.22	3.78	51.00	74.00	-23.00	peak
4884	36.84	3.78	40.62	54.00	-13.38	AVG
7326	45.56	8.23	53.79	74.00	-20.21	peak
7326	35.03	8.23	43.26	54.00	-10.74	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Polarization**	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4946	49.96	3.81	53.77	74.00	-20.23	peak
4946	39.63	3.81	43.44	54.00	-10.56	AVG
7419	47.12	8.27	55.39	74.00	-18.61	peak
7419	37.58	8.27	45.85	54.00	-8.15	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Rc Car	**Model Name**	HS14331
Temperature	24.0° C	**Relative Humidity**	60.6%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Polarization**	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4946	46.77	3.81	50.58	74.00	-23.42	peak
4946	37.45	3.81	41.26	54.00	-12.74	AVG
7419	44.13	8.27	52.40	74.00	-21.60	peak
7419	35.91	8.27	44.18	54.00	-9.82	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.

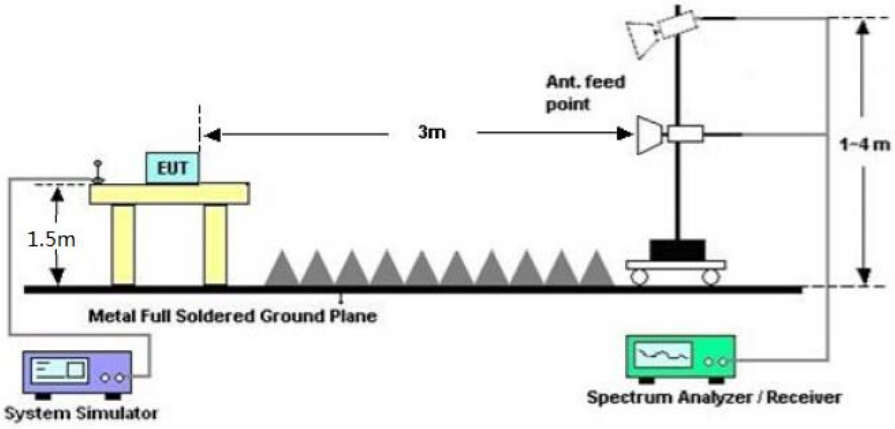
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz; VBW=3MHz / Sweep=AUTO

3. Other procedures refer to clause 7.2.

8.2. TEST SETUP

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(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.

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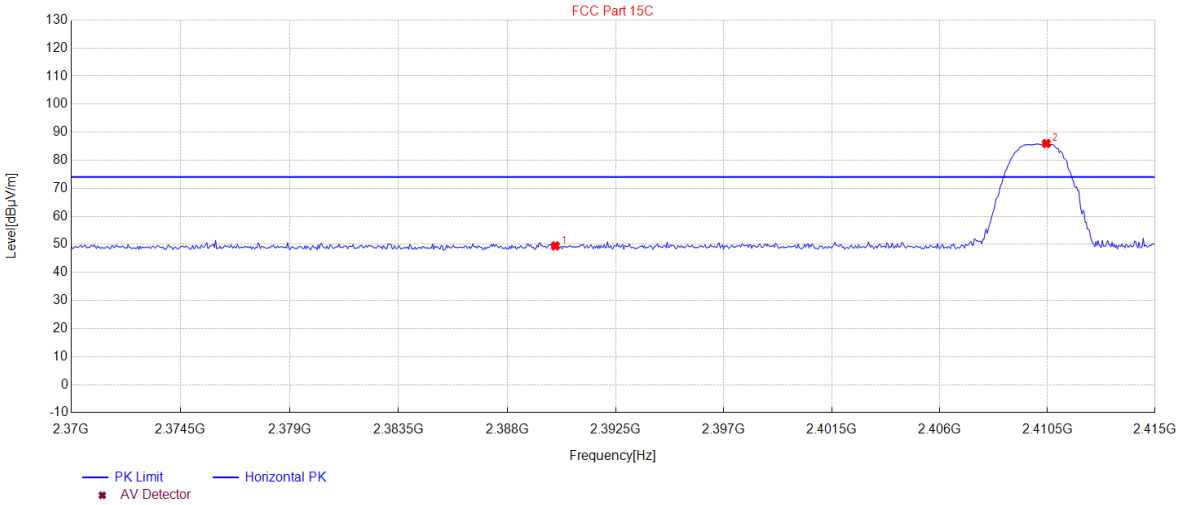
EUT	Rc Car	**Model Name**	HS14331
Temperature	23.5° C	**Relative Humidity**	59.9%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 1	**Polarization**	Horizontal

Peak Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390	49.46	33.57	74.00	24.54	150	233	Horizontal
2	2410.450	85.95	33.67	74.00	-11.95	150	333	Horizontal

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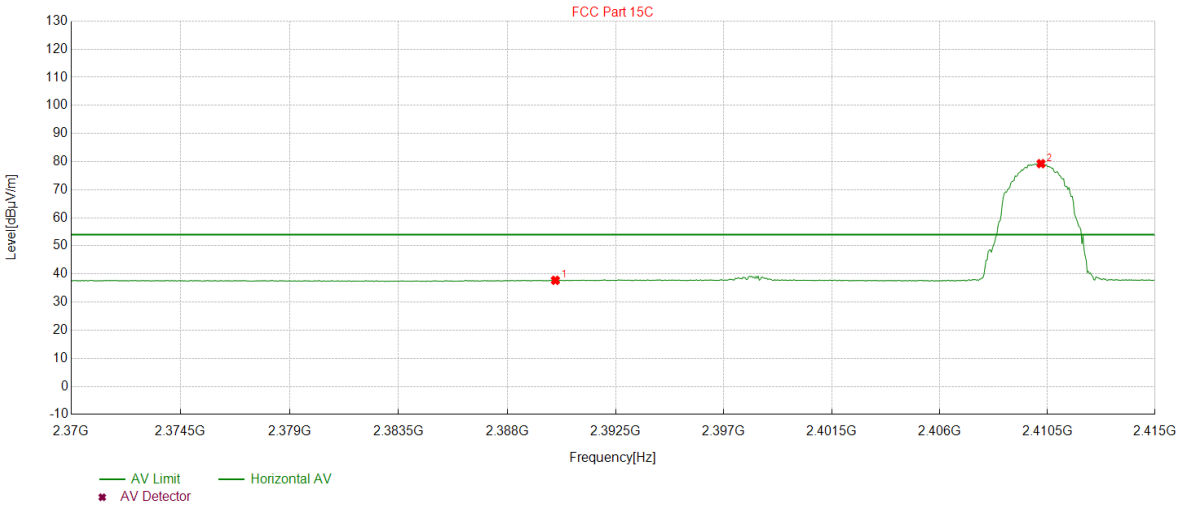
Average Value



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390	37.74	33.57	54.00	16.26	150	130	Horizontal
2	2410.225	79.25	33.67	54.00	-25.25	150	200	Horizontal

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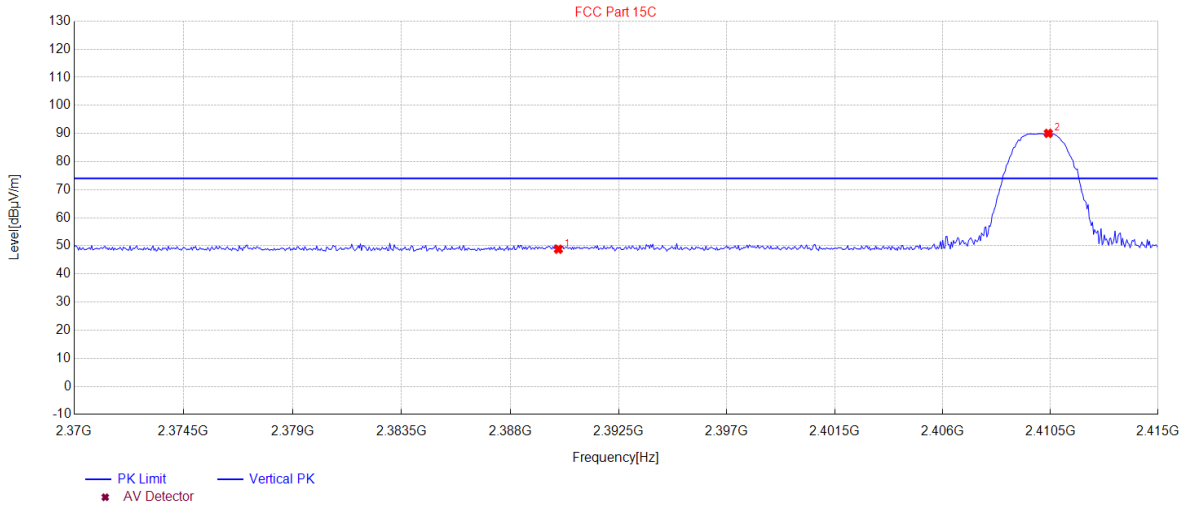
EUT	Rc Car	**Model Name**	HS14331
Temperature	23.5° C	**Relative Humidity**	59.9%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 1	**Polarization**	Vertical

Peak Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390	48.81	33.57	74.00	25.19	150	7	Vertical
2	2410.405	90.03	33.67	74.00	-16.03	150	91	Vertical

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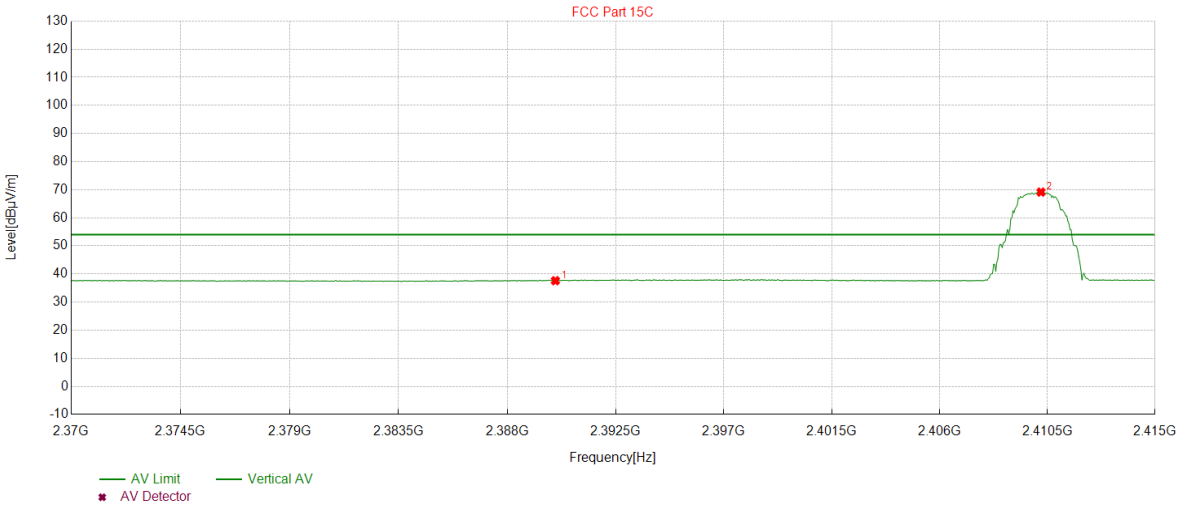
Average Value



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390	37.60	33.57	54.00	16.40	150	310	Vertical
2	2410.225	69.13	33.67	54.00	-15.13	150	60	Vertical

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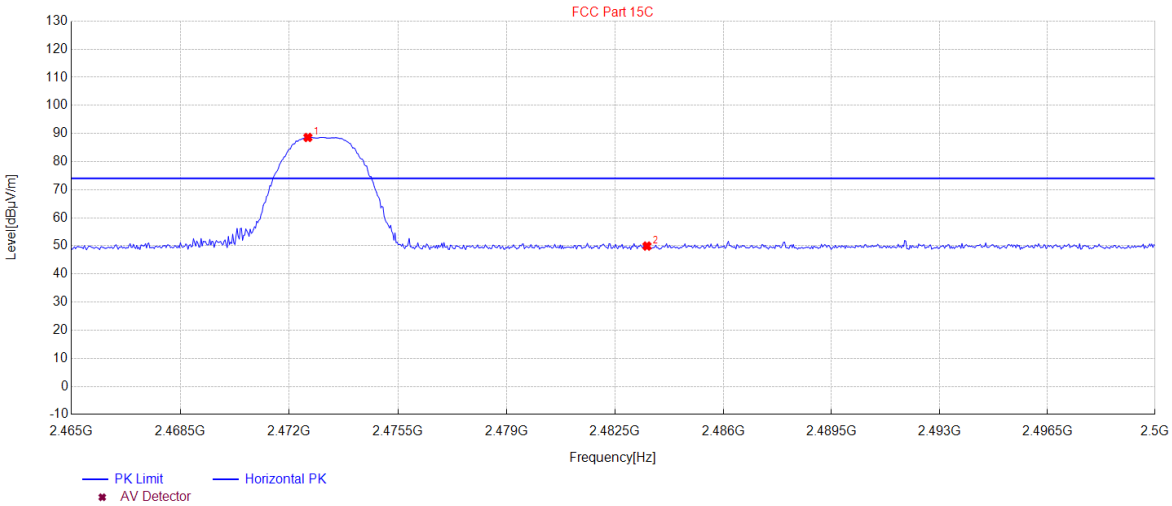
EUT	Rc Car	**Model Name**	HS14331
Temperature	23.5° C	**Relative Humidity**	59.9%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Polarization**	Horizontal

Peak Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2472.602	88.58	33.95	74.00	-14.58	150	318	Horizontal
2	2483.533	49.93	34.00	74.00	24.07	150	183	Horizontal

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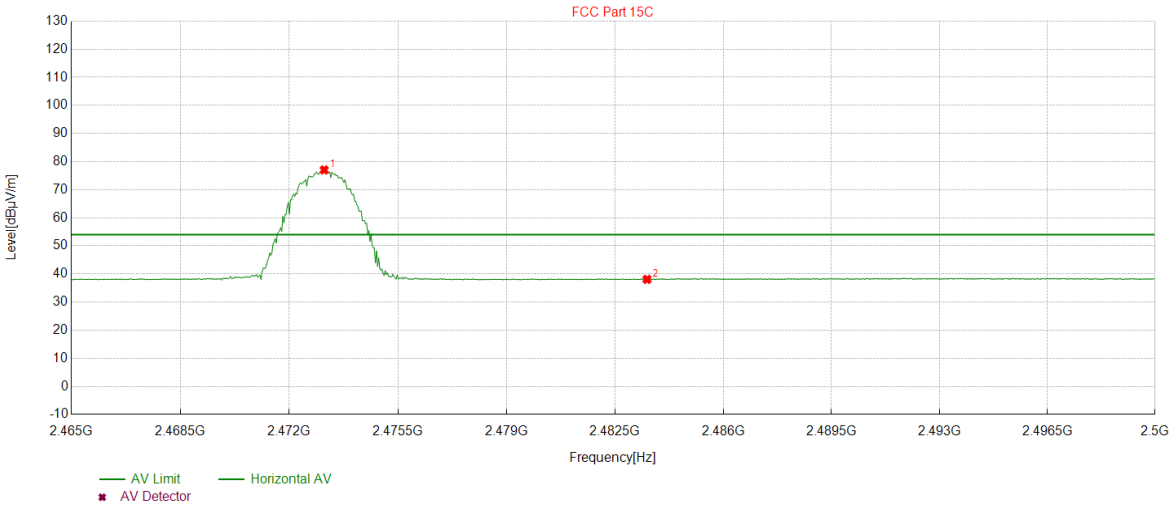
Average Value



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2473.128	77.02	33.96	54.00	-23.02	150	70	Horizontal
2	2483.533	38.08	34.00	54.00	15.92	150	100	Horizontal

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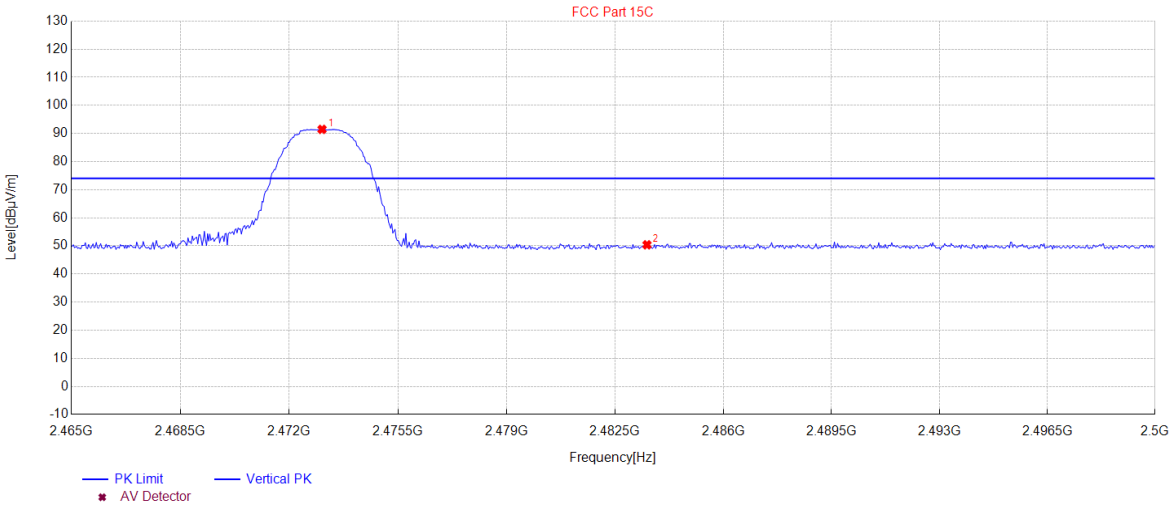
EUT	Rc Car	**Model Name**	HS14331
Temperature	23.5° C	**Relative Humidity**	59.9%
Pressure	985kPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Polarization**	Vertical

Peak Value



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2473.058	91.46	33.96	74.00	-17.46	150	90	Vertical
2	2483.533	50.37	34.00	74.00	23.63	150	67	Vertical

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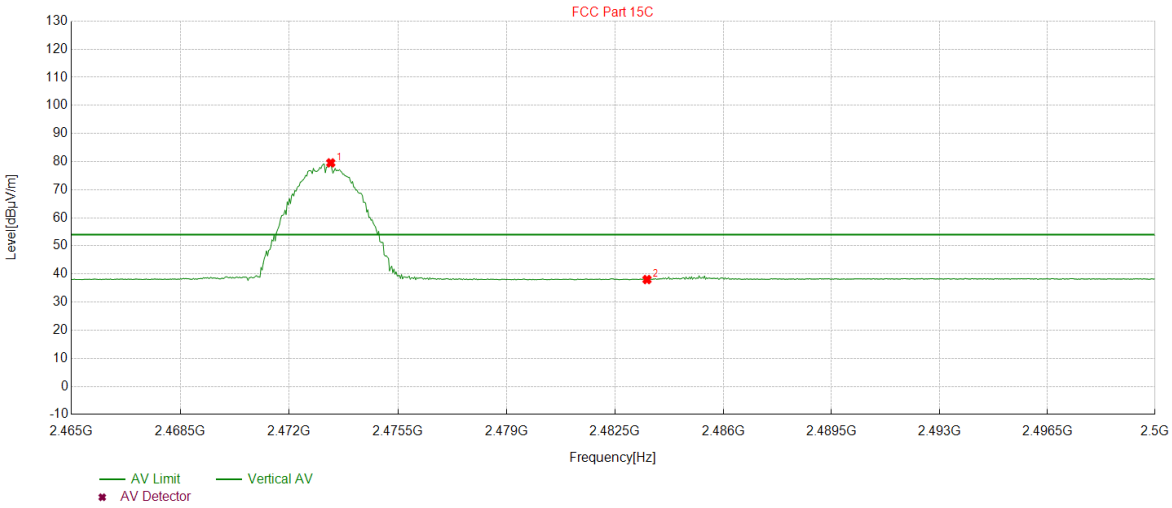
Average Value



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2473.338	79.53	33.96	54.00	-25.53	150	360	Vertical
2	2483.533	38.01	34.00	54.00	15.99	150	280	Vertical

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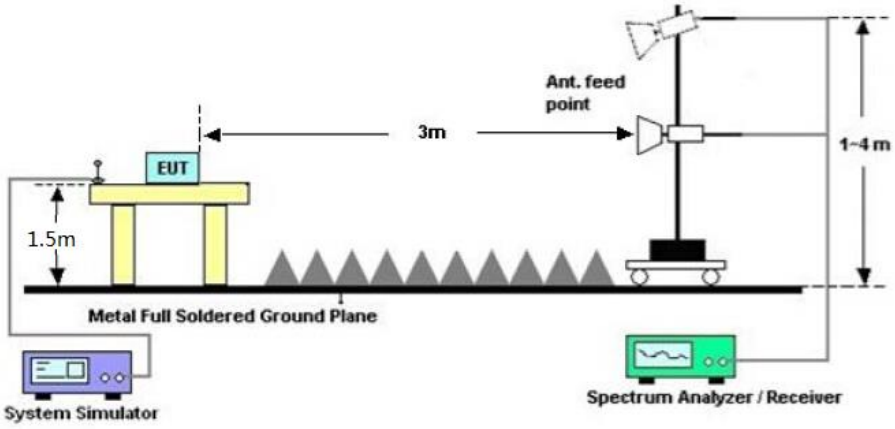
9. 20DB BANDWIDTH

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≥3×RBW.
3. Set SPA Trace 1 Max hold, then View.

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



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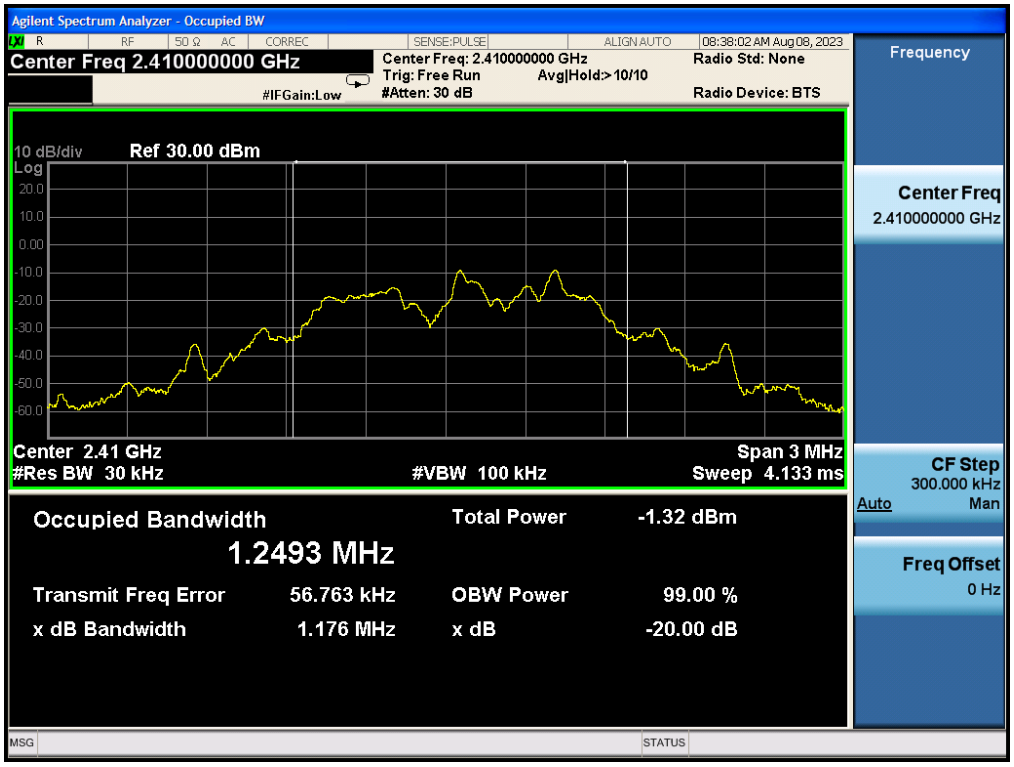
9.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

Test Channel (MHz)	20DB BANDWIDTH (MHz)	99% BANDWIDTH (MHz)	Criteria
2410	1.176	1.2493	PASS
2442	1.164	1.3361	PASS
2473	1.418	1.3500	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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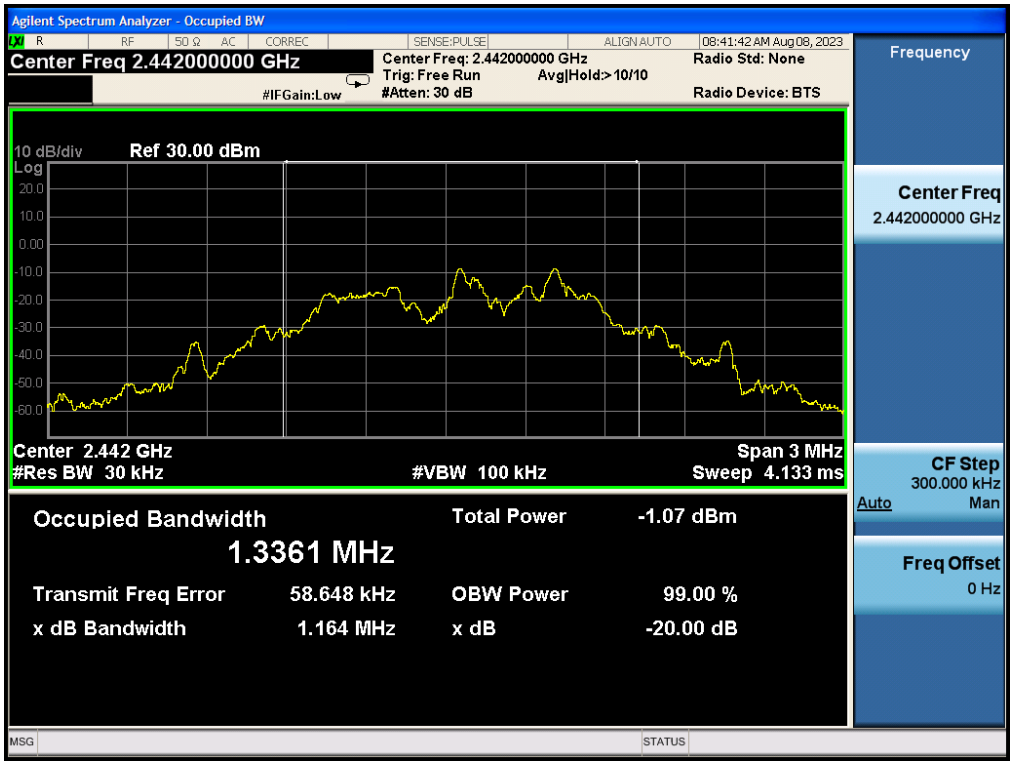
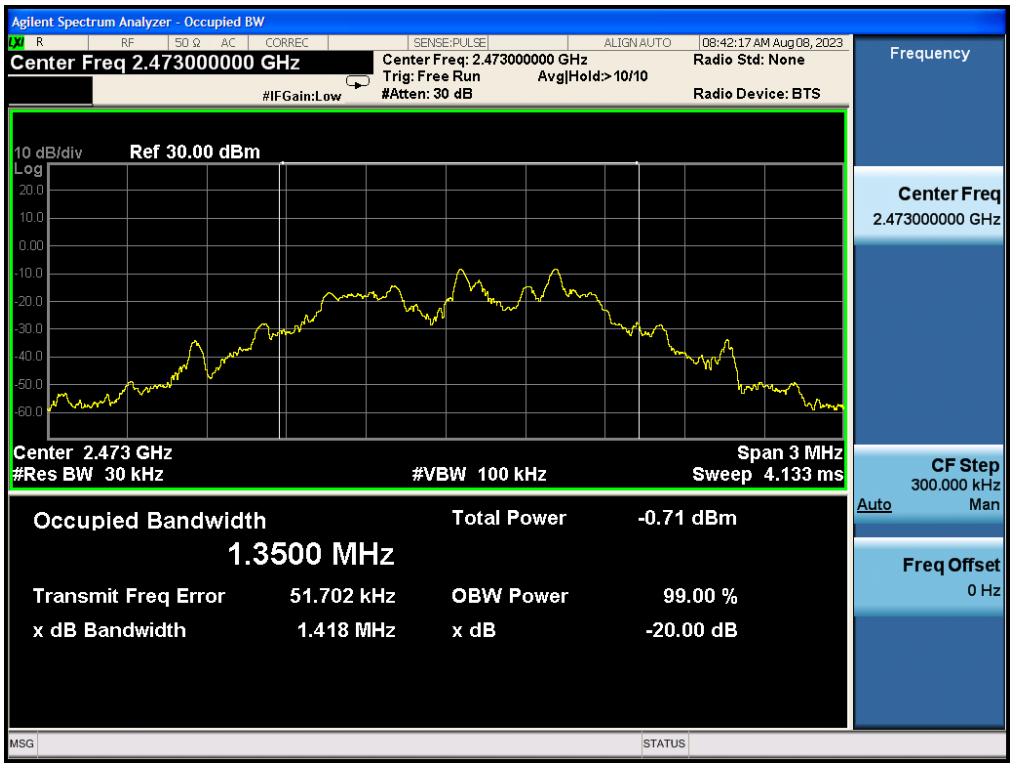
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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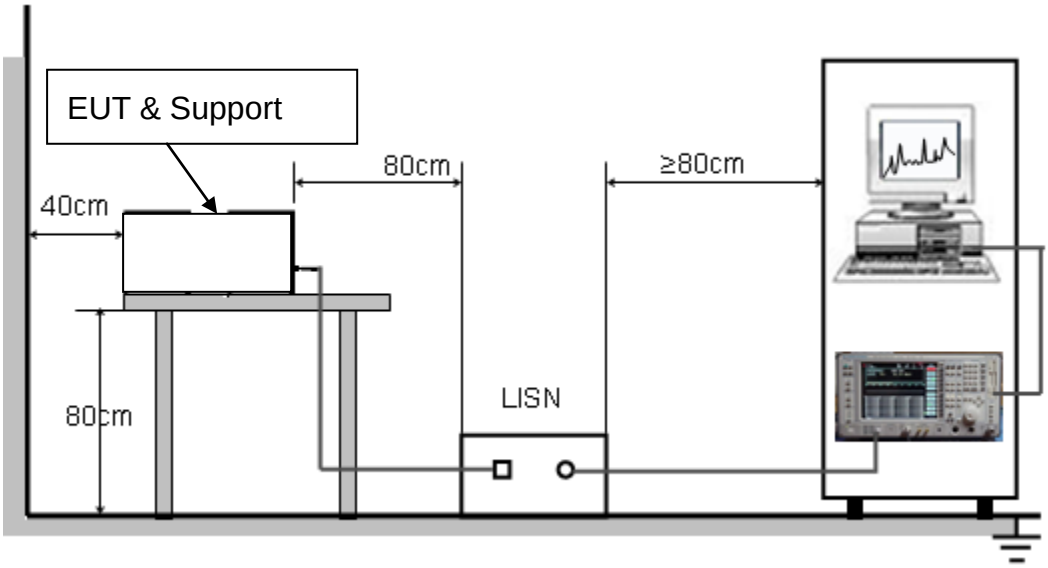
10. FCC LINE CONDUCTED EMISSION TEST

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.

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC15705230719AP02

APPENDIX B: PHOTOGRAPHS OF THE EUT

Refer to the Report No.: AGC15705230719AP03

----END OF REPORT----

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

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.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

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.

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