

FCC TEST REPORT

FCC ID: 2A2INCQ-623

Product : Stunt dumper with lights

Model Name : ZWD-005, ZWD-006, ZWD-011, ZWD-007, ZWD-013,
CQ-500, CQ-501, CQ-502, CQ-503, CQ-504, CQ-505,
CQ-507, CQ-508, CQ-509, CQ-529, CQ-539, CQ-623,
CQ-624, CQ-625, CQ-626, CQ-627, CQ-628, CQ-629,
CQ-630, CQ-631, CQ-632, CQ-647, CQ-648, CQ-649,
CQ-650, CQ-651, CQ-655, CQ-656, CQ-657, CQ-658,
CQ-659, CQ-660, CQ-147A

Brand :



Report No. : NCT24001029E

Prepared for

CHEN QI TOYS FACTORY

CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, CHINA

Prepared by

Shenzhen NCT Testing Technology Co., Ltd.

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1 TEST RESULT CERTIFICATION

Applicant's name : CHEN QI TOYS FACTORY
Address : CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, CHINA
Manufacture's name : CHEN QI TOYS FACTORY
Address : CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, CHINA
Product name : Stunt dumper with lights
Model name : ZWD-005, ZWD-006, ZWD-011, ZWD-007, ZWD-013, CQ-500, CQ-501, CQ-502, CQ-503, CQ-504, CQ-505, CQ-507, CQ-508, CQ-509, CQ-529, CQ-539, CQ-623, CQ-624, CQ-625, CQ-626, CQ-627, CQ-628, CQ-629, CQ-630, CQ-631, CQ-632, CQ-647, CQ-648, CQ-649, CQ-650, CQ-651, CQ-655, CQ-656, CQ-657, CQ-658, CQ-659, CQ-660, CQ-147A
Standards : FCC CFR47 Part 15 Section 15.227
Test procedure : ANSI C63.10:2013
Date of test : Jan. 03, 2024-Jan. 09, 2024
Date of Issue : Jan. 09, 2024

This device described above has been tested by NCT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Engineer:


Keven Wu / Engineer

Technical Manager:


Henry Wang / Manager



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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	N/A
Field Strength and Restricted Band Emissions	15.205(a) 15.209 15.227(a), 15.227(b)	PASS
20dB Bandwidth	15.215(c)	PASS
Antenna Requirement	15.203	PASS

Remark:

1. "N/A" denotes test is not applicable in this Test Report.

2.1 Test Site

Site Description

EMC Lab. : Accredited by CNAS, 2022-09-27

The certificate is valid until 2028.01.07

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)

The Certificate Registration Number is L8251

Designation Number: CN1347

Test Firm Registration Number: 894804

Accredited by A2LA, June 14, 2023

The Certificate Registration Number is 6837.01

Accredited by Industry Canada, November 09, 2018

The Conformity Assessment Body Identifier is CN0150

Company Number: 30806

Name of Firm : Shenzhen NCT Testing Technology Co., Ltd.

Site Location : A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District, Shenzhen, People's Republic of China

3 General Information

3.1 General Description of E.U.T.

Product Name	:	Stunt dumper with lights
Model Name	:	CQ-623
Sample ID	:	20240103A-001
Sample(s) Status:	:	Engineer sample
Series Model	:	ZWD-005, ZWD-006, ZWD-011, ZWD-007, ZWD-013, CQ-500, CQ-501, CQ-502, CQ-503, CQ-504, CQ-505, CQ-507, CQ-508, CQ-509, CQ-529, CQ-539, CQ-624, CQ-625, CQ-626, CQ-627, CQ-628, CQ-629, CQ-630, CQ-631, CQ-632, CQ-647, CQ-648, CQ-649, CQ-650, CQ-651, CQ-655, CQ-656, CQ-657, CQ-658, CQ-659, CQ-660, CQ-147A
Model Different.:	:	All the same except the model number and colour.
Operating frequency	:	27.145MHz
Number of Channels	:	1 channels
Type of Modulation	:	FSK
Antenna installation	:	External Antenna
Antenna Gain	:	1.06 dBi
Power supply	:	DC 3V
Hardware Version	:	/
Software Version	:	/
Remark: the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.		

3.2 Channel List

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The details of test channels and bandwidth were for RF conductive measurement.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	27.145				

3.3 Test Setup Configuration

Radiated Emission

EUT

Conducted Spurious

EUT

3.4 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

4 Equipment During Test

4.1 Equipments List

Conducted emission Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	944 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESPI	101604	Rohde & Schwarz	2023/6/21	2024/6/20
LISN	ENV 216	102796	Rohde & Schwarz	2023/6/21	2024/6/20
LISN	VN1-13S	004023	CRANAGE	2023/6/21	2024/6/20
Cable	RG223-1500MM	NA	RG	2023/6/21	2024/6/20

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESCI	101178	Rohde & Schwarz	2023/6/21	2024/6/20
Spectrum Analyze (10Hz-26.5GHz)	N9020A	MY50510202	Agilent	2023/6/21	2024/6/20
Amplifier (30MHz-1GHz)	BBV 9743 B	00374	SCHNARZBECK	2023/6/21	2024/6/20
Bilog Antenna (30MHz-1GHz)	VULB9162	00473	SCHNARZBECK	2023/3/19	2025/3/18
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHNARZBECK	2023/3/19	2025/3/18
Preamplifier (1GHz-18GHz)	BBV 9718D	0024	SCHNARZBECK	2023/6/21	2024/6/20
Spectrum Analyze (10Hz-40GHz)	FSV 40	100952	Rohde & Schwarz	2023/6/21	2024/6/20
Preamplifier (18GHz-40GHz)	BBV 9721	0056	SCHNARZBECK	2023/6/21	2024/6/20
Double Ridge Guide Horn Antenna (18GHz-40GHz)	SAS-574	588	A.H.System	2023/3/19	2025/3/18
Loop Antenna (9KHz-30MHz)	FMZB1519B	014	SCHNARZBECK	2023/6/21	2024/6/20

Amplifier (9KHz-30MHz)	CVP 9222 C	00109	SCHNARZBECK	2023/6/21	2024/6/20
MXG Signal Analyzer	N9020A	101178	Agilent	2023/6/21	2024/6/20
MXG Vector Signal Generator	N5182A	MY50510202	Agilent	2023/6/21	2024/6/20
MXG Analog Signal Generator	N5181A	00374	Agilent	2023/6/21	2024/6/20
Power Sensor	TR1029-2	00473	Techoy	2023/6/21	2024/6/20
RF Swith	TR1029-1	02622	Techoy	2023/6/21	2024/6/20
Cable	DA800- 4000MM	NA	DA	2023/6/21	2024/6/20
Cable	DA800- 11000MM	NA	DA	2023/6/21	2024/6/20

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	AUDIX	e3	6.120718
2	EMC radiation test system	AUDIX	e3	6.120718
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

4.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Stunt dumper with lights	N/A	CQ-623	N/A	EUT

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

5 Conducted Emission

Test Requirement	: FCC CFR 47 Part 15 Section 15.207
Test Method	: ANSI C63.10: 2013
Test Result	: PASS
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B

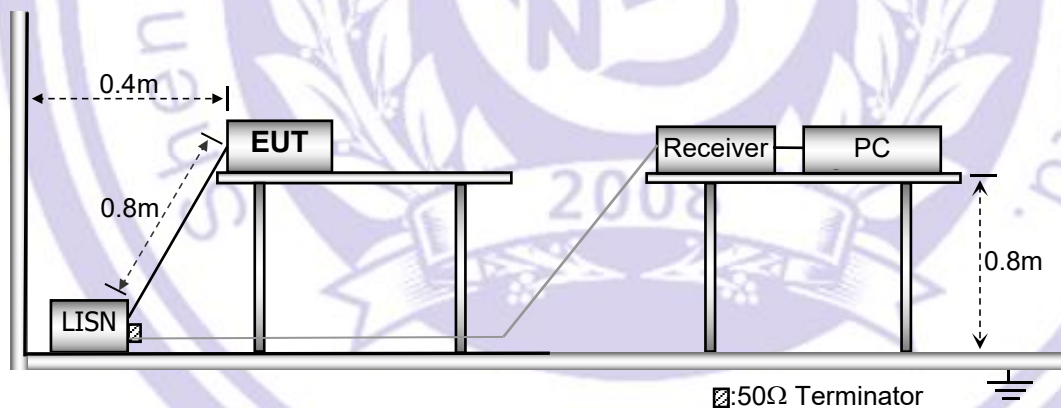
5.1 E.U.T. Operation

Operating Environment :

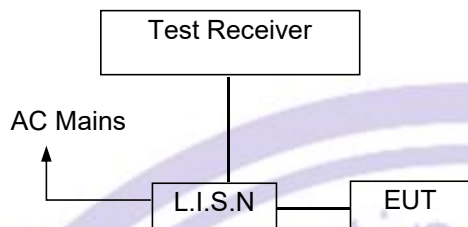
Temperature	: 25.5 °C
Humidity	: 51 % RH
Atmospheric Pressure	: 101.2kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.7 Conducted Emission Test Result

N/A

6 Field Strength and Restricted Band Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.205, 15.209, 15.227
Test Method : ANSI C63.10:2013
Test Result : PASS
Measurement Distance : 3m
Limit : The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

According to FCC §15.227 (a), the field strength if any emission within this band shall not exceed 10,000microvolts/meter at 3 meters.

6.1 EUT Operation

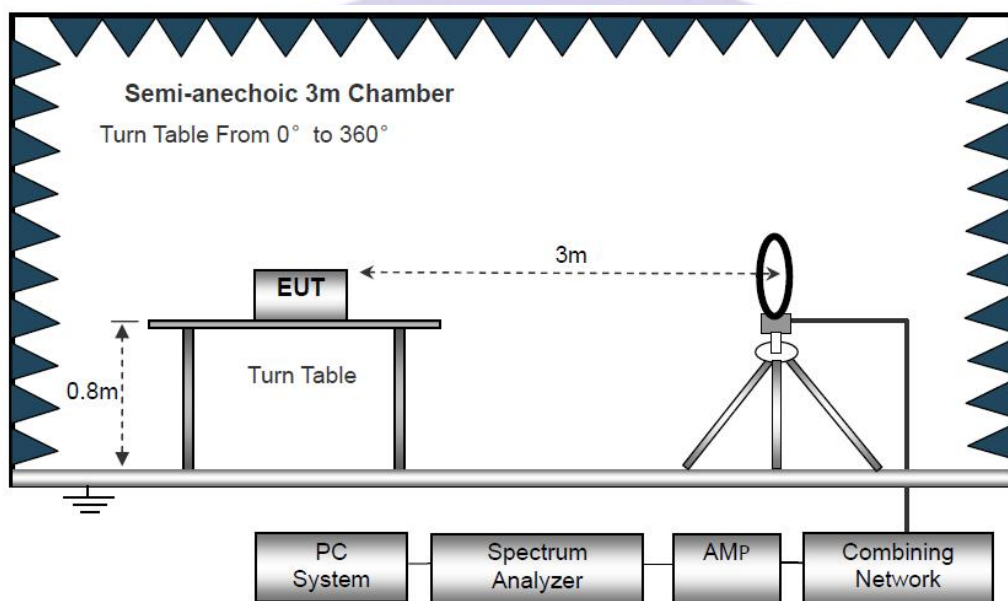
Operating Environment :

Temperature : 23.5 °C
Humidity : 51.1 % RH
Atmospheric Pressure : 101.2kPa

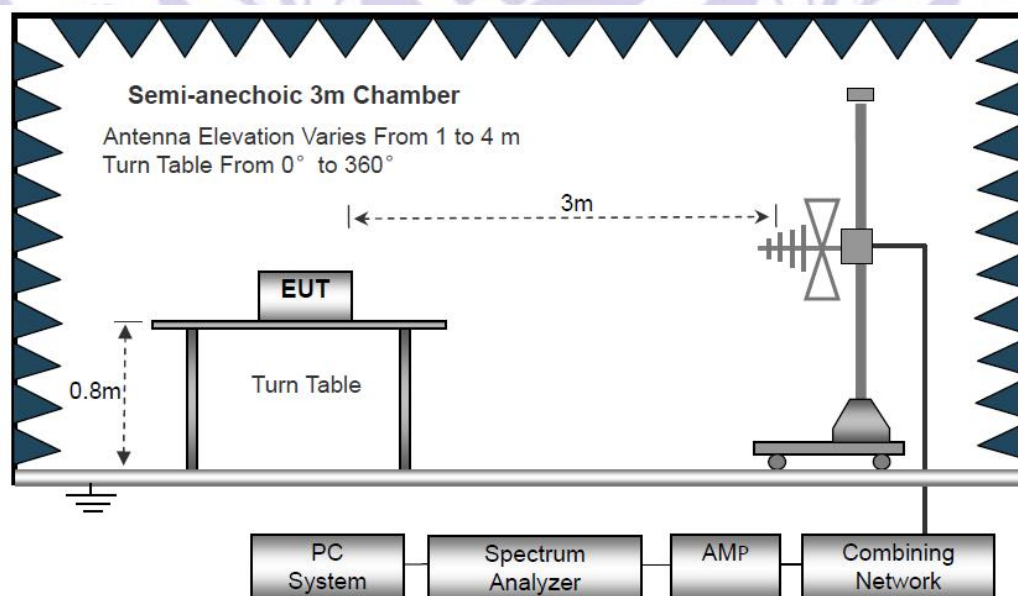
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

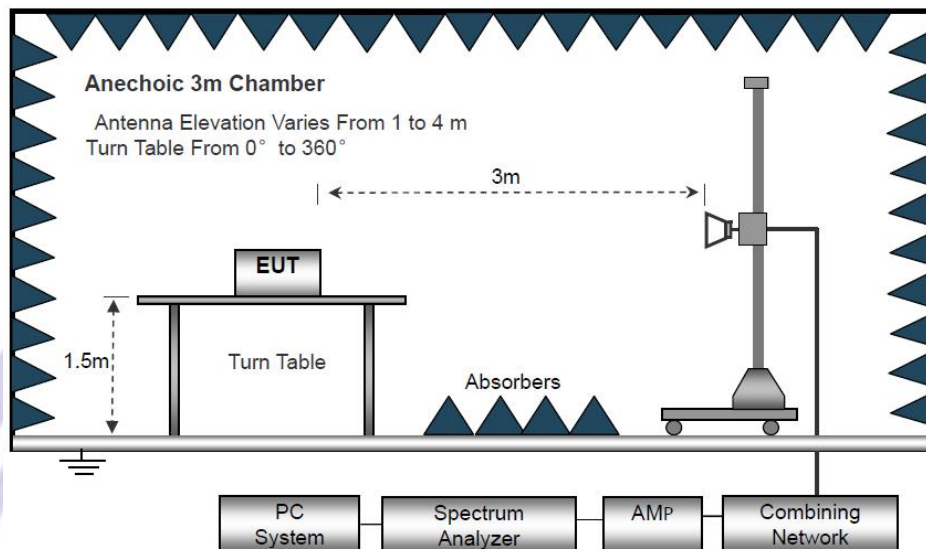
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

6.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2013.
2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
7. Test Procedure of measurement (For Above 1GHz):
 - 1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
 - 2) Change the antenna polarization and repeat 1) with vertical polarization.
 - 3) Make a hardcopy of the spectrum.
 - 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
 - 5) Change the analyser mode to Clear/ Write and found the cone of emission.
 - 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
 - 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
 - 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.
8. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(kHz)	(dBμV/m)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
72.00	51.85	20.03	71.88	110.41	-38.53	PK
72.00	43.21	20.03	63.24	90.41	-27.17	AV
136.01	48.62	20.07	68.69	104.91	-36.22	PK
136.01	40.17	20.07	60.24	84.91	-24.67	AV
446.35	44.39	20.11	64.5	94.61	-30.11	PK
446.35	33.73	20.11	53.84	74.61	-20.77	AV
1275.15	23.92	21.89	45.81	69.54	-23.73	QP
12530.06	24.18	22.57	46.75	69.54	-22.79	QP
23568.25	23.15	24.49	47.64	69.54	-21.9	QP

Note:

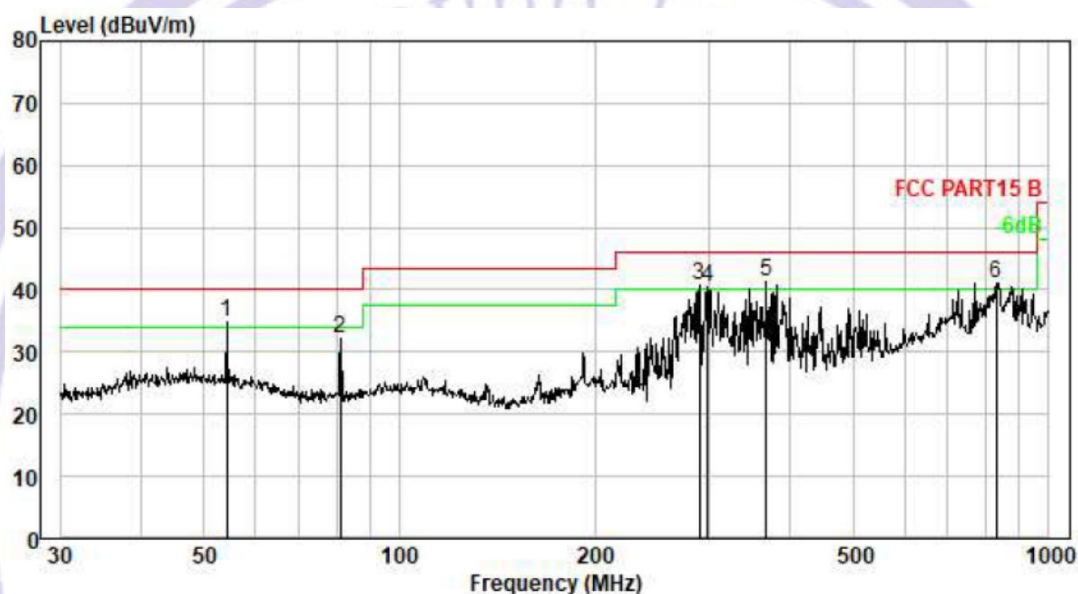
The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40 \log(\text{Specific distance} / \text{test distance})$ (dB);

Limit line = Specific limits (dBμV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

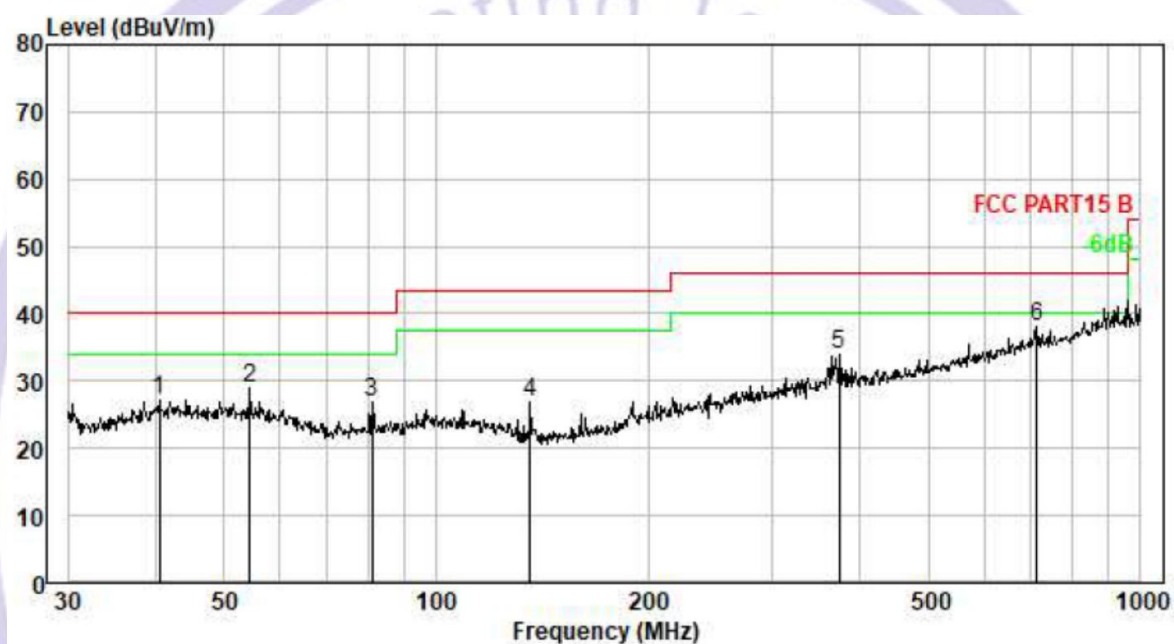
Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 3V		



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Preamp Gain dB	Receiver Reading dBμV	Emission Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
1	54.261	0.46	12.25	0.00	22.08	34.79	40.00	-5.21	QP
2	81.212	0.61	9.73	0.00	21.70	32.04	40.00	-7.96	QP
3	290.017	1.26	14.06	0.00	25.48	40.80	46.00	-5.20	QP
4	298.268	1.27	14.26	0.00	25.03	40.56	46.00	-5.44	QP
5	368.112	1.39	15.37	0.00	24.68	41.44	46.00	-4.56	QP
6	830.400	2.02	21.84	0.00	17.07	40.93	46.00	-5.07	QP

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	DC 3V		

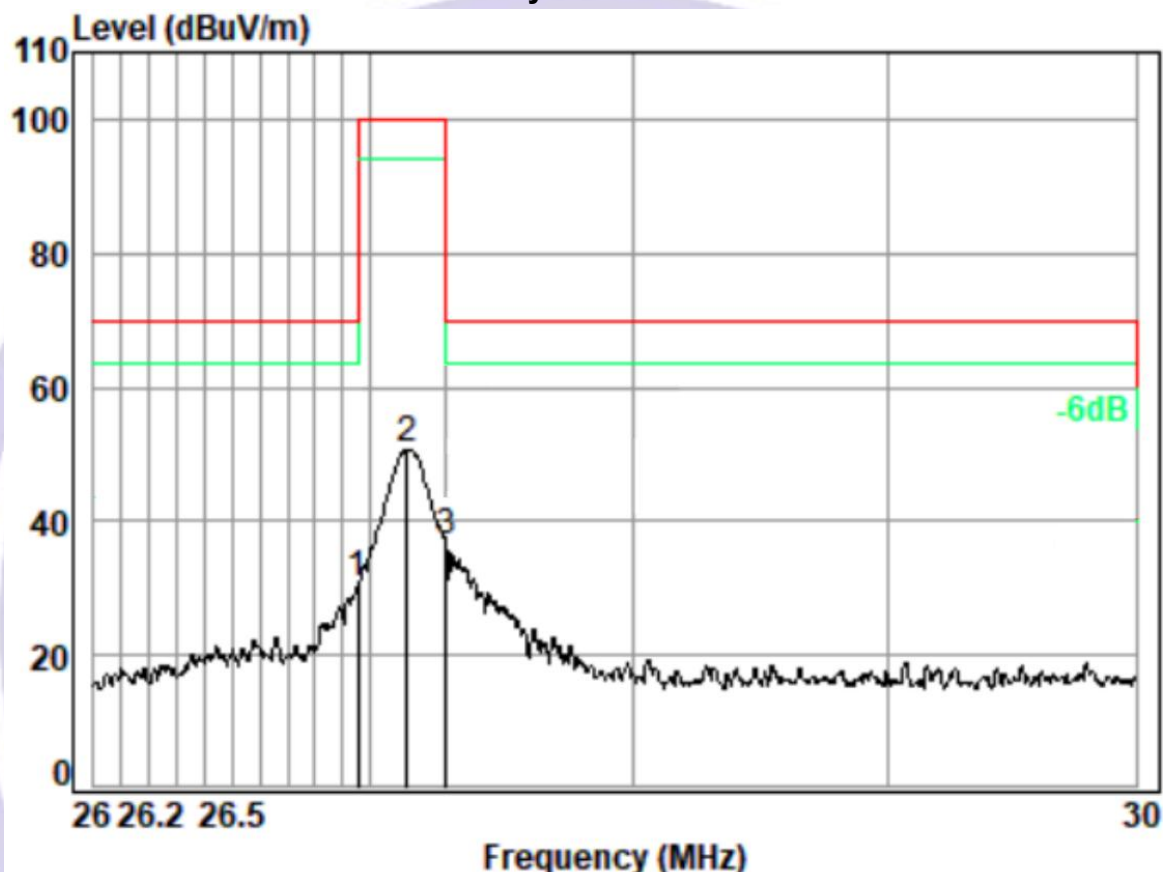


No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Preamp Gain dB	Receiver Reading dBμV	Emission Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
1	40.417	0.35	12.51	0.00	14.32	27.18	40.00	-12.82	QP
2	54.452	0.46	12.23	0.00	16.39	29.08	40.00	-10.92	QP
3	81.212	0.61	9.73	0.00	16.59	26.93	40.00	-13.07	QP
4	135.982	0.85	8.74	0.00	17.39	26.98	43.50	-16.52	QP
5	373.311	1.39	15.44	0.00	17.16	33.99	46.00	-12.01	QP
6	714.173	1.88	20.64	0.00	15.50	38.02	46.00	-7.98	QP

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor

Spurious Emission in Restricted Band

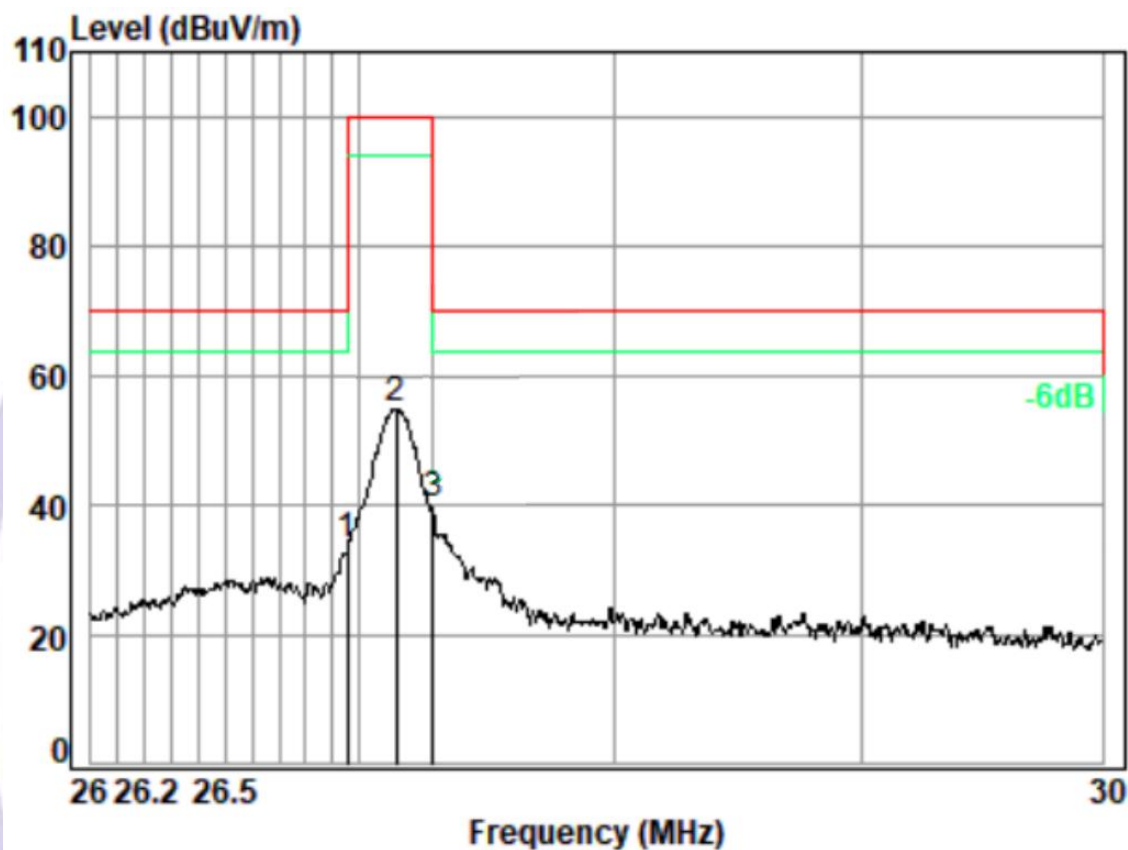
Polarity: Horizontal



		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	26.9586	0.17	16.57	25.91	39.53	30.36	70.00	-39.64 Peak
2	27.1444	0.17	16.55	25.91	59.98	50.79	100.00	-49.21 Peak
3 P	27.2885	0.17	16.54	25.91	46.04	36.84	70.00	-33.16 Peak

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor

Polarity: Vertical



	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	26.9586	0.17	16.57	25.91	43.16	33.99	70.00	-36.01	Peak
2	27.1483	0.17	16.55	25.91	64.11	54.92	100.00	-45.08	Peak
3 P	27.2885	0.17	16.54	25.91	49.18	39.98	70.00	-30.02	Peak

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor

7 20dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.215

Test Method : ANSI C63.10:2013

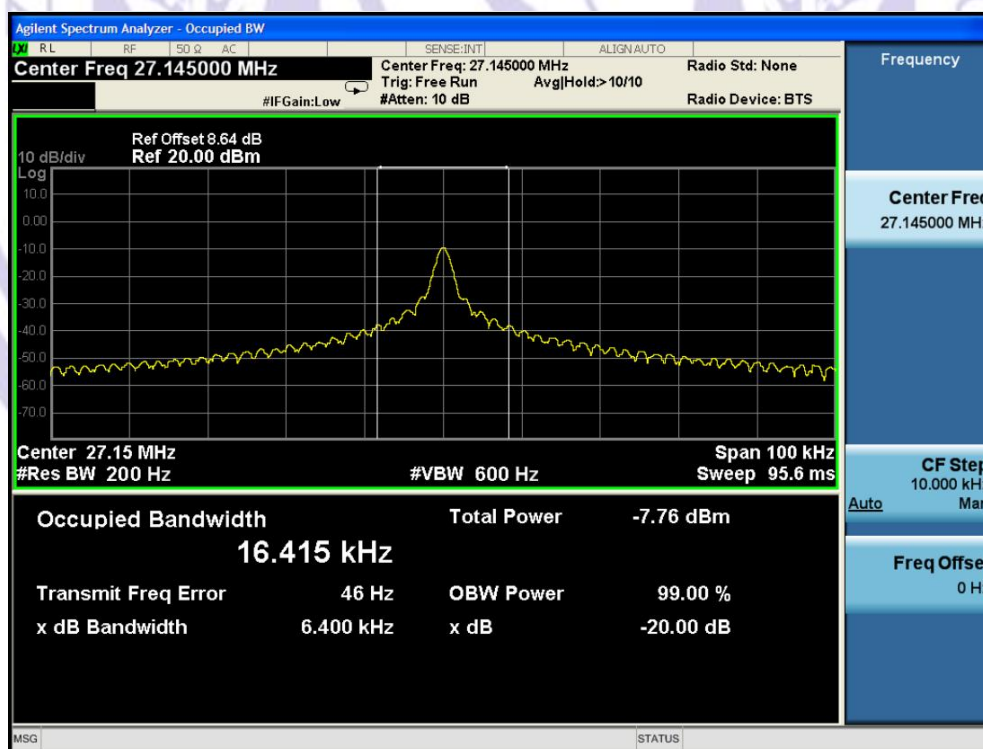
Test Limit

7.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 300Hz, VBW = 1kHz

7.2 Test Result

Channel number	Channel frequency (MHz)	-20dB Bandwidth(KHz)	99% Bandwidth(KHz)
1	27.145	6.400	16.415



8 Antenna Application

8.1 Antenna Requirement

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

8.2 Result

The antenna is External antenna, the best case gain of the antennas is 1.06 dBi, reference to the attachment for details

9 Test Setup Photos and EUT Photos

Please see the attachment for details.

*****THE END REPORT*****

