

FCC 15.231 & RSS-210 Above 70MHz Test Report

for

Powertech Industrial Co Ltd

**10F., No.407, Sec. 2, Zhong Shan Rd., Zhonghe Dist., New
Taipei City 23558, Taiwan (R.O.C.)**

**Product Name : Wi-Fi Smart Garage Door
Controller**

Model Name : NS-CH1XGO8
(For FCC ID)

Model Name : NS-CH1XGO8-C
(For IC)

FCC ID : NHS-NS-CH1XGO8

IC : 3653A-CH1XGO8

**Prepared by: : AUDIX Technology Corporation,
EMC Department**



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APPENDIX A TEST DATA AND PLOTS
APPENDIX B TEST PHOTOGRAPHS

TEST REPORT CERTIFICATION

Applicant : Powertech Industrial Co Ltd
Manufacturer : DONGGUAN QUAN SHENG ELECTRIC CO LTD
EUT Description
(1) Product : Wi-Fi Smart Garage Door Controller
(2) Model : (1)NS-CH1XGO8 (2)NS-CH1XGO8-C
(3) Power Rating : AC 120V/60Hz

Applicable Standards:

47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 4), November 2014
RSS-210 (Issue 9), August 2016
ANSI C63.10:2013

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2017. 12. 20

Reviewed by: Annie Yu (Annie Yu/Administrator)

Approved by: Ben Cheng (Ben Cheng/Manager)

1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2017. 12. 20	Original Report	EM-F170789

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	PASS
15.209/15.231(b)	RSS-Gen §8.9 RSS-210 Annex A table A1	Radiated Spurious Emission and Fundamental Frequency	PASS
15.231(c)	RSS-Gen §6.6	Emission Bandwidth	PASS
15.231(a)(1)	RSS-210 Annex A A1.1(a)	Periodic Operated	PASS
15.203	RSS-Gen §8.3	Antenna Requirement	Compliance

3. GENERAL INFORMATION

3.1. Description of Application

Applicant	Powertech Industrial Co Ltd 10F, No. 407, Chung Shan Rd., Sec 2 Chung Ho City, Taipei Hsien 235, Taiwan						
Manufacture	DONGGUAN QUAN SHENG ELECTRIC CO LTD CHU-TANG 2ND INDUSTRIAL PARK HOU-CHIEH TOWN DONGGUAN GUANGDONG 523963 CHINA						
Product	Wi-Fi Smart Garage Door Controller						
Model	(1)NS-CH1XGO8 (2)NS-CH1XGO8-C The difference of above models is in sales region. <table border="1"><thead><tr><th>Model</th><th>Sales Region</th></tr></thead><tbody><tr><td>NS-CH1XGO8</td><td>USA</td></tr><tr><td>NS-CH1XGO8-C</td><td>Canada</td></tr></tbody></table>	Model	Sales Region	NS-CH1XGO8	USA	NS-CH1XGO8-C	Canada
Model	Sales Region						
NS-CH1XGO8	USA						
NS-CH1XGO8-C	Canada						

3.2. Description of EUT

Test Model	NS-CH1XGO8
Serial Number	N/A
Product HW version	N/A
Product SW version	N/A
Radio HW version	N/A
Radio SW version	N/A
Power Rating	AC 120V/60Hz
RF Features	FSK
Transmit Type	1T1R
Accessories	N/A
Date of Receipt	2017. 10. 26
Date of Test	2017. 11. 06 ~ 12. 20

3.3. EUT Specifications Assessed in Current Report

Mode	Fundamental Range (MHz)	Channel Number	Modulation
---	433.55 – 434.45	3	FSK

Channel List	
Channel Number	Frequency (MHz)
1	433.55
2	434.00
3	434.45

3.4. Antenna Information

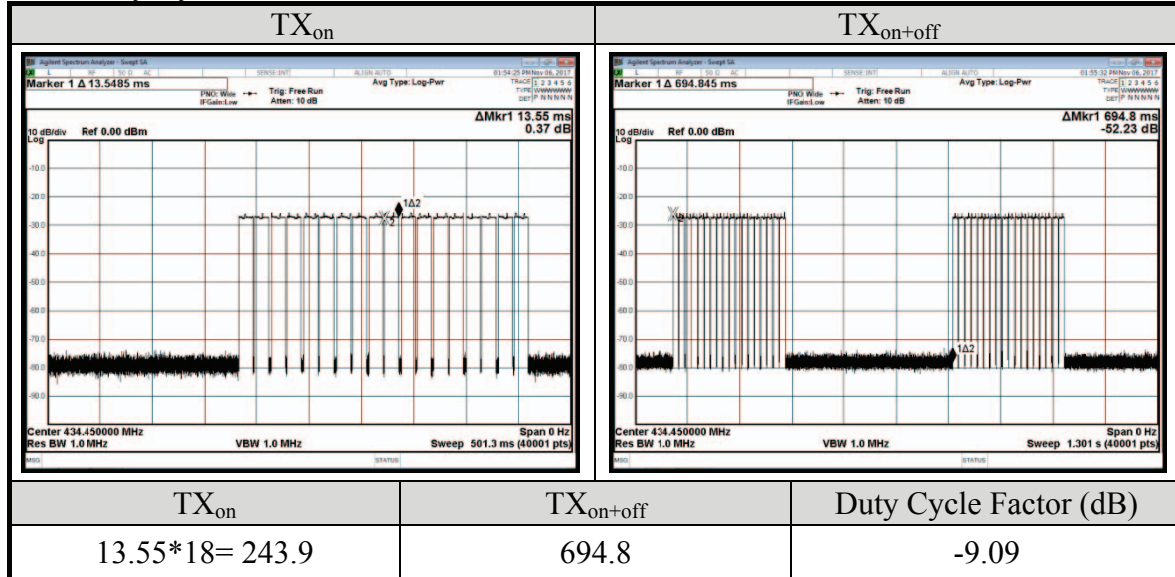
No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	---	---	Spring Coil Antenna	---	---

3.5. Description of Key Components

Item	Supplier	Model/Type	Character
WiFi-MCU Module	Powertech Industrial Co Ltd	WSDB-750GN_A	802.11/b/g/n FCC ID:NHS-WSDB750GN IC:3653A-WSDB750GN

3.6. Test Configuration

Duty Cycle



Item	Test Channel
Radiated Spurious Emission and Fundamental Frequency	1/2/3
Emission Bandwidth	1/2/3
Periodic Operated	1/2/3

Note 1:

- Mobile Device, and 3 axis were assessed, and the worst axis was Stand.
 - Lie
 - Side
 - Stand
- Portable Device
 - Lie
 - Side
 - Stand

3.7. Tested Supporting System List

None.

3.8. Setup Configuration

3.8.1. EUT Configuration for Radiated Emission



3.8.2. EUT Configuration for RF Conducted Test Items



3.9. Operating Condition of EUT

To Set EUT on RF function under continues transmitting.

3.10. Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: sales@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 (3) FCC OET Designation No. TW1004 & TW1090 & TW1724
Test Facilities	(1) No. 7 Shielding Room (2) Semi-Anechoic Chamber (IC Test Site Registration No.: 5183B-1) (3) Fully Anechoic Chamber (IC Test Site Registration No.: 5183B-4)

3.11. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.50dB
Radiation Test (Distance: 3m)	9kHz~30MHz	± 0.5dB
	30MHz~1000MHz	± 3.68dB
	Above 1GHz	± 5.82dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
Emission Bandwidth (20dB)	± 0.2kHz
Periodic Operated	± 0.05s

4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI	101276	2017. 03. 23	1 Year
2.	A.M.N.	R&S	ESH2-Z5	100366	2017. 07. 20	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-881-13	2016. 12. 28	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	101495	2017. 01. 16	1 Year
5.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.7 S/R	2017. 04. 21	1 Year
6.	Test Software	Audix	e3	V.120619C	N.C.R.	N.C.R.

4.2. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2017. 09. 13	1 Year
2.	Spectrum Analyzer	Agilent	N9010A-526	MY52220368	2016. 12. 01	1 Year
3.	Test Receiver	R & S	ESCS30	100338	2017. 06. 19	1 Year
4.	Amplifier	HP	8447D	2944A06305	2017. 02. 16	1 Year
5.	Amplifier	Sonoma	310N	187161	2017. 06. 08	1 Year
6.	Loop Antenna	R & S	HFH2-Z2	891847/27	2016. 12. 23	1 Year
7.	Bilog Antenna	TESEQ	CBL6112D	33821	2017. 01. 21	1 Year
8.	Horn Antenna	ETS-Lindgren	3117	00135902	2017. 03. 08	1 Year
9.	Digital Thermo-Hygro Meter	Shenzhen Datronn Electronics	KT-905	RF	2017. 04. 24	1 Year
10.	Digital Thermo-Hygro Meter	EVERY DAY	E-512	RF-02	2017. 04. 24	1 Year
11.	Test Software	Audix	e3	V.6.1206197	N.C.R.	N.C.R.
12.	Test Software	Audix	e3	V.6.110601	N.C.R.	N.C.R.

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2017. 01. 03	1 Year
2.	Spectrum Analyzer	R&S	FSV30	101181	2017. 07. 10	1 Year
3.	Wide Band Antenna	Diamond	RH799	N/A	N.C.R.	N.C.R.
4.	Digital Thermo-Hygro Meter	Shenzhen Datronn Electronics	KT-905	RF	2017. 04. 21	1 Year

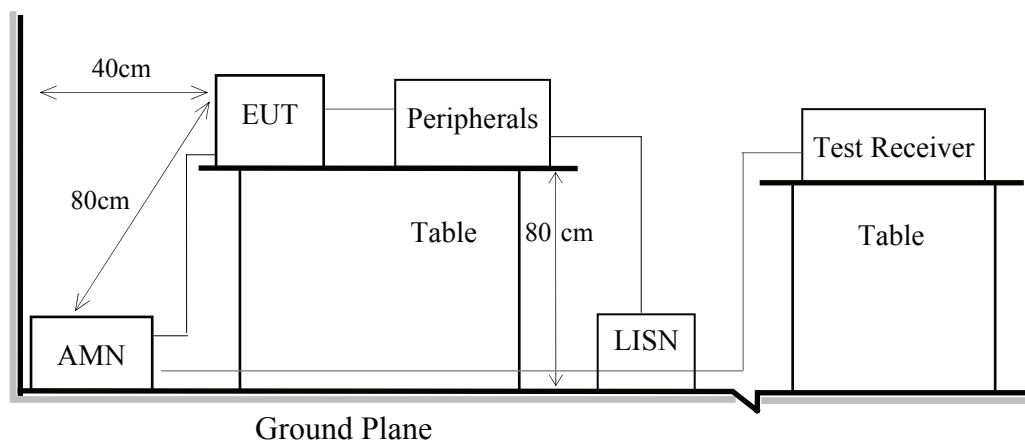
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.8

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark 1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.

2.: The lower limit applies to the band edges.

5.3. Test Procedure

- 5.3.1. To set up the EUT as indicated in ANSI C 63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.
- 5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).
- 5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)
- 5.3.4. Checking frequency range from 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Test Results

Please refer to Appendix A.

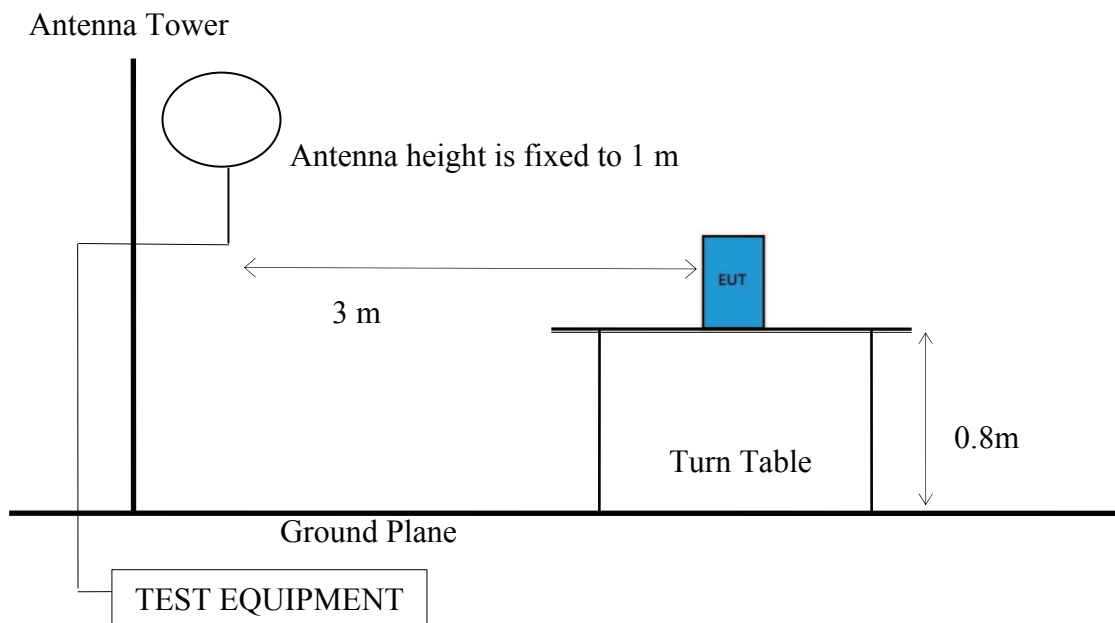
6. RADIATED SPURIOUS EMISSION

6.1. Block Diagram of Test Setup

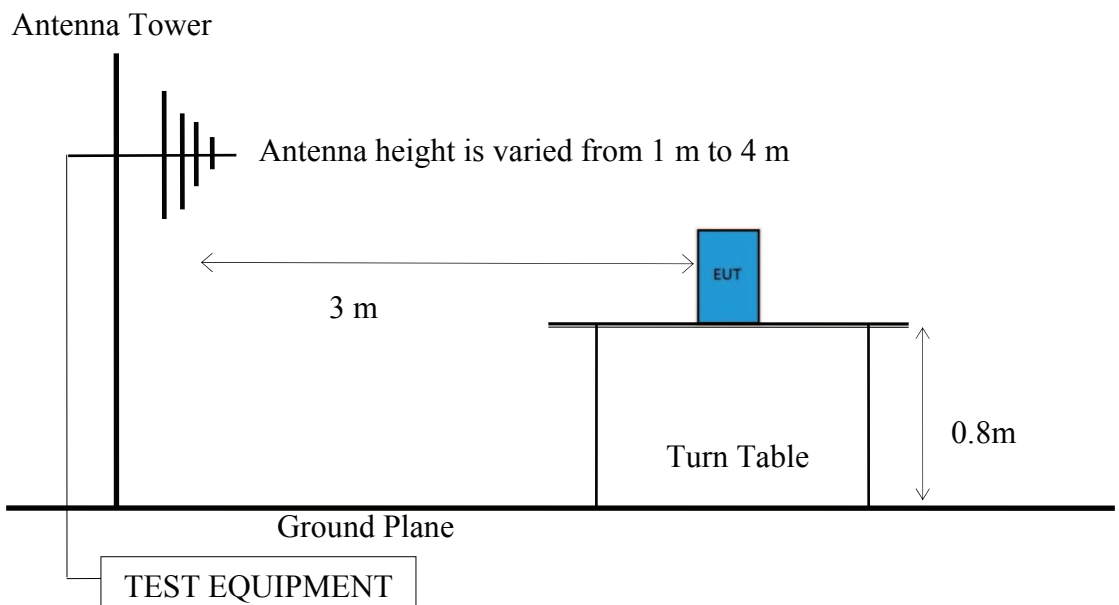
6.1.1. Block Diagram of EUT

Indicated as section 3.8

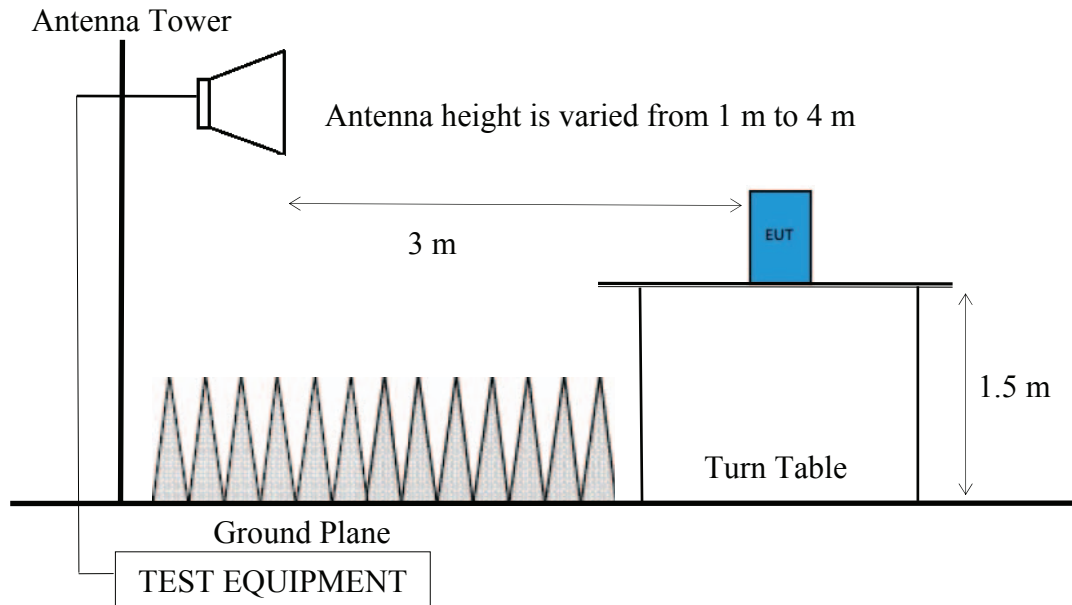
6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30MHz-1000MHz



6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

6.2.1. General Limit

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205/RSS-Gen Section 8.10 table 6 must also comply with the radiated emission limits specified as below.

Frequency (MHz)	Distance (m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6	2400/kHz
0.490 - 1.705	30	87.6	24000/kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark : (1) dB μ V/m = 20 log (μ V/m)

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

6.2.2. Limite for Fundamental Frequency

In addition to the provisions of §15.205/RSS-210 Annex A table A1, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	¹ 1,250 to 3,750	¹ 125 to 375
174-260	3,750	375
260-470	¹ 3,750 to 12,500	¹ 375 to 1,250
Above 470	12,500	1,250
¹ :Linear Interpolations		

Remark : (1) $\text{dB}\mu\text{V}/\text{m} = 20 \log (\mu\text{V}/\text{m})$

(2) The tighter limit applies to the edge between two frequency bands.

(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

(4) Where limit of Fundamental Freq. is calculated by:

$$41.6667 \times 433.55 - 7083.3333 = 10981.264485 \mu\text{V}/\text{m} = 80.81 \text{dB}\mu\text{V}/\text{m}$$

$$41.6667 \times 433.99 - 7083.3333 = 10999.597833 \mu\text{V}/\text{m} = 80.83 \text{dB}\mu\text{V}/\text{m}$$

$$41.6667 \times 434.45 - 7083.3333 = 11018.764515 \mu\text{V}/\text{m} = 80.84 \text{dB}\mu\text{V}/\text{m}$$

(5) The limits in this table are based on CFR 47 Part 15.231(b).

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level.

In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

(1) RBW = 9kHz with peak and average detector.

(2) Detector: average and peak (9kHz-490kHz)

Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 25GHz:

The EUT setup on the turn find table which has 80 cm (for 30-1000 MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1 GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1)RBW = 120KHz
- (2)VBW $\geq 3 \times$ RBW.
- (3)Detector = Peak.
- (4)Sweep time = auto.
- (5)Trace mode = max hold.
- (6)Allow sweeps to continue until the trace stabilizes.
- (7)When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

Frequency above 1GHz to 10th harmonic:**Peak Detector:**

- (1)RBW = 1MHz
- (2)VBW $\geq 3 \times$ RBW.
- (3)Detector = Peak.
- (4)Sweep time = auto.
- (5)Trace mode = max hold.
- (6)Allow sweeps to continue until the trace stabilizes.
- (7)When peak-detected value is lower than limit that the measurement using the average detector is not required. Otherwise using average detector for finally measurement.

Average Detector: **Option 1:**

- (1)RBW = 1MHz
- (2)VBW $\geq 1/ T$.
- (3)Detector = Peak.
- (4)Sweep time = auto.
- (5)Trace mode = max hold.
- (6)Allow sweeps to continue until the trace stabilizes.

 Option 2:

Average Emission Level= Peak Emission Level+ D.C.C.F.

6.4. Measurement Result Explanation

Peak Emission Level=Antenna Factor + Cable Loss + Meter Reading

Average Emission Level l=Antenna Factor + Cable Loss + Meter Reading

Average Emission Level= Peak Emission Level+ DCCF

Duty Cycle Correction Factor (DCCF)= $20\log(TX_{on}/TX_{on+off})$ presented in section 3.6

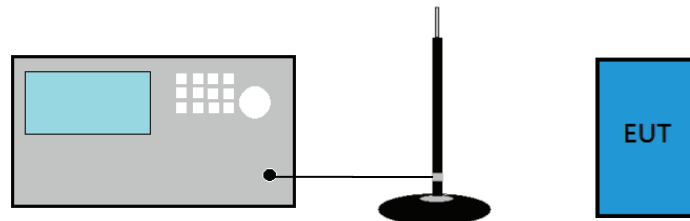
ERP= Peak Emission Level-95.2dB-2.14dB

6.5. Test Results

Please refer to Appendix A.

7. EMISSION BANDWIDTH MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Specification Limits

The bandwidth of emission shall be no wider than 0.25% of the center frequency for device operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

7.3. Test Procedure

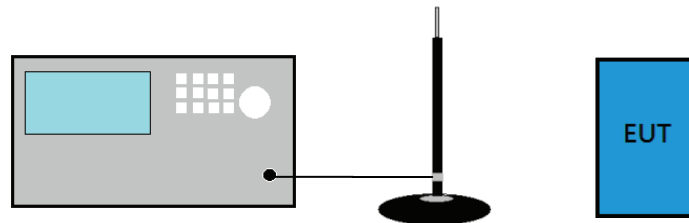
- (1) Set RBW close to 1-5 % of OBW.
- (2) Set $VBW \geq RBW$.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

8. PERIODIC OPERATED MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. Specification Limits

The operation of this device is manually operated transmitter that is automatically deactivated the transmitter within not more than 5 seconds of being released

8.3. Test Procedure

- (1) Span = zero
- (2) RBW \geq 100kHz
- (3) VBW \geq RBW
- (4) Sweep = 5s
- (5) Detector function = peak
- (6) Trace = single sweep

8.4. Test Results

Please refer to Appendix A

9. DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPENDIX A

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APPDNDIX A

TEST DATA AND PLOTS

(Model: (1)NS-CH1XGO8 (2)NS-CH1XGO8-C)

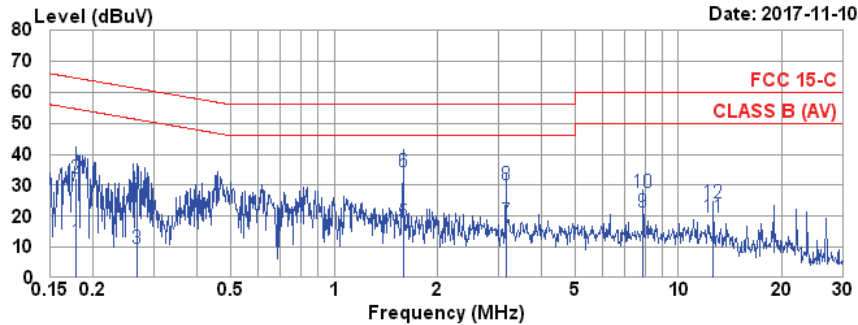
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A.4 PERIODIC OPERATED MEASUREMENT	19
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A.4.2 Measurement Plots	19

A.1 CONDUCTED EMISSION

Test Date	2017/11/10	Temp./Hum.	25°C/50%
Test Voltage	AC 120V, 60Hz		

Data: 2 File: C:\Documents and Settings\Sr-no7\桌面\C1M1710300-C-D-RFIDATA\C1M1710300-C



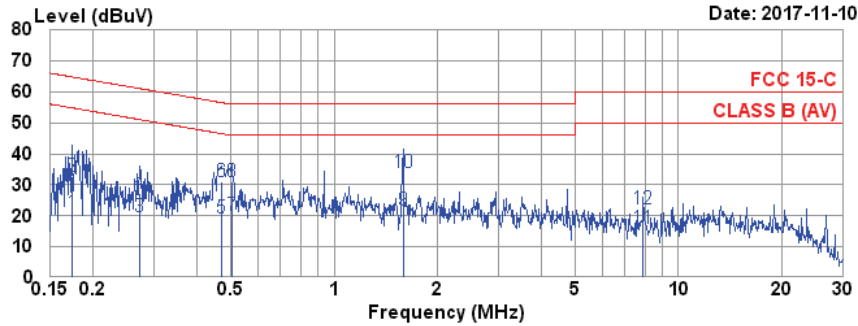
Site no. : No.7 Shielded Room Data no. : 2
 Condition : ESH2-Z5 366(ADAPTER) Phase : NEUTRAL
 Limit : FCC 15-C
 Env. / Ins. : 25°C / 50% ESCI(1276) Engineer : Nick Du
 EUT : NS-CH1XG08
 Power Rating : 120Vac/60Hz
 Test Mode : Operaing

	AMN	Cable	Pulse	Emission		Limits	Margin	Remark	
	Freq.	Factor	Loss	Att.	Reading	Level			
	(MHz)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dBμV)	(dB)	
1	0.178	0.18	0.04	9.86	1.79	11.87	54.56	42.69	Average
2	0.178	0.18	0.04	9.86	22.34	32.42	64.56	32.14	QP
3	0.267	0.18	0.04	9.86	-0.62	9.46	51.20	41.74	Average
4	0.267	0.18	0.04	9.86	17.29	27.37	61.20	33.83	QP
5	1.585	0.24	0.08	9.86	7.69	17.87	46.00	28.13	Average
6	1.585	0.24	0.08	9.86	24.09	34.27	56.00	21.73	QP
7	3.156	0.30	0.15	9.87	8.33	18.65	46.00	27.35	Average
8	3.156	0.30	0.15	9.87	20.02	30.34	56.00	25.66	QP
9	7.903	0.48	0.21	9.88	10.88	21.45	50.00	28.55	Average
10	7.903	0.48	0.21	9.88	17.03	27.60	60.00	32.40	QP
11	12.639	0.68	0.26	9.91	8.80	19.65	50.00	30.35	Average
12	12.639	0.68	0.26	9.91	13.56	24.41	60.00	35.59	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

Test Date	2017/11/10	Temp./Hum.	25°C/50%
Test Voltage	AC 120V, 60Hz		

Data: 1 File: C:\Documents and Settings\Sr-no7\桌面\C1M1710300-C-D-RFIDATA\C1M1710300-C



Site no. : No.7 Shielded Room Data no. : 1
 Condition : ESH2-Z5 366(ADAPTER) Phase : LINE
 Limit : FCC 15-C
 Env. / Ins. : 25°C / 50% ESCI(1276) Engineer : Nick Du
 EUT : NS-CH1XG08
 Power Rating : 120Vac/60Hz
 Test Mode : Operaing

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.173	0.17	0.03	9.86	11.02	21.08	54.81	33.73	Average
2	0.173	0.17	0.03	9.86	22.76	32.82	64.81	31.99	QP
3	0.273	0.17	0.04	9.86	9.66	19.73	51.03	31.30	Average
4	0.273	0.17	0.04	9.86	17.23	27.30	61.03	33.73	QP
5	0.471	0.19	0.04	9.86	9.33	19.42	46.49	27.07	Average
6	0.471	0.19	0.04	9.86	21.00	31.09	56.49	25.40	QP
7	0.505	0.19	0.04	9.86	10.02	20.11	46.00	25.89	Average
8	0.505	0.19	0.04	9.86	20.72	30.81	56.00	25.19	QP
9	1.585	0.24	0.08	9.86	11.62	21.80	46.00	24.20	Average
10	1.585	0.24	0.08	9.86	23.69	33.87	56.00	22.13	QP
11	7.893	0.51	0.21	9.88	5.36	15.96	50.00	34.04	Average
12	7.893	0.51	0.21	9.88	11.56	22.16	60.00	37.84	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector,
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

A.2 RADIATED spurious EMISSION

Test Date	2017/11/10	Temp./Hum.	23°C/50%
Test Voltage	AC 120V, 60Hz		

A.2.1 Emissions Applied to General Requirement

A.2.1.1 Frequency 9kHz~30MHz

The emissions (9kHz~30MHz) not reported for there is no emission be found.

A.2.1.2 Frequency Below 1 GHz

Mode	TX 433.54MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
94.02	11.19	2.20	18.39	31.78	43.50	11.72	Peak
191.99	9.39	3.26	20.11	32.76	43.50	10.74	Peak
240.49	12.19	3.73	10.71	26.63	46.00	19.37	Peak
288.02	13.54	4.19	17.45	35.18	46.00	10.82	Peak
639.16	18.45	6.88	2.66	27.99	46.00	18.01	Peak
867.11	20.17	7.99	20.69	48.85	46.00	-2.85	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
867.11	48.85	-9.09	39.76	46.00	6.24	Average

Mode	TX 433.54MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
144.46	12.06	2.77	11.21	26.04	43.50	17.46	Peak
191.99	9.39	3.26	21.16	33.81	43.50	9.69	Peak
288.02	13.54	4.19	18.72	36.45	46.00	9.55	Peak
384.05	15.63	5.38	5.96	26.97	46.00	19.03	Peak
634.31	18.45	6.87	3.96	29.28	46.00	16.72	Peak
867.11	20.17	7.99	15.97	44.13	46.00	1.87	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
867.11	44.13	-9.09	35.04	46.00	10.96	Average

Mode	TX 433.99MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
144.46	17.40	2.77	10.08	30.25	43.50	13.25	Peak
191.99	15.57	3.26	19.59	38.42	43.50	5.08	Peak
240.49	18.37	3.73	11.83	33.93	46.00	12.07	Peak
288.02	19.59	4.19	18.59	42.37	46.00	3.63	Peak
606.18	24.79	6.77	1.79	33.35	46.00	12.65	Peak
868.08	26.97	8.00	12.27	47.24	46.00	-1.24	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
868.08	47.24	-9.09	38.15	46.00	7.85	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
143.49	17.48	2.76	10.75	30.99	43.50	12.51	Peak
191.99	15.57	3.26	21.24	40.07	43.50	3.43	Peak
239.52	18.27	3.71	11.08	33.06	46.00	12.94	Peak
288.02	19.59	4.19	16.85	40.63	46.00	5.37	Peak
538.28	24.15	6.55	3.50	34.20	46.00	11.80	Peak
868.08	26.97	8.00	10.05	45.02	46.00	0.98	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
868.08	45.02	-9.09	35.93	46.00	10.07	Average

Mode	TX 434.44MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
191.99	15.57	3.26	20.48	39.31	43.50	4.19	Peak
240.49	18.37	3.73	11.52	33.62	46.00	12.38	Peak
288.02	19.59	4.19	17.12	40.90	46.00	5.10	Peak
664.38	25.35	6.97	1.28	33.60	46.00	12.40	Peak
709.97	25.76	7.13	1.74	34.63	46.00	11.37	Peak
869.05	26.97	8.00	19.10	54.07	46.00	-8.07	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
869.05	54.07	-9.09	44.98	46.00	1.02	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
51.34	14.52	1.59	16.79	32.90	40.00	7.10	Peak
144.46	17.40	2.77	11.41	31.58	43.50	11.92	Peak
191.99	15.57	3.26	21.49	40.32	43.50	3.18	Peak
288.99	19.60	4.20	18.22	42.02	46.00	3.98	Peak
647.89	25.20	6.91	3.59	35.70	46.00	10.30	Peak
869.05	26.97	8.00	13.58	48.55	46.00	-2.55	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
869.05	48.55	-9.09	39.46	46.00	6.54	Average

A.2.1.3 Frequency Above 1 GHz

Mode	TX 433.54MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
1300.00	28.04	4.81	18.36	51.21	74.00	22.79	Peak
1764.00	29.92	5.71	18.75	54.38	74.00	19.62	Peak
2168.00	31.84	6.30	13.48	51.62	74.00	22.38	Peak
3036.00	32.89	7.51	11.36	51.76	74.00	22.24	Peak
3468.00	32.81	8.14	8.20	49.15	74.00	24.85	Peak
3904.00	33.21	8.63	10.91	52.75	74.00	21.25	Peak
4336.00	33.83	9.19	7.94	50.96	74.00	23.04	Peak
4768.00	34.21	9.52	4.20	47.93	74.00	26.07	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1300.00	51.21	-9.09	42.12	54.00	11.88	Average
1764.00	54.38	-9.09	45.29	54.00	8.71	Average
2168.00	51.62	-9.09	42.53	54.00	11.47	Average
3036.00	51.76	-9.09	42.67	54.00	11.33	Average
3468.00	49.15	-9.09	40.06	54.00	13.94	Average
3904.00	52.75	-9.09	43.66	54.00	10.34	Average
4336.00	50.96	-9.09	41.87	54.00	12.13	Average
4768.00	47.93	-9.09	38.84	54.00	15.16	Average

Mode	TX 433.54MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
1300.00	28.04	4.81	12.77	45.62	74.00	28.38	Peak
1764.00	29.92	5.71	12.30	47.93	74.00	26.07	Peak
2168.00	31.84	6.30	9.59	47.73	74.00	26.27	Peak
3036.00	32.89	7.51	10.67	51.07	74.00	22.93	Peak
3468.00	32.81	8.14	4.41	45.36	74.00	28.64	Peak
3904.00	33.21	8.63	7.30	49.14	74.00	24.86	Peak
4336.00	33.83	9.19	6.50	49.52	74.00	24.48	Peak
4768.00	34.21	9.52	2.97	46.70	74.00	27.30	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1300.00	45.62	-9.09	36.53	54.00	17.47	Average
1764.00	47.93	-9.09	38.84	54.00	15.16	Average
2168.00	47.73	-9.09	38.64	54.00	15.36	Average
3036.00	51.07	-9.09	41.98	54.00	12.02	Average
3468.00	45.36	-9.09	36.27	54.00	17.73	Average
3904.00	49.14	-9.09	40.05	54.00	13.95	Average
4336.00	49.52	-9.09	40.43	54.00	13.57	Average
4768.00	46.7	-9.09	37.61	54.00	16.39	Average

Mode	TX 433.99MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
1304.00	28.04	4.81	21.44	54.29	74.00	19.71	Peak
1760.00	29.92	5.71	11.43	47.06	74.00	26.94	Peak
2172.00	31.84	6.30	16.65	54.79	74.00	19.21	Peak
3040.00	32.89	7.51	13.57	53.97	74.00	20.03	Peak
3472.00	32.81	8.14	5.79	46.74	74.00	27.26	Peak
3908.00	33.21	8.63	10.22	52.06	74.00	21.94	Peak
4340.00	33.83	9.19	8.10	51.12	74.00	22.88	Peak
4772.00	34.21	9.52	8.09	51.82	74.00	22.18	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1304.00	54.29	-9.09	45.20	54.00	8.80	Average
1760.00	47.06	-9.09	37.97	54.00	16.03	Average
2172.00	54.79	-9.09	45.70	54.00	8.30	Average
3040.00	53.97	-9.09	44.88	54.00	9.12	Average
3472.00	46.74	-9.09	37.65	54.00	16.35	Average
3908.00	52.06	-9.09	42.97	54.00	11.03	Average
4340.00	51.12	-9.09	42.03	54.00	11.97	Average
4772.00	51.82	-9.09	42.73	54.00	11.27	Average

Mode	TX 433.99MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
1304.00	28.04	4.81	14.27	47.12	74.00	26.88	Peak
2172.00	31.84	6.30	16.42	54.56	74.00	19.44	Peak
3040.00	32.89	7.51	11.75	52.15	74.00	21.85	Peak
3904.00	33.21	8.63	10.35	52.19	74.00	21.81	Peak
4340.00	33.83	9.19	9.70	52.72	74.00	21.28	Peak
4776.00	34.21	9.52	7.70	51.43	74.00	22.57	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1304.00	47.12	-9.09	38.03	54.00	15.97	Average
2472.00	54.56	-9.09	45.47	54.00	8.53	Average
3040.00	52.15	-9.09	43.06	54.00	10.94	Average
3904.00	52.19	-9.09	43.10	54.00	10.90	Average
4340.00	52.72	-9.09	43.63	54.00	10.37	Average
4776.00	51.43	-9.09	42.34	54.00	11.66	Average

Mode	TX 434.44MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
1304.00	28.04	4.81	21.44	54.29	74.00	19.71	Peak
1760.00	29.92	5.71	11.43	47.06	74.00	26.94	Peak
2172.00	31.84	6.30	16.65	54.79	74.00	19.21	Peak
3040.00	32.89	7.51	13.57	53.97	74.00	20.03	Peak
3472.00	32.81	8.14	5.79	46.74	74.00	27.26	Peak
3908.00	33.21	8.63	10.22	52.06	74.00	21.94	Peak
4340.00	33.83	9.19	8.10	51.12	74.00	22.88	Peak
4772.00	34.21	9.52	8.09	51.82	74.00	22.18	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1304.00	57.58	-9.09	48.49	54.00	5.51	Average
2172.00	50.57	-9.09	41.48	54.00	12.52	Average
3040.00	53.22	-9.09	44.13	54.00	9.87	Average
3476.00	45.42	-9.09	36.33	54.00	17.67	Average
3912.00	51.87	-9.09	42.78	54.00	11.22	Average
4344.00	49.34	-9.09	40.25	54.00	13.75	Average
4780.00	49.18	-9.09	40.09	54.00	13.91	Average

Mode	TX 434.44MHz
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Antenna at Vertical Polarization

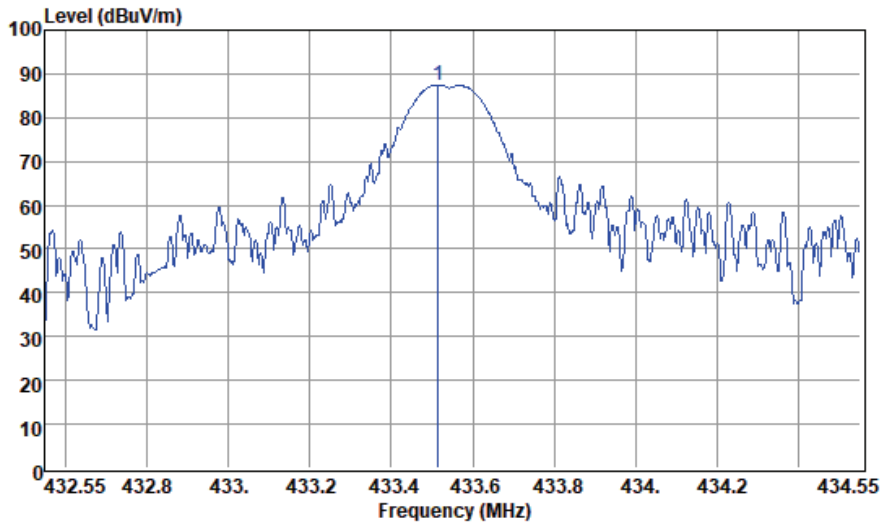
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
1304.00	28.04	4.81	16.19	49.04	74.00	24.96	Peak
1764.00	29.92	5.71	10.81	46.44	74.00	27.56	Peak
2172.00	31.84	6.30	9.85	47.99	74.00	26.01	Peak
3040.00	32.89	7.51	12.22	52.62	74.00	21.38	Peak
3908.00	33.21	8.63	8.35	50.19	74.00	23.81	Peak
4344.00	33.86	9.21	8.05	51.12	74.00	22.88	Peak
4780.00	34.21	9.52	4.28	48.01	74.00	25.99	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1304.00	49.04	-9.09	39.95	54.00	14.05	Average
1764.00	46.44	-9.09	37.35	54.00	16.65	Average
2172.00	47.99	-9.09	38.90	54.00	15.10	Average
3040.00	52.62	-9.09	43.53	54.00	10.47	Average
3908.00	50.19	-9.09	41.10	54.00	12.90	Average
4344.00	51.12	-9.09	42.03	54.00	11.97	Average
4780.00	48.01	-9.09	38.92	54.00	15.08	Average

A.2.2 Fundamental Frequency

Mode	TX 433.54MHz
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Data: 1 File: C:\Users\audix\Desktop\martin\C1M1710300连接器E3\FCC\Hub\power.EMI.EM6 (6)



Site no. : AUDIX No.1 3m Chamber	Data no. : 1
Dis. / Ant. : 3m CBL6112D 33821	Ant. pol. : VERTICAL
Limit :	Engineer : Martin
Env. / Ins. : 23°C / 50% N9010A	
EUT : NS-CH1XG08	
Power Rating : 120Vac/60Hz	
Test Mode : Tx 433.54MHz	

Antenna at Horizontal Polarization

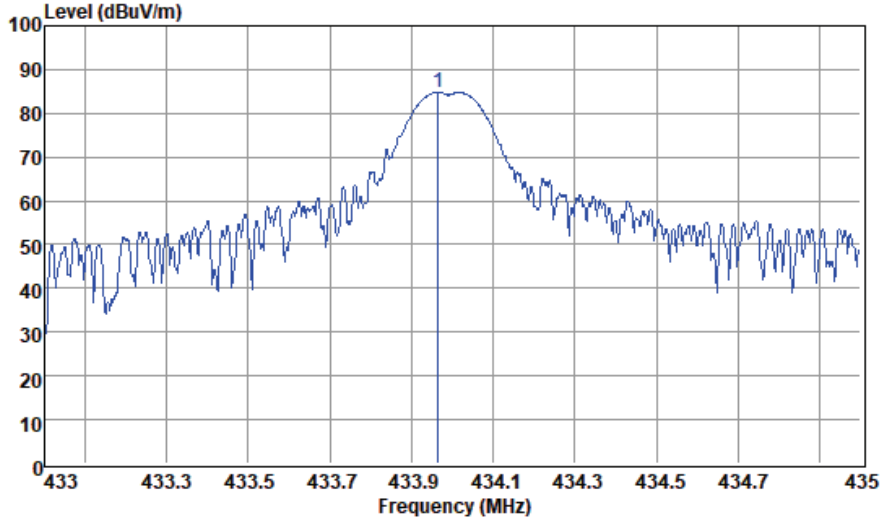
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
433.52	16.38	5.87	65.28	87.53	100.81	13.28	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
433.52	87.53	-9.09	78.44	80.81	2.37	Average

Remark: Vertical is the strongest polarization and peak value has complied with average limit, so horizontal won't be listed in test report.

Mode	TX 433.99MHz
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Data: 3 File: C:\Users\audix\Desktop\martin\C1M1710300透控器IE3\FCC\Hub\power.EMI.EM6 (6)



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Site no.      : AUDIX No.1 3m Chamber      Data no.   : 3
Dis. / Ant.  : 3m CBL6112D 33821        Ant. pol.  : VERTICAL
Limit        :
Env. / Ins.  : 23°C / 50% N9010A         Engineer   : Martin
EUT         : NS-CH1XG08
Power Rating : 120Vac/60Hz
Test Mode    : Tx 433.99MHz
    
```

Antenna at Horizontal Polarization

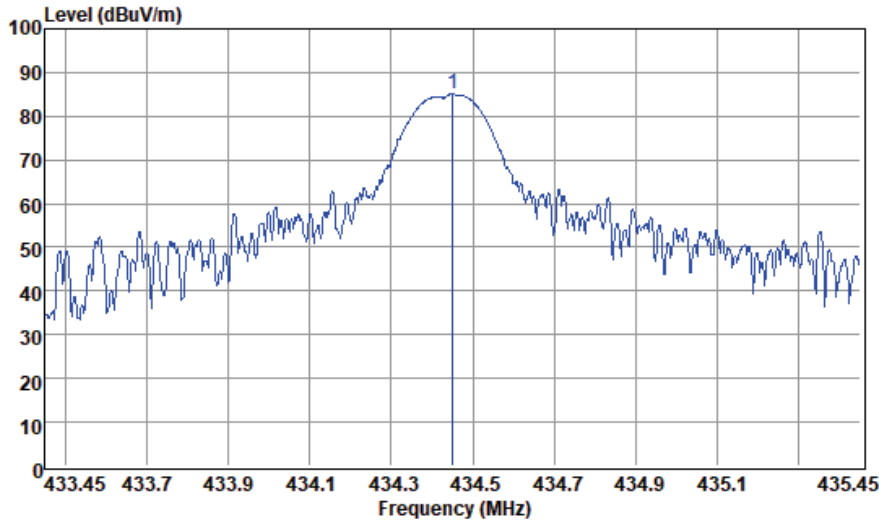
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
433.97	16.38	5.87	62.54	84.79	100.83	16.04	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
433.97	84.79	-9.09	75.70	80.83	5.13	Average

Remark: Vertical is the strongest polarization and peak value has complied with average limit, so horizontal won't be listed in test report.

Mode	TX 434.44MHz
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Data: 6 File: C:\Users\audix\Desktop\martin\C1M1710300遙控器IE3\FCC\Hub\power.EMI.EM6 (6)



Site no. : AUDIX No.1 3m Chamber	Data no. : 6
Dis. / Ant. : 3m CBL6112D 33821	Ant. pol. : HORIZONTAL
Limit :	
Env. / Ins. : 23°C / 50% N9010A	Engineer : Martin
EUT : NS-CH1XG08	
Power Rating : 120Vac/60Hz	
Test Mode : Tx 434.44MHz	

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
434.45	16.38	5.87	62.92	85.17	100.84	15.67	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
434.45	85.17	-9.09	76.08	80.84	4.76	Average

Remark: Horizontal is the strongest polarization and peak value has complied with average limit, so vertical won't be listed in test report.

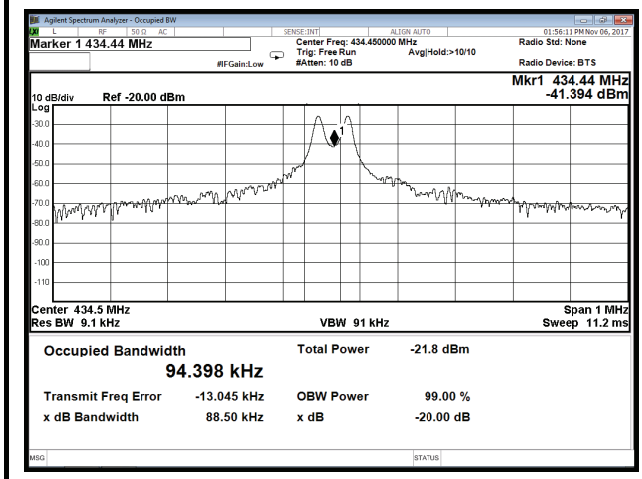
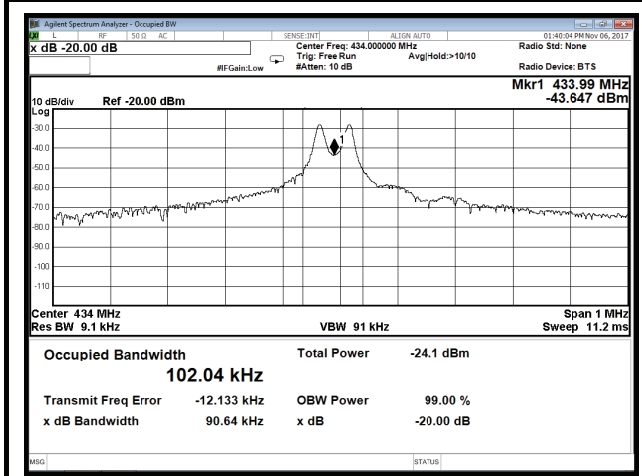
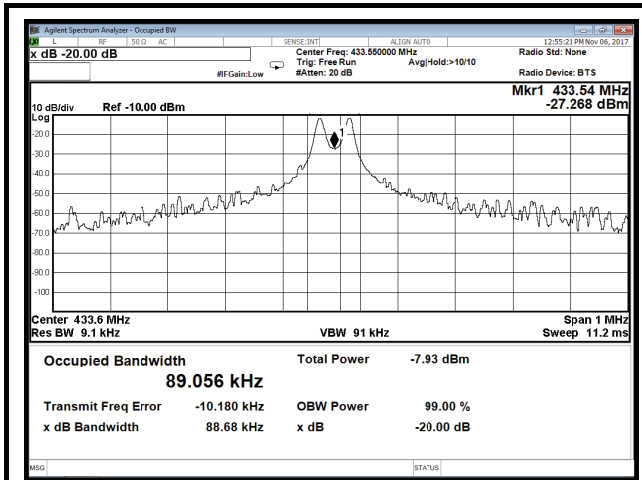
A.3 EMISSION BANDWIDTH MEASUREMENT

Test Date	2017/11/06	Temp./Hum.	24°C/55%
Frequency	TX 433.55MHz TX 434.00MHz TX 434.45MHz	Test Voltage	DC 3V (Via Battery)

A.3.1 Emission Bandwidth

Center Frequency (MHz)	20dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Tolerance (%)	Limit (%)
433.55	0.08868	0.089056	0.020	0.25
434.00	0.09064	0.102040	0.021	0.25
434.45	0.08850	0.094398	0.020	0.25

A.3.2 Measurement Plots



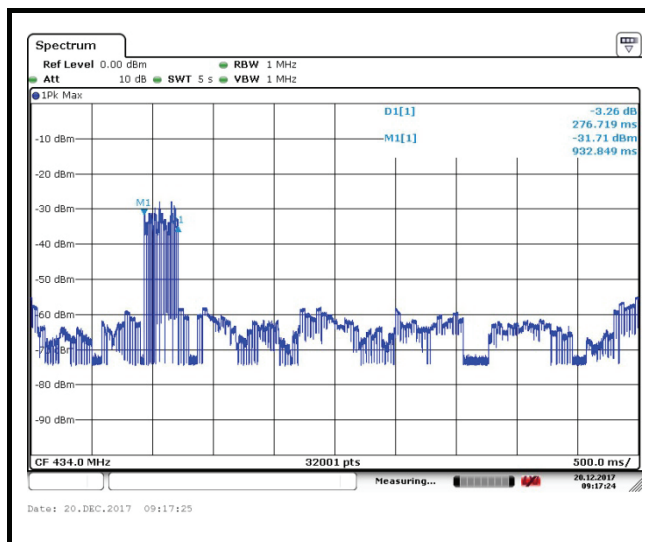
A.4 PERIODIC OPERATED MEASUREMENT

Test Date	2017/12/20	Temp./Hum.	23°C/55%
Frequency	TX 433.55MHz TX 434.00MHz TX 434.45MHz	Test Voltage	DC 3V (Via Battery)

A.4.1 Periodic Operated

Center Frequency (MHz)	Time (Sec.)	Limit (Sec.)
All Frequencies	0.830	< 5

A.4.2 Measurement Plots



Note: Time= 276.719*3 (The Transmitter transmit with three frequencies sequence) = 830.157ms=
 0.830 Sec.

APPDNDIX B

TEST PHOTOGRAPHS

(Model: (1)NS-CH1XGO8 (2)NS-CH1XGO8-C)