

TEST REPORT

Applicant: Comelit Group Spa

Address of Applicant: via Don Arrigoni 5 san Lorenzo di Rovetta Bergamo Italy

Manufacturer: Zhong Shan Jesmay Electronics Co., Ltd

Address of Manufacturer: First Industry District, Tan Zhou, Zhong Shan, Canton, China

Equipment Under Test (EUT)

Product Name: Smart Video Doorbell

Model No.: CM96201FR-CMS

FCC ID: 2ANSR-CM96201FR

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.231

Date of sample receipt: May 27, 2019

Date of Test: May 28, 2019-June 20, 2019

Date of report issued: June 21, 2019

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Lo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
01	June 21, 2019	Original

Prepared By:

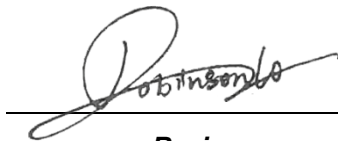


Date:

June 21, 2019

Project Engineer

Check By:



Date:

June 21, 2019

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203	Pass
Conduction Emission	15.207	Pass
Field strength of the Fundamental Signal	15.231 (b)	Pass
Spurious Emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Dwell Time	15.231 (a)(1)	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not applicable.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.64dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.64dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 3.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Smart Video Doorbell
Model No.:	CM96201FR-CMS
Serial No.:	as0745qwcd
Hardware Version:	ALM-VA-MB-222 (D) 20181031
Software Version:	V1.0.0
Test sample(s) ID:	GTS201905000212-1
Sample(s) Status:	Engineer sample
Operation Frequency:	433.92MHz
Modulation technology:	ASK
Antenna Type:	Integral Antenna
Antenna gain:	2.0dBi(declare by applicant)
Power supply:	DC 12V

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode.
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Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which only the worst case was shown in this test report and defined as follows:

433.92MHz	Axis	X	Y	Z
	Field Strength(dBuV/m)	71.26	72.55	70.34

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
Zhong Shan Jesmay Electronics	Smart Video Doorbell	CM93602W	NA

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

- **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
 No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone,
 Xixiang Road, Baoan District, Shenzhen, Guangdong, China
 Tel: 0755-27798480
 Fax: 0755-27798960

5.6 Other Information Requested by the Customer

None.

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 27 2018	June. 26 2019
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 27 2018	June. 26 2019
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 27 2018	June. 26 2019
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 27 2018	June. 26 2019
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 20 2018	Oct. 19 2019
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 20 2018	Oct. 19 2019
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 20 2018	Oct. 19 2019
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 27 2018	June. 26 2019

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 27 2018	June. 26 2019
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 27 2018	June. 26 2019
5	Coaxial Cable	GTS	N/A	GTS227	June. 27 2018	June. 26 2019
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 27 2018	June. 26 2019
8	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	June. 27 2018	June. 26 2019

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	ChangChun	DYM3	GTS257	June 27 2018	June 26 2019

7 Test results and Measurement Data

7.1 Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
<i>The antenna is integral antenna, the best case gain of the antenna is 2.0dBi, reference to the appendix II for details</i>	

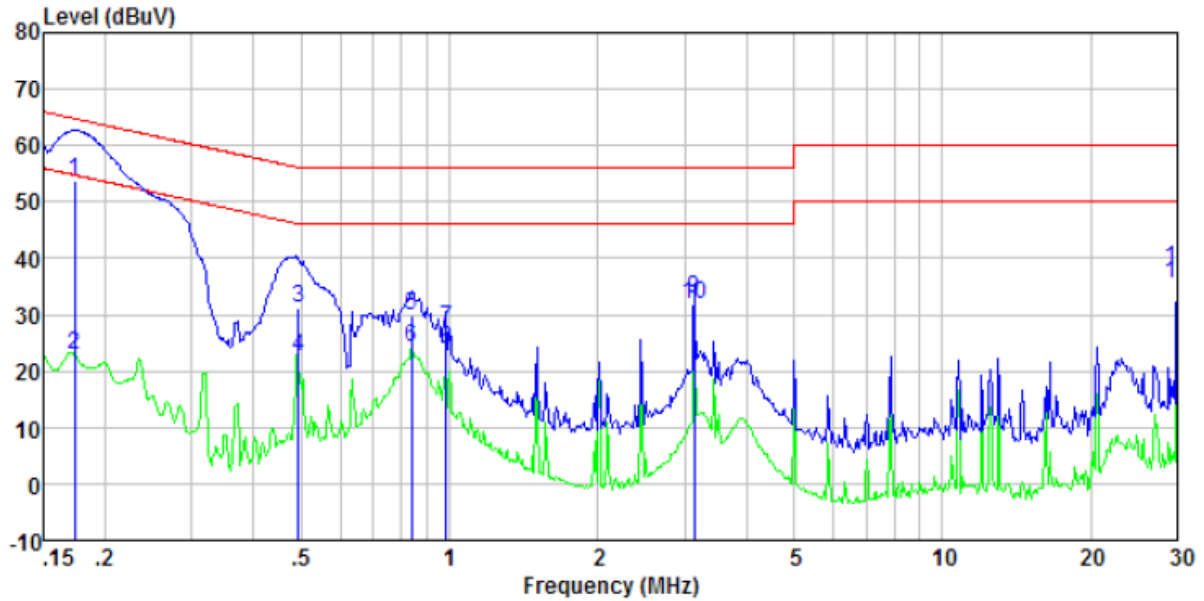
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	150KHz to 30MHz				
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto				
Limit:	Frequency range (MHz)	Limit (dBuV)			
		Quasi-peak		Average	
	0.15-0.5	66 to 56*		56 to 46*	
	0.5-5	56		46	
	5-30	60		50	
* Decreases with the logarithm of the frequency.					
Test setup:	<p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>				
Test Instruments:	Refer to section 6.0 for details				
Test mode:	Refer to section 5.2 for details				
Test environment:	Temp.:	25 °C	Humid.:	50%	Press.: 1 010mbar
Test voltage:	DC12V				
Test results:	Pass				

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

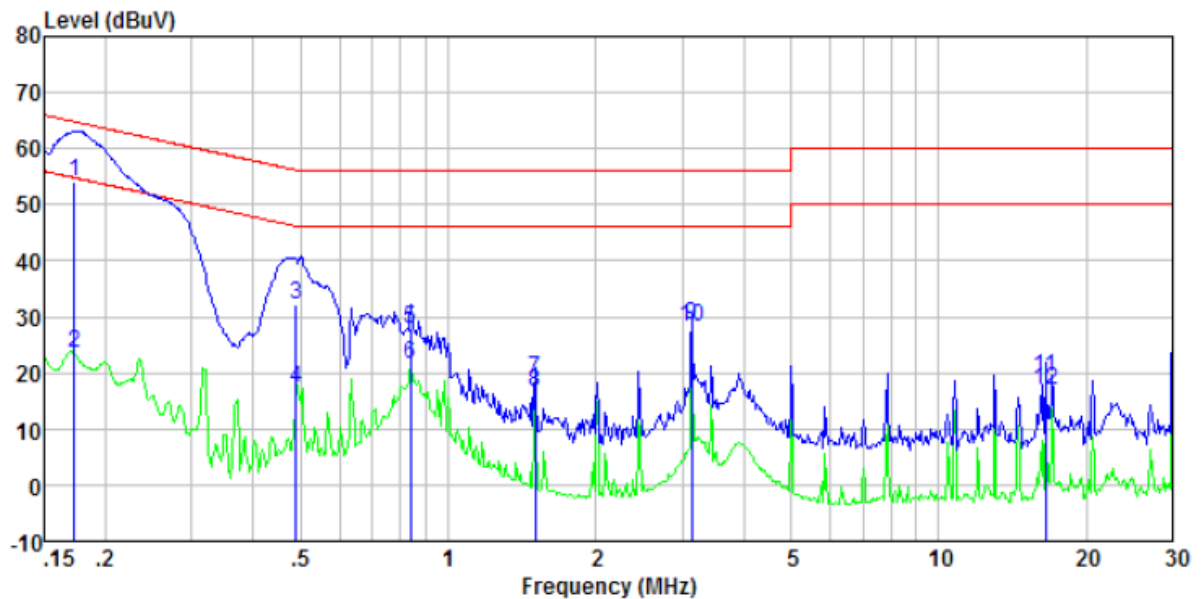
Measurement data

Mode:	Transmitting mode	Polarization:	Line
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Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	53.37	0.40	0.09	53.86	64.77	-10.91	QP
0.17	22.36	0.40	0.09	22.85	54.77	-31.92	Average
0.49	30.88	0.32	0.11	31.31	56.10	-24.79	QP
0.49	22.01	0.32	0.11	22.44	46.10	-23.66	Average
0.84	29.57	0.23	0.14	29.94	56.00	-26.06	QP
0.84	23.69	0.23	0.14	24.06	46.00	-21.94	Average
0.98	27.09	0.20	0.15	27.44	56.00	-28.56	QP
0.98	23.47	0.20	0.15	23.82	46.00	-22.18	Average
3.14	32.51	0.20	0.19	32.90	56.00	-23.10	QP
3.14	31.34	0.20	0.19	31.73	46.00	-14.27	Average
30.00	37.54	0.40	0.23	38.17	60.00	-21.83	QP
30.00	34.88	0.40	0.23	35.51	50.00	-14.49	Average

Mode:	Transmitting mode	Polarization:	Neutral
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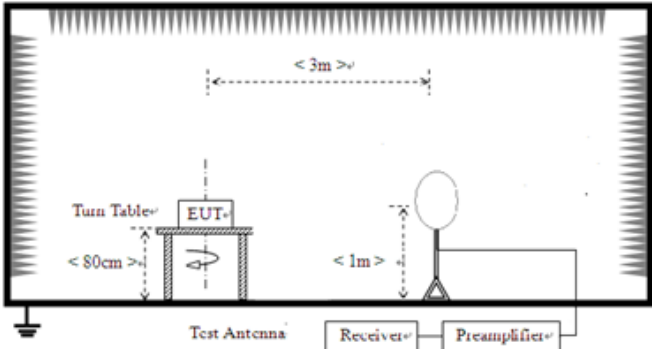


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	53.71	0.40	0.09	54.20	64.81	-10.61	QP
0.17	23.02	0.40	0.09	23.51	54.81	-31.30	Average
0.49	31.78	0.32	0.11	32.21	56.19	-23.98	QP
0.49	16.65	0.32	0.11	17.08	46.19	-29.11	Average
0.84	27.65	0.23	0.14	28.02	56.00	-27.98	QP
0.84	21.30	0.23	0.14	21.67	46.00	-24.33	Average
1.50	18.52	0.20	0.16	18.88	56.00	-37.12	QP
1.50	16.35	0.20	0.16	16.71	46.00	-29.29	Average
3.14	28.11	0.20	0.19	28.50	56.00	-27.50	QP
3.14	27.86	0.20	0.19	28.25	46.00	-17.75	Average
16.49	18.68	0.23	0.22	19.13	60.00	-40.87	QP
16.49	16.61	0.23	0.22	17.06	50.00	-32.94	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

7.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.231 (b)& Section 15.209					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	9kHz to 5000MHz					
Test site:	Measurement Distance: 3m					
Receiver setup:	Frequency	Detector	RBW	VBW	Value	
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak	
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak	
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak	
	Above 1GHz	Peak	1MHz	3MHz	Peak	
Peak		1MHz	10Hz	Average		
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark		
	433.92MHz	100.83		Peak Value		
		80.83		Average Value		
Limit: (Spurious Emissions)	Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)		Field Strength of Unwanted Emissions (microvolts/meter)		
	40.66-40.70	2250		225		
	70-130	1250		125		
	130-174	1250 to 3750**		125 to 735		
	174-260	3750		375		
	260-470	3750 to 12500		375 to 1250		
	Above 470	12500		1250		
	Frequency (MHz)	Class B(dBuV/m @3m)				
		Above 1000	Peak	Average		
			74	54		
Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits higher field strength.						
Test setup:	<p>Below 30MHz</p>  <p>Below 1GHz</p>					

Test Instruments:	Refer to section 6.0 for details							
Test mode:	Refer to section 5.2 for details							
Test environment:	Temp.:	25 °C	Humid.:	50%	Press.:	1 010mbar		
Test results:	Pass							

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.92	89.94	16.03	3.02	37.52	71.47	80.82	-9.35	Horizontal
433.92	91.02	16.03	3.02	37.52	72.55	80.82	-8.27	Vertical

Remarks:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *Average limit shall apply to PK value*

7.3.2 Spurious Emissions

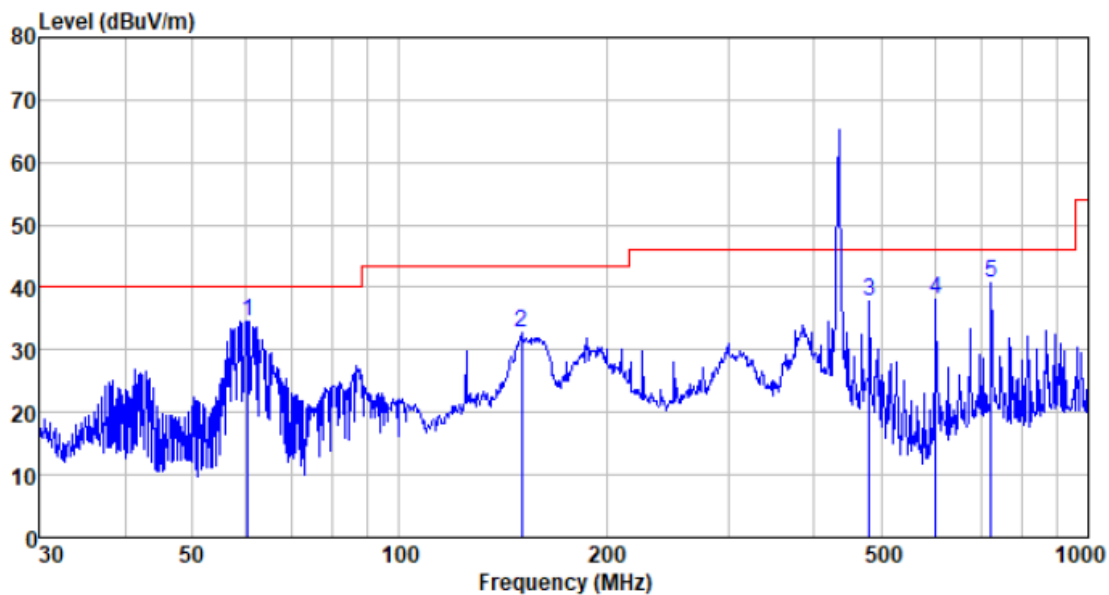
Measurement data:

9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

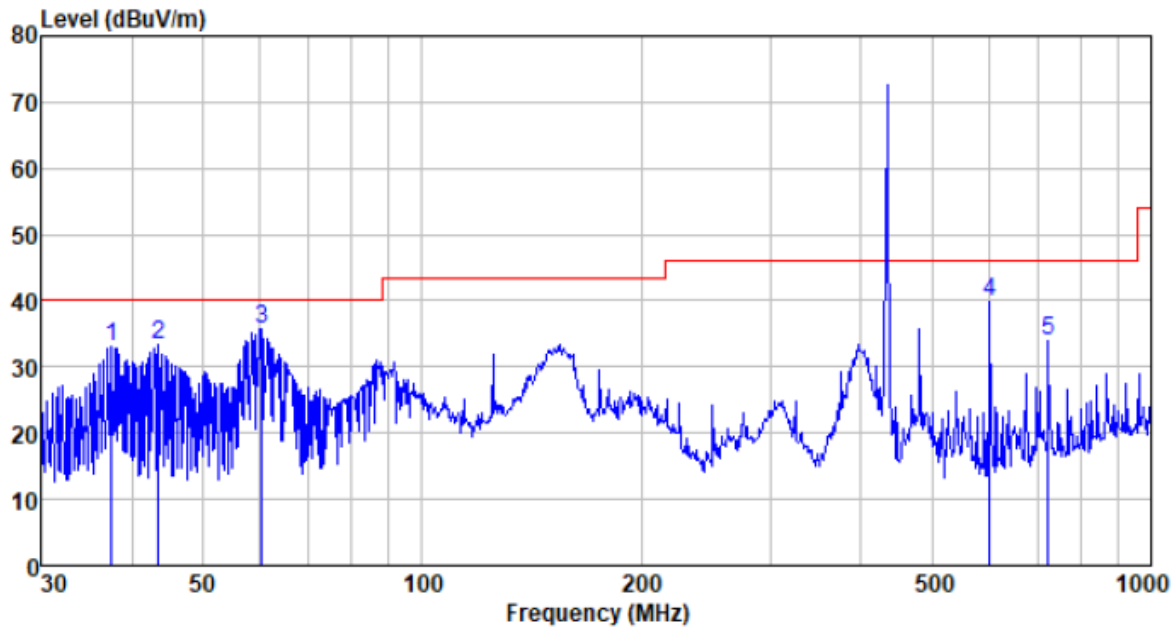
Below 1GHz:

Mode:	Transmitting mode	Polarization:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
60.280	58.90	11.18	0.86	36.33	34.61	40.00	-5.39	QP
150.538	60.68	7.65	1.57	37.08	32.82	43.50	-10.68	QP
480.528	55.04	16.93	3.22	37.51	37.68	46.00	-8.32	QP
601.427	52.36	19.50	3.73	37.54	38.05	46.00	-7.95	QP
721.726	54.22	20.03	4.17	37.63	40.79	46.00	-5.21	QP

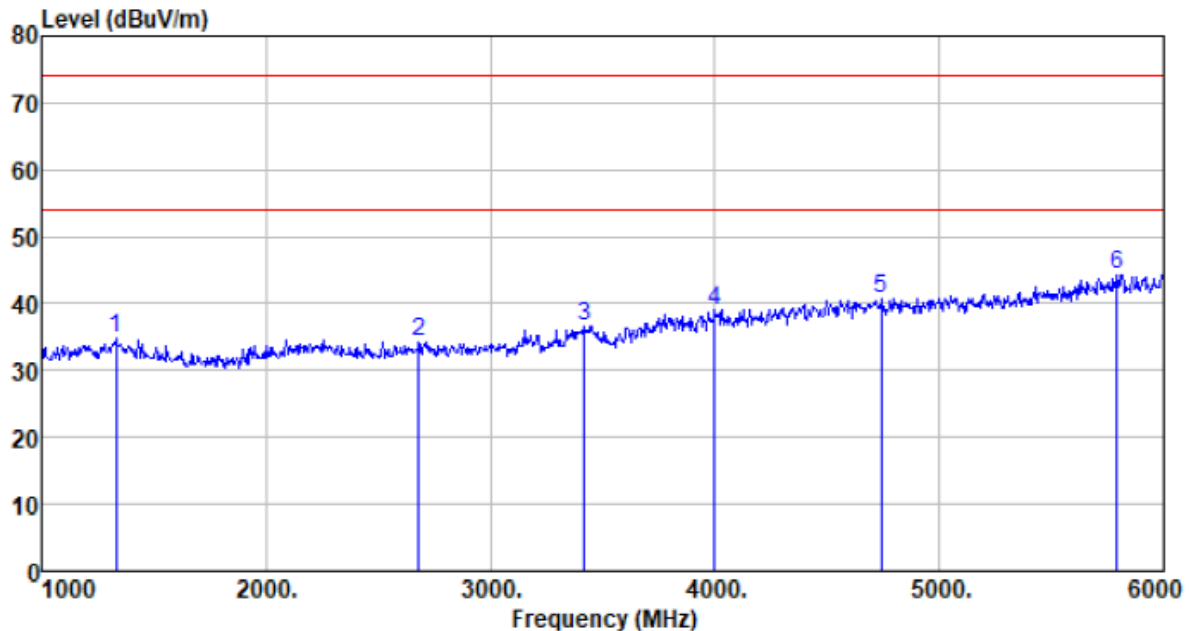
Mode:	Transmitting mode	Polarization:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
37.548	56.25	11.80	0.64	35.52	33.17	40.00	-6.83	QP
43.506	56.42	12.24	0.70	35.86	33.50	40.00	-6.50	QP
60.280	60.10	11.18	0.86	36.33	35.81	40.00	-4.19	QP
601.427	54.21	19.50	3.73	37.54	39.90	46.00	-6.10	QP
721.726	47.29	20.03	4.17	37.63	33.86	46.00	-12.14	QP

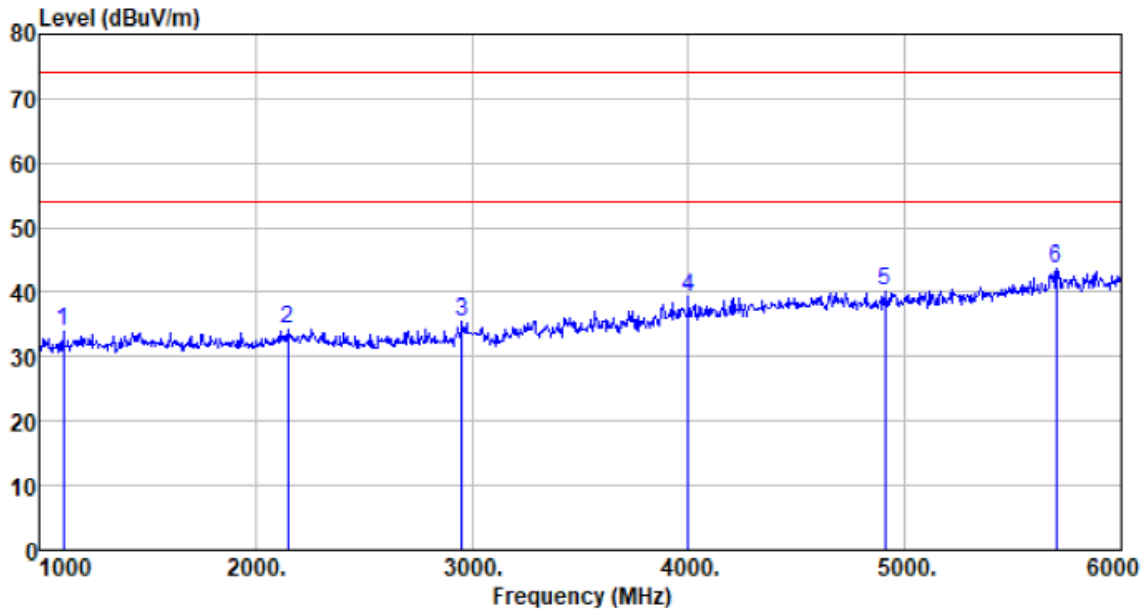
Above 1G:

Mode:	Transmitting mode	Polarization:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
1330.000	40.54	25.68	4.57	36.03	34.76	74.00	-39.24	Peak
2680.000	37.66	28.08	5.65	37.08	34.31	74.00	-39.69	Peak
3420.000	38.58	28.67	6.80	37.35	36.70	74.00	-37.30	Peak
4000.000	38.85	29.68	7.87	37.40	39.00	74.00	-35.00	Peak
4740.000	38.24	31.70	8.54	37.70	40.78	74.00	-33.22	Peak
5790.000	38.40	32.63	9.93	36.67	44.29	74.00	-29.71	Peak

Mode:	Transmitting mode	Polarization:	Vertical
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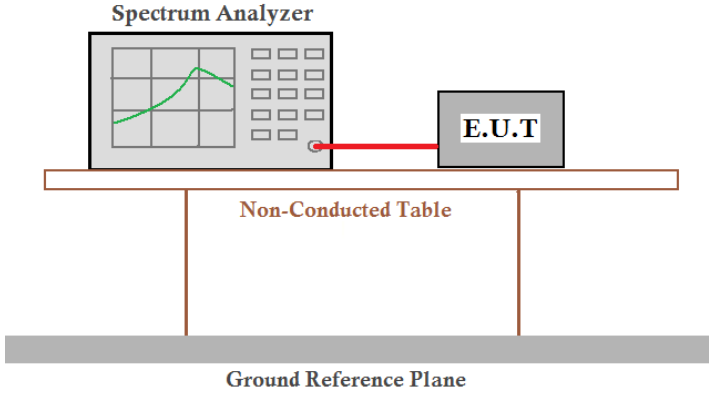


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
1110.000	40.70	24.80	4.39	35.82	34.07	74.00	-39.93	Peak
2150.000	38.24	27.52	5.13	36.64	34.25	74.00	-39.75	Peak
2955.000	38.45	28.43	5.89	37.27	35.50	74.00	-38.50	Peak
4000.000	39.04	29.68	7.87	37.40	39.19	74.00	-34.81	Peak
4910.000	37.46	31.88	8.69	37.77	40.26	74.00	-33.74	Peak
5700.000	38.19	32.50	9.79	36.80	43.68	74.00	-30.32	Peak

Remarks:

Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.10:2013
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

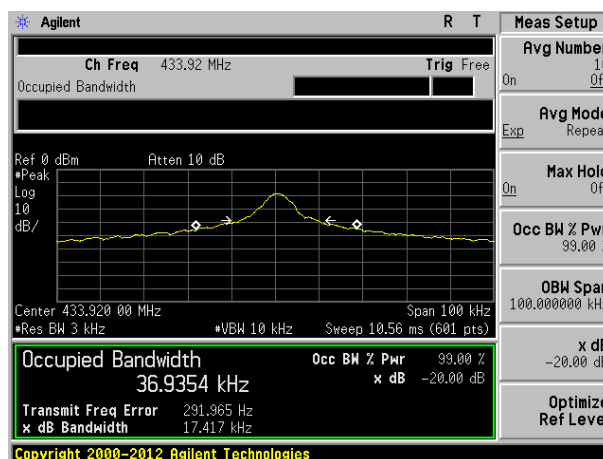
Measurement Data

Test Frequency (MHz)	20dB bandwidth (kHz)	Limit (MHz)	Result
433.92	17.417	1.085	Pass

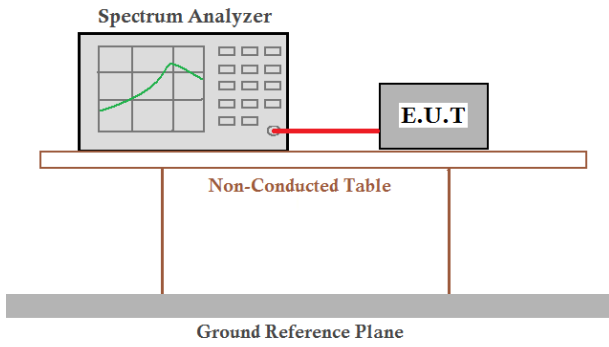
Note: Limit= Fundamental frequency×0.25%

$$433.92 \times 0.25\% = 1.085 \text{ MHz}$$

Test plot as follows:



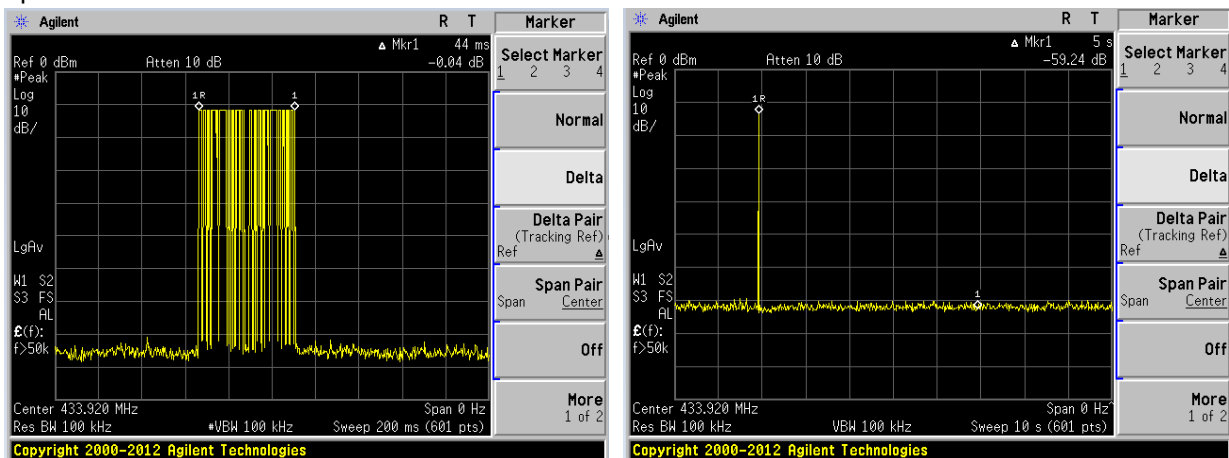
7.5 Dwell Time

Test Requirement:	FCC Part15 C Section 15.231 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=100KHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Frequency (MHz)	Duration of each TX (second)	Limit (second)	Result
433.92	0.044	<5.0	Pass

Test plot as follows:



8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

----- End -----