TEST REPORT

FCC ID: VII-DMWV1

For

Elexa Consumer Products Inc.

Water Valve Shut Off

Model No.	:	DMWV1
Trade name	:	DOME
Prepared for	:	Elexa Consumer Products Inc.
Address	:	2275 Half Day Road, Suite 333 Bannockburn, IL 60015, U.S.A
Prepared by	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China
Report No.	:	T1862225 01
Date of Receipt	:	November 07, 2016
Date of Test	:	November 07-14, 2016
Date of Report	:	November 14, 2016
Version Number	:	REV0

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Description **Page**

DECLARATION

Applicant	:	Elexa Consumer Products Inc.
Manufacturer	:	GR TECHNOLOGY INTERNATIONAL LIMITEO U-Fairy G.R.IOT Tech. co., Ltd
Product	:	Water Valve Shut Off
	(A) Model No.	: DMWV1
	(B) Trade Name	: DOME
	(C) Power supply	: DC 12V from DC Power

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249: 2016, ANSI C63.10-2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Reak Yang Test Engineer	Reak Yang ……
Approved by (name + signature)…....:	Simple Guan Project Manager	……
Date of issue…… ……..:		November 14, 2016

1 General Information

1.1 Description of Device (EUT)

EUT	:	Water Valve Shut Off
Model No.	:	DMWV1
Trade mark	:	DOME
Power supply	:	DC 12V from DC Power
Operation frequency	:	908.42MHz
Channel number	:	1
Modulation	:	ASK
Antenna Type	:	Integral Antenna, max gain 0dBi.
Software Version	:	N/A
Hardware Version	:	REV.001
Applicant	:	Elexa Consumer Products Inc.
Address	:	2275 Half Day Road, Suite 333 Bannockburn, IL 60015, U.S.A
Manufacturer	:	GR TECHNOLOGY INTERNATIONAL LIMITEO U-Fairy G.R.IOT Tech. co., Ltd
Address	:	guanrong technology garden, baihuali, changing town, dongguan city, guangdong province

1.2 Description of Test Facility

Shenzhen Alpha Product Testing Co., Ltd.

Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China

March 25, 2015 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2 EMC Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal. Due To	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2017.01.16	1Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2017.01.16	1Year
Receiver	R&S	ESCI	101165	2017.01.16	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.01.16	1 Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2017.01.16	1 Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2018.01.18	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2017.01.20	2Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2017.01.20	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	MY6562/4	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	309972/4	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	329112/4	2017.01.16	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2017.01.18	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2017.01.18	1Year

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Equipment	Manufacture	Model No.	Serial No.	Test Location	Frequency Rang
Cable	Resenberger	SUCOFLEX 104	309972/4	Radiation	9KHz-2GHz
Cable	Resenberger	SUCOFLEX 104	329112/4	Radiation	1GHz-26.5GHz
Note: For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB					

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard C63.10-2013 using a 50 u H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25℃ with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard C63.10-2013 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25℃ with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.
Example:
Freq (MHz) METER READING + ACF + CABLE = FS
33.20 dBuV + 10.36 dB + 0.9 dB= 44.46 dBuV/m @ 3m
ANSI STANDARD C63.10-2013 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard C63.10-2013 10.1.7 with the EUT 40 cm from the vertical ground wall.

4 Summary of Measurement

4.1 Summary of test result

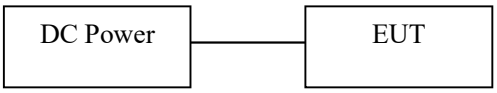
Test Item	Test Requirement	Stanadard Paragraph	Result
Spurious Emission	FCC PART 15: 2016	Section 15.249&15.209	Compliance
Conduction Emission	FCC PART 15: 2016	Section 15.207	Compliance
Occupied bandwidth	FCC PART 15: 2016	Section 15.215	Compliance
Band edge Requirement	FCC PART 15: 2016	Section 15.249	Compliance
Antenna Requirement	FCC PART 15: 2016	Section 15.203	Compliance

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.

4.2 Test connection

EUT was placed on a turn table, which is 0.8 meter high above ground for blew 1GHz, 1.5 meter high above ground for above 1GHz.

TX Mode:



4.3 Assistant equipment used for test

Description	:	DC Power
Manufacturer	:	Longwei
Model No.	:	TPR12100

4.4 Test mode

Channel List, Mode

Mode	Channel No.	Frequency(MHz)
ASK	CH1	908.42

4.5 Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

4.6 Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.71dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.90 dB	Polarize: V
	3.92dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.26 dB	Polarize: H
	4.28 dB	Polarize: V
Uncertainty for radio frequency	1×10-9	
Uncertainty for DC and low frequency voltages	0.06%	

5 Spurious Emission

5.1 Radiation Emission

5.2 Radiation Emission Limits(15.209&249)

Frequency (MHz)	**Field Strength Limits at 3 metres (watts, e.i.r.p.)**		
	uV/m	dB uV/m	Measurement distance(m)
0.009-0.490	2400/F(kHz)	XX	300
0.490-1.705	24000/F(kHz)	XX	30
1.705-30	30	29.5	30
30~88	100(3nW)	40	3
88~216	150(6.8nW)	43.5	3
216~960	200(12nW)	46	3
Above960	500(75nW)	54	3
Carrier frequency		93.97(QP)	3

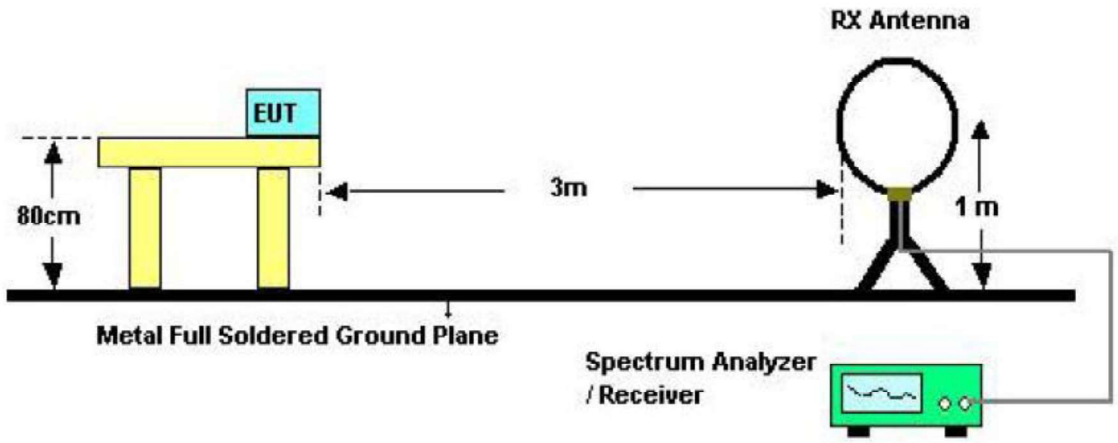
NOTE:

a) The tighter limit applies at the band edges.

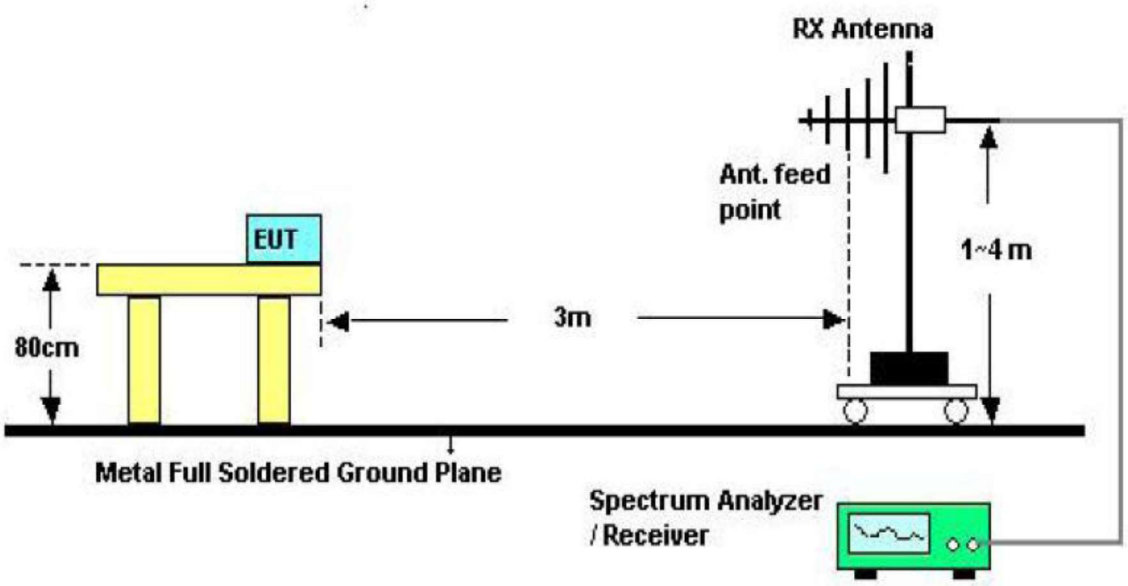
b) Emission Level(dB uV/m)=20log Emission Level(uV /m)

5.3 Test Setup

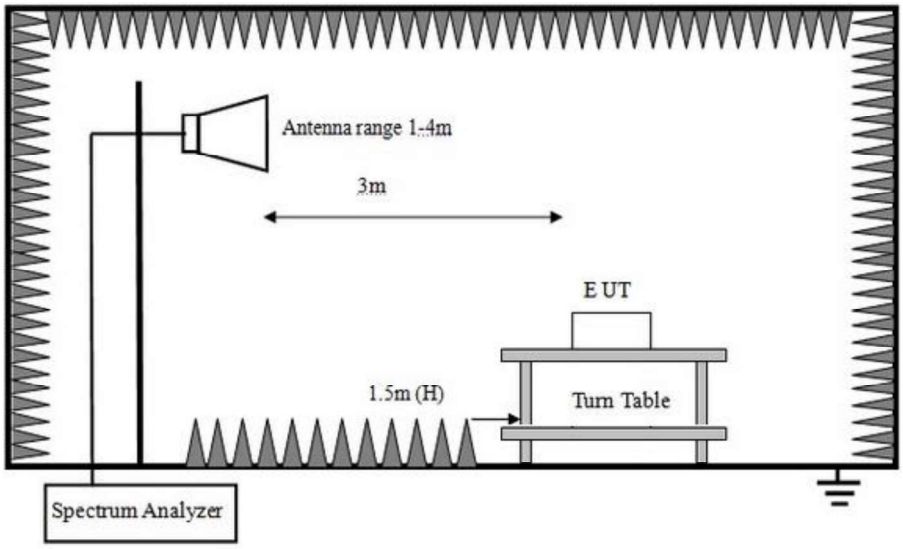
See the next page



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

5.4 Test Procedure

a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation
b) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set of make measurement.
c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Qusia Peak Detector mode premeasured
d) If Peak value comply with QP limit Below 1GHz.The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
e) For the actual test configuration, please see the test setup photo.
f) Test for all x, y, z axes is performed and only the worst case of X xes was recorded in the test report.
g) For the radiated emission test above 1GHz:
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.

5.5 Test Equipment Setting For emission test Result.

9KHz~150KHz	RBW 200Hz	VBW1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHZ~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

5.6 Test Condition

Continual Transmitting in maximum power.

5.7 Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

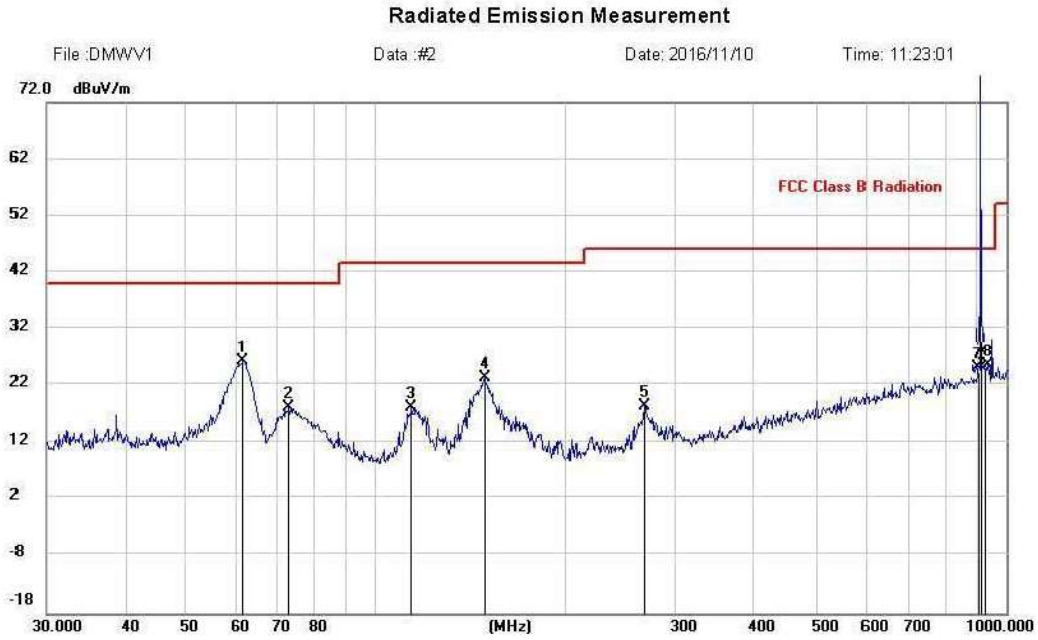
From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Remark: Only show the test data of the worst Channel in this report.

From 30MHz to 1000MHz: Conclusion: PASS

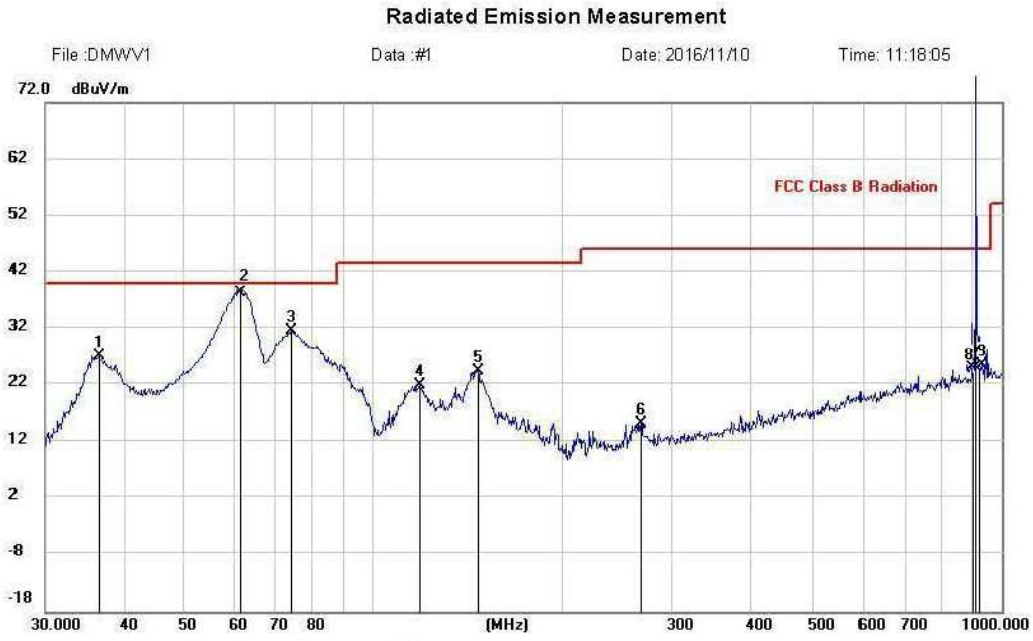
Below 1GHz
H:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		61.5618	13.73	12.54	26.27	40.00	-13.73	peak			
2		72.8466	7.57	10.47	18.04	40.00	-21.96	peak			
3		114.1138	6.18	11.96	18.14	43.50	-25.36	peak			
4		148.4410	8.84	14.44	23.28	43.50	-20.22	peak			
5		266.6089	5.64	12.63	18.27	46.00	-27.73	peak			
6	*	908.4206	70.25	23.25	93.50			QP			
7		902.0000	0.25	23.02	23.27	46.00	-22.73	QP			
8		928.0000	0.56	23.35	23.91	46.00	-22.09	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

V:

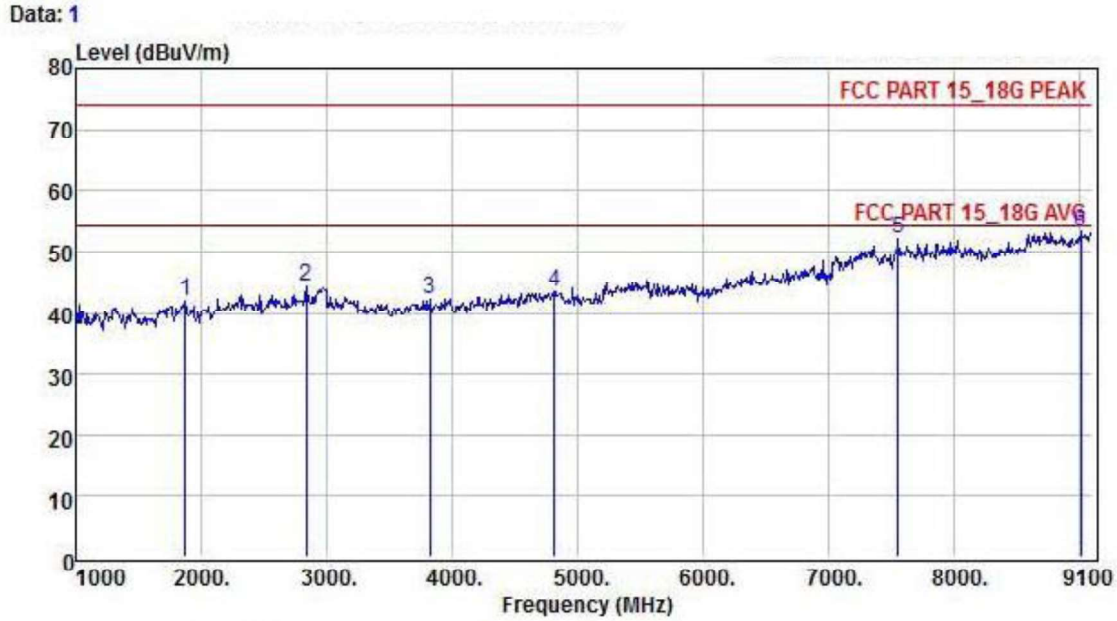


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		36.5092	13.49	13.66	27.15	40.00	-12.85	peak			
2		61.5618	23.56	12.54	36.10	40.00	-4.10	peak			
3		74.1351	21.12	10.41	31.53	40.00	-8.47	peak			
4		119.0180	9.35	12.49	21.84	43.50	-21.66	peak			
5		146.8877	10.15	14.33	24.48	43.50	-19.02	peak			
6		266.6089	2.57	12.63	15.20	46.00	-30.80	peak			
7	*	908.4206	68.82	23.25	92.07			QP			
8		902.0000	0.31	23.02	23.33	46.00	-22.67	QP			
9		926.0000	0.42	23.35	23.77	46.00	-22.23	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Notes: Above is below 1GHz test data.

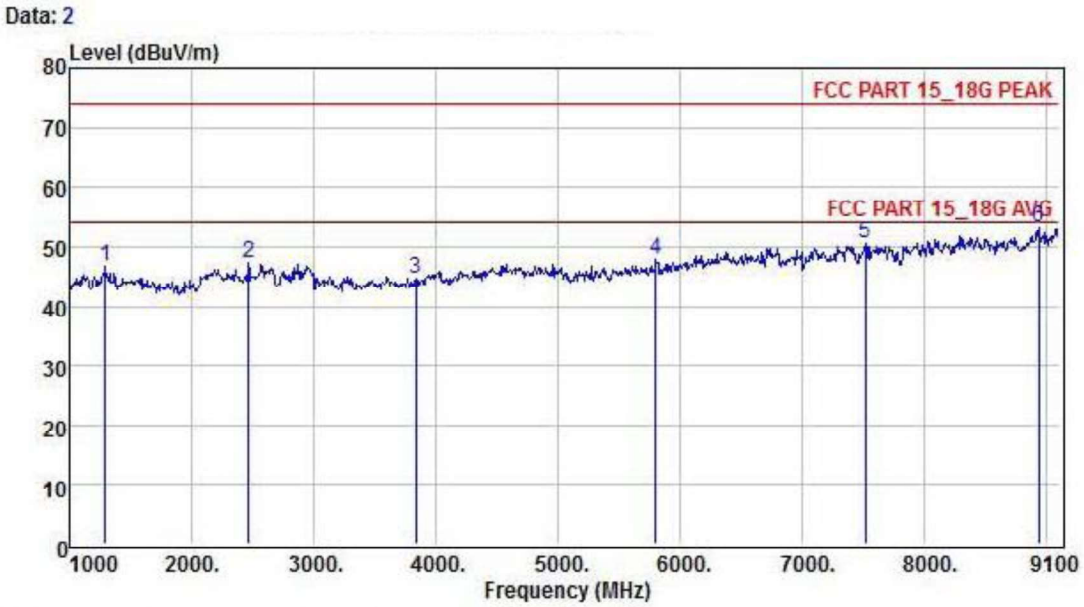
Radiated Emissions above 1GHz



Condition : FCC PART 15_18G PEAK POL: HORIZONTAL
EUT :
Model No :
Test Mode :
Power :
Test Engineer :
Remark :
Temp :
Hum :

Item	Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dBuV	
1	1874.80	36.26	25.22	3.51	41.95	54.00	-12.05	peak
2	2838.70	35.21	27.94	4.29	44.28	54.00	-9.72	peak
3	3818.80	31.05	29.12	5.07	42.26	54.00	-11.74	peak
4	4815.10	28.94	31.26	5.70	43.50	54.00	-10.50	peak
5	7552.90	29.75	36.43	7.25	51.98	54.00	-2.02	peak
6	9010.90	30.04	37.41	7.98	53.16	54.00	-0.84	peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Condition : FCC PART 15_18G PEAK POL: VERTICAL
EUT :
Model No :
Test Mode :
Power :
Test Engineer :
Remark :
Temp :
Hum :

Item	Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dBuV	
1	1291.60	42.29	24.92	2.48	46.66	74.00	-27.34	Peak
2	2466.10	38.86	27.59	4.00	47.30	74.00	-26.70	Peak
3	3835.00	33.37	29.17	5.08	44.65	74.00	-29.35	Peak
4	5803.30	31.04	32.43	6.30	47.94	74.00	-26.06	Peak
5	7520.50	28.34	36.45	7.23	50.58	74.00	-23.42	Peak
6	8938.00	29.87	37.45	7.94	53.11	74.00	-20.89	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Notes: Above is above 1GHz test data.

EUT: Water Valve Shut Off M/N: DMWV1						
Power: DC 12V From DC Power						
Test date: 2016-11-10 Test site: 3m Chamber Tested by: Reak Yang						
Test mode: Tx mode						
Antenna polarity: Vertical						
Freq (MHz)	Polarity H/V	Read Level (dBuV/m)	Correct Factor (dB)	Measurement Result (dBuV/m)	Limit (dBuV/m)	Remark
908.42	H	70.25	23.25	93.5	94	QP
902	H	0.25	23.02	23.27	46	QP
928	H	0.56	23.35	23.91	46	QP
908.42	V	68.82	23.25	92.07	94	QP
902	V	0.31	23.02	23.33	46	QP
928	V	0.42	23.35	23.77	46	QP

Notes: 1 "/" Means other frequency and mode comply with standard requirements and at least have 20dB margin.
Measurement Result=Reading + Correct Factor
Margin=Measurement Result-Limit
2–Spectrum setting: a. QP setting 30MHz-1GHz, RBW=120KHz,VBW=300KHz.

6 POWER LINE CONDUCTED EMISSION

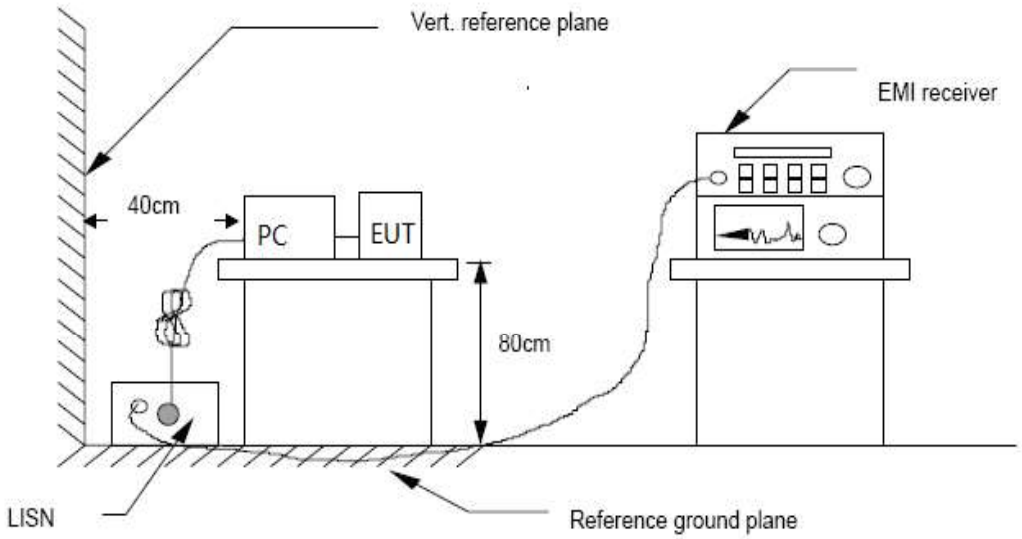
6.1 Conducted Emission Limits(15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

6.2 Test Setup



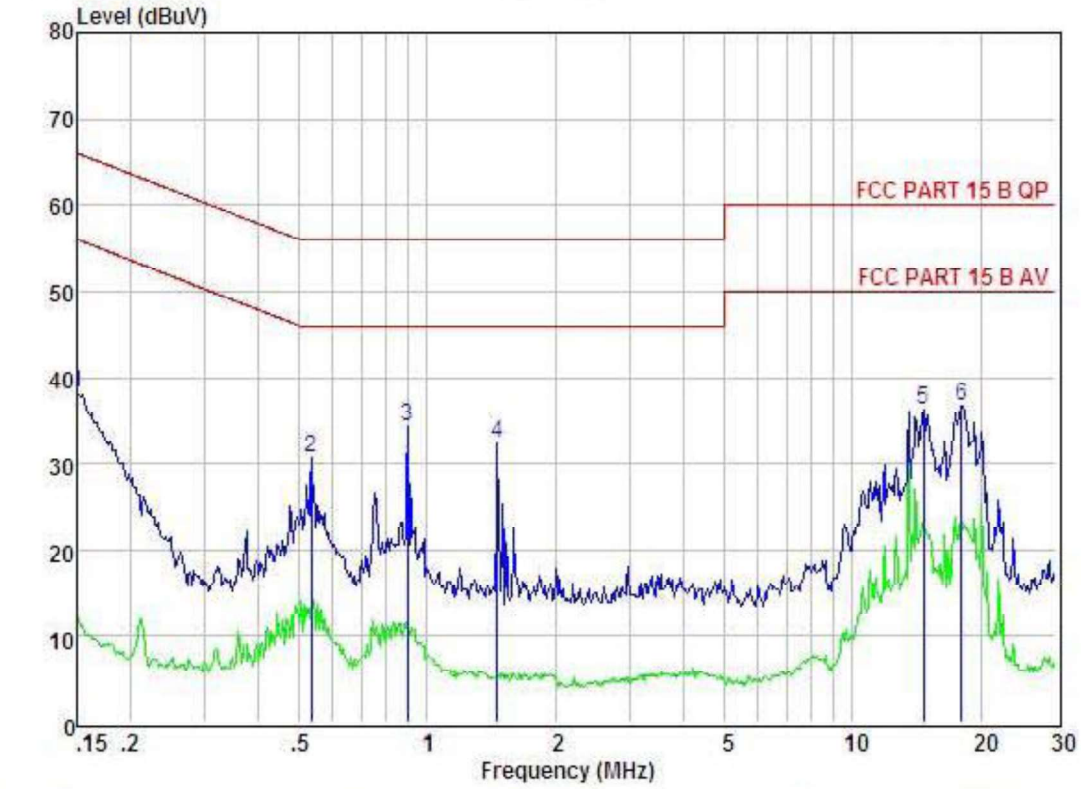
6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10-2013 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

6.4 Test Results

PASS
Test data as below.

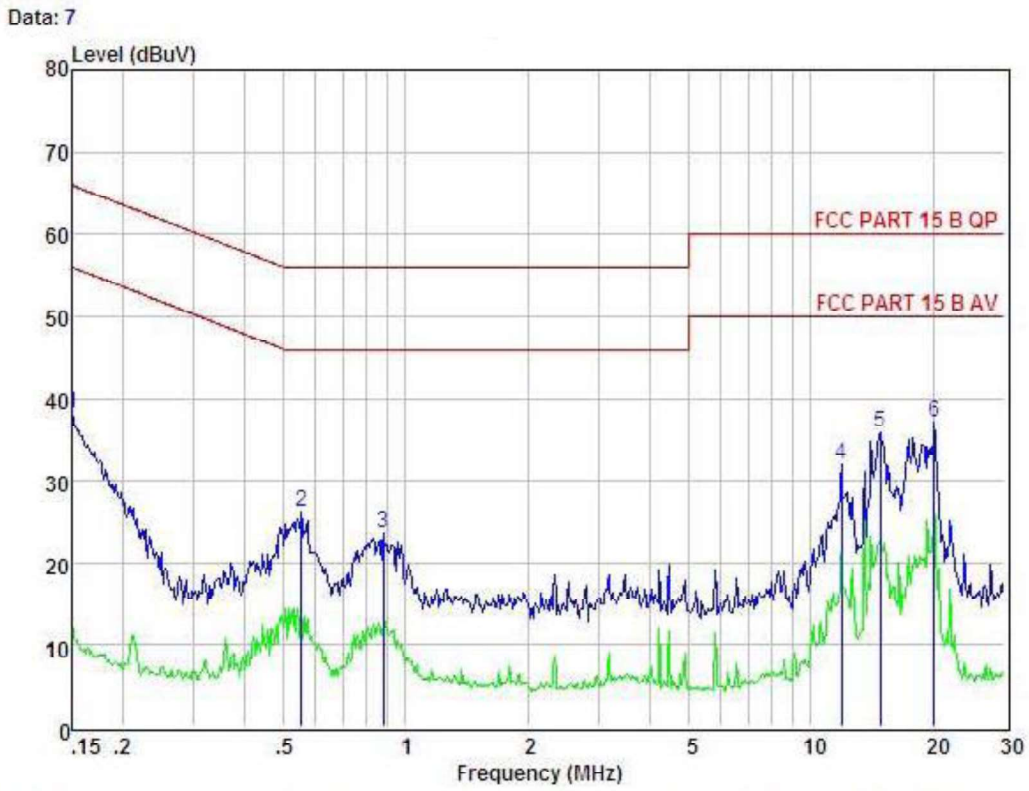
Data: 5



Condition : FCC PART 15 B QP POL: LINE Temp: 25℃ Hum: 51 %
EUT :
Model No :
Test Mode :
Power :
Test Engineer :
Remark :

Item	Freq	Read Level	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.150	28.59	0.03	-9.49	0.10	38.21	66.00	-27.79	Peak
2	0.535	20.87	0.03	-9.58	0.10	30.58	56.00	-25.42	Peak
3	0.899	24.66	0.04	-9.62	0.10	34.42	56.00	-21.58	Peak
4	1.464	22.45	0.05	-9.68	0.10	32.28	56.00	-23.72	Peak
5	14.672	25.97	0.24	-9.86	0.23	36.30	60.00	-23.70	Peak
6	18.039	26.33	0.29	-9.82	0.32	36.76	60.00	-23.24	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss



Condition : FCC PART 15 B QP POL: NEUTRAL Temp: 25℃ Hum: 51 %
EUT :
Model No :
Test Mode :
Power :
Test Engineer :
Remark :

Item	Freq	Read Level	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.150	28.53	0.03	-9.49	0.10	38.15	66.00	-27.85	Peak
2	0.552	16.47	0.03	-9.59	0.10	26.19	56.00	-29.81	Peak
3	0.880	13.88	0.04	-9.62	0.10	23.64	56.00	-32.36	Peak
4	11.933	21.56	0.26	-9.90	0.22	31.94	60.00	-28.06	Peak
5	14.828	25.46	0.24	-9.86	0.23	35.79	60.00	-24.21	Peak
6	20.162	26.55	0.31	-9.80	0.35	37.01	60.00	-22.99	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

7 Bandwidth

7.1 Test limit

Please refer section15.215

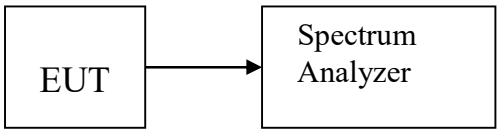
7.2 Method of measurement

a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b)The test receiver RBW set 30Hz,VBW set 100KHz,Sweep time set auto.

c) Peak detector is used

7.3 Test Setup

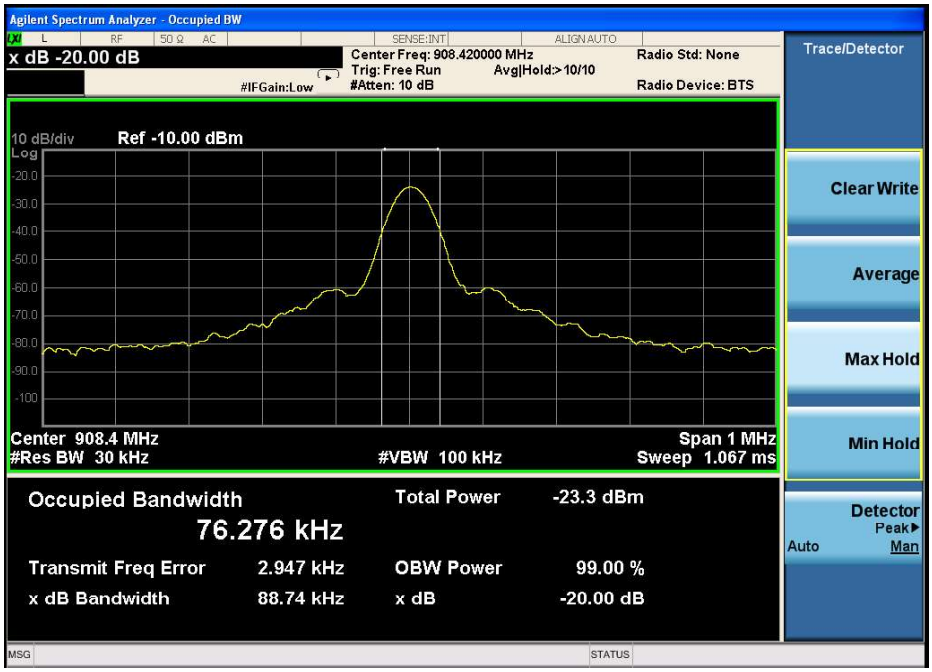


7.4 Test Results

PASS.

Detailed information please see the following page.

Channel	Frequency (MHz)	20dB Bandwidth (KHz)	Limit (KHz)	Result
CH1	908.42	88.74	/	PASS


Agilent Spectrum Analyzer - Occupied BW
x dB -20.00 dB
Center Freq: 908.420000 MHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Log
Ref -10.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Center 908.4 MHz
#Res BW 30 kHz
#VBW 100 kHz
Span 1 MHz
Sweep 1.067 ms
Occupied Bandwidth
76.276 kHz
Total Power -23.3 dBm
Transmit Freq Error 2.947 kHz
OBW Power 99.00 %
x dB Bandwidth 88.74 kHz
x dB -20.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

8 Antenna Requirement

8.1 Standard 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 shall be considered sufficient to comply with the provisions of this Section. 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.

8.2 Antenna Connected Construction

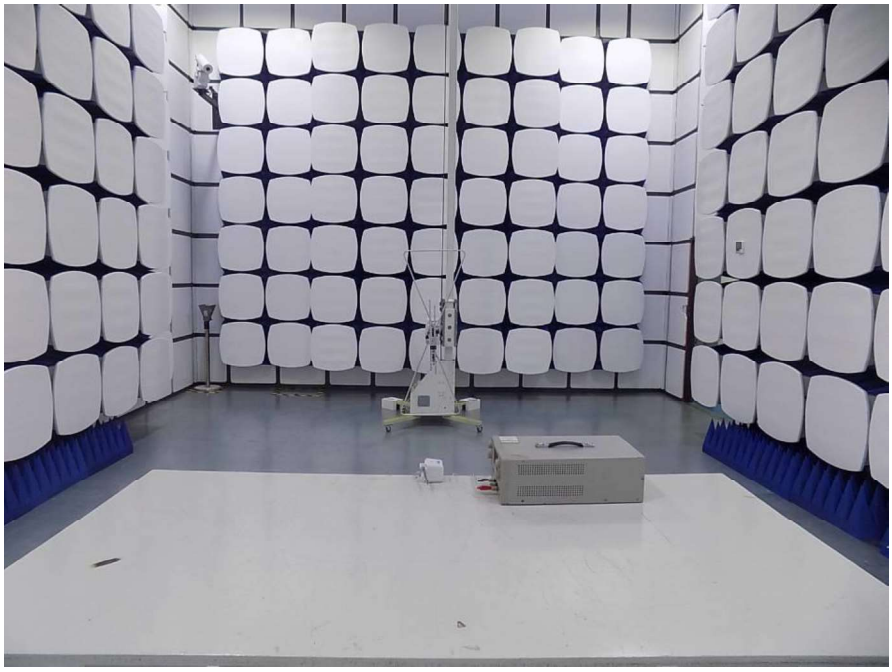
The directional gains of antenna used for transmitting is 0 dBi, and is a PCB Antenna and no consideration of replacement. Please see EUT photo for details.

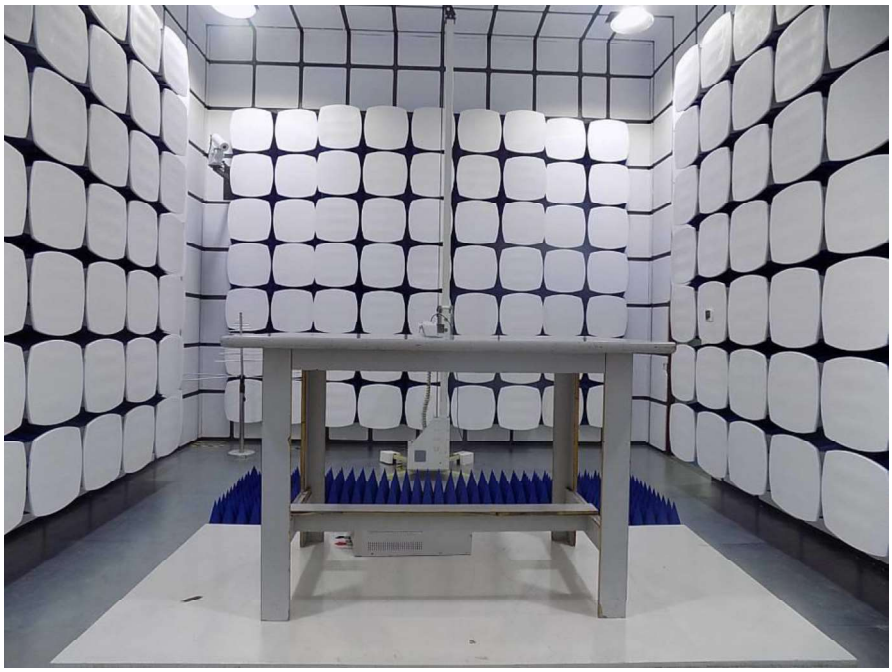
8.3 Result

The EUT antenna is PCB Antenna. It comply with the standard requirement.

9 Photographs of Test Setup

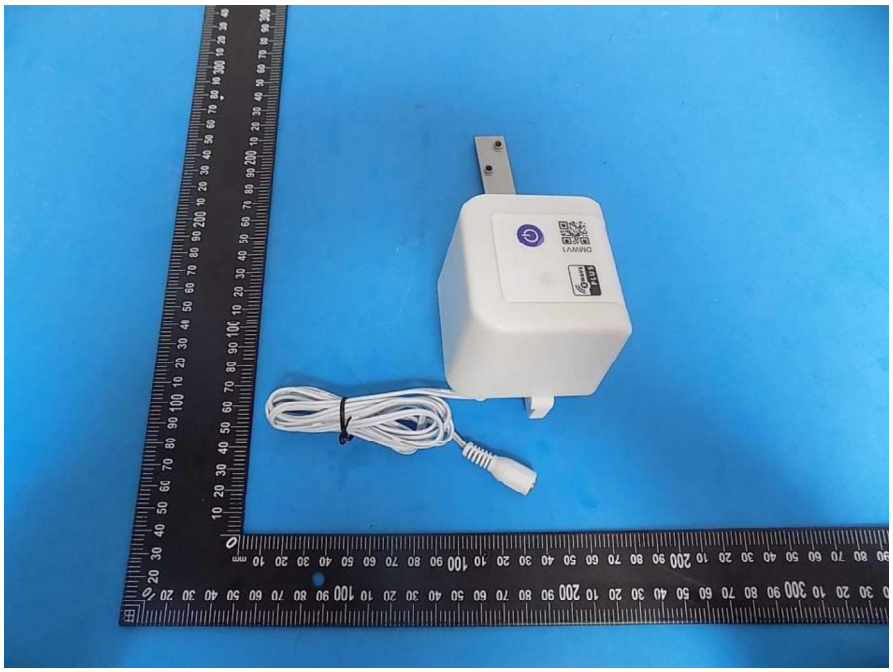
9.1 Photos of Radiated emission

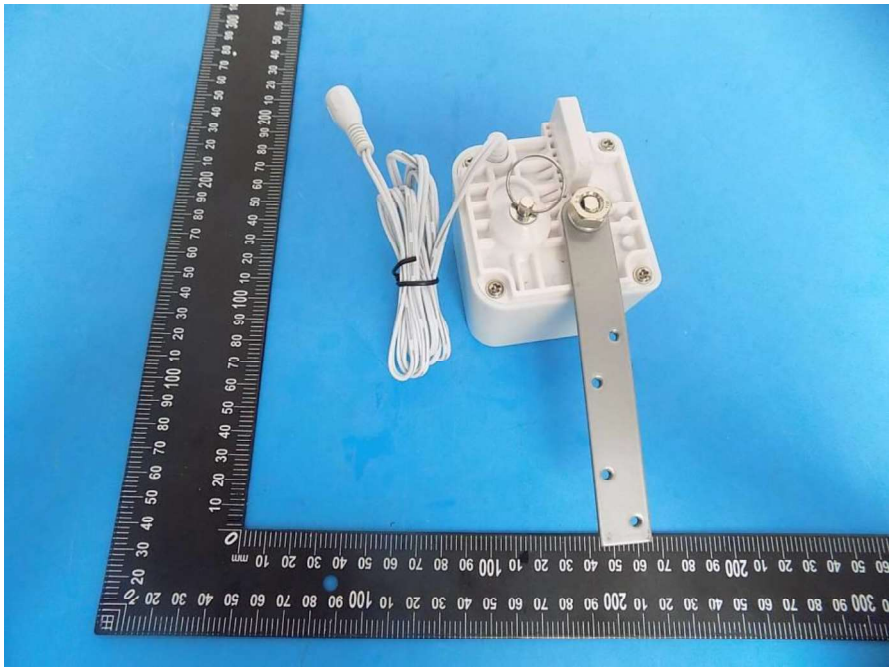


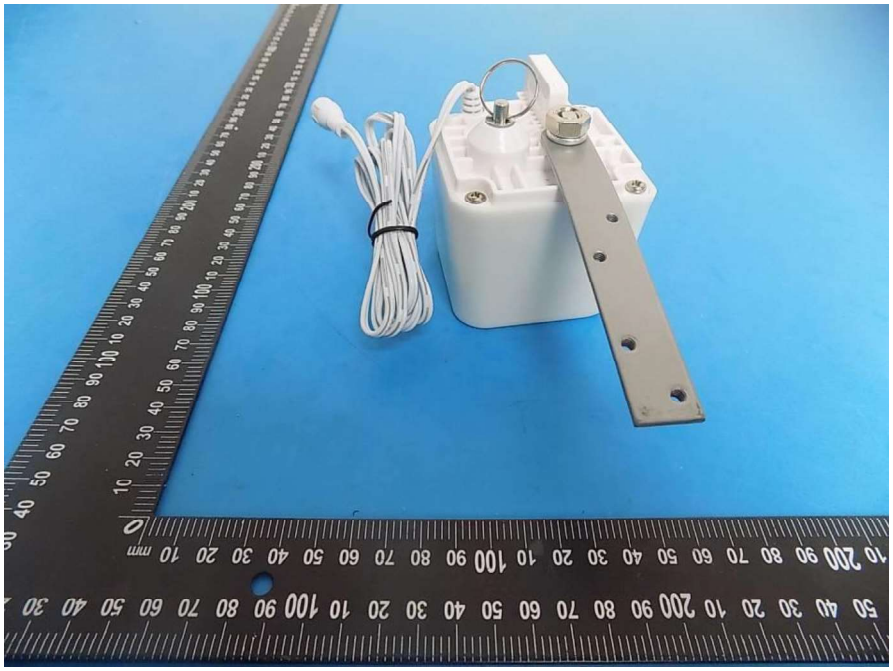


9.2 Photos of Power Line Conducted Emission

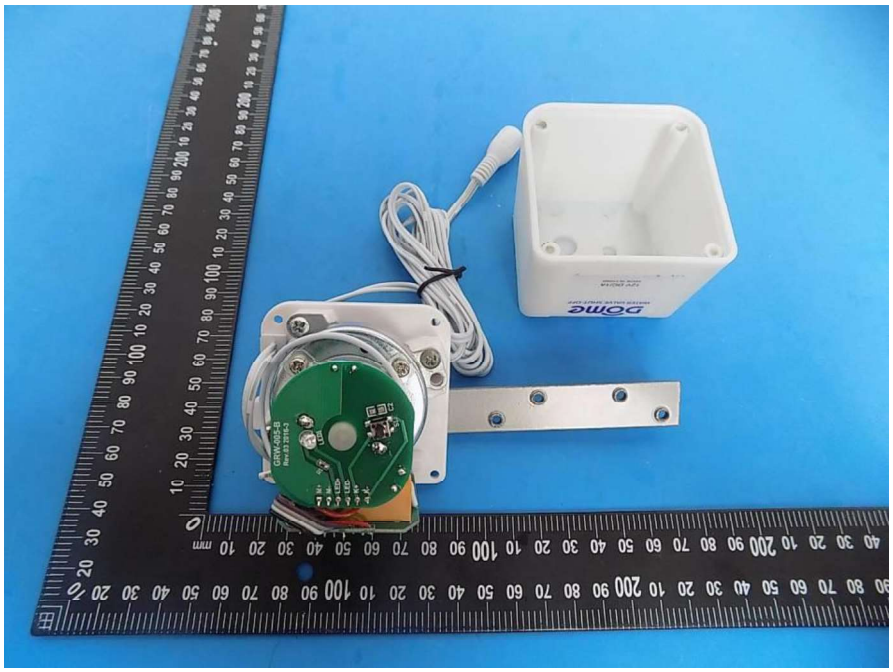
10 Photographs of EUT

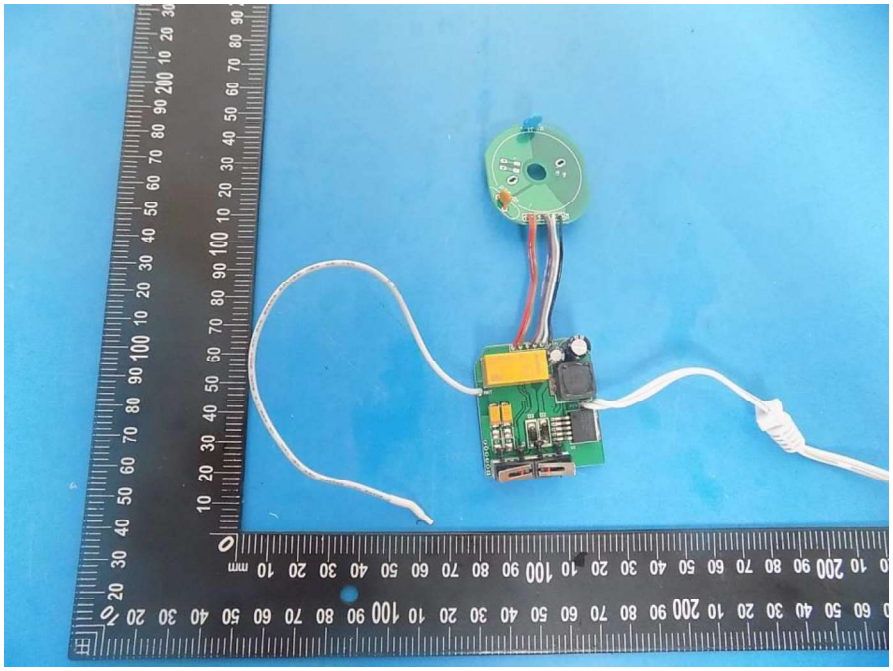


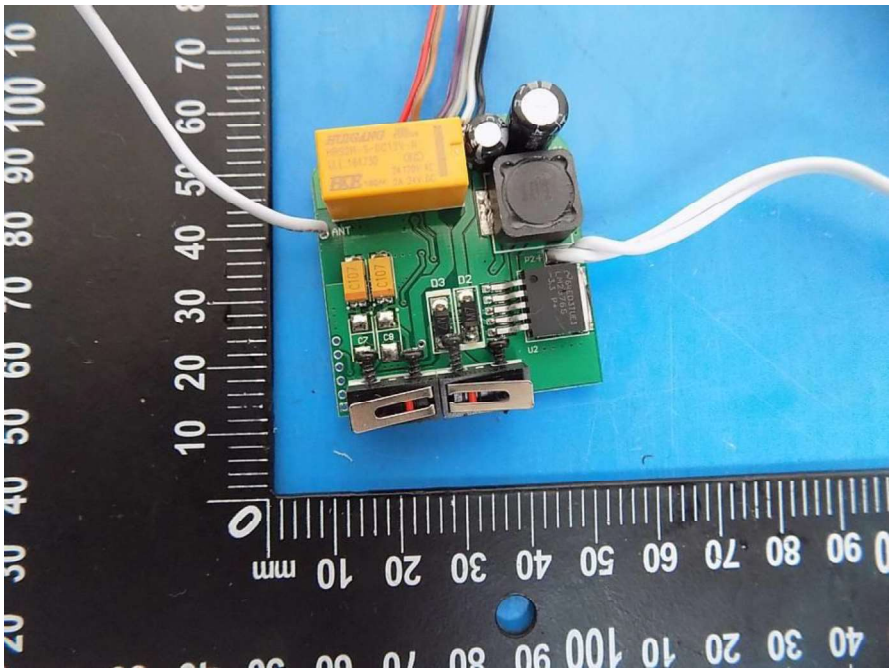


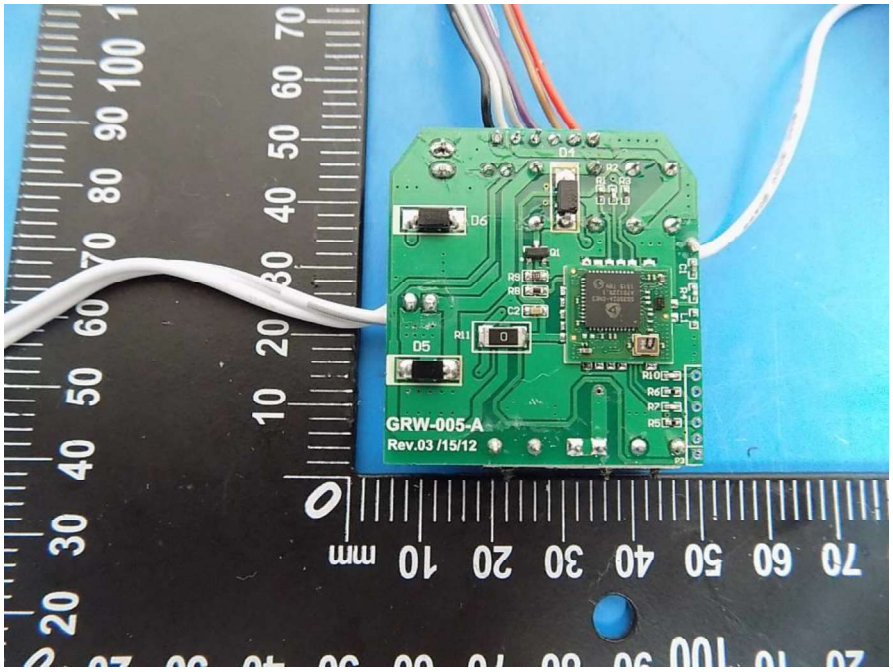



Dome
WATER VALVE SHUT-OFF
12V DC/1A





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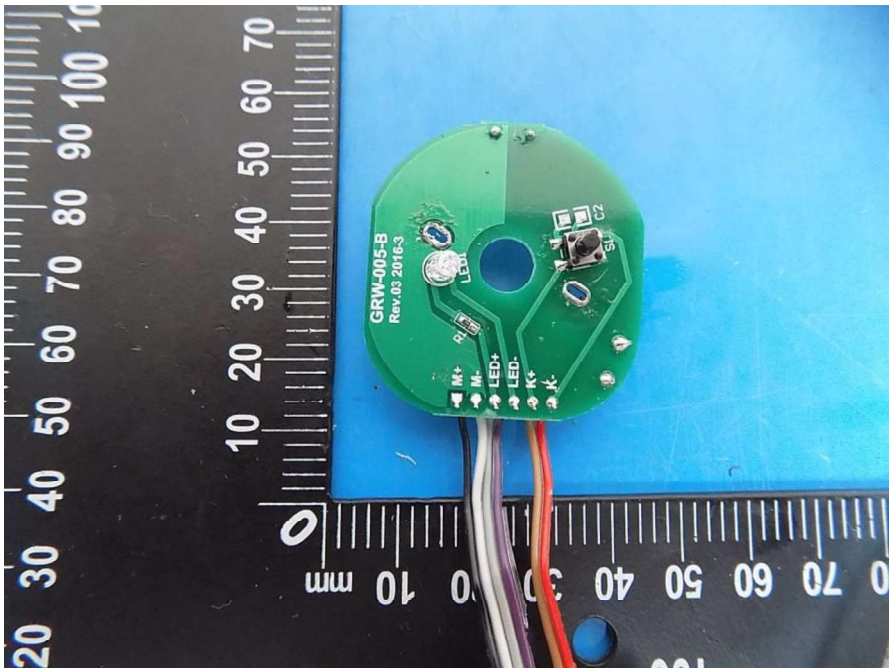

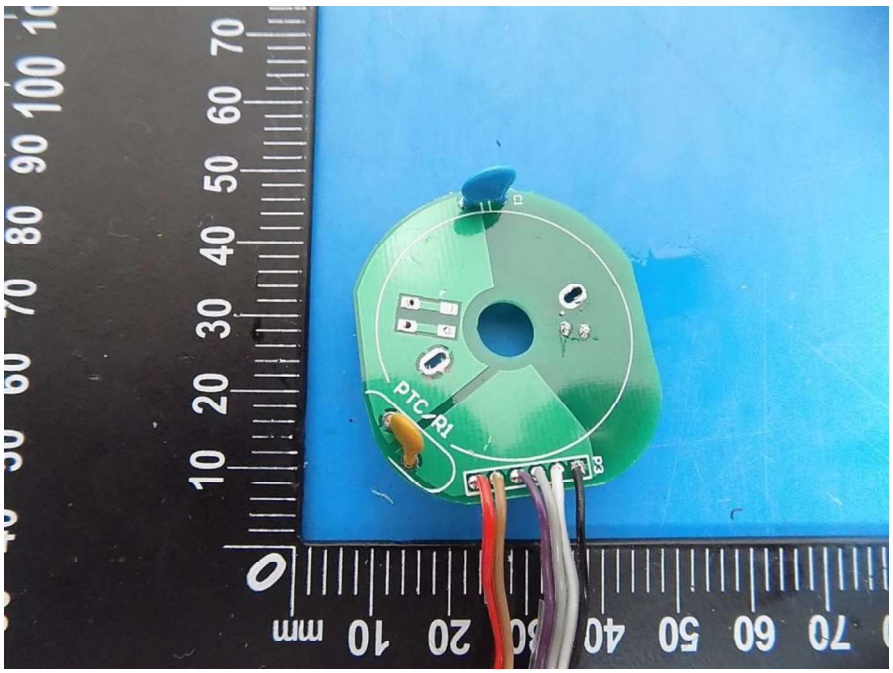

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