

FCC TEST REPORT
FOR
Shenzhen Chitongda Electronic Co., LTD.
3G alarm system
Test Model: YL-007WM3GR
Additional Model No.: Please refer to page 6

Prepared for	:	Shenzhen Chitongda Electronic Co., LTD.
Address	:	Wolfguard Building, Chitongda Group Industrial Park, No.108 of Baoshi West Road, Shiyan, Baoan District, Shenzhen, Guangdong, China
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Date of receipt of test sample	:	October 11, 2017
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	October 11, 2017~November 28, 2017
Date of Report	:	November 28, 2017

**FCC TEST REPORT
FCC CFR 47 PART 15 C (15.209): 2016**

Report Reference No. : LCS171011001AEB

Date of Issue..... : November 28, 2017

Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address..... : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure : Full application of Harmonised standards

Partial application of Harmonised standards

Other standard testing method

Applicant's Name..... : Shenzhen Chitongda Electronic Co., LTD.

Address..... : Wolfguard Building, Chitongda Group Industrial Park, No.108 of Baoshi West Road, Shiyan, Baoan District, Shenzhen, Guangdong, China

Test Specification

Standard : FCC CFR 47 PART 15 C (15.209): 2016

Test Report Form No. : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test Item Description. : 3G alarm system

Trade Mark..... : Wolf-Guard

Test Model : YL-007WM3GR

Ratings..... : DC 7.4V by Lithium ion polymer battery (500mAh)

Recharge Voltage: DC 12.0V 1A or 1.2A by AC/DC Adapter

Result : **Positive**

Compiled by:



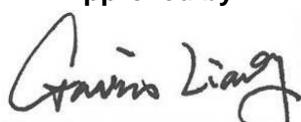
Aking Jin/ File administrators

Supervised by:



Dick Su/ Technique principal

Approved by:



Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS171011001AEB

November 28, 2017
Date of issue

Test Model..... : YL-007WM3GR

EUT..... : 3G alarm system

Applicant..... : Shenzhen Chitongda Electronic Co., LTD.

Address..... : Wolfguard Building, Chitongda Group Industrial Park, No.108 of Baoshi West Road, Shiyan, Baoan District, Shenzhen, Guangdong, China

Telephone..... : /

Fax..... : /

Manufacturer..... : Shenzhen Chitongda Electronic Co., LTD.

Address..... : Wolfguard Building, Chitongda Group Industrial Park, No.108 of Baoshi West Road, Shiyan, Baoan District, Shenzhen, Guangdong, China

Telephone..... : /

Fax..... : /

Factory..... : Shenzhen Chitongda Electronic Co., LTD.

Address..... : Wolfguard Building, Chitongda Group Industrial Park, No.108 of Baoshi West Road, Shiyan, Baoan District, Shenzhen, Guangdong, China

Telephone..... : /

Fax..... : /

Test Result

Positive

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
000	November 28, 2017	Initial Issue	Gavin Liang

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1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	: 3G alarm system
Model Number	: YL-007M3FX, YL-007M3GS1, YL-007WM3GR, YL-007WM3FX, : YL-007M3GR, YL-007W3G7, YL-007WM2
Model Declaration	: PCB board, structure and internal of these model(s) are the : same, So no additional models were tested.
Test Model	: YL-007WM3GR
Hardware version	: VER:2.0
Software version	: 3GCN_EN3GW1.0
Power Supply	: DC 7.4V by Lithium ion polymer battery (500mAh) : Recharge Voltage: DC 12.0V 1A or 1.2A by AC/DC Adapter
GSM/EDGE/GPRS Operation	: GSM850/PCS1900/GPRS850/GPRS1900/EDGE850/EDGE1900
Frequency Band	
GSM/EDGE/GPRS	: Supported GSM/GPRS/EDGE
GSM Release Version	: R99
GSM/EDGE/GPRS Power Class	: GSM850:Power Class 4/ PCS1900:Power Class 1
GPRS/EDGE Multi-slot Class	: Class 12
GPRS operation mode	: Class B
UMTS Operation Frequency Band	: UMTS FDD Band II/V
WCDMA Release Version	: R99
HSDPA Release Version	: Release 8
HSUPA Release Version	: Release 8
DC-HSUPA Release Version	: Not Supported
Antenna Type	: Internal Antenna
Antenna Gain	: 2.0dBi (max.) For all GSM Band : 2.0dBi (max.) For all WCDMA Band
2.4G WLAN	: Supported 802.11b/802.11g/802.11n IEEE 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz
Operation frequency	: IEEE 802.11n HT20:2412-2462MHz IEEE 802.11n HT40:2422-2452MHz IEEE 802.11b: DSSS (CCK,DQPSK,DBPSK)
Modulation Type	: IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK)
Channel Number	: 11 Channels for WIFI 20MHz Bandwidth(802.11b/g/n-HT20) : 7 Channels for WIFI 40MHz Bandwidth(802.11n-HT40)
Antenna Type	: Internal Antenna
Antenna Gain	: 1.0dBi (Max.)
433MHz Operation frequency	: 433.92MHz
Modulation Type	: ASK
Channel Number	: 1
Antenna Type	: Internal Antenna
Antenna Gain	: 0dBi (Max)
RFID Operation frequency	: 125KHz
Modulation Type	: OOK

Channel Number	: 1
Antenna Type	: Internal Antenna
Antenna Gain	: 0dBi (Max)
Extreme temp. Tolerance	: -20°C to 40°C
Extreme vol. Limits	: 6.66 VDC to 8.14 VDC (nominal: 7.40VDC)

1.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Shenzhen Berls Technology Co.,Ltd	AC/DC Adapter	XFS-1201200	--	VoC

1.3 External I/O

I/O Port Description	Quantity	Cable
SIM Card Slot	1	N/A
DC Power Port	1	N/A

1.4 Description of Test Facility

FCC Registration Number. is 254912.
 Industry Canada Registration Number. is 9642A-1.
 ESMD Registration Number. is ARCB0108.
 UL Registration Number. is 100571-492.
 TUV SUD Registration Number. is SCN1081.
 TUV RH Registration Number. is UA 50296516-001.
 NVLAP Registration Code is 600167-0.

1.5 Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty	9KHz~30MHz	±3.10dB	(1)
	30MHz~200MHz	±2.96dB	(1)
	200MHz~1000MHz	±3.10dB	(1)
	1GHz~26.5GHz	±3.80dB	(1)
	26.5GHz~40GHz	±3.90dB	(1)
Conduction Uncertainty	150kHz~30MHz	±1.63dB	(1)
Power disturbance	30MHz~300MHz	±1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7 Description Of Test Modes

The EUT was set to transmit at 100% duty cycle for testing and the worst case was record.

All the modulation types were tested and only the worst case (OOK) was recorded in this report.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC CFR PART 15C 15.209.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.209 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions (N/A)

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate YL-007WM3GR degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013

3. SYSTEM TEST CONFIGURATION

3.1 Justification

N/A.

3.2 EUT Exercise Software

N/A.

3.3 Special Accessories

N/A.

3.4 Block Diagram/Schematics

Please refer to the report.

3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6 Test Setup

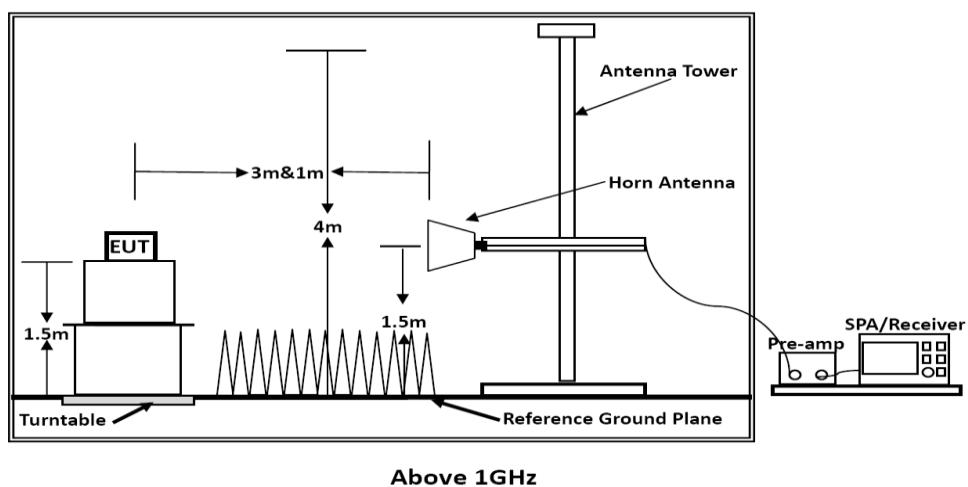
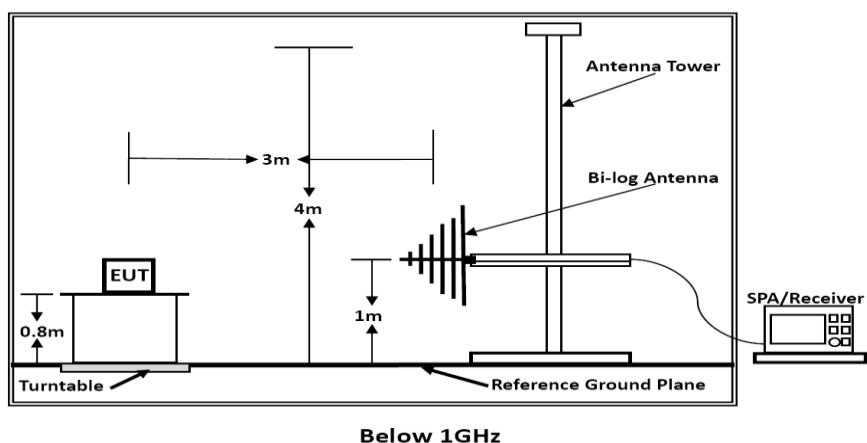
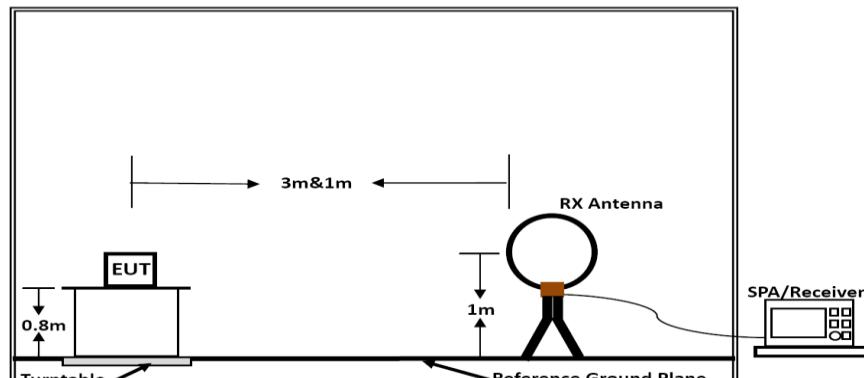
Please refer to the test setup photo.

4. SUMMARY OF TEST RESULT

FCC Rules	Test Items	Result
15.207	Power-line Conducted Emissions	PASS
15.205 & 15.209	Radiated Emissions	PASS
15.215	20dB Bandwidth	PASS
15.203	Antenna Requirement	PASS

5. RADIATED MEASUREMENT

5.1 Block Diagram of Test Setup



Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1.5m]})$ (dB);
 Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.2 Radiated Emission Limit

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	YL-007WM3GR0-4400	(2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	Limit (dBuV/m)	Distance (m)
0.009-0.490	$20\log(2400/F(KHz))+40\log(300/3)$	3
0.490-1.705	$20\log(2400/F(KHz))+40\log(30/3)$	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

5.3 Test Results

PASS.

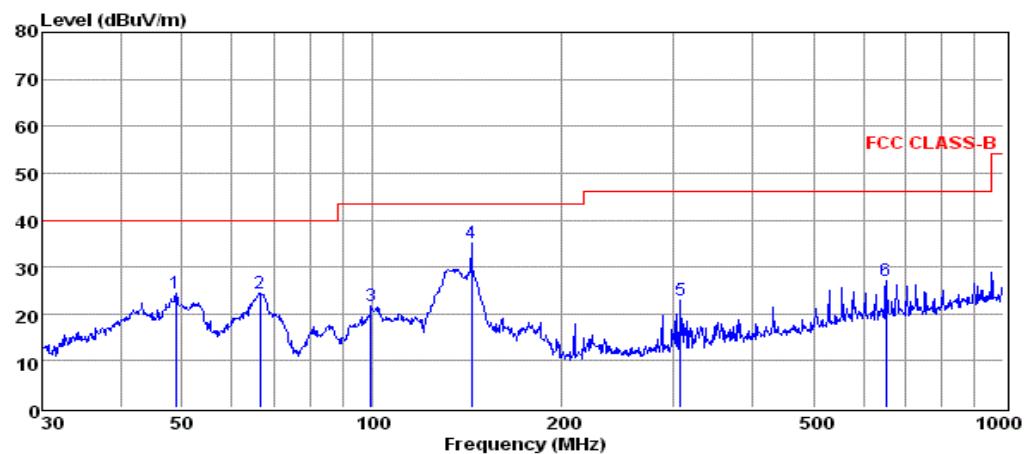
The test data please refer to following page:

9KHz ~ 30MHz (TX-125KHz)

Freq. MHz	Reading dBuV	Factor dB/m	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark
0.125	59.26	12.01	71.27	105.67	-34.40	Peak
0.250	38.72	12.00	50.72	99.65	-48.93	Peak
0.375	36.28	11.89	48.17	96.12	-47.95	Peak
0.875	31.40	11.81	43.21	68.76	-25.55	Peak
1.000	33.39	11.77	45.16	67.76	-22.60	Peak
3.61	27.81	11.71	39.52	69.5	-29.98	Peak
11.04	28.64	11.04	39.68	69.5	-29.82	Peak
18.87	21.99	10.54	32.53	69.5	-36.97	Peak
24.31	27.71	9.60	37.31	69.5	-32.19	Peak
28.56	24.51	8.91	33.42	69.5	-36.08	Peak

***Note:

- 1). Factor= Antenna Factor + Cable Loss – Amplifier Gain.
- 2). The EUT was configured as normal. The measurement antenna was positioned with its plane perpendicular to the ground at the specified distances (Antenna Position: Horizontal). Only record the worst test data in this report.

30MHz ~ 1GHz (TX-125KHz)

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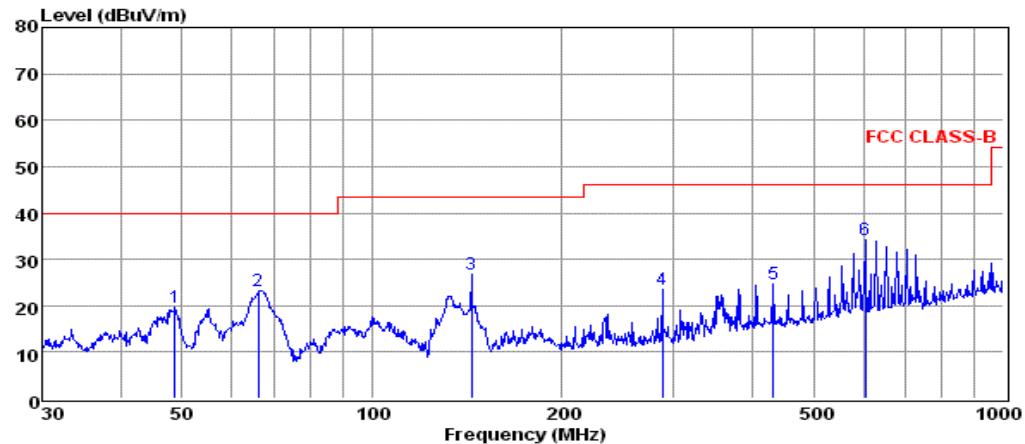
VERTICAL

	Freq	Reading	CabLoss	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	48.84	10.63	0.35	13.32	24.30	40.00	-15.70	QP
2	66.50	13.73	0.52	10.09	24.34	40.00	-15.66	QP
3	99.53	8.02	0.61	13.13	21.76	43.50	-21.74	QP
4	143.83	26.31	0.71	8.22	35.24	43.50	-8.26	QP
5	307.83	8.62	1.08	13.17	22.87	46.00	-23.13	QP
6	651.94	6.97	1.58	18.64	27.19	46.00	-18.81	QP

Note: 1. All readings are Quasi-peak values.

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that ate 20db blow the offical limit are not reported



pol:

HORIZONTAL

	Freq	Reading	CabLoss	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	48.67	5.81	0.35	13.33	19.49	40.00	-20.51	QP
2	66.03	12.43	0.52	10.28	23.23	40.00	-16.77	QP
3	143.83	17.85	0.71	8.22	26.78	43.50	-16.72	QP
4	287.99	9.55	1.05	12.83	23.43	46.00	-22.57	QP
5	432.55	8.05	1.18	15.53	24.76	46.00	-21.24	QP
6	603.54	14.29	1.55	18.46	34.30	46.00	-11.70	QP

Note: 1. All readings are Quasi-peak values.

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that ate 20db blow the offical limit are not reported

6. BANDWIDTH OF THE OPERATING FREQUENCY

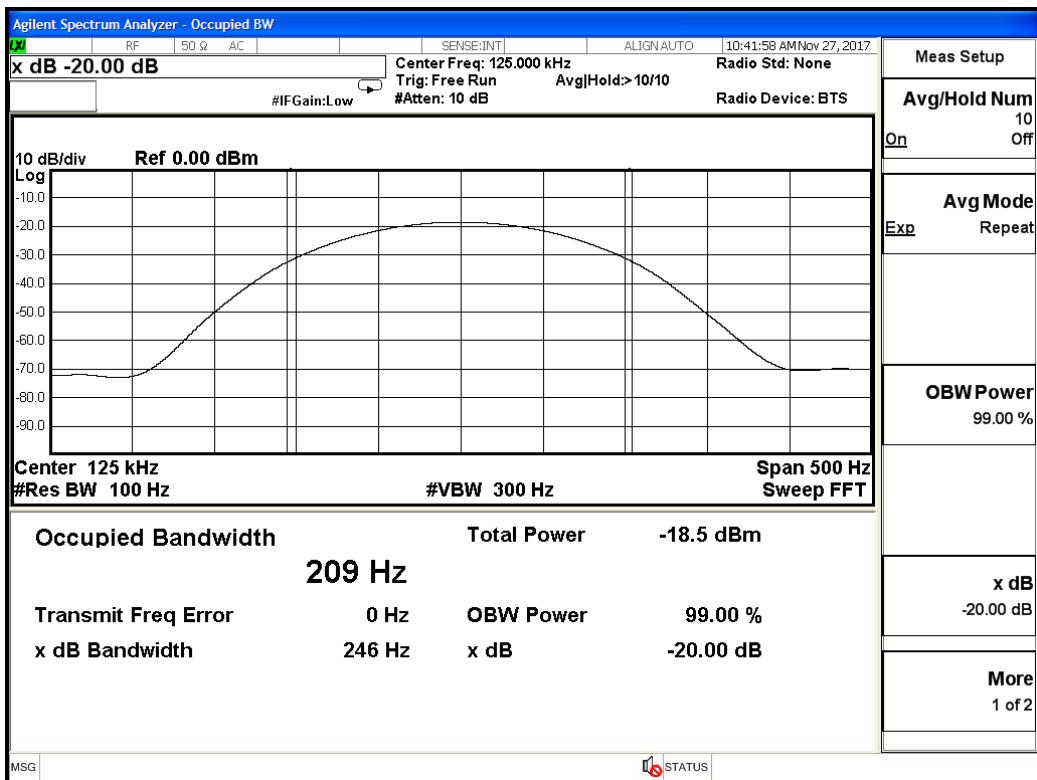
6.1 Standard Applicable

According to its specifications, the EUT must comply with the 20dB Bandwidth measurement of the Section 15.215 under the FCC Rules Part 15 Subpart C.

6.2 Test Result

EUT	3G alarm system	
RBW	100Hz	
VBW	300Hz	
SPAN	500Hz	
Carrier Freq. (KHz)	20dB Bandwidth (KHz)	Limit (KHz)
125	0.2 4609	None

Please refer to the test plot:



7. AC POWER LINE CONDUCTED EMISSIONS

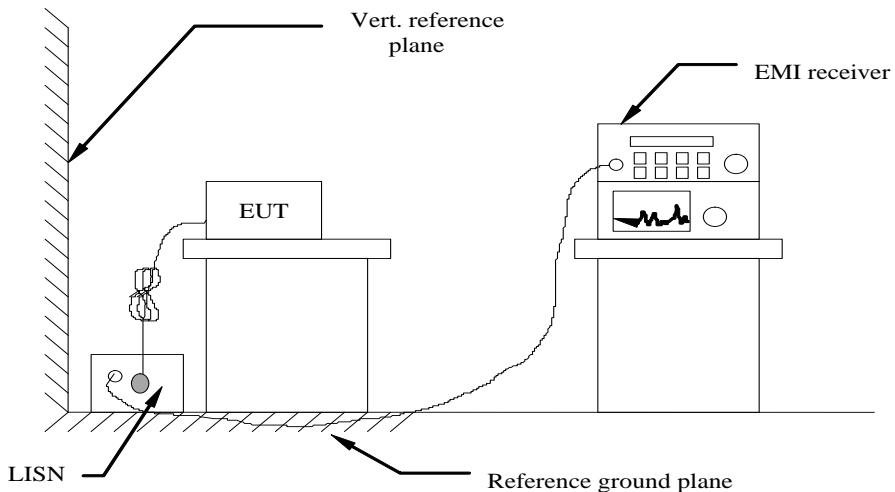
7.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

7.2 Block Diagram of Test Setup



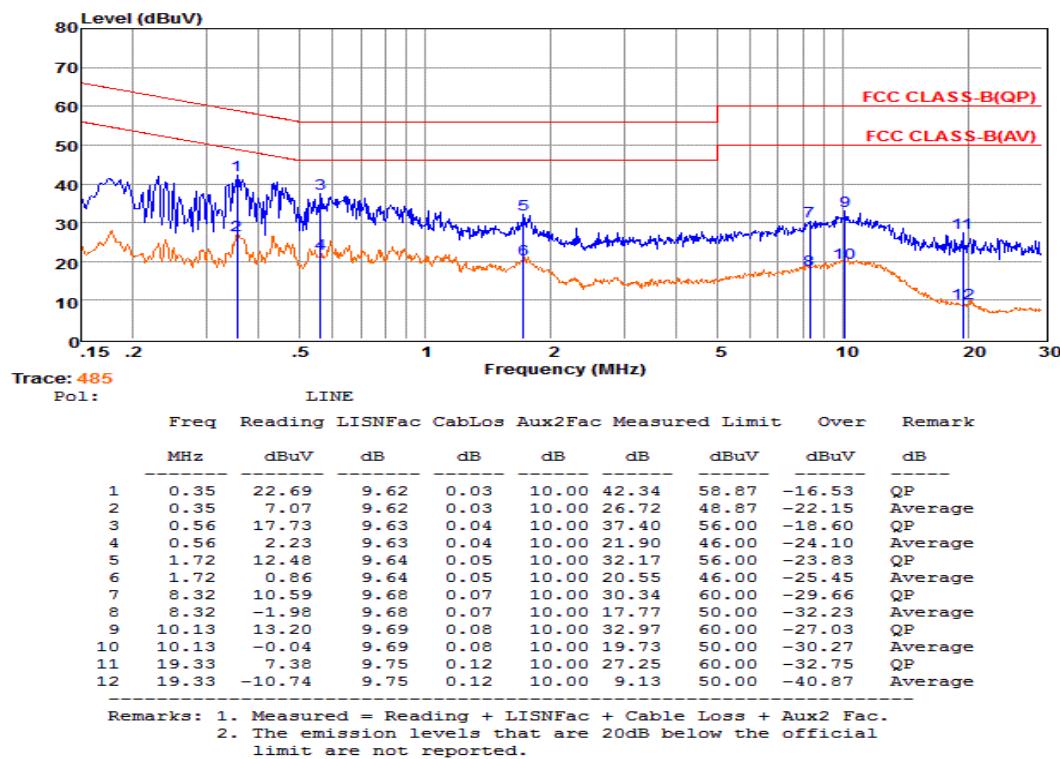
7.3 Test Results

PASS.

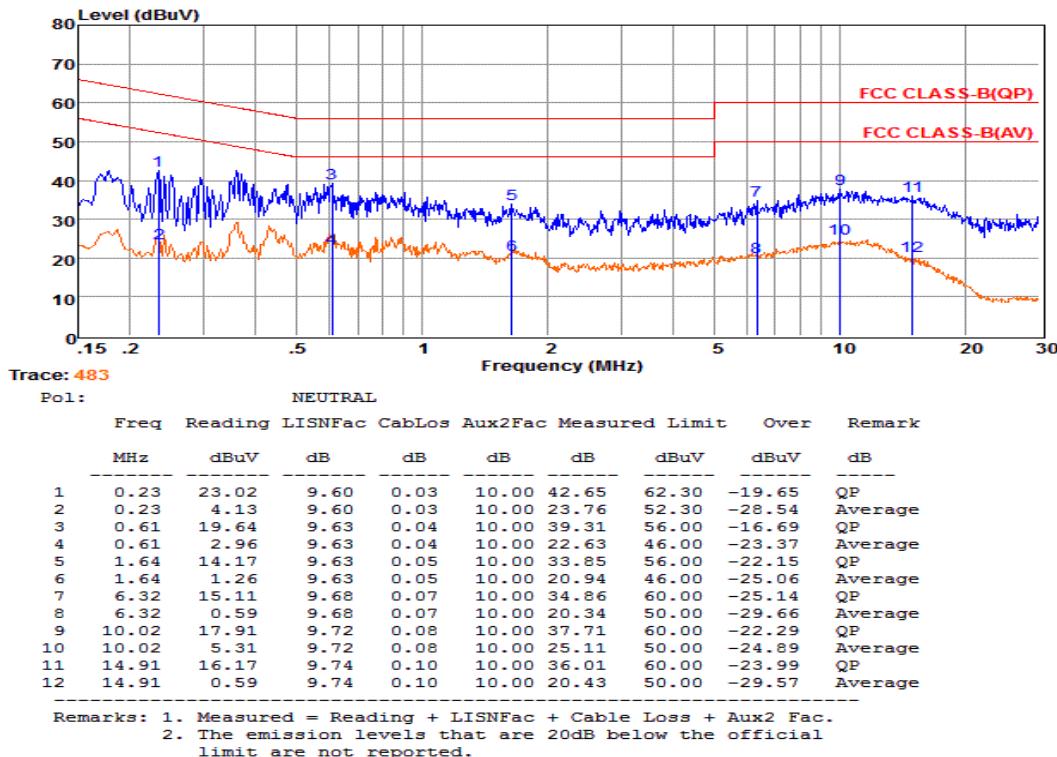
The test data please refer to following page.

AC Conducted Emission of power adapter @ AC 120V/60Hz @ IEEE 802.11b (worst case)

Line:



Neutral:



***Note: Pre-scan all mode and recorded the worst case results in this report (IEEE 802.11b).

8. ANTENNA REQUIREMENT

8.1 Standard Applicable

According to § 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. 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 antenna used for transmitting is permanently attached and no consideration of replacement. Please see EUT photo for details.

9. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

10. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

11. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

12. LIST OF MEASURING EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Meter	R&S	NRVS	100444	2017-06-17	2018-06-16
2	Power Sensor	R&S	NRV-Z81	100458	2017-06-17	2018-06-16
3	Power Sensor	R&S	NRV-Z32	10057	2017-06-17	2018-06-16
4	EPM Series Power Meter	Agilent	E4419B	MY45104493	2017-06-17	2018-06-16
5	E-SERIES AVG POWER SENSOR	Agilent	E9301H	MY41495234	2017-06-17	2018-06-16
6	ESA-E SERIES SPECTRUM ANALYZER	Agilent	E4407B	MY41440754	2017-11-17	2018-11-16
7	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2017-06-17	2018-06-16
8	SPECTRUM ANALYZER	R&S	FSP	100503	2017-06-17	2018-06-16
9	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2017-06-17	2018-06-16
10	Positioning Controller	MF	MF-7082	/	2017-06-17	2018-06-16
11	EMI Test Software	AUDIX	E3	N/A	2017-06-17	2018-06-16
12	EMI Test Receiver	ROHDE & SCHWARZ	ESR 7	101181	2017-06-17	2018-06-16
13	AMPLIFIER	QuieTek	QTK-A2525G	CHM10809065	2017-11-17	2018-11-16
14	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2017-06-23	2018-06-22
15	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2017-05-02	2018-05-01
16	Horn Antenna	EMCO	3115	6741	2017-06-23	2018-06-22
17	Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	2017-06-10	2018-06-09
18	RF Cable-R03m	Jye Bao	RG142	CB021	2017-06-17	2018-06-16
19	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2017-06-17	2018-06-16
20	TEST RECEIVER	R&S	ESCI	101142	2017-06-17	2018-06-16
21	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2017-06-17	2018-06-16
22	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-0032	2017-06-17	2018-06-16
23	Artificial Mains	R&S	ENV216	101288	2017-06-17	2018-06-16

-----THE END OF REPORT-----