SGS-CSTC Standards Technical Services Co., Ltd.

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# TEST REPORT

| | |
|---|---|
| **Application No.:** | GZEM1312005881TX |
| **Applicant:** | Q Global Solutions (Xiamen) Electronics Corp. |
| **FCC ID:** | UWRQGS300181406 |
| **Product Name:** | Ultrasonic sensor system with OSD |
| **Product Description:** | Ultrasonic sensor system with OSD |
| **Model No.:** | BUN-OSD, FS-OSD, (BUN+FS)-OSD, (BUN+BUN)-OSD, (FS+FS)-OSD, BUN, FS ♣ |
| ♣ | Please refer to section 3 of this report for more details. |
| **Standards**: | FCC CFR 47 PART 18: 2013(Test as applicant request) |
| **Date of Receipt**: | 2013-12-17 |
| **Date of Test**: | 2014-04-07 |
| **Date of Issue**: | 2014-08-05 |
| **Test Result :** | **Pass*** |

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

Authorized Signature:

**Richard Li**
**Manager**

# 2 Version

| Revision Record | | | | |
|---|---|---|---|---|
| **Version** | **Chapter** | **Date** | **Modifier** | **Remark** |
| 00 | | 2014-08-05 | | Original |
| | | | | |
| | | | | |
| | | | | |
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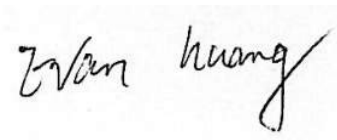
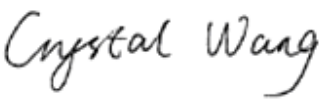
| | | | | |
|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| **Tested By** | |  **(Evan Huang) / Project Engineer** | | 2014-04-07 **Date** |
| **Prepared By** | |  **(June Chen) / Clerk** | | 2014-04-16 **Date** |
| **Checked By** | |  **(Crystal Wang) / Reviewer** | | 2014-08-05 **Date** |

# 3 Test Summary

| Electromagnetic Interference (EMI) | | | | |
|---|---|---|---|---|
| **Test** | **Test Requirement** | **Test Method** | **Class / Severity** | **Result** |
| Radiated Emission (9 kHz to 30 MHz) | FCC PART 18: 2013 | FCC OST/ MP-5:1986 | 18.305(b) | PASS |
| Radiated Emission (30 MHz to 1GHz) | FCC PART 18: 2013 | N/A | 18.309 | N/A |

**Remark :**

**EUT:** In this whole report EUT means Equipment Under Test.

N/A: Not applicable. Please refer to section 7.1 for further details.

♣ Model No.: BUN-OSD, FS-OSD, (BUN+FS)-OSD, (BUN+BUN)-OSD, (FS+FS)-OSD, BUN, FS

According to the declaration of the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the mode of connection and number of system units.

Therefore only one model **(BUN+FS)-OSD** was tested in this report.

# 4 Contents

# 5 General Information

## 5.1 Client Information

| | |
|---|---|
| Applicant: | Q Global Solutions (Xiamen) Electronics Corp. |
| Address of Applicant: | 195, Si-Ming Yuan, Tong-An Collective Industrial part, Tong-An District, Xiamen, China |

## 5.2 General Description of E.U.T.

| | |
|---|---|
| Product Name: | Ultrasonic sensor system with OSD |
| Product Description: | Ultrasonic sensor system with OSD |
| Model No.: | (BUN+FS)-OSD |

## 5.1 Details of E.U.T.

| | |
|---|---|
| Rated Supply (Voltage): | DC 12V |
| Power Port: | 1.2m unscreened DC inlet cable |
| Ultrasonic frequency: | 40KHz for BUN unit, 58KHz for FS unit |

## 5.2 Description of Support Units

The EUT had been test with monitor & camera (which supplied by the applicant) as whole sensor system.

## 5.3 Deviation from Standards

None.

## 5.4 General Test Climate During Testing

Temperature: 15-30 °C Humidity: 30~70 %RH Atmospheric Pressure: 860-1060 mbar

## 5.5 Abnormalities from Standard Conditions

The applicant requested FCC tests for the ultrasonic sensor system with OSD

## 5.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,

Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

## 5.7 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **ACMA**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC (Registration No.: 282399)**

  SGS-CSTC Standards Technical Services Co., Ltd., 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 our files. Registration 282399, May 31, 2002.

- **Industry Canada (Registration No.: 4620B-1)**

  The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

  The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584，G-449 and T-1179 respectively.

- **CBTL (Lab Code: TL129)**

  SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01:2006-10 and Rules of procedure IECEE 02:2006-10, and the relevant IECEE CB-Scheme Operational documents.

# 6 Equipment Used during Test

| RE in Chamber | | | | | | |
|---|---|---|---|---|---|---|
| No. | Test Equipment | Manufacturer | Model No. | Serial No. | Cal.Due date (YYYY-MM-DD) | Calibration Interval |
| EMC0525 | Compact Semi-Anechoic Chamber | ChangZhou ZhongYu | N/A | N/A | 2014-08-30 | 2Y |
| EMC0522 | EMI Test Receiver | Rohde & Schwarz | ESIB26 | 100283 | 2014-05-06 | 1Y |
| EMC0056 | EMI Test Receiver | Rohde & Schwarz | ESCI | 100236 | 2015-03-03 | 1Y |
| EMC0528 | RI High frequency Cable | SGS | 20 m | N/A | 2014-05-09 | 1Y |
| EMC2025 | Trilog Broadband Antenna 30-3000MHz | SCHWARZBECK MESS-ELEKTRONIK | VULB 9163 | 9163-450 | 2016-08-31 | 3Y |
| EMC0524 | Bi-log Type Antenna | Schaffner -Chase | CBL6112B | 2966 | 2016-08-31 | 3Y |
| EMC0519 | Bilog Type Antenna | Schaffner -Chase | CBL6143 | 5070 | 2014-06-02 | 2Y |
| EMC2026 | Horn Antenna 1-18GHz | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9120D | 9120D-841 | 2016-08-31 | 3Y |
| EMC0518 | Horn Antenna | Rohde & Schwarz | HF906 | 100096 | 2014-07-01 | 2Y |
| EMC0521 | 1-26.5 GHz Pre-Amplifier | Agilent | 8449B | 3008A01649 | 2015-03-03 | 1Y |
| EMC2065 | Amplifier | HP | 8447F | N/A | 2014-08-31 | 1Y |
| EMC2063 | 1-26GHz Pre Amplifier | Compliance Direction System Inc. | PAP-1G26-48 | 6279.628 | 2014-07-29 | 1Y |
| EMC0075 | 310N Amplifier | Sonama | 310N | 272683 | 2015-03-03 | 1Y |
| EMC0523 | Active Loop Antenna | EMCO | 6502 | 42963 | 2016-03-03 | 2Y |
| EMC2041 | Broad-Band Horn Antenna (14)15-26.5(40)GHz | SCHWARZBECK MESS-ELEKTRONI | BBHA 9170 | 9170-375 | 2014-06-01 | 3Y |
| EMC2069 | 2.4GHz filter | Micro-Tronics | BRM 50702 | 149 | 2014-06-05 | 1Y |
| EMC0530 | 10m Semi-Anechoic Chamber | ETS | N/A | N/A | 2014-04-27 | 2Y |
| EMC2041 | Broad-Band Horn Antenna(14)15-26.5(40)GHz | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9170 | 9170-375 | 2014-06-11 | 3Y |

| General used equipment | | | | | | |
|---|---|---|---|---|---|---|
| No. | Test Equipment | Manufacturer | Model No. | Serial No. | Cal.Due date (YYYY-MM-DD) | Calibration Interval |
| EMC0006 | DMM | Fluke | 73 | 70681569 | 2014-09-13 | 1Y |
| EMC0007 | DMM | Fluke | 73 | 70671122 | 2014-09-13 | 1Y |

# 7 Emission Test Results

## 7.1 Radiated Emissions, 9 kHz to 30 MHz

Test Requirement: FCC Part 18

Test Method: FCC OST/ MP-5

Power Supply: AC 120V 60Hz

Test Date: 2014-04-07

Frequency Range: 9 kHz to 30 MHz

Measurement Distance: 10 m

Detector: Peak for pre-scan, Average for the final result
(200 Hz Resolution Bandwidth for 9 kHz to 150 kHz
9 kHz Resolution Bandwidth for 150 kHz to 30 MHz)

Limit:

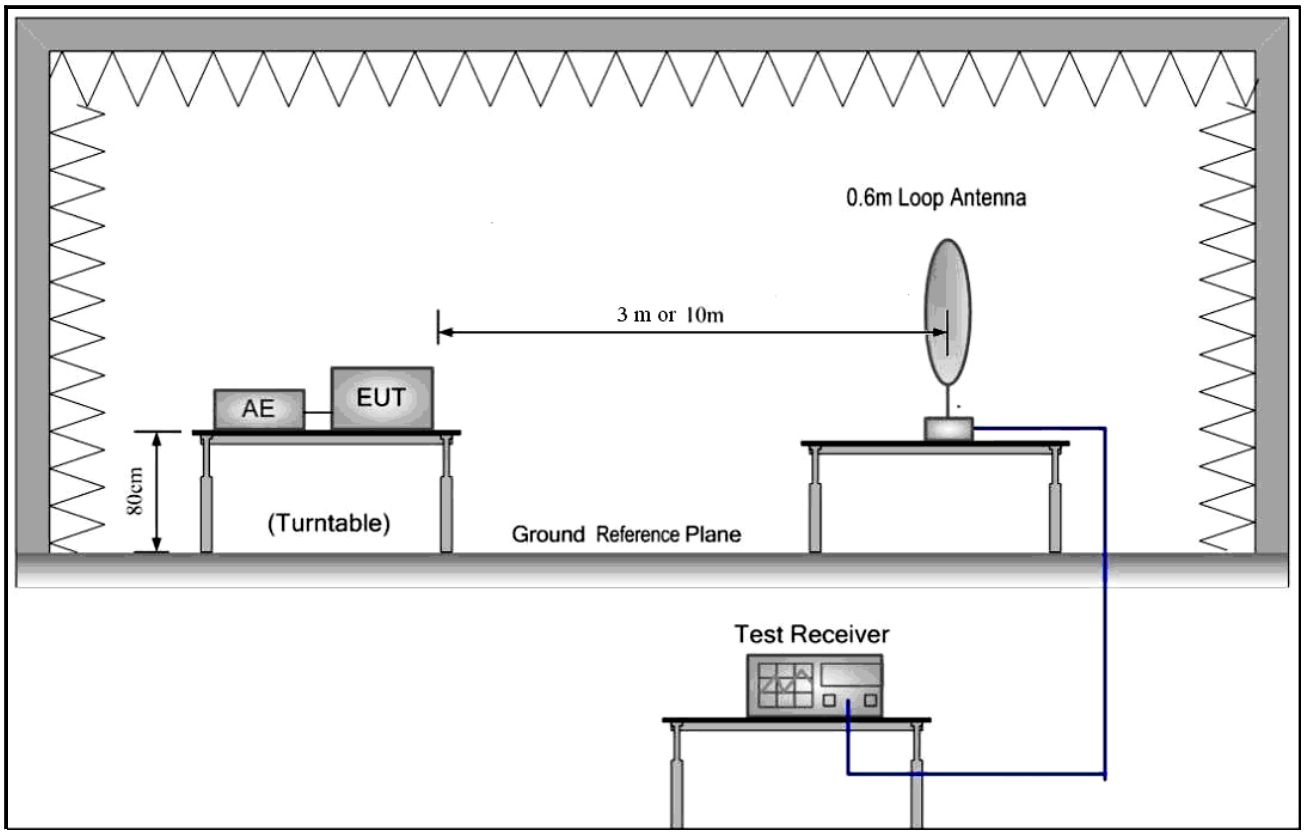
| Equipment | Operating frequency | RF Power generated by equipment (watts) | Field strength limit (uV/m) |
|---|---|---|---|
| Ultrasonic | Below 490 kHz | Below 500 | 2,400/F(kHz) |
| | | 500 or more | 2,400/F(kHz)× SQRT(power/500). |
| | 490 to 1,600 kHz | Any | 24,000/F(kHz) |
| | Above 1,600 kHz | Any | 15 |

For any ultrasonic equipment which operating frequency below 490KHz, the field strength limit is 2,400/F(KHz) μV/m@300m, i.e. **78.06dBμV/m at 9KHz & 7.60dBμV/m at 30MHz @10m distance.**

### 7.1.1 E.U.T. Operation

EUT Operation: Test the EUT in monitor & sense mode.

### 7.1.2 Test Setup and Procedure




1. The magnetic emissions test was conducted in a semi-anechoic chamber.
2. The EUT was connected to AC power source through a mains power outlet which was bonded to the ground reference plane; The mains cables shall drape to the ground reference plane.
3. The tabletop EUT was placed upon a non-metallic table 1 m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of magnetic emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum signature data plots of the EUT.

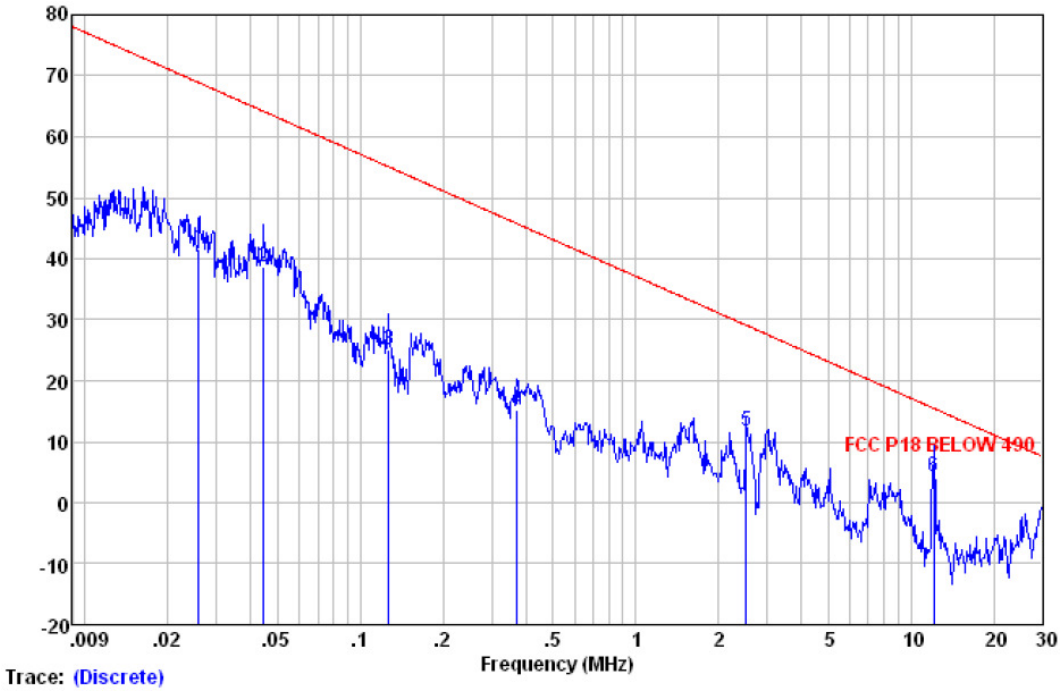
   The frequencies of maximum emission were determined in the final magnetic emissions measurement, The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, the antenna was supported in the vertical plane and be rotatable about a vertical axis. The antenna height was set at around 2 m above the ground reference plane.

### 7.1.3 Measurement Data

Vertical:

Peak scan

Level (dBμV/m)



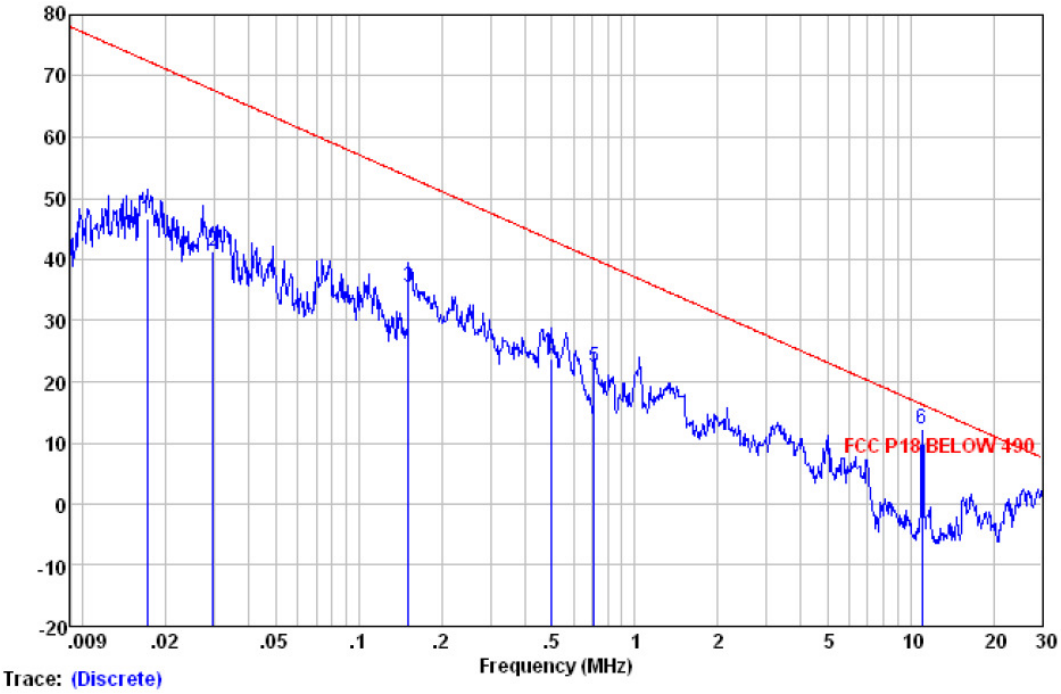

Average measurement

| Freq | ReadAntenna Level | Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 0.026 | 56.45 | 17.04 | 0.00 | 31.87 | 41.62 | 68.90 | -27.28 | Average |
| 0.044 | 56.74 | 13.76 | 0.00 | 31.82 | 38.68 | 64.18 | -25.50 | Average |
| 0.127 | 43.10 | 13.64 | 0.06 | 31.80 | 25.00 | 55.09 | -30.09 | Average |
| 0.370 | 33.60 | 13.40 | 0.05 | 31.77 | 15.28 | 45.79 | -30.51 | Average |
| 2.527 | 30.26 | 13.11 | 0.10 | 31.63 | 11.84 | 29.09 | -17.25 | Average |
| 12.094 | 27.44 | 8.20 | 0.20 | 31.60 | 4.24 | 15.49 | -11.25 | Average |

Horizontal:

Peak scan

Level (dBμV/m)




Average measurement

| Freq | ReadLevel | Antenna Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 0.017 | 60.01 | 18.46 | 0.00 | 31.89 | 46.58 | 72.49 | -25.91 | Average |
| 0.030 | 56.99 | 16.25 | 0.00 | 31.85 | 41.39 | 67.70 | -26.31 | Average |
| 0.151 | 53.48 | 13.60 | 0.06 | 31.79 | 35.35 | 53.54 | -18.19 | Average |
| 0.499 | 41.99 | 13.40 | 0.05 | 31.76 | 23.68 | 43.18 | -19.50 | Average |
| 0.713 | 40.68 | 13.49 | 0.04 | 31.75 | 22.46 | 40.08 | -17.62 | Average |
| 11.061 | 33.45 | 10.14 | 0.18 | 31.60 | 12.17 | 16.27 | -4.10 | Average |

**Level = Read Level + Transducer.**

## 7.2 Radiated Emissions, 30 MHz to 1GHz

Test Requirement: FCC Part 18

Test Method: N/A: See Remark Below

N/A: Not applicable. since the frequency in which device operating is below 1.705MHz. Please refer to § 18.307 (f) Conduction limits and § 18.309 frequency range of measurements for details.

§ 18.307 (f) Conduction limits:

For ultrasonic equipment, compliance with the conducted limits shall preclude the need to show compliance with the field strength limits below 30 MHz unless requested by the Commission.

§ 18.309 frequency range of measurements

| Frequency band in which device operates (MHz) | Range of frequency measurements | |
|---|---|---|
| | Lowest frequency | Highest frequency |
| Below 1.705 | Lowest frequency generated in the device, but not lower than 9 kHz. | 30 MHz. |
| 1.705 to 30 | Lowest frequency generated in the device, but not lower than 9 kHz. | 400 MHz. |
| 30 to 500 | Lowest frequency generated in the device or 25 MHz, whichever is lower. | Tenth harmonic or 1,000 MHz, whichever is higher. |
| 500 to 1,000 | Lowest frequency generated in the device or 100 MHz, whichever is lower. | Tenth harmonic. |
| Above 1,000 | .....do | Tenth harmonic or highest detectable emission. |

**--End of Report--**