

Test Report

FCC Part15 Subpart C

Product Name : Unattended Payment Terminal
Model No. : xUPT-303
FCC ID : MQT-XUPT303
IC : 6692A-XUPT303

Applicant : XAC AUTOMATION CORP.
Address : No. 30, Industry E. Rd. IX, Science-based Industrial
Park, Hsinchu City 30075, Taiwan,

Date of Receipt : Mar. 09, 2015
Test Date : Mar. 10, 2015
Issued Date : Mar. 20, 2015
Report No. : 1530156R-RF-US-P06V01
Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

Issued Date : Mar. 20, 2015
 Report No. : 1530156R-RF-US-P06V01



Product Name : Unattended Payment Terminal
 Applicant : XAC AUTOMATION CORP.
 Address : No. 30, Industry E. Rd. IX, Science-based Industrial
 Park, Hsinchu City 30075, Taiwan,
 Manufacturer : XAC AUTOMATION CORP.
 Address : No. 30, Industry E. Rd. IX, Science-based Industrial
 Park, Hsinchu City 30075, Taiwan,
 Model No. : xUPT-303
 FCC ID : MQT-XUPT303
 IC : 6692A-XUPT303
 EUT Voltage : DC12V/3A
 Brand Name : XAC
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2014
 Industry Canada RSS-Gen Issue 4/RSS-210 Issue 8
 Test Result : Complied
 Performed Location : Suzhou EMC Laboratory
 No.99 Hongye Rd., Suzhou Industrial Park Loufeng
 Hi-Tech Development Zone., Suzhou, China
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 FCC Registration Number: 800392

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Laboratory Information

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|----------------------|----------|-----------------------|
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| Germany | : | TUV Rheinland |
| Norway | : | Nemko, DNV |
| USA | : | FCC |
| Japan | : | VCCI |
| China | : | CNAS |

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The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
<http://www.quietek.com/>

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History of This Test Report

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|-----------------------|---------|-----------------------|---------------|
| 1530156R-RF-US-P06V01 | V1.0 | Initial Issued Report | Mar. 20, 2015 |
| | | | |
| | | | |
| | | | |

1. General Information**1.1. EUT Description**

| | |
|--------------------|-----------------------------|
| Product Name | Unattended Payment Terminal |
| Model No. | xUPT-303 |
| Working Voltage | DC 12V |
| Frequency Range | 13.56 MHz |
| Channel Number | 1 |
| Type of Modulation | ASK |
| Data Rate | 106kbps |
| Antenna Type | Loop Antenna |
| Peak Antenna Gain | 13dBi |

Working Frequency of Each Channel:

| Channel | Frequency | | | | | | |
|---------|-----------|--|--|--|--|--|--|
| 00 | 13.56MHz | | | | | | |

1.2. Mode of Operation

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

| |
|------------------|
| Test Mode |
| Mode 1: Transmit |

Note:

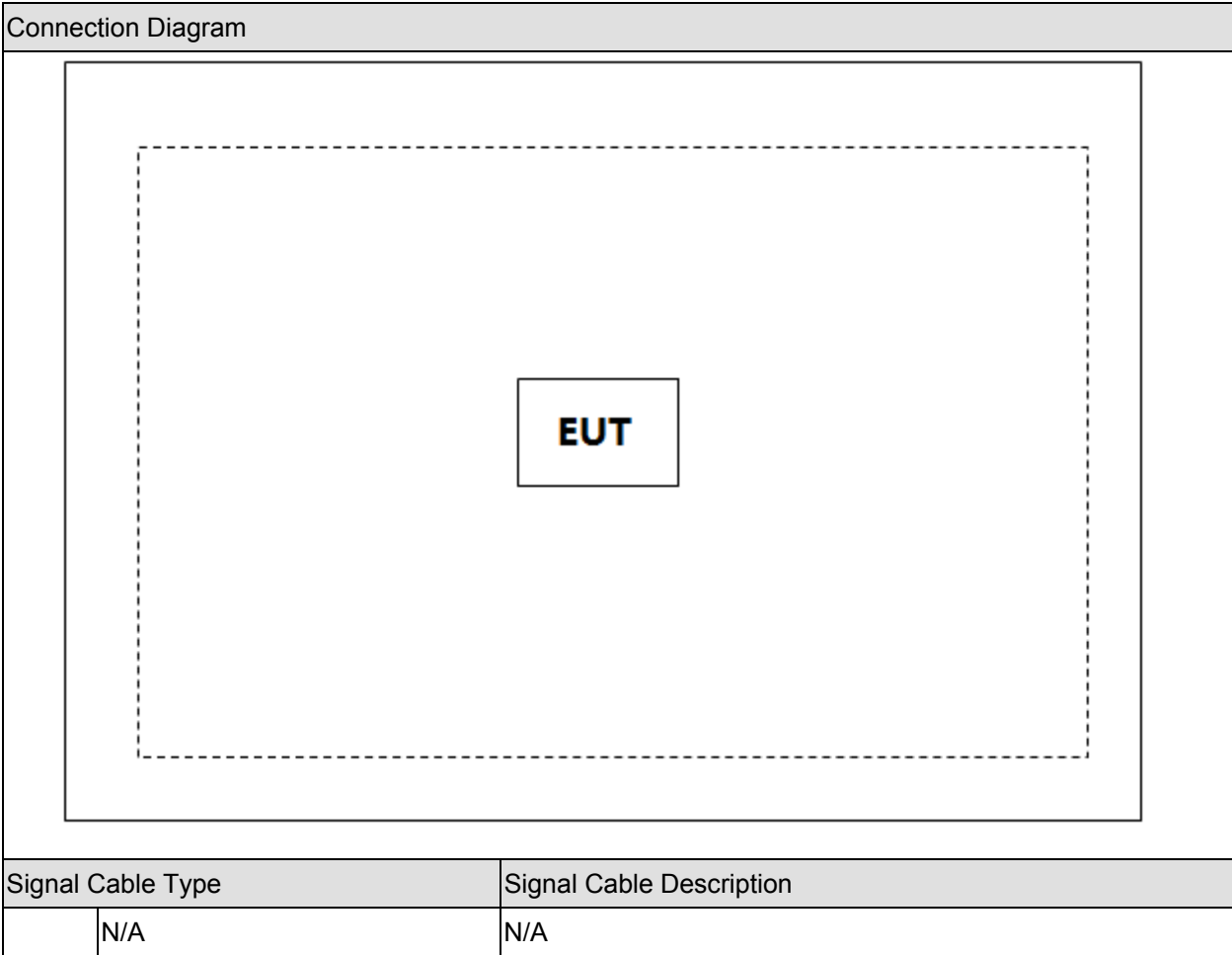
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For portable device, radiated spurious emission was verified over X, Y, Z Axis, and shown the worst case on this report.

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

| Product | Manufacturer | Model No. | Serial No. | Power Cord |
|---------|--------------|-----------|------------|------------|
| 1 N/A | N/A | N/A | N/A | N/A |

1.4. Configuration of Tested System



1.5. EUT Exercise Software

| | |
|---|---|
| 1 | Setup the EUT and simulators as shown on above. |
| 2 | Turn on the power of all equipment. and start to test |

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
- Deviations from the test standards as below description:

| Performed Test Item | Normative References | Test Performed | Deviation |
|-------------------------------|--|----------------|-----------|
| Conducted Emission | FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.207 | Yes | No |
| Field Strength of Fundamental | FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.225(a)(b)(c) | Yes | No |
| Field Strength of Spurious | FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.209 & 15.225(d) | Yes | No |
| Frequency Tolerance | FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.225(e) | Yes | No |
| Channel Bandwidth | FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.215(c) | Yes | No |

| Performed Test Item | Normative References | Test Performed | Deviation |
|----------------------------|---|----------------|-----------|
| Conducted Emission | RSS-Gen Issue 4 November 2014 Section 8.8 | Yes | No |
| Field Strength in Band | RSS-210 Issue 8 December 2010 Section A2.6 (a)(b)(c) | Yes | No |
| Field Strength of Spurious | RSS-210 Issue 8 December 2010 Section A2.6 (d) | Yes | No |
| Frequency Tolerance | RSS-Gen Issue 4 November 2014 Section 6.11 | Yes | No |
| Occupied Bandwidth | RSS-Gen Issue 4 November 2014 Section 6.6 | Yes | No |

2.2. Test Environment

| Items | Required (IEC 68-1) | Actual |
|----------------------------|---------------------|----------|
| Temperature (°C) | 15-35 | 21 |
| Humidity (%RH) | 25-75 | 50 |
| Barometric pressure (mbar) | 860-1060 | 950-1000 |

3. Conducted Emission

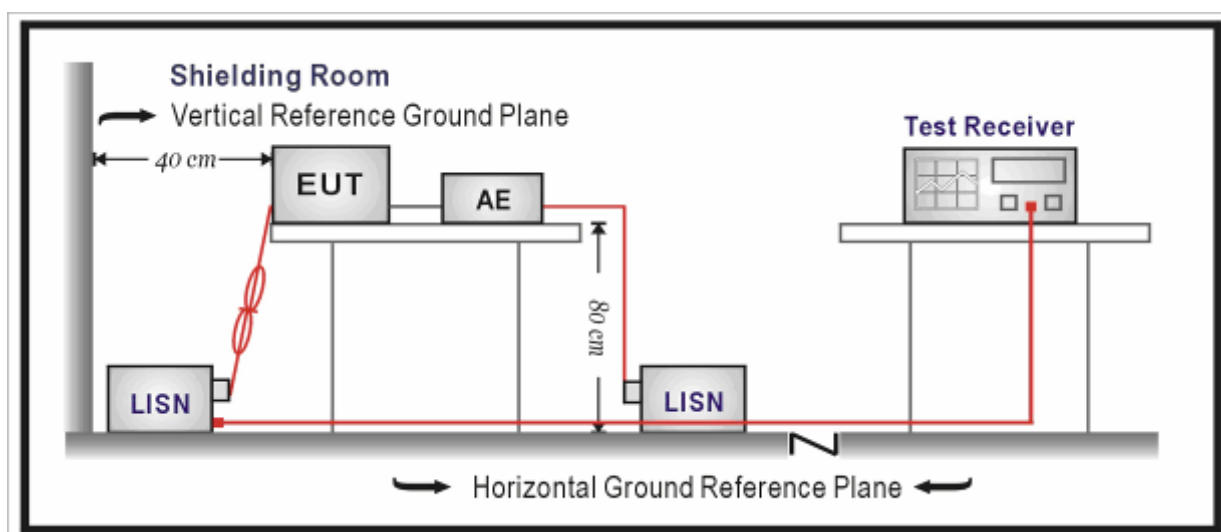
3.1. Test Equipment

Conducted Emission / TR-1

| Instrument | Manufacturer | Type No. | Serial No. | Cal. Due Date |
|----------------------------|--------------|----------|------------|---------------|
| EMI Test Receiver | R&S | ESCI | 100726 | 2015.03.30 |
| Two-Line V-Network | R&S | ENV216 | 100043 | 2015.03.30 |
| Two-Line V-Network | R&S | ENV216 | 100044 | 2015.09.16 |
| 50ohm Coaxial Switch | Anritsu | MP59B | 6200464462 | 2016.03.01 |
| 50ohm Termination | SHX | TF2 | 07081401 | 2015.09.16 |
| Temperature/Humidity Meter | zhicheng | ZC1-2 | TR1-TH | 2016.01.07 |

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

| FCC Part 15 Subpart C Paragraph 15.207 Limits | | |
|---|-----------|-----------|
| Frequency (MHz) | QP (dBuV) | AV (dBuV) |
| 0.15 - 0.50 | 66 - 56 | 56 – 46 |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2014 and tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

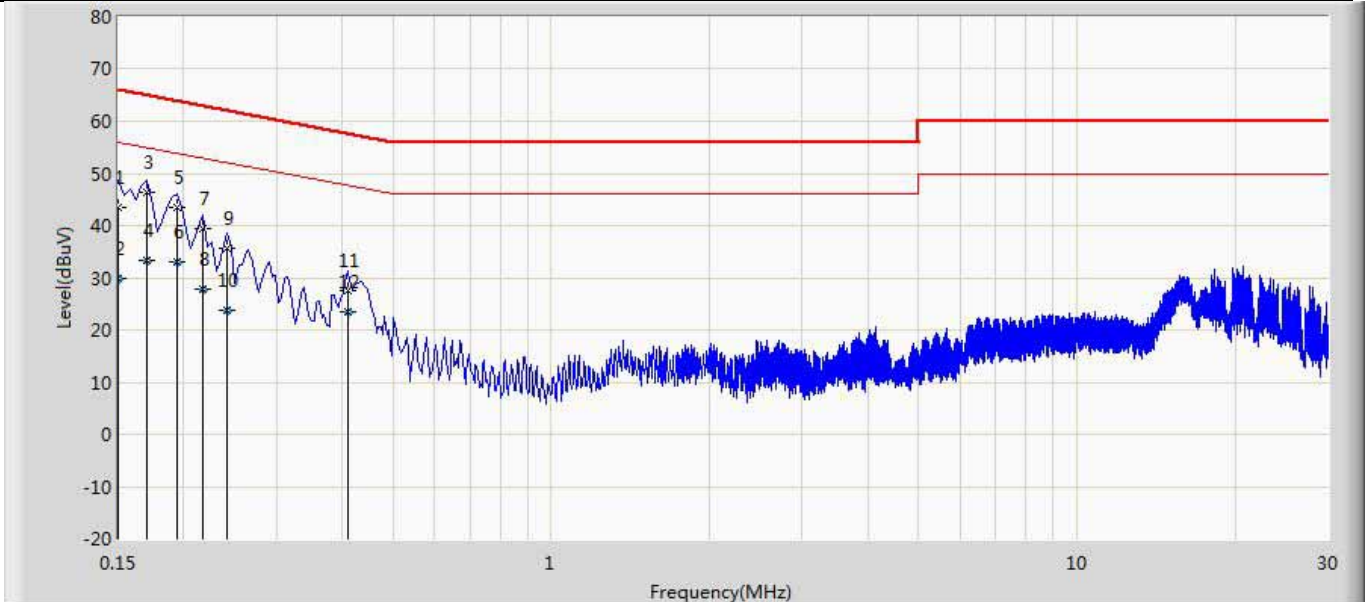
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

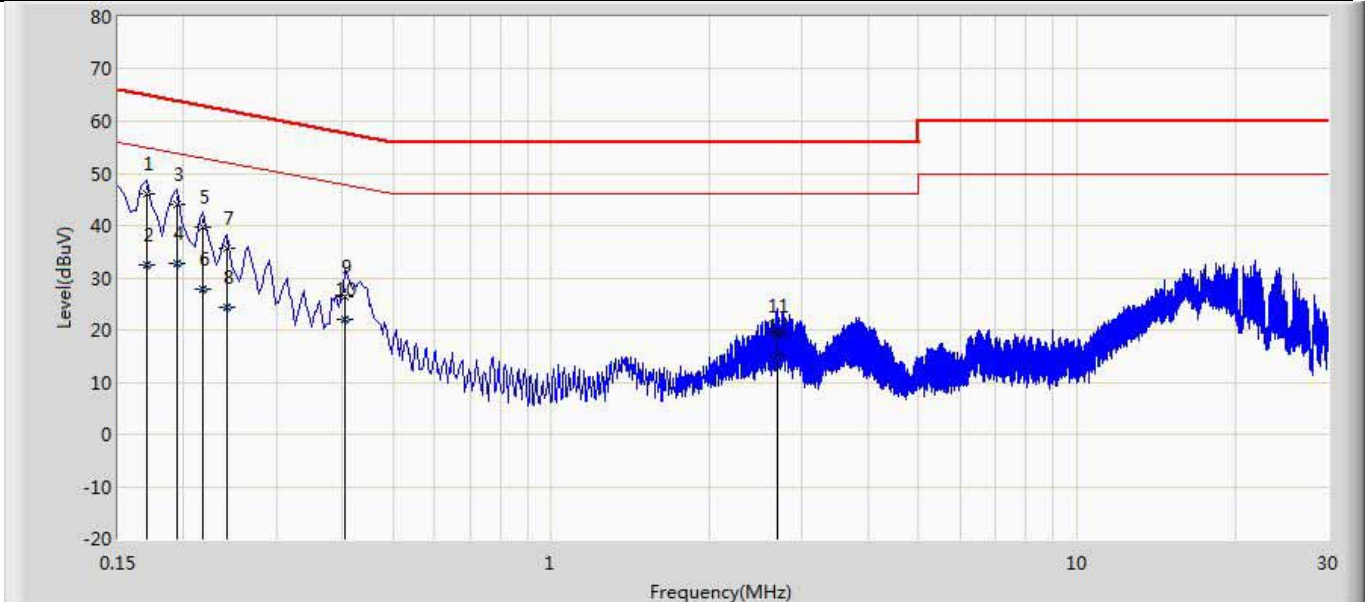
3.6. Test Result

| | |
|--|--------------------------|
| Site: TR1 | Time: 2015/03/12 - 17:04 |
| Limit: FCC_Part15.107_CE_AC Power_ClassB | Margin: 0 |
| Probe: ENV216_101044(0.009-30MHz) | Polarity: Neutral |
| EUT: Unattended Payment Terminal | Power: AC 120V/60Hz |
| Note: Mode 1 | |



| No | Mark | Frequency (MHz) | Measure Level (dBuV) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV) | Probe (dB) | Cable (dB) | Amp (dB) | Type |
|----|------|-----------------|----------------------|----------------------|-----------------|--------------|------------|------------|----------|------|
| 1 | | 0.150 | 43.383 | 33.535 | -22.617 | 66.000 | 9.798 | 0.050 | 0.000 | QP |
| 2 | | 0.150 | 29.824 | 19.976 | -26.176 | 56.000 | 9.798 | 0.050 | 0.000 | AV |
| 3 | * | 0.170 | 46.308 | 36.457 | -18.652 | 64.960 | 9.794 | 0.057 | 0.000 | QP |
| 4 | | 0.170 | 33.437 | 23.586 | -21.524 | 54.960 | 9.794 | 0.057 | 0.000 | AV |
| 5 | | 0.194 | 43.561 | 33.702 | -20.302 | 63.864 | 9.799 | 0.060 | 0.000 | QP |
| 6 | | 0.194 | 33.158 | 23.300 | -20.705 | 53.864 | 9.799 | 0.060 | 0.000 | AV |
| 7 | | 0.218 | 39.464 | 29.601 | -23.431 | 62.895 | 9.803 | 0.060 | 0.000 | QP |
| 8 | | 0.218 | 27.849 | 17.986 | -25.046 | 52.895 | 9.803 | 0.060 | 0.000 | AV |
| 9 | | 0.242 | 35.712 | 25.846 | -26.316 | 62.027 | 9.806 | 0.060 | 0.000 | QP |
| 10 | | 0.242 | 23.675 | 13.808 | -28.353 | 52.027 | 9.806 | 0.060 | 0.000 | AV |
| 11 | | 0.410 | 27.450 | 17.555 | -30.198 | 57.648 | 9.828 | 0.067 | 0.000 | QP |
| 12 | | 0.410 | 23.533 | 13.638 | -24.115 | 47.648 | 9.828 | 0.067 | 0.000 | AV |

| | |
|--|--------------------------|
| Site: TR1 | Time: 2015/03/12 - 17:16 |
| Limit: FCC_Part15.107_CE_AC Power_ClassB | Margin: 0 |
| Probe: ENV216_101044(0.009-30MHz) | Polarity: Line |
| EUT: Unattended Payment Terminal | Power: AC 120V/60Hz |
| Note: Mode 1 | |



| No | Mark | Frequency (MHz) | Measure Level (dBuV) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV) | Probe (dB) | Cable (dB) | Amp (dB) | Type |
|----|------|-----------------|----------------------|----------------------|-----------------|--------------|------------|------------|----------|------|
| 1 | * | 0.170 | 46.200 | 36.349 | -18.760 | 64.960 | 9.794 | 0.057 | 0.000 | QP |
| 2 | | 0.170 | 32.411 | 22.560 | -22.549 | 54.960 | 9.794 | 0.057 | 0.000 | AV |
| 3 | | 0.194 | 44.036 | 34.177 | -19.828 | 63.864 | 9.799 | 0.060 | 0.000 | QP |
| 4 | | 0.194 | 32.693 | 22.834 | -21.170 | 53.864 | 9.799 | 0.060 | 0.000 | AV |
| 5 | | 0.218 | 39.573 | 29.710 | -23.321 | 62.895 | 9.803 | 0.060 | 0.000 | QP |
| 6 | | 0.218 | 27.868 | 18.005 | -25.027 | 52.895 | 9.803 | 0.060 | 0.000 | AV |
| 7 | | 0.242 | 35.689 | 25.823 | -26.338 | 62.027 | 9.806 | 0.060 | 0.000 | QP |
| 8 | | 0.242 | 24.330 | 14.464 | -27.697 | 52.027 | 9.806 | 0.060 | 0.000 | AV |
| 9 | | 0.406 | 26.339 | 16.445 | -31.391 | 57.730 | 9.828 | 0.066 | 0.000 | QP |
| 10 | | 0.406 | 21.914 | 12.020 | -25.816 | 47.730 | 9.828 | 0.066 | 0.000 | AV |
| 11 | | 2.690 | 18.814 | 9.012 | -37.186 | 56.000 | 9.692 | 0.110 | 0.000 | QP |
| 12 | | 2.690 | 14.972 | 5.170 | -31.028 | 46.000 | 9.692 | 0.110 | 0.000 | AV |

4. In Band Emission

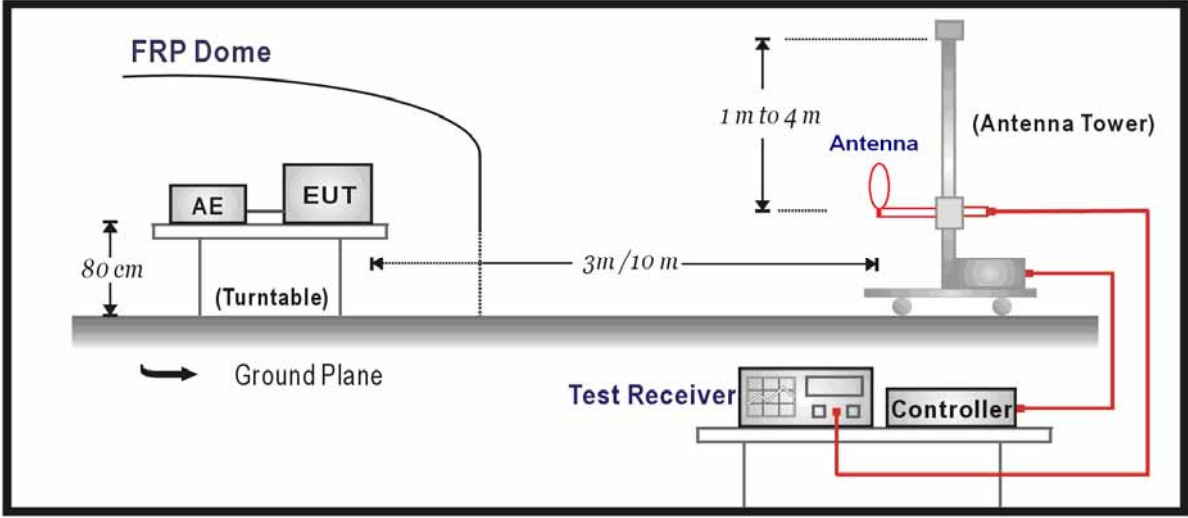
4.1. Test Equipment

Out of Band Emission / AC-2

| Instrument | Manufacturer | Type No. | Serial No. | Cal. Due Date |
|----------------------------|--------------|--------------|------------|---------------|
| EMI Test Receiver | R&S | ESCI | 100573 | 2015.03.28 |
| Loop Antenna | R&S | HFH2-Z2 | 833799/003 | 2015.11.25 |
| Bilog Antenna | Teseq GmbH | CBL6112D | 27611 | 2015.10.10 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC2-C | 2016.03.01 |
| Temperature/Humidity Meter | Zhicheng | ZC1-2 | AC2-TH | 2016.01.07 |

4.2. Test Setup

9kHz~30MHz Test Setup:



4.3. Limit

| FCC Part 15.225 & RSS210 Issue8 Section A2.6 (a)(b)(c) | | |
|--|--------------|--------------|
| Frequency (MHz) | Distance (m) | Level (mV/m) |
| 13.553-13.567 MHz | 30 | 15.848 |
| 13.410-13.553 MHz and 13.567-13.710 MHz | 30 | 0.334 |
| 13.110-13.410 MHz and 13.710-14.010 MHz | 30 | 0.106 |
| outside of the 13.110-14.010 MHz | Table Below | Table Below |

Note 1: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 2: E field strength (dBmV/m) = 20 log E field strength (mV/m)

Note 3: Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$.

Note 4: Fc= 13.56 MHz.

Field strength of emissions from intentional radiators operated under 15.225(d) and 15.209(a) shall not exceed the following:

| Fundamental frequency (MHz) | Field strength of fundamental ($\mu\text{V/m}$) | Field strength of spurious emissions ($\mu\text{V/m}$) |
|-----------------------------|---|--|
| 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 |

(1)The tighter limits apply at the band edges.

(2)Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$.

(3) All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.

4.4. Test Procedure

The EUT was setup according to ANSI C63.4 and tested according to ANSI C63.10 for compliance to FCC 47CFR 15.225 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4 on radiated measurement.

4.5. Uncertainty

The measurement uncertainty is defined as ± 3.80 dB

4.6. Test Result

| | | | |
|--------------|-----------------------------|-----------|------|
| Product | Unattended Payment Terminal | | |
| Test Item | In Band Emission | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2015/03/10 | Test Site | AC-2 |

| Frequency (MHz) | Measure Level (dBµV/m) | Loop Ant. Pol. (H/V) | Correction factor (dB) | Reading Level (dBµV/m) | Distance factor (dB) | Corrected Measure level (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|-----------------|------------------------|----------------------|------------------------|------------------------|----------------------|----------------------------------|----------------|-------------|
| 13.56 | 69.99 | H | 21.09 | 48.89 | -40 | 29.99 | 84.00 | -54.01 |
| 13.56 | 50.09 | V | 21.09 | 29.00 | -40 | 10.09 | 84.00 | -74.91 |
| 13.55 | 65.24 | H | 21.09 | 44.15 | -40 | 25.24 | 50.50 | -25.26 |
| 13.568 | 64.88 | H | 21.09 | 43.79 | -40 | 24.88 | 50.50 | -25.62 |
| 13.41 | 54.67 | H | 21.08 | 33.59 | -40 | 14.67 | 40.50 | -35.33 |
| 13.71 | 55.31 | H | 21.10 | 34.21 | -40 | 15.31 | 40.50 | -34.69 |

Note1: Antenna Test Distance at 3 meters.

Note2: Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$.

5. Radiated Emission

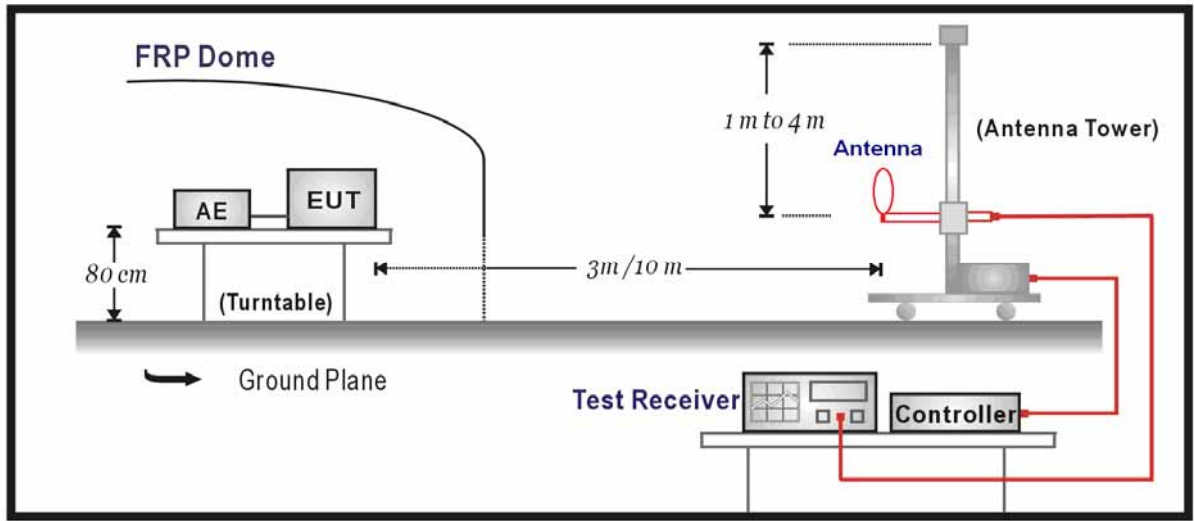
5.1. Test Equipment

Radiated Emission / AC-2

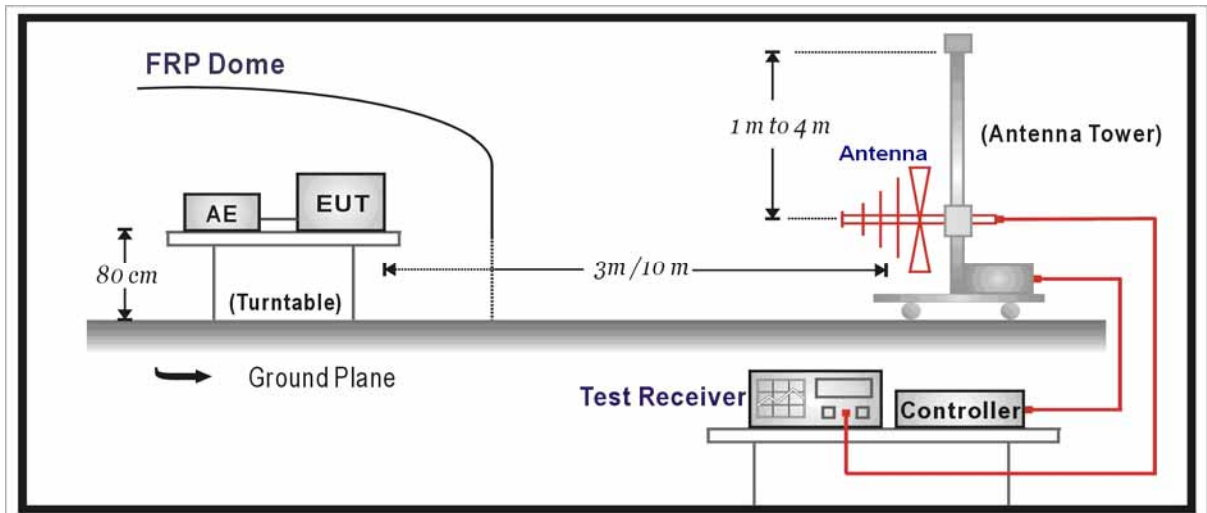
| Instrument | Manufacturer | Type No. | Serial No. | Cal. Due Date |
|----------------------------|--------------|--------------|------------|---------------|
| EMI Test Receiver | R&S | ESCI | 100573 | 2015.03.28 |
| Loop Antenna | R&S | HFH2-Z2 | 833799/003 | 2015.11.25 |
| Bilog Antenna | Teseq GmbH | CBL6112D | 27611 | 2015.10.10 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC2-C | 2016.03.01 |
| Temperature/Humidity Meter | Zhicheng | ZC1-2 | AC2-TH | 2016.01.07 |

5.2. Test Setup

9kHz~30MHz Test Setup:



30MHz~1GHz Test Setup:



5.3. Limit

Field strength of emissions from intentional radiators operated under 15.225(d) and 15.209(a) shall not exceed the following:

| FCC Part 15.225(d) and 15.209(a) | | |
|----------------------------------|--|---|
| Fundamental frequency (MHz) | Field strength of fundamental (μ V/m) | Field strength of spurious emissions (μ V/m) |
| 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 |

- (4)The tighter limits apply at the band edges.
- (5)Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$ for example.
- (6)All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.

5.4. Test Procedure

The EUT was setup according to ANSI C63.4 and tested according to ANSI C63.10 for compliance to FCC 47CFR 15.225 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4 on radiated measurement.

The frequency range from 9kHz to 10th harmonic is checked.

5.5. Uncertainty

The measurement uncertainty is defined as ± 3.80 dB

5.6. Test Result

| | | | |
|--------------|-----------------------------|-----------|------|
| Product | Unattended Payment Terminal | | |
| Test Item | Radiated Spurious Emission | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2015/03/10 | Test Site | AC-2 |

| Frequency (MHz) | Measure Level (dBµV/m) | Loop Ant. Pol. (H/V) | Correction factor (dB) | Reading Level (dBµV/m) | Distance factor (dB) | Corrected Measure level (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|-----------------|------------------------|----------------------|------------------------|------------------------|----------------------|----------------------------------|----------------|-------------|
| 0.016 | 51.32 | H | 21.23 | 30.09 | -80 | -28.68 | 43.52 | -72.20 |
| 0.048 | 47.97 | V | 21.94 | 26.03 | -80 | -32.03 | 33.98 | -66.01 |
| 0.072 | 43.64 | V | 21.92 | 21.72 | -40 | 3.64 | 50.46 | -46.82 |
| 0.096 | 39.18 | V | 21.89 | 17.29 | -40 | -0.82 | 47.96 | -48.78 |
| 0.121 | 39.98 | V | 21.86 | 18.18 | -40 | -0.02 | 45.95 | -45.97 |
| 4.77 | 25.31 | V | 23.93 | 8.29 | -40 | -14.69 | 29.54 | -44.23 |
| 27.12 | 24.52 | V | 19.27 | 8.16 | -40 | -15.48 | 29.54 | -45.02 |
| 30.364 | 32.21 | V | 19.22 | 12.51 | 0 | -7.79 | 40.00 | -47.79 |
| 40.670 | 27.44 | V | 18.66 | 13.41 | 0 | -12.56 | 40.00 | -52.56 |
| 116.694 | 31.74 | V | 17.32 | 14.56 | 0 | -8.26 | 43.50 | -51.76 |
| 136.700 | 32.07 | V | 27.61 | 12.00 | 0 | -7.93 | 43.50 | -51.43 |
| 149.916 | 31.88 | V | 23.93 | 8.29 | 0 | -8.12 | 43.50 | -51.62 |
| 576.716 | 39.62 | V | 19.27 | 8.16 | 0 | -0.38 | 46.00 | -46.38 |

| | |
|-------------|------|
| Test Result | Pass |
|-------------|------|

6. Frequency Tolerance

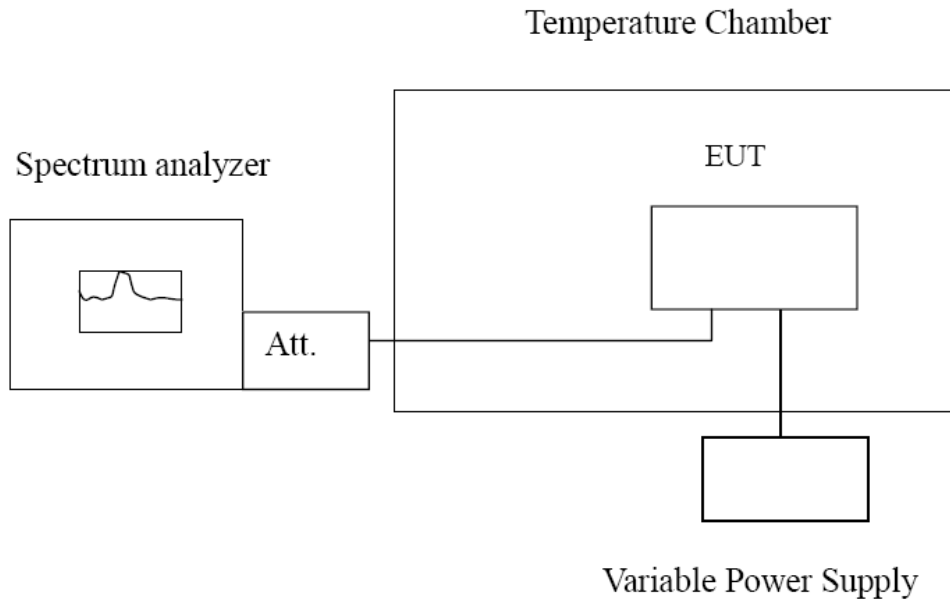
6.1. Test Equipment

Frequency Tolerance / TR-7

| Instrument | Manufacturer | Type No. | Serial No. | Cal. Due Date |
|--------------------------------|--------------|--------------|--------------|---------------|
| PSA Series Spectrum Analyzer | Agilent | E4440A | MY49420184 | 2015.03.28 |
| DC Power Supply | IDRC | CD-035-020PR | 977272 | 2015.03.28 |
| Temperature & Humidity Chamber | Gaoyu | TH-1P-B | WIT-05121302 | 2016.01.07 |
| Temperature/Humidity Meter | Zhicheng | ZC1-2 | AC6-TH | 2016.01.07 |

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

6.4. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

6.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

6.6. Test Result

| | | |
|-----------|---|-----------------------------|
| Product | : | Unattended Payment Terminal |
| Test Item | : | Frequency Stability |
| Test Site | : | TR-7 |
| Test Mode | : | Mode 1: Transmit |

Frequency Stability under Temperature

| Temperature Interval (°C) | Test Frequency (MHz) | Deviation (Hz) | Limit (Hz) |
|---------------------------|----------------------|----------------|------------|
| -20 | 13.56 | 26 | ±1356 |
| -10 | 13.56 | 30 | ±1356 |
| 0 | 13.56 | 25 | ±1356 |
| 10 | 13.56 | 34 | ±1356 |
| 20 | 13.56 | 28 | ±1356 |
| 30 | 13.56 | 35 | ±1356 |
| 40 | 13.56 | 43 | ±1356 |
| 50 | 13.56 | 77 | ±1356 |

Frequency Stability under Voltage

| DC Voltage (V) | Test Frequency (MHz) | Deviation (Hz) | Limit (Hz) |
|----------------|----------------------|----------------|------------|
| 10.2 | 13.56 | 20 | ±1356 |
| 12 | 13.56 | -10 | ±1356 |
| 13.8 | 13.56 | 29 | ±1356 |

| | |
|-------------|------|
| Test Result | Pass |
|-------------|------|

7. 20dB Occupied Bandwidth

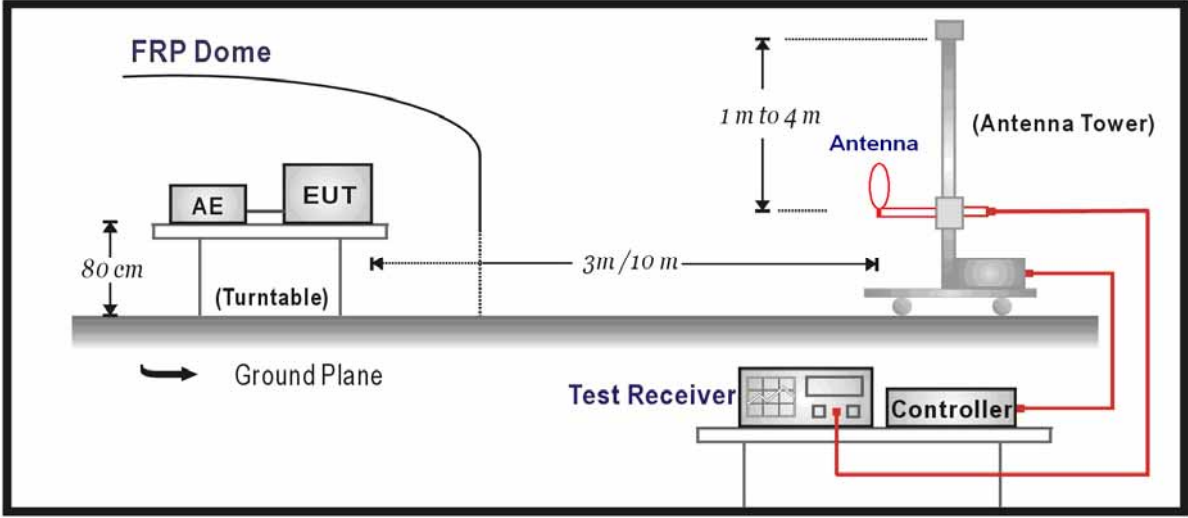
7.1. Test Equipment

Occupied Bandwidth / AC-2

| Instrument | Manufacturer | Type No. | Serial No. | Cal. Due Date |
|------------------------------|--------------|--------------|------------|---------------|
| EMI Test Receiver | R&S | ESCI | 100573 | 2015.03.28 |
| PSA Series Spectrum Analyzer | Agilent | E4440A | MY49420184 | 2016.03.10 |
| Loop Antenna | R&S | HFH2-Z2 | 833799/003 | 2015.11.25 |
| Bilog Antenna | Teseq GmbH | CBL6112D | 27611 | 2015.10.10 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC2-C | 2016.03.01 |
| Temperature/Humidity Meter | Zhicheng | ZC1-2 | AC2-TH | 2016.01.07 |

7.2. Test Setup

9kHz~30MHz Test Setup:



7.3. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The operating frequency band is 13.553MHz~13.567MHz.

7.4. Test Procedure

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 1kHz RBW and 3kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

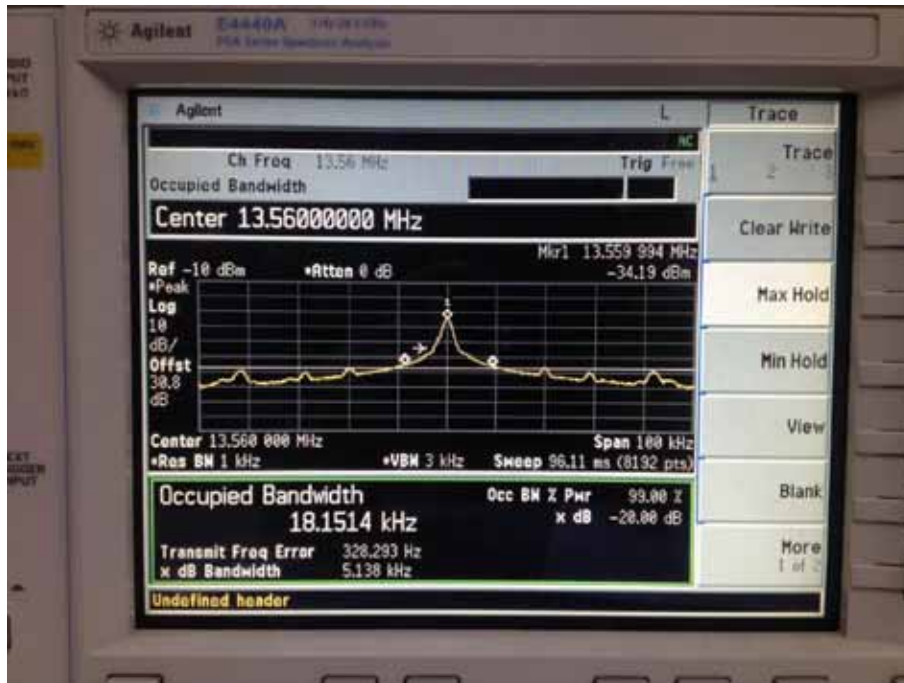
7.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

7.6. Test Result

| | | | |
|--------------|-----------------------------|-----------|------|
| Product | Unattended Payment Terminal | | |
| Test Item | 20dB Occupied Bandwidth | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2015/03/10 | Test Site | AC-2 |

| Frequency (MHz) | 20dB Bandwidth (kHz) | 20dBc point (Low) (MHz) | 20dBc point (High) (MHz) | Frequency Range (MHz) |
|-----------------|----------------------|-------------------------|--------------------------|-----------------------|
| 13.56 | 5.138 | 13.5532 | 13.5668 | 13.553 ~ 13.567 |



| | |
|-------------|------|
| Test Result | Pass |
|-------------|------|

8. 99% Occupied Bandwidth

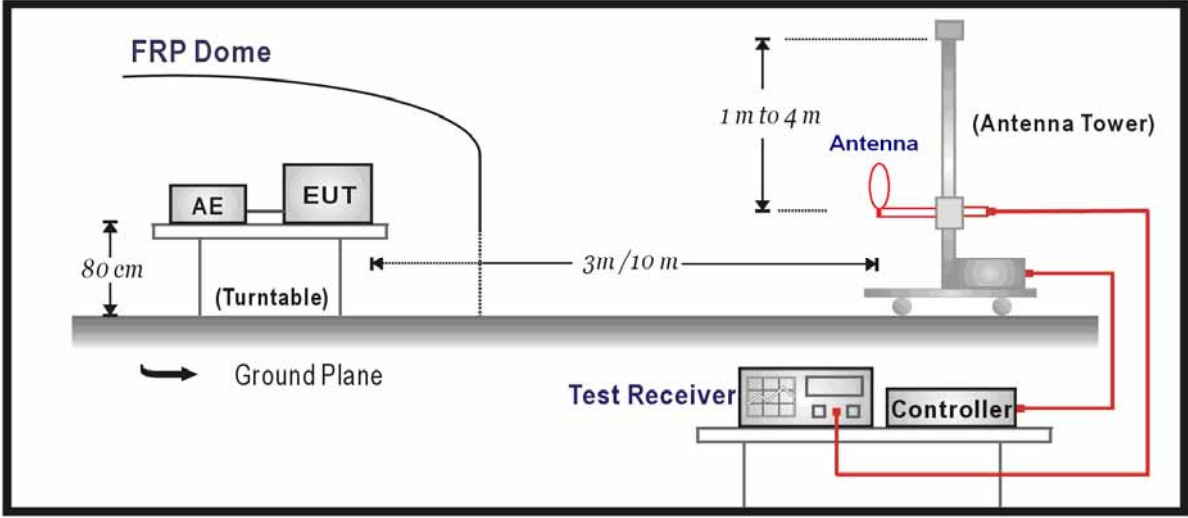
8.1. Test Equipment

Occupied Bandwidth / AC-2

| Instrument | Manufacturer | Type No. | Serial No. | Cal. Due Date |
|------------------------------|--------------|--------------|------------|---------------|
| EMI Test Receiver | R&S | ESCI | 100573 | 2015.03.28 |
| PSA Series Spectrum Analyzer | Agilent | E4440A | MY49420184 | 2016.03.10 |
| Loop Antenna | R&S | HFH2-Z2 | 833799/003 | 2015.11.25 |
| Bilog Antenna | Teseq GmbH | CBL6112D | 27611 | 2015.10.10 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC2-C | 2016.03.01 |
| Temperature/Humidity Meter | Zhicheng | ZC1-2 | AC2-TH | 2016.01.07 |

8.2. Test Setup

9kHz~30MHz Test Setup:



8.3. Limit

N/A

8.4. Test Procedure

The emission bandwidth (x dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated x dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth. When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured. A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

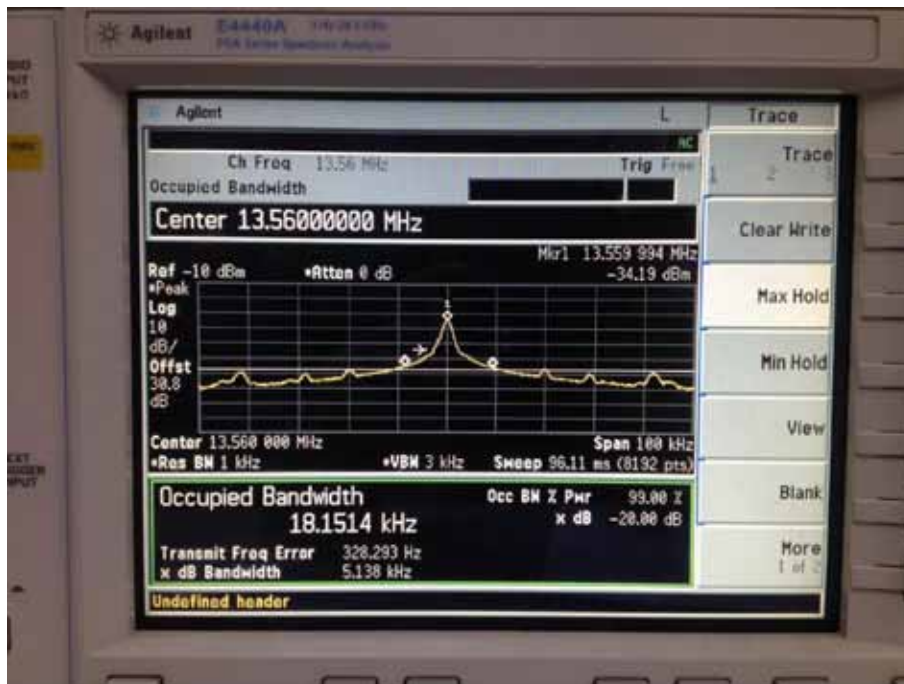
8.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

8.6. Test Result

| | | | |
|--------------|-----------------------------|-----------|------|
| Product | Unattended Payment Terminal | | |
| Test Item | 99% Occupied Bandwidth | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2015/03/10 | Test Site | AC-2 |

| Frequency (MHz) | 99% Occupied Bandwidth (kHz) |
|-----------------|------------------------------|
| 13.56 | 18.1514 |



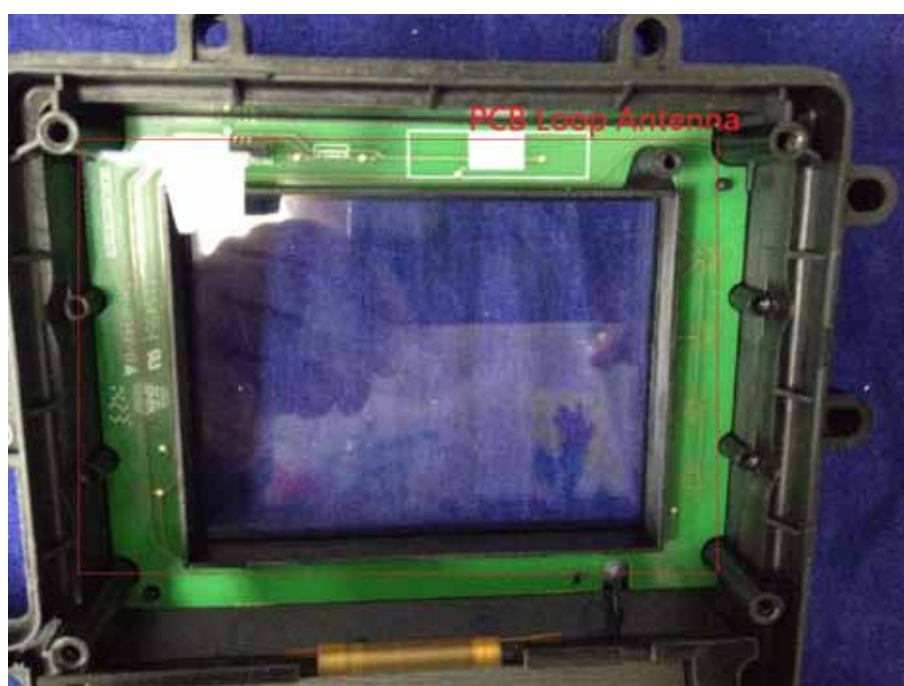
9. Antenna Requirement

9.1. Requirement

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

9.2. Result

The EUT is equipped with integrate antenna, which can't be replaced by other antenna. So the EUT complied with the antenna requirement of section 15.203.



The End