

FCC 47 CFR PART 15 SUBPART C FCC ID : Z8QPZA02 TEST REPORT

For

Applicant: MyEnergy Domain, Inc.

Address: 5604 Nicholas St, Omaha NE 68132, United States

Product Name: Smart plug

Model Name: PZ-A-02

Brand Name: N/A

FCC ID: Z8QPZA02

Report No.: STS1408019F01

Date of Issue: Aug.25, 2014

Prepared by

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TABLE OF CONTENTS

| 1. VERIFICATION OF CONFORMITY | |
|---|------|
| 2. GENERAL INFORMATION | |
| 2.1 PRODUCT INFORMATION | |
| 2.2 OBJECTIVE | |
| 2.3 TEST STANDARDS AND RESULTS | |
| 2.4 ENVIRONMENTAL CONDITIONS | |
| 3. TEST FACILITY | |
| 3.1 TEST FACILITY | |
| 3.2 MEASUREMENT UNCERTAINTY | |
| 3.3 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS | |
| 4. SETUP OF EQUIPMENT UNDER TEST | 7 |
| 4.1 SUPPORT EQUIPMENT | |
| 4.2 TEST EQUIPMENT LIST | 7 |
| 5. 47 CFR Part 15C 15.249 Requirements | |
| 5.1 SPURIOUS EMISSION TEST | 9 |
| 5.1.1 REQUIREMENT | |
| 5.1.2 TEST DESCRIPTION | . 10 |
| 5.1.3 TEST DESCRIPTION | 11 |
| 5.1.4 TEST RESULT | . 12 |
| 5.2 BAND EDGE | |
| 5.2.1 REQUIREMENT | . 17 |
| 5.2.2 TEST DESCRIPTION | . 17 |
| 5.2.3 TEST RESULT | . 17 |
| 5.3 LINE CONDUCTED EMISSION TEST | . 20 |
| 5.3.1 LIMITS OF LINE CONDUCTED EMISSION TEST | . 20 |
| 5.3.2 BLOCK DIAGRAM OF TEST SETUP | . 20 |
| 5.3.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST | . 20 |
| 5.3.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST | . 21 |
| 5.3.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST | . 21 |
| 5.4 20dB Bandwidth | . 24 |
| 5.4.1 Definition | . 24 |
| 5.4.2 Test Description | |
| 5.4.3 Test Result | |
| APPENDIX 1 | |
| PHOTOGRAPHS OF TEST SETUP | |
| | |



Address: 5604 Nicholas St, Omaha NE 68132, United States

Manufacture's Name: MyEnergy Domain, Inc.

Address 5604 Nicholas St, Omaha NE 68132, United States

Product description:

Product name Smart plug

Model and/or type reference .: PZ-A-02

Serial Model: N/A

Ratings...... DC 3.8V

Standards..... FCC Part15.249

Test procedure ANSI C63.4-2003

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test:

Date (s) of performance of tests..... Aug. 15, 2014- Aug. 23, 2014

Date of Issue Aug. 25, 2014

Test Result......Pass

The test results of this report relate only to the tested sample identified in this report.

Testing Engineer :

(Tony Liu)

Technical Manager:

(Vita Li)

Authorized

Signatory

[houry land

(Bovey Yang)



2. GENERAL INFORMATION

2.1 PRODUCT INFORMATION

| Product | Smart plug |
|-------------------|---|
| Trade Name | N/A |
| Model Number | PZ-A-02 |
| Power Supply | AC 110V |
| Frequency Range | 2405MHz -2475MHz |
| Modulation Type | DSSS, O-QPSK |
| Antenna Type: | Antenna Designation: FPCB Antenna Gain(Peak): 0.2dBi |
| Channel Spacing: | 5MHz |
| Channel Number | 15(CH Low: 2405MHz, CH Mid: 2440MHz, CH High: 2475MHz) |
| Temperature Range | -20°C ~ 50°C |

NOTE:

1. Please refer to Appendix I for the photographs of the EUT. For a more detailed features description about the EUT, please refer to User's Manual.



2.2 OBJECTIVE

The objective of the report is to perform tests according to 47 CFR Part 15 Subpart C for the EUT FCC ID:

| No. | Identity | Document Title |
|-----|---------------------------------|-------------------------|
| 1 | 47 CFR Part 15(10-1-05 Edition) | Radio Frequency Devices |

2.3 TEST STANDARDS AND RESULTS

Test items and the results are as bellow:

| FCC Rules | Description | Result | Date of Test |
|--|----------------------------|--------|--------------|
| FCC Part 15 C: 15.249 FCC Part 15 : 109 | Radiated Emission Test | PASS | Aug 14, 2014 |
| FCC Part 15 C: 15.207 | Conducted Emission Test | PASS | Aug 14, 2014 |
| FCC Part 15 C: 15.249 | Band Edge Test | PASS | Aug 24, 2014 |
| FCC Part 15 C: 15.215 | 20 dB Bandwidth Test | PASS | Aug 24, 2014 |

Note: 1. The test result judgment is decided by the limit of measurement standard

2. The information of measurement uncertainty is available upon the customer's request.

3. N/A denotes test is not applicable in this Test Report

2.4 ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35°C - Humidity: 30-60 %

- Atmospheric pressure: 86-106 kPa



3. TEST FACILITY

3.1 TEST FACILITY

BZT Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an

District, Shenzhen P.R. China. FCC Registration No.: 701733

3.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $\mathbf{y} \pm \mathbf{U}$, where expended uncertainty \mathbf{U} is based on a standard uncertainty multiplied by a coverage factor of $\mathbf{k=2}$, providing a level of confidence of approximately $\mathbf{95}$ % $^{\circ}$

| | , - | |
|-----|------------------------------|-------------|
| No. | Item | Uncertainty |
| 1 | Conducted Emission Test | ±1.38dB |
| 3 | Spurious emissions,conducted | ±0.21dB |
| 4 | All emissions,radiated(<1G) | ±4.68dB |
| 5 | All emissions,radiated(>1G) | ±4.89dB |
| 6 | Temperature | ±0.5°C |
| 7 | Humidity | ±2% |

3.3 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(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 | 2655 - 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 | 3600 - 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

⁽b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



4. SETUP OF EQUIPMENT UNDER TEST

4.1 SUPPORT EQUIPMENT

| Device Type | Brand | Model | Series No. | Note |
|-------------|-------|---------|------------|------|
| Smart plug | N/A | PZ-A-02 | N/A | |

Remark:

All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at Most for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

Radiation Test equipment

| Item | Kind of | Manufacturer | Type No. | Serial No. | Last | Calibrated | Calibration |
|------|----------------------|---------------|-----------------|------------------|-------------|------------|-------------|
| | Equipment | | | | calibration | until | period |
| 1 | Spectrum Analyzer | Agilent | E4407B | MY451080 40 | 2014.07.06 | 2015.07.05 | 1 year |
| 2 | Test Receiver | R&S | ESPI | 101318 | 2014.06.07 | 2015.06.06 | 1 year |
| 3 | Bilog Antenna | TESEQ | CBL6111D | 31216 | 2014.07.06 | 2015.07.05 | 1 year |
| 4 | 50Ω Coaxial Switch | Anritsu | MP59B | 620026441 6 | 2014.06.07 | 2015.06.06 | 1 year |
| 5 | Spectrum Analyzer | ADVANTES T | R3132 | 150900201 | | 2015.06.06 | • |
| 6 | Horn Antenna | EM | EM-AH-10 180 | 201107140 2 | 2014.07.06 | 2015.07.05 | 1 year |
| 7 | Horn Ant | Schwarzbeck | BBHA 9170 | 9170-181 | 2014.07.06 | 2015.07.05 | 1 year |
| 8 | Amplifier | EM | EM-30180 | 060538 | 2013.12.21 | 2014.12.21 | 1 year |
| 9 | Loop Antenna | ARA | PLA-1030/ B | 1029 | 2014.06.08 | 2015.06.07 | 1 year |
| 10 | Power Meter | R&S | NRVS | 100696 | 2014.07.06 | 2015.07.05 | 1 year |
| 11 | Power Sensor | R&S | URV5-Z4 | 0395.1619. 05 | 2014.07.06 | 2015.07.05 | 1 year |

Conduction Test equipment

| Item | Kind of | Manufact | Type No. | Serial No. | Last | Calibrated | Calibration |
|------|---------------|----------|----------|------------|-------------|------------|-------------|
| | Equipment | urer | | | calibration | until | period |
| 1 | Test Receiver | R&S | ESCI | 101160 | 2014.06.06 | 2015.06.05 | 1 year |
| 2 | LISN | R&S | ENV216 | 101313 | 2014.08.24 | 2015.08.23 | 1 year |





| 3 | LISN | EMCO | 3816/2 | 00042990 | 2014.08.24 | 2015.08.23 | 1 year |
|---|--------------------------|---------|---------|------------|------------|------------|--------|
| 4 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264417 | 2014.06.07 | 2015.06.06 | 1 year |
| 5 | Passive Voltage Probe | R&S | ESH2-Z3 | 100196 | 2014.06.07 | 2015.06.06 | 1 year |
| 6 | Absorbing clamp | R&S | MOS-21 | 100423 | 2014.06.08 | 2015.06.07 | 1 year |

NOTE: Equipments listed above have been calibrated and are in the period of validation.





5. 47 CFR Part 15C 15.249 Requirements

5.1 SPURIOUS EMISSION TEST

5.1.1 REQUIREMENT

According to FCC section 15.249(a):

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| • | | |
|-----------------------------|--------------------------------------|------------------------------------|
| Fundamental Frequency (MHz) | Field Strength of Fundamental (mV/m) | Field Strength of Harmonics (μV/m) |
| 902-928 | 50 | 500 |
| 2400-2483.5 | 50 | 500 |
| 5725-5875 | 50 | 500 |
| 24000-24250 | 250 | 2500 |

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (μV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 1.705 - 30.0 | 30 | 30 |
| 30 - 88 | 100 | 3 |
| 88 - 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

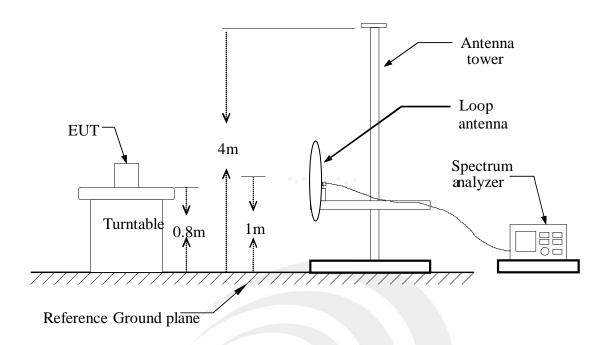
In the above emission table, the tighter limit applies at the band edges.

| Frequency (MHz) | Field Strength (μV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 30 - 88 | 100 | 3 |
| 88 - 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

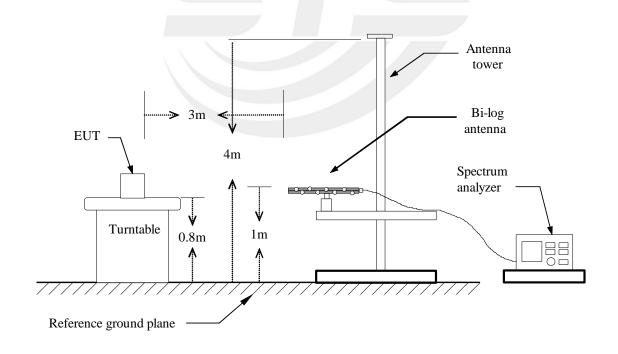


5.1.2 TEST DESCRIPTION

TEST SETUP:

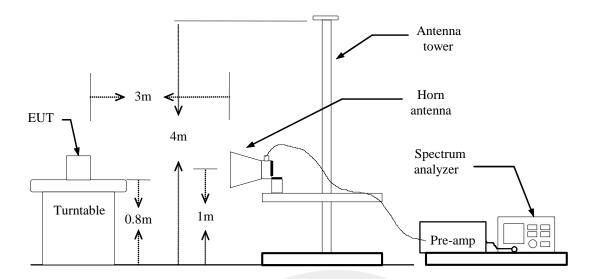


Blow 1GHz:





Above 1GHz:



5.1.3 TEST DESCRIPTION

- 1. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Set the spectrum analyzer in the following setting as:

Below 1GHz: RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

Above 1GHz:(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

- 7. Repeat above procedures until the measurements for all frequencies are complete.
- 8. Determine the spurious emission test using the following equation:

CF= antenna factor (dB) + Cable loss (dB) - amplifier (dB)



5.1.4 TEST RESULT

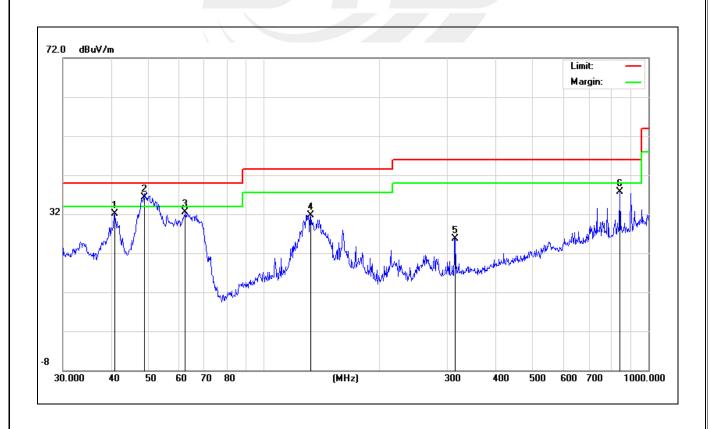
Form 30 MHz to 1GHz:

| EUT: | Smart plug | Model Name. : | PZ-A-02 |
|----------------|-------------|--------------------|------------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase : | Horizontal |
| Test Voltage : | AC 110V | Test Mode: | Running |

| Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | Detector |
|----------|---------------|----------------|--------------|--------|--------|----------|
| MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 40.8444 | 19.58 | 12.44 | 32.02 | 40 | -7.98 | QP |
| 48.8429 | 28.1 | 8.28 | 36.38 | 40 | -3.62 | QP |
| 62.4313 | 27.77 | 4.72 | 32.49 | 40 | -7.51 | QP |
| 132.2204 | 20.48 | 11.28 | 31.76 | 43.5 | -11.74 | QP |
| 314.3765 | 12.23 | 13.4 | 25.63 | 46 | -20.37 | QP |
| 842.1295 | 14.31 | 23.42 | 37.73 | 46 | -8.27 | QP |
| 40.8444 | 19.58 | 12.44 | 32.02 | 40 | -7.98 | QP |

Remark:

- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.



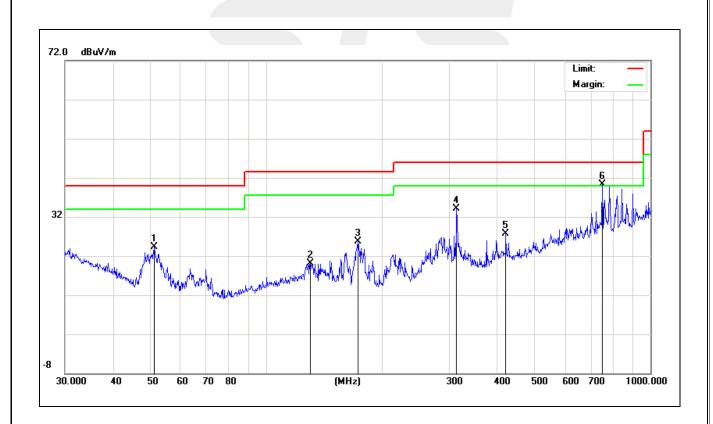


| EUT: | Smart plug | Model Name. : | PZ-A-02 |
|----------------|-------------|--------------------|----------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase : | Vertical |
| Test Voltage : | AC 110V | Test Mode: | Running |

| Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | Detector |
|----------|------------------|-------------------|--------------|--------|--------|----------|
| MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 51.3004 | 17.21 | 7.11 | 24.32 | 40 | -15.68 | QP |
| 130.3788 | 8.83 | 11.27 | 20.1 | 43.5 | -23.4 | QP |
| 173.205 | 16.63 | 9.08 | 25.71 | 43.5 | -17.79 | QP |
| 313.276 | 20.65 | 13.36 | 34.01 | 46 | -11.99 | QP |
| 420.5803 | 11.06 | 16.68 | 27.74 | 46 | -18.26 | QP |
| 750.1082 | 17.87 | 22.5 | 40.37 | 46 | -5.63 | QP |

Remark:

- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.







Above 1 GHz

Operation Mode: CH Low Test Date: Aug. 24, 2014

Temperature: 20°C Humidity: 50 % RH

| Freq. | Ant. Pol | Peak | AV | Ant. / CL | Actu | al Fs | Peak | AV | Peak | AV |
|---------|-------------|---------|---------|--------------|----------|----------|----------|---------|--------|--------|
| (MHz) | H/V | Reading | Reading | CF | Peak | AV | Limit | Limit | Margin | Margin |
| | | (dBuV) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dBuV/m) | (dBuV/m | (dB) | (dB) |
| 2404.89 | Н | 98.52 | 72.04 | 9.64 | 108.16 | 81.68 | 114.00 | 94.00 | -5.84 | -12.32 |
| 4809.57 | Η | 58.93 | 41.30 | -3.64 | 55.29 | 37.66 | 74.00 | 54.00 | -18.71 | -16.34 |
| N/A | | | | | | | | | >20 | >20 |
| | | | | | | Ŧ | | | | |
| 2404.89 | V | 97.29 | 78.03 | 9.62 | 106.91 | 87.65 | 114.00 | 94.00 | -6.35 | -6.35 |
| 4809.57 | V | 56.12 | 39.29 | -3.68 | 52.44 | 35.61 | 74.00 | 54.00 | -21.56 | -18.39 |
| N/A | | | | | | | | | >20 | >20 |

Notes:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Spectrum setting:
 - a. Peak Setting 1GHz 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.





Operation Mode: CH Mid Test Date: Aug. 24, 2014

Temperature: 20°C Humidity: 50 % RH

| Freq. | Ant. Pol | Peak | AV | Ant. / CL | Actu | al Fs | Peak | AV | Peak | AV |
|---------|-------------|---------|---------|--------------|----------|----------|----------|---------|--------|--------|
| (MHz) | H/V | Reading | Reading | CF | Peak | AV | Limit | Limit | Margin | Margin |
| | | (dBuV) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dBuV/m) | (dBuV/m | (dB) | (dB) |
| 2440.42 | Н | 100.86 | 72.37 | 9.51 | 110.37 | 81.88 | 114.00 | 94.00 | -3.63 | -12.12 |
| 4880.80 | Ι | 62.03 | 43.53 | -3.60 | 58.43 | 39.93 | 74.00 | 54.00 | -15.57 | -14.07 |
| N/A | | | | | | | | | >20 | >20 |
| | | | | | | Ŧ | | | | |
| 2440.42 | V | 101.79 | 81.84 | 9.45 | 111.24 | 91.29 | 114.00 | 94.00 | -2.76 | -2.71 |
| 4880.80 | V | 59.26 | 43.56 | -3.68 | 55.58 | 39.88 | 74.00 | 54.00 | -18.42 | -14.12 |
| N/A | | | | | | | | | >20 | >20 |

Notes:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Spectrum setting:
 - a. Peak Setting 1GHz 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.





Operation Mode: CH High Test Date: Aug. 24, 2014

Temperature: 20°C Humidity: 50 % RH

| Freq. | Ant. Pol | Peak | AV | Ant. / CL | Actu | al Fs | Peak | AV | Peak | AV |
|---------|-------------|---------|---------|--------------|----------|----------|----------|---------|--------|--------|
| (MHz) | H/V | Reading | Reading | CF | Peak | AV | Limit | Limit | Margin | Margin |
| | | (dBuV) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dBuV/m) | (dBuV/m | (dB) | (dB) |
| 2480.52 | Η | 97.53 | 78.47 | 9.48 | 107.01 | 87.95 | 114.00 | 94.00 | -6.99 | -6.05 |
| 4961.03 | Ι | 59.20 | 44.75 | -3.52 | 55.68 | 41.23 | 74.00 | 54.00 | -18.32 | -12.77 |
| N/A | | | | | | | | | >20 | >20 |
| | • | • | • | | | - | - | | | |
| 2480.52 | V | 96.97 | 78.38 | 9.42 | 106.39 | 87.80 | 114.00 | 94.00 | -6.20 | -6.20 |
| 4961.03 | V | 57.36 | 41.40 | -3.49 | 53.87 | 37.91 | 74.00 | 54.00 | -20.13 | -16.09 |
| N/A | | | | | | | | | >20 | >20 |

Notes:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Spectrum setting:
 - a. Peak Setting 1GHz 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.

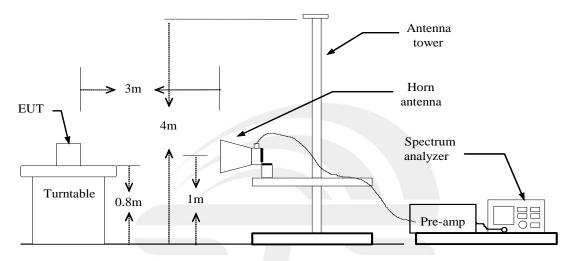


5.2 BAND EDGE

5.2.1 REQUIREMENT

According to FCC section 15.249(a), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.2.2 TEST DESCRIPTION



5.2.3 TEST RESULT

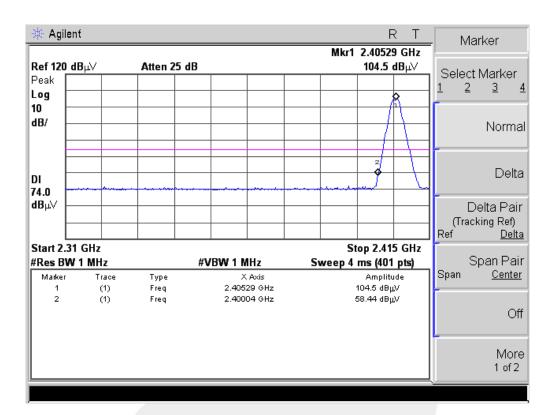
The EUT operates at hopping-off test mode. The lowest and highest channels are tested to verify the band edge emissions.

| Test Channel | Frequency(MHz) | Peak Reading (dBuV) | Av Reading (dBuV) | Peak Limit (dBuV/m) | Av Limit (dBuV/m) |
|--------------|----------------|---------------------|-------------------|------------------------|----------------------|
| CH00 | 2405 | 58.44 | 38.36 | 74 | 54 |
| CH15 | 2475 | 56.6 | 39.93 | 74 | 54 |

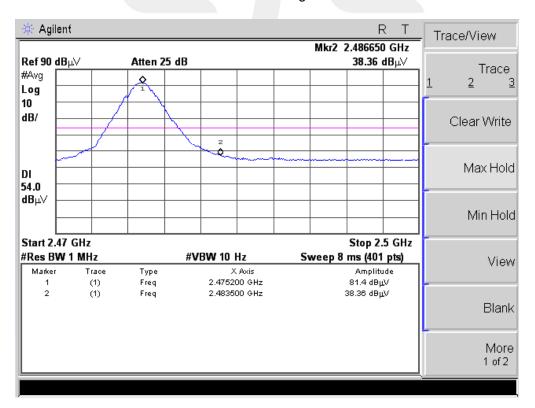
Note: 1. Every data is test both vertical and horizontal polarization and Spectrum Analyzer is max hold.



CH Low Peak

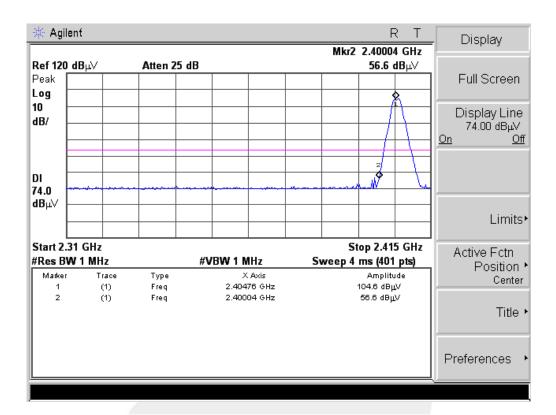


CH Low Avg

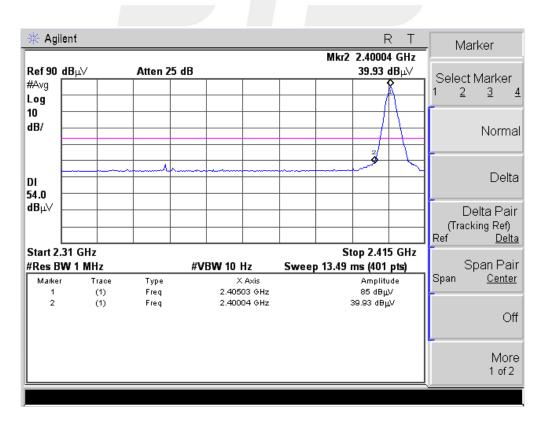




CH High Peak



CH High Avg





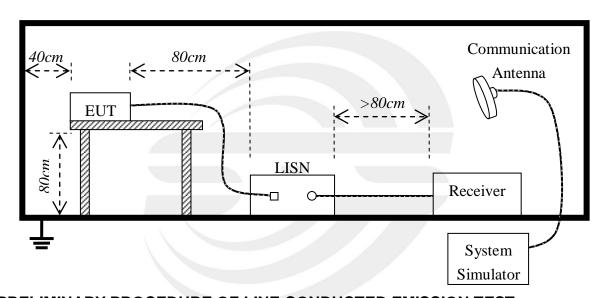
5.3 LINE CONDUCTED EMISSION TEST

5.3.1 LIMITS OF LINE CONDUCTED EMISSION TEST

| Fraguency | Maximum RF | Line Voltage |
|---------------|-------------|----------------|
| Frequency | Q.P.(dBuV) | Average(dBuV) |
| 150kHz-500kHz | 66-56 | 56-46 |
| 500kHz-5MHz | 56 | 46 |
| 5MHz-30MHz | 60 | 50 |

^{**}Note: 1. the lower limit shall apply at the transition frequency.

5.3.2 BLOCK DIAGRAM OF TEST SETUP



5.3.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per FCC Part 15 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per FCC Part 15.
- 3) All I/O cables were positioned to simulate typical actual usage as per FCC Part 15.
- 4) The EUT received DC 5V power by AC/DC adapter which through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5) All support equipments received power from a second LISN supplying power of AC 120V/60Hz, if any.
- 6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.

^{2.} The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz



5.3.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

EUT and support equipment was set up on the test bench as per step 9 of the preliminary test.

A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

The test data of the worst case condition(s) was reported on the Summary Data page.

5.3.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST



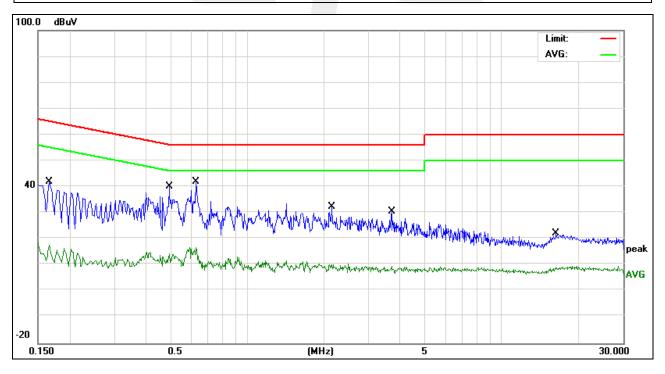


| EUT: | Mobile Phone | Model Name. : | SL320 |
|----------------|-----------------------------------|--------------------|--------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase : | L |
| LEST VOITAGE . | DC 5.0V from adapter AC 230V/50Hz | Test Mode: | Mode 1 |

| No. | Freq. | Level | Factor | Measure -ment | Limit | Over | Detector | |
|-----|---------|-------|--------|------------------|-------|--------|----------|--|
| | MHz | dBuV | dB | dBuV | dBuV | dB | | |
| 1 | 0.166 | 32.27 | 9.59 | 41.86 | 65.15 | -23.29 | QP | |
| 2 | 0.166 | 7.96 | 9.59 | 17.55 | 55.15 | -37.6 | AVG | |
| 3 | 0.494 | 30.62 | 9.51 | 40.13 | 56.1 | -15.97 | QP | |
| 4 | 0.494 | 4.8 | 9.51 | 14.31 | 46.1 | -31.79 | AVG | |
| 5 | 0.63 | 32.56 | 9.52 | 42.08 | 56 | -13.92 | QP | |
| 6 | 0.63 | 7.2 | 9.52 | 16.72 | 46 | -29.28 | AVG | |
| 7 | 2.154 | 22.78 | 9.55 | 32.33 | 56 | -23.67 | QP | |
| 8 | 2.154 | 0.51 | 9.55 | 10.06 | 46 | -35.94 | AVG | |
| 9 | 3.698 | 20.83 | 9.58 | 30.41 | 56 | -25.59 | QP | |
| 10 | 3.698 | -0.05 | 9.58 | 9.53 | 46 | -36.47 | AVG | |
| 11 | 16.3539 | 12.14 | 9.97 | 22.11 | 60 | -37.89 | QP | |
| 12 | 16.3539 | -0.68 | 9.97 | 9.29 | 50 | -40.71 | AVG | |

Remark:

- All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.



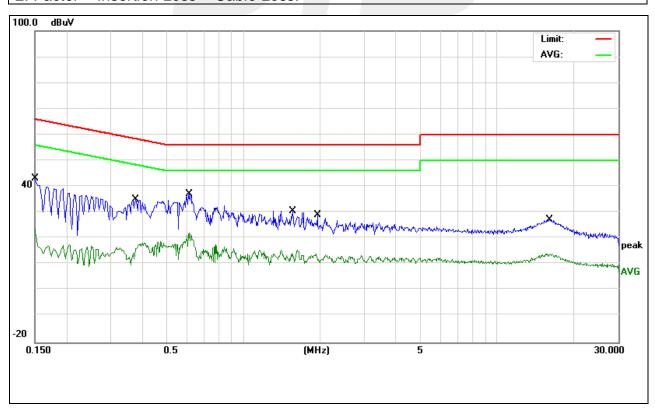


| EUT: | Mobile Phone | Model Name. : | SL320 |
|--------------|-----------------------------------|--------------------|--------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase : | N |
| | DC 5.0V from adapter AC 230V/50Hz | Test Mode : | Mode 1 |

| No. | Freq. | Reading Level | Correct Factor | Measure -ment | Limit | Over | Detector |
|-----|---------|------------------|-------------------|------------------|-------|--------|----------|
| | MHz | dBuV | dB | dBuV | dBuV | dB | |
| 1 | 0.15 | 33.59 | 9.66 | 43.25 | 65.99 | -22.74 | QP |
| 2 | 0.15 | 14 | 9.66 | 23.66 | 55.99 | -32.33 | AVG |
| 3 | 0.374 | 25.56 | 9.52 | 35.08 | 58.41 | -23.33 | QP |
| 4 | 0.374 | 7.41 | 9.52 | 16.93 | 48.41 | -31.48 | AVG |
| 5 | 0.61 | 27.66 | 9.53 | 37.19 | 56 | -18.81 | QP |
| 6 | 0.61 | 12.56 | 9.53 | 22.09 | 46 | -23.91 | AVG |
| 7 | 1.562 | 21.09 | 9.56 | 30.65 | 56 | -25.35 | QP |
| 8 | 1.562 | 4.79 | 9.56 | 14.35 | 46 | -31.65 | AVG |
| 9 | 1.95 | 19.47 | 9.57 | 29.04 | 56 | -26.96 | QP |
| 10 | 1.95 | 4.47 | 9.57 | 14.04 | 46 | -31.96 | AVG |
| 11 | 16.1139 | 17.43 | 9.91 | 27.34 | 60 | -32.66 | QP |
| 12 | 16.1139 | 4.28 | 9.91 | 14.19 | 50 | -35.81 | AVG |

Remark:

- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.



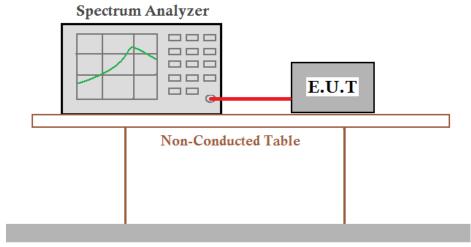


5.4 20dB Bandwidth

5.4.1 Definition

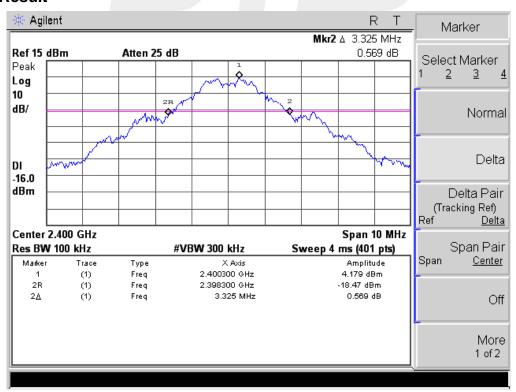
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific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

5.4.2 Test Description



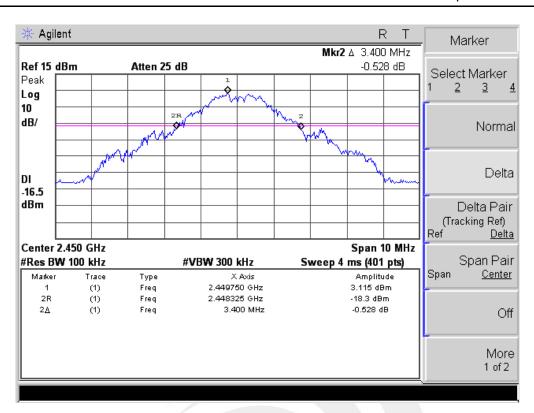
Ground Reference Plane

5.4.3 Test Result

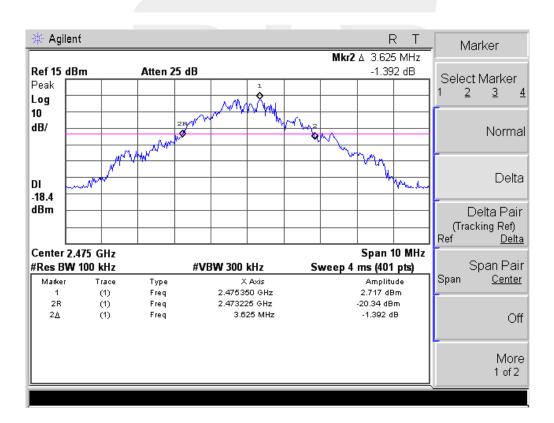


(CH Low)





(CH Mid)



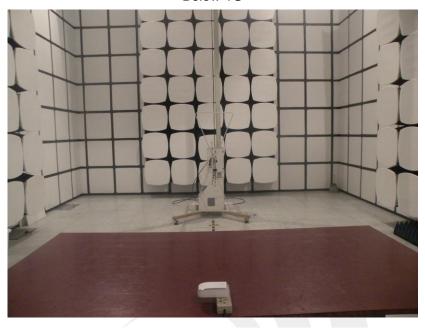
(CH High)



APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

RE TEST SETUP





ABOVE 1G





CE Test Setup

