# *EMC TEST REPORT*

**Reference No.** : WT11062647-F-E-E

**Applicant** : GlobTek, Inc.
**Address** : 186 Veterans Dr. Northvale, NJ 07647 USA.

**Equipment Under Test (EUT) :**

Product Name : Switching Power Adaptor
Model No : GT-81090 series (more details refer to 3.3 model list)

**Standards** : EN 55022: 2006 +A1: 2007
EN 55024: 1998+A1: 2001+A2: 2003
EN 61000-3-2: 2006+A1:2009+A2:2009
EN 61000-3-3: 2008

**Date of Test** : June 1~9, 2011

**Project Engineer** : Andy wu

**Reviewed By** : Philo.Zhong

| | |
|---|---|
| **Test Result :** | **PASS *** |

**Prepared By:**
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* The sample detailed above has been tested to the requirements of Council Directives 2004/108/EC. The test results have been reviewed against the Directives above and found to meet their essential requirements.

# 1 Test Summary

| Test | Test Requirement | Test Method | Class / Severity | Result |
|---|---|---|---|---|
| Mains Terminal Disturbance Voltage, 150kHz to 30MHz | EN 55022:2006 +A1:2007 | EN 55022:2006 +A1:2007 | Class B | PASS |
| Radiation Emission, 30MHz to 1000MHz | EN 55022:2006 +A1:2007 | EN 55022:2006 +A1:2007 | Class B | PASS |
| Harmonic Emission, 100Hz to 2kHz | EN 61000-3-2:2006+A1:2009 +A2:2009 | EN 61000-3-2:2006+A1:2009 +A2:2009 | Clause 7 of EN61000-3-2 | N/A |
| Flicker Emission on AC | EN 61000-3-3 :2008 | EN 61000-3-3 :2008 | Clause 5 of EN61000-3-3 | PASS |
| ESD | EN 55024 : 1998 +A1:2001+A2:2003 | EN 61000-4-2:2009 | Contact Air | PASS |
| Radiated Immunity (80MHz to 1GHz) | EN 55024 : 1998 +A1:2001+A2:2003 | EN 61000-4-3:2006 | 3V/m, 80%, 1kHz, Amp. Mod. | PASS |
| Electrical Fast Transients (EFT) on AC | EN 55024 : 1998 +A1:2001+A2:2003 | EN 61000-4-4:2004 | AC±1.0kV DC±0.5kV | PASS |
| Surge Immunity on AC | EN 55024 : 1998 +A1:2001+A2:2003 | EN 61000-4-5:2006 | ±1kV D.M.† ±2kV C.M.‡ | PASS |
| Injected Currents on AC, 150kHz to 80MHz | EN 55024 : 1998 +A1:2001+A2:2003 | EN61000-4-6:2009 | 3Vrms(emf), 80%, 1kHz Amp. Mod. | PASS |
| Power-frequency magnetic field | EN 55024 : 1998 +A1:2001+A2:2003 | EN 61000-4-8:2010 | 1A/m | PASS |
| Voltage Dips and Interruptions on AC | EN 55024 : 1998 +A1:2001+A2:2003 | EN 61000-4-11:2004 | ＜5 % $U_T$* for 0.5per ＜5 % $U_T$* for 250per 70 % $U_T$* for 25per | PASS |

**Remark:**

A.M. Amplitude Modulation.

P.M. Pulse Modulation.

† D.M. – Differential Mode.

- $U_T$ is the nominal supply voltage

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# 3 General Information

## 3.1 Client Information

Applicant : GlobTek, Inc.
Address of Applicant : 186 Veterans Dr. Northvale, NJ 07647 USA.

Manufacturer 1 : GlobTek, Inc.
Address of Manufacturer 1: 186 Veterans Dr. Northvale, NJ 07647 USA.
Manufacturer 2: GlobTek (Suzhou) Co., Ltd.
Address of Manufacturer 2: Building 4, No. 76, Jin Ling East Rd., Suzhou Industrial Park, Suzhou,JiangSu 215021, China.

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

Product Name : Switching Power Adaptor
Model No. : GT-81090 series (more details refer to 3.3 model list)
Remark : The models GT-81090-067.5-2.3-W2E-USB,GT-81090-067.5-W2E-USB, GT-81090-067.5-2.3-WR2E-USB, GT-81090-067.5-WR2E-USB, GT-81090-0612-4.0-W2E and GT-81090-0612-W2E are the test samples.But the models GT-81090-067.5-W2E-USB and GT-81090-0612-W2E were the worse. So the two models' test datas were shown below.

## 3.3 Details of E.U.T.

Model list

| Model | Input | Output voltage | Output current | Max.Power |
|---|---|---|---|---|
| GT-81090-WW7.5-X.X-W2Z-USB | 100-240Vac,50/60Hz | 5-7.5V | Max 1A | Max.5.2W |
| GT-81090-WW7.5-X.X-WR2Z-USB | 100-240Vac,50/60Hz | 5-7.5V | Max 1A | Max.5.2W |
| GT-81090-WW12-X.X-W2Z-USB | 100-240Vac,50/60Hz | 8-12V | Max 0.75A | Max.6W |
| GT-81090-WW12-X.X-W2Z | 100-240Vac,50/60Hz | 8-12V | Max 0.75A | Max.6W |

Remark：GT-81090-WWVV-X.X-W2Zseries/GT-81090-WWVV-X.X-W2Z-USB series/GT-81090-WWVV-X.X-WR2Z-USB series:

WW is the standard output wattage, with a maximum value of "6"

VV is the standard rated output voltage designation, with a maximum value of "12";

-X.X is optional or blank and denotes the output voltage differentiator, subtracting or adding X.X volts from standard output voltage VV in 0.1V increments, blank is to indicate the no voltage different.

"Z" designates type of plug and can be E for European plug, U for British plug, blank for North American / Japan plug/Taiwan plug, C for Chinese plug, I for India plug, A for Australia plug, K for Korea plug, AR for Argentina plug.

## 3.4 Description of Support Units

The EUT has been tested as an independent unit. All the tests were performed in the condition of AC 230V/50Hz.

## 3.5 Standards Applicable for Testing

The customer requested EMC tests for a Switching Power Adaptor. The standards used were EN55022, EN61000-3-2, EN61000-3-3 for emissions & EN55024 for immunity.

.

**Table 1 : Tests Carried Out Under EN 55022: 2006+A1:2007**

| Standard | | Status |
|---|---|---|
| EN 55022:2006+A1:2007 | Radiation Emission, 30MHz to 1000MHz | √ |
| EN 55022:2006+A1:2007 | Mains Terminal Disturbance Voltage,150KHz to 30MHz | √ |

**Table 2 : Tests Carried Out Under EN 61000-3-2: 2006+A1:2009+A2:2009& EN 61000-3-3: 2008**

| | | |
|---|---|---|
| EN 61000-3-2: 2006+A1:2009+A2:2009 | Harmonics Emissions on AC | x |
| EN 61000-3-3: 2008 | Flicker Emissions on AC | √ |

**Table 3 : Tests Carried Out Under EN 55024:1998+A1:2001+A2: 2003**

| Standard | | Status |
|---|---|---|
| EN 61000-4-2:2009 | Electro-static discharge | √ |
| EN 61000-4-3:2006 | Radio frequency EM fields (80MHz to 1GHz) | √ |
| EN 61000-4-4:2004 | Fast transients | √ |
| EN 61000-4-5:2006 | Surges | √ |
| EN 61000-4-6: 2009 | Radio frequency continuous conducted (150kHz to 80MHz) | √ |
| EN 61000-4-8:2010 | Power-frequency magnetic field (50Hz) | √ |
| EN 61000-4-11:2004 | Voltage dips & interruptions | √ |

√ Indicates that the test is applicable

× Indicates that the test is not applicable

## 3.6 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

  Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, Aug .03, 2010.

- **FCC – Registration No.: 880581**

  Waltek Services(Shenzhen) 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 880581, May 26, 2011.

## 3.7 Test Location

All the tests were performed at:-
Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China.

# 4 Equipment Used during Test

| Equipment Name | Model | Equipment No | Specification | Cal. Date | Due Date | Cert. No | Uncertainty |
|---|---|---|---|---|---|---|---|
| EMC Analyzer | Agilent/ E7405A | MY45114943 | 9K-26.5GHz | 2010-8-3 | 2011-8-3 | WWM20100587 | ±1dB |
| Test Receiver | ROHDE&SCHWARZ/ ESPI | 101155 | 9KHz-3GHz | 2010-8-3 | 2011-8-3 | WWM20100588 | ±1dB |
| Test Receiver | ROHDE&SCHWARZ/ ESCI | 100947 | 9KHz-3GHz | 2010-8-3 | 2011-8-3 | WWM20100589 | ±1dB |
| Digital Power Analyzer | Em Test AG/Switzerland / DPA 500 | V0745103095 | Power:2000VA Vol-range:0-300V Freq_range:10-80Hz | 2010-8-3 | 2011-8-3 | WWD20101078 | Voltage distinguish: 0.025% Power:freq distingish: 0.02Hz |
| Power Source | Em Test AG/Switzerland /ACS 500 | V0745103096 | Vol-range:0-300V Freq_range:10-80Hz | 2010-8-3 | 2011-8-3 | WWD20101078 | Voltage distinguish: 0.025% Power:freq distingish: 0.02Hz |
| Electrostatic Discharge Simulator | Em Test AG/Switzerland / DITO | V0745103094 | Contact discharge: 500V-10KV Air discharge: 500V-16.5KV | 2010-8-3 | 2011-8-3 | WWM20100586 | 7.5A Current Will be changed in Vm=1.5V |
| RF Generator | TESEQ GmbH/NSG4070 | 25781 | Fraq-range: 9K-1GHz RF voltage: -60dB to 10dB | 2010-8-3 | 2011-8-3 | WWM20100590 | Power_freq distinguish: 0.1Hz Rfeletricity distinguish:0.1dB |
| ALL Modules Generator | SCHAFFNER/ 6150 | 34579 | Voltage:200V-4.4KV Cuttent:100A-2.2KA | 2010-8-3 | 2011-8-3 | WWM20100591 | Voltage:±10% Pulse Cuttent:±10% |
| AC Power Supply | Beijing hengyuan/ DTDGC-4 | W2008020 | Voltage: 0-250V Current: 0-20A | 2010-8-3 | 2011-8-3 | WWM20100592 | ACV:0.06% ACA:0.15% |
| Trilog Broadband Antenna | SCHWARZBECK MESS-ELEKTRONIK/ VULB9163 | 336 | 25-3000MHz | 2009-8-20 | 2010-8-19 | XDdj2009-2658 | ±1dB |
| Two-Line V-Network | ROHDE&SCHWARZ/ ENV216 | 100115 | 9KHz-3GHz | 2010-8-3 | 2011-8-3 | WWC20100909 | ±10% |
| Absorbing Clamp | ROHDE&SCHWARZ/ MDS-21 | 100205 | impandance 50 ohm Loss:17dB | 2010-8-3 | 2011-8-3 | WWC20100901 | ±1dB |
| V-LISN | SCHWARZBECK MESS-ELEKTRONIK/ NSLK 8128 | 8128-259 | 9KHz-3GHz | 2010-8-3 | 2011-8-3 | WWC20100903 | ±10% |

| Equipment Name | Model | Equipment No | Specification | Cal. Date | Due Date | Cert. No | Uncertainty |
|---|---|---|---|---|---|---|---|
| Attenuator 6dB | TESEQ GmbH/ ATN6050 | 25376 | Attenuator 6dB | 2010-8-3 | 2011-8-3 | WWC20100904 | Attenuation:0.2dB |
| Magnetic Field Probe 100cm² | Narda safety TEST Solutions/ ELT-400 | M-1070 | Test freq range: 1-400KHz | 2010-8-3 | 2011-8-3 | WWD20101072 | 1-10 Hz:16.2% 10-120Hz:2.2% 120-400Hz:4.7% |
| Voltage Probe | SCHWARZBECK MESS-ELEKTRONIK/ TK 9420 | 9420-328 | 9K-30MHz | 2010-8-3 | 2011-8-3 | WWC20100905 | Insertion Loss:<±0.5dB |
| Loop Antenna | Laplace/ RF300 | 9057 | Diameter:2m | 2010-8-3 | 2011-8-3 | WWD20101079 | U=2Db,K=2 |
| CDN M-Type | TESEQ GmbH/ CDN M016 | 25112 | Voltage correct factor: 9.5dB | 2010-8-3 | 2011-8-3 | WWC20100906 | 1.5K-80MHz:±1dB 80-230MHz:-2--+3dB |
| EM-Clamp | TESEQ GmbH/ KEMZ 801 | 25453 | Freq_range: 0.15-1000MHz | 2010-8-3 | 2011-8-3 | WWC20100902 | 0.3-400MHz:±4dB Other freq:±5dB |
| Attenuator | | 61115-001-0024 | 9KHz-30MHz | 2010-8-3 | 2011-8-3 | WWC20100910 | |
| Capacitive Coupling Clamp | SCHAFFNER/ CDN 8014 | 25311 | Max.permissible burst voltage:8KV Typical coupling capacitance:100pF | 2010-8-3 | 2011-8-3 | WWC20100907 | Urel:1.5%,k=2 |
| Signal and Data Line Coupling Network | SCHAFFNER/ CDN 117 | 25627 | 1.2/50μS | 2010-8-3 | 2011-8-3 | WWC20100908 | Urel:1.0%,k-2 |
| Audio Generator | GIIIINSTEK/ GAG-809 | EH831261 | Freq range: 10Hz-1MHz Output Resistance: 600Ω | 2010-8-3 | 2011-8-3 | WWS20100845 | Freq: ±(3%+1Hz) |
| Digital Multimeters | FLUKE/15B | 98760784 | Voltage:AC/DC 4mV-1000V Current:AC/DC40 mA-10A Resistor:400Ω-40MΩ | 2010-8-3 | 2011-8-3 | DBS2010-736 | DCV Urel=0.1% ACV Urel=0.2% DCA Urel=0.2% ACA Urel=0.2% OHM Urel=0.2% K=2 |
| Digital Multimeters | FLUKE/15B | 98750790 | Voltage:AC/DC 4mV-1000V Current:AC/DC40 mA-10A Resistor:400Ω-40MΩ | 2010-8-3 | 2011-8-3 | DBS2010-735 | DCV Urel=0.1% ACV Urel=0.2% DCA Urel=0.2% ACA Urel=0.2% OHM Urel=0.2% K=2 |
| Thermo meter | KTJ/TA218B | TA218B | TemperatureRange: -10ºC to 60ºC Humidity Range: 25%RH to 98%RH | 2010-8-3 | 2011-8-3 | RSD20103126 | Humidity: U=3%RH(K=2) Temperature: U=1ºC(K=2) |

| Equipment Name | Model | Equipment No | Specification | Cal. Date | Due Date | Cert. No | Uncertainty |
|---|---|---|---|---|---|---|---|
| Thermo meter | KTJ/TA218B | TA218B | TemperatureRange: -10ºC to 60ºC Humidity Range: 25%RH to 98%RH | 2010-8-3 | 2011-8-3 | RSD20103127 | Humidity: U=3%RH(K=2) Temperature: U=1ºC(K=2) |
| Broad-Band Horn Antenna 1-18GHz | SCHWARZBECK MESS-ELEKTRONIK/ BBHA 9120D | 667 | 1-18GHz | 2010-7-15 | 2011-7-15 | 2PB10000125-0001 | f<10GHz: ±1dB 10GHz<f<18GHz: ±1.5dB |
| Broadband Preamplifier 0.5-18 GHz | SCHWARZBECK MESS-ELEKTRONIK/ BBV 9718 | 9718-147 | 0.5-18GHz | 2010-7-19 | 2011-7-19 | 2PB10000125-0002 | ±1.2dB |
| Oscilloscope | TDS3032B | B401960 | 0-300MHz | 2010-11-8 | 2011-11-8 | DZ201023152398 8 | Vertical deflection：+0.4% Scanning time：+0.3% |

# 5 Emission Test Results

## 5.1 Mains Terminals Disturbance Voltage, 150kHz to 30MHz

Test Requirement: EN 55022 Class B
Test Method: EN 55022 Class B
Test Result: PASS
Frequency Range: 150kHz to 30MHz
Class/Severity: Class B
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
Quasi-Peak & Average if maximised peak within 6dB of Average Limit

### 5.1.1 E.U.T. Operation

Operating Environment:
Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 1012 mbar

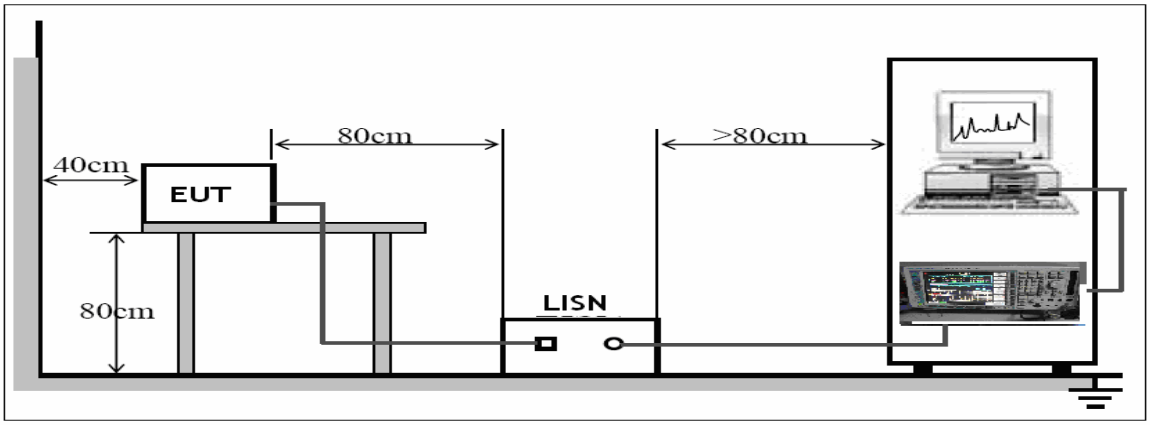
EUT Operation :

Compliance test was performed in full load,half load and no load mode.The full load is the worst,so the test datas only shown the full load mode.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

### 5.1.2 Conducted Test Setup

The conducted emission tests were performed using the setup accordance with the EN 55022:2006+A1:2007, The specification used in this report was the EN 55022:2006+A1: 2007 Paragraph 5 limits.



### 5.1.3 Measurement Data

An initial pre-scan was performed on the live and neutral lines.

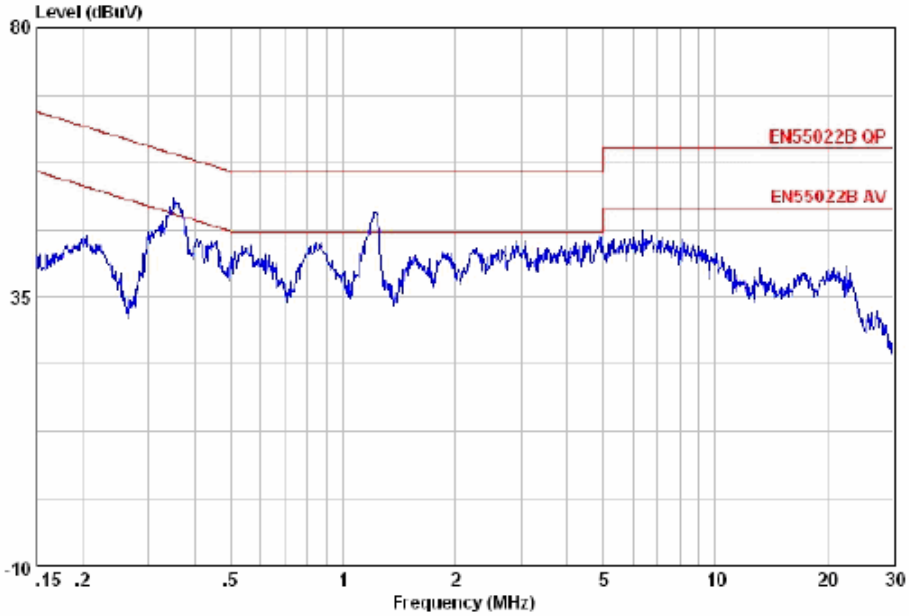
No futher quasi-peak or average measurements were performed since no peak emissions were detected within 10dB line below the average limit.

Please refer to the following peak scan graph for reference.

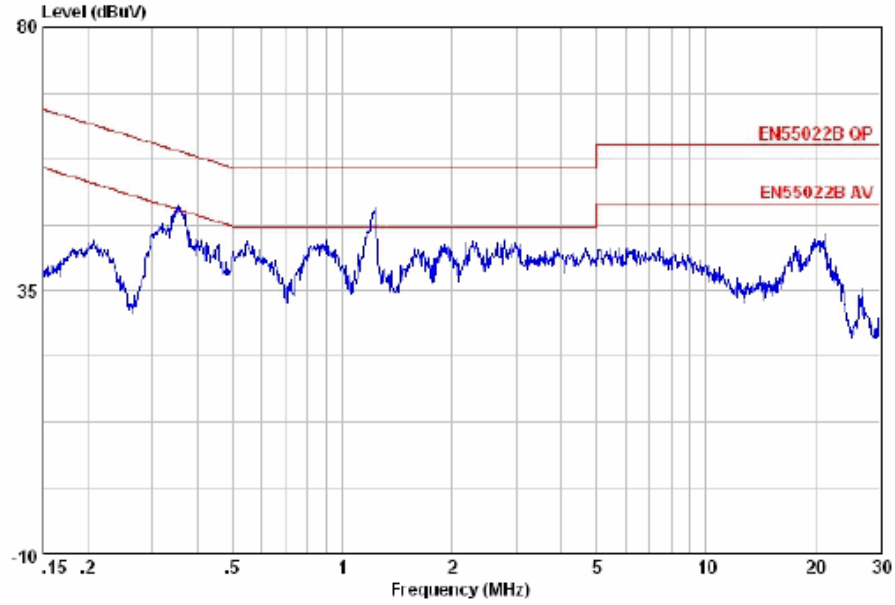
### 5.1.4 Conducted Emissions Test Data

Model: GT-81090-067.5-W2E-USB

Live Line:

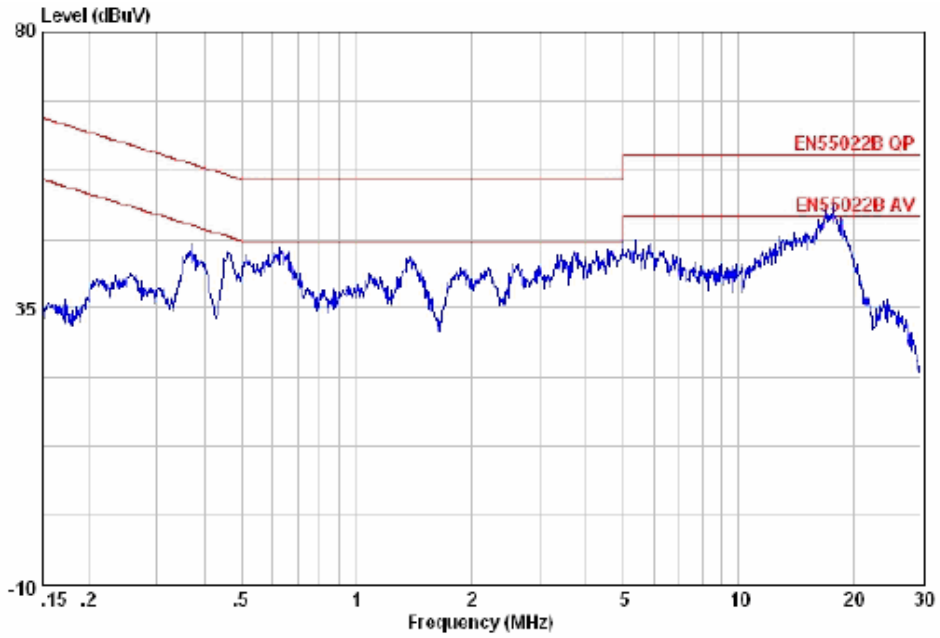



Neutral Line

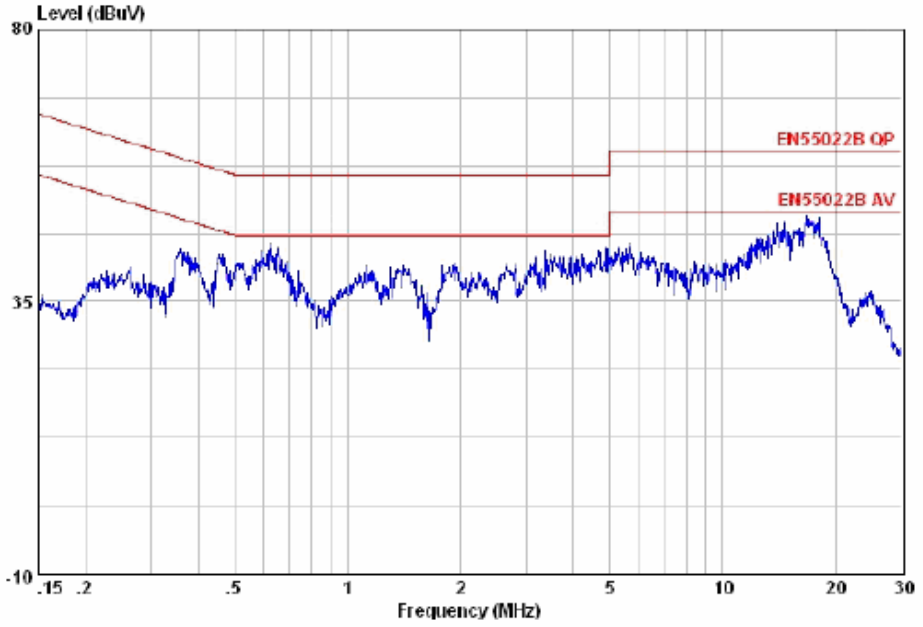


Model: GT-81090-0612-W2E

Live Line:




Neutral Line:



### 5.1.5 Photograph– Mains Terminal Disturbance Voltage on AC Test Setup

## 5.2 Radiation Emission Data

| | |
|---|---|
| Test Requirement: | EN 55022 Class B |
| Test Method: | EN 55022 Class B |
| Test Result: | PASS |
| Frequency Range: | 30MHz to 1000MHz |
| Class/Severity: | Class B |
| Detector: | Peak for pre-scan (120KHz Resolution Bandwidth)<br>Quasi-Peak & Average if maximised peak within 6dB of Average Limit |

### 5.2.1 E.U.T. Operation

Operating Environment:

| | |
|---|---|
| Temperature: | 25.5 °C |
| Humidity: | 51 % RH |
| Atmospheric Pressure: | 1012 mbar |

EUT Operation :

Compliance test was performed in full load,half load and no load mode.The full load is the worst,so the test datas only shown the full load mode.

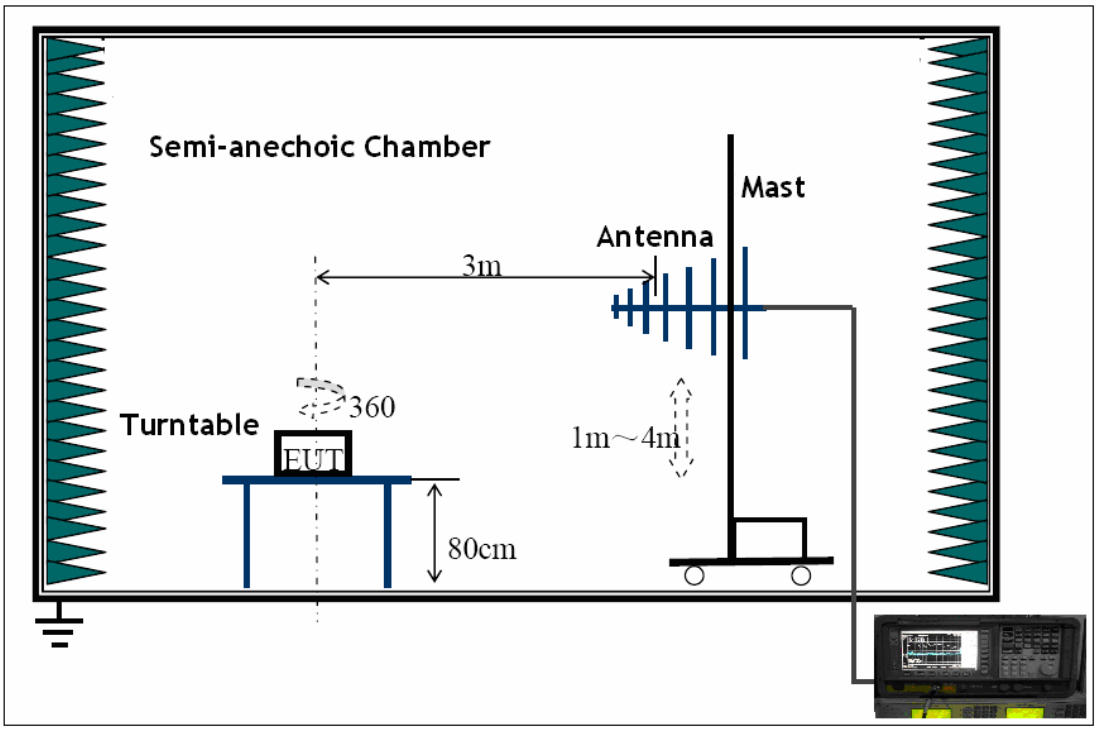
### 5.2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek EMC Lab is ±5.03 dB.

### 5.2.3 Radiated Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the EN 55022:2006+A1:2007, The specification used in this report was the EN 55022:2006+A1:2007Paragraph 6 limits.




### 5.2.4 Spectrum Analyzer Setup

According to EN55022 Class B Rules, the system was tested to 1000 MHz.

Start Frequency.....30 MHz
Stop Frequency.....1000 MHz
Sweep Speed Auto
IF Bandwidth.....120KHz
Video Bandwidth.....100KHz
Quasi-Peak Adapter Bandwidth .....120 KHz
Quasi-Peak Adapter Mode .....Normal
Resolution Bandwidth .....100KHz

### 5.2.5 Test procedure

For the radiated emissions test, maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within +/-4 dBμV of specification limits), and are distinguished with a "**Qp**" in the data table.
The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

### 5.2.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Class B Limit

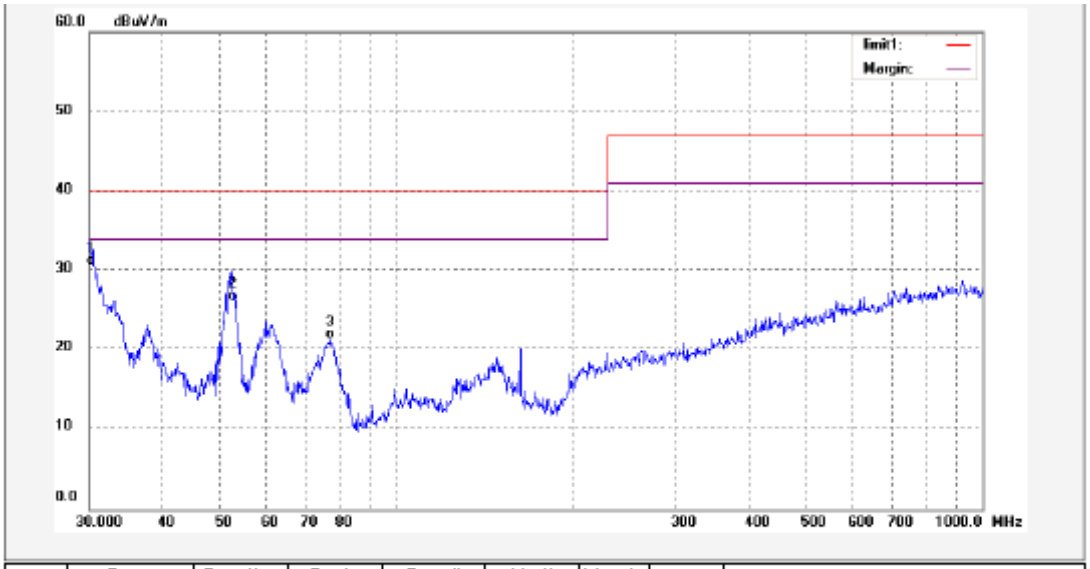
### 5.2.7 Summary of Test Results

According to the data in section 5.2.8, the EUT complied with the EN55022 Class B standards.

### 5.2.8 Radiated Emissions Test Data

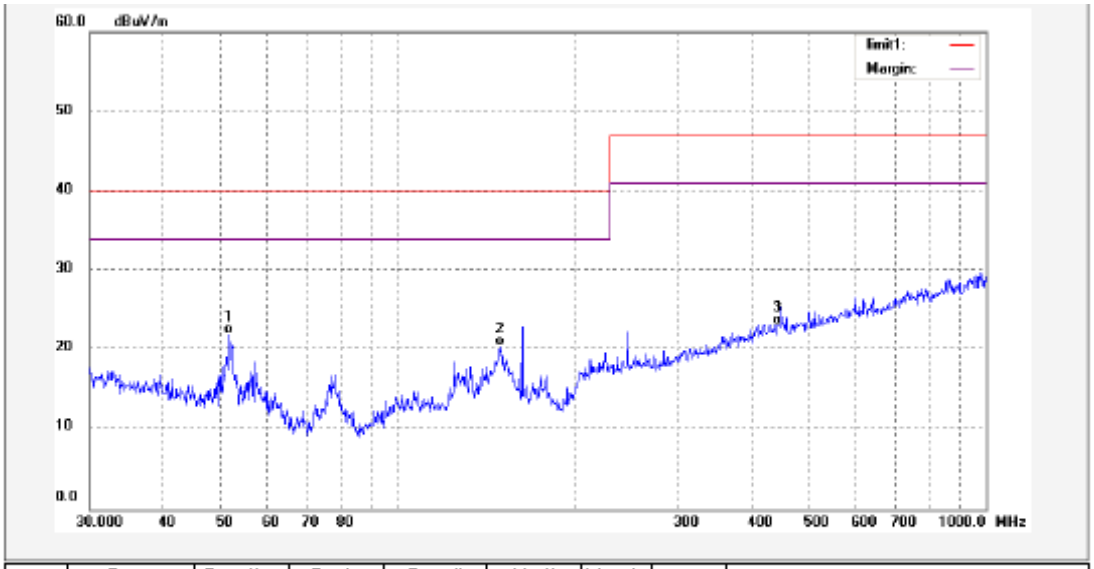
Model: GT-81090-067.5-W2E-USB

Antenna Polarization：Vertical




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 30.0000 | 13.21 | 17.40 | 30.61 | 40.00 | -9.39 | QP | |
| 2 | 52.6345 | 13.01 | 13.16 | 26.17 | 40.00 | -13.83 | QP | |
| 3 | 77.4680 | 12.14 | 9.30 | 21.44 | 40.00 | -18.56 | QP | |

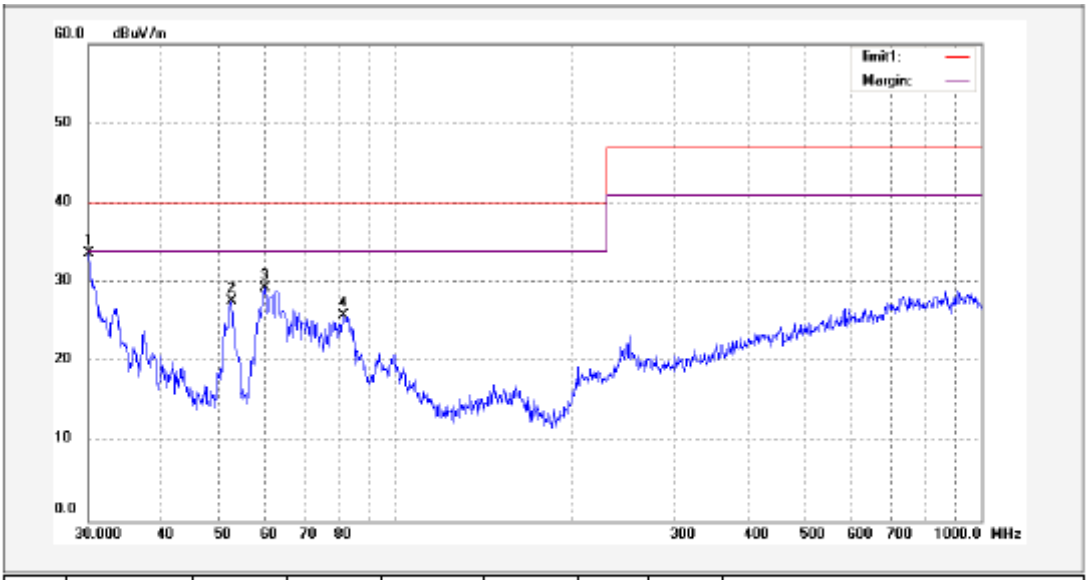
Antenna Polarization：Horizontal




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 51.7179 | 8.54 | 13.42 | 21.96 | 40.00 | -18.04 | QP | |
| 2 | 149.4416 | 6.43 | 14.00 | 20.43 | 40.00 | -19.57 | QP | |
| 3 | 442.5722 | 1.58 | 21.62 | 23.20 | 47.00 | -23.80 | QP | |

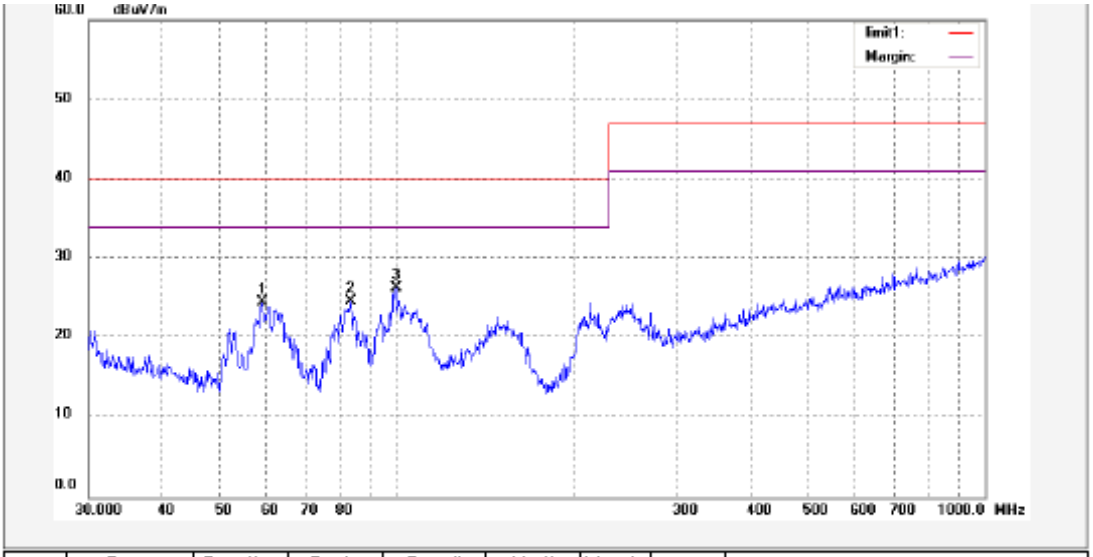
Model: GT-81090-0612-W2E

Antenna Polarization：Vertical



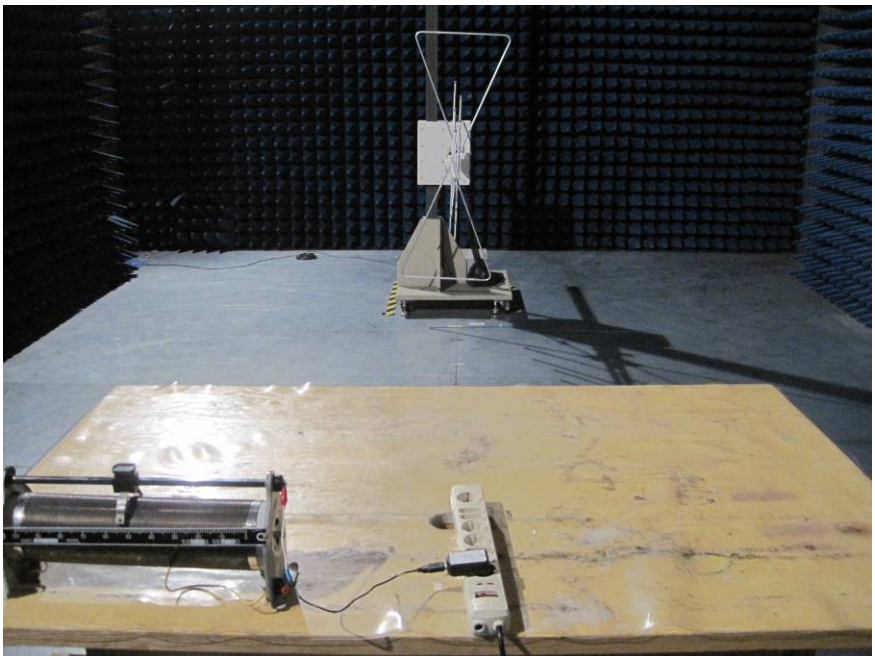

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 30.0000 | 16.34 | 17.40 | 33.74 | 40.00 | -6.26 | peak | |
| 2 | 52.6345 | 14.52 | 13.16 | 27.68 | 40.00 | -12.32 | peak | |
| 3 | 59.9418 | 17.29 | 12.10 | 29.39 | 40.00 | -10.61 | peak | |
| 4 | 81.6604 | 16.63 | 9.26 | 25.89 | 40.00 | -14.11 | peak | |

Antenna Polarization：Horizontal




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 59.1052 | 12.35 | 12.18 | 24.53 | 40.00 | -15.47 | peak | |
| 2 | 83.6937 | 15.18 | 9.45 | 24.63 | 40.00 | -15.37 | peak | |
| 3 | 99.7676 | 13.32 | 13.02 | 26.34 | 40.00 | -13.66 | peak | |

### 5.2.9 Photograph – Radiation Emission Test Setup



## 5.3 Harmonics Test Results

Test Requirement: EN61000-3-2
Test Method: EN61000-3-2
Frequency Range: 100Hz to 2kHz
Test Result: N/A

For further details, please refer to Clause 7, Note 1 of EN61000-3-2 which states:-

"For the following categories of equipment limits are not specified in this edition of the standard.

Note 1: Equipment with a rated power of 75W or less, other than lighting equipment."

## 5.4 Flicker Test

| | |
|---|---|
| Test Requirement: | EN 61000-3-3: 2008 |
| Test Method: | EN 61000-3-3: 2008 |
| Test Result | PASS |

### 5.4.1 E.U.T. Operation

Operating Environment:

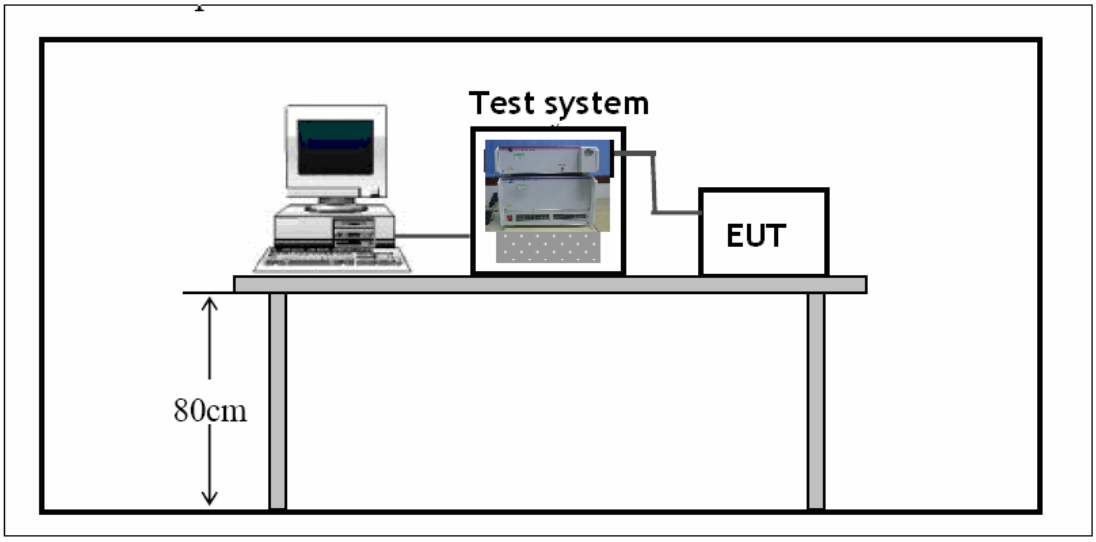
| | |
|---|---|
| Temperature: | 25.5 °C |
| Humidity: | 51 % RH |
| Barometric Pressure: | 1012 mbar |

EUT Operation:

Compliance test was performed in full load mode.

### 5.4.2 Test Setup

The Flicker Test steup accordance with the EN 61000-3-3, The Specification used in this report was the EN61000-3-3 Paragraph 5 limits.



### 5.4.3 Test Data

| Limit / Model | Pst(1.00) | Plt(0.65) | dc [%](3.30) | dmax [%](4.00) | dt [s](0.50) |
|---|---|---|---|---|---|
| GT-81090-067.5-W2E-USB | 0.064 | \ | 0.000 | 0.000 | 0.000 |
| GT-81090-0612-W2E | 0.064 | \ | 0.000 | 0.000 | 0.000 |

### 5.4.4 Photograph- Flicker Test Setup

# 6 Immunity Test Results

## 6.1 Performance Criteria Description

Criterion A: The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Criterion C: Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

**For further details, please refer to EN55024.**

## 6.2 ESD

| | | |
|---|---|---|
| Test Requirement: | EN55024 | |
| Test Method: | EN61000-4-2 | |
| Test Result: | PASS | |
| Discharge Impedance: | 330 Ω / 150 pF | |
| Discharge Voltage: | Air Discharge: | +/- 8 kV |
| | Contact Discharge: | +/- 4 kV |
| | HCP & VCP: | +/- 4 kV |
| Polarity: | Positive & Negative | |
| Number of Discharge: | Minimum 10 times at each test point | |
| Discharge Mode: | Single Discharge | |
| Discharge Period: | 1 second minimum | |

### 6.2.1 E.U.T. Operation

Operating Environment:

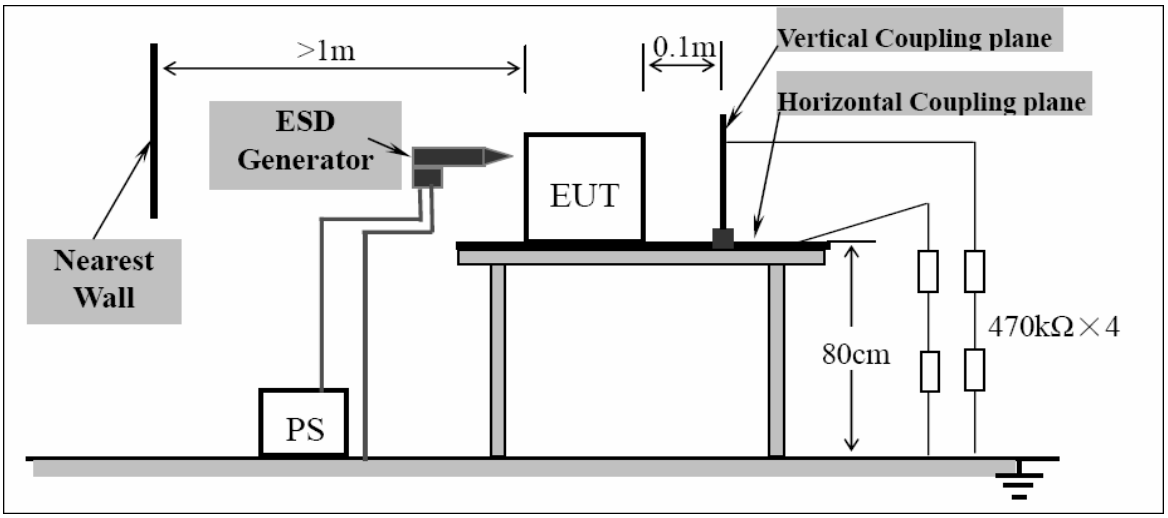
| | |
|---|---|
| Temperature : | 25.5 °C |
| Humidity : | 51 % RH |
| Barometric Pressure : | 1012 mbar |

EUT Operation:

Compliance test was performed in full load mode.

### 6.2.2 ESD Test Setup

The ESD Test steup accordance with the EN 61000-4-2, The Specification used in this report was the EN 55024 Paragraph 4.2 requirements.




### 6.2.3 Direct Application Test Results

**Observations :** Test points : 1. All Exposed Surface & Seams;
2. All metallic part

| Direct Application | | | Test Results | |
|---|---|---|---|---|
| **Discharge Level (kV)** | **Polarity (+/-)** | **Test Point** | **Contact Discharge** | **Air Discharge** |
| 8 | +/- | 1 | N/A | B |
| 4 | +/- | 2 | B | N/A |

**Results**
B: Degradation in the performance of the E.U.T. was observed.
N/A: Not applicable.

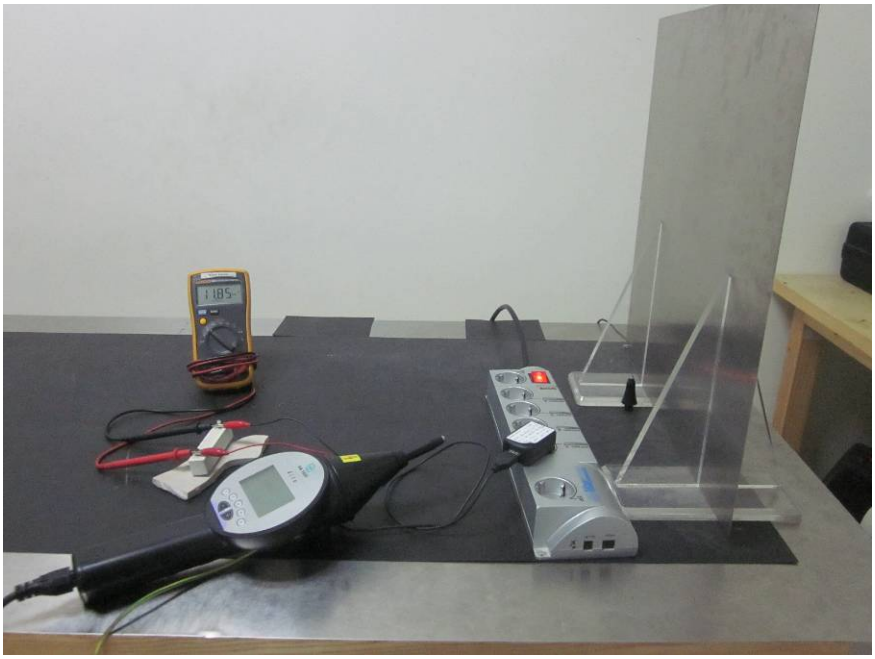
### 6.2.4 Indirect Application Test Results

**Observations :** Test points : 1. All sides.

| Indirect Application | | | Test Results | |
|---|---|---|---|---|
| **Discharge Level (kV)** | **Polarity (+/-)** | **Test Point** | **Horizontal Coupling** | **Vertical Coupling** |
| 4 | +/- | 1 | B | B |

**Results**
B: Degradation in the performance of the E.U.T. was observed.

### 6.2.5 Photograph - ESD Test Setup



## 6.3 Radiated Immunity

| | |
|---|---|
| Test Requirement: | EN55024 |
| Test Method: | EN61000-4-3 |
| Frequency Range: | 80MHz–1GHz |
| Face Under Test: | Three Mutually Orthogonal Faces |
| Severity: | 3V/m, 1kHz, 80% Amp. Mod. from 80MHz to 1GHz |
| Test Result: | PASS |

### 6.3.1 E.U.T. Operation

Operating Environment:

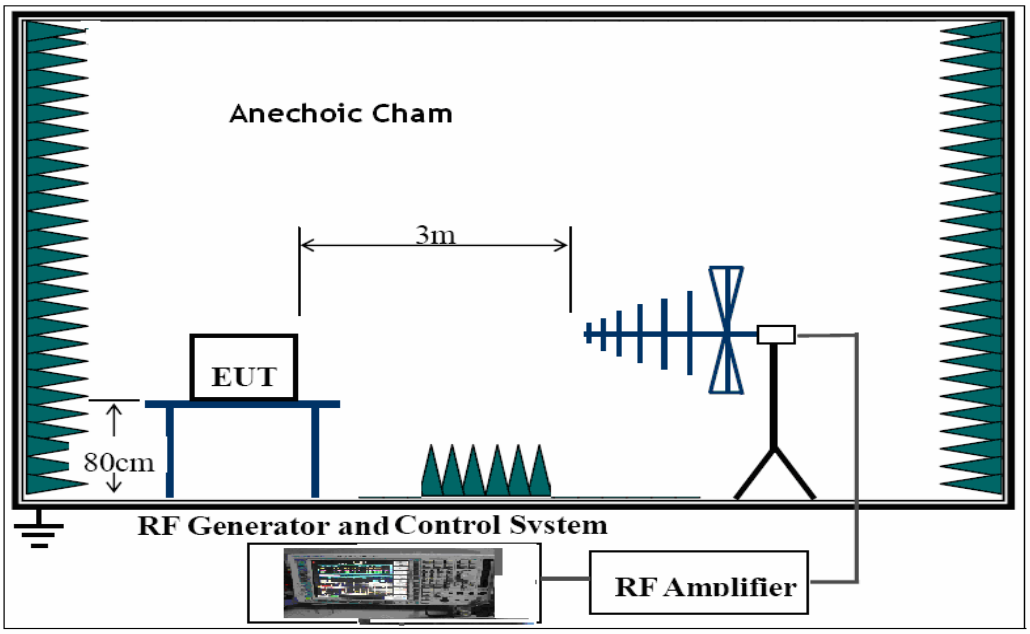
| | |
|---|---|
| Temperature: | 25.5° C |
| Humidity: | 51 % RH |
| Barometric Pressure: | 1012 mbar |

EUT Operation:

Compliance test was performed in full load mode.

### 6.3.2 Radiated Immunity Test Setup

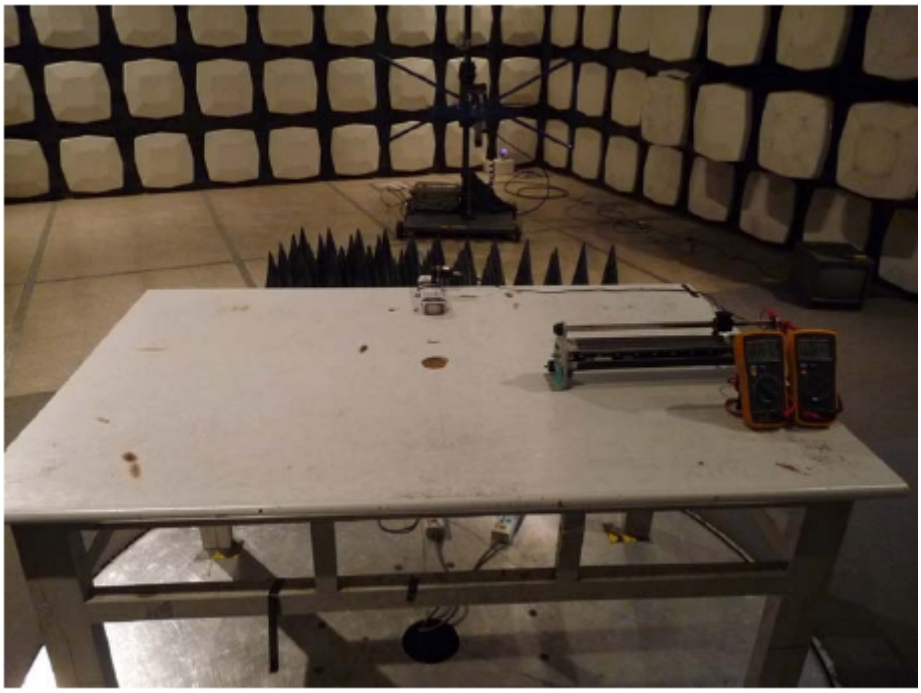
The Radiated Immunity test setup accordance with the EN 61000-4-3, The Specification used in this report was the EN 55024 Paragraph 4.2.3 requirements.



### 6.3.3 Test Results

| Frequency | Level | Modulation | Position | Result | Observations |
|---|---|---|---|---|---|
| 80MHz-1GHz | 3V/m | 1kHz, 80%, Amp. Mod. | Front | Pass | During test and after test, the EUT was normal(A). |
| | | | Right | Pass | |
| | | | Rear | Pass | |
| | | | Left | Pass | |

### 6.3.4 Photograph - Radiated Immunity Test Setup



## 6.4 Electrical Fast Transients (EFT)

Test Requirement: EN 55024
Test Method: EN 61000-4-4
Test Result: PASS
Test Level: 1.0kV on AC
Polarity: Positive & Negative
Repetition Frequency: 5kHz
Burst Duration: 300ms
Test Duration: 2 minutes per level & polarity

### 6.4.1 E.U.T. Operation

Operating Environment:
Temperature: 25.5 °C
Humidity: 51 % RH
Barometric Pressure: 1012 mbar

EUT Operation:

Compliance test was performed in full load mode.

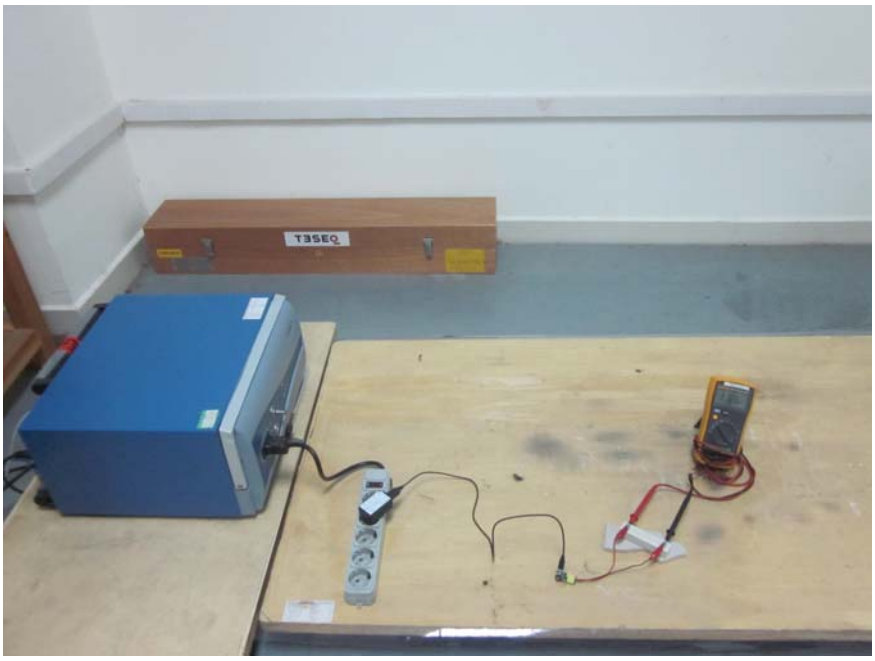
### 6.4.2 Test Results On AC Cable

| Lead under Test | Level (±kV) | Coupling Direct/Clamp | EUT operating mode | Observations (Performance Criterion) |
|---|---|---|---|---|
| L | ±1.0 | Direct | full load | B |
| N | ±1.0 | | | B |
| L-N | ±1.0 | | | B |

**Results**

B: Degradation in the performance of the E.U.T. was observed.

### 6.4.3 Photograph - EFT Test Setup For EUT On AC Cable



## 6.5 Surge

Test Requirement: EN 55024
Test Method: EN 61000-4-5
Test Result: PASS
Test level: ±1kV Live to Neutral
Interval: 60s between each surge
No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

### 6.5.1 E.U.T. Operation

Operating Environment:
Temperature: 25.5 °C
Humidity: 51 % RH
Barometric Pressure: 1012 mbar

EUT Operation:
Compliance test was performed in full load mode.

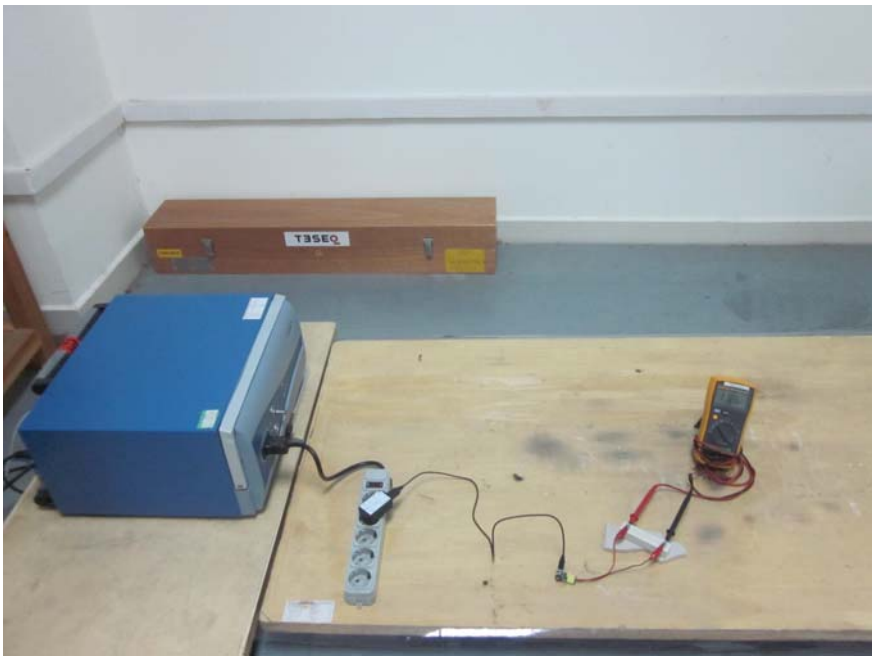
### 6.5.2 Test Results

| Level | Voltage | Poll | Path | Pass | Fail |
|---|---|---|---|---|---|
| 1 | 0.5kV | ± | L-N | / | / |
| 2 | 1kV | ± | L-N | B | / |
| 3 | 2kV | ± | L-PE, N-PE | / | / |
| 4 | 4kV | ± | L-N, L-PE, N-PE | / | / |

**Results**

B: Degradation in the performance of the E.U.T. was observed.

### 6.5.3 Photograph -Surge Test Setup



## 6.6 Conducted Immunity 0.15MHz to 80MHz

Test Requirement: EN 55024
Test Method: EN 61000-4-6
Test Result: PASS
Frequency Range: 0.15MHz to 80MHz
Test level: 3V rms (unmodulated emf into 150 Ω)
Modulation: 80%, 1kHz Amplitude Modulation.

### 6.6.1 E.U.T. Operation

Operating Environment:
Temperature: 25.5° C
Humidity: 51% RH
Barometric Pressure: 1012 mbar

EUT Operation:
Compliance test was performed in full load mode.

### 6.6.2 Test Results AC mains of EUT

| Frequency | Line | Test Level | Modulation | Step Size | Dwell Time | Observation (Performance Criterion) |
|---|---|---|---|---|---|---|
| 150kHz to 80MHz | 2Wire AC Supply Cable | 3Vrms | 80%, 1kHz Amp. Mod. | 1% | 1s | During test and after test,EUT was normal (A). |

**Results**

A: No degradation in the performance of the E.U.T. was observed.

### 6.6.3 Photograph -Conducted Immunity Test Setup On AC Cable

## 6.7 Power-frequency Magnetic Fields

Test Requirement: EN 55024
Test Method: EN 61000-4-8
Test Result: PASS
Test level: 1A/m(r.m.s) for continuous field.

### 6.7.1 E.U.T. Operation

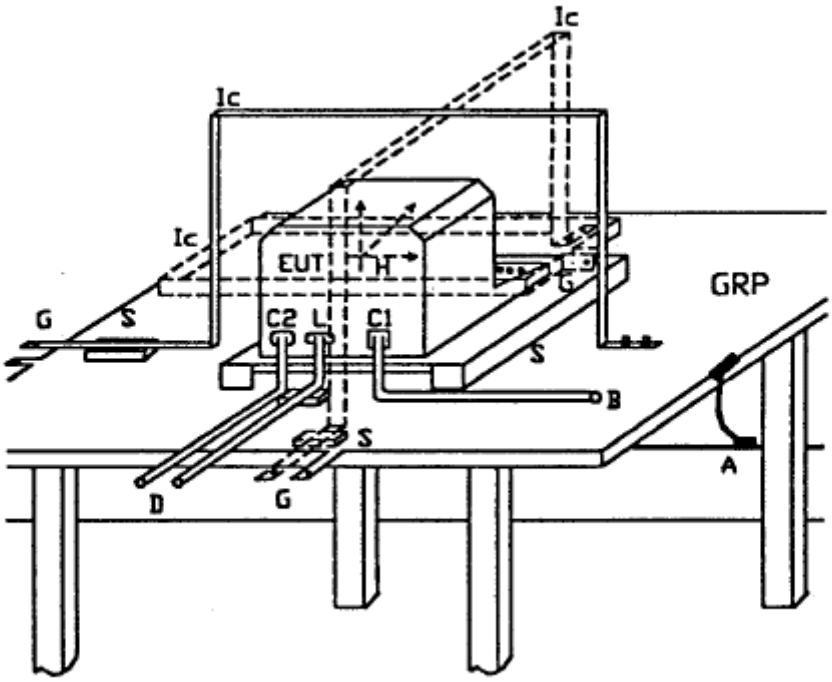
Operating Environment:
Temperature: 25.5 °C
Humidity: 51 % RH
Barometric Pressure: 1012 mbar

EUT Operation:

Compliance test was performed in full load mode.

### 6.7.2 Power-frequency Magnetic Fields Test Setup

The Power-frequency Magnetic Fields test setup accordance with the EN 61000-4-8, The Specification used in this report was the EN 55024 Paragraph 4.2.4 requirements.

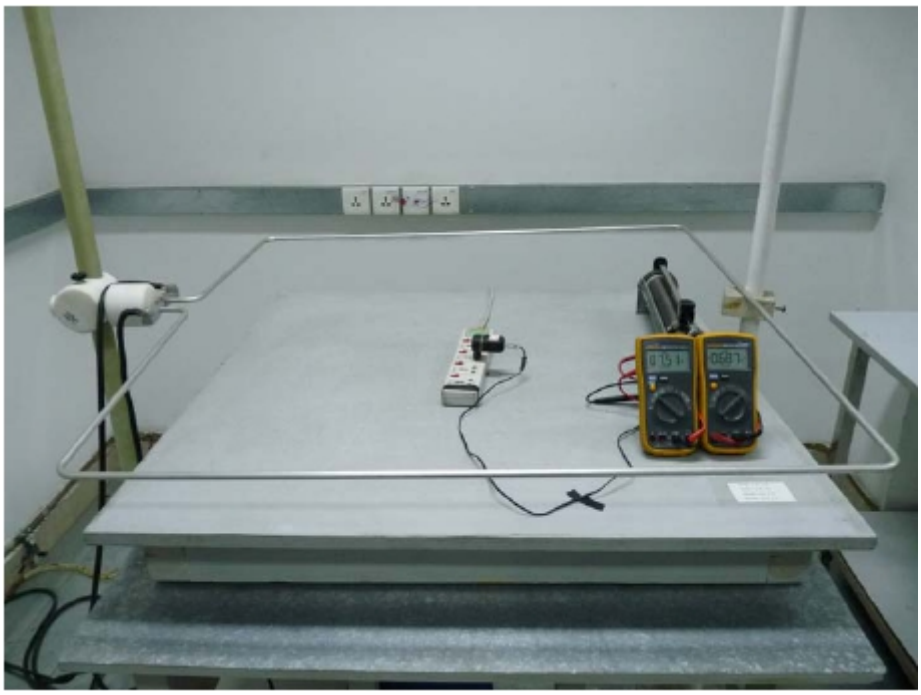


**Test Results**

| Test level | Test duration | Coil Orientation | Criterion | Result |
|---|---|---|---|---|
| 1A/m | 5 mins | X | A | Pass |
| 1A/m | 5 mins | Y | A | Pass |
| 1A/m | 5 mins | Z | A | Pass |

A: No degradation in the performance of the E.U.T. was observed.

### 6.7.3 Photograph –Power-frequency Magnetic Fields Test Setup



## 6.8 Voltage Dips and Interruptions

Test Requirement: EN 55024
Test Method: EN 61000-4-11
Test Result: PASS
Test Level(Voltage reduction): ＜5% & ＜5% & 70 % of $U_T$ (Supply Voltage)
No. of Dips / Interruptions: 1 per Level at 20ms intervals

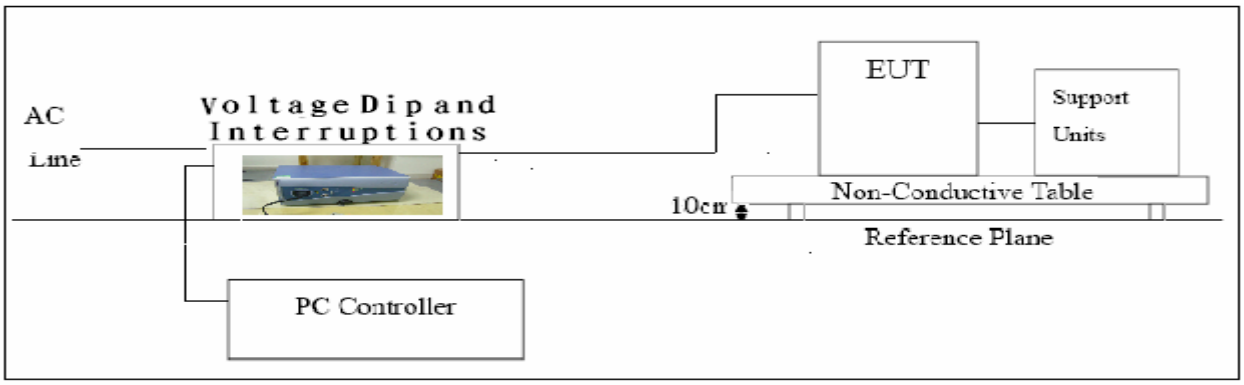
### 6.8.1 E.U.T. Operation

Operating Environment:
Temperature: 25.5 °C
Humidity: 51% RH
Barometric Pressure: 1012 mbar

EUT Operation:
Compliance test was performed in full load mode.

### 6.8.2 Voltage Dips and Interruptions Test Setup

The Voltage dips and Interruptions Test setup accordance with the EN 61000-4-11, the Specification used in this report was the EN 55024 Paragraph 4.2.6 requirements.



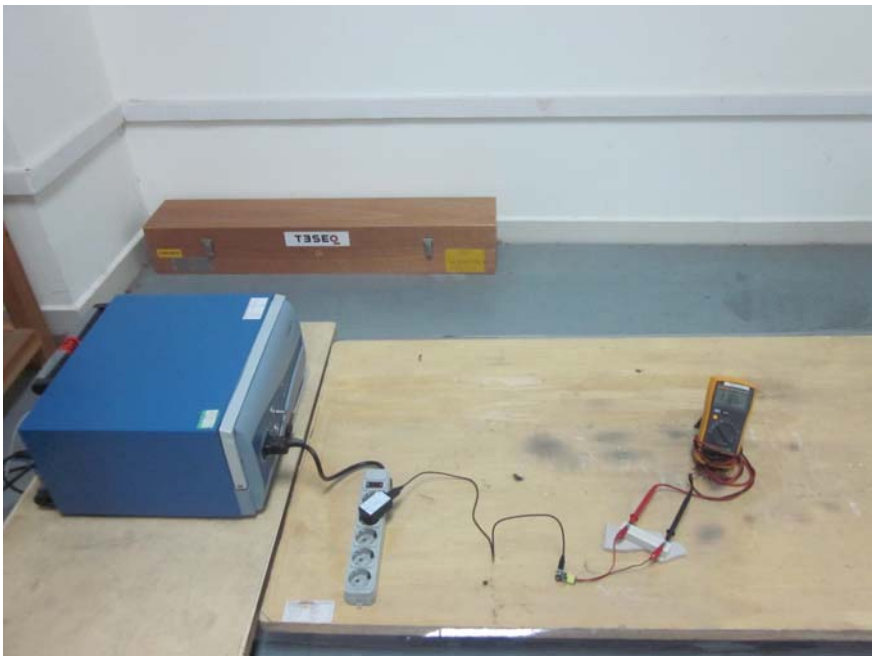

### 6.8.3 Measurement Data

| EUT operating mode | Dropout % $U_T$ | Phase | Duration of dropout in Periods | No of dropout | Time between dropout | Observations (Performance Criterion) |
|---|---|---|---|---|---|---|
| full load | 95 | 0° | 0.5 | 3 | 10ms | B |
| ditto | 95 | 0° | 250 | 3 | 5000ms | C |
| ditto | 30 | 0° | 25 | 3 | 500ms | C |

**Results**

B : During test, This was within the minimum performance criteria set by the applicant. Please refer to section 6.1 of this report for further details.

### 6.8.4 Photograph - Voltage Dips and Interruptions Test Setup



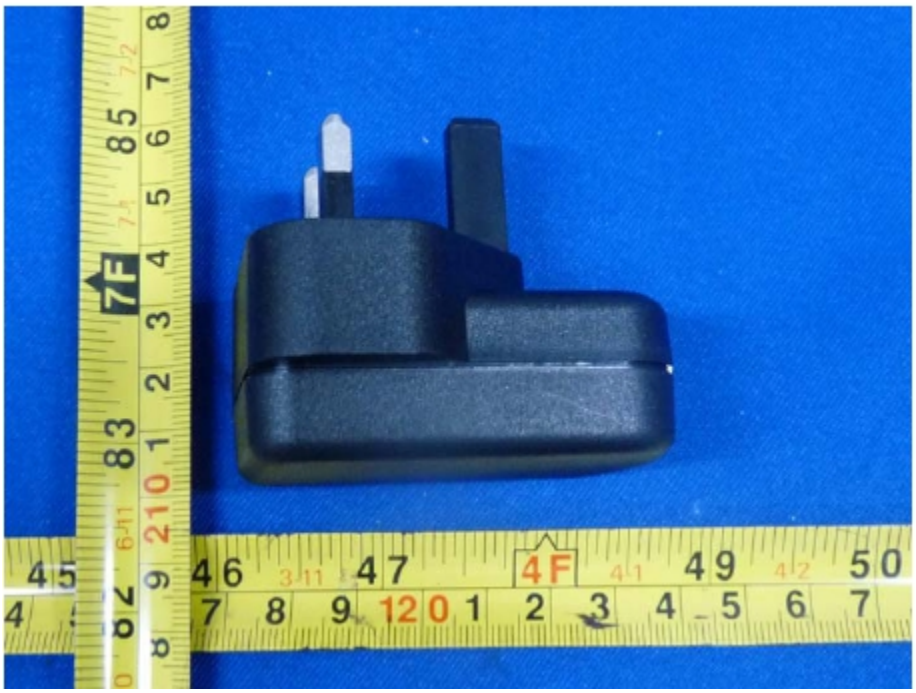
# 7 Photographs - Constructional Details

## 7.1 EUT-Appearance View

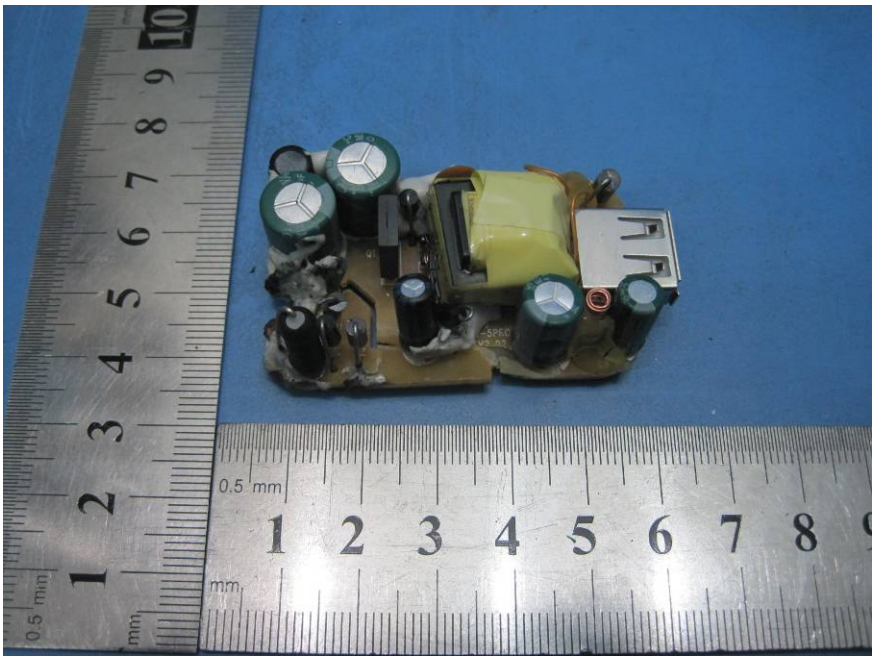
DVE

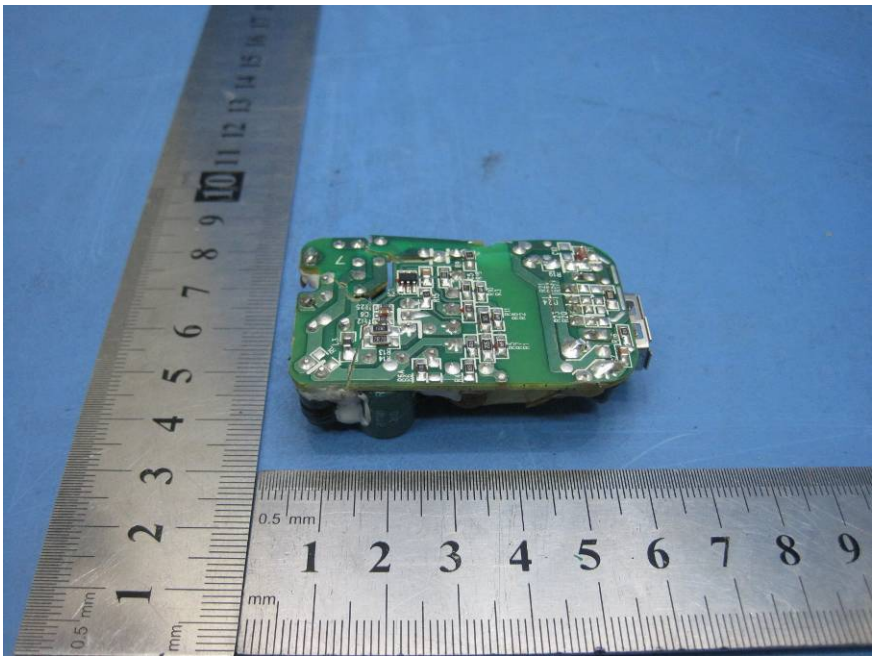
DVE
Switching Adapter

DVE

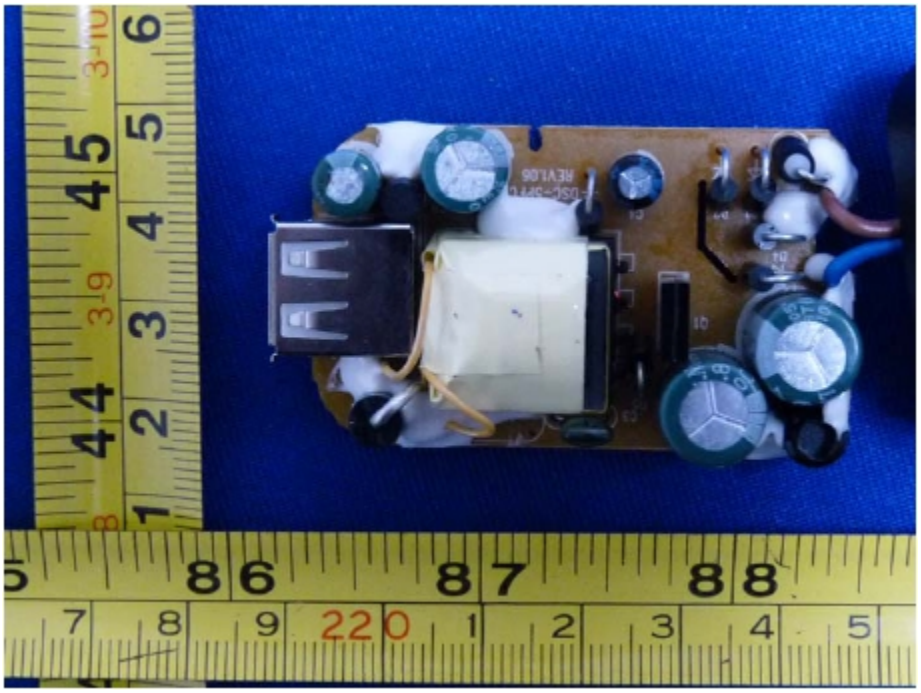


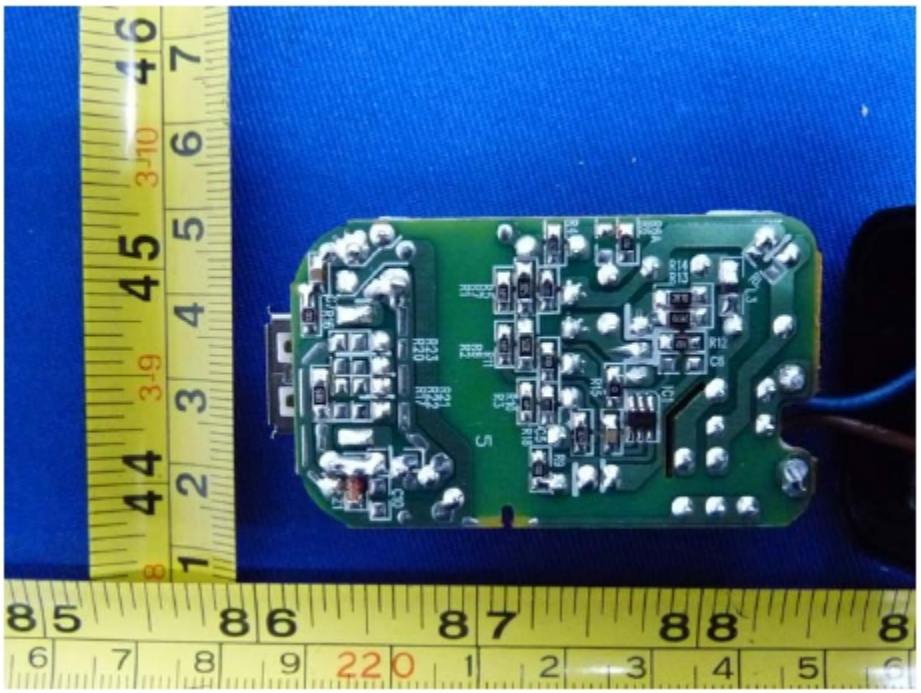
## 7.2 EUT-PCB View



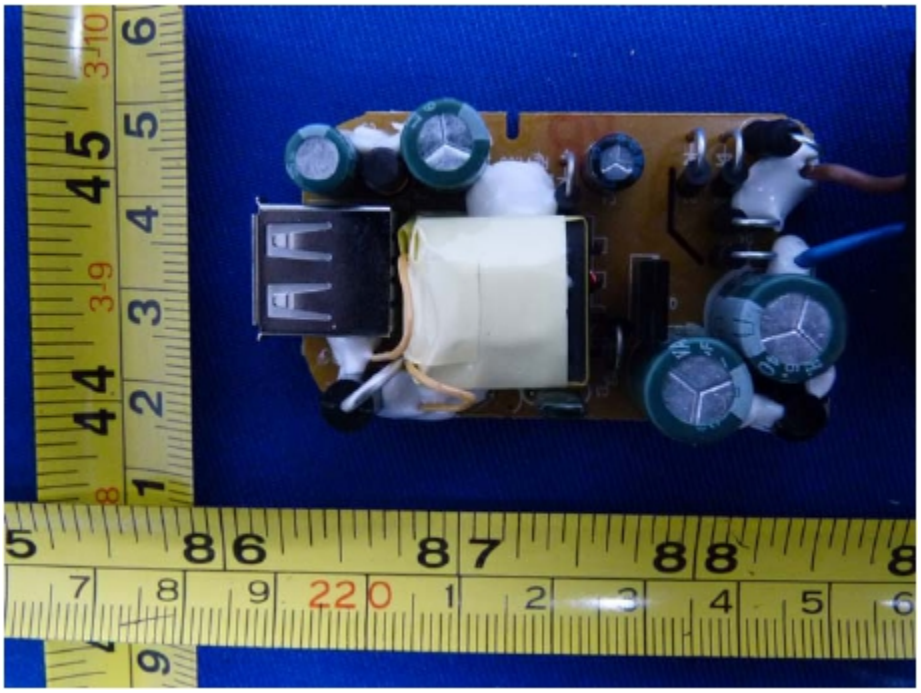


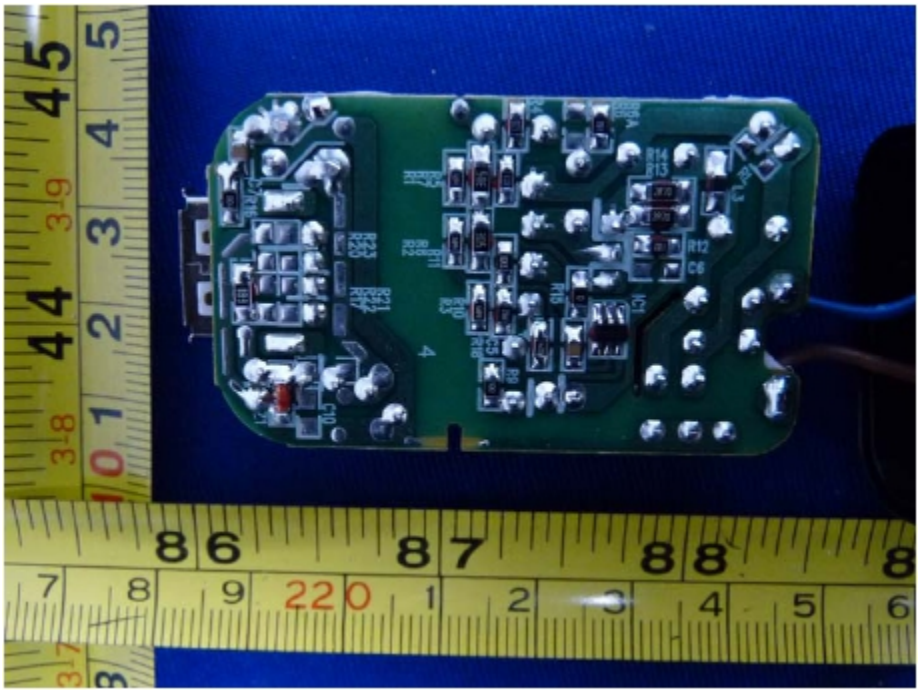
### 7.3 EUT(GT-81090-067.5-2.3-W2E-USB)-PCB View





## 7.4 EUT(GT-81090-067.5-W2E-USB)-PCB View





# 8 CE Label

1. The CE conformity marking must consist of the initials ‘CE’ taking the following form: If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.
3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.
4. The CE marking must be affixed visibly, legibly and indelibly.
   It must have the same height as the initials ‘CE’

Proposed Label Location on EUT

EUT Front View/proposed CE Mark Location