# *Demo Board Test Report for LD7536*

## *--- 40W (19V, 2.1A) Adapter*

| Tested by | Reviewed by | Approved by |
|---|---|---|
| Jolin Lin | Vincent Wang | Renyi Chen |

| Total pages | Revision | Date |
|---|---|---|
| 27 | 01 | 2010/01/29 |

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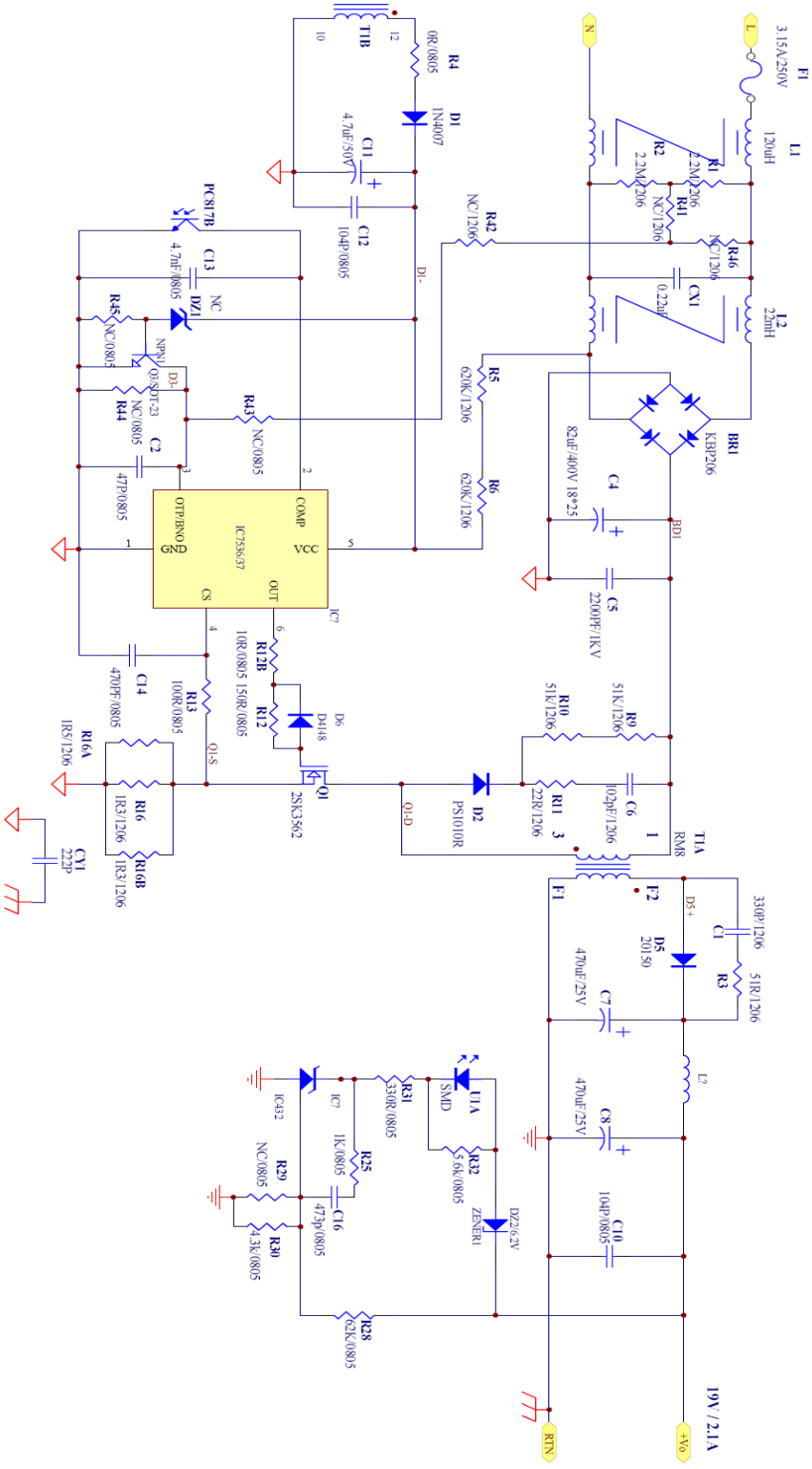
# I. SCHEMATIC


F1
3.15A/250V
L1
120uH
R1
2.2M/1206
R2
2.2M/1206
R41
NC/1206
R46
NC/1206
CX1
0.22uF
L2
22mH
N
L
BR1
KBP206
C4
82uF/400V 18*25
C5
2200PF/1KV
BD1
T1B
T1A
RM8
R4
0R/0805
D1
1N4007
C11
4.7uF/50V
C12
104P/0805
R42
NC/1206
R5
620K/1206
R6
620K/1206
R43
NC/0805
R44
NC/0805
C2
472P/0805
R45
NC/0805
Q3
SOT-23
C13
4.7nF/0805
DZ1
NC
PC817B
IC7
OTP/BNO
GND
COMP
VCC
CS
OUT
IC7356/57
R12B
10R/0805
R12
150R/0805
R13
100R/0805
C14
470PF/0805
Q1
2SK3562
D6
D4148
R10
51K/1206
R9
51K/1206
R11
22R/1206
C6
102pF/1206
D2
PS10/10R
R16A
1R5/1206
R16
1R3/1206
R16B
1R3/1206
CY1
222P
F1
F2
D5
20150
C1
330P/1206
R3
51R/1206
C7
470uF/25V
C8
470uF/25V
C10
104P/0805
U1A
SMD
R31
330R/0805
R32
5.6K/0805
DZ2/6.2V
ZENER1
R25
1K/0805
C16
473p/0805
R29
NC/0805
R30
4.3K/0805
R28
622K/0805
IC432
RTN
+Vo
19V / 2.1A

## Ⅱ. BOM

| P/N | Component Value | Note |
|---|---|---|
| R1 | 2.2MΩ, 1206, 1% | |
| R2 | 2.2MΩ, 1206, 1% | |
| R3 | 51Ω, 1206, 1% | |
| R4 | 0Ω, 0805, 1% | |
| R5 | 620KΩ, 1206, 1% | |
| R6 | 620KΩ, 1206, 1% | |
| R9 | 51KΩ, 1206, 1% | |
| R10 | 51KΩ, 1206, 1% | |
| R11 | 22Ω, 1206, 1% | |
| R12 | 150Ω, 0805, 1% | |
| R12B | 10Ω, 0805, 1% | |
| R13 | 100Ω, 0805, 1% | |
| R16 | 1.5Ω, 1206, 1% | |
| R16A | 1.3Ω, 1206, 1% | |
| R16B | 1.3Ω, 1206, 1% | |
| R25 | 1KΩ, 0805, 1% | |
| R28 | 62KΩ, 0805, 1% | |
| R29 | 4.3KΩ, 0805, 1% | |
| R30 | NC | |
| R31 | 330Ω, 0805, 1% | |
| R32 | 5.6KΩ, 0805, 1% | |
| R41 | NC | |
| R42 | NC | |
| R43 | NC | |
| R44 | NC | |
| R45 | NC | |
| L1 | Leadtrend's Design | |
| L2 | Leadtrend's Design | |
| T1 | Leadtrend's Design | |
| L | Leadtrend's Design | |
| | | |
| | | |
| | | |
| | | |

| P/N | Component Value | Note |
|---|---|---|
| C1 | 330pF,1000V,1206 | |
| C2 | 47pF,50V,0805 | |
| C4 | 82uF, 400V | |
| C5 | 2200pF, 1000V, 1206 | |
| C6 | 1000pF, 1000V, 1206 | |
| C7 | 470uF, 25V | |
| C8 | 470uF, 25V | |
| C10 | 0.1uF, 50V, 0805 | |
| C11 | 4.7uF, 50V | |
| C12 | 0.1uF, 50V, 0805 | |
| C13 | 4.7nF, 50V, 0805 | |
| C14 | 470pF, 50V, 0805 | |
| C16 | 0.047uF, 16V, 0805 | |
| CX1 | 0.22μF, X-cap | |
| CY1 | 2200pF,Y-cap, class1 | |
| DZ1 | NC | |
| DZ2 | 6.2V, ZENER | |
| D1 | GS1002F | |
| D2 | PS1010R | |
| D5 | SB20150CT | |
| D6 | 1N4148 | |
| Q1 | K2843 | |
| Q3 | NC | |
| BD1 | 2A, 600V | |
| IC1 | LD7536<br>(D/C:JBP) | |
| U1 | EL817B | |
| IC2 | 432 | |
| F1 | 250V,T2A | |
| | | |

## III. EXECUTIVE SUMMARY

| | |
|---|---|
| Office | Taipei |
| Model Name | LD7536-DemoBoard#01 |
| Version | 01 |
| IC | LD7536(D/C:JBP) |

| TEST | Result | Comments |
|---|---|---|
| 3. Green Mode Power Consumption | **PASS** | |
| 4. Line Regulation | **PASS** | |
| . Load Regulation | **PASS** | |
| 5. Output Dynamic Response | **PASS** | |
| 6. Peak to Peak Output Ripple and Noise | **PASS** | |
| 7. Turn On Delay Time | **PASS** | |
| 8. Holdup Time | **PASS** | |
| 9. Over Current Protection | **PASS** | |
| 10. Over Voltage Protection | **PASS** | |
| 11. Output Short Protection | **PASS** | |
| 12. Efficiency Test | **PASS** | |
| 13. Stress Voltage Test | **PASS** | |
| 14. EMI conduction | **?** | |
| 15. Surge For System | **PASS** | |
| 16. ESD For System | **PASS** | |
| 17. Hi-pot Test | **?** | |
| 18. Thermal Test | **PASS** | |

**1. Input Voltage & Frequency**

The unit shall be capable of operating as a universal AC input power supply accepting AC inputs. The power supply shall operate between the following voltages (from 90V to 264V). The supply will be designed to operate for a Table 1.

| | Minimum | Normal | Maximum |
|---|---|---|---|
| Input Voltage | 90Vac | 110Vac | 264Vac |
| Frequency | 47HZ | 60HZ | 63HZ |

Table 1

**2. Output Loads**

The line and load regulation for each of the outputs are shown in Table. 2.

| Parameter | Output Voltage | | | Output Current | |
|---|---|---|---|---|---|
| | Minimum | Typical | Maximum | Minimum | Maximum |
| +19V | 17.1V | 19V | 20.9V | 0A | 2.1A |
| Line Regulation | -1% | / | +1% | / | 2.1A |
| Load Regulation | -2% | / | +2% | 0A | 2.1A |

Table 2

**3. Green Mode Power Consumption**

The input power of power supply shall remain **less than 300mW** under output at no load condition.

**Test Condition:**
**Input:** 90Vac/264Vac (60Hz)
**Output:** +19V=0A
**Ambient Temperature:** 25℃

**Test Result:** PASS

| $V_{in}$ (Vac) | Pin (mW) |
|---|---|
| 90 | 54.7 |
| 264 | 92.0 |

Table 3

**4. Total Regulation**

Line regulation is defined to be the percent change in output voltage versus the nominal output voltage due to a change in AC input. The supply shall maintain the specified regulation throughout its specified operating range. Line regulation is measured at Min. Nominal and Max input voltages.

Load regulation is defined to be the percent change in output voltage versus the nominal output voltage due to a change in load. The supply shall maintain the specified regulation throughout its specified operating range. Load regulation to be measured at Min. and Max output voltages.

**Test Conditions:**
**Input: 90Vac/264Vac(60Hz)**
**Output:** +19V=0A/2.1A
**Ambient Temperature :** 25℃

| AMB | Output | 90Vac | 264Vac |
|---|---|---|---|
| 25 DEG.C | 2.1A | 19.13 | 19.12 |
| | 0A | 19.22 | 19.22 |
| Reading | | 0.47% | 0.52% |
| SPEC | | ±2% | |

Table 4

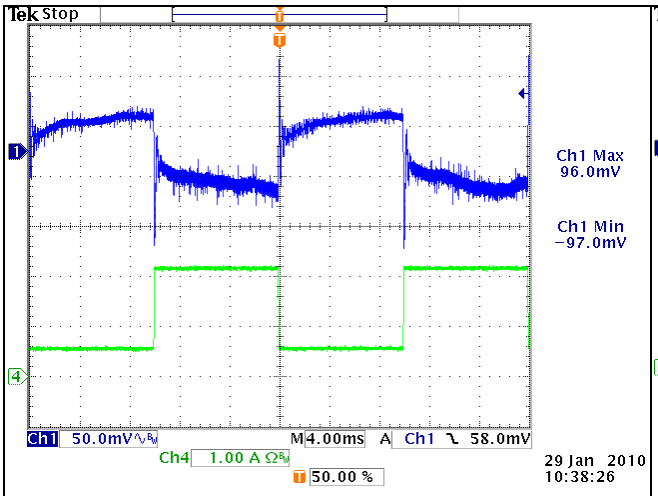
## 5. Output Dynamic Response

The dynamic of the output response refers to the change in output voltage to a step increase in the current of **25% to 100%** load shall maintain ±10% of specified regulation.

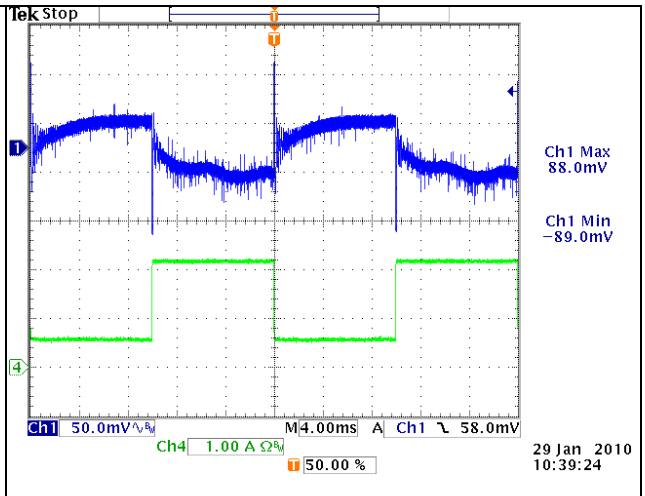
**Test Condition:**
**Input: 90Vac/264Vac (60Hz)**
**Ambient Temperature:** 25℃

| Input | Output Dynamic | Reading | | Derating | |
|---|---|---|---|---|---|
| | | $V_H$ | $V_L$ | $V_H$ | $V_L$ |
| 90Vac | 0.527→2.102A | 96.0mV | -97.0mV | 5.05% | 5.10% |
| 264Vac | 0.527→2.102A | 88.0mV | -89.0mV | 4.63% | 4.68% |
| Reading | Max | 96.0mV | -97.0mV | 5.05% | 5.10% |
| Reading | Min | 88.0mV | -89.0mV | 4.63% | 4.68% |
| SPEC | Max/Min | ±1.9V | | 100% | |

Table 5




Output Load Dynamic Response Fig.1
Vin: 90Vac
O/P : +19V= 0.527A→2.1A
CH1: $V_{O\_+19V}$
CH4: $I_{O\_+19V}$
Reading: $+19V_{Max}$= **96.0m V(AC)**
$+19V_{Min}$= **-97.0mV(AC)**




Output Load Dynamic Response Fig.2
Vin: 264Vac
O/P : +19V= 0.527A→2.1A
CH1: $V_{O\_+19V}$
CH4: $I_{O\_+19V}$
Reading: $+19V_{Max}$= **88.0mV(AC)**
$+19V_{Min}$= **-89.0mV(AC)**

**6. Peak to Peak Output Ripple and Noise**

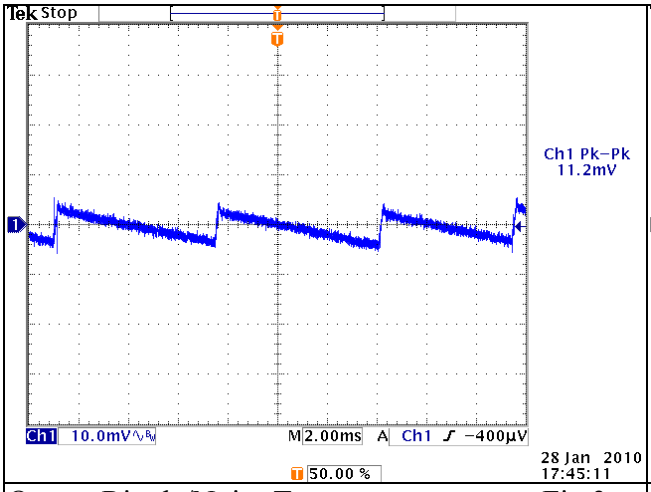
This refers to the peak-to-peak residual AC that remains on the DC power line after passing through all the filtering processes conducted within the power supply. The peak to peak output ripple and noise shall be considered to comprise of the complex envelope of the low frequency saw tooth voltage ripple and the high frequency switching noise. It shall be measured across output terminals using a single ended measurement with an oscilloscope (bandwidth limited to 20 MHz) and a high persistence display. Readings shall be made through the range of minimum to maximum load current and **within 120mV**.

**Test Conditions:**
**Input: 90Vac/264Vac(60Hz)**
**Output:** +19V=0A/2.1A
**Ambient Temperature :** 25℃

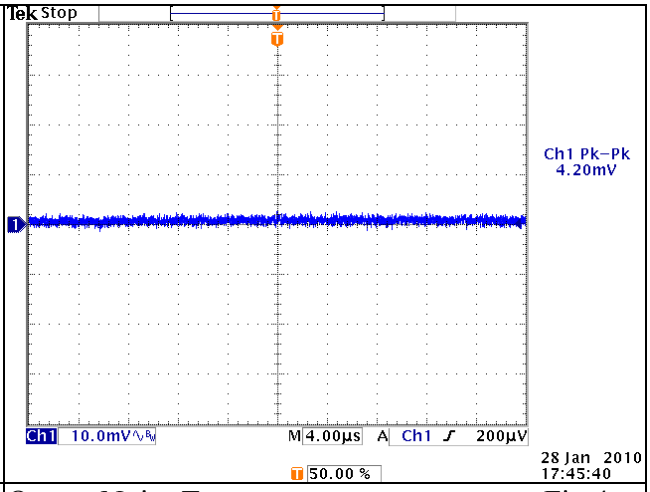
**Test Result:** PASS

| Input | Output Load | Vout Voltage (VAC) | |
|---|---|---|---|
| | | Vripple(mV) | Vnoise(mV) |
| 90Vac | 0A | 11.20 | 4.20 |
| | 2.1A | 54.80 | 39.80 |
| 264Vac | 0A | 19.40 | 4.00 |
| | 2.1A | 58.20 | 57.80 |
| Reading | Min | 11.20 | 4.00 |
| | Max | 58.20 | 57.80 |
| SPEC | Max | 120mV | |

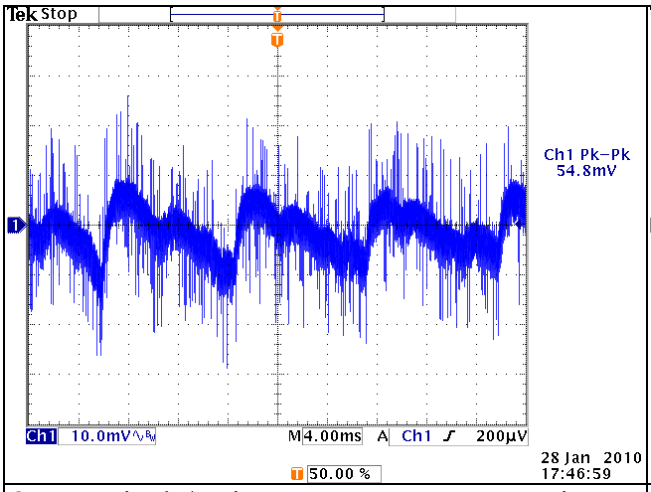
Table 6



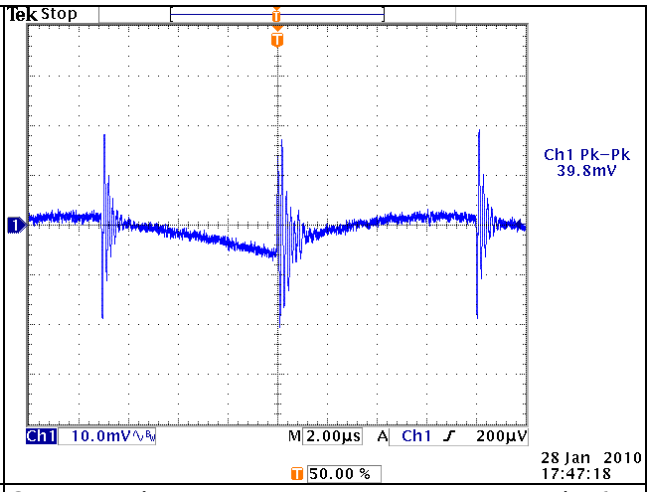

Output Ripple/Noise Test Fig.3
Vin: 90Vac
O/P: +19V=0A
CH1: $V_{P-P\_+19V}$
Reading: **11.2mV(AC)**



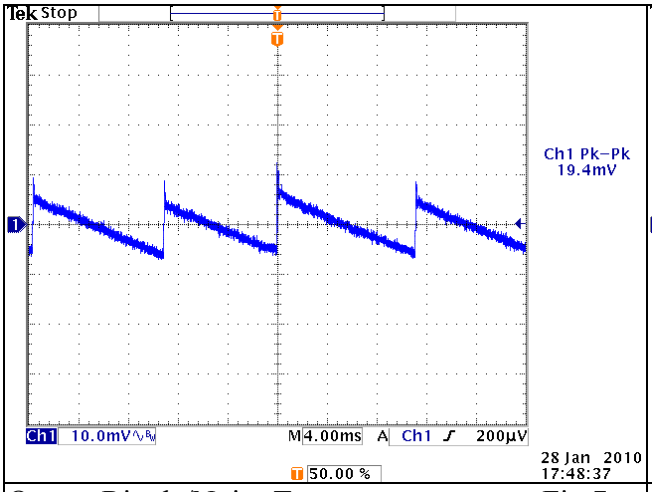

Output Noise Test Fig.4
Vin: 90Vac
O/P: +19V=0A
CH1: $V_{P-P\_+19V}$
Reading: **4.20mV(AC)**



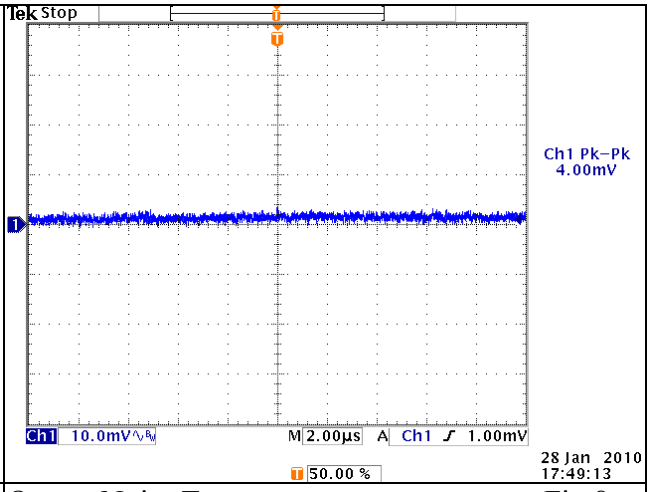

Output Ripple/Noise Test Fig.5
Vin: 90Vac
O/P: +19V=2.1A
CH1: $V_{P-P\_+19V}$
Reading: **54.8mV(AC)**



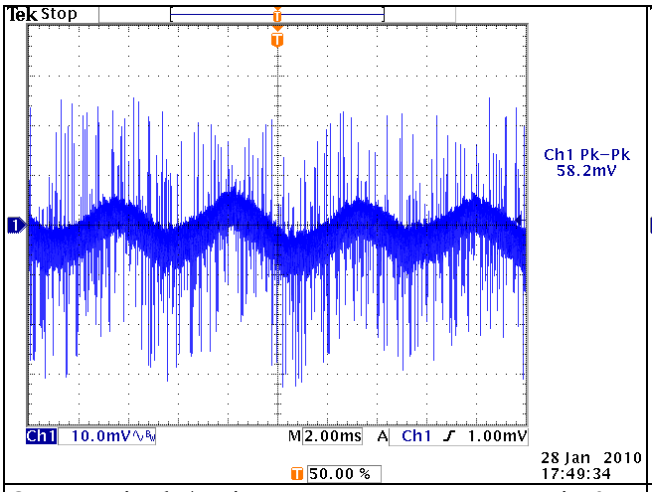

Output Noise Test Fig.6
Vin: 90Vac
O/P: +19V=2.1A
CH1: $V_{P-P\_+19V}$
Reading: **39.8mV(AC)**



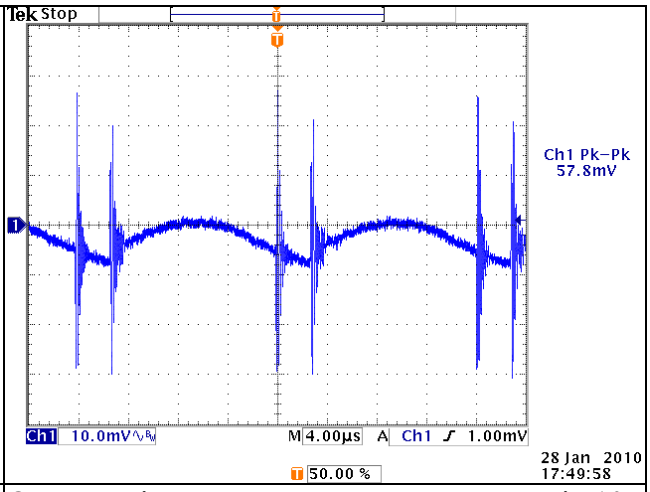

Output Ripple/Noise Test Fig.7
Vin: 264Vac
O/P: +19V=0A
CH1: $V_{P-P\_+19V}$
Reading: **19.4mV(AC)**




Output Noise Test Fig.8
Vin: 264Vac
O/P: +19V=0A
CH1: $V_{P-P\_+19V}$
Reading: **4.00mV(AC)**




Output Ripple/Noise Test Fig.9
Vin: 264Vac
O/P: +19V=2.1A
CH1: $V_{P-P\_+19V}$
Reading: **58.2mV(AC)**




Output Noise Test Fig.10
Vin: 264Vac
O/P: +19V=2.1A
CH1: $V_{P-P\_+19V}$
Reading: **57.8mV(AC)**

**7. Turn On Delay Time**

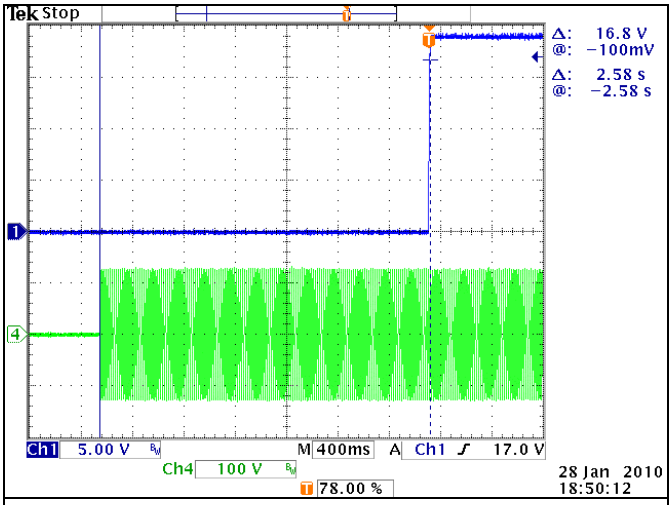
Turn on delay time will be **less than 3 seconds** at full load. Turn on delay time is measured as the delay between input voltage being applied at $0^o$ phase angle and when the outputs arrive within 10% of their operating value. Turn on delay time is measured using an input voltage of 90VAC(rms) and input frequency of 60Hz.

**Test Conditions:**
**Input: 90Vac(60Hz)**
**Output:** +19V=2.1A
**Ambient Temperature** : 25℃

**Test Result:** PASS

| Input | $T_{turn\ on\ delay}$ |
|---|---|
| **90Vac** | 2.58s |

Table 7




Turn on Time Test Fig.11
Vin: 90Vac/60Hz
O/P: +19V=2.1A
CH1: $V_{O\_+19V}$
CH4: AC Input Voltage
Reading:**2.58s**

## 8. Holdup Time

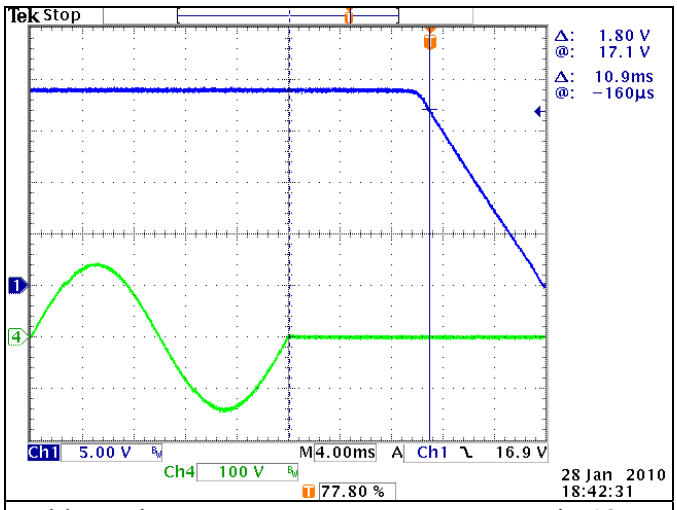
Holdup time refers to the time it takes for a loss of input voltage to propagate through the power supply and affect the output voltages. Holdup time spec must be met at 100Vac input line voltage and maintain minimum half AC cycle. Holdup time shall be measured by monitoring the output voltages and measuring the time it takes for the first affected output voltage to pass through the lower bound of the regulation threshold after input power to the converter is removed. The initial conditions of loading and input voltage are max load and minimum operational line input. The holdup time is measured by triggering an oscilloscope on the loss of input voltage while monitoring the conditions of the output voltages.

**Test Conditions:**
**Input: 100Vac(50Hz)**
**Output:** +19V=2.1A
**Ambient Temperature** : 25℃

**Test Result:** PASS

| Input | $T_{hold\ on}$ |
|---|---|
| **100Vac** | 10.9ms |

Table 8




Hold-up Time Test Fig.12
Vin: 100Vac/50HZ
O/P: Max Load
CH1: $V_{O\_+19V}$
CH4: AC Input Voltage
Reading:**10.9ms**

## 9. Over Current Protection

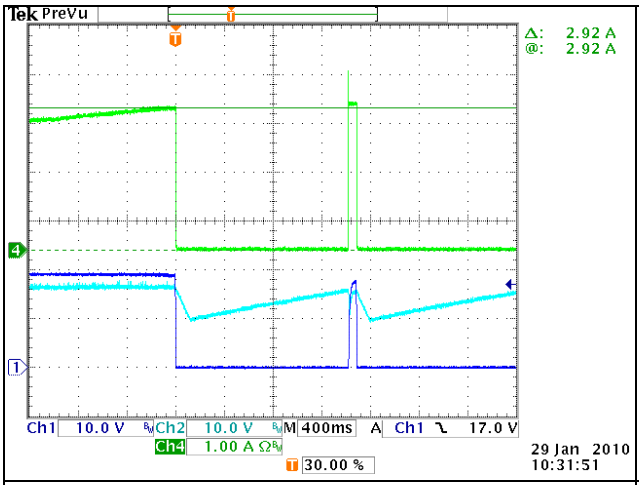
The supply shall be designed with appropriate output over current protection. This protection shall be activated in the event of a short or long-term condition during which one or more of the output current load increases such that the primary current exceeds a predetermined limit. The primary shall limit the total power without inflicting any damage to any internal supply components and shall be reversible pending removal of the cause of the condition and without any user intervention. This protection shall be activated **within 130% to 180%** of maximum load.

**Test Condition:**
**Input: 90Vac/264Vac (60Hz)**
**Ambient Temperature:** 25℃

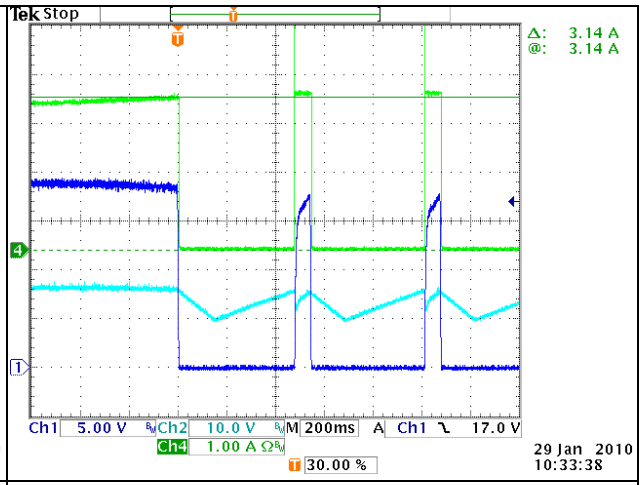
**Test Result:** PASS

| Intput | OCP |
|---|---|
| **90Vac** | 2.92A |
| **264Vac** | 3.14A |

Table 9




Over Current Protection Fig.13
Vin: 90Vac
O/P : +19V=Max→OCP
CH1: $V_{O\_+19V}$ CH2: Vcc
CH4: $I_{+19V}$




Over Current Protection Fig.14
Vin: 264Vac
O/P : +19V=Max→OCP
CH1: $V_{O\_+19V}$ CH2: Vcc
CH3: $I_{+19V}$

## 10. Over Voltage Protection

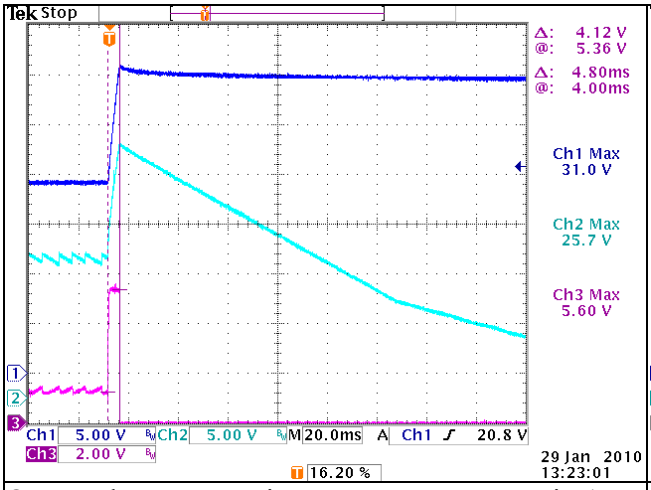
The supply shall be designed with appropriate output over voltage protection. This protection shall be activated in the event of a short or long-term condition during which one or more of the output open loop circuit happened. It shall limit the power supply without inflicting any damage to any internal supply components.

**Test Condition:**
**Input: 90Vac/264Vac (60Hz)**
**Ambient Temperature:** 25℃

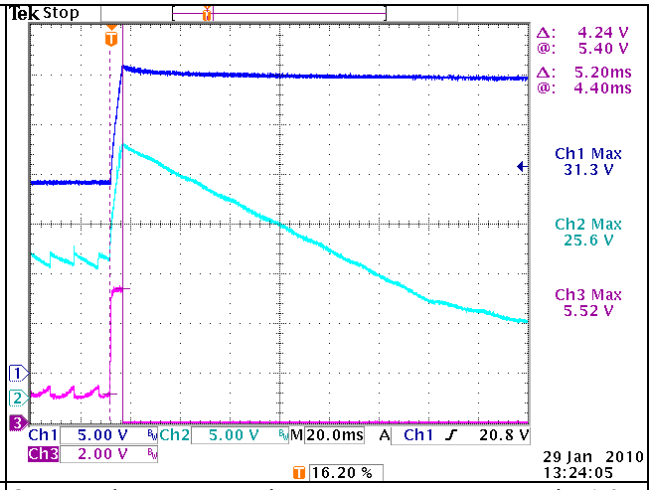
**Test Result:** PASS

| | Primary-side | Second-side |
|---|---|---|
| Vin(Vac) | Vcc Voltage(V) | +19Vout(V) |
| Vac=90V | 25.7 | 31.0 |
| Vac=264V | 25.6 | 31.3 |

Table 10




Over Voltage Protection Test Fig.15
Vin: 90Vac turn on
O/P: +19V=0A
CH1: $V_{O\_+19V}$ CH2: Vcc
CH3: Vcomp
Reading: Vcc=25.7V (OVP Protection)
$V_{O\ +19V}$ =31.0V



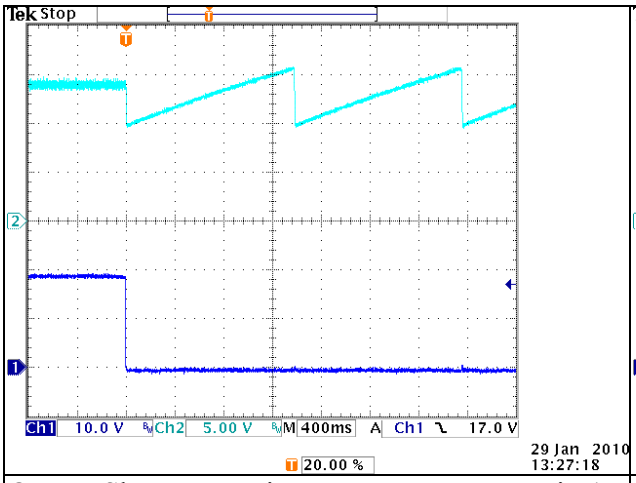

Over Voltage Protection Test Fig.16
Vin: 264Vac turn on
O/P: +19V=0A
CH1: $V_{O\_+19V}$ CH2: Vcc
CH3: Vcomp
Reading: Vcc=25.6V (OVP Protection)
$V_{O\ +19V}$ =31.3V

## 11. Output Short Protection

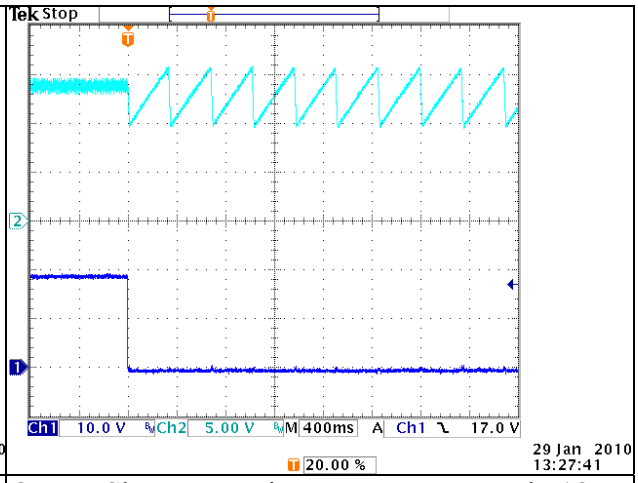
The supply shall be designed with appropriate output short circuit protection. This protection shall be activated in the event of a short or long-term condition happened. The primary shall limit the total power without inflicting any damage to any internal supply components and shall be reversible pending removal of the cause of the condition and without any user intervention.

**Test Condition:**
**Input: 90Vac/264Vac (60Hz)**
**Ambient Temperature:** 25℃

**Test Result:** PASS




Output Short Protection Fig.17
Vin: 90Vac
O/P : +19V=0A→Short
CH1: $V_{O\_+19V}$ CH2: Vcc




Output Short Protection Fig.18
Vin: 264Vac
O/P : +19V=0A→Short
CH1: $V_{O\_+19V}$ CH2: Vcc

**12. Efficiency Test**

The efficiency of power supply shall be measured throughout its specified operating input range and at output maximum load conditions. It should remain **80% minimum**.

**Test Condition:**

**Input: 115Vac/230Vac (60Hz)**

**Output:** 25%、50%、75%、100% of Max Load(2.1A)

**Ambient Temperature:** 25℃

| | 115V | | 230V | |
|---|---|---|---|---|
| Po | Pin | Eff(%) | Pin | Eff(%) |
| 10.11 | 11.65 | 86.78% | 11.83 | 85.46% |
| 20.14 | 23 | 87.57% | 23.19 | 86.85% |
| 30.16 | 34.2 | 88.19% | 34.63 | 87.09% |
| 40.25 | 45.66 | 88.15% | 45.26 | 88.93% |
| Result | | 87.67% | | 87.08% |

Table 11

## 13. Power Component Stress Voltage

**Test Condition:**
- Set the output loads at full load and ambient 25 ºC.
- The PSU test on everyone voltage and frequency.

**Check:**
- Under Steady state the derating shall be below **95%.**
- Under Transient state the derating shall be below **95%**.
- Input line bulk capacitors limits are **100%** (continuous).

**Result:**
**Input Voltage**: 90Vac/264Vac (47/63Hz)
**Output Power**: Max Load/Short

| No. | Location | Max. Rating(V) | Steady State(90V / 47HZ) | |
|---|---|---|---|---|
| | | | Measurement | Derating(%) |
| | | | V | V |
| 1 | Q1 | 600 | 304 | 50.67% |
| 2 | IC1 | 29 | 17.1 | 58.97% |
| 3 | C4 | 400 | 125 | 31.25% |
| 4 | D5 | 150 | 54.8 | 36.53% |
| 5 | C8 | 25 | 19.2 | 76.80% |

Table 12-1

| No. | Location | Max. Rating(V) | Steady State(264V / 63HZ) | |
|---|---|---|---|---|
| | | | Measurement | Derating(%) |
| | | | V | V |
| 1 | Q1 | 600 | 552 | 92.00% |
| 2 | IC1 | 29 | 17 | 58.62% |
| 3 | C4 | 400 | 378 | 94.50% |
| 4 | D5 | 150 | 97.6 | 65.07% |
| 5 | C8 | 25 | 19.5 | 78.00% |

Table 12-2

| No. | Location | Max. Rating(V) | Transient State(90V / 47HZ) | |
|---|---|---|---|---|
| | | | Measurement | Derating(%) |
| | | | V | V |
| 1 | Q1 | 600 | 315 | 52.50% |
| 2 | IC1 | 29 | 17.1 | 58.97% |
| 3 | C4 | 400 | 125 | 31.25% |
| 4 | D5 | 150 | 58.8 | 39.20% |
| 5 | C8 | 25 | 19.2 | 76.80% |

Table 13-1

| No. | Location | Max. Rating(V) | Transient State(264V / 63HZ) | |
|---|---|---|---|---|
| | | | Measurement | Derating(%) |
| | | | V | V |
| 1 | Q1 | 600 | 552 | 92.00% |
| 2 | IC1 | 29 | 17 | 58.62% |
| 3 | C4 | 400 | 376 | 94.00% |
| 4 | D5 | 150 | 120 | 80.00% |
| 5 | C8 | 25 | 19.3 | 77.20% |

Table 13-2

**14. EMI**

**Test Condition:**

The power supply should comply with FCC part15,EN 55022 and CISPR22 meeting Class B for conducted emissions with a 3dB margin. Tested unit should be connected to a pure resistor load (rated loding). The test condition shall be followed as:110 VAC(L and N),220VAC(L and N)

**Test Result:** ?

**Other detail please check the appendix**.

**15. Surge For System**

**Test Condition:**
High Energy Transients are applied to the power supply once each 20 second period with 5 transients per test. The surge Test defines four levels of peak voltage.
**Check:**
Survival: No component shall be damage electrically during the tests. The PSU shall continue to operate in a safe manner during abnormal operation.

**Input Voltage**: 220V (60Hz)
**Output Power**: +19V=2.1A
**Result:**

| Surge voltage | Coupling Mode | Test Level | Phase | | Repetition | Test Result |
|---|---|---|---|---|---|---|
| 1KV | Diff. | ±1KV | 0 | L to N | 5 pulses 20Sec | Pass |
| | | | 90 | | | Pass |
| | | | 180 | | | Pass |
| | | | 270 | | | Pass |

Table 14

| Surge voltage | Coupling Mode | Test Level | Phase | | Repetition | Test Result |
|---|---|---|---|---|---|---|
| 2KV | COM.. | ±2KV | 0 | L to Earth GND N to Earth GND | 5 pulses 20Sec | Pass |
| | | | 90 | | | Pass |
| | | | 180 | | | Pass |
| | | | 270 | | | Pass |

Table 15

**16. ESD Test**

**Test Condition:**

The voltage level is set initially at 2 kV, and increased to a maximum level of 4 kV for contact discharges and 8 kV for air discharges. Fifteen discharges for each polarity are made to each test point with a minimum time interval of 2 second between discharges.

**Check:**

Survival: No component shall be damage electrically during the tests. The PSU shall continue to operate in a safe manner during abnormal operation.

| Polarity | Testing Mode | Test Level | Step Level | Repetition | Test Result |
|---|---|---|---|---|---|
| Positive & Negative | **Contact** | ±2KV ↓ ±4KV | 2KV | 15 pulses | Pass |
| | | | 2.5KV | | Pass |
| | | | 3KV | | Pass |
| | | | 4KV | | Pass |

| Polarity | Testing Mode | Test Level | Step Level | Repetition | Test Result |
|---|---|---|---|---|---|
| Positive & Negative | **Air** | 2KV ↓ 8KV | 2KV | 15 pulses | Pass |
| | | | 4KV | | Pass |
| | | | 6KV | | Pass |
| | | | 8KV | | Pass |

Table 16

**17. Dielectric Withstand Voltage**

**Test Condition:**

- Test the PSU primary to secondary insulation capability.

**Check:**

- The PSU shall be meet specific（**3000Vac for 1minute / 10mA**）and no Component damage.

**Result:**

| Test Item | Test Criteria | | | Pass/Fail |
|---|---|---|---|---|
| **Hi-pot** | Voltage(Vac) | Test Time (Second) | Leakage Current(mA) | ? |
| | 3000 | 60 | <10mA | |

Table 17

**18. Thermal Test**

**Test Condition:**

- Set the output loads at full load and ambient **25°C**.
- The PSU test on everyone voltage and frequency.
- Born-In 2 hours

**Check:**

- All of component and magnetic device (transformer, Filter choke) shall NOT exceed 100℃.

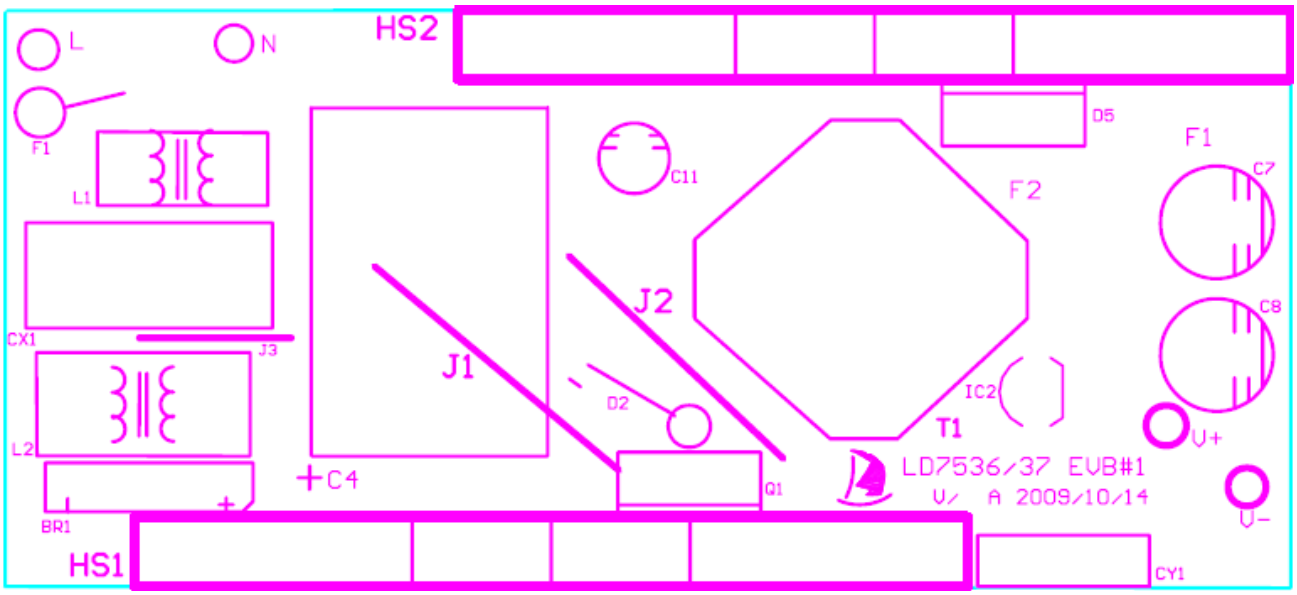
**Result:**

| No. | Location | Max. Rating(℃.) | 90V/47Hz(℃.) | 264/63Hz(℃.) | Derating(%) | |
|---|---|---|---|---|---|---|
| | | | | | 90V/47Hz | 264/63Hz |
| 2 | L1 | 130 | 37.9 | 34.9 | 29.15% | 26.85% |
| 3 | L2 | 130 | 52.1 | 40.4 | 40.08% | 31.08% |
| 4 | BR1 | 125 | 71.4 | 56.3 | 57.12% | 45.04% |
| 5 | C4 | 105 | 58.3 | 54.5 | 55.52% | 51.90% |
| 6 | IC1 | 150 | 62.3 | 61 | 41.53% | 40.67% |
| 7 | D1 | 150 | 78.6 | 73.1 | 52.40% | 48.73% |
| 8 | D2 | 150 | 70.8 | 73.4 | 47.20% | 48.93% |
| 9 | Q1 Body | 150 | 65.7 | 68.4 | 43.80% | 45.60% |
| 10 | R10 | 125 | 75.6 | 72 | 60.48% | 57.60% |
| 11 | D5 | 150 | 73 | 73.4 | 48.67% | 48.93% |
| 12 | T1 core | 130 | 81.1 | 95.3 | 62.38% | 73.31% |
| 13 | C8 | 105 | 42.6 | 46.8 | 40.57% | 44.57% |
| Ambient | | | | | -- | -- |

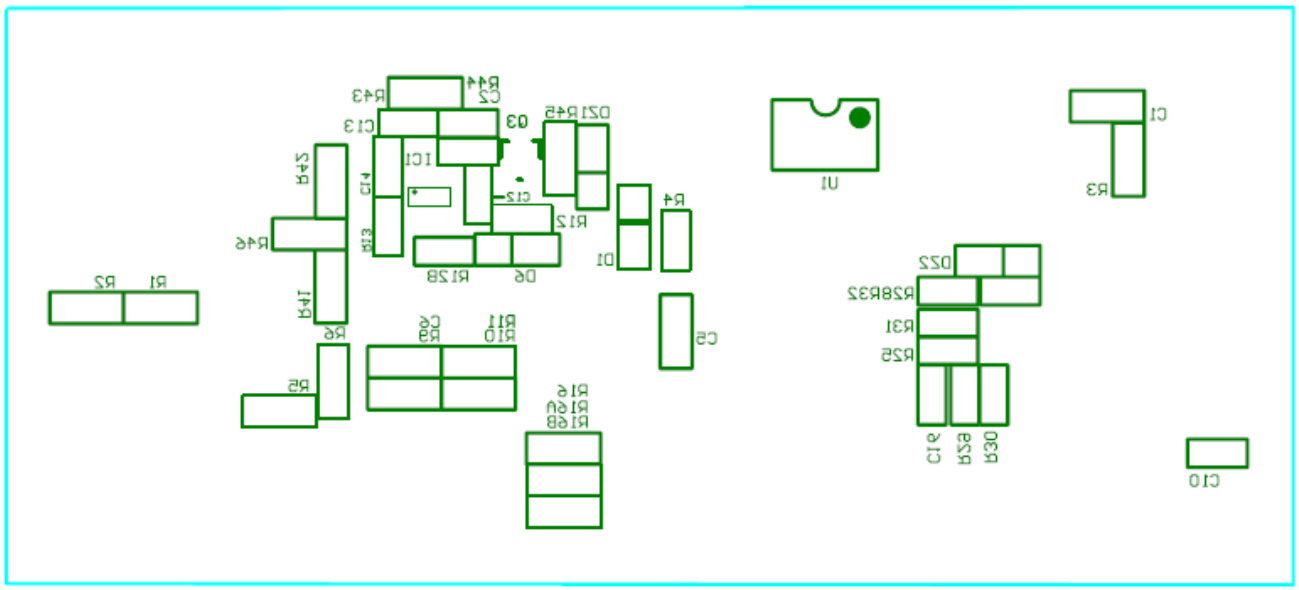
Table 18. Key Parts for Thermal Test

## Ⅳ. Gerber File:

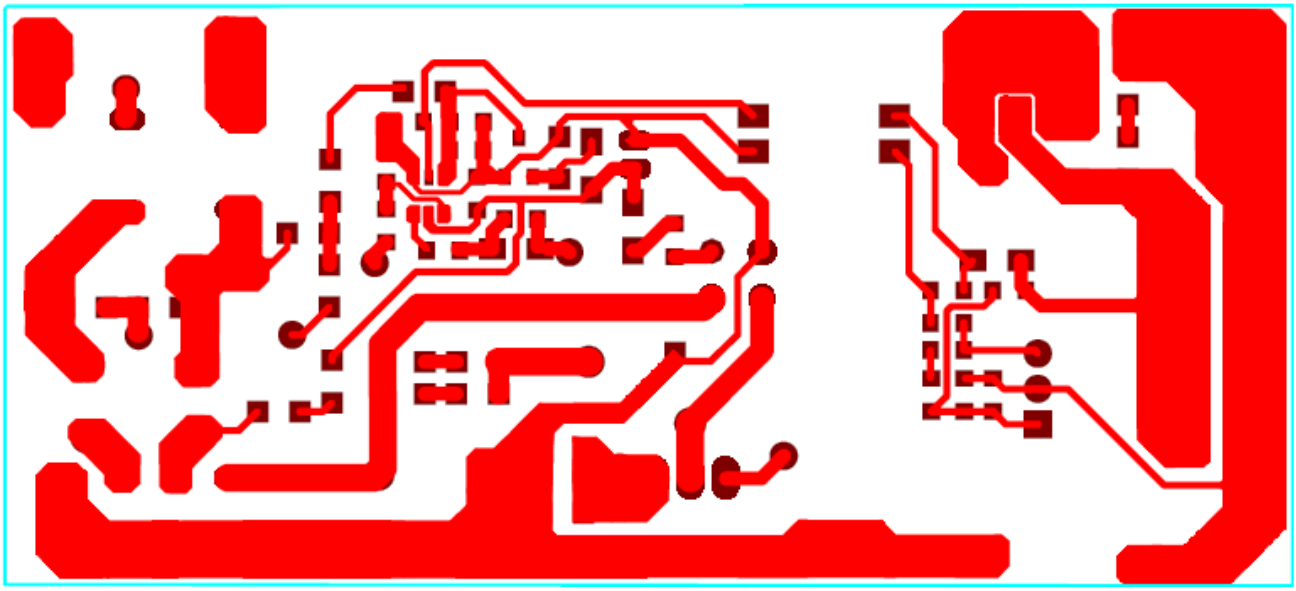
**Silkscreen TOP**




**Silkscreen Bottom**



**Bottom Layer**



**Soldermask Bottom**