

# *Power Supplies*



**MYRRA**

*...Of course !*

**Encapsulated Solutions  
1W ~ 60W**

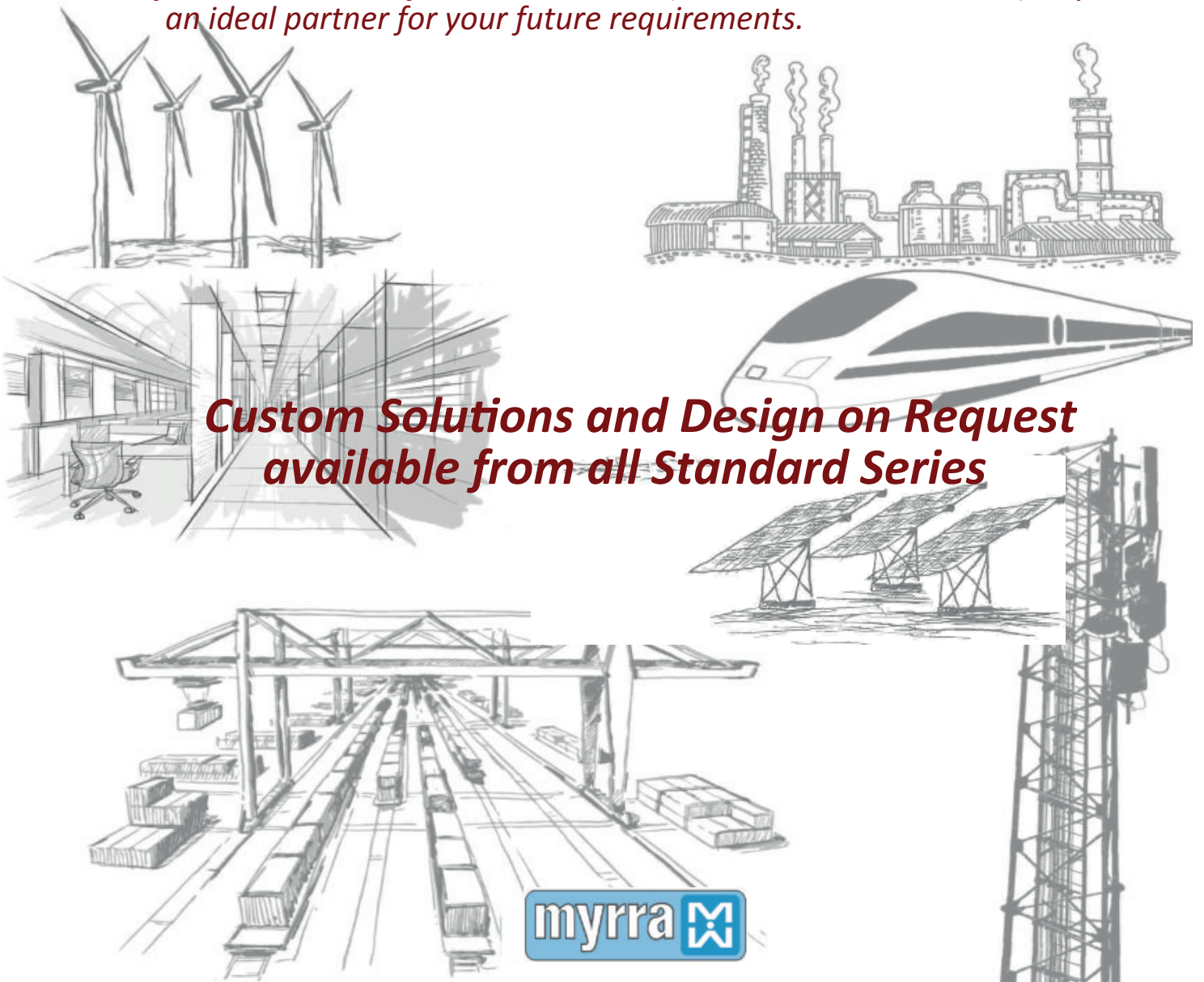
## **Myrra company Profile**

*Myrra Transformers, Inductors, Chokes and Power Supplies are World renowned for their reliability and performance. This is the result of constant technological development and continuous production process improvements, which has made Myrra Group a leading Company in both design ( R&D) and manufacturing.*

*With their own range of products, including encapsulated Power Supplies, Transformers ( 50/60Hz ), HF Transformers and Value-Added Services, Myrra has become a reliable and renowned Global Supplier.*

*Since incorporation in 1949, Myrra has become one of the largest European sources for their products in the electrical market, and is striving to grow their position in a continuously evolving market.*

*As a Company certified by VDE, UL, CSA, ISO9001 and with a clear policy for conservation of the environment ( RoHs, REACH, ISO14001), Myrra is an ideal partner for your future requirements.*



# Encapsulated Power Supplies

*"We at Myrra, Design and Manufacture  
all our Power Products,  
ensuring our Customers experience  
consistent Quality and Reliability"*

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# 1W to 3W

3 Certified Power Ratings  
in  
1 Power Supply



# 2.5W to 5W



# 7.5W



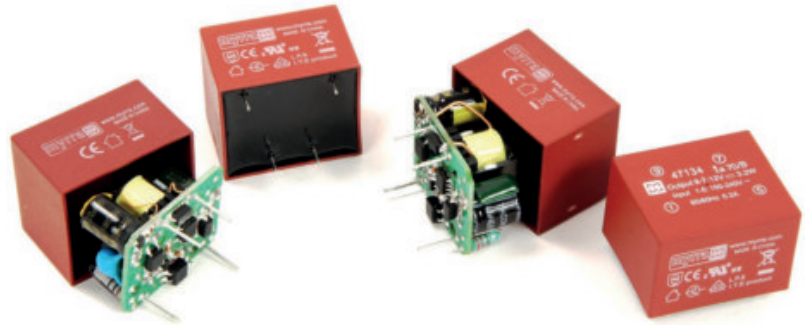
# 10W



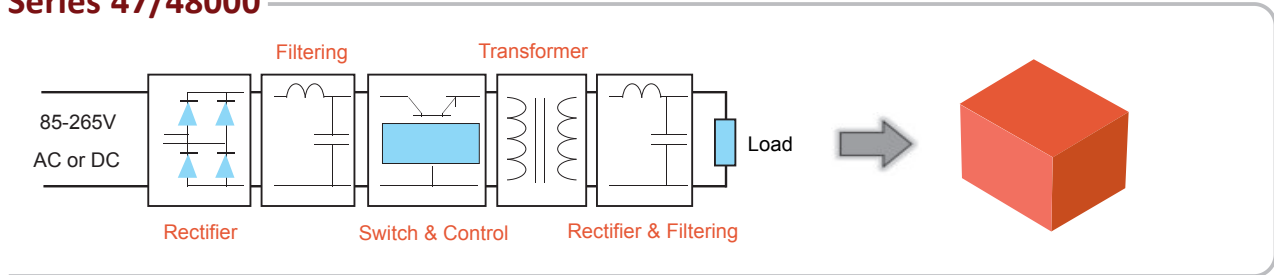
# 20W to 60W



# POWER SUPPLIES 1W to 60W



## Series 47/48000



MYRRA encapsulated Switched Mode Power Supplies is based on Flyback topology.

They constitute an interesting alternative to the traditional supply in the most common applications of power from 1W to 60W.

**ENERGY SAVING** due to high efficiency and low standby power.

### Application for our Power Supplies:

- Alternative to the linear transformers in all AC/DC applications of power up to 60W
- Alternative to DC/DC converters for application in D.C. current (Telecom supplies, electric substations etc.)
- Industrial, domestic and consumer electronics applications
- Standby devices and others DC or AC auxiliary supplies

With the same footprint as an EI30 transformer, they will replace:

- 50 Hz Transformer
- Fuse
- Bridge Rectifier
- Filtering Capacitor

Regulated types will also replace linear regulator and heatsink

### MAIN FEATURES

- **Wide input voltage range**
- **Increased power: 3 x compared to standard EE20-EI30-EI38 transformers**
- **Better energetic efficiency: 70% typical compared to 40% for the conventional supply**
- **Very low Standby Power consumption: meets requirements of Energy Star or EC Code of Conduct**
- **Same footprint as EE20-EI30-EI38-EI48 transformer: (1W~10W) Upgrade your application without redesign of PCB**

### SAFETY STANDARDS

Meets all requirements of:

- EN 60950
- EN 60335
- EN 61558-2-16
- EN 61558-1
- UL 60950-1
- CSA 22.2 N°60950-1
- UL 94-V0

### EMC STANDARDS

Conducted and radiated emissions conform to

- EN 55014-1
- EN 55022 class B

Immunity conform to

- EN 55014-2
- EN 61000-4-x

# ONE OUTPUT 1W to 3W - Small Compact Size



## MAIN FEATURES :

- Small Compact Size - PCB Mount
- Single Output
- Output Range : 3.3VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption < 0.15W
- Better Energetic Efficiency : Meet Requirements Of Energy Star And EC Code Of Conduct
- Encapsulated Design And Same Footprint As EE20 Transformer : Upgrade Your Application Without Redesign Of PCB
- Safety : IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE, VDE, ENEC Mark
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014 CLASS B, EN55032 CLASS B And FCC Part 15
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Max. Operating Ambient (°C) | Min. Part Efficiency(%) |
|-------------|------------------|----------------------|---------------------|----------------------------|-----------------------------|-------------------------|
| 48021       | 1                | 3.3                  | 300                 | ± 6                        | 80                          | 60                      |
|             | 2.5              |                      | 750                 |                            | 60                          | 63                      |
|             | 2.75             |                      | 830                 |                            | 50                          |                         |
| 48022       | 1                | 5                    | 200                 | ± 5                        | 80                          | 60                      |
|             | 2.5              |                      | 500                 |                            | 60                          | 65                      |
|             | 3                |                      | 600                 |                            | 50                          |                         |
| 48023       | 1                | 9                    | 110                 |                            | 80                          | 67                      |
|             | 2.5              |                      | 280                 |                            | 70                          | 70                      |
|             | 3                |                      | 330                 |                            | 60                          |                         |
| 48024       | 1                | 12                   | 84                  |                            | 80                          | 67                      |
|             | 2.5              |                      | 210                 |                            | 70                          | 72                      |
|             | 3                |                      | 250                 |                            | 60                          |                         |
| 48025       | 1                | 15                   | 67                  |                            | 80                          | 67                      |
|             | 2.5              |                      | 170                 | 70                         | 72                          |                         |
|             | 3                |                      | 200                 | 60                         |                             |                         |
| 48026       | 1                | 18                   | 56                  | 80                         | 67                          |                         |
|             | 2.5              |                      | 140                 | 70                         | 72                          |                         |
|             | 3                |                      | 170                 | 60                         |                             |                         |
| 48027       | 1                | 24                   | 42                  | 80                         | 70                          |                         |
|             | 2.5              |                      | 105                 | 70                         | 74                          |                         |
|             | 3                |                      | 125                 | 60                         |                             |                         |

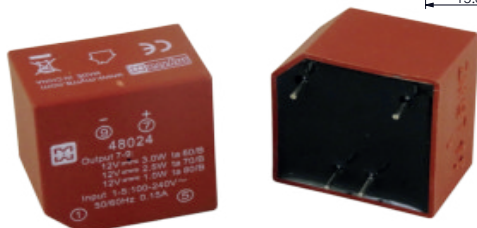
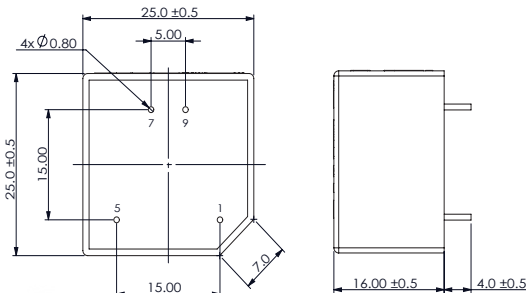
## DIMENSIONS and PINOUT

4 pins

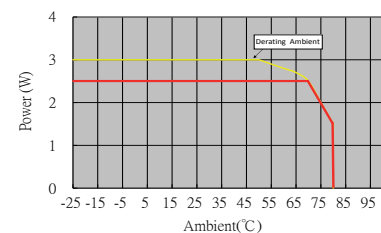
PRI : Pins 1 – 5 : AC or DC Input

SEC : Pin 7 : DC Output +V

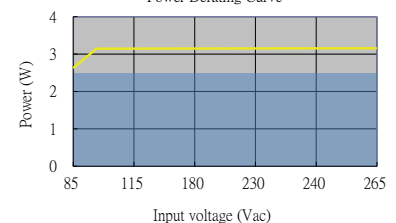
Pin 9 : DC Output 0V



Power Derating Curve



Power Derating Curve



| Model: 1 to 3 Watt         |                                  | Specification  |
|----------------------------|----------------------------------|--|
| AC Input Characteristics   | Rated AC input Voltage           | 100~240Vac or 140VDC-340VDC  |
|                            | AC Input Voltage Range           | 85~265Vac or 120VDC-370VDC   |
|                            | AC Input Frequency Range         | 47Hz~63Hz  |
|                            | Rated AC Input Frequency         | 50/60Hz  |
|                            | Input Current                    | 0.15A Max@85Vac~265Vac, at full load   |
|                            | Standby Power                    | 0.15W Max(Meet Requirements Of Energy Star And EC Code Of Conduct)   |
| DC Output Characteristics  | Output Voltage Accuracy          | 3.3V type: $\pm 6\%$ Other types(5V,9V,12V,15V,18V and 24V): $\pm 5\%$   |
|                            | Output Voltage Line Regulation   | 3.3V type: $\pm 5\%$ Other types(5V,9V,12V,15V,18V and 24V): $\pm 3\%$   |
|                            | Output Voltage Load Regulation   | 3.3V type: $\pm 6\%$ Other types(5V,9V,12V,15V,18V and 24V): $\pm 5\%$   |
|                            | Ripple & Noise                   | Max 200mVp-p@ Rated AC input, at nominal line (The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Ceramic-Cap. An oscilloscope set at 20MHz bandwidth)  |
|                            | Dynamic Response                 | The output voltage shall not exceed $\pm 10\%$ rated output voltage @ 50% $\leftarrow$ $\rightarrow$ 100% Load change, 1A/uS, 1KHz 50% duty cycle  |
|                            | Hold Up Time                     | 5mS min@ 100Vac ~240Vac, DC output with full load  |
|                            | Turn On Delay                    | 3S max @ 85Vac~265Vac input and DC output with full load   |
|                            | Rise Time                        | 50ms max @ 85Vac~265Vac input and DC output with full load   |
|                            | Overshoot                        | The output voltage shall not exceed +10% rated output voltage @ Power on and 85Vac~265Vac input, and DC with full load   |
|                            | Undershoot                       | The output voltage shall not exceed -10% rated output voltage @ Power off and 85Vac~265Vac input and DC output with full load  |
|                            | Efficiency                       | See table (Meets Requirements Of Energy Star And EC Code Of Conduct)   |
| Protection Characteristics | Over Current Protection          | The power supply shall automatic protect. The power supply shall auto-recover normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur with no safety hazard   |
|                            | Output Short Circuit Protection  | The power supply shall withstand a continuous output short without damage in 24 hours; The short may be applied before power on, or after power on; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur with no safety hazard |
|                            | Over temperature protection      | The power supply shall shut down when the junction temperature of PWM controller exceeds the thermal shutdown temperature, typically 140°C $\pm 10^\circ\text{C}$  |
| Environmental              | Operation Temperature            | -25°C ~+ (see table)   |
|                            | Operation Humidity               | 10~ 90% RH(No Condensing) @ full load  |
|                            | Storage Temperature              | -40°C~ +85°C   |
|                            | Storage Humidity                 | 5%~95%   |
|                            | Cooling Method                   | Ordinary or thermostat   |
| Safety & EMC Requirement   | Dielectric Strength              | Primary to Secondary: 4000Vac 5mA, 3 secs.   |
|                            | Radiation                        | Meeting EN55032,EN55014,FCC part 15, Class B. under 3dB margin   |
|                            | Conduction                       | Meeting EN55032,EN55014, FCC part 15,Class B. under 3dB margin   |
|                            | Harmonic Current Disturbance     | Meeting EN61000-3-2:2014, Class A  |
|                            | Voltage Fluctuation And Flicker  | Meeting EN61000-3-3:2013   |
|                            | Electrostatic Discharge          | Meeting IEC61000-4-2:2008 Contact Discharge $\pm 4\text{KV}$ ,Air Discharge $\pm 8\text{KV}$   |
|                            | RF Field Strength Susceptibility | Meeting IEC61000-4-3:2006+A1:2007+A2:2010  |
|                            | Electrical Fast Transient        | Meeting IEC61000-4-4:2012, $\pm 1\text{KV}$  |
|                            | Lightning Surge                  | Meeting IEC61000-4-5:2014, $\pm 1\text{KV}$ (surge level can be extended to 6KV with an external circuit - please refer to MYRRA's website and catalogue for MYRRA SMPS application notes).  |
|                            | Conducted Susceptibility         | Meeting IEC61000-4-6 : 2013  |
|                            | Voltage Dips And Interruptions   | Meeting IEC61000-4-11 : 2004   |
|                            | Safety Standards                 | Meet all requirements of : UL/CUL60950, UL/CUL62368, IEC/EN60950, IEC/EN60335,IEC/EN61558-2-16, IEC/EN62368, CE, VDE, ENEC Mark  |
| Reliability Requirement    | MTBF                             | Calculated by MIL-HDBK-217-F2 >200K Hours @230VAC input at max operation temperature; >550K Hours @230VAC input at 25deg.C   |
|                            | Burn-In Test                     | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C  |
| Net Weight                 | About 16 grams per product unit  |  |
| Guarantee                  | This product meets RoHS standard |  |

# ONE OUTPUT 2.5W to 5W



## MAIN FEATURES

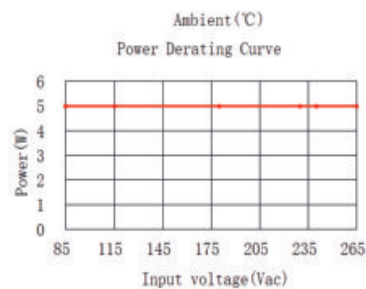
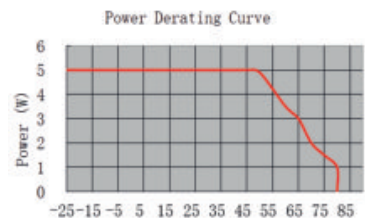
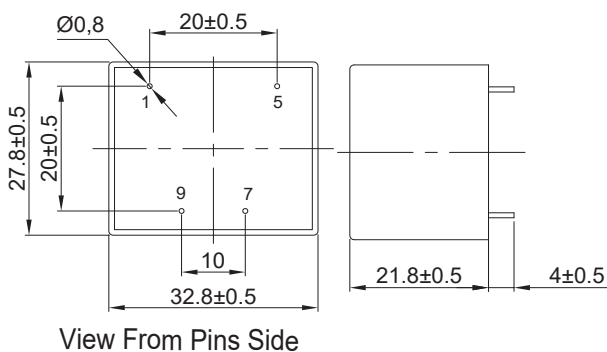
- 2.5 To 5W Small Compact Size - PCB Mount
- Single Output
- Output Range : 3.3VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption < 0.2W
- Better Energetic Efficiency : Meet Requirements Of Energy Star And EC Code Of Conduct
- Encapsulated Design And Same Footprint As EI30 Transformer : Upgrade Your Application Without Redesign Of PCB
- Safety : Meets All Requirements of: IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE, VDE, ENEC Mark
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014, EN55032, CLASS B
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output voltage (Vdc) | Output current (mA) | Output Load Regulation (%) | Max. Operating Ambient (°C) | Min. Part Efficiency(%) |
|-------------|------------------|----------------------|---------------------|----------------------------|-----------------------------|-------------------------|
| 47121       | 2.5              | 3.3                  | 750                 | ± 2                        | 70                          | 65                      |
| 47122       | 2.75             | 5                    | 550                 |                            |                             | 68                      |
| 47123       | 2.5              | 9                    | 270                 |                            |                             | 72                      |
| 47124       |                  | 12                   | 210                 |                            |                             | 74                      |
| 47125       |                  | 15                   | 170                 |                            |                             | 75                      |
| 47126       |                  | 24                   | 110                 |                            |                             | 77                      |
| 47151       |                  | 4.5                  | 3.3                 |                            |                             | 1350                    |
| 47152       | 5                | 5                    | 900                 |                            | 68                          |                         |
| 47153       | 5                | 9                    | 550                 |                            | 72                          |                         |
| 47154       |                  | 12                   | 420                 |                            | 75                          |                         |
| 47155       |                  | 15                   | 320                 |                            | 76                          |                         |
| 47156       |                  | 24                   | 220                 |                            | 79                          |                         |
| 47157       | 4.5              | 3.8                  | 1180                |                            | 66                          |                         |

Special Version : 4712xSLI and 4715xSLI = 19.2mm case height (x=1, 2, 3, 4, 5, 6 or 7)

## DIMENSIONS and PINOUT

4 pins  
 pins 1 & 5 : AC or DC Input  
 pin 7 : DC output +V  
 pin 9 : DC output 0V





| Model: 2.5 To 5 Watt       |                                    | Specification  |
|----------------------------|------------------------------------|--|
| AC Input Characteristics   | Rated AC input Voltage             | 100~240Vac Or 140VDC-340VDC  |
|                            | AC Input Voltage Range             | 85~265Vac Or 120VDC-370VDC   |
|                            | AC Input Frequency Range           | 47Hz~63Hz  |
|                            | Rated AC Input Frequency           | 50/60Hz  |
|                            | Input Current                      | 0.2A Max@85Vac~265Vac, at full load  |
|                            | Standby Power                      | 0.2W Max(Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| DC Output Characteristics  | Output Voltage Accuracy            | ± 2%   |
|                            | Output Voltage Line Regulation     | ± 0.5%   |
|                            | Output Voltage Load Regulation     | ± 1%   |
|                            | Ripple & Noise                     | Max 200mVp-p@ Rated AC input(The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Cer-Cap. An oscilloscope set at 20MHz bandwidth)  |
|                            | Efficiency                         | See Table (Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| Protection Characteristics | Over Current Protection            | The power supply shall automatic protection. The power supply shall autorecovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard  |
|                            | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours ; The short may be applied before power on, or after power on ; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
| Environmental              | Operation Temperature              | The power supply shall shut down when the junction temperature of PWM controller exceeds the thermal shutdown temperature , typically 140°C±10°C.  |
|                            | Operation Humidity                 | 10~ 90% RH(No Condensing) @ full load  |
|                            | Storage Temperature                | -40°C~ +85°C   |
|                            | Storage Humidity                   | 5%~95%   |
| Safety & EMC Requirement   | Dielectric Strength                | Primary to Secondary: 4000Vac 5mA, 3 sec.  |
|                            | Radiation                          | Meet EN55022,EN55014 , Class B. under 3dB margin   |
|                            | Conduction                         | Meet EN55022,EN55014, Class B. under 3dB margin  |
|                            | Safety Standards                   | Meet all requirements of<br>UL/CUL60950 - IEC/EN60950 - IEC/EN60335 - EC/EN61558-2-16<br>CE,VDE, And ENEC Mark<br>VDE Approval No. 40034334 - UL Approval No.E352488   |
| Reliability Requirement    | MTBF                               | Calculated by MIL-HDBK-217-F2<br>550K Hours Min. @230VAC input, 25deg.C  |
|                            | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C  |
| Net Weight                 | About 30 grams per product unit    |  |
| Guarantee                  | This product meet to RoHS standard |  |

# ONE OUTPUT 2.4W to 5W



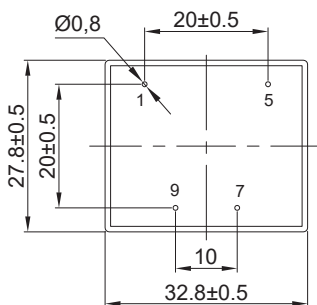
## MAIN FEATURES

- 2.4W to 5W Small Compact Size - PCB Mount
- Single Output
- Output Range : 5.5VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption < 0.3W
- Better Energetic Efficiency : Meet Requirements Of Energy Star
- Encapsulated Design And Same Footprint As EI30 Transformer : Upgrade Your Application Without Redesign Of PCB

- Safety : Meets All Requirements of: IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE, VDE, ENEC Mark
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014, EN55032, CLASS B
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

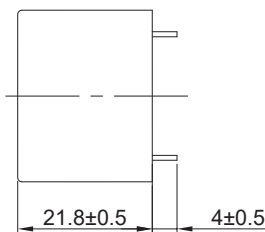
| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Ambient (°C) | Min. Part Efficiency(%) |
|-------------|------------------|----------------------|---------------------|----------------------------|--------------|-------------------------|
| 47114       | 2.4              | 12                   | 200                 | ± 5                        | 70           | 74                      |
| 47132       | 2.5              | 5                    | 500                 |                            |              | 68                      |
| 47133       | 3.2              | 9                    | 360                 |                            |              | 73                      |
| 47134       |                  | 12                   | 270                 |                            |              | 75                      |
| 47135       |                  | 18                   | 180                 |                            |              | 78                      |
| 47136       |                  | 24                   | 130                 |                            |              | 80                      |
| 47162       | 5                | 5                    | 900                 |                            | 50           | 68                      |
| 47163       |                  | 9                    | 560                 |                            |              | 73                      |
| 47164       |                  | 12                   | 420                 |                            |              | 75                      |
| 47165       |                  | 18                   | 280                 |                            |              | 78                      |
| 47166       |                  | 24                   | 210                 |                            |              | 80                      |

## DIMENSIONS and PINOUT

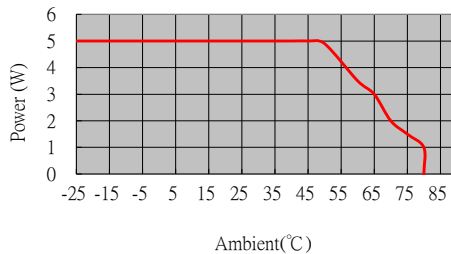


View From Pins Side

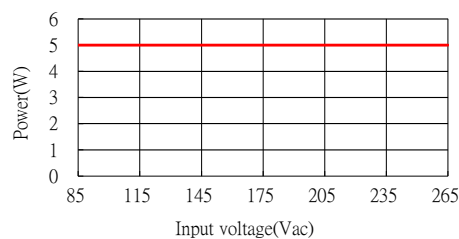
4 pins  
 pins 1 & 5 : AC or DC Input  
 pin 7 : DC output +V  
 pin 9 : DC output 0V



Power Derating Curve



Power Derating Curve



| Model: 2.5 To 5 Watt       |                                    | Specification  |
|----------------------------|------------------------------------|--|
| AC Input Characteristics   | Rated AC input Voltage             | 100~240Vac Or 140VDC-340VDC  |
|                            | AC Input Voltage Range             | 85~265Vac Or 120VDC-370VDC   |
|                            | AC Input Frequency Range           | 47Hz~63Hz  |
|                            | Rated AC Input Frequency           | 50/60Hz  |
|                            | Input Current                      | 0.2A Max@85Vac~265Vac, at full load  |
|                            | Standby Power                      | 0.2W Max(Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| DC Output Characteristics  | Output Voltage Accuracy            | ± 2%   |
|                            | Output Voltage Line Regulation     | ± 0.5%   |
|                            | Output Voltage Load Regulation     | ± 1%   |
|                            | Ripple & Noise                     | Max 200mVp-p@ Rated AC input(The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Cer-Cap. An oscilloscope set at 20MHz bandwidth)  |
|                            | Efficiency                         | See Table (Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| Protection Characteristics | Over Current Protection            | The power supply shall automatic protection. The power supply shall autorecovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard  |
|                            | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours ; The short may be applied before power on, or after power on ; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
| Environmental              | Operation Temperature              | The power supply shall shut down when the junction temperature of PWM controller exceeds the thermal shutdown temperature , typically 140°C±10°C.  |
|                            | Operation Humidity                 | 10~ 90% RH(No Condensing) @ full load  |
|                            | Storage Temperature                | -40°C~ +85°C   |
|                            | Storage Humidity                   | 5%~95%   |
| Safety & EMC Requirement   | Dielectric Strength                | Primary to Secondary: 4000Vac 5mA, 3 sec.  |
|                            | Radiation                          | Meet EN55022,EN55014 , Class B. under 3dB margin   |
|                            | Conduction                         | Meet EN55022,EN55014, Class B. under 3dB margin  |
|                            | Safety Standards                   | Meet all requirements of<br>UL/CUL60950 - IEC/EN60950 - IEC/EN60335 - EC/EN61558-2-16<br>CE,VDE, And ENEC Mark<br>VDE Approval No. 40034334 - UL Approval No.E352488   |
| Reliability Requirement    | MTBF                               | Calculated by MIL-HDBK-217-F2<br>550K Hours Min. @230VAC input, 25deg.C  |
|                            | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C  |
| Net Weight                 | About 30 grams per product unit    |  |
| Guarantee                  | This product meet to RoHS standard |  |

# TWO OUTPUTS - COMMON 3W to 5W



## MAIN FEATURES

- 3W To 5W Small Compact Size - PCB Mount
- Two Common Output
- Output Voltage Accuracy :  
See Table For 15 to 100% Rated Load Of Each Output  
(includes line and load variations)
- Input Range : 85VAC - 265VAC/47 - 63Hz Or  
120VDC - 370VDC
- Very Low Standby Power Consumption < 0.2W
- Better Energetic Efficiency : Meet Requirements Of Energy Star

- Encapsulated Design And Same Footprint As EI30 Transformer : Upgrade Your Application Without Redesign Of PCB
- Safety : Meets All Requirements of: IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE, VDE, ENEC Mark
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014, EN55032, CLASS B
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

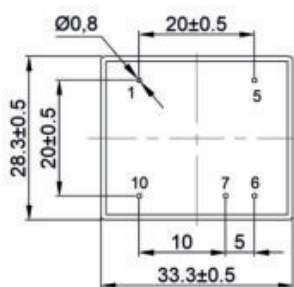
| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Max. Operating Ambient (°C) | Min. Part Efficiency(%) |
|-------------|------------------|----------------------|---------------------|----------------------------|-----------------------------|-------------------------|
| 47243       | 4.7              | (+)10.5<br>(+) 7.0   | 380<br>100          | ± 3<br>± 15                | 50                          | 72                      |
| 47244       | 5                | (+) 15<br>(+) 7.0    | 300<br>70           | ± 3<br>± 15                |                             |                         |
| 47245       | 3.2              | (+) 12<br>(+) 5.5    | 130<br>300          | ± 5<br>± 10                | 70                          | 65                      |
| 47246       | 4                | (+) 5.0<br>(+) 12    | 400 (600max)<br>170 | ± 3<br>± 15                | 60                          |                         |
| 47247       |                  | (+) 15<br>(+) 15     | 130<br>130          | ± 8<br>± 8                 |                             |                         |

Notes : The dual DC Voltage Outputs share a Common OV reference.  
Power deration must be considered at higher Operating Ambient Temperatures.

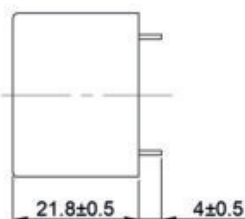
## DIMENSIONS and PINOUT

5 pins

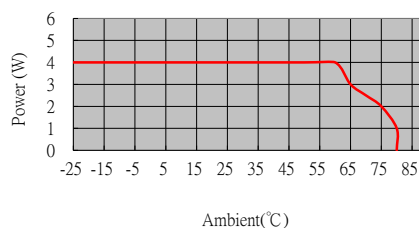
pins 1 & 5: AC or DC Input  
pin 6: Common output 0V  
pin 7: DC output 1  
pin 10: DC output



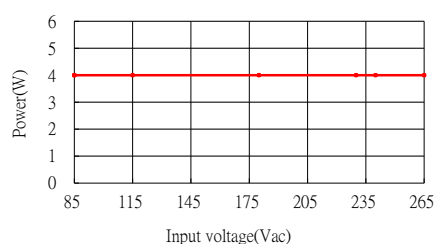
View From Pins Side



Power Derating Curve



Power Derating Curve



| <b>Model: Two Common Outputs 3 TO 5W</b> |                                    | <b>Specification</b>  |
|--|------------------------------------|---|
| AC Input Characteristics                 | Rated AC input Voltage             | 100~240Vac Or 140VDC-340VDC   |
|  | AC Input Voltage Range             | 85~265Vac Or 120VDC-370VDC  |
|  | AC Input Frequency Range           | 47Hz~63Hz   |
|  | Rated AC Input Frequency           | 50/60Hz   |
|  | Input Current                      | 0.2A Max@85Vac~265Vac, at full load   |
|  | Standby Power                      | 0.2W Max (Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| DC Output Characteristics                | Output Voltage Accuracy            | See Table For 15 To 100% Rated Load Of Each Output (includes line and load variations)  |
|  | Efficiency                         | See Table(Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| Protection Characteristics               | Over Current Protection            | The power supply shall automatic protection. The power supply shall autorecovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard   |
|  | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours; The short may be applied before power on, or after power on ; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
|  | Over Temperature Protection        | The power supply shall shut down when the junction temperature of PWM controller exceeds the thermal shutdown temperature, typically 140°C±10°C.  |
| Environmental                            | Operation Temperature              | -25°C ~ +Ta (see table)   |
|  | Operation Humidity                 | 10~ 90% RH(No Condensing) @ full load   |
|  | Storage Temperature                | -40°C~ +85°C  |
|  | Storage Humidity                   | 5%~95%  |
| Safety & EMC Requirement                 | Dielectric Strength                | Primary to Secondary: 4000Vac 5mA, 3 sec.   |
|  | Radiation                          | Meet EN55022,EN55014, Class B. under 3dB margin   |
|  | Conduction                         | Meet EN55022,EN55014,Class B. under 3dB margin  |
|  | Safety Standards                   | Meets all requirements of<br>UL/CUL60950<br>IEC/EN60950<br>IEC/EN60335<br>IEC/EN61558-2-16<br>CE,VDE, And ENEC Mark<br>VDE Approval No. 40034334<br>UL Approval No.E352488  |
| Reliability Requirement                  | MTBF                               | Calculated by MIL-HDBK-217-F2<br>550K Hours Min. @230VAC input, 25deg.C   |
|  | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C   |
| Net Weight                               | About 30 grams per product unit    |   |
| Guarantee                                | This product meet to RoHS standard |   |

# TWO OUTPUTS - ISOLATED 3.5W to 4W



## MAIN FEATURES

- Small Compact Size - P C B Mount
- Two Isolated Output
- Output Voltage Accuracy :
- See Table For 15 to 100% Rated Load Of Each Output  
(includes line and load variations)
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption < 0.2W
- Better Energetic Efficiency : Meet Requirements Of Energy Star

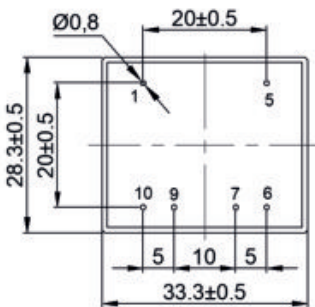
- Encapsulated Design And Same Footprint As EI30 Transformer : Upgrade Your Application Without Redesign Of PCB
- Safety : Meets All Requirements of: IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE, VDE, ENEC Mark
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014, EN55032, CLASS B
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Max. Operating Ambient (°C) | Min. Part Efficiency(%) |
|-------------|------------------|----------------------|---------------------|----------------------------|-----------------------------|-------------------------|
| 47252       | 3.5              | 5                    | 350 (600 max)       | ± 3                        | 60                          | 60                      |
|             |                  | 5                    | 350                 | ± 15                       |                             |                         |
| 47254       | 4                | 12                   | 165 (300max)        | ± 5                        |                             | 72                      |
|             |                  | 12                   | 165                 | ± 15                       |                             |                         |
| 47255       |                  | 15                   | 135 (200 max)       | ± 5                        |                             | 73                      |
|             |                  | 15                   | 135                 | ± 15                       |                             |                         |
| 47257       |                  | 5                    | 400 (600 max)       | ± 3                        |                             | 68                      |
|             |                  | 12                   | 170                 | ± 15                       |                             |                         |
| 47258       |                  | 18                   | 150 (200 max)       | ± 5                        |                             | 72                      |
|             |                  | 8                    | 150                 | ± 15                       |                             |                         |

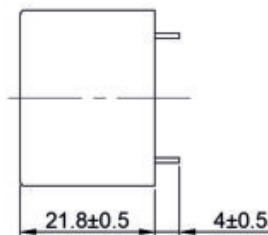
## DIMENSIONS and PINOUT

6 pins

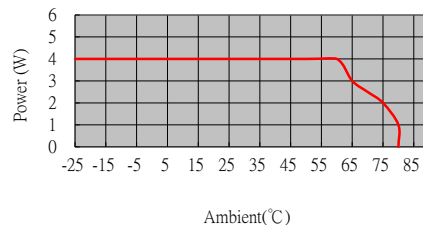
pins 1 & 5: AC or DC Input  
 pin 6: DC output 1 0V  
 pin 7: DC output 1 +V  
 pin 9: DC output 2 0V  
 pin 10: DC output 2 +



View From Pins Side

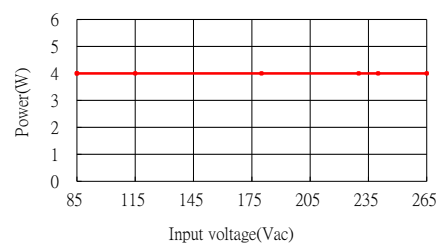


Power Derating Curve



Ambient(°C)

Power Derating Curve



Input voltage(Vac)

| Model : Two Common Outputs 3 TO 5W |                                    | Specification   |
|------------------------------------|------------------------------------|---|
| AC Input Characteristics           | Rated AC input Voltage             | 100~240Vac Or 140VDC-340VDC   |
|                                    | AC Input Voltage Range             | 85~265Vac Or 120VDC-370VDC  |
|                                    | AC Input Frequency Range           | 47Hz-63Hz   |
|                                    | Rated AC Input Frequency           | 50/60Hz   |
|                                    | Input Current                      | 0.2A Max@85Vac~265Vac, at full load   |
|                                    | Standby Power                      | 0.2W Max (Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| DC Output Characteristics          | Output Voltage Accuracy            | See Table For 15 To 100% Rated Load Of Each Output (includes line and load variations)  |
|                                    | Efficiency                         | See Table(Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| Protection Characteristics         | Over Current Protection            | The power supply shall automatic protection. The power supply shall autorecovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard   |
|                                    | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours; The short may be applied before power on, or after power on ; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
|                                    | Over Temperature Protection        | The power supply shall shut down when the junction temperature of PWM controller exceeds the thermal shutdown temperature, typically 140°C±10°C.  |
| Environmental                      | Operation Temperature              | -25°C ~ +Ta (see table)   |
|                                    | Operation Humidity                 | 10~ 90% RH(No Condensing) @ full load   |
|                                    | Storage Temperature                | -40°C~ +85°C  |
|                                    | Storage Humidity                   | 5%~95%  |
| Safety & EMC Requirement           | Dielectric Strength                | Primary to Secondary: 4000Vac 5mA, 3 sec.   |
|                                    | Radiation                          | Meet EN55022,EN55014, Class B. under 3dB margin   |
|                                    | Conduction                         | Meet EN55022,EN55014,Class B. under 3dB margin  |
|                                    | Safety Standards                   | Meets all requirements of<br>UL/CUL60950<br>IEC/EN60950<br>IEC/EN60335<br>IEC/EN61558-2-16<br>CE,VDE, And ENEC Mark<br>VDE Approval No. 40034334<br>UL Approval No.E352488  |
| Reliability Requirement            | MTBF                               | Calculated by MIL-HDBK-217-F2<br>550K Hours Min. @230VAC input, 25deg.C   |
|                                    | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C   |
| Net Weight                         | About 30 grams per product unit    |   |
| Guarantee                          | This product meet to RoHS standard |   |

# ONE OUTPUT 7.5W

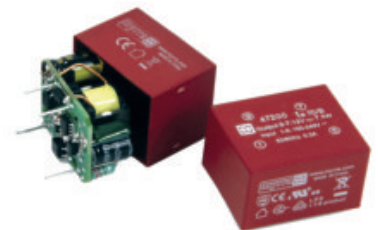


## MAIN FEATURES

- 7.5W Small Compact Size - PC B Mount
- Single Output
- Output Range : 3.3VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption < 0.15W
- Better Energetic Efficiency : Meet Requirements Of Energy Star
- Encapsulated Design And Same Footprint As EI38 Transformer : Upgrade Your Application Without Redesign Of PCB

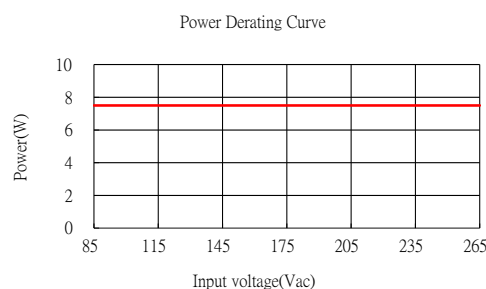
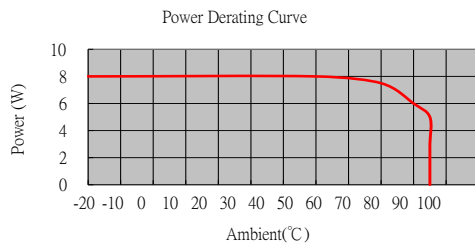
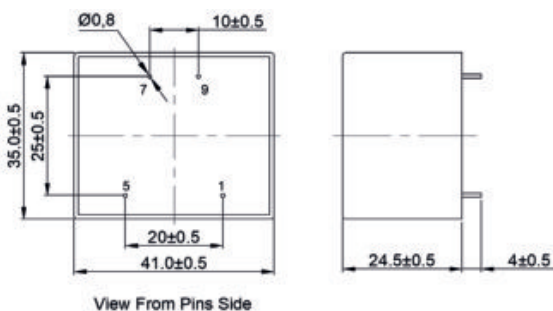
- Safety : Meets All Requirements of: IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE, VDE, ENEC Mark
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014, EN55032, CLASS B and FFC Part15
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Max. Operating Ambient (°C) | Min. Part Efficiency(%) |    |
|-------------|------------------|----------------------|---------------------|----------------------------|-----------------------------|-------------------------|----|
| 47206       | 7.5              | 3.3                  | 2270                | ± 3                        | 50                          | 74                      |    |
| 47200       |                  | 5                    | 1500                | ± 2                        |                             | 70                      | 77 |
| 47201       |                  | 9                    | 830                 |                            |                             |                         | 80 |
| 47202       |                  | 12                   | 625                 |                            | 82                          |                         |    |
| 47203       |                  | 15                   | 500                 |                            |                             |                         |    |
| 47204       |                  | 18                   | 420                 |                            |                             |                         |    |
| 47205       |                  | 24                   | 310                 |                            |                             |                         |    |



## DIMENSIONS and PINOUT

4 pins  
 pins 1 & 5 : AC or DC Input  
 pin 7 : DC output +V  
 pin 9 : DC output 0V





| Model: 7.5 Watt            |                                    | Specification  |
|----------------------------|------------------------------------|--|
| AC Input Characteristics   | Rated AC input Voltage             | 100~240Vac Or 140VDC-340VDC  |
|                            | AC Input Voltage Range             | 85~265Vac Or 120VDC-370VDC   |
|                            | AC Input Frequency Range           | 47Hz~63Hz  |
|                            | Rated AC Input Frequency           | 50/60Hz  |
|                            | Input Current                      | 0.3A Max@85Vac~265Vac, at full load  |
|                            | Standby Power                      | 0.15W Max(Meet Requirements Of Energy Star And EC Code Of Conduct)   |
| DC Output Characteristics  | Output Voltage Accuracy            | ± 2% (5V,9V,12V,15V,18V,24V Types) - ± 3%(3.3V Type)   |
|                            | Output Voltage Line Regulation     | ± 0.5%   |
|                            | Output Voltage Load Regulation     | ± 1%(5V,9V,12V,15V,18V,24V Types)<br>± 3%(3.3V Type)   |
|                            | Ripple & Noise                     | Max 180mVp-p@ Rated AC input, at nominal line (The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Cer-Cap. An oscilloscope set at 20MHz bandwidth)  |
|                            | Efficiency                         | Meet Requirements Of Energy Star And EC Code Of Conduct  |
| Protection Characteristics | Over Current Protection            | The power supply shall automatic protection. The power supply shall autorecovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard  |
|                            | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours; The short may be applied before power on, or after power on; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
| Environmental              | Operation Temperature              | -20°C ~ +Ta (see table)  |
|                            | Operation Humidity                 | 10~ 90% RH(No Condensing) @ full load  |
|                            | Storage Temperature                | -40°C~ +85°C   |
|                            | Storage Humidity                   | 5%~95%   |
| Safety & EMC Requirement   | Dielectric Strength                | Primary to Secondary: 4000Vac 5mA, 3 sec.  |
|                            | Radiation                          | Meet EN55022,EN55014,FCC, part 15, Class B. under 3dB margin   |
|                            | Conduction                         | Meet EN55022,EN55014, FCC, part 15,Class B. under 3dB margin   |
|                            | Safety Standards                   | Meet all requirements of<br>UL/CUL60950<br>IEC/EN60950<br>IEC/EN60335<br>IEC/EN61558-2-16<br>CE,VDE and ENEC Mark  |
| Reliability Requirement    | MTBF                               | Calculated by MIL-HDBK-217-F2<br>550K Hours Min. @230VAC input, 25deg.C  |
|                            | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C  |
| Net Weight                 | About 56 grams per product unit    |  |
| Guarantee                  | This product meet to RoHS standard |  |

# ONE OUTPUT 10W



## MAIN FEATURES

- 10W Small Compact Size - PC B Mount
- Single Output
- Output Range : 3.3VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz  
120VDC - 370VDC  
Or
- Very Low Standby Power Consumption < 0. 0W
- Better Energetic Efficiency : Meet Requirements Of Energy Star
- Encapsulated Design And Same Footprint As EI48 Transformer : Upgrade Your Application Without Redesign Of PCB

- Safety : Meets All Requirements of: IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE, VDE, ENEC Mark
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014, EN55032, CLASS B d r
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Max.Operating Ambient (°C) | Min. Part Efficiency(%) |
|-------------|------------------|----------------------|---------------------|----------------------------|----------------------------|-------------------------|
| 47210       | 10               | 5                    | 2000                | ± 3                        | 60                         | 74                      |
| 47211       |                  | 9                    | 1100                | ± 2                        |                            | 80                      |
| 47212       |                  | 12                   | 830                 |                            |                            | 82                      |
| 47213       |                  | 15                   | 670                 |                            |                            |                         |
| 47214       |                  | 18                   | 560                 | 72                         |                            |                         |
| 47215       |                  | 24                   | 420                 |                            |                            |                         |
| 47216       |                  | 3.3                  | 3000                | ± 4                        | 50                         |                         |

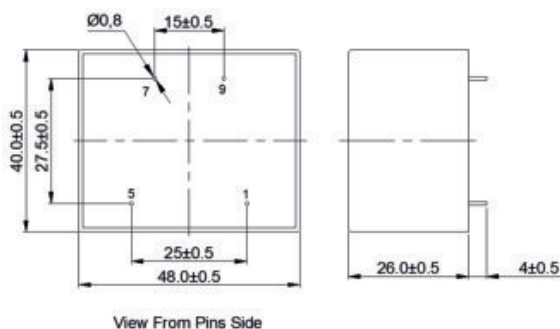
## DIMENSIONS and PINOUT

4 pins

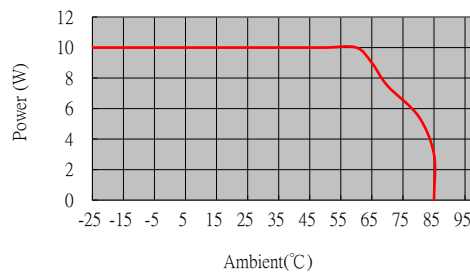
pins 1 & 5 : AC or DC Input

pin 7 : DC output +V

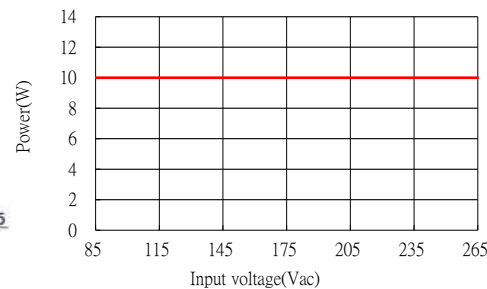
pin 9 : DC output 0V



Power Derating Curve



Power Derating Curve



| Model: 10 Watt             |                                    | Specification  |
|----------------------------|------------------------------------|--|
| AC Input Characteristics   | Rated input Voltage                | 100~240Vac Or 140VDC-340VDC  |
|                            | Input Voltage Range                | 85~265Vac Or 120VDC-370VDC   |
|                            | AC Input Frequency Range           | 47Hz~63Hz  |
|                            | Rated AC Input Frequency           | 50/60Hz  |
|                            | Input Current                      | 0.4A Max@85Vac~265Vac, at full load  |
|                            | Standby Power                      | 0.1W Max(Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| DC Output Characteristics  | Output Voltage Accuracy            | ± 2% (9V,12V,15V,18V,24V Types), ± 3% (5V Type), ± 4%(3.3V Type)   |
|                            | Output Voltage Line Regulation     | ± 0.5%(9V,12V,15V,18V,24V Types), ± 1%(3.3V and 5V Types )   |
|                            | Output Voltage Load Regulation     | ± 1%(9V,12V,15V,18V,24V Types)<br>± 3% (5V Type), ± 4%(3.3V Type)  |
|                            | Ripple & Noise                     | Max 150mVp-p @Rated AC input (The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Cer-Cap. An oscilloscope set at 20MHz bandwidth)   |
|                            | Efficiency                         | Meets Requirements Of Energy Star And EC Code Of Conduct   |
| Protection Characteristics | Over Current Protection            | The power supply shall automatic protection. The power supply shall auto-recovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard   |
|                            | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours; The short may be applied before power on, or after power on; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
| Environmental              | Operation Temperature              | -25°C ~ +Ta (see table)  |
|                            | Operation Humidity                 | 10~ 90% RH(No Condensing) @ full load  |
|                            | Storage Temperature                | -40°C~ +85°C   |
|                            | Storage Humidity                   | 5%~95%   |
| Safety & EMC Requirement   | Dielectric Strength                | Primary to Secondary: 4000Vac 5mA, 3 sec .   |
|                            | Radiation                          | Meeting EN55032,EN55014,FCC part 15, Class B. under 3dB margin   |
|                            | Conduction                         | Meeting EN55032,EN55014, FCC part 15,Class B. under 3dB margin   |
|                            | Safety Standards                   | Meet all requirements of<br>UL/CUL60950<br>IEC/EN60950<br>IEC/EN60335<br>IEC/EN61558-2-16<br>CE,VDE,And ENEC Mark<br>VDE Approval No. 40044416<br>UL Approval No.E345767   |
| Reliability Requirement    | MTBF                               | Calculated by MIL-HDBK-217-F2<br>5V ,9V,12V,15V,18V,24V Types: 200K Hours Min. @230VAC input, 60deg.C<br>3.3V type:200K Hours Min. @230VAC input, 50deg.C  |
|                            | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C  |
| Net Weight                 | About 80.2 grams per product unit. |  |
| Guarantee                  | This product meet to RoHS standard |  |

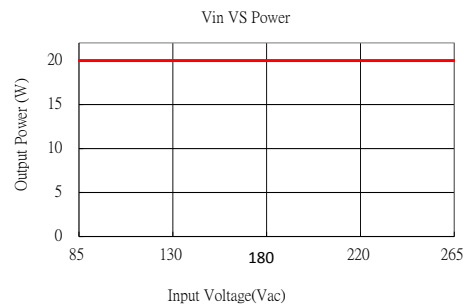
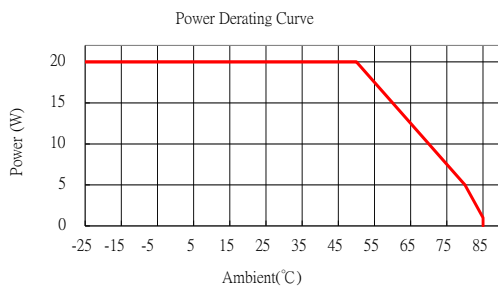
# ONE OUTPUT 20W

## MAIN FEATURES

- 20W Small Compact Size - PCB Mount
- Single Output
- Output Range : 3.3VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption = 0.1W
- Better Energetic Efficiency : Meet Requirements Of Energy Star And EC Code Of Conduct
- Encapsulated Design  
PCB Total Power Solution

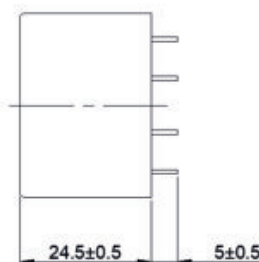
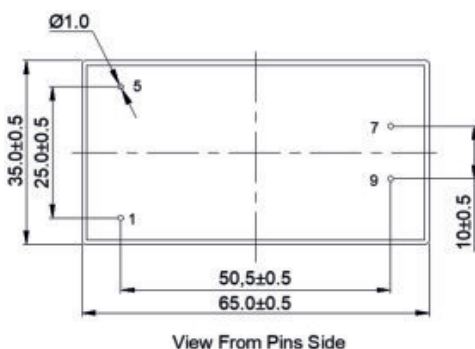
- Safety : Complies with IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE.
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014 CLASS B, EN55032 CLASS B And FCC Part 15
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output voltage (Vdc) | Output current (mA) | Output Load Regulation (%) | Max.Operating Ambient (°C) | Min. Part Efficiency (%) |
|-------------|------------------|----------------------|---------------------|----------------------------|----------------------------|--------------------------|
| 47220       | 15               | 3.3                  | 4500                | ± 4                        | 50                         | 82                       |
| 47221       |                  | 5                    | 4000                |                            |                            |                          |
| 47222       | 20               | 9                    | 2200                | ± 3                        | 60                         | 85                       |
| 47223       |                  | 12                   | 1700                |                            |                            |                          |
| 47224       |                  | 15                   | 1400                |                            |                            |                          |
| 47225       |                  | 18                   | 1100                |                            |                            |                          |
| 47226       |                  | 24                   | 840                 |                            |                            |                          |



## DIMENSIONS and PINOUT

4 pins  
pins 1 & 5 : AC or DC Input  
pin 7 : DC output +V  
pin 9 : DC output 0V



@ pending certification

| Model: 20 Watt             |                                  | Specification  |
|----------------------------|----------------------------------|--|
| AC Input Characteristics   | Rated input Voltage              | 100~240Vac Or 140VDC-340VDC  |
|                            | Input Voltage Range              | 85~265Vac Or 120VDC-370VDC   |
|                            | AC Input Frequency               | 47Hz~63Hz  |
|                            | Rated AC Input Frequency         | 50/60Hz  |
|                            | Input Current                    | 0.6A Max@85Vac~265Vac, at full load  |
|                            | Standby Power                    | 0.15W Max (Meets requirements Of Energy Star And EC Code Of Conduct)   |
| DC Output Characteristics  | Output Voltage Accuracy          | ± 3% (9V, 12V, 15V, 18V, 24V Types)<br>± 4% (3.3V Type, 5V Type)   |
|                            | Output Voltage Line Regulation   | ± 2% (9V, 12V, 15V, 18V, 24VTypes)<br>± 3% (3.3V and 5V Types )  |
|                            | Output Voltage Load Regulation   | ± 3% (9V, 12V, 15V, 18V, 24V Types)<br>± 4% (3.3V Type, 5V Type)   |
|                            | Ripple & Noise                   | Max 180mVp-p @Rated AC input (The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Cer-Cap. An oscilloscope set at 20MHz bandwidth)   |
|                            | Efficiency                       | Meets requirements Of Energy Star And EC Code Of Conduct   |
| Protection Characteristics | Over Current Protection          | The power supply shall automatically protect. The power supply shall auto-recover normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard   |
|                            | Output Short Circuit Protection  | The power supply shall withstand a continuous output short without damage in 24 hours; The short may be applied before power on, or after power on; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
| Environmental              | Operation Temperature            | -25°C ~+50°C (see derating curve)  |
|                            | Operation Humidity               | 10~ 90% RH (No Condensing) @ full load   |
|                            | Storage Temperature              | -40°C~ +85°C   |
|                            | Storage Humidity                 | 5%~95%   |
| Safety & EMC Requirement   | Dielectric Strength              | Primary to Secondary: 4000Vac 5mA, 3 sec .   |
|                            | Radiation                        | Meeting EN55032, EN55014, FCC part 15, Class B. under 3dB margin   |
|                            | Conduction                       | Meeting EN55032, EN55014, FCC part 15, Class B. under 3dB margin   |
|                            | Safety Standards                 | Meet all requirements of :<br>UL/CUL62368 - IEC/EN60335 - IEC/EN61558-2-16 - IEC/EN62368 -   |
| Reliability Requirement    | MTBF                             | Calculated by MIL-HDBK-217-F2 200K Hours Minimum @230VAC input, 50deg.C  |
|                            | Burn-In Test                     | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C  |
| Mechanical                 | Physical Size                    | The units do not including PINs of input and output , and dimension is :<br>(L)65*(W)35*(H)24.5± 0.5mm (see appearance drawing)  |
|                            | Net Weight                       | Approximately 92 grams per product unit.   |
| Guarantee                  | This product meets RoHS standard |  |

# ONE OUTPUT 40W

## MAIN FEATURES

- Small Compact Size - PCB Mount
- Single Output
- Output Range : 5VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption = 0.1W
- Better Energetic Efficiency : Meet Requirements Of Energy Star And EC Code Of Conduct
- Encapsulated Design  
PCB Total Power Solution

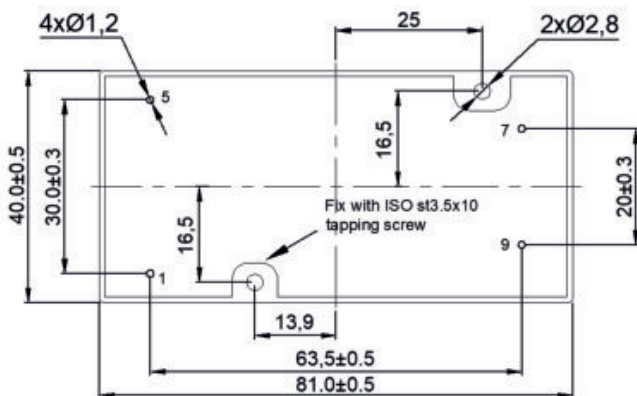
- Safety : Complies with IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE.
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014 CLASS B, EN55032 CLASS B And FCC Part 15
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Max.Operating Ambient (°C) | Min. Part Efficiency (%) |
|-------------|------------------|----------------------|---------------------|----------------------------|----------------------------|--------------------------|
| 47231       | 30               | 5                    | 6000                | ± 5                        | 50                         | 82                       |
| 47232       | 40               | 9                    | 4400                | ± 3                        |                            | 85                       |
| 47233       |                  | 12                   | 3300                |                            |                            |                          |
| 47234       |                  | 15                   | 2700                |                            |                            |                          |
| 47235       |                  | 18                   | 2200                |                            |                            |                          |
| 47236       |                  | 24                   | 1700                |                            |                            |                          |

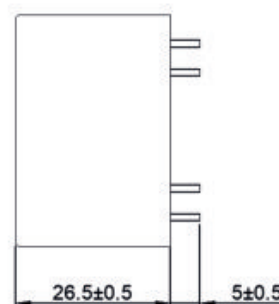


## DIMENSIONS and PINOUT

4 pins  
 pins 1 & 5 : AC or DC Input  
 pin 7 : DC output +V  
 pin 9 : DC output 0V



View From Pins Side



@ pending certification

| Model: 40 Watt             |                                    | Specification  |
|----------------------------|------------------------------------|--|
| AC Input Characteristics   | Rated input Voltage                | 100~240Vac Or 140VDC-340VDC  |
|                            | Input Voltage Range                | 85~265Vac Or 120VDC-370VDC   |
|                            | AC Input Frequency Range           | 47Hz~63Hz  |
|                            | Rated AC Input Frequency           | 50/60Hz  |
|                            | Input Current                      | 0.8A Max@85Vac~265Vac, at full load  |
|                            | Standby Power                      | 0.15W Max (Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| DC Output Characteristics  | Output Voltage Accuracy            | ± 3% (9V, 12V, 15V, 18V, 24V Types)<br>± 5% (5V Type)  |
|                            | Output Voltage Line Regulation     | ± 2% (9V, 12V, 15V,18V, 24V Types) ±<br>3% ( 5V Types )  |
|                            | Output Voltage Load Regulation     | ± 3% (9V, 12V, 15V,18V, 24V Types) ±<br>5% (5V Type)   |
|                            | Ripple & Noise                     | Max 200mVp-p @Rated AC input (The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Cer-Cap. An oscilloscope set at 20MHz bandwidth)   |
|                            | Efficiency                         | See table (Meet Requirements Of Energy Star And EC Code Of Conduct)  |
| Protection Characteristics | Over Current Protection            | The power supply shall automatic protection. The power supply shall auto-recovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard   |
|                            | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours; The short may be applied before power on, or after power on; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
| Environmental              | Operation Temperature              | -25°C ~ + 50°C (see derating curve)  |
|                            | Operation Humidity                 | 10~ 90% RH (Non Condensing) @ full load  |
|                            | Storage Temperature                | -40°C~ +85°C   |
|                            | Storage Humidity                   | 5%~95%   |
| Safety & EMC Requirement   | Dielectric Strength                | Primary to Secondary : 4000Vac 5mA, 3 sec.   |
|                            | Radiation                          | Meeting EN55032, EN55014, FCC part 15, Class B. under 3dB margin   |
|                            | Conduction                         | Meeting EN55032, EN55014, FCC part 15, Class B. under 3dB margin   |
|                            | Safety Standards                   | Meet all requirements of:UL/CUL62368 - IEC/EN60335 - IEC/EN61558-2-16 - IEC/EN62368  |
| Reliability Requirement    | MTBF                               | Calculated by MIL-HDBK-217-F2 200K Hours minimum @230VAC input, 50deg.C  |
|                            | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C  |
|                            | Net Weight                         | Approximately 150 grams per product unit.  |
| Guarantee                  | This product meet to RoHS standard |  |

*we reserve the right to change specifications in this document without notice*

# ONE OUTPUT 60W

## MAIN FEATURES

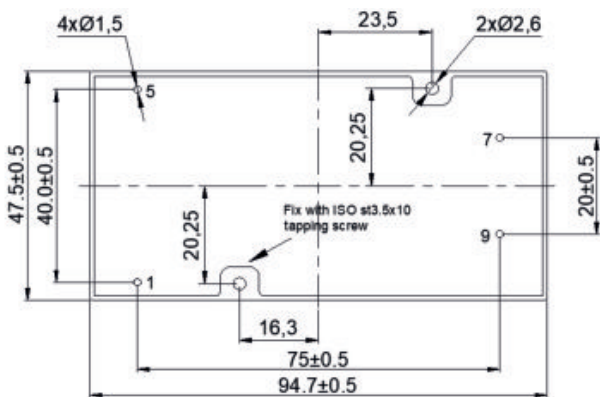
- Small Compact Size - PCB Mount
- Single Output
- Output Range : 5VDC - 24VDC
- Input Range : 85VAC - 265VAC/47 - 63Hz Or 120VDC - 370VDC
- Very Low Standby Power Consumption = 0.1W
- Better Energetic Efficiency : Meet Requirements Of Energy Star And EC Code Of Conduct
- Encapsulated Design  
PCB Total Power Solution

- Safety : Complies with IEC/EN61558-2-16, IEC/EN60950, IEC/EN60335, UL/CUL60950, CE.
- Materials : Uses UL 94-V0 Plastic And Resin
- EMC : Conducted And Radiated Emissions Conform To EN55014 CLASS B, EN55032 CLASS B And FCC Part 15
- Immunity Conform To EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

| Part Number | Output Power (W) | Output Voltage (Vdc) | Output Current (mA) | Output Load Regulation (%) | Max.Operating Ambient (°C) | Min. Part Efficiency (%) |
|-------------|------------------|----------------------|---------------------|----------------------------|----------------------------|--------------------------|
| 47261       | 50               | 5                    | 10000               | ± 5                        | 50                         | 82                       |
| 47262       | 60               | 9                    | 6600                | ± 3                        |                            | 85                       |
| 47263       |                  | 12                   | 5000                |                            |                            |                          |
| 47264       |                  | 15                   | 4000                |                            |                            |                          |
| 47265       |                  | 18                   | 3300                |                            |                            |                          |
| 47266       |                  | 24                   | 2500                |                            |                            |                          |

## DIMENSIONS and PINOUT

- 4 pins  
 pins 1 & 5 : AC or DC Input  
 pin 7 : DC output +V  
 pin 9 : DC output 0V



@ pending certification



| Model: 60 Watt             |                                    | Specification   |
|----------------------------|------------------------------------|---|
| AC Input Characteristics   | Rated input Voltage                | 100~240Vac Or 140VDC-340VDC   |
|                            | Input Voltage Range                | 85~265Vac Or 120VDC-370VDC  |
|                            | AC Input Frequency Range           | 47Hz~63Hz   |
|                            | Rated AC Input Frequency           | 50/60Hz   |
|                            | Input Current                      | 1.5A Max@85Vac~265Vac, at full load   |
|                            | Standby Power                      | 0.15W Max (Meet Requirements Of Energy Star And EC Code Of Conduct)   |
| DC Output Characteristics  | Output Voltage Accuracy            | ± 3% (9V, 12V, 15V, 18V, 24V Types)<br>± 5% (5V Type)   |
|                            | Output Voltage Line Regulation     | ± 3% (9V, 12V, 15V, 18V, 24V Types)<br>± 5% ( 5V Types )  |
|                            | Output Voltage Load Regulation     | ± 3%(9V,12V,15V,18V,24V Types)<br>± 5% (5V Type)  |
|                            | Ripple & Noise                     | Max 200mVp-p @Rated AC input (The measuring will be terminated with a 47uF AL E-Cap and a 0.1uF Cer-Cap. An oscilloscope set at 20MHz bandwidth)  |
|                            | Efficiency                         | See table (Meet Requirements Of Energy Star And EC Code Of Conduct)   |
| Protection Characteristics | Over Current Protection            | The power supply shall automatic protection. The power supply shall auto-recovery normal operation after the deformation is removed. No excessive heat, odor, or plastic deformation shall occur, no safety hazard  |
|                            | Output Short Circuit Protection    | The power supply shall withstand a continuous output short without damage in 24 hours ; The short may be applied before power on, or after power on; The power supply shall resume normal operation after the short is removed, no excessive heat, odor, or plastic deformation shall occur, no safety hazard |
| Environmental              | Operation Temperature              | -25°C ~ + 50°C (see derating curve)   |
|                            | Operation Humidity                 | 10~ 90% RH (Non Condensing) @ full load   |
|                            | Storage Temperature                | -40°C~ +85°C  |
|                            | Storage Humidity                   | 5%~95%  |
| Safety & EMC Requirement   | Dielectric Strength                | Primary to Secondary : 4000Vac 5mA, 3 sec.  |
|                            | Radiation                          | Meeting EN55032, EN55014, FCC part 15, Class B. under 3dB margin  |
|                            | Conduction                         | Meeting EN55032, EN55014, FCC part 15, Class B. under 3dB margin  |
|                            | Safety Standards                   | Meet all requirements of : UL/CUL62368 - IEC/EN60335 - IEC/EN61558-2-16 - IEC/EN62368   |
| Reliability Requirement    | MTBF                               | Calculated by MIL-HDBK-217-F2 200K Hours minimum @230VAC input, 50deg.C   |
|                            | Burn-In Test                       | The unit shall be burned in for 2~ 5hours under 230Vac input and DC with full load at an ambient temperature of 30~45 degrees C   |
|                            | Net Weight                         | (TBA)   |
| Guarantee                  | This product meet to RoHS standard |   |

*we reserve the right to change specifications in this document without notice*

# Application notes for 47000 & 48000 Series

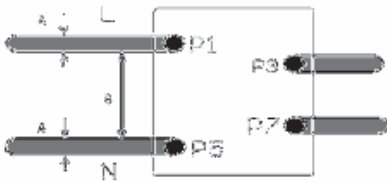
## 1 – Storage Guide:

Storage temperature :  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , Storage humidity : 5% to 95%

## 2 – Shelf life Guide :

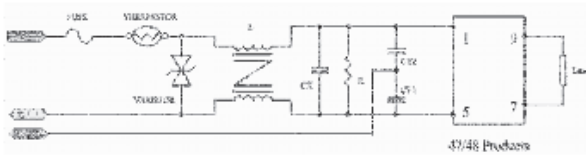
To ensure best power supply reliability and life, we would recommend clients to keep the shelf life less than 6 months. If the power supply is not used or is kept in stock more than 12 months, it is recommended that the Power Supply should be subject to a 2 hour burn-in process.

## 3- Safety and recommend wiring : linewidth $A \geq 2\text{mm}$ , $B \geq 5\text{mm}$ .



## 4- Recommended circuit for applications requiring higher EMC performance :

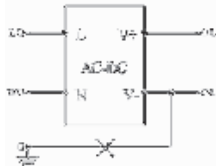
The 47/48 series are already certified as compliant to EN55022 and EN55014 CLASS B for emc. For this compliance no additional external components are required. Should a more stringent emc performance be required the circuit below can be proposed



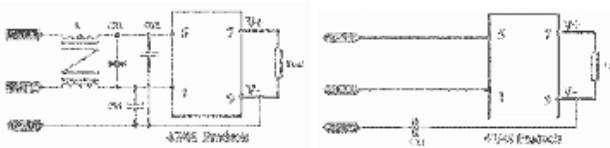
**Fuse:** recommended parameters : 5A to 10A/250Vac, Time-lag type.  
**THERMISTOR:** recommended parameters : 2A, 5Ω, 1.8W to 5A D10, 2.5Ω, 2.4W.  
**Varistor:** recommended parameters : 14D471, 300Vac, maximum energy 118 Joule.  
**L** is a common mode inductor : recommended parameters : 10mH to 30mH  
**CX** is a X2 capacitor : recommended parameters : 0.1uF to 0.22uF/275Vac  
**CY1 and CY2** are Y capacitors : recommended parameters : 1000pF to 2200pF/400V  
**R** is a resistor : recommended parameters: 1.0MΩ to 3.0 MΩ.

## 5 – Application of the connection to ground :

This application is not supported for 47 / 48 products



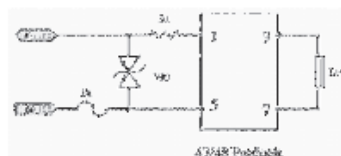
The following proposed circuit may assist :



**L** : is a common mode inductor, the recommended parameters: 10mH to 30mH  
**CX1** : is an X2 capacitor, the recommended parameters : 0.1uF to 0.22uF/275Vac  
**CY1 and CY2** are Y capacitors, the recommended parameters : 1000pF to 2200pF/400V

## 6 – High surge circuit :

The 47 / 48 Series is tested and certified for a surge level in accordance with IEC61000-4-5 as standard without requiring any additional external components. To extend the surge level to 6KV the external circuit below can be proposed.



**VR1** is a varistor, the recommended parameters : 14D471, 300Vac, maximum energy 118 Joule.  
**R1** is a wire-wound resistor, the recommended parameters : 10R/1W to 10R/3W, resistance wire  $\Phi 0.1$  to 0.23mm. **F1** is a fuse, the recommended parameters : 6.3A to 10A/250Vac, Time-lag type.

The information contained in this document is subject to change without notice.

## Modified and Custom Solutions

### TECHNICAL SERVICES :

- Alternative DC Output Voltages
- Single, Dual or Triple Output Voltages
- Addition of Signal Pins for AC OK, Remote on/off, sense etc.
- Alternative Power Rating
- Revised 'Hold-up' timing to suit System needs
- Customer specific product 'Branding/Labelling'
- Specific Power Supply Manufacturing Functional Test Profile
- Integrating the Power Supply on the System PCB
- Alternative Power Supply Housing
- Revised DC Output Filtering

### CUSTOMER SERVICES :

- Existing Designs for Modified Standards
- Flexible Manufacturing Batch Sizes
- European Stock-holding locations
- European Engineering and Logistics Support
- Country Specific Distribution Partners
- Manufacturing dynamics for Volume Fluctuations
- Myrra Quality Controlled Design and Manufacturing
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