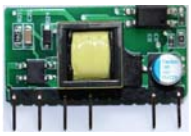


**DESCRIPTION:** **5W 3KVAC Isolation Wide Input AC/DC Converters**

TP05AL series is an economical open frame AC/DC switching power supply,The rated output power is 5W with wide input voltage range, for both AC input and DC input application. High reliability, Low power consumption, safety isolation .Widely used in industrial control and electrical instrumentation, smart home,etc.

## FEATURES

| | | |
|---|---|---|
| Universal input voltage range | Both for AC and DC input voltage | Low Ripple &Noise |
| High efficiency, high power density, miniature | Low power consumption≤50mW | Overheat protection ,Over current protection |
| International standard Footprint&Pinouts | Industrial product design | Operating temperature : -40℃ to 70℃ |

## SELECTION GUIDE

| Part Number | Input Voltage | | Output | | Efficiency (Typ. ) % | Ripple &Noise mVp-p ( Typ.) |
|---|---|---|---|---|---|---|
| | Voltage (VAC) | | Voltag(VDC) | Current(A) | | |
| | Rated | Range values | | | | |
| TP05AL220S03W | 220(4:1) | 85-305 | 3.3 | 1.00 | 67 | 50 |
| TP05AL220S05W | 220(4:1) | 85-305 | 5 | 1.00 | 74 | 50 |
| TP05AL220S09W | 220(4:1) | 85-305 | 9 | 0.55 | 76 | 50 |
| TP05AL220S12W | 220(4:1) | 85-305 | 12 | 0.42 | 78 | 50 |
| TP05AL220S15W | 220(4:1) | 85-305 | 15 | 0.33 | 80 | 50 |
| TP05AL220S24W | 220(4:1) | 85-305 | 24 | 0.21 | 78 | 50 |

All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified.

## OUTPUT CHARACTERISTICS

| | |
|---|---|
| Output Voltage accuracy (3.3Voutput) | ±2.0% |
| Output Voltage accuracy (others) | ±1.0% |
| Line regulation (3.3V output) | ±1.0% |
| Line regulation (others) | ±0.5% |
| Load regulation (3.3V output) | ±1.5% |
| Load regulation (others) | ±1.0% |
| Start rising time (Typ.) | 10ms/230VAC |
| Output hold time (Typ.) | 50ms/230VAC |

## INPUT CHARACTERISTICS

| | |
|---|---|
| Input Voltage | 85-305VAC |
| Nominal Input Voltage | 100-240VAC |
| Input frequency | 47 ~ 63Hz |
| Input Current ( Typ.) | 120mA / 115VAC 60m A / 230VAC |
| Inrush current( Typ.) | Cold start 40A / 230 VAC |
| Leakage current( Typ.) | <1mA at 230VAC/50Hz |

## PROTECTION CHARACTERISTICS

| | |
|---|---|
| Over-current protection | 120--150% load, Automatic recovery after troubleshooting |
| Over-voltage protection | yes |

## ENVIRONMENT CHARACTERISTICS

| | |
|---|---|
| Operating temperature | -40 ~ +70 ℃ (According to the output load derating curve) |
| Operating humidity | 85% .RH max |
| Storage temperature | –40 ~ +85, 10 ~ 95% RH |
| Temperature coefficient | 0.03%/ (0~ 50℃ ) |
| Vibration coefficient | 10~500Hz,2G10min./1cycle, 60min.each along X,Y,Z axes |
| Cooling method | Natural cooling |

## SAFETY & ELECTROMAGNETIC COMPATIBILITY

| | |
|---|---|
| Safety Standard | UL60950,EN60950 |
| Safety Level | CLASS II |
| Isolation voltage | I/P-O/P:3KVAC |
| Isolation resistance | I/P-O/P,:>100M Ohms/500VDC 25℃ 70% RH |
| Conduction and Radiation | EN55011, EN55022 (CISPR22) class B (Typical application circuit diagram 1) |
| Electrostatic Discharge | IEC/EN 61000-4-2 level 4 8kV/15kV (Typical application circuit diagram 1) |
| RF radiation immunity | IEC/EN 61000-4-3 level 4 (Typical application circuit diagram 1) |
| Electrical Fast Transient Burst | IEC/EN 61000-4-4 level 4 4kV (Typical application circuit diagram 1) |
| Surge | IEC/EN 61000-4-5 level 4 2kV (Typical application circuit diagram 1) |
| Harmonic Current | EN61000-3-2 (Typical application circuit diagram 1) |

## OTHERS

| | |
|---|---|
| MTBF | ≥300K hrs min. MIL-HDBK-217F(25) |
| Dimensions | 37*18.5*12mm (L*W*H) |
| Weight | 10g |
| packaging | 360*300*250mm |

## NOTES

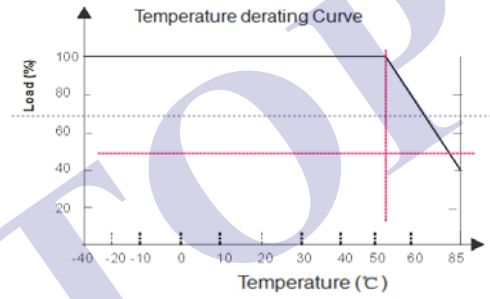
1.This model is open Frame, in order to meet the safety requirements of the module primary and secondary external components between the need to maintain a safe distance of at least 6.4mm.

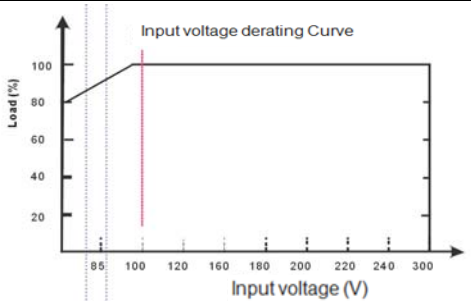
2.The data in this manual are measured at TA=25 ° C, humidity <75%, input nominal voltage (115Vac and 230Vac) and output rated load,except for special instructions.

3.In order to improve the efficiency of light load conversion, when the module load <30% of the rated load, the module may have weak audio noise, but does not affect the product performance and reliability.

4. After the module is assembled, it needs to be Dispensing fixed

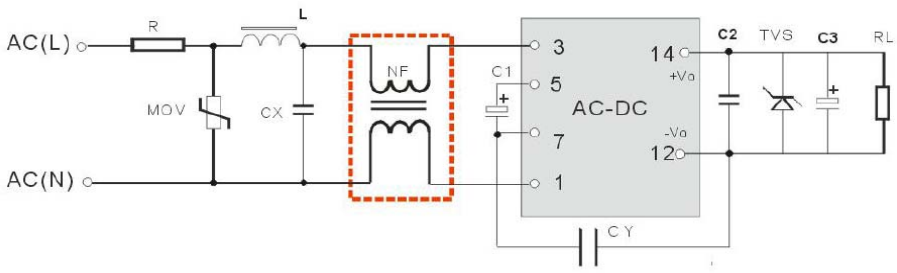
## PRODUCT CHARACTERISTICS CURVE




## TYPICAL APPLICATION CIRCUIT

diagram 1




Notes：

1.C2 is a ceramic capacitor to filter out high frequency noise.C3 is High-frequency low-resistance electrolytic capacitor ,TVS tube in the module exception protection after the circuit, it is recommended to use.

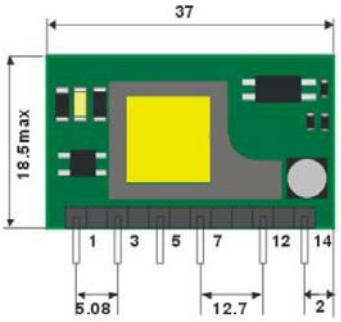
2. In the general application, Its not mandatory to use the common-mode inductance within the dashed box;
You can use this common-mode inductance (L=30mH) to meet the higher EMC requirements.

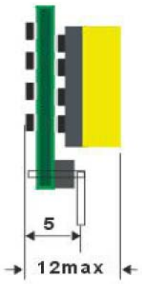
3. For technical support, please contact our engineers.

## APPLICATION CIRCUIT TYPICAL VALUES

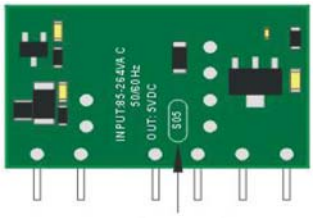
| PN | R | MOV | L | C1 | C2 | CX | CY | C3 | TVS tubes |
|---|---|---|---|---|---|---|---|---|---|
| TP05AL220S03W | 10Ω/1W | 10D561K | 2mH | 10μF/450V | 104K/50V | 104K/275Vac | 1nF/400Vac | 330uF/16V | SMBJ7.0A |
| TP05AL220S05W | | | | | | | | 330uF/16V | SMBJ7.0A |
| TP05AL220S09W | | | | | | | | 330uF/16V | SMBJ12A |
| TP05AL220S12W | | | | | | | | 220uF/16V | SMBJ20A |
| TP05AL220S15W | | | | | | | | 150uF/25V | SMBJ30A |
| TP05AL220S24W | | | | | | | | 150uF/35V | SMBJ30A |

## MECHANICAL DIMENSIONS



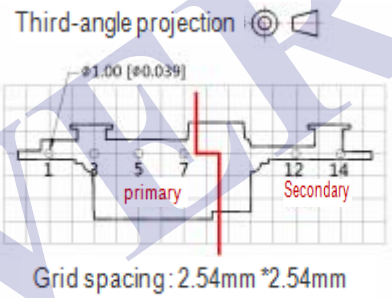



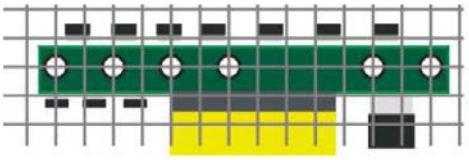

| PIN | |
|---|---|
| 1 | AC |
| 3 | AC |
| 5 | +V(cap) |
| 7 | -V(cap) |
| 12 | -Vo |
| 14 | +Vo |




Part No.

All dimensions in mm ±0.2~±0.5mm



## MODEL SELECTION