

**DESCRIPTION**

The TMC60 series of compact, open PCB constructed, AC-DC switching power supplies are capable of delivering 37.5-64 watts of continuous output power at convection cooling. They operate at 90-264 VAC input voltage without the need of voltage selection, and are suited for medical, information technology and industrial applications. Approval to both EN 60601-1 and EN 60950-1 safety standards improves design-in time and reduces end equipment compliance costs.

**FEATURES**

- Medical and ITE approvals
- Compact size 2" x 4" x 1.18"
- Single, dual and triple outputs
- Full range input 90-264 VAC
- Low earth leakage current
- Level B emissions
- RoHS compliant

**INPUT SPECIFICATIONS**

Input voltage: 90-264 VAC  
 Input frequency: 47-63 Hz  
 Input current: 1.3 A (rms) for 100 VAC  
 0.7 A (rms) for 240 VAC  
 Earth leakage current: 150 µA max. @ 264 VAC, 60 Hz

**OUTPUT SPECIFICATIONS**

Output voltage/current: See rating chart  
 Maximum output power: See rating chart  
 Ripple and noise: 2% peak to peak on 5.0 V model, 1% peak to peak on other models.  
 Overvoltage protection: Provided on output #1 only; set at 112-132% of its nominal output voltage  
 Overcurrent protection: All outputs protected to short circuit conditions  
 Temperature coefficient: All outputs  $\pm 0.04\%$  /°C maximum  
 Transient response: Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change

**ENVIRONMENTAL SPECIFICATIONS**

Operating temperature: -10°C to +70°C  
 Storage temperature: -40°C to +85°C  
 Relative humidity: 5% to 95% non-condensing  
 Derating: Derate from 100% at +50°C linearly to 50% at +70°C

**TMC60 SERIES****SAFETY STANDARD APPROVALS**

**UL 60601-1**  
**CSA C22.2 No. 601.1**



**TÜV EN60601-1**

**GENERAL SPECIFICATIONS**

Switching frequency: 62±5 KHz  
 Efficiency: 80-88% typical except TMC60-T31-3 and TMC60-T31-5 at 75% typical  
 Hold-up time: 12 msec minimum at 110 VAC  
 Line regulation:  $\pm 0.5\%$  maximum at full load  
 Inrush current: 30 A @ 115 VAC, or 60 A @ 230 VAC, at 25°C cold start  
 Withstand voltage: 4000 VAC from input to output  
 1500 VAC from input to ground  
 500 VAC from output to ground  
 MTBF: 400,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F  
 EMC Performance  
 EN55011 / EN55022: Class B conducted, class B radiated  
 FCC: Class B conducted, class B radiated  
 VCCI: Class B conducted, class B radiated  
 EN61000-3-2: Harmonic distortion, class A and D  
 EN61000-3-3: Line flicker  
 EN61000-4-2: ESD,  $\pm 8$  KV air and  $\pm 6$  KV contact  
 EN61000-4-3: Radiated immunity, 3 V/m  
 EN61000-4-4: Fast transient/burst,  $\pm 2$  KV  
 EN61000-4-5: Surge,  $\pm 1$  KV diff.,  $\pm 2$  KV com.  
 EN61000-4-6: Conducted immunity, 3 Vrms  
 EN61000-4-8: Magnetic field immunity, 3 A/m  
 EN61000-4-11: Voltage dips,  
 30% reduction for 500 ms  
 60% reduction for 100 ms  
 >95% reduction for 10 ms

# UNIVERSAL INPUT

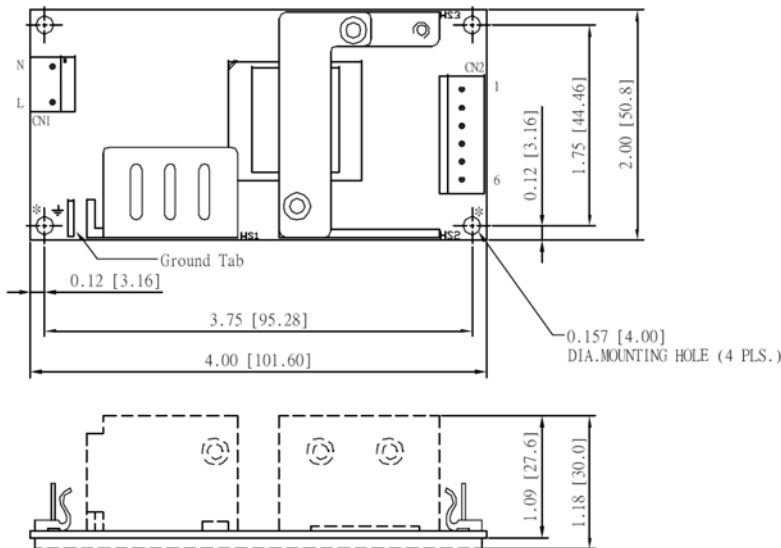
# TMC60 MEDICAL & ITE SERIES

## OUTPUT VOLTAGE/CURRENT RATING CHART

| P/N         | Output #1 |                                |                                    |      | Output #2 |       |       |      | Output #3 |      |       |       | Maximum Output(3)<br>Power |
|-------------|-----------|--------------------------------|------------------------------------|------|-----------|-------|-------|------|-----------|------|-------|-------|----------------------------|
|             | Vnom      | Min.-Max.Current at convection | Min.-Max.Current at forced air (2) | Tol. | Vnom      | Imin  | Imax  | Tol. | Vnom      | Imin | Imax  | Tol.  |                            |
| TMC60-S05   | 5 V       | 0-11 A                         | (N/A)                              | 2%   |           |       | (N/A) |      |           |      |       | (N/A) | 55 W                       |
| TMC60-S12   | 12 V      | 0-5 A                          | (N/A)                              | 2%   |           |       | (N/A) |      |           |      |       | (N/A) | 60 W                       |
| TMC60-S15   | 15 V      | 0-4.3 A                        | (N/A)                              | 2%   |           |       | (N/A) |      |           |      |       | (N/A) | 64 W                       |
| TMC60-S24   | 24 V      | 0-2.7 A                        | (N/A)                              | 2%   |           |       | (N/A) |      |           |      |       | (N/A) | 64 W                       |
| TMC60-S48   | 48 V      | 0-1.35 A                       | (N/A)                              | 2%   |           |       | (N/A) |      |           |      |       | (N/A) | 64 W                       |
| TMC60-D23   | +5 V      | 0.5-6 A                        | 0.5-8 A                            | 3%   | +12 V     | 0.1 A | 3 A   | 5%   |           |      |       | (N/A) | 55 W                       |
| TMC60-D25   | +5 V      | 0.5-6 A                        | 0.5-8 A                            | 3%   | +24 V     | 0.1 A | 1.5 A | 5%   |           |      |       | (N/A) | 55 W                       |
| TMC60-T31   | +5 V      | 0.5-6 A                        | 0.5-8 A                            | 3%   | +12 V     | 0.1 A | 3 A   | 5%   | -12 V     | 0 A  | 0.5 A | 4%    | 55 W                       |
| TMC60-T31-3 | +3.3 V    | 0.8-6 A                        | 0.5-8 A                            | 3%   | +5.2 V    | 0.1 A | 3 A   | 5%   | +12 V     | 0 A  | 0.5 A | 4%    | 37.5 W                     |
| TMC60-T31-5 | +5 V      | 0.5-6 A                        | 0.5-8 A                            | 3%   | +3.3 V    | 0 A   | 1.5 A | 5%   | +12 V     | 0 A  | 0.5 A | 4%    | 37.5/47.5W(4)              |
| TMC60-T32   | +5 V      | 0.5-6 A                        | 0.5-8 A                            | 3%   | +15 V     | 0.1 A | 2.4 A | 5%   | -15 V     | 0 A  | 0.5 A | 4%    | 55 W                       |
| TMC60-T39   | +5 V      | 0.5-6 A                        | 0.5-8 A                            | 3%   | +24 V     | 0.1 A | 1.5 A | 5%   | -12 V     | 0 A  | 0.5 A | 4%    | 55 W                       |

- NOTES: 1. Safety approvals are for PCB form only. To order unit with cover fitted, add suffix "C".  
 2. Maximum current of output #1 of multi-output models can be 8 A at 5 CFM forced air provided by user.  
 3. The maximum output power shown is convection rating.  
 4. 47.5W with 5CFM forced air provide by user.

## MECHANICAL SPECIFICATIONS



### NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector mates with Molex housing 09-50-3031 and Molex 2878 series crimp terminal.
- Output connector mates with Molex housing 09-50-3061 and Molex 2878 series crimp terminal..
- Ground tab is 0.25 [6.35] x 0.032 [0.8].
- To ensure compliance with level B emissions, connect the two "\*" marked mounting holes with metallic standoffs to chassis.
- Weight: 205 grams (0.45 lbs.) approx.

## PIN CHART

| MODEL       | PIN                    |                        | 1         | 2   | 3   | 4   | 5    | 6    |
|-------------|------------------------|------------------------|-----------|-----|-----|-----|------|------|
|             | TMC60-S05<br>TMC60-S24 | TMC60-S12<br>TMC60-S48 | TMC60-S15 | +V1 | +V1 | RTN | RTN  | N.C. |
| TMC60-D23   | TMC60-D25              |                        | +V1       | +V1 | RTN | RTN | N.C. | +V2  |
| TMC60-T31   | TMC60-T32              | TMC60-T39              | +V1       | +V1 | RTN | RTN | -V3  | +V2  |
| TMC60-T31-3 | TMC60-T31-5            |                        | +V1       | +V1 | RTN | RTN | +V3  | +V2  |

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