



# TR70M SERIES

## 70W MEDICAL SWITCHING ADAPTER



### Features

- \* Universal Input Range 80~264VAC
- \* Meets EN55011 Class B and CISPR/FCC Class B
- \* Continuous Short Circuit Protection
- \* Over Voltage Protection
- \* No Load Power Consumption <150mW
- \* IEC/EN 60601-1-11 for TR70MB
- \* Meets CoC Tier 2 & DoE Level VI
- \* Meets IEC/EN60335-1
- \* Meets 2 MOPP
- \* Altitude 5000m
- \* Class I (TR70MA) & Class II (TR70MB)
  - (TR70MA/B120: Output Cable Length  $\leq$  1220mm 16AWG) (note7)
  - (TR70MA/B150: Output Cable Length  $\leq$  1220mm 16AWG)
  - (TR70MA/B180: Output Cable Length  $\leq$  1800mm 16AWG)
  - (Output Cable Length  $\leq$  1800mm 18AWG)



### Ordering information

TR70MXXXX	XX	X	XX
Model No.	DC Plug Type	OVP	DC Cable Length and Type
X: A or B		E: With OV	01: 720mm
A: CLASS I			02: 1220mm
B: CLASS II			03: 1800mm
			11: 720mm with Ferrite Core
			12: 1220mm with Ferrite Core
			13: 1800mm with Ferrite Core
			*18AWG/UL1185
			*16AWG/UL1185 for 12V

MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE NOTE 2	VOLTAGE SETPOINT NOTE 1	LINE REGULATION NOTE 3	LOAD REGULATION NOTE 4	EFFICIENCY (Typ.) NOTE 5
TR70MA120	12V	5.8A	120mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 5\%$	89%
TR70MA150	15V	4.65A	150mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 3\%$	89%
TR70MA180	18V	3.9A	180mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	89%
TR70MA240	24V	3.0A	240mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	90%
TR70MA360	36V	1.9A	360mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	90%
TR70MA480	48V	1.5A	480mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	91%
TR70MB120	12V	5.8A	120mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 5\%$	89%
TR70MB150	15V	4.65A	150mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 3\%$	89%
TR70MB180	18V	3.9A	180mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	89%
TR70MB240	24V	3.0A	240mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	90%
TR70MB360	36V	1.9A	360mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	90%
TR70MB480	48V	1.5A	480mVp-p	$\pm 2\%$	$\pm 1\%$	$\pm 2\%$	91%

Specifications are subject to change without notice.

## Specifications

### INPUT SPECIFICATIONS:

Voltage ..... 80~264Vac(80Vac with derating curve)  
 Frequency ..... 47 to 63Hz  
 Inrush Current ..... Cold Start @25°C 100A max. @240Vac  
 Conducted EMI ..... CISPR/FCC Class B  
 Leakage Current ..... 90uA max.

### OUTPUT SPECIFICATIONS:

Hold-up Time ..... 10ms typ. @115Vac  
 Short Circuit Protection.....Hiccup Mode (Auto Recovery)  
 Over Voltage Protection ..... IC Component to Clamp (Auto Recovery)  
 Temperature Coefficient ..... ±0.05%/°C max.

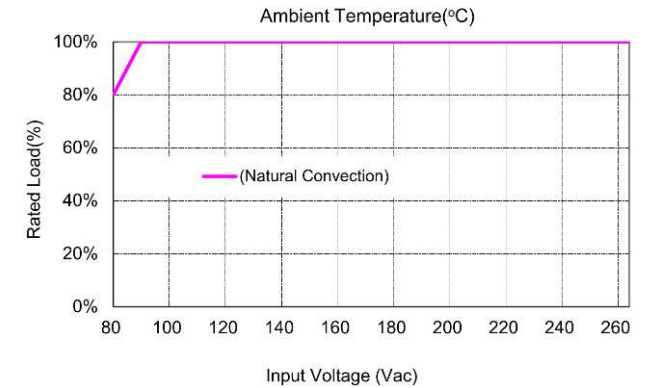
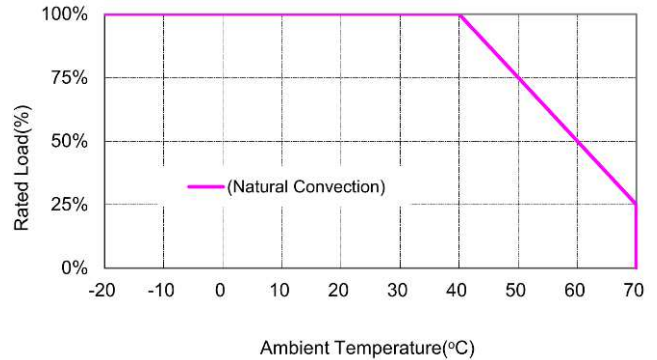
### GENERAL SPECIFICATIONS:

Isolation ..... Input to Output = 4,400VAC  
 Operating Temperature ..... -20 ~ 70°C (See Derating Curve, note6)  
 Storage Temperature ..... -40~85°C  
 Humidity ..... 93% RH max. Non Condensing  
 Cooling..... Natural Convection  
 Switching Frequency ..... 65KHz Typical  
 MTBF ..... MIL-HDBK-217F, GB, at 25°C/115VAC ..... 500Khrs min.  
 Altitude ..... 5000m  
 Life Time ..... Ambient 40°C 75% Load ..... >3years  
 AC Inlet ..... IEC320/C14(TR70MA) / IEC320/C8(TR70MB)  
 Dimensions ..... 4.724x2.047x1.220 inches (120.00x52.00x31.00 mm)  
 Weight ..... 300g(0.66 Pounds)

### SAFETY AND EMC:

Emissions and Immunity (Ed 4.0) ..... EN55011 Class B, EN61000-3-2,3  
 EN60601-1-2, IEC 61000-4-2, 3, 4, 5, 6, 8, 11  
 Safety Approved (Ed.3.1) ..... IEC/EN 60601-1, UL ANSI/AAMI ES60601-1  
 IEC/EN 60601-1-11 for TR70MB

## TR70M Series Derating Curve



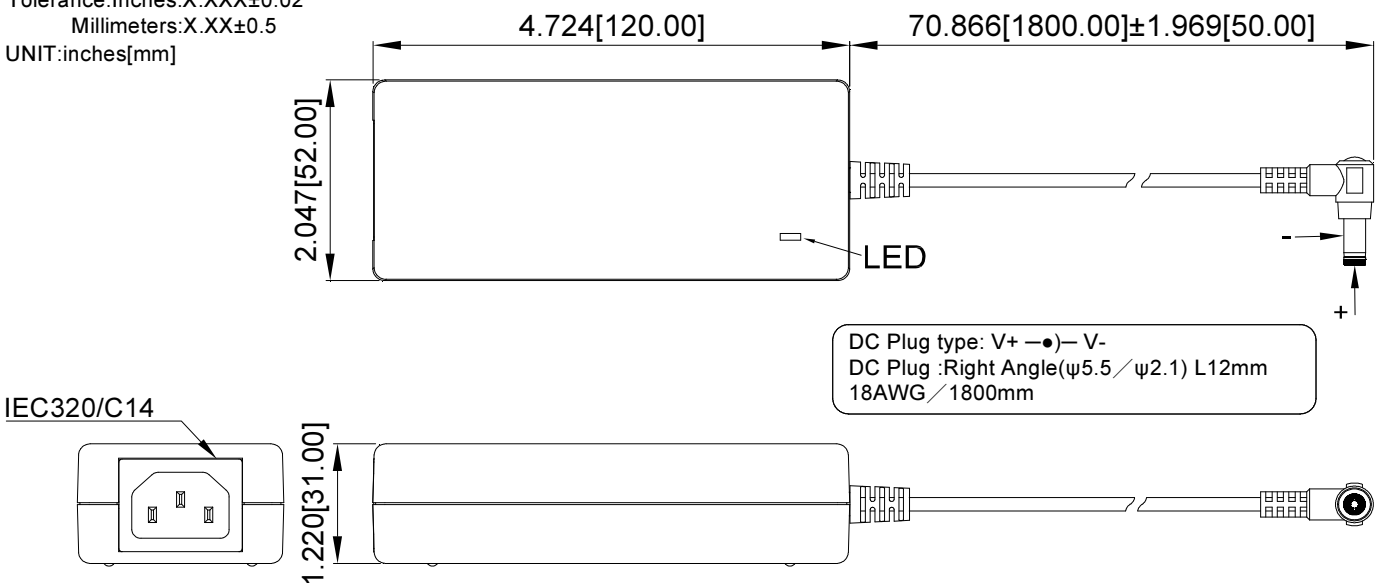
### NOTE:

1. Voltage accuracy at 60% full load.
2. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple&noise measurement @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac, full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load).
5. Typical efficiency at 230VAC and 75% load at 25°C.
6. -30°C can be start-up at full load.
7. TR70MA120 & TR70MB120 of 115VAC full load meet DoE Level VI and 230VAC full load meet CoC Tier 2

## Mechanical Specification

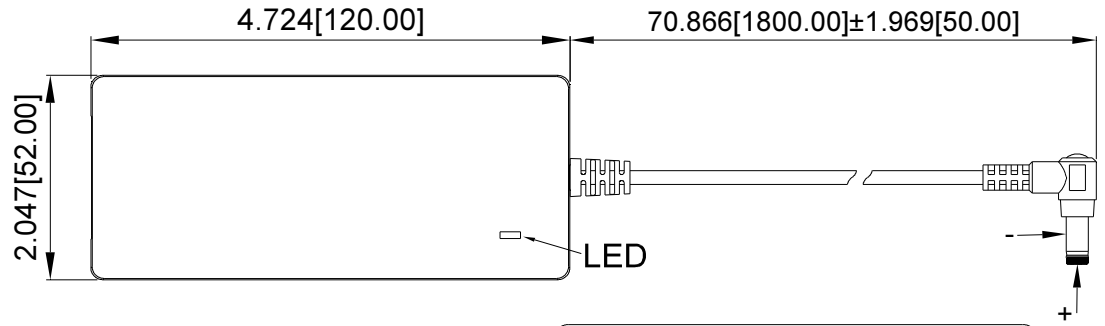
All Dimensions are in inches(mm)  
 Tolerance:Inches:X.XXX±0.02  
 Millimeters:X.XX±0.5  
 UNIT:inches[mm]

### TR70MAXXX Series

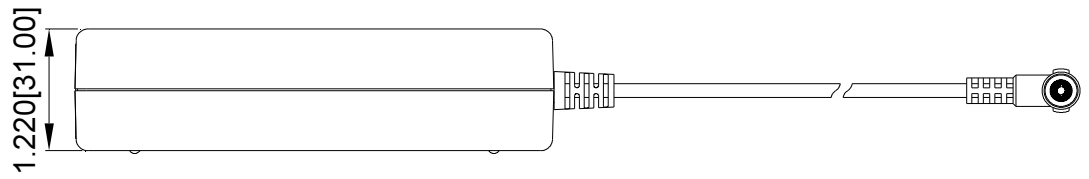
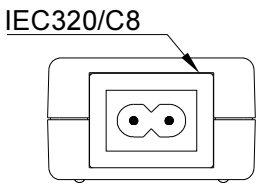


**Mechanical Specification**

**TR70MBXXX Series**



DC Plug type: V+ —●— V-  
 DC Plug :Right Angle(ψ5.5/ψ2.1) L12mm  
 18AWG/1800mm



Typical at 25°C, nominal line and 75% load, unless otherwise Specified

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