



electronic powersolutions

# TR18RDM SERIES 18 WATT AC-DC MEDICAL INTERCHANGEABLE PLUG ADAPTER

## Features

- Universal Input Range 80~264Vac
- High Efficiency up to 87%
- Interchangeable AC Plugs
- Leakage Current < 30uA
- Class II
- No Load Power Consumption < 75mW
- Approval IEC/EN/UL 60601-1 2 MOPP
- Approval EN60601-1-11  
for Home Healthcare Applications
- Approval EN55011, FCC 47 CFR Part 18 Class B
- Approval IP22
- Meets IEC/EN 60335-1
- Operating Altitude 5000m
- Over Voltage Protection
- Continuous Short Circuit Protection
- Meets CoC Tier 2 & DoE Level VI  
(Output Cable Length  $\leq$  1800mm)



AC Plug Sold Separately



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	VOLTAGE ACCURACY NOTE1	RIPPLE& NOISE NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
TR18RDM050	5V	3A	±5%	100mV	±1%	±5%	82%
TR18RDM090	9V	2A	±3%	100mV	±1%	±3%	86%
TR18RDM120	12V	1.5A	±3%	120mV	±1%	±2%	86%
TR18RDM150	15V	1.2A	±3%	120mV	±1%	±2%	86%
TR18RDM180	18V	1A	±3%	120mV	±1%	±2%	86%
TR18RDM240	24V	0.75A	±3%	120mV	±1%	±2%	87%

Note:

1. Voltage accuracy is set at 60% full load.
2. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from 100V<sub>ac</sub> to 240V<sub>ac</sub> with 100% 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 230 V<sub>ac</sub> and 75% full load at 25°C.

## PART NUMBER

Series	Output Voltage	AC Plug Type	DC Plug Type	Cable Type	Cable Length	Case Color
TR18RDM	XXX	-XXXX	-XX	X	XX	-XX-BK
18W Medical Adapter	050: 5V 090: 9V 120: 12V 150: 15V 180: 18V 240: 24V	Blank: Sold Separately ASUE: Include 4 Type AC Plug	See Page 6	G: UL1571 with OVP	01: 720mm 02: 1220mm 03: 1800mm 11: 720mm with Ferrite Core 12: 1220mm with Ferrite Core 13: 1800mm with Ferrite Core	BK-BK: Black-Black BE-BK: Blue-Black

Part Number Example:

**TR18RDM120-11G13-BK-BK**, 12V<sub>dc</sub> Output, DC Jack Type, Cable Length 1800mm with Ferrite Core, Case Color Black-Black

**TR18RDM120-ASUE-11G03-BE-BK**, 12V<sub>dc</sub> Output, include 4 Type AC Plug, DC Jack Type, Cable Length 1800mm, Case Color Blue-Black

## TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage		All	80		264	V <sub>ac</sub>
Operating Case Temperature	See Derating Curve	All	-30		70	°C
Storage Temperature		All	-30		85	°C
Operating Altitude		All			5000	m

### INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V <sub>ac</sub>
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Full load, V <sub>in</sub> =100V <sub>ac</sub>	All			0.5	A
Leakage Current		All			30	uA
Inrush Current	V <sub>in</sub> =240V <sub>ac</sub> , Cold start at 25°C	All		45		A

### OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V <sub>in</sub> =115V <sub>ac</sub> and 230V <sub>ac</sub> , I <sub>o</sub> =60% Full load T <sub>c</sub> =25°C	TR18RDM050	4.75	5	5.25	V <sub>dc</sub>
		TR18RDM090	8.73	9	9.27	
		TR18RDM120	11.64	12	12.36	
		TR18RDM150	14.55	15	15.45	
		TR18RDM180	17.46	18	18.54	
		TR18RDM240	23.28	24	24.72	
Operating Output Current Range	V <sub>in</sub> =115V <sub>ac</sub> and 230V <sub>ac</sub> , T <sub>c</sub> =25°C	TR18RDM050			3	A
		TR18RDM090			2	
		TR18RDM120			1.5	
		TR18RDM150			1.2	
		TR18RDM180			1	
		TR18RDM240			0.75	
Holdup Time	V <sub>in</sub> =115V <sub>ac</sub>	All		12		ms
Output Voltage Regulation						
Load Regulation	±40% Full load change	TR18RDM050			±5.0	%
		TR18RDM090			±3.0	
		TR18RDM120			±2.0	
		TR18RDM150			±2.0	
		TR18RDM180			±2.0	
		TR18RDM240			±2.0	
Line Regulation	V <sub>in</sub> =100V <sub>ac</sub> to 240V <sub>ac</sub>	All			±1.0	%
Over Voltage Protection	TVS Component to clamp	TR18RDM050			7.14	V <sub>dc</sub>
		TR18RDM090			12.60	
		TR18RDM120			15.75	
		TR18RDM150			18.90	
		TR18RDM180			23.1	
		TR18RDM240			31.5	
Over Current Protection	Auto recovery	All	110		180	%
Short Circuit Protection	Auto recovery	All				

# TR18RDM Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Ripple and Noise	1. Add a 0.1uF ceramic capacitor and a 10uF aluminum electrolytic capacitor to output 2. Oscilloscope is 20MHz band width 3. Ambient temperature=25°C	TR18RDM050			100	mV
		TR18RDM090			100	
		TR18RDM120			120	
		TR18RDM150			120	
		TR18RDM180			120	
		TR18RDM240			120	
Load Capacitance	1. $V_{in}=115V_{ac}$ and $230V_{ac}$ 2. Output is max. load 3. Ambient temperature=25°C	TR18RDM050			3000	uF
		TR18RDM090			2000	
		TR18RDM120			1500	
		TR18RDM150			1200	
		TR18RDM180			1000	
		TR18RDM240			750	
Efficiency	1. $V_{in}=230V_{ac}$ 2. Output is 75% full load 3. Ambient temperature=25°C	TR18RDM050		82		%
		TR18RDM090		86		
		TR18RDM120		86		
		TR18RDM150		86		
		TR18RDM180		86		
		TR18RDM240		87		

## ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute	All			4000	$V_{ac}$
Isolation Resistance	Input to output	All	100			MΩ

## FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pout=max. rated power	All		50		kHz

## GENERAL SPECIFICATIONS

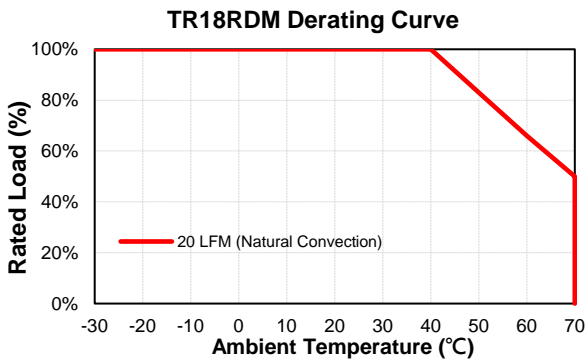
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	$I_o=100\%$ ; $T_a=25^\circ C$ per MIL-HDBK-217F	All	750			k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-I 10ms, each axis 3 times( $\pm X$ 、 $\pm Y$ 、 $\pm Z$ axis)	All		75		g
Vibration	Meet MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X、Y、Z axis, 1 hour (each axis),. Total 3 hrs.	All		4		g
Weight		All		115		g
Dimensions		All	3.165x1.693x1.453 Inches (80.40x43.00x36.90mm)			
<b>Safety</b>	Class II, IEC 60601-1:2005, COR1:2006, COR2:2007, AMD1:2012, EN 60601-1:2006+A11+A1+A12 ANSI/AAMI ES60601-1 (2005/(R)2012+A1:2012, C1:2009/(R)2012+A2:2010/(R)2012) IEC/EN 60601-1-11:2015 for Home Healthcare Applications					Ed.3.1
<b>EMC Emission</b>	EN 55011:2016+A1:2017, CISPR 11:2015+A1:2016, Class B, EN 61003-3:2013, FCC 47 CFR Part 18					
Conducted Disturbance	EN 55011:2016+A1:2017, CISPR 11:2015+A1:2016, FCC 47 CFR Part 18					Class B
Radiated Disturbance	EN 55011:2016+A1:2017, CISPR 11:2015+A1:2016, FCC 47 CFR Part 18					Class B
Voltage Fluctuations	EN 61000-3-3:2013					
<b>EMC Immunity</b>	EN60601-1-2:2015, IEC61000-4-2,3,4,5,6,8,11					Ed.4.0
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008, Air Discharge: $\pm 15kV$ Contact Discharge: $\pm 8kV$					Criteria A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2006+A1:2007+A2:2010					Criteria A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012, $\pm 0.5kV$ , $\pm 1kV$ , $\pm 2kV$					Criteria A

## GENERAL SPECIFICATIONS

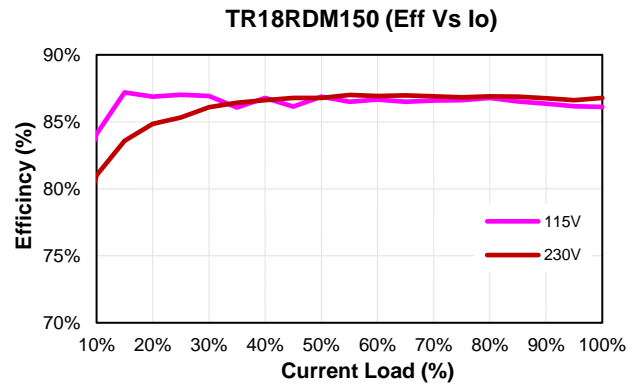
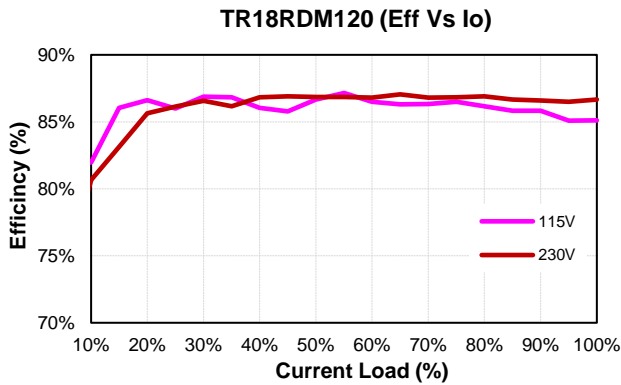
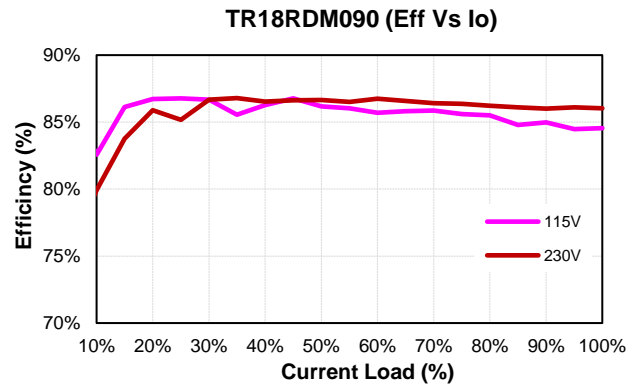
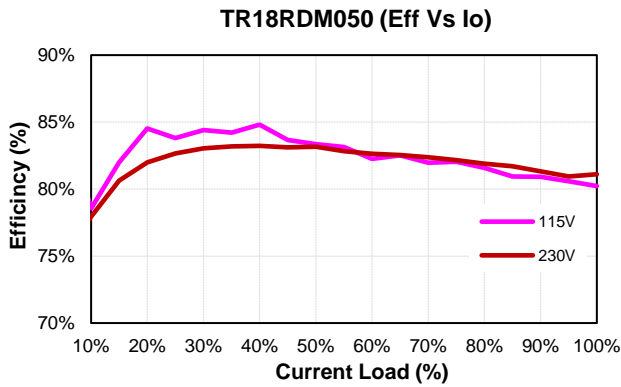
Surge	IEC 61000-4-5:2014/AMD1:2017, L-N: $\pm 0.5kV$ , $\pm 1kV$	Criteria A
Conducted disturbances, induced by RF fields	IEC 61000-4-6:2013	Criteria A
Power frequency magnetic field	IEC 61000-4-8:2009	Criteria A
Voltage dips	IEC 61000-4-11:2004/AMD1:2017, Dips: 30% Reduction, Dips: >95% Reduction	Criteria A
Voltage interruptions	IEC 61000-4-11:2004/AMD1:2017, >95% reduction	Criteria A
Application Note Link	<a href="#">TR18RDM Series App Notes</a>	

## CHARACTERISTIC CURVE

### Power Derating Curve



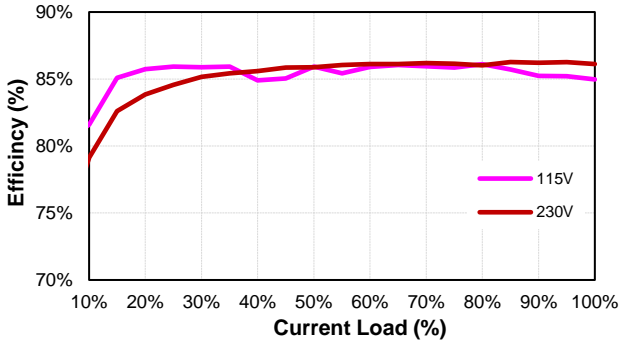
### Performance Data



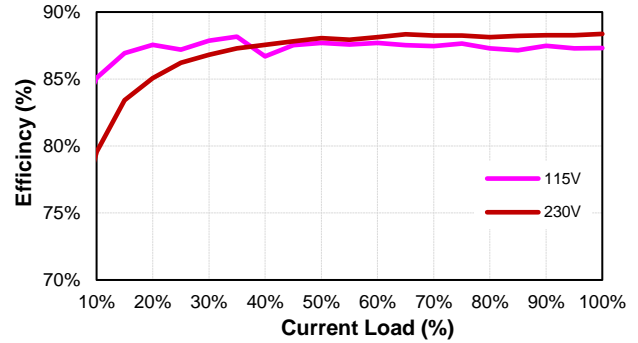


# TR18RDM Series

TR18RDM180 (Eff Vs Io)

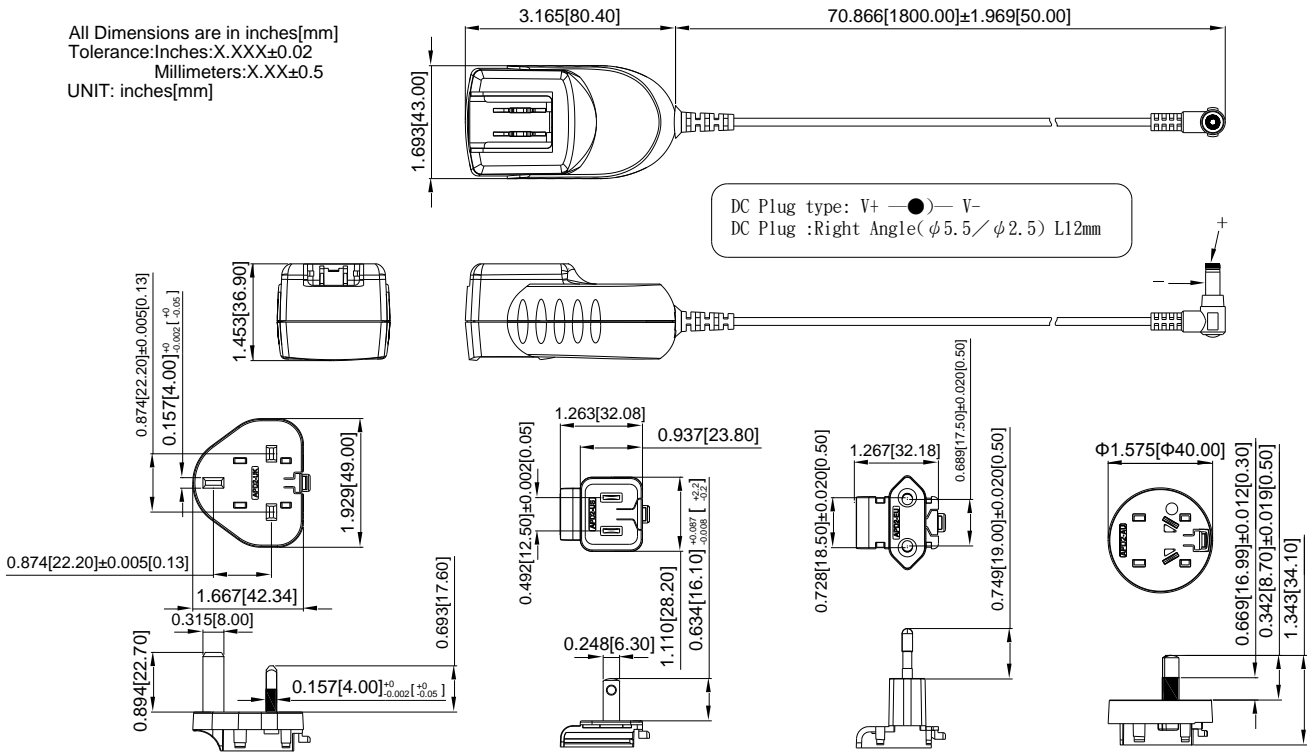


TR18RDM240 (Eff Vs Io)



## MECHANICAL SPECIFICATION

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

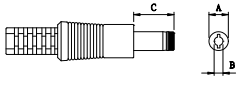
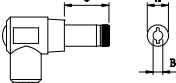


## INTERCHANGEABLE AC PLUG SPECIFICALLY for TR18RDM (SOLD SEPARATELY)

TYPE				
	U.K type (U)	American type (A)	European type (E)	Australian type (S)
ORDER NO.	AC PLUG RE-U	AC PLUG RE-A	AC PLUG RE-E	AC PLUG RE-S



## STANDARD OUTPUT DC PLUG

DC Plug Type	Cable Number -XXXXX	A	B	C	Cable Type	Cable Length	Cable AWG
		OD (mm)	ID (mm)	L (mm)			
 <p>Straight/Inner+Outer-</p> <p>+ ● -</p>	11G03	Φ5.5	Φ2.1	12	UL1571	1800mm without Core	18AWG for Vo: 5V, 9V 22AWG for Vo: 12V, 15V 18V, 24V
	12G03	Φ5.5	Φ2.5	12			
	23G03	Φ5.5	Φ2.1	9.5			
	26G03	Φ5.5	Φ2.5	9.5			
 <p>Right Angle/Inner+Outer-</p> <p>+ ● -</p>	01G03	Φ5.5	Φ2.1	12			
	02G03	Φ5.5	Φ2.5	12			
	21G03	Φ5.5	Φ2.1	9.5			
	24G03	Φ5.5	Φ2.5	9.5			