TR100M SERIES
100 WATT MEDICAL SWITCH ADAPTER

Features

- Universal Input Range 90~264Vac
- High Efficiency up to 89%
- Class II
- No Load Input Power Consumption < 300mW
- Approval IEC/EN/UL 60601-1 2 MOPP
- Approval EN 55011 and CISPR/FCC Class B
- Operating Altitude 3000m
- Continuous Short Circuit Protection
- Over Voltage Protection

MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE NOTE1	VOLTAGE ACCURACY NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
TR100M120	12 V	8.34 A	120mV	±2%	±1%	±4%	88%
TR100M150	15 V	6.67 A	150mV	±2%	±1%	±3%	88%
TR100M180	18 V	5.56 A	180mV	±2%	±1%	±2%	88%
TR100M190	19 V	5.27 A	190mV	±2%	±1%	±2%	88%
TR100M200	20 V	5.0 A	200mV	±2%	±1%	±2%	88%
TR100M240	24 V	4.17 A	240mV	±2%	±1%	±2%	88%
TR100M480	48 V	2.1 A	480mV	±2%	±1%	±2%	89%

Note:

1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 60% full load.
3. Line regulation is measured from $100V_{ac}$ to $240V_{ac}$ with full load.
4. Load regulation measured from 60% to 100% full load and from 60% to 20% full load (60%±40% full load).
5. Typical efficiency at $230V_{ac}$ and 75% full load at 25℃.

PART NUMBER

Series	Output Voltage	DC Plug Type	Cable Type	Cable Length
TR100M	XXX	-XX	E	XX
100W Medical Adapter	120：12V 150：15V 180：18V 190：19V 200：20V 240：24V 480：48V	See Page 6	E：UL1185 with OVP	11：720mm with Ferrite Core 12：1220mm with Ferrite Core 13：1800mm with Ferrite Core See page 6 for restrictions

Part Number Example:
TR100M120-11E36, 100W, Class II, $12V_{dc}$ Output, DC Jack Type, Cable Length 1500mm with Ferrite Core

TECHNICAL SPECIFICATIONS

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage		All	90 120		264 370	V_{ac} V_{dc}
Operating Temperature	See Derating Curve	All	-20		70	℃
Storage Temperature		All	-20		85	℃
Input/Output Isolation Voltage	1 minute	All			4800	V_{ac}
Operating Altitude		All			3000	m

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V_{ac}
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Load, V_{in}=100V_{ac}	All			1.5	A
Leakage Current (Touch)		All			100	uA
Power Factor	230V_{ac}/50Hz @ Full load	All	0.9			
Inrush Current	V_{in}=240V_{ac}, Cold start at 25℃	All			100	A

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V_{in}=115V_{ac} and 230V_{ac}, I_o=60% Full load T_c=25℃	TR100M120 TR100M150 TR100M180 TR100M190 TR100M200 TR100M240 TR100M480	11.76 14.7 17.64 18.62 19.6 23.52 47.04	12 15 18 19 20 24 48	12.24 15.3 18.36 19.38 20.4 24.48 48.96	V_{dc}
Operating Output Current Range	V_{in}=115V_{ac} and 230V_{ac},T_c=25℃	TR100M120 TR100M150 TR100M180 TR100M190 TR100M200 TR100M240 TR100M480	0 0 0 0 0 0 0		8.34 6.67 5.56 5.27 5 4.17 2.1	A
Holdup Time	V_{in}=115V_{ac}	All		16		ms
Output Voltage Regulation						
Load Regulation	60%±40% Full load change	TR100M120 TR100M150 TR100M180 TR100M190 TR100M200 TR100M240 TR100M480			±4.0 ±3.0 ±2.0 ±2.0 ±2.0 ±2.0 ±2.0	%
Line Regulation	V_{in}=High line to low line, full load	All			±1.0	%

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Voltage Protection	TVS Component to clamp	TR100M120	14.3		15.8	V_{dc}
		TR100M150	17.1		19.3	
		TR100M180	20.9		23.1	
		TR100M190	20.9		23.1	
		TR100M200	22.8		25.2	
		TR100M240	28.5		31.9	
		TR100M480	53.2		59.2	
Over Current Protection	Auto recovery	All	160		180	%
Short Circuit Protection	Auto recovery	All				
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℃	TR100M120			120	mV
		TR100M150			150	
		TR100M180			180	
		TR100M190			190	
		TR100M200			200	
		TR100M240			240	
		TR100M480			480	
Load Capacitance	1. V_{in}=115V_{ac} and 230V_{ac} 2. Output is max. load 3. Ambient temperature=25℃	TR100M120			8400	uF
		TR100M150			6600	
		TR100M180			5800	
		TR100M190			5200	
		TR100M200			5100	
		TR100M240			4200	
		TR100M480			2040	
Efficiency	1. V_{in}=230V_{ac} 2. Output is 75% full load 3. Ambient temperature=25℃	TR100M120		88		%
		TR100M150		88		
		TR100M180		88		
		TR100M190		88		
		TR100M200		88		
		TR100M240		88		
		TR100M480		89		

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 Minute (without dielectric breakdown)	All			4800	V_{ac}
Isolation Resistance	Input to output	All	100			MΩ

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency		All		70		kHz

GENERAL SPECIFICATIONS

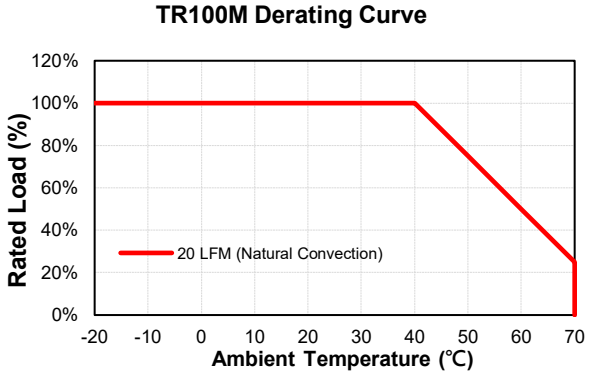
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100%; T_a=25℃ per MIL-HDBK-217F I_o=100%; T_a=25℃, Telcordia SR332	All	240 2800			k hours
Humidity	Non-condensing	All			93	% RH
Shock	MIL-STD-810F Table 516.5,TABLE 516.5-I 10ms, each axis 3 times(±X、±Y、±Z axis)	All		75		g
Vibration	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		485		grams

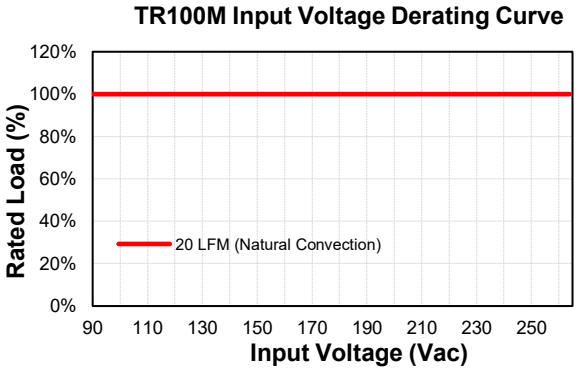
GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Dimension		All	5.591x2.283x1.457 inches (142.00x58.00x37.00 mm)			
Safety	Class II IEC 60601-1:2005/AMD2:2020 EN 60601-1:2006+A1+A12+A2 ANSI/AAMI ES 60601-1:2005/(R)2012 and A1:2012/(R)2012 and A2:2021					Ed 3.2
EMC Emission	EN 55011:2016+A11:2020, EN 61000-3-2:2019, EN 6100-3-3:2013+A1:2019, FCC CFR 47 Part 18					
Conducted Disturbance	EN 55011:2016+A11:2020, FCC CFR 47 Part 18					Class B
Radiated Disturbance	EN 55011:2016+A11:2020, FCC CFR 47 Part 18					Class B
Harmonic Current Emissions	EN 61000-3-2:2019					Class A
Voltage Fluctuations & Flicker	EN 61000-3-3:2013+A1:2019					Criterion A
EMC Immunity	EN 60601-1-2:2015+A1:2021, IEC 61000-4-2,3,4,5,6,8,11					Ed 4.1
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008 Air Discharge: ±15kV Contact Discharge: ±8kV					Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2020					Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012,±2kV					Criterion A
Surge	IEC 61000-4-5:2014+A1:2017, L-N:±1kV					Criterion A
Conducted Disturbances, Induced by RF Fields	IEC 61000-4-6:2013					Criterion A
Power Frequency Magnetic Field	IEC 61000-4-8:2009					Criterion A
Voltage Dips	IEC 61000-4-11:2020, Dips:30% reduction, Dips: >95% Reduction, Criteria A					Criterion A
Voltage Interruptions	IEC 61000-4-11:2020, >95% Reduction					Criterion B
Application Note Link	TR100M Series App Notes					

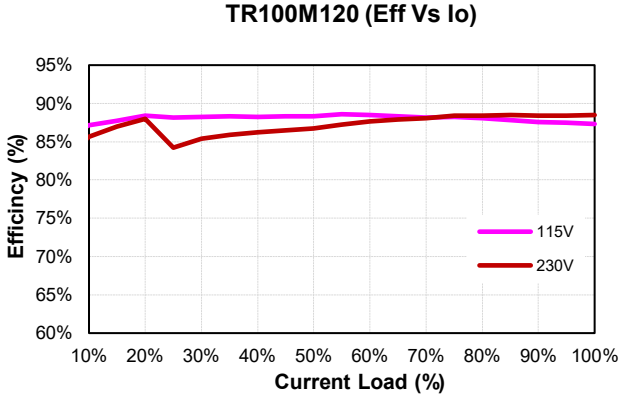
CHARACTERISTIC CURVE

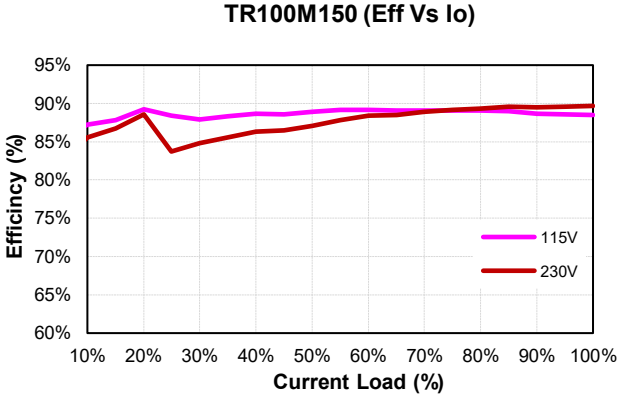
Power Derating Curve



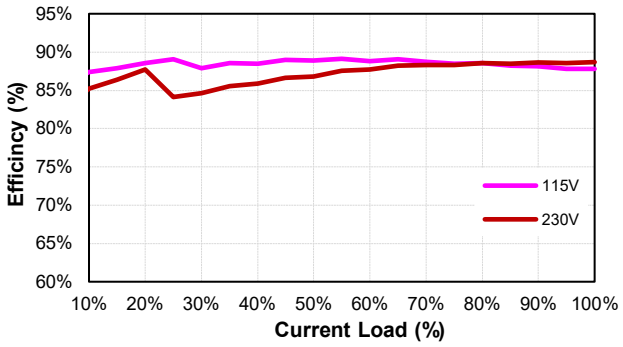


Performance Data

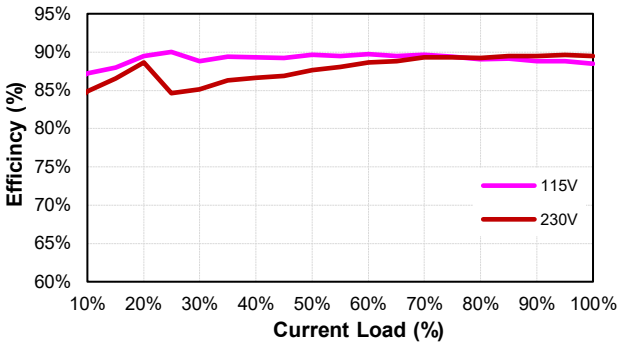




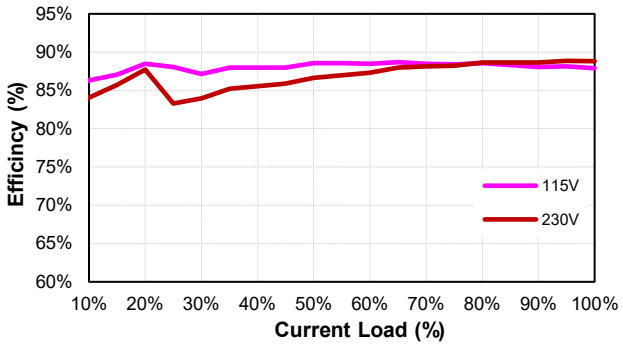
TR100M180 (Eff Vs Io)



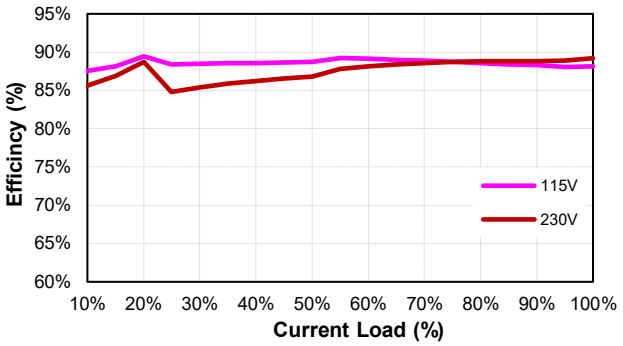
TR100M190 (Eff Vs Io)



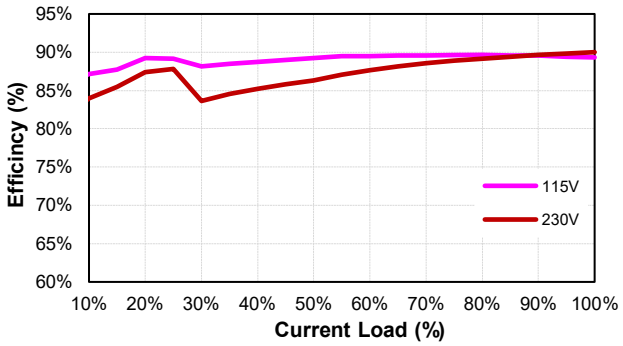
TR100M200 (Eff Vs Io)



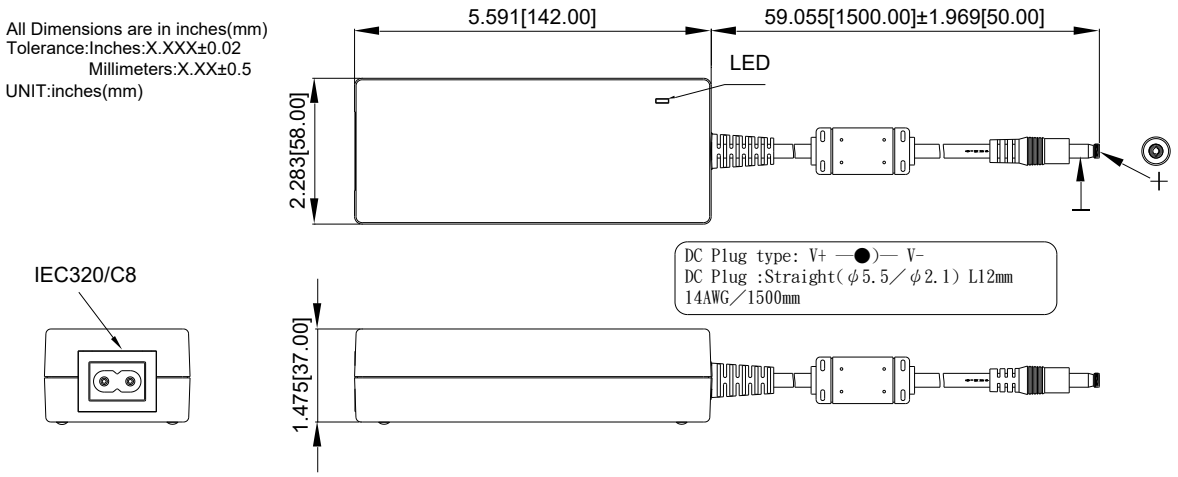
TR100M240 (Eff Vs Io)



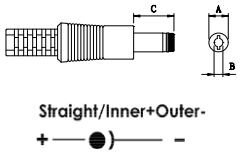
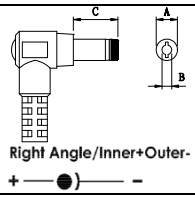
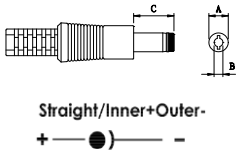
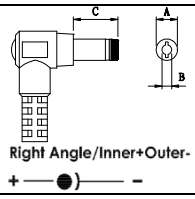
TR100M480 (Eff Vs Io)



MECHANICAL SPECIFICATION



Standard Output Dc Plug

DC Plug Type	Cable Number-XXXXX	A OD (mm)	B ID (mm)	C L (mm)	Cable Type	Cable Length	Cable AWG
	11E36	Φ5.5	Φ2.1	12	UL1185	1500mm with Ferrite Core	14AWG for Vo: 12V, 15V
	12E36	Φ5.5	Φ2.5	12			
	23E36	Φ5.5	Φ2.1	9.5			
	26E36	Φ5.5	Φ2.5	9.5			
	01E36	Φ5.5	Φ2.1	12			
	02E36	Φ5.5	Φ2.5	12			
	21E36	Φ5.5	Φ2.5	9.5			
	24E36	Φ5.5	Φ2.1	9.5			
	11E13	Φ5.5	Φ2.1	12	UL1185	1800mm with Ferrite Core	16AWG for Vo: 18V, 19V, 20V, 24V, 48V
	12E13	Φ5.5	Φ2.5	12			
	23E13	Φ5.5	Φ2.1	9.5			
	26E13	Φ5.5	Φ2.5	9.5			
	01E13	Φ5.5	Φ2.1	12			
	02E13	Φ5.5	Φ2.5	12			
	21E13	Φ5.5	Φ2.5	9.5			
	24E13	Φ5.5	Φ2.1	9.5			

※Other DC Plug Type please refer to the link: https://www.cincon.com/productdownload/TR100M-cable-DC-plug.pdf

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