TRE15 SERIES
15 WATT AC-DC I.T.E SWITCHING ADAPTER

Features

- Universal Input Range 90~264Vac
- High Efficiency up to 86%
- Class II
- No Load Power Consumption < 75mW
- Approval IEC/EN/UL 62368-1
- Approval EN55032 and CISPR/FCC Class B
- Operating Altitude 5000m
- Over Voltage Protection
- Continuous Short Circuit Protection
- Meets CoC Tier 2 & DoE Level VI

MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	VOLTAGE ACCURACY NOTE1	RIPPLE& NOISE NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
TRE15050	5 V	2 A	±2%	50 mV	±1%	±4%	79%
TRE15090	9 V	1.4 A	±2%	90 mV	±1%	±2%	84%
TRE15120	12 V	1 A	±2%	100 mV	±1%	±2%	83%
TRE15150	15 V	1 A	±2%	100 mV	±1%	±2%	85%
TRE15240	24 V	0.63 A	±2%	100 mV	±1%	±2%	86%

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_{ac} to 240V_{ac} 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_{ac} and 75% full load at 25℃.

PART NUMBER

Series	Output Voltage	AC Plug Type	DC Plug Type	Cable Type	Cable Length
TRE15	XXX	-X	-XX	X	XX
15W I.T.E Adapter	050 : 5V 090 : 9V 120 : 12V 150 : 15V 240 : 24V	A: USA 2 Pin E: Europe 2 Pin U: British 3 Pin	See Page 5	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 See page 5 for restrictions

Part Number Example:

TRE15120-A-01G03, 12V_{dc} Output, AC Plug Type, DC Jack Type, Cable Length 1800mm

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		264	V_{ac}
Operating Case Temperature	See Derating Curve	All	-20		60	℃
Storage Temperature		All	-20		85	℃
Operating Altitude		All			5000	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% Full load, V_{in}=100V_{ac}	All			0.5	A
Leakage Current		All			250	uA
Inrush Current	V_{in}=240V_{ac}, Cold start at 25℃	All			50	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℃	TRE15050	4.9	5	5.1	V_{dc}
		TRE15090	8.82	9	9.18	
		TRE15120	11.76	12	12.24	
		TRE15150	14.7	15	15.30	
		TRE15240	23.52	24	24.48	
Operating Output Current Range	V_{in}=115V_{ac} and 230V_{ac},T_c=25℃	TRE15050			2	A
		TRE15090			1.4	
		TRE15120			1	
		TRE15150			1	
		TRE15240			0.63	
Holdup Time	V_{in}=115V_{ac}	All		10		ms
Output Voltage Regulation						
Load Regulation	60%±40% Full load change	TRE15050			±4.0	%
		TRE15090			±2.0	
		TRE15120			±2.0	
		TRE15150			±2.0	
		TRE15240			±2.0	
Line Regulation	V_{in}=100V_{ac} to 240V_{ac}	All			±1.0	%
Over Voltage Protection	IC component to clamp (auto recovery)	TRE15050			7.14	V_{dc}
		TRE15090			12.1	
		TRE15120			15.8	
		TRE15150			19.5	
		TRE15240			28.4	
Over Current Protection	Auto recovery	All	110		160	%
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℃	TRE15050			50	mV
		TRE15090			90	
		TRE15120			100	
		TRE15150			100	
		TRE15240			100	

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Load Capacitance	1. V_{in}=115V_{ac} and 230V_{ac} 2. Output is max. load 3. Ambient temperature=25℃	TRE15050			2000	uF
		TRE15090			1500	
		TRE15120			1000	
		TRE15150			1000	
		TRE15240			660	
Efficiency	1. V_{in}=230V_{ac} 2. Output is 75% full load 3. Ambient temperature=25℃	TRE15050		79		%
		TRE15090		84		
		TRE15120		83		
		TRE15150		85		
		TRE15240		86		

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute	All			3000	V_{ac}
Isolation Resistance	Input to output	All	100			MΩ

FEATURE CHARACTERISTICS

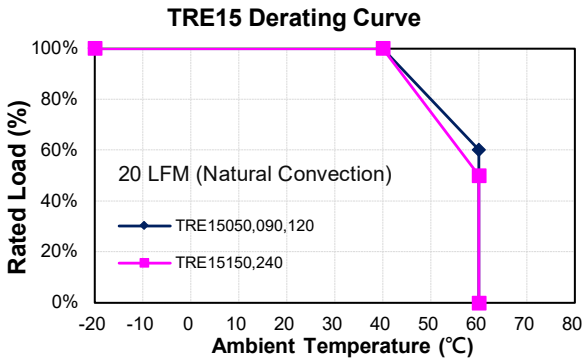
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Vin=115Vac, Io=100%	All		85		kHz
	Vin=230Vac, Io=100%			65		

GENERAL SPECIFICATIONS

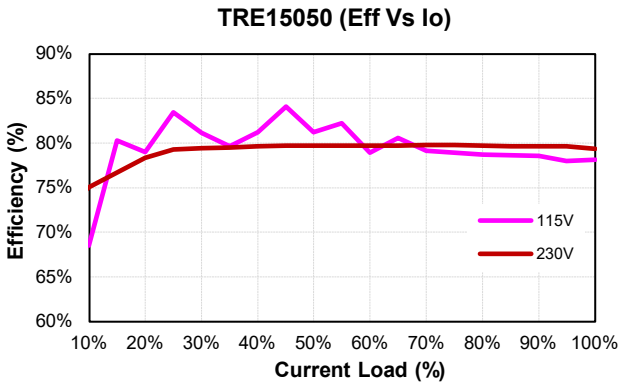
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100%; T_a=25℃ per MIL-HDBK-217F	All	530			k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5,Table 516.5-I 10ms, each axis 3 times(±X、±Y、±Z axis)	All		75		g
Vibration	Meet MIL-STD-810F Table 514.5C-VIII,15~2000Hz, X、Y、Z axis, 1 hour (each axis),. Total 3 hrs.	All		4		g
Weight		All		100		g
Dimensions		All	2.795x1.906x1.299 inches (71.00x48.40x33.00 mm)			
Safety	Class II, IEC/EN/UL 62368-1					Ed.3.0
EMC Emission	EN 55032:2015+A1:2020, EN 61204-3:2018, EN 61000-6-3:2021, EN 61000-3-2:2019 EN 61000-3-3:2013+A1:2019, FCC CFR Title 47 Part 15 Subpart B: 2016					Class B
Conducted Disturbance	EN 55032:2015+A1:2020, EN 61204-3:2018, EN 61000-6-3:2021					Class B
Radiated Disturbance	EN 55032:2015+A1:2020, EN 61204-3:2018, EN 61000-6-3:2021					Class B
Power Harmonics	EN 61000-3-2:2019					
Voltage Fluctuations	EN 61000-3-3:2013+A1:2019					
EMC Immunity	EN 55035:2017+A11:2020, EN 61204-3:2018, EN 61000-6-1:2019					
Electrostatic Discharge (ESD)	IEC 61000-4-2 Ed. 2.0: 2008, Air Discharge: ±8kV, Contact Discharge: ±4kV					Criteria A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3 Ed. 4.0: 2020					Criteria A
Electrical Fast Transient (EFT)	IEC 61000-4-4 Ed. 3.0: 2012, ±1kV					Criteria A
Surge	IEC 61000-4-5 Ed. 3.1: 2017, L-N: ±1kV					Criteria A
Conducted disturbances, induced by RF fields	IEC 61000-4-6 Ed. 4.0: 2013					Criteria A
Power frequency magnetic field	IEC 61000-4-8 Ed. 2.0: 2009					Criteria A
Voltage dips	IEC 61000-4-11 Ed. 3.0: 2020, Dips: 30% Reduction, Dips: >95% Reduction					Criteria A
Voltage interruptions	IEC 61000-4-11 Ed. 3.0: 2020, >95% reduction					Criteria B
Application Note Link	TRE15 Series App Notes					

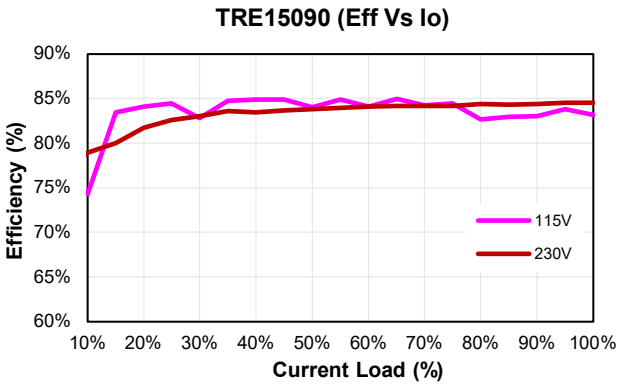
CHARACTERISTIC CURVE

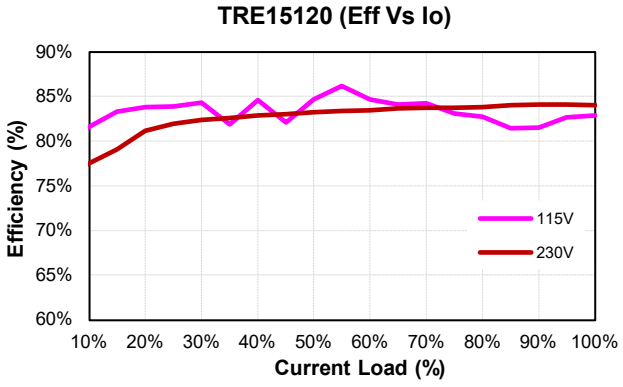
Power Derating Curve

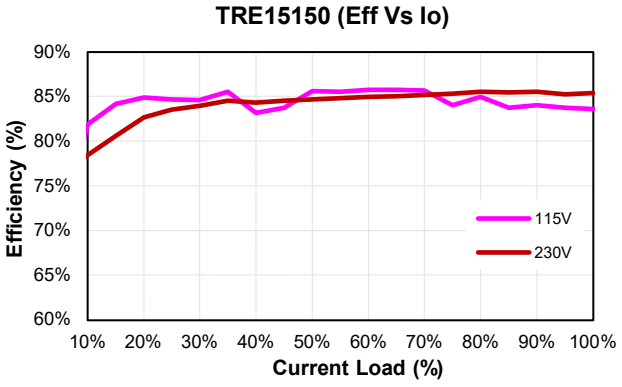


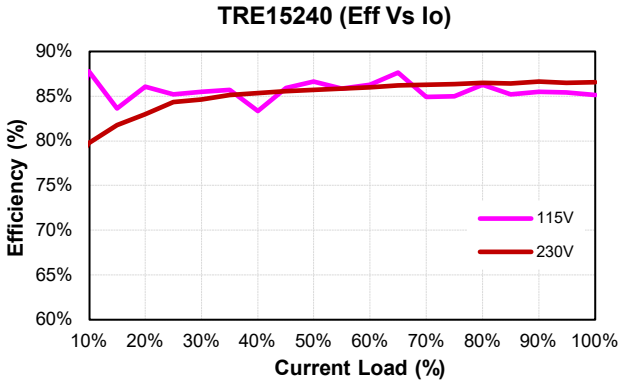
Performance Data



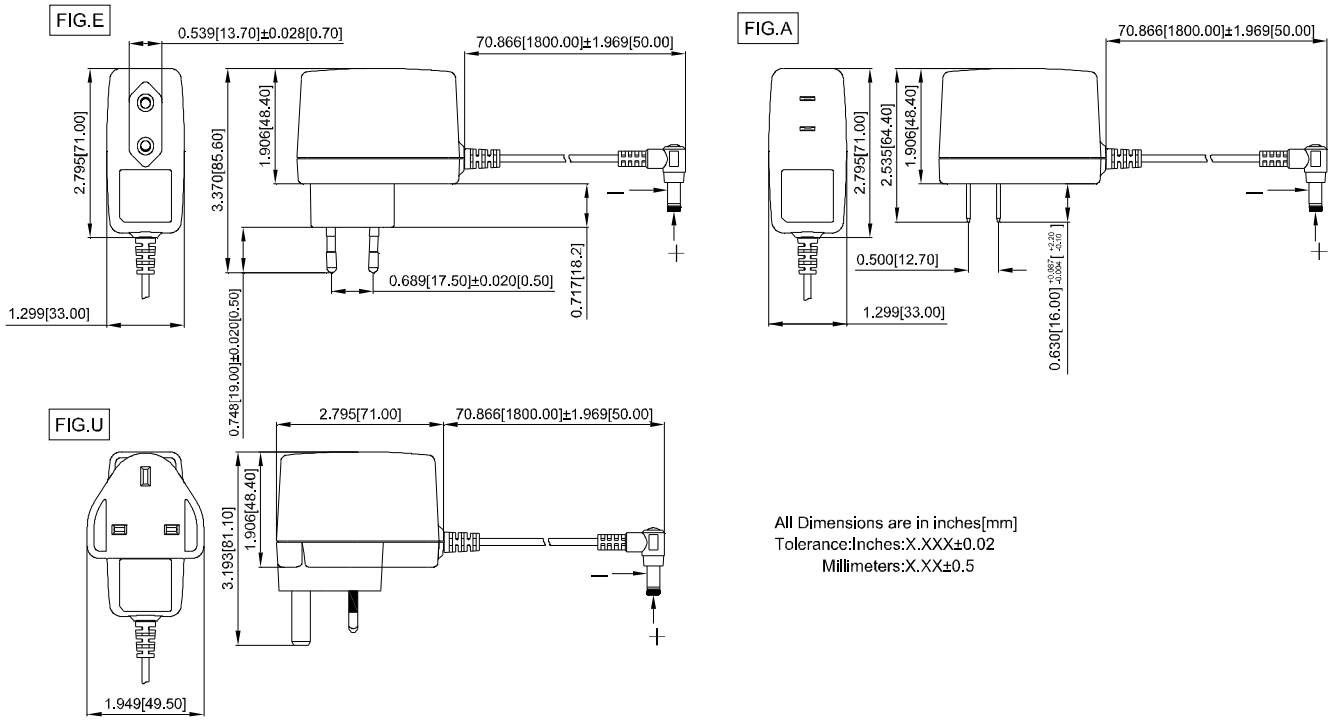




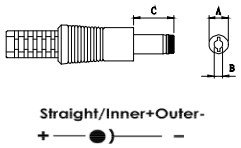
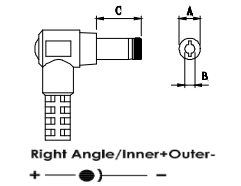




MECHANICAL SPECIFICATION



STANDARD OUTPUT PLUG

DC Plug Type	Cable Number -XXXXX	A OD (mm)	B ID (mm)	C L (mm)	Cable Type	Cable Length	Cable AWG
 Straight/Inner+Outer-	11G03	Φ5.5	Φ2.1	12	UL1571	1800mm without Core	20AWG for Vo: 5V 18AWG for Vo: 9V 24AWG for Vo: 12V, 15V, 24V
	12G03	Φ5.5	Φ2.5	12			
	23G03	Φ5.5	Φ2.1	9.5			
	26G03	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer-	01G03	Φ5.5	Φ2.1	12			
	02G03	Φ5.5	Φ2.5	12			
	21G03	Φ5.5	Φ2.5	9.5			
	24G03	Φ5.5	Φ2.1	9.5			

※Other DC Plug Type please refer to the link: https://www.cincon.com/productdownload/TRE15-cable-DC-Plug.pdf

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