



TRG36 SERIES 36W SWITCHING ADAPTER

Features

- Universal Input Range 90~264Vac
- High Efficiency up to 89%
- Class II
- No Load Input Power Consumption < 75mW
- Approval IEC/EN/UL62368-1
- Approval EN55032 and CISPR/FCC Class B
- Operating Altitude 2000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meets CoC Tier 2 and DoE Level VI



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE NOTE1	VOLTAGE ACCURACY NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.)
TRG36A05	5 V	4.0 A	50mV	±2%	±1%	±6%	84%
TRG36A09	9 V	3.0 A	90mV	±2%	±1%	±5%	87%
TRG36A12	12 V	2.5 A	120mV	±2%	±1%	±5%	87%
TRG36A13	13.5 V	2.4 A	135mV	±2%	±1%	±5%	87%
TRG36A15	15 V	2.4 A	150mV	±2%	±1%	±3%	87%
TRG36A18	18 V	2.0 A	180mV	±2%	±1%	±2%	88%
TRG36A24	24 V	1.5 A	240mV	±2%	±1%	±2%	88%
TRG36A48	48 V	0.75 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% load (60% ±40% full load).
5. Typical efficiency at 230V_{ac} and 75% full load at 25°C

PART NUMBER

Series	Output Voltage	DC Plug Type	Cable Type	Cable Length
TRG36A	XX	-XX	E	XX
36W I.T.E Adapter	05 : 5V 09 : 9V 12 : 12V 13 : 13.5V 15 : 15V 18 : 18V 24 : 24V 48 : 48V	See Page 6	5V UL2464 with OVP E : 9V~48V UL1185 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 6 for restrictions

Part Number Example:

TRG36A12-01E03, 36W, Class II, 12V_{dc} Output, DC Jack Type, Cable Length 1800mm

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TRG36A Series

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	90		264	V _{ac}
Operating Temperature	See Derating Curve	All	-20		60	°C
Storage Temperature		All	-20		85	°C
Input/Output Isolation Voltage	1 minute	All			3000	V _{ac}
Operating Altitude		All			2000	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			1.0	A
Leakage Current		All			250	uA
Inrush Current	V _{in} =240V _{ac} , Cold start at 25°C	All			60	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°C	TRG36A05	4.9	5	5.1	V _{dc}
		TRG36A09	8.82	9	9.18	
		TRG36A12	11.76	12	12.24	
		TRG36A13	13.23	13.5	13.77	
		TRG36A15	14.7	15	15.3	
		TRG36A18	17.64	18	18.36	
		TRG36A24	23.52	24	24.48	
		TRG36A48	47.04	48	49.96	
Operating Output Current Range	V _{in} =115V _{ac} and 230V _{ac} , T _c =25°C	TRG36A05	0		4	A
		TRG36A09	0		3	
		TRG36A12	0		2.5	
		TRG36A13	0		2.4	
		TRG36A15	0		2.4	
		TRG36A18	0		2	
		TRG36A24	0		1.5	
		TRG36A48	0		0.75	
Holdup Time	V _{in} =115V _{ac}	All		8		ms
Output Voltage Regulation						
Load Regulation	60%±40% Full load change	TRG36A05			±6.0	%
		TRG36A09			±5.0	
		TRG36A12			±5.0	
		TRG36A13			±5.0	
		TRG36A15			±3.0	
		TRG36A18			±2.0	
		TRG36A24			±2.0	
		TRG36A48			±2.0	
Line Regulation	V _{in} =High line to low line	All			±1.0	%



TRG36A Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Voltage Protection	TVS Component to clamp	TRG36A05	6.45		7.14	V_{dc}
		TRG36A09	10.5		12	
		TRG36A12	14.3		15.8	
		TRG36A13	14.3		15.8	
		TRG36A15	17.1		18.9	
		TRG36A18	20.9		23.5	
		TRG36A24	28.5		31.5	
		TRG36A48	53.2		58.8	
Output Ripple and Noise	1. Add a 0.1 μ F ceramic capacitor and a 10 μ F aluminum electrolytic capacitor to output 2. Oscilloscope is 20MHz band width 3. Ambient temperature=25 $^{\circ}$ C	TRG36A05			50	mV
		TRG36A09			90	
		TRG36A12			120	
		TRG36A13			135	
		TRG36A15			150	
		TRG36A18			180	
		TRG36A24			240	
		TRG36A48			480	
Over Current Protection	Auto recovery	All	120		150	%
Short Circuit Protection	Auto recovery	All				
Load Capacitance	1. V_{in} =115 V_{ac} and 230 V_{ac} 2. Output is max. load 3. Ambient temperature=25 $^{\circ}$ C	TRG36A05			4000	μ F
		TRG36A09			3000	
		TRG36A12			2500	
		TRG36A13			2400	
		TRG36A15			2400	
		TRG36A18			2000	
		TRG36A24			1500	
		TRG36A48			780	
Efficiency	1. V_{in} =230 V_{ac} 2. Output is 75% full load 3. Ambient temperature=25 $^{\circ}$ C	TRG36A05		84%		%
		TRG36A09		87%		
		TRG36A12		87%		
		TRG36A13		87%		
		TRG36A15		87%		
		TRG36A18		88%		
		TRG36A24		88%		
		TRG36A48		89%		

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute (without dielectric breakdown)	All			3000	V_{ac}
Isolation Resistance		All	100			M Ω

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency		All		65		kHz

GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	V_{in} =115 V_{ac} , I_o =100%; T_a =25 $^{\circ}$ C per MIL-HDBK-217F	All	200			k hours
Humidity	Non-condensing	All			93	% RH
Shock	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



TRG36A Series

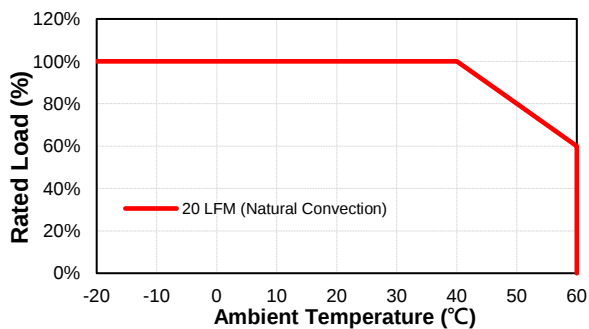
GENERAL SPECIFICATIONS

Vibration	MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X · Y · Z axis, 1 hour(each axis),. total 3 hours.	All	4	g
Weight		All	190	grams
Dimension		All	4.370x2.008x0.886 inches (111.00x51.00x22.50 mm)	
Safety	Class II IEC 62368-1: 2014, EN62368-1: 2014+A11, UL 62368-1, 2nd Edition			Ed 2.0
EMC Emission	EN55032: 2015, EN61000-3-2: 2014, EN6100-3-3: 2013, FCC CFR 47 Part 15			
Conducted Disturbance	EN55032: 2015, FCC CFR 47 Part 15			Class B
Radiated Disturbance	EN55032: 2015, FCC CFR 47 Part 15			Class B
Harmonic Current Emissions	EN 61000-3-2: 2014			Class A
Voltage Fluctuations & Flicker	EN 61000-3-3: 2013			Criterion A
EMC Immunity	EN55024:2010, EN61000-6-1:2007, EN61204-3:2000, IEC61000-4-2,3,4,5,6,8,11,			
Electrostatic Discharge (ESD)	IEC 61000-4-2: 2008 Air Discharge: ±8kV Contact Discharge: ±4kV			Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3: 2010			Criterion A
Electrical Fast Transient (EFT)	IEC61000-4-4: 2012, ±1kV			Criterion A
Surge	IEC61000-4-5: 2014, 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: 2004, Dips:30% reduction, Dips: >95% Reduction			Criterion A
Voltage Interruptions	IEC 61000-4-11: 2004, >95% Reduction			Criterion B
Application Note Link			TRG36A Series App Notes	

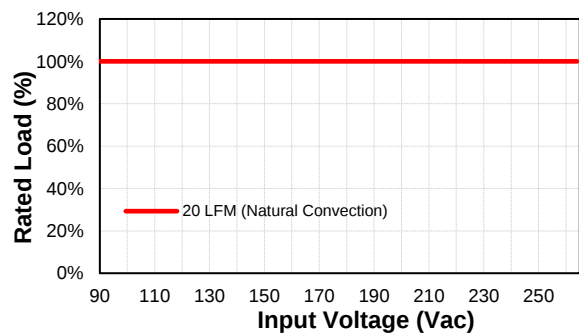
CHARACTERISTIC CURVE

Power Derating Curve

TRG36A Derating Curve

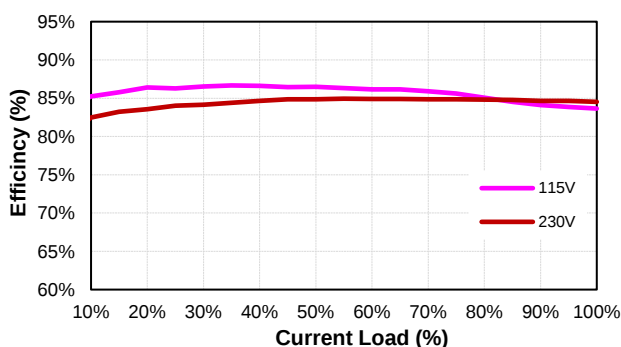


TRG36A Input Voltage Derating Curve

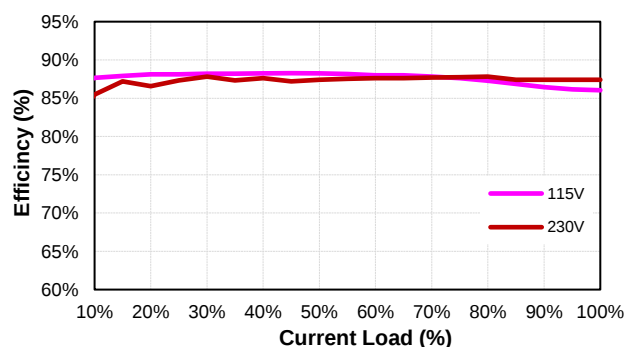


Performance Data

TRG36A05 (Eff Vs Io)



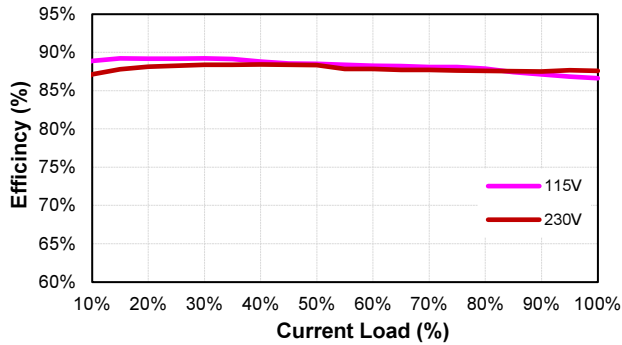
TRG36A09 (Eff Vs Io)



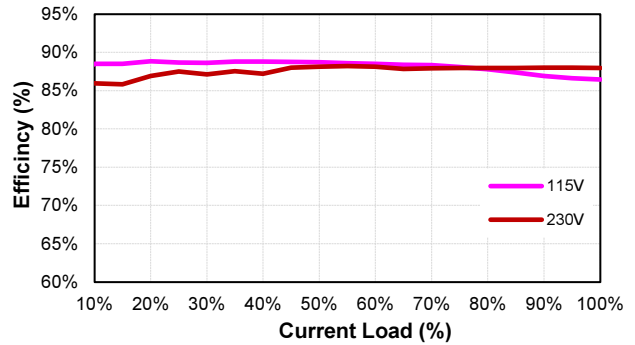


TRG36A Series

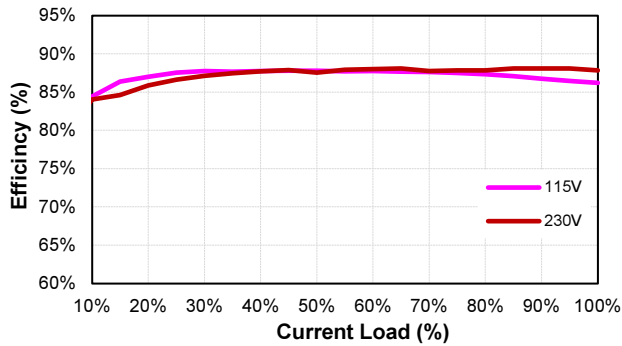
TRG36A12 (Eff Vs Io)



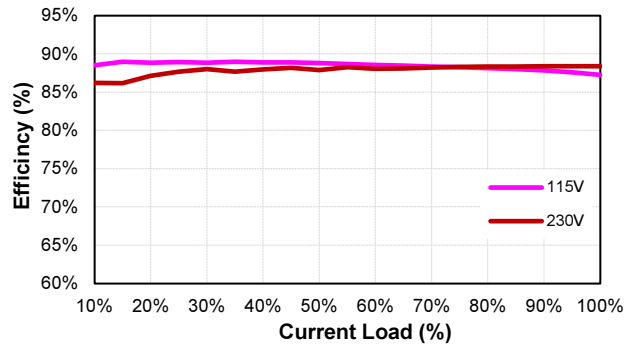
TRG36A13 (Eff Vs Io)



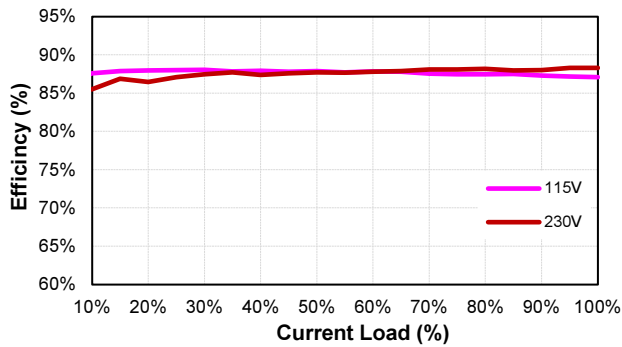
TRG36A15 (Eff Vs Io)



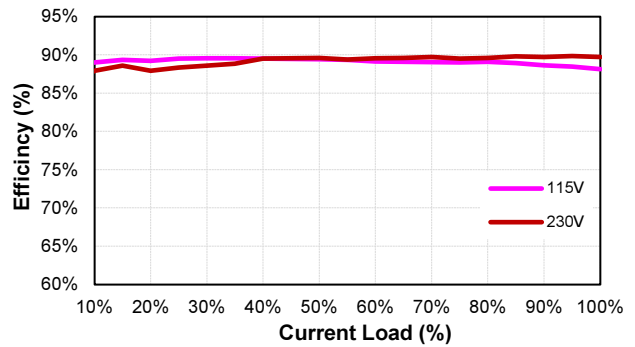
TRG36A18 (Eff Vs Io)



TRG36A24 (Eff Vs Io)

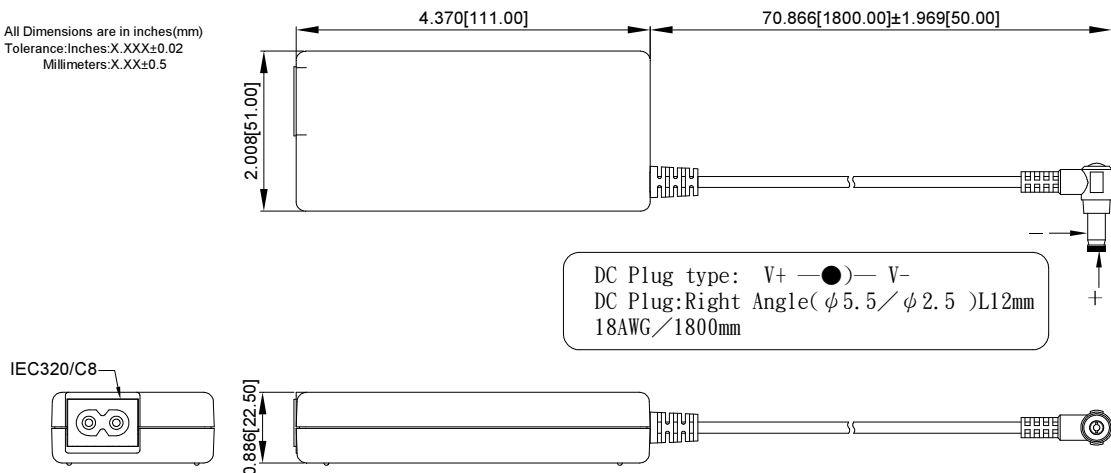


TRG36A48 (Eff Vs Io)



MECHANICAL SPECIFICATION

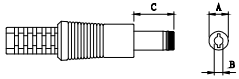
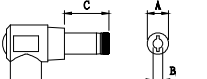
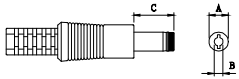
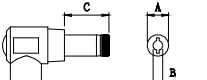
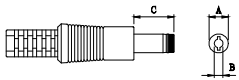
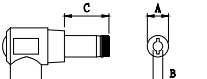
All Dimensions are in inches(mm)
Tolerance: Inches: X.XXX±0.02
Millimeters: X.XX±0.5





TRG36A Series

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)			
 Straight/Inner+Outer- + ● -	11E01	Φ5.5	Φ2.1	12	UL2464	720mm without Core	18AWG for Vo: 5V
	12E01	Φ5.5	Φ2.5	12			
	23E01	Φ5.5	Φ2.1	9.5			
	26E01	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● -	01E01	Φ5.5	Φ2.1	12			
	02E01	Φ5.5	Φ2.5	12			
	21E01	Φ5.5	Φ2.5	9.5			
	24E01	Φ5.5	Φ2.1	9.5			
 Straight/Inner+Outer- + ● -	11E02	Φ5.5	Φ2.1	12	UL1185	1220mm without Core	18AWG for Vo: 9V
	12E02	Φ5.5	Φ2.5	12			
	23E02	Φ5.5	Φ2.1	9.5			
	26E02	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● -	01E02	Φ5.5	Φ2.1	12			
	02E02	Φ5.5	Φ2.5	12			
	21E02	Φ5.5	Φ2.5	9.5			
	24E02	Φ5.5	Φ2.1	9.5			
 Straight/Inner+Outer- + ● -	11E03	Φ5.5	Φ2.1	12	UL1185	1800mm without Core	18AWG for Vo: 12V, 13.5V, 15V, 18V, 24V, 48V
	12E03	Φ5.5	Φ2.5	12			
	23E03	Φ5.5	Φ2.1	9.5			
	26E03	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● -	01E03	Φ5.5	Φ2.1	12			
	02E03	Φ5.5	Φ2.5	12			
	21E03	Φ5.5	Φ2.5	9.5			
	24E03	Φ5.5	Φ2.1	9.5			

※Other DC Plug Type please refer to the link: <https://www.cincon.com/productdownload/TRG36-cable--DC-Plug.pdf>

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