TE40

40W Single Output External Power
Test & Measurement/Industrial Series

Features

- Meets DoE Efficiency Level VI Requirements
  - No load input power
  - Average Efficiency
- Up to 40W of AC-DC Power
- Universal Input 90-264Vac Input Range
- Desktop and Wall-Plug versions
- Meets "Heavy Industrial" Levels of EN61000 EMC Requirements
- Meets EN55011/CISPR11, and FCC Part 15.109 Class B Conducted & Radiated Emissions, with 6db margin
- Approved to EN/IEC/UL60950-1, 2nd Ed., Am. 2
- E-cap life of >8 years
- >1,000,000 hours MTBF
- 3 Year Warranty
- RoHS Compliant

Description

A high performance AC to DC external power supply family designed for test & measurement and industrial applications. The TE40A Series models are compliant with Efficiency Level VI requirements per U.S. Dept. of Energy, as well as the Heavy Industrial levels of various EN61000-4-x standards for EMC. The TE40A series models also meets Class B conducted and radiated emissions per FCC Part 15, EN55022, and CISPR22, with margin.

Model Selection

Model Number	Volts	Output Current	Output Power	Ripple & Noise[1]	Line Regulation	Load Regulation	Overvoltage Trip Range	Output Connector	Input Configuration
TE40A1203F01	12.0V	3.40A	40W	120mV pk-pk	±1%	±5%	120%-150%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	Class I Desktop, IEC60320 C14 Receptacle
TE40A1803F01	18.0V	2.20A	40W	180mV pk-pk	±1%	±5%	120%-150%		
TE40A2403F01	24.0V	1.70A	40W	240mV pk-pk	±1%	±5%	120%-140%		
TE40A1203N01	12.0V	3.40A	40W	120mV pk-pk	±1%	±5%	120%-150%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	Class I Desktop, IEC60320 C8 Receptacle
TE40A1803N01	18.0V	2.20A	40W	180mV pk-pk	±1%	±5%	120%-150%		
TE40A2403N01	24.0V	1.70A	40W	240mV pk-pk	±1%	±5%	120%-140%		
TE40A1203Q01	12.0V	3.40A	40W	120mV pk-pk	±1%	±5%	120%-150%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	Class II Desktop, IEC60320 C18 Receptacle
TE40A1803Q01	18.0V	2.20A	40W	180mV pk-pk	±1%	±5%	120%-150%		
TE40A2403Q01	24.0V	1.70A	40W	240mV pk-pk	±1%	±5%	120%-140%		
TE40A1203B01	12.0V	3.40A	40W	120mV pk-pk	±1%	±5%	120%-150%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	Class II Wall-Plug, Interchangeable Blades[2]
TE40A1803B01	18.0V	2.20A	40W	180mV pk-pk	±1%	±5%	120%-150%		
TE40A2403B01	24.0V	1.70A	40W	240mV pk-pk	±1%	±5%	120%-140%		
TE40A1203C01	12.0V	3.40A	40W	120mV pk-pk	±1%	±5%	120%-150%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	Class II Wall-Plug, Fixed North American Blades[3]
TE40A1803C01	18.0V	2.20A	40W	180mV pk-pk	±1%	±5%	120%-150%		
TE40A2403C01	24.0V	1.70A	40W	240mV pk-pk	±1%	±5%	120%-140%		

Notes:
1. Measured at the output connector, with noise probe directly across output and load terminated with 0.1µF ceramic and 10µF low ESR capacitors.
2. Standard models are fitted with North American blades. Order blade kit KT-1027K for other blades (EU. UK, Australia)
3. For EU fixed blades, replace "C" in the model number with "M", for UK blades, replace "C" with "G", for Australia blades, replace "C" with "H".
4. All specifications are typical at nominal input, full load, at 25°C ambient unless noted.
5. For Input Class I models: For AC GND connected to output common (-), insert a "B" in the part number where the "A" is located (TE40B1203F01).

General Specifications

AC Input	100-240Vac, ±10%, 47-63Hz, 1∅	**Turn On Time**	Less than 700mS @115Vac, full load
Input Current	115Vac: 1.2A, 230Vac: 0.6A	**Hold-up Time**	20mS min., at full Load, 100Vac input
Inrush Current	264Vac, cold start: will not exceed 40A	**Overtemperature Protection**	Will shutdown upon an overtemperature condition, auto-recovery.
Input Fuses	2.0A, 250Vac	**Overload Protection**	130% - 160%, Hiccup Mode
Earth Leakage Current	Input-GND: <500µA@264Vac, 60Hz, NC Output-GND: <4mA@264Vac, 60Hz, NC	**Short Circuit Protection**	Hiccup Mode, auto recovery.
Efficiency	Meets US DoE Efficiency Level VI Average efficiency levels	**Overvoltage Protection**	Hiccup Mode. See models chart for trip ranges.
Output Power	40W continuous – See models chart for specific voltage model ratings.	**Isolation**	Input-Output: 4000Vac Input-Ground: 1500Vac Output-Ground: 1500Vac
No Load Input Power	<0.1W per DoE Efficiency Level VI Requirements	**Safety Standards**	EN/CSA/UL/IEC 60950-1, 2nd Edition, Am 2
Ripple and Noise	See models chart on pg 1.	**Operating Temperature**	-20°C to +70°C Start Up at -40°C, full load, (warmup period before all parameters are within published specifications).
Output Voltage	See models chart on pg 1.	**Temperature Derating**	See derating chart.
Transient Response	500µs response time for return to within 0.5% of final value for any 50% load step over the range of 5% to 100% of rated load, $\Delta i/\Delta t <$ 0.2A/µs. Max. voltage deviation is +/-3.5%.	**Storage Temperature**	-40°C to +85°C
Regulation	See models chart on pg 1.	**Altitude**	Operating: to 5000m. Non-operating: -500 to 40,000 ft.
Drop Test	1.4m from table top to wooden platform, 6 faces.	**Relative Humidity**	5% to 95%, non-condensing
Vibration	Operating: 0.003g/Hz, 1.5grms overall, 3 axes, 10 min/axis, 1-500Hz. Non-Oper.: random waveform, 3 minutes per axis, 3 axes and Sine waveform, Vib. frequency/acceleration: 10-500Hz/1g, sweep rate of 1 octave / minutes, Vibration time of 10 sweeps / axes, 3 axes	**Shock**	Operating: Half-sine, 20gpk, 10mS, 3 axes, 6 shocks total Non-Operating: Half-sine waveform, impact acceleration of 100G, Pulse duration of 6 mS, Number of shocks: 3 for each of the three axis
Dimensions	See outline drawings	**MTBF**	>250,000 hours, full load, 110 & 220Vac input, 25°C amb., per Telcordia 332 Issue 6.
Weight	250g	**E-Cap Life**	>7 year life based on calculations at 115Vac/60Hz & 230Vac/50Hz, ambient 25°C at 24 hrs per day, 365 days/year, 6 power up cycles per day. (@80% load for the 12V model)

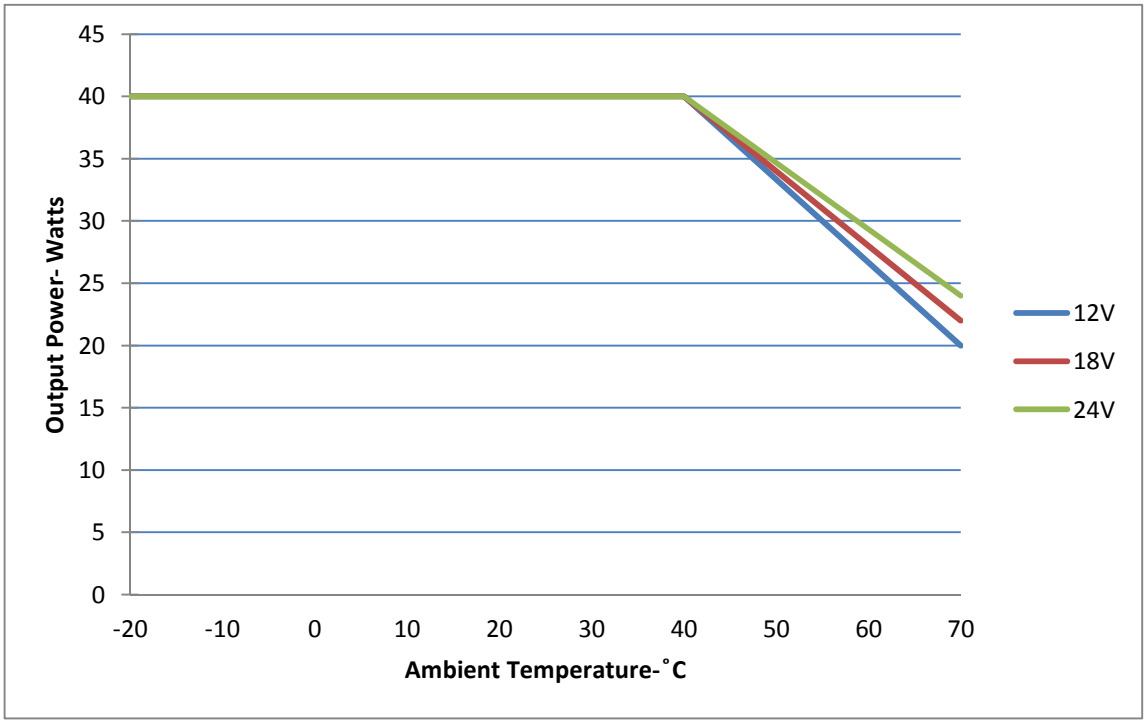
All specifications are typical at nominal input, full load, at 25°C ambient unless noted.

EMI/EMC Compliance

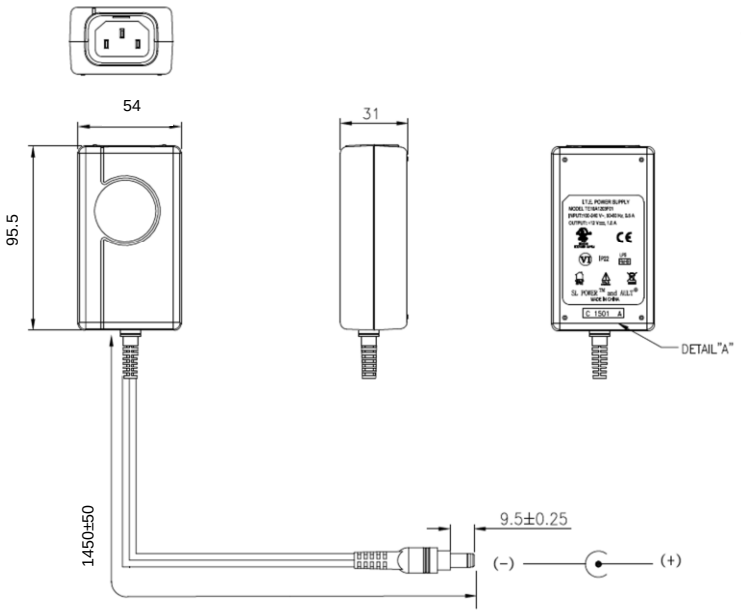
Conducted Emissions:	EN55011/CISPR22 Class B, FCC Part 15.107, Class B: 6db margin typ, at 115 and 230Vac
Radiated Emissions:	EN55022/CISPR22 Class B, FCC Part 15.109, Class B: 3db margin typ, at 115 and 230Vac
Common Mode Noise:	High Frequency (100kHz-20MHz): <40mA pk-pk
Electro-Static Discharge (ESD) Immunity on Power ports:	EN55024/IEC61000-4-2, Level 4: +/- 8kV contact, +/- 15kV air, Criteria A
Radiated RF EM Fields Susceptibility	EN55022/EN61000-4-3, 10V/m, 80MHz-2.7GHz, 80% AM at 1kHz
Electrical Fast Transients (EFT) /Bursts:	EN55024/IEC61000-4-4, Level 4, +/- 4kV, 100Khz rep rate, 40A, Criteria A
Surges, Line to Line (Diff Mode) and Line to GND (CMN Mode)	EN55024/IEC61000-4-5, Level 4, +/-2kV DM, +/-4kV CM, Criteria A
Conducted Disturbances induced by RF Fields	EN55022/IEC61000-4-6, 3V/m – Level 4, 0.15 to 80Mhz; and 12V/m) in ISM and amateur radio bands between 0.15Mhz and 80Mhz, 80% AM at 1KHz
Rated Power frequency magnetic fields	EN55024/IEC1000-4-8, Level 4: 30A/m, 50/60 Hz
Voltage Interruptions, Dips, Sags & Surges	EN55024/IECEN61000-4-11: --100% dip for 20mS, Criteria A --100% dip for 5000mS (250/300 cycles), Criteria B --60% dip for 100mS, Criteria B --30% dip for 500mS, Criteria A
Harmonic Current Emissions	EN55011/EN61000-3-2, Class A
Flicker Test	EN61000-3-3

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

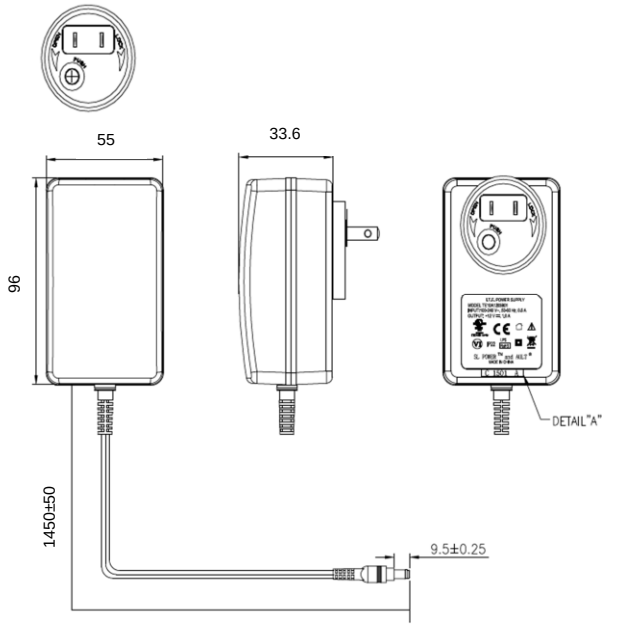
Derating Chart



Mechanical Drawing



IEC60320 C14 Receptacle, 2.5 x 5.5 x 9.5mm Barrel Connector



Interchangeable N.A. Blade, 2.5 x 5.5 x 9.5mm barrel connector

Notes:
1. All dimensions in mm.
2. Interchangeable blade models come with North American blade fitted. For other blades (EU, UK, Aust.) order blade kit KT1027K.

Connector Information

Standard models include a 2.5 x 5.5 x 9.5mm straight barrel type connector (Ault #3), center positive. Other standard options are listed below. The "03" in the standard model number is replaced by the applicable digits below:

Connector No.	Description	Connector No.	Description
02	2.1 x 5.5 x 9.5mm straight barrel plug - Center Positive	44	2.1 x 5.5 x 9.5mm straight barrel plug, locking - Center Positive
03	2.5 x 5.5 x 9.5mm straight barrel plug - Center Positive (Standard Models)	45	2.5 x 5.5 x 9.5mm straight barrel plug, locking - Center Positive
12	5 pin DIN-180 male connector (Pins 3, 5 = (+), pins 1, 2, 4 = (-))	48	3 pin Snap n Lock, Kycon Kpp-3P or equivalent(Pin 1 = (+), pin 2 = (-))
22	6 pin DIN male connector(Pins 1, 2 = (+), pins 4, 5 = (-))	49	4 pin Snap n Lock, Kycon Kpp-4P or equivalent(Pins 1, 3 = (+), pins 2, 4 = (-))
23	8 pin DIN male connector(Pins 3, 7 = (+), pins 1, 4, 6, 8 = (-), shell = FG))	51	6 pin Minifit - Molex 39-01-2060 or equivalent (Pins 1, 4 = (+), pins 3, 6 = (-))
32	9 pin "D" type, female (Pin 8 = (+), pin 5 = (-), all others = NC)	65	Stripped and Tinned Leads
33	2.5 x 5.5 x 12.5mm straight barrel plug - Center Positive	70	2.1 x 5.5 x 11mm right angle barrel plug (high retention) - Center Positive
40	2.1 x 5.5 x 9.5mm right angle barrel plug (high retention) - Center Positive	71	2.5 x 5.5 x 11mm right angle barrel plug (high retention) - Center Positive
41	2.5 x 5.5 x 9.5mm right angle barrel plug (high retention) - Center Positive	72	2.1 x 5.5 x 9.5mm straight barrel plug (high retention, no spark) - Center Positive
42	2.1 x 5.5 x 11mm straight barrel plug (high retention) - Center Positive	73	2.5 x 5.5 x 9.5mm straight barrel plug (high retention, no spark) - Center Positive
43	2.5 x 5.5 x 11mm straight barrel plug (high retention) - Center Positive	74	EIAJ#5 style connector - Center Positive

Efficiency Level VI Information:

Single-Voltage External AC-DC Power Supply, Basic-Voltage		
Nameplate Output Power (P_{out})	**Minimum Average Efficiency in Active Mode** *(expressed as a decimal)*	**Maximum Power in No-Load Mode [W]**
$P_{out} \leq 1$ W	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.100
1 W < $P_{out} \leq 49$ W	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.100
49 W < $P_{out} \leq 250$ W	≥ 0.880	≤ 0.210
$P_{out} > 250$ W	≥ 0.875	≤ 0.500
Single-Voltage External AC-DC Power Supply, Low-Voltage		
Nameplate Output Power (P_{out})	**Minimum Average Efficiency in Active Mode** *(expressed as a decimal)*	**Maximum Power in No-Load Mode [W]**
$P_{out} \leq 1$ W	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.100
1 W < $P_{out} \leq 49$ W	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.100
49 W < $P_{out} \leq 250$ W	≥ 0.870	≤ 0.210
$P_{out} > 250$ W	≥ 0.875	≤ 0.500

TE40A Series

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