

LEVEL VI
EFFICIENCY
EMI & EMC



 **RoHS**

 **VI**

 **CE**



Features

- Meets DoE Efficiency Level VI Requirements
 - No load input power
 - Average Efficiency
- Up to 90W of AC-DC Power
- Universal Input 90-264Vac Input Range
- IP22 Rated Enclosure
- Meets “Heavy Industrial” Levels of EN61000 EMC Requirements
- Meets EN55011/CISPR11, FCC Part 15.109 Class B Conducted & Radiated Emissions, with 6db margin
- Approved to EN/IEC/UL60950-1, 2nd Edition, Am. 2
- E-cap life of >7 years
- 3 Year Warranty
- RoHS/REACH Compliant

Description

A high performance AC to DC external power supply family designed for test & measurement and industrial applications. Fully compliant with Efficiency Level VI requirements per U.S. Dept. of Energy, and also compliant to the Heavy Industrial levels of various EN61000-4-x standards for EMC. The TE90 series models also meet Class B conducted and radiated EMI per FCC Part 15, EN55022, CISPR22, with margin. Designed to allow easy integration with test and measurement equipment and other industrial applications.

Model Selection

| Model Number | Volts | Output Current | Output Power | Ripple & Noise ¹ | Line Regulation | Load Regulation | Output Cable & Connector | Input Configuration |
|--------------|-------|----------------|--------------|-----------------------------|-----------------|-----------------|---|---|
| TE90A1251F01 | 12.0V | 7.50A | 90W | 120mV pk-pk | ±1% | ±5% | 6 pin Molex Type ² | Class I Desktop, IEC60320 C14 Receptacle |
| TE90A1503F01 | 15.0V | 6.00A | 90W | 150mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | |
| TE90A1803F01 | 18.0V | 5.00A | 90W | 180mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | |
| TE90A2403F01 | 24.0V | 3.75A | 90W | 240mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | Class II Desktop, IEC60320 C8 Receptacle |
| TE90A1251N01 | 12.0V | 7.50A | 90W | 120mV pk-pk | ±1% | ±5% | 6 pin Molex Type ² | |
| TE90A1503N01 | 15.0V | 6.00A | 90W | 150mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | |
| TE90A1803N01 | 18.0V | 5.00A | 90W | 180mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | Class II Desktop, IEC60320 C18 Receptacle |
| TE90A2403N01 | 24.0V | 3.75A | 90W | 240mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | |
| TE90A1251Q01 | 12.0V | 7.50A | 90W | 120mV pk-pk | ±1% | ±5% | 6 pin Molex Type ² | |
| TE90A1503Q01 | 15.0V | 6.00A | 90W | 150mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | |
| TE90A1803Q01 | 18.0V | 5.00A | 90W | 180mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | |
| TE90A2403Q01 | 24.0V | 3.75A | 90W | 240mV pk-pk | ±1% | ±5% | 2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive | |

Notes: 1. Measured at the output connector, with noise probe directly across output and load, terminated with 0.1µF ceramic and 47µF low ESR capacitors.
 2. Molex p/n 39-01-2060 or equivalent. See outline drawing for pinout information.
 3. For Input Class I models: For AC GND connected to output common (-), insert a “B” in the part number where the “A” is located (TE90B1251F01).
 4. All specifications are typical at nominal input, full load, at 25°C ambient unless noted.

General Specifications

| | | | |
|------------------------------|--|-----------------------------------|---|
| AC Input | 100-240Vac, ±10%, 47-63Hz, 1Ø | Turn On Time | Less than 1 sec @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 60A | Overtemperature Protection | Will shutdown upon an over-temperature condition, auto-recovery. |
| Input Fuses | F1, F2: 5A, 250Vac fuses (line & neutral lines) provided on all models | Overload Protection | 130 to 180% of rating, 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 | 130 to 150% of output voltage (max. 60V on 48V model), hiccup mode |
| Output Power | 90W continuous – See models chart for specific voltage model ratings. | Isolation | Input-Output: 4000Vac Input-Ground: 1500Vac Output-Ground: 1500Vac |
| No Load Input Power | <0.210W 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. Derate above 40°C. |
| Output Voltage | See models chart on pg 1. | Case Temperature | Case Temperatures are within regulatory guidelines. Care should be taken to avoid prolonged contact with skin or other heat sensitive surfaces. |
| 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, $\Delta i/\Delta t < 0.2A/\mu s$. Max. voltage deviation is +/-3.5%. >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 on 12V model) | Temperature Derating | See Derating Chart |
| E-Cap Life | 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, $\Delta i/\Delta t < 0.2A/\mu s$. Max. voltage deviation is +/-3.5%. >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 on 12V model) | MTBF | >500,000 hours, full load, 110 & 220Vac input, 25°C amb., per Telcordia 332 Issue 6. |
| Weight | 600g | Storage Temperature | -40°C to +85°C |
| Safety Drop Test | 1.4m from table top to wooden platform, 6 faces. | Altitude | Operating: to 5000m (derate to TBD temp. above 3000m). Non-operating: -500 to 40,000 ft. |
| Dimensions | W: 2.58" x L: 5.9" x H: 1.34" W: 65.5mm x L: 150.5mm x H: 34mm | 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 |

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

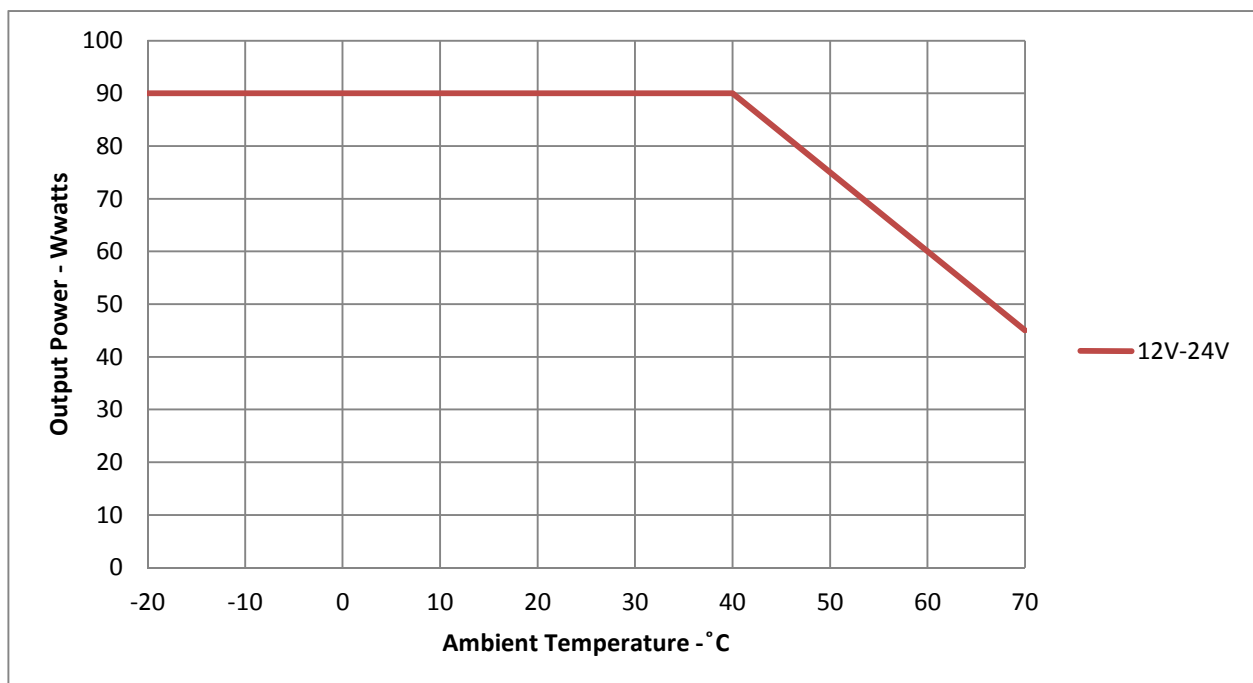
EMI/EMC Compliance

| | |
|--|---|
| 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, 10Vrms – Level 4, 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: 30 A/m, 50/60 Hz |
| Voltage Interruptions, Dips, Sags & Surges | EN55024/IECEN61000-4-11: --100% dip for 10 mS, at 0, 45, 90, 135, 180, 225, 270 and 315 degrees; 20mS at 0 degrees. 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 |

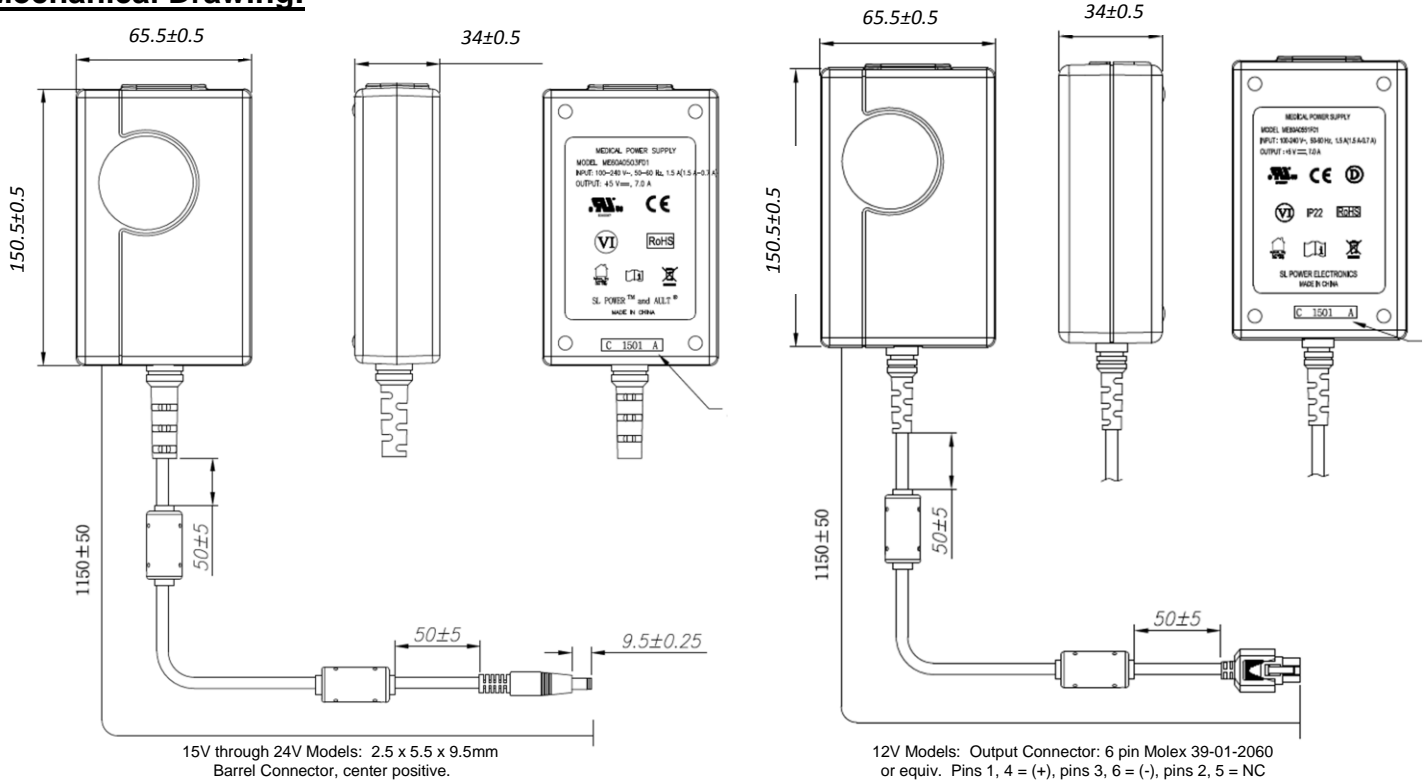
Notes: Performance criteria are based on EN55024. According to the standards, performance criteria are defined as following:

- A – Normal performance during and after the test
- B – Temporary degradation, self-recoverable
- C – Temporary degradation, operator intervention required to recover the operation
- D – Permanent damage

Derating Chart:



Mechanical Drawing:



- Notes:**
- 1) All dimensions in mm.
 - 2) The unit should not be covered or enclosed to protect against excessive case temperature rise.

Connector Information

Standard models include a 2.5 x 5.5 x 9.5mm straight barrel type connector (Ault #3), center positive. (#51 for the 12V models). 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 |

..... TE90A Series



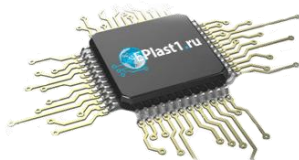
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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