

KEY FEATURES

- Switching Power Modules for PCB Mounting
- Fully Encapsulated Plastic Case
- Universal Input Range 90-264VAC, 47-440 Hz
- Regulated Output
- Low Ripple and Noise
- Isolation Class II
- CE, CB, UL, cUL, TUV Approvals
- 3-Years Product Warranty


ELECTRICAL SPECIFICATIONS

| Model No. (Single Output) | MSC-3.3S-E1 | MSC-5S-E1 | MSC-9S-E1 | MSC-12S-E1 | MSC-15S-E1 | MSC-24S-E1 | |
|---------------------------|---------------------------------|-----------|-----------|------------|------------|------------|------|
| Max output wattage (W) | 26.4W | 40W | 40W | 40W | 40W | 40W | |
| Output | Voltage (V.DC.) | 3.3V | 5V | 9V | 12V | 15V | 24V |
| | Current (mA) max | 8000 | 8000 | 4444 | 3333 | 2666 | 1667 |
| | Voltage set accuracy | ±2% | ±2% | ±2% | ±2% | ±2% | ±2% |
| | Line regulation (Typ.) | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% |
| | Load regulation (1-100%) (Typ.) | 1% | 1% | 1% | 1% | 1% | 1% |
| | Minimum load | 1% | 1% | 1% | 1% | 1% | 1% |
| | Efficiency (Typ) | 75% | 79% | 82% | 83% | 83% | 83% |

| Model No. (Dual Output) | MSC-5D-E1 | | MSC-12D-E1 | | MSC-15D-E1 | | |
|-------------------------|----------------------------------|---------------------|------------|---------------------|------------|---------------------|------|
| Max output wattage (W) | 40W | | 40W | | 40W | | |
| Output | Output 1 | Output 2 | Output 1 | Output 2 | Output 1 | Output 2 | |
| | Voltage (V.DC.) | +5V | -5V | +12V | -12V | +15V | -15V |
| | Current (mA) max | 4000 | 4000 | 1666 | 1666 | 1333 | 1333 |
| | Voltage set accuracy | ±2% | | ±2% | | ±2% | |
| | Line regulation (Typ.) | 0.5% | | 0.5% | | 0.5% | |
| | Load regulation (10-100%) (Typ.) | 1% (symmetric load) | | 1% (symmetric load) | | 1% (symmetric load) | |
| | Cross regulation (Typ.) | 5% | | 5% | | 5% | |
| | Minimum load | 10% | | 10% | | 10% | |
| | Efficiency (Typ) | 79% | | 83% | | 83% | |

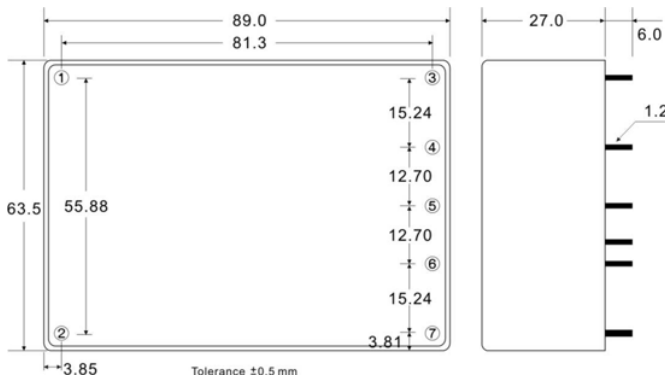
| Model No. (Dual Output) | MSC-5S12S-E1 | | MSC-5S24S-E1 | | |
|-------------------------|----------------------------------|---------------------|---------------------|---------------------|---------------------|
| Max output wattage (W) | 40W | | 40W | | |
| Output | Output 1 | Output 2 | Output 1 | Output 2 | |
| | Voltage (V.DC.) | 5V | 12V | 5V | 24V |
| | Current (mA) max | 5000 | 1250 | 5000 | 625 |
| | Voltage set accuracy | ±3% | ±5% | ±3% | ±5% |
| | Line regulation (Typ.) | 0.5% | 5% | 0.5% | 5% |
| | Load regulation (10-100%) (Typ.) | 2% (symmetric load) | 6% (symmetric load) | 2% (symmetric load) | 6% (symmetric load) |
| | Cross regulation (Typ.) | 1% | 7% | 1% | 7% |
| | Minimum load | 25% | | 25% | |
| | Efficiency (Typ) | 80% | | 80% | |

| Model No. (Triple Output) | | MSC-5S12D-E1 | | | MSC-5S15D-E1 | |
|-----------------------------|---|--------------|----------|----------|--------------|----------|
| Max output wattage (W) | | 40W | | | 40W | |
| Output | | Output 2 | Output 3 | Output 1 | Output 2 | Output 3 |
| | Voltage (V.DC.) | +12 | -12 | 5 | +15 | -15 |
| | Current (mA) max | 600 | 600 | 5000 | 500 | 500 |
| | Voltage set accuracy | ±5% | | ±3% | ±5% | |
| | Line regulation (Typ.) | 5% | | 0.5% | 5% | |
| | Load regulation (25-100%) (Typ.) (symmetric load) | 7% | | 3% | 7% | |
| | Cross regulation (Typ.) | 7% | | 3% | 7% | |
| | Minimum load | 25% | | | 25% | |
| | Efficiency (Typ) | 80% | | | 80% | |

| | | | |
|------------------|---------------------------|---|---------------------|
| Input | Voltage | 90-264 VAC or 100-375 VDC | |
| | Frequency (Hz) | 47-440 Hz | |
| | Current (Full load) | 860 mA max. (115 VAC) / 460 mA max. (230 VAC) | |
| | Inrush current (<2ms) | 23 A max. (115 VAC) / 46 A max. (230 VAC) | |
| | Leakage Current | 0.1 mA max. (115 VAC) / 0.2 mA max. (230 VAC) | |
| | External fuse (recommend) | 3.15 A slow blow type | |
| Output | Maximum capacitive load | 470-23,000µF depending on model | |
| | Ripple & Noise | 3.3V : 50mV of Vout | 5V~24V : 1% of Vout |
| | Hold-up time | 18 ms min. | |
| | Switching frequency | 132 kHz | |
| Protection | Over current protection | Above 105% rated output power | |
| | Over voltage protection | Zener diode clamp | |
| | Short circuit protection | Hiccup mode, indefinite (automatic recovery) | |
| | OTP | 100°C | |
| Isolation | Input-Output (V.AC) | 4000V | |
| Environment | Operating temperature | -40°C...+70°C (Case Temperature max. +95°C) | |
| | Storage temperature | -40°C...+100°C | |
| | Temperature coefficient | 0.01%/°C | |
| | Humidity | 95% RH | |
| | MTBF | 200,000 h~400,000 h @ 25°C | |
| Physical | Dimension (L x W x H) | 3.5 x 2.5 x 1.06 Inches (89.0 x 63.5 x 27.0 mm) Tolerance ±0.5 mm | |
| | Case Material | Plastic resin + Fiberglass (flammability to UL 94V-0) | |
| | Weight | 280 g | |
| | Cooling method | Free air convection | |
| Safety & EMC | Class II | To IEC / EN 60536 | |
| | approval | cUL / UL / CB | |
| | EMI / PFI conducted | EN 55011 class B | |
| | EMC Standards | EN60601-1-2 | |
| | ESD Susceptibility | EN60601-1-2 | |
| | Radiated Susceptibility | EN60601-1-2 | |
| | EFT / Burst | EN60601-1-2 | |
| | Surge | EN60601-1-2 | |
| | Conducted Susceptibility | EN60601-1-2 | |
| Safety Approvals | EN60601-1 | | |

All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

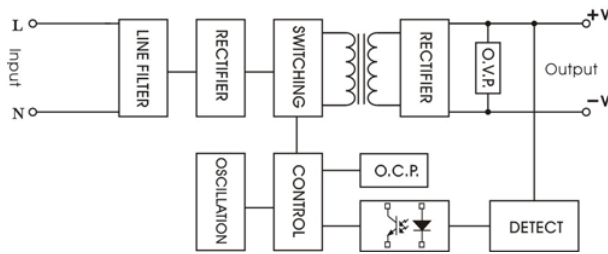
MECHANICAL DIMENSION (Top View)



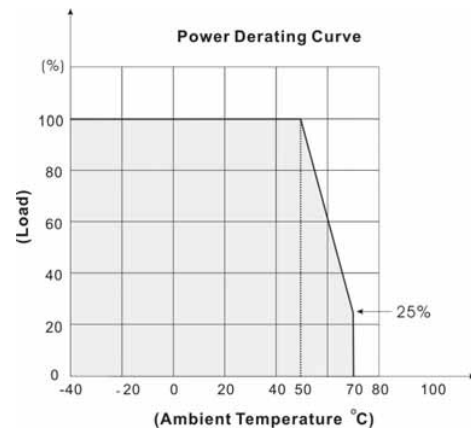
| PIN# | SINGLE | Dual | 5S/12S 5S/24S | Triple |
|------|-----------|-----------|------------------|-----------|
| 1 | AC IN (L) | AC IN (L) | AC IN (L) | AC IN (L) |
| 2 | AC IN (N) | AC IN (N) | AC IN (N) | AC IN (N) |
| 3 | +DC OUT | +DC OUT | +OUT2 | +DC OUT |
| 4 | NO PIN | NO PIN | +OUT1 | +5V |
| 5 | -DC OUT | COMMON | +OUT2 RTN | COMMON |
| 6 | NO PIN | NO PIN | +OUT1 RTN | +5 RTN |
| 7 | NOCONNECT | -DC OUT | NO PIN | -DC OUT |

BLOCK DIAGRAM

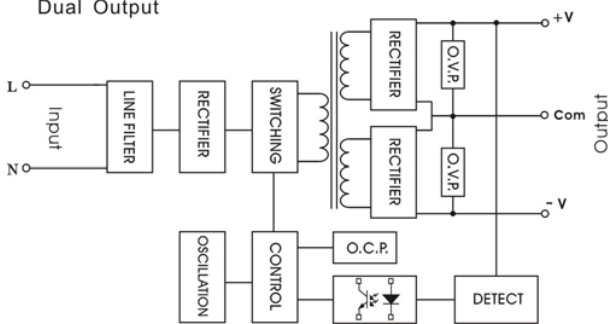
Single Output



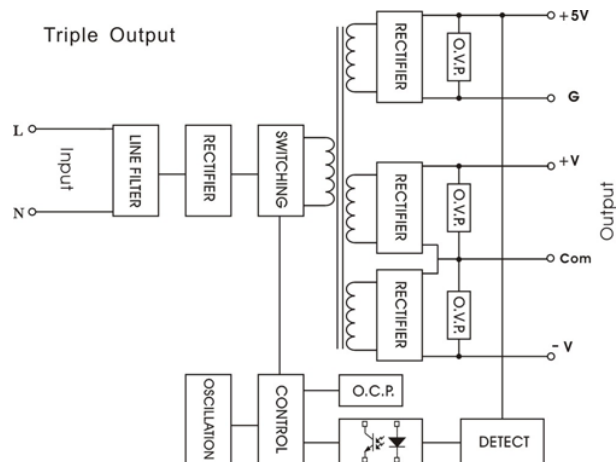
DERATING



Dual Output



Triple Output



SCREW TERMINAL

MSC-E1-A2

| PIN# | Single | Dual | 5S/12S 5S/24S | Triple |
|------|-----------|-----------|------------------|-----------|
| 1 | NOCONNECT | NOCONNECT | NOCONNECT | NOCONNECT |
| 2 | AC IN (L) | AC IN (L) | AC IN (L) | AC IN (L) |
| 3 | AC IN (N) | AC IN (N) | AC IN (N) | AC IN (N) |
| 4 | +DC OUT | +DC OUT | +OUT2 | +DC OUT |
| 5 | NOCONNECT | NOCONNECT | +OUT1 | +5V OUT |
| 6 | -DC OUT | COMMON | +OUT2 RTN | COMMON |
| 7 | NOCONNECT | NOCONNECT | +OUT1 RTN | +5V RTN |
| 8 | NOCONNECT | -DC OUT | NOCONNECT | -DC OUT |

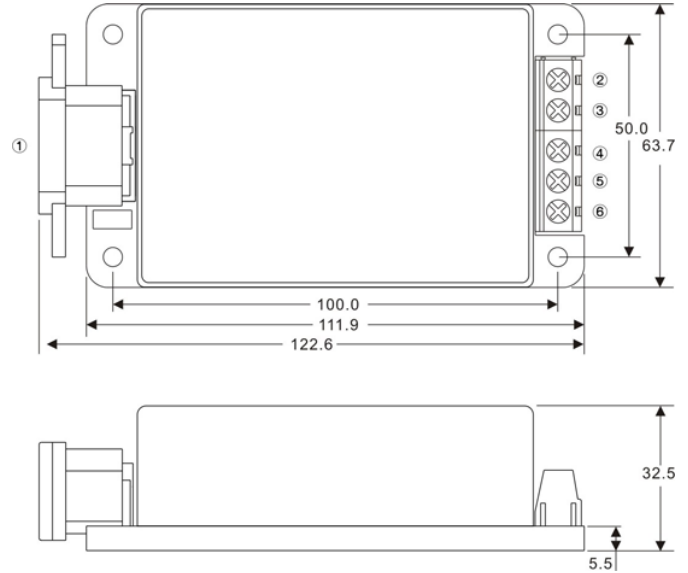
MSC-E1-A3

| PIN# | Single | Dual | 5S/12S 5S/24S | Triple |
|------|-----------|-----------|------------------|---------|
| 1 | AC IN | AC IN | AC IN | AC IN |
| 2 | +DC OUT | +DC OUT | +OUT2 | +DC OUT |
| 3 | NOCONNECT | NOCONNECT | +OUT1 | +5V OUT |
| 4 | -DC OUT | COMMON | +OUT2 RTN | COMMON |
| 5 | NOCONNECT | NOCONNECT | +OUT1 RTN | +5V RTN |
| 6 | NOCONNECT | -DC OUT | NOCONNECT | -DC OUT |

MSC-E1 SERIES

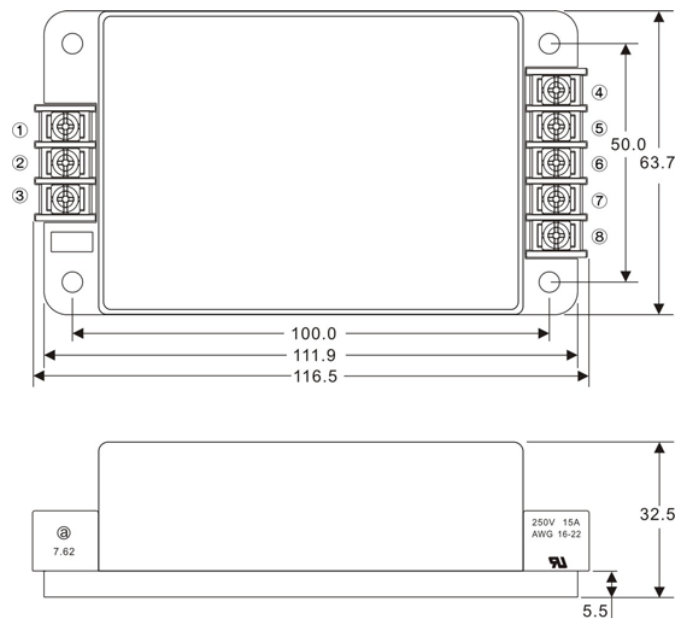
40 Watts

MSC-E1-A4



| PIN# | Single | Dual | 5S/12S 5S/24S | Triple |
|------|-----------|-----------|------------------|---------|
| 1 | AC IN | AC IN | AC IN | AC IN |
| 2 | +DC OUT | +DC OUT | +OUT2 | +DC OUT |
| 3 | NOCONNECT | NOCONNECT | +OUT1 | +5V OUT |
| 4 | -DC OUT | COMMON | +OUT2 RTN | COMMON |
| 5 | NOCONNECT | NOCONNECT | +OUT1 RTN | +5V RTN |
| 6 | NOCONNECT | -DC OUT | NOCONNECT | -DC OUT |

MSC-E1-A5



| PIN# | Single | Dual | 5S/12S 5S/24S | Triple |
|------|-----------|-----------|------------------|-----------|
| 1 | NOCONNECT | NOCONNECT | NOCONNECT | NOCONNECT |
| 2 | AC IN (L) | AC IN (L) | AC IN (L) | AC IN (L) |
| 3 | AC IN (N) | AC IN (N) | AC IN (N) | AC IN (N) |
| 4 | +DC OUT | +DC OUT | +OUT2 | +DC OUT |
| 5 | NOCONNECT | NOCONNECT | +OUT1 | +5V OUT |
| 6 | -DC OUT | COMMON | +OUT2 RTN | COMMON |
| 7 | NOCONNECT | NOCONNECT | +OUT1 RTN | +5V RTN |
| 8 | NOCONNECT | -DC OUT | NOCONNECT | -DC OUT |

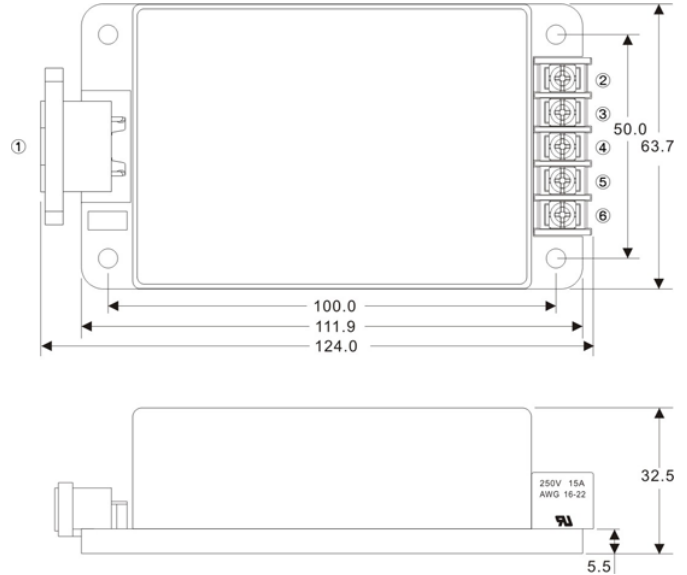
MSC-E1 SERIES

40 Watts

MSC-E1-A6



| PIN# | Single | Dual | 5S/12S 5S/24S | Triple |
|------|-----------|-----------|------------------|---------|
| 1 | AC IN | AC IN | AC IN | AC IN |
| 2 | +DC OUT | +DC OUT | +OUT2 | +DC OUT |
| 3 | NOCONNECT | NOCONNECT | +OUT1 | +5V OUT |
| 4 | -DC OUT | COMMON | +OUT2 RTN | COMMON |
| 5 | NOCONNECT | NOCONNECT | +OUT1 RTN | +5V RTN |
| 6 | NOCONNECT | -DC OUT | NOCONNECT | -DC OUT |



MSC-E1-A7



| PIN# | Single | Dual | 5S/12S 5S/24S | Triple |
|------|-----------|-----------|------------------|---------|
| 1 | AC IN | AC IN | AC IN | AC IN |
| 2 | +DC OUT | +DC OUT | +OUT2 | +DC OUT |
| 3 | NOCONNECT | NOCONNECT | +OUT1 | +5V OUT |
| 4 | -DC OUT | COMMON | +OUT2 RTN | COMMON |
| 5 | NOCONNECT | NOCONNECT | +OUT1 RTN | +5V RTN |
| 6 | NOCONNECT | -DC OUT | NOCONNECT | -DC OUT |

