

MSC60 SERIES
60 Watts
KEY FEATURES

- Switching Power Modules for PCB Mounting
- Fully Encapsulated Plastic Case
- Universal Input Range 90-264VAC
- Low Standby <0.25W
- Regulated Output
- Low Ripple and Noise
- Isolation Class II
- Screw Terminal and Din Rail Kit For Optional
- CE, CB, UL, cUL Approvals
- 3-Year Product Warranty


ELECTRICAL SPECIFICATIONS

| Model No. (Single Output) | MSC60-5S | MSC60-9S | MSC60-12S | MSC60-15S | MSC60-24S | |
|-----------------------------|---------------------------------|----------|-----------|-----------|-----------|------|
| Max output wattage (W) | 51W | 60W | 60W | 60W | 60W | |
| Output | Voltage (V.DC.) | 5.1V | 9V | 12V | 15V | 24V |
| | Current (mA) max | 10,000 | 6666 | 5000 | 4000 | 2500 |
| | Voltage set accuracy | ±2% | ±2% | ±2% | ±2% | ±2% |
| | Line regulation (Typ.) | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% |
| | Load regulation (1-100%) (Typ.) | 1% | 1% | 1% | 1% | 1% |
| | Efficiency (Typ) | 86% | 87% | 89% | 87% | 88% |
| Capacitor Load (max.) | Pending | Pending | Pending | Pending | Pending | |

| Model No. (Dual Output) | MSC60-5D | | MSC60-12D | | MSC60-15D | | |
|---------------------------|----------------------------------|---------------------|-----------|---------------------|-----------|---------------------|------|
| Max output wattage (W) | 51W | | 60W | | 60W | | |
| 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 | 5100 | 5100 | 2500 | 2500 | 2000 | 2000 |
| | 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.) | 10% | | 10% | | 10% | |
| | Minimum load | 10% | | 10% | | 10% | |
| | Efficiency (Typ) | 81% | | 86% | | 86% | |
| | Capacitor Load (max.) | Pending | | Pending | | Pending | |

| Model No. (Dual Output) | MSC60-5S12S | | MSC60-5S24S | | |
|---------------------------|----------------------------------|---------------------|---------------------|---------------------|---------------------|
| Max output wattage (W) | 55W | | 55W | | |
| Output | Output 1 | Output 2 | Output 1 | Output 2 | |
| | Voltage (V.DC.) | 5V | 12V | 5V | 24V |
| | Current (mA) max | 8000 | 1250 | 8000 | 625 |
| | Voltage set accuracy | ±3% | ±5% | ±3% | ±5% |
| | Line regulation (Typ.) | 0.5% | 7% | 0.5% | 7% |
| | Load regulation (10-100%) (Typ.) | 2% (symmetric load) | 6% (symmetric load) | 2% (symmetric load) | 6% (symmetric load) |
| | Cross regulation (Typ.) | 1% | 10% | 1% | 10% |
| | Minimum load | 25% | | 25% | |
| | Efficiency (Typ) | 81% | | 81% | |
| | Capacitor Load (max.) | Pending | | Pending | |

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| Model No. (Triple Output) | | MSC60-5S12D | | | MSC60-5S15D | |
|-----------------------------|---|-------------|----------|----------|-------------|----------|
| Max output wattage (W) | | 55W | | | 55W | |
| Output | | Output 2 | Output 3 | Output 1 | Output 2 | Output 3 |
| | Voltage (V.DC.) | +12 | -12 | 5 | +15 | -15 |
| | Current (mA) max | 625 | 625 | 8000 | 500 | 500 |
| | Voltage set accuracy | ±7% | | ±3% | ±7% | |
| | Line regulation (Typ.) | 7% | | 0.5% | 7% | |
| | Load regulation (25-100%) (Typ.) (symmetric load) | 10% | | 3% | 10% | |
| | Cross regulation (Typ.) | 10% | | 3% | 10% | |
| | Minimum load | 25% | | | 25% | |
| | Efficiency (Typ) | 81% | | | 81% | |
| | Capacitor Load (max.) | Pending | | | Pending | |

ELECTRICAL SPECIFICATIONS

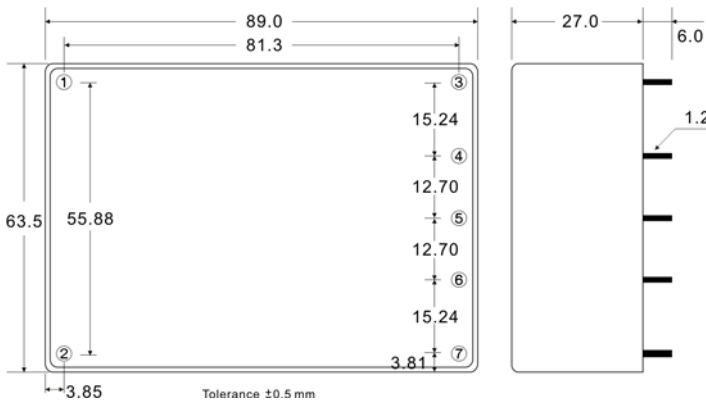
All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

| | | | | |
|--------------|----------------------------|---|--------------------|---------------------|
| Input | Voltage | 90-264 VAC | | |
| | Frequency (Hz) | 47-440 Hz | | |
| | Current (Full load) | 2 A max. (115 VAC) / 1 A max. (230 VAC) | | |
| | Inrush current (<2ms) | 35 A max. (115 VAC) / 70 A max. (230 VAC) | | |
| | Leakage Current | 0.1 mA max. (230 VAC) | | |
| | External fuse (recommend) | 3.15 A slow blow type | | |
| Output | Ripple & Noise | 3.3V : 50mV of Vout | 5V : 100mV of Vout | others : 1% of Vout |
| | Hold-up time | 12 ms min. | | |
| Protection | Over current protection | Automatic recovery | | |
| | Over voltage protection | Zener diode clamp | | |
| | Short circuit protection | Automatic recovery | | |
| | OTP | 100°C | | |
| Isolation | Input-Output (V.AC) | 4000V | | |
| Environment | Operating temperature | -40°C...+80°C (Case Temperature max. +95°C) | | |
| | Storage temperature | -40°C...+90°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 | Protection Class II | IEC/EN 60536 | | |
| | Approval | IEC/EN 60950-1, 60601-1 3rd, 2XMOPP cUL/UL 60950-1, 60601-1 3rd, 2XMOPP, UL 508 listed | | |
| EMC | Conducted and radiated EMI | EN55011, EN55022, FCC part 15 | | |
| | ESD | EN61000-4-2 air ± 8kV , Contact ± 4kV | | |
| | Radiated Immunity | EN61000-4-3 10V/m | | |
| | Fast Transient | EN61000-4-4 ± 2kV | | |
| | Surge | EN61000-4-5 ±1kV | | |
| | Conducted Immunity | EN61000-4-6 10Vrms | | |
| | PFMF | EN61000-4-8 30A/m | | |
| | Dips | EN61000-4-11 30% 10ms | | |
| Interruption | EN61000-4-11 >95% 5000ms | | | |

NOTE

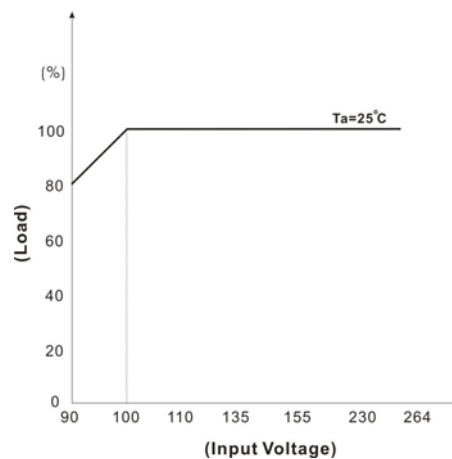
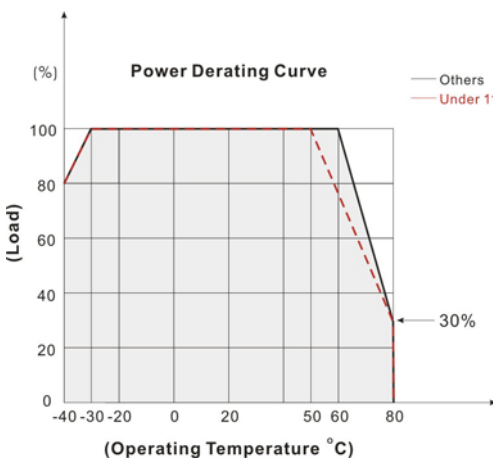
- This product is not designed for use in critical life support systems, equipment used in hazardous environment, nuclear control systems or other such applications which necessitate specific safety and regulatory standards other the ones listed in this datasheet.**
- Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.
- Safety approvals cover frequency 47-63 Hz.
- That "natural convection" is about 20LFM but is not equal to still air (0 LFM).

MECHANICAL DIMENSION (Top View)



| PIN# | Single | Dual | 5S/12S | Triple |
|------|-----------|-----------|-----------|-----------|
| | | | 5S/24S | |
| 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 |

DERATING

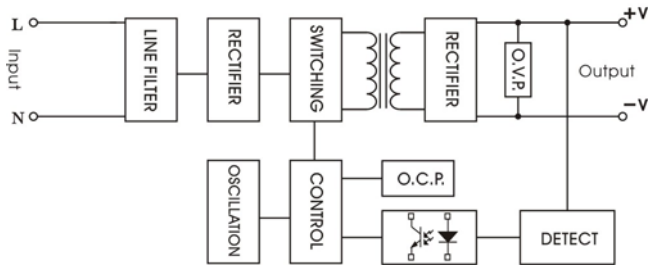


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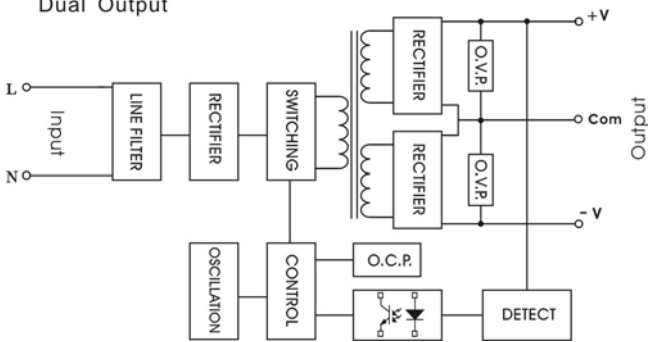
60 Watts

BLOCK DIAGRAM

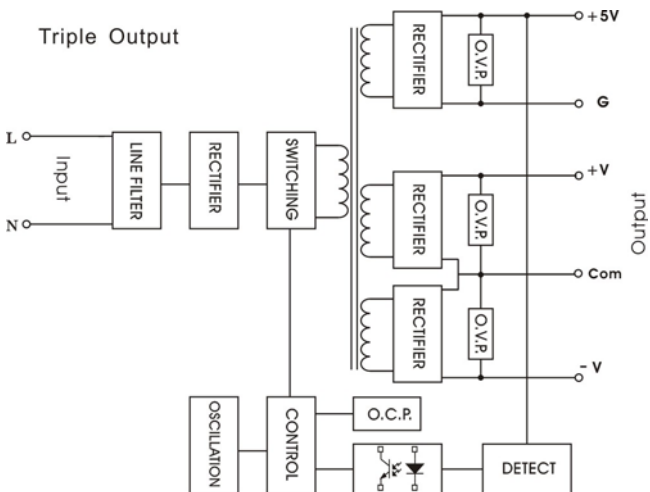
Single Output



Dual Output



Triple Output



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SCREW TERMINAL

MSC60-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 |

Din Rail Kit

MSC60-A2-DN