

**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)	76%	79%	82%	83%	83%	83%
	Capacitor Load (max.)	70000 uF	38000 uF	10000 uF	4000 uF	3300 uF	1400 uF

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)	80%		83%		83%	
	Capacitor Load (max.)	±7000 uF		±550 uF		±2000 uF	

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%	
Capacitor Load (max.)	18000 uF / 750 uF		18000 uF / 47 uF		

**MSC-E1 SERIES**
**40 Watts**

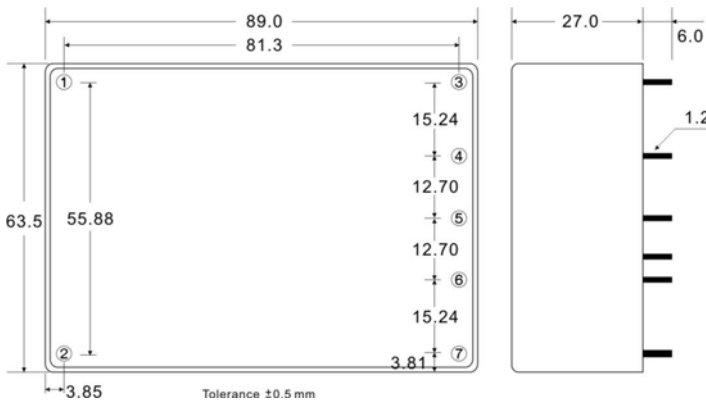
Model No. (Triple Output)	MSC-5S12D-E1			MSC-5S15D-E1		
Max output wattage (W)	40W			40W		
Output		Output 2	Output 3	Output 1	Output 2	Output 3
	Voltage (V.DC.)	+12	-12	5	+15	-15
	Current (mA) max	600	600	5000	500	500
	Voltage set accuracy	±5%		±3%	±5%	
	Line regulation (Typ.)	5%		0.5%	5%	
	Load regulation (25-100%) (Typ.) (symmetric load)	7%		3%	7%	
	Cross regulation (Typ.)	7%		3%	7%	
	Minimum load	25%			25%	
	Efficiency (Typ)	79%			79%	
	Capacitor Load (max.)	18000 uF / ±200 uF			18000 uF / ±470 uF	

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	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 approval	To IEC / EN 60536	
	EMI / PFI conducted	cUL / UL / CB	
	EMC Standards	EN 55011 class B	
	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	

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

2. Ripple &amp; Noise are measured at 20MHz of bandwidth with 0.1µF &amp; 47µF parallel capacitor.

**MECHANICAL DIMENSION ( Top View )**

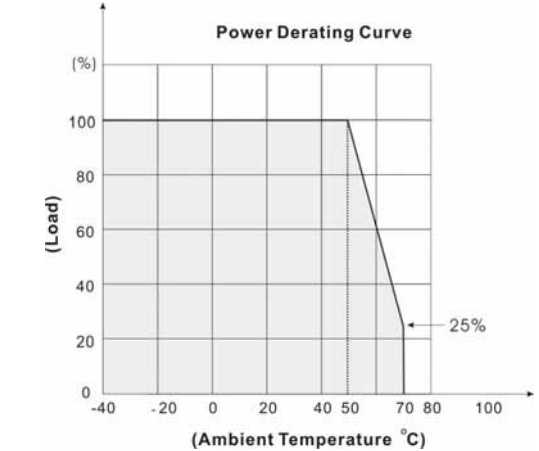
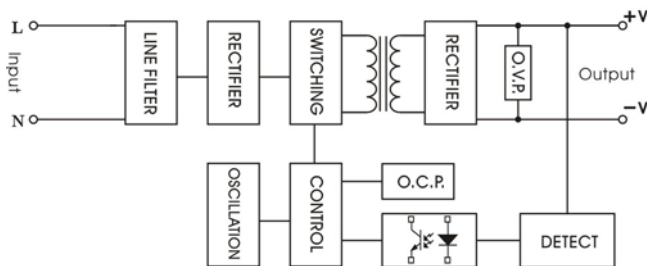


PIN#	SINGLE	Dual	5S/12S 5S/24S	Triple
1	AC IN (L)	AC IN (L)	AC IN (L)	AC IN (L)
2	AC IN (N)	AC IN (N)	AC IN (N)	AC IN (N)
3	+DC OUT	+DC OUT	+OUT2	+DC OUT
4	NO PIN	NO PIN	+OUT1	+5V
5	-DC OUT	COMMON	+OUT2 RTN	COMMON
6	NO PIN	NO PIN	+OUT1 RTN	+5 RTN
7	NOCONNECT	-DC OUT	NO PIN	-DC OUT

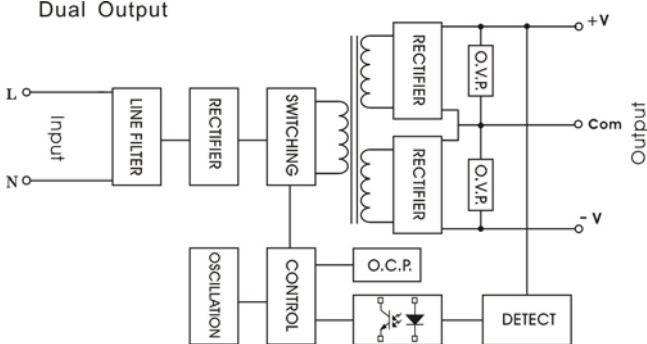
**BLOCK DIAGRAM**

**DERATING**

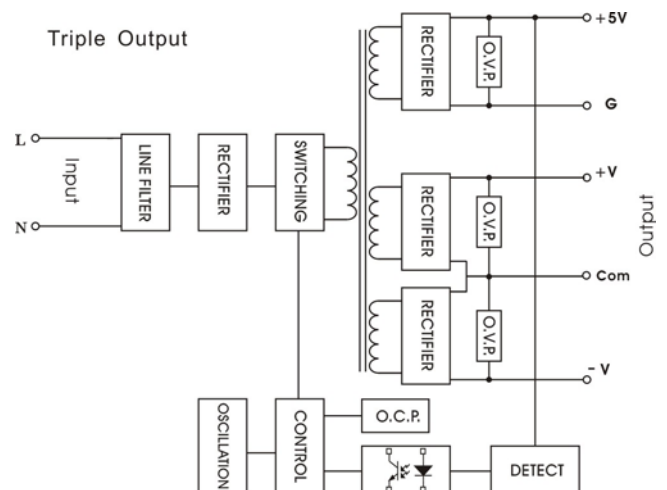
Single Output

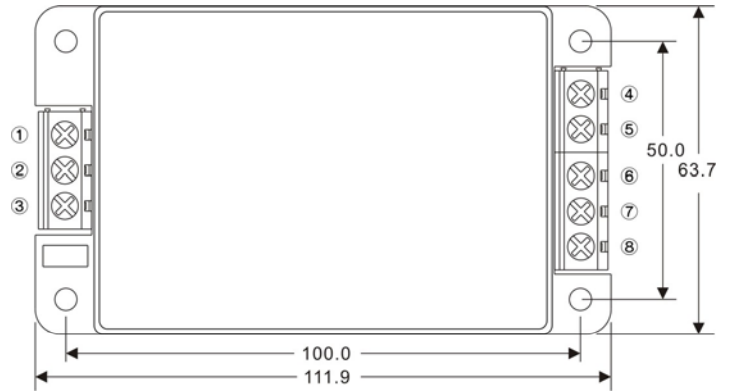


Dual Output

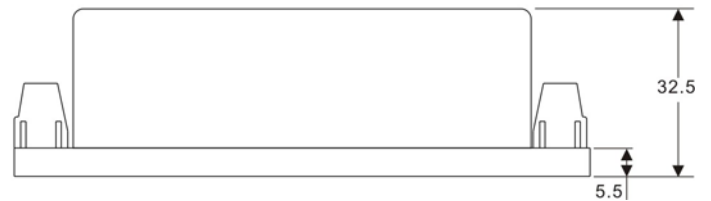
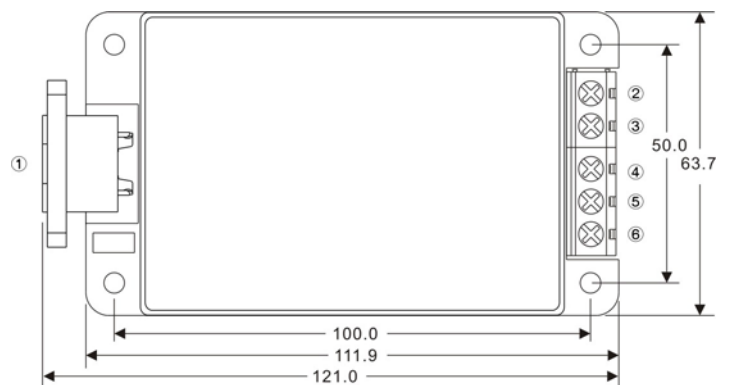


Triple Output

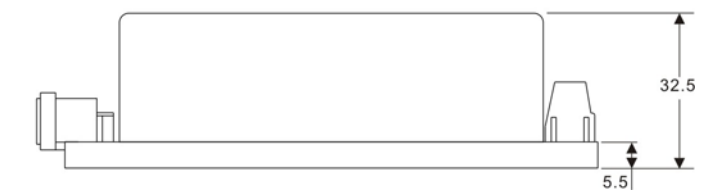


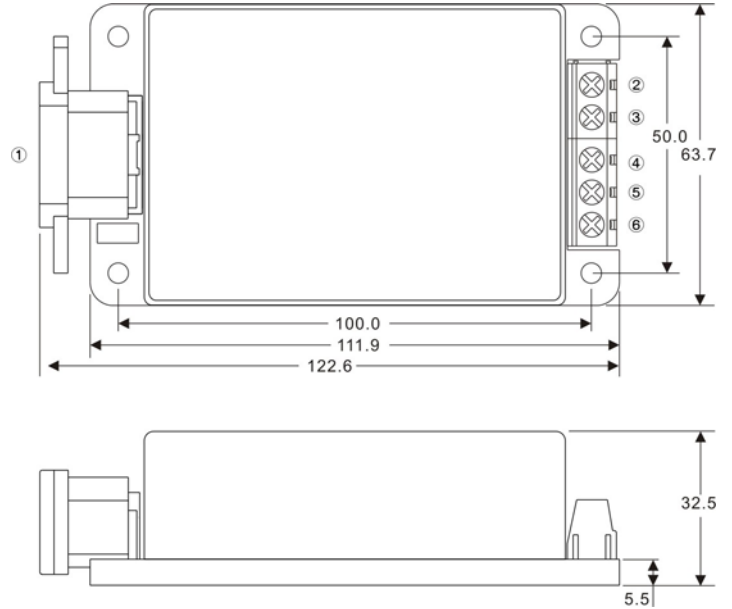
**MSC-E1 SERIES**
**40 Watts**
**SCREW TERMINAL**
**MSC-E1-A2**


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

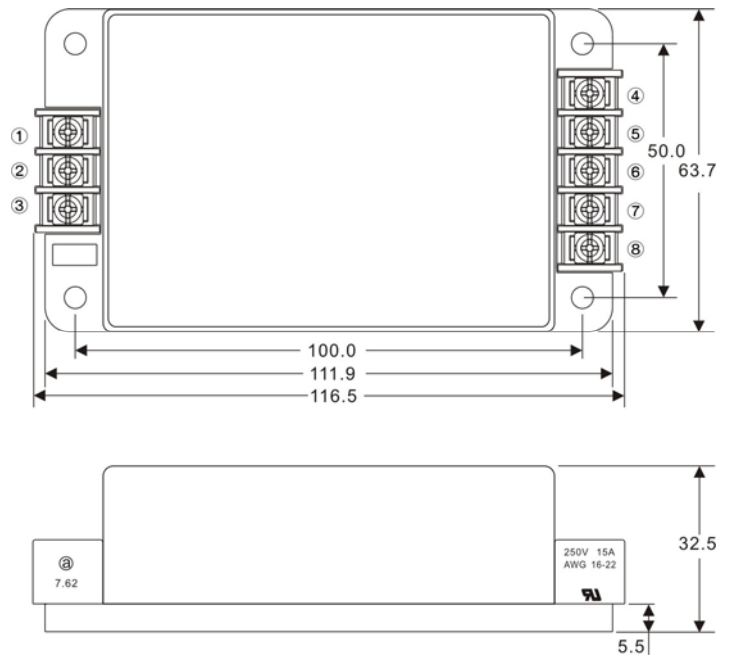

**MSC-E1-A3**


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

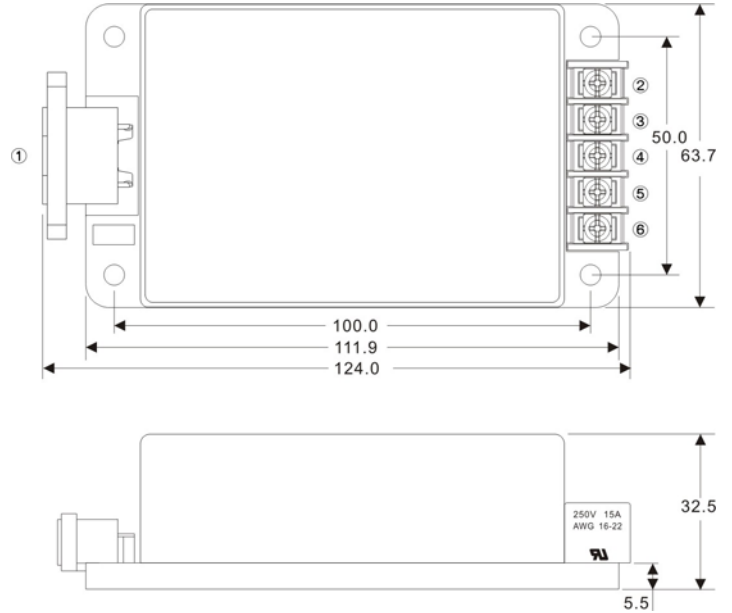


**MSC-E1 SERIES**
**40 Watts**
**MSC-E1-A4**


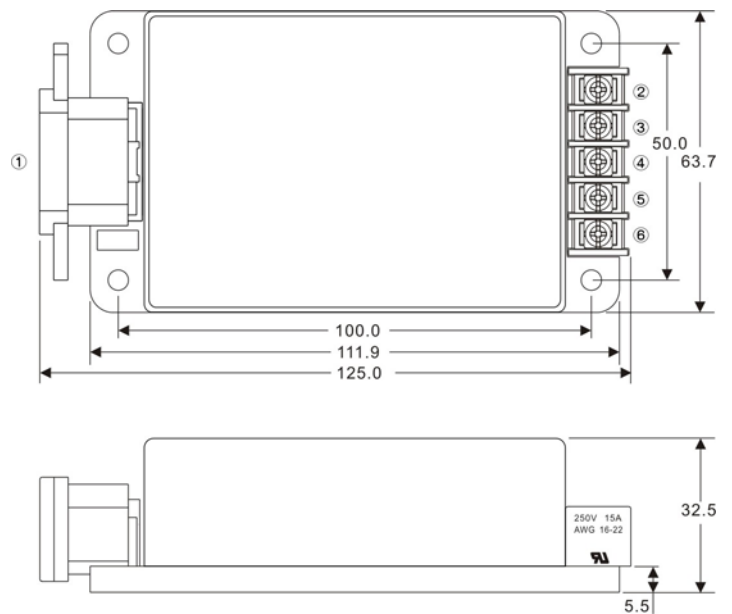
PIN#	Single	Dual	5S/12S 5S/24S	Triple
1	AC IN	AC IN	AC IN	AC IN
2	+DC OUT	+DC OUT	+OUT2	+DC OUT
3	NOCONNECT	NOCONNECT	+OUT1	+5V OUT
4	-DC OUT	COMMON	+OUT2 RTN	COMMON
5	NOCONNECT	NOCONNECT	+OUT1 RTN	+5V RTN
6	NOCONNECT	-DC OUT	NOCONNECT	-DC OUT

**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