

BA10 SERIES

10 Watts

KEY FEATURES

- Wide Input Voltage range (4:1), Output Power 10W
- Transfer Efficiency up to 88%
- Stand-by Power Consumption as Low as 0.05W
- Output Fast Start Up
- Continuous Short Circuit Protection, Auto-recovery
- Input Under Voltage, Short Circuit, Over Current Protection
- Isolation Voltage 2250VDC
- Operating Temperature: -40°C ~+85°C
- Good EMI Performance
- International Standard Pin-Out



ELECTRICAL SPECIFICATIONS

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

Model No.		BA10-24F-5S	BA10-24F-12S	BA10-24F-15S	BA10-24F-24S
Input Voltage (V.DC.)		24V (9-36V)	24V (9-36V)	24V (9-36V)	24V (9-36V)
Output Voltage (V.DC.)		5	12	15	24
Current (mA)	Max.	2000	834	667	416
Efficiency (%)	Min.	85	86	86	86
	Typ.	87	88	88	88
Capacitor Load (μF)	Max.	2200	470	330	220

Model No.		BA10-48F-5S	BA10-48F-12S	BA10-48F-15S	BA10-24F-24S
Input Voltage (V.DC.)		48V (18-72V)	48V (18-72V)	48V (18-72V)	48V (18-72V)
Output Voltage (V.DC.)		5	12	15	24
Current (mA)	Max.	2000	834	667	416
Efficiency (%)	Min.	85	86	86	86
	Typ.	87	88	88	88
Capacitor Load (μF)	Max.	2200	470	330	220

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Model No.		BA10-24F-5S	BA10-24F-12S	BA10-24F-15S	BA10-24F-24S
		BA10-48F-5S	BA10-48F-12S	BA10-48F-15S	BA10-48F-24S
Max Output Wattage		10W			
Input	Stand-by Power Consumption (Typ.)	0.2W			
	Voltage	BA10-24F- x S: 24VDC (9-36VDC)			
		BA10-48F- x S: 48VDC (18-72VDC)			
	Input Under Voltage Protection	24VDC Normal Input: 5~19VDC			
		48VDC Normal Input: 11~18VDC			
	Input surge voltage (1sec.max)	24VDC Normal Input: -0.7~50VDC			
		24VDC Normal Input: -0.7~100VDC			
Filter		Capacitor type			
Output	Voltage	5VDC	12VDC	15VDC	24VDC
	Voltage Accuracy (Max.)	±2%			
	Current (Max.)	2000mA	834mA	667mA	416mA
	Line Regulation (LL-HL) (Max.)	±0.5%			
	Load Regulation (10-100%) (Max.)	±1%			
	Capacitor Load	2200μF	470μF	330μF	220μF
	Ripple & Noise (10-100%) (Max.)	150mVp-p			
	Switching Frequency	300KHz			
Protection	Over Power Protection (%Io)	Min.: 110 / Typ.: 160 / Max.: 250			
	Short Circuit Protection (Typ.)	Auto-recovery after short circuit is released			
Isolation	Voltage	2250VDC (I/P-O/P, Test 1min, Leakage Current<0.5mA)			
	Capacitance	1000pF (I/P-O/P, 100KHz/0.1V)			
Environment	Operating Temperature	-40°C...+85°C (with derating)			
	Storage Temperature	-55°C...+125°C			
	Max Case Temperature	+105°C			
	Relative Humidity	Min.: 5% RH / Max.: 95% RH			
	MTBF (Min.)	1000K Hrs @ 25°C (MIL-HDBK-217F)			
	Temperature Drift Coefficient (Full Load)	±0.03% / °C			
Physical	Dimensions (L x W x H)	0.866 x 0.374 x 0.472 Inches			
	Tolerance ±0.5 mm	22.0 x 9.5 x 12.0 mm			
	Case Material	Black Flame-Retardant Heat-Resistant Plastic			
	Weight (Typ.)	5 g			
	Cooling Method	Natural Air Cooling			

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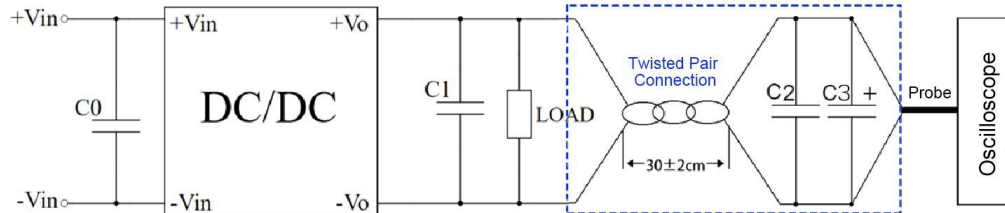
Model No.		BA10-24F-5S	BA10-24F-12S	BA10-24F-15S	BA10-24F-24S
		BA10-48F-5S	BA10-48F-12S	BA10-48F-15S	BA10-48F-24S
CTRL	Module is Turned On		CTRL is left floating or connected to high level (3.5V-12VDC)		
	Module Shutdown		CTRL connected to-Vin or low level (0-1.2VDC)		
	Input Current at Shutdown (Typ.)		5mA		
Parameter	Standards & Level				Performance
EMC	EMI	Conduction	EN 55032		Class B (EMC Recommended Circuit)
		Radation	EN 55032		Class B (EMC Recommended Circuit)
	EMS	RS	IEC / EN 61000-4-3 10V/m		Perf.Criteria B (EMC Recommended Circuit)
		CS	IEC / EN 61000-4-6 3Vr.m.s		Perf.Criteria B (EMC Recommended Circuit)
		ESD	IEC / EN 61000-4-2, Contact $\pm$ 6KV		Perf.Criteria B
		Surage	IEC / EN 61000-4-5 $\pm$ 2KV		Perf.Criteria B (EMC Recommended Circuit)
		EFT	IEC / EN 61000-4-4 $\pm$ 2KV		Perf.Criteria B (EMC Recommended Circuit)

NOTE

1. C is the control pin.
2. The maximum capacitive load refers to the capacitance that the output is allowed to connect when the power supply is fully loaded. If the capacitance exceeds this value, the power supply may not start.
3. In order to reduce no-load power consumption and improve light-load efficiency, the IC works in a frequency-shaking state when it is no-load and light-loaded. The output cannot be no-loaded. It must be at least 10% loaded or an electrolytic capacitor with a high-frequency resistance of more than 470uF, otherwise the output voltage ripple will increase.
4. CTRL controls the voltage on the pin relative to the input -Vin pin.
5. 0% - 15% load ripple & noise is less than or equal to 5%Vo; the ripple & noise test adopts the twisted pair test method, see the ripple & noise test instructions for details.
6. Unless otherwise specified, the above data are measured at Ta=25°C, humidity<75%, input nominal voltage and output rated load (pure resistance load).
7. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual.
8. If the product works beyond the product load range, it cannot be guaranteed that the product performance meets all the performance indicators in this manual.
9. The products should be used according to the specifications in this manual, otherwise it could be permanently damaged.
10. Please check the derating curve for more details.
11. All values or indicators in this manual had been tested based on ARCH test specifications.
12. The specifications are specially for the parts listed in this manual, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
13. Product specifications are subject to change without prior notice. Please pay attention to the latest manual published on our official website.
14. ARCH can provide customization service.

NOTE

15. Ripple & Noise Test (Twisted Pair Method)

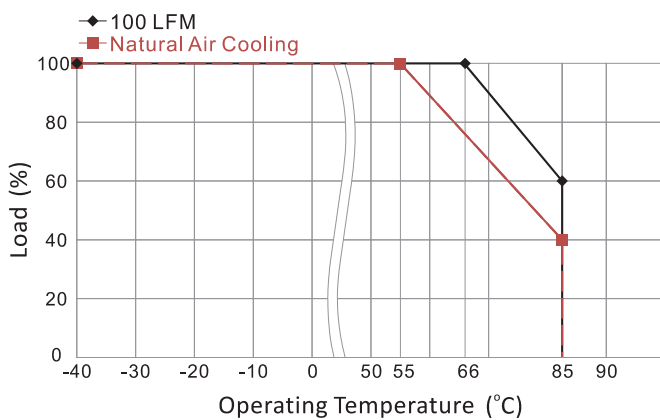


Test Conditions:

- Ripple noise is connected using 12# twisted pair cable, oscilloscope sampling uses sampling mode, oscilloscope bandwidth is set to 20MHz, 100M bandwidth probe is used, probe cap and ground clip are removed; and C2 (0.1uF) polypropylene capacitor and C3 (10uF) high-frequency low-resistance electrolytic capacitor are connected in parallel at the probe end of the twisted pair cable, and the capacitance values of C0 and C1 refer to the design application circuit data.
- Ripple noise test: The module input end (INPUT) is connected to the input power supply, and the power supply output is connected to the electronic load (LOAD) through the power line. The test is sampled from the power supply output port using a 30±2 cm twisted pair cable alone, and connected to the oscilloscope probe according to polarity.
- It is recommended to output a minimum 10% load or connect an electrolytic capacitor with a high-frequency resistance of more than 470uF, otherwise the output voltage ripple will increase.

DERATING

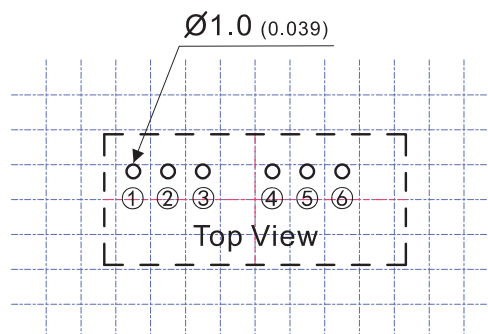
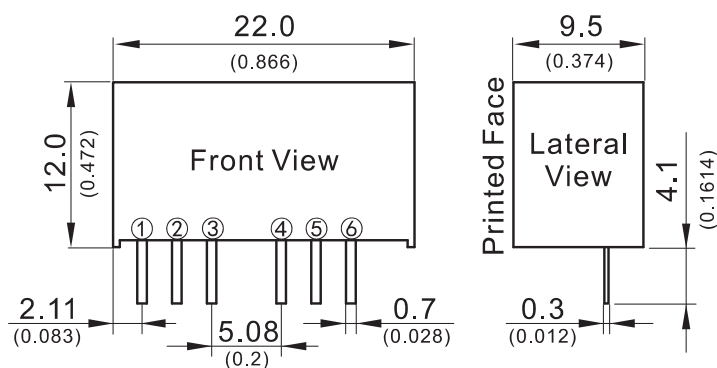
Derating Output Load versus Operating Temperature



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MECHANICAL DIMENSIONS



Printed Board Vertical View

Dimension in mm (inch)

Tolerances: xx.xx ±0.2 (xx.xx ±0.008)
 x.xx ±0.2 (xx.x ±0.008)
 0.xx ±0.1 (xx.x ±0.004)

Printed Board Vertical View

Grid Space: 2.54 (0.1)

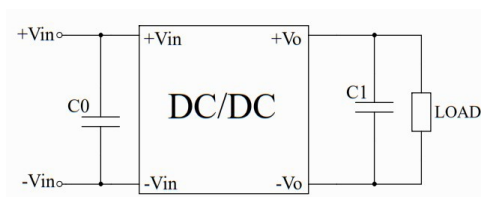
Tolerances: ± 0.25 (0.01)

Pin Dimension Tolerance: ± 0.10 (± 0.004)

PIN#	Single
1	-DC IN
2	+DC IN
3	CTRL
4	NC
5	+DC OUT
6	-DC OUT

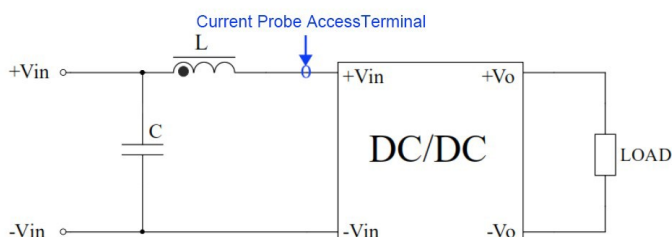
RECOMMENDED CIRCUITS FOR APPLICATION

1. This series of module power supplies are tested according to this peripheral circuit before leaving the factory. Increasing the capacity of C0 or C1 can reduce the output ripple, but the output capacity must be less than the maximum capacitive load



Component	Parameter
C0	100-220uF/100V
C1	470uF/50V

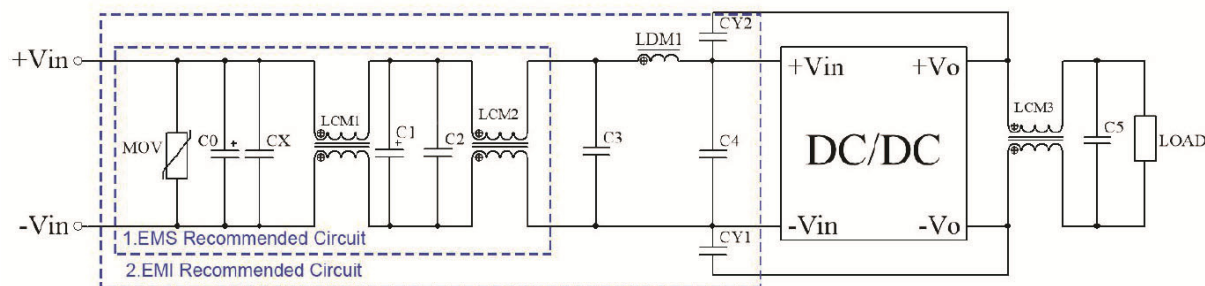
2. Input reflected ripple current test peripheral circuit.



Component	Parameter
C	220uF/100V
L	4.7uH/15A

RECOMMENDED CIRCUITS FOR APPLICATION

3. Recommended EMC circuits



Note: Part 1 in the figure is for EMS testing, and part 2 is for EMI filtering, which can be adjusted according to the actual situation.

Component	Vin=24V	Vin=48V
FUSE	Choose according to customer needs	
MOV	14D560K	20D101K
CX	0.47uF	0.47uF
LDM1	4.7uH	4.7Uh
C0	1000uF/50V	1000uF/100V
C1	220uF/50V	220uF/100V
C2,C3,C4	1uF/50V	1uF/100V
C5	47uF/50V	
LCM1	10mH	
LCM2	3~5mH	1mH
LCM3	30uH	
CY1,CY2	2.2nF/2KV	