

AKF-15 Series

15 Watts Universal Input Range AC/DC Power Modules

Single, Dual and Triple Outputs

Key Features

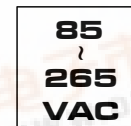
- High Efficiency up to 79%
- 85~265VAC, 47~440Hz Universal Input Range
- Single, Dual and Triple Output Modules
- PCB and Chassis Mounting Packages
- I/O Isolation 3000VAC
- EMI Complies With EN55022, Class B and FCC part 15, level B
- EMC Complies With EN61000
- MTBF > 280,000 Hours
- UL 60950-1 Safety Approval
- IEC61140 Safety Class II Approval
- Operating Temperature 71°C (Reference to Derating Curve)



AKF-15 is a 15-Watt series of AC-DC power modules. These modules have universal input range of 85-265VAC and are available in 10 models with efficiency as high as 79%.

Other features include continuous short circuit protection, overvoltage protection, output current limitation, EMC EN61000-4(-2,-3,-4) and EMI EN55022 level B approved which conducted noise compliance minimize design-in time, cost and eliminate the need for external components.

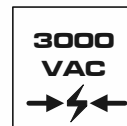
The AKF-15 series has IEC / EN / UL 60950-1 safety approval qualifies this product for worldwide markets. The series is a wide variety of applications including in commercial and industrial of the MTBF 280,000 hours.



Universal Voltage



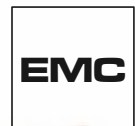
Protection



I/O Isolation

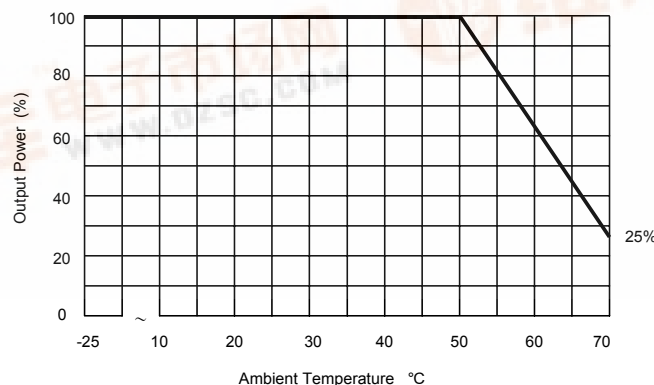


EN55022



EN61000

Derating Curve



Model Selection Guide

Model Number	Output Voltage	Output Current		Capacitive Load	Input Current		Efficiency
					115VAC, 60Hz		
		Max.	Min.		Max.	@Max. Load	@No Load
	VDC	mA	mA	uF	mA (Typ.)	mA (Typ.)	% (Typ.)
AKF-15S05	5	3000	300	3900	290	30	75
AKF-15S12	12	1250	125	2200	275	30	79
AKF-15S15	15	1000	100	2200	275	30	79
AKF-15S24	24	625	63	1000	275	30	79
AKF-15S48	48	310	30	680	273	30	79
AKF-15D12	±12	±650	±65	# 1500	275	30	79
AKF-15D15	±15	±500	±50	# 1500	275	30	79
AKF-15D512	5	1500	150	2000	302	30	72
	* 12	625	63	1500			
AKF-15T512	5	2000	200	2200	290	30	74
	* 12	200	20	1500			
	* -12	-200	-20	1500			
AKF-15T515	5	2000	200	2200	284	30	74
	* 15	150	15	1500			
	* -15	-150	-15	1500			

*Output voltage accuracy 4% max.

For each output

Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Temperature	Ambient	-25	71	°C
Storage Temperature		-40	85	°C
Humidity		---	95	%
Cooling	Free-Air Convection			
Conducted EMI	EN55022 Class B			
Conducted EMC	Standard	specification requirement		Performance Criteria
	EN61000-4-2	Air ±8KV Cont. ±4KV		B
	EN61000-4-3	80~1000MHz 10V/m 80% AM1KHz modulation		A
	EN61000-4-4	AC port ±2KV DC, SL, TL ±2KV not less than 1 min.		B
	EN61000-4-5	1.2/50uS(8/20uS) AC dif. ±1KV DC ±0.5KV		B
	EN61000-4-6	0.15~80MHz 10Vrms (functional earth ports included) 80% AM 1kHz modulation		B
	EN61000-4-11	30% 10ms 60% 100ms 95% 5000ms		B C C

Note :

1. Specifications typical at Ta=+25°C, resistive load, 115VAC, 60Hz input voltage, rated output current unless otherwise noted.
2. Ripple & Noise measurement bandwidth is 0~20 MHz.
3. These power modules require a minimum output loading to maintain specified regulation.
4. Operation under no-load conditions will not damage these devices; however they may not meet all listed specifications.
5. Other input and output voltage may be available, please contact factory.
6. Specifications subject to change without notice.
7. To order the power module with chassis mounting style, please add a suffix C (e.g. AKF-15S05C).
8. Part Number for DIN-Rail bracket: AC-DIN-01

AKF-15 Series

Input Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	All Models	85	---	265	VAC
Input Frequency Range		47	---	440	Hz
Inrush Current (Cold Start at 25°C)	115VAC	---	---	15	A
	230VAC	---	---	30	A

Output Specifications

Parameter		Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy			---	±1.0	±2.0	%	
Line Regulation		Vin=Min. to Max.	---	±0.5	±1.0	%	
Load Regulation		Iout=Min. to Max.	Single Output	---	±0.5	±1.0	%
			Dual / Triple Output	---	±2.5	±5.0	%
Cross Regulation– Dual Positives / Triple Output	Vo1	Measured output Io = 20% to 100% of rated load Other output are set at 50% of rated load	---	±1.0	---	%	
	Vo2		---	±2.5	---	%	
	Vo3		---	±2.5	---	%	
Ripple & Noise (20MHz)		5.0VDC Output	---	1.5	1.8	%Vpp of Vo	
		Other Output	---	0.8	1.0	%Vpp of Vo	
Over Voltage Protection		Zener diode clamp	---	120	---	% of Vo	
Temperature Coefficient			---	±0.01	±0.02	%/°C	
Overshoot			---	---	5.0	%	
Current Limitation		85VAC, Hiccup technique, auto–recovery	105	---	---	%	
Short Circuit Protection		Hiccup mode, indefinite (automatic recovery)					

General Specifications

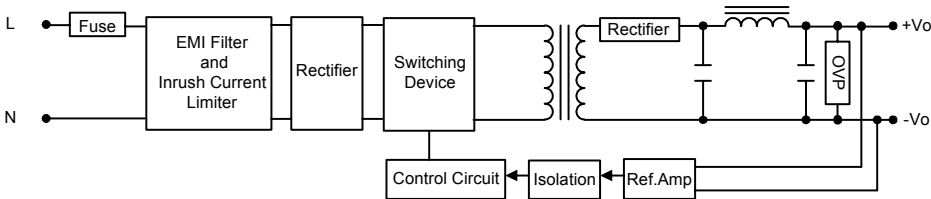
Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input to Output, 60 Seconds	3000	---	---	VAC
Isolation Test Voltage	Input to Output, Flash Tested for 1 Second	4700	---	---	VDC
Isolation Resistance	500VDC	100	---	---	MΩ
Switching Frequency		---	100	---	KHz
Hold-up Time	115VAC, 60Hz	---	20	---	ms
MTBF	MIL-HDBK-217F @ 25°C, Ground Benign	280	---	---	K Hours

Input Fuse

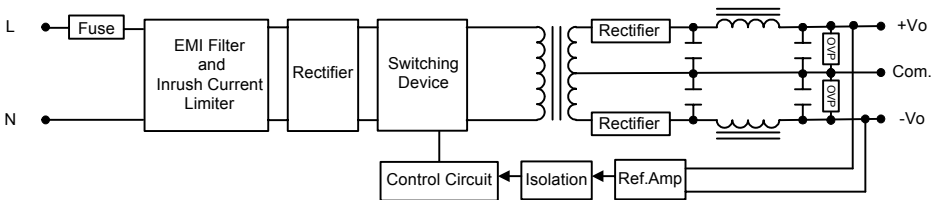
All Models	
Built-in Fuse	2A / 250VAC
External Fuse (Recommended)	1.5A Slow – Blow Type

Block Diagram

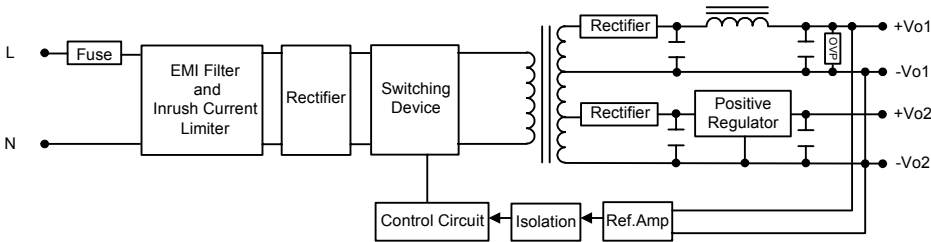
Single Output



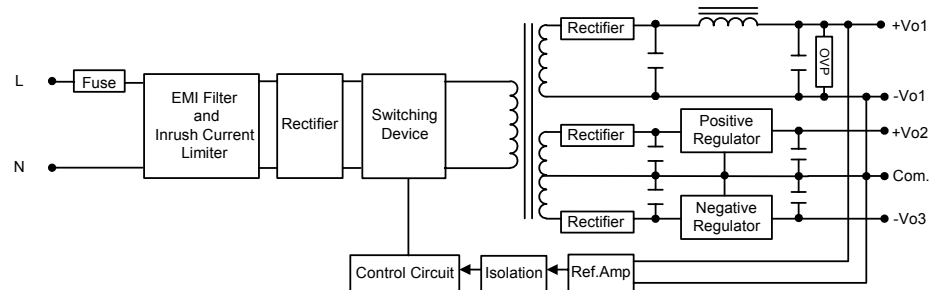
Dual Output1



Dual Output2



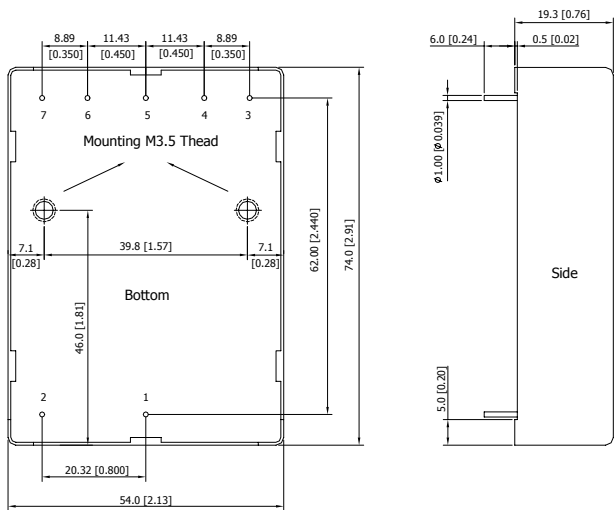
Triple Output



AKF-15 Series

Mechanical Dimensions

PCB mounting



Pin Connections

Pin	Single Output	Dual Output1	Dual Output2	Triple Output
1	AC(N) – AC Neutral			
2	AC(L) – AC Line			
3	No Pin			–Vout3
4	–Vout	–Vout	–Vout2	Common
5	No Pin	Common	+Vout2	+Vout2
6	+Vout	+Vout	–Vout1	–Vout1
7	No Pin		+Vout1	+Vout1

NC: No Connection

Physical Characteristics

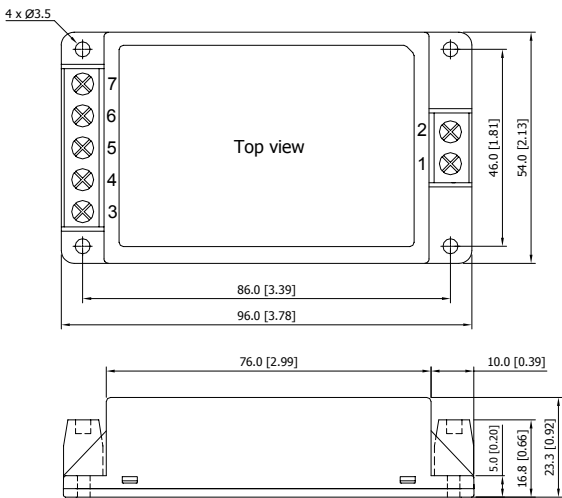
Case Size : 74.0×54.0×19.3 mm
2.91×2.13×0.76 inches

Case Material : Plastic resin + Fiberglass

Weight : 114g

Flammability : UL94V–0

Chassis mounting



Pin Connections

Pin	Single Output	Dual Output1	Dual Output2	Triple Output
1	AC(N) – AC Neutral			
2	AC(L) – AC Line			
3	NC			–Vout3
4	–Vout	–Vout	–Vout2	Common
5	NC	Common	+Vout2	+Vout2
6	+Vout	+Vout	–Vout1	–Vout1
7	NC		+Vout1	+Vout1

NC: No Connection

Physical Characteristics

Case Size : 96.0×54.0×23.3 mm
3.78×2.13×0.92 inches

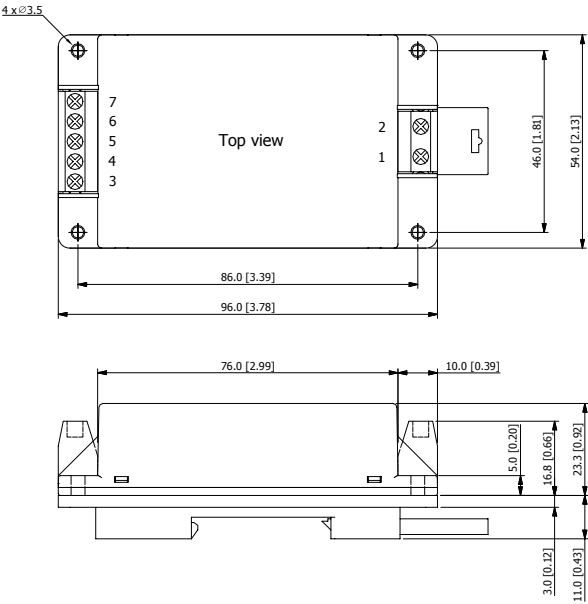
Case Material : Plastic resin + Fiberglass

Weight : 162g

Flammability : UL94V–0

AKF-15 Series

DIN-Rail Package



Pin Connections

Pin	Single Output	Dual Output1	Dual Output2	Triple Output
1	AC(N) – AC Neutral			
2	AC(L) – AC Line			
3	NC			–Vout3
4	–Vout1	–Vout	–Vout2	Common
5	NC	Common	+Vout2	+Vout2
6	+Vout	+Vout	–Vout1	–Vout1
7	NC		+Vout1	+Vout1

NC: No Connection

Physical Characteristics

Case Size	:	96.0×54.0×34.3 mm 3.78×2.13×1.35 inches
Case Material	:	Plastic resin + Fiberglass
Weight	:	216g
Flammability	:	UL94V-0

Tolerance	Millimeters	Inches
	X.X±0.5	X.XX±0.02
	X.XX±0.25	X.XXX±0.01
Pin	±0.1	±0.004