

# AKF-15 Series

## 15 Watts Universal Input Range AC/DC Power Modules Single, Dual and Triple Outputs

### Key Features

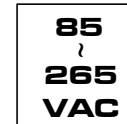
- High Efficiency up to 79%
- 85~265VAC, 47~440Hz Universal Input Range
- Single, Dual and Triple Output Modules
- PCB and Chassis Mounting Packages
- I/O Isolation 3000VAC
- EMI Complies With EN55022, Class B and FCC part 15, level B
- EMC Complies With EN61000
- MTBF > 280,000 Hours
- UL 60950-1 Safety 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.

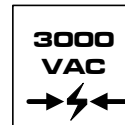
The AKF-15 series has IEC / EN / UL 60950-1 safety approval qualifies this product for worldwide markets. The series is a wide variety of applications including in commercial and industrial of the MTBF 280,000 hours.



Universal Voltage



Protection



I/O Isolation

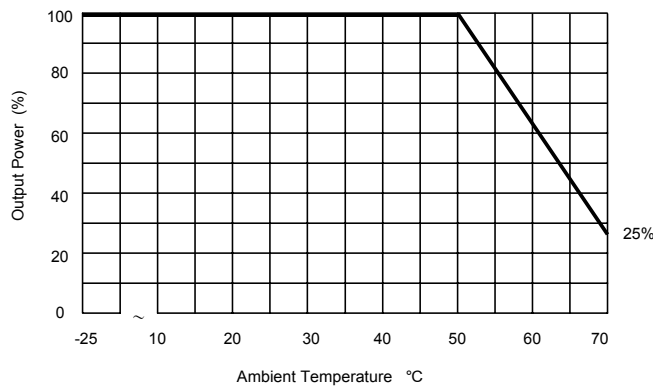


EN55022



EN61000

### Derating Curve



## Model Selection Guide

Model Number	Output Voltage	Output Current		Capacitive Load	Input Current		Efficiency
		Max.	Min.		115VAC, 60Hz		
	VDC	mA	mA	uF	@Max. Load mA (Typ.)	@No Load mA (Typ.)	@Max. Load % (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 :

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

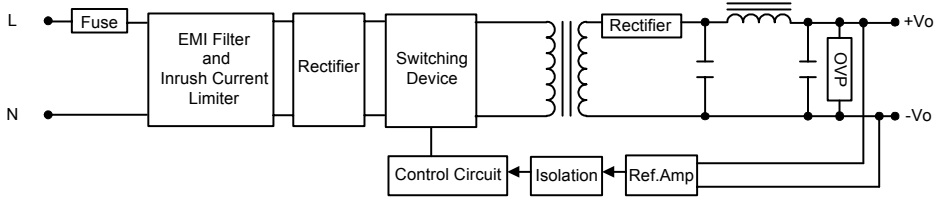
Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input to Output, 60 Seconds	3000	---	---	VAC
Isolation Test Voltage	Input to Output, Flash Tested for 1 Second	4700	---	---	VDC
Isolation Resistance	500VDC	100	---	---	MΩ
Switching Frequency		---	100	---	KHz
Hold-up Time	115VAC, 60Hz	---	20	---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

## Input Fuse

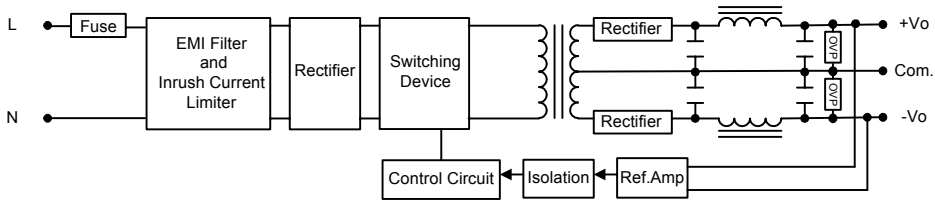
All Models	
Built-in Fuse	2A / 250VAC
External Fuse (Recommended)	1.5A Slow – Blow Type

## Block Diagram

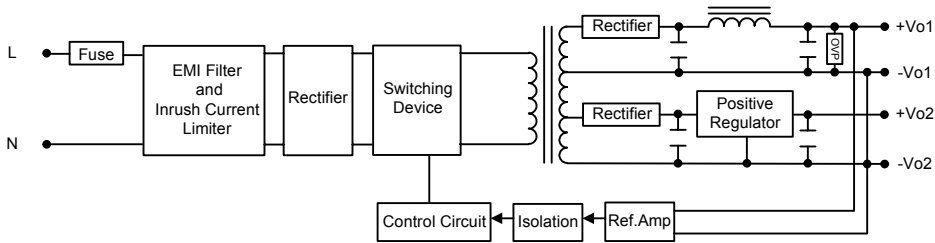
### Single Output



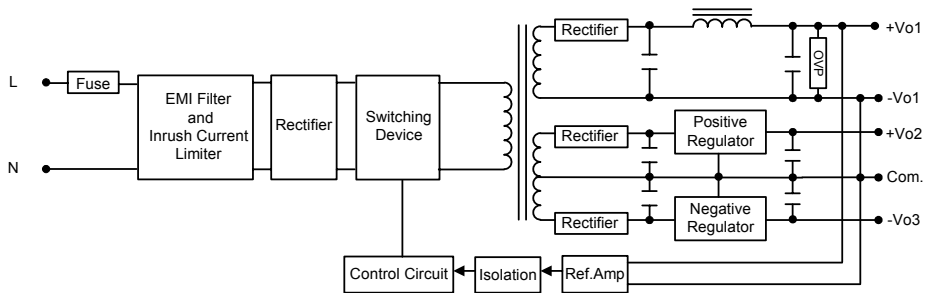
### Dual Output1



### Dual Output2

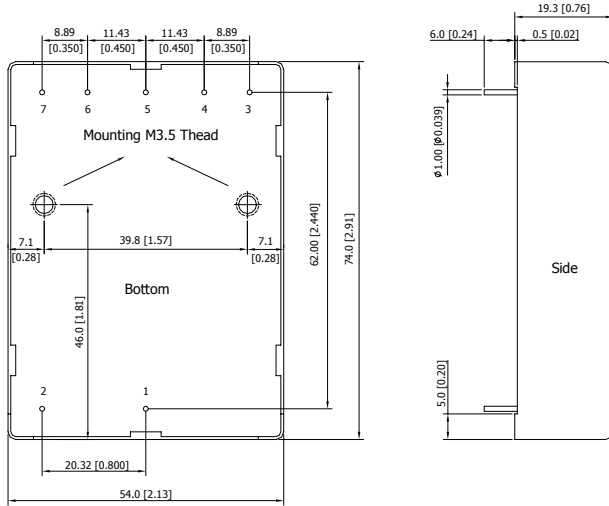


### Triple Output



## 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

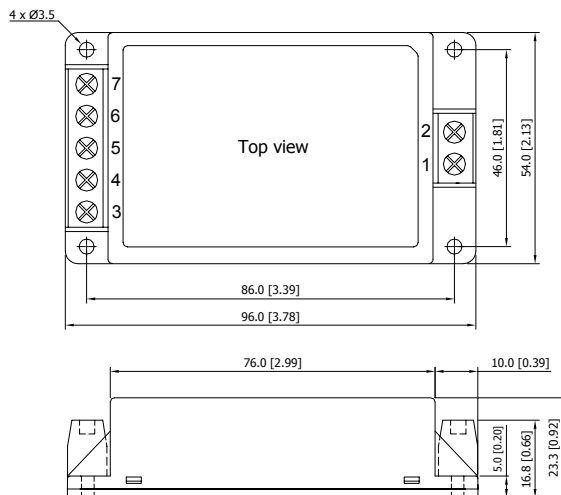
Case Size : 74.0x54.0x19.3 mm  
: 2.91x2.13x0.76 inches

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

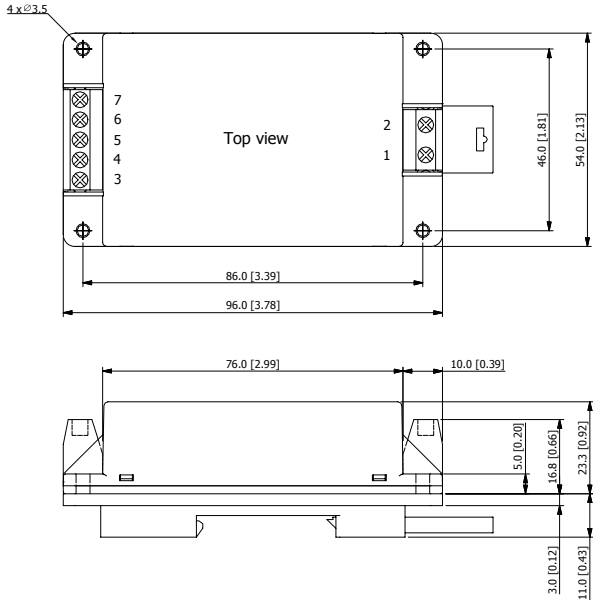
Case Size : 96.0x54.0x23.3 mm  
: 3.78x2.13x0.92 inches

Case Material : Plastic resin + Fiberglass

Weight : 162g

Flammability : UL94V-0

## 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	-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 : 96.0x54.0x34.3 mm  
3.78x2.13x1.35 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