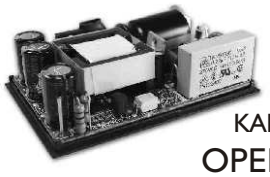
KAD/KAM15 SERIES



KAM series



KAD series

OPEN FRAME

AC - DC POWER MODULE

13 ~ 15W SINGLE & DUAL OUTPUTL

FEATURES

- AC/DC POWER MODULE
- UNIVERSAL INPUT 85 ~ 265 VAC
- HIGH EFFICIENCY UP TO 82%
- SHORT CIRCUIT PROTECTION
- INTERNAL INPUT FILTER
- 3 YEARS WARRANTY

c UL us UL 60950-1 EN 60950-1 CE

MODEL LIST

MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
Single Output Models							
KAM1503 / KAD1503	85~265 VAC	13 WATTS	+3.3 VDC	4000 mA	70%	73%	7000 μF
KAM1505 / KAD1505	85~265 VAC	15 WATTS	+ 5 VDC	3000 mA	74%	76%	7000 μF
KAM1512 / KAD1512	85~265 VAC	15 WATTS	+ 12 VDC	1250 mA	80%	82%	3500 μF
KAM1515 / KAD1515	85~265 VAC	15 WATTS	+ 15 VDC	1000 mA	80%	82%	1500 μF
KAM1524 / KAD1524	85~265 VAC	15 WATTS	+ 24 VDC	625 mA	80%	82%	470 μF
Dual Output Models							
KAM1512D / KAD1512D	85~265 VAC	15 WATTS	± 12 VDC	± 625 mA	79%	81%	± 1000 μF
KAM1515D / KAD1515D	85~265 VAC	15 WATTS	± 15 VDC	± 500 mA	78%	80%	± 470 μF
KAM15503D / KAD15503D	85~265 VAC	15 WATTS	+ 5 /+ 3.3 VDC	+ 1A / + 3A	72%	74%	3500 μF

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL

Characteristics	Conditions		min.	typ.	max.	unit
Switching frequency	Vi nom, Io nom			100		KHz
Isolation voltage	Input - Output		3,000/4,242			VAC/VDC
Isolation resistance	Input - Output, @ 500VDC		100			MΩ
Ambient temperature	Operating at Vi nom, Io nom		-40		+ 71	°C
Case temperature	Operating at Vi nom, Io nom	KAM15			+ 85	°C
Derating	Vi nom, +51 to + 71°C				2	% / °C
Storage temperature	Non operational		-40		+100	°C
Relative humidity	Vi nom, Io nom		20		95	% RH
Temperature coefficient	Vi nom, Io min				± 0.03	% / °C

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL

Characteristics	Conditions		min.	typ.	max.	unit
MTBF	Bellcore issue 6 @40°C, GB	3.3V, 5V & 503D		1,220,000		Hours
		12V, 15V & 24V		1,250,000		Hours
		12D & 15D		1,230,000		Hours
Altitude during operation	IEC 60068-2-13				4,850	m
Dimension		KAM15		L76.2 x W50.8 x H22.8		mm
		KAD15		L76.2 x W50.8 x H22		mm
Cooling	Free air convection					

INPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Rated input voltage	Io nom		85		265	VAC
Input voltage range	Ta min ... Ta max, Io nom	AC in	85		265	VAC
		DC in	120		375	VDC
Input current	Vi : 115 / 230 VAC, Io nom			310 / 190		mA
Rated input current	Vi : 85 VAC, Io nom				500	mA
Line frequency	Vi nom, Io nom		47		63	Hz
Inrush current	Vi : 115 / 230 VAC, Io nom				10/18	A
Leakage current	Input - Output				0.25	mA

OUTPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Output voltage accuracy	Vi nom,Io nom				± 2	%
Minimum load	Vi nom	single output models	0			%
		dual output models (each output)	20			%
Line regulation	Io nom, Vi min ...Vi max				± 1	%
Load regulation	Vi nom, Io min ...Io nom	single output models			± 2	%
		dual output models			± 2	%
Cross regulation	Asymmetrical load 20% / 100% FL				± 6	%
Hold up time	Vi : 115 / 230 VAC, Io nom		15/30			ms
Turn on time	Vi nom, Io nom				1,000	ms
Rise time	Vi nom, Io nom				150	ms
Fall time	Vi nom, Io nom				150	ms
Transient recovery time	Vi nom, 1~0.5 Io nom				1	ms
Ripple & noise	Vi nom, Io nom, BW = 20MHz	3.3V & 5V			100	mV
		12V, 15V, 24V & dual			150	mV
External trim ADJ. Range 1) (for single output only)	Io = 5% ...100%		- 10		+ 10	%
Efficiency	Vi nom, Io nom, Po / Pi		Up to 82%, See model list and typ efficiency curve			

NOTE 1 : Pls refer to Fig 1 & Table 1 for connection and resistance recommended.

CONTROL AND PROTECTION

Characteristics	Conditions	min.	typ.	max.	unit
Input fuse		T2A / 250VAC internal			
Internal surge voltage protection	IEC 61000-4-5	Varistor			
Output short circuit		Hiccup mode			

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

APPROVALS AND STANDARDS

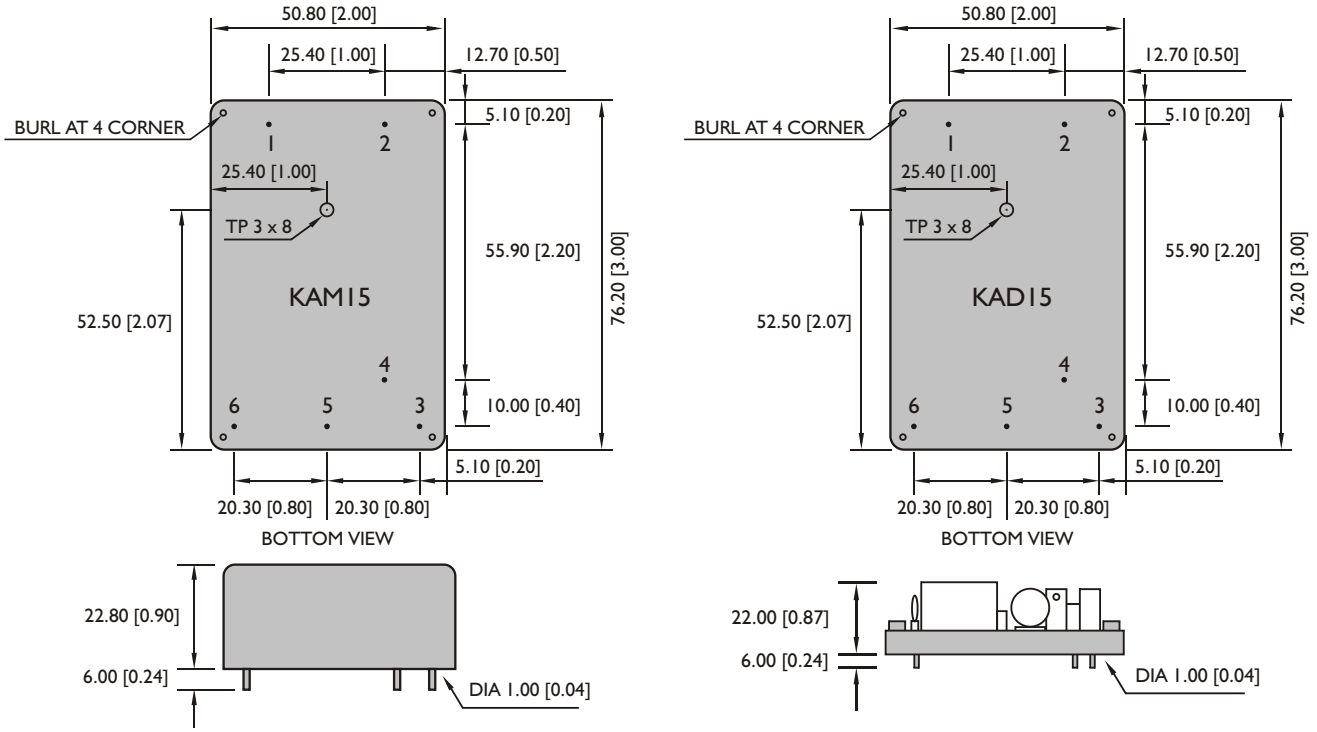
UL / cUL	UL 60950-1, Recognized
TUV	EN 60950-1
CE	EN 61000-6-3, EN 55022 Class B, EN 61000-3-2, EN 61000-3-3 EN 61000-6-2, EN 55024, EN 61000-4-2, EN 61000-4-3 EN 61000-6-2, EN 55024, EN 61000-4-2, EN 61000-4-3 EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8 EN 61000-4-11, EN 61204-3
Vibration resistance	meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)
Shock resistance	meet IEC 60068-2-27 (15G, 11ms, 3 axes, 6 Faces, 3 times for each Face)

PHYSICAL CHARACTERISTICS

Case size	KAM15 : 76.2 x 50.8 x 22.8mm (3 x 2 x 0.90 inches)	KAD15 : 76.2 x 50.8 x 22mm (3 x 2 x 0.87 inches)
Case (Base) material	Plastic	
Weight	KAM15 : 160g	KAD15 : 100g
Potting material	KAM15 : Epoxy	

MECHANISM & PIN CONFIGURATION

mm [inch]



GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

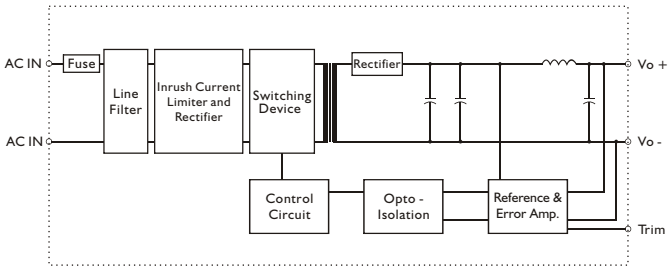
PIN ASSIGNMENT

GENERAL

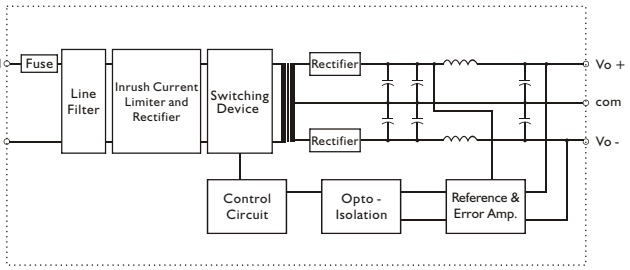
PIN NO.		1	2	3	4	5	6
SINGLE		AC IN	AC IN	Vo -	Trim	NO PIN	Vo +
DUAL	12D, 15D	AC IN	AC IN	Vo -	NO PIN	com	Vo +
	503D	AC IN	AC IN	+3.3V	NO PIN	com	+5V

CIRCUIT SCHEMATIC

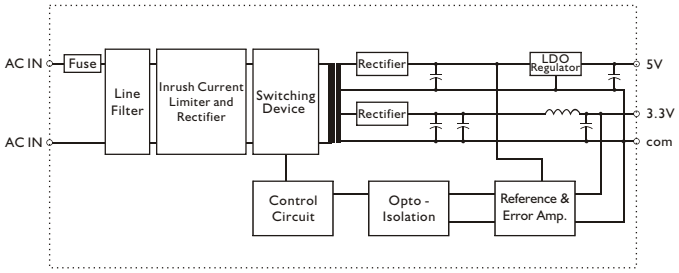
• Block diagram for KAM(D)15 series with single output



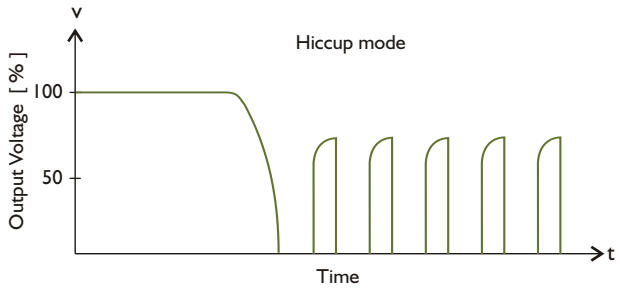
• Block diagram for KAM(D)15 series with dual output



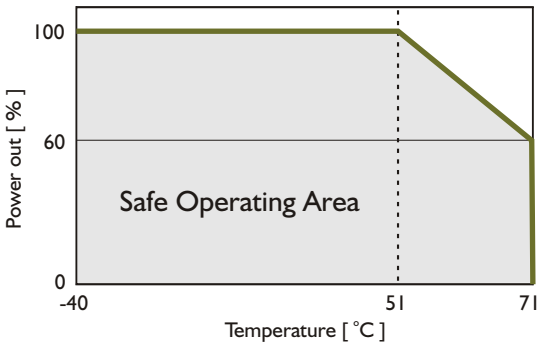
• Block diagram for KAM(D)15503D



TYP. CURRENT LIMITED CURVE



DERATING CURVE



TYP. EFFICIENCY CURVE

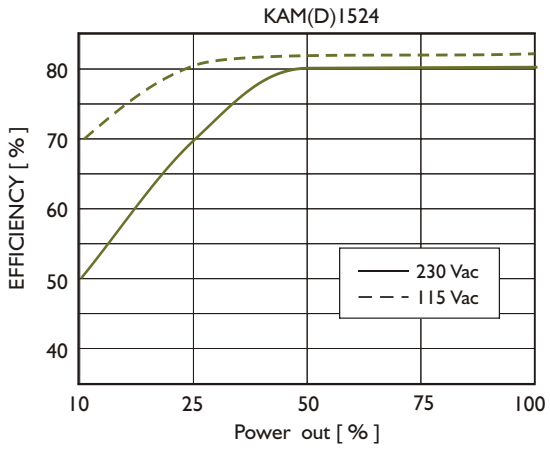


Fig. 1 Trim connection (For single output only)

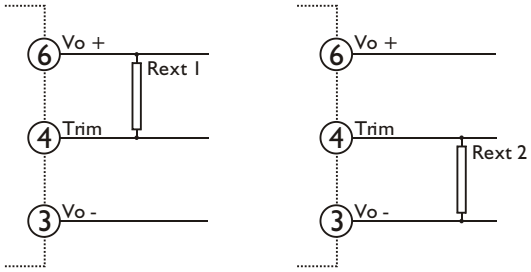


Table 1 Typical resistor values for various output voltage adjustment settings and max continuous power

Type	Rext 1		Rext 2		Max continuous power
	Vo nom -5%	Vo nom -10%	Vo nom +5%	Vo nom +10%	
KAM(D)1503	180KΩ	56KΩ	100KΩ	20KΩ	13W
KAM(D)1505	39KΩ	15KΩ	9.1KΩ	2.2KΩ	15W
KAM(D)1512	51KΩ	20KΩ	10KΩ	2KΩ	15W
KAM(D)1515	150KΩ	68KΩ	20KΩ	4.7KΩ	15W
KAM(D)1524	130KΩ	56KΩ	12KΩ	2KΩ	15W