



## AM150HB-JZ



The AM150HB-JZ series is a high-performance half brick DC/DC converter specifically designed for a variety of railway applications. It features 150W of output power with no requirement for minimum load, a wide input voltage of 43-160VDC, operating temperatures up to 100°C and reinforced I/O isolation of 3000VAC.

Additionally, this series includes input under-voltage protection, output over-voltage, short-circuit, over-current and over-temperature protection, remote On/Off control, remote sense compensation and output voltage trim adjustment.

The AM150HB-JZ meets EN50155 railway standards and are widely used in the centralized lighting, air conditioning and related on-board equipment applications.

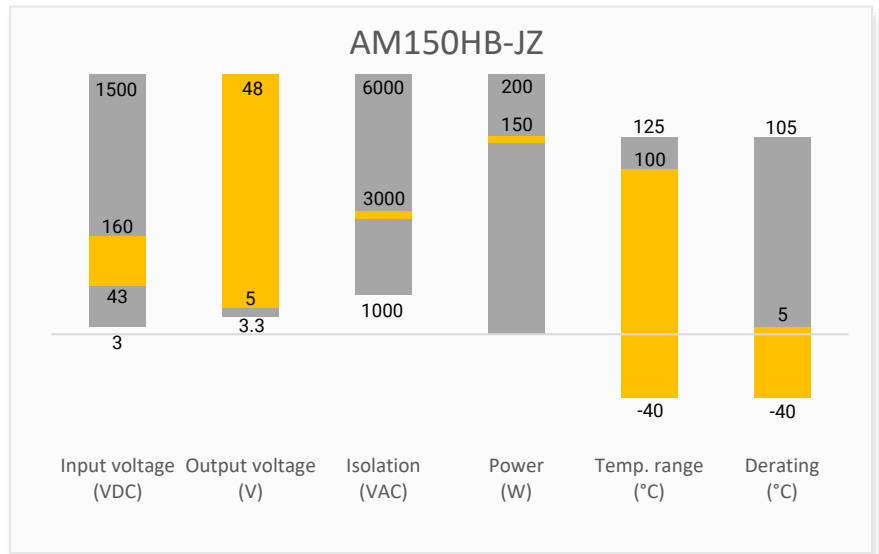
## Features



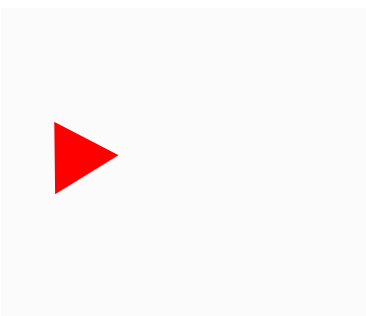
- Operating Temp: -40 °C to +100 °C
- Isolation voltage: 3000VAC
- High efficiency: Up to 90% typ.
- Regulated single output
- Output short circuit, over-current, over-voltage, input under-voltage, over temperature protection
- Standard ½ brick package
- EN50155



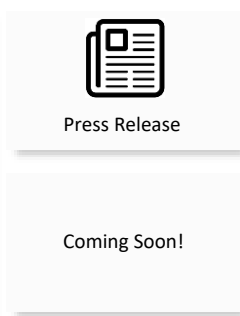
## Summary



## Training



Product Training Video  
(click to open)



Application Notes

## Applications



Power Grid



Industrial



Telecom



Instrumentation

## Models & Specifications

### Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Nominal Vin Input Current Max (mA)		Output Current Max (A)	Maximum Capacitive Load (μF)	Efficiency Full Load Typ (%)
			No Load	Full Load			
AM150HB-11005SA30JZ	43-66	5	45	1586	19,2	26400	88
	66-160				24	33000	
AM150HB-11012SA30JZ	43-66	12	45	1568	10	10000	89
	66-160				12,5	12500	
AM150HB-11015SA30JZ	43-66	15	45	1568	8	5400	89
	66-160				10	6800	
AM150HB-11024SA30JZ	43-66	24	45	1550	4,37	3080	90
	66-160				6,25	4400	
AM150HB-11048SA30JZ	43-66	48	45	1584	2,49	800	88
	66-160				3,12	1000	

Add suffix "-K" for optional heat sink.

### Input Specification

Parameters	Conditions	Typical	Maximum	Units
Input voltage	Nominal 110V	43 - 160	170	VDC
Absolute maximum rating	1s max.	≥0.7	180	VDC
Start-up voltage			43	VDC
Shut down voltage		40		VDC
Input reflected current	Nominal 110V	100		mA
On/Off control	On	Control pin open or 3.5-12VDC		
	Off	Control pin short to -Vin or 0-1.2VDC		
Input filter	Idle current	2	8	mA

Pi filter

### Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested isolation voltage	Input / output 60 sec, ≤ 5mA	≥3000		VAC
	Input / case 60 sec, ≤ 5mA	≥2100		VAC
	Output / case 60 sec, ≤ 1mA	≥1500		VDC
Resistance	500VDC	≥1000		MΩ
Capacitance	100KHz / 0.1V	2200		pF

### Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	0% -100% load	±1	±3	%
Line regulation	LL – HL 100% load	±0.1	±0.3	%
Load regulation	0% - 100% load	±0.3	±0.5	%
Short circuit protection	Continues, Auto recovery			
Over current protection		140	190	% Io
Over voltage protection	5V output	≥110	160	% Vo
	others	≥110	140	% Vo

Transient Recovery Time	Nominal input, 25% load step change	200	500	μs
Transient Response Deviation	Nominal input, 25% load step change, 5V output		±10	%
	Nominal input, 25% load step change, others	±3	±5	%
Ripple & Noise*	20MHz bandwidth, 10% -100% load, 48V output	200	300	mV pk-pk
	20MHz bandwidth, 10% -100% load, others	100	200	mV pk-pk
Trim			±10	%
Sense compensation			5	%

\* Tested with the ripple & noise circuit.

General Specifications				
Parameters	Conditions	Typical	Maximum	Units
Switching frequency		170		KHz
Operating temperature	With derating	-40 to +100		°C
Storage temperature		-55 to +125		°C
Over temperature protection	Case temperature	115		°C
Soldering temperature	1.5mm distance, ≤ 10s		300	°C
Temperature coefficient	100% Load		± 0.03	%/°C
Thermal Resistance	Models without heatsink, 100LFM	≥4.3		°C/W
	Models without heatsink, 200LFM	≥2.8		°C/W
	5Vout model with heatsink, free air convection, 100LFM	≥3.5		°C/W
	Other models with heatsink, free air convection	≥3.4		°C/W
	Other models with heatsink, 100LFM	≥2.8		°C/W
Cooling	Free air convection, force air convection			
Humidity	Non-condensing	≥5	95	% RH
Weight	Pin mountable	125		g
	With optional -K heatsink	180		g
Dimensions (L x W x H)	Pin mountable	2.40 x 2.28 x 0.54 inches (61.0 x 57.9 x 13.8 mm)		
	With optional -K heatsink	2.44 x 2.28 x 1.25 inches (62.0 x 58.0 x 31.8 mm)		
Case material	Aluminum case, black plastic bottom (UL94V-0)			
MTBF	≥ 500 000 hrs (MIL-HDBK -217F, t=+25°C)			

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Environment Approval	
Parameters	Conditions
Vibration	IEC/EN 61373 Category 1, class B

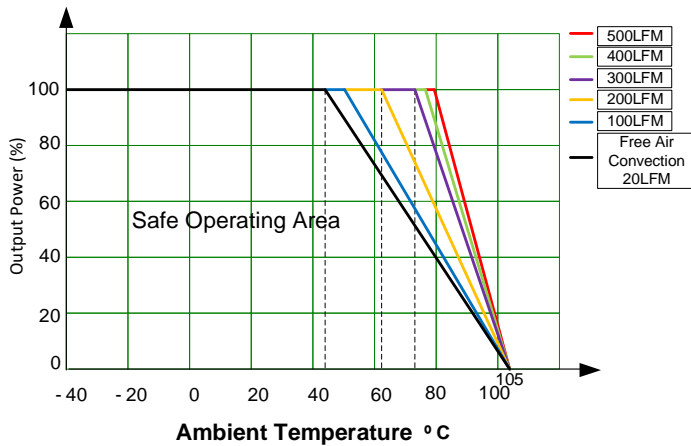
### Safety Specifications

#### Parameters

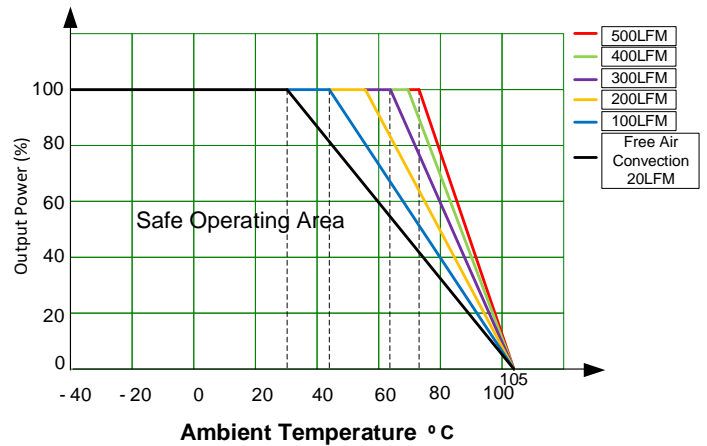
Agency approvals	CE	
	EN50155	
Standards	EMI - Conducted and radiated emission	CISPR32/EN55032 Class B with the recommended EMC circuit EN50121-3-2 with the recommended EN50155 EMC circuit EN55016-2-1 with the recommended EN50155 EMC circuit
	Electrostatic Discharge Immunity	IEC/EN 61000-4-2, Contact $\pm 6$ KV, Air $\pm 8$ KV, Criteria A EN50121-3-2, Contact $\pm 6$ KV, Air $\pm 8$ KV, Criteria A
	RF, Electromagnetic Field Immunity	IEC/EN 61000-4-3, 20V/m, Criteria A EN50121-3-2, 20V/m, Criteria A
	Electrical Fast Transient/Burst Immunity	IEC/EN 61000-4-4, $\pm 2$ KV, Criteria A with the recommended EMC circuit EN50121-3-2, $\pm 2$ KV, Criteria A with the recommended EN50155 EMC circuit
	Surge Immunity	IEC/EN 61000-4-5, L-L $\pm 2$ KV, Criteria A with the recommended EMC circuit EN50121-3-2, L-L $\pm 1$ KV, Criteria A with the recommended EN50155 EMC circuit
	RF, Conducted Disturbance Immunity	IEC/EN 61000-4-6, 10Vr.m.s, Criteria A EN50121-3-2, 10Vr.m.s, Criteria A

### Derating

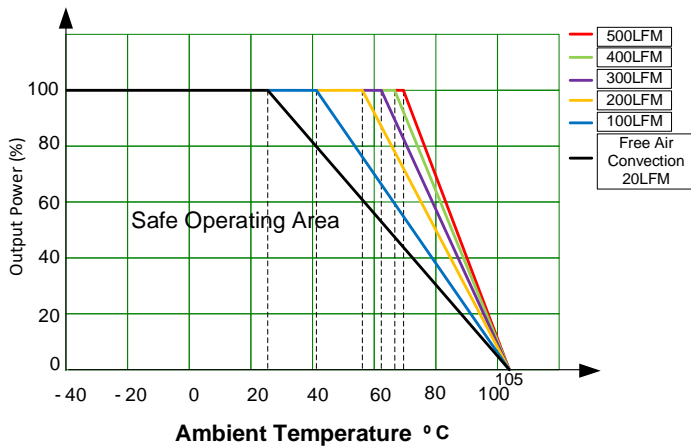
AM150HB-11005SA30JZ-K



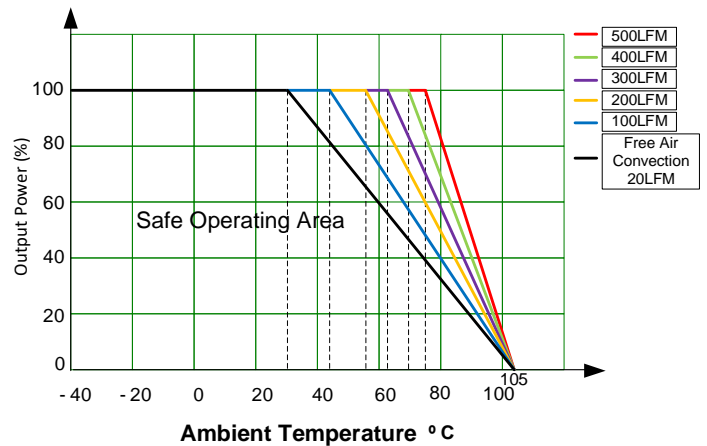
AM150HB-11048SA30JZ-K



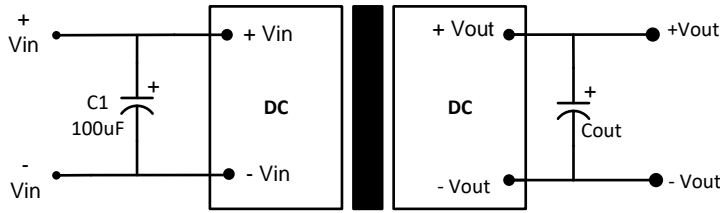
AM150HB-11012SA30JZ-K



AM150HB-11015 / 24SA30JZ-K



## Typical application circuit

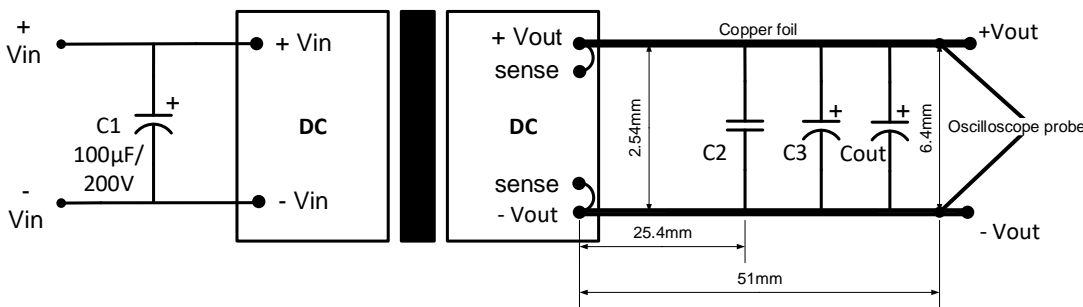


Vout	Cout
5	330μF/16V
12	330μF/25V
15	330μF/25V
24	330μF/50V
48	330μF/100V

Note:

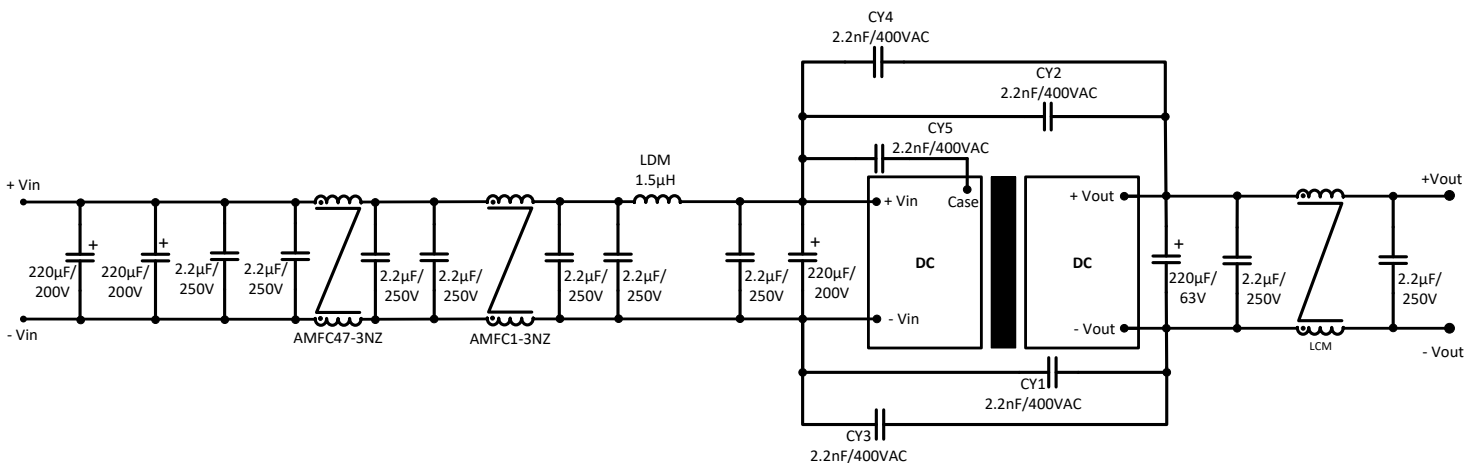
1. When not using the sense function, connect the +sense to +Vout and -sense to -Vout with the shortest possible traces to avoid interference and minimize the voltage drop.
2. When using the sense function, connect the sense pins to the load with the shortest possible traces, twisted pair wire or shielded wire and make sure the voltage drop is less than 0.3V.

## Ripple & noise circuit



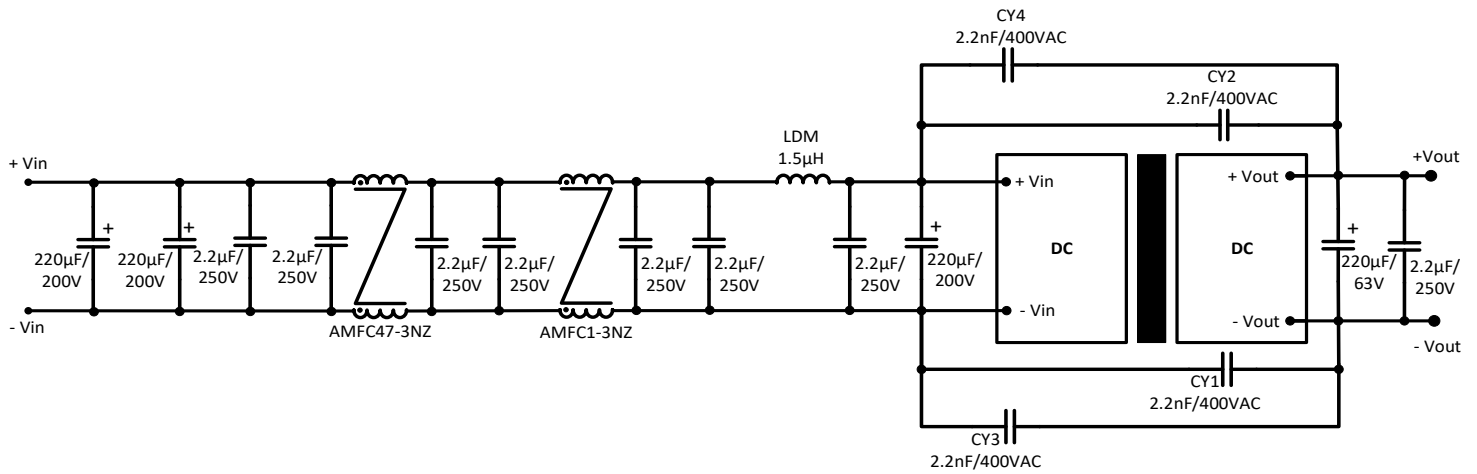
Vout	C2	C3
5	1μF/16V	10μF/16V
12	1μF/25V	10μF/25V
15	1μF/25V	10μF/25V
24	1μF/50V	10μF/50V
48	1μF/100V	10μF/100V

## Recommended EMC circuit

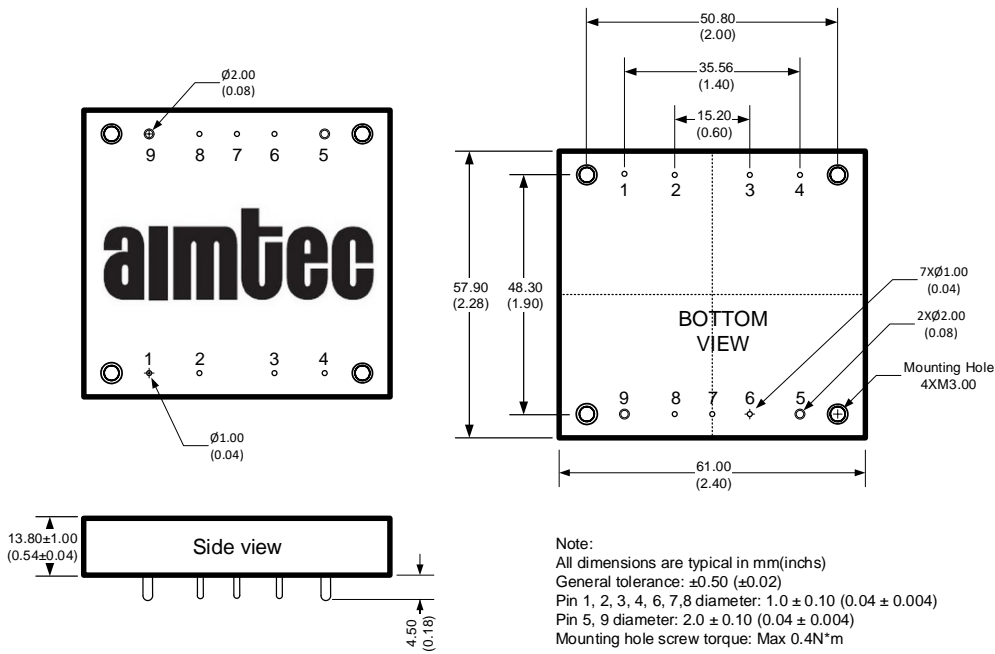


Recommended LCM Specifications			
Iout	Inductance (μH)	DCR (mΩ)	Impedance at 2.8Mhz (Ω)
≤7A	36*2	2.5*2	180
≤13A	36*2	2.0*2	170
≤25A	36*2	1.5*2	160

## Recommended EN50155 EMC circuit



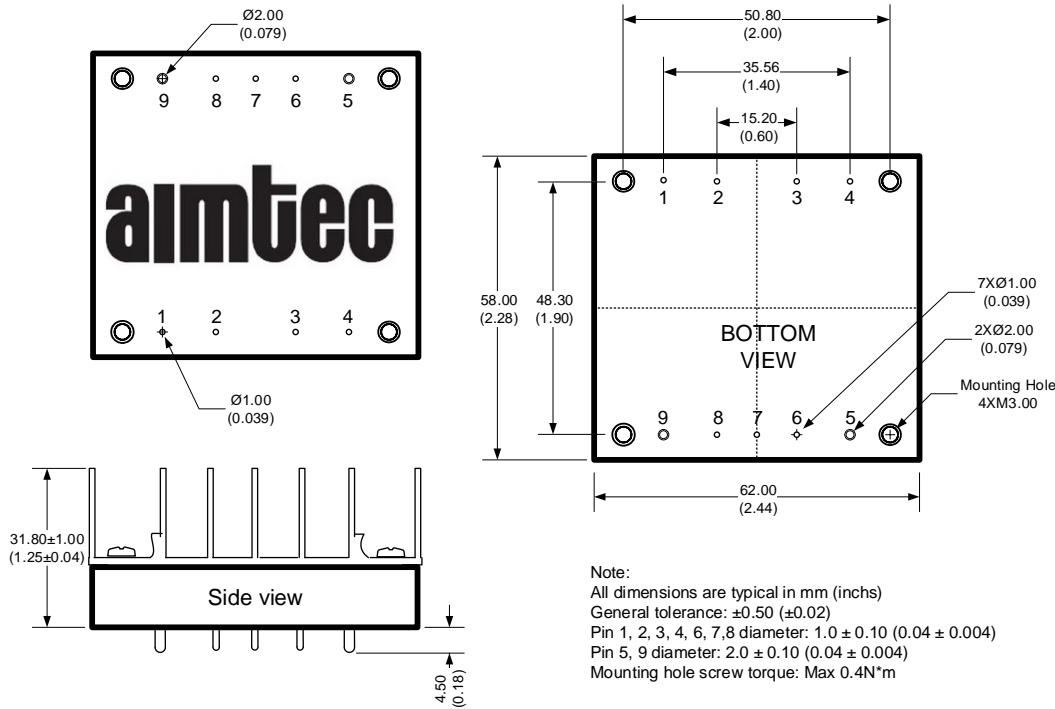
## Dimension



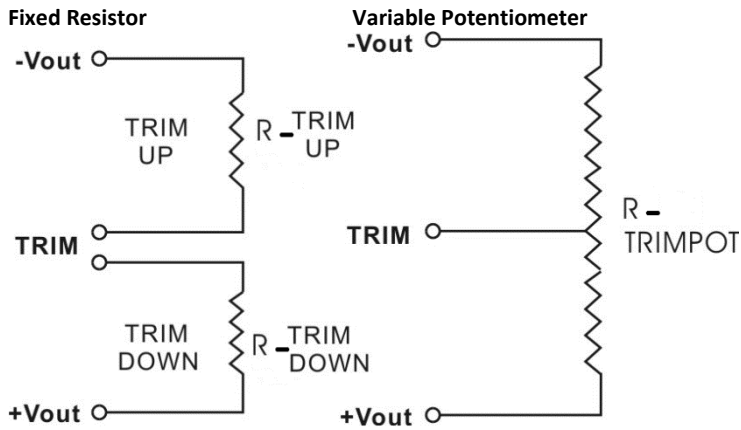
### Pin Out Specifications

Pin	Single
1	+Vin
2	On/Off Control
3	EMI
4	-Vin
5	-Vout
6	-Sense
7	Trim
8	+Sense
9	+Vout

## Dimension for models with -K option



## Trim



### Vout = 5V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	4.95	4.9	4.85	4.8	4.75	4.7	4.65	4.6	4.55	4.5
Rt down (K $\Omega$ )	136.63	64.88	40.963	29.005	21.83	17.047	13.63	11.068	9.074	7.48
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	5.05	5.1	5.15	5.2	5.25	5.3	5.35	5.4	5.45	5.5
Rt up (K $\Omega$ )	139.5	67.75	43.833	31.875	24.7	19.917	16.5	13.938	11.944	10.35

**Vout = 12V**

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	11.88	11.76	11.64	11.52	11.4	11.28	11.16	11.04	10.92	10.8
Rt down (KΩ)	500.092	305.452	216.527	165.585	132.573	109.442	92.332	79.164	68.716	60.223
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	12.12	12.24	12.36	12.48	12.6	12.72	12.84	12.96	13.08	13.2
Rt up (KΩ)	710.435	162.92	87.879	58.075	42.077	32.095	25.274	20.317	16.552	13.595

**Vout = 15V**

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	14.85	14.7	14.55	14.4	14.25	14.1	13.95	13.8	13.65	13.5
Rt down (KΩ)	642.028	402.954	289.279	222.84	179.26	148.474	125.568	107.86	93.761	82.271
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	15.15	15.3	15.45	15.6	15.75	15.9	16.05	16.2	16.35	16.5
Rt up (KΩ)	1275.5	187.455	94.426	59.777	41.679	30.559	23.034	17.602	13.498	10.287

**Vout = 24V**

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	23.76	23.52	23.28	23.04	22.8	22.56	22.32	22.08	21.84	21.6
Rt down (KΩ)	1288.521	791.049	563.771	433.571	349.197	290.076	246.346	212.69	185.986	164.281
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.24	24.48	24.72	24.96	25.2	25.44	25.68	25.92	26.16	26.4
Rt up (KΩ)	794.55	175.609	90.778	57.086	39.001	27.717	20.006	14.402	10.146	6.803

**Vout = 48V**

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	47.52	47.04	46.56	46.08	45.6	45.12	44.64	44.16	43.68	43.2
Rt down (KΩ)	3828.521	2228.785	1560.525	1193.633	961.757	801.949	685.13	596.01	525.782	469.015
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	48.48	48.96	49.44	49.92	50.4	50.88	51.36	51.84	52.32	52.8
Rt up (KΩ)	532.977	187.411	111.275	77.85	59.069	47.037	38.67	32.516	27.798	24.067

**NOTE:** 1. Datasheets are updated as needed and as such, specifications are subject to change without notice. Once printed or downloaded, datasheets are no longer controlled by Aimtec; refer to [www.aimtec.com](http://www.aimtec.com) for the most current product specifications. 2. Product labels shown, including safety agency certifications on labels, may vary based on the date manufactured. 3. Mechanical drawings and specifications are for reference only. 4. All specifications are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. 5. Aimtec may not have conducted destructive testing or chemical analysis on all internal components and chemicals at the time of publishing this document. CAS numbers and other limited information are considered proprietary and may not be available for release. 6. This product is not designed for use in critical life support systems, equipment used in hazardous environments, nuclear control systems or other such applications which necessitate specific safety and regulatory standards other the ones listed in this datasheet. 7. Warranty is in accordance with Aimtec's standard Terms of Sale available at [www.aimtec.com](http://www.aimtec.com).