



AMSRL1-Z



Aimtec's AMSRL1-Z series was developed to appeal to customers thanks to its compact size and high efficiency. Continuing this trend, Aimtec is proud to announce a new 1A non-isolated switching regulator, the AMSRL1-Z series, to better meet the market demand.

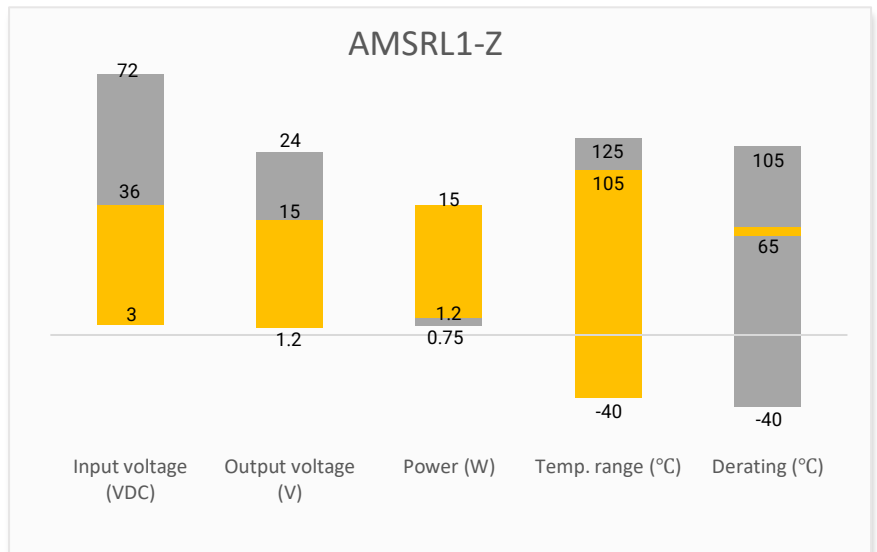
The new AMSRL1-Z series is a compact open frame design measuring 15.2 x 11.8 x 3.6mm with ultra-low height profile ideal for SMD soldering. The series feature an ultra-wide input voltage range of 3-36V, continuous short-circuit & over-temperature protection and low ripple noise (typ.: 50mV). These models target a diverse range of applications such as industrial control, IoT, grid power, instrumentation, mining, and other related industries where limited board space is a key concern. The new 1A series can accommodate operating temperature from -40°C to +105°C and offer conversion efficiency up to 94%.

Features



- Wide Input Range: 3VDC - 36VDC
- Operating Temp: -40 °C to +105 °C
- Low ripple & noise, up to 50mV(p-p)
- Output short circuit, over-temperature protection
- Regulated Output
- SMD type package

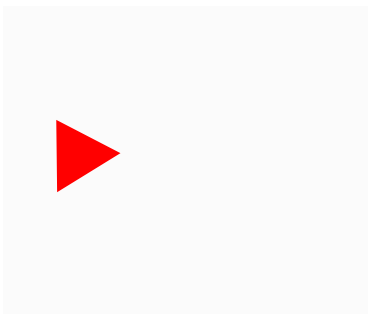
Summary



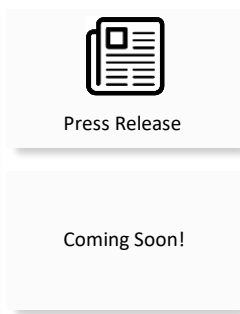
Training



Applications



Product Training Video
(click to open)



Application Notes



Power Grid



Industrial



Telecom



Instrumentation

Models & Specifications

Single Output								
Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Max (mA)		Output Current Max (mA)	Maximum Capacitive Load (μF)	Efficiency (%) Full Load	
			No Load	Full Load			Vin (Min)	Vin (Max)
AMSRL1-051.2Z	5 (3 ~ 5.5)	1.2	0.4	442	1000	330	90.5	90.5
AMSRL1-051.5Z	5 (3 ~ 5.5)	1.5	0.4	544	1000	330	92	92
AMSRL1-051.8Z	5 (3 ~ 5.5)	1.8	0.4	649	1000	330	92.5	92.5
AMSRL1-052.5Z	5 (3.8 ~ 5.5)	2.5	0.4	697	1000	330	94.5	94
AMSRL1-241.2Z	24 (4.6 ~ 36)	1.2	1.5	300	1000	330	87	72
AMSRL1-241.5Z	24 (4.6 ~ 36)	1.5	1.5	367	1000	330	89	76
AMSRL1-241.8Z	24 (4.6 ~ 36)	1.8	1.5	433	1000	330	90.5	79
AMSRL1-242.5Z	24 (4.6 ~ 36)	2.5	1.5	588	1000	330	92.5	83
AMSRL1-243.3Z	24 (4.75 ~ 36)	3.3	1.5	740	1000	330	94	86.5
AMSRL1-2405Z	24 (6.5 ~ 36)	5	1.5	806	1000	330	95.5	89.5
AMSRL1-246.5Z	24 (9 ~ 36)	6.5	1.5	765	1000	330	94.5	90
AMSRL1-2409Z	24 (12 ~ 36)	9	1.5	786	1000	330	95.5	92
AMSRL1-2412Z	24 (15 ~ 36)	12	1.5	843	1000	330	95	93
AMSRL1-2415Z	24 (18 ~ 36)	15	1.5	869	1000	330	96	94

Note: Use suffix "TR" for tape & reel packing (ex. AMSRL1-2415ZTR).

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage range	See models table			VDC
Filter	Capacitance Filter			
Absolute maximum rating	100ms	5VDC input models	6	VDC
		24VDC input models	40	VDC
Start up time		5		ms
Input reflected ripple current		35		mA pk-pk
On/Off Control	ON – 2 to 5Vdc or open circuit OFF – 0 to 0.4Vdc or pin10 connected to "-V Input" OFF idle current : 5VDC input models 0.3mA max / 24VDC input models 0.8mA max			

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy			±2.0	%
Output voltage adjustability (Trim)	1.2VDC output model only support Vadj up		±10	%
Line regulation	Full load, main input range		±0.2	%
Load regulation	10 ~ 100% load		±0.6	%
Short circuit protection	Continuous, Auto recovery			
Temperature coefficient	Full load		±0.02	%/°C
Ripple & Noise*	20MHz bandwidth	Output < 7.5VDC	50	mV pk-pk
		Output > 7.5VDC	75	
Transient recovery time	50% load step change	250		μS

Transient response deviation	50% load step change	Output < 4VDC	±5	%
		Output > 4VDC	±3	

* Ripple and Noise are measured at 20MHz bandwidth by using a 0.1µF (M/C) and 10µF (E/C) parallel capacitor and typical input with full load

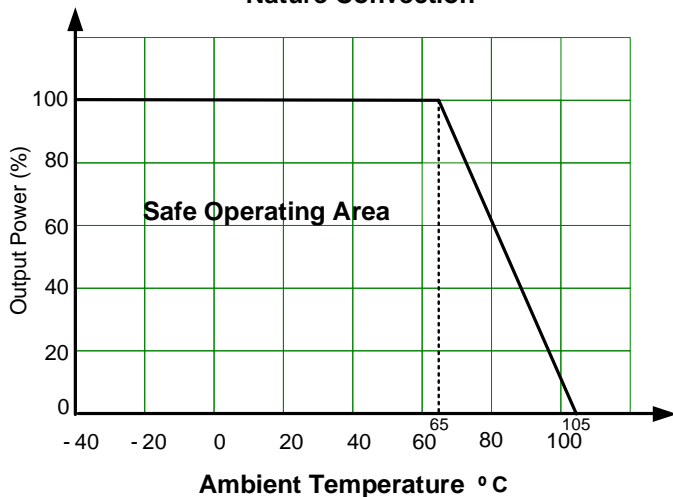
General Specifications					
Parameters	Conditions		Typical	Maximum	Units
Switching frequency	100% load	5VDC input models	1.2		MHz
		24VDC input models	410		KHz
Operating temperature	See derating graph		-40 to +105		°C
Storage temperature			-55 to +125		°C
Over temperature protection	Internal IC junction		150		°C
Maximum case temperature				95	°C
Reflow temperature	10 sec.			245	°C
Lead-free reflow solder process	IPC/JEDEC J-STD-020D.1				
Moisture sensitivity level (MSL)	IPC/JEDEC J-STD-020D.1		Level 1		
Cooling	Nature Convection (30~65 LFM)				
Humidity	Non-condensing			95	% RH
Weight	1.4				g
Dimensions (L x W x H)	0.60 x 0.47 x 0.15 inches, 15.20 x 11.80 x 3.60mm				

Safety Specifications		
Parameters		
Standards	EMC - Conducted and radiated emission	EN55032 , CLASS B with recommended circuit
	Electrostatic Discharge Immunity	IEC 61000-4-2 , Criteria A
	RF, Electromagnetic Field Immunity	IEC 61000-4-3 , Criteria A
	Electrical Fast Transient/Burst Immunity	IEC 61000-4-4 , Criteria A with recommended circuit
	Surge Immunity	IEC 61000-4-5 , Criteria A with recommended circuit
	RF, Conducted Disturbance Immunity	IEC 61000-4-6 , Criteria A
	PFMF	IEC 61000-4-8 , Criteria A

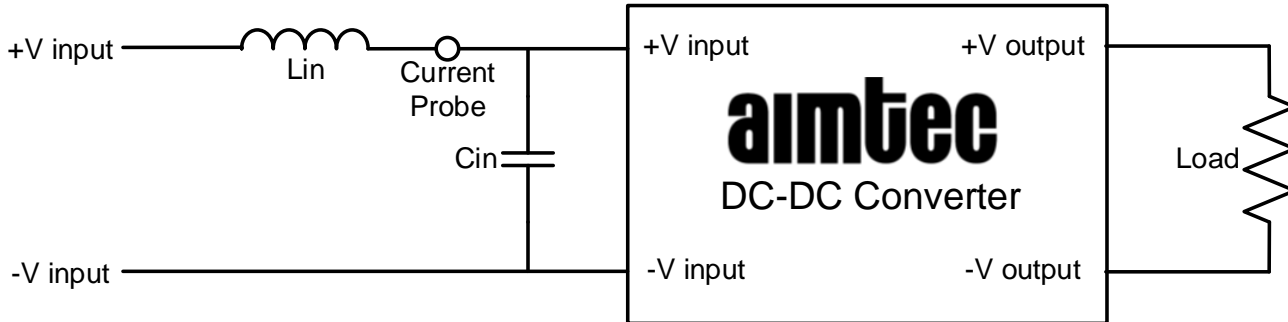
Derating



Nature Convection

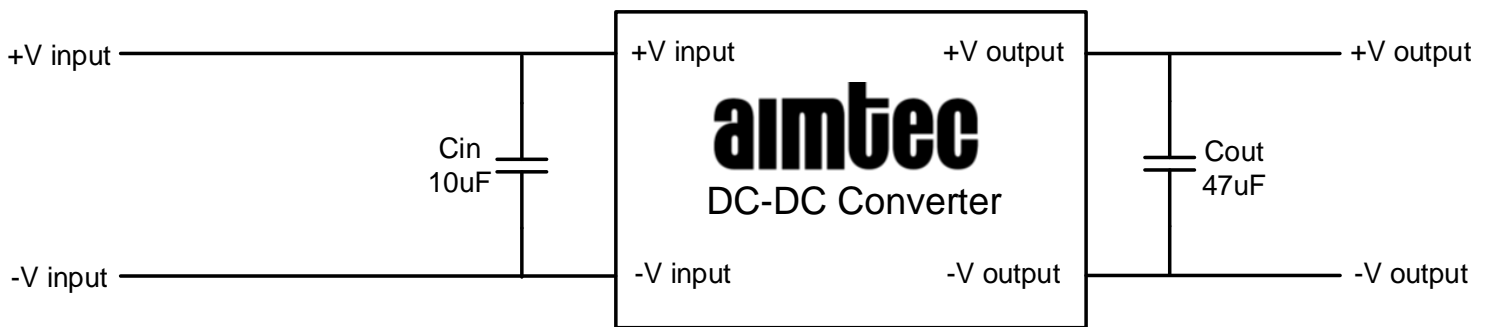


Input Reflected Ripple Current

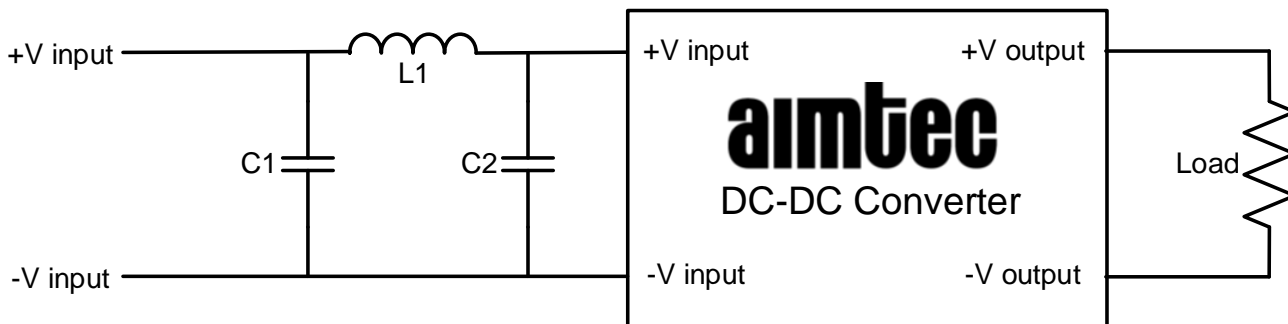


$L_{in} : 12\mu H / C_{in} : 10\mu F, ESR < 1.0\Omega$ at 100KHz

Typical Application Circuit

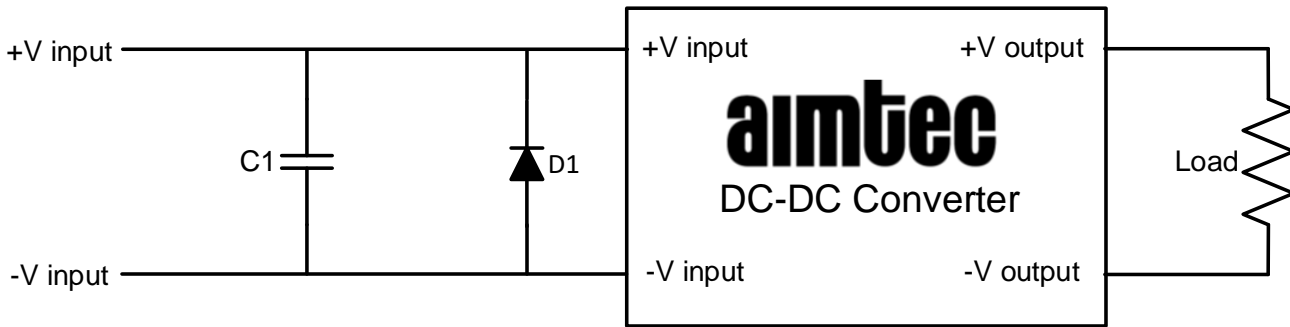


EMI Recommended Circuit



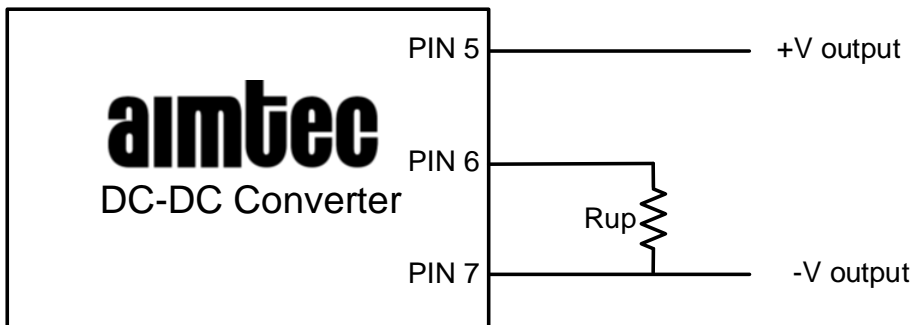
	C1	L1	Cin
AMSRL1-05XX	1206,10uF,50V	6.8uH	1206,10uF,50V
AMSRL1-24XX	1206,4.7uF,50V	33uH	1206,10uF,50V

EFT & Surge Recommended Circuit

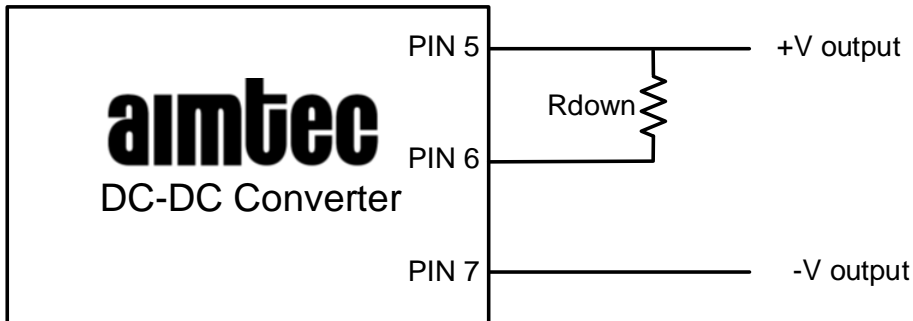


	C1	D1
AMSRL1-05XX	2200uF,50V,KY series	SMDJ 6.0A
AMSRL1-24XX	330uF,100V,KY series	SMDJ 36A

Output voltage adjustment

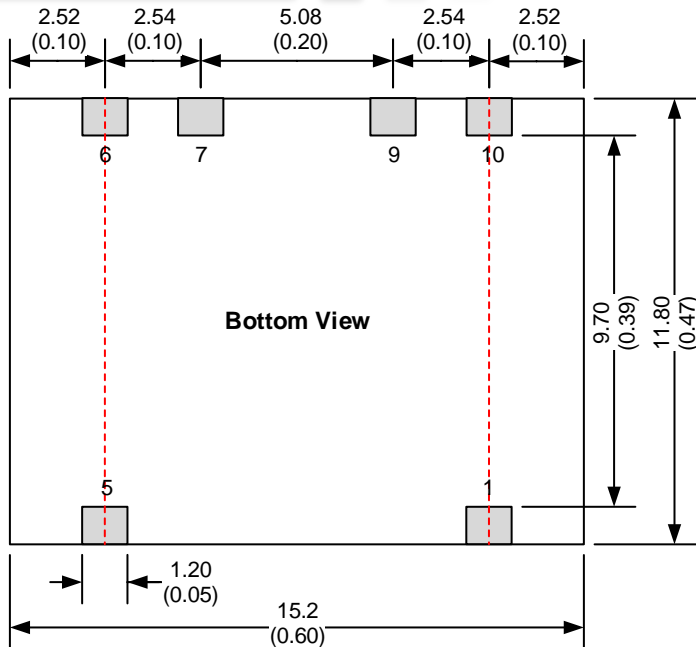


Pin 6 via a resistor to Pin 7(-Vout),Vo trim up.

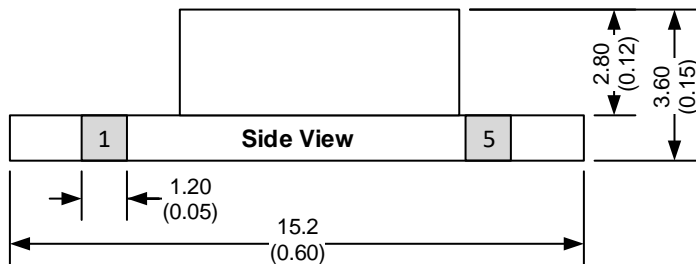


Pin 6 via a resistor to Pin 5(+Vout),Vo trim down.

Dimensions



Pin Out Specifications	
Pin	Single
1	+V Input
5	+V Output
6	Trim
7	-V Output
9	-V Input
10	ON/OFF



Notes:

- All dimensions are typical in millimeters (inches).
- Pin profile tolerance ± 0.10 (± 0.004)
- Pin pitch tolerance ± 0.25 (± 0.01)
- Stand-off tolerance ± 0.50 (± 0.02)

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 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 than the ones listed in this datasheet. **7.** Warranty is in accordance with Aimtec's standard Terms of Sale available at www.aimtec.com.