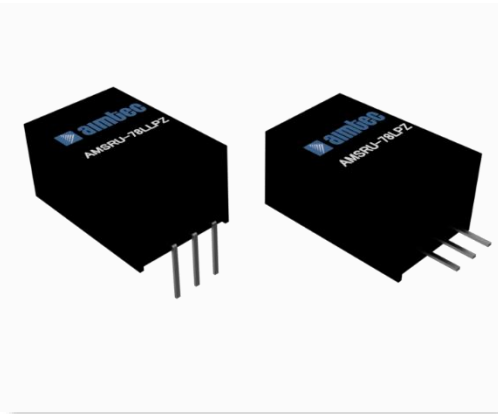


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**AMSRU-78LPZ**



Aimtec introduces the new AMSRU-78LPZ, a 0.5A Switching Regulator which is designed to be a plug and play alternative to the traditional 78xx series three-terminal linear regulators.

The series features an ultra-wide input voltage range of 9-90V, 1.5mA low no load input current, continuous short-circuit protection, low ripple noise (Max : 80mV).

The new AMSRU-78LPZ has operating temperature from -40°C to +85°C, has delivers efficiencies up to 95%, eliminating the need for a heat sink and cutting additional design space and installation cost. This series is suitable for use in applications such as industrial controls, medical, mining, railway and other related industries.

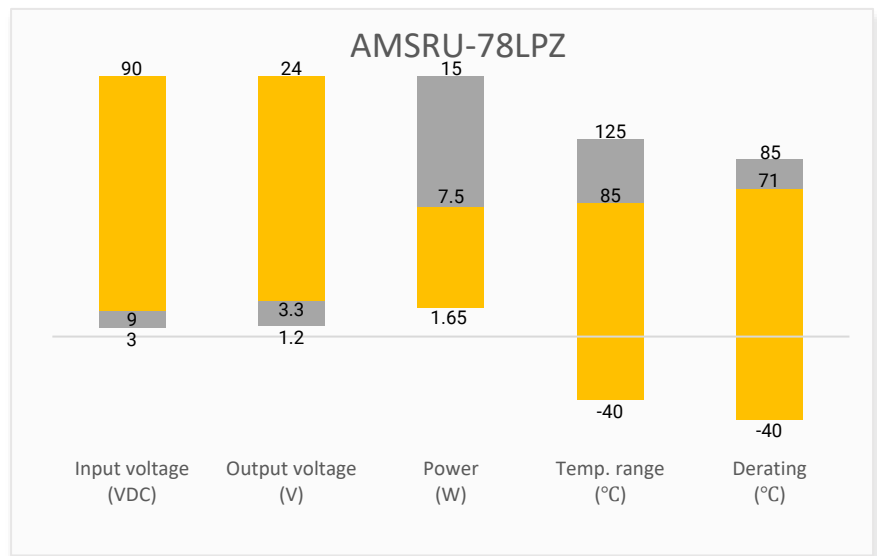
**Features**



- Input Range: 9VDC – 90VDC
- Operating Temp: -40 °C to +85 °C
- Low ripple & noise, up to 80mV(p-p) Max.
- Efficiency up to 95%
- Output short circuit protection
- Regulated Output



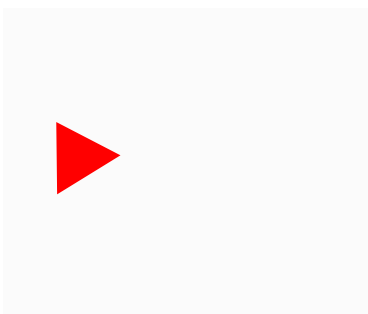
**Summary**



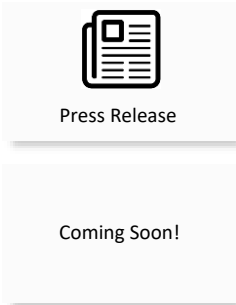
**Training**



**Applications**



Product Training Video  
(click to open)



Application Notes



IoT



Industrial



Portable Equipment



Telecommunication

## Models & Specifications

### Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current Max (mA)	Maximum Capacitive Load ( $\mu$ F)	Efficiency (%) Full Load Min / Max Vin
<b>Straight Pins</b>					
AMSRU-783.3LPZ	48 (9 ~ 90)	3.3	500	100	82 / 75
AMSRU-7805LPZ	48 (9 ~ 90)	5	500	100	87 / 81
AMSRU-786.5LPZ	48 (9 ~ 90)	6.5	500	100	91 / 84
AMSRU-7809LPZ	48 (14 ~ 90)	9	500	100	92 / 86
AMSRU-7812LPZ	48 (18 ~ 90)	12	500	100	93 / 89
AMSRU-7815LPZ	48 (20 ~ 90)	15	500	100	94 / 90
AMSRU-7824LPZ	48 (36 ~ 90)	24	300	100	95 / 91
<b>Right Angled Pins</b>					
AMSRU-783.3LLPZ	48 (9 ~ 90)	3.3	500	100	82 / 75
AMSRU-7805LLPZ	48 (9 ~ 90)	5	500	100	87 / 81
AMSRU-786.5LLPZ	48 (9 ~ 90)	6.5	500	100	91 / 84
AMSRU-7809LLPZ	48 (14 ~ 90)	9	500	100	92 / 86
AMSRU-7812LLPZ	48 (18 ~ 90)	12	500	100	93 / 89
AMSRU-7815LLPZ	48 (20 ~ 90)	15	500	100	94 / 90
AMSRU-7824LLPZ	48 (36 ~ 90)	24	300	100	95 / 91

NOTE: The LLPZ suffix indicate right angled pins and the LPZ suffix indicates straight pins.

### Input Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage range	See models table	--	--	VDC
No load input current		0.2	1.5	mA
Input filter		Capacitor		

### Output Specification

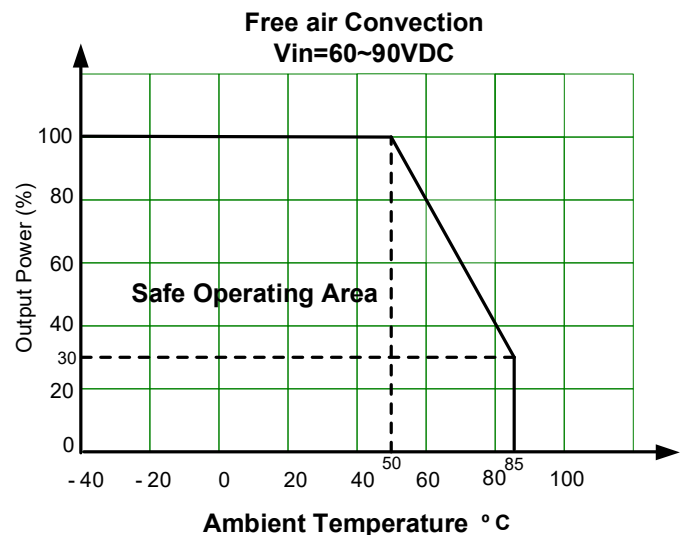
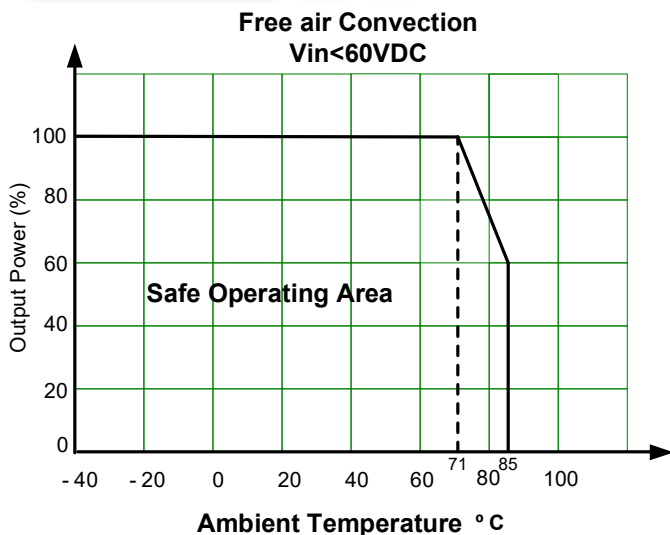
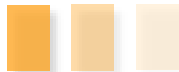
Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	100% load, 3.3V output model	$\pm 3$	$\pm 4$	%
	100% load, others	$\pm 2$	$\pm 3$	%
Line regulation		$\pm 0.6$	$\pm 1$	%
Load regulation	10 ~ 100% load	$\pm 0.5$	$\pm 1$	%
Minimum load required		$\geq 10$	--	%
Ripple & Noise	20MHz bandwidth, full load	40	80	mV pk-pk
Transient recovery time	I <sub>out</sub> =25% ~ 50% ~ 75% of I <sub>out</sub> rated	1	1.5	ms
Transient recovery deviation	I <sub>out</sub> =25% ~ 50% ~ 75% of I <sub>out</sub> rated	$\pm 0.4$	$\pm 1.5$	%

General Specifications				
Parameters	Conditions	Typical	Maximum	Units
Switching frequency	Full load	≥ 120	800	KHz
Short circuit protection	Continuous, Auto recovery			
Operating temperature	See derating graph	-40 to +85	--	°C
Storage temperature		-55 to +125	--	°C
Storage humidity	Non-condensing	≥ 5	95	% RH
Maximum case temperature		65	100	°C
Cooling method	Free air convection			
Temperature coefficient	-40 to +85 °C	--	±0.03	% / °C
Pin soldering resistance	1.5mm away from case for 10 sec	--	300	°C
Case material	Black plastic (UL94V-0)			
Weight		4.0	--	g
Dimensions (L x W x H)	AMSRU-78xxLPZ	0.45 x 0.35 x 0.69 inches, 11.50 x 9.00 x 17.50mm		
	AMSRU-78xxLLPZ	0.75 x 0.45 x 0.35 inches, 19.00 x 11.50 x 9.00mm		
MTBF	> 2 000 000 hrs (MIL-HDBK -217F, t=+25°C)			

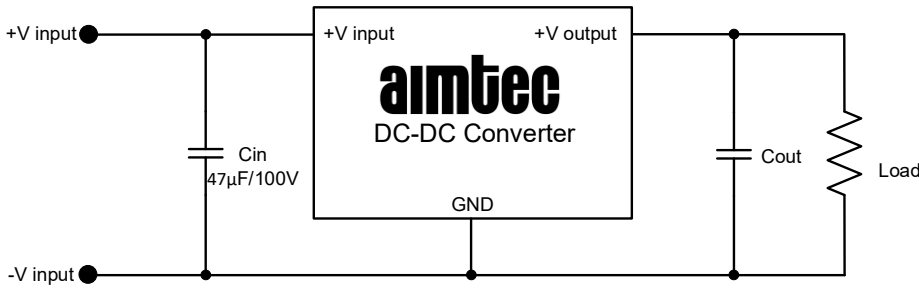
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Safety Specifications		
Parameters		
Standards	Designed to meet UL/EN/IEC 62368-1	
	EMC - Conducted and radiated emission	CISPR32/EN55032, CLASS B with EMC recommended circuit
	Electrostatic Discharge Immunity	IEC/EN 61000-4-2
	RF, Electromagnetic Field Immunity	IEC/EN 61000-4-3
	Electrical Fast Transient/Burst Immunity	IEC/EN 61000-4-4
	RF, Conducted Disturbance Immunity	IEC/EN 61000-4-6

## Derating



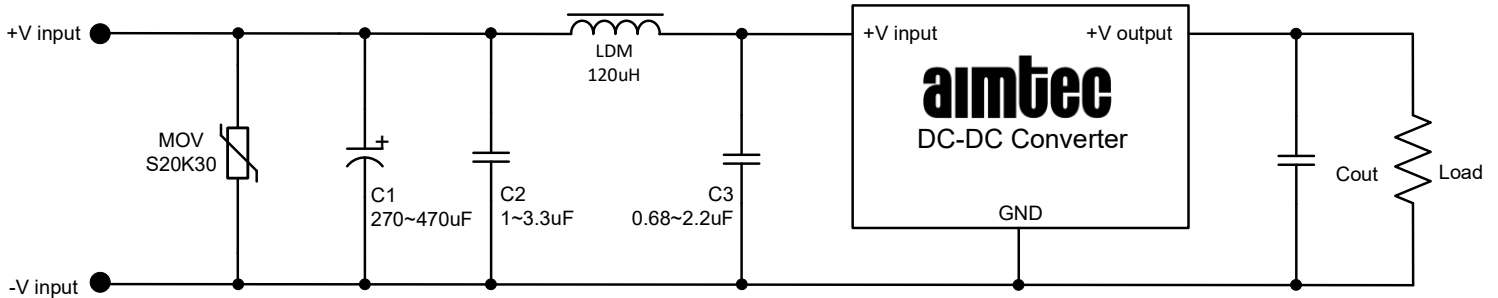
## Typical Application Circuit



Model	Cout
3.3V/5V/6.5V output	22 μF / 10V
9V output	22 μF / 16V
12V/15V output	22 μF / 25V
24V output	22 μF / 50V

- Note :**
- 1.Cin and Cout are required for the operating, and to be connected as close to the converter as possible.
  - 2.These converters are not allowed to use in parallel or hot plug without support from properly designed external circuits.

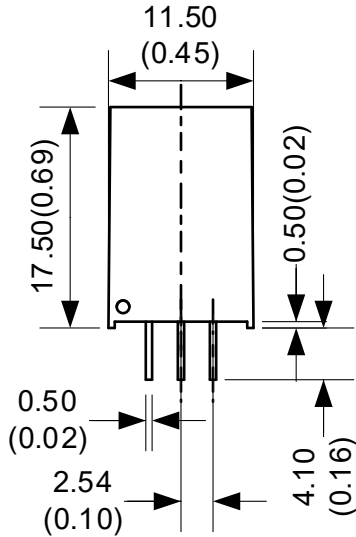
## EMC Recommended Circuit



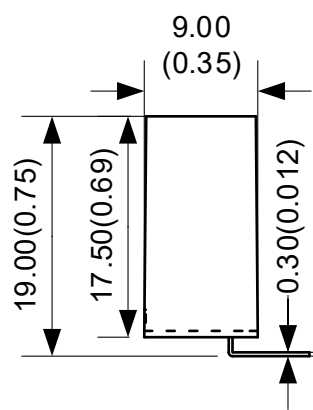
**Note :** Cout refer to Typical Application Circuit

Dimensions

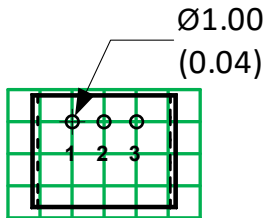
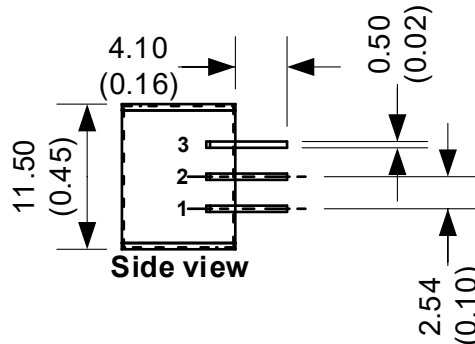
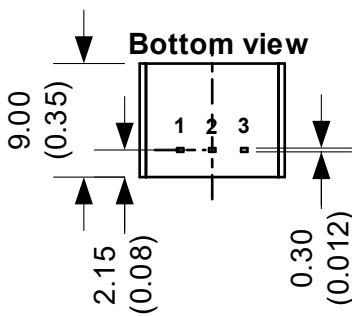
**AMSRU-78XXLPZ**



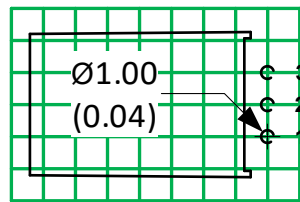
**AMSRU-78XXLLPZ**



Pin Out Specifications		
Pin	Positive Out	Negative Out
1	+V Input	+V Input
2	GND	-V Output
3	+V Output	GND



PCB Layout



PCB Layout

Unit: mm (inch)  
 General tolerance:  $\pm 0.50$  (0.02)  
 Pin thickness:  $\pm 0.10$  (0.004)  
 Footprint grid 2.54 x 2.54 mm

**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).