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**AM1LS-VZ**



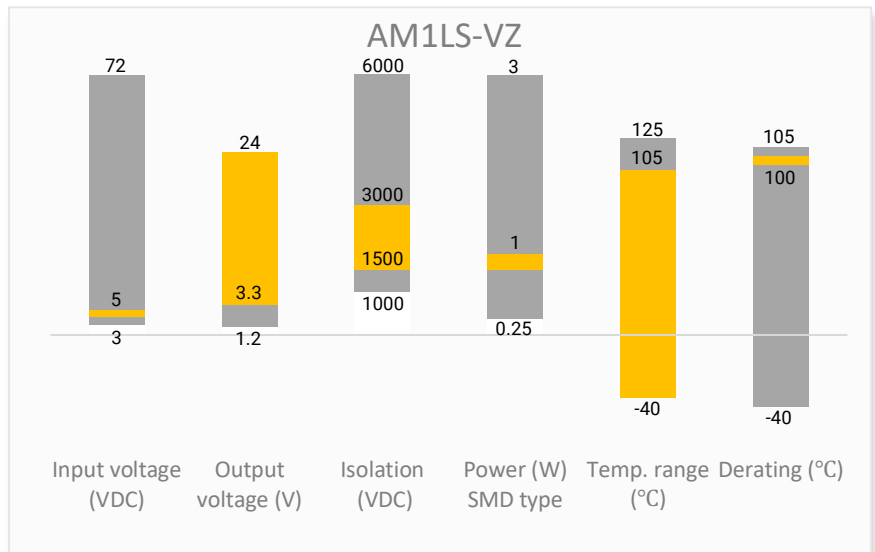
The new AM1LS-VZ is a DC/DC converter that is a direct replacement to the AM1L-NZ. Offering much greater cost effectiveness due to material normalization and production automation which increases the reliability and performance of this new component. Offering a commercial input voltage range of 5VDC and an output voltage range from 3.3-24V, this series will offer many benefits to your new system design.

This new series offers great operating temperatures, from -40°C to 105°C with full power up to 100°C. It also features an isolation of 1500VDC or 3000VDC for improved reliability and system safety. Furthermore, a higher MTBF of 3500,000h and output short circuit protection (OSCP) come standard with the series. The AM1LS-VZ is perfect for information technology, instrumentation, communication and civil applications.

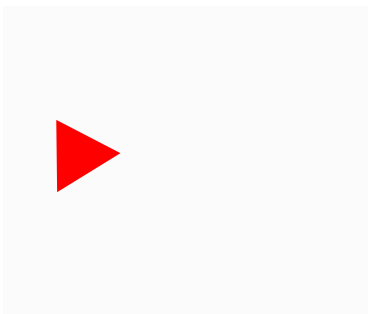
**Features**

- No load input current as low as 5mA
- Operating Temp: -40 °C to +105 °C
- High I/O isolation voltage : 1500 to 3000 VDC
- Output short circuit protection
- High efficiency up to 85%
- SMD type package, Industry standard pin-out

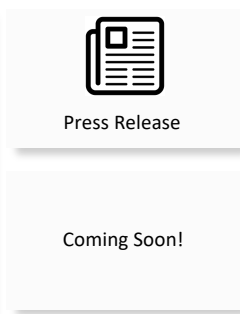
**Summary**



**Training**



Product Training Video  
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Application Notes

**Applications**



IoT



Industrial



Telecom



Instrumentation

## Models & Specifications

### Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Max (mA)		Output Current Max (mA)	Isolation (VDC)	Maximum Capacitive Load (μF)	Efficiency (%) Full Load Typ.
			No Load	Full Load				
AM1LS-0503SVZ	5 (4.5 ~ 5.5)	3.3	10	286	303	1500	2400	74
AM1LS-0505SVZ	5 (4.5 ~ 5.5)	5	10	286	200	1500	2400	82
AM1LS-0509SVZ	5 (4.5 ~ 5.5)	9	20	254	111	1500	1000	83
AM1LS-0512SVZ	5 (4.5 ~ 5.5)	12	20	254	84	1500	560	83
AM1LS-0503SH30VZ	5 (4.5 ~ 5.5)	3.3	10	286	303	3000	2400	74
AM1LS-0505SH30VZ	5 (4.5 ~ 5.5)	5	10	286	200	3000	2400	82
AM1LS-0509SH30VZ	5 (4.5 ~ 5.5)	9	20	254	111	3000	1000	83
AM1LS-0512SH30VZ	5 (4.5 ~ 5.5)	12	20	254	84	3000	560	83
AM1LS-0515SH30VZ	5 (4.5 ~ 5.5)	15	30	254	67	3000	560	83
AM1LS-0524SH30VZ	5 (4.5 ~ 5.5)	24	30	254	42	3000	220	85

### Dual Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Max (mA)		Output Current Max (mA)	Isolation (VDC)	Maximum Capacitive Load (μF)	Efficiency (%) Full Load Typ.
			No Load	Full Load				
AM1LS-0503DH30VZ	5 (4.5 ~ 5.5)	± 3.3	10	286	± 151	3000	1200	74
AM1LS-0505DH30VZ	5 (4.5 ~ 5.5)	± 5	10	286	± 100	3000	1200	82
AM1LS-0509DH30VZ	5 (4.5 ~ 5.5)	± 9	20	254	± 56	3000	470	83
AM1LS-0512DH30VZ	5 (4.5 ~ 5.5)	± 12	20	254	± 42	3000	220	83
AM1LS-0515DH30VZ	5 (4.5 ~ 5.5)	± 15	30	254	± 34	3000	220	83
AM1LS-0524DH30VZ	5 (4.5 ~ 5.5)	± 24	30	254	± 21	3000	100	85

### Input Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage range	5	4.5 – 5.5		VDC
Filter	Capacitor			
Absolute maximum rating	1 sec, max		9	VDC
Input reflected ripple current		15		mA

### Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	See Typical Characteristic			
Line regulation	Input voltage change : 1%	3.3V output model	1.5	%
		Others	1.2	

Load regulation	10 ~ 100% load	3.3V output model	15	20	%
		5V output model	10	15	
		9V output model	8	10	
		12V output model	7	10	
		15V output model	6	10	
		24V output model	5	10	
Temperature coefficient	Full load		±0.02		%/°C
Ripple & Noise	20MHz bandwidth	Others	30	75	mV pk-pk
		24V output model	50	100	
Note: Please refer to application notes for Ripple & Noise test information.					

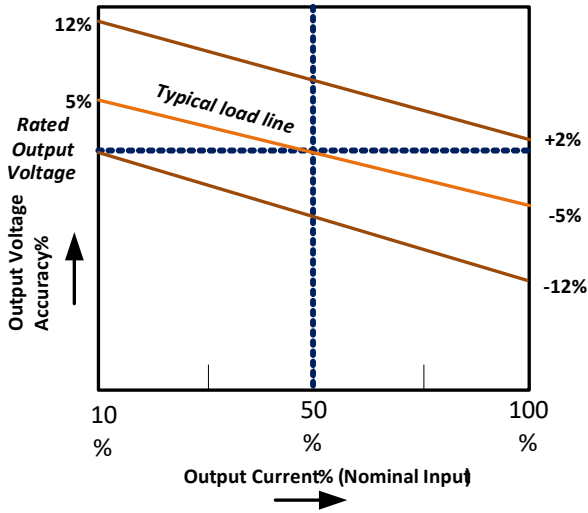
Isolation Specification				
Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage	60 sec, 1mA max	1500 / 3000		VDC
Resistance	Input to output resistance at 500Vdc	>1000		MOhm
Capacitance	Input to output, 100KHz/0.1V	20		pF

General Specifications				
Parameters	Conditions	Typical	Maximum	Units
Switching frequency	Full load, nominal input voltage	270		KHz
Operating temperature	See derating graph	-40 to +105		°C
Storage temperature		-55 to +125		°C
Case temperature rise	Ta = 25°C	3.3V output mode	25	°C
		Others	15	
Maximum case temperature			95	°C
Reflow Temperature	Maximum duration ≤60s over 217°C.		245	°C
Lead-free reflow solder process	IPC/JEDEC J-STD-020D.1			
Short circuit protection	Continuous, auto-recovery			
Cooling	Free air convection			
Humidity	Non-condensing		95	% RH
Case material	Heat resistant black Plastic (flammability to UL 94V-0)			
Weight	1.3			g
Dimensions (L x W x H)	1500VDC isolated models	0.52 x 0.45 x 0.29inches (13.20 x 11.40 x 7.25mm)		
	3000VDC isolated models	0.60 x 0.45 x 0.29inches (15.24 x 11.40 x 7.25mm)		
MTBF	> 3 500 000 hrs (MIL-HDBK -217F, t=+25°C) / Full Load			
Moisture sensitivity level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1		
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.				

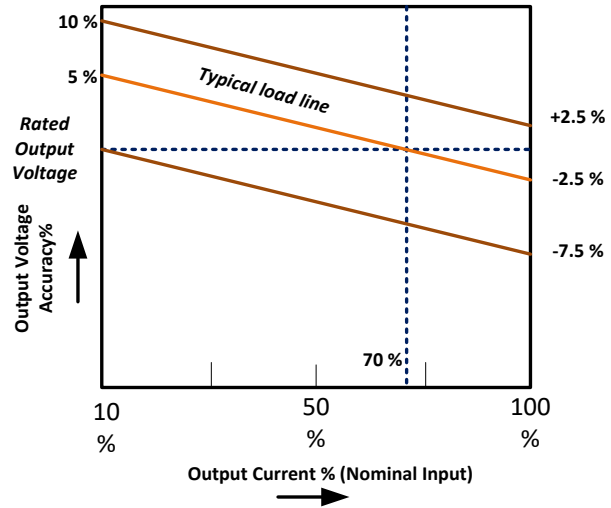
Safety Specifications		
Parameters		
Standards	Design to meet IEC62368/UL62368/EN62368	
	EMC - Conducted and radiated emission	CISPR32/EN55032, Class B with recommended circuit
	Electrostatic Discharge Immunity	IEC 61000-4-2 Air ±8KV, Contact ±4KV, Criteria B

Typical Characteristic

3.3V output models

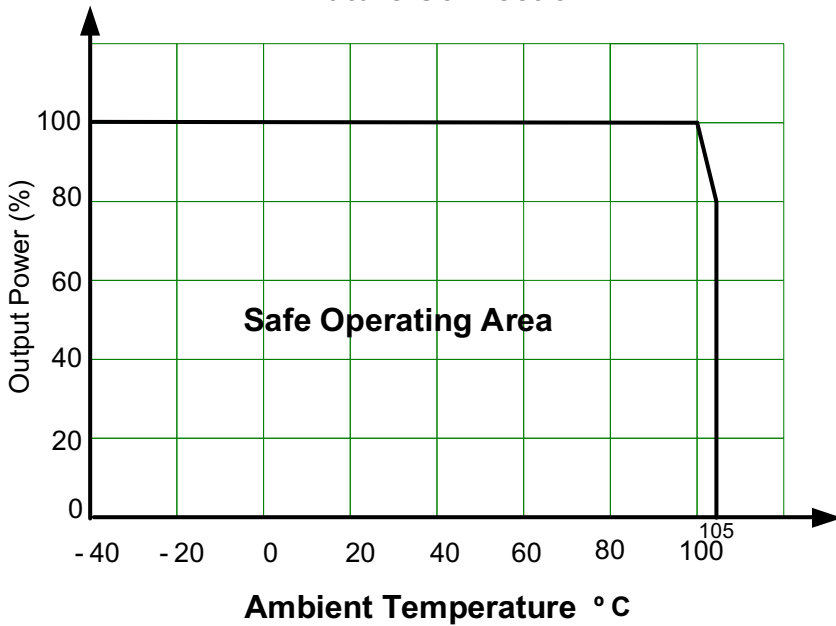


Other models

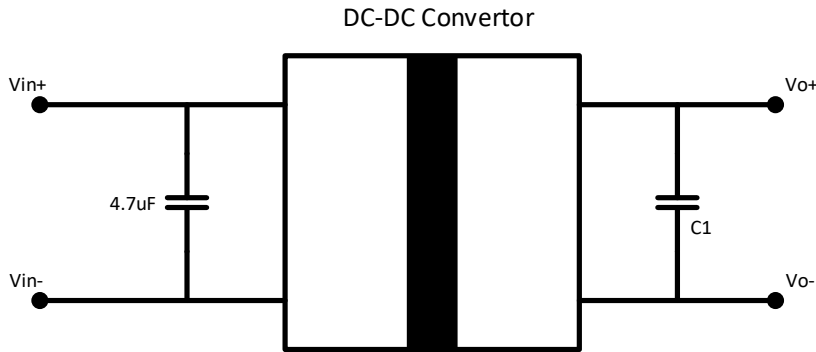


Derating

Nature Convection



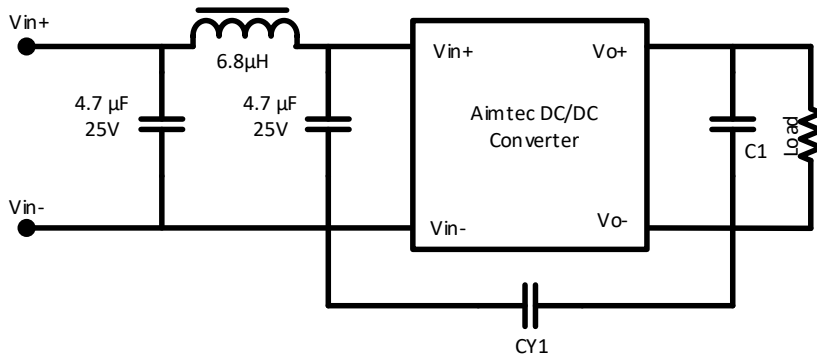
## Typical Application Circuit



Capacitor selection Table

Output voltage	C1
3.3 V	10µF
5 V	10µF
9 V	4.7µF
12 V	2.2µF
15 V	1µF
24V	0.47µF

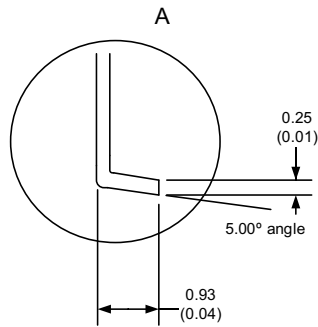
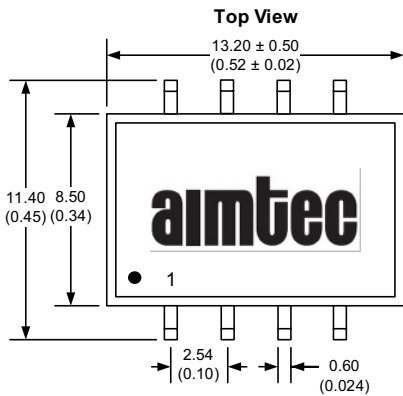
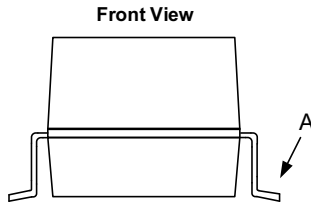
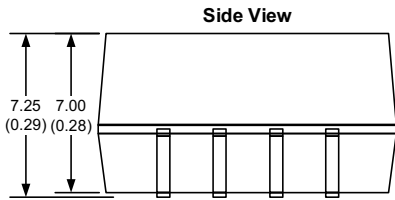
## EMI Recommended Circuit



Output voltage	C1	CY1
3.3 V	10µF	N/C
5 V	10µF	
9 V	4.7µF	
12 V	2.2µF	1nF / 4KVDC for 3KV isolation 1nF / 2KVDC for 1.5KV isolation
15 V	1µF	
24V	0.47µF	

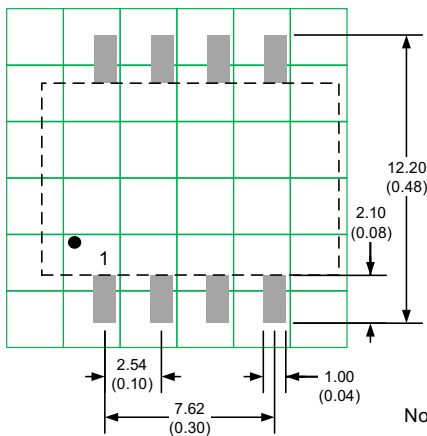
## Dimensions

### Dimensions for 1500VDC isolated models



Pin Out Specifications	
Pin	Single
1	-V Input
2	+V Input
4	-V Output
5	+V Output
Other Pins	NC

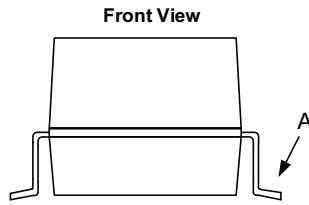
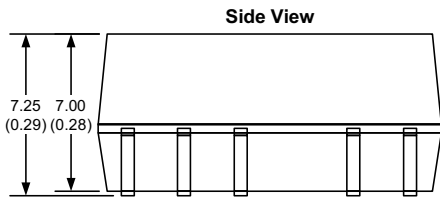
NC: Pin to be isolated from circuitry



Notes:  
All dimensions are typical in millimeters (inches).  
Pin section tolerances : ± 0.10 (± 0.004)  
General tolerances : ± 0.25 (± 0.01)

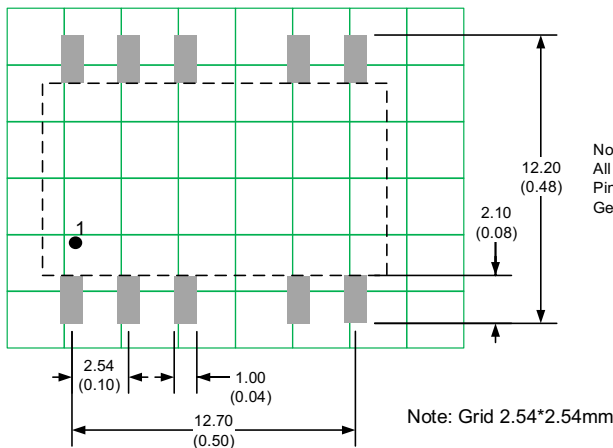
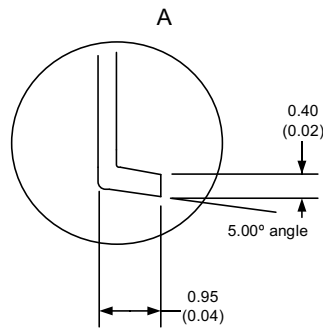
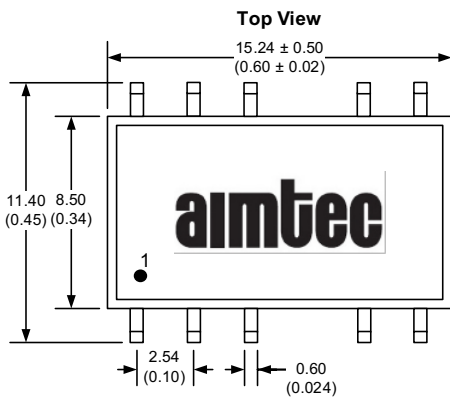
Note: Grid 2.54\*2.54mm

**Dimensions for 3000VDC isolated models**



Pin Out Specifications		
Pin	Single	Dual
1	-V Input	-V Input
2	+V Input	+V Input
5	-V Output	Common
6	NC	-V Output
8	+V Output	+V Output
Other Pins	NC	NC

NC: Pin to be isolated from circuitry



Notes:  
All dimensions are typical in millimeters (inches).  
Pin section tolerances : ± 0.10 (± 0.004)  
General tolerances : ± 0.25 (± 0.01)

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