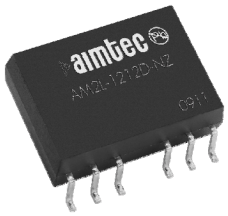
Series AM2L-NZ

2 Watt | DC-DC Converter



FEATURES:

- Low Profile SMD (Surface Mount Device)
- 1000VDC & 6000VDC Isolation
- Industry Standard Pinout
- Unregulated Single, Dual, Dual Separated Output Models
- MTBF>1,000,000 hours
- Operating temperature: -40°C to +85°C
- High Efficiency up to 85%

RoHS CE

Models
Single output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Efficiency (%)
AM2L-0505S-NZ	4.5-5.5	5	400	1000	80
AM2L-0509S-NZ	4.5-5.5	9	222	1000	82
AM2L-0512S-NZ	4.5-5.5	12	167	1000	84
AM2L-0515S-NZ	4.5-5.5	15	133	1000	84
AM2L-1205S-NZ	10.8-13.2	5	400	1000	82
AM2L-1209S-NZ	10.8-13.2	9	222	1000	83
AM2L-1212S-NZ	10.8-13.2	12	167	1000	85
AM2L-1215S-NZ	10.8-13.2	15	133	1000	85
AM2L-0505SH60-NZ	4.5-5.5	5	400	6000	76
AM2L-0512SH60-NZ	4.5-5.5	12	167	6000	79
AM2L-0515SH60-NZ	4.5-5.5	15	133	6000	78
AM2L-1205SH60-NZ	10.8-13.2	5	400	6000	76
AM2L-1212SH60-NZ	10.8-13.2	12	167	6000	80
AM2L-1215SH60-NZ	10.8-13.2	15	133	6000	79
AM2L-2405SH60-NZ	21.6-26.4	5	400	6000	77
AM2L-2412SH60-NZ	21.6-26.4	12	167	6000	80
AM2L-2415SH60-NZ	21.6-26.4	15	133	6000	78

Models
Dual output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Efficiency (%)
AM2L-0505D-NZ	4.5-5.5	±5	±200	1000	82
AM2L-0509D-NZ	4.5-5.5	±9	±111	1000	83
AM2L-0512D-NZ	4.5-5.5	±12	±83	1000	84
AM2L-0515D-NZ	4.5-5.5	±15	±67	1000	82
AM2L-1205D-NZ	10.8-13.2	±5	±200	1000	83
AM2L-1209D-NZ	10.8-13.2	±9	±111	1000	84
AM2L-1212D-NZ	10.8-13.2	±12	±83	1000	84
AM2L-1215D-NZ	10.8-13.2	±15	±67	1000	85

Models
Dual Separated output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Efficiency (%)
AM2L-050505D-NZ	4.5-5.5	5/5	200/200	1000	82
AM2L-050909D-NZ	4.5-5.5	9/9	112/112	1000	83
AM2L-051212D-NZ	4.5-5.5	12/12	84/84	1000	84
AM2L-051515D-NZ	4.5-5.5	15/15	67/67	1000	85
AM2L-120505D-NZ	10.8-13.2	5/5	200/200	1000	82
AM2L-120909D-NZ	10.8-13.2	9/9	112/112	1000	83
AM2L-121212D-NZ	10.8-13.2	12/12	84/84	1000	84
AM2L-121515D-NZ	10.8-13.2	15/15	67/67	1000	85

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.

Input Specifications

Parameters	Nominal	Typical	Maximum	Units
Voltage range	5	4.5-5.5		VDC
	12	10.8-13.2		
	24	21.6-26.4		

Isolation Specifications

Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage	60 sec	1000, 6000		VDC
Tested V1 output/ V2 output	60 sec	1000		VDC
Capacitance V input/V output	500VDC	60		pF
Capacitance V1 output/V2 output	500VDC	60		pF
Resistance	500Vdc	>1000		MOhm

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	See Tolerance Graph	±5		%
Short Circuit protection	1000VDC Momentary		1 sec	
	6000VDC Continuous			
Short Circuit Restart	Auto-Recovery			
Line voltage regulation	For a 1% change of Vin	±1.2		%
Load voltage regulation (5 Vout)	From 10% load to 100% load	12.8		%
Load voltage regulation (9 Vout)		8.3		
Load voltage regulation (12 Vout)		6.8		
Load voltage regulation (15 Vout)		6.3		
Temperature coefficient	At 100% load	±0.03		%/°C
Ripple & Noise*	20MHz Bandwidth	150		mV p-p
Minimum Load Current**		10		% of Max

* Test ripple & noise by “Parallel Cable Method” as described in Application Note “Ripple and Noise Measurement of Brick & POL DC-DC Converters” available on Aimtec’s website www.aimtec.com

** If the operating output current is less than 10% of maximum it is recommended to install a load resister in parallel with the load to ensure the actual load current meets the minimum load current requirement.

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% load, nominal input	100		KHz
Operating temperature	-40 to + 85			°C
Storage temperature	-55 to + 125			°C
Maximum case temperature			100	°C
Cooling	Free Air Convection			
Humidity			95	% RH
Case material	Plastic(UL94-V0)			
Weight	1000VDC	2.1		g
	6000VDC	3.8		
Dimensions (L x W x H)	Single, Dual, Dual Separated 1000VDC	0.70 x 0.70 x 0.24 inches	17.78 x 17.78 x 6.00 mm	
	Single 6000VDC	0.94 x 0.79 x 0.32 inches	23.86 x 18.50 x 8.00mm	
MTBF	> 1,000, 000 hours (MIL-HDBK -217F, Ground Benign, t=+25°C)			
Maximum Soldering Temperature	1.5mm from case for 10 seconds		260	°C

Safety Specifications

Parameters	
Agency approvals	CE (for 6000VDC isolation models)
Standards	EN 60601-1-1; EN 60601-1-2

Pin Out Specifications

1000VDC

Pin	Single	Dual	Dual Separated
1	-Vin	- Vin	- Vin
2	+ Vin	+ Vin	+ Vin
5	NC	-Vout	-V1out
6	- Vout	Common	+V1out
7	+Vout	+Vout	NC
8	NC	NC	NC
9	NC	NC	+V2out
10	NC	-Vout	-V2out
12	NC	NC	NC
13	NC	NC	NC
14	NC	NC	NC

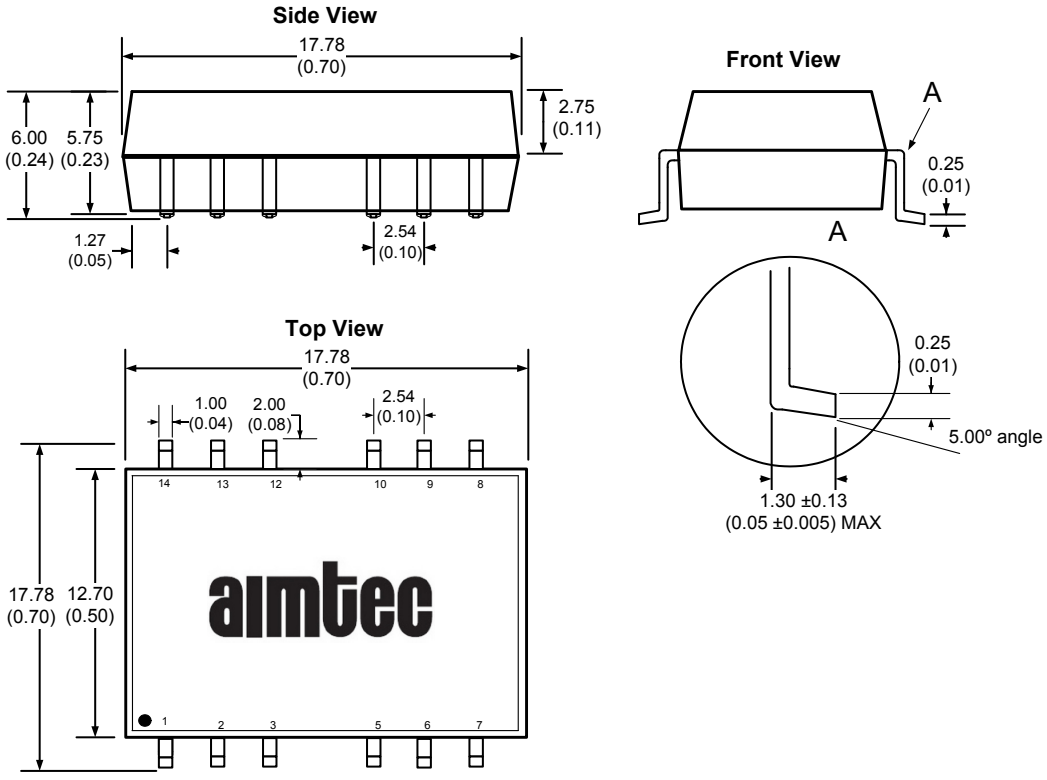
NOTE: On dual output models Pin 5 and Pin 10 are connected internally together.
Either Pin 5 or Pin 10, or both can be used as the -Vout
NC: not connected

6000VDC

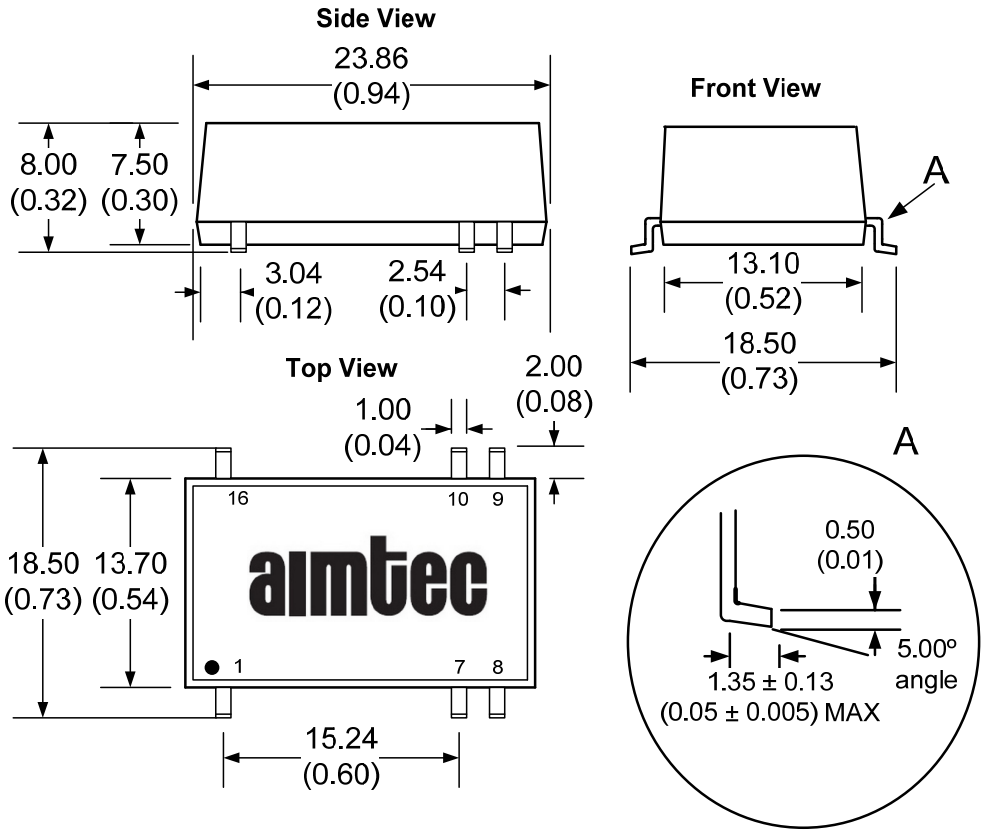
Pin	Single
1	- V in
2	No Pin
3	No Pin
4	No Pin
5	No Pin
6	No Pin
7	NC
8	NC
9	+V out
10	-V out
11	No Pin
12	No Pin
13	No Pin
14	No Pin
15	No Pin
16	+V in

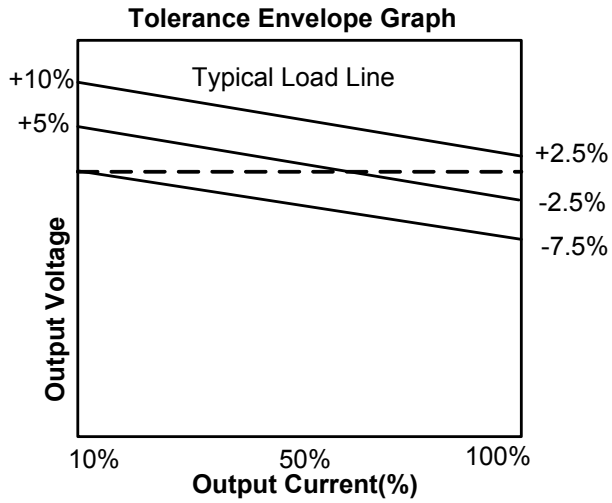
Dimensions

1000VDC

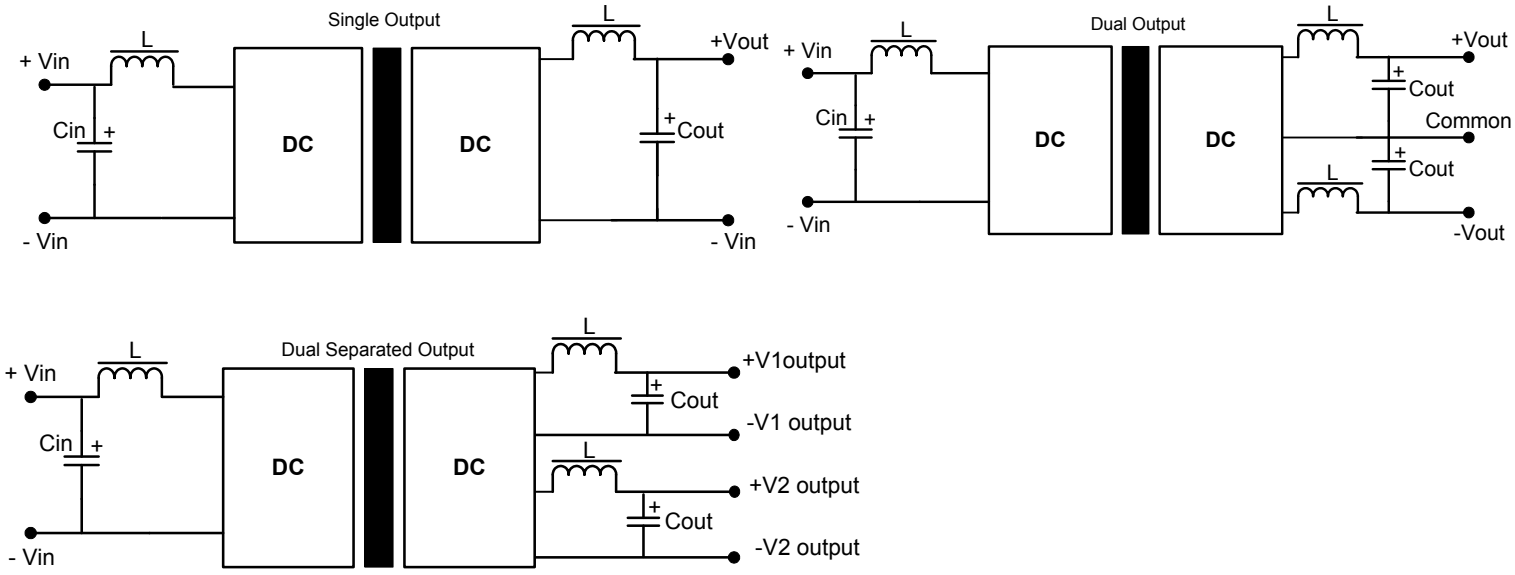


Dimensions
6000VDC





Recommended Filter Circuit



If it is required to decrease the input/output ripple an “LC” filter network can be installed on the input and output of the converter (see above).

It should be noted that the inductance and the resonant frequency of the “LC” filtering network should differ from the DC/DC converter switching frequency to avoid mutual interference.

The capacitance of the output filter capacitor must not exceed the values in the Table below to avoid startup problems and ensure safe and reliable operation.

It’s not recommended to connect any external capacitor in the application field when output loading is less than 0.5 watt.

External Capacitor Tables

Input Capacitor (Cin)

Vin (VDC)	Cin (uF)
5	4.7
12	2.2
24	1

Output Capacitor (Cout)

Single Vout (VDC)	Cout (uF)	Dual Vout (Vdc)	Cout (uF)	Dual Separated Vout (Vdc)	Cout (uF)
5	10	±5	4.7	5/5	4.7
9	4.7	±9	2.2	9/9	2.2
12	2.2	±12	1	12/12	1
15	1	±15	0.47	15/15	0.47

Overload Protection

The output circuit of these products has no protection against overload. It is recommended to install external overload protection in the form of a self-recovery fuse or a circuit breaker in series at the converter’s input.

To achieve a high degree of output voltage regulation, over-voltage, and over-current protection it is suggested to use the AM2LV-NZ series as an alternative.