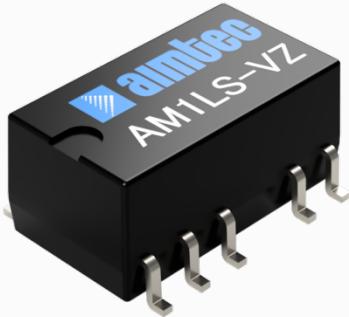


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AM1LS-VZ



SMD

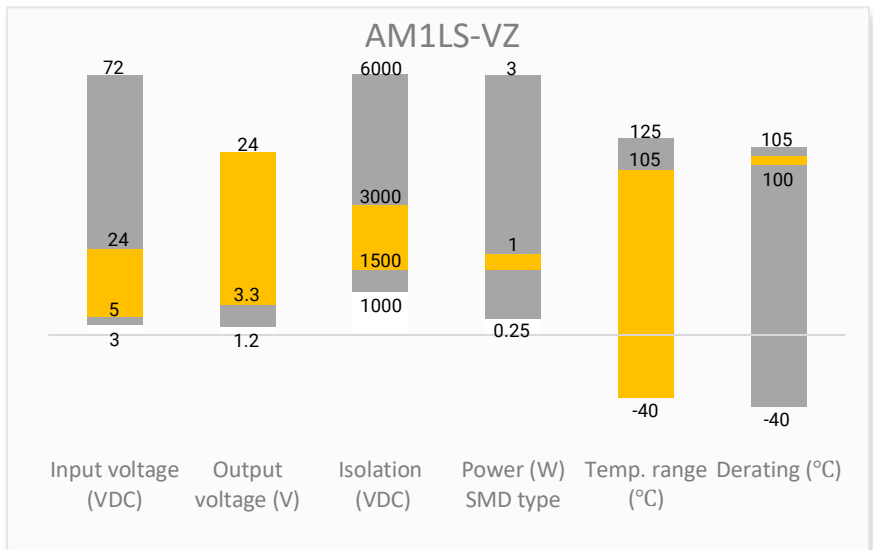
The new AM1LS-VZ is a DC/DC converter that is a direct replacement to the AM1L-NZ. Offering much greater cost effectiveness due to material normalization and production automation which increases the reliability and performance of this new component. Offering a commercial input voltage range of 5-24VDC 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.

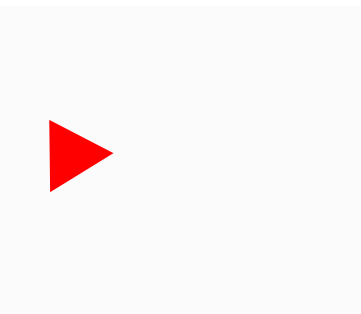
Features

- No load input current as low as 4mA
- 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

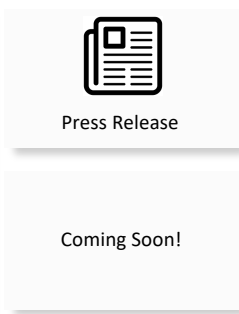
Summary



Training



Product Training Video
(click to open)



Application Notes

Applications



IoT



Industrial



Telecom



Instrumentation

Models & Specifications

Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Max (mA)		Output Current (mA)		Isolation (VDC)	Maximum Capacitive Load (μ F)	Efficiency Full Load Typ. (%)
			No Load	Full Load	No Load	Full Load			
AM1LS-0503SVZ	5 (4.5-5.5)	3.3	10	286	30	303	1500	2400	74
AM1LS-0505SVZ	5 (4.5-5.5)	5	10	286	20	200	1500	2400	82
AM1LS-0509SVZ	5 (4.5-5.5)	9	20	254	12	111	1500	1000	83
AM1LS-0512SVZ	5 (4.5-5.5)	12	20	254	9	84	1500	560	83
AM1LS-0503SH30VZ	5 (4.5-5.5)	3.3	10	286	30	303	3000	2400	74
AM1LS-0505SH30VZ	5 (4.5-5.5)	5	10	286	20	200	3000	2400	82
AM1LS-0509SH30VZ	5 (4.5-5.5)	9	20	254	12	111	3000	1000	83
AM1LS-0512SH30VZ	5 (4.5-5.5)	12	20	254	9	84	3000	560	83
AM1LS-0515SH30VZ	5 (4.5-5.5)	15	30	254	7	67	3000	560	83
AM1LS-0524SH30VZ	5 (4.5-5.5)	24	30	254	4	42	3000	220	85
AM1LS-1205SH30VZ	12 (10.8-13.2)	5	8	107	20	200	3000	2400	82
AM1LS-1212SH30VZ	12 (10.8-13.2)	12	8	107	9	84	3000	560	83
AM1LS-1215SH30VZ	12 (10.8-13.2)	15	8	107	7	67	3000	560	83
AM1LS-2405SH30VZ	24 (21.6-26.4)	5	8	57	20	200	3000	2400	80
AM1LS-2415SH30VZ	24 (21.6-26.4)	15	8	57	7	67	3000	560	80

Dual Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Max (mA)		Output Current (mA)		Isolation (VDC)	Maximum Capacitive Load (μ F)	Efficiency Full Load Typ. (%)
			No Load	Full Load	No Load	Full Load			
AM1LS-0503DH30VZ	5 (4.5-5.5)	\pm 3.3	10	286	\pm 15	\pm 151	3000	1200	74
AM1LS-0505DH30VZ	5 (4.5-5.5)	\pm 5	10	286	\pm 10	\pm 100	3000	1200	82
AM1LS-0509DH30VZ	5 (4.5-5.5)	\pm 9	20	254	\pm 6	\pm 56	3000	470	83
AM1LS-0512DH30VZ	5 (4.5-5.5)	\pm 12	20	254	\pm 5	\pm 42	3000	220	83
AM1LS-0515DH30VZ	5 (4.5-5.5)	\pm 15	30	254	\pm 4	\pm 34	3000	220	83
AM1LS-0524DH30VZ	5 (4.5-5.5)	\pm 24	30	254	\pm 2	\pm 21	3000	100	85
AM1LS-1215DH30VZ	12 (10.8-13.2)	\pm 15	8	107	\pm 3	\pm 33	3000	220	83

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Filter	Capacitor			
Absolute maximum rating	Maximum duration 1s, 5Vin	>0.7	9	VDC
	Maximum duration 1s, 12Vin	>0.7	18	VDC
	Maximum duration 1s, 24Vin	>0.7	30	VDC
Input reflected ripple current		15		mA

Output Specification				
Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	See Typical Characteristic			
Line regulation	Per 1% Vin change ,3.3V output model		1.5	%
	Per 1% Vin change, Others		1.2	%
Load regulation	10-100% load, 5Vin 3.3Vout model	15	20	%
	10-100% load, 5Vin 5Vout model	10	15	%
	10-100% load, 5Vin 9Vout model	8	10	%
	10-100% load, 5Vin 12Vout model	7	10	%
	10-100% load, 5Vin 15Vout model	6	10	%
	10-100% load, 5Vin 24Vout model	5	10	%
	10-100% load, 12/24Vin 5Vout models	5	15	%
	10-100% load, 12/24Vin 12/15Vout models	2	10	%
Temperature coefficient	Full load	±0.02		%/°C
Ripple & Noise*	5Vin 3.3/5/9/12/15Vout models	30	75	mV pk-pk
	others	50	100	mV pk-pk

* Ripple and Noise are measured at 20MHz bandwidth. Please refer to the application note for specific details.

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, 5Vin models	270		KHz
	Full load, nominal input voltage, 12/24Vin models	260		KHz
Operating temperature	See derating graph	-40 to +105		°C
Storage temperature		-55 to +125		°C
Case temperature rise	Ambient temp 25°C, 5Vin 5/9/12/15/24Vout models	15		°C
	Ambient temp 25°C, others	25		°C
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			
Vibration	10-150Hz, 5G, 0.75mm, along all axis (Except 5Vin models)			
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

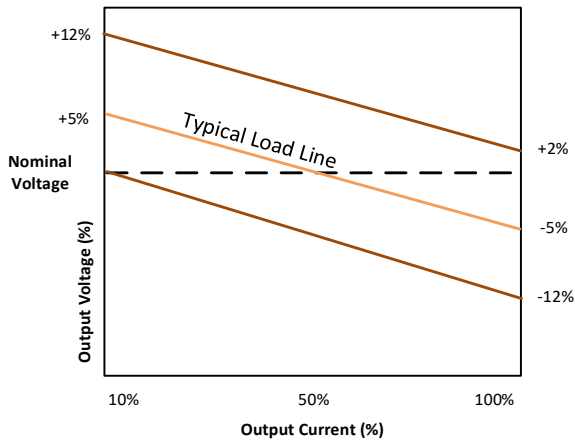
Parameters

Standards	Design to meet IEC62368/UL62368/EN62368 (5Vin models only)	
	EMC - Conducted and radiated emission	CISPR32/EN55032, Class B the recommended EMI circuit
	Electrostatic Discharge Immunity	IEC 61000-4-2 Air ± 8 KV, Contact ± 4 KV, Criteria B (5Vin models) IEC 61000-4-2 Air ± 8 KV, Contact ± 6 KV, Criteria B with the recommended EMI circuit (12/24Vin models)

Typical Characteristic

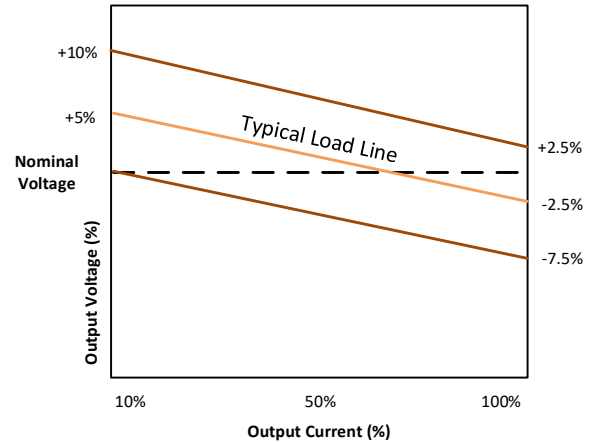
5Vin 3.3Vout models

Tolerance Envelope Graph



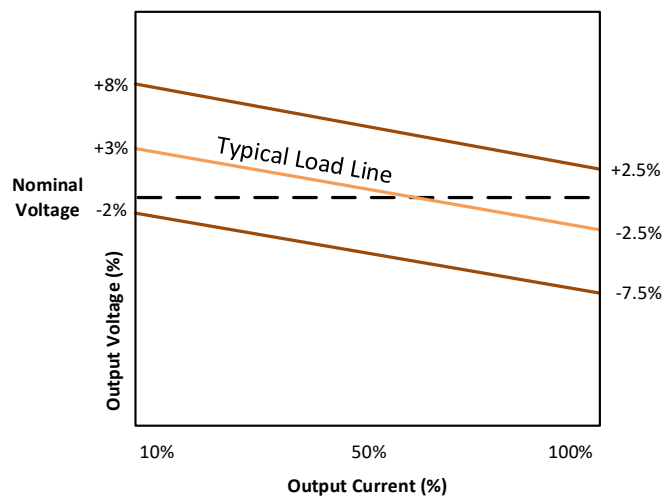
Other 5Vin models

Tolerance Envelope Graph

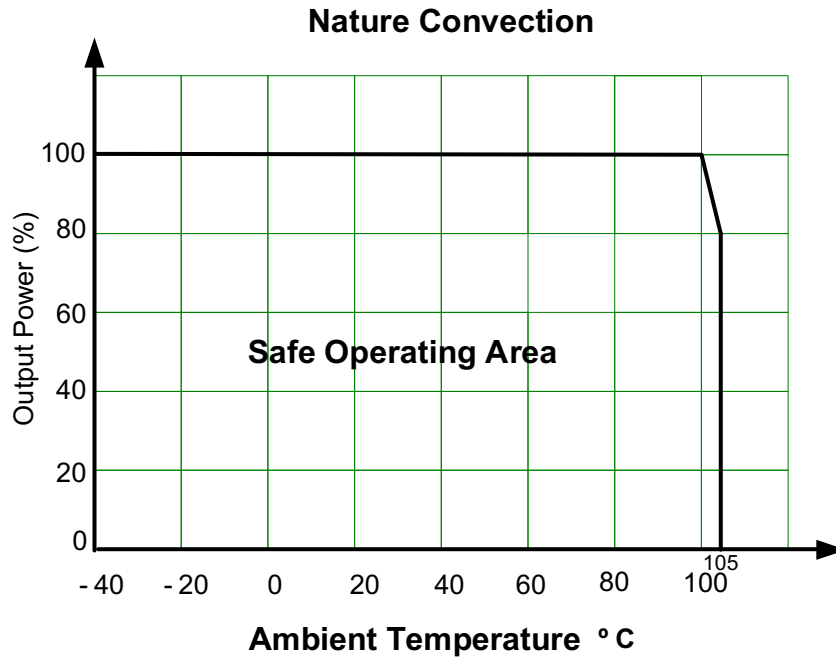


12/24Vin models

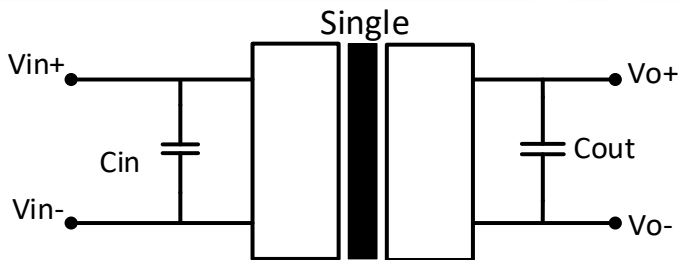
Tolerance Envelope Graph



Derating

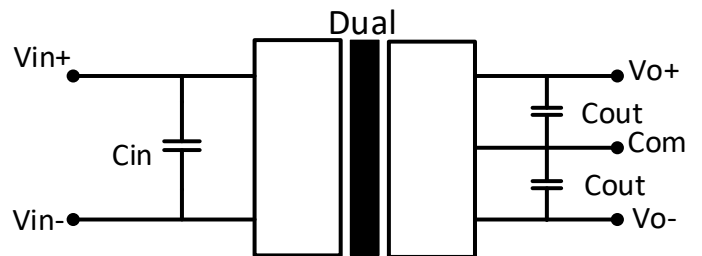


Typical Application Circuit



Vin	Cin
5	4.7 μF
12	2.2 μF
24	1 μF

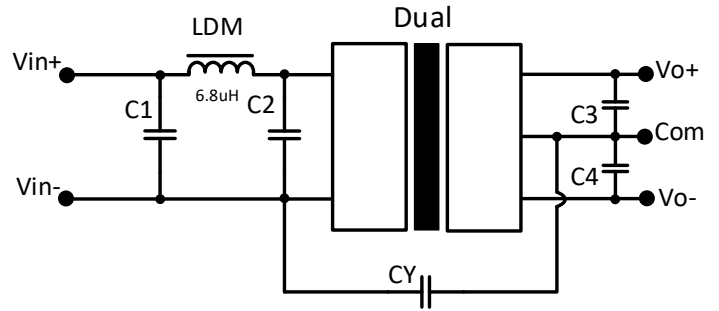
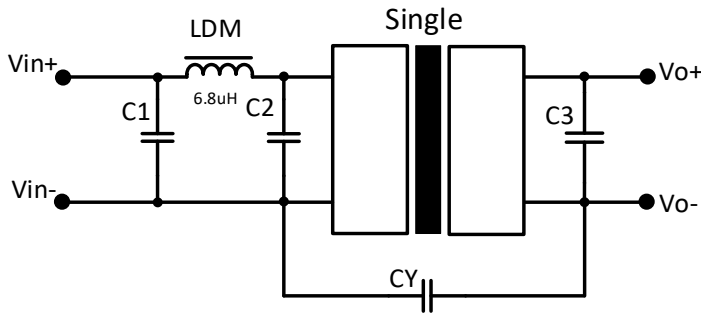
Vout	Cout
3.3 V	10 μF
5 V	10 μF
9 V	4.7 μF
12 V	2.2 μF
15 V	1 μF
24V	0.47 μF



24Vin Dual output model	
Vout	Cout
±15V	0.47 μF

1500VDC isolation models	
Vout	Cout
15V	2.2 μF

EMI Recommended Circuit

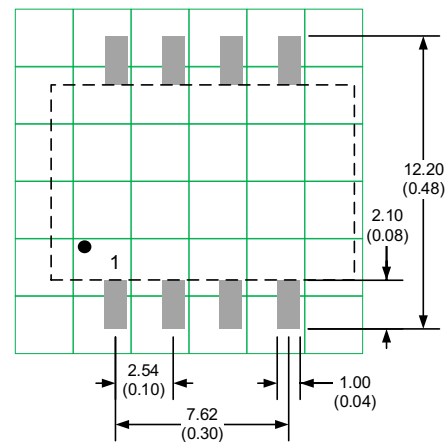
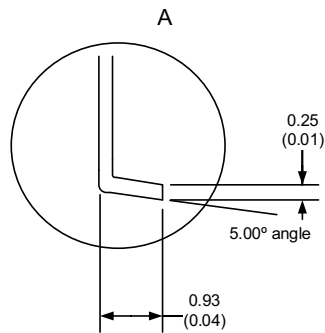
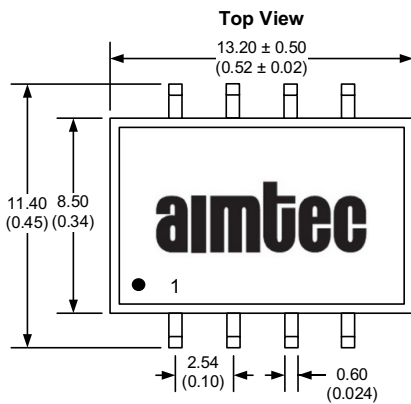
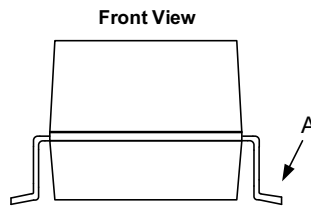
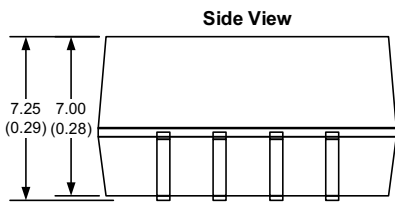


Input voltage	C1/C2	C3/C4
5V	4.7 μ F/25V	Refer to Cout in typical circuit
12V	4.7 μ F/50V	Refer to Cout in typical circuit
24V	4.7 μ F/50V	Refer to Cout in typical circuit

Input voltage	Output voltage	CY1
5V	3.3/5/9V	N/C
	12/15/24V	1nF/4KVDC for 3KV isolation 1nF/2KVDC for 1.5KV isolation
12V	All	270pF/3KVDC
24V	All	270pF/3KVDC

Dimensions

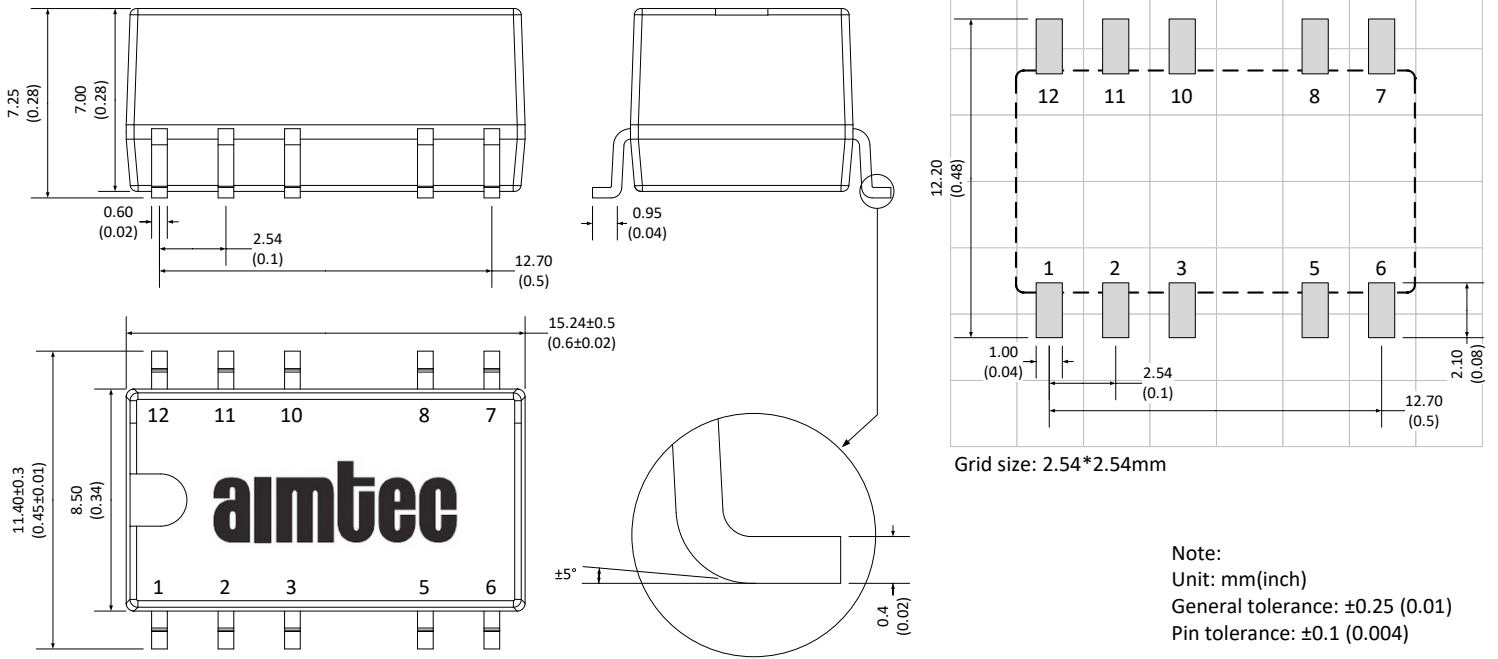
Dimensions for 1500VDC isolated models



Note: Grid 2.54*2.54mm

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

Dimensions for 3000VDC isolated models



Note:
Unit: mm(inch)
General tolerance: ± 0.25 (0.01)
Pin tolerance: ± 0.1 (0.004)

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

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