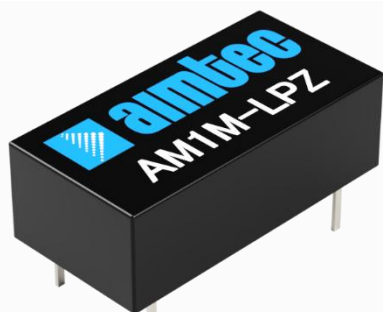


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AM1M-LPZ



DIP4 Package

The AM1M-LPZ is a 1W DIP14 DC/DC converter that offers great cost savings thanks to an improved manufacturing process. It also features excellent reliability and performance while offering a standard input voltage range of 3.3-24VDC as well as an output voltage of 3.3-24V. This compact SIP4 design will surely benefit your new system design.

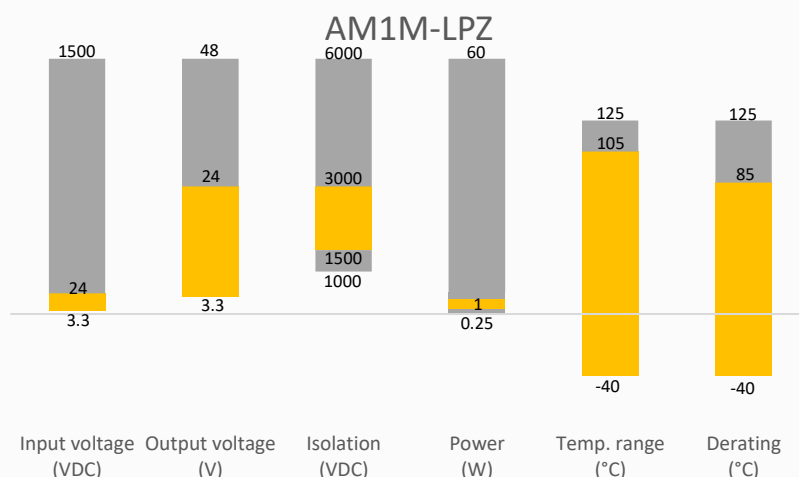
This new series offers great operating temperatures, from -40 to 105°C with full power up to 85°C. Also, an isolation of 1500 or 3000VDC for improved reliability and system safety as well as a great 3,500,000h MTBF come standard.

The AM1M-LPZ is suitable for instrumentation, industrial controls, industrial applications, communication and IoT applications.

Features

- High I/O Isolation of 1500/3000VDC
- Continuous Short circuit protection
- Operating Temp: -40 °C to +105 °C
- Industry standard DIP14 pin-out
- Efficiency up to 89%
- Unregulated output

Summary



Training



Product Training Video
(click to open)



Press Release

Coming Soon!

Application Notes

Applications



IoT



Industrial



Telecom



Portable Equipment

Models & Specifications



Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current max min (mA)*	Isolation (VDC)	Maximum capacitive Load (μF)	Efficiency Typ. (%)
AM1M-0303SLPZ	3.3 (2.97-3.63)	3.3	303 / 30	1500	4000	82
AM1M-0305SLPZ	3.3 (2.97-3.63)	5	200 / 20	1500	4000	83
AM1M-0309SLPZ	3.3 (2.97-3.63)	9	111 / 11	1500	2000	84
AM1M-0312SLPZ	3.3 (2.97-3.63)	12	84 / 8	1500	1000	85
AM1M-0503SLPZ	5 (4.5-5.5)	3.3	303 / 30	1500	4000	83
AM1M-0505SLPZ	5 (4.5-5.5)	5	200 / 20	1500	4000	86
AM1M-0509SLPZ	5 (4.5-5.5)	9	111 / 12	1500	2000	86
AM1M-0512SLPZ	5 (4.5-5.5)	12	84 / 9	1500	1000	88
AM1M-0515SLPZ	5 (4.5-5.5)	15	67 / 7	1500	680	88
AM1M-0524SLPZ	5 (4.5-5.5)	24	42 / 4	1500	560	89
AM1M-1203SLPZ	12 (10.8-13.2)	3.3	303 / 30	1500	4000	84
AM1M-1205SLPZ	12 (10.8-13.2)	5	200 / 20	1500	4000	86
AM1M-1209SLPZ	12 (10.8-13.2)	9	111 / 12	1500	2000	87
AM1M-1212SLPZ	12 (10.8-13.2)	12	84 / 9	1500	1000	87
AM1M-1215SLPZ	12 (10.8-13.2)	15	67 / 7	1500	680	88
AM1M-1224SLPZ	12 (10.8-13.2)	24	42 / 5	1500	560	89
AM1M-1505SLPZ	15 (13.5-16.5)	5	200 / 20	1500	4000	86
AM1M-1509SLPZ	15 (13.5-16.5)	9	111 / 12	1500	2000	87
AM1M-1512SLPZ	15 (13.5-16.5)	12	84 / 9	1500	1000	87
AM1M-1515SLPZ	15 (13.5-16.5)	15	67 / 7	1500	680	88
AM1M-2403SLPZ	24 (21.6-26.4)	3.3	303 / 30	1500	4000	84
AM1M-2405SLPZ	24 (21.6-26.4)	5	200 / 20	1500	4000	87
AM1M-2409SLPZ	24 (21.6-26.4)	9	111 / 12	1500	2000	88
AM1M-2412SLPZ	24 (21.6-26.4)	12	84 / 9	1500	1000	88
AM1M-2415SLPZ	24 (21.6-26.4)	15	67 / 7	1500	680	88
AM1M-2424SLPZ	24 (21.6-26.4)	24	42 / 5	1500	560	89
AM1M-0303SH30LPZ	3.3 (2.97-3.63)	3.3	303 / 30	3000	4000	82
AM1M-0305SH30LPZ	3.3 (2.97-3.63)	5	200 / 20	3000	4000	83
AM1M-0309SH30LPZ	3.3 (2.97-3.63)	9	111 / 11	3000	2000	84
AM1M-0312SH30LPZ	3.3 (2.97-3.63)	12	84 / 8	3000	1000	85
AM1M-0315SH30LPZ	3.3 (2.97-3.63)	15	67 / 7	3000	680	85
AM1M-0324SH30LPZ	3.3 (2.97-3.63)	24	42 / 4	3000	560	84
AM1M-0503SH30LPZ	5 (4.5-5.5)	3.3	303 / 30	3000	4000	83
AM1M-0505SH30LPZ	5 (4.5-5.5)	5	200 / 20	3000	4000	86
AM1M-0509SH30LPZ	5 (4.5-5.5)	9	111 / 12	3000	2000	86
AM1M-0512SH30LPZ	5 (4.5-5.5)	12	84 / 9	3000	1000	88
AM1M-0515SH30LPZ	5 (4.5-5.5)	15	67 / 7	3000	680	88
AM1M-0524SH30LPZ	5 (4.5-5.5)	24	42 / 4	3000	560	89
AM1M-1203SH30LPZ	12 (10.8-13.2)	3.3	303 / 30	3000	4000	84
AM1M-1205SH30LPZ	12 (10.8-13.2)	5	200 / 20	3000	4000	86
AM1M-1209SH30LPZ	12 (10.8-13.2)	9	111 / 12	3000	2000	87
AM1M-1212SH30LPZ	12 (10.8-13.2)	12	84 / 9	3000	1000	87
AM1M-1215SH30LPZ	12 (10.8-13.2)	15	67 / 7	3000	680	88
AM1M-1224SH30LPZ	12 (10.8-13.2)	24	42 / 5	3000	560	89

AM1M-1505SH30LPZ	15 (13.5-16.5)	5	200 / 20	3000	4000	86
AM1M-1509SH30LPZ	15 (13.5-16.5)	9	111 / 12	3000	2000	87
AM1M-1512SH30LPZ	15 (13.5-16.5)	12	84 / 9	3000	1000	87
AM1M-1515SH30LPZ	15 (13.5-16.5)	15	67 / 7	3000	680	88
AM1M-1524SH30LPZ	15 (13.5-16.5)	24	42 / 5	3000	560	84
AM1M-2403SH30LPZ	24 (21.6-26.4)	3.3	303 / 30	3000	4000	84
AM1M-2405SH30LPZ	24 (21.6-26.4)	5	200 / 20	3000	4000	87
AM1M-2409SH30LPZ	24 (21.6-26.4)	9	111 / 12	3000	2000	88
AM1M-2412SH30LPZ	24 (21.6-26.4)	12	84 / 9	3000	1000	88
AM1M-2415SH30LPZ	24 (21.6-26.4)	15	67 / 7	3000	680	88
AM1M-2424SH30LPZ	24 (21.6-26.4)	24	42 / 5	3000	560	89

* Performance will be degraded if the load is not within the output current range.

Dual Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current max min (mA)*	Isolation (VDC)	Maximum capacitive Load (μF)	Efficiency Typ. (%)
AM1M-0505DLPZ	5 (4.5-5.5)	±5	±100 / ±10	1500	2000	86
AM1M-0509DLPZ	5 (4.5-5.5)	±9	±56 / ±6	1500	1000	86
AM1M-0512DLPZ	5 (4.5-5.5)	±12	±42 / ±5	1500	560	88
AM1M-0515DLPZ	5 (4.5-5.5)	±15	±34 / ±4	1500	220	88
AM1M-1203DLPZ	12 (10.8-13.2)	±3.3	±152 / ±15	1500	2000	84
AM1M-1205DLPZ	12 (10.8-13.2)	±5	±100 / ±10	1500	2000	86
AM1M-1209DLPZ	12 (10.8-13.2)	±9	±56 / ±6	1500	1000	87
AM1M-1212DLPZ	12 (10.8-13.2)	±12	±42 / ±5	1500	560	87
AM1M-1215DLPZ	12 (10.8-13.2)	±15	±34 / ±4	1500	220	88
AM1M-1505DLPZ	15 (13.5-16.5)	±5	±100 / ±10	1500	2000	86
AM1M-1512DLPZ	15 (13.5-16.5)	±12	±42 / ±5	1500	560	87
AM1M-1515DLPZ	15 (13.5-16.5)	±15	±34 / ±4	1500	220	88
AM1M-2405DLPZ	24 (21.6-26.4)	±5	±100 / ±10	1500	2000	87
AM1M-2409DLPZ	24 (21.6-26.4)	±9	±56 / ±6	1500	1000	88
AM1M-2412DLPZ	24 (21.6-26.4)	±12	±42 / ±5	1500	560	88
AM1M-2415DLPZ	24 (21.6-26.4)	±15	±34 / ±4	1500	220	88
AM1M-0503DH30LPZ	5 (4.5-5.5)	±3.3	±152 / ±15	3000	2000	84
AM1M-0505DH30LPZ	5 (4.5-5.5)	±5	±100 / ±10	3000	2000	86
AM1M-0509DH30LPZ	5 (4.5-5.5)	±9	±56 / ±6	3000	1000	86
AM1M-0512DH30LPZ	5 (4.5-5.5)	±12	±42 / ±5	3000	560	88
AM1M-0515DH30LPZ	5 (4.5-5.5)	±15	±34 / ±4	3000	220	88
AM1M-0524DH30LPZ	5 (4.5-5.5)	±24	±21 / ±3	3000	100	88
AM1M-1203DH30LPZ	12 (10.8-13.2)	±3.3	±152 / ±15	3000	2000	84
AM1M-1205DH30LPZ	12 (10.8-13.2)	±5	±100 / ±10	3000	2000	86
AM1M-1209DH30LPZ	12 (10.8-13.2)	±9	±56 / ±6	3000	1000	87
AM1M-1212DH30LPZ	12 (10.8-13.2)	±12	±42 / ±5	3000	560	87
AM1M-1215DH30LPZ	12 (10.8-13.2)	±15	±34 / ±4	3000	220	88
AM1M-1224DH30LPZ	12 (10.8-13.2)	±24	±21 / ±3	3000	100	84
AM1M-1505DH30LPZ	15 (13.5-16.5)	±5	±100 / ±10	3000	2000	86
AM1M-1512DH30LPZ	15 (13.5-16.5)	±12	±42 / ±5	3000	560	87
AM1M-1515DH30LPZ	15 (13.5-16.5)	±15	±34 / ±4	3000	220	88
AM1M-1524DH30LPZ	15 (13.5-16.5)	±24	±21 / ±2	3000	100	84
AM1M-2405DH30LPZ	24 (21.6-26.4)	±5	±100 / ±10	3000	2000	87
AM1M-2409DH30LPZ	24 (21.6-26.4)	±9	±56 / ±6	3000	1000	88

AM1M-2412DH30LPZ	24 (21.6-26.4)	±12	±42 / ±5	3000	560	88
AM1M-2415DH30LPZ	24 (21.6-26.4)	±15	±34 / ±4	3000	220	88
AM1M-2424DH30LPZ	24 (21.6-26.4)	±24	±21 / ±3	3000	100	84
* Performance will be degraded if the load is not within the output current range.						

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Input current	Full load, 3.3Vin	370		mA
	Full load, 5Vin	235		mA
	Full load, 12Vin	99		mA
	Full load, 15Vin	80		mA
	Full load, 24Vin	50		mA
No load input current		3	15	mA
Filter	Capacitor			
Absolute maximum rating	Maximum duration 1s, 3.3Vin	> -0.7	5	VDC
	Maximum duration 1s, 5Vin	> -0.7	9	VDC
	Maximum duration 1s, 12Vin	> -0.7	18	VDC
	Maximum duration 1s, 15Vin	> -0.7	21	VDC
	Maximum duration 1s, 24Vin	> -0.7	30	VDC
Input reflected ripple current		15		mA

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage	60 sec, leakage ≤ 1mA	>1500		VDC
	60 sec, leakage ≤ 1mA for H30 models	>3000		VDC
Resistance	500VDC	>1000		MΩ
Capacitance	100kHz/0.1V	20		pF

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	See output voltage tolerance		+10/-7.5	%
Line regulation	Per 1% Vin change, 3.3Vout models		1.5	%
	Per 1% Vin change, other models		1.2	%
Load regulation	10-100% load, 3.3Vout	10		%
	10-100% load, 5Vout	8		%
	10-100% load, 9Vout	8		%
	10-100% load, 12Vout	7		%
	10-100% load, 15Vout	6		%
	10-100% load, 24Vout	6		%
Ripple & Noise*		45	120	mV pk-pk
Temperature coefficient		±0.03		%/°C

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

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	Full load	220		KHz
Short circuit protection	Continuous, Auto recovery			

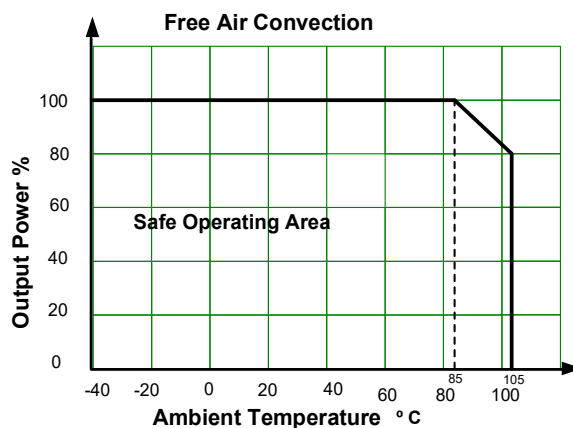
Operating temperature	With derating	-40 to +105		°C
Storage temperature		-55 to +125		°C
Case temperature rise	Full load	25		°C
Manual soldering temperature	1.5mm away from case, duration ≤ 10sec		300	°C
Cooling	Free air convection			
Humidity	Non-condensing	>5	95	% RH
Vibration	10-150Hz, 5G, 0.75mm, along X, Y and Z			
Case material	Black plastic (flammability to UL 94V-0)			
Weight		2.4		g
Dimensions (L x W x H)	0.77 x 0.39 x 0.32 inches (19.50 x 9.80 x 8.00 mm)			
MTBF	3 500 000 hrs (MIL-HDBK -217F, t=+25°C) / Full Load			
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

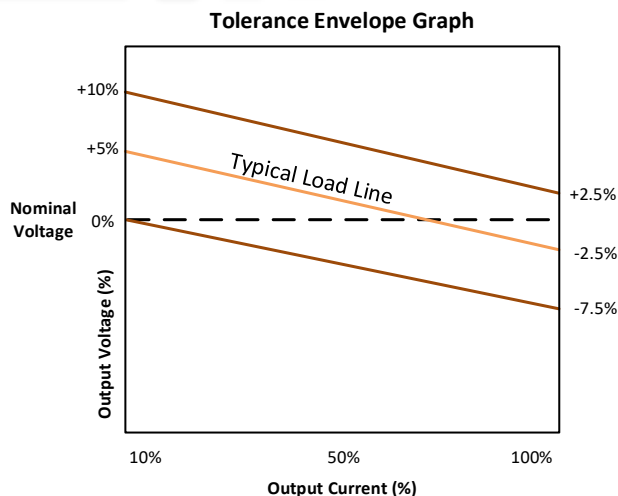
Parameters

Standards	Information technology Equipment	Design to meet UL/EN/IEC 62368-1
	EMC - Conducted and radiated emission	CISPR32 / EN55032, class B with the recommended EMI circuit
	Electrostatic Discharge Immunity	IEC 61000-4-2 Air ±8KV, Contact ±6KV, Criteria B

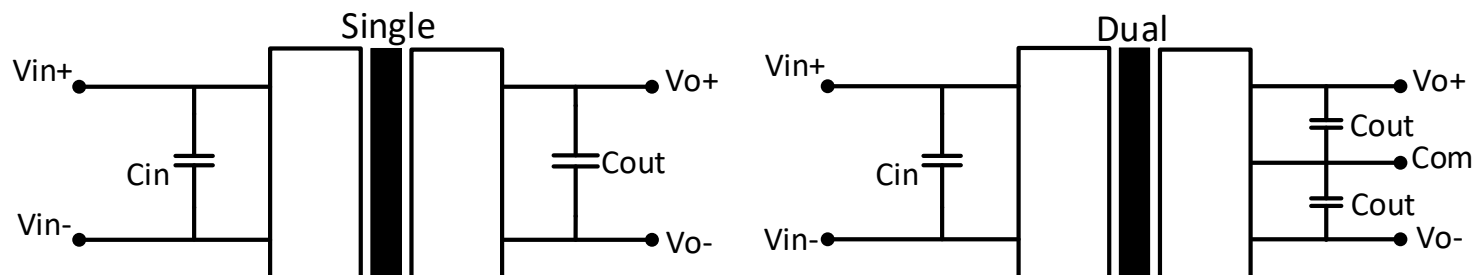
Derating



Output voltage tolerance

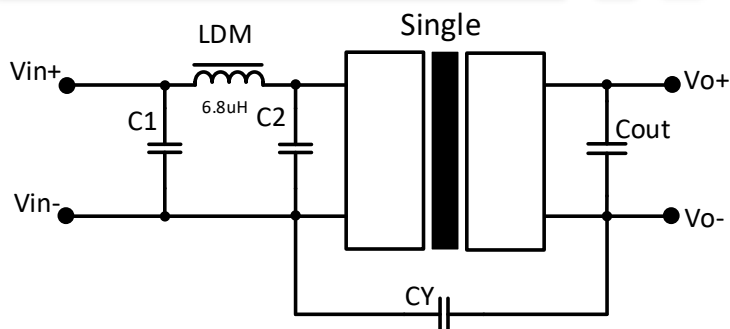


Typical application circuit



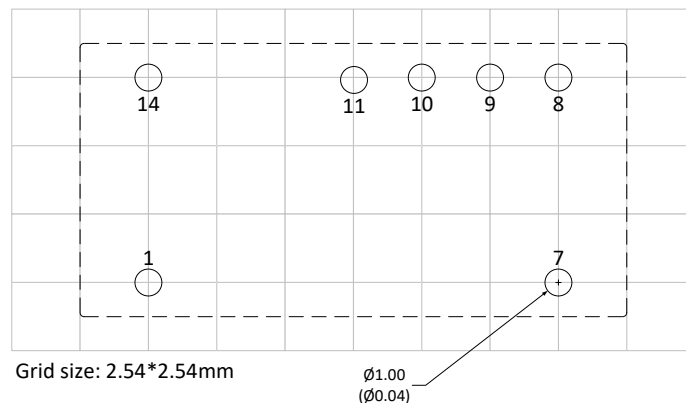
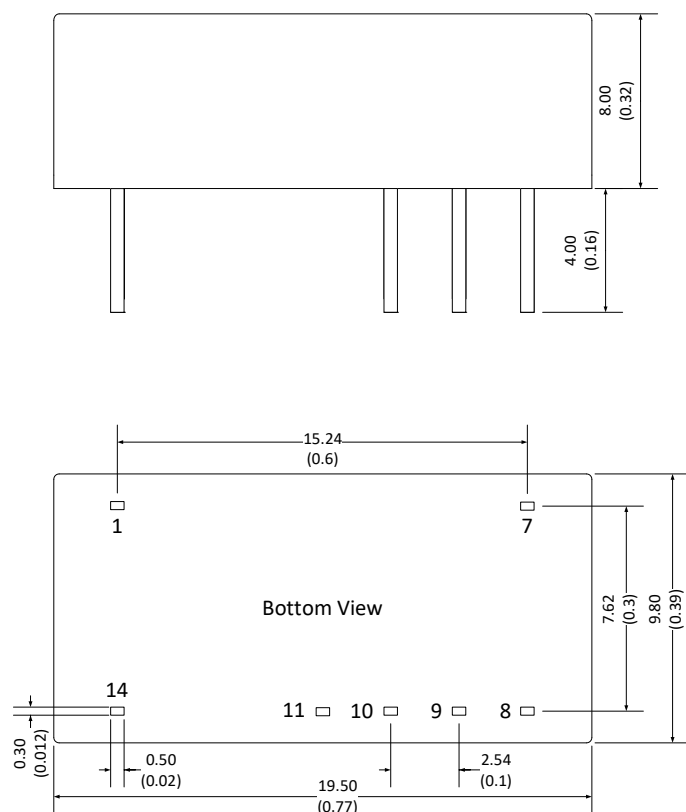
Vin	Cin	Single output models		Dual output models	
		Vout	Cout	Vout	Cout
3.3V	4.7 μ F/16V	3.3V	10 μ F/16V	$\pm$ 3.3V	10 μ F/16V
5V	4.7 μ F/16V	5V	10 μ F/16V	$\pm$ 5V	10 μ F/16V
12V	2.2 μ F/25V	9V	4.7 μ F/16V	$\pm$ 9V	4.7 μ F/16V
15V	2.2 μ F/25V	12V	2.2 μ F/25V	$\pm$ 12V	2.2 μ F/25V
24V	1 μ F/50V	15V	1 μ F/25V	$\pm$ 15V	1 μ F/25V
		24V	0.47 μ F/50V	$\pm$ 24V	0.47 μ F/50V

Recommended EMI circuit



Models	C1/C2	CY
1500VDC	4.7 μ F/50V	1nF/2kVdc
3000VDC	4.7 μ F/50V	1nF/4kVdc

Dimensions



Note:
Unit: mm(inch)
General tolerance: ± 0.50 (0.02)
Pin tolerance: ± 0.1 (0.004)

Pin Out Specifications				
Pin	1.5KV isolation models		3KV isolation models	
	Single output	Dual output	Single output	Dual output
1	-V Input	-V Input	-V Input	-V Input
7	NC	NC	NC	NC
8	-V Output	-V Output	+V Output	+V Output
9	+V Output	+V Output	No pin	Com
10	No pin	No pin	-V Output	-V Output
11	No pin	-V Output	No pin	No pin
14	+V Input	+V Input	+V Input	+V Input

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