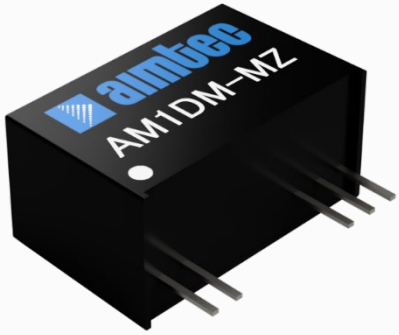
AM1DM-MZ



SIP9 Package

Aimtec launched the AM1DM-MZ, a 1W medical grade DC/DC converter in a SIP9 case to satisfy the rigorous power demands of medical equipment. This series meets EN60601-1, ANSI/AAMI ES60601-1 medical safety standard and has a high I/O isolation of 5000VAC or 6000VDC with reinforced insulation rated for a 250VAC working voltage and 2xMOPP.

This 1W converter has a standard input voltage range of 10.8-26.4VDC, single & dual outputs (3.3...24V, +/-5...+/-15V). This new series offers great operating temperatures, from -40 to 105°C with full power up to 85°C, as well as a great 19,360,000h MTBF come standard. In terms of safety, this series has output short circuit protections.

AM1DM-MZ series meet reinforced insulation requirements. They are specially designed for applications that require compact size, high isolation, low isolation capacitor and low leakage current power. They are widely used in medical, electricity, IGBT driver and so on.

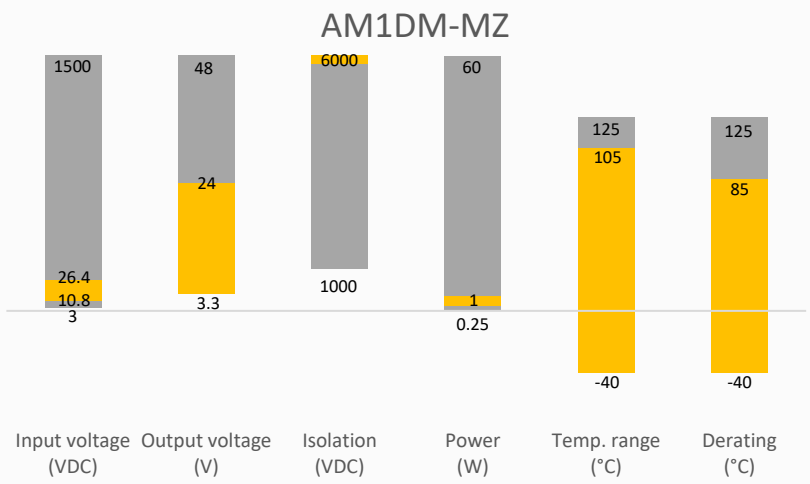
Features

- High I/O Isolation of 5000VAC or 6000VDC
- Continuous Short circuit protection
- Operating Temp: -40 °C to +105 °C
- Industry standard SIP9 pin-out
- Efficiency up to 83%
- Unregulated output
- Meets EN60601-1, ANSI/AAMI ES60601-1 medical safety standard (2xMOPP)

RoHS

3yr Warranty

Summary



Training

Product Training Video (click to open)

Press Release

Coming Soon!

Application Notes

Applications

Industrial

Portable Equipment

Medical

IoT

Models & Specifications

Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Full | No load typ. (mA)	Output Current max | min (mA)*	Isolation (VDC)	Maximum capacitive Load (µF)	Efficiency Typ. (%)
AM1DM-1203SH60MZ	12 (10.8-13.2)	3.3	106 / 10	303 / 31	6000	2200	76
AM1DM-1205SH60MZ	12 (10.8-13.2)	5	106 / 10	200 / 20	6000	2200	79
AM1DM-1209SH60MZ	12 (10.8-13.2)	9	106 / 10	111 / 12	6000	680	81
AM1DM-1212SH60MZ	12 (10.8-13.2)	12	106 / 10	84 / 9	6000	470	83
AM1DM-1215SH60MZ	12 (10.8-13.2)	15	106 / 10	67 / 7	6000	470	83
AM1DM-1224SH60MZ	12 (10.8-13.2)	24	106 / 10	42 / 4	6000	220	82
AM1DM-2405SH60MZ	24 (21.6-26.4)	5	56 / 12	200 / 20	6000	2200	76
AM1DM-2409SH60MZ	24 (21.6-26.4)	9	56 / 12	111 / 12	6000	680	76
AM1DM-2412SH60MZ	24 (21.6-26.4)	12	56 / 12	84 / 9	6000	470	76
AM1DM-2415SH60MZ	24 (21.6-26.4)	15	56 / 12	67 / 7	6000	470	76
AM1DM-2424SH60MZ	24 (21.6-26.4)	24	56 / 12	42 / 4	6000	220	76

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

Dual Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Full | No load typ. (mA)	Output Current max | min (mA)*	Isolation (VDC)	Maximum capacitive Load (µF)	Efficiency Typ. (%)
AM1DM-1205DH60MZ	12 (10.8-13.2)	± 5	106 / 10	± 100 / ± 10	6000	± 1000	79
AM1DM-1209DH60MZ	12 (10.8-13.2)	± 9	106 / 10	± 56 / ± 6	6000	± 470	79
AM1DM-1212DH60MZ	12 (10.8-13.2)	± 12	106 / 10	± 42 / ± 5	6000	± 220	81
AM1DM-1215DH60MZ	12 (10.8-13.2)	± 15	106 / 10	± 34 / ± 4	6000	± 220	81
AM1DM-1505DH60MZ	15 (13.5-16.5)	± 5	90 / 10	± 100 / ± 10	6000	± 1000	77
AM1DM-1512DH60MZ	15 (13.5-16.5)	± 12	90 / 10	± 42 / ± 5	6000	± 220	79
AM1DM-1515DH60MZ	15 (13.5-16.5)	± 15	90 / 10	± 33 / ± 4	6000	± 220	79
AM1DM-2405DH60MZ	24 (21.6-26.4)	± 5	56 / 12	± 100 / ± 10	6000	± 1000	75
AM1DM-2409DH60MZ	24 (21.6-26.4)	± 9	56 / 12	± 56 / ± 6	6000	± 470	75
AM1DM-2412DH60MZ	24 (21.6-26.4)	± 12	56 / 12	± 42 / ± 5	6000	± 220	76
AM1DM-2415DH60MZ	24 (21.6-26.4)	± 15	56 / 12	± 34 / ± 4	6000	± 220	76

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

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Filter	Capacitor			
Absolute maximum rating	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		200		mA

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	See output voltage tolerance	5	10	%
Line regulation	Per 1% Vin change, 3.3Vout models		1.5	%
	Per 1% Vin change, other models		1.2	%
Load regulation	10-100% load, 3.3/5Vout models		20	%
	10-100% load, other models		15	%
Ripple & Noise*	3.3Vout models	100	150	mV pk-pk
	other models	80	120	mV pk-pk
Temperature coefficient		±0.02		%/°C

* 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, leakage ≤ 1mA	>5000		VAC
	60 sec, leakage ≤ 1mA	>6000		VDC
Tested I/O resistance	500VDC	>1000		MΩ
Capacitance	100kHz/0.1V	4		pF
Leakage Current	250VAC, 50/60Hz		2	µA

General Specifications

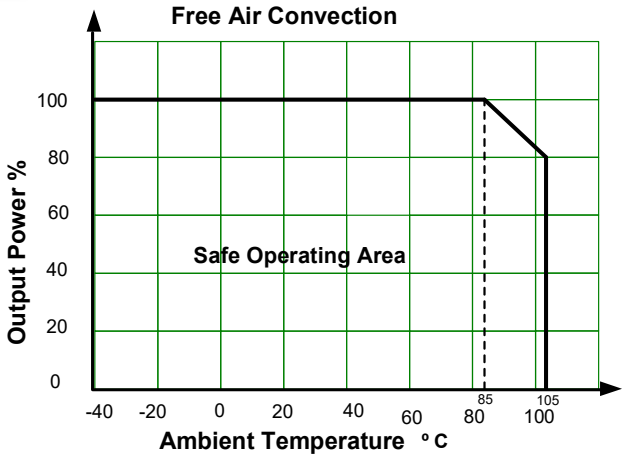
Parameters	Conditions	Typical	Maximum	Units
Switching frequency	Full load, nominal input	200		KHz
Short circuit protection	Continuous, Auto recovery			
Operating temperature	With derating	-40 to +105		°C
Storage temperature		-55 to +125		°C
Case temperature rise	Ta = 25°C	25		°C
Manual soldering temperature	1.5mm away from case, duration ≤ 10sec		300	°C
Cooling	Free air convection			
Humidity	Non-condensing	>5	95	% RH
Creepage & Clearance distance		>8		mm
Altitude			5000	m
Case material	Black plastic (flammability to UL 94V-0)			
Weight		4.0		g
Dimensions (L x W x H)	0.77 x 0.39 x 0.49 inches (19.50 x 9.80 x 12.50 mm)			
MTBF	19 360 000 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

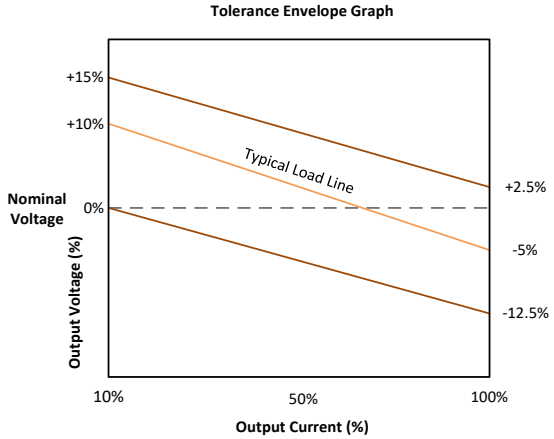
Parameters		
Standards	Designed to meet UL61010-1	
	Information technology equipment	Design to meet IEC62368, EN60601-1, ANSI/AAMI ES60601-1(2xMOPP)
	EMC - Conducted and radiated emission	CISPR32 / EN55032, class B with the recommended EMI circuit EN60601-1-2/CISPR 11 GROUP1, class B with the recommended EMI circuit
	Electrostatic Discharge Immunity	EN60601-1-2(IEC/EN61000-4-2) Air ±15KV, Contact ±8KV, Criteria B

Derating

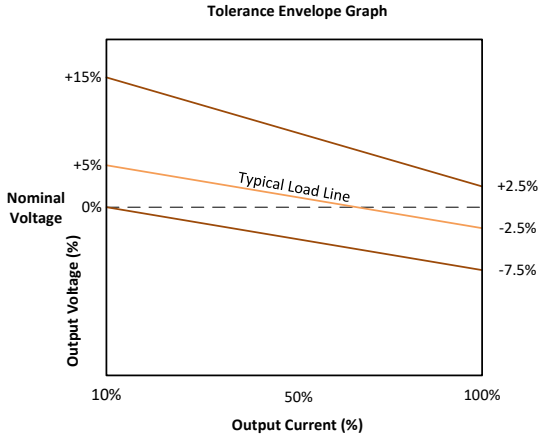


Output voltage tolerance

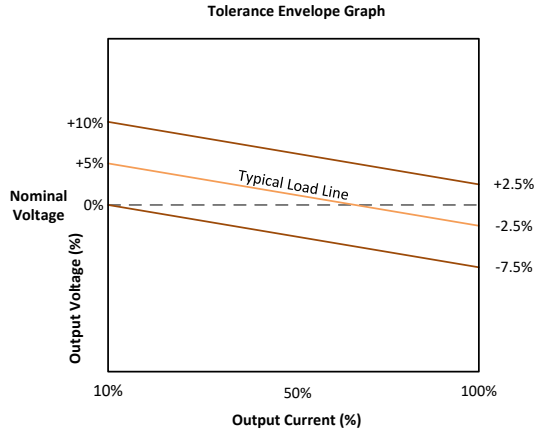
3.3Vout models



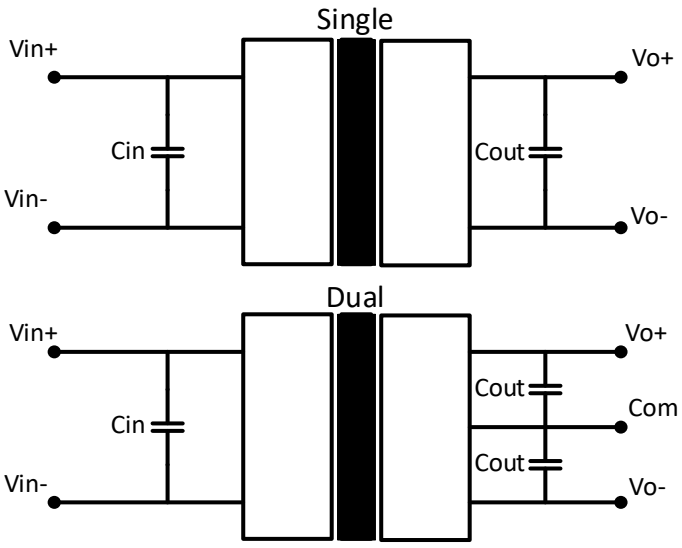
5Vout models



Other models



Typical application circuit

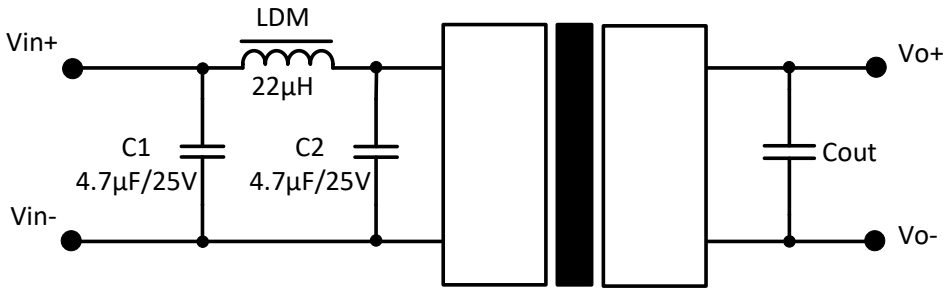


Vin	Cin
12V	10µF/25V
15V	1µF/25V
24V	2.2µF/50V

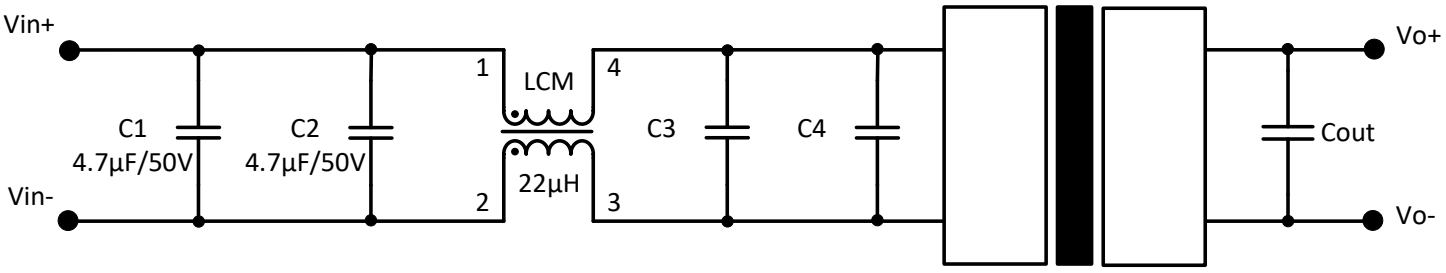
Vout		Cout
Single	3.3 / 5 / 9V	10µF/16V
	12V	2.2µF/25V
	15V	1µF/25V
	24V	0.47µF/50V
Dual	± 5 / ± 9V	4.7µF/16V
	± 12 / ± 15V	1µF/25V

Recommended EMI circuit

12 / 15 Vin models

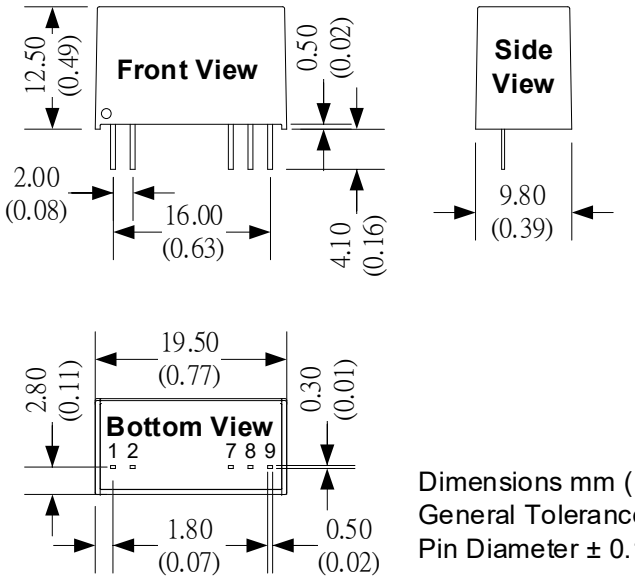


24 Vin models

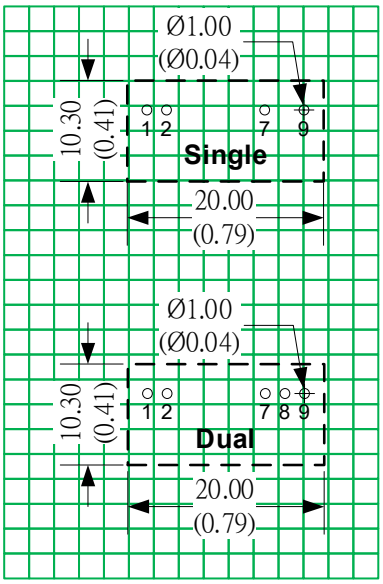


24Vin models			
Vout	C3	C4	LCM
Single	4.7µF/50V	4.7µF/50V	22µH (Nickel zinc inductance)
Dual	100µF/50V	--	22µH (Nickel zinc inductance)

Dimensions



Dimensions mm (inch)
General Tolerance ±0.50 (±0.02)
Pin Diameter ± 0.10 (± 0.004)



Grid 2.54*2.54mm

Pin Out Specifications		
Pin	Single output	Dual output
1	+V Input	+V Input
2	-V Input	-V Input
7	-V Output	-V Output
8	No Pin	Common
9	+V Output	+V Output

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