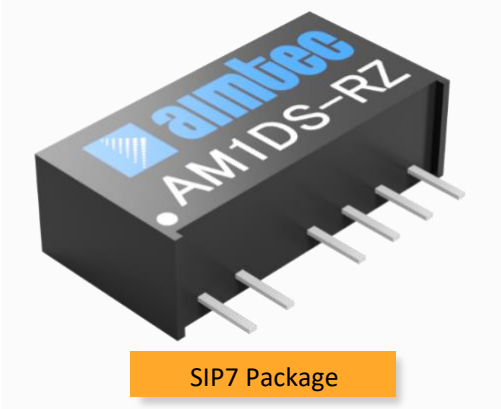


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AM1DS-RZ



The AM1DS-RZ is a new 1W SIP7 DC/DC converter that offers high product quality by the 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 range of 3.3-15V. This compact SIP7 design will surely benefit your new system design.

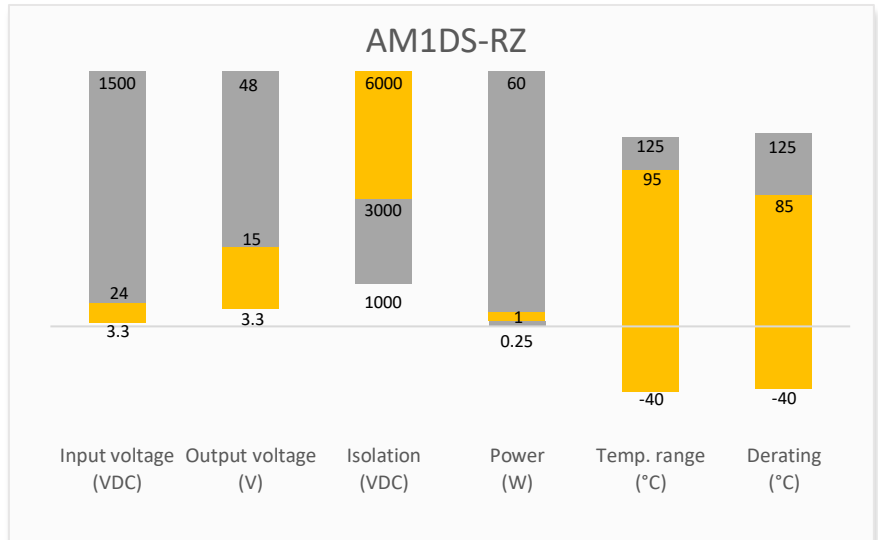
This new series offers great operating temperatures, from -40 to 95°C with full power up to 90°C. Also, isolation of 3000 and 6000VDC options for high reliability and system safety as well as a great 2,500,000h MTBF come standard.

The AM1DS-RZ is suitable for instrumentation, industrial controls, industrial digital isolation applications, isolated communication interface and IoT applications.


Features

- High I/O Isolation of 3000/6000VDC
- Continuous Short circuit protection
- Operating Temp: -40 °C to +95 °C
- Industry standard SIP7 pin-out
- Efficiency up to 84%
- Unregulated output
- Functional insulation


Summary



Training



Product Training Video
(click to open)



Press Release

Coming Soon!

Application Notes

Applications



Models & Specifications



Single Output							
Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current Full No load typ. (mA)	Output Current max (mA)*	Isolation (VDC)	Maximum capacitive Load (μF)	Efficiency Typ. (%)
AM1DS-0303SH30RZ	3.3 (2.97-3.63)	3.3	393 / 55	303	3000	3300	77
AM1DS-0305SH30RZ	3.3 (2.97-3.63)	5	383 / 55	200	3000	2200	79
AM1DS-0312SH30RZ	3.3 (2.97-3.63)	12	369 / 70	83	3000	470	82
AM1DS-0315SH30RZ	3.3 (2.97-3.63)	15	388 / 85	66	3000	470	78
AM1DS-0503SH30RZ	5 (4.5-5.5)	3.3	259 / 40	303	3000	3300	77
AM1DS-0505SH30RZ	5 (4.5-5.5)	5	246 / 35	200	3000	2200	81
AM1DS-0512SH30RZ	5 (4.5-5.5)	12	243 / 45	83	3000	470	82
AM1DS-0515SH30RZ	5 (4.5-5.5)	15	243 / 55	66	3000	470	82
AM1DS-1203SH30RZ	12 (10.8-13.2)	3.3	105 / 20	303	3000	3300	79
AM1DS-1205SH30RZ	12 (10.8-13.2)	5	102 / 25	200	3000	2200	81
AM1DS-1212SH30RZ	12 (10.8-13.2)	12	102 / 30	83	3000	470	81
AM1DS-1215SH30RZ	12 (10.8-13.2)	15	105 / 35	66	3000	470	79
AM1DS-2403SH30RZ	24 (21.6-26.4)	3.3	53 / 15	303	3000	3300	78
AM1DS-2405SH30RZ	24 (21.6-26.4)	5	50 / 15	200	3000	2200	82
AM1DS-2412SH30RZ	24 (21.6-26.4)	12	49 / 15	83	3000	470	84
AM1DS-2415SH30RZ	24 (21.6-26.4)	15	50 / 20	66	3000	470	82
AM1DS-0303SH60RZ	3.3 (2.97-3.63)	3.3	393 / 55	303	6000	3300	77
AM1DS-0305SH60RZ	3.3 (2.97-3.63)	5	383 / 55	200	6000	2200	79
AM1DS-0312SH60RZ	3.3 (2.97-3.63)	12	369 / 70	83	6000	470	82
AM1DS-0315SH60RZ	3.3 (2.97-3.63)	15	388 / 85	66	6000	470	78
AM1DS-0503SH60RZ	5 (4.5-5.5)	3.3	259 / 40	303	6000	3300	77
AM1DS-0505SH60RZ	5 (4.5-5.5)	5	246 / 35	200	6000	2200	81
AM1DS-0512SH60RZ	5 (4.5-5.5)	12	243 / 45	83	6000	470	82
AM1DS-0515SH60RZ	5 (4.5-5.5)	15	243 / 55	66	6000	470	82
AM1DS-1203SH60RZ	12 (10.8-13.2)	3.3	105 / 20	303	6000	3300	79
AM1DS-1205SH60RZ	12 (10.8-13.2)	5	102 / 25	200	6000	2200	81
AM1DS-1212SH60RZ	12 (10.8-13.2)	12	102 / 30	83	6000	470	81
AM1DS-1215SH60RZ	12 (10.8-13.2)	15	105 / 35	66	6000	470	79
AM1DS-2403SH60RZ	24 (21.6-26.4)	3.3	53 / 15	303	6000	3300	78
AM1DS-2405SH60RZ	24 (21.6-26.4)	5	50 / 15	200	6000	2200	82
AM1DS-2412SH60RZ	24 (21.6-26.4)	12	49 / 15	83	6000	470	84
AM1DS-2415SH60RZ	24 (21.6-26.4)	15	50 / 20	66	6000	470	82

* 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 (mA)*	Isolation (VDC)	Maximum capacitive Load (μF)	Efficiency Typ. (%)
AM1DS-0303DH30RZ	3.3 (2.97-3.63)	±3.3	393 / 60	±151	3000	±1680	77
AM1DS-0305DH30RZ	3.3 (2.97-3.63)	±5	388 / 70	±100	3000	±1000	78
AM1DS-0312DH30RZ	3.3 (2.97-3.63)	±12	393 / 75	±41	3000	±220	77
AM1DS-0315DH30RZ	3.3 (2.97-3.63)	±15	388 / 75	±33	3000	±220	78

AM1DS-0503DH30RZ	5 (4.5-5.5)	±3.3	256 / 40	±151	3000	±1680	78
AM1DS-0505DH30RZ	5 (4.5-5.5)	±5	246 / 40	±100	3000	±1000	81
AM1DS-0512DH30RZ	5 (4.5-5.5)	±12	253 / 45	±41	3000	±220	79
AM1DS-0515DH30RZ	5 (4.5-5.5)	±15	256 / 45	±33	3000	±220	78
AM1DS-1203DH30RZ	12 (10.8-13.2)	±3.3	104 / 25	±151	3000	±1680	80
AM1DS-1205DH30RZ	12 (10.8-13.2)	±5	101 / 25	±100	3000	±1000	82
AM1DS-1212DH30RZ	12 (10.8-13.2)	±12	105 / 30	±41	3000	±220	79
AM1DS-1215DH30RZ	12 (10.8-13.2)	±15	101 / 25	±33	3000	±220	82
AM1DS-2403DH30RZ	24 (21.6-26.4)	±3.3	52 / 15	±151	3000	±1680	80
AM1DS-2405DH30RZ	24 (21.6-26.4)	±5	50 / 15	±100	3000	±1000	82
AM1DS-2412DH30RZ	24 (21.6-26.4)	±12	53 / 20	±41	3000	±220	78
AM1DS-2415DH30RZ	24 (21.6-26.4)	±15	54 / 15	±33	3000	±220	77
AM1DS-0303DH60RZ	3.3 (2.97-3.63)	±3.3	393 / 60	±151	6000	±1680	77
AM1DS-0305DH60RZ	3.3 (2.97-3.63)	±5	388 / 70	±100	6000	±1000	78
AM1DS-0312DH60RZ	3.3 (2.97-3.63)	±12	393 / 75	±41	6000	±220	77
AM1DS-0315DH60RZ	3.3 (2.97-3.63)	±15	388 / 75	±33	6000	±220	78
AM1DS-0503DH60RZ	5 (4.5-5.5)	±3.3	256 / 40	±151	6000	±1680	78
AM1DS-0505DH60RZ	5 (4.5-5.5)	±5	246 / 40	±100	6000	±1000	81
AM1DS-0512DH60RZ	5 (4.5-5.5)	±12	253 / 45	±41	6000	±220	79
AM1DS-0515DH60RZ	5 (4.5-5.5)	±15	256 / 45	±33	6000	±220	78
AM1DS-1203DH60RZ	12 (10.8-13.2)	±3.3	104 / 25	±151	6000	±1680	80
AM1DS-1205DH60RZ	12 (10.8-13.2)	±5	101 / 25	±100	6000	±1000	82
AM1DS-1212DH60RZ	12 (10.8-13.2)	±12	105 / 30	±41	6000	±220	79
AM1DS-1215DH60RZ	12 (10.8-13.2)	±15	101 / 25	±33	6000	±220	82
AM1DS-2403DH60RZ	24 (21.6-26.4)	±3.3	52 / 15	±151	6000	±1680	80
AM1DS-2405DH60RZ	24 (21.6-26.4)	±5	50 / 15	±100	6000	±1000	82
AM1DS-2412DH60RZ	24 (21.6-26.4)	±12	53 / 20	±41	6000	±220	78
AM1DS-2415DH60RZ	24 (21.6-26.4)	±15	54 / 15	±33	6000	±220	77

* 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 100ms, 3.3Vin		6	VDC
	Maximum duration 100ms, 5Vin		9	VDC
	Maximum duration 100ms, 12Vin		18	VDC
	Maximum duration 100ms, 24Vin		30	VDC
Input reflected ripple current*		20		mA pk-pk
Fuse (non-mandatory)	3.3Vin slow blow type	1		A
	5Vin slow blow type	0.5		A
	12Vin slow blow type	0.25		A
	24Vin, slow blow type	0.1		A

* Measured with a simulated source inductance of 12μH and a source capacitor Cin (47μF, ESR<1Ω at 100KHz).

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage	60 sec, leakage ≤ 1mA for H30 models	>3000		VDC
	60 sec, leakage ≤ 1mA for H60 models	>6000		VDC
Resistance (I/O)		>1000		MΩ

Capacitance (I/O)		65	pF
Insulation type	Functional insulation		

Output Specification				
Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	Nominal Vin		±3	%
Line regulation	Per 1% Vin change		±1.2	%
Load regulation	10-100% load, 3.3V / 5V output models		15	%
	10-100% load, 12V / 24V output models		10	%
Cross regulation	Asymmetrical load 25% / 100% for dual output, 3.3V / 5V input models		±6	%
	Asymmetrical load 25% / 100% for dual output, 12V / 24V input models		±4	%
Ripple & Noise*		100	150	mV pk-pk
Start-up time	Constant resistive load		10	ms
Temperature coefficient	Full load		±0.02	%/°C

* Ripple and Noise are measured at 20MHz bandwidth by using a 0.1µF MLCC.

General Specifications				
Parameters	Conditions	Typical	Maximum	Units
Switching frequency		100		KHz
Short circuit protection	Continuous, Auto recovery			
Operating temperature	With derating	-40 ~ +95		°C
Storage temperature		-40 ~ +125		°C
Case temperature			115	°C
Thermal impedance		>45		°C/W
Soldering temperature	1.5mm away from case, duration ≤ 10sec		260	°C
Cooling	Natural convection	>30	65	LFM
Humidity			95	% RH
Case material	Black plastic (flammability to UL 94V-0)			
Pin material	Tinned copper			
Potting material	Silicone (UL 94V-0)			
Weight		2.3		g
Dimensions (L x W x H)	0.76 x 0.24 x 0.39 inches (19.50 x 6.00 x 10.00 mm)			
MTBF	2 500 000 hrs (MIL-HDBK -217F, t=+25°C) / Full Load			

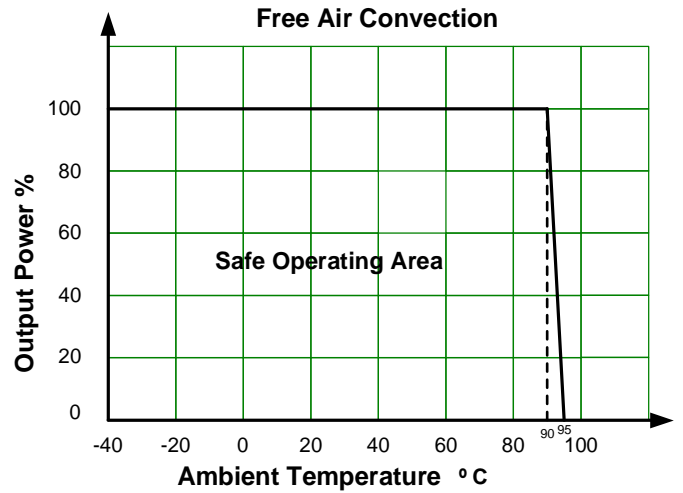
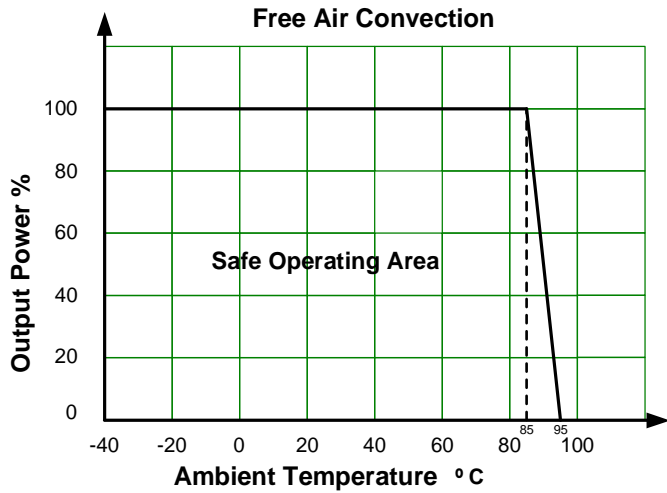
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Safety Specifications		
Parameters		
Agency approvals	CE, EN62368-1	
Standards	Information technology Equipment	Design to meet IEC/UL62368-1
	EMC - Conducted and radiated emission	EN55032, class B with the recommended EMI circuit
	Electrostatic Discharge Immunity	IEC 61000-4-2 Air ±15KV, Contact ±8KV, Criteria A
	RF, Electromagnetic Field Immunity	IEC 61000-4-3 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity	IEC 61000-4-4 ±2KV, Criteria A with the recommended EMI circuit
	Surge Immunity	IEC 61000-4-5 ±2KV, Criteria A with the recommended EMI circuit
	RF, Conducted Disturbance Immunity	IEC 61000-4-6 10Vr.m.s, Criteria A
	Power-frequency magnetic field Immunity	IEC 61000-4-8 100A/m, Criteria A

Derating

24Vin models

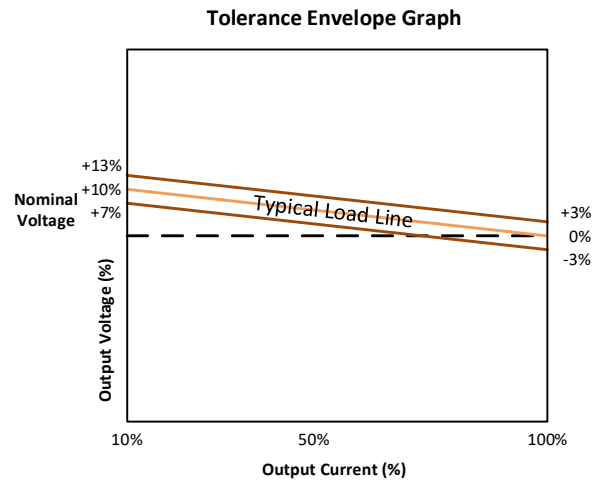
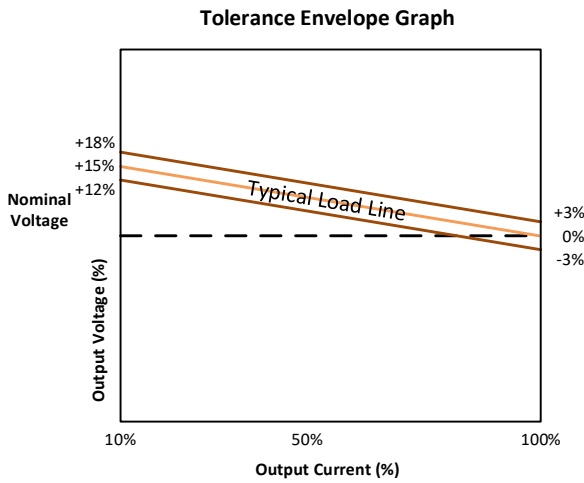
Others



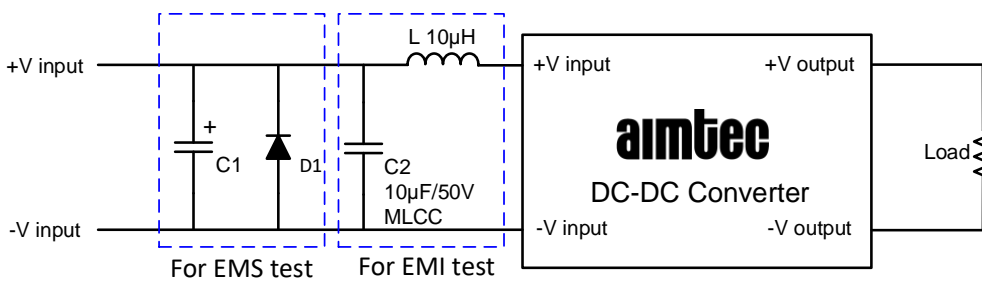
Output voltage tolerance

All 3.3/5Vout models

All 12/24Vout models

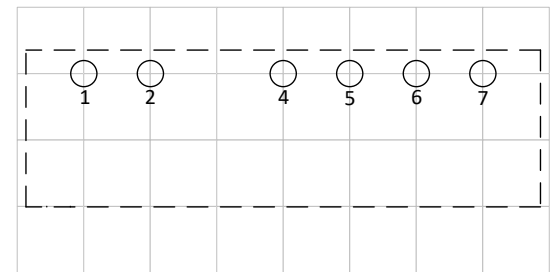
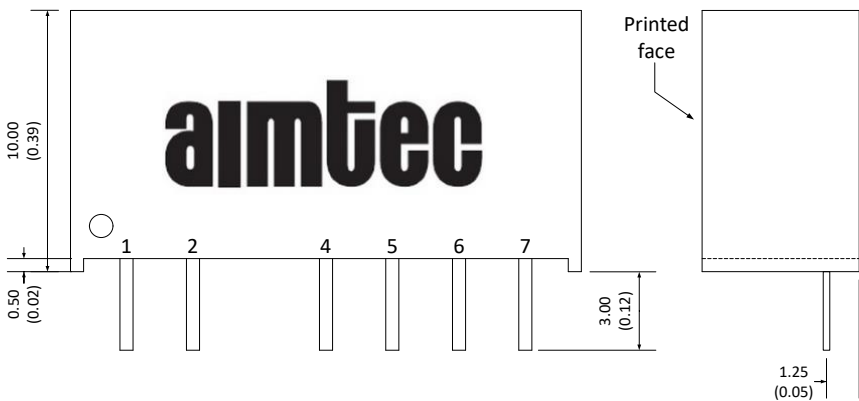


Recommended EMI circuit



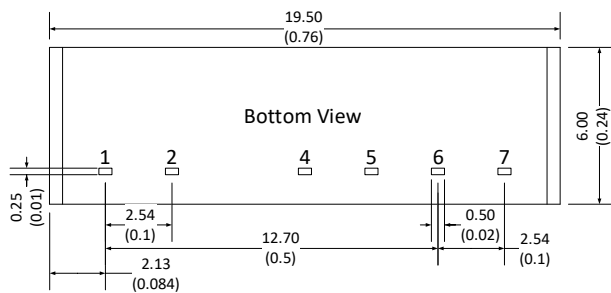
Vin	C1	D1
3.3V	NIPPON Chemi-con KY series 470μF/100V	SMDJ6A
5V		SMDJ9A
12V		SMDJ18A
24V	NIPPON Chemi-con KY series 680μF/100V	SMDJ30A

Dimensions



Grid size: 2.54*2.54mm
Through hold : \varnothing 0.8 (0.031)
Top view pad : \varnothing 1.0 (0.039)
Bottom view pad : \varnothing 1.6 (0.063)

Note:
Unit: mm(inch)
General tolerance: \pm 0.5 (0.02)
Pin tolerance: \pm 0.05 (0.002)
Pin pitch and length tolerance: \pm 0.35 (0.014)



Pin Out Specifications

Pin	3KV isolation Single output	3KV isolation Dual output	6KV isolation Single output	6KV isolation Dual output
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
4	-V Output	-V Output	No pin	No pin
5	No pin	Com	-V Output	-V Output
6	+V Output	+V Output	No pin	Com
7	No pin	No pin	+V Output	+V Output

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