

Series AM1D-RZ

1 Watt | DC-DC Converter



FEATURES:

- RoHS compliant
- High efficiency up to 89%
- Low profile plastic package
- 7 pin SIP package
- Operating temperature -40°C to + 85°C
- Short circuit protection
- Pin compatible with multiple manufacturers
- Input / Output Isolation 1000 and 3000VDC



Models

Single output

Model	Input Voltage (V)	Output Voltage (V)	Output Current Max (mA)	Isolation (VDC)	Input Current Full Load No Load (mA)		Max Capacitive Load (uF)	Load Regulation (%)	Efficiency (%)
AM1D-0505S-RZ	4.5-5.5	5	200	1000	230	20	220	6	83
AM1D-0509S-RZ	4.5-5.5	9	111.1	1000	230	30	220	5.5	86
AM1D-0512S-RZ	4.5-5.5	12	83.3	1000	228	20	100	5.5	87
AM1D-0515S-RZ	4.5-5.5	15	66.7	1000	228	20	100	5	87
AM1D-1205S-RZ	10.8-13.2	5	200	1000	98	15	220	4	84
AM1D-1209S-RZ	10.8-13.2	9	111.1	1000	95	15	220	3.5	86
AM1D-1212S-RZ	10.8-13.2	12	83.3	1000	94	15	100	3.5	88
AM1D-1215S-RZ	10.8-13.2	15	66.7	1000	94	15	100	3	88
AM1D-1505S-RZ	13.6-16.5	5	200	1000	78	10	220	4	84
AM1D-1509S-RZ	13.6-16.5	9	111.1	1000	76	10	220	3.5	86
AM1D-1512S-RZ	13.6-16.5	12	83.3	1000	76	10	100	3.5	87
AM1D-1515S-RZ	13.6-16.5	15	66.7	1000	75	10	100	3	89
AM1D-2405S-RZ	21.6-26.4	5	200	1000	51	7	220	4	81
AM1D-2409S-RZ	21.6-26.4	9	111.1	1000	49	7	220	3.5	84
AM1D-2412S-RZ	21.6-26.4	12	83.3	1000	48	7	100	3.5	85
AM1D-2415S-RZ	21.6-26.4	15	66.7	1000	48	7	100	2.5	86
AM1D-4805S-RZ	43.6-52.8	5	200	1000	27	5	220	4	78
AM1D-4809S-RZ	43.6-52.8	9	111.1	1000	26	5	220	3.5	80
AM1D-4812S-RZ	43.6-52.8	12	83.3	1000	26	5	100	3	81
AM1D-4815S-RZ	43.6-52.8	15	66.7	1000	26	5	100	3	81
AM1D-0505SH30-RZ	4.5-5.5	5	200	3000	230	20	220	6	83
AM1D-0509SH30-RZ	4.5-5.5	9	111.1	3000	230	30	220	5.5	86
AM1D-0512SH30-RZ	4.5-5.5	12	83.3	3000	228	20	100	5.5	87
AM1D-0515SH30-RZ	4.5-5.5	15	66.7	3000	228	20	100	5	87
AM1D-1205SH30-RZ	10.8-13.2	5	200	3000	98	15	220	4	84
AM1D-1209SH30-RZ	10.8-13.2	9	111.1	3000	95	15	220	3.5	86
AM1D-1212SH30-RZ	10.8-13.2	12	83.3	3000	94	15	100	3.5	88
AM1D-1215SH30-RZ	10.8-13.2	15	66.7	3000	94	15	100	3	88
AM1D-1505SH30-RZ	13.6-16.5	5	200	3000	78	10	220	4	84
AM1D-1509SH30-RZ	13.6-16.5	9	111.1	3000	76	10	220	3.5	86
AM1D-1512SH30-RZ	13.6-16.5	12	83.3	3000	76	10	100	3.5	87
AM1D-1515SH30-RZ	13.6-16.5	15	66.7	3000	75	10	100	3	89
AM1D-2405SH30-RZ	21.6-26.4	5	200	3000	51	7	220	4	81
AM1D-2409SH30-RZ	21.6-26.4	9	111.1	3000	49	7	220	3.5	84
AM1D-2412SH30-RZ	21.6-26.4	12	83.3	3000	48	7	100	3.5	85
AM1D-2415SH30-RZ	21.6-26.4	15	66.7	3000	48	7	100	2.5	86
AM1D-4805SH30-RZ	43.6-52.8	5	200	3000	27	5	220	4	78
AM1D-4809SH30-RZ	43.6-52.8	9	111.1	3000	26	5	220	3.5	80
AM1D-4812SH30-RZ	43.6-52.8	12	83.3	3000	26	5	100	3	81
AM1D-4815SH30-RZ	43.6-52.8	15	66.7	3000	26	5	100	3	81

Models
Dual output

Model	Input Voltage (V)	Output Voltage (V)	Output Current Max (mA)	Isolation (VDC)	Input Current Full Load No Load (mA)		Max Capacitive Load (uF)	Load Regulation (%)	Efficiency (%)
AM1D-0505D-RZ	4.5-5.5	±5	±100	1000	230	20	±100	6	84
AM1D-0509D-RZ	4.5-5.5	±9	±55.6	1000	230	30	±100	5.5	86
AM1D-0512D-RZ	4.5-5.5	±12	±41.7	1000	228	20	±47	5.5	87
AM1D-0515D-RZ	4.5-5.5	±15	±33.3	1000	228	20	±47	5	87
AM1D-1205D-RZ	10.8-13.2	±5	±100	1000	98	15	±100	4	85
AM1D-1209D-RZ	10.8-13.2	±9	±55.6	1000	95	15	±100	3.5	86
AM1D-1212D-RZ	10.8-13.2	±12	±41.7	1000	94	15	±47	3.5	87
AM1D-1215D-RZ	10.8-13.2	±15	±33.3	1000	94	15	±47	3.5	87
AM1D-1505D-RZ	13.6-16.5	±5	±100	1000	78	10	±100	3.5	85
AM1D-1509D-RZ	13.6-16.5	±9	±55.6	1000	76	10	±100	2.5	87
AM1D-1512D-RZ	13.6-16.5	±12	±41.7	1000	76	10	±47	2.5	87
AM1D-1515D-RZ	13.6-16.5	±15	±33.3	1000	75	10	±47	2.5	88
AM1D-2405D-RZ	21.6-26.4	±5	±100	1000	51	7	±100	3.5	82
AM1D-2409D-RZ	21.6-26.4	±9	±55.6	1000	49	7	±100	2.5	85
AM1D-2412D-RZ	21.6-26.4	±12	±41.7	1000	48	7	±47	2.5	87
AM1D-2415D-RZ	21.6-26.4	±15	±33.3	1000	48	7	±47	2.5	87
AM1D-4805D-RZ	43.6-52.8	±5	±100	1000	27	5	±100	3	77
AM1D-4809D-RZ	43.6-52.8	±9	±55.6	1000	26	5	±100	3	81
AM1D-4812D-RZ	43.6-52.8	±12	±41.7	1000	26	5	±47	3	82
AM1D-4815D-RZ	43.6-52.8	±15	±33.3	1000	26	5	±47	2	81
AM1D-0505DH30-RZ	4.5-5.5	±5	±100	3000	230	20	±100	6	84
AM1D-0509DH30-RZ	4.5-5.5	±9	±55.6	3000	230	30	±100	5.5	86
AM1D-0512DH30-RZ	4.5-5.5	±12	±41.7	3000	228	20	±47	5.5	87
AM1D-0515DH30-RZ	4.5-5.5	±15	±33.3	3000	228	20	±47	5	87
AM1D-1205DH30-RZ	10.8-13.2	±5	±100	3000	98	15	±100	4	85
AM1D-1209DH30-RZ	10.8-13.2	±9	±55.6	3000	95	15	±100	3.5	86
AM1D-1212DH30-RZ	10.8-13.2	±12	±41.7	3000	94	15	±47	3.5	87
AM1D-1215DH30-RZ	10.8-13.2	±15	±33.3	3000	94	15	±47	3.5	87
AM1D-1505DH30-RZ	13.6-16.5	±5	±100	3000	78	10	±100	3.5	85
AM1D-1509DH30-RZ	13.6-16.5	±9	±55.6	3000	76	10	±100	2.5	87
AM1D-1512DH30-RZ	13.6-16.5	±12	±41.7	3000	76	10	±47	2.5	87
AM1D-1515DH30-RZ	13.6-16.5	±15	±33.3	3000	75	10	±47	2.5	88
AM1D-2405DH30-RZ	21.6-26.4	±5	±100	3000	51	7	±100	3.5	82
AM1D-2409DH30-RZ	21.6-26.4	±9	±55.6	3000	49	7	±100	2.5	85
AM1D-2412DH30-RZ	21.6-26.4	±12	±41.7	3000	48	7	±47	2.5	87
AM1D-2415DH30-RZ	21.6-26.4	±15	±33.3	3000	48	7	±47	2.5	87
AM1D-4805DH30-RZ	43.6-52.8	±5	±100	3000	27	5	±100	3	77
AM1D-4809DH30-RZ	43.6-52.8	±9	±55.6	3000	26	5	±100	3	81
AM1D-4812DH30-RZ	43.6-52.8	±12	±41.7	3000	26	5	±47	3	82
AM1D-4815DH30-RZ	43.6-52.8	±15	±33.3	3000	26	5	±47	2	81

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		
	15	13.6-16.5		
	24	21.6-26.4		
	48	43.6-52.8		
Filter	Capacitor			

Input Specifications (continued)

Parameters	Nominal	Typical	Maximum	Units
Voltage range	5	4.5-5.5		VDC
	12	10.8-13.2		
	15	13.6-16.5		
	24	21.6-26.4		
	48	43.6-52.8		
Filter	Capacitor			
Absolute Maximum Rating	5 Vin	9		VDC
	12 Vin	18		
	15 Vin	20		
	24 Vin	30		
	48 Vin	54		
Peak Input Voltage time		100		ms
Input Reflected Ripple Current	5 & 12Vin	20		mA p-p
	15 Vin	30		
	24Vin	40		
	48	50		

Isolation Specifications

Parameters	Conditions	Typical	Rated	Units
Tested I/O voltage	60 sec		1000, 3000	VDC
Resistance		> 1000		MOhm
Capacitance		60		pF

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±3		%
Voltage balance (Dual Output model)	Balanced Load	±1		%
Line voltage regulation	For 1.0% of Vin	±1.2		%
Load voltage regulation	load 10~100%	See table		%
Temperature coefficient		±0.02		%/°C
Ripple & Noise	At 20MHz Bandwidth	50		mV p-p

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% load	Variable 70		KHz
Operating temperature	Full Load without Derating	-40 to +85		°C
Storage temperature		-40 to +125		°C
Max Case temperature			+100	°C
Cooling	Free air convection			
Humidity			95	%
Case material	Non-conductive black plastic (UL94V-0 rated)			
Weight	Others	2.3		g
	48V input models	2.8		g
Dimensions (L x W x H)	Others	0.76 x 0.24 x 0.39 inch	19.50 x 6.00 x 10.00 mm	
	48V input models	0.76 x 0.28 x 0.39 inch	19.50 x 7.20 x 10.00 mm	
MTBF	>2 000 000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C)			

Safety Specifications

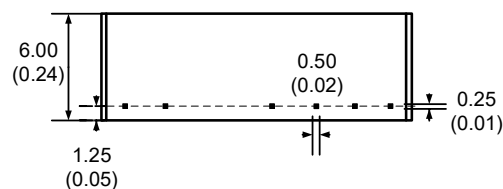
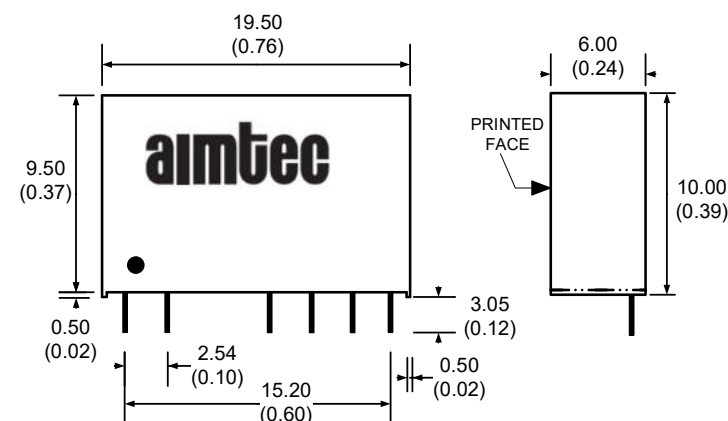
Parameters

Agency Approval	CE
Standards	EN55032 , Class B
	EN55024: 1998 + A1: 2001 + A2:2003
	IEC61000-4-2:2008
	IEC61000-4-3: 2006 + A1: 2007
	IEC61000-4-4, 2004 (With the EFT circuit)
	IEC61000-4-6: 2008
	IEC61000-4-8: 1993 + A1:2000

Pin Out Specifications

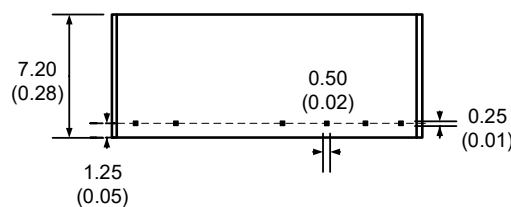
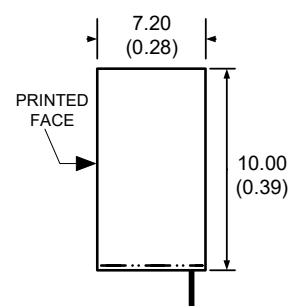
Pin	1000VDC		3000VDC	
	Single	Dual	Single	Dual
1	+ V Input	+ V Input	+ V Input	+ V Input
2	- V Input	- V Input	- V Input	- V Input
4	- V Output	- V Output	No pin	No pin
5	No pin	Common	- V Output	- V Output
6	+ V Output	+ V Output	No pin	Common
7	No pin	No pin	+ V Output	+ V Output

Dimensions:

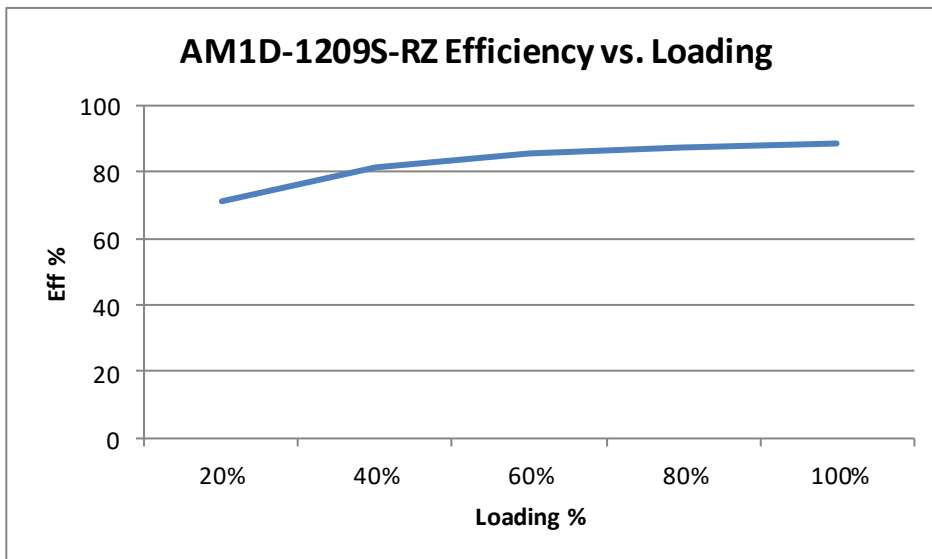
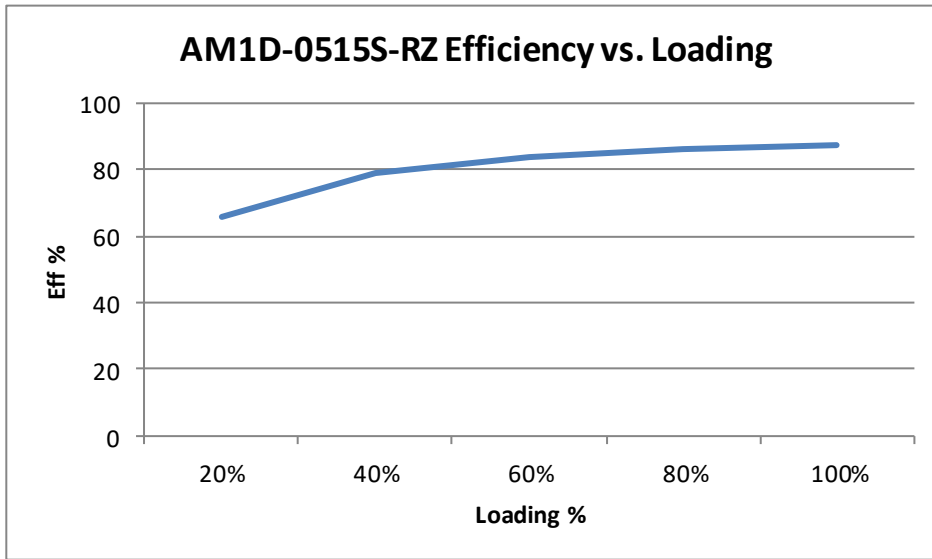


NOTE: Unit:mm [inch]
Pin tolerances: $\pm 0.05\text{mm}$ [$\pm 0.002\text{inch}$]
General tolerances: $\pm 0.5\text{mm}$ [$\pm 0.02\text{inch}$]
Pin pitch and length tolerance: ± 0.35 (± 0.014)

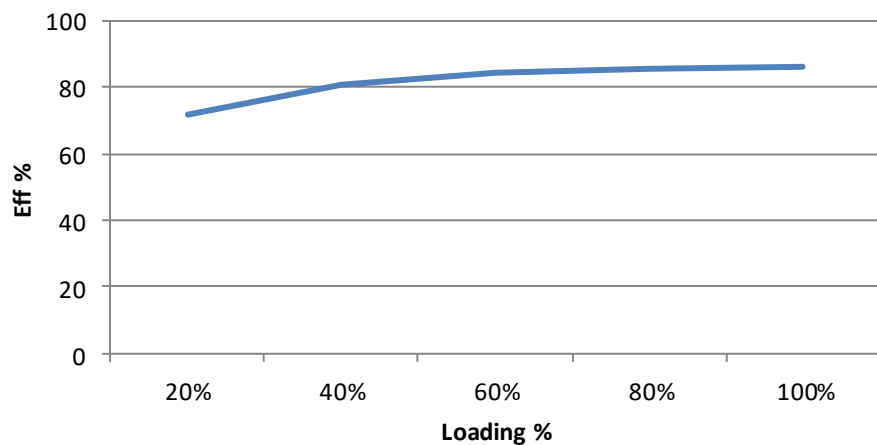
48V Input models



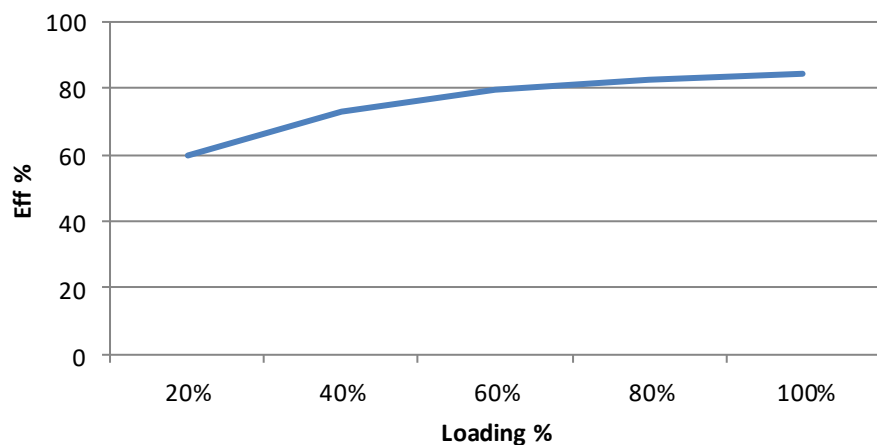
Typical Efficiency Chart Examples



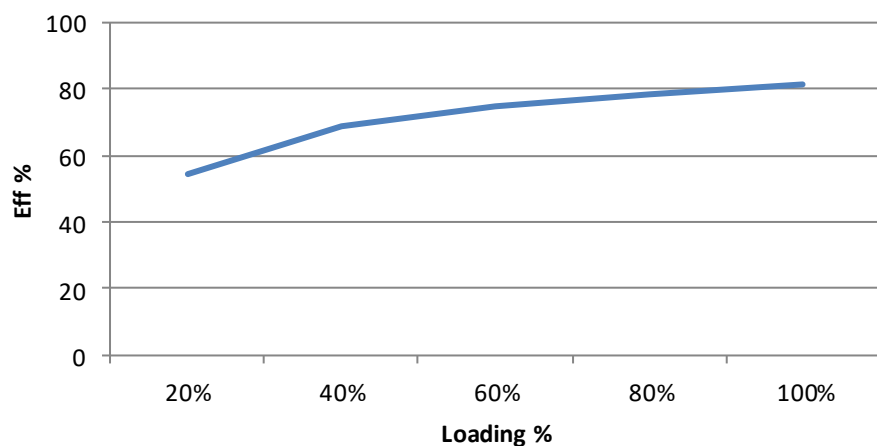
AM1D-1505S-RZ Efficiency vs. Loading



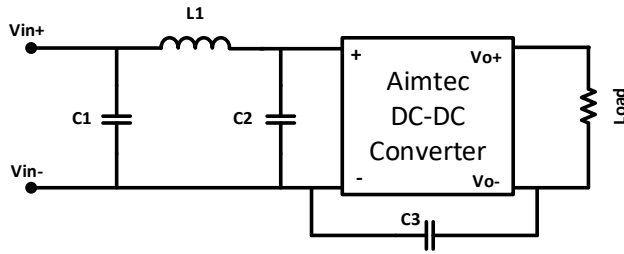
AM1D-2409S-RZ Efficiency vs. Loading



AM1D-4805S-RZ Efficiency vs. Loading

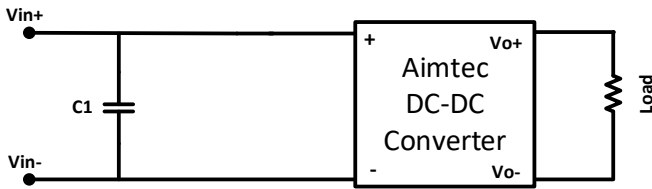


Conducted Emissions



Vin	C1	L1	C2	C3
3.3V	2.2 μ F / 100V	18 μ H		
5 V	2.2 μ F / 100V	18 μ H		
12 V	2.2 μ F / 100V	18 μ H		
15 V	2.2 μ F / 100V	18 μ H		
24 V	2.2 μ F / 100V	18 μ H	2.2 μ F / 100V	470 pF / 2kV
48 V	2.2 μ F / 100V	18 μ H	2.2 μ F / 100V	470 pF / 2kV

EFT



Vin	C1
3.3V	220 μ F / 100V
5 V	220 μ F / 100V
12 V	220 μ F / 100V
15 V	220 μ F / 100V
24 V	220 μ F / 100V
48 V	220 μ F / 100V

NOTE: 1. Datasheets are updated as needed and as such, specifications are subject to change without notice. Once printed or downloaded, datasheets are no longer controlled by Aimtec; refer to www.aimtec.com for the most current product specifications. 2. Product labels shown, including safety agency certifications on labels, may vary based on the date manufactured. 3. Mechanical drawings and specifications are for reference only. 4. All specifications are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. 5. Aimtec may not have conducted destructive testing or chemical analysis on all internal components and chemicals at the time of publishing this document. CAS numbers and other limited information are considered proprietary and may not be available for release. 6. This product is not designed for use in critical life support systems, equipment used in hazardous environments, nuclear control systems or other such applications which necessitate specific safety and regulatory standards other the ones listed in this datasheet. 7. Warranty is in accordance with Aimtec's standard Terms of Sale available at www.aimtec.com.