aimtec
Your Power Partner

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 -40ºC to + 85ºC
- Short circuit protection
- Pin compatible with multiple manufacturers
- Input / Output Isolation 1000 and 3000VDC

RoHS CE

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		%/ºC
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		ºC
Storage temperature		-40 to +125		ºC
Max Case temperature			+100	ºC
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=+25ºC)			

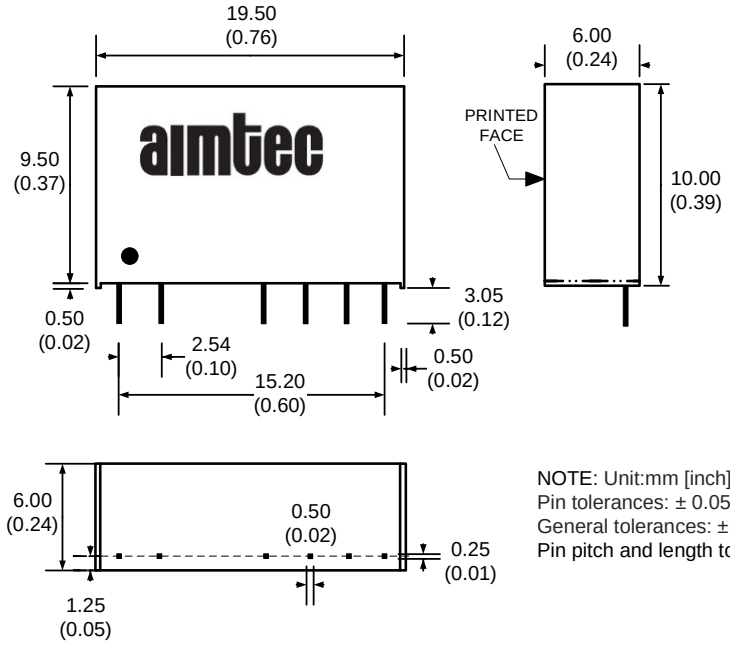
Safety Specifications

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

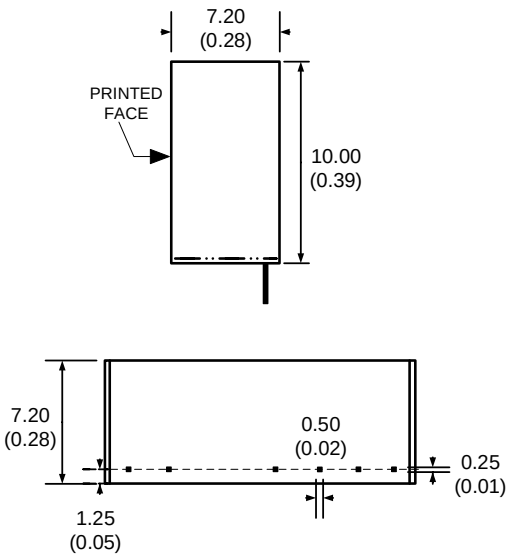
Pin	1000VDC		3000VDC	
	Single	Dual	Single	Dual
1	+ V Input	+ V Input	+ V Input	+ V Input
2	- V Input	- V Input	- V Input	- V Input
4	- V Output	- V Output	No pin	No pin
5	No pin	Common	- V Output	- V Output
6	+ V Output	+ V Output	No pin	Common
7	No pin	No pin	+ V Output	+ V Output

Dimensions:

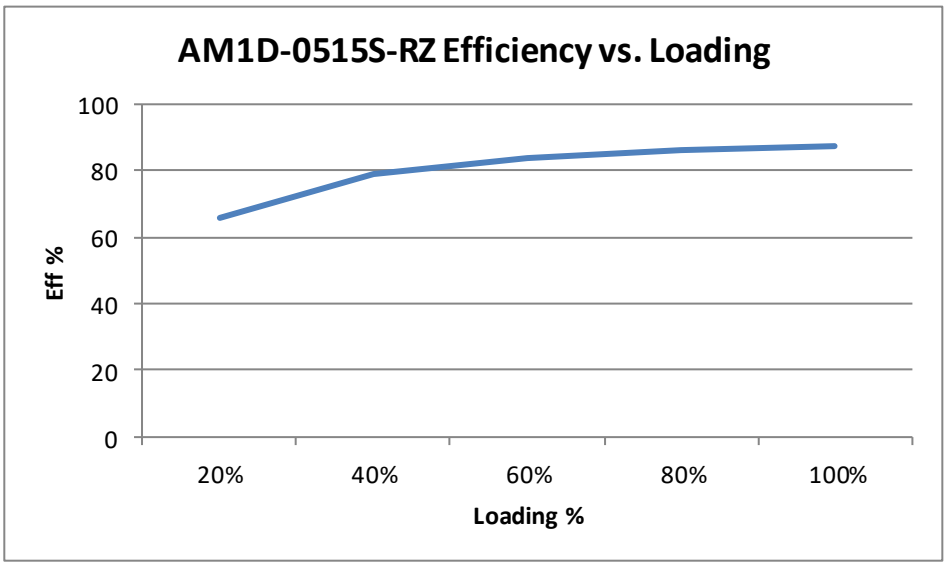


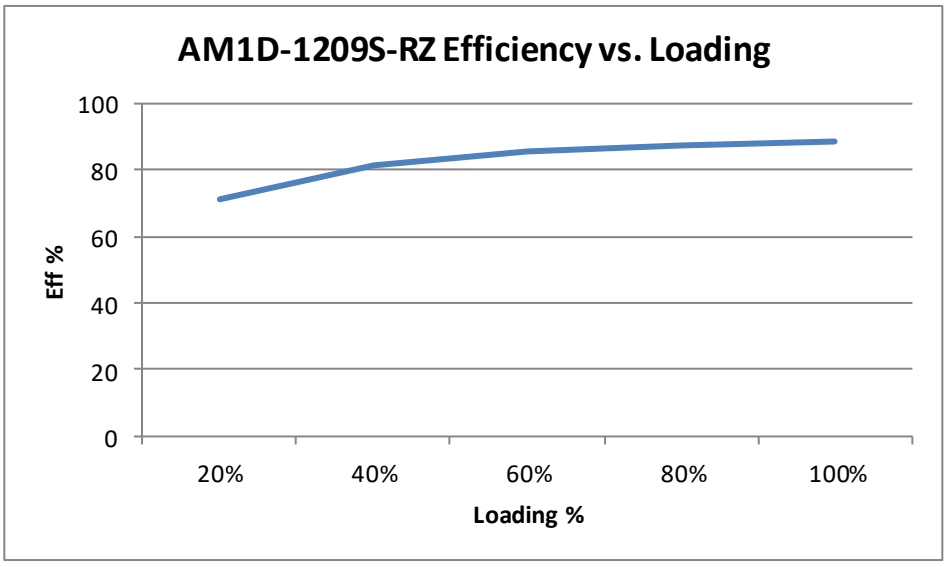
NOTE: Unit:mm [inch]
Pin tolerances: ± 0.05mm [± 0.002inch]
General tolerances: ± 0.5mm [± 0.02inch]
Pin pitch and length tolerance: ±0.35 (±0.014)

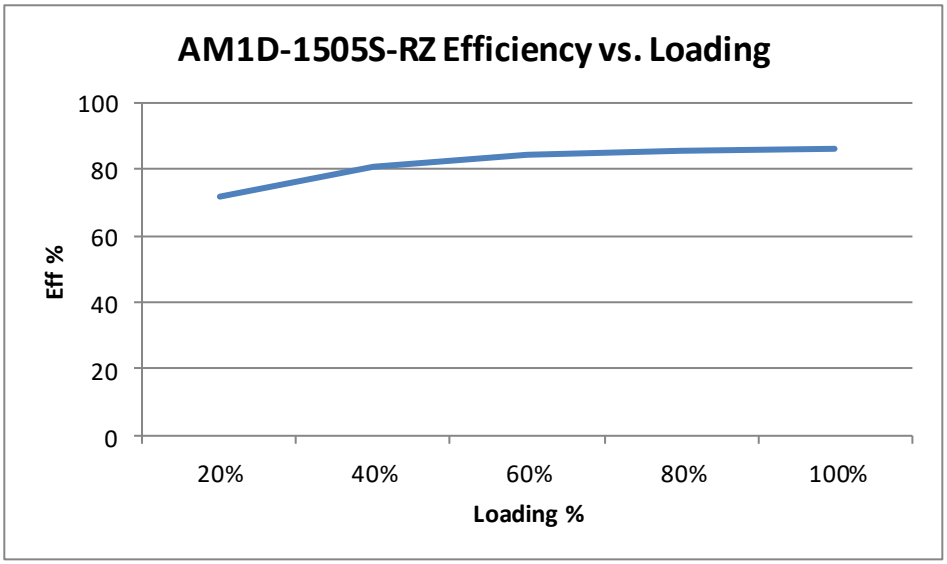
48V Input models

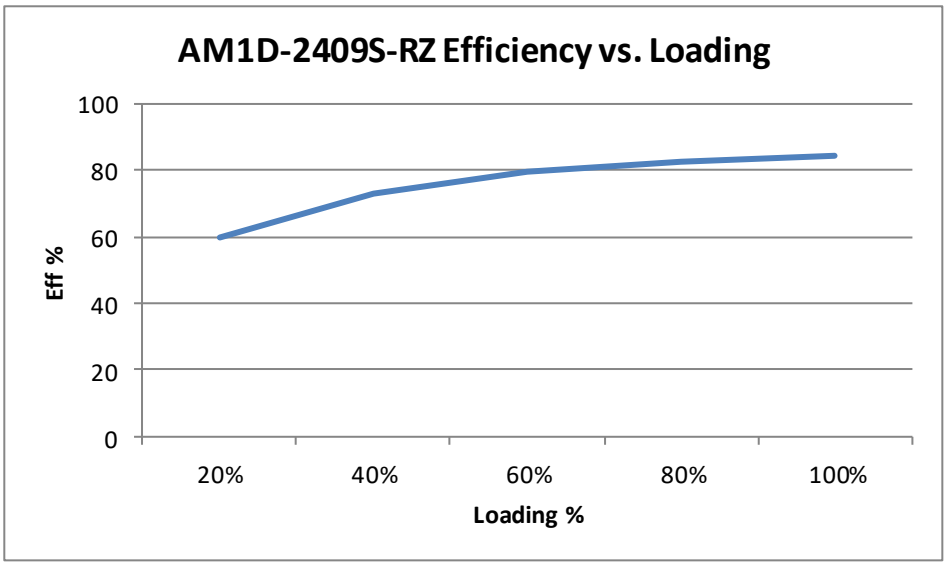


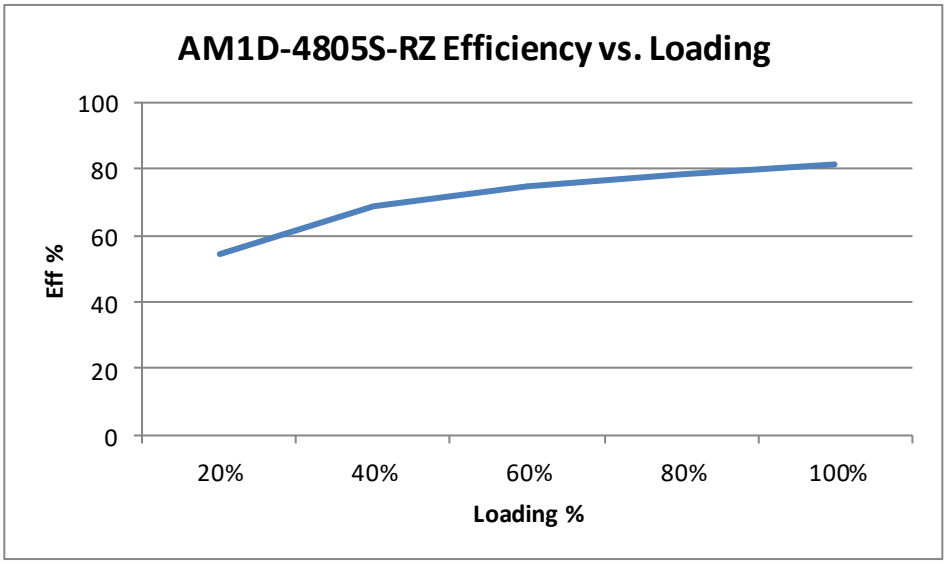
Typical Efficiency Chart Examples



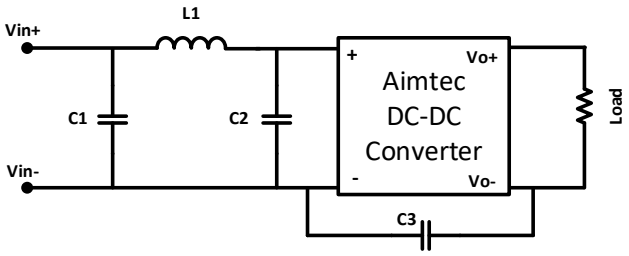



AM1D-1505S-RZ Efficiency vs. Loading
100
80
60
40
20
0
Eff %
20%
40%
60%
80%
100%
Loading %


AM1D-2409S-RZ Efficiency vs. Loading
100
80
60
40
20
0
Eff %
20%
40%
60%
80%
100%
Loading %

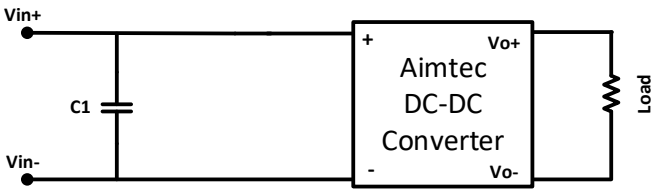

AM1D-4805S-RZ Efficiency vs. Loading
100
80
60
40
20
0
Eff %
20%
40%
60%
80%
100%
Loading %

Conducted Emissions



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

EFT



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

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