

Series AM1P-Z

1 Watt | DC-DC Converter



FEATURES:

- RoHS compliant
- 8 Pin DIP Package
- Low ripple and noise
- High efficiency up to 85%
- Operating temperature -40°C to + 85°C
- Input / Output Isolation 1000 & 3000VDC
- Pin compatible with multiple manufacturers



Models Single output

Model	Input Voltage (V)	Output Voltage (V)	Output Current Max (mA)	Isolation (VDC)	Max Capacitive Load (uF)	Input Current Full Load No Load (mA)		Efficiency (%)
AM1P-0303SZ	2.97-3.63	3.3	303	1000	220	410	25	74
AM1P-0305SZ	2.97-3.63	5	200	1000	220	394	25	77
AM1P-0307SZ	2.97-3.63	7.2	138.9	1000	220	404	30	75
AM1P-0309SZ	2.97-3.63	9	111.1	1000	220	399	30	76
AM1P-0312SZ	2.97-3.63	12	100	1000	220	485	45	75
AM1P-0315SZ	2.97-3.63	15	66.6	1000	220	384	25	79
AM1P-0318SZ	2.97-3.63	18	55.5	1000	220	399	35	76
AM1P-0324SZ	2.97-3.63	24	50	1000	220	485	90	75
AM1P-0503SZ	4.5-5.5	3.3	303	1000	220	256	16	78
AM1P-0505SZ	4.5-5.5	5	200	1000	220	253	15	79
AM1P-0507SZ	4.5-5.5	7.2	138.9	1000	220	241	16	83
AM1P-0509SZ	4.5-5.5	9	111	1000	220	253	25	79
AM1P-0512SZ	4.5-5.5	12	100	1000	220	296	25	81
AM1P-0515SZ	4.5-5.5	15	67	1000	220	244	25	82
AM1P-0518SZ	4.5-5.5	18	56	1000	220	241	25	83
AM1P-0524SZ	4.5-5.5	24	50	1000	220	293	28	82
AM1P-1203SZ	10.8-13.2	3.3	303	1000	220	108	15	77
AM1P-1205SZ	10.8-13.2	5	200	1000	220	105	16	79
AM1P-1207SZ	10.8-13.2	7.2	138.9	1000	220	100	16	83
AM1P-1209SZ	10.8-13.2	9	111.1	1000	220	105	15	79
AM1P-1212SZ	10.8-13.2	12	100	1000	220	125	20	80
AM1P-1215SZ	10.8-13.2	15	66.6	1000	220	105	17	79
AM1P-1218SZ	10.8-13.2	18	55.5	1000	220	103	15	81
AM1P-1224SZ	10.8-13.2	24	50	1000	220	127	25	79
AM1P-2403SZ	21.6-26.4	3.3	303	1000	220	89	15	79
AM1P-2405SZ	21.6-26.4	5	200	1000	220	83	10	79
AM1P-2407SZ	21.6-26.4	7.2	138.9	1000	220	88	12	74
AM1P-2409SZ	21.6-26.4	9	111.1	1000	220	85	10	79
AM1P-2412SZ	21.6-26.4	12	100	1000	220	98	13	80
AM1P-2415SZ	21.6-26.4	15	66.6	1000	220	83	15	80
AM1P-2418SZ	21.6-26.4	18	55.5	1000	220	85	12	82
AM1P-2424SZ	21.6-26.4	24	50	1000	220	99	10	82
AM1P-4803SZ	43.2-52.8	3.3	303	1000	220	53	8	79
AM1P-4805SZ	43.2-52.8	5	200	1000	220	53	8	79
AM1P-4807SZ	43.2-52.8	7.2	139	1000	220	56	10	74
AM1P-4809SZ	43.2-52.8	9	111	1000	220	53	7	79
AM1P-4812SZ	43.2-52.8	12	100	1000	220	63	8	80
AM1P-4815SZ	43.2-52.8	15	67	1000	220	52	8	80
AM1P-4818SZ	43.2-52.8	18	56	1000	220	51	8	82
AM1P-4824SZ	43.2-52.8	24	50	1000	220	61	9	82
AM1P-0303SH30Z	2.97-3.63	3.3	303	3000	220	410	25	74
AM1P-0305SH30Z	2.97-3.63	5	200	3000	220	394	25	77
AM1P-0307SH30Z	2.97-3.63	7.2	138.9	3000	220	404	30	75
AM1P-0309SH30Z	2.97-3.63	9	111.1	3000	220	399	30	76
AM1P-0312SH30Z	2.97-3.63	12	100	3000	220	485	45	75
AM1P-0315SH30Z	2.97-3.63	15	66.6	3000	220	384	25	79
AM1P-0318SH30Z	2.97-3.63	18	55.5	3000	220	399	35	76
AM1P-0324SH30Z	2.97-3.63	24	50	3000	220	485	90	75
AM1P-0503SH30Z	4.5-5.5	3.3	303	3000	220	256	16	78

AM1P-0505SH30Z	4.5-5.5	5	200	3000	220	253	15	79
AM1P-0507SH30Z	4.5-5.5	7.2	138.9	3000	220	241	16	83
AM1P-0509SH30Z	4.5-5.5	9	111	3000	220	253	25	79
AM1P-0512SH30Z	4.5-5.5	12	100	3000	220	296	25	81
AM1P-0515SH30Z	4.5-5.5	15	67	3000	220	244	25	82
AM1P-0518SH30Z	4.5-5.5	18	56	3000	220	241	25	83
AM1P-0524SH30Z	4.5-5.5	24	50	3000	220	293	28	82
AM1P-1203SH30Z	10.8-13.2	3.3	303	3000	220	108	15	77
AM1P-1205SH30Z	10.8-13.2	5	200	3000	220	105	16	79
AM1P-1207SH30Z	10.8-13.2	7.2	138.9	3000	220	100	16	83
AM1P-1209SH30Z	10.8-13.2	9	111.1	3000	220	105	15	79
AM1P-1212SH30Z	10.8-13.2	12	100	3000	220	125	20	80
AM1P-1215SH30Z	10.8-13.2	15	66.6	3000	220	105	17	79
AM1P-1218SH30Z	10.8-13.2	18	55.5	3000	220	103	15	81
AM1P-1224SH30Z	10.8-13.2	24	50	3000	220	127	25	79
AM1P-2403SH30Z	21.6-26.4	3.3	303	3000	220	89	15	79
AM1P-2405SH30Z	21.6-26.4	5	200	3000	220	83	10	79
AM1P-2407SH30Z	21.6-26.4	7.2	138.9	3000	220	88	12	74
AM1P-2409SH30Z	21.6-26.4	9	111.1	3000	220	85	10	79
AM1P-2412SH30Z	21.6-26.4	12	100	3000	220	98	13	80
AM1P-2415SH30Z	21.6-26.4	15	66.6	3000	220	83	15	80
AM1P-2418SH30Z	21.6-26.4	18	55.5	3000	220	85	12	82
AM1P-2424SH30Z	21.6-26.4	24	50	3000	220	99	10	82
AM1P-4803SH30Z	43.2-52.8	3.3	303	3000	220	53	8	79
AM1P-4805SH30Z	43.2-52.8	5	200	3000	220	53	8	79
AM1P-4807SH30Z	43.2-52.8	7.2	139	3000	220	56	10	74
AM1P-4809SH30Z	43.2-52.8	9	111	3000	220	53	7	79
AM1P-4812SH30Z	43.2-52.8	12	100	3000	220	63	8	80
AM1P-4815SH30Z	43.2-52.8	15	67	3000	220	52	8	80
AM1P-4818SH30Z	43.2-52.8	18	56	3000	220	51	8	82
AM1P-4824SH30Z	43.2-52.8	24	50	3000	220	61	9	82

Models

Dual output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Max Capacitive Load	Input Current Full Load No Load (mA)		Efficiency (%)
AM1P-0503DZ	4.5-5.5	±3.3	±152	1000	±100	299	15	67
AM1P-0505DZ	4.5-5.5	±5	±100	1000	±100	270	20	74
AM1P-0507DZ	4.5-5.5	±7.2	±69	1000	±100	260	15	77
AM1P-0509DZ	4.5-5.5	±9	±56	1000	±100	260	20	77
AM1P-0512DZ	4.5-5.5	±12	±50	1000	±100	300	22	80
AM1P-0515DZ	4.5-5.5	±15	±34	1000	±100	247	20	81
AM1P-0518DZ	4.5-5.5	±18	±28	1000	±100	244	22	82
AM1P-0524DZ	4.5-5.5	±24	±25	1000	±100	300	20	85
AM1P-1203DZ	10.8-13.2	±3.3	±152	1000	±100	121	10	69
AM1P-1205DZ	10.8-13.2	±5	±100	1000	±100	110	7	76
AM1P-1207DZ	10.8-13.2	±7.2	±69	1000	±100	109	15	76
AM1P-1209DZ	10.8-13.2	±9	±56	1000	±100	109	15	78
AM1P-1212DZ	10.8-13.2	±12	±50	1000	±100	123	12	81
AM1P-1215DZ	10.8-13.2	±15	±33	1000	±100	102	10	82
AM1P-1218DZ	10.8-13.2	±18	±28	1000	±100	103	15	81
AM1P-1224DZ	10.8-13.2	±24	±25	1000	±100	125	20	80
AM1P-2403DZ	21.6-26.4	±3.3	±152	1000	±100	89	15	70
AM1P-2405DZ	21.6-26.4	±5	±100	1000	±100	83	10	74
AM1P-2407DZ	21.6-26.4	±7.2	±69	1000	±100	88	12	76
AM1P-2409DZ	21.6-26.4	±9	±56	1000	±100	85	10	75
AM1P-2412DZ	21.6-26.4	±12	±50	1000	±100	98	13	81
AM1P-2415DZ	21.6-26.4	±15	±33	1000	±100	83	15	81
AM1P-2418DZ	21.6-26.4	±18	±28	1000	±100	85	12	78
AM1P-2424DZ	21.6-26.4	±24	±25	1000	±100	64	7	78
AM1P-4803DZ	43.2-52.8	±3.3	±150	1000	±100	60	5	70
AM1P-4805DZ	43.2-52.8	±5	±100	1000	±100	56	6	74

AM1P-4807DZ	43.2-52.8	±7.2	±70	1000	±100	55	6	76
AM1P-4809DZ	43.2-52.8	±9	±55	1000	±100	56	7	75
AM1P-4812DZ	43.2-52.8	±12	±42	1000	±100	62	5	81
AM1P-4815DZ	43.2-52.8	±15	±34	1000	±100	51	5	81
AM1P-4818DZ	43.2-52.8	±18	±28	1000	±100	53	7	78
AM1P-4824DZ	43.2-52.8	±24	±21	1000	±100	64	7	78

Models

Dual Separated Output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Max Capacitive Load (uF)	Input Current Full Load No Load (mA)		Efficiency (%)
AM1P-050303DZ	4.5-5.5	3.3 / 3.3	152 / 152	1000	100	111	15	67
AM1P-050505DZ	4.5-5.5	5 / 5	100 / 100	1000	100	111	10	81
AM1P-050707DZ	4.5-5.5	7.2 / 7.2	69 / 69	1000	100	260	16	77
AM1P-050909DZ	4.5-5.5	9 / 9	56 / 56	1000	100	253	15	79
AM1P-051212DZ	4.5-5.5	12 / 12	50 / 50	1000	100	300	20	80
AM1P-051515DZ	4.5-5.5	15 / 15	34 / 34	1000	100	247	20	81
AM1P-051818DZ	4.5-5.5	18 / 18	28 / 28	1000	100	247	20	81
AM1P-052424DZ	4.5-5.5	24 / 24	25 / 25	1000	100	320	25	75
AM1P-120303DZ	10.8-13.2	3.3 / 3.3	152 / 152	1000	100	111	15	75
AM1P-120505DZ	10.8-13.2	5 / 5	100 / 100	1000	100	111	10	75
AM1P-120707DZ	10.8-13.2	7.2 / 7.2	69 / 69	1000	100	107	10	78
AM1P-120909DZ	10.8-13.2	9 / 9	56 / 56	1000	100	105	10	79
AM1P-121212DZ	10.8-13.2	12 / 12	50 / 50	1000	100	125	15	80
AM1P-121515DZ	10.8-13.2	15 / 15	33 / 33	1000	100	104	13	80
AM1P-121818DZ	10.8-13.2	18 / 18	28 / 28	1000	100	107	20	78
AM1P-122424DZ	10.8-13.2	24 / 24	25 / 25	1000	100	128	20	78
AM1P-240303DZ	21.6-26.4	3.3 / 3.3	152 / 152	1000	100	53	5	79
AM1P-240505DZ	21.6-26.4	5 / 5	100 / 100	1000	100	50	8	83
AM1P-240707DZ	21.6-26.4	7.2 / 7.2	69 / 69	1000	100	53	5	78
AM1P-240909DZ	21.6-26.4	9 / 9	56 / 56	1000	100	54	8	77
AM1P-241212DZ	21.6-26.4	12 / 12	50 / 50	1000	100	63	6	80
AM1P-241515DZ	21.6-26.4	15 / 15	33 / 33	1000	100	54	6	77
AM1P-241818DZ	21.6-26.4	18 / 18	28 / 28	1000	100	56	13	74
AM1P-242424DZ	21.6-26.4	24 / 24	25 / 25	1000	100	65	5	77
AM1P-480303DZ	43.2-52.8	3.3 / 3.3	150 / 150	1000	100	60	5	70
AM1P-480505DZ	43.2-52.8	5 / 5	100 / 100	1000	100	56	6	74
AM1P-480707DZ	43.2-52.8	7.2 / 7.2	70 / 70	1000	220	55	6	76
AM1P-480909DZ	43.2-52.8	9 / 9	55 / 55	1000	100	56	7	75
AM1P-481212DZ	43.2-52.8	12 / 12	42 / 42	1000	100	62	5	81
AM1P-481515DZ	43.2-52.8	15 / 15	34 / 34	1000	100	51	5	81
AM1P-481818DZ	43.2-52.8	18 / 18	28 / 28	1000	100	53	7	78
AM1P-482424DZ	43.2-52.8	24 / 24	21 / 21	1000	100	64	7	78

Input Specifications

Parameters	Nominal	Typical	Maximum	Units
Voltage range	3.3	2.97-3.63		VDC
	5	4.5-5.5		
	12	10.8-13.2		
	24	21.6-26.4		
	48	43.2-52.8		
Filter	Capacitor			
Turn on Transient process time			25	ms
Startup time		200		ms
Absolute Maximum Rating	3.3 Vin	0-6		VDC
	5 Vin	0-7		
	12 Vin	0-15		
	24 Vin	0-28		
	48 Vin	0-54		
Peak Input Voltage time		100		ms

Isolation Specifications

Parameters	Conditions	Typical	Rated	Units
Tested I/O voltage	60 sec		1000 all models, 3000 (single output)	VDC
Resistance		> 1000		MOhm
Capacitance		60		pF

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±3		%
Short Circuit protection	Momentary (1 sec)			
Line voltage regulation	48V input models	±1.2		%
	Others, for 1% change of Vin	±1.2		
Load voltage regulation	Load 20 – 100%	Single 3.3V output models	±20	%
		Dual Separated 5V, 12V, 24V input and 3.3V output model	±15	
		48V input model	±1.2	
		Others	±10	
Temperature coefficient		±0.02		%/°C
Ripple & Noise	At 20MHz Bandwidth	48V input models	50	mV p-p
		Others	100	
Rising time		50		ms

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% load	80		KHz
Operating temperature	Full Load without Derating	-40 to +85		°C
Storage temperature		-55 to +125		°C
Max Case temperature			90	°C
Cooling	Free air convection			
Humidity			90	%
Case material	Non-conductive black plastic			
Weight		1.8		g
Dimensions (L x W x H)	0.50 x 0.40 x 0.27 inches 12.70 x 10.16 x 6.85 mm			
MTBF	>1 121 000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C)			
MTBF (48V input models)	>1 191 000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C)			

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

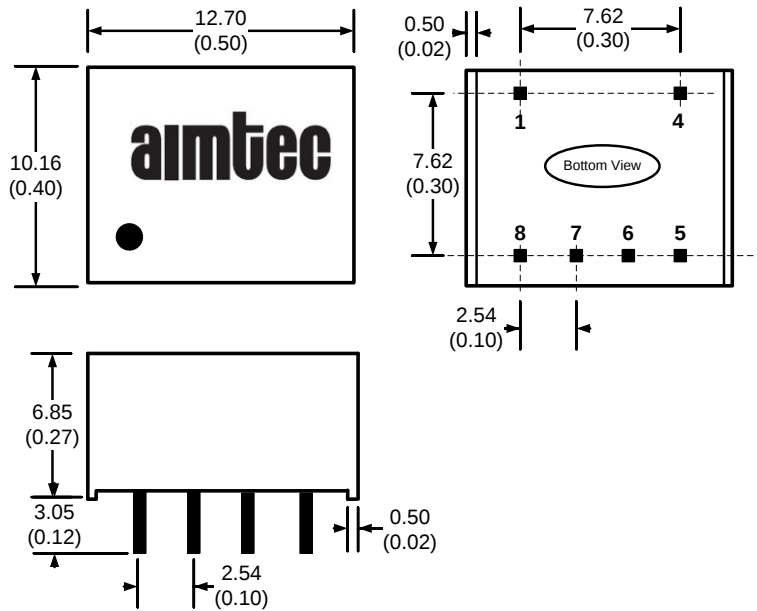
Safety Specifications

Parameters	
Agency approvals	CE , 48V input models are excluded.
Standards	EN55032 (Radiated Emissions) class B , 48V input models are excluded.
	IEC61000-4-3(Radiated immunity)

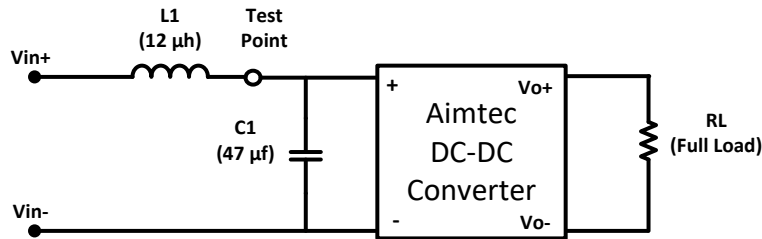
Pin Out Specifications

Pin	1000 and 3000 VDC		1000 VDC
	Single	Dual	Dual Separated
1	- V Input	- V Input	- V Input
4	+ V Input	+ V Input	+ V Input
5	+ V Output	+ V Output	+ V1 Output
6	No pin	No pin	- V1 Output
7	- V Output	Common	+ V2 Output
8	No pin	- V Output	- V2 Output

Dimensions



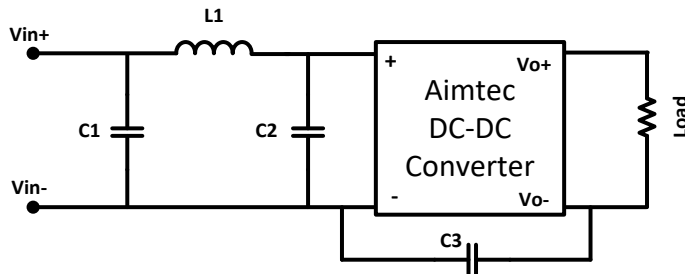
Input Reflected Ripple Test Circuit



* Tested at full load, and nominal input

EMI Filtering

To meet conducted emissions, the following circuit is recommended with the external components as noted in the table below.

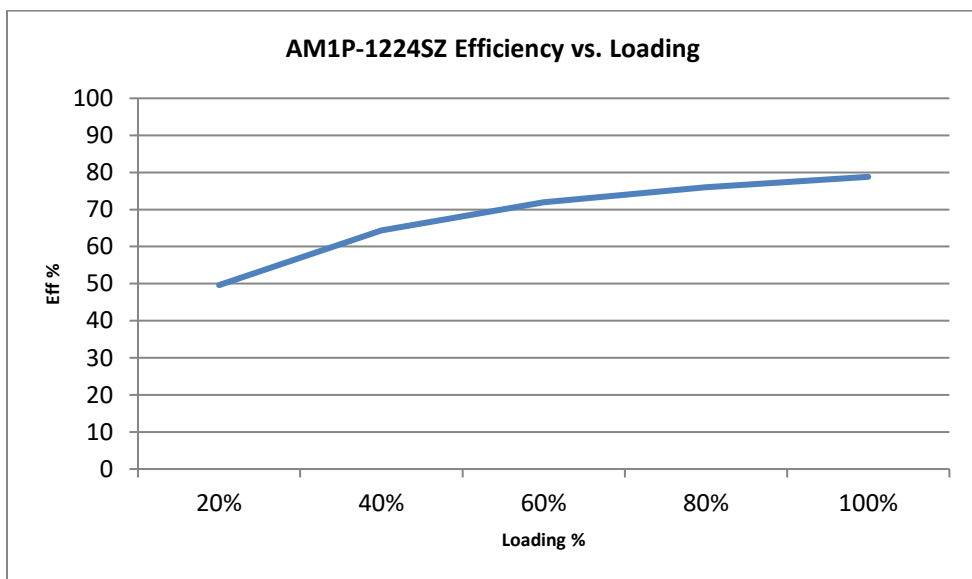
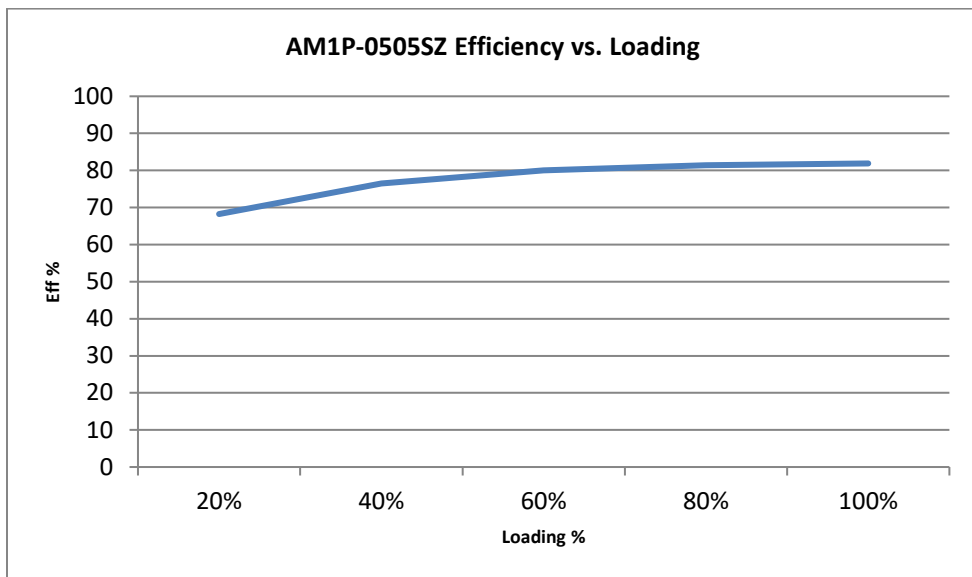


Model	C1	L1	C2	C3
5 Vin	2.2 µF / 100V	18 µH		
12 Vin	2.2 µF / 100V	18 µH		
24 Vin	2.2 µF / 100V	18 µH	2.2 µF / 100V	470pF / 2KV
48 Vin	10 µF / 100V*	18 µH	2.2 µF / 100V	470pF / 2KV

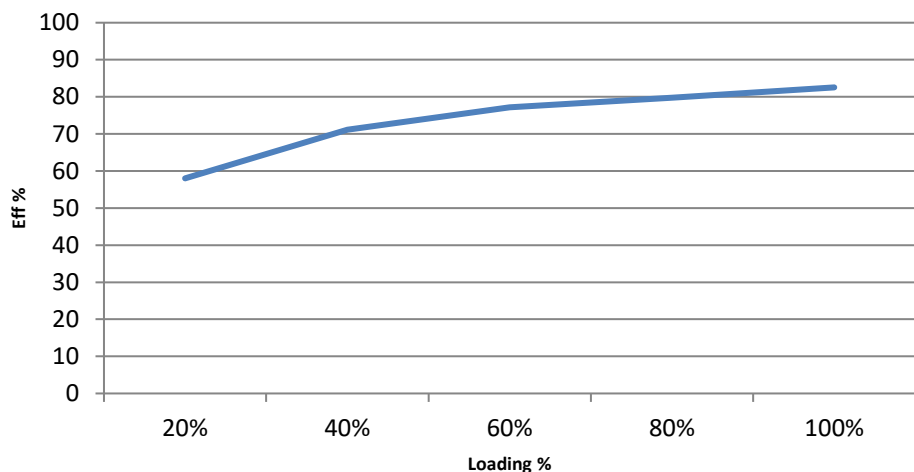
* - Electrolytic Capacitor Type

Additionally, in order to meet IEC 61000-4-4 and 61000-4-5 and external capacitor is recommended (ex. Nippon KY series of size 470 µF / 100V).

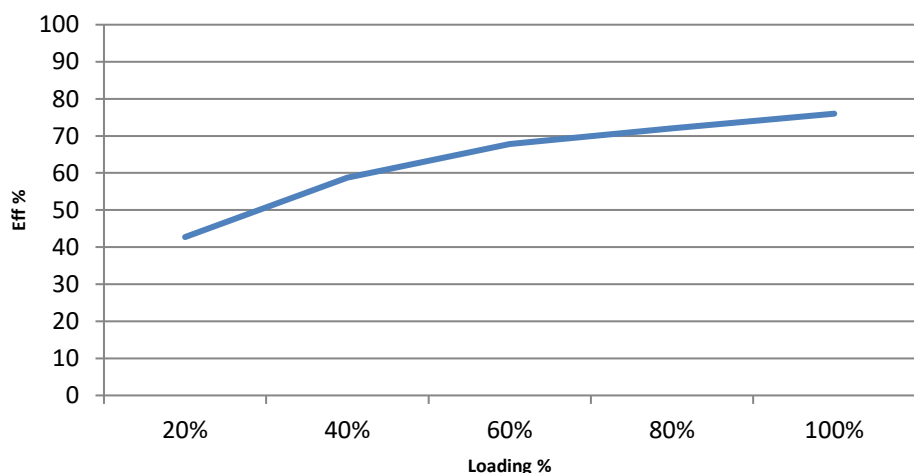
Typical Efficiency Chart Examples



AM1P-2424SZ Efficiency vs. Loading



AM1P-4824SZ Efficiency vs. Loading



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.