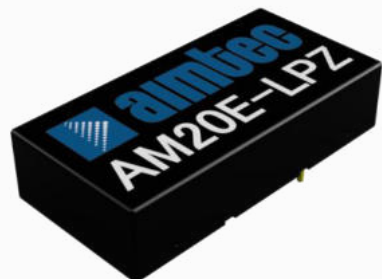


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AM20E-LPZ



2 x 1"

The AM20E-LPZ is a 20W DC/DC converter that offers a regulated output which contributes to a more stable and reliable output performance. It features a wide 2:1 input voltage range of 9-75VDC, which will benefit your new system design.

This series offers great operating temperatures, from -40°C to 85°C. Furthermore, an isolation of 1500VDC, a high MTBF of 1,000,000h, continuous output short circuit protection (OSCP), over-current protection (OCP) and over-voltage protection (OVP) come standard with the series.

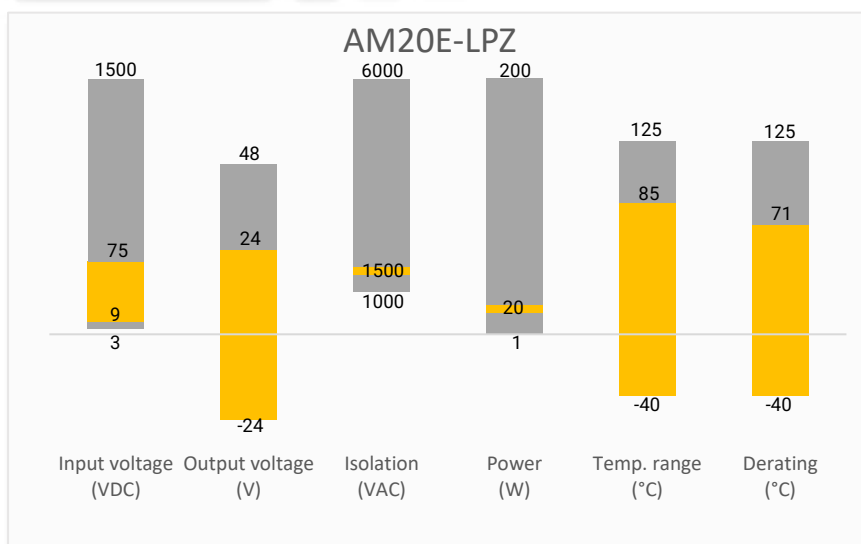
The AM20E-LPZ is suitable for grid power, instrumentation, industrial controls, communication, and civil applications.

Features

- Operating Temp: -40 °C to +85 °C
- Isolation voltage: 1500VDC
- High efficiency: Up to 90% typ.
- Regulated single output
- Output short circuit, over-current, over-voltage
- Standard 2 x1 package



Summary



Training



Product Training Video
(click to open)



Press Release

Coming Soon!

Application Notes

Applications



Power Grid



Industrial



Telecom



Instrumentation

Models & Specifications



Single Output							
Model	Input Voltage (VDC)	Output Voltage (VDC)	Nominal Vin Input Current Typ (mA)		Output Current Max (mA)	Maximum capacitive load (μF)	Efficiency Full Load Typ (%)
			No Load	Full Load			
AM20E-2403SLPZ	24 (18-36)	3.3	40	799	5000	10000	86
AM20E-2405SLPZ	24 (18-36)	5	40	969	4000	10000	90
AM20E-2409SLPZ	24 (18-36)	9	6	947	2222	4700	87
AM20E-2412SLPZ	24 (18-36)	12	6	947	1667	1600	87
AM20E-2415SLPZ	24 (18-36)	15	6	947	1333	1000	88
AM20E-2424SLPZ	24 (18-36)	24	6	947	834	500	88
AM20E-4803SLPZ	48 (36-75)	3.3	20	400	5000	10000	86
AM20E-4805SLPZ	48 (36-75)	5	20	485	4000	10000	90
AM20E-4809SLPZ	48 (36-75)	9	5	474	2222	470	89
AM20E-4812SLPZ	48 (36-75)	12	5	474	1667	1600	89
AM20E-4815SLPZ	48 (36-75)	15	5	474	1333	1000	90
AM20E-4824SLPZ	48 (36-75)	24	5	474	834	500	90

Dual Output							
Model	Input Voltage (VDC)	Output Voltage (VDC)	Nominal Vin Input Current Typ (mA)		Output Current Max (mA)	Maximum capacitive load (μF)	Efficiency Full Load Typ (%)
			No Load	Full Load			
AM20E-1215DLPZ	12 (9-18)	±15	12	1916	±667	625	87
AM20E-1224DLPZ	12 (9-18)	±24	15	1894	±417	220	88
AM20E-2405DLPZ	24 (18-36)	±5	40	969	±2000	4800	84
AM20E-2409DLPZ	24 (18-36)	±9	6	947	±1111	1000	86
AM20E-2412DLPZ	24 (18-36)	±12	6	947	±834	800	86
AM20E-2415DLPZ	24 (18-36)	±15	6	947	±667	625	86
AM20E-2424DLPZ	24 (18-36)	±24	6	947	±417	500	86
AM20E-4805DLPZ	48 (36-75)	±5	20	485	±2000	4800	86
AM20E-4812DLPZ	48 (36-75)	±12	5	474	±834	800	88
AM20E-4815DLPZ	48 (36-75)	±15	5	474	±667	625	89

Input Specification				
Parameters	Conditions	Typical	Maximum	Units
Voltage types			2:1	
Absolute maximum rating	12Vin, 1sec. max.		-0.7~25	VDC
	24Vin, 1sec. max.		-0.7~50	VDC
	48Vin, 1sec. max.		-0.7~100	VDC
Input reflected ripple current		30		mA
Start-up time	Nominal Vin and constant resistive load	10		mS
Start-up voltage	12V input		9	VDC
	24V input		18	VDC
	48V input		36	VDC
Filter	π(Pi) Network			
On/Off control	ON – open or 3.5-12VDC; OFF – short to –Vin or 0-1.2VDC,			

Idle current: 4 - 7mA

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested isolation voltage	Input / output, 60 sec, 1 mA	≥1500		VDC
Resistance	Input / output, 500VDC	≥1000		MΩ
Capacitance	Input / output, 100KHz/0.1V, AM20E-2424SLPZ	2050		pF
	Input / output, 100KHz/0.1V, others	1050		pF

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage Tolerance	100% load @ Vin (nom.), output 1	±1	±3	%
	100% load @ Vin (nom.), output 2	±2	±4	%
Line Regulation	LL to HL at Full Load, output 1	±0.2	±0.5	%
	LL to HL at Full Load, output 2	±0.5	±1.0	%
Load Regulation	5% to 100% load, output 1	±0.5	±1	%
	5% to 100% load, output 2	±1.0	±1.5	%
Cross Regulation	Dual, positive output 50% load, negative output 10% to 100% Load		±5	%
Transient Recovery Time	25% load step change	300	500	μs
Transient recovery deviation	25% load step change, 3.3/5/±5Vout models	±5	±8	%
	25% load step change, others	±3	±5	%
External Trim Adj. Range			±10	%
Ripple & Noise	20MHz Bandwidth, 100% load	50	100	mV pk-pk

General Specifications

Parameters	Conditions	Minimum	Typical	Maximum	Units
Switching frequency	100% load		270		KHz
Short circuit protection	Continuous, Auto recovery				
Over current protection		110		190	% of Io
Over voltage protection	Input voltage range	110		160	%Vo
Operating temperature	See derating curve	-40		85	°C
Maximum soldering temperature	1.5mm from case for 10 sec			300	°C
Storage temperature		-55		125	°C
Temperature coefficient	100% Load			± 0.03	%/°C
Cooling	Free air convection				
Humidity			≥5	95	% RH
Weight			26		g
Dimensions (L x W x H)	2.00x 1.00 x 0.47 inches (50.8 x 25.4 x 12.0 mm)				
Case material	Aluminum alloy				
Vibration	10-150Hz, 5G, 90 minutes, along all axis				
MTBF	≥ 1 000 000 hrs (MIL-HDBK -217F, t=+25°C)				

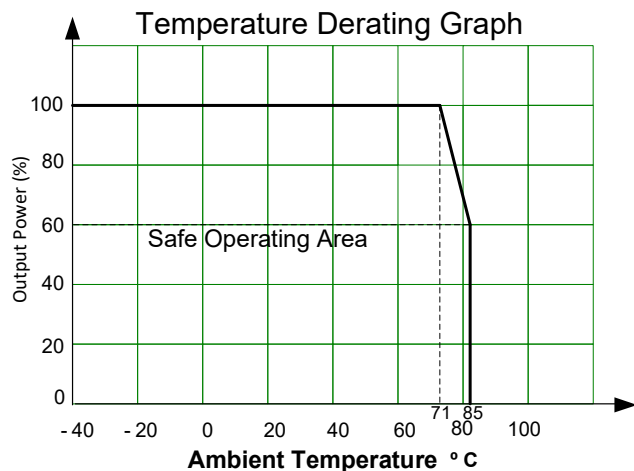
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Safety Specifications

Parameters		
Standards	Information technology Equipment	Designed to meet UL/EN/IEC 62368-1
	EMI - Conducted and radiated emission	CISPR32/EN 55032, Class B, with the recommended EMC circuit
	Electrostatic Discharge Immunity	EN61000-4-2

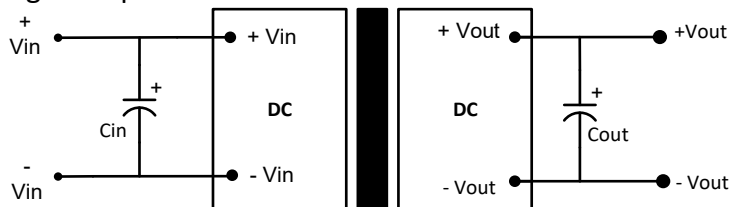
RF, Electromagnetic Field Immunity	EN61000-4-3
Electrical Fast Transient/Burst Immunity	EN61000-4-4
Surge Immunity	EN61000-4-5
RF, Electromagnetic Field Immunity	EN61000-4-6
Voltage dips, Short Interruptions & Voltage variations Immunity	EN61000-4-29

Derating

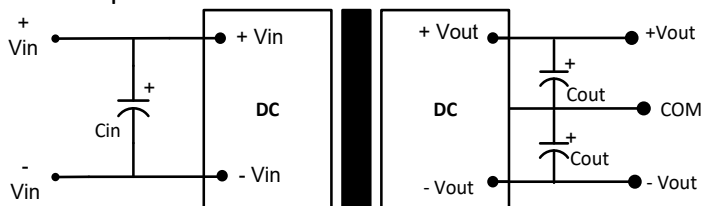


Typical Application Circuit

Single Output models

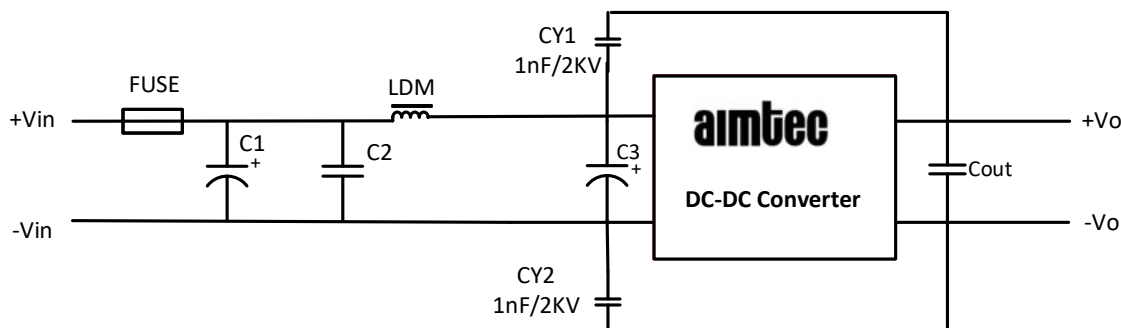


Dual Output models



Vin	Cin	Vout	Cout
12Vin	100μF, 25V	3.3Vout	470μF
24Vin	100μF, 50V	5Vout	470μF
48Vin	100μF, 100V	9Vout	220μF
		12Vout	220μF
		15Vout	220μF
		24Vout	100μF
		±5Vout	220μF
		±9Vout	100μF
		±12Vout	100μF
		±15Vout	100μF
		±24Vout	100μF

Recommended EMC Circuit



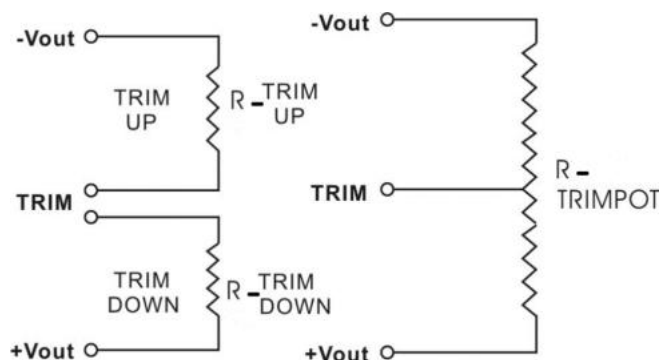
Component	12/24Vin	48Vin
C1	680 μ F, 50V	680 μ F, 100V
C2	1 μ F, 50V	1 μ F, 100V
C3	330 μ F, 50V	330 μ F, 100V
Cout	Refer to Cout in Typical Application Circuit	
LDM	4.7 μ H	

Trimming

Output voltage can be externally trimmed by utilizing the methods as shown below

Fixed Resistor

Variable Potentiometer



Leave open if not used.

3.3V Output

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.970
Rt down (K Ω)	195.198	107.438	70.997	51.044	38.453	29.785	23.453	18.625	14.822	11.749
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.630
Rt up (K Ω)	298.695	101.771	57.515	37.984	26.983	19.925	15.012	11.395	8.622	6.428

5V Output

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	4.950	4.900	4.850	4.800	4.750	4.700	4.680	4.600	4.550	4.500
Rt down (KΩ)	110.182	53.582	32.644	21.738	15.047	10.524	9.100	4.798	2.871	1.323
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	5.060	5.100	5.150	5.200	5.250	5.300	5.350	5.400	5.450	5.500
Rt up (KΩ)	130.380	68.870	40.959	27.639	19.840	14.718	11.096	8.401	6.316	4.655

9V Output

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	8.910	8.820	8.730	8.640	8.550	8.460	8.370	8.280	8.190	8.100
Rt down (KΩ)	375.533	207.430	139.157	102.145	78.924	62.997	51.393	42.562	35.617	30.011
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	9.090	9.180	9.270	9.360	9.450	9.540	9.630	9.720	9.810	9.900
Rt up (KΩ)	314.532	112.639	64.148	42.357	29.975	21.990	16.412	12.297	9.134	6.629

12V Output

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	11.880	11.760	11.640	11.520	11.400	11.280	11.160	11.040	10.920	10.800
Rt down (KΩ)	496.092	301.452	212.527	161.585	128.573	105.442	88.332	75.164	64.716	56.223
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	12.120	12.240	12.360	12.480	12.600	12.720	12.840	12.960	13.080	13.200
Rt up (KΩ)	706.435	158.920	83.879	54.075	38.077	28.095	21.274	16.317	12.552	9.595

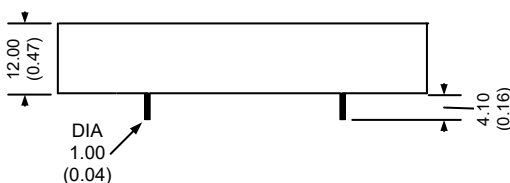
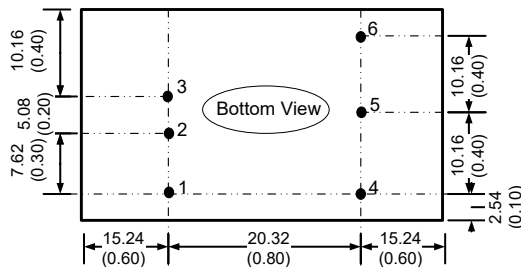
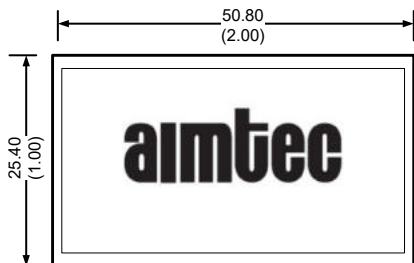
15V Output

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	14.850	14.700	14.550	14.400	14.250	14.100	13.950	13.800	13.650	13.500
Rt down (KΩ)	259.486	206.711	170.213	143.469	123.029	106.899	93.847	83.067	74.014	66.304
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	15.150	15.300	15.450	15.600	15.750	15.900	16.050	16.200	16.350	16.500
Rt up (KΩ)	--	--	--	468.181	149.393	84.045	55.873	40.178	30.174	23.241

24V Output

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	23.760	23.520	23.280	23.040	22.800	22.560	22.320	22.080	21.840	21.600
Rt down (KΩ)	1291.721	794.249	566.971	436.771	352.397	293.276	249.546	215.890	189.186	167.481
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.240	24.480	24.720	24.960	25.200	25.440	25.680	25.920	26.160	26.400
Rt up (KΩ)	797.750	178.809	93.978	60.286	42.201	30.917	23.206	17.602	13.346	10.003

Dimensions



Notes:
All dimensions are typical in millimeters (inches).
Pin diameter Tolerance ± 0.10 (± 0.014)
Case Tolerance ± 0.50 (± 0.02)

Pin Out Specifications		
Pin	Single	Dual
1	On/off control	On/off control
2	-Vin	-Vin
3	+Vin	+Vin
4	-Vout	-Vout
5	Trim	Common
6	+Vout	+Vout

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