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AM40EW-LPZ



2 x 1”

The AM40EW-LPZ is a 40W DC/DC converter that offers a regulated output which contributes to a more stable and reliable output performance. It features a wide 4:1 input voltage range of 9-160VDC, which will benefit your new system design.

This series offers great operating temperatures, from -40°C to 85°C. Furthermore, an isolation of 1500VDC/3000VDC, continuous output short circuit protection (OSCP), over-current protection (OCP), over-voltage protection (OVP), and under voltage lock-out (UVLO) come standard with the series.

The AM40EW-LPZ is suitable for grid power, instrumentation, industrial controls, communication, and civil applications.

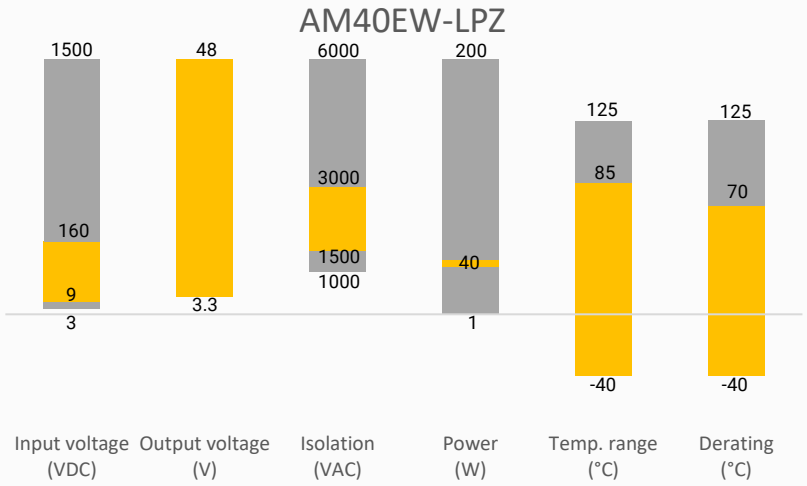
Features

- Operating Temp: -40 °C to +85 °C
- Isolation voltage: 1500VDC/3000VDC
- High efficiency: Up to 93% typ.
- Regulated single output
- Output short circuit, over-current, over-voltage
- Standard 2 x1 package

RoHS

3yr Warranty

Summary



Training

Product Training Video (click to open)

Press Release

Coming Soon!

Application Notes

Applications

Power Grid

Industrial

Telecom

Instrumentation

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Models & Specifications

Single Output							
Model	Input Voltage (VDC)	Output Voltage (VDC)	Nominal Vin Input Current Max (mA)		Output Current Max (mA)	Maximum capacitive load (µF)	Efficiency Full Load Typ (%)
			No Load	Full Load			
AM40EW-2405SLPZ	24 (9-36)	5	12	1894	8000	15000	91
AM40EW-2409SLPZ	24 (9-36)	9	12	1852	4444	4700	91
AM40EW-2412SLPZ	24 (9-36)	12	12	1852	3333	3000	92
AM40EW-2415SLPZ	24 (9-36)	15	12	1852	2666	2200	93
AM40EW-2424SLPZ	24 (9-36)	24	12	1852	1666	1300	92
AM40EW-4805SLPZ	48 (18-75)	5	12	926	8000	15000	91
AM40EW-4812SLPZ	48 (18-75)	12	12	926	3333	3000	92
AM40EW-4815SLPZ	48 (18-75)	15	12	926	2666	2200	93
AM40EW-4824SLPZ	48 (18-75)	24	12	926	1666	1300	92
AM40EW-11003SH30LPZ	110 (40-160)	3.3	5	345	10000	10000	87
AM40EW-11005SH30LPZ	110 (40-160)	5	3	413	8000	10000	88
AM40EW-11012SH30LPZ	110 (40-160)	12	3	413	3333	2700	91
AM40EW-11015SH30LPZ	110 (40-160)	15	3	413	2666	1680	91
AM40EW-11024SH30LPZ	110 (40-160)	24	3	413	1666	680	89
AM40EW-11048SH30LPZ	110 (40-160)	48	3	413	833	470	89

Dual Output							
Model	Input Voltage (VDC)	Output Voltage (VDC)	Nominal Vin Input Current Max (mA)		Output Current Max (mA)	Maximum capacitive load (µF)	Efficiency Full Load Typ (%)
			No Load	Full Load			
AM40EW-2412DLPZ	24 (9-36)	±12	12	1852	±1666	1000	87
AM40EW-2415DLPZ	24 (9-36)	±15	12	1852	±1333	680	87
AM40EW-2424DLPZ	24 (9-36)	±24	12	1852	±833	470	87
AM40EW-4812DLPZ	48 (18-75)	±12	12	926	±1666	1000	87
AM40EW-4815DLPZ	48 (18-75)	±15	12	926	±1333	680	87
AM40EW-4824DLPZ	48 (18-75)	±24	12	926	±833	680	87

Input Specification				
Parameters	Conditions	Typical	Maximum	Units
Voltage types			4:1	
Absolute maximum rating	24Vin, 1sec. max.		-0.7~50	VDC
	48Vin, 1sec. max.		-0.7~100	VDC
	110Vin, 1sec. max.		-0.7~180	VDC
Input reflected ripple current	Nominal Vin and full load, 24/48Vin models	40		mA
	Nominal Vin and full load, 110Vin models	25		mA
Start-up time	Nominal Vin and constant resistive load, 24/48Vin models	10		mS
	Nominal Vin and constant resistive load, 110Vin models	20		mS
Start-up voltage	24V input		9	VDC
	48V input		18	VDC
	110V input		40	VDC

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Input under voltage lockout	24V input	5.5-6.5		VDC
	48V input	12-15.5		VDC
	110V input	28-32		VDC
Filter	π(Pi) Network			
On/Off control	ON – open or 3.5-12VDC; OFF – short to –Vin or 0-1.2VDC, Idle current: 5 - 10mA (24/48Vin models), 2 – 10mA (110Vin models)			

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested isolation voltage	Input / output, 60 sec, 1 mA, 24/48Vin models	≥1500		VDC
	Input / output, 60 sec, 1 mA, 110Vin models	≥3000		VDC
Resistance	Input / output, 500VDC	≥1000		MΩ
Capacitance	Input / output, 100KHz/0.1V, 24/48Vin models	2000		pF
	Input / output, 100KHz/0.1V, 110Vin models	2200		pF

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage Tolerance	5%-100% load @ Vin (nom.)	±1	±3	%
Line Regulation	LL to HL at Full Load, 24/48Vin models	±0.2	±0.5	%
	LL to HL at Full Load, 110Vin models	±0.4	±1	%
Load Regulation	5% to 100% load	±0.5	±1	%
Cross Regulation	Dual, positive output 50% load, negative output 10% to 100% Load		±5	%
Transient Recovery Time	25% load step change, 24/48Vin models	250	500	µs
	25% load step change, 110Vin models	300	500	µs
Transient recovery deviation	25% load step change, 110Vin @ 12/15/24/48Vout models	±3	±5	%
	25% load step change, others	±5	±8	%
External Trim Adj. Range			±10	%
Ripple & Noise	20MHz Bandwidth, 100% load, 24/48Vin models	100	200	mV pk-pk
	20MHz Bandwidth, 100% load, 110Vin models	150	200	mV pk-pk

General Specifications

Parameters	Conditions	Minimum	Typical	Maximum	Units
Switching frequency	100% load, 24/48Vin models		330		KHz
	100% load, 110Vin models		220		KHz
Short circuit protection	Continuous, Auto recovery				
Over current protection	Nominal input	110	140	190	% of Io
Over voltage protection		110		160	%
Operating temperature	See derating curve, 24/48Vin models	-40		80	°C
	See derating curve 110Vin models	-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			41		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	IEC/EN61373, category 1/grade B				

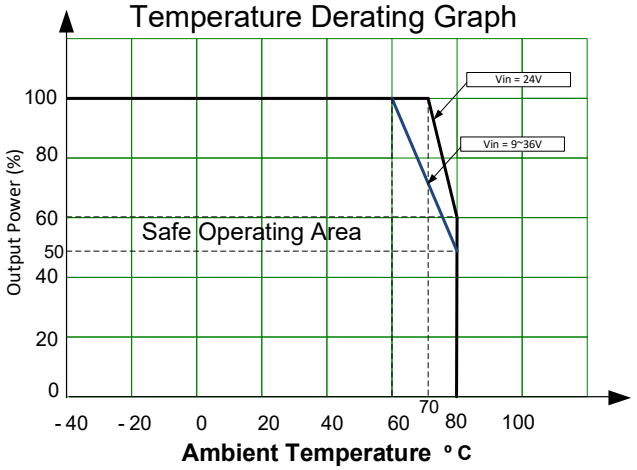
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MTBF	24/48Vin models	≥ 1 000 000 hrs (MIL-HDBK -217F, t=+25°C)
	110Vin models	≥ 500 000 hrs (MIL-HDBK -217F, t=+25°C)
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.		

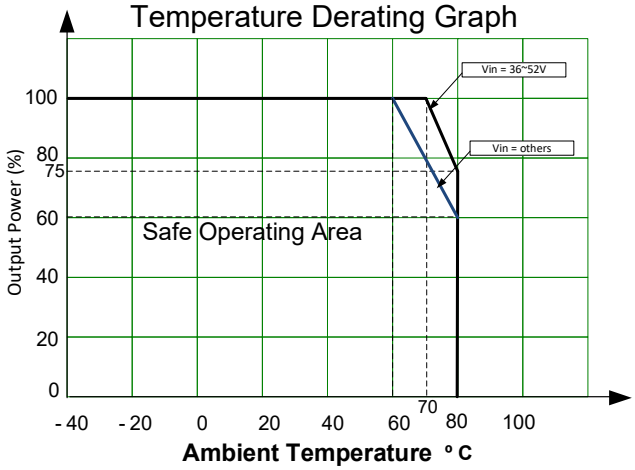
Safety Specifications		
Parameters		
Standards	Designed to meet EN55016-2-1 (110Vin models)	
	Information technology Equipment	Designed to meet UL/EN/IEC 62368-1
	Electronic equipment in railway application	Designed to meet EN50155 (110Vin models)
	EMI - Conducted and radiated emission	CISPR32/EN 55032, Class A, with the recommended EMC circuit, 24/48Vin models CISPR32/EN 55032, Class A, with the recommended EMC circuit, 110Vin models
	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

Derating

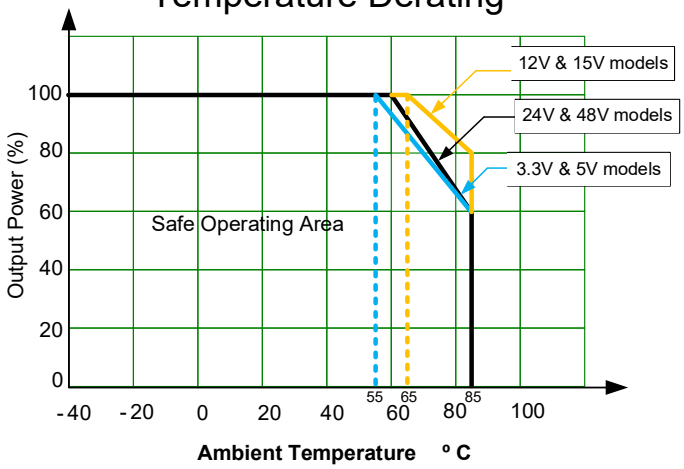
24Vin models
Temperature Derating Graph



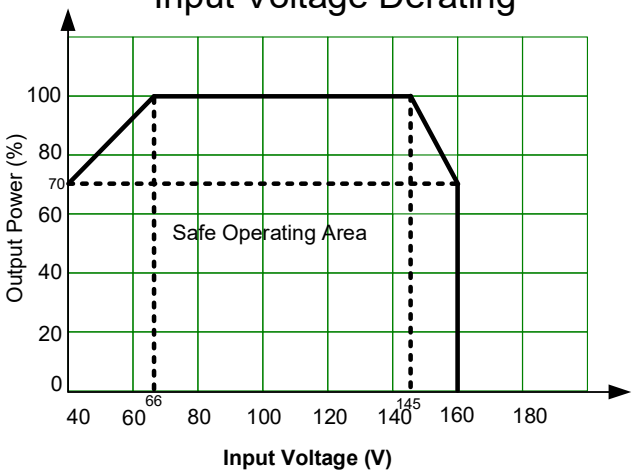
48Vin models
Temperature Derating Graph



110Vin models
Temperature Derating



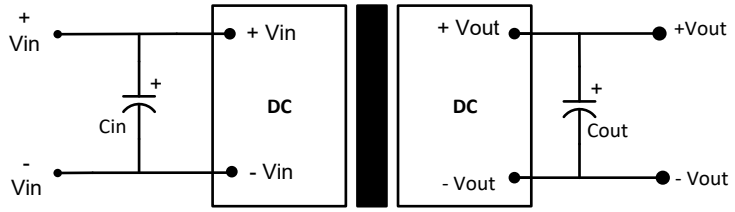
110Vin models
Input Voltage Derating



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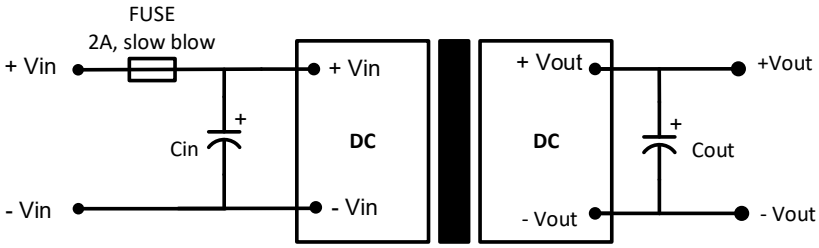
Typical Application Circuit

Single Output 24/48Vin models



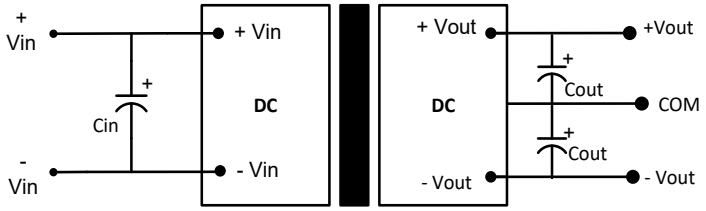
Single outputs			
Vin	Cin	Vout	Cout
24VDC	100µF/50V	5VDC	100µF,24V
48VDC	100µF/100V	9VDC	100µF,24V
		12VDC	100µF,24V
		15VDC	100µF,24V
		24VDC	47µF,50V

Single Output 110Vin models



Single outputs			
Vin	Cin	Vout	Cout
110VDC	100µF/100V	3.3VDC	470µF,50V
		5VDC	470µF,50V
		12VDC	220µF,50V
		15VDC	220µF,50V
		24VDC	100µF,100V
		48VDC	100µF,100V

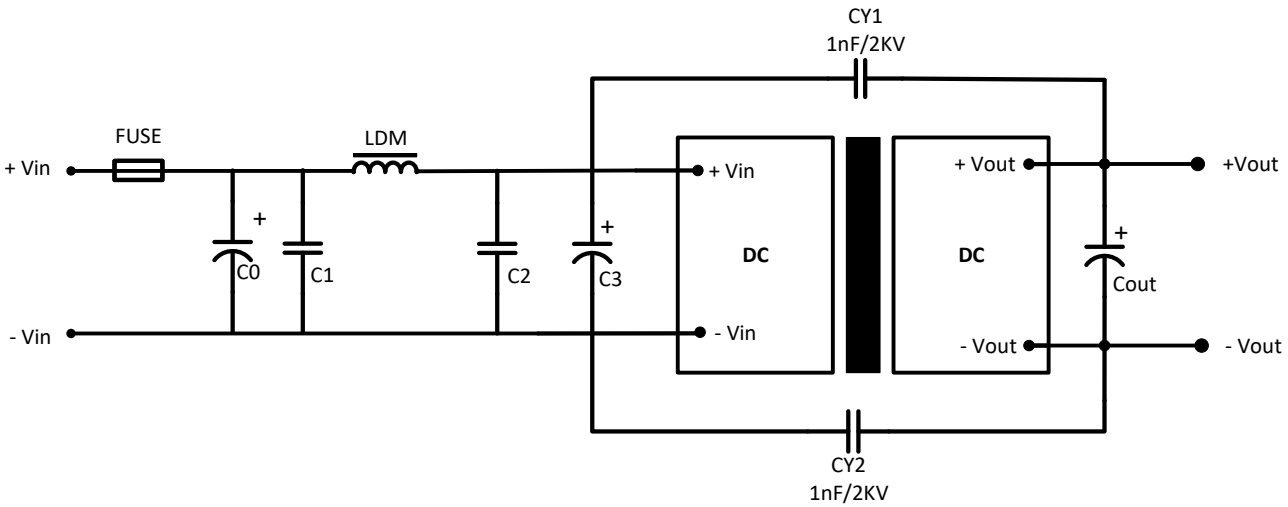
Dual Output 24/48Vin models



Dual outputs			
Vin	Cin	Vout	Cout
24VDC	100µF/50V	±12VDC	100µF,24V
48VDC	100µF/100V	±15VDC	100µF,24V
		±24VDC	47µF,50V

Recommended EMC Circuit

24/48Vin models



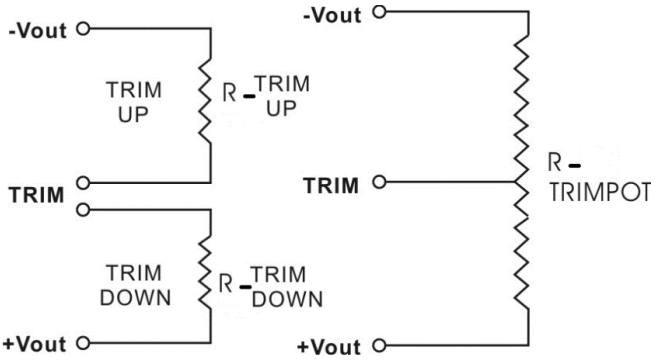
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Component	24Vin	48Vin
C0, C3	330µF, 50V	330µF, 100V
C1, C2	4.7µF, 50V	4.7µF, 100V
Cout	Refer to Cout in Typical Application Circuit	
LDM	2.2µH, 4A	2.2µH, 2A

Trimming

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

Fixed Resistor **Variable Potentiometer**



Leave open if not used.

AM40EW-11003SH30LPZ

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 (KΩ)	195.744	109.218	73.096	53.270	40.741	32.108	25.797	20.983	17.190	14.124
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 (KΩ)	308.349	105.149	60.286	40.580	29.504	22.407	17.472	13.842	11.058	8.857

5V Output 24/48Vin

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	4.679	4.550	4.500
Rt down (KΩ)	39.966	22.440	13.270	7.631	3.813	1.056	--	--	--	--
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)	--	135.361	52.843	29.152	17.912	11.350	7.048	4.011	1.752	0.006

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AM40EW-11005SH30LPZ

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)	105.181	52.154	31.997	21.378	14.823	10.373	8.969	4.719	2.811	1.277
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)	138.071	71.279	41.974	28.200	20.198	14.967	11.281	8.544	6.430	4.749

12V Output 24/48Vin

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)	525.855	272.916	179.060	130.111	100.061	79.736	65.073	53.995	45.330	38.368
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)	190.983	76.518	43.233	27.375	18.096	12.007	7.703	4.500	2.023	0.050

AM40EW-11012SH30LPZ

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 24/48Vin

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)	675.367	382.496	260.958	194.429	152.455	123.560	102.455	86.363	73.689	63.447
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	16.490
Rt up (KΩ)	323.076	105.467	56.466	34.831	22.640	14.818	9.373	5.365	2.291	--

AM40EW-11015SH30LPZ

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)	974.008	517.390	346.387	256.863	201.789	164.487	137.551	117.187	101.251	88.440
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)	283.713	117.996	70.541	48.045	34.918	26.315	20.242	15.725	12.235	9.456

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24V Output 24/48Vin

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)	635.592	358.741	246.163	185.102	146.779	120.487	101.330	86.750	75.282	66.025
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)	154.790	53.216	28.902	17.987	11.787	7.790	4.999	2.939	1.357	0.104

AM40EW-11024SH30LPZ

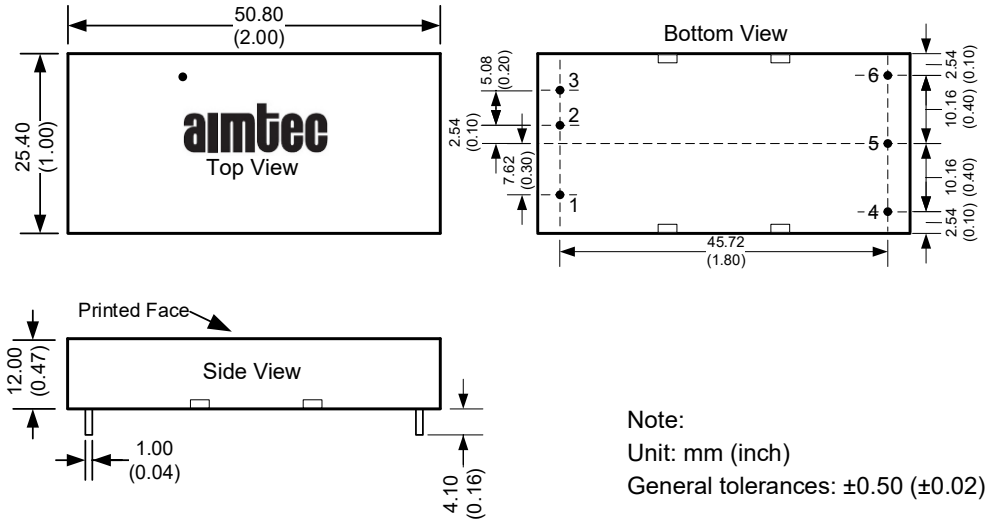
Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	23.760	23.520	23.280	23.040	22.800	22.560	22.320	22.080	21.840	21.600
Rt down (KΩ)	1286.200	792.123	565.867	436.104	351.954	292.963	249.315	215.714	189.047	167.370
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.240	24.480	24.720	24.960	25.200	25.440	25.680	25.920	26.160	26.400
Rt up (KΩ)	816.889	179.914	94.338	60.464	42.307	30.988	23.257	17.640	13.376	10.027

AM40EW-11048SH30LPZ

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	47.520	47.040	46.560	46.080	45.600	45.120	44.640	44.160	43.680	43.200
Rt down (KΩ)	2357.744	1592.776	1193.772	948.808	783.113	663.569	573.251	502.609	445.845	399.235
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	48.480	48.960	49.440	49.920	50.400	50.880	51.360	51.840	52.320	52.800
Rt up (KΩ)	-1614.615	331.356	138.244	82.118	55.382	39.741	29.475	22.220	16.821	12.646

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Dimensions



Note:
Unit: mm (inch)
General tolerances: ±0.50 (±0.02)

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

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