Series AM15EW-NZ

15 Watt | DC-DC Converter



FEATURES:

- Efficiency up to 85%
- Ultra-wide 4:1 Input range
- Continuous short circuit protection
- Operating Temperature: -40°C to +85°C
- On/Off Remote Control
- Over Voltage & Over Current Protection
- Input / Output Isolation 2250VDC
- Input Under Voltage Lockout

Models

Single output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Max Capacitive Load (uF)	Efficiency (%)
AM15EW-11003SH22-NZ	40-160	3.3	4000	2250	5400	82
AM15EW-11005SH22-NZ	40-160	5	3000	2250	5400	84
AM15EW-11012SH22-NZ #	40-160	12	1250	2250	1000	84
AM15EW-11015SH22-NZ	40-160	15	1000	2250	820	85
AM15EW-11024SH22-NZ #	40-160	24	625	2250	270	85

Add suffix "-K" for optional heat sink
***Add suffix "-ST" for optional screw terminal bottom plate or "-STD" for optional DIN Rail screw terminal bottom plate and reverse voltage protection.**
****Add suffix "-K" for optional heatsink, "-K-ST" for optional heatsink and screw terminal bottom plate or "-K-STD" for optional heatsink and DIN Rail screw terminal bottom plate and reverse voltage protection.**

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
	110	40-160		VDC
Filter		π(Pi) Network		
Startup time		10		ms
	110		180	VDC
Peak Input Voltage time			1	s
On/Off control	110V input	ON – open or 3.5-12VDC; OFF – short to –Vin or 0-1.2VDC, Idle current 1mA		
No load Input Current			60	mA
Input reflected current		30		mA

Isolation Specifications

Parameters	Conditions	Rated	Maximum	Units
Tested I/O voltage	60 sec, 1mA	1500 & 2250		VDC
Tested I/FG & O/FG voltage	2250V Isolated models, 60 sec, 1mA	1600		VDC
Resistance		>1000		MOhm
Capacitance	110Vin 2250V Isolation, I/O, 100KHz/0.1V	2000		pF

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±3		%
Over voltage protection	Zener Diode Clamp			%
Over current protection		120	210	% of Io
Short Circuit protection	Hiccup, Continuous			
Short circuit restart	Auto-Recovery			
Line voltage regulation	Full load, LL-HL	±0.5		% of Vin
Load voltage regulation	0-100% load for 2250V instead models; 5-100% load others	±1		%
Temperature coefficient			±0.03	%/°C
Ripple & Noise	20MHz Bandwidth		100	mV p-p
Voltage adjustment range			±10	%
Transient recovery time	25% load step change		500	µS
Transient recovery deviation	25% load step change	±5		%

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General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% load	300		KHz
Operating temperature	See derating curve	-40 to +85		ºC
Storage temperature	-55 to +125			ºC
Maximum case temperature			105	ºC
Cooling	Free air convection			
Humidity			95	% RH
Case material	Aluminum Alloy			
Dimensions (L x W x H)	PCB mountable without heatsink	2.00 x 1.00 x 0.46 inches; 50.80 x 25.40 x 11.80mm		
	Optional packages	See dimensions drawing		
Weight	Pin mountable without heatsink	26 (2250VDC Isolated models)		g
	Pin mountable with heatsink	34 (2250VDC Isolated models)		
	-ST option without heatsink	48 (2250VDC Isolated models)		
	-ST option with heatsink	56 (2250VDC Isolated models)		
	-STD option without heatsink	68 (2250VDC Isolated models)		
	-STD option with heatsink	76 (2250VDC Isolated models)		
MTBF	>1,000,000 hours (MIL-HDBK -217F, Ground Benign, t=+25°C)			
Maximum soldering temperature	1.5mm from case for 10 sec		300	ºC

Environmental Specifications

Parameters	
Vibration (110 Vin/2250VDC isolation)	IEC61373 car body 1 B mold

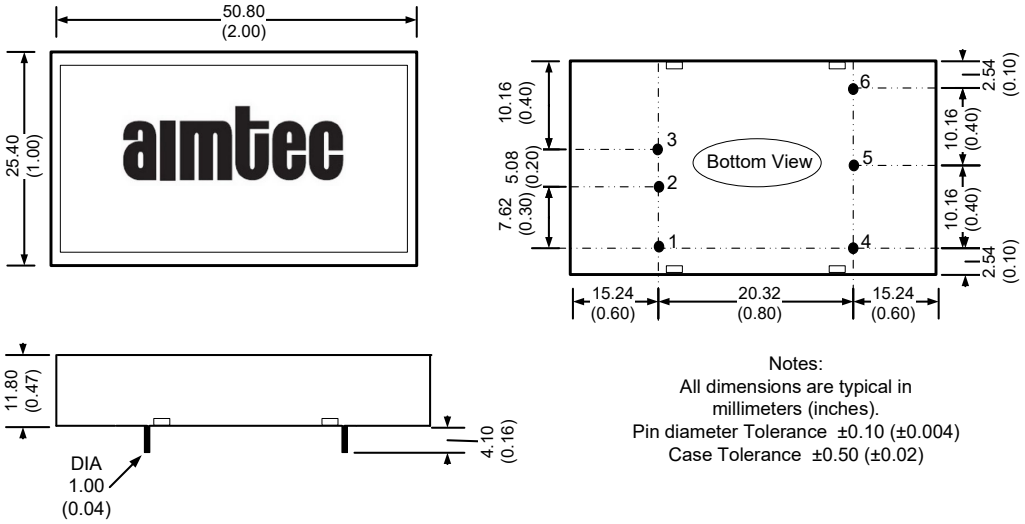
Safety Specifications

Parameters	
Approvals	CE, EN62368-1
Standards	EN 55022, class B (with the recommended EMC circuit) IEC61000-4-2, Contact ±6KV (110Vin 2250V Isolation), Criteria B IEC61000-4-3, 10V/m, Criteria A IEC61000-4-4, ±4KV (110Vin 2250V Isolation), Criteria B IEC61000-4-5, ±2KV, Criteria B, (with the recommended EMC circuit) IEC61000-4-6, 10 Vrms (2250 VDC Isolated models) Criteria A Design to meet IEC/EN/UL 60950-1 (# 110V input 12V, 24V output models only), EN50155 IEC/EN62368, designed to meet UL 62368 (AM15EW-11012SH22-NZ & AM15EW-11024SH22-NZ models only)

Pin Out Specifications

Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	-Vout
5	Trim
6	+Vout

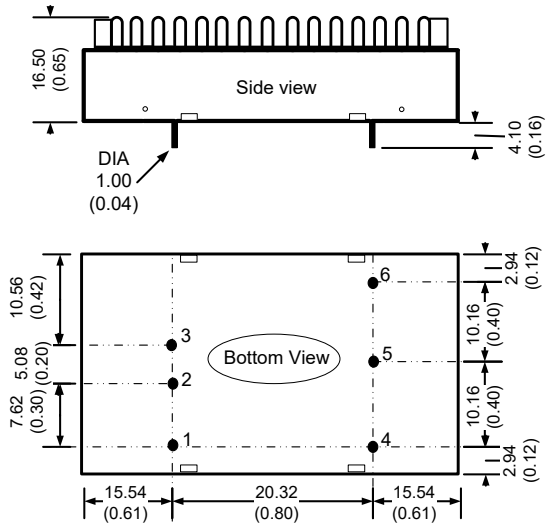
Dimensions



Notes:
All dimensions are typical in millimeters (inches).
Pin diameter Tolerance ±0.10 (±0.004)
Case Tolerance ±0.50 (±0.02)

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Optional -K heatsink

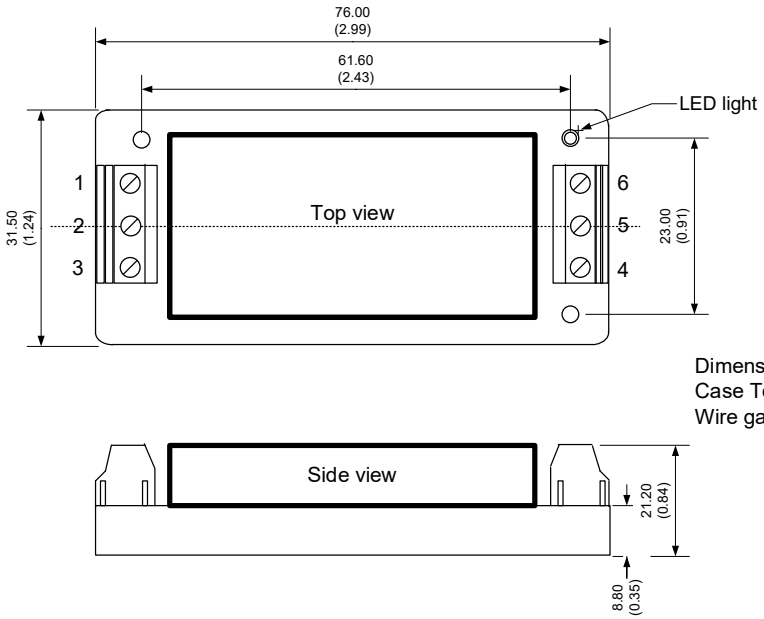


Notes:
All dimensions are typical in millimeters (inches).
Pin diameter Tolerance: ±0.10 (±0.004)
Case Tolerance: ±0.50 (±0.02)

Pin Out Specifications

Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	-Vout
5	Trim
6	+Vout

Dimensions with -ST options



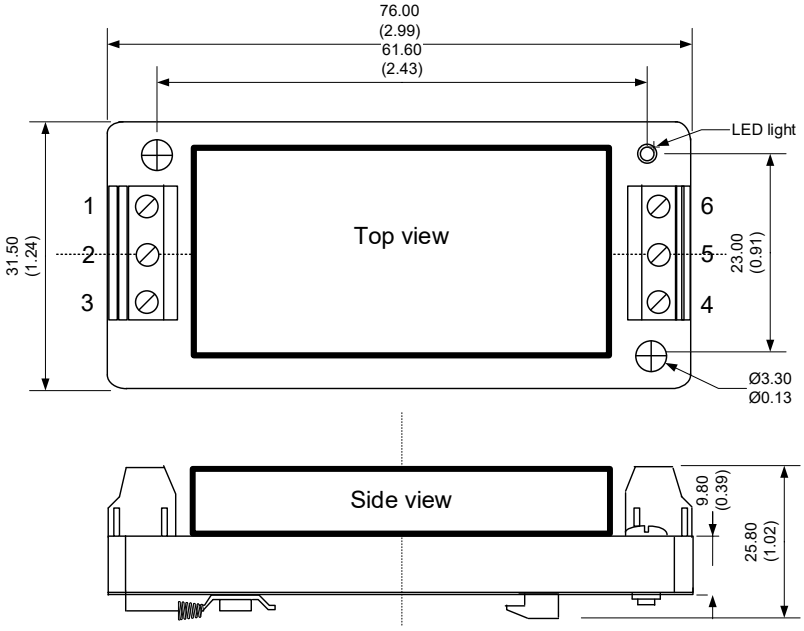
Dimensions: mm (inch)
Case Tolerance:± 0.50 (0.02)
Wire gauge: 24-12AWG

Pin Out Specifications

Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	+ Vout
5	Trim
6	- Vout

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Dimensions with -STD options

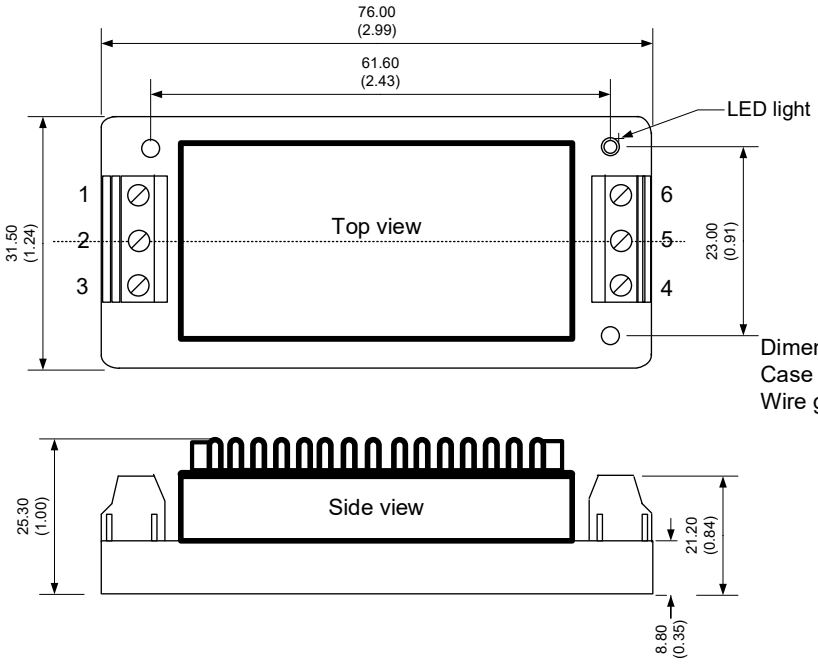


Dimensions: mm (inch)
Case Tolerance:± 1.00 (0.04)
Wire gauge: 24-12AWG

Pin Out Specifications

Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	+ Vout
5	Trim
6	- Vout

Dimensions with heatsink and -ST options



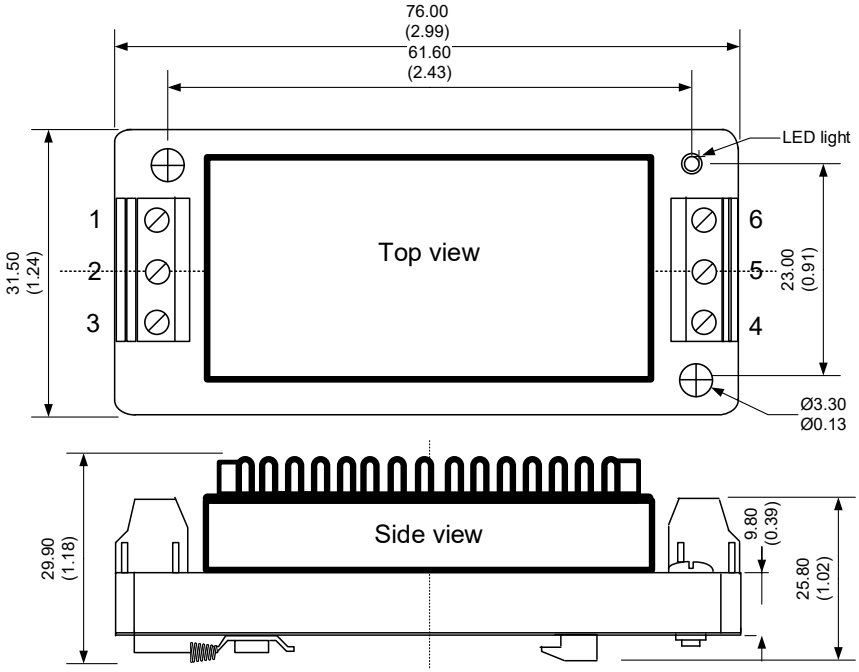
Dimensions: mm (inch)
Case Tolerance:± 0.50 (0.02)
Wire gauge: 24-12AWG

Pin Out Specifications

Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	+ Vout
5	Trim
6	- Vout

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Dimensions with heatsink and -STD options



Dimensions: mm (inch)
Case Tolerance:± 0.50 (0.02)
Wire gauge: 24-12AWG

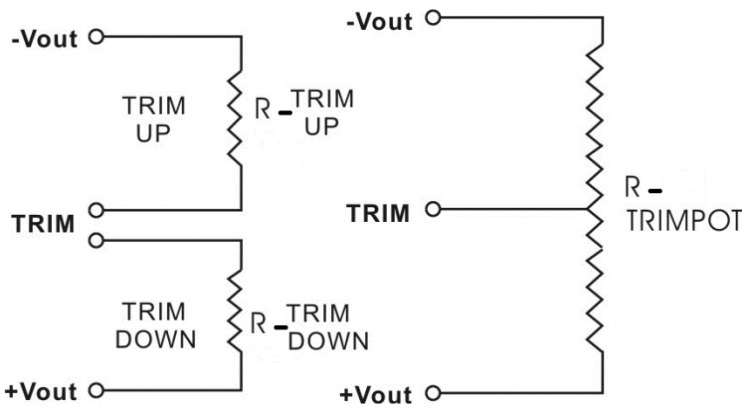
Pin Out Specifications

Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	+ Vout
5	Trim
6	- Vout

Trimming

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

Fixed Resistor



Variable Potentiometer

Leave open if not used.

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AM15EW-11003SH22-NZ

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	2.97
Rt down (KΩ)	210.002	103.334	72.327	54.213	42.335	31.667	25.963	21.505	16.884	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	3.63
Rt up (KΩ)	369.179	96.88	59.466	41.454	28.235	22.058	17.6	14.23	10.837	8.857

AM15EW-11005SH22-NZ

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	4.95	4.9	4.85	4.8	4.75	4.7	4.65	4.6	4.55	4.5
Rt down (KΩ)	105.181	52.154	31.997	21.378	14.823	10.373	7.155	4.719	2.811	1.277
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	5.05	5.1	5.15	5.2	5.25	5.3	5.35	5.4	5.45	5.5
Rt up (KΩ)	176.356	71.279	41.974	28.2	20.198	14.967	11.281	8.544	6.43	4.749

AM15EW-11012SH22-NZ

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	11.88	11.76	11.64	11.52	11.4	11.28	11.16	11.04	10.92	10.8
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)	12.12	12.24	12.36	12.48	12.6	12.72	12.84	12.96	13.08	13.2
Rt up (KΩ)	706.435	158.92	83.879	54.075	38.077	28.095	21.274	16.317	12.552	9.595

AM15EW-11015SH22-NZ

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	14.85	14.7	14.55	14.4	14.25	14.1	13.95	13.8	13.65	13.5
Rt down (KΩ)	974.008	517.391	346.387	256.863	201.789	164.487	137.551	117.187	101.251	88.44
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	15.15	15.3	15.45	15.6	15.75	15.9	16.05	16.2	16.35	16.5
Rt up (KΩ)	283.713	117.996	70.541	48.045	34.918	26.315	20.242	15.725	12.235	9.456

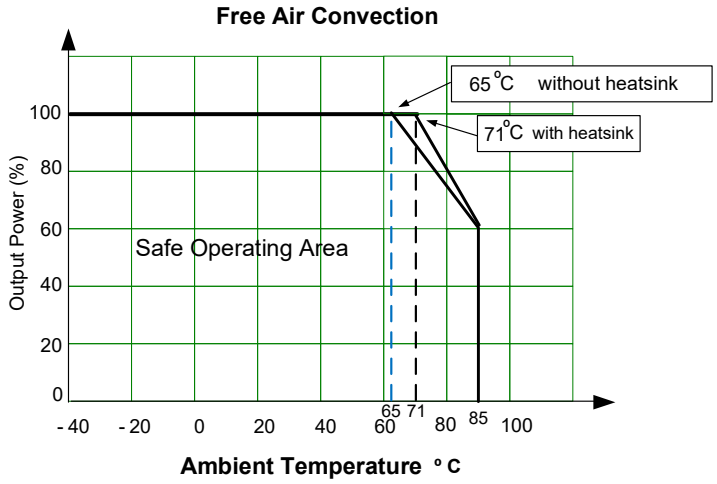
AM15EW-11024SH22-NZ

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	23.76	23.52	23.28	23.04	22.8	22.56	22.32	22.08	21.84	21.6
Rt down (KΩ)	1286.2	792.123	565.867	436.104	351.954	292.963	249.316	215.714	189.047	167.37
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.24	24.48	24.72	24.96	25.2	25.44	25.68	25.92	26.16	26.4
Rt up (KΩ)	816.889	179.914	94.338	60.464	42.307	30.988	23.257	17.64	13.376	10.027

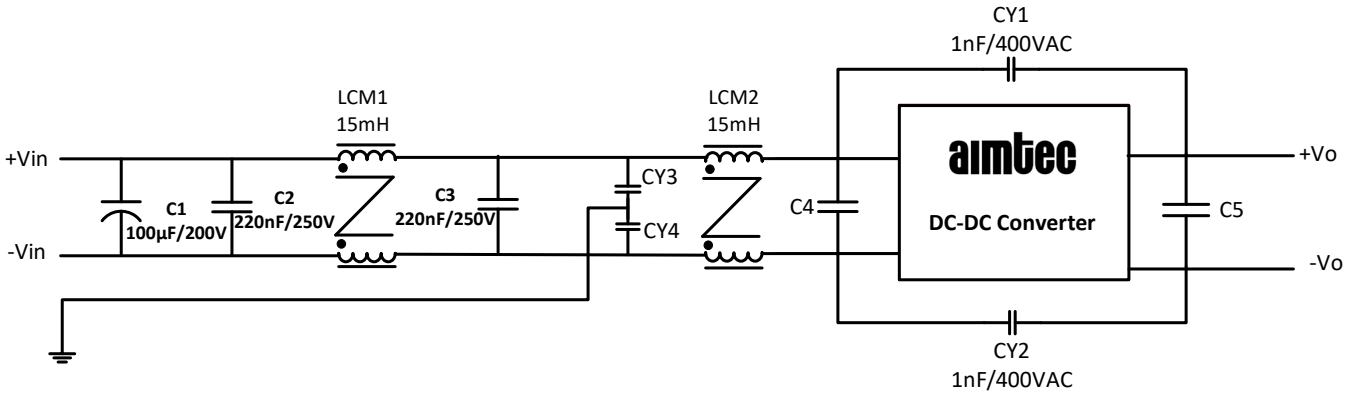
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Derating

110Vin 2250V Isolation



EMC recommended filter 110Vin 2250V Isolation



CY3 & CY4	C4	Vout	C5
1nF / 400V	10-47 µF / 250V	3.3V & 5V	470 µF
		12V & 15V	220 µF
		24V	100 µF

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