



#### FEATURES:

- Efficiency up to 87%
- Ultra-Wide 4:1 input range
- Continuous Short Circuit Protection
- Operating temperature -40°C to +85°C
- 110Vin models design to meet EN50155
- Input Under-voltage Protection
- Over Voltage, Over Current Protection
- I/O Isolation 2250 & 3000VDC
- On/Off remote control

#### Models Single output



Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	I/O Isolation (VDC)	Capacitive load max (µF)	Efficiency (%)
AM10EW-2403SH30-NZ	9-36	3.3	2400	3000	5400	78
AM10EW-2405SH30-NZ	9-36	5	2000	3000	5400	82
AM10EW-2409SH30-NZ	9-36	9	1111	3000	680	84
AM10EW-2412SH30-NZ	9-36	12	833	3000	470	84
AM10EW-2415SH30-NZ	9-36	15	667	3000	330	87
AM10EW-2424SH30-NZ	9-36	24	416	3000	100	86
AM10EW-4803SH30-NZ	18-75	3.3	2400	3000	5400	79
AM10EW-4805SH30-NZ	18-75	5	2000	3000	5400	82
AM10EW-4812SH30-NZ	18-75	12	833	3000	470	86
AM10EW-4815SH30-NZ	18-75	15	667	3000	330	87
AM10EW-4824SH30-NZ	18-75	24	416	3000	100	87
AM10EW-11003SH22-NZ	40-160	3.3	2400	2250	5400	76
AM10EW-11005SH22-NZ	40-160	5	2000	2250	5400	80
AM10EW-11012SH22-NZ	40-160	12	833	2250	470	84
AM10EW-11015SH22-NZ	40-160	15	667	2250	330	84
AM10EW-11024SH22-NZ	40-160	24	417	2250	100	85

\* For 110Vin single output models, add suffix “- K” for optional heatsink or “- K-ST” for optional heatsink with screw terminal bottom plate or “-K-STD” for optional heatsink with DIN Rail screw terminal bottom plate.

\* Add suffix “-ST” for optional screw terminal bottom plate or “-STD” for optional DIN Rail screw terminal bottom plate.

\* “-ST” and “-STD” options come with reverse polarity protection. 24Vin and 48Vin models with “-ST” or “-STD” option will increase the minimum input voltage and under voltage lockout threshold by 1V and reduce the efficiency by 2%. 110Vin models with “-ST” or “-STD” option will reduce the efficiency by 2%

#### Models Dual output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	I/O Isolation (VDC)	Capacitive load max (µF)	Efficiency (%)
AM10EW-2405DH30-NZ	9-36	±5	±1000	3000	±1000	81
AM10EW-2412DH30-NZ	9-36	±12	±416	3000	±330	85
AM10EW-2415DH30-NZ	9-36	±15	±333	3000	±220	87
AM10EW-4805DH30-NZ	18-75	±5	±1000	3000	±1000	82
AM10EW-4812DH30-NZ	18-75	±12	±416	3000	±330	86
AM10EW-4815DH30-NZ	18-75	±15	±333	3000	±220	87
AM10EW-11005DH22-NZ	40-160	±5	±1000	2250	±1000	80
AM10EW-11012DH22-NZ	40-160	±12	±417	2250	±470	84
AM10EW-11015DH22-NZ	40-160	±15	±334	2250	±330	84

\* For 110Vin dual output models, add suffix “- O” for no on/off control option. (ex. AM10EW-11005DH22-NZ-O Has no on/off control and no Ctrl pin.)

\* For 24Vin dual output, and 48Vin dual output models, add suffix “-ST” for optional screw terminal bottom plate or “-STD” for optional DIN Rail screw terminal bottom plate.

\* “-ST” and “-STD” options come with reverse polarity protection. 24Vin and 48Vin models with “-ST” or “-STD” option will increase the minimum input voltage and under voltage lockout threshold by 1V and reduce the efficiency by 2%.

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	24	9-36	40	VDC
	48	18-75	80	
	110	40~160	170	
Input Current (full load)	24Vin, 3.3Vout	423	527	mA
	24Vin, others	514	434	
	48Vin, 3.3Vout	208	214	
	48Vin, others	254	260	
	110Vin, 3.3Vout	95	98	
	110Vin, $\pm 5$ Vout	113	117	
	110Vin, $\pm 12$ , $\pm 15$ Vout	108	111	
	110Vin, others	110	117	
Filter	$\pi$ (Pi) Network			
Input surge Voltage (1sec max.)	24		50	VDC
	48		100	
	110		180	
Start-up time	Nominal Input, resistive load		10	ms
Reflected Input Ripple Current	24	40		mA
	48	30		
	110	25		
Under-voltage lockout	24	6.5		V
	48	15.5		
	110	33		
Remote On/Off Control (Except 110Vin single output models)	On	3.5-12VDC or leave open		
Idle current when off	Off	0-1.2VDC or connect to GND		
			10	mA

### Isolation Specifications

Parameters	Conditions	Typical	Rated	Units
Tested I/O voltage	1 min, <1mA		2250, 3000	VDC
Tested I/Case & O/Case	1 min, <1mA, 110Vin single output models		1600	VDC
	1 min, <1mA, 110Vin dual output models		1500	
Resistance	At 500VDC Isolation	> 1000		MOhm
Capacitance	24 & 48 Vin, I/O, 100KHz/0.1V	500		pF
	110 Vin, I/O, 100KHz/0.1V	2200		

### Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	AM10EW-11005DH22-NZ, 5-100% load Others, 0-100% load	$\pm 1$	$\pm 3$	%
Line voltage regulation	Positive output	$\pm 0.2$	$\pm 0.5$	%
	Negative output	$\pm 0.5$	$\pm 1$	
Load voltage regulation	110Vin single output, 0-100% load	$\pm 0.5$	$\pm 1$	%
	Others, 5-100%, positive output	$\pm 0.5$	$\pm 1$	
	Others, 5-100%, negative output	$\pm 0.5$	$\pm 1.5$	
Cross Regulation	110Vin, +Vout 50% load, -Vout 25-100% load Others, +Vout 50% load, -Vout 10-100% load		$\pm 5$	%
Short Circuit protection	Continuous, Auto Recovery			
Over Voltage Protection	110Vin models	> 110	160	% of Vo
	others	130	160	
Over Current Protection	24 & 48 Vin models	140	190	% of Io
	110 Vin single output	> 120	210	
	110 Vin dual output	> 110	210	
Transient Recovery Time	110 Vin , 25% Load Step Change	300	500	$\mu$ s
Transient Response Deviation	110Vin dual output, $\pm 5$ Vout	$\pm 4$	$\pm 8$	%
	110Vin single output, 3.3, 5Vout	$\pm 3$	$\pm 8$	
	Others, 25% Load Step Change	$\pm 3$	$\pm 5$	
Temperature coefficient			$\pm 0.03$	%/°C
Ripple & Noise	110Vin, 5-100% load, 20Mhz bandwidth	50	100	mV p-p
	Others, 5-100% load, 20Mhz bandwidth	60	120	

## General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	110 Vin, 100% load Others, 100% load	300 350		KHz
Operating temperature	Derating above 71°C	-40 to +85		°C
Storage temperature		-55 to +125		°C
Max case temperature			105	°C
Cooling	Free air convection			
Humidity	Non-condensing		95	%
Solder Temp Leads	1.5 mm from case 10 sec.		300	°C
Case material	Plastic (24, 48Vin models) Aluminum Alloy (Others)			
Weight	Pin mountable, 24, 48Vin models	21.2		g
	Pin mountable, 110Vin single output models	26		
	Pin mountable, 110Vin dual output models	27		
	-ST option, 24, 48Vin models	46		
	-ST option, 110Vin models	48		
	-STD option, 24, 48Vin models	66		
	-STD option, 110Vin models	68		
	-K option, 110Vin single output models	34		
-K-ST option, 110Vin single output models	56			
-K-STD option, 110Vin single output models	76			
Dimensions (L x W x H)	24, 48Vin models	2.03 x 1.04 x 0.47inches, 51.50 x 26.50 x 12.00mm		
	110Vin models	2.00 x 1.00 x 0.46inches, 50.80 x 25.40 x 11.80mm		
	Optional packages	See dimensions drawing		
MTBF	>1 000 000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C)			

## Environmental Specifications

Parameters		
Vibration (24 & 48 Vin)	Test mode	10-55Hz
	Acceleration	2G, 30min, every axis tested
Vibration (110 Vin)	IEC61373 - Category 1, Grade B	

## Safety Specifications

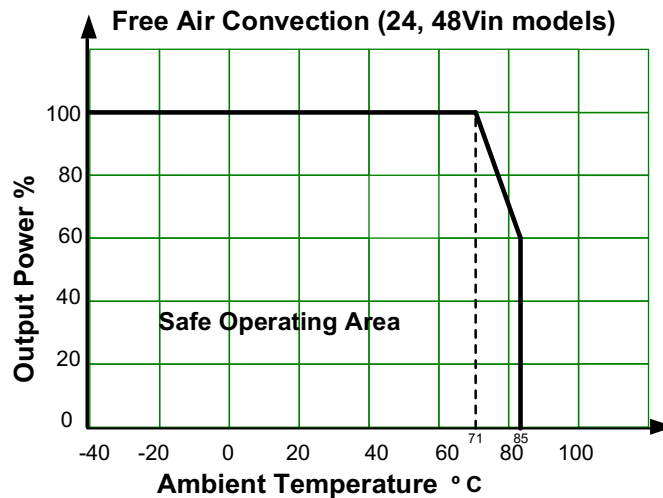
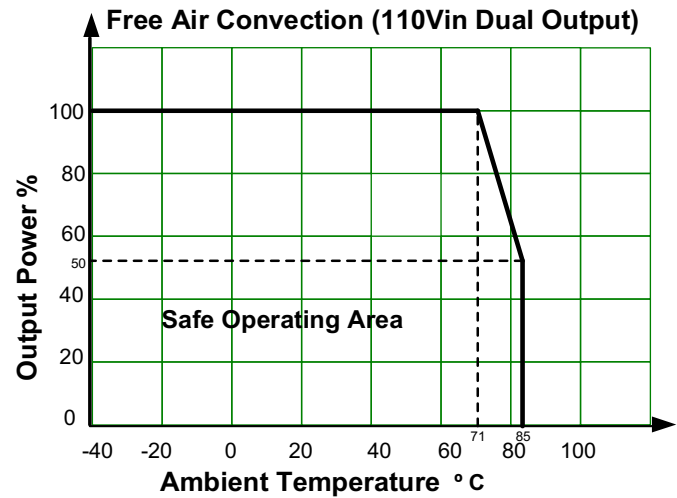
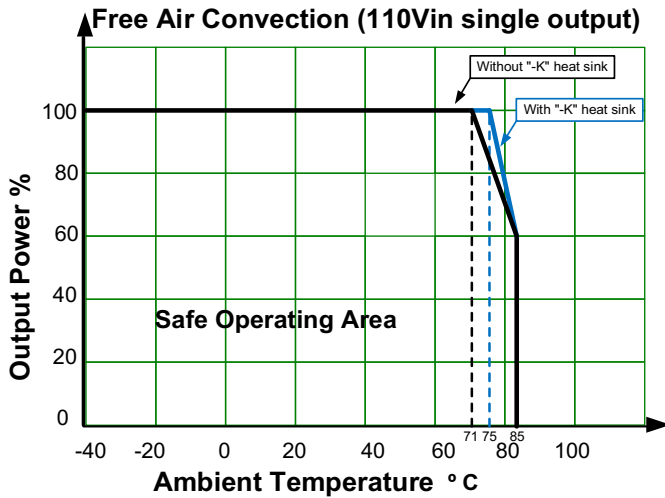
Parameters	
Approvals	CE, UL (24 & 48 Vin models only) EN/IEC/UL60950-1 Design to meet EN62368, EN50155 (2250 VDC Isolated models)
Standards	EMI - Conducted and radiated emission EN55032, class A (all models) Class B (110Vin models) (110Vin dual output models with recommended EMC circuit 1 or 2) (110Vin single output models with recommended EMC circuit 3 or 4) EN50121-3-2 150kHz-500kHz 99dBuV (110Vin models) EN55016-2-1 500kHz-30MHz 93dBuV (110Vin models) EN50121-3-2 30MHz-230MHz 40dBuV/m at 10m (110Vin models) EN55016-2-1 230MHz-1GHz 47dBuV/m at 10m (110Vin models)
	Electrostatic Discharge Immunity IEC61000-4-2, Contact ±6KV, Air ±8KV (110Vin models), Contact ±4KV, Criteria B (24 & 48 Vin models) EN50121-3-2 Contact ±6KV, Air ±8KV, Criteria B (110Vin models)
	RF, Electromagnetic Field Immunity IEC61000-4-3, 10V/m, Criteria A EN50121-3-2 20V/m, Criteria A (110Vin models)
	Electrical Fast Transient/Burst Immunity IEC61000-4-4, ±4KV, Criteria B (110Vin dual output models with recommended EMC circuit 1 or 2) (110Vin single output models with recommended EMC circuit 3 or 4) ±2KV, Criteria B (24 & 48 Vin with the recommended EMC circuit 5) EN50121-3-2 ±2kV, 5/50ns, 5KHz, Criteria A (110Vin models)
	Surge Immunity IEC61000-4-5, L-L ±2KV, Criteria B, (24 & 48 Vin with the recommended EMC circuit 5) L-L ±2KV, L-G ±4KV, Criteria B (110Vin dual output models with recommended EMC circuit 1) (110Vin single output models with recommended EMC circuit 3)

	EN50121-3-2 L-L $\pm 1KV$ ( $42\Omega$ $0.5\mu F$ ), L-G $\pm 2KV$ ( $42\Omega$ $0.5\mu F$ ), Criteria B (110Vin models)
RF, Conducted Disturbance Immunity	IEC61000-4-6, 3 Vrms, Criteria A (24 & 48 Vin models) 10 Vrms, Criteria A (110Vin models) EN50121-3-2 0.15MHz-80MHz 10Vr.m.s, Criteria A (110Vin models)
Voltage dips, short interruptions and voltage variations immunity	IEC61000-4-29, 0-70%, Criteria B (24 & 48 Vin models)

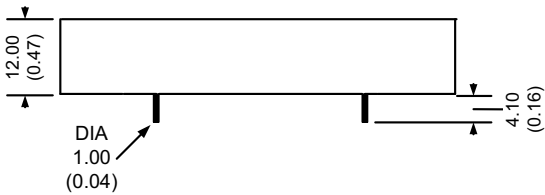
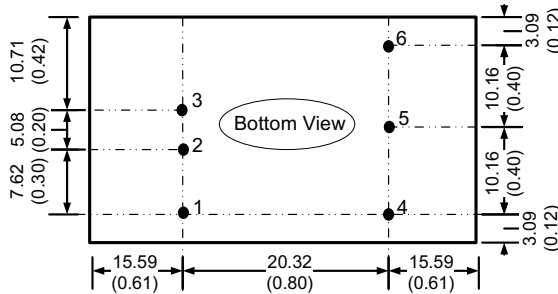
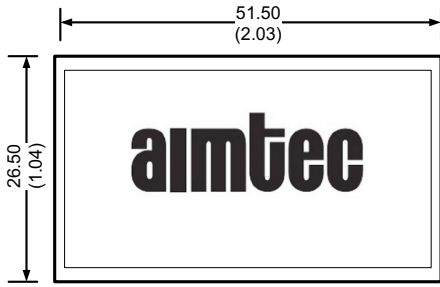
\*For 110Vin dual output models, EN50155, EN50121-3-2 and EN55016-2-1 are measured with an input capacitor 100 $\mu F$ /200V or AMFW72-13NZ.

\*For 110Vin single output models, EN50155, EN50121-3-2 and EN55016-2-1 are measured with an input capacitor 100 $\mu F$ /200V or AMFW72-0.41NZ.

## Derating



**Pin Out Specifications**  
24 & 48 Vin models

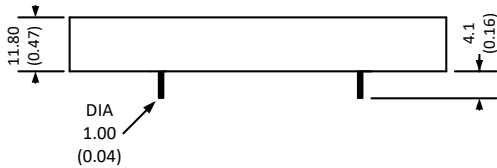
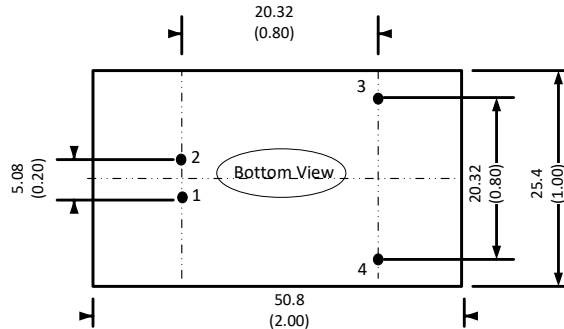
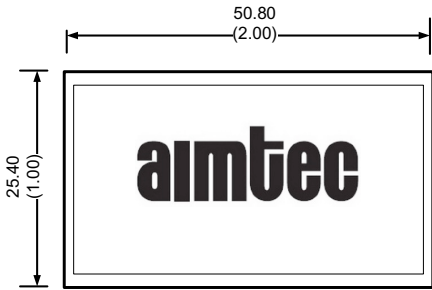


Notes:  
All dimensions are typical in millimeters (inches).  
General Tolerance  $\pm 0.50$  ( $\pm 0.02$ )  
Pin diameter Tolerance  $\pm 0.10$  ( $\pm 0.004$ )

Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	- Vout
5	No pin
6	+ Vout

Pin	Dual
1	On/Off Control
2	-Vin
3	+Vin
4	- Vout
5	Common
6	+ Vout

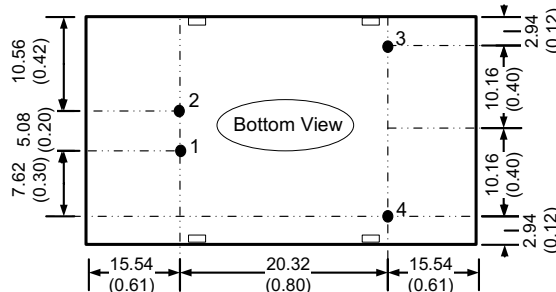
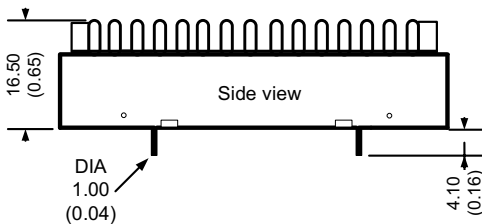
**110Vin single output models**



Notes:  
All dimensions are typical in millimeters (inches).  
General tolerance:  $\pm 0.5$  ( $\pm 0.02$ )  
Pin diameter tolerance:  $\pm 0.1$  ( $\pm 0.004$ )

Pin	Single
1	Vin -
2	Vin +
3	+Vout
4	-Vout

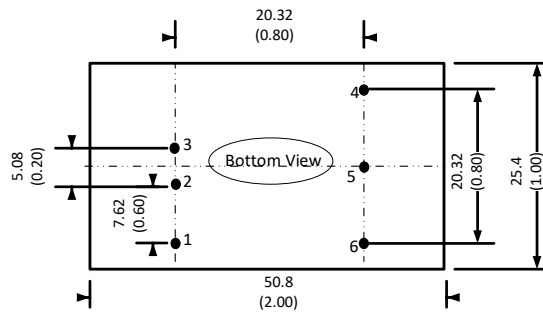
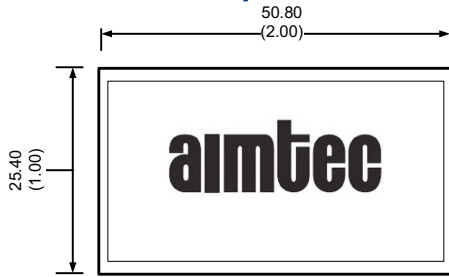
**110Vin single output models with -K option**



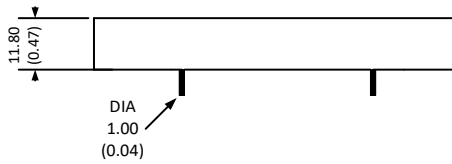
Notes:  
All dimensions are typical in millimeters (inches).  
Pin diameter Tolerance:  $\pm 0.10$  ( $\pm 0.004$ )  
General Tolerance:  $\pm 0.50$  ( $\pm 0.02$ )

Pin	Single
1	Vin -
2	Vin +
3	+Vout
4	-Vout

**110Vin dual output models**

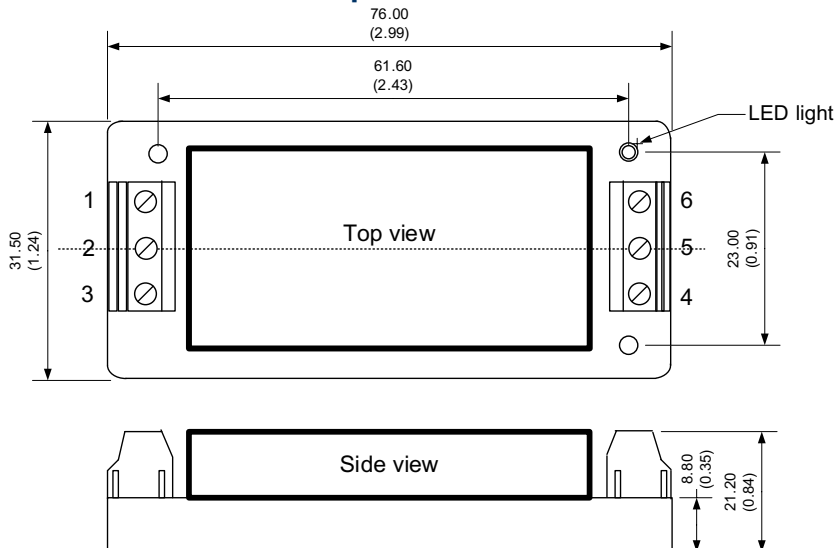


Pin	Single
1	Ctrl
2	-V Input
3	+V Input
4	+V Output
5	Common
6	-V Output



Notes:  
All dimensions are typical in millimeters (inches).  
General tolerance  $\pm 0.5$  ( $\pm 0.02$ )  
Pin diameter tolerance  $\pm 0.1$  ( $\pm 0.004$ )

**Dimensions with -ST options**



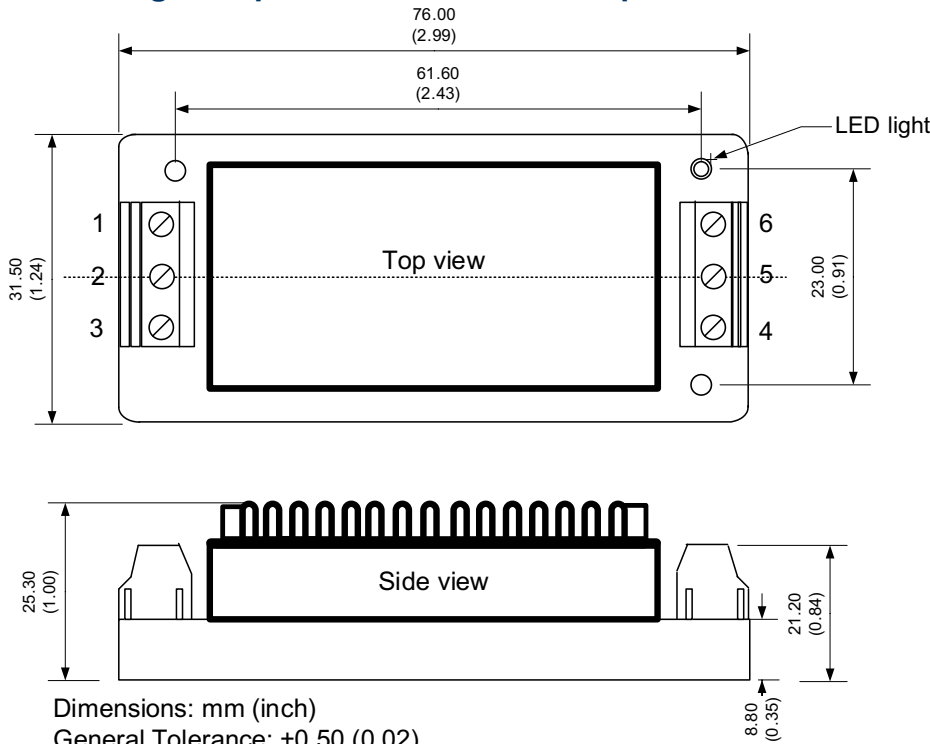
Dimensions: mm (inch)  
General Tolerance:  $\pm 0.50$  (0.02)  
Tightening torque: 0.4N-m max.  
Wire gauge: 24-12AWG

**Pin Out Specifications**

110Vin models	
Pin	Single
1	N.C.
2	-Vin
3	+Vin
4	+ Vout
5	N.C.
6	- Vout

24 & 48 Vin models		
Pin	Single	Dual
1	On/Off Control	On/Off Control
2	-Vin	-Vin
3	+Vin	+Vin
4	+ Vout	+ Vout
5	NC	Common
6	- Vout	- Vout

**110Vin single output models with -K-ST option**



Dimensions: mm (inch)  
General Tolerance:  $\pm 0.50$  (0.02)  
Tightening torque: 0.4N-m max.  
Wire gauge: 24-12AWG

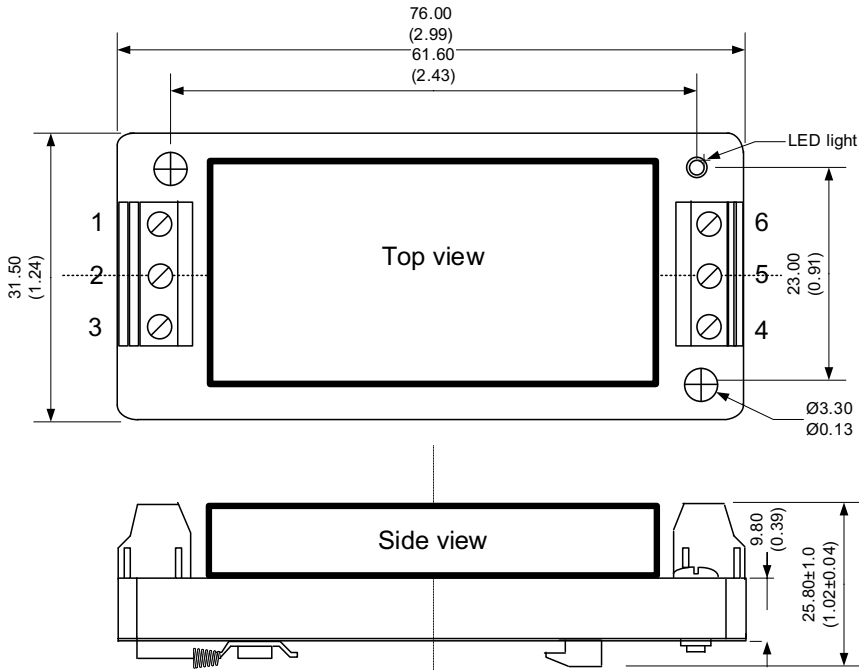
**Dimensions with -STD options**

110Vin models	
Pin	Single
1	N.C.
2	-Vin
3	+Vin
4	+ Vout
5	N.C.
6	- Vout

**Pin Out Specifications**

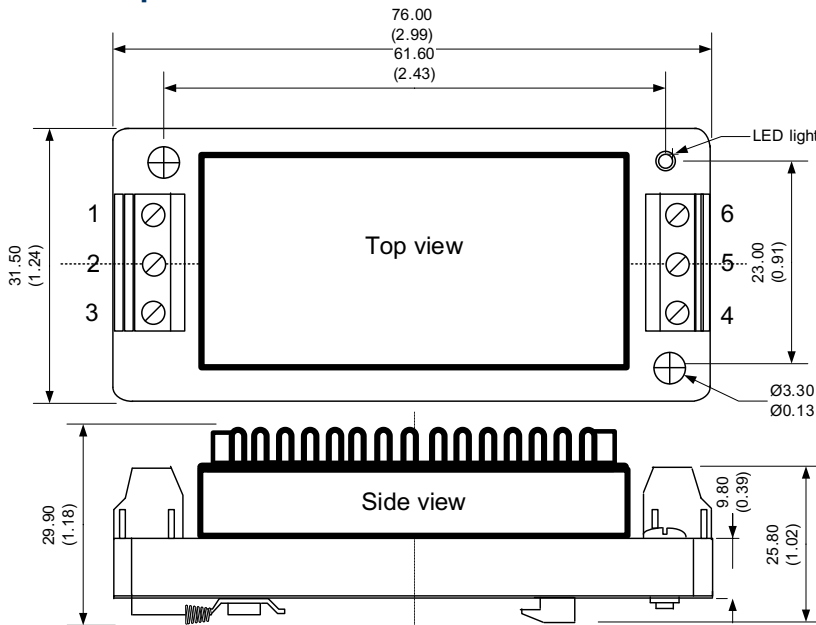
110Vin models	
Pin	Single
1	N.C.
2	-Vin
3	+Vin
4	+ Vout
5	N.C.
6	- Vout

24 & 48 Vin models		
Pin	Single	Dual
1	On/Off Control	On/Off Control
2	-Vin	-Vin
3	+Vin	+Vin
4	+ Vout	+ Vout
5	NC	Common
6	- Vout	- Vout



Dimensions: mm (inch)  
 General tolerance: ±0.50 (0.02)  
 Tightening torque: 0.4N-m max.  
 Wire gauge: 24-12AWG  
 DIN rail: TS35

**-K-STD option**



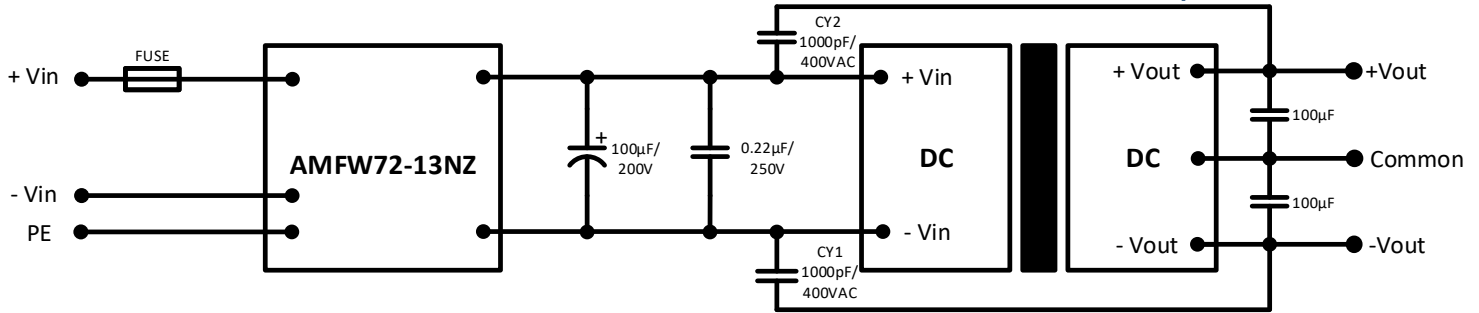
Dimensions: mm (inch)  
 General Tolerance: ±0.50 (0.02)  
 Tightening torque: 0.4N-m max.  
 Wire gauge: 24-12AWG  
 DIN rail: TS35

**110Vin single output models with**

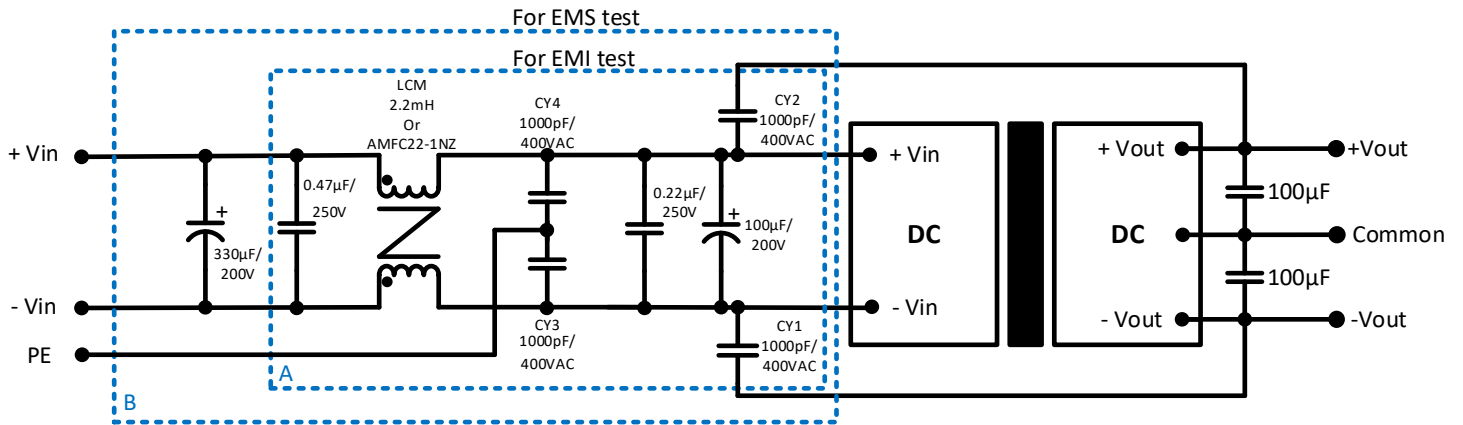
110Vin models	
Pin	Single
1	N.C.
2	-Vin
3	+Vin
4	+ Vout
5	N.C.
6	- Vout

**Recommended EMC circuit 1 (110Vin dual output models)**



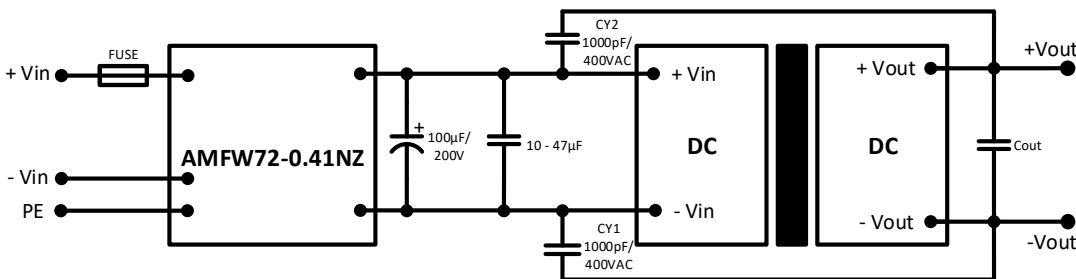


**Recommended EMC circuit 2 (110Vin dual output models)**



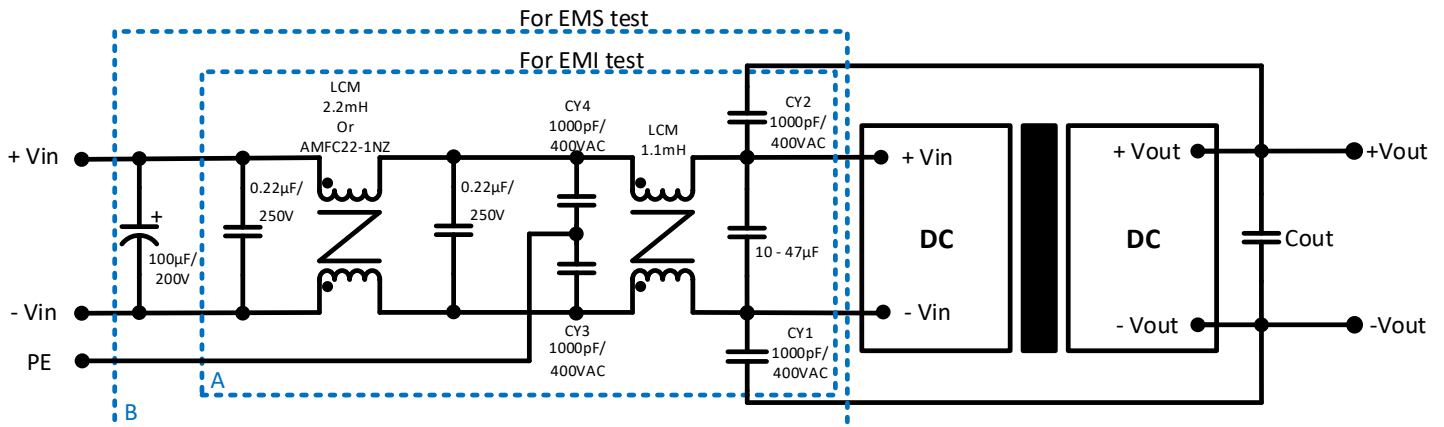
Notes: Part A for EMI filtering and Part B is used for EMS filtering.

**Recommended EMC circuit 3 (110Vin single output models)**



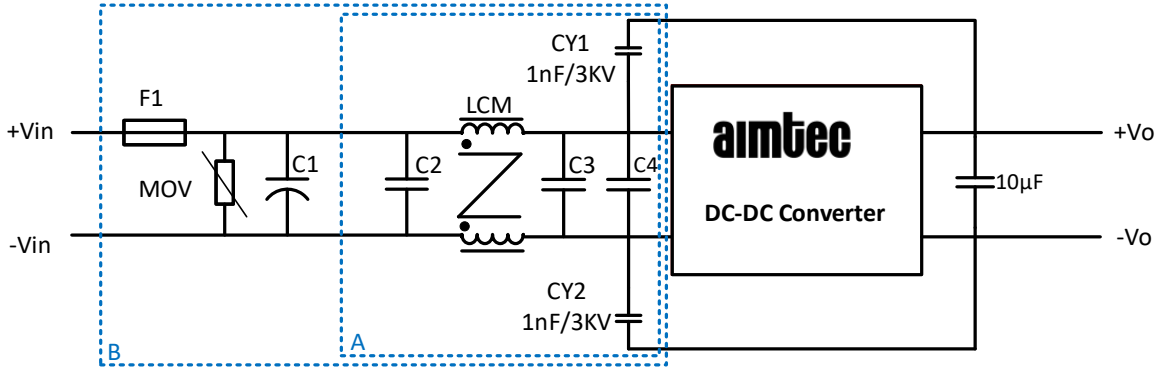
Vout	Cout
3.3 / 5	100µF
12 / 15	47µF
24	22µF

**Recommended EMC circuit 4 (110Vin single output models)**



Notes: Part A for EMI filtering and Part B is used for EMS filtering.

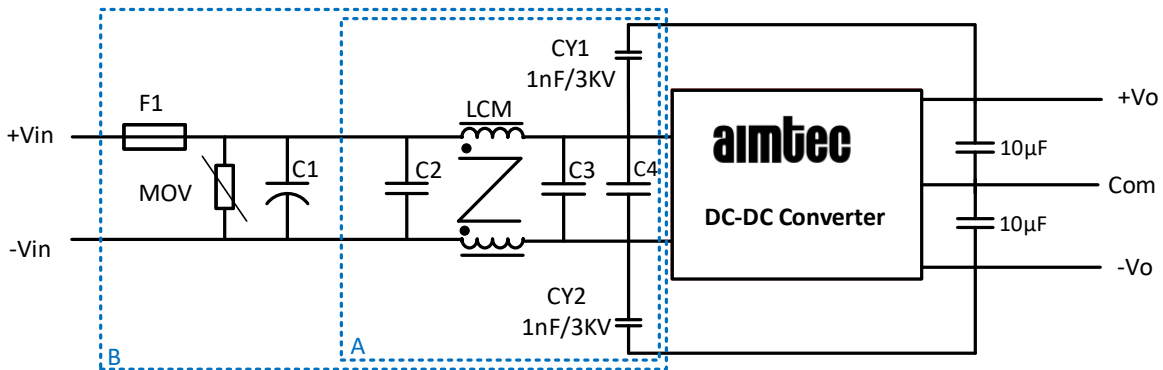
**Recommended EMC circuit 5**  
24 & 48 Vin single output models



Notes: Part A for EMI filtering and Part B is used for EMS filtering.

Vin	MOV	C1	C2	C3	C4	LCM
24V	S20K30	680 µF / 50V	1 µF / 50V	330 µF / 50V	4.7 µF / 50V	4.7mH or AMFC47-3NZ
48V	S14K60	680 µF / 100V	1 µF / 100V	330 µF / 100V	4.7 µF / 100V	6.8mH

**24 & 48 Vin dual output models**



Notes: Part A for EMI filtering and Part B is used for EMS filtering.

Vin	MOV	C1	C2	C3	C4	LCM
24V	S20K30	680 µF / 50V	1 µF / 50V	330 µF / 50V	4.7 µF / 50V	4.7mH or AMFC47-3NZ
48V	S14K60	680 µF / 100V	1 µF / 100V	330 µF / 100V	4.7 µF / 100V	4.7mH or AMFC47-3NZ

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