

## Series AM30EW-Z

### 30 Watt | DC-DC Converter



#### FEATURES:

- Ultra Wide 4:1 input range
- Efficiency up to 91%
- Soft start
- Continuous short circuit protection
- Remote on/off control
- Input/Output Isolation 1600VDC
- Operating temperature -40°C to + 75°C
- RoHS compliant



#### Models

##### Single output

| Model           | Input Voltage (V) | Output Voltage (V) | Output Current max (A) | Maximum Capacitive Load (uF) | Efficiency (%) |
|-----------------|-------------------|--------------------|------------------------|------------------------------|----------------|
| AM30EW-2403SZ   | 9-36              | 3.3                | 7.5                    | 20000                        | 86             |
| AM30EW-2405SZ   | 9-36              | 5                  | 6                      | 14000                        | 88             |
| AM30EW-2405.1SZ | 9-36              | 5.1                | 6                      | 14000                        | 88             |
| AM30EW-2412SZ   | 9-36              | 12                 | 2.5                    | 2000                         | 89             |
| AM30EW-2415SZ   | 9-36              | 15                 | 2                      | 2000                         | 89             |
| AM30EW-4803SZ   | 18-75             | 3.3                | 7.5                    | 20000                        | 86             |
| AM30EW-4805SZ   | 18-75             | 5                  | 6                      | 14000                        | 88             |
| AM30EW-4805.1SZ | 18-75             | 5.1                | 6                      | 14000                        | 88             |
| AM30EW-4812SZ   | 18-75             | 12                 | 2.5                    | 2000                         | 90             |
| AM30EW-4815SZ   | 18-75             | 15                 | 2                      | 2000                         | 91             |

Add suffix “-K” for optional heat sink

#### Models

##### Dual output

| Model         | Input Voltage (V) | Output Voltage (V) | Output Current max (A) | Maximum Capacitive Load (uF) | Efficiency (%) |
|---------------|-------------------|--------------------|------------------------|------------------------------|----------------|
| AM30EW-2405DZ | 9-36              | ±5                 | ±3                     | ±3000                        | 88             |
| AM30EW-2412DZ | 9-36              | ±12                | ±1.25                  | ±1300                        | 87             |
| AM30EW-2415DZ | 9-36              | ±15                | ±1                     | ±1300                        | 87             |
| AM30EW-4805DZ | 18-75             | ±5                 | ±3                     | ±3000                        | 88             |
| AM30EW-4812DZ | 18-75             | ±12                | ±1.25                  | ±1300                        | 88             |
| AM30EW-4815DZ | 18-75             | ±15                | ±1                     | ±1300                        | 88             |

Add suffix “-K” for optional heat sink

#### Models

##### Triple output

| Model           | Input Voltage (V) | Output Voltage (V) | Output Auxiliary Voltage (V) | Output Current max (A) | Maximum Capacitive Load (uF) | Efficiency (%) |
|-----------------|-------------------|--------------------|------------------------------|------------------------|------------------------------|----------------|
| AM30EW-240312TZ | 9-36              | 3.3                | ±12                          | 5 / ±0.42              | 15000 / ±220                 | 88             |
| AM30EW-240315TZ | 9-36              | 3.3                | ±15                          | 5 / ±0.33              | 15000 / ±220                 | 88             |
| AM30EW-240512TZ | 9-36              | 5                  | ±12                          | 4 / ±0.42              | 8000 / ±220                  | 90             |
| AM30EW-240515TZ | 9-36              | 5                  | ±15                          | 4 / ±0.33              | 8000 / ±220                  | 90             |
| AM30EW-480312TZ | 18-75             | 3.3                | ±12                          | 5 / ±0.42              | 15000 / ±220                 | 88             |
| AM30EW-480315TZ | 18-75             | 3.3                | ±15                          | 5 / ±0.33              | 15000 / ±220                 | 88             |
| AM30EW-480512TZ | 18-75             | 5                  | ±12                          | 4 / ±0.42              | 8000 / ±220                  | 90             |
| AM30EW-480515TZ | 18-75             | 5                  | ±15                          | 4 / ±0.33              | 8000 / ±220                  | 90             |

Add suffix “-K” for optional heat sink

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       |         | VDC   |
|                         | 48                                                       | 36-75      |         |       |
| Filter                  | π (Pi) Network                                           |            |         |       |
| Start up time           |                                                          | 30         |         | ms    |
| Absolute Maximum Rating | 24                                                       | -0.7 ~ 50  |         | VDC   |
|                         | 48                                                       | -0.7 ~ 100 |         |       |
| Peak Input Voltage time |                                                          |            | 100     | ms    |
| On/Off control          | ON: 3 ~12VDC or open circuit                             |            |         |       |
|                         | OFF: 0 ~ 1.2VDC or Short circuit between pin 2 and pin 3 |            |         |       |
| No Load Input Current   | Vin 9~36                                                 | 100        |         | mA    |
|                         | Vin 36~75                                                | 50         |         |       |
| Under voltage lockout   | 24V ON/OFF                                               | 8.8 / 7.9  |         | VDC   |
|                         | 48V ON/OFF                                               | 17.8 / 16  |         |       |
| Input reflected current |                                                          | 20         |         | mAp-p |

## Isolation Specifications

| Parameters                | Conditions | Typical | Rated | Units |
|---------------------------|------------|---------|-------|-------|
| Tested I/O voltage        | 3 sec      |         | 1600  | VDC   |
| Case/Input tested voltage | 3 sec      | 1600    |       | VDC   |
| Resistance                |            | 1000    |       | MOhm  |
| Capacitance               |            | 1500    |       | pF    |

## Output Specifications

| Parameters                            | Conditions                                        | Typical | Maximum | Units    |
|---------------------------------------|---------------------------------------------------|---------|---------|----------|
| Voltage accuracy (Single and Dual)    |                                                   | ±1      |         | %        |
| Voltage accuracy (Triple)             | Main / Auxiliary                                  | ±1 / ±5 |         |          |
| Cross Regulation (Dual Output Models) | 25% load on one output - 100% load on second load | ±5      |         | %        |
| Cross Regulation (Triple)             | Main 100%, 25% load on Aux1 and 100% on Aux2      | ±5      |         |          |
| Over voltage protection               | Zener diode clamp                                 |         |         |          |
| Over current protection               |                                                   | 120     |         | %        |
| Short Circuit protection              | Continuous                                        |         |         |          |
| Short circuit restart                 | Auto-Recovery                                     |         |         |          |
| Thermal Shutdown                      | Case temp                                         | 115     |         | °C       |
| Line voltage regulation (Single)      | HL-LL                                             | ±0.2    |         | %        |
| Line voltage regulation (Dual)        | HL-LL                                             | ±0.2    |         | %        |
| Line voltage regulation (Triple)      | HL-LL Main / Auxiliary                            | ±1 / ±5 |         | %        |
| Load voltage regulation (Single)      | 0-100% load                                       | ±0.5    |         | %        |
| Load voltage regulation (Dual)        | Balanced load                                     | ±1      |         | %        |
| Load voltage regulation (Triple)      | 10~100% Main / Auxiliary                          | ±1 / ±5 |         | %        |
| Temperature coefficient               |                                                   | ±0.02   |         | %/°C     |
| Ripple & Noise (Single and Dual)      | 20MHz bandwidth, 3.3V/5V/5.1V/±5V                 | 100     |         | mV p-p   |
|                                       | 20MHz bandwidth, 12V/15V/±12V/±15V                | 150     |         |          |
| Ripple & Noise (Triple)               | 20MHz bandwidth Main / Auxiliary                  | 50 / 75 |         | mV p-p   |
| Voltage adjustment range (single)     |                                                   | ±10     |         | %        |
| Minimum Load Current                  |                                                   | 10      |         | % of Max |

## General Specifications

| Parameters                    | Conditions                 | Typical                                                             | Maximum                  | Units |
|-------------------------------|----------------------------|---------------------------------------------------------------------|--------------------------|-------|
| Switching frequency           | 100% load                  | 330                                                                 |                          | KHz   |
| Operating temperature         | Derating above 50          | -40 to +75                                                          |                          | °C    |
| Storage temperature           |                            | -40 to +125                                                         |                          | °C    |
| Maximum case temperature      |                            |                                                                     | 105                      | °C    |
| Derating                      |                            | 2                                                                   |                          | %/°C  |
| Cooling                       |                            | Free Air Convection                                                 |                          |       |
| Humidity                      |                            |                                                                     | 95                       | % RH  |
| Case material                 |                            | Nickel coated Copper                                                |                          |       |
| Weight                        |                            | 30                                                                  |                          | g     |
| Dimensions (L x W x H)        |                            | 2.00 x 1.00 x 0.4 inches                                            | 50.80 x 25.40 x 10.17 mm |       |
| MTBF                          |                            | Single & Dual: >450000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C) |                          |       |
|                               |                            | Triple: >320000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C)        |                          |       |
| Maximum soldering temperature | 1.5mm from case for 10 sec |                                                                     | 260                      | °C    |
| Transient recovery time       |                            | 250                                                                 |                          | µs    |
| Transient recovery deviation  |                            | ±3                                                                  |                          | %     |

## Safety Specifications

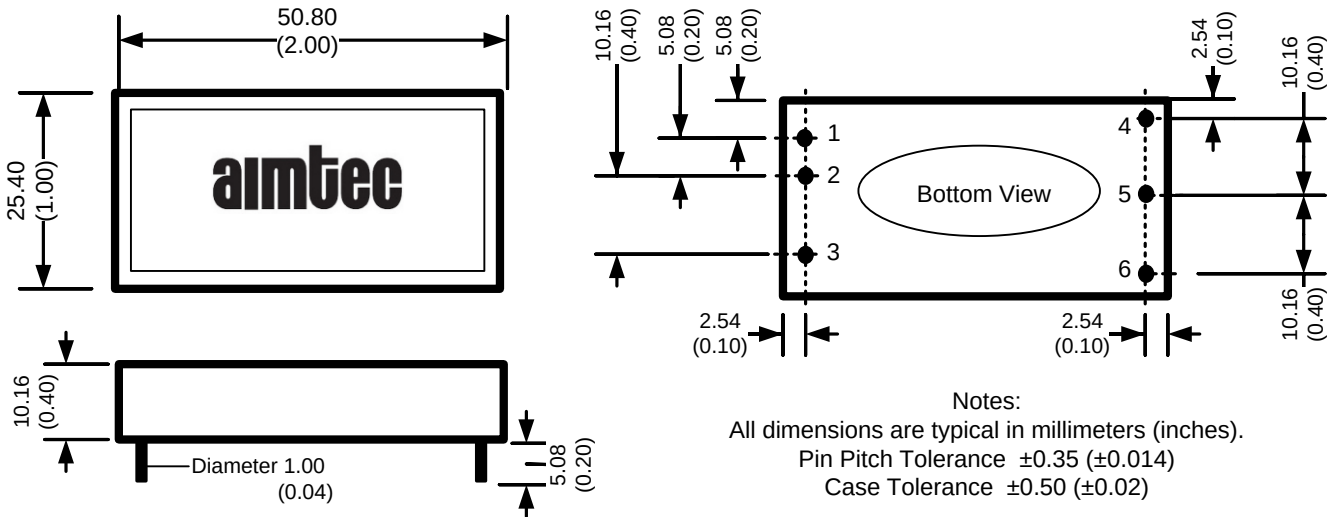
| Parameters      |                                                                   |
|-----------------|-------------------------------------------------------------------|
| Agency Approval | CE                                                                |
| Standards       | EN55022 Class A, EN55024                                          |
|                 | IEC61000-4-2, Perf. Criteria B                                    |
|                 | IEC61000-4-3, Perf. Criteria A                                    |
|                 | IEC61000-4-4, Perf. Criteria B (external 220µF/100V cap required) |
|                 | IEC61000-4-5, Perf. Criteria B (external 220µF/100V cap required) |
|                 | IEC61000-4-6, Perf. Criteria A                                    |
|                 | IEC61000-4-8, Perf. Criteria A                                    |

## Pin Out Specifications

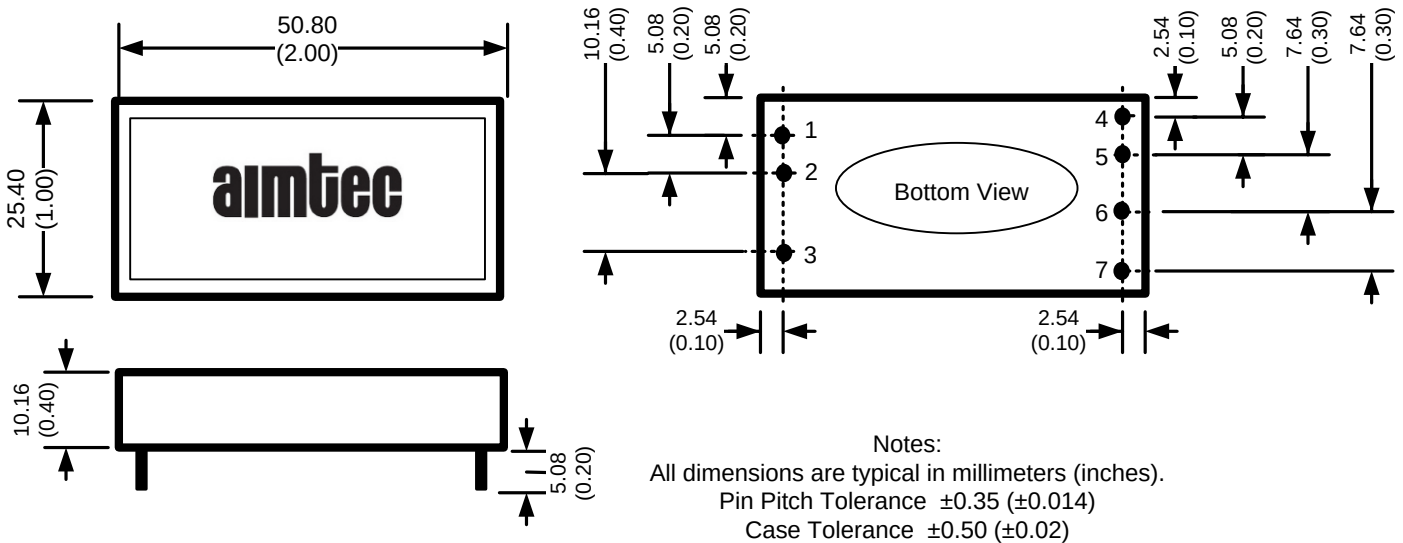
| Pin | Single         | Dual           | Triple         |
|-----|----------------|----------------|----------------|
| 1   | + V Input      | + V Input      | + V Input      |
| 2   | - V Input      | - V Input      | - V Input      |
| 3   | On/Off Control | On/Off Control | On/Off Control |
| 4   | + V Output     | + V Output     | + Vaux Output  |
| 5   | -V Output      | Common         | - Vaux Output  |
| 6   | Trim           | - V Output     | Common         |
| 7   | No Pin         | No Pin         | + V Output     |

## Dimensions

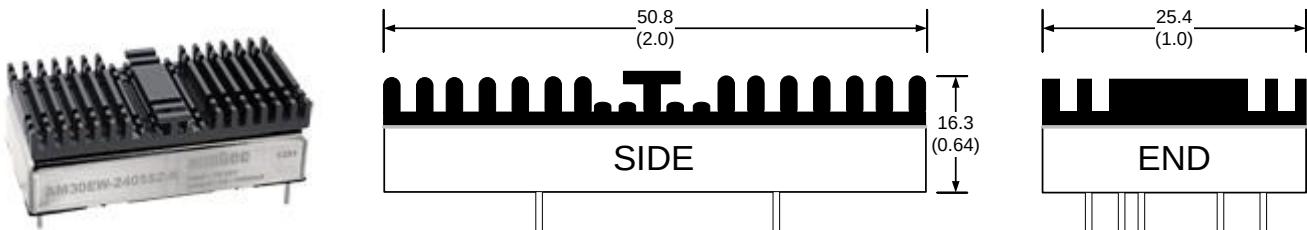
Single and Dual Output Models



Triple Output Models

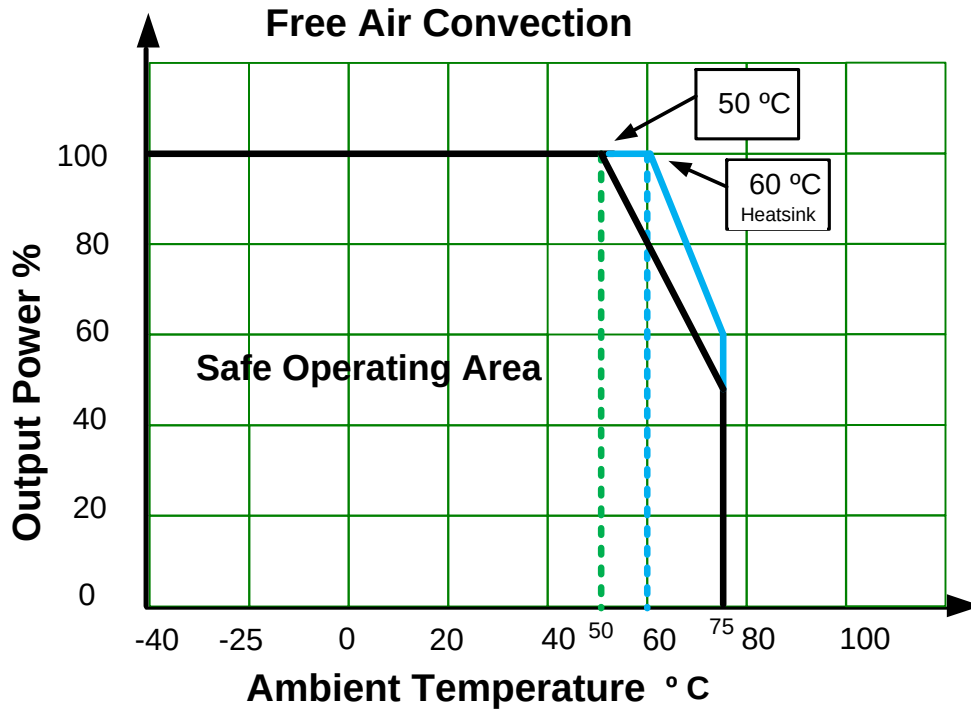


## Dimensions with Optional Heat Sink



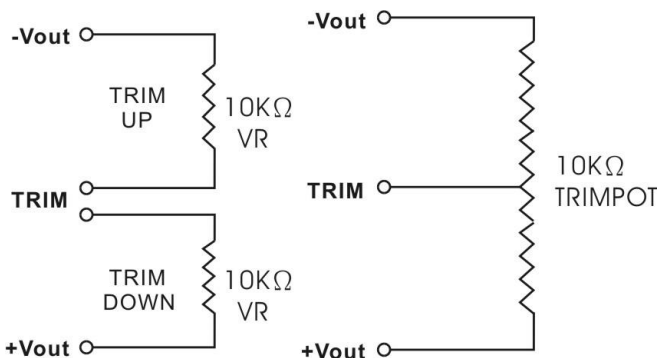
Notes: Add "-K" suffix for ordering, heat sink is affixed with thermally dissipative adhesive tape.  
See derating graph for temperature performance. Heat sink material is anodized (black) aluminum, adds weight 11.2g to total mass (41.2g). Thermal impedance of converter is: with heat sink  $10^{\circ}\text{C/W}$  and  $12^{\circ}\text{C/W}$  without heat sink

## Derating

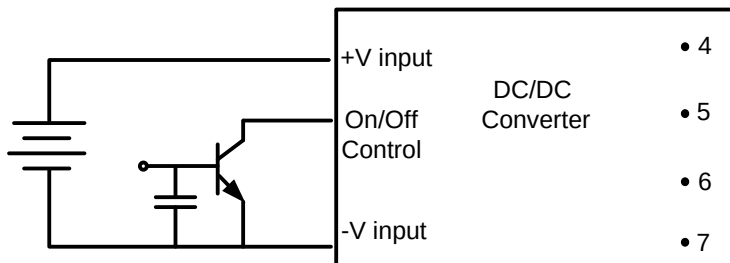


Extended temperature performance can be achieved with optional heat sink. (add suffix “-K” to part number)

## Trimming



## On/Off Control

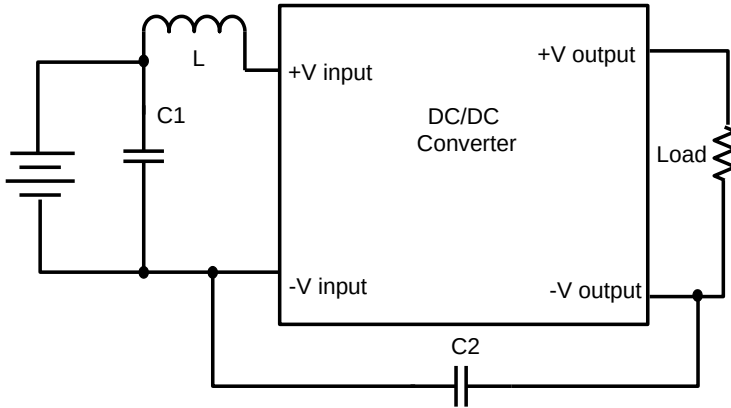


Positive logic turns on the module during high logic and off during low logic. Module can be controlled by an external switch between the On/Off CTRL terminal and -Vinput terminal. The switch can be either open collector or open drain.

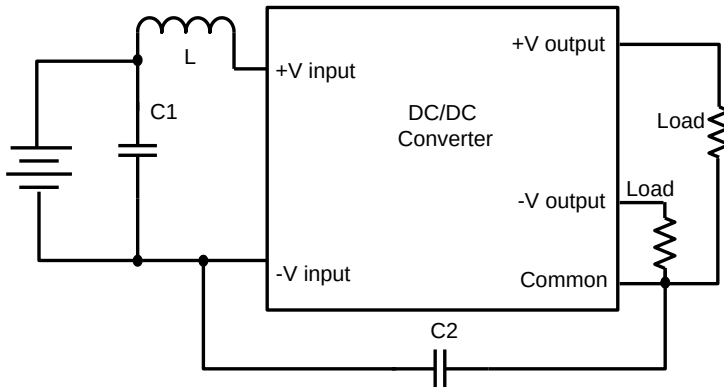
## Recommended Circuits

| C1          | L    | C2               |
|-------------|------|------------------|
| 100uF, 100V | 12uH | 1206, 470pF, 2KV |

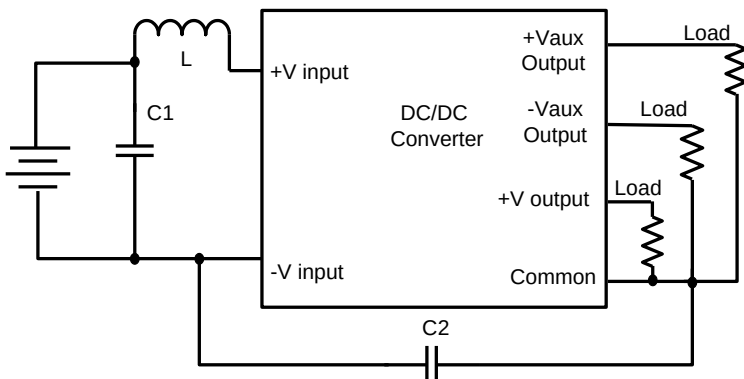
Conducted/Radiated Emissions  
Single Output



Conducted/Radiated Emissions  
Dual Output



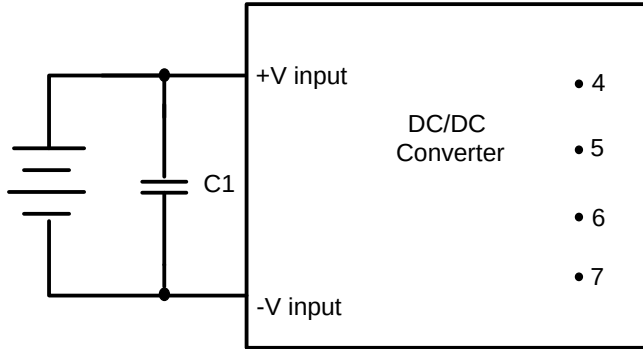
Conducted/Radiated Emissions  
Triple Output



Surge/EFT

C1

220uF, 100V



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