



**FEATURES:**

- RoHS Compliant
- Ultra-wide 4:1 Input range
- Adjustable Output Voltage
- Remote On/Off
- 2" x 1" package
- Soft start
- Industrial temperature range -40 to +85°C
- High efficiency up to 91%
- No minimum load required

**Models**  
**Single output**



| Model         | Input Voltage (V) | Output Voltage (V) | Output Current max (A) | Maximum capacitive load (µF) | Efficiency (%) |
|---------------|-------------------|--------------------|------------------------|------------------------------|----------------|
| AM20EW-2403SZ | 9-36              | 3.3                | 5.5                    | 10000                        | 89             |
| AM20EW-2405SZ | 9-36              | 5                  | 4                      | 6800                         | 91             |
| AM20EW-2412SZ | 9-36              | 12                 | 1.67                   | 1000                         | 89             |
| AM20EW-2415SZ | 9-36              | 15                 | 1.33                   | 680                          | 89             |
| AM20EW-4803SZ | 18-75             | 3.3                | 5.5                    | 10000                        | 89             |
| AM20EW-4805SZ | 18-75             | 5                  | 4                      | 6800                         | 91             |
| AM20EW-4812SZ | 18-75             | 12                 | 1.67                   | 1000                         | 89             |
| AM20EW-4815SZ | 18-75             | 15                 | 1.33                   | 680                          | 89             |

Add suffix "-K" for optional heatsink

**Models**  
**Dual output**

| Model         | Input Voltage (V) | Output Voltage (V) | Output Current max (A) | Maximum capacitive load (µF) | Efficiency (%) |
|---------------|-------------------|--------------------|------------------------|------------------------------|----------------|
| AM20EW-2405DZ | 9-36              | ±5                 | ±2                     | ±2200                        | 89             |
| AM20EW-2412DZ | 9-36              | ±12                | ±0.835                 | ±470                         | 88             |
| AM20EW-2415DZ | 9-36              | ±15                | ±0.665                 | ±330                         | 89             |
| AM20EW-4805DZ | 18-75             | ±5                 | ±2                     | ±2200                        | 89             |
| AM20EW-4812DZ | 18-75             | ±12                | ±0.835                 | ±470                         | 88             |
| AM20EW-4815DZ | 18-75             | ±15                | ±0.665                 | ±330                         | 89             |

Add suffix "-K" for optional heatsink

**Input Specifications**

| Parameters                       | Nominal  | Typical             | Maximum | Units  |
|----------------------------------|--|---------------------|---------|--------|
| Voltage range                    | 24<br>48   | 9-36<br>18-75       |         | VDC    |
| Under voltage lockout            | 24 (ON/OFF)<br>48 (ON/OFF)   | 8.6/7.9<br>17.8/16  |         | VDC    |
| Filter                           | π (Pi) Network   |                     |         |        |
| Transient recovery time          | 25% load step change   | 250                 |         | µs     |
| Transient recovery deviation     | 25% load step change   |                     | ±3      | %      |
| Startup time                     |  | 20                  |         | ms     |
| Absolute Maximum Rating          | 24<br>48   | -0.7~50<br>-0.7~100 |         | VDC    |
| Peak Input Voltage time          |  |                     | 100     | ms     |
| On/Off Control                   | ON: 3 ~12VDC or open circuit<br>OFF: 0 ~ 1.2VDC or Short circuit between pin 2 and pin 1 |                     |         |        |
| OFF idle current                 |  | 5                   |         | mA     |
| Input reflected ripple current * |  | 20                  |         | mA p-p |

\* The input reflected ripple current should be measured with a 12µH inductor and a 47µF input capacitor (ESR<1Ω at 100 KHz)

### Isolation Specifications

| Parameters                 | Conditions | Typical | Rated | Units |
|----------------------------|------------|---------|-------|-------|
| Tested I/O voltage         | 60 sec     |         | 1600  | VDC   |
| Tested I,O to case voltage | 60 sec     | 1600    |       | VDC   |
| Resistance                 |            | >1000   |       | MOhm  |
| Capacitance                |            | 1200    |       | pF    |

### Output Specifications

| Parameters               | Conditions   | Typical | Maximum | Units    |
|--------------------------|--|---------|---------|----------|
| Voltage accuracy         |  |         | ±1      | %        |
| Over voltage protection  | 3.3Vout, Zener diode clamp   | 3.9     |         | VDC      |
|                          | 5Vout, Zener diode clamp   | 6.2     |         | VDC      |
|                          | 12Vout, Zener diode clamp  | 15      |         | VDC      |
|                          | 15Vout, Zener diode clamp  | 18      |         | VDC      |
|                          | ±12Vout, Zener diode clamp   | ±15     |         | VDC      |
|                          | ±15Vout, Zener diode clamp   | ±18     |         | VDC      |
| Over current protection  |  | 120     |         | % of FL  |
| Short Circuit protection | Continuous   |         |         |          |
| Short Circuit restart    | Auto recovery  |         |         |          |
| Line voltage regulation  | HL-LL  |         | ±0.5    | % of Vin |
| Load voltage regulation  | Single output, 0-100% load   |         | ±0.5    | %        |
| Load voltage regulation  | Dual output, Balanced load   |         | ±1      | %        |
| Cross regulation         | 25% load on 1 <sup>st</sup> output and 100% load on 2 <sup>nd</sup> output | ±5      |         | %        |
| Temperature coefficient  |  | ±0.02   |         | %/°C     |
| Ripple & Noise *         | At 20MHz Bandwidth   |         | 75      | mV p-p   |
| Voltage adjustment range |  | ±10     |         | %        |

\* Measured with 1µF CC.

### General Specifications

| Parameters             | Conditions  | Typical                 | Maximum | Units |
|------------------------|---|-------------------------|---------|-------|
| Switching frequency    | 100% load   | 330                     |         | KHz   |
| Operating temperature  | With derating above 65°C                              | -40 to +85              |         | °C    |
| Storage temperature    |   | -55 to +125             |         | °C    |
| Derating               | Without heatsink, 66 to 85°C                          | 2.57                    |         | %/°C  |
|                        | With heatsink, 72 to 85°C                             | 3.03                    |         | %/°C  |
| Max Case temperature   |   |                         | 105     | °C    |
| Cooling                | Free air convection                                   |                         |         |       |
| Humidity               |   |                         | 95      | % RH  |
| Case material          | Nickel coated copper with non conductive base         |                         |         |       |
| Potting material       | UL94V-0 rated   |                         |         |       |
| Weight                 |   | 31                      |         | g     |
| Dimensions (L x W x H) | 2.00 x 1.00 x 0.40 inches                             | 50.80 x 25.40 x 10.2 mm |         |       |
| MTBF                   | >560 000 hrs (MIL-HDBK -217F, Ground Benign, 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.

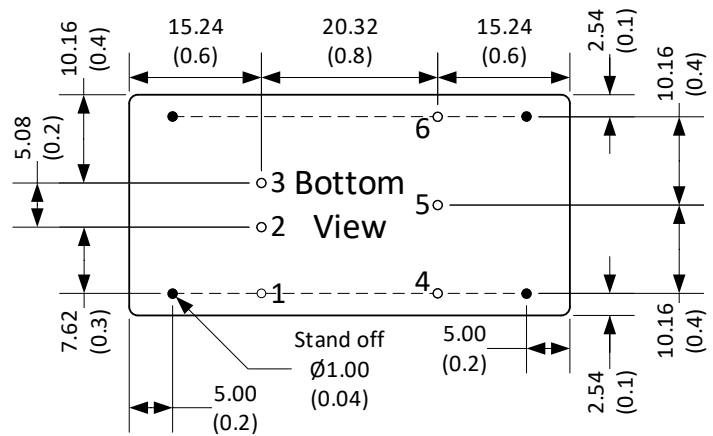
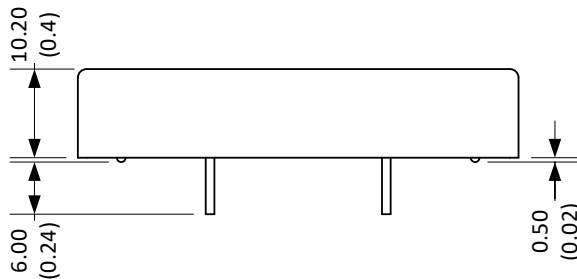
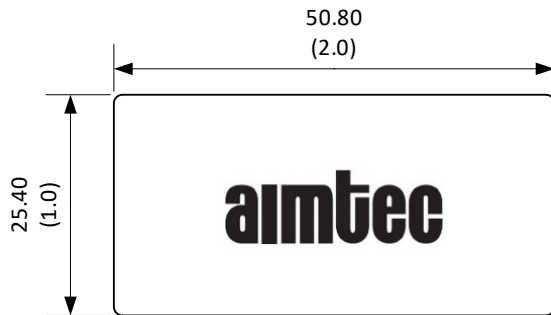
### Safety Specifications

| Parameters              |   |
|-------------------------|---|
| Agency Approvals        | CE  |
| Standards               | Designed to meet IEC/EN 60950-1                                     |
|                         | EN55032, class A, with the recommended circuit                      |
|                         | EN61000-4-2, criteria A   |
|                         | EN61000-4-3, criteria A   |
|                         | EN61000-4-4, criteria A, with external filter capacitor, 220µF/100V |
|                         | EN61000-4-5, criteria A, with external filter capacitor, 220µF/100V |
|                         | EN61000-4-6, criteria A   |
| EN61000-4-8, criteria A |   |

### Pin Out Specifications

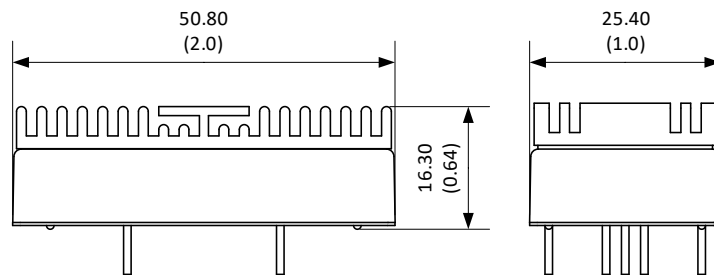
| Pin | Single         | Dual           |
|-----|----------------|----------------|
| 1   | On/Off Control | On/Off Control |
| 2   | -V Input       | -V Input       |
| 3   | +V Input       | +V Input       |
| 4   | -V Output      | -V Output      |
| 5   | Trim           | Common         |
| 6   | +V Output      | +V Output      |

### Dimensions



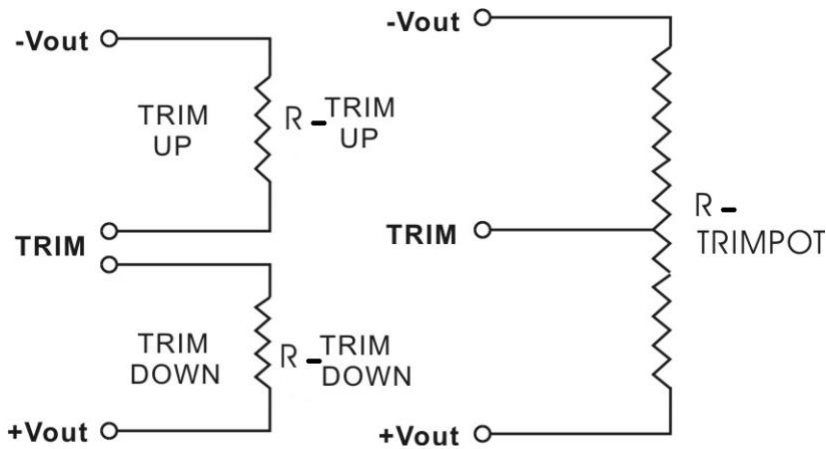
All dimensions are typical: millimeters (inches)  
 Pin Diameter:  $1.0 \pm 0.05$  ( $0.04 \pm 0.002$ )  
 Pin Pitch tolerance:  $\pm 0.35$  ( $\pm 0.014$ )  
 Case tolerance:  $\pm 0.5$  ( $\pm 0.02$ )  
 Stand off tolerance:  $\pm 0.1$  ( $\pm 0.004$ )

### Dimensions with Optional Heatsink



Notes: Add “-K” suffix for ordering, heatsink is affixed with thermally dissipative adhesive tape.  
 See derating graph for temperature performance. Heatsink material is anodized (black) aluminum, adds weight 11.3g to total mass (42.3g).

### Trimming



### Trim Table

#### AM20E(W)-xx03SZ

| Trim down  | 1       | 2       | 3       | 4      | 5      | 6      | 7      | 8      | 9      | 10     | %     |
|------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|-------|
| Vout=      | 3.267   | 3.234   | 3.201   | 3.168  | 3.135  | 3.102  | 3.069  | 3.036  | 3.003  | 2.970  | Volts |
| Rtrim-down | 315.932 | 172.257 | 112.528 | 79.806 | 59.153 | 44.930 | 34.539 | 26.616 | 20.374 | 15.330 | KOhms |
| Trim up    | 1.000   | 2.000   | 3.000   | 4.000  | 5.000  | 6.000  | 7.000  | 8.000  | 9.000  | 10.000 | %     |
| Vout=      | 3.333   | 3.366   | 3.399   | 3.432  | 3.465  | 3.498  | 3.531  | 3.564  | 3.597  | 3.630  | Volts |
| Rtrim-up   | 544.612 | 184.034 | 103.305 | 67.715 | 47.676 | 34.824 | 25.880 | 19.297 | 14.249 | 10.255 | KOhms |

#### AM20E(W)-xx05SZ

| Trim down  | 1       | 2       | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | %     |
|------------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Vout=      | 4.950   | 4.900   | 4.850  | 4.800  | 4.750  | 4.700  | 4.650  | 4.600  | 4.550  | 4.500  | Volts |
| Rtrim-down | 230.566 | 106.182 | 64.301 | 43.281 | 30.643 | 22.207 | 16.177 | 11.651 | 8.129  | 5.310  | KOhms |
| Trim up    | 1.000   | 2.000   | 3.000  | 4.000  | 5.000  | 6.000  | 7.000  | 8.000  | 9.000  | 10.000 | %     |
| Vout=      | 5.050   | 5.100   | 5.150  | 5.200  | 5.250  | 5.300  | 5.350  | 5.400  | 5.450  | 5.500  | Volts |
| Rtrim-up   | 244.547 | 113.776 | 70.631 | 49.142 | 36.274 | 27.707 | 21.592 | 17.010 | 13.447 | 10.598 | KOhms |

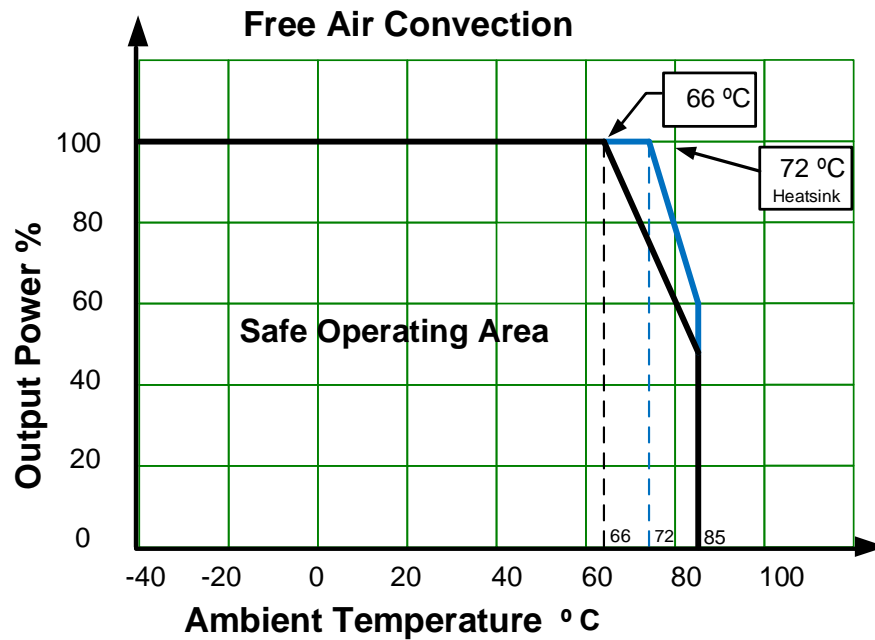
#### AM20E(W)-xx12SZ

| Trim down  | 1       | 2       | 3       | 4      | 5      | 6      | 7      | 8      | 9      | 10     | %     |
|------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|-------|
| Vout=      | 11.880  | 11.760  | 11.640  | 11.520 | 11.400 | 11.280 | 11.160 | 11.040 | 10.920 | 10.800 | Volts |
| Rtrim-down | 327.351 | 142.100 | 83.928  | 55.470 | 38.591 | 27.418 | 19.477 | 13.542 | 8.939  | 5.264  | KOhms |
| Trim up    | 1.000   | 2.000   | 3.000   | 4.000  | 5.000  | 6.000  | 7.000  | 8.000  | 9.000  | 10.000 | %     |
| Vout=      | 12.120  | 12.240  | 12.360  | 12.480 | 12.600 | 12.720 | 12.840 | 12.960 | 13.080 | 13.200 | Volts |
| Rtrim-up   | 371.425 | 183.645 | 117.623 | 83.929 | 63.489 | 49.767 | 39.919 | 32.508 | 26.728 | 22.094 | KOhms |

#### AM20E(W)-xx15SZ

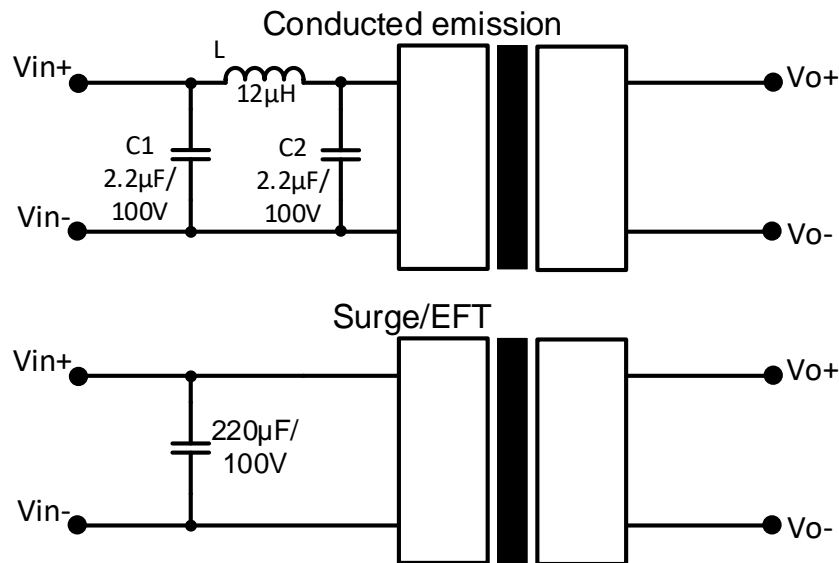
| Trim down  | 1       | 2       | 3       | 4      | 5      | 6      | 7      | 8      | 9      | 10     | %     |
|------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|-------|
| Vout=      | 14.850  | 14.700  | 14.550  | 14.400 | 14.250 | 14.100 | 13.950 | 13.800 | 13.650 | 13.500 | Volts |
| Rtrim-down | 433.811 | 174.916 | 100.946 | 65.907 | 45.468 | 32.077 | 22.625 | 15.596 | 10.165 | 5.842  | KOhms |
| Trim up    | 1.000   | 2.000   | 3.000   | 4.000  | 5.000  | 6.000  | 7.000  | 8.000  | 9.000  | 10.000 | %     |
| Vout=      | 15.150  | 15.300  | 15.450  | 15.600 | 15.750 | 15.900 | 16.050 | 16.200 | 16.350 | 16.500 | Volts |
| Rtrim-up   | 347.293 | 178.523 | 115.235 | 82.084 | 61.683 | 47.863 | 37.882 | 30.336 | 24.430 | 19.682 | KOhms |

## Derating



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

## Recommended Circuits



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