

# Series AMEL20-AZ

## 20 Watt | AC-DC / DC-DC Converter



### FEATURES:

- I/O Isolation 3000VAC
- Operating Temp: -40 °C to +80 °C
- Over load and, Over Voltage Protection
- Input: 90-305VAC, 47-440Hz, or 130-430VDC
- Energy Star compliant
- Small package
- Up to 81% efficiency
- Short Circuit Protection

### Models Single output



| Model         | Input Voltage (VAC/Hz) | Input Voltage (VDC) | Max Output wattage (W) | Output Voltage (V) | Output Current max (A) | Maximum capacitive load (μF) | Efficiency (%) |         |         |
|---------------|------------------------|---------------------|------------------------|--------------------|------------------------|------------------------------|----------------|---------|---------|
|               |                        |                     |                        |                    |                        |                              | 115 VAC        | 230 VAC | 277 VAC |
| AMEL20-3.3SAZ | 90-305/47-440          | 130-430             | 13.2                   | 3.3                | 4                      | 5600                         | 73             | 73      | 72      |
| AMEL20-5SAZ   | 90-305/47-440          | 130-430             | 20                     | 5                  | 4                      | 4700                         | 74             | 74      | 72      |
| AMEL20-12SAZ  | 90-305/47-440          | 130-430             | 20                     | 12                 | 1.66                   | 3300                         | 80             | 80      | 80      |
| AMEL20-15SAZ  | 90-305/47-440          | 130-430             | 20                     | 15                 | 1.33                   | 2200                         | 81             | 80      | 80      |
| AMEL20-24SAZ  | 90-305/47-440          | 130-430             | 20                     | 24                 | 0.84                   | 1000                         | 79             | 80      | 79      |

**Note:** Optional mounting plate version can be order by adding "-ST" suffix to part number (ex. AMEL20-5SAZ-ST)

### Input Specifications

| Parameters                       | Conditions                 | Typical | Maximum | Units |
|----------------------------------|----------------------------|---------|---------|-------|
| Current (full load)              | 115 VAC                    |         | 460     | mA    |
|                                  | 230 VAC                    |         | 290     | mA    |
|                                  | 277 VAC                    |         | 260     | mA    |
| Inrush current <2ms (cold start) | 115 VAC                    |         | 30      | A     |
|                                  | 230 VAC                    |         | 50      | A     |
|                                  | 277 VAC                    |         | 55      | A     |
| Leakage current                  |                            |         | 0.25    | mA    |
| External fuse                    | Recommended slow blow type | 1.5     |         | A     |
| Input dissipation                | (115/230/277 VAC)          | ≤0.5    |         | W     |
| Start-up time                    |                            | 150     |         | ms    |

### Output Specifications

| Parameters                   | Conditions    | Typical | Maximum | Units     |
|------------------------------|---------------|---------|---------|-----------|
| Voltage accuracy             |               | ±2      |         | %         |
| Line regulation              | (LL-HL)       | ±1      |         | %         |
| Load regulation              | 0-100% load   | ±2      |         | %         |
| Transient recovery time      |               | 500     |         | μs        |
| Transient response deviation | 25% load step | ±2      |         | % of Vout |
| Ripple & Noise*              |               | 200     |         | mV p-p    |
| Hold-up time                 |               | 10      |         | ms        |

\*Ripple and Noise are measured at 20MHz bandwidth & 230VAC by using a 0.1μF (M/C) and 470μF (E/C) parallel capacitor.

### Isolation Specifications

| Parameters           | Conditions | Typical | Rated | Units |
|----------------------|------------|---------|-------|-------|
| Tested I/O voltage   | 60 sec     |         | 3000  | VAC   |
| Isolation resistance |            | >1000   |       | MΩ    |

### General Specifications

| Parameters              | Conditions            | Typical | Maximum | Units |
|-------------------------|-----------------------|---------|---------|-------|
| Switching frequency     |                       | 65      |         | KHz   |
| Over load protection    | Foldback, AMEL20-5SAZ | 110     |         | %     |
|                         | Others                | 130     |         |       |
| Over voltage protection | Zener Diode Clamp     |         |         |       |

### General Specifications (continued)

| Parameters               | Conditions                                                                                                                         | Typical        | Maximum | Units  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|--------|
| Short circuit protection | Auto recovery                                                                                                                      |                |         |        |
| Operating temperature    | With derating over 45°C                                                                                                            | Refer to Chart |         | °C     |
| Maximum case temperature |                                                                                                                                    |                | 100     | °C     |
| Storage temperature      |                                                                                                                                    | -45 to +95     |         | °C     |
| Temperature coefficient  |                                                                                                                                    | ±0.02          |         | % / °C |
| Cooling                  | Free air convection                                                                                                                |                |         |        |
| Humidity                 | Non condensing                                                                                                                     | 20 ~ 95        |         | % RH   |
| Case material            | Plastic (flammability to UL 94V-0)                                                                                                 |                |         |        |
| Weight                   |                                                                                                                                    | 70             |         | g      |
| Dimensions (L x W x H)   | 56.48 x 30.86 x 25.10mm (2.22 x 1.21 x 0.99 inches)                                                                                |                |         |        |
| MTBF                     | > 400 000 hrs (MIL-HDBK -217F, t=+25°C)/ Full Load<br>> 100,000 hrs (MIL-HDBK -217F, t=at highest operating temperature)/Full Load |                |         |        |

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage (115/230/277VAC) and at rated output load unless otherwise specified.

### Environment Approval

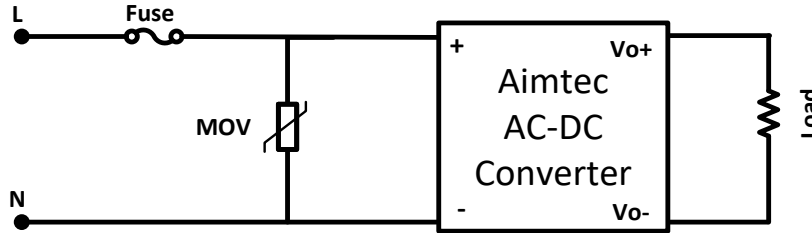
| Test      | Parameters             | Conditions                                               |
|-----------|------------------------|----------------------------------------------------------|
| Shock     | Wave form              | Half sine wave                                           |
|           | Acceleration amplitude | 5gn                                                      |
|           | Bump duration          | 30ms                                                     |
|           | Converter operation    | before and after test, body mounted (on chassis)         |
|           | Number of bumps        | 18 (3 in each direction for every axis)                  |
| Vibration | Test mode              | Sweep sine, 10-100Hz, speed 0.05Hz/s                     |
|           | Displacement           | 1mm                                                      |
|           | Acceleration           | 3g, 3 loops 30min one cycle, 3h total, every axis tested |
|           | Converter operation    | before and after test, body mounted (on chassis)         |

### Safety Specifications

| Parameters       |                                            |                                                                 |
|------------------|--------------------------------------------|-----------------------------------------------------------------|
| Agency approvals | CE, UL, FCC, CB                            |                                                                 |
|                  |                                            |                                                                 |
| Standards        | Information Technology Equipment           | UL 60950-1: 2 <sup>nd</sup> Edition                             |
|                  | Information Technology Equipment           | CAN/CSA-C22.2 No.60950-1-07, 2 <sup>nd</sup> Edition            |
|                  | EMI - Conducted and radiated emission      | EN55022, class B<br>EN55024: 2010                               |
|                  | Harmonic Current Emissions                 | IEC/EN 61000-3-2, Class A                                       |
|                  | Voltage fluctuations and flicker           | IEC/EN 61000-3-3, :2008                                         |
|                  | Electrostatic Discharge Immunity           | IEC 61000-4-2, Contact ±4KV/Air ±8KV, Criteria A                |
|                  | RF, Electromagnetic Field Immunity         | IEC 61000-4-3, 3V/m, Criteria A                                 |
|                  | Electrical Fast Transient/Burst Immunity   | IEC 61000-4-4, ±1KV, Criteria A                                 |
|                  | Surge Immunity                             | IEC 61000-4-5, ±1KV, Criteria A                                 |
|                  | RF, Conducted Disturbance Immunity         | IEC 61000-4-6, 3Vrms, Criteria A                                |
|                  | Power frequency Magnetic Field Immunity    | IEC 61000-4-8, 1A/m, Criteria A                                 |
|                  | Voltage dips, Short Interruptions Immunity | IEC 61000-4-11: 2004                                            |
|                  | FCC                                        | 47 CFR Part 15 Subpart B, ICES-003 Iss. 5-2012, ANSI C63.4-2009 |

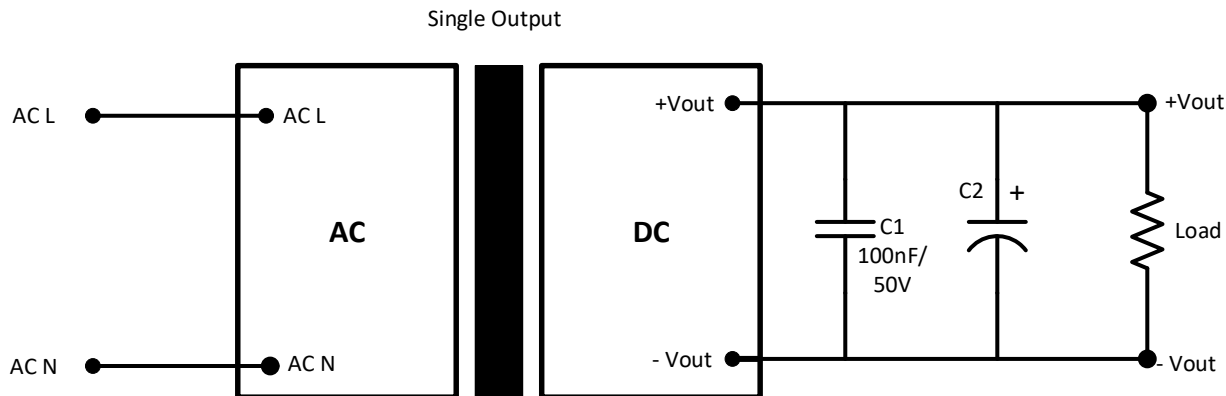
## Additional Surge Protective Circuitry

The AMEL20-AZ series design level surge protection is certified to IEC 61000-4-5 surge Line to Line of 1KV. However greater protection can be enhanced by adding protective devices to ingress circuitry. For example, by adding an MOV (Metal Oxide Varistor) device example S14K320E2 to the N / L input lines 2KV surge protection or greater, can be achieved.



| MOV PN    | Vrms<br>V | Vdc<br>V | Wmax (2ms)<br>J | Pmax<br>W |
|-----------|-----------|----------|-----------------|-----------|
| S14K320E2 | 320       | 420      | 136             | 0.6       |

## Application Circuit For Ripple Noise Consideration

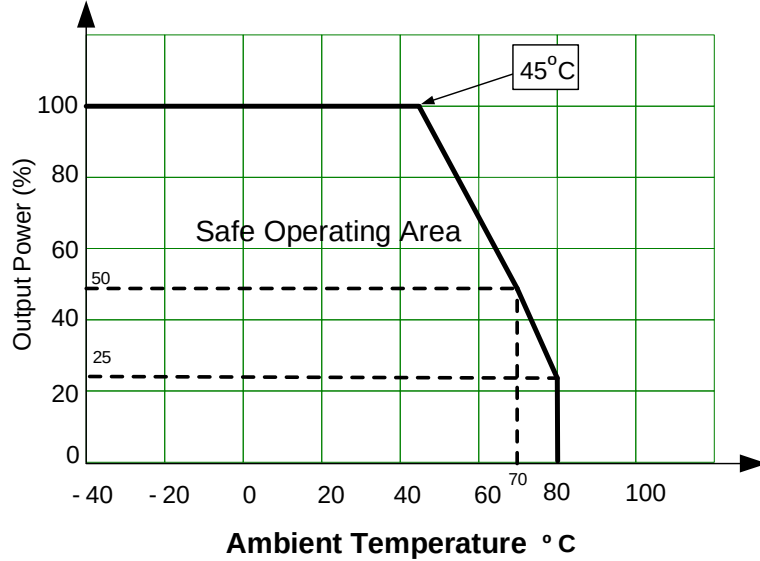


| Output             | C2        |
|--------------------|-----------|
| 3.3V, 5V, 12V, 15V | 470μF/25V |
| 24V                | 470μF/50V |

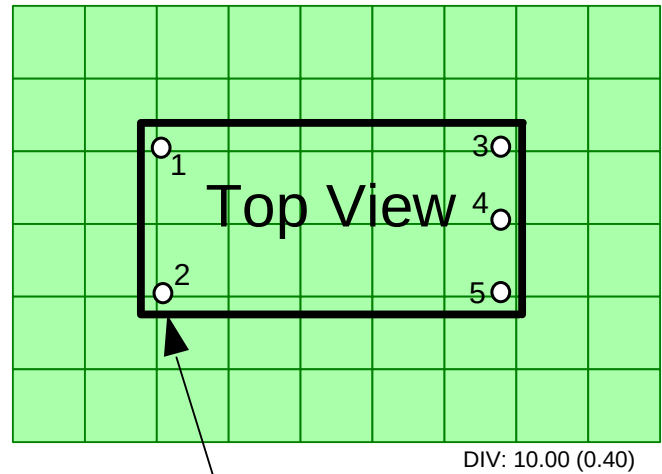
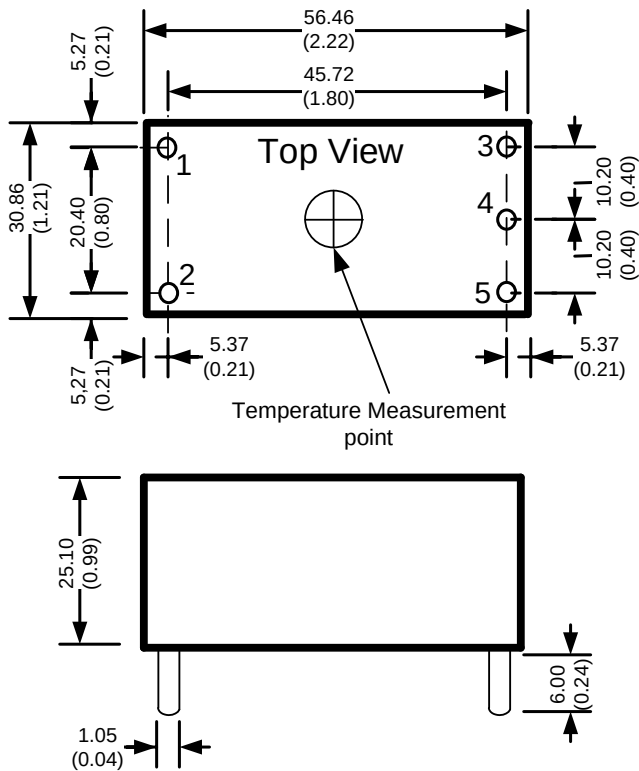
## Pin Out Specifications

| Pin | Single       |
|-----|--------------|
| 1   | AC Input (L) |
| 2   | AC Input (N) |
| 3   | +V Output    |
| 4   | -V Output    |
| 5   | No pin       |

## Derating



## Dimensions

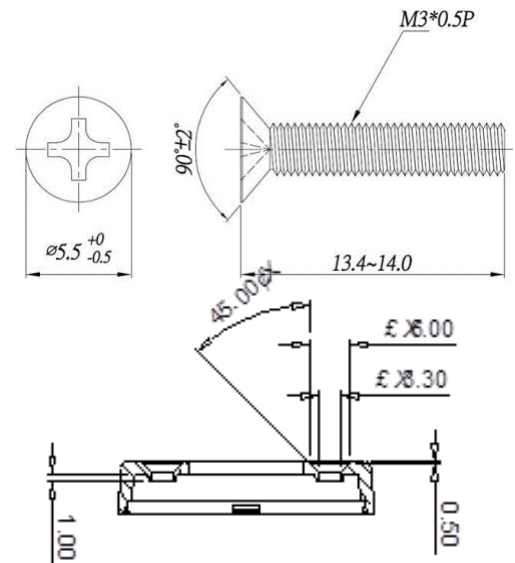
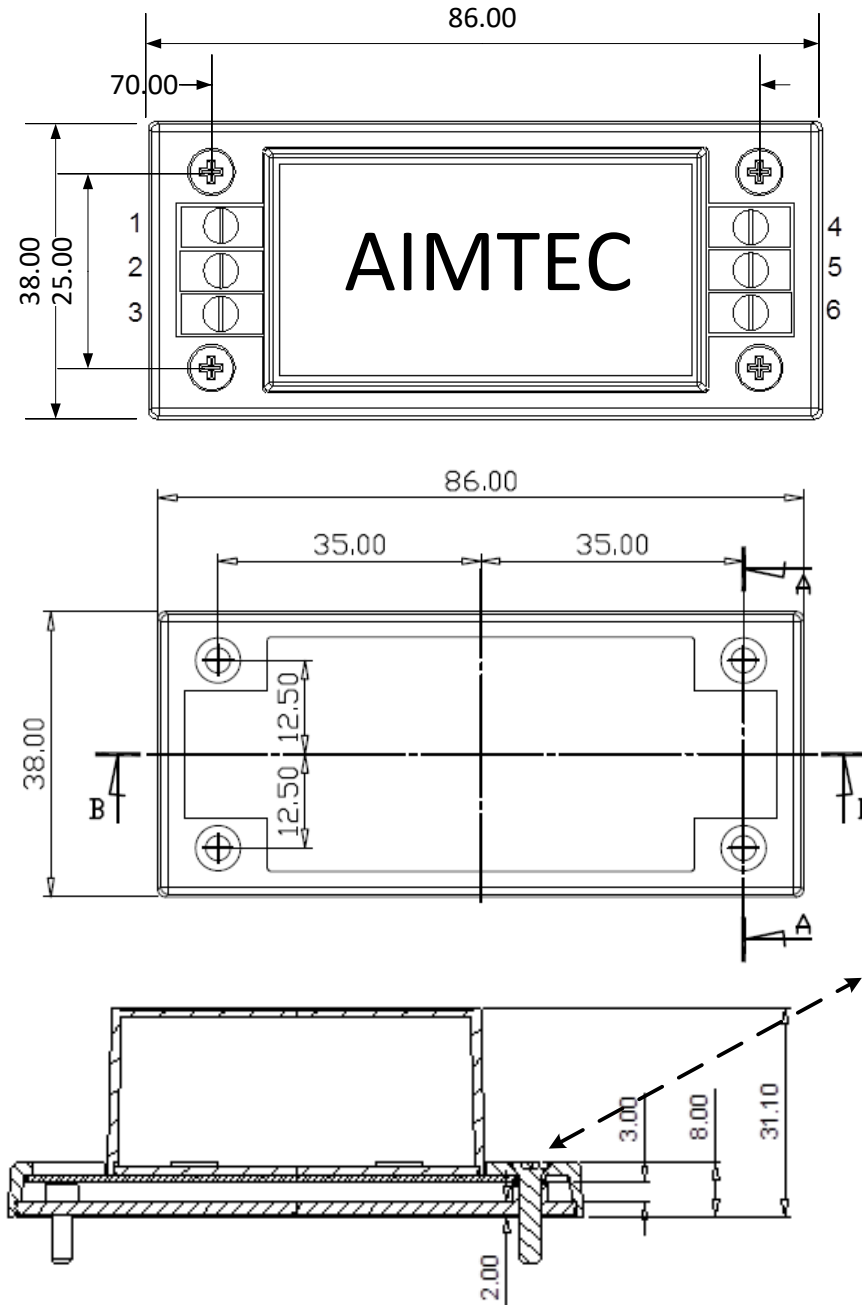


Dimensions mm (inch)  
Case Tolerance  $\pm 0.50$  ( $\pm 0.02$ )  
Pin Diameter  $1.0 \pm 0.05$  ( $0.04 \pm 0.002$ )  
Pin Pitch Tolerance  $\pm 0.5$  ( $\pm 0.02$ )

## Dimensions of Optional ST Mounting Plate Version

### Pin Out Specification ST Version

| Pin | Single       |
|-----|--------------|
| 1   | AC Input (N) |
| 2   | No pin       |
| 3   | AC Input (L) |
| 4   | +V Output    |
| 5   | Common       |
| 6   | No pin       |



**NOTE:** 1. Datasheets are updated as needed and as such, specifications are subject to change without notice. Once printed or downloaded, datasheets are no longer controlled by Aimtec; refer to [www.aimtec.com](http://www.aimtec.com) for the most current product specifications. 2. Product labels shown, including safety agency certifications on labels, may vary based on the date manufactured. 3. Mechanical drawings and specifications are for reference only. 4. All specifications are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. 5. Aimtec may not have conducted destructive testing or chemical analysis on all internal components and chemicals at the time of publishing this document. CAS numbers and other limited information are considered proprietary and may not be available for release. 6. This product is not designed for use in critical life support systems, equipment used in hazardous environments, nuclear control systems or other such applications which necessitate specific safety and regulatory standards other the ones listed in this datasheet. 7. Warranty is in accordance with Aimtec's standard Terms of Sale available at [www.aimtec.com](http://www.aimtec.com).