### 3ACA_S Series

3W- Single Output AC-DC Converter - Universal Input - Isolated & Regulated

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>UL/CE</td>
<td>3ACA_03S3</td>
<td>3.3V</td>
<td>700mA</td>
<td>75</td>
<td>65</td>
<td>0.2</td>
</tr>
<tr>
<td>UL/CE</td>
<td>3ACA_05S3</td>
<td>5V</td>
<td>500mA</td>
<td>50</td>
<td>70</td>
<td>0.2</td>
</tr>
<tr>
<td>UL/CE</td>
<td>3ACA_09S3</td>
<td>9V</td>
<td>300mA</td>
<td>50</td>
<td>71</td>
<td>0.3</td>
</tr>
<tr>
<td>UL/CE</td>
<td>3ACA_12S3</td>
<td>12V</td>
<td>250mA</td>
<td>50</td>
<td>72</td>
<td>0.4</td>
</tr>
<tr>
<td>UL/CE</td>
<td>3ACA_15S3</td>
<td>15V</td>
<td>200mA</td>
<td>50</td>
<td>72</td>
<td>0.55</td>
</tr>
<tr>
<td>UL/CE</td>
<td>3ACA_24S3</td>
<td>24V</td>
<td>120mA</td>
<td>50</td>
<td>73</td>
<td>0.7</td>
</tr>
</tbody>
</table>

* Add suffix CM for Chassis mounting with screw terminals (f.ex. 3ACA_15S3CM), see different package measurements at common specifications

### Input specifications

- **Input voltage range**: 85~264VAC, 120~370VDC
- **Input frequency**: 47~63Hz
- **Input current**: 110VAC • 65mA (typ) 230VAC • 30mA (typ)
- **Inrush current**: 110VAC • 10A (typ) 230VAC • 20A (typ)
- **Leakage current**: None
- **Recommended External Input Fuse**: 0.5A/250V Slow-Blow

### Output specifications

- **Voltage set accuracy**: ±2% ±3% at 3.3V output
- **Input variation**: ±0.5% (typ)
- **Load variation (10% to 100%)**: ±1% (typ)
- **Ripple & Noise (p-p)**: 20MHz Bandwidth; 30mV (typ), 60mV (max)
- **Short circuit protection**: Continuous, and auto resume
- **Over temperature protection**: 150°C (max)
- **Output voltage (setting accuracy)**: ±1% (typ); ±3% (max)
- **Load regulation (10% to 100%)**: ±1% (typ)
- **Voltage regulation (input voltage from low to high)**: ±0.5% (typ)
- **Starting delay**: ≤1s

### Note:

1. Ripple and Noise were measured by the method of near measure (for details see near measure).
2. All specifications measured at Ta=25°C, humidity<75%, 220VAC input voltage and rated output load unless otherwise specified.
3. All characteristics are for listed model only, non-standard models may perform differently, please contact our technical person for more detail.

### Model selection:

- **WTC_yyN##**
  - **W** = Watt; **T** = Type; **C** = Case; **yy** = Vout; **N** = Numbers of Output;
  - **##** = Isolation (kVAC)

**Example:**

- **3ACA_03S3**: 3= 3Watt; AC= AC-DC; A= case style; 5Vout; S= Single Output; 3= 3kVAC

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### Universal input: 85~264VAC/120~370VDC
### AC and DC dual-use (input from the same terminal)
### High efficiency
### Operating temperature: -20°C~+85°C

The 3ACA_S Series is a compact size power converter series offered by Gaptec. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, and is UL & CE certified, and widely used in industrial, electricity, instruments, telecommunication and civil applications.
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<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature range</td>
<td>-20°C ~ +85°C</td>
</tr>
</tbody>
</table>
| Power derating temperature range | • 55°C ~ 70°C: 2%/°C  
• -25°C ~ 0°C: 2%/°C |
| Storage temperature range | -40°C ~ +105°C |
| Case temperature range | +95°C MAX |
| Hold-up time (Vin=230VAC) | 50ms TYP |
| Humidity | 95% MAX |
| Temperature coefficient | 0.03%/°C |
| Switching frequency | 40kHz MIN; 100kHz TYP; 150kHz MAX |
| I/O-isolation voltage | 2500VAC/1Min (Resistance: 100MΩ (typ) at 500VDC) |
| EMC / EMI / CE | CISPR22/EN55022, CLASS A (without external circuit)  
CLASS B (with typical applications Figure 4) |
| EMC / EMI / RE | CISPR22/EN55022,  
CLASS A (without external circuit)  
CLASS B (with typical applications Figure 4) |
| EMC / EMI / ESD | IEC/EN 61000-4-2  
Contact ±6KV / Air ±8KV  
perf. Criteria B |
| EMC / EMI / RS | IEC/EN 61000-4-3  
10V/m  
perf. Criteria A |
| EMC / EMI / EFT | IEC/EN 61000-4-4  
± 2KV (with typical applications Figure 4)  
perf. Criteria B |
| EMC / EMI / Surge | IEC/EN 61000-4-5  
±1KV±2KV (with typical applications Figure 4)  
perf. Criteria B |
| EMC / EMI / CS | IEC/EN61000-4-6 10 Vrms  
perf. Criteria A |
| EMC / EMI / PFM | IEC/EN61000-4-8 10A/m  
perf. Criteria A |
| EMC / EMI / Voltage dips, short and interruptions immunity | IEC/EN61000-4-11 0%~70%  
perf. Criteria B |
| Safety standards | IEC60950, EN60950, UL60950 |
| Safety approvals | EN60950, UL60950 |
| Safety class | CLASS II |
| Case material | UL94V-0 |
| Install | PCB mounting, Chassis mounting with Screw Terminals |
| MTBF | >300,000h @25°C |
| Package | • 37x23x15mm (PCB mounting)  
• 76x531.5x23.8mm (Chassis mounting with Screw Terminals) |
| Weight | • 20g (PCB mounting) |

### Ripple testing demonstration

![Ripple testing demonstration diagram](image)

### Typical application circuit

![Typical application circuit diagram](image)
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Product typical curve

External capacitors typical value (unit: uF)

<table>
<thead>
<tr>
<th>Vout (VDC)</th>
<th>C5</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3</td>
<td>330µF/16V</td>
</tr>
<tr>
<td>5</td>
<td>330µF/16V</td>
</tr>
<tr>
<td>9</td>
<td>330µF/16V</td>
</tr>
<tr>
<td>12</td>
<td>220µF/25V</td>
</tr>
<tr>
<td>15</td>
<td>220µF/25V</td>
</tr>
<tr>
<td>24</td>
<td>150µF/25V</td>
</tr>
</tbody>
</table>

AC/DC application
1. Recommended circuit: see typical application circuit. If EMC performance is not required, circuit in frame of dashed line can be removed.
2. Clearance and creepage: for application Environment of Class I and Class II devices, users should guarantee there is clearance no less than 2mm and creepage no less than 2.5mm between L and N before the fuse.
3. It must be connected to FUSE. It is recommended to use 1A/250V or 10Ω/2W wire-wound resistor. The special package contains fuse.
4. Input filtering capacitor. Terminals 22 and 26 are internal rectification and filtering terminals. To protect the models further, it is recommended to connect an electrolytic capacitor C4 (it is recommended to be 4.7µF/400V). If operation voltage of the module is between 160~264VAC, C4 can be removed. When the operating voltage is below 160VAC, It need to derate, refer to PRODUCT TYPICAL CURVE
5. Input EMI filtering network. (Refer to typical application circuit)
   Combination of NF, C1, C2 and C3 form input EMI filtering network.
   MOV: Voltage dependent resistor, model 471KD07.
   C1,X capacitor, recommended parameter 0.1µF/275V
   C2,C3: Recommended parameter 470pF/2000V
   CY: 102K/400V
   LCM: Common model choke, inductance is about 15mH-30mH, can use MORNSUN’s FL2D-z5-103
6. To make sure the product work at perfect operation status with full loading external capacitor is necessary and it is recommended to use high frequency low resistance electrolytic capacitor. Recommended value refer to the below table.
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PCB mounting with solder pins

![PCB mounting diagram]

Note:
- Unit: mm (inch)
- Pin section tolerances: ± 0.10mm (± 0.004inch)
- General tolerances: ± 0.25mm (± 0.010inch)

Chassis mounting with screw terminals

![Chassis mounting diagram]

Footprint Details:

<table>
<thead>
<tr>
<th>Pin</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>AC(N)</td>
<td>AC(L)</td>
<td>+Vo</td>
<td>-Vo</td>
</tr>
</tbody>
</table>

Note:
- Unit: mm (inch)
- General tolerances: ± 0.50mm (± 0.020inch)
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Tube outline dimensions

![Diagram of tube outline dimensions]

**Note:**
Unit: mm[inch]
General tolerances: 0.5mm[0.020inch]

L=530mm[20.866inch] Devices per tube quantity: 13 pcs
L=220mm[8.661inch] Devices per tube quantity: 5 pcs