



## 5ACA\_S Series

5W- Single Output AC-DC Converter - Universal Input - Isolated & Regulated

# AC-DC Converter 5 Watt

- ⊕ Universal input: 85~264VAC/110~370VDC
- ⊕ AC and DC dual-use (input from the same terminal)
- ⊕ High efficiency
- ⊕ High power density
- ⊕ Output over voltage protection
- ⊕ Short circuit protection (SCP)
- ⊕ Over temperature protection
- ⊕ Meet EN60601, UL60601
- ⊕ Devised for medical treatment
- ⊕ Mounting: PCB Mounting & Chassis Mounting with Screw Terminal

The 5ACA\_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.



RoHS

CE

Approval	Model*	Power [W]	Output [Vo]	Output [Io]	Ripple and Noise [mV, typ]	Efficiency [%, typ]	Standby Power [W, typ]
UL/CE	5ACA_03S4	4.2	3.3V	1250mA	30	66	0.3
UL/CE	5ACA_05S4	5	5V	1000mA	30	72	0.3
UL/CE	5ACA_09S4	5	9V	550mA	30	74	0.35
UL/CE	5ACA_12S4	5	12V	420mA	30	76	0.35
UL/CE	5ACA_15S4	5	15V	333mA	30	76	0.35
UL/CE	5ACA_24S4	5.5	24V	230mA	30	78	0.4

\* Add suffix CM for Chassis mounting with screw terminals (f.ex. 5ACA\_03S4CM), see different package measurements at common specifications

Input specifications	
Input voltage range	85~264VAC, 110~370VDC
Input frequency	47~63Hz
Input current	110VAC • 110mA (typ)      230VAC • 70mA (typ)
Inrush current	110VAC • 10A (typ)      230VAC • 20A (typ)
Leakage current	None
Recommended External Input Fuse (5ACA_S special package series include fuse)	• 1A/250V      • Slow-Blow

**Note:**

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

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)
Over output voltage protection	diode clamp

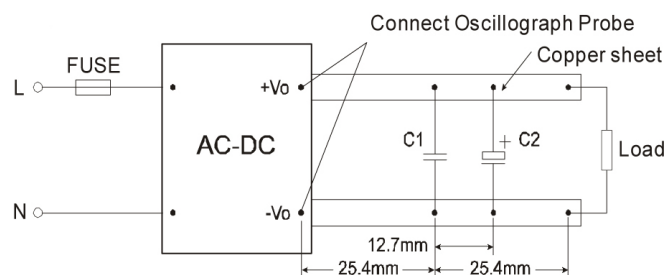
**Model selection:**  
**WTC\_yyN##**  
**W=** Watt; **T=** Type; **C=** Case; **yy=** Vout; **N=** Numbers of Output; **##=** Isolation (kVAC)  
**Example:**  
**5ACA\_05S4**  
**5=** 5Watt; **AC=** AC-DC; **A=** case style; **5Vout**; **S=** Single Output; **4=** 4kVAC

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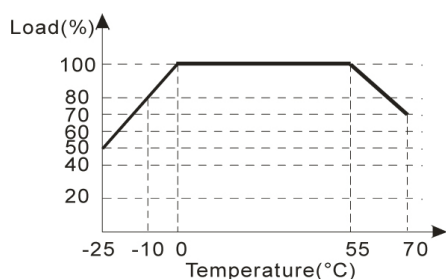
Common specifications		
Operating temperature range	-25°C ~ +70°C	
Power derating temperature range	<ul style="list-style-type: none"> <li>• 55°C ~ 70°C: 2%/°C</li> <li>• -25°C ~ 0°C: 2%/°C</li> </ul>	
Storage temperature range	-40°C ~ +105°C	
Case temperature range	+95°C MAX	
Hold-up time (Vin=230VAC)	50ms TYP	
Humidity	95% MAX	
Temperature coefficient	0.02%/°C	
Switching frequency	100kHz TYP	
I/O-isolation voltage	4000VAC/1Min	
EMC / EMI / CE	CISPR11/EN55011, CLASS A (without external circuit) CLASS B (with typical applications Figure 5)	
EMC / EMI / RE	CISPR11/EN55011, CLASS A (without external circuit) CLASS B (with typical applications Figure 5)	
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	<ul style="list-style-type: none"> <li>• IEC/EN 61000-4-4 ± 2kV (without external circuit)</li> <li>• IEC/EN 61000-4-4 ± 4kV (with typical applications Figure 5)</li> </ul>	perf. Criteria B perf. Criteria B
EMC / EMI / Surge	<ul style="list-style-type: none"> <li>• IEC/EN 61000-4-5 ±1KV/±2KV (without external circuit)</li> <li>• IEC/EN 61000-4-5 ±2KV/±4KV (with typical applications Figure 5)</li> </ul>	perf. Criteria B perf. Criteria B
EMC / EMI / CS	IEC/EN61000-4-6 10 Vr.m.s	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	IEC60601, EN60601, UL60601	
Safety approvals	EN60601, UL60601	
Safety class	CLASS II	
Case material	UL94V-0	
Install	PCB mounting, Chassis mounting with Screw Terminals	
MTBF	>300,000h @25°C	
Package	<ul style="list-style-type: none"> <li>• 50.8x25.4x15.16mm (PCB mounting)</li> <li>• 96.1x54.0x23.66mm (Chassis mounting with Screw Terminals)</li> </ul>	
Weight	<ul style="list-style-type: none"> <li>• 35g (PCB mounting)</li> <li>• 85g (Chassis mounting with Screw Terminals)</li> </ul>	

## Anear measure

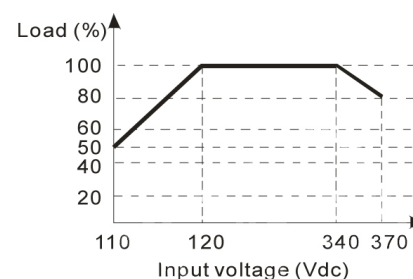
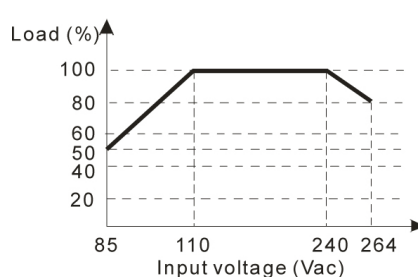


Note:  
C1: 1μF (Ceramic capacitor) C2: 10μF (Electrolytic capacitor)

## Temperature vs. load



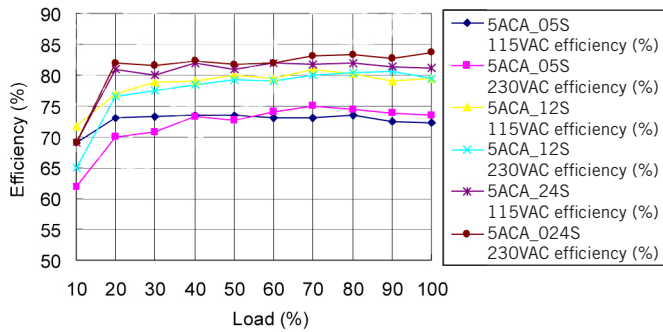
## Input voltage vs. load



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### Typical efficiency curve



### Typical applications

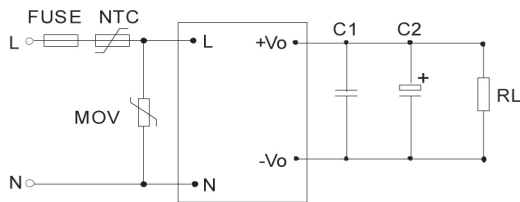


Figure 1:  
5ACA\_S series.

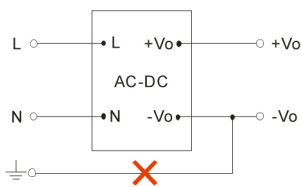


Figure 2:  
This application is not supported for this series.

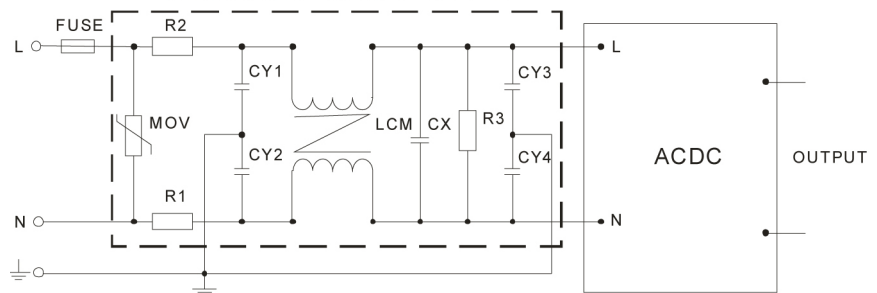


Figure 3:  
5ACA\_S series Recommended circuit for application require higher EMC standard (external circuit output same as above)

### External capacitors typical value

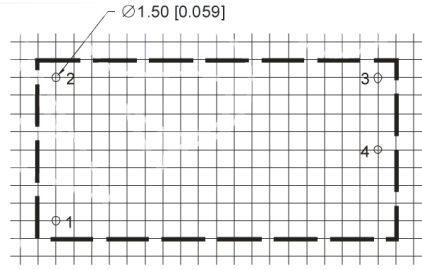
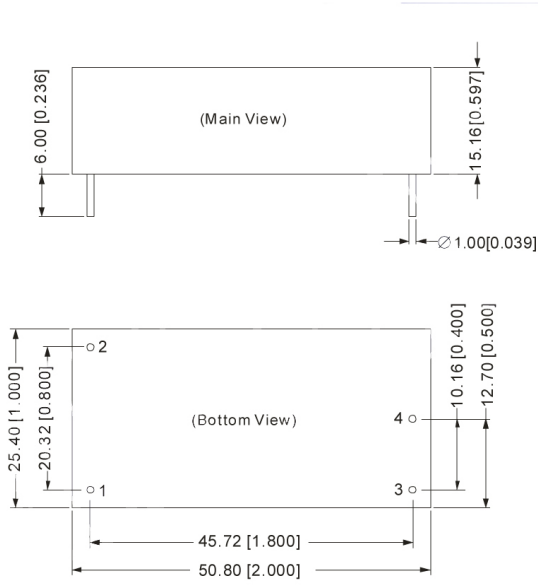
Model	C1	C2
5ACA_03S4	1	47
5ACA_05S4	1	47
5ACA_09S4	1	33
5ACA_12S4	1	33
5ACA_15S4	1	33
5ACA_24S4	1	10

- Note:
- Output filtering capacitor C2 is an electrolytic capacitor. It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Voltage derating of capacitor should be 80% or above. C1 is ceramic capacitor, it is used to filter high frequency noise. External input NTC is recommended to use 5D-9.
  - For standard EMC requirement, please refer to figure 1, if higher EMC requirement, please refer to figure 3.  
MOV: Varistor, model: 561KD14, it is used to protect the device under surge;  
R1, R2: 2Ω/3W Winding resistor  
R3: 1MΩ/2W  
CY1, CY2, CY3, CY4: 102M/400VAC  
CX: 0.22μF/275VAC  
LCM: 10mH-30mH  
CY: Y capacitor, recommended parameter 102K/400V
  - 5ACA\_ is recommended to use 1A/250V.

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## PCB mounting with solder pins

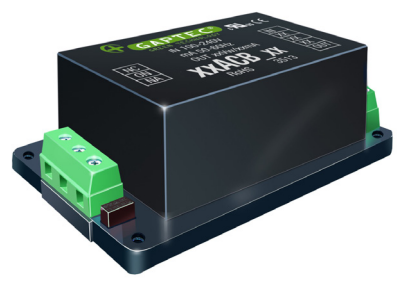
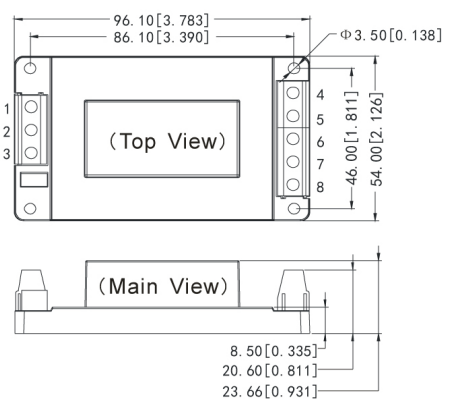


Note: grid 2.54\*2.54mm.

FOOTPRINT DETAILS	
PIN	FUNCTION
1	N
2	L
3	+Vo
4	-Vo

**Note:**  
 Unit: mm[inch]  
 Pin section tolerances: ± 0.10mm[± 0.004inch]  
 General tolerances: ± 0.25mm[± 0.010inch]

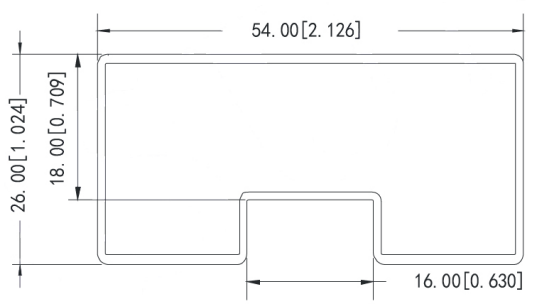
## Chassis mounting with screw terminals



**Note:**  
 Unit: mm[inch]  
 General tolerances: ± 0.50mm[± 0.020inch]

Footprint Details								
Pin	1	2	3	4	5	6	7	8
Function	NC	AC(N)	AC(L)	+Vo	NC	-Vo	NC	NC

## Tube outline dimensions



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

L=530mm[20.866inch]      Devices per tube quantity: 19 pcs  
 L=220mm[8.661inch]      Devices per tube quantity: 7 pcs