5ACBE_4 Series

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

AC-DC Converter 5 Watt

- Universal input: 85~264VAC, 100~370VDC
- Regulated output, low ripple and noise
- High efficiency up to 82%
- Plastic case, meets UL94V-0
- Over current protection
- Short circuit protection (SCP)
- Over voltage protection
- Meets IEC62368, UL62368, EN62368 standards
- PCB mounting, chassis mounting, DIN rail mounting

The 5ACBE_4 series is a compact size power converter 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, which meet IEC/EN61000-4, CISPR32/EN55032, UL62368 and EN62368 standards, and it's widely used in industrial, office and civil applications. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

UL-62368-1 (E347551)

Certification	Model	Output power [W]	Output [Vo]	Output current [mA]	Capacitive Load [µF, max]	Efficiency [%, typ]
UL/CE/CB	5ACBE_03S4	4	3.3	1250	8100	70
UL/CE/CB	5ACBE_05S4	5	5	1000	6800	75
UL/CE/CB	5ACBE_09S4	5	9	550	1200	77
UL/CE/CB	5ACBE_12S4	5	12	420	1000	79
UL/CE/CB	5ACBE_15S4	5	15	330	680	80
UL/CE/CB	5ACBE_24S4	5.5	24	230	270	82

Input specifications		
Input voltage range	85~264VAC, 100~370VDC	
Input frequency	47~63Hz	
Input current	115VAC • 0.125A (max)	230VAC • 0.08A (max)
Inrush current	115VAC • 10A (typ)	230VAC • 20A (typ)
Recommended External Input Fuse	• 1A/250V	• slow fusing
Hot plug	Unavailable	

Example:
5ACBE_05S4
5 = 5Watt; AC = AC-DC; B = series; E = Cost effective; 05 = 5Vout; S = Single Output; 4 = 4kVAC isolation

Output specifications	
Voltage accuracy	±2%
Line regulation (full load)	±0.5%
Load regulation (0% to 100%)	±1%
Minimum load	0%
Ripple & Noise (p-p)	20MHz Bandwidth: 50mV (typ), 100mV (max)
Short circuit protection	Continuous, and auto resume
Over current protection	150%-300% I_O self-recovery
Output over-voltage protection • 3.3/5VDC models • 9VDC models • 12/15VDC models • 24VDC models	 • ≤7.5VDC • ≤13VDC • ≤20VDC • ≤30VDC
Hold-up time	Vin=115VAC: 12ms MIN, 15ms TYP Vin=230VAC: 70ms MIN, 80ms TYP
Temperature coefficient	0.02%/°C

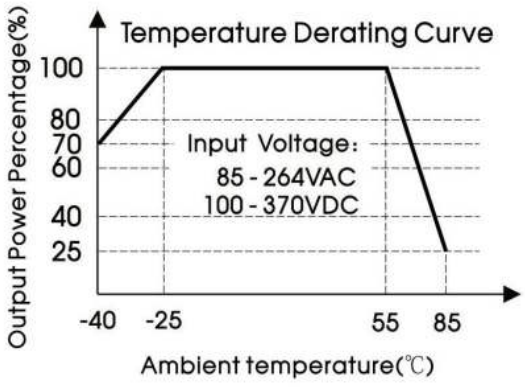
Note:

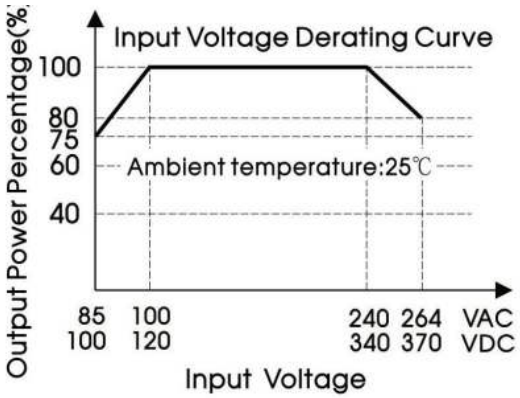
1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75% with nominal input voltage and rated output load;
2. All index testing methods in this datasheet are based on our Company's corporate standards;
3. We can provide product customization service, please contact our technicians directly for specific information;
4. Products are related to laws and regulations: see „Features" and „EMC";
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com

Common specifications			
Operating temperature range	-40°C ~ +85°C		
Power derating temperature range	• -40°C ~ -25°C: 2.0 %/°C (min) • +55°C ~ +85°C: 2.5%/°C (min) • 85VAC-100VAC: 1.66%/VAC (min) • 240VAC-264VAC: 0.83%/VAC (min)		
Storage temperature range	-40°C ~ +105°C		
Humidity (non-condensing)	95% MAX		
Welding Temperature	Wave-soldering: 260±5°C, time:5-10s Manual-welding: 360±10°C, time:3-5s		
Switching frequency	100kHz TYP		
Cooling	Free air convection		
I/O-isolation voltage	Input-output: 4000VAC/1Mmin Input-PE: 2000VAC/1min		
EMC / EMI / CE	CISPR32/EN55032	CLASS B	
EMC / EMI / RE	CISPR32/EN55032	CLASS B	
EMC / EMS / ESD	IEC/EN 61000-4-2	±6KV / ±8KV	perf. Criteria B
EMC / EMS / RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
EMC / EMS / EFT	• IEC/EN 61000-4-4 • IEC/EN 61000-4-4	± 2kV ± 4kV (see EMC solution recommended circuit)	perf. Criteria B perf. Criteria B
EMC / EMS / Surge	• IEC/EN 61000-4-5 • IEC/EN 61000-4-5	line to line ±1KV/line to ground ±2KV line to line ±2KV/line to ground ±4KV (see EMC solution recommended circuit)	perf. Criteria B perf. Criteria B
EMC / EMS / Conducted disturbance immunity	IEC/EN 61000-4-6	10Vr.m.s	perf. Criteria A
EMC / EMS / Immunities of voltage dip, drop and short interruption	IEC/EN 61000-4-11	0%-70%	perf. Criteria B
Safety standards	IEC62368/EN62368/UL62368		
Safety certification	IEC62368/EN62368/UL62368 (pending)		
Safety class	CLASS I		
Case material	UL94V-0		
MTBF	>300,000h @25°C		
Package	48.50*36.00*20.50 mm		
Weight	55g		

Typical characteristics

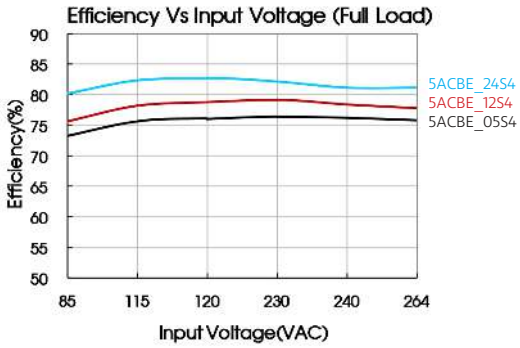


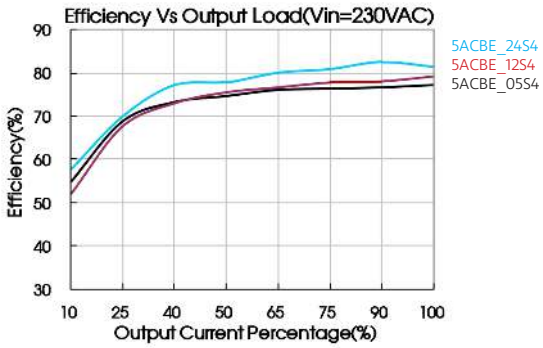


Note:

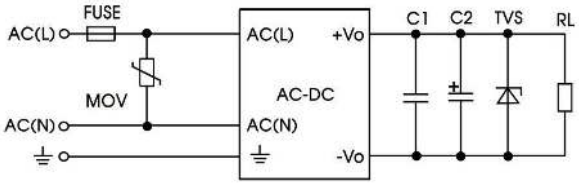
1. When input 85~100VAC/240~264VAC/100~120VDC/340~370VDC, it needs to be voltage derated on basis of temperature derating;
2. This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.

Efficiency





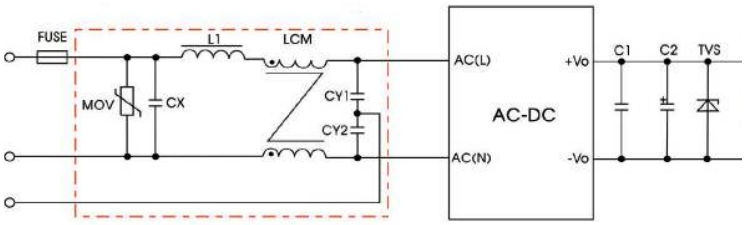
Typical application circuit



Note:
Output filtering capacitors C2 is electrolytic capacitors, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitor voltage reduced to at least 80%. C1 is ceramic capacitors, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

External circuit parameters				
Model	C2 (µF)	Fuse	MOV	TVS1
5ACBE_03S4	330	1A/250V slow fusing, necessary	S14K300	SMBJ7.0A
5ACBE_05S4	330			SMBJ7.0A
5ACBE_09S4	120			SMBJ12A
5ACBE_12S4	120			SMBJ20A
5ACBE_15S4	68			SMBJ20A
5ACBE_24S4	68			SMBJ30A

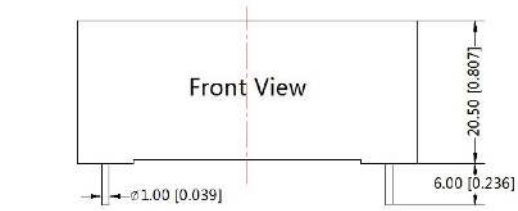
EMC solution recommended circuit

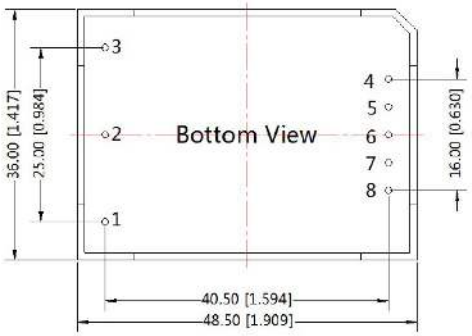


Components	Recommend Parameter
MOV	S14K300
CY1, CY2	1000pF/400VAC
CX	0.1µF/275VAC
LCM	10mH
L1	4.7uH/2A
FC-LX1D	2KV/4KV EMC filter
FUSE	2A/250V slow fusing, necessary

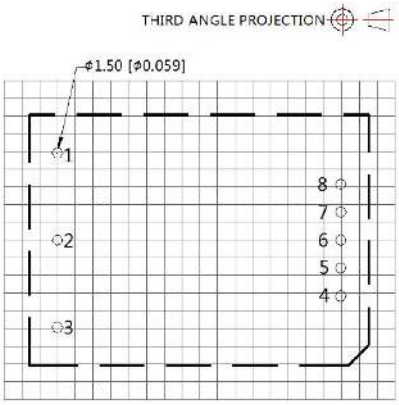
GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com

Mechanical dimensions





Note:
Unit:mm[inch]
Pin diameter tolerances:±0.10[±0.004]
General tolerances:±0.50[±0.020]



Note : Grid 2.54*2.54mm

Pin-Out	
PIN	5ACBE_4
1	⏚
2	AC(N)
3	AC(L)
4	+Vo
5	No Pin
6	No Pin
7	No Pin
8	-Vo