25ACBE_4 series

25W - Single Output AC-DC Converter - Universal Input - Isolated & Regulated

AC-DC Converter 25 Watt

- Universal input: 85-264VAC/100-370VDC
- Operating temperature range: -40°C to +85°C
- High Isolation 4000VAC
- Short circuit protection (SCP)
- High efficiency, high reliability
- Low ripple and noise
- Output over voltage, over current protection
- Meet EMI CISPR32/EN55032 CLASS B
- IEC62368, UL62368, EN62368 approved

The 25ACBE_4 series are compact size power converters. They feature universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. The converters offer good EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, UL62368 and EN62368 standards.

They are widely used in industrial, electricity, instrumentation, telecommunications and civil applications. For extremely harsh EMC environment, we strongly recommend using the application circuit of this datasheet.

UL-62368-1 (E347551)

Certification	Model	Output power [W]	Output [V]	Output [mA]	Efficiency [%, typ]	Capacitive load [µF, max]
UL/CE/CB	25ACBE_03S4	13.53	3.3	4100	74	48000
UL/CE/CB	25ACBE_05S4	20.5	5	4100	79	12240
UL/CE/CB	25ACBE_09S4	25	9	2500	81	5600
UL/CE/CB	25ACBE_12S4	25	12	2100	83	5400
UL/CE/CB	25ACBE_15S4	25	15	1600	84	2400
UL/CE/CB	25ACBE_24S4	25	24	1100	85	1440
UL/CE/CB	25ACBE_48S4	25	48	500	87	600

Input specifications		
Input voltage range	85-264VAC, 100-370VDC	
Input frequency	47-63Hz	
Input current (full load)	115VAC • 0.6A (typ)	230VAC • 0.34A (typ)
Inrush current (<2ms, cold start)	115VAC • 20A (typ)	230VAC • 40A (typ)
Hot plug	Unavailable	

Example:
25ACBE_05S4
25 = 25Watt; AC = AC-DC; B = case style; E = Cost effective; 25Vout; S = Single Output; 4 = 4kVAC isolation

Output specifications	
Voltage set accuracy	• 3.3V: ±3% (typ) • others: ±2% (typ)
Line regulation (Rated load)	±0.5% (typ)
Load regulation (0% to 100%)	±1%
Ripple & Noise*	50mV typ., 100mV max.
Short circuit protection	Hiccup mode, indefinite (automatic recovery)
Over current protection	≥140%Io, self-recovery
Over voltage protection	• 3.3V/5V: 7.5V • 9V: 15V • 12V/15V: 20V • 24V: 30V • 48V: 60V
Hold-up time	• 115VAC: 10ms (typ) • 230VAC: 60ms (typ)

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 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.

* The "parallel cable" method is used for ripple and noise test.

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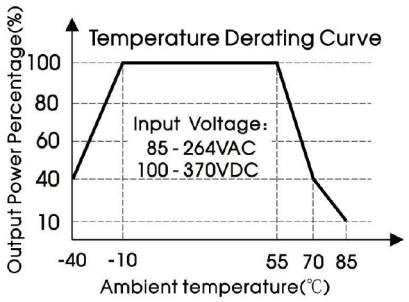
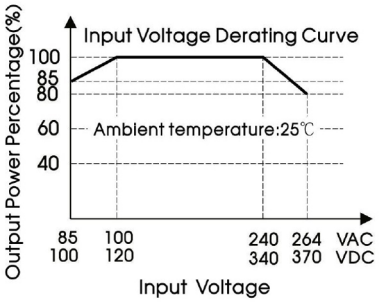
Common specifications			
Operating temperature range	-40°C ~ +85°C		
Storage temperature range	-40°C ~ +85°C		
Power derating	• -40°C ~ -10°C: 2.00 %/°C (min) •+50°C ~ +70°C: 3.00 %/°C (min) • +70°C ~ +85°C: 2.00 %/°C (min) • 85VAC-100VAC: 1.00 %/VAC (min) • 240VAC-264VAC: 0.83 %/VAC (min)		
Humidity	95% MAX		
Temperature coefficient	0.02%/°C		
Soldering temperature	Wave-soldering: 260 ± 5°C; time: 5 - 10s Manual-welding: 360 ± 10°C; time: 3 - 5s		
I/O-isolation voltage	4000VAC/1Min		
EMC / EMI / CE	CISPR32/EN55032	CLASS B	
EMC / EMI / RE	CISPR32/EN55032	CLASS B	
EMC / EMS / ESD	IEC/EN 61000-4-2	Contact ±6KV / Air ±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 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 recommended circuit)	perf. Criteria B perf. Criteria B
EMC / EMS / CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
EMC / EMS / Voltage dips, short and interruptions immunity	IEC/EN61000-4-11	0%-70%	perf. Criteria B
Safety standards	IEC62368/EN62368/UL62368		
Safety class	CLASS I		
Case material	UL94V-0		
Install	PCB mounting		
MTBF (MIL-HDBK-217F@25°C)	>300,000h		
Cooling	Free air convection		
Package	70.00 x 48.00 x 23.50mm 96.10 x 54.00 x 32.00mm (Chassis mounting) 96.10 x 54.00 x 36.60mm (Dinrail mounting)		
Weight	120g 170g (Chassis mounting) 210g (Dinrail mounting)		

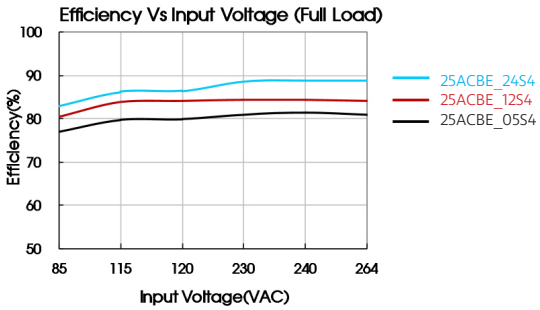
Typical characteristics

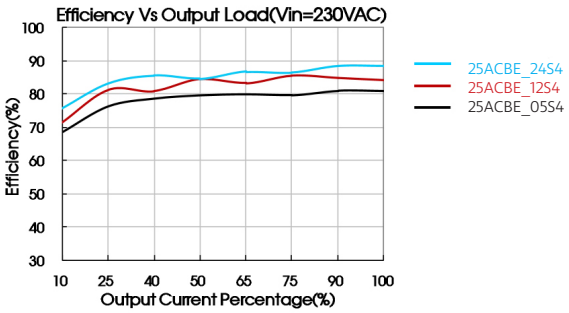




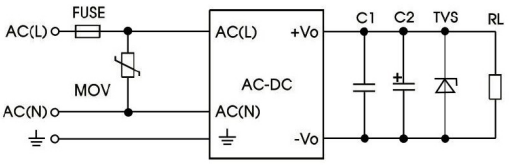
Note:
①When input 85-100VAC/240-264VAC/100-120VDC/340-370VDC, it need to be voltage derated on basis of temperature derating;
②This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company.

Efficiency





Typical application circuit

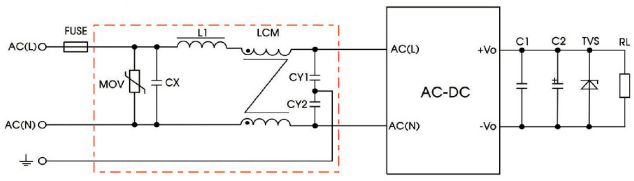


Note:
Output filtering capacitors C2 is electrolytic capacitors, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitor voltage reduced to at least 80%. C1 is ceramic capacitors, which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

Model	C1 (µF)	C2 (µF)	Fuse	MOV	TVS
25ACBE_03S4	1	330	3.15A/250V slow-blow, required	S14K300	SMBJ7.0A
25ACBE_05S4	1	330	3.15A/250V slow-blow, required	S14K300	SMBJ7.0A
25ACBE_09S4	1	330	3.15A/250V slow-blow, required	S14K300	SMBJ12A
25ACBE_12S4	1	330	3.15A/250V slow-blow, required	S14K300	SMBJ20A
25ACBE_15S4	1	330	3.15A/250V slow-blow, required	S14K300	SMBJ20A
25ACBE_24S4	1	120	3.15A/250V slow-blow, required	S14K300	SMBJ30A
25ACBE_48S4	1	68	3.15A/250V slow-blow, required	S14K300	SMBJ64A

EMC solution recommended circuit

EMC recommended circuit with higher requirements



Component	Recommended value
MOV	S14K300
CY1, CY2	1000pF/400VAC
CX	0.1µF/275VAC
LCM	10mH
L1	4.7µH/2A
FC-LX1D	2KV/4KV EMC filter
FUSE	3.15A/250V slow-blow, required

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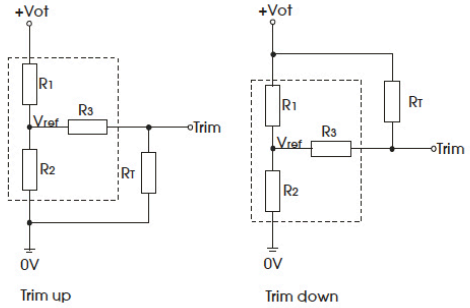
Trim

Trim Function for Output Voltage Adjustment (open if unused)



Calculation formula of Trim resistance:

$$\text{up: } R_T = \frac{aR_2}{R_2-a} - R_3 \qquad a = \frac{Vref}{Vot-Vref} \cdot R_1$$

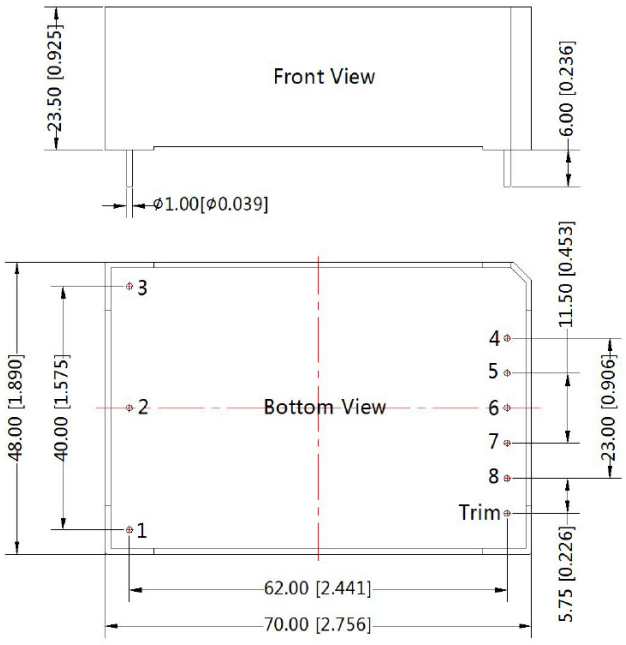
$$\text{down: } R_T = \frac{aR_1}{R_1-a} - R_3 \qquad a = \frac{Vot-Vref}{Vref} \cdot R_2$$

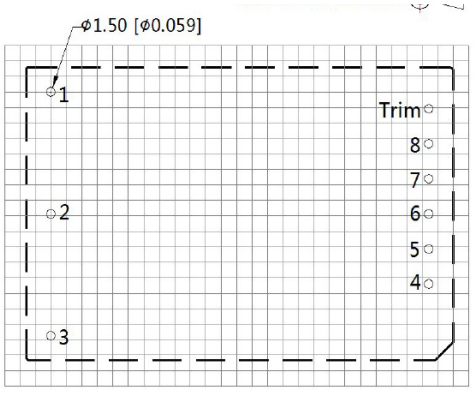
R_T is Trim resistance
a is a self-defined parameter, with no real meaning.

Applied circuits of Trim (Part in broken line is the interior of models):

Vout	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)	Vot(V)
3.3V	3.3	1.98	1	1.24	Output voltage after regulation, variation ≤ ±10%
5V	3.3	3.3	1	2.5	
9V	7.5	2.87	1	2.5	
12V	3.83	1	1	2.5	
15V	7.5	1.5	1	2.5	
24V	8.66	1	1	2.5	
48V	68	3.73	1	2.5	

Mechanical dimensions





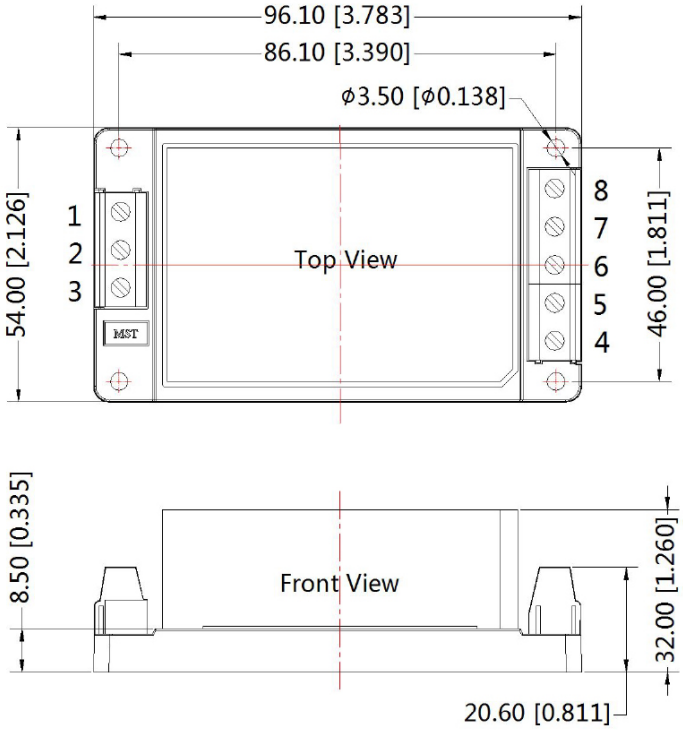
Note: Grid 2.54*2.54mm

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

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

Chassis mounting

THIRD ANGLE PROJECTION

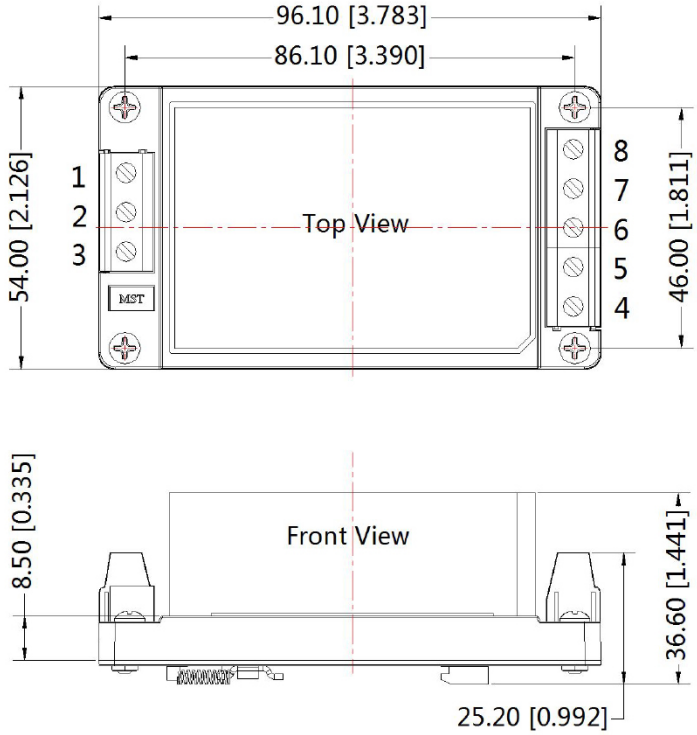


Pin-Out	
Pin	Function
1	⏚
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	Trim
7	NC
8	-Vo

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

Din Rail mounting

THIRD ANGLE PROJECTION



Pin-Out	
Pin	Function
1	⏚
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	Trim
7	NC
8	-Vo

Note:
Unit: mm[inch]
Mounting rail: TS35, rail needs to connect safety ground
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]