



## 20ACB Series

20W - Single/Dual Output AC-DC Converter - Universal Input - Isolated & Regulated

### AC-DC Converter

20 Watt

- ⊕ Universal input: 85~264VAC, 50/60Hz
- ⊕ Regulated output, low ripple and noise
- ⊕ High efficiency up to 85%
- ⊕ Plastic case, meets UL94V-0
- ⊕ Output current protection
- ⊕ Short circuit protection (SCP)
- ⊕ Over temperature protection
- ⊕ Meet EN60950, UL 60950
- ⊕ Mounting: PCB Mounting & Chassis Mounting with Screw Terminal

The 20ACB 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, meets IEC/EN61000-4, CISPR22/EN55022, UL60950 and EN60950 standards, and is widely used in industrial, office and civil applications.



RoHS

CE

Approval	Model*	Power [W]	Output [Vo]	Output [Io]	Ripple and Noise [mV, typ]	Efficiency [%, typ]
UL/CE	20ACB_03S3	20	3.3V	4100mA	50	73
UL/CE	20ACB_05S3	20	5V	3500mA	50	75
UL/CE	20ACB_09S3	20	9V	2100mA	50	77
UL/CE	20ACB_12S3	20	12V	1600mA	50	81
UL/CE	20ACB_15S3	20	15V	1300mA	50	83
UL/CE	20ACB_24S3	20	24V	850mA	50	85
	20ACB_05D3	20	±5V	2000mA	50	75
	20ACB_12D3	20	±12V	830mA	50	82
	20ACB_15D3	20	±15V	650mA	50	83

\* Add suffix CM for Chassis mounting with screw terminals (f.ex. 20ACB\_03S3CM), see different package measurements at common specifications

Input specifications	
Input voltage range	85~264VAC, 120~370VDC
Input frequency	47~63Hz
Input current	110VAC      230VAC • 330mA (typ)      • 180mA (typ)
Inrush current	110VAC      230VAC • 16A (typ)      • 30A (typ)
Leakage current	0.3mA RMS typ./230VAC/50Hz
Recommended External Input Fuse (special package series include fuse)	• 3.15A/250V      • Slow-Blow

**Note:**

- Ripple and Noise are measured by the method of parallel lines.
- Unless otherwise specified, all specifications are measured at rated input voltage and rated output load, TA=25°C, humidity < 75%.

Output specifications	
Voltage set accuracy	±2%
Input variation	±0.5% (main output) ±1.5% (supplement output)
Load variation (10% to 100%)	• ±1% • ±2%
Minimum load	• 0% • 10%
Ripple & Noise (p-p)	20MHz Bandwidth: 50mV (typ), 100mV (max)
Short circuit protection	Continuous, and auto resume
Over current protection	≥110% I <sub>o</sub>
Output over-voltage protection	• ≤7.5VDC • ≤12VDC • ≤20VDC • ≤30VDC

**Model selection:**

WTC\_yyN##  
W= Watt; T= Type; C= Case; yy= Vout; N= Numbers of Output;  
##= Isolation (kVAC)

**Example:**

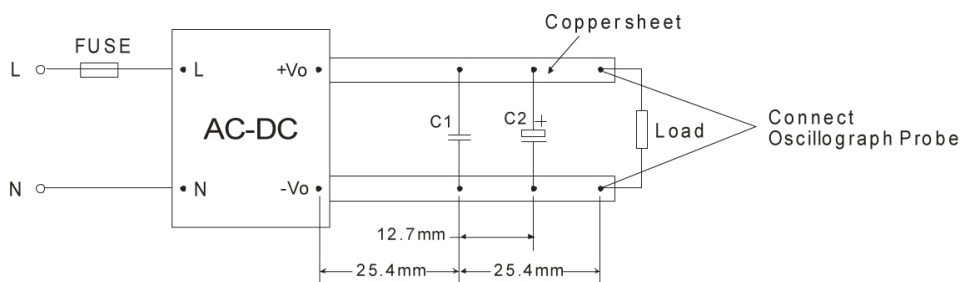
20ACB\_05S3  
20= 20Watt; AC= AC-DC; B= series; 5Vout; S= Single Output;  
3= 3kVAC

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Common specifications			
Operating temperature range	-40°C ~ +70°C		
Power derating temperature range	55°C ~ 70°C:	3.75%/°C	
	-40°C ~ -10°C:	2%/°C	
Storage temperature range	-40°C ~ +105°C		
Case temperature range	+90°C MAX		
Hold-up time (Vin=230VAC)	80ms TYP		
Humidity (non-condensing)	95% MAX		
Temperature coefficient	0.02%/°C		
Switching frequency	65kHz TYP		
I/O-isolation voltage	3000VAC/1Min		
EMC / EMI / CE	CISPR22/EN55022, CLASS B (without external circuit)		
EMC / EMI / RE	CISPR22/EN55022, CLASS B (without external circuit)		
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	± 2kV (without external circuit)	perf. Criteria B
	• IEC/EN 61000-4-4	± 4kV	perf. Criteria B
EMC / EMS / Surge	• IEC/EN 61000-4-5	±1KV/±2KV (without external circuit)	perf. Criteria B
	• IEC/EN 61000-4-5	±2KV/±4KV	perf. Criteria B
Safety standards	IEC60950, EN60950, UL60950		
Safety approvals	EN60950, UL60950		
Safety class	CLASS I		
Case material	UL94V-0		
Install	PCB mounting		
MTBF	>300,000h @25°C		
Package	• 70x48x23.5mm (PCB mounting)		
	• 96.1x54x32mm (Chassis mounting with Screw Terminals)		
Weight	• 120g (PCB mounting)		
	• 170g (Chassis mounting with Screw Terminals)		

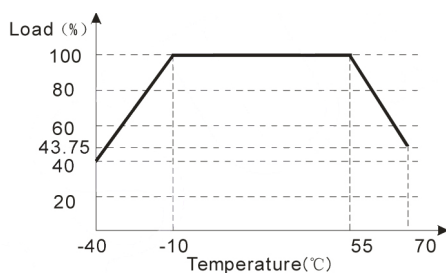
## Parallel lines measure



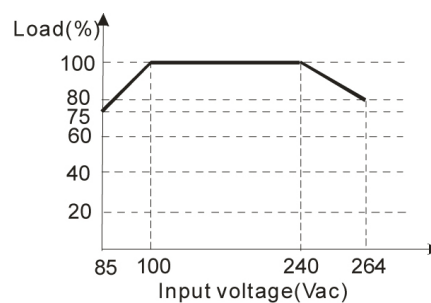
**Note:**

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

## Temperature vs. load



## Input voltage vs. load



**Note:**

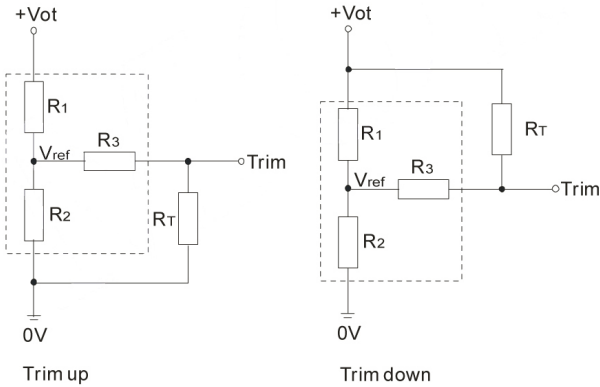
When input DC, Vdc=1.414\*Vac-20.

# 20ACB Series

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## Trim application & trim calculation

**Application circuit for TRIM**  
(Part in broken line is the interior of models)



**Formula for resistance of Trim**

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \quad a = \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2$$

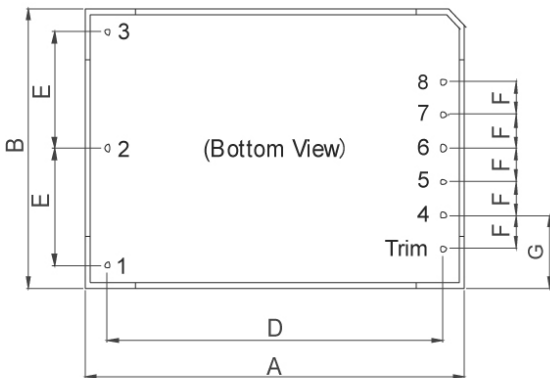
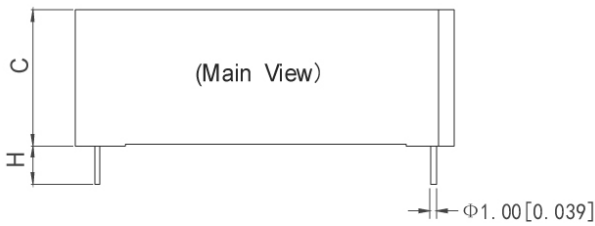
Note: Value for R1, R2, R3, and Vref refer to the following table.

R<sub>T</sub>: Resistance of Trim

a: User-defined parameter, no actual meanings.

Vo(V)	3.3	5	9	12	15	24
Resistance						
R1(KΩ)	2	3.3	7.5	3.8	7.5	8.6
R2(KΩ)	1.2	3.3	2.8	1	1.5	1
R3(KΩ)	1	1	1	1	1	1
Vref(V)	1.2	2.5	2.5	2.5	2.5	2.5
Vot(V)	Output voltage of Trim, variation ≤ ±10%					

## PCB mounting with solder pins



**Note:**

Unit: mm[inch]

Pin length (H): ≥6.00mm[0.236inch]

Pin diameter tolerances: ±0.10mm[±0.004inch]

General tolerances: ±0.50mm[±0.020inch]

A: 70.00mm

B: 48.00mm

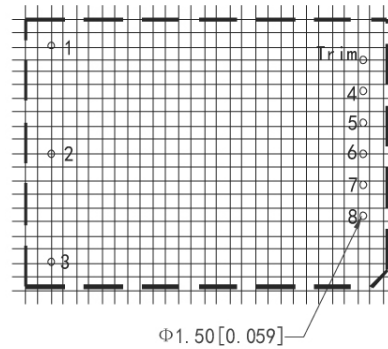
C: 23.50mm

D: 62.00mm

E: 20.00mm

F: 5.75mm

G: 12.50mm



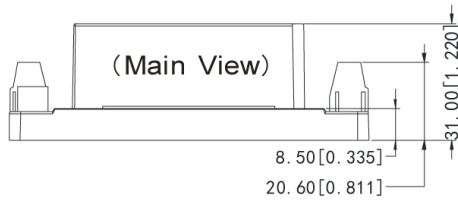
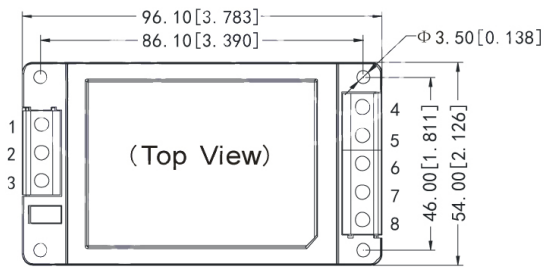
FOOTPRINT DETAILS		
Pin	20ACB_XXS3	20ACB_XXD3
1		
2	AC(N)	AC(N)
3	AC(L)	AC(L)
4	-Vo	-Vo
5	No Pin	No Pin
6	No Pin	COM
7	No Pin	No Pin
8	+Vo	+Vo
Trim	Trim	No Pin

(without Trim Pin optional)

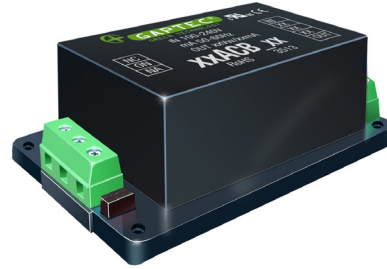
## 20ACB Series

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### Chassis mounting with screw terminals



Note:  
Unit: mm[inch]  
General tolerances:  $\pm 0.50\text{mm}$  [ $\pm 0.020\text{inch}$ ]



FOOTPRINT DETAILS		
Pin	20ACB_XXS3	20ACB_XXD3
1		
2	AC(N)	AC(N)
3	AC(L)	AC(L)
4	-Vo	-Vo
5	NC	NC
6	NC/Trim*	COM
7	NC	NC
8	+Vo	+Vo



NC/Trim\*: The pin is Trim on 20ACB\_XXS3  
The pin is not connected on other single output products.