

20 W AC-DC Power Supply PAC20DxxBS3-Series

- Enclosed plastic case
- Wide input range 85 ... 305 V_{AC} or 100 ... 430 V_{DC}
- Continuously short circuit protected
- No load consumption 0.1 W
- Safety standard EN-, IEC-, UL 62368-1, EN 60335, EN 61558
- Isolation class II
- MTBF > 1.5 Mio. h



Model guide

Type	Output voltage [V _{DC}]	Output current [mA] max.	Output power [W] max.	Efficiency @ full load [%] typ.	Capacitive load [µF] max.
PAC20D03BS3	3.3	4500	14.85	81	8000
PAC20D05BS3	5.0	4000	20	85	8000
PAC20D09BS3	9.0	2200	20	84	5400
PAC20D12BS3	12	1670	20	86	4000
PAC20D15BS3	15	1330	20	87	3000
PAC20D24BS3	24	830	20	87	1000

Specifications

Input	
Voltage range	85...305 V _{AC} or 100...430 V _{DC} Power derating see diagram
Line frequency range	47...440 Hz
Full load input current	≤ 0.5 A @ 115 V _{AC} ≤ 0.3 A @ 230 V _{AC}
Inrush current	20 A typ. @ 115 V _{AC} 45 A typ. @ 230 V _{AC}
Typical no load power consumption	Only PAC20D24BS3: ≤ 0.12 W All others: ≤ 0.1 W
Recommended fuse	3.15 A / 300 V _{AC} , time delayed type
Isolation input to output	
Isolation voltage, 1 minute, ≤ 5 mA	≥ 4000 V _{AC}
Leakage current	≤ 0.1 mA @ 277 V _{AC} , 50 Hz
Isolation resistance	100 MΩ at 500 V _{DC}
Output	
Voltage tolerance	± 1.5 %
Line regulation	± 0.5 %, typ.
Temperature coefficient	± 0.02 % / °C
Ripple & noise, bandwidth 20 MHz	≤ 150 mVp-p (see Figure 1)
Load regulation @ load change 0 %...100 %	1 %, typ.
Minimum load	Not required
Protection	
Short circuit	Continuous, hiccup, auto recovery
Over current	110 %, of full load
Output over voltage protection hiccup additional external TVS D1 (see Figure 2)	PAC20D03BS3: ≤ 7.5 V _{DC} PAC20D05BS3: ≤ 7.5 V _{DC} PAC20D09BS3: ≤ 15 V _{DC} PAC20D12BS3: ≤ 20 V _{DC} PAC20D15BS3: ≤ 20 V _{DC} PAC20D24BS3: ≤ 30 V _{DC}
General	
Power derating	See power derating diagram
Vin 85...165 V _{AC} & Ta -40...-25 °C	2 % / °C
PAC20D03BS3 PAC20D05BS3 PAC20D09BS3	Ta 50...70 °C 2.5 % / °C
PAC20D12BS3 PAC20D15BS3 PAC20D24BS3	Ta 55...70 °C 3.33 % / °C
Ta 70...85 °C	1.33 % / °C
Vin 85...100 V _{AC}	2 % / V _{AC}
Vin 277...305 V _{AC}	0.71 % / V _{AC}
Altitude 2000...5000 m	6.7 % / 1000 m
Switching frequency	65 kHz, typ.
Hold up time @ full load	8 ms @ 115 V _{AC} , typ. 50 ms @ 230 V _{AC} , typ.

Safety standard	EN-, IEC-, UL 62368-1 EN 60335-1, EN 61558-1
Safety	Class II
Reliability MIL-HDBK-217 @ 25 °C	MTBF: ≥ 1.5 Mio. h
Designed for life time (230 V _{AC})	≥ 130000 h at Ta: 25 °C, load 100% ≥ 16000 h at Ta: 55 °C, load 100 % ≥ 27000 h at Ta: 55 °C, load 80 %
EMC specification	
CE, RE	EN 55032, CISPR32 EN 55011, CISPR11 EN 55014-1 Class B
ESD	EN-, IEC 61000-4-2, EN-, IEC 55014-2 Contact ± 6 kV, Perf. Criteria B Air ± 8 kV, Perf. Criteria B
RS	EN-, IEC 61000-4-3 EN-, IEC 55014-2 10 V / m, Perf. Criteria A
EFT	EN-, IEC 61000-4-4 EN-, IEC 55014-2 ± 2 kV, Perf. Criteria B ± 4 kV, Perf. Criteria B (see Figure 3) Perf. Criteria B
Surge	EN-, IEC 61000-4-5 EN-, IEC 55014-2 Line to line ± 1 kV, Perf. Criteria B Line to line ± 2 kV, Perf. Criteria B (see Figure 3) Perf. Criteria B
CS	EN-, IEC 61000-4-6 EN-, IEC 55014-2 10 Vrms, Perf. Criteria A Perf. Criteria A
Voltage dips, short interruptions and voltage variations immunity	EN-, IEC 61000-4-11 EN-, IEC 55014-2 0 %...70 %, Perf. Criteria B Perf. Criteria B
Environmental	
Operating ambient temperature range	-40 ... 85 °C, see derating diagram
Storage temperature	-40 ... 85 °C
Storage humidity	≤ 95 %, non condensing
Cooling	Free air convection, ≥ 35 LFM
Physical	
Mechanical dimensions Weight	
PAC20DxxBS3:	52.4 x 27.2 x 24 mm 55 g
PAC20DxxBS3A2	76 x 31.5 x 32.8 mm 75 g
PAC20DxxBS3A4:	76 x 31.5 x 37.4 mm 95 g
Case material	Black plastic, UL94 V-0 rated
Wave soldering temperature	≤ 265 °C, peak duration ≤ 10 s, ≥ 1.5 mm distance from case
Manual soldering temperature	≤ 370 °C, peak duration ≤ 5 s, ≥ 1.5 mm distance from case

Notes:

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. Products are related to laws and regulations: see "Features" and "EMC".

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Figure 1 Output ripple & noise measure method

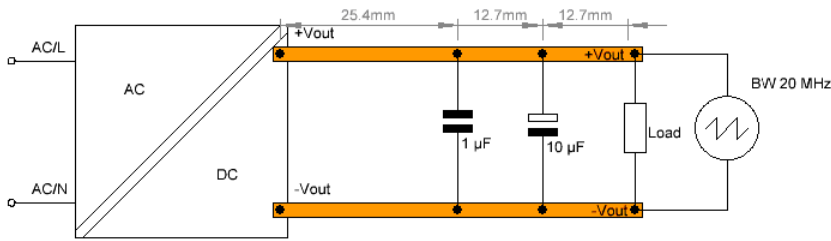


Figure 2 Typical application circuit

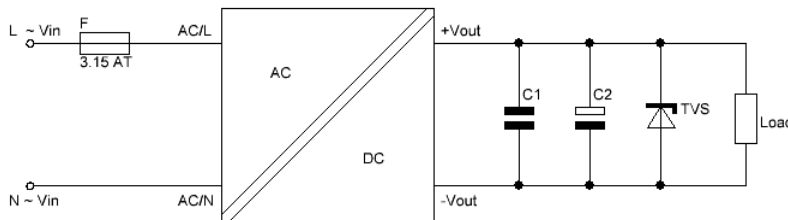


Figure 3 Application circuit to meet EN-, IEC 61000-4-4 ± 4 kV and EN-, IEC 61000-4-5 ± 2 kV

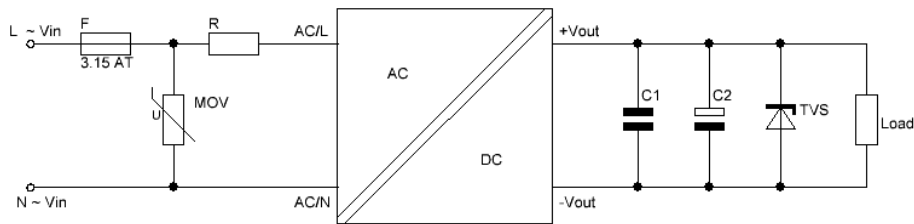
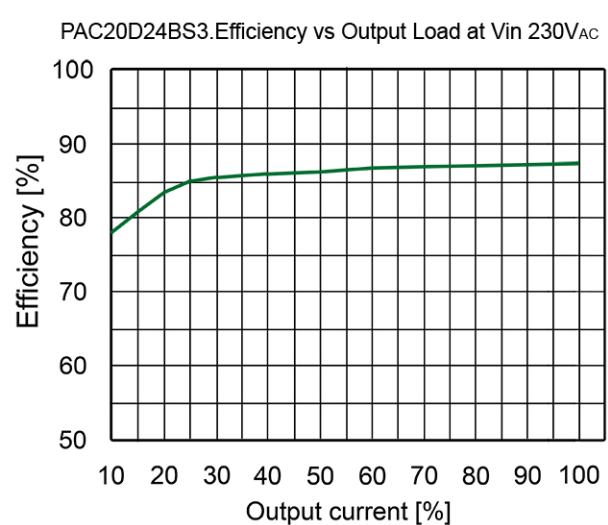
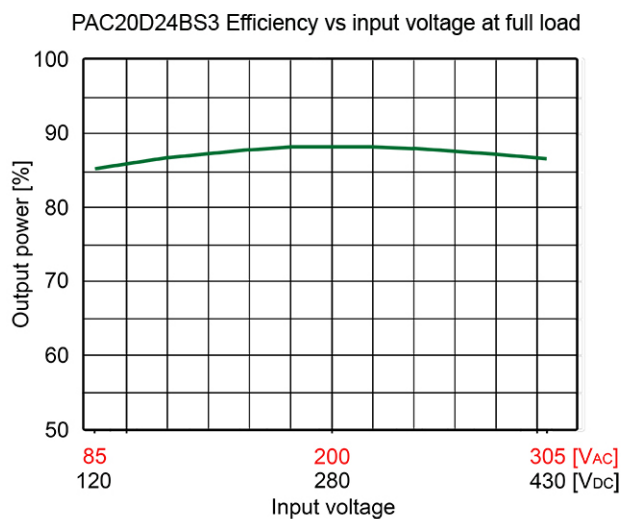
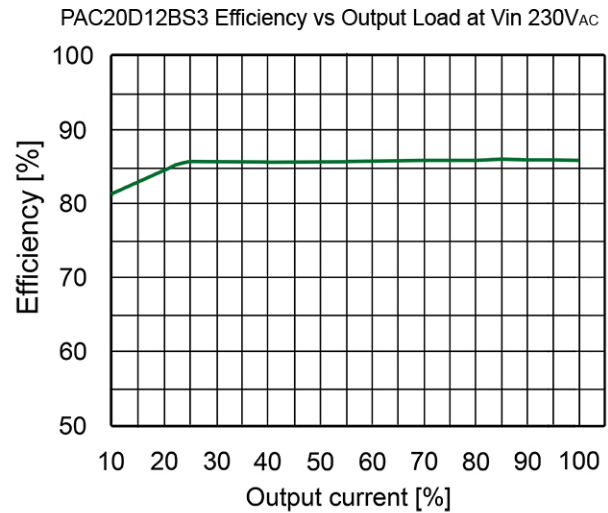
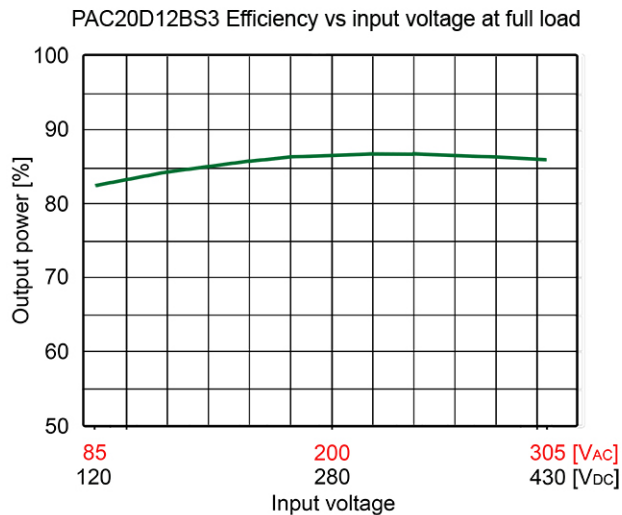
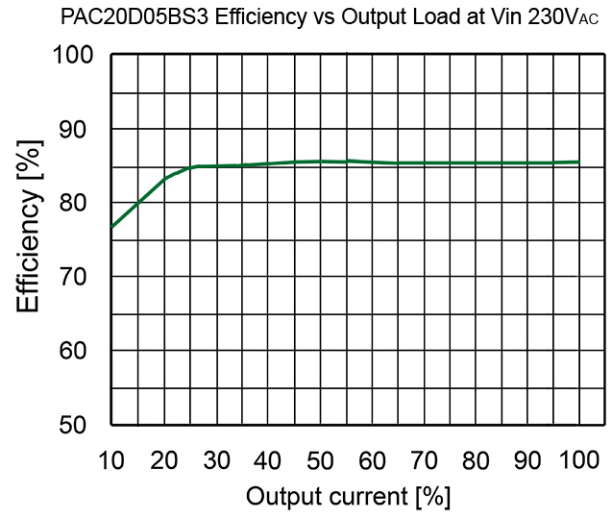
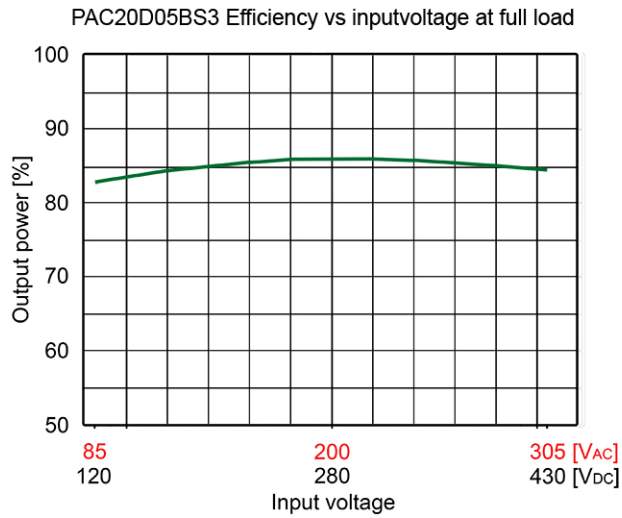


Table for circuit in Figure 2 and 3						
Type	F time delayed type	MOV	R	C1	C2	TVS
PAC20D03BS3	3.15 AT / 300 V~	S14K350	3 Ω, 3 W	1 µF, MLCC	10 µF, 16 V	SMBJ7.0A
PAC20D05BS3	3.15 AT / 300 V~	S14K350	3 Ω, 3 W	1 µF, MLCC	10 µF, 16 V	SMBJ7.0A
PAC20D09BS3	3.15 AT / 300 V~	S14K350	3 Ω, 3 W	1 µF, MLCC	10 µF, 25 V	SMBJ12A
PAC20D12BS3	3.15 AT / 300 V~	S14K350	3 Ω, 3 W	1 µF, MLCC	10 µF, 25 V	SMBJ20A
PAC20D15BS3	3.15 AT / 300 V~	S14K350	3 Ω, 3 W	1 µF, MLCC	10 µF, 25 V	SMBJ20A
PAC20D24BS3	3.15 AT / 300 V~	S14K350	3 Ω, 3 W	1 µF, MLCC	10 µF, 35 V	SMBJ30A

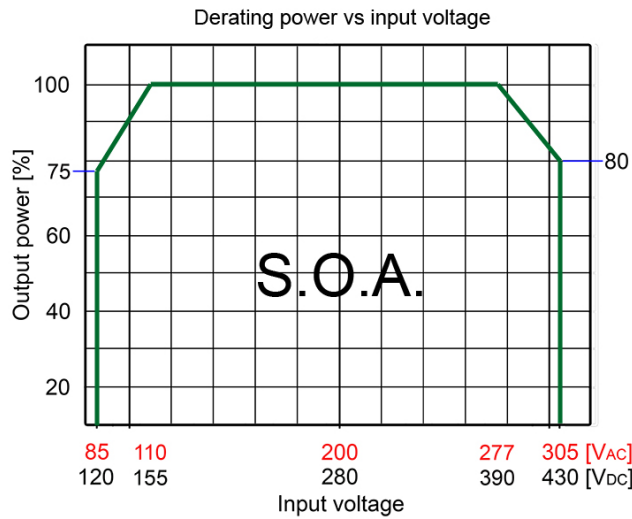
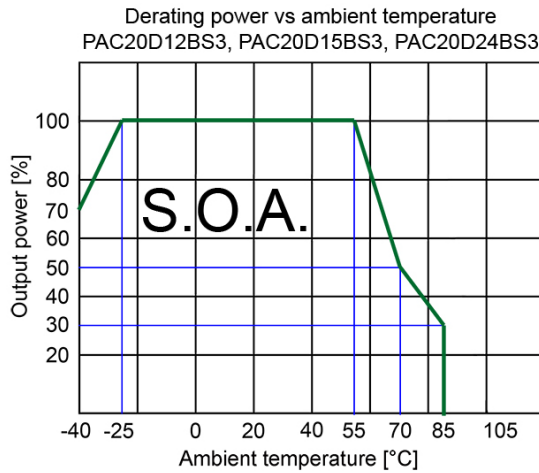
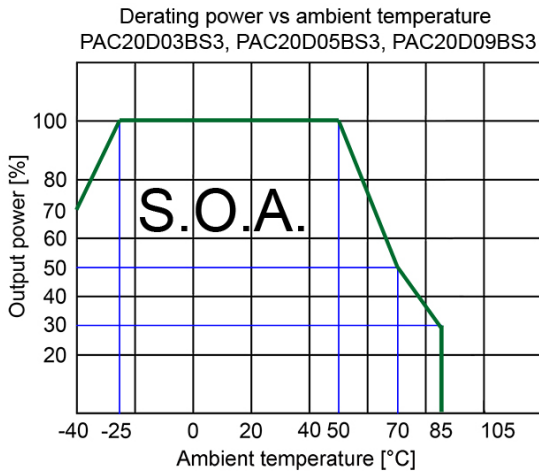


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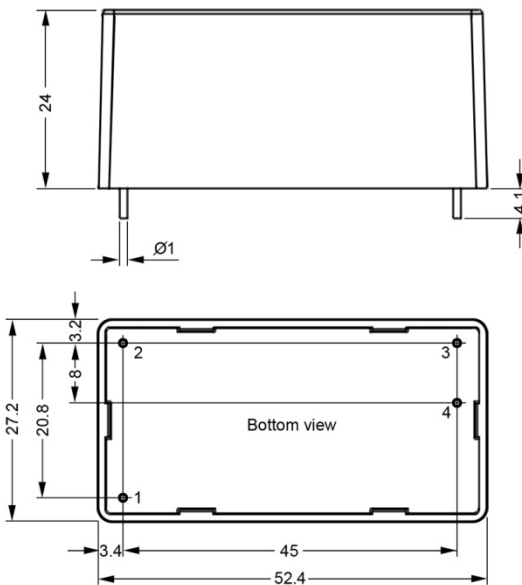
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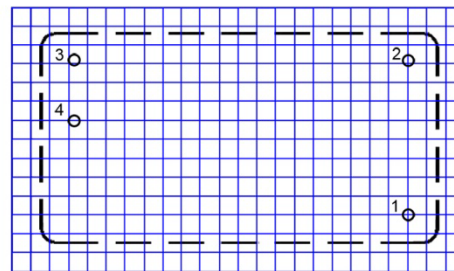


Mechanical dimensions PCB module



Pin assignment	
1	AC in, N
2	AC in, L
3	- V out
4	+ V out

Note:
Unit: mm
Pin diameter tolerance: ± 0.1 mm
General tolerances: ± 0.5 mm
Recommended hole diameter 1.5 mm



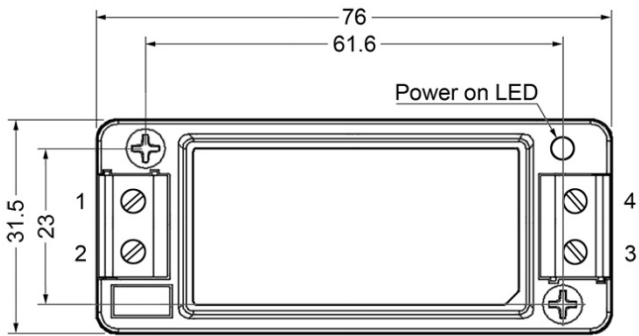
Top view, Pitch 2.54, Drill hole diameter 1.5 mm



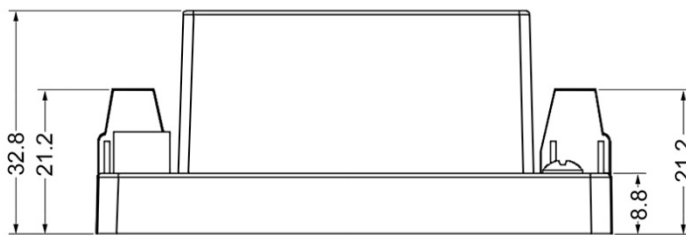
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20 W AC-DC Power Supply PAC20DxxBS3-Series

Mechanical dimensions chassis mountable version (PAC20DxxBS3A2)

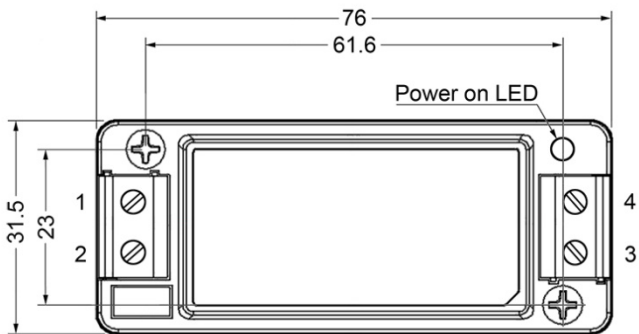


Terminal assignment	
1	AC in, N
2	AC in, L
3	- V out
4	+ V out

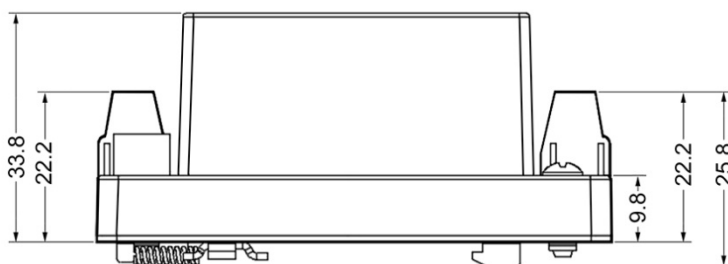


Units in mm
 General tolerances: ± 1 mm
 Wire range: 24...12 AWG
 Tightening torque: 0.4 Nm, max.

Mechanical dimensions DIN Rail version (PAC20DxxBS3A4)



Terminal assignment	
1	AC in, N
2	AC in, L
3	- V out
4	+ V out



Units in mm
 General tolerances: ± 1 mm
 Wire range: 24...12 AWG
 Tightening torque: 0.4 Nm, max.
 The DIN rail must be connected with protection ground

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