

20W Convection cooled

AC-DC power supplies 

20W version of low cost green power AC-DC power supplies, with approvals to world-wide safety standards including ITE and household, the VCE20 are available for PCB mounting as encapsulated or open frame (with suffix -P). Their compact design features an integral EMC filter and hold-up capacitor, so no external components are required.

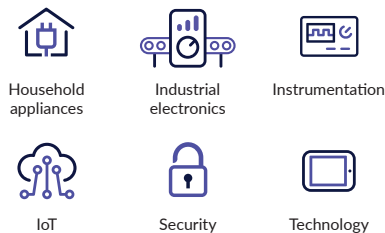
The VCE20 provides a cost-effective, PCB mount, single component, AC-DC power supply solution for Internet of Things (IoT) including home automation, heating & lighting control, smart metering, set-top box & multiple industrial applications.



Features

- ▶ Regulated single outputs from 3.3V to 48VDC
- ▶ Wide input range 85 to 305VAC
- ▶ Encapsulated or open frame PCB mount
- ▶ ITE & household appliance approvals
- ▶ EN55035 immunity standard
- ▶ Class II operation
- ▶ No load input power <0.3W
- ▶ -25°C to +70°C operating temperature
- ▶ 3 year warranty

Applications



Dimensions

VCE20:
66.0 x 33.0 x 23.4mm (2.60" x 1.30" x 0.92")

VCE20-P:
63.5 x 30.5 x 21.8mm (2.50" x 1.20" x 0.86")

Documentation

For further information click the link or scan the code

→ xppower.com



Models & ratings

Model number	Output voltage	Output current	Output power
VCE20US03	3.3VDC	4.55A	15W
VCE20US05	5.0VDC	4.00A	20W
VCE20US09 ⁽¹⁾	9.0VDC	2.22A	20W
VCE20US12 ⁽¹⁾	12.0VDC	1.67A	20W
VCE20US15 ⁽¹⁾	15.0VDC	1.33A	20W
VCE20US24 ⁽¹⁾	24.0VDC	0.83A	20W
VCE20US48 ⁽¹⁾	48.0VDC	0.42A	20W

Notes:

1. For Open Frame version add suffix -P to model number, e.g. VCE20US12-P.



Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	85		305	VAC	Derate from 100% at 90VAC to 90% at 85VAC
Input frequency	47		63	Hz	
Input current - full load		0.35/0.22		A rms	At 115/230VAC
No load input power			0.3	W	
Inrush current			40	A	At 230VAC, cold start +25°C
Earth leakage current	Class II construction no earth				
Input protection	Internal T1.0 A/300 VAC fuse fitted in line				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		48	VDC	
Initial set accuracy			1.5/1.0	%	1.5% for 3V3 & 5V models, 1% for others at 50% load
Minimum load	0			A	No minimum load required
Line regulation			1	%	
Load regulation			1	%	
Start up delay			2	s	
Start up rise time			35	ms	
Hold up time	8	14		ms	At full load and 115VAC
Transient response			4	%	Deviation, recovery within 1% in less than 500µs for a 25% load change
Ripple & noise			100	mV pk-pk	3.3-5V models, 20 MHz bandwidth
			1	% pk-pk	9V to 48V models, 20 MHz bandwidth
Overvoltage protection	115		140	% Vnom	210% typical for 3V3 model, auto recovery
Overload protection	110		190	%	
Short circuit protection					Trip & Restart (hiccup mode)
Temperature coefficient			0.05	%/°C	

General

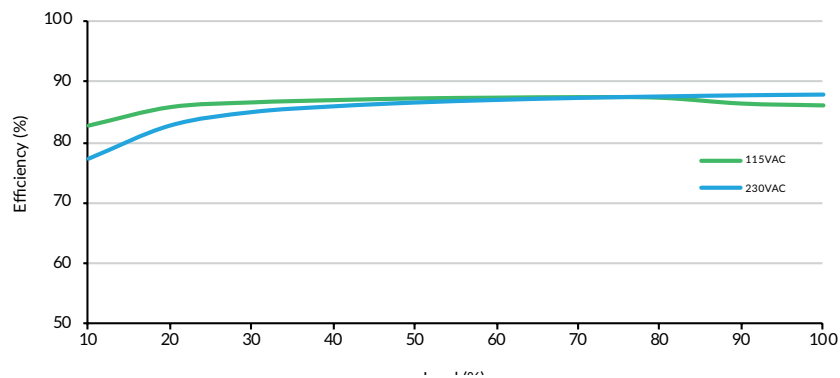
Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		85		%	Model dependent
Isolation: Input to Output	3000			VAC	
Switching Frequency	5		65	kHz	Varied load
Power Density			0.469 (7.7)	W/cm ³ (W/in ³)	For '-P' version
Mean Time Between Failure	550	600		khrs	MIL-HDBK-217F, +25°C GB
Weight		40 (0.088)		g (lb)	Open frame versions (-P)
		90 (0.198)			Encapsulated version

Environmental

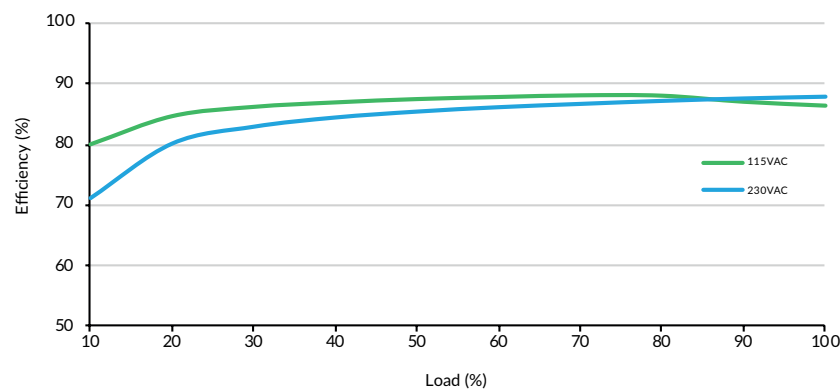
Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-25		+70	°C	3V3 & 5V models: derate output linearly from 100% at +45°C to 45% at +70°C. Other models: derate output linearly from 100% at +50°C to 50% at +70°C.
Storage temperature	-40		+85	°C	
Cooling	Convection-cooled				
Humidity			95	%RH	Non-condensing
Operating altitude			5000	m	
Shock	IEC68-2-27, 30g, 11ms half sine, 3 times in each of 6 axes				
Vibration	IEC68-2-6, 2g, 10Hz to 500kHz, 10 mins/cycle, 60 mins each cycle				

Efficiency graphs

VCE20US12-P



VCE20US24-P



EMC: emissions

Phenomenon	Standard	Test Level	Notes & conditions
Conducted	EN55032	Class B	If output is connected to a ground additional external components will be required. See application notes
Radiated	EN55032	Class B	
Harmonic currents	EN61000-3-2	Class A	
Voltage flicker	EN61000-3-3		

EMC: immunity

Phenomenon	Standard	Test Level	Criteria	Notes & conditions
ITE	EN55035	As below		As below
ESD immunity	EN61000-4-2	±6kV contact, ±8kV air discharge	A	
Radiated immunity	EN61000-4-3	10 V/m	A	
EFT/burst	EN61000-4-4	3	A	
Surge	EN61000-4-5	2	A	Line to Line
Conducted	EN61000-4-6	10 Vrms	A	
Magnetic fields	EN61000-4-8	30A/m	A	
Dips and interruptions	EN61000-4-11 (115 VAC)	70% U _T (80.5 VAC) for 100ms	A	
		40% U _T (46 VAC) for 200ms	B	
		<5% U _T (0 VAC) for 10ms	A	
		<5% U _T (0 VAC) for 5000ms	B	
	EN61000-4-11 (230 VAC)	70% U _T (161 VAC) for 100ms	A	
		40% U _T (92 VAC) for 200ms	A	
		<5% U _T (0 VAC) for 10ms	A	
		<5% U _T (0 VAC) for 5000ms	B	

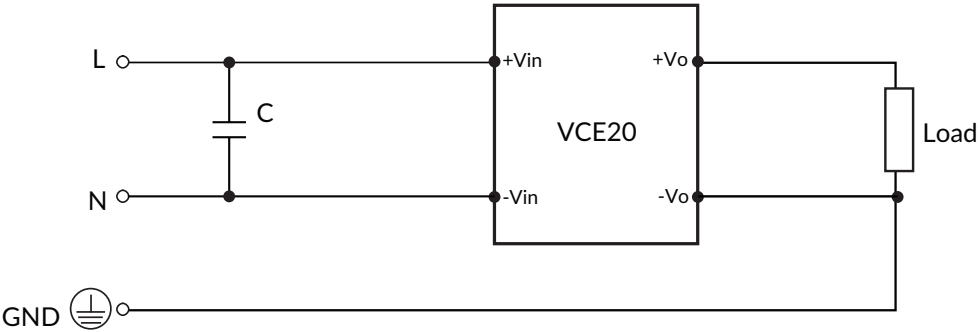
Safety approvals

Certification	Standard	Notes & conditions
CB	IEC60950-1	ITE
	IEC62368-1	
IEC	IEC60335-1	Household, informative only
UL	UL62368-1	ITE
TUV	EN62368-1	ITE
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Application notes

EMC with output grounded

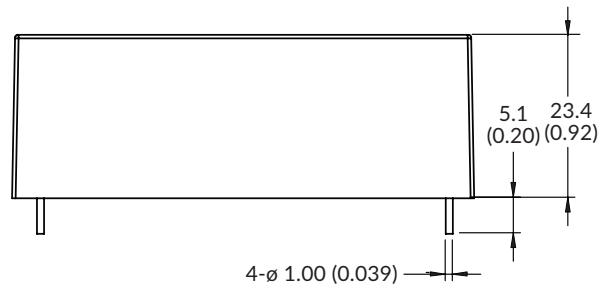
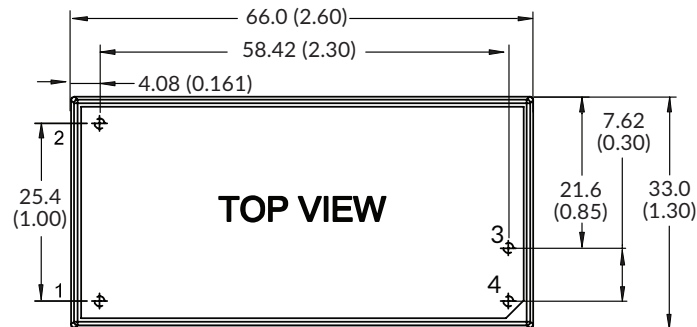
This product is designed for class II operation, but if there is a requirement to connect the output to ground then an X-capacitor as shown in the diagram can be added to improve emissions.



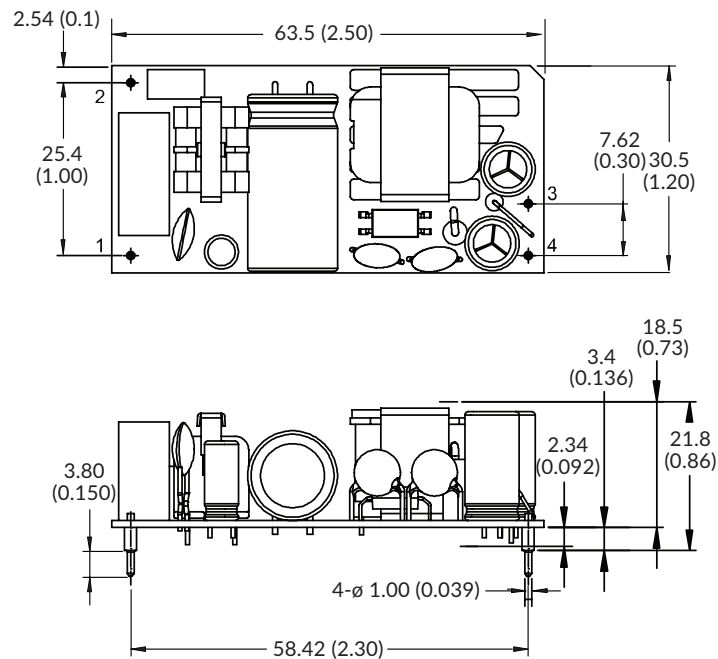
Suggested value - C: X2 cap, 0.4µF/310V, 10%, metallised polypropylene film.

Mechanical details

Encapsulated



Open Frame (-P)



Pin connections	
Pin	Single
1	ACN
2	ACL
3	-Vout
4	+Vout

Notes:

1. Dimensions in mm (inches).
2. Weight: Open frame versions (-P): 40g (0.088lbs)
Encapsulated: 90g (0.198lbs)

3. Tolerances: x.x (x.xx) = ± 0.5 (± 0.02) x.xx (x.xxx) = ± 0.25 (± 0.01)