



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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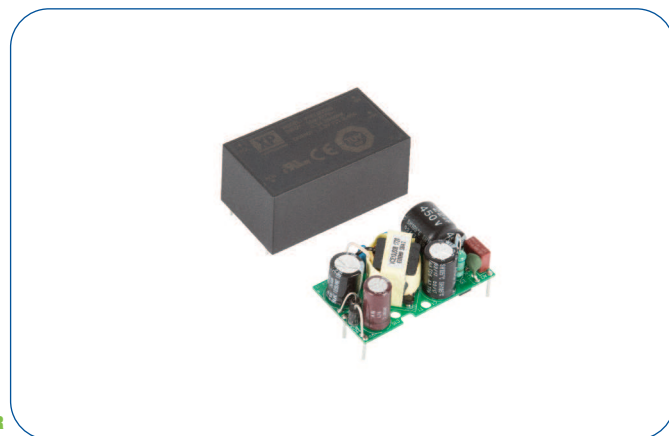
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

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### 10 Watts

- Compact PCB mount package
- Encapsulated & open frame versions
- ITE & household appliance approvals
- Class II operation
- Input range 85 to 305VAC
- Single outputs from 3.3 to 48VDC
- No load input power <0.3W
- Low cost
- -25°C to +70°C operating temperature
- 3 year warranty



#### Dimensions:

##### VCE10:

2.00 x 1.15 x 0.91" (50.8 x 29.2 x 23.1 mm)

##### VCE10-P:

1.90 x 1.05 x 0.88" (48.3 x 26.7 x 22.4 mm)

The VCE10 is a series of open frame and encapsulated AC-DC single output power supplies designed for low cost ITE, industrial and domestic applications. The series provides two mechanical options including open frame and encapsulated PCB mount. With approvals to world-wide safety standards including ITE and Household, compliance with class B for conducted and radiated emissions, these class II isolation parts benefit system designers with easy integration into a wide range of applications.

### Models & Ratings

Output Power	Output Voltage	Output Current	Model Number <sup>(1)</sup>
8 W	3.3 VDC	2400 mA	VCE10US03
10 W	5.0 VDC	2000 mA	VCE10US05
10 W	9.0 VDC	1110 mA	VCE10US09
10 W	12.0 VDC	830 mA	VCE10US12
10 W	15.0 VDC	670 mA	VCE10US15
10 W	24.0 VDC	420 mA	VCE10US24
10 W	48.0 VDC	210 mA	VCE10US48

### Notes

1. For Open Frame version add suffix -P to model number, e.g. VCE10US12-P.

### Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	85		305	VAC	Derate from 100% at 90 VAC to 90% at 85 VAC
No Load Input Power			0.3	W	
Efficiency		80		%	Model dependent
Operating Temperature	-25		+70	°C	Derate linearly from 100% at +50 °C to 50% at +70 °C
EMC	EN55032 Level B Conducted & Radiated, EN61000-3-2, EN61000-3-3, EN55024				
Safety Approvals	IEC62368-1, IEC60335-1, IEC60950-1, EN62368-1, EN60335-1, UL62368-1				

### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	85		305	VAC	Derate from 100% at 90 VAC to 90% at 85 VAC
Input Frequency	47		63	Hz	
Input Current - Full Load		0.20/0.12		A rms	At 115/230 VAC
No Load Input Power			0.3	W	
Inrush Current			40	A	At 230 VAC, 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

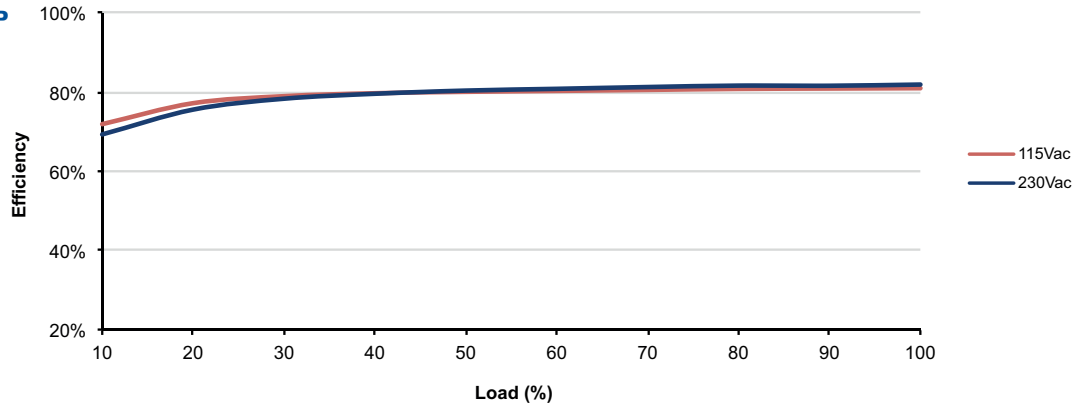
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		48	VDC	
Initial Set Accuracy			3/2	%	3% for 3.3 & 5 V models, 2% for others at 50% load
Minimum Load	0			A	No minimum load required
Total Regulation			5/3	%	For 3.3 & 5 V models/Other models: from 10% to 100% load. Includes initial set accuracy, line and load regulation. Total regulation is 7% max. from 0% to 100% load.
Start Up Delay			2	s	
Start Up Rise Time			35	ms	
Hold Up Time	16	20		ms	at full load and 115 VAC
Transient Response			4	%	Deviation, recovery within 1% in less than 500 $\mu$ s for a 25% load change
Ripple & Noise			120	mV pk-pk	3.3 & 5 V models, 20 MHz bandwidth
			1	% pk-pk	9 to 48 V models, 20 MHz bandwidth
Overvoltage Protection	115		140	% Vnom	210% typical for 03 model, auto recovery
Overload Protection	110		180	%	
Short Circuit Protection					Trip & Restart (hiccup mode)
Temperature Coefficient			0.05	%/°C	

### General

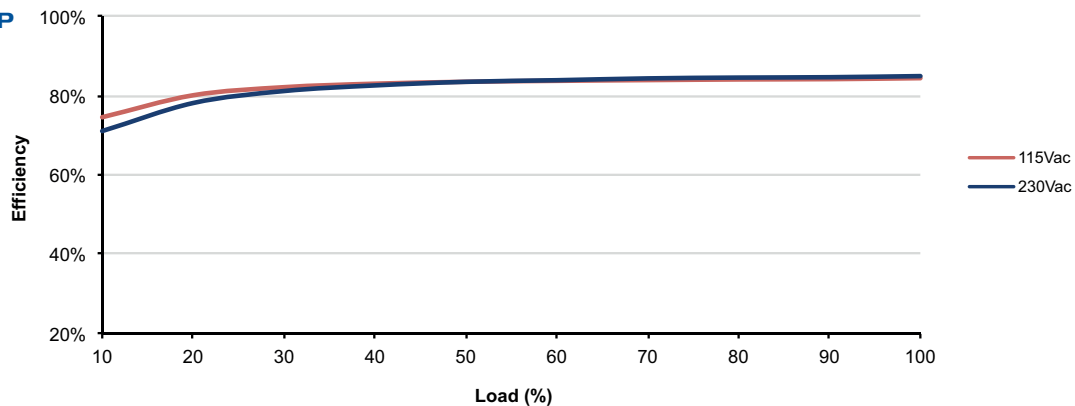
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		80		%	Model Dependent
Isolation: Input to Output	3000			VAC	
Switching Frequency	5		50	kHz	Varied with load
Power Density			5.7	W/in <sup>3</sup>	For '-P' version
Mean Time Between Failure	550	600		kHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.051 (23)		lb (g)	Open frame versions (-P)
		0.115 (52)		lb (g)	Encapsulated version

### Efficiency Graphs

VCE10US12-P



VCE10US24-P



### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-25		+70	°C	Derate 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			3048	m	
Shock	IEC68-2-27, 30 g, 11 ms half sine, 3 times in each of 6 axes				
Vibration	IEC68-2-6, 2 g, 10 Hz to 500 kHz, 10 mins/cycle, 60 mins each cycle				

### EMC: Emissions

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Conducted	EN55032	Class B		If output is connected to a ground additional external components will be required. Contact sales for details
Radiated	EN55032	Class B		
Harmonic Current	EN61000-3-2			Class A
Voltage Flicker	EN61000-3-3			

### EMC: Immunity

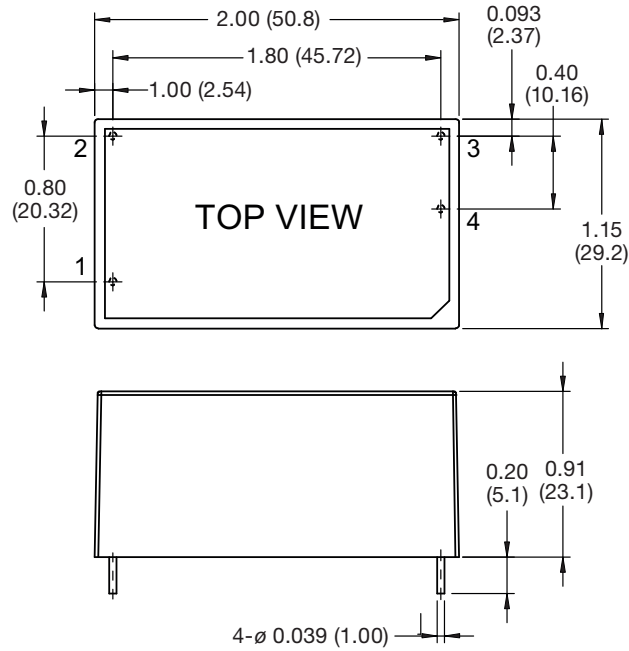
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	±6kV contact, ±8kV air discharge	A	
Radiated	EN61000-4-3	10 V/m	A	
EFT	EN61000-4-4	3	A	
Surge	EN61000-4-5	2	A	Line to Line
Conducted	EN61000-4-6	10 Vrms	A	
Magnetic Fields	EN61000-4-8	30 A/m	A	
Dips and Interruptions	EN61000-4-11 (115 VAC)	70% U <sub>r</sub> (80.5 VAC) for 100 ms	A	
		40% U <sub>r</sub> (46 VAC) for 200 ms	B	
		<5% U <sub>r</sub> (0 VAC) for 10 ms	A	
		<5% U <sub>r</sub> (0 VAC) for 5000 ms	B	
	EN61000-4-11 (230 VAC)	70% U <sub>r</sub> (161 VAC) for 100 ms	A	
		40% U <sub>r</sub> (92 VAC) for 200 ms	A	
		<5% U <sub>r</sub> (0 VAC) for 10 ms	A	
		<5% U <sub>r</sub> (0 VAC) for 5000 ms	B	

### Safety Approvals

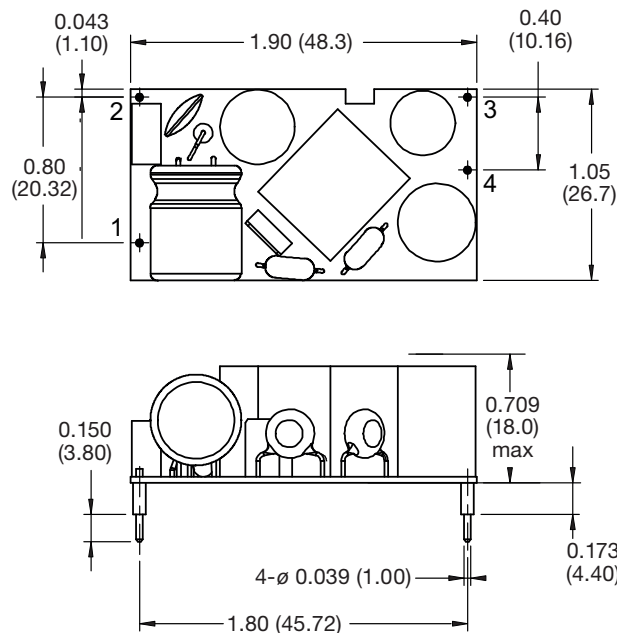
Safety Agency	Safety Standard	Notes & Conditions
CB	IEC60950-1	ITE
	IEC62368-1	
	IEC60335-1	Household, Encapsulated Version
	IEC61558-1	Power Supply Units
UL	UL62368-1	ITE
TUV	EN62368-1	ITE

### Mechanical Details

#### Encapsulated



#### Open Frame (-P)



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

#### Notes

1. Dimensions in inches (mm).

2. Weight: Open frame versions (-P): 0.051 lbs (23 g)  
Encapsulated: 0.115 lbs (52 g)

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