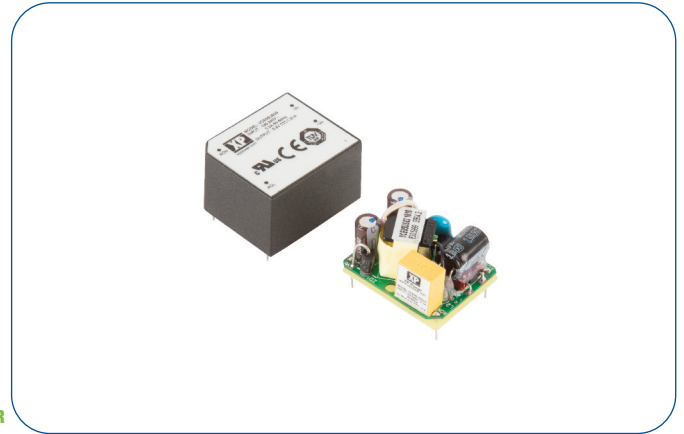


### 5 Watts

- Compact Size
- Single Outputs from 3.3 to 48 V
- PCB Mount
- Encapsulated & Open Frame
- Class II
- <0.3 W No Load Input Power
- Peak Load Capability
- Low Cost
- 3 Year Warranty



#### Dimensions:

##### VCE05:

1.30 x 1.10 x 0.75" (33.02 x 27.94 x 19.05 mm)

##### VCE05-P:

1.20 x 1.00 x 0.705" (30.8 x 25.4 x 17.9 mm)

The VCE05 is a series of open frame and encapsulated AC-DC single output power supplies designed for low cost ITE and Industrial applications. The series provides two mechanical options including open frame and encapsulated PCB mount. With approvals to world-wide safety standards, compliance with class B for conducted and radiated emissions and a 130%, 30s peak load capability, 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>(2)</sup> |
|--------------|----------------|----------------|---------------------|-----------------------------|
|              |                | Nominal        | Peak <sup>(1)</sup> |                             |
| 5 W          | 3.3 VDC        | 1210 mA        | 1573 mA             | VCE05US03                   |
| 5 W          | 5.0 VDC        | 1000 mA        | 1300 mA             | VCE05US05                   |
| 5 W          | 9.0 VDC        | 550 mA         | 722 mA              | VCE05US09                   |
| 5 W          | 12.0 VDC       | 410 mA         | 541 mA              | VCE05US12                   |
| 5 W          | 15.0 VDC       | 330 mA         | 433 mA              | VCE05US15                   |
| 5 W          | 24.0 VDC       | 210 mA         | 270 mA              | VCE05US24                   |
| 5 W          | 48.0 VDC       | 100 mA         | 135 mA              | VCE05US48                   |

### Notes

1. Peak load lasting <30 s with a maximum duty cycle of 10%, average output power not to exceed nominal.
2. For Open Frame version add suffix -P to model number, e.g. VCE05US12-P.

### Summary

| Characteristic        | Minimum   | Typical | Maximum | Units | Notes & Conditions                                   |
|-----------------------|---|---------|---------|-------|--|
| Input Voltage Range   | 85  |         | 264     | VAC   | Derate from 100% at 90 VAC to 90% at 85 VAC          |
| No Load Input Power   |   |         | 0.3     | W     |  |
| Efficiency            |   | 78      |         | %     | Model dependant                                      |
| Operating Temperature | -25   |         | +70     | °C    | Derate linearly from 100% at +50 °C to 50% at +70 °C |
| EMC                   | EN55022 Level B Conducted & Radiated, EN61000-3-2, EN61000-3-3, EN60601-1-2 |         |         |       |  |
| Safety Approvals      | EN60950, UL60950, IEC60950  |         |         |       |  |

### Input

| Characteristic            | Minimum                                     | Typical   | Maximum | Units | Notes & Conditions             |
|---------------------------|---|-----------|---------|-------|--------------------------------|
| Input Voltage Range       | 85  |           | 264     | VAC   |                                |
| Input Frequency           | 47  |           | 63      | Hz    |                                |
| Input Current - Full Load |   | 0.10/0.06 |         | A rms | At 115/230 VAC                 |
| No Load Input Power       |   |           | 0.3     | W     |                                |
| Inrush Current            |   |           | 40      | A     | At 230 VAC                     |
| Earth Leakage Current     |   |           |         |       | Class II construction no earth |
| Input Protection          | Internal T1.0 A/250 VAC fuse fitted in line |           |         |       |                                |

### Output

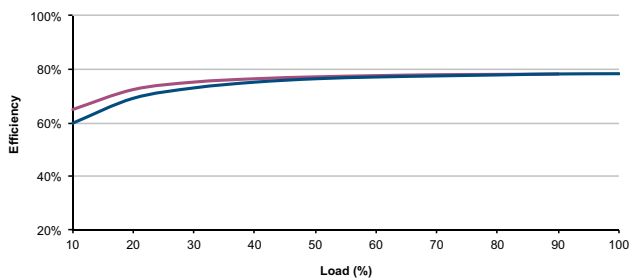
| Characteristic           | Minimum | Typical | Maximum | Units    | Notes & Conditions  |
|--------------------------|---------|---------|---------|----------|---|
| Output Voltage           | 3.3     |         | 48      | VDC      |   |
| Initial Set Accuracy     |         |         | 3/2     | %        | 3% for 03 & 05 models, 2% for others at 50% load                        |
| Minimum Load             | 0       |         |         | A        | No minimum load required  |
| Line Regulation          |         |         | ±1.0    | %        |   |
| Load Regulation          |         |         | 3/2     | %        | 3% for 03 & 05 models, 2% for others from 10% to 100% load              |
| Start Up Delay           |         |         | 2       | s        |   |
| Start Up Rise Time       |         |         | 14      | ms       |   |
| Hold Up Time             | 6       | 9       |         | ms       | at full load and 115 VAC  |
| Transient Response       |         |         | 4       | %        | Deviation, recovery within 1% in less than 500 µs for a 25% load change |
| Ripple & Noise           |         |         | 180     | mV pk-pk | 3.3-5V, 20 MHz bandwidth  |
|                          |         |         | 1       | % pk-pk  | 9V to 48V models, 20 MHz bandwidth                                      |
| Overvoltage Protection   | 115     |         | 140     | % Vnom   | Recycle input to reset  |
| Overload Protection      | 110     |         | 180     | %        |   |
| Short Circuit Protection |         |         |         |          | Trip & Restart (hiccup mode)  |
| Temperature Coefficient  |         |         | 0.05    | %/°C     |   |

### General

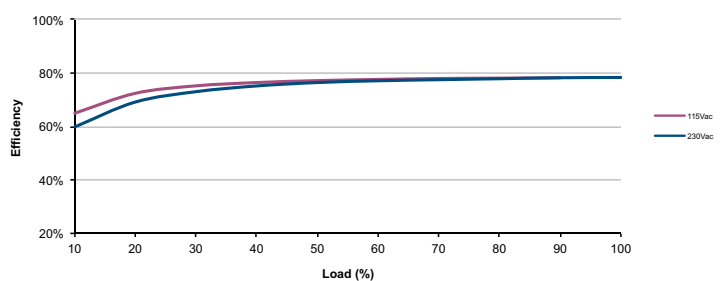
| Characteristic             | Minimum | Typical    | Maximum | Units             | Notes & Conditions       |
|----------------------------|---------|------------|---------|-------------------|--------------------------|
| Efficiency                 |         | 78         |         | %                 | Model Dependant          |
| Isolation: Input to Output | 3000    |            |         | VAC               |                          |
| Switching Frequency        |         | 40         |         | kHz               |                          |
| Power Density              |         |            | 5.9     | W/in <sup>3</sup> |                          |
| Mean Time Between Failure  |         | >400       |         | kHrs              | MIL-HDBK-217F, +25 °C GB |
| Weight                     |         | 0.03 (14)  |         | lb (g)            | Open frame versions (-P) |
|                            |         | 0.053 (24) |         | lb (g)            | Encapsulated version     |

### Efficiency Graphs

VCE05US12



VCE05US24



### 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    |          |                    |
| Radiated         | EN55032     | Class B    |          |                    |
| Harmonic Current | EN61000-3-2 |            |          | Class A            |
| Voltage Flicker  | EN61000-3-3 |            |          |                    |

### EMC: Immunity

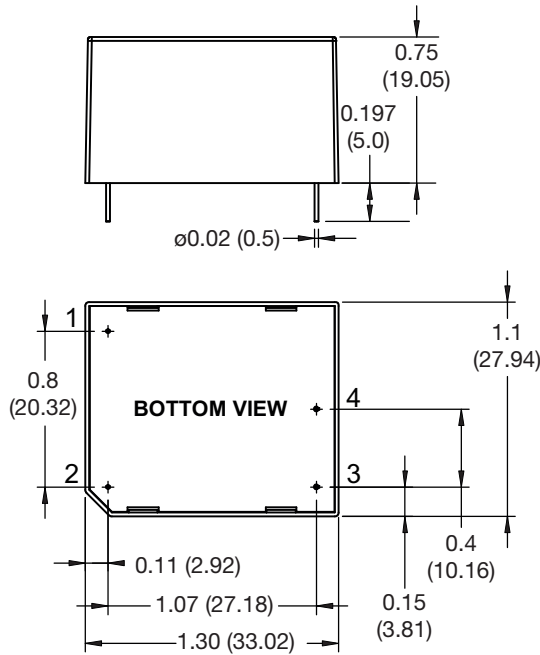
| Phenomenon             | Standard               | Test Level                               | Criteria | Notes & Conditions            |
|------------------------|------------------------|--|----------|-------------------------------|
| ESD                    | EN61000-4-2            | ±6kV contact,<br>±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        | A at High Line, B at Low Line |
|                        |                        | 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        | A at High Line, B at Low Line |
|                        |                        | 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 Report     | IEC60950                             |                    |
| UL            | UL60950-1 & CSA C22.2, No.60950-1:08 |                    |
| TUV           | EN60950-1                            |                    |

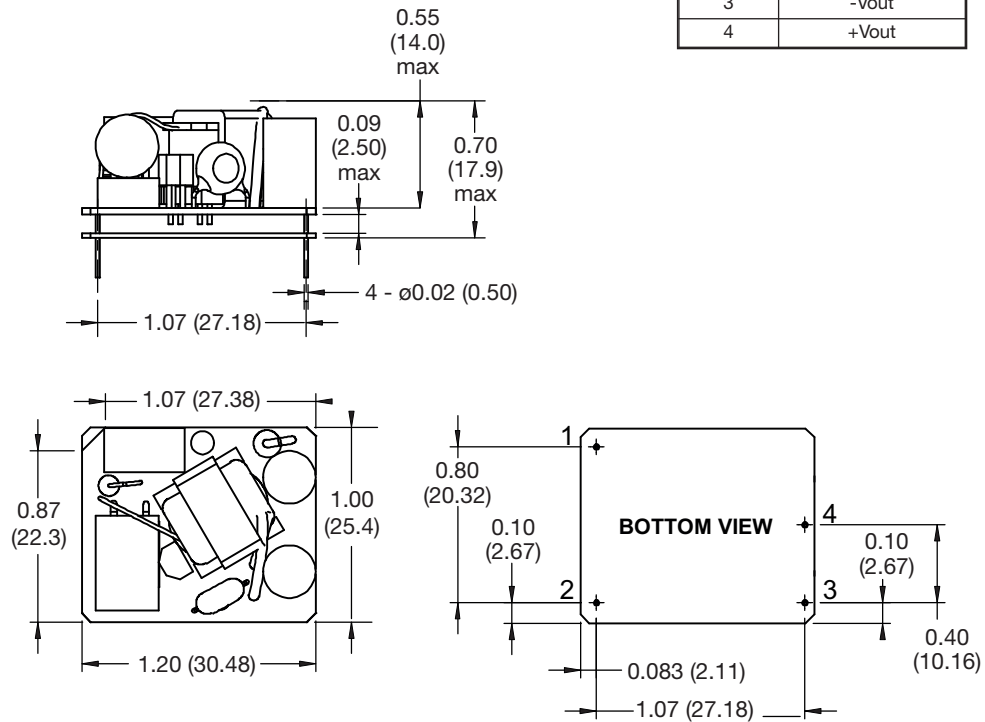
### Mechanical Details

#### Encapsulated



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

#### Open Frame (-P)



#### Notes

1. Dimensions in inches (mm).
2. Weight: Open frame versions (-P): 0.03 lbs (14 g)  
Encapsulated: 0.053 lbs (24 g)

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