

## 50W CONVECTION COOLED

### AC-DC POWER SUPPLIES

The LCW series of regulated output convection cooled AC-DC power supplies are designed to provide a cost effective solution for industrial electronics, technology and household applications. Features include wide range AC input from 85-305VAC, output voltage adjustment, low stand-by power consumption, output short circuit protection, over current and over voltage protection. Applications include auxiliary power sources, security installations, lighting control, smart home or office control systems, ticketing and vending applications.



### Features

- 50W convection cooled
- Integrated connector cover
- ITE, industrial & household approvals
- Class B conducted & radiated emissions
- Input voltage range 85-305VAC
- Regulated single outputs from 5.0V to 48VDC
- Output voltage trim  $\pm 10\%$
- Efficiency to 90%
- Short circuit, overvoltage & overload protection
- Conformal coating option
- $-30^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  operating temperature
- 3 year warranty

### Applications



Household Appliances



Industrial Electronics



Instrumentation



Robotics



Technology

### Dimensions

3.898" x 3.228" x 1.181" (99.0 x 82.0 x 30.0mm)

### Models & Ratings

| Model Number <sup>(3)</sup> | Output Voltage |                                 | Output Current | Ripple & Noise<br>pk to pk <sup>(1)</sup> | Efficiency <sup>(2)</sup> | Maximum<br>Capacitive Load | Power |
|-----------------------------|----------------|---------------------------------|----------------|---|---------------------------|----------------------------|-------|
|                             | Nominal        | Adjustment Range <sup>(4)</sup> |                |   |                           |                            |       |
| LCW50US05                   | 5.0V           | 4.5 - 5.5V                      | 10.0A          | 80mV                                      | 83%                       | 8000 $\mu\text{F}$         | 50W   |
| LCW50US12                   | 12.0V          | 10.8 - 13.2V                    | 4.2A           | 120mV                                     | 86%                       | 2000 $\mu\text{F}$         | 50W   |
| LCW50US15                   | 15.0V          | 13.5 - 16.5V                    | 3.4A           | 120mV                                     | 87%                       | 1500 $\mu\text{F}$         | 50W   |
| LCW50US24                   | 24.0V          | 21.6 - 26.4V                    | 2.2A           | 150mV                                     | 88%                       | 1000 $\mu\text{F}$         | 50W   |
| LCW50US36                   | 36.0V          | 32.4 - 39.6V                    | 1.45A          | 240mV                                     | 89%                       | 220 $\mu\text{F}$          | 50W   |
| LCW50US48                   | 48.0V          | 43.2 - 52.8V                    | 1.1A           | 240mV                                     | 90%                       | 470 $\mu\text{F}$          | 50W   |

#### Notes:

1. Ripple & noise measured with 20MHz bandwidth and 47 $\mu\text{F}$  electrolytic capacitor in parallel with 0.1 $\mu\text{F}$  ceramic capacitor.
2. Typical efficiencies measured at 230VAC full load.
3. Add suffix -E to model number to specify conformal coating option, MOQ applies, please contact sales.
4. Output power rating must not be exceeded.

## Input

| Characteristic            | Minimum                                    | Typical | Maximum | Units | Notes & Conditions  |
|---------------------------|--|---------|---------|-------|---|
| Input Voltage - Operating | 85   | 115/230 | 305     | VAC   | Derate output power linearly from 100% at 100VAC to 80% at 85VAC and from 100% at 277VAC to 80% at 305VAC   |
|                           | 120  |         | 430     | VDC   | Alternative input. Not to be used in addition to AC input. DC input not included in safety approvals, external DC rated fuse required. Derate output power linearly from 100% at 120VDC to 80% at 100VDC and from 100% at 390VDC to 80% at 430VDC |
| Input Frequency           | 47   | 50/60   | 63      | Hz    |   |
| Input Current - Full Load |  |         | 1.2     | A     | 115VAC  |
|                           |  |         | 0.8     |       | 230VAC  |
| No Load Input Power       |  |         | 0.5     | W     |   |
| Inrush Current            |  | 30      |         | A     | 115VAC cold start at 25°C ambient   |
|                           |  | 60      |         |       | 230VAC cold start at 25°C ambient   |
| Earth Leakage Current     |  |         | 0.75    | mA    | 277VAC/50Hz (Typ)   |
| Input Protection          | T3.15A/300VAC Internal fuse fitted in line |         |         |       |   |

## Output

| Characteristic           | Minimum                               | Typical | Maximum | Units    | Notes & Conditions  |                  |           |                  |
|--------------------------|---------------------------------------|---------|---------|----------|---|------------------|-----------|------------------|
| Output Voltage           | 4.5                                   |         | 52.8    | VDC      | See Models & Ratings table  |                  |           |                  |
|                          |                                       | ±2      |         |          |   | %                | Full load | LCW50US05        |
|                          |                                       | ±1      |         |          |   |                  |           | All other models |
| Voltage Adjustment       |                                       | ±10     |         | %        |   |                  |           |                  |
| Minimum Load             | 0                                     |         |         | A        | No minimum load required  |                  |           |                  |
| Start Up Delay           | 58                                    |         | 130     | ms       | 115VAC full load  |                  |           |                  |
|                          | 60                                    |         | 138     |          | 230VAC full load  |                  |           |                  |
| Hold Up Time             |                                       | 8       |         | ms       | 115VAC  |                  |           |                  |
|                          |                                       | 30      |         |          | 230VAC  |                  |           |                  |
| Drift                    |                                       |         | ±0.03   | %        | After 20 minutes warm up, 230VAC, 0°C to 50°C                         |                  |           |                  |
| Line Regulation          |                                       | ±0.5    |         | %        | 100-264VAC, full load   |                  |           |                  |
| Load Regulation          |                                       |         | ±1.0    | %        | 0-100% load   | LCW50US05        |           |                  |
|                          |                                       |         | ±0.5    |          |   | All other models |           |                  |
| Transient Response       |                                       |         | 10      | %        | Recovery within 1% in less than 5ms for a 50-75% and 75-50% load step |                  |           |                  |
| Ripple & Noise           |                                       |         |         | mV pk-pk | See Models & Ratings table  |                  |           |                  |
| Over/Undershoot          |                                       |         | 10      | %        | Full load 5ms recovery  |                  |           |                  |
| Overvoltage Protection   |                                       |         | 6.3     | %        | Hiccup mode, auto recovery  | LCW50US05        |           |                  |
|                          |                                       |         | 16.2    |          |   | LCW50US12        |           |                  |
|                          |                                       |         | 21.75   |          |   | LCW50US15        |           |                  |
|                          |                                       |         | 33.6    |          |   | LCW50US24        |           |                  |
|                          |                                       |         | 49.0    |          |   | LCW50US36        |           |                  |
|                          |                                       |         | 60.0    |          |   | LCW50US48        |           |                  |
| Overload Protection      | 110                                   |         | 200     | %        | Nominal output current, auto recovery                                 |                  |           |                  |
| Temperature Coefficient  |                                       | ±0.03   | 5       | %/°C     |   |                  |           |                  |
| Short Circuit Protection | Continuous, hiccup with auto recovery |         |         |          |   |                  |           |                  |

## General

| Characteristic             | Minimum  | Typical       | Maximum | Units             | Notes & Conditions                            |
|----------------------------|--|---------------|---------|-------------------|---|
| Efficiency                 |  | 88            |         | %                 | 230VAC Full load (see Models & Ratings table) |
| Isolation: Input to Output | 4000   |               |         | VAC               | Class I construction                          |
| Input to Ground            | 2000   |               |         | VAC               |   |
| Output to Ground           | 1250   |               |         | VAC               |   |
| Switching Frequency        |  | 65            |         | kHz               |   |
| Power Density              |  |               | 3.60    | W/in <sup>3</sup> |   |
| Mean Time Between Failure  | 300  |               |         | khrs              | MIL-HDBK-217F, Notice 2 25°C GB               |
| Weight                     |  | 0.418 (190.0) |         | lb(g)             |   |
| Case Material              | Aluminium chassis with vented galvanized steel cover   |               |         |                   |   |
| Conformal Coating Option   | Acrylic resin, UL94V-0 rated, certified (UL No. E351072), minimum 30µm coating thickness. Add suffix -E to part number |               |         |                   |   |

## Environmental

| Characteristic        | Minimum   | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|---|---------|---------|-------|--------------------|
| Operating Temperature | -30   |         | +70     | °C    | See derating curve |
| Storage Temperature   | -40   |         | +85     | °C    |                    |
| Cooling               | Natural convection  |         |         |       |                    |
| Humidity              | 5   |         | 90      | %RH   | Non-condensing     |
| Operating Altitude    |   |         | 5000    | m     |                    |
| Shock and Vibration   | Tested according to EN60068-2-27, 10 - 500Hz, 5g (1H) for each X, Y and Z plane |         |         |       |                    |

## EMC: Emissions

| Phenomenon | Standard | Test Level | Notes & Conditions |
|------------|----------|------------|--------------------|
| Conducted  | EN55032  | Class B    |                    |
| Radiated   | EN55032  | Class B    |                    |

## EMC: Immunity

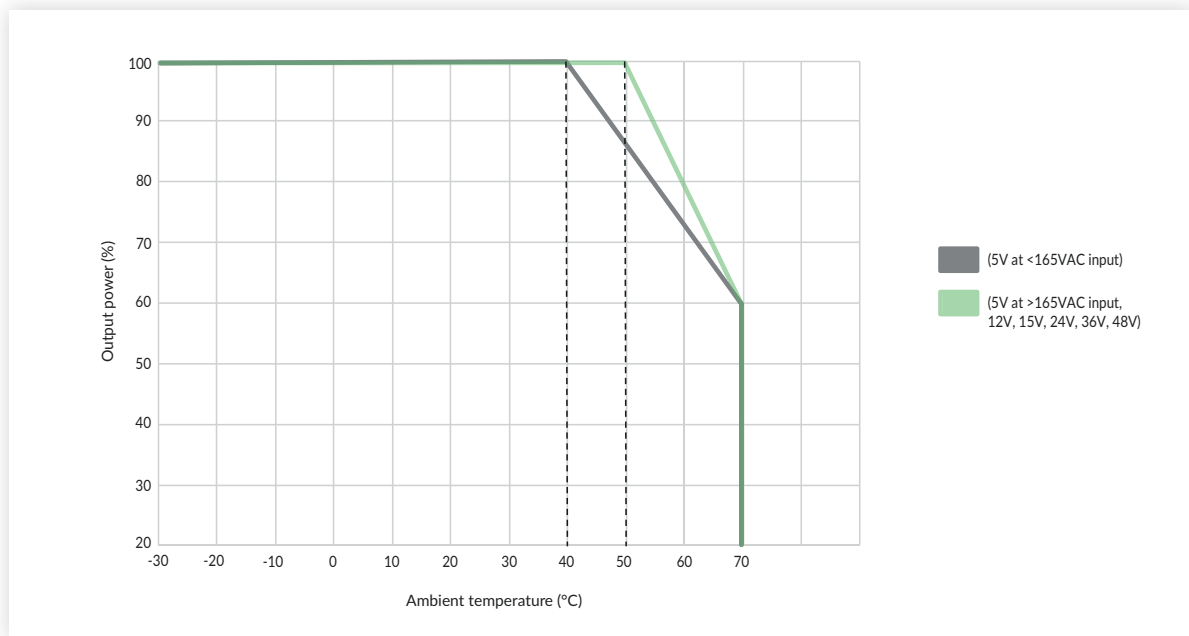
| Phenomenon        | Standard     | Test Level                | Criteria | Notes & Conditions                     |
|-------------------|--------------|---------------------------|----------|--|
| ESD Immunity      | EN61000-4-2  | 3                         | A        | Contact ±6kV/Air ±8kV                  |
| Radiated Immunity | EN61000-4-3  | 3                         | A        | 10V/m                                  |
| EFT               | EN61000-4-4  | 3                         | A        | ±2kV                                   |
| Surge             | EN61000-4-5  | Installation class 4      | A        | Line to line ±1kV, line to ground ±2kV |
| Conducted         | EN61000-4-6  | 3                         | A        | 10Vrms                                 |
| Dips              | EN61000-4-11 | Dip. 100% (0VAC), 10ms    | A        |  |
|                   |              | Dip. 100% (0VAC), 20ms    | B        |  |
|                   |              | Dip. 60% (88VAC), 200ms   | A        |  |
|                   |              | Dip. 30% (154VAC), 500ms  | A        |  |
|                   |              | Dip. 20% (176VAC), 5000ms | A        |  |
| Interruptions     |              | Int. 100% (0VAC), 5000ms  | B        |  |

## Safety Approvals

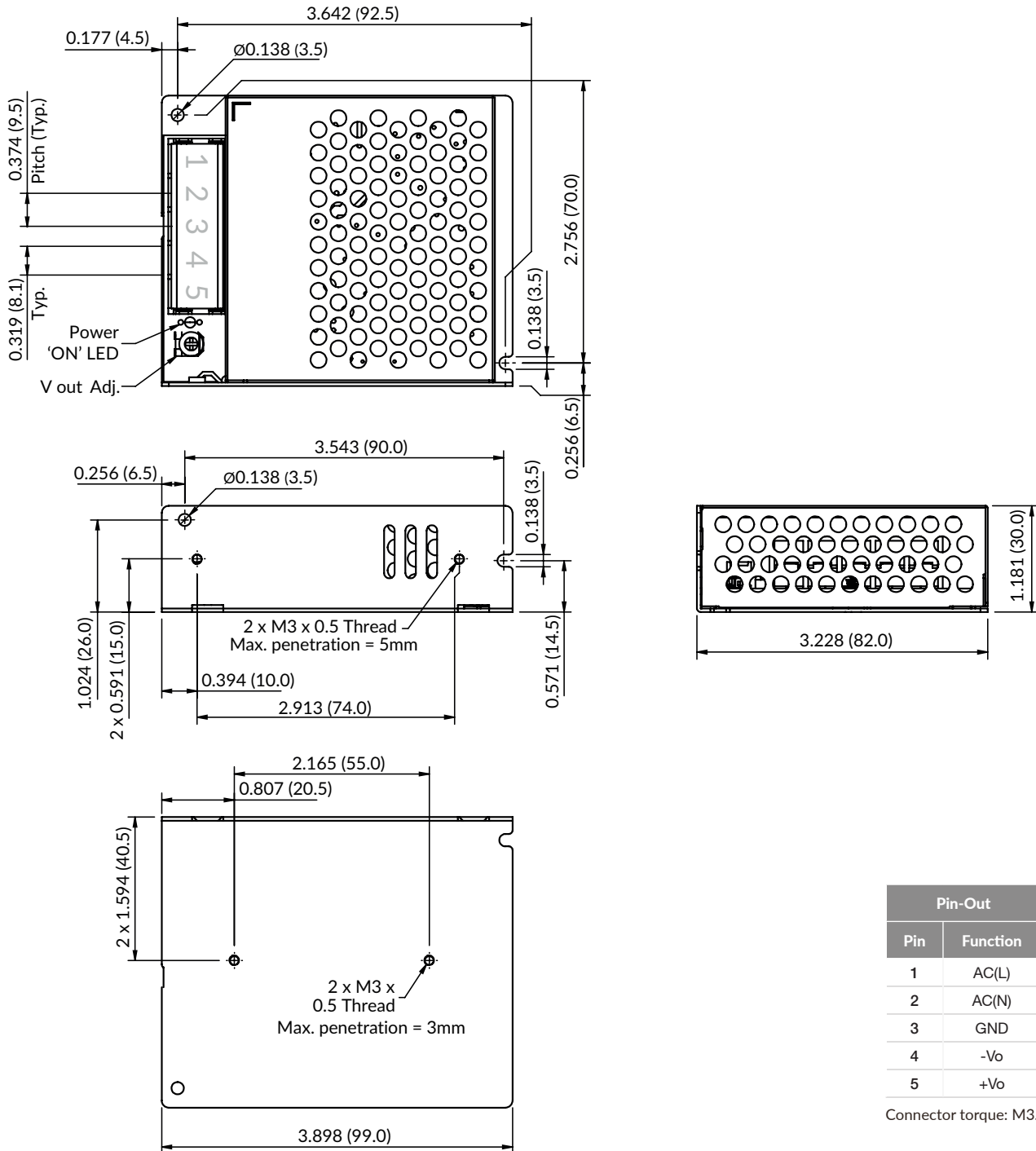
| Certification | Standard                         | Notes & Conditions                   |
|---------------|----------------------------------|--------------------------------------|
| UL            | UL62368-1                        | Information Technology               |
| EN            | EN62368-1, EN60335, EN61558      | Information Technology and Household |
| CE            | Meets all applicable directives  |                                      |
| UKCA          | Meets all applicable legislation |                                      |

## Application Notes

### Temperature Derating



## Mechanical Details



| Pin-Out |          |
|---------|----------|
| Pin     | Function |
| 1       | AC(L)    |
| 2       | AC(N)    |
| 3       | GND      |
| 4       | -Vo      |
| 5       | +Vo      |

Connector torque: M3.5, 0.4Nm

### Notes:

- All dimensions are in inches (mm).
- Tightening torque: M3.5, 0.4Nm fixings
- General tolerances:  $\pm 0.039$  ( $\pm 1.00$ )
- Chassis must be connected to protective earth.
- Use 22-14 AWG wire range for connector