# C23 Series of Single, Dual & Triple DC-DC Converters of up-to 40 Watt


## FEATURES

- Industry standard (2 inch x 3 inch) Package
- 40 Watts of output power
- Regulated Outputs, Fixed Switching Frequency
- 85 % Efficiency
- Single, Dual and Triple Output
- Fully Isolated to 1500 VDC
- Over Current, Voltage and Temperature Protection
- Wide Input range (9 – 36, 18 – 75 Volts)
- Input Under Voltage Lockout Protection (UVLO)
- Extended temperature range of -40°C to +100°C
- Remote On/Off logic control
- Continuous Short Circuit Protection
- Designed to meet CE 2004/108/EC
- Safety designed to meet UL1950, EN60950

## PRODUCT OVERVIEW

This C23 series offers 40 watts of output power in standard 2 inch x 3 inch package. This series features high efficiency of 85% and 1500 Volts of DC isolation. These converters are reliable and compact, with single, dual and triple output voltage. This C23 series provides precise regulated output voltage over wide input ranges of 9 to 36 or 18 to 75 volts. These modules operate over a wide case temperature range of –40°C to +100°C. These converters offer Input Under and Over Voltage Lockout Protection (UVLO). The main features of these converters include Remote On/Off, continuous short circuit, over voltage, and temperature protection.

## APPLICATIONS:

- Distributed Power Architectures
- Telecommunication and Servers
- Mobile Equipment
- Military and industrial applications

## AVAILABLE OPTIONS

- Customizable Input/ Output voltages
- Heatsink, customizable packaging
- UL1950, EN60950 and CE 2004/108/EC

Contact DATEL for other series with smaller Footprint, Cost Saving, Lower Power, different input or output voltage, etc.

| MODEL NUMBER | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT MAX | OUTPUT POWER | OPTION |
|---|---|---|---|---|---|
| C23-22S5-8 | 9-36 VDC | 5VDC | 8 A | 40W | A |
| C23-22S8-5 | 9-36 VDC | 8VDC | 5 A | 40W | A |
| C23-22S12-3.3 | 9-36 VDC | 12 VDC | 3.3 A | 40W | A |
| C23-22S15-2.66 | 9-36 VDC | 15 VDC | 2.66 A | 40W | A |
| C23-22S18-2.22 | 9-36 VDC | 18 VDC | 2.22 A | 40W | A |
| C23-22D5-4 | 9-36 VDC | ±5 VDC | 4 A | 40W | A |
| C23-22D12-1.66 | 9-36 VDC | ±12 VDC | ±1.66 A | 40W | A |
| C23-22D15-1.33 | 9-36 VDC | ±15 VDC | ±1.33 A | 40W | A |
| C23-22T-5/12-4/0.8 | 9-36 VDC | 5 VDC, ±12 VDC | 4 / ±0.833 A | 40W | A |
| C23-22T-5/15-4/0.6 | 9-36 VDC | 5VDC, ±15 VDC | 4 / ±0.667 A | 40W | A |
| C23-45S5-8 | 18-75 VDC | 5VDC | 8 A | 40W | A |
| C23-45S8-5 | 18-75 VDC | 8VDC | 5 A | 40W | A |
| C23-45S12-3.3 | 18-75 VDC | 12 VDC | 3.3 A | 40W | A |
| C23-45S15-2.66 | 18-75 VDC | 15 VDC | 2.66 A | 40W | A |
| C23-45S18-2.22 | 18-75 VDC | 18 VDC | 2.22 A | 40W | A |
| C23-45D5-4 | 18-75 VDC | ±5 VDC | 4 A | 40W | A |
| C23-45D5-1.66 | 18-75 VDC | ±12 VDC | ±1.66 A | 40W | A |
| C23-45D5-1.33 | 18-75 VDC | ±15 VDC | ±1.33 A | 40W | A |
| C23-45T-5/12-4/0.8 | 18-75 VDC | 5 VDC, ±12 VDC | 4 / ±0.833 A | 40W | A |
| C23-45T-5/15-4/0.6 | 18-75 VDC | 5VDC, ±15 VDC | 4 / ±0.667 A | 40W | A |

## ABSOLUTE MAXIMUM RATINGS

| PARAMETER | CONDITIONS | Model | Min. | Typical | Max. | Units |
|---|---|---|---|---|---|---|
| Input Voltage | | | | | | |
| Continuous | DC | Vin=24<br>Vin=48 | 0<br>0 | | 36<br>75 | Volts |
| Transient | 100ms, DC | Vin=24<br>Vin=48 | | | 40<br>80 | Volts |
| Operating Case Temperature | | All | -40 | | +100 | °C |
| Storage Temperature | | All | -55 | | +105 | °C |
| Isolation Voltage | 1 minute; input/output, | All | 1500 | | | VDC |

**Note**: Stresses above the absolute maximum ratings can cause permanent damage to the device.

## FUNCTIONAL SPECIFICATIONS

The following specifications apply over the operating temperature range, under the following conditions TA = +25°C unless otherwise specified

## INPUT CHARACTERISTICS

| PARAMETER | CONDITIONS | Model | Min. | Typical | Max. | Units |
|---|---|---|---|---|---|---|
| Operating Input Voltage | DC | Vin=24<br>Vin=48 | 9<br>18 | 24<br>48 | 36<br>75 | Volts |
| Input Under-voltage Lockout | | | | | | |
| Turn-On Voltage Threshold | | $24V_{in}$<br>48Vin | | 8.5<br>17 | | Volts |
| Input Over-voltage Lockout | | | | | | |
| Turn-Off Voltage Threshold | DC | $24V_{in}$<br>48Vin | | 40<br>80 | | Volts |
| Input Reflected Ripple Current | P-P thru 12µH inductor, 5Hz to 20MHz | All | | 30 | | mA |

## OUTPUT CHARACTERISTICS

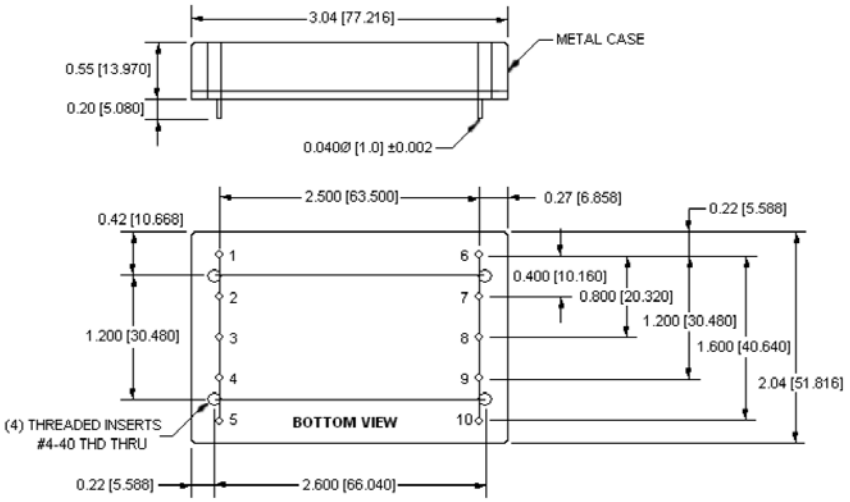
| PARAMETER | CONDITIONS | Model | Min. | Typical | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage Set Point | $V_{in}$ =Nominal $V_{in}$ , $I_o$ = $I_{o\_max}$, Tc=25°C | Vo=5.0<br>Vo= 8.0<br>Vo=12<br>Vo=15<br>Vo=18<br>Vo=±5<br>Vo=±12<br>Vo=±15 | 4.95<br>7.92<br>11.88<br>14.85<br>17.82<br>4.95<br>11.88<br>14.85 | 5<br>8<br>12<br>15<br>18<br>5<br>12<br>15 | 5.05<br>8.08<br>12.12<br>15.15<br>18.18<br>5.05<br>12.12<br>15.15 | Volts |
| Output Voltage Regulation | | | | | | |
| Line Regulation | $V_{in}$ =High line to Low line Full Load | Single<br>Dual<br>Triple<br>(primary)<br>(Auxiliary) | | | ±0.5<br>±0.5<br><br>±0.5<br>±1 | %<br>%<br>%<br>%<br>% |
| Load Regulation | $I_o$ = Full Load to min. Load | Single<br>Dual<br>Triple | | | ±10<br>±1.0<br>±1.0 | %<br>%<br>% |
| Cross Regulation | Load cross variation 10%/100% | Dual<br>Triple | | | ±5<br>±5 | %<br>% |
| Temperature Coefficient | TC=-40°C to 80°C | | | ±0.02 | | %/°C |
| Output Voltage Ripple and Noise | 5Hz to 20MHz bandwidth | | | | | |
| Peak-to-Peak | Full Load, 20MHz bandwidth 0.1uF ceramic capacitor | Vo=5V<br>Vo=8V | | | 100 | mV |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Vo=15V<br>Vo=12V<br>Vo=18V<br>Vo=±5V<br>Vo=±15V<br>Vo=±12V | | | 100 | |
| Operating Output Current Range | | Vo=5V<br>Vo=8V<br>Vo=12V<br>Vo=15V<br>Vo=18V<br>Vo=±5V<br>Vo=±12V<br>Vo=±15V<br>Vo=5/±12V<br>Vo=5/±15V | | | 8<br>5<br>3.3<br>2.66<br>2.22<br>±4<br>±1.66<br>±1.33<br>4/0.833<br>4/0.667 | A |
| Isolation Voltage | | | 1500 | | | VDC |
| Isolation Resistance | | | | 1 | | MΩ |
| Efficiency | | | | 85 | | % |
| Switching Frequency | | | | 350 | | kHz |
| Weight | | | | 6 | | Oz |
| Case | | | Black Coated Aluminum | | | |
| Pins | | | Gold plated | | | |
| MTBF | | | 3,510,000 | | | Hrs |

**NOTES**: Add the suffix "A" to the part number to reverse input pin functions (see last page Options)

1. Auto off power train protection
2. Ripple & Noise is measured with a 0.1µF Capacitor across output
3. Heat sinks & Application Notes on thermal management and external trim are available. Please consult factory for details
4. Case and pin-to-case measurements are for reference only, unless otherwise noted
5. Regulation for Single Vo: ± 1% min. to full load, Dual Vo: ±1 % min. to full load (balanced), Triple Vo: ±1 % min. to full load main Vo and ± 5% min. from 20% to full load aux. (unbalanced).
6. 10% minimum load required on all outputs.
7. Pins on all the units of this series are gold plated.

## MECHANICAL SPECIFICATIONS




Note: All dimensions are in inches (millimeters). Tolerance: x.xx ±0.02 in. (0.5mm), x.xxx ±0.010 in. (0.25 mm) unless otherwise noted

## PIN CONNECTIONS

| PIN CONNECTION | | | |
|---|---|---|---|
| PIN | SINGLE | DUAL | TRIPLE |
| 1 | No Pin | No Pin | No Pin |
| 2 | -V Input | -V Input | -V Input |
| 3 | + V Input | + V Input | + V Input |
| 4 | Case | Case | Case |
| 5 | On/Off | On/Off | On/Off |
| 6 | No Pin | - V Output | -12V / -15Vout |
| 7 | No Pin | No Pin | +12V / +15Vout |
| 8 | Common | Common | Common |
| 9 | + V Output | + V Output | + V Output |
| 10 | Trim | Trim | Trim |

## PART NUMBER ORDERING INFORMATION

| Family, Form Factor Package | Nominal Input Voltage | Number of Outputs | Voltage Output | Current Output (A) | Options |
|---|---|---|---|---|---|
| C23 | – 22 | T | 5/12 | – 4/0.8 | A |

- 22: (9-36) - 22Volts; (18-75) - 45Volts
- T: S - Single, D - Dual, T - Triple
- 5/12: Vo = 5V, Vo = 8V, Vo = 12V, Vo=15V, Vo=18V, Vo=±5V, Vo=±12V, Vo=±15V, Vo=5/±12V, Vo= 5/±15V
- 4/0.8: 5 Volts – 8, 8 Volts – 5, 12 Volts – 3.3, 15 Volts – 2.66, 18 Volts – 2.22, ±5V – 4, ±12V – 1.66, ±15V – 1.33, 5/±12V – 4/0.8, 5/±15V – 4/.06
- A: "A" suffix where Pin 2 is +Vin and Pin 3 is -Vin

Note: For proper part ordering, enter option suffixes in order listed in table above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