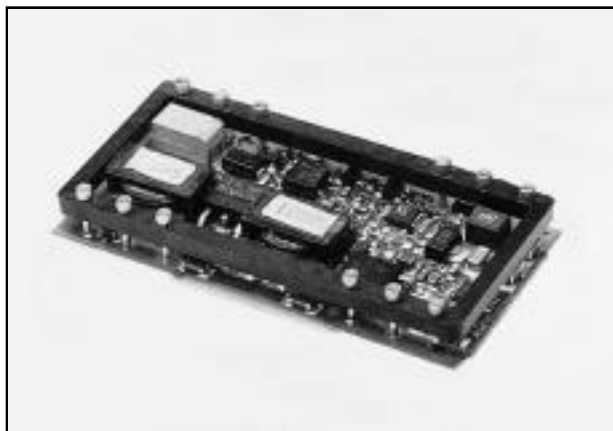


# MAC10 SERIES

## SINGLE & DUAL OUTPUTS



PATENT PENDING

### FEATURES:

- Wide Input Range 4:1
- Low Profile 0.315"Ht.
- High Efficiency to 85%
- External Trim
- -40C To +105C Operation
- 1500Vdc Isolation
- Open Frame Construction
- **Surface Mount & Thru-Hole Types**
- Pick & Place Packaging
- Remote On/Off
- Under-Voltage Lockout
- Overvoltage & Short Circuit Protection
- Integral Metal Substrate

The MAC10 series of DC-DC converters have been designed as a surface-mount & thru-hole solution for a wide range of applications where low profile and ease of assembly are needed. Utilizing the latest thermal transfer techniques the MAC10 series packs up to 10 watts of power in 1.0" x 2.0" x .315" open frame construction, with input ranges of 9-36Vdc and 18-75Vdc, make the MAC10 series ideal for telecommunications, industrial systems and mobile battery systems. Although small in size, this series compacts 16 watt/in.cubed and operating temperatures to 105C. All models are designed to meet UL1950, CSA 950 and EN 60950.

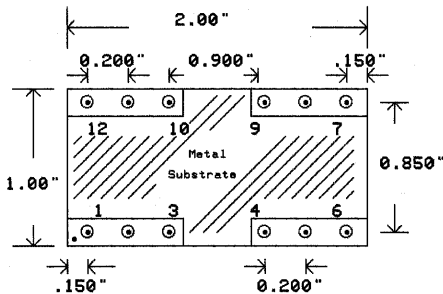
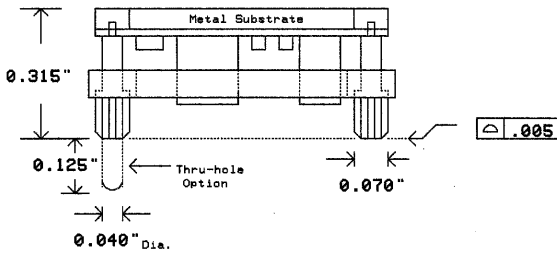
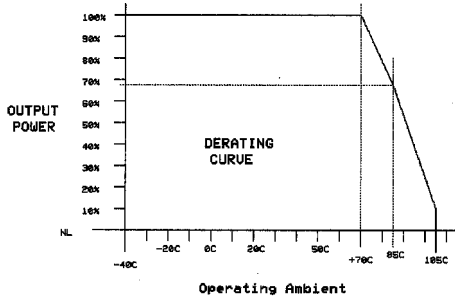
### MODEL SELECTION GUIDE:

| INPUT VOLTAGE<br>NOM. | INPUT VOLTAGE<br>RANGE | I <sub>in</sub> @ VIN NOM.<br>FL | NL  | OUTPUT<br>VOLTAGE | OUTPUT<br>CURRENT(FL) | PO<br>(W) | OUTPUT<br>OVP | TYPICAL<br>EFFICIENCY | MODELNUMBER<br>NOTE (**) |
|-----------------------|------------------------|----------------------------------|-----|-------------------|-----------------------|-----------|---------------|-----------------------|--------------------------|
| 12Vdc                 | 9-36Vdc                | 0.855                            | 7mA | 3.30              | 2.0A                  | 8         | 3.9V          | 78%                   | MAC10-12S3V3(**)         |
| 12Vdc                 | 9-36Vdc                | 0.833                            | 7mA | 5.00              | 1.6A                  | 8         | 6.8V          | 80%                   | MAC10-12S05(**)          |
| 12Vdc                 | 9-36Vdc                | 0.823                            | 7mA | 7.00              | 1.1A                  | 8         | 8.2V          | 81%                   | MAC10-12S07(**)          |
| 12Vdc                 | 9-36Vdc                | 0.803                            | 7mA | 12.00             | 0.666                 | 8         | 15V           | 83%                   | MAC10-12S12(**)          |
| 12Vdc                 | 9-36Vdc                | 0.803                            | 7mA | 15.00             | 0.444                 | 8         | 18V           | 83%                   | MAC10-12S15(**)          |
| 12Vdc                 | 9-36Vdc                | 0.833                            | 7mA | +/-5.00           | +/-1.0A               | 8         | 12 (1)        | 80%                   | MAC10-12D05(**)          |
| 12Vdc                 | 9-36Vdc                | 0.803                            | 7mA | +/-12.00          | +/- .333A             | 8         | 30 (1)        | 83%                   | MAC10-12D12(**)          |
| 12Vdc                 | 9-36Vdc                | 0.803                            | 7mA | +/-15.00          | +/- .222A             | 8         | 36 (1)        | 83%                   | MAC10-12D15(**)          |
| 48Vdc                 | 18-75Vdc               | 0.208                            | 7mA | 3.30              | 2.4A                  | 8         | 3.9V          | 80%                   | MAC10-48S3V3(**)         |
| 48Vdc                 | 18-75Vdc               | 0.254                            | 7mA | 5.00              | 2.0A                  | 10        | 6.8V          | 82%                   | MAC10-48S05(**)          |
| 48Vdc                 | 18-75Vdc               | 0.251                            | 7mA | 7.00              | 1.43A                 | 10        | 8.2V          | 83%                   | MAC10-48S07(**)          |
| 48Vdc                 | 18-75Vdc               | 0.245                            | 7mA | 12.00             | .833A                 | 10        | 15V           | 85%                   | MAC10-48S12(**)          |
| 48Vdc                 | 18-75Vdc               | 0.245                            | 7mA | 15.00             | .666A                 | 10        | 18V           | 85%                   | MAC10-48S15(**)          |
| 48Vdc                 | 18-75Vdc               | 0.254                            | 7mA | +/-5.00           | +/-1.5A               | 10        | 12 (1)        | 82%                   | MAC10-48D05(**)          |
| 48Vdc                 | 18-75Vdc               | 0.245                            | 7mA | +/-12.00          | +/- .412A             | 10        | 30 (1)        | 85%                   | MAC10-48D12(**)          |
| 48Vdc                 | 18-75Vdc               | 0.245                            | 7mA | +/-15.00          | +/- .333A             | 10        | 36 (1)        | 85%                   | MAC10-48D15(**)          |

Note (\*\*): Insert suffix; **SM** for Surface-mount type or **TH** for Thru-hole Type mounting • **MODIFICATIONS AND CUSTOMS AVAILABLE**

# 10 WATT DC-DC

**SPECIFICATIONS:** All Specifications Are Typical @ Nominal Input, Full Load & 25C Unless Otherwise Stated and are Subject to Change without Notice



## PIN CONNECTIONS

| PIN NUMBER | SINGLE OUTPUTS | DUAL OUTPUTS |
|------------|----------------|--------------|
| 1          | -Vin           | -Vin         |
| 2          | -Vin           | -Vin         |
| 3          | -Vin           | -Vin         |
| 4          | N/C            | N/C          |
| 5          | +Vo            | Com.         |
| 6          | -Vo            | +Vo          |
| 7          | -Vo            | -Vo          |
| 8          | +Vo            | Com.         |
| 9          | Trim           | Trim         |
| 10         | ON/OFF         | ON/OFF       |
| 11         | -Vin           | -Vin         |
| 12         | +Vin           | +Vin         |

## INPUT

|                       |                       |                           |
|-----------------------|-----------------------|---------------------------|
| Input Voltage Range   | 4:1                   |                           |
| Note (3)              | 9-36Vdc (12V Models)  |                           |
|                       | 18-75Vdc (48V Models) | Input filter Pi           |
| Type                  |                       |                           |
| Under Voltage Lockout | 8.5V (12V Models)     |                           |
|                       | 16.5V (48V Models)    |                           |
| Remote                | :ON                   | +5V or open, Ref. (-)Vin  |
|                       | :OFF                  | +0.7V, Ref. (-)Vin        |
| Conducted Noise       |                       | EN55022, level A (Note 5) |

## OUTPUT

|                              |                                           |
|------------------------------|-------------------------------------------|
| Output Power                 | 10 W Continuous(Max)                      |
| Output Voltage/current       | See Model Table                           |
| Output Setting Accuracy      |                                           |
| Singles                      | +/- 1% typ., +/- 1.5%max.                 |
| Duals                        | +/- 1% typ., +/- 2.0 %max.                |
| Load Regulation              |                                           |
| Singles(FL.-NL.)             | +/- 0.5% Note (4),(6)                     |
| Duals(FL.-10%L)              | +/- 0.5% Balanced                         |
|                              | +/- 2% Unbalanced                         |
| Line Regulation              | +/- 0.2%                                  |
| Total Error Band             |                                           |
| Singles                      | +/- 3%, Line/Load&Temp.                   |
| Duals                        | +/-5%                                     |
| Ripple & Noise(20Mhz BW)     | 30mV Typ., 75mV Max.                      |
| Transient Response (FL-1/2L) | 2 % Deviation, 200uS                      |
| Temperature Coefficient      | +/- .01%/c                                |
| Short circuit Protection     | Indefinite, Modulated, Automatic Recovery |

## GENERAL

|                      |                                            |
|----------------------|--------------------------------------------|
| Efficiency           | See Model Table                            |
| Isolation Voltage    | 1500Vdc ( 1Min)                            |
| Isolation Resistance | 100M                                       |
| Switching Frequency  | 400Khz                                     |
| MTBF                 | 1.0M hrs.MIL-HDBK-217F Ground Benign @ 25C |

## ENVIRONMENTAL

|                             |                                     |
|-----------------------------|-------------------------------------|
| Operating Temperature Range | -40C To +105C (See Derating Curve)  |
|                             | -40C To +70C@ FL                    |
| Storage Temperature Range   | -55C To +125C                       |
| Maximum Case Temperature    | 110 C                               |
| Humidity                    | 5% To 95% RH, Non-condensing        |
| Cooling                     | Natural Convection                  |
| Processing (Note 2)         | (230C peak, 20 sec.),water washable |

## MECHANICAL

|               |                                                               |
|---------------|---------------------------------------------------------------|
| Size          | 1.00" X 2.00" X 0.315"                                        |
| Weight        | 11.2G                                                         |
| Mounting      | SMD & Through Hole Types                                      |
| Case/Material | Open-Frame, 94V-0 FR-4 P.C.B., with Bonded Aluminum Substrate |

## NOTES:

- 1) On dual output models O.V.P. protection is across +Vo to -Vo
- 2) Consult factory for recommended reflow profile.
- 3) Typical start-up for 12Vin models is 9V. Maximum startup is 9.5V, with full operation down to 9.0V
- 4) Operation is allowed to No-Load on single outputs, however operation below 10% load may cause ripple & noise to exceed spec.
- 5) External Capacitor required.
- 6) Dual outputs are tightly regulated across +Vo to -Vo, unbalanced loads rely on cross coupling of output channels