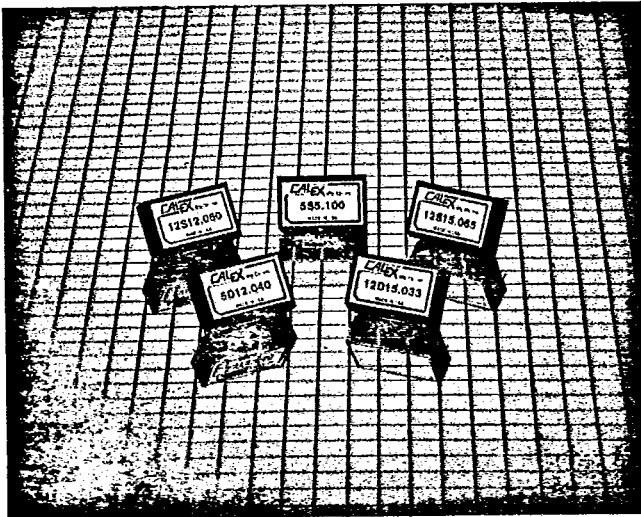


# 0.5 to 1.0 Watt Single & Dual Outputs

3355 Vincent Road, Pleasant Hill, CA 94523-4389 Telephone (415) 932-3911 Telex: 269 888 Telefax: (415) 932-6017

T-57-11  
**CALEX**



## FEATURES

- Low Noise Operation—LC Input Filter  
10 mV p-p Output Noise
- 300 VDC Ground Isolation
- High Placement Density "μWatt" Case  
0.8" × 1.25" × 0.4"
- Wide Input Voltage Range ±10%
- High Efficiency >50%
- Continuous Short Circuit Protection
- No External Components Required for Proper Operation
- Computer Tested Three Times During Manufacture
- Vacuum Encapsulated (No Voids) Potting for Long Life

## SELECTION CHART

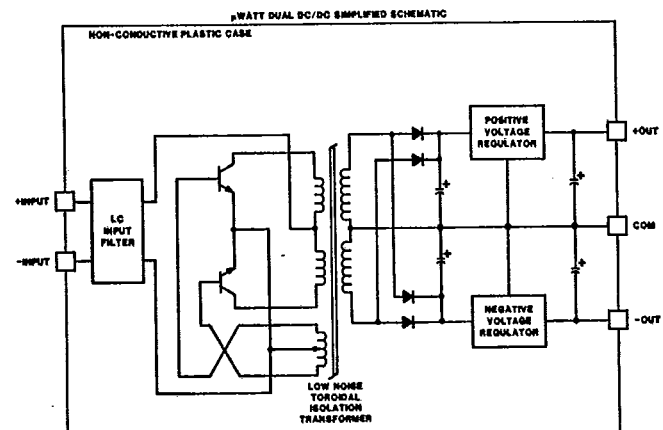
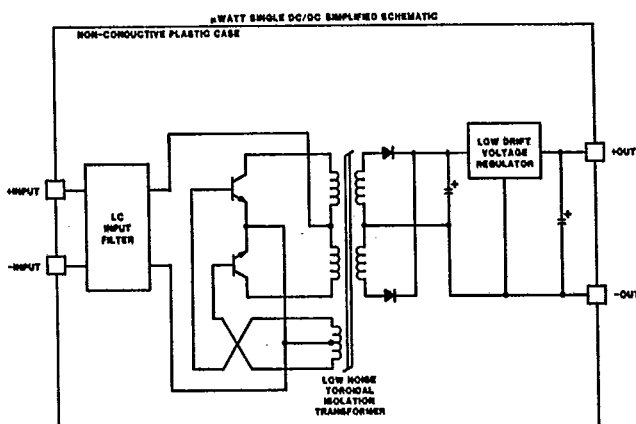
| MODEL     | INPUT RANGE VDC | OUTPUT VDC | OUTPUT mA | CASE* |
|-----------|-----------------|------------|-----------|-------|
| 5S5.100   | 5               | 5          | 100       | F     |
| 5S12.080  | 5               | 12         | 80        | F     |
| 5S15.065  | 5               | 15         | 65        | F     |
| 12S5.100  | 12              | 5          | 100       | F     |
| 12S12.080 | 12              | 12         | 80        | F     |
| 12S15.065 | 12              | 15         | 65        | F     |
| 5D12.040  | 5               | ±12        | ±40       | F     |
| 5D15.033  | 5               | ±15        | ±33       | F     |
| 12D12.040 | 12              | ±12        | ±40       | F     |
| 12D15.033 | 12              | ±15        | ±33       | F     |

\*Case details page 53

## DESCRIPTION

These DC/DC converters are designed to fill the high performance power needs of analog and digital systems.

The converters consist of a bipolar chopper stage driving a low noise toroidal power transformer that provides 300 VDC ground isolation, followed by a high regulation protected linear regulator for low noise highly stable outputs.





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# 0.5 to 1.0 Watt Single & Dual Outputs

## ELECTRICAL SPECIFICATIONS

Conditions (Unless Noted): Vin Nominal, Tc = 25°C, Rated Load

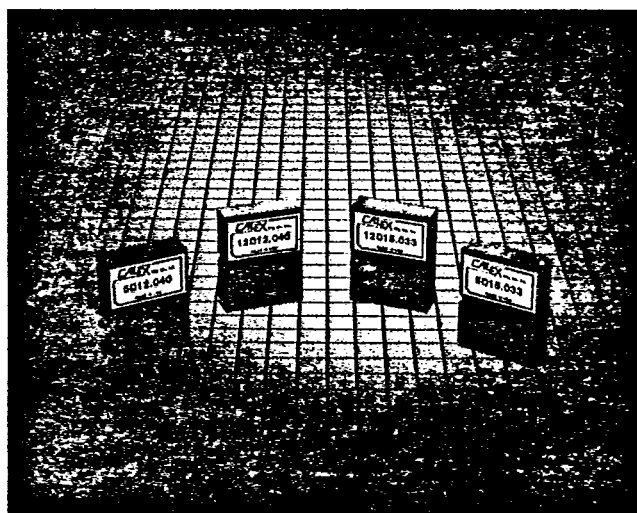
### INPUT PARAMETERS

| MODEL                                 |         | 5S5.100 | 5S12.080 | 5S15.065 | 12S5.100 | 12S12.080 | 12S15.065 | 5D12.040<br>5D15.033 | 12D12.040<br>12D15.033 | UNITS  |
|---------------------------------------|---------|---------|----------|----------|----------|-----------|-----------|----------------------|------------------------|--------|
| Input Range                           | MIN     | 4.5     |          |          | 10.8     |           |           | 4.5                  | 10.8                   | VDC    |
|                                       | TYP     | 5.0     |          |          | 12.0     |           |           | 5.0                  | 12.0                   |        |
|                                       | MAX     | 5.5     |          |          | 13.2     |           |           | 5.5                  | 13.2                   |        |
| Input Current Full Load               | TYP     | 250     | 380      | 380      | 100      | 150       | 150       | 380                  | 150                    | mA     |
|                                       | No Load | 75      | 85       | 90       | 20       | 28        | 28        | 80                   | 30                     |        |
| Input Reflected<br>Ripple 0-20MHz, BW | TYP     | 5       |          |          | 15       |           |           | 7                    | 15                     | mA p-p |
|                                       | MAX     | 10      |          |          | 30       |           |           | 10                   | 30                     |        |
| Efficiency                            | TYP     | 40      | 50       | 51       | 42       | 53        | 54        | 50                   | 53                     | %      |
| Switching Frequency                   | TYP     | 50      |          |          |          |           |           |                      | 50                     | KHz    |

### SPECIFICATIONS

| MODEL                                                 |     | ALL MODELS      | UNITS   |
|-------------------------------------------------------|-----|-----------------|---------|
| <b>ISOLATION</b>                                      |     |                 |         |
| Isolation Voltage                                     | MIN | 300             | VDC     |
| 10 $\mu$ A Leakage                                    |     |                 |         |
| Input to Output<br>Capacitance                        | TYP | 90              | pF      |
| Short Circuit Protection<br>to Common for all Outputs |     | 8 Hours Minimum |         |
| <b>ENVIRONMENTAL</b>                                  |     |                 |         |
| Case Operating Range<br>No Derating                   | MIN | -25             | °C      |
|                                                       | MAX | 70              | °C      |
| Storage Range                                         | MIN | -35             | °C      |
|                                                       | MAX | 90              | °C      |
| Case                                                  |     | F (see page 53) |         |
| Thermal Impedance (1)                                 | TYP | 34              | °C/Watt |

(1) Defined as case temperature rise over ambient per package Watt dissipated.



### OUTPUT PARAMETERS

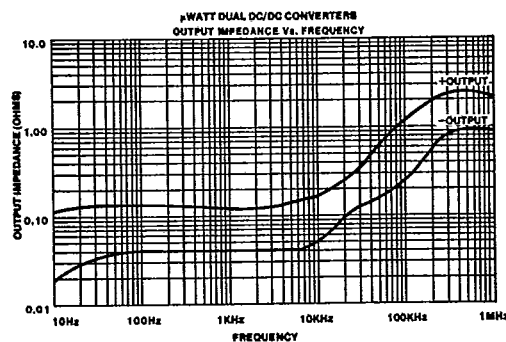
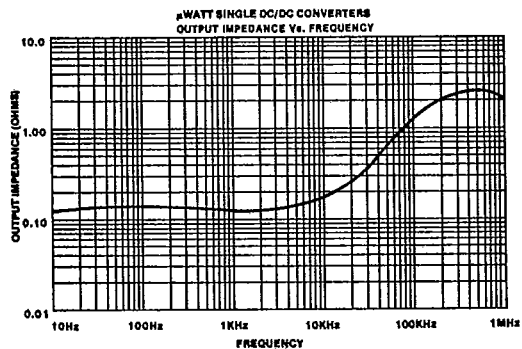
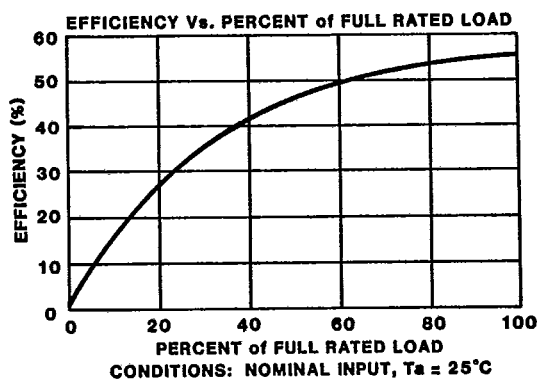
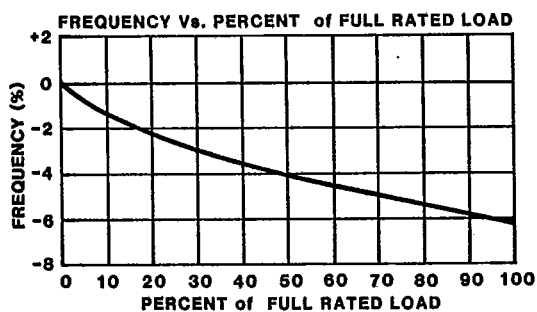
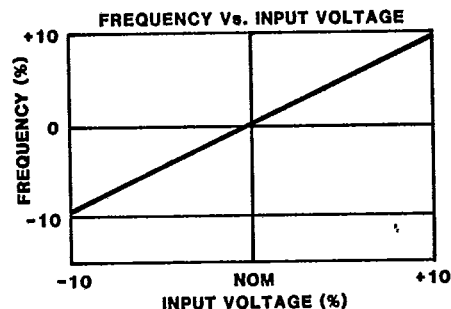
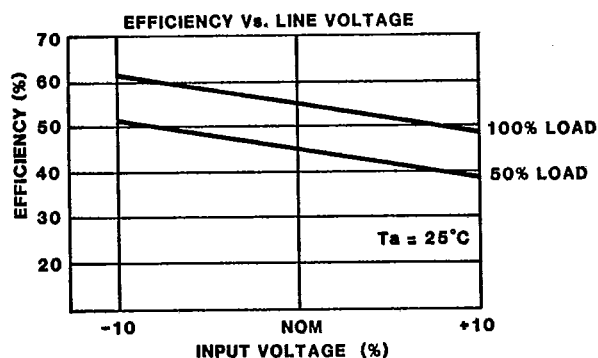
| MODEL                                                   |     | 5S5.100<br>12S5.100 | 5S12.080<br>12S12.080 | 5S15.065<br>12S15.065 | 5D12.040<br>12D12.040 | 5D15.033<br>12D15.033 | UNITS     |
|---------------------------------------------------------|-----|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|
| Output Voltage                                          |     | 5                   | 12                    | 15                    | $\pm 12$              | $\pm 15$              | VDC       |
| Rated Load                                              | MIN | 0                   | 0                     | 0                     | 0                     | 0                     | mA        |
|                                                         | MAX | 100                 | 80                    | 65                    | $\pm 40$              | $\pm 33$              |           |
| Accuracy<br>100% Load                                   | MIN | 4.75                | 11.40                 | 14.25                 | 11.40                 | 14.25                 | VDC       |
|                                                         | TYP | 5.00                | 12.00                 | 15.00                 | 12.00                 | 15.00                 |           |
|                                                         | MAX | 5.25                | 12.60                 | 15.75                 | 12.60                 | 15.75                 |           |
| Load Regulation<br>NL-FL                                | TYP | 0.5                 | 0.20                  | 0.20                  | 0.20                  | 0.20                  | %         |
|                                                         | MAX | 1.0                 | 0.40                  | 0.40                  | 0.40                  | 0.40                  |           |
| Line Regulation<br>Vin = LL - HL                        | TYP |                     | 0.15                  |                       | 0.15                  | 0.15                  | %         |
|                                                         | MAX |                     | 0.30                  |                       | 0.30                  | 0.30                  |           |
| Transient Response<br>NL-FL<br>FL-NL                    | TYP |                     | 5                     |                       | 5                     | 5                     | $\mu$ Sec |
|                                                         | TYP |                     | 5                     |                       |                       |                       |           |
| Step Load<br>Change to 0.1% Error                       |     |                     |                       |                       |                       |                       |           |
| Long Term Stability                                     | TYP |                     | 0.4                   |                       | 0.4                   |                       | %/KHrs    |
| Short Term Stability (2)                                | TYP |                     | 0.2                   |                       | 0.2                   |                       | %/24Hrs   |
| Noise, 10Hz-20HMz<br>Co = 0 $\mu$ F<br>Co = 10 $\mu$ F* |     |                     |                       |                       |                       |                       | mV p-p    |
|                                                         | MAX |                     | 80                    |                       | 60                    |                       |           |
|                                                         | MAX |                     | 40                    |                       | 20                    |                       |           |
| Temp Coefficient                                        | TYP |                     | 100                   |                       | 100                   |                       | ppm/°C    |
|                                                         | MAX |                     | 200                   |                       | 200                   |                       |           |

(2) After 30 minute warm-up.

\*Sprague 199D 10 $\mu$ F @ 25VDC

# 0.5 to 1.0 Watt Single & Dual Outputs

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## Case Sizes and Mounting Kits

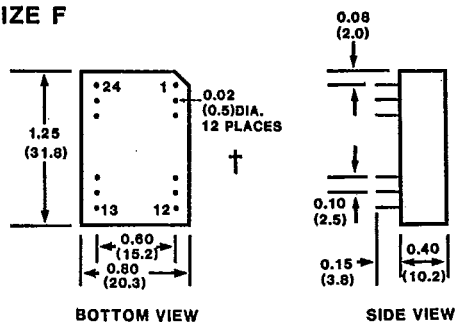


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T-90-20

## 0.5 to 1.0 Watt Case pages 4-6

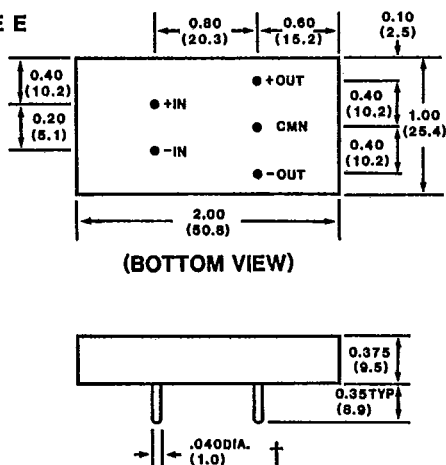
## CASE SIZE F



| PIN NUMBER | SINGLE OUTPUTS | DUAL OUTPUTS |
|------------|----------------|--------------|
| 1          | +Vin           | +Vin         |
| 2          | NC             | -Vout        |
| 3          | NC             | OUT COM      |
| 10         | -Vout          | OUT COM      |
| 11         | +Vout          | +Vout        |
| 12         | -Vin           | -Vin         |
| 13         | -Vin           | -Vin         |
| 14         | +Vout          | +Vout        |
| 15         | -Vout          | OUT COM      |
| 22         | NC             | OUT COM      |
| 23         | NC             | -Vout        |
| 24         | +Vin           | +Vin         |

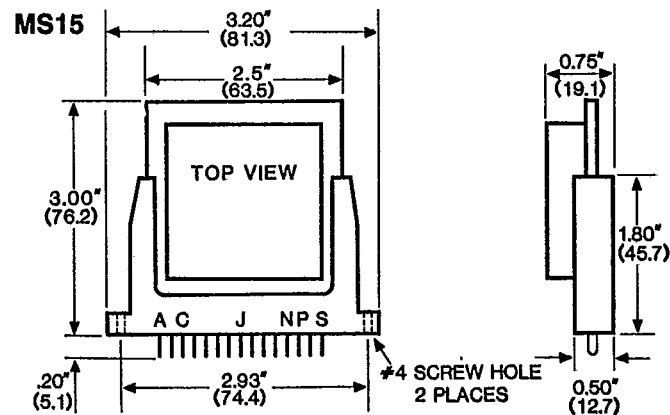
## 1.8 Watt thru 6 Watt Cases pages 7-27

## CASE SIZE E



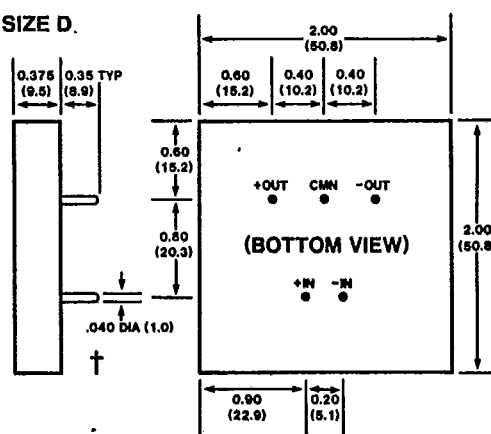
NOTE: Single output pin configuration not shown.

## Mounting Kits for D and E Cases



| PIN | FUNCTION   |            |
|-----|------------|------------|
|     | SINGLE     | DUAL       |
| A   | + DC INPUT | + DC INPUT |
| C   | - DC INPUT | - DC INPUT |
| J   | N/C        | CMN.       |
| N   | KEY        | KEY        |
| P   | + OUTPUT   | + OUTPUT   |
| S   | CMN.       | - OUTPUT   |

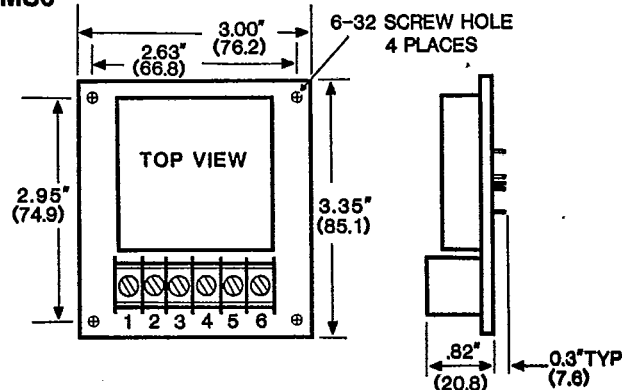
## CASE SIZE D.



Alternate Industry Standard 5 pin configuration available upon request. Consult factory for details (415)932-3911.

† Seal around terminals is not hermetic. Do not immerse units in any liquid.

## MS6



| SCREW TERMINAL | FUNCTION   |            |
|----------------|------------|------------|
|                | SINGLE     | DUAL       |
| 1              | + OUTPUT   | + OUTPUT   |
| 2              | N/C        | CMN.       |
| 3              | CMN.       | - OUTPUT   |
| 4              | N/C        | N/C        |
| 5              | + DC INPUT | + DC INPUT |
| 6              | - DC INPUT | - DC INPUT |

