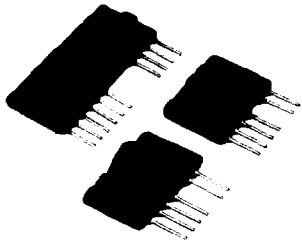


# DC-DC Converters



## FEATURES —

### NON-ISOLATED

- Miniaturized
- Surface mount technology
- Low cost non-isolation models
- Voltage boosting
- Polarity reversing
- Built-in noise filter inductor
- Up to 70% efficiency
- Single and dual outputs
- Board mountable
- MIL-STD-202 testing

## SPECIFICATIONS

### ISOLATED AND NON-ISOLATED

#### Input Voltage

±20% of nominal except 5 VDC output, ±20%. 48 VDC input range 42-60 VDC. Do not exceed 1.2x nom. or rev polarity.

#### Output Voltage

±1% of nominal.

#### Output Current

See rating table. Load regulation specified over output current range.

#### Line Regulation

0.5% of nominal  $V_{out}$  for isolation series except -0505 models. All others 0.8%.

#### Load Regulation

Specified over output current range. Non-isolation series is 1.5%. Isolation series is 3% except 5 VDC outputs and Telcom series, 6%.

#### Efficiency

70%; 5 VDC outputs 60%.

#### Temperature Coefficient

0.03%/°C max.

#### Overload Protection

Current limiting type circuitry on isolation series only. Short circuit current is 130-200% F.L.

#### Operating Temperature

Full rated output from -10°C to +70°C without derating.

#### Operating Frequency

150 kHz.

#### Ripple and Noise

60 mv typical, 100 mv p-p max.

#### Storage Temperature

-30°C to +85°C.

#### Humidity

95% RH.

#### Weight

See table.

#### Insulation Resistance

50 Mohm at 500 VDC min.

#### Dielectric Voltage

500 VDC, primary to secondary for one minute. Isolation series only.

#### Solderability

230°C ± 5°C; dipping time 5 sec. ± 0.5 sec. MIL-STD-202, method 208C.

#### Soldering Heat Resistance

260°C ± 5°C; dipping time 10 sec. ± 1 sec. MIL-STD-202, method 210A.

#### Temperature Cycling

5 cycles; -30°C to +85°C at 30 min. each. MIL-STD-202, method 102A.

#### Vibration

Smallest of longest distance; 1.52 mm or 15G, 10-2,000 Hz. MIL-STD-202, method 204C.

#### Shock

50G half-wave sine wave. MIL-STD-202, method 213B.

#### Humidity Resistance

40°C, 95% RH; 1344 hours. MIL-STD-202, 103B.

#### High Temperature Life

500 hrs at +70°C, fixed rated FL current. MIL-STD-202, method 108A.

#### Terminal Strength

Tensile 2.2kg, bending 90° 3 times. MIL-STD-202, method 211A.

## NON-ISOLATION POLARITY REVERSING CONVERTERS

| Model No.    | $V_{in}$<br>(VDC) | $V_{out}$<br>(VDC) | Line Reg.<br>(%) max. | $I_{out}$<br>(mA)—(mA) | Load Reg.<br>(%) max. | Efficiency<br>(%) TYP | Temp.<br>Coefficient<br>(%/°C)<br>max. |
|--------------|-------------------|--------------------|-----------------------|------------------------|-----------------------|-----------------------|--|
| OPT-BAN-0205 | 1-3.5             | -5                 | ±2                    | 3-10                   | 1.5                   | 57                    | 0.1                                    |
| OPT-BAN-0212 | 1-3.5             | -12                | ±1                    | 1.25-4.17              | 1.5                   | 62                    | 0.1                                    |
| OPT-BAN-0215 | 1-3.5             | -15                | ±1                    | 1-3.33                 | 1.5                   | 62                    | 0.1                                    |
| OPT-BAP-0205 | 1-3.5             | 5                  | ±2                    | 3-10                   | 1.5                   | 57                    | 0.1                                    |
| OPT-BAP-0212 | 1-3.5             | 12                 | ±1                    | 1.25-4.17              | 1.5                   | 62                    | 0.1                                    |
| OPT-BAP-0215 | 1-3.5             | 15                 | ±1                    | 1-3.33                 | 1.5                   | 62                    | 0.1                                    |
| OPT-NAN-0505 | 5                 | -5                 | ±0.8                  | 5-20                   | 1.5                   | 60                    | 0.03                                   |
| OPT-NAN-0512 | 5                 | -12                | ±0.8                  | 2.5-8.5                | 1.5                   | 60                    | 0.03                                   |
| OPT-NCN-0505 | 5                 | -5                 | ±0.8                  | 18-60                  | 1.5                   | 60                    | 0.03                                   |
| OPT-NCN-0512 | 5                 | -12                | ±0.8                  | 7.5-25                 | 1.5                   | 60                    | 0.03                                   |
| OPT-RCN-0505 | 5 ± 10%           | -5                 | ±1.2                  | 18-60                  | 1.5                   | 62                    | ±0.05                                  |
| OPT-RCN-0512 | 5 ± 10%           | -12                | ±1.2                  | 7.5-25                 | 1.5                   | 62                    | ±0.1                                   |
| OPT-RCN-1205 | 12 ± 20%          | -5                 | ±1.2                  | 18-60                  | 1.5                   | 67                    | ±0.05                                  |
| OPT-RCN-1212 | 12 ± 20%          | -12                | ±1.2                  | 7.5-25                 | 1.5                   | 67                    | ±0.1                                   |
| OPT-RFP-2405 | 24 ± 30%          | 5                  | ±1.2                  | 60-200                 | 1.5                   | 72                    | ±0.05                                  |
| OPT-RHP-2405 | 24 ± 30%          | 5                  | ±1.2                  | 120-400                | 1.5                   | 72                    | ±0.05                                  |

0.3 to 3 Watt Isolation Converters

Polarity Reversing and Voltage Boosting Non-Isolation Converters

## NON-ISOLATION VOLTAGE BOOSTING CONVERTERS

| Model No.    | $V_{in}$<br>(VDC) | $V_{out}$<br>(VDC) | Line Reg.<br>(%) max. | $I_{out}$<br>(mA)—(mA) | Load Reg.<br>(%) max. | Efficiency<br>(%) TYP | Temp.<br>Coefficient<br>(%/°C)<br>max. |
|--------------|-------------------|--------------------|-----------------------|------------------------|-----------------------|-----------------------|--|
| OPT-NAP-0512 | 5                 | 12                 | ±0.8                  | 2.5-8.4                | 1.5                   | 70                    | 0.03                                   |
| OPT-NAP-0515 | 5                 | 15                 | ±0.8                  | 2.0-6.7                | 1.5                   | 70                    | 0.03                                   |
| OPT-NAP-0524 | 5                 | 24                 | ±0.8                  | 1.2-4.2                | 1.5                   | 70                    | 0.03                                   |
| OPT-NCP-0512 | 5                 | 12                 | ±0.8                  | 7.5-25                 | 1.5                   | 70                    | 0.03                                   |
| OPT-NCP-0515 | 5                 | 15                 | ±0.8                  | 6.0-20                 | 1.5                   | 70                    | 0.03                                   |
| OPT-NCP-0524 | 5                 | 24                 | ±0.8                  | 3.7-12.5               | 1.5                   | 70                    | 0.03                                   |
| OPT-NDP-0512 | 5                 | 12                 | ±0.8                  | 12.5-42                | 1.5                   | 70                    | 0.03                                   |
| OPT-NDP-0515 | 5                 | 15                 | ±0.8                  | 10-34                  | 1.5                   | 70                    | 0.03                                   |
| OPT-NDP-0524 | 5                 | 24                 | ±0.8                  | 6.2-21                 | 1.5                   | 70                    | 0.03                                   |
| OPT-NFP-0512 | 5                 | 12                 | ±0.8                  | 25-84                  | 1.5                   | 70                    | 0.03                                   |
| OPT-NFP-0515 | 5                 | 15                 | ±0.8                  | 20-67                  | 1.5                   | 70                    | 0.03                                   |
| OPT-NFP-0524 | 5                 | 24                 | ±0.8                  | 12.5-42                | 1.5                   | 70                    | 0.03                                   |

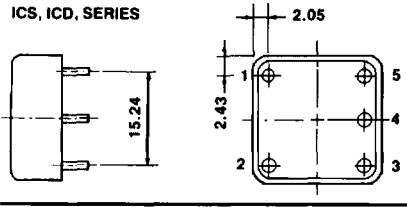
Request brochure for circuit configurations, dimensions and pin outs.

# DC-DC Converters

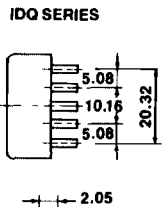
## ISOLATION CONVERTERS

### ISOLATION SERIES, PINOUT DIMENSIONS

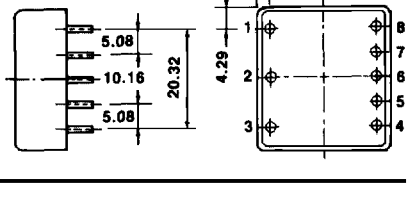
ICS, ICD, SERIES



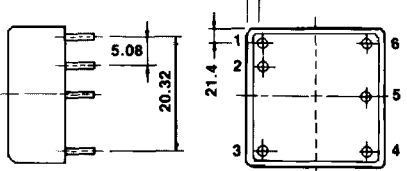
IDQ SERIES



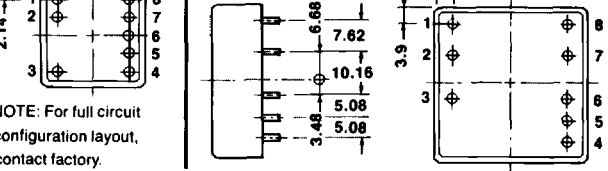
IFS, IFD, IFQ SERIES



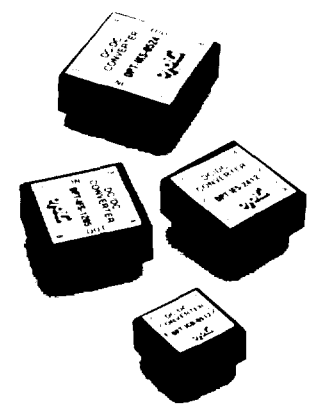
IDS, IDD, SERIES



IKS, IKD, IKQ SERIES



NOTE: For full circuit configuration layout, contact factory.



### 0.3 WATT ISOLATION CONVERTERS

| Model No.    | V <sub>in</sub> (VDC) | V <sub>out</sub> (VDC) | I <sub>out</sub> (ma) |
|--------------|-----------------------|------------------------|-----------------------|
| OPT-ICS-0505 | 5                     | 5                      | 60                    |
| OPT-ICS-0512 | 5                     | 12                     | 25                    |
| OPT-ICD-0512 | 5                     | ± 12                   | 12.5                  |
| OPT-ICS-1205 | 12                    | 5                      | 60                    |
| OPT-ICS-1212 | 12                    | 12                     | 25                    |
| OPT-ICD-1212 | 12                    | ± 12                   | 12.5                  |
| OPT-ICS-2405 | 24                    | 5                      | 60                    |
| OPT-ICS-2412 | 24                    | 12                     | 25                    |
| OPT-ICD-2412 | 24                    | ± 12                   | 12.5                  |

### 3.0 WATT ISOLATION TYPE CONVERTERS

| Model No.    | V <sub>in</sub> (VDC) | V <sub>out</sub> (VDC) | I <sub>out</sub> (ma) |
|--------------|-----------------------|------------------------|-----------------------|
| OPT-IKS-0505 | 5                     | 5                      | 600                   |
| OPT-IKD-0512 | 5                     | ± 12                   | 125                   |
| OPT-IKS-0524 | 5                     | 24                     | 125                   |
| OPT-IKS-1205 | 12                    | 5                      | 600                   |
| OPT-IKS-1212 | 12                    | 12                     | 250                   |
| OPT-IKD-1212 | 12                    | ± 12                   | 125                   |
| OPT-IKS-2405 | 24                    | 5                      | 600                   |
| OPT-IKS-2412 | 24                    | 12                     | 250                   |
| OPT-IKD-2412 | 24                    | ± 12                   | 125                   |

### FEATURES— ISOLATED

- Miniaturized
- Surface mount technology
- Board mountable
- Low cost
- Point of load application
- Built-in noise filter
- Up to 70% efficiency
- Floating/isolated outputs
- 5, 12, and 24 volt inputs
- 0.3 to 3W outputs
- Telcom 48 Vdc input series

### 0.5 WATT ISOLATION CONVERTERS

| Model No.    | V <sub>in</sub> (VDC) | V <sub>out</sub> (VDC) | I <sub>out</sub> (ma) |
|--------------|-----------------------|------------------------|-----------------------|
| OPT-IDS-0505 | 5                     | 5                      | 100                   |
| OPT-IDS-0512 | 5                     | 12                     | 42                    |
| OPT-IDD-0512 | 5                     | ± 12                   | 21                    |
| OPT-IDS-1205 | 12                    | 5                      | 100                   |
| OPT-IDS-1212 | 12                    | 12                     | 42                    |
| OPT-IDD-1212 | 12                    | ± 12                   | 21                    |
| OPT-IDS-2405 | 24                    | 5                      | 100                   |
| OPT-IDS-2412 | 24                    | 12                     | 42                    |
| OPT-IDD-2412 | 24                    | ± 12                   | 21                    |

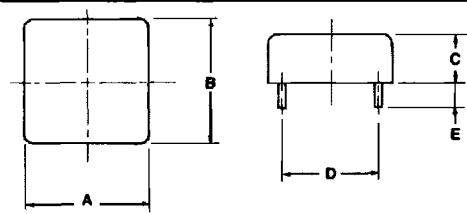
### 48V TELCOM MULTIPLE OUTPUT CONVERTERS

| Model No.   | V <sub>in</sub> (VDC) | V <sub>out</sub> (VDC) | I <sub>out</sub> (ma) |
|-------------|-----------------------|------------------------|-----------------------|
| OPT-IDQ-48A | 48                    | ± 5<br>± 12            | 20<br>4.2             |
| OPT-IFQ-48A | 48                    | ± 5<br>± 12            | 33<br>7.1             |
| OPT-IKQ-48A | 48                    | ± 5<br>± 12            | 67<br>14.2            |

### 1.0 WATT ISOLATION CONVERTERS

| Model No.    | V <sub>in</sub> (VDC) | V <sub>out</sub> (VDC) | I <sub>out</sub> (ma) |
|--------------|-----------------------|------------------------|-----------------------|
| OPT-IFS-0505 | 5                     | 5                      | 200                   |
| OPT-IFS-0512 | 5                     | 12                     | 84                    |
| OPT-IFD-0512 | 5                     | ± 12                   | 42                    |
| OPT-IFS-0524 | 5                     | 24                     | 42                    |
| OPT-IFS-1205 | 12                    | 5                      | 200                   |
| OPT-IFS-1212 | 12                    | 12                     | 84                    |
| OPT-IFD-1212 | 12                    | ± 12                   | 42                    |
| OPT-IFS-2405 | 24                    | 5                      | 200                   |
| OPT-IFS-2412 | 24                    | 12                     | 84                    |
| OPT-IFD-2412 | 24                    | ± 12                   | 42                    |

### ISOLATION SERIES DIMENSIONS



| SERIES        | DIMENSIONS <sup>1</sup> |                |                |      |                |                |
|---------------|-------------------------|----------------|----------------|------|----------------|----------------|
|               | A <sup>2</sup>          | D <sup>2</sup> | C <sup>3</sup> | D    | E <sup>4</sup> | W <sup>5</sup> |
| ICS, ICD      | 20.1                    | 20.1           | 8.5            | 16   | 4              | 6.3            |
| IDS, IDD, IDQ | 24.6                    | 24.6           | 10.5           | 20.5 | 5              | 11.5           |
| IFS, IFD, IFQ | 26.9                    | 28.9           | 10.5           | 22.8 | 5              | 14.7           |
| IKS, IKD, IKQ | 36.4                    | 36.4           | 12.0           | 28   | 4              | 29.9           |

- NOTES: 1. Dimensions in mm  
 2. Tolerance ± 0.3 mm  
 3. Maximum dimension  
 4. Minimum dimension  
 5. Weight in grams  
 6. Pin dia. 0.75mm