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| <p><b>66116</b></p> <p><b>Single Channel Optocoupler</b></p> <p>Electrically Similar to 4N47-4N49</p> <p>Coaxial or Bulkhead Mount packages</p> |  <p><b>OPTOELECTRONIC PRODUCTS DIVISION</b></p> |
|---|--|

|  |  |
|--|--|
| <p><b>Features:</b></p> <ul style="list-style-type: none"> <li>• High reliability</li> <li>• Base lead provided for conventional transistor biasing</li> <li>• Very high gain, high voltage transistor</li> <li>• Hermetically sealed for reliability and stability</li> <li>• Stability over wide temperature range</li> <li>• High voltage electrical isolation</li> </ul> | <p><b>Applications:</b></p> <ul style="list-style-type: none"> <li>• Line Receivers</li> <li>• Switchmode Power Supplies</li> <li>• Signal ground isolation</li> <li>• Process Control input/output isolation</li> </ul> |
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**DESCRIPTION**

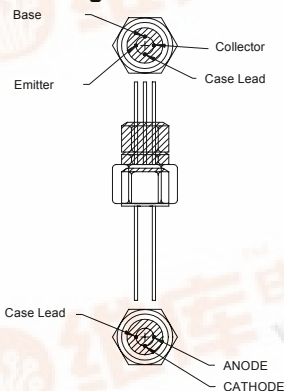
Very high gain optocoupler utilizing GaAIs infrared LED optically coupled to an N-P-N silicon phototransistor packaged in a hermetically sealed metal case. These devices can be tested to customer specifications, as well as to MIL-PRF-38534 H&K quality levels.

**\*ABSOLUTE MAXIMUM RATINGS**

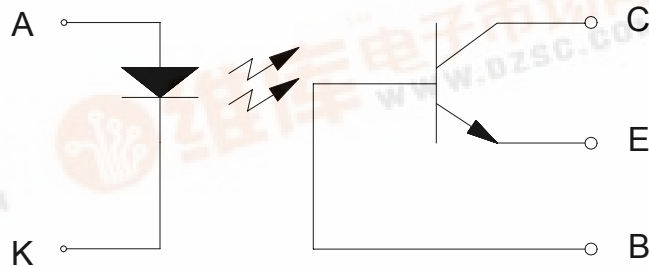
|  |                 |
|--|-----------------|
| Input to Output Voltage .....  | ±1kV            |
| Collector-Base Voltage .....   | 45V             |
| Collector-Emitter Voltage (See Note 1) .....   | 40V             |
| Emitter-Base Voltage .....   | 7V              |
| Input Diode Reverse Voltage .....  | 2V              |
| Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 2) .....  | 40mA            |
| Continuous Collector Current .....   | 50mA            |
| Peak Diode Current (See Note 3) .....  | 1A              |
| Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 4) ..... | 300mW           |
| Operating Free-Air Temperature Range .....   | -55°C to +125°C |
| Storage Temperature .....  | -65°C to +125°C |
| Lead Temperature (1/16" (1.6mm) from case for 10 seconds) .....                                    | 240°C           |

\* JEDEC registered data

**Package Dimensions**



**Schematic Diagram**



**Notes:**

1. This value applies with the emitter-base diode open-circuited and the input-diode current equal to zero.
2. Derate linearly to 125°C free-air temperature at the rate of 0.67 mW/°C.
3. This value applies for  $t_w \leq 1\mu s$ . PRR < 300 pps.
4. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C.

# 66116

# Single Channel Optocoupler

## ELECTRICAL CHARACTERISTICS $T_A = 25^\circ\text{C}$ Unless otherwise specified

| PARAMETER                          | SYMBOL | MIN    | TYP | MAX | UNITS         | TEST CONDITIONS     | NOTE |
|------------------------------------|--------|--------|-----|-----|---------------|---------------------|------|
| Input Diode Static Reverse Current | $I_R$  |        |     | 100 | $\mu\text{A}$ | $V_R = 2\text{V}$   |      |
| Input Diode Static Forward Voltage | $V_F$  | 1      | 1.4 | 1.7 | V             | $I_E = 10\text{mA}$ |      |
|                                    |        | -55°C  |     |     |               |                     |      |
|                                    |        | +25°C  |     |     |               |                     |      |
|                                    |        | +100°C |     |     |               |                     |      |

## OUTPUT TRANSISTOR $T_A = 25^\circ\text{C}$ Unless otherwise specified

| PARAMETER                           | SYMBOL        | MIN | TYP | MAX | UNITS | TEST CONDITIONS                          | NOTE |
|-------------------------------------|---------------|-----|-----|-----|-------|--|------|
| Collector-Base Breakdown Voltage    | $V_{(BR)CBO}$ | 45  |     |     | V     | $I_C = 100\mu\text{A}, I_B = 0, I_F = 0$ |      |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 40  |     |     | V     | $I_C = 1\text{mA}, I_B = 0, I_F = 0$     |      |
| Emitter-Collector Breakdown Voltage | $V_{(BR)ECO}$ | 7   |     |     | V     | $I_C = 0, I_E = 100\mu\text{A}, I_F = 0$ |      |

## COUPLED CHARACTERISTICS $T_A = 25^\circ\text{C}$ Unless otherwise specified

| PARAMETER                            | SYMBOL        | MIN       | TYP | MAX  | UNITS         | TEST CONDITIONS  | NOTE |
|--------------------------------------|---------------|-----------|-----|------|---------------|--|------|
| On State Collector Current           | $I_{C(ON)}$   | 0.5       |     | 5    | mA            | $V_{CE} = 5\text{V}, I_B = 0, I_F = 1\text{mA}$          |      |
|                                      |               | -XX1      |     |      |               |  |      |
|                                      |               | -XX2      |     |      |               |  |      |
|                                      |               | -XX3      |     |      |               |  |      |
| On State Collector Current           | $I_{C(ON)}$   | 0.7       |     |      | mA            | $V_{CE} = 5\text{V}, I_B = 0, I_F = 2\text{mA}$          |      |
|                                      |               | -55°C     |     |      |               |  |      |
|                                      |               | 1.4       |     |      |               |  |      |
|                                      |               | 2.8       |     |      |               |  |      |
| On State Collector Current           | $I_{C(ON)}$   | 0.5       |     |      | mA            | $V_{CE} = 5\text{V}, I_B = 0, I_F = 2\text{mA}$          | 2    |
|                                      |               | -XX1      |     |      |               |  |      |
|                                      |               | -XX2      |     |      |               |  |      |
|                                      |               | -XX3      |     |      |               |  |      |
| Off State Collector Current          | $I_{C(OFF)}$  |           |     | 100  | nA            | $V_{CE} = 20\text{V}, I_B = 0, I_F = 0\text{mA}$         |      |
|                                      |               | +25°C     |     |      |               |  |      |
| Off State Collector Current          | $I_{C(OFF)}$  |           |     | 100  | $\mu\text{A}$ | $V_{CE} = 20\text{V}, I_B = 0, I_F = 0\text{mA}$         |      |
|                                      |               | +100°C    |     |      |               |  |      |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ |           |     | 0.3  | V             | $I_C = 0.5\text{mA}, I_B = 0, I_F = 2\text{mA}$          |      |
|                                      |               | -XX1      |     |      |               |  |      |
|                                      |               | -XX2      |     | 0.3  | V             | $I_C = 1\text{mA}, I_B = 0, I_F = 2\text{mA}$            |      |
|                                      |               | -XX3      |     | 0.3  | V             | $I_C = 2\text{mA}, I_B = 0, I_F = 2\text{mA}$            |      |
| Input to Output Resistance           | $R_{I-O}$     | $10^{11}$ |     |      |               | $V_{IN-OUT} = 1\text{kV}$                                | 1    |
| Input to Output Capacitance          | $C_{I-O}$     |           |     | 5    | pF            | $f = 1\text{MHz}, V_{IN-OUT} = 1\text{kV}$               | 1    |
| Rise Time/ Fall Time                 | $t_r / t_f$   |           |     | 20   | $\mu\text{s}$ | $V_{CC} = 10\text{V}, I_F = 5\text{mA}, R_L = 100\Omega$ |      |
|                                      |               | -XX1      |     |      |               |  |      |
| Phototransistor Operation            | $t_r / t_f$   |           |     | 25   | $\mu\text{s}$ |  |      |
|                                      |               | -XX2      |     |      |               |  |      |
|                                      |               | -XX3      |     | 25   | $\mu\text{s}$ |  |      |
| Rise Time/ Fall Time                 | $t_r / t_f$   |           |     | 0.85 | $\mu\text{s}$ | $V_{CC} = 10\text{V}, I_F = 5\text{mA}, R_L = 100\Omega$ |      |
|                                      |               | -XX1      |     |      |               |  |      |
| Photodiode Operation                 | $t_r / t_f$   |           |     | 0.85 | $\mu\text{s}$ |  |      |
|                                      |               | -XX2      |     |      |               |  |      |
|                                      |               | -XX3      |     | 0.85 | $\mu\text{s}$ |  |      |

### NOTES:

- These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.
- This parameter measured using pulse techniques  $t_w = 100\mu\text{s}$ , duty cycle  $\leq 1\%$ .

### RECOMMENDED OPERATING CONDITIONS:

| PARAMETER                 | SYMBOL   | MIN | MAX | UNITS         |
|---------------------------|----------|-----|-----|---------------|
| Input Current, Low Level  | $I_{FL}$ | 0   | 100 | $\mu\text{A}$ |
| Input Current, High Level | $I_{FH}$ | 2   | 10  | mA            |
| Supply Voltage            | $V_{CE}$ | 5   | 10  | V             |

### SELECTION GUIDE

| PART NUMBER | PART DESCRIPTION  |
|-------------|---|
| 66116-001   | Single Channel, Commercial (0 to 70°C) Coaxial Packaging          |
| 66116-002   | Single Channel, Commercial (0 to 70°C) Coaxial Packaging          |
| 66116-003   | Single Channel, Commercial (0 to 70°C) Coaxial Packaging          |
| 66116-001B  | Single Channel, Commercial (0 to 70°C) Bulkhead Packaging         |
| 66116-002B  | Single Channel, Commercial (0 to 70°C) Bulkhead Packaging         |
| 66116-003B  | Single Channel, Commercial (0 to 70°C) Bulkhead Packaging         |
| 66116-101   | Single Channel, 100% screened, (-55 to +125°C) Coaxial Packaging  |
| 66116-102   | Single Channel, 100% screened, (-55 to +125°C) Coaxial Packaging  |
| 66116-103   | Single Channel, 100% screened, (-55 to +125°C) Coaxial Packaging  |
| 66116-101B  | Single Channel, 100% screened, (-55 to +125°C) Bulkhead Packaging |
| 66116-102B  | Single Channel, 100% screened, (-55 to +125°C) Bulkhead Packaging |
| 66116-103B  | Single Channel, 100% screened, (-55 to +125°C) Bulkhead Packaging |
| 66116-201   | Single Channel, full mil-temp, (-55 to +125°C) Coaxial Packaging  |
| 66116-202   | Single Channel, full mil-temp, (-55 to +125°C) Coaxial Packaging  |
| 66116-203   | Single Channel, full mil-temp, (-55 to +125°C) Coaxial Packaging  |
| 66116-201B  | Single Channel, full mil-temp, (-55 to +125°C) Bulkhead Packaging |
| 66116-202B  | Single Channel, full mil-temp, (-55 to +125°C) Bulkhead Packaging |
| 66116-203B  | Single Channel, full mil-temp, (-55 to +125°C) Bulkhead Packaging |