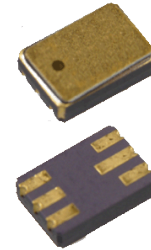


Surface Mount Optically Coupled Isolator

4N22U, 4N23U, 4N24U (TX, TXV)
4N47U, 4N48U, 4N49U (TX, TXV)



Features:

- Surface Mount (SM), Leadless Chip Carrier (LCC)
- 1 kV electrical isolation
- Base contact provided for conventional transistor biasing

Description:

Each isolator in this series consists of an infrared emitting diode and a NPN silicon phototransistor, which are mounted in a hermetically sealed Surface Mount, 6 Pin package. Devices are designed for military and/or harsh environments.

The 4N22U, 4N23U and 4N24U (TX, TXV) devices are processed to MIL-PRF-19500/486. The 4N47U, 4N48U and 4N49U (TX, TXV) devices are processed to MIL-PRF-19500/548.

Please contact your local representative or OPTEK for more information.

Applications:

- Military equipment
- High-Reliability environments
- High voltage isolation between input and output
- Electrical isolation in dirty environments
- Industrial equipment
- Medical equipment
- Office equipment

| Ordering Information | | | | |
|----------------------|------------------------|-------------------------------|-----------------------------|---------------------------|
| Part Number | Isolation Voltage (kV) | I _F (mA) Typ / Max | V _{CE} (Volts) Max | Processing MIL-PRF-195000 |
| 4N22U | 1 | 10 / 40 | 35 | 486 |
| 4N22UTX | | | | |
| 4N22UTXV | | | | |
| 4N23U | | | | |
| 4N23UTX | | | | |
| 4N23UTXV | | | | |
| 4N24U | | | 45 | 548 |
| 4N24UTX | | | | |
| 4N24UTXV | | | | |
| 4N47U | | | | |
| 4N47UTX | | | | |
| 4N47UTXV | | | | |
| 4N48U | | | | |
| 4N48UTX | | | | |
| 4N48UTXV | | | | |
| 4N49U | | | | |
| 4N49UTX | | | | |
| 4N49UTXV | | | | |

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

Surface Mount Optically Coupled Isolator

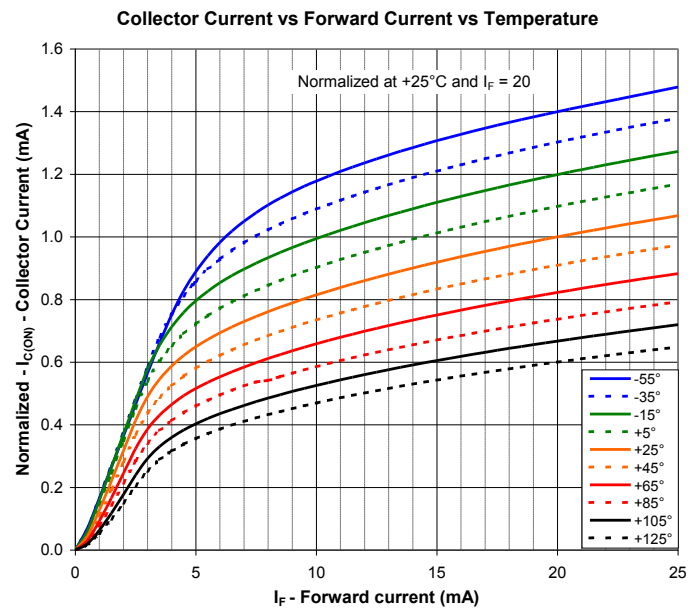
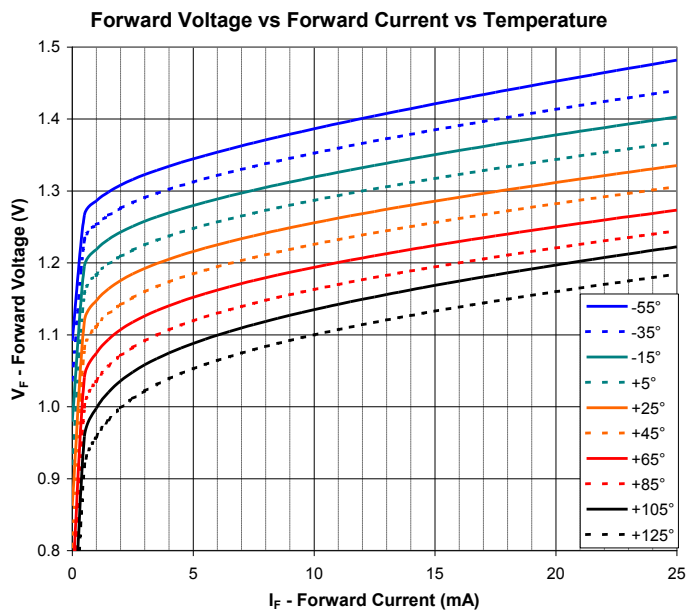
4N22U, 4N23U, 4N24U (TX, TXV)
4N47U, 4N48U, 4N49U (TX, TXV)



| Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted) | |
|--|-------------------|
| Storage Temperature | -65° C to +150° C |
| Operating Temperature | -55° C to +125° C |
| Input-to-Output Isolation Voltage ⁽¹⁾ | ± 1 kVDC |
| Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron) ⁽²⁾ | 260° C |
| Input Diode | |
| Forward DC Current ⁽³⁾ | 50 mA |
| Reverse DC Voltage | 2 V |
| Power Dissipation ⁽⁴⁾ | 100 mW |
| Output Photosensor | |
| Collector-Emitter Voltage | 35 V |
| Emitter-Collector Voltage | 7.0 V |
| Power Dissipation ⁽⁵⁾ | 300 mW |

Notes:

- (1) Measured with input leads shorted together and output leads shorted together. Typical input/output capacitance is 0.06 pF.
- (2) RMA flux is recommended. The duration can be extended to 10 seconds maximum when flow soldering.
- (3) Derate linearly 0.67 mW/°C above 65°C.
- (4) Derate linearly 0.83 mW/°C above 25°C.
- (5) Derate linearly 1.67 mW/°C above 25°C.



General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

Surface Mount Optically Coupled Isolator

4N22U, 4N23U, 4N24U (TX, TXV)
4N47U, 4N48U, 4N49U (TX, TXV)



Electrical Characteristics (T_A = 25° C unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|--------|-----------|-----|-----|-----|-------|-----------------|
|--------|-----------|-----|-----|-----|-------|-----------------|

Input LED

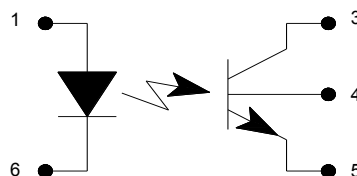
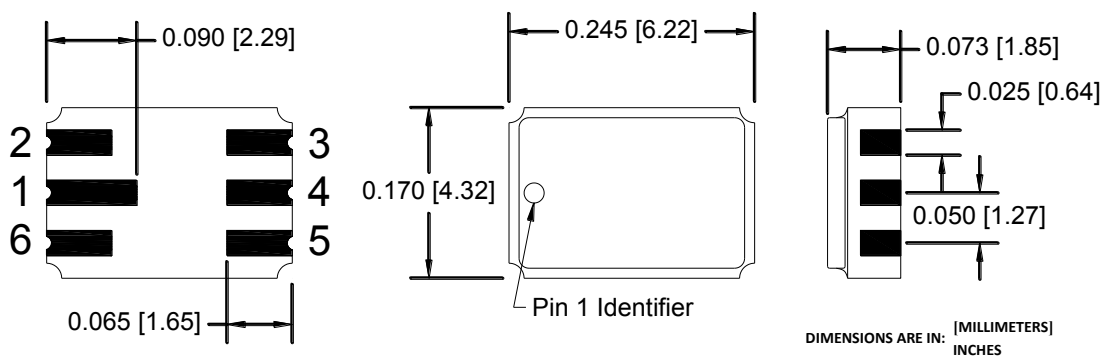
| | | | | | | |
|----------------|-------------------------------|------|---|------|----|---|
| V _F | Forward Voltage | | | | | |
| | 4N22U, 4N23U, 4N24U (TX, TXV) | 0.80 | - | 1.30 | | I _F = 10.0 mA |
| | 4N22U, 4N23U, 4N24U (TX, TXV) | 1.00 | - | 1.50 | | I _F = 10.0 mA, T _A = -55° C ⁽¹⁾ |
| | 4N22U, 4N23U, 4N24U (TX, TXV) | 0.70 | - | 1.20 | V | I _F = 10.0 mA, T _A = -100° C ⁽¹⁾ |
| | 4N47U, 4N48U, 4N49U (TX, TXV) | 0.80 | - | 1.50 | | I _F = 10.0 mA |
| | 4N47U, 4N48U, 4N49U (TX, TXV) | 1.00 | - | 1.70 | | I _F = 10.0 mA, T _A = -55° C ⁽¹⁾ |
| | 4N47U, 4N48U, 4N49U (TX, TXV) | 0.70 | - | 1.30 | | I _F = 10.0 mA, T _A = -100° C ⁽¹⁾ |
| I _R | Reverse Current | - | - | 100 | μA | V _R = 2.0 V |

Output Phototransistor

| | | | | | | |
|----------------------|---|----------|----------|------------|----------|---|
| V _{(BR)CEO} | Collector-Emitter Breakdown Voltage 4N22U Series 4N47U Series | 35 40 | 80 90 | - - | V | I _C = 100 μA, I _F = 0 |
| V _{(BR)ECO} | Emitter-Collector Breakdown Voltage 4N22U Series 4N47U Series | 4 7 | 6 10 | - - | V | I _E = 100 μA, I _F = 0 |
| I _{CEO} | Collector-Emitter Dark Current | - - | 20 - | 100 100 | nA μA | V _{CE} = 20 V, I _F = 0 I _B = 0 T _A = 25° C V _{CE} = 20 V, I _F = 0 I _B = 0 T _A = 100° C |
| V _{CE(SAT)} | Collector Saturation Voltage | - | 0.2 | 0.3 | V | I _F = 20 mA, I _C = 2 mA |

Notes:

- (1) Measured with input leads shorted together and output leads shorted together. Typical input/output capacitance is 0.06 pF.



| Pin # | LED | Pin # | Transistor |
|-------|---------|-------|------------|
| 2 | N/A | 3 | Collector |
| 1 | Anode | 4 | Base |
| 6 | Cathode | 5 | Emitter |

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

Surface Mount Optically Coupled Isolator

4N22U, 4N23U, 4N24U (TX, TXV)
4N47U, 4N48U, 4N49U (TX, TXV)



| SYMBOL | PARAMETER | PART NUMBER | MIN | TYP | MAX | UNITS | TEST CONDITIONS | | |
|----------------|-------------------------------|-------------|-----------|-------|---|--|---|----|--|
| Coupled | | | | | | | | | |
| I_C/I_F | DC Current Transfer Ratio | 4N22U | 25 | - | - | % | $I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V}$ | | |
| | | 4N23U | 60 | - | - | | | | |
| | | 4N24U | 100 | - | - | % | $I_F = 2 \text{ mA}, V_{CE} = 5 \text{ V}$ | | |
| | | 4N47U | 50 | - | - | | | | |
| | | 4N48U | 100 | - | - | | | | |
| | | 4N49U | 200 | - | - | | | | |
| $I_{C(ON)}$ | On-State Collector Current | 4N22U | 0.15 | - | - | mA | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = 25^\circ\text{C}$ | | |
| | | | 2.50 | - | - | | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = 25^\circ\text{C}$ | | |
| | | | 1.00 | - | - | | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = -55^\circ\text{C}$ | | |
| | | | | 4N23U | 0.2 | - | - | mA | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = 25^\circ\text{C}$ |
| | | | | | 6.0 | - | - | | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = 25^\circ\text{C}$ |
| | | | | | 2.5 | - | - | | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = -55^\circ\text{C}$ |
| | | | | 4N24U | 2.5 | - | - | mA | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = 100^\circ\text{C}$ |
| | | 0.4 | - | | - | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = 25^\circ\text{C}$ | | | |
| | | 4N47U | 10.0 | - | - | mA | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = 25^\circ\text{C}$ | | |
| | | | 4.0 | - | - | | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = -55^\circ\text{C}$ | | |
| | | 4N48U | 4.0 | - | - | mA | $V_{CE} = 10 \text{ V}, I_B = 0, I_F = 10.0 \text{ mA } T_A = 100^\circ\text{C}$ | | |
| | | | 0.5 | - | - | | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 1.0 \text{ mA } T_A = 25^\circ\text{C}$ | | |
| | | | 0.7 | - | - | | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = -55^\circ\text{C}$ | | |
| | | 4N49U | 0.5 | - | - | mA | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = 100^\circ\text{C}$ | | |
| | | | 1.0 | - | 5.0 | | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 1.0 \text{ mA } T_A = 25^\circ\text{C}$ | | |
| | | 4N49U | 1.4 | - | - | mA | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = -55^\circ\text{C}$ | | |
| | | | 1.0 | - | - | | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = 100^\circ\text{C}$ | | |
| | | 4N49U | 2.0 | - | 10.0 | mA | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 1.0 \text{ mA } T_A = 25^\circ\text{C}$ | | |
| | | | 2.8 | - | - | | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = -55^\circ\text{C}$ | | |
| | | 4N49U | 2.0 | - | - | | $V_{CE} = 5 \text{ V}, I_B = 0, I_F = 2.0 \text{ mA } T_A = 100^\circ\text{C}$ | | |
| $V_{CE(SAT)}$ | Collector Saturation Voltage | 4N22U | - | - | 0.3 | V | $I_C = 2.5 \text{ mA}, I_B = 0, I_F = 20 \text{ mA}$ | | |
| | | 4N23U | - | - | 0.3 | | $I_C = 5.0 \text{ mA}, I_B = 0, I_F = 20 \text{ mA}$ | | |
| | | 4N24U | - | - | 0.3 | | $I_C = 10.0 \text{ mA}, I_B = 0, I_F = 20 \text{ mA}$ | | |
| | | 4N47U | - | - | 0.3 | V | $I_C = 0.5 \text{ mA}, I_B = 0, I_F = 2.0 \text{ mA}$ | | |
| | | 4N48U | - | - | 0.3 | | $I_C = 1.0 \text{ mA}, I_B = 0, I_F = 2.0 \text{ mA}$ | | |
| 4N49U | - | - | 0.3 | | $I_C = 2.0 \text{ mA}, I_B = 0, I_F = 2.0 \text{ mA}$ | | | | |
| h_{FE} | DC Current Gain | 4N22U | 200 | - | - | - | $V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}, I_F = 0 \text{ mA}$ | | |
| | | 4N23U | 300 | - | - | | | | |
| | | 4N24U | 400 | - | - | | | | |
| | | 4N47U | 100 | - | - | | | | |
| | | 4N48U | 100 | - | - | | | | |
| | | 4N49U | 100 | - | - | | | | |
| t_r & t_f | Rise and Fall Time | 4N22U | - | - | 15 | μs | $V_{CC} = 10 \text{ V}, I_F = 10 \text{ mA}, R_L = 100\Omega,$ Pulse width = 100 ms, Duty cycle = 1% | | |
| | | 4N23U | - | - | 15 | | | | |
| | | 4N24U | - | - | 20 | | | | |
| | | 4N47U | - | - | 20 | μs | $V_{CC} = 10 \text{ V}, I_F = 5 \text{ mA}, R_L = 100\Omega,$ Pulse width = 100 ms, Duty cycle = 1% | | |
| | | 4N48U | - | - | 20 | | | | |
| | | 4N49U | - | - | 20 | | | | |
| R_{IO} | Resistance (Input to Output) | | 10^{11} | - | - | Ω | $V_{I-O} = \pm 1,000 \text{ Vdc}$ | | |
| C_{IO} | Capacitance (Input to Output) | | - | - | 5.0 | pF | $V_{I-O} = 0 \text{ Vdc}, f = 1.0 \text{ MHz}$ | | |

General Note
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

Surface Mount Optically Coupled Isolator

4N22U, 4N23U, 4N24U (TX, TXV)
4N47U, 4N48U, 4N49U (TX, TXV)



Electrical Characteristics (T_A = 25°C unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|-------------------------------|--|------------------|------|--|-------|--|
| I _{C(ON)} | On-State Collector Current | | | | | |
| | 4N22U, 4N22U (TX, TXV) | 0.15 | - | - | mA | I _F = 2.0 mA, V _{CE} = 5 V, I _B = 0 |
| | 4N22U, 4N22U (TX, TXV) | 2.50 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0 |
| | 4N22U, 4N22U (TX, TXV) | 1.00 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0, T _A = -55° C ⁽¹⁾ |
| | 4N22U, 4N22U (TX, TXV) | 1.00 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0, T _A = 100° C ⁽¹⁾ |
| | 4N23U, 4N23U (TX, TXV) | 0.20 | - | - | | I _F = 2.0 mA, V _{CE} = 5 V, I _B = 0 |
| | 4N23U, 4N23U (TX, TXV) | 6.00 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0 |
| | 4N23U, 4N23U (TX, TXV) | 2.50 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0, T _A = -55° C ⁽¹⁾ |
| | 4N23U, 4N23U (TX, TXV) | 2.50 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0, T _A = 100° C ⁽¹⁾ |
| | 4N24U, 4N24U (TX, TXV) | 0.40 | - | - | | I _F = 2.0 mA, V _{CE} = 5 V, I _B = 0 |
| | 4N24U, 4N24U (TX, TXV) | 10.0 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0 |
| | 4N24U, 4N24U (TX, TXV) | 4.00 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0, T _A = -55° C ⁽¹⁾ |
| | 4N24U, 4N24U (TX, TXV) | 4.00 | - | - | | I _F = 10.0 mA, V _{CE} = 5 V, I _B = 0, T _A = 100° C ⁽¹⁾ |
| | 4N47U, 4N47U (TX, TXV) | 0.50 | - | - | | I _F = 1.0 mA, V _{CE} = 5.0 V, I _B = 0 |
| | 4N47U, 4N47U (TX, TXV) | 0.70 | - | - | | I _F = 2.0 mA, V _{CE} = 5.0 V, I _B = 0, T _A = -55° C ⁽¹⁾ |
| | 4N47U, 4N47U (TX, TXV) | 0.50 | - | - | | I _F = 2.0 mA, V _{CE} = 5.0 V, I _B = 0, T _A = 100° C ⁽¹⁾ |
| | 4N48U, 4N48U (TX, TXV) | 1.00 | - | 5 | | I _F = 1.0 mA, V _{CE} = 5.0 V, I _B = 0 |
| | 4N48U, 4N48U (TX, TXV) | 1.40 | - | - | | I _F = 2.0 mA, V _{CE} = 5.0 V, I _B = 0, T _A = -55° C ⁽¹⁾ |
| | 4N48U, 4N48U (TX, TXV) | 1.00 | - | - | | I _F = 2.0 mA, V _{CE} = 5.0 V, I _B = 0, T _A = 100° C ⁽¹⁾ |
| | 4N49U, 4N49U (TX, TXV) | 2.00 | - | 10 | | I _F = 1.0 mA, V _{CE} = 5.0 V, I _B = 0 |
| | 4N49U, 4N49U (TX, TXV) | 2.80 | - | - | | I _F = 2.0 mA, V _{CE} = 5.0 V, I _B = 0, T _A = -55° C ⁽¹⁾ |
| 4N49U, 4N49U (TX, TXV) | 2.00 | - | - | I _F = 2.0 mA, V _{CE} = 5.0 V, I _B = 0, T _A = 100° C ⁽¹⁾ | | |
| I _{CB(ON)} | On-State Collector Base 4N47U, 4N48U, 4N49U (TX, TXV) | 30 | - | - | μA | V _{CB} = 5 V, I _E = 0, I _F = 10 mA |
| V _{CE(SAT)} | Collector-Emitter Saturation Voltage | | | | V | |
| | 4N22U, 4N23U, 4N24U (TX, TXV) | - | - | 0.30 | | I _F = 20 mA, I _C = 2.5 mA, I _B = 0 |
| | 4N22U, 4N23U, 4N24U (TX, TXV) | - | - | 0.30 | | I _F = 20 mA, I _C = 5.0 mA, I _B = 0 |
| | 4N22U, 4N23U, 4N24U (TX, TXV) | - | - | 0.30 | | I _F = 20 mA, I _C = 10.0 mA, I _B = 0 |
| | 4N47U, 4N47U (TX, TXV) | - | - | 0.30 | | I _F = 2.0 mA, I _C = 0.5 mA, I _B = 0 |
| | 4N48U, 4N48U (TX, TXV) | - | - | 0.30 | | I _F = 2.0 mA, I _C = 1.0 mA, I _B = 0 |
| 4N49U, 4N49U (TX, TXV) | - | - | 0.30 | I _F = 2.0 mA, I _C = 2.0 mA, I _B = 0 | | |
| H _{FE} | DC Current Gain | | | | V | |
| | 4N22U, 4N22U (TX, TXV) | 200 | - | - | | V _{CE} = 5.0 V, I _C = 10.0 mA, I _F = 0 mA |
| | 4N23U, 4N23U (TX, TXV) | 300 | - | - | | V _{CE} = 5.0 V, I _C = 10.0 mA, I _F = 0 mA |
| | 4N24U, 4N24U (TX, TXV) | 400 | - | - | | V _{CE} = 5.0 V, I _C = 10.0 mA, I _F = 0 mA |
| 4N47U, 4N48U, 4N49U (TX, TXV) | 100 | - | - | V _{CE} = 5.0 V, I _C = 10.0 mA, I _F = 0 mA | | |
| R _{IO} | Resistance (Input-to-Output) | | | | Ω | |
| | 4N22U, 4N23U, 4N24U (TX, TXV) | 10 ¹¹ | - | - | | V _{I-O} = ± 1,000 VDC ⁽²⁾ |
| 4N47U, 4N48U, 4N49U (TX, TXV) | 10 ¹¹ | - | - | V _{I-O} = ± 1,000 VDC ⁽²⁾ | | |
| C _{IO} | Capacitance (Input-to-Output) | - | - | 5 | pF | V _{I-O} = 0 V, f = 1.0 MHz ⁽²⁾ |

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.