

# Optoisolator

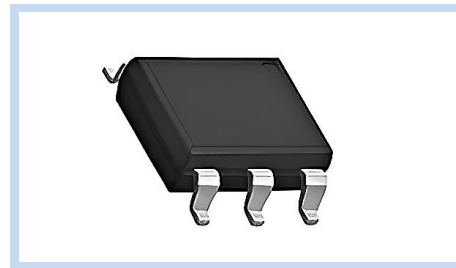
## 1CH DC BJT SMD-6

OPI150DCB4N28

MERITEK

### FEATURE

- Current Transfer Ratio: 10% Min
- Isolation Voltage: 5000 Vrms
- High CTR with Low Input Current
- Low Coupling Capacitance
- Application: Programmable Controller, Relay Contact Monitor, HF Power Supply Feedback Control, AC Line/Digital Logic, Telegraph Line Receiver
- In Accordance with Safety Class UL1577 Standard

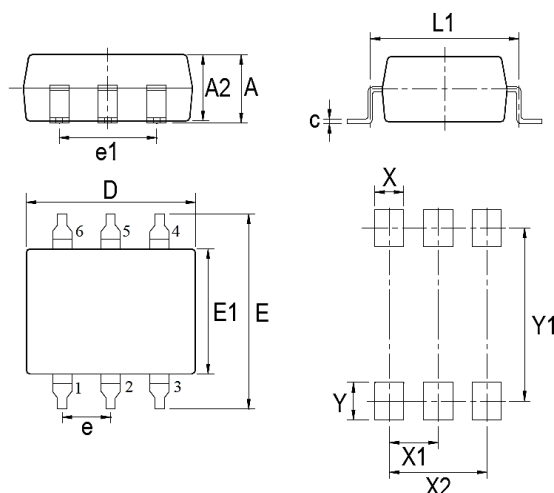


### MAXIMUM RATINGS

| Parameter                        |                                        | Symbol    | Value    | Unit           |
|----------------------------------|----------------------------------------|-----------|----------|----------------|
| Input Forward Current            |                                        | $I_F$     | 60       | mA             |
| Input Peak Forward Current       | Pulse width $t=10\mu s$                | $I_{FP}$  | 1        | A              |
| Input Reverse Voltage            |                                        | $V_R$     | 6        | V              |
| Input Power Dissipation          | $T_A=25^\circ C$                       | $P_I$     | 100      | mW             |
|                                  | Derating Factor (above $100^\circ C$ ) |           | 3.8      | mW/ $^\circ C$ |
| Output Power Dissipation         | $T_A=25^\circ C$                       | $P_C$     | 150      | mW             |
|                                  | Derating Factor (above $100^\circ C$ ) |           | 9.0      | mW/ $^\circ C$ |
| Output Collector-Emitter Voltage |                                        | $V_{CEO}$ | 80       | V              |
| Output Collector-Base Voltage    |                                        | $V_{CBO}$ | 80       | V              |
| Output Emitter-Collector Voltage |                                        | $V_{ECO}$ | 7        | V              |
| Output Emitter-Base Voltage      |                                        | $V_{EBO}$ | 7        | V              |
| Isolation Voltage                | AC for 60sec, RH40~60%                 | $V_{ISO}$ | 5000     | $V_{RMS}$      |
| Total Power Dissipation          |                                        | $P_T$     | 200      | mW             |
| Operating Temperature Range      |                                        | $T_{Opr}$ | -55~+110 | $^\circ C$     |
| Storage Temperature Range        |                                        | $T_{Stg}$ | -55~+125 | $^\circ C$     |
| Soldering Temperature            |                                        | $T_{SOL}$ | 260      | $^\circ C$     |

### DIMENSIONS

| Item | Min (mm) | Max (mm) | Pin Layout                                                                                             |
|------|----------|----------|--------------------------------------------------------------------------------------------------------|
| A    | 4.00     | 4.60     | <p>1. LED Anode      4. Emitter<br/>2. LED Cathode    5. Collector<br/>3. N/A              6. Base</p> |
| A2   | 3.20     | 3.80     |                                                                                                        |
| c    |          | 0.25     |                                                                                                        |
| D    | 6.82     | 7.42     |                                                                                                        |
| E    | --       | 10.30    |                                                                                                        |
| E1   | 6.20     | 6.80     |                                                                                                        |
| e    |          | 2.54     |                                                                                                        |
| e1   |          | 5.08     |                                                                                                        |
| L1   |          | 7.62     |                                                                                                        |
| X    |          | 1.71     |                                                                                                        |
| X1   |          | 2.54     |                                                                                                        |
| X2   |          | 5.08     |                                                                                                        |
| Y    |          | 1.83     |                                                                                                        |
| Y1   |          | 9.24     |                                                                                                        |



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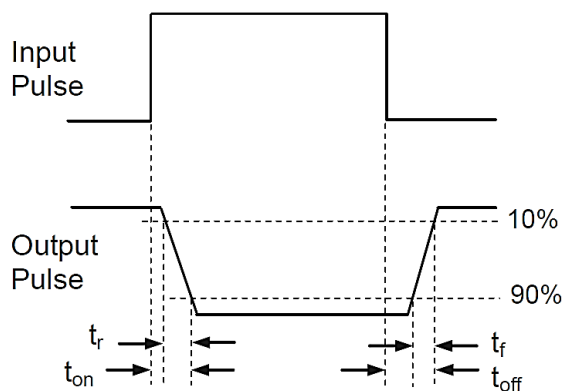
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### ELECTRICAL CHARACTERISTICS

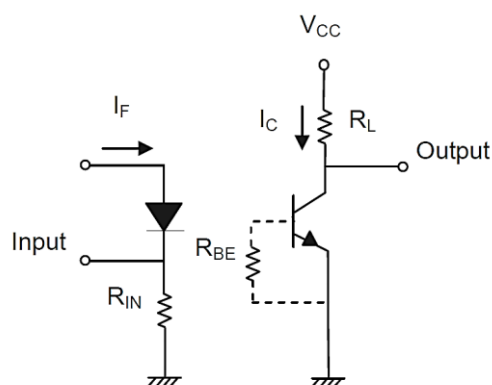
| Input Characteristics                | Conditions                                          | Symbol        | Min       | Typ. | Max | Unit          |
|--------------------------------------|-----------------------------------------------------|---------------|-----------|------|-----|---------------|
| Forward Voltage                      | $I_F=10\text{mA}$                                   | $V_F$         | --        | 1.2  | 1.5 | V             |
| Reverse Current                      | $V_R=6\text{V}$                                     | $I_R$         | --        | --   | 10  | $\mu\text{A}$ |
| Input Capacitance                    | $V=0, f=1\text{MHz}$                                | $C_{in}$      | --        | 30   | --  | pF            |
| Output Characteristics               | Conditions                                          | Symbol        | Min       | Typ. | Max | Unit          |
| Collector-Base Dark Current          | $V_{CB}=10\text{V}$                                 | $I_{CBO}$     | --        | --   | 20  | nA            |
| Collector-Emitter Dark Current       | $V_{CE}=10\text{V}, I_F=0\text{mA}$                 | $I_{CEO}$     | --        | --   | 50  | nA            |
| Collector-Emitter Breakdown Voltage  | $I_C=1\text{mA}$                                    | $BV_{CEO}$    | 80        | --   | --  | V             |
| Collector-Base Breakdown Voltage     | $I_C=0.1\text{mA}$                                  | $BV_{CBO}$    | 80        | --   | --  | V             |
| Emitter-Collector Breakdown Voltage  | $I_E=0.1\text{mA}$                                  | $BV_{ECO}$    | 7         | --   | --  | V             |
| Emitter-Base Breakdown Voltage       | $I_E=0.1\text{mA}$                                  | $BV_{EBO}$    | 7         | --   | --  | V             |
| Collector-Emitter Capacitance        | $V_{CE}=0\text{V}, f=1\text{MHz}$                   | $C_{CE}$      | --        | 8    | --  | pF            |
| Coupled Characteristics              | Conditions                                          | Symbol        | Min       | Typ. | Max | Unit          |
| Current Transfer Ratio               | $I_F=\pm 10\text{mA}, V_{CE}=10\text{V}$            | CTR           | 10        | --   | --  | %             |
| Collector-Emitter Saturation Voltage | $I_F=50\text{mA}, I_C=2\text{mA}$                   | $V_{CE(SAT)}$ | --        | --   | 0.5 | V             |
| Isolation Resistance                 | $V_{IO}=500\text{V}_{DC}$                           | $R_{ISO}$     | $10^{11}$ | --   | --  | $\Omega$      |
| Isolation Capacitance                | $V=0\text{V}, f=1\text{MHz}$                        | $C_{ISO}$     | --        | 0.2  | --  | pF            |
| Turn-on Time                         | $V_{CC}=10\text{V}, I_F=10\text{mA}, R_L=100\Omega$ | $t_{on}$      | --        | 3    | 10  | $\mu\text{s}$ |
| Turn-off Time                        | $V_{CC}=10\text{V}, I_F=10\text{mA}, R_L=100\Omega$ | $t_{off}$     | --        | 3    | 10  | $\mu\text{s}$ |

Note:  $T_A=25^\circ\text{C}$  unless otherwise noted.

Switching Time Waveform

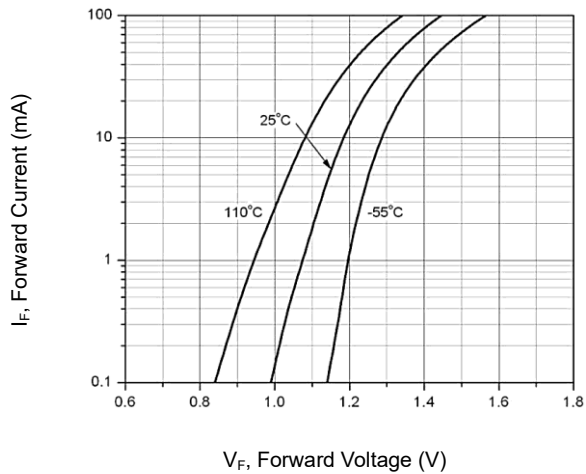


Switching Test Circuit

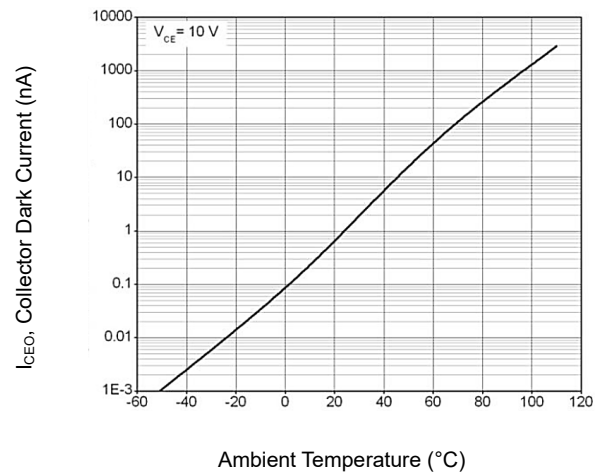


### CHARACTERISTIC CURVES

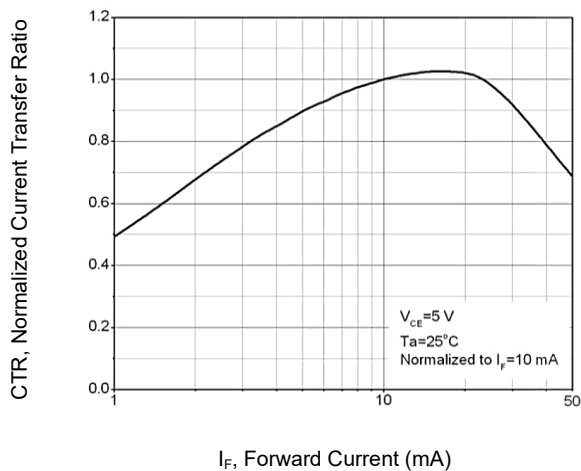
Forward Current vs. Forward Voltage



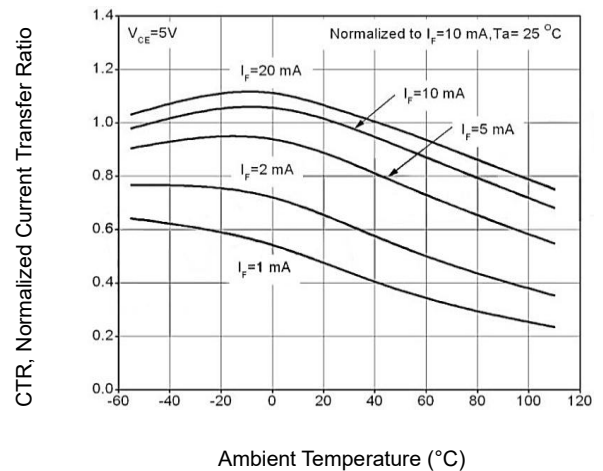
Collector Dark Current vs. Temperature



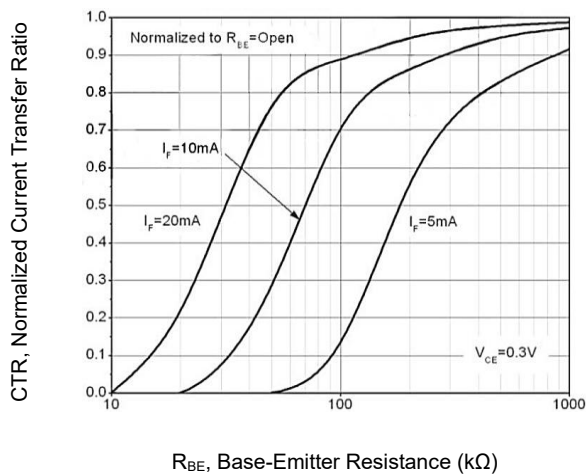
Current Transfer Ratio vs. Forward Current



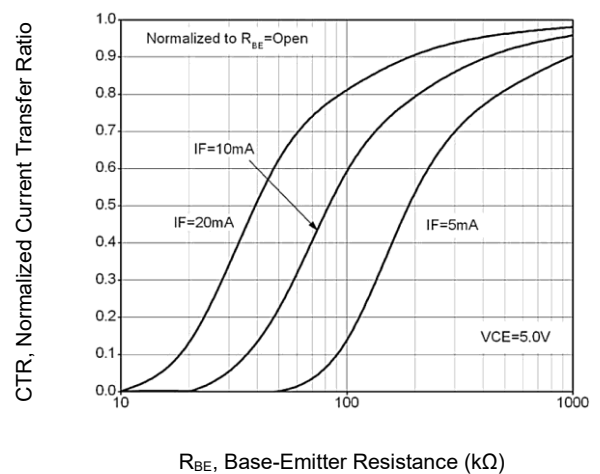
Relative Current Transfer Ratio vs Temperature



Current Transfer Ratio (Saturated) vs. Base-Emitter Resistance

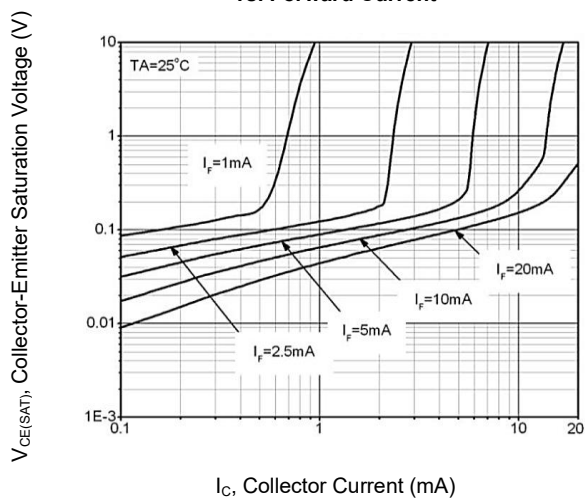


Current Transfer Ratio (Unsaturated) vs. Base-Emitter Resistance

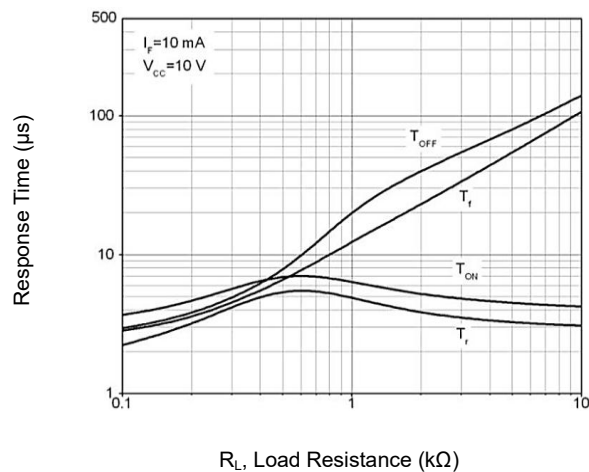


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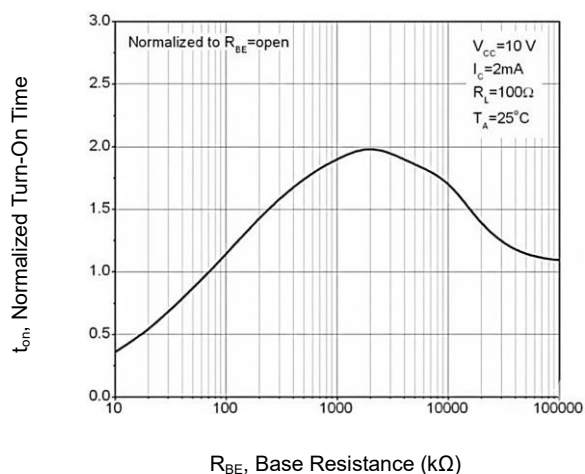
Collector-Emitter Saturation Voltage  
vs. Forward Current



Response Time vs. Load Resistance



Turn-On Time vs. Base-Emitter Resistance



Turn-Off Time vs. Base-Emitter Resistance

