



| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) | | | | |
|---|--|-------------------|--------------------|------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| INPUT | | | | |
| Reverse voltage | | V _R | 6 | V |
| Forward current | | I _F | 60 | mA |
| Surge current | t ≤ 10 μs | I _{FSM} | 2.5 | A |
| Power dissipation | | P _{diss} | 70 | mW |
| OUTPUT | | | | |
| Collector emitter breakdown voltage | | V _{CEO} | 70 | V |
| Emitter base breakdown voltage | | V _{EBO} | 7 | V |
| Collector current | | I _C | 50 | mA |
| Collector peak current | t _p /T = 0.5, t _p ≤ 10 ms | I _{CM} | 100 | mA |
| Output power dissipation | | P _{diss} | 150 | mW |
| COUPLER | | | | |
| Isolation test voltage | | V _{ISO} | 5000 | V _{RMS} |
| Creepage distance | | | ≥ 7 | mm |
| Clearance distance | | | ≥ 7 | mm |
| Isolation thickness between emitter and detector | | | ≥ 0.4 | mm |
| Comparative tracking index | DIN IEC 112/VDE0303, part 1 | | ≥ 175 | |
| Isolation resistance | V _{IO} = 500 V, T _{amb} = 25 °C | R _{IO} | ≥ 10 ¹² | Ω |
| | V _{IO} = 500 V, T _{amb} = 100 °C | R _{IO} | ≥ 10 ¹¹ | Ω |
| Storage temperature | | T _{stg} | - 55 to + 150 | °C |
| Operating temperature | | T _{amb} | - 55 to + 100 | °C |
| Junction temperature | | T _j | 100 | °C |
| Soldering temperature ⁽¹⁾ | 2 mm from case, ≤ 10 s | T _{slid} | 260 | °C |

Notes

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.
- ⁽¹⁾ Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

| ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | | |
|---|--|------|----------------------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| INPUT | | | | | | | |
| Forward voltage ⁽¹⁾ | I _F = 50 mA | | V _F | | 1.36 | 1.5 | V |
| Reverse current ⁽¹⁾ | V _R = 3.0 V | | I _R | | 0.1 | 100 | μA |
| Capacitance | V _R = 0 V | | C _O | | 25 | | pF |
| OUTPUT | | | | | | | |
| Collector base breakdown voltage ⁽¹⁾ | I _C = 100 μA | | BV _{CBO} | 70 | | | V |
| Collector emitter breakdown voltage ⁽¹⁾ | I _C = 1.0 mA | | BV _{CEO} | 30 | | | V |
| Emitter collector breakdown voltage ⁽¹⁾ | I _E = 100 μA | | BV _{ECO} | 7 | | | V |
| I _{CEO} (dark) ⁽¹⁾ | V _{CE} = 10 V, (base open) | 4N25 | | | 5 | 50 | nA |
| | | 4N26 | | | 5 | 50 | nA |
| | | 4N27 | | | 5 | 50 | nA |
| | | 4N28 | | | 10 | 100 | nA |
| I _{CBO} (dark) ⁽¹⁾ | V _{CB} = 10 V, (emitter open) | | | | 2.0 | 20 | nA |
| Collector emitter capacitance | V _{CE} = 0 | | C _{CE} | | 6.0 | | pF |
| COUPLER | | | | | | | |
| Isolation test voltage ⁽¹⁾ | Peak, 60 Hz | | V _{IO} | 5000 | | | V |
| Saturation voltage, collector emitter | I _{CE} = 2.0 mA, I _F = 50 mA | | V _{CE(sat)} | | | 0.5 | V |
| Resistance, input output ⁽¹⁾ | V _{IO} = 500 V | | R _{IO} | 100 | | | GΩ |
| Capacitance, input output | f = 1 MHz | | C _{IO} | | 0.5 | | pF |

Notes

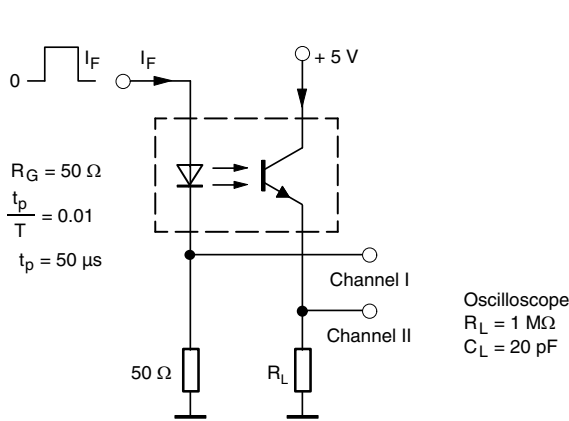
- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.
- ⁽¹⁾ JEDEC registered values are 2500 V, 1500 V, 1500 V and 500 V for the 4N25, 4N26, 4N27, and 4N28 respectively.

| CURRENT TRANSFER RATIO ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|--|------|------------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| I_C/I_F | $V_{CE} = 10\text{ V}, I_F = 10\text{ mA}$ | 4N25 | CTR_{DC} | 20 | 50 | | % |
| | | 4N26 | CTR_{DC} | 20 | 50 | | % |
| | | 4N27 | CTR_{DC} | 10 | 30 | | % |
| | | 4N28 | CTR_{DC} | 10 | 30 | | % |

Note

- Indicates JEDEC registered values.

| SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|--|--------|------|------|------|---------------|--|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT | |
| Rise time | $V_{CC} = 5\text{ V}, I_F = 10\text{ mA}, R_L = 100\text{ }\Omega$ | t_r | | 2.0 | | μs | |
| Fall time | $V_{CC} = 5\text{ V}, I_F = 10\text{ mA}, R_L = 100\text{ }\Omega$ | t_f | | 2.0 | | μs | |



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Fig. 1 - Test Circuit, Non-Saturated Operation

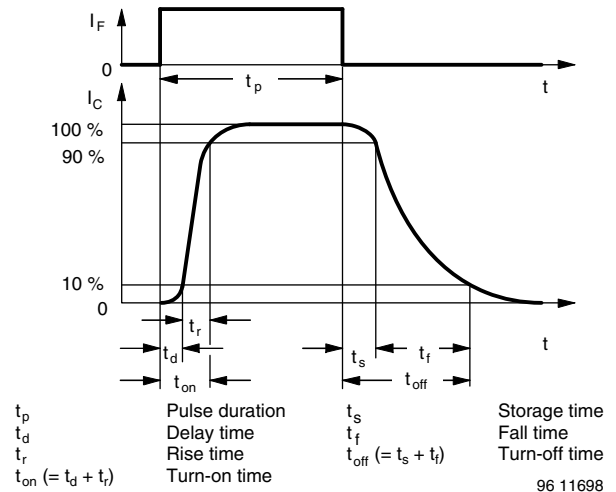


Fig. 2 - Switching Times

TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

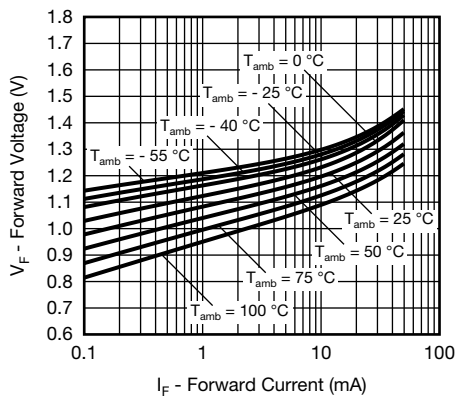


Fig. 3 - Forward Voltage vs. Forward Current

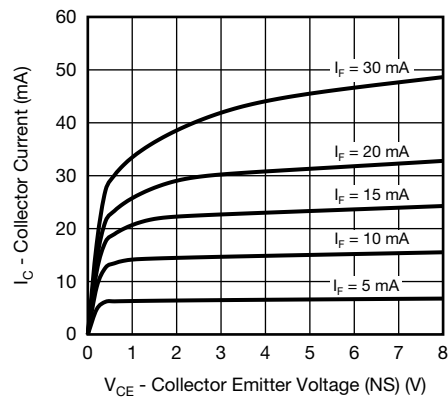


Fig. 4 - Collector Current vs. Collector Emitter Voltage (NS)

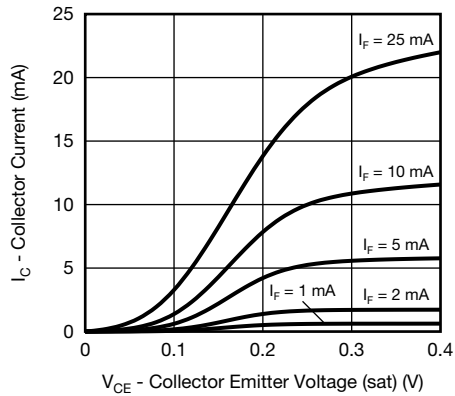


Fig. 5 - Collector Current vs. Collector Emitter Voltage (sat)

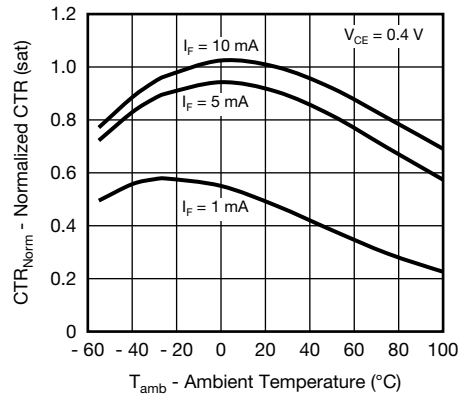


Fig. 8 - Normalized CTR (sat) vs. Ambient Temperature

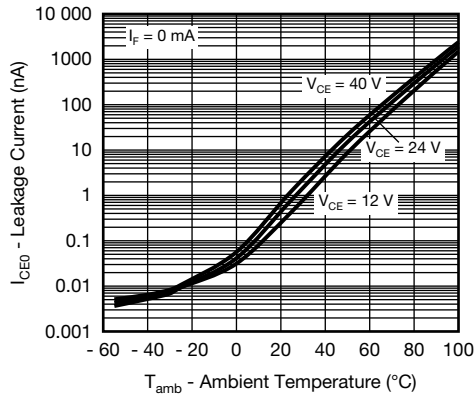


Fig. 6 - Leakage Current vs. Ambient Temperature

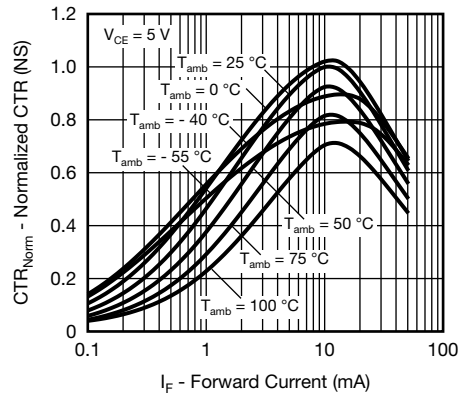


Fig. 9 - Normalized CTR (NS) vs. Forward Current

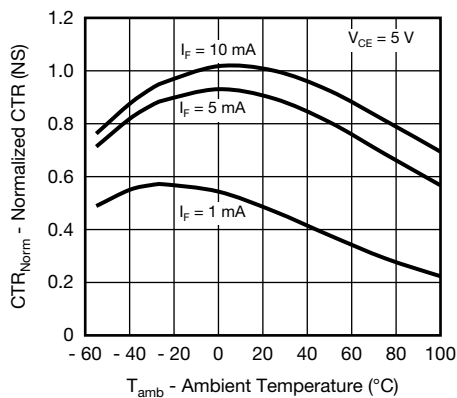


Fig. 7 - Normalized CTR (NS) vs. Ambient Temperature

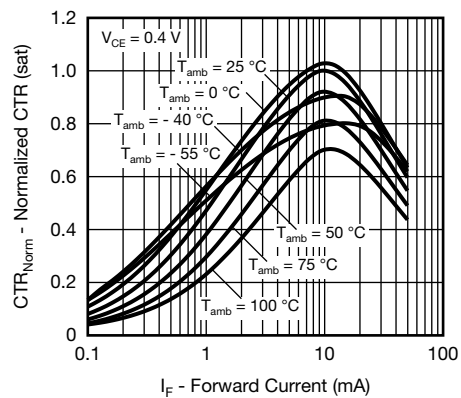


Fig. 10 - Normalized CTR (sat) vs. Forward Current



Fig. 11 - CTR Frequency vs. Phase Angle



Fig. 12 - CTR Frequency vs. Collector Current



Fig. 13 - Switching Time vs. Load Resistance



PACKAGE DIMENSIONS in millimeters



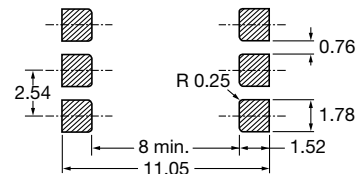
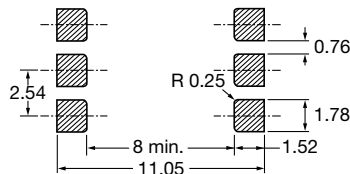
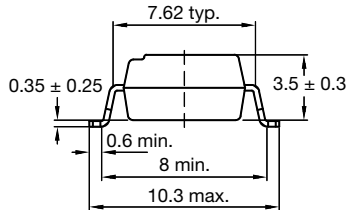
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Option 6

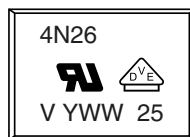
Option 7

Option 9



20802-34

PACKAGE MARKING



Notes

- VDE logo is only marked on option 1 parts. Option information is not marked on the part.
- Tape and reel suffix (T) is not part of the package marking.



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