



IS281 (Compact Range)



APPROVALS

UL Approved File number E91321 THP

DESCRIPTION

The IS281 is an optically coupled isolator consisting of an infrared light emitting diode and an NPN silicon photo transistor. It belongs to Isocom's Compact range of opto-couplers

FEATURES

- Low profile package (half pitch)
- AC Isolation test voltage 3750V_{RMS}
- Low coupling capacitance typically 0.3pF
- CTR selections available
- Wide temperature range
- Lead free
- Halogen Free

APPLICATIONS

- Power Supply Feedback Voltage/Current
- Industrial system controllers
- Measuring instruments
- Signal transmission between systems of different potentials and impedance

ORDER INFORMATION

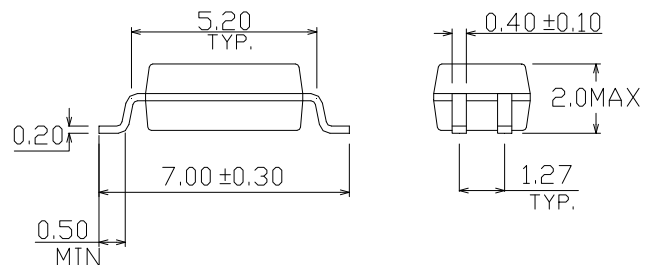
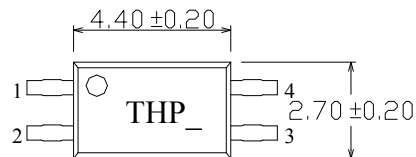
- Available in Tape and Reel with 1000 & 5000 pieces per reel

MARKING INFORMATION

Please note that the device will be marked with the generic part number "THP*" the date code will also be marked on the device.

* Denotes internal binning identification

Pin 1 Anode Pin 4 Collector
Pin 2 Cathode Pin 3 Emitter



ABSOLUTE MAXIMUM RATINGS

Input Diode

| | |
|------------------------|----------|
| Forward Current | 60mA |
| Reverse Voltage | 6V |
| Power dissipation | 70mW |
| Derating Factor > 90°C | 2mW / °C |

Output Transistor

| | |
|------------------------------|------------|
| Collector to Emitter Voltage | 80V |
| Emitter to Collector Voltage | 7V |
| Collector Current | 50mA |
| Power Dissipation | 150mW |
| Derating Factor > 70°C | 3.1mW / °C |

Total Package

| | |
|------------------------|----------------------|
| Isolation test Voltage | 3750V _{RMS} |
| Operating Temperature | -55 to 110 C |
| Storage Temperature | -55 to 150 C |

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ELECTRICAL CHARACTERISTICS

Ambient Temperature = 25°C unless otherwise specified

INPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------|----------|------------------------------------|-----|------|------|---------------|
| Forward Voltage | V_F | $I_F = 20\text{mA}$ | | 1.20 | 1.40 | V |
| Reverse Leakage | I_R | $V_R = 4\text{V}$ | | | 10 | μA |
| Input Capacitance | C_{in} | $V = 0\text{V}, f = 1 \text{ KHz}$ | | 30 | 250 | pF |

OUTPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------------------|------------|---|-----|------|-----|------|
| Collector—Emitter breakdown Voltage | BV_{CEO} | $I_C = 100\mu\text{A}$ | 80 | | | V |
| Emitter—Collector breakdown Voltage | BV_{ECO} | $I_E = 100\mu\text{A}$ | 7 | | | V |
| Collector dark Current | I_{CEO} | $V_{CE} = 20\text{V}, I_F = 0\text{mA}$ | | | 100 | nA |

COUPLED

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|-------------|---|---|------|---|---------------|
| Current transfer ratio | CTR | $I_F = 5\text{mA}, V_{CE} = 5\text{V}$ Rank A B C D E F GR GB | 50 80 130 200 300 100 150 100 100 | | 600 160 260 400 600 200 300 300 600 | % |
| Collector—Emitter saturation Voltage | V_{CEsat} | $I_F = 10\text{mA}, I_C = 1\text{mA}$ | | 0.1 | 0.2 | V |
| Input to output isolation Voltage | V_{ISO} | See note 1 | 3750 | | | V_{RMS} |
| Output rise time | t_r | $V_{ce} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$ | | 5.0 | 18 | μS |
| Output fall time | t_f | $V_{ce} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$ | | 3.0 | 18 | μS |
| Cut off frequency | f_c | $I_F = 10\text{mA}, V_{CE} = 5\text{V}, R_L = 100\Omega$ | | 100 | | kHz |
| Coupling Capacitance | C_k | $f = 1 \text{ MHz}$ | | 0.3 | | pF |

Note 1 Measured with input leads shorted together and output leads shorted together



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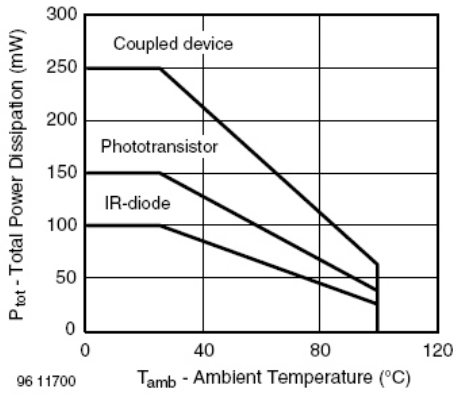


Figure 4. Total Power Dissipation vs. Ambient Temperature

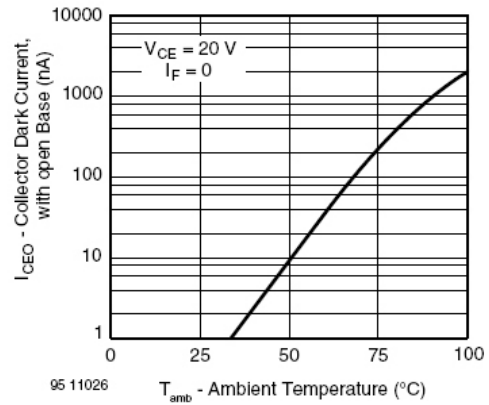


Figure 7. Collector Dark Current vs. Ambient Temperature

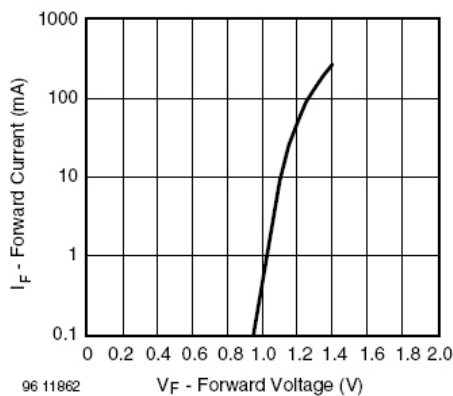


Figure 5. Forward Current vs. Forward Voltage

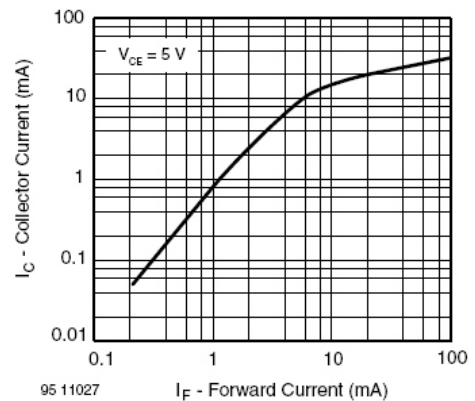


Figure 8. Collector Current vs. Forward Current

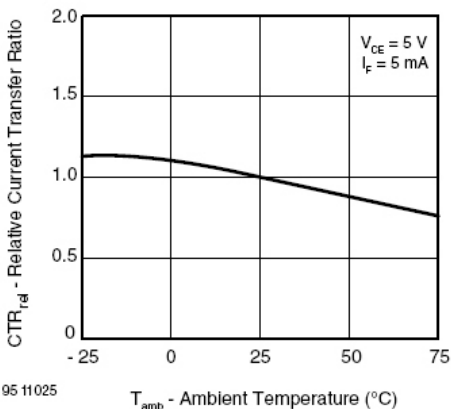


Figure 6. Relative Current Transfer Ratio vs. Ambient Temperature

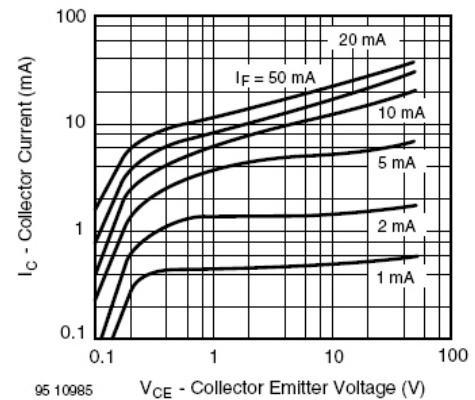


Figure 9. Collector Current vs. Collector Emitter Voltage



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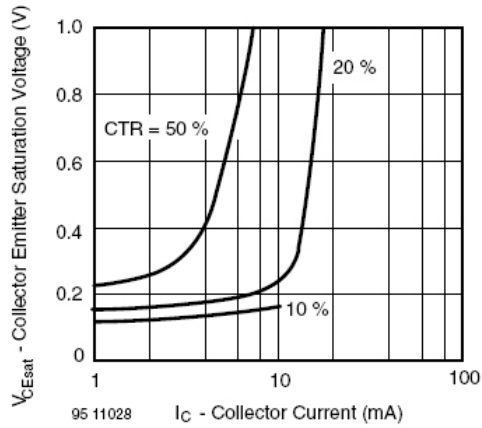


Figure 10. Collector Emitter Saturation Voltage vs. Collector Current

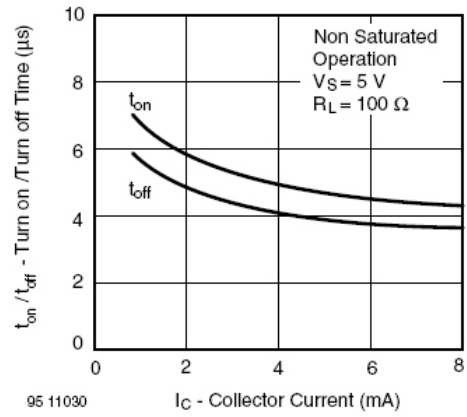


Figure 13. Turn on/off Time vs. Collector Current

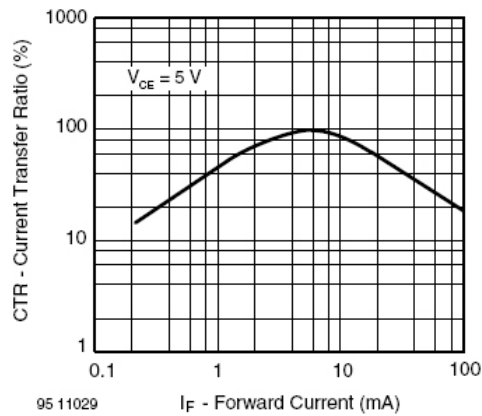


Figure 11. Current Transfer Ratio vs. Forward Current

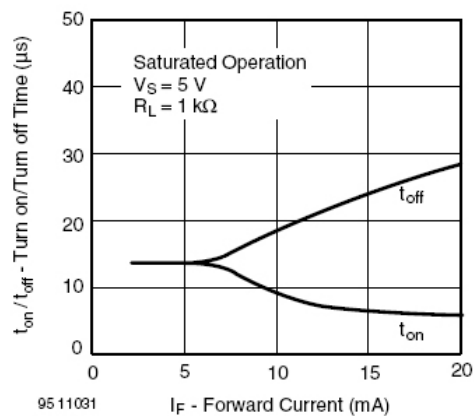


Figure 12. Turn on/off Time vs. Forward Current

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