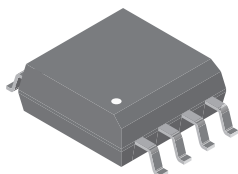
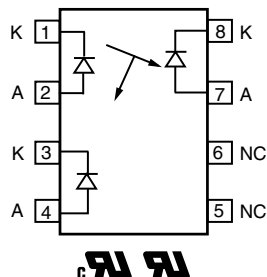


Linear Optocoupler for Optical DAA in Telecommunications, High Performance



i179028



FEATURES

- 2 mm high SMD package
- High sensitivity (K1) at low operating LED current
- Couples AC and DC signals
- Low input-output capacitance
- Isolation voltage, 3000 V_{RMS}
- Low distortion
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT
GREEN
(5-2008)

DESCRIPTION

The IL350, IL358 family of linear optocoupler consist of an IRLED optically coupled to two photodiodes. The emitter mechanically faces both diodes enabling them to receive approximately an equal amount of infrared light. The diodes produce a proportional amount of photocurrents. The ratio of the photocurrents stays constant with high accuracy when either the LED current changes or the ambient temperature changes. Thus one can control the output diode current optically by controlling the input photodiode current.

The IL350, IL358 optocouplers can be used with the aid of operational amplifiers in closed loop conditions to achieve highly linear and electrically isolated AC and or DC signal amplifiers.

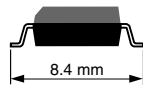
APPLICATIONS

- Optical DAA for V.34 FAX/modem PCMCIA cards
- Digital telephone line isolation

AGENCY APPROVALS

- UL file no. E52744 system code S
- cUL tested to CSA 22.2 bulletin 5A

ORDERING INFORMATION

| <div><div><div>I</div><div>L</div><div>3</div><div>5</div><div>#</div></div><div>PART NUMBER</div></div> | | | | | <div><div><div>T</div></div><div>TAPE AND REEL</div></div> | <div><div>SOP-#</div><div></div></div> |
|--|-----------------------|-----------------------|-----------------------|-----------------------|--|---|
| AGENCY CERTIFIED/PACKAGE | | K1 BIN | | K3 BIN | | |
| UL, cUL | 0.003 | 0.008 | 0.557 to 1.681 | 0.690 to 1.311 | | |
| SOP-8 | IL350T ⁽¹⁾ | IL358T ⁽¹⁾ | IL350T ⁽¹⁾ | IL358T ⁽¹⁾ | | |

Note

⁽¹⁾ Also available in tubes, do not put T on the end.

**ABSOLUTE MAXIMUM RATINGS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|---------------------------------|---|------------|----------------|-----------|
| INPUT | | | | |
| Reverse voltage | | V_R | 3 | V |
| Forward current | | I_F | 30 | mA |
| Surge current | Pulse width < 10 ms | I_{FSM} | 150 | mA |
| Power dissipation | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | P_{diss} | 150 | mW |
| Derate linearly from 25 °C | | | 2 | mW/°C |
| OUTPUT | | | | |
| Reverse voltage | | V_R | 15 | V |
| Power dissipation | | P_{diss} | 50 | mW |
| Derate linearly from 25 °C | | | 0.65 | mW/°C |
| Junction temperature | | T_j | 100 | °C |
| COUPLER | | | | |
| Isolation test voltage | $t = 1\text{ s}$ | V_{ISO} | 3000 | V_{RMS} |
| Total package power dissipation | | P_{tot} | 250 | mW |
| Derate linearly from 25 °C | | | 2.8 | mW/°C |
| Storage temperature range | | T_{stg} | - 40 to + 150 | °C |
| Operating temperature | | T_{amb} | 75 | °C |
| Lead soldering time at 260 °C | | | 10 | s |
| Isolation resistance | $V_{IO} = 500\text{ V}$, $T_{amb} = 25\text{ }^{\circ}\text{C}$ | R_{IO} | $\geq 10^{12}$ | Ω |
| | $V_{IO} = 500\text{ V}$, $T_{amb} = 100\text{ }^{\circ}\text{C}$ | R_{IO} | $\geq 10^{11}$ | Ω |

Note

- 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.

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

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|--|---|------|----------------------------------|------|--------------------|------|-------|
| INPUT | | | | | | | |
| Forward voltage | I _F = 10 mA | | V _F | | 1.8 | 2.1 | V |
| Reverse current | V _R = 3 V | | I _R | | 0.01 | 10 | μA |
| V _F temperature coefficient | | | ΔV _F /Δ °C | | - 2.2 | | mW/°C |
| Junction capacitance | V _F = 0 V, f = 1 MHz | | C _j | | 15 | | pF |
| Dynamic resistance | I _F = 2.5 mA, ΔI _F = 1 mA | | ΔV _F /ΔI _F | | 6 | | Ω |
| Switching time IL358/359 | I _F = 2.5 mA, ΔI _F = 1 mA | | t _f | | 40 | | ns |
| | | | t _r | | 40 | | ns |
| OUTPUT | | | | | | | |
| Junction capacitance | V _F = 0 V, f = 1 MHz | | C _j | | 12 | | pF |
| NEP | V _{DET} = 0 V | | | | < 4 ⁻¹⁴ | | W/√Hz |
| COUPLER | | | | | | | |
| Capacitance (input to output) | V _F = 0 V, f = 1 MHz | | C _{IO} | | 1 | | pF |
| Common mode capacitance | V _F = 0 V, f = 1 MHz | | C _{CM} | | 0.5 | | pF |

Note

- Minimum and maximum values were tested requirements. Typical values are characteristics of the device and are the result of engineering evaluations. Typical values are for information only and are not part of the testing requirements.

**SWITCHING CHARACTERISTICS - AC CHARACTERISTICS PHOTOVOLTAIC MODE**

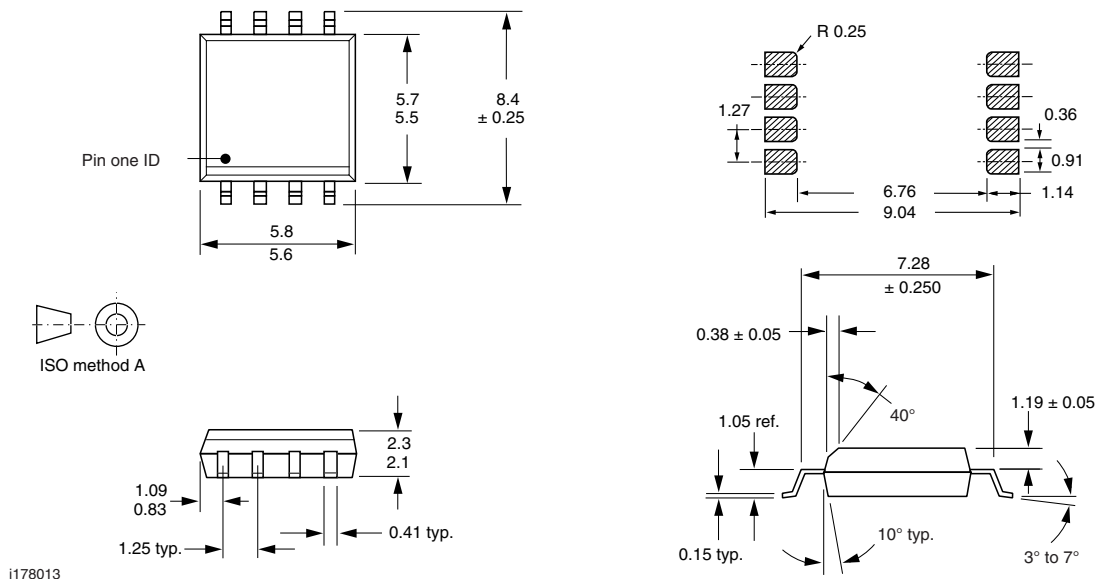
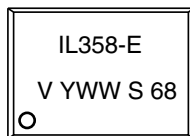
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|--------------------|---|-------|-------------|------|------|------|------|
| Frequency response | $I_{P1} = 25 \mu A$, modulation current $\Delta I_P = \pm 6 \mu A$ | IL358 | BW (- 3 db) | | 1 | | MHz |
| Phase response | $I_{P1} = 25 \mu A$, modulation current $\Delta I_P = \pm 6 \mu A$ | | | | 45 | | ° |
| Rise time | $I_{P1} = 25 \mu A$, modulation current $\Delta I_P = \pm 6 \mu A$ | | | | 350 | | ns |

BIN TABLE

| BIN | MIN. | MAX. |
|-----|-------|-------|
| A | 0.557 | 0.626 |
| B | 0.620 | 0.696 |
| C | 0.690 | 0.773 |
| D | 0.765 | 0.859 |
| E | 0.851 | 0.955 |
| F | 0.945 | 1.061 |
| G | 1.051 | 1.181 |
| H | 1.169 | 1.311 |
| I | 1.297 | 1.456 |
| J | 1.442 | 1.618 |

COUPLED CHARACTERISTICS

| PART NUMBER | K1 AT $I_F = 2 \text{ mA}$, $V_O = 0 \text{ V}$ MIN. | K3 BINS |
|-------------|--|------------------|
| IL350 | 0.003 | A to J |
| IL358 | 0.008 | C, D, E, F, G, H |

PACKAGE DIMENSIONS in millimeters

PACKAGE MARKING (example)

Note

- Tape and reel suffix (T) is not part of the package marking



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