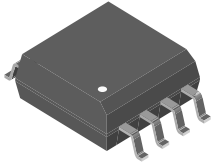
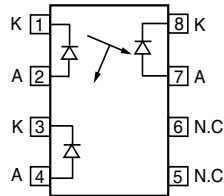


Linear Optocoupler for Optical DAA in Telecommunications, High Performance



I179028



DESCRIPTION

The IL350/351/358/359 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 IL350/351/358/359 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.

FEATURES

- 2.0 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
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

APPLICATIONS

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

ORDER INFORMATION

PART	REMARKS
IL350	Couples AC and DC signals
IL351	Couples AC and DC signals
IL358	Couples AC and DC signals
IL359	Couples AC and DC signals

Note

For additional information on the available options refer to option information.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Reverse voltage		V _R	3.0	V
Forward current		I _F	30	mA
Surge current	pulse width < 10 ms	I _{FSM}	150	mA
Power dissipation	T _{amb} = 25 °C	P _{diss}	150	mW
Derate linearly from 25 °C			2.0	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

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
COUPLER				
Isolation test voltage	$t = 1.0 \text{ s}$	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	$V_{\text{IO}} = 500 \text{ V}, T_{\text{amb}} = 25 \text{ °C}$	R_{IO}	$\geq 10^{12}$	Ω
	$V_{\text{IO}} = 500 \text{ V}, T_{\text{amb}} = 100 \text{ °C}$	R_{IO}	$\geq 10^{11}$	Ω

Note

$T_{\text{amb}} = 25 \text{ °C}$, unless otherwise specified.

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							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage	$I_{\text{F}} = 10 \text{ mA}$		V_{F}		1.8	2.1	V
Reverse current	$V_{\text{R}} = 3.0 \text{ V}$		I_{R}		0.01	10	μA
V_{F} temperature coefficient			$\Delta V_{\text{F}}/\Delta \text{ °C}$		- 2.2		mW/°C
Junction capacitance	$V_{\text{F}} = 0 \text{ V}, f = 1.0 \text{ MHz}$		C_{j}		15		pF
Dynamic resistance	$I_{\text{F}} = 2.5 \text{ mA}, \Delta I_{\text{F}} = 1.0 \text{ mA}$		$\Delta V_{\text{F}}/\Delta I_{\text{F}}$		6.0		Ω
Switching time IL358/359	$I_{\text{F}} = 2.5 \text{ mA}, \Delta I_{\text{F}} = 1.0 \text{ mA}$		t_{f}		40		ns
			t_{r}		40		ns
OUTPUT							
Junction capacitance	$V_{\text{F}} = 0 \text{ V}, f = 1.0 \text{ MHz}$		C_{j}		12		pF
NEP	$V_{\text{DET}} = 0 \text{ V}$				$< 4^{-14}$		W/ $\sqrt{\text{Hz}}$
COUPLER							
Capacitance (input to output)	$V_{\text{F}} = 0 \text{ V}, f = 1.0 \text{ MHz}$		C_{IO}		1.0		pF
Common mode capacitance	$V_{\text{F}} = 0 \text{ V}, f = 1.0 \text{ MHz}$		C_{CM}		0.5		pF

Note

$T_{\text{amb}} = 25 \text{ °C}$, unless otherwise specified.

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.

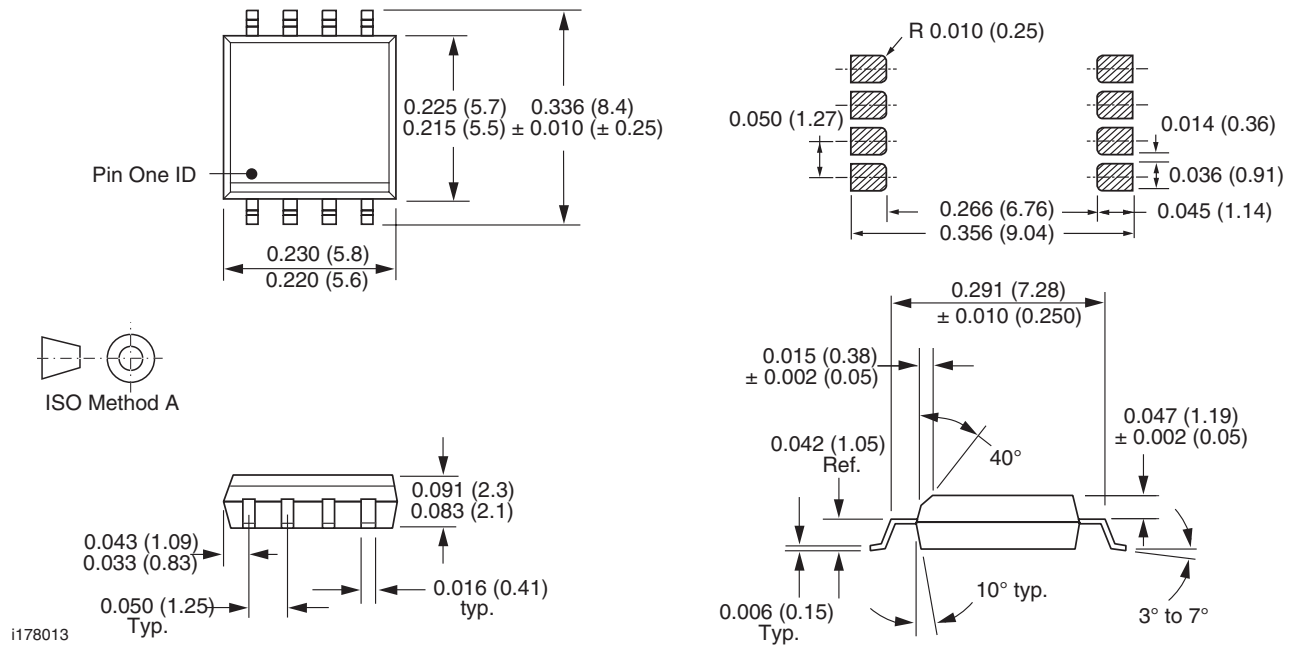
SWITCHING CHARACTERISTICS - AC CHARACTERISTICS PHOTOVOLTAIC MODE							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Frequency response	$I_{\text{P1}} = 25 \text{ }\mu\text{A}$, modulation current $\Delta I_{\text{P}} = \pm 6.0 \text{ }\mu\text{A}$	IL358	BW (- 3 db)		1.0		MHz
		IL359	BW (- 3 db)		1.0		MHz
Phase response	$I_{\text{P1}} = 25 \text{ }\mu\text{A}$, modulation current $\Delta I_{\text{P}} = \pm 6.0 \text{ }\mu\text{A}$				45		°
Rise time	$I_{\text{P1}} = 25 \text{ }\mu\text{A}$, modulation current $\Delta I_{\text{P}} = \pm 6.0 \text{ }\mu\text{A}$				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
IL351	0.005	D, E, F, G
IL358	0.008	C, D, E, F, G, H
IL359	0.008	D, E, F, G

PACKAGE DIMENSIONS in inches (millimeters)



OZONE DEPLETING SUBSTANCES POLICY STATEMENT

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively.
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design
and may do so without further notice.

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