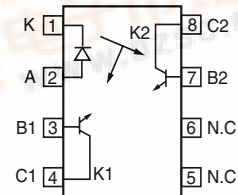
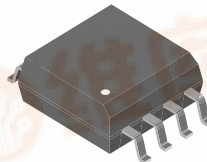




## Linear Optocoupler, PCMCIA package

### Features

- 2.3 mm High SMD package
- High sensitivity (K1) at low operating LED current
- Couples AC and DC signals
- Low input-output capacitance
- Isolation test voltage, 2500 V<sub>RMS</sub>, 1 second
- Low distortion, below -80 db
- 0.4 mm internal insulation thickness



1179085

### Applications

Optical DAA for V.34 FAX/Modem PCMCIA cards

Digital telephone line isolation

### Description

The IL388 family of linear optocoupler consist of an IRLED optically coupled to two photodiodes. The emitter is located such that both photodiodes 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 photodiode current.

The IL388 optocouplers can be used with the aid of operational amplifiers in closed loop conditions to achieve highly linearly and electrically AC and or DC signals amplifiers.

### Order Information

Part	Remarks
IL388	Couples AC and DC signals, SMD-8

For additional information on the available options refer to Option Information.

### Absolute Maximum Ratings

T<sub>amb</sub> = 25 °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 Rating for extended periods of the time can adversely affect reliability.

### Input

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V <sub>R</sub>	≤ 3.0	V
Forward current		I <sub>F</sub>	≤ 30	mA
Surge current pulse width < 10 μs		I <sub>PK</sub>	≤ 150	mA
Power dissipation		P <sub>diss</sub>	≤ 150	mW
Derate linearly from 25 °C			≤ 2.0	mW/°C
Junction temperature		T <sub>j</sub>	≤ 100	°C



### Output

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		$V_R$	$\leq 15$	V
Power dissipation		$P_{diss}$	$\leq 50$	mW
Derate linearly from 25 °C			$\leq 0.65$	mW/°C
Junction temperature		$T_j$	$\leq 100$	°C

### Coupler

Parameter	Test condition	Symbol	Value	Unit
Isolation test voltage		$V_{ISO}$	$\leq 2500$	$V_{RMS}$
Total package power dissipation		$P_{tot}$	$\leq 250$	mW
Derate linearly from 25 °C			$\leq 2.8$	mW/°C
Storage temperature		$T_{stg}$	- 40 to + 150	°C
Operating temperature		$T_{amb}$	0 to + 75	°C
Lead soldering time at 260 °C			$\leq 10$	sec.
Isolation resistance	$V_{IO} = 500, T_{amb} = 25\text{ °C}$	$R_{IO}$	$\geq 10^{12}\ \Omega$	$\Omega$
	$V_{IO} = 500, T_{amb} = 100\text{ °C}$	$R_{IO}$	$\leq 10^{11}\ \Omega$	$\Omega$

### Electrical Characteristics

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

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.

### Input

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	$I_F = 10\text{ mA}$	$V_F$		1.8	2.1	V
Reverse current	$V_R = 3.0\text{ V}$	$I_R$		.01	10	$\mu\text{A}$
$V_F$ temperature coefficient		$\Delta V_F / \Delta\text{ °C}$		- 2.2		mV/°C
Junction capacitance	$V_F = 0\text{ V}, f = 1.0\text{ MHz}$	$C_j$		15		pF
Dynamic resistance	$I_F = 10\text{ mA}$	$\Delta V_F / \Delta I_F$		6.0		$\Omega$

### Output

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Junction capacitance	$V_F = 0\text{ V}, f = 1.0\text{ MHz}$	$C_j$		12		pF
<b>AC Characteristics photovoltaic mode</b>						
Frequency response	$I_{P1} = 25\text{ A}$ Modulation current $\Delta I_{P1} = \pm 6.0\ \mu\text{A}$	BW (-3 db)		1.0		MHz
Phase response	$I_{P1} = 25\text{ A}$ Modulation current $\Delta I_{P1} = \pm 6.0\ \mu\text{A}$			45		Deg.
Rise time	$I_{P1} = 25\text{ A}$ Modulation current $\Delta I_{P1} = \pm 6.0\ \mu\text{A}$	$t_r$		350		ns



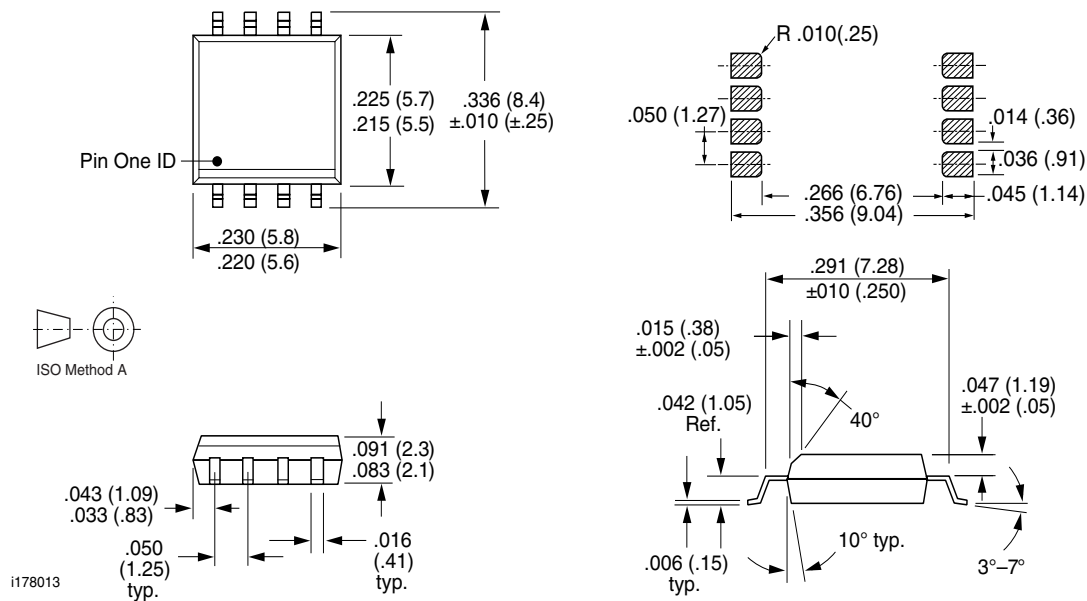
Coupler

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Capacitance (input-output)	$V_F = 0\text{ V}, f = 1.0\text{ MHz}$	$C_{IO}$		1.0		pF
Common mode capacitance	$V_F = 0\text{ V}, f = 1.0\text{ MHz}$	$C_{CM}$		0.5		pF
<b>Coupled characteristics</b>						
$K_1$	$I_F = 2.0\text{ mA}, V_D = 0\text{ V}$	$K_1$	0.0007			
THD	$f_0 = 316, I_{P1} = 35\text{ }\mu\text{A}, V_D = 0\text{ V}$		- 83			db
$K_3 = K_2/K_1$	$I_F = 2.0\text{ mA}, V_D = 0\text{ V}$		0.690		1.311	

Bin Table for  $K_3$

Bin	Min.	Max.
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

Package Dimensions in Inches (mm)



### 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.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423