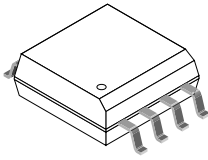
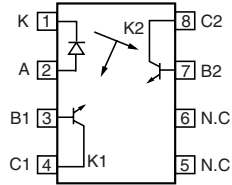


## Linear Optocoupler, PCMCIA Package



1179085



### 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.

### 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, 2130 V<sub>DC</sub>
- Low distortion, below - 80 db
- 0.4 mm internal insulation thickness
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### APPLICATIONS

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

### ORDER INFORMATION

PART	REMARKS
IL388	Couples AC and DC signals, SOP-8

#### Note

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

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
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
<b>OUTPUT</b>				
Reverse voltage		V <sub>R</sub>	≤ 15	V
Power dissipation		P <sub>diss</sub>	≤ 50	mW
Derate linearly from 25 °C			≤ 0.65	mW/°C
Junction temperature		T <sub>j</sub>	≤ 100	°C

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>COUPLER</b>				
Isolation test voltage		$V_{ISO}$	$\leq 2130$	$V_{DC}$
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			$\leq 10$	s
Isolation resistance	$V_{IO} = 500 \text{ V}, T_{amb} = 25 \text{ °C}$	$R_{IO}$	$\geq 10^{12}$	$\Omega$
	$V_{IO} = 500 \text{ V}, T_{amb} = 100 \text{ °C}$	$R_{IO}$	$\leq 10^{11}$	$\Omega$

**Note**

$T_{amb} = 25 \text{ °C}$ , 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
<b>INPUT</b>							
Forward voltage	$I_F = 10 \text{ mA}$		$V_F$		1.8	2.1	V
Reverse current	$V_R = 3.0 \text{ V}$		$I_R$		0.01	10	$\mu\text{A}$
$V_F$ temperature coefficient			$\Delta V_F / \Delta \text{ °C}$		- 2.2		mW/°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		$\Omega$
<b>OUTPUT</b>							
Junction capacitance	$V_F = 0 \text{ V}, f = 1.0 \text{ MHz}$		$C_j$		12		pF
AC Characteristics photovoltaic mode							
Frequency response	$I_{P1} = 25 \text{ mA modulation current } \Delta I_{P1} = \pm 6.0 \text{ } \mu\text{A}$		BW (- 3 db)		1.0	50	MHz
Phase response	$I_{P1} = 25 \text{ mA modulation current } \Delta I_{P1} = \pm 6.0 \text{ } \mu\text{A}$				45		°
Rise time	$I_{P1} = 25 \text{ mA modulation current } \Delta I_{P1} = \pm 6.0 \text{ } \mu\text{A}$		$t_r$		350		ns
<b>COUPLER</b>							
Capacitance (input to 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
Coupled characteristics							
$K_1$	$I_F = 2.0 \text{ mA}, V_D = 0 \text{ V}$		$K_1$	0.007			
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	

**Note**

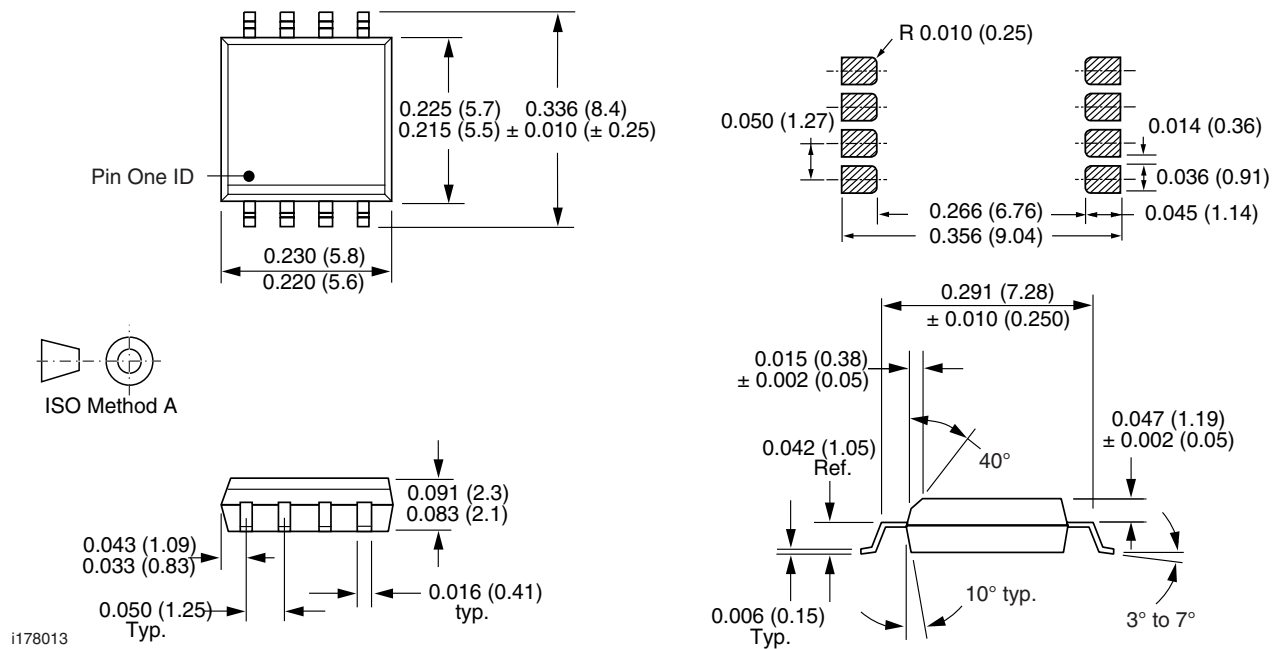
$T_{amb} = 25 \text{ °C}$ , unless otherwise specified.

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.

BIN TABLE FOR K <sub>3</sub>		
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

**Note**

Binning categorization is for information only. Product cannot be ordered by this categorization.

**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.

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



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.