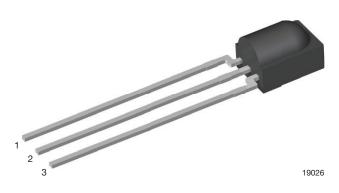
TSSP980..

www.vishay.com

Vishay Semiconductors

IR Receiver Module for Light Barrier Systems



LINKS TO ADDITIONAL RESOURCES

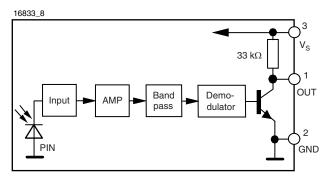


DESCRIPTION

The TSSP980.. is a compact infrared detector module for presence, proximity, or light curtain applications. It provides an active low output in response to infrared bursts at 940 nm. The frequency of the burst should correspond to the carrier frequency shown in the parts table.

This component has not been qualified according to automotive specifications.

BLOCK DIAGRAM



FEATURES

- Presence sensor: up to 2 m distance, find more info at: <u>www.vishay.com/doc?49009</u>
- Light barrier: up to 12 m distance, TSAL6200 with I_F = 50 mA, find more info at: <u>www.vishav.com/doc?49650</u>



RoHS

FREE

GREEN

(5-2008)

- Fast proximity: up to 2 m range at 5 ms response time, find more info at: www.vishay.com/doc?82741
- Supply voltage: 2.0 V to 3.6 V
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

MECHANICAL DATA

Pinning:

1 = OUT, 2 = GND, 3 = V_S

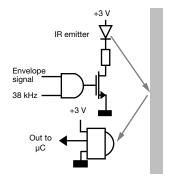
ORDERING CODE

TSSP980.. - 1500 pieces in bags

APPLICATIONS

- Reflective sensors for hand dryers, towel or soap dispensers, water faucets, toilet flush
- Vending machine fall detection
- · Security and pet gates
- · Person or object vicinity switch
- Fast proximity sensors for toys, robotics, drones, and other consumer and industrial uses

PRESENCE SENSING





www.vishay.com

TSSP980..

Vishay Semiconductors

PARTS TABLE							
Carrier frequency	38 kHz	TSSP98038					
	56 kHz	TSSP98056					
Package		Minicast					
Pinning		1 = OUT, 2 = GND, 3 = V _S					
Dimensions (mm)		5.0 W x 6.95 H x 4.8 D					
Mounting		Leaded					
Application		Presence sensors, fast proximity sensors					

ABSOLUTE MAXIMUM RATINGS									
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT					
Supply voltage		V _S	-0.3 to +3.6	V					
Supply current		I _S	5	mA					
Output voltage		Vo	-0.3 to +3.6	V					
Output current		Ι _Ο	5	mA					
Junction temperature		Tj	100	°C					
Storage temperature range		T _{stg}	-25 to +85	°C					
Operating temperature range		T _{amb}	-25 to +85	°C					
Power consumption	T _{amb} ≤ 85 °C	P _{tot}	10	mW					

Note

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only
and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification
is not implied. Exposure to absolute maximum rating conditions for extended periods may affect the device reliability

ELECTRICAL AND OPTICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)									
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT			
Supply aurrent (pip 2)	$E_{v} = 0, V_{S} = 5 V$	I _{SD}	0.25	0.37	0.45	mA			
Supply current (pin 3)	E _v = 40 klx, sunlight	I _{SH}	-	0.8	-	mA			
Supply voltage		V _S	2.0	-	3.6	V			
Transmission distance	$E_v = 0$, test signal see fig. 1, IR diode TSAL6200, $I_F = 50 \text{ mA}$	d	-	8	-	m			
Output voltage low (pin 1)	I _{OSL} = 0.5 mA, E _e = 2 mW/m ² , test signal see fig. 1	V _{OSL}	-	-	100	mV			
Minimum irradiance	Pulse width tolerance: t_{pi} - 5/f _o < t_{po} < t_{pi} + 6/f _o , test signal see fig. 1	E _{e min.}	-	0.7	1.2	mW/m ²			
Maximum irradiance	$\begin{array}{c} t_{pi} \text{ - } 5/f_o < t_{po} < t_{pi} + 6/f_o, \\ \text{test signal see fig. 1} \end{array}$	E _{e max.}	30	-	-	W/m ²			
Directivity	Angle of half transmission distance	Φ1/2	-	± 45	-	o			

Rev. 1.4, 13-Apr-2022

2



Vishay Semiconductors

TYPICAL CHARACTERISTICS (Tamb = 25 °C, unless otherwise specified)

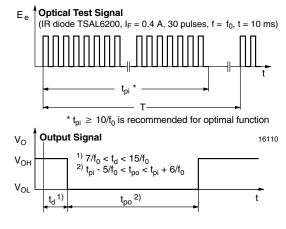


Fig. 1 - Output Active Low

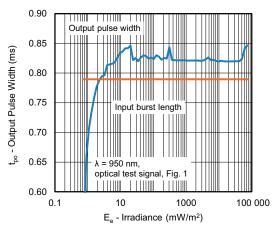


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

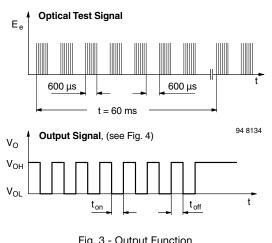
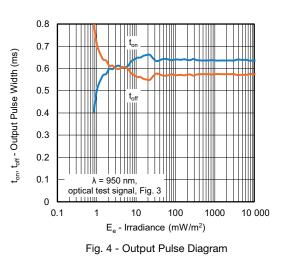


Fig. 3 - Output Function



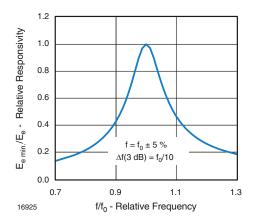


Fig. 5 - Frequency Dependence of Responsivity

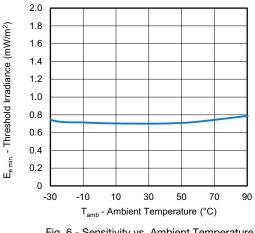


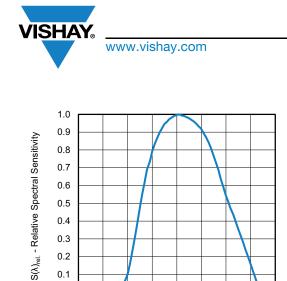
Fig. 6 - Sensitivity vs. Ambient Temperature

Rev. 1.4, 13-Apr-2022

Document Number: 82869

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000





850



0

750

 λ - Wavelength (nm) Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

950

1050

1150

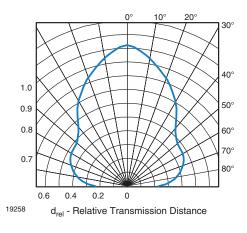


Fig. 8 - Horizontal Directivity

The typical application of this device is a reflective or beam break sensor with active low "detect" or "no detect" information contained in its output. The TSSP980.. is also suitable for fast (~ 15 ms) proximity sensor applications for ranges between 10 cm and 2 m, if a burst pattern with variable intensity is used.

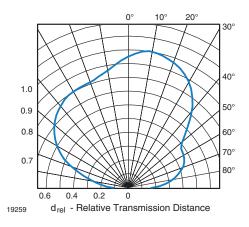
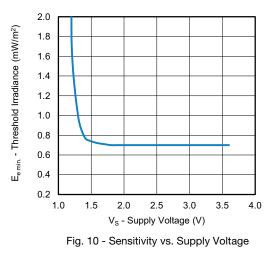
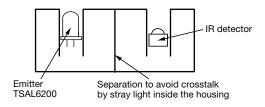


Fig. 9 - Vertical Directivity



Example for a sensor hardware:



There should be no common window in front of the emitter and detector in order to avoid crosstalk via guided light through the window.

Rev. 1.4, 13-Apr-2022

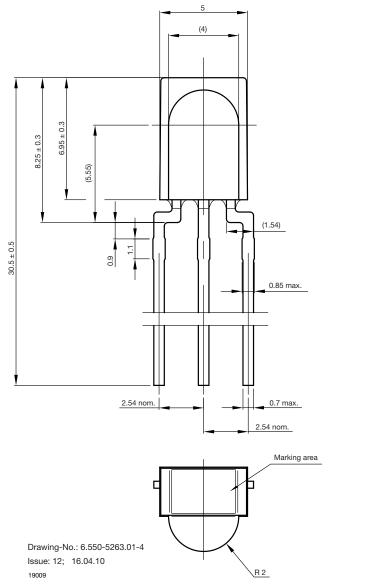
4

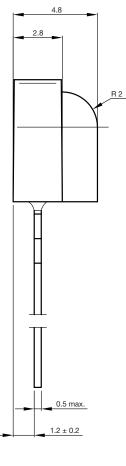






PACKAGE DIMENSIONS in millimeters







Not indicated to lerances ± 0.2



Vishay

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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

© 2024 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED

Revision: 01-Jul-2024