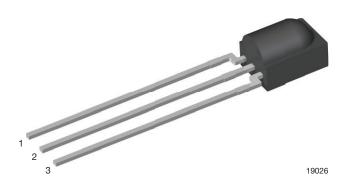


www.vishay.com

Vishay Semiconductors

IR Receiver Module for Light Barrier Systems



LINKS TO ADDITIONAL RESOURCES













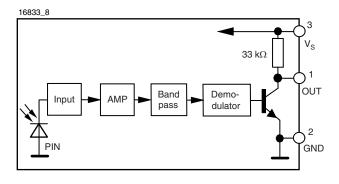


DESCRIPTION

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: www.vishay.com/doc?49009



- 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 www.vishay.com/doc?99912





ROHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

MECHANICAL DATA

Pinning:

 $1 = OUT, 2 = GND, 3 = V_S$

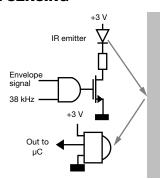
ORDERING CODE

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





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		Vs	-0.3 to +3.6	V					
Supply current		I _S	5	mA					
Output voltage		V _O	-0.3 to +3.6	V					
Output current		Io	5	mA					
Junction temperature		T _j	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 current (pin 3)	$E_{v} = 0, V_{S} = 5 V$	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		Vs	2.0	-	3.6	V				
Transmission distance	E_{v} = 0, test signal see fig. 1, IR diode TSAL6200, I_{F} = 50 mA	d	-	8	-	m				
Output voltage low (pin 1)	$I_{OSL} = 0.5 \text{ mA}, E_e = 2 \text{ mW/m}^2,$ 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/m²				
Maximum irradiance	t_{pi} - 5/f _o < t_{po} < t_{pi} + 6/f _o , test signal see fig. 1	E _{e max.}	30	-	-	W/m ²				
Directivity	Angle of half transmission distance	Ψ1/2	-	± 45	-	0				

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

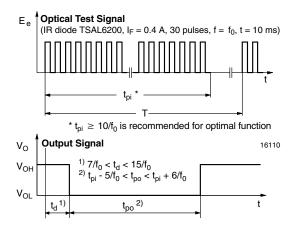


Fig. 1 - Output Active Low

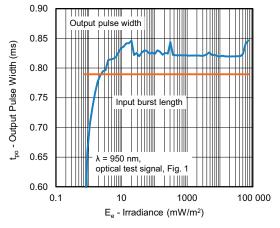


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

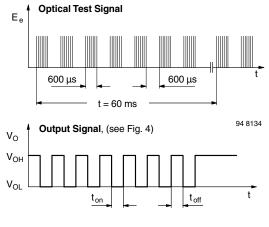


Fig. 3 - Output Function

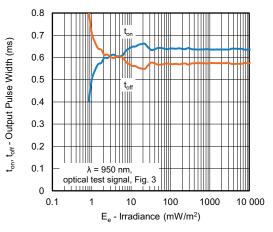


Fig. 4 - Output Pulse Diagram

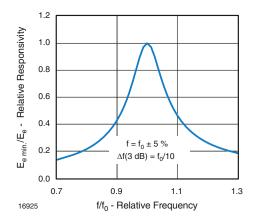


Fig. 5 - Frequency Dependence of Responsivity

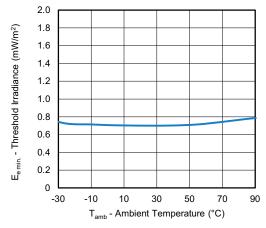


Fig. 6 - Sensitivity vs. Ambient Temperature



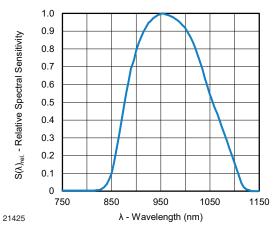


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

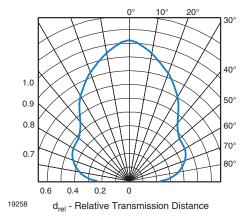


Fig. 8 - Horizontal Directivity

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 (\sim 15 ms) proximity sensor applications for ranges between 10 cm and 2 m, if a burst pattern with variable intensity is used.

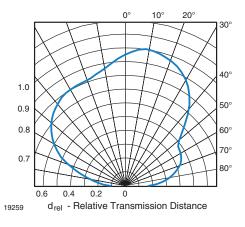


Fig. 9 - Vertical Directivity

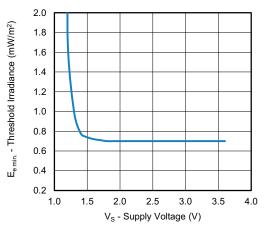
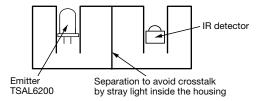


Fig. 10 - Sensitivity vs. Supply Voltage

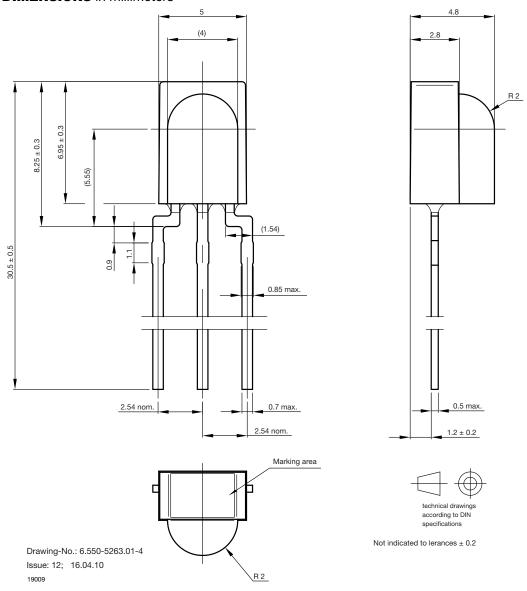
Example for a sensor hardware:



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



PACKAGE DIMENSIONS in millimeters





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Vishay

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