

IR Receiver Module for Light Barrier Systems



16672

LINKS TO ADDITIONAL RESOURCES

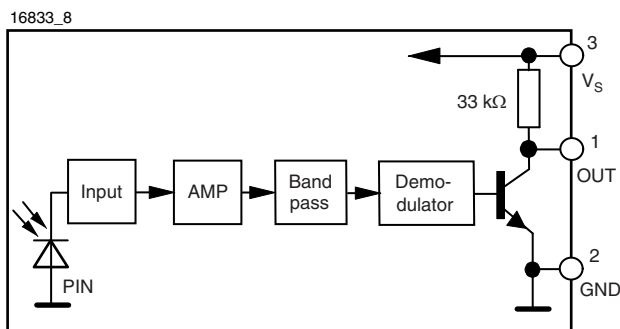


DESCRIPTION

The TSSP40..SS1XB are compact infrared detector modules for presence sensing applications. They provide an active low output in response to infrared bursts at 940 nm. The TSSP40..SS1XB are 20 x less sensitive than the TSSP40.., for ease of use in reflective applications at less than 1 m range where high sensitivity is not needed and can complicate the design.

This component has not been qualified to automotive specifications.

BLOCK DIAGRAM



FEATURES

- Presence sensor: up to 2 m distance, find more info at: www.vishay.com/doc?49009
- Light barrier: up to 12 m distance, TSAL6200 with $I_F = 50 \text{ mA}$, find more info at: www.vishay.com/doc?49650
- Fast proximity: up to 2 m range at 5 ms response time, find more info at: www.vishay.com/doc?82741
- Supply voltage: 2.5 V to 5.5 V
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



MECHANICAL DATA

Pinning:

1 = OUT, 2 = GND, 3 = V_S

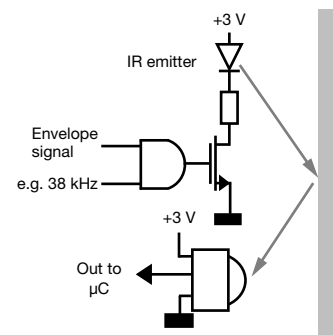
ORDERING CODE

TSSP40..SS1XB - 2160 pieces in tubes

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	TSSP4038SS1XB
	56 kHz	TSSP4056SS1XB
Package	Mold	
Pinning	1 = OUT, 2 = GND, 3 = V _S	
Dimensions (mm)	6.0 W x 6.95 H x 5.6 D	
Mounting	Leaded	
Application	Presence sensors, fast proximity sensors	
Special options	<ul style="list-style-type: none"> Narrow optical filter: www.vishay.com/doc?81590 Wide optical filter: www.vishay.com/doc?82726 	

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Supply voltage (pin 3)		V _S	-0.3 to +6.0	V
Supply current (pin 3)		I _S	5	mA
Output voltage (pin 1)		V _O	-0.3 to 5.5	V
Voltage at output to supply		V _S - V _O	-0.3 to (V _S + 0.3)	V
Output current (pin 1)		I _O	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
Soldering temperature	t ≤ 10 s, 1 mm from case	T _{sd}	260	°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}	0.55	0.7	0.9	mA
	E _v = 40 klx, sunlight	I _{SH}	-	0.8	-	mA
Supply voltage		V _S	2.5	-	5.5	V
Transmission distance	E _v = 0, test signal see Fig. 1, IR diode TSAL6200, I _F = 50 mA	d	-	2.4	-	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 ₀ < t _{po} < t _{pi} + 6/f ₀ , test signal see Fig. 1	E _{e min.}	-	7	14	mW/m ²
Maximum irradiance	t _{pi} - 5/f ₀ < t _{po} < t _{pi} + 6/f ₀ , test signal see Fig. 1	E _{e max.}	50	-	-	W/m ²
Directivity	Angle of half transmission distance	φ _{1/2}	-	± 45	-	deg

TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

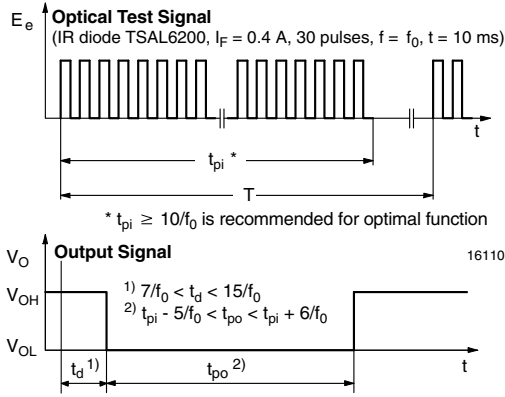


Fig. 1 - Output Active Low

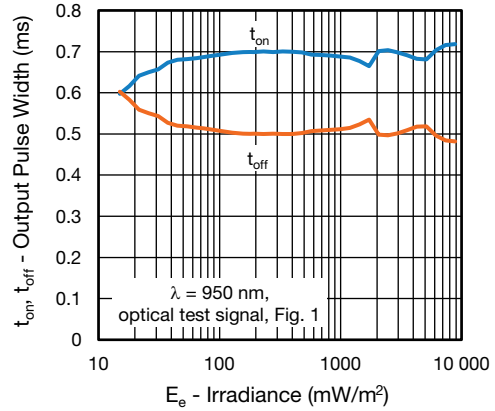


Fig. 4 - Output Pulse Diagram

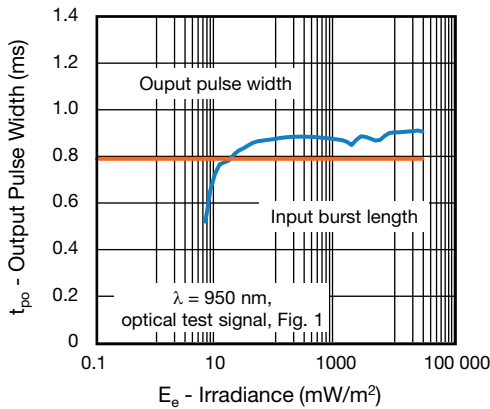


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

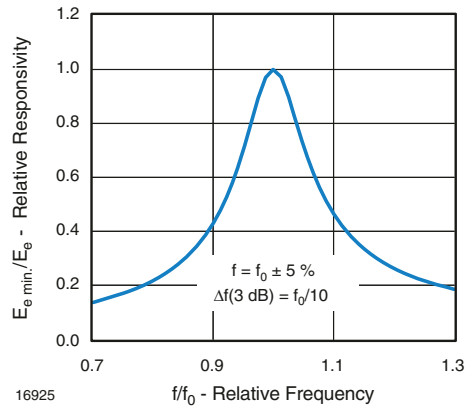


Fig. 5 - Frequency Dependence of Responsivity

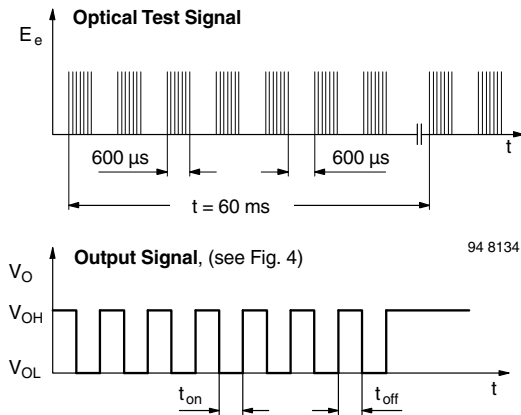


Fig. 3 - Output Function

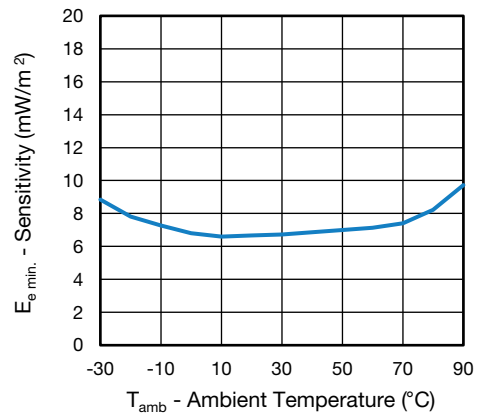
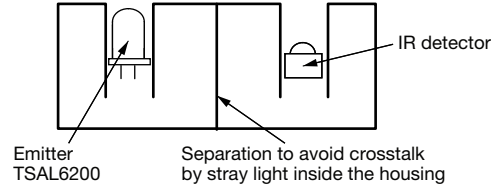


Fig. 6 - Sensitivity vs. Ambient Temperature

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 TSSP40.. 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.

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.

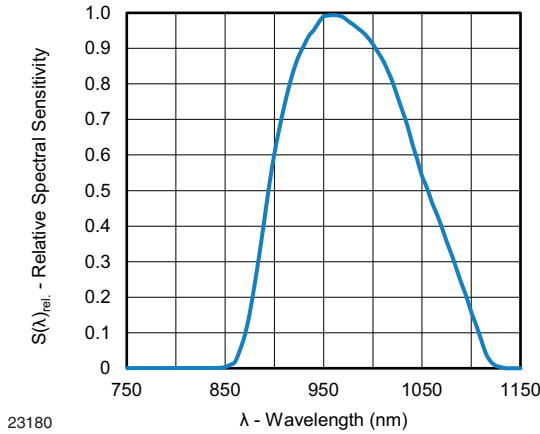


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

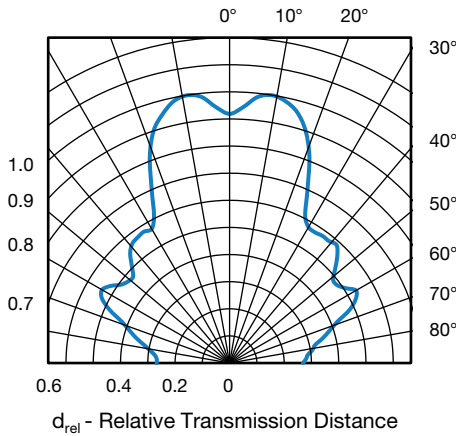


Fig. 8 - Horizontal Directivity

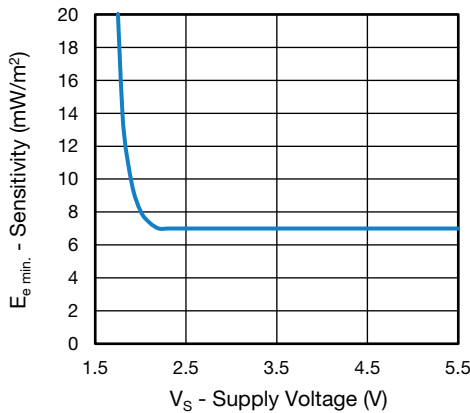
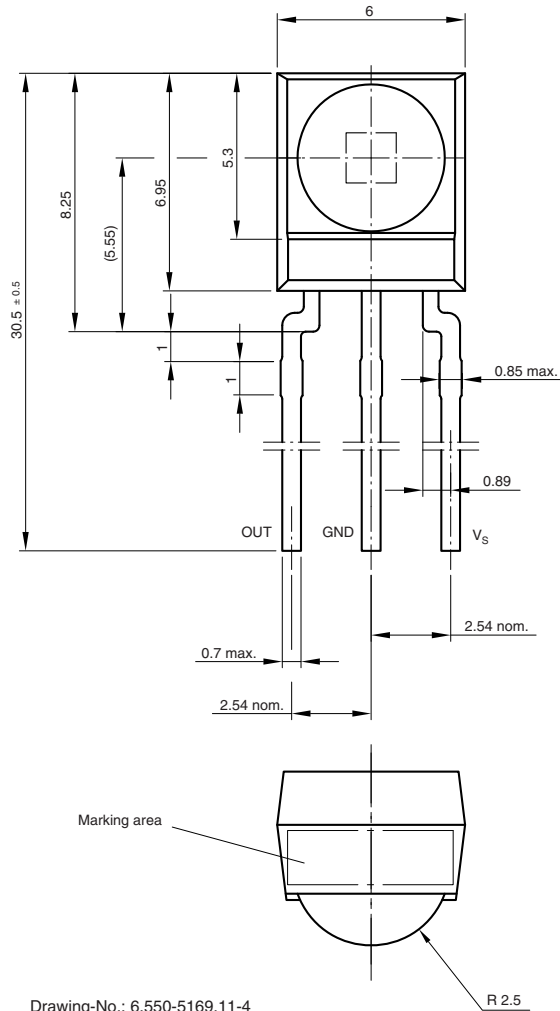


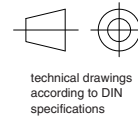
Fig. 9 - Sensitivity vs. Supply Voltage



PACKAGE DIMENSIONS in millimeters



Not indicated tolerances ± 0.2



Drawing-No.: 6.550-5169.11-4
Issue: 13; 17.12.08
16003



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