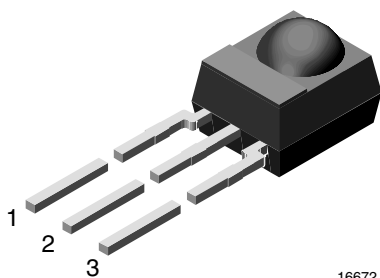


## IR Receiver Module for Light Barrier Systems



### MECHANICAL DATA

#### Pinning:

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

### DESCRIPTION

The TSSP4038SS1XB is a compact infrared detector module for presence sensing applications. It receives 38 kHz modulated signals and has a peak sensitivity of 940 nm. The TSSP4038SS1XB is 20 x less sensitive than the TSSP4038, 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.

### FEATURES

- Constant gain for consistent results under any lighting condition
- Up to 1 m for presence sensing
- Uses modulated bursts at 38 kHz
- 940 nm peak wavelength
- PIN diode and sensor IC in one package
- Low supply current
- Shielding against EMI
- Visible light is suppressed by IR filter
- Insensitive to supply voltage ripple and noise
- Supply voltage: 2.5 V to 5.5 V
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

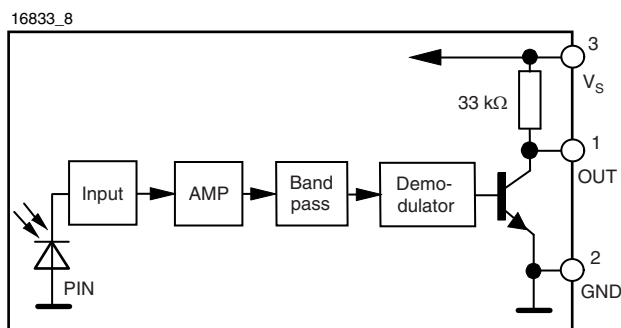
### APPLICATIONS

- 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 activation

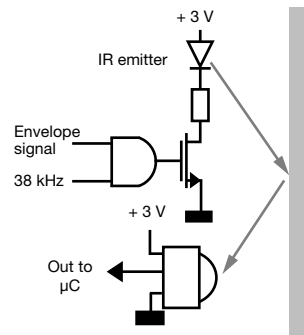
### PARTS TABLE

Carrier frequency	38 kHz	TSSP4038SS1XB
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

### BLOCK DIAGRAM



### PRESENCE SENSING



**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	$t \leq 10$ s, 1 mm from case	$T_{sd}$	260	°C
Power consumption	$T_{amb} \leq 85$ °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, $I_F = 400$ mA	$d$		7		m
Output voltage low (pin 1)	$I_{OSL} = 0.5$ mA, $E_e = 2$ mW/m <sup>2</sup> , 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 <sup>2</sup>
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 <sup>2</sup>
Directivity	Angle of half transmission distance	$\phi_{1/2}$		$\pm 45$		deg

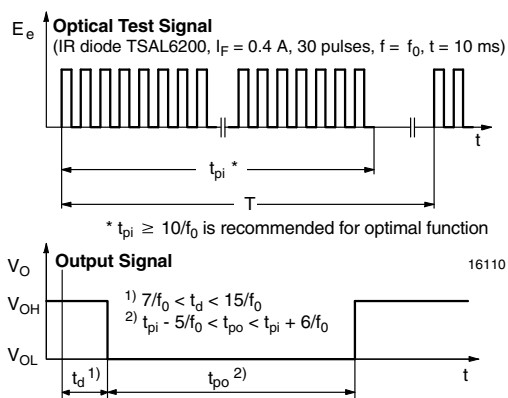
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25$  °C, unless otherwise specified)


Fig. 1 - Output Active Low

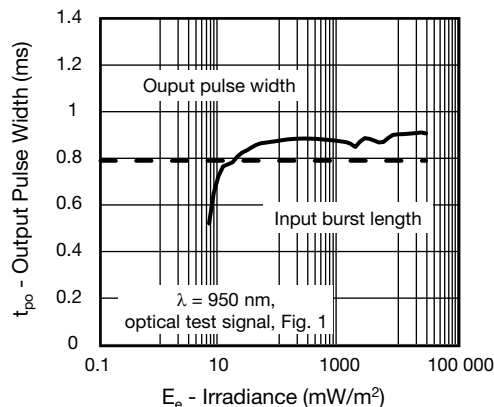


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

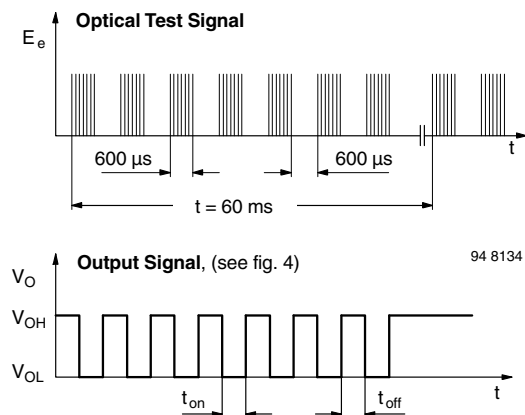


Fig. 3 - Output Function

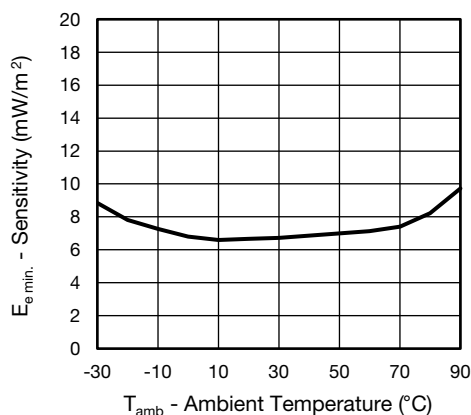


Fig. 6 - Sensitivity vs. Ambient Temperature

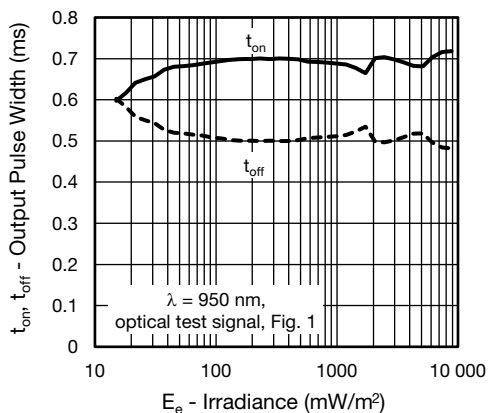


Fig. 4 - Output Pulse Diagram

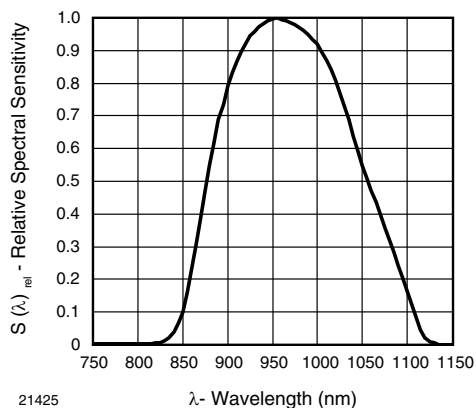


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

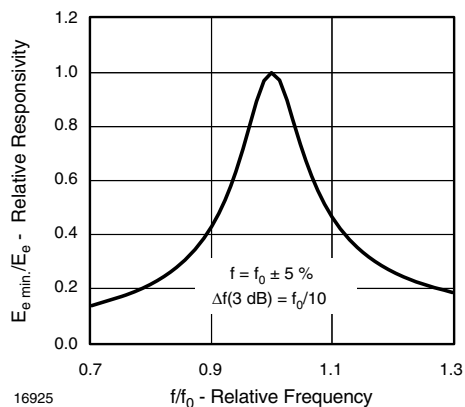


Fig. 5 - Frequency Dependence of Responsivity

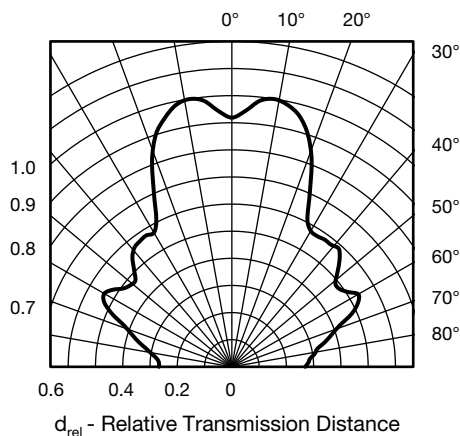


Fig. 8 - Horizontal Directivity

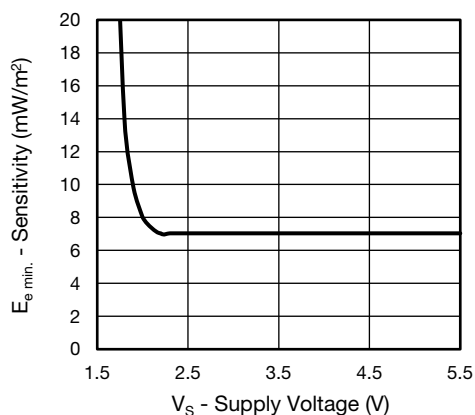
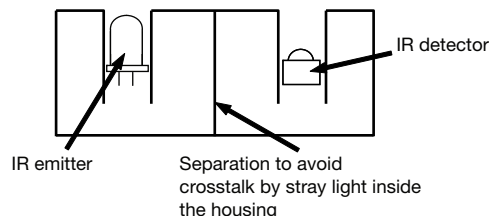


Fig. 9 - Sensitivity vs. Supply Voltage

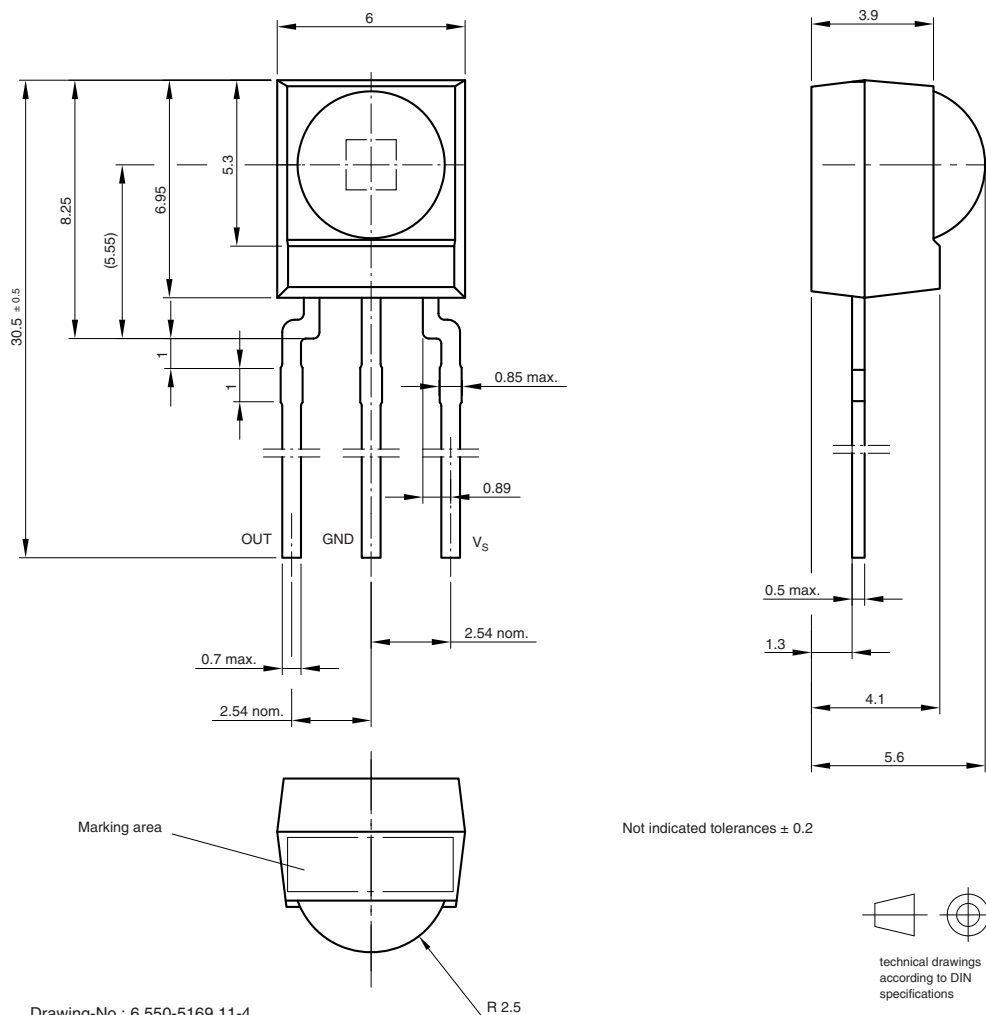
The typical application of this device is a reflective or beam break sensor with active low “detect” or “no detect” information contained in its output. Applications requiring up to 1 m beam break or 0.5 m reflective range benefit from the lower gain of these sensors because they are less sensitive to stray signal from the emitter, simplifying the mechanical design.

Example for a sensor hardware:

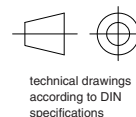


There should be no common window in front of the emitter and detector in order to avoid crosstalk via guided light through the window.

## PACKAGE DIMENSIONS in millimeters



Not indicated tolerances ± 0.2



Drawing-No.: 6.550-5169.11-4

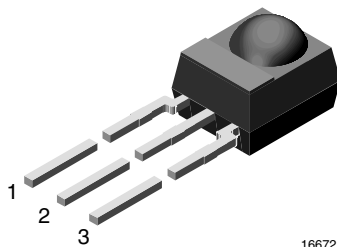
Issue: 13; 17.12.08

16003

**IR Receiver Modules for Remote Control Systems**

Vishay offers stock molded IR receivers in four different packages:

- Loose packed in tubes, mounted on tape for reel or ammopack, or packed bulk in plastic bags.
- Vishay IR receiver with metal holders are packed in plastic trays. Vishay IR receiver with plastic holders are packed in plastic tubes.

**FEATURES**

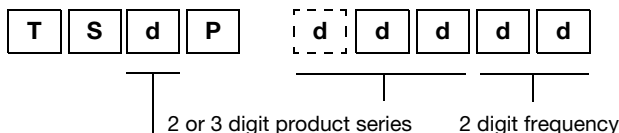
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
**GREEN**  
(5-2008)

**AVAILABLE FOR**

- TSOP348..
- TSOP344..
- TSOP343..
- TSOP341..
- TSOP44...
- TSOP48...
- TSOP41...
- TSOP324..
- TSOP323..
- TSOP322..
- TSOP321..
- TSOP24...
- TSOP22...
- TSOP21...
- TSOP345..
- TSOP325..
- TSOP43...
- TSOP23...
- TSSP4..
- TSMP4..

**LOOSE PACKED IN TUBE****ORDERING INFORMATION**

O = for IR receiver applications  
M = for repeater/learning applications  
S = for sensor applications

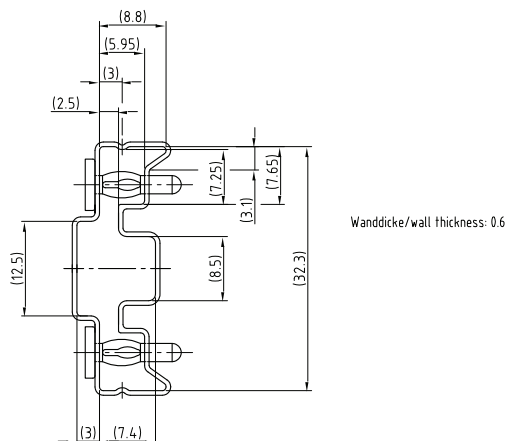
**Note**

- d = "digit", please consult the list of available devices create a valid part number.

**Example: TSOP4838**

**PACKAGING QUANTITY**

- 90 pieces per tube
- 24 tubes per carton

**PACKAGING DIMENSIONS** in millimeters

1:1

Drawing-No.: 9.700-5185.0-4  
Rev. 13; Date: 20.11.03  
20273-1

Druck / Printing for tubes  
1.400-5548.0-3 Version 1

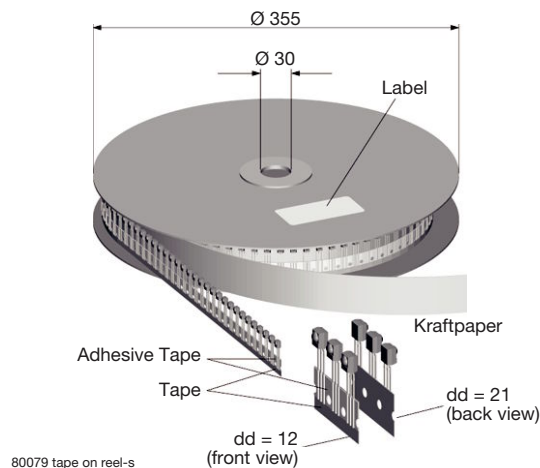


## TAPE AND REEL/AMMOPACK

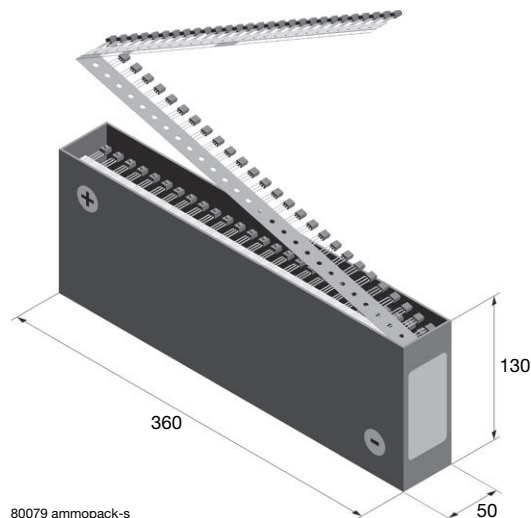
Up to 3 consecutive components may be missing if the gap is followed by at least 6 components. A maximum of 0.5 % of the components per reel quantity may be missing. At least 5 empty positions are present at the start and the end of the tape to enable insertion.

Tensile strength of the tape: > 15 N

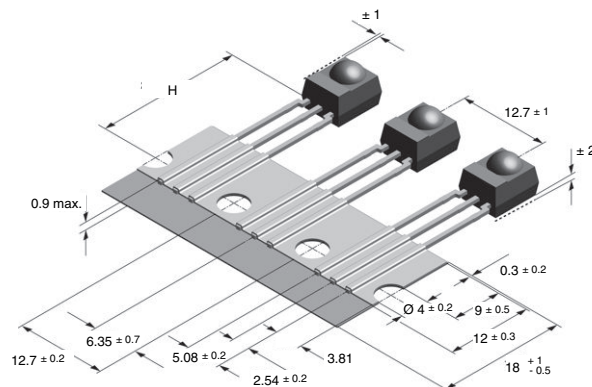
Pulling force in the plane of the tape, at right angles to the reel: > 5 N



80079 tape on reel-s



80079 ammpack-s



VERSION	DIMENSION "H"
BS	20 ± 0.5
PS	23.3 ± 0.5
OS	26 ± 0.5

## ORDERING INFORMATION

T S d P

O = for IR receiver applications  
M = for repeater/learning applications  
S = for sensor applications

d d d d d

2 or 3 digit product series  
2 digit frequency

S S 1

SS1 for T and R, bulk or ammpack

d d d d

dd = BS, PS or OS  
Tape and reel  
dd = 12 or 21

Z

Ammpack

### Note

- d = "digit", please consult the list of available devices create a valid part number.

Example: TSOP4838SS1BS12

TSOP2238SS1BS12Z

## PACKAGING QUANTITY

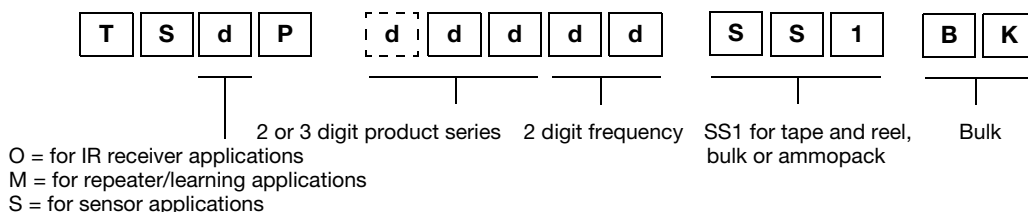
- 1000 pieces per reel
- 1000 pieces per ammpack



## BULK PACKAGING

The option “BK” signifies bulk packaging in conductive plastic bags. A maximum of 0.3 % of the components per box may be missing.

## ORDERING INFORMATION



### Note

- d = “digit”, please consult the list of available devices create a valid part number.

EXAMPLE: TSOP4838SS1BK

TSOP2238SS1BK

## PACKAGING QUANTITY

- 250 pieces per bag (each bag is individually boxed)
- 6 bags per carton

## OUTER PACKAGING

CARTON BOX DIMENSIONS in millimeters			
KINDS OF CARTON BOX	THICKNESS	WIDTH	LENGTH
<b>Packaging Plastic Tubes</b> (Normal/auxiliary devices)	80	150	600
<b>Packaging Plastic Trays</b> (Devices with metal holders)	120	290	490
<b>Tape and Reel Box</b> (Taping in reels)	400	310	410
<b>Ammo-Box</b> (Zigzag taping)	50	130	350



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