

## IR Sensor Module for Remote Control Systems



19026

### DESIGN SUPPORT TOOLS AVAILABLE



### MECHANICAL DATA

#### Pinning:

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

### FEATURES

- Photo detector and preamplifier in one package
- AC coupled response from 20 kHz to 60 kHz, all data formats
- Improved shielding against electrical field disturbance
- TTL and CMOS compatibility
- Output active low
- Supply voltage 2.5 V to 5.5 V, typically the device works in the range between 2.0 V and 5.5 V
- Carrier out signal for code learning functions
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



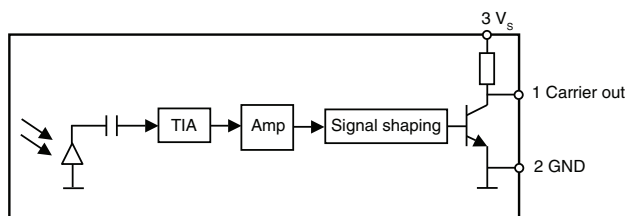
### DESCRIPTION

The TSMP58000 is a miniaturized sensor for receiving the modulated signal of infrared remote control systems. A PIN diode and preamplifier are assembled on a lead frame, the epoxy package is designed as an IR filter. The modulated output signal, carrier out, can be used for code learning applications.

This component has not been qualified according to automotive specifications.

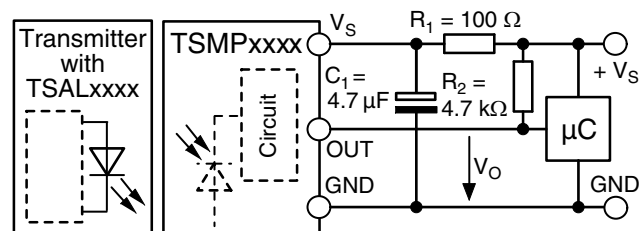
PARTS TABLE		
Carrier frequency	20 kHz to 60 kHz	TSMP58000
Package		Minicast
Pinning		1 = carrier OUT, 2 = GND, 3 = $V_S$
Dimensions (mm)		5.0 W x 6.95 H x 4.8 D
Mounting		Leaded
Application		Code learning

### BLOCK DIAGRAM



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### APPLICATION CIRCUIT



$R_1 + C_1$  recommended to suppress power supply disturbances.

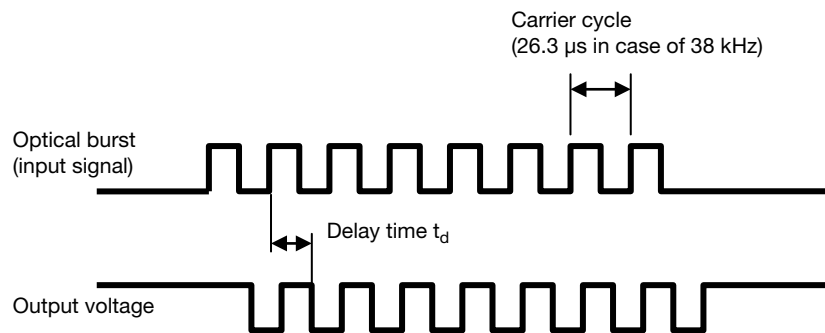
$R_2$  recommended to get faster slopes and a correct high level of the output pulses.

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Supply voltage (pin 3)		$V_S$	-0.3 to +6	V
Output voltage (pin 1)		$V_O$	-0.3 to ( $V_S + 0.3$ )	V
Output current (pin 1)		$I_O$	5	mA
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	-25 to +85	$^{\circ}\text{C}$
Operating temperature range		$T_{amb}$	-25 to +85	$^{\circ}\text{C}$
Soldering temperature	$t \leq 10\text{ s}$ , 1 mm from case	$T_{sd}$	260	$^{\circ}\text{C}$

**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

<b>ELECTRICAL AND OPTICAL CHARACTERISTICS CARRIER OUT</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified, $V_S = 3\text{ V}$ )						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply current (pin 3)	$E_v = 0$	$I_{SD}$	0.55	0.7	0.9	mA
Supply voltage		$V_S$	2.5	-	5.5	V
Transmission distance	$E_v = 0$ , test signal see Fig. 1, IR diode TSAL6200, $I_F = 50\text{ mA}$	$d$	-	1.8	-	m
Output voltage low (pin 1)	$I_{OSL} = 0.5\text{ mA}$ , test signal see Fig. 1	$V_{OSL}$	-	-	250	mV
Minimum irradiance	$V_S = 3\text{ V}$ , (20 kHz to 60 kHz)	$E_{e\text{ min.}}$	-	12	25	$\text{mW}/\text{m}^2$
Maximum irradiance	Test signal see Fig. 1, (20 kHz to 60 kHz)	$E_{e\text{ max.}}$	50	80	-	$\text{W}/\text{m}^2$
Directivity	Angle of half transmission distance	$\varphi_{1/2}$	-	$\pm 45$	-	deg
Output accuracy	$f_C = 20\text{ kHz to }60\text{ kHz}$ , $E_e = 25\text{ mW}/\text{m}^2\text{ to }50\text{ W}/\text{m}^2$ , test signal see Fig. 1, BER $\leq 2\%$	N carrier pulses	input burst length - 1 cycle	input burst length	input burst length + 1 cycle	counts

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


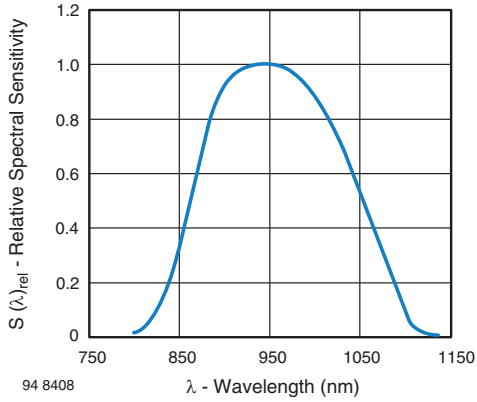


Fig. 2 - Relative Spectral Sensitivity vs. Wavelength

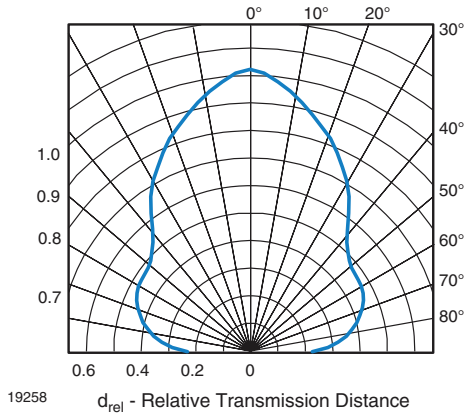


Fig. 3 - Horizontal Directivity

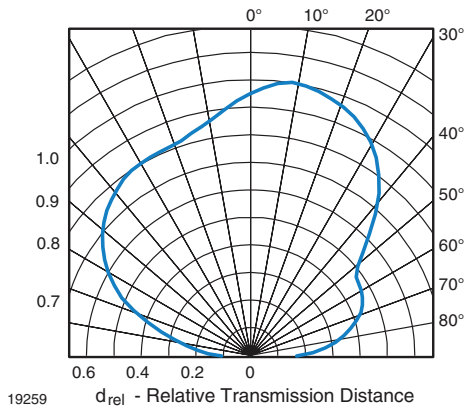
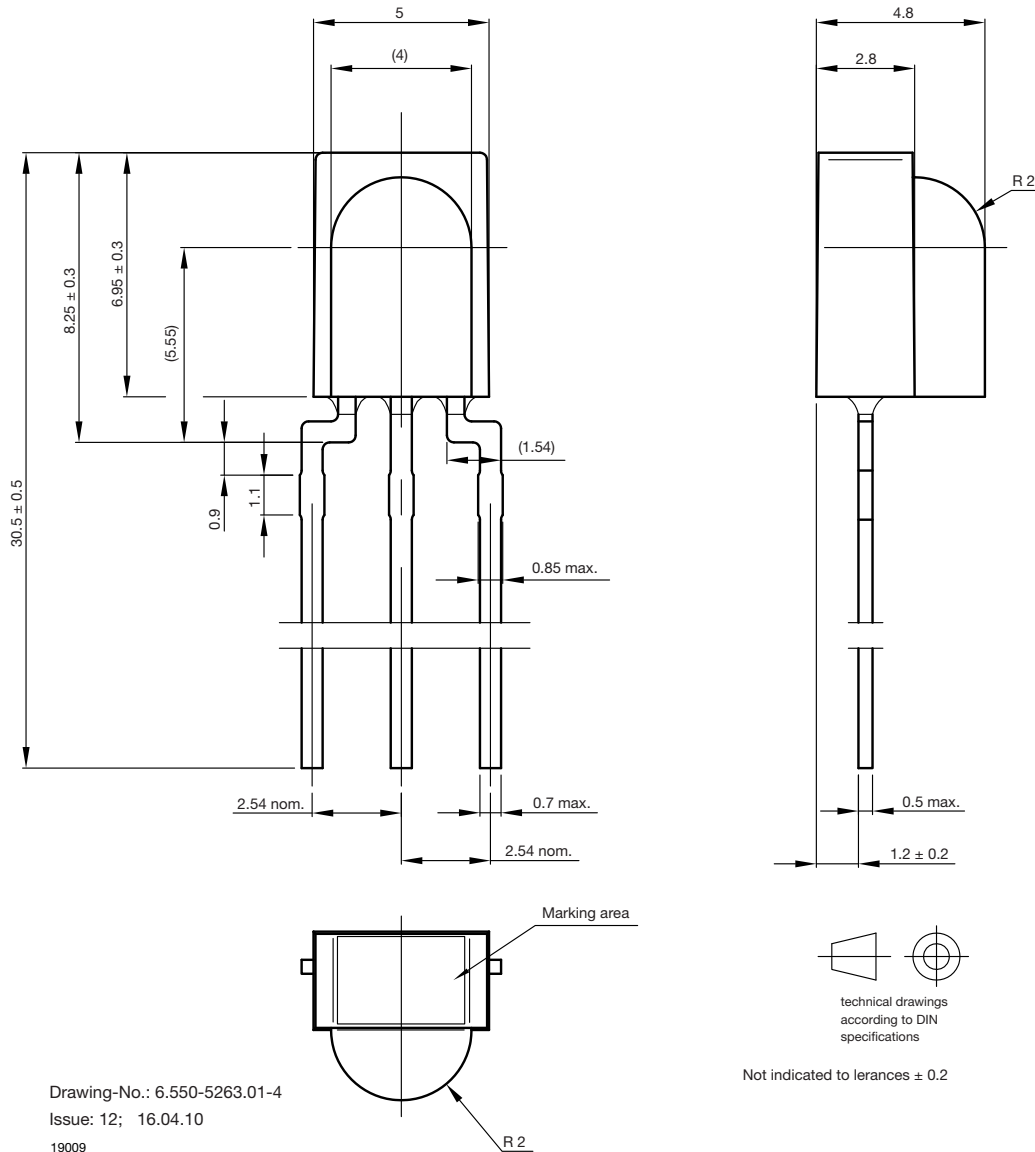


Fig. 4 - Vertical Directivity



PACKAGE DIMENSIONS in millimeters



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 19009



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