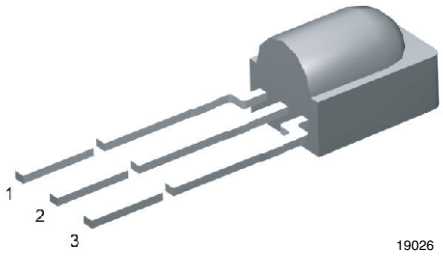
IR Sensor Module for Remote Control Systems



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

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

MECHANICAL DATA

Pinning:

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

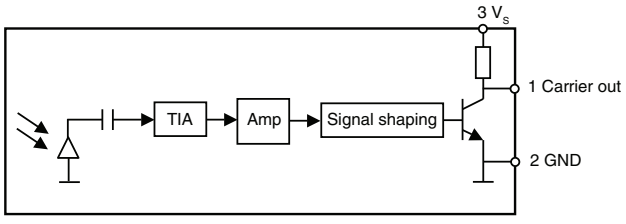
DESCRIPTION

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.

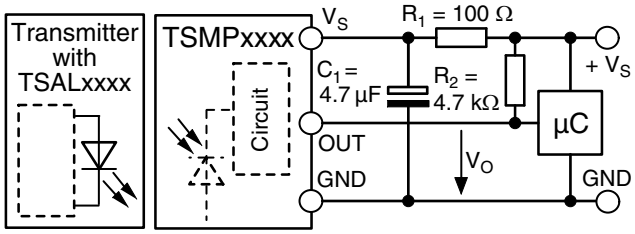
This component has not been qualified according to automotive specifications.

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



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.

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °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	°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

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 CARRIER OUT (T_{amb} = 25 °C, unless otherwise specified, V_S = 3 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 = 400 mA	d		5		m
Output voltage low (pin 1)	I_{OSL} = 0.5 mA, test signal see fig. 1	V_{OSL}			250	mV
Minimum irradiance	V_S = 3 V, (20 kHz to 60 kHz)	$E_{e\ min.}$		12	25	mW/m²
Maximum irradiance	test signal see fig. 1, (20 kHz to 60 kHz)	$E_{e\ max.}$	50	80		W/m²
Directivity	Angle of half transmission distance	$\varphi_{1/2}$		± 45		deg
Output accuracy	f_C = 20 kHz to 60 kHz, E_e = 25 mW/m² to 50 W/m², testsignal see fig. 1, BER ≤ 2%	N carrier pulses	input burst length - 1 cycle	input burst length	input burst length + 1 cycle	counts

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

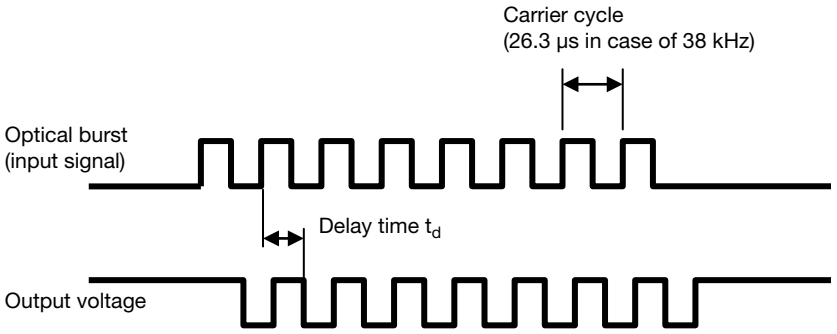


Fig. 1 - Testsignal

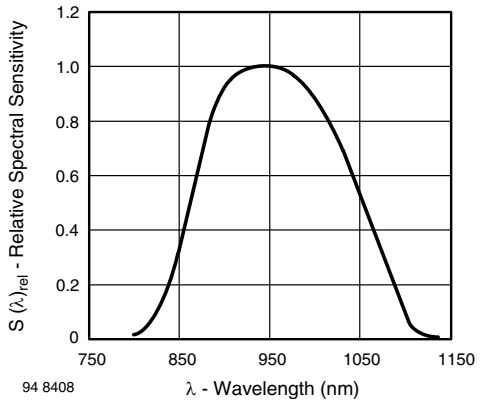


Fig. 2 - Relative Spectral Sensitivity vs. Wavelength

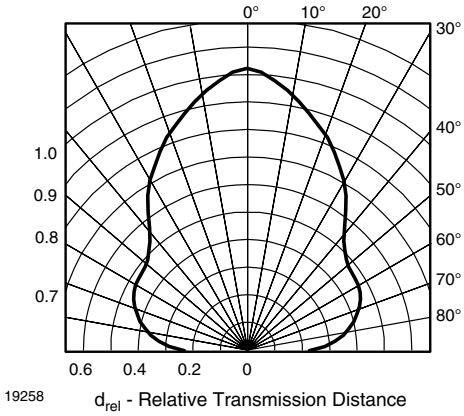


Fig. 3 - Horizontal Directivity

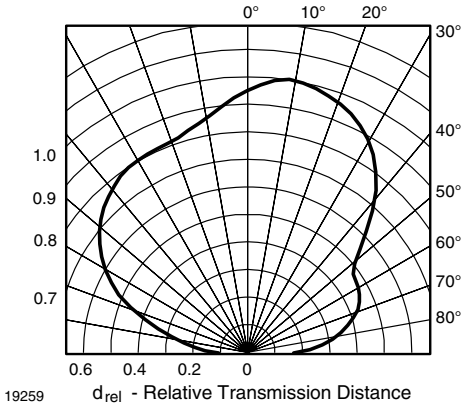
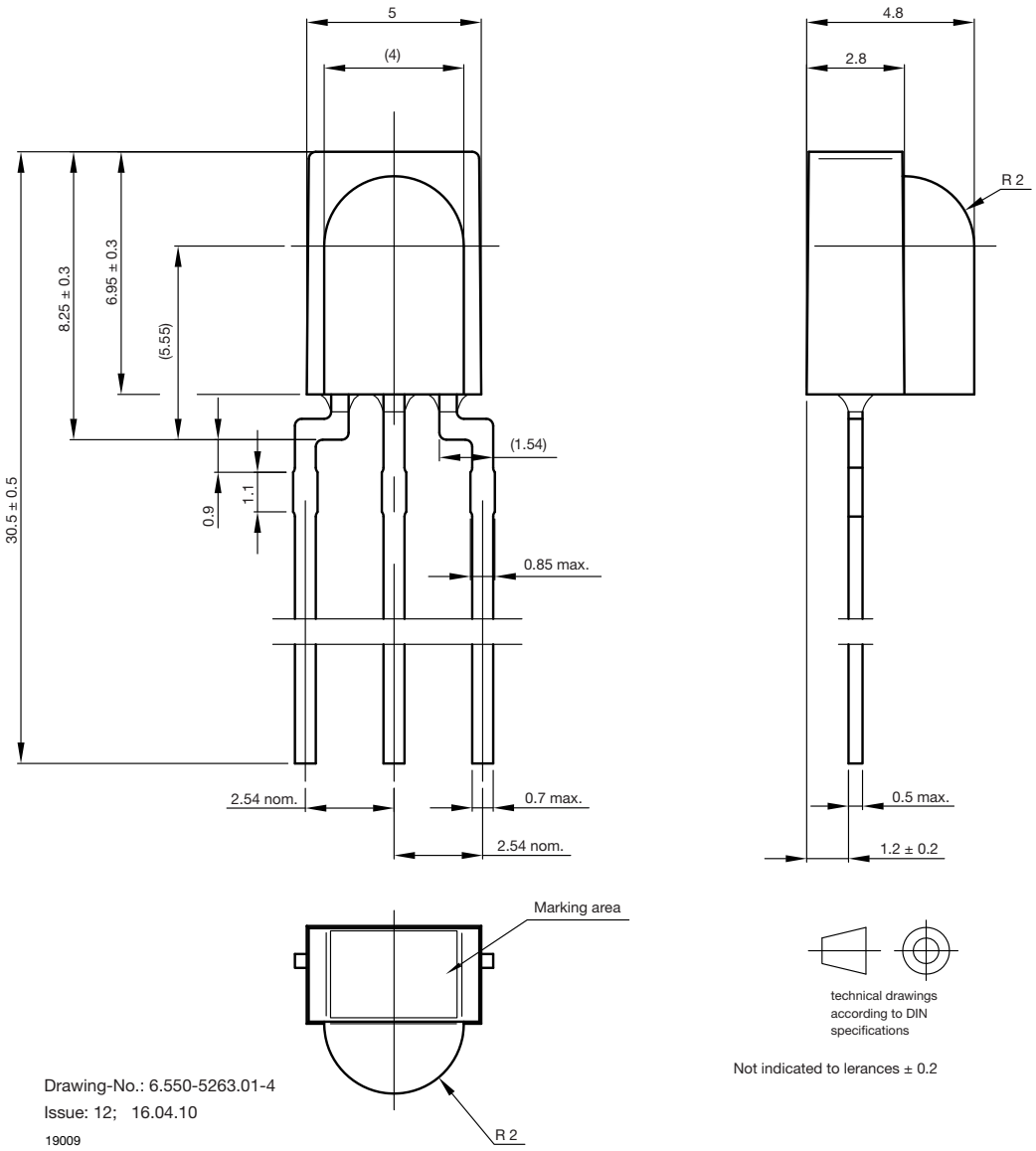


Fig. 4 - Vertical Directivity

PACKAGE DIMENSIONS in millimeters



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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. 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.