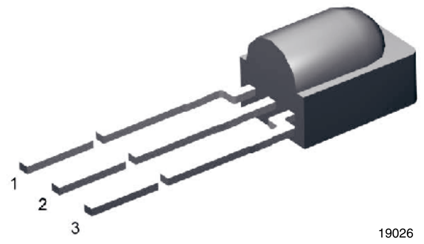
IR Sensor Module for Remote Control Systems

Description

The TSOP98200 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.



Features

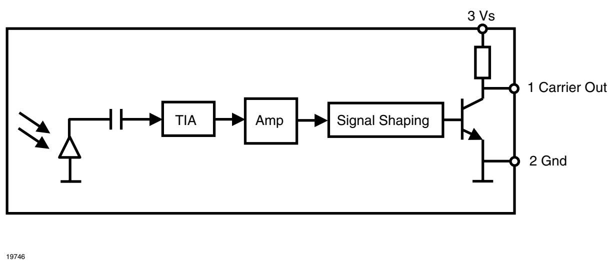
- Photo detector and preamplifier in one package
- AC coupled response from 20 kHz - 455 kHz, all data formats
- Improved shielding against electrical field disturbance
- TTL and CMOS compatibility
- Output active low
- Supply voltage: 2.7 V to 5.5 V
- Carrier Out signal for code learning functions
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Mechanical Data

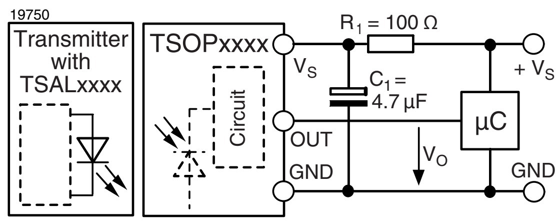
Pin Description:

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

Block Diagram



Application Circuit



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

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 + 5.5	V
Output Voltage	(Pin 1)	V_O	- 0.3 to (V_S + 0.3)	V
Output Current	(Pin 1)	I_O	10	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

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}		0.6	0.8	mA
Supply Voltage		V_S	2.7		5.5	V
Output Voltage Low (Pin 1)	I_{OSL} = 0.5 mA, test signal see fig. 1	V_{OSL}			250	mV
Maximum Irradiance	test signal see fig. 1 (20 - 60* kHz)	$E_{e\ max}$	300	500		W/m^2
Directivity	Angle of half transmission distance	$\varphi_{1/2}$		± 45		deg
Transmission Distance	E_v = 0, test signal see fig. 1, IR diode TSAL6200, I_F = 400 mA	d		1		m
Threshold Irradiance	V_S = 3 V (20 - 60* kHz)	$E_{e\ min}$		0.3	0.5	W/m^2
Carrier Out rise time	Vs = 3 V, C_L = 10 pF	T_R		100		ns
Carrier Out fall time	Vs = 3 V, C_L = 10 pF	T_F		10		ns
Output pulse width	T_{PI} = 10 µs, C_L = 10 pF	T_{PO}	0.6	1.1	1.6	µs

* These irradiance values are guaranteed to 60 kHz. The TSOP98200 will continue to function up to frequencies higher than 600 kHz, however the irradiance at frequencies above 60 kHz is dependent on the carrier frequency and the pulse pattern received.
Typical E_{emin} = 2 W/m^2 at 455 kHz.

Typical Characteristics

T_{amb} = 25 °C, unless otherwise specified

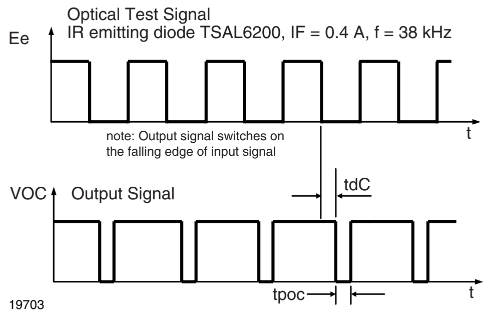


Figure 1. Carrier Output Pulse Diagram

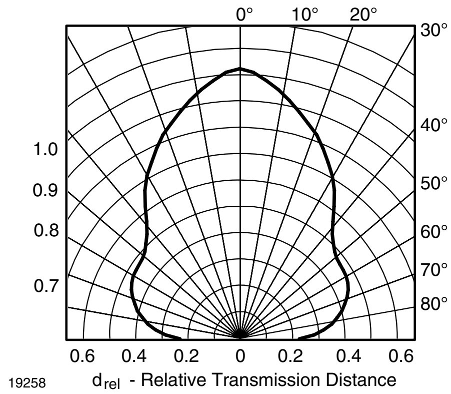


Figure 4. Horizontal Directivity φ_x

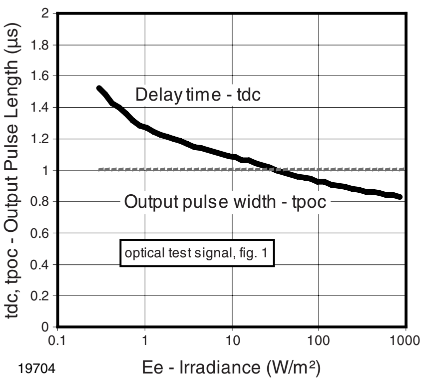


Figure 2. Carrier Output Function Diagram

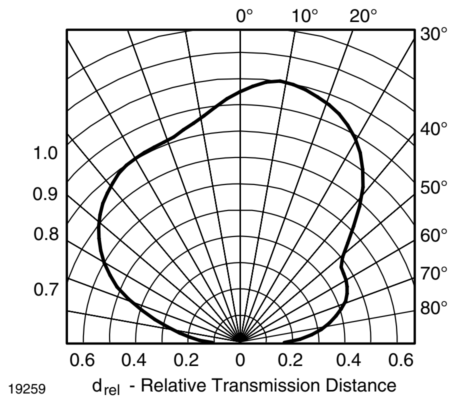


Figure 5. Vertical Directivity φ_y

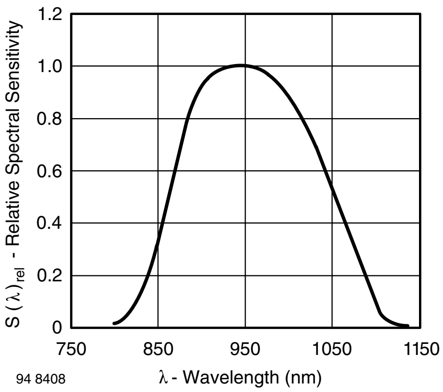
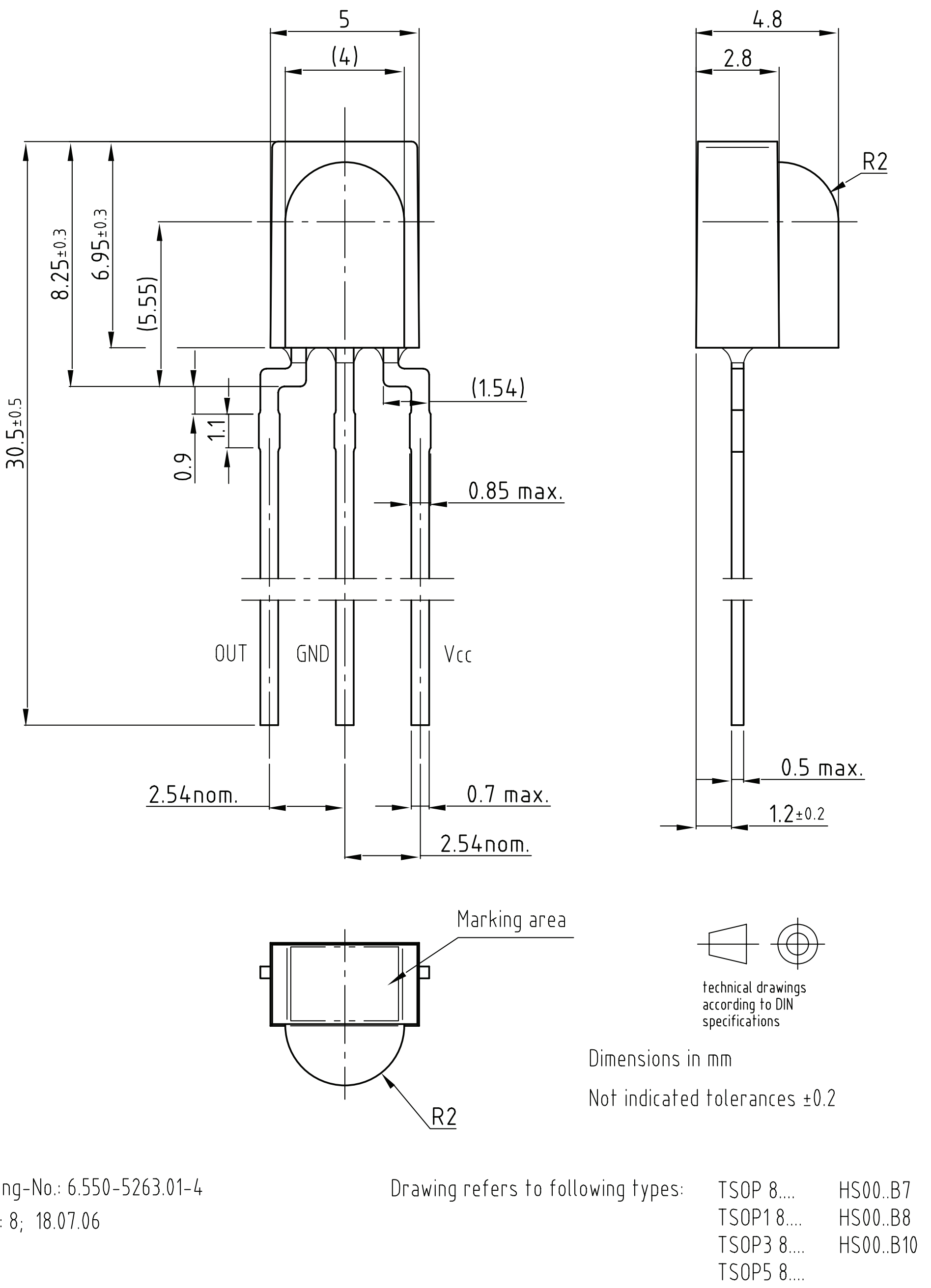


Figure 3. Relative Spectral Sensitivity vs. Wavelength

Package Dimensions in mm



Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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