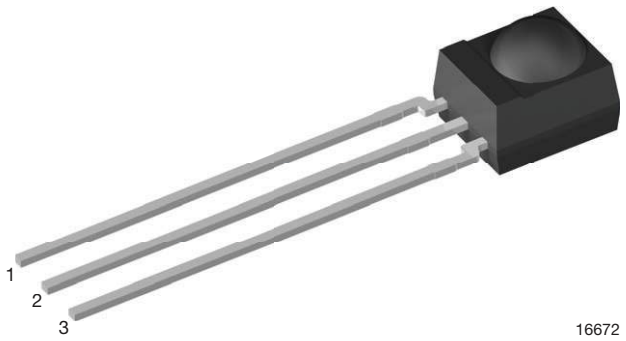
IR Sensor Module for Remote Control Systems



LINKS TO ADDITIONAL RESOURCES

Product Page | 3D Models | Calculators | Marking | Packages | Holders | Bends and Cuts

DESCRIPTION

The TSMP4138 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 repeater applications and 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 30 kHz to 60 kHz, all data formats
- If the IR signal strength is more then 600 mW/m² (distance less than 0.45 m with a typical IR remote control), the frequency range is limited to 55 kHz
- Improved shielding against electrical field disturbance
- AGC to suppress ambient noise
- High sensitivity, long receiving range
- Supply voltage: 2.5 V to 5.5 V
- Carrier out signal for IR repeater applications
- 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

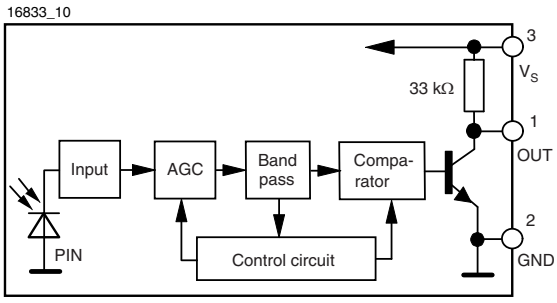
Pinning:

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

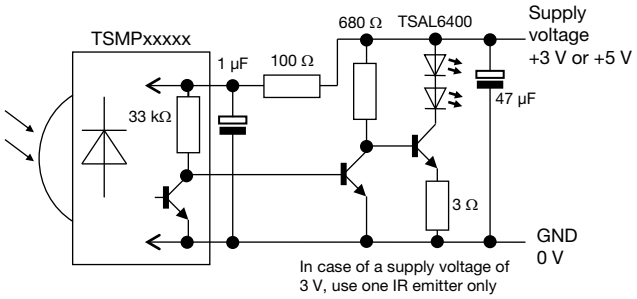
ORDERING CODE

TSMP4138 - 2160 pieces in tubes

BLOCK DIAGRAM



APPLICATION CIRCUIT



Recommended circuit for best sensitivity in repeater applications.
It limits the output voltage swing V_o to about 0.7 V in order to avoid internal coupling.

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PARTS TABLE		
Carrier frequency	38 kHz	TSMP4138
Package		Mold
Pinning		1 = carrier OUT, 2 = GND, 3 = V_S
Dimensions (mm)		6.0 W x 6.95 H x 5.6 D
Mounting		Leaded
Application		Repeater
Special options		• 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	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
Power consumption	$T_{amb} \leq 85$ °C	P_{tot}	10	mW
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 (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	-	9	-	m
Output voltage low (pin 1)	I_{OSL} = 0.5 mA, E_e = 0.7 mW/m², test signal see Fig. 1	V_{OSL}	-	-	100	mV
Minimum irradiance	Less than 5 missing or 5 additional sub carrier pulses related to one burst	$E_{e\ min.}$	-	0.6	1.2	mW/m²
Maximum irradiance	Less than 5 missing or 5 additional sub carrier pulses related to one burst	$E_{e\ max.}$	30	-	-	W/m²
Directivity	Angle of half transmission distance	$\varphi_{1/2}$	-	± 45	-	deg

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

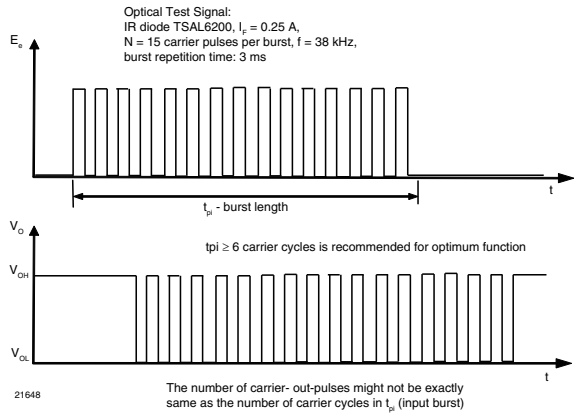

Fig. 1 - Output Function

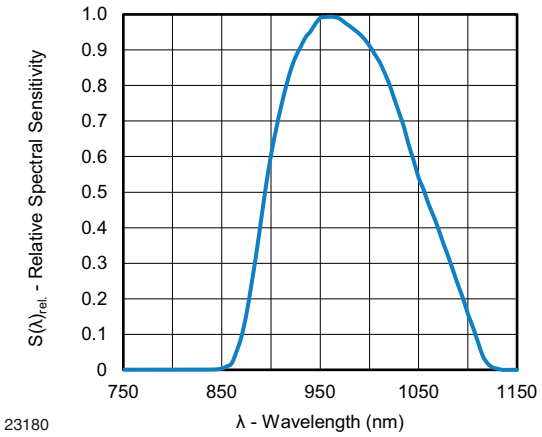

Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

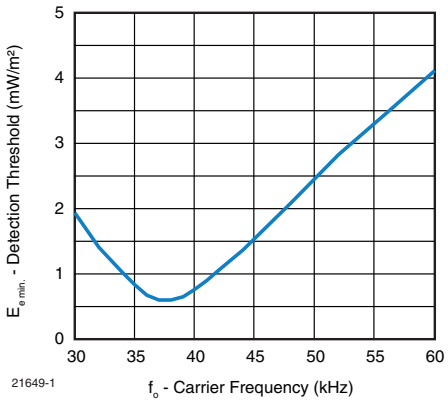

Fig. 2 - Frequency Dependence of Sensitivity

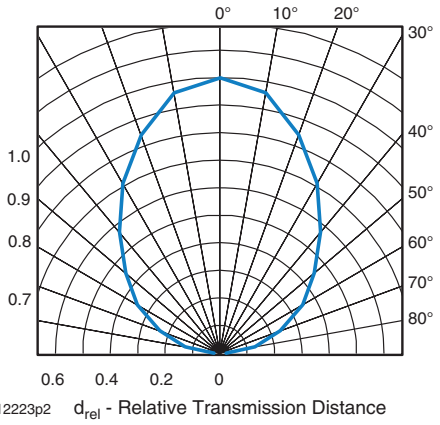

Fig. 4 - Horizontal Directivity

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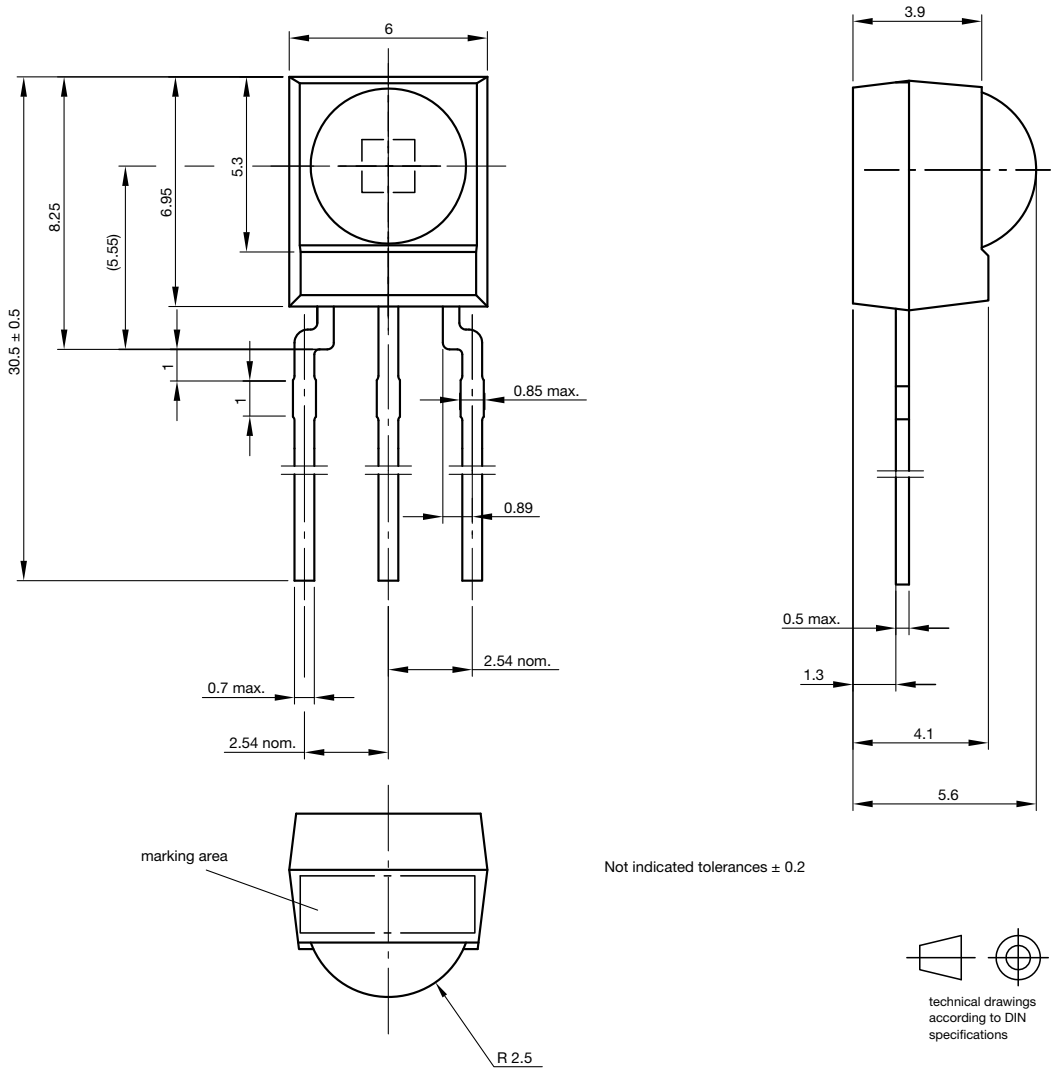
PACKAGE DIMENSIONS in millimeters



Not indicated tolerances ± 0.2

technical drawings
according to DIN
specifications

Drawing-No.: 6.550-5169.01-4
Issue: 9; 03.11.10
13655

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