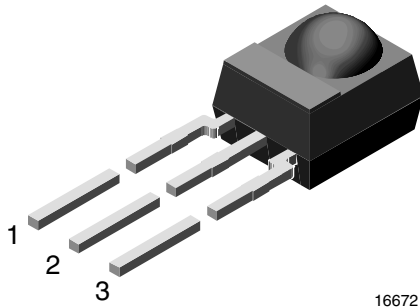


IR Sensor Module for Remote Control Systems



16672

MECHANICAL DATA

Pinning:

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

FEATURES

- Photo detector and preamplifier in one package
- AC coupled response from 30 kHz to 50 kHz, all data formats
- If the IR signal strength is less than 2 W/m² (distance more than 0.2 m with a typical IR remote control), the frequency range is up to 55 kHz
- If the IR signal strength is less than 15 mW/m² (distance more than 2.5 m with a typical IR remote control), the frequency range is up to 60 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



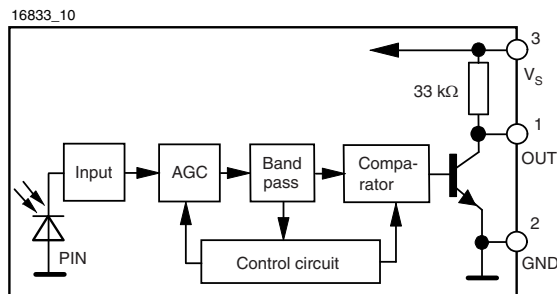
DESCRIPTION

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.

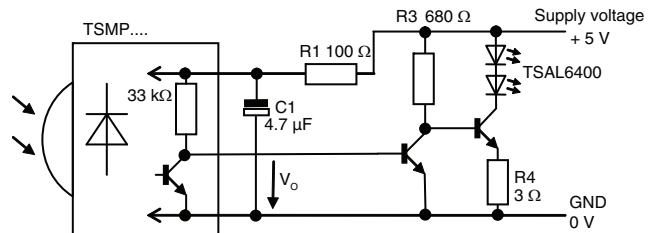
This component has not been qualified according to automotive specifications.

PARTS TABLE	
Carrier frequency	38 kHz
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

BLOCK DIAGRAM



APPLICATION CIRCUIT



Recommended circuit for best sensitivity of the TSMP.... in repeater applications. It limits the output voltage swing V_o to about 0.7 V in order to avoid internal coupling.
22638-1

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	$T_{amb} \leq 85\text{ °C}$	P_{tot}	10	mW
Soldering temperature	$t \leq 10\text{ s}$, 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 ($T_{amb} = 25\text{ °C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply current (pin 3)	$E_v = 0, V_S = 5\text{ V}$	I_{SD}	0.55	0.7	0.9	mA
	$E_v = 40\text{ klx}$, 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, $I_F = 400\text{ mA}$	d		20		m
Output voltage low (pin 1)	$I_{OSL} = 0.5\text{ mA}$, $E_e = 0.7\text{ mW/m}^2$, 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/m^2
Maximum irradiance	Less than 5 missing or 5 additional sub carrier pulses related to one burst	$E_{e\ max.}$	30			W/m^2
Directivity	Angle of half transmission distance	$\phi_{1/2}$		± 45		deg

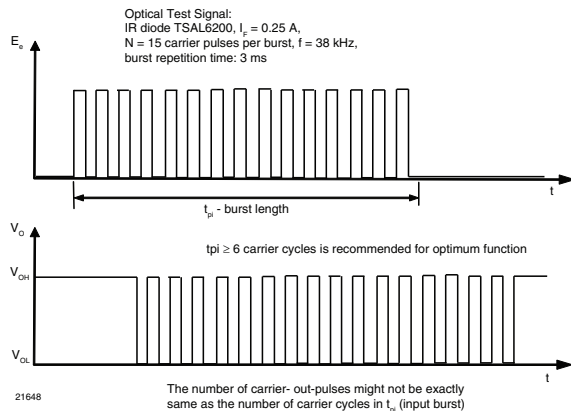
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$, unless otherwise specified)


Fig. 1 - Output Function

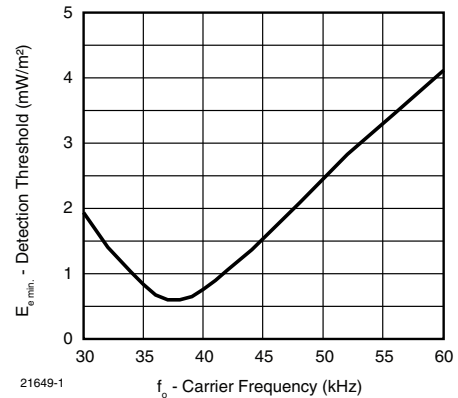


Fig. 2 - Frequency Dependence of Sensitivity

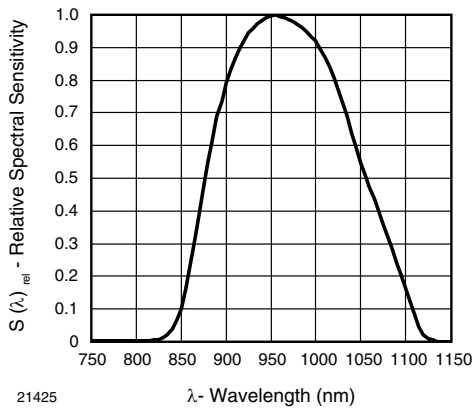


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

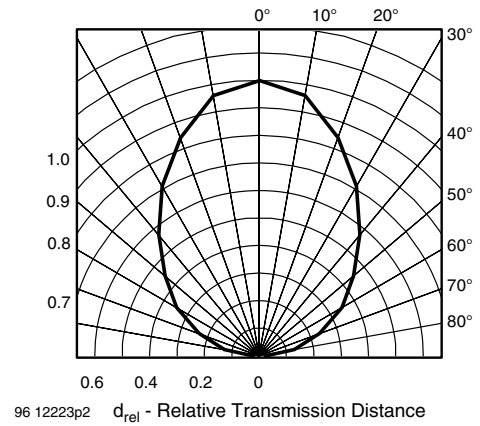
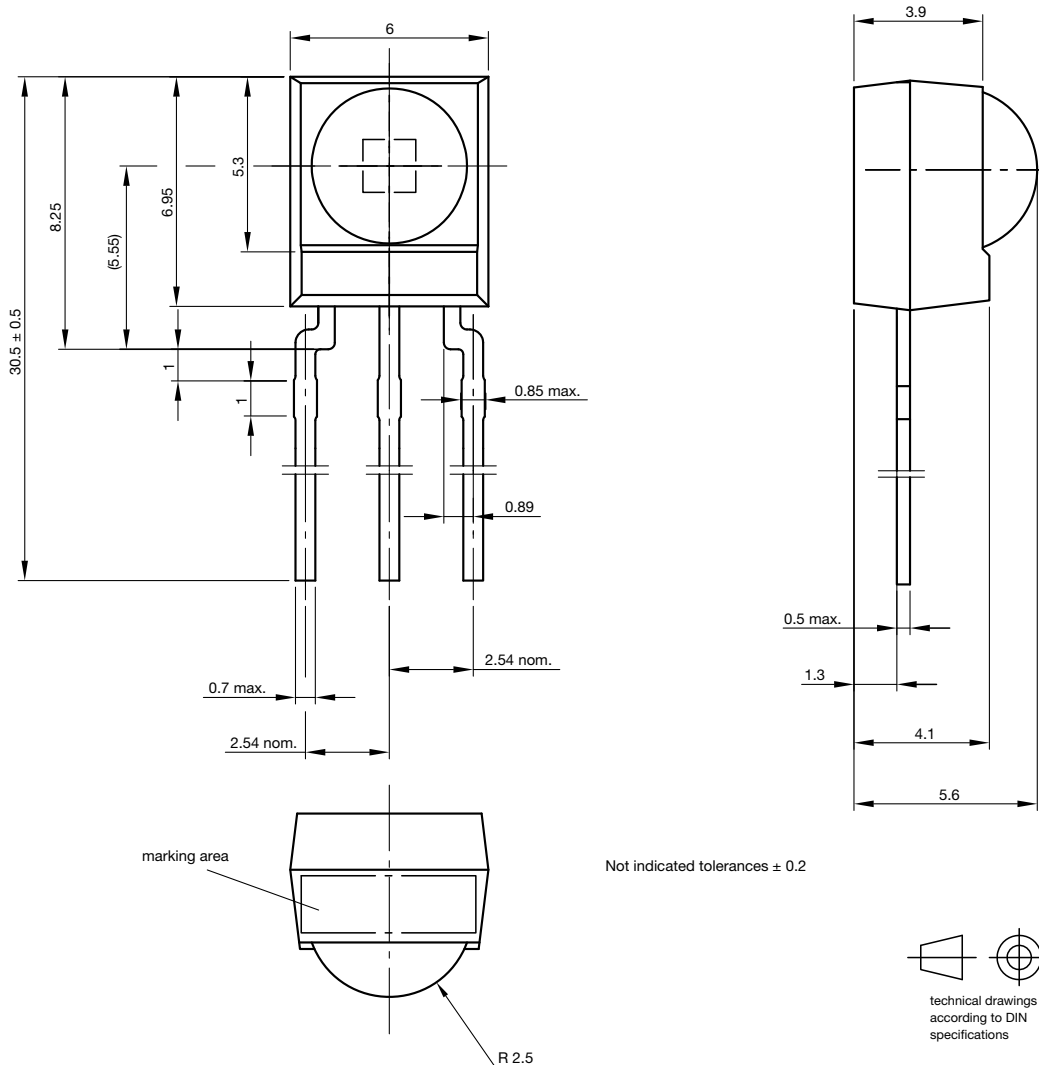


Fig. 4 - Horizontal Directivity

PACKAGE DIMENSIONS in millimeters



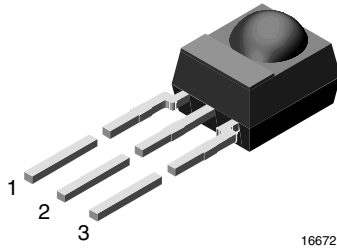
Drawing-No.: 6.550-5169.01-4
 Issue: 9; 03.11.10
 13655



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

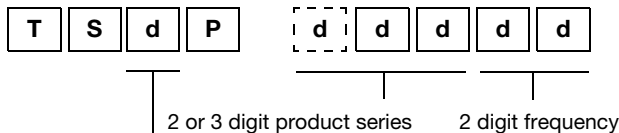


AVAILABLE FOR

- 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

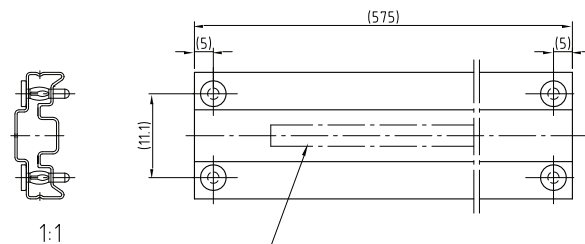
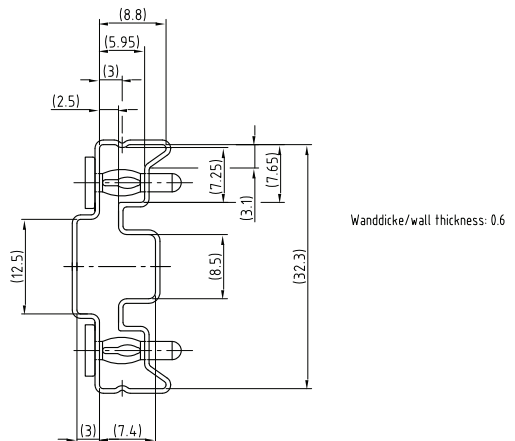
- d = "digit", please consult the list of available devices create a valid part number.

Example: TSOP4838

PACKAGING QUANTITY

- 90 pieces per tube
- 24 tubes per carton

PACKAGING DIMENSIONS in millimeters



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

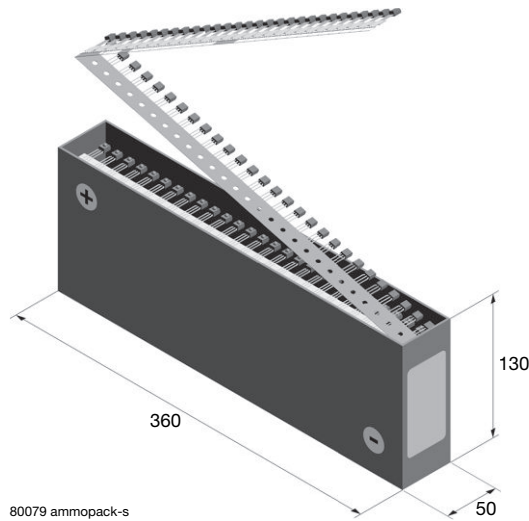
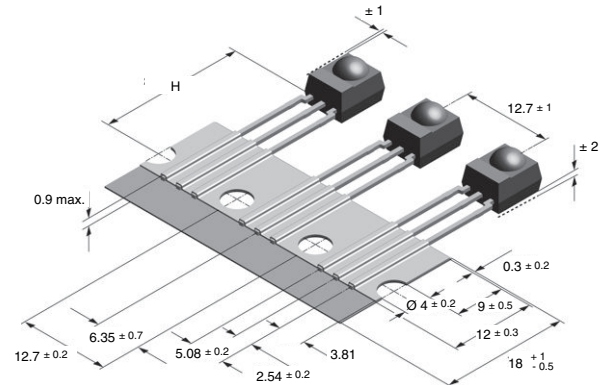
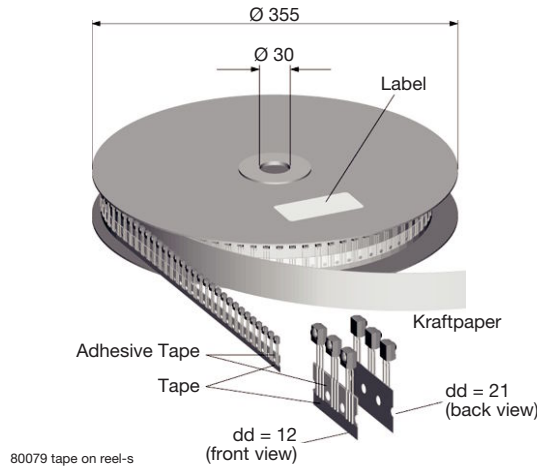


TAPE AND REEL/AMMOPACK

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



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

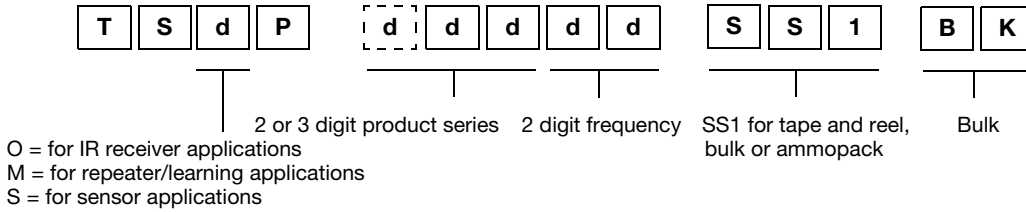
- 1000 pieces per reel
- 1000 pieces per ammpack



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
Packaging Plastic Tubes (Normal/auxiliary devices)	80	150	600
Packaging Plastic Trays (Devices with metal holders)	120	290	490
Tape and Reel Box (Taping in reels)	400	310	410
Ammo-Box (Zigzag taping)	50	130	350



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