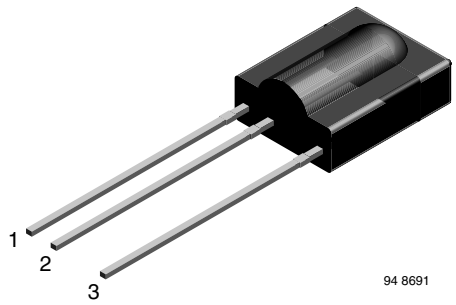
IR Sensor Module for Remote Control Systems



MECHANICAL DATA

Pinning:

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

FEATURES

- Photo detector and preamplifier in one package
- AC coupled response from 30 kHz to 55 kHz, all data formats
- If the IR singal strength is less then 300 mW/m² (distance more than 0.6 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

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

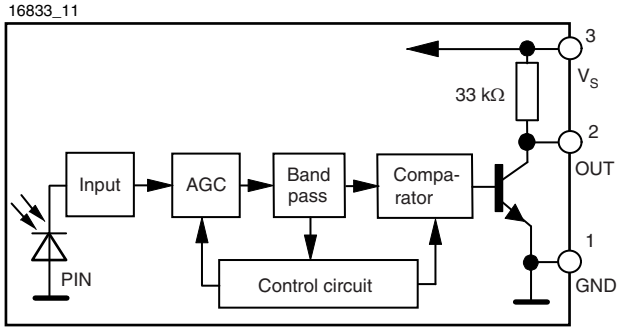
DESCRIPTION

The TSMP1138 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.

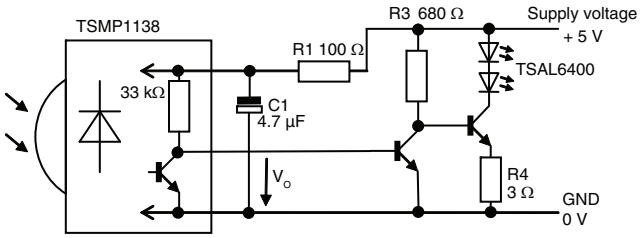
This component has not been qualified according to automotive specifications.

PARTS TABLE		
Carrier frequency	38 kHz	TSMP1138
Package		Cast
Pinning		1 = GND, 2 = Carrier OUT, 3 = V_S
Dimensions (mm)		10.0 W x 12.5 H x 5.8 D
Mounting		Leaded
Application		Repeater

BLOCK DIAGRAM



APPLICATION CIRCUIT



Recommended circuit for best sensitivity of the TSOP9xx38 in repeater applications. It limits the output voltage swing V_o to about 0.7 V in order to avoid internal coupling.

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 2)		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 2)		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 = 400 mA	d		30		m
Output voltage low (pin 2)	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	$E_{e\ min.}$		0.5	1	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	$\varphi_{1/2}$		± 55		deg

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

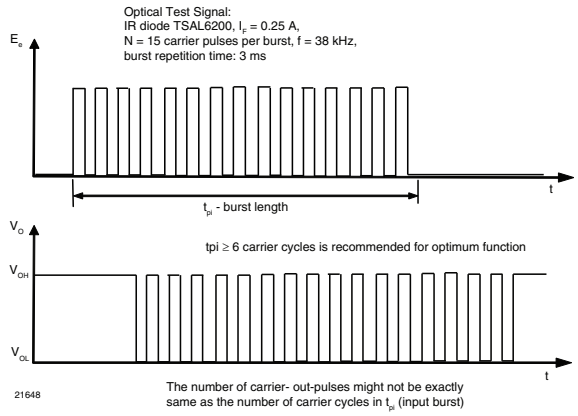


Fig. 1 - Output Function

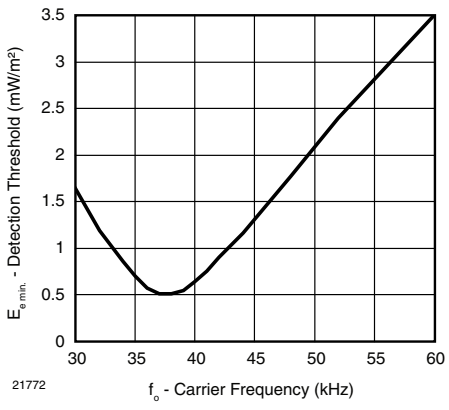


Fig. 2 - Frequency Dependence of Sensitivity

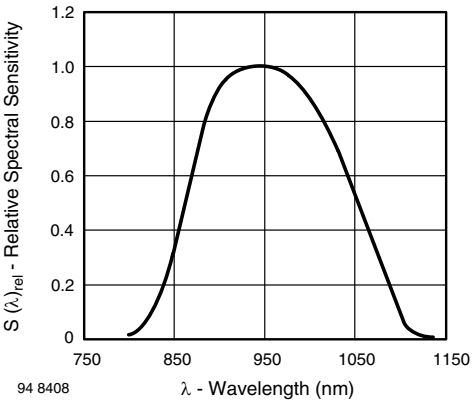


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

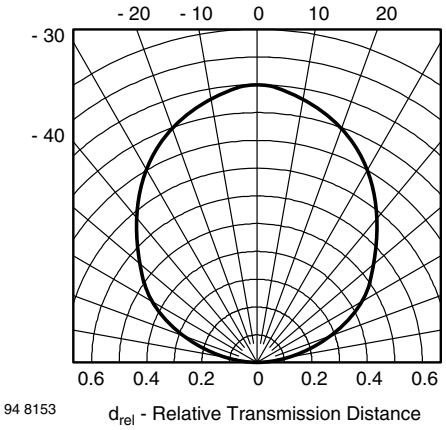


Fig. 4 - Horizontal Directivity φ_x

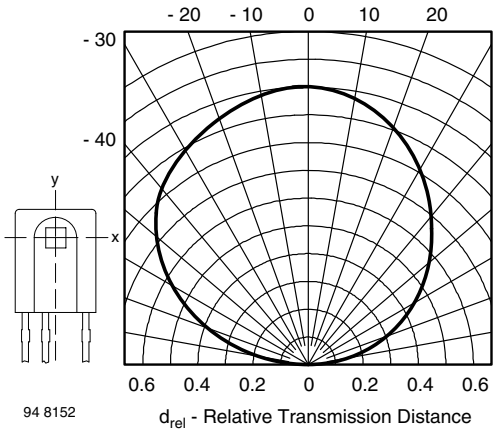
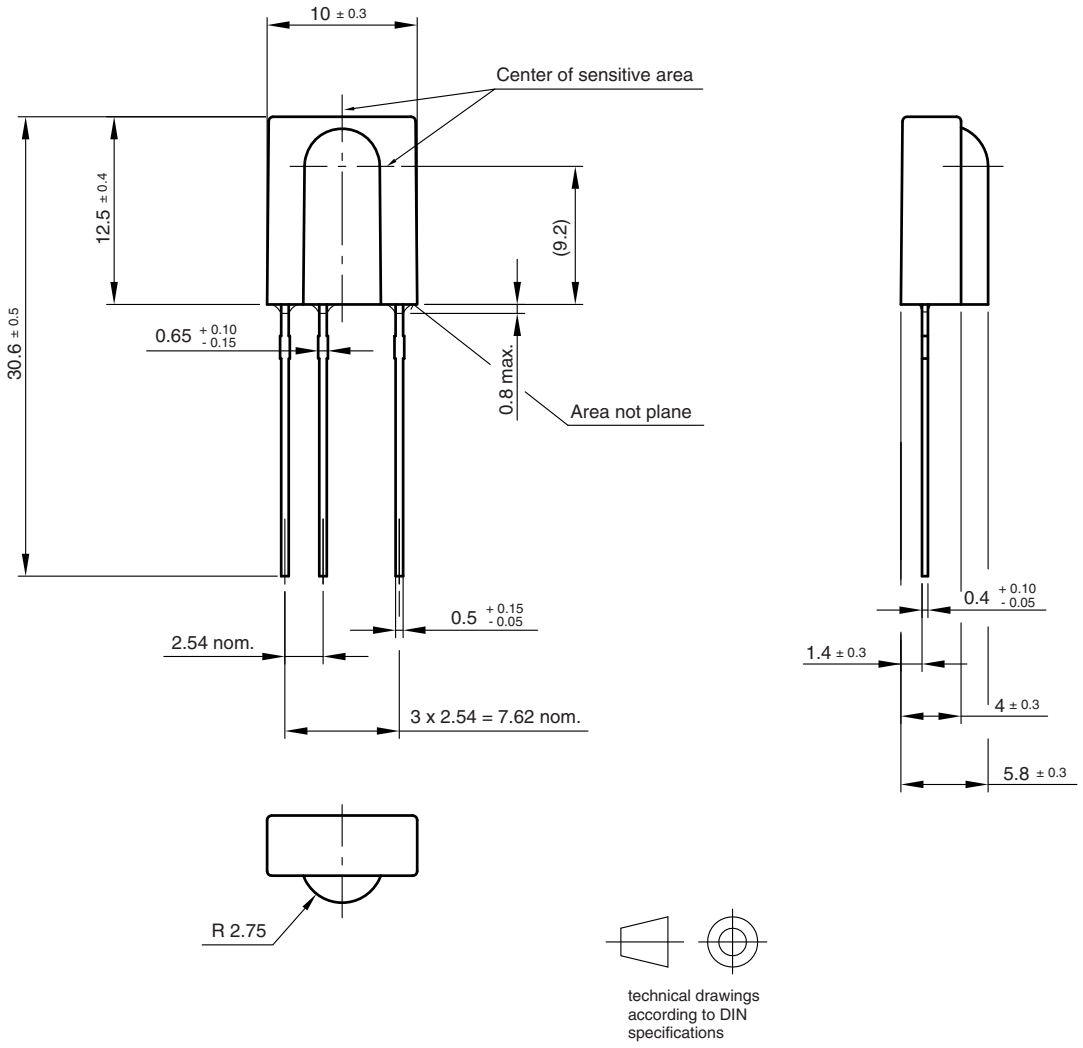


Fig. 5 - Vertical Directivity φ_y

PACKAGE DIMENSIONS in millimeters

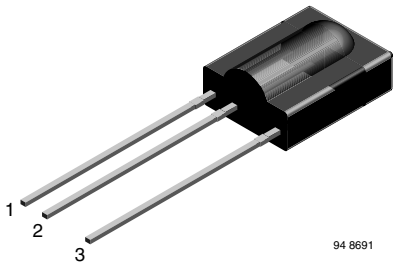


Drawing-No.: 6.550-5095.01-4
Issue: xx; 20.05.09
96 12116-1

IR Receiver Modules for Remote Control Systems

Vishay offers stock Cast IR Receivers in three different packages:

- Loose packed in tubes and mounted on tape for reel or ammopack
- 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

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)

AVAILABLE FOR

- TSOP312..
- TSOP311..
- TSOP12...
- TSOP11...
- TSOP13...
- TSOP313..
- TSOP314..
- TSOP315..
- TSMP1138

LOOSE PACKED IN TUBE

ORDERING INFORMATION

T	S	d	P	d	d	d	d	d

2 or 3 digit product series — 2 digit frequency

O = for IR receiver applications
M = for repeater/learning applications

Note

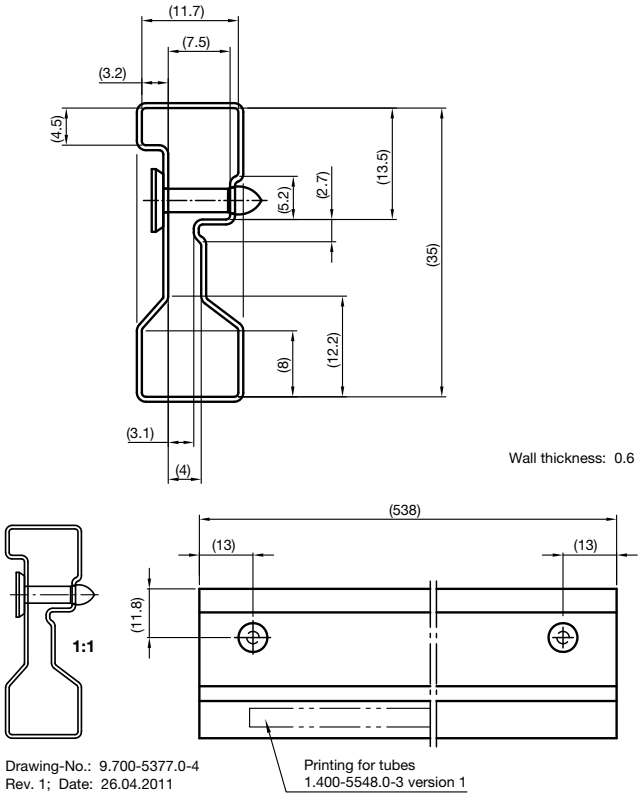
- d = “digit”, please consult the list of available devices create a valid part number.

EXAMPLE: TSOP1238

PACKAGING QUANTITY

- 50 pieces per tube
- 20 tubes per carton

PACKAGING DIMENSIONS in millimeters

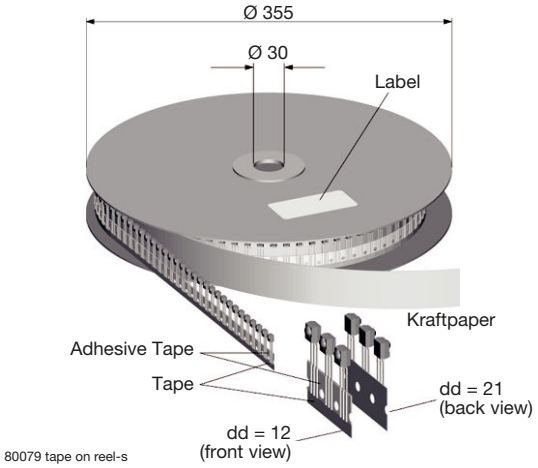


TAPE AND REEL/AMMOPACK

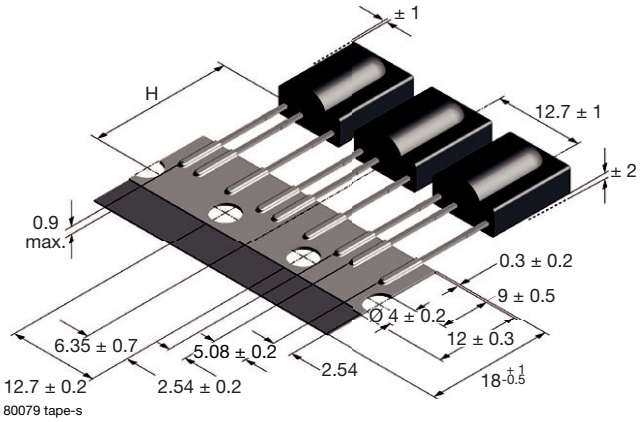
Up to 3 consecutive components may be missing if the gap is followed by at least 6 components. A maximum of 0.5 % of the components per reel quantity may be missing. At least 5 empty positions are present at the start and the end of the tape to enable insertion.

Tensile strength of the tape: > 15 N

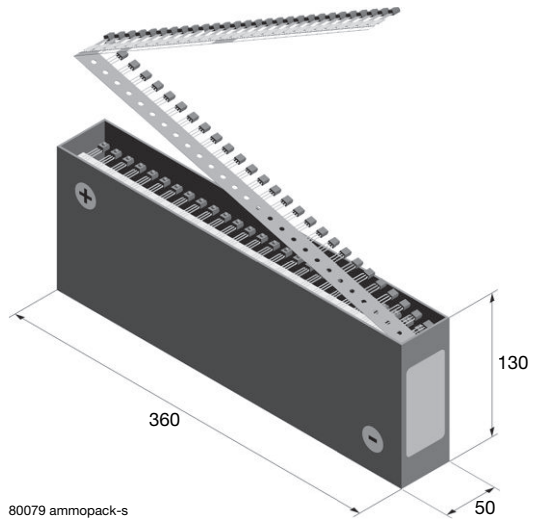
Pulling force in the plane of the tape, at right angles to the reel: > 5 N



80079 tape on reel-s



80079 tape-s



80079 ammopack-s

VERSION	DIMENSION "H"
BS	20 ± 0.5
PS	23.3 ± 0.5
OS	26 ± 0.5

ORDERING INFORMATION

T	S	d	P	d	d	d	d	d	S	S	1	d	d	d	d	Z

- T S d P: O = for IR receiver applications; M = for repeater/learning 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 ammopack
- d d: dd = BS, PS, or OS
- d d: Tape and reel
- dd = 12 or 21
- Z: Ammopack

Note

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

EXAMPLE: TSOP1238SS1BS12

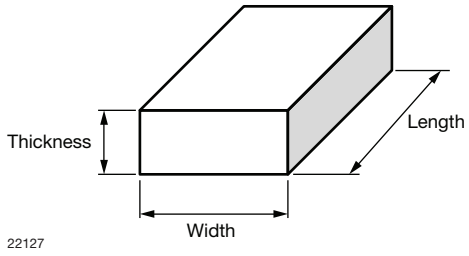
TSOP1238SS1BS12Z

PACKAGING QUANTITY

- 1000 pieces per reel
- 1000 pieces per ammopack

OUTER PACKAGING

CARTON BOX DIMENSIONS in millimeters



KINDS OF CARTON BOX	THICKNESS	WIDTH	LENGTH
Packaging Plastic Tubes (Normal/auxiliary devices)	82	152	564
Tape and Reel Box (Taping in reels)	400	310	410
Ammo-Box (Zigzag taping)	50	130	350

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