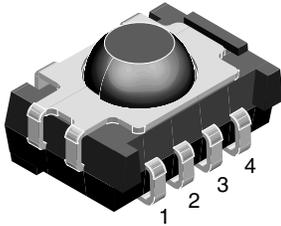


IR Receiver Modules for Remote Control Systems



16797

MECHANICAL DATA

Pinning

1 = GND, 2 = N.C., 3 = V_S , 4 = OUT

DESCRIPTION

The TSOP61.. series are miniaturized SMD-IR receiver modules for infrared remote control systems. PIN diode and preamplifier are assembled on lead frame, the epoxy package is designed as IR filter.

The demodulated output signal can directly be decoded by a microprocessor. The main benefit is the operation with short burst transmission codes and high data rates.

This component has not been qualified according to automotive specifications.

FEATURES

- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Continuous data transmission possible
- Supply voltage: 2.7 V to 5.5 V
- Output active low
- Low power consumption
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT

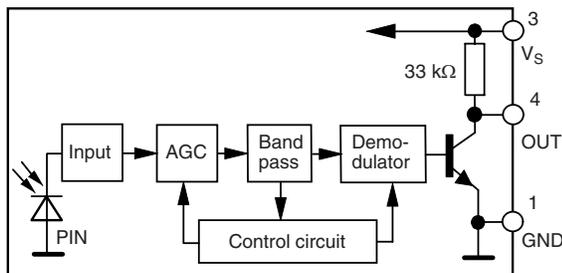
SPECIAL FEATURES

- Enhanced data rate up to 4000 bit/s
- Operation with short burst possible (≥ 6 cycles/burst)
- Taping available for topview and sideview assembly

PARTS TABLE

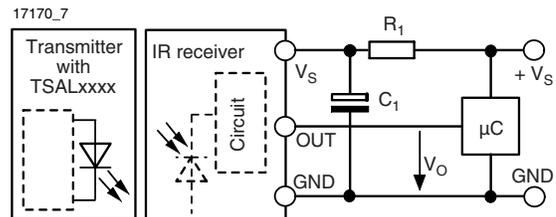
CARRIER FREQUENCY	SHORT BURSTS AND HIGH DATA RATES (AGC1)
30 kHz	TSOP6130
33 kHz	TSOP6133
36 kHz	TSOP6136
36.7 kHz	TSOP6137
38 kHz	TSOP6138
40 kHz	TSOP6140
56 kHz	TSOP6156

BLOCK DIAGRAM



16838-1

APPLICATION CIRCUIT



The external components R_1 and C_1 are optional to improve the robustness against electrical overstress (typical values are $R_1 = 100 \Omega$, $C_1 = 0.1 \mu F$). The output voltage V_o should not be pulled down to a level below 1 V by the external circuit. The capacitive load at the output should be less than 2 nF.



ABSOLUTE MAXIMUM RATINGS (1)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Supply voltage (pin 3)		V_S	- 0.3 to + 6.0	V
Supply current (pin 3)		I_S	5	mA
Output voltage (pin 4)		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 4)		I_O	5	mA
Junction temperature		T_j	100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Operating temperature range		T_{amb}	- 25 to + 85	°C
Power consumption	$T_{amb} \leq 85$ °C	P_{tot}	10	mW

Note

(1) 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 (1)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply current (pin 3)	$E_v = 0, V_S = 5$ V	I_{SD}	0.65	0.85	1.05	mA
	$E_v = 40$ klx, sunlight	I_{SH}		0.95		mA
Supply voltage		V_S	2.7		5.5	V
Transmission distance	$E_v = 0$, test signal see fig. 1, IR diode TSAL6200, $I_F = 400$ mA	d		40		m
Output voltage low (pin 4)	$I_{OSL} = 0.5$ mA, $E_e = 0.7$ mW/m ² , test signal see fig. 1	V_{OSL}			100	mV
Minimum irradiance	Pulse width tolerance: $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see fig. 1	E_e min.		0.3	0.45	mW/m ²
Maximum irradiance	$t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see fig. 1	E_e max.	30			W/m ²
Directivity	Angle of half transmission distance	$\phi_{1/2}$		± 50		deg

Note

(1) $T_{amb} = 25$ °C, unless otherwise specified

TYPICAL CHARACTERISTICS

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

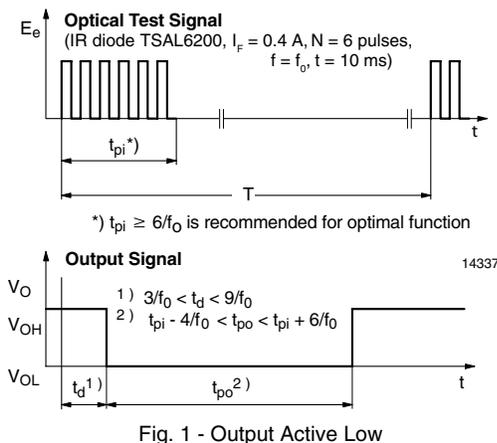


Fig. 1 - Output Active Low

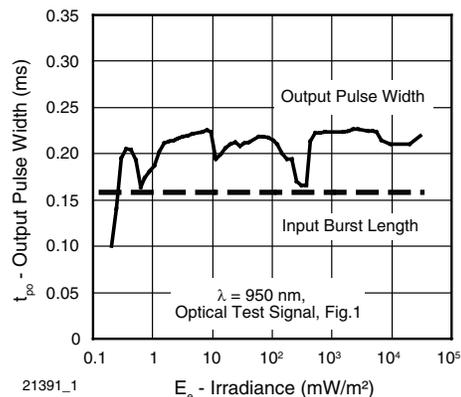


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

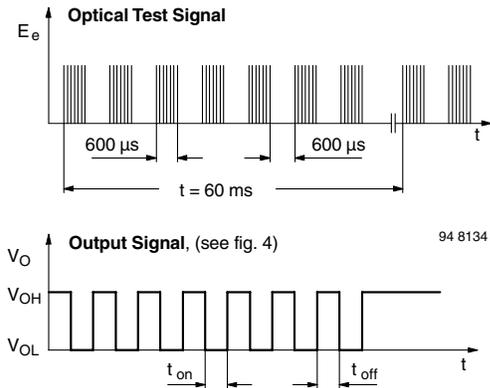


Fig. 3 - Output Function

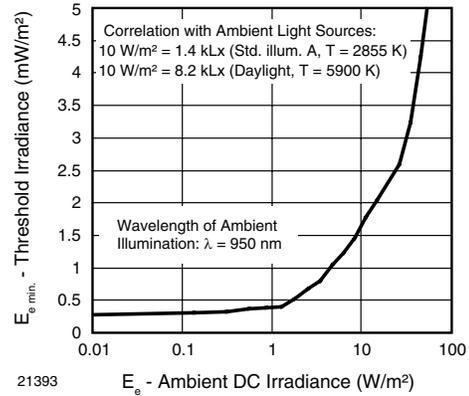


Fig. 6 - Sensitivity in Bright Ambient

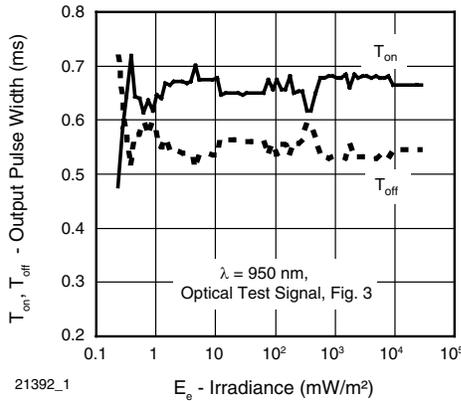


Fig. 4 - Output Pulse Diagram

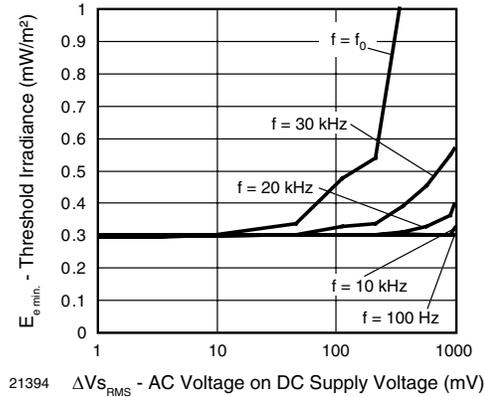


Fig. 7 - Sensitivity vs. Supply Voltage Disturbances

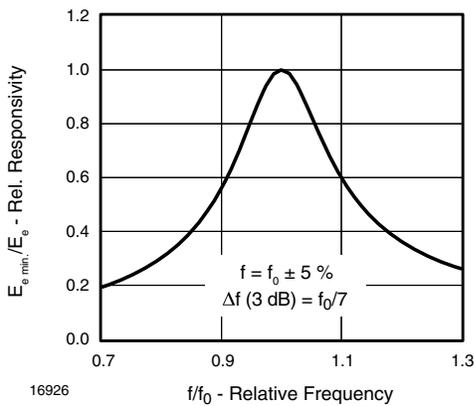


Fig. 5 - Frequency Dependence of Responsivity

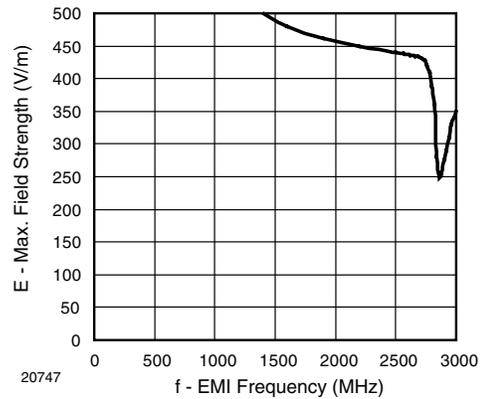


Fig. 8 - Sensitivity vs. Electric Field Disturbances

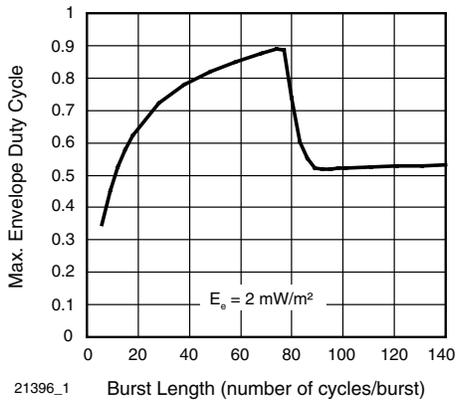


Fig. 9 - Max. Envelope Duty Cycle vs. Burst Length

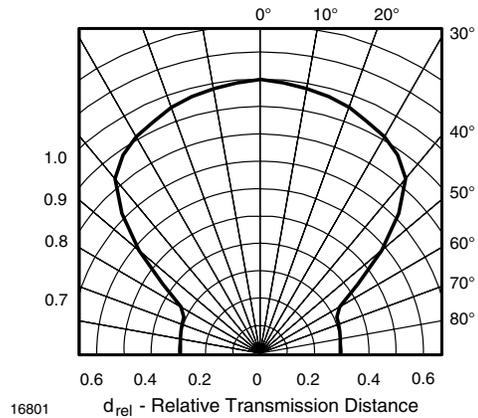


Fig. 12 - Horizontal Directivity

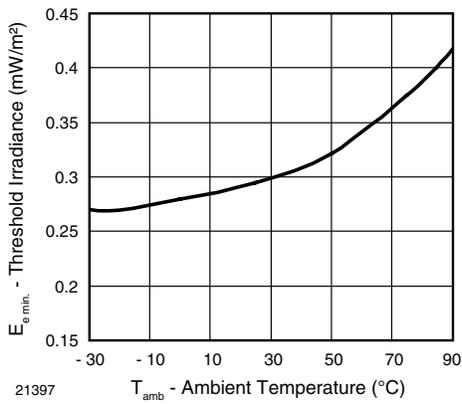


Fig. 10 - Sensitivity vs. Ambient Temperature

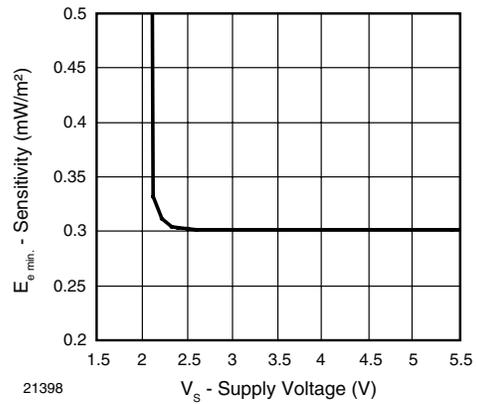


Fig. 13 - Sensitivity vs. Supply Voltage

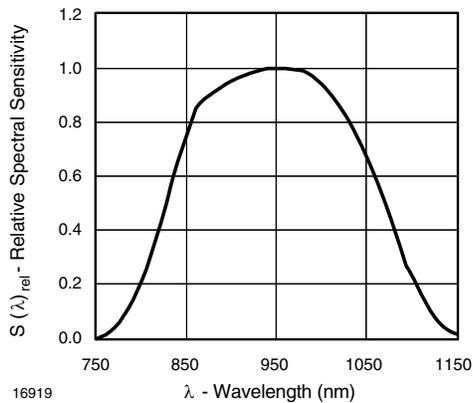


Fig. 11 - Relative Spectral Sensitivity vs. Wavelength

SUITABLE DATA FORMAT

The TSOP61.. series is designed to suppress spurious output pulses due to noise or disturbance signals. Data and disturbance signals can be distinguished by the devices according to carrier frequency, burst length and envelope duty cycle. The data signal should be close to the band-pass center frequency (e.g. 38 kHz) and fulfill the conditions in the table below.

When a data signal is applied to the TSOP61.. in the presence of a disturbance signal, the sensitivity of the receiver is reduced to insure that no spurious pulses are present at the output. Some examples of disturbance signals which are suppressed are:

- DC light (e.g. from tungsten bulb or sunlight)
- Continuous signals at any frequency
- Modulated IR signals from common fluorescent lamps (example of noise pattern is shown in figure 14)

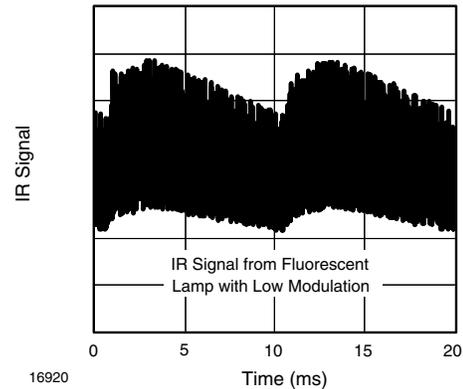


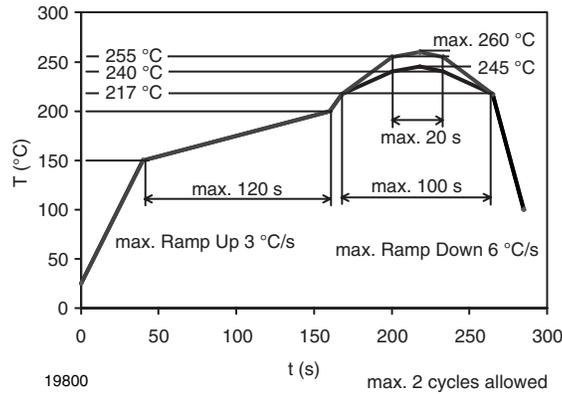
Fig. 14 - IR Signal from Fluorescent Lamp with Low Modulation

	TSOP61..
Minimum burst length	6 cycles/burst
After each burst of length a minimum gap time is required of	6 to 70 cycles ≥ 10 cycles
For bursts greater than a minimum gap time in the data stream is needed of	70 cycles > 1.1 x burst length
Maximum number of continuous short bursts/second	2000
Recommended for NEC code	yes
Recommended for RC5/RC6 code	yes
Recommended for RCMM code	yes
Recommended for RECS-80 code	yes
Recommended for r-Step and r-Map data format	yes
Recommended for XMP data format	yes
Suppression of interference from fluorescent lamps	Most common disturbance signals are suppressed

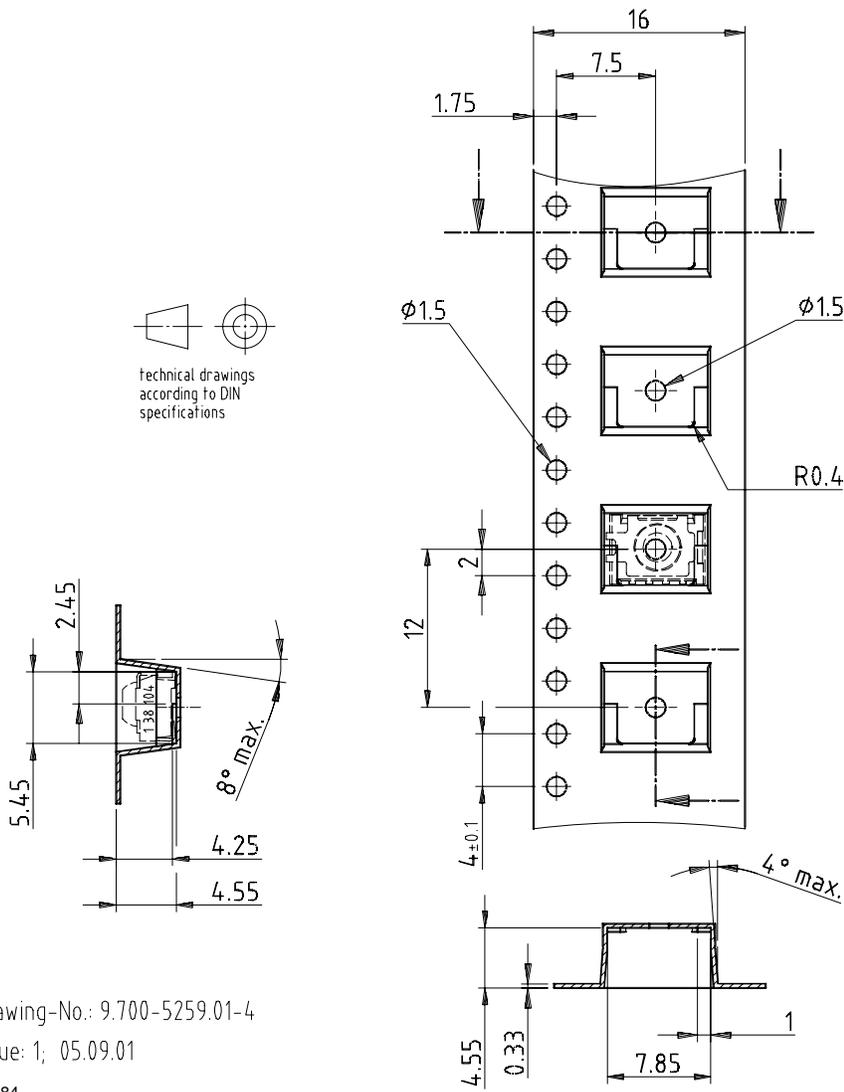
Note

For data formats with long bursts (10 carrier cycles or longer) we recommend the TSOP62.. because of the better noise suppression.

VISHAY LEAD (Pb)-FREE REFLOW SOLDER PROFILE



TAPING VERSION TSOP..TT dimensions in millimeters



Drawing-No.: 9.700-5259.01-4

Issue: 1; 05.09.01

16584

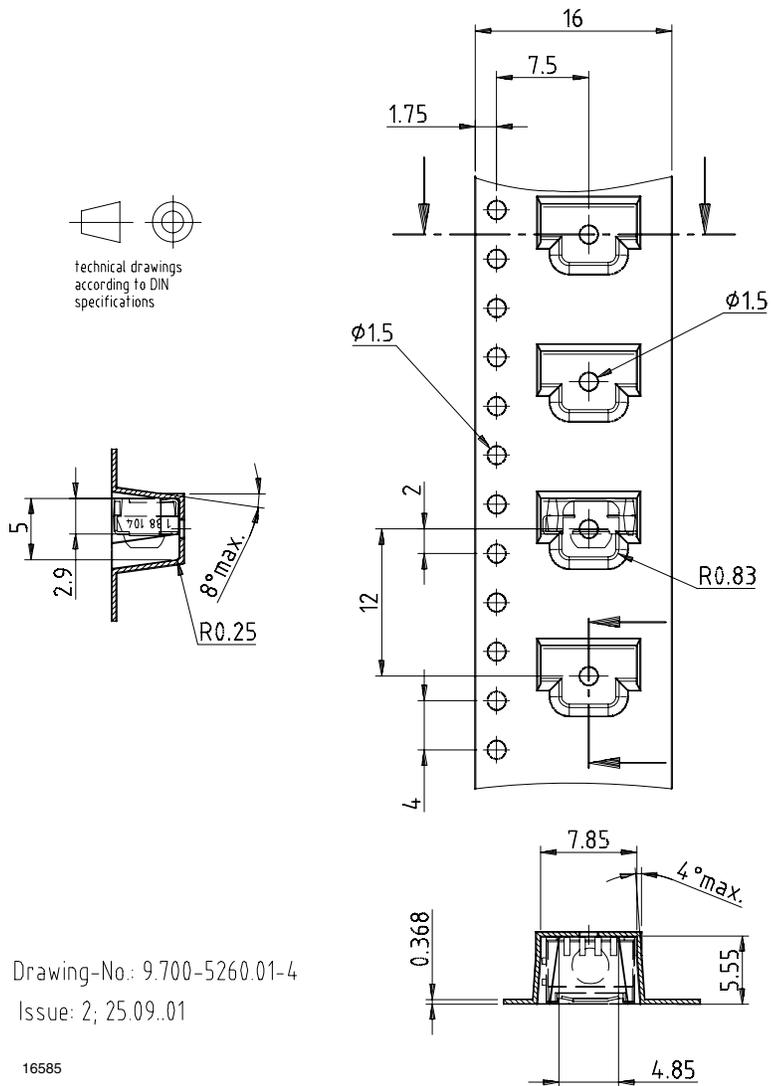
New TSOP61..

Vishay Semiconductors

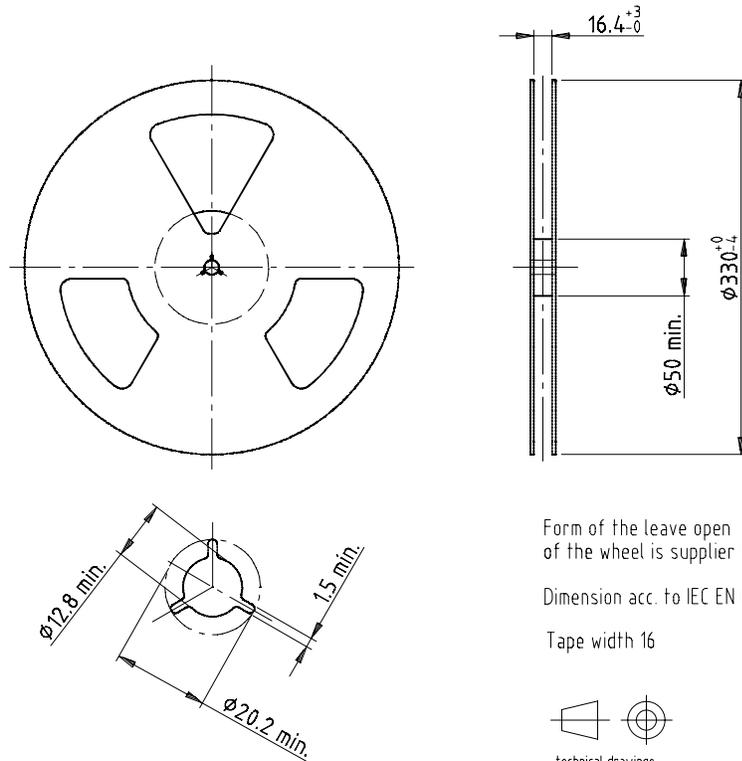
IR Receiver Modules for
Remote Control Systems



TAPING VERSION TSOP..TR dimensions in millimeters

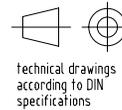


REEL DIMENSIONS in millimeters



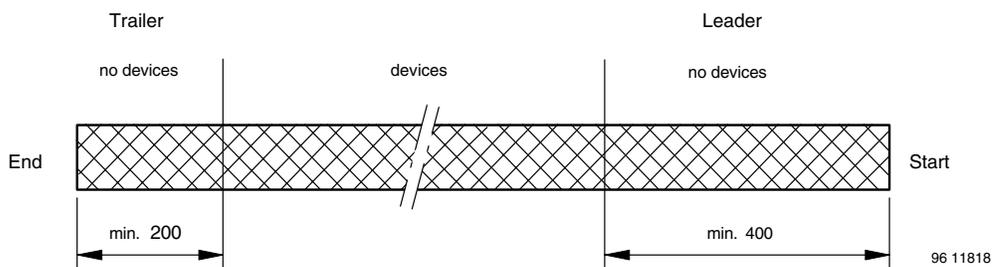
Reel hub 2:1

Form of the leave open of the wheel is supplier specific.
 Dimension acc. to IEC EN 60 286-3
 Tape width 16



Drawing refers to following types: Reel for blister carrier tape Version B
 Drawing-No.: 9.800-5052.V2-4
 Issue: 1; 07.05.02
 16734

LEADER AND TRAILER dimensions in millimeters



COVER TAPE PEEL STRENGTH

According to DIN EN 60286-3
 0.1 N to 1.3 N
 300 ± 10 mm/min.
 165° to 180° peel angle

LABEL

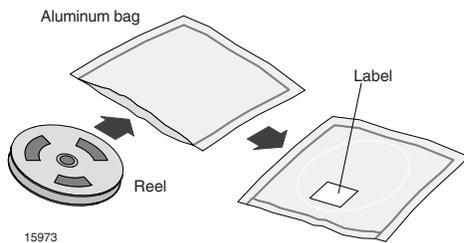
Standard bar code labels for finished goods

The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain Vishay Semiconductor GmbH specific data.

VISHAY SEMICONDUCTOR GMBH STANDARD BAR CODE PRODUCT LABEL (Finished Goods)		
PLAIN WRITING	ABBREVIATION	LENGTH
Item-description	-	18
Item-number	INO	8
Selection-code	SEL	3
LOT-/serial-number	BATCH	10
Data-code	COD	3 (YWW)
Plant-code	PTC	2
Quantity	QTY	8
Accepted by	ACC	-
Packed by	PCK	-
Mixed code indicator	MIXED CODE	-
Origin	xxxxxxx+	Company logo
LONG BAR CODE TOP	TYPE	LENGTH
Item-number	N	8
Plant-code	N	2
Sequence-number	X	3
Quantity	N	8
Total length	-	21
SHORT BAR CODE BOTTOM	TYPE	LENGTH
Selection-code	X	3
Data-code	N	3
Batch-number	X	10
Filter	-	1
Total length	-	17

DRY PACKING

The reel is packed in an anti-humidity bag to protect the devices from absorbing moisture during transportation and storage.



After more than 72 h under these conditions moisture content will be too high for reflow soldering. In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:
 192 h at 40 °C + 5 °C/ - 0 °C and < 5 % RH (dry air/nitrogen) or
 96 h at 60 °C + 5 °C and < 5 % RH for all device containers or
 24 h at 125 °C + 5 °C not suitable for reel or tubes.
 An EIA JEDEC standard JESD22-A112 level 4 label is included on all dry bags.

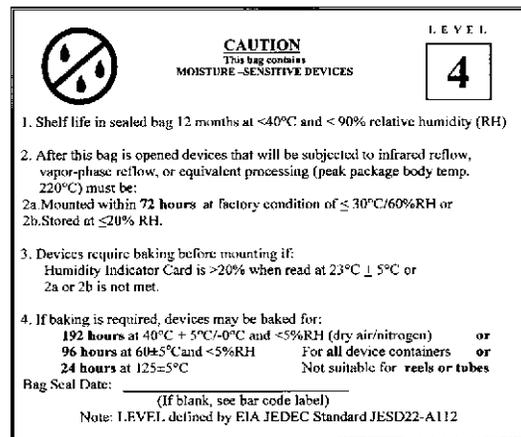
FINAL PACKING

The sealed reel is packed into a cardboard box. A secondary cardboard box is used for shipping purposes.

RECOMMENDED METHOD OF STORAGE

Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.



Example of JESD22-A112 level 4 label

16943



ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the antistatic shielding bag. Electro-static sensitive devices warning labels are on the packaging.

**VISHAY SEMICONDUCTORS STANDARD
BAR CODE LABELS**

The Vishay Semiconductors standard bar code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.



16962



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All product specifications and data are subject to change without notice.

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