

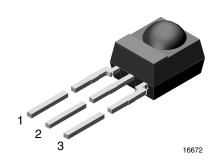
RoHS

HALOGEN FREE

GREEN

(5-2008)

IR Receiver Modules for Data Transmission



MECHANICAL DATA

Pinning for TSDP341.., TSDP343..:

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

FEATURES

- Very low supply current
- · Continuous data rates up to 7777 bps
- Range up to 32 m
- · Photo detector and preamplifier in one package
- Internal filter tuned to 38.4 kHz for 4800 bps or 57.6 kHz for 9600 bps
- Shielding against EMI
- Supply voltage: 2.5 V to 5.5 V
- · Immunity against ambient light
- Insensitive to supply voltage ripple and noise
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



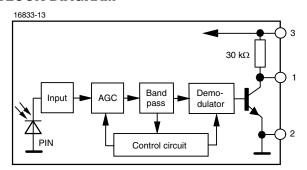
These products are miniaturized receivers for low speed infrared data transmission. A PIN diode and a preamplifier are assembled on a lead frame, the epoxy package contains an IR filter.

The demodulated output can be directly connected to a UART or a microprocessor. The TSDP34138 may be used for continuous reception of data according to RS-232 at 4800 bps in noise free environments. Higher data rate RS-232 may require data monitoring of gain levels. Non RS-232 codings may be used to achieve continuous average data rates up to 7800 bps in noisy ambients.

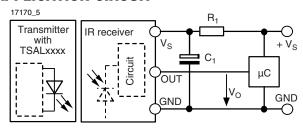
This component has not been qualified according to automotive specifications.

PARTS TABLE					
AGC		AGC1 FOR LOW NOISE ENVIRONMENTS	AGC3 FOR NOISY ENVIRONMENTS		
Carrier	38.4 kHz	TSDP34138	TSDP34338		
frequency	57.6 kHz	TSDP34156	TSDP34356		
Package		Mold			
Pinning		1 = OUT, 2 = GND, 3 = V _S	1 = OUT, 2 = GND, 3 = V _S		
Dimensions (mm)		6.0 W x 6.95 H x 5.6 D			
Mounting		Leaded			
Application		Data transmission			

BLOCK DIAGRAM



APPLICATION CIRCUIT



 $R_{_1}$ and $C_{_1}$ are recommended for protection against EOS. Components should be in the range of 33 Ω < $R_{_1}$ < 1 $k\Omega,$ $C_{_1}$ > 0.1 $\mu F.$

Rev. 1.1, 22-Aug-14 **1** Document Number: 82667



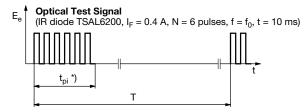
ABSOLUTE MAXIMUM RATINGS					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Supply voltage		Vs	-0.3 to +6	V	
Supply current		I _S	3	mA	
Output voltage		Vo	-0.3 to (V _S + 0.3)	V	
Output current		I _O	5	mA	
Junction temperature		T _j	100	°C	
Storage temperature range		T _{stg}	-25 to +85	°C	
Operating temperature range		T _{amb}	-25 to +85	°C	
Power consumption	T _{amb} ≤ 85 °C	P _{tot}	10	mW	
Soldering temperature	$t \le 10 \text{ s}, 1 \text{ mm from case}$	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	$E_{V} = 0, V_{S} = 3.3 V$	I _{SD}	0.27	0.35	0.45	mA
Supply current	$E_v = 40$ klx, sunlight	I _{SH}		0.45		mA
Supply voltage		Vs	2.5		5.5	V
Transmission distance	$E_{V}=0$, test signal see fig. 1, IR diode TSAL6200, $I_{F}=150~\text{mA}$	d		35		m
Output voltage low	$I_{OSL} = 0.5 \text{ mA}, E_e = 0.7 \text{ mW/m}^2,$ test signal see fig. 1	V _{OSL}			100	mV
Minimum irradiance	Pulse width tolerance: t_{pi} - $1/f_0 < t_{po} < t_{pi} + 4/f_0$, test signal see fig. 1	E _{e min.}		0.15	0.30	mW/m²
Maximum irradiance	t_{pi} - 1/f ₀ < t_{po} < t_{pi} + 4/f ₀ , test signal see fig. 1	E _{e max.}	30			W/m ²
Maximum pulse width	$E_{e min.} > 10 \text{ mW/m}^2, t_{pi} = 8/f_0$	t _{po max.}			11.5/f ₀	S
Directivity	Angle of half transmission distance	Ψ1/2		± 45		deg

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



*) $t_{pi} \ge 6/f_0$ is recommended for optimal function

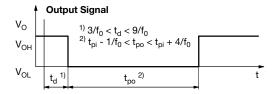


Fig. 1 - Output Active Low

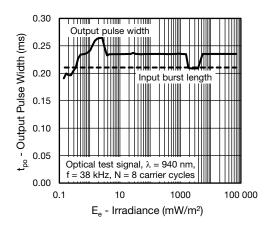
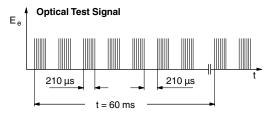


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient



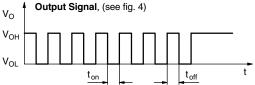


Fig. 3 - Output Function

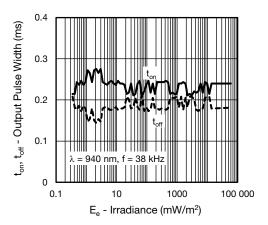


Fig. 4 - Output Pulse Diagram

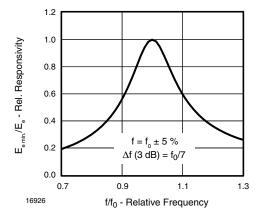


Fig. 5 - Frequency Dependence of Responsivity

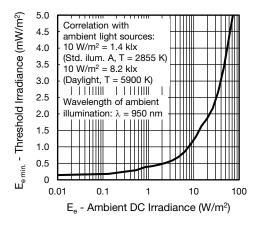


Fig. 6 - Sensitivity in Bright Ambient

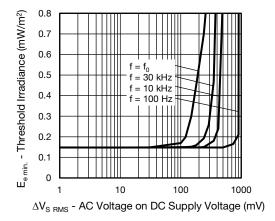


Fig. 7 - Sensitivity vs. Supply Voltage Disturbances

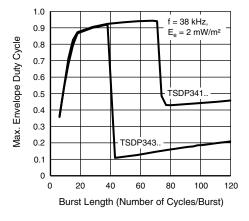


Fig. 8 - Maximum Envelope Duty Cycle vs. Burst Length



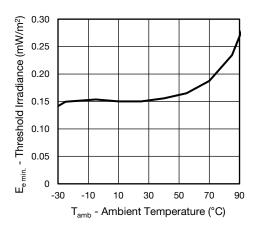


Fig. 9 - Sensitivity vs. Ambient Temperature

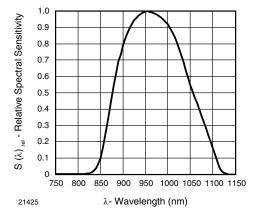


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

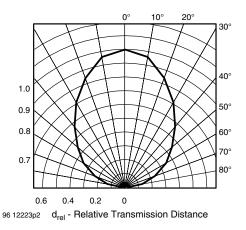


Fig. 11 - Horizontal Directivity

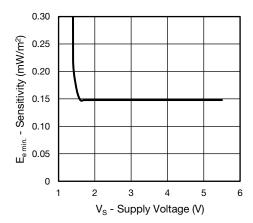


Fig. 12 - Sensitivity vs. Supply Voltage



SUITABLE DATA FORMAT

Theses receivers are designed to suppress spurious output pulses due to noise or optical disturbances. The devices can distinguish data signals from noise due to differences in frequency, burst length, and envelope duty cycle. For optimum sensitivity, the data's modulation frequency should be close to the device's band-pass center frequency (e.g. 38.4 kHz) and fulfill the conditions in the table below.

When a data signal is applied to the receiver in the presence of noise, the sensitivity of the receiver is automatically reduced by the AGC to insure that no spurious pulses are present at the receiver's output. Some examples of noise which is suppressed:

- DC light (e.g. from tungsten bulbs sunlight)
- · Continuous signals at any frequency
- Strongly or weakly modulated patterns from fluorescent lamps with electronic ballasts (see fig. 13 or fig. 14).

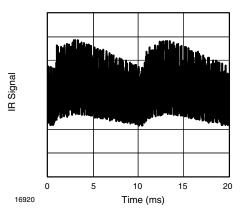


Fig. 13 - IR Disturbance from Fluorescent Lamp with Low Modulation

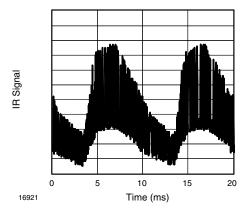
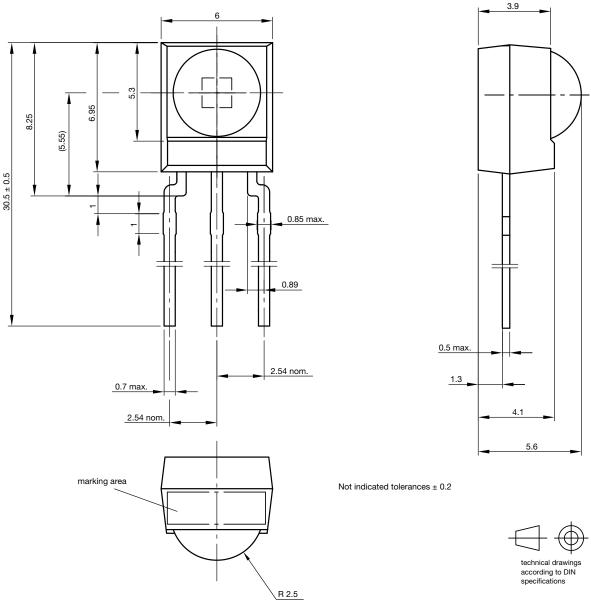


Fig. 14 - IR Disturbance from Fluorescent Lamp with High Modulation

	TSDP341	TSDP343
Minimum burst length	6 cycles/burst	6 cycles/burst
After each burst of length A gap time is required of	6 to 70 cycles ≥ 7 cycles	6 to 35 cycles ≥ 7 cycles
For bursts greater than a minimum gap time in the data stream is needed of	70 cycles > 1.2 x burst length	35 cycles > 6 x burst length
Maximum number of continuous short bursts/second	3000	3000
Suppression of interference from fluorescent lamps	Mildly modulated noise patterns are suppressed (fig. 13)	Strongly modulated noise patterns are suppressed (fig. 14)

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.550-5169.01-4

Issue: 9; 03.11.10

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