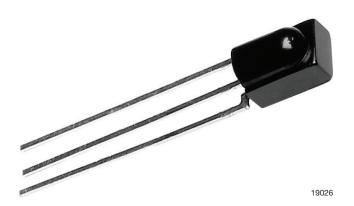


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IR Receiver Modules for Remote Control Systems



DESCRIPTION

This IR receiver series is optimized for short burst remote control systems in different environments. The customer can chose between different IC settings (AGC variants), to find the optimum solution for his application. The higher the AGC, the better noise is suppressed, but the lower the code compatibility.

The devices contain a PIN diode and a preamplifier assembled on a lead frame. The epoxy package contains an IR filter. The demodulated output signal can be directly connected to a microprocessor for decoding. These components have not been qualified to automotive specifications.

FEATURES

· Individual IC settings to reach maximum performance



- · Immunity against noise (lamps, LCD TV, Wi-Fi)
- Low supply current
- · Photo detector and preamplifier in one package
- Supply voltage: 2.0 V to 5.5 V
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS **HALOGEN** FREE GREEN (5-2008)

LINKS TO ADDITIONAL RESOURCES











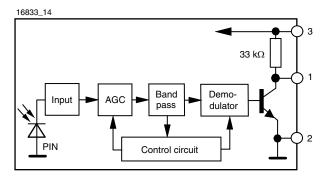
APPLICATIONS

· Infrared remote control systems

DESIGN SUPPORT TOOLS

- 3D models
- Window size calculator

BLOCK DIAGRAM



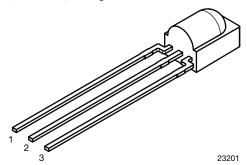


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MECHANICAL DATA

Pinning for TSOP581.., TSOP583.., TSOP585..:

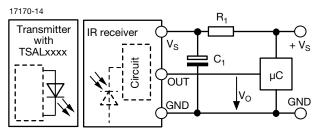
 $1 = OUT, 2 = GND, 3 = V_S$



ORDERING CODE

TSOP58... - 1500 pieces in bags

APPLICATION CIRCUIT



 R_1 and C_1 recommended in case there are strong ripple or spikes on the supply line.

PARTS TABLE					
AGC		LEGACY PRODUCT FOR SHORT BURST REMOTE CONTROLS (AGC1)	NOISY ENVIRONMENTS AND SHORT BURSTS (AGC3)	VERY NOISY ENVIRONMENTS AND SHORT BURSTS (AGC5)	
	30 kHz	TSOP58130	TSOP58330	TSOP58530	
	33 kHz	TSOP58133	TSOP58333	TSOP58533	
Carrier frequency	36 kHz	TSOP58136	TSOP58336 (1)(2)	TSOP58536	
	38 kHz	TSOP58138	TSOP58338 (3)(5)	TSOP58538	
	40 kHz	TSOP58140	TSOP58340	TSOP58540	
	56 kHz	TSOP58156	TSOP58356 ⁽⁴⁾	TSOP58556	
Package		Minicast			
Pinning	g $1 = OUT, 2 = GND, 3 = V_S$				
Dimensions (mm)		5.0 W x 6.95 H x 4.8 D			
Mounting		Leaded			
Application		Remote control			
Best choice for		(1) MCIR (2) RCMM (3) RECS-80 Code (4) r-map (5) XMP			

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Supply voltage		V _S	-0.3 to +6	V	
Supply current		I _S	5	mA	
Output voltage		Vo	-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		I _O	5	mA	
Junction temperature		Tj	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 ≤ 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.



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ELECTRICAL AND OPTICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage		Vs	2.0	-	5.5	V
Supply current	$V_S = 3.3 \text{ V}, E_V = 0$	I _{SD}	0.25	0.35	0.45	mA
Supply current	E _v = 40 klx, sunlight	I _{SH}	-	0.45	-	mA
Transmission distance	$E_V = 0$, IR diode TSAL6200, $I_F = 50$ mA, test signal see Fig. 1	d	-	18	-	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	Test signal: RC5 code	E _{e min.}	- - - - - 30	0.2	0.4	mW/m ²
Minimum irradiance	Test signal: XMP code	E _{e min.}		0.35	0.5	mW/m ²
Maximum irradiance	Pulse width tolerance: $t_{pi} - 3/f_0 < t_{po} < t_{pi} + 3.5/f_0,$ test signal see Fig. 1	E _{e max.}	30	-	-	W/m²
Directivity	Angle of half transmission distance	Ψ1/2	-	± 45	-	0

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

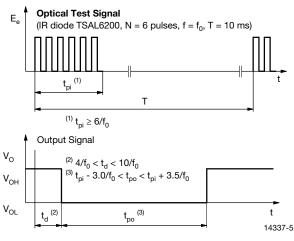


Fig. 1 - Output Active Low

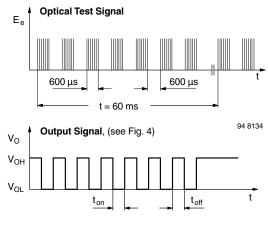


Fig. 3 - Output Function

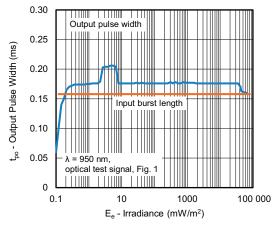


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

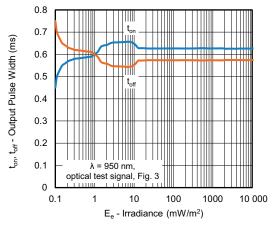


Fig. 4 - Output Pulse Diagram



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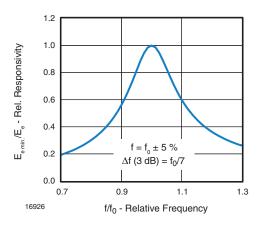


Fig. 5 - Frequency Dependence of Responsivity

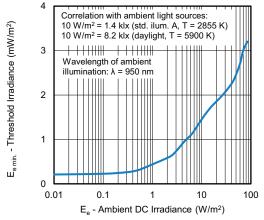


Fig. 6 - Sensitivity in Bright Ambient

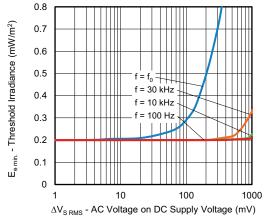


Fig. 7 - Sensitivity vs. Supply Voltage Disturbances

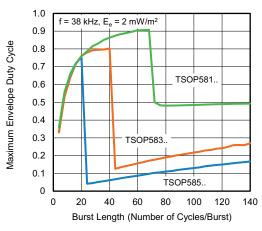


Fig. 8 - Max. Envelope Duty Cycle vs. Burst Length

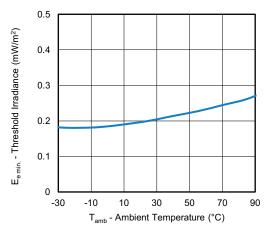


Fig. 9 - Sensitivity vs. Ambient Temperature

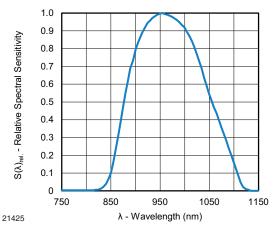


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

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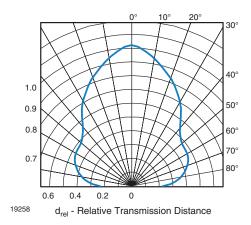


Fig. 11 - Horizontal Directivity

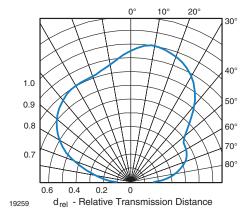


Fig. 12 - Vertical Directivity

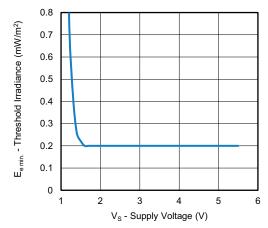


Fig. 13 - Sensitivity vs. Supply Voltage



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SUITABLE DATA FORMAT

These products are 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 IR receiver 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 Fig. 15 or Fig. 16)
- 2.4 GHz and 5 GHz Wi-Fi

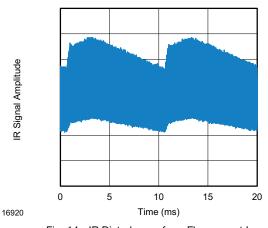


Fig. 14 - IR Disturbance from Fluorescent Lamp With Low Modulation

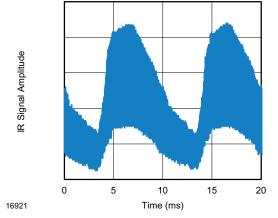


Fig. 15 - IR Disturbance from Fluorescent Lamp With High Modulation

	TSOP581	TSOP583	TSOP585	
Minimum burst length	6 cycles/burst	6 cycles/burst	6 cycles/burst	
After each burst of length A gap time is required of	6 to 68 cycles ≥ 6 cycles	6 to 35 cycles ≥ 10 cycles	6 to 24 cycles ≥ 10 cycles	
For bursts greater than a minimum gap time in the data stream is needed of	68 cycles > 1 x burst length	35 cycles > 6 x burst length	24 cycles > 25 ms	
Maximum number of continuous short bursts/second	2500	2000	2000	
RCMM code	Yes	Preferred	Yes	
XMP code	Yes	Preferred	Yes	
r-map code	Yes	Preferred	Yes	
Suppression of interference from fluorescent lamps	Mild disturbance patterns are suppressed (example: signal pattern of Fig. 14)	Complex disturbance patterns are suppressed (example: signal pattern of Fig. 14 and Fig. 15)	Critical disturbance patterns are suppressed, e.g. highly dimmed LCDs	

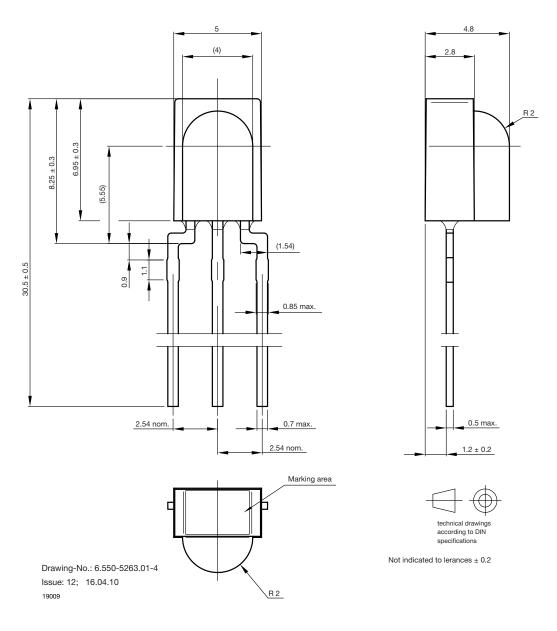
Note

• For data formats with long bursts (more than 10 carrier cycles) please see the datasheet for TSOP582... TSOP584...



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PACKAGE DIMENSIONS in millimeters





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