



INFRARED RECEIVERS AND EMITTERS 3DTV ACTIVE GLASSES SYNCHRONIZATION



- Immune to Optical Interference
- Transmission Range up to 45 meters
- Highly Integrated Solution

Immune from Optical Noise

The infrared synchronization signal from the 3DTV to the active glasses must be unaffected by the TV remote control signal. It must also be immune from other optical noise like fluorescent, CFL and plasma light sources. This can be accomplished by tailoring the transmission signal, carrier frequency, and wavelengths used by the 3D system.

Signal

Transmission systems use modulation and band-pass filtering to create a high signal-to-noise ratio. To ensure a noise free operation, a minimum **burst of 6 cycles** followed by a minimum **gap of 240 μ s** is required to optimize the transmission link. An integrated Automatic Gain Control (AGC) further enhances noise immunity by discriminating and suppressing noise from typical light sources such as fluorescent lights and CFLs.

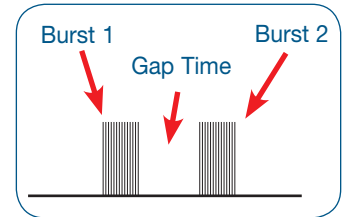


Figure 1. Burst and gap pattern

Carrier Frequency and Wavelength

TV remote control systems typically use a carrier frequency between 36 kHz and 56 kHz and an infrared wavelength of 940 nm. Two ways to reduce or eliminate interference between TV remote and 3D systems is by using a carrier frequency outside of the remote control range and by using a different wavelength for the 3D emitter in the TV. The TSOP35D25 and TSOP75D25 feature a band pass filter of **25 kHz** and are sensitive to **830 nm and 850 nm** wavelengths, while the remote control receiver (e.g. TSOP38438) blocks these wavelengths.

Range

Vishay's remote control receivers have an industry leading transmission range of up to 45 meters. A high sensitivity is needed because a large part of the signal is often lost passing through the front panel material. In addition, the remote should continue to work even when not pointed directly at the TV's receiver. Similarly, the 3D specification should allow some freedom of movement of a person's head without losing synchronization. The TSOP35D25 and TSOP75D25 can receive signals from **26 meters** away, meaning you will be able to turn your head and stay in synch.

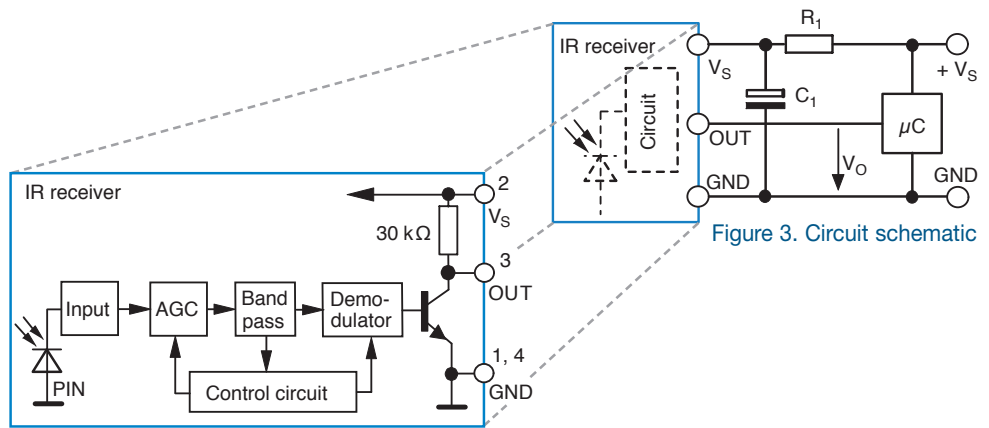
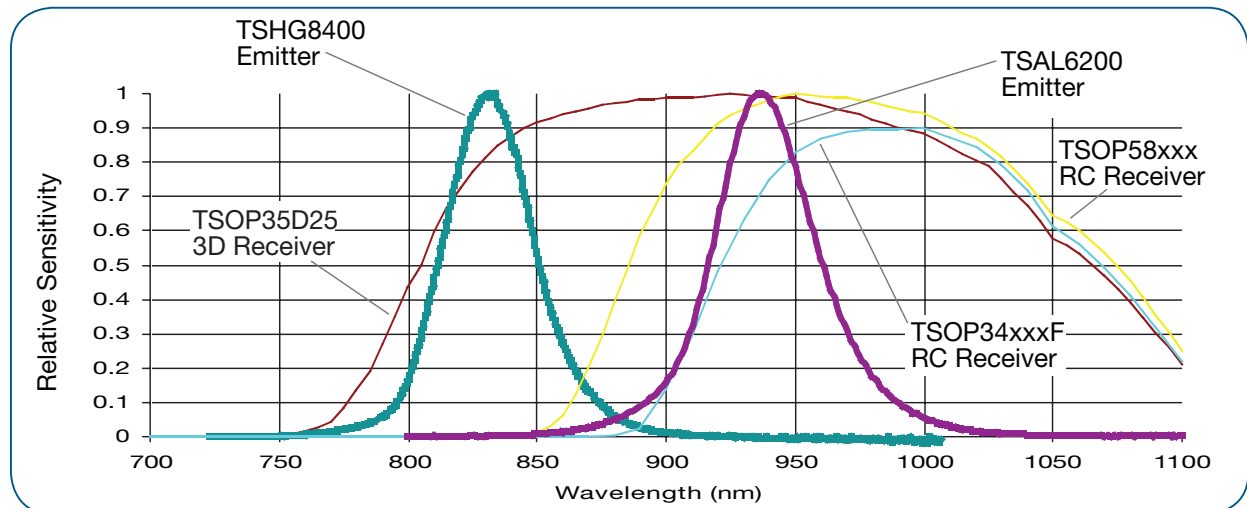


Figure 2. Highly integrated






Figure 3. Circuit schematic



3D-TV INFRARED RECEIVERS AND EMITTERS

Vishay Semiconductors



Application	Package	Part Number	Carrier Frequency (kHz)	Dimensions L x W x H (mm)	Sensitivity (mW/m ²)	Range ¹ (m)	Recommended for Codes
3D Active Glasses		TSOP35D25	25	7.5 x 5.3 x 4.0	0.15	26	
		TSOP75D25		6.8 x 3.0 x 3.2	0.15	26	
Remote Control (RC)		TSOP58xxx	30, 33, 36, 38, 40, 56	6.9 x 5.0 x 4.8	0.30	45	TSOP58436 - RC5, RC6 TSOP58438 - NEC TSOP58240 - Sony
		TSOP38xxx			0.15	45	TSOP38436 - RC5, RC6 TSOP38438 - NEC TSOP38240 - Sony
		TSOP75xxxW	30, 33, 36, 38, 40, 56	6.8 x 3.0 x 2.3	0.30	45	TSOP75436W - RC5, RC6 TSOP75438W - NEC TSOP75240W - Sony
		TSOP75xxx			6.8 x 3.0 x 3.2	0.15	45

¹TSAL6200, I_F = 200 mA, I_e = 100 mW/sr

Infrared Emitters

With Vishay's 3D IR Receivers, only **1 emitter** is required in the TV to transmit the 3D synchronization signal.

Application	Peak Wavelength (nm)	Part Number	Package	Radiant Intensity ¹ (mW/sr)	Angle of Half Intensity (°)	Rise, Fall Time (ns ₁)
3D Active Glasses	830	TSHG8400	5 mm (T1 3/4)	70	± 22	20
		VSMG2720	PLCC2	14	± 60	15
	850	TSHG6400	5 mm (T1 3/4)	70	± 22	20
		TSHG6410	5 mm (T1 3/4)	90	± 18	20
		VSMG3700	PLCC2	90	± 60	15
Remote Control	940	VSLB3940	3 mm (T1)	10	± 10	15
		TSAL6100	5 mm (T1 3/4)	180	± 10	800
		TSAL6200	5 mm (T1 3/4)	130	± 17	

¹I_F = 100 mA

For technical support, contact: 3DTVanswers@vishay.com

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