



• Description

The H11Lx series has a high-speed integrated circuit detector optically coupled to a gallium-arsenide infrared emitting diode. The output incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping. The detector circuit is optimized for simplicity of operation and utilizes an open-collector output for maximum application flexibility.

Schematic



1. Anode	4.Vo
2. Cathode	5. GND
3. N.C.	6. Vcc

Features

- 1. High Data Rate, 2 MHz Typical (NRZ)
- 2. Free from Latch-up and Oscillation Throughout Voltage and Temperature Ranges
- 3. Microprocessor Compatible Drive
- 4. Logic Compatible Output Sinks 16 mA at 0.4 V Maximum
- 5. Guaranteed On/Off Threshold Hysteresis
- 6. Wide Supply Voltage Capability, Compatible with All Popular Logic Systems
- 7. Safety and Regulatory Approvals:

Applications

- •Logic-to-Logic Isolator
- •Programmable Current Level Sensor
- •Line Receiver Eliminate Noise and Transient Problems
- •AC to TTL Conversion Square Wave Shaping
- •Digital Programming of Power Supplies
- •Interfaces Computers with Peripherals

• Truth Table

Input	Output
Н	L
L	Н



H11Lx Series 6PIN Schmitt Trigger OUTPUT PHOTOCOUPLER

• Outside Dimension

Unit : mm

1.Dual-in-line type.



3.Long creepage distance type



2.Surface mount type.



TOLERANCE : ±0.2mm

• Device Marking



Notes: COSMO

H11L□	H11L1, H11L2, H11L3
YWW	Y: Year code / WW: Week code



H11Lx Series 6PIN Schmitt Trigger OUTPUT PHOTOCOUPLER

• Abso	olute Maximum Ratings			(Ta = 25°C)
	Parameter	Symbol	Rating	Unit
	Forward current ¹	I _F	50	mA
	Peak forward current	I _{FM}	100	mA
Input	Reverse voltage	V _R	6	V
	Power dissipation	P _D	60	mW
	Supply voltage	Vcc	3 to16	V
	Output voltage	Vo	0 to 16	V
Output	Output Current	I _{OL}	50	mA
	Detector Power Dissipation	P _D	150	mW
Isolation voltage 1 minute ²		Viso	5000	V _{RMS}
Operating temperature		Topr	-40 to +110	°C
Storage temperature		Tstg	-55 to +125	°C
Soldering temperature 10 seconds		Tsol	260	°C
Total Device Power Dissipation		P _D	250	mW

Note 1 Ta=25°C

2 This device is considered as a two-terminal device: Pins 1 and 3 are shorted together, and pins 4, 5 and 6 are shorted together

• Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply voltage	V_{cc}	3	15	V



• Electro-optical Characteristics $Ta = 25^{\circ}C$ unless otherwise specified					fied		
Parameter	Symbol	Conditions		Min.	Тур.	Max.	Unit
Input Forward Voltage	V	I _F = 10 mA		-	1.3	1.6	V
	VF	I _F = 0.3 mA		1.0	1.2	-	V
Reverse Current	I _R	$V_R = 3 V$		-	-	10	uA
Capacitance	CJ	V = 0, f = 1.0 MHz		-	60	100	pF
High Level Supply Current	I _{CC(off)}	I _F =0, V _{CC} =5V		-	1.6	5.0	mA
High Level Output Current	I _{OH}	$I_{F}=0, V_{CC}=V_{O}=15V$		-	-	100	uA
Low level Supply Current	I _{CC(on)}	I _F =10m A,V _{CC} =5V		-	1.6	5.0	mA
Low Level Output Voltage	V _{OL}	$R_L = 270\Omega$, $V_{CC} = 5$ V, $I_F = I_F(on) max$		-	0.2	0.4	V
Turn-On Threshold Current ³			H11L1	-	-	1.6	mA
	$I_{F(op)}$ $R_{L} = 270\Omega$, $V_{CC} = 5 V$	R_L = 270 Ω , V_{CC} = 5 V	H11L2	-	-	10	mA
			H11L3	-	-	5	mA
Turn-Off Threshold Current	I _{F(off)}	$R_{L} = 270$, $V_{CC} = 5$ V		0.3	1.0	-	mA
Hysteresis Ratio	I _{F(off)} /I _{F(on)}	$R_{L} = 270$, $V_{CC} = 5$ V		0.5	0.75	0.9	-
Isolation Capacitance	C _{ISO}	V _{I-O} = 0 V, f = 1 MHz		-	1.6	2.0	pF
Isolation Resistance	R _{ISO}	$V_{I-O} = \pm 500 V_{DC}, T_A = 25^{\circ}C$		10 ¹¹	-	-	Ω
Turn On Time	T _{on}			-	1	4	us
Fall Time	t _f	$- T_{A} = 25^{\circ}C, V_{CC} = 5V, I_{F} = I_{Fon}, R_{L} = 270\Omega$ $- 1$ $- 0.1$ $- 0.1$			0.1	-	us
Turn Off Time	T _{off}				1	4	us
Rise Time	tr				0.1	-	us

Note

3. Maximum IF(ON) is the maximum current required to trigger the output. For example, a 1.6 mA maximum trigger current would require the LED to be driven at a current greater than 1.6 mA to guarantee the device turns on. A 10% guard band is recommended to account for degradation of the LED over its lifetime. The maximum allowable LED drive current is 30 mA.

Test Circuit for Propagation Delay time

TYPICAL PERFORMANCE CURVES (continued)



Figure 7. Switching Test Circuit and Waveforms



H11Lx Series 6PIN Schmitt Trigger OUTPUT PHOTOCOUPLER

• Characteristics Curves





Recommended Soldering Conditions

(a) Infrared reflow soldering :

Peak reflow soldering :	$260^\circ\!C$ or below (package surface temperature)
Time of peak reflow temperature :	10 sec
Time of temperature higher than 230 $^\circ\!{\rm C}$:	30-60 sec
Time to preheat temperature from 180~190 $^\circ\!\mathrm{C}$:	60-120 sec
Time(s) of reflow :	Тwo
Flux :	Rosin flux containing small amount of chlorine (The
	flux with a maximum chlorine content of 0.2 Wt% is

recommended.)

Recommended Temperature Profile of Infrared Reflow



(b) Wave soldering :

- Temperature :
- Time :

- Preheating conditions :
- Time(s) of reflow :
- Flux :

- 260°C or below (molten solder temperature)
- 10 seconds or less
 - 120°C or below (package surface temperature)
 - One
- Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(c) Cautions :

- Fluxes : Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.



• Numbering System

H11LX <u>Y</u> (Z)

Notes:

H11Lx = Part No. (H11L1 or H11L2 or H11L3)

- Y = Lead form option (blank $\$ S $\$ H)
- Z = Tape and reel option (TL \cdot TR)

Option	Description	Packing quantity	
S (TL)	surface mount type package + TL tape & reel option	1000 units per reel	
S (TR)	surface mount type package + TR tape & reel option	1000 units per reel	

• Recommended Pad Layout for Surface Mount Lead Form

1.Surface mount type

Unit :mm







• 6-pin SMD Carrier Tape & Reel





• Application Notice

The statements regarding the suitability of products for certain types of applications are based on cosmo's knowledge of general applications of cosmo products. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to verify the specifications are suitable for use in a particular application. Customers are solely responsible for all aspects of their own product design or applications. The parameters provided in the datasheet may vary in different applications and performance may vary over time. All operating parameters (including typical parameters) must be validated by customer's technical experts for different applications. cosmo assumes no liability for customer' product design or applications. Product specifications do not expand or otherwise change cosmo's terms and conditions of purchase, including but not limited to the warranty expressed therein.

When using cosmo products, please comply with safety standards and instructions. cosmo has no liability and responsibility to the damage caused by improper use of the instructions specified in the specifications.

cosmo products are designed for use in general electronic equipment such as telecommunications, office automation equipments, personal computers, test and measurement equipments, consumer electronics, industrial control, instrumentation, audio, video.

cosmo devices shall not be used in equipment that requires higher level of reliability and safety, such as nuclear power control equipment, telecommunication equipment(trunk lines), space application, medical and other life supporting equipments, and equipment for aircraft, military, automotive or any other application that can cause human injury or death.

cosmo reserves the right to change the specifications, data, characteristics, structure, materials and other contents at any time without notice. Please contact cosmo to obtain the latest specification.

cosmo disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.