DATASHEET

6 PIN DIP SCHMITT TRIGGER PHOTOCOUPLER H11LX Series



Features:

- High data rate, 1MHz typical (NRZ)
- Free from latch up and oscillation throughout voltage and temperature ranges.
- Microprocessor compatible drive
- Logic compatible output sinks 16mA at 0.4V maximum
- · Guaranteed on/off threshold hysteresis
- Wide supply voltage capability, compatible with all popular logic systems
- High isolation voltage between input and output (Viso=5000 V rms)
- Compact dual-in-line package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved

Description

The H11LX series of devices each consist of a GaAs infrared emitting diode optically coupled a high speed integrated circuit detector. The output detector incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping.

The devices are in a 6-pin DIP package and available in wide-lead spacing and SMD option.

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

Schematic

Pin Configuration

- 1. Anode
- 2. Cathode
- 3. No Connection
- 4. V_O
- 5. GND
- $6. \ V_{CC}$

Truth Table			
Input Outpu			
Н	L		
L	Н		

Absolute Maximum Ratings (Ta=25℃)

	Parameter	Symbol	Rating	Unit
Input	Forward current	l _F	60	mA
	Reverse voltage	V _R	6	V
	Power dissipation	P _D	120	mW
Output	V ₄₅ Allowed Range	Vo	0 to 16	V
	V ₆₅ Allowed Range	V _{CC}	3 to 16	V
	Output Current	Ι _ο	50	mA
	power dissipation	P _D	150	mW
Total power dissipation		P _{tot}	250	mW
Isolation v	oltage	V _{iso}	5000	V rms
Operating temperature		T _{opr}	-55~+100	°C
Storage te	mperature	T _{stg}	-55~+150	°C
Soldering temperature *2		T _{sol}	260	°C

Notes:

*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

*2 For 10 seconds

Electro-Optical Characteristics (Ta=25°C unless specified otherwise)

Input							
Parameter		Symbol	Min.	Тур.*	Max.	Unit	Condition
Forward Volt	age	V _F	-	1.15	1.5	V	I _F = 10mA
Reverse Cur	rent	I _R	-	-	10	μA	$V_R = 5V$
Input capacit	ance	CJ	-	-	100	pF	V=0, f=1MHz
Output							
Par	ameter	Symbol	Min.	Тур.*	Max.	Unit	Condition
Operation Vo	Itage Range	V _{CC}	3	-	15	V	
Supply Curre	ent	I _{CC(off)}	-	1.6	5	mA	I _F =0mA, Vcc=5V
Output Curre	nt, High	I _{OH}	-	-	100	μA	I _F =0mA, Vcc=Vo=15V
Isolation Res	istance	R _{ISO}	10 ¹¹	-	-	Ω	V _{I-O} =500VDC
Transfer Cl	naracteristics						
Pa	rameter	Symbol	Min	Тур.	Max.	Unit	Condition
Supply Curre	ent	I _{CC(on)}	-	1.6	5	mA	I _F =10mA, Vcc=5V
Output Volta	ge .low	V _{OL}	-	-	0.4	V	Vcc=5V, $I_F=I_{Fon}(max.)$, R _L =270 Ω
Turn on	H11L1	I _{Fon}	-	-	1.6	mA	
Threshold Current ¹	H11L2		-	-	10		Vcc=5V, R _L =270 Ω
Current	H11L3		-	-	5		
Turn off Thre	shold Current	I _{Foff}	-	1	-	mA	Vcc=5V, RL=270 Ω
Hysteresis R	atio	I _{Foff} /I _{Fon}	0.5	-	0.9		Vcc=5V, R _L =270 Ω
Turn on Time)	t _{on}	-	-	4	$\mu{f S}$	
Fall Time		t _r	-	0.1	-	$\mu{f S}$	Vcc=5V,
Turn off Time		t _{off}	-	-	4	$\mu{f S}$	- I _F =I _{Fon} , R _L =270 Ω
Rise Time		t _r	-	0.1	-	$\mu{f S}$	_
Data Rate			-	1	-	MHz	

* Typical values at $T_a = 25 \degree C$

¹. Max. $I_{F(ON)}$ is the maximum current required to trigger the output. For examples, a 1.6mA maximum trigger current would require the LED to be driven at a current greater than 1.6mA to guarantee the device will turn on. A 10% guard band is recommended to account for degradation of the LED over its lifetime. The maximum allowable LED drive current is 60mA.

Typical Electro-Optical Characteristics Curves



Figure 3. Turn On Threshold Current







Figure 4. Turn On Threshold Current vs Ambient Temperature







Figure 7. Switching Time Test Circuit & Waveforms

Order Information

Part Number

H11LXY(Z)-V

Note

- X Y = Part No. for 1, 2 or 3
- = Lead form option (S, S1, M or none)
- Ż = Tape and reel option (TA, TB or none).
- = VDE (optional)

Option	Description	Packing quantity
None	Standard DIP-6	65 units per tube
М	Wide lead bend (0.4 inch spacing)	65 units per tube
S + TA	Surface mount lead form + TA tape & reel option	1000 units per reel
S + TB	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 + TA	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 + TB	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel

Package Dimension (Dimensions in mm)

Standard DIP Type





Option M Type







Option S Type







Option S1 Type









Recommended pad layout for surface mount leadform



Device Marking



Notes

EL	denotes Everlight
H11L3	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

Tape & Reel Packing Specifications



Direction of feed from reel

\square



Direction of feed from reel

Tape dimensions



Dimension No.	Α	В	Do	D1	E	F
Dimension(mm)	10.4±0.1	7.5±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1
Dimension No.	Ро	P1	P2	t	W	к
Dimension(mm)	4.0±0.15	12±0.1	2.0±0.1	0.35±0.03	16.0±0.2	4.5±0.1

Precautions for Use

1. Soldering Condition

1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Preheat

Temperature min (T _{smin})	150 ℃
Temperature max (T _{smax})	200 °C
Time $(T_{smin} \text{ to } T_{smax})$ (t_s)	60-120 seconds
Average ramp-up rate $(T_{smax}$ to $T_{p})$	3 °C/second max
Other	
Liquidus Temperature (T _L)	217 ℃
Time above Liquidus Temperature (t $_{L}$)	60-100 sec
Peak Temperature (T _P)	260 <i>°</i> C
Time within 5 $^{\circ}\!\mathrm{C}$ of Actual Peak Temperature: T_P - 5 $^{\circ}\!\mathrm{C}$	30 s
Ramp- Down Rate from Peak Temperature	6℃ /second max.
Time 25 ℃ to peak temperature Reflow times	8 minutes max. 3 times

Reference: IPC/JEDEC J-STD-020D

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