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H11L1, H11L2, H11L3

DC Input 6-Pin DMC-Isolator®

Schmitt Trigger

Features

- High isolation 5000 VRMS
- Patented coplanar structure DMC-Isolator®
- DC input with Schmitt Trigger output
- 1MHz(NRZ) data rate
- Operating Temperature range - 55 °C to 100 °C
- External Creepage ≥ 7.4mm
- Distance Through Isolation ≥ 0.4mm
- Clearance Distance ≥ 7.5mm (S/SL Type)
- Clearance Distance ≥ 8.0mm (M Type)
- RoHS and REACH Compliance
- Halogen Free Compliance (Optional)
- MSL class 1
- Regulatory Approvals
  - ✓ UL - UL1577 (E364000)
  - ✓ VDE - EN60747-5-5(VDE0884-5)
  - ✓ CQC – GB4943.1, GB8898
  - ✓ IEC60065, IEC60950

Description

The H11L1, H11L2 and H11L3 series consist of a Schmitt Trigger optically coupled to a gallium arsenide Infrared-emitting diode in a 6-lead DIP package with different lead forming options.

Applications

- Line Receiver
- Logic to Logic Isolator
- Microprocessor system interface
- AC to TTL conversion

Package Outline

Schematic

Note: Different lead forming options available. See package dimension.

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Absolute Maximum Ratings *T_A = 25°C, unless otherwise specified*

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	*Parameters*	*Ratings*	*Units*	*Notes*
V_{ISO}	Isolation voltage (AC, 1 minute, 40 ~ 60% R.H.)	5000	V_{RMS}	
T_{OPR}	Operating temperature	-55 ~ +100	°C	
T_{STG}	Storage temperature	-55 ~ +150	°C	
T_{SOL}	Soldering temperature (For 10 seconds)	260	°C	
Emitter				
I_F	Forward current	60	mA	
$I_{F(TRANS)}$	Peak transient current (≤1μs P.W,300pps)	1	A	
V_R	Reverse voltage	6	V	
P_D	Power dissipation	100	mW	
Detector				
P_D	Power dissipation	150	mW	
Vo	Output Voltage	0 to 16	V	
Vcc	Supply Voltage	3 to 16	V	
Io	Output Current	50	mA	

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Electrical Characteristics *T_A = 25°C (unless otherwise specified)*

Emitter Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
V_F	Forward voltage	I_F=10mA		1.24	1.4	V	
I_R	Reverse Current	V_R = 6V	-	-	5	µA	
C_{IN}	Input Capacitance	f= 1MHz	-	45	-	pF	

Detector Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
V_{CC}	Supply Voltage		3	-	15	V	
I_{CCH}	Logic High Supply Current	I_F= 0mA, V_{CC}= 5V		1.5	5	mA	
I_{OH}	Logic High Output Current	I_F= 0mA, V_{CC}=V_O=15V			100	µA	

Transfer Characteristics

Symbol	*Parameters*		*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
I_{CCL}	Logic Low Supply Current		I_F= 10mA, V_{CC}= 5V		1.5	5	mA	
$I_{F(ON)}$	Input Threshold Current	H11L1	V_{CC}= 5V, R_L= 270 Ω			1.6	mA	
		H11L2				10	mA	
		H11L3				5	mA	
$I_{F(OFF)}$	Off Threshold Current		V_{CC}= 5V, R_L= 270 Ω	0.3	1		mA	
$I_{F(OFF)}$/ $I_{F(ON)}$	Hysteresis Ratio			0.5		0.9		
V_{OL}	Logic Low Output Voltage		I_F= $I_{F(ON)}$ Max, V_{CC}= 5V, R_L= 270 Ω			0.4	V	
R_{IO}	Isolation Resistance		V_{IO}= 500V_{DC}	$1x10^{11}$			Ω	
C_{IO}	Isolation Capacitance		f= 1MHz		0.25		pF	

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Electrical Characteristics *T_A = 25°C (unless otherwise specified)*

Switching Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
t_{ON}	Turn On Time	$I_F = I_{F(ON)}$, V_{CC}= 5V, R_L= 270Ω	-	-	3.8	µs	
t_r	Rise Time		-	0.1	-		
t_{OFF}	Turn Off Time		-	-	3.8		
t_f	Fall Time		-	0.1	-		
	Data Rate		-	1	-	MHz	

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Typical Characteristic Curves *T_A = 25°C, unless otherwise specified*

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

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Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole

Forming Option

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Marking Information

Note:

CT	: Denotes “CT Micro”
H11LX	: Part Number (X=1, 2, or 3)
V	: VDE Safety Mark Option (Blank or V)
Y	: One Digit Year Code
WW	: Two Digit Work Week
K	: Manufacturing Code

Ordering Information

H11LX(V)(Y)(Z)-G

CT	= Denotes “CT Micro”
H11LX	= Part Number
V	= VDE Safety Mark Option (Blank or V)
Y	= Lead Form Option (S, SL, M or Blank)
Z	= Tape and Reel Option (Blank, T1 or T2)
G	= Material Option (G: Halogen Free, Blank: Non-Halogen Free)

Option	***Description***	***Quantity***
None	Standard 6 Pin Dip	50 Units/Tube
M	Gullwing (400mil) Lead Forming	50 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1000 Units/Reel

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Carrier Specifications *Dimensions in mm unless otherwise stated*

Tube Option Standard DIP

Tube Option M Type

Reel Dimension *All dimensions are in mm, unless otherwise stated*

Option S(T1/T2) & SL(T1/T2)

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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S (T1) & SL (T1)

Option S (T2) & SL (T2)

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Solderability spec (follow the JEDEC standard JESD22-B102)

Reflow Soldering: Immersed surface, other than the end of pin as cut-surface, must be covered by solder.
Solder-Bath: More than 95% of the electrode must be covered with solder.

Wave soldering (follow the JEDEC standard JESD22-A111)

One time soldering is recommended within the condition of temperature.
Temperature: 260+0/-5˚C.
Time: 10 sec.
Preheat temperature: 25 to 140˚C.
Preheat time: 30 to 80 sec.

Iron Soldering (follow the standard MIL-STD 202G, Method 210F)

Allow single lead soldering in every single process.
One time soldering is recommended.
Temperature: 350±10˚C
Time: 5 sec max.

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Reflow Profile (follow the JEDEC standard J-STD-020)

Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

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