



THE DATASHEET OF CNX48U3S



DESCRIPTION

The CNX48U, H11BX, MOC8080 and TIL113 have a gallium arsenide infrared emitter optically coupled to a silicon planar photodarlington.

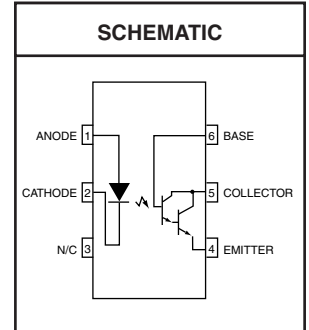
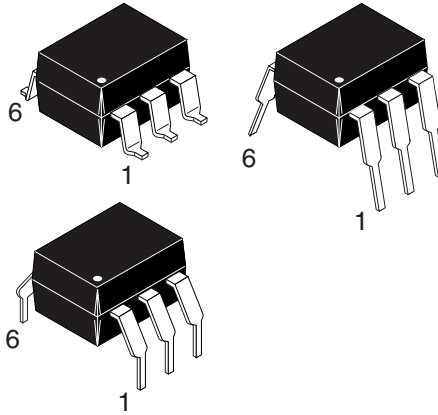
CNX48U	H11B1	H11B2	H11B255	H11B3
MOC8080	TIL113			

FEATURES

- High sensitivity to low input drive current
- Meets or exceeds all JEDEC Registered Specifications
- VDE 0884 approval available as a test option
-add option .300. (e.g., H11B1.300)

APPLICATIONS

- Low power logic circuits
- Telecommunications equipment
- Portable electronics
- Solid state relays
- Interfacing coupling systems of different potentials and impedances.



Parameter	Symbol	Device	Value	Units
TOTAL DEVICE				
Storage Temperature	T_{STG}	All	-55 to +150	°C
Operating Temperature	T_{OPR}	All	-55 to +100	°C
Lead Solder Temperature	T_{SOL}	All	260 for 10 sec	°C
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	All	250	mW
			3.3	mW/°C
EMITTER				
Continuous Forward Current	I_F	All	100	mA
Reverse Voltage	V_R	All	6	V
Forward Current - Peak (300 μs , 2% Duty Cycle)	$I_{F(pk)}$	All	3.0	A
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	All	100	mW
			1.8	mW/°C
DETECTOR				
Collector-Emitter Breakdown Voltage	BV_{CEO}	CNX48U, TIL113	30	V
		H11B1, H11B2 H11B3	25	
		H11B255 MOC8080	55	
Collector-Base Breakdown Voltage	BV_{CBO}	CNX48U, H11B1 H11B2, H11B3 TIL113	30	V
		H11B255 MOC8080	55	V
Emitter-Collector Breakdown Voltage	BV_{ECO}	All	7	V
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	All	150	mW
			2.0	mW/°C

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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise specified.)

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameter	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
EMITTER Input Forward Voltage	($I_F = 10\text{ mA}$)	V_F	H11B1, H11B2 H11B255 MOC8080 TIL113	0.8	1.2	1.5	V
	($I_F = 10\text{ mA}$)		CNX48U		1.2	1.3	
	($I_F = 10\text{ mA}$, $T_A = -55^\circ\text{C}$)		MOC8080	0.9	1.3	1.7	
	($I_F = 10\text{ mA}$, $T_A = 100^\circ\text{C}$)			0.7	1.05	1.4	
	($I_F = 50\text{ mA}$)		H11B3		1.35	1.5	
Reverse Leakage Current	($V_R = 6\text{ V}$)	I_R	All		0.001	10	μA
Capacitance	($V_F = 0\text{ V}$, $f = 1.0\text{ MHz}$)	C	All		50		pF
DETECTOR Collector-Emitter Breakdown Voltage	($I_C = 1\text{ mA}$, $I_F = 0$)	BV_{CEO}	CNX48U	30	60		V
	($I_C = 100\text{ }\mu\text{A}$, $I_F = 0$)		TIL113				
	($I_C = 10\text{ mA}$, $I_F = 0$)		H11B1, H11B2 H11B3	25	60		
	($I_C = 100\text{ }\mu\text{A}$, $I_F = 0$)		H11B255	55	70		
	($I_C = 1\text{ mA}$, $I_F = 0$)		MOC8080				
Collector-Base Breakdown Voltage	($I_C = 100\text{ }\mu\text{A}$, $I_E = 0$)	BV_{CBO}	CNX48U, H11B1 H11B2, H11B3 TIL113	30	100		V
	($I_C = 100\text{ }\mu\text{A}$, $I_F = 0$)		H11B255 MOC8080	55	100		
Emitter-Collector Breakdown Voltage	($I_E = 100\text{ }\mu\text{A}$, $I_B = 0$)	BV_{ECO}	All	7	10		V
Collector-Emitter Dark Current	($V_{CE} = 10\text{ V}$, Base Open)	I_{CEO}	All		1	100	nA

Note

 ** Typical values at $T_A = 25^\circ\text{C}$

CNX48U	H11B1	H11B2	H11B255	H11B3
MOC8080	TIL113			

TRANSFER CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise specified.)								
DC Characteristics	Test Conditions	Symbol	Device	Min	Typ**	Max	Units	
Collector Output Current ⁽¹⁾	$(I_F = 10\text{ mA}, V_{CE} = 5\text{ V})$	I_C (CTR)	MOC8080	50 (500)			mA (%)	
			H11B255	10 (100)				
	$(I_F = 10\text{ mA}, V_{CE} = 1\text{ V})$		CNX48U	60 (600)				
			TIL113	30 (300)				
	$(I_F = 1\text{ mA}, V_{CE} = 5\text{ V})$		H11B1	5 (500)				
			H11B2	2 (200)				
	$(I_F = 1\text{ mA}, V_{CE} = 1\text{ V})$		CNX48U	5 (500)				
$(I_F = 0.5\text{ mA}, V_{CE} = 1\text{ V})$	1.75 (350)							
Saturation Voltage	$(I_F = 1\text{ mA}, I_C = 1\text{ mA})$	$V_{CE(sat)}$	H11B1, H11B2 H11B3, MOC8080			1.0	V	
	$(I_F = 5\text{ mA}, I_C = 10\text{ mA})$		CNX48U			1.0		
	$(I_F = 50\text{ mA}, I_C = 50\text{ mA})$		H11B255			1.0		
	$(I_F = 8\text{ mA}, I_C = 2\text{ mA})$		TIL113			1.25		
AC Characteristics	$(I_C = 10\text{ mA}, V_{CE} = 10\text{ V})$ $(R_L = 100\ \Omega)$ (Fig.7)	t_{on}	H11B1 H11B2		25		μs	
		t_{off}	H11B255 H11B3		18			
	$(I_F = 10\text{ mA}, V_{CC} = 5\text{ V})$ $(R_E = 100\ \Omega), (R_{BE} = 1\text{M}\Omega)$ (Fig. 8)	t_{on}	CNX48U			3.5		
		t_{off}				36		
	$(I_F = 1\text{ mA}, V_{CC} = 5\text{ V})$ $(R_E = 1\text{k}\Omega), (R_{BE} = 10\text{M}\Omega)$ (Fig. 8)	t_{on}	MOC8080			70		
		t_{off}				190		
	$(I_F = 5\text{ mA}, V_{CC} = 10\text{ V})$ $(R_L = 100\ \Omega)$ (Fig.7)	t_{on}	TIL113			3.5		
		t_{off}				25		
	$(I_F = 200\text{ mA}, I_C = 50\text{ mA})$ $(V_{CC} = 10\text{ V}) (R_L = 100\ \Omega)$ (Fig.7)	t_{on}				0.35		5
		t_{off}				55		100

ISOLATION CHARACTERISTICS							
Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units	
Input-Output Isolation Voltage ⁽²⁾	$(I_{I-O} \leq 1\ \mu\text{A}, V_{rms}, t = 1\text{ min.})$		5300			Vac(rms)	
Isolation Resistance ⁽²⁾	$(V_{I-O} = 500\text{ VDC})$	R_{ISO}		10^{11}		Ω	
Isolation Capacitance ⁽²⁾	$(V_{I-O} = \emptyset, f = 1\text{ MHz})$	C_{ISO}		0.8		pf	

Note
 ** Typical values at $T_A = 25^\circ\text{C}$

**CNX48U H11B1 H11B2 H11B255 H11B3
MOC8080 TIL113**

Fig. 1 Output Current vs. Input Current

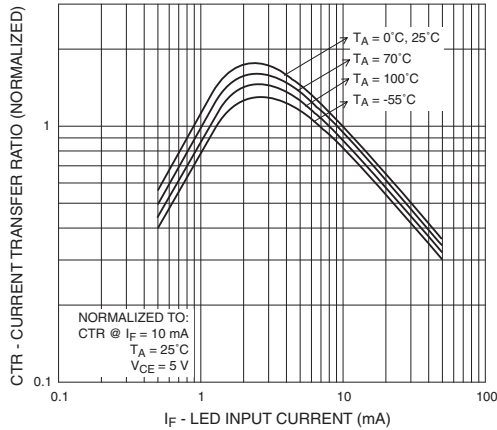


Fig. 2 Current Transfer Ratio vs. Ambient Temperature

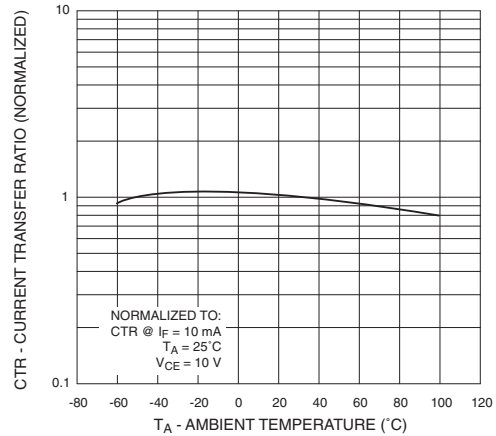


Fig. 3 Collector Current vs. Collector-Emitter Voltage

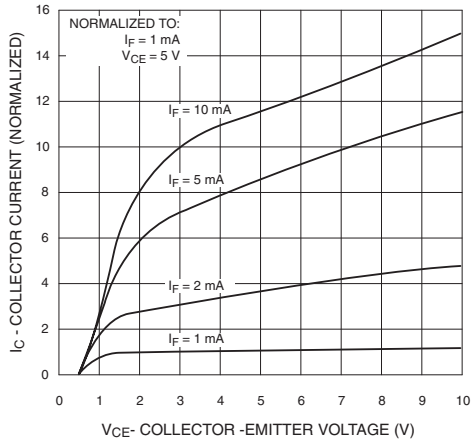


Fig. 4 Dark Current vs. Ambient Temperature

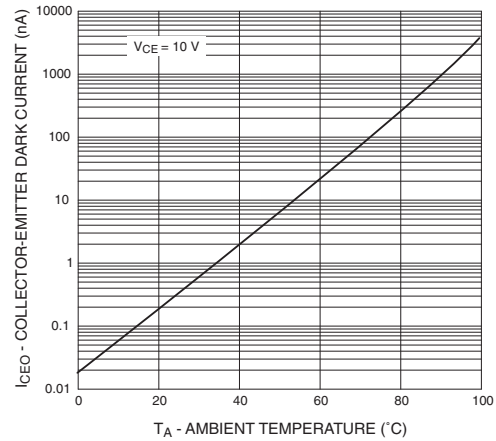


Fig. 5 Turn-On Time vs. Input Current

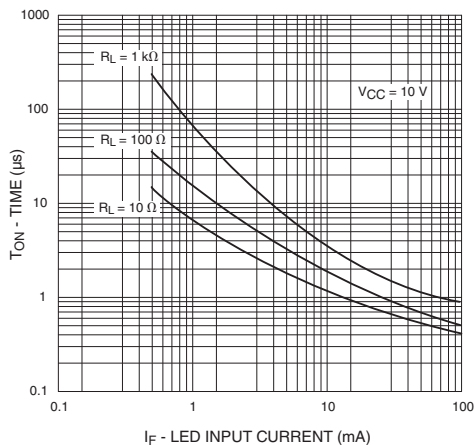
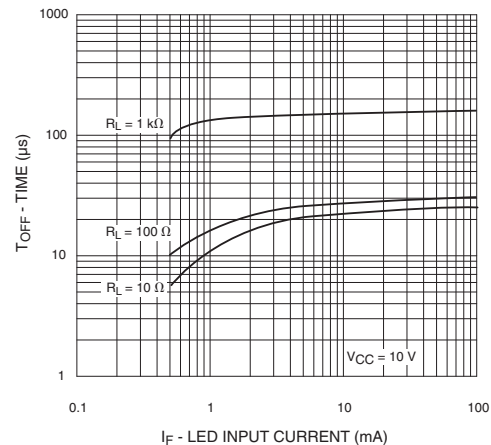


Fig. 6 Turn-Off Time vs. Input Current



CNX48U H11B1 H11B2 H11B255 H11B3
MOC8080 TIL113

TYPICAL ELECTRO-OPTICAL CHARACTERISTIC CURVES

(25°C Free air temperature unless otherwise specified) (Cont.)

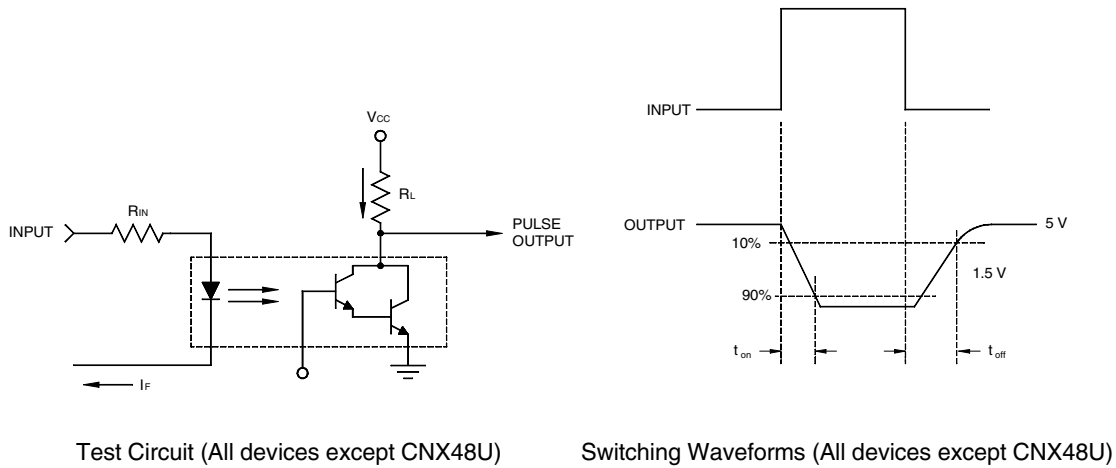


Fig. 7 Switching Time Test Circuit and Waveforms (All devices except CNX48U)

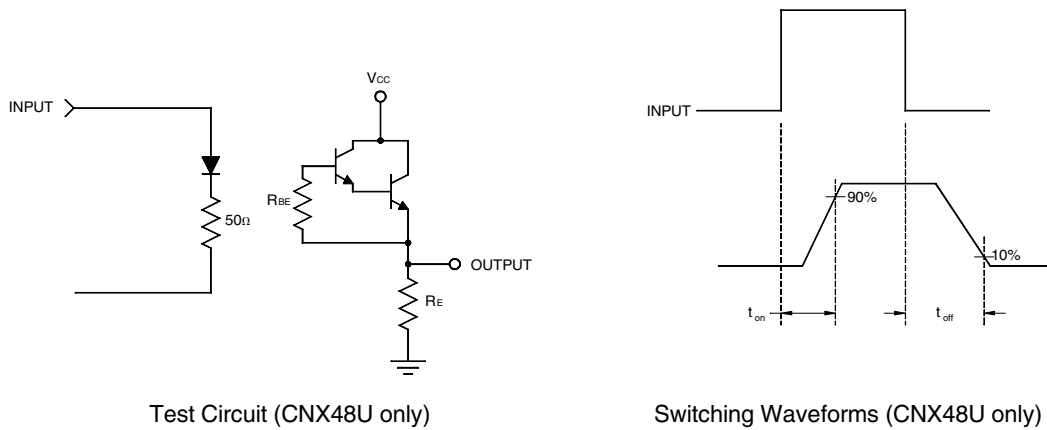


Fig. 8 Switching Time Test Circuit and Waveforms (CNX48U only)

Notes

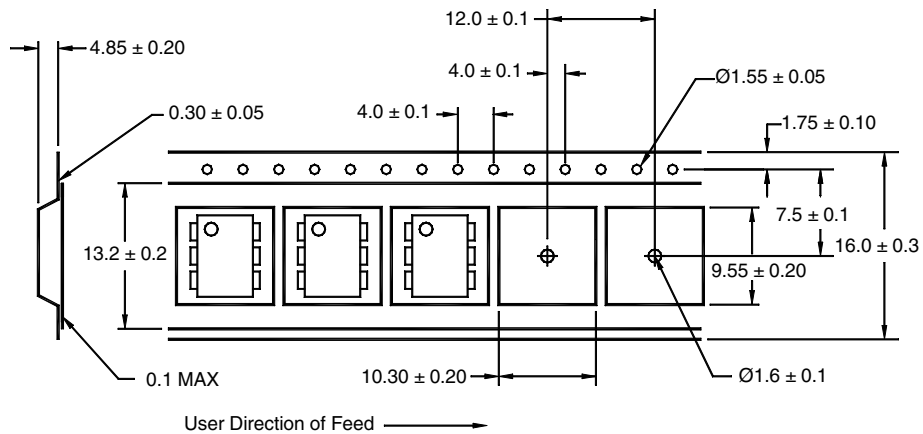
1. The current transfer ratio (I_C/I_F) is the ratio of the detector collector current to the LED input current with $V_{CE} @ 10$ V.
2. For this test, LED pins 1 and 2 are common and phototransistor pins 4,5 and 6 are common.

CNX48U	H11B1	H11B2	H11B255	H11B3
MOC8080	TIL113			

ORDERING INFORMATION

Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
W	.W	0.4" Lead Spacing
300	.300	VDE 0884
300W	.300W	VDE 0884, 0.4" Lead Spacing
3S	.3S	VDE 0884, Surface Mount
3SD	.3SD	VDE 0884, Surface Mount, Tape & Reel

QT Carrier Tape Specifications ("D" Taping Orientation)



NOTE

All dimensions are millimeters

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