

Device No.	Output	Max Ratings @ $T_A = 25^\circ\text{C}$					Coupled Characteristics			
		P_D mW	Transistor I_C mA	V_{CEO} V	Diode V_R V	I_F mA	V_{ISO} kV	Min Current Transfer Ratio I_C/I_F %	@ I_F mA	@ V_{CE} V
H11A1	Trans	250	100	30	3.0	60	2.5	50	10	10
H11A2	Trans	250	100	30	3.0	60	1.5	20	10	10
H11A3	Trans	250	100	30	3.0	60	2.5	20	10	10
H11A4	Trans	250	100	30	3.0	60	1.5	10	10	10
H11B1	Darlg	250	100	25	3.0	60	2.5	50	10	5.0
H11B2	Darlg	250	100	25	3.0	60	1.5	20	10	5.0
H11D1	Trans	250	25	300	6.0	50	2.5	20	10	10
H11D2	Trans	250	25	300	6.0	50	1.5	20	10	10
H11D3	Trans	250	25	200	6.0	50	1.5	20	10	10
H11D4	Trans	250	25	200	6.0	50	1.5	10	10	10
MCA230	Darlg	300	0.1	30	3.0	60	1.5	40	10	5.0
MCA231 ⁽³⁾	Darlg	300	0.1	30	3.0	60	1.5	4.0	1.0	1.0
MCA255	Darlg	300	0.1	55	3.0	60	1.5	40	10	5.0
MCT2	Trans	250	—	30	3.0	60	1.5	20	10	10
MCT2E	Trans	250	—	30	3.0	60	2.5	20	10	10
MCT26	Trans	250	—	30	3.0	60	1.5	6.0	10	10
TIL111 ⁽³⁾	Trans	250	—	30	3.0	100	1.5	7.0	16	0.4
TIL112	trans	250	—	20	3.0	100	1.5	2.0	10	5.0
TIL113 ⁽³⁾	Trans	250	—	30	3.0	100	1.5	100	10	1.0
TIL114 ⁽³⁾	Trans	250	—	30	3.0	100	2.5	7.0	16	0.4
TIL115	Trans	250	—	20	3.0	100	2.5	2.0	10	5.0
TIL116	Trans	250	—	30	3.0	100	2.5	5.0	10	10
TIL117	Trans	250	—	30	3.0	100	2.5	9.0	10	10
TIL118	Trans	250	—	20	3.0	100	1.5	10	10	5.0
TIL119	Darlg	250	—	30	3.0	100	1.5	160	10	2.0

Notes

1. Standard Transistor output
2. High-speed transistor output
guaranteed 2.0 μs max t_r and t_f with 100 Ω R_L
8.0 μs typ at 1 k Ω R_L
3. CTR guaranteed with transistor in saturation
4. JEDEC registered data and conditions
5. CTR typ at 1.0 mA = 40%

Couplers (Cont'd)

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Coupled Characteristics		Input Diode Characteristics		Output Transistor Characteristics			Output Darlington Characteristics		Data Sheet Page No.	Device No.
T_r μs Typ	t_f μs Typ	V_F V Max	@ I_F mA	$V_{CE(sat)}$ V Max	@ I_C mA	@ I_F mA	I_{CEO} μA Max	@ V_{CE} V		
2.0	2.0	1.5	10	0.4	0.5	10			5-25	H11A1
2.0	2.0	1.5	10	0.4	0.5	10			5-25	H11A2
2.0	2.0	1.5	10	0.4	0.5	10			5-25	H11A3
2.0	2.0	1.5	10	0.4	0.5	10			5-25	H11A4
125	100	1.5	10	1.0	1.0	1.0	0.1	10	5-27	H11B1
125	100	1.5	10	1.0	1.0	1.0	0.1	10	5-27	H11B2
5.0	5.0	1.5	10	0.4	0.5	10			5-29	H11D1
5.0	5.0	1.5	10	0.4	0.5	10			5-29	H11D2
5.0	5.0	1.5	10	0.4	0.5	10			5-29	H11D3
5.0	5.0	1.5	10	0.4	0.5	10			5-29	H11D4
40	50	1.5	20	1.0	50	50	0.1	10	5-33	MCA230
40	50	1.5	20	1.0	2.0	1.0	0.1	10	5-33	MCA231 ⁽³⁾
40	50	1.5	20	1.0	50	50	0.1	10	5-33	MCA255
2.5	2.5	1.5	20	0.4	2.0	16			5-35	MCT2
2.5	2.5	1.5	20	0.4	2.0	16			5-35	MCT2E
2.5	2.5	1.5	20	0.5	1.6	60			5-35	MCT26
2.5	2.5	1.4	16	0.4	2.0	16			5-40	TIL111 ⁽³⁾
15.0	15.0	1.4	16	0.5	2.0	50			5-43	TIL112
50	50	1.5	10	1.0	125	50	0.1	10	5-45	TIL113 ⁽³⁾
2.0	2.0	1.4	16	0.4	2.0	16			5-40	TIL114 ⁽³⁾
15.0	15.0	1.5	10	0.5	2.0	50			5-43	TIL115
2.0	2.0	1.5	60	0.4	2.2	15			5-40	TIL116
2.0	2.0	1.4	16	0.4	0.5	10			5-40	TIL117
15.0	15.0	1.5	10	0.5	2.0	50			5-43	TIL118
50	50	1.5	10	1.0	10	10	0.1	10	5-45	TIL119

Optically-Coupled Isolator

Optoelectronic Products

H11A1, H11A2 H11A3, H11A4

General Description

The H11A1, H11A2, H11A3 and H11A4 optical isolators are electrical and mechanical replacements for the General Electric series. Optical intercoupling provides a high degree of ac and dc isolation. A capability for continuous operation of the input diode results in a frequency response extending to dc. Connection to the base is also provided for design flexibility.

Glassolated™

Electrically Equivalent to GE Devices

Pin-for-Pin Equivalent to GE Devices

Availability of Base Pin for Flexible Design

Absolute Maximum Ratings

Maximum Temperature and Humidity

Storage Temperature	-55°C to +150°C
Operating Temperature	-55°C to +100°C
Pin Temperature (Soldering, 5 s)	260°C
Total Package Power Dissipation at $T_A = 25^\circ\text{C}$	
LED plus Detector	250 mW
Derate Linearly from 25°C	3.3 mW/°C

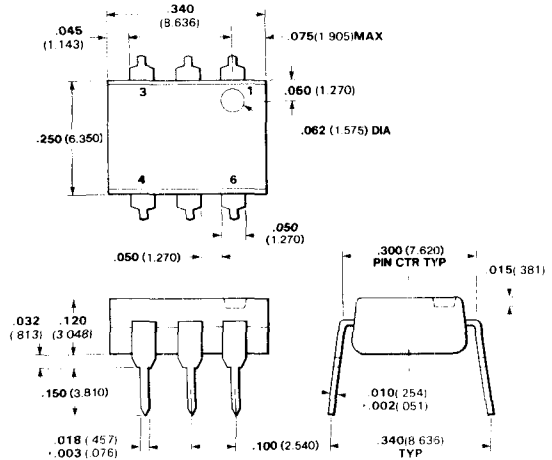
Input Diode

V_R	Reverse Voltage	3.0 V
I_F	Forward dc Current	60 mA
I_{pk}	Peak Forward Current at 1 μs pulse width, 300 pps	3.0 A
P_D	Power Dissipation at $T_A = 25^\circ\text{C}$	100 mW/°C
	Derate Linearly from 25°C	1.33 mW/°C

Output Transistor

V_{CE}	Collector-to-Emitter Voltage	30 V
V_{CB}	Collector-to-Base Voltage	70 V
I_C	Collector Current	100 mA
P_D	Power Dissipation at $T_A = 25^\circ\text{C}$	150 mW
	Derate Linearly from 25°C	2.0 mW/°C

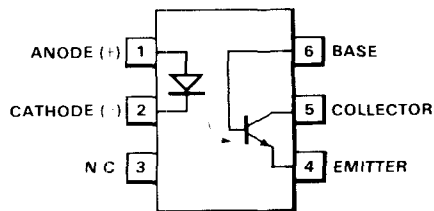
Package Outline



Notes

All dimensions in inches bold and millimeters (parentheses)
Tolerance unless specified = $\pm .015$ ($\pm .381$)

Connection Diagram DIP (Top View)



Pin

1	Anode (+)	} Input Diode
2	Cathode (-)	
3	NC	} Output npn Phototransistor
4	Emitter	
5	Collector	
6	Base	

Typical Electrical Characteristics

H11A1, H11A2 H11A3, H11A4

Electrical Characteristics—Input Diode $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_F	Forward Voltage		1.1	1.5	V	$I_F = 10\text{ mA}$
I_R	Reverse Current			10	μA	$V_R = 3.0\text{ V}$

Electrical Characteristics—Output Transistor $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{CEO}	Collector-to-Emitter Voltage	30			V	$I_C = 10\text{ mA}$, $I_F = 0$
V_{CBO}	Collector-to-Base Voltage	70			V	$I_C = 100\text{ }\mu\text{A}$, $I_F = 0$
V_{ECO}	Emitter-to-Collector Voltage	7.0			V	$I_E = 100\text{ }\mu\text{A}$, $I_F = 0$
I_{CEO}	Collector-to-Emitter Leakage Current		5.0	50	nA	$V_{CE} = 10\text{ V}$, $I_F = 0$

Electrical Characteristics—Coupled $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{ISO}	Isolation Voltage (Note 3) H11A1, H11A3 H11A2, H11A4	2500 1500			V V V	Peak Peak Peak
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage		0.1	0.4	V	$I_C = 0.5\text{ mA}$, $I_F = 50\text{ mA}$
$I_C/I_F(\text{CTR})$	Collector Current Transfer Ratio (Note 1) H11A1 H11A2, H11A3 H11A4	50 20 10 10^{11}			% % %	$V_{CE} = 10\text{ V}$, $I_F = 10\text{ mA}$
R_{IO}	Input-to-Output Resistance		2.0		Ω	$V_{IO} = 500\text{ V}$
C_{IO}	Input-to-Output Capacitance		2.0		pF	$f = 1.0\text{ MHz}$
t_r, t_f	Collector Rise and Fall Times (Note 2)		2.0		μs	$I_C = 2.0\text{ mA}$, $V_{CE} = 10\text{ V}$, $R_L = 100\text{ }\Omega$

Notes

- Collector current transfer ratio is defined as the ratio of the collector current to the forward bias input current.
- Rise time is defined as the time for the collector current to rise from 10% to 90% of peak value. Fall time is defined as the time required for the current to decrease from 90% to 10% of peak value.
- Isolation voltage defined as minimum of 5 s continuous application.