

High Collector-emitter Voltage Type Photocoupler

H11D1 Series

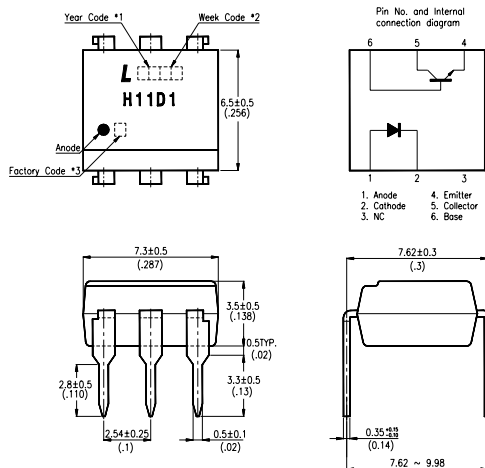
Features

- Current transfer ratio
(CTR : MIN. 20% at $I_F = 10\text{mA}$, $V_{CE} = 10\text{V}$)
- High isolation voltage between input and output
($V_{ISO} = 5,000\text{Vrms}$)
- High collector-emitter breakdown voltage
($BV_{CER} = 300\text{V}$)
- UL approved (No. E113898)
- VDE approved (No. 094722)
- CSA approve in progress
- Options Available :
 - Leads with 0.4" (10.16mm) Spacing (M Type)
 - Lead Bends for Surface Mounting (S Type)
 - Tape and Reel of Type I for SMD (Add "-TA" Suffix)
 - Tape and Reel of Type II for SMD (Add "-TA1" Suffix)
 - VDE 0884 Approvals (Add "-V" Suffix)

Applications

1. Copy Machines
2. Interfacing and coupling systems of different potentials and impedances
3. Monitor and detection circuits
4. Solid state relays

Package Dimensions



NOTES :

1. Year date code.
2. 2-digit work week.
3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
4. All dimensions are in millimeters (inches).
5. Tolerance is $\pm 0.25\text{mm}$ (.010") unless otherwise noted.
6. Specifications are subject to change without notice.

Ordering Information

Part Number	Package	Safety Standard Approval	Application part number
H11D1 H11D1M H11D1S H11D1S-TA H11D1S-TA1	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)	• UL approved • CSA approve in progress	H11D1
H11D1-V H11D1M-V H11D1S-V H11D1STA-V H11D1STA1-V	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)	• VDE approved	H11D1

Ratings and Characteristics

Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I _F	60	mA
	Reverse Voltage	V _R	6	V
	Power Dissipation	P	100	mW
Output	Collector-Emitter Voltage	V _{CEO}	300	V
	Emitter-Collector Voltage	V _{ECO}	7	V
	Collector-Base Voltage	V _{CBO}	300	V
	Emitter-Base Voltage	V _{EBO}	7	V
	Collector Current	I _C	100	mA
	Collector Power Dissipation	P _C	150	mW
Total Power Dissipation		P _{tot}	250	mW
*1.Isolation Voltage		V _{iso}	5,000	V _{rms}
Operating Temperature		T _{opr}	-55~+100	°C
Storage Temperature		T _{stg}	-55~+150	°C
*2.Soldering Temperature		T _{sol}	260	°C

*1. AC for 1 minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

(1) Short between anode and cathode on the primary side and between collector and emitter on the secondary side.

(2) The isolation voltage tester with zero-cross circuit shall be used.

(3) The waveform of applied voltage shall be a sine wave.

*2. For 10 seconds

Electrical / Optical Characteristics

(Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	unit	Conditions
Input	Forward Voltage	V _F	—	1.2	1.5	V	I _F =10mA
	Reverse Current	I _R	—	0.01	10	μA	V _R =6V
	Terminal Capacitance	C _t	—	30	250	pF	V=0, f=1KHz
Output	Collector Dark Current	I _{CER}	—	—	100	nA	V _{CE} =200V, R _{BE} =1MΩ
	Collector-Emitter Breakdown Voltage	BV _{CER}	300	—	—	V	I _C =0.1mA, I _F =0 R _{BE} =1MΩ
	Emitter-Collector Breakdown Voltage	BV _{ECO}	7	—	—	V	I _E =10 μA I _F =0mA
Transfer Characteristics	Collector Current	I _C	2	—	—	mA	I _F =10mA V _{CE} =10V
	*1 Current Transfer Ratio	CTR	20	—	—	%	R _{BE} =1MΩ
	Collector-emitter Saturation Voltage	V _{CE(sat)}	—	0.25	0.4	V	I _F =10mA, I _C =0.5mA R _{BE} =1MΩ
	Isolation Resistance	R _{iso}	5 × 10 ¹⁰	—	—	Ω	DC500V 40~60% R.H.
	Floating Capacitance	C _f	—	0.6	—	pF	V=0, f=1MHz
	Response Time (Rise)	t _r	—	5	—	μs	V _{CC} =10V, I _C =2mA
	Response Time (Fall)	t _f	—	5	—	μs	R _L =100Ω

*1. CTR= $\frac{I_C}{I_F} \times 100\%$

Typical Electrical/Optical Characteristic Curves
(25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Forward Current vs.
Ambient Temperature

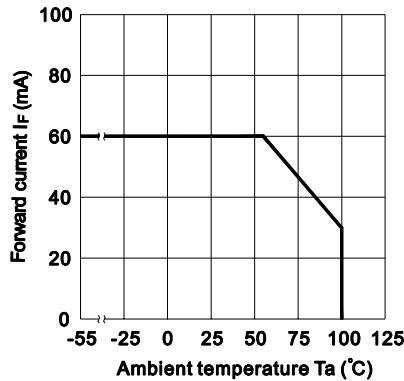


Fig.2 Collector Power Dissipation vs.
Ambient Temperature

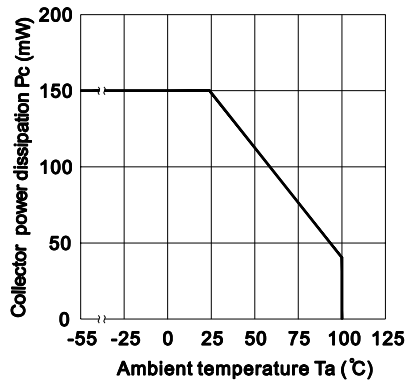


Fig.3 Collector-emitter saturation
Voltage vs. Forward current

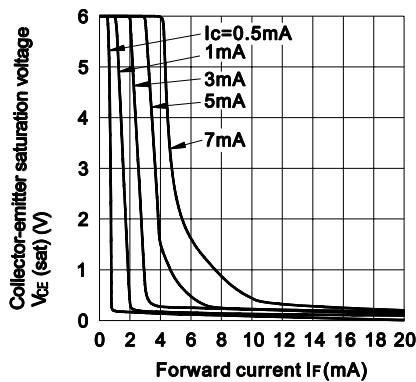


Fig.4 Forward Current vs. Forward
Voltage

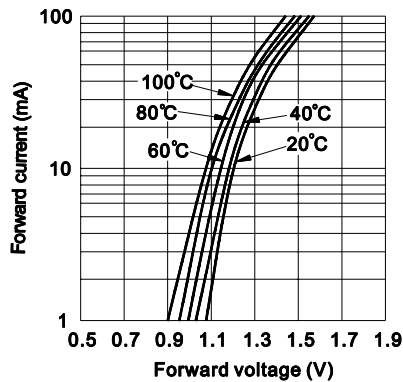


Fig.5 Output Current vs.
Forward Current Curve

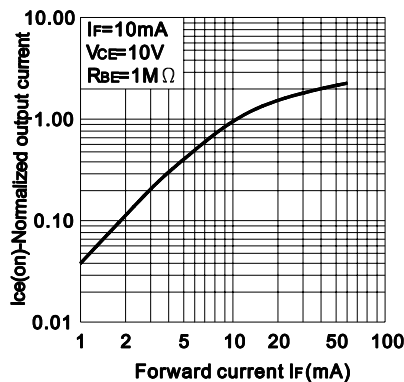


Fig.6 Collector Current vs.
Collector-emitter Voltage

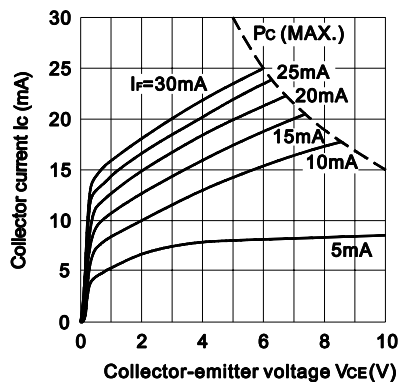


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

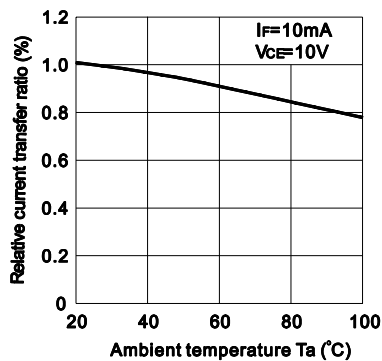


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

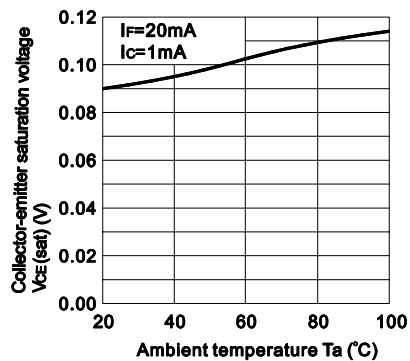


Fig.9 Collector Dark Current vs. Ambient Temperature

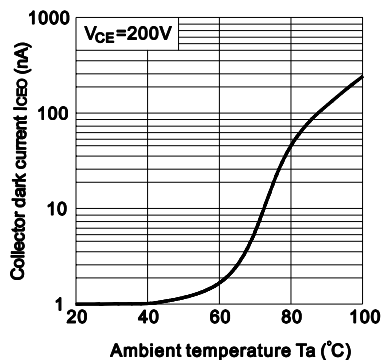


Fig.10 Response Time vs. Load Resistance

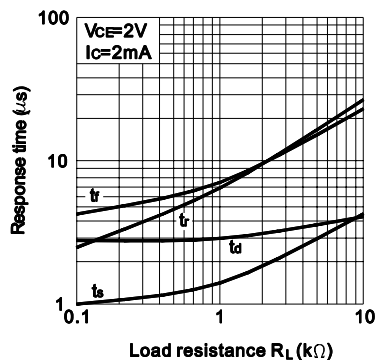
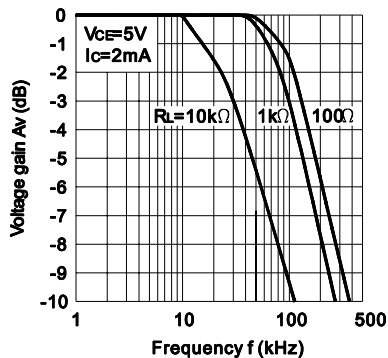
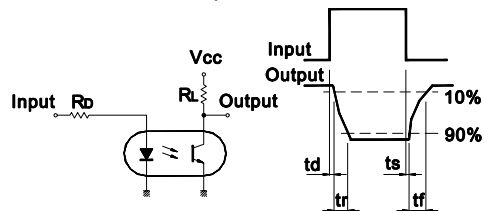


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

