High Collector-emitter Voltage Type Photocoupler

H11D1 Series

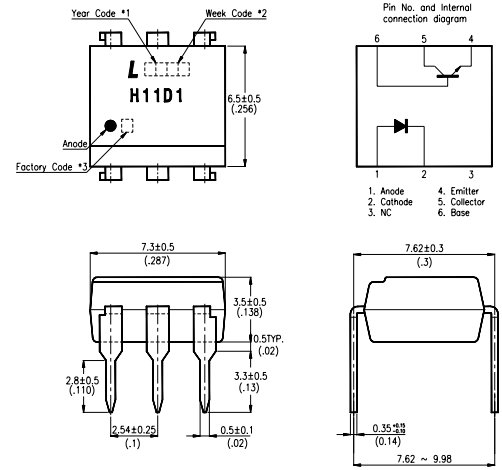
Features

- Current transfer ratio
  (CTR : MIN. 20% at I_F = 10mA, V_{CE} = 10V)
- High isolation voltage between input and output
  (V_{ISO} = 5,000 Vrms)
- High collector-emitter breakdown voltage
  (BV_{CER} = 300V)
- 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 ± 0.25mm (.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℃)

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	Vrms
Operating Temperature		T_{opr}	-55~+100	℃
Storage Temperature		T_{stg}	-55~+150	℃
*2.Soldering Temperature		T_{sol}	260	℃

*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℃)

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 R_{BE}=1MΩ
	*1 Current Transfer Ratio	CTR	20	–	–	%	
	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℃Ambient Temperature Unless Otherwise Noted)

Fig.1 Forward Current vs. Ambient Temperature

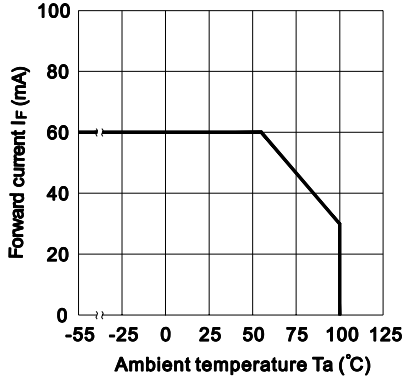


Fig.2 Collector Power Dissipation vs. Ambient Temperature

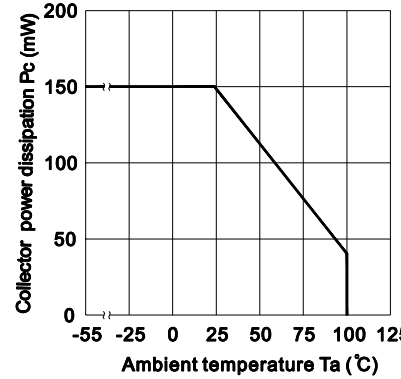


Fig.3 Collector-emitter saturation Voltage vs. Forward current

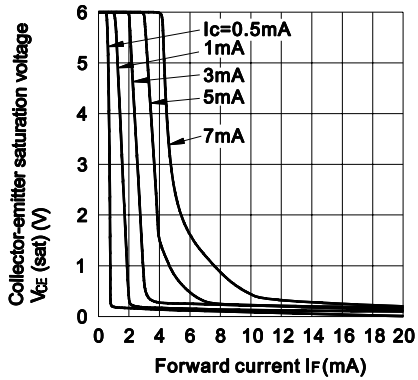


Fig.4 Forward Current vs. Forward Voltage

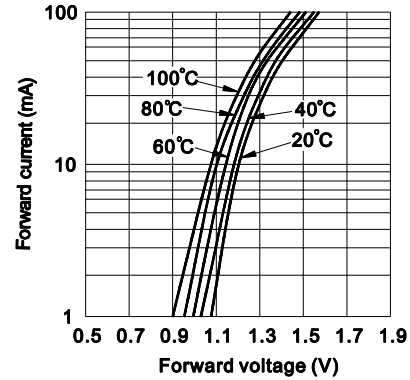


Fig.5 Output Current vs. Forward Current Curve

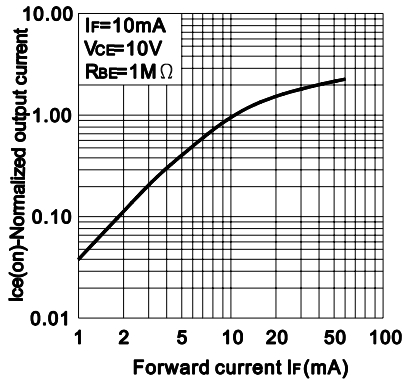


Fig.6 Collector Current vs. Collector-emitter Voltage

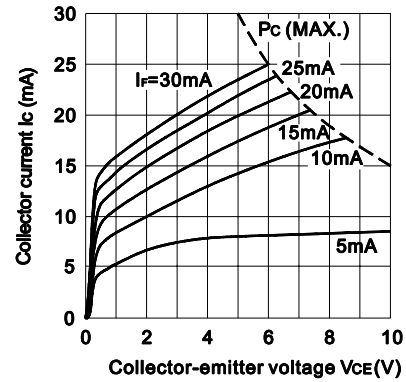


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

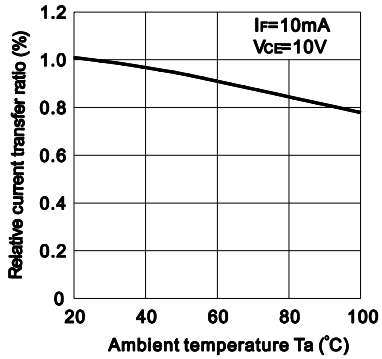


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

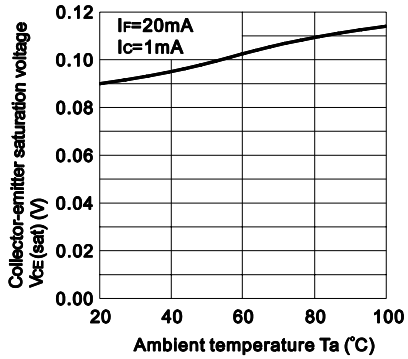


Fig.9 Collector Dark Current vs. Ambient Temperature

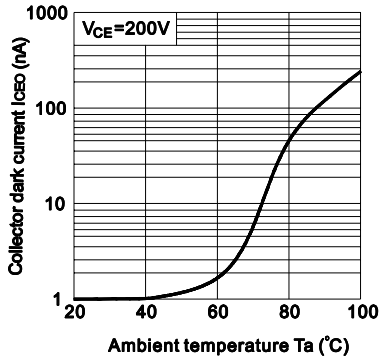


Fig.10 Response Time vs. Load Resistance

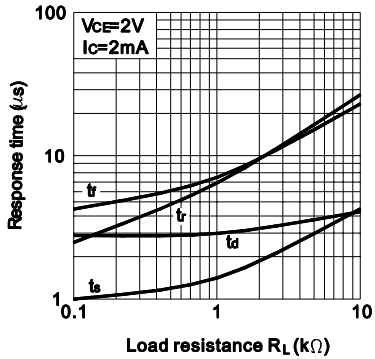
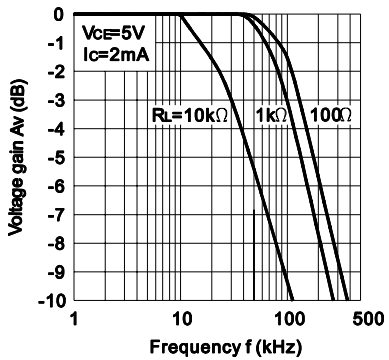
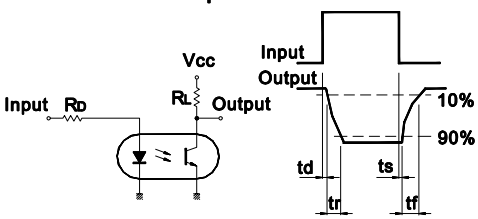


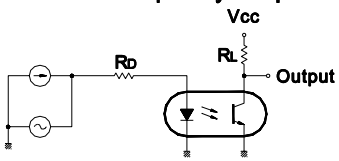
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



PHOTOCOUPLER