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LITEON

General Purpose Type Photocoupler

LTV-4N35 Series/LTV-4N37 Series
4N35 Series/4N37 Series

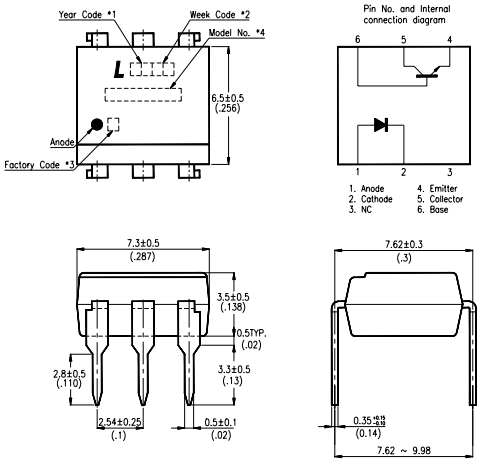
Features

- High current transfer ratio
  (CTR : MIN.100% at I_F=10mA, V_{CE}=10V)
- Response time
  (t_{on} : TYP, 3μs at V_{CE}=10V, I_C=2mA, R_L=100 Ω)
- Input-output isolation voltage :
  LTV-4N35(Viso : 3,550Vrms)
  LTV-4N37(Viso : 1,550Vrms)
- UL approved (No. E113898)
- TUV approved (No.R9653630)
- CSA approved (No. CA91533-1)
- FIMKO approved (No. 193422)
- NEMKO approved (No. P96103013)
- DEMKO approved (No. 303985)
- SEMKO approved (No. 9646047/01-30)
- VDE approved (No. 094722)
- Options available :
  -Leads with 0.4"(10.16mm)spacing (M Type)
  -Leads 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. I/O interfaces for computers.
2. System appliances, measuring instruments.
3. Signal transmission between circuits of different potentials and impedances.

Package Dimensions



Note:
1.Year date code.
2. 2-digit work week.
3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
4. Model No.:LTV4N35 ; LTV4N37 ; 4N35 ; 4N37
5. All dimensions are in millimeters (inches).
6. Tolerance is ± 0.25mm (.010”) unless otherwise noted.
7. Specifications are subject to change without notice.

PHOTOCOUPLER

Ordering Information

Part Number	Package	Safety Standard Approval	Application part number
LTV-4N35 / 4N35 LTV-4N35M / 4N35M LTV-4N35S / 4N35S LTV-4N35S-TA / 4N35S-TA LTV-4N35S-TA1 / 4N35S-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 • TUV approved • CSA approved • FIMKO approved • NEMKO approved • SEMKO approved • DEMKO approved	LTV - 4N35
LTV-4N37 / 4N37 LTV-4N37M / 4N37M LTV-4N37S / 4N37S LTV-4N37S-TA / 4N37S-TA LTV-4N37S-TA1 / 4N37S-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)		LTV - 4N37
LTV4N35-V / 4N35-V LTV4N35M-V / 4N35M-V LTV4N35S-V / 4N35S-V LTV4N35STA-V / 4N35STA-V LTV4N35STA1-V / 4N35STA1-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	LTV - 4N35
LTV4N37-V / 4N37-V LTV4N37M-V / 4N37M-V LTV4N37S-V / 4N37S-V LTV4N37STA-V / 4N37STA-V LTV4N37STA1-V / 4N37STA1-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)		LTV - 4N37

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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}	30	V
	Collector-Base Voltage		V_{CBO}	70	V
	Emitter-Collector Voltage		V_{ECO}	7	V
	Collector Current		I_C	100	mA
	Collector Power Dissipation		P_C	300	mW
Total Power Dissipation			P_{tot}	350	mW
*1.Isolation Voltage		4N35	V_{iso}	3,550	V_{rms}
		4N37		1,500	
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, emitter and base on the secondary side.
  (2)The isolation voltage tester with zero-cross circuit shall be used.
  (3)The waveform of applied volttage 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	–	–	10	μA	V_R=4V
	Terminal Capacitance		C_t	–	50	–	pF	V=0, f=1kHz
Output	Collector Dark Current	Ta=25℃	I_{CEO}	–	–	50	nA	V_{CE}=10V
		Ta=25℃		–	–	500	μA	V_{CE}=30V
	Collector-Emitter Breakdown Voltage		BV_{CEO}	30	–	–	V	I_C=0.1mA
	Emitter-Collector Breakdown Voltage		BV_{ECO}	7	–	–	V	I_E=10 μA
	Collector-Base Breakdown Voltage		BV_{CBO}	70	–	–	V	I_C=0.1mA
Transfer Characteristics	Collector Current	Ta=25℃	I_C	10	–	–	mA	I_F=10mA V_{CE}=10V
	*1 Current Transfer Ratio	Ta=25℃	CTR	100	–	–	%	I_F=10mA V_{CE}=10V
	Collector-emitter Saturation Voltage		$V_{CE(sat)}$	–	–	0.3	V	I_F=50mA, IC=2mA
	Isolation Resistance		R_{ISO}	5×10^{10}	1×10^{11}	–	Ω	DC500V, 40~60% R.H.
	Floating Capacitance		C_f	–	1.0	2.5	pF	V=0, f=1MHz
	Response Time (Turn-on Time)		t_{on}	–	3	10	μs	V_{CE}=10V, R_{BE}=∞
	Response Time (Turn-off Time)		t_{off}	–	3	10	μs	R_L=100 Ω, I_C=2mA

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

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

Fig.1 Forward Current vs. Ambient Temperature

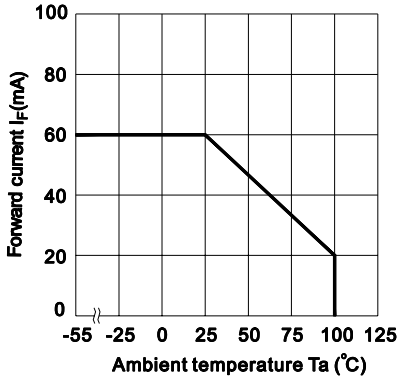

Fig.2 Collector Power Dissipation vs. Ambient Temperature

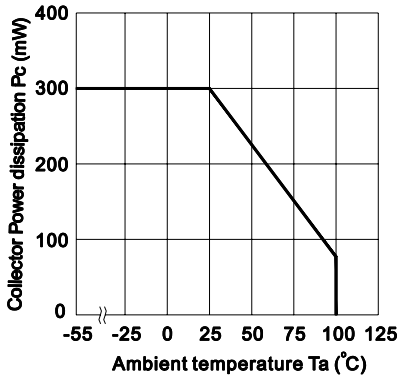

Fig.3 Forward Current vs. Forward Voltage

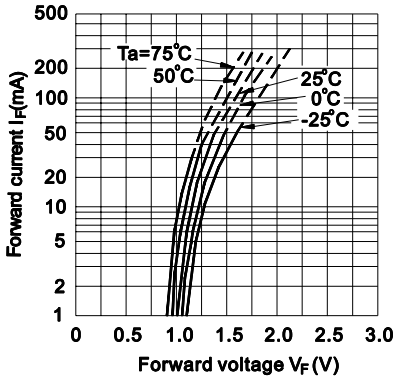

Fig.4 Current Transfer Ratio vs. Forward Current

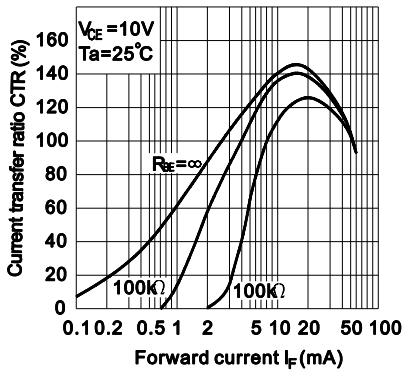

Fig.5 Collector Current vs. Collector-emitter Voltage

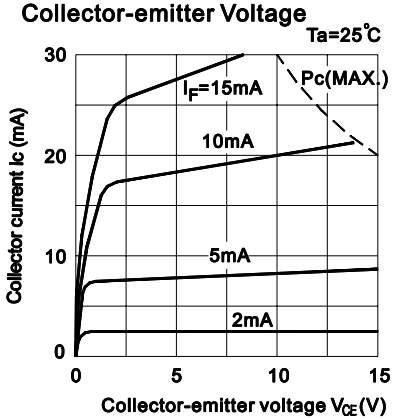

Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature

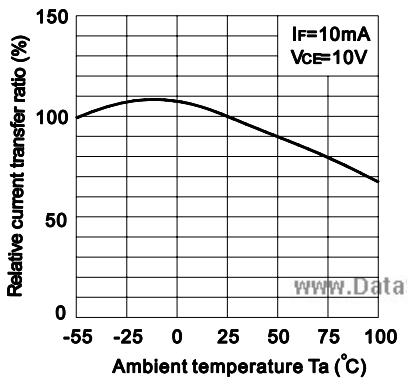

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Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

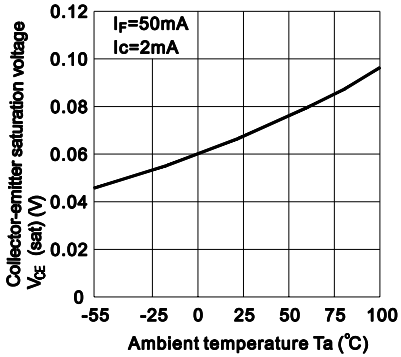


Fig.8 Collector Dark Current vs. Ambient Temperature

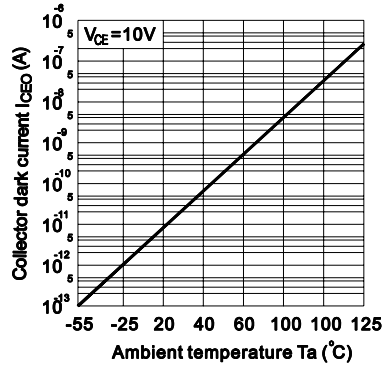


Fig.9 Response Time vs. Load Resistance

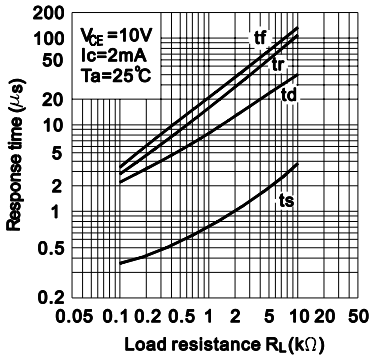


Fig.10 Frequency Response

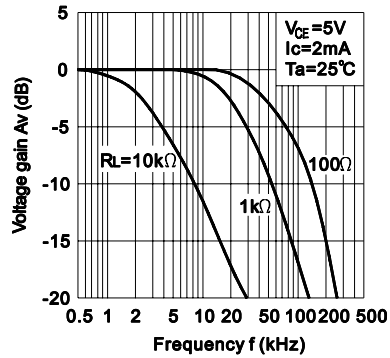
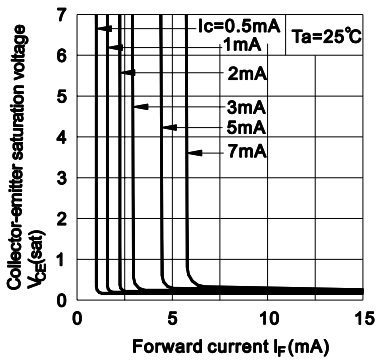
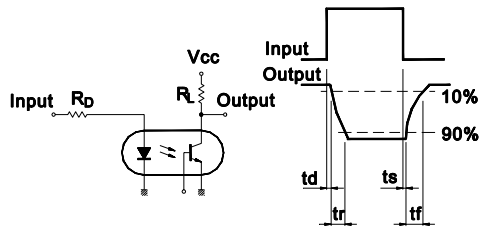


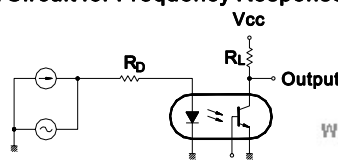
Fig.11 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Response Time



Test Circuit for Frequency Response



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