

LITEON

HIGH TRANSFER EFFICIENCY, GENERAL PURPOSE TYPE PHOTOCOUPLER

LTV4N32/LTV4N33
LTV4N32S/LTV4N33S
LTV4N32M/LTV4N33M

FEATURES

1. High current transfer ratio
(CTR : MIN. 500% at $I_f = 10\text{mA}$, $V_{ce} = 10\text{V}$)
2. Response time
(t_{on} : MAX. $5\mu\text{s}$ at $I_f = 200\text{mA}$, $V_{cc} = 10\text{V}$, $I_c = 50\text{mA}$)
3. UL approved (No. E113898)
4. TUV approved (No. R9653630)
5. CSA approved (No. LR91533)
6. FIMKO approved (No. 182728)
7. NEMKO approved (No. P95101691)
8. DEMKO approved (No. 303985)
9. SEMKO approved (No. 9519208)
10. VDE approved (No. 90533 Taiwan, No. 90534 Thailand)
11. 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)

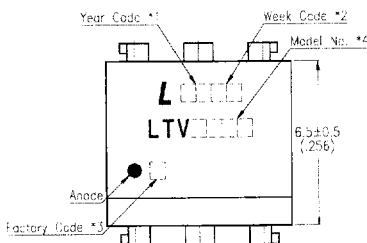


PHOTOCOUPLERS

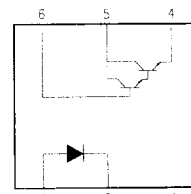
APPLICATIONS

1. I/O interfaces for computers
2. System appliances, measuring instruments
3. Signal transmission between circuits of different potentials and impedances

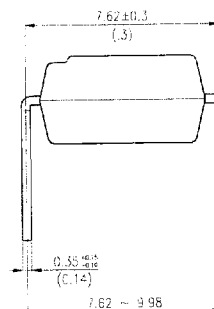
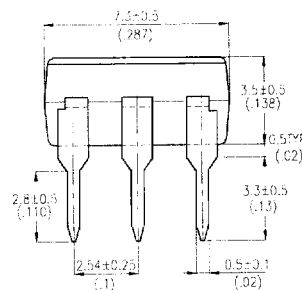
PACKAGE DIMENSIONS



Pin No. and Internal connection diagram



- | | |
|------------|--------------|
| 1. Anode | 4. Emitter |
| 2. Cathode | 5. Collector |
| 3. NC | 6. Ecase |



NOTES :

- *1. The last 2 digits of work year.
- *2. 2-digit number means work week.
- *3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
- *4. Model No. 4N32, 4N33.
- *5. All dimensions are in millimeters (inches).
- *6. Tolerance is $\pm 0.25\text{mm}$ (.010") unless otherwise noted.
- *7. Specifications are subject to change without notice.

■ RATINGS AND CHARACTERISTICS

● Absolute maximum ratings

(Ta=25 °C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I _F	80	mA
	Reverse voltage	V _R	6	V
	Power dissipation	P	150	mW
Output	Collector-emitter voltage	V _{CEO}	30	V
	Collector-base voltage	V _{CB0}	30	V
	Emitter-collector voltage	V _{ECO}	5	V
	Collector current	I _C	100	mA
	Collector power dissipation	P _C	150	mW
Total power dissipation		P _{tot}	250	mW
* 1. Isolation voltage	LTV4N32	V _{iso}	2,500	V _{rms}
	LTV4N33		1,500	
Operating temperature		T _{op}	-55~+100	°C
Storage temperature		T _{stg}	-55~+150	°C
* 2. Soldering temperature		T _{sol}	260	°C

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

• 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 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	—	—	10	μA	V _R =4V
	Terminal capacitance	C _t	—	50	—	pF	V=0, f=1kHz
Output	Collector dark current	I _{CEO}	—	—	100	nA	V _{CE} =10V
	Collector-emitter breakdown voltage	BV _{CEO}	30	—	—	V	I _C =0.1mA
	Emitter-collector breakdown voltage	BV _{ECO}	5	—	—	V	I _E =10 μA
	Collector-base breakdown voltage	BV _{CBO}	30	—	—	V	I _C =0.1mA
Transfer characteristics	* 1 Collector current	I _C	50	—	—	mA	I _F =10mA V _{CE} =10V
	* 1 Current transfer ratio	CTR	500	—	—	%	
	Collector-emitter saturation voltage	V _{CE(sat)}	—	—	1.0	V	I _F =8mA, I _C =2mA
	Isolation resistance	R _{ISO}	5×10 ¹⁰	1×10 ¹¹	—	Ω	DC500V, 40~60% R.H.
	Floating capacitance	C _f	—	1.0	—	pF	V=0, f=1MHz
	Response time (Turn-on time)	t _{on}	—	—	5	μs	I _F =200mA (tw=1.0mS) V _{CC} =10V I _C =50mA
	Response time (Turn-off time)	t _{off}	—	—	100	μs	

* 1. Pulse test: input pulse width=300 μs, Duty ratio ≤ 0.02, CTR = $\frac{I_C}{I_F} \times 100\%$

PHOTOCOUP LERS

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES (25 °C Ambient Temperature Unless Otherwise Noted)

Fig. 1 Forward Current vs. Ambient Temperature

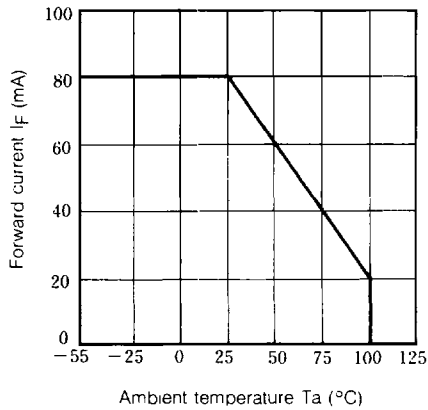


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

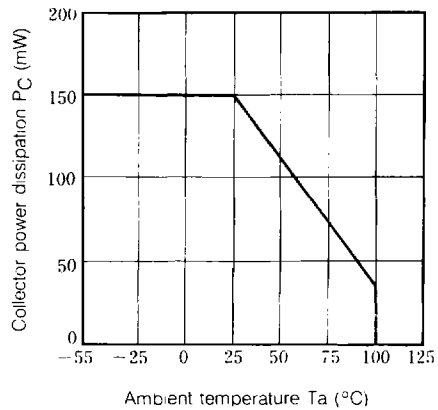


Fig. 3 Forward Current vs. Forward Voltage

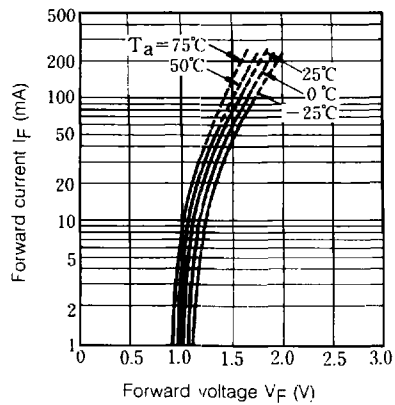


Fig. 4 Current Transfer Ratio vs. Forward Current

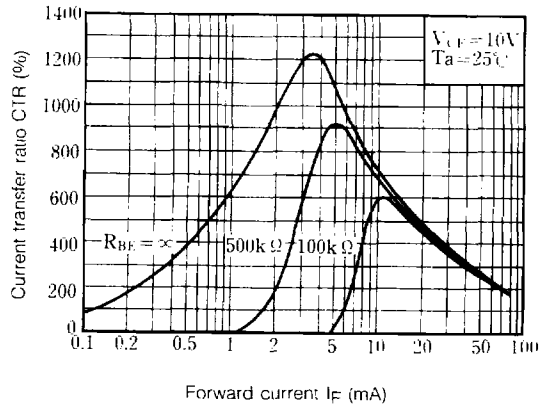


Fig. 5 Collector Current vs. Collector-emitter Voltage

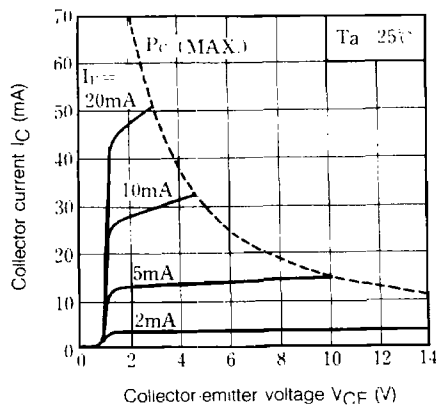


Fig. 6 Relative Current Transfer Ratio vs. Ambient Temperature

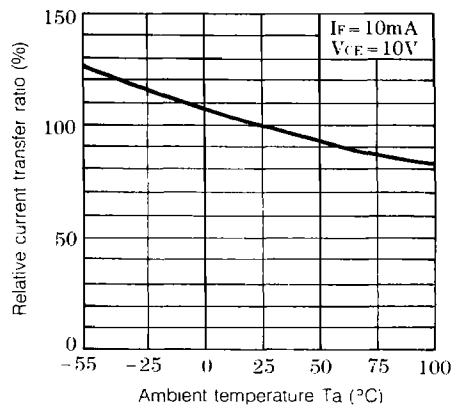


Fig. 7 Collector-emitter Saturation Voltage vs. Ambient Temperature

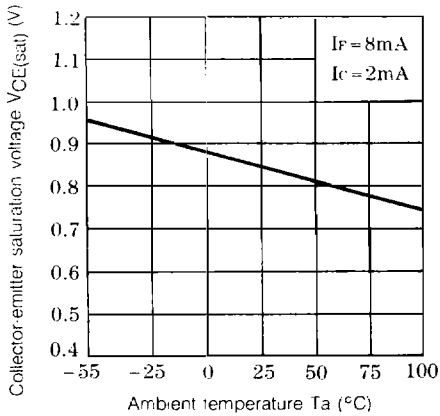
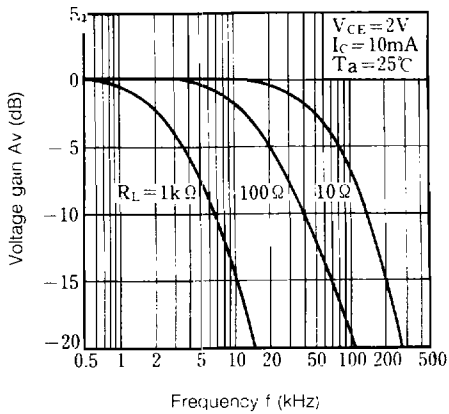


Fig. 9 Frequency Response



Test Circuit for Response Time

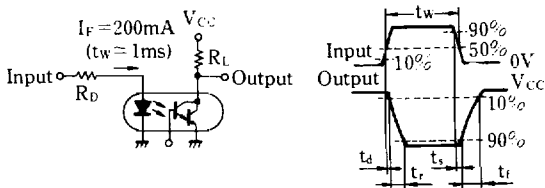


Fig. 8 Collector Dark Current vs. Ambient Temperature

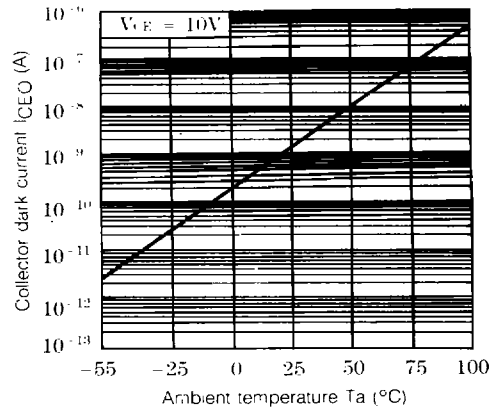
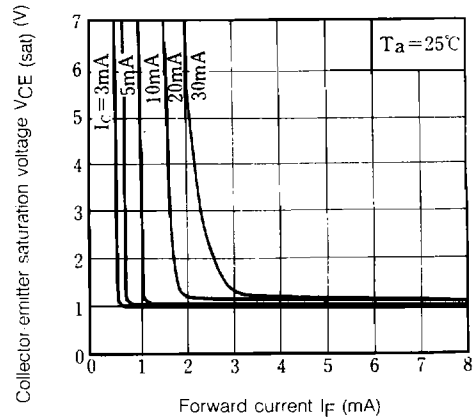
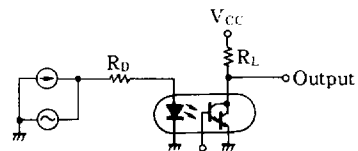


Fig. 10 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Frequency Response



PHOTOCOUPLEDERS