



HIGH TRANSFER EFFICIENCY, GENERAL PURPOSE TYPE PHOTOCOUPLER

LTV4N32/LTV4N33
LTV4N32S/LTV4N33S
LTV4N32M/LTV4N33M

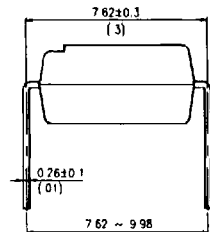
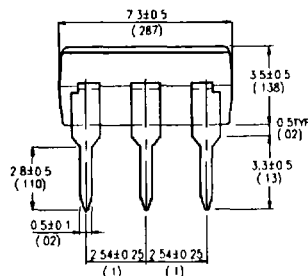
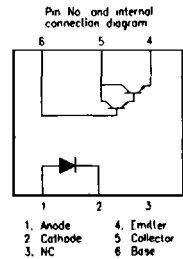
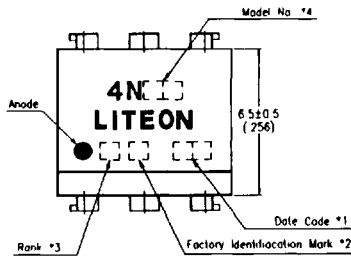
■ FEATURES

- 1 High current transfer ratio
(CTR MIN 500% at $I_F=10mA$, $V_{CE}=10V$)
- 2 Response time t_{on} : MAX, $5\mu s$ at $I_F=200mA$,
- 3 UL approved (No. E113898)
- 4 TUV approved (No. R9552469)
- 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
 - Option 1-Leads with 0.4" (10.16mm) Spacing (M Type)
 - Option 2-Lead Bends for Surface Mounting (S Type)

■ APPLICATIONS

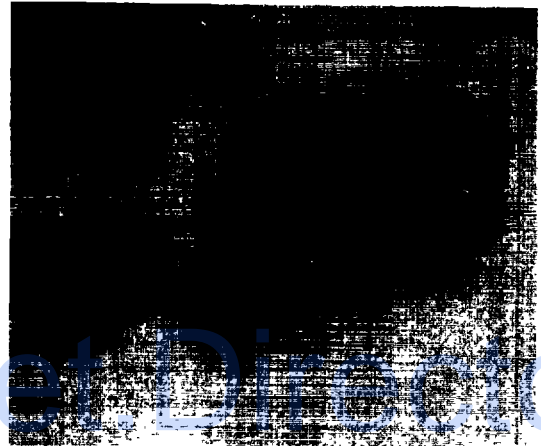
1. I/O interfaces for computers
2. System appliances, measuring instruments
3. Signal transmission between circuits of different potentials and impedances

■ PACKAGE DIMENSIONS



NOTES .

- * 1 2-digit number marked according to DIN standard
- * 2 Factory identification mark shall be marked (1. Taiwan, 2: Thailand)
- * 3 Rank shall be or shall not be marked
- * 4 Model No. 4N32, 4N33
- * 5 All dimensions are in Millimeters (inches)
- * 6 Tolerance is $\pm 0.25mm$ (0.01") unless otherwise noted.
- * 7 Specifications are subject to change without notice



PHOTOCOUPLERS

■ RATINGS AND CHARACTERISTICS

● Absolute maximum ratings

($T_a=25^{\circ}\text{C}$)

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_{CE0}	30	V
	Collector-base voltage	V_{CB0}	30	V
	Emitter-collector voltage	V_{EC0}	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	$^{\circ}\text{C}$
Storage temperature		T_{stg}	-55~+150	$^{\circ}\text{C}$
* 2. Soldering temperature		T_{sol}	260	$^{\circ}\text{C}$

* 1 AC for 1 minute, 40~60% RH

• 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	—	—	%	I _F = 10mA V _{CE} = 10V
	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 (t _w = 1.0mS) V _{CC} = 10V, I _C = 50mA
	Response time (Turn-off time)	t _{off}	—	—	100	μs	I _F = 200mA (t _w = 1.0mS) V _{CC} = 10V, I _C = 50mA

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

PHOTOCOUPPLERS

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

Fig. 1 Forward Current vs Ambient Temperature

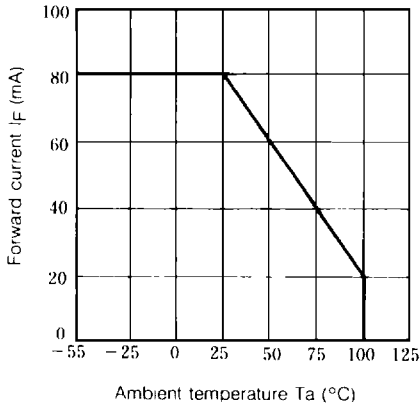


Fig. 3 Forward Current vs. Forward Voltage

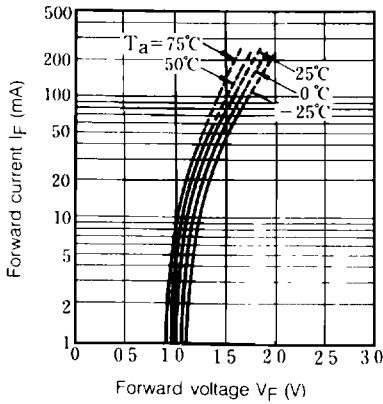


Fig. 5 Collector Current vs. Collector-emitter Voltage

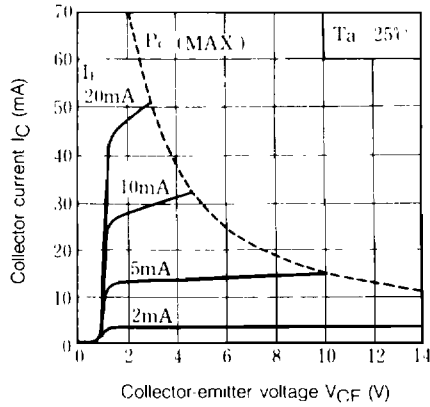


Fig. 2 Collector Power Dissipation vs Ambient Temperature

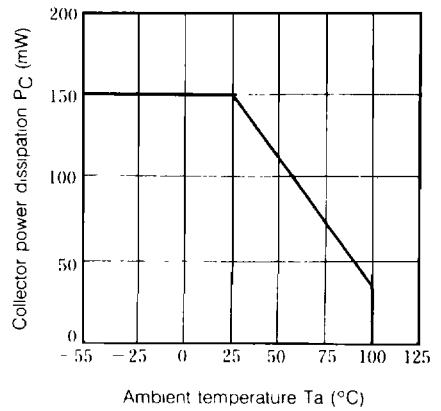


Fig. 4 Current Transfer Ratio vs. Forward Current

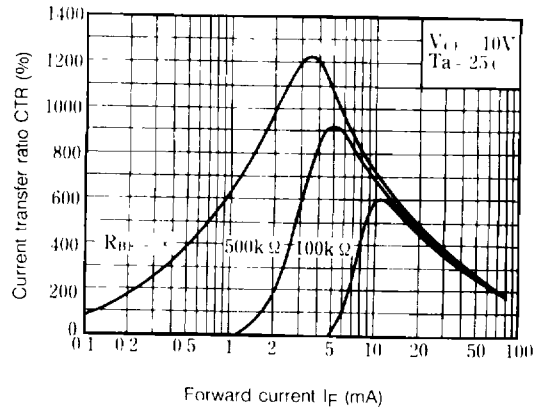


Fig. 6 Relative Current Transfer Ratio vs Ambient Temperature

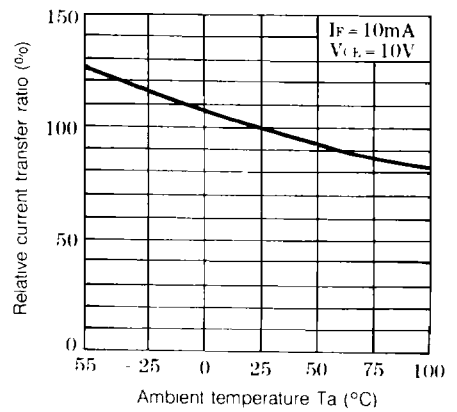


Fig. 7 Collector-emitter Saturation Voltage vs Ambient Temperature

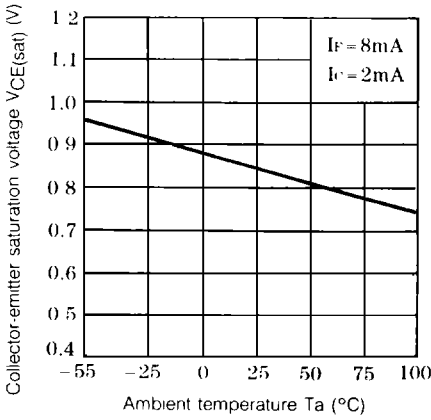


Fig. 8 Collector Dark Current vs. Ambient Temperature

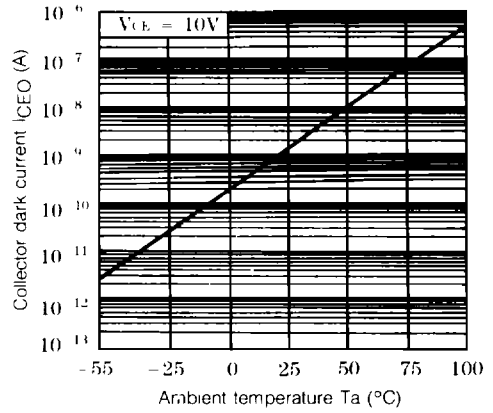


Fig. 9 Frequency Response

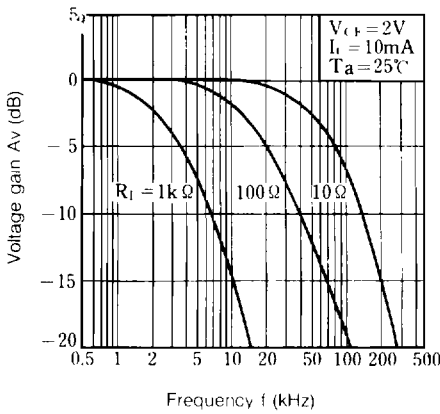
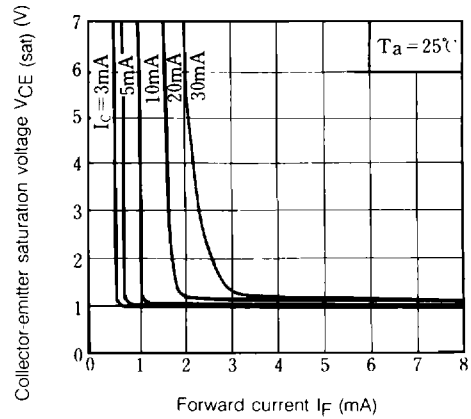
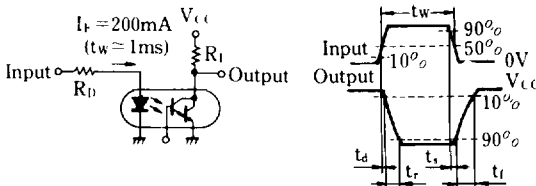


Fig. 10 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Response Time



Test Circuit for Frequency Response

