HIGH TRANSFER EFFICIENCY, GENERAL PURPOSE TYPE PHOTOCOUPLER

LTV4N32/LTV4N33
LTV4N32S/LTV4N33S
LTV4N32M/LTV4N33M

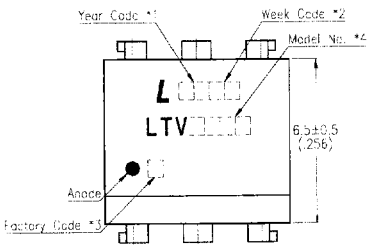
■ FEATURES

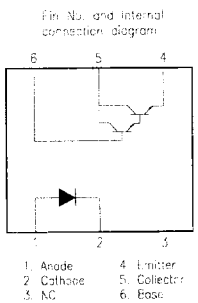
1. High current transfer ratio
   (CTR : MIN. 500% at I_F = 10mA, V_{CE} = 10V)
2. Response time
   (t_{on} : MAX. 5μs at I_F = 200mA, V_{CC} = 10V, I_C = 50mA)
3. UL approved (No. E113898)
4. TUV approved (No. R9653630)
5. CSA approved (No. LR91533)
6. FIMKO approved (No. 182728)
7. NEMKO approved (No. 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)

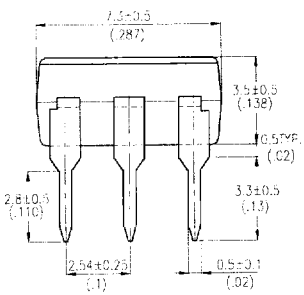
■ APPLICATIONS

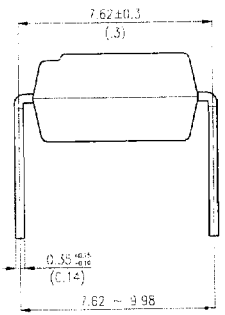
1. I/O interfaces for computers
2. System appliances, measuring instruments
3. Signal transmission between circuits of different potentials and impedances

■ PACKAGE DIMENSIONS









NOTES :
*1. 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 ± 0.25mm (.010") unless otherwise noted.
*7. Specifications are subject to change without notice.

■RATINGS AND CHARACTERISTICS

• Absolute maximum ratings

(Ta=25℃)

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_{CBO}	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_{opr}	-55~+100	℃
Storage temperature			T_{stg}	-55~+150	℃
* 2. Soldering temperature			T_{sol}	260	℃

* 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= $\frac{I_C}{I_F}$ × 100%

PHOTOCOUPLERS

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

Fig. 1 Forward Current vs. Ambient Temperature

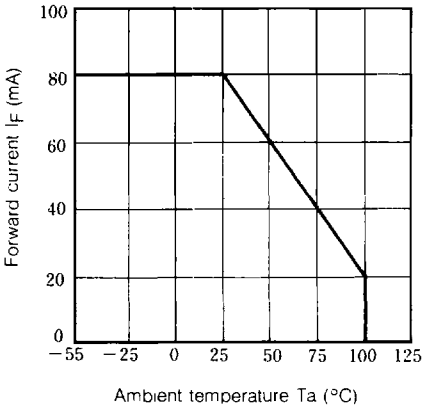


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

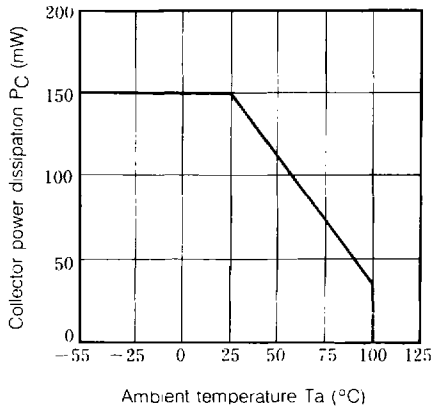


Fig. 3 Forward Current vs. Forward Voltage

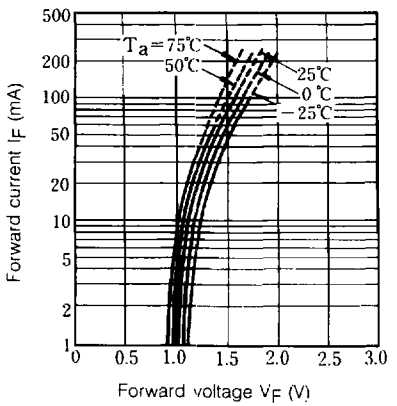


Fig. 4 Current Transfer Ratio vs. Forward Current

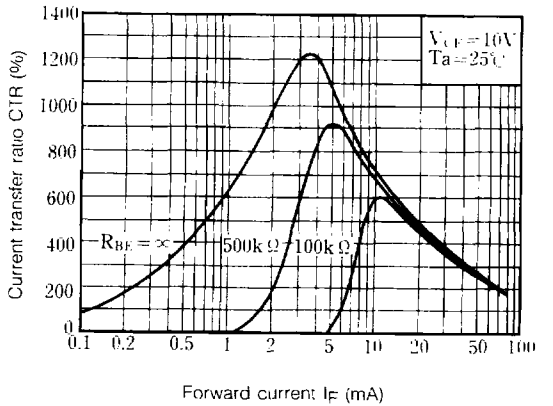


Fig. 5 Collector Current vs. Collector-emitter Voltage

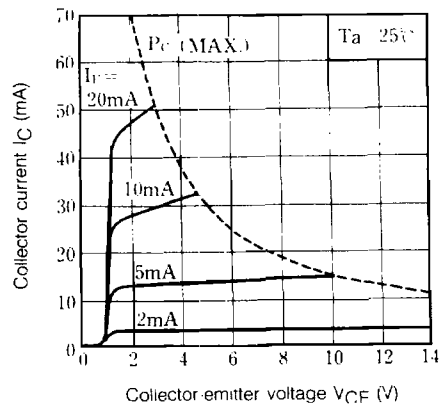


Fig. 6 Relative Current Transfer Ratio vs Ambient Temperature

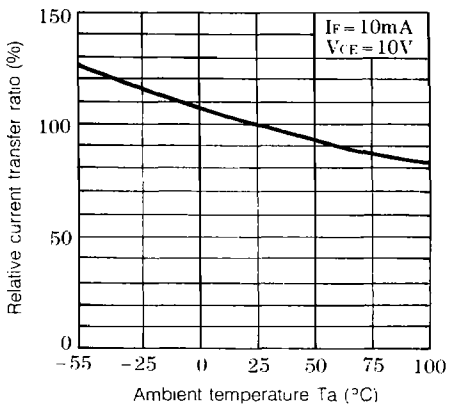


Fig. 7 Collector-emitter Saturation Voltage vs. Ambient Temperature

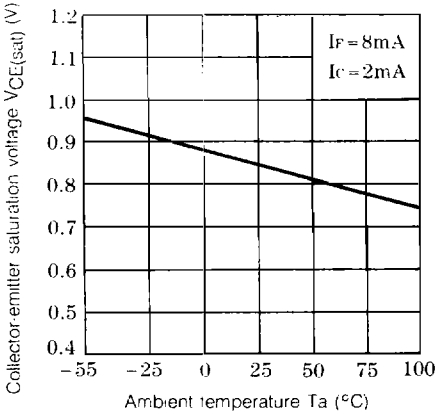


Fig. 8 Collector Dark Current vs. Ambient Temperature

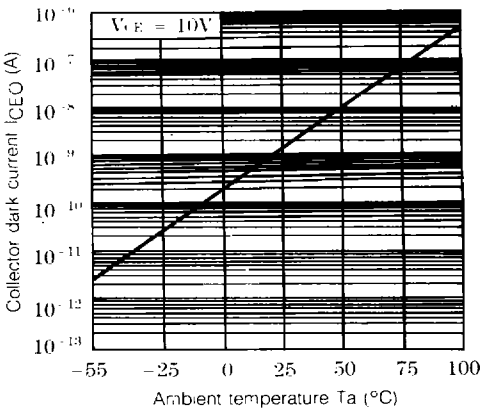


Fig. 9 Frequency Response

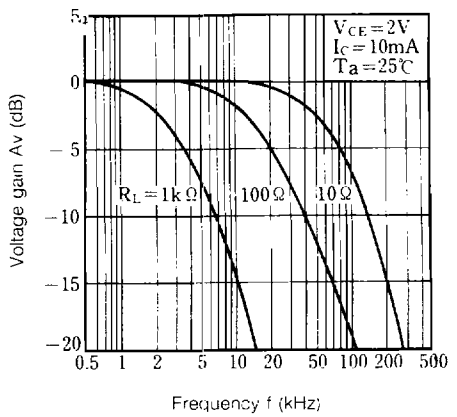
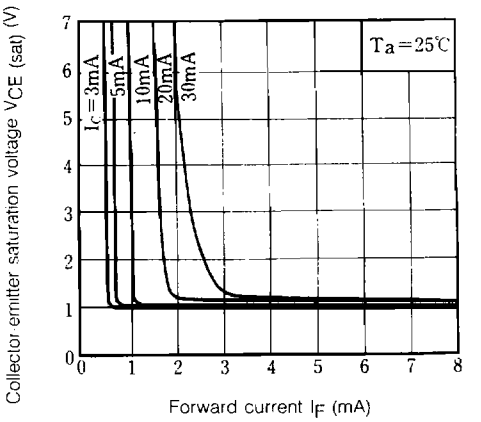
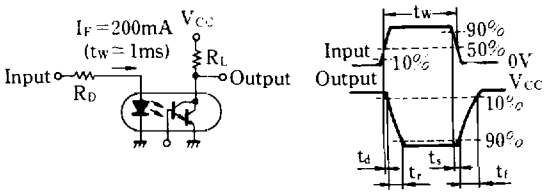


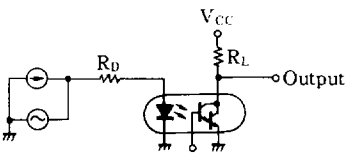
Fig. 10 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Response Time



Test Circuit for Frequency Response



PHOTOCOUPLERS