High Density Mounting Type Photocoupler

LTV-817 Series

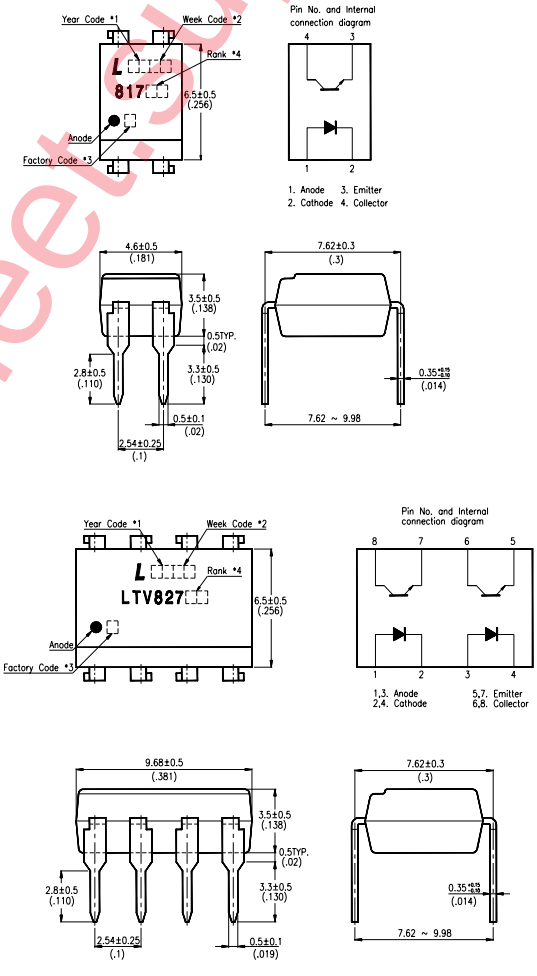
Features

- Current transfer ratio
  (CTR : MIN. 50% at I_F=5mA, V_{CE}=5V)
- High input-output isolation voltage:
  (V_{ISO} : 5,000V_{rms})
- Compact dual-in-line package
  LTV-817 : 1-channel type
  LTV-827 : 2-channel type
  LTV-847 : 4-channel type
- UL approved (No. E113898)
- TUV approved (No. R9653630)
- CSA approved (No. CA91533-1)
- FIMKO approved (No. 202634)
- NEMKO approved (No. P98101945)
- DEMKO approved (No. 307857)
- SEMKO approved (No. 9832157/01-03)
- 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. Computer terminals.
2. System appliances, measuring instruments.
3. Registers, copiers, automatic vending machines.
4. Electric home appliances such as fan heaters, etc.
5. Signal transmission between circuits of different potentials and impedances.

Package Dimensions



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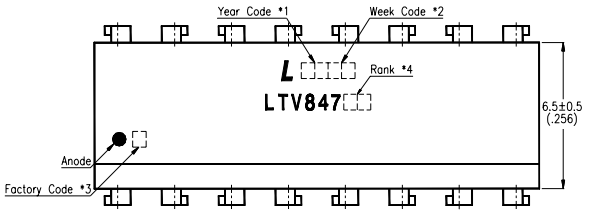
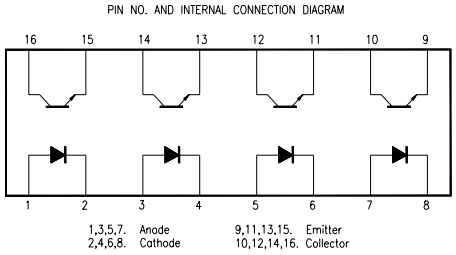
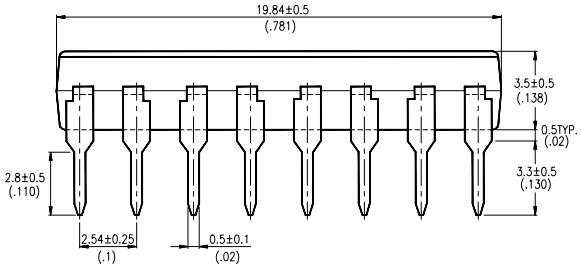
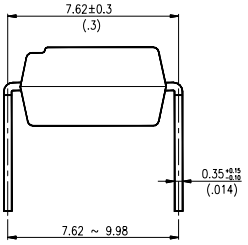








Note:
1.Year date code.
2. 2-digit work week.
3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
4.Rank shall be or shall not be marked.
5. All dimensions are in millimeters (inches).
6. Tolerance is ± 0.25mm (.010") unless otherwise noted.
7. Specifications are subject to change without notice.

Ordering Information

Part Number	Package	Safety Standard Approval	Application part number
LTV-817 LTV-817M LTV-817S LTV-817S-TA LTV-817S-TA1	4-pin DIP 4-pin (leads with 0.4" spacing) 4-pin (lead bends for surface mount) 4-pin (tape and reel packaging of type I) 4-pin (tape and reel packaging of type II)	• UL approved • TUV approved • CSA approved • FIMKO approved • NEMKO approved • SEMKO approved • DEMKO approved	LTV-817
LTV-827 LTV-827M LTV-827S LTV-827S-TA LTV-827S-TA1	8-pin DIP 8-pin (leads with 0.4" spacing) 8-pin (lead bends for surface mount) 8-pin (tape and reel packaging of type I) 8-pin (tape and reel packaging of type II)		LTV-827
LTV-847 LTV-847M LTV-847S LTV-847S-TA LTV-847S-TA1	16-pin DIP 16-pin (leads with 0.4" spacing) 16-pin (lead bends for surface mount) 16-pin (tape and reel packaging of type I) 16-pin (tape and reel packaging of type II)		LTV-847
LTV817-V LTV817M-V LTV817S-V LTV817STA-V LTV817STA1-V	4-pin DIP 4-pin (leads with 0.4" spacing) 4-pin (lead bends for surface mount) 4-pin (tape and reel packaging of type I) 4-pin (tape and reel packaging of type II)	• VDE approved	LTV-817
LTV827-V LTV827M-V LTV827S-V LTV827STA-V LTV827STA1-V	8-pin DIP 8-pin (leads with 0.4" spacing) 8-pin (lead bends for surface mount) 8-pin (tape and reel packaging of type I) 8-pin (tape and reel packaging of type II)		LTV-827
LTV847-V LTV847M-V LTV847S-V LTV847STA-V LTV847STA1-V	16-pin DIP 16-pin (leads with 0.4" spacing) 16-pin (lead bends for surface mount) 16-pin (tape and reel packaging of type I) 16-pin (tape and reel packaging of type II)		LTV-847

Absolute Maximum Ratings

(Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	70	mW
Output	Collector-Emitter Voltage	V_{CEO}	35	V
	Emitter-Collector Voltage	V_{ECO}	6	V
	Collector Current	I_C	50	mA
	Collector Power Dissipation	P_C	150	mW
Total Power Dissipation		P_{tot}	200	mW
Operating Temperature		T_{opr}	-30~+100	℃
Storage Temperature		T_{stg}	-55~+125	℃
*1.Isolation Voltage		V_{iso}	5	KV_{rms}
*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	1.4	V	I_F=20mA
	Reverse Current	I_R	–	–	10	μA	V_R=4V
	Terminal Capacitance	C_t	–	30	250	pF	V=0, f=1KHz
Output	Collector Dark Current	I_{CEO}	–	–	100	nA	V_{CE}=20V
	Collector-Emitter Breakdown Voltage	BV_{CEO}	35	–	–	V	I_C=0.1mA
	Emitter-Collector Breakdown Voltage	BV_{ECO}	6	–	–	V	I_E=10 μ A
Transfer Characteristics	*Current Transfer Ratio	CTR	50	–	600	%	I_F=5mA, V_{CE}=5V R_{BE}=∞
	Collector Current	I_C	2.5	–	30	mA	
	Collector-emitter Saturation Voltage	$V_{CE(sat)}$	–	0.1	0.2	V	I_F=20mA, I_C=1mA
	Isolation Resistance	R_{ISO}	5×10^{10}	10^{11}	–	Ω	DC500V, 40~60% R.H.
	Floating Capacitance	C_f	–	0.6	1.0	pF	V=0, f=1MHz
	Cut-off Frequency	f_c	–	80	–	KHz	V_{CE}=5V, I_C=2mA R_L=100 Ω, -3dB
	Response Time (Rise)	t_r	–	4	18	μs	V_{CE}=2V, I_C=2mA R_L=100 Ω
	Response Time (Fall)	t_f	–	3	18	μs	

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

■ Supplement

Rank Table of Current Transfer Ratio CTR

Model No.	Rank Mark	CTR(%)
LTV-817	L	50~100
LTV-817	A	80~160
LTV-817	B	130~260
LTV-817	C	200~400
LTV-817	D	300~600
LTV-817	L or A or B or C or D	50~600

Conditions	I_F=5mA V_{CE}=5V Ta=25℃

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

Fig.1 Forword Current vs. Ambient Temperatute

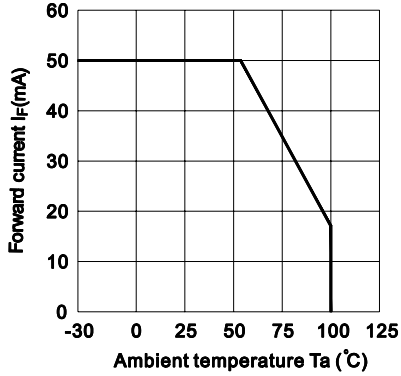


Fig.2 Collector Power Dissipation vs. Ambient Temperature

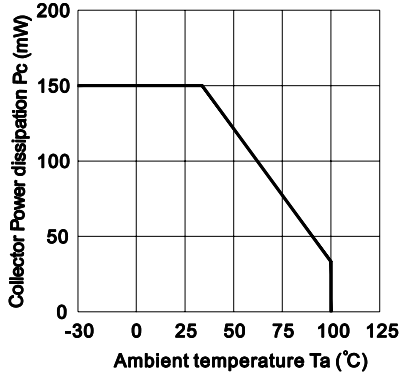


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

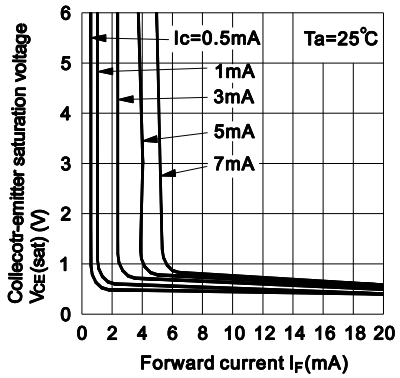


Fig.4 Forward Current vs. Forward Voltage

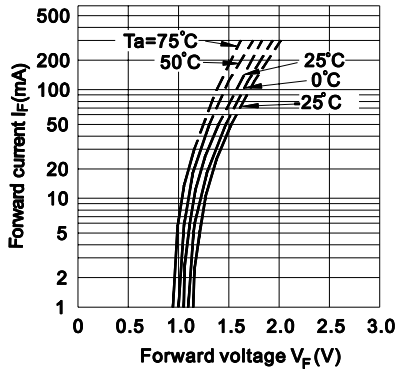


Fig.5 Current Transfer Ratio vs. Forward Current

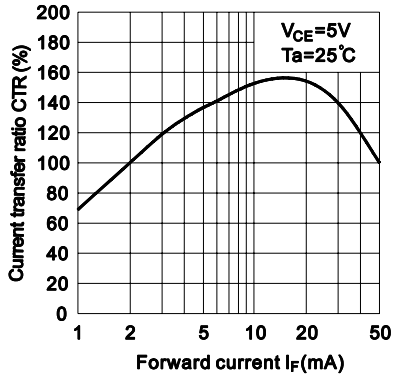
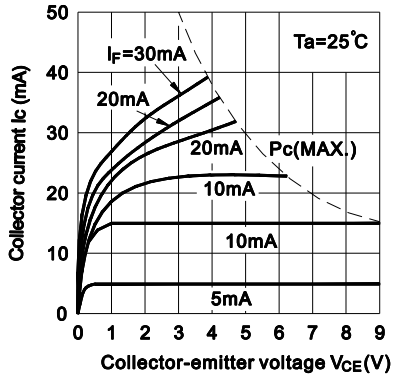


Fig.6 Collector Current vs. Collector-emitter Voltage



PHOTOCOUPLER

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

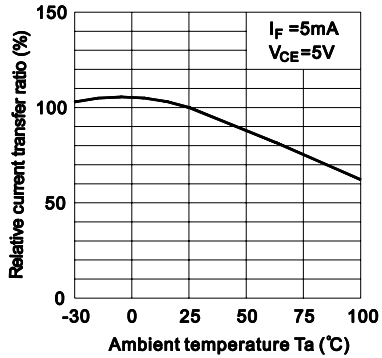


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

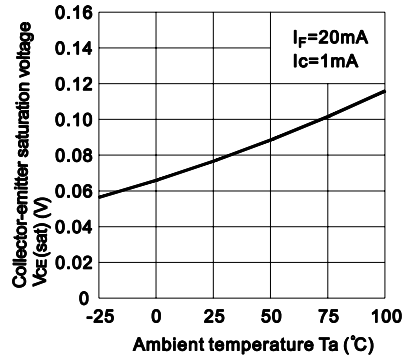


Fig.9 Collector Dark Current vs. Ambient Temperature

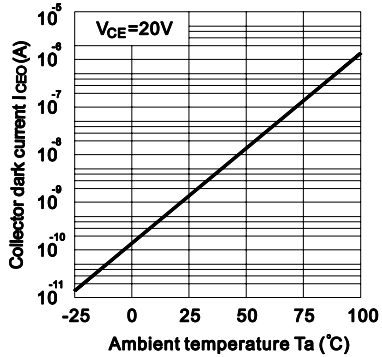


Fig.10 Response Time vs. Load Resistance

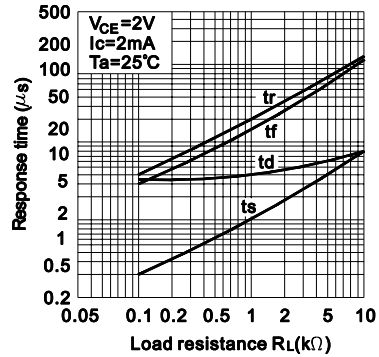
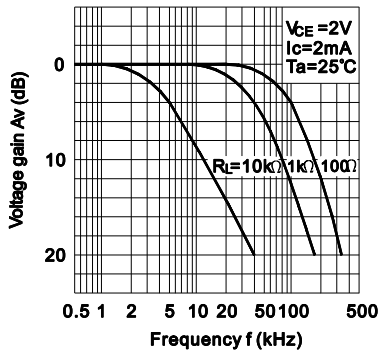
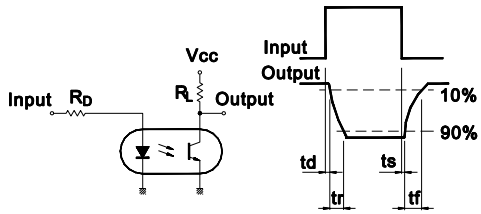


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

