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# High Density Mounting Type Photocoupler

## LTV-817 Series

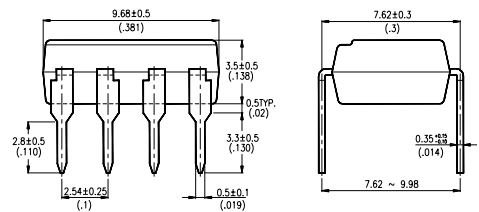
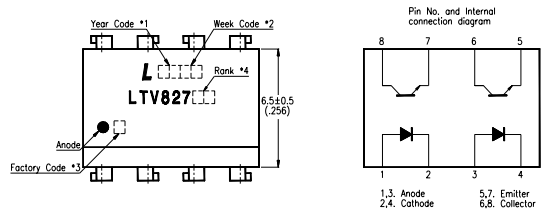
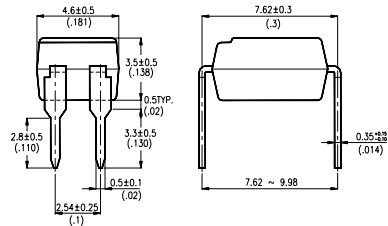
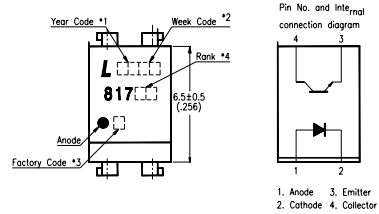
### Features

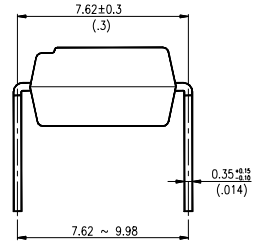
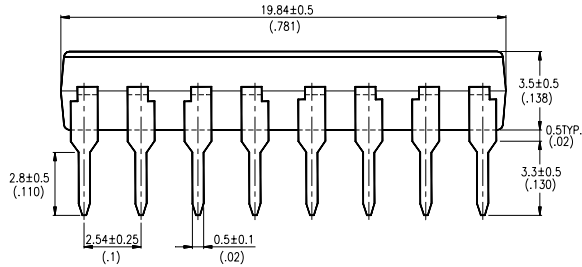
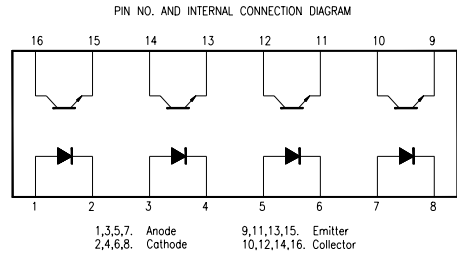
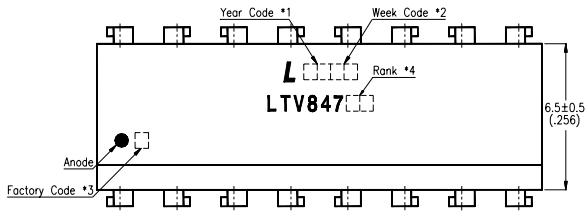
- Current transfer ratio  
(CTR : MIN. 50% at  $I_F=5mA$ ,  $V_{CE}=5V$ )
- High input-output isolation voltage:  
( $V_{ISO}$  : 5,000V<sub>rms</sub>)
- Compact dual-in-line package  
LTV-817 : 1-channel type  
LTV-827 : 2-channel type  
LTV-847 : 4-channel type
- UL approved (No. E113898)
- TUV approved (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





**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  $\pm 0.25\text{mm}$  (.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 style="list-style-type: none"> <li>• UL approved</li> <li>• TUV approved</li> <li>• CSA approved</li> <li>• FIMKO approved</li> <li>• NEMKO approved</li> <li>• SEMKO approved</li> <li>• DEMKO approved</li> </ul>	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	16-pin DIP 16-pin (leads with 0.4" spacing) 16-pin (lead bends for surface mount)		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)		<ul style="list-style-type: none"> <li>• VDE approved</li> </ul>	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	16-pin DIP 16-pin (leads with 0.4" spacing) 16-pin (lead bends for surface mount)			LTV-847

PHOTOCOUPLER

## Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I <sub>F</sub>	50	mA
	Reverse Voltage	V <sub>R</sub>	6	V
	Power Dissipation	P	70	mW
Output	Collector-Emitter Voltage	V <sub>CEO</sub>	35	V
	Emitter-Collector Voltage	V <sub>ECO</sub>	6	V
	Collector Current	I <sub>C</sub>	50	mA
	Collector Power Dissipation	P <sub>C</sub>	150	mW
Total Power Dissipation		P <sub>tot</sub>	200	mW
Operating Temperature		T <sub>opr</sub>	-30~+100	°C
Storage Temperature		T <sub>stg</sub>	-55~+125	°C
*1.Isolation Voltage		V <sub>iso</sub>	5	KV <sub>rms</sub>
*2.Soldering Temperature		T <sub>sol</sub>	260	°C

\*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 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 <sub>F</sub>	—	1.2	1.4	V	I <sub>F</sub> =20mA
	Reverse Current	I <sub>R</sub>	—	—	10	μA	V <sub>R</sub> =4V
	Terminal Capacitance	C <sub>t</sub>	—	30	250	pF	V=0, f=1KHz
Output	Collector Dark Current	I <sub>CEO</sub>	—	—	100	nA	V <sub>CE</sub> =20V
	Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	35	—	—	V	I <sub>C</sub> =0.1mA
	Emitter-Collector Breakdown Voltage	BV <sub>ECO</sub>	6	—	—	V	I <sub>E</sub> =10 μA
Transfer Characteristics	*Current Transfer Ratio	CTR	50	—	600	%	I <sub>F</sub> =5mA, V <sub>CE</sub> =5V R <sub>BE</sub> =∞
	Collector Current	I <sub>C</sub>	2.5	—	30	mA	
	Collector-emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	0.1	0.2	V	I <sub>F</sub> =20mA, I <sub>C</sub> =1mA
	Isolation Resistance	R <sub>iso</sub>	5 × 10 <sup>10</sup>	10 <sup>11</sup>	—	Ω	DC500V, 40~60% R.H.
	Floating Capacitance	C <sub>f</sub>	—	0.6	1.0	pF	V=0, f=1MHz
	Cut-off Frequency	f <sub>c</sub>	—	80	—	KHz	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA R <sub>L</sub> =100 Ω, -3dB
	Response Time (Rise)	t <sub>r</sub>	—	4	18	μs	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA
Response Time (Fall)	t <sub>f</sub>	—	3	18	μs	R <sub>L</sub> =100 Ω	

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

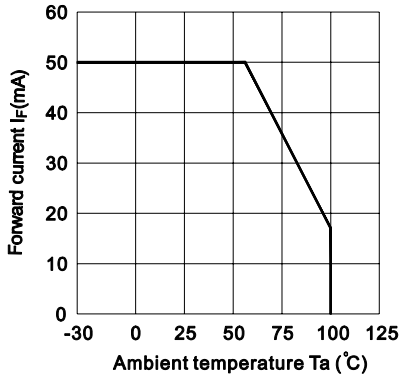
## ■ Supplement

### Rank Table of Current Transfer Ratio CTR

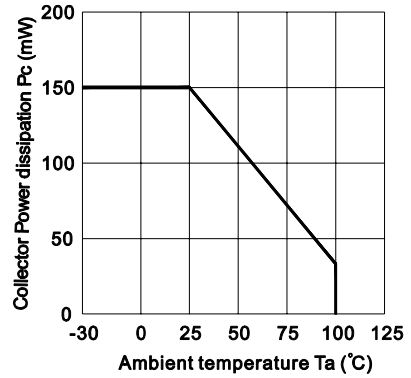
Model No.	Rank Mark	CTR(%)
LTV-817	L	50~100
LTV-817	A	80~160
LTV-817	B	130~260
LTV-817	C	200~400
LTV-817	D	300~600
LTV-817	L or A or B or C or D	50~600
Conditions	I <sub>F</sub> =5mA V <sub>CE</sub> =5V Ta=25°C	

# Typical Electrical/Optical Characteristic Curves (25°C Ambient Temperature Unless Otherwise Noted)

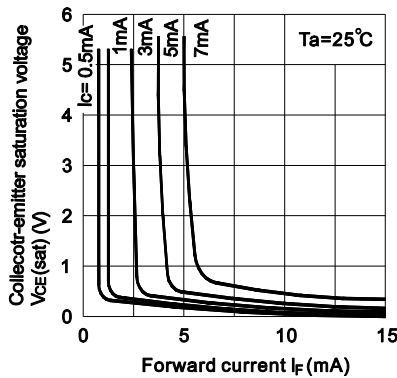
**Fig.1 Forward Current vs. Ambient Temperature**



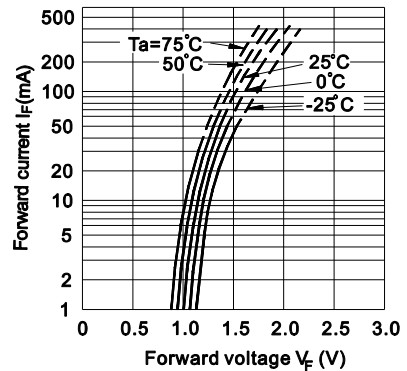
**Fig.2 Collector Power Dissipation vs. Ambient Temperature**



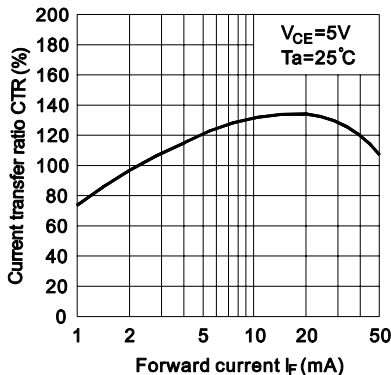
**Fig.3 Collector-emitter Saturation Voltage vs. Forward Current**



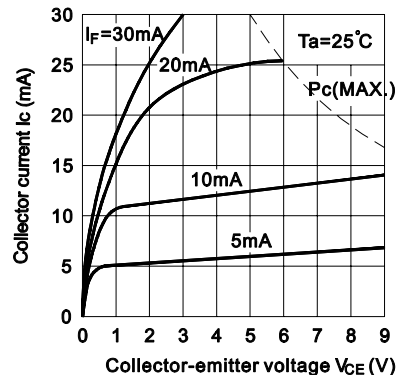
**Fig.4 Forward Current vs. Forward Voltage**



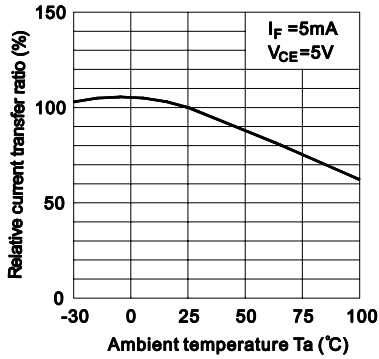
**Fig.5 Current Transfer Ratio vs. Forward Current**



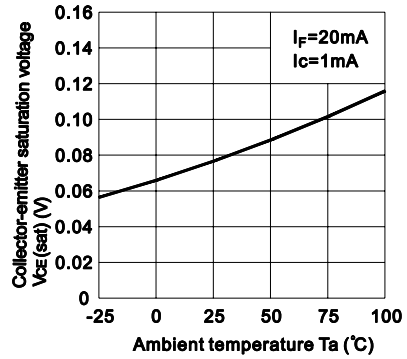
**Fig.6 Collector Current vs. Collector-emitter Voltage**



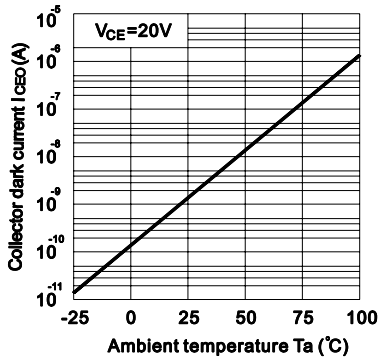
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



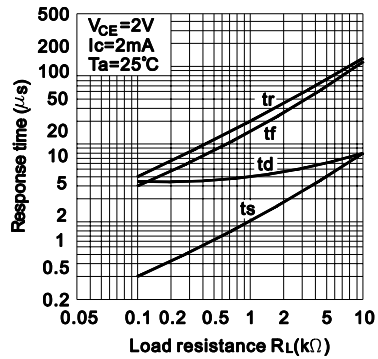
**Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature**



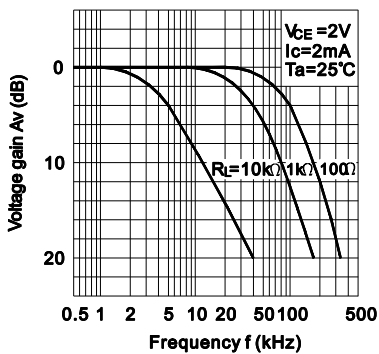
**Fig.9 Collector Dark Current vs. Ambient Temperature**



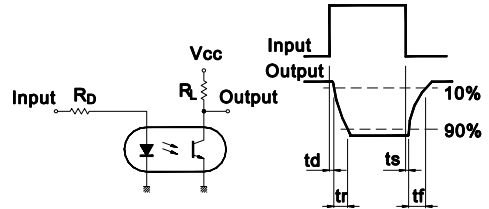
**Fig.10 Response Time vs. Load Resistance**



**Fig.11 Frequency Response**



**Test Circuit for Response Time**



**Test Circuit for Frequency Response**

