

## High Density Mounting Type Photocoupler LTV-819 Series

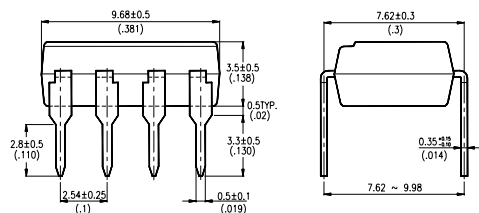
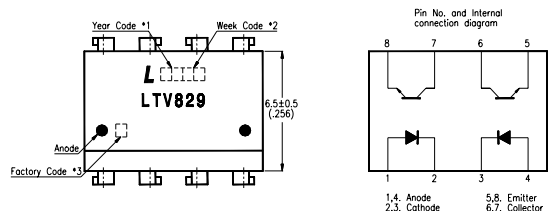
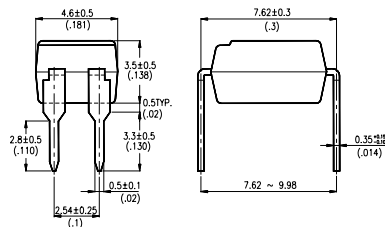
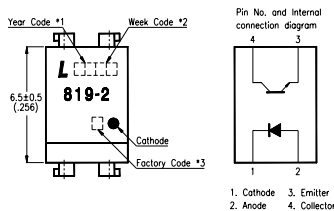
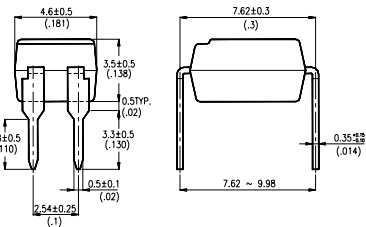
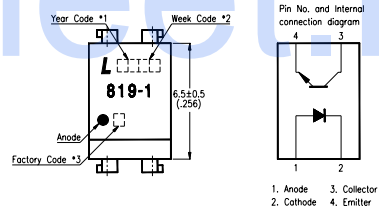
### Features

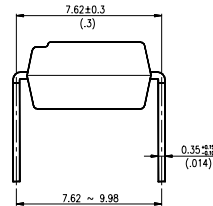
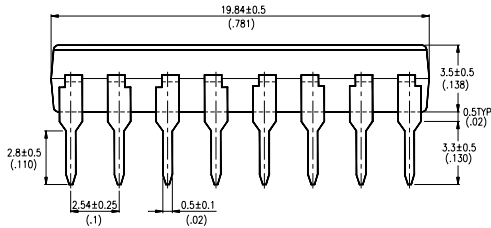
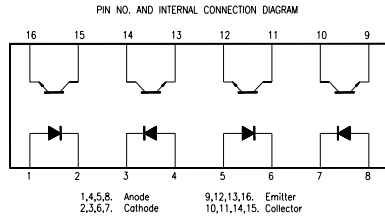
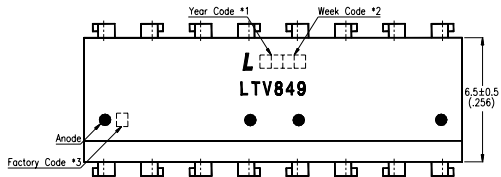
- Current transfer ratio  
(CTR : MIN. 50% at  $I_F=5mA$ ,  $V_{CE}=5V$ )
- High input-output isolation voltage:  
( $V_{ISO}$  : 5,000V<sub>rms</sub>)
- Compact dual-in-line package  
LTV-819-1 : 1-channel type  
LTV-819-2 : 1-channel type  
LTV-829 : 2-channel type  
LTV-849 : 4-channel type
- UL approved (No. E113898)
- TUV approved (No. R9653630)
- CSA approved (No. CA91533-1)
- FIMKO approved (No. 193422)
- NEMKO approved (No. P96103013)
- DEMKO approved (No. 303986)
- SEMKO approved (No. 9646047/01-30)
- 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. Telephone exchanges.
2. Computer terminals.
3. System appliances, measuring instruments.
4. 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. All dimensions are in millimeters (inches).
5. Tolerance is  $\pm 0.25\text{mm}$  (.010") unless otherwise noted.
6. Specifications are subject to change without notice.

## Ordering Information

Part Number	Package	Safety Standard Approval	Application part number	
LTV-819-1 LTV-819-1M LTV-819-1S LTV-819-1S-TA LTV-819-1S-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-819-1	
LTV-819-2 LTV-819-2M LTV-819-2S LTV-819-2S-TA LTV-819-2S-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)		LTV-819-2	
LTV-829 LTV-829M LTV-829S LTV-829S-TA LTV-829S-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-829	
LTV-849 LTV-849M LTV-849S LTV-849S-TA LTV-849S-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-849	
LTV8191-V LTV8191M-V LTV8191S-V LTV8191STA-V LTV8191STA1-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-819-1
LTV8192-V LTV8192M-V LTV8192S-V LTV8192STA-V LTV8192STA1-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)			LTV-819-2
LTV829-V LTV829M-V LTV829S-V LTV829STA-V LTV829STA1-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-829
LTV849-V LTV849M-V LTV849S-V LTV849STA-V LTV849STA1-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-849

# 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>	170	mW
*1.Isolation Voltage		V <sub>iso</sub>	5,000	V <sub>rms</sub>
Operating Temperature		T <sub>opr</sub>	-25~+100	°C
Storage Temperature		T <sub>stg</sub>	-40~+125	°C
*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)

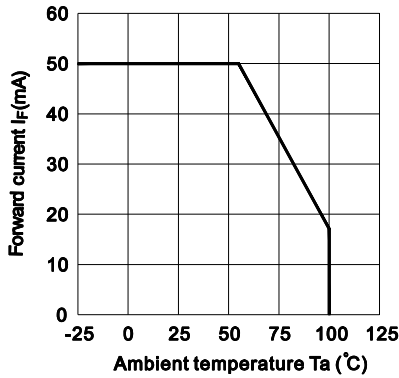
Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	V <sub>F</sub>	—	1.2	1.4	V	I <sub>F</sub> =20mA
	Reverse Current	I <sub>R</sub>	—	—	10	μA	V <sub>R</sub> =4V
	Terminal Capacitance	C <sub>t</sub>	—	30	250	pF	V=0, f=1KHz
Output	Collector Dark Current	I <sub>CEO</sub>	—	—	100	nA	V <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	Collector Current	I <sub>C</sub>	2.5	—	20	mA	I <sub>F</sub> =5mA, V <sub>CE</sub> =5V
	*Current Transfer Ratio	CTR	50	—	400	%	
	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	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	—	μs	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA
Response Time (Fall)	t <sub>f</sub>	—	3	—	μs	R <sub>L</sub> =100 Ω	

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

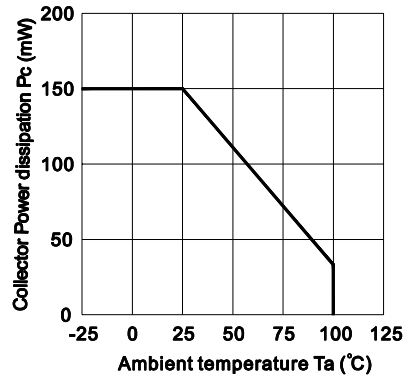
PHOTOCOUPLER

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

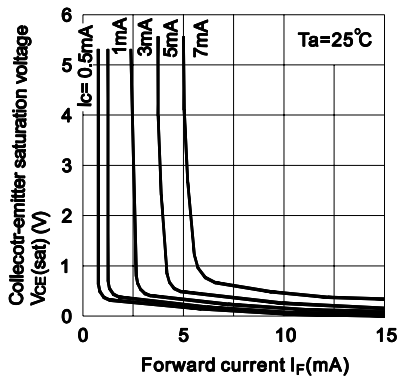
**Fig.1 Forward Current vs. Ambient Temperature**



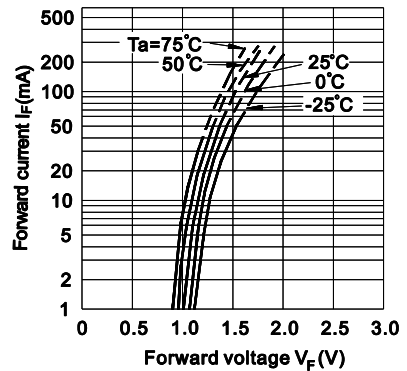
**Fig.2 Collector Power Dissipation vs. Ambient Temperature**



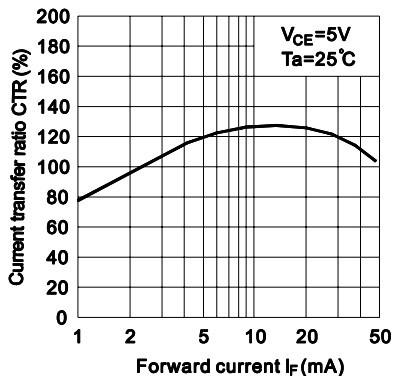
**Fig.3 Collector-emitter Saturation Voltage vs. Forward Current**



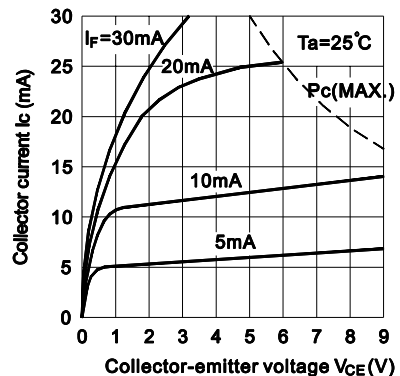
**Fig.4 Forward Current vs. Forward Voltage**



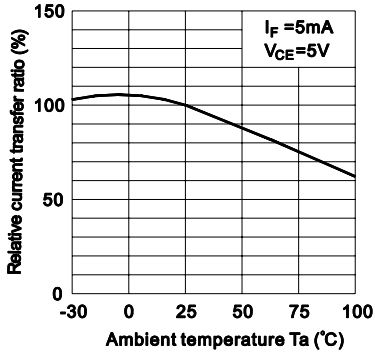
**Fig.5 Current Transfer Ratio vs. Forward Current**



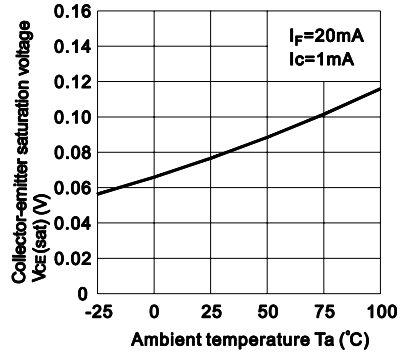
**Fig.6 Collector Current vs. Collector-emitter Voltage**



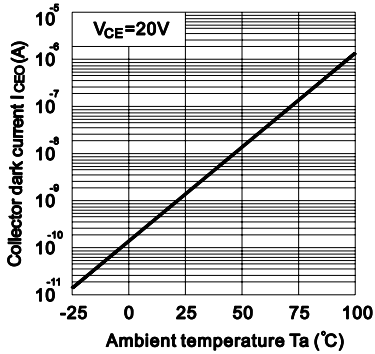
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



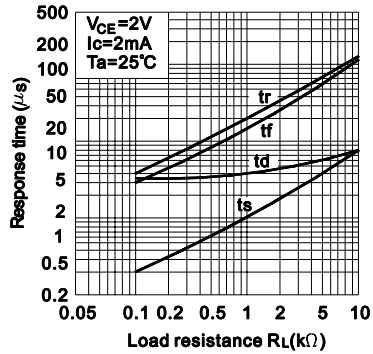
**Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature**



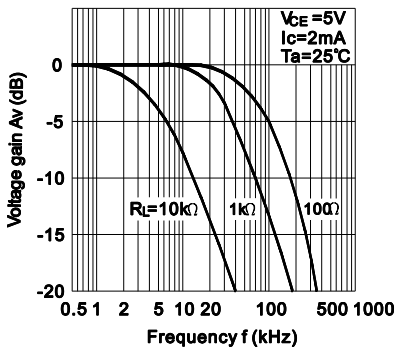
**Fig.9 Collector Dark Current vs. Ambient Temperature**



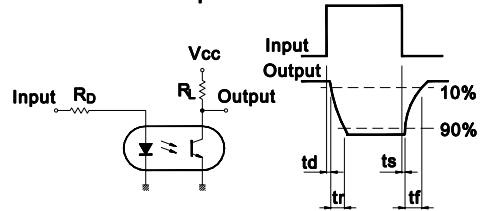
**Fig.10 Response Time vs. Load Resistance**



**Fig.11 Frequency Response**



**Test Circuit for Response Time**



**Test Circuit for Frequency Response**

