

Photocoupler LTV-817-IN series

1. DESCRIPTION

1.1 Features

- Current transfer ratio (Test condition : $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$, $T_a = 25^\circ\text{C}$)
 - LTV-817-IN (CTR = 30 to 400%)
 - LTV-817-A-IN (CTR = 80 to 160%)
 - LTV-817-B-IN (CTR = 130 to 260%)
 - LTV-817-C-IN (CTR = 200 to 400%)
- High input-output isolation voltage ($V_{iso} = 5,000\text{Vrms}$)
- Response time (t_r : TYP. $4\mu\text{s}$ at $V_{CE} = 2\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$)
- Dual-in-line package :
 - LTV-817-IN : 1-channel type
- Safety approval
 - UL 1577
 - VDE DIN EN60747-5-5 (VDE 0884-5)
 - CSA CA5A
 - CQC GB4943.1-2011/ GB8898-2011 (meet Altitude up to 5000m)
 - Nordic Safety (FIMKO/NEMKO/SEMKO/DEMKO)
- RoHS Compliance
 - All materials be used in device are followed EU RoHS directive (No.2002/95/EC).

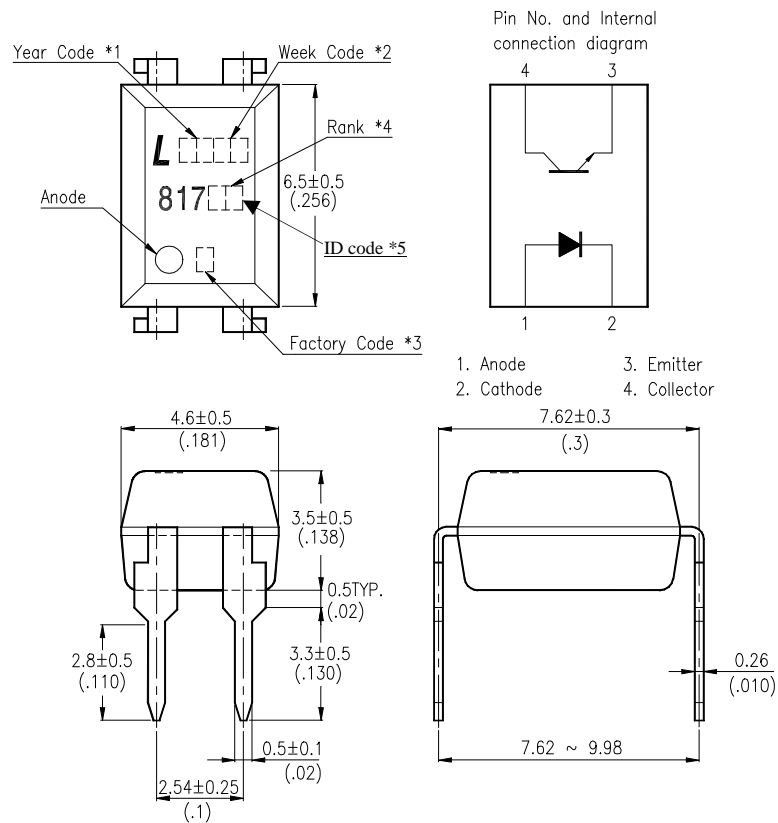
1.2 Applications

- Hybrid substrates that require high density mounting.
- Programmable controllers

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2. PACKAGE DIMENSIONS

2.1 LTV-817-IN



Notes :

1. Year date code.
2. 2-digit work week.
3. Factory identification mark shall be marked
(Y: Thailand, W: China-CZ, X: China-TJ)
4. Rank shall be or shall not be marked.
5. ID code: — \ N \ no mark \ IN or any indicator character.

* Dimensions are in Millimeters and (Inches).

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3. RATING AND CHARACTERISTICS

3.1 Absolute Maximum Ratings at Ta=25°C

	Parameter	Symbol	Rating	Unit
Input	Forward Current	I_F	30	mA
	Reverse Voltage	V_R	5	V
	Power Dissipation	P	49	mW
Output	Collector - Emitter Voltage	V_{CEO}	35	V
	Emitter - Collector Voltage	V_{ECO}	6	V
	Collector Current	I_C	30	mA
	Collector Power Dissipation	P_C	150	mW
	Total Power Dissipation	P_{tot}	150	mW
1.	Isolation Voltage	V_{iso}	5000	V_{rms}
	Operating Temperature	T_{opr}	-55 ~ +110	°C
	Storage Temperature	T_{stg}	-55 ~ +125	°C
2.	Soldering Temperature	T_{sol}	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 and emitter 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

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3.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Condition
Input	Forward Voltage	V_F	—	1.2	1.7	V	$I_F=20\text{mA}$
	Reverse Current	I_R	—	—	20	μA	$V_R=4\text{V}$
	Terminal Capacitance	C_t	—	30	250	pF	$V=0, f=1\text{KHz}$
Output	Collector Dark Current	I_{CEO}	—	—	250	nA	$V_{CE}=20\text{V}, I_F=0$
	Collector-Emitter Breakdown Voltage	BV_{CEO}	35	—	—	V	$I_C=0.1\text{mA}, I_F=0$
	Emitter-Collector Breakdown Voltage	BV_{ECO}	6	—	—	V	$I_E=10\mu\text{A}, I_F=0$
TRANSFER CHARACTERISTICS	Collector Current	I_C	1.5	—	20	mA	$I_F=5\text{mA}$
	1. Current Transfer Ratio	CTR	30	—	400	%	$V_{CE}=5\text{V}$
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	0.1	0.4	V	$I_F=20\text{mA}$ $I_C=1\text{mA}$
	Isolation Resistance	R_{iso}	—	5×10^5	—	Ω	DC500V, 40 ~ 60% R.H.
	Floating Capacitance	C_f	—	0.6	1	pF	$V=0, f=1\text{MHz}$
	Response Time (Rise)	t_r	—	4	—	μs	$V_{CE}=2\text{V},$ $I_C=2\text{mA}$
	Response Time (Fall)	t_f	—	3	—	μs	$R_L=100\Omega,$

$$1. \text{CTR} = \frac{I_C}{I_F} \times 100\%$$

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4. RANK TABLE OF CURRENT TRANSFER RATIO CTR

CTR Rank	Min	Max	Condition
L	30	100	$I_F=5\text{mA}$, $V_{CE}=5\text{V}$, $T_a=25^\circ\text{C}$
A	80	160	
B	130	260	
C	200	400	
L or A or B or C or D	30	400	

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5. CHARACTERISTICS CURVES

Fig.1 Forward Current vs. Ambient Temperature

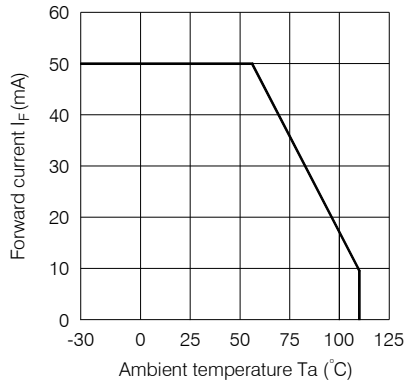


Fig.2 Collector Power Dissipation vs. Ambient Temperature

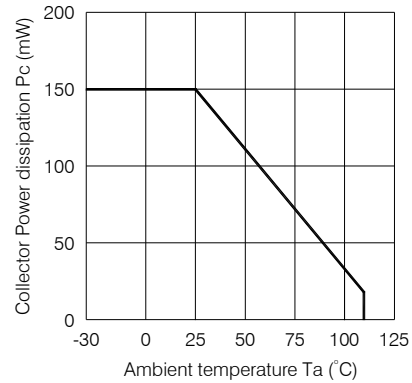


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

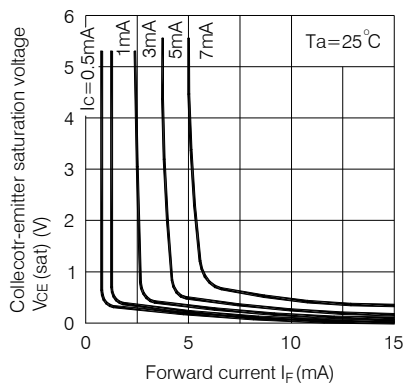


Fig.4 Forward Current vs. Forward Voltage

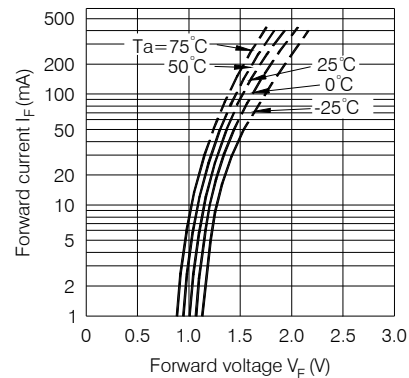


Fig.5 Current Transfer Ratio vs. Forward Current

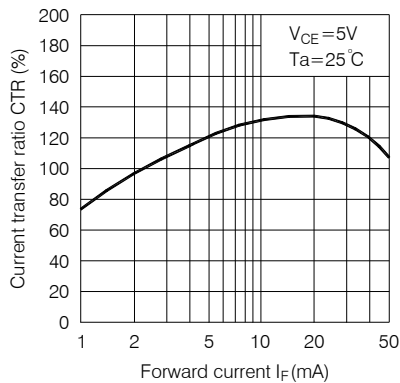
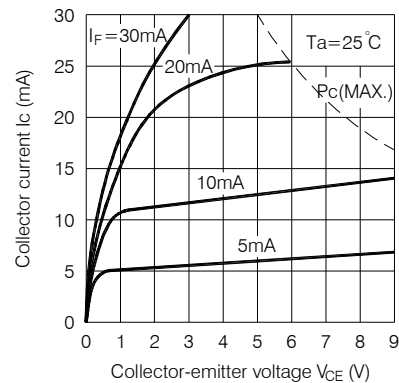


Fig.6 Collector Current vs. Collector-emitter Voltage



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Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

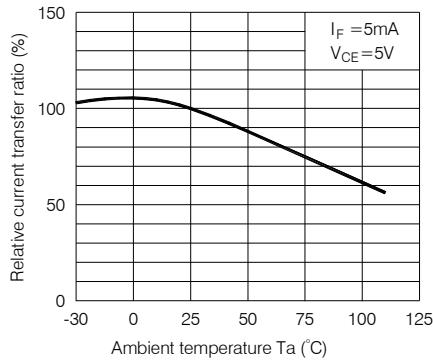


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

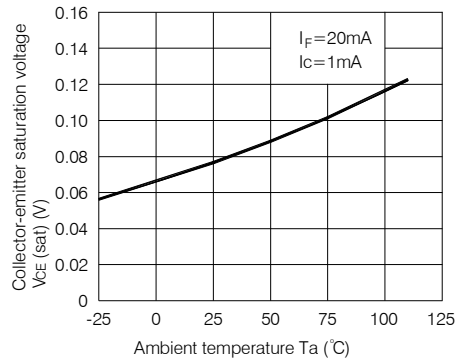


Fig.9 Collector Dark Current vs. Ambient Temperature

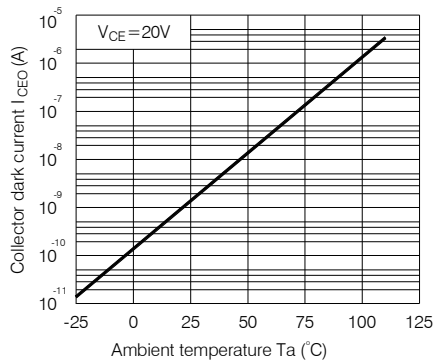


Fig.10 Response Time vs. Load Resistance

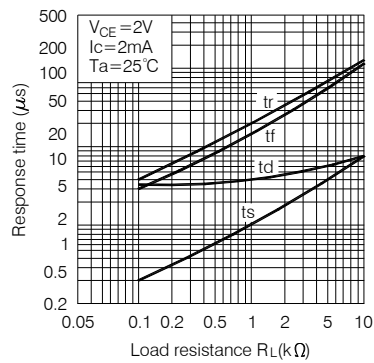
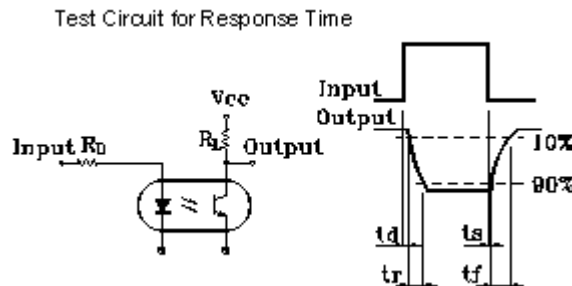


Fig.11 Frequency Response

Test Circuit for Response Time



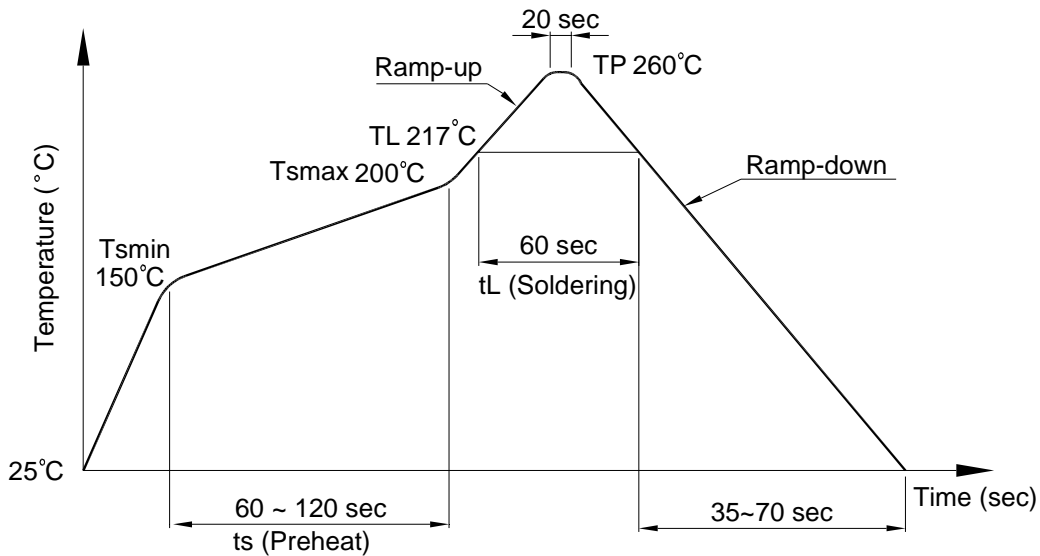
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6. TEMPERATURE PROFILE OF SOLDERING

6.1 IR Reflow soldering (JEDEC-STD-020C compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

Profile item	Conditions
Preheat	
- Temperature Min (T_{Smin})	150°C
- Temperature Max (T_{Smax})	200°C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature (T_L)	217°C
- Time (t_L)	60 sec
Peak Temperature (T_P)	260°C
Ramp-up rate	3°C / sec max.
Ramp-down rate	3~6°C / sec



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6.2 Wave soldering (JEDEC22A111 compliant)

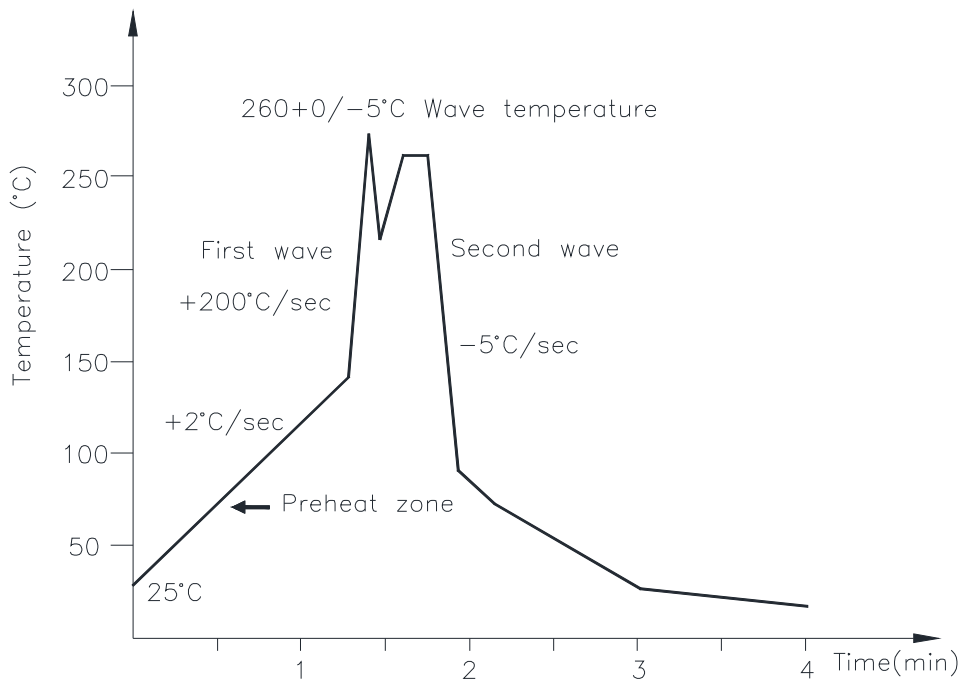
One time soldering is recommended within the condition of temperature.

Temperature: $260+0/-5^{\circ}\text{C}$

Time: 10 sec.

Preheat temperature: 25 to 140°C

Preheat time: 30 to 80 sec.



6.3 Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

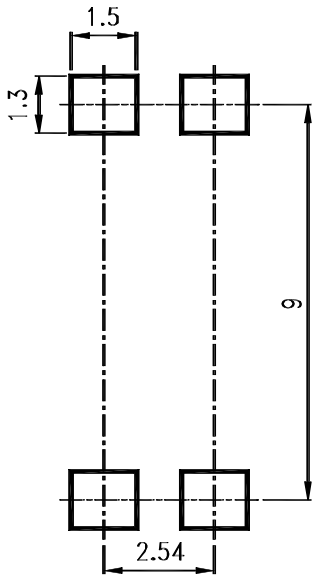
Temperature: $380+0/-5^{\circ}\text{C}$

Time: 3 sec max.

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7. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



8. Notes

- LiteOn is continually improving the quality, reliability, function or design and LiteOn reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- When requiring a device for any "specific" application, please contact our sales in advice.
- If there are any questions about the contents of this publication, please contact us at your convenience.
- The contents described herein are subject to change without prior notice.
- Immerge unit's body in solder paste is not recommended.