FEATURES

* Current transfer ratio
  ( CTR : MIN. 50% at \( I_F = 5\,\text{mA}, V_{CE} = 5\,\text{V} \) )

* High input-output isolation voltage
  ( \( V_{iso} = 5,000\,\text{Vrms} \) )

* Response time
  ( \( t_r : \text{TYP.} \, 4\mu\text{s at } V_{CE} = 2\,\text{V}, I_c = 2\,\text{mA}, R_L = 100\,\Omega \) )

* Dual-in-line package :
  - LTV-817 : 1-channel type
  - LTV-827 : 2-channel type
  - LTV-847 : 4-channel type

* Wide lead spacing package :
  - LTV-817M : 1-channel type
  - LTV-827M : 2-channel type
  - LTV-847M : 4-channel type

* Surface mounting package :
  - LTV-817S : 1-channel type
  - LTV-827S : 2-channel type
  - LTV-847S : 4-channel type

* Tape and reel packaging :
  - LTV-817S-TA : 1-channel type
  - LTV-817S-TA1 : 1-channel type
  - LTV-817S-TP : 1-channel type
  - LTV-827S-TA1 : 2-channel type

* Safety approval
  - UL / CSA / FIMKO / NEMKO / DEMKO / SEMKO / VDE* approved

* Required “V” ordering option

* RoHS compliance

* ◇ Critical characteristic

* ○ Safety or compliance characteristic
OUTLINE DIMENSIONS

LTV-817:

TYPE I (INK MARK)

TYPE II (LASER MARK)

LTV-827:

*1. Year date code.
*2. 2-digit work week.
*3. Factory identification mark shall be marked.
   (Z : Taiwan, Y : Thailand, X : China-TJ, W : China-CZ)
*4. Rank shall be or shall not be marked.

Part No. : LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series
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OUTLINE DIMENSIONS

**LTV-847:**

![Diagram of LTV-847 dimensions](image)

**LTV-817M:**

- **TYPE I (INK MARK):**
  - ![Diagram of LTV-817M Type I](image)
- **TYPE II (LASER MARK):**
  - ![Diagram of LTV-817M Type II](image)

*1. Year date code.*

*2. 2-digit work week.*

*3. Factory identification mark shall be marked.
   (Z: Taiwan, Y: Thailand, X: China-TJ, W: China-CZ)*

*4. Rank shall be or shall not be marked.*

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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OUTLINE DIMENSIONS

LTV-827M:

LTV-847M:

*1. Year date code.
*2. 2-digit work week.
*3. Factory identification mark shall be marked.
   (Z : Taiwan, Y : Thailand, X : China-TJ, W : China-CZ)
*4. Rank shall be or shall not be marked.

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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OUTLINE DIMENSIONS

LTV-817S :

TYPE I (INK MARK)

TYPE II (LASER MARK)

LTV-827S :

*1. Year date code.
*2. 2-digit work week.
*3. Factory identification mark shall be marked.
   (Z : Taiwan, Y : Thailand, X : China-TJ, W : China-CZ)
*4. Rank shall be or shall not be marked.

Part No. : LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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OUTLINE DIMENSIONS

LTV-847S:

- Year date code.
- 2-digit work week.
- Factory identification mark shall be marked.
  (Z : Taiwan, Y : Thailand, X : China-TJ, W : China-CZ)
- Rank shall be or shall not be marked.

Part No. : LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series
TAPING DIMENSIONS

LTV-817S-TA1:

<table>
<thead>
<tr>
<th>Description</th>
<th>Symbol</th>
<th>Dimensions in mm ( inches )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape wide</td>
<td>W</td>
<td>16 ± 0.3 (.63)</td>
</tr>
<tr>
<td>Pitch of sprocket holes</td>
<td>P₀</td>
<td>4 ± 0.1 (.15)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td>F</td>
<td>7.5 ± 0.1 (.295)</td>
</tr>
<tr>
<td>Distance of compartment to</td>
<td>P₁</td>
<td>2 ± 0.1 (.079)</td>
</tr>
<tr>
<td>compartment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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TAPING DIMENSIONS

LTV-817S-TA:

- Tape wide $W = 16 \pm 0.3$ (0.63 in)
- Pitch of sprocket holes $P_0 = 4 \pm 0.1$ (0.15 in)
- Distance of compartment $F = 7.5 \pm 0.1$ (0.295 in)
- Distance of compartment to compartment $P_1 = 12 \pm 0.1$ (0.472 in)

LTV-817S-TP:

- Tape wide $W = 16 \pm 0.3$ (0.63 in)
- Pitch of sprocket holes $P_0 = 4 \pm 0.1$ (0.15 in)
- Distance of compartment $F = 7.5 \pm 0.1$ (0.295 in)
- Distance of compartment to compartment $P_1 = 12 \pm 0.1$ (0.472 in)

<table>
<thead>
<tr>
<th>Description</th>
<th>Symbol</th>
<th>Dimensions in mm (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape wide</td>
<td>$W$</td>
<td>$16 \pm 0.3$ (0.63)</td>
</tr>
<tr>
<td>Pitch of sprocket holes</td>
<td>$P_0$</td>
<td>$4 \pm 0.1$ (0.15)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td>$F$</td>
<td>$7.5 \pm 0.1$ (0.295)</td>
</tr>
<tr>
<td>Distance of compartment to compartment</td>
<td>$P_1$</td>
<td>$12 \pm 0.1$ (0.472)</td>
</tr>
</tbody>
</table>
# ABSOLUTE MAXIMUM RATING

(\(Ta = 25^\circ C\))

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>RATING</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>(I_F)</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>(V_R)</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>(P)</td>
<td>70</td>
<td>mW</td>
</tr>
<tr>
<td>Collector - Emitter Voltage</td>
<td>(V_{CEO})</td>
<td>35</td>
<td>V</td>
</tr>
<tr>
<td>Emitter - Collector Voltage</td>
<td>(V_{ECO})</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>Collector Current</td>
<td>(I_C)</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Collector Power Dissipation</td>
<td>(P_C)</td>
<td>150</td>
<td>mW</td>
</tr>
<tr>
<td>Total Power Dissipation</td>
<td>(P_{tot})</td>
<td>200</td>
<td>mW</td>
</tr>
<tr>
<td>*1 Isolation Voltage (\bigcirc)</td>
<td>(V_{iso})</td>
<td>5,000</td>
<td>Vrms</td>
</tr>
<tr>
<td>Operating Temperature (LTV-827 / 847)</td>
<td>(T_{opr})</td>
<td>-30 ~ +110</td>
<td>(^\circ C)</td>
</tr>
<tr>
<td>Operating Temperature (LTV-817)</td>
<td>(T_{opr})</td>
<td>-30 ~ +110</td>
<td>(^\circ C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>(T_{stg})</td>
<td>-55 ~ +125</td>
<td>(^\circ C)</td>
</tr>
<tr>
<td>*2 Soldering Temperature</td>
<td>(T_{sol})</td>
<td>260</td>
<td>(^\circ C)</td>
</tr>
</tbody>
</table>

*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
## ELECTRICAL - OPTICAL CHARACTERISTICS

( \( T_a = 25^\circ C \) )

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
<th>CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>( V_F )</td>
<td>—</td>
<td>1.2</td>
<td>1.4</td>
<td>V</td>
<td>( I_F = 20\text{mA} )</td>
</tr>
<tr>
<td>Reverse Current</td>
<td>( I_R )</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>( \mu \text{A} )</td>
<td>( V_R = 4\text{V} )</td>
</tr>
<tr>
<td>Terminal Capacitance</td>
<td>( C_t )</td>
<td>—</td>
<td>30</td>
<td>250</td>
<td>( \text{pF} )</td>
<td>( V = 0, f = 1\text{KHz} )</td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector Dark Current</td>
<td>( I_{CEO} )</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>( \text{nA} )</td>
<td>( V_{CE} = 20\text{V}, I = 0 )</td>
</tr>
<tr>
<td>Collector-Emitter Breakdown Voltage</td>
<td>( B V_{CEO} )</td>
<td>35</td>
<td>—</td>
<td>—</td>
<td>V</td>
<td>( I_C = 0.1\text{mA} ) ( I = 0 )</td>
</tr>
<tr>
<td>Emitter-Collector Breakdown Voltage</td>
<td>( B V_{EEO} )</td>
<td>6</td>
<td>—</td>
<td>—</td>
<td>V</td>
<td>( I_E = 10\text{\mu A} ) ( I = 0 )</td>
</tr>
<tr>
<td><strong>TRANSFER CHARACTERISTICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector Current</td>
<td>( I_C )</td>
<td>2.5</td>
<td>—</td>
<td>30</td>
<td>mA</td>
<td>( I_C = 5\text{mA} ) ( V_{CE} = 5\text{V} )</td>
</tr>
<tr>
<td>*1 Current Transfer Ratio ( \triangle )</td>
<td>CTR</td>
<td>50</td>
<td>—</td>
<td>600</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Collector-Emitter Saturation Voltage</td>
<td>( V_{CE(sat)} )</td>
<td>— 0.1</td>
<td>0.2</td>
<td>V</td>
<td>( I_C = 20\text{mA} ) ( I_C = 1\text{mA} )</td>
<td></td>
</tr>
<tr>
<td>Isolation Resistance</td>
<td>( R_{iso} )</td>
<td>( 5 \times 10^{10} ) ( 1 \times 10^{11} )</td>
<td>—</td>
<td>( \Omega )</td>
<td>DC500V ( 40 - 60% \text{ R.H.} )</td>
<td></td>
</tr>
<tr>
<td>Floating Capacitance</td>
<td>( C_t )</td>
<td>— 0.6</td>
<td>1</td>
<td>( \text{pF} )</td>
<td>( V = 0, f = 1\text{MHz} )</td>
<td></td>
</tr>
<tr>
<td>Cut-Off Frequency</td>
<td>( f_c )</td>
<td>— 80</td>
<td>—</td>
<td>kHz</td>
<td>( V_{CE} = 5\text{V}, I_C = 2\text{mA} ) ( R_L = 100\Omega ) ( -3\text{dB} )</td>
<td></td>
</tr>
<tr>
<td>Response Time (Rise)</td>
<td>( t_r )</td>
<td>— 4</td>
<td>18</td>
<td>( \mu\text{s} )</td>
<td>( V_{CE} = 2\text{V}, I_C = 2\text{mA} ) ( R_L = 100\Omega )</td>
<td></td>
</tr>
<tr>
<td>Response Time (Fall)</td>
<td>( t_f )</td>
<td>— 3</td>
<td>18</td>
<td>( \mu\text{s} )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 \( \text{CTR} = \frac{I_C}{I_F} \times 100\% \)
## RANK TABLE OF CURRENT TRANSFER RATIO CTR

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>RANK MARK</th>
<th>CTR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LTV-817</strong></td>
<td>L</td>
<td>50 ~ 100</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>80 ~ 160</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>130 ~ 260</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>200 ~ 400</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>300 ~ 600</td>
</tr>
<tr>
<td></td>
<td>L or A or B or C or D</td>
<td>50 ~ 600</td>
</tr>
<tr>
<td><strong>LTV-827</strong></td>
<td>No Bin</td>
<td>50~600</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>130 ~ 260</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>200 ~ 400</td>
</tr>
<tr>
<td></td>
<td>BC</td>
<td>130~400</td>
</tr>
<tr>
<td></td>
<td>CD</td>
<td>200~600</td>
</tr>
<tr>
<td><strong>LTV-847</strong></td>
<td>No Bin</td>
<td>50~600</td>
</tr>
<tr>
<td></td>
<td>BC</td>
<td>130~400</td>
</tr>
<tr>
<td></td>
<td>CD</td>
<td>200~600</td>
</tr>
</tbody>
</table>

### CONDITIONS

- \( I_F = 5 \text{ mA} \)
- \( V_{CE} = 5 \text{ V} \)
- \( T_a = 25 \text{ °C} \)
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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CHARACTERISTICS CURVES

Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

![Relative Current Transfer Ratio vs. Ambient Temperature](image1)

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

![Collector-emitter Saturation Voltage vs. Ambient Temperature](image2)

Fig. 9 Collector Dark Current vs. Ambient Temperature

![Collector Dark Current vs. Ambient Temperature](image3)

Fig. 10 Response Time vs. Load Resistance

![Response Time vs. Load Resistance](image4)

Fig. 11 Frequency Response

![Frequency Response](image5)

Test Circuit for Frequency Response

![Test Circuit for Frequency Response](image6)

Test Circuit for Response Time

![Test Circuit for Response Time](image7)
RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm

4 PIN

8 PIN

16 PIN
Notes:

- Lite-On is continually improving the quality, reliability, function or design and Lite-On 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.