



THE DATASHEET OF LTV-214



FEATURES



June 2010

- * Current transfer ratio
(CTR : 80%~300% at $I_F = \pm 1\text{mA}$, $V_{CE} = 5\text{V}$)
- * Isolation voltage between input and output LTV-214 / 244
(Viso = 3.75KVrms)
- * Employs double transfer mold technology

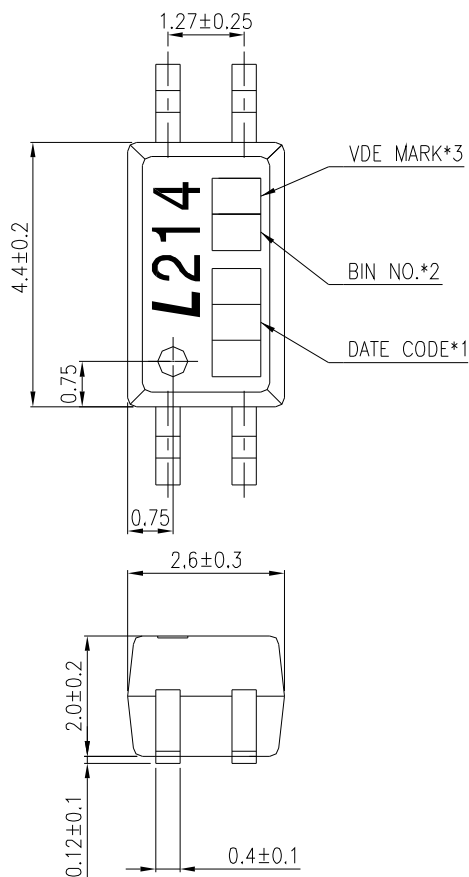
- * Safety Approval
UL, CSA, FIMKO, VDE* Approved
(*Requires "V" ordering option)
- * RoHS compliance

APPLICATIONS

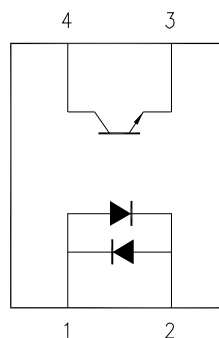
- * Programmable controllers
- * System appliances, measuring instruments

OUTLINE DIMENSIONS

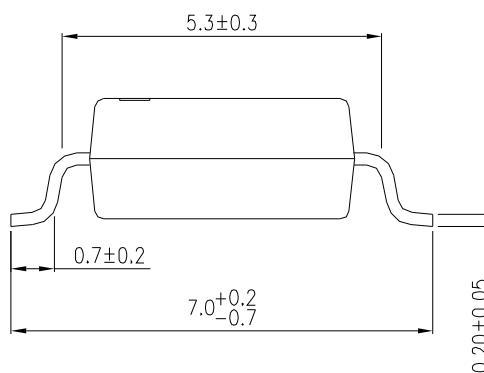
LTV-214 :



Pin No. and Internal connection diagram



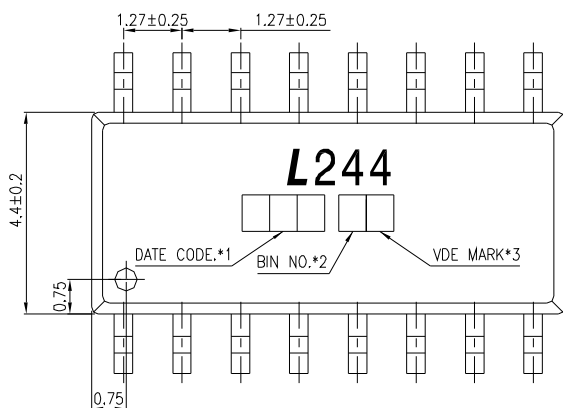
1. Anode, Cathode
2. Cathode, Anode
3. Emitter
4. Collector



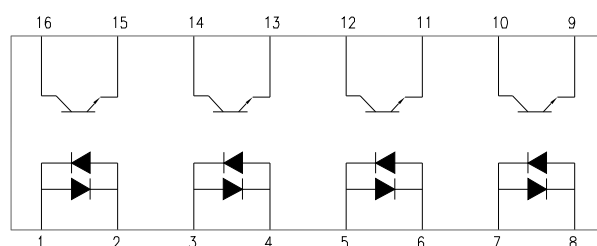
- *1. 3-digit date code.
- *2. Rank shall be or shall not be marked.
- *3. VDE mark, only appears on devices ordered "V" option.

OUTLINE DIMENSIONS

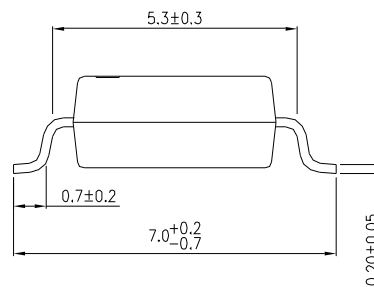
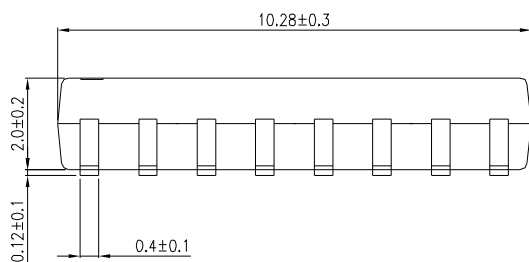
LTV-244 :



PIN NO. AND INTERNAL CONNECTION DIAGRAM



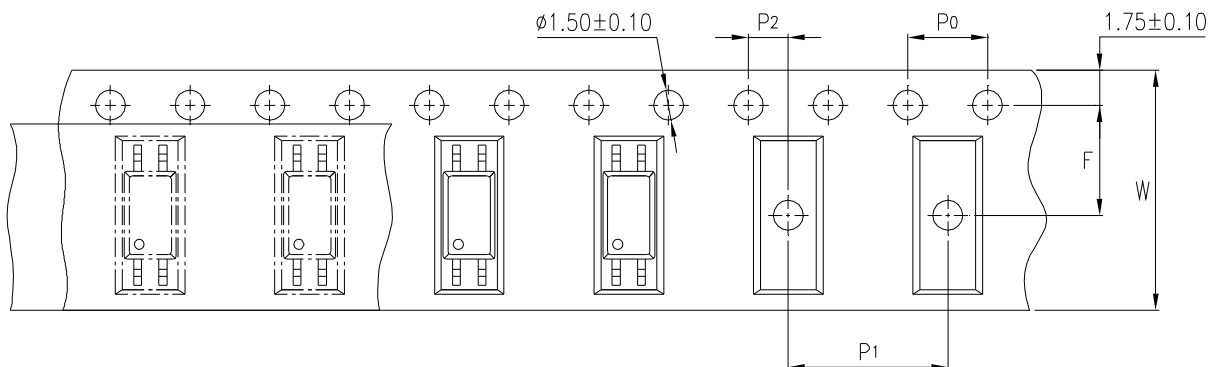
1,3,5,7. Anode,Cathode 9,11,13,15. Emitter
2,4,6,8. Cathode,Anode 10,12,14,16. Collector



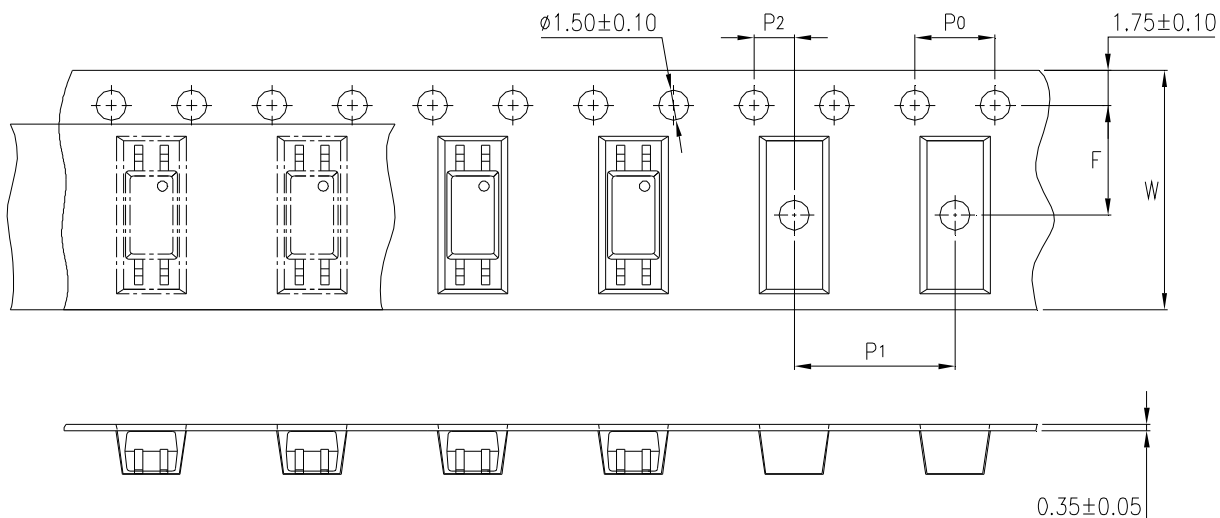
- *1. 3-digit date code.
- *2. Rank shall be or shall not be marked.
- *3. VDE mark, only appears on devices ordered "V" option.

TAPING DIMENSIONS

LTV-214 series



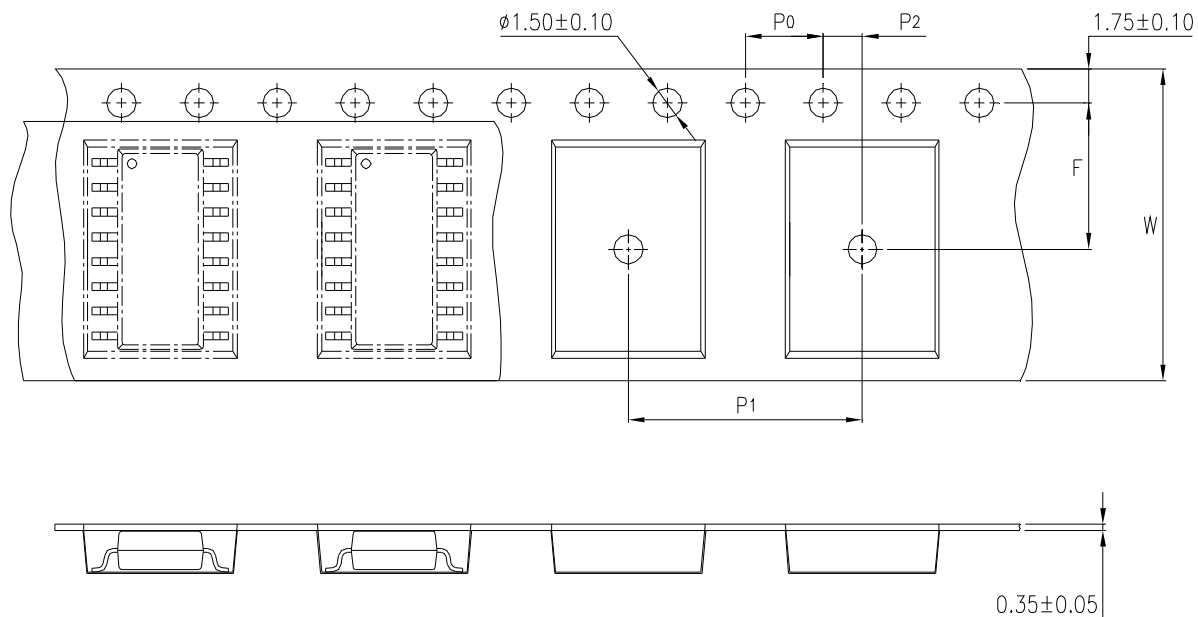
LTV-214-TP1 series



| Description | Symbol | Dimension in mm (inches) |
|--|---------------------|------------------------------------|
| Tape wide | W | 12 ± 0.3 (.47) |
| Pitch of sprocket holes | P ₀ | 4 ± 0.1 (.15) |
| Distance of compartment | F P ₂ | 5.5 ± 0.1 (.217) 2 ± 0.1 (.079) |
| Distance of compartment to compartment | P ₁ | 8 ± 0.1 (.315) |

TAPING DIMENSIONS

LTV-244 series



| Description | Symbol | Dimension in mm (inches) |
|--|----------------|--------------------------|
| Tape wide | W | 16 ± 0.3 (.47) |
| Pitch of sprocket holes | P ₀ | 4 ± 0.1 (.15) |
| Distance of compartment | F | 7.5 ± 0.1 (.217) |
| | P ₂ | 2 ± 0.1 (.079) |
| Distance of compartment to compartment | P ₁ | 12 ± 0.1 (.63) |

Quantities per Reel :

| Package Type | LTV-214 | LTV-244 |
|------------------|-------------|-------------|
| Quantities (pcs) | 3000 | 2000 |

ABSOLUTE MAXIMUM RATING

(Ta = 25°C)

| PARAMETER | | SYMBOL | RATING | | UNIT |
|-------------------------|-----------------------------|-----------|------------|-----|------|
| | | | 214 | 244 | |
| INPUT | Forward Current | I_F | 50 | | mA |
| | Reverse Voltage | V_R | 6 | | V |
| | Pulse Forward Current | I_{FSM} | 1 | | A |
| | Power Dissipation | P | 65 | | mW |
| OUTPUT | Collector - Emitter Voltage | V_{CEO} | 80 | | V |
| | Emitter - Collector Voltage | V_{ECO} | 7 | | V |
| | Collector Current | I_C | 50 | | mA |
| | Collector Power Dissipation | P_C | 150 | 100 | mW |
| Total Power Dissipation | | P_{tot} | 200 | 170 | mW |
| *1 | Isolation Voltage | V_{iso} | 3750 | | Vrms |
| Operating Temperature | | T_{opr} | -55 ~ +110 | | °C |
| Storage Temperature | | T_{stg} | -55 ~ +150 | | °C |
| *2 | Soldering Temperature | T_{sol} | 260 (10s) | | °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

ELECTRICAL - OPTICAL CHARACTERISTICS

(Ta = 25°C)

| PARAMETER | | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|--------------------------|--------------------------------------|----------------------|--------------------|--------------------|------|------|-------------------------------|
| INPUT | Forward Voltage | V _F | — | 1.2 | 1.4 | V | IF=±20mA |
| | Terminal Capacitance | C _t | — | 60 | — | pF | V=0, f=1MHz |
| OUTPUT | Collector Dark Current | I _{CEO} | — | — | 100 | nA | VCE=50V, IF=0 |
| | Collector-Emitter Breakdown Voltage | BV _{CEO} | 80 | — | — | V | IC=0.1mA IF=0mA |
| | Emitter-Collector Breakdown Voltage | BV _{ECO} | 7 | — | — | V | IE=10 μA IF=0mA |
| TRANSFER CHARACTERISTICS | Collector Current | I _C | 0.8 | — | 3 | mA | IF=±1mA VCE=5V |
| | *1 Current Transfer Ratio | CTR | 80 | — | 300 | % | |
| | Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | — | 0.4 | V | IF=±8mA IC=2.4mA |
| | Isolation Resistance | R _{iso} | 5×10 ¹⁰ | 1×10 ¹¹ | — | Ω | DC500V R.H.< 60% |
| | Floating Capacitance | C _f | — | 0.8 | 1 | pF | V=0, f=1MHz |
| | Response Time (Rise) | t _r | — | 3 | 18 | μs | VCE=2V, IC=±2mA RL=100Ω |
| | Response Time (Fall) | t _f | — | 4 | 18 | μs | |

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

RANK TABLE OF CURRENT TRANSFER RATIO CTR

| MODEL NO. | RANK MARK | CTR (%) |
|------------------|------------------|------------------|
| LTV-214 / 244 | DE | 80 ~ 300 |

| | |
|-------------------|---|
| CONDITIONS | $I_F = \pm 1 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $T_a = 25 \text{ }^\circ\text{C}$ |
|-------------------|---|

CHARACTERISTICS CURVES

Figure 1. Collector Power Dissipation vs. Ambient Temperature

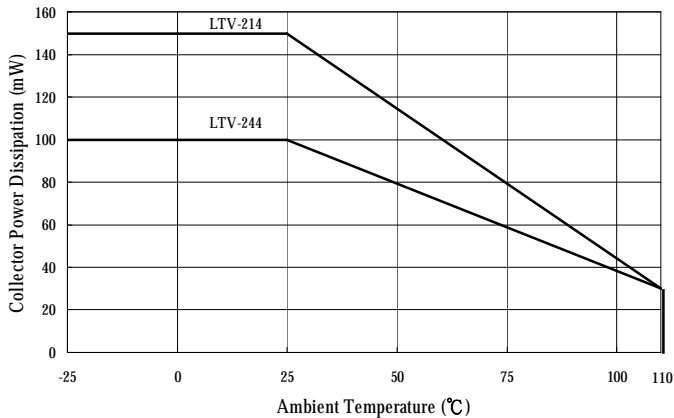


Figure 2. Forward Current vs. Ambient Temperature

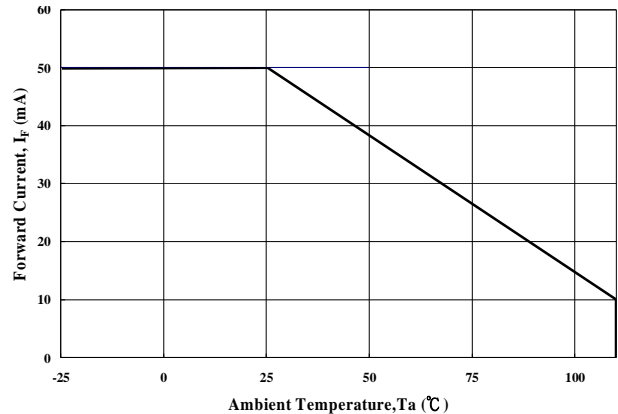


Figure 3. Forward Current vs. Forward Voltage

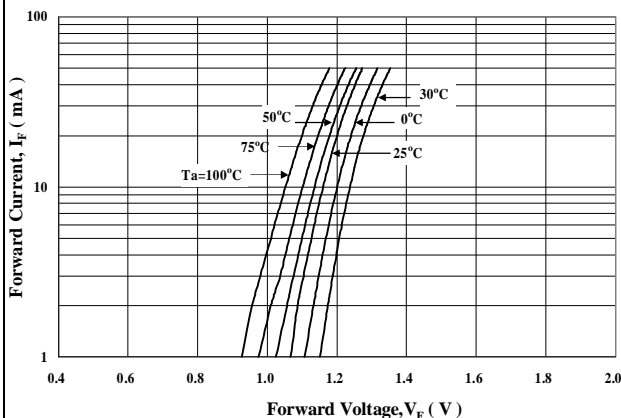


Figure 4. Forward Voltage Temperature Coefficient vs. Forward Current

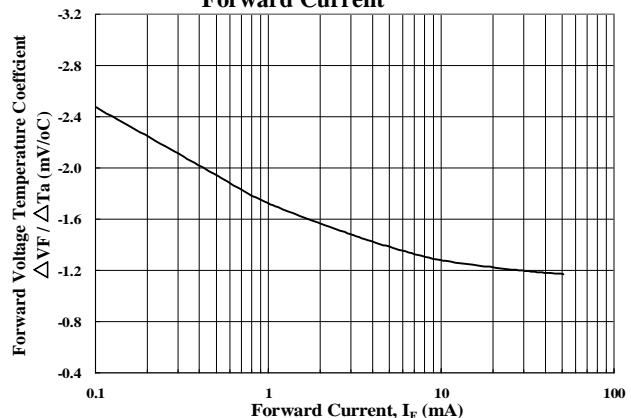


Figure 5. Pulse Forward Current vs. Duty Cycle Ratio

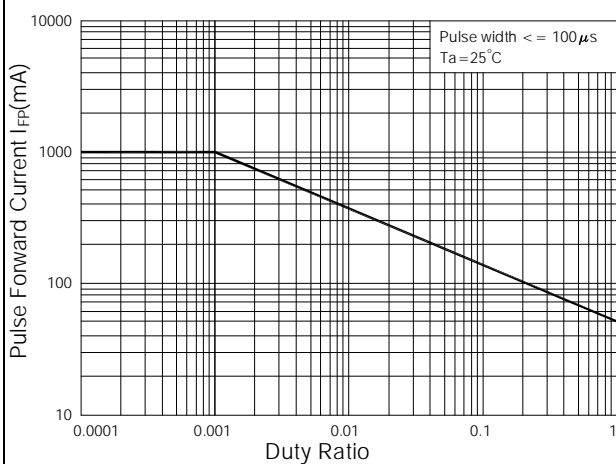
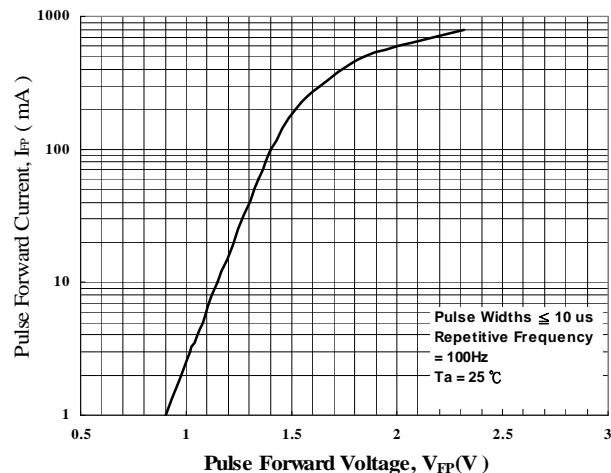


Figure 6. Pulse Forward Current vs. Pulse Forward Voltage



CHARACTERISTICS CURVES

Figure 7. Collector-Emitt Saturation Voltage vs. Forward Current

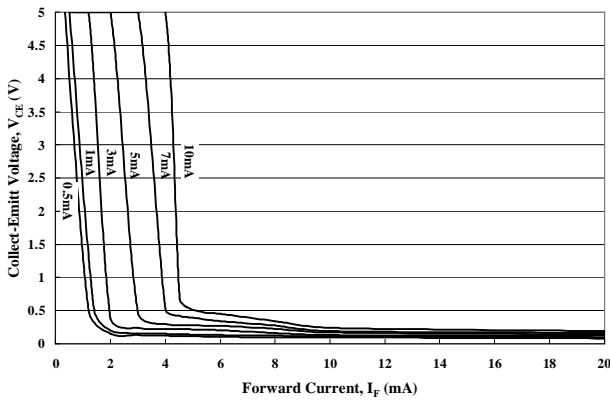


Figure 8. Collector Current vs. Collector-Emitt Voltage

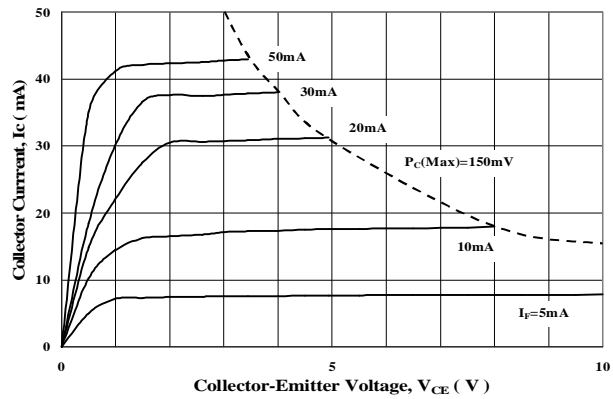


Figure 9. Collector Current vs. Small Collector-Emitt Voltage

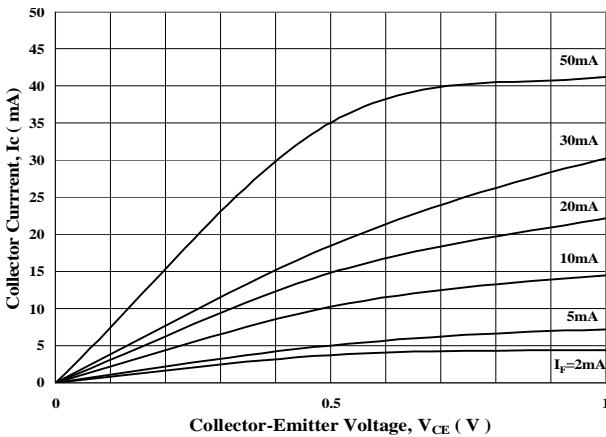


Figure 10. Collector Current vs. Forward Current

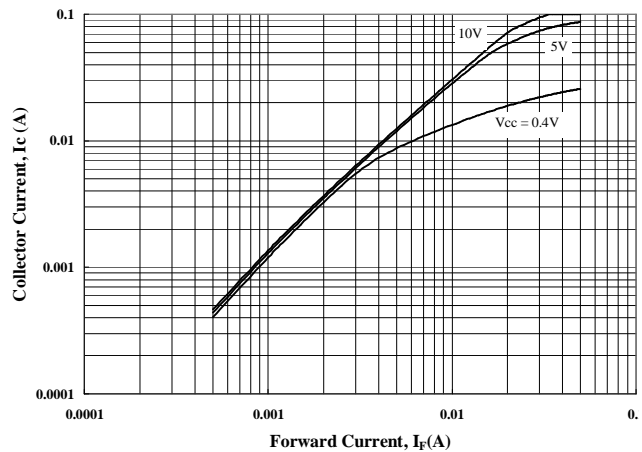


Figure 11. Collector Dark Current vs. Ambient Temperature

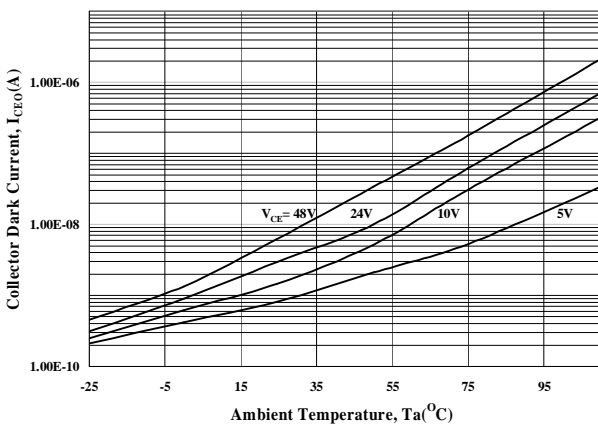
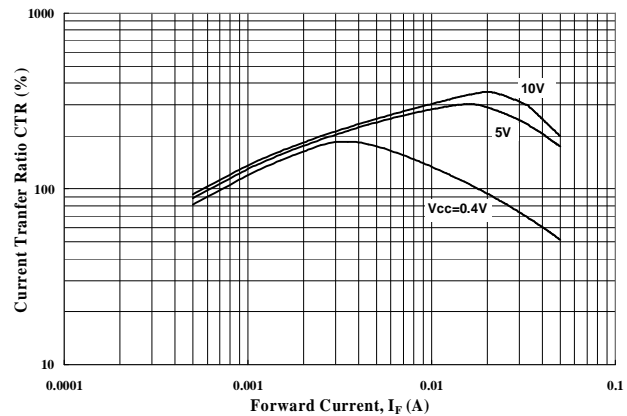


Figure 12. Current Transfer Ratio vs. Forward Current



CHARACTERISTICS CURVES

Figure 13. Collector-Emitter Saturation Voltage vs. Ambient Temperature

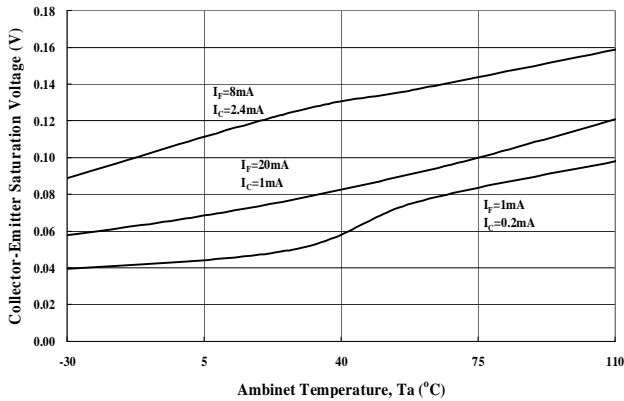


Figure 14. Collector Current vs. Ambient Temperature

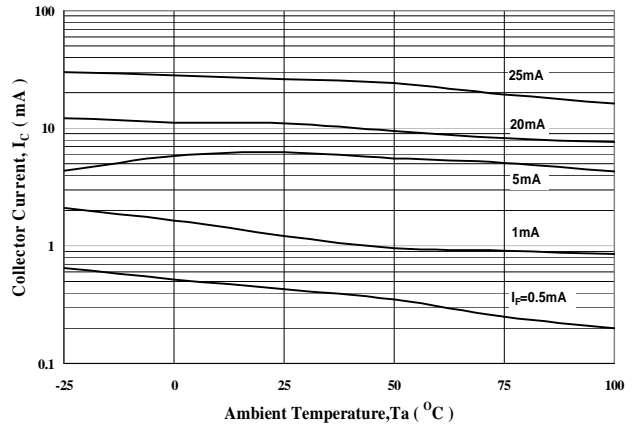


Figure 15. Switching Time vs. Load Resistance

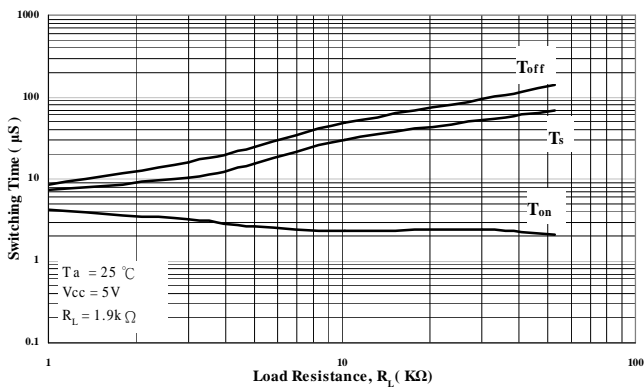


Figure 16. Switching Time vs. Ambient Temperature

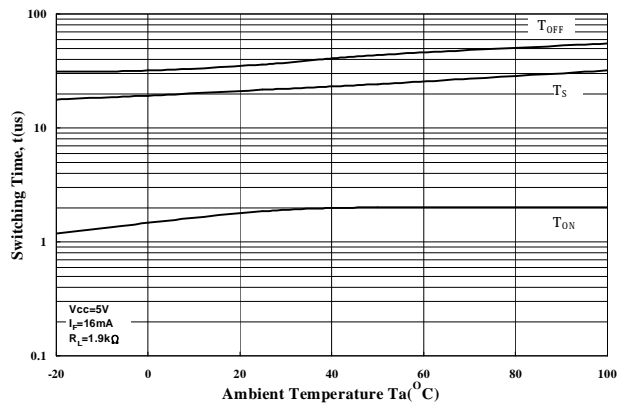
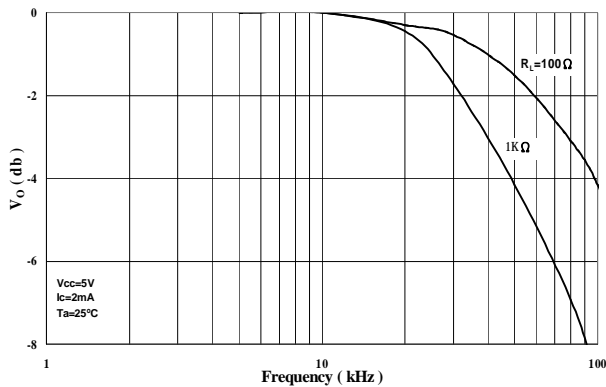
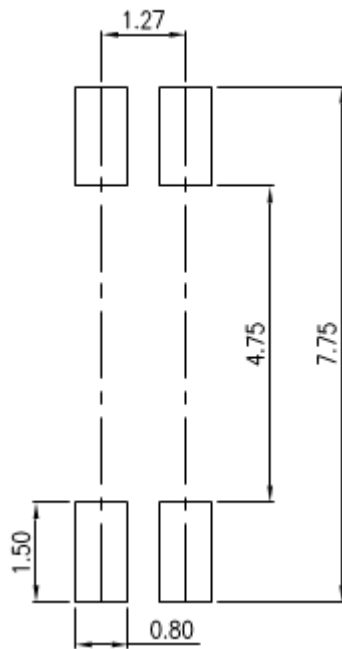


Figure 17. Frequency Response

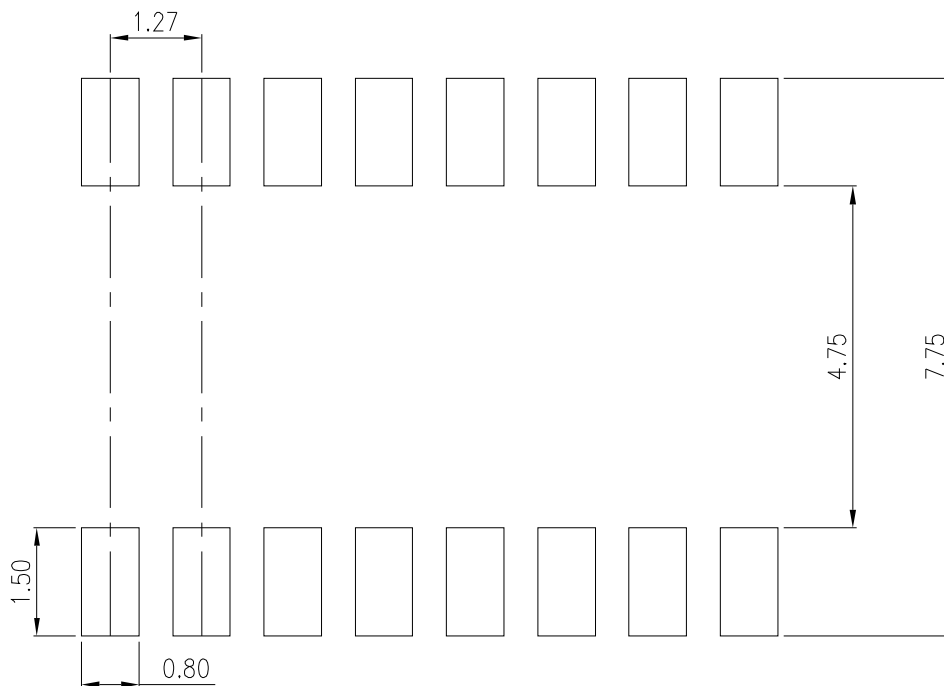


RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

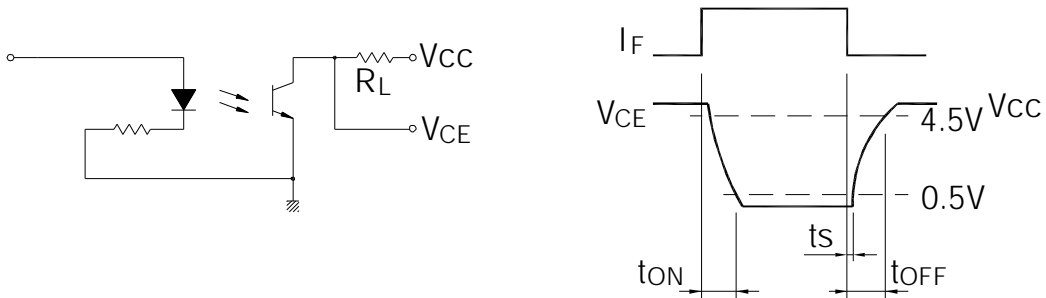
LTV-214



LTV-244



SWITCHING TIME TEST CIRCUIT



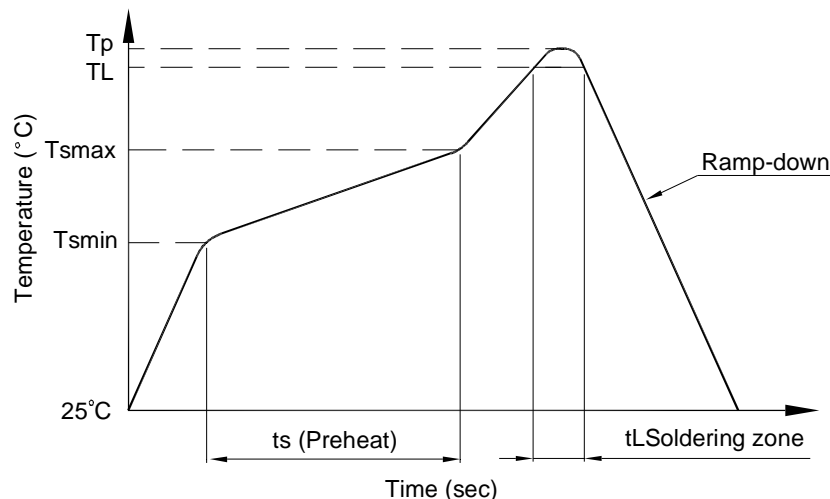
TEMPERATURE PROFILE OF SOLDERING REFLOW

(1) One time soldering reflow is recommended within the condition of temperature and time profile shown below.

1. Wave solder
 - 260°C / 10 sec.

2. IR Reflow

| Profile item | Conditions |
|----------------------------------|-------------|
| Preheat | |
| - Temperature Min (T_{Smin}) | 150°C |
| - Temperature Max (T_{Smax}) | 180°C |
| - Time (min to max) (ts) | 90±30°C |
| Soldering zone | |
| - Temperature (T_L) | 250°C |
| - Time (t_L) | 10~15 sec |
| Peak Temperature (T_P) | 260°C |
| Ramp-down rate | 3~6°C / sec |



TEMPERATURE PROFILE OF SOLDERING REFLOW

(2) When using another soldering method such as infrared ray lamp, the temperature may rise partially in the mold of the device.

Keep the temperature on the package of the device within the condition of above (1)

Notes:

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- The contents described herein are subject to change without prior notice.
- Do not immerse unit's body in solder paste.

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