



Photocoupler Product Data Sheet

LTV-702F

(M,S,S-TA1)

Spec No.: DS-70-96-0010

Effective Date: 09/15/2001

Revision: E

LITE-ON DCC

RELEASE

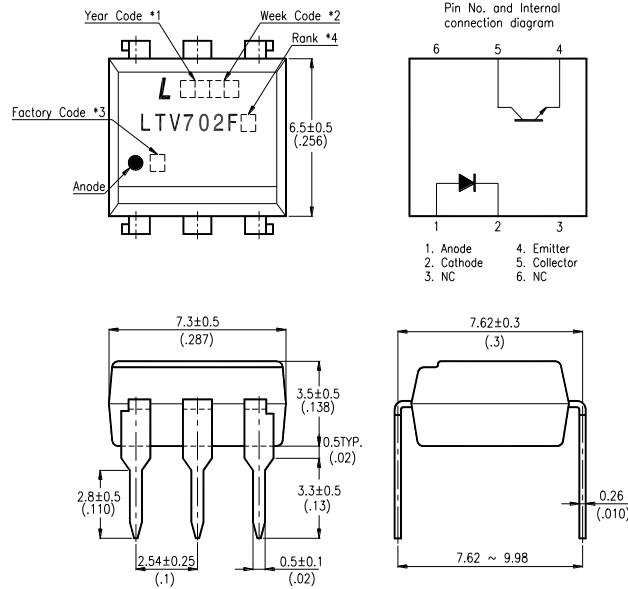
BNS-OD-FC001/A4

FEATURES

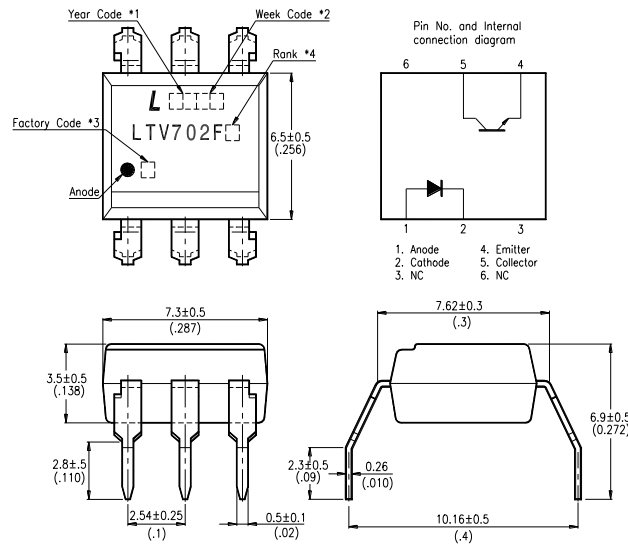
- * Directly connectable to TTL
- * High collector-emitter voltage
($V_{CEO} = 70V$)
- * High input-output isolation voltage
($V_{iso} = 5,000V_{rms}$)
- * Response time
(t_r : TYP. $2\mu s$ at $V_{CC} = 5V$, $I_F = 10mA$, $R_L = 75\Omega$)
- * Current transfer ratio
(CTR : MIN. 40% at $I_F = 10mA$, $V_{CE} = 5V$)
- * Dual-in-line package :
LTV-702F
- * Wide lead spacing package :
LTV-702FM
- * Surface mounting package :
LTV-702FS
- * Tape and reel packaging :
LTV-702FS-TA1
- * UL approved (No. E113898)
- * TUV approved (No. R9653630)
- * CSA approved (No. CA91533-1)
- * FIMKO approved (No. 193422-01)
- * NEMKO approved (No. P96103013)
- * DEMKO approved (No. 303968)
- * SEMKO approved (No. 9646047 / 01-30)
- * VDE approved (No. 094722)

OUTLINE DIMENSIONS

LTV-702F :



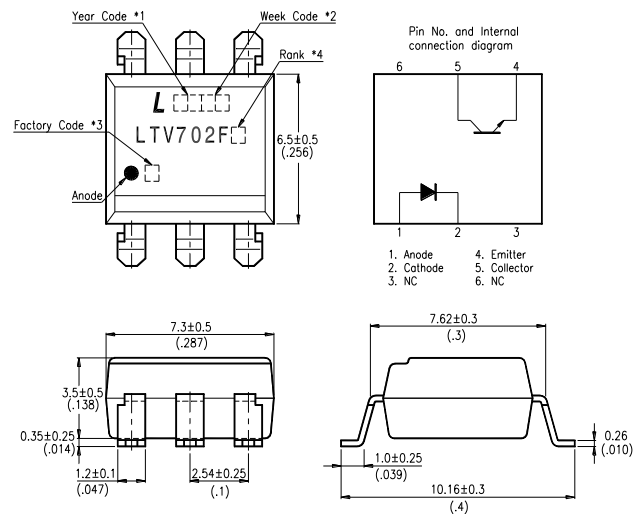
LTV-702FM :



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

OUTLINE DIMENSIONS

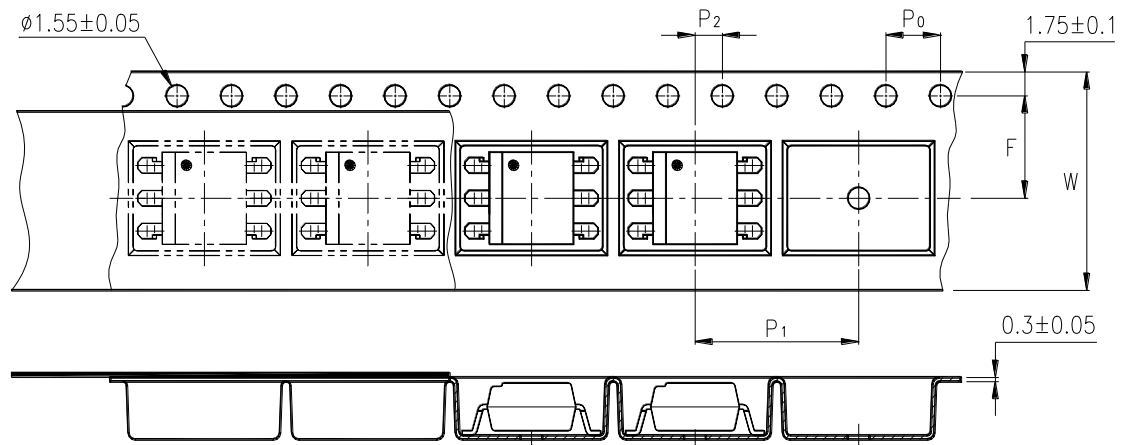
LTV-702FS :



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

TAPING DIMENSIONS

LTV-702FS-TA1 :



| Description | Symbol | Dimensions in mm (inches) |
|--|--------|-----------------------------|
| Tape wide | W | 16 ± 0.3 (.63) |
| Pitch of sprocket holes | P_0 | 4 ± 0.1 (.15) |
| Distance of compartment | F | 7.5 ± 0.1 (.295) |
| Distance of compartment to compartment | P_1 | 2 ± 0.1 (.079) |
| Distance of compartment to compartment | P_1 | 12 ± 0.1 (.472) |

ABSOLUTE MAXIMUM RATING

(Ta = 25°C)

| PARAMETER | | SYMBOL | RATING | UNIT |
|-------------------------|-----------------------------|------------------|------------|------------------|
| INPUT | Forward Current | I _F | 60 | mA |
| | Reverse Voltage | V _R | 6 | V |
| | Power Dissipation | P | 105 | mW |
| OUTPUT | Collector - Emitter Voltage | V _{CEO} | 70 | V |
| | Emitter - Collector Voltage | V _{ECO} | 6 | V |
| | Collector Current | I _C | 50 | mA |
| | Collector Power Dissipation | P _C | 160 | mW |
| Total Power Dissipation | | P _{tot} | 200 | mW |
| *1 | Isolation Voltage | V _{iso} | 5,000 | V _{rms} |
| Operating Temperature | | T _{opr} | -55 ~ +100 | °C |
| Storage Temperature | | T _{stg} | -55 ~ +150 | °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

ELECTRICAL - OPTICAL CHARACTERISTICS

(Ta = 25°C)

| PARAMETER | | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|--------------------------|--------------------------------------|----------------------|--------------------|--------------------|------|------|--|
| INPUT | Forward Voltage | V _F | — | 1.4 | 1.7 | V | I _F =60mA |
| | Reverse Current | I _R | — | — | 10 | μA | V _R =6V |
| | Terminal Capacitance | C _t | — | 30 | 250 | pF | V=0, f=1KHz |
| OUTPUT | Collector Dark Current | I _{CEO} | — | — | 50 | nA | V _{CE} =10V, I _F =0 |
| | Collector-Emitter Breakdown Voltage | BV _{CEO} | 70 | — | — | V | I _C =0.1mA I _F =0 |
| | Emitter-Collector Breakdown Voltage | BV _{ECO} | 6 | — | — | V | I _E =10μA I _F =0 |
| TRANSFER CHARACTERISTICS | Collector Current | I _C | 4 | — | 32 | mA | I _F =10mA |
| | * Current Transfer Ratio | CTR | 40 | — | 320 | % | V _{CE} =5V |
| | Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | 0.25 | 0.4 | V | I _F =10mA I _C =2.5mA |
| | Isolation Resistance | R _{iso} | 5×10 ¹⁰ | 1×10 ¹¹ | — | Ω | DC500V 40 ~ 60% R.H. |
| | Floating Capacitance | C _f | — | 0.6 | 1 | pF | V=0, f=1MHz |
| | Cut-Off Frequency | f _c | — | 150 | — | kHz | V _{CC} =5V, I _F =10mA R _L =75Ω, -3dB |
| | Response Time (Rise) | t _r | — | 2 | 7 | μs | V _{CC} =5V, I _F =10mA R _L =75Ω |
| | Response Time (Fall) | t _f | — | 2 | 8 | μs | |

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

RANK TABLE OF CURRENT TRANSFER RATIO CTR

| MODEL NO. | RANK MARK | CTR (%) |
|------------------|-----------------------------|------------------|
| LTV-702F | A | 40 ~ 80 |
| LTV-702F | B | 63 ~ 125 |
| LTV-702F | C | 100 ~ 200 |
| LTV-702F | D | 160 ~ 320 |
| LTV-702F | A or B or C or D or No mark | 40 ~ 320 |

| | |
|-------------------|--|
| CONDITIONS | $I_F = 10 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $T_a = 25 \text{ }^\circ\text{C}$ |
|-------------------|--|

CHARACTERISTICS CURVES

Fig.1 Forward Current vs. Ambient Temperature

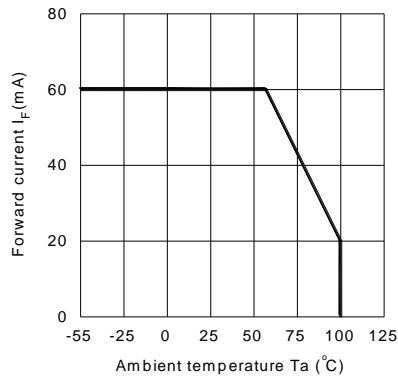


Fig.2 Collector Power Dissipation vs. Ambient Temperature

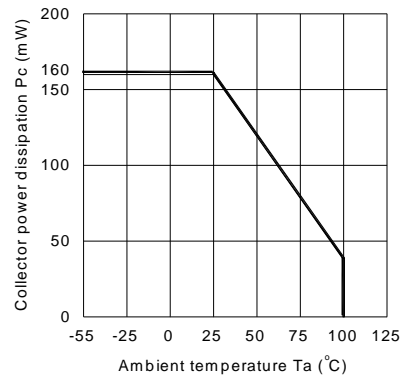


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

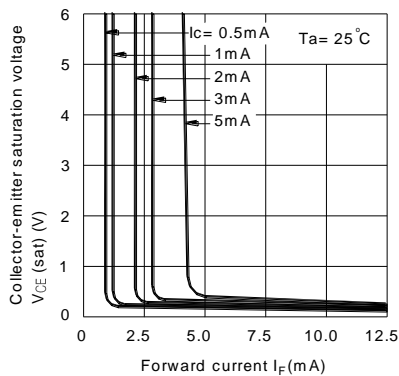


Fig.4 Forward Current vs. Forward Voltage

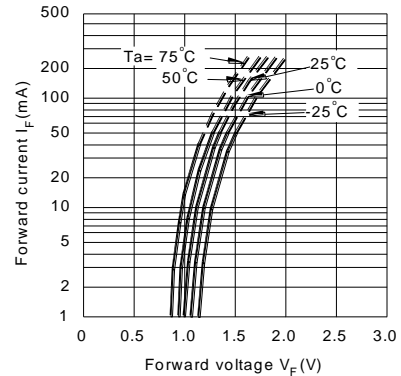


Fig.5 Current Transfer Ratio vs. Forward Current

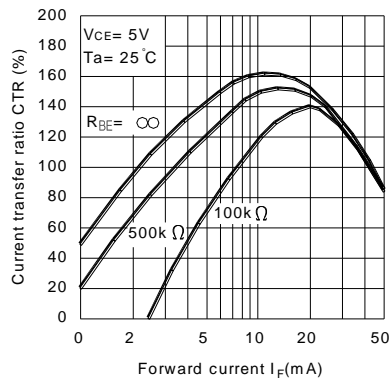
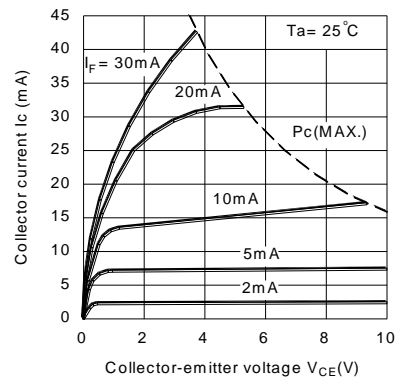


Fig.6 Collector Current vs. Collector-emitter Voltage



CHARACTERISTICS CURVES

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

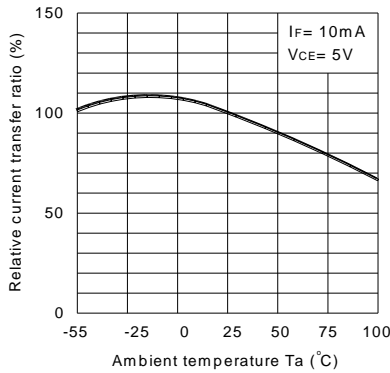


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

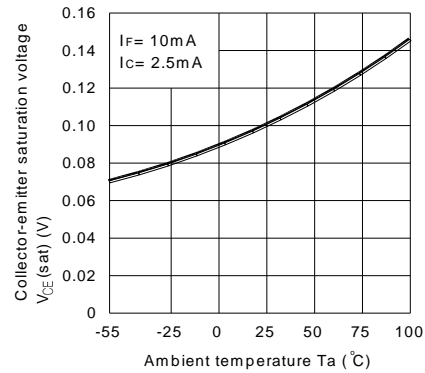


Fig.9 Collector Dark Current vs. Ambient Temperature

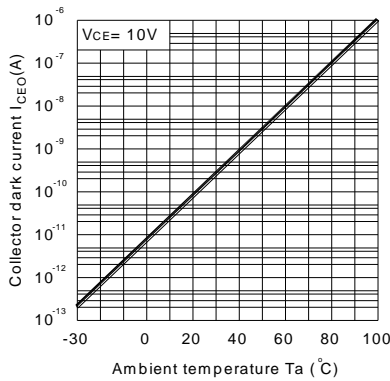


Fig.10 Response Time vs. Load Resistance

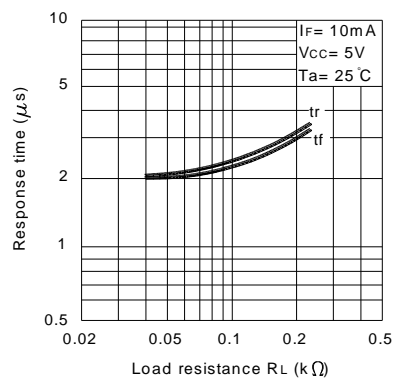
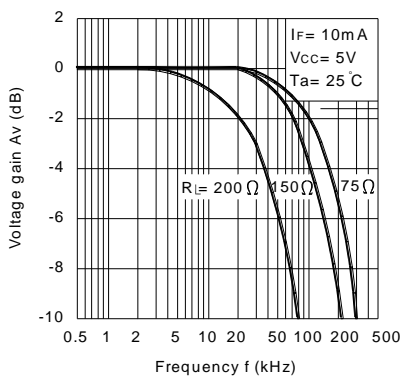
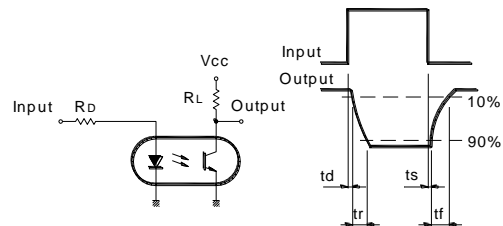


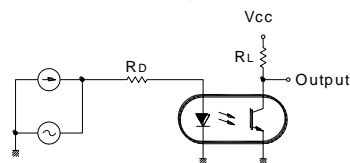
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit : mm

