LITEON®
OPTOELECTRONICS

Photocoupler

Product Data Sheet

LTV-352T

Spec No.: DS70-2001-002

Effective Date: 10/27/2016

Revision: K

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

LITE-ON Technology Corp. / Optoelectronics
No.90,Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.
Tel: 886-2-2222-6181 Fax: 886-2-2221-1948 / 886-2-2221-0660
http://www.liteon.com/opto

Photocoupler
LTV-352T series

1. DESCRIPTION

1.1 Features

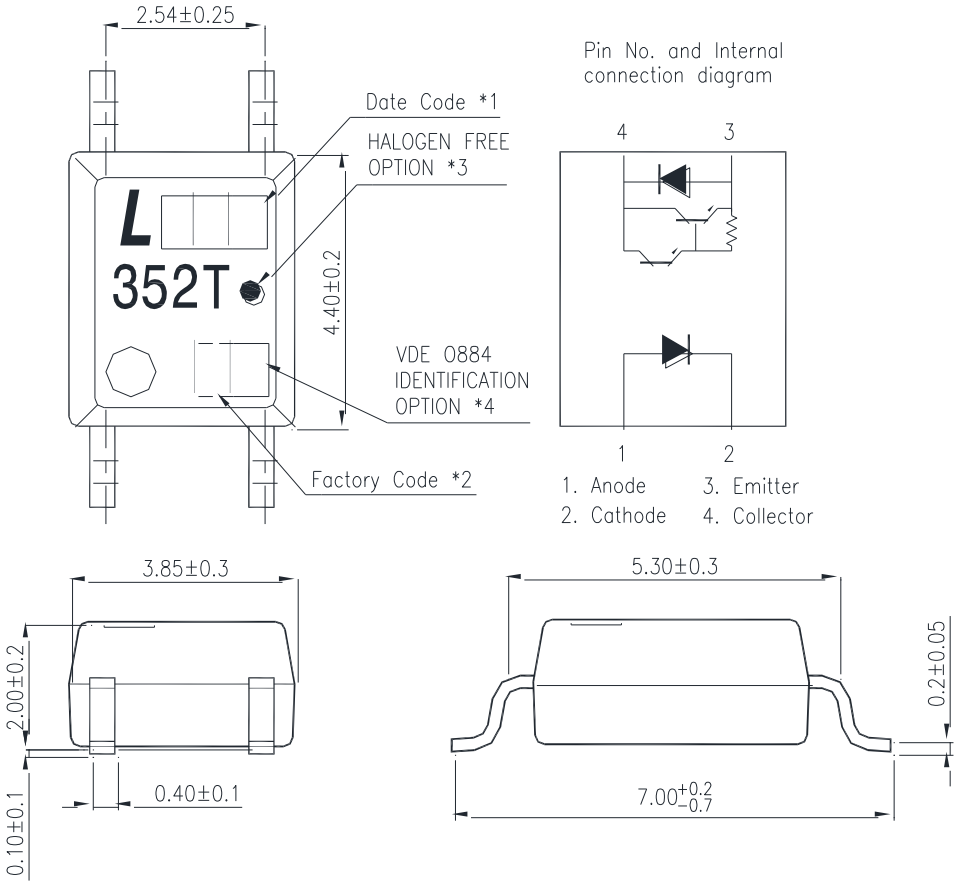
- Current transfer ratio (CTR : MIN. 1000% at I_F = 1mA, V_{CE} = 2V)
- High input-output isolation voltage (Viso = 3,750Vrms)
- High collector-emitter voltage (V_{CEO} = 300V)
- Mini-flat package : 2.0mm profile : LTV-352T
- SOP-4 package
- Safety approval
  UL 1577 & cUL
  VDE DIN EN60747-5-5 (VDE 0884-5) ,
  CSA CA5A
  FIMKO/DEMKO/SEMKO/NEMKO
- RoHS Compliance
  All materials be used in device are followed EU RoHS directive (No.2002/95/EC).
- ESD pass HBM 8000V/ MM2000V/ CDM2000V
- MSL class1

1.2 Applications

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

2. PACKAGE DIMENSIONS

2.1 LTV-352T series



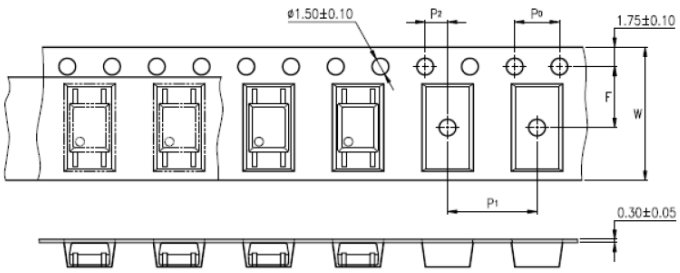
Notes :

1. 1-digit year code, Example : 2010 = A
   2-digit work week ranging from '01' to '53'
2. Factory identification mark shall be marked (W: China -CZ, X: China -TJ)
3. "●" indicates halogen free option.
4. "4"or"V" for VDE option.

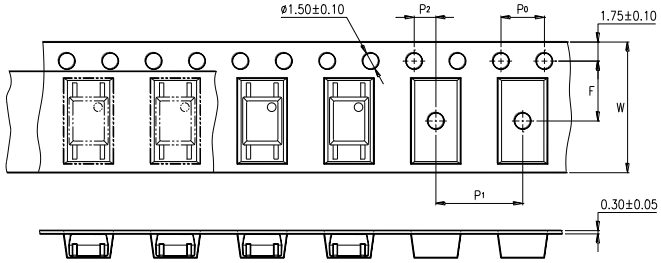
*All dimensions in millimeters.

3. TAPING DIMENSIONS

3.1 LTV-352T-TP



3.2 LTV-352T-TP1



Description	Symbol	Dimension in mm (inch)
Tape wide	W	12±0.3 (0.472)
Pitch of sprocket holes	P_0	4±0.1 (0.157)
Distance of compartment	F	5.5±0.1 (0.217)
	P_2	2±0.1 (0.079)
Distance of compartment to compartment	P_1	8±0.1 (0.315)

3.3 Quantities Per Reel

Package Type	LTV-352T series
Quantities (pcs)	3000

4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25°C

	Parameter	Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	70	mW
	Junction Temperature	T_J	125	°C
Output	Collector - Emitter Voltage	V_{CEO}	300	V
	Emitter - Collector Voltage	V_{ECO}	0.1	V
	Collector Current	I_C	150	mA
	Collector Power Dissipation	P_C	150	mW
	Junction Temperature	T_J	125	°C
	Total Power Dissipation	P_{tot}	170	mW
1.	Isolation Voltage	V_{iso}	3750	V_{rms}
	Operating Temperature	T_{opr}	-55 ~ +110	°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

4.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

Parameter			Symbol	Min.	Typ.	Max.	Unit	Test Condition
Input		Forward Voltage	V_F	—	1.2	1.4	V	I_F=10mA
		Reverse Current	I_R	—	—	10	μA	V_R=4V
		Terminal Capacitance	C_t	—	30	250	pF	V=0, f=1KHz
Output		Collector Dark Current	I_{CEO}	—	—	200	nA	V_{CE}=200V, I_F=0
		Collector-Emitter Breakdown Voltage	BV_{CEO}	300	—	—	V	I_C=0.1mA, I_F=0
		Emitter-Collector Breakdown Voltage	BV_{ECO}	0.1	—	—	V	I_E=10μA, I_F=0
TRANSFER CHARACTERISTICS		Collector Current	I_C	10	—	—	mA	I_F=1mA V_{CE}=2V
	1.	Current Transfer Ratio	CTR	1000	5000	—	%	
		Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	1.2	V	I_F=20mA I_C=100mA
		Isolation Resistance	R_{iso}	5×10^{10}	1×10^{11}	—	Ω	DC500V, 40 ~ 60% R.H.
		Floating Capacitance	Cf	—	0.6	1	pF	V=0, f=1MHz
		Cut-Off Frequency	fc	1	7	—	kHz	V_{CE}=2V, I_C=20mA R_L=100Ω, -3dB
		Response Time (Rise)	tr	—	100	300	μs	V_{CE}=2V, I_C=20mA R_L=100Ω
		Response Time (Fall)	tf	—	20	100	μs	

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

5. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

Fig.1 Forward Current vs. Ambient Temperature

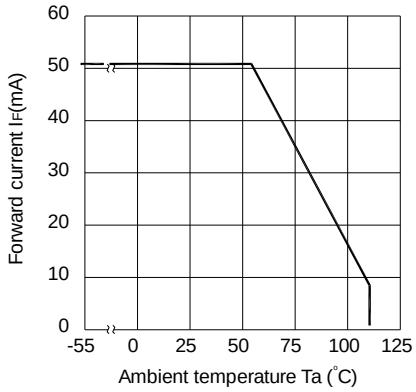


Fig.2 Collector Power Dissipation vs. Ambient Temperature

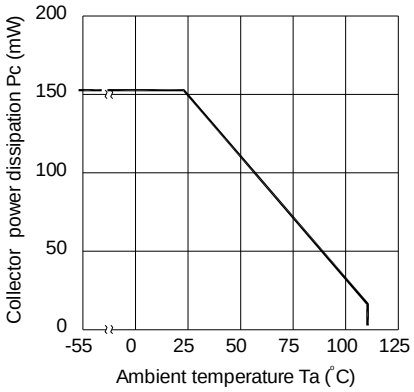


Fig.3 Collector-emitter saturation Voltage vs. Forward current

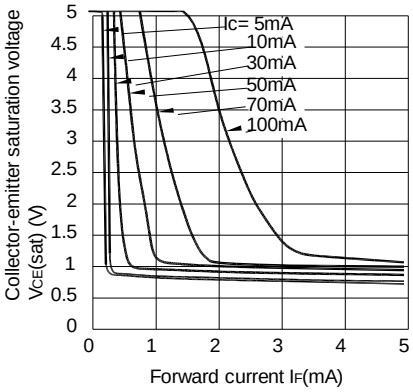


Fig.4 Forward Current vs. Forward Voltage

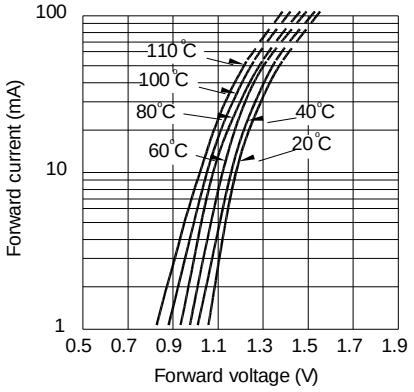


Fig.5 Current Transfer Ratio vs. Forward Current

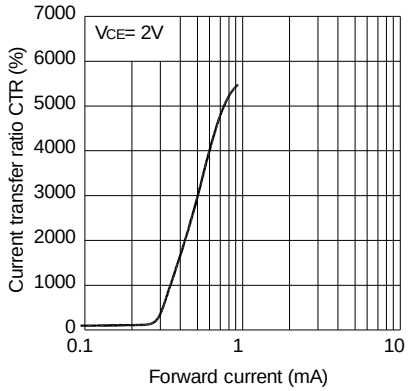


Fig.6 Collector Current vs. Collector-emitter Voltage

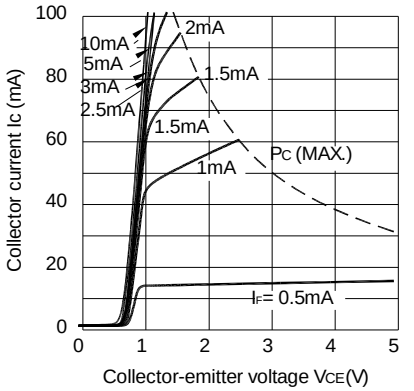


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

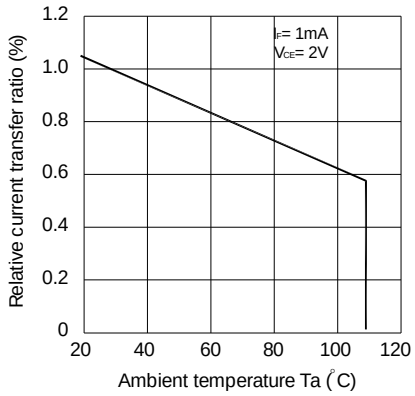


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

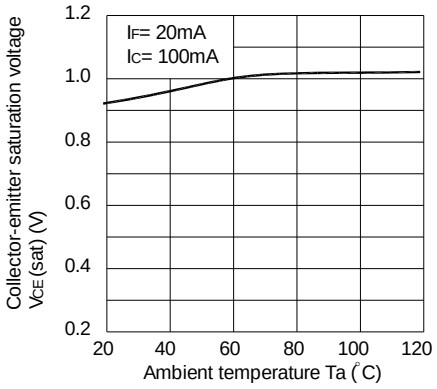


Fig.9 Collector Dark Current vs. Temperature

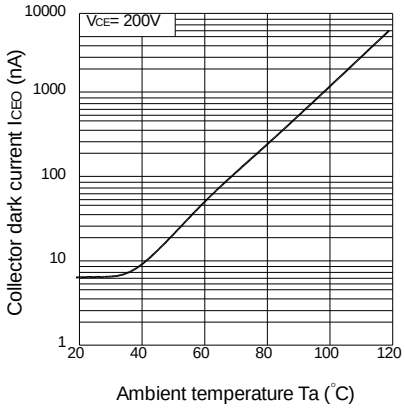


Fig.10 Response Time vs. Load Resistance

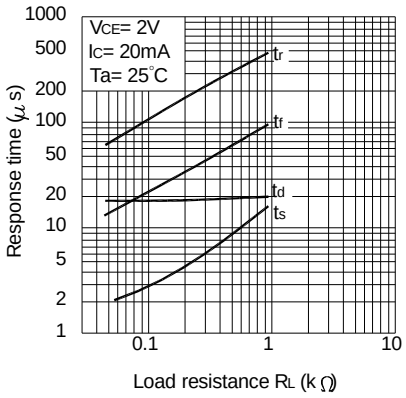
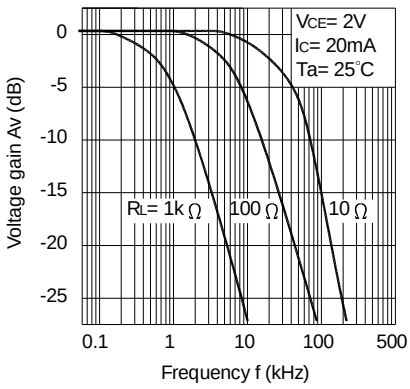
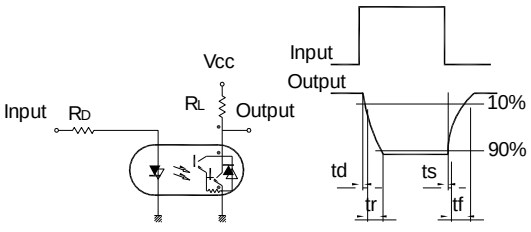


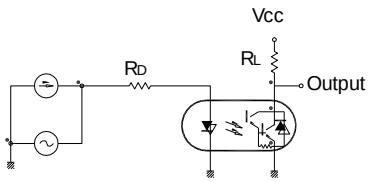
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

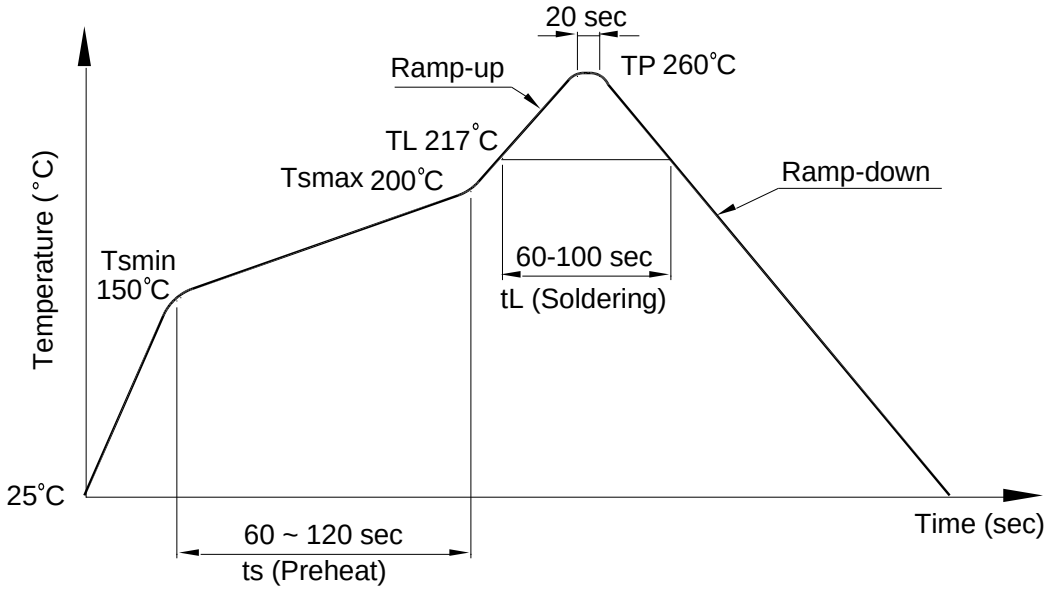


6. TEMPERATURE PROFILE OF SOLDERING

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 ~ 100 sec
Peak Temperature (T_P)	260˚C
Ramp-up rate	3˚C / sec max.
Ramp-down rate	3~6˚C / sec



6.2 Wave soldering (JEDEC22A111 compliant)

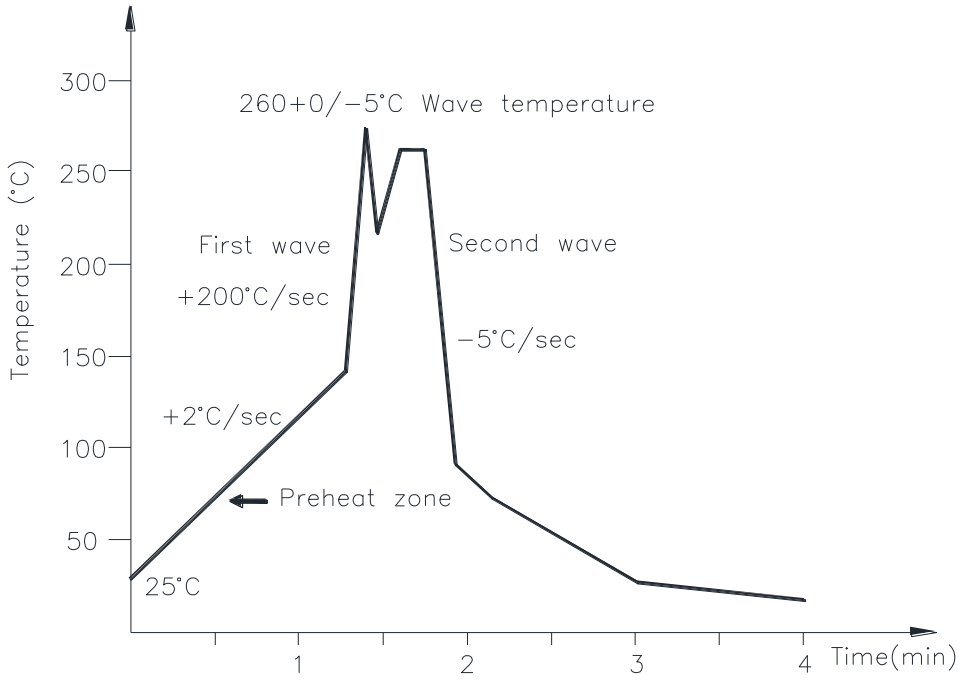
One time soldering is recommended within the condition of temperature.

Temperature: 260+0/-5˚C

Time: 10 sec.

Preheat temperature:25 to 140˚C

Preheat time: 30 to 80 sec.



6.3 Hand soldering by soldering iron

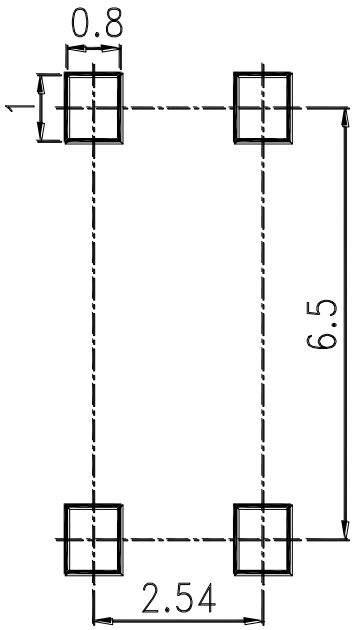
Allow single lead soldering in every single process. One time soldering is recommended.

Temperature: 380+0/-5˚C

Time: 3 sec max.

7. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



8. NAMING RULE

LTV-352T-(1)-G

DEVICE PART NUMBER

(1) TAPING TYPE (TP,TP1)
LTV-352T has tape and reel solution.
Please refer to orientation of taping on Page P3

(2) Halogen free option

Example : LTV-352T-TP-G

LTV 352T(1)-V-G

DEVICE PART NUMBER

(1) TAPING TYPE (TP,TP1)
LTV-352T has tape and reel solution.
Please refer to orientation of taping on Page P3

(2) VDE option

(3) Halogen free option

Example : LTV352TTP-V-G

9. 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.