



Spec No.: DS70-2001-010 Effective Date: 05/28/2014

Revision: K

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4



1. **DESCRIPTION**

1.1 Features

- Current transfer ratio (CTR : MIN. 50% at $I_F = 5mA$, $V_{CE} = 5V$)
- High input-output isolation voltage (Viso = 3,750Vrms)
- High collector-emitter voltage (V_{CEO} = 80V)
- Subminiature type (The volume is smaller than that of conventional DIP type by as far as 30%)
- Employs double transfer mold technology
- Mini-flat package: 2.0mm profile: LTV-356T
- Safety approval

UL 1577

VDE DIN EN60747-5-5 (VDE 0884-5),

CSA CA5A

CQC GB4943.1-2011/ GB8898-2011

FIMKO/DEMKO/SEMKO/NEMKO

■ RoHS Compliance

All materials be used in device are followed EU RoHS directive (No.2002/95/EC).

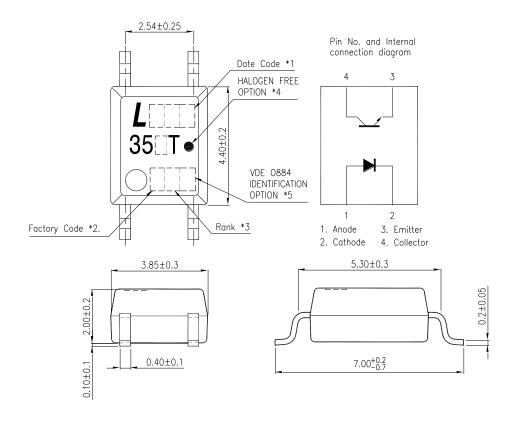
- ESD pass HBM 8000V/ MM2000V/ CDM2000V
- MSL class1

1.2 Applications

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



2. PACKAGE DIMENSIONS



Part No: LTV-356T

Notes:

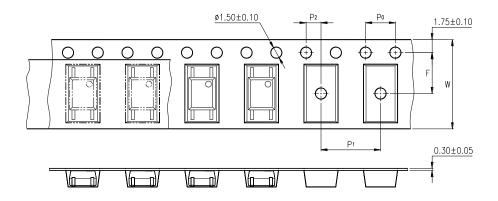
- 1. 3-digit date code.
- 2. Factory identification mark shall be marked (W: China -CZ, X: China -TJ, Y: Thailand)
- 3. Rank shall be or shall not be marked.
- 4. "●" for halogen free option.
- 5. "4"or"V" for VDE option.



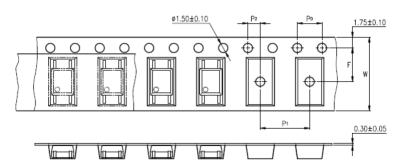
3. TAPING DIMENSIONS

P/N: LTV-356T

TP1 MINI FLAT (3000pcs/reel): No Suffix & Suffix "TP1"



TP MINI FLAT (3000pcs/reel) : Suffix "-TP"



Description	Symbol	Dimension in mm (inch)
Tape wide	W	12±0.3 (0.47)
Pitch of sprocket holes	P ₀	4±0.1 (0.15)
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)



4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25°C

	Parameter	Symbol	Rating	Unit
	Forward Current	I _F	50	mA
Input	Reverse Voltage	V_{R}	6	V
	Power Dissipation	Р	70	mW
	Collector - Emitter Voltage	V_{CEO}	80	V
Outout	Emitter - Collector Voltage	V_{ECO}	6	V
Output Collector Current		Ic	50	mA
	Collector Power Dissipation	Pc	150	mW
	Total Power Dissipation	P_{tot}	170	mW
1.	Isolation Voltage	$V_{\rm iso}$	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.	Тур.	Max.	Unit	Test Condition
Input	Forward Voltage	V _F	_	1.2	1.4	V	I _F =20mA
	Reverse Current	I _R	_	_	10	μΑ	V _R =4V
	Terminal Capacitance	Ct	_	30	250	pF	V=0, f=1KHz
	Collector Dark Current	I _{CEO}	_	_	100	nA	V _{CE} =20V, I _F =0
Output	Collector-Emitter Breakdown Voltage	BV _{CEO}	80	_	_	V	I _C =0.1mA, I _F =0
	Emitter-Collector Breakdown Voltage	BV _{ECO}	6	_	_	V	I _E =10μΑ, I _F =0
TRANSFER CHARACTERISTICS	Collector Current	Ic	2.5	_	30	mA	I _F =5mA
	Current Transfer Ratio	CTR	50	_	600	%	V _{CE} =5V
	Collector-Emitter Saturation Voltage	V _{CE(sat)}	_	_	0.2	V	I _F =20mA I _C =1mA
	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
	Response Time (Rise)	tr	_	4	18	μS	V _{CE} =2V,
	Response Time (Fall)	tf	_	3	18	μS	I_C =2mA R_L =100 Ω ,

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



5. RANK TABLE OF CURRENT TRANSFER RATIO CTR

Parameter	CTR Rank	Min	Max	Condition
DC Current Transfer Ratio	Α	80	160	
	В	130	260	
	С	200	400	I _F =5mA, V _{CE} =5V, Ta=25°C
	D	300	600	1, 21111 1, 102 21, 12 20
	A or B or C or D or No mark	50	600	



6. CHARACTERISTICS CURVES

Fig.1 Forward Current vs.

Ambient Temperature

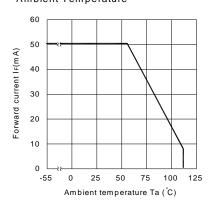


Fig.2 Collector Power Dissipation vs.

Ambient Temperature

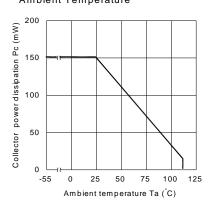


Fig.3 Collector-emitter Saturation
Voltage vs. Forward Current

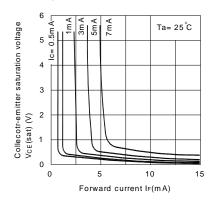


Fig.4 Forward Current vs. Forward Voltage

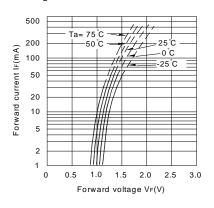


Fig.5 Current Transfer Ratio vs.

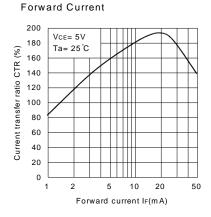


Fig.6 Collector Current vs.

Collector-emitter Voltage

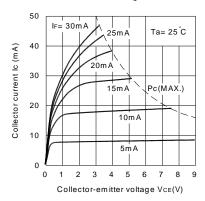




Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

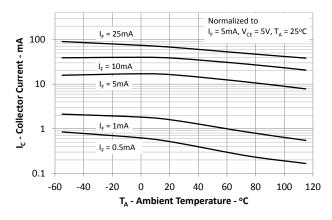


Fig.9 Collector Dark Current vs.

Ambient Temperature

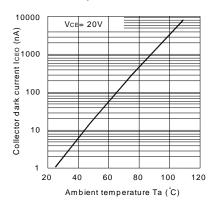


Fig.11 Frequency Response

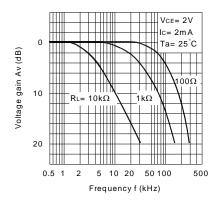


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

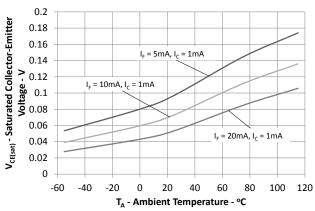
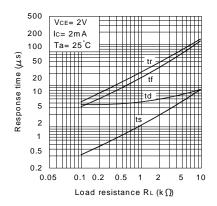
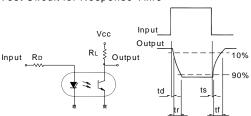


Fig.10 Response Time vs. Load

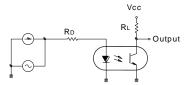




Test Circuit for Response Time



Test Circuit for Frequency Response



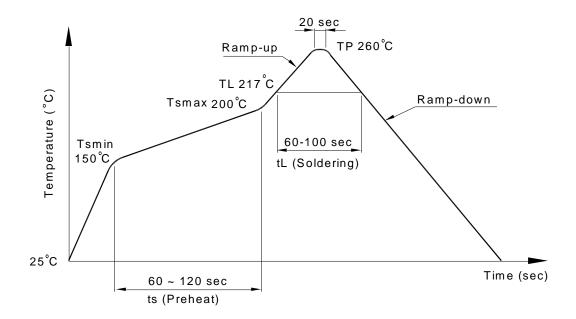


7. TEMPERATURE PROFILE OF SOLDERING

7.1 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		





7.2 Wave soldering (JEDEC22A111 compliant)

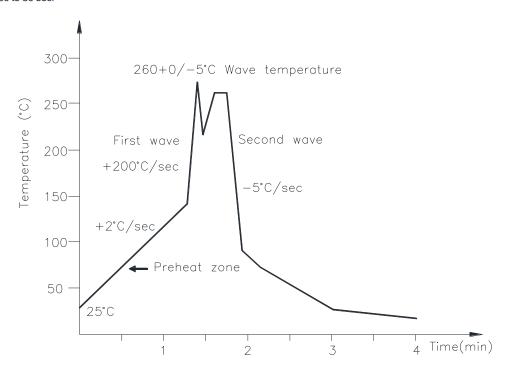
One time soldering is recommended within the condition of temperature.

Temperature: 260+0/-5°C

Time: 10 sec.

Preheat temperature:25 to 140°C

Preheat time: 30 to 80 sec.



7.3 Hand soldering by soldering iron

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

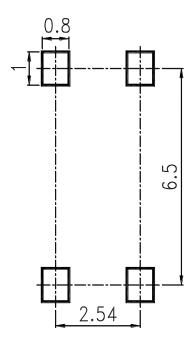
Temperature: 380+0/-5°C

Time: 3 sec max.



8. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



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.