FEATURES

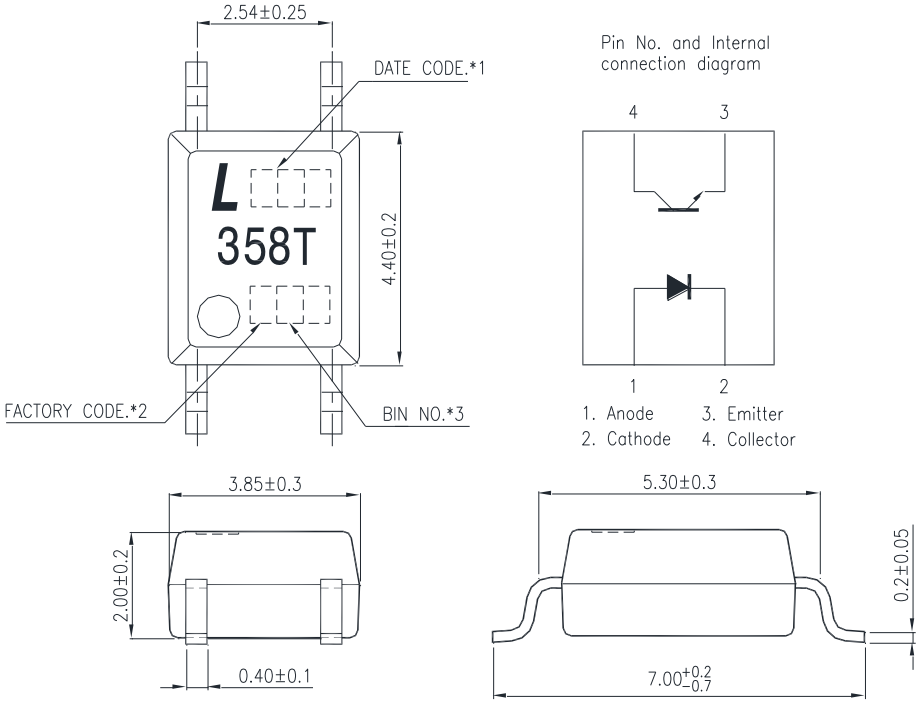
* Current transfer ratio
  (CTR : MIN. 80% at I_F = 5mA, V_{CE} = 5V)
* Isolation voltage between input and output LTV-358T
  (V_{iso} = 3,750Vrms)
* High collector-emitter voltage
  (V_{CEO} = 120V)
* Employs double transfer mold technology
* Subminiature type
  (The volume is smaller than that of conventional DIP type by as far as 30%)
* Mini-flat package :
  2.0mm profile : LTV-358T
* Safety approval
  UL, CSA, FIMKO NEMKO, DEMKO, SEMKO, VDE* approved
  (*Requires “V” ordering option)
* RoHS compliance

APPLICATIONS

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

OUTLINE DIMENSIONS

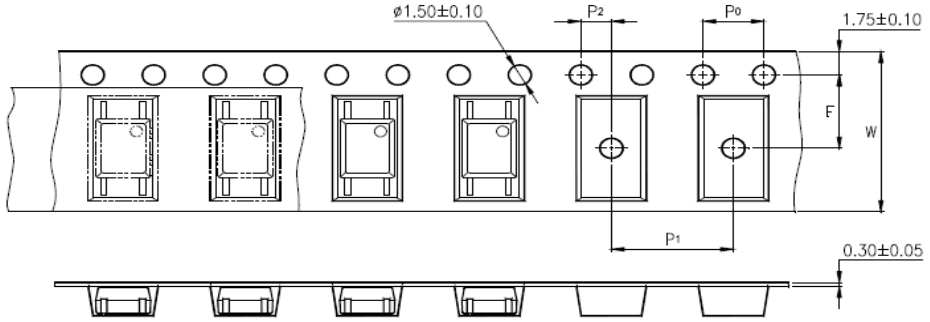
LTV-358T :



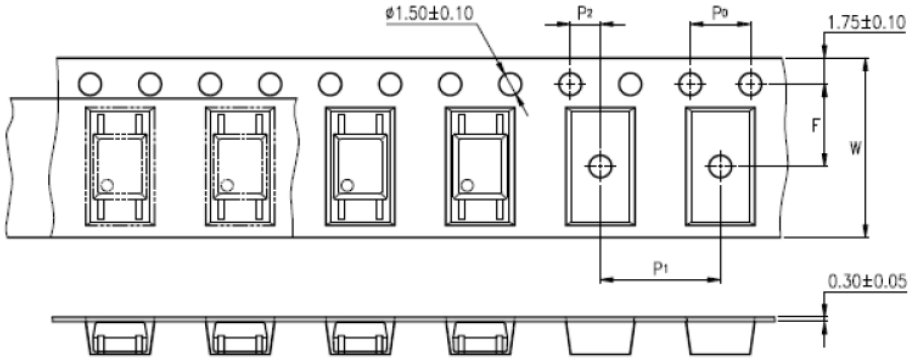
*1. 3-digit date code.
*2. Factory identification mark shall be marked (W: China-CZ, X: China-TJ, Y: Thailand).
*3. Rank shall be or shall not be marked.

TAPING DIMENSIONS

TP1 MINI FLAT (3000pcs/reel) : Suffix "-TP1"



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



Content Quantity

Model	Reel volume (pcs/Reel)	Inner Box volume (Reel/Box)	Outer carton volume (Box/Carton)	Total volume (pcs/outer carton)
MFP TP/TP1	3000	2	10	60000

Description	Symbol	Dimensions 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)

ABSOLUTE MAXIMUM RATING

(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
OUTPUT	Collector - Emitter Voltage	V_{CEO}	120	V
	Emitter - Collector Voltage	V_{ECO}	6	V
	Collector Current	I_C	50	mA
	Collector Power Dissipation	P_C	150	mW
Total Power Dissipation		P_{tot}	170	mW
*1 Isolation Voltage		V_{iso}	3,750	Vrms
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	—	1.2	1.4	V	I_F=20mA
	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}	—	—	100	nA	V_{CE}=40V, I_F=0
	Collector-Emitter Breakdown Voltage	BV_{CEO}	120	—	—	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	—	20	mA	I_F=5mA V_{CE}=5V
	*1 Current Transfer Ratio	CTR	80	—	400	%	
	Collector Current	I_C	0.2	—	—	mA	I_F=1mA V_{CE}=5V
	*1 Current Transfer Ratio	CTR	20	—	—	%	
	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	C_f	—	0.6	1	pF	V=0, f=1MHz
	Response Time (Rise)	t_r	—	4	18	μs	V_{CE}=2V, I_C=2mA R_L=100Ω
	Response Time (Fall)	t_f	—	3	18	μs	

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

RANK TABLE OF CURRENT TRANSFER RATIO CTR

MODEL NO.	RANK MARK	CTR (%)	CTR (%)
LTV-358T	A	80 ~ 160	>20
	B	130 ~ 260	>45
	C	200 ~ 400	>70
	A or B or C or No Rank	80 ~ 400	>20

CONDITIONS	I_F = 5 mA V_{CE} = 5 V Ta = 25 °C	I_F = 1 mA V_{CE} = 5 V Ta = 25 °C

CHARACTERISTICS CURVES

Fig.1 Forword Current vs. Ambient Temperatute

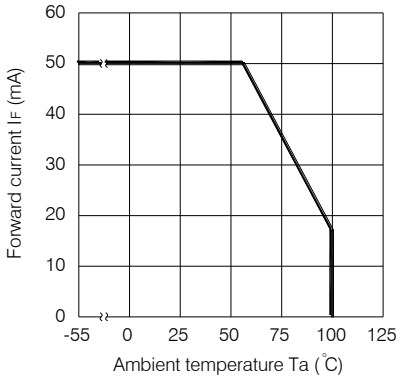


Fig.2 Collector Power Dissiption vs. Ambient Temperature

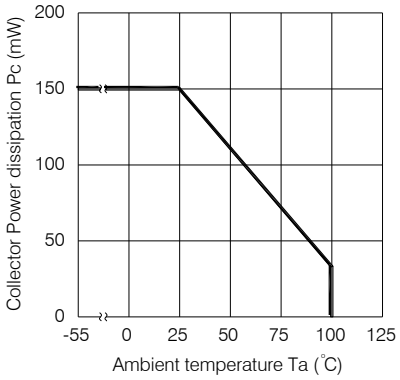


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

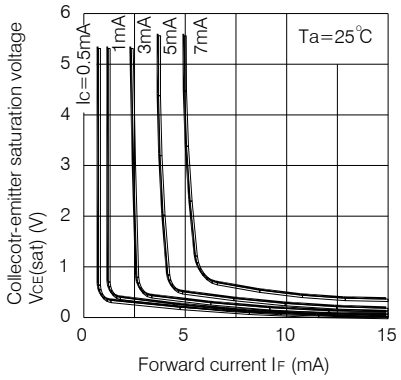


Fig.4 Forward Current vs. Forward Voltage

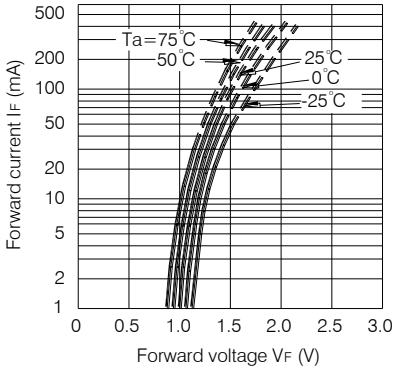


Fig.5 Current Transfer Ratio vs. Forward Current

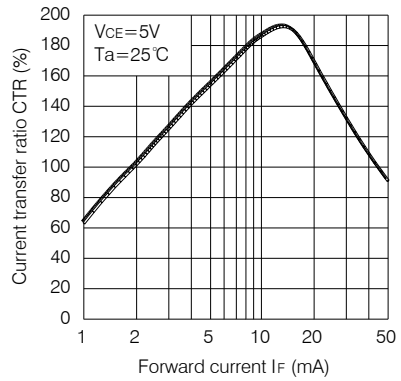
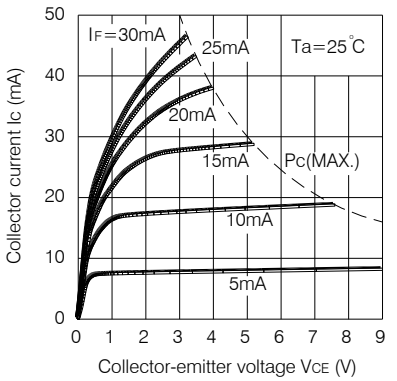


Fig.6 Collector Current vs. Collector-emitter Voltage



CHARACTERISTICS CURVES

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

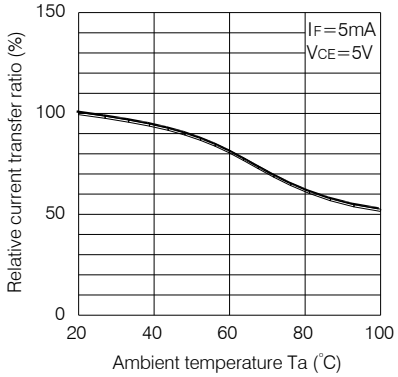


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

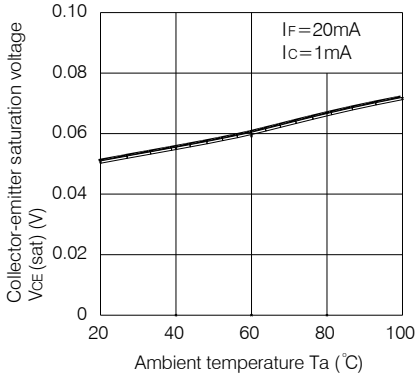


Fig.9 Collector Dark Current vs. Ambient Temperature

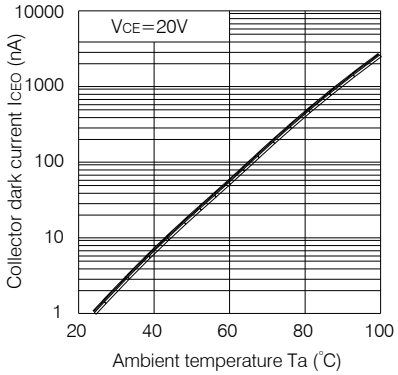


Fig.10 Response Time vs. Load Resistance

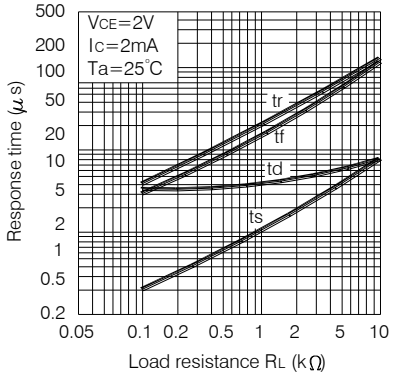
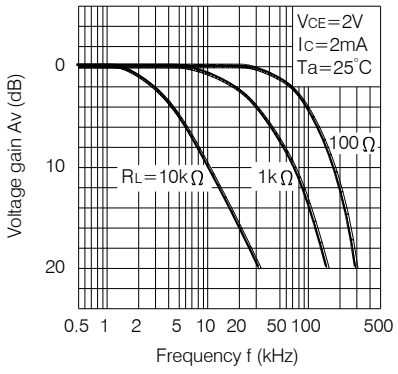
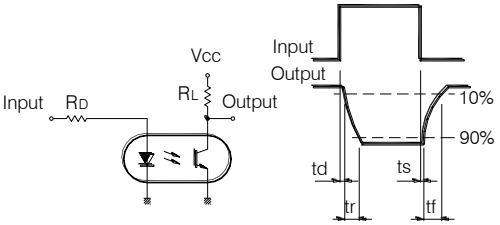


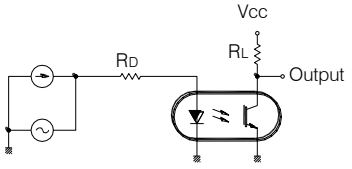
Fig.11 Frequency Response



Test Circuit for Response Time



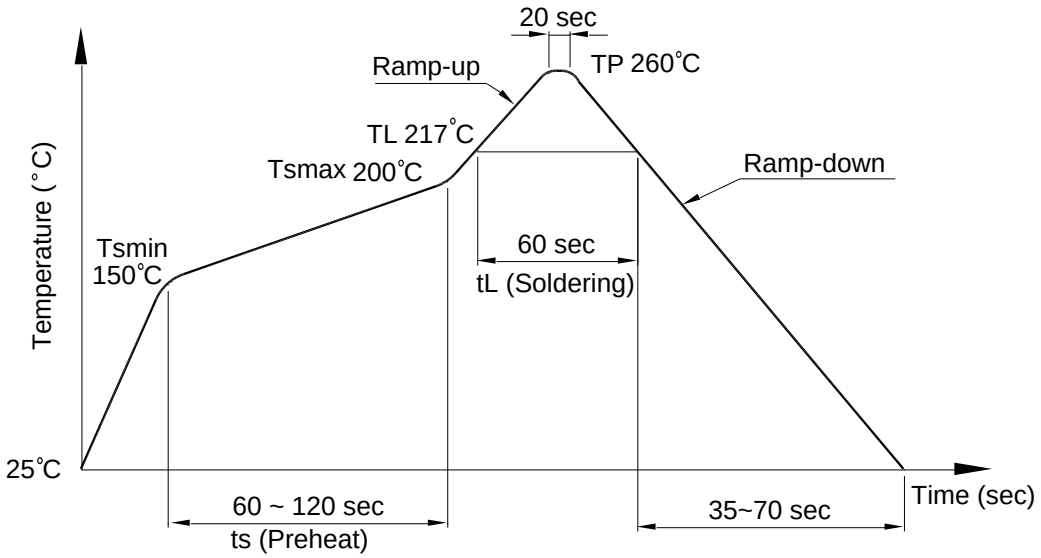
Test Circuit for Frequency Response



TEMPERATURE PROFILE OF SOLDERING REFLOW

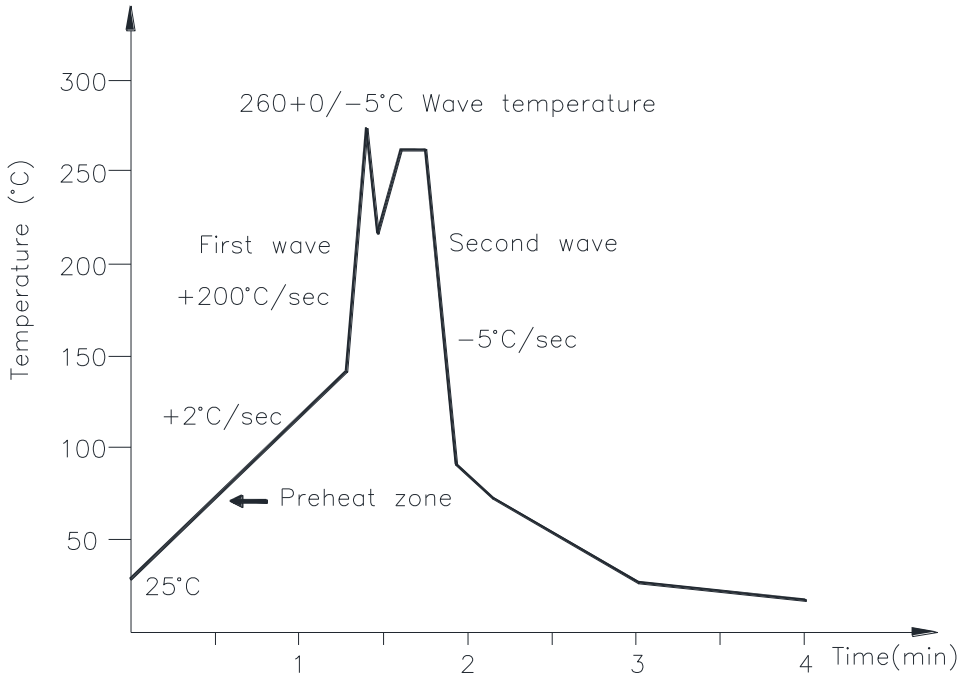
(1) IR Reflow soldering (JEDEC-STD-020C compliant)
One time soldering reflow is recommended within the condition of temperature and time profile shown below.

Profile item	Conditions
Preheat - Temperature Min (T_{Smin}) - Temperature Max (T_{Smax}) - Time (min to max) (ts)	 150˚C 200˚C 90±30 sec
Soldering zone - Temperature (T_L) - Time (t_L)	 217˚C 60 sec
Peak Temperature (T_P)	260˚C
Ramp-up rate	3˚C / sec max.
Ramp-down rate	3~6˚C / sec



TEMPERATURE PROFILE OF SOLDERING REFLOW

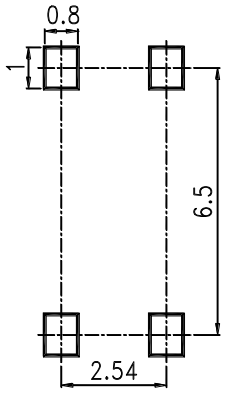
(2) Wave soldering (JEDEC22A111 compliant)
One time soldering is recommended within the condition of temperature.
Temperature: 260+0/-5˚C
Time: 10 sec.
Preheat temperature:25 to 140˚C
Preheat time: 30 to 80 sec.



(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.

RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit : mm



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- 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 body in solder paste is not recommended.

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