

Features

- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output (Viso =5000V rms)
- Collector - emitter breakdown voltage $BV_{CEO} \geq 80\text{V}$
- Operating Temperature: $-55^{\circ}\text{C} \sim 110^{\circ}\text{C}$
- VDE: 40034140
- UL : E340048
- CQC :CQC24001438922

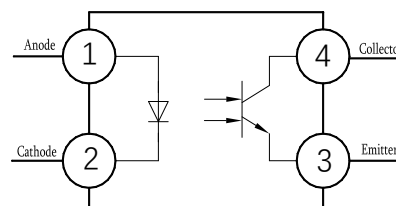
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Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as Fan Heaters, etc
- Signal transmission between circuits of different potentials and impedances

Mechanical Data

- Case: DIP-4L, DIP-4L(M), SMD-4L, SMD-4L(SS)
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



Ordering Information

BL 817 (M) (G) (X) - (U) (N) (Y)

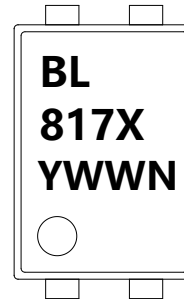
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|-------------|-----------------------|---|--------------------------------------|--------------------------------|--|-------------------------------------|---|---|
| ① | ② | ③ | ④ | ⑤ | | ⑥ | ⑦ | ⑧ |
| ① Brand(BL) | ② Product series(817) | ③ Package type(DIP-4L:None, DIP-4L(M):M,SMD-4L:S,SMD-4L(SS):SS) | ④ Halogen option(None :Halogen free) | ⑤ CTR Bank(A,B,C,D ...or None) | | ⑥ Lead frame (None: Copper; F:Iron) | ⑦ Customer option 1 (0-9 or A-Z ornone) | ⑧ Customer option 2 (0-9 or A-Z ornone) |

Part Number	Package	Shipping Quantity	Marking Code
BL817X ^{*1}	DIP-4L	100 pcs / Tube	BL817X ^{*1}
BL817MX ^{*1}	DIP-4L(M)	100 pcs / Tube	BL817X ^{*1}
BL817SX ^{*1}	SMD-4L	2000 pcs / Tape & Reel	BL817X ^{*1}
BL817SSX ^{*1}	SMD-4L(SS)	2000 pcs / Tape & Reel	BL817X ^{*1}

Notes 1: X denotes CTR Rank : A, B, C, Dor None.

Marking Information

- "BL" denotes brand
- "X" denotes CTR Rank : A, B, C, D....or None.
- "Y" denotes Year : A(2024), B(2025), C(2026)
- "WW" denotes Week's number
- "N" denotes the day of Week.



Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current ^{*1}	I_{FM}	1	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	70	mW
Output	Collector Power Dissipation	P_C	150	mW
	Collector Current	I_C	50	mA
	Collector-Emitter Voltage	V_{CEO}	80	V
	Emitter-Collector Voltage	V_{ECO}	7	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	P_{TOT}	200	mW
Isolation Voltage ^{*2}	V_{ISO}	5000	V _{rms}
Rated Impulse Isolation Voltage	V_{IOTM}	8000	V
Rated Repetitive Peak Isolation Voltage	V_{IORM}	1500	V
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	430	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	350	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Lead	$R_{\theta JL}$	368	$^\circ\text{C/W}$
Operating Temperature	T_{OPR}	-55 ~ +110	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +125	$^\circ\text{C}$
Soldering Temperature ^{*3}	T_{SOL}	260	$^\circ\text{C}$

Notes:

1. Pulse width $\leq 1\mu\text{s}$, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	$I_F = 20\text{mA}$	-	1.2	1.4	V
	Peak Forward Voltage	V_{FM}	$I_{FM} = 0.5\text{A}$	-	-	3.0	V
	Reverse Current	I_R	$V_R = 4\text{V}$	-	-	10	μA
	Input Capacitance	C_{in}	$V_R = 0\text{V}$, $f = 1\text{kHz}$	-	30	250	pF
Output	Collector-Emitter Dark	I_{CEO}	$V_{CE} = 20\text{V}$, $I_F = 0$	-	-	100	nA

	Current						
	Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C = 0.1\text{mA}, I_F = 0$	80	-	-	V
	Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E = 10\mu\text{A}, I_F = 0$	7	-	-	V
Transfer Characteristics	Collector Current	I_C	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	2.5	-	30	mA
	Current Transfer Ratio	CTR	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	50	-	600	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}, I_C = 1\text{mA}$	-	0.1	0.2	V
	Isolation Resistance	R_{IO}	$V_{IO} = 500\text{Vdc}$ 40~60% R.H.	1×10^{12}	-	-	Ω
	Isolation current	R_{isc}	DC6000V, 40~60% R.H.	-	-	2	μA
	Floating Capacitance	C_{IO}	$V_{IO} = 0, f = 1\text{MHz}$	-	0.6	1.0	pF
	Cut-off frequency	f_c	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$	-	80	-	kHz
	Turn On Time	T_{on}	$V_{CE} = 2\text{V}, R_L = 100\Omega$	-	4	18	μs
	Turn Off Time	T_{off}	$I_C = 2\text{mA}$	-	3	18	

Rank Table of Current Transfer Ratio CTR

Rank Mark	Min. (%)	Max. (%)	Condition
L	50	100	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$
X	100	200	
A	80	160	
B	130	260	
C	200	400	
D	300	600	
No mark	50	600	

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Fig.1 Allowable Forward Current vs. Ambient Temperature

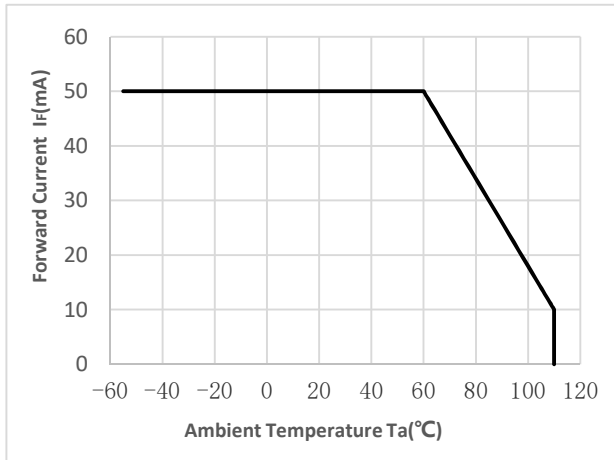


Fig.2 Allowable collector power dissipation vs. Ambient Temperature ($^\circ\text{C}$)

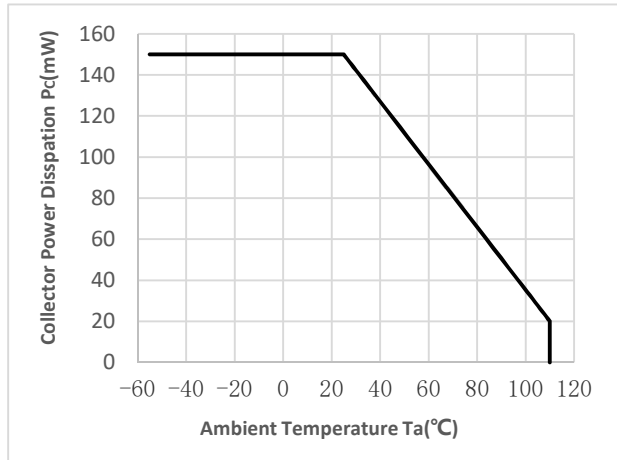


Fig.3 Relative Current Transfer Ratio vs. Forward Current

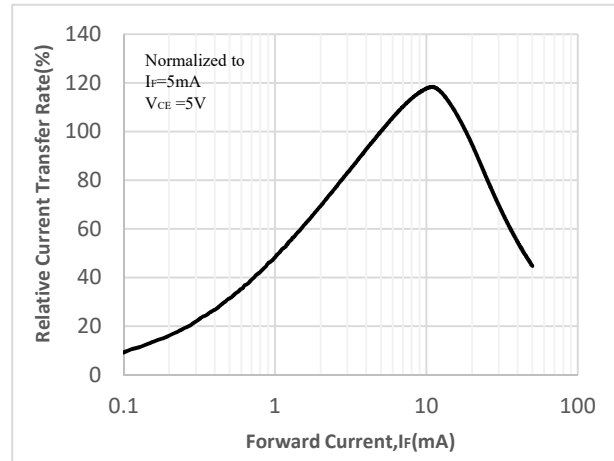


Fig.4 Forward Current vs. Forward Voltage

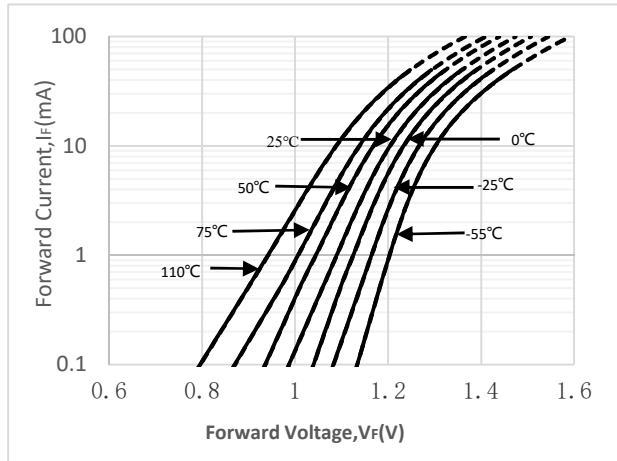


Fig.5 Collector Current vs. Collector-emitter Voltage

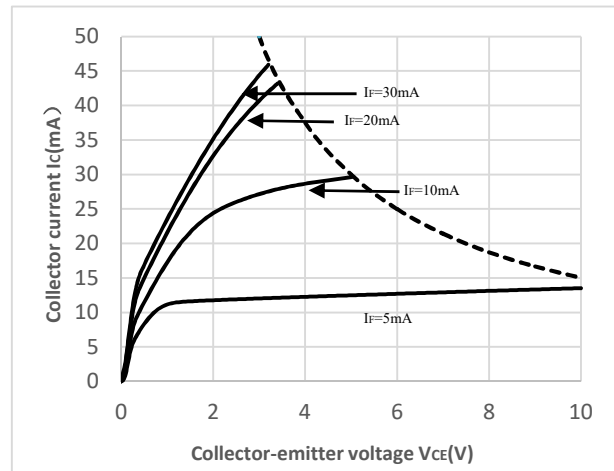


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature

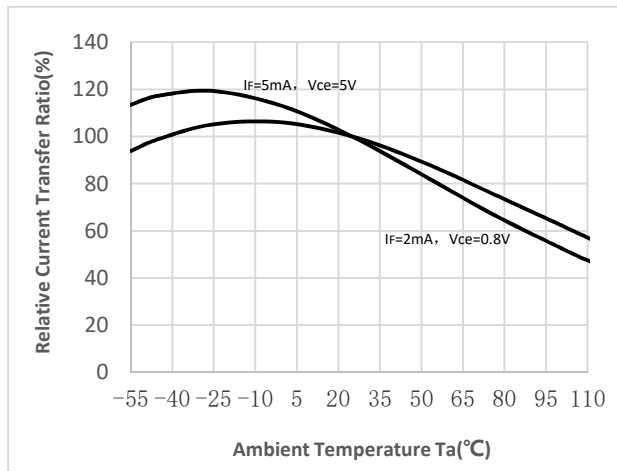


Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

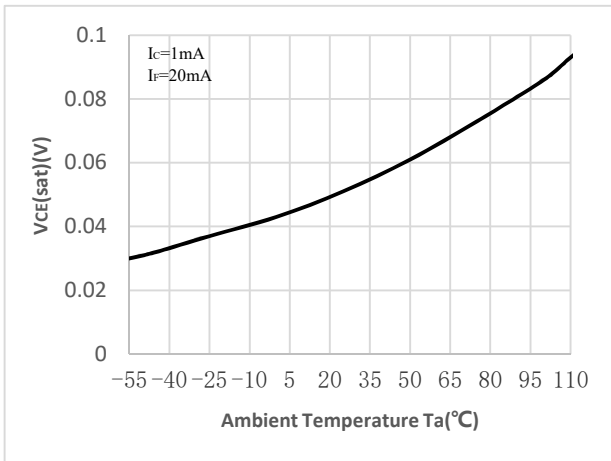


Fig.8 Collector Dark Current vs. Ambient Temperature

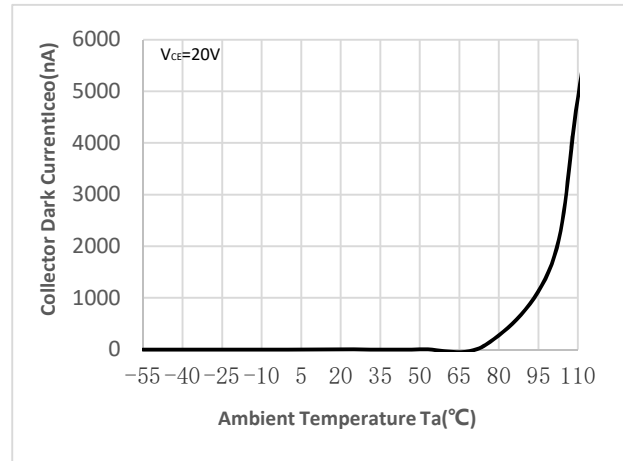


Fig.9 Response Time vs. Load Resistance

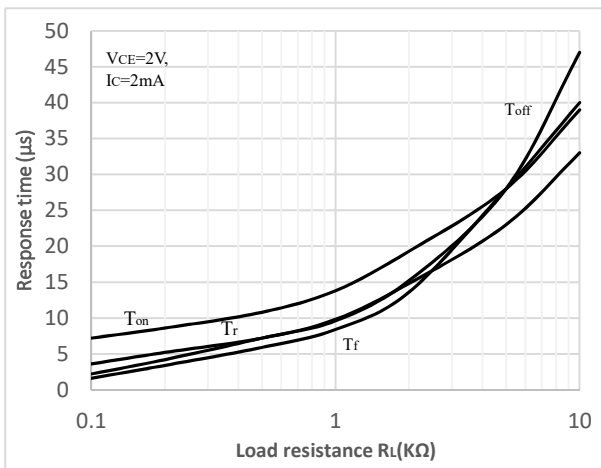


Fig.10 Frequency Response

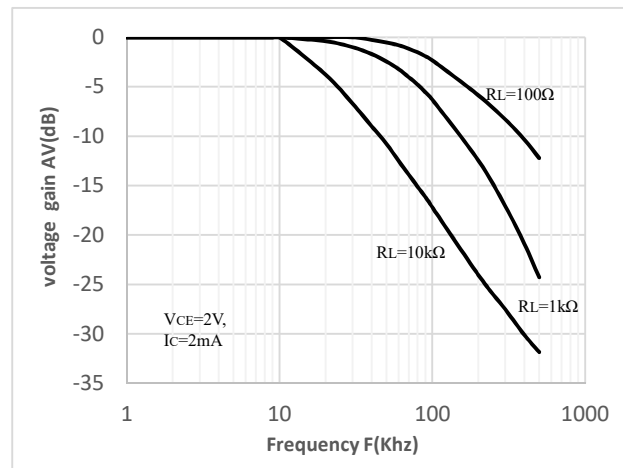


Fig.11 Collector-emitter Saturation Voltage vs. Forward Current

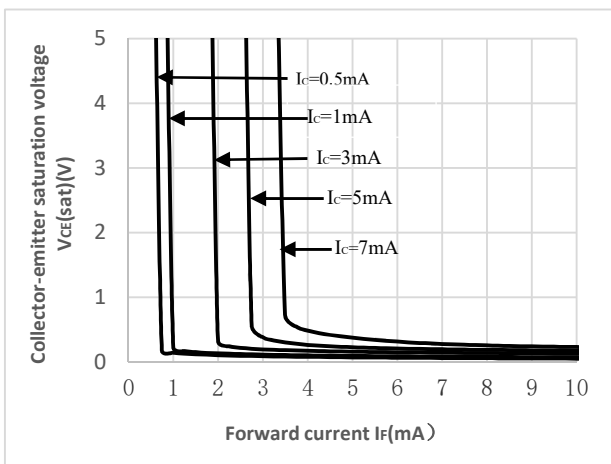
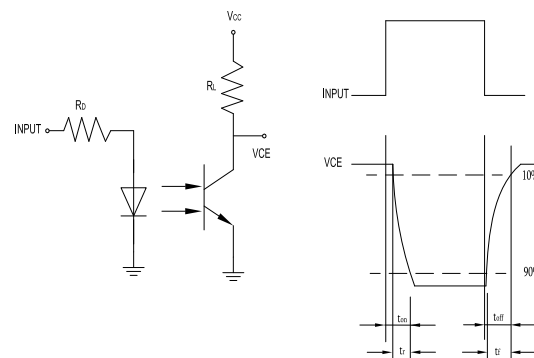
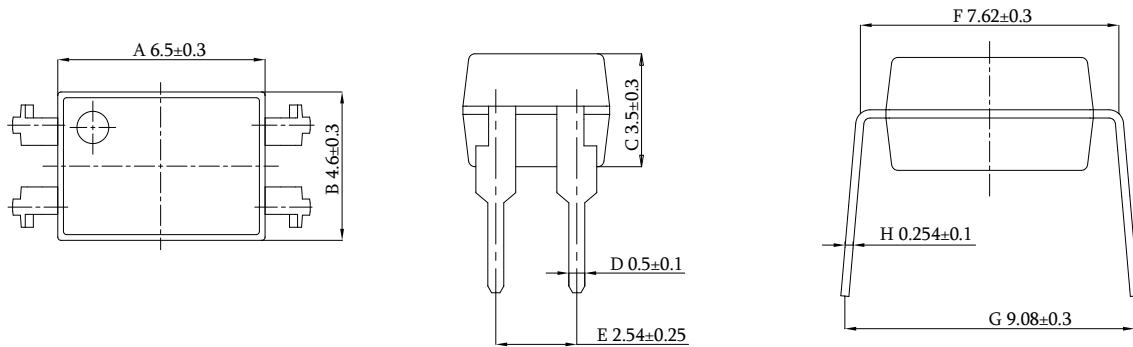


Fig.12 Switching Time Test Circuit & Waveforms

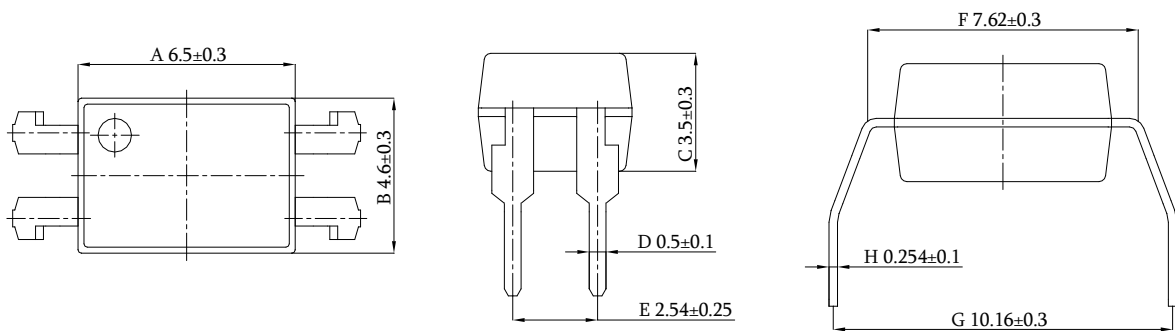


Package Outline Dimensions (unit: mm)

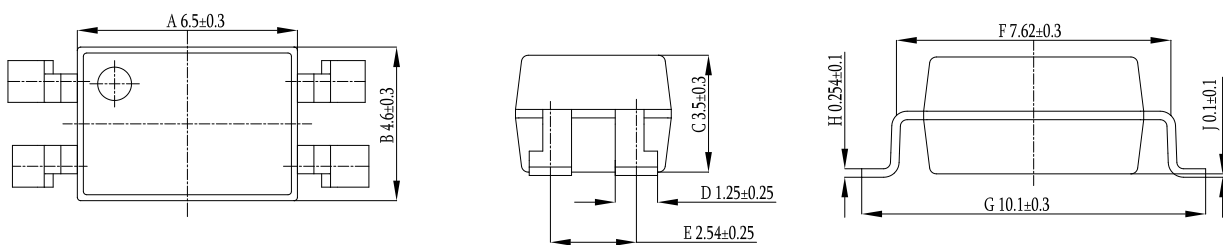
DIP-4L



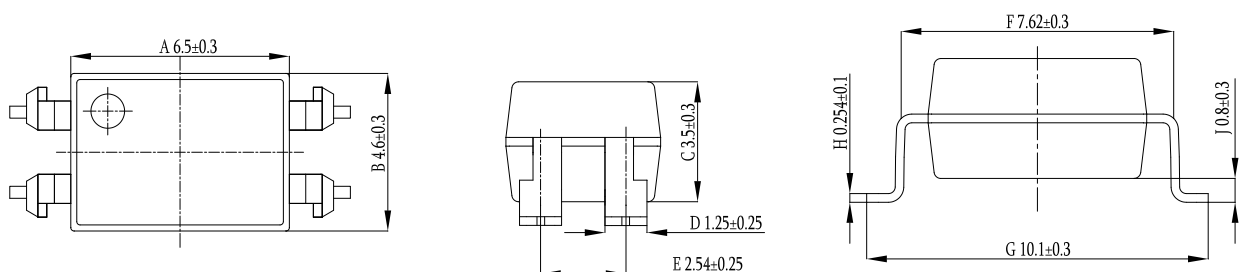
DIP-4L (M)



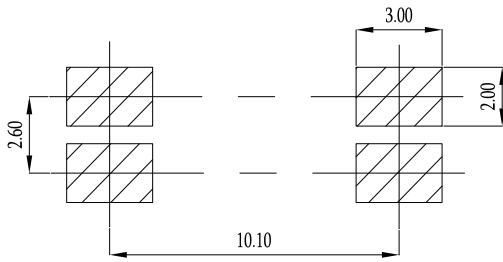
SMD-4L



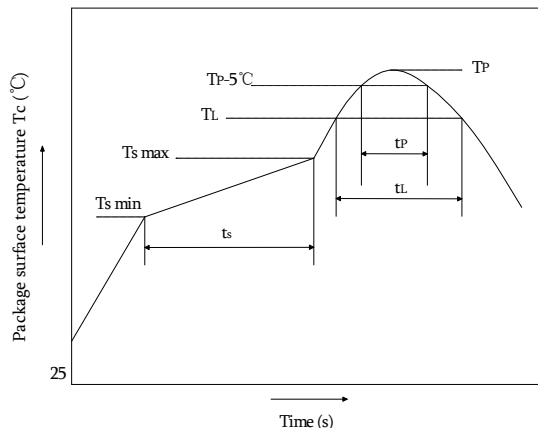
SMD-4L(SS)



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

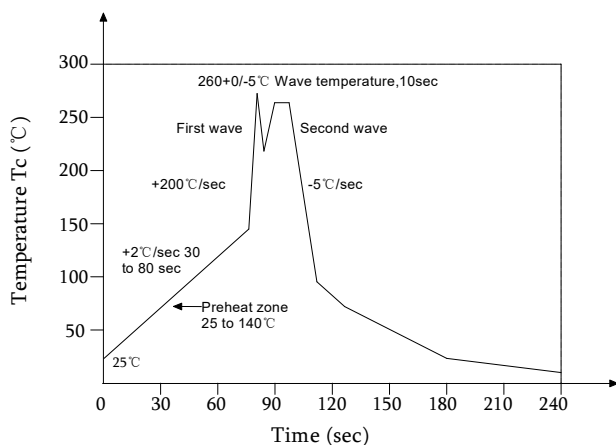


	Symbol	Min	Max	Unit
Preheat temperature	T_s	150	200	$^\circ\text{C}$
Preheat time	t_s	60	120	s
Ramp-up rate(T_L to T_P)			3	$^\circ\text{C/s}$
Liquidus temperature	T_L	217		$^\circ\text{C}$
Time above T_L	t_L	60	150	s
Peak temperature	T_P		260	$^\circ\text{C}$
Time during which T_c is between ($T_P - 5$) and T_P	t_P		30	s
Ramp-down rate(T_P to T_L)			6	$^\circ\text{C/s}$

Note:

Reflow soldering is recommended at the temperatures and times shown, no more than three times.

Wave soldering



Profile feature	
Average ramp-up rate	$\sim 200^\circ\text{C/s}$
Heating rate during preheat	1°C/s to 2°C/s typical; 4°C/s maximum
Final preheat temperature T_s	$\sim 130^\circ\text{C}$
Preheat time (25°C to T_s)	$> 60\text{s}$
Peak temperature T_P	260°C
Time within peak temperature t_P	10s
Ramp-down rate	5°C/s maximum

Soldering with hand soldering iron

- Hand soldering iron is only used for product rework or sample testing.
- Hand soldering iron requirements: Temperature: $360^\circ\text{C} \pm 5^\circ\text{C}$ within 3s.

Packing

Package Type	Packing Form	Quantity per Tube & Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
DIP-4L/ DIP-4L(M)	Tube(500mm)	100 pcs/tube	25 tubes /box	12 boxes /ctn	190*670mm	520*105*50mm	545*372*235mm	Straight insert type material tube
SMD-4L/ SMD-4L(SS)	Reel($\phi 330$ mm)	2000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm /min.

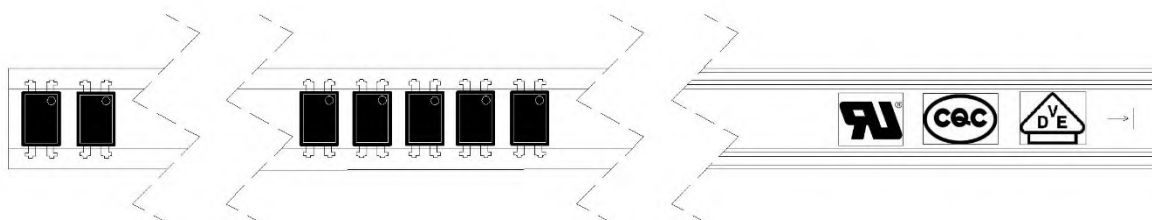
■ Summary table

■ DIP-4L/ DIP-4L(M) (Tube)

Qty/ tube : 100 pcs. Qty/box: 2500 pcs.

Qty/ctn : 30000 pcs.

Schematic: (unit:mm)

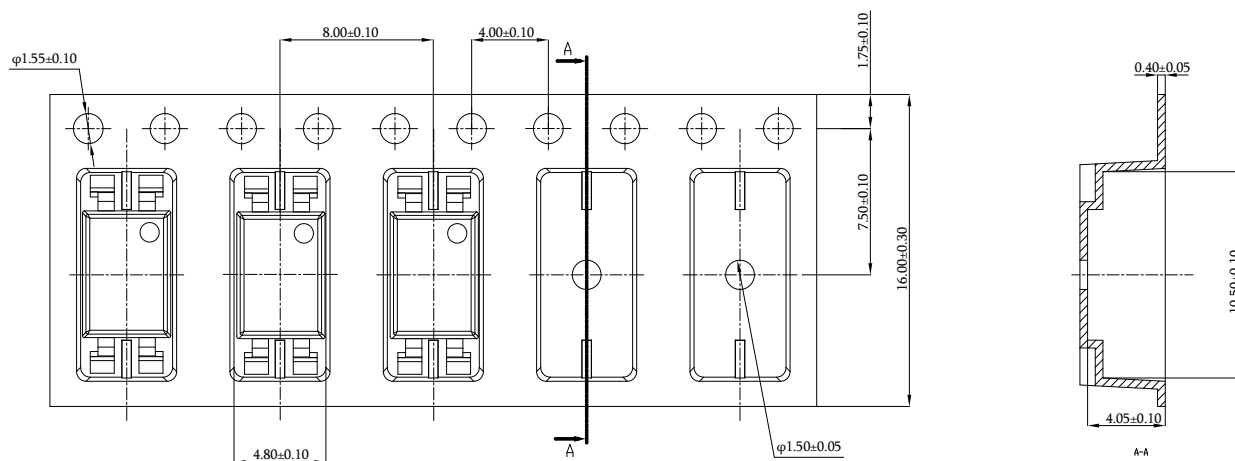


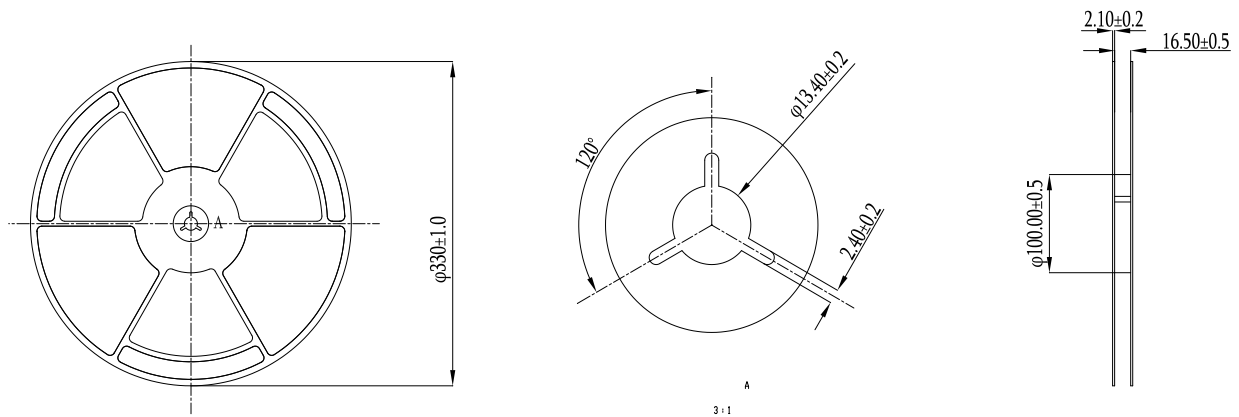
■ SMD-4L/ SMD-4L(SS) (Reel)

Qty/reel: 2000 pcs. Qty/box: 4000 pcs.

Qty/ctn : 20000 pcs.

Schematic: (unit:mm)





IMPORTANT NOTICE

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No.	Revise contents			Rev.	Reviser	Date
1	文件新定制			1.0	李令媛	2024.3.5
2	增加分档备注说明			1.1	李令媛	2024.9.29
3	增加档位 X:100-200			1.2	李令媛	2024.10.30
4	修改产品渲染图及 S 脚 POD 图			1.3	李令媛	2024.12.26
5	POD 图纸肩宽由 8.1 变更为 7.6			1.4	李令媛	2025.3.13
6	新增 SMD-4L(SS)封装			1.5	李令媛	2025.6.10
7	新增安规证书信息			1.6	李令媛	2025.9.8
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