

Features

- Very high speed – 10 MBit/s
- High isolation voltage between input and output ($V_{iso} = 5000V_{rms}$)
- Operating Temperature: $-40^{\circ}C \sim 85^{\circ}C$
- Logic gate output

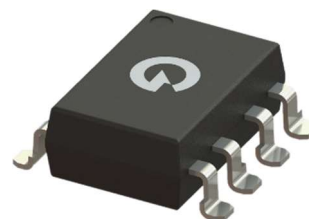
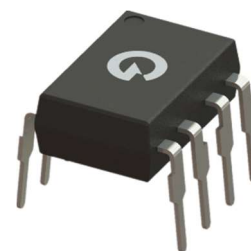
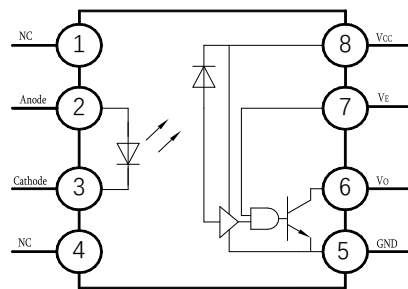
HF

Applications

- Ground loop elimination
- LSTTL to TTL, LSTTL or 5-volt CMOS
- Line receiver, data transmission
- Data multiplexing
- Switching power supplies
- Pulse transformer replacement
- Computer-peripheral interface

Mechanical Data

- Case: SMD-8L、DIP-8L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



Truth Table (Positive Logic) :

Input	EN	Output
ON	H	L
OFF	H	H
ON	L	H
OFF	L	H
ON	NC	L
OFF	NC	H

Ordering Information

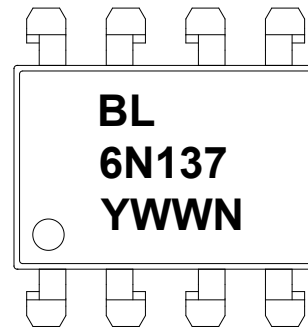
BL 6N137 (M) (G) (X) - (U) (N) (Y)

- | | | | | | | | |
|-------------|-------------------------|--------------------------------------|--------------------------------------|------------------|-----------------------------|--|--|
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| ① Brand(BL) | ② Product series(6N137) | ③ Package type(DIP-8L:None,SMD-8L:S) | ④ Halogen option(None :Halogen free) | ⑤ CTR Bank(None) | ⑥ Lead frame (None: Copper) | ⑦ Customer option 1 (0-9 or A-Z or none) | ⑧ Customer option 2 (0-9 or A-Z or none) |

Part Number	Package	Shipping Quantity	Marking Code
BL6N137	DIP-8L	100 pcs / Tube	BL6N137

Marking Information

- "BL" denotes brand
- "6N137" denotes Product series.
- "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°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Emitter	Forward Current	I _F	50	mA
	Reverse Voltage	V _R	5	V
	Power Dissipation	P _D	100	mW
Detector	Collector Output	P _O	85	mW
	Output Current	I _O	50	mA
	Supply Voltage	V _{CC}	7	V
	Output Voltage	V _O	7	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage ^{*2}	V _{ISO}	5000	V _{rms}
Operating Temperature	T _{OPR}	-40 ~ +85	°C
Storage Temperature Range	T _{STG}	-55 ~ +125	°C
Soldering Temperature ^{*3}	T _{SOL}	260	°C

Notes:

1. Pulse width ≤ 1μs, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Units
Input Current, Low Level	I _{FL}	0	250	μA
Input Current, High Level	I _{FH}	*6.3	15	mA
Supply Voltage, Output	V _{CC}	4.5	5.5	V
Enable Voltage, Low Level	V _{EL}	0	0.8	V
Enable Voltage, High Level	V _{EH}	2.0	V _{CC}	V
Low Level Supply Current	T _A	-40	+85	°C
Fan Out (TTL load)	N		8	

Notes:

1. *6.3mA is a guard banded value which allows for at least 20% CTR degradation. Initial input current threshold value is 5.0mA or less.
2. We do not recommend exceeding them or designing to absolute maximum ratings.

Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V _F	I _F = 10mA	-	1.33	1.75	V
	Reverse Breakdown Voltage	B _{VR}	I _R = 10μA	5	-	-	V
	Capacitance	C _{in}	V _R = 0V, f = 1MHz	-	70	-	pF
	Diode Temperature Coefficient	ΔV _F /ΔT _A	I _F = 10mA	-	-1.4	-	mV/°C
Output	High Level Supply Current	I _{CCH}	V _{CC} = 5.5V, I _F = 0mA V _E = 0.5V	-	6.5	10	mA
	Low Level Supply Current	I _{CCL}	V _{CC} = 5.5V, I _F = 10mA	-	9	13	mA
	Low Level Enable Current	I _{EL}	V _{CC} = 5.5V, V _E = 0.5V		-0.8	-1.6	mA

	High Level Enable Current	I_{EH}	$V_{CC}=5.5V, V_E=2.0V$		-0.6	-1.6	mA
	High Level Enable Voltage	V_{EH}	$V_{CC}=5.5V, I_F=10mA$	2.0			V
	Low Level Enable Voltage	V_{EL}	$V_{CC}=5.5V, I_F=10mA$			0.8	V
Transfer Characteristics	High Level Output Current	I_{OH}	$V_{CC}=5.5V, V_O=5.5V$ $I_F=250\mu A, V_E=2V$	-	-	100	μA
	Low Level Output Voltage	V_{OL}	$V_{CC}=5.5V, I_F=5mA$ $I_{CL}=13mA, V_E=2V$	-	0.35	0.6	V
	Input Threshold Current	I_{FT}	$V_{CC}=5.5V, V_O=0.6V$ $I_{OL}=13mA, V_E=2V$	-	3	5	mA
	Isolation Resistance	R_{IO}	$V_{IO}=500V_{dc}$ 40~60% R.H.	1×10^{12}	-	-	Ω
	Floating Capacitance	C_{IO}	$f=1MHz$	-	0.6	-	pF

Switching Characteristics (@ $T_A = -40^\circ C \sim 85^\circ C, V_{CC}=5V, I_F=7.5mA$, unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to Output HIGH Level	T_{PLH}	$C_L=15pF$ $R_L=350\Omega$ $T_A=25^\circ C$	20	41	100	ns
Propagation Delay Time to Output Low Level	T_{PHL}		25	50	100	ns
Pulse Width Distortion	$ T_{PHL}-T_{PLH} $		-	5	35	ns
Output Rise Time (10~90%)	t_r		-	30	-	ns
Output Rise Time (90~10%)	t_f		-	10	-	ns
Enable Propagation Delay Time to Output HIGH Level	t_{ELH}	$I_F=7.5mA,$ $V_{EH}=3.5V,$ $R_L=350\Omega,$ $C_L=15pF$		15		ns
Enable Propagation Delay Time to Output LOW Level	t_{EHL}			40		ns
Common Mode Transient Immunity (at Output HIGH Level)	$ CM_H $	$T_A=25^\circ C, I_F=0mA$ $ V_{CM} =50V(\text{Peak})$ $V_{OH}=2.0V, R_L=350\Omega$	5000	10000	-	V/ μs
Common Mode Transient Immunity (at Output LOW Level)	$ CM_L $	$I_F=7.5mA, V_{OL}=0.8V$ $R_L=350\Omega, T_A=25^\circ C$	5000	10000	-	V/ μs

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

Fig.1 Forward Current vs. Forward Voltage

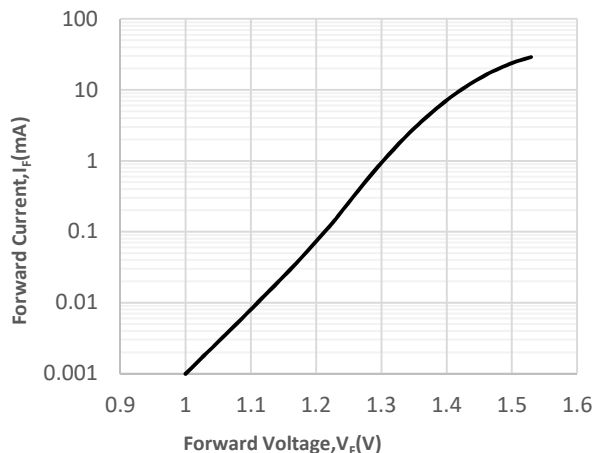


Fig.2 Low Level Output Voltage vs. Ambient Temperature

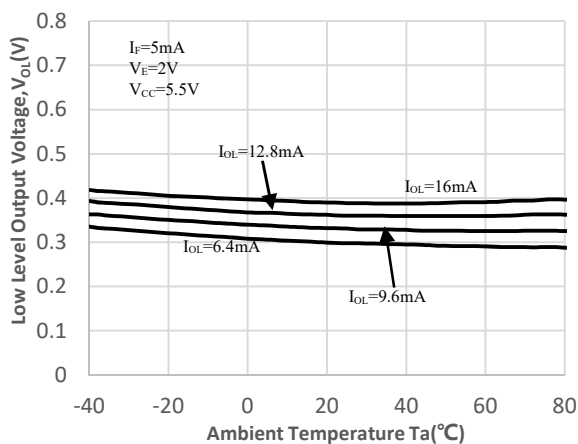


Fig.3 Switching time vs. Forward Current

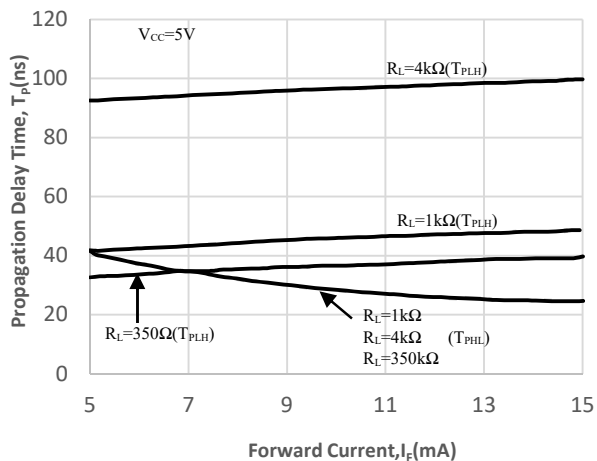


Fig.4 Low Level Output Current vs. Ambient Temperature

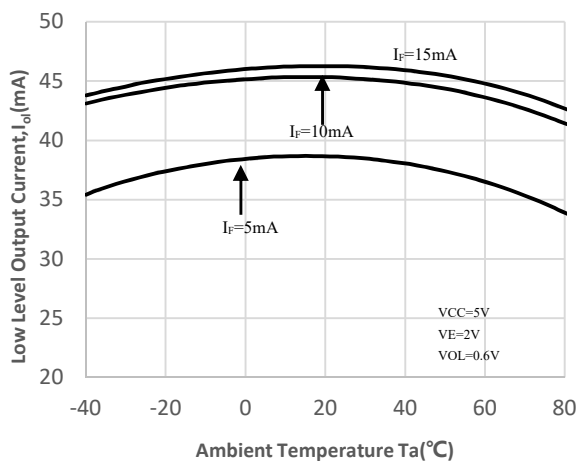


Fig.5 Start Current vs. Ambient Temperature

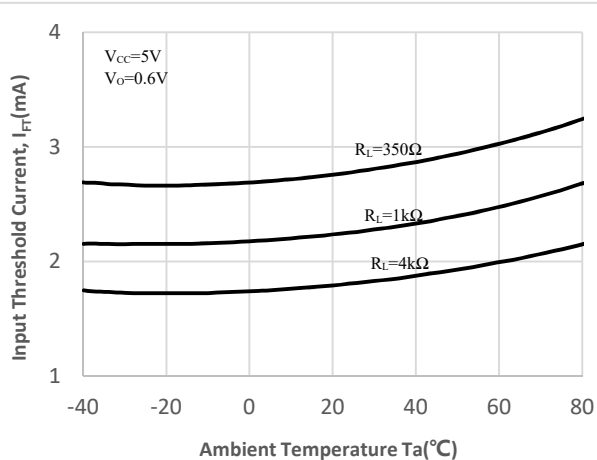


Fig.6 Output Voltage vs. Input Forward Current

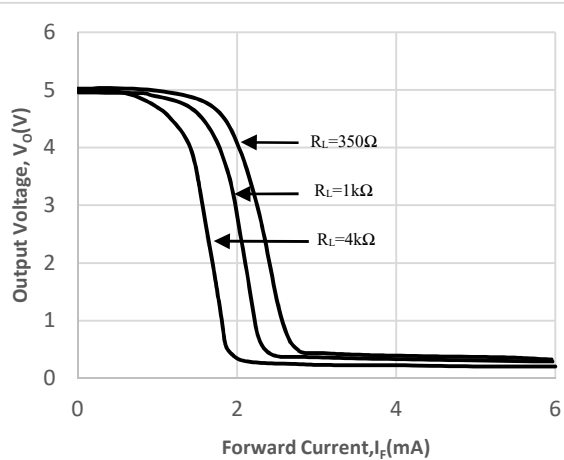


Fig.7 Pulse Width Distortion vs. Ambient Temperature

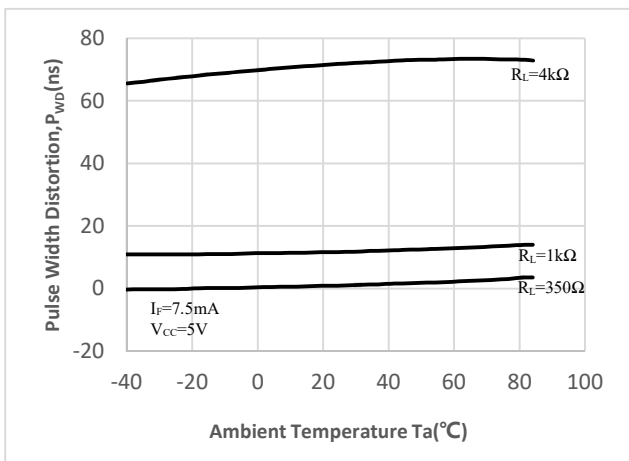


Fig.8 Rise and Fall Time vs. Ambient Temperature

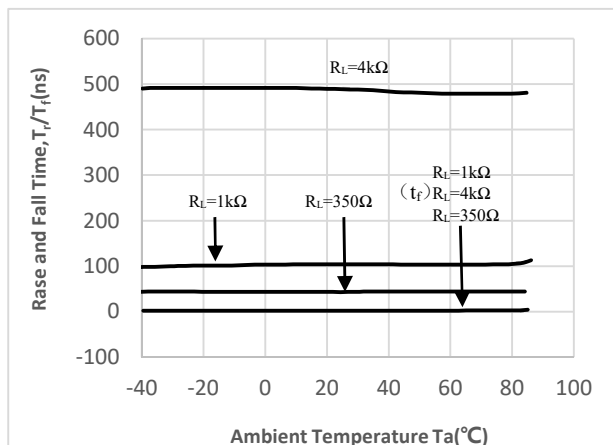


Fig.9 Test Circuit and Waveforms for t_{PLH} , t_{PHL} , t_r and t_f

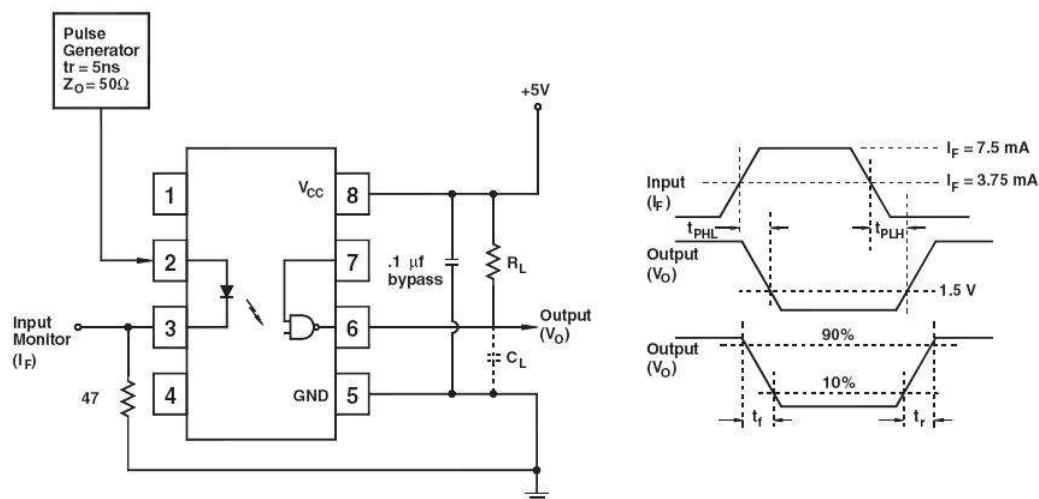


Fig.10 Test Circuit t_{EHL} and t_{ELH}

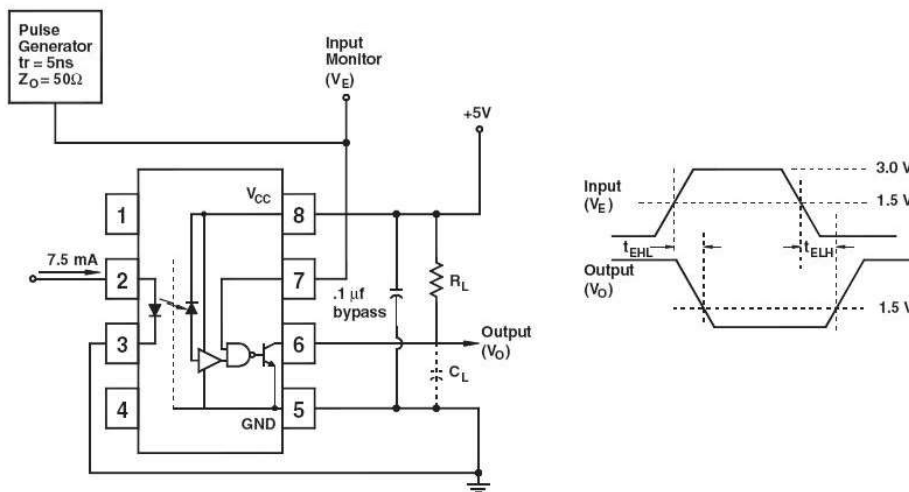
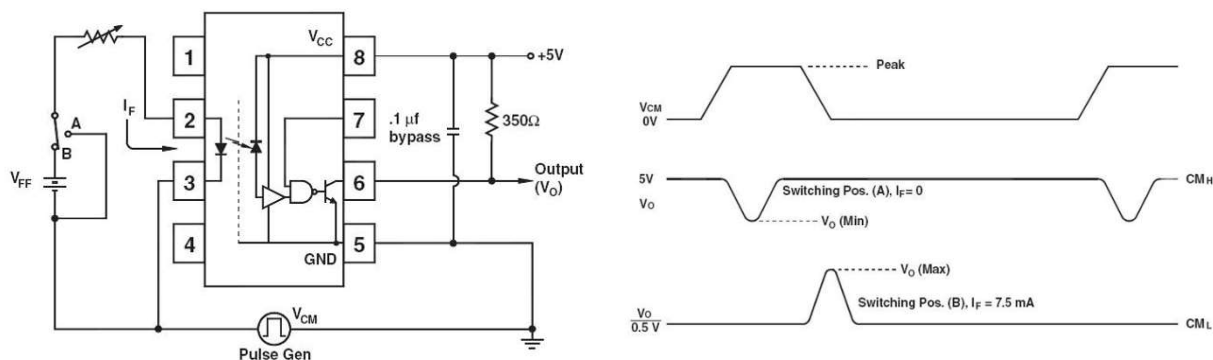
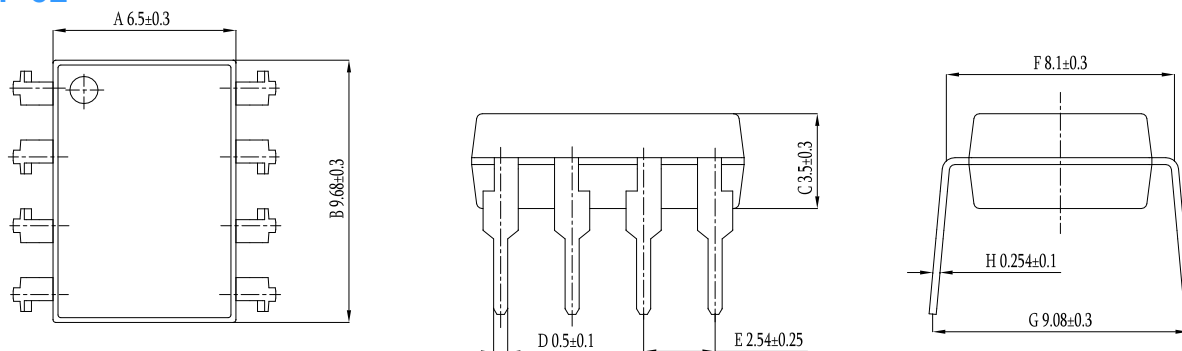


Fig.11 Test Circuit Common Mode Transient Immunity

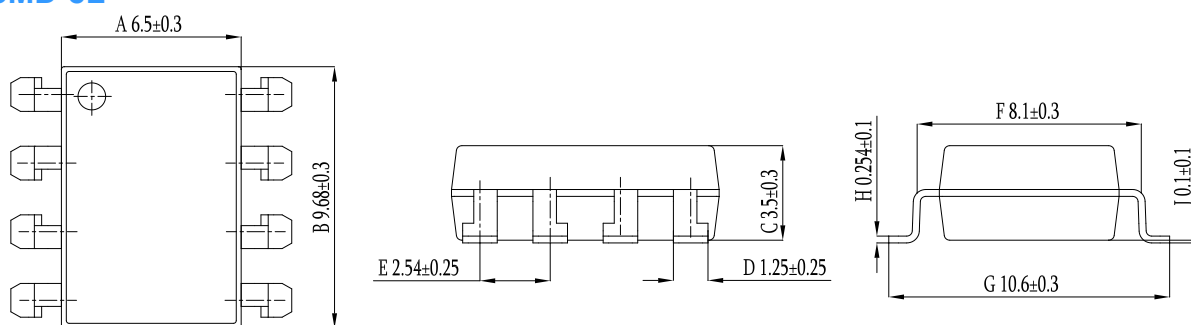


Package Outline Dimensions (unit: mm)

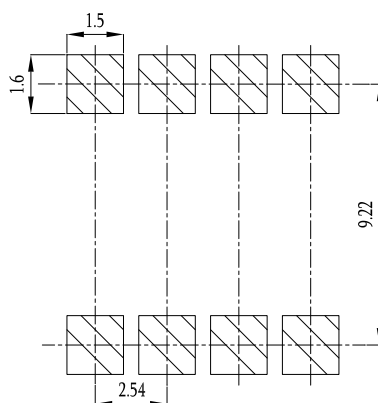
DIP-8L



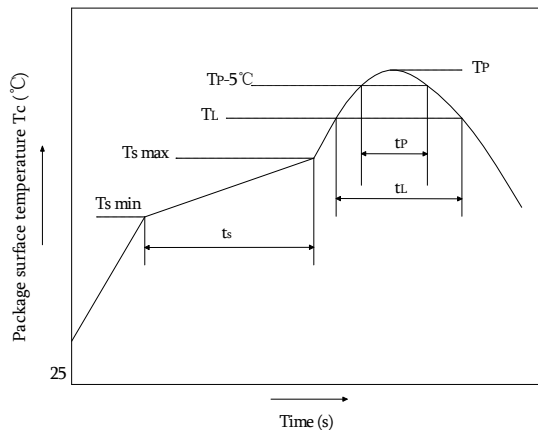
SMD-8L



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

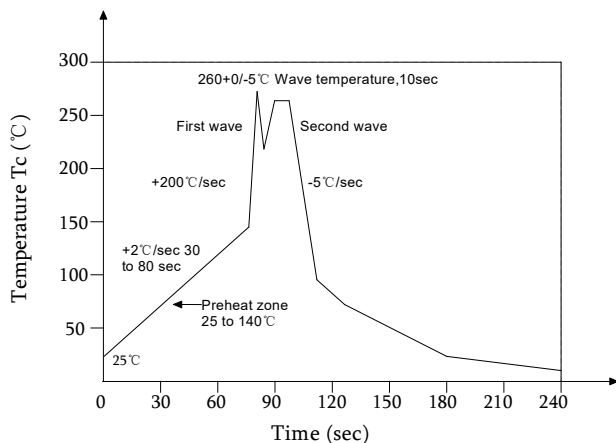


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up rate(T _L to T _P)			3	°C/s
Liquidus temperature	T _L	217		°C
Time above T _L	t _L	60	150	s
Peak temperature	T _P		260	°C
Time during which T _c is between (T _P -5) and T _P	t _p		30	s
Ramp-down rate(T _P to T _L)			6	°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	~200°C/s
Heating rate during preheat	1°C/s to 2°C/s typical; 4°C/s maximum
Final preheat temperature Ts	~130°C
Preheat time (25°C to Ts)	>60s
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 °C±5°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-8L	Tube(500mm)	45 pcs/tube	25 tubes /box	12 boxes /ctn	190*670mm	520*105*50mm	545*372*235mm	Straight insert type material tube
SMD-8L	Reel(φ330mm)	1000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm /min.

■Summary table

■DIP-8L (Tube)

Qty/ tube : 45 pcs. Qty/box: 1.125 pcs.

Qty/ctn : 13500 pcs.

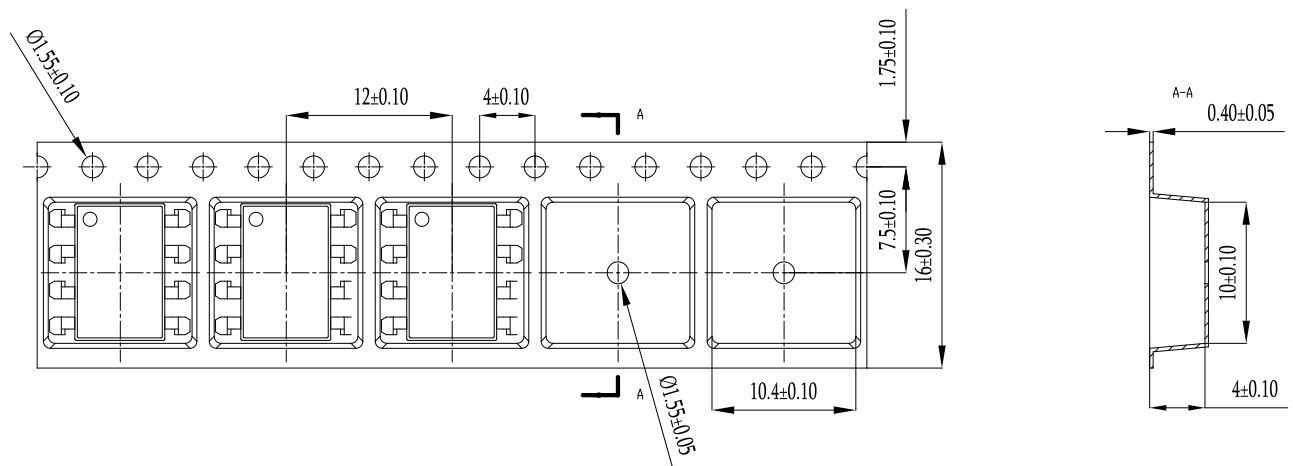
Schematic: (unit:mm)

■SMD-8L (Reel)

Qty/reel: 1000 pcs. Qty/box: 2000 pcs.

Qty/ctn : 10000 pcs.

Schematic: (unit:mm)



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