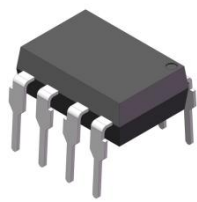
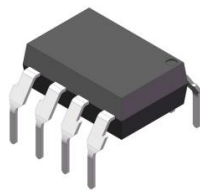
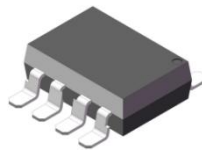


Product packaging logic diagram

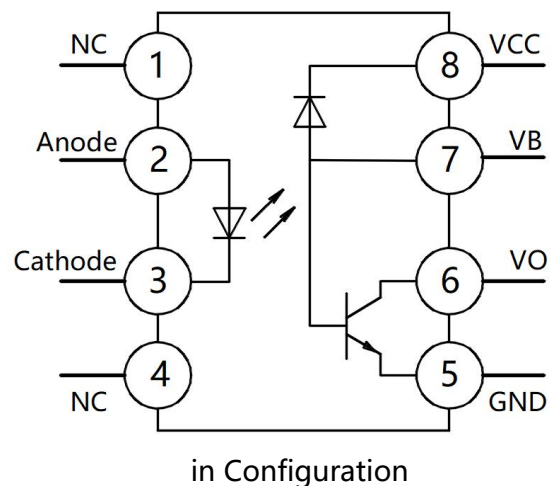
DIP8



DIP8-M



SMD8

**Features**

- Very high speed: 1 MBit/s
- High isolation voltage between input and output (Viso = 5000Vrms)
- Operating Temperature: -40°C~100°C
- Open-Collector Output
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

Mechanical Data

- Case: DIP8、DIP8-M、SMD8
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solder ability-per MIL-STD-202, Method 208

Applications

- Fiber optic communication, photoelectric conversion, and digital signal processing are widely used. Can improve data transmission speed and reliability
- In motor control, PLC systems, and industrial robots, Achieve precise control through microsecond-level response and enhance system stability.
- Relying on high-speed optocouplers to achieve real-time data transmission and electrical isolation, ensuring patient safety and data accuracy. Medical imaging equipment and vital signs monitors.
- Spacecraft, satellite communications and radar systems, High-speed digital signal transmission, whose anti-interference capability is crucial in complex environments
- Power system monitoring, frequency converters and renewable energy converters, Ensure the safe operation of equipment.
- In-vehicle entertainment system, BMS (Battery Management System), Improve audio quality and circuit safety.



Ordering Information

<u>XL</u>	<u>6N13X</u>	<u>(M)</u>	<u>(G)</u>	<u>(X)</u>	-	<u>(U)</u>	<u>(N)</u>	<u>(Y)</u>
①	②	③	④	⑤		⑥	⑦	⑧

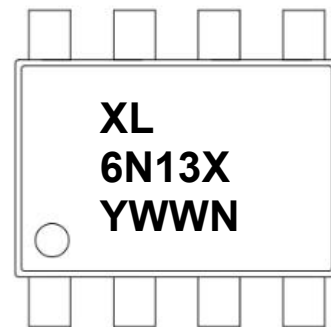
- ① Brand (XL)
- ② Product series (6N135,6N136)
- ③ Package type (None: (DIP8、DIP8-M、SMD8)
- ④ Halogen option (None : Halogen free)
- ⑤ CTR Bank(None)
- ⑥ Lead frame (None: Copper)
- ⑦ Customer option 1 (0-9 or A- Z or none)
- ⑧ Customer option 2 (0-9 or A- Z or none)

Part Number	Package	Shipping Quantity	Marking Code
XL6N13X ¹	DIP8	45pcs / Tube	XL6N13X ¹
XL6N13X ¹ M	DIP8-M	45pcs / Tube	XL6N13X ¹
XL6N13X ¹ S	SMD8	1000pcs / Tape & Reel	XL6N13X ¹

Notes 1: X denotes product series:5,6

Marking Information

- " XL" denotes brand
- " 6N13X" denotes product series: 6N135,6N136.
- " 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
Input	DC/Average forward input current	I _{F (avg)}	25	mA
	Peak forward input current (50% duty cycle, 1 ms p.w.)	I _{F (pk)}	50	mA
	Reverse Voltage	V _R	5	V
	Peak transient input current	I _{F(trans)}	1	A
	Power Dissipation	P _I	45	mW
Output	Supply Voltage	V _{CC}	-0.5~30	V
	Output Current	I _O	8	mA
	Peak output current	I _{O(pk)}	16	mA
	Output power dissipation	P _O	100	mW
	Output Voltage	V _O	-0.5~20	V
	Emitter-base reverse voltage	V _{EBR}	5	V
	Base current	I _B	5	mA

Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage *2	V _{ISO}	5000	V _{rms}
Operating Temperature	T _{OPR}	-40 ~ +100	°C
Storage Temperature Range	T _{STG}	-55 ~ +125	°C
Soldering Temperature *3	T _{SOL}	260	°C

Notes:

1. Pulse width ≤ 1μs, 300 pps
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

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

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V _F	I _F = 16mA	-	1.45	1.7	V
	Reverse Breakdown Voltage	BV _R	I _R =10μA	5	20	-	V
	Diode Temperature Coefficient	ΔV _F /ΔT _A	I _F =16mA	-	-1.6	-	mV/°C
Output	High Level Supply Current	I _{CCH}	V _{CC} =15V, I _F =0mA V _O =Open	-	-	1	μA
			T _A =0~70°C	-	-	2	μA
	Low Level Supply Current	I _{CCL}	V _{CC} =15V, I _F =16mA, V _O =Open	-	50	200	μA
Transfer Characteristics	High Level Output Current	I _{OH}	V _{CC} =5.5V, V _O =5.5V I _F = 0mA	-	0.001	0.5	μA
			V _{CC} =15V, V _O =15V I _F = 0mA	-	0.005	1	
			V _{CC} =15V, V _O =15V T _A =0~70°C	-	-	50	
	Low Level Output Voltage	V _{OL}	6N135 V _{CC} =4.5V, I _F =16mA I _O =1.1mA	-	0.1	0.4	V
			6N136 V _{CC} =4.5V, I _F =16mA I _O =3mA	-	0.1	0.4	V
	Current Transfer ratio	CTR	6N135 V _{CC} =4.5V, I _F =16mA	7	18	50	%
			6N136 V _O =0.4V	19	24	50	
	Isolation Voltage	V _{ISO}	R _H <50%, T _A =25°C , I _{I-O} ≤50μA	5000	-	-	V _{RMS}
	Isolation Resistance	R _{IO}	V _{IO} = 500V	-	1×10 ¹²	-	Ω
	Floating Capacitance	C _{IO}	f = 1MHz	-	0.6	-	pF

Switching Characteristics (@ T_A = -40°C~85°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}	6N135	I _F =16 mA, R _L =4.1KΩ	-	1300	1500	ns
		6N136	I _F =16 mA, R _L =1.9KΩ	-	600	800	
Propagation Delay Time to Output Low Level	T _{PHL}	6N135	I _F =16 mA, R _L =4.1KΩ	-	200	1500	ns
		6N136	I _F =16 mA, R _L =1.9KΩ	-	200	800	
Common Mode Transient Immunity (at Output HIGH Level)	C _{MH}	6N135	R _L =4.1KΩ	1000	-	-	V/μs
		6N136	R _L =1.9KΩ				
Common Mode Transient Immunity (at Output LOW Level)	C _{ML}	6N135	R _L =4.1KΩ	1000	-	-	V/μs
		6N136	R _L =1.9KΩ				

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

Fig.1 Normalized CTR vs. Input current

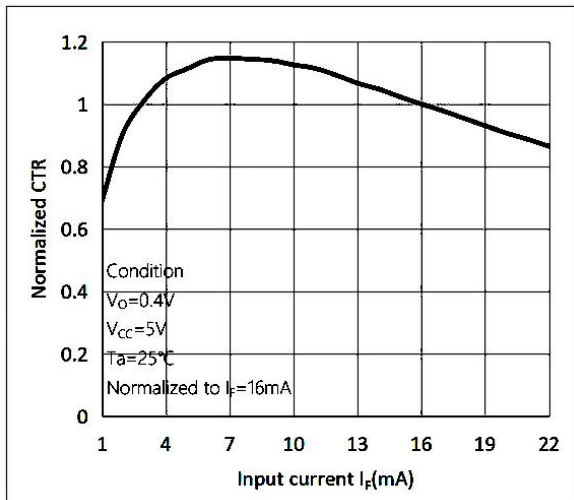


Fig.2 Normalized CTR vs. Ambient temperature

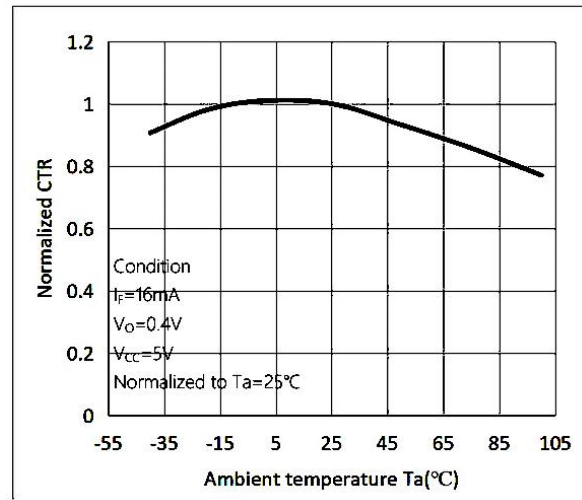


Fig.3 Output current vs. Output voltage

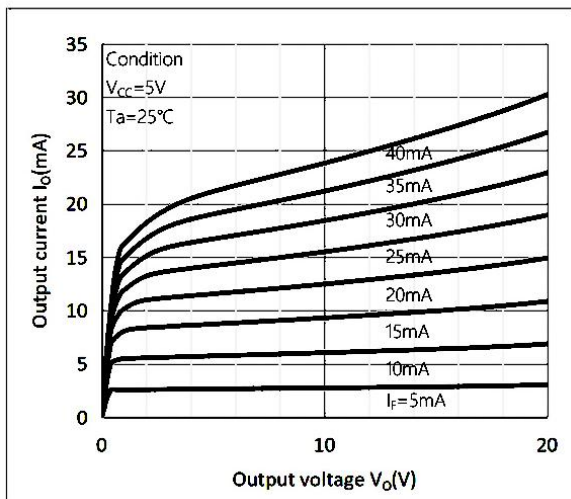


Fig.4 High level output voltage vs. Ambient temperature

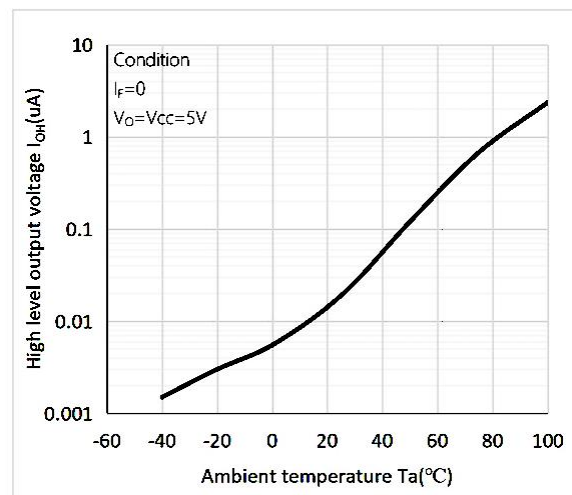


Fig.5 Propagation Delay Time vs. Ambient temperature

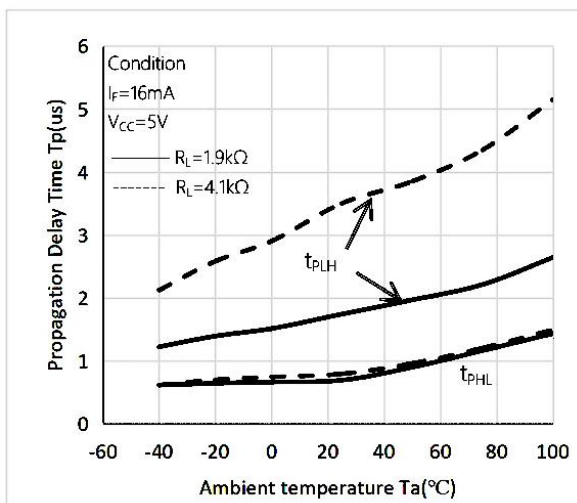
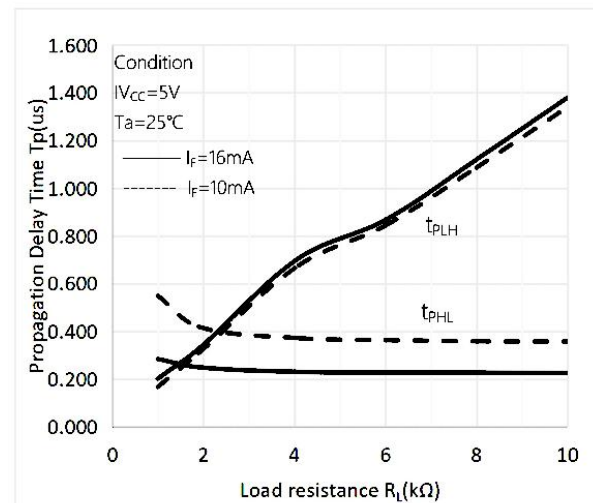


Fig.6 Propagation Delay Time vs. Load resistance



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

Fig.7 Switching Time Test Circuit

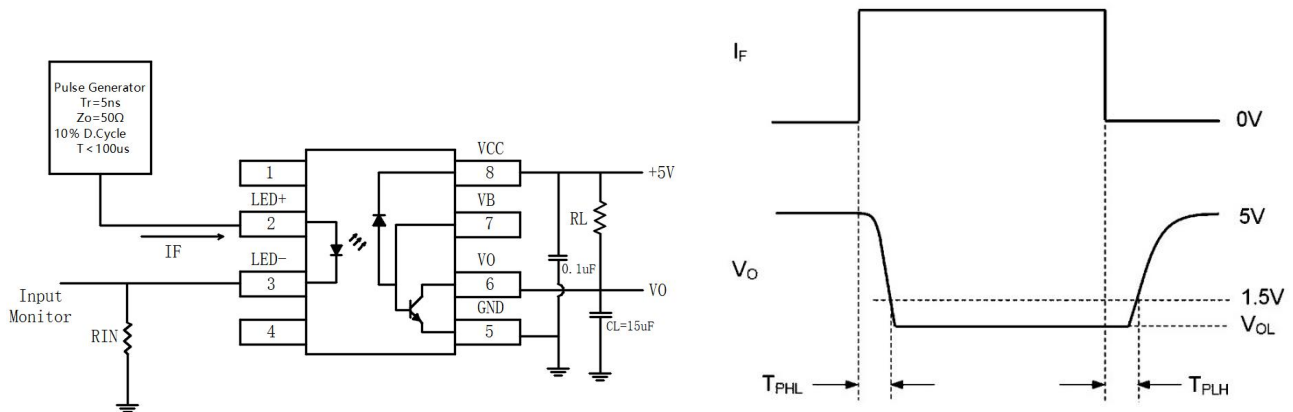
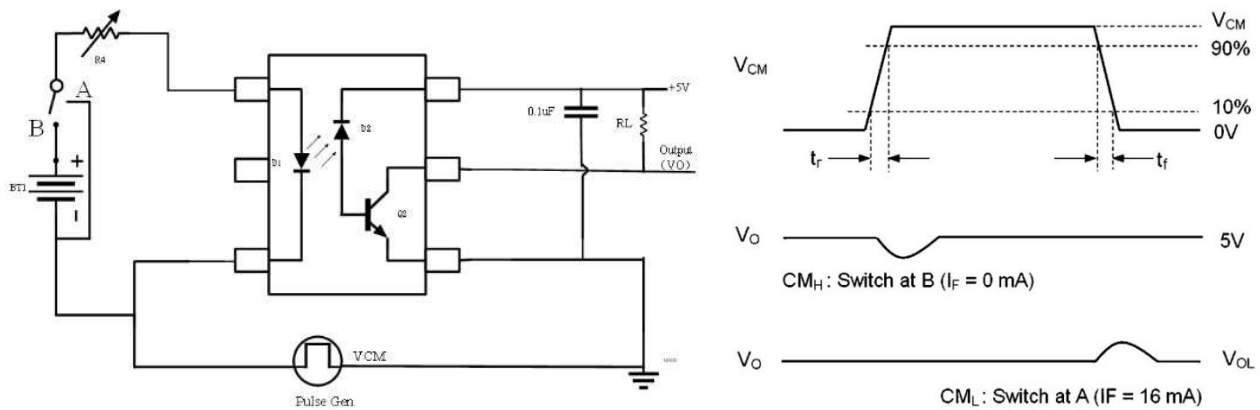
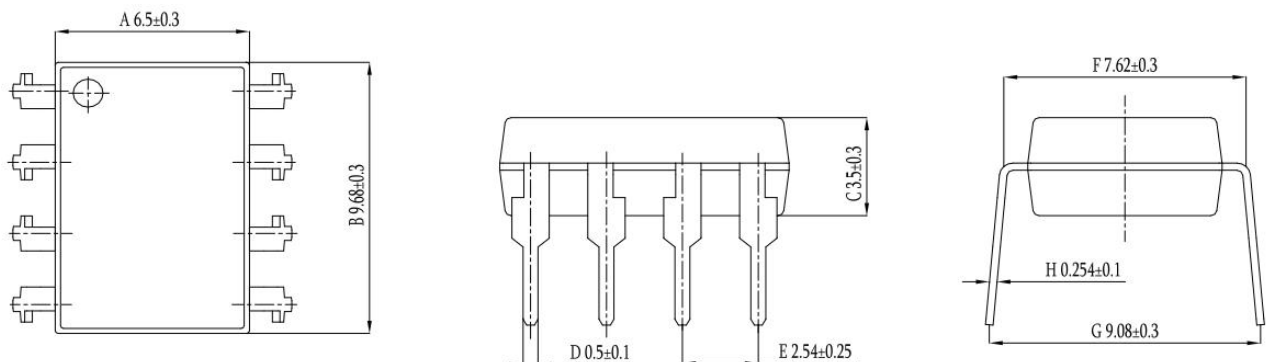


Fig.8 Test Circuit for Common Mode Transient Immunity

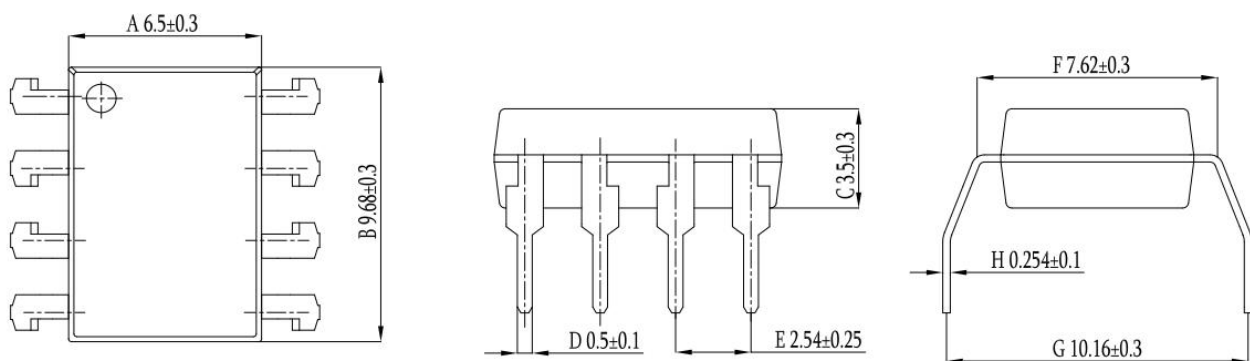


Package Outline Dimensions (unit: mm)

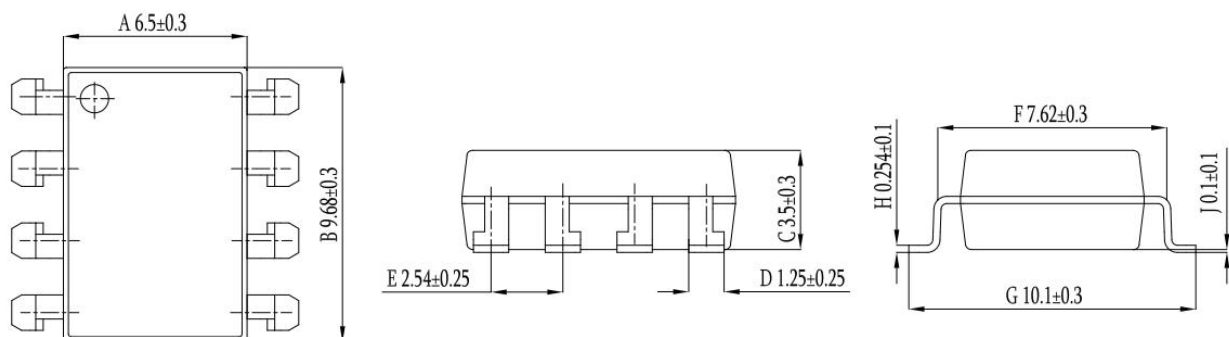
DIP8



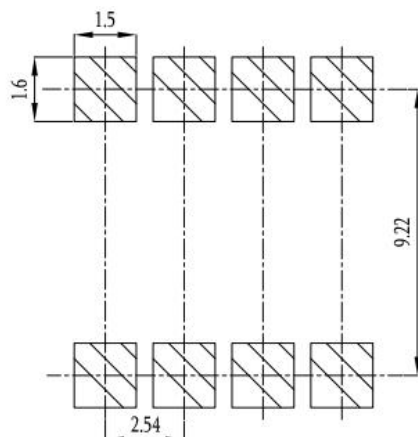
DIP8-M



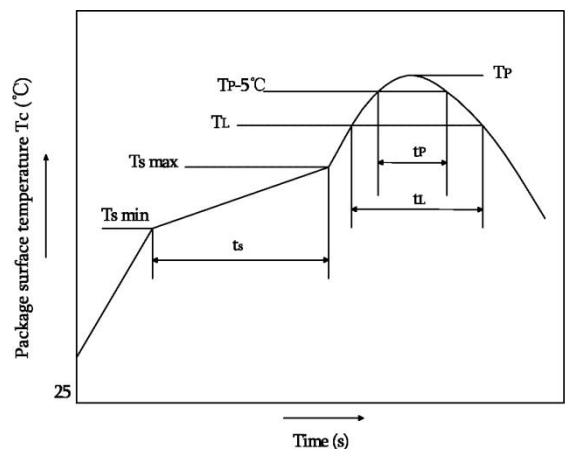
SMD8



SOLDERING FOOTPRINT (unit: mm)



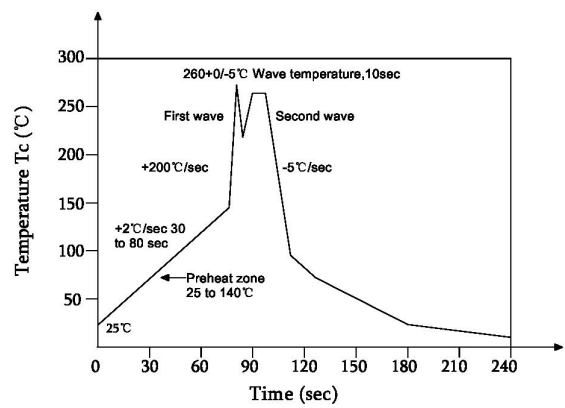
Reflow soldering



	Symbol	Min	Max	Unit
Preheat temperayure	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up ratea(TL to TP)			3	°C/s
Liquidus temperature	TL	217		°C
Time above TL	tL	60	150	s
Peak temperature	TP		260	°C
Time during which Tc is between (TP-5) and TP	tP		30	s
Ramp-down rate(TP to TL)			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 TP	260°C
Time within peak temperature tP	10s
Ramp-down rate	5°C/s maximum

Soldering with hand soldering iron

- A. Hand soldering iron is only used for product rework or sample testing.
- B. 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
DIP8	Tube(500mm)	45pcs/tube	25 tubes /box	12 boxes /ctn	190*670mm	520*105*50mm	545*372*235mm	Straight insert type material tube
DIP8-M	Tube(500mm)	45pcs/tube	25 tubes /box	12 boxes /ctn	190*670mm	520*105*50mm	545*372*235mm	Seagull foot (M foot) tube
SMD8	Reel(φ330mm)	1000pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm /min.

■ Summary table

■ DIP8/DIP8-M (Tube)

Qty/tube: 45pcs. Qty/box: 1125pcs.

Qty/ctn : 13500pcs.

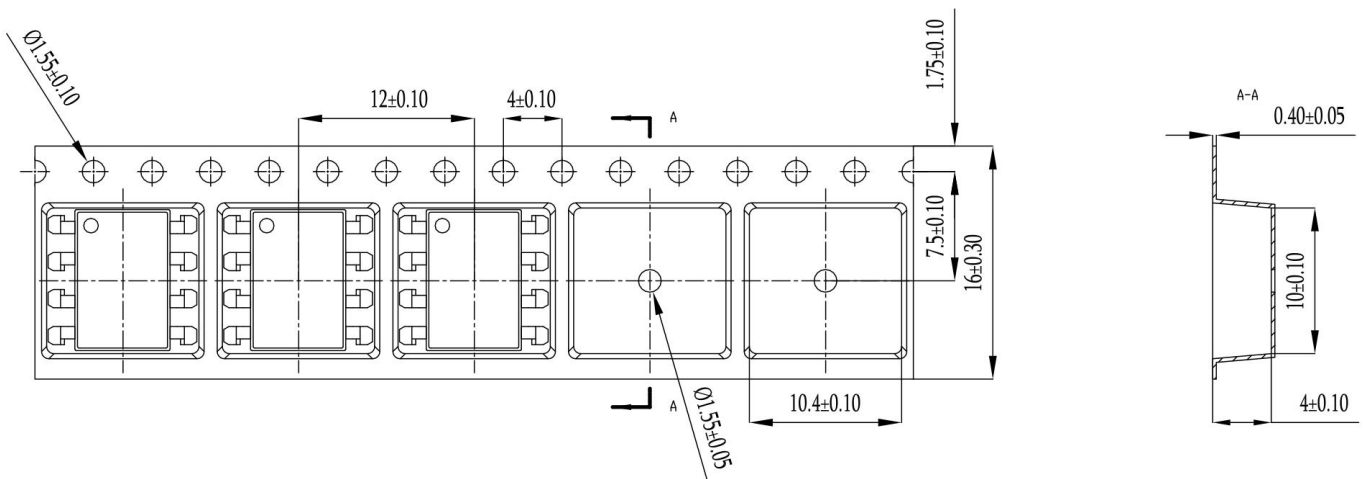
Schematic: (unit:mm)

■ SMD8 (Reel)

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

Qty/ctn : 10000pcs.

Schematic: (unit:mm)



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