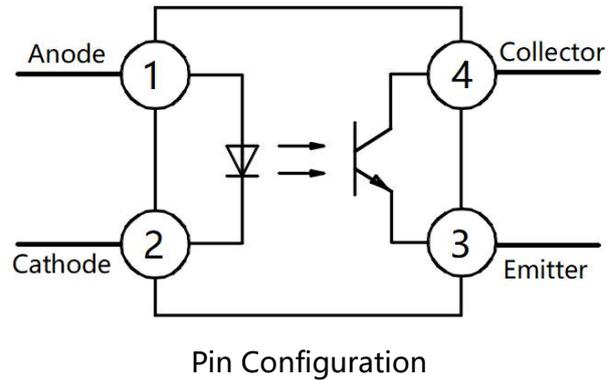


**Product packaging logic diagram**

SOP4

**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 ( $V_{iso} = 3750\text{V}_{rms}$ )
- Collector - emitter breakdown voltage  $BV_{CEO} \geq 80\text{V}$
- Operating Temperature:  $-55^\circ\text{C} \sim 110^\circ\text{C}$
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

**Mechanical Data**

- Case: SOP4
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solder ability-per MIL-STD-202, Method 208

**Applications**

- Industrial automation equipment (PLC module, sensor interface)
- Measurement instrument signal isolation
- Design and application of smart meters and switching power supplies
- Photo voltaic inverters, energy storage system applications
- Main control circuit for household appliances (air conditioning, refrigerator, water heater);



## Ordering Information

XL    356    (M)    (G)    (X) -    (U)    (N)    (Y)  
 ①            ②            ③            ④            ⑤            ⑥            ⑦            ⑧

- ① Brand(XL)
- ② Product series(356)
- ③ Package type(None:(SOP4))
- ④ Halogen option(None :Halogen free)
- ⑤ CTR Bank(A, B, C, D or 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
XL356A	SOP4	3000pcs / Tape & Reel	XL356A

## Marking Information

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



## Maximum Ratings (@ T<sub>A</sub> = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Input	Forward Current	I <sub>F</sub>	50	mA
	Peak Forward Current *1	I <sub>FM</sub>	1	A
	Reverse Voltage	V <sub>R</sub>	6	V
	Power Dissipation	P <sub>D</sub>	70	mW
Output	Collector Power Dissipation	P <sub>C</sub>	150	mW
	Collector Current	I <sub>C</sub>	50	mA
	Collector-Emitter Voltage	V <sub>CEO</sub>	80	V
	Emitter-Collector Voltage	V <sub>ECO</sub>	7	V

## Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	P <sub>TOT</sub>	200	mW
Isolation Voltage *2	V <sub>ISO</sub>	3750	V <sub>rms</sub>
Rated Impulse Isolation Voltage	V <sub>IOTM</sub>	5000	V
Rated Repetitive Peak Isolation Voltage	V <sub>IORM</sub>	600	V
Thermal Resistance Junction-to-Air	R <sub>θJA</sub>	430	°C/W
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	350	°C/W
Thermal Resistance Junction-to-Lead	R <sub>θJL</sub>	368	°C/W
Operating Temperature	T <sub>OPR</sub>	-55 ~ +110	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ +125	°C
Soldering Temperature *3	T <sub>SOL</sub>	260	°C

**Notes:**

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

**Electrical Characteristics** (@ T<sub>A</sub> = 25°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 20mA	-	1.2	1.4	V
	Peak Forward Voltage	V <sub>FM</sub>	I <sub>FM</sub> = 0.5A	-	-	3.0	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 4V	-	-	10	μA
	Input Capacitance	C <sub>in</sub>	V <sub>R</sub> = 0V, f = 1kHz	-	30	250	pF
Output	Collector-Emitter Dark Current	I <sub>CEO</sub>	V <sub>CE</sub> = 20V, I <sub>F</sub> = 0	-	-	100	nA
	Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	I <sub>C</sub> = 0.1mA, I <sub>F</sub> = 0	80	-	-	V
	Emitter-Collector Breakdown Voltage	BV <sub>ECO</sub>	I <sub>E</sub> = 10μA, I <sub>F</sub> = 0	7	-	-	V
Transfer Characteristics	Collector Current	I <sub>C</sub>	I <sub>F</sub> = 5mA, V <sub>CE</sub> = 5V	2.5	-	30	mA
	Current Transfer Ratio	CTR	I <sub>F</sub> = 5 mA, V <sub>CE</sub> = 5V	50	-	600	%
	Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> = 20mA, I <sub>C</sub> = 1mA	-	0.1	0.2	V
	Isolation Resistance	R <sub>ISO</sub>	V <sub>IO</sub> = 500Vdc 40~60% R.H.	1×10 <sup>12</sup>	-	-	Ω
	Isolation current	R <sub>ISC</sub>	DC6000V, 40~60%R.H	-	-	2	μA
	Floating Capacitance	C <sub>IO</sub>	V <sub>IO</sub> = 0, f = 1MHz	-	0.6	1.0	pF
	Cut-off frequency	f <sub>c</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 2mA R <sub>L</sub> =100Ω, -3dB	-	80	-	kHz
	Turn On Time	T <sub>on</sub>	V <sub>CE</sub> =2V, R <sub>L</sub> = 100Ω	-	4	18	μs
	Turn Off Time	T <sub>off</sub>	I <sub>C</sub> =2mA	-	3	18	

**Rank Table of Current Transfer Ratio CTR**

Rank Mark	Min. (%)	Max. (%)	Condition
A	80	160	I <sub>F</sub> = 5mA, V <sub>CE</sub> = 5V
B	130	260	
C	200	400	
D	300	600	
No mark	80	600	

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

Fig.1 Allowable Forward Current vs. Ambient Temperature

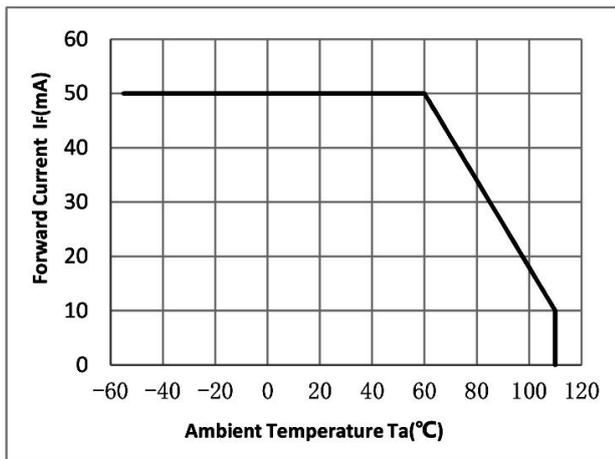


Fig.2 Allowable collector power dissipation vs. Ambient Temperature ( $^\circ\text{C}$ )

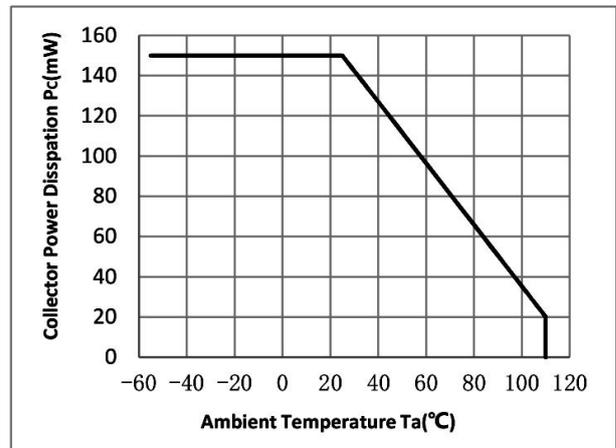


Fig.3 Relative Current Transfer Ratio vs. Forward Current

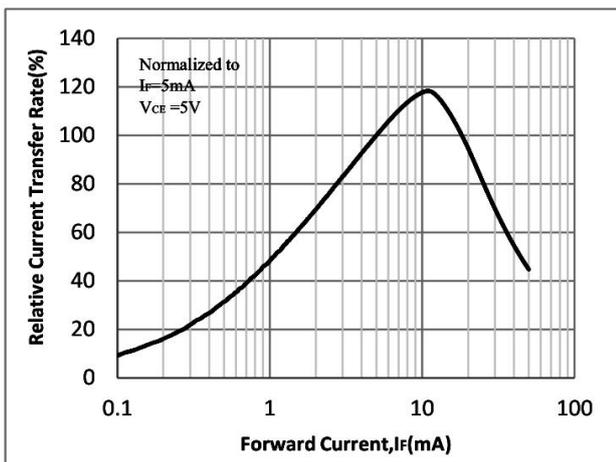


Fig.4 Forward Current vs. Forward Voltage

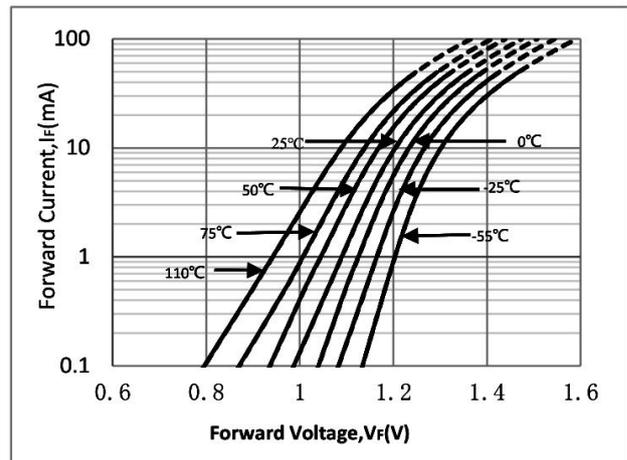


Fig.5 Collector Current vs. Collector-emitter Voltage

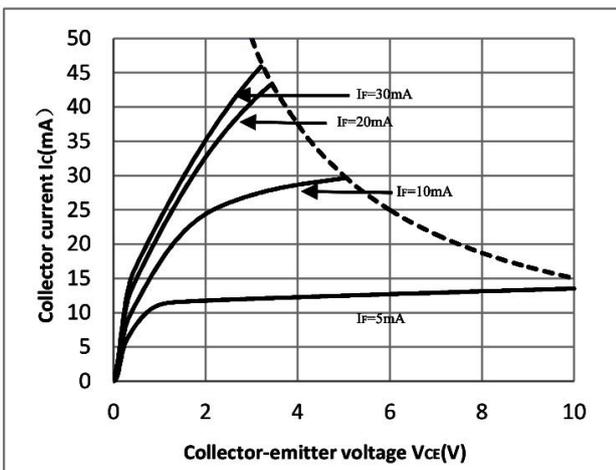
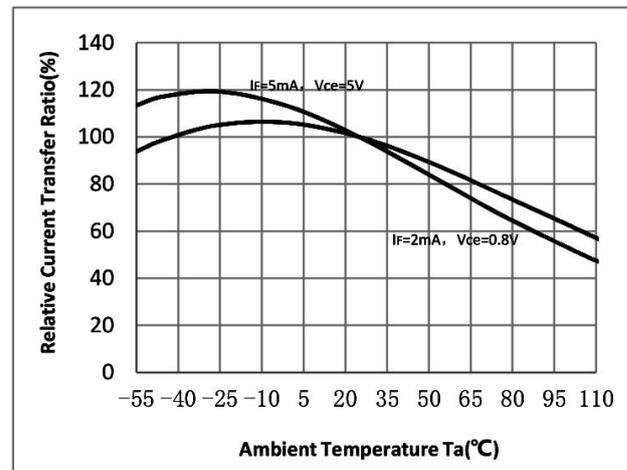


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature



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

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

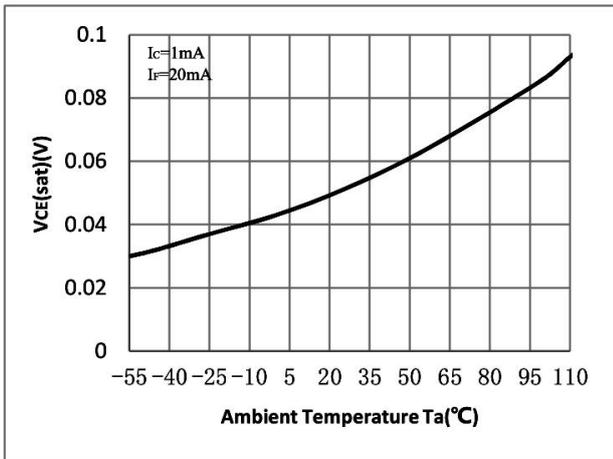


Fig.8 Collector Dark Current vs. Ambient Temperature

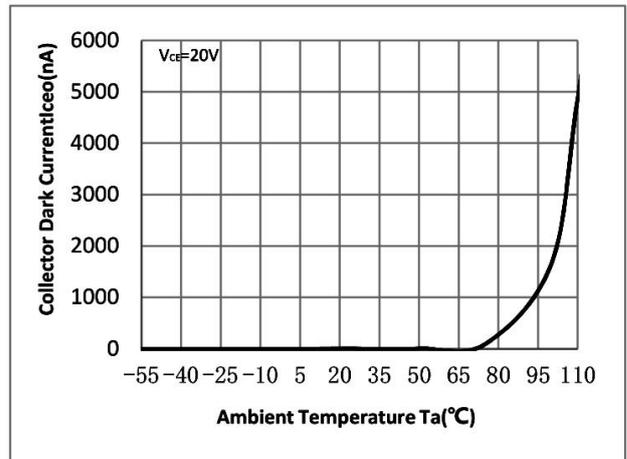


Fig.9 Response Time vs. Load Resistance

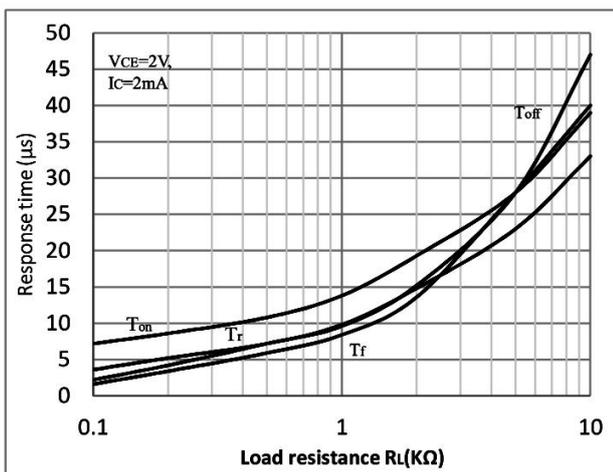


Fig.10 Frequency Response

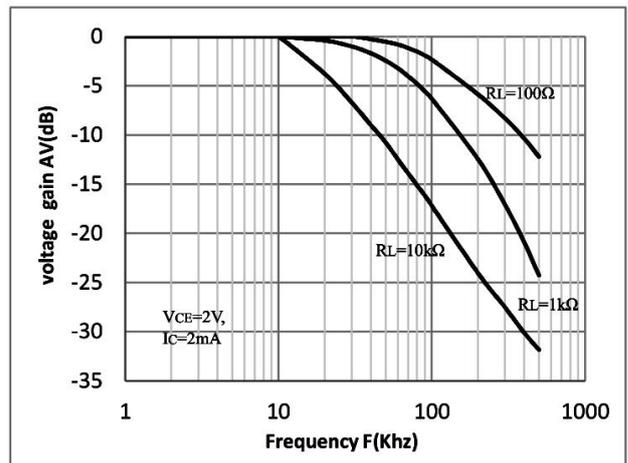


Fig.11 Collector-emitter Saturation Voltage vs. Forward Current

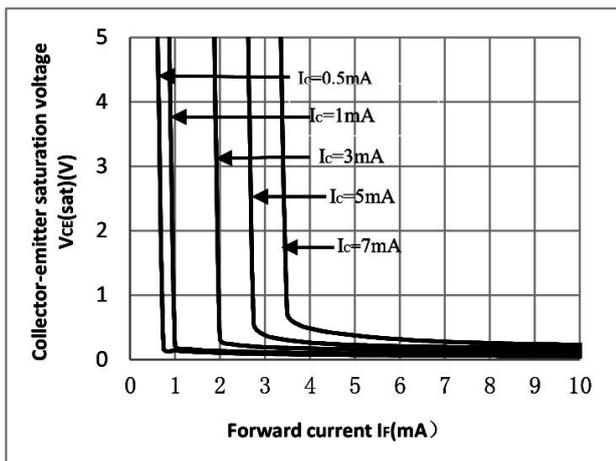
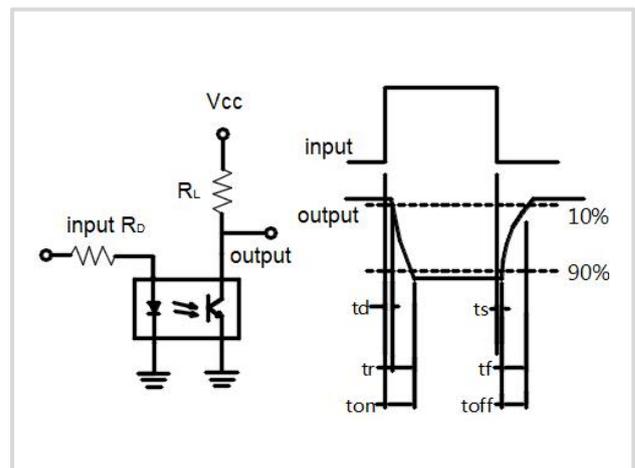
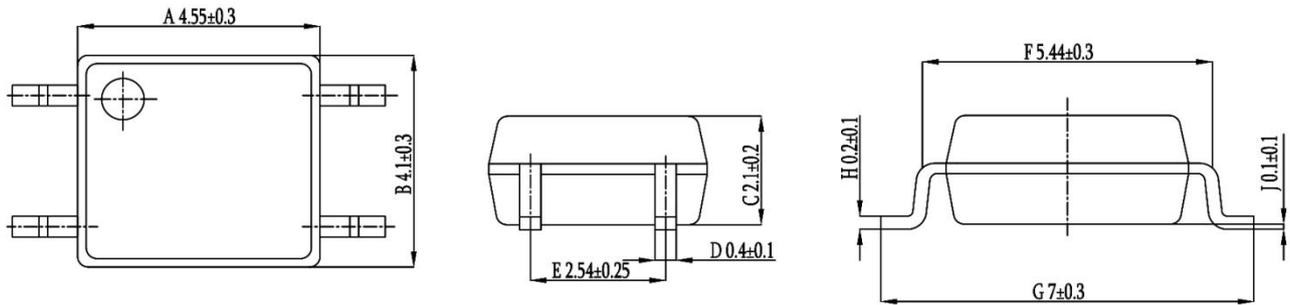
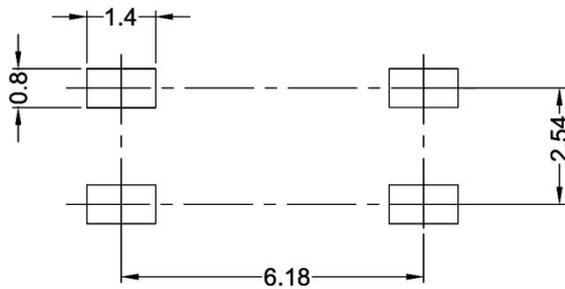
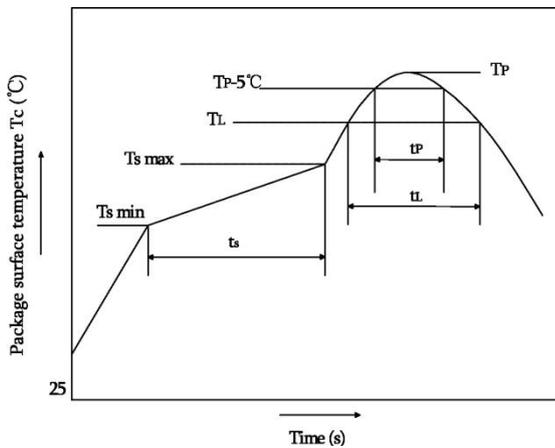


Fig.12 Switching Time Test Circuit & Waveforms



**Package Outline Dimensions (unit: mm)****SOP4****SOLDERING FOOTPRINT (unit: mm)**

## Reflow soldering

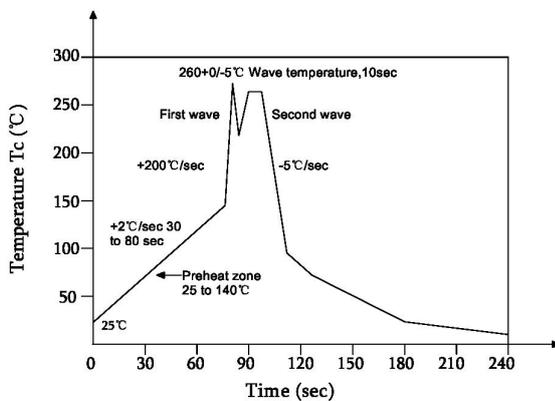


	Symbol	Min	Max	Unit
Preheat temperature	$T_s$	150	200	°C
Preheat time	$t_s$	60	120	s
Ramp-up rate( $T_L$ to $T_P$ )			3	°C/s
Liquidus temperature	$T_L$	217		°C
Time above $T_L$	$t_L$	60	150	s
Peak temperature	$T_P$		260	°C
Time during which $T_c$ is between ( $T_P - 5$ ) and $T_P$	$t_p$		30	s
Ramp-down 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 $T_s$	~130°C
Preheat time (25°C to $T_s$ )	> 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
SOP4	Reel(φ330mm)	3000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Leave 20 Spaces at the beginning and 50 Spaces at the end

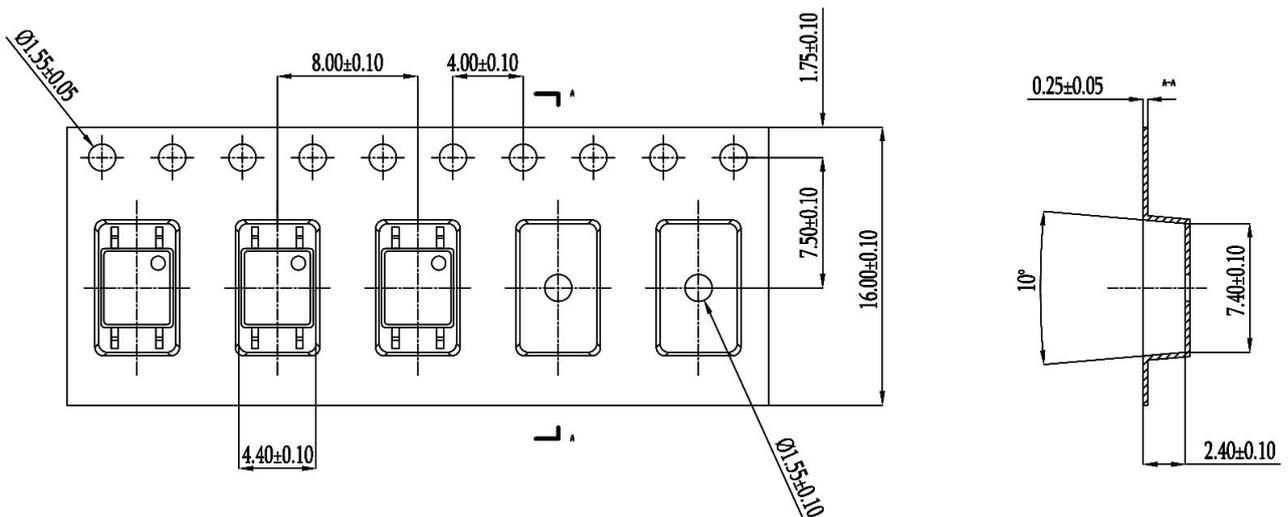
■ Summary table

■ SOP4 (Reel)

Qty/reel: 3000pcs. Qty/box: 6000pcs.

Qty/ctn : 30000pcs.

Schematic: (unit:mm)



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