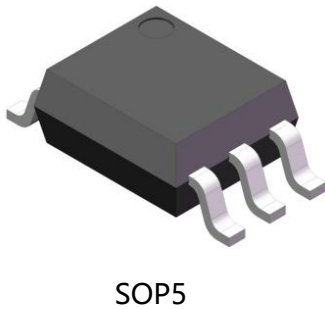
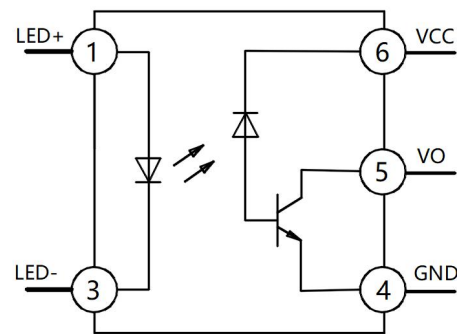


Product packaging logic diagram

SOP5



in Configuration

Features

- Very high speed: 1MBit/s
- High isolation voltage between input and output ($V_{iso} = 3750V$ rms)
- Operating Temperature: $-40^{\circ}C \sim 100^{\circ}C$
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

Mechanical Data

- Case: SOP5
- 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>M452</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 (M452)
- ③ Package type(SOP5:None)
- 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
XLM452P	SOP5	3000pcs / Tape & Reel	XLM452

Marking Information

- " XL" denotes brand
- " M452" denotes Product series: 01, 11.
- " 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	45	mW
Detector	Collector Output	P _O	100	mW
	Output Current	I _O	16	mA
	Supply Voltage	V _{CC}	30	V
	Output Voltage	V _O	20	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage *2	V _{ISO}	3750	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, Duty ratio: 0.001
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	B _{VR}	I _R = 10μA	5	20	-	V
	Diode Temperature Coefficient	ΔV _F /ΔT _A	I _F = 10mA	-	-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	-	120	800	μA
Transfer Characteristics	High Level Output Current	I _{OH}	I _F = 0mA, V _O = 5.5V V _{CC} = 5.5V		0.001	0.5	
			I _F = 0mA, V _O = 15V V _{CC} = 15V		0.005	1	μA
			T _A = 0-70°C			50	
	Low Level Output Voltage	V _{OL}	V _{CC} = 4.5V, I _F = 16mA I _O = 3mA	-	0.1	0.4	V
			V _{CC} = 4.5V, I _F = 16mA I _O = 2.4mA		0.1	0.5	V
	Current transfer ratio	CTR	I _F = 16mA, V _{CC} = 4.5V V _O = 0.4V	19	24	80	%
			I _F = 16mA, V _{CC} = 4.5V V _O = 0.5V	15	25		
	Isolation Resistance	R _{IO}	V _{IO} = 500Vdc 40~60% R.H.	-	1×10 ¹²	-	Ω
	Floating Capacitance	C _{IO}	f = 1MHz	-	0.6	-	pF

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to Output HIGH Level	T_{PLH}	$I_F = 16\text{mA}$, $R_L = 1.9\text{k}\Omega$, $T_A = 25^{\circ}\text{C}$	-	150	800	ns
		$I_F = 16\text{mA}$, $R_L = 1.9\text{k}\Omega$			800	
Propagation Delay Time to Output Low Level	T_{PHL}	$I_F = 16\text{mA}$, $R_L = 1.9\text{k}\Omega$, $T_A = 25^{\circ}\text{C}$	-	200	800	ns
		$I_F = 16\text{mA}$, $R_L = 1.9\text{k}\Omega$			800	
Common Mode Transient Immunity(at Logic High)	$ CM_H $	$T_A = 25^{\circ}\text{C}$, $I_F = 0\text{mA}$ $ V_{CM} = 10\text{V(Peak)}$ $C_L = 15\text{pF}$, $R_L = 1.9\text{k}\Omega$	5000	-	-	V/ μs
Common Mode Transient Immunity (at Logic Low)	$ CM_L $	$T_A = 25^{\circ}\text{C}$, $I_F = 16\text{mA}$ $ V_{CM} = 10\text{V(Peak)}$ $C_L = 15\text{pF}$, $R_L = 1.9\text{k}\Omega$	5000	-	-	V/ μs

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

Fig.1 Normalized CTR vs Forward Current

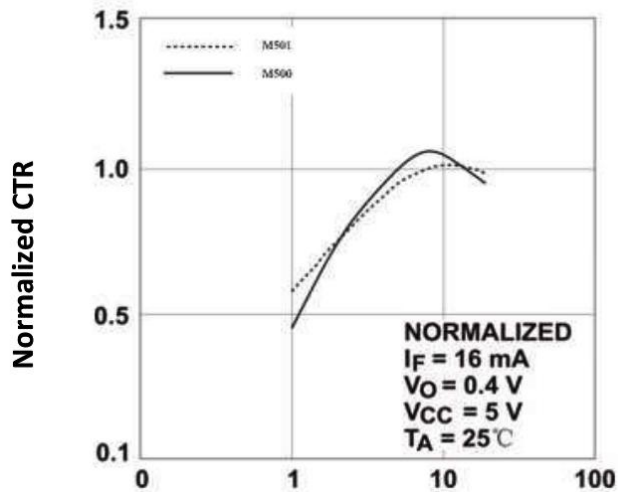


Fig.2 Normalized CTR vs Temperature

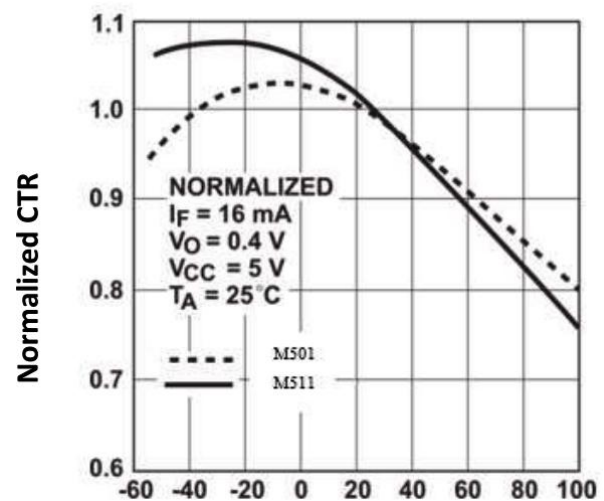


Fig.3 Output Current vs Output Voltage

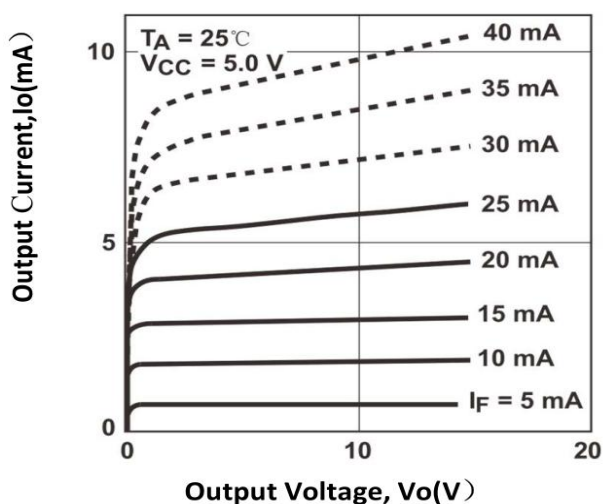


Fig.4 Logic High Output Current vs Temperature

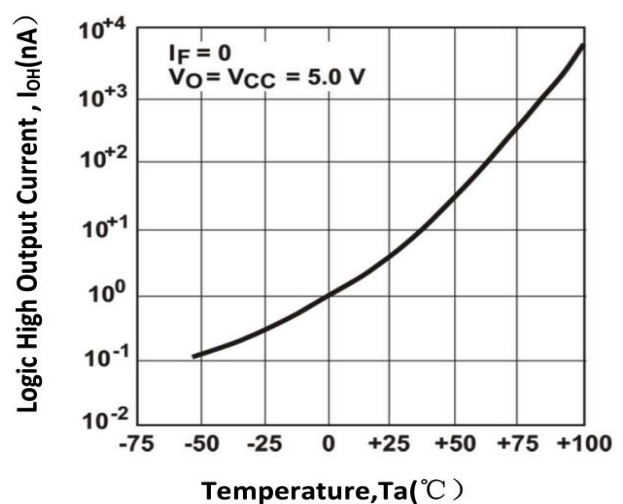


Fig. 5 Propagation Delay vs Temperature

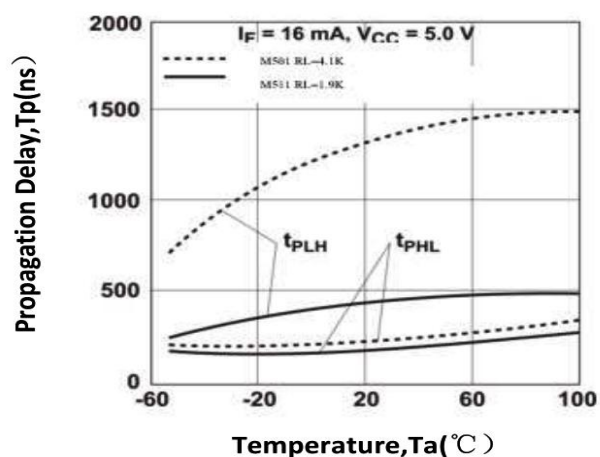
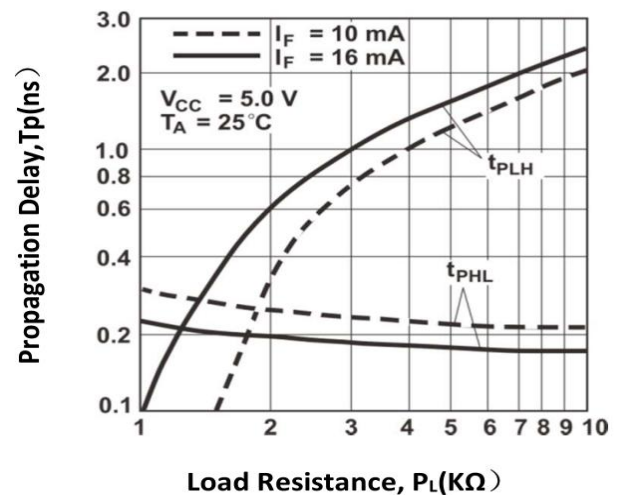


Fig.6 Propagation Delay vs Load Resistance



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

Fig.7 Test Circuit and Wave forms for t_{PLH} , t_{PHL} , t_r and t_f

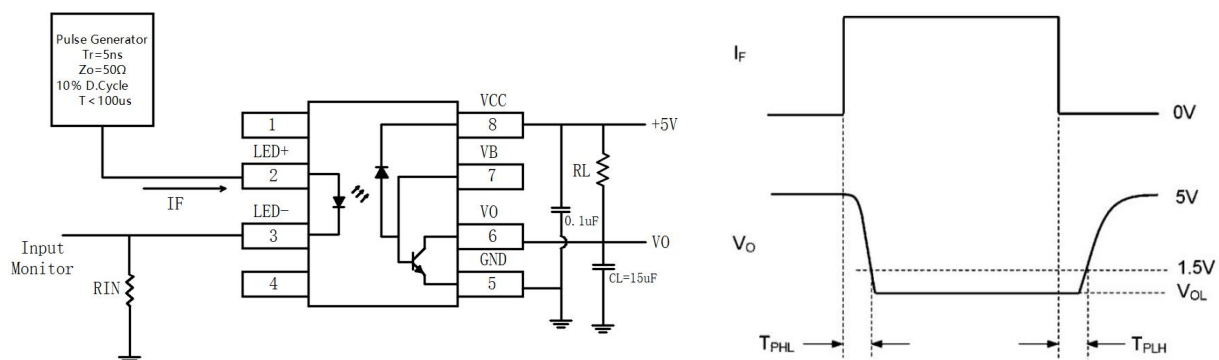
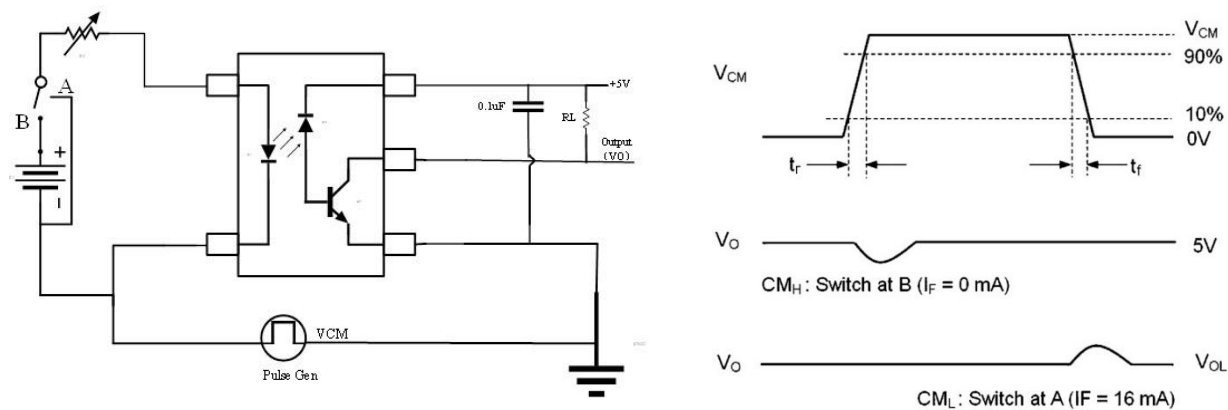
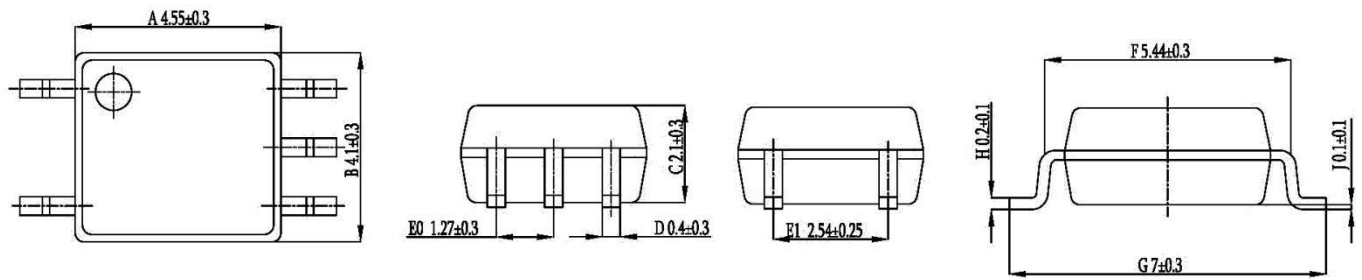


Fig.8 Test Circuit Common Mode Transient Immunity

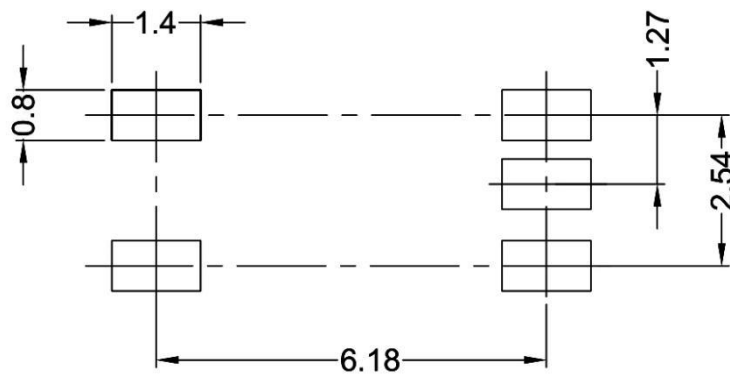


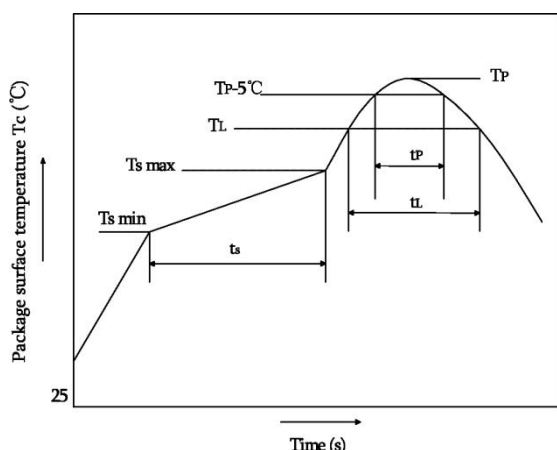
Package Outline Dimensions (unit: mm)

SOP5



SOLDERING FOOTPRINT (unit: mm)



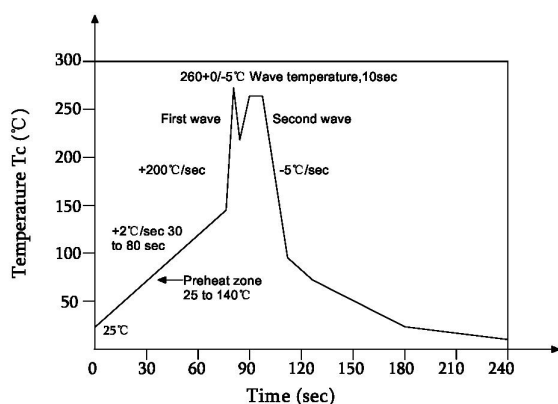


	Symbol	Min	Max	Unit
Preheat temperature	T_s	150	200	$^\circ\text{C}$
Preheat time	t_s	60	120	s
Ramp-up rate(T_l to T_p)			3	$^\circ\text{C/s}$
Liquidus temperature	T_l	217		$^\circ\text{C}$
Time above T_l	t_l	60	150	s
Peak temperature	T_p		260	$^\circ\text{C}$
Time during which T_c is between ($T_p - 5$) 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.

Package Type	Packing Form	Quantity per Tube & Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP5	Reel($\phi 330$ mm)	3000pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm/min.

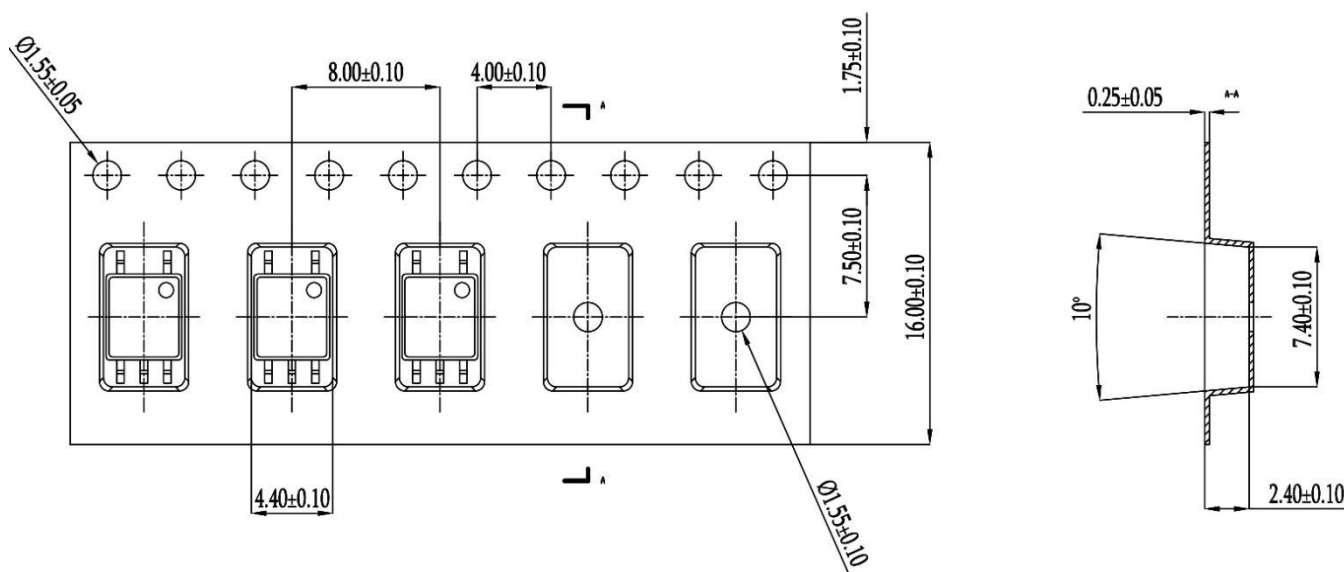
■ Summary table

■ SOP5 (Reel)

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

Qty/ctn : 30000pcs.

Schematic: (unit:mm)



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