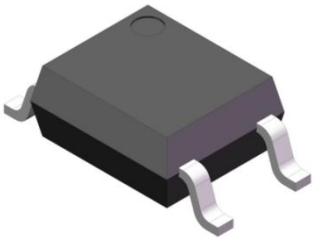
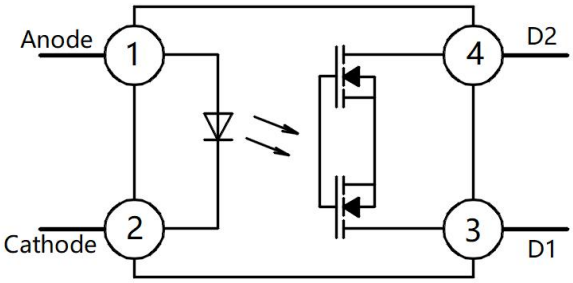
Product packaging logic diagram



SOP4



Pin Configuration

Features

- Normally opened (SPST)
- High isolation voltage between input and output (Viso =3750Vrms)
- High sensitivity, low conductivity resistance
- Operating Temperature: -40℃~85℃
- 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

- In industrial control systems, optocoupler relays are commonly used for the control and monitoring of machinery and equipment.
- In household appliances and consumer electronics, optocoupler relays are used for power Management. Overcurrent protection and safe isolation between devices
- In the field of communications, optocoupler relays are used for data transmission, signal amplification, and signal isolation.
- In medical electronic devices, optical couplers are used for electrical isolation and signal transmission. to ensure the safety of patients and operators
- Optocoupler relays are used in automotive electronic systems to control various onboard devices。Improve system stability and security
- In the field of new energy,Battery management system for electric vehicles(BMS),For detection and troubleshooting.




Ordering Information

XL	M440A	(M)	(G)	-	(U)	(N)	(Y)
①	②	③	④		⑤	⑥	⑦

① Brand(XL)
② Product series (M440A)
③ Package type (S:SOP4)
④ Halogen option (None :Halogen free)
⑤ Lead frame (None: Copper)
⑥ Customer option 1 (0-9 or A-Z or none)
⑦ Customer option 2 (0-9 or A-Z or none)

Part Number	Package	Shipping Quantity	Marking Code
XLM440A	SOP4	3000pcs / Tape & Reel	XLM440A

Marking Information

- " XL" denotes brand
- " M440A" 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
Input	Forward Current	I_F	50	mA
	Peak Forward Current *1	I_{FP}	1	A
	Reverse Voltage	V_R	5	V
	Power Dissipation	P_D	75	mW
Output	Load Voltage (peak AC)	V_L	60	V
	Continuous load current (peak AC)	I_L	0.5	A
	Peak load current	I_{peak}	1.5	A
	Power Dissipation	P_{out}	300	mW

Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage *2	V_{ISO}	3750	Vrms
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature Range	T_{STG}	-40 ~ +100	°C

Notes:

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

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

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	LED turn on current	I_{Fon}	I_L=0.5A	-	0.4	3	mA
	LED turn off current	I_{Foff}	I_L=0.5A	-	0.3	3	mA
	LED dropout voltage	V_F	I_F=5mA	1	1.3	1.4	V
Output	On resistance	R_{on}	I_F=5mA, I_L=0.5A, Within 1s on time	-	0.9	1.5	Ω
	Off state leakage current	I_{Leak}	I_F=0mA , V_L=60V	-	-	1000	nA
Transfer Characteristics	Turn on time	T_{on}	I_F=5mA, I_L=0.5A	-	0.17	2	ms
	Turn off time	T_{off}	I_F=5mA, I_L=0.5A	-	0.14	1	ms
	I/O capacitance	C_{iso}	f=1MHz, V_B=0	-	0.8	1.5	pF
	Initial I/O isolation resistance	R_{iso}	500V DC	1,000	-	-	MΩ

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

Fig.1 Load current vs. Ambient temperature characteristics

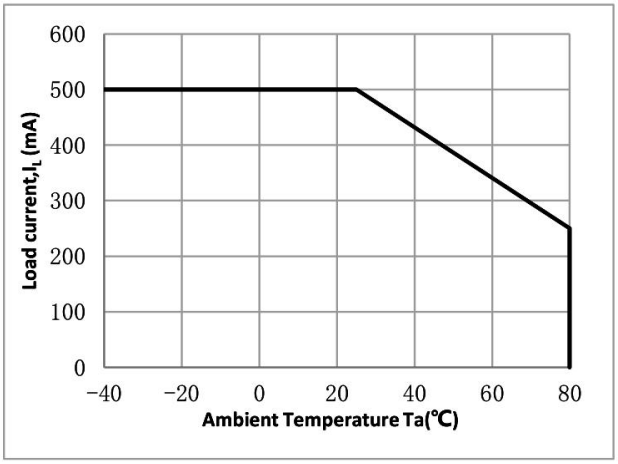


Fig.2 On resistance vs. Ambient temperature characteristics

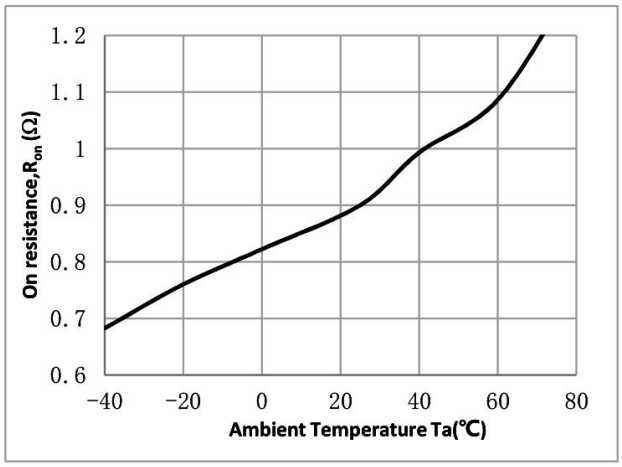


Fig.3 Turn on time vs. Ambient temperature characteristics

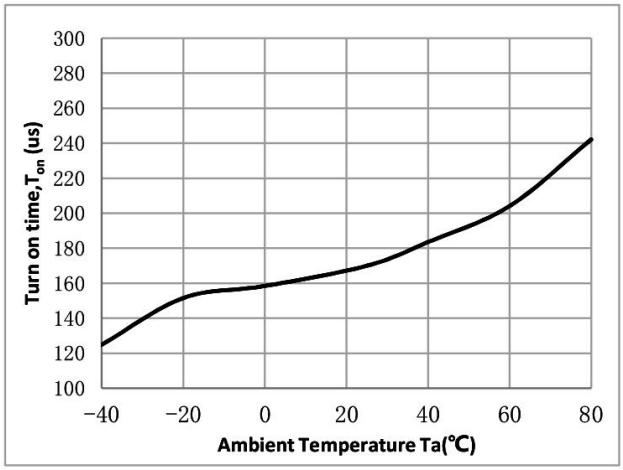


Fig4 Turn off time vs. Ambient temperature characteristics

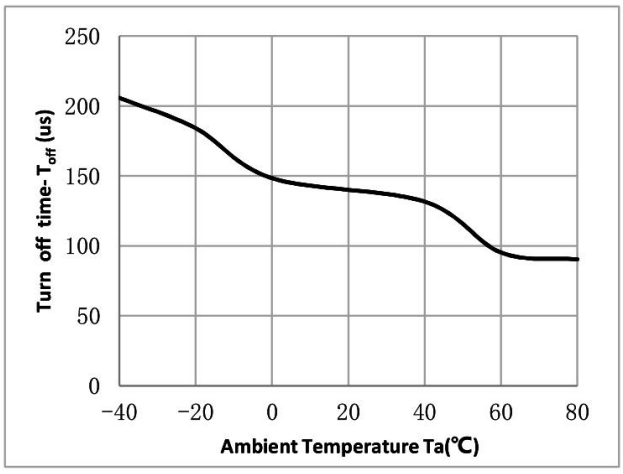


Fig.5 LED turn on current vs. Ambient temperature characteristics

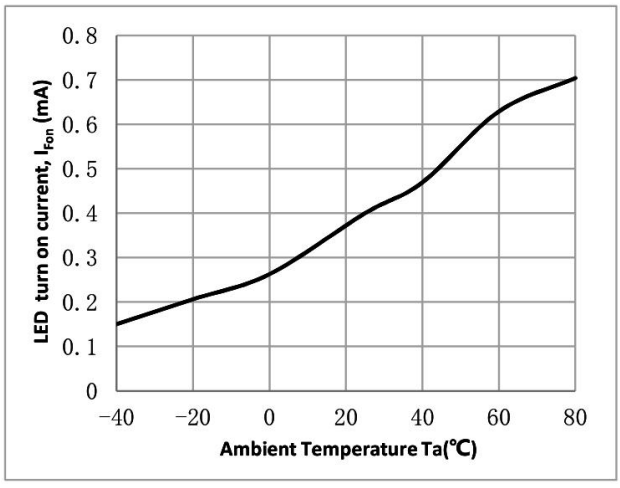
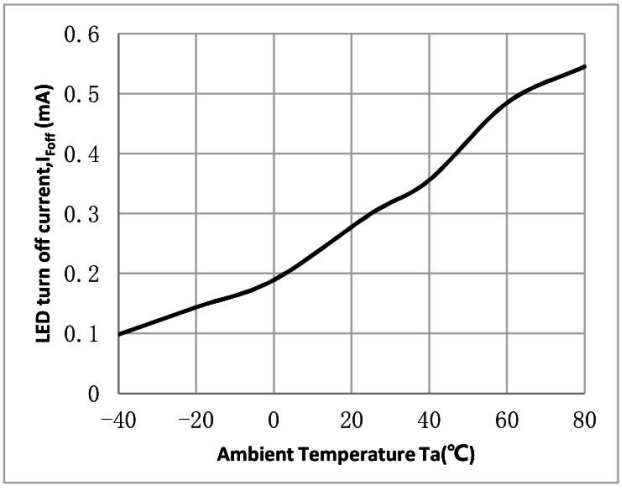


Fig.6 LED turn off current vs. Ambient temperature characteristics



Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

Fig.7 LED dropout voltage vs. Ambient temperature characteristics

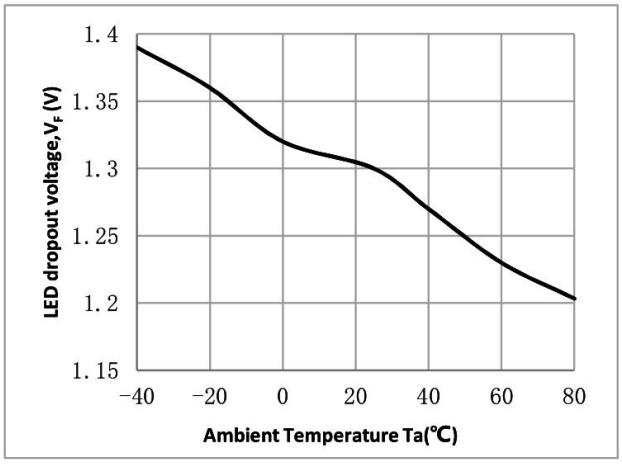


Fig.8 Output current vs Output voltage

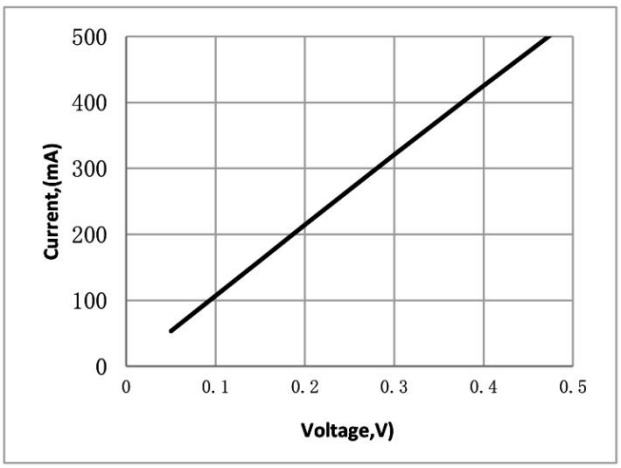


Fig.9 Off state leakage current vs Load voltage characteristics

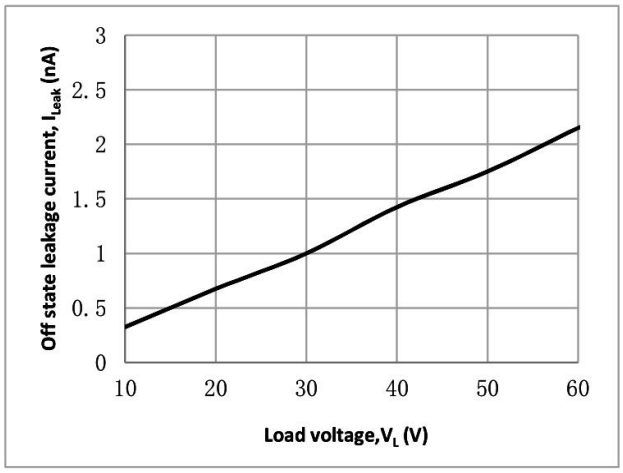


Fig.10 LED turn on time vs Forward current characteristics

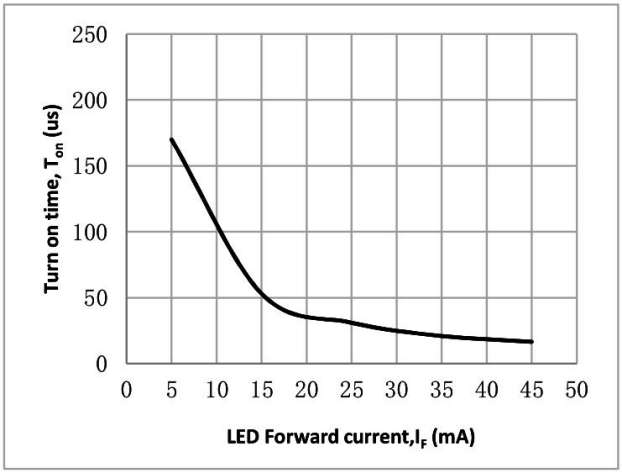


Fig.11 LED turn off time vs Forward current characteristics

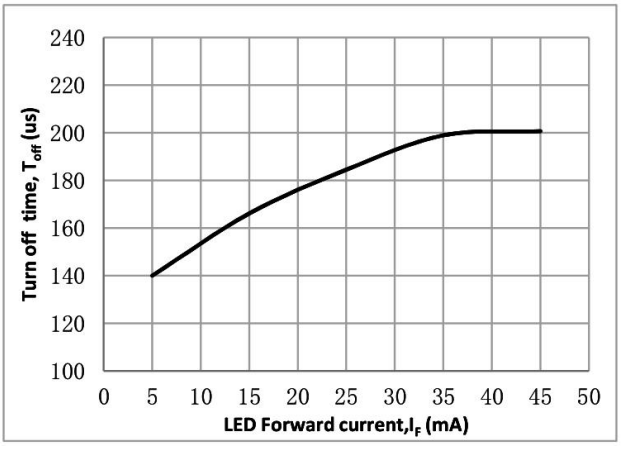
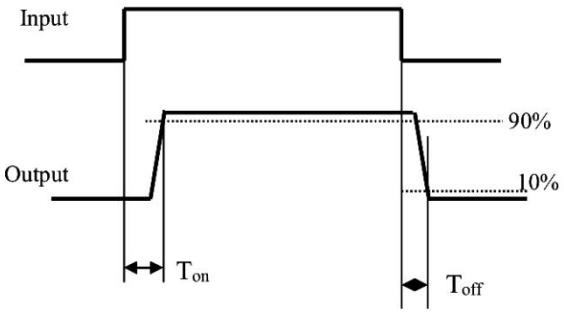
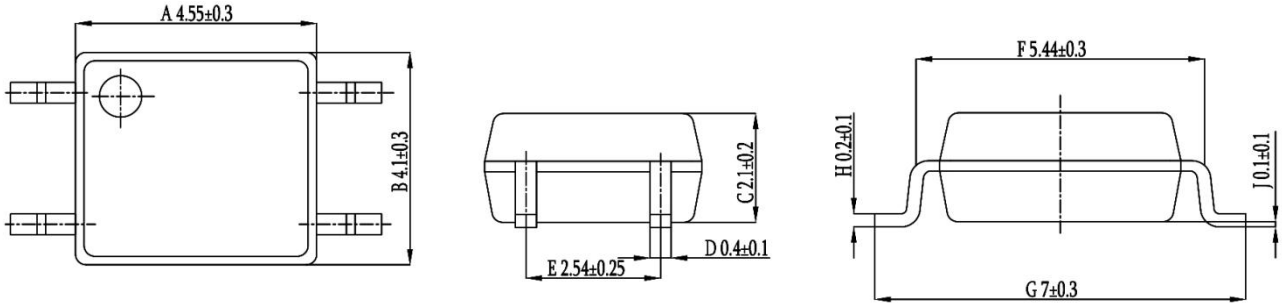


Fig.12 Turn on/off time

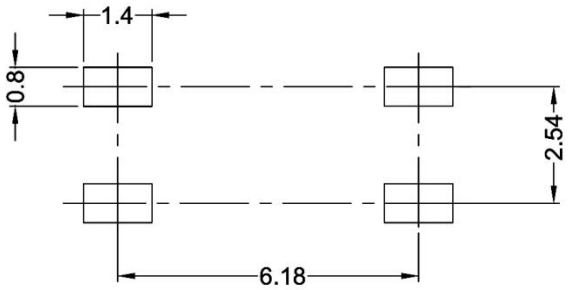


Package Outline Dimensions (unit: mm)

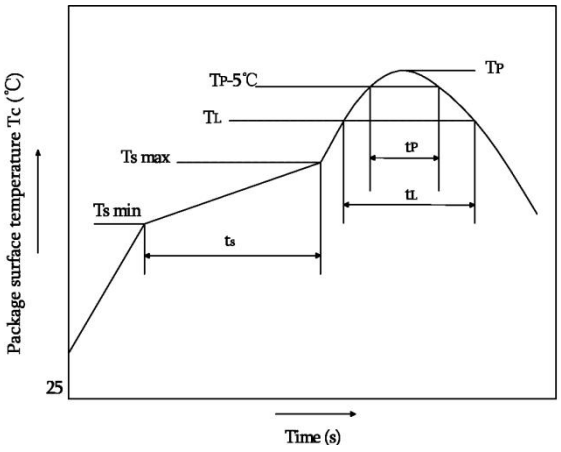
SOP4



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

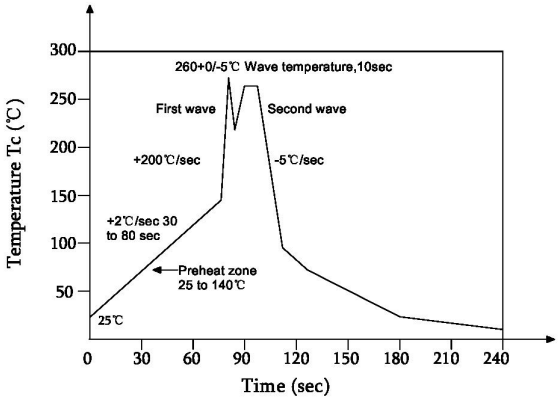


	Symbol	Min	Max	Unit
Preheat temperayure	Ts	150	200	℃
Preheat time	ts	60	120	s
Ramp-up ratea(T_L to T_P)			3	℃/s
Liquidus temperature	T_L	217		℃
Time above T_L	t_L	60	150	s
Peak temperature	Tp		260	℃
Time during which Tc is between (T_P-5) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	℃/s

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℃/s
Heating rate during preheat	1℃/s to 2℃/s typical;4℃/s maximum
Final preheat temperature Ts	~130℃
Preheat time (25℃ to Ts)	>60s
Peak temperature Tp	260℃
Time within peak temperature tp	10s
Ramp-down rate	5℃/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 ℃+5℃ 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

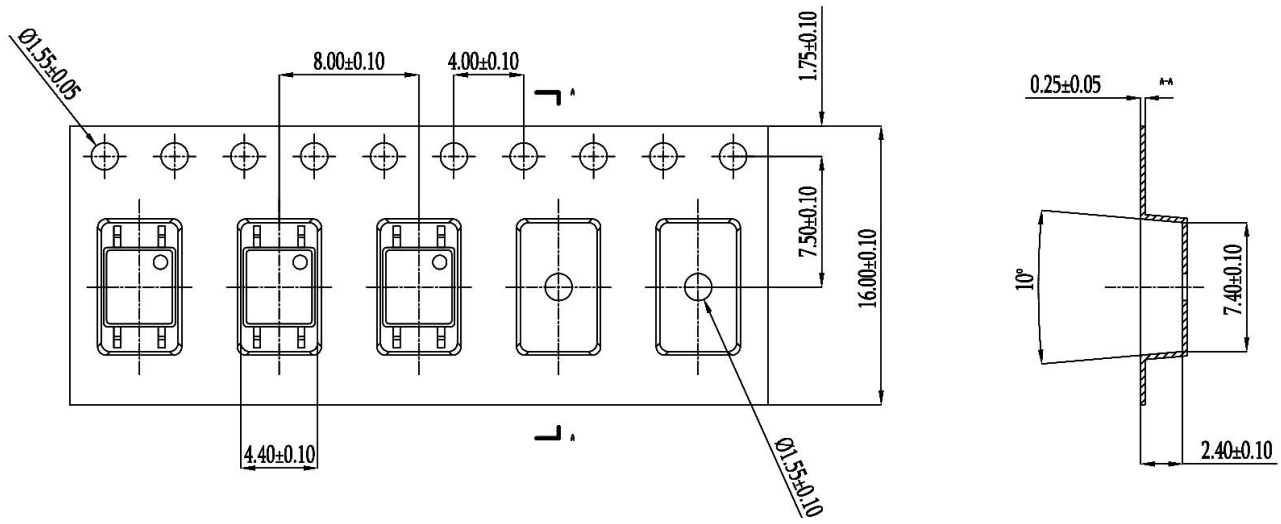
■ Summary table

■ SOP4 (Reel)

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

Qty/ctn : 30000pcs.

Schematic: (unit:mm)



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