

400V Normally Open (1-Form-A) Optical MOSFET Relay

General Features

- Low-level off State Leakage Current
- No Moving Parts
- Fast Switching Speed
- 1500 Vrms Input/Output Isolation
- SOP Package 4 Pin Type in Miniature Design
- Highly Efficient GaAlAs Infrared LED and Reliability MOSFETs

V_{OFF}	I_{ON}	$R_{ON(TYP.)}$
400V	100mA	15Ω

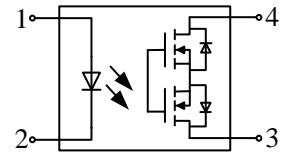
Applications

- Telecommunications
- Measurement Equipment
- Industrial Automation
- Security Equipments
- Control Equipment
- New Energy Vehicles

SOP-4



(Unit: mm)



1. LED Anode
2. LED Cathode
3. Drain (MOSFET)
4. Drain (MOSFET)

Ordering Information

Part Number	Package	Marking	Packing quantity
AKJ12C40ASSR	SOP-4	12C40ASSR	2000pcs/Reel

Absolute Maximum Ratings

$T_A=25^\circ\text{C}$ unless otherwise specified

Item		Symbol	Note	Value	Unit
Input	LED Forward Current	I_F	--	50	mA
	LED Pulse Forward Current	I_{FP}	f=100Hz, duty=1%	1000	mA
	LED Reverse Voltage	V_R	--	5	V
	LED Power Dissipation	P_D	--	75	mW
	LED Junction Temperature	T_J	--	100	$^\circ\text{C}$
Output	Off-state Output Terminal Voltage	V_{OFF}	AC Peak or DC	400	V
	On-state Current	I_{ON}	--	100	mA
	On-state Peak Current	I_{ONP}	100ms(1 pulse)	0.3	A
	Output Power Dissipation	P_O	--	300	mW
	Junction Temperature	T_J	--	100	$^\circ\text{C}$
Total Power Dissipation		P_T	--	350	mW
Storage Temperature		T_{stg}	--	-40 to 100	$^\circ\text{C}$
Operating Temperature		T_{opr}	--	-40 to 85	$^\circ\text{C}$
Lead Soldering Temperature		T_{sol}	10 sec max.	260	$^\circ\text{C}$
Isolation Voltage ^[1]		BV_{IO}	AC, RH ≤ 60%, 60s	1500	Vrms

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

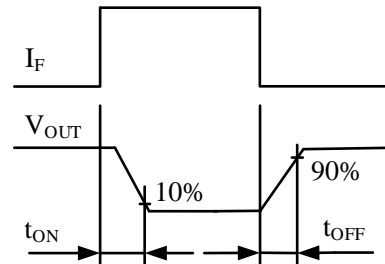
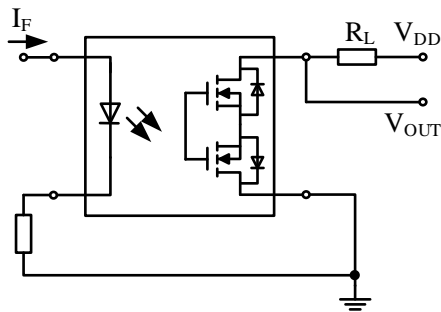
Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise specified

Item		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input	LED Forward Voltage	V_F	--	1.3	1.5	V	$I_F=10\text{mA}$
	LED Reverse Current	I_R	--	--	5.0	μA	$V_R=5\text{V}$
	Trigger LED Current	I_{FT}	--	0.2	2.0	mA	$I_{ON}=100\text{mA}$
	Return LED Current	I_{FC}	--	0.2	0.5	mA	$I_{OFF}=100\mu\text{A}$
	Return LED Voltage	V_{FC}	0.7	--	--	V	$I_{OFF}=100\mu\text{A}$
Output	On- state Resistance ^[2]	R_{ON}	--	15	30	Ω	$I_F=5\text{mA}, I_{ON}=100\text{mA}$
	Off-state Leakage Current	I_{OFF}	--	--	1000	nA	$V_{OFF}=400\text{V}$
	Output Capacitance	C_{OUT}	--	45	--	pF	$V_{OUT}=0\text{V}, f=1\text{MHz}$
Transmission	Turn-on Time ^[3]	T_{ON}	--	120	500	μs	$I_F=5\text{mA}, I_{ON}=100\text{mA}$
	Turn-off Time ^[3]	T_{OFF}	--	350	500	μs	
Coupled	Capacitance Input to Output	C_{IO}	--	0.6	--	pF	$V_{IO}=0\text{V}, f=1\text{MHz}$
	Isolation Resistance	R_{IO}	10^{10}	--	--	Ω	DC=500V
	Isolation Voltage	BV_{IO}	1500	--	--	V _{rms}	AC, 60s

NOTE:

- [1] LED pins are shorted together. Detector pins are also shorted together.
- [2] Measurement Taken within 1 Second of On-time.
- [3] Switching Time Test Circuit.



Typical Characteristics

Figure 1. Load Current vs. Ambient Temperature

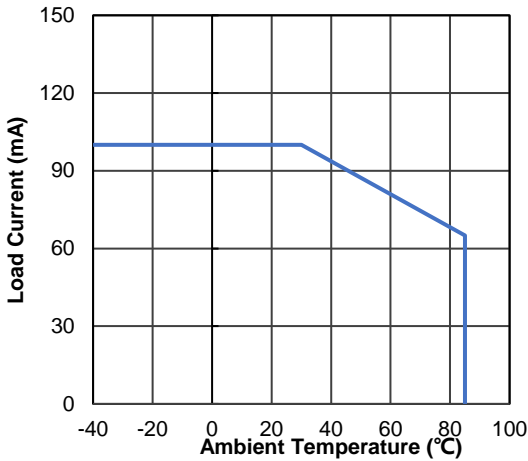


Figure 2. On-state Resistance vs. Ambient Temperature

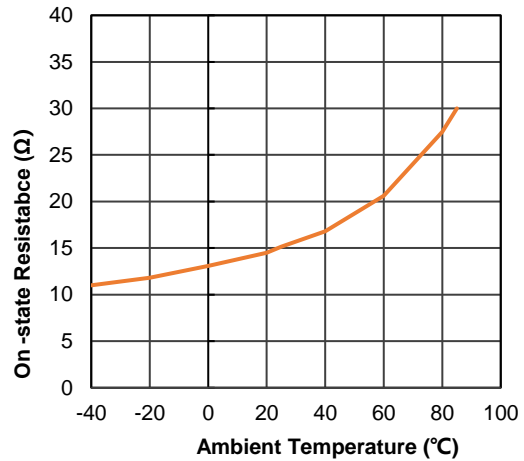


Figure 3. Switching Time vs. Ambient Temperature

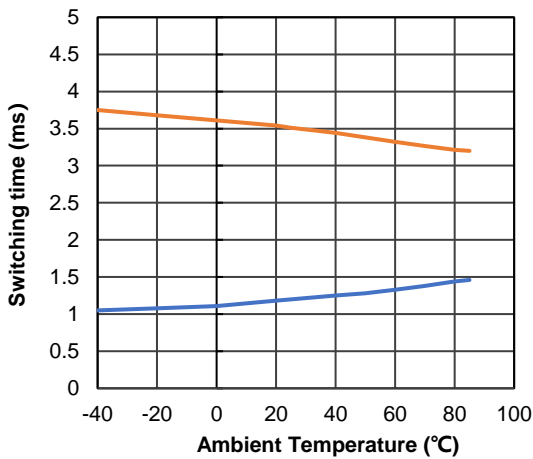


Figure 4. Trigger LED Current vs. Ambient Temperature

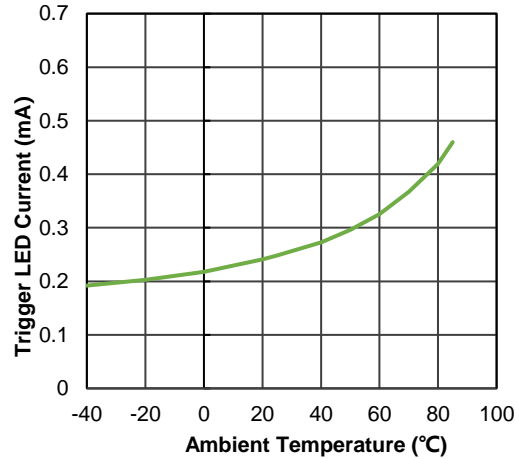


Figure 5. Off-state Current vs. Ambient Temperature

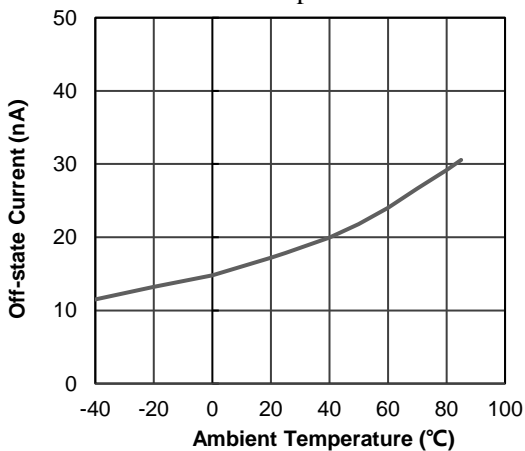
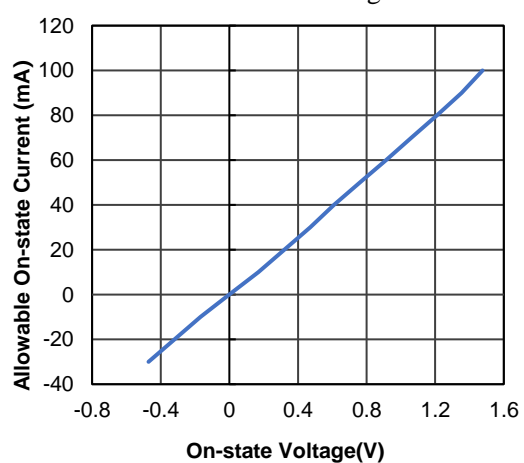
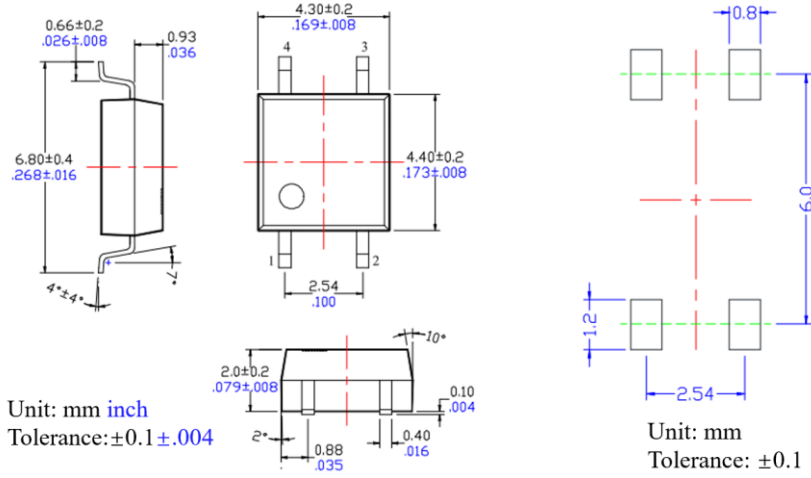


Figure 6. Allowable On-state Current vs. On-state Voltage

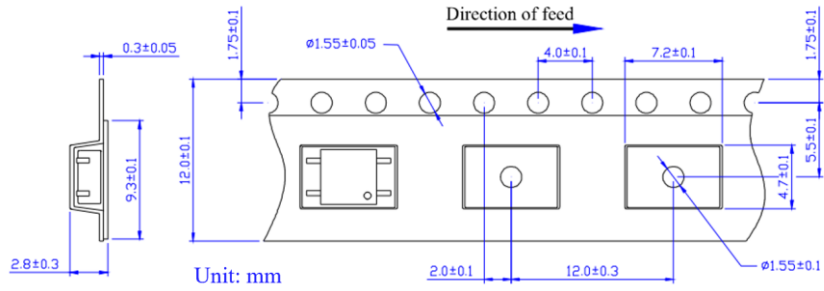


Package Dimensions

SOP -4



Tape dimensions



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