

400V Normally Closed (1-Form-B) Optical MOSFET Relay

General Features

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

V_{OFF}	I_{ON}	$R_{ON(TYP.)}$
400V	200mA	20Ω

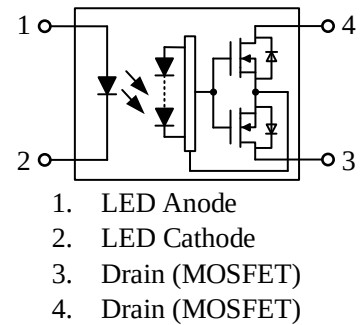
Applications

- Telecommunications
- Measuring and Testing Equipment
- Industrial Control
- Security Equipments
- High speed Inspection Machine



(Unit: mm)

SOP-4



Ordering Information

Part Number	Package	Marking	Packing quantity
OPY414S	SOP-4	OPY414S	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
	Diode Power Dissipation	P_D	--	75	mW
Output	Load Voltage	V_{OFF}	AC Peak or DC	400	V
	On-state Current	I_{ON}	--	200	mA
	On-state Peak Current	I_{ONP}	100ms(1 pulse)	0.3	A
	Output Power Dissipation	P_O	--	300	mW
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_L	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

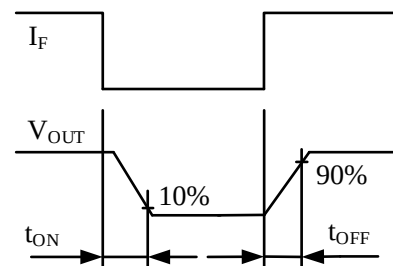
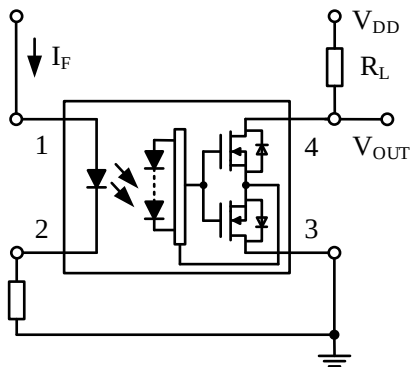
Item		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input	LED Forward Voltage	V_F	--	1.3	1.5	V	$I_F = 10\text{mA}$
	LED Reverse Current	I_R	--	--	5.0	μA	$V_R = 5\text{V}$
	Trigger LED Current	I_{FC}	--	0.2	2.0	mA	$I_{OFF} = 100\mu\text{A}$
	Return LED Current	I_{FT}	0.1	0.2	--	mA	$I_{ON} = 100\text{mA}$
	Return LED Voltage	V_{FC}	0.7	--	--	V	$I_{OFF} = 100\mu\text{A}$
Output	On - state Resistance ^[2]	R_{ON}	--	20	50	Ω	$I_{ON} = 100\text{mA}$
	Off-State Leakage Current	I_{OFF}	--	--	1.0	μA	$V_{OFF} = 400\text{V}$, $I_F = 5\text{mA}$
	Output Capacitance	C_{OUT}	--	45	--	pF	$V_{OFF} = 0\text{V}$, $f = 1\text{MHz}$ $I_F = 5\text{mA}$
Transmission	Turn-on Time ^[3]	T_{ON}	--	0.02	0.5	ms	$I_F = 5\text{mA}$, $I_{ON} = 100\text{mA}$
	Turn-off Time ^[3]	T_{OFF}	--	0.1	0.5	ms	
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	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 Device Performance

Figure 1. Load Current Vs. Ambient Temperature

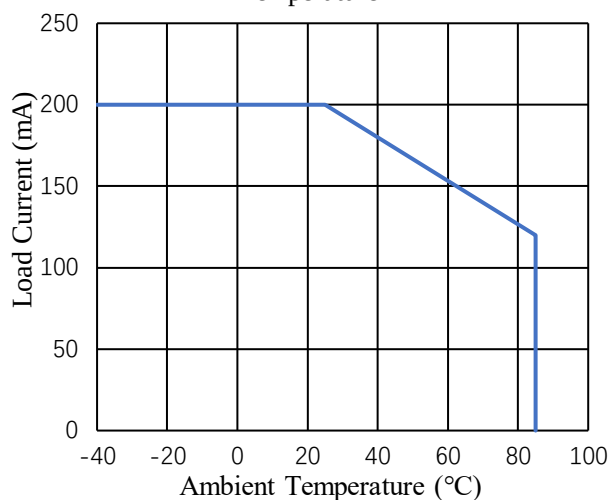


Figure 2. On Resistance Vs. Ambient Temperature

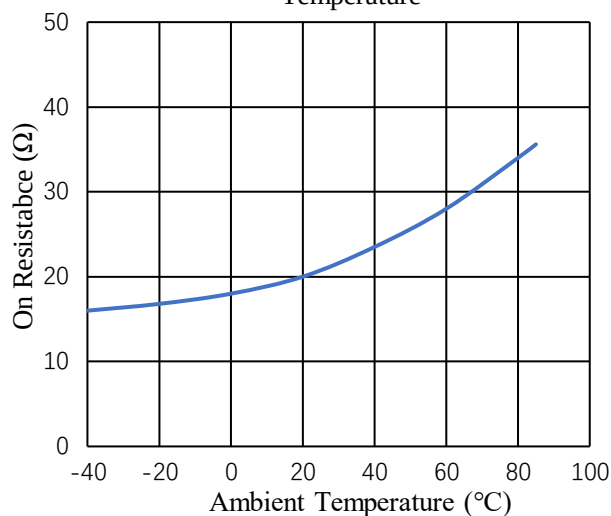


Figure 3. Operate (OFF) time Vs. Ambient Temperature

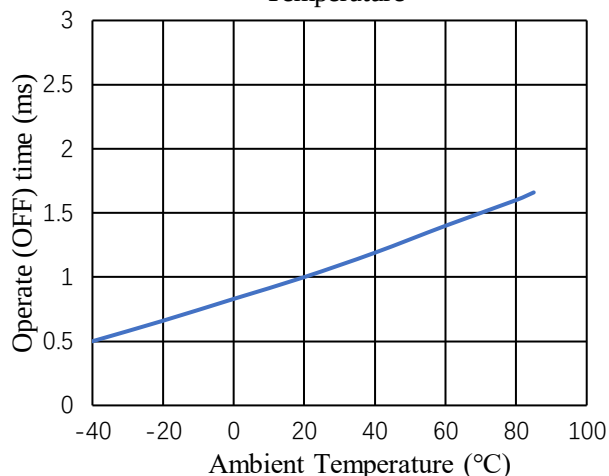


Figure 4. Reverse (ON) time Vs. Ambient Temperature

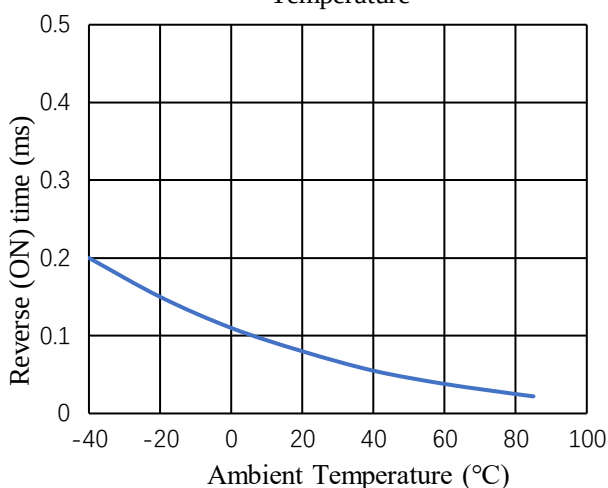


Figure 5. LED Operate (OFF) Current Vs. Ambient Temperature

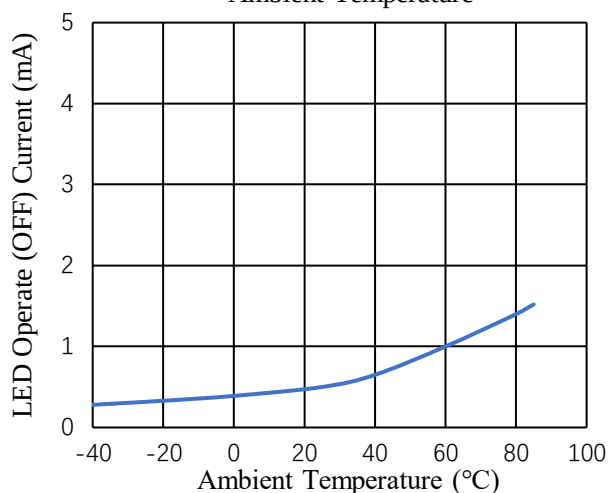


Figure 6. LED Turn off time Vs. Ambient Temperature

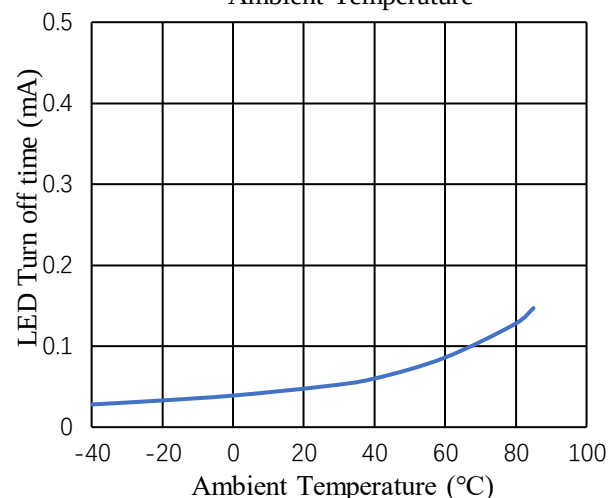


Figure 7. LED Forward Voltage Vs. Ambient Temperature

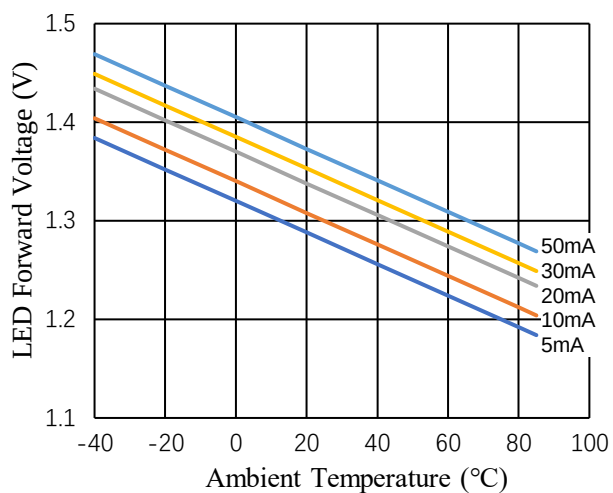


Figure 8. Voltage Vs. Current Characteristics of Output at MOS Portion

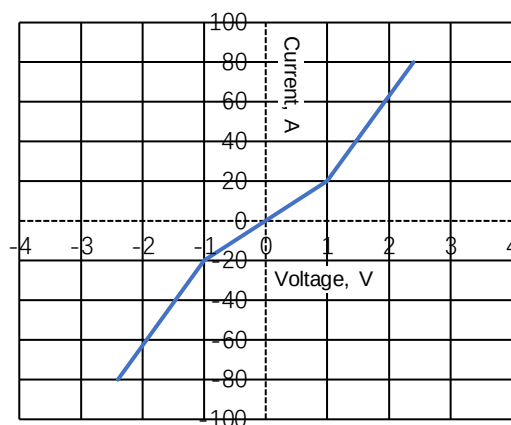


Figure 9. Off State Leakage Current Vs. Load Voltage Characteristics

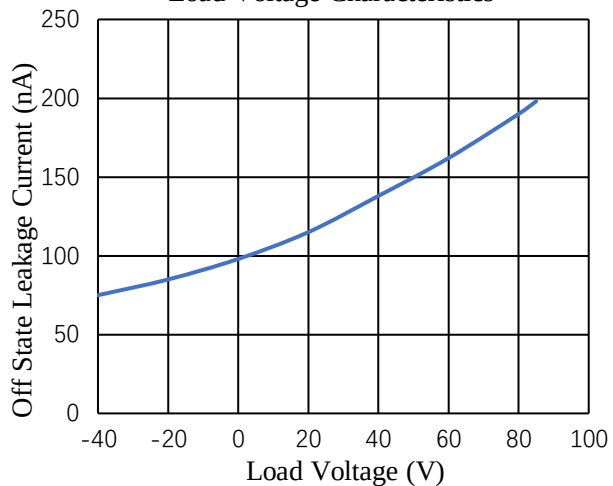
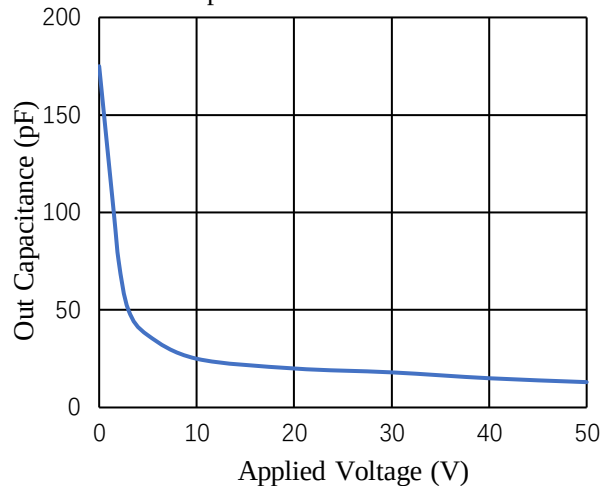
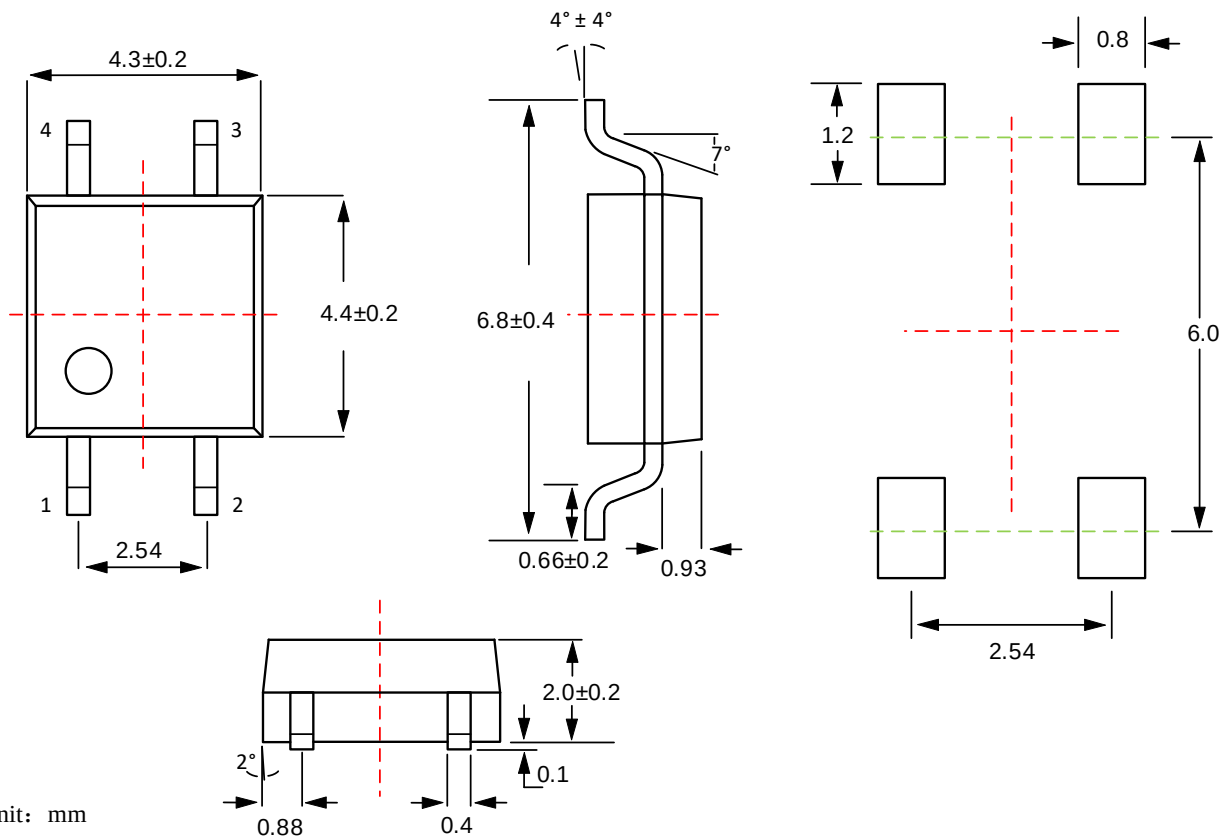


Figure 10. Applied Voltage Vs. Output Capacitance Characteristics



Package Dimensions

SOP -4



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