

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

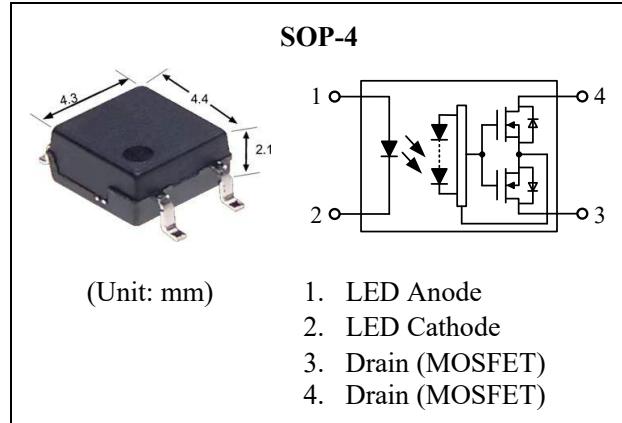
General Features

- 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	120mA	18Ω

Applications

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



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}	$f=100\text{Hz}$, 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}	--	120	mA
	On-state Peak Current	I_{ONP}	100ms (1 pulse)	300	mA
	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, $RH \leq 60\%$, 60s	1500	Vrms

Caution: Stresses beyond 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

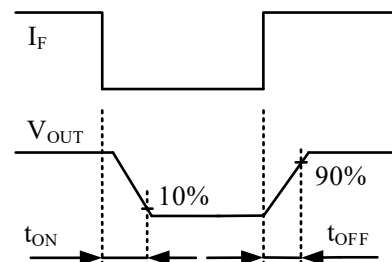
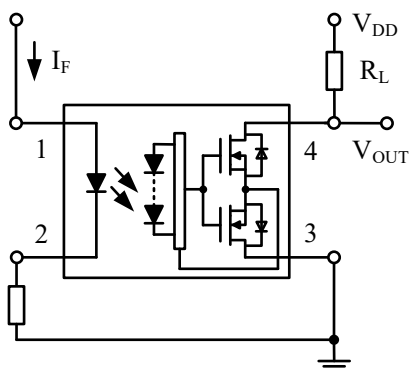
Item		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input	LED Forward Voltage	V_F	--	1.3	1.4	V	$I_F = 10\text{mA}$
	LED Reverse Current	I_R	--	--	5.0	μA	$V_R = 5\text{V}$
	Trigger LED Current	I_{FC}	--	0.2	2.0	mA	$I_{OFF} = 100\mu\text{A}$
	Return LED Current	I_{FT}	0.1	0.2	--	mA	$I_{ON} = 120\text{mA}$
Output	On-state Resistance ^[2]	R_{ON}	--	18	30	Ω	$I_{ON} = 120\text{mA}$
	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}	--	50	500	μs	$I_F = 5\text{mA}$, $I_{ON} = 120\text{mA}$
	Turn-off Time ^[3]	T_{OFF}	--	20	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	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

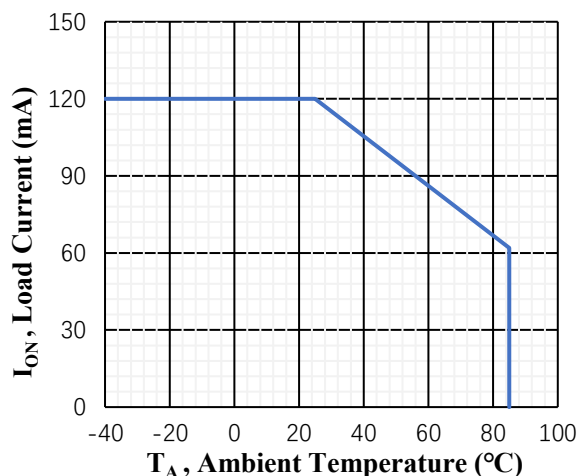


Figure 2. On-state Resistance vs. Ambient Temperature

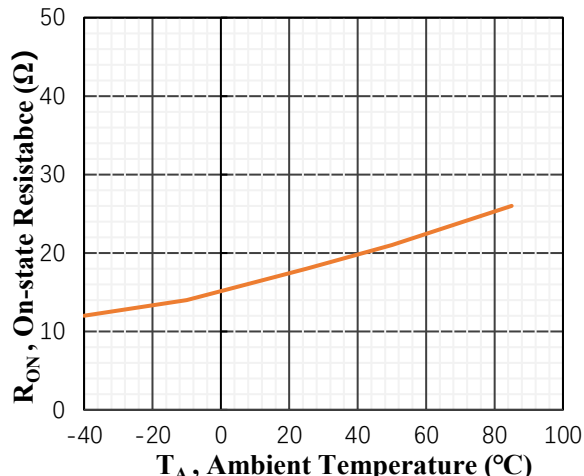


Figure 3. Switching Time vs. Ambient Temperature

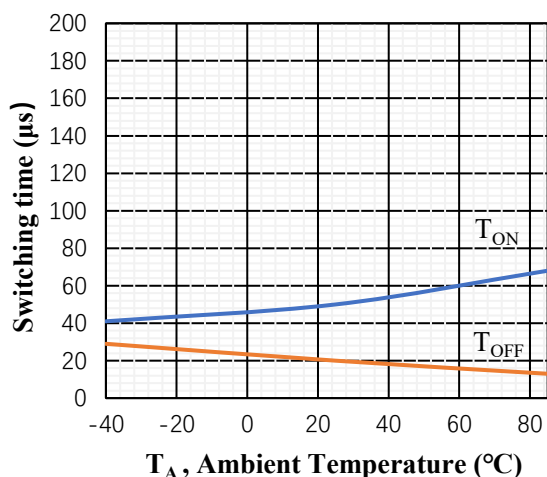


Figure 4. Trigger LED Current vs. Ambient Temperature

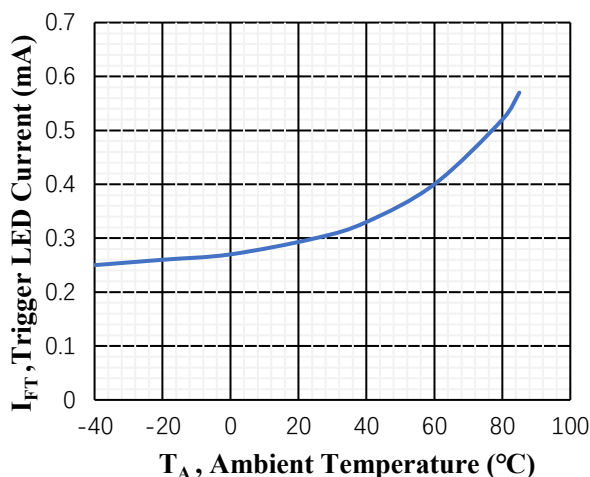


Figure 5. LED forward Voltage Vs. Ambient Temperature

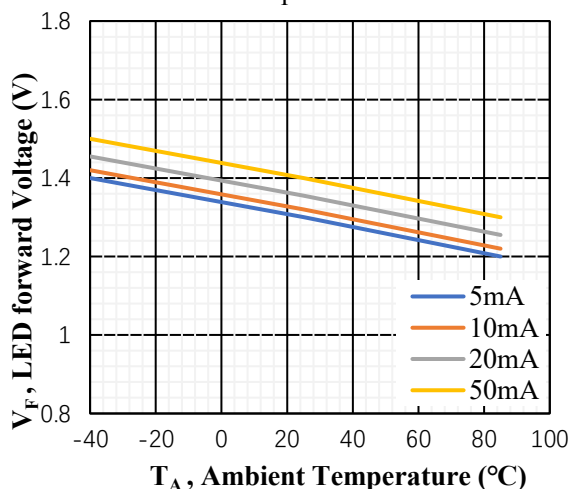
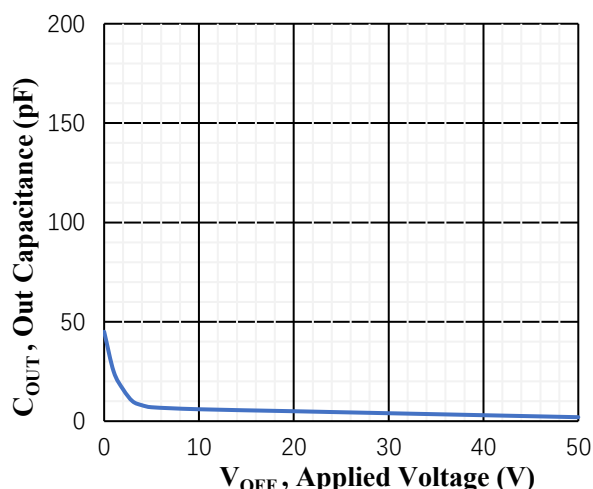
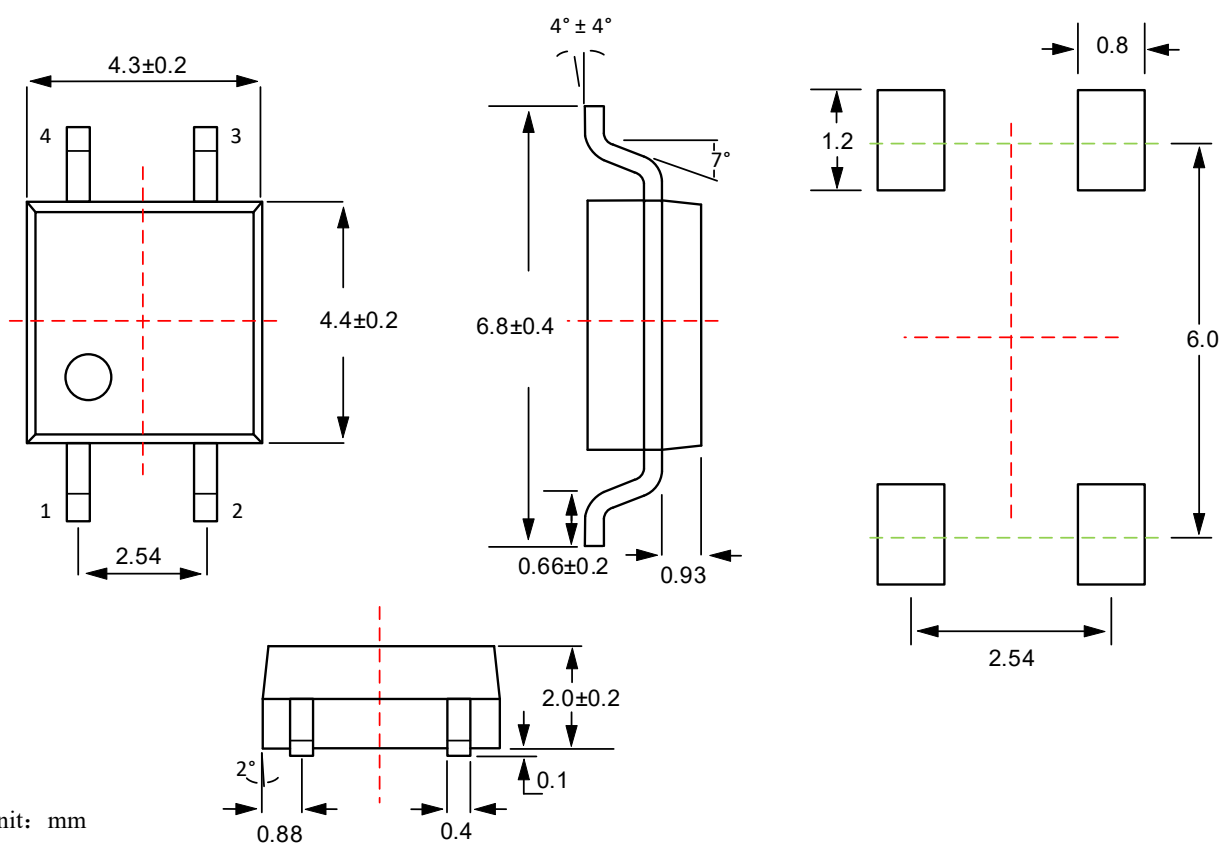


Figure 6. Output Capacitance Vs. Applied Voltage



Package Dimensions

SOP - 4



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