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

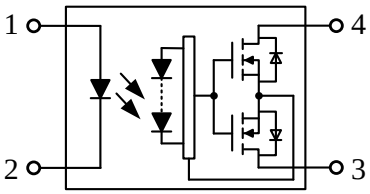
## General Features

- 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** | **130mA** | **14Ω** |

**SOP-4**


(Unit: mm)




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

## Applications

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

## Ordering Information

| Part Number | Package | Marking | Packing quantity |
|---|---|---|---|
| OPY214S | SOP-4 | OPY214S | 2000pcs/Reel |

## Absolute Maximum Ratings

$T_a$=25℃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 |
| Output | Off-state Output Terminal Voltage | $V_{OFF}$ | AC Peak or DC | 400 | V |
| | On-state Current | $I_{ON}$ | -- | 130 | mA |
| | On-state Peak Current | $I_{ONP}$ | 100ms (1 pulse) | 600 | mA |
| | Output Power Dissipation | $P_O$ | -- | 300 | mW |
| Total Power Dissipation | | $P_T$ | -- | 350 | mW |
| Storage Temperature | | $T_{STG}$ | -- | -40 to 100 | ℃ |
| Operating Temperature | | $T_{OPR}$ | -- | -40 to 85 | ℃ |
| Soldering Temperature | | $T_L$ | 10 sec max. | 260 | ℃ |
| 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℃ unless otherwise specified

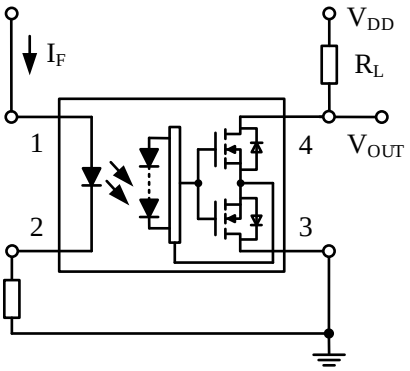
| Item | | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|---|
| Input | LED Forward Voltage | $V_F$ | -- | 1.35 | 1.4 | V | $I_F$=5mA |
| | Trigger LED Current | $I_{FT}$ | -- | 0.3 | 3.0 | mA | $I_{ON}$=130mA |
| | Return LED Current | $I_{FC}$ | -- | 0.35 | 0.5 | mA | $I_{ON}$=100μA |
| | Return LED Voltage | $V_{FC}$ | 0.7 | -- | -- | V | $I_{ON}$=100μA |
| Output | On-state Resistance [2] | $R_{ON}$ | -- | 14 | 20 | Ω | $I_F$=5mA, $I_{ON}$=130mA |
| | Off-state Leakage Current | $I_{OFF}$ | -- | -- | 100 | nA | $V_{OFF}$=400V |
| | Output Capacitance | $C_{OUT}$ | -- | 65 | -- | pF | $V_{OFF}$=0V, f=1MHz |
| Transmission | Turn-on Time [3] | $T_{ON}$ | -- | 40 | 100 | μs | $I_F$=5mA, $I_{ON}$=130mA |
| | Turn-off Time [3] | $T_{OFF}$ | -- | 20 | 100 | μs | |
| Coupled | Capacitance Input to Output | $C_{IO}$ | -- | 0.8 | 1.5 | pF | $V_{IO}$=0V, f=1MHz |
| | Isolation Resistance | $R_{IO}$ | $10^{10}$ | -- | -- | Ω | DC=500V |
| | Isolation Voltage | $BV_{IO}$ | 1500 | -- | -- | Vrms | AC, 60s |

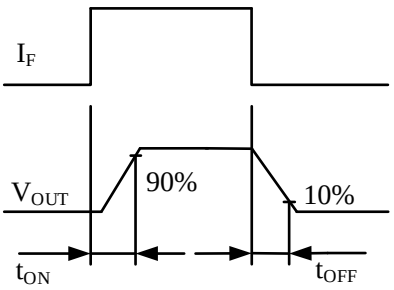
NOTE:

[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 Curent vs Ambient Temperature

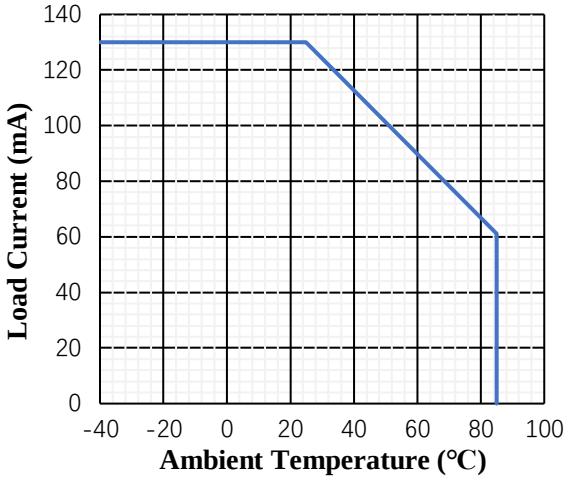



Figure 2. On -state Resistance vs Ambient Temperature

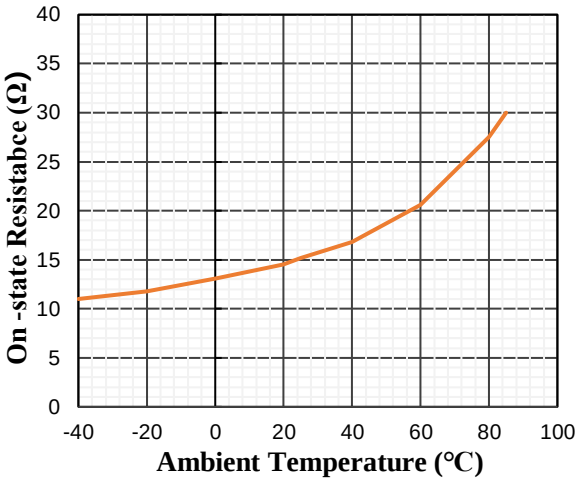



Figure 3. Swtching Time vs. Ambient Temperature

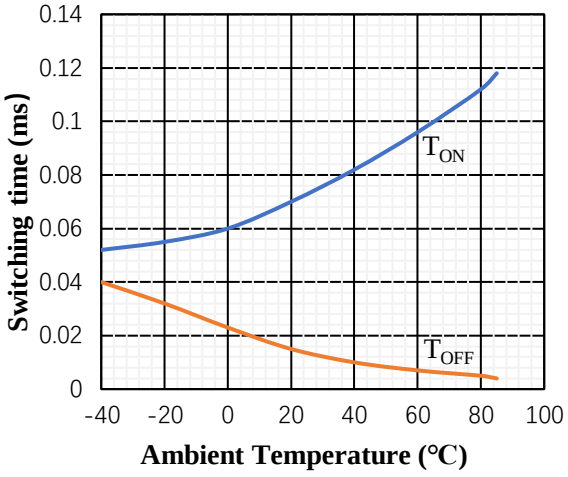



Figure 4. Trigger LED Current vs. Ambient Temperature

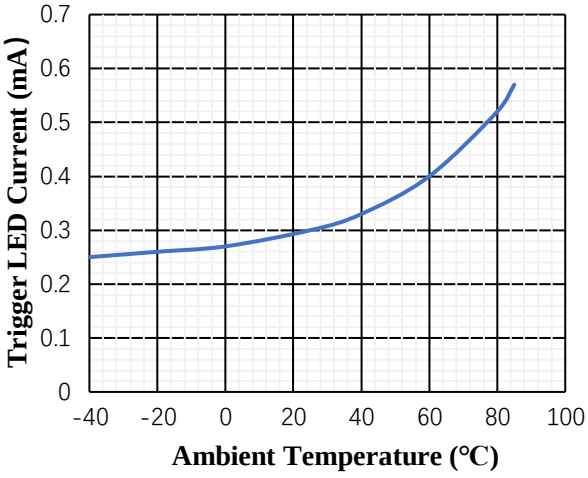



Figure 5. LED turn off Current vs Ambient Temperature

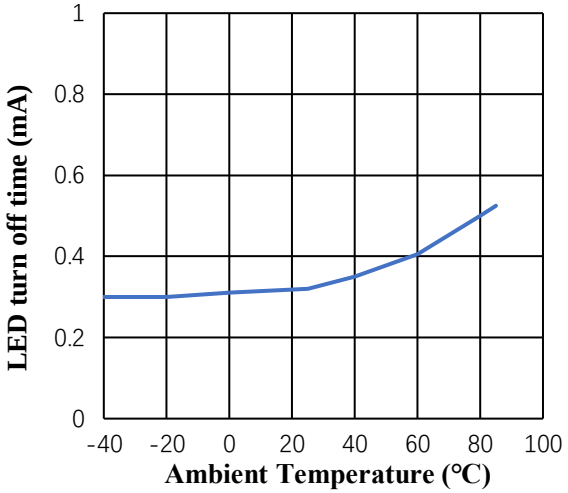



Figure 6. Off-state Current vs Ambient Temperature

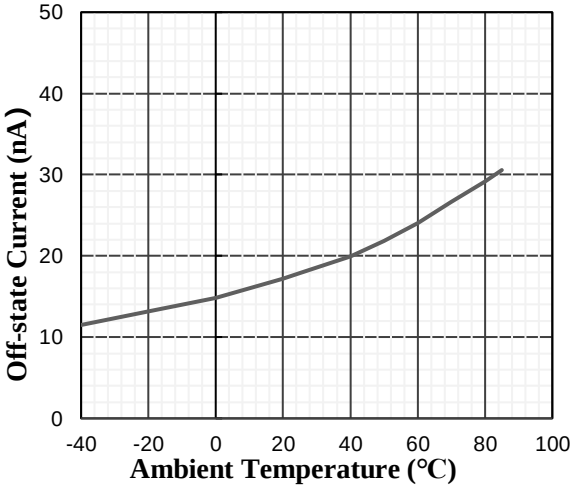


Figure 7. LED forward Voltage Vs. Ambient Temperature

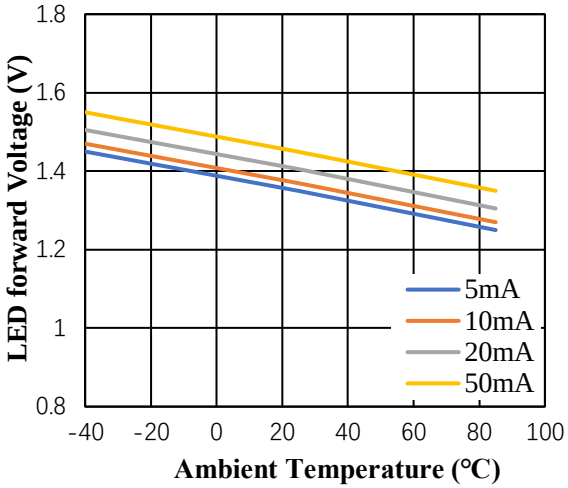
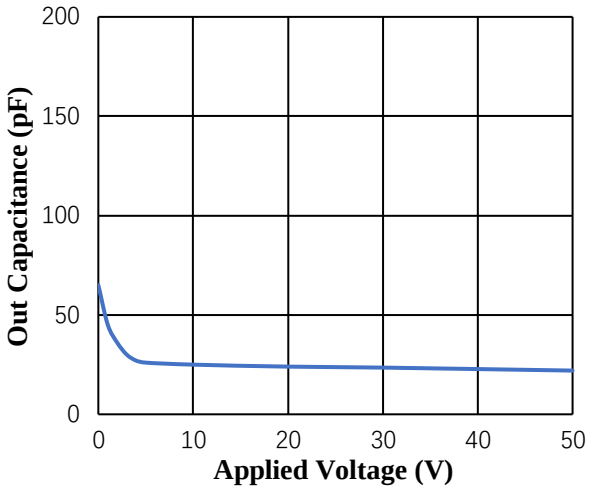
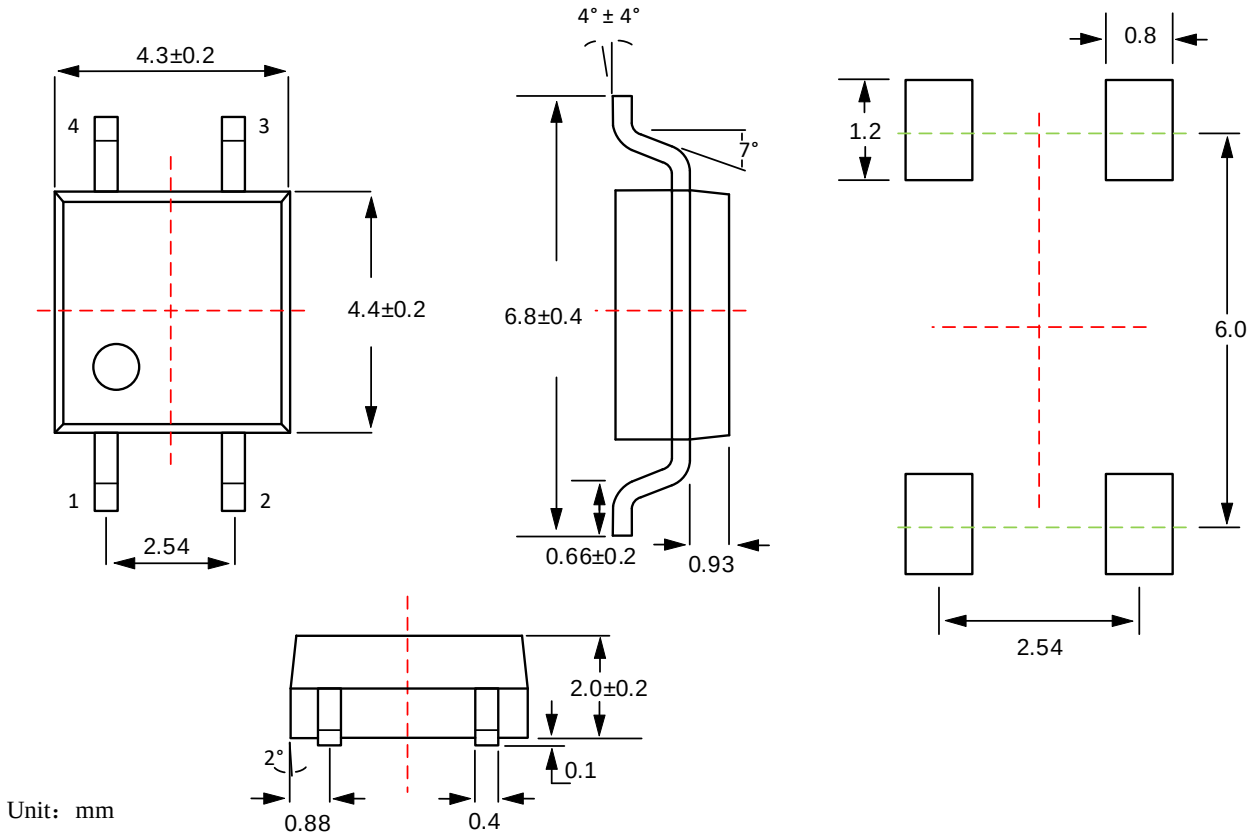



Figure 8. Output Capacitance Vs. Applied Voltage



## Package Dimensions

**SOP -4**




Unit：mm

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