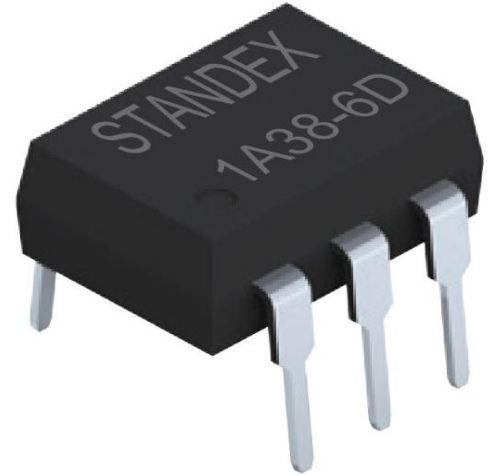


38 Series Photo-MOSFET Relay

- **Features:** High Voltage Photo MOSFET Relay, switching up to 600V DC or Peak AC
- THT, SMD or SOP; High I/O Isolation
- Tested in accordance with AEC-Q101, UL listed, RoHS Compliance
- **Applications:** Automatic Test Equipment, Battery Management Systems, I/O Modules, Telephone Equipment
- **Markets:** Automotive, Telecommunication, Test & Measurement, Security



Part Description: **SMP-XA38-XXX-X**

| Number of Poles | Contact Form | Series Number | Number of Pins | Mounting Type | Package Style | Special Features |
|-----------------|--------------|---------------|----------------|---------------|---------------|------------------|
| 1, 2 | A | 38 | 4, 6, 8 | D, S, P | Tube, Reel | Nil, Q, R |

See page 7 for Glossary

Maximum Ratings @ Ambient Temperature = 25°C

| Parameters | Symbol | Value | | | | | Units | Condition |
|-------------------------------|------------|----------|----------|------------|------------|------------|---------------|------------------------|
| | | 1A38-4P | 2A38-8P | 1A38-4D, S | 2A38-8D, S | 1A38-6D, S | | |
| INPUT SPECIFICATIONS | | | | | | | | |
| Continuous LED Current | I_F | 50 | 50 | 50 | 50 | 50 | mA | - |
| Peak LED Current | I_{FP} | 500 | 500 | 500 | 500 | 500 | mA | f=100Hz, 1% Duty Cycle |
| LED Reverse Voltage | V_R | 5 | 5 | 5 | 5 | 5 | V | - |
| Input Power Dissipation | P_{IN} | 75 | 75 | 75 | 75 | 75 | mW | - |
| OUTPUT SPECIFICATIONS | | | | | | | | |
| Load Voltage | V_L | 600 | 600 | 600 | 600 | 600 | DC or Peak AC | - |
| Load Current | I_L | 70 | 60 | 80 | 70 | 80 | mA | - |
| Peak Load Current | I_{PEAK} | 200 | 200 | 200 | 200 | 200 | mA | 1 ms, 1 shot |
| Output Power Dissipation | P_{OUT} | 300 | 450 | 450 | 600 | 450 | mW | - |
| GENERAL SPECIFICATIONS | | | | | | | | |
| Total Power Dissipation | P_T | 350 | 500 | 500 | 650 | 500 | mW | - |
| I/O Breakdown Voltage | $V_{I/O}$ | 1500 | 1500 | 3750 | 3750 | 3750 | V_{RMS} | - |
| I/O Breakdown Voltage | $V_{I/O}$ | 3750 | 3750 | 5000 | 5000 | 5000 | V_{RMS} | Suffix R |
| Operating Temperature | T_{OPR} | -40/+85 | -40/+85 | -40/+85 | -40/+85 | -40/+85 | °C | - |
| Operating Temperature | T_{OPR} | -40/+105 | -40/+105 | -40/+105 | -40/+105 | -40/+105 | °C | Suffix Q |
| Storage Temperature | T_{STG} | -40/+100 | -40/+100 | -40/+100 | -40/+100 | -40/+100 | °C | - |

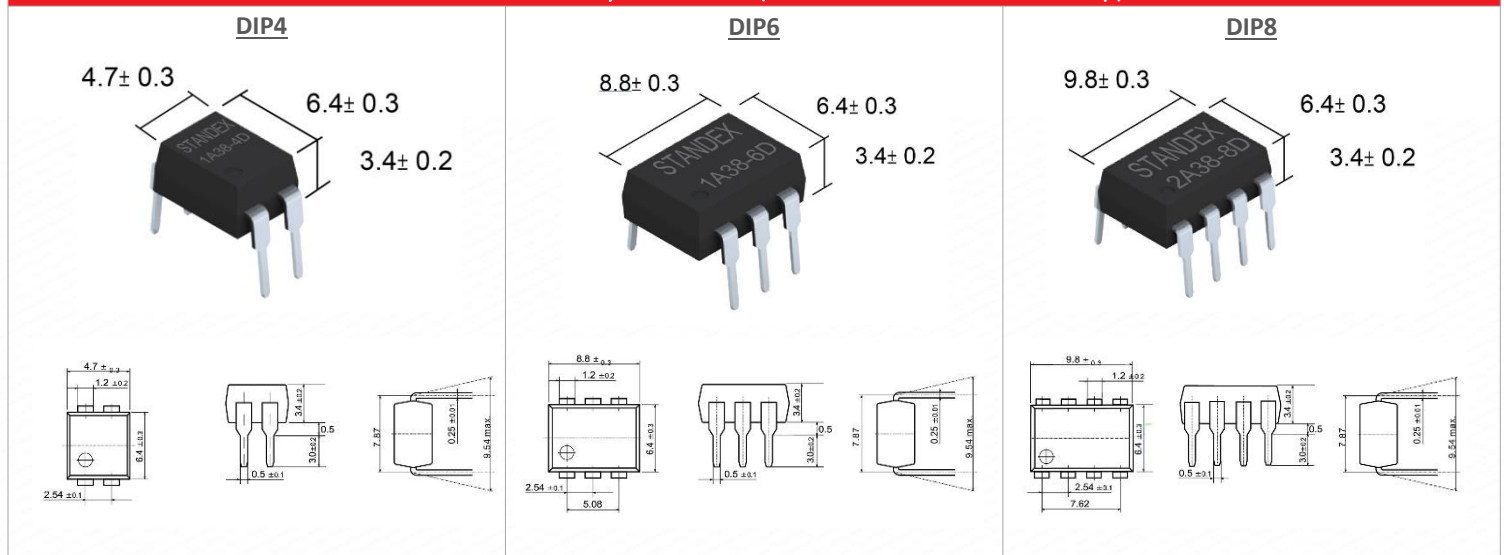


38 Series Photo-MOSFET Relay

Maximum Ratings @ Ambient Temperature = 25°C

| Parameters | Symbol | Min | Typ | Max | Units | Condition |
|------------------------------------|--------------------|--------|------|-----|----------------|---|
| INPUT SPECIFICATIONS | | | | | | |
| LED Forward Voltage | V_F | 1.0 | 1.17 | 1.5 | V | $I_F = 10\text{mA}$ |
| Operation LED Current | $I_{F\text{ ON}}$ | - | 1.0 | 3.0 | mA | - |
| Recovery LED Voltage | $V_{F\text{ OFF}}$ | 0.5 | 1.0 | - | V | - |
| OUTPUT SPECIFICATIONS | | | | | | |
| On Resistance: Drain to Drain | R_{ON} | - | 40 | 60 | Ω | $I_F = 5\text{mA}, I_L = \text{Rating (within 1 sec.)}$ |
| Off-State Leakage Current | I_{LEAK} | - | - | 1.0 | μA | $V_L = 200\text{V}$ |
| Output Capacitance | C_{OUT} | - | 47 | - | ρF | $V_L = 0\text{V}, f = 1\text{MHz}$ |
| TRANSMISSION SPECIFICATIONS | | | | | | |
| Turn-On Time | T_{ON} | - | 0.2 | 0.5 | ms | $I_F = 5\text{mA}, I_L = \text{Rating (for SOP type)}$ |
| Turn-Off Time | T_{OFF} | - | 0.05 | 0.2 | ms | |
| Turn-On Time | T_{ON} | - | 0.1 | 1.0 | ms | $I_F = 10\text{mA}, I_L = \text{Rating (for DIP/SMD type)}$ |
| Turn-Off Time | T_{OFF} | - | 0.05 | 0.5 | ms | |
| COUPLED SPECIFICATIONS | | | | | | |
| I/O Insulation Resistance | $R_{\text{I/O}}$ | 10^9 | - | - | Ω | - |
| I/O Capacitance | $C_{\text{I/O}}$ | - | 1.3 | - | ρF | $f = 1\text{MHz}$ |

Photo-MOSFET Relay Dimensions (Tolerances acc. to ISO 2768-mp)



38 Series Photo-MOSFET Relay

Photo-MOSFET Relay Dimensions (Tolerances acc. to ISO 2768-mp)

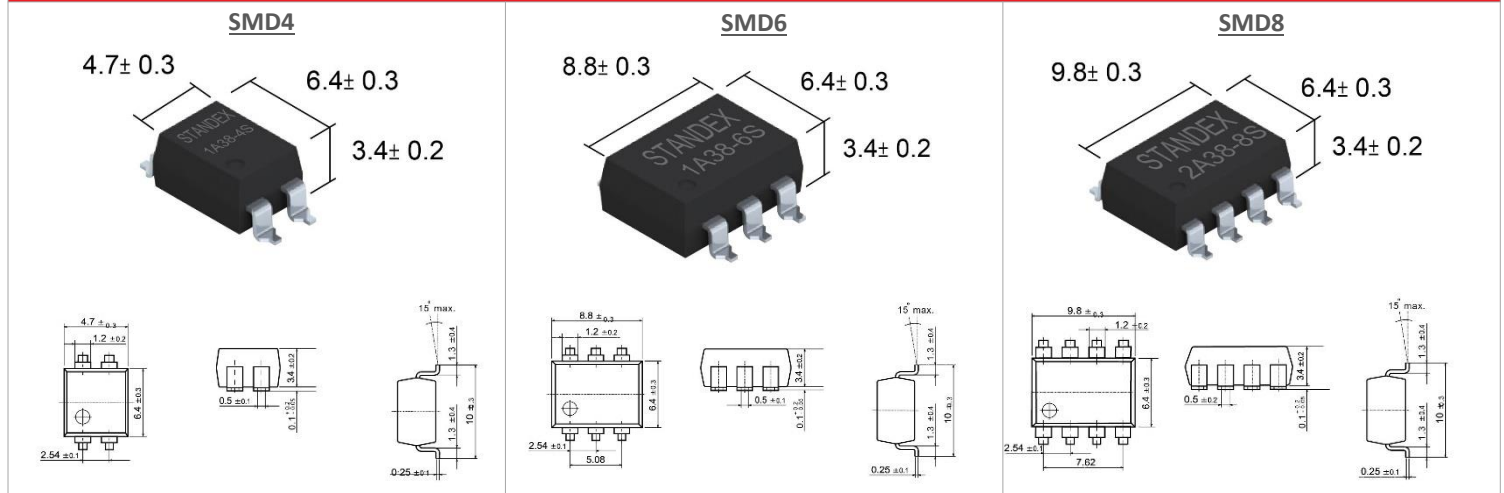


Photo-MOSFET Relay Dimensions (Tolerances acc. to ISO 2768-mp)

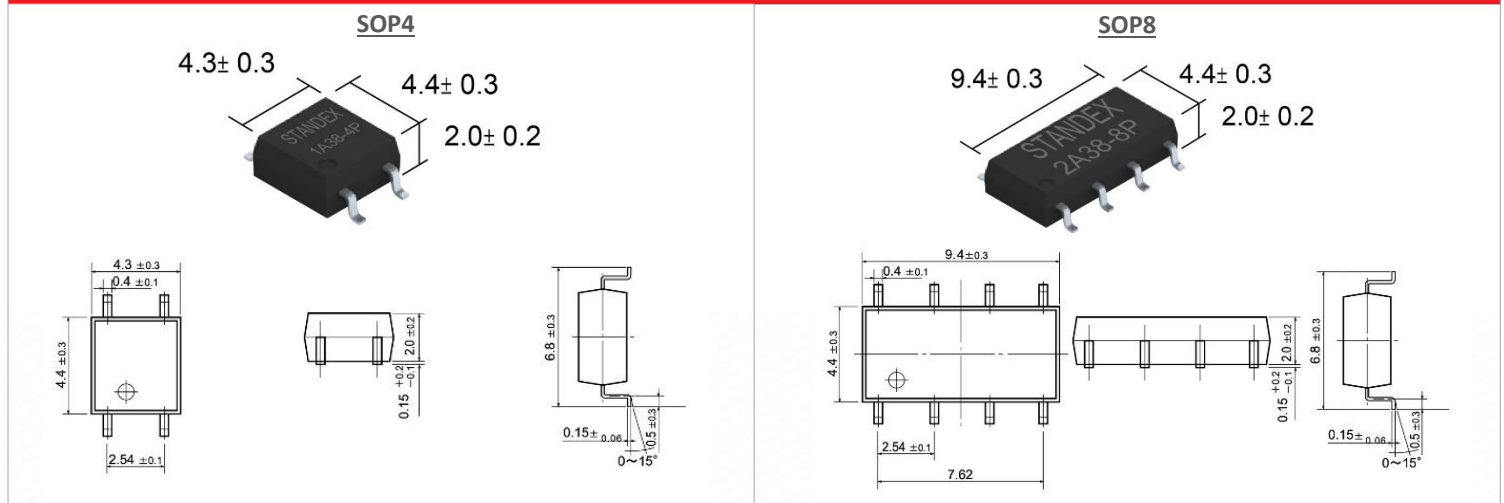
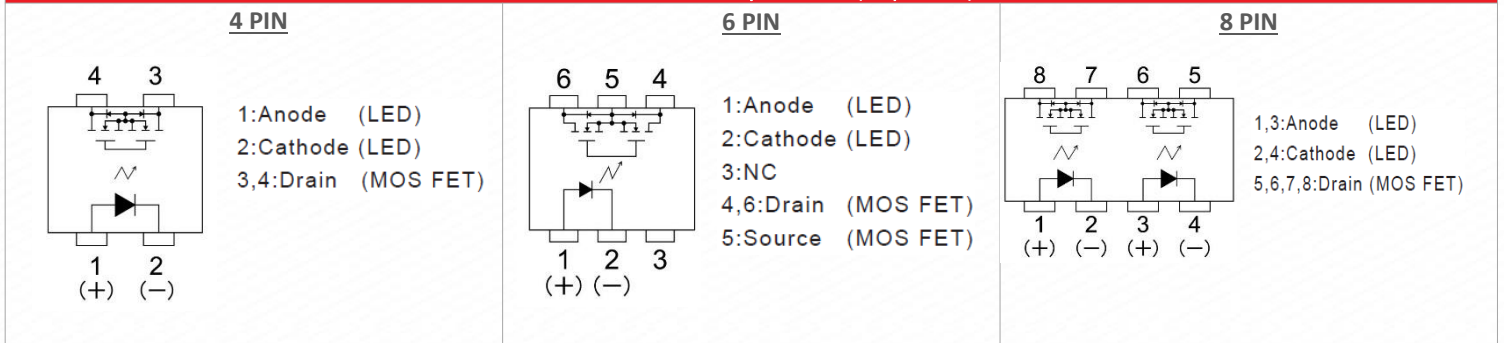


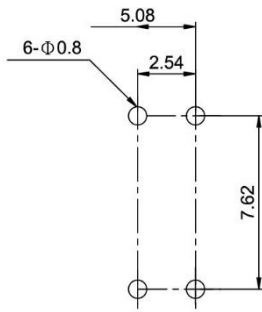
Photo MOSFET Relay Pin-Out (Top View)



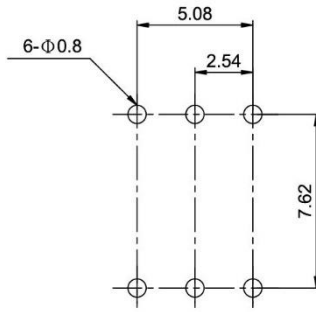
38 Series Photo-MOSFET Relay

Photo MOSFET Relay Recommended PCB Pad Layout (Tolerances acc. to ISO 2768-mp)

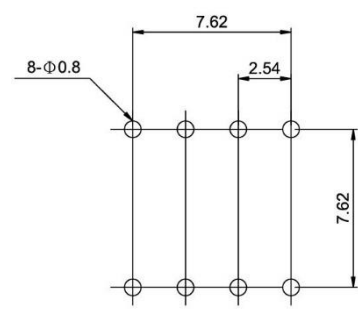
DIP4 (Bottom View)



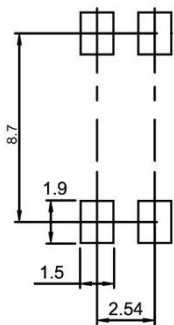
DIP6 (Bottom View)



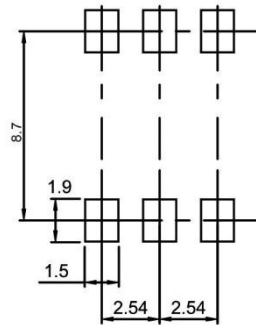
DIP8 (Bottom View)



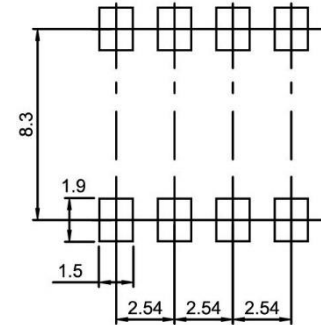
SMD4 (Top View)



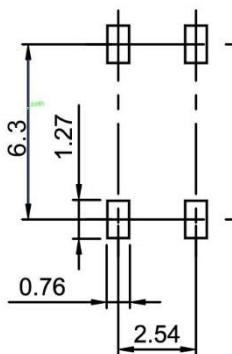
SMD6 (Top View)



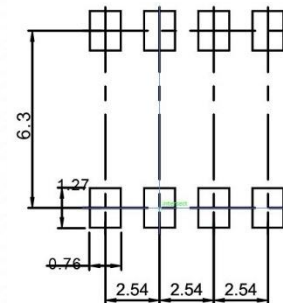
SMD8 (Top View)



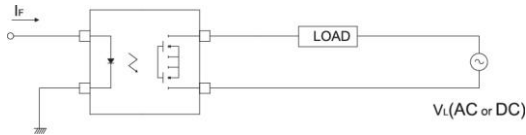
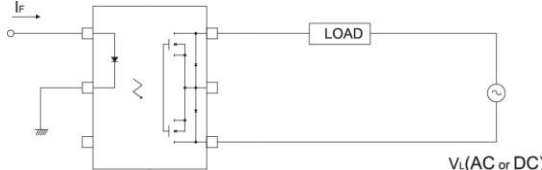
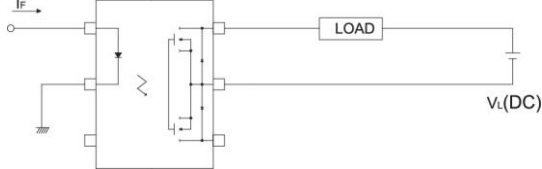
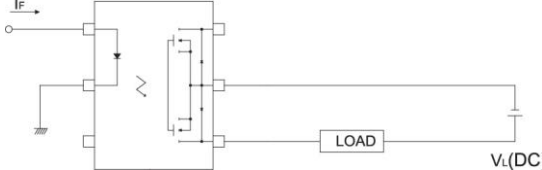
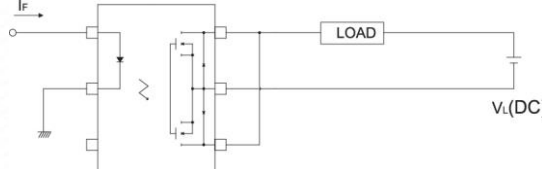
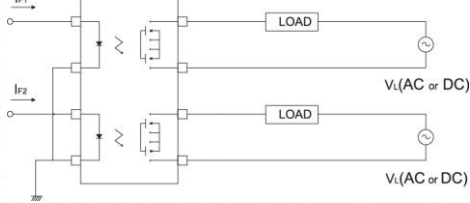
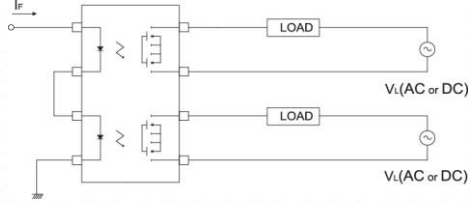
SOP4 (Top View)



SOP8 (Top View)

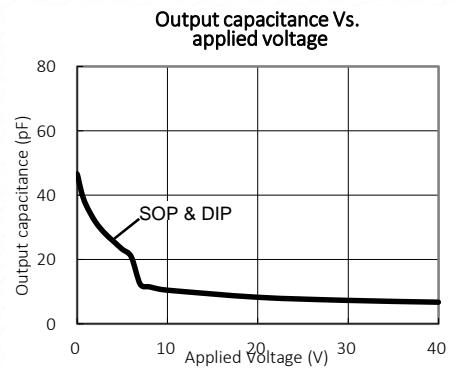
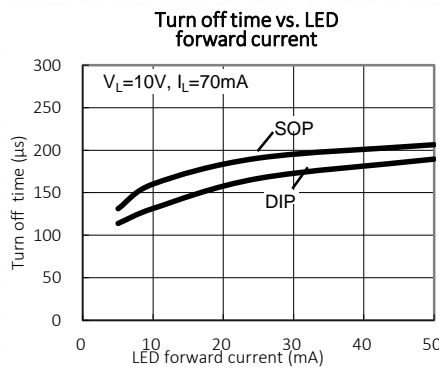
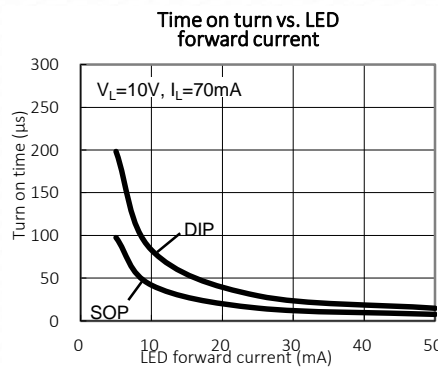
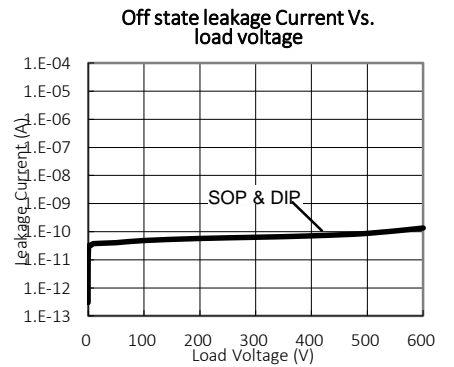
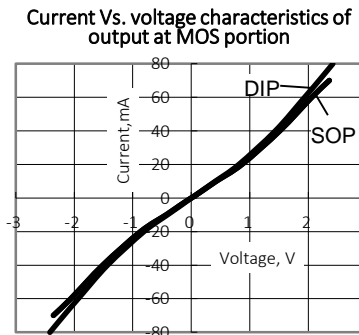
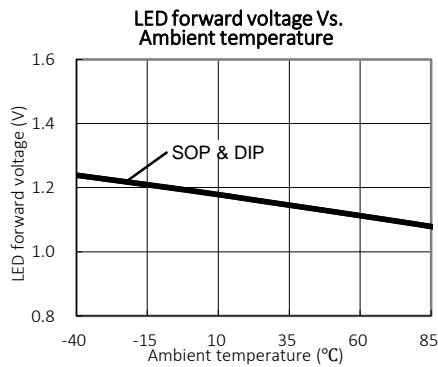
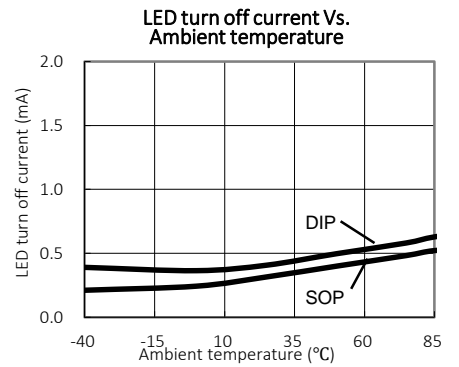
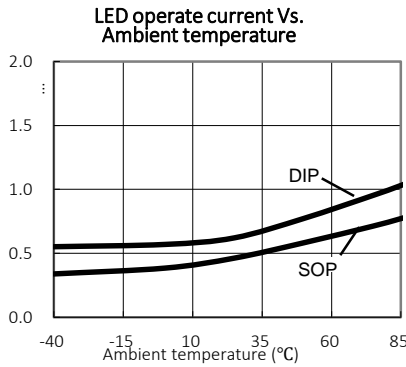
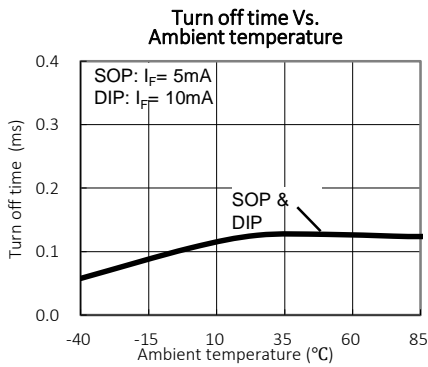
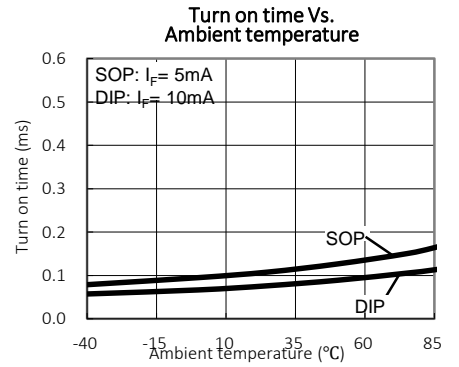
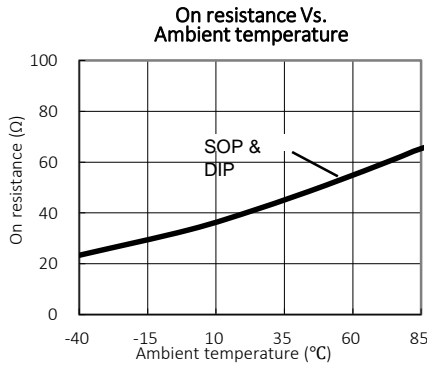
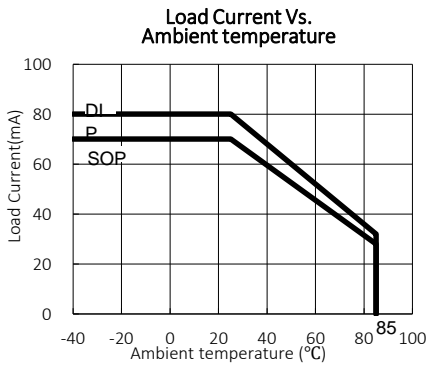


38 Series Photo-MOSFET Relay

| Photo-MOSFET Relay Load Connection Method | | | |
|---|--|--|---|
| TYPE | LOAD | CONNECTION | FEATURE |
| 4-PIN | AC OR DC |  | Control bi-directional signal |
| 6-PIN | AC OR DC |  | Control bi-directional signal |
| | DC |  | On-Resistance is 1/2 of connection 1 2-Make-contacts (Source Common) |
| | |  | |
| DC |  | On-Resistance is 1/2 of connection 2 | |
| 8-PIN | AC OR DC |  | 2 inputs and 2 outputs |
| | |  | 1 input and 2 outputs |

38 Series Photo-MOSFET Relay

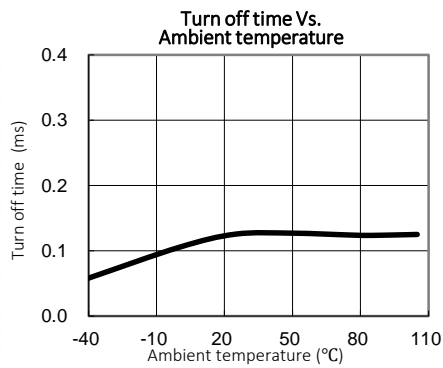
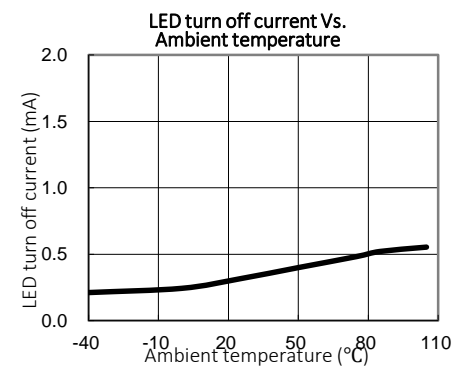
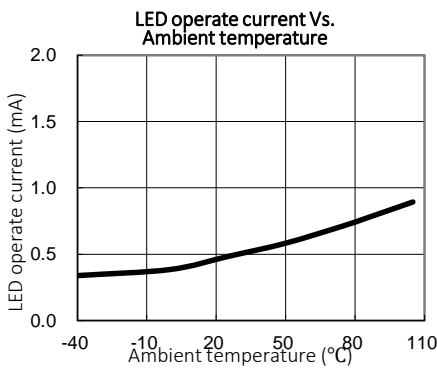
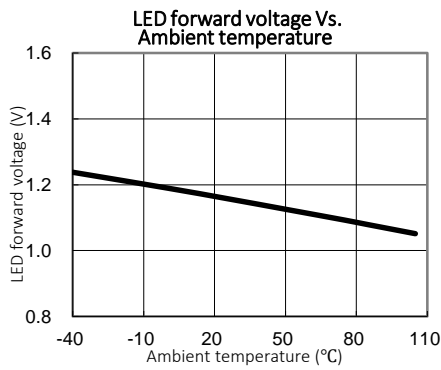
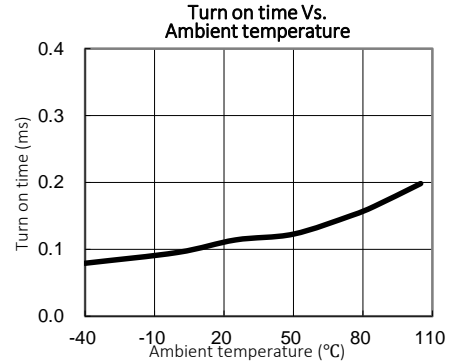
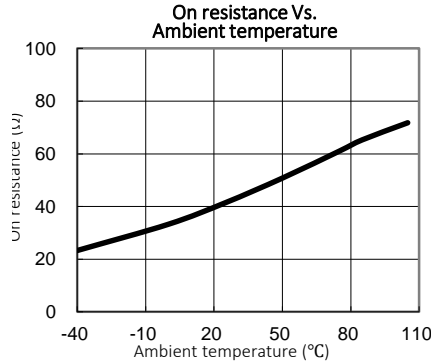
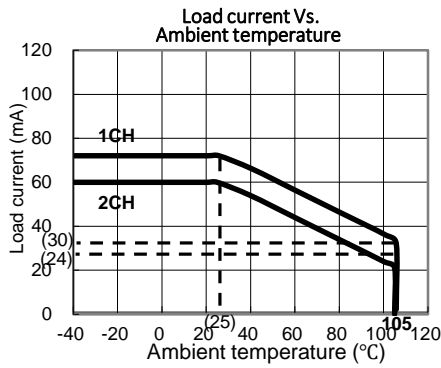
Photo MOSFET Relay Reference Data



38 Series Photo-MOSFET Relay



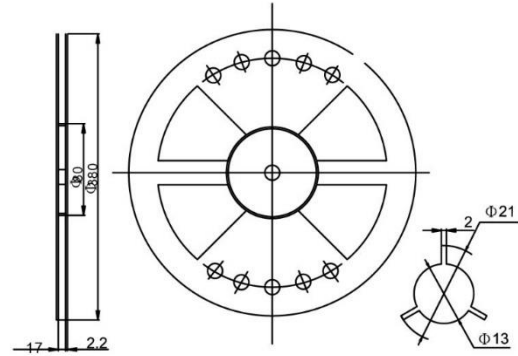
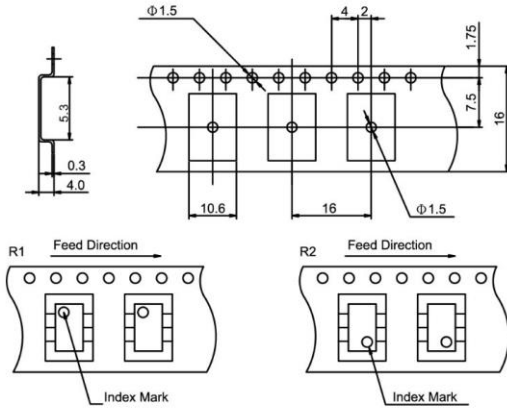
Photo MOSFET Relay Reference Data for "Q" High Temperature Version



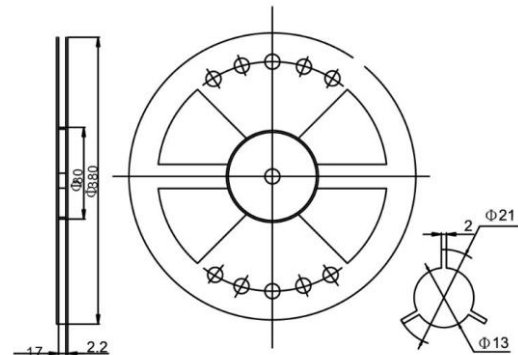
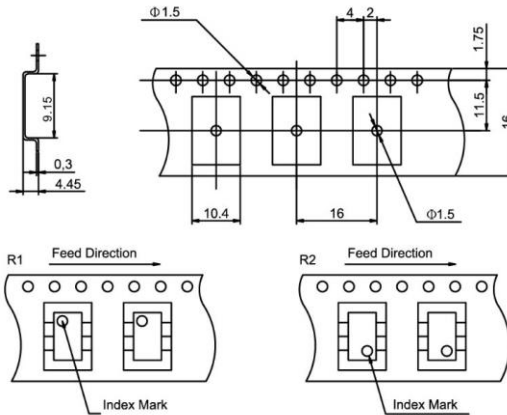
38 Series Photo-MOSFET Relay

Photo MOSFET Relay Tape & Reel Packaging (1,000 pcs per reel)

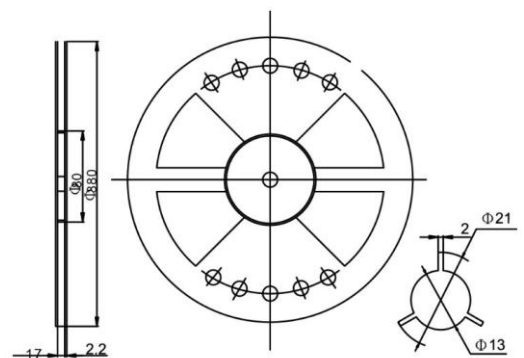
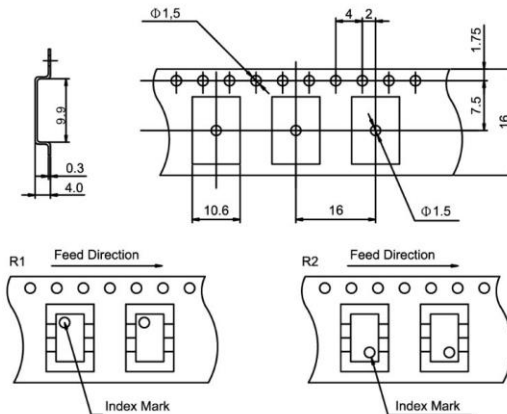
SMD4



SMD6



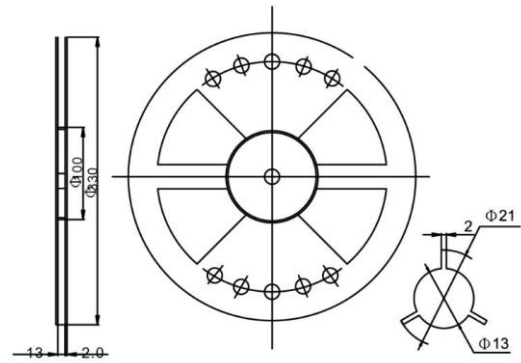
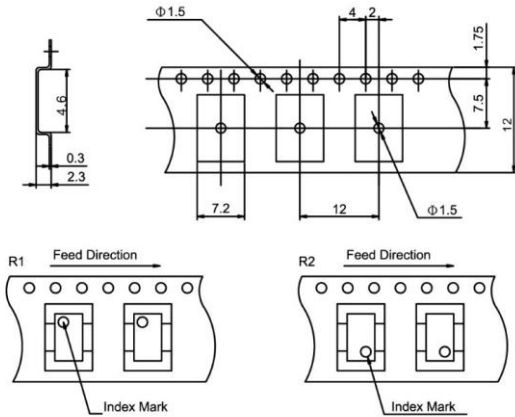
SMD8



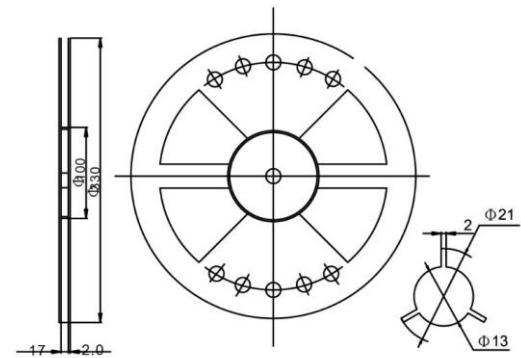
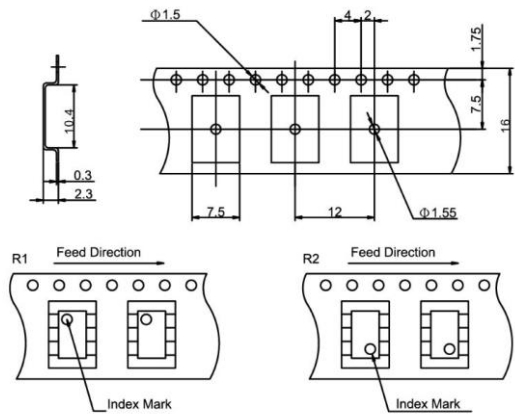
38 Series Photo-MOSFET Relay

Photo MOSFET Relay Tape & Reel Packaging (1,000 pcs per reel)

SOP4



SOP8



Glossary Options

| | |
|---|-----------------------------|
| D | DIP (Dual-In-Line Package) |
| S | SMD (Surface Mount Design) |
| P | SOP (Small-Outline Package) |
| Q | AEC-Q101 / High Temperature |
| R | Reinforced Isolation |

Please note: All technical specifications in this series datasheet refer to the standard product range. Modifications in the sense of technical progress are reserved. For general information only. For more specific information, please consult the product datasheet, available upon request.

This series datasheet could contain technical inaccuracies or typographical errors. Changes are periodically made to the information herein. These changes will be incorporated in future revisions.

For deviating values, latest specifications and product details, please contact your nearest sales office.