# OCM 4X8 SERIES

**Dual-Channel, Bidirectional Optical MOS Relay with Two Channels**

## GENERAL DESCRIPTION

The OCM4X8 Series are dual-channel, bidirectional (AC) optical MOS relays. The device is available in the same form factor as single-channel devices, with 8-pin DIP and F-type (gull wing) package.

## FEATURES

- Low offset voltage
- Large range of current control
- Non-contact, optical operation
- No chattering or switch bounces
- No mechanical switching noises
- Small size
- Low "on" resistance

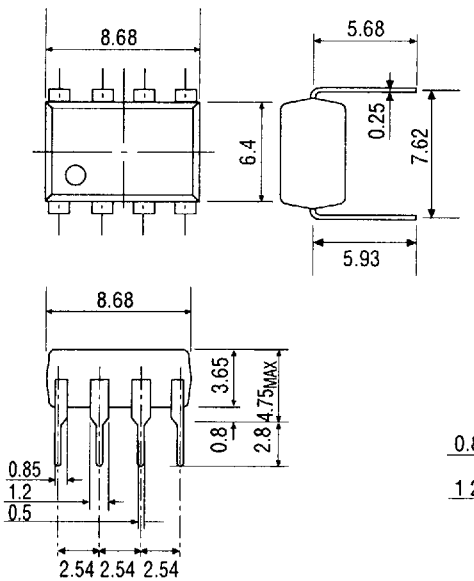
## APPLICATIONS

- Computer cards and portable computing applications (such as PCMCIA cards)
- Telecommunications equipment
- Measurement equipment
- Home electronics
- Automatic meter reading equipment
- Telemetry systems
- Other applications requiring small size or high performance
- Other applications requiring non-contact switches

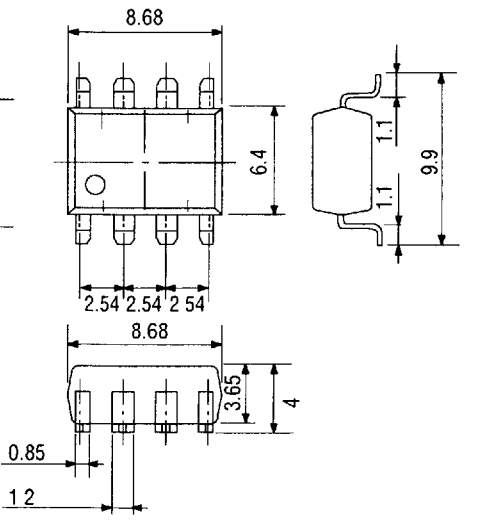
## PIN CONFIGURATION

(Unit: mm)

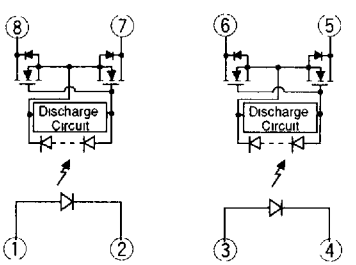
• DIP




• F type (Gull Wing)




• Pin Connection Diagram




1: Anode (LED1)
2: Cathode (LED1)
3 Anode (LED2)
4 Cathode (LED2)
5. Drain (MOS•FET2)
6 Drain (MOS•FET2)
7. Drain (MOS•FET1)
8: Drain (MOS•FET1)

## ABSOLUTE MAXIMUM RATINGS

(Ambient Temperature Ta=25°C)

| Parameter | | | Symbol | Rating | Unit |
|---|---|---|---|---|---|
| LED | Forward Current | | $I_F$ | 50 | mA |
| | Derating | | — | See characteristics curve | mA/°C |
| | Peak Forward Current *1 | | $I_{FM}$ | 0.5 | A |
| | Reverse Voltage | | $V_R$ | 5 | V |
| | Power Dissipation | | $P_{DL}$ | 75 | mW |
| FET | Load Voltage | OCM408 | $V_D$ | 60 | V |
| | | OCM418 | | 100 | |
| | | OCM428 | | 200 | |
| | | OCM448 | | 400 | |
| | Continuous Load Current | OCM408 | $I_D$ | 200 | mA |
| | | OCM418 | | 150 | |
| | | OCM428 | | 100 | |
| | | OCM448 | | 50 | |
| | Derating | | — | See characteristics curve | mA/°C |
| | Surge Load Current *2 | OCM408 | $I_{SUG}$ | 0.5 | A |
| | | OCM418 | | | |
| | | OCM428 | | | |
| | | OCM448 | | 0.3 | |
| | Power Dissipation | | $P_D$ | 400 | mW |
| Total Power Dissipation | | | $P_{TOT}$ | 450 | mW |
| Isolation Voltage | | | $V_{I-O}$ | 1500 | V |
| Operating Temperature | | | $T_{opr}$ | −40 to +85 | °C |
| Storage Temperature | | | $T_{stg}$ | −40 to +100 | °C |

*1 Pulse width 100 µs, cycle 10 ms
*2 Pulse width 1 ms, 1 shot

## ELECTRICAL CHARACTERISTICS

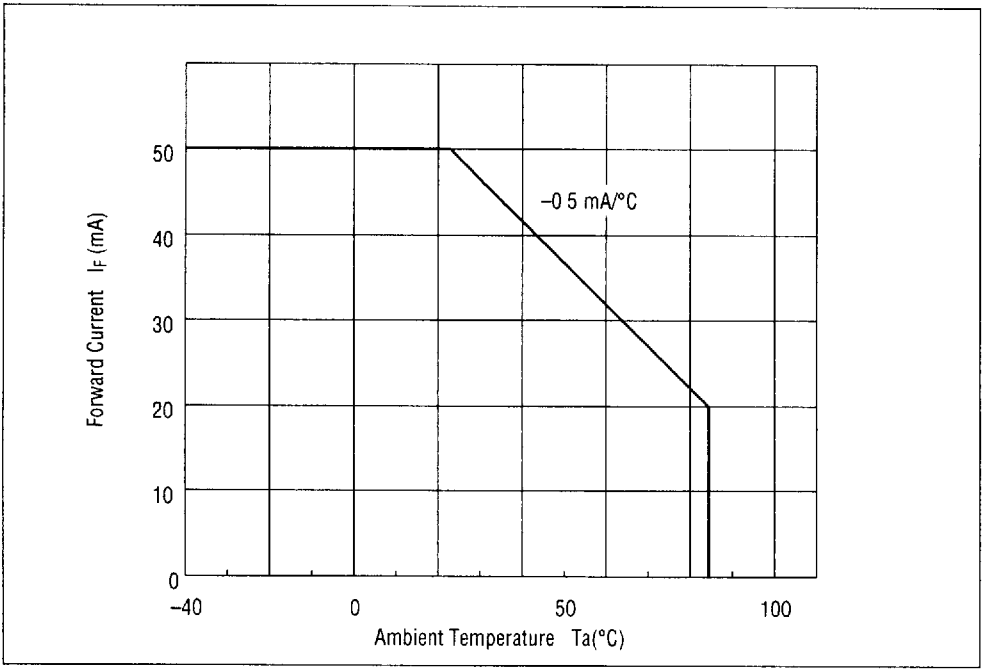
(Ambient Temperature Ta=25°C)

| Parameter | | | Symbol | Test Condition | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|---|---|---|
| LED | Forward Voltage | | $V_F$ | $I_F$=10 mA | 1.0 | — | 1.3 | V | — |
| | Reverse Current | | $I_R$ | $V_R$=5 V | — | — | 10 | μA | — |
| FET | ON Resistance | OCM408 | $R_{ON}$ | $I_F$=10 mA<br>$I_D$=Rating | 3 0 | 4 0 | 5.0 | Ω | Time to flow current is within one second |
| | | OCM418 | | | 3 0 | 5 0 | 7 0 | | |
| | | OCM428 | | | 8.0 | 12.0 | 16.0 | | |
| | | OCM448 | | | 30.0 | 50.0 | 70.0 | | |
| | Leakage Current *1 | OCM408 | $I_{LEAK}$ | $V_D$=60 V | — | — | 1.0 | μA | — |
| | | OCM418 | | $V_D$=100 V | | | | | |
| | | OCM428 | | $V_D$=200 V | | | | | |
| | | OCM448 | | $V_D$=400 V | | | | | |
| | Output Capacitance | OCM408 | $C_{OUT}$ | $V_D$=50 V<br>f=1 MHz | — | 15 | — | pF | — |
| | | OCM418 | | | — | 10 | — | | |
| | | OCM428 | | | — | 8 | — | | |
| | | OCM448 | | | — | 5 | — | | |
| Coupled | Operating LED Current *2 | | $I_{F\,ON}$ | $I_D$=Rating | — | — | 5 | mA | — |
| | Returning LED Current | OCM408 | $I_{F\,OFF}$ | $V_D$=60 V<br>$I_D$=100 μA | 0 2 | — | — | mA | — |
| | | OCM418 | | $V_D$=100 V<br>$I_D$=100 μA | | | | | |
| | | OCM428 | | $V_D$=200 V<br>$I_D$=100 μA | | | | | |
| | | OCM448 | | $V_D$=400 V<br>$I_D$=100 μA | | | | | |
| | I/O Capacitance | | $C_{I-O}$ | f=1 MHz | — | 1.3 | — | pF | — |
| | Turn ON Time *3 | | $t_{ON}$ | $I_F$=10 mA<br>$I_D$=Rating<br>$R_L$=5 kΩ | — | 0.3 | 1.0 | ms | — |
| | Turn OFF Time *3 | | $t_{OFF}$ | | — | 0.2 | 1.0 | ms | — |

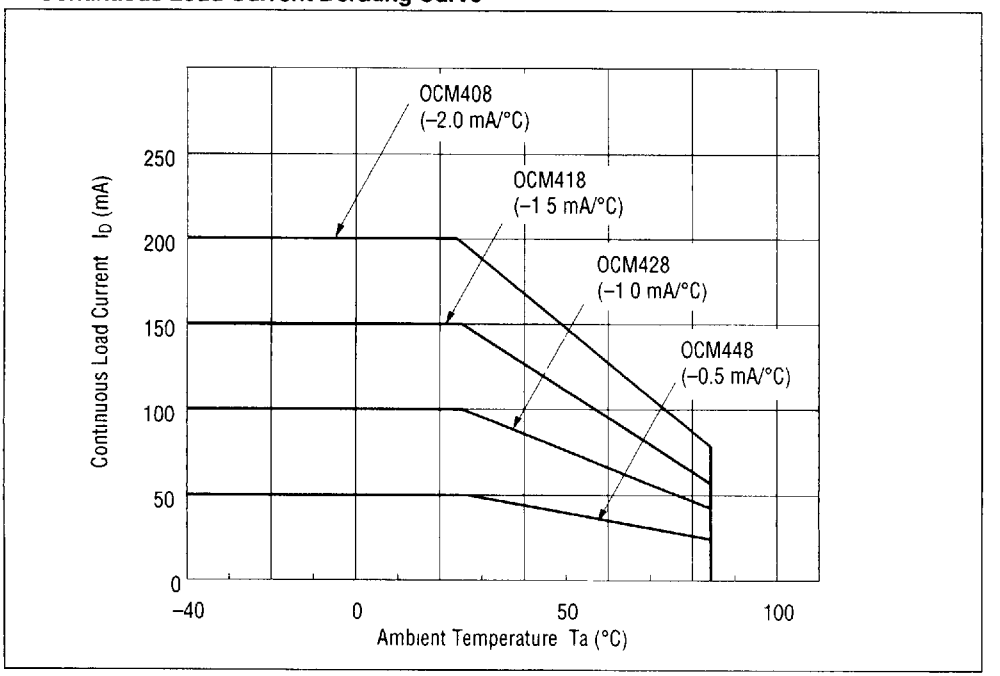
*1 Can correspond to special specification $I_{LEAK}$ < 0.1 nA
*2 Can correspond to special specification $I_{FON}$ < 3.0 mA
*3 Can correspond to special specification $t_{ON-OFF}$ < 0 5 ms

## TYPICAL CHARACTERISTICS

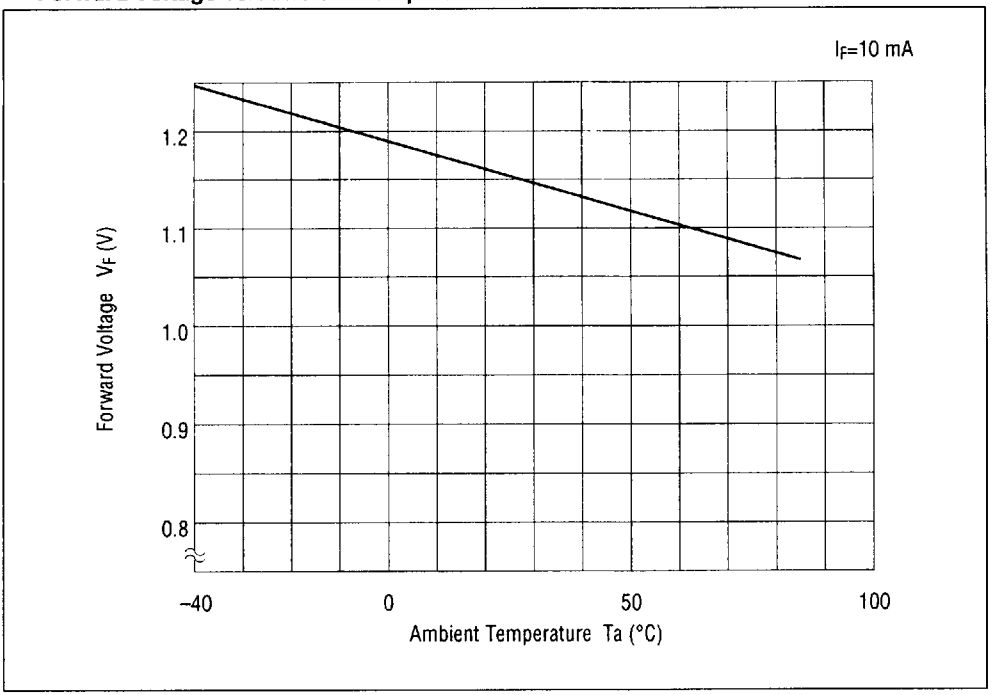
- **Forward Current Derating Curve**



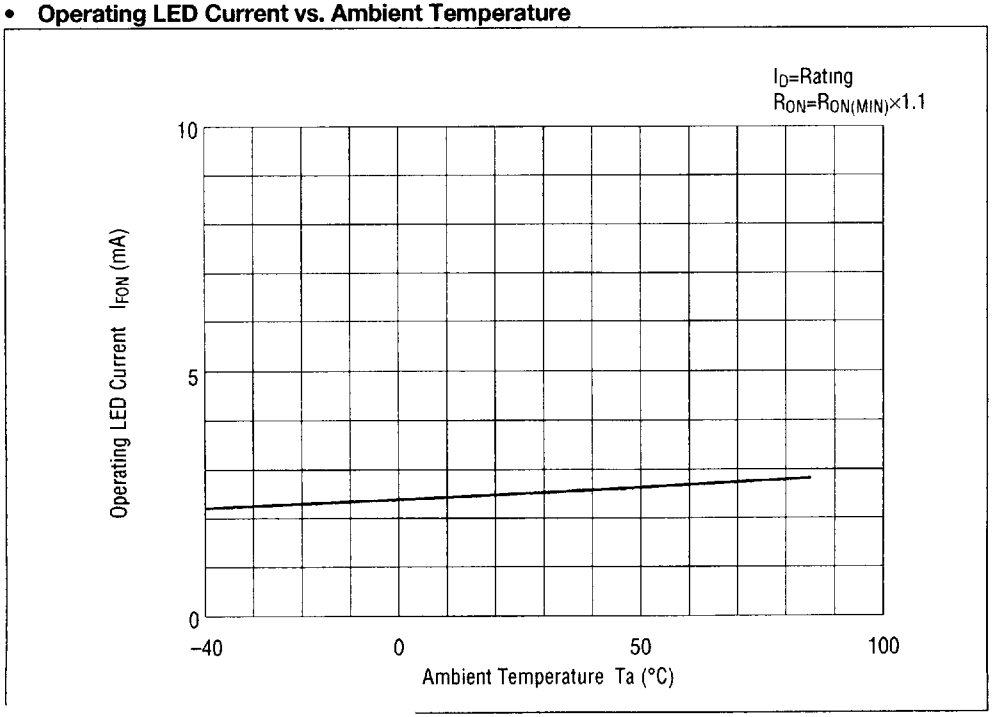

- **Continuous Load Current Derating Curve**



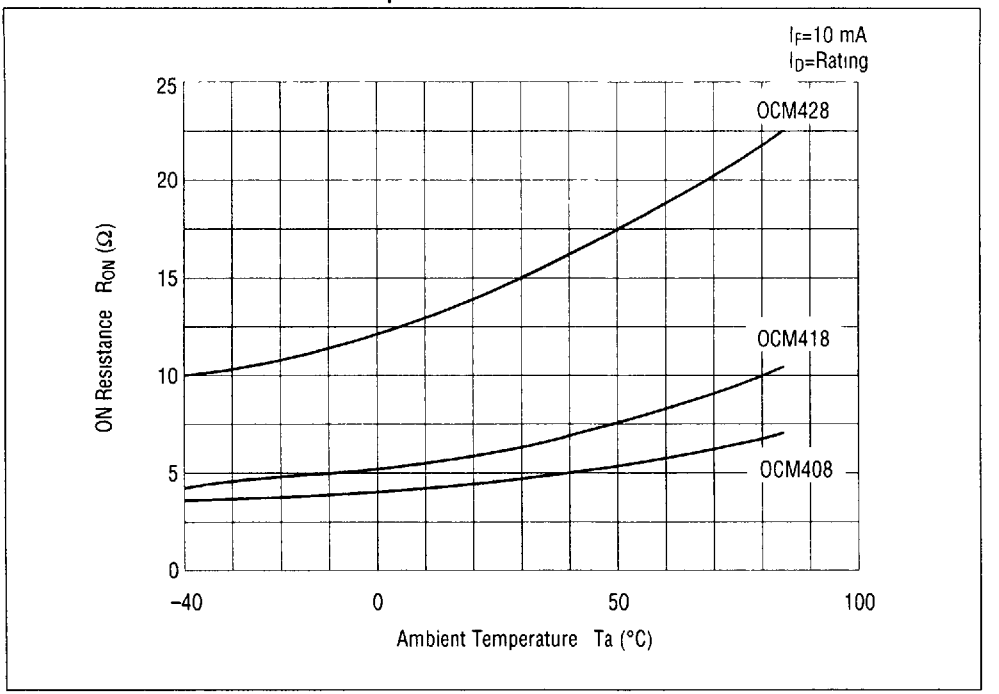
- **Forward Voltage vs. Ambient Temperature**



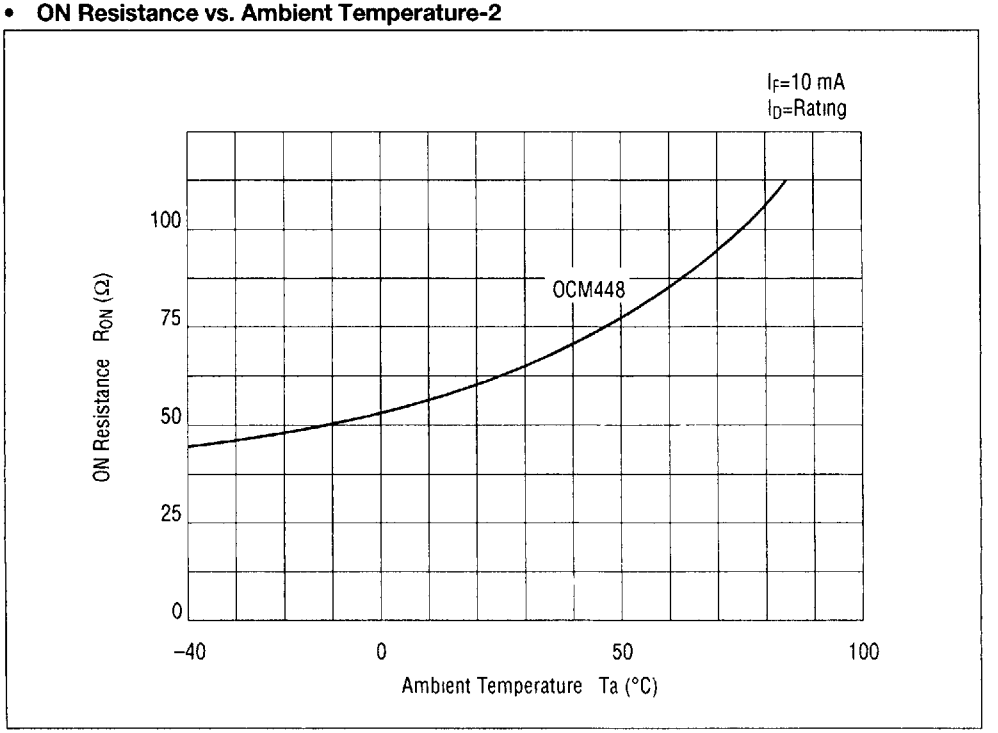

- **Operating LED Current vs. Ambient Temperature**



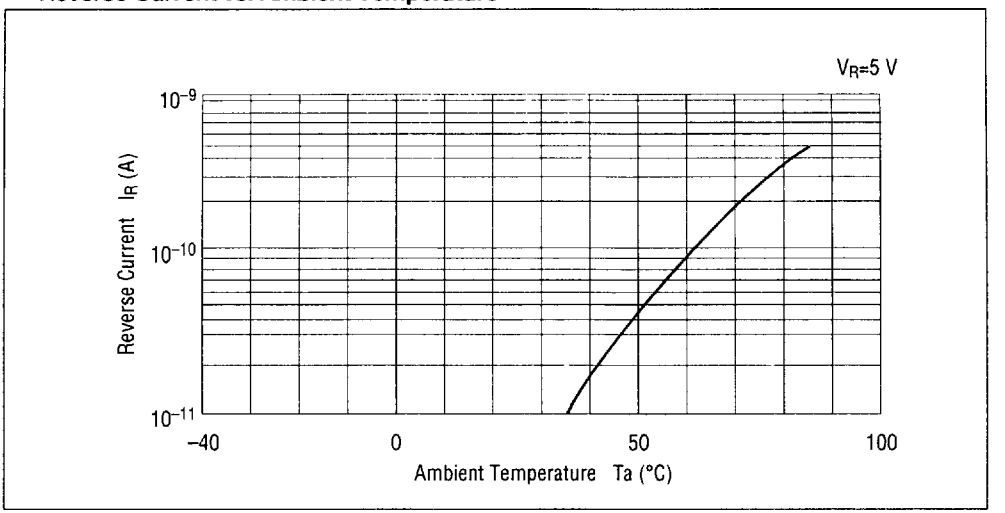
- **ON Resistance vs. Ambient Temperature-1**



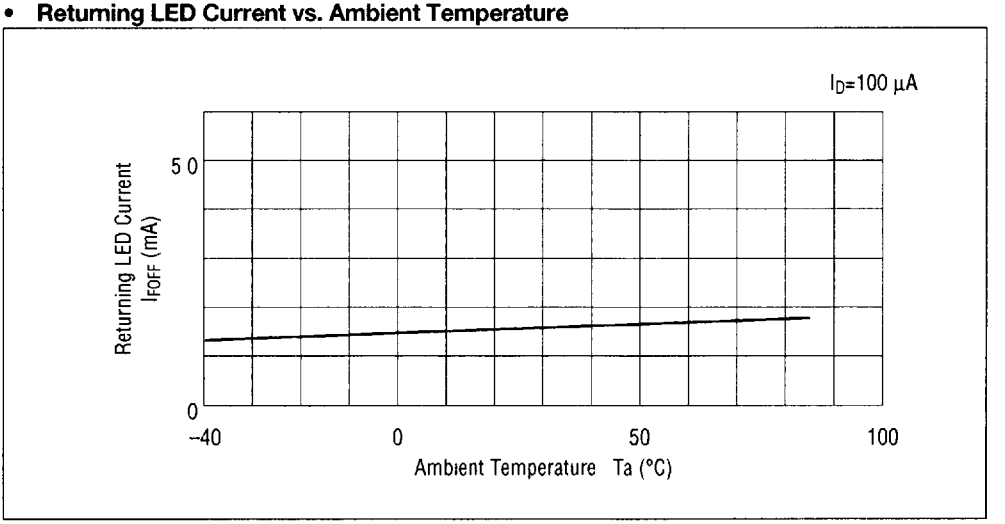

- **ON Resistance vs. Ambient Temperature-2**



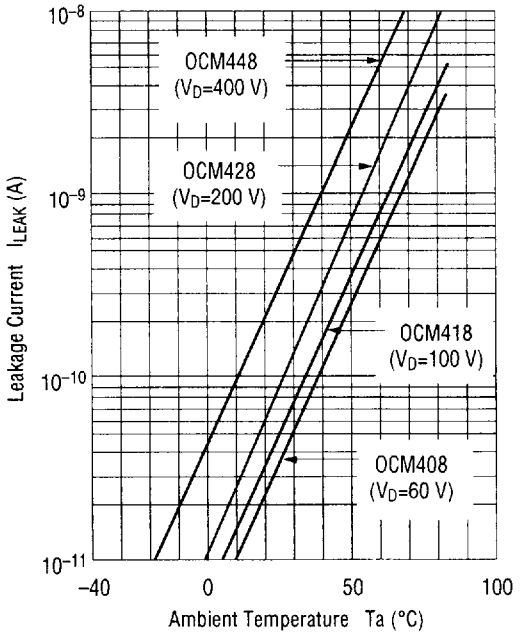
- **Reverse Current vs. Ambient Temperature**



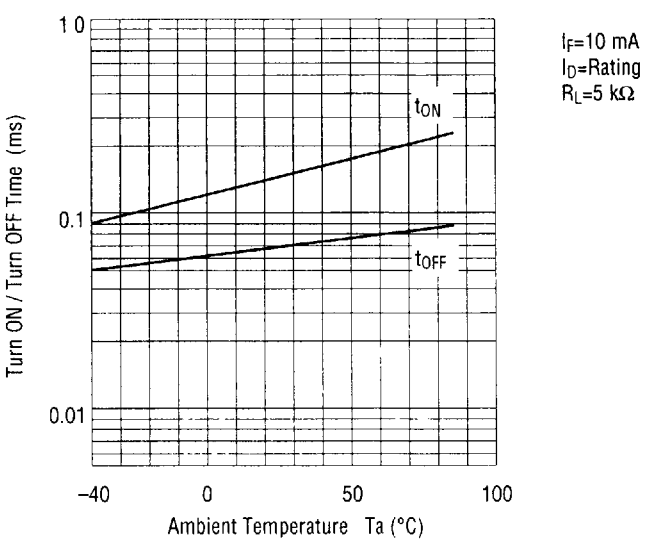

- **Returning LED Current vs. Ambient Temperature**



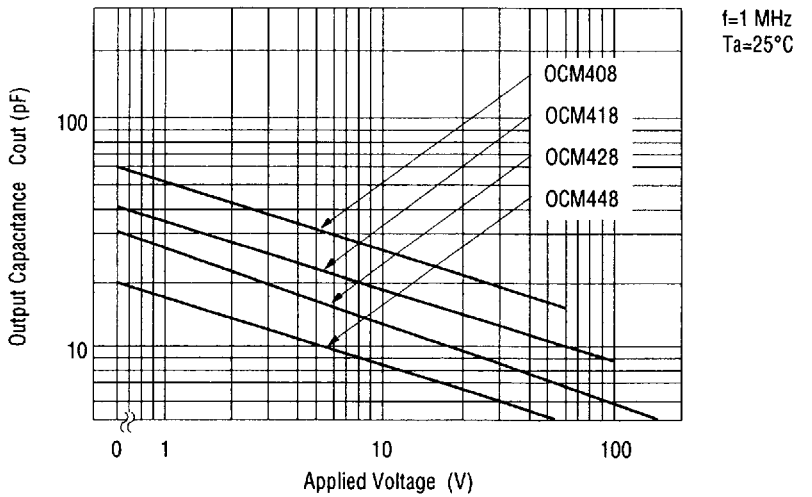
- **Leakage Current vs. Ambient Temperature**



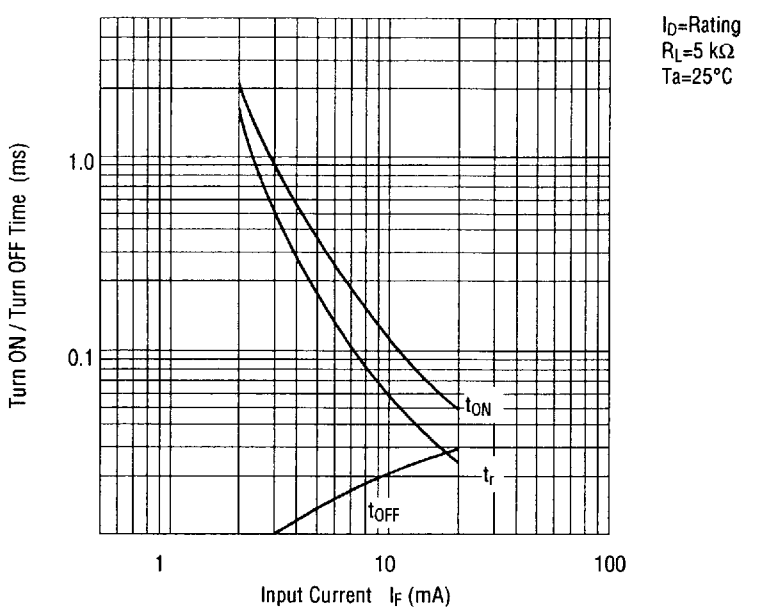

- **Turn ON / Turn OFF Time vs. Ambient Temperature**



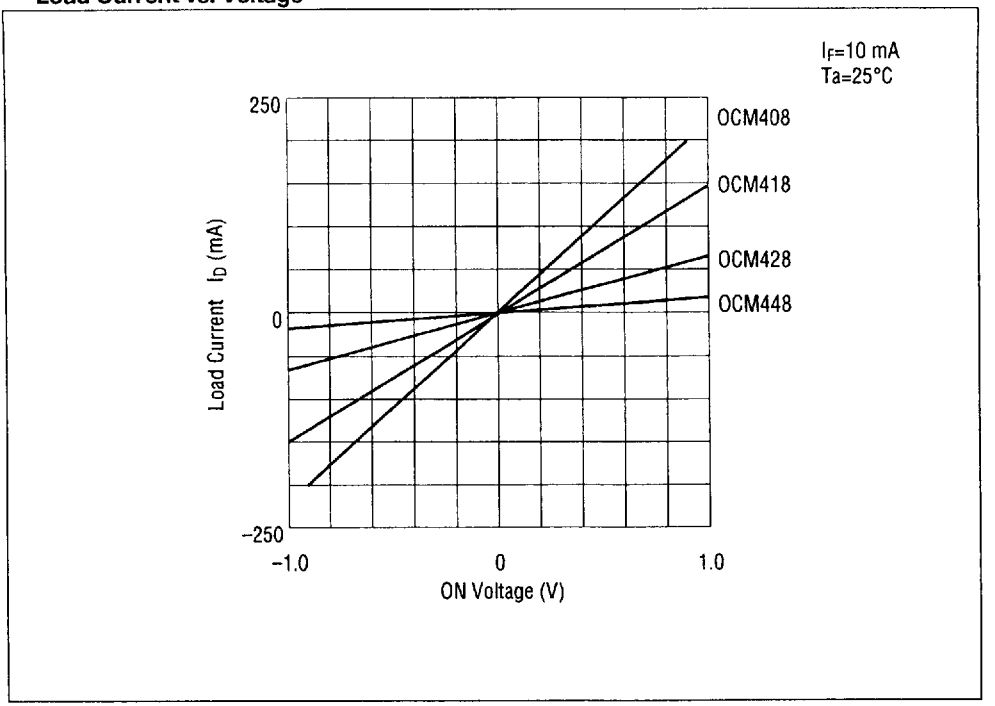
- **Output Capacitance vs. Applied Voltage**



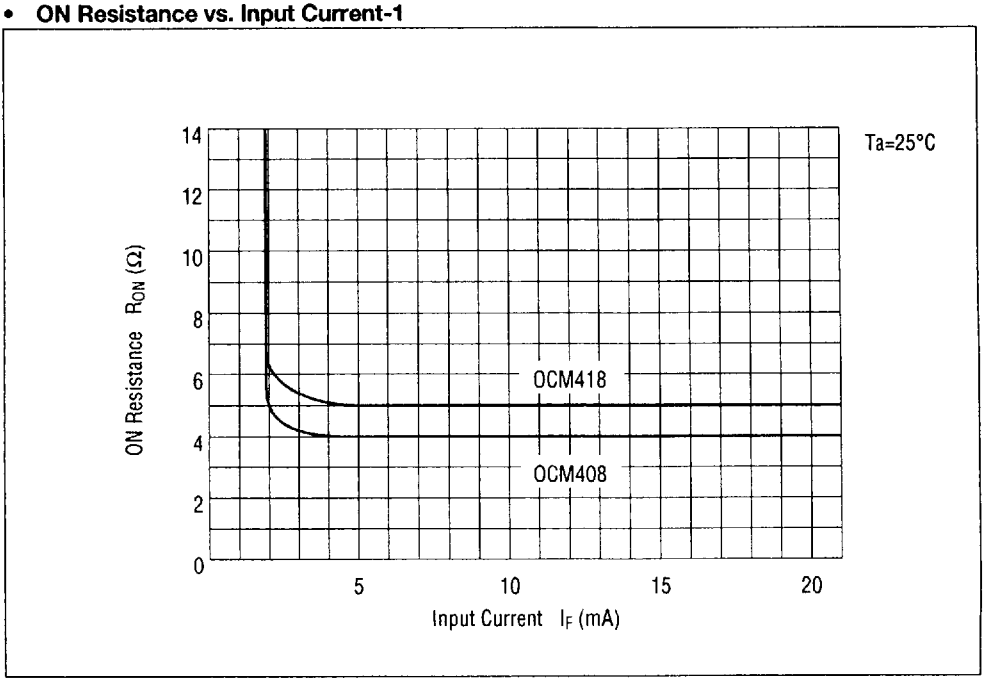

- **Turn ON / Turn OFF Time vs. Input Current**



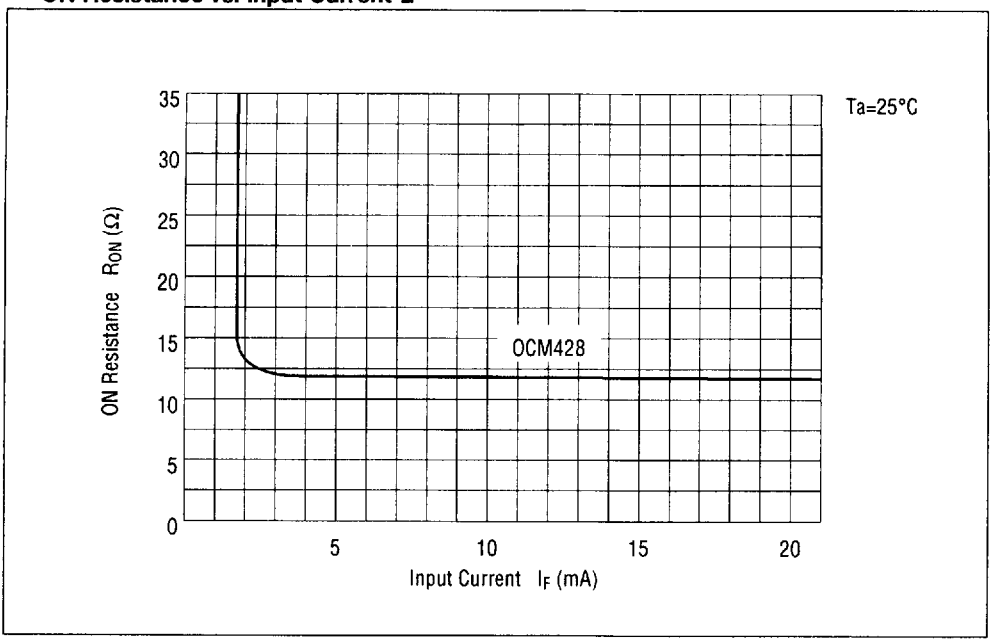
- **Load Current vs. Voltage**



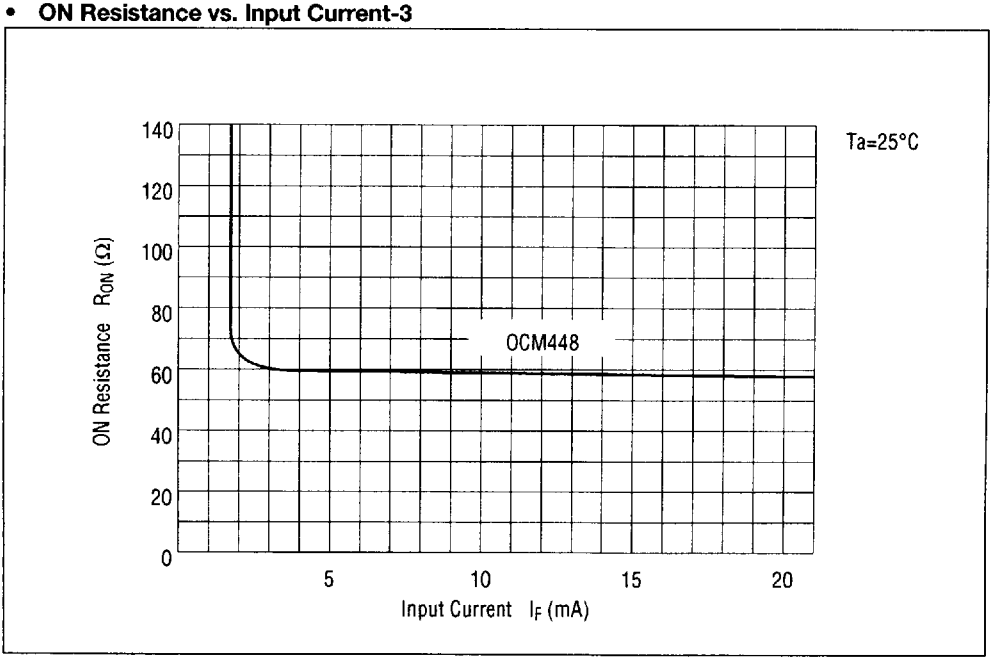

- **ON Resistance vs. Input Current-1**



- **ON Resistance vs. Input Current-2**




- **ON Resistance vs. Input Current-3**



- **Circuit for Measuring Response Characteristics**