OKI electronic components

OCM2□6LD, 2□7LD SERIES

Power Saving General-purpose Type Optical MOS Relay For AC/DC Load

GENERAL DESCRIPTION

The OCM2□6LD and OCM2□7LD Series are optical MOS relays for AC/DC load that are lower in cost than the OCM2□0/2□1 Series. The input portion is an infrared light emitting diode. The output portion uses a combination of VD-MOS (Vertical Diffusion MOS) FETs and photodiode arrays. The device is encased in an extremely small 6-pin plastic DIP or SMD-type (gull-wing) package.

The optical MOS relay switch may be used in applications that currently use mechanical relay switches, but offers smaller size, noise-free switching, and electronic circuit compatibility because of its non-mechanical operation. Optical MOS relay switches also dissipate less power than equivalent bipolar devices at lower switching frequencies.

FEATURES

- Extremely low voltage control
- High reliability due to non-contact, optical operation
- No chattering or switch bounces
- No mechanical switching noises
- Small size and easy mounting (6-pin plastic DIP or SMD-type [gull-wing] package)

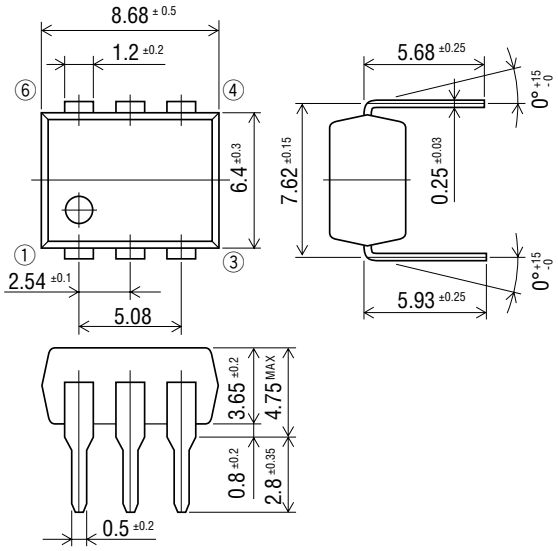
APPLICATIONS

- Telecommunications equipment
- Measurement equipment
- Home electronics
- Automatic meter reading equipment
- Other applications requiring small size or high performance
- Other applications requiring non-contact switches

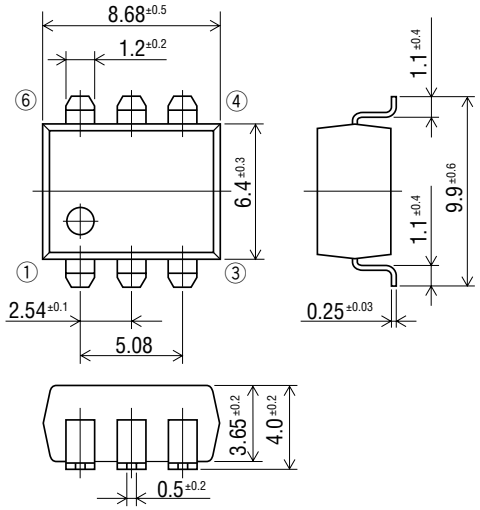
PIN CONFIGURATION

(Unit: mm)

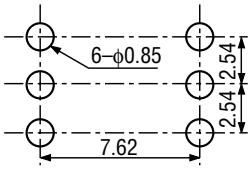
• DIP Type



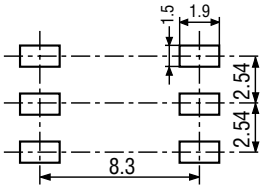
• SMD Type (gull-wing)



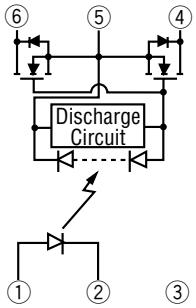
• Through hole (Bottom view)



• Mounting pad (Top view)



• Pin Connection Diagram



1: Anode (LED)
2: Cathode (LED)
3: NC
4: Drain (MOS FET)
5: Source (MOS FET)
6: Drain (MOS FET)

ABSOLUTE MAXIMUM RATINGS

(Ambient temperature Ta=25°C)

Product Name					OCM206LD	OCM236LD OCM237LD	OCM246LD OCM247LD
	Parameter	Symbol	Condition	Unit			
Input Characteristics	Continuous Forward Current	I_F		mA	50		
	Derating Factor of Continuous Forward Current	ΔI_F		mA/°C	Refer to [Derating Factor of Continuous Forward Current] of characteristics data		
	Peak Forward Current	I_{FM}	Pulse width 100 µs Cycle 10 ms	A	0.5		
	Reverse Voltage	V_R		V	5		
	Power Dissipation	P_{DL}		mW	75		
Output Characteristics	Load Voltage	V_{OFF}		V	60	350	400
	Load Current	I_{ON}		mA	350	140	120
	Derating Factor of Load Current	ΔI_{ON}		mA/°C	Refer to [Derating Factor of Load Current] of characteristics data		
	Surge Load Current	I_{SUG}	Pulse width 1 ms 1shot	A	1.0	0.8	0.7
	Power Dissipation	P_D		mW	300		
	Total Power Dissipation	P_{tot}		mW	325		
	Isolation Voltage	V_{IO}		V(rms)	1500		
					OCM206LD	OCM236LD	OCM246LD
					4000		
					—	OCM237LD	OCM247LD
	Operating Temperature	T_{opr}		°C	–40 to +85		
	Storage Temperature	T_{stg}		°C	–40 to +100		

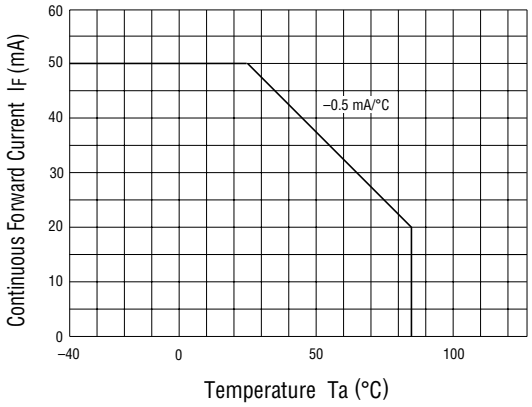
ELECTRICAL CHARACTERISTICS

(Ambient temperature Ta=25°C)

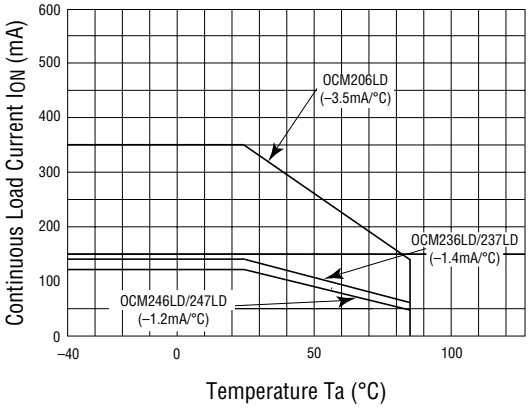
Product Name						OCM206LD	OCM236LD OCM237LD	OCM246LD OCM247LD
	Parameter	Symbol	Condition		Unit			
Input Characteristics	Forward Voltage	V_F	I_F=10 mA	Min.	V	1.0		
				Max.		1.3		
	Reverse Current	I_R	V_R=5 V	Max.	μA	10		
	Operation Input Current	I_{FA}	I_{ON}=100 mA	Max.	mA	0.5		
	Recovery Input Current	I_{FR}	V_{OFF}=Rating I_{ON}=100 μA	Min.	mA	0.02		
Output Characteristics	On-resistance	R_{ON}	I_F=10 mA I_{ON}=Rating Time to flow current is within one second	Min.	Ω	1.0	7.0	10
				Typ.		2.0	17	22
				Max.		3.0	24	33
	Off-state Leakage Current	I_{OFF}	V_{OFF}=Rating	Max.	μA	1.0		
	Output Terminal Capacitance	C_{OUT}	V_{OFF}=50 V f=1 MHz	Typ.	pF	35	12	10
Coupling Characteristics	Input-to-output Capacitance	C_{IO}	f=1 MHz	Typ.	pF	1.3		
	Turn-on Time	t_{ON}	I_F=2 mA I_{ON}=100 mA OCM206LD	Typ.	ms	—	—	—
				Max.		3.0	2.0 (236LD)	2.0 (246LD)
	Turn-off Time	t_{OFF}	I_{ON}=50 mA OCM236LD OCM237LD OCM246LD OCM247LD				4.0 (237LD)	4.0 (247LD)
				Typ.	ms	—		
				Max.		0.5		

TYPICAL CHARACTERISTICS

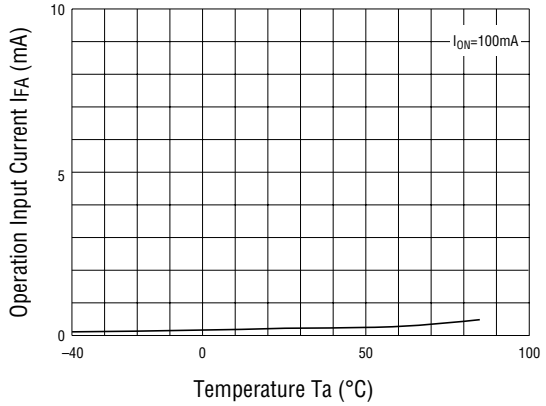
- **Derating Factor of Continuous Forward Current**



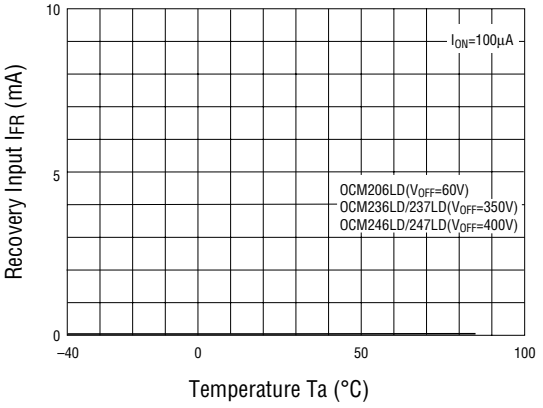
- **Derating Factor of Load Current**



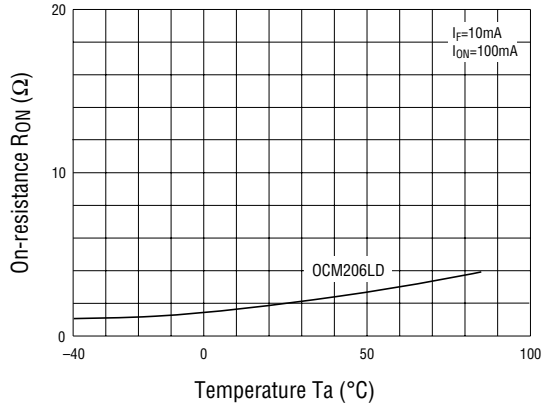
- **Operation Input Current vs. Ambient Temperature**



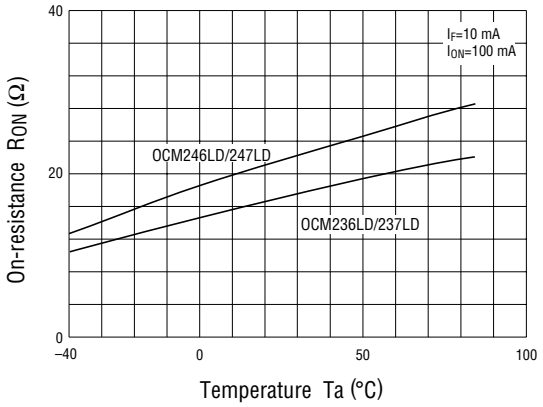
- **Recovery Input Current vs. Ambient Temperature**



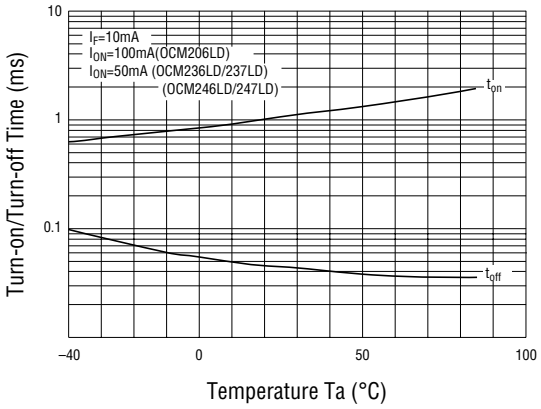
- **On-resistance vs. Ambient Temperature 1**



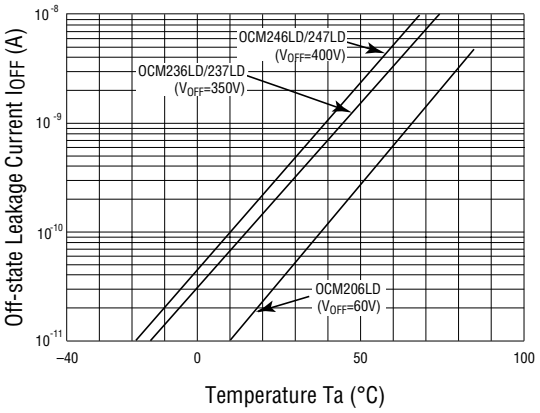
- **On-resistance vs. Ambient Temperature 2**



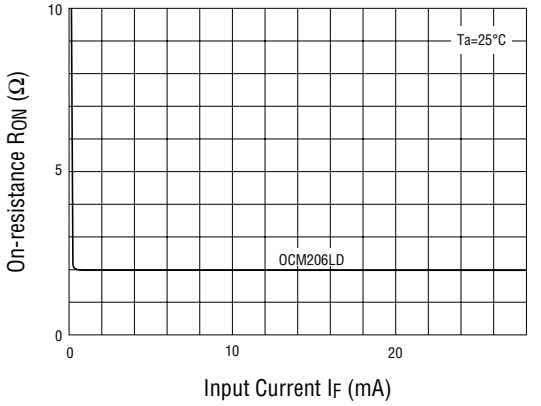
- **Turn-on/Turn-off Time vs. Ambient Temperature**



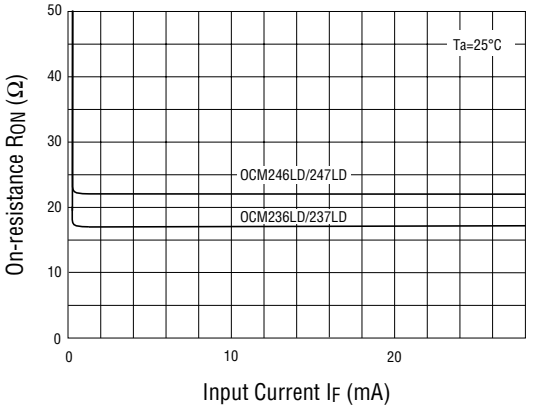
- **Off-state Leakage Current vs. Ambient Temperature**



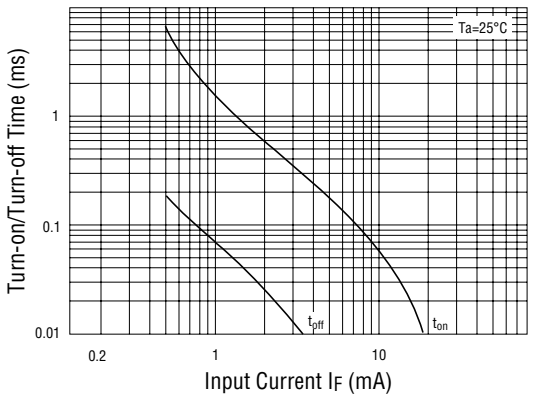
- **Continuous Forward Current vs. On-resistance 1**



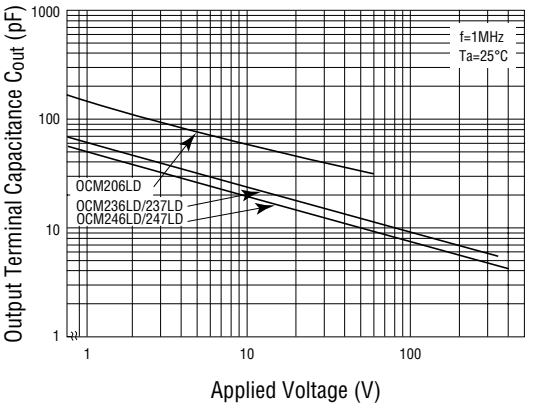
- **Continuous Forward Current vs. On-resistance 2**



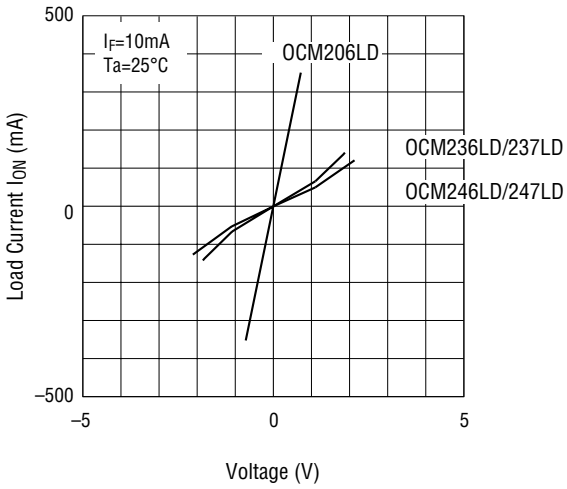
- **Continuous Forward Current vs. Turn-on/Turn-off Time**



- **Output Terminal Capacitance vs. Applied Voltage**



- **Load Current vs. Voltage**



- **Example Circuit for Measuring Turn-on/Turn-off Time**