

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)

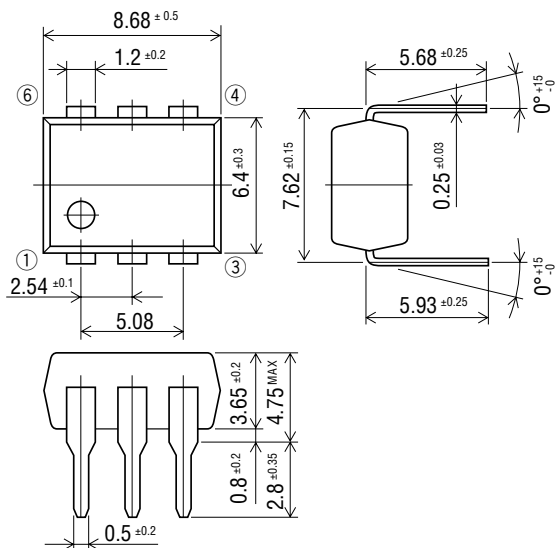
APPLICATIONS

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

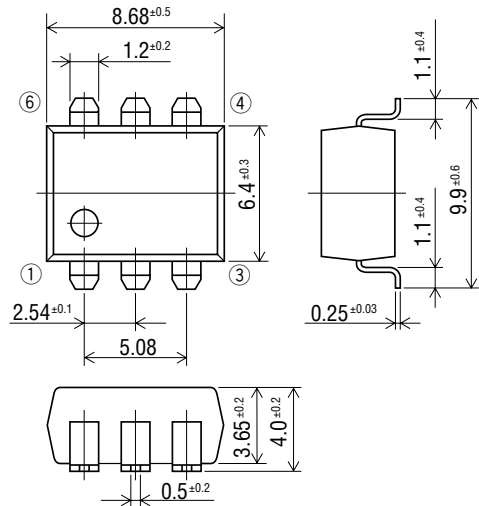
PIN CONFIGURATION

(Unit: mm)

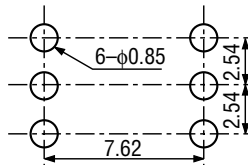
• DIP Type



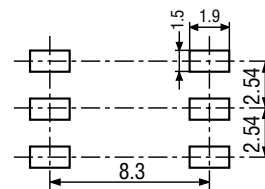
• SMD Type (gull-wing)



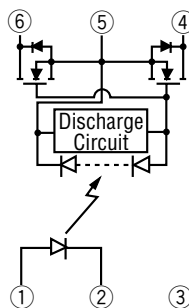
• Through hole (Bottom view)



• 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		OCM246LD
Parameter		Symbol	Condition	Unit		OCM237LD		OCM247LD
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				

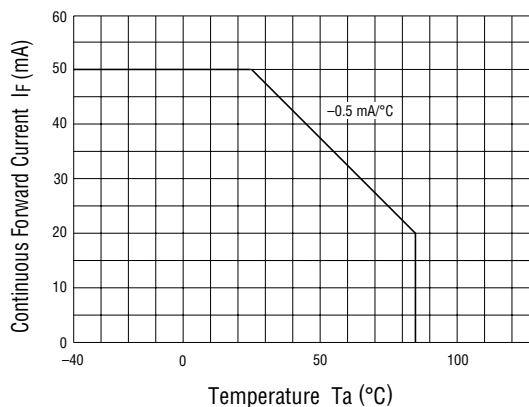
ELECTRICAL CHARACTERISTICS

(Ambient temperature Ta=25°C)

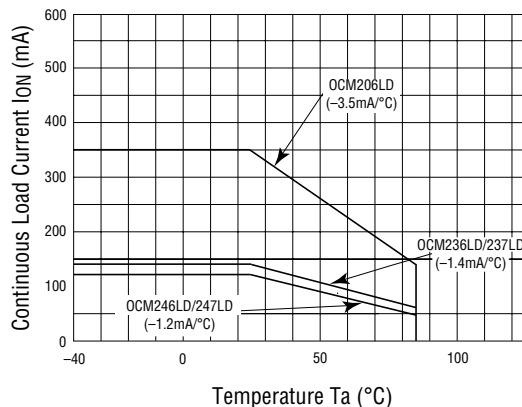
Product Name					OCM206LD	OCM236LD		OCM246LD	
Parameter		Symbol	Condition			Unit	OCM237LD		OCM247LD
Input Characteristics	Forward Voltage	V _F	I _F =10 mA	Min.	V	1.0			
				Max.		1.3			
	Reverse Current	I _R	V _R =5 V	Max.	μA	10			
	Operation Input Current	I _{FA}	I _{ON} =100 mA	Max.	mA	0.5			
	Recovery 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	Min.	Ω	1.0	7.0	10	
			I _{ON} =Rating	Typ.		2.0	17	22	
			Time to flow current is within one second	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	Typ.	ms	—			
			Max.	0.5					

TYPICAL CHARACTERISTICS

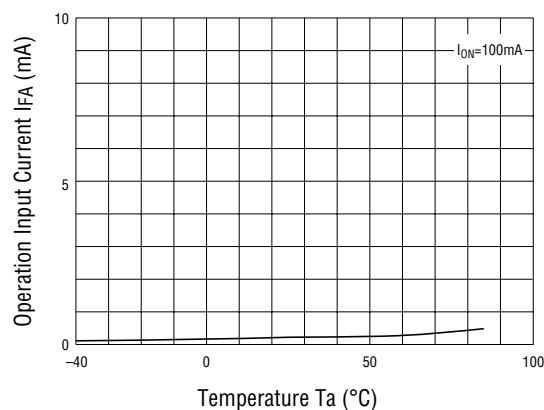
- Derating Factor of Continuous Forward Current



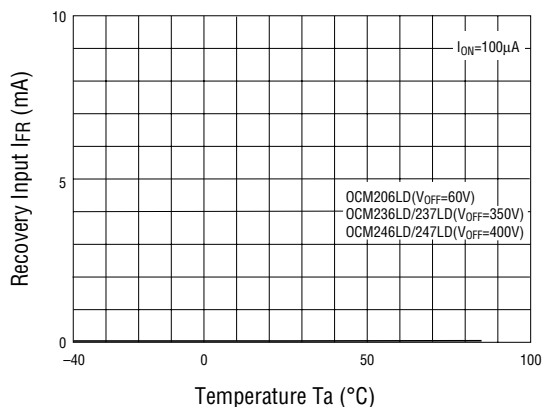
- Derating Factor of Load Current



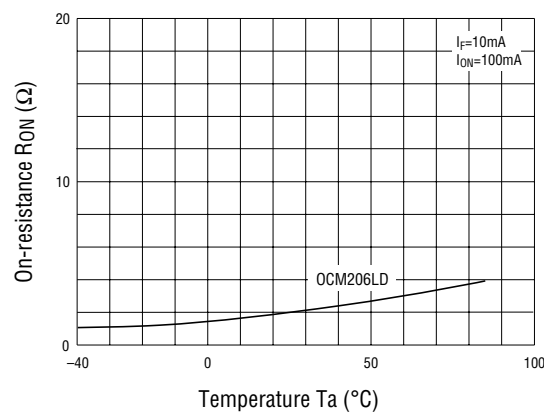
- Operation Input Current vs. Ambient Temperature



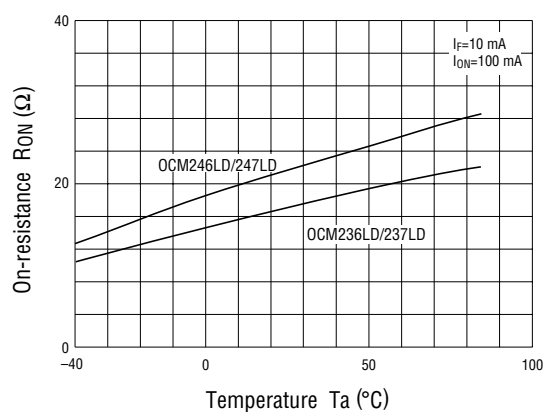
- Recovery Input Current vs. Ambient Temperature



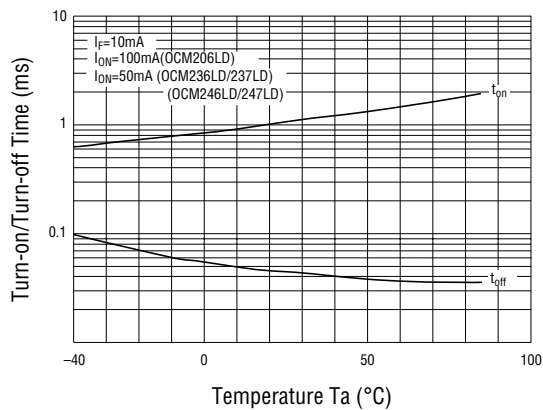
- On-resistance vs. Ambient Temperature 1



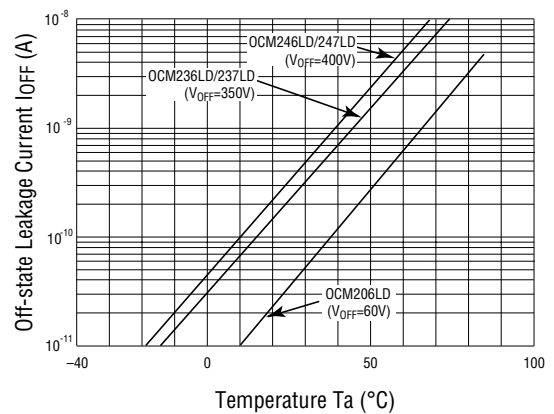
- On-resistance vs. Ambient Temperature 2



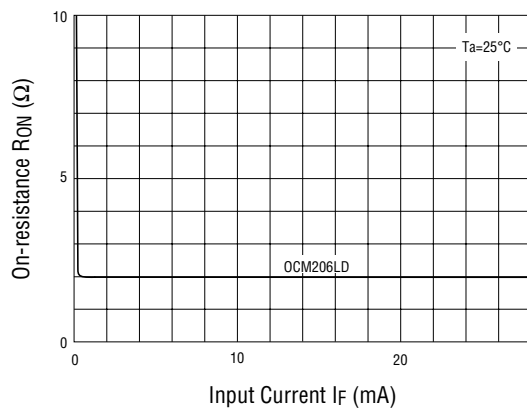
- Turn-on/Turn-off Time vs. Ambient Temperature



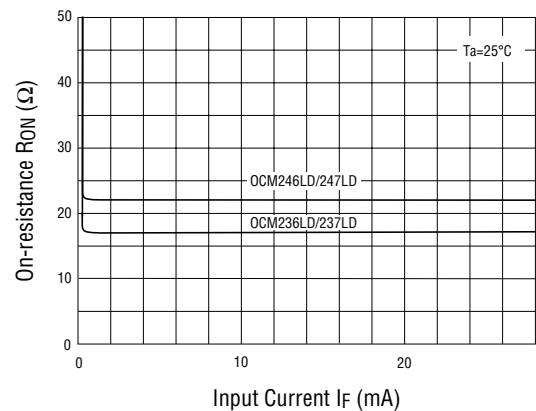
- Off-state Leakage Current vs. Ambient Temperature



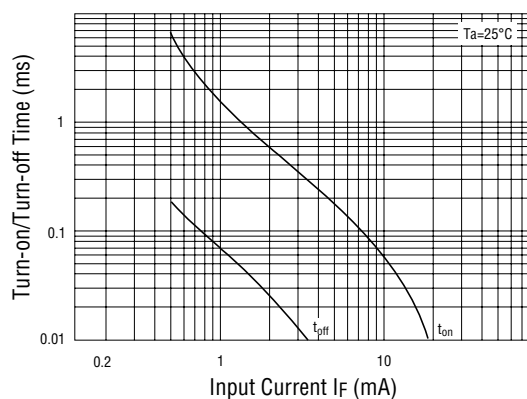
- Continuous Forward Current vs. On-resistance 1



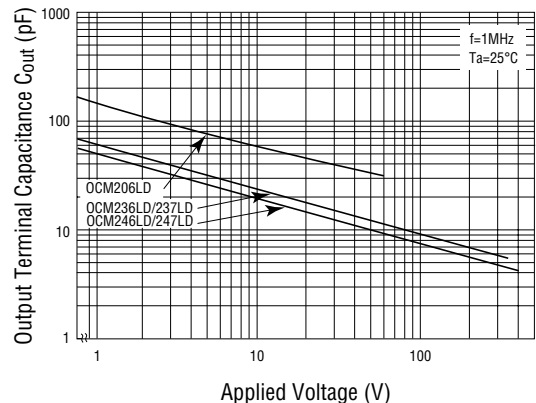
- Continuous Forward Current vs. On-resistance 2



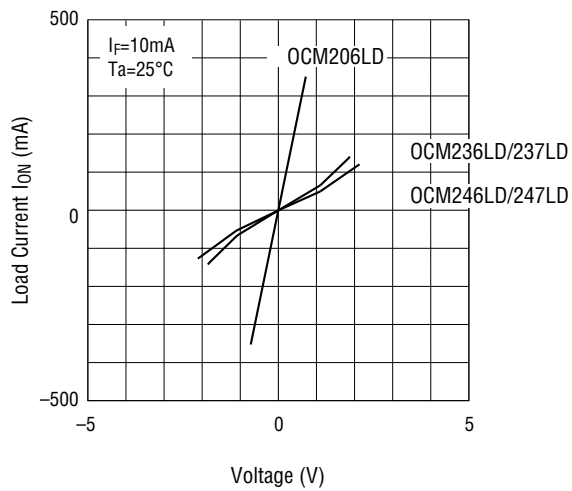
- Continuous Forward Current vs. Turn-on/Turn-off Time



- Output Terminal Capacitance vs. Applied Voltage



- Load Current vs. Voltage



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

