

OKI electronic components

OCMS2□6 SERIES

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

GENERAL DESCRIPTION

The OCMS2□6 series is a family of optical MOS relays for AC/DC load. 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 SOP type package.

The series reduced its area to 50% and its volume to 27% of the conventional DIP or SMD-type optical MOS relays.

The series is 2.1mm thick and is ideal for modem card applications.

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
- Thickness of 2.1mm
- High reliability due to non-contact and optical operation
- No chattering or switch bounces
- No mechanical switching noises
- Small size and easy mounting (6-pin plastic SOP package)

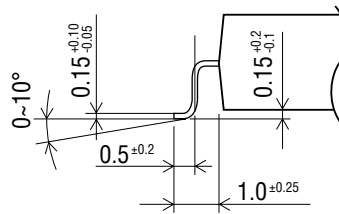
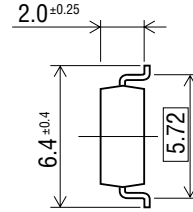
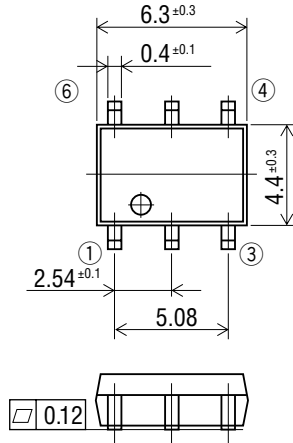
APPLICATIONS

- Telecommunications system (such as modem cards)
- Measurement equipment
- Home electronics
- Automatic meter reading equipment
- Other applications requiring small size or high performance
- Other applications requiring non-contact switches

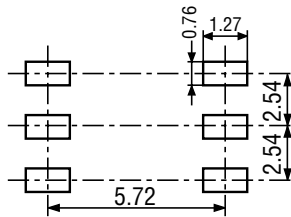
PIN CONFIGURATION

(Unit: mm)

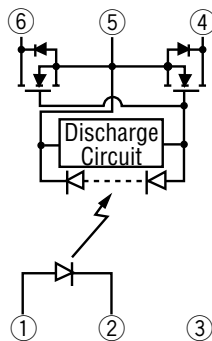
- 6pin SOP Type



- 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 $T_a=25^\circ\text{C}$)

Product Name				OCMS206	OCMS216	OCMS226	OCMS236	OCMS246		
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					60 100 200 350 400	
	Load Current	I_{ON}		mA					320 280 180 120 100	
	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
Operating Temperature				T_{opr}					°C	-40 to +85
Storage Temperature				T_{stg}					°C	-40 to +100

ELECTRICAL CHARACTERISTICS

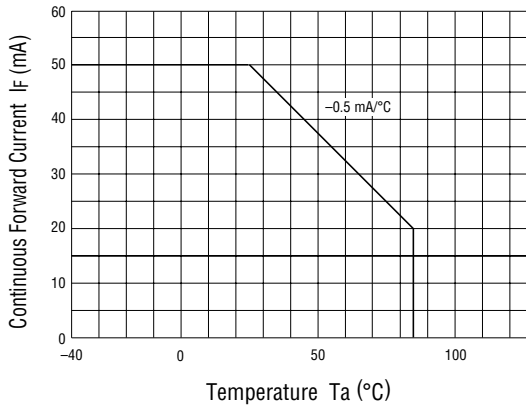
(Ambient temperature Ta=25°C)

Product Name					OCMS206	OCMS216	OCMS226	OCMS236	OCMS246	
Parameter	Symbol	Condition	Unit							
Input Characteristics	Forward Voltage	V_F	$I_F=10\text{ mA}$	Min.	V	1.0				
				Max.		1.3				
	Reverse Voltage	I_R	$V_R=5\text{ V}$	Max.	μA	10				
	Operation Input Current *1	I_{FA}	$I_{ON}=100\text{ mA}$	Max.	mA	5				
Recovery Input Current	I_{FR}	$V_{OFF}=\text{Rating}$ $I_{ON}=100\ \mu\text{A}$	Min.	mA	0.2					
Output Characteristics	On-resistance	R_{ON}	$I_F=10\text{ mA}$ $I_{ON}=100\text{ mA}$ <small>Time to flow current is within one second</small>	Min.	Ω	1.0	2.0	4.0	7.0	10
				Typ.		2.0	3.0	7.0	17	22
				Max.		3.0	4.0	10	24	33
Off-state Leakage Current*2	I_{OFF}	$V_{OFF}=\text{Rating}$	Max.	μA	1.0					
Output Terminal Capacitance	C_{OUT}	$V_{OFF}=50\text{ V}$ $f=1\text{ MHz}$	Typ.	pF	35	25	15	12	10	
Coupling Characteristics	Input-to-output Capacitance	C_{IO}	$f=1\text{ MHz}$	Typ.	pF	1.3				
	Turn-on Time *3	t_{ON}	$I_F=10\text{ mA}$ $I_{on}=100\text{ mA}$ OCMS206 OCMS216 OCMS226	Typ.	ms	0.3				
				Max.		1.0				
	Turn-off Time *3	t_{OFF}	$I_{off}=50\text{ mA}$ OCMS236 OCMS246	Typ.	ms	0.2				
Max.				1.0						

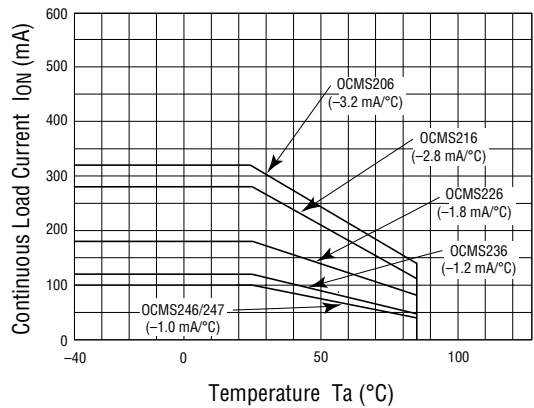
*1: Can correspond to special specification $I_{FA}<3.0\text{ mA}$ *2: Can correspond to special specification $I_{OFF}<1.0\text{ nA}$ *3: Can correspond to special specification $t_{ON} / t_{OFF}<0.5\text{ ms}$

TYPICAL CHARACTERISTICS

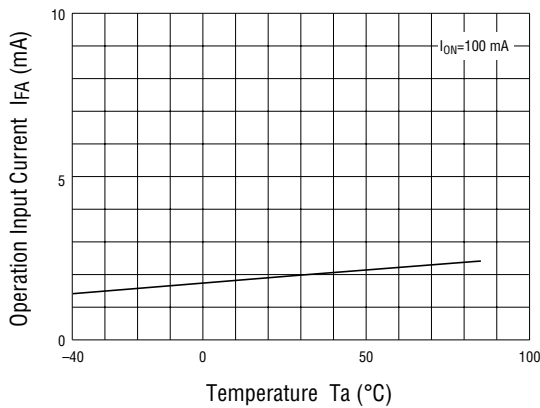
- Derating Factor of Continuous Forward Current



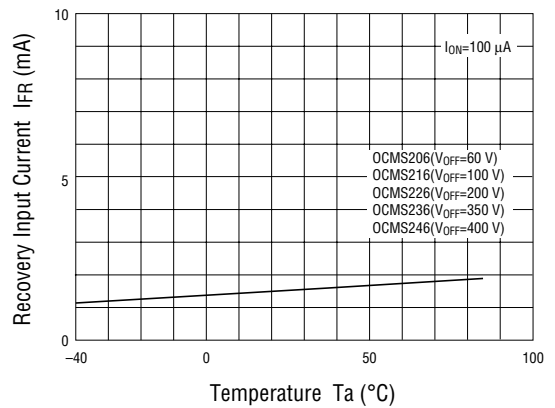
- Derating Factor of Load Current



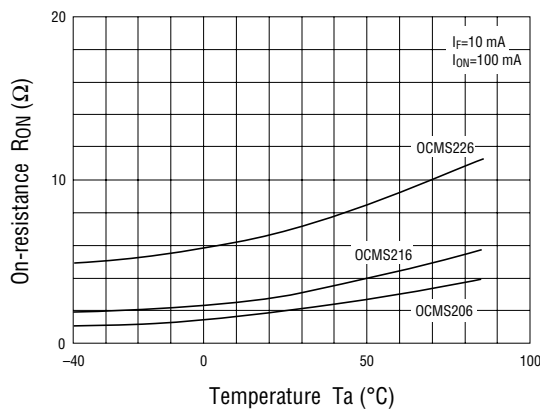
- Operation Input Current vs. Ambient Temperature



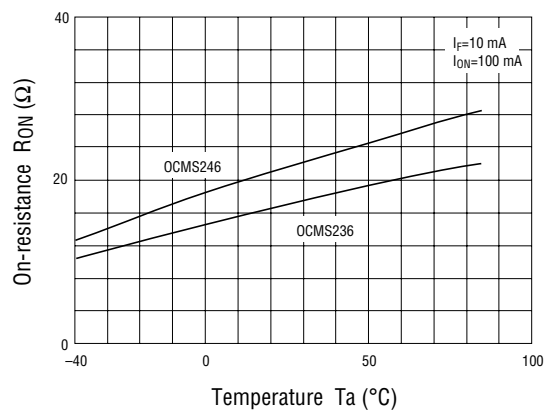
- Recovery Input Current vs. Ambient Temperature



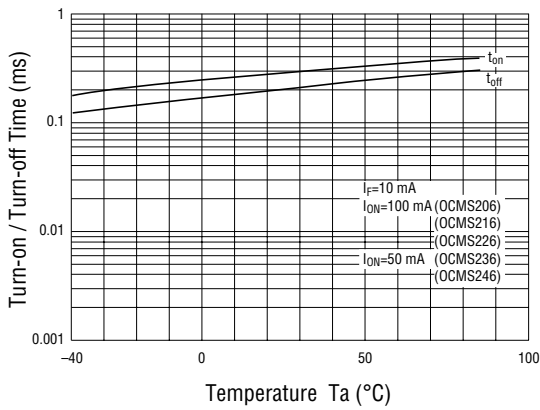
- On-resistance vs. Ambient Temperature 1



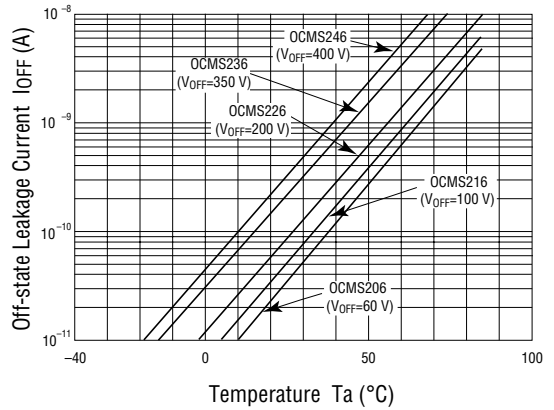
- On-resistance vs. Ambient Temperature 2



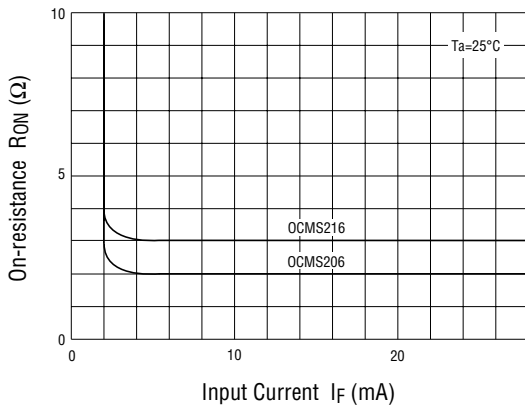
- Turn-on/Turn-off Time vs. Ambient Temperature



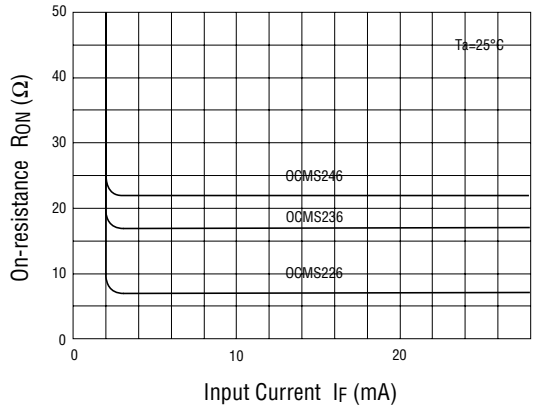
- Off-state Leakage Current vs. Ambient Temperature



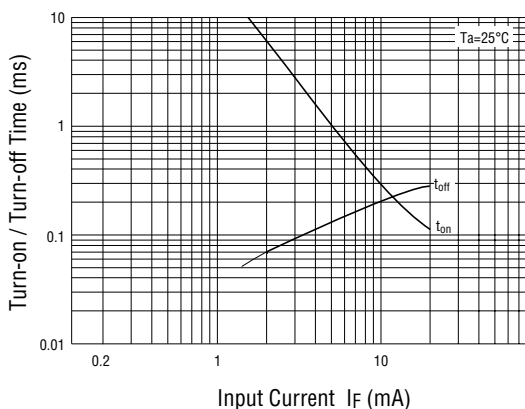
- Output Terminal Capacitance vs. Applied Voltage



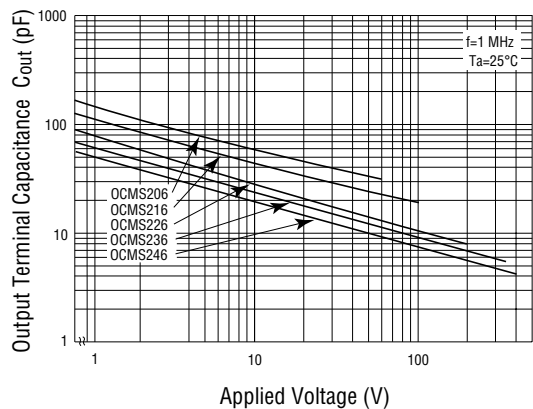
- Continuous Forward Current vs. Turn-on/Turn-off Time



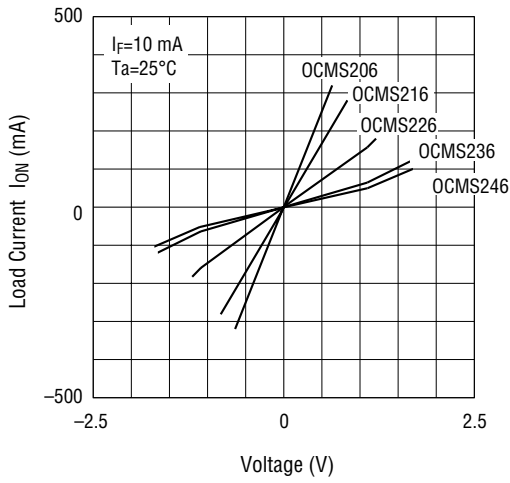
- Output Terminal Capacitance vs. Applied Voltage



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



• Load Current vs. Voltage



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

