

# OKI electronic components

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## OCM 4X8 SERIES

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Dual-Channel, Bidirectional Optical MOS Relay with Two Channels

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### 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

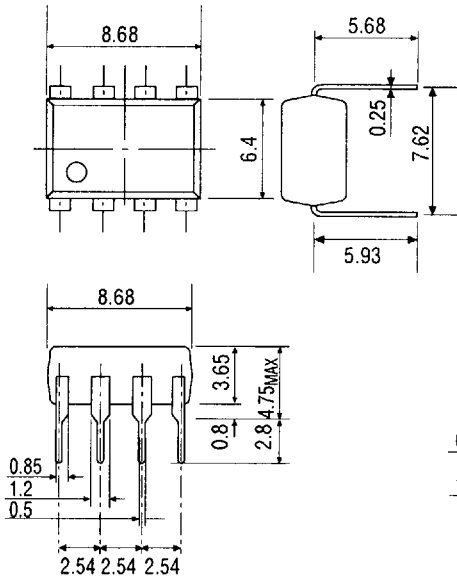
### APPLICATIONS

- 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

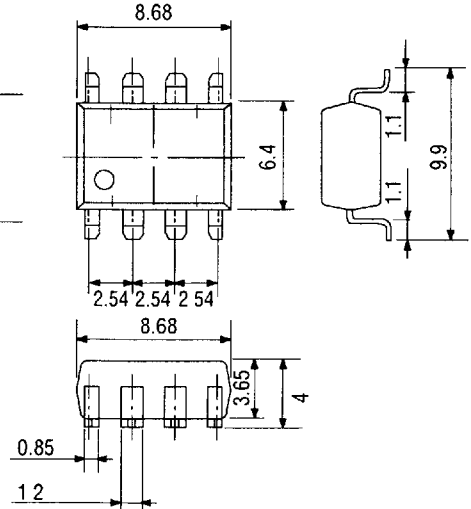
PIN CONFIGURATION

(Unit: mm)

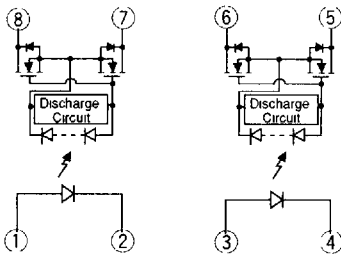
• DIP



• 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  $T_a=25^\circ\text{C}$ )

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  $\mu\text{s}$ , 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	$V_F$	$I_F=10\text{ mA}$	1.0	—	1.3	V	—	
	Reverse Current	$I_R$	$V_R=5\text{ V}$	—	—	10	$\mu\text{A}$	—	
FET	ON Resistance	$R_{ON}$	$I_F=10\text{ mA}$ $I_D=\text{Rating}$	OCM408	3.0	4.0	5.0	$\Omega$	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	$I_{LEAK}$	$V_D=60\text{ V}$ $V_D=100\text{ V}$ $V_D=200\text{ V}$ $V_D=400\text{ V}$	OCM408	—	—	1.0	$\mu\text{A}$	—
				OCM418					
				OCM428					
				OCM448					
	Output Capacitance	$C_{OUT}$	$V_D=50\text{ V}$ $f=1\text{ MHz}$	OCM408	—	15	—	pF	—
				OCM418	—	10	—		
				OCM428	—	8	—		
				OCM448	—	5	—		
Coupled	Operating LED Current *2	$I_{FON}$	$I_D=\text{Rating}$	—	—	5	mA	—	
	Returning LED Current	$I_{FOFF}$	$V_D=60\text{ V}$ $I_D=100\text{ }\mu\text{A}$ $V_D=100\text{ V}$ $I_D=100\text{ }\mu\text{A}$ $V_D=200\text{ V}$ $I_D=100\text{ }\mu\text{A}$ $V_D=400\text{ V}$ $I_D=100\text{ }\mu\text{A}$	OCM408	0.2	—	—	mA	—
				OCM418					
				OCM428					
				OCM448					
	I/O Capacitance	$C_{I-O}$	$f=1\text{ MHz}$	—	1.3	—	pF	—	
	Turn ON Time *3	$t_{ON}$	$I_F=10\text{ mA}$ $I_D=\text{Rating}$	—	0.3	1.0	ms	—	
Turn OFF Time *3	$t_{OFF}$	$R_L=5\text{ k}\Omega$	—	0.2	1.0	ms	—		

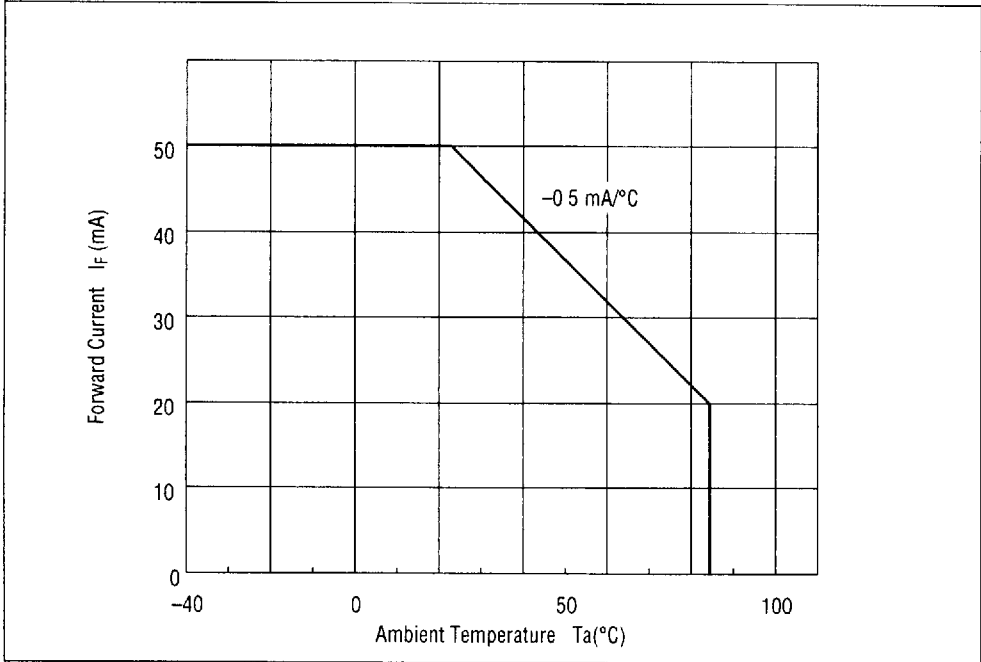
\*1 Can correspond to special specification  $I_{LEAK} < 0.1\text{ nA}$

\*2 Can correspond to special specification  $I_{FON} < 3.0\text{ mA}$

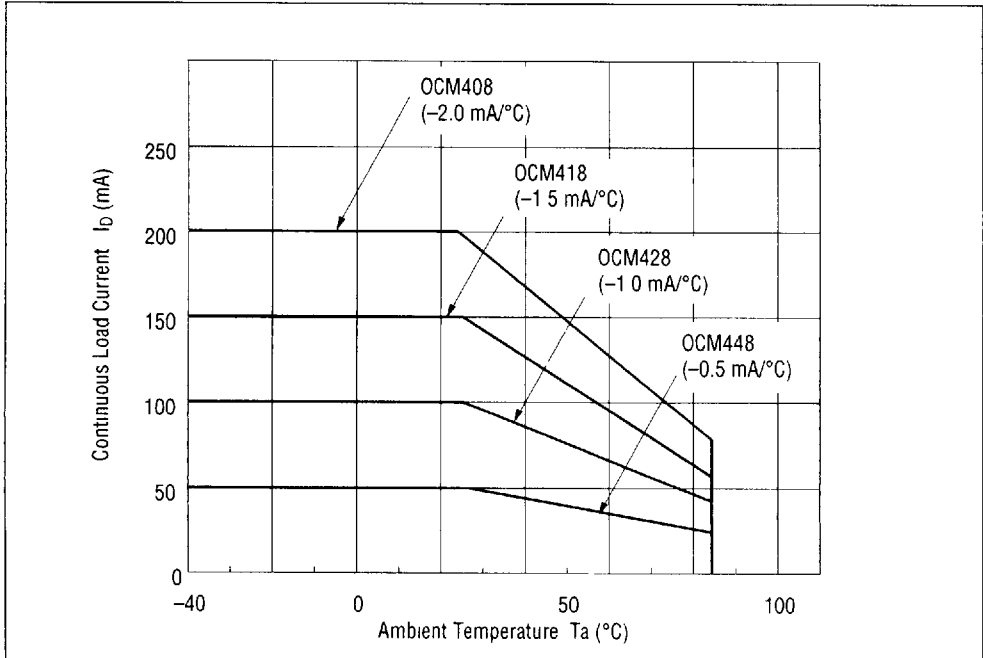
\*3 Can correspond to special specification  $t_{ON-OFF} < 0.5\text{ ms}$

TYPICAL CHARACTERISTICS

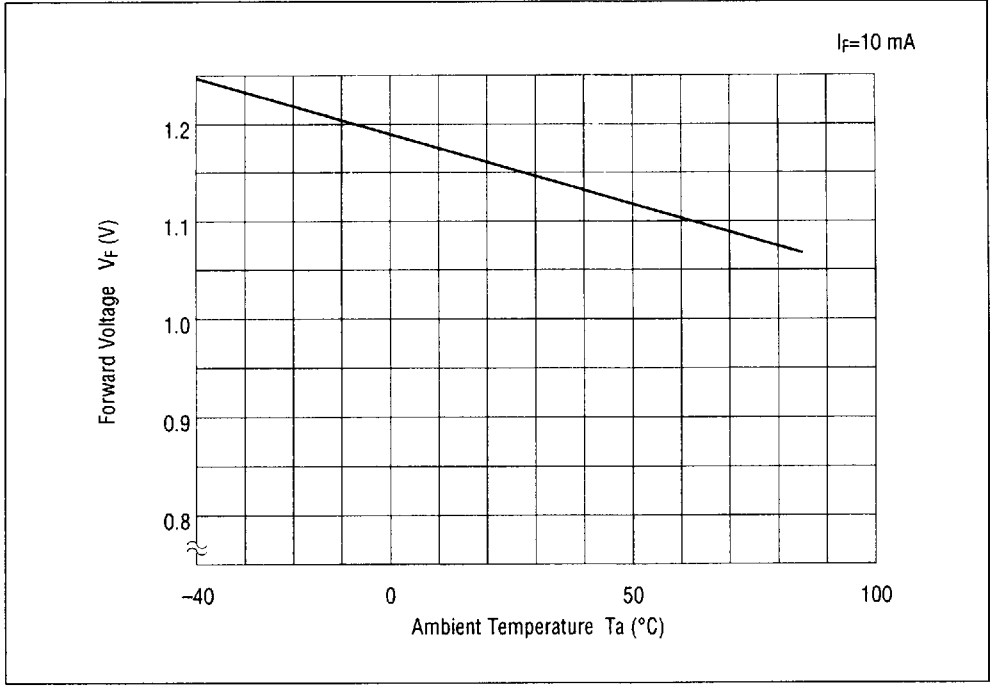
• Forward Current Derating Curve



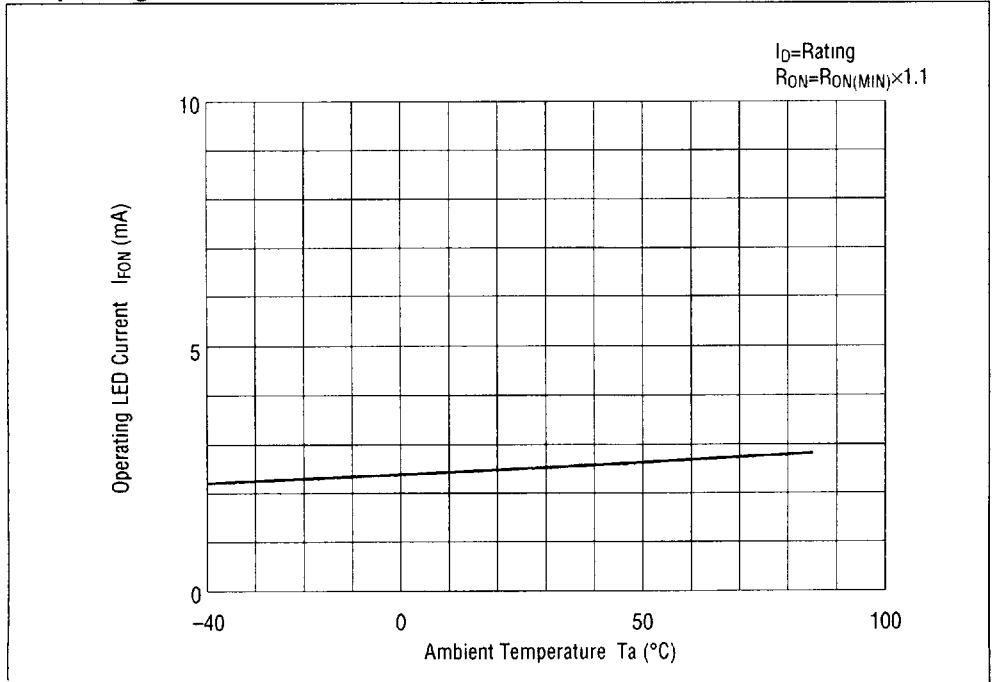
• Continuous Load Current Derating Curve



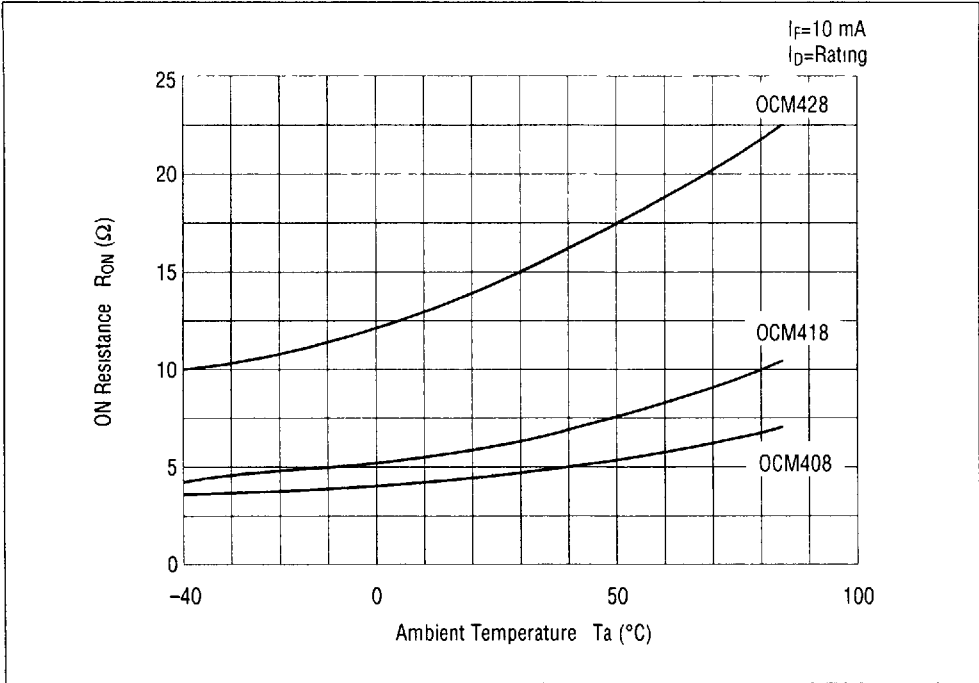
• Forward Voltage vs. Ambient Temperature



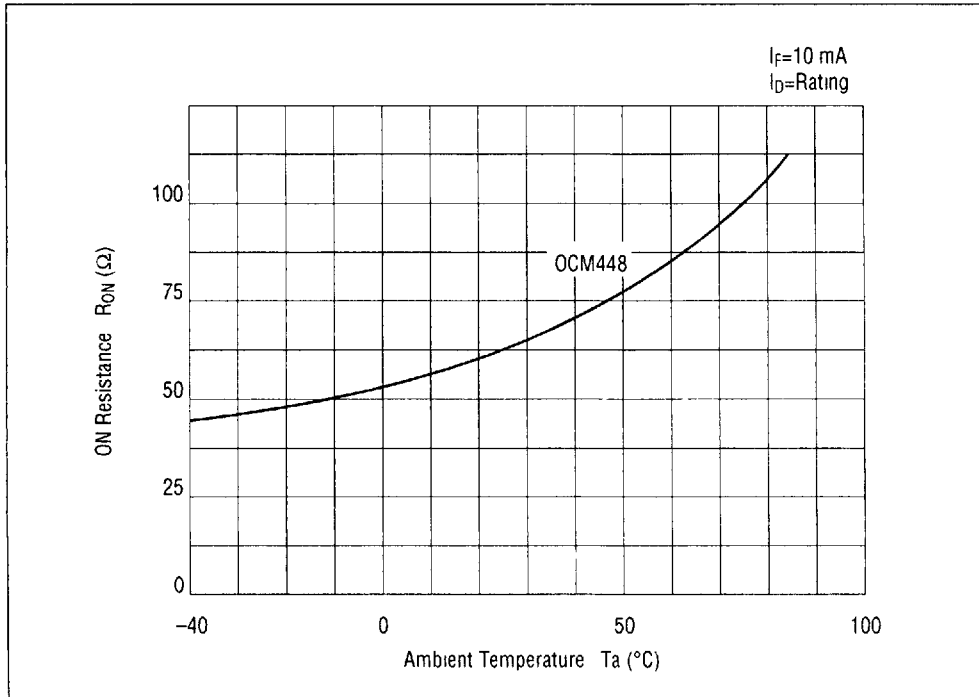
• Operating LED Current vs. Ambient Temperature



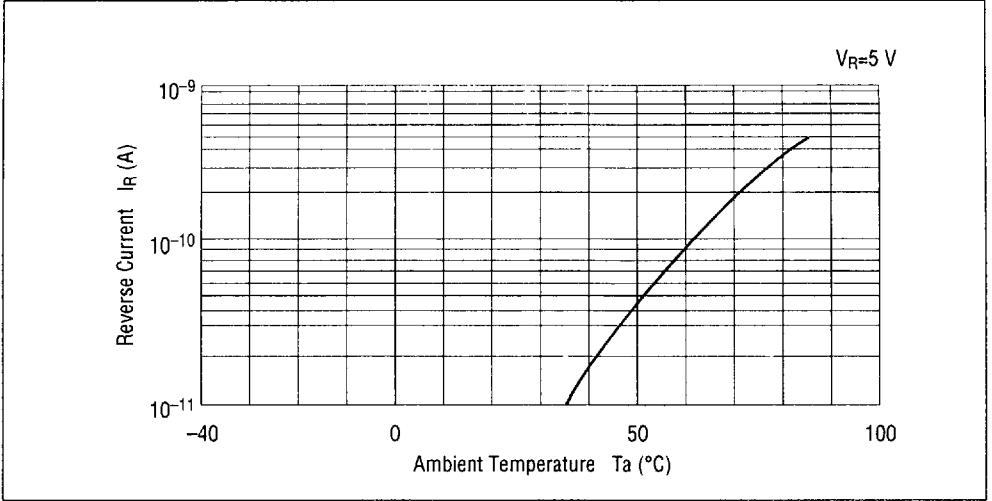
• ON Resistance vs. Ambient Temperature-1



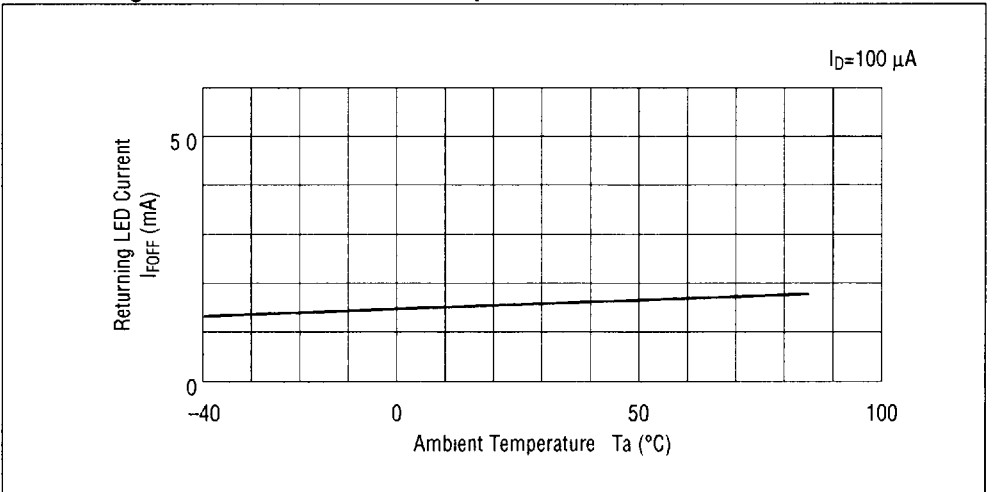
• ON Resistance vs. Ambient Temperature-2



• Reverse Current vs. Ambient Temperature

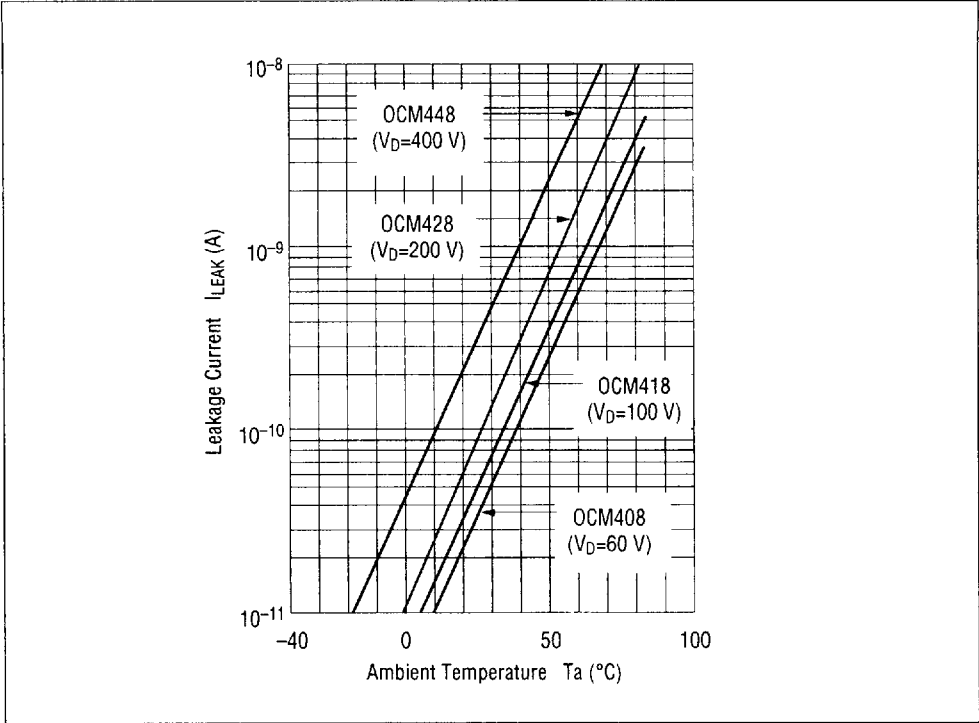


• Returning LED Current vs. Ambient Temperature

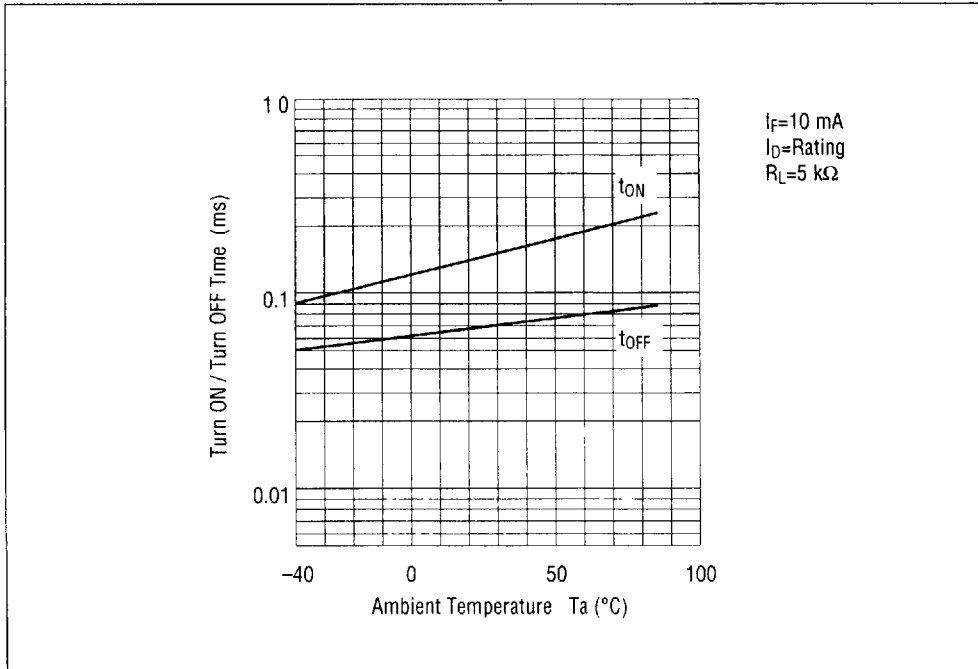




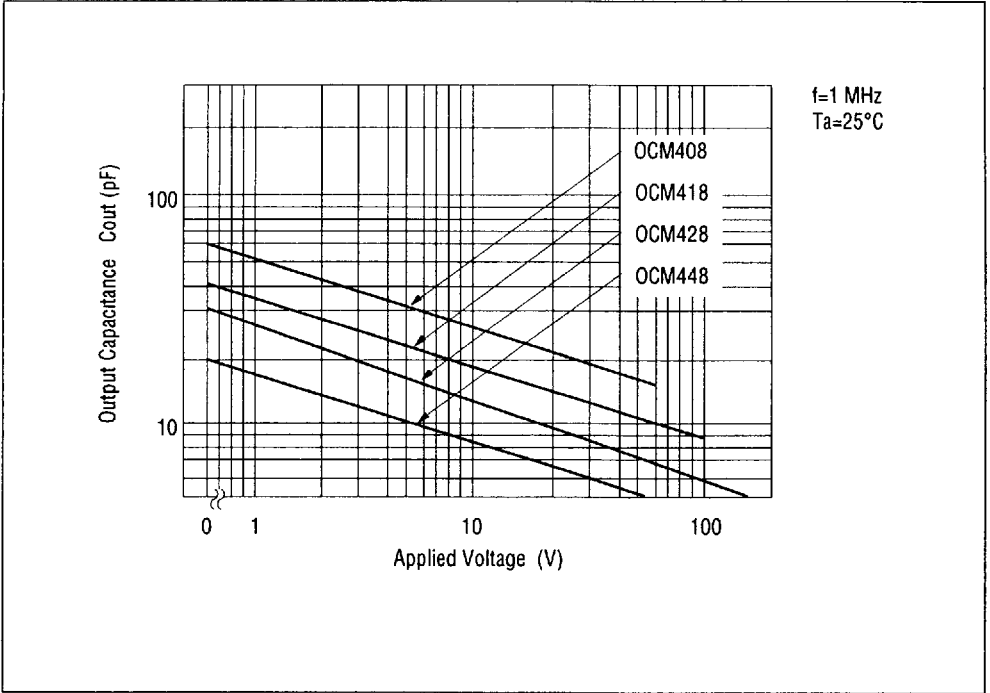
• Leakage Current vs. Ambient Temperature



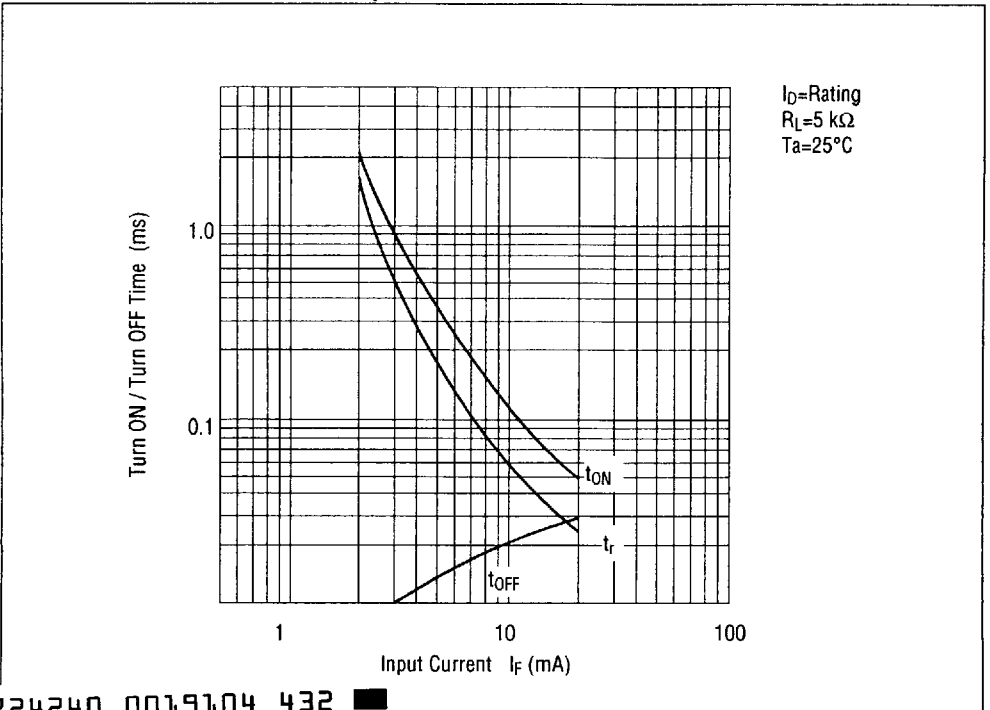
• Turn ON / Turn OFF Time vs. Ambient Temperature



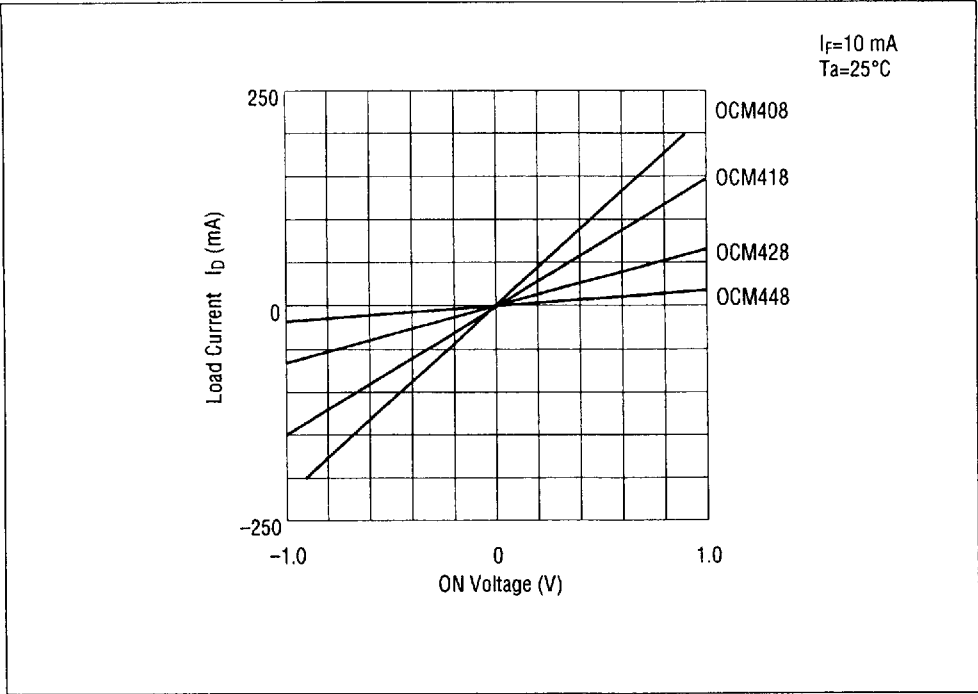
• Output Capacitance vs. Applied Voltage



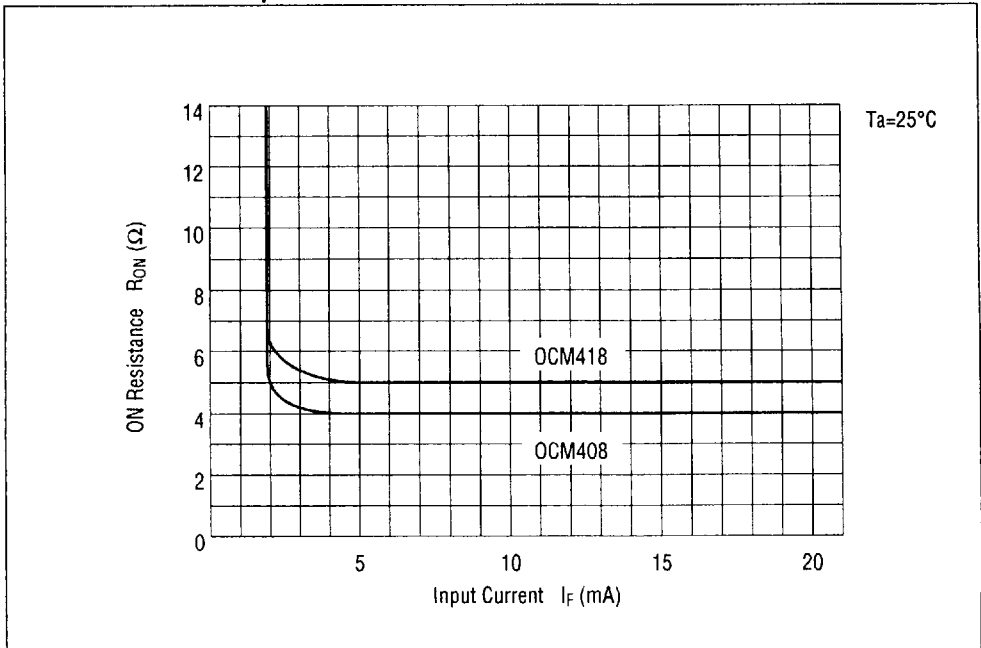
• Turn ON / Turn OFF Time vs. Input Current



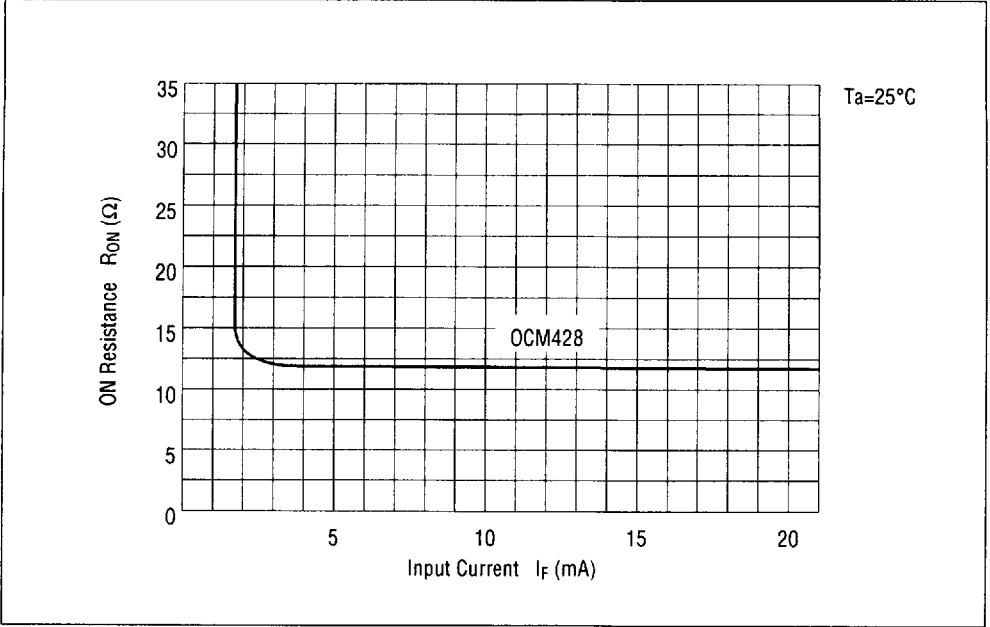
• Load Current vs. Voltage



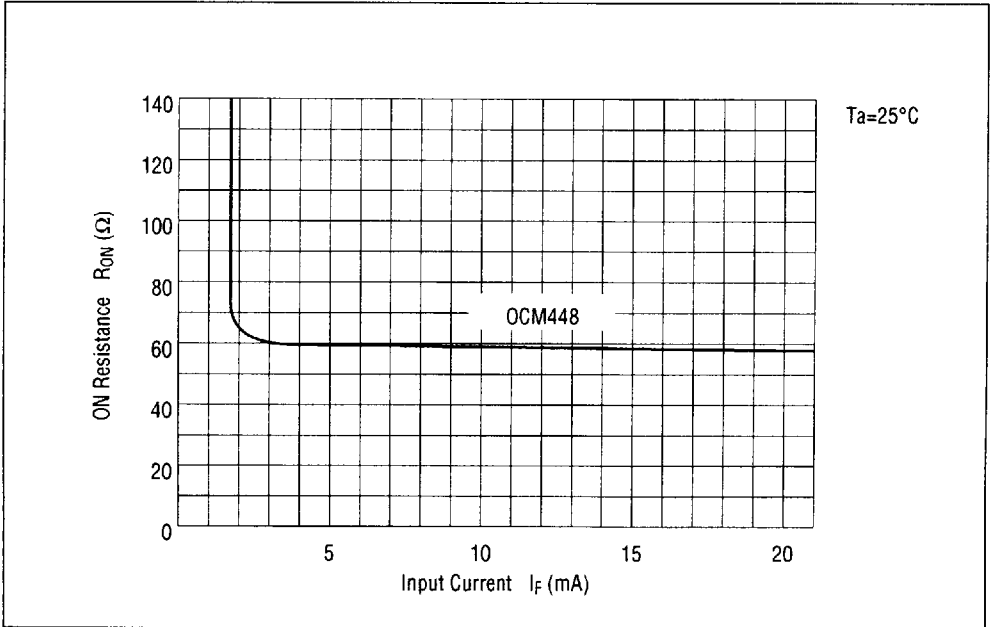
• ON Resistance vs. Input Current-1



• ON Resistance vs. Input Current-2



• ON Resistance vs. Input Current-3



• Circuit for Measuring Response Characteristics

