

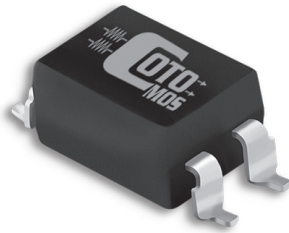
## Description

The CS230-HC features current switching capability to 130mA with a low on resistance of 28Ω Maximum. Designed for Security, Measurement and Instrumentation applications the CotoMOS® relay is capable of handling 350V load conditions. If your requirements are different please contact your Coto Applications Engineer for assistance through [www.cotorelay.com](http://www.cotorelay.com).

## Device Information

Part Series	Package	Body Size (mm)
CS230-HC	SMD	6.4 x 4.7 x 3.4

## Device Package



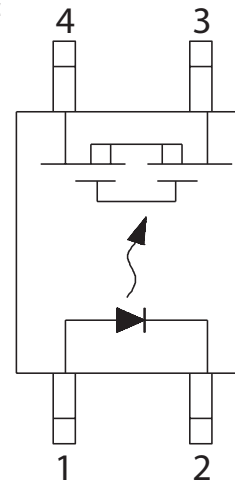
## Features

- ▶ Contact Form: 1A
- ▶ Load Voltage: 350V Maximum
- ▶ Operation LED Current: 5.0mA Maximum
- ▶ Load Current: 130mA Maximum
- ▶ On-Resistance: 22Ω Typical
- ▶ Output Capacitance: 41pF Typ.
- ▶ Low Off-State Leakage Current: 1.0μA Maximum
- ▶ Suffix - H for I/O Breakdown Voltage: 5000Vrms Minimum
- ▶ Transient Current Limiting (Over-Current Protection): 180 mA Typ.

## Applications

- ▶ Telecommunications (PC, electronic notepad)
- ▶ Measuring and Testing equipment
- ▶ Industrial control
- ▶ Security equipment
- ▶ High speed inspection machines

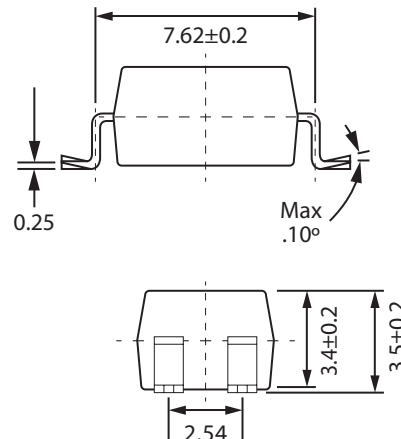
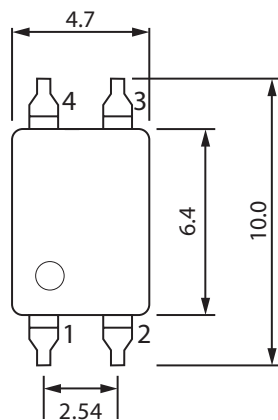
## Schematic



1. LED Anode
2. LED Cathode
- 3, 4. Drain (MOS FET)

## Outside Dimensions

Millimeters



## Specifications

### Absolute Maximum Ratings

Parameters		Symbol	Rating	Unit
Input	Continuous LED Current	$I_F$	50	mA
	Peak LED Current (f=100 Hz, duty=1%)	$I_{FP}$	1000	mA
	LED Reverse Voltage	$V_R$	5	V
	Input Power Dissipation	$P_{in}$	75	mW
Output	Load Voltage	$V_L$	350	V (AC peak or DC)
	Load Current	$I_L$	130	mA
	Output Power Dissipation	$P_{out}$	300	mW
Total Power Dissipation		$P_T$	350	mW
I/O Breakdown Voltage (RH=60%, 1 min)		$V_{I/O}$	5000	Vrms
Operating Temperature		$T_{opr}$	-40 to +85	°C
Storage Temperature		$T_{stg}$	-40 to +100	°C
Pin Soldering Temperature (10 sec. max)		$T_{sol}$	260	°C

### Electro-Optical Characteristics

Parameters		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	LED Forward Voltage	$V_F$	$I_F=10mA$		1.2	1.4	V
	Operation LED Current	$I_{FON}$			0.5	5.0	mA
	Recovery LED Current	$I_{FOFF}$			0.35	0.5	mA
	Recovery LED Voltage	$V_{FOFF}$		0.7			V
Output	On-Resistance Drain to Drain	$R_{on}$	$I_F=5mA, I_L=100mA$ Time to flow is within 1 sec.		22	28	$\Omega$
	Current Limit	$I_T$	$I_F=5mA$ within 5 ms ontime		180	240	mA
	Off-State Leakage Current	$I_{LEAK}$	$V_L=Rating$			1.0	$\mu A$
	Output Capacitance	$C_{out}$	$V_L=0V, f=1MHz$		41		pF
Trans- mission	Turn-On Time	$T_{ON}$	$I_F=5mA, I_L=100mA$		0.3	1.0	ms
	Turn-Off Time	$T_{OFF}$			0.05	0.2	ms
Coupled	I/O Isolation Resistance	$R_{I/O}$	DC500V	$10^{10}$			$\Omega$
	I/O Capacitance	$C_{I/O}$	f=1MHz		0.8	1.5	pF

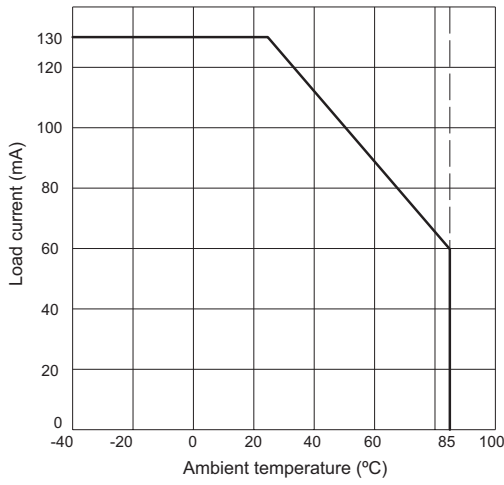
#### Environmental Ratings:

Operating Temp: -40°C to +85°C; Storage Temp: -40 to +100 C.

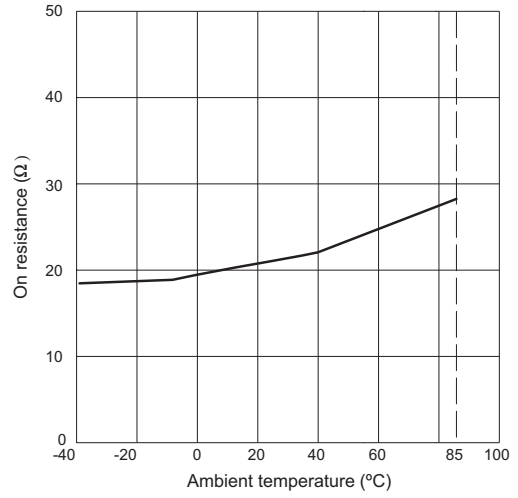
All electrical parameters measured at 25°C unless otherwise specified.

### CS230-HC Series Graphs

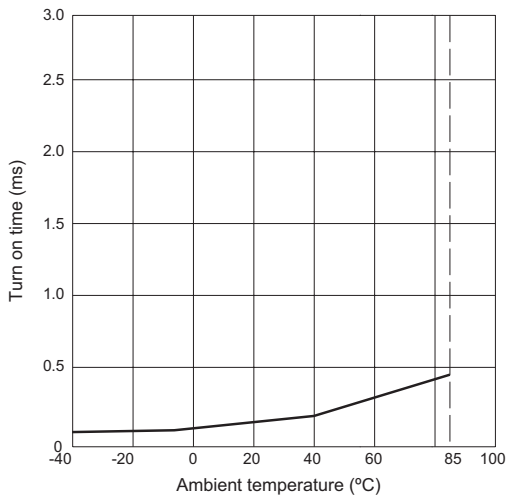
**Load Current Vs. Ambient Temperature**



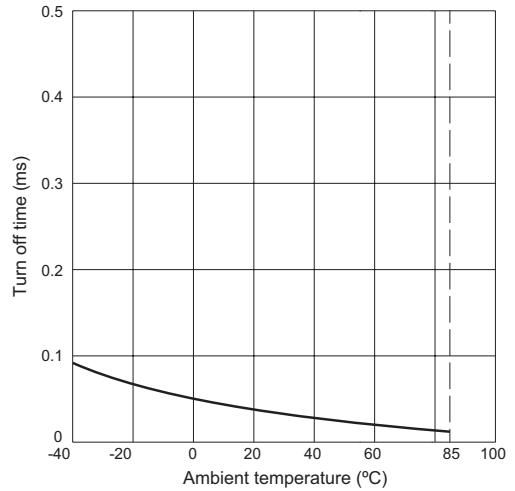
**On-Resistance Vs. Ambient Temperature**



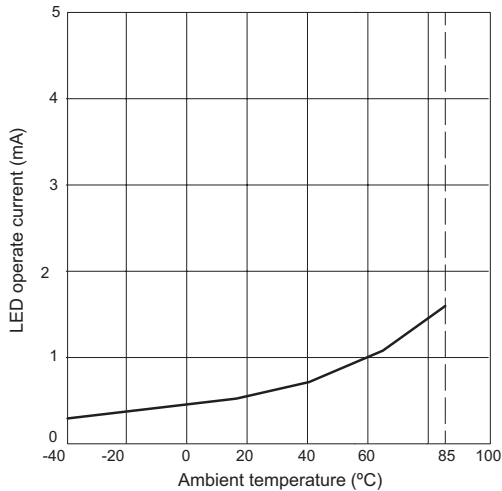
**Turn-On Time Vs. Ambient Temperature**



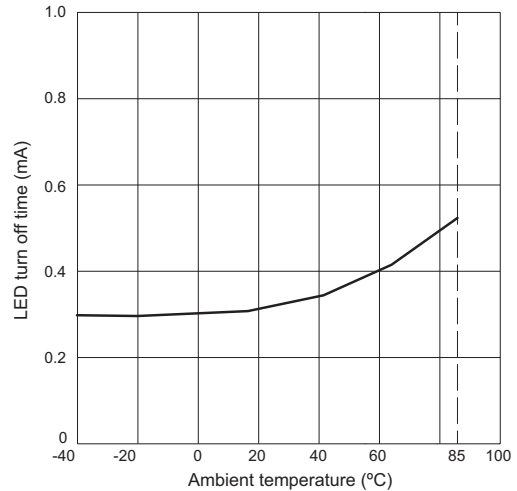
**Turn-Off Time Vs. Ambient Temperature**



**LED Operate Current Vs. Ambient Temperature**

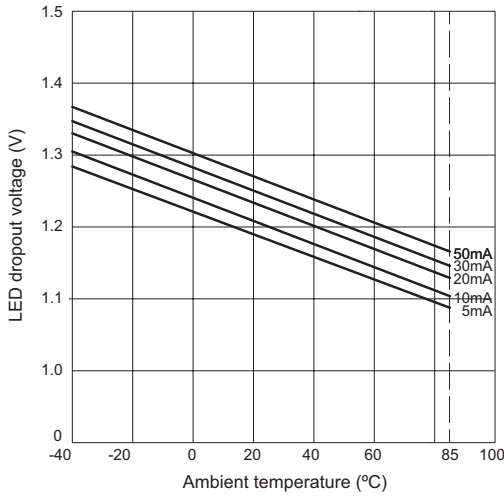


**LED Turn-Off Current Vs. Ambient Temperature**

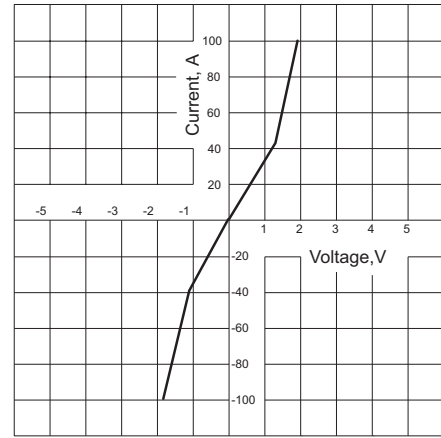


**CS230-HC Series Graphs, cont.**

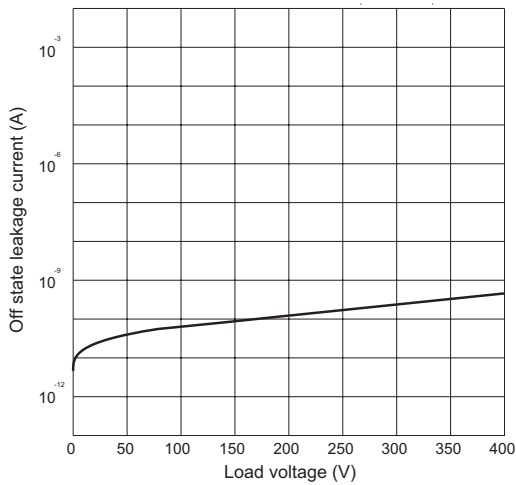
**LED Forward Voltage Vs. Ambient Temperature**



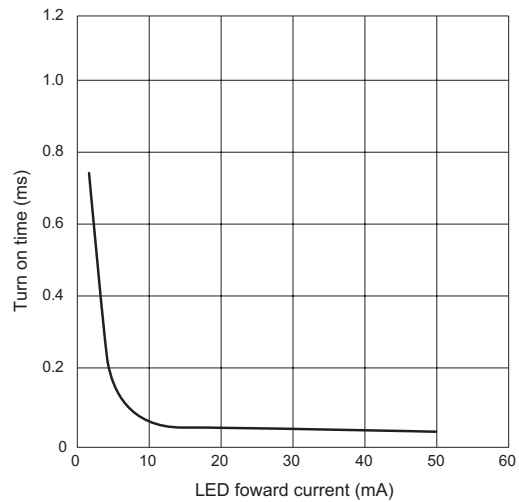
**Voltage Vs. Current Characteristics of Output at MOS Portion**



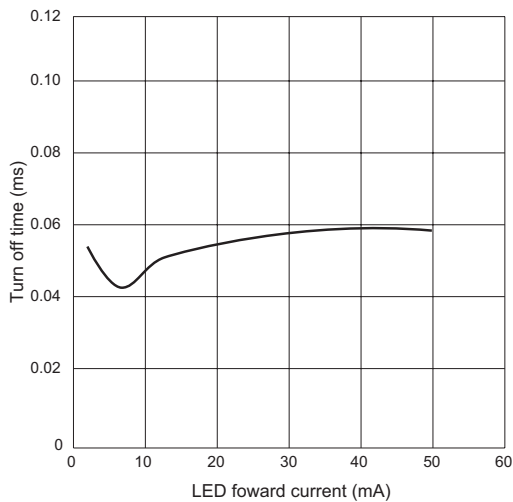
**Off-State Leakage Current Vs. Load Voltage**



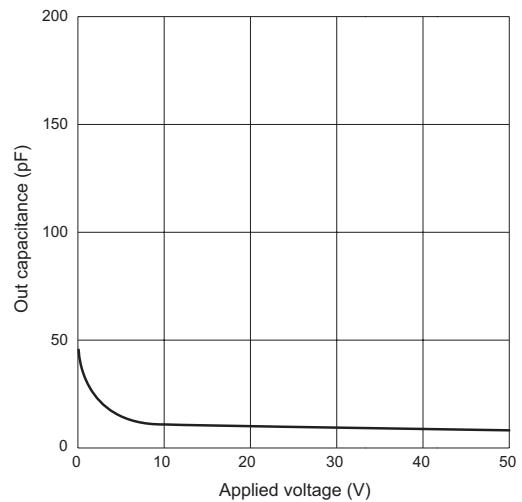
**LED Forward Current Vs. Turn-On Time Characteristics**



**LED Forward Current Vs. Turn-Off Time Characteristics**

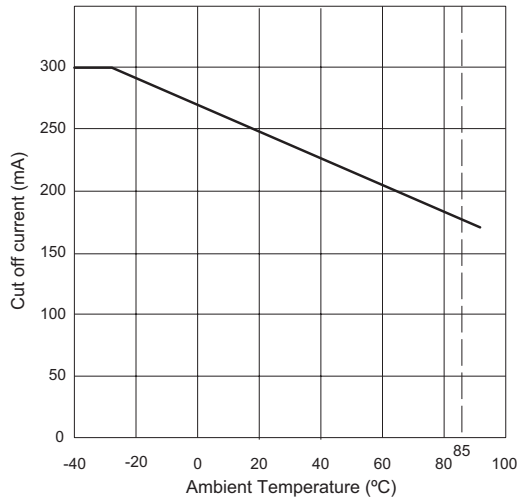


**Applied Voltage Vs. Output Capacitance Characteristics**

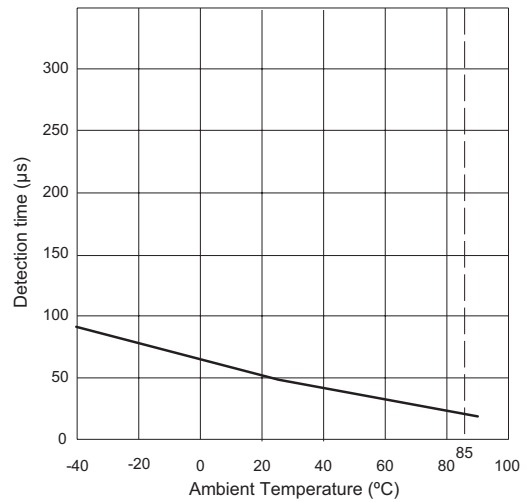


### CS230-HC Series Graphs, cont.

**Cut off current Vs. Ambient Temperature**



**Detection time Vs. Ambient Temperature**



### Recommended Operating Conditions

Please note the following conditions to ensure proper device operation and resetting.

Item	Symbol	Recommended Value	Unit
Input LED Current	$I_F$	5 ~ 10	mA

### Short-Circuit Protection Function

When the load current exceeds a fixed value, the short-circuit protection function activates to completely cut off the load current and keep the Photo MOS Relay turned off. In the Photo MOS Relay, the short-circuit protection instantaneously completely cuts off the load current. This function protects any circuits that follow the Photo MOS Relay from excess current and prevents them from becoming damaged. Turn off the input current, and restart, Photo MOS relay function to restore. To make the short circuit protection complete, make sure that the input current is at least  $I_F = 5$  mA.

### Output Voltage & Current Characteristics

**V-I Characteristics of Short-Circuit Protection Circuit**

