

## 1 Description

The C208S series is robust, ideal for security and analog multiplexing applications. It is a SPST normally open switch (1 Form A) that replaces electromechanical relays in many applications. It is constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die is fabricated in a high-voltage dielectrically isolated technology and is comprised of a photodiode array, switch control circuitry and MOSFET switches.

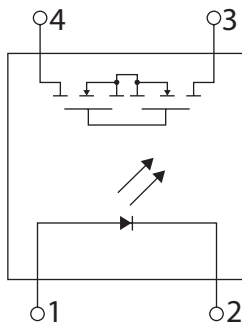
### Device Information

Part Series	Package	Body Size (mm)
C208S	SOP	4.4 x 3.9 x 2.0

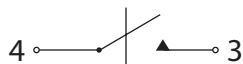
### Device Package



## 4 Schematic



1 FORM A  
NORMALLY OPEN



## 2 Features

- ▶ Normally open, single pole single throw
- ▶ Control 100V AC peak or DC voltage
- ▶ Switch 150mA loads
- ▶ Controls low-level analog signals down to zero voltage
- ▶ High sensitivity, low ON resistance
- ▶ Low-level off-state leakage current
- ▶ High isolation voltage
- ▶ Pb free and RoHS compliant **Pb**
- ▶ Agency Approvals:
  - UL / CUL Approved (No. E351594)

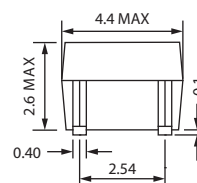
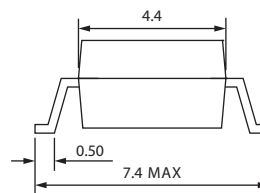
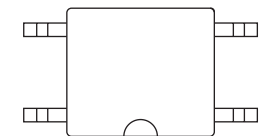
## 3 Applications

- ▶ Telecommunications (PC, electronic notepad)
- ▶ Modem
- ▶ Telephone equipment
- ▶ Security equipment
- ▶ Sensors
- ▶ Measuring and testing equipment
- ▶ Factory automation equipment
- ▶ High speed inspection machines
- ▶ Analog Multiplexing

## 5 Device Package Details

### 5.1 Outside Dimensions

(Millimeters)



### 5.2 Device Marking



**Notes:**

YWW = Y: Year code / W: Week code

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## 6 Specifications

### 6.1 Absolute Maximum Ratings

Parameters		Symbol	Rating	Unit
Input	Continuous Forward Current	$I_F$	50	mA
	Peak Forward Current	$I_{FP}$	1	A
	Reverse Voltage	$V_R$	5	V
	Power Dissipation	$P_{in}$	100	mW
	Derate Linearly from 25°C	-	1.3	mW/°C
Output	Breakdown Voltage	$V_B$	100	V
	Continuous Load Current	$I_L$	150	mA
	Power Dissipation	$P_{out}$	500	mW
Isolation Voltage		$V_{iso}$	1500 Vrms	Vrms
Isolation Resistance ( $V_{io}=500V$ )		$R_{iso}$	$\geq 10^{10}$	$\Omega$
Total Power Dissipation		$P_t$	550	mW
Derate Linearly from 25°C		-	2.5	mW/°C
Operating Temperature		$T_{opr}$	-40 to +85	°C
Storage Temperature		$T_{stg}$	-40 to +125	°C
Junction Temperature		$T_j$	100	°C
Soldering Temperature 10 seconds		$V_{sot}$	260	°C

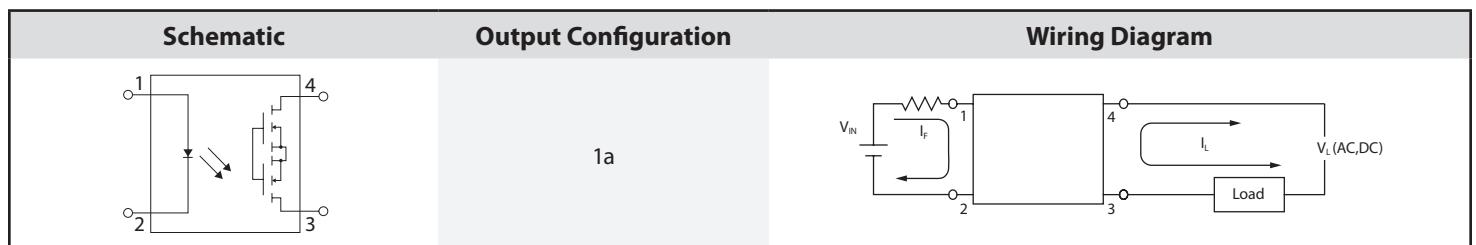
### 6.2 Electro-Optical Characteristics

Parameters		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward Voltage	$V_F$	$I_F=10mA$	-	1.2	1.5	V
	Operation Input Current	$I_{FON}$	$V_L=20V, I_L=100mA$	-	-	2.0	mA
	Recovery Input Current	$I_{FOFF}$	$V_L=20V, I_L \leq 5\mu A$	0.2	-	-	mA
Output	Breakdown Voltage	$V_B$	$I_B=50\mu A$	100	-	-	V
	Off-State Leakage Current	$I_{LEAK}$	$V_L=60V, I_F=0mA$	-	0.2	1.0	$\mu A$
I/O Capacitance		$C_{iso}$	$V_B=0V, f=0mA$	-	6	-	pF
Output Capacitance		$C_{OUT}$	$V_L=0V, f=1MHz$	-	50	-	pF
ON Resistance		$R_{ON}$	$I_F=10mA, I_L=100mA$	-	6	8	$\Omega$
Turn-On Time		$T_{ON}$	$I_F=10mA, V_L=20V$	-	0.3	2.0	ms
Turn-Off Time		$T_{OFF}$	$I_L=100mA, t=10ms$	-	0.1	1.0	ms

**Notes:**

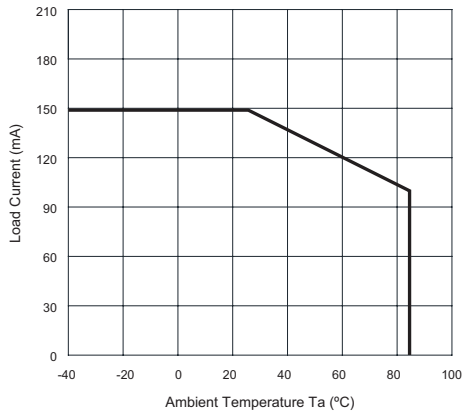
$T_a=25^\circ C$

## 7 Schematic and Wiring Diagrams

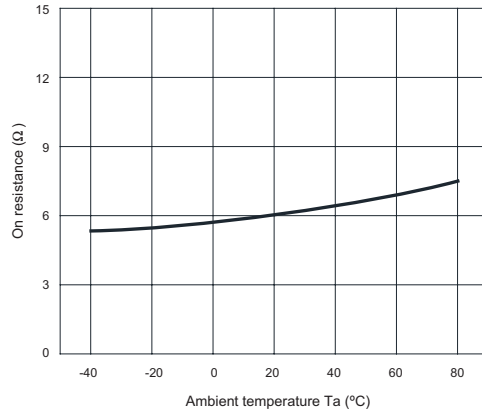


## 8 C208S Series Graphs

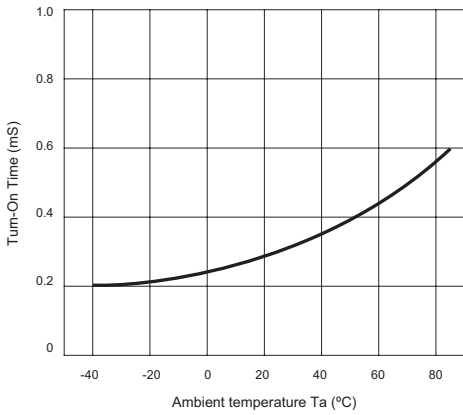
**Load Current Vs. Ambient Temperature**



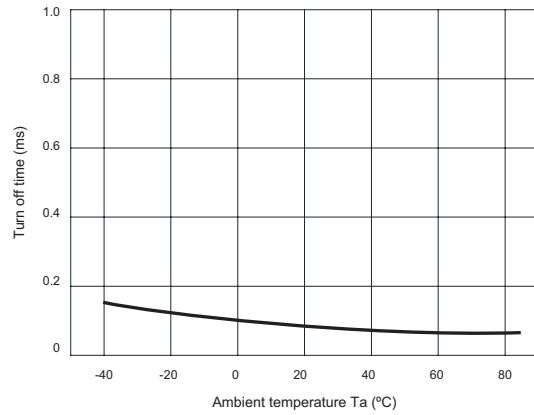
**On-Resistance Vs. Ambient Temperature**



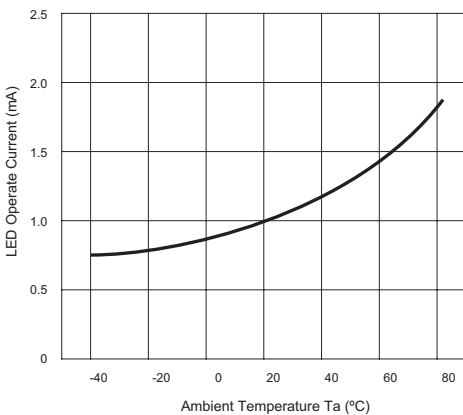
**Turn-On Time Vs. Ambient Temperature**



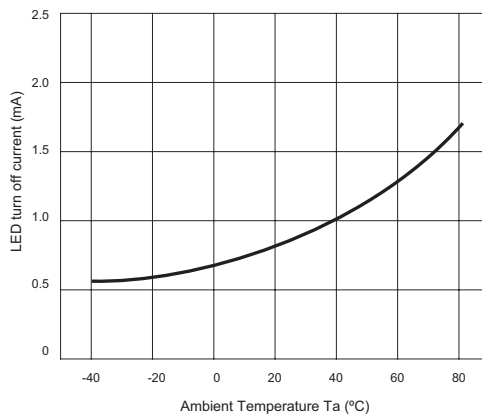
**Turn-Off Time Vs. Ambient Temperature**



**LED Operate Current Vs. Ambient Temperature**

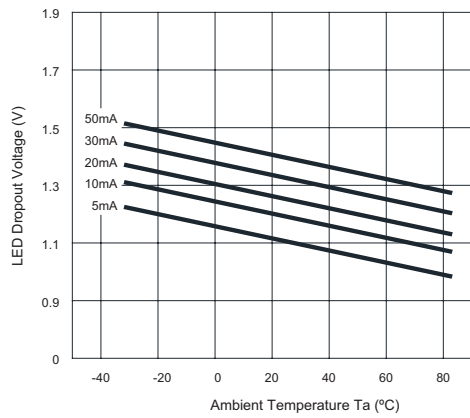


**LED Turn-Off Current Vs. Ambient Temperature**

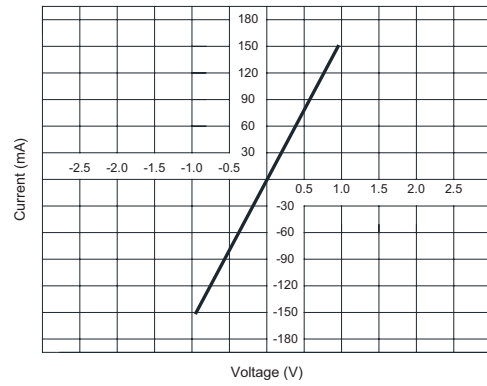


## 8 C208S Series Graphs

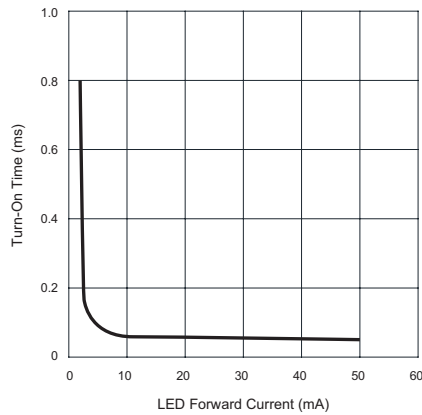
**LED Dropout Voltage Vs. Ambient Temperature**



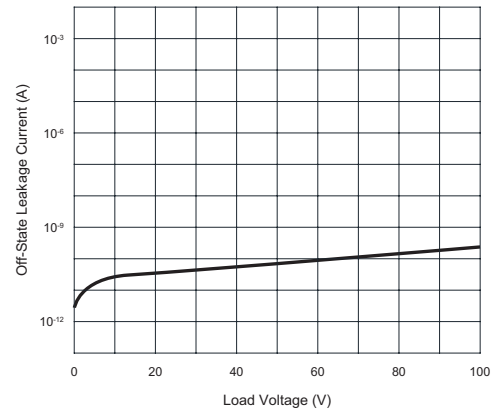
**Voltage Vs. Current Characteristics of Output at MOSFET Portion**



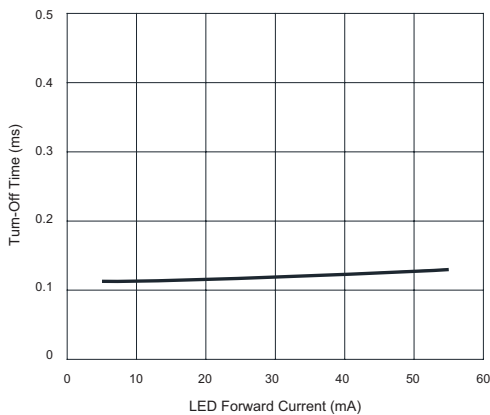
**Turn-On Time Vs. LED Forward Current**



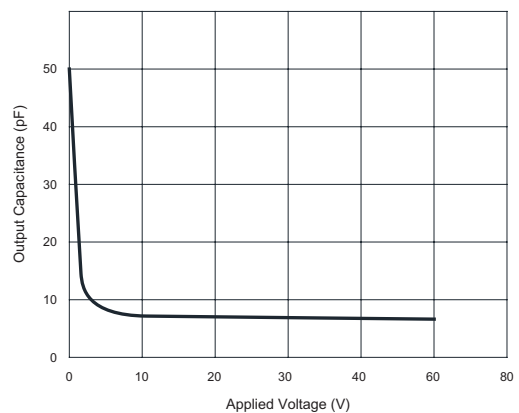
**Off-State Leakage Current Vs. Load Voltage**



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

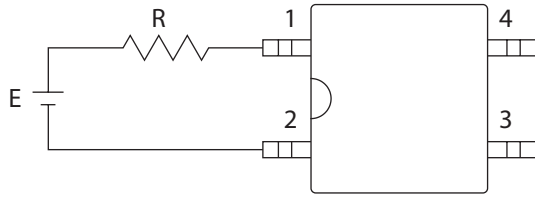


**Output Capacitance Vs. Applied Voltage**



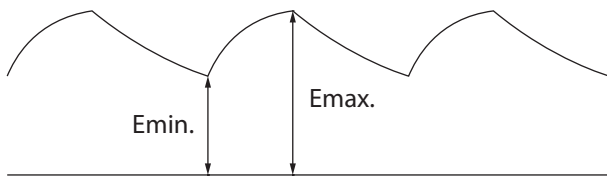
## 9 Using Methods

Examples of resistance value to control LED forward current ( $I_f=5\text{mA}$ )

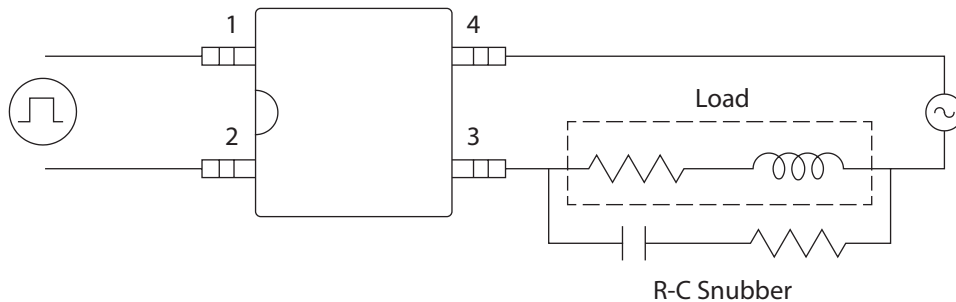
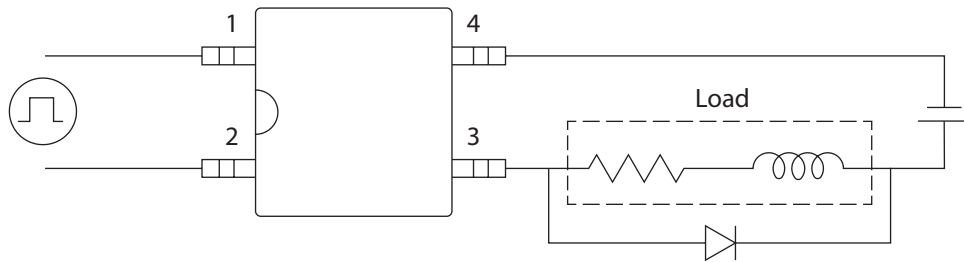


E	R
3.3V	Approx. 720 $\Omega$
5V	Approx. 1.5K $\Omega$
12V	Approx. 4.5K $\Omega$
15V	Approx. 6.0K $\Omega$
24V	Approx. 9.5K $\Omega$

- LED forward current must be more than 2mA, at E min.
- LED forward current must be less than 50mA, at E max.



Regulate the spike voltage generated on the inductive load as follows:

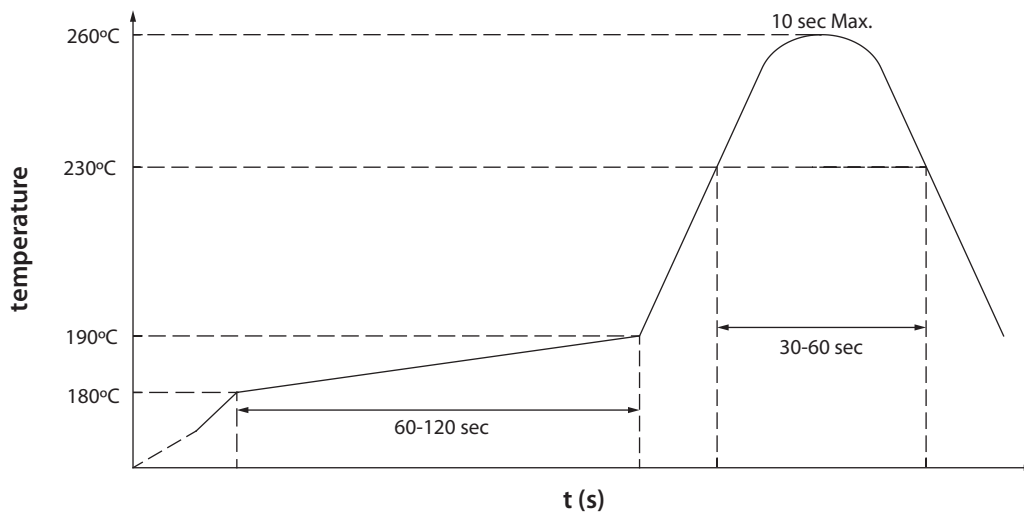


## 10 Recommended Soldering Conditions

### 10.1 Infrared Reflow Soldering

- ▶ Peak reflow soldering: 260°C or below (package surface temperature)
- ▶ Time of peak reflow temperature: 10 seconds
- ▶ Time of temperature higher than 230°C: 30-60 seconds
- ▶ Time to preheat temperature from 180~190°C: 60-120 seconds
- ▶ Number of reflows: Two
- ▶ Flux: Rosin flux containing small amount of chlorine  
(The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

### 10.2 Recommended Temperature Profile of Infrared Reflow



### 10.3 Wave Soldering

- ▶ Temperature: 260°C or below (molten solder temperature)
- ▶ Time: 10 seconds or less
- ▶ Preheating conditions: 120°C or below (package surface temperature)
- ▶ Number of times: One
- ▶ Flux: Rosin flux containing small amount of chlorine  
(The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

### 10.4 Cautions

- ▶ Fluxes: Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- ▶ Avoid shorting between portion of frame and leads.

**11 4-pin SOP Carrier Tape & Reel** Units: mm

