

# Current Regulator Diode



## CA500 Series / SST500 Series

### FEATURES

- Simple Two Lead Current Sources
- 1 to 100 Volt Operation
- Zero Temperature Coefficient
- Simplifies Floating Current Sources
- No Power Supplies Required

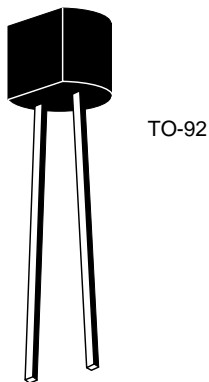
### GENERAL DESCRIPTION

Calogic's current regulator diode is available in plastic TO-92 and surface mount SOT-23. The devices are selected for narrow current ranges and are excellent choices for test instrumentation and medical applications. With nominal current ranges from 0.24mA to 4.7mA, all in 20% bands. The devices allow the designer a cost effective method of providing a current regulator with no power supply requirements and lower part count. The lower current devices operate at 1 volt.

### ORDERING INFORMATION

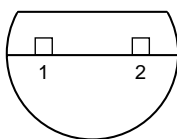
Part No.	Package	Part No.	Package	I <sub>F</sub> (mA)
CA500	TO-92	SST500	SOT-23	0.24
CA501	TO-92	SST501	SOT-23	0.33
CA502	TO-92	SST502	SOT-23	0.43
CA503	TO-92	SST503	SOT-23	0.56
CA504	TO-92	SST504	SOT-23	0.75
CA505	TO-92	SST505	SOT-23	1.00
CA506	TO-92	SST506	SOT-23	1.40
CA507	TO-92	SST507	SOT-23	1.80
CA508	TO-92	SST508	SOT-23	2.40
CA509	TO-92	SST509	SOT-23	3.00
CA510	TO-92	SST510	SOT-23	3.60
CA511	TO-92	SST511	SOT-23	4.70

### PIN CONFIGURATION



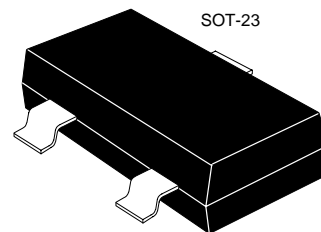
TO-92

### BOTTOM VIEW



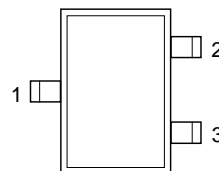
1 ANODE  
2 CATHODE

5010



SOT-23

### TOP VIEW



3 ANODE  
2 CATHODE

Externally connect  
pin 1 to pin2.

### PRODUCT MARKING (SOT-23)

SST500	500
SST501	501
SST502	502
SST503	503
SST504	504
SST505	505
SST506	506
SST507	507
SST508	508
SST509	509
SST510	510
SST511	511

**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^{\circ}\text{C}$  unless otherwise noted)

PARAMETERS/TEST CONDITIONS	SYMBOL	LIMIT	UNITS
Peak Operating Voltage	$P_{OV}$	50	V
Forward Current	$I_F$	20	mA
Reverse Current	$I_R$	50	
Power Dissipation	$P_D$	360	mW
Power Derating		3.27	mW/ $^{\circ}\text{C}$
Operating Junction Temperature	$T_J$	-55 to 150	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-55 to 200	

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^{\circ}\text{C}$  unless otherwise noted)

SYMBOL	$I_F$			$Z_d$		$Z_k$	$V_L$		$P_{OV}$		$C_F$	$\theta_1$
PARAMETER	REGULATOR CURRENT			DYNAMIC IMPEDANCE		KNEE IMPEDANCE	LIMITING VOLTAGE		PEAK OPERATING VOLTAGE		CAPACITANCE	TEMPERATURE COEFFICIENT (TYPICALS)
TEST CONDITIONS	$V_F = 25\text{V}$ (Note 1)			$V_F = 25\text{V}$ (Note 2)		$V_F = 6\text{V}$	$I_F = 0.8 I_{F(MIN)}$ (Note 3)		$I_F = 1.1 I_{F(MAX)}$ (Note 4)		$V_F = 25\text{V}$ $f = 1\text{MHz}$	$V_F = 25\text{V}$ $0^{\circ}\text{C} \leq T_A \leq 100^{\circ}\text{C}$
UNITS	mA			$\text{M}\Omega$		$\text{M}\Omega$	V		V		pF	ppm/ $^{\circ}\text{C}$
	NOM	MIN	MAX	MIN	TYP	TYP	MAX	TYP	MIN	TYP	TYP	TYP
<b>500</b>	0.24	0.192	0.288	4.00	40.0	2.50	1.20	0.4	50	100	2.2	1300
<b>501</b>	0.33	0.264	0.396	2.20	25.0	1.60	1.30	0.5	50	100	2.2	600
<b>502</b>	0.43	0.344	0.516	1.50	15.0	1.10	1.50	0.6	50	100	2.2	0
<b>503</b>	0.56	0.448	0.672	1.20	12.0	0.80	1.70	0.7	50	100	2.2	-400
<b>504</b>	0.75	0.600	0.900	0.80	7.0	0.55	1.90	0.8	50	100	2.2	-1000
<b>505</b>	1.00	0.800	1.200	0.50	5.0	0.40	2.10	0.9	50	100	2.2	-1300
<b>506</b>	1.40	1.120	1.680	0.33	3.0	0.25	2.50	1.1	50	100	2.2	-1900
<b>507</b>	1.80	1.440	2.160	0.20	2.0	0.19	2.80	1.3	50	100	2.2	-2200
<b>508</b>	2.40	1.900	2.900	0.20	1.5	0.13	3.10	1.5	50	100	2.2	-2600
<b>509</b>	3.00	2.400	3.600	0.15	1.0	0.09	3.50	1.7	50	100	2.2	-2800
<b>510</b>	3.60	2.900	4.300	0.15	0.8	0.07	3.90	1.9	50	100	2.2	-3000
<b>511</b>	4.70	3.800	5.600	0.12	0.6	0.05	4.20	2.1	50	100	2.2	-3000

- Notes: 1. Pulse test - steady state currents may vary.  
 2. Pulse test - steady state impedances may vary.  
 3. Min  $V_F$  required to insure  $I_F > 0.8 I_{F(MIN)}$ .  
 4. Max  $V_F$  where  $I_F > 1.1 I_{F(MAX)}$  is guaranteed.