

# Current Regulator Diode



## J500 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

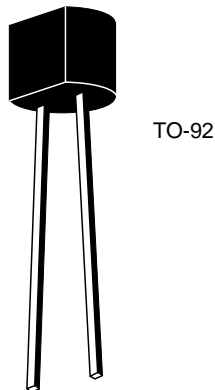
### GENERAL DESCRIPTION

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.

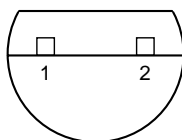
### ORDERING INFORMATION

Part No.	Package	Part No.	Package	I <sub>F</sub> (mA)
J500	TO-92	SST500	SOT-23	0.24
J501	TO-92	SST501	SOT-23	0.33
J502	TO-92	SST502	SOT-23	0.43
J503	TO-92	SST503	SOT-23	0.56
J504	TO-92	SST504	SOT-23	0.75
J505	TO-92	SST505	SOT-23	1.00
J506	TO-92	SST506	SOT-23	1.40
J507	TO-92	SST507	SOT-23	1.80
J508	TO-92	SST508	SOT-23	2.40
J509	TO-92	SST509	SOT-23	3.00
J510	TO-92	SST510	SOT-23	3.60
J511	TO-92	SST511	SOT-23	4.70

### PIN CONFIGURATION

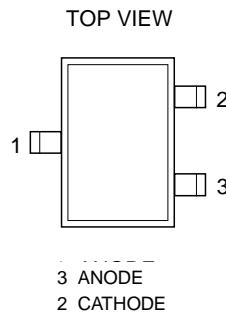
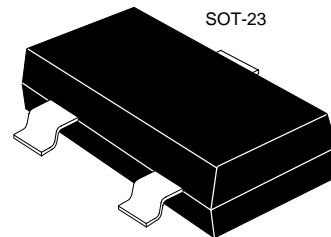


BOTTOM VIEW



1 ANODE  
2 CATHODE

5010



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		$\text{pF}$	$\text{ppm}/^{\circ}\text{C}$
	NOM	MIN	MAX	MIN	TYP	TYP	MAX	TYP	MIN	TYP	TYP	TYP
500	0.24	0.192	0.288	4.00	40.0	2.50	1.20	0.4	50	100	2.2	1300
501	0.33	0.264	0.396	2.20	25.0	1.60	1.30	0.5	50	100	2.2	600
502	0.43	0.344	0.516	1.50	15.0	1.10	1.50	0.6	50	100	2.2	0
503	0.56	0.448	0.672	1.20	12.0	0.80	1.70	0.7	50	100	2.2	-400
504	0.75	0.600	0.900	0.80	7.0	0.55	1.90	0.8	50	100	2.2	-1000
505	1.00	0.800	1.200	0.50	5.0	0.40	2.10	0.9	50	100	2.2	-1300
506	1.40	1.120	1.680	0.33	3.0	0.25	2.50	1.1	50	100	2.2	-1900
507	1.80	1.440	2.160	0.20	2.0	0.19	2.80	1.3	50	100	2.2	-2200
508	2.40	1.900	2.900	0.20	1.5	0.13	3.10	1.5	50	100	2.2	-2600
509	3.00	2.400	3.600	0.15	1.0	0.09	3.50	1.7	50	100	2.2	-2800
510	3.60	2.900	4.300	0.15	0.8	0.07	3.90	1.9	50	100	2.2	-3000
511	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.