Current Regulator Diode

calogic
CORPORATION

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**

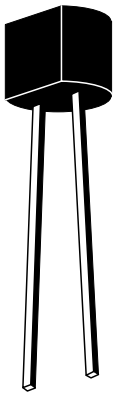
GENERAL DESCRIPTION

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

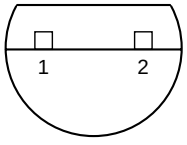
Part No.	Package	Part No.	Package	I_F (mA)
CA500	TO-92	SST500	SOT-23	0.24
CA501	TO-92	SST501	SOT-23	0.33
CA502	TO-92	SST502	SOT-23	0.43
CA503	TO-92	SST503	SOT-23	0.56
CA504	TO-92	SST504	SOT-23	0.75
CA505	TO-92	SST505	SOT-23	1.00
CA506	TO-92	SST506	SOT-23	1.40
CA507	TO-92	SST507	SOT-23	1.80
CA508	TO-92	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



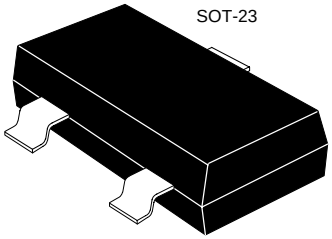
TO-92

BOTTOM VIEW



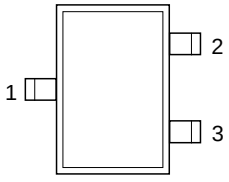
1 ANODE
2 CATHODE

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 ($T_A = 25^oC$ 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/^{o}C
Operating Junction Temperature	T_J	-55 to 150	^{o}C
Storage Temperature	T_{stg}	-55 to 200	

ELECTRICAL CHArACTERISTICS ($T_A = 25^oC$ unless otherwise noted)

SYMBOL	I_F			Z_d		Z_k	V_L		P_{OV}		C_F	θ_1
PARAMETER	REGULATOR CURRENT			DYNAMIC IMPEDANCE		KNEE IMPEDANCE	LIMITING VOLTAGE		PEAK OPERATING VOLTAGE		CAPACITANCE	TEMPERATURE COEFFICIENT (TYPICALS)
TEST CONDITIONS	V_F = 25V (Note 1)			V_F = 25V (Note 2)		V_F = 6V	$I_F = 0.8\ I_{F(MIN)}$ (Note 3)		$I_F = 1.1\ I_{F\ (MAX)}$ (Note 4)		V_F = 25V f = 1MHz	V_F = 25V $0^oC \le T_A \le 100^oC$
UNITS	mA			MΩ		MΩ	V		V		pF	ppm/^{o}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.