

CR022 SERIES

Siliconix
incorporated

Current Regulator Diodes

T-11-21

The CR022 Series is a family of precision current regulators designed for demanding applications in test equipment and instrumentation. These devices combine the proven performance of a JFET with an integrated resistor to produce a single two-lead device which is extremely simple to operate. With nominal current ranges from 0.22 mA to 5.30 mA, the CR022 Series will meet a wide array of design requirements. In addition to its two-lead construction, this series features 10% current ranges, improved current control over wide temperature ranges, and simple "floating" operation as no power supplies are required for biasing. Finally, its TO-18 hermetically sealed package is available with military processing per MIL-S-19500. (See Section 1.)

For additional design information please see typical performance curves (Section 7) as follows:

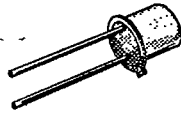
CR022 - CR062 NKL
 CR068 - CR150 NKM
 CR160 - CR530 NKO

SIMILAR PRODUCTS

- TO-92, See J500 Series
- 20% Ranges, See CRR0240 Series
- Chips, Order CRXXXCHP

PART	I_F (mA)	PART	I_F (mA)	PART	I_F (mA)
CR022	0.22	CR075	0.75	CR200	2.00
CR024	0.24	CR082	0.82	CR220	2.20
CR027	0.27	CR091	0.91	CR240	2.40
CR030	0.30	CR100	1.00	CR270	2.70
CR033	0.33	CR110	1.10	CR300	3.00
CR039	0.39	CR120	1.20	CR330	3.30
CR043	0.43	CR130	1.30	CR360	3.60
CR047	0.47	CR140	1.40	CR390	3.90
CR056	0.56	CR150	1.50	CR430	4.30
CR062	0.62	CR160	1.60	CR470	4.70
CR068	0.68	CR180	1.80	CR530	5.30

TO-18 2 LEADS



BOTTOM VIEW



1 ANODE
 2 CATHODE

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

PARAMETERS/TEST CONDITIONS	SYMBOL	LIMIT	UNITS
Peak Operating Voltage	P_{OV}	100	V
Reverse Current	I_R	50	mA
Thermal Resistance	R_{thJC}	100	$^\circ\text{C}/\text{W}$
Power Dissipation at $T_C = 25^\circ\text{C}$	P_D	1.25	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to 200	



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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

SYMBOL	I _F			Z _d		Z _k		V _L		POV		C _F	θ _J
	REGULATOR CURRENT			DYNAMIC IMPEDANCE		KNEE IMPEDANCE		LIMITING VOLTAGE		PEAK OPERATING VOLTAGE			
PARAMETER	V _F = 25 V (Note 1)			V _F = 25 V (Note 2)		V _F = 6 V		I _F = 0.8 I _{F(MIN)} (Note 3)		I _F = 1.1 I _{F(MAX)} (Note 4)		V _F = 25 V 0 °C ≤ T _A ≤ 100 °C	
TEST CONDITIONS	mA			MΩ		MΩ		V		V		ppm/°C	
UNITS	NOM	MIN	MAX	MIN	TYP	MIN	TYP	MAX	TYP	MIN	TYP	TYP	TYP
CR022	0.22	0.198	0.242	9.000	18.00	2.750	3.50	1.00	0.40				2200
CR024	0.24	0.216	0.264	8.000	15.50	2.350	3.00	1.00	0.45				1800
CR027	0.27	0.243	0.297	7.000	13.00	1.950	2.50	1.00	0.50				1450
CR030	0.30	0.270	0.330	6.000	11.50	1.600	2.00	1.00	0.55				1100
CR033	0.33	0.297	0.363	5.000	10.00	1.300	1.80	1.00	0.60	100	180	2.2	800
CR039	0.39	0.351	0.429	4.100	9.00	1.000	1.50	1.05	0.65	(All)	(All)	(All)	500
CR043	0.43	0.387	0.473	3.300	8.00	0.870	1.30	1.05	0.70				250
CR047	0.47	0.423	0.517	2.700	7.00	0.750	1.20	1.10	0.75				0
CR056	0.56	0.504	0.616	1.900	6.00	0.560	0.90	1.20	0.82				-200
CR062	0.62	0.556	0.682	1.550	4.50	0.470	0.70	1.30	0.90				-600
CR068	0.68	0.612	0.748	1.350	10.00	0.400	1.60	1.15	0.85				-350
CR075	0.75	0.675	0.825	1.150	9.00	0.335	1.80	1.20	0.90				-450
CR082	0.82	0.738	0.902	1.000	7.80	0.290	1.40	1.25	0.95				-550
CR091	0.91	0.819	1.001	0.880	6.60	0.240	1.20	1.29	1.00	100	180	4.2	-650
CR100	1.00	0.900	1.100	0.800	5.50	0.205	1.00	1.35	1.06	(All)	(All)	(All)	-750
CR110	1.10	0.990	1.210	0.700	4.80	0.180	0.90	1.40	1.12				-875
CR120	1.20	1.080	1.320	0.640	4.10	0.155	0.80	1.45	1.18				-1000
CR130	1.30	1.170	1.430	0.580	3.50	0.135	0.80	1.50	1.25				-1100
CR140	1.40	1.260	1.540	0.540	3.10	0.115	0.70	1.55	1.32				-1200
CR150	1.50	1.350	1.650	0.510	2.70	0.105	0.60	1.60	1.40				-1300
CR160	1.60	1.440	1.760	0.475	1.10	0.092	0.40	1.65	0.70				1000
CR180	1.80	1.620	1.980	0.420	1.00	0.074	0.34	1.75	0.75				650
CR200	2.00	1.800	2.200	0.395	0.90	0.061	0.28	1.85	0.80				300
CR220	2.20	1.980	2.420	0.370	0.83	0.052	0.25	1.95	0.85				100
CR240	2.40	2.160	2.640	0.345	0.76	0.044	0.22	2.00	0.90				0
CR270	2.70	2.430	2.970	0.320	0.70	0.035	0.19	2.15	0.95	100	175	6	-200
CR300	3.00	2.700	3.300	0.300	0.65	0.029	0.16	2.25	1.00	(All)	(All)	(All)	-400
CR330	3.30	2.970	3.630	0.280	0.60	0.024	0.14	2.35	1.05				-550
CR360	3.60	3.240	3.960	0.265	0.54	0.020	0.13	2.50	1.10				-730
CR390	3.90	3.510	4.290	0.255	0.47	0.017	0.12	2.60	1.17				-820
CR430	4.30	3.870	4.730	0.245	0.40	0.014	0.10	2.75	1.25				-1000
CR470	4.70	4.230	5.170	0.235	0.35	0.012	0.09	2.90	1.32				-1125
CR530	5.30	4.770	5.830	0.220	0.30	0.010	0.07	3.10	1.40				-1250

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.

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