

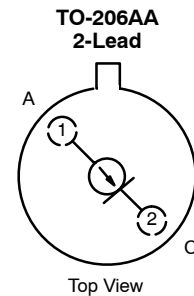


Current Regulator Diodes

CR160	CR220	CR300	CR390
CR180	CR240	CR330	CR430
CR200	CR270	CR360	CR470

PRODUCT SUMMARY

Part Number	Typ I_F (mA)	Min P_{OV} (V)	Part Number	Typ I_F (mA)	Min P_{OV} (V)
CR160	1.60	100	CR300	3.00	100
CR180	1.80	100	CR330	3.30	100
CR200	2.00	100	CR360	3.60	100
CR220	2.20	100	CR390	3.90	100
CR240	2.40	100	CR430	4.30	100
CR270	2.70	100	CR470	4.70	100



FEATURES

- Two-Lead Hermetic Package
- Guaranteed Tight $\pm 10\%$ Tolerance
- Operation from 1 V (CR160) to 100 V
- Excellent Temperature Stability

BENEFITS

- Simple Series Circuitry, No Separate Voltage Source
- Tighter Guaranteed Circuit Performance
- Excellent Performance in Low-Voltage/Battery Circuits and High-Voltage Spike Protection
- High Circuit Stability vs. Temperature

APPLICATIONS

- Constant-Current Supply
- Current-Limiting
- Timing Circuits

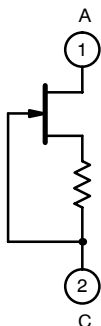
DESCRIPTION

The CR160 series is a family of $\pm 10\%$ range current regulators designed for demanding applications in test equipment and instrumentation. These devices combine a JFET with an integrated resistor to produce a single two-leaded device which is extremely simple to operate. With nominal current ranges from 1.60 mA to 4.70 mA, this series

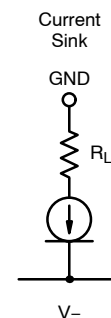
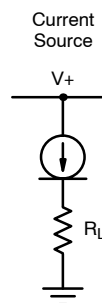
will meet a wide array of design requirements.

The TO-206AA hermetically sealed package is available with military processing per MIL-S-19500 (see Military Information).

SCHEMATIC DIAGRAM



APPLICATIONS



For applications information see AN103.



ABSOLUTE MAXIMUM RATINGS

Peak Operating Voltage 100 V
 Reverse Current 50 mA
 Thermal Resistance (θ_{JA}) 417°C/W

Storage Temperature -55 to 200°C
 Power Dissipation^a 300 mW

Notes:

a. Derate 2.4 mW/°C above 25°C

SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ ^a	Max	
Peak Operating Voltage ^b	P_{OV}	$I_F = 1.1 I_{F(max)}$	100	135		V
Reverse Voltage	V_R	$I_R = 1 \text{ mA}$		0.8		
Capacitance	C_F	$V_F = 25 \text{ V}, f = 1 \text{ MHz}$		6		pF

Part Number	Regulator Current ^c (I_F)			Dynamic Im- pedance ^d (Z_d)		Knee Impedance (Z_k)		Limiting Voltage ^e (V_L)		Temperature Coefficient (θ_1)
	$V_F = 25 \text{ V}$			$V_F = 25 \text{ V}$		$V_F = 6 \text{ V}$		$I_F = 0.8 I_{F(min)}$		$V_F = 25 \text{ V}$ $0^\circ\text{C} \leq T_A \leq 100^\circ\text{C}$
	mA			M Ω		M Ω		V		ppm/°C
	Min	Nom	Max	Min	Typ ^a	Min	Typ ^a	Max	Typ ^a	Typ ^a
CR160	1.440	1.60	1.760	0.475	1.10	0.092	0.40	1.65	0.70	1000
CR180	1.620	1.80	1.980	0.420	1.00	0.074	0.34	1.75	0.75	650
CR200	1.800	2.00	2.200	0.395	0.90	0.061	0.28	1.85	0.80	300
CR220	1.980	2.20	2.420	0.370	0.83	0.052	0.25	1.95	0.85	100
CR240	2.160	2.40	2.640	0.345	0.76	0.044	0.22	2.00	0.90	0
CR270	2.430	2.70	2.970	0.320	0.70	0.035	0.19	2.15	0.95	-200
CR300	2.700	3.00	3.300	0.300	0.65	0.029	0.16	2.25	1.00	-400
CR330	2.970	3.30	3.630	0.280	0.60	0.024	0.14	2.35	1.05	-550
CR360	3.240	3.60	3.960	0.265	0.54	0.020	0.13	2.50	1.10	-730
CR390	3.510	3.90	4.290	0.255	0.47	0.017	0.12	2.60	1.17	-820
CR430	3.870	4.30	4.730	0.245	0.40	0.014	0.10	2.75	1.25	-1000
CR470	4.230	4.70	5.170	0.235	0.35	0.012	0.09	2.90	1.32	-1125

Notes:

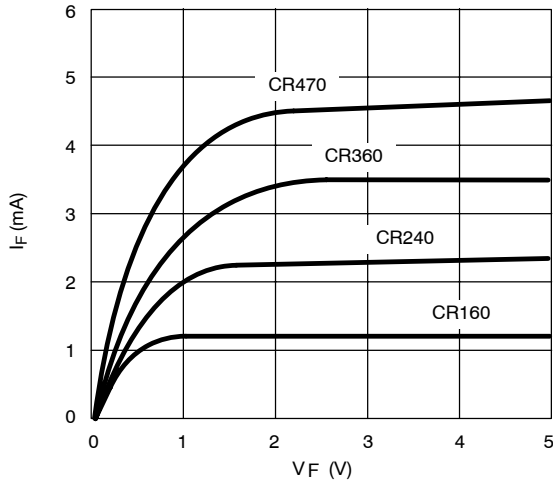
- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
 b. Peak voltage at which $I_F = 1.1 I_{F(max)}$.
 c. Pulse test—steady state currents may vary.
 d. Pulse test—steady state impedances may vary.
 e. Min V_F required to insure $I_F = 0.8 I_{F(min)}$.

NKO

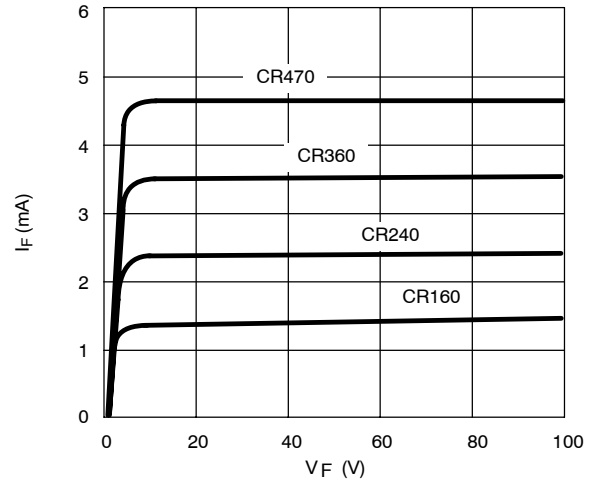


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

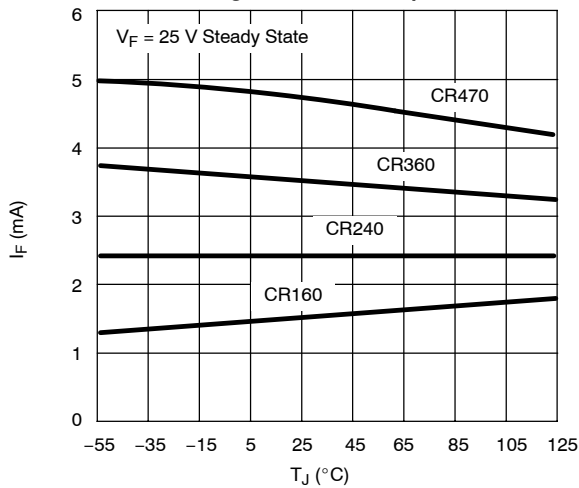
Output Current vs. Forward Voltage



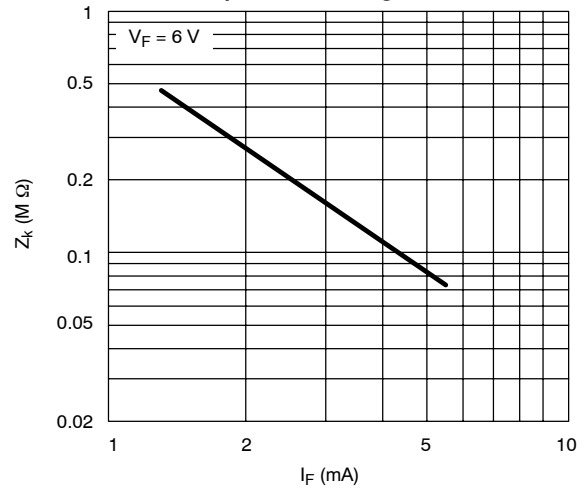
Output Current vs. Forward Voltage



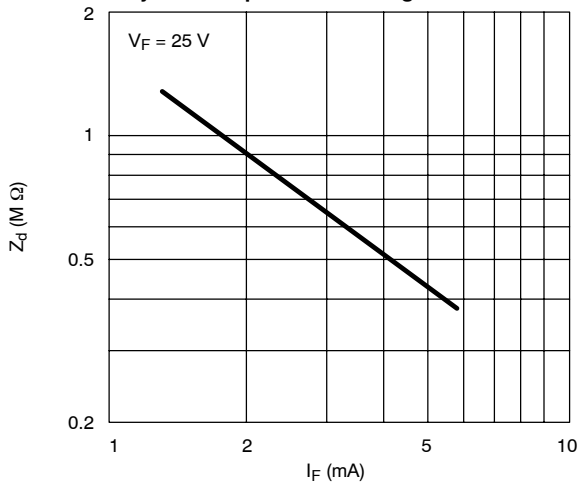
Limiting Current vs. Temperature



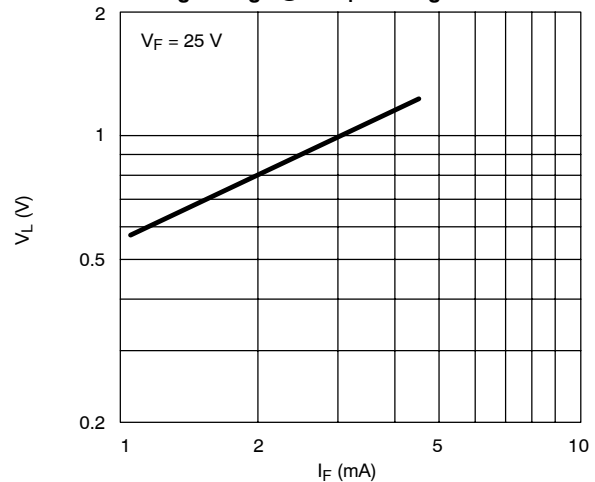
Knee Impedance vs. Regulator Current



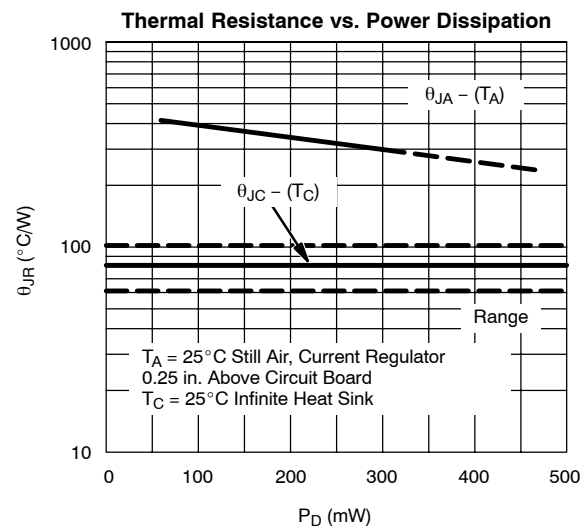
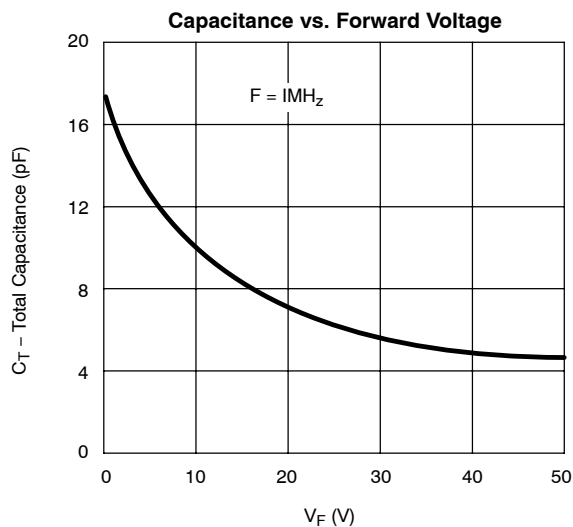
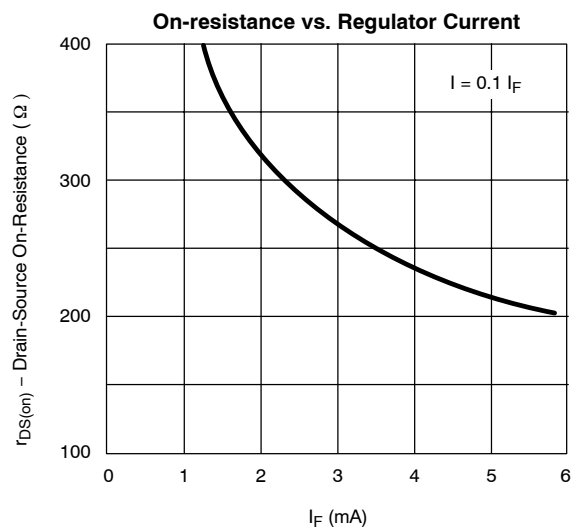
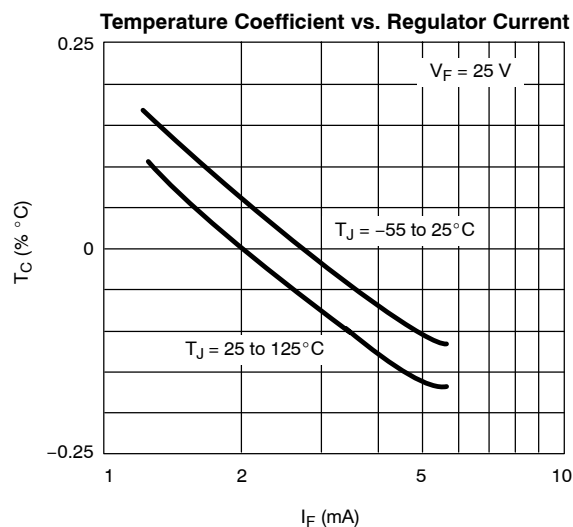
Dynamic Impedance vs. Regulator Current



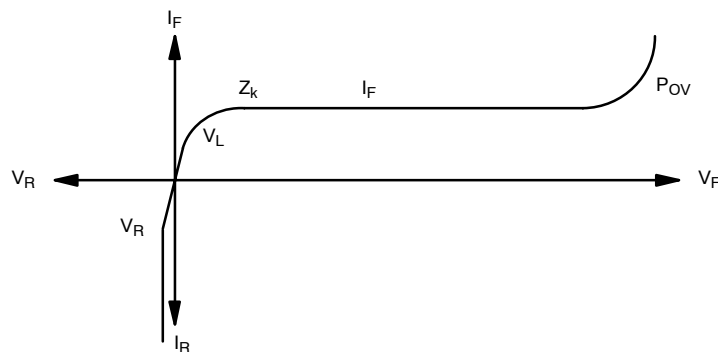
Limiting Voltage @ 0.8 I_F vs. Regulator Current



TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)



CURRENT REGULATOR DIODE V-1 CHARACTERISTIC





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