

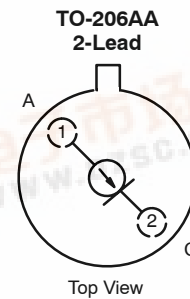


CR160 Series Vishay Siliconix

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

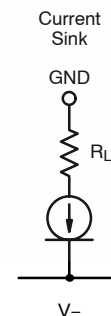
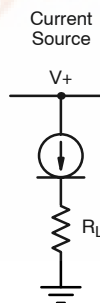
will meet a wide array of design requirements.

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

SCHEMATIC DIAGRAM



APPLICATIONS



CR160 Series

Vishay Siliconix



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 Impedance ^d (Z_d)		Knee Impedance (Z_k)		Limiting Voltage ^e (V_L)		Temperature Coefficient (θ_1)
	$V_F = 25\text{ V}$			$V_F = 25\text{ V}$		$V_F = 6\text{ V}$		$I_F = 0.8 I_{F(min)}$		$V_F = 25\text{ V}$ $0^\circ\text{C} \leq T_A \leq 100^\circ\text{C}$
	Min	Nom	Max	Min	Typ ^a	Min	Typ ^a	Max	Typ ^a	ppm/°C
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:

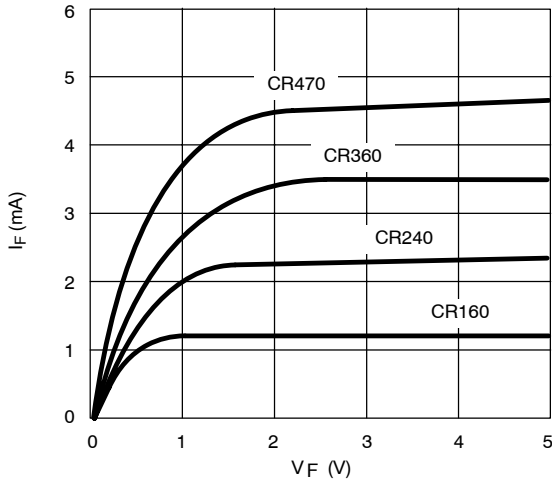
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Peak voltage at which $I_F = 1.1 I_{F(max)}$.
- Pulse test—steady state currents may vary.
- Pulse test—steady state impedances may vary.
- Min V_F required to insure $I_F = 0.8 I_{F(min)}$.

NKO

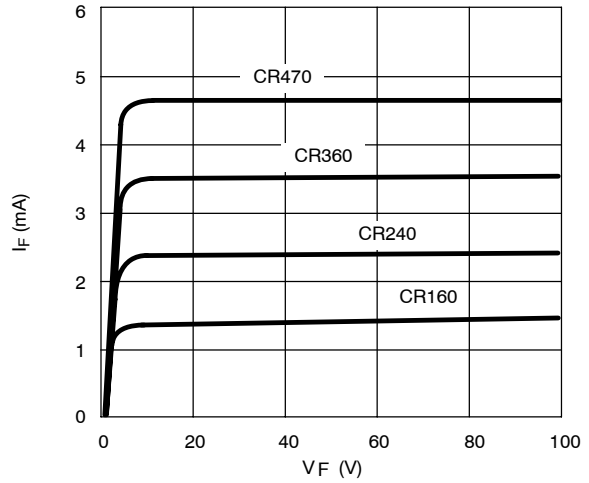


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

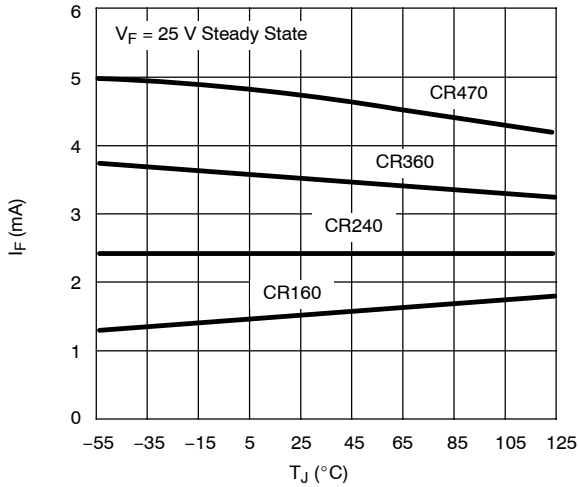
Output Current vs. Forward Voltage



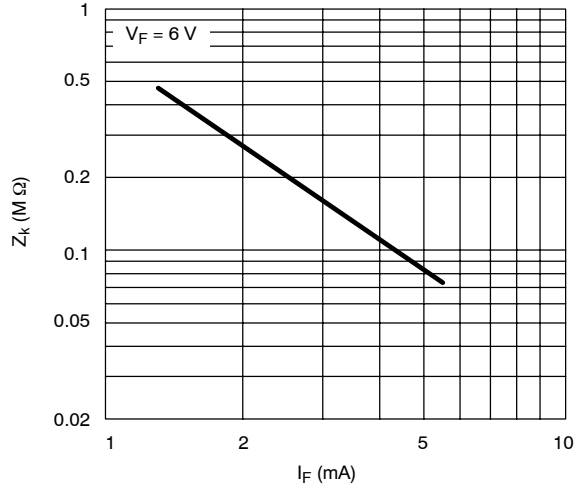
Output Current vs. Forward Voltage



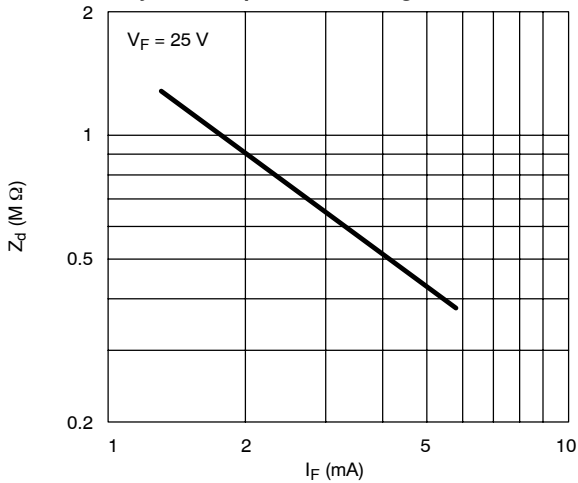
Limiting Current vs. Temperature



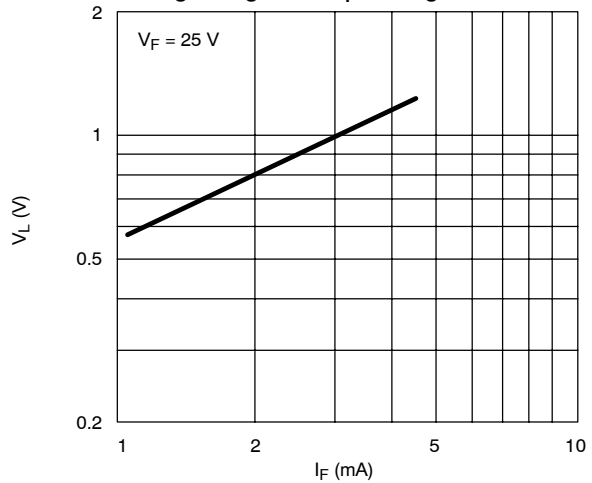
Knee Impedance vs. Regulator Current



Dynamic Impedance vs. Regulator Current

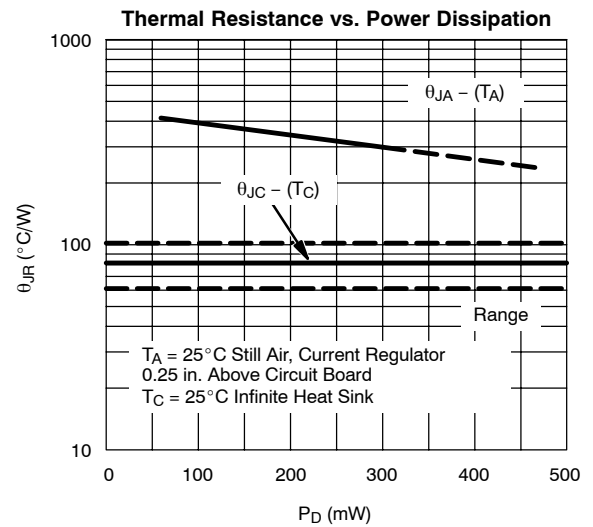
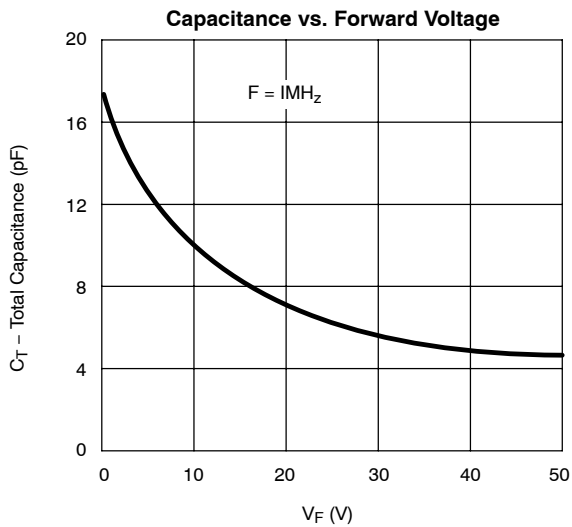
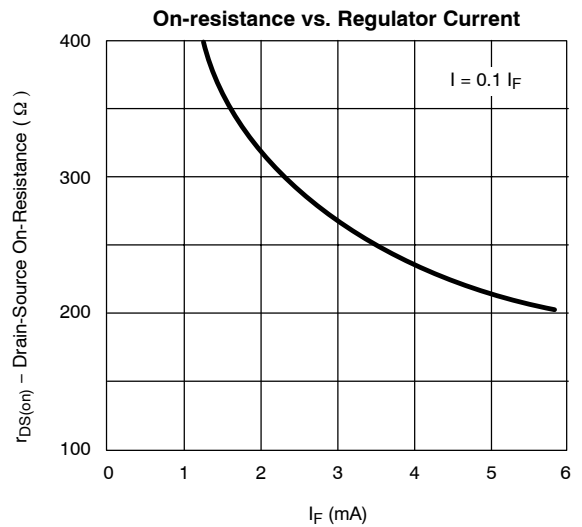
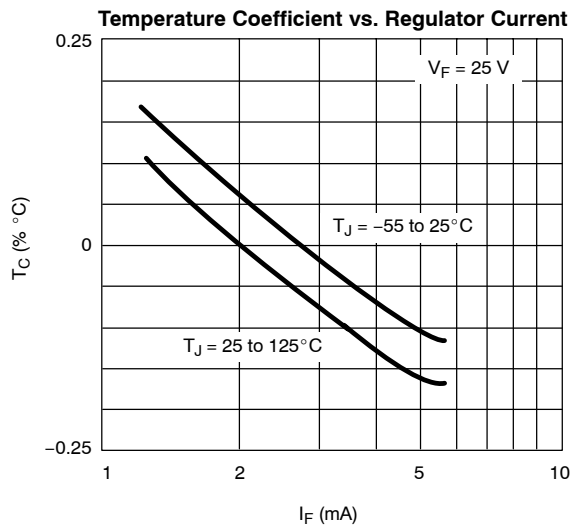


Limiting Voltage @ 0.8 I_F vs. Regulator Current





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



CURRENT REGULATOR DIODE V-1 CHARACTERISTIC

