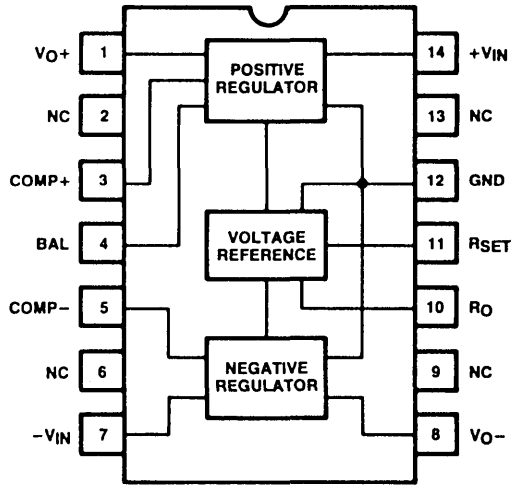
Dual-Tracking Voltage Regulator

GENERAL DESCRIPTION

The XR-4194 is a dual-polarity tracking regulator designed to provide balanced or unbalanced positive and negative output voltages at currents of up to 200 mA. A single resistor can be used to adjust both outputs between the limits of ±50mV and ±42 V. The device is ideal for local on-card regulation, which eliminates the distribution problems associated with single-point regulation. The XR-4194 is available in a 14-pin ceramic dual-in-line package, which has a 900 mW rating.

FUNCTIONAL BLOCK DIAGRAM



FEATURES

Direct Replacement for RM/RC 4194
Both Outputs Adjust with Single Resistor
Load Current to ±200 mA with 0.2% Load Regulation
Low External Parts Count
Internal Thermal Shutdown at T_J = 175°C
External Adjustment for ± V_O Unbalancing

APPLICATIONS

On-Card Regulation
Adjustable Regulator

ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-4194CN	Ceramic DIP	0°C to +70°C
XR-4194M	Ceramic DIP	−55°C to +125°C

ABSOLUTE MAXIMUM RATINGS

Input Voltage ± V to Ground	
XR-4194M	±45 V
XR-4194CN	±35 V
Input/Output Voltage Differential	±45 V
Power Dissipation at T_A = 25°C	900 mW
Load Current	30 mA
Operating Junction Temperature Range	
XR-4194M	−55°C to +150°C
XR-4194CN	0°C to +125°C
Storage Temperature Range	−65°C to +150°C

SYSTEM DESCRIPTION

The XR-4194 is a dual polarity tracking voltage regulator. An on board reference, set by a single resistor, determines both output voltages. Tracking accuracy is better than 1%. Non-symmetrical output voltages are obtained by connecting a resistor to the balance adjust (Pin 4). Internal protection circuits include thermal shutdown and active current limiting.

ELECTRICAL CHARACTERISTICS

Test Conditions: $\pm 5 \leq V_{OUT} \leq V_{MAX}$; XR-4194M $-55°C \leq +125°C$; XR-4194CN $0°C \leq T_J \leq +70°C$

$-55°C \leq T_J \leq +125°C$	XR-4194M			XR-4194CN				
PARAMETERS	**MIN**	**TYP**	**MAX**	**MIN**	**TYP**	**MAX**	**UNIT**	**CONDITIONS**
Line Regulation		0.02	0.1		0.02	0.1	$\%V_{OUT}$	$\Delta V_{IN} = 0.1\ V_{IN}$
Load Regulation		0.001	0.0025		0.001	0.004	$\%V_O$/mA	XR-4194CN, M: I_L = 5 to 100 mA
TC of Output Voltage		0.002	0.020		0.003	0.015	%/°C	
*Stand-by Current Drain from		+0.3	+1.0		+0.3	+1.5	mA	$V_{IN} = V_{MAX}$, V_O = 0V
to		−1.2	−2.0		−1.2	−2.0		$V_{IN} = V_{MAX}$, V_O = 0V
Input Voltage Range	±9.5		±45	±9.5		±35	V	
Output Voltage Scale Factor	2.45	2.5	2.55	2.38	2.5	2.62	KΩ/V	R_{SET} = 71.5 K, T_J = 25°C
Output Voltage Range	0.05		+42	0.05		±32	V	R_{SET} = 71.5 K
Output Voltage Tracking			1.0			2.0	%	
Ripple Rejection		70			70		dB	f = 120 Hz, T_J = 25°C
Input-Output Voltage Differential	3.0			3.0			V	I_L = 50mA
Output Short Circuit Current		300			300		mA	V_{IN} = ±30 V Max
Output Noise Voltage		250			250		μV RMS	C_L = 4.7 μF, V_O = ±15 V, f = 10 Hz to 100 KHz
Internal Thermal Shutdown		175			175		°C	

* $\pm I_{Quiescent}$ will increase by 50 $\mu A/V_{OUT}$ on positive side and 100 $\mu A/V_{OUT}$ on negative side.

THERMAL CHARACTERISTICS

	XR-4194M			XR-4194CN			
PARAMETERS	**MIN**	**TYP**	**MAX**	**MIN**	**TYP**	**MAX**	**CONDITIONS**
Power Dissipation			900 mW 2.2 W			900 mW 2.2 W	T_A = 25°C T_C = 25°C
Thermal Resistance Junction to Ambient Junction to Case		128°C/W 55°C/W			128°C/W 55°C/W		

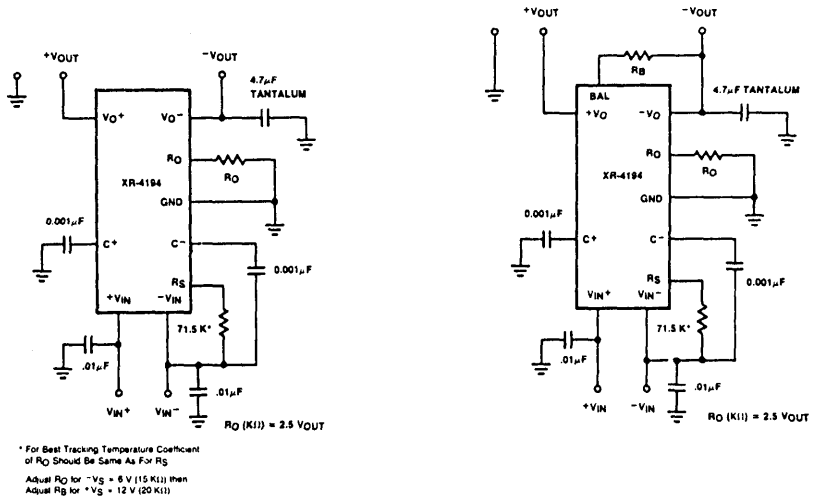
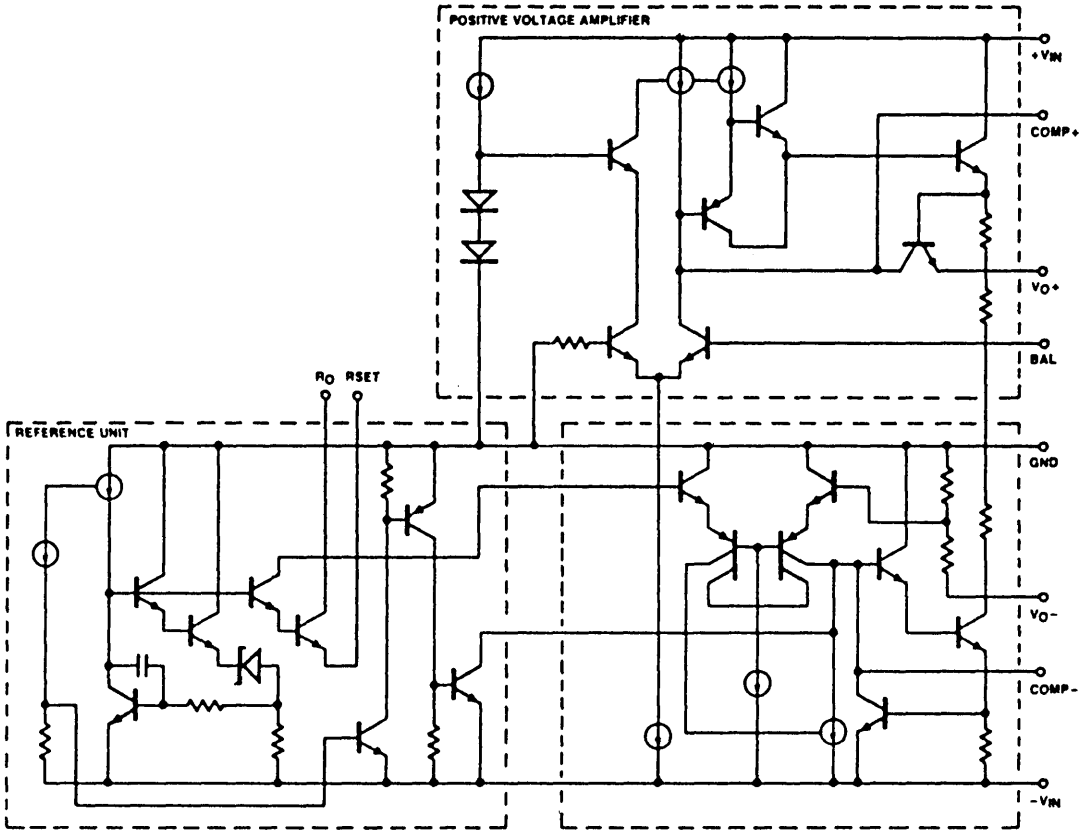


Figure 2. Typical Applications

XR-4194



EQUIVALENT SCHEMATIC DIAGRAM