

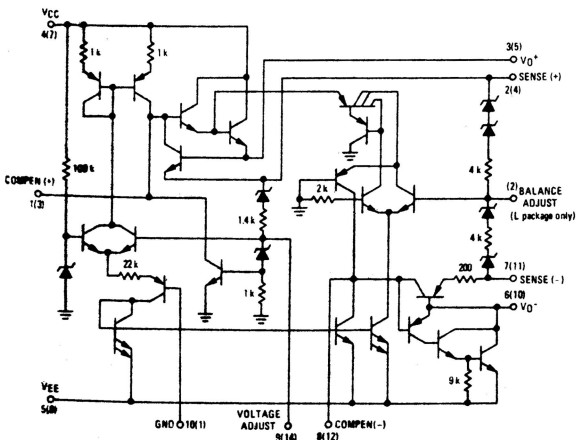
DUAL VOLTAGE REGULATORS

MC1568 MC1468

DUAL ± 15 -VOLT REGULATOR

The MC1568/MC1468 is a dual polarity tracking regulator designed to provide balanced positive and negative output voltages at currents to 100 mA. Internally, the device is set for ± 15 -volt outputs but a single external adjustment can be used to change both outputs simultaneously from 14.5 to 20 volts. Input voltages up to ± 30 volts can be used and there is provision for adjustable current limiting. The device is available in three package types to accommodate various power requirements.

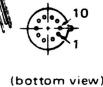
- Internally set to ± 15 V Tracking Outputs
- Output Currents to 100 mA
- Outputs Balanced to within 1% (MC1568)
- Line and Load Regulation of 0.06%
- 1% Maximum Output Variation due to Temperature Changes
- Standby Current Drain of 3.0 mA
- Externally Adjustable Current Limit
- Remote Sensing Provisions
- Case is at Ground Potential (R suffix package)



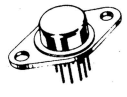
Pin numbers adjacent to terminals are for the G and R suffix packages only. Pin numbers in parentheses are for the L suffix package only. Pin 10 is grounded for the G suffix package only. For the R package, the case is grounded.

DUAL ± 15 -VOLT TRACKING REGULATOR

MONOLITHIC SILICON
INTEGRATED CIRCUIT

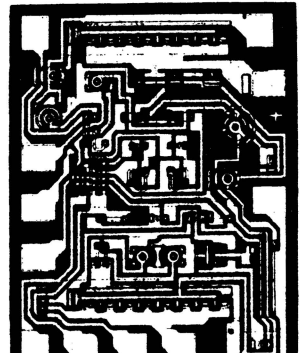
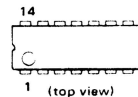
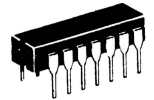


CASE 603-3
METAL PACKAGE
G SUFFIX



CASE 614
METAL PACKAGE
R SUFFIX

CASE 632
CERAMIC PACKAGE
TO-116
L SUFFIX



MAXIMUM RATINGS ($T_C = +25^{\circ}\text{C}$ unless otherwise noted.)

Rating	Symbol	Value			Unit
Input Voltage	V_{CC}, I_{VEE}	30			Vdc
Peak Load Current	I_{PK}	100			mA
Power Dissipation and Thermal Characteristics		G Package	R Package	L Package	
$T_A = +25^{\circ}\text{C}$	P_D	0.8	2.4	1.0	Watts
Derate above $T_A = +25^{\circ}\text{C}$	$1/\theta_{JA}$	5.4	16	6.7	mW/ $^{\circ}\text{C}$
Thermal Resistance, Junction to Air	θ_{JA}	185	62	150	$^{\circ}\text{C}/\text{W}$
$T_C = +25^{\circ}\text{C}$	P_D	2.1	9.0	2.5	Watts
Derate above $T_C = +25^{\circ}\text{C}$	$1/\theta_{JC}$	14	61	20	mW/ $^{\circ}\text{C}$
Thermal Resistance, Junction to Case	θ_{JC}	70	17	50	$^{\circ}\text{C}/\text{W}$
Storage Junction Temperature Range	T_J, T_{stg}	-65 to +175			$^{\circ}\text{C}$
Minimum Short-Circuit Resistance	$R_{SC}(\text{min})$	4.0			Ohms

OPERATING TEMPERATURE RANGE

Ambient Temperature	T_A	0 to +75 -55 to +125	$^{\circ}\text{C}$
MC1468 MC1568			

ELECTRICAL CHARACTERISTICS ($V_{CC} = +20\text{ V}$, $V_{EE} = -20\text{ V}$, $C_1 = C_2 = 1500\text{ pF}$, $C_3 = C_4 = 1.0\text{ }\mu\text{F}$, $R_{SC}^{+} = R_{SC}^{-} = 4.0\text{ }\Omega$, $I_L^{+} = I_L^{-} = 0$, $T_C = +25^{\circ}\text{C}$ unless otherwise noted.) (See Figure 1.)

Characteristic	Symbol*	MC1568			MC1468			Unit
		Min	Typ	Max	Min	Typ	Max	
Output Voltage	V_O	14.8	15	15.2	14.5	15	15.5	Vdc
Input Voltage	V_{in}	—	—	30	—	—	30	Vdc
Input-Output Voltage Differential	$ V_{in} - V_O $	2.0	—	—	2.0	—	—	Vdc
Output Voltage Balance	V_{Bal}	—	± 50	± 150	—	± 50	± 300	mV
Line Regulation Voltage ($V_{in} = 18\text{ V}$ to 30 V) (T_{low} ① to T_{high} ②)	Reg_{in}	—	—	10	—	—	10	mV
		—	—	20	—	—	20	
Load Regulation Voltage ($I_L = 0$ to 50 mA , $T_J = \text{constant}$) ($T_A = T_{low}$ to T_{high})	Reg_L	—	—	10	—	—	10	mV
		—	—	30	—	—	30	
Output Voltage Range (See Figures 2 and 12)	V_{OR}	14.5	—	20	14.5	—	20	Vdc
Ripple Rejection ($f = 120\text{ Hz}$)	RR	—	75	—	—	75	—	dB
Output Voltage Temperature Stability (T_{low} to T_{high})	$ TSV_O $	—	0.3	1.0	—	0.3	1.0	%
Short-Circuit Current Limit ($R_{SC} = 10\text{ ohms}$)	I_{SC}	—	60	—	—	60	—	mA
Output Noise Voltage (BW = $100\text{ Hz} \cdot 10\text{ kHz}$)	V_N	—	100	—	—	100	—	$\mu\text{V(RMS)}$
Positive Standby Current ($V_{in} = +30\text{ V}$)	I_B^{+}	—	2.4	4.0	—	2.4	4.0	mA
Negative Standby Current ($V_{in} = -30\text{ V}$)	I_B^{-}	—	1.0	3.0	—	1.0	3.0	mA
Long-Term Stability	$\Delta V_O/\Delta t$	—	0.2	—	—	0.2	—	%/k Hr

① $T_{low} = 0^{\circ}\text{C}$ for MC1468
= -55°C for MC1568

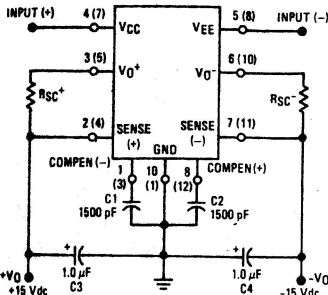
② $T_{high} = +75^{\circ}\text{C}$ for MC1468
= $+125^{\circ}\text{C}$ for MC1568

*Symbols conform to JEDEC Engineering
Bulletin No. 1 when applicable.

MC1568, MC1468 (continued)

TYPICAL APPLICATIONS

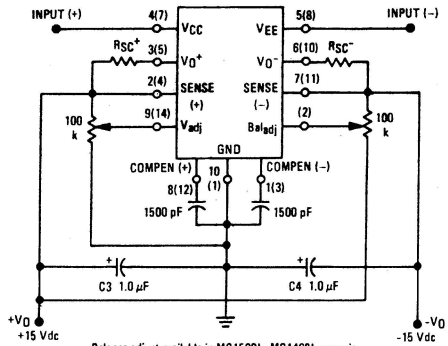
FIGURE 1 - BASIC 50-mA REGULATOR



C1 and C2 should be located as close to the device as possible. A 0.1 μF ceramic capacitor may be required on the input lines if the device is located an appreciable distance from the rectifier filter capacitors.

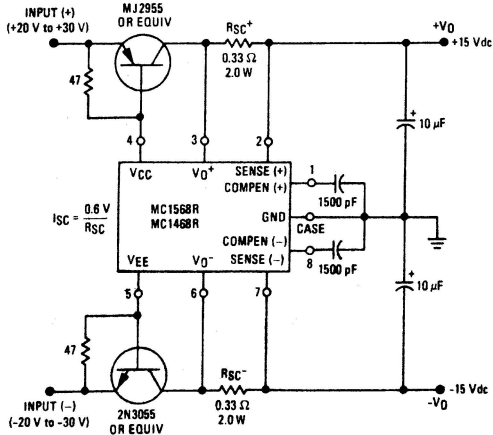
C3 and C4 may be increased to improve load transient response and to reduce the output noise voltage. At low temperature operation, it may be necessary to bypass C4 with a 0.1 μF ceramic disc capacitor.

FIGURE 2 - VOLTAGE ADJUST AND BALANCE ADJUST CIRCUIT



Balance adjust available in MC1568L, MC1468L ceramic dual in-line package only.

FIGURE 3 - ±1.5-AMPERE REGULATOR
(Short-Circuit Protected, with Proper Heatsinking)



TYPICAL CHARACTERISTICS

($V_{CC} = +20\text{ V}$, $V_{EE} = -20\text{ V}$, $V_O = \pm 15\text{ V}$, $T_A = +25^\circ\text{C}$ unless otherwise noted.)

FIGURE 4 – LOAD REGULATION

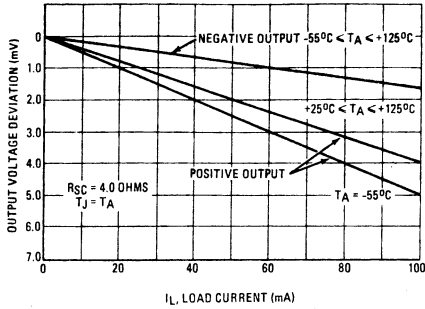


FIGURE 5 – REGULATOR DROPOUT VOLTAGE

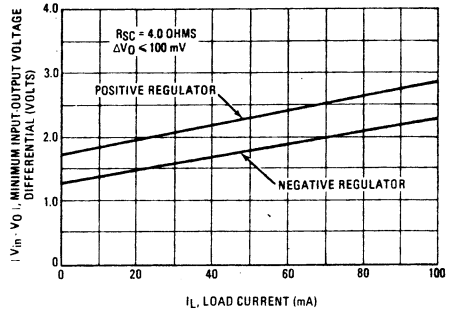


FIGURE 6 – MAXIMUM CURRENT CAPABILITY

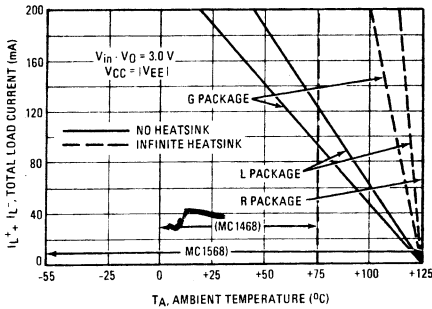


FIGURE 7 – MAXIMUM CURRENT CAPABILITY

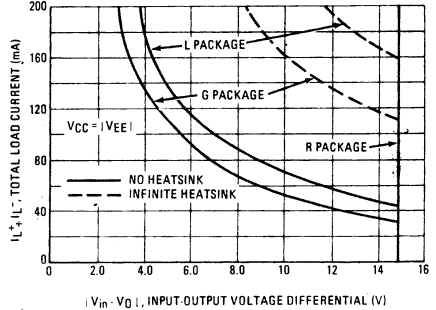


FIGURE 8 – I_{SC} versus R_{SC}

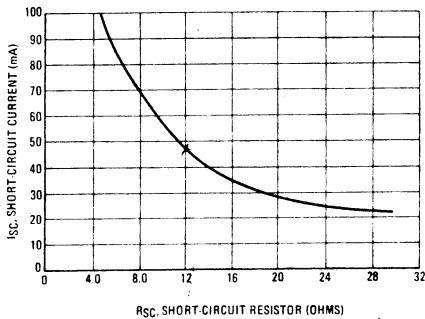
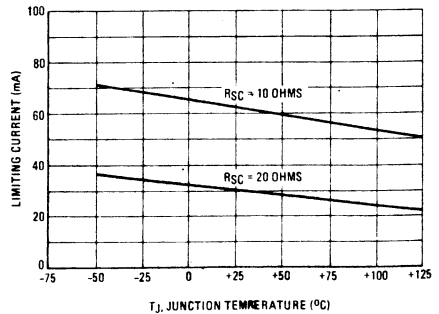


FIGURE 9 – CURRENT-LIMITING CHARACTERISTICS



TYPICAL CHARACTERISTICS (continued)
 $(V_{CC} = +20\text{ V}, V_{EE} = -20\text{ V}, V_O = \pm 15\text{ V}, T_A = +25^\circ\text{C}$ unless otherwise noted.)

FIGURE 10 – STANDBY CURRENT DRAIN

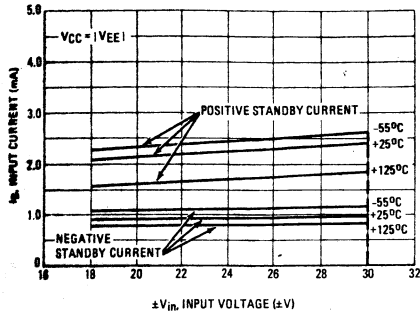


FIGURE 11 – STANDBY CURRENT DRAIN

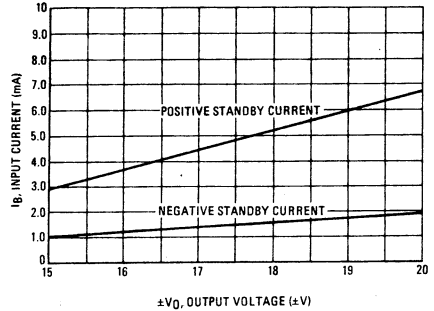


FIGURE 12 – TEMPERATURE COEFFICIENT OF OUTPUT VOLTAGE

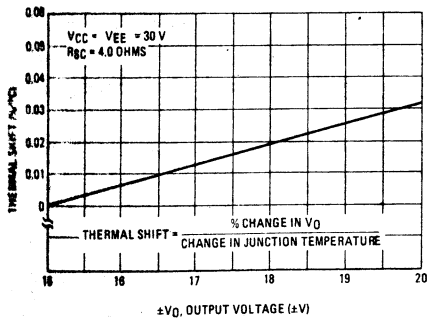


FIGURE 13 – LOAD TRANSIENT RESPONSE

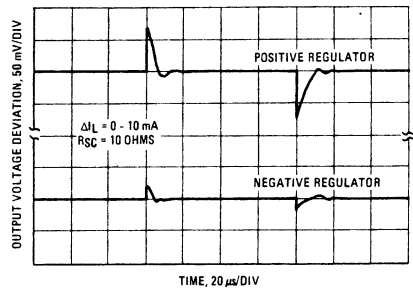


FIGURE 14 – LINE TRANSIENT RESPONSE

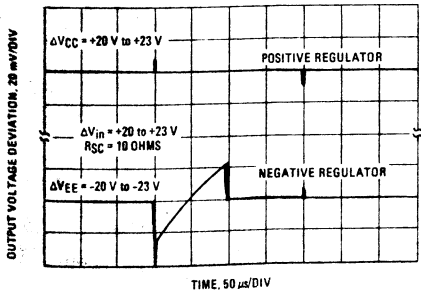
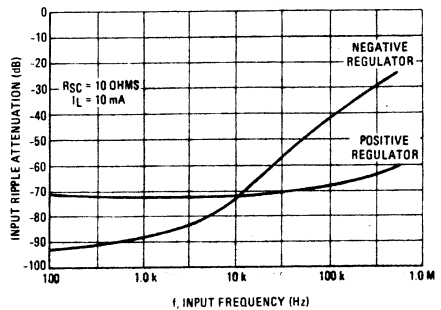


FIGURE 15 – RIPPLE REJECTION



TYPICAL CHARACTERISTICS (continued)

($V_{CC} = +20\text{ V}$, $V_{EE} = -20\text{ V}$, $V_O = \pm 15\text{ V}$, $T_A = +25^\circ\text{C}$ unless otherwise noted.)

FIGURE 16 – OUTPUT IMPEDANCE

