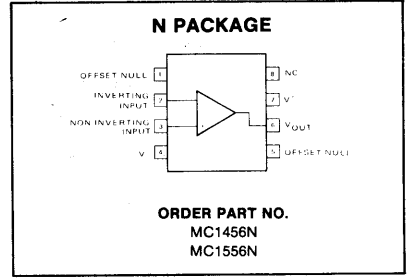
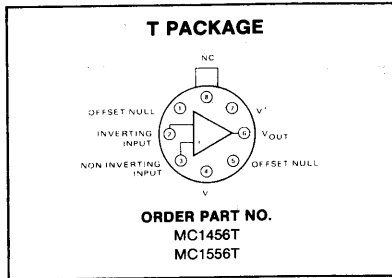


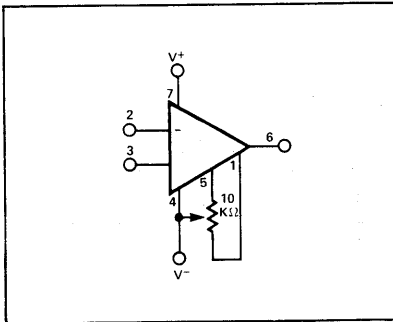
**DESCRIPTION**

The MC1456/1556 is an internally compensated precision monolithic operational amplifier featuring extremely low offset and bias currents and offset null capability. The MC1456/1556 is short circuit protected and its high common mode and differential input voltage range provides exceptional performance when used as an integrator, summing amplifier, and voltage follower.

**PIN CONFIGURATIONS**

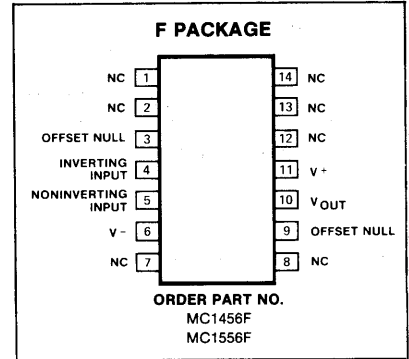


**OFFSET ADJUST CIRCUIT**

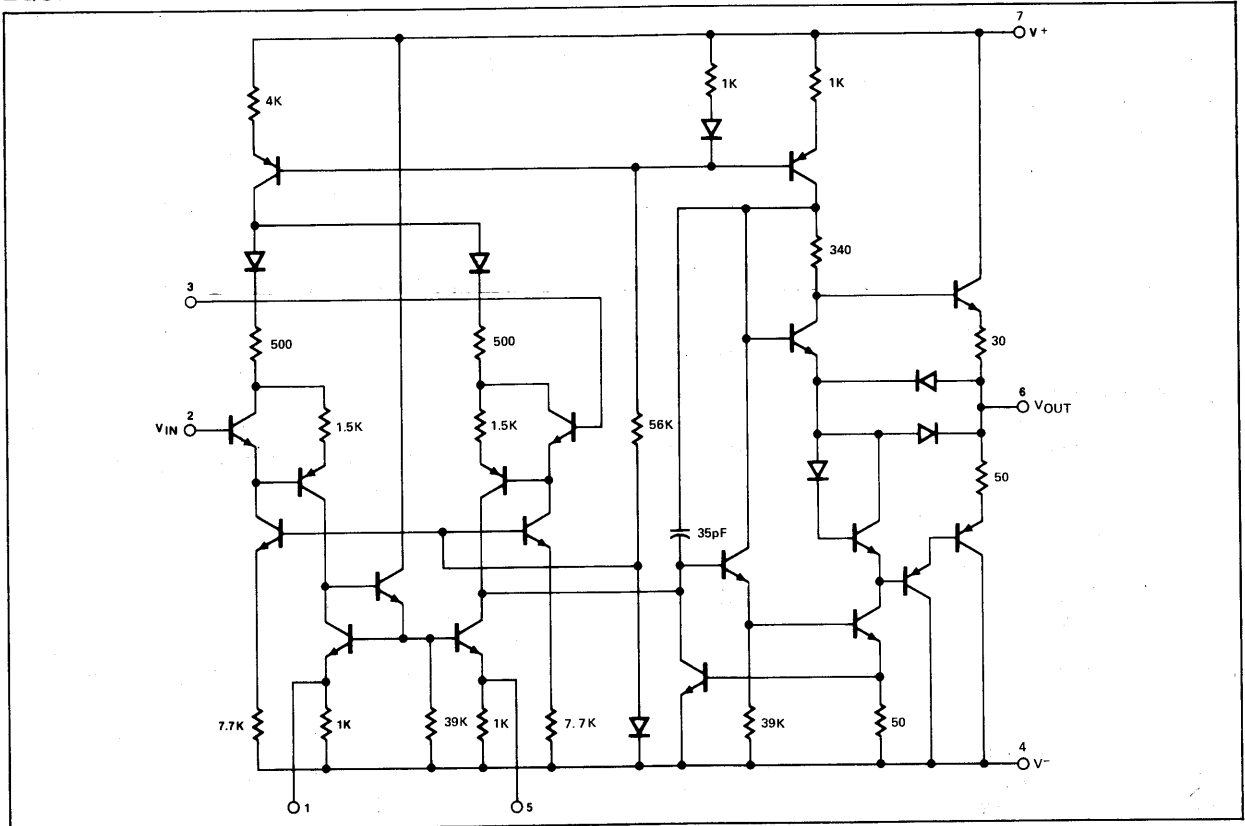


**FEATURES**

- Low input bias current—15nA maximum
- Low input offset current—2.0nA maximum
- Low input offset voltage—4.0mV maximum
- High slew rate—2.5V/μs typical
- Large power bandwidth—40kHz typical
- Low power consumption—45mW maximum
- Offset voltage null capability
- Output short circuit protection
- Input over-voltage protection
- Mil std 883A,B,C, available



**EQUIVALENT SCHEMATIC**



**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	RATING	UNIT
Power supply voltage MC1556	±22	V
MC1456	±18	V
Differential input voltage	± V <sub>CC</sub>	V
Common mode input voltage	± V <sub>CC</sub>	V
Load current	20	mA
Output short circuit duration	Continuous	
Power dissipation	680	mW
Derate above T <sub>A</sub> = 25°C	4.6	mW/°C
Operating temperature range		
MC1556	-55 to +125	°C
MC1456	0 to +70	°C
Storage temperature range	-65 to +150	°C

**DC ELECTRICAL CHARACTERISTICS** T<sub>A</sub> = 25°C, V<sub>S</sub> = ± 15V unless otherwise specified

PARAMETER	TEST CONDITIONS	MC1556			MC1456			UNIT
		Min	Typ	Max	Min	Typ	Max	
V <sub>OS</sub> Offset voltage	Over temperature		2.0	4.0 6.0		5.0	10.0 14.0	mVdc mVdc
I <sub>OS</sub> Offset current	0°C ≤ T <sub>A</sub> ≤ 70°C 25°C ≤ T <sub>A</sub> ≤ 125°C -55°C ≤ T <sub>A</sub> ≤ 25°C		1.0	2.0 3.0 5.0		5.0	10.0 14	nA nA nA
I <sub>BIAS</sub> Input current	Over temperature		8.0	15 30		15.0	30.0 40	nA nA
V <sub>CM</sub> Common mode voltage range	R <sub>S</sub> ≤ 10kΩ, T <sub>A</sub> = 25°C, f = 100Hz f = 20Hz	±12	±13		±11	±12		V
CMRR Common mode rejection ratio		80	110		70	110		dB
Z <sub>IN</sub> Common mode input impedance		250			250			MΩ
V <sub>OUT</sub> Output voltage swing	R <sub>L</sub> = 2kΩ	±12	±13		±11	±12		V
I <sub>CC</sub> Supply current			1.0	1.5		1.3	3.0	mA
P <sub>D</sub> DC quiescent power dissipation (V <sub>O</sub> = 0)			30	45		40	90	mW
PSRR Supply voltage rejection ratio	R <sub>S</sub> ≤ 10kΩ		50	100		75	200	μV/V
Large signal voltage gain	R <sub>L</sub> ≤ 2kΩ, V <sub>OUT</sub> = ±10V, T <sub>A</sub> = 25°C Over temperature	100	200		70	100		V/mV
		40			40			V/mV

**AC ELECTRICAL CHARACTERISTICS** T<sub>A</sub> = 25°C, V<sub>S</sub> = ± 15V unless otherwise specified.

PARAMETER	TEST CONDITIONS	MC1556			MC1456			UNIT
		Min	Typ	Max	Min	Typ	Max	
C <sub>p</sub> Differential input impedance	Open loop f = 20Hz A <sub>v</sub> = 100, R <sub>S</sub> = 10kΩ, f = 1.0kHz, BW = 1.0Hz		6.0			6.0		pF
r <sub>p</sub> Parallel input capacitance			5			3		MΩ
e <sub>n</sub> Parallel input resistance				45			45	nV/√Hz
e <sub>n</sub> Equivalent input noise voltage								
BW <sub>p</sub> Power bandwidth	A <sub>v</sub> = 1, R <sub>L</sub> = 2kΩ, THD ≤ 5% V <sub>OUT</sub> = ±10V		40			40		kHz
Phase margin (open loop, unity gain)			70			70		degrees
Gain margin			18			18		dB
S <sub>R</sub> Slew rate (unity gain)			2.5			2.5		V/μsec
Z <sub>OUT</sub> Output impedance	f = 20Hz		1.0	2.0		1.0	2.5	kΩ
BW Unity gain crossover frequency (open loop)			1.0			1.0		MHz