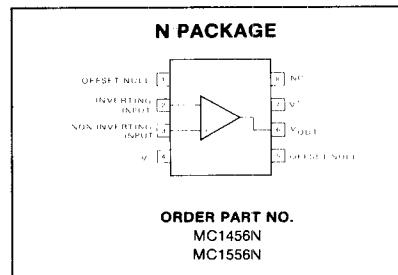
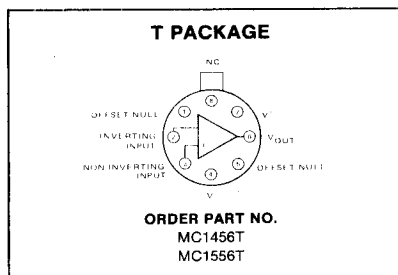


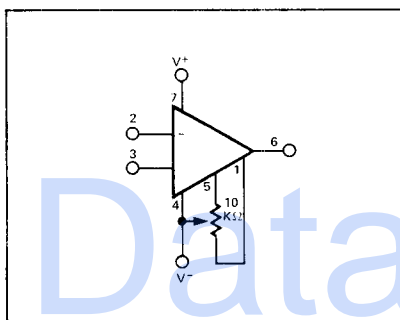
DESCRIPTION

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

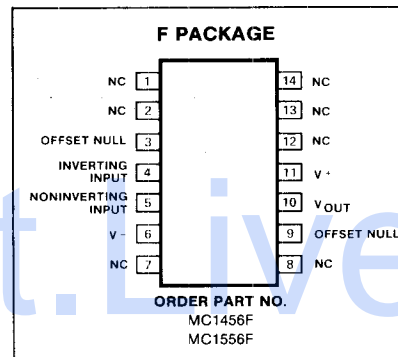


OFFSET ADJUST CIRCUIT

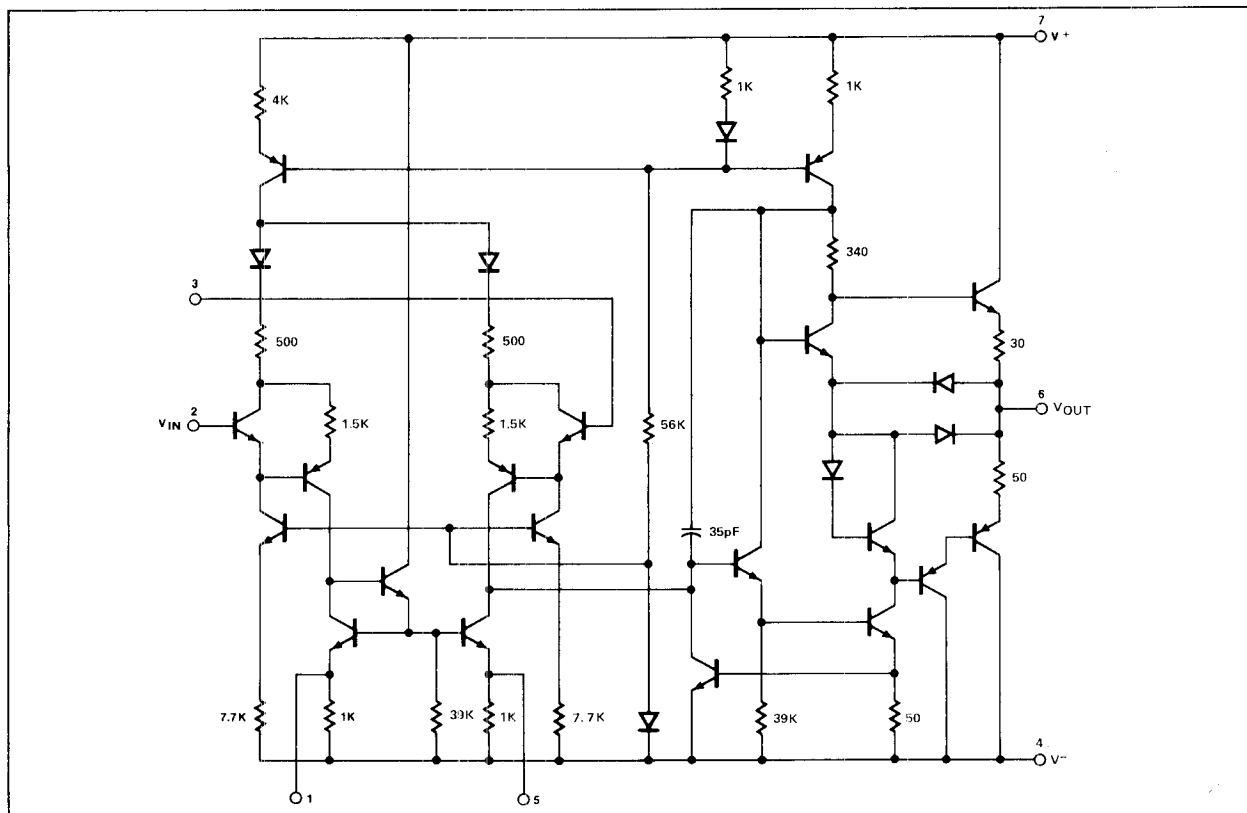


FEATURES

- 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/ μ s 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 _{CC}	V
Common mode input voltage	± V _{CC}	V
Load current	20	mA
Output short circuit duration	Continuous	
Power dissipation	680	mW
Derate above T _A = 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_A = 25°C, V_S = ± 15V unless otherwise specified

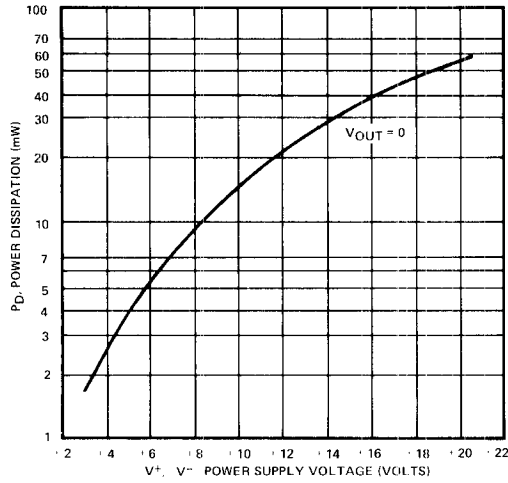
PARAMETER	TEST CONDITIONS	MC1556			MC1456			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OS} Offset voltage	Over temperature		2.0	4.0 6.0		5.0 10.0 14.0		mVdc mVdc
I _{OS} Offset current	0°C ≤ T _A ≤ 70°C 25°C ≤ T _A ≤ 125°C -55°C ≤ T _A ≤ 25°C		1.0	2.0 3.0 5.0		5.0 10.0 14		nA nA nA
I _{BIAS} Input current	Over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

AC ELECTRICAL CHARACTERISTICS T_A = 25°C, V_S = ± 15V unless otherwise specified.

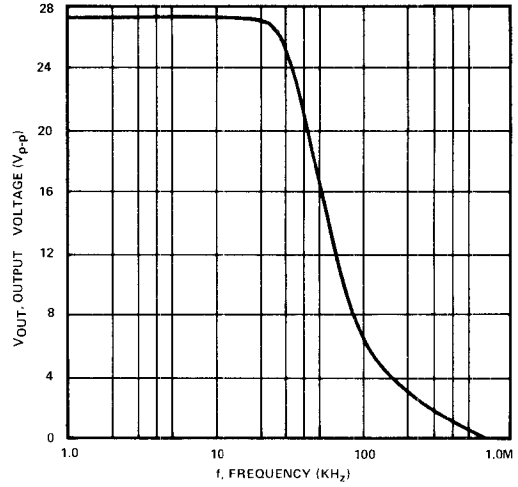
PARAMETER	TEST CONDITIONS	MC1556			MC1456			UNIT
		Min	Typ	Max	Min	Typ	Max	
c _p Differential input impedance	Open loop f = 20Hz A _v = 100, R _S = 10kΩ, f = 1.0kHz, BW = 1.0Hz		6.0			6.0		pF
r _p Parallel input capacitance			5			3		MΩ
e _n Parallel input resistance				45			45	
e _n Equivalent input noise voltage								nV/√Hz
BW _p Power bandwidth	A _v = 1, R _L = 2kΩ, THD ≤ 5% V _{OUT} = ±10V		40			40		kHz
Phase margin (open loop, unity gain)			70			70		degrees
Gain margin			18			18		dB
S _R Slew rate (unity gain)			2.5			2.5		V/μsec
Z _{OUT} 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

TYPICAL PERFORMANCE CHARACTERISTICS

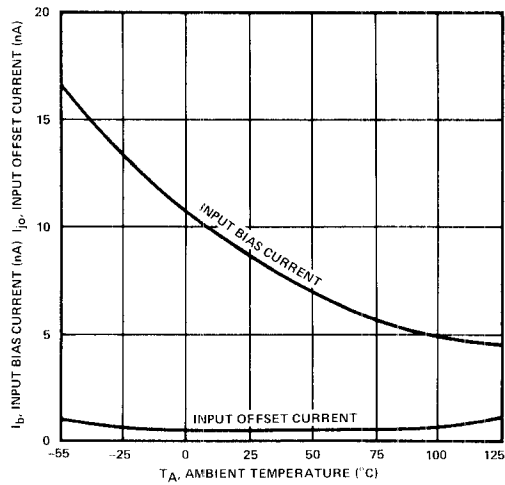
POWER DISSIPATION vs POWER SUPPLY VOLTAGE



POWER BANDWIDTH



TYPICAL INPUT BIAS CURRENT AND INPUT OFFSET CURRENT vs TEMPERATURE FOR MC1556



VOLTAGE FOLLOWER PULSE RESPONSE

