

DESCRIPTION

The 536 is a special purpose high performance operational amplifier utilizing a FET input stage for extremely high input impedance and low input current.

The device features internal compensation, standard pinout, wide differential and common mode input voltage range, high slew rate and high output drive capability.

FEATURES

- 5pA INPUT BIAS CURRENT
- INPUT AND OUTPUT PROTECTION
- OFFSET NULL CAPABILITY
- INTERNALLY COMPENSATED
- 6V/ μ sec SLEW RATE
- STANDARD PINOUT
- 1 MHz UNITY GAIN BANDWIDTH

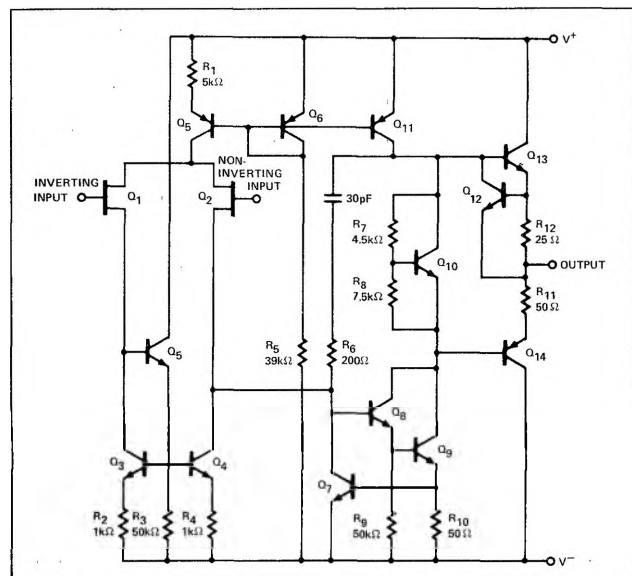
ABSOLUTE MAXIMUM RATING

Supply Voltage	$\pm 22V$
Differential Input Voltage Range	$\pm 30V$
Common Mode Input Voltage Range	$\pm V_s$
Power Dissipation (Note 1)	500mW
Operating Temperature Range	SU536T $-55^\circ C$ to $+85^\circ C$ NE536T $0^\circ C$ to $+70^\circ C$
Storage Temperature Range	$-65^\circ C$ to $+150^\circ C$
Lead Temperature (Solder, 60 sec)	$300^\circ C$
Output Short Circuit Duration (Note 2)	Indefinite

NOTES:

1. Rating applies for case temperatures to $+25^\circ C$; derate linearly at $6.5mW/^\circ C$ for ambient temperatures above $75^\circ C$.
2. Short circuit may be to ground or either supply. Rating applies to $+125^\circ C$ case temperature or $+75^\circ C$ ambient temperature.

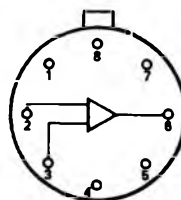
EQUIVALENT CIRCUIT



LINEAR INTEGRATED CIRCUITS

PIN CONFIGURATION

T PACKAGE (Top View)

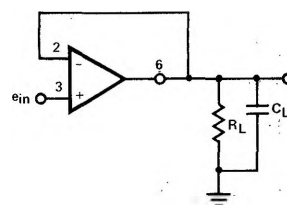


1. Offset Null
2. Inverting Input
3. Non-inverting Input
4. V^-
5. Offset Null
6. Output
7. V^+
8. NC

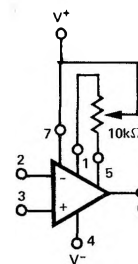
ORDER PART NOS. SE536T/NE536T

TEST CIRCUITS

VOLTAGE FOLLOWER CIRCUIT



OFFSET NULL CIRCUIT



SIGNETICS ■ SU536/NE536 – FET OPERATIONAL AMPLIFIER

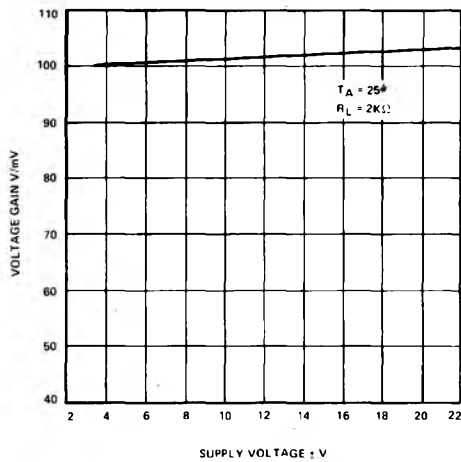
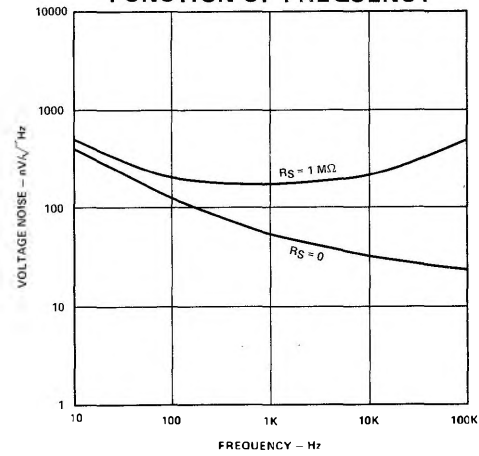
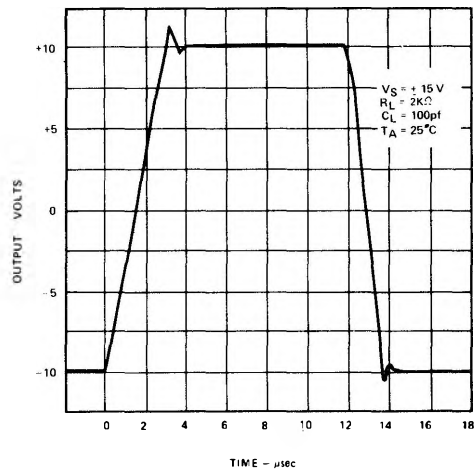
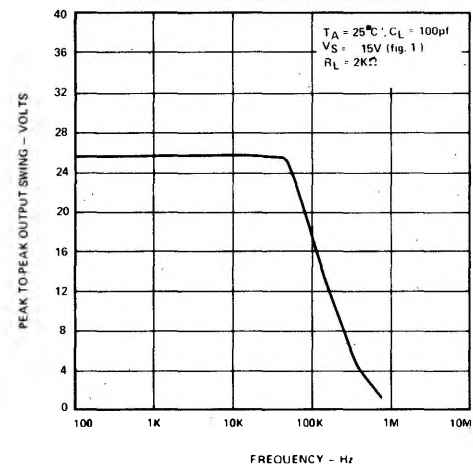
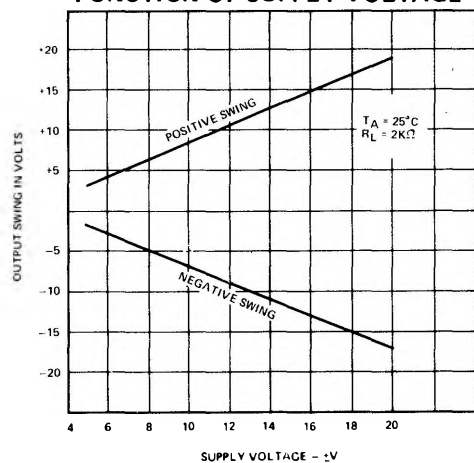
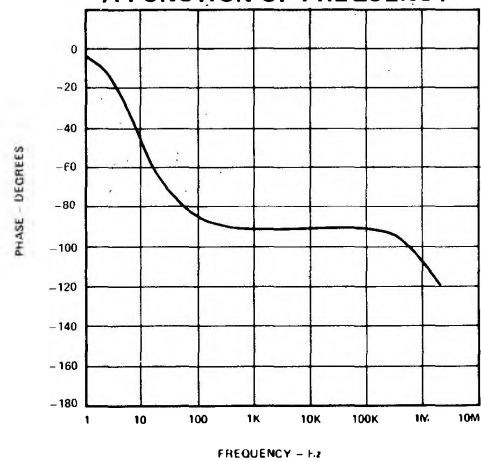
ELECTRICAL CHARACTERISTICS (SU536: $\pm 6V \leq V_S \leq \pm 20V$; NE536: $V_S = \pm 15V$ unless otherwise noted.)

PARAMETER	TEST CONDITIONS	SU536			NE536			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
INPUT CHARACTERISITICS								
Large Signal Voltage Gain @ +25°C Over Temperature Range	V _S = ±15 V, V _{OUT} = ±10V R _L ≥ 2kΩ	50	100		50	100		V/mV
		50	100		25	100		V/mV
Input Offset Voltage @ +25°C Over Temperature Range vs Temperature (drift) vs Common Mode Voltage (C.M.R.R.) vs Power Supply (P.S.R.R.)	V _{IN} = ±10V, R _S ≤ 10kΩ Note 1, R _S ≤ 10kΩ		7.5	20		30	90	mV
			7.5	30		30		mV
			20			30		μV/°C
		70	80		64	80		dB
			50	150		100	300	μV/V
Input Current @ +25°C Over Temperature Range vs Temperature (drift)	Either Input		5	30		30	100	pA
			250	3000				pA
		Typ. Doubles Every 10°C						
Input Offset Current @ +25°C Over Temperature (drift)			5			5		pA
Input Impedance Differential Resistance Differential Capacitance	T _A = +25°C		10 ¹⁴			10 ¹⁴		Ω
	T _A = +25°C		6			6		pF
Input Noise (0.1Hz – 100kHz) Voltage Noise			20			20		μVrms
Common Mode Voltage Range	V _S = ±15V	±10	±11		±10	±11		V
OUTPUT CHARACTERISTICS								
Output Current	V _S = ±15V	5			5			mA
Open Loop Output Impedance			100			100		Ω
Output Voltage Swing	V _S = ±15V, R _L ≥ 2kΩ	±10	±12		±10	±10		V
	V _S = ±15V, R _L ≥ 10kΩ	±12	±13		±12	±13		V
Short Circuit Current	V _S = ±15V, T _A = +25°C		17			17		mA
FREQUENCY AND TRANSIENT RESPONSE								
Gain Bandwidth Product	V _S = ±15V, T _A = +25°C, A = 100		1			1		MHz
Unity Gain Frequency	V _S = ±15V, T _A = +25°C		1			1		MHz
Full Power Bandwidth	V _S = ±15V, T _A = +25°V		100			100		kHz
Slew Rate Inverter Follower	V _S = ±15V, T _A = +25°C, A = –1		6			6		V/μs
	V _S = ±15V, T _A = +25°C, A = +1		6			6		V/μs
POWER SUPPLY REQUIREMENT								
Power Supply Range		±6		±20	±6		±18	V
Quiescent Supply Current	V _S = ±20V, V _{OUT} = 0V, T _A = +25°C		4.5	5.5				mA
	V _S = ±15V, V _{OUT} = 0V, T _A = +25°C					6.0	8.0	mA
Quiescent Power Dissipation	V _S = ±15V, V _{OUT} = 0V, T _A = +25°C		180			180		mW

Parameters are tested over temperature range unless otherwise noted.

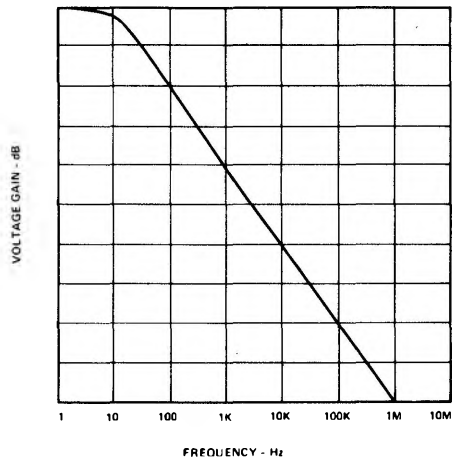
NOTE 1: SU536: $V_S = \pm 6V$ to $\pm 20V$
NE536: $V_S = \pm 6V$ to $\pm 15V$

TYPICAL CHARACTERISTIC CURVES

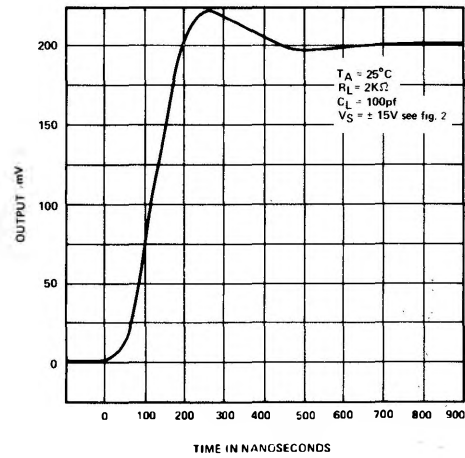
OPEN LOOP VOLTAGE GAIN
AS A FUNCTION OF SUPPLY VOLTAGEINPUT VOLTAGE NOISE AS A
FUNCTION OF FREQUENCYLARGE SIGNAL VOLTAGE
FOLLOWER PULSE RESPONSEOUTPUT VOLTAGE SWING AS A
FUNCTION OF FREQUENCYOUTPUT VOLTAGE SWING AS A
FUNCTION OF SUPPLY VOLTAGEOPEN LOOP PHASE RESPONSE AS
A FUNCTION OF FREQUENCY

TYPICAL CHARACTERISTIC CURVES (Cont'd.)

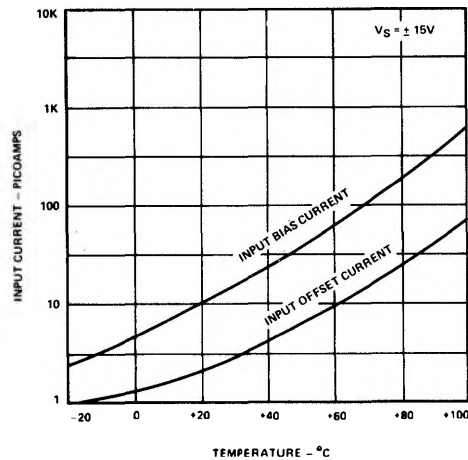
OPEN LOOP VOLTAGE GAIN AS A FUNCTION OF SUPPLY VOLTAGE



VOLTAGE FOLLOWER TRANSIENT RESPONSE



INPUT CURRENTS AS A FUNCTION OF AMBIENT TEMPERATURE



OUTPUT SHORT-CIRCUIT CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE

