SE531-T • NE531-T,V

FEATURES

- **35V/μsec SLEW RATE AT UNITY GAIN**
- **PIN FOR PIN REPLACEMENT FOR μA709, μA748 OR LM101**
- **COMPENSATED WITH A SINGLE CAPACITOR**
- **SAME LOW DRIFT OFFSET NULL CIRCUITRY AS μA741**
- **SMALL SIGNAL BANDWIDTH 1MHz**
- **LARGE SIGNAL BANDWIDTH 500KHz**
- **TRUE OP AMP D.C. CHARACTERISTICS MAKE THE 531 THE IDEAL ANSWER TO ALL SLEW RATE LIMITED OPERATIONAL AMPLIFIER APPLICATIONS**

ABSOLUTE MAXIMUM RATINGS

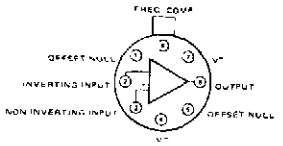
Supply Voltage	±22V
Internal Power Dissipation (Note 1)	300mW
Differential Input Voltage	±15V
Common Mode Input Voltage (Note 2)	±15V
Voltage Between Offset Null and V—	±0.5V
Operating Temperature Range	
NE531	0°C to +70°C
SE531	—55°C to +125°C
Storage Temperature Range	—65°C to +150°C
Lead Temperature (Solder, 60 sec.)	300°C
Output Short Circuit Duration (Note 3)	Indefinite

NOTES:

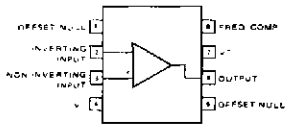
1. Rating applies for case temperatures to 125°C, derate linearly at 6.5mW/°C for ambient temperatures above +75°C.
2. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
3. Short circuit may be to ground or either supply. Rating applies to ±125°C case temperature or +75°C ambient temperature.

PIN CONFIGURATION

T PACKAGE



V PACKAGE

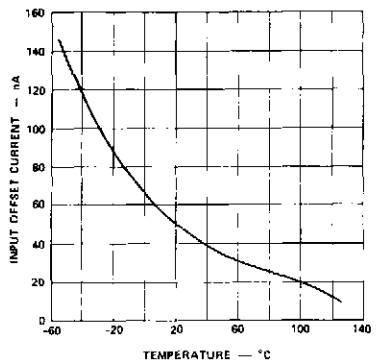


ELECTRICAL CHARACTERISTICS

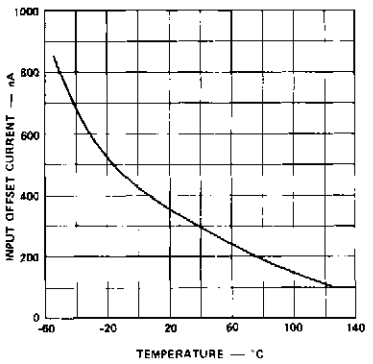
		LIMITS		
		SE531	NE 531	
Parameter	Test Conditions	Min Typ Max	Min Typ Max	Units
Output Resistance		75	75	Ω
Full Power Bandwidth		500	500	kHz
Settling Time 1%	AV=+1, VIN=±10V	1.5	1.5	μsec
Settling Time .01%	AV=+1, VIN=±10V	2.5	2.5	μsec
Large Signal Overshoot	AV=+1, VIN=±10V	2	2	%
Small Signal Overshoot	AV=+1, VIN=400mV	5	5	%
Small Signal Risetime	AV=+1, VIN=400mV	300	300	nsec
Slew Rate	AV=100	35	35	V/μs
	AV=10	35	35	V/μs
	AV=1 (non-inverting)	20 30	30	V/μs
	AV=1 (inverting)	25 35	35	V/μs

TYPICAL PERFORMANCE CHARACTERISTICS ($V_S = \pm 15V$, $T_A = +25°C$, unless otherwise noted)

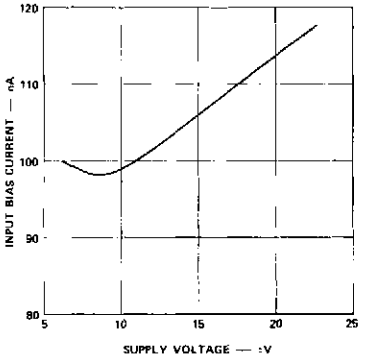
INPUT OFFSET CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



INPUT BIAS CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE

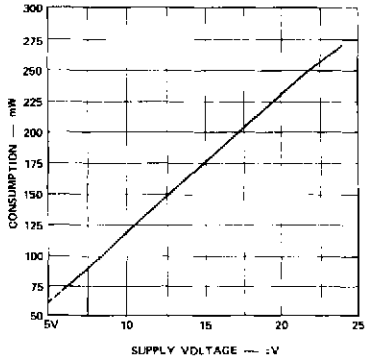


INPUT BIAS CURRENT AS A FUNCTION OF SUPPLY VOLTAGE

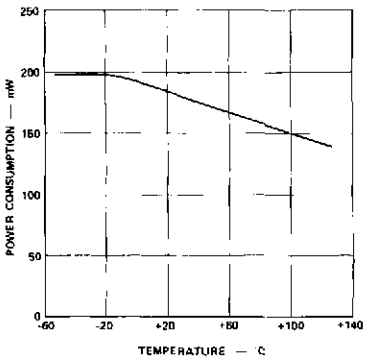


TYPICAL PERFORMANCE CHARACTERISTICS (Cont'd)

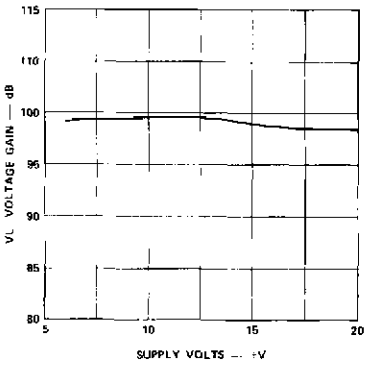
POWER CONSUMPTION AS A FUNCTION OF SUPPLY VOLTAGE



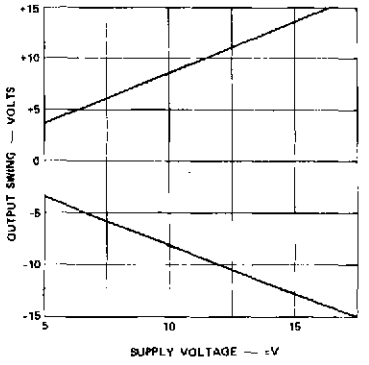
POWER CONSUMPTION AS A FUNCTION OF AMBIENT TEMPERATURE



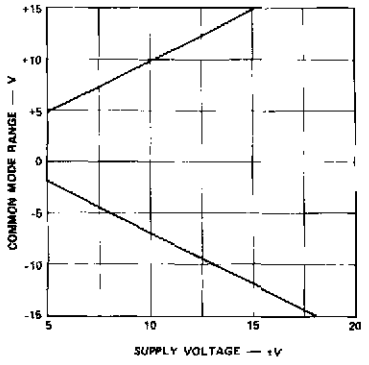
OPEN LOOP VOLTAGE GAIN AS A FUNCTION OF SUPPLY VOLTAGE



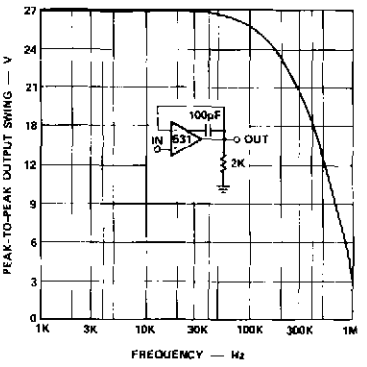
OUTPUT VOLTAGE SWING AS A FUNCTION OF SUPPLY VOLTAGE



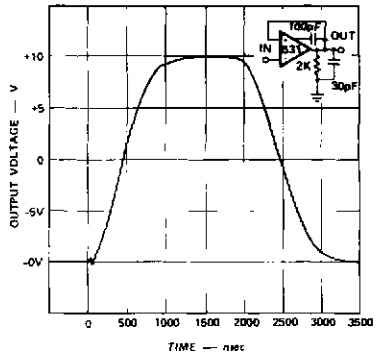
INPUT VOLTAGE RANGE AS A FUNCTION OF SUPPLY VOLTAGE



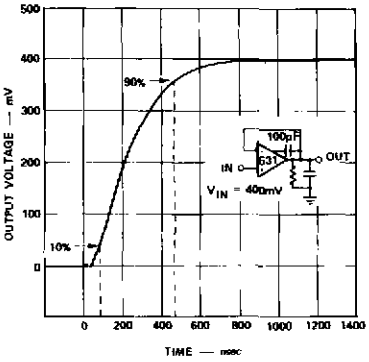
OUTPUT VOLTAGE SWING AS A FUNCTION OF FREQUENCY



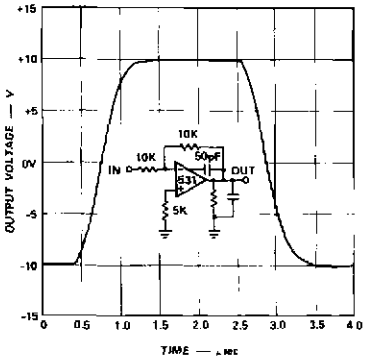
VOLTAGE FOLLOWER LARGE SIGNAL RESPONSE



VOLTAGE FOLLOWER TRANSIENT RESPONSE

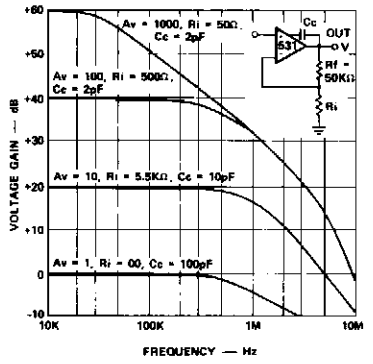


UNITY GAIN INVERTING AMPLIFIER LARGE SIGNAL RESPONSE

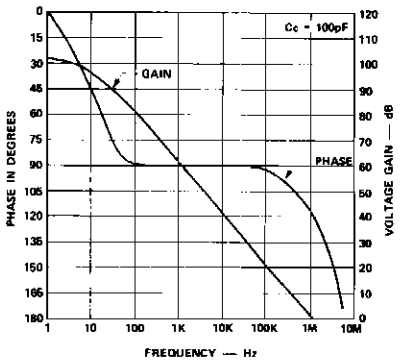


TYPICAL PERFORMANCE CHARACTERISTICS (Cont'd)

CLOSED LOOP NON-INVERTING VOLTAGE GAIN AS A FUNCTION OF FREQUENCY

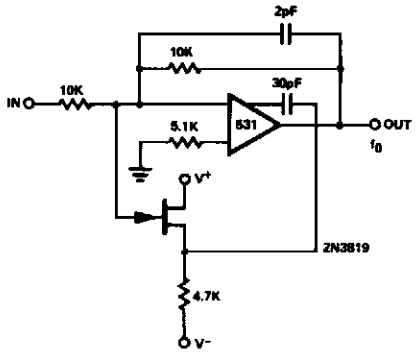


OPEN LOOP PHASE RESPONSE AND VOLTAGE GAIN AS A FUNCTION OF FREQUENCY



TYPICAL APPLICATIONS

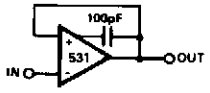
HIGH SPEED INVERTER (10MHz BANDWIDTH)



PULSE RESPONSE HIGH SPEED INVERTER

200nsec/DIV

FAST SETTLING VOLTAGE FOLLOWER

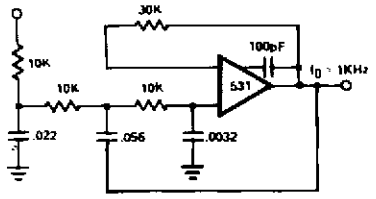


LARGE SIGNAL RESPONSE VOLTAGE FOLLOWER

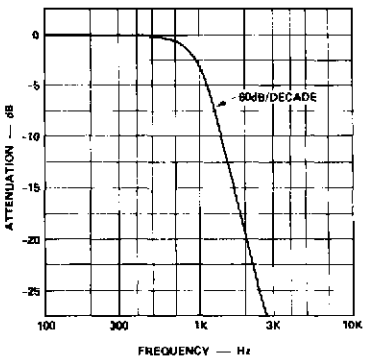
0.5μs/DIV f = 500KHz

TYPICAL APPLICATIONS (Cont'd)

3 POLE ACTIVE LOW PASS FILTER BUTTERWORTH MAXIMALLY FLAT RESPONSE*



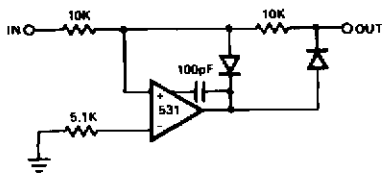
RESPONSE OF 3-POLE ACTIVE BUTTERWORTH MAXIMALLY FLAT FILTER



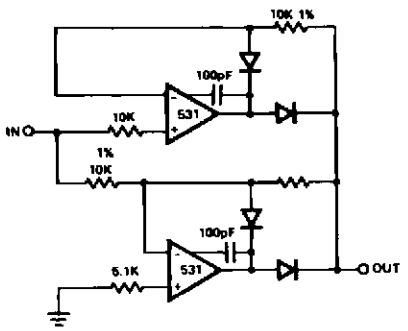
*Reference — EDN Dec. 15, 1970
Simplify 3-Pole Active Filter Design
A. Paul Brokow

PRECISION RECTIFIERS

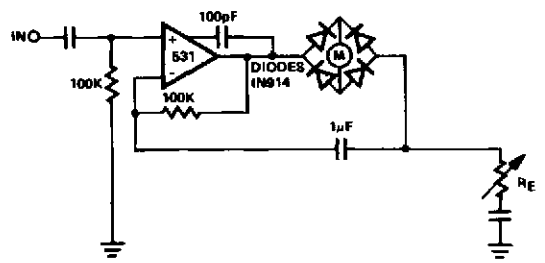
(a) HALF WAVE



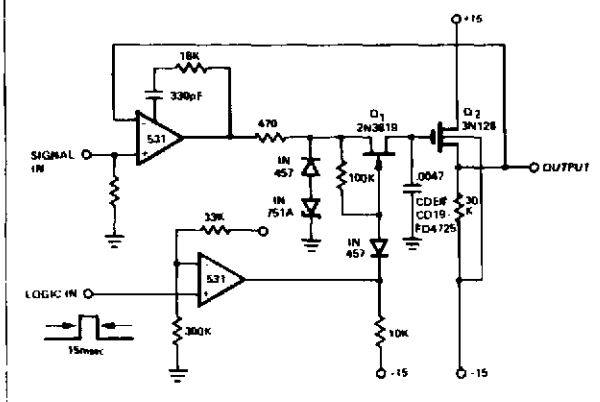
(b) FULL WAVE



AC MILLIVOLTMETER

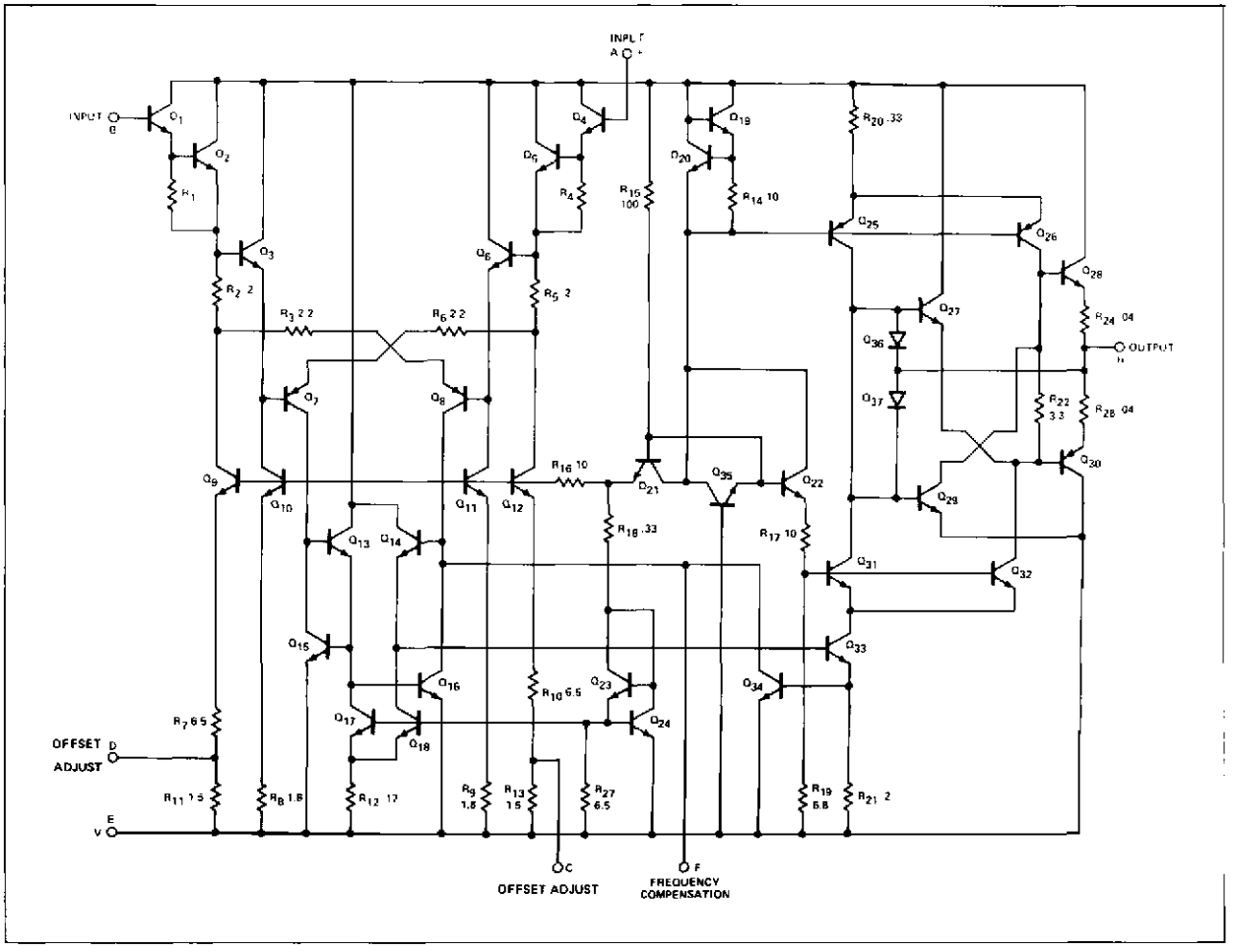


SAMPLE AND HOLD



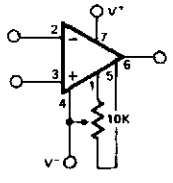
ANALOG

SCHEMATIC DIAGRAM



TEST CIRCUITS

OFFSET NULL CIRCUIT



TRANSIENT RESPONSE CIRCUIT