HARRIS

HA-2530/2535

High Slew Rate, Wideband Inverting Amplifier

2

FEATURES

- HIGH SLEW RATE ±320V/μs
- FAST SETTLING TIME 550ns
- WIDE POWER BANDWIDTH 5MHz
- HIGH GAIN BANDWIDTH PRODUCT 70MHz
- LOW OFFSET VOLTAGE 0.8mV
- LOW POWER SUPPLY CURRENT 3.6

APPLICATIONS

- PULSE AMPLIFIC
- SIGNAL CONDITIO
- SIGNAL GENERATOR
- COAXIAL CABLE DRIVE
- INTEGRATORS

Product to be Discontinued. HA-2539 or HA-2540 Suggested for New Designs.

DESCRIPTION

HA-2530 and HA-2535 are monolithic high speed inverting amplifiers which deliver super w rate, bandwidth, and accuracy specifications other amplifier in its class. Designs ated amplifiers utilize the feed produce excellent low power con- compensation at

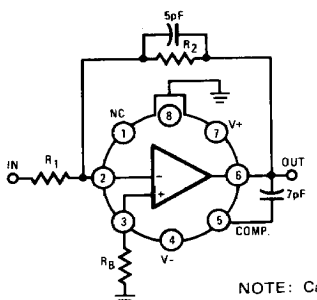
omponents for pulse circuits, nd high speed integrators that can take 320V/μs slew rate and 550ns (0.1%) settling Hz gain bandwidth product, 5MHz power bandwidth pled with 0.8mV offset voltage and ±50mA typical output current levels make these amplifiers ideally suited for signal conditioning, signal generation, and coaxial driver applications.

The HA-2530 and HA-2535 are available in metal can (TO-99) packages. HA-2530 is specified over the -55°C to +125°C range while HA-2535 is specified from 0°C to +75°C.

PINOUT

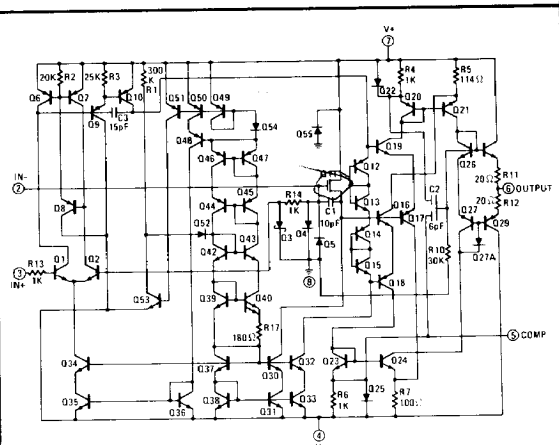
Section 11 for Packaging

TOP VIEW



NOTE: Case tied to V-

SCHEMATIC



SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS

Voltage Between V+ and V- Terminals	40V	Internal Power Dissipation (Note 1)	550mW	
		Operating Temperature Range	$-55^{o}C \leq T_A \leq +125^{o}C$	(HA-2530)
Peak Output Current	±100mA		$0^{o}C \leq T_A \leq +75^{o}C$	(HA-2535)
		Storage Temperature Range	$-65^{o}C \leq T_A \leq +150^{o}C$	

ELECTRICAL CHARACTERISTICS

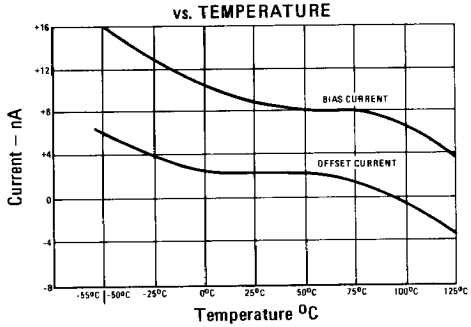
Test Conditions: V_{Supply} = ±15.0V Unless Otherwise Specified.

		HA-2530 $-55^{o}C$ to $+125^{o}C$			HA-2535 $0^{o}C$ to $+75^{o}C$			
		LIMITS			LIMITS			
PARAMETER	TEMP.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	UNITS
INPUT CHARACTERISTICS								
Offset Voltage	+25°C		0.8			0.8		mV
	Full			3			5	mV
Average Offset Voltage Drift	Full		5			5		µV/°C
Bias Current	+25°C		15			15		nA
	Full			100			200	nA
Offset Current	+25°C		5			5		nA
	Full			20			20	nA
Input Resistance	+25°C		2			2		MΩ
Input Capacitance	+25°C		10			10		pF
TRANSFER CHARACTERISTICS								
Large Signal Voltage Gain (Notes 2,5)	+25°C		$2X10^6$			$2X10^6$		V/V
	Full	10^5			10^5			V/V
Common-Mode Rejection Ratio (Note 3)	Full	86	100		80	100		dB
Gain Bandwidth Product (Note 4)	+25°C		70			70		MHz
OUTPUT CHARACTERISTICS								
Output Voltage Swing (Note 2)	Full	±10	±12		±10	±12		V
Output Current (Note 5)	+25°C	±25	±50		±25	±50		mA
Full Power Bandwidth (Note 5)	+25°C	4	5		4	5		MHz
TRANSIENT RESPONSE (NOTES 6&7)								
Rise Time	+25°C		20	40		20	40	ns
Overshoot	+25°C		30	45		30	50	%
Slew Rate	+25°C	±280	±320		±250	±320		V/µs
Settling Time	+25°C		500			500		ns
POWER SUPPLY CHARACTERISTICS								
Supply Current	+25°C		3.5	8		3.5	8	mA
Power Supply Rejection Ratio (Note 8)	Full	86	100		80	100		dB

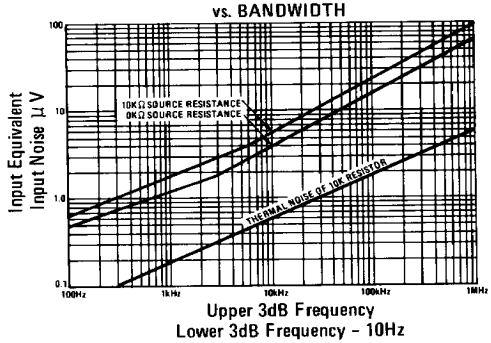
NOTES:
1. Derate at 5.5mW/°C for Operation at Ambient Temperature Above 75°C.
2. R_L = 2K
3. V_{CM} = ±5.0V
4. A_V >10
5. V_O = ±10V
6. C_L = 50pF
7. See Transient Response Test Circuit and Wave Forms
8. ΔV = ±5.0V

V+ = 15VDC, V- = 15VDC, T_A = 25°C UNLESS OTHERWISE STATED

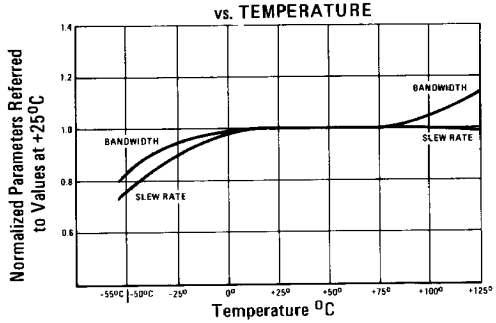
INPUT BIAS AND OFFSET CURRENT vs. TEMPERATURE



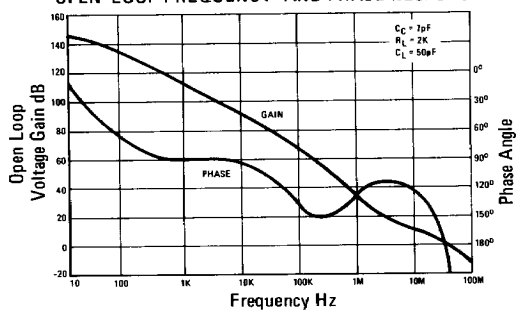
EQUIVALENT INPUT NOISE vs. BANDWIDTH



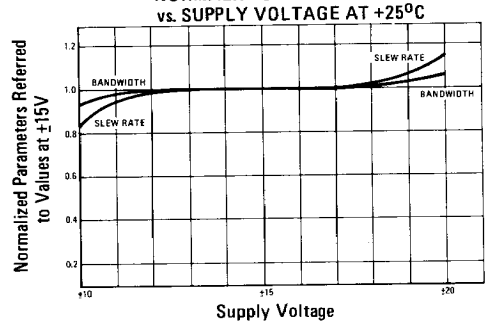
NORMALIZED AC PARAMETERS vs. TEMPERATURE



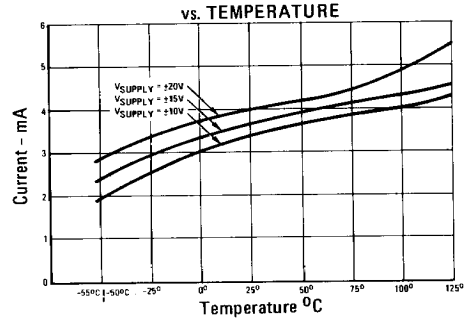
OPEN-LOOP FREQUENCY AND PHASE RESPONSE



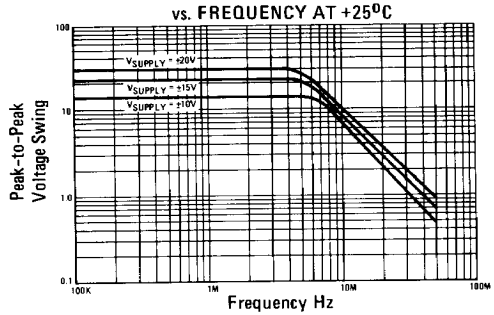
NORMALIZED AC PARAMETERS vs. SUPPLY VOLTAGE AT +25°C



POWER SUPPLY CURRENT vs. TEMPERATURE

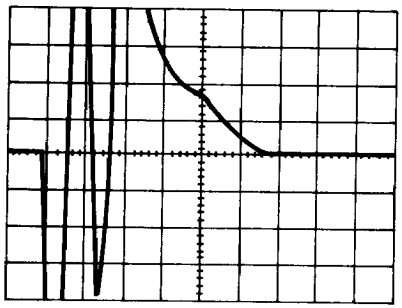


OUTPUT VOLTAGE SWING vs. FREQUENCY AT +25°C



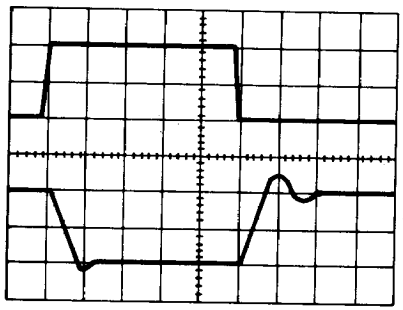
PERFORMANCE CURVES (continued)

SETTLING TIME MEASUREMENT *1



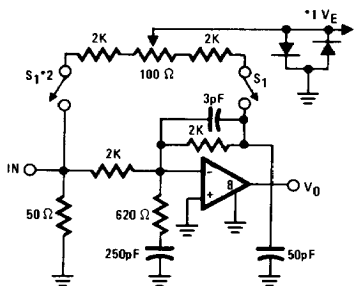
VERTICAL = 5mV/DIV.
HORIZONTAL = 100ns/DIV.
$T_A = +25^oC$, $V_S = \pm 15V$

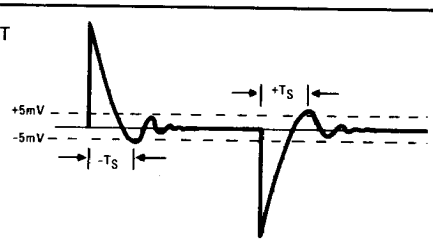
UNITY GAIN PULSE RESPONSE



UPPER TRACE: INPUT VERTICAL = 5V/DIV.
LOWER TRACE: OUTPUT HORIZONTAL = 50ns/DIV.
$T_A = +25^oC$, $V_S = \pm 15V$

SLEW RATE/SETTLING TIME/TRANSIENT RESPONSE TEST CIRCUIT

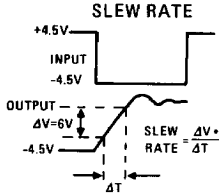




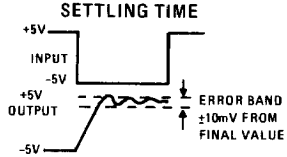
*1 Settling time (T_S) is measured using a high speed high recovery oscilloscope to display the error voltage V_E. When V_E is within ±5mV of final value the output V_O will be within ±10mV (0.1%).

*2 S_1 closed for settling time.

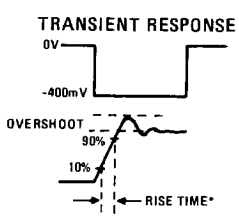
SLEW RATE



SETTLING TIME



TRANSIENT RESPONSE



* MEASURED ON BOTH POSITIVE AND NEGATIVE EXCURSIONS.

5MHz VIDEO AMPLIFIER (A_V = 10)