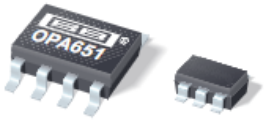
BURR - BROWN®



OPA651

Wideband, Low Power Voltage Feedback OPERATIONAL AMPLIFIER

FEATURES

- STABLE IN GAINS: ≥ 2V/V
- LOW POWER: 50mW
- BANDWIDTH: 470MHz at G = 2
- FAST SETTLING TIME: 16ns to 0.01%
- LOW HARMONICS: –78dB at 5MHz
- LOW INPUT BIAS CURRENT: 4∝A
- DIFFERENTIAL GAIN/PHASE ERROR: 0.01%/0.025°
- LOW VOLTAGE NOISE: 4.6nV/√Hz

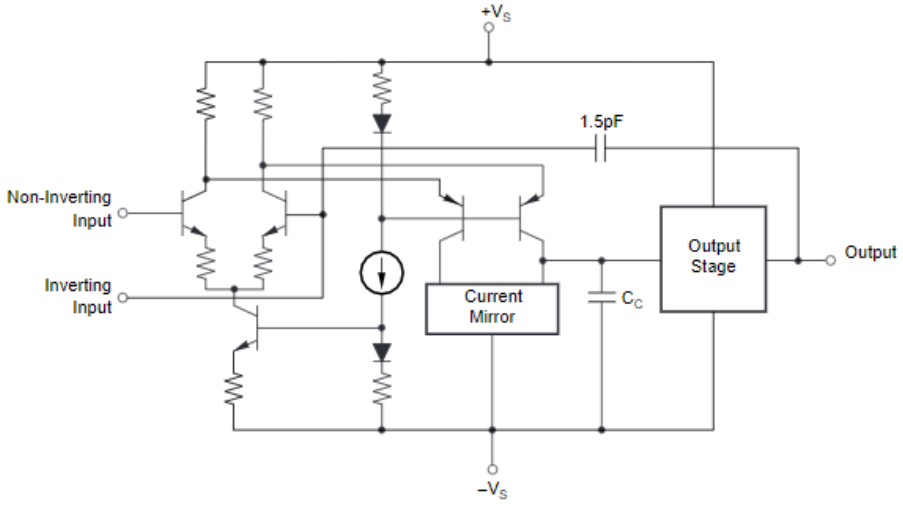
APPLICATIONS

- HIGH RESOLUTION VIDEO
- MONITOR PREAMPLIFIER
- CCD IMAGING AMPLIFIER
- ULTRASOUND SIGNAL PROCESSING
- ADC/DAC GAIN AMPLIFIER
- BASEBAND SIGNAL PROCESSING

DESCRIPTION

The OPA651 is a low power, wideband voltage feedback operational amplifier. It features a bandwidth at G = +2 of 470MHz as well as a 12-bit settling time of only 16ns. The wide bandwidth and true differential input stage make it suitable for use in a variety of applications. Its low distortion gives exceptional performance for telecommunications, medical imaging and video applications.

The OPA651 is compensated for stability in gains of two or more, differentiating it from the unity gain stable OPA650. Its unusual combination of speed, accuracy and low power make it an outstanding choice for many portable, multi-channel and other high speed applications, where power is at a premium.



International Airport Industrial Park • Mailing Address: PO Box 11400, Tucson, AZ 85734 • Street Address: 6730 S. Tucson Blvd., Tucson, AZ 85706 • Tel: (520) 746-1111 • Twx: 910-952-1111
Internet: http://www.burr-brown.com/ • FAXLine: (800) 548-6133 (US/Canada Only) • Cable: BBRCORP • Telex: 066-6491 • FAX: (520) 889-1510 • Immediate Product Info: (800) 548-6132

PDS-1265E

Printed in U.S.A. March, 1998

SBOS042

SPECIFICATIONS

At T_A = +25°C, V_S = ±5V, R_L = 100Ω, R_{FB} = 402Ω, G = +2, unless otherwise noted.

PARAMETER	CONDITIONS	OPA651U, N MIN	OPA651U, N TYP	OPA651U, N MAX	OPA651UB, NB MIN	OPA651UB, NB TYP	OPA651UB, NB MAX	UNITS
FREQUENCY RESPONSE								
Closed-Loop Bandwidth[2]	G = +2		470			*[1]		MHz
	G = +5		70			*		MHz
	G = +10		34			*		MHz
Gain Bandwidth Product			340			*		MHz
Slew Rate	G = +2, V_O = 2V step		300			*		V/∝s
Over Specified Temperature			275			*		V/∝s
Rise Time	0.2V Step		0.8			*		ns
Fall Time	0.2V Step		0.8			*		ns
Settling Time 0.01%	G = +2, V_O = 2V step		16.2			*		ns
0.1%	G = +2, V_O = 2V step		11.5			*		ns
1%	G = +2, V_O = 2V step		7.2			*		ns
Spurious Free Dynamic Range	G = +2, f = 5.0 MHz, V_O = 2Vp-p,							
	R_L = 100Ω		67			*		dBc
	R_L = 400Ω		78			*		dBc
Differential Gain	G = +2, NTSC, V_O = 1.4Vp, R_L = 150Ω		0.01			*		%
Differential Phase	G = +2, NTSC, V_O = 1.4Vp, R_L = 150Ω		0.025			*		Degrees
Bandwidth For 0.1dB Flatness	G = +2		43			*		MHz
INPUT OFFSET VOLTAGE								
Input Offset Voltage			±1	±5.0		*	±2.0	mV
Average Drift			±3			*		∝V/°C
Power Supply Rejection (+V_S)	V_S = ±4.5V to ±5.5V	65	85		70	*		dB
(–V_S)		52	60		55	*		dB
INPUT BIAS CURRENT								
Input Bias Current	V_{CM} = 0V		4	20		*	10	∝A
Over Temperature			6	30		*	20	∝A
Input Offset Current	V_{CM} = 0V		0.4	1.5		*	*	∝A
Over Temperature			0.9	3.0		*	*	∝A
INPUT NOISE								
Input Voltage Noise								
Noise Density, f = 100Hz			13			*		nV/√Hz
f = 10kHz			4.6			*		nV/√Hz
f = 1MHz			4.6			*		nV/√Hz
Voltage Noise, BW = 10Hz to 100MHz			46			*		∝Vrms
Input Bias Current Noise								
Current Noise Density, f = 0.1Hz to 20kHz			1.1			*		pA/√Hz
Noise Figure (NF)	R_S = 10kΩ		3.2			*		dB
	R_S = 50Ω		14			*		dB
INPUT VOLTAGE RANGE								
Common-Mode Input Range			±3.5			*		V
Over Specified Temperature		±3.0			*			V
Common-Mode Rejection	V_{CM} = ±0.5V	75	90		80	*		dB
INPUT IMPEDANCE								
Differential			60 || 1			*		kΩ || pF
Common-Mode			2.6 || 1			*		MΩ || pF
OPEN-LOOP GAIN								
Open-Loop Voltage Gain	V_O = ±2V, R_L = 100Ω	42	50		45	*		dB
Over Specified Temperature	V_O = ±2V, R_L = 100Ω	40			42			dB
OUTPUT								
Voltage Output								
Over Specified Temperature	No Load	±2.2	±3.0		±2.4	*		V
	R_L = 250Ω	±2.2	±2.5		±2.4	*		V
	R_L = 100Ω	±2.0	±2.3		±2.1	*		V
Current Output, Sourcing		75	110		*	*		mA
Over Specified Temperature		65			*			mA
Current Output, Sinking		65	85		*	*		mA
Over Specified Temperature		35			*			mA
Short Circuit Current			150			*		mA
Output Resistance	0.1MHz, G = +2		0.05			*		Ω
POWER SUPPLY								
Specified Operating Voltage			±5			*		V
Operating Voltage Range		±4.5		±5.5	*		*	V
Quiescent Current			±5.1	±7.75		*	±6.5	mA
Over Specified Temperature				±8.75			±7.5	mA
TEMPERATURE RANGE								
Specification: U, N, UB, NB		–40		+85	*		*	°C
Thermal Resistance, θ_{JA}								
U SO-8			125			*		°C/W
N SOT23-5			150			*		°C/W

NOTES: (1) An asterisk (*) specifies the same value as the grade to the left. (2) Frequency response can be strongly influenced by PC board parasitics. The OPA651 is nominally compensated assuming 2pF parasitic load. The demonstration boards show low parasitic layouts for the different package styles.