VANGUARD SEMICONDUCTOR
Division of California Micro Devices

VN2018/VN2018B

FAST-SETTLING, WIDEBAND DIFFERENTIAL AMPLIFIER

FEATURES

- Single-Chip Wideband Amplifier
- 180 MHz Unity-Gain Bandwith
- 25 ns Settling Time to 0.1%
- 500 V/μs Slew Rate
- 2ns/2.5ns Rise/Fall Times
- $\pm$1V Output Voltage Swing
- $\pm$70mA Output Current
- 100dB Open Loop Gain

APPLICATIONS

- High Speed A/D, D/A Conversion
- Video Communications
- Pulse Amplifiers
- ATE Pin Electronics
- High Speed Fiber Optics
- Imaging/Display Systems
- Radar and IF Processors

PACKAGING OPTIONS

Package Type	Temp. Range
8 Pin Cerdip	C, I, M
8 Pin P-Dip	C
8 Pin Side Braze	C, I, M

C = 0°C to +70°C,
I = -40°C to +85°C
M = -55°C to +125°C

GENERAL DESCRIPTION

The VN2018/VN2018B are monolithic general-purpose wideband differential amplifiers fabricated using Vanguard Semiconductor's proprietary BiCMOS process technology. The best features of MOS and bipolar devices are used in the VN2018/VN2018B to achieve excellent dc characteristics while maintaining stable dynamic performance over a wide range of frequencies.

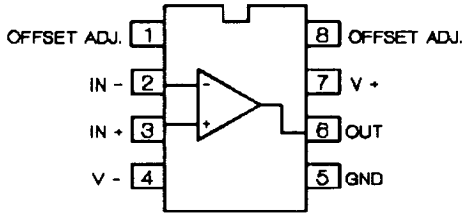
Featuring a unity-gain bandwith of 180 MHz and a settling time to 0.1% of 25ns, the VN2018/VN2018B are ideally suited for analog-to-digital conversion systems operating at video frequencies and above, as well as for wide bandwidth filters. Additionally, their high slew rate of 500V/μs and fast rise and fall time make the VN2018/VN2018B ideal choices for applications requiring pulse detection and amplification.

Innovative circuit design techniques have been incorporated in the VN2018/VN2018B to ensure unity gain stability while driving 50 ohm loads to meet the stringent requirements of high speed pin electronics applications for automated test equipment, and other systems requiring low closed-loop gain.

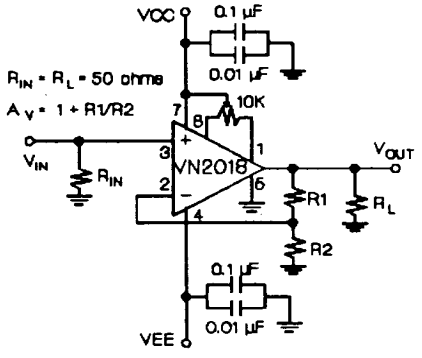
The VN2018/VN2018B are fully differential, dc-coupled operational amplifiers with built-in compensation networks, thus, eliminating the need for external components resulting in board space savings and reduced system costs. Their class AB output stage ensure unity-gain stability with high output swings and low impedance output loads. In addition, this feature eliminates power dissipation variations versus output load.

Offered in 8 pin dual-in-line packages, the VN2018/VN2018B are guaranteed to operate over the commercial, industrial, and military temperature ranges using $\pm$5V power supplies.

PINOUT CONFIGURATION



NON-INVERTING CONFIGURATION



Patents Pending
This specification is subject to change without notice.

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Absolute Maximum Ratings

Rating	Symbol	Value
Supply Voltage	V_S	±7V
Input Voltage	V_{IN}	±5V
Peak Output Current *	I_{OP}	±200mA
Continuous Output Current *	I_{OC}	±150mA
Internal Power Dissipation	P_D	900mW
Junction Temperature	T_J	150°C
Storage Temperature	T_S	-60°C to +150°C

*Note: Exceeding these ratings may cause permanent damage. Functional operation under these conditions is not implied.

dc Electrical Characteristics

V_S = ±5V, R_L = 50Ω, T_A = 25°C, Unless Otherwise Specified

Parameter	Symbol	Conditions	VN2018			VN2018B			Units
			Min	Typ	Max	Min	Typ	Max	
Offset Voltage	V_{OS}			±5	±10		±5	±30	mV
Offset Voltage Drift	TCV_{OS}			10			10		μV/°C
Bias Current	I_B			10	100		10		nA
Offset Current	I_{OS}			1	10		1		nA
Input Resistance	R_{IN}			60			60		KΩ
Input Capacitance	C_{IN}			1	2		1		pF
Common Mode Range	V_{CM}		±1	±2.5			±2.5		V
Input Noise Voltage	e_{IN}	f=1KHz		10			10		nV/√Hz
Large Signal Voltage Gain	A_{VOL}	V_O=±1V	60	100		60	100		dB
Common Mode Rejection Ratio	CMRR	V_{CM}=±1V	55	65		55	65		dB
Output Voltage Swing	V_O		±1	±2.5			±2.5		V
Output Current	I_O	V_O=±1V	±50	±70		±50	±70		mA
Output Resistance	R_O	Open Loop		8	12		8	12	Ω
Supply Current	I_S	Quiescent		60			60		mA
Power Supply Rejection Ratio	PSRR	V_S=±5V	50	65		45	65		dB

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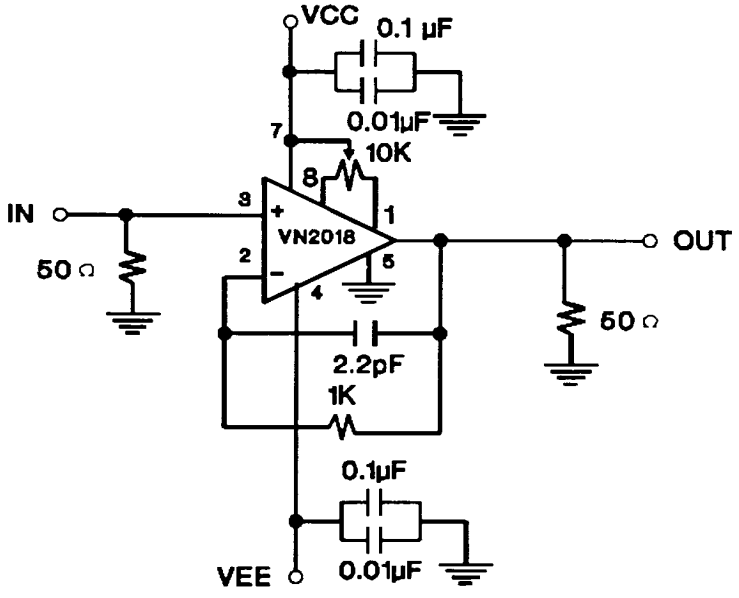
ac Electrical Characteristics

V_s = ±5V, R_L = 50Ω, T_A =25°C, Unless Otherwise Specified

Parameter	Symbol	Conditions	VN2018			VN2018B			Units
			Min	Typ	Max	Min	Typ	Max	
Small Signal Bandwidth	GBW	V_OMHz= ±1V AV=1	100	200		100	200		MHz
Full Power Bandwidth (1)	FPBW	V_O= ±1V	60	80		60	80		MHz
Rise Time (2)	t_r	Step= ±0.5V 10-90%		2.0			2		ns
Fall Time (2)	t_f	Step= ±0.5V 10-90%		2.5			2.5		ns
Slew Rate (2)	SR		300	500		300	500		V/μs
Settling Time to 0.1% (2)	t_s	Step= ±0.5V		25			25		ns

Notes:
(1) FPBW = Slew Rate / 2π x V_{PEAK}
(2) Refer to ac Test Circuit Below



Unity-Gain ac Test Circuit

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