Absolute Maximum Ratings

Rating	Symbol	Value
Analog Input Voltage	V_{IN}	±5V
Differential Input Voltage	V_{diff}	±3.5V
Digital Input Voltage	V_{DIN}	0V to -5V
Output Current	I_O	±150mA Continuous
Supply Voltages	V_S	±7V
Junction Temperature	T_J	150°C
Storage Temperature	T_S	-60°C to +150°C

Notes: Exceeding these ratings may cause permanent damage, functional operation under these conditions is not implied.

Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max	Units
Analog Input Voltage						
Voltage Range	V_{IN}		-3	±1	+3	V
Input Impedance	R_{IN}			60		KΩ
Bias Current	I_B		1	10	100	nA
Input Capacitance	C_{IN}			1	2	pF
ECL-Compatible Digital Input						
Track Mode	CK_{IN}	CK_{IN}=1, CK_{INB}=0	-1.8	-1.5		V
Hold Mode	CK_{IN}	CK_{IN}=0, CK_{INB}=1		-1.1	-0.5	V
Input High Current	I_{IH}			3.0	10.0	μA
Input Low Current	I_{IL}			3.0	10.0	μA
Analog Output						
Current (Short Circuit Protected)	I_{OUT}		±50	±70		mA
Impedance	R_{OUT}			8.0	12.0	Ω
Noise in Track Mode	e_{TM}	Across Bandwidth				mV(rms)
DC Accuracy/Stability						
Gain	G		0.99	0.999		
Gain Non-Linearity	G_{NL}	1VFS Input		0.01	.1	%
Initial Offset Voltage	V_{OS}			±5.0	±10.0	mV
Input Noise Voltage	e_{IN}	f=1KHz		10		nV/√Hz

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Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Track-Mode Dynamics						
Small Signal Bandwidth	SSBW		100	200		MHz
Full Power Bandwidth	FPBW		60	80		MHz
Slew Rate	SR		0.3	0.5		V/ns
Harmonic Distortion	DH	2Vpp @ 20MHz		-44		dB
Track-To-Hold Switching						
Effective Aperture Delay	t_{EAD}			2		ns
Aperture Uncertainty	t_{AUN}			2		ps(rms)
Offset Step (Pedestal)	P_{OS}			1	25	mV
Temperature Coefficient	$\delta P_{OS}/\delta T$			50	150	μV/°C(NM)
Sensitivity to -5V				1	10	mV/V
Switching Delay	t_{SW}			1.5		ns
Switching Transient						
Amplitude	TH_A			30	100	mV
Settling to ±1mV	TH_S			20	30	ns
Hold Mode Dynamics						
Droop Rate	DR	T_A=25°C		20	50	nV/μs
		T_A=85°C		1.5		μV/μs
Temperature Variation	δDR/δT			Double		/10°C
Feedthrough Rejection	FT_R	Vpp=2V@20MHz	55	60		dB
Hold-To-Track Dynamics						
Acquisition Time	t_{AQ1}	Vpp=1V				
to ±1%				15	20	ns
to ±0.1%				25	35	ns
Acquisition Time	t_{AQ2}	Vpp=2V				
to ±1%				20	27	ns
to ±0.1%				30	40	ns
Power Requirements						
V_{CCA} (+5V±0.5V)	I_{CCA}			25	35	mA
V_{EEA} (-5V±0.5V)	I_{EEA}			25	35	mA
V_{CCD} (+5V±0.5V)	I_{CCD}			5	8	mA
V_{EED} (-5V±0.5V)	I_{EED}			5	8	mA
V_{CCAO} (+5V±0.5V)	I_{CCAO}			30	50	mA
V_{EEAO} (-5V±0.5V)	I_{EEAO}			30	50	mA
Standby Current	I_{SB}			60	93	mA
Power Dissipation	P_D			600	930	mW
Power Supply Rejection Ratio	P_{SSR}			2	3	mV/V

PARAMETER DEFINITION

Initial Offset Voltage - The output voltage in track mode when the input signal is grounded.

Linearity Error - The deviation from a straight line on the input versus held output transfer characteristics. This parameter is given as a percentage of the maximum analog input voltage.

Gain Error - The voltage gain deviation during the sample mode over the full scale voltage range. Ideal gain is assumed to be unity.

Small Signal Bandwidth - The frequency at which the voltage gain is 3dB below its dc value when the input signal is a sinusoidal waveform with amplitude equal or less than 100mV peak-to-peak.

Full Power Bandwidth - The frequency at which the voltage gain is 3dB below its dc value when the input signal is a sinusoidal waveform with amplitude equal to the full scale voltage range.

Acquisition Time - The track time required to acquire a full scale input step within a specified error range.

Analog Delay - The time required for an analog input signal to propagate to the analog output.

Effective Aperture Delay Time - The time difference between the propagation delays on the analog input and the digital switch control logic. This parameter indicates the point in time when input signal is actually held relative to the hold command input.

Aperture Jitter - The sample-to-sample variation in effective aperture delay time due to noise in the switch control logic. This parameter is also referred to as aperture uncertainty and causes an error in the output voltage which is dependent on the slew rate of the input signal.

Droop Rate - A change in the output voltage during the hold mode due to leakage currents in the holding capacitor.

Feedthrough Rejection - The change in the output signal during the hold mode when a full scale sinusoidal waveform is applied at the input as a function of frequency.

Offset Step (Pedestal) - The output voltage offset during the hold mode caused by charge injection in the storage capacitor and other internal offsets.

Track-to-Hold Settling Time - The time required for the output to settle within a specified range referenced to the hold command input signal.

Track-to-Hold Switching Transient - The transient output voltage after a track to hold transition.

Hold-to-Track Switch Delay - The time required for the output signal to start changing as a result of a track command.

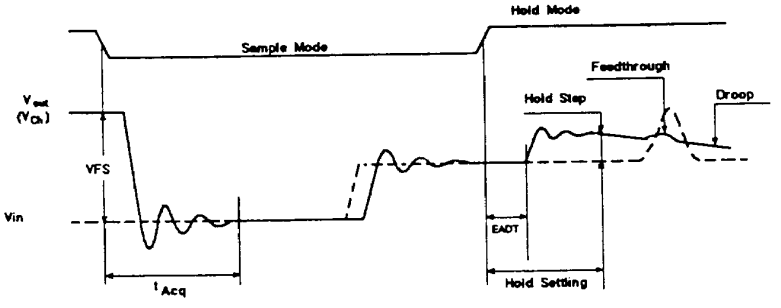


Figure 1. - Typical Waveforms

HIGH FREQUENCY VIDEO BUFFER-AMPLIFIER

FEATURES

- 0.1% Differential Gain Error
- 0.1° Differential Phase Error
- ±70mA Output Current
- 500 V/μs Slew Rate
- 2ns/2.5ns Rise/Fall Times
- 180MHz -3dB Bandwidth
- 80MHz Full Power Bandwidth
- Low Output Impedance, 0.2Ω
- Short-circuit Protection

APPLICATIONS

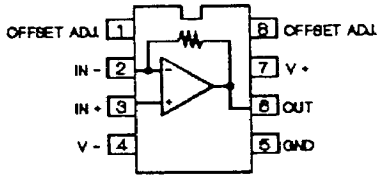
- High Speed Line Drivers
- Coaxial Drivers
- Flash A/D Input Buffers
- Video Impedance Matching
- Op Amp Isolation Buffers
- Current Boosters
- ATE Pin Drivers

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

PINOUT CONFIGURATION



GENERAL DESCRIPTION

The VN3018 is a monolithic general-purpose unity gain buffer fabricated using Vanguard Semiconductor's proprietary BiCMOS process technology. The best features of MOS and bipolar devices are used in the VN3018 to achieve excellent dc characteristics while maintaining stable dynamic performance over a wide range of frequencies.

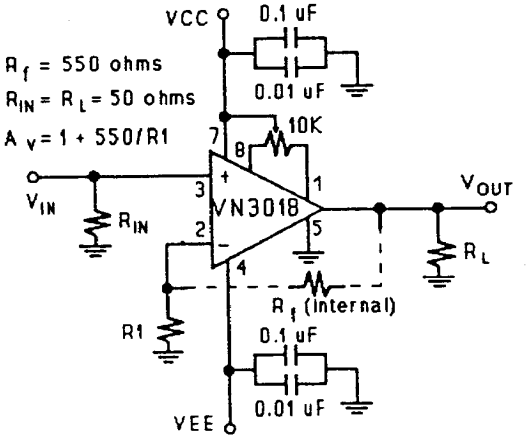
Featuring a unity-gain bandwidth of 180 MHz and excellent differential gain and phase characteristics, the VN3018 is ideally suited for system designs requiring video frequencies and above. Its high slew rate of 500V/μs and high output drive capabilities make the VN3018 an ideal choice for driving coaxial and twisted pair cables.

Innovative circuit design techniques have been incorporated in the VN3018 to ensure unity gain stability over a wide range of resistive or capacitive loads. Thus, the VN3018 can be used to enhance the performance of flash A/D converters in video circuit design.

The VN3018 includes on-chip short circuit current protection, eliminating the need for external components, allowing board space savings and reduced system costs. Its class AB output stage ensures unity-gain stability with high ouput 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 VN3018 is guaranteed to operate over the commercial, industrial, and military temperature ranges using ±5V power supplies.

PROGRAMMABLE-GAIN CONFIGURATION



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