

VA003
UNITY GAIN VIDEO
BUFFER

T-74-07-01

FEATURES

- Low Offset: 8mV
- High Slew Rate: 700V/ μ s.
- Fast Rise Time: 3ns
- High Output Current: \pm 100mA
- Wide Power Bandwidth: DC to 50MHz
- Replace Costly Hybrids
- Free of Thermal Runaway with Input Overdrive
- Available in Commercial and Military Versions

DESCRIPTION

The VA003 is a high-speed unity gain buffer capable of \pm 100mA output current, 700V/ μ s slew rate and a small signal bandwidth in excess of 200MHz. It is intended to fulfill a wide range of buffer applications such as high-speed line drivers, video impedance transformation, op amp isolation buffer for driving reactive loads, and high impedance input buffers for high-speed A-to-Ds and comparators.

The device is available in 8-pin ceramic and plastic DIP and SOIC (surface mount) packages as well as an 8-pin TO-99 metal can.

ABSOLUTE MAXIMUM RATINGS

Supply Voltages.....	\pm 6V
Input Voltage.....	\pm Vs
Output Current (Peak).....	\pm 200 mA
Power Dissipation (Note 1):	
$T_A = 25^\circ\text{C}$	1.15W: Plastic DIP
	0.83W: SOIC, Ceramic DIP, TO-99

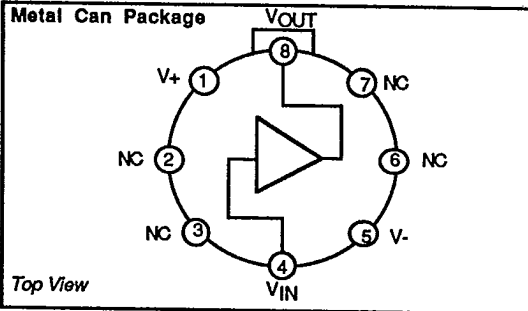
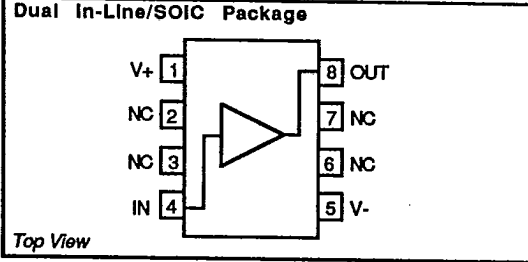
Note 1: Power derating above 25°C is based on a maximum junction temperature of 175°C and the following thermal resistance factors:

Packages	θ_{JC} (°C/W)	θ_{JA} (°C/W)
Plastic DIP	60	130
TO-99 SOIC/Ceramic DIP	100	100

PACKAGE TYPES AVAILABLE

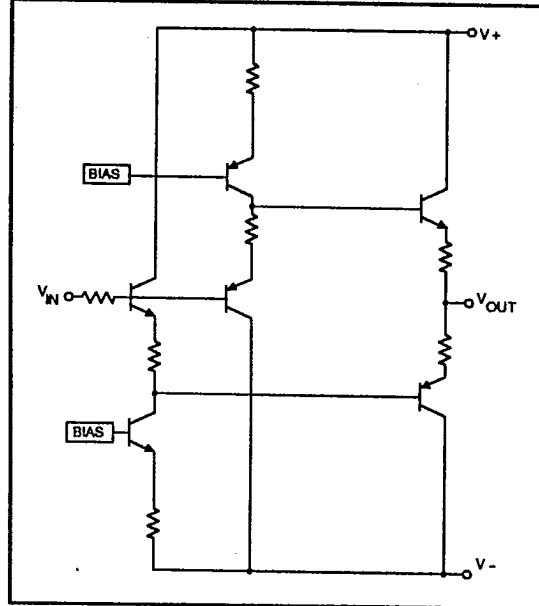
- 8-Pin Plastic DIP
- 8-Pin CERDIP
- 8-Pin SOIC
- 8-Pin Metal Can, TO-99

CONNECTION DIAGRAMS



LSP FAMILY DATA SHEETS

SIMPLIFIED SCHEMATIC



VA003

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ELECTRICAL CHARACTERISTICS $V_S = \pm 5V$, $R_L = 50\Omega$, $T_A = 25^\circ C$ (unless otherwise stated)

PARAMETER	SYM	CONDITIONS	VA003J			VA003S			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
Output Offset Voltage	V _{OS}	V _{IN} = 0V		8	20		4	15	mV
		0° ≤ T _A ≤ 70° C		12	30				
		-55° C ≤ T _A ≤ 125° C					10	30	
Input Bias Current	I _B	R _L = 1kΩ		15	50		15	50	μA
		0° ≤ T _A ≤ 70° C		20	80				
		-55° C ≤ T _A ≤ 125° C					30	100	
Input Resistance	R _{IN}	V _{IN} = ±3V R _L = 1kΩ	30K	60K		30K	60K	Ω	
Input Capacitance	C _{IN}			2.5		2.5		pF	
Input Noise Voltage	e _N	10Hz to 2MHz		60		60		μV	
Voltage Gain	A _V	V _{IN} = 10mV	R _L = 50Ω	0.85	0.88		0.85	0.88	V/V
			R _L = 1kΩ	0.95	0.97		0.95	0.97	
			0° ≤ T _A ≤ 70° C R _L = 1kΩ	0.94					
			-55° C ≤ T _A ≤ 125° C R _L = 1kΩ				0.93		
Output Voltage Swing	V _{OUT}	V _{IN} = +3.5V R _L = 25Ω	± 2.5			± 2.5		V	
		V _{IN} = ± 4V R _L = 1kΩ	± 3.5			± 3.5			
Output Resistance	R _{OUT}	R _L = 1kΩ		6			6	Ω	
Rise / Fall Time	t _{r/f}	V _O = ± 0.25V		3			3	ns	
Small Signal Bandwidth	BW	C _L ≤ 10pF R _L = 50Ω		300		300		MHz	
Slew Rate	SR	C _L = 10pF V _{IN} = ±3V R _L = 1kΩ	500	700		500	700	V/μs	
Full Power Bandwidth	FPBW	C _L = 10pF V _{IN} = 1VRMS R _L = 1kΩ		50		50		MHz	
Supply Current	I _S	V _{IN} = 0V		35	45		35	45	mA

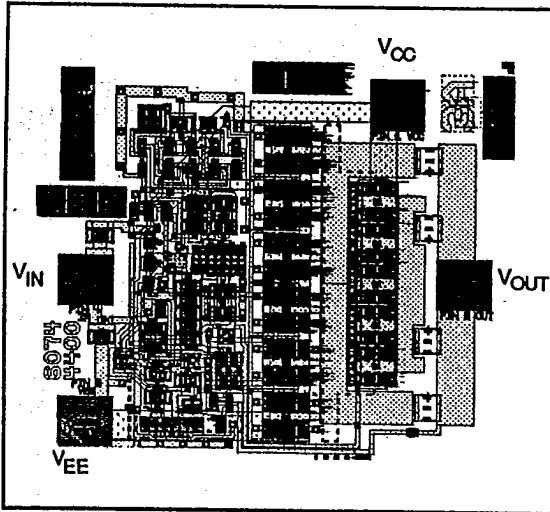
LSP FAMILY DATA SHEETS

WAFER TEST LIMITS $V_S = \pm 5V$, $T_A = 25^\circ C$ (unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	VA003XS LIMITS			UNITS
			MIN	TYP	MAX	
Output Offset Voltage	V_{OS}	$V_{IN} = 0V$ $R_L = 50\Omega$		10	30	mV
Input Bias Current	I_B	$R_L = 1K\Omega$		30	60	μA
Input Resistance	R_{IN}			60K		Ω
Input Noise Voltage	e_N	10Hz to 2MHz		60		μV
Voltage Gain	A_V	$R_L = 1K\Omega$ $V_{IN} = \pm 3.0V$	0.93	0.97		V/V
Output Voltage Swing	V_{OUT}	$V_{IN} = \pm 4V$ $R_L = 1K\Omega$	± 3.5			V
Output Resistance	R_{OUT}	$R_L = 1K\Omega$		6		Ω
Rise/Fall Times	tr/tf	$V_O = \pm 0.25V$		3		ns
Small Signal Bandwidth	BW	$R_L = 50\Omega$		250		MHz
Slew Rate	SR	$C_L = 10pF$ $V_{IN} = \pm 2V$ $R_L = 1K\Omega$		700		V/ μs
Full Power Bandwidth	FPBW			50		MHz
Supply Current	I_S			35	45	mA

LSP FAMILY DATA SHEETS

DIE



DICE POLICY

Electrical Characteristics

Each die is electrically tested to the commercial or military grade DC parameters to guard band limits at $25^\circ C$ to guarantee operation over the full temperature range.

Quality Assurance

All dice are 100% visually inspected to the requirement of MIL-STD-883C, Method 2010.2, Condition 3.

All dice are glass passivated to provide scratch protection, with only the bonding pads exposed.

All dice are provided with gold backing.

Shipping Packages/Order Information

All dice are packaged in die crates with individual compartments which prevent damage to the die during shipping. Minimum order for dice is 100, supplied only in multiples of 100.

Die size = 0.050 X 0.050 Inch (2500sq mils)
= 1.27 X 1.27mm (1.61sq mm)