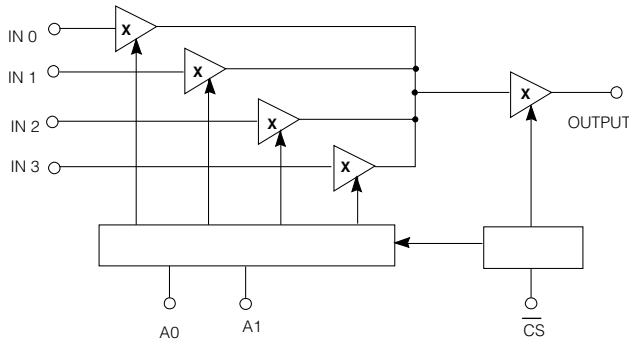# GX4314 Wideband, Monolithic 4x1 Video Multiplexer

FEATURES

- low differential phase and gain

- wide bandwidth, 100 MHz at -1 dB (Flattened)

- small switching transient

- ±4.5 to ± 11 volts supplies

FUNCTIONAL BLOCK DIAGRAM

GX4314

TRUTH TABLE

$\overline{CS}$	A1	A0	OUTPUT
0	0	0	IN 0
0	0	1	IN 1
0	1	0	IN 2
0	1	1	IN 3
1	X	X	HI - Z

X = DON'T CARE

AVAILABLE PACKAGING

14 pin PDIP

14 pin SOIC

CIRCUIT DESCRIPTION

The GX4314 is a wideband video multiplexer implemented in bipolar technology. This device is characterized by excellent differential phase and gain in the enabled state, very high off-isolation in the disabled state and fully buffered unilateral signal path. Make-before-break switching assures virtually glitch-free switching.

For use in NxM routing matrices, the GX4314 features a very high, nearly constant input impedance coupled with high output impedance in the disabled state. This allows multiple devices to be paralleled at the inputs and outputs without additional circuitry.

Logic inputs are TTL and 5V CMOS compatible, providing address and chip select functions. The operation of the devices is described in the Truth Table below.

The wideband GX4314 is pin for pin compatible with the high performance GX414, extending the flat frequency response characteristics from 50 to 100 MHz.

APPLICATIONS

- HDTV
- Very high quality video switching
- Very high density video switching
- Computer graphics
- PCM / data routing

ORDERING INFORMATION

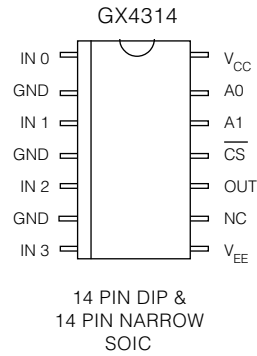| Part Number	Package Type	Temperature Range
GX4314 - CDB	14 pin PDIP	0 to 70°C
GX4314 - CKB	14 pin SOIC	0 to 70°C

CAUTION

ELECTROSTATIC

SENSITIVE DEVICES

DO NOT OPEN PACKAGES OR HANDLE
EXCEPT AT A STATIC-FREE WORKSTATION

ABSOLUTE MAXIMUM RATINGS

Parameter	Value
Supply Voltage	±13.5V
Operating Temperature Range	0°C T_A 70° C
Storage Temperature Range	-65°C T_S 150° C
Lead Temperature (Soldering, 10 Sec)	260° C
Analog Input Voltage	(V_{EE} - 1.4) or -7.5<V_A< (V_{cc}+ 0.3) or (V_{EE}+ 15) V
Logic Input Voltage	-0.5V V_L +5.5V

PIN CONNECTIONS

GX4314

IN 0 — V_{CC}
GND — A0
IN 1 — A1
GND — $\overline{CS}$
IN 2 — OUT
GND — NC
IN 3 — V_{EE}

14 PIN DIP &
14 PIN NARROW
SOIC

ELECTRICAL CHARACTERISTICS (V_S = ±8V DC, 0°C T_A 70°C, R_L = 10k , C_L = 30 pF, unless otherwise shown.)

	PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
DC SUPPLY	Supply Voltage	±V_S	Operating Range		±4.5	-	±11	V
	Supply Current	I⁺	$\overline{CS}$ = 0		-	22	25	mA
		I⁻	$\overline{CS}$ = 0		-	22	25	mA
		I⁺	$\overline{CS}$ = 1		-	270	350	A
		I⁻	$\overline{CS}$ = 1		-	350	600	A
STATIC	Analog Output Voltage Swing	V_{OUT}	Extremes before clipping occurs		-2.4	-	2.6	V
	Analog Input Bias Current	I_{BIAS}			-	11	-	A
	Output Offset Voltage	V_{OS}	T_A = 25°C		7	14	21	mV
	Output Offset Voltage Drift	V_{OS}			-	160	-	V/°C
LOGIC	Chip Enable Time	t_{ON}	Enable input to appearance of signal		-	200	400	ns
	Chip Disable Time	t_{OFF}	Enable input to disappearance of signal at output.		0.6	1.2	-	s
	Logic Input Thresholds	V_{IH}	1		2.0	-	-	V
		V_{IL}	0		-	-	0.8	V
	Logic Input Current	I_L			-	-	4	A
DYNAMIC	Insertion Loss	I.L.	1V p-p sine or sq. wave at 100 kHz		0.025	0.038	0.050	dB
	Bandwidth (-3dB)	B.W.	small signal C_L = 0 pF		-	300	-	MHz
	Input Resistance	R_{IN}	$\overline{CS}$ = 0, crosspoint on		0.5	-	-	M
	Input Capacitance	C_{IN}	$\overline{CS}$ = 0, crosspoint on		-	1.4	-	pF
	Output Resistance	R_{OUT}	$\overline{CS}$ = 0, crosspoint on		-	6	-	
	Output Capacitance	C_{OUT}	$\overline{CS}$ = 1, chip disabled		-	2.6	-	pF
	Differential Gain	dg	f = 3.58 MHz, V_{IN} = 40 IRE		-	-	0.03	%
	Differential Phase	dp	f = 3.58 MHz, V_{IN} = 40 IRE		-	-	0.02	deg
	All Hostile Crosstalk	$XTLK_{AH}$	1Vp-p on 3 inputs 4 th input has 10 resistor to gnd f=30 MHz		-	70	-	dB
	Chip Disabled Crosstalk	$XTLK_{CD}$	Enabled device on O/P f=100 MHz		-	80	-	dB
	Slew Rate	+SR	V_{IN} = 1V p-p (C_L = 10 pF)		1000	1500	-	V/ s
		-SR	V_{IN} =1V p-p (C_L = 10 pF)		440	660	-	V/ s
	Gain Spread at 30 MHz	A_V			-	-	±0.05	dB
	Crosspoint Scatter		R_S = 75	T_A = 25°C	-	-	±0.15	deg
			f = 3.58 MHz	0°C<TA<70°C	-	-	±0.25	deg

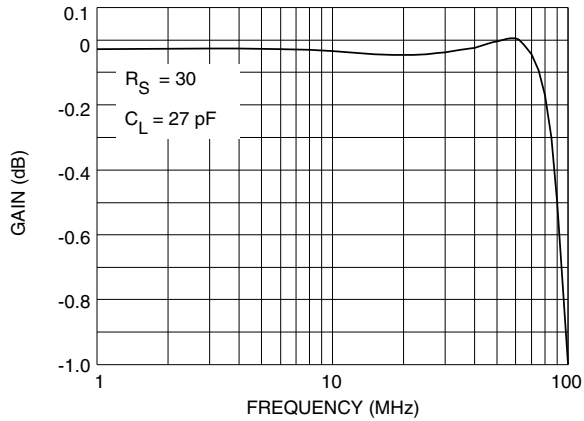2

TYPICAL PERFORMANCE CURVES FOR GX4314
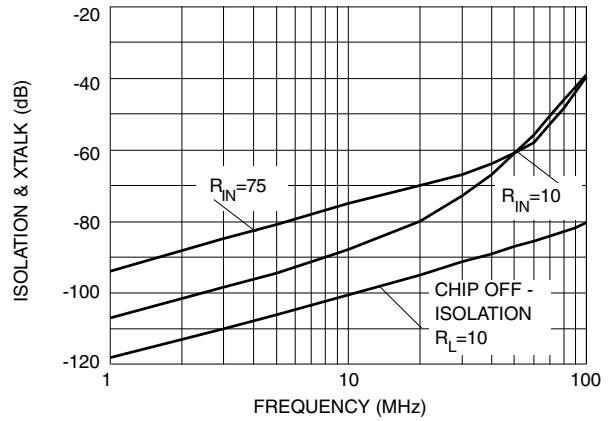
Fig. 1 Flattened Frequency Response

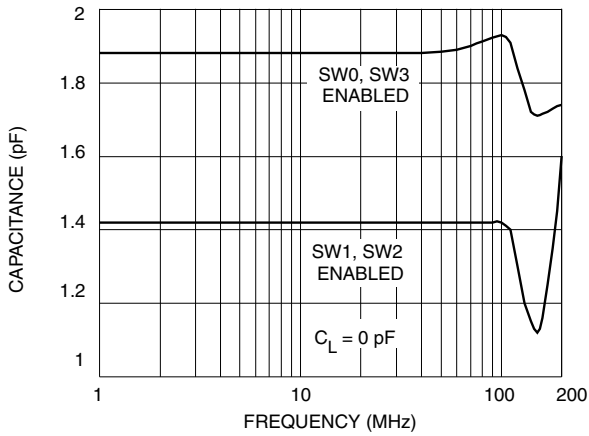Fig. 2 All Hostile Crosstalk & Isolation
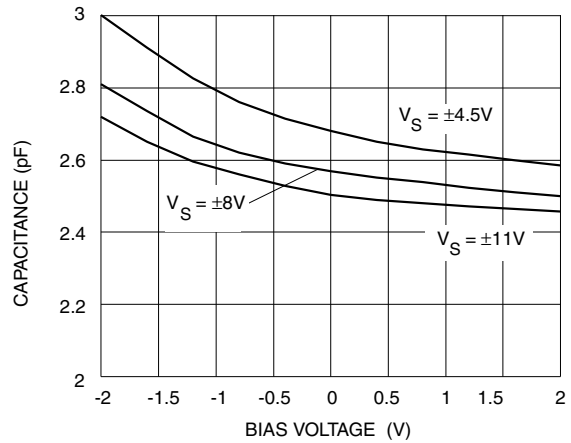
Fig. 3   Input Capacitance
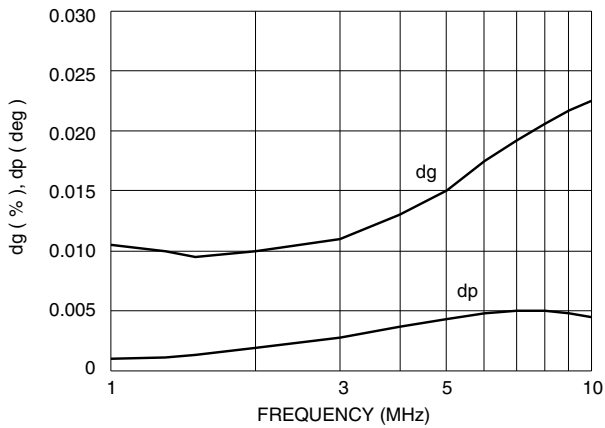
Fig. 4   Output Capacitance
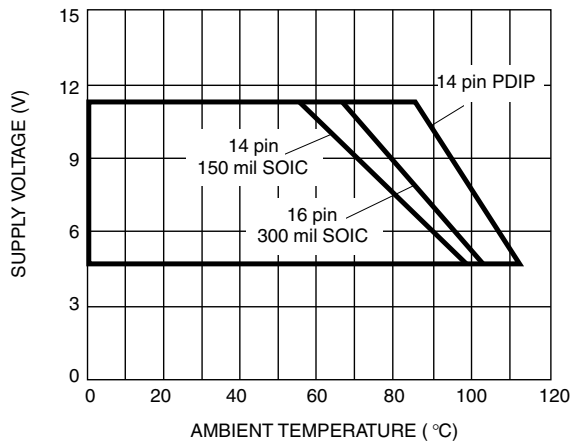
Fig. 5   Differential Gain & Phase

Fig. 6   Safe Operating Area for GX4314
(All packages)

NOTE: Curves are based on 25 mA max. supply current
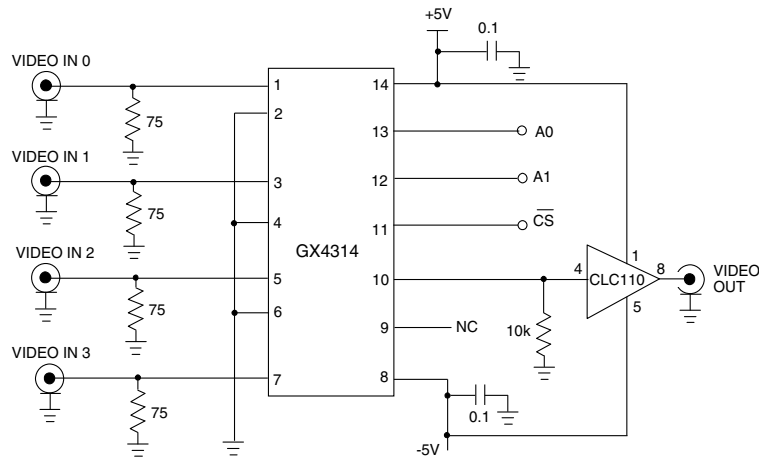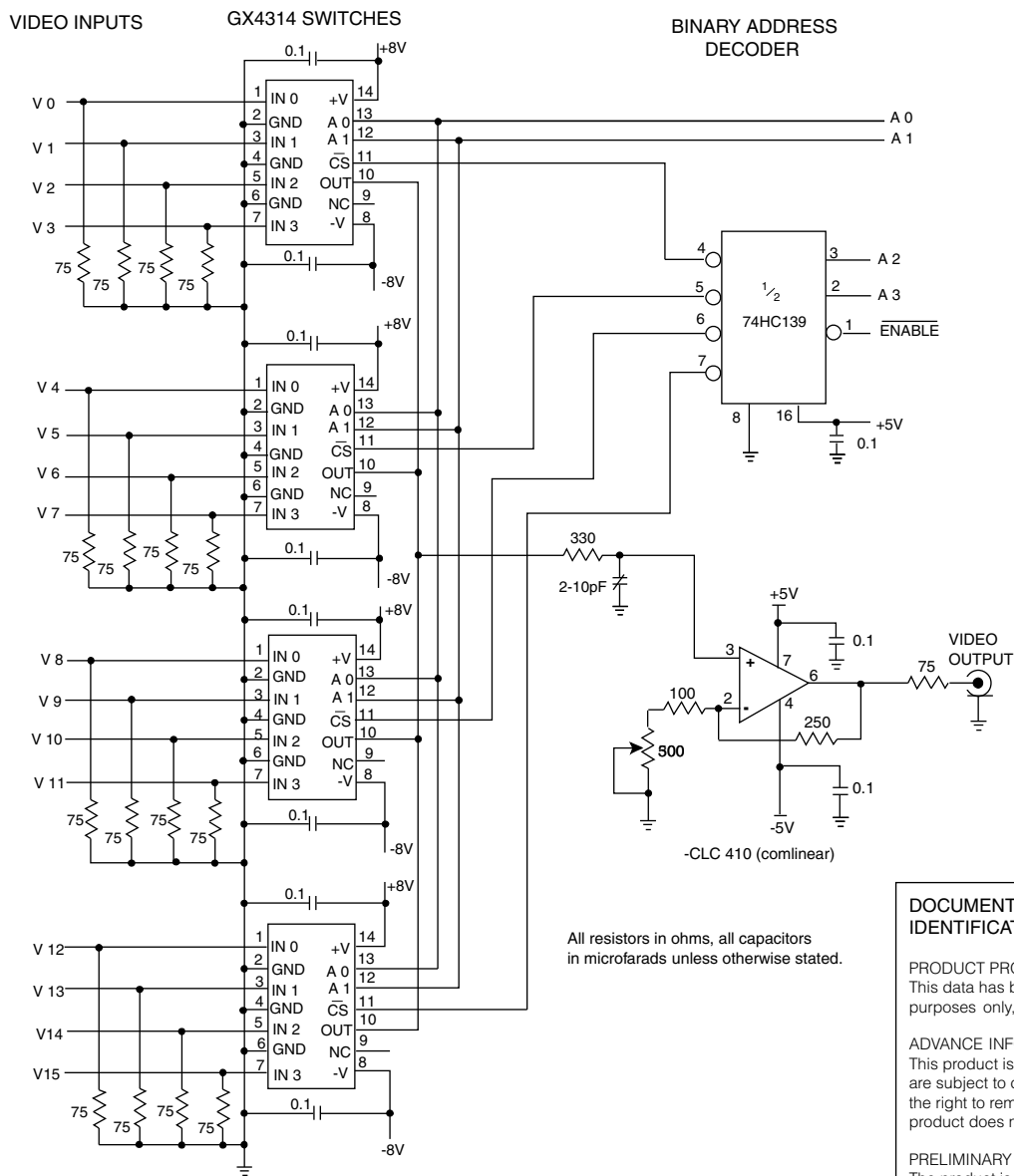and 130°C max. junction temperature.

Fig. 7   Test Circuit

Fig. 8   16 x 1 Video Multiplexer Circuit

All resistors in ohms, all capacitors
in microfarads unless otherwise stated.