FEATURES

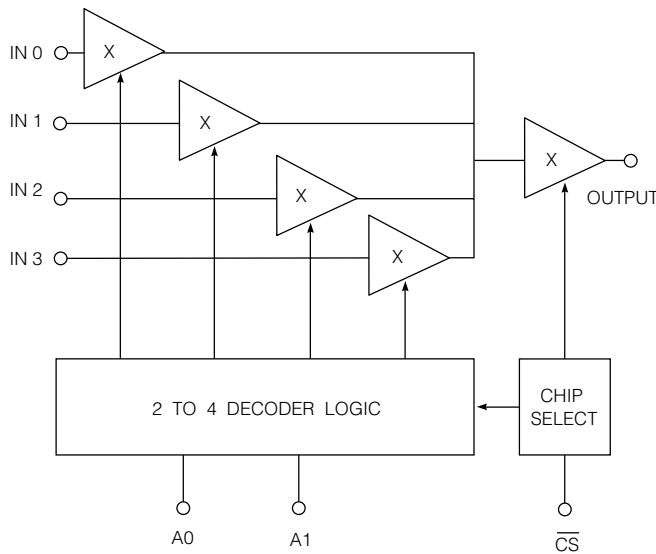- **low power; 12 mA ON current at ±5 volts**

- **low differential gain and phase**

- **wide bandwidth; 100 MHz at -1 dB**

- **±4.5 to ±11 volt power supplies**

- **available in 14 pin PDIP as well as 14 and 16 pin SOIC packaging**

- **identical functions and pin outs to GX4314 with lower power**

FUNCTIONAL BLOCK DIAGRAM

DESCRIPTION

The GX4314L is a low power, wideband video multiplexer implemented in bipolar technology. This device is characterized by excellent differential gain and phase in the enabled state, very high off-isolation in the disabled state and a fully buffered, unilateral signal path.

Make-before-break switching assures virtually glitch-free switching. The GX4314L 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 5 V CMOS compatible, providing address and chip select functions. The operation of the device is described in the Truth Table below.

The GX4314L offers pin for pin compatibility with Gennum's other 4x1 multipliers such as GX414, GX414A and GX434 with greatly improved bandwidth and slew rate. Since the GX4314L is capable of operation at ±5 V supplies, system power can be reduced.

Typically, the ON current is only 12 mA while the chip disabled current drops to less than 260 µA. This feature allows the use of many devices in high density situations without excessive power dissipation.

APPLICATIONS

- Multimedia

- Computer graphics.

- Very high density video switching.

- PCM / data routing.

TRUTH TABLE

$\overline{CS}$	A1	A0	Output
0	0	0	Input 0
0	0	1	Input 1
0	1	0	Input 2
0	1	1	Input 3
1	X	X	High - Z

X = don't care

ORDERING INFORMATION

Part Number	Package Type	Temperature Range
GX4314LCDB	14 pin PDIP	0ºC to 70ºC
GX4314LCKB	14 pin SOIC	0ºC to 70ºC
GX4314LCKC	16 pin SOIC	0ºC to 70ºC
GX4314LCTC	Tape16 pin SOIC	0ºC to 70ºC

ABSOLUTE MAXIMUM RATINGS

Parameter	Value
Supply Voltage	±13.5V
Operating Temperature Range	$0°C \leq T_A \leq 70°C$
Storage Temperature Range	$-65°C \leq T_S \leq 150°C$
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	$-0.5V \leq V_L \leq +5.5V$

PIN CONNECTIONS

GX4314L

14 PIN DIP &
14 PIN NARROW
SOIC

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

16 PIN WIDE SOIC

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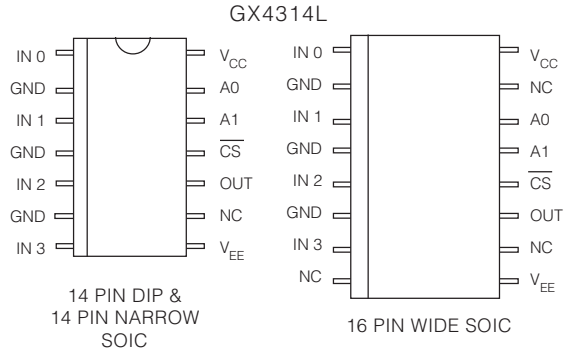
ELECTRICAL CHARACTERISTICS

$V_S = \pm 8$ V DC, $0°C \leq T_A \leq 70°C$, $R_L = 10k\Omega$, $C_L = 30$ pF, unless otherwise shown

	PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
DC SUPPLY	Supply Voltage	$\pm V_S$	Operating Range		±4.5	-	±11	V
	Supply Current	I^+	$\overline{CS} = 0$		-	12	15	mA
		I^-	$\overline{CS} = 0$		-	12	15	mA
		I^+	$\overline{CS} = 1$		-	270	350	µA
		I^-	$\overline{CS} = 1$		-	350	600	µA
STATIC	Analog Output Voltage Swing	V_{OUT}	Extremes before clipping occurs		-2.4	-	+3.6	V
	Analog Input Bias Current	I_{BIAS}			-	5	-	µA
	Output Offset Voltage	V_{OS}	$T_A = 25°C$		-10	-3	+4	mV
	Output Offset Voltage Drift	ΔV_{OS}			-	15	60	µV/°C
LOGIC	Chip Enable Time	t_{ON}	Enable input to appearance of signal		-	350	500	ns
	Chip Disable Time	t_{OFF}	Enable input to disappearance of signal at output.		0.6	1.0	-	µs
	Logic Input Thresholds	V_{IH}	$V_{IH} = 1$		2.0	-	-	V
		V_{IL}	$V_{IL} = 0$		-	-	0.8	V
	Logic Input Current	I_L			-	-	4	µA
DYNAMIC	Insertion Loss	I.L.	1V p-p sine or sq. wave at 100 kHz		0.035	0.047	0.060	dB
	Bandwidth (-3dB)	B.W.	Small signal $C_L = 0$ pF		-	200	-	MHz
	Frequency Response		At -1 dB flattened, $R_S = 27\Omega$		100	-	-	MHz
	Input Resistance	R_{IN}	Chip enabled		1.0	-	-	MΩ
	Input Capacitance	C_{IN}	Chip enabled		-	1.5	-	pF
	Output Resistance	R_{OUT}	Chip enabled		-	18	-	Ω
	Output Capacitance	C_{OUT}	Chip enabled		-	-	5	pF
	Differential Gain	dg	At 3.58 MHz		-	-	0.03	%
	Differential Phase	dp	At 3.58 MHz		-	-	0.02	deg
	All Hostile Crosstalk	$XTLK_{AH}$	30 MHz $R_{IN} = 10\Omega$		70	-	-	dB
	Chip Disabled Crosstalk	$XTLK_{CD}$	At 100 MHz		-	80	-	dB
	Slew Rate	+SR	$V_{IN} = 1V$ p-p ($C_L = 10$ pF)		600	900	-	V/µs
		-SR	$V_{IN} = 1V$ p-p ($C_L = 10$ pF)		225	300	-	V/µs
	Gain Spread at 30 MHz	ΔA_V			-	-	±0.05	dB
	Crosspoint Scatter		$R_S = 75 \Omega$	$T_A = 25°C$	-	-	±0.15	deg
			$f = 3.58$ MHz	$0°C < T_A < 70°C$	-	-	±0.25	deg

TYPICAL PERFORMANCE CURVES FOR GX4314L

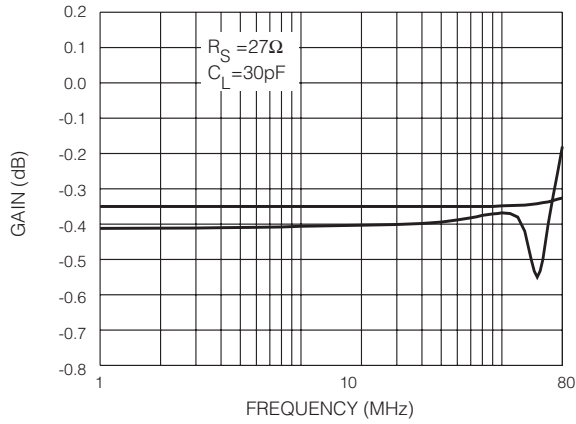(V$_S$ = ±5V DC, T$_A$ ≤ 25°C, C$_L$ = 30 pF, unless otherwise shown.)
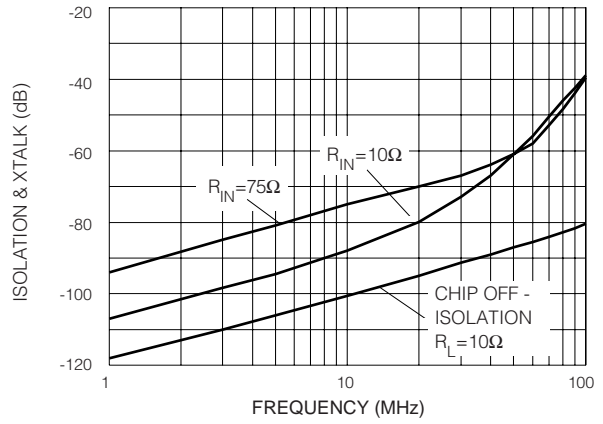
Fig. 1   Flattened Frequency Response
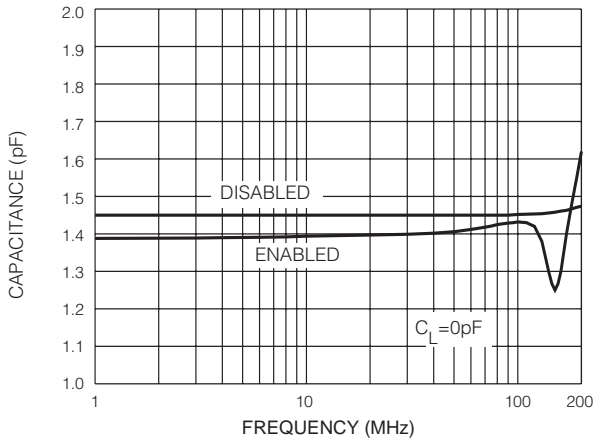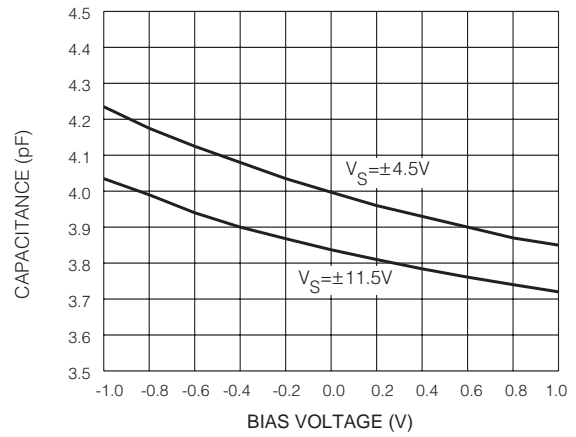
Fig. 2   All Hostile Crosstalk & Isolation

Fig. 3   Input Capacitance

Fig. 4   Output Capacitance
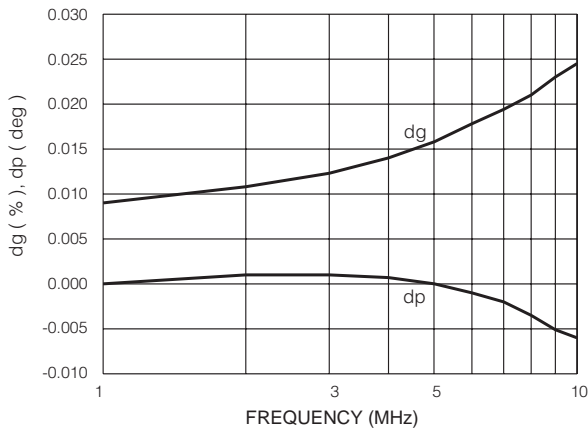
Fig. 5   Differential Gain & Phase

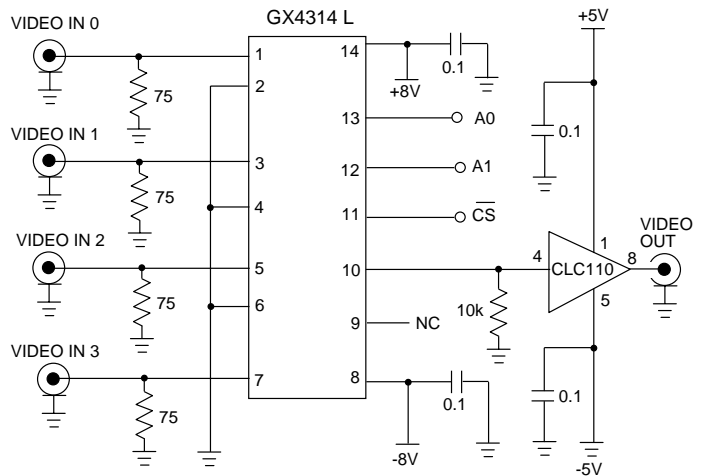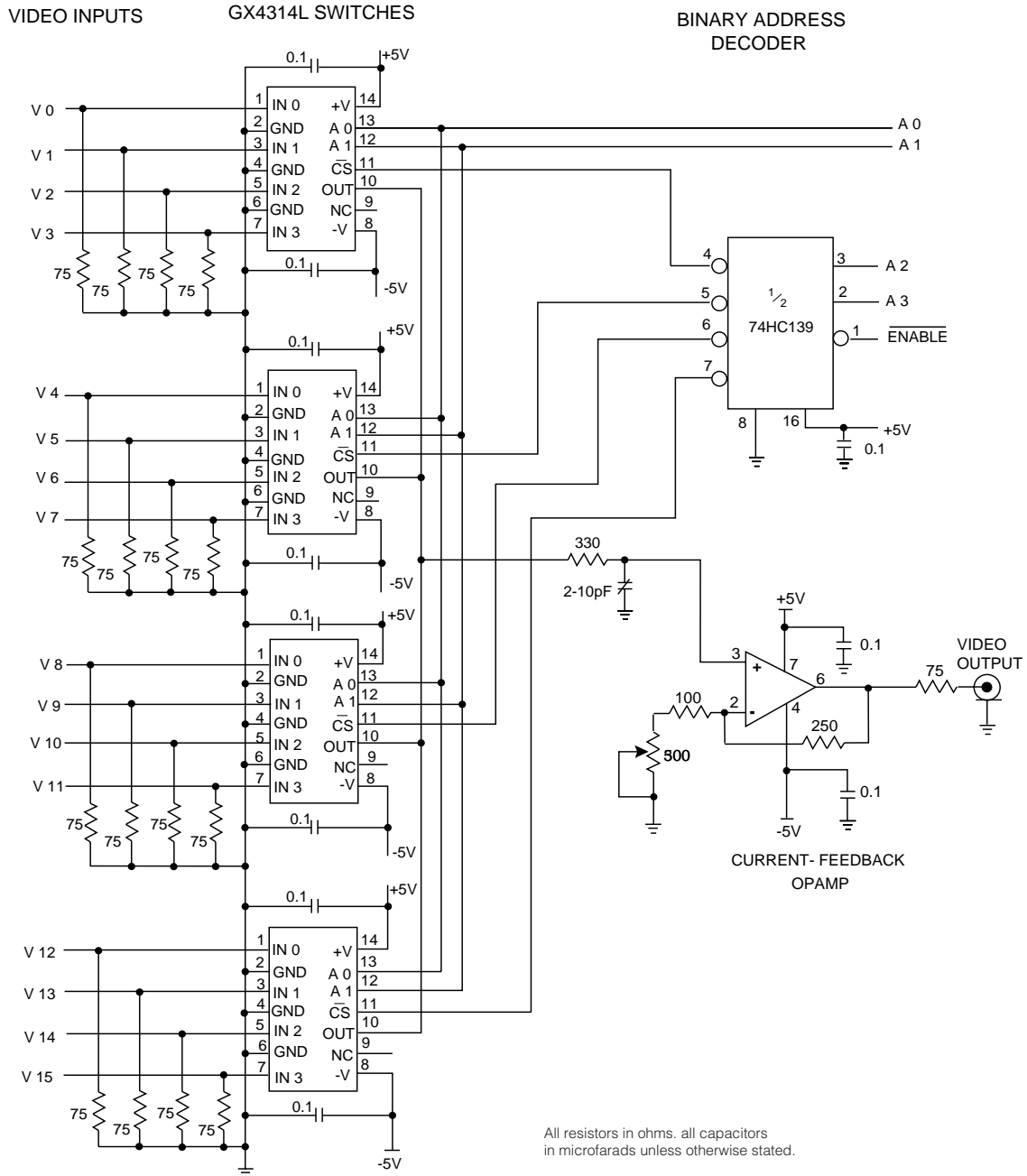Fig. 6   Test Circuit

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

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VIDEO INPUTS   GX4314L SWITCHES   BINARY ADDRESS DECODER

0.1   +5V

V 0   1 IN 0   +V 14
2 GND   A 0 13 — A 0
V 1   3 IN 1   A 1 12 — A 1
4 GND   CS 11
V 2   5 IN 2   OUT 10
6 GND   NC 9
V 3   7 IN 3   -V 8
0.1
75 75 75 75   -5V

0.1   +5V

V 4   1 IN 0   +V 14
2 GND   A 0 13
V 5   3 IN 1   A 1 12
4 GND   CS 11
V 6   5 IN 2   OUT 10
6 GND   NC 9
V 7   7 IN 3   -V 8
0.1
75 75 75 75   -5V

0.1   +5V

V 8   1 IN 0   +V 14
2 GND   A 0 13
V 9   3 IN 1   A 1 12
4 GND   CS 11
V 10   5 IN 2   OUT 10
6 GND   NC 9
V 11   7 IN 3   -V 8
0.1
75 75 75 75   -5V

0.1   +5V

V 12   1 IN 0   +V 14
2 GND   A 0 13
V 13   3 IN 1   A 1 12
4 GND   CS 11
V 14   5 IN 2   OUT 10
6 GND   NC 9
V 15   7 IN 3   -V 8
0.1
75 75 75 75   -5V

4   3 — A 2
5   1/2   2 — A 3
6   74HC139   1 — ENABLE
7
8   16   +5V
0.1

330
2-10pF

+5V
3 +   7
0.1
2 -   6   75   VIDEO OUTPUT
100   4
500   250
0.1
-5V

CURRENT- FEEDBACK OPAMP

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

Fig. 7   16 x 1 Video Multiplexer Circuit

DOCUMENT IDENTIFICATION

PRODUCT PROPOSAL
This data has been compiled for market investigation purposes
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ADVANCE INFORMATION NOTE
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subject to change without notice. Gennum reserves the right to
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DATA SHEET
The product is in production. Gennum reserves the right to make
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