4:1 high speed analog switch

Target product data – July 2001

ZXFV302

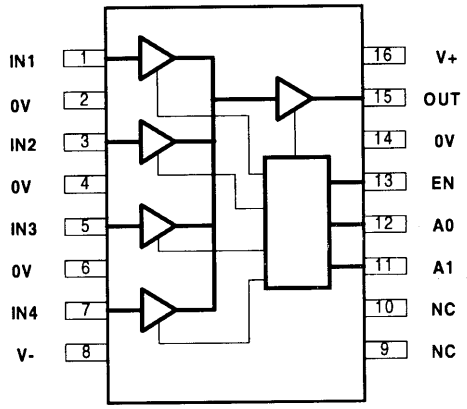
Device Description

The ZXFV302 is a 4:1 high-speed analog switch designed for use as a buffered video multiplexer and other high-speed applications.

It features low differential gain and phase distortion. The high speed high output current capability provides 75 ohm cable drive for use in high performance video applications.

The input channel is selected by means of two logic lines using an internal decoder. An output enable line allows expansion to eight channels using two devices ZXFV302 as shown in the example application below.

Connection diagram



ZXFV302

Features and Benefits

- **3dB Bandwidth 240MHz**
- **Slew rate 450V/µs**
- **Differential gain 0.01%**
- **Differential phase 0.04º**
- **Output current 40mA**
- **Characterised up to 400pF load**
- **±5 Volt supply**
- **Supply current 15mA**
- **16 pin SO package**

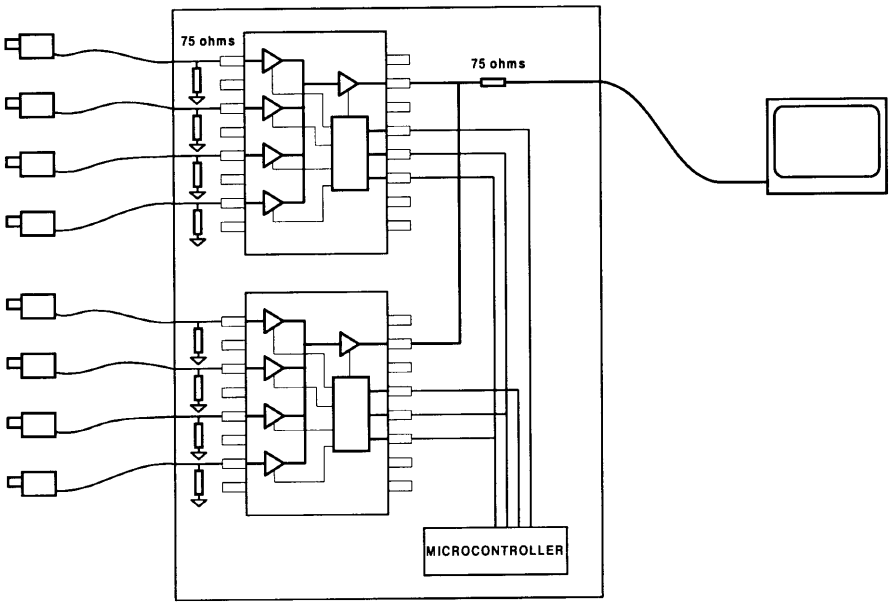
Applications

- **Video routing and switching**
- **CCTV switching**
- **Video distribution selection**
- **RGB multiplexing**
- **High frequency instrumentation**
- **Data acquisition**

Ordering information

Part Number	Container	Increment
ZXFV302N16TA	Reel 7"	500
ZXFV302N16TC	Reel 13"	2500

TYPICAL APPLICATION FOR 8 CHANNEL CCTV



ABSOLUTE MAXIMUM RATINGS

Supply Voltage Vcc	-0.5V to +6V
Supply Voltage Vee	-6V to +0.5V
Analog inputs to ground*	Vee-0.5V to Vcc+0.5V
Digital inputs to ground*	-0.5V to Vcc+0.5V
Outputs to ground*	Vee-0.5V to Vcc+0.5V
Operating Temperature Range	-40°C to 85°C Storage –65°C to 150°C
Operating Junction temperature T_{JMAX}	150°C**

**The thermal resistance from the semiconductor die to ambient is typically 120°C/W when the SO16 package is mounted on a PCB in free air. The power dissipation of the device when loaded must be designed to keep the device junction temperature below 150°C.

*During power-up and power-down, these voltage ratings require an appropriate sequence of applying and removing signals and power supplies.

ELECTRICAL CHARACTERISTICS

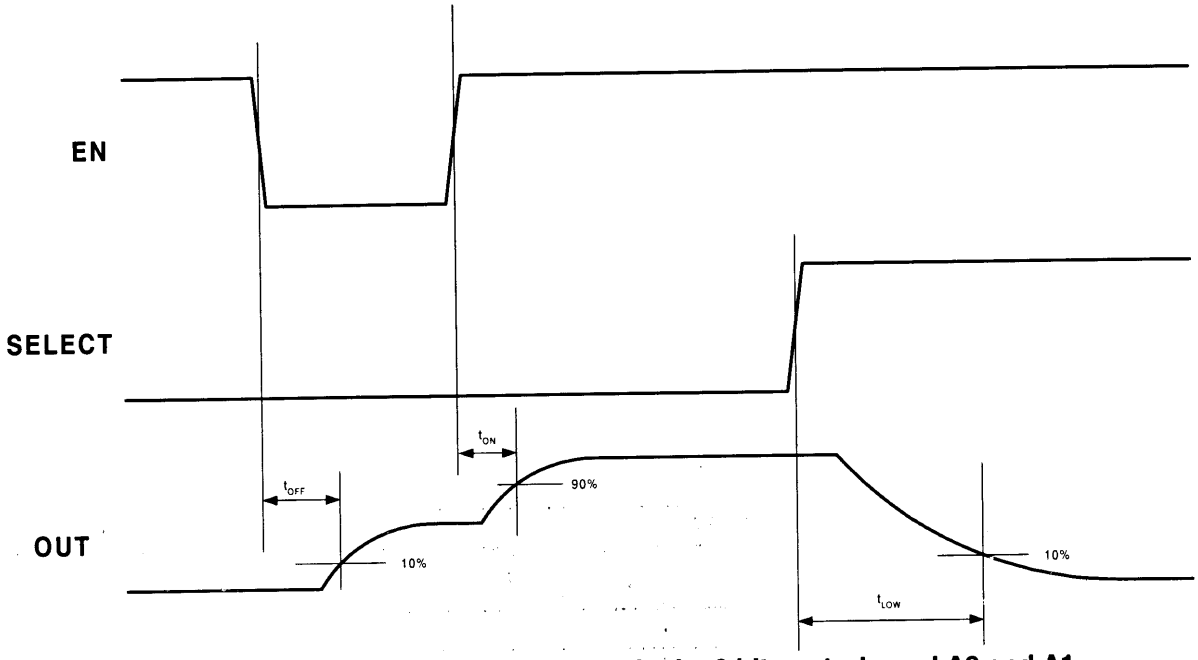
Vcc=±5V, Tamb= 25°C unless otherwise stated. R_L = 150Ω, C_L= 10pF
Characteristics apply to channel selected, and EN input HIGH unless otherwise stated

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage V+		4.75	5	5.25	V
Supply Voltage V-		-5.25	-5	-4.75	V
Positive supply current			15		mA
Negative supply current			12		mA
Voltage gain		0.970	1.000	1.03	V/V
Input Common mode Voltage			±3		V
Input resistance			45		Kohm
Output offset voltage	All channels held at 0V		10		mV
Input bias current	Active channel held at 0V		+8		μA
Output voltage swing			±3		V
Output drive current			40		mA
Output resistance				1	ohm
Output resistance	Disabled (EN low)		27		Kohm
Positive PSRR			-51		dB
Negative PSRR			-54		dB
Small signal bandwidth			240		MHz
Slew rate			450		V/μs
Logic input HIGH V_{Hmin}				2	V
Logic input LOW V_{Lmax}		0.8			V
t_{ON}	Vout = ±2 V, see timing diagram	25	35	45	ns
t_{OFF}	Vout = ±2 V, see timing diagram	7	10	15	ns
t_{LOW}	Vout = ±2 V, see timing diagram	35	50	70	ns
t_{HIGH}	Vout = ±2 V, see timing diagram	35	45	60	ns
Cross-talk			60		dB
Differential Gain			0.01		%
Differential Phase			0.04		deg
Switching transients, magnitude	All channels held at 0V		50		mV
Switching transients, duration	All channels held at 0V		25		ns

Truth table for selection of input channel

A1	A0	EN	OUT
X	X	0	Hi Z
0	0	1	IN 1
0	1	1	IN 2
1	0	1	IN 3
1	1	1	IN 4

TIMING DIAGRAM



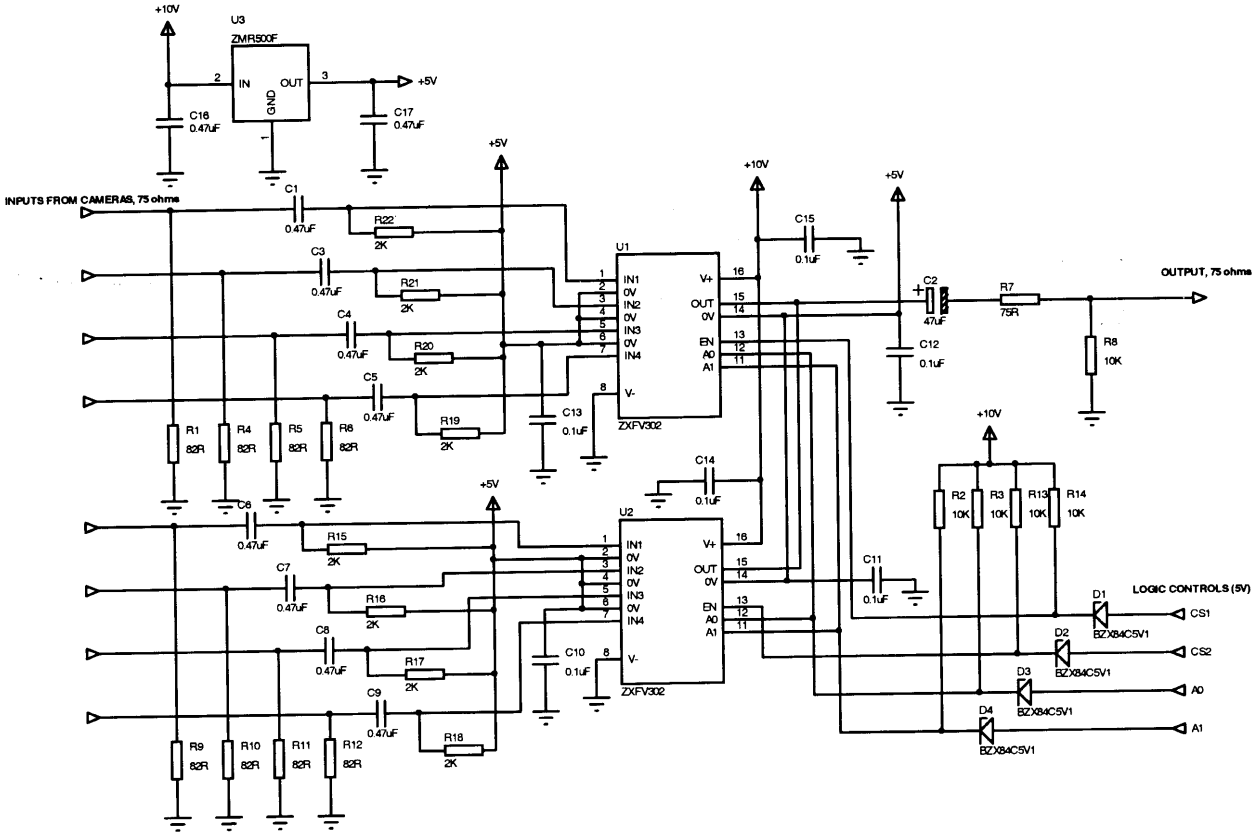
Notes: The 'select' waveform represents a change in the 2 bit control word A0 and A1. t_{HIGH} is equivalent to t_{LOW} but, applies for a positive going transition of OUT.

GRAPHS OF TYPICAL CHARACTERISTICS - To be included in a later issue

Selected channel frequency response. RL = 150 ohm CL = 10pF Vin = 20mV, 370mV, 700mV, 1V	**Selected channel frequency response** RL = 150 ohm CL = 100pF Vin = 20mV, 370mV, 700mV, 1V
Selected channel frequency response. RL = 150 ohm CL = 300pF Vin = 20mV, 370mV, 700mV, 1V	

Channel small signal pulse response. RL = 150 ohm CL = 10pF Vin = 50mV	**Large signal pulse response** RL = 150 ohm CL = 10pF Vin = 2V
Differential Gain RL = 150 ohm CL = 10pF Vin = 50mV	**Differential Phase** RL = 150 ohm CL = 10pF Vin = 50mV

Application Circuit: operation from single supply



SO16 package drawing to be included in a later issue	**SO16 package dimensions** Body 9.9mm x 3.9 mm lead pitch 1.27 mm (0.05")

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