Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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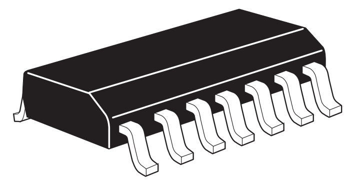
QUAD AND TRIPLE VIDEO AMPLIFIER

Device description

The ZXFV201/203 are quad and triple, high speed amplifiers designed for video and other high speed applications.

They feature low differential gain and phase performance. Together with high output drive and slew rate capability, this brings high performance to video applications.

The ZXFV203 is ideal for RGB buffer applications, with the ZXFV201 ideal for RGSB applications.



Features and benefits

- Unity gain bandwidth 300MHz
- Slew rate 400V/µs
- Differential gain 0.01%
- Differential phase 0.01°
- Output current 40mA
- Characterized up to 300pF load
- ±5 Volt supply
- Supply current 7mA per amplifier
- 14 pin SO package

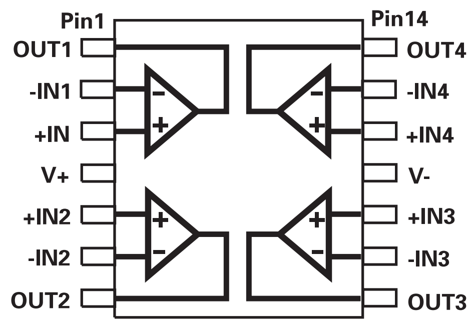
Applications

- Video gain stages
- CCTV buffer
- Video distribution
- RGB buffering
- Home theatre
- Fast ADC signal input drive
- Cable driving

Ordering Information

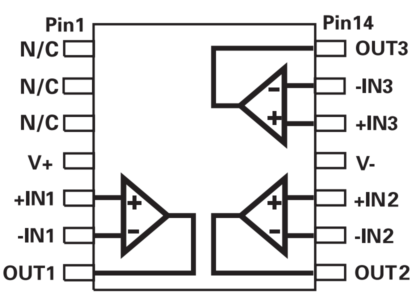
Part number	Container	Increment
ZXFV201N14TA	reel 7”	500
ZXFV201N14TC	reel 13”	2500
ZXFV203N14TA	reel 7”	500

Connection diagram



ZXFV201

Connection diagram



ZXFV203

ABSOLUTE MAXIMUM RATINGS Over Operating Free-Air Temperature (Unless Otherwise Stated [1]

Supply voltage, V+ to V-	**-0.5V to +11V**
Input voltage (V_{-IN}, V_{+IN})*	**V_- -0.5V to V_+ +0.5V**
Differential input voltage, VID	**±3V**
Inverting input current (I-IN) [2]	**±5 mA**
Output current, (continuous, T_J < 110°C)	**±60 mA**
Internal power dissipation	**See power dissipation derating table**
Operating free air temperature range, T_A	**-40 to 85°C**
Storage temperature range	**-65°C to +150°C**
Operating ambient junction temperature T_{JMAX}	**150°C**

Notes:

(1) Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(2) At high closed loop gains and low gain setting resistors care must be taken if large input signals are applied to the device which cause the output stage to saturate for extended periods of time.

(3) The power dissipation of the device when loaded must be designed to keep the device junction temperature below T_{JMAX}.

Package	Theta-ja	Power rating at 25°C
SO14	120°C/W	1.04W

*During power-up and power-down, these voltage ratings require that signals be applied only when the power supply is connected.

ESD: This device is sensitive to static discharge and proper handling precautions are required.

ELECTRICAL CHARACTERISTICS

±5V power supplies, T_{amb}= 25°C unless otherwise stated. R_f = 1kΩ, R_L = 150Ω, $C_L \leqslant$ = 10pF

PARAMETER	CONDITIONS	TEST	MIN	TYP	MAX	UNIT
Supply voltage V+ operating range			4.75	5	5.25	V
Supply voltage V- operating range			-5.25	-5	-4.75	V
Supply current/per channel		P	5.0	7.5	10	mA
Input common mode voltage range		P		±3		V
Input offset voltage		P		1	10	mV
Output offset voltage		P		2	20	mV
Input bias current, non-inverting input		P		5	10	µA
Input resistance		P	1.5	2	6.5	MΩ
Output voltage swing	I_{OUT} = 40mA	P		±3		V
Output drive current	V_{IN} = 3V	P	40			mA
Positive PSRR	ΔV+ = ±0.25	P	49	57		dB
Negative PSRR	ΔV- = ±0.25	P	49	57		dB
Bandwidth –3dB	Av= +1, Vout = 200mV pk-pk	C		300		MHz
Bandwidth –0.1dB	Av= +1, Vout = 200mV pk-pk	C		30		MHz
Slew rate	Av= +1 Av = +2 Av = +10	C		400 400 400		V/µs
Rise time	V_{OUT} = ±1 V, 10% - 90%	C		4.0		ns
Fall time	V_{OUT} = ±1 V, 10% - 90%	C		3.2		ns
Propagation delay	V_{OUT} = ±2 V, 50%	C		4.0		ns
Differential gain	3.58MHz (NTSC) and 4.43MHz (PAL) DC = -714 to +714 mV, 280mVpp	C		0.02		%
Differential phase		C		0.02		deg

Test – P = production tested. C = characterised

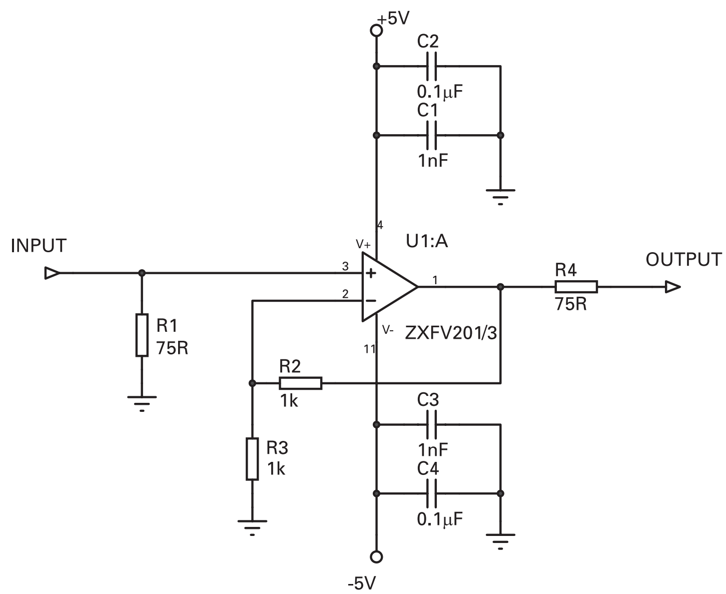


Figure 1: Typical video signal application circuit, gain = 2 (overall gain = 1 for 75Ω load)

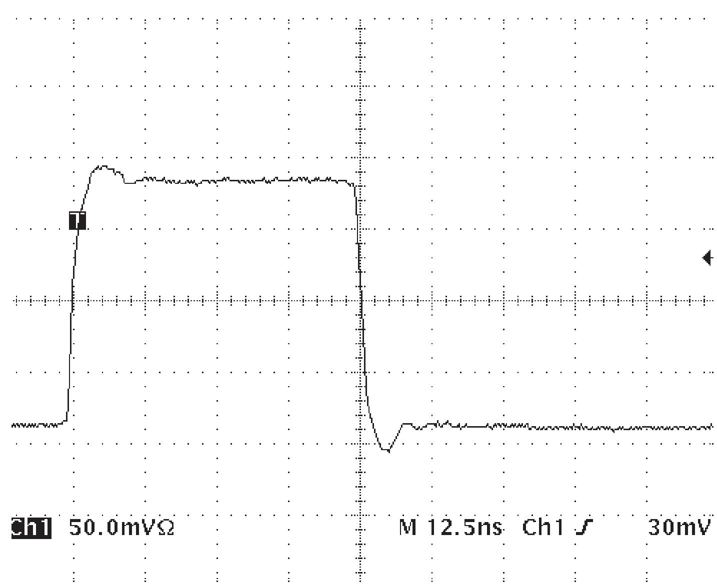


Figure 2: Pulse response, unity gain, 1V pk-pk, R_F = 510Ω

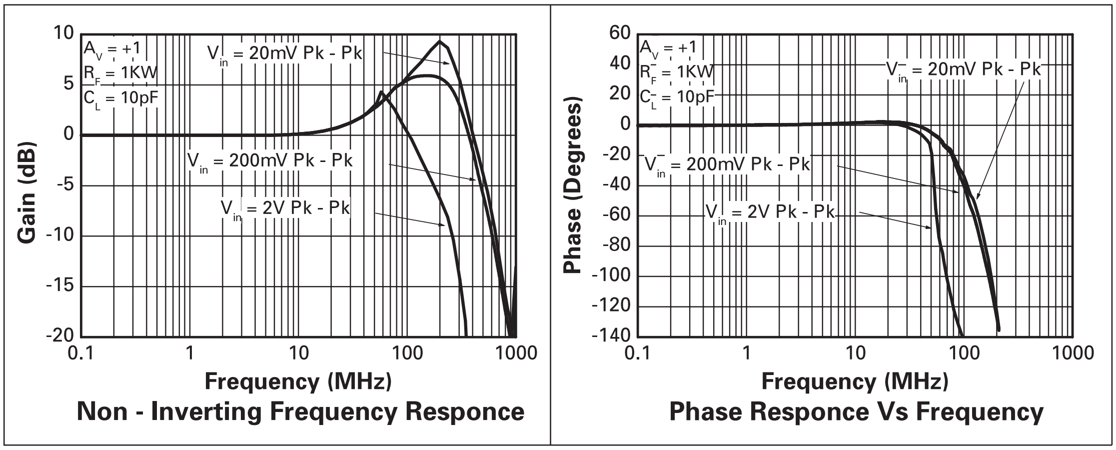


Figure 3: Graphs of gain and phase vs frequncy (R_L=150Ω)

APPLICATIONS INFORMATION

Introduction

A typical circuit application is shown in Figure 1, above. This is suitable for 75Ω transmission line connections at both the input and the output and is useful for distribution of wide-band signals such as video via cables. The 75Ω reverse terminating resistor R4 gives the correct matching condition to a terminated video cable. The amplifier load is then 150Ω in parallel with the local feedback network.

The wide bandwidth of this device necessitates some care in the layout of the printed circuit. A continuous ground plane is required under the device and its signal connection paths, to provide the shortest possible ground return paths for signals and power supply filtering. A double-sided or multi-layer PCB construction is required, with plated-through via holes providing closely spaced low-inductance connections from some components to the continuous ground plane.

For the power supply filtering, low inductance surface mount capacitors are normally required. It has been found that very good RF decoupling is provided on each supply using a 1000pF NPO size 0805 or smaller ceramic surface mount capacitor, closest to the device pin, with an adjacent 0.1uF X7R capacitor. Other configurations are possible and it may be found that a single 0.01uF X7R capacitor on each supply gives good results. However this should be supported by larger decoupling capacitors elsewhere on the printed circuit board. Values of 1 to 10µF are recommended, particularly where the voltage regulators are located more than a few inches from the device. These larger capacitors are recommended to be solid tantalum electrolytic or ceramic types.

Note particularly that the inverting input of this current feedback type of amplifier is sensitive to small amounts of capacitance to ground which occur as part of the practical circuit board layout. This capacitance affects bandwidth, frequency response peaking and pulse overshoot. Therefore to minimise this capacitance, the feedback components R2 and R3 of Figure1 should be positioned as close as possible to the inverting input connection.

The frequency response and pulse response will vary according to particular values of resistors and layout capacitance. The response can be tailored for the application to some extent by choice of the value of feedback resistor. Figure 2 shows an oscilloscope display of the pulse response for a practical double sided printed circuit board where RF = 510Ω.

Notes

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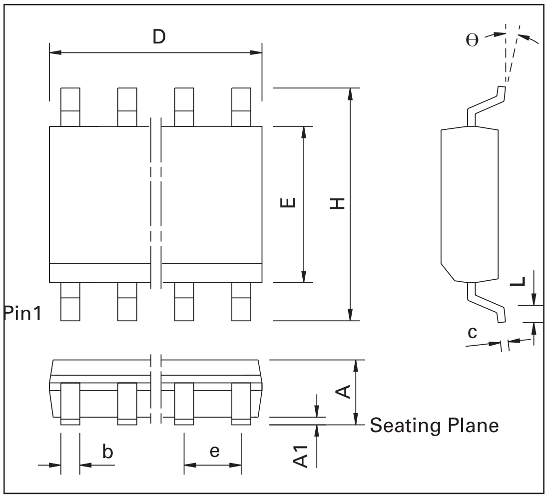
Notes

ZXFV201, ZXFV203

PACKAGE OUTLINE



PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.35	1.75	0.053	0.069	E	3.80	4.00	0.15	0.157
A1	0.10	0.25	0.004	0.01	H	5.80	6.20	0.228	0.244
b	0.33	0.51	0.013	0.020	L	0.40	1.27	0.016	0.05
c	0.19	0.25	0.008	0.010	θ	0°	8°	0°	8°
D	8.55	8.75	0.337	0.344	-	-	-	-	-
e	1.27 BSC		0.05 BSC		-	-	-	-	-

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