

ZXFV302EV

4:1 CHANNEL VIDEO MULTIPLEXER EVALUATION BOARD

Evaluation board description

The wide bandwidth of the ZXFV302 4:1 channel video multiplexer necessitates some care in the layout of the printed circuit. For this reason Zetex has made available an Evaluation Board.

The Evaluation Board layout serves as a useful example for many applications, showing a practical implementation of the advice given below.

The ZXFV302EV can also be used to evaluate the ZXFV301 4:1 channel multiplexer. The ZXFV301 and ZXFV302 devices have very similar ac performance, with the only difference being in the active channel selection.

Figures 1, 2 and 3 show the schematic and copper layout of a double-sided printed circuit board suitable for evaluation of the device in the laboratory.

BNC connector sockets allow connection to test instruments via 50Ω cables. The output circuit includes a resistor matching circuit to present a load of 150Ω to the amplifier (equivalent to a 75Ω back-terminated video line) and simultaneously provide 50Ω output impedance.

The attenuation of this matching circuit is 15.45 dB. As the multiplexer is internally configured for a voltage gain of 1, the overall gain from input to output is -15.45dB.

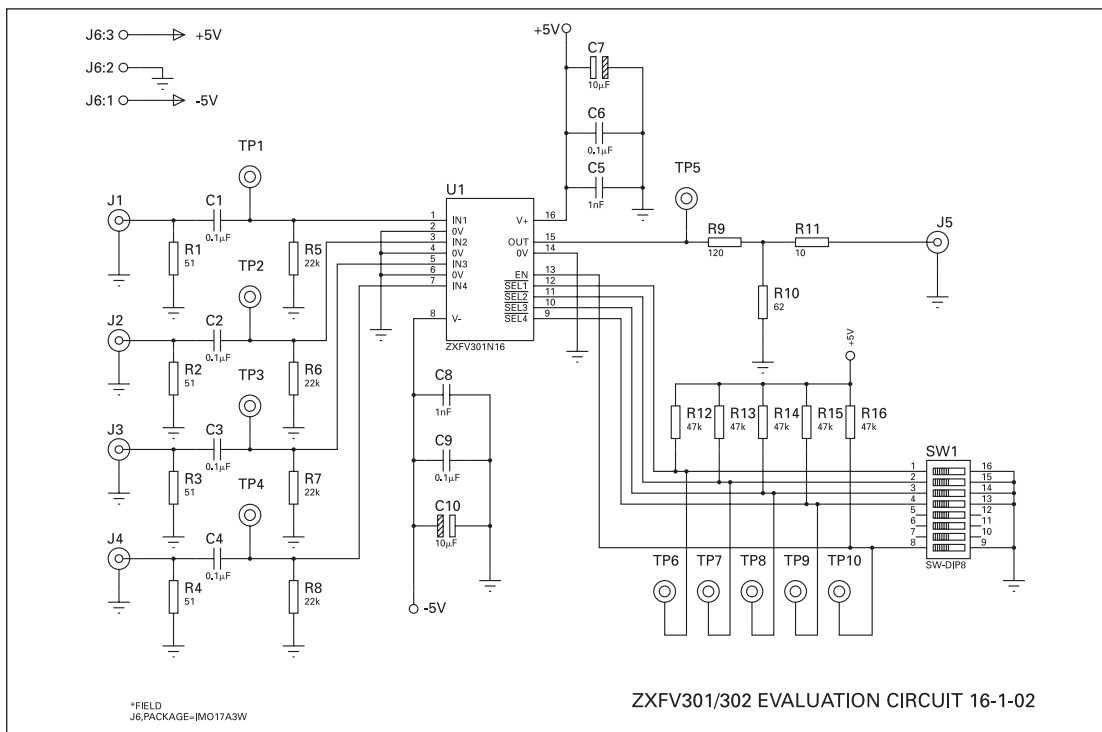


Figure 1 Circuit schematic

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PCB design

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 (some of these holes are not visible in the figures for the Evaluation Board –artworks and NC drill output can be provided if required).

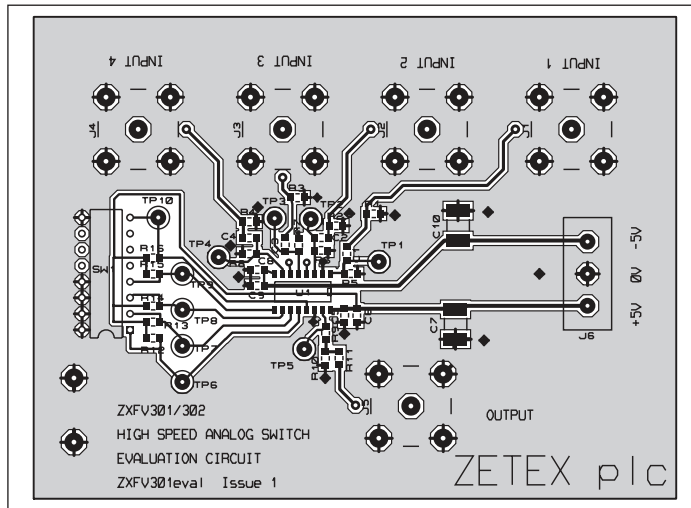


Figure 2 Evaluation circuit top copper layout
(overall dimensions 2.5 x 2.25 inches)

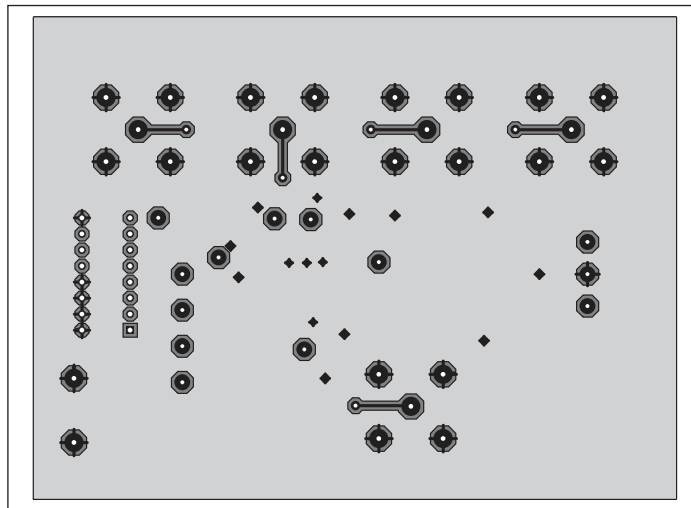


Figure 3 Evaluation board bottom copper layout
(viewed through from top)

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Power supply filtering

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 0.1µF X7R capacitor. Other configurations are possible and it may be found that a single 0.01µF 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.

Evaluation board parts list

| QTY | CCT - REF | VALUE | DESCRIPTION |
|----------------------------------|-------------|--|----------------------|
| Resistors, surface mount | | | |
| 1 | R1, | 51R | 0805 |
| 2 | R2,R3 | 1kΩ | 0805 |
| 1 | R4 | 120R | 0805 |
| 1 | R5 | 10R | 0805 |
| 1 | R6 | 62R | 0805 |
| 4 | R1 to R4 | 51R | 0805 |
| 4 | R5 to R8 | 22kΩ | 0805 |
| 1 | R9 | 120R | 0805 |
| 1 | R10 | 62R | 0805 |
| 1 | R11 | 10R | 0805 |
| 5 | R12 - R16 | 47kΩ | 0805 |
| Capacitors, surface mount | | | |
| 2 | | 1nF | 50V ceramic 0805 NPO |
| 6 | | 100nF | 25V ceramic 0805 XR7 |
| 2 | | 10µF | 16V Tant Elec size C |
| Integrated circuits | | | |
| 1 | U1 | Zetex ZXFV302N16 | |
| Miscellaneous | | | |
| 5 | | BNC socket, PCB straight flange, e.g. Tyco B35N14H999X99 | |
| 1 | | 3-way PCB screw terminal block IMO 20.501/3SB | |
| 1 | SW1 | DIL switch, 8 way | |
| 10 | TP1 to TP10 | PCB test terminal, red, W.Hughes 100-107 | |

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