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SYNC SEPARATOR AND DC RESTORATION AMPLIFIER EVALUATION BOARD

Evaluation board description

This evaluation board has been developed to allow the user to quickly evaluate the ZXFV4583 Sync separator IC and the ZXFV4089 dc restoration video amplifier.

The evaluation board schematic diagram is shown in Figure 1, and the printed circuit layout is shown in Figures 2, 3 and 4.

The analog video source is brought onto the board via a BNC connector socket and is terminated via a 51Ω resistor. This provides matching to standard laboratory test instruments. The circuit can be easily adapted for 75Ω source impedance by changing resistor R1.

The incoming video signal is ac coupled to the ZXFV4583 via capacitor C1 and is ac coupled to the ZXFV4089 by capacitor C7.

Header PL2 in conjunction with links LK1 and LK2 allow the incoming video signal to be passed through the internal color burst filter or to bypass it.

To use the color burst filter:

Links LK1 should be connected between PL2:1 and PL2:6
Link LK2 should be connected between PL2:4 and PL2:5

To bypass the color burst filter:

Links LK1 should be connected between PL2:2 and PL2:5
Link LK2 should be connected between PL2:3 and PL2:4

Test point TP2 has been provided to monitor the output of the color burst filter.

Diagrams of this are shown on the PCB itself.

The synchronized logic outputs of the ZXFV4583 are brought to header H1 for examination using oscilloscope probes

The ZXFV4089 DC Restoration Amplifier, which is described in its own datasheet, uses the Back Porch output from the ZXFV4583 in order to control and stabilize the black level of a video waveform.

The ZXFV4089 contains an uncommitted current feedback amplifier. This evaluation board uses resistors R7 and R8 to set the gain of this amplifier. The default gain setting of the evaluation board is +2 or 6.02dB.

The output circuit includes a resistor matching circuit to present a load of 150Ω to the amplifier while simultaneously providing a 50Ω output impedance to any test instrument connected to the BNC connector. The attenuation of this matching circuit is 19.92dB. This results in an overall gain for a 50Ω system of:

$$6.02 - 19.92 = -13.9\text{dB.}$$

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.

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. However larger decoupling capacitors elsewhere on the printed circuit board, values of 1 to 10μF, are also 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.

ZXFV4583EV

Evaluation board parts list:

QTY	CCT-REF	VALUE	DESCRIPTION
Resistors, surface mount			
1	R1	51	0805
1	R2	22k	0805
1	R3	82k	0805
1	R4	681k	0805
2	R5, R12	2.2k	0805
3	R6, R7, R8	1k	0805
1	R9	130	0805
1	R10	33	0805
1	R11	24	0805
Capacitors, surface mount			
5	C1, C2, C3, C5, C6	100nF	Ceramic X7R 50V 0805
1	C4	1nF	Ceramic NPO 50V 0805
1	C7	10nF	Ceramic X7R 50V 0805
2	C8, C9	10 μ F	Tantalum elec 16V size C

QTY	CCT-REF	DESCRIPTION
Integrated circuits		
1	U1	Zetex ZXFV4583N16
1	U2	Zetex ZXFV4089N8
Miscellaneous		
2	J1,J2	BNC socket, PCB straight flange, e.g. Tyco B35N14H999X99
1	J3	3-way PCB screw terminal block IMO 20.501/3SB
1	PL1	Header 8 way single row 2.54mm, Harwin M20-9990805
1	PL2	Header 8 way double row 2.54mm, Harwin M
3	TP1, TP2, TP3	Test terminal, W. Hughes 200-207
2	LK1, LK2	Jumper link, Harwin M7567-05

ZXFV4583EV

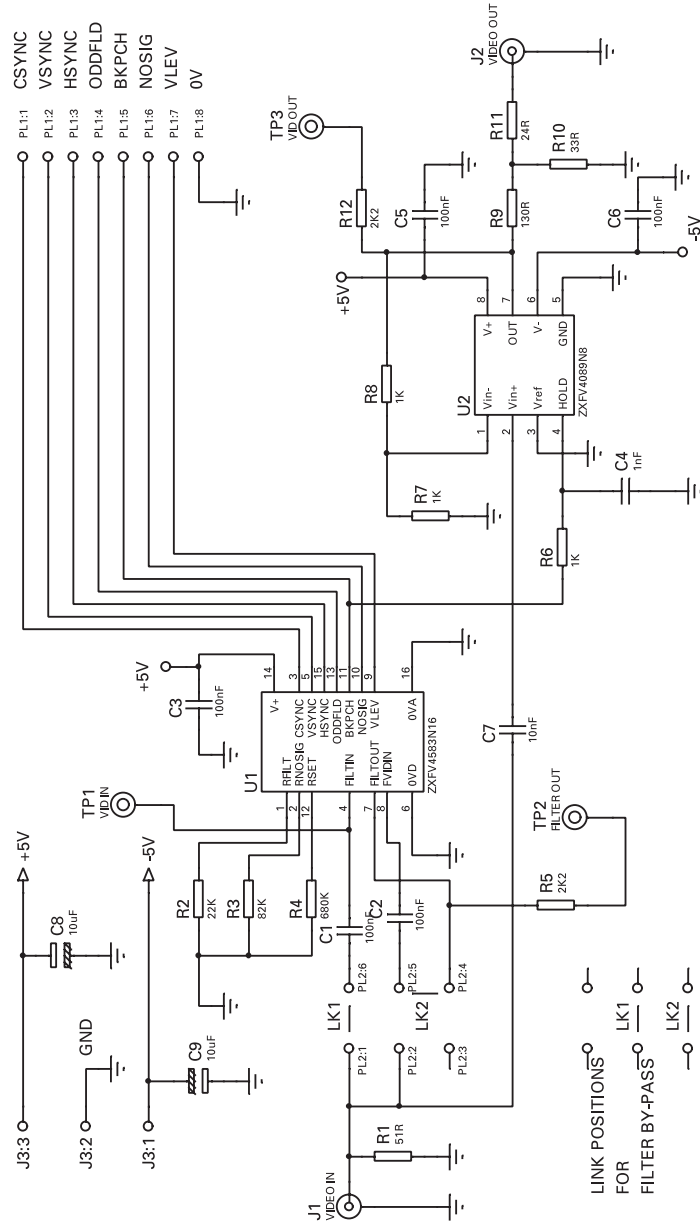


Figure 1 Circuit schematic

ZXFV4583EV

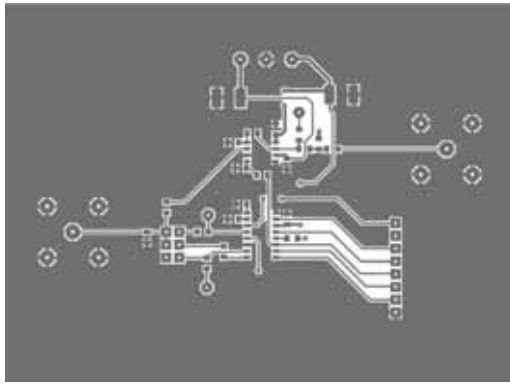


Figure 2 Evaluation circuit layout: Top side

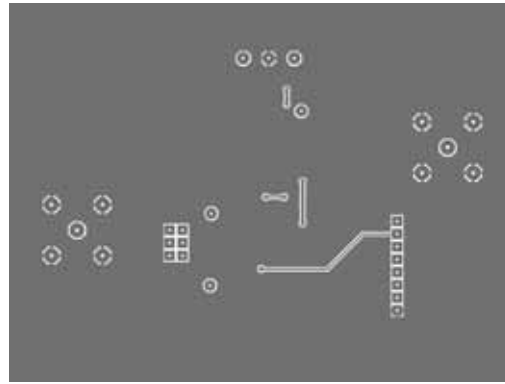


Figure 3 Evaluation circuit layout: Bottom side (viewed through board)

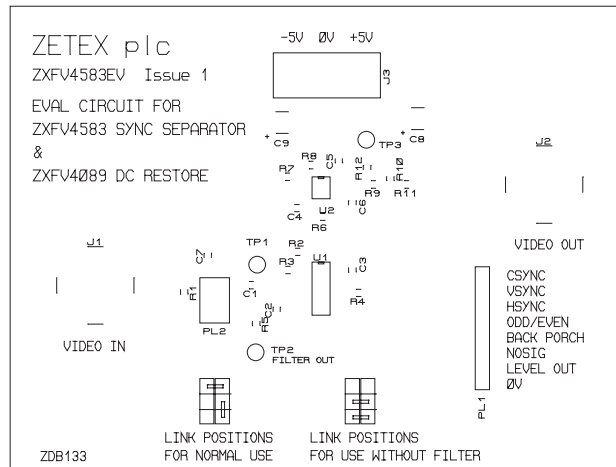


Figure 4 Evaluation circuit layout: Component layout

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