

TEA5031D

COLOR TV VIDEO PROCESSOR

- MATRIXING OF R. G. B SIGNAL FROM (R-Y) AND (B-Y)
- ELECTRONIC CONTROL OF CONTRAST, BRIGHTNESS AND SATURATION
- THREE CHANNELS VIDEO SWITCH, FOR SE-LECTION OF INTERNAL SIGNAL (broadcast) OR EXTERNAL R, G, B INFORMATION (teletext, TV games, home computer)
- AUTOMÀTIC COLOR PICTURE TUBES CUT-OFF ADJUSTMENT



Ground	f.	U	28	B-Y input
Blue output	2		27	R-Y input
Blue clamp	3		26	Saturation control
Blue feedback	4		25	Voltage ref
Green output	5		24	VCC
Green clamp	6		23	Ground
Green feedback	中		22	Video input
Red output	8		21	Inverse video outpu
Red clamp	þ		20	Video delayed input
Red feedback	10		19	Contrast control
Fast blank	0		18	Y clamp
Blue O.S.D. input	12		17	Brightness control
Red O.S.D. input	13		16	Frame retrace
Green O.S.D. input	14	_	15	Sand Castle

DESCRIPTION

The TEA5031D is a color TV video processor compatible with all standards PAL/SECAM/NTSC and new needs such as teletext, Antiope, TV games, nemote control etc...

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BLOCK DIAGRAM



GENERAL DESCRIPTION

In order to ensure compatibility with standard video transmission systems the luma input is a high impedance, AC coupled, designed to accept a 1V video signal. After a X3 gain voltage amplifier the inverted luma signal is brought out to the luma delay line. This output is low impedance to match the delay accurately.

Following the luma delay line the video is controlled by an electronic gain control with a range of 40dB.

The DC luma level is locked on the black level (cutoff current) with a range of \pm 1V depending of brightness. The DC voltage level is clamped during each line retrace and an external capacitor holds this voltage during the line trace.

After brightness and contrasts controls the luminance is fed to the matrix with R-Y and B-Y signals.

The R-Y and B-Y inputs are high impedance with AC coupling, compatible with decoder I'Cs such as the TEA5630 for SECAM and the TEA5620 for PAL.

The voltage gain of R-Y and B-Y is controlled by saturation. The saturation is in tracking with contrast and then the R-Y and B-Y signals are fed to the matrix and summed with on-screen display signals which are controlled in gain by the luma contrast control. Each input is AC coupled and black level clamped using the coupling capacitor as the storage element for the clamp voltage.

All the controls have an active range of 0.5 to 4.5 V making them compatible with D/A converter derived control signals, such as those from remote control systems. The three on-chip output stages are high gain class B amplifiers with the gain set by parallel feedback resistor.

This gives a well defined gain and stable output voltage level. The beam current in each cathode of the picture tube is monitored by a high-voltage PNP transistor or the TEA5101A video amplifier. A sample of this current is fed back to the IC.

In the luma signal a reference black level is inserted during the line and frame blanking periods. While this reference level is present, and after the frame flyback, the output stage feedback input goes high impedance and an internal comparator is actived.

This circuit compares an internal reference voltage (2V typ) to the voltage developed across an external resistor by the picture tube beam current, and the output voltage is trimmed to get the desired cathode current value.



An internal logic delivers blanking and clamping pulses from the normalized sandcastle and frame retrace signals.

A supersandcastle and a frame blanking signals can be used only if the frame blanking pulse is longer or equal than the frame level of SSC.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vcc	Supply Voltage	16	V
Tamb	Operating Ambient Temperature	0 to 70	°C
Tstg	Storage Temperature Range	- 65 to 150	°C

THERMAL DATA

Rth(i-a)	Junction-ambient Thermal Resist	ance	55	°C/W

ELECTRICAL OPERATING CHARACTERISTICS

 $T_{amb} = +25^{\circ}C$; $V_{CC} = 12V$ (unless otherwise noted)

Symbol	Parameter		Value			IInte
Symbol			Min.	Тур.	Max.	Unit
Vcc Icc Vz	Supply voltage Supply Current Internal Voltage Ref.	Pin 24 Pin 24 Pin 25	10.8	12 55 9	13.2	V mA V
	Input-output characteristics Video Input Output Voltage Inv. Video (V22 = 1 V _{PP}) Max Output Voltage Swing - 3 dB Bandwidth	Pin 22 Pin 21 Pin 21 Pins 2-5-8	4.5	1 3 7 5		V _{PP} V _{PP} V _{PP} MHz
	(R-Y) Input Voltage (100% modulation) (B-Y) Input Voltage (100% modulation) - 3 dB Bandwidth	Pin 27 Pin 28	1.5	1.4 1.0	2 2	V _{PP} V _{PP} MHz
	Luma Gain G21/22 G2/20, G5/20, G8/20 at Max Adjustement Differential Gain Fault : Luma Channel	Pin 21 Pins 2-5-8	8.5 13.5	10 15.5	11.5 19.1 0.5	dB dB dB
	Chroma Gain G8/27 at Max Adjustment G2/28 at Max Adjustment Chroma Gain Ratio at Max Adjustment		8.8 12 1.28	11.6 14.7 1.40	14.5 17.2 1.48	dB dB
	Voltage Control for Electronic Potentiometers Contrast (pin 19) Saturation (pin 26) Range of Adjustment V19 = 5V ; V26 = 5V V19 = 0V ; V26 = 0V Attenuation Brightness (pin 17) V_{out} Adjustment (V17 varying from 0 to 5V)		40	G _{max} 46 ± 1		dB dB V
	On Screen Display Inputs OSD Input Voltage (black to white level) OSD Gain (V2/12; V8/13; V5/14) OSD Generator Max Impedance – 3 dB Bandwidth	Pins 12-13-14	13.5 5	1 15	2 17 75	V dB Ω MHz
	Fast Blanking Threshold			0.5		V
	Max Output Voltage Swing	Pins 2-5-8	7	8		VPP
	Cut-off Control Feedback Threshold	Pins 4-7-10	1.7	2	2.4	V



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ELECTRICAL OPERATING CHARACTERISTICS (continued)

Cumbal	Decementer		Value			Ilmit
Symbol	Parameter			Тур.	Max.	Unit
	Sand-Castle Input	Pin 15				
	Clamp Y 8V			8		V
	Line Blanking 2.5V			2.5		V
	Frame Return Input Voltage	Pin 16		2.5		V
	Control Current (V15 = V16 = 4V)			0.5		mA
	Matrix Coefficient					
	Red Output (V5/V8 with V27 = 1V ; V28 = 0 ; V20 = 0)			0.51		
	Blue Output (V5/V2 with V27 = 0 ; V28 = 1 ; V20 = 0)			0.19		







APPLICATION CIRCUIT FULFILLING THE EURODCART SPECIFICATIONS



SGS-THOMSON MICROELECTRONICS

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PACKAGE MECHANICAL DATA

28 PINS - PLASTIC DIP



