PAL-NTSC ONE-CHIP DECODER

Technology: Bipolar

Features:

- o Chrominance signal processing
- o Two synchronous demodulators for (R-Y) and (B-Y) signals
- o PAL flipflop and PAL switch
- o Horizontal and vertical blanking
- o Luminance signal processing with clamping
- o Linear saturation control
- o (G-Y)- and RGB-Matrix
- o Linear transmission of inserted RGB-signals
- o Colour reference oscillator with twice colour subcarrier frequency
- o Linear contrast and brightness control acting on inserted and matrixed signals
- o Automatic cut off control
- o Emitter-follower outputs to drive RGB-signal stages
- o NTSC option with hue control

Case:

28-pin dual inline plastic

Absolute maximum ratings

Supply voltage	Pin 1	V_S	13.2	V
Power dissipation T_{amb} = 65 °C	Fig. 3	P_{tot}	1.7	W
Junction temperature		T_j	125	°C
Ambient temperature range		T_{amb}	0 ... + 70	°C
Storage temperature range		T_{stg}	-25 ... + 125	°C

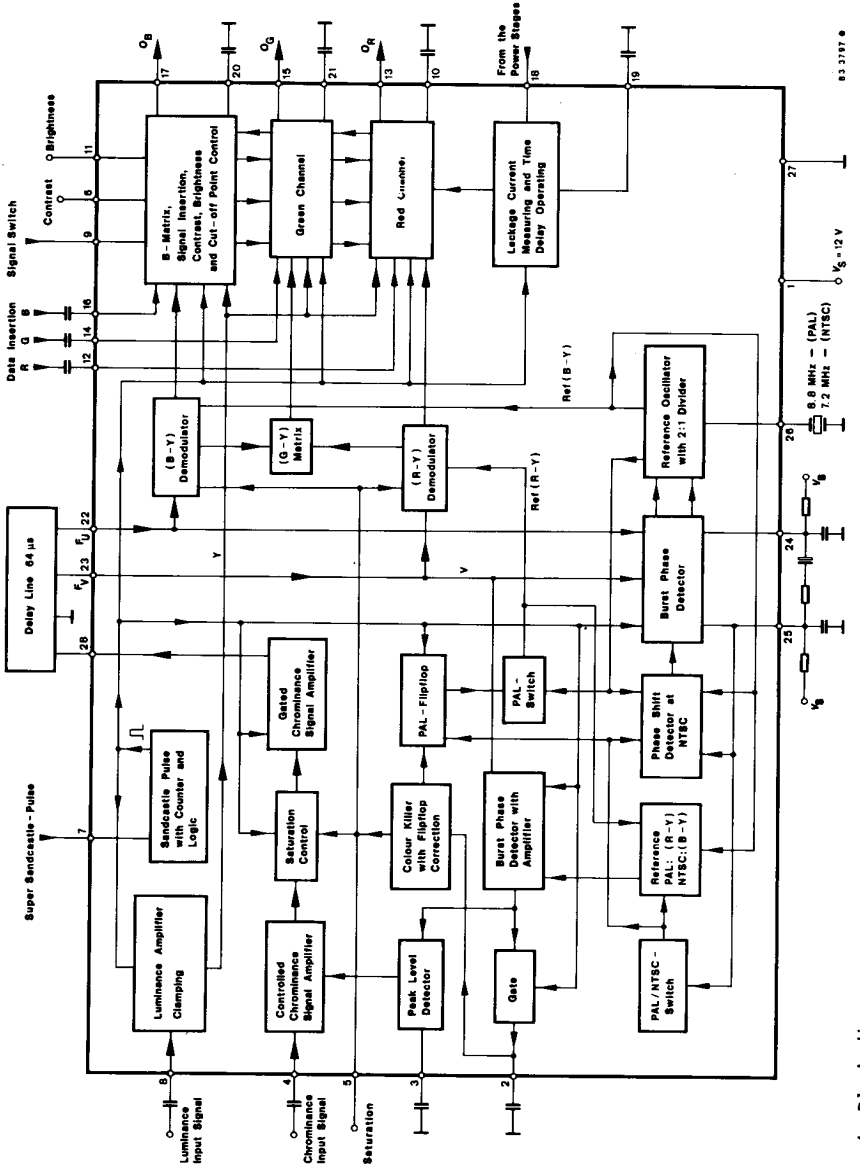


Fig. 1 Block diagram

Electrical characteristics

V_S = 12 V, V_{i8} = 0.45 V_{pp}, V_{i4} = 0.39 V_{pp}, [1])
T_{amb} = 25 °C, and nominale adjustment
for brightness, contrast and saturation,
Fig. 2, reference point pin 27,
unless otherwise specified

			Min.	Typ.	Max.	
Supply voltage range	Pin 1	V_S	10.8		13.2	V
Supply current	Pin 1	I_S		80		mA
Luminance amplifier						
Input voltage	Pin 8	V_i		0.45		V_{pp}
Input current	Pin 8	I_i			1	µA
Chrominance amplifier						
Input voltage range	Pin 4	V_i	40		1100	mV_{pp}
Nominal input voltage	Pin 4	V_i		390		mV_{pp}
Control range		ΔChr	30			dB
Output signal nom.adjustment, burst signal = 0.64 V_{pp}	Pin 28	V_{ochr}		2		V_{pp}
Saturation control range Fig. 5	Pin 5	C_S	-44		+6	dB
Phase shift between burst and chrominance	Pin 28				5°	
Saturation control voltage range	Pin 5	V_I	2		4	V
nom. saturation control voltage ΔSat = 0 dB	Pin 5	V_I		3		V
Input current	Pin 5	I_I			20	µA
Control voltage V_4 = 390 mV_{pp}	Pin 2	V_{OACC}		4.5		V
V_4 = 0	Pin 2	V_{OACC}		2.0		V

1) Nominale adjustment: Max. contrast -5 dB
Max. saturation -6 dB
Brightness V_{11} 2 V

			Min.	Typ.	Max.	
Reference oscillator						
Oscillator frequency		f_{osc}		$2xf_{sc}$ 2)		MHz
Capture range f = 8.8 MHz		Δf	500			Hz
Phase shift between reference signal and burst Δf_{osc} = ± 400 Hz		±		5°		
Input resistance	Pin 26	R_i		400		Ω
Input capacitance	Pin 26	C_i			10	pF
Demodulator						
Input signal F_v at pin 23 and F_u at pin 22						
Input burst signal amplitude	Pin 22,23	V_i		80		mV
Input resistance	Pin 22,23	R_i		1		kΩ
Ratio of demodulated signals without luminance signal	Pin 17/13	(B-Y)/(R-Y)		1.78		
without (B-Y)	Pin 15/13	(G-Y)/(R-Y)		-0.51		
without (R-Y)	Pin 15/17	(G-Y)/(B-Y)		-0.19		
RGB-matrix and output amplifier						
Output voltage	Pin 13,15,17	V_o		4		V_{pp}
Maximum white level	Pin 13,15,17	V_0		10		V
Relative spread between R-,G- and B output signals		ΔV_{oRGB}			10	%
Variation of black level at contrast control range	Pin 6	ΔV_I			200	mV
Relative black level variation during variation of contrast saturation and brightness		ΔV_{SC}			20	mV
Differential black level drift ΔT_{amb} = 40 °C		ΔV_{Tamb}			20	mV

2) f_{cs} = colour subcarrier frequency

			Min.	Typ.	Max.	
Blanking level at RGB outputs	Pin 13,15,17	V_{BL}		0.95		V
Residual f = 8.8 MHz		V_C			150	mV
Frequency response f = 0... 5 MHz, reference point pin 8	Pin 13,15,17	Δf			3	dB
Black level output voltage V_{11} = 2 V	Pin 13,15,17	V_O		3		V
Cut-off control range $V_{ORGB(Black\ level)}$=3V,V_{11}=2V		$\pm V_I$		2		V
Slope of brightness control voltage range	Fig. 6	V_{13},V_{15},V_{17},V_{11}		1.3		V/V
Nom. brightness adjustm. voltage for signal black level equal to cut off pulse level		V_{11}		2.0		V
Input current		I_{11}			5	µA
Contrast control range	Fig. 4	ΔContr		-15...+5		dB
Contrast control voltage	Pin 6	Y_I	2		4	V
nom. control voltage A_{Contr} = 0 dB	Pin 6	V_I		3.1		V
Input current	Pin 6	I_I			15	µA
Cut-off control[3])						
Required bias voltage	Pin 18	V_I		5		V
Internal limiting at	Pin 18	V_I		9		V
Differential voltage between cut-off and leckage current information	Pin 18	ΔV_I		0.5		V
Input resistance during scanning time	Pin 18	R_i		1.5		kΩ
Input current during cut-off measurement	Pin 18	I_I			2	µA

3) The controlling is activated during the first 3 lines after vertical blanking

			Min.	Typ.	Max.	
Max. input current during scanning time	Pin 18	I_I			10	mA
Input current, outtime of measurement	Pin 18	I_I			50	nA
Super sandcastle input						
Input voltages for burst gating and clamping	Pin 7	V_I	7.5			V
Horizontal pulse separation	Pin 7	V_I	4		5	V
RGB-signal blanking	Pin 7	V_I	2		3	V
No gating	Pin 7	V_I			1	V
NTSC-Operation						
PAL-operation	Pin 24,25	V		9...11		V
PAL/NTSC-switch activated	Pin 24,25	V		8.8		V
Current-mean value t_p = 4 µs	Pin 24,25	I		90		µA
NTSC hue control				±40°		
NTSC hue control voltage	Pin 24,25	V		7.5...8.5		V
RGB signal insertion						
Input voltages V_{oRGB} = 4 V_{pp}	Pin 12,14,16	V_i		1		V_{pp}
Input currents	Pin 12,14,16	I_I			10	µA
Difference between the black levels of the RGB signals and the inserted RGB signals at the outputs	Pin 13,15,17	ΔV_o			200	mV
Output rise time	Pin 13,15,17	t_r		50		ns

			Min.	Typ.	Max.	
Differential delay time for the three channels	Pin 13,15,17	t_{diff}			40	ns
Signal switching						
Insertion -ON	Pin 9	V_I		0.9...3		V
-OFF	Pin 9	V_I			0.4	V
Delay time between signal switching voltage and signal switching at the outputs	Pin 13,15,17	t_d		60		ns

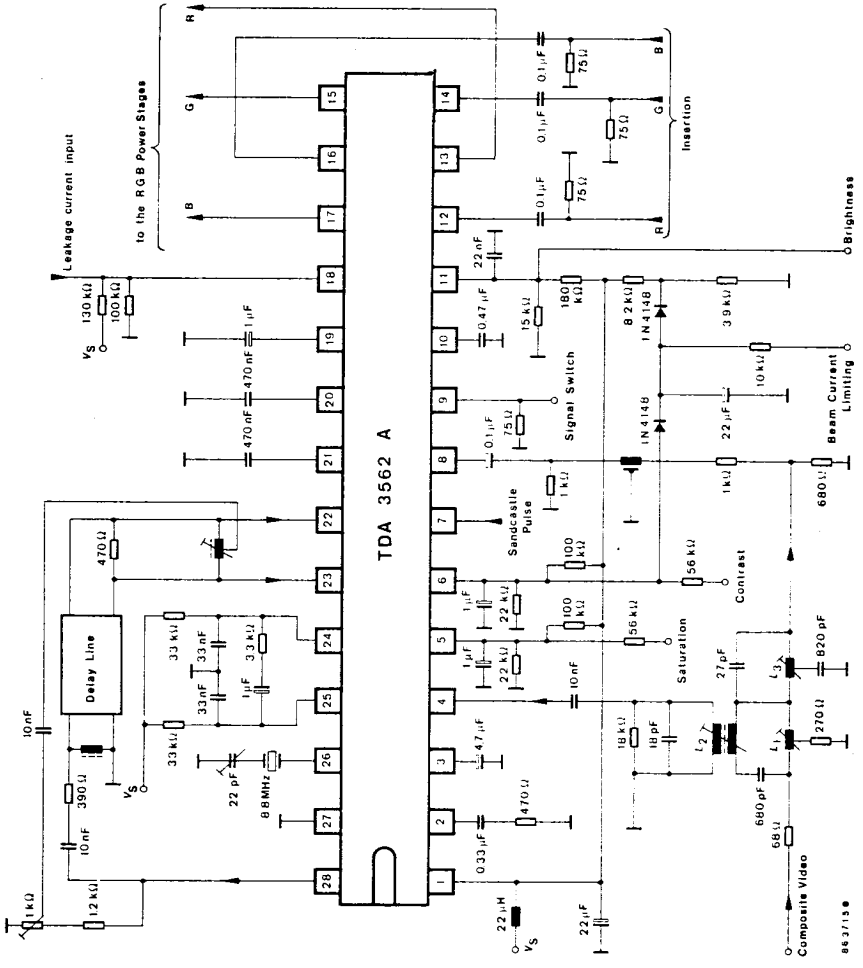
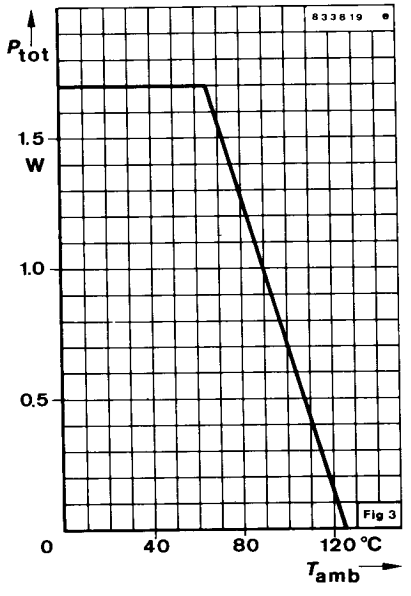
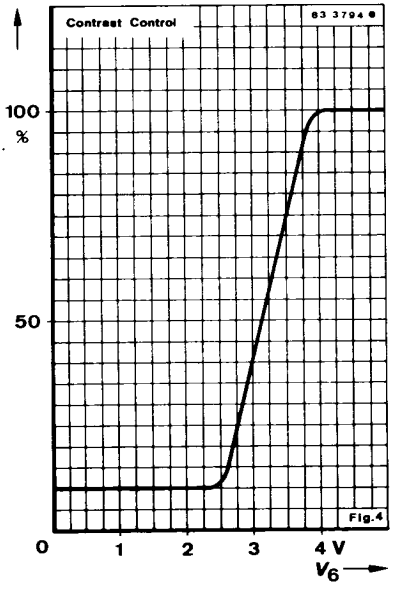
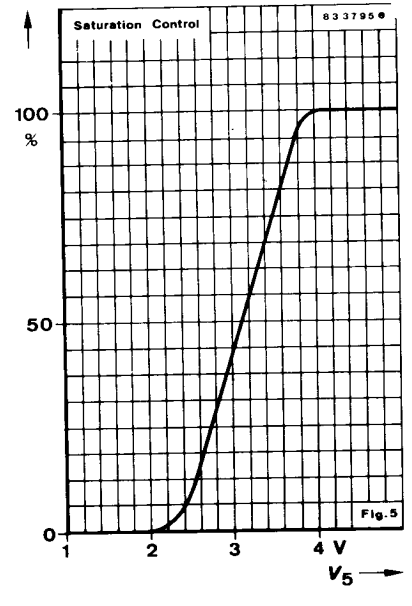
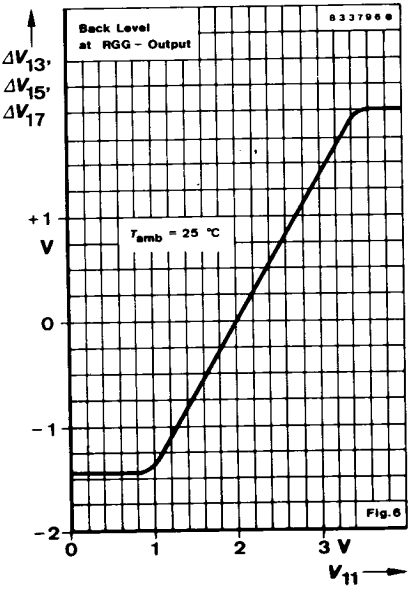


Fig. 2 Test circuit

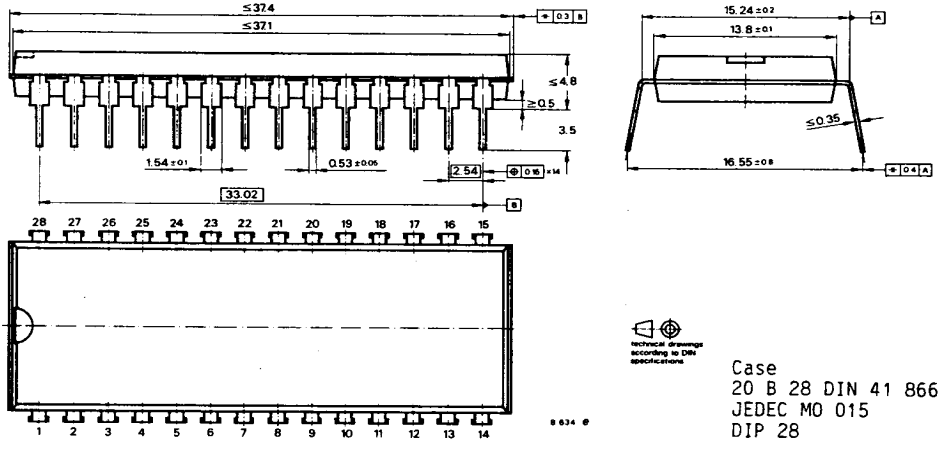








Dimensions in mm



technical drawings according to DIN specifications

Case
20 B 28 DIN 41 866
JEDEC MO 015
DIP 28