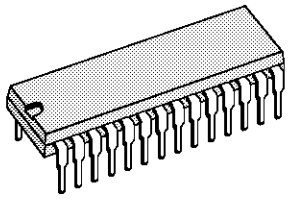
SGS-THOMSON MICROELECTRONICS

TDA3562A

PAL/NTSC ONE-CHIP DECODER

- CHROMINANCE SIGNAL PROCESSOR
- LUMINANCE SIGNAL PROCESSING WITH CLAMPING
- HORIZONTAL AND VERTICAL BLANKING
- LINEAR TRANSMISSION OF INSERTED RGB SIGNALS
- LINEAR CONTRAST AND BRIGHTNESS CONTROL ACTING ON INSERTED AND MATRIXED SIGNALS
- AUTOMATIC CUT-OFF CONTROL
- NTSC HUE CONTROL



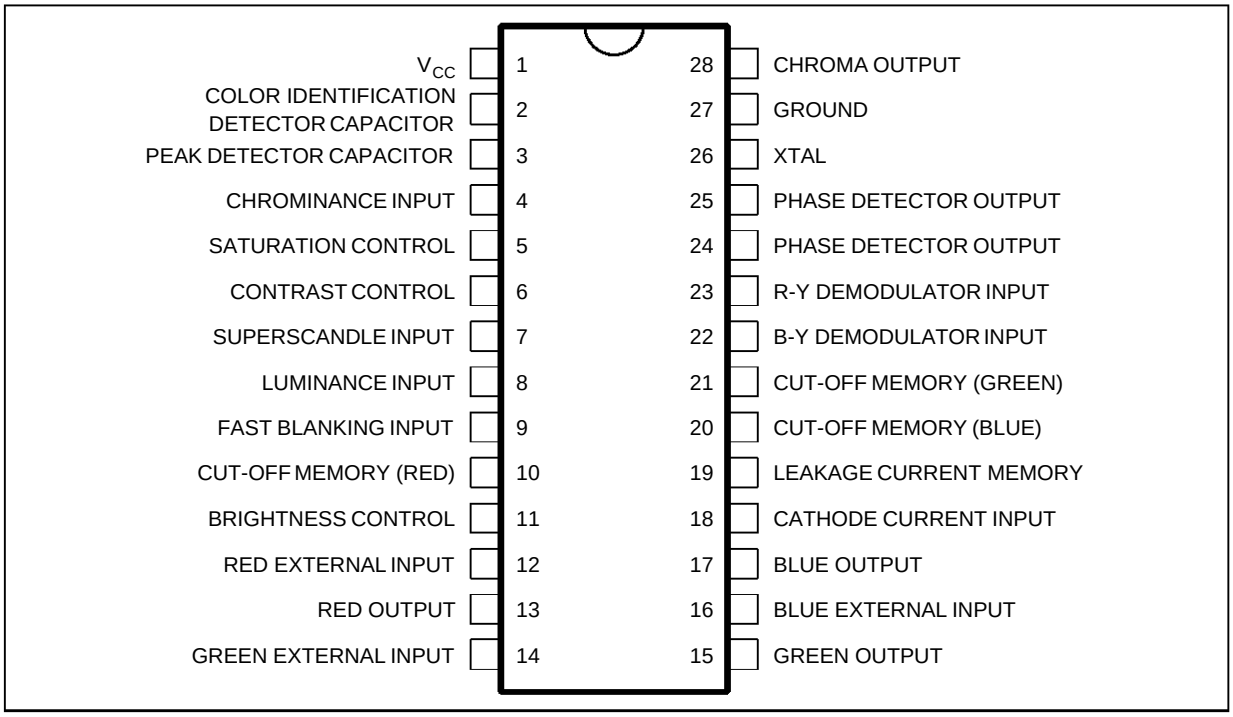
DIP28
(Plastic Package)

ORDER CODE : TDA3562A

DESCRIPTION

The TDA3562A is a monolithic IC designed as decode PAL and/or NTSC colour television standards and it combines all functions required for the identification and demodulation of PAL and NTSC signals.

PIN CONNECTIONS



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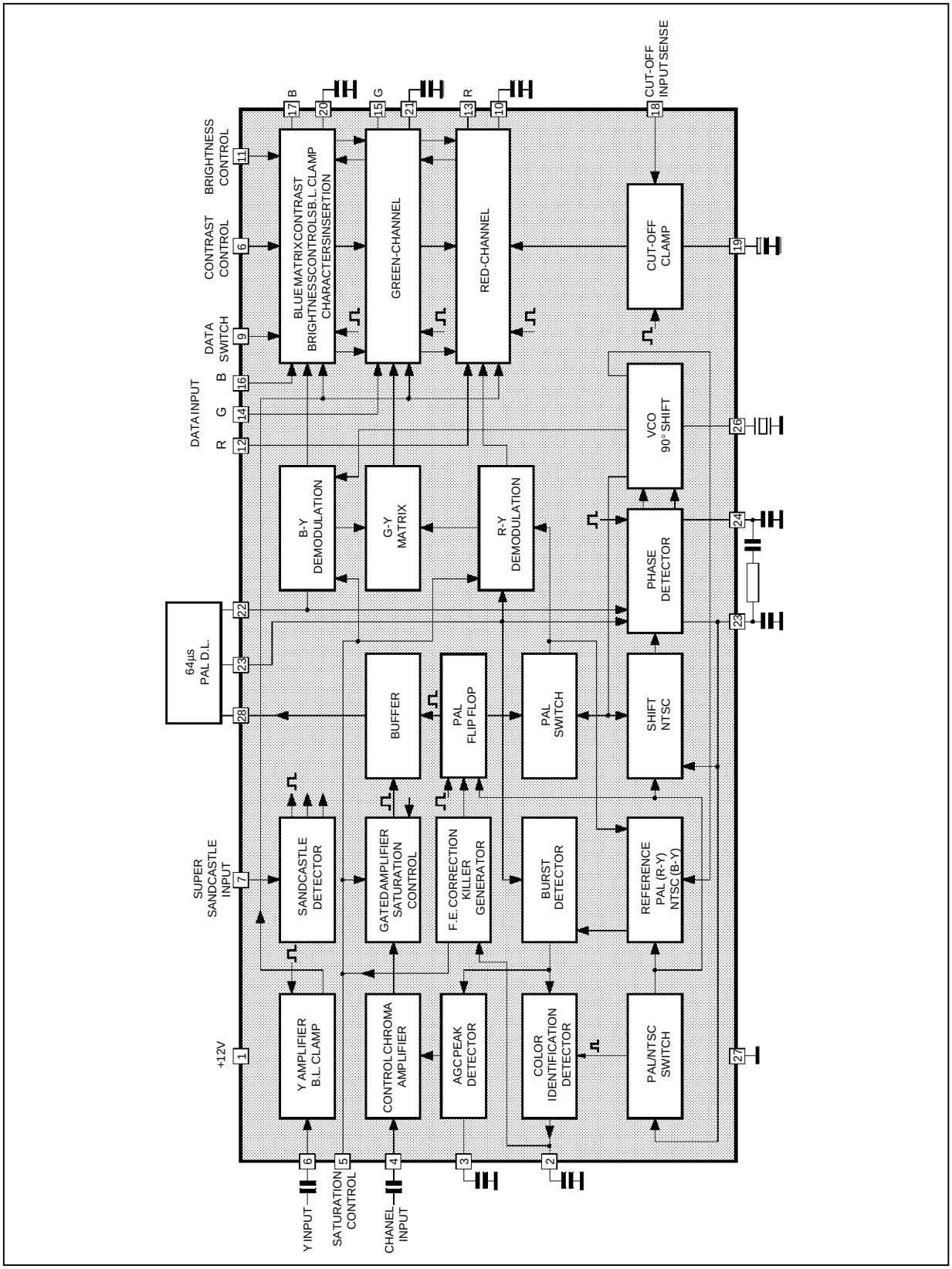
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply Voltage	13.2	V
P_{tot}	Power Dissipation at T_{amb} = 65 °C	1.7	W
T_{stg}, T_j	Storage and Junction Temperature	– 25, +150	°C
T_{amb}	Ambient Temperature Range	0, +70	°C

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THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	40	°C/W

3562A-02.TBL

ELECTRICAL CHARACTERISTICS

Test conditions unless otherwise specified : Supply voltage, Pin 1 at 12 V - T_{amb} = 25 °C

Input signals : Luminance input signal V_8 = 0.48 V_{PP} (Composite video signal (100 % white)
Chrominance input signal V_4 = 0.39 V_{PP} (Colour bar signal with 75 % colour saturation and chrominance to burst ratio = 2.2 : 1)
Data input signals $V_{12,\ 14,\ 16}$ = 1.4 V_{PP} (Including neg.going sync. pulse)

Control inputs at nominal value : Pin 6 Nom. contrast = max. contrast – 5dB
Pin 5 Nom. saturation = max. saturation – 6 dB
Pin 11 Nom. brightness = 2V, Pin 9 at 0.4 V

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
SUPPLY INPUT (pin 1)						
	Supply Voltage Range		10.8		13.2	V
	Supply Current	V_1 = 12 V		80	110	mA
LUMINANCE INPUT (pin 8)						
	Composite Input Signal				0.8	V_{pp}
	Input Current			0.1	1	µA
CHROMINANCE INPUT (pin 4)						
	Input Signal		40		1100	mV_{PP}
	Input Resistance			10		KΩ
	Input Capacitance				6.5	pF
SUPER SANDCASTLE INPUT (pin 7)						
	Gating & Clamping Level		7.5			V
	H-pulse Separating Level		4		5	V
	V-pulse Separating Level		2		3	V
	Forbidden Range			1 to 2		V
	Input Current	V_7 = 0 to 1V V_7 = 1 to 8.5V V_7 = 8.5 to 12V		50	– 460 2	µA µA mA
	Delay Between Black Level Clamping Pulse and Gating Pulse			0.6		µs
DATA BLANKING INPUT (pin 9)						
	Input Voltage for no Data Insertion				0.4	V
	Input Voltage for Data Insertion		0.9		3	V
	Input Resistance		7		13	kΩ
"BLACK CURRENT" STABILIZATION INPUT (pin 18)						
	D. C. Bias Voltage		3.5	5	7	V
	Internal Limiting Threshold			9		V
	Switching Threshold for "Black Current" ON			8		V

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ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
"BLACK CURRENT" STABILIZATION INPUT (pin 18) (continued)						
	Difference between Input Voltage for "BlackCurrent" and Leakage Current			0.5		V
	Input Resistance during Scan			1.5		kΩ
	Input Current during "Black Current" Measurement				2	µA
	Input Current during Scan				10	mA
RGB - OUTPUTS (Pins 13, 15, 17)						
	Output Resistance			50		Ω
	Current Source		2	3		mA
	Peak Output Level		10.7		11.3	V
	Residual 4.4 MHz at RGB Outputs				100	mVpp
	Residual 8.8 MHz at RGB Outputs				150	mVpp
LUMINANCE CHANNEL						
	Frequency Resp. of Total Lumin. Amplifiers	f = 0 to 5MHz		–1	–3	dB
	RGB Output Signal (black to white)		3.5	4	4.5	Vpp
	Relative Spread of RGB - Output Signals				1	dB
	Contrast Control Range	(see fig. 1)		–5 to 10		dB
	Tracking Over 10 dB Contrast Control			0		dB
	Contrast Control Input Current				15	µA
	Blanking Level of RGB - Output Signals			1	1.2	V
	Difference Between Blanking Levels,		0		mV	
	Differential Drift of Blanking Levels	ΔT = 40 °C		0		mV
	Brightness Control Input Current				5	µA
	Brightness Control Range	(see fig. 3)		1 to 3		V
	Relation Ship between Black Level Variation and Brightness Control Variation	(see fig. 3)		1.3		V/V
	Black Level of RGB Output Signals	(see note 4)		3		V
	Difference between Black Levels	(see note 4)		0		mV
	Tracking Over Brightness Control				2	%
	Differential Drift of Black Levels	ΔT = 40 °C			20	mV
	Drift of Black Level Versus 10 % Variation of Supply Voltage and Contrast Control				20	mV
"CUT OFF CURRENT" REGULATION						
	RGB Output Level of the "3L Windows" after Switch-on		7.5			V
	RGB Outputs Level of the "3L Windows" after Cut off Current Stabilization	(see note 4)	1	3	5	V
	RGB Output Range		1		5	V
	Charge/Discharge Current during Measuring Time (3L windows) at Pins 10, 19, 20 and 21			1		mA
	Leakage Currents Flowing into Pins 10, 20 and 21 during Scan				50	nA
RGB DATA INSERTION						
	Data RGB Output Signal	V_9 = 0.9 to 3V		4		Vpp
	Differential Amplitude Error between RGB Output Signal and Data Output Signal				10	%
	Differential Error between Black Levels of RGB Output Signals and Black Levels of Data Output Signals				200	mV

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ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
RGB DATA INSERTION (continued)						
	Rise Time of Data Output Signal			50	80	ns
	Differential Delay			0	40	ns
	Attenuation of RGB Output Signal	V_9 = 0.9 to 3 V		46		dB
	Frequency Response for f = 0 to 5 MHz			– 1	– 3	dB
CHROMINANCE CHANNEL						
Pin 4	Chrominance Input Signal		40		1100	mVpp
Pin 4	Input Resistance			10		kΩ
Pin 4	Input Capacitance				6.5	pF
	ACC Control Range		30			dB
PIn 28	Burst Change Over 30 dB ACC Range				1	dB
	Saturation Control Range	(see fig. 2)		– 44 to 6		dB
Pin 5	Sat. Control Input Current				20	µA
Pin 28	Chrominance Output Voltage	V_5 = 4.2 V	4			Vpp
	Burst Input Signal at Pins 22 and 23			100		mVpp
	Input Resist. Bet. Pins 22, 23 and Ground			1		kΩ
Pin 28	Phase Shift Bet. Burst and Chrom. Signal		– 5	0	5	°
Pin 2	Voltage at Nom. Input Signal			4.7		V
Pin 2	Voltage without Input Signal			2.6		V
Pin 2	Identificaton-on Voltage			2.1		V
Pin 2	Colour-off Voltage			3.4		V
Pin 2	Colour-on Voltage			3.6		V
Pin 3	Voltage at Nom. Input Signal			5.1		V
COLOUR DEMODULATORS AND G-Y MATRIX						
	Ratio (B-Y) / (R-Y)		1.60	1.78	1.96	
	Ratio (G-Y) / (R-Y)	(B – Y) = 0	– 0.46	– 0.51	– 0.56	
	Ratio (G-Y) / (B-Y)	(R – Y) = 0	– 0.14	– 0.19	– 0.24	
REFERENCE OSCILLATOR						
	Oscillator Frequency			2 fcs		MHz
	Temp. Coefficient of Oscillator Frequency	(see note 5)		– 2		Hz/k
Pin 26	Input Resistance			400		Ω
Pin 26	Input Capacitance				10	pF
	Pull-in Range	(see note 5)	500	700		Hz
	Phase Shift for ±400 Hz Deviation				5	°C
	Phase Shift between (R – Y) and (R – Y) Ref.Signal				5	°C
	Phase Shift between (R – Y) and (B – Y) Ref.Signal		85	90	95	°C
NTSC OPERATION						
Pins 24, 25	PAL-on Operating Range		9		11	V
Pins 24, 25	Threshold for NTSC-on			8.8		V
J_{24} + J_{25}	Avarage Output Current	Key Pulse = 4 µs		90		µA
	Hue Control		± 30			°C
Pins 24, 25	Hue Control Voltage		7.5		8.5	V

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(4) The levels depend on the application circuit and on the spread and drift of picture tube guns.
(5) All frequency variations are referred to 4.4 MHz carrier frequency.

Figure 1 : Contrast Control Voltage Range

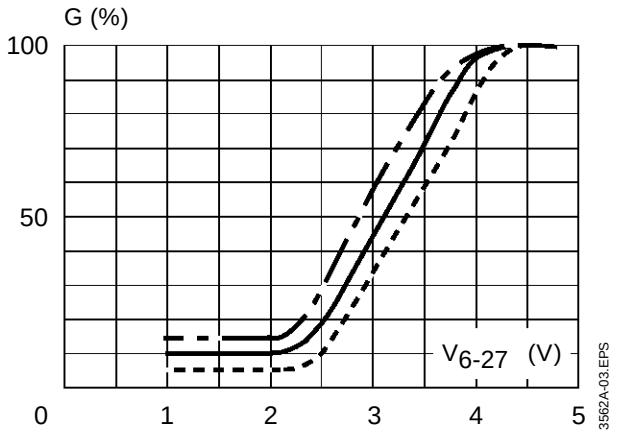

Figure 2 : Saturation Control Voltage Range

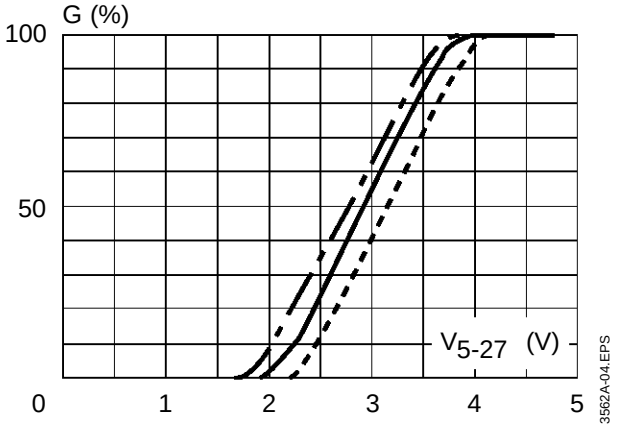

Figure 3 : Difference between signal black level and measuring level (3L windows after cut off current stabilization) at the RGB outputs (ΔV) versus control voltage (V_{11} - V_{12}).

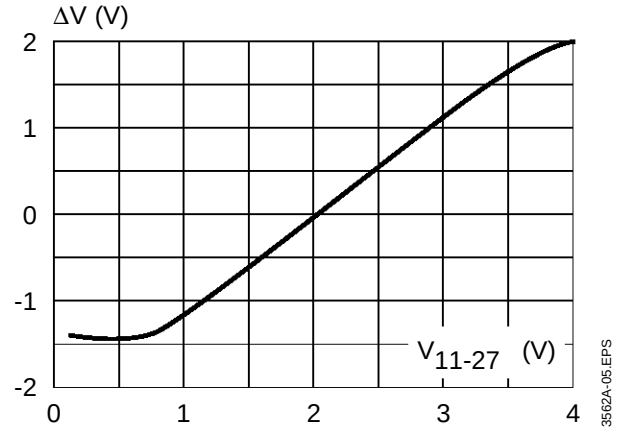

Figure 4 : Hue Control Voltage Range

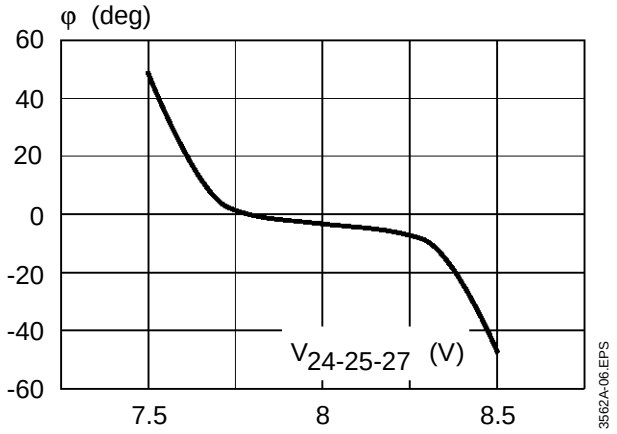

Figure 5 : Application Diagram showing the TDA3562A for a PAL Decoder

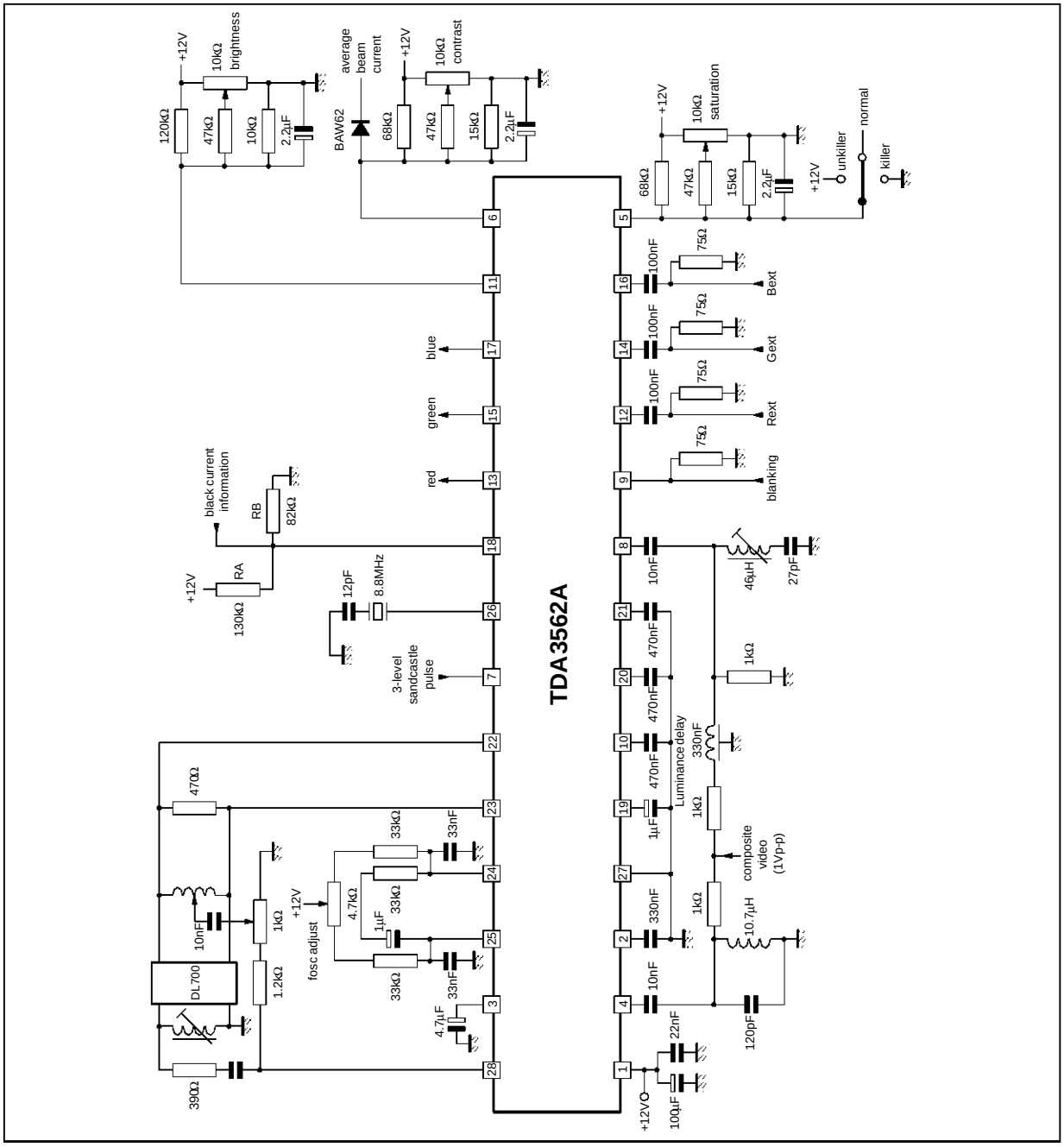

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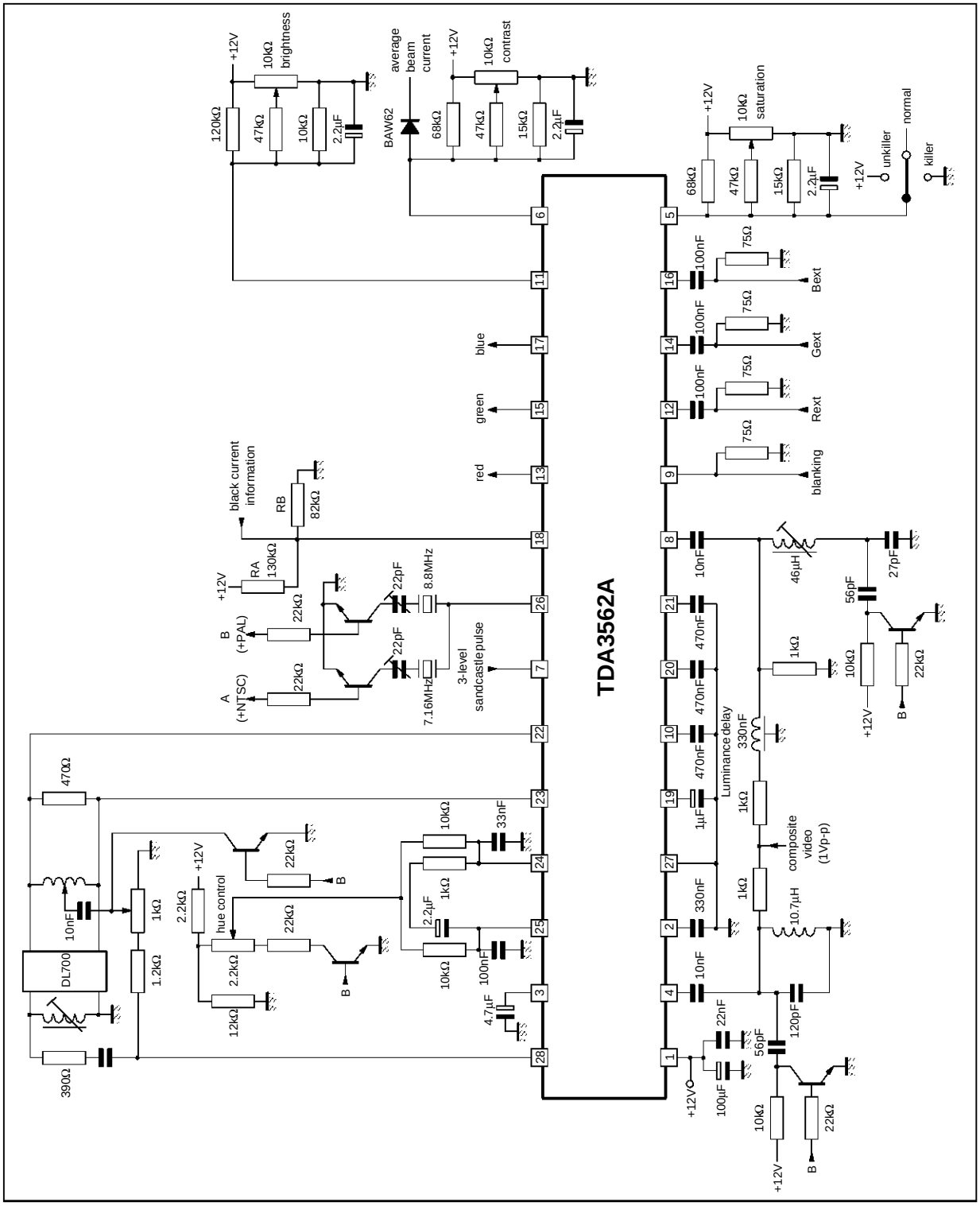
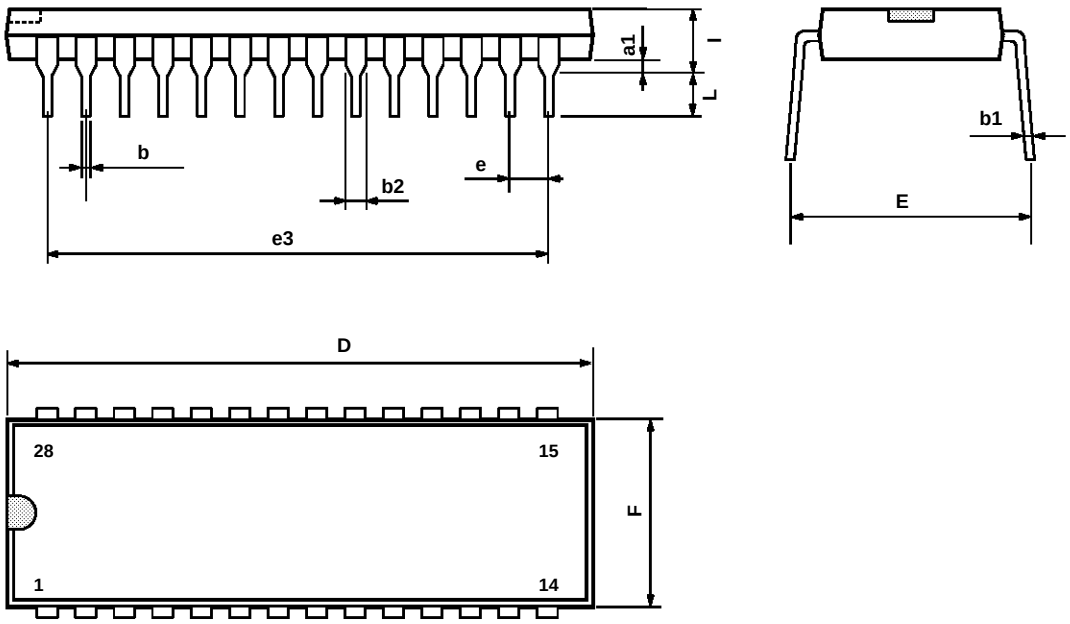
Figure 6 : Application Diagram showing the TDA3562A for a PAL/NTSC Decoder



PACKAGE MECHANICAL DATA

28 PINS - PLASTIC 28



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Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1		0.63			0.025	
b		0.45			0.018	
b1	0.23		0.31	0.009		0.012
b2		1.27			0.050	
D			37.4			1.470
E	15.2		16.68	0.598		0.657
e		2.54			0.100	
e3		33.02			1.300	
F			14.1			0.555
i		4.445			0.175	
L		3.3			0.130	

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