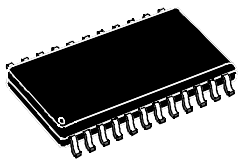
STV6434

Filtered Video Buffers for STB and DVD Devices

TARGET SPECIFICATION

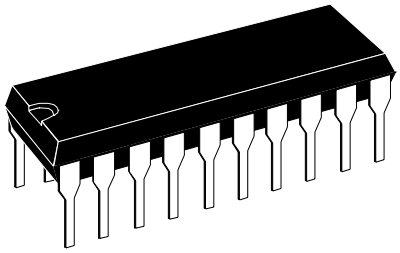
FEATURES

- **Y, C, CVBS Inputs with 7 MHz Filters**
- **Y, Pr, Pb Inputs with 14 MHz Filters**
- **6 dB Gains**
- **Capabilities of Integrated Output Buffers: Single Load (150Ω) for Y/Pr/Pb signals Double Load (75Ω) for Y, C and CVBS signals**
- **DC Coupled Outputs for CVBS and YPrPb signals, DC or AC coupled output for Chroma signal**
- **Bottom Clamp on Y and CVBS, Bias Clamp on C, Sync Clamps on Pr and Pb**
- **Crosstalk: 55 dB (typ.)**
- **Separate Stand-by Modes on Y/C/CVBS and on Y/Pr/Pb signals**
- **Switchable Y+C Adder for Decoders without CVBS Outputs**



SO24

Order Code: STV6434S



PDIP20

Order Code: STV6434D

DESCRIPTION

The STV6434 is a filtered video output interface for STB and DVD applications.

After removing D/A conversion noises using integrated low pass filters, the STV6434 adapts in amplitude and impedance the video signals coming from the digital decoder for transmission, via 75Ω adapted cables, to the TV set, VCR and auxiliary devices.

The STV6434 is powered by a 5V supply.

The STV6434 is fully compatible with STi55xx Digital Decoders.

The STV6434 is mounted in a SO24 package (STV6434S) or in a DIP package (STV6434D).

This is preliminary information on a new product now in development or undergoing evaluation. Details are subject to change without notice.

TABLE OF CONTENTS

Chapter 1 General Information 3

1.1 I/O Pin Description 4

Chapter 2 Electrical Characteristics 6

2.1 Absolute Maximum Ratings 6

2.2 Thermal Data 6

2.3 Electrical Characteristics 6

Chapter 3 Input/Output Groups 10

Chapter 4 Application Diagram 14

Chapter 5 Package Mechanical Data 15

Chapter 6 Revision History 17

1 General Information

Figure 1: STV6434S Pinout

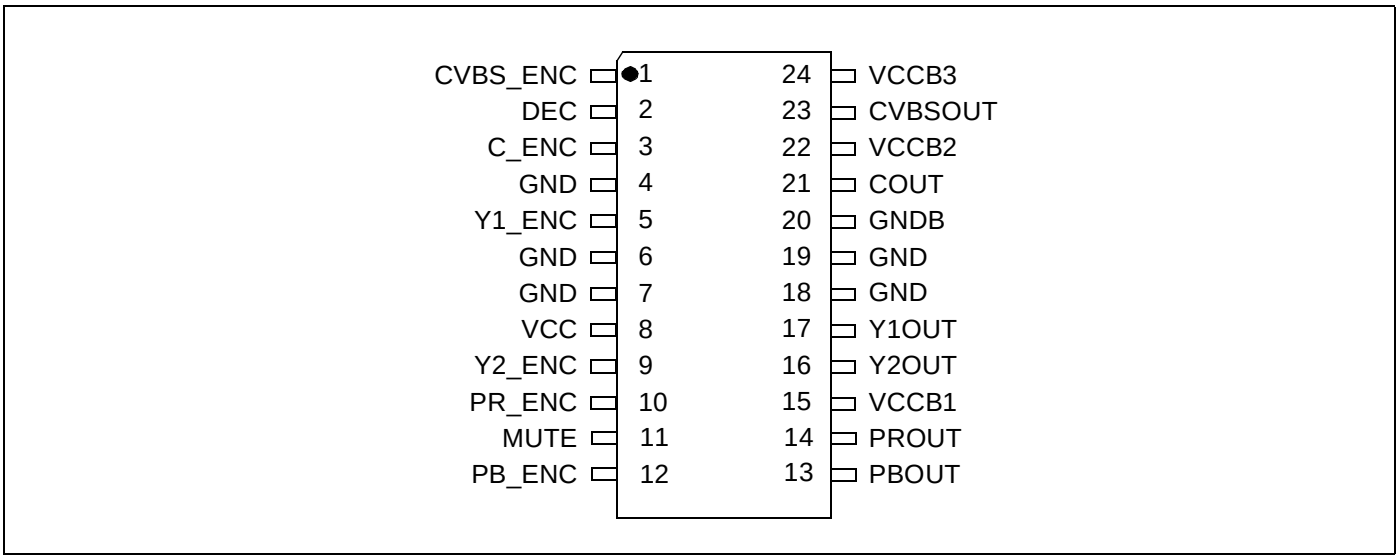
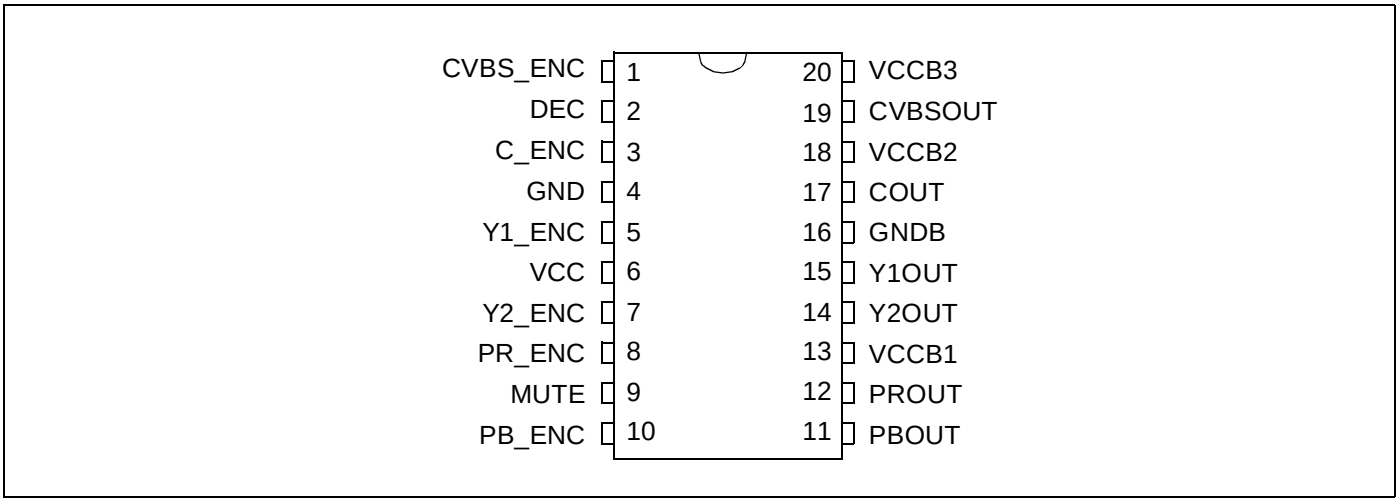


Figure 2: STV6434D Pinout

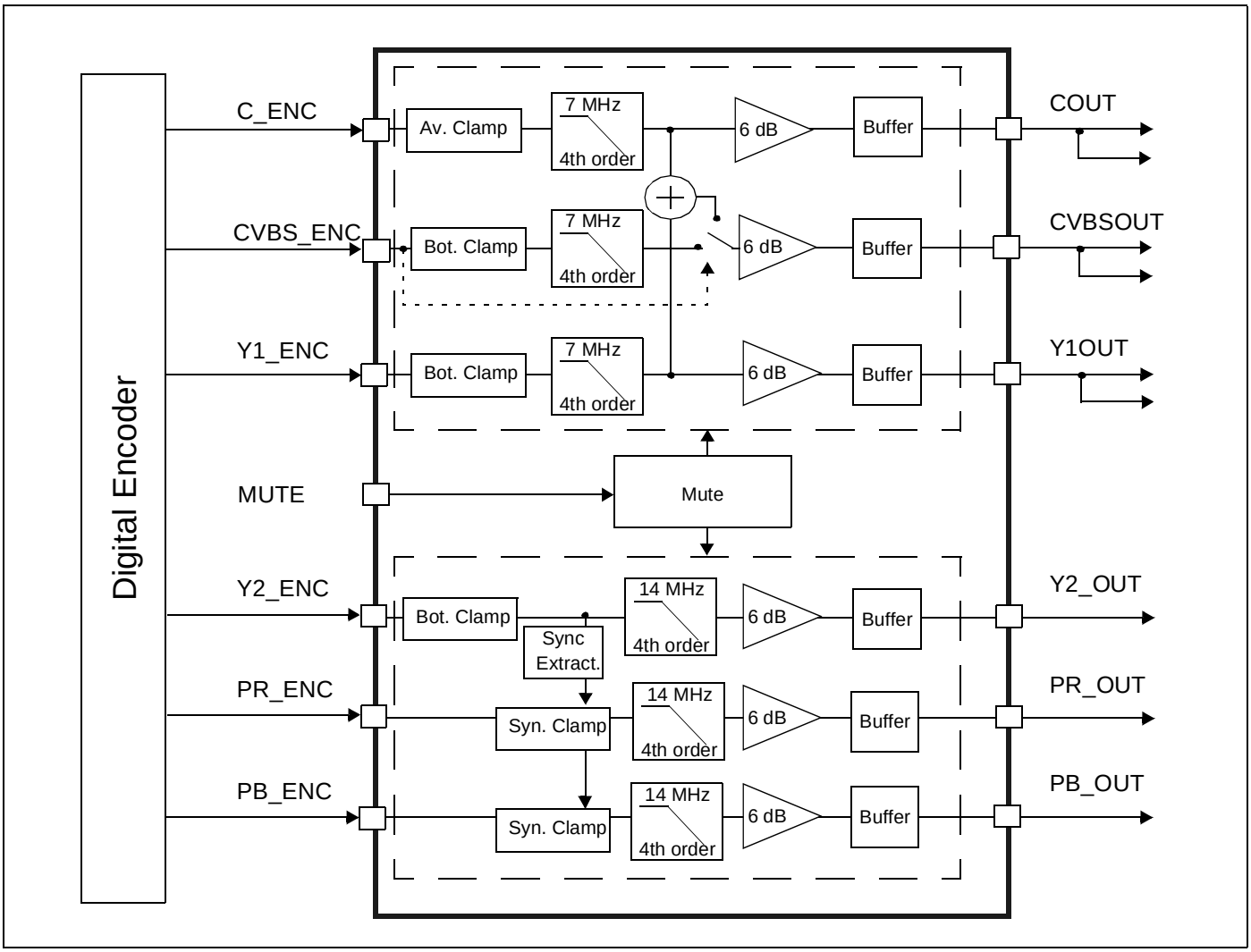


1.1 I/O Pin Description

Table 1: Pin Description

STV6434S	STV6434D	Name	Function
1	1	CVBS_ENC	CVBS Input from Encoder command internal CVBS switch
2	2	DEC	Decoupling Capacitor
3	3	C_ENC	Chroma Input from Encoder
4	4	GND	Ground
5	5	Y1_ENC	Y Input from Encoder
6		GND	Ground
7		GND	Ground
8	6	VCC	+5 V Supply
9	7	Y2_ENC	Large-band Y Input from Encoder
10	8	PR_ENC	Large-band Pr Input from Encoder
11	9	MUTE	4-State command for Mute
12	10	PB_ENC	Large-band Pb Input from Encoder
13	11	PBOUT	Pb Output
14	12	PROUT	Pr Output
15	13	VCCB1	+5 V Supply for Output Buffers
16	14	Y2OUT	Y2 Output
17	15	Y1OUT	Y1 Output
18		GND	Ground
19		GND	Ground
20	16	GNDB	Ground for Buffers
21	17	COUT	Chroma Output
22	18	VCCB2	+5 V Supply for Output Buffers
23	19	CVBSOUT	CVBS Output
24	20	VCCB3	+5 V Supply for Output Buffers

Figure 3: STV6434 Block Diagram



2 Electrical Characteristics

2.1 Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V_{CC}, V_{CCB}	Supply Voltage		6	V
V	Voltage at all pins to Ground		-0.6 to V_{CC}	V
V_{ESD}	ESD Susceptibility	Human Body Model: 100 pF discharged through 1.5 kΩ serial resistor	±4	kV

2.2 Thermal Data

Symbol	Parameter		Value	Unit
R_{thJA}	Junction-to-Ambient Thermal Resistance	STV6434S STV6434D	70 65	°C/W
T_J	Maximum Recommended Junction Temperature	STV6434S STV6434D	130	°C
T_{OPER}	Operating Ambient Temperature		0 to +70	°C
T_{STG}	Storage Temperature		-55 to +150	°C

2.3 Electrical Characteristics

Test conditions: T_{AMB} = 25°C, V_{CC} = 5 V; V_{CCB} = 5 V; $R_{GENERATOR}$ = 75 Ω, R_{LOUT} = 75 Ω for Y1OUT, CVBSOUT and COUT R_{LOUT} = 150 Ω for Y2OUT, PBOUT and PROUT, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{CC}	Operating Supply Voltage		4.75	5.00	5.25	V
V_{CCB}	Buffer Supply Voltage		4.75	5.00	5.25	V
Active (Channels ON)						
I_{CC1}	Supply Current (V_{CC} + V_{CCB})	No Load, MUTE pin to VCC pin (5 V) All channels active		50	65	mA
I_{CC2}	Supply Current (V_{CC} + V_{CCB})	No Load, MUTE pin = 1.5 V (not connected) Y1/C/CVBS active		30		mA
I_{CC3}	Supply Current (V_{CC} + V_{CCB})	No Load, MUTE pin = 3 V Y2/Pr/Pb active		30		mA
Standby (All Channels OFF)						
I_{CCSTB}	Total Supply Current	No Load, MUTE pin to 0 V		4		mA

2.3.1 Video Section (Y1, Y2 and CVBS Signals)

Test conditions: T_{AMB} = 25°C, V_{CC} = 5 V; V_{CCB} = 5 V; $R_{GENERATOR}$ = 75 Ω, R_{LOUT} = 75 Ω for Y1 and CVBS outputs and R_{LOUT} = 150 Ω for Y2 output, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DCIN}	DC Input Level, Bottom Clamp input	Bottom level, Y1 and CVBS inputs		2		V
I_{CLAMP}	Clamping Current, Bottom Clamp input	at V_{DCIN} - 400 mV	1	2		mA
I_{LEAK}	Input Leakage Current, Bottom Clamp input	$V_{IN} = V_{DCIN}$ +1 V		1	10	µA
V_{DCIN_YSYNC}	DC Input Level	Y2 input, YPrPb mode, black level		2.3		V
C_{IN}	Input Capacitance			2		pF
V_{IN}	Maximum Input Signal	V_{CCV} = 5 V		1.4		V_{PP}
DYN	Dynamic Output Signal	V_{CCV} = 5 V		2.8		V_{PP}
Y1F1	-1 dB Bandwidth (Flatness) of Y1 and CVBS	1H signal	4.0	4.5		MHz
Y2F1	-1 dB Bandwidth (Flatness) of Y2	2H signal	8	9		MHz
Y1F3	-3 dB Bandwidth of Y1 and CVBS	1H signal		7		MHz
Y2F3	-3 dB Bandwidth of Y2	2H signal		14		MHz
Y1SBR	Stopband Rejection	27 MHz versus 100 kHz		- 40		dB
Y2SBR	Stopband Rejection	54 MHz versus 100 kHz		- 40		dB
Flatness	Spread of Gain in Video Bands	V_{IN} = 1 V_{PP} Band = 15 kHz to 5 MHz for Y1 and CVBS Band = 15 kHz to 10 MHz for Y2			±0.5	dB
VCTo	Crosstalk Isolation of Y1 (or Y2 or CVBS) from C and Pr Pb channels	V_{IN} = 0.5 V_{PP} at f = 3.58 MHz, on either CIN_ENC or PRIN_ENC or PBIN_ENC input, R_{LOAD} = 150Ω		55		dB
R_{OUT}	Output Resistance			5	10	Ω
GY	Gain on Y1, Y2 and CVBS channels	V_{IN} = 1 V_{PP} at f = 1 MHz	5.5	6	6.5	dB
DC_{YOUT}	DC Output Voltage (Y1 and Y2)	Video signal bottom sync pulse at IC output pins		0.5		V
$DC_{CVBSOUT}$	DC Output Voltage (CVBS)	Video signal bottom sync pulse at IC output pin		1.0		V
DPHI	Differential Phase	V_{IN} = 1 V_{PP} at f = 3.58 MHz		0.2	3	deg.
DG	Differential Gain	V_{IN} = 1 V_{PP} at f = 3.58 MHz		0.3	3	%
LNL	Luminance non-linearity			0.5	3	%
VSN7	Video S/N Ratio: Y1, C and CVBS channels (7 MHz filter)	NTC-7 weighting 4.2 MHz Lowpass		70		dB
VSN14	Video S/N Ratio: Y2, Pr and Pb channels (14 MHz filter)	NTC-7 weighting 4.2 MHz Lowpass		67		dB

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Dtpd7	Group delay variation from flatness	7 MHz filter		20		nS
Dtpd14	Group delay variation from flatness	14 MHz filter		10		nS

2.3.2 Chroma Section

Test conditions: T_{AMB} = 25°C, V_{CC} = 5 V; V_{CCB} = 5 V; $R_{GENERATOR}$ = 75 Ω and R_{LOUT} = 75 Ω unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DCIN}	DC Input Level			3		V
R_{IN}	Input Resistance		30	50		kΩ
C_{IN}	Input Capacitance			2		pF
V_{IN}	Max Input Signal				1	V_{PP}
DYN	Dynamic Output Signal				2	V_{PP}
DC_{COUT}	DC Output Voltage (COUT)	Without signal		1.5		V
CF1	-1 dB Bandwidth (Flatness)		4	4.5		MHz
CF3	-3 dB Bandwidth			7		MHz
CSBR	Stopband Rejection	27 MHz versus 100 kHz		- 40		dB
Flatness	Spread of Gain in Video Bands	V_{IN} = 1 V_{PP} Band = 15 kHz to 5 MHz for Y1 and CVBS			±0.5	dB
CCTo	Crosstalk Isolation of C from Y1, Y2 and CVBS Channels	V_{IN} = 1 V_{PP} at f = 3.58 MHz, on Y1 or Y2 or CVBS inputs, R_{LOAD} = 150Ω		55		dB
R_{OUT}	Output Resistance			5	10	Ω
GC	Gain on C channel	V_{IN} = 1 V_{PP} at f = 1 MHz	5.5	6	6.5	dB
CToYdel	Chroma to Luma Delay, source Y1/C	V_{IN} = 1 V_{PP} at f = 3.58 MHz			20	ns
YCadd	Voltage to be applied at CVBS_ENC input for Y+C adder selection			V_{CC}	V_{CC}	V

2.3.3 Pb/Pr Section

Test conditions: T_{AMB} = 25°C, V_{CC} = 5 V; V_{CCB} = 5 V; $R_{GENERATOR}$ = 75 Ω and R_{LOUT} = 150 Ω, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DCIN_SYNC}	DC Input Level	Sync clamp input (Pr,Pb) Sync signal on Y input		3.0		V
I_{CLAMP_SYNC}	Clamping Current, Sync clamp	Sync clamp input (Pr,Pb) at V_{DCIN} -400 mV		100		µA
C_{IN}	Input Capacitance			2		pF
V_{IN}	Max Input Signal				1	V_{PP}
DYN	Dynamic Output Signal				2	V_{PP}
$DC_{PrPbOUT}$	DC Output Voltage (Pr and Pb Outputs)	Black Level sync signal on Y2 input		1.5		V
PF1	-1 dB Bandwidth (Flatness)		8	9		MHz
PF3	-3 dB Bandwidth			14		MHz
PSBR	Stopband Rejection	27 MHz versus 100 kHz		- 40		dB
Flatness	Spread of Gain in Video Bands	V_{IN} = 1 V_{PP} Band = 15 kHz to 10 MHz			±0.5	dB
PCTo	Crosstalk Isolation of Pr or Pb from Y1, Y2 and CVBS Channels	V_{IN} = 1 V_{PP} at f = 3.58 MHz, on Y1 or Y2 or CVBS input, R_{LOAD} = 150Ω		55		dB
R_{OUT}	Output Resistance			5	10	Ω
GP	Gain on Pr and Pb channels	V_{IN} = 1 V_{PP} at f = 1 MHz	5.5	6	6.5	dB

2.3.4 Mute Section

Test conditions: T_{AMB} = 25°C, V_{CC} = 5 V; V_{CCB} = 5 V; $R_{GENERATOR}$ = 75 Ω and R_{LOUT} = 75 Ω unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{00}	MUTE Voltage for Y1/C/CVBS muted and Y2/Pr/Pb muted	Pin MUTE to GND or logical 0	0		1.1	V
V_{01}	MUTE Voltage for Y1/C/CVBS active and Y2/Pr/Pb muted	Pin MUTE opened (not connected) See Note 1.	1.3		1.7	V
V_{10}	MUTE Voltage for Y1/C/CVBS muted and Y2/Pr/Pb active	Pin MUTE connected by 22 kΩ to VCC or at 3.3V (I_{IN} < 140 µA)	1.9		4	V
V_{11}	MUTE Voltage for Y1/C/CVBS active and Y2/Pr/Pb active	Pin MUTE to VCC (5V)	4.2		Vcc	V

Note: 1 When the MUTE pin is left open, its voltage is defined by an internal voltage divider performed by a 42 kΩ resistor to Vcc and 18 kΩ resistor to GND.

3 Input/Output Groups

Figure 4: Bottom Clamped Video Input (Y1_ENC)

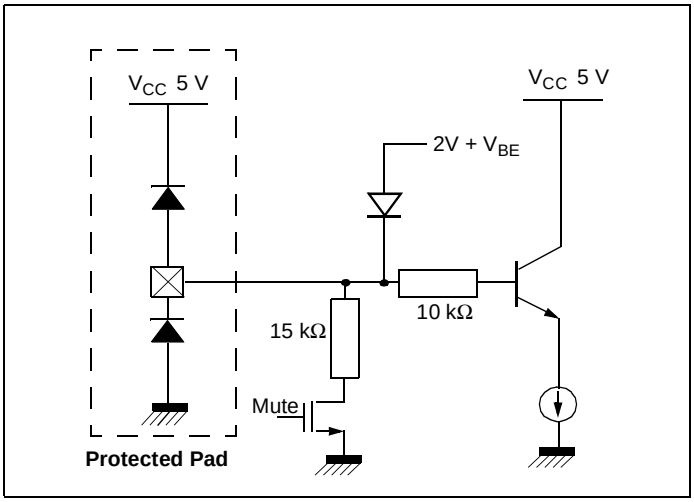


Figure 5: Average Clamped Video Input (C_ENC)

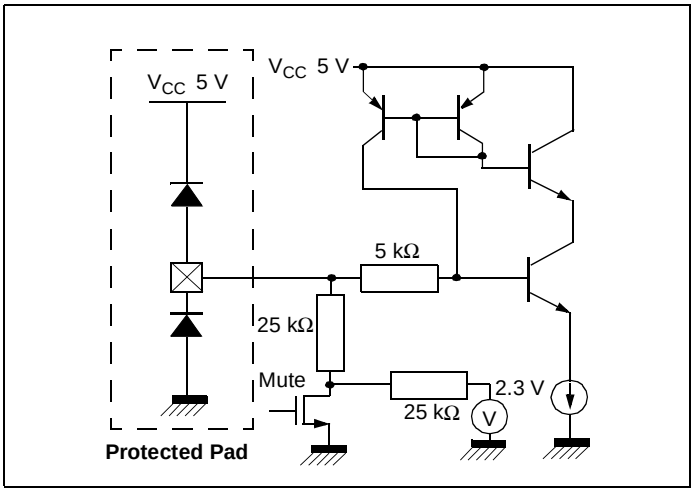


Figure 6: Video Outputs (CVBSOUT, Y1OUT, Y2OUT, PROUT and PBOUT)

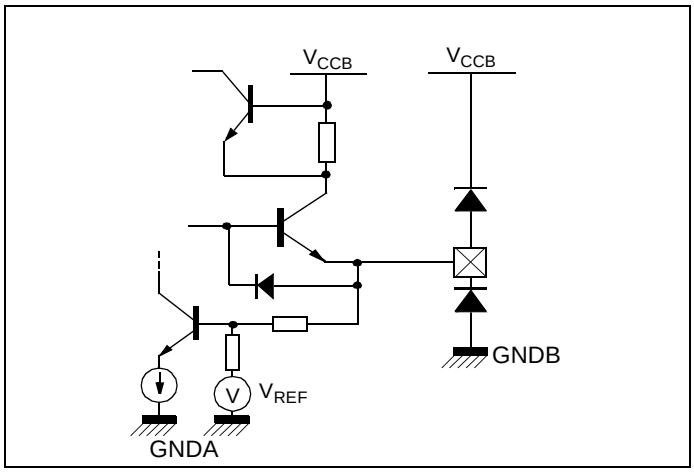


Figure 7: C Video Output (COUT)

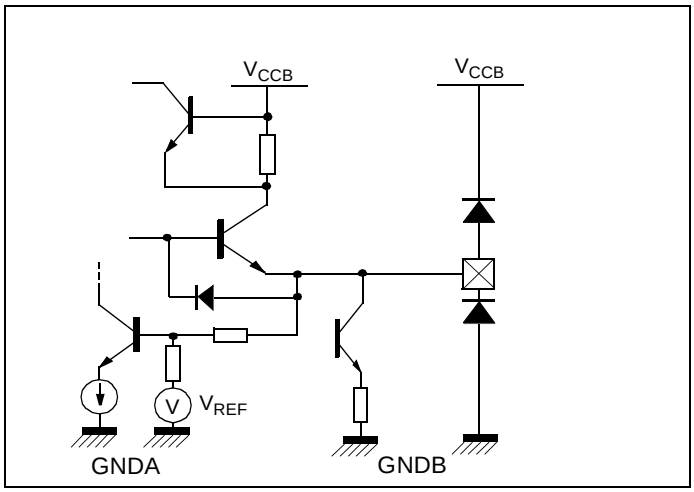


Figure 8: Black Level Clamped Video Input (Y2_ENC)

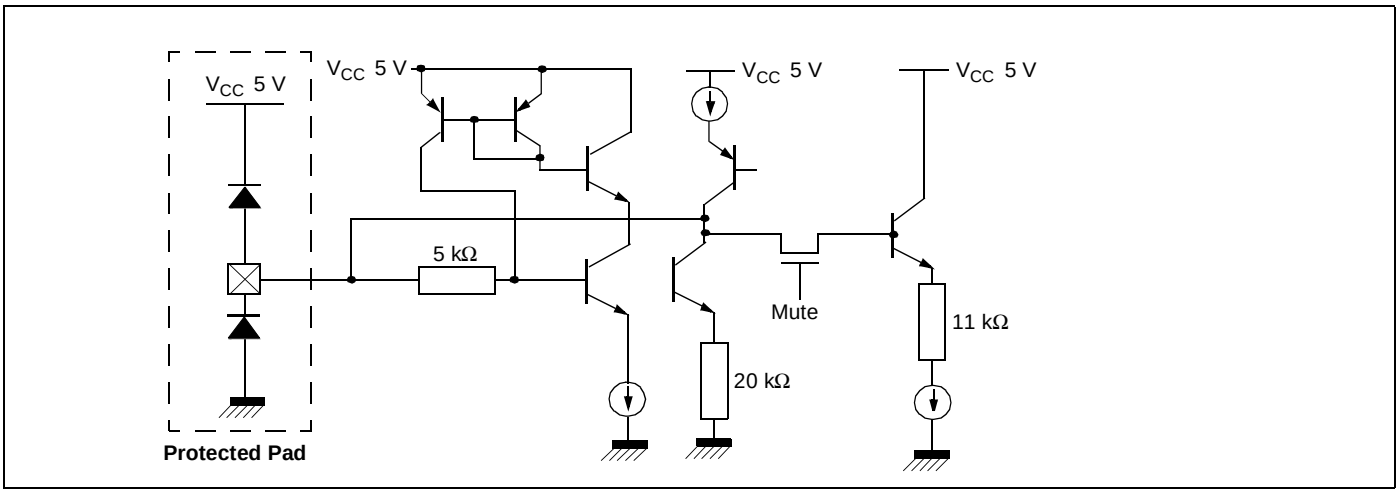


Figure 9: Pb/Pr Inputs (PR_ENC and PB_ENC)

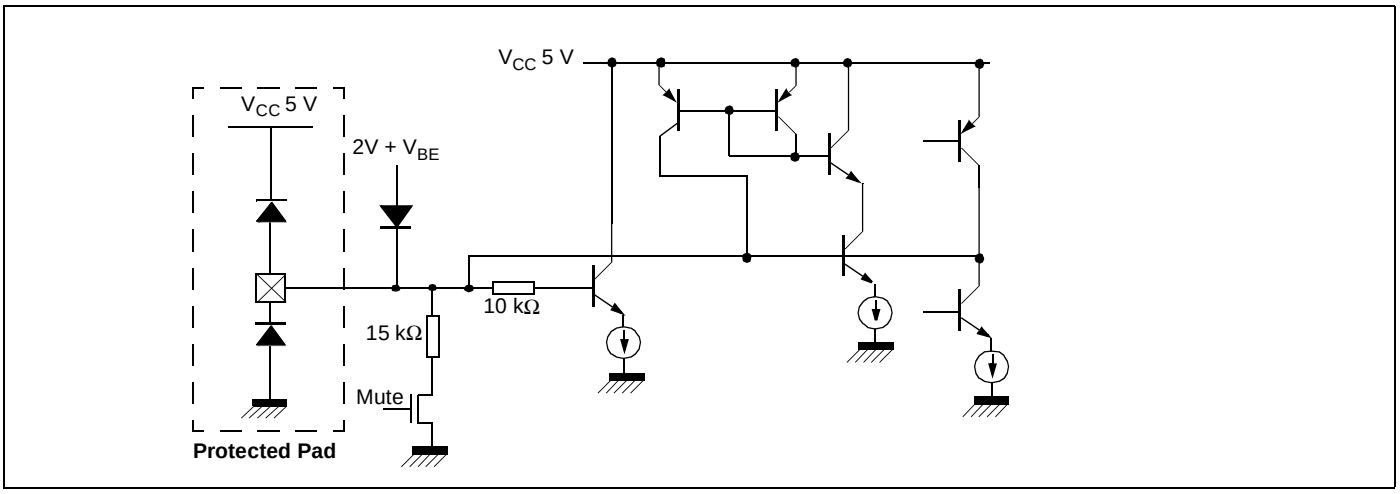


Figure 10: Decoupling Capacitor (DEC)

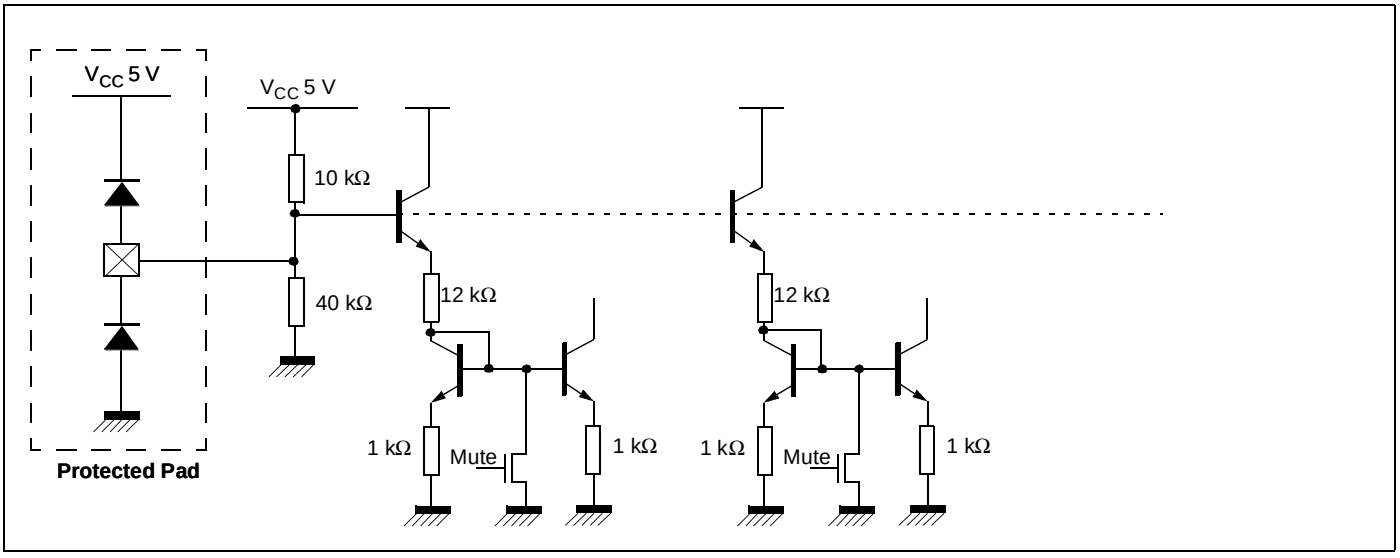


Figure 11: Mute (MUTE)

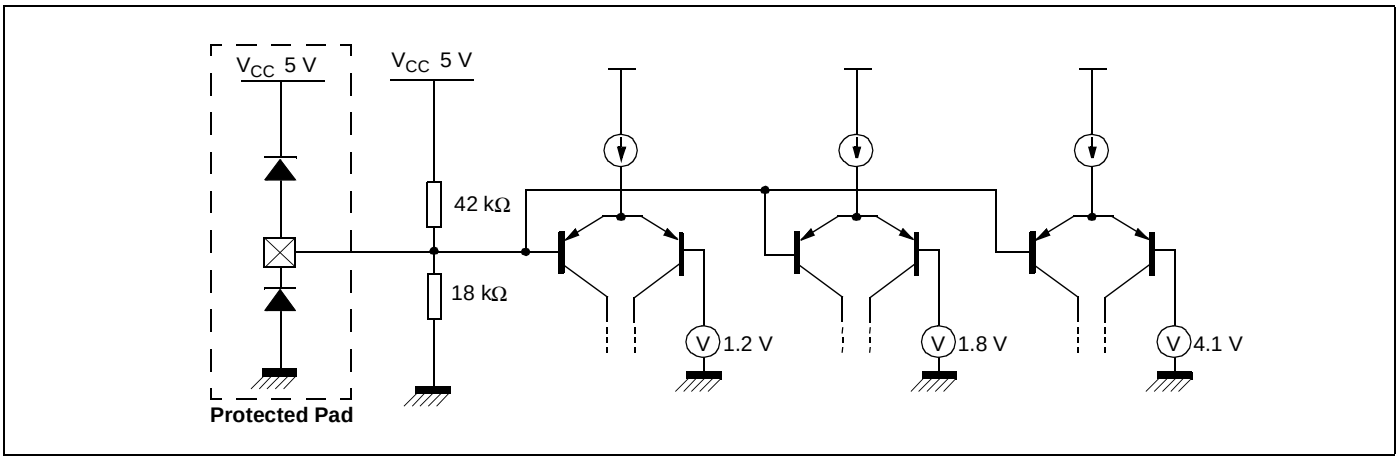


Figure 12: CVBS Input (CVBS_ENC)

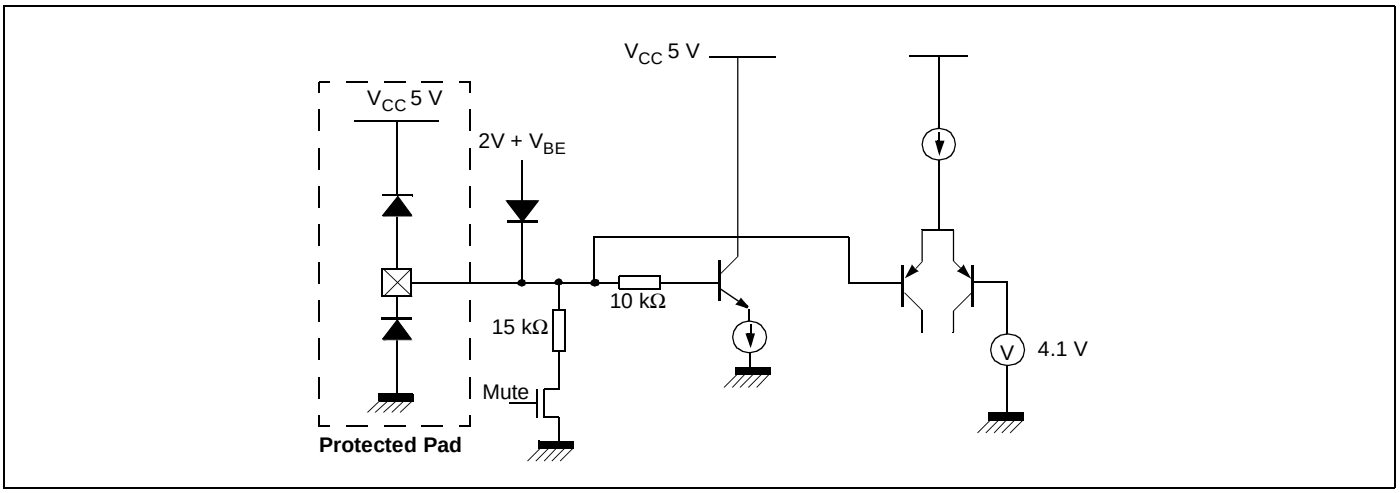
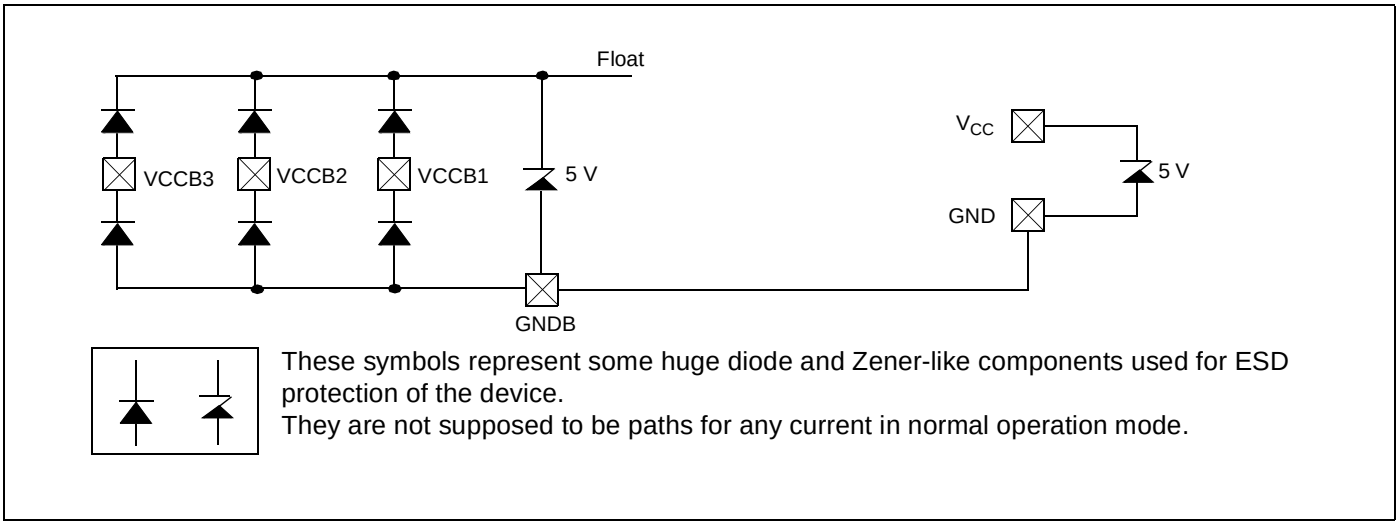


Figure 13: Power Supply Connection



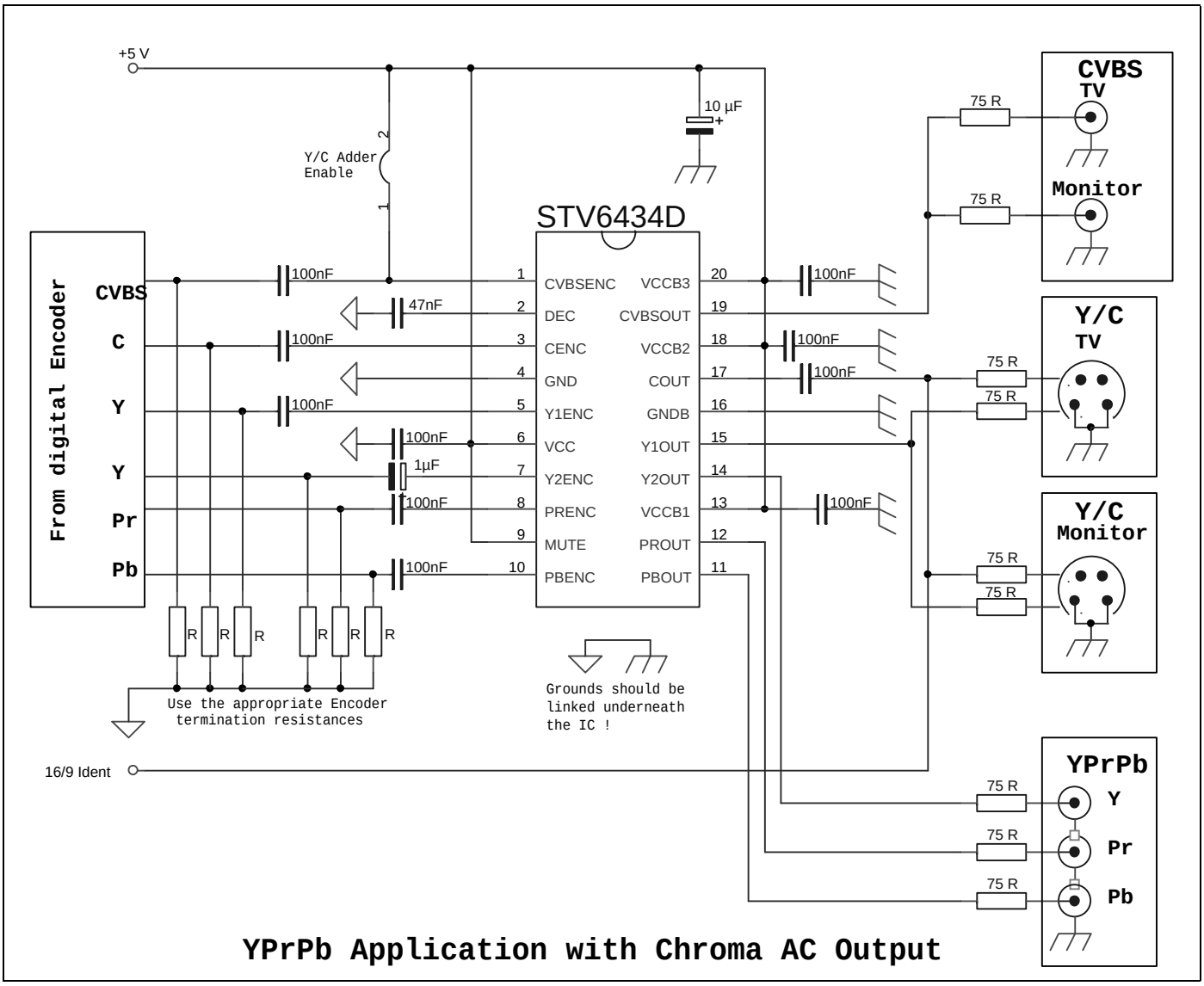
These symbols represent some huge diode and Zener-like components used for ESD protection of the device.
They are not supposed to be paths for any current in normal operation mode.

Table 2: Power Supply Connections

Supply	Description
VCCB1	Y2OUT, PROUT and PBOUT Supply
VCCB2	Y1OUT and COUT Supply
VCCB3	CVBSOUT Supply
GNDB	Output Buffer Ground
VCC	Input Stages, Filters and 6-dB Amplifier Supply
GND	Input Stages, Filters and 6-dB Amplifier Ground

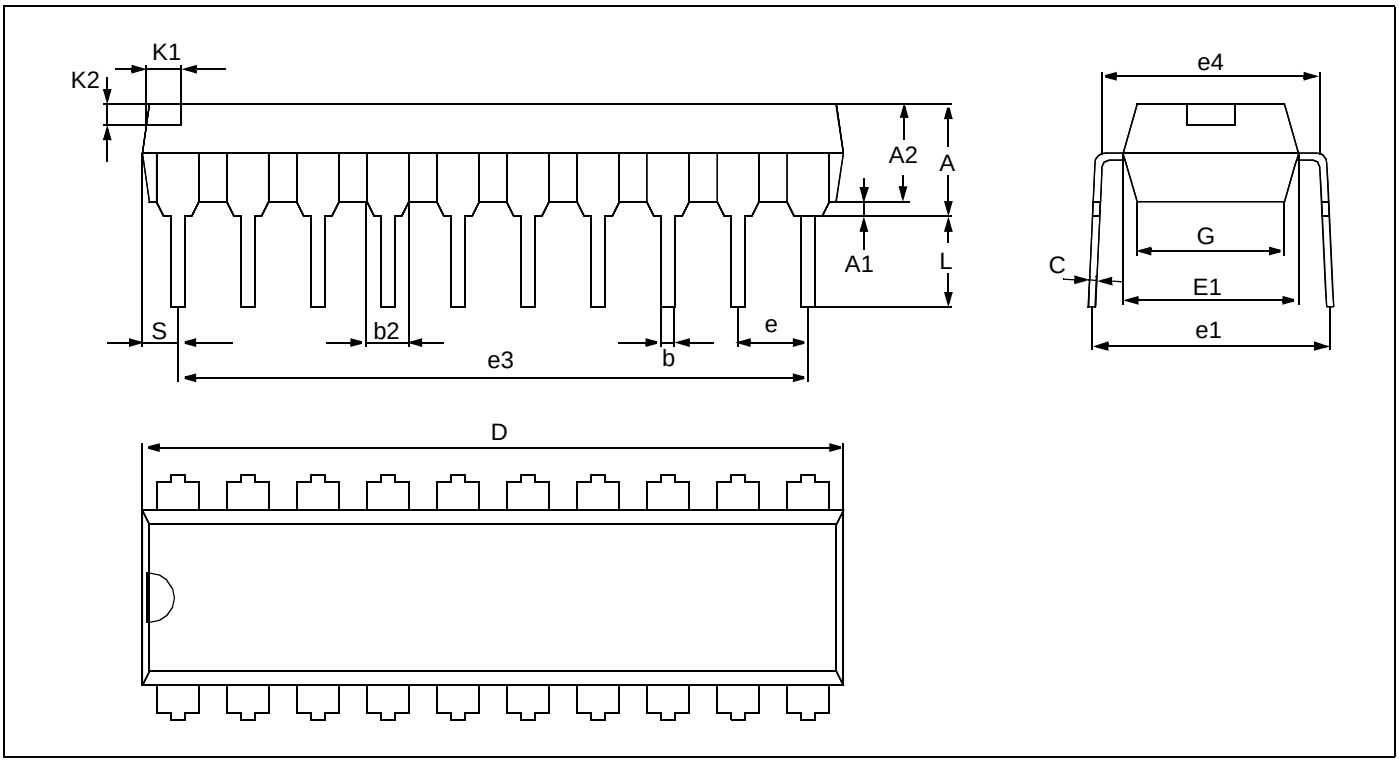
4 Application Diagram

Figure 14: Typical STV6434 Application Diagram



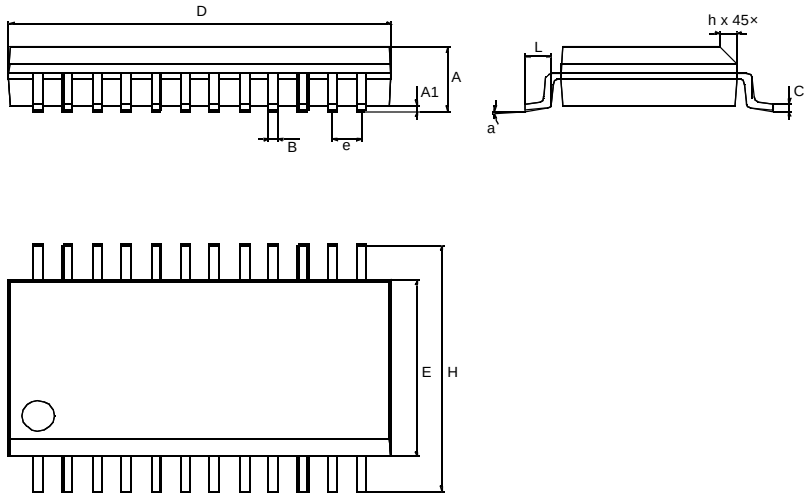
5 Package Mechanical Data

Figure 15: 20-Pin Plastic Single in Line Package (PDIP20)



Dim.	mm			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.33			0.210
A1	0.38			0.015		
A2	2.92	3.30	4.95	0.115	0.130	0.195
b	0.36	0.46	0.56	0.014	0.018	0.022
b2	1.14	1.52	1.78	0.045	0.060	0.070
c	0.20	0.25	0.36	0.008	0.010	0.014
D	24.89		26.92	0.980		1.060
e		2.54			0.100	
E1	6.10	6.35	7.11	0.240	0.250	0.280
L	2.92	3.30	3.81	0.115	0.130	0.150

Figure 16: 24-Pin Plastic Small Outline Package (SO24)



Dim.	mm			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.35		2.65	0.093		0.104
A1	0.10		0.30	0.004		0.012
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.009		0.013
D	15.20		15.60	0.599		0.614
E	7.40		7.60	0.291		0.299
e		1.27			0.050	
H	10.00		10.65	0.394		0.419
h	0.25		0.75	0.010		0.030
α	0°		8°	0°		8°
L	0.40		1.27	0.016		0.050

6 Revision History

Revision	Main Changes	Date
0.1	First Issue.	03 January 2002
1.0	Revised Issue. Document format updated.	31 January 2002
1.1	Modification of MUTE and PB_ENC pinout. Modification of Figure 3: STV6434 Block Diagram. Modification of values in Section 2.3: Electrical Characteristics, Section 2.3.1: Video Section (Y1, Y2 and CVBS Signals), Section 2.3.2: Chroma Section and Section 2.3.3: Pb/Pr Section.	13 February 2002
1.2	Addition of Section 3: Input/Output Groups. Modification of Figure 3: STV6434 Block Diagram. Modification of values in Section 2.3: Electrical Characteristics, Section 2.3.1: Video Section (Y1, Y2 and CVBS Signals), Section 2.3.2: Chroma Section and Section 2.3.3: Pb/Pr Section.	23 April 2002
1.3	Addition of Figure 14: Typical STV6434 Application Diagram, Modification of Figure 3: STV6434 Block Diagram and parameters in Section 2.3: Electrical Characteristics.	14 June 2002
1.4	Modification of Figure 3: STV6434 Block Diagram and Active Channel and Mute values in Section 2.3: Electrical Characteristics.	21 June 2002
1.5	Modification of Vin and DYN values in Section 2.3.1: Video Section (Y1, Y2 and CVBS Signals).	27 August 2003

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