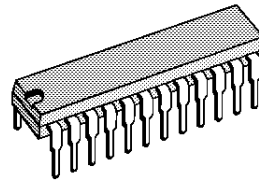


**MULTISTANDARD VIDEO AND SOUND IF SYSTEM  
WITH AUDIO AND VIDEO SWITCHES**

PRELIMINARY DATA

- VIDEO PLL DEMODULATION
- SOUND PLL DEMODULATION
- NEGATIVE MODULATION
- AGC FOR BG STANDARDS
- AUDIO SWITCH
- DC VOLUME CONTROL
- VIDEO SWITCH



**SHRINK24**  
(Plastic Package)

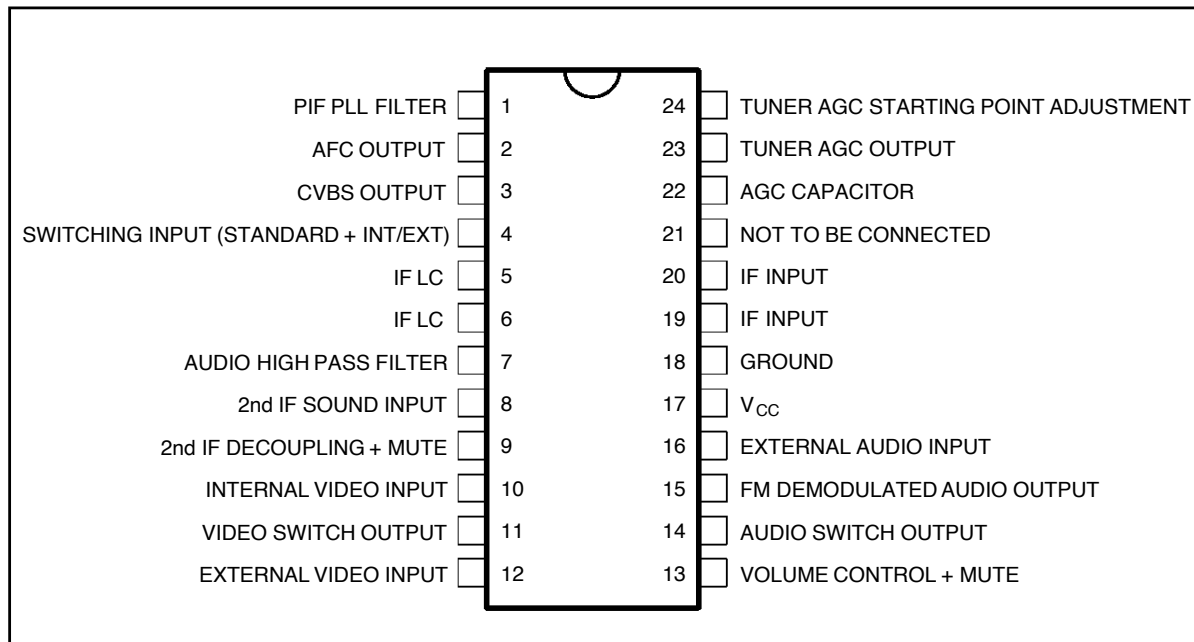
**ORDER CODE : STV8223A**

**DESCRIPTION**

The STV8223A is a picture and sound IF processor for negative modulation application with very few external components and adjustments.

It provides the audio and video switches for one SCART plug application.

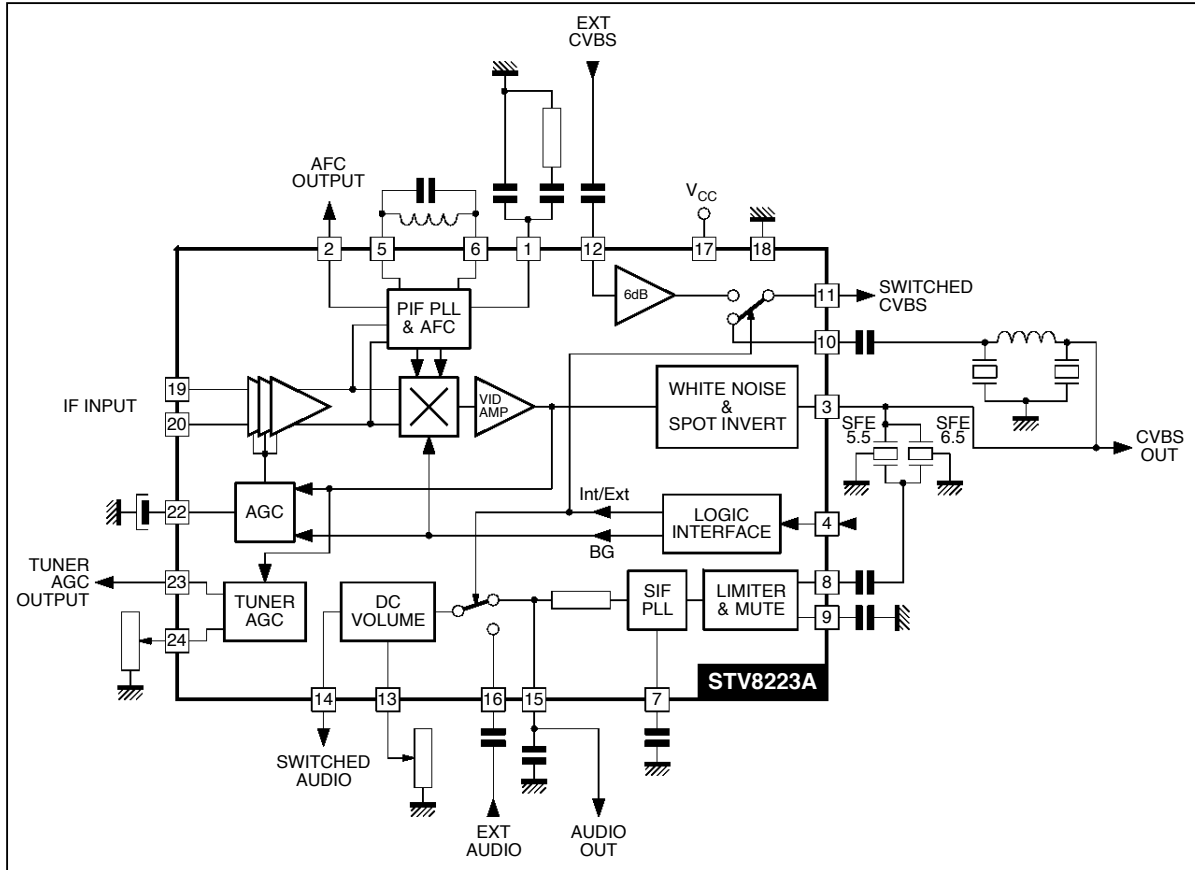
**PIN CONNECTIONS**



8223A-01.EPS

# STV8223A

## BLOCK DIAGRAM



8223A-02.EPS

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_S$	Supply Voltage	13.5	V
$V_x$	Tuner AGC Voltage	$V_{CC}$	V
$T_{stg}$	Storage Temperature	-40, +150	$^{\circ}C$
$T_{oper}$	Operating Temperature	0, +70	$^{\circ}C$

8223A-01.TBL

## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction-ambient Thermal Resistance	Max. 75	$^{\circ}C/W$

8223A-02.TBL

**ELECTRICAL CHARACTERISTICS**

( $T_{amb} = 25^{\circ}\text{C}$ ,  $V_{CC} = 9\text{V}$ , IF input =  $10\text{mV}_{RMS}$  sync level at B/G, Video modulation DSB,  $D = 90\%$  at B/G,  $f_{PC} = 38.9\text{MHz}$ ,  $f_{SC} = 33.4\text{MHz}$ , Video BW =  $5\text{MHz}$ , Sound carrier input :  $5.5\text{MHz}$ ,  $10\text{mV}_{RMS}$ ,  $f_M = 1\text{kHz}$ , Audio BW =  $20\text{kHz}$ ,  $\Delta f = \pm 50\text{kHz}$ , Volume attenuation =  $0\text{dB}$ , unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
--------	-----------	-----------------	------	------	------	------

**SUPPLY**

$V_{CC}$	Supply Voltage		8	9	12.6	V
$I_{CC}$	Supply Current	$I_{17}$ , $V_{CC} = 9\text{V}$		70	95	mA

**IF AMPLIFIER**

$V_{19-20}$	Input Sensitivity (RMS)	-3dB Video at Output		70		$\mu\text{V}_{RMS}$
$R_{19-20}$	Differential Input Resistance			1.5		$\text{k}\Omega$
$C_{19-20}$	Differential Input Capacitance			2		pF
Gr	Gain Control Range			64		dB
	Max Input Signal	+1dB Video at Output		110		$\text{mV}_{RMS}$

**SYNCHRONOUS VIDEO DEMODULATOR**

$DF_{PC}$	Vision Carrier Capture		-1.4		1.6	MHz
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**AFC**

S2	AFC Slope	See Figure 20		0.2		$\mu\text{A}/\text{kHz}$
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**DEMODULATED VIDEO OUTPUT (Pin 3)**

$V_{A3}$	Amplitude	Top Sync to White	2	2.3	2.6	$V_{PP}$
$V_{S3}$	Top Sync Level	B/G	1.6	1.9	2.2	V
	Zero Carrier Level	B/G		4.4		V
BW	Bandwidth	-3dB Video Signal	6	7		MHz
Dg	Differential Gain			6	8	%
Dp	Differential Phase			6	8	Degree
$V_{r3c}$	Residual Carrier Signal (RMS Value)			1	10	mV
$V_{r3h}$	Residual 2nd Harmonic (RMS Value)			1	10	mV
$I_3$	Internal Bias of Emitter Follower		3	5		mA
S/N	Signal to Noise Ratio	Note 1 - Weighted CCIR-567	53	58		dB
	Intermodulation 1.07MHz	Note 2		52		dB
$V_{WTH}$	White Noise Threshold Voltage			4.85		V
$V_{WIL}$	White Noise Insertion Level			3.6		V
$V_{BTH}$	Black Noise Threshold Voltage			1.3		V
$V_{BIL}$	Black Noise Insertion Level			2.5		V

**AGC CIRCUIT (BG MODE)**

$I_{22CBG}$	Charging Current		550	950	1300	$\mu\text{A}$
$I_{22DBG}$	Discharge Current		12	20	28	$\mu\text{A}$
C/D	Charging/Discharging Ratio			45		

**TUNER AGC**

$I_{23}$	Maximum Sunked Current		1.5	2	2.5	mA
S23	Current Slope	$R_{24} = 5\text{k}\Omega$	100	170	230	$\mu\text{A}/\text{dB}$
$I_{23+}$	Maximum Tuner Plus Sunked Current	Note 3		40		mA

Notes : 1.  $\frac{S}{N} = 20 \log 10 \frac{V_{out \text{ black white}}}{V_N (\text{mV}_{RMS})}$  at BW =  $5\text{MHz}$

2. Video carrier relative level =  $0\text{dB}$ , Chroma subcarrier level =  $-3.2\text{dB}$ , Sound carrier relative level =  $-20\text{dB}$ . AGC voltage (Pin 22) is adjusted to get  $1V_{PP}$  signal on output (Pin 3).

3. Additional sunked current for large increasing steps of input signal when :  
 - Voltage Pin 22 > starting point defined Pin 24.  
 - Output signal (Pin 3) saturated ( $V_3 < V_{BTH}$  in BG mode).

8223A-03.TBL

## STV8223A

### ELECTRICAL CHARACTERISTICS (continued)

( $T_{amb} = 25^{\circ}\text{C}$ ,  $V_{CC} = 9\text{V}$ , IF input =  $10\text{mV}_{RMS}$  sync level at B/G, Video modulation DSB,  $D = 90\%$  at B/G,  $f_{PC} = 38.9\text{MHz}$ ,  $f_{SC} = 33.4\text{MHz}$ , Video BW =  $5\text{MHz}$ , Sound carrier input :  $5.5\text{MHz}$ ,  $10\text{mV}_{RMS}$ ,  $f_M = 1\text{kHz}$ , Audio BW =  $20\text{kHz}$ ,  $\Delta f = \pm 50\text{kHz}$ , Volume attenuation =  $0\text{dB}$ , unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Ma.	Unit
--------	-----------	-----------------	------	------	-----	------

#### FM SOUND DEMODULATION

$V_{8S}$	Input Sensitivity	-3dB FM detected signal		35		$\mu\text{V}$
$R_8$	Limiter Input Resistance			1.2		$\text{k}\Omega$
AMR	Amplitude Modulation Rejection	Note 4	50	61		dB
SVR	Supply Voltage Rejection Ratio	Ripple signal : $100\text{Hz}$ , $0.5V_{PP}$	12	17		dB
$V_{15}$	Detected Audio Output Signal		0.85	1.1	1.4	$V_{RMS}$
THD	Total Harmonic Distortion			0.2	1	%
$R_{15}$	Internal Deemphasis Resistor		600	750	900	$\Omega$
S/N	Signal to Noise Ratio	Note 5, Weighted CCIR 468-4	50	55		dB

#### VOLUME CONTROL

$V_C$ Range	Control Range	See Figure 21	72	77		dB
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#### AUDIO SWITCH

$R_{16}$	Input Resistance		45	60	75	$\text{k}\Omega$
CRtk	Crosstalk		70	80		dB
EXTHD	THD on External Signal	$V_{IN} = 2V_{RMS}$ , Attenuation = $0\text{dB}$		0.1	0.3	%

#### VIDEO SWITCH

$V_{DC12}$	DC Input Level	No signal	1.6	1.9	2.2	V
$V_{S12}$	Top Sync. Clamp Level			1.8		V
$V_{11}$	DC Output Level	No signal	1.7	2	2.3	V
$V_{S11}$	Top Sync. Clamp Level			1.5		V
	Crosstalk			55		dB
GEX	Gain from External Input to Output		5.5	6	6.5	dB
	Output Swing		4	5		V
$I_{12}$	Input Current	$V_{12} = V_{DC12} = 1.5\text{V}$		1	5	$\mu\text{A}$
VBW	Bandwidth	$V_{IN} = 1V_{PP}$		15		MHz
$G_{IN}$	Gain from Internal Input to Output		-0.5	0	+0.5	dB

#### MUTE (Pin 9 or Pin 13)

$V_{TH9}$	Threshold Voltage Pin 9		1.7	2	2.3	V
$V_9$	DC Level when Mute Disabled	High impedance controlling circuit		2.8		V
$V_{TH13}$	Threshold Voltage Pin 13		0.2	0.3	0.4	V

#### CONTROL INPUT

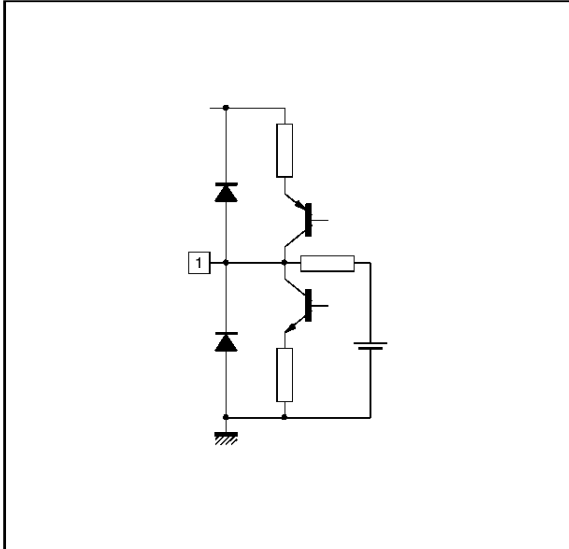
	Negative Modulation	Video : External - Audio : External Video : Internal - Audio : Internal	7.2		1.8	V V
	Positive Modulation	Video : External - Audio : External Video : Internal - Audio : External	4.9 2.6		6.4 4.1	V V
	Threshold 3	Level linked to $V_{CC}$	6.4	6.8	7.2	V
	Threshold 2	Level linked to $V_{CC}$	4.1	4.5	4.9	V
	Threshold 1	Level linked to $V_{CC}$	1.8	2.2	2.6	V

Notes : 4.  $AMR = 20 \log \frac{V_{15} (mV_{RMS})}{V_{AM}}$  (dB) where  $V_{AM}$  = output amplitude in AM for  $f_M = 1\text{kHz}$  and  $m = 30\%$

5.  $\frac{S}{N} = 20 \log \frac{V_{15} (mV_{RMS})}{V_N (mV_{RMS})}$  (dB)

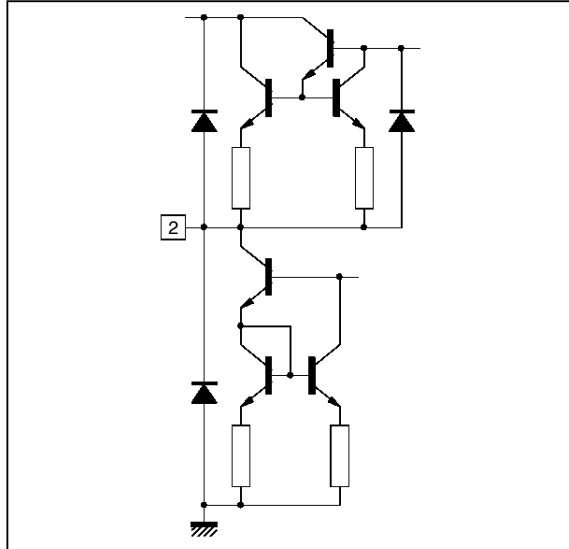
**INPUT/OUTPUT PIN CONFIGURATION**

**Figure 1 : PIF PLL Filter**



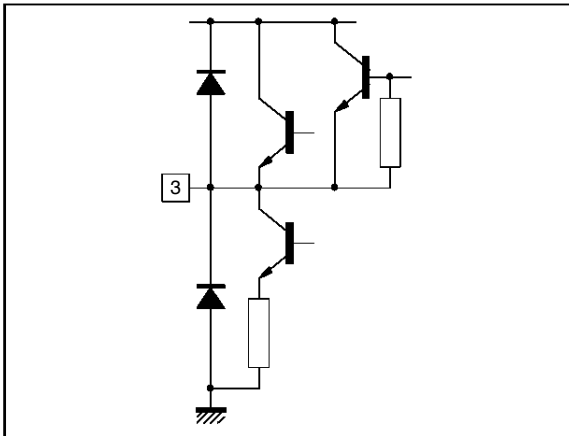
8223A-03.EPS

**Figure 2 : AFC Output**



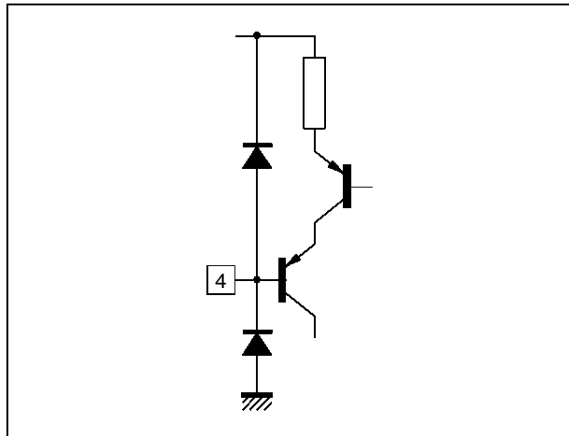
8223A-04.EPS

**Figure 3 : CVBS Output**



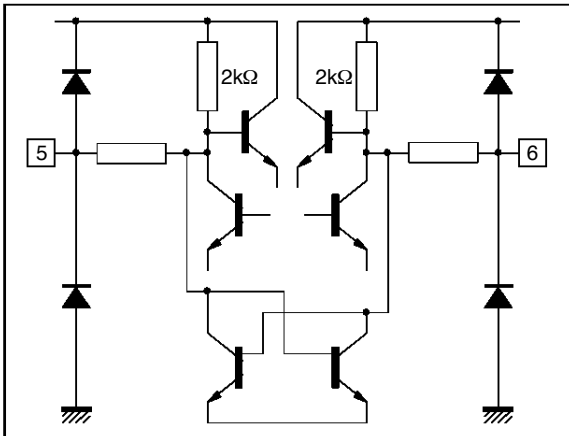
8223A-05.EPS

**Figure 4 : Switching Input Standard + INT/EXT**



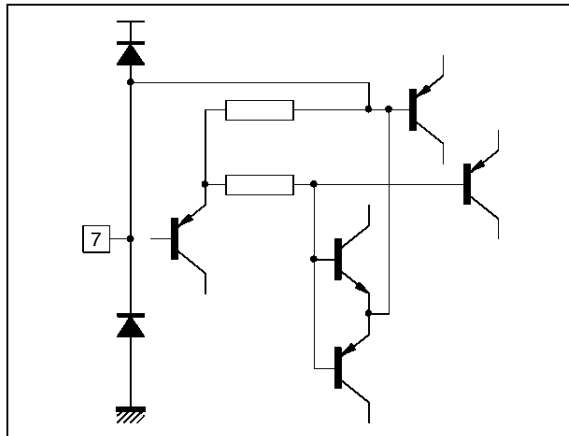
8223A-06.EPS

**Figure 5 : IFLC**



8223A-07.EPS

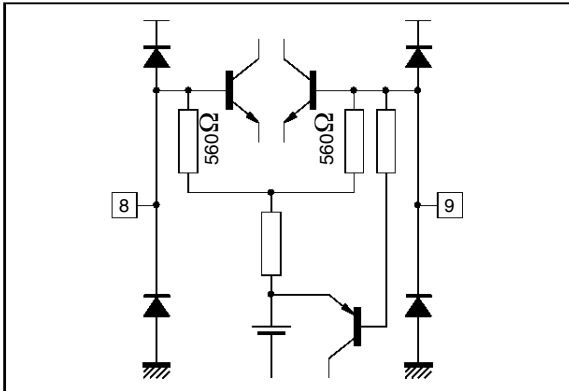
**Figure 6 : Audio High Pass Filter**



8223A-08.EPS

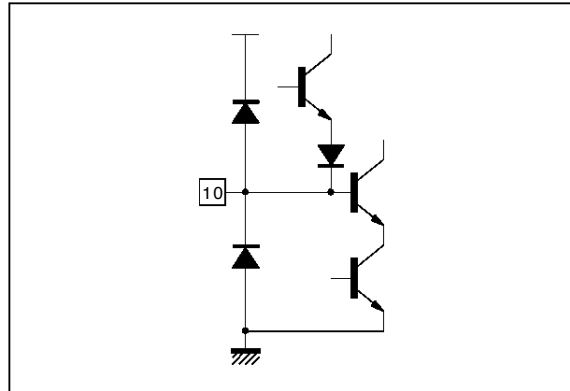
INPUT/OUTPUT PIN CONFIGURATION (continued)

Figure 7 : 2CD IF Sound Input (Pin 8)  
2CD IF Decoupling + Mute (Pin 9)



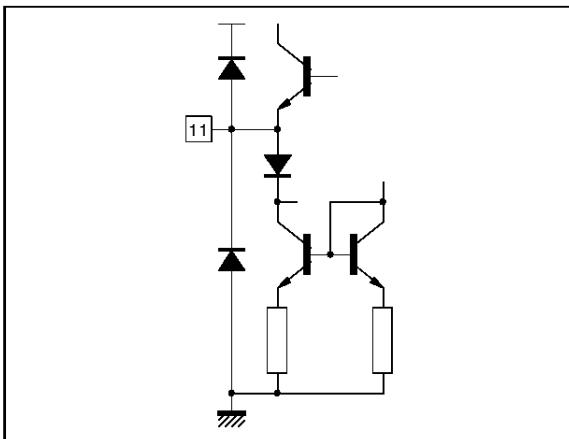
8223A-09.EPS

Figure 8 : Internal Video Input



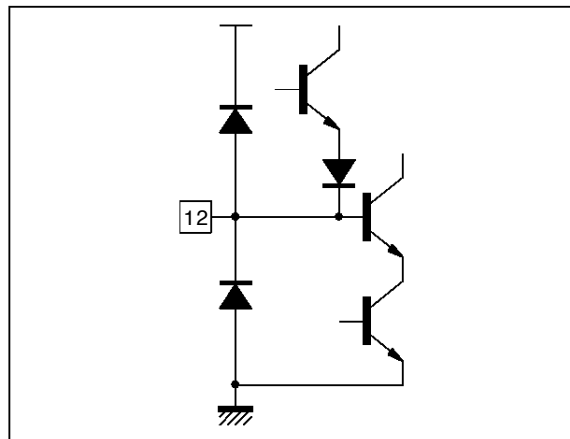
8223A-10.EPS

Figure 9 : Video Switch Output



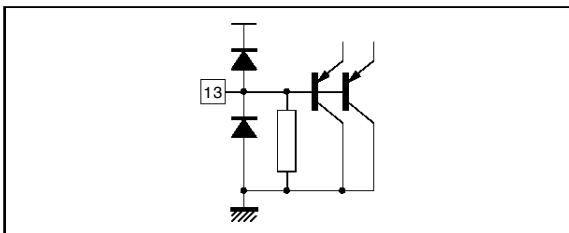
8223A-11.EPS

Figure 10 : External Video Input



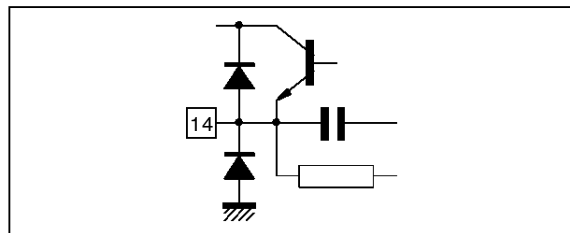
8223A-12.EPS

Figure 11 : Volume Control + Mute



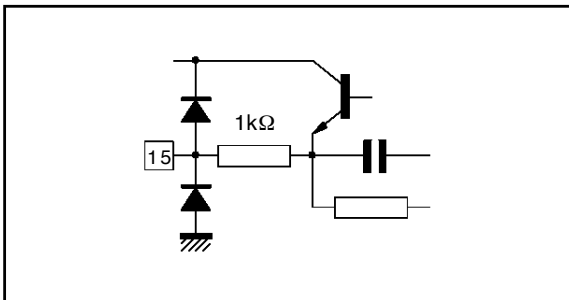
8223A-13.EPS

Figure 12 : Audio Switch Output



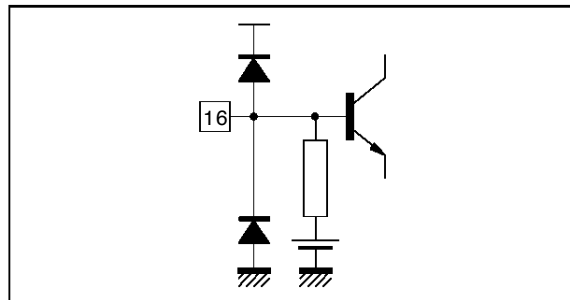
8223A-14.EPS

Figure 13 : FM Demodulated Audio Output



8223A-15.EPS

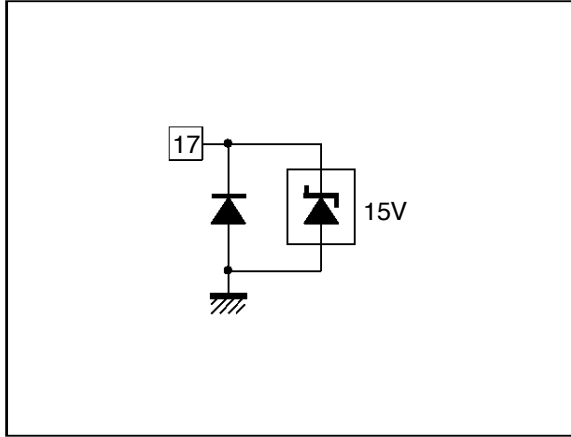
Figure 14 : External Audio Input



8223A-16.EPS

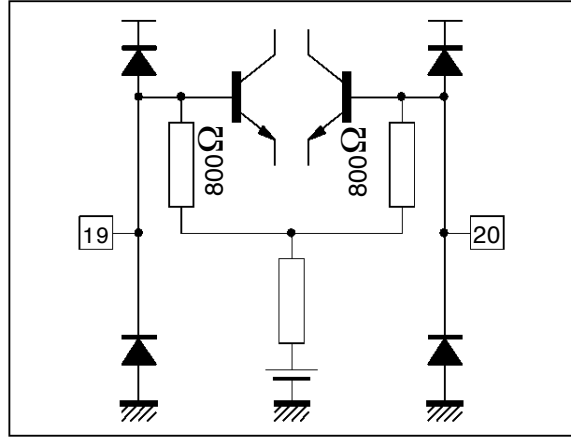
INPUT/OUTPUT PIN CONFIGURATION (continued)

Figure 15 : V<sub>CC</sub>



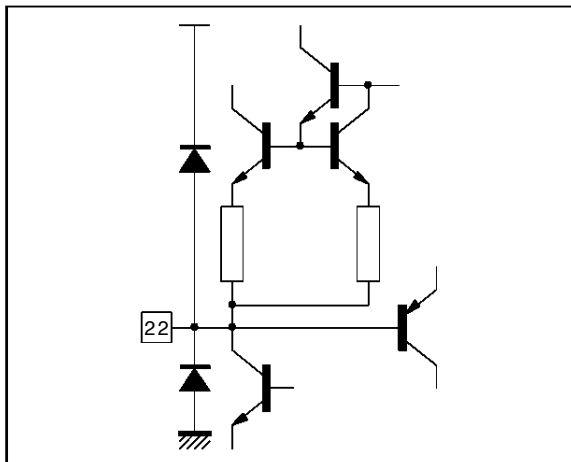
8223A-17.EPS

Figure 16 : IF Input



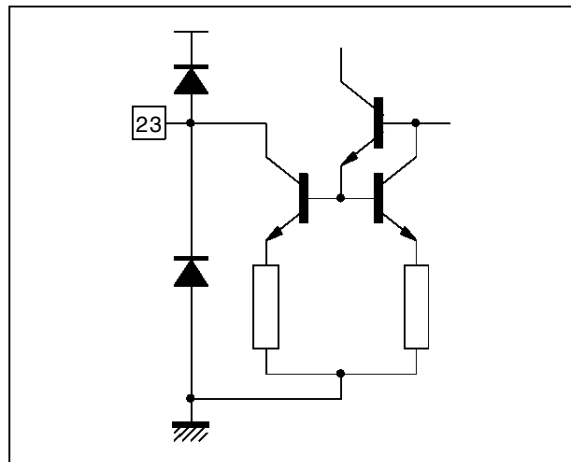
8223A-18.EPS

Figure 17 : AGC Capacitor



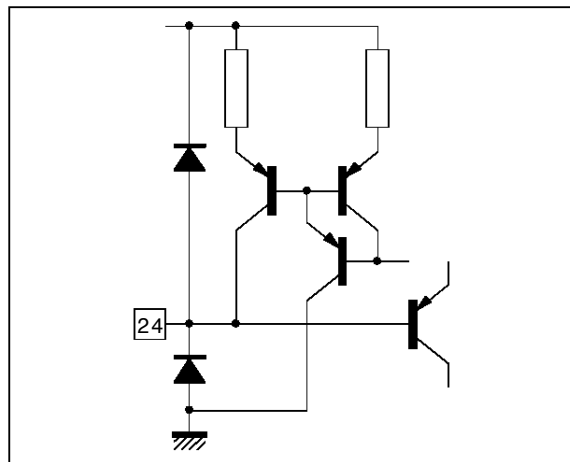
8223A-20.EPS

Figure 18 : Tuner AGC Output



8223A-21.EPS

Figure 19 : Tuner AGC Starting Point Adjustment



8223A-22.EPS

Figure 20 : AFC Voltage Pin 2 vs IF Frequency

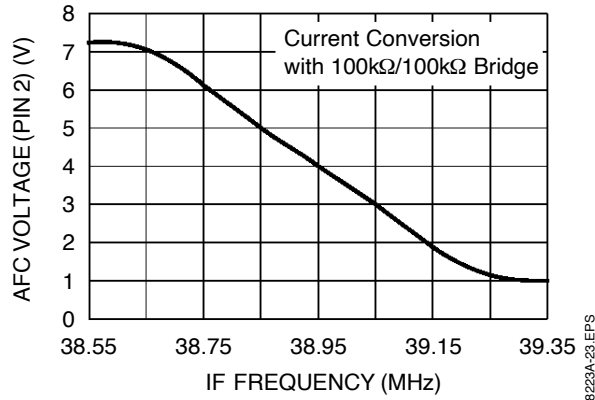


Figure 21 : Volume Control Attenuation vs V<sub>13</sub>

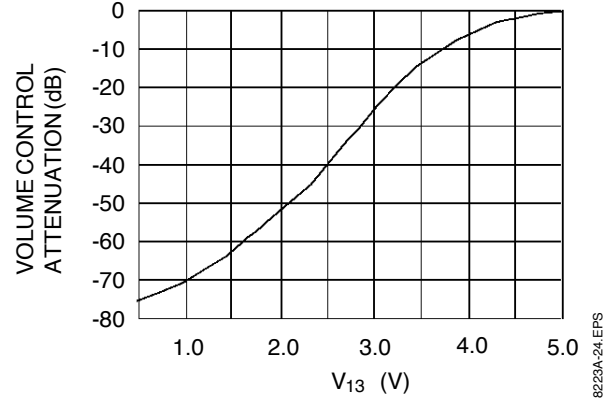


Figure 22 : Tuner AGC Output Current vs V<sub>IN</sub> (R24 is external adjustment Pin 24)

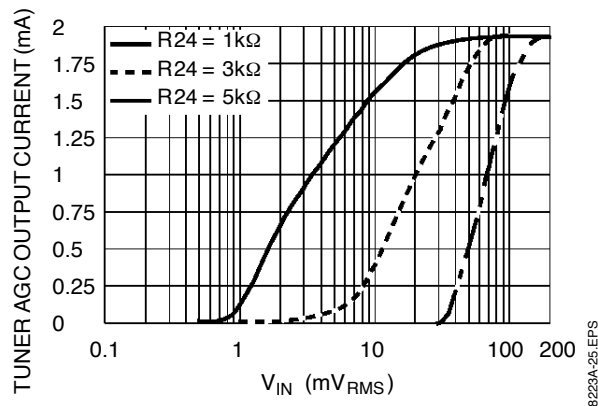
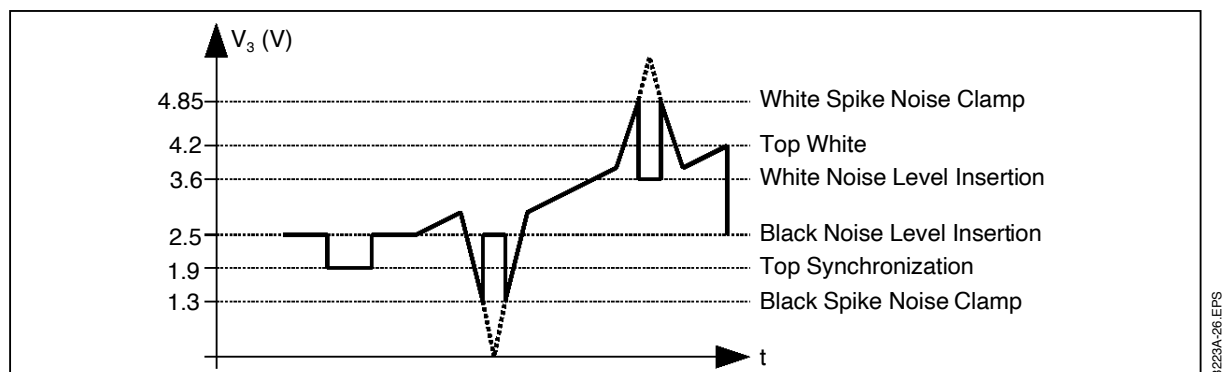
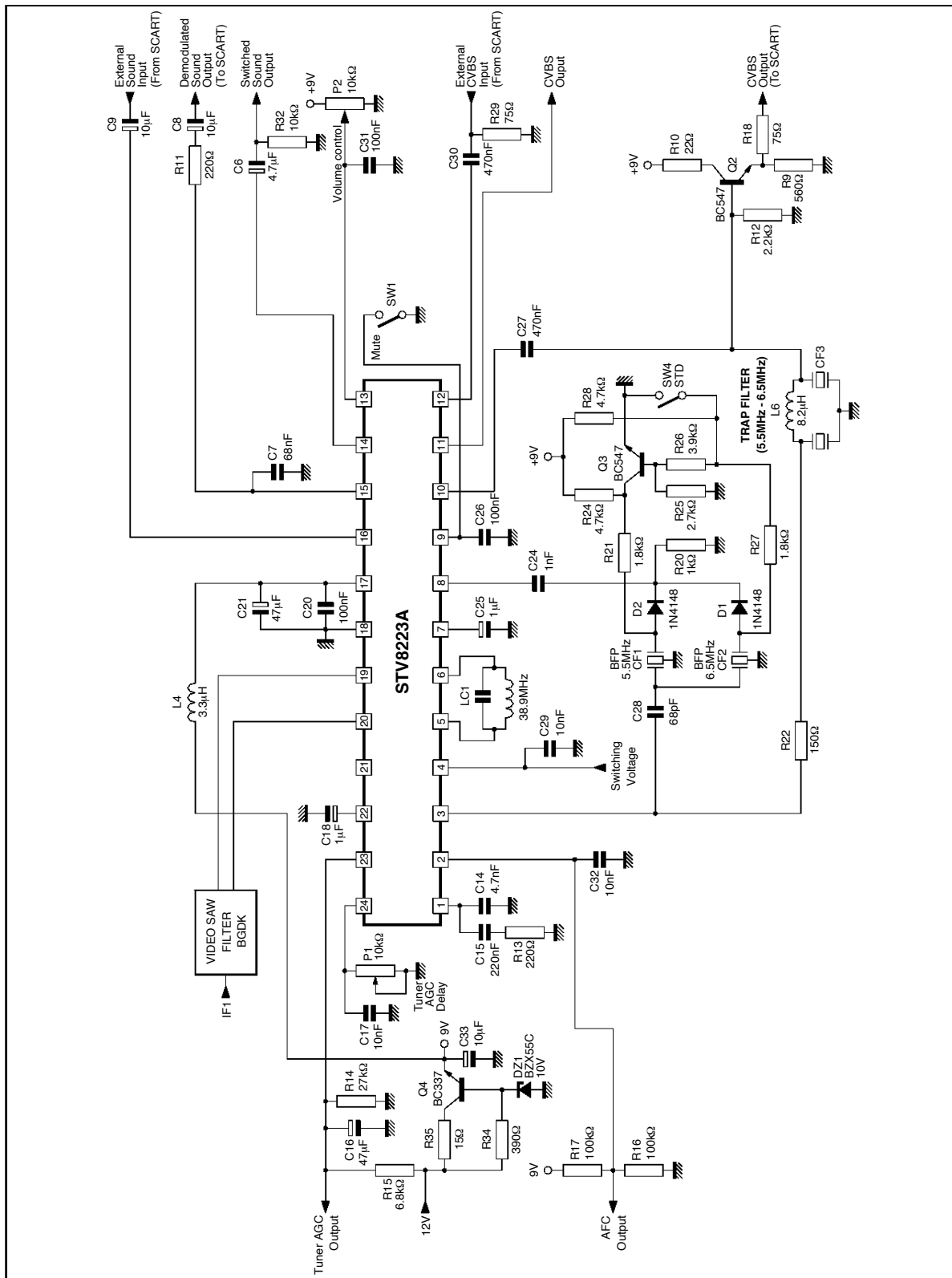


Figure 23 : Black and White Noise Inverter





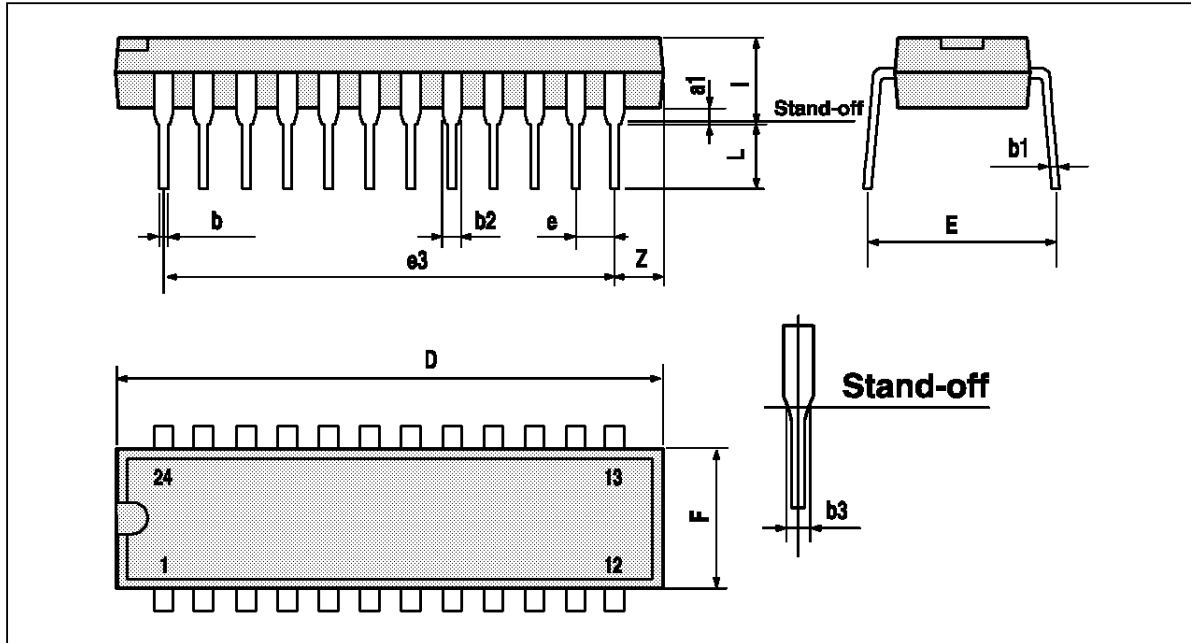
APPLICATION DIAGRAM



8223A-27.EPS

# STV8223A

## PACKAGE MECHANICAL DATA 24 PINS - PLASTIC SHRINK DIP



PMSDIP24.WMF

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		3.3			0.130	
a1	0.51			0.020		
b	0.35		0.59	0.014		0.023
b1	0.2		0.36	0.008		0.014
b2	0.75		1.42	0.030		0.056
b3	0.75			0.030		
D			23.11			0.910
E	7.95		9.73	0.313		0.383
e		1.778			0.070	
e3		19.558			0.770	
e4		7.62			0.300	
F			6.86			0.270
i			5.08			0.200
L	2.54			0.100		

SDIP24.TBL

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