

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

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

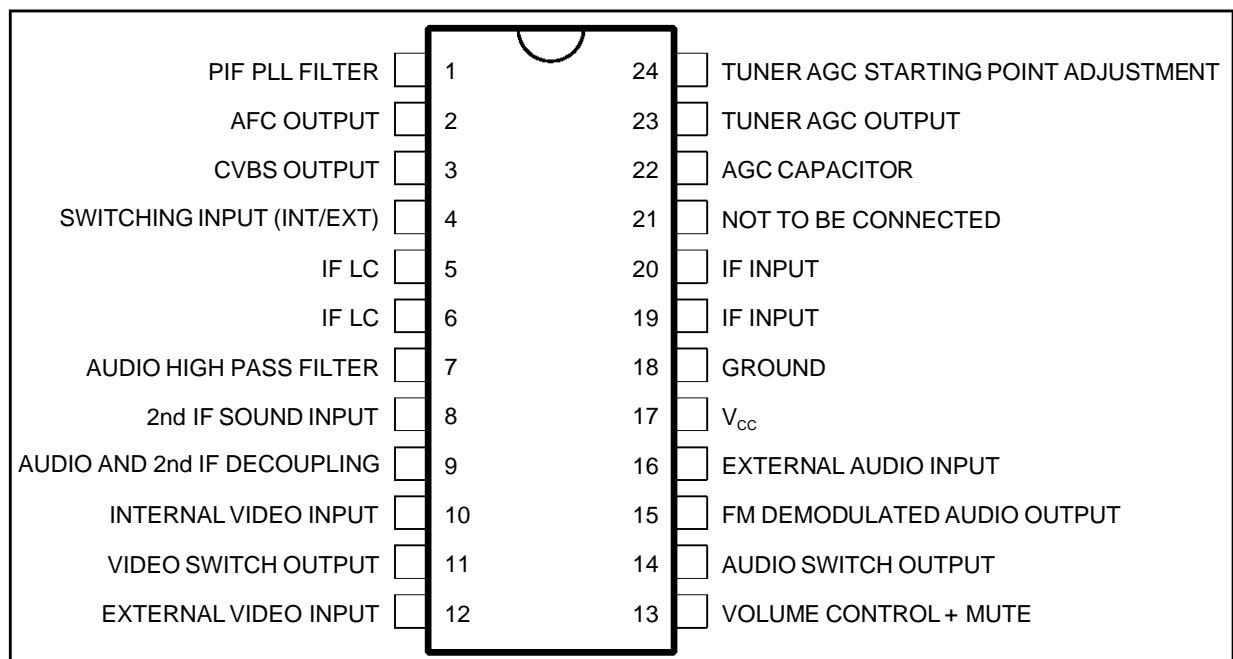


**DESCRIPTION**

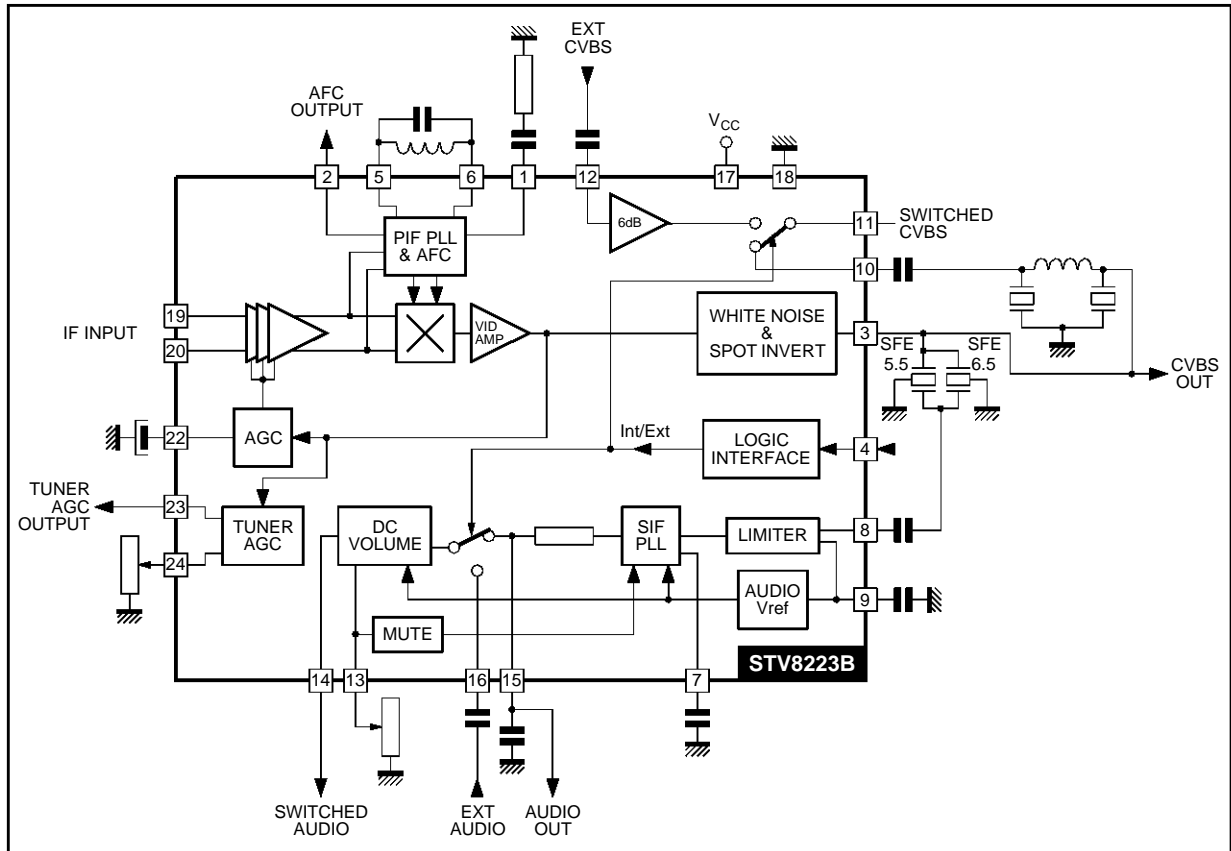
The STV8223B is a picture and sound IF processor for multistandard application with very few external components and adjustments.

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

**PIN CONNECTIONS**



**BLOCK DIAGRAM**



8223B-02.EPS

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>S</sub>	Supply Voltage	13.5	V
V <sub>X</sub>	Tuner AGC Voltage	V <sub>CC</sub>	V
T <sub>stg</sub>	Storage Temperature	-40, +150	°C
T <sub>oper</sub>	Operating Temperature	0, +70	°C

8223B-01.TBL

**THERMAL DATA**

Symbol	Parameter	Value	Unit
R <sub>th (j-a)</sub>	Junction-ambient Thermal Resistance	Max. 75	°C/W

8223B-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
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**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			2		$\text{k}\Omega$
$C_{19-20}$	Differential Input Capacitance			2		pF
Gr	Gain Control Range			68		dB
	Max Input Signal	+1dB Video at Output		180		$\text{mV}_{RMS}$

**SYNCHRONOUS VIDEO DEMODULATOR**

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

S2	AFC Slope	See Figure 21		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	$V_{PP}$
BG vs L	Amplitude Difference				10	%
$V_{S3}$	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	7	9		MHz
Dg	Differential Gain			6	8	%
Dp	Differential Phase			3	6	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	56	61		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**

$I_{22CBG}$	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).

**ELECTRICAL CHARACTERISTICS** (continued)

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
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FM SOUND DEMODULATION

$V_{8S}$	Input Sensitivity			150		$\mu V_{RMS}$
$R_8$	Limiter Input Resistance			600		$\Omega$
	DC Voltage (Pin 8)			4.2		V
AMR	Amplitude Modulation Rejection	Note 4	50	61		dB
SVR	Supply Voltage Rejection Ratio	Ripple signal : $100Hz$ , $0.5V_{PP}$	28	33		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	See Note 5, Weighted CCIR 468-4, (quasi peak level) input Pin 8	55	60		dB
	Black Picture (sync only)	Measurement between IF input (Pins 19-20) and audio output (Pin 15) SAW : K2955 BPF : SFE5.5MB	47	52		dB
	White Picture		46	50		dB
	250kHz Square Wave		47	52		dB

VOLUME CONTROL

$V_C$ Range	Control Range	See Figure 22	72	77		dB
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AUDIO SWITCH

$R_{16}$	Input Resistance		55	70	85	$k\Omega$
CRtk	Crosstalk		70	80		dB
En	Output Noise Level (Pin 14)	Weighted CCIR 468-4, $V_{13} = 0.5V$ (quasi peak level)		70		$\mu V$
EXTHD	THD on External Signal (Pin 14)	$V_{IN} = 2V_{RMS}$ , Attenuation = $0dB$		0.1	0.3	%
	Audio Reference Voltage (Pin 9)			4.5		V

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 Ext. Input to Output		5.5	6	6.5	dB
	Output Swing		4	5		V
$I_{12}$	Input Current	$V_{12} = V_{DC12} = 1.5V$		1	5	$\mu A$
VBW	Bandwidth	$V_{IN} = 1V_{PP}$		15		MHz
$G_{IN}$	Gain from Int. Input to Output		-0.5	0	+0.5	dB

MUTE (Pin 13)

$V_{TH13}$	Threshold Voltage Pin 13		0.2	0.3	0.4	V
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CONTROL INPUT

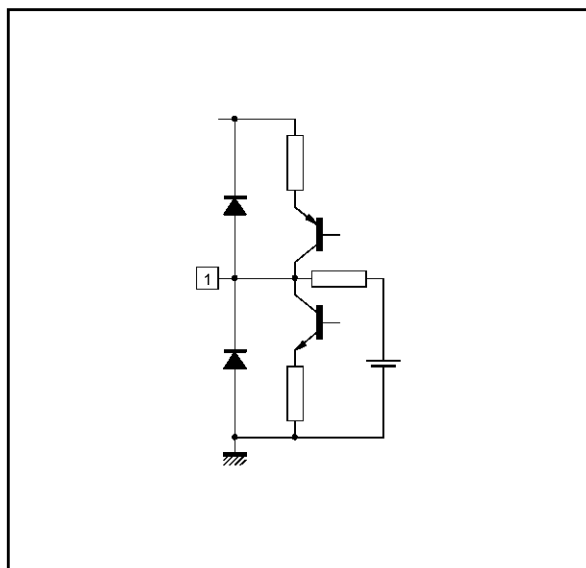
	Negative Modulation	Video : External - Audio : External	7.2			V
	Negative Modulation	Video : Internal - Audio : Internal			1.8	V

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

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

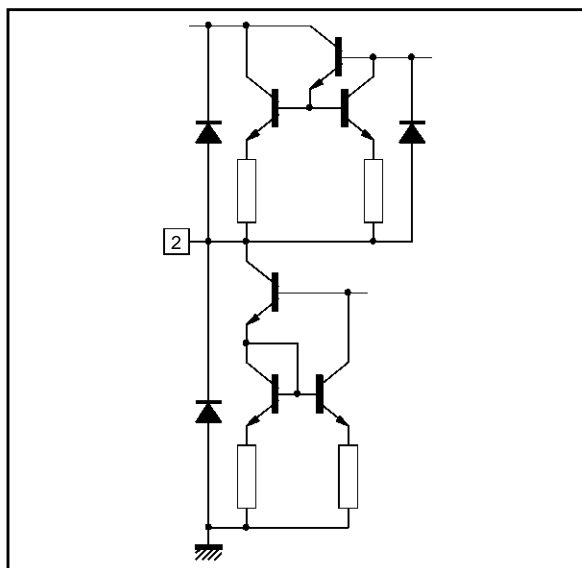
INPUT/OUTPUT PIN CONFIGURATION

Figure 1 : PIF PLL Filter



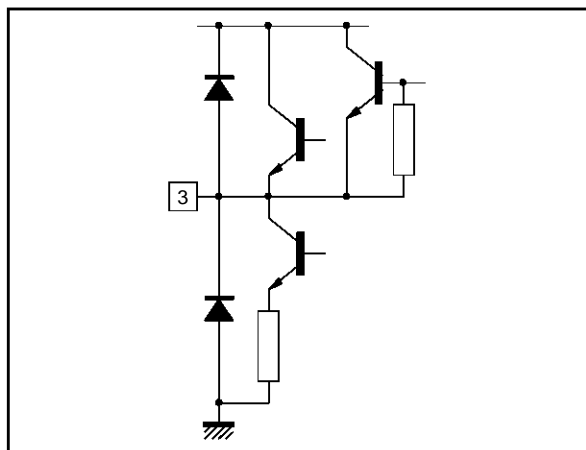
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Figure 2 : AFC Output



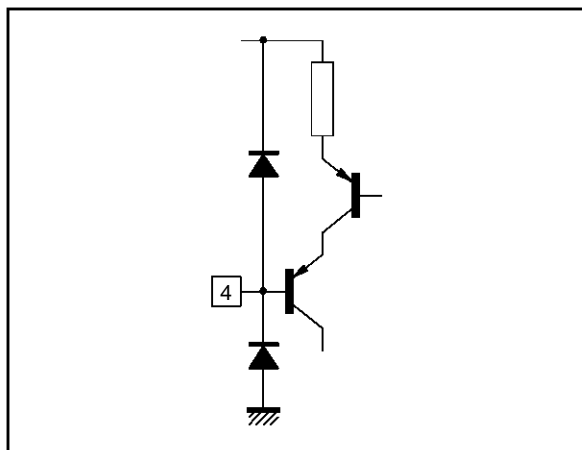
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Figure 3 : CVBS Output



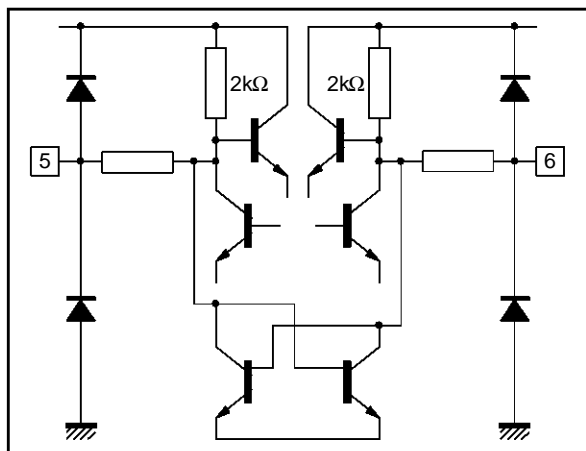
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Figure 4 : Switching Input INT/EXT



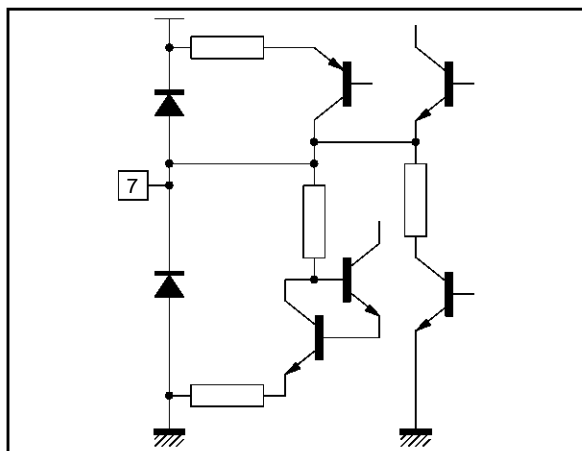
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Figure 5 : IFLC



8223B-07.EPS

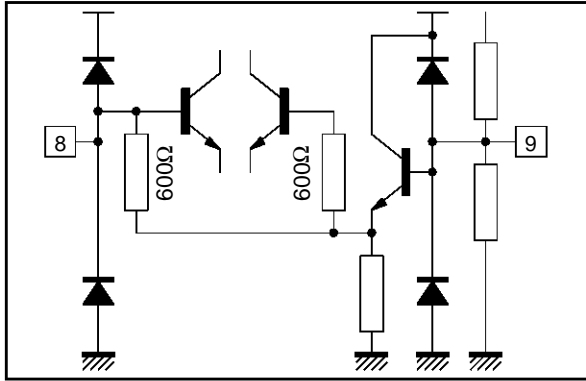
Figure 6 : Audio High Pass Filter



8223B-08.EPS

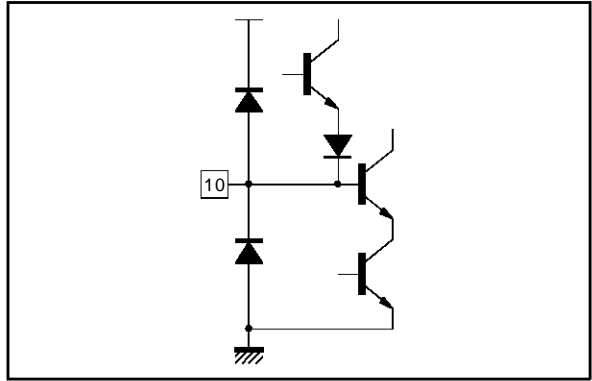
INPUT/OUTPUT PIN CONFIGURATION (continued)

**Figure 7 :** 2<sup>nd</sup> IF Sound Input (Pin 8)  
Audio and 2<sup>nd</sup> IF Decoupling (Pin 9)



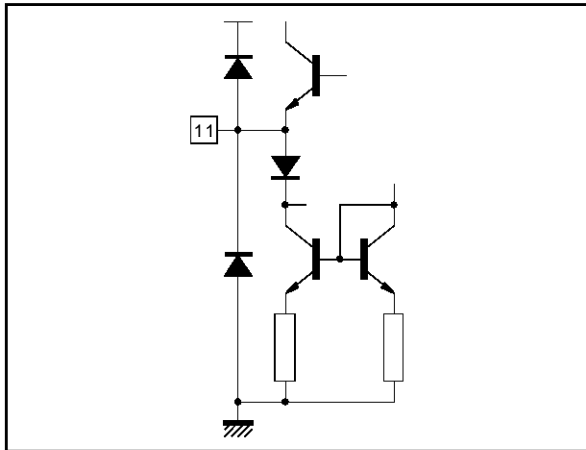
8223B-09.EPS

**Figure 8 :** Internal Video Input



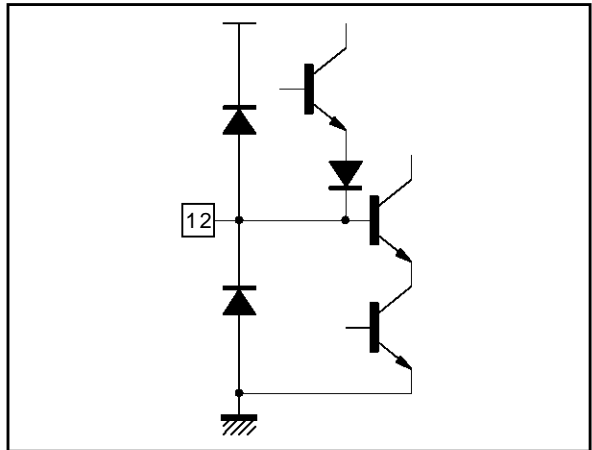
8223B-10.EPS

**Figure 9 :** Video Switch Output



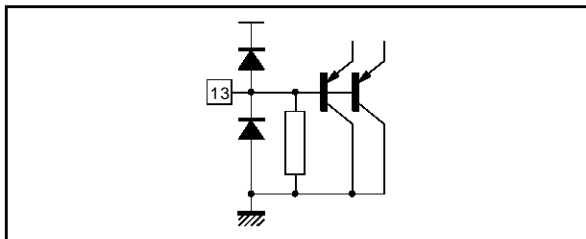
8223B-11.EPS

**Figure 10 :** External Video Input



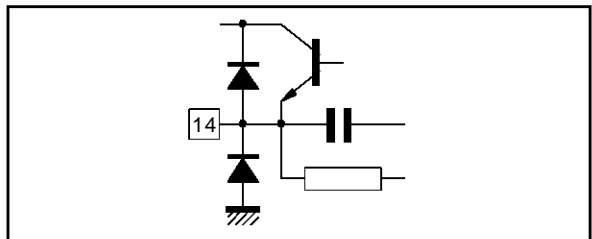
8223B-12.EPS

**Figure 11 :** Volume Control + Mute



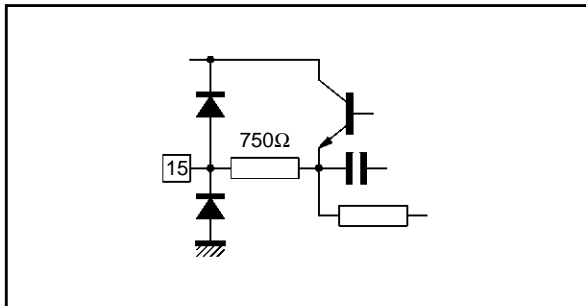
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**Figure 12 :** Audio Switch Output



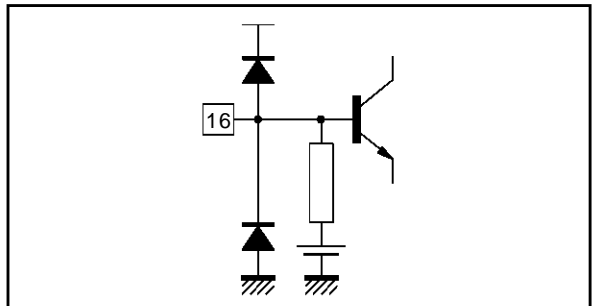
8223B-14.EPS

**Figure 13 :** FM Demodulated Audio Output



8223B-15.EPS

**Figure 14 :** External Audio Input



8223B-16.EPS

INPUT/OUTPUT PIN CONFIGURATION (continued)

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

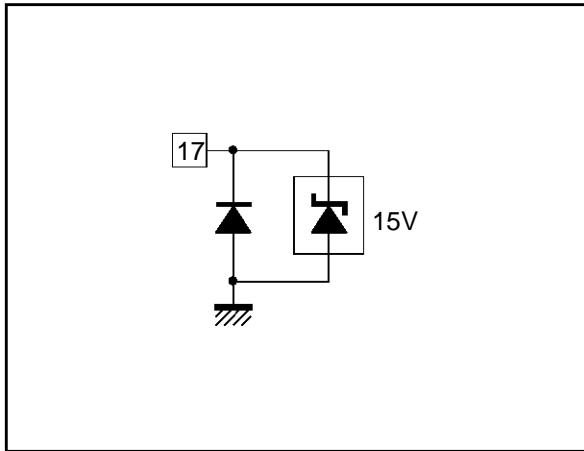


Figure 16 : IF Input

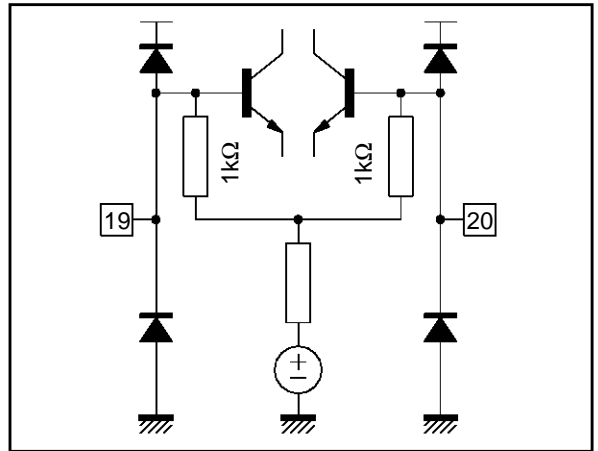


Figure 18 : AGC Capacitor

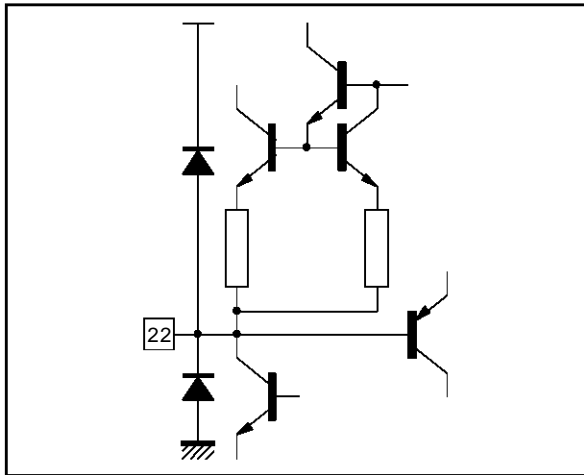


Figure 19 : Tuner AGC Output

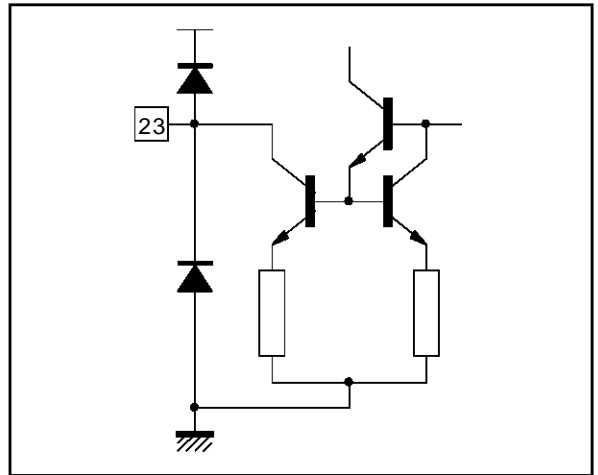


Figure 20 : Tuner AGC Starting Point Adjustment

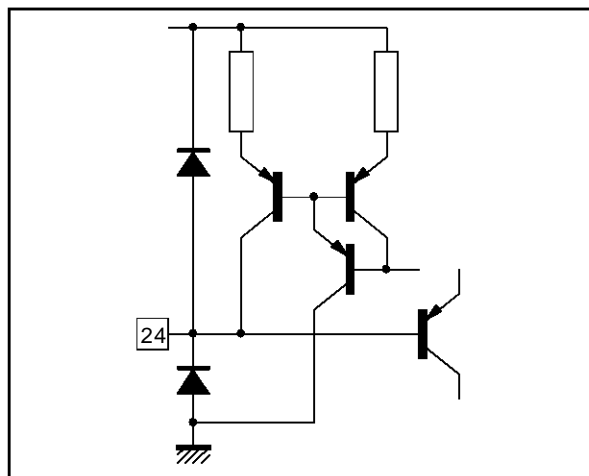


Figure 21 : AFC Voltage Pin 2 vs IF Frequency

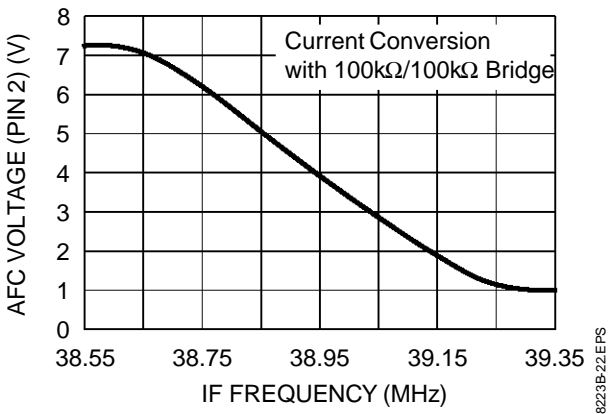


Figure 22 : Volume Control Attenuation vs  $V_{13}$

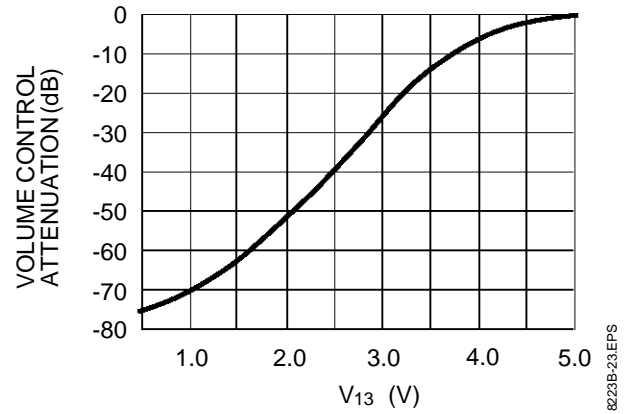


Figure 23 : Tuner AGC Output Current vs  $V_{IN}$  (R24 is external adjustment Pin 24)

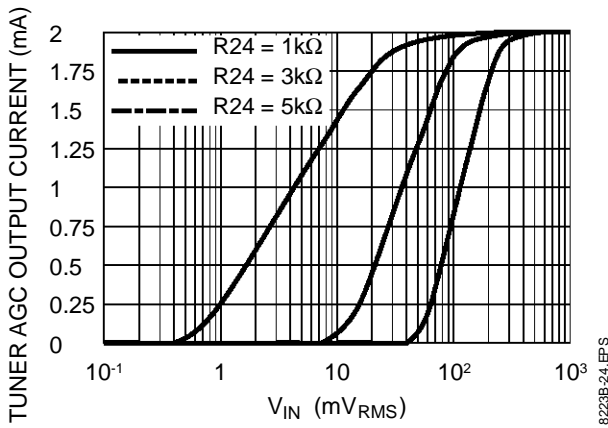


Figure 24 : Video Signal to Noise Ratio (Pin 3) as a function of IF Input Signal (Pins 19-20) Weighted CCIR-567

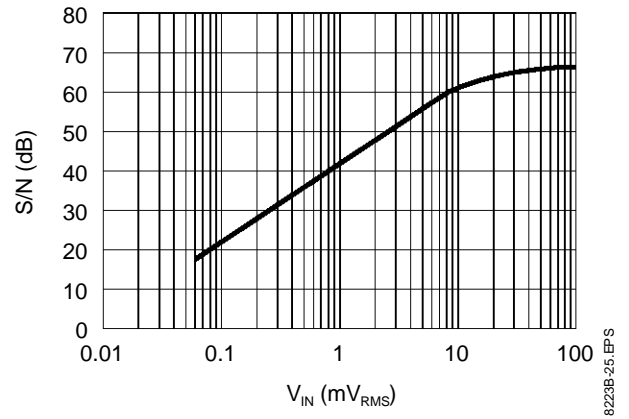
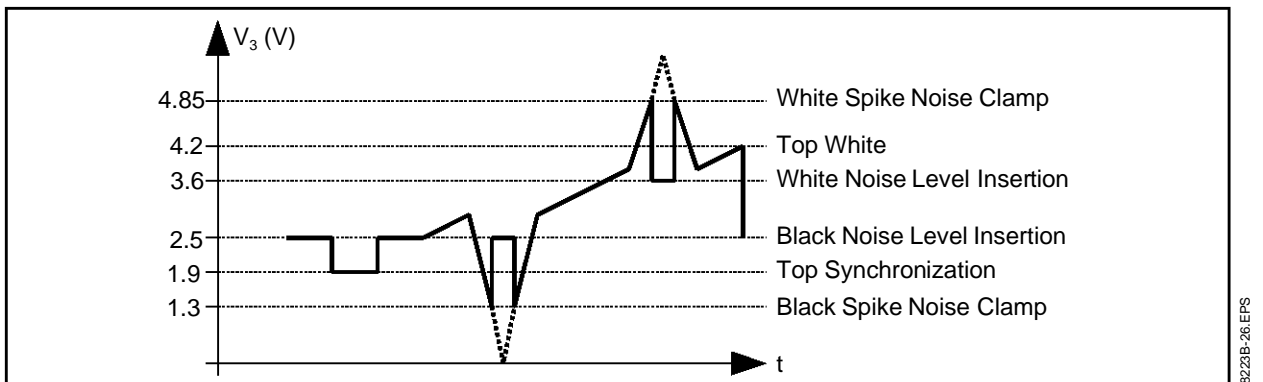
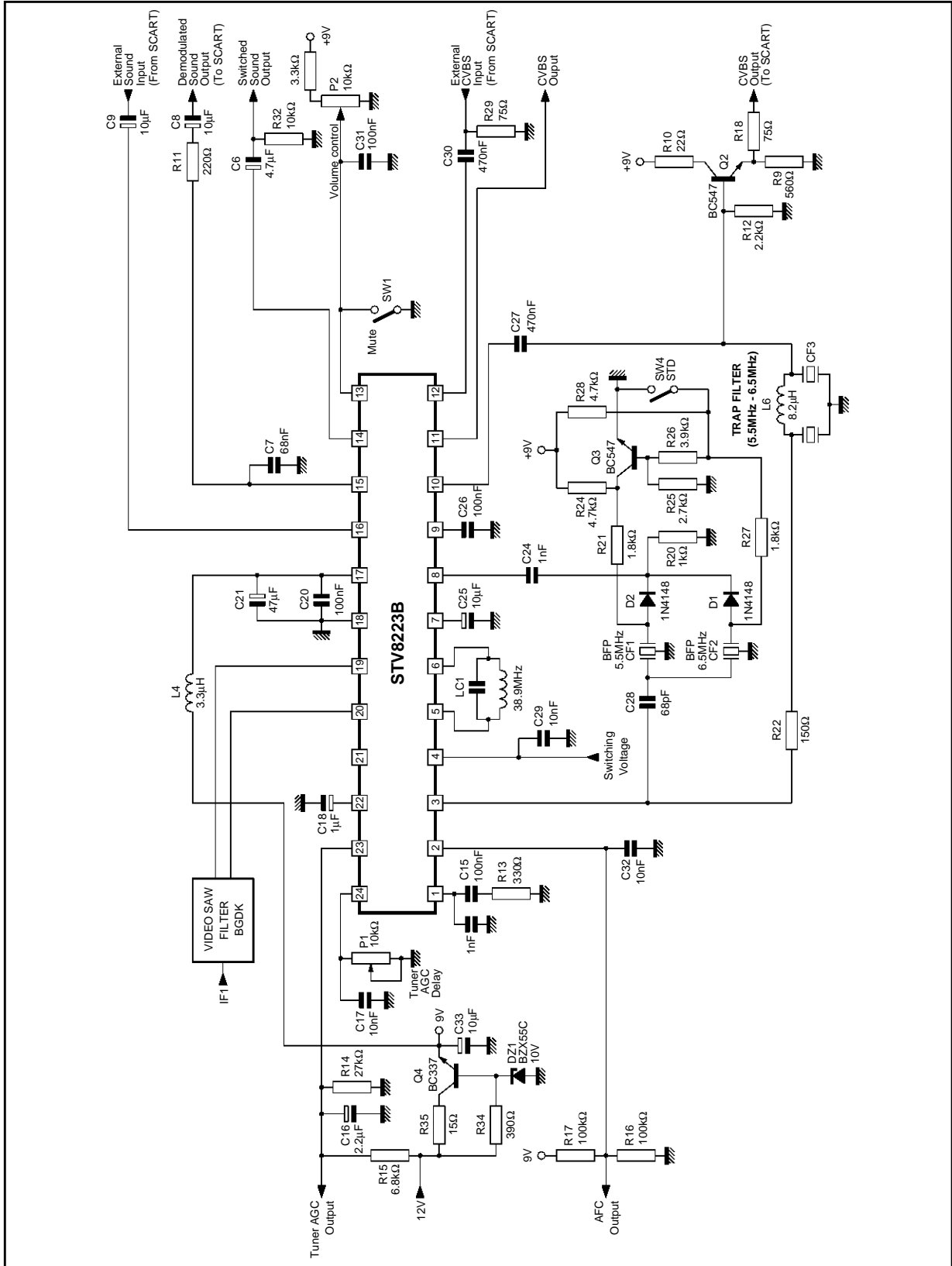


Figure 25 : Black and White Noise Inverter



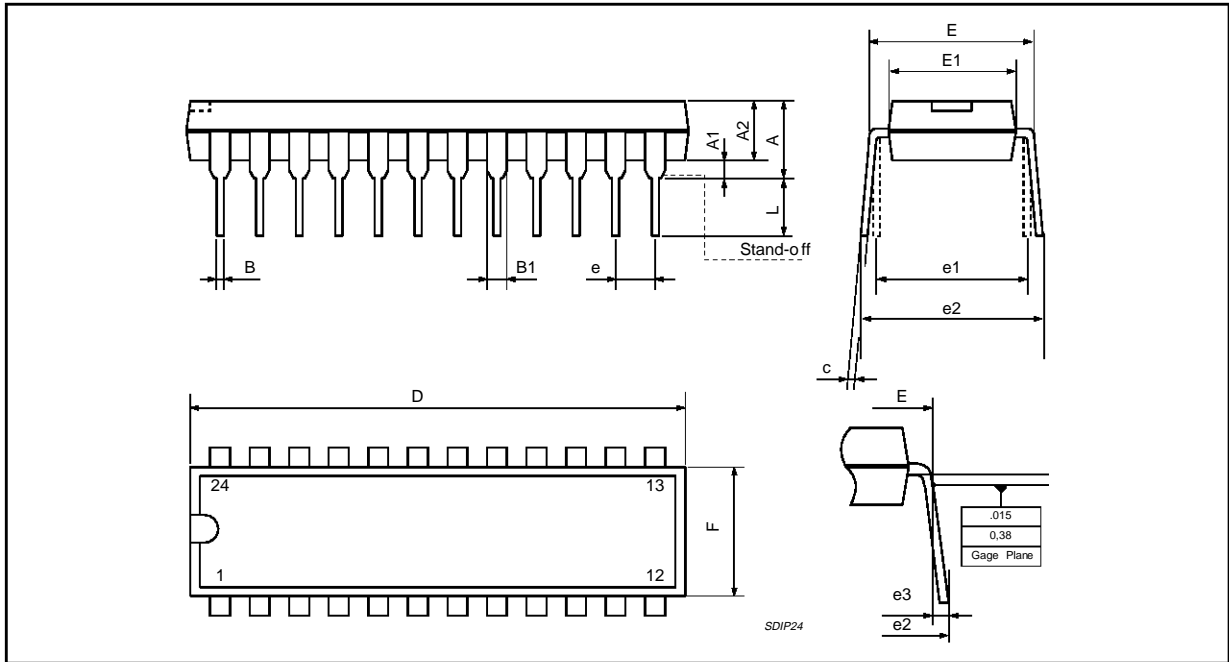


APPLICATION DIAGRAM (B/G/D/K)



8223B-27.EPS

**PACKAGE MECHANICAL DATA**  
24 PINS - PLASTIC SHRINK DIP



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.08			0.20
A1	0.51			0.020		
	3.05	3.30	4.57	0.120	0.130	0.180
B	0.36	0.46	0.56	0.0142	0.0181	0.0220
B1	0.76	1.02	1.14	0.030	0.040	0.045
C	0.23	0.25	0.38	0.0090	0.0098	0.0150
D	22.61	22.86	23.11	0.890	0.90	0.910
E	7.62		8.64	0.30		0.340
E1	6.10	6.40	6.86	0.240	0.252	0.270
e		1.778			0.070	
e1		7.62			0.30	
e2			10.92			0.430
e3			1.52			0.060
L	2.54	3.30	3.81	0.10	0.130	0.150

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