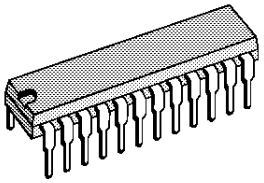
SGS-THOMSON MICROELECTRONICS

STV8223A

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)

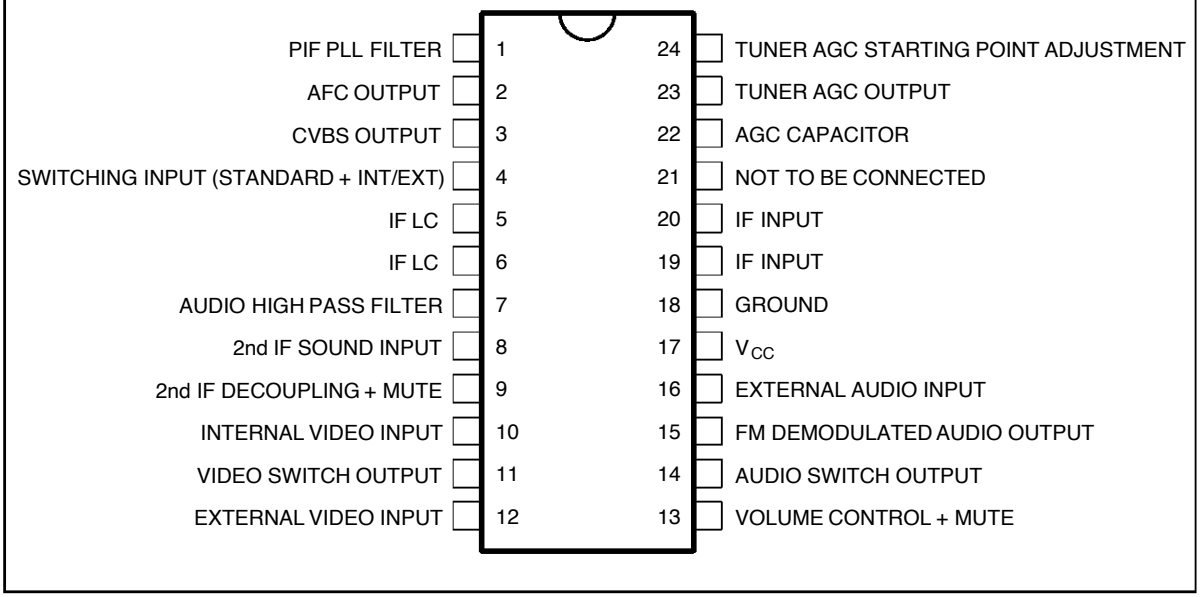
ORDER CODE : STV8223A

DESCRIPTION

The STV8223Ais a picture and sound IF processor for negative modulation application with very few external components and adjustments.

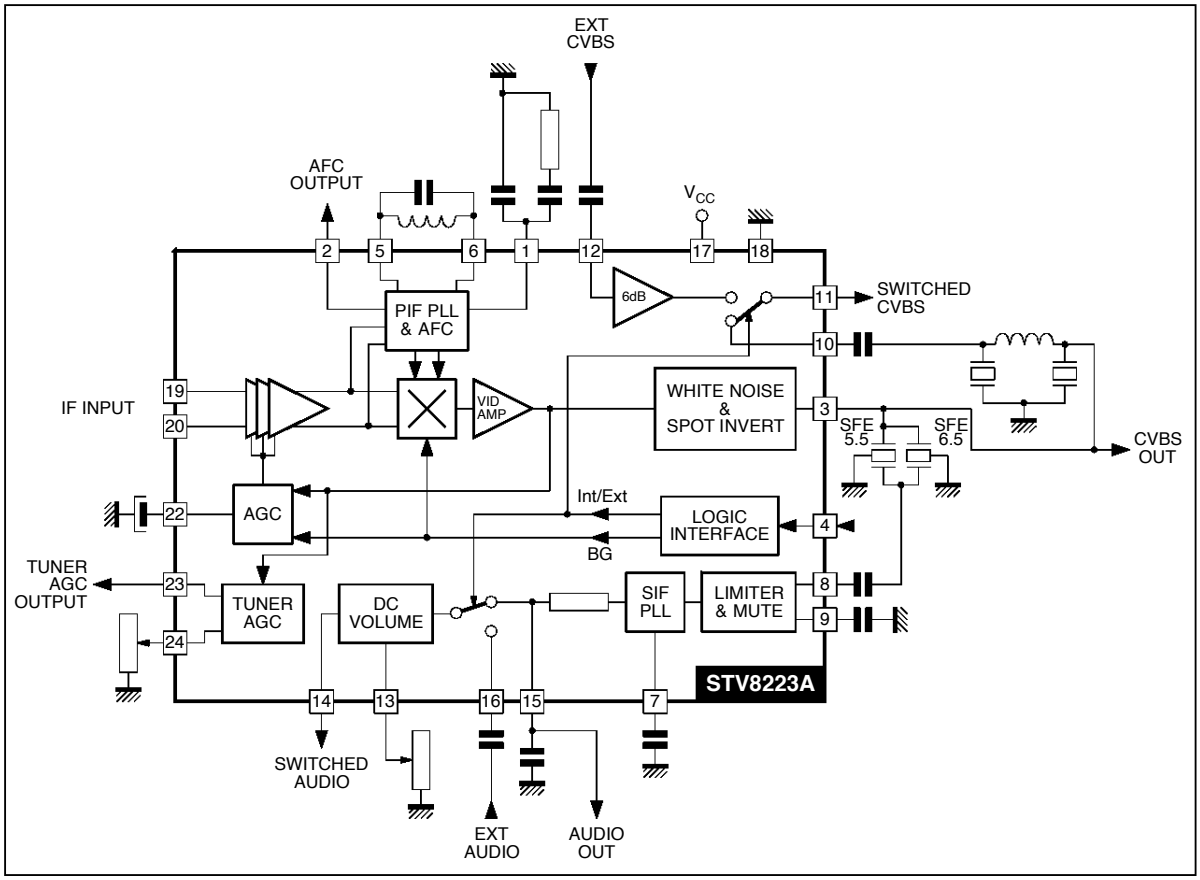
It provides the audio and video switches for one SCART plug application.

PIN CONNECTIONS



8223A-01.EPS

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

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

8223A-01.TBL

THERMAL DATA

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

8223A-02.TBL

ELECTRICAL CHARACTERISTICS

(T_{amb} = 25°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, Δf = ±50kHz, Volume attenuation = 0dB, 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} = 9V		70	95	mA
IF AMPLIFIER						
V_{19-20}	Input Sensitivity (RMS)	-3dB Video at Output		70		μV_{RMS}
R_{19-20}	Differential Input Resistance			1.5		kΩ
C_{19-20}	Differential Input Capacitance			2		pF
Gr	Gain Control Range			64		dB
	Max Input Signal	+1dB Video at Output		110		mV_{RMS}
SYNCHRONOUS VIDEO DEMODULATOR						
DF_{PC}	Vision Carrier Capture		-1.4		1.6	MHz
AFC						
S2	AFC Slope	See Figure 20		0.2		μA/kHz
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
Vr3c	Residual Carrier Signal (RMS Value)			1	10	mV
Vr3h	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	μA
I_{22DBG}	Discharge Current		12	20	28	μA
C/D	Charging/Discharging Ratio			45		
TUNER AGC						
I_{23}	Maximum Sinked Current		1.5	2	2.5	mA
S23	Current Slope	R_{24} = 5kΩ	100	170	230	μA/dB
I_{23+}	Maximum Tuner Plus Sinked Current	Note 3		40		mA

8223A-03.TBL

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

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

3. Additional sinked 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°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, Δf = ±50kHz, Volume attenuation = 0dB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Ma.	Unit
FM SOUND DEMODULATION						
V_{8S}	Input Sensitivity	-3dB FM detected signal		35		μV
R_8	Limiter Input Resistance			1.2		kΩ
AMR	Amplitude Modulation Rejection	Note 4	50	61		dB
SVR	Supply Voltage Rejection Ratio	Ripple signal : 100Hz, 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	Ω
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
AUDIO SWITCH						
R_{16}	Input Resistance		45	60	75	kΩ
CRtk	Crosstalk		70	80		dB
EXTHD	THD on External Signal	V_{IN} = 2V_{RMS}, Attenuation = 0dB		0.1	0.3	%
VIDEO SWITCH						
$V_{DC\,12}$	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} = 1.5V		1	5	μA
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 controling 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

8223A-04.TBL

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 $\frac{V_{15}\,(mV_{RMS})}{V_N\,(mV_{RMS})}$ (dB)

INPUT/OUTPUT PIN CONFIGURATION

Figure 1 : PIF PLL Filter

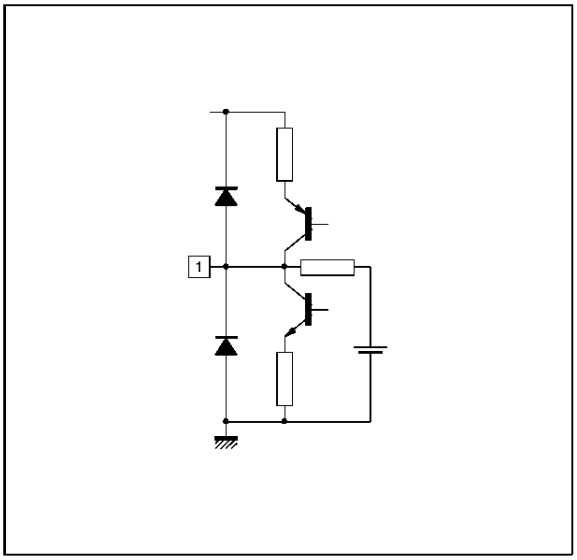


Figure 2 : AFC Output

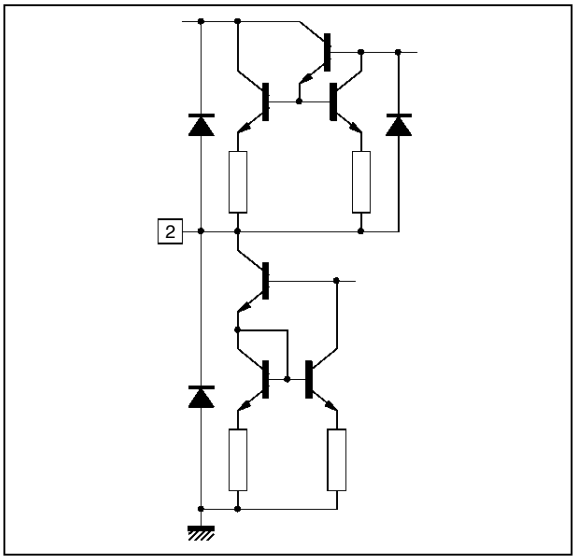


Figure 3 : CVBS Output

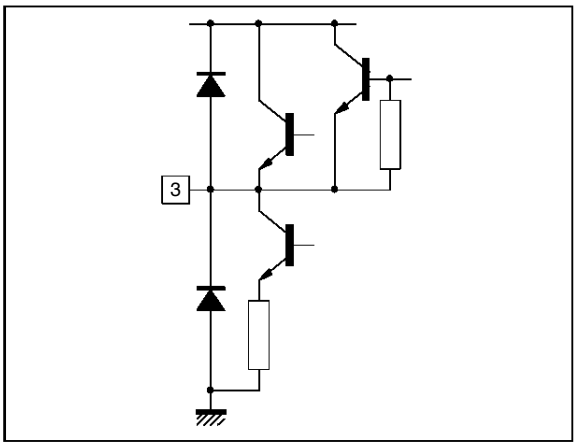


Figure 4 : Switching Input Standard + INT/EXT

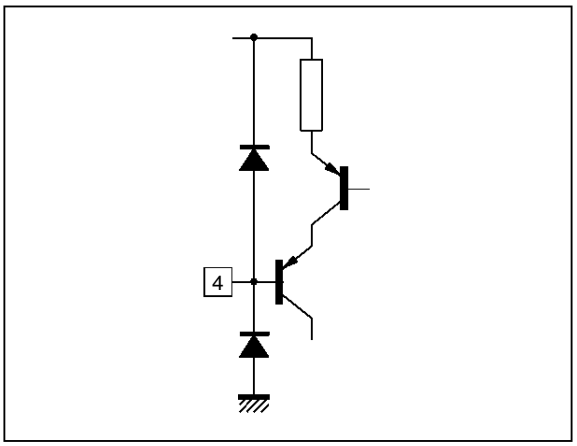


Figure 5 : IFLC

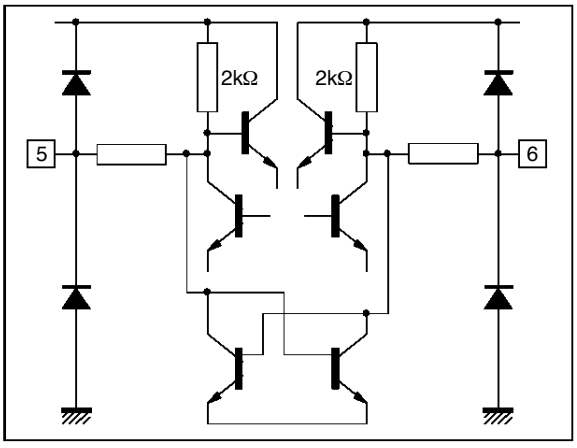
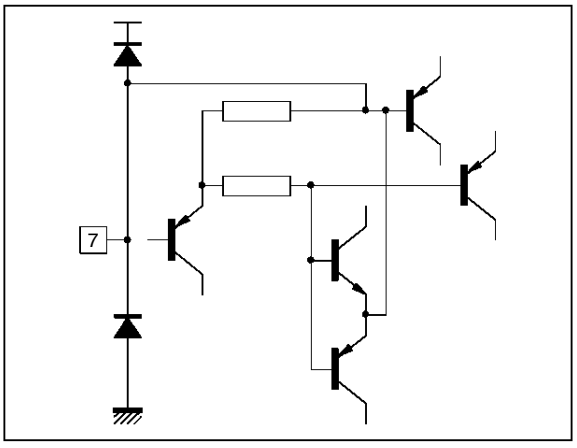


Figure 6 : Audio High Pass Filter



INPUT/OUTPUT PIN CONFIGURATION (continued)

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

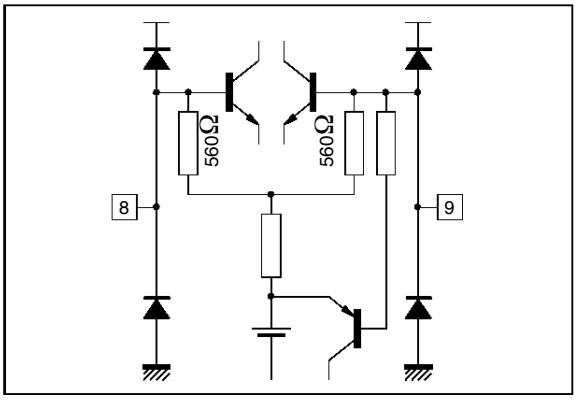


Figure 8 : Internal Video Input

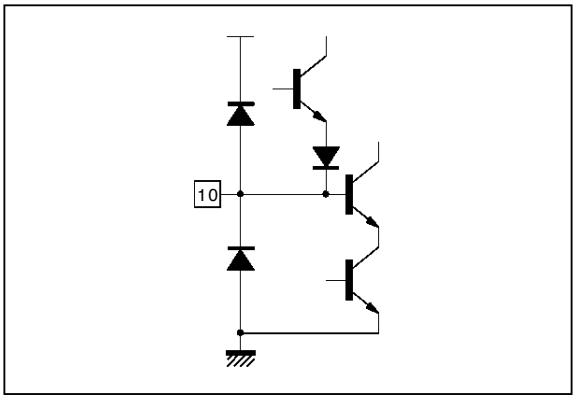


Figure 9 : Video Switch Output

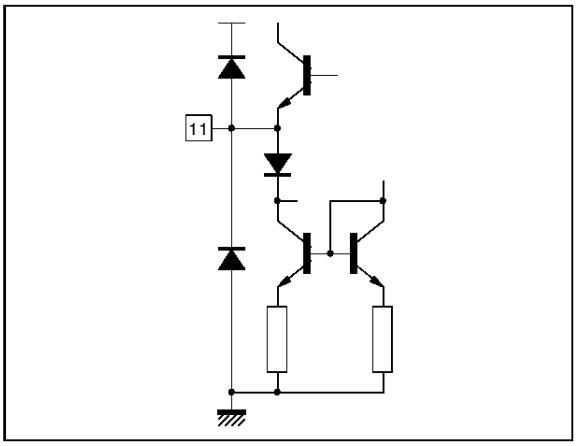


Figure 10 : External Video Input

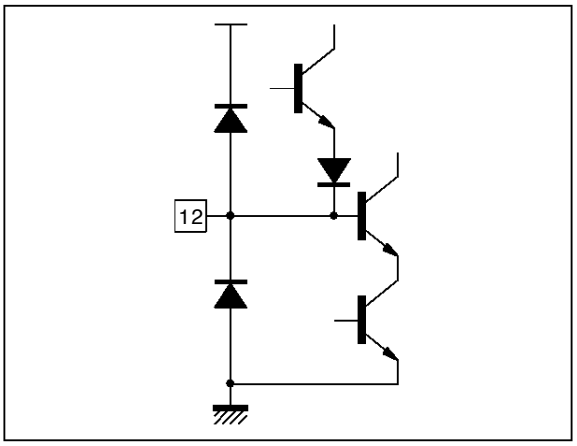


Figure 11 : Volume Control + Mute

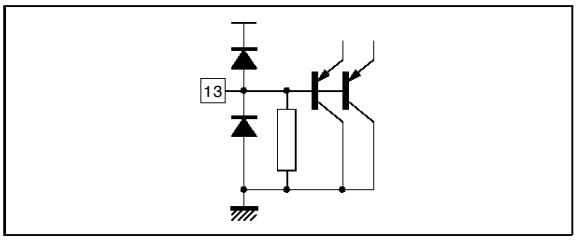


Figure 12 : Audio Switch Output

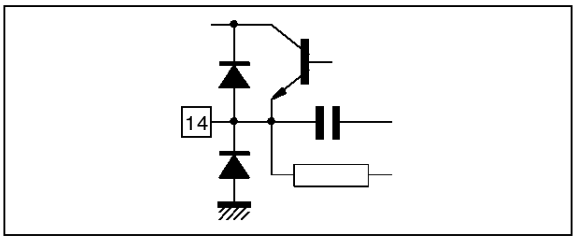


Figure 13 : FM Demodulated Audio Output

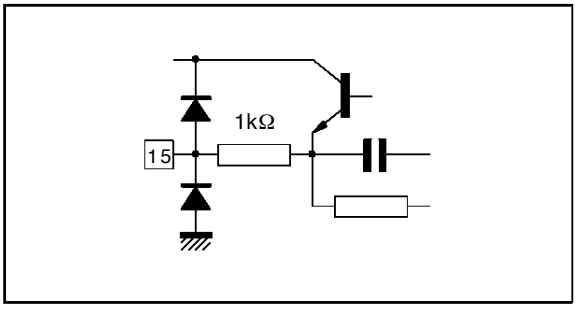
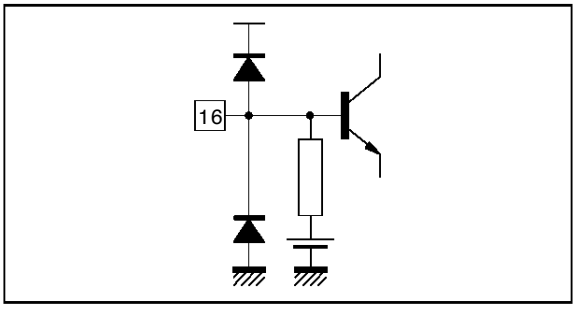


Figure 14 : External Audio Input



INPUT/OUTPUT PIN CONFIGURATION (continued)

Figure 15 : V_{CC}

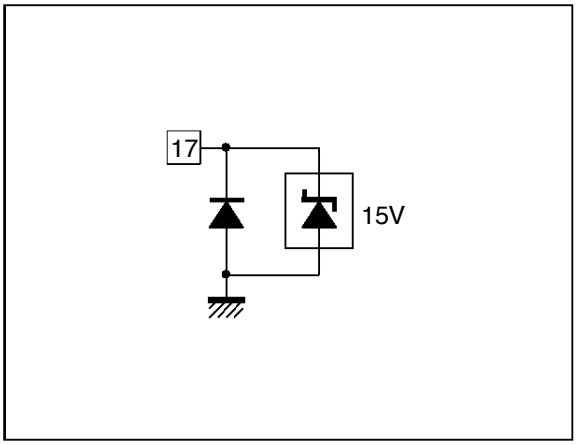


Figure 16 : IF Input

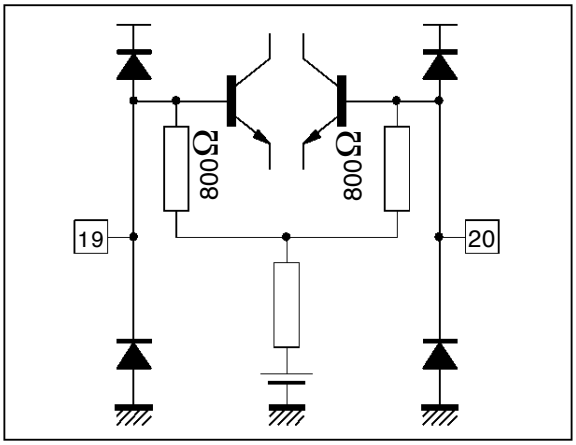


Figure 17 : AGC Capacitor

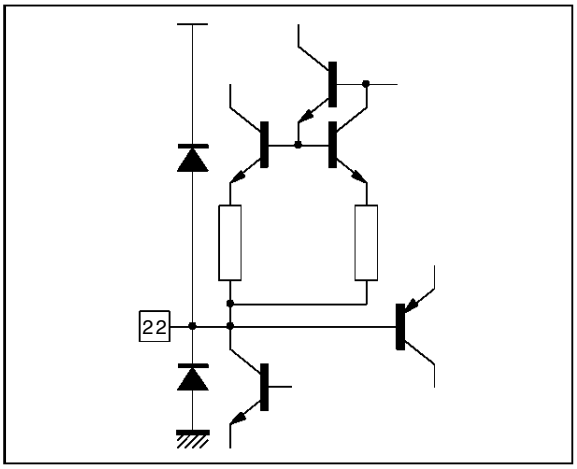


Figure 18 : Tuner AGC Output

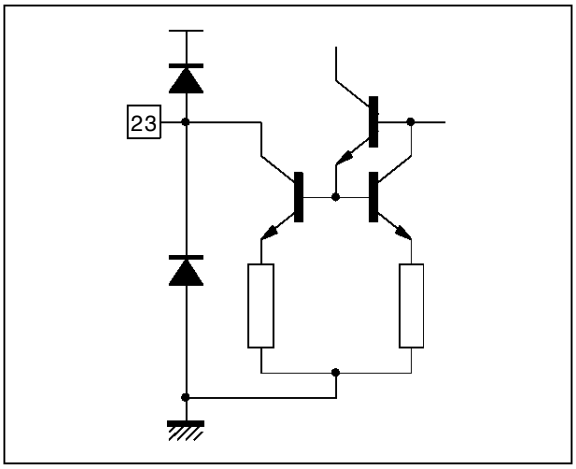


Figure 19 : Tuner AGC Starting Point Adjustment

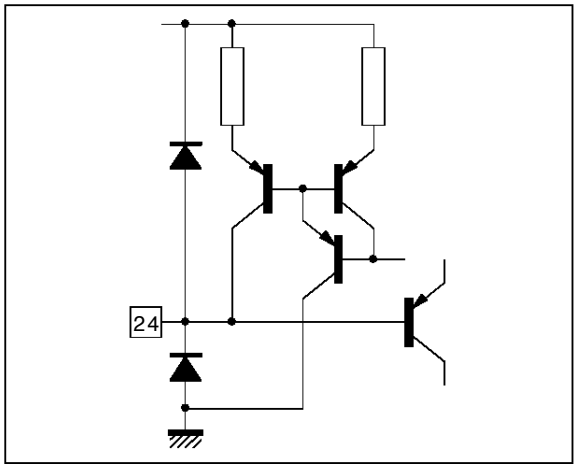


Figure 20 : AFC Voltage Pin 2 vs IF Frequency

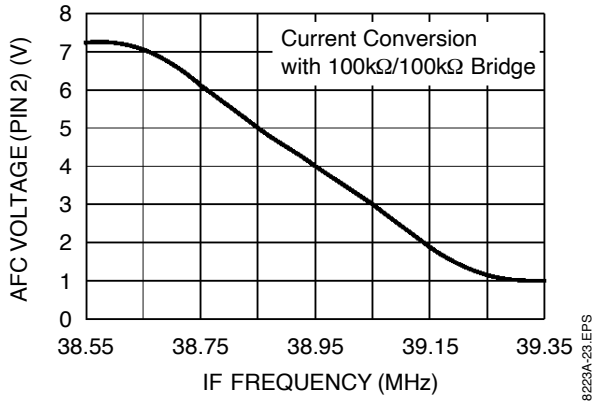


Figure 21 : Volume Control Attenuation vs V_{13}

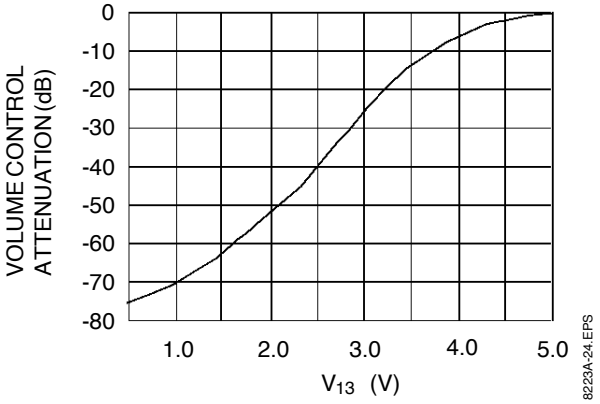


Figure 22 : Tuner AGC Output Current vs V_{IN}
(R24 is external adjustment Pin 24)

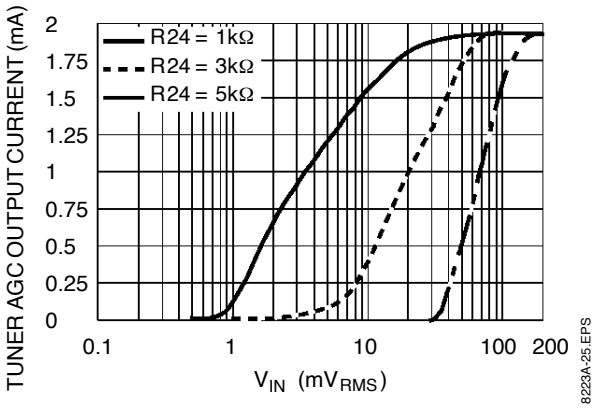
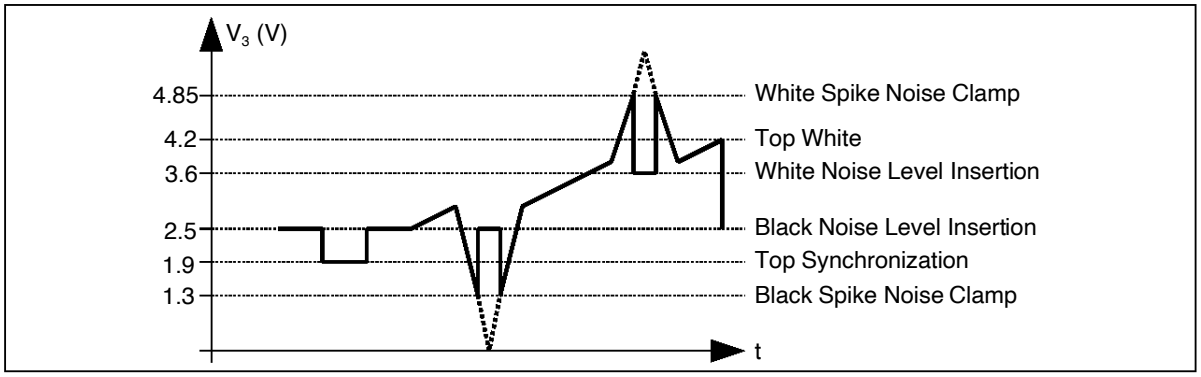
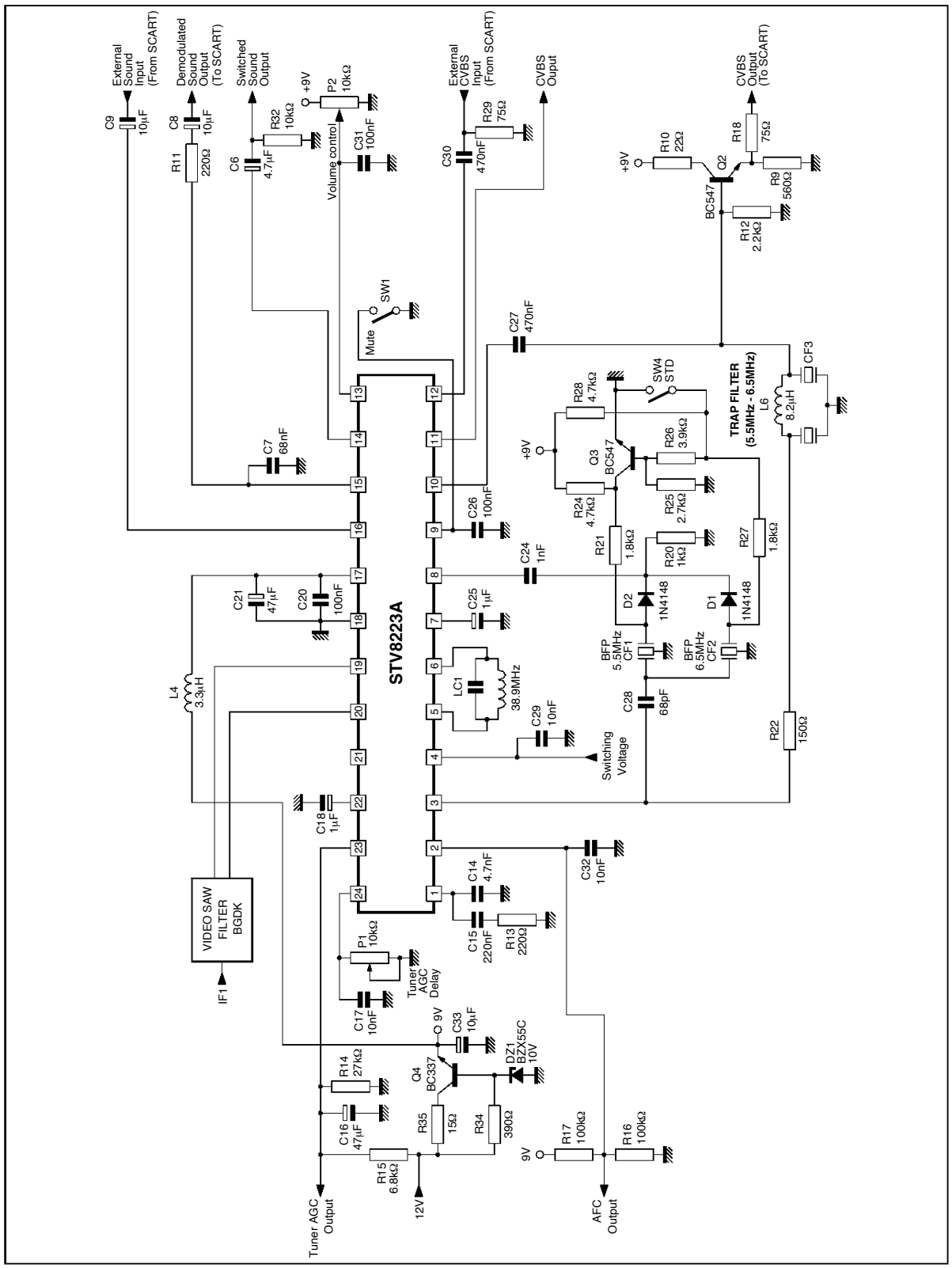


Figure 23 : Black and White Noise Inverter

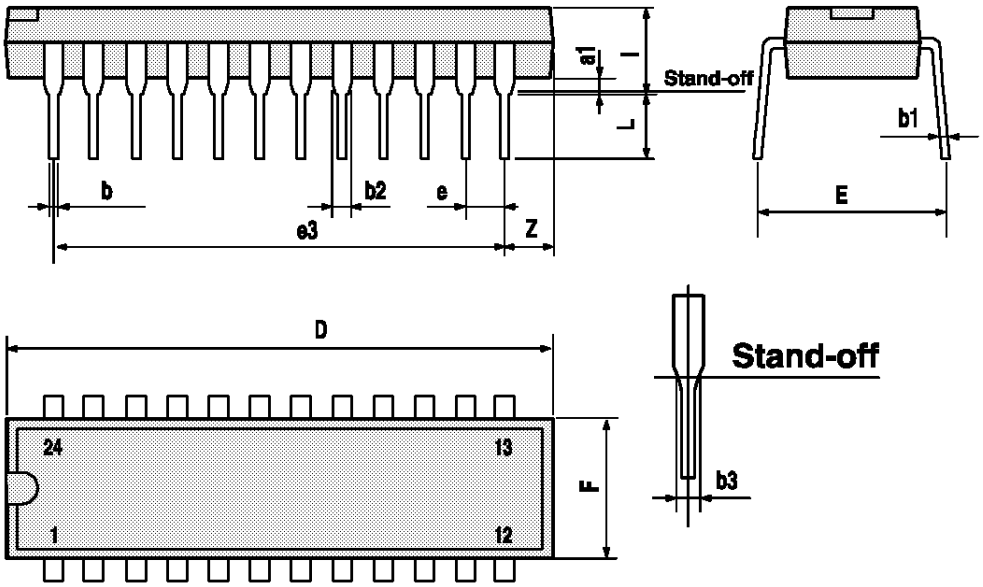


APPLICATION DIAGRAM



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			0270
i			5.08			0.200
L	2.54			0.100		

SDIP24.TBL