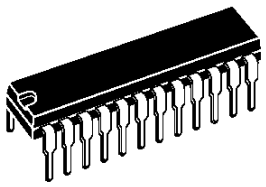
SGS-THOMSON MICROELECTRONICS

STV8223B

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



SHRINK24
(Plastic Package)

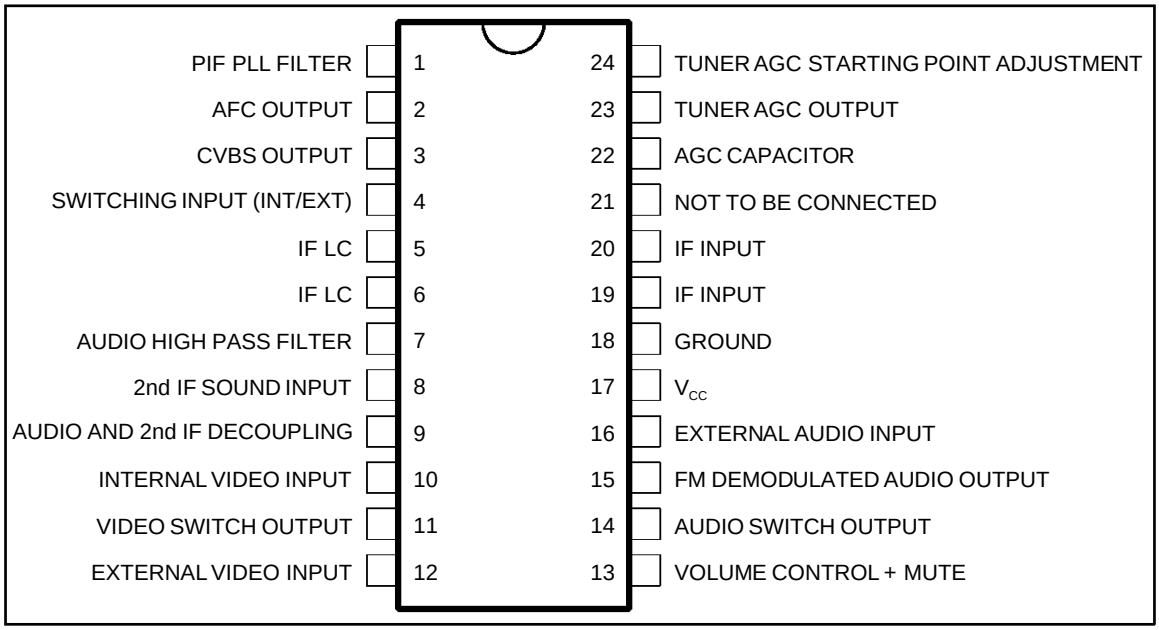
ORDER CODE : STV8223B

DESCRIPTION

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

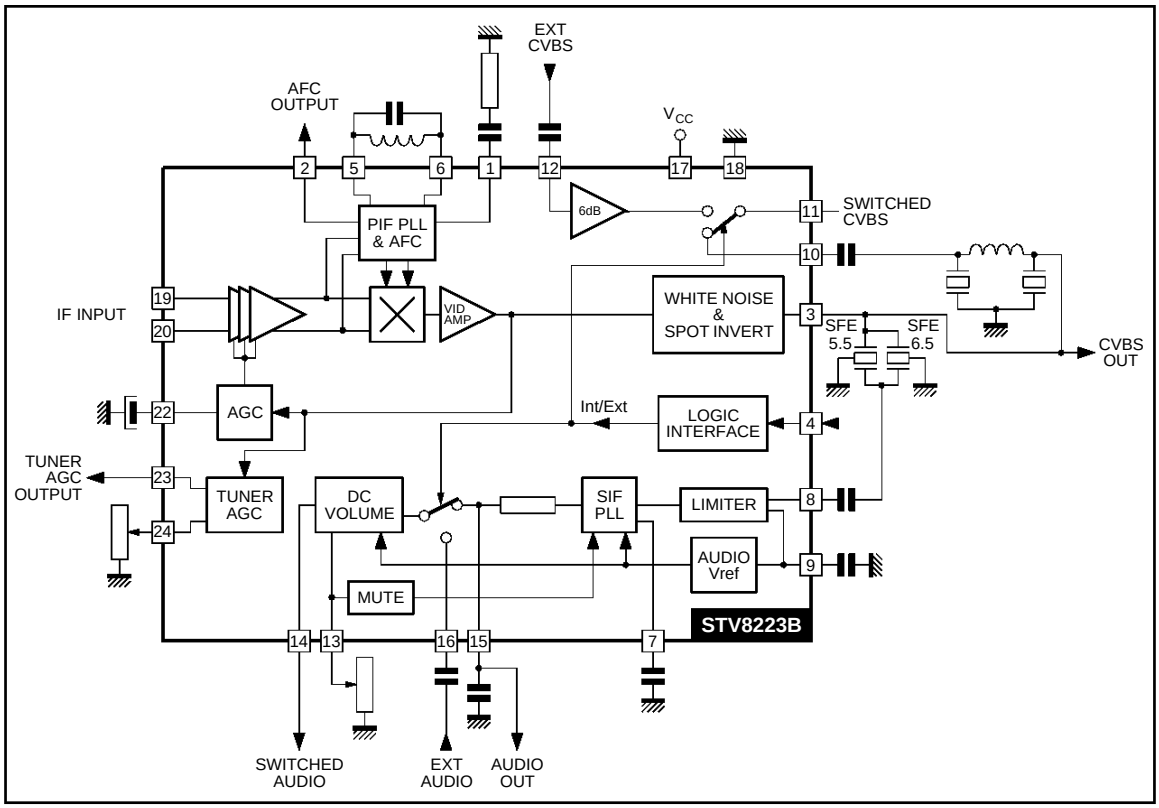
It provides the audio and video switches for one SCART plug application.

PIN CONNECTIONS



8223B-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

8223B-01.TBL

THERMAL DATA

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

8223B-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, $\Delta f = \pm 50$kHz,
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			2		kΩ
C_{19-20}	Differential Input Capacitance			2		pF
Gr	Gain Control Range			68		dB
	Max Input Signal	+1dB Video at Output		180		mV_{RMS}
SYNCHRONOUS VIDEO DEMODULATOR						
DF_{PC}	Vision Carrier Capture		-1.4		1.6	MHz
AFC						
S2	AFC Slope	See Figure 21		0.2		µA/kHz
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
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	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	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

8223B-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, $\Delta f = \pm 50$kHz,
Volume attenuation = 0dB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
FM SOUND DEMODULATION						
V_{8S}	Input Sensitivity			150		μV_{RMS}
R_8	Limiter Input Resistance			600		Ω
	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	Ω
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
AUDIO SWITCH						
R_{16}	Input Resistance		55	70	85	kΩ
CRtk	Crosstalk		70	80		dB
En	Output Noise Level (Pin 14)	Weighted CCIR 468-4, V_{13} = 0.5V (quasi peak level)		70		µV
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	µA
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
CONTROL INPUT						
	Negative Modulation	Video : External - Audio : External	7.2			V
	Negative Modulation	Video : Internal - Audio : Internal			1.8	V

8223B-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

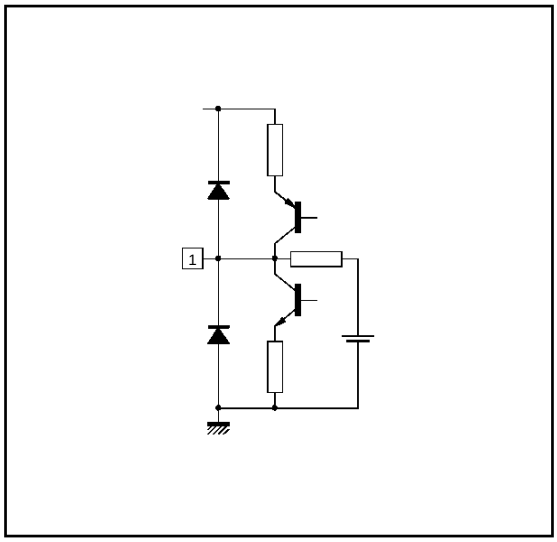


Figure 2 : AFC Output

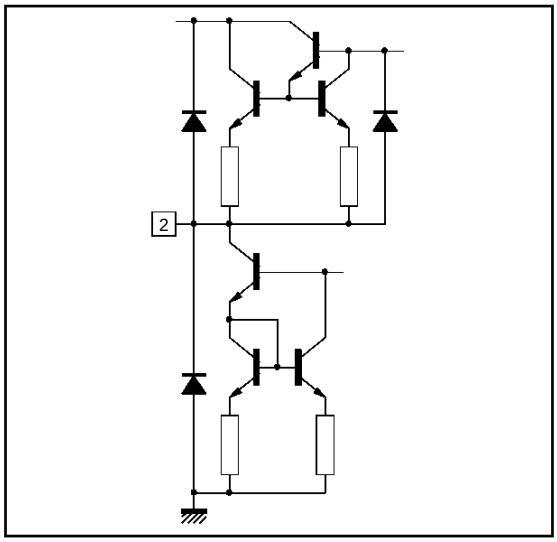


Figure 3 : CVBS Output

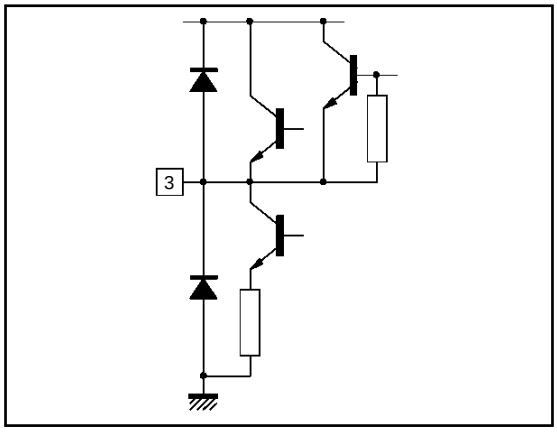


Figure 4 : Switching Input INT/EXT

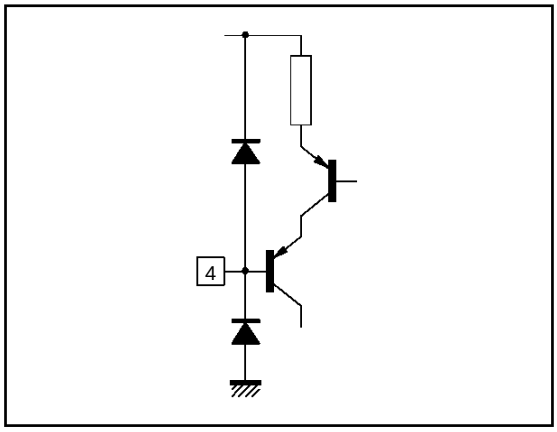


Figure 5 : IFLC

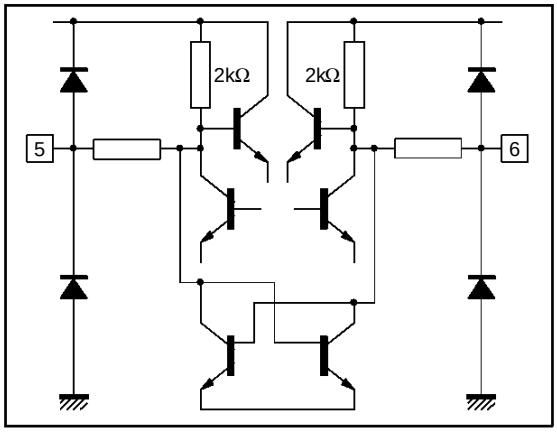
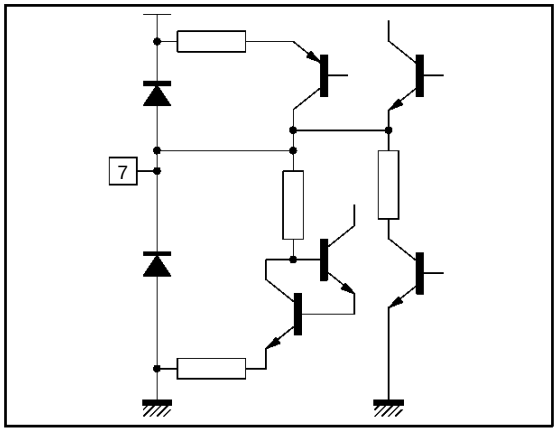


Figure 6 : Audio High Pass Filter



INPUT/OUTPUT PIN CONFIGURATION (continued)

Figure 7 : 2nd IF Sound Input (Pin 8)
Audio and 2nd IF Decoupling (Pin 9)

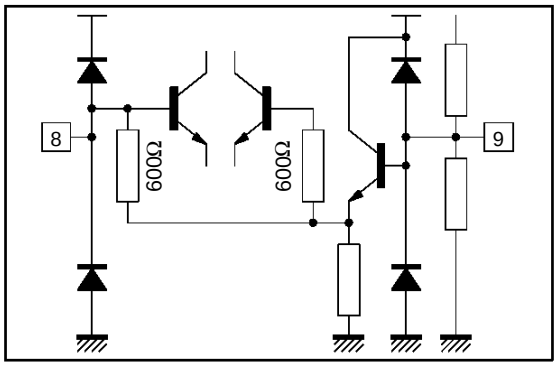


Figure 8 : Internal Video Input

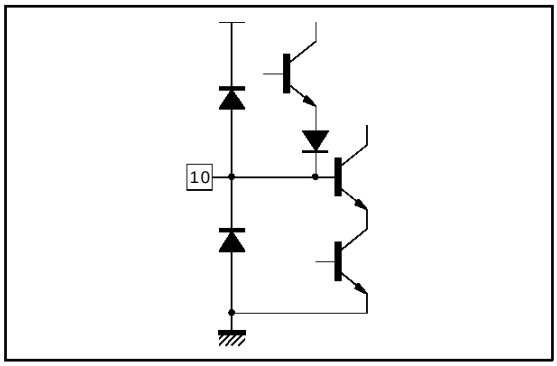


Figure 9 : Video Switch Output

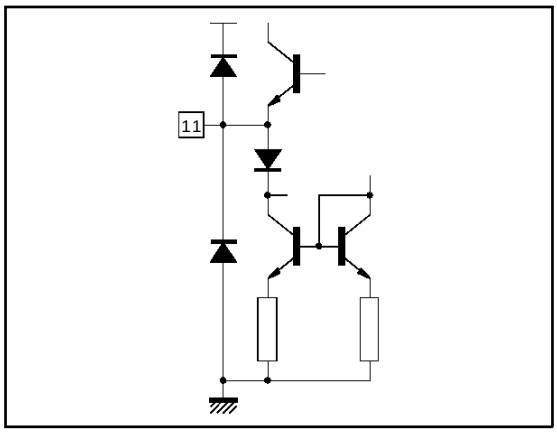


Figure 10 : External Video Input

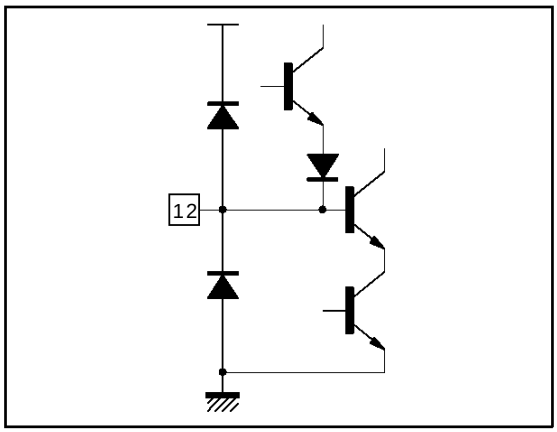


Figure 11 : Volume Control + Mute

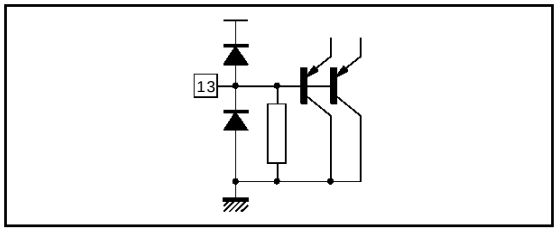


Figure 12 : Audio Switch Output

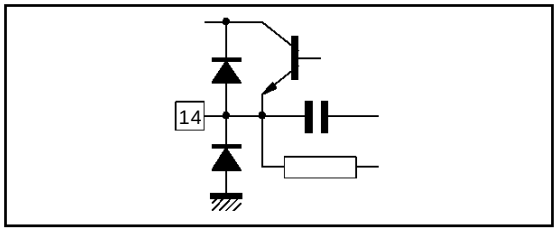


Figure 13 : FM Demodulated Audio Output

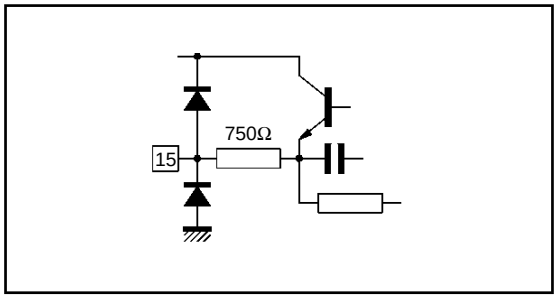
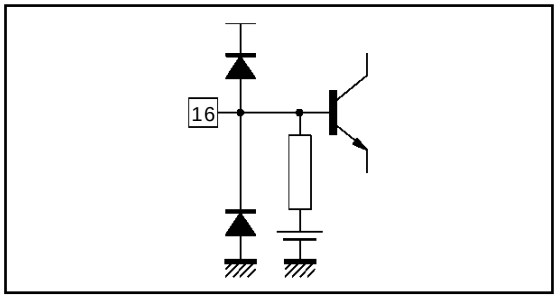


Figure 14 : External Audio Input



INPUT/OUTPUT PIN CONFIGURATION (continued)

Figure 15 : V_{CC}

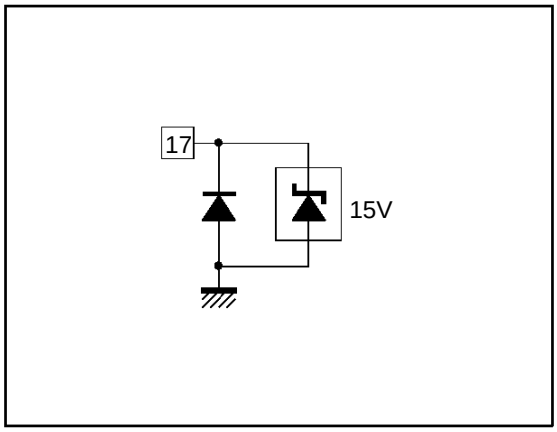


Figure 16 : IF Input

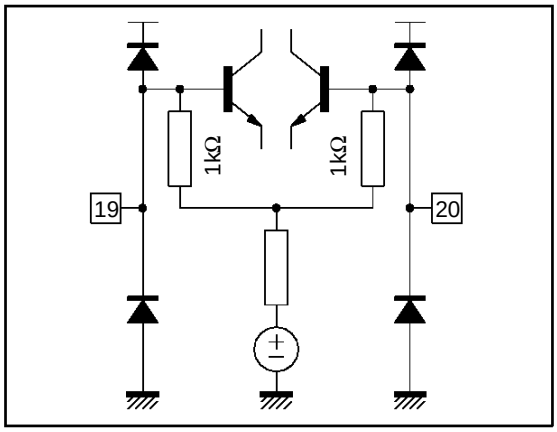


Figure 18 : AGC Capacitor

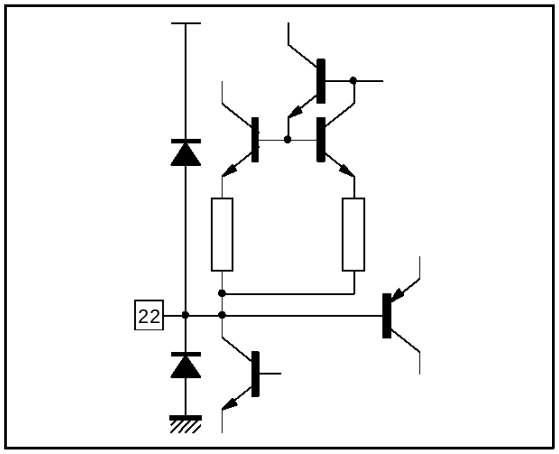


Figure 19 : Tuner AGC Output

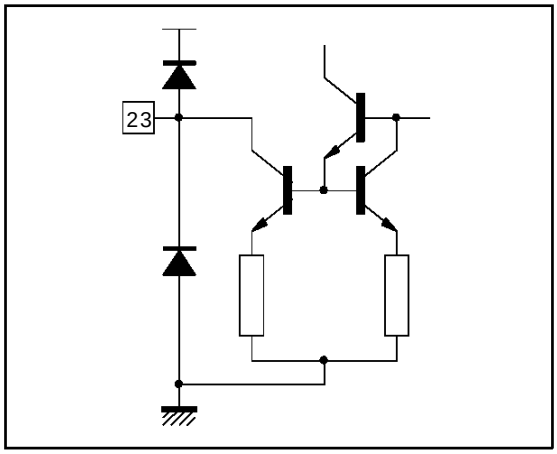


Figure 20 : Tuner AGC Starting Point Adjustment

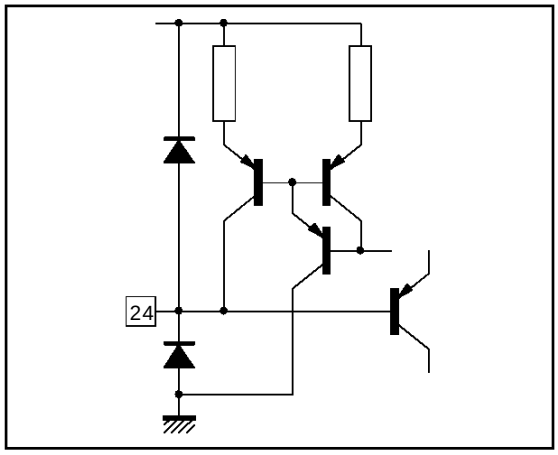


Figure 21 : AFC Voltage Pin 2 vs IF Frequency

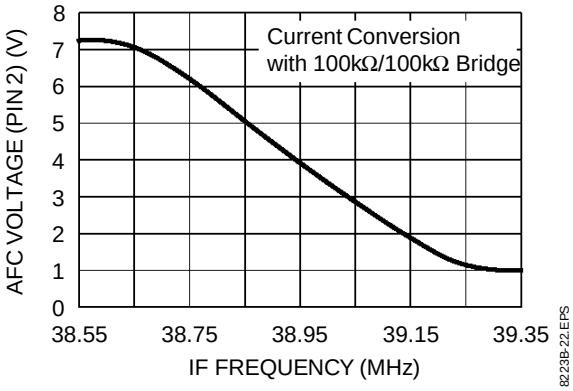


Figure 22 : Volume Control Attenuation vs V_{13}

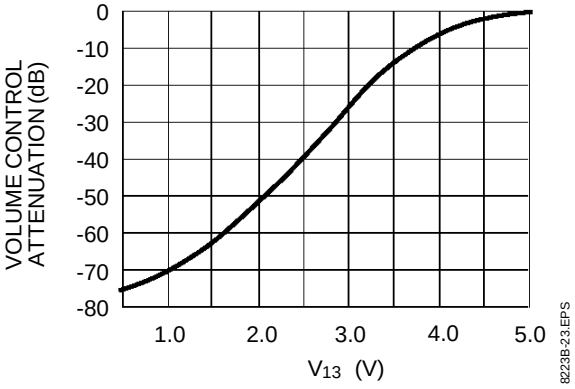


Figure 23 : Tuner AGC Output Current vs V_{IN} (R24 is external adjustment Pin 24)

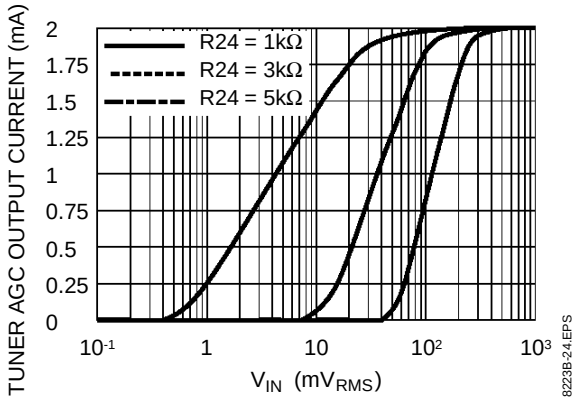


Figure 24 : Video Signal to Noise Ratio (Pin 3) as a function of IF Input Signal (Pins 19-20) Weighted CCIR-567

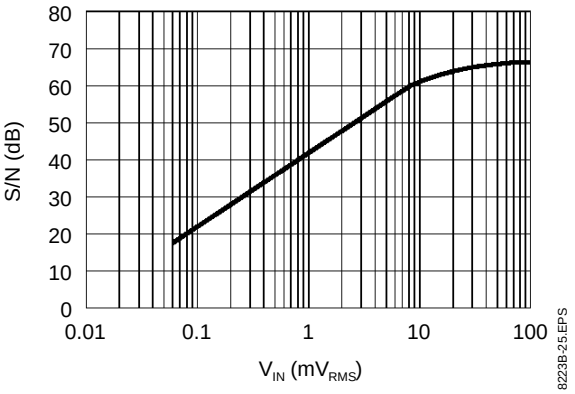
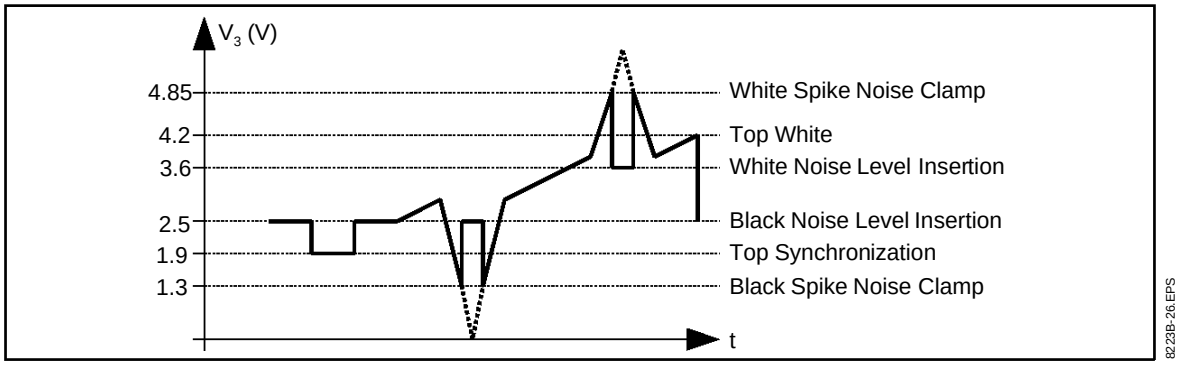
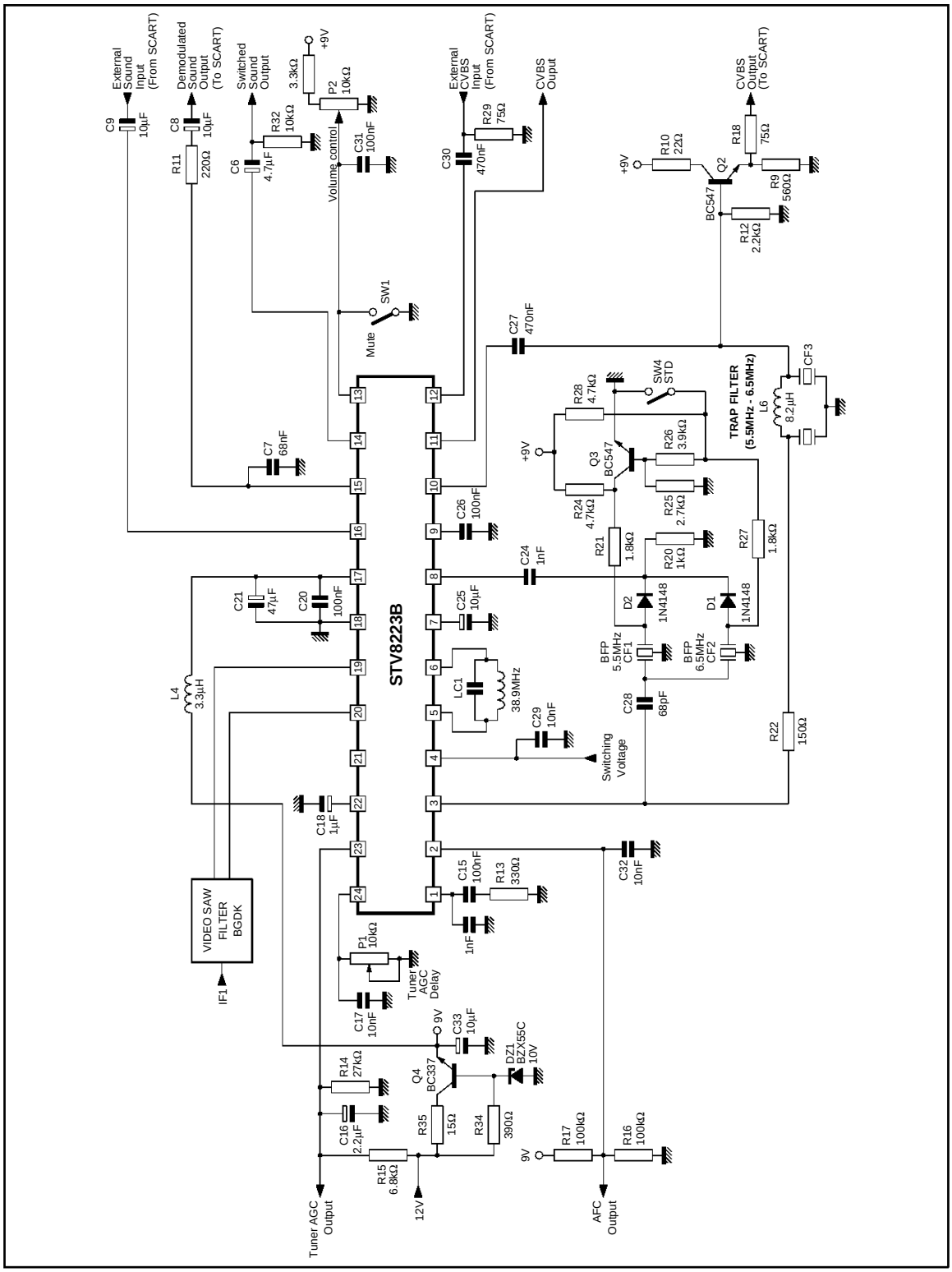


Figure 25 : Black and White Noise Inverter

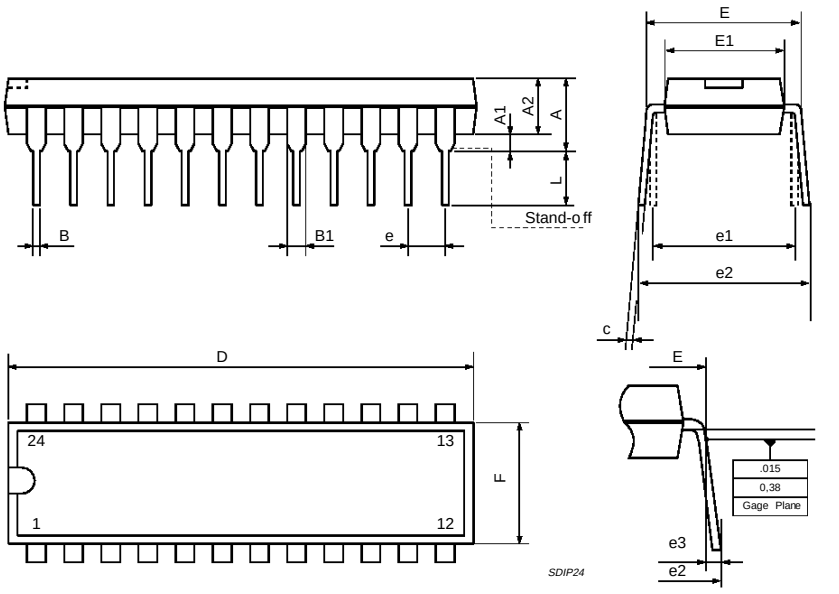


APPLICATION DIAGRAM (B/G/D/K)



PACKAGE MECHANICAL DATA

24 PINS - PLASTIC SHRINK DIP



PMSDIP24.EPS

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	0270
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

SDIP24.TBL