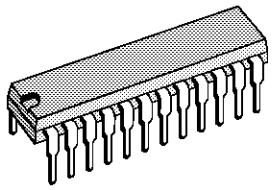
SGS-THOMSON MICROELECTRONICS

# STV8223

## VIDEO AND SOUND IF SYSTEM WITH AUDIO AND VIDEO SWITCHES

**PRELIMINARY DATA**

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



**SHRINK24**
(Plastic Package)

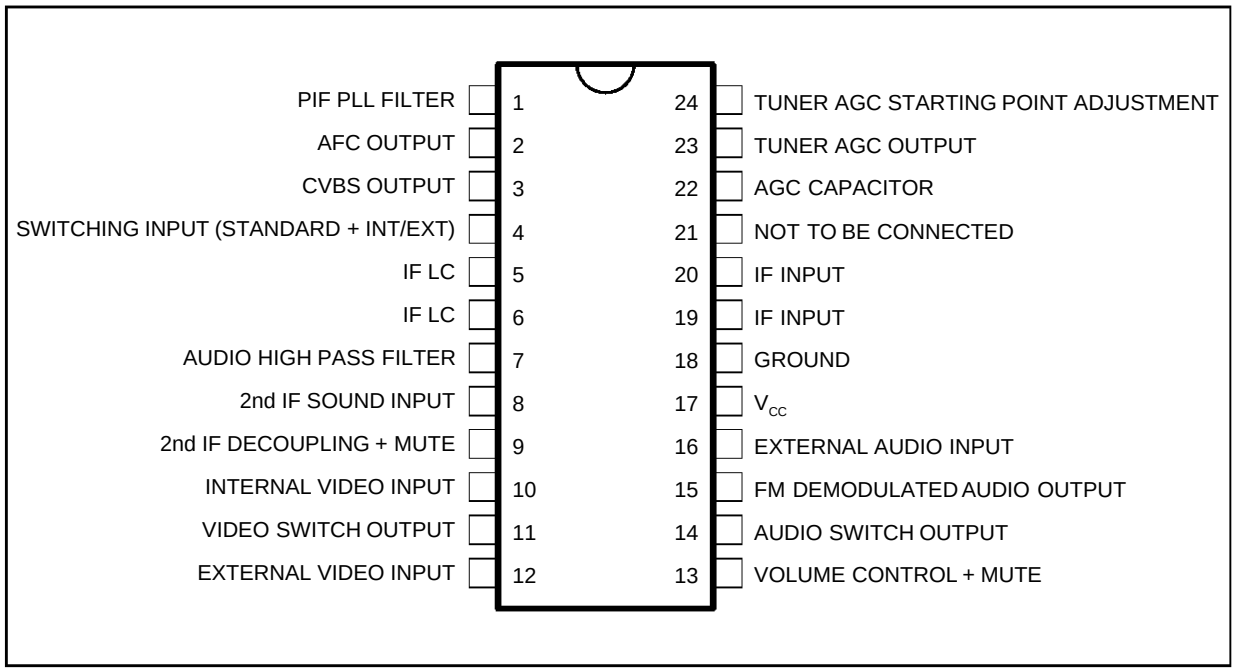
**ORDER CODE :** STV8223

### DESCRIPTION

The STV8223 is a picture and sound IF processor for negative modulation application with very few external components and adjustements.

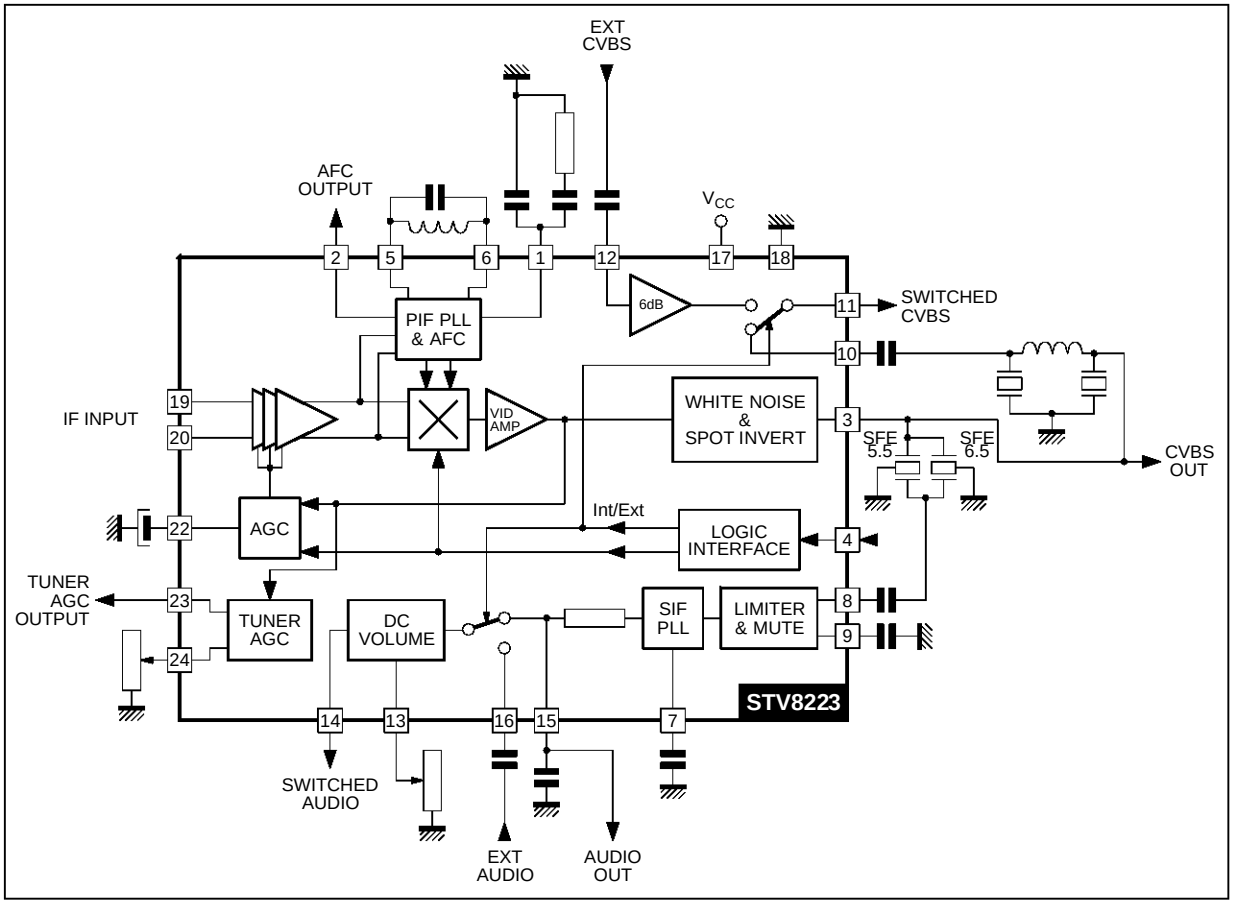
It provides the audio and video switches for one SCART plug application.

### PIN CONNECTIONS




8223-01.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 |

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## THERMAL DATA

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

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## ELECTRICAL CHARACTERISTICS

($T_{amb}$ = 25°C, $V_{CC}$ = 9V, IF input = 10m$V_{RMS}$ 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, 10m$V_{RMS}$, $f_M$ = 1kHz, Audio BW = 20kHz, $\Delta f = \pm 50$kHz, Volume attenuation = 0dB, unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| SUPPLY | | | | | | |
| $V_{CC}$ | Voltage Operating | | 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 | | $\mu V_{RMS}$ |
| $R_{19-20}$ | 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 | | $mV_{RMS}$ |
| 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 | | 4.3 | | V |
| BW | Bandwidth | -3dB Video Signal | | 9 | | MHz |
| Dg | Differential Gain | | | 3 | 7 | % |
| Dp | Differential Phase | | | 3 | 7 | Degree |
| Vr3 | Residual Carrier Signal (RMS Value) | | | 1 | 10 | mV |
| Vr3 | 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 | | 55 | | dB |
| | Intermodulation 1.07MHz | Note 2 | | 50 | | dB |
| $V_{WTH}$ | White Noise Threshold Voltage | | | 4.6 | | V |
| $V_{WIL}$ | White Noise Insertion Level | | | 3.3 | | V |
| $V_{BTH}$ | Black Noise Threshold Voltage | | | 1.3 | | V |
| $V_{BIL}$ | Black Noise Insertion Level | | | 2.5 | | V |
| AGC CIRCUIT (BG MODE) | | | | | | |
| $I_{22C}$ | Charging Current | | 550 | 950 | 1300 | µA |
| $I_{22D}$ | Discharge Current | | 12 | 20 | 28 | µA |
| C/D | Charging/Discharging Ratio | | | 45 | | |
| TUNER AGC | | | | | | |
| $I_{23}$ | Sinked Current | | 1.4 | 2.1 | 2.8 | mA |
| S23 | Current Slope | R = 3kΩ on Pin 24 | | 300 | | µA/dB |
| AFC | | | | | | |
| | AFC Slope | | | 0.2 | | µA/kHz |

8223-03.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

**ELECTRICAL CHARACTERISTICS** (continued)
($T_{amb}$ = 25°C, $V_{CC}$ = 9V, IF input = 10m$V_{RMS}$ 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, 10m$V_{RMS}$, $f_M$ = 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 | -3dB FM detected signal | | 60 | | µV |
| $R_8$ | Limiter Input Resistance | | | 1.2 | | kΩ |
| AMR | Amplitude Modulation Rejection | Note 3 | 40 | 53 | | dB |
| SVR | Supply Voltage Rejection Ratio | | | TBF | | dB |
| $V_{15}$ | Detected Audio Output Signal | | | 1 | | $V_{RMS}$ |
| THD | Total Harmonic Distortion | | | 0.2 | 1 | % |
| $R_{15}$ | Internal Deemphasis Resistor | | 600 | 750 | 900 | Ω |
| S/N | Signal to Noise Ratio | Note 4, Weighted CCIR 468-4 | | 55 | | dB |
| VOLUME CONTROL | | | | | | |
| $V_C$ Range | Control Range | | | 80 | | dB |
| AUDIO SWITCH | | | | | | |
| $R_{16}$ | Input Resistance | | 40 | 65 | | kΩ |
| CRtk | Crosstalk | | 70 | 80 | | dB |
| EXTHD | THD on External Signal | $V_{IN}$ = 2$V_{RMS}$, Attenuation = 0dB | | 0.05 | 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 | 1.4 | 1.7 | 2 | 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 | | | V |
| $I_{12}$ | Input Current | $V_{12}$ = $V_{DC12}$ = 1.5V | | 1 | 5 | µA |
| VBW | Bandwidth | $V_{IN}$ = 1$V_{PP}$ | | 15 | | MHz |
| $G_{IN}$ | Gain from Int. Input to Output | | -0.5 | 0 | +0.5 | dB |
| MUTE (Pin 9 or Pin 13) | | | | | | |
| $V_9$ | Threshold Voltage | | | 2.1 | | V |
| $V_9$ | DC Level when Mute Disabled | High impedance controling circuit | | 2.8 | | V |
| $V_{13}$ | Threshold | | | 0.3 | | V |
| CONTROL INPUT | | | | | | |
| | Negative Modulation | Video : External - Audio : External<br>Video : Internal - Audio : Internal | 7.2 | | 1.8 | V<br>V |

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**Notes :** 3. 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%

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

## INPUT/OUTPUT PIN CONFIGURATION

**Figure 1 :** PIF PLL Filter

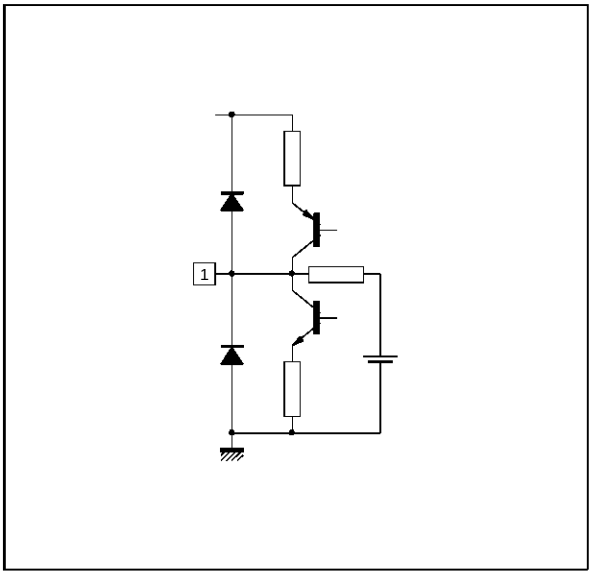



**Figure 2 :** AFC Output

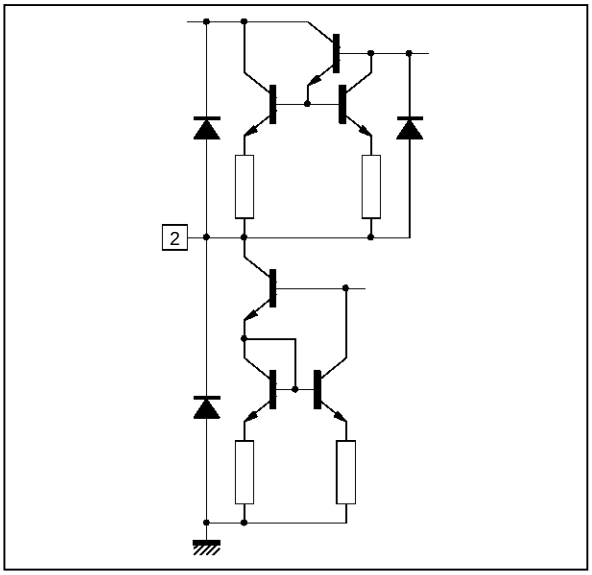



**Figure 3 :** CVBS Output

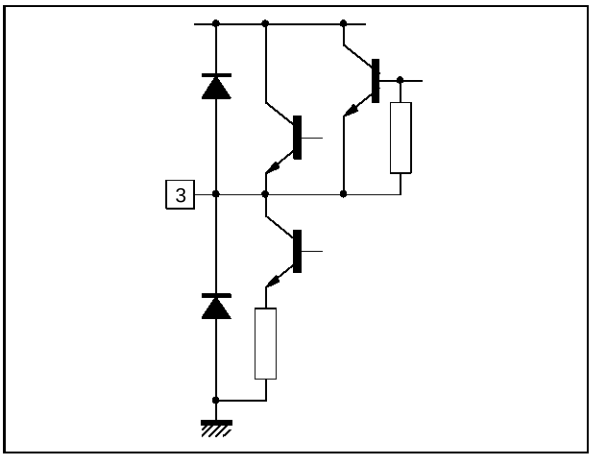



**Figure 4 :** Switching Input Standard + INT/EXT

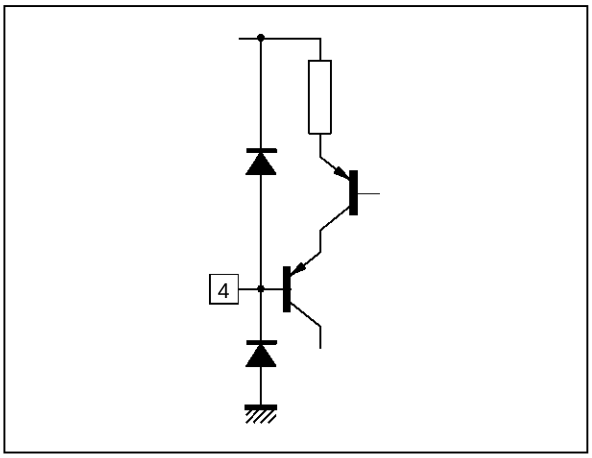



**Figure 5 :** IFLC

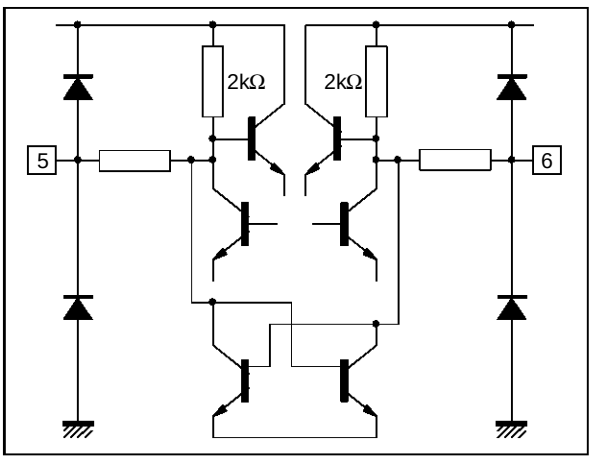
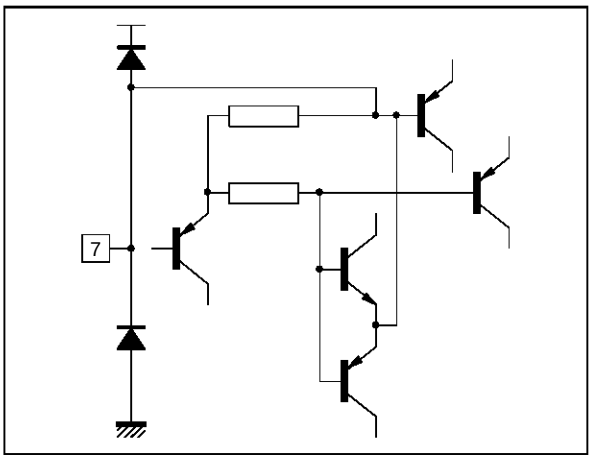



**Figure 6 :** Audio High Pass Filter



**INPUT/OUTPUT PIN CONFIGURATION** (continued)

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

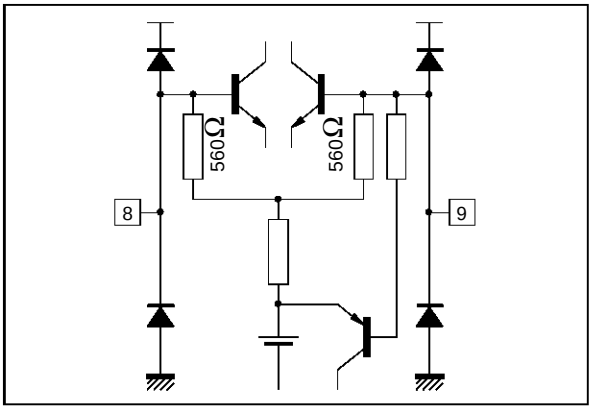



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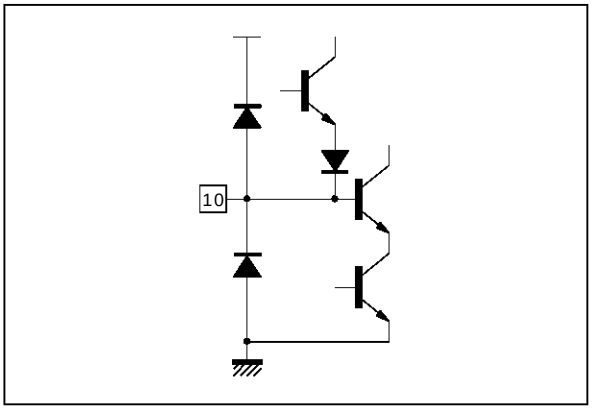
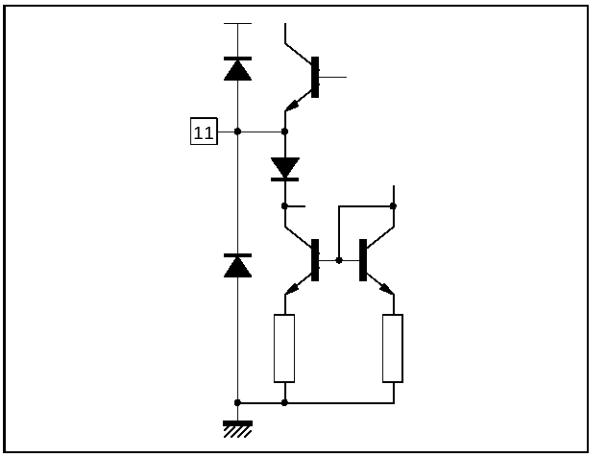
**Figure 8 :** Internal Video Input



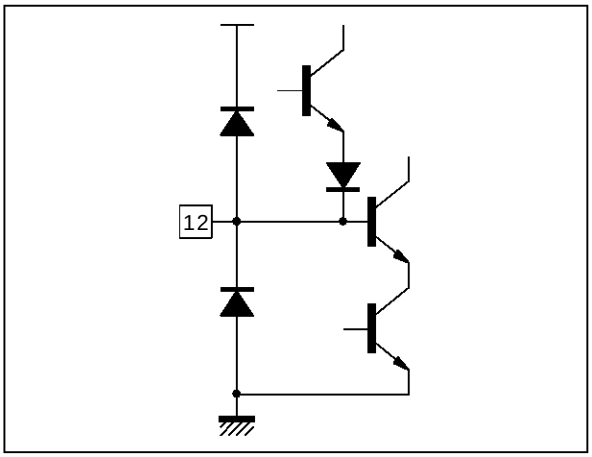

8223A-10.EPS

**Figure 9 :** Video Switch Output



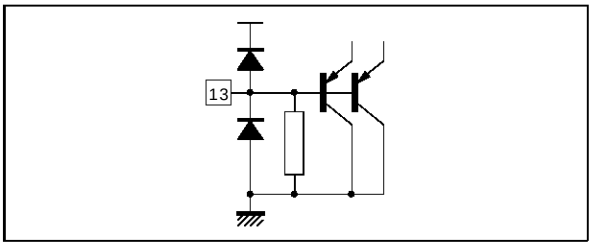

8223A-11.EPS

**Figure 10 :** External Video Input



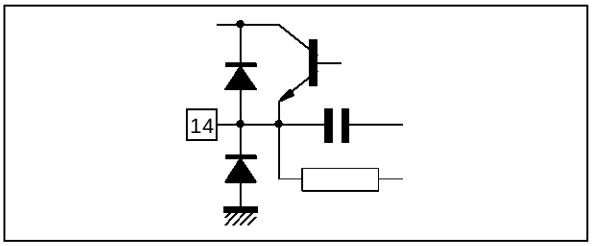

8223A-12.EPS

**Figure 11 :** Volume Control + Mute



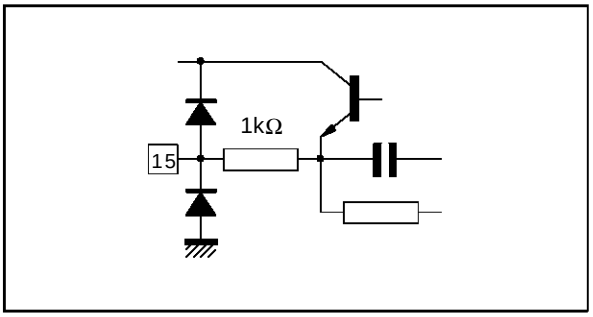

8223A-13.EPS

**Figure 12 :** Audio Switch Output



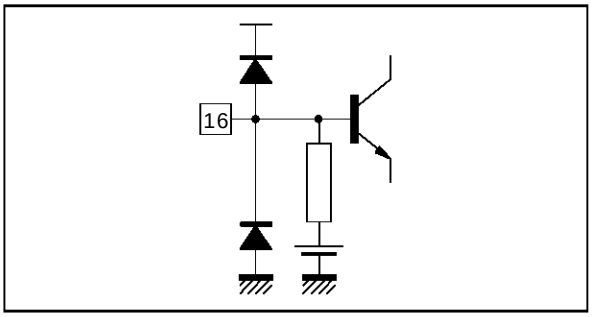

8223A-14.EPS

**Figure 13 :** FM Demodulated Audio Output




8223A-15.EPS

**Figure 14 :** External Audio Input




8223A-16.EPS

**INPUT/OUTPUT PIN CONFIGURATION** (continued)

**Figure 15 :** $V_{CC}$

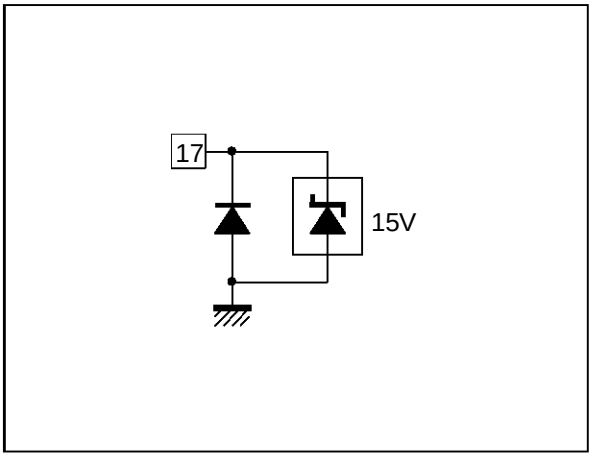



**Figure 16** : IF Input

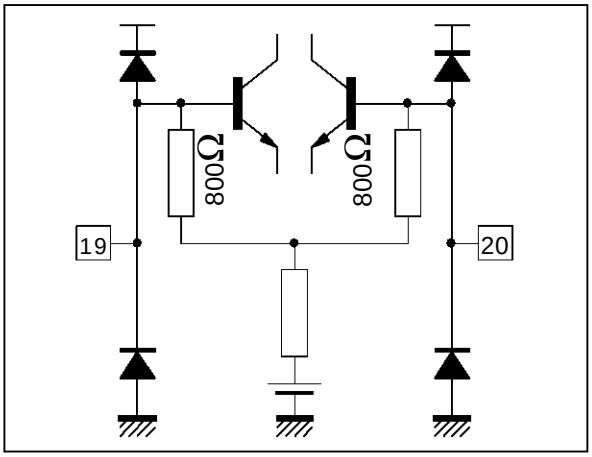



**Figure 17 :** AGC Capacitor

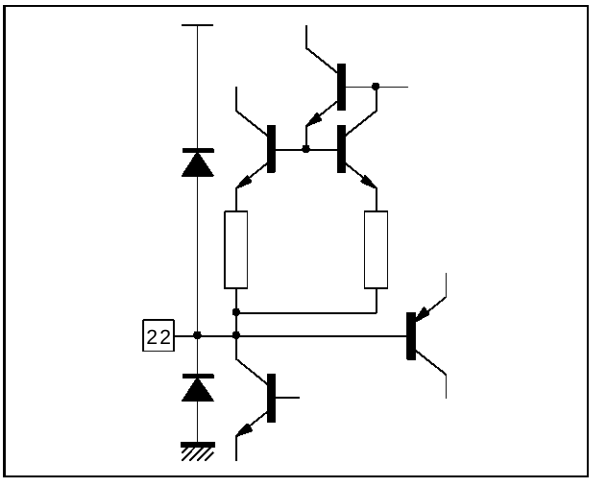



**Figure 18 :** Tuner AGC Output

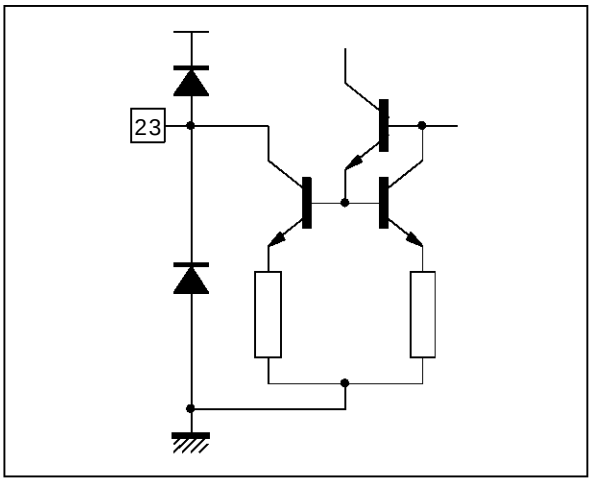
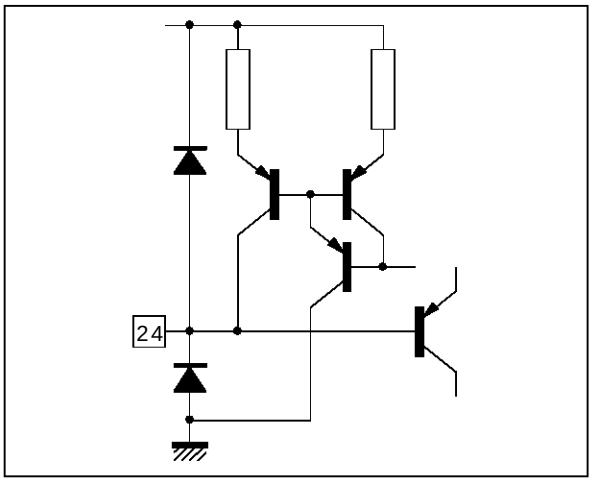
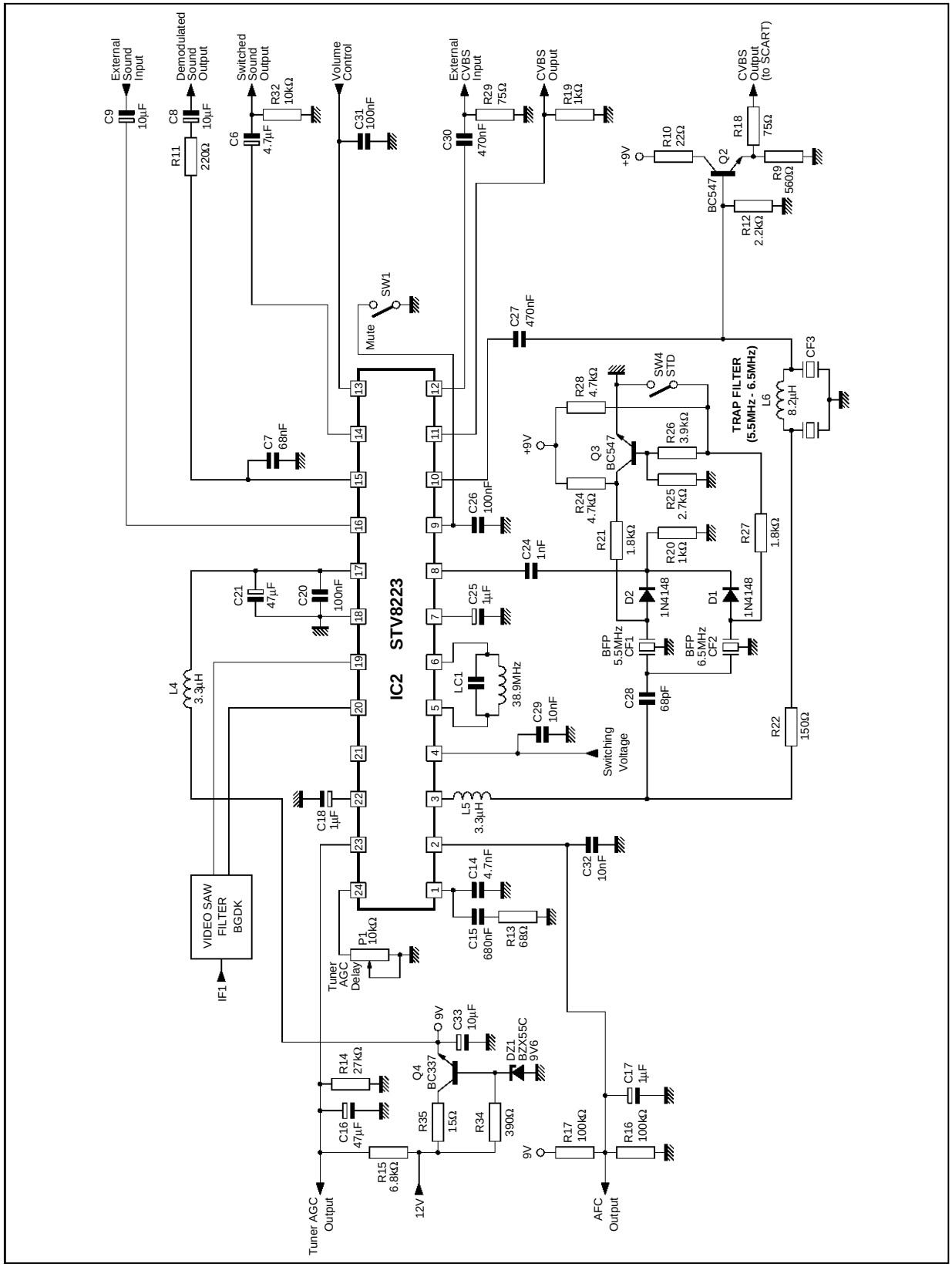



**Figure 19 :** Tuner AGC Starting Point Adjustment

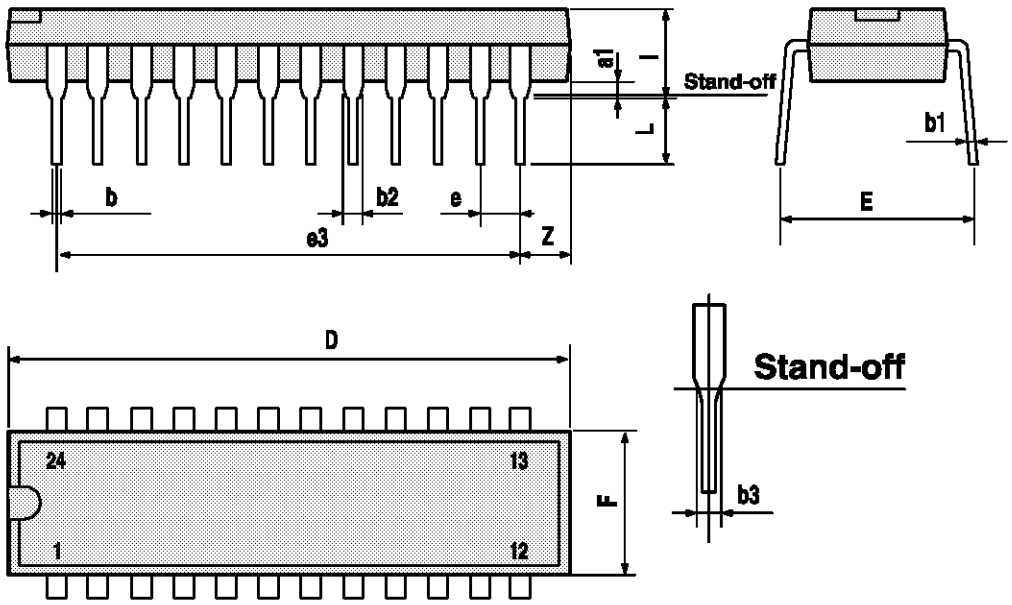


## APPLICATION DIAGRAM



## 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