Signetics

# TDA2549
## Multistandard Video IF/Demodulator

*Product Specification*

**Linear Products**

### DESCRIPTION

The TDA2549 is a complete IF circuit with AFC, AGC, demodulation, and video preamplification facilities for multistandard television receivers. It is capable of handling positively and negatively modulated video signals in both color and black/white receivers.

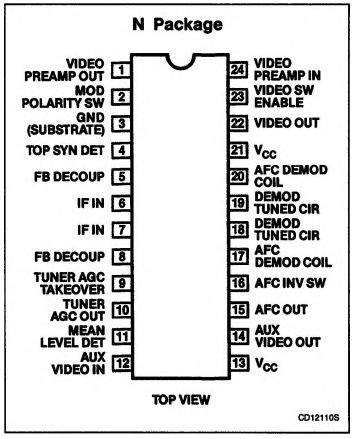
### FEATURES

- **Gain-controlled wide-band amplifier providing complete IF gain**
- **Synchronous demodulator for positive and negative modulation**
- **Video preamplifier with noise protection for negative modulation**
- **Auxiliary video input and output (75Ω)**
- **Video switch to select between auxiliary video input signal and demodulated video signal**
- **AFC circuit with on/off switch and inverter switch**
- **AGC circuit for positive modulation (mean level) and negative modulation (noise gate)**
- **AGC output for controlling MOSFET tuners**

### APPLICATIONS

- **NTSC/PAL/SECAM TV receiver/monitors**
- **Multistandard VCR**
- **CATV converters**

### PIN CONFIGURATION



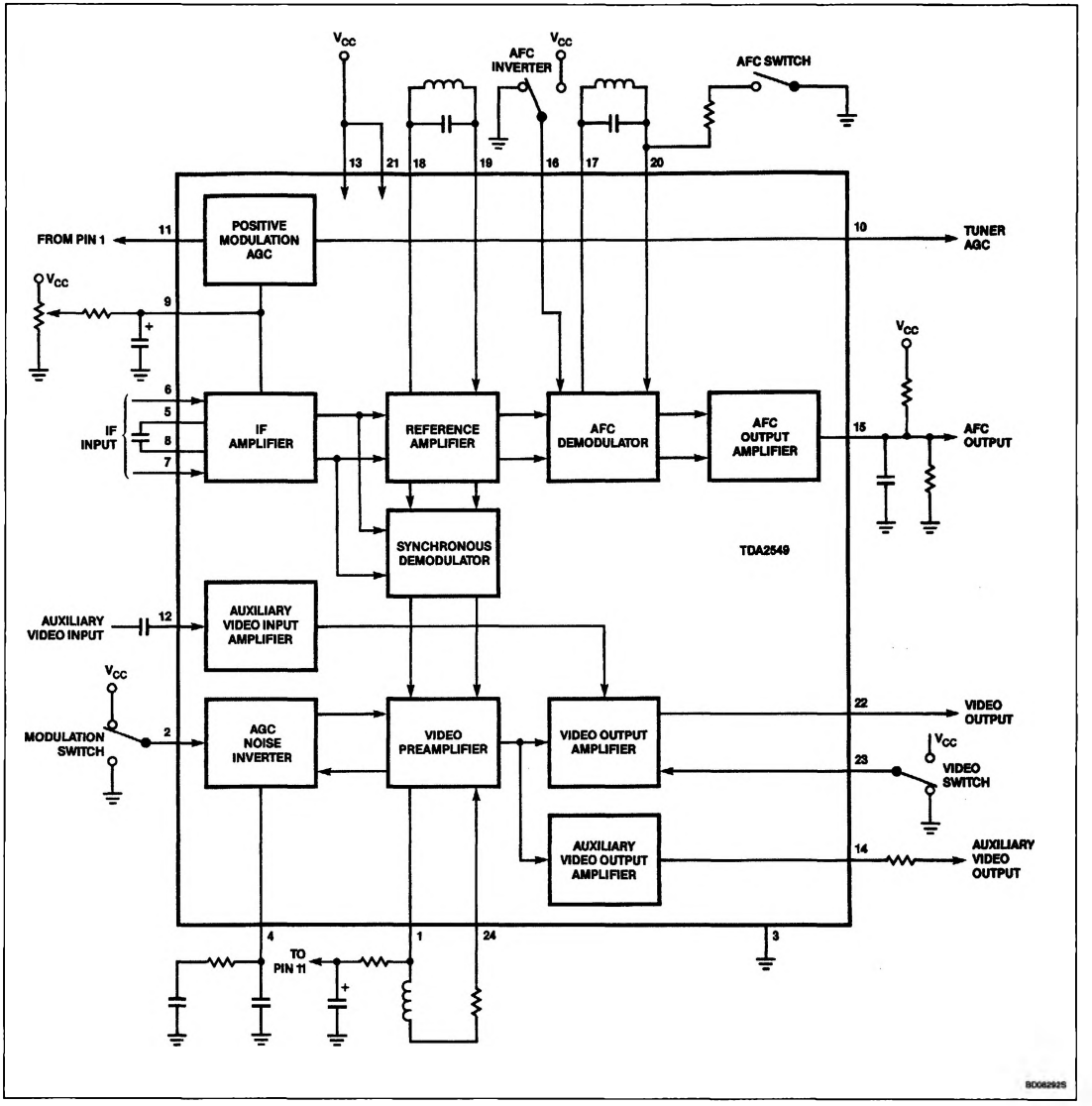

### ORDERING INFORMATION

| DESCRIPTION | TEMPERATURE RANGE | ORDER CODE |
|---|---|---|
| 24-Pin Plastic DIP (SOT-101A) | −25°C to +70°C | TDA2549N |

### ABSOLUTE MAXIMUM RATINGS

| SYMBOL | DESCRIPTION | RATING | UNIT |
|---|---|---|---|
| $V_{CC}$ | Supply voltage (Pins 13 and 21) | 13.8 | V |
| $T_{STG}$ | Storage temperature range | −65 to +150 | °C |
| $T_A$ | Operating ambient temperature range | −25 to +70 | °C |

## BLOCK DIAGRAM



**DC ELECTRICAL CHARACTERISTICS** (Measured in Figure 4) $V_{CC}$ = 12V; $T_A$ = 25°C, unless otherwise specified.

| SYMBOL | PARAMETER | LIMITS | | | UNIT |
|---|---|---|---|---|---|
| | | Min | Typ | Max | |
| $V_{CC}$ | Supply voltage range | 10.8 | 12 | 13.2 | V |
| $I_{CC}$ | Supply current (Pins 13 and 21) | | 82 | | mA |
| $V_I = V_{6-7}$ | IF input signal for $V_O$ = 2V (between Pins 6 and 7) | | 50 | 150 | μV |
| $\lvert Z_{6-7} \rvert$ | Input impedance (differential) | | 2 | | kΩ |
| $C_{6-7}$ | Input capacitance (differential) | | 2 | | pF |
| | Zero signal output level | | | | |
| $V_{22-3}$ | Positive modulation | 1.6 | 2 | 2.3 | V |
| $V_{22-3}$ | Negative modulation | 3.7 | 4 | 4.3 | V |
| $V_{22-3}$ | Top sync output level | 1.7 | 2 | 2.3 | V |
| $A_V$ | Gain control range | 50 | 74 | | dB |
| S/N | Signal-to-noise ratio at $V_I$ = 10mV[1] | 50 | 57 | | dB |
| $V_{23-3(P-P)}$ | Maximum video output amplitude for positive modulation (peak-to-peak value) | 4.5 | | | V |
| BW | Bandwidth of video amplifier (3dB) | | 5.5 | | MHz |
| dG | Differential gain at $V_O$ = 2V | | 4 | 10 | % |
| dφ | Differential phase at $V_O$ = 2V | | 2 | 10 | % |
| $V_{24-3(RMS)}$ | Residual carrier signal (RMS value) | | 10 | 20 | mV |
| $V_{24-3(RMS)}$ | Residual second harmonic of carrier signal (RMS value) | | 20 | 60 | mV |
| $V_{15-3}$ | AFC output voltage swing | 10 | | | V |
| Δf | Change of frequency required for AFC output voltage swing of 10V | | 70 | 200 | kHz |
| $V_{17-3}$ | AFC switch off for a voltage lower than: | | | 1.5 | V |
| | AFC inverter switch | | | | |
| $V_{16-3}$ | positive AFC (Figure 1) | 0 | | 1.5 | V |
| $V_{16-3}$ | negative AFC (Figure 2) | 4 | | 12 | V |
| **Tuner AGC** | | | | | |
| $I_{10}$ | Leakage current | | | 15 | μA |
| | Saturation voltage | | | | |
| $V_{10-3}$ | $I_{10}$ = 0.3mA | | 0.1 | 0.3 | V |
| $V_I$ | take-over point Low | | | 3 | mV |
| $V_I$ | take-over point High | 10 | | | mV |
| $\Delta V_{22-3}$ | Signal expansion at $A_V$ = 50dB | | | 0.5 | dB |
| | Negative modulation (Figure 3) | | | | |
| $V_{22-3}$ | white spot inverter threshold level | | 4.6 | | V |
| $V_{22-3}$ | white spot insertion level | | 3.2 | | V |
| $V_{22-3}$ | noise inverter threshold level | | 0.9 | | V |
| $V_{22-3}$ | noise insertion level | | 2.5 | | V |
| $V_{11-3}$ | Positive modulation AGC detector reference level | 3.0 | 3.2 | 3.4 | V |
| $V_{12-3}$ | Auxiliary video input signal for $V_{O(P-P)}$ = 2V | 0.7 | 1 | 1.4 | V |
| | Auxiliary video output | | | | |
| $V_{14-3}$ | output signal[2] | | 1 | | V |
| $V_{14-3}$ | top sync level | 1 | 2 | 3 | V |
| $\lvert Z_{14-3} \rvert$ | output impedance | | 7 | | Ω |

**DC ELECTRICAL CHARACTERISTICS** (Continued) (Measured in Figure 4) $V_{CC}$ = 12V; $T_A$ = 25°C, unless otherwise specified.

| SYMBOL | PARAMETER | LIMITS | | | UNIT |
|---|---|---|---|---|---|
| | | Min | Typ | Max | |
| | Levels for video switches | | | | |
| $V_{2-3}$ | positive video | | | 1 | V |
| $V_{2-3}$ | negative video | 3 | | | V |
| $V_{23-3}$ | internally demodulated signal | | | 1 | V |
| $V_{23-3}$ | auxiliary video signal | 3 | | | V |

**NOTES:**

1. Signal-to-noise ratio $S/N = \frac{V_O \text{ black-to-white}}{V_{N(RMS)} \text{ at } B = 5MHz}$.
2. Measured in application of Figure 4.

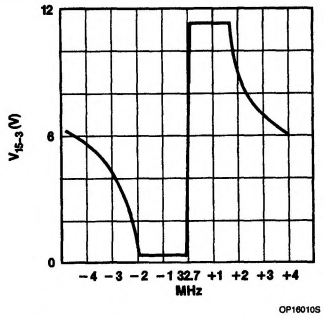



**Figure 1. AFC Output Voltage $V_{15-3}$ for Positive AFC**

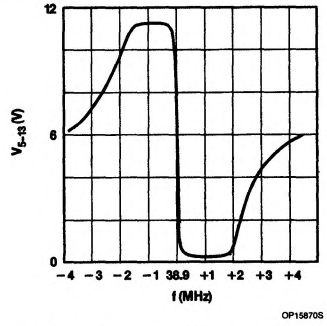



**Figure 2. AFC Output Voltage $V_{15-3}$ for Negative AFC**

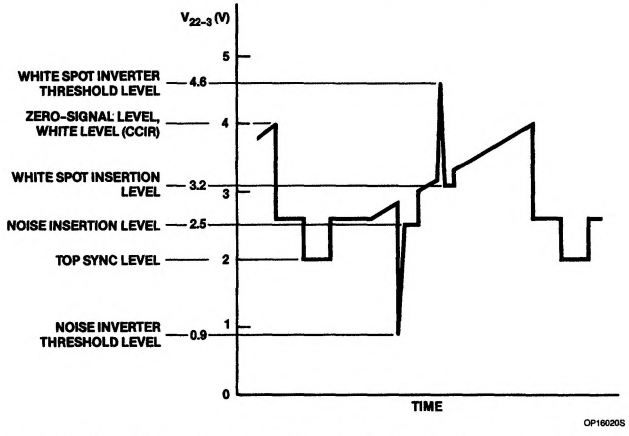



**Figure 3. Video Output Waveform Showing White Spot and Noise Inverter Threshold Levels**

## APPLICATION INFORMATION

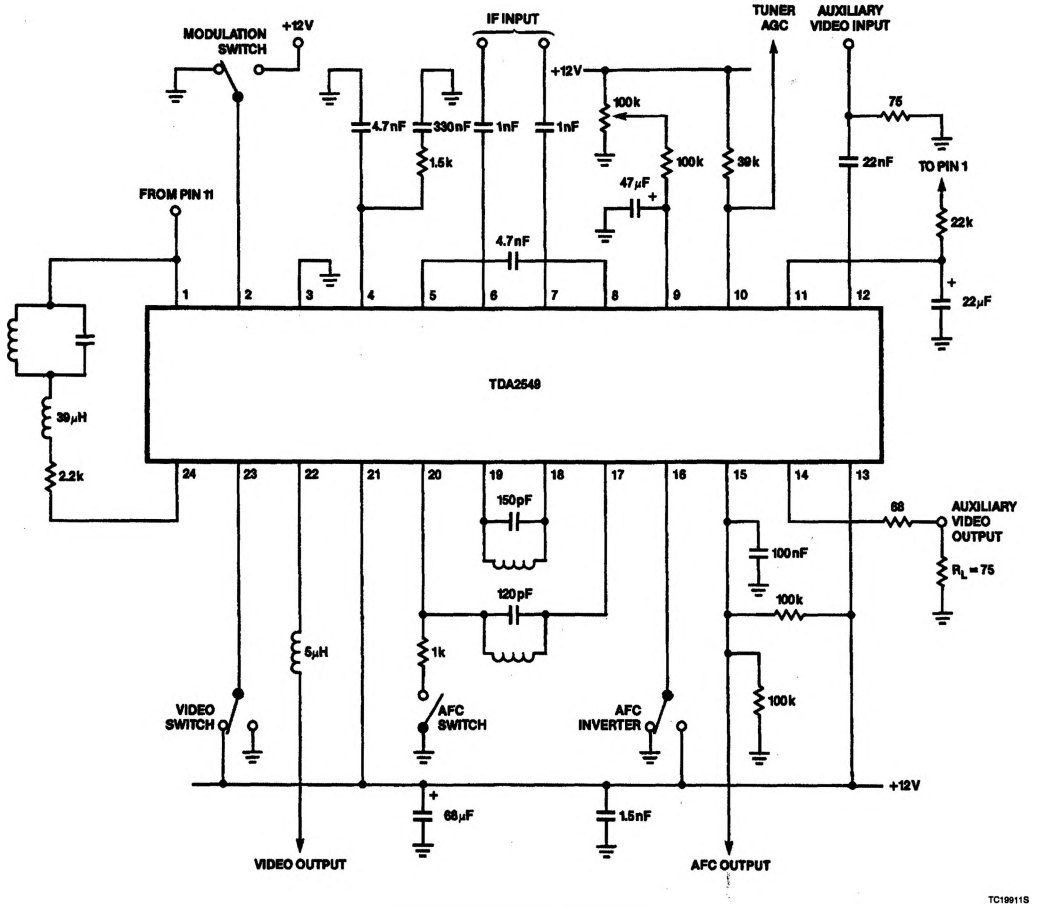



**Figure 4. Application Diagram**