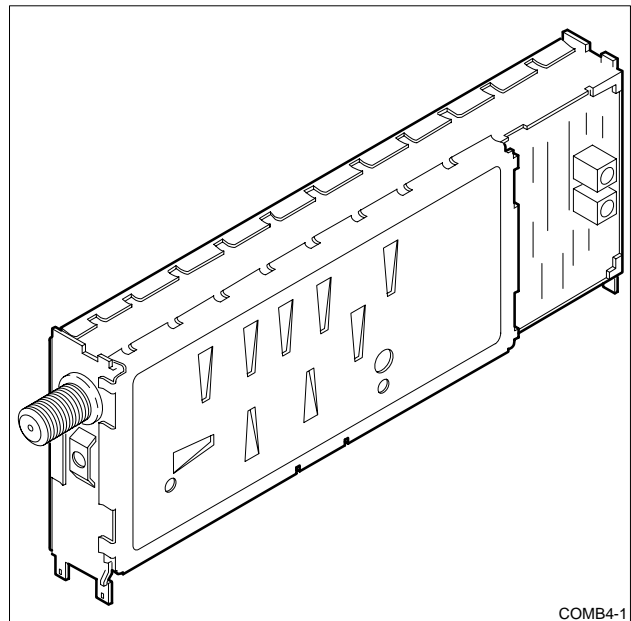


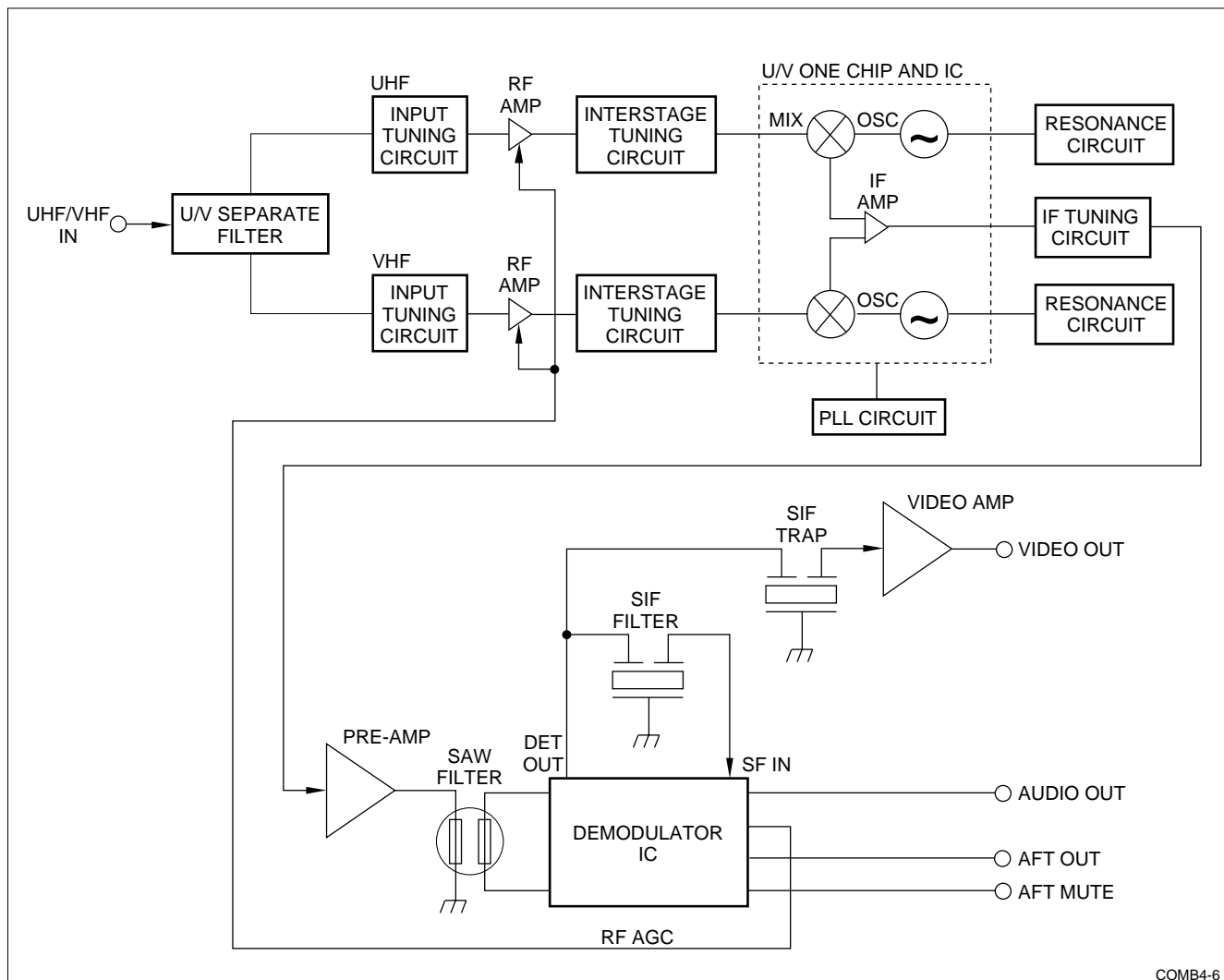
### FEATURES

- Receiving Standard: USA
- Receiving Channels:
  - VHF Section
    - Low Band – Air: 2 to 6 CATV: (A-8) A-5 to B
    - High Band – Air: 7 to 13 CATV: C to W + 11
  - UHF Section
    - Air: 14 to 69
    - CATV: W + 12 to W + 84
- Receiving System: USA Standard M-System (NTSC)
- Channel Selection System: PLL Tuning
- Detection System: Dummy Synchronization Detection System, Intercarrier Sound Receiving System
- Nominal Input Impedance: RF 75  $\Omega$
- Output Load Impedance:
  - Video: 1 k $\Omega$
  - Audio: 4.7 k $\Omega$
- Intermediate Frequency:
  - Picture: 45.75 MHz
  - Sound: 41.25 MHz
- Weight: 42 g  $\pm$ 10 g
- Applicable Standards:
  - EIA Standard Number 544
  - EIA Standard Number 16A
  - FCC Standards
  - UL Standard



### FUNCTIONAL DESCRIPTION

The VTBT5UF201 is a combination tuner and demodulator in one package. It is compatible with North American NTSC television broadcast signals. An internal Phase-Locked Loop circuit performs all of the required tuning functions. The tuner and demodulator blocks are internally connected. An IF sample port is provided for monitoring the signal level or frequency characteristics of the recovered IF signal. The RF connector is mounted on the end of the housing so that the smallest possible area is used on the rear panel of a final installation. Demodulated audio, video, and AFT outputs are provided. The AFT Mute function is available as well. The AGC control line from the demodulator to the tuner is not accessible to the system designer.



COMB4-6

Figure 1. VTBT5UF201 Block Diagram

## ELECTRICAL CHARACTERISTICS

- Nominal Supply Voltage (TYP.)
  - BT: 31 V
  - BP: 5 V
  - BM: 5 V
- Operating Voltage (TYP.)
  - BT: 31 V  $\pm$ 2.0 V
  - BP: 5 V  $\pm$ 0.5 V
  - BM: 5 V  $\pm$ 0.5 V
  - Control: 5 V  $\pm$ 0.2 V
- Breakdown Voltage (MIN.)
  - BT: 34 V
  - BP: 5.5 V
  - BM: 5.5 V
- Test Conditions (TYP.)
  - BT: 31 V
  - BP: 5 V
  - BM: 5 V
  - Ambient Temperature 25°C  $\pm$ 5°C
  - Relative Humidity 65%  $\pm$ 10%
- Current Consumption (MAX.)
  - BT: 5 mA
  - BP: 16 mA
  - BM: 150 mA
- Temperature (TYP.)
  - Storage -20°C to +70°C
  - Operating -10°C to +60°C

- Noise Figure (UHF AIR)
  - Maximum 7 dB (TYP.), 10 dB (MAX.)
  - $\bar{X} = \Sigma xi/n$
  - $S = \Sigma \sqrt{(Xi - x)^2} / (n - 1), n = 10^*$   
(Tested channels including worst)
  - Shall satisfy the requirements stated in FCC NF Sampling Plan C (effective January, 1980)
  - Noise figure measurement shall be based on FCC OST 50 (effective January, 1980)
  - XIRS: 7 dB (TYP.), 10 dB (MAX.)

**NOTE:** \*A representative tuner test shall be conducted on the following channels and on the worst channel found CH 14 through CH69: Ch14, 20, 26, 32, 38, 44, 50, 56, 62, and 69.

- Image Rejection
  - At -47 dBm Input
    - VHF Air: 70 dB (TYP.), 60 dB (MIN.)
    - VHF CATV: 70 dB (TYP.), 60 dB (MIN.)
    - UHF: 60 dB (TYP.), 40 dB (MIN.)
- IF Rejection (dB)
  - At -47 dBm Input
    - VHF Low: 80 dB (TYP.), 55 dB (MIN.)
    - VHF High: 90 dB (TYP.), 90 dB (MIN.)
    - UHF: 85 dB (TYP.), 60 dB (MIN.)
  - At -17 dBm: Input
    - VHF Low: 58 dB (TYP.), 50 dB (MIN.)
    - VHF High: 63 dB (TYP.), 50 dB (MIN.)
    - UHF: 60 dB (TYP.), 50 dB (MIN.)
- Specific Channel Rejection.
  - Desirable 54 dBμ input; Undesireable 49 dbμ input.
  - CH 6 ← CH A-5: 55 dB (TYP.); 50 dB (MIN.)
  - CHP 6 ← CHS6: 55 dB (TYP.); 52 dB (MIN.)
- Band Edge Tuning Margin
  - CH 2: -4.0 MHz (TYP.), -1 MHz (MIN.)
  - CH B: 3.0 MHz (TYP.), +1 MHz (MIN.)
  - CH C: -4.0 MHz (TYP.), -1 MHz (MIN.)
  - CH W + 11: 3.0 MHz (TYP.), +1 MHz (MIN.)
  - CH W + 12: -5.0 MHz (TYP.), -1.5 MHz (MIN.)
  - CH 69: 6.0 MHz (TYP.), 1.0 MHz (MIN.)
- Antenna Terminal Voltage
  - Fundamental Wave 40 dBμ (MAX.)
  - Higher Harmonic 48 dBμ (MAX.)
- PLL AC Characteristics
  - Setting Up Enable: Tsuen 1 μs (MIN.)
  - Holding Enable: Thden 1 μs (MIN.)
  - Setting Up Data: Tsuda 1 μs (MIN.)
  - Holding Data: Thdda 1 μs (MIN.)
  - Clock Level High: Thicl 1 μs (MIN.)
  - Clock Level Low: Tlocl 1 μs (MIN.)
  - Clock Rate: Trate 10 μs (MIN.)

- Signal Rising: Trise 1 μs (MIN.)
- Signal Falling: Tfall 1 μs (MIN.)
- Picture Output
  - Output Level (CH 10) 1.0 Vp-p (TYP.), 1.0 ±15 Vp-p
  - At 1 kΩ termination, fp 70 dBμ, White 100%
  - Differential Gain (CH 10) 3% (TYP.), 10% (MAX.)
  - fp 90 dBμ, Sterstep 80 IRE
  - Differential Phase (CH 10) 3° (TYP.), 10° (MAX.)
  - fp 90 dBμ, Sterstep 80 IRE
  - S/N ratio 47 dB (TYP.), 43 dB (MIN.)
  - fp 70 dBμ, White 100%, 100 kHz to 4.2 MHz filter, Sctrap On
  - Frequency Characteristics (CH 10), fp 70 dBμ, multi-burst
    - 1.0 MHz: -0.3 dB (TYP.), -2 ±0.3 dB
    - 2.0 MHz: -0.4 dB (TYP.), -2 ±0.4 dB
    - 3.0 MHz: -1.0 dB (TYP.), -1.7 ±0.7 dB
    - 3.58 MHz: -2.0 dB (TYP.), -2 ±2 dB
  - Synchronized Ratio (CH 10)
    - 28.5% (TYP.), 23.6% to 33.6%
    - fp 70 dBμ, SMPTE color bar
- Sound Output
  - Output Level (CH 10) 245 mVrms (TYP.), 185 mVrms to 315 mVrms
  - fp 70 dBμ, SMPTE color bar 87.5% modulation, P/S 6 dB, fs 1 kHz, sin-curve 60% modulation, 75 μs pre-emphasis
  - Distortion Rate (CH 10) 1% (TYP.), 4% (MAX.)
  - S/N Ratio (CH 10) 53 dB (TYP.), 42 dB (MAX.)
  - Frequency Characteristics (CH 10) 0 dB (TYP.), 0 ±3 dB
  - AM Removal Level (CH 10) 45 dB (TYP.), 35 dB (MAX.)
- AFT Output
  - Output Voltage 2.5 V (TYP.), 1.75 V to 3.25 V
  - Frequency Accuracy 25 kHz (TYP.), 100 kHz (MAX.)

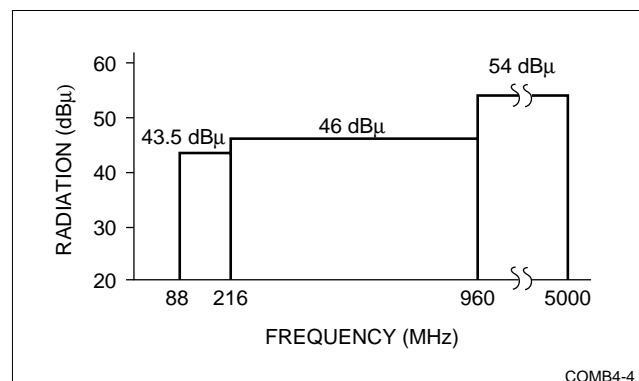


Figure 2. Radiation (3m Method)

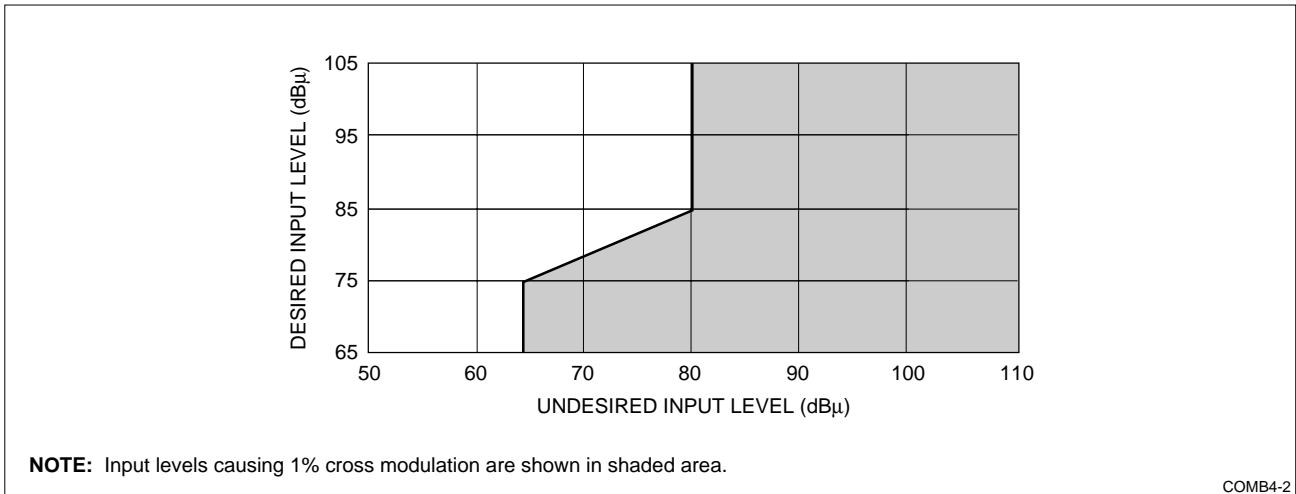


Figure 3. Cross Modulation Between Next and Adjacent Channels

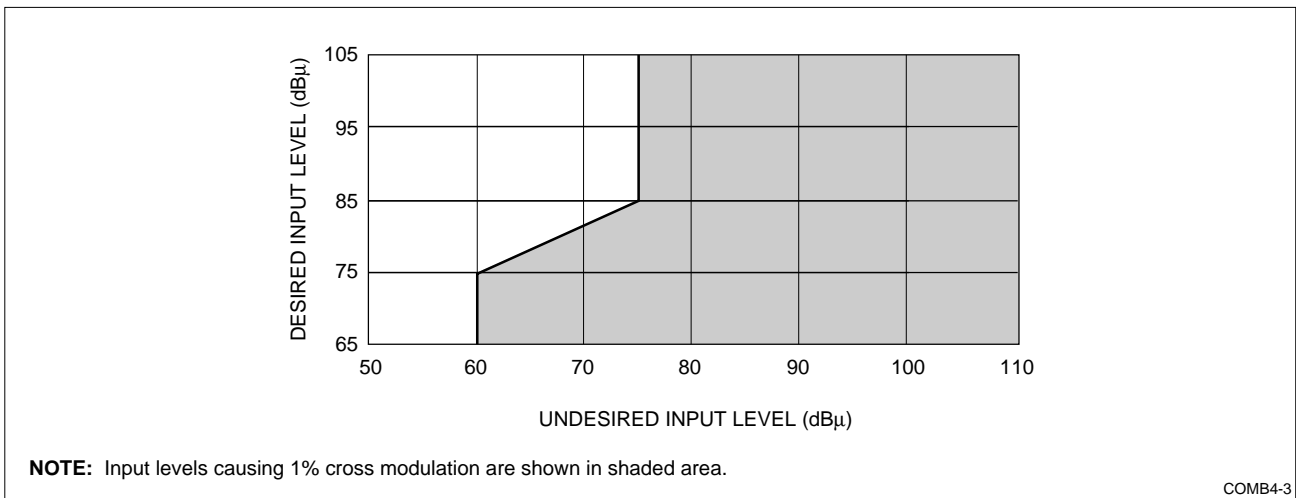


Figure 4. Cross Modulation Between Adjacent Channels

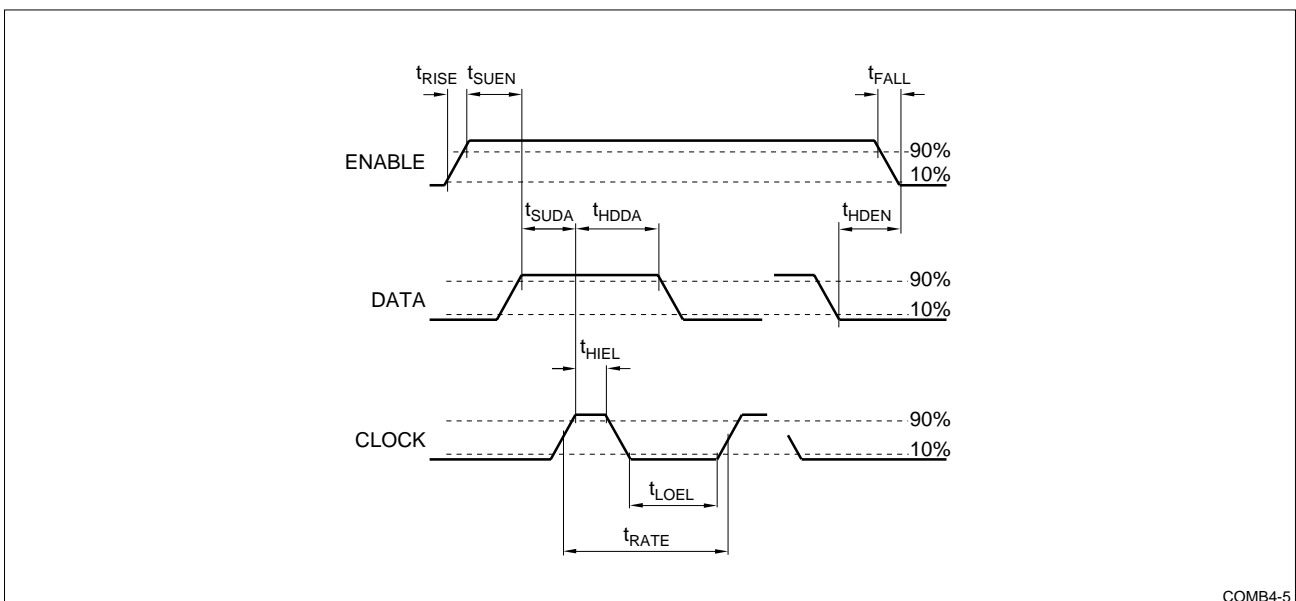
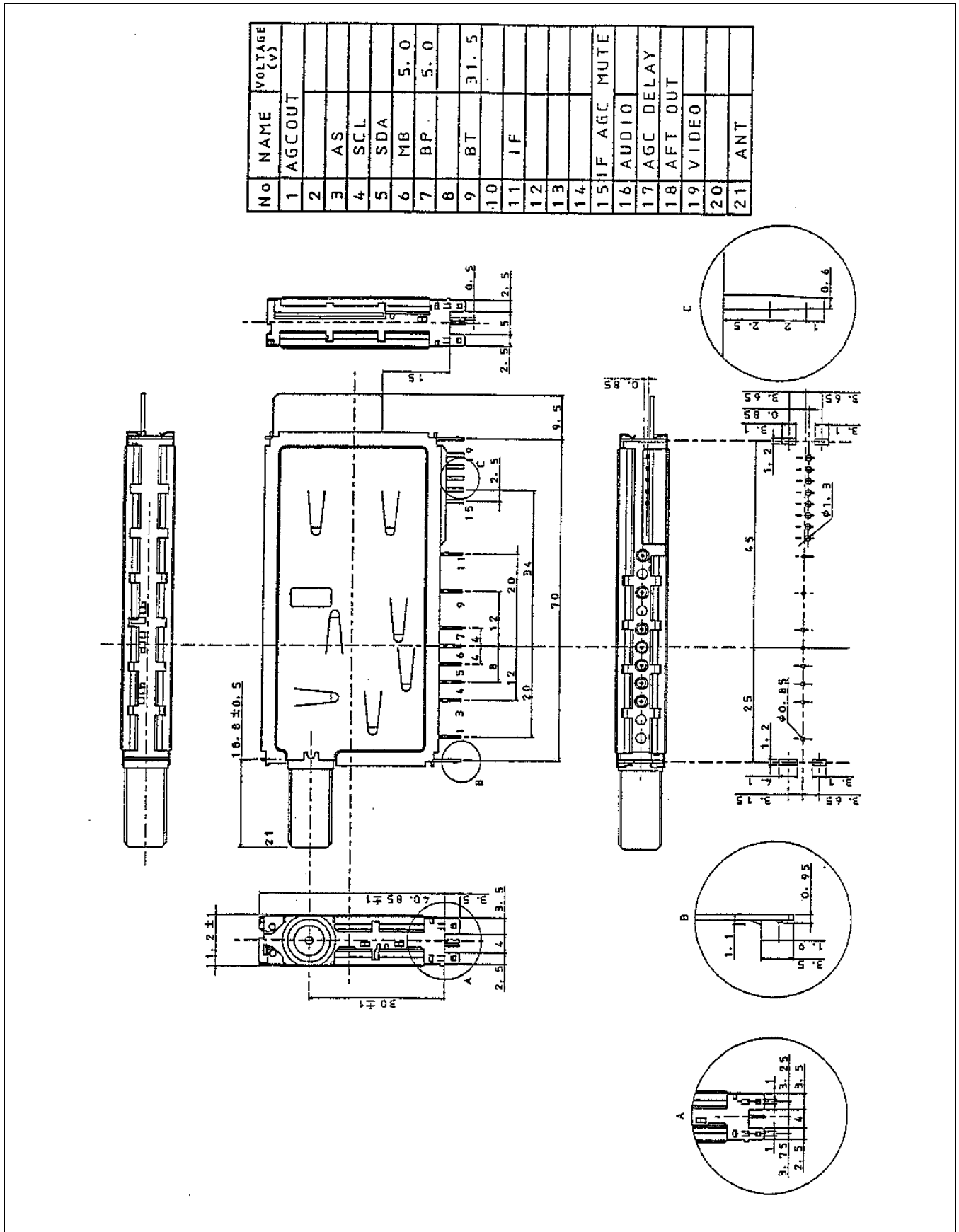


Figure 5. PLL AC Characteristics

OUTLINE DIMENSIONS



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