



ELECTRONICS, INC.
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NTE1441 Integrated Circuit FM IF Amplifier, Detector

Function:

- IF Amplification, Limiter
- Quadrature Detector
- AF Preamplifier
- Muting at Weak Input
- Muting at the Detuning
- Signal Meter Drive Output
- AFC Tuning Meter Drive Output
- Delay AGC Output
- Inverting Circuit for Muting Drive Voltage
- IF Amplifier Stop Circuit

Features:

- High Limiting Sensitivity: 18 μ V Typ.
- Low Distortion: 0.05% Typ Determined by the Linearity of Phase Characteristics in Phase Shifting Circuit
- High Demodulation Output: 330mV_{rms} Typ
- High S/N Ratio: 78.5dB Typ
- Muting at Detuning with Little Shock Noise
- Single Meter Drive Output Proportional with the Input Signal Level dB
- Detuning Muting Band having Good Symmetrics
- Tuning Meter Driving Output having Wide Swing Width
- Delay AGC Drive Output for Front End
- Constant Voltage Circuit is Built-In: Operating Voltage Range = 9V to 14V
- Muting Characteristics Between Adjacent Stations are Distinguished

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

| | |
|--|----------------|
| Maximum Supply Voltage (Pin11), V _{CCmax} | 16V |
| Maximum Input Voltage (Pin1-2), V _I | $\pm 1V_{P-P}$ |
| Maximum Supply Current (Pin11), I _{CC} | 40mA |
| Maximum Flow-In Current | |
| Pin15, I ₁₅ | 1mA |
| Pin16, I ₁₆ | 1mA |
| Maximum Flow-Out Current | |
| Pin10, I ₁₀ | 2mA |
| Pin12, I ₁₂ | 2mA |
| Pin13, I ₁₃ | 2mA |
| Pin15, I ₁₅ | 2mA |
| Allowable Power Dissipation, P _{Dmax} | 650mW |
| Operating Temperature Range, T _{opr} | -20° to +70°C |
| Storage Temperature Range, T _{stg} | -40° to +125°C |

Recommended Operating Condition: (T_A = +25°C unless otherwise specified)

| | |
|---------------------------------------|-----|
| Supply Voltage, V _{CC} | 12V |
|---------------------------------------|-----|

Electrical Characteristics: ($T_A = +25^\circ\text{C}$, $V_{CC} = 12\text{V}$, $f = 10.7\text{MHz}$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|-----------------------------|------------------------------|---|-------|------|-------|--------------------------|
| Quiescent Current | I_{CCO} | | – | 22 | 30 | mA |
| Current Dissipation | I_{CC} | $V_{IN} = 100\text{dB}\mu$ | – | 26.5 | 33.0 | mA |
| Demodulated Output | V_O | $V_{IN} = 100\text{dB}\mu$, 400Hz – 100% MOD | 240 | 330 | 460 | mV_{rms} |
| Signal-to-Noise Ratio | S/N | $V_{IN} = 100\text{dB}\mu$, 400Hz – 100% MOD | 72.0 | 78.5 | – | dB |
| Input Limiting Voltage | $V_{IN(\text{lim})}$ | V_O 3dB down, 400Hz – 100% MOD | – | 25 | 31 | $\text{dB}\mu$ |
| Total Harmonic Distortion | THD | $V_{IN} = 100\text{dB}\mu$, 400Hz – 100% MOD | – | 0.05 | 0.3 | % |
| Muting Sensitivity | $V_{IN(\text{mute})}$ | $V_{12} = 1.4\text{V}$ | 23 | 29 | 35 | $\text{dB}\mu$ |
| Muting Attenuation | $\text{Mute}_{(\text{att})}$ | $V_5 = 2\text{V}$, $V_{IN} = 100\text{dB}\mu$, 400Hz – 100% MOD | 60 | 65 | – | dB |
| Muting Bandwidth | $\text{BW}_{(\text{mute})}$ | $V_{IN} = 100\text{dB}\mu$, $V_{12} = 1.4\text{V}$ | 140 | 220 | 370 | kHz |
| AM Rejection Ratio | AMR | $V_{IN} = 100\text{dB}\mu$, FM: 400Hz – 100% MOD, AM: 1kHz – 30% MOD | 45 | 60 | – | dB |
| Muting Driving Output | V_{12} | Quiescent | 4.0 | 4.9 | 6.0 | V |
| | | $V_{IN} = 100\text{dB}\mu$ | 0 | 0 | 0.3 | V |
| Signal Meter Driving Output | V_{13} | Quiescent | 0 | 0 | 0.1 | V |
| | | $V_{IN} = 70\text{dB}\mu$ | 1.9 | 3.0 | 4.2 | V |
| | | $V_{IN} = 100\text{dB}\mu$ | 4.5 | 5.5 | – | V |
| AGC Output | V_{15} | Quiescent | 4.2 | 5.0 | 5.5 | V |
| | | $V_{IN} = 100\text{dB}\mu$ | 0 | 0 | 0.5 | V |
| IF OFF Current | $I_{15(\text{off})}$ | Quiescent, $V_{8-10} \leq 20\text{mV}$ | 10 | 35 | 60 | μA |
| Voltage of Muting Operation | $V_{16(\text{mute})}$ | $V_{IN} = 100\text{dB}\mu$, $V_{12} = 1.4\text{V}$ | 0.7 | 0.84 | 1.0 | V |
| Offset Voltage | V_{6-10B} | Quiescent, Pin6 – Pin10 | –0.5 | 0 | +0.5 | V |
| | V_{7-10B} | Quiescent, Pin7 – Pin10, $R_{7-10} = 5.1\text{k}$ | –0.25 | 0 | +0.25 | V |
| Pin Voltage | V_1 | Quiescent | – | 2.6 | – | V |
| | V_2 | | – | 2.6 | – | V |
| | V_3 | | – | 2.6 | – | V |
| | V_6 | | – | 5.6 | – | V |
| | V_7 | | – | 5.6 | – | V |
| | V_8 | | – | 5.4 | – | V |
| | V_{10} | | – | 5.6 | – | V |
| | V_{12} | | – | 4.9 | – | V |
| | V_{13} | | – | 0 | – | V |
| V_{15} | – | 5.0 | – | V | | |

Pin Connection Diagram

