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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 $\mu$ V Typ.
- Low Distortion: 0.05% Typ Determined by the Linearity of Phase Characteristics in Phase Shifting Circuit
- High Demodulation Output: 330mV<sub>rms</sub> 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:** ( $T_A = +25^\circ\text{C}$  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, $T_{opr}$ .....	$-20^\circ$ to $+70^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-40^\circ$ to $+125^\circ\text{C}$

**Recommended Operating Condition:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Supply Voltage, $V_{CC}$ .....	12V
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**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	$\text{mV}_{\text{rms}}$
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	$\mu\text{A}$
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

