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## NTE1608 Integrated Circuit AM Tuner <sup>w</sup>/Electronic Tuning

### **Description:**

The NTE1608 is a high performance integrated circuit in a 20-Lead DIP type package to be used as an AM electronic tuner. It provides an automatic search-stop signal, local oscillator buffer-output, and the low level local oscillation, as well as providing all other functions required of an AM tuner. Moreover, the stable local oscillation from LW to SW facilitates the use of many bands.

### **Functions:**

- RF Amplifier
- IF Amplifier
- MIX
- AGC
- OSC (with ALC)
- Detection
- Local Oscillation Buffer-Output
- Signal Meter Driving Output (also used as an Automatic Search Stop-Signal).

### **Features:**

- **Narrow-Band Signal Meter:** Available as an automatic search-stop signal (also available as a wide-band signal meter). Signal meter output =  $1/2$  frequency  $\pm$  1.5kHz typ.
- **Local Oscillation Buffer-Output:** Facilitates the design of electronic tuning systems and frequency representation.
- **OSC (with ALC):** The oscillation output has been stabilized at a low level ( $350\text{mV}_{\text{rms}}$ ) for a varactor diode, and tracking error has been minimized.
- **RF Amplifier:** Excellent in usable sensitivity by incorporating low-noise transistors in cascode circuit (45dB/m typ)
- **MIX:** Double balanced differential MIX prevents the influence of spurious radiation and IF interferences (IF interference = 85dB typ)
- **Low Noise:** Excellent in S/N for intermediate input (57dB typ).
- **Compensation for  $V_{\text{CC}}$  Fluctuation:** Allows little gain fluctuation and little distortion fluctuation (8 to 16V).
- **Low Shock Noise:** Able to decrease the shock noise by selecting AGC time constant when changing  $V_{\text{CC}}$ -on and/or switching the mode.

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Supply Voltage (Pin8, Pin14), $V_{CCmax}$ .....	16V
Output Voltage (Pin5, Pin7), $V_o$ .....	24V
Input Voltage (Pin3), $V_i$ .....	5.6V
Supply Current (Pin5 + Pin7 + Pin8 + Pin14), $I_{CCmax}$ .....	32mA
Output High Drive Current (Pin18), $I_{18}$ .....	5mA
Output High Drive Current (Pin20), $I_{20}$ .....	2mA
Allowable Power Dissipation, $P_{Dmax}$ .....	700mW
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)

Recommended Supply Voltage, $V_{CC}$ .....	12V
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**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 12\text{V}$ ,  $f_r = 1\text{MHz}$ ,  $f_m = 400\text{Hz}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Current Dissipation	$I_{CC}$	Quiescent	16	25	35	mA
		With 107dB $\mu$ Input	19	29	40	mA
Detector Output	$v_o$	With 23dB $\mu$ Input, MOD = 30%	-27.5	-23.0	-18.5	dBm
		With 80dB $\mu$ Input, MOD = 30%	-15.5	-12.5	-9.5	dBm
Signal-to-Noise Ratio	S/N	With 23dB $\mu$ Input, MOD = 30%	16	20	-	dB
		With 80dB $\mu$ Input, MOD = 30%	52	57	-	dB
Total Harmonic Distortion	THD	With 80dB $\mu$ Input, MOD = 30%	-	0.4	1.0	%
		With 107dB $\mu$ Input, MOD = 30%	-	0.3	1.0	%
Signal Meter Output	$V_{SM}$	Quiescent	-	0	0.5	V
		With 107dB $\mu$ Input	3.0	4.5	7.0	V
Input at Signal Meter Output = 1V	$V_{in}$		19	25	31	dB $\mu$
Local Oscillation-Buffer Output	$V_{OSC}$		250	350	-	mV <sub>rms</sub>

**Reference Characteristics:**

Parameter	Symbol	Test Conditions	Typ	Unit
Signal Meter Output	$V_{SM}$	With 40dB $\mu$ Input	2.5	V
Total Harmonic Distortion	THD	With 112dB $\mu$ Input, MOD = 30%	2	%
Local Oscillation Fluctuation within a Band	$\Delta V_{OSC}$	From $V_{OSC(L)}$ (522kHz) to $V_{OSC(H)}$ (1647kHz)	10	mV <sub>rms</sub>
Signal Meter Bandwidth (Note 1)	$V_{SM-BW}$	With 80dB $\mu$ Input, 1/2 Output Frequency	$\pm 1.5$	kHz
		With 80dB $\mu$ Input, 1/10 Output Frequency	-4.5 +7.0	kHz
Selectivity		$\pm 10\text{kHz}$ at 30% MOD	45	dB
IF Interference		$f_r = 600\text{kHz}$	85	dB
Image Frequency Interference Ratio		$f_r = 1400\text{kHz}$	40	dB

Note 1. BFB450C4 (Murata, japan) was used as a narrow band filter (0dBm = 775mV, 0dB $\mu$  = 1 $\mu$ V).

### Pin Connection Diagram

