NTE7164
Integrated Circuit
Double–Balanced Mixer & Oscillator

Description:
The NTE7164 is a low–power VHF monolithic double–balanced mixer with input amplifier, on–board oscillator, and voltage regulator in an 8–Lead DIP type package designed for use in high performance, low power communication systems. The gain, intercept performance, low–power and noise characteristics make the NTE7164 a superior choice for high–performance battery operated equipment.

Features:
● Low Current Consumption
● Excellent Noise Figure
● High Operating Frequency
● Excellent Gain, Intercept and Sensitivity
● Low External Parts Count; Suitable for Crystal/Ceramic Filters

Applications:
● Cellular Radio Mixer/Oscillator
● Portable Radio
● VHF Transceivers
● RF Data Links
● HF/VHF Frequency Conversion
● Instrumentation Frequency Conversion
● Broadband LANs

Absolute Maximum Ratings:
Maximum Operating Voltage, V_CC ................................................................. 9V
Operating Ambient Temperature Range, T_A ........................................... −40° to +85°C
Storage Temperature Range, T_stg ............................................................. −65° to +150°C

Electrical Characteristics:  (T_A = +25°C, V_CC = 6V unless otherwise specified)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply Voltage Range</td>
<td>V_CC</td>
<td></td>
<td>4.5</td>
<td>–</td>
<td>8.0</td>
<td>V</td>
</tr>
<tr>
<td>DC Current Drain</td>
<td></td>
<td></td>
<td>–</td>
<td>2.4</td>
<td>2.8</td>
<td>mA</td>
</tr>
<tr>
<td>Input Signal Frequency</td>
<td>f_IN</td>
<td></td>
<td>–</td>
<td>500</td>
<td>–</td>
<td>MHz</td>
</tr>
<tr>
<td>Oscillator Frequency</td>
<td>f_OSC</td>
<td></td>
<td>–</td>
<td>200</td>
<td>–</td>
<td>MHz</td>
</tr>
</tbody>
</table>
**Electrical Characteristics (Cont’d):** \((T_A = +25°C, \ V_{CC} = 6V\) unless otherwise specified\)

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<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise Figure at 45MHz</td>
<td></td>
<td></td>
<td>−</td>
<td>5.0</td>
<td>6.0</td>
<td>dB</td>
</tr>
<tr>
<td>Third–Order Intercept Point</td>
<td></td>
<td>(R_{FIN} = -45\text{dBm}: f_1 = 45.0, f_2 = 45.06)</td>
<td>−</td>
<td>−15</td>
<td>−17</td>
<td>dBm</td>
</tr>
<tr>
<td>Conversion Gain at 45MHz</td>
<td></td>
<td></td>
<td>14</td>
<td>18</td>
<td>−</td>
<td>dB</td>
</tr>
<tr>
<td>RF Input Resistance</td>
<td>(R_{IN})</td>
<td></td>
<td>1.5</td>
<td>−</td>
<td>−</td>
<td>kΩ</td>
</tr>
<tr>
<td>RF Input Capacitance</td>
<td>(C_{IN})</td>
<td></td>
<td>−</td>
<td>3.0</td>
<td>3.5</td>
<td>pF</td>
</tr>
<tr>
<td>Mixer Output Resistance</td>
<td>Pin4 or Pin5</td>
<td></td>
<td>−</td>
<td>1.5</td>
<td>−</td>
<td>kΩ</td>
</tr>
</tbody>
</table>

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**Pin Connection Diagram**

- Input A: 1
- Input B: 2
- GND: 3
- Output A: 4
- Output B: 5
- \(V_{CC}\): 8
- Oscillator: 6, 7

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Dimensions:
- 0.280 (7.1) inches
- 0.300 (7.62) inches
- 0.400 (10.16) inches (Max)
- 0.100 (2.54) inches
- 0.125 (3.17) inches (Min)
- 0.200 (5.08) inches