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NTE1693 Integrated Circuit Telephone Pulse Dialer (CMOS)

Description:

The NTE1693 is a CMOS LSI pulse dialer in a 16-Lead DIP type package with redial which integrates a ceramic resonator as a frequency reference.

Features:

- Make Ratio: 33/39% Pin-Selectable.
- Pulse Output: "1" True
- Mute Output: "0" True
- 17-Digit Redial with either * or # Input
- Uses a Ceramic Oscillator as a Frequency Reference
- Direct Telephone Line Operation
- Uses either a Standard 2-of-7 Matrix Keyboard or a Single Contact Keyboard
- Mute Signal Generated on Pulse Signal

Absolute Maximum Ratings:

| | |
|--|-------------------------------------|
| Supply Voltage (Note 1), V_{DD} | -0.3 to +6.2V |
| Maximum Pin Voltage | |
| V_{IN1} (Note 2) | -0.3V |
| V_{IN2} (Note 3) | +0.3V |
| Maximum Power Dissipation ($T_A = +25^\circ\text{C}$), P_D | 500mW |
| Operating Temperature Range, T_{opr} | -30° to $+60^\circ\text{C}$ |
| Storage Temperature Range, T_{stg} | -55° to $+150^\circ\text{C}$ |

Note 1. Referenced to GND

Note 2. The maximum applicable voltage or any pin with respect to GND

Note 3. The maximum applicable voltage on any pin with respect to V_{DD}

Recommended Operating Conditions:

| | |
|--------------------------------|-------------|
| Supply Voltage, V_{DD} | 2.5 to 6.0V |
|--------------------------------|-------------|

DC Electrical Characteristics: ($T_A = -30^\circ$ to $+60^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------|-----------|---|-------------|-------|-------------|---------------|
| Key Contact Resistance | R_{KI} | | – | – | 1 | $k\Omega$ |
| Keyboard Capacitance | C_{KI} | | – | – | 30 | μF |
| Input Voltage | K_{1H} | 2-of-7 input mode, Note 4 | $0.8V_{DD}$ | – | V_{DD} | V |
| | | | GND | – | $0.2V_{DD}$ | V |
| Key Pull-Up Resistance | K_{IRU} | $V_{DD} = 6.0\text{V}$, $V_{IN} = 4.8\text{V}$ | – | 4 | – | $k\Omega$ |
| Key Pull-Down Resistance | K_{IRD} | | – | 100 | – | $k\Omega$ |
| MUTE Sink Current | I_M | $V_{DD} = 2.5\text{V}$, $V_{OUT} = 0.5\text{V}$, Note 5 | 500 | – | – | μA |
| Pulse Output Sink Current | I_P | $V_{DD} = 2.5\text{V}$, $V_{OUT} = 0.5\text{V}$, Note 6 | 1.0 | – | – | mA |
| $V_{DD}-V_{RFF}$ Value | V_{REF} | $I_{SUPPLY} = 150\mu\text{A}$, Note 7 | 1.5 | 2.5 | 3.5 | V |
| Memory Retention Current | I_{MR} | All outputs in no-load state | – | 0.7 | – | μA |
| Operating Current | I_{OP} | All outputs in no-load state | – | 100 | 150 | μA |
| MUTE, PULSE Leakage | I_{LKG} | $V_{DD} = 6.0\text{V}$, $V_{OUT} = 6.0\text{V}$, Note 5, Note 6 | – | 0.001 | 1 | μA |

Note 4. Applies to key input pins (ROW1–ROW4 COL1–COL3)

Note 5. Applies to MUTE output pin.

Note 6. Applies to PULSE output pin

Note 7. Applies to V_{REF} pin.

AC Electrical Characteristics:

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------|-----------|-----------------|-----|-----|-----|------|
| Oscillator Frequency | f_{OSC} | Note 8 | – | 480 | – | kHz |
| Keyboard Debounce Time | t_{DB} | | – | 10 | – | ms |
| Time for Valid Key Entry | t_{KD} | | 40 | – | – | ms |
| Oscillator Start-Up Time | t_{ON} | Note 9 | – | 6 | – | ms |
| Pulse Rate | P_R | | – | 10 | – | pps |
| Break Time | t_B | Pin9 tied to V+ | – | 61 | – | ms |
| | | Pin9 tied to V– | – | 67 | – | ms |
| Inter-Digital Pause | t_{IDP} | | – | 800 | – | ms |

Note 8. Typical values are exact with a nominal 480kHz frequency reference (except for oscillator start-up time)

Note 9. Ceramic resonator should have the following equivalent values: $R < 20\Omega$, $R_A \geq 70k\Omega$, $C_O \leq 500\text{pF}$.

Pin Connection Diagram

