ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089

NTE1691 & NTE1692
Integrated Circuit
Telephone Pulse Dialer w/Redial

Description:

The NTE1691 and NTE1692 are monolithic CMOS integrated circuits in an 18–Lead DIP type package that provide all the features required for implementing a pulse dialer with redial.

Functions:

- Mute Output Logic “0”
- $\overline{\text{Pulse}}$ Output Logic “0”
- RC Oscillation for Reference Frequency
- Designed to Operate Directly from the Telephone Line
- Used CMOS Technology for Low Voltage, Low Power Operation
- Power Up Clear Circuitry
- NTE1691 Pin2: V_{REF}
- NTE1692 Pin2: Tone Out

Features:

- Uses Either a Standard 2 of 7 Matrix Keyboard with Negative True Common or the Inexpensive Form A–Type Keyboard
- Make/Break Ratio Can Be Selected
- Redial with * or #
- Tone Signal Output or On–Chip Reference Voltage by Bonding Option on Chip
- 10pps/20pps Can be Selected

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

DC Supply Voltage, V_{CC} 6.2V
Voltage on Any Pin, V_{IN} . . . . . V_{CC}+0.3, GND–0.3V
Power Dissipation, P_D 500mW
Operating Temperature Range, T_{opr} . . . . . –30° to +60°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C

DC Electrical Characteristics: (T_A = +25°C, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		2.5	–	6.0	V
Key Contact Resistance	R_{KI}	Note 2	–	–	1	kΩ
Keyboard Capacitance	C_{KI}	Note 2	–	–	30	pF
Key Input Voltage	K_{IH}	2 of 7 input mode, Note 2	$0.8V_{CC}$	–	V_{CC}	V
	K_{IL}		GND	–	$0.2V_{CC}$	V
Key Pull–Up Resistance	K_{IRU}	V_{CC} = 6V	–	100	–	kΩ
Key Pull–Down Resistance	K_{IRD}	V_{IN} = 4.8V	–	4.0	–	kΩ
Mute Sink Current	I_M	V_{CC} = 2.5V, V_O = 500mV, Note 3	500	–	–	µA
Pulse Output Sink Current	I_P	V_{CC} = 2.5V, V_O = 500mV, Note 4	1.0	–	–	mA
Tone Output Sink Current	I_{TL}	V_{CC} = 2.5V, V_O = 500mV, Note 5	250	–	–	µA
Tone Output Source Current	I_{TH}	V_{CC} = 2.5V, V_O = 500mV, Note 5	250	–	–	µA
Memory Retention Current	I_{MR}	All outputs under no load, Note 7	–	0.7	–	µA
Operating Current	I_{OP}	All outputs under no load	–	100	150	µA
Mute or Pulse Off Leakage	I_{LKG}	V_{CC} = 6V, V_O = 6V, Note 3, Note 4	–	0.001	1.0	µA
V_{REF} Output Source Current	I_{REF}	Note 6	1.0	7.0	–	mA

Note 1. Typical values are to be used as a design aid and are not subject to production testing.
Note 2. Applies to key input pin (R_1–R_4, C_1–C_3).
Note 3. Applies to $\overline{\text{MUTE}}$ output pin.
Note 4. Applies to $\overline{\text{PULSE}}$ output pin.
Note 5. Applies to TONE pin (NTE1692 only).
Note 6. Applies to V_{REF} pin (NTE1691 only).
Note 7. Current necessary for memory to be maintained. All outputs unloaded.

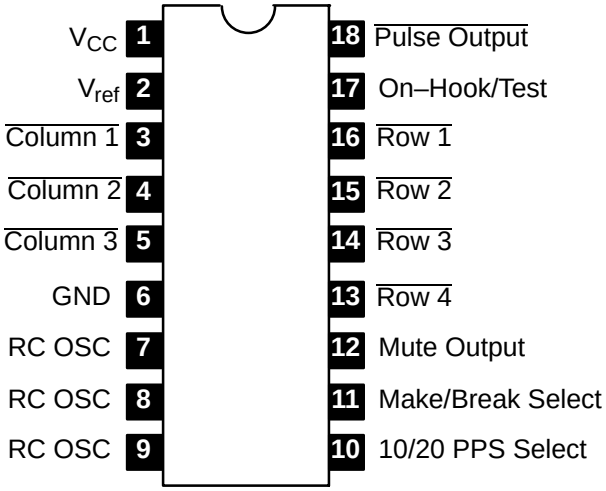
AC Electrical Characteristics: (T_A = +25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Oscillator Frequency	F_{OSC}	Note 8	–	4	–	kHz
Key Input Debounce Time	T_{DB}	Note 10, Note 11	–	10	–	ms
Key Down Time for Valid Entry	T_{KD}	Note 11, Note 12	40	–	–	ms
Key Down Time During Two–Key Roll Over	t_{KR}	Note 11	5	–	–	ms
Oscillator Start–Up Time	t_{os}	V_{CC} = 2.5V	–	1	–	ms
Mute Valid After Last Outpulses	t_{MO}	Note 10, Note 11	–	5	–	ms
Pulse Output Pulse Rate	P_R	Note 9	–	10	–	PPS
On–Hook Time Required to Clear Memory	t_{OH}	Note 11	300	–	–	ms
Pre–Digital Pause	T_{PDP}	Note 10, Note 11	–	800	–	ms
Inter–Digital Pause	T_{IDP}	Note 10, Note 11	–	800	–	ms
Frequency Stability	Δf	V_{CC} = 2.5 to 3.5V	–	±4	–	%
		V_{CC} = 2.5 to 6.0V	–	±4	–	%
Tone Output Frequency	F_{TONE}	Note 11, Note 13	–	1	–	kHz

Note 8. R_S = 2MΩ, R = 220kΩ, C = 390pF.
Note 9. If Pin10 is tied to V_{CC}, the output pulse rate will be 20pps.
Note 10. If the 20pps option is selected, the time will be $^1/_2$ these shown.
Note 11. These times are directly proportional to the oscillator frequency.
Note 12. Debounce plus oscillator start–up time ≤ 40ms.
Note 13. If the 20pps option is selected, the tone output frequency will be 2kHz (NTE1692 only).

Pin Connection Diagram

NTE1691



NTE1692