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## NTE1609 Integrated Circuit Instrumentation Timer

**Description:**

The NTE1609 is a monolithic integrated circuit in a 7-Lead SIP type package consisting of a timer developed for use in measurement instrumentation, control equipment and digital data processing equipment. This device is designed to require few externally connected components.

**Features:**

- Wide Timing Range from Microseconds to Several Hours
- A Load Current of 200mA is Achievable
- Capable of Directly Driving DTL and TTL Circuits
- Good Temperature Stability (Typically 50ppm/°C)
- Good Supply Voltage Stability (Typically 0.1%/V)

**Applications:**

- Delay Timers
- Monostable Multivibrators
- Astable Multivibrators
- Pulse Generators
- Dividers
- Sequence Timers

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Supply Voltage,  $V_{CC}$  ..... 18V  
 Power Dissipation,  $P_D$  ..... 500mW  
     Derate Above  $25^\circ\text{C}$  ..... 5.0mW/°C  
 Operating Temperature Range,  $T_{opr}$  .....  $-10^\circ$  to  $+75^\circ\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-55^\circ$  to  $+125^\circ\text{C}$

**Electrical Characteristics:** ( $T_A = +25$ ,  $V_{CC} = +5\text{V}$ ,  $+15\text{V}$  unless otherwise specified)

| Parameter      | Symbol    | Test Conditions                        | Min | Typ | Max  | Unit |
|----------------|-----------|--|-----|-----|------|------|
| Supply Voltage | $V_{CC}$  |  | 4.5 | –   | 16.0 | V    |
| Supply Current | $I_{CC1}$ | $V_{CC} = 5\text{V}$ , $R_L = \infty$  | –   | 3   | 7    | mA   |
|                | $I_{CC2}$ | $V_{CC} = 15\text{V}$ , $R_L = \infty$ | –   | 10  | 15   | mA   |

**Electrical Characteristics (Cont'd):** ( $T_A = +25$ ,  $V_{CC} = +5V, +15V$  unless otherwise specified)

| Parameter                                 | Symbol        | Test Conditions   | Min       | Typ       | Max  | Unit            |
|---|---------------|---|-----------|-----------|------|-----------------|
| Monostable Timing Accuracy                | $T_{ERR (M)}$ | $R_A = 1k\Omega$ to $100k\Omega$ , $C = 0.1\mu F$       | –         | 1         | –    | %               |
| Monostable Timing Temperature Coefficient | $T_{DT (M)}$  | $R_A = 1k\Omega$ to $10k\Omega$ , $C = 0.1\mu F$        | –         | 50        | –    | ppm/°C          |
| Monostable Timing Supply Regulation       | $T_{DS (M)}$  | $R_A = 1k\Omega$ to $10k\Omega$ , $C = 0.1\mu F$        | –         | 0.1       | –    | %/V             |
| Astable Timing Accuracy                   | $T_{ERR (A)}$ | $R_A = R_B = 1k\Omega$ to $100k\Omega$ , $C = 0.1\mu F$ | –         | 2.5       | –    | %               |
| Astable Timing Temperature Coefficient    | $T_{DT (A)}$  | $R_A = R_B = 1k\Omega$ to $10k\Omega$ , $C = 0.1\mu F$  | –         | 150       | –    | ppm/°C          |
| Astable Timing Supply Regulation          | $T_{DS (A)}$  | $R_A = R_B = 1k\Omega$ to $100k\Omega$ , $C = 0.1\mu F$ | –         | 0.3       | –    | %/V             |
| Threshold Voltage                         | $V_{TH}$      |   | –         | 2/3       | –    | $\times V_{CC}$ |
| Threshold Current                         | $I_{TH}$      |   | –         | 0.1       | 0.25 | $\mu A$         |
| Trigger Voltage                           | $V_T$         |   | –         | 1/3       | –    | $\times V_{CC}$ |
| Trigger Current                           | $I_T$         |   | –         | 0.5       | –    | $\mu A$         |
| Reset Voltage                             | $V_R$         |   | –         | 0.7       | 1.0  | V               |
| Reset Current                             | $I_R$         |   | –         | 0.1       | –    | mA              |
| Control Voltage                           | $V_{CR1}$     |   | 2.60      | 3.33      | 4.00 | V               |
|   | $V_{CR2}$     |   | 9         | 10        | 11   | V               |
| Low-Level Output Voltage                  | $V_{OL1}$     | $V_{CC} = 5V, I_{sink} = 5mA$                           | –         | 0.25      | 0.35 | V               |
|   | $V_{OL2}$     | $V_{CC} = 15V, I_{sink} = 10mA$                         | –         | 0.10      | 0.25 | V               |
|   | $V_{OL3}$     | $V_{CC} = 15V, I_{sink} = 50mA$                         | –         | 0.40      | 0.75 | V               |
|   | $V_{OL4}$     | $V_{CC} = 15V, I_{sink} = 100mA$                        | –         | 2.0       | 2.5  | V               |
|   | $V_{OL5}$     | $V_{CC} = 15V, I_{sink} = 200mA$                        | –         | 2.5       | –    | V               |
| High-Level Output Voltage                 | $V_{OH1}$     | $V_{CC} = 5V, I_{source} = 100mA$                       | 2.75      | 3.30      | –    | V               |
|   | $V_{OH2}$     | $V_{CC} = 15V, I_{source} = 100mA$                      | 12.7<br>5 | 13.3<br>0 | –    | V               |
|   | $V_{OH3}$     | $V_{CC} = 15V, I_{source} = 200mA$                      | –         | 12.5<br>0 | –    | V               |
| Output Rise Time                          | $t_r$         |   | –         | 100       | –    | ns              |
| Output Fall Time                          | $t_f$         |   | –         | 100       | –    | ns              |

**Pin Connection Diagram**  
(Front View)

