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NTE6404 Silicon Unilateral Switch (SUS)

Description:

The NTE6404 is a silicon planar, monolithic integrated circuit having thyristor electrical characteristics closely approximating those of an “ideal” four layer diode. The device is designed to switch at 8 volts with a 0.02%/°C temperature coefficient. A gate lead is provided to eliminate rate effect, obtain triggering at lower values and to obtain transient free wave forms.

Silicon Unilateral Switches are specifically designed and characterized for use in monostable and bistable applications where low cost is of prime importance.

Applications:

- SCR Triggers
- Frequency Dividers
- Ring Counters
- Cross Point Switching
- Over-Voltage Sensors

Absolute Maximum Ratings:

| | |
|---|----------------|
| Power Dissipation (Note 1) | 300mW |
| Peak Reverse Voltage | -30V |
| DC Forward Anode Current (Note 1) | 175mA |
| DC Gate Current (Note 1, Note 2) | 5mA |
| Peak Recurrent Forward Current (1% duty cycle, 10µs pulse width, T _A = +100°C) | 1A |
| Peak Non-Recurrent Forward Current (10µs pulse width, T _A = +25°C) | 5A |
| Operating Junction Temperature Range | -55° to +125°C |
| Storage Temperature Range | -65° to +150°C |

Note 1. Derate linearly to zero at 125°C

Note 2. This rating applicable only in OFF state. Maximum gate current in conducting state limited by maximum power rating.

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|-------------------------------|----------------|-----------------|-----|-----|------|------|
| Static Characteristics | | | | | | |
| Forward Switching Voltage | V _S | | 7 | - | 9 | V |
| Forward Switching Current | I _S | | - | - | 200 | µA |
| Holding Current | I _H | | - | - | 0.75 | mA |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--|-----------|---|-----|------------|-----|---------------------|
| Static Characteristics (Cont'd) | | | | | | |
| Reverse Current | I_R | $V_R = -30\text{V}, T_A = +25^\circ\text{C}$ | - | - | 0.1 | μA |
| | | $V_R = -30\text{V}, T_A = +100^\circ\text{C}$ | - | - | 10 | μA |
| Forward Current (Off-State) | I_B | $V_F = 5\text{V}, T_A = +25^\circ\text{C}$ | - | - | 0.1 | μA |
| | | $V_F = 5\text{V}, T_A = +25^\circ\text{C}$ | - | - | 10 | μA |
| Forward Voltage Drop (On-State) | V_F | $I_F = 175\text{mA}$ | - | - | 1.5 | V |
| Temperature Coefficient of Switching Voltage | T_C | $T_A = -55^\circ$ to $+100^\circ\text{C}$ | - | ± 0.02 | - | $\%/^\circ\text{C}$ |
| Dymanic Characteristics | | | | | | |
| Turn-On Time | t_{on} | | - | - | 1.0 | μs |
| Turn-Off Time | t_{off} | | - | - | 25 | μs |
| Capacitance | C | $f = 1\text{MHz}$ | - | 2.5 | - | pF |

