

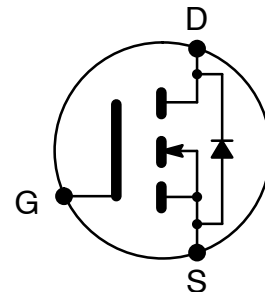


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NTE491 NTE491SM MOSFET N-Ch, Enhancement Mode High Speed Switch

Features:

- Available in either TO92 (NTE491) or SOT-23 Surface Mount (NTE491SM) Type Package
- High Density Cell Design for Low $R_{DS(ON)}$
- Voltage Controlled Small Signal Switch
- Rugged and Reliable
- High Saturation Current Capability



Absolute Maximum Ratings:

| | |
|--|-------------------------------|
| Drain-Source Voltage, V_{DS} | 60V |
| Drain-Gate Voltage ($R_{GS} = 1M\pm$), V_{DGR} | 60V |
| Gate-Source Voltage, V_{GS} | |
| Continuous | $\pm 20V$ |
| Non-Repetitive ($t_p \leq 50\mu s$) | $\pm 40V$ |
| Drain Current, I_D | |
| Continuous | |
| NTE491 | 200mA |
| NTE491SM | 115mA |
| Pulsed | |
| NTE491 | 500mA |
| NTE491SM | 800mA |
| Total Device Dissipation ($T_A = +25^\circ C$), P_D | |
| NTE491 | 350mW |
| NTE491SM | 200mW |
| Derate above $25^\circ C$ | |
| NTE491 | 2.8mW/ $^\circ C$ |
| NTE491SM | 1.6mW/ $^\circ C$ |
| Operating Junction Temperature Range, T_J | -55° to $+150^\circ C$ |
| Storage Temperature Range, T_{stg} | -55° to $+150^\circ C$ |
| Thermal Resistance, Junction-to-Ambient, $R_{th} (JA)$ | |
| NTE491 | 312.5 $^\circ C/W$ |
| NTE491SM | 625 $^\circ C/W$ |
| Maximum Lead Temperature (During Soldering, 1/16" from case, 10sec), T_L | $+300^\circ C$ |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--|---------------|---|---|------|------|-------------------|
| OFF Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0, I_D = 10\geq\text{A}$ | 60 | - | - | V |
| Zero-Gate-Voltage Drain Current NTE491 | I_{DSS} | $V_{DS} = 48\text{V}, V_{GS} = 0$ $T_J = +125^\circ\text{C}$ | - | - | 1.0 | $\geq\text{A}$ |
| NTE491SM | | | - | - | 1.0 | $\geq\text{A}$ |
| | | $V_{DS} = 60\text{V}, V_{GS} = 0$ $T_J = +125^\circ\text{C}$ | - | - | 0.5 | mA |
| Gate-Body Leakage Current, Forward NTE491 | I_{GSSF} | $V_{GSF} = 15\text{V}, V_{DS} = 0$ | - | - | 10 | nA |
| NTE491SM | | $V_{GSF} = 20\text{V}, V_{DS} = 0$ | - | - | 100 | nA |
| Gate-Body Leakage Current, Reverse NTE491 | I_{GSSR} | $V_{GSF} = -15\text{V}, V_{DS} = 0$ | - | - | -10 | nA |
| NTE491SM | | $V_{GSF} = -20\text{V}, V_{DS} = 0$ | - | - | -100 | nA |
| ON Characteristics (Note 1) | | | | | | |
| Gate Threshold Voltage NTE491 | $V_{GS(Th)}$ | $I_D = 1\text{mA}, V_{DS} = V_{GS}$ | 0.8 | - | 3.0 | V |
| NTE491SM | | $I_D = 250\geq\text{A}, V_{DS} = V_{GS}$ | 1.0 | 2.1 | 2.5 | V |
| Static Drain-Source ON Resistance NTE491 | $r_{DS(on)}$ | $V_{GS} = 10\text{V}, I_D = 500\text{mA}$ $T_J = +125^\circ\text{C}$ | - | 1.2 | 5.0 | \pm |
| | | | $V_{GS} = 4.5\text{V}, I_D = 75\text{mA}$ | - | 1.8 | 5.3 |
| NTE491SM | | $V_{GS} = 10\text{V}, I_D = 500\text{mA}$ $T_J = +100^\circ\text{C}$ | - | 1.2 | 7.5 | \pm |
| | | | - | 1.7 | 13.5 | \pm |
| Drain-Source ON-Voltage NTE491 | $V_{DS(on)}$ | $V_{GS} = 10\text{V}, I_D = 500\text{mA}$ | - | 0.6 | 2.5 | V |
| | | $V_{GS} = 4.5\text{V}, I_D = 75\text{mA}$ | - | 0.14 | 0.45 | V |
| NTE491SM | | $V_{GS} = 10\text{V}, I_D = 500\text{mA}$ | - | 0.6 | 3.75 | V |
| | | $V_{GS} = 4.5\text{V}, I_D = 75\text{mA}$ | - | 0.9 | 1.5 | V |
| ON-State Drain Current NTE491 | $I_{d(on)}$ | $V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}$ | 75 | 600 | - | mA |
| NTE491SM | | $V_{GS} = 10\text{V}, V_{DS} \geq 2 V_{DS(on)}$ | 500 | 2700 | - | mA |
| Forward Transconductance NTE491 | g_{fs} | $V_{DS} = 10\text{V}, I_D = 200\text{mA}$ | 100 | 320 | - | $\geq\text{mhos}$ |
| NTE491SM | | $V_{DS} \geq 2 V_{DS(on)}, I_D = 200\text{mA}$ | 80 | 320 | - | $\geq\text{mhos}$ |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 25\text{V}, V_{GS} = 0, f = 1\text{MHz}$ | - | 20 | 50 | pF |
| Reverse Transfer Capacitance | C_{oss} | | - | 11 | 25 | pF |
| Output Capacitance | C_{rss} | | - | 4 | 5 | pF |

Note 1. Pulse Test: Pulse Width $\leq 300\geq\text{s}$, Duty Cycle $\leq 2\%$.

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|-----------|---|-----|------|-----|------|
| Turn-On Time NTE491 | t_{on} | $V_{DD} = 15\text{V}, R_L = 25\pm,$ $I_D = 500\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\pm$ | - | - | 10 | ns |
| NTE491SM | | $V_{DD} = 30\text{V}, R_L = 150\pm,$ $I_D = 200\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\pm$ | - | - | 20 | ns |
| Turn-Off Time NTE491 | t_{off} | $V_{DD} = 15\text{V}, R_L = 25\pm,$ $I_D = 500\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\pm$ | - | - | 10 | ns |
| NTE491SM | | $V_{DD} = 30\text{V}, R_L = 150\pm,$ $I_D = 200\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\pm$ | - | - | 20 | ns |
| Drain-Source Diode Characteristics and Maximum Ratings (NTE491SM ONLY) | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | I_S | | - | - | 115 | mA |
| Maximum Pulsed Drain-Source Diode Forward Current | I_{SM} | | - | - | 0.8 | A |
| Drain-Source Diode Forward Voltage | V_{SD} | $V_{GS} = 0, I_S = 115\text{mA}, \text{Note 1}$ | - | 0.88 | 1.5 | V |

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

