

**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 ($R_{GS} = 1M\Omega$), 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	$V_{(BR)DSS}$	$V_{GS} = 0, I_D = 10\mu\text{A}$	60	-	-	V
Zero-Gate-Voltage Drain Current NTE491	I_{DSS}	$V_{DS} = 48\text{V}, V_{GS} = 0$	-	-	1.0	μA
			$T_J = +125^\circ\text{C}$	-	-	1.0
NTE491SM		$V_{DS} = 60\text{V}, V_{GS} = 0$	-	-	1.0	μA
			$T_J = +125^\circ\text{C}$	-	-	0.5
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		$I_D = 250\mu\text{A}, V_{DS} = V_{GS}$	1.0	2.1	2.5	V
Static Drain-Source ON Resistance NTE491	$r_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 500\text{mA}$	-	1.2	5.0	Ω
			$T_J = +125^\circ\text{C}$	-	1.9	9.0
		$V_{GS} = 4.5\text{V}, I_D = 75\text{mA}$	-	1.8	5.3	Ω
NTE491SM		$V_{GS} = 10\text{V}, I_D = 500\text{mA}$	-	1.2	7.5	Ω
			$T_J = +100^\circ\text{C}$	-	1.7	13.5
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	-	μmhos
NTE491SM		$V_{DS} \geq 2 V_{DS(on)}, I_D = 200\text{mA}$	80	320	-	μmhos
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_{riss}		-	4	5	pF

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, 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}	$V_{DD} = 15\text{V}, R_L = 25\Omega,$ $I_D = 500\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\Omega$	-	-	10	ns
NTE491SM		$V_{DD} = 30\text{V}, R_L = 150\Omega,$ $I_D = 200\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\Omega$	-	-	20	ns
Turn-Off Time NTE491	t_{off}	$V_{DD} = 15\text{V}, R_L = 25\Omega,$ $I_D = 500\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\Omega$	-	-	10	ns
NTE491SM		$V_{DD} = 30\text{V}, R_L = 150\Omega,$ $I_D = 200\text{mA}, V_{GS} = 10\text{V},$ $R_{GEN} = 25\Omega$	-	-	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 $\leq 2\%$.

