

# NOS100B ■ NOS101B ■ NOS102B



## N-Channel Depletion Mode MOSPOWER

### APPLICATIONS

- Current Regulators
- Normally Closed Relay
- Telephone Line Switches
- Failsafe Systems



PIN 1 – Source  
PIN 2 – Gate  
PIN 3 – Drain; Case

### PRODUCT SUMMARY

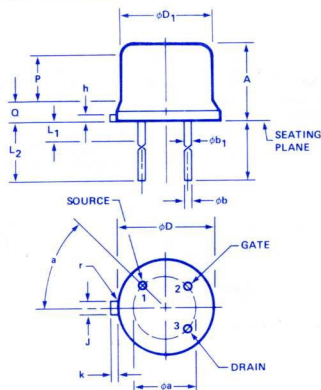
Part Number	$V_{DSS}$ Volts	$r_{DS(ON)}$ (ohms)	Package
NOS100B	150	4.5	T0-205AF
NOS101B	120	4.5	T0-205AF
NOS102B	80	4.5	T0-205AF

### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ C$ unless otherwise noted)

Parameter	NOS100B	NOS101B	NOS102B	Units
$V_{DS}$ Drain-Source Voltage	150	120	80	V
$V_{DGR}$ Drain-Gate Voltage ( $R_{GS} = 1 M\Omega$ )	150	120	80	V
$I_D @ T_C = 25^\circ C$ Continuous Drain Current <sup>(2)</sup>	±500	±500	±500	mA
$I_D @ T_C = 100^\circ C$ Continuous Drain Current <sup>(2)</sup>	±500	±500	±500	mA
$I_{DM}$ Pulsed Drain Current <sup>1</sup>	±1.8	±1.8	±1.8	A
$V_{GS}$ Gate-Source Voltage	±40	±40	±40	V
$P_D @ T_C = 25^\circ C$ Max. Power Dissipation	20	20	20	W
$P_D @ T_C = 100^\circ C$ Max. Power Dissipation	8	8	8	W
Junction to Case Linear Derating Factor	0.16	0.16	0.16	$W/^\circ C$
Junction to Ambient Linear Derating Factor	5.7	5.7	5.7	$mW/^\circ C$
$T_J$ Operating and Storage Temperature Range	-40 To 125 $^\circ C$	-40 To 125 $^\circ C$	-40 To 125 $^\circ C$	$^\circ C$
Lead Temperature (1/16" from case for 10 secs.)	300	300	300	$^\circ C$

**1 Pulse Test:** Pulsewidth  $\leq 300\mu sec$ , Duty Cycle  $\leq 2\%$

**2 Die Limits Current Capability**



Ltr	Dimensions			
	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	0.160	0.180	4.07	4.57
$\phi a$	0.200 TP		5.08 TP	
$\phi b$	0.016	0.021	0.41	0.53
$\phi b_1$	0.016	0.019	0.41	0.48
$\phi D$	0.335	0.370	8.51	9.40
$\phi D_1$	0.305	0.335	7.75	8.51
h	0.009	0.041	0.23	1.04
j	0.028	0.034	0.71	0.86
k	0.029	0.045	0.74	1.14
L	0.500	0.750	12.70	19.05
$L_1$	0.050		1.27	
$L_2$	0.250		6.35	
P	0.100		2.54	
Q	0.050		1.27	
r	0.010		0.25	
a	45 TP		45 TP	

# ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

## STATIC

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DSX</sub>	Drain-Source Breakdown Voltage	NOS100B	150			V	$V_{GS} = -10\text{V}$ $I_D = 1\text{ mA}$
		NOS101B	120			V	
		NOS102B	100			V	
V <sub>GS(OFF)</sub>	Gate-Source Cut Off Voltage	All		-4	-10	V	$V_{DS} = 50\text{V}$ , $I_D = 10\ \mu\text{A}$
I <sub>GSSF</sub>	Gate-Body Leakage Forward	All		10	100	nA	$V_{GS} = 20\text{V}$
I <sub>GSSR</sub>	Gate-Body Leakage Reverse	All		-10	-100	nA	$V_{GS} = -20\text{V}$
I <sub>DSX</sub>	Drain-Source Off Current	All		1	10	$\mu\text{A}$	$V_{DS} = 60\text{V}$ , $V_{GS} = -10\text{V}$
		All		0.5	1	mA	$V_{DS} = 60\text{V}$ , $V_{GS} = -10\text{V}$ $T_C = 125^\circ\text{C}$
I <sub>D(on)</sub>	On-State Drain Current <sup>1</sup>	All	0.2			A	$V_{DS} \geq 15\text{V}$ , $V_{GS} = 0$
		All	1			A	$V_{DS} \geq 15\text{V}$ , $V_{GS} = 10\text{V}$
V <sub>DS(on)</sub>	Static Drain-Source On-State Voltage <sup>1</sup>	All			0.45	V	$V_{GS} = 0$ , $I_D = 100\text{ mA}$
R <sub>DS(on)</sub>	Static Drain-Source On-State Resistance <sup>1</sup>	All		3.5	4.5	$\Omega$	$V_{GS} = 0$ , $I_D = 100\text{ mA}$
R <sub>DS(on)</sub>	Static Drain-Source On-State Resistance <sup>1</sup>	All		5.3		$\Omega$	$V_{GS} = 0$ , $I_D = 50\text{ mA}$ , $T_J = 125^\circ\text{C}$

## DYNAMIC

g <sub>fs</sub>	Forward Transductance <sup>1</sup>	All		500		mS	$V_{DS} \geq 2V_{DS(ON)}$ , $I_D = 200\text{ mA}$
C <sub>iss</sub>	Input Capacitance	All		200		pF	
C <sub>oss</sub>	Output Capacitance	All		100		pF	$V_{GS} = -10\text{V}$ , $V_{DS} = 25\text{V}$ $f = 1\text{ MHz}$
C <sub>rss</sub>	Reverse Transfer Capacitance	All		40		pF	
t <sub>d(on)</sub>	Turn-On Delay Time	All		10		ns	$V_{DD} = 60\text{V}$ , $I_D \cong 0.1\text{ A}$ $R_g = 25\ \Omega$ , $R_L = 700\ \Omega$ (MOSFET switching times are essentially independent of operating temperature.)
t <sub>r</sub>	Rise Time	All		15		ns	
t <sub>d(off)</sub>	Turn-Off Delay Time	All		8		ns	
t <sub>f</sub>	Fall Time	All				ns	

## THERMAL RESISTANCE

R <sub>thJC</sub>	Junction-to-Case	All		4.5	6.25	$^\circ\text{C/W}$	
R <sub>thJA</sub>	Junction-to-Ambient	All		130	175	$^\circ\text{C/W}$	Free Air Operation

## BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I <sub>S</sub>	Continuous Source Current (Body Diode)	All			-0.5	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier 
I <sub>SM</sub>	Source Current <sup>1</sup> (Body Diode)	All			-1.8	A	
V <sub>SD</sub>	Diode Forward Voltage <sup>1</sup>	All		-0.35	-0.45	V	

<sup>1</sup> Pulse Test: Pulse Width  $\leq 300\ \mu\text{sec}$ , Duty Cycle  $\leq 2\%$