

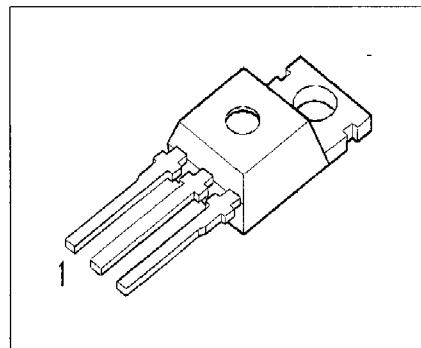
# New Jersey Semi-Conductor Products, Inc.

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- N channel
- Enhancement mode
- Avalanche-rated

## BUZ 31



Pin 1	Pin 2	Pin 3
G	D	S

Type	V <sub>DS</sub>	I <sub>D</sub>	R <sub>DS(on)</sub>	Package
BUZ 31	200 V	14.5 A	0.2 Ω	TO-220 AB

### Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current $T_C = 30^\circ\text{C}$	I <sub>D</sub>	14.5	A
Pulsed drain current $T_C = 25^\circ\text{C}$	I <sub>Dpuls</sub>	58	
Avalanche current, limited by $T_{j\max}$	I <sub>AR</sub>	14.5	
Avalanche energy, periodic limited by $T_{j\max}$ $I_D = 14.5 \text{ A}, V_{DD} = 50 \text{ V}, R_{GS} = 25 \Omega$ $L = 1.42 \text{ mH}, T_j = 25^\circ\text{C}$	E <sub>AR</sub>	9	mJ
Avalanche energy, single pulse $T_C = 25^\circ\text{C}$	E <sub>AS</sub>	200	
Gate source voltage	V <sub>GS</sub>	± 20	V
Power dissipation $T_C = 25^\circ\text{C}$	P <sub>tot</sub>	95	W
Operating temperature	T <sub>j</sub>	-55 ... + 150	°C
Storage temperature	T <sub>stg</sub>	-55 ... + 150	
Thermal resistance, chip case	R <sub>thJC</sub>	≤ 1.32	K/W
Thermal resistance, chip to ambient	R <sub>thJA</sub>	75	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

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Quality Semi-Conductors

## BUZ 31

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**Electrical Characteristics**, at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

### Static Characteristics

Drain- source breakdown voltage $V_{GS} = 0 \text{ V}, I_D = 0.25 \text{ mA}, T_j = 25^\circ\text{C}$	$V_{(\text{BR})\text{DSS}}$	200	-	-	V
Gate threshold voltage $V_{GS}=V_{DS}, I_D = 1 \text{ mA}$	$V_{GS(\text{th})}$	2.1	3	4	
Zero gate voltage drain current $V_{DS} = 200 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 25^\circ\text{C}$	$I_{DSS}$	-	0.1	1	$\mu\text{A}$
		-	10	100	
Gate-source leakage current $V_{GS} = 20 \text{ V}, V_{DS} = 0 \text{ V}$	$I_{GSS}$	-	10	100	nA
Drain-Source on-resistance $V_{GS} = 10 \text{ V}, I_D = 9 \text{ A}$	$R_{DS(\text{on})}$	-	0.16	0.2	$\Omega$

## BUZ 31

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**Electrical Characteristics**, at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

### Dynamic Characteristics

Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}, I_D = 9 \text{ A}$	$g_{fs}$	5	10	-	S
Input capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	$C_{iss}$	-	840	1120	pF
Output capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	$C_{oss}$	-	180	270	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	$C_{rss}$	-	95	150	
Turn-on delay time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(on)}$	-	12	20	ns
Rise time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_r$	-	50	75	
Turn-off delay time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(off)}$	-	150	200	
Fall time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_f$	-	60	80	

**Electrical Characteristics**, at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Reverse Diode</b>					
Inverse diode continuous forward current $T_C = 25^\circ\text{C}$	$I_S$	-	-	14.5	A
Inverse diode direct current,pulsed $T_C = 25^\circ\text{C}$	$I_{SM}$	-	-	58	
Inverse diode forward voltage $V_{GS} = 0 \text{ V}, I_F = 29 \text{ A}$	$V_{SD}$	-	1.1	1.6	V
Reverse recovery time $V_R = 100 \text{ V}, I_F=I_S, dI_F/dt = 100 \text{ A}/\mu\text{s}$	$t_{rr}$	-	170	-	ns
Reverse recovery charge $V_R = 100 \text{ V}, I_F=I_S, dI_F/dt = 100 \text{ A}/\mu\text{s}$	$Q_{rr}$	-	1.1	-	$\mu\text{C}$