

## BUZ31

# SIPMOS<sup>®</sup> POWER TRANSISTORS

### FEATURE

- Nchannel
- Enhancement mode
- Avalanche-rated
- TO-220 envelope
- Compliance to RoHS.

### ABSOLUTE MAXIMUM RATINGS

| Symbol       | Ratings   | Value       | Unit             |
|--------------|---|-------------|------------------|
| $V_{DS}$     | Drain-Source Voltage  | 200         | V                |
| $I_{DS}$     | Continuous Drain Current $T_C= 37^\circ\text{C}$  | 14.5        | A                |
| $I_{DM}$     | Pulsed Drain Current $T_C= 25^\circ\text{C}$  | 58          |                  |
| $I_{AR}$     | Avalanche Current, Limited by $T_{jmax}$  | 14.5        |                  |
| $E_{AR}$     | Avalanche Energy, Periodic Limited by $T_{jmax}$  | 9           | mJ               |
| $E_{AS}$     | Avalanche Energy, Single pulse<br>$I_D = 14.5\text{ A}$ , $V_{DD} = 50\text{ V}$ , $R_{GS} = 25\ \Omega$<br>$L = 1.42\text{ mH}$ , $T_j = 25^\circ\text{C}$ | 200         |                  |
| $V_{GS}$     | Gate-Source Voltage   | 20          | V                |
| $R_{DS(on)}$ | Drain-Source on Resistance  | 0.2         | $\Omega$         |
| $P_T$        | Power Dissipation at Case Temperature $T_C= 25^\circ\text{C}$   | 95          | W                |
| $t_J$        | Operating Temperature   | -55 to +150 | $^\circ\text{C}$ |
| $t_{stg}$    | Storage Temperature range   | -55 to +150 |                  |

### THERMAL CHARACTERISTICS

| Symbol     | Ratings                             | Value | Unit |
|------------|-------------------------------------|-------|------|
| $R_{thJC}$ | Thermal Resistance, chip case       | <1.32 | K/W  |
| $R_{thJA}$ | Thermal Resistance, chip to ambient | <75   |      |

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### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

| Symbol       | Ratings                         | Test Condition(s)                                     | Min | Typ  | Max | Unit     |
|--------------|---------------------------------|---|-----|------|-----|----------|
| $V_{DSS}$    | Drain-Source Breakdown Voltage  | $I_D = 250 \mu A, V_{GS} = 0 V$                       | 200 | -    | -   | V        |
| $V_{GS(th)}$ | Gate-threshold Voltage          | $I_D = 1 mA, V_{GS} = V_{DS}$                         | 2.1 | 3    | 4   | V        |
| $I_{DSS}$    | Zero Gate Voltage Drain Current | $V_{DS} = 200 V, V_{GS} = 0 V$<br>$T_j = 25^\circ C$  | -   | 0.1  | 1   | $\mu A$  |
|              |                                 | $V_{DS} = 200 V, V_{GS} = 0 V$<br>$T_j = 125^\circ C$ | -   | 1    | 100 |          |
| $I_{GSS}$    | Gate-Source leakage Current     | $V_{GS} = 20 V, V_{DS} = 0 V$                         | -   | 10   | 100 | nA       |
| $R_{DS(on)}$ | Drain-Source on Resistance      | $I_D = 9 A, V_{GS} = 10 V$                            | -   | 0.16 | 0.2 | $\Omega$ |

### DYNAMIC CHARACTERISTICS

| Symbol       | Ratings                      | Test Condition(s)   | Min | Typ | Max  | Unit    |
|--------------|------------------------------|---|-----|-----|------|---------|
| $g_{fs}$     | Transconductance             | $V_{DS} > 2 * I_D * R_{DS(on)max}$<br>$I_D = 9 A$                 | 3   | 4.2 | -    | S       |
| $C_{ISS}$    | Input Capacitance            | $V_{GS} = 0 V, V_{DS} = 25 V$<br>$f = 1 MHz$                      | -   | 840 | 1120 | $\mu F$ |
| $C_{OSS}$    | Output Capacitance           |   | -   | 180 | 270  |         |
| $C_{RSS}$    | Reverse transfer Capacitance |   | -   | 95  | 150  |         |
| $t_{d(on)}$  | Turn-on Delay Time           | $V_{DD} = 30 V, V_{GS} = 10 V$<br>$I_D = 3 A, R_{GS} = 50 \Omega$ | -   | 12  | 20   | ns      |
| $t_r$        | Rise time                    |   | -   | 50  | 75   |         |
| $t_{d(off)}$ | Turn-off Delay Time          |   | -   | 150 | 200  |         |
| $t_f$        | Fall Time                    |   | -   | 60  | 80   |         |

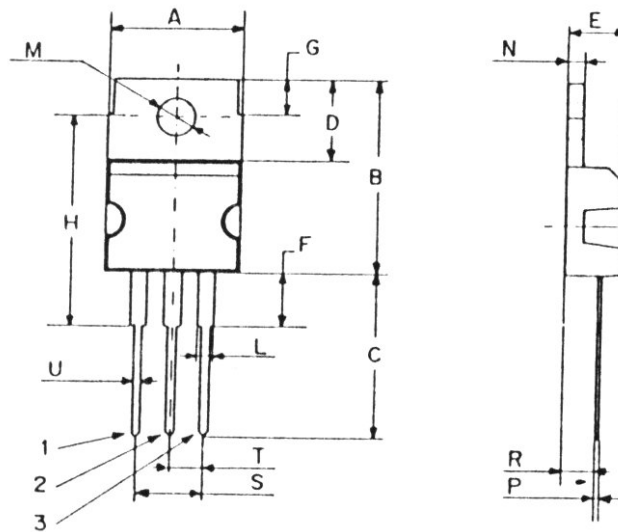
### REVERSE DIODE

| Symbol   | Ratings                                   | Test Condition(s)                                   | Min | Typ | Max  | Unit    |
|----------|---|---|-----|-----|------|---------|
| $I_S$    | Inverse Diode Continuous Forward Current. | $T_C = 25^\circ C$                                  | -   | -   | 14.5 | A       |
| $I_{SM}$ | Inverse diode direct current, pulsed.     | $T_C = 25^\circ C$                                  | -   | -   | 58   |         |
| $V_{SD}$ | Inverse Diode Forward voltage             | $V_{GS} = 0 V, I_F = 29 A$                          | -   | 1.1 | 1.6  | V       |
| $T_{rr}$ | Reverse Recovery Time                     | $V_R = 100 V, I_F = I_S$<br>$di_F/dt = 100 A/\mu s$ | -   | 170 | -    | ns      |
| $Q_{rr}$ | Reverse Recovery Charge                   |   | -   | 1.1 | -    | $\mu C$ |

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## MECHANICAL DATA CASE TO-220

| DIMENSIONS (mm) |       |       |
|-----------------|-------|-------|
|                 | Min.  | Max.  |
| A               | 9,90  | 10,30 |
| B               | 15,65 | 15,90 |
| C               | 13,20 | 13,40 |
| D               | 6,45  | 6,65  |
| E               | 4,30  | 4,50  |
| F               | 2,70  | 3,15  |
| G               | 2,60  | 3,00  |
| H               | 15,75 | 17,15 |
| L               | 1,15  | 1,40  |
| M               | 3,50  | 3,70  |
| N               | -     | 1,37  |
| P               | 0,46  | 0,55  |
| R               | 2,50  | 2,70  |
| S               | 4,98  | 5,08  |
| T               | 2,49  | 2,54  |
| U               | 0,70  | 0,90  |



|         |        |
|---------|--------|
| Pin 1 : | Gate   |
| Pin 2 : | Drain  |
| Pin 3 : | Source |

Revised october 2014

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