



# BBS3002 — P-Channel Silicon MOSFET

## General-Purpose Switching Device

### Applications

#### Features

- 4V drive.
- Load switching applications.
- Avalanche resistance guarantee.

#### Specifications

Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$

| Parameter                          | Symbol    | Conditions                                      | Ratings     | Unit             |
|------------------------------------|-----------|---|-------------|------------------|
| Drain-to-Source Voltage            | $V_{DSS}$ |   | -60         | V                |
| Gate-to-Source Voltage             | $V_{GSS}$ |   | $\pm 20$    | V                |
| Drain Current (DC)                 | $I_D$     |   | -100        | A                |
| Drain Current (Pulse)              | $I_{DP}$  | $PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$ | -400        | A                |
| Allowable Power Dissipation        | $P_D$     | $T_c=25^\circ\text{C}$                          | 90          | W                |
| Channel Temperature                | $T_{ch}$  |   | 150         | $^\circ\text{C}$ |
| Storage Temperature                | $T_{stg}$ |   | -55 to +150 | $^\circ\text{C}$ |
| Avalanche Energy (Single Pulse) *1 | $E_{AS}$  |   | 340         | mJ               |
| Avalanche Current *2               | $I_{AV}$  |   | -60         | A                |

Note : \*1  $V_{DD}=-30\text{V}$ ,  $L=100\mu\text{H}$ ,  $I_{AV}=-60\text{A}$

\*2  $L \leq 100\mu\text{H}$ , Single pulse

Electrical Characteristics at  $T_a=25^\circ\text{C}$

| Parameter                         | Symbol        | Conditions                                   | Ratings |     |          | Unit          |
|-----------------------------------|---------------|--|---------|-----|----------|---------------|
|                                   |               |  | min     | typ | max      |               |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=-1\text{mA}$ , $V_{GS}=0\text{V}$       | -60     |     |          | V             |
| Zero-Gate Voltage Drain Current   | $I_{DSS}$     | $V_{DS}=-60\text{V}$ , $V_{GS}=0\text{V}$    |         |     | -1       | $\mu\text{A}$ |
| Gate-to-Source Leakage Current    | $I_{GSS}$     | $V_{GS}=\pm 16\text{V}$ , $V_{DS}=0\text{V}$ |         |     | $\pm 10$ | $\mu\text{A}$ |
| Cutoff Voltage                    | $V_{GS(off)}$ | $V_{DS}=-10\text{V}$ , $I_D=-1\text{mA}$     | -1.2    |     | -2.6     | V             |

Marking : BS3002

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# BBS3002

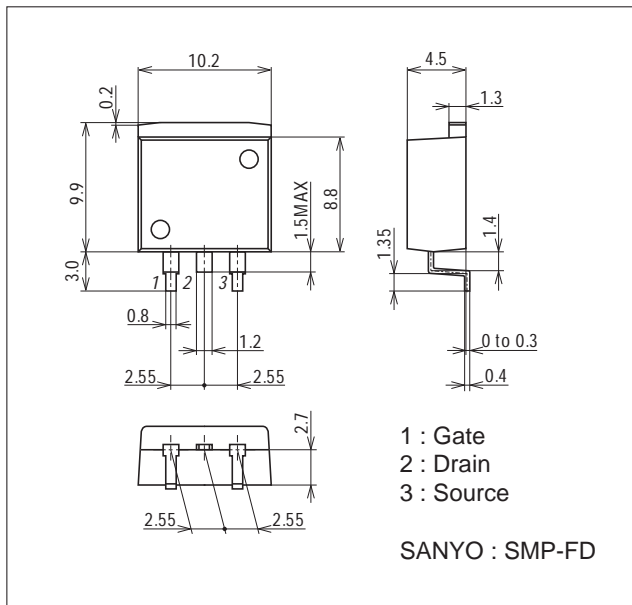
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| Parameter                                  | Symbol        | Conditions                            | Ratings |       |      | Unit      |
|--|---------------|---------------------------------------|---------|-------|------|-----------|
|  |               |                                       | min     | typ   | max  |           |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=-10V, I_D=-50A$               | 54      | 90    |      | S         |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=-50A, V_{GS}=-10V$               |         | 4.4   | 5.8  | $m\Omega$ |
|  | $R_{DS(on)2}$ | $I_D=-50A, V_{GS}=-4V$                |         | 6.4   | 9.0  | $m\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=-20V, f=1MHz$                 |         | 13200 |      | $\mu F$   |
| Output Capacitance                         | $C_{oss}$     | $V_{DS}=-20V, f=1MHz$                 |         | 1300  |      | $\mu F$   |
| Reverse Transfer Capacitance               | $C_{rss}$     | $V_{DS}=-20V, f=1MHz$                 |         | 950   |      | $\mu F$   |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit.           |         | 95    |      | ns        |
| Rise Time                                  | $t_r$         | See specified Test Circuit.           |         | 1000  |      | ns        |
| Turn-OFF Delay Time                        | $t_{d(off)}$  | See specified Test Circuit.           |         | 800   |      | ns        |
| Fall Time                                  | $t_f$         | See specified Test Circuit.           |         | 820   |      | ns        |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=-30V, V_{GS}=-10V, I_D=-100A$ |         | 280   |      | nC        |
| Gate-to-Source Charge                      | $Q_{gs}$      | $V_{DS}=-30V, V_{GS}=-10V, I_D=-100A$ |         | 50    |      | nC        |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      | $V_{DS}=-30V, V_{GS}=-10V, I_D=-100A$ |         | 55    |      | nC        |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=-100A, V_{GS}=0V$                |         | -1.0  | -1.5 | V         |

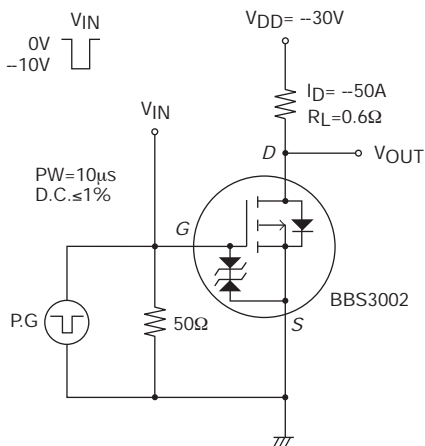
## Package Dimensions

unit : mm (typ)

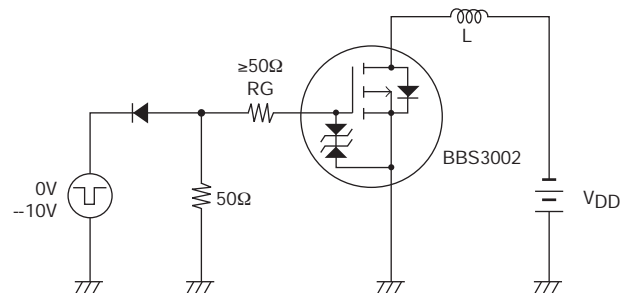
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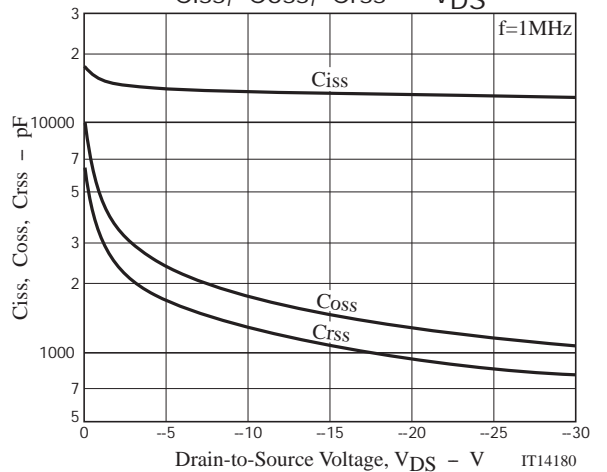
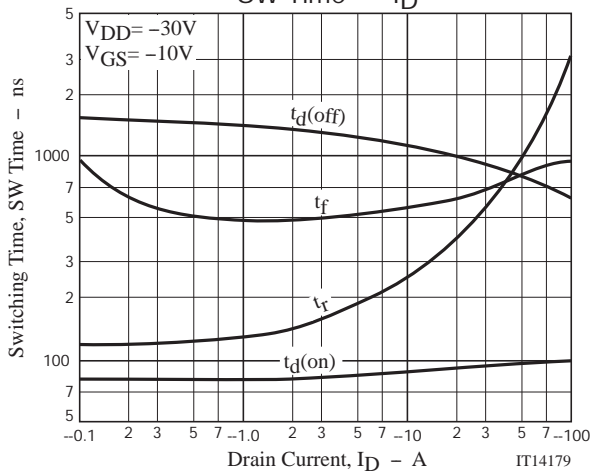
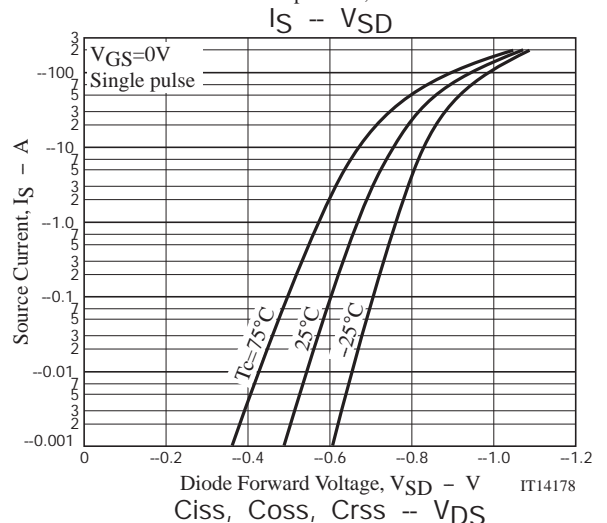
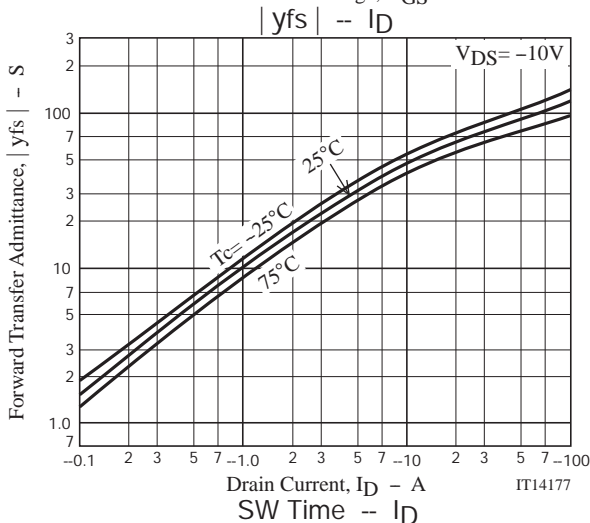
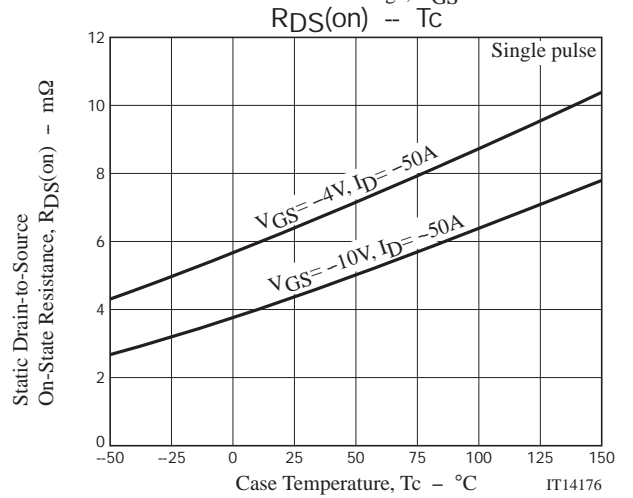
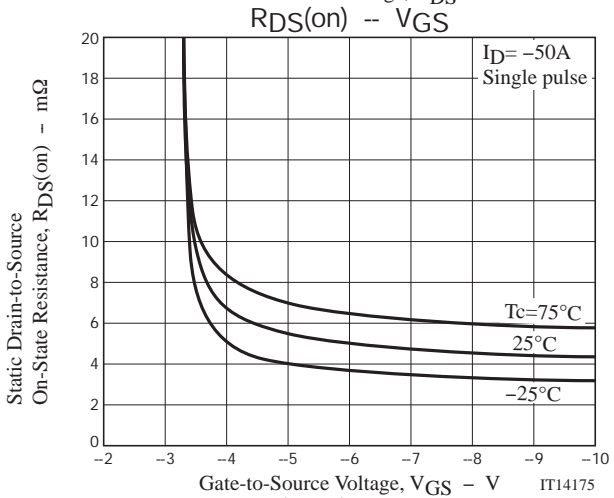
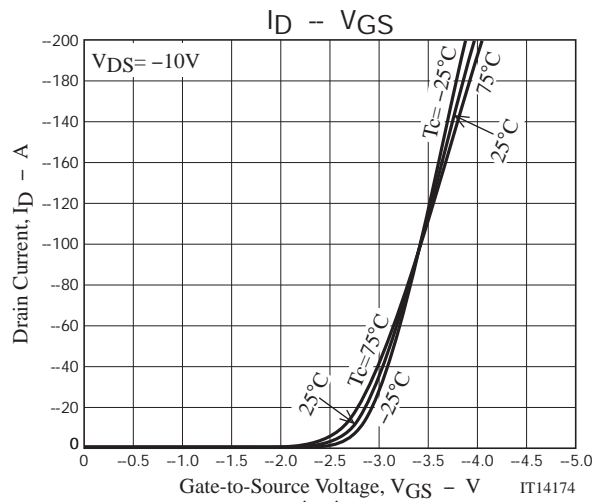
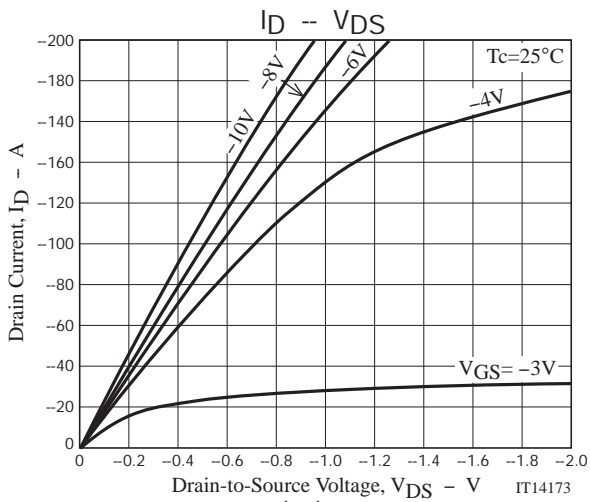


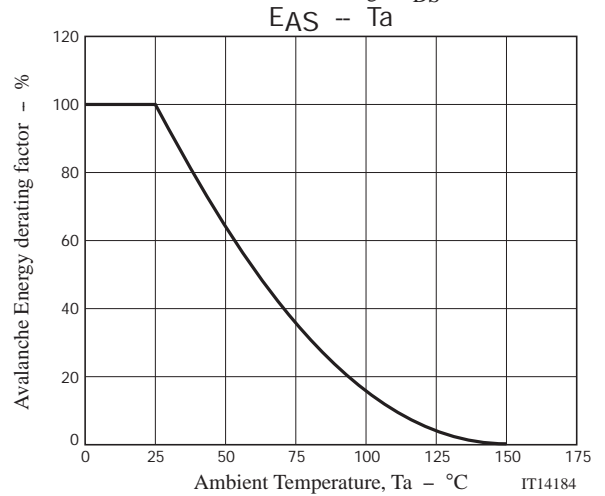
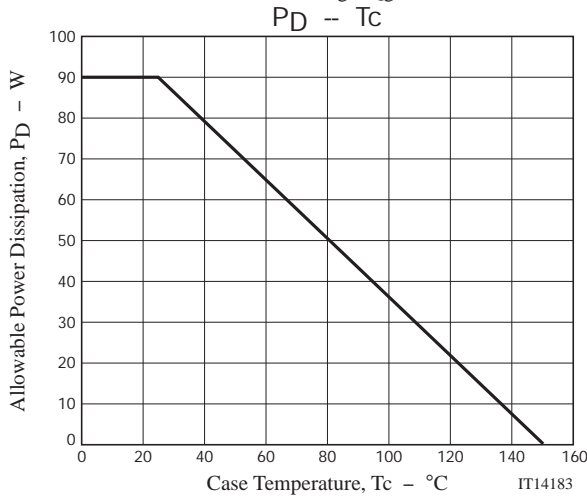
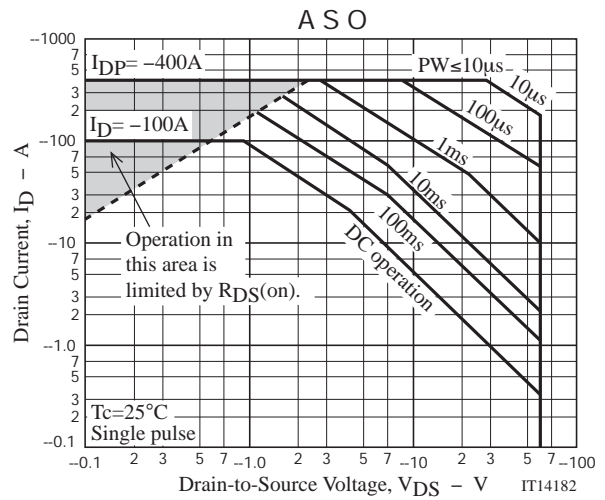
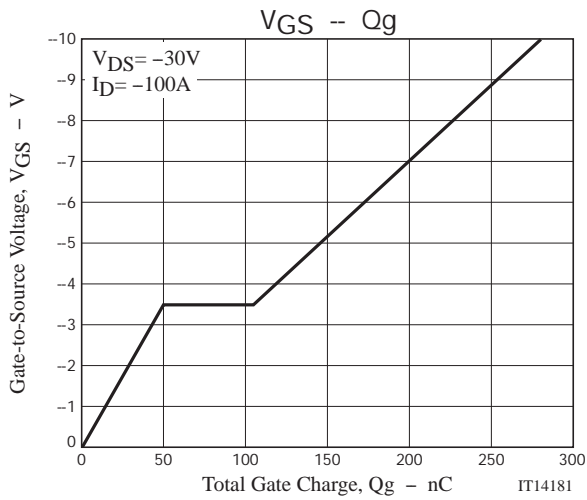
## Switching Time Test Circuit



## Avalanche Resistance Test Circuit







Note on usage : Since the BBS3002 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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