



# BMS3003 — P-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- ON-resistance  $R_{DS(on)1}=5.0m\Omega$  (typ.)
- Input capacitance  $C_{iss}=13200pF$  (typ.)
- 4V drive

### Specifications

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

| 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)                 | $I_D$     |   | -78         | A          |
| Drain Current (Pulse)              | $I_{DP}$  | $PW \leq 10\mu s$ , duty cycle $\leq 1\%$ | -312        | A          |
| Allowable Power Dissipation        | PD        |   | 2.0         | W          |
|                                    |           | $T_c=25^\circ C$                          | 40          | W          |
| Channel Temperature                | $T_{ch}$  |   | 150         | $^\circ C$ |
| Storage Temperature                | $T_{stg}$ |   | -55 to +150 | $^\circ C$ |
| Avalanche Energy (Single Pulse) *1 | $E_{AS}$  |   | 420         | mJ         |
| Avalanche Current *2               | $I_{AV}$  |   | -60         | A          |

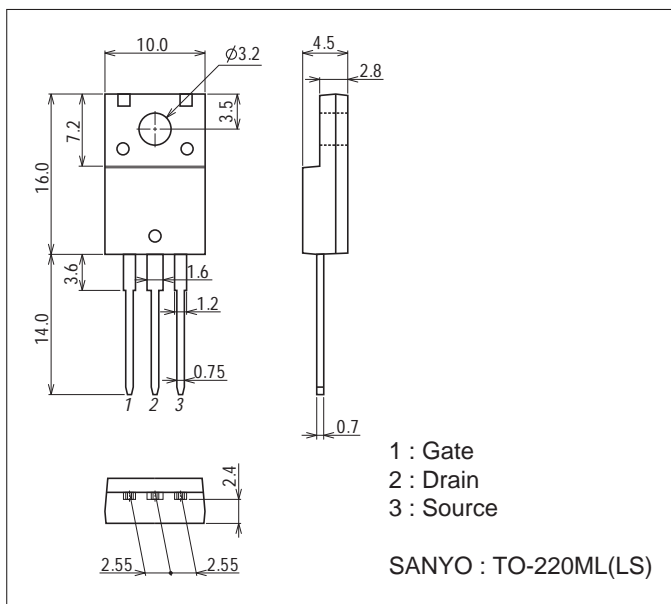
Note : \*1  $V_{DD}=-36V$ ,  $L=100\mu H$ ,  $I_{AV}=-60A$  (Fig.1)

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

### Package Dimensions

unit : mm (typ)

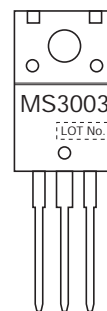
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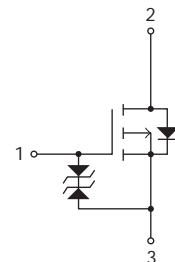
### Product & Package Information

- Package : TO-220ML(LS)
- JEITA, JEDEC : SC-67, SOT-186A
- Minimum Packing Quantity : 100 pcs./bag or 50pcs./magazine

### Marking



### Electrical Connection



# BMS3003

## 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            | $I_{DSS}$     | $V_{DS}=-60\text{V}, V_{GS}=0\text{V}$                              |           |       | -10      | $\mu\text{A}$    |
| 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                |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=-10\text{V}, I_D=-39\text{A}$                               |           | 130   |          | S                |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=-39\text{A}, V_{GS}=-10\text{V}$                               |           | 5.0   | 6.5      | $\text{m}\Omega$ |
|  | $R_{DS(on)2}$ | $I_D=-39\text{A}, V_{GS}=-4\text{V}$                                |           | 6.5   | 9.0      | $\text{m}\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=-20\text{V}, f=1\text{MHz}$                                 |           | 13200 |          | pF               |
| Output Capacitance                         | $C_{oss}$     |   |           | 1300  |          | pF               |
| Reverse Transfer Capacitance               | $C_{rss}$     |   |           | 950   |          | pF               |
| Turn-ON Delay Time                         | $t_{d(on)}$   |   | See Fig.2 |       | 90       |                  |
| Rise Time                                  | $t_r$         |   |           | 360   |          | ns               |
| Turn-OFF Delay Time                        | $t_{d(off)}$  |   |           | 1200  |          | ns               |
| Fall Time                                  | $t_f$         |   |           | 680   |          | ns               |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=-36\text{V}, V_{GS}=-10\text{V}, I_D=-78\text{A}$           |           |       | 285      |                  |
| Gate-to-Source Charge                      | $Q_{gs}$      |   |           | 35    |          | nC               |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      |   |           | 70    |          | nC               |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=-78\text{A}, V_{GS}=0\text{V}$                                 |           | -0.95 | -1.5     | V                |
| Reverse Recovery Time                      | $t_{rr}$      | See Fig.3   |           | 150   |          | ns               |
| Reverse Recovery Charge                    | $Q_{rr}$      | $I_S=-78\text{A}, V_{GS}=0\text{V}, di/dt=-100\text{A}/\mu\text{s}$ |           | 470   |          | nC               |

Fig.1 Avalanche Resistance Test Circuit

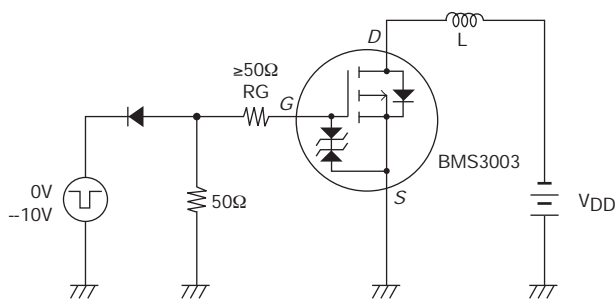


Fig.2 Switching Time Test Circuit

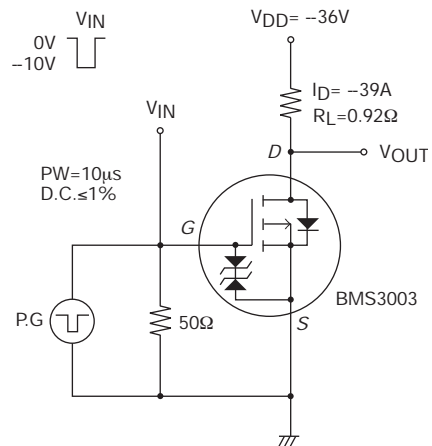
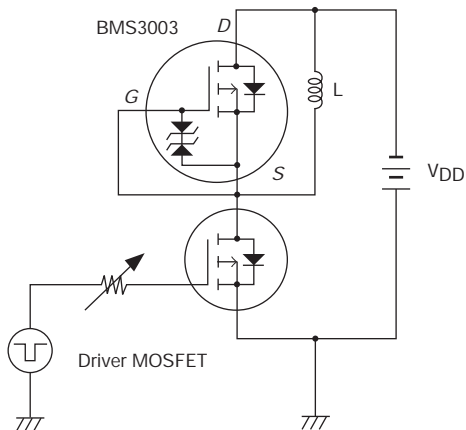
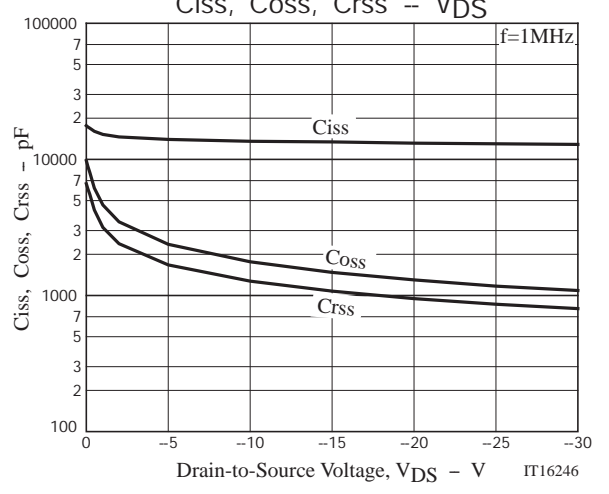
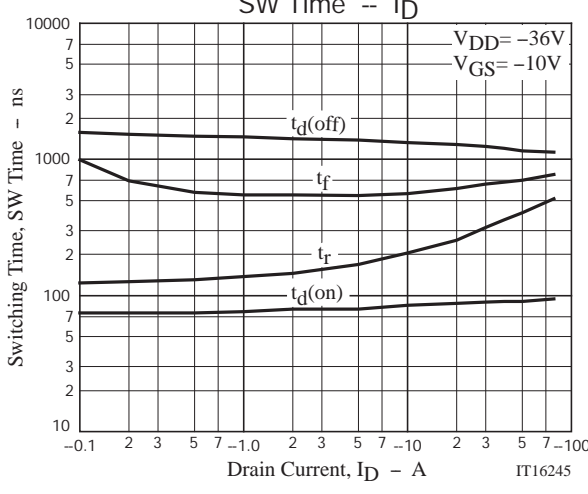
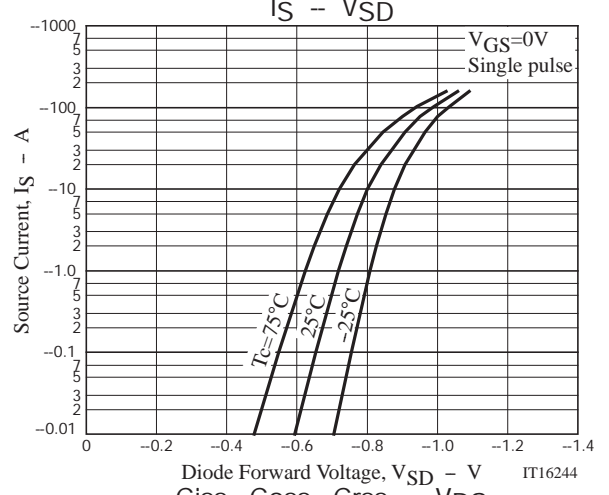
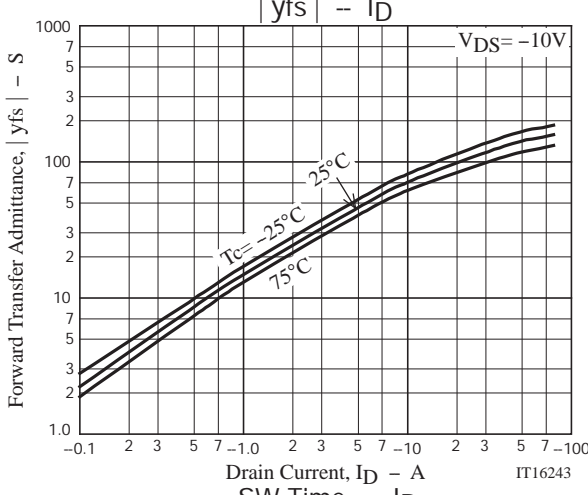
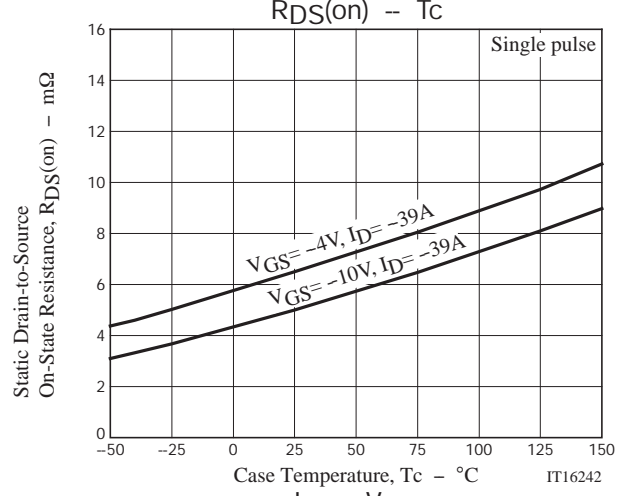
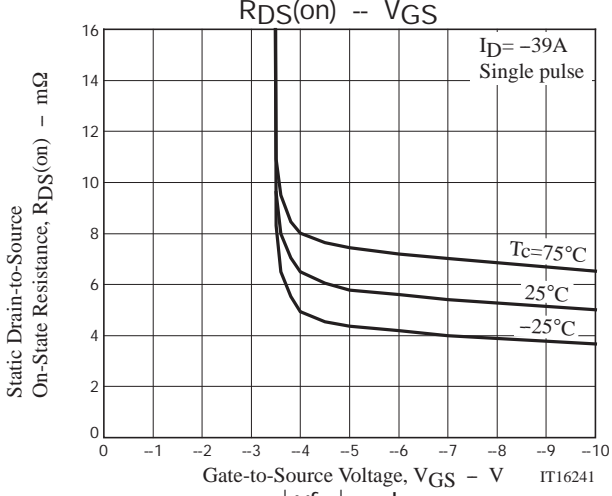
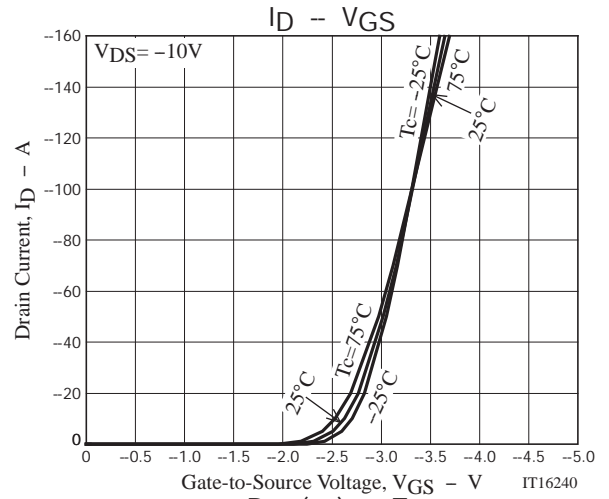
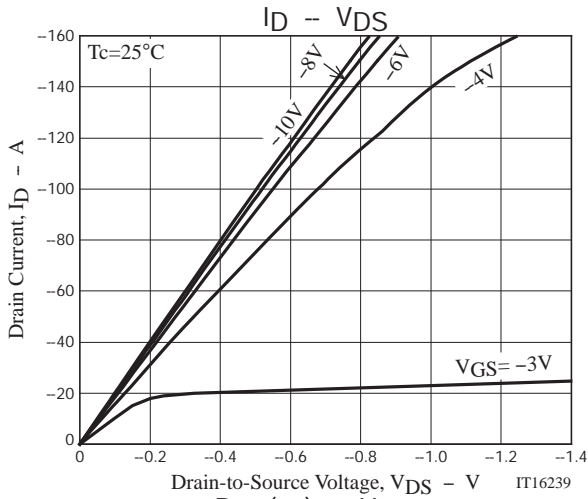
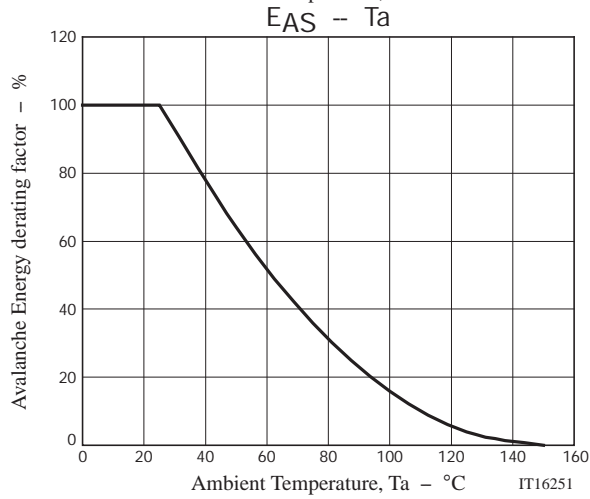
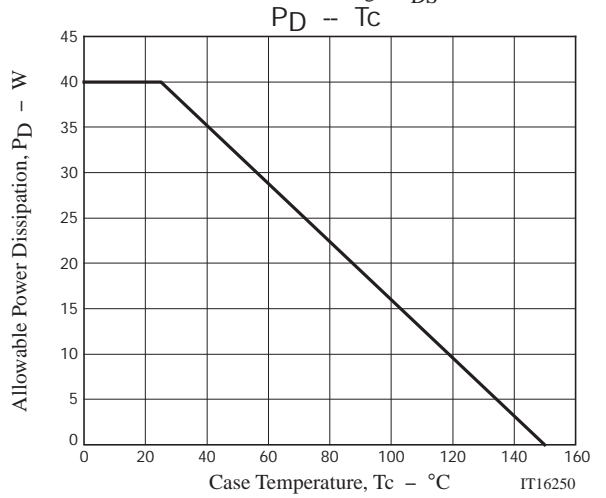
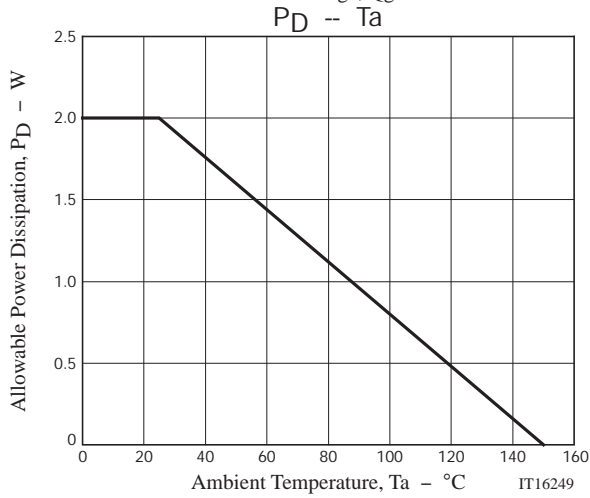
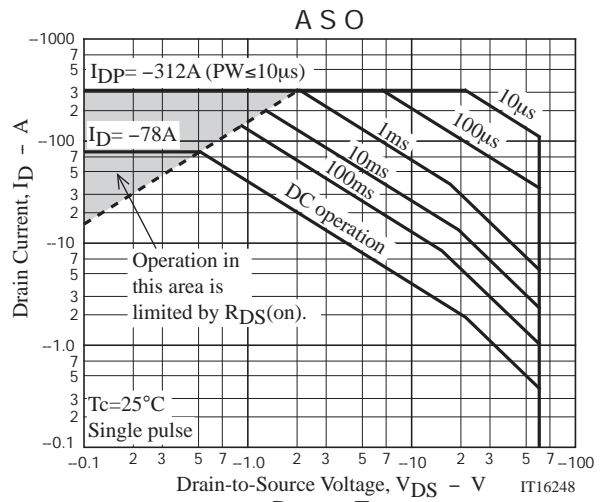
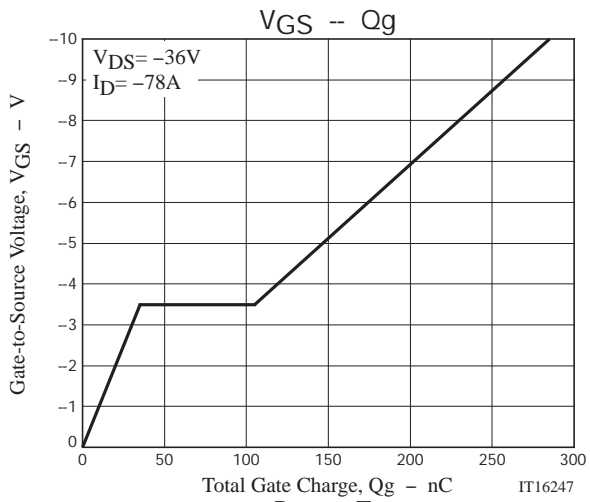


Fig.3 Reverse Recovery Time Test Circuit







Note on usage : Since the BMS3003 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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