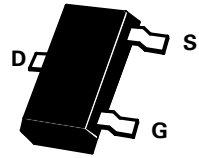


# SOT23 P-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

ISSUE 3 - JANUARY 1996

## BS250F



SOT23

PARTMARKING DETAIL – MX

### ABSOLUTE MAXIMUM RATINGS.

| PARAMETER   | SYMBOL         | VALUE       | UNIT        |
|---|----------------|-------------|-------------|
| Drain-Source Voltage                              | $V_{DS}$       | -45         | V           |
| Continuous Drain Current at $T_{amb}=25^{\circ}C$ | $I_D$          | -90         | mA          |
| Pulsed Drain Current                              | $I_{DM}$       | -1.6        | A           |
| Gate Source Voltage                               | $V_{GS}$       | $\pm 20$    | V           |
| Power Dissipation at $T_{amb}=25^{\circ}C$        | $P_{tot}$      | 330         | mW          |
| Operating and Storage Temperature Range           | $T_j; T_{stg}$ | -55 to +150 | $^{\circ}C$ |

### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ unless otherwise stated).

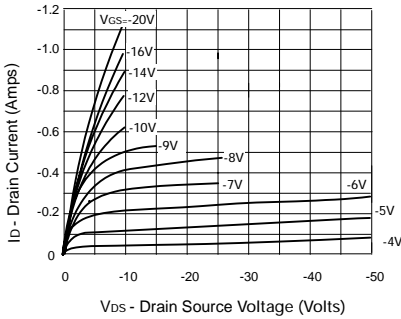
| PARAMETER                                   | SYMBOL       | MIN. | TYP. | MAX. | UNIT     | CONDITIONS.                            |
|---|--------------|------|------|------|----------|--|
| Drain-Source Breakdown Voltage              | $BV_{DSS}$   | -45  | -70  |      | V        | $I_D = -100\mu A, V_{GS} = 0V$         |
| Gate-Source Threshold Voltage               | $V_{GS(th)}$ | -1   |      | -3.5 | V        | $I_D = -1mA, V_{DS} = V_{GS}$          |
| Gate-Body Leakage                           | $I_{GSS}$    |      |      | -20  | nA       | $V_{GS} = -15V, V_{DS} = 0V$           |
| Zero Gate Voltage Drain Current             | $I_{DSS}$    |      |      | -0.5 | $\mu A$  | $V_{DS} = -25V, V_{GS} = 0V$           |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ |      | 9    | 14   | $\Omega$ | $V_{GS} = -10V, I_D = -200mA$          |
| Forward Transconductance (1)(2)             | $g_{fs}$     |      | 90   |      | mS       | $V_{DS} = -10V, I_D = -200mA$          |
| Input Capacitance (2)                       | $C_{iss}$    |      | 25   |      | pF       | $V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$ |
| Turn-On Delay Time (2)(3)                   | $t_{d(on)}$  |      |      | 10   | ns       | $V_{DD} \approx -25V, I_D = -200mA$    |
| Rise Time (2)(3)                            | $t_r$        |      |      | 10   | ns       |  |
| Turn-Off Delay Time (2)(3)                  | $t_{d(off)}$ |      |      | 10   | ns       |  |
| Fall Time (2)(3)                            | $t_f$        |      |      | 10   | ns       |  |

(1) Measured under pulsed conditions. Width=300 $\mu s$ . Duty cycle  $\leq 2\%$  (2) Sample test.

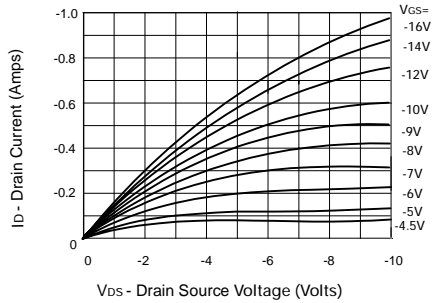
(3) Switching times measured with 50 $\Omega$  source impedance and <5ns rise time on a pulse generator  
Spice parameter data is available upon request for this device

# BS250F

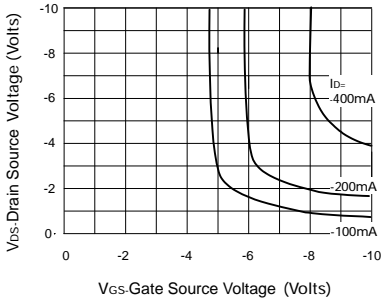
## TYPICAL CHARACTERISTICS



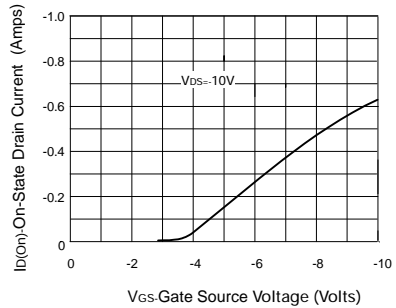
**Output Characteristics**



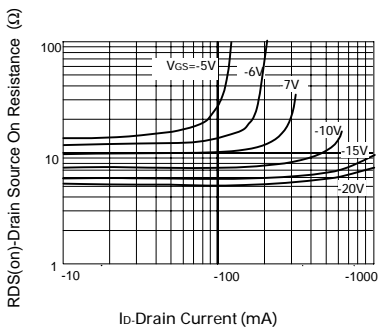
**Saturation Characteristics**



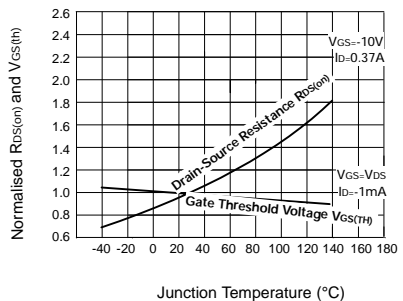
**Voltage Saturation Characteristics**



**Transfer Characteristics**

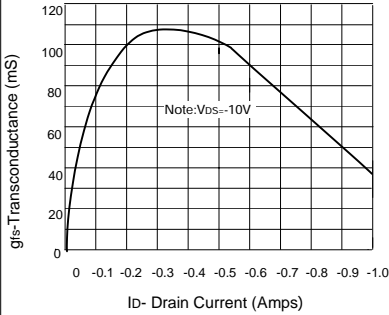


**On-resistance vs Drain Current**

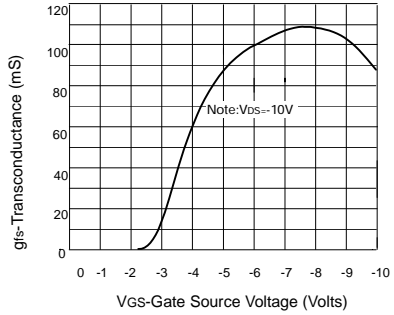


**Normalised  $R_{DS(on)}$  and  $V_{GS(th)}$  vs Temperature**

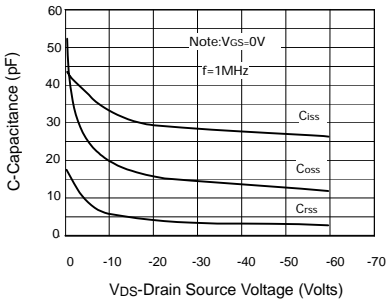
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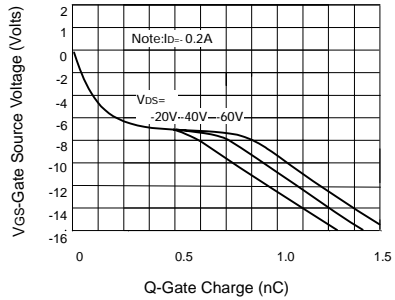
**Transconductance v drain current**



**Transconductance v gate-source voltage**



**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**