

## Thermal Characteristics

| Package           | $I_D$<br>(continuous) <sup>†</sup> | $I_D$<br>(pulsed) | Power Dissipation<br>@ $T_c = 25^\circ\text{C}$ | $I_{DR}^{\dagger}$ | $I_{DRM}$ |
|-------------------|------------------------------------|-------------------|-------------------------------------------------|--------------------|-----------|
| TO-236AB (SOT-23) | 134mA                              | 250mA             | 0.36W                                           | 134mA              | 250mA     |

### Notes:

<sup>†</sup>  $I_D$  (continuous) is limited by max rated  $T_j$ .

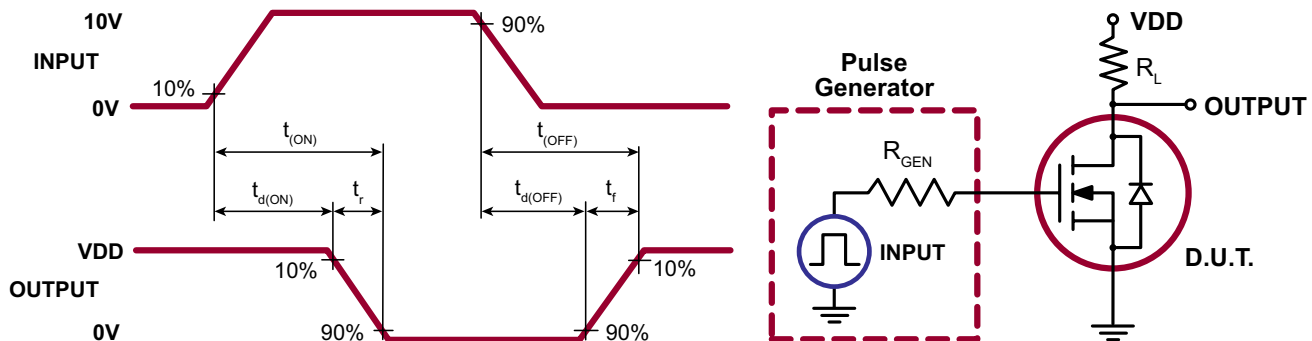
## Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Sym                 | Parameter                                  | Min | Typ | Max  | Units                | Conditions                                                              |
|---------------------|--------------------------------------------|-----|-----|------|----------------------|-------------------------------------------------------------------------|
| $BV_{DSS}$          | Drain-to-source breakdown voltage          | 240 | -   | -    | V                    | $V_{GS} = 0V, I_D = 1.0mA$                                              |
| $V_{GS(th)}$        | Gate threshold voltage                     | 0.8 | -   | 2.0  | V                    | $V_{GS} = V_{DS}, I_D = 1.0mA$                                          |
| $\Delta V_{GS(th)}$ | Change in $V_{GS(th)}$ with temperature    | -   | -   | -5.5 | mV/ $^\circ\text{C}$ | $V_{GS} = V_{DS}, I_D = 1.0mA$                                          |
| $I_{GSS}$           | Gate body leakage                          | -   | 0.1 | 100  | nA                   | $V_{GS} = \pm 20V, V_{DS} = 0V$                                         |
| $I_{DSS}$           | Zero gate voltage drain current            | -   | -   | 1.0  | $\mu\text{A}$        | $V_{GS} = 0V, V_{DS} = \text{Max Rating}$                               |
|                     |                                            | -   | -   | 100  |                      | $V_{DS} = 0.8 \text{ Max Rating}, V_{GS} = 0V, T_A = 125^\circ\text{C}$ |
| $I_{D(ON)}$         | On-state drain current                     | 140 | -   | -    | mA                   | $V_{GS} = 4.5V, V_{DS} = 25V$                                           |
| $R_{DS(ON)}$        | Static drain-to-source on-state resistance | -   | -   | 30   | $\Omega$             | $V_{GS} = 3.0V, I_D = 25mA$                                             |
|                     |                                            | -   | -   | 15   | $\Omega$             | $V_{GS} = 4.5V, I_D = 120mA$                                            |
| $\Delta R_{DS(ON)}$ | Change in $R_{DS(ON)}$ with temperature    | -   | 0.7 | 1.0  | %/ $^\circ\text{C}$  | $V_{GS} = 4.5V, I_D = 120mA$                                            |
| $G_{FS}$            | Forward transductance                      | 100 | 170 | -    | mmho                 | $V_{DS} = 25V, I_D = 120mA$                                             |
| $C_{ISS}$           | Input capacitance                          | -   | 38  | 50   | pF                   | $V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz$                                 |
| $C_{OSS}$           | Common source output capacitance           | -   | 9.0 | 15   |                      |                                                                         |
| $C_{RSS}$           | Reverse transfer capacitance               | -   | 3.0 | 5.0  |                      |                                                                         |
| $t_{d(ON)}$         | Turn-on delay time                         | -   | 4.0 | 7.0  | ns                   | $V_{DD} = 25V, I_D = 140mA, R_{GEN} = 25\Omega$                         |
| $t_r$               | Rise time                                  | -   | 2.0 | 5.0  |                      |                                                                         |
| $t_{d(OFF)}$        | Turn-off delay time                        | -   | 7.0 | 10   |                      |                                                                         |
| $t_f$               | Fall time                                  | -   | 9.0 | 12   |                      |                                                                         |
| $V_{SD}$            | Diode forward voltage drop                 | -   | -   | 1.8  | V                    | $V_{GS} = 0V, I_{SD} = 120mA$                                           |
| $t_{rr}$            | Reverse recovery time                      | -   | 400 | -    | ns                   | $V_{GS} = 0V, I_{SD} = 120mA$                                           |

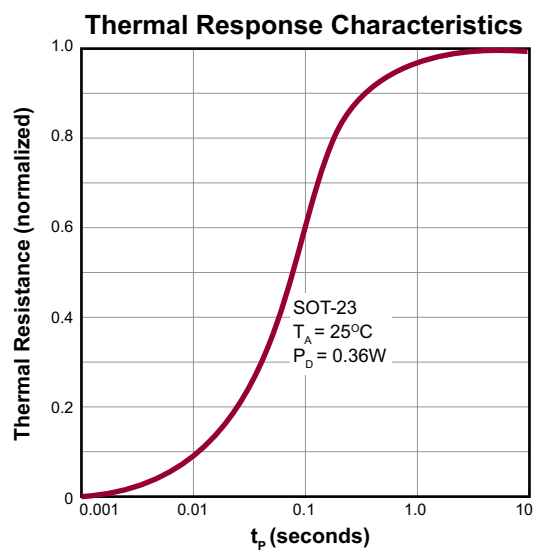
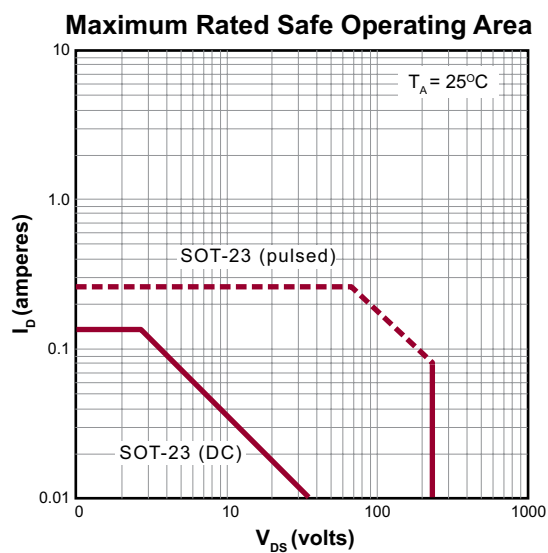
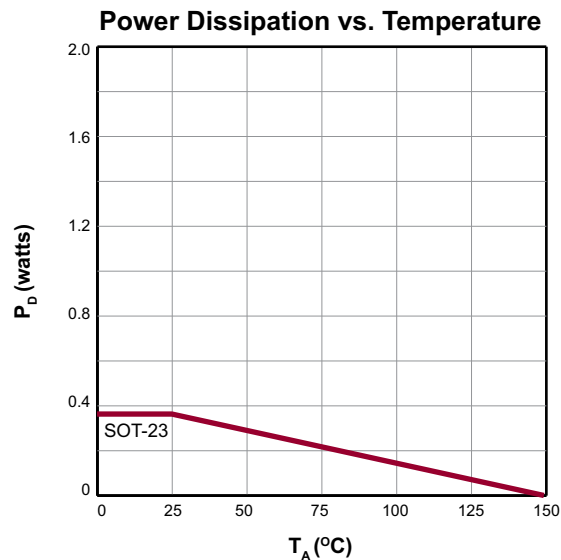
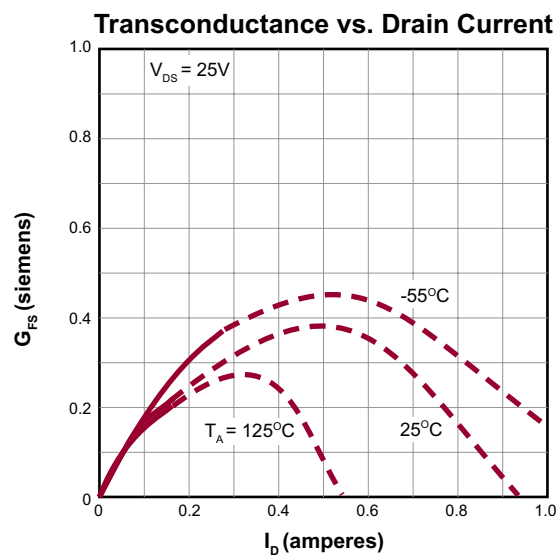
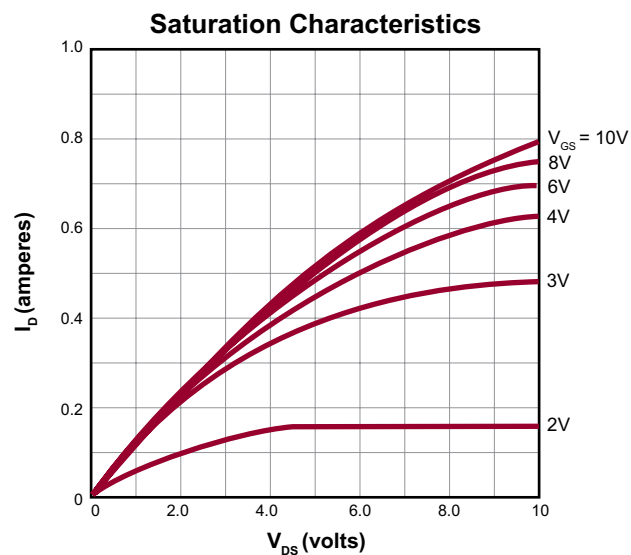
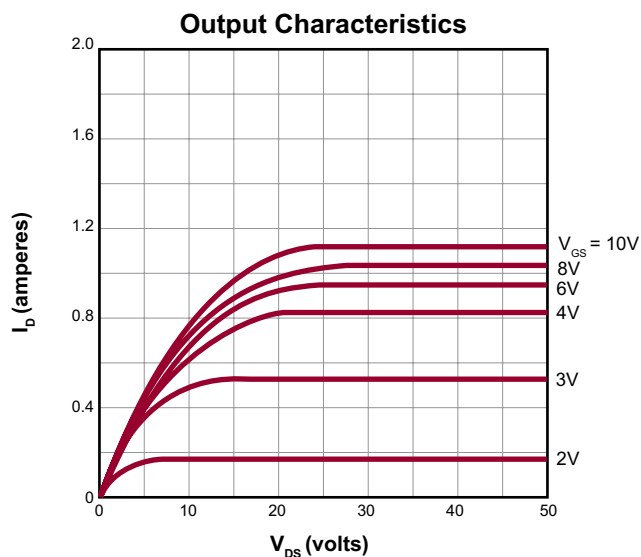
### Notes:

1. All D.C. parameters 100% tested at  $25^\circ\text{C}$  unless otherwise stated. (Pulse test: 300 $\mu\text{s}$  pulse, 2% duty cycle.)
2. All A.C. parameters sample tested.

## Switching Waveforms and Test Circuit

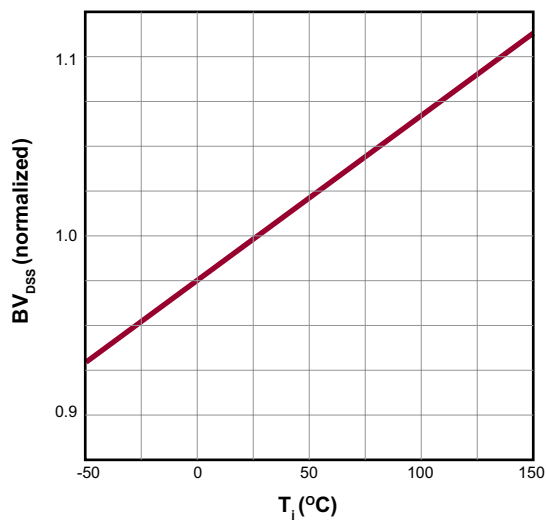


## Typical Performance Curves

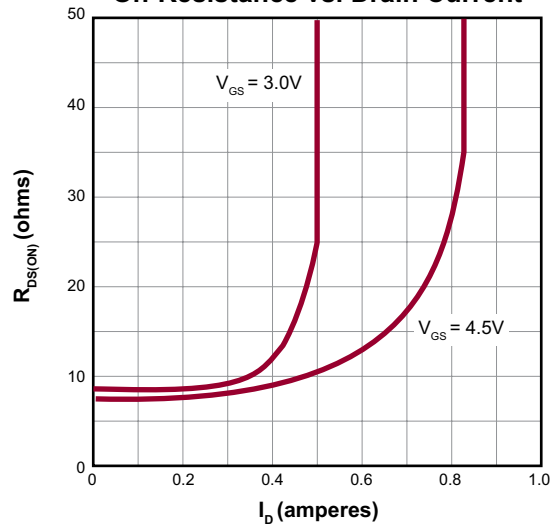


# Typical Performance Curves (cont.)

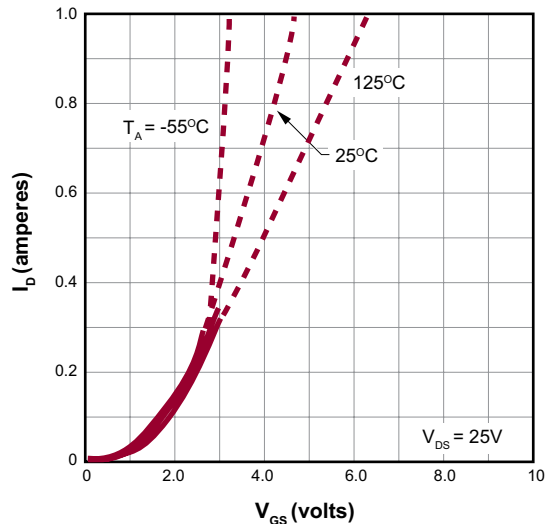
## BV<sub>DSS</sub> Variation with Temperature



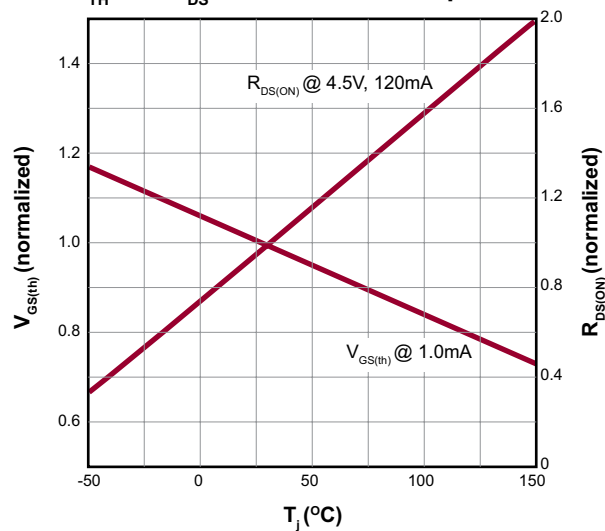
## On-Resistance vs. Drain Current



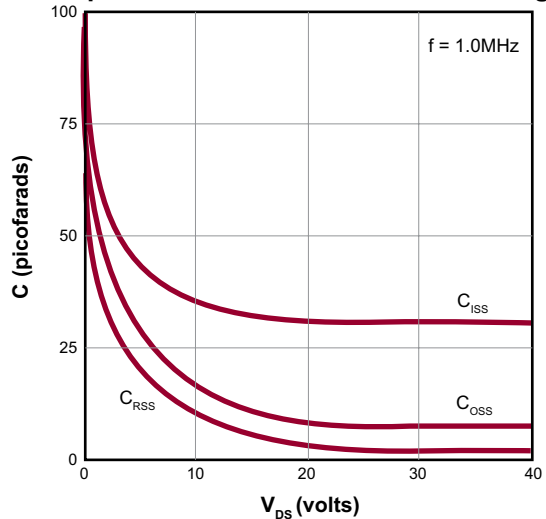
## Transfer Characteristics



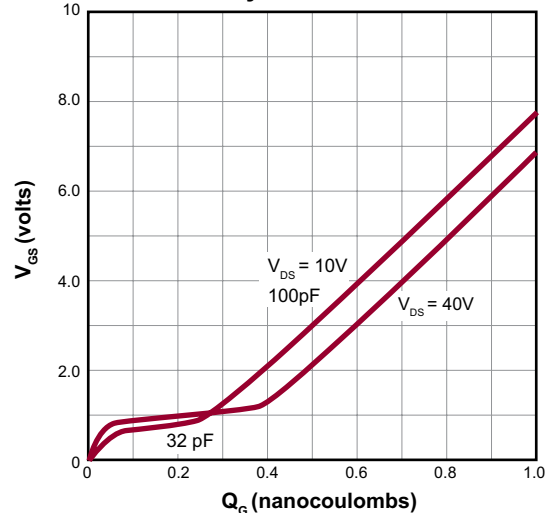
## V<sub>TH</sub> and R<sub>DS</sub> Variation with Temperature



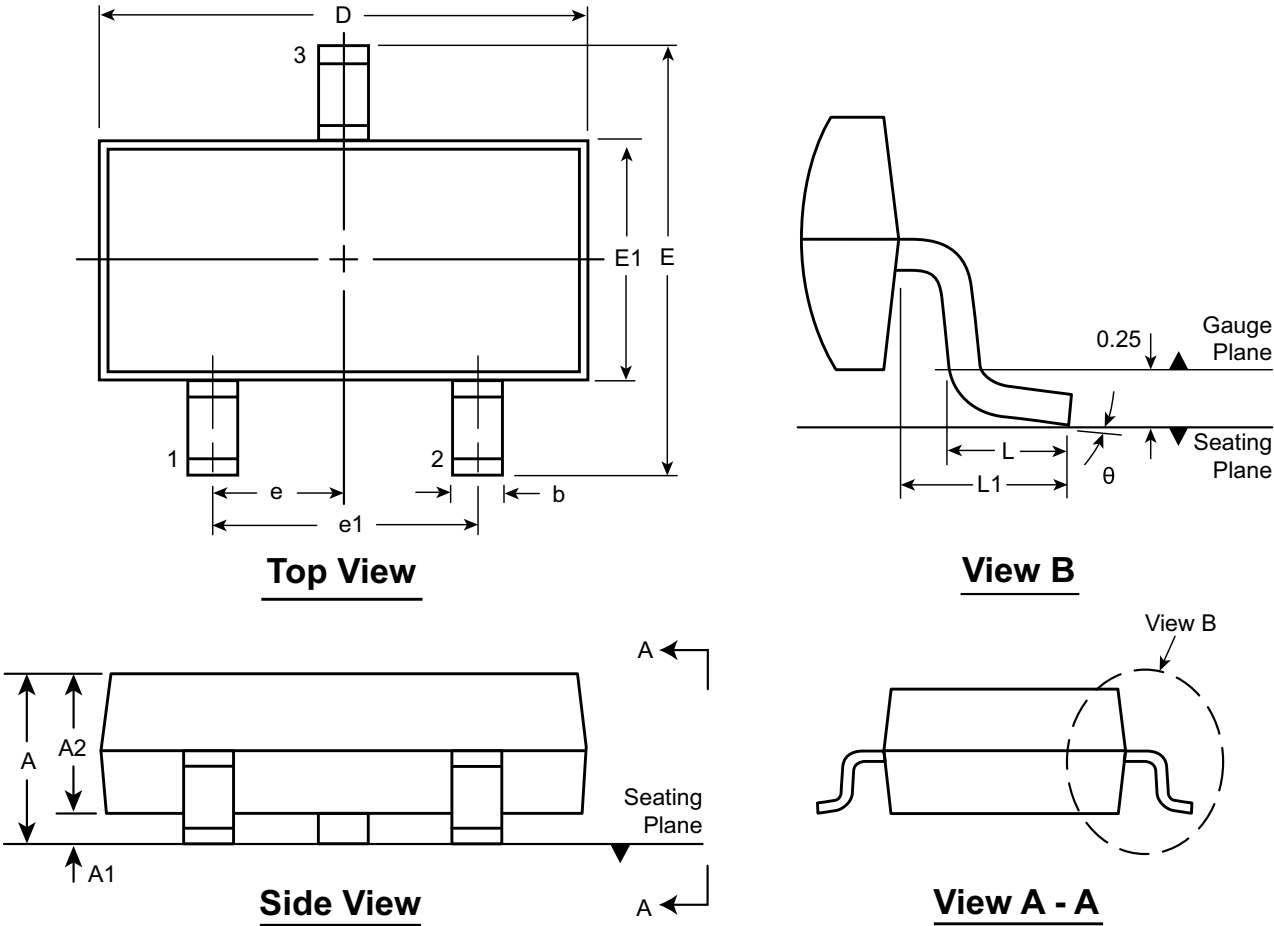
## Capacitance vs. Drain-to-Source Voltage



## Gate Drive Dynamic Characteristics



3-Lead TO-236AB (SOT-23) Package Outline (K1)  
2.90x1.30mm body, 1.12mm height (max), 1.90mm pitch



| Symbol         |     | A    | A1   | A2   | b    | D    | E    | E1   | e        | e1       | L     | L1       | θ  |
|----------------|-----|------|------|------|------|------|------|------|----------|----------|-------|----------|----|
| Dimension (mm) | MIN | 0.89 | 0.01 | 0.88 | 0.30 | 2.80 | 2.10 | 1.20 | 0.95 BSC | 1.90 BSC | 0.20† | 0.54 REF | 0° |
|                | NOM | -    | -    | 0.95 | -    | 2.90 | -    | 1.30 |          |          | 0.50  |          | -  |
|                | MAX | 1.12 | 0.10 | 1.02 | 0.50 | 3.04 | 2.64 | 1.40 |          |          | 0.60  |          | 8° |

JEDEC Registration TO-236, Variation AB, Issue H, Jan. 1999.  
† This dimension differs from the JEDEC drawing.  
**Drawings not to scale.**  
**Supertex Doc.#:** DSPD-3TO236ABK1, Version C041309.

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to <http://www.supertex.com/packaging.html>.)

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