

## Thermal Characteristics

| Package           | $I_D$<br>(continuous) <sup>†</sup><br>(mA) | $I_D$<br>(pulsed)<br>(mA) | Power Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>(W) | $\theta_{jc}$<br>$^\circ\text{C/W}$ | $\theta_{ja}$<br>$^\circ\text{C/W}$ | $I_{DR}^{\dagger}$<br>(mA) | $I_{DRM}$<br>(mA) |
|-------------------|--------------------------------------------|---------------------------|--------------------------------------------------------|-------------------------------------|-------------------------------------|----------------------------|-------------------|
| TO-236AB (SOT-23) | -120                                       | -400                      | 0.36                                                   | 200                                 | 350                                 | -120                       | -400              |

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

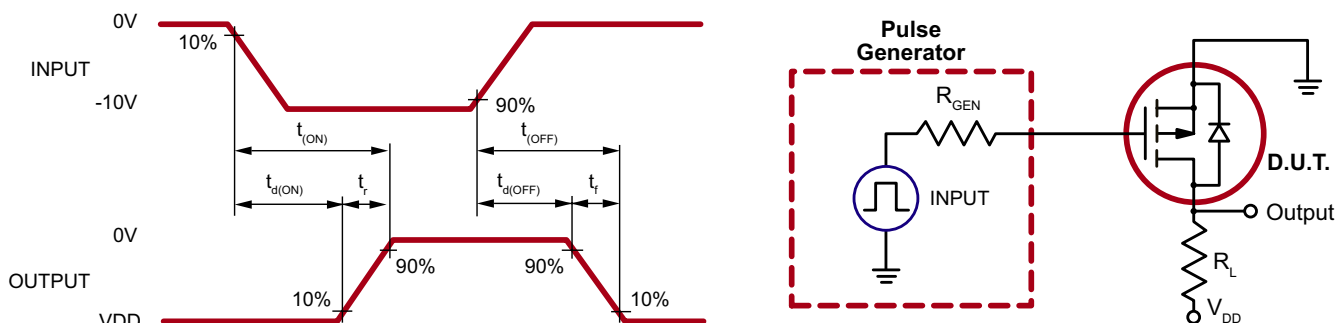
## Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Sym                 | Parameter                                  | Min  | Typ | Max      | Units                | Conditions                                                              |
|---------------------|--------------------------------------------|------|-----|----------|----------------------|-------------------------------------------------------------------------|
| $BV_{DSS}$          | Drain-to-source breakdown voltage          | -60  | -   | -        | V                    | $V_{GS} = 0V, I_D = -10\mu A$                                           |
| $V_{GS(th)}$        | Gate threshold voltage                     | -1.0 | -   | -2.4     | V                    | $V_{GS} = V_{DS}, I_D = -1.0mA$                                         |
| $\Delta V_{GS(th)}$ | Change in $V_{GS(th)}$ with temperature    | -    | -   | 6.5      | mV/ $^\circ\text{C}$ | $V_{GS} = V_{DS}, I_D = -1.0mA$                                         |
| $I_{GSS}$           | Gate body leakage                          | -    | -   | $\pm 10$ | nA                   | $V_{GS} = \pm 20V, V_{DS} = 0V$                                         |
| $I_{DSS}$           | Zero gate voltage drain current            | -    | -   | -1.0     | $\mu A$              | $V_{GS} = 0V, V_{DS} = \text{Max Rating}$                               |
|                     |                                            |      | -   | -200     |                      | $V_{DS} = 0.8 \text{ Max Rating}, V_{GS} = 0V, T_A = 125^\circ\text{C}$ |
| $I_{D(ON)}$         | On-state drain current                     | -50  | -   | -        | mA                   | $V_{GS} = -4.5V, V_{DS} = -10V$                                         |
| $R_{DS(ON)}$        | Static drain-to-source on-state resistance | -    | -   | 25       | $\Omega$             | $V_{GS} = -4.5V, I_D = -25mA$                                           |
|                     |                                            |      | -   | 10       |                      | $V_{GS} = -10V, I_D = -200mA$                                           |
| $\Delta R_{DS(ON)}$ | Change in $R_{DS(ON)}$ with temperature    | -    | -   | 1.0      | %/ $^\circ\text{C}$  | $V_{GS} = -10V, I_D = -200mA$                                           |
| $G_{FS}$            | Forward transconductance                   | 60   | -   | -        | mmho                 | $V_{DS} = -10V, I_D = -100mA$                                           |
| $C_{ISS}$           | Input capacitance                          | -    | -   | 60       | pF                   | $V_{GS} = 0V,$<br>$V_{DS} = -25V,$<br>$f = 1.0 \text{ MHz}$             |
| $C_{OSS}$           | Common source output capacitance           | -    | -   | 30       |                      |                                                                         |
| $C_{RSS}$           | Reverse transfer capacitance               | -    | -   | 10       |                      |                                                                         |
| $t_{d(ON)}$         | Turn-on delay time                         | -    | -   | 10       | ns                   | $V_{DD} = -25V,$<br>$I_D = -180mA,$<br>$R_{GEN} = 25\Omega$             |
| $t_r$               | Rise time                                  | -    | -   | 15       |                      |                                                                         |
| $t_{d(OFF)}$        | Turn-off delay time                        | -    | -   | 15       |                      |                                                                         |
| $t_f$               | Fall time                                  | -    | -   | 20       |                      |                                                                         |
| $V_{SD}$            | Diode forward voltage drop                 | -    | -   | -2.0     | V                    | $V_{GS} = 0V, I_{SD} = -120mA$                                          |
| $t_{rr}$            | Reverse recovery time                      | -    | 400 | -        | ns                   | $V_{GS} = 0V, I_{SD} = -400mA$                                          |

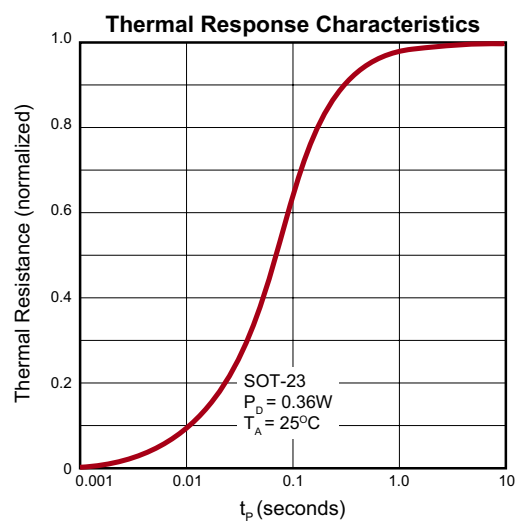
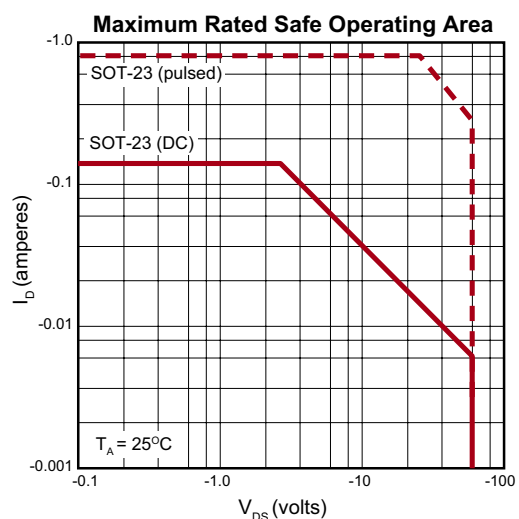
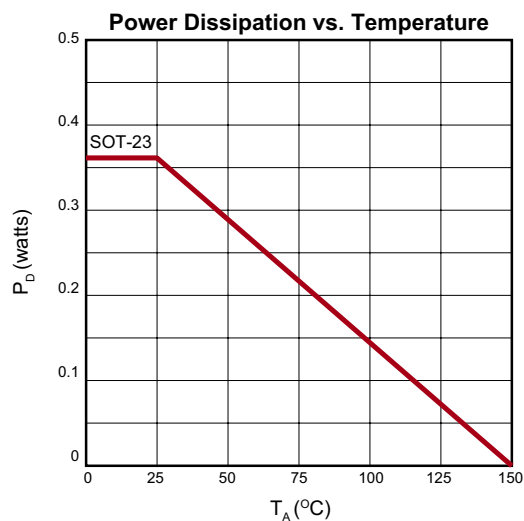
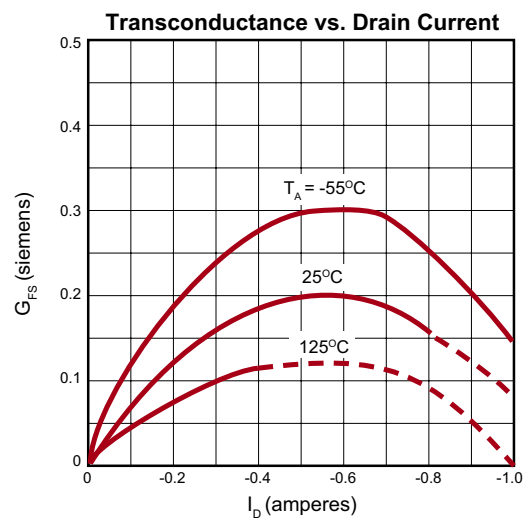
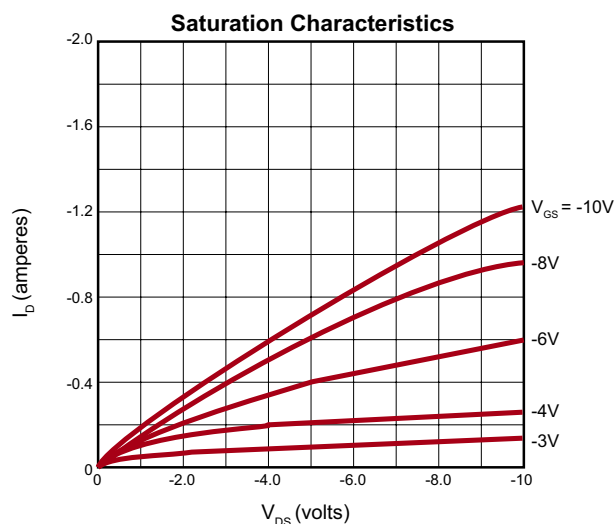
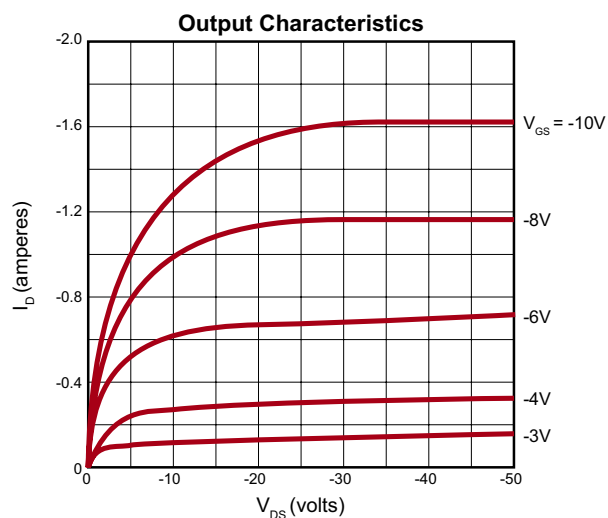
### Notes:

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

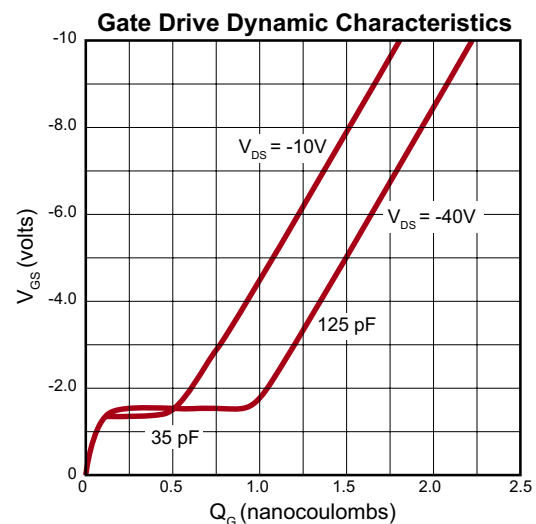
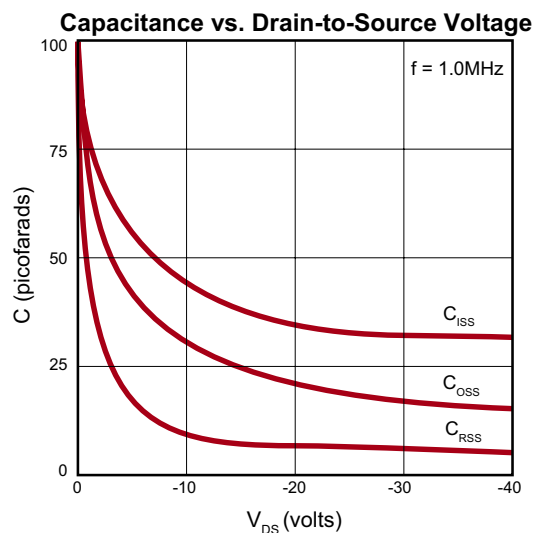
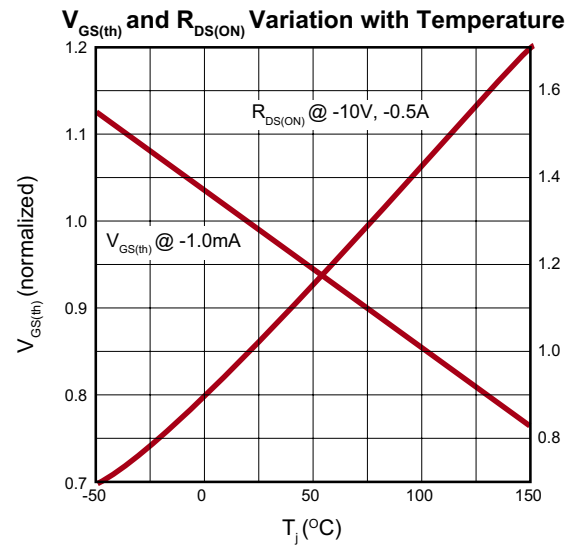
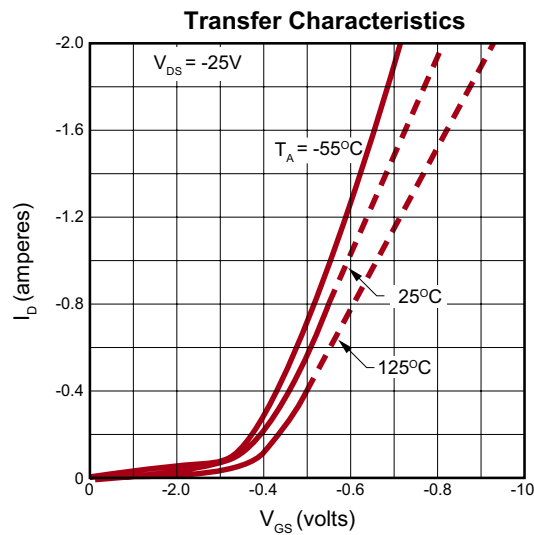
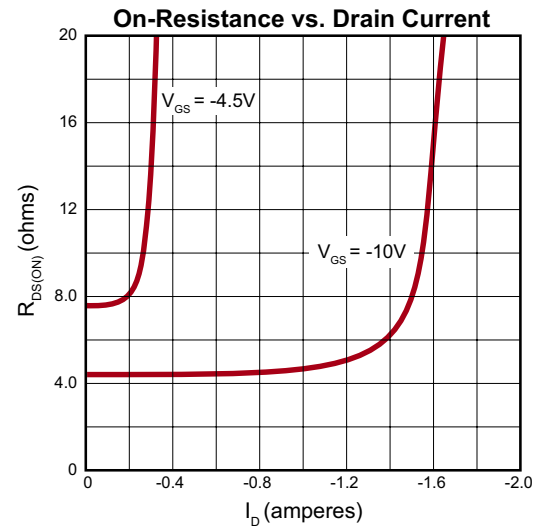
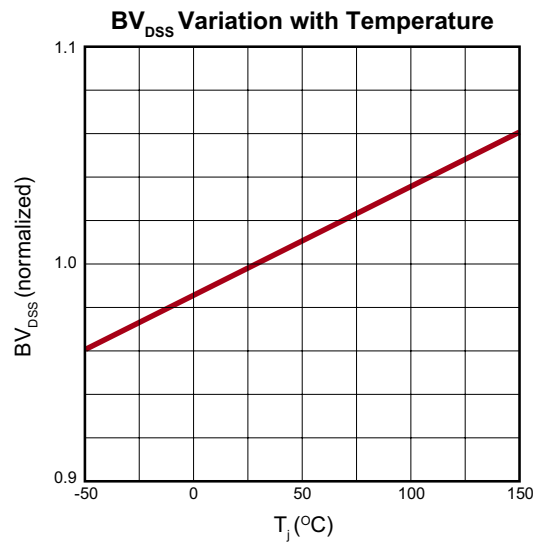
## Switching Waveforms and Test Circuit



## Typical Performance Curves

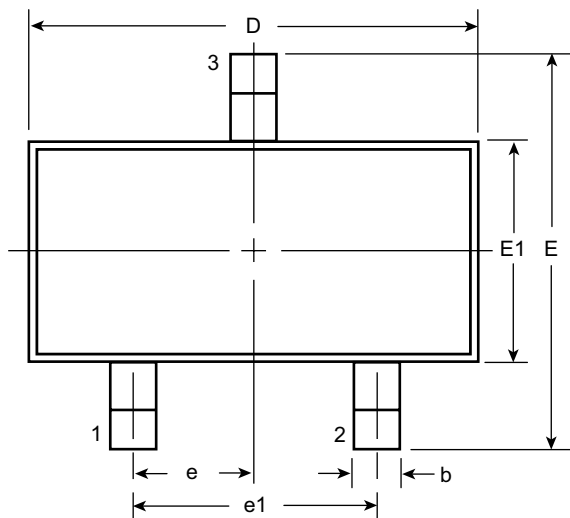


# Typical Performance Curves (cont.)

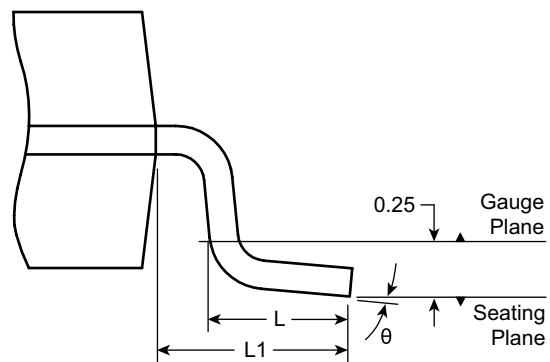


### 3-Lead TO-236AB (SOT-23) Package Outline (T)

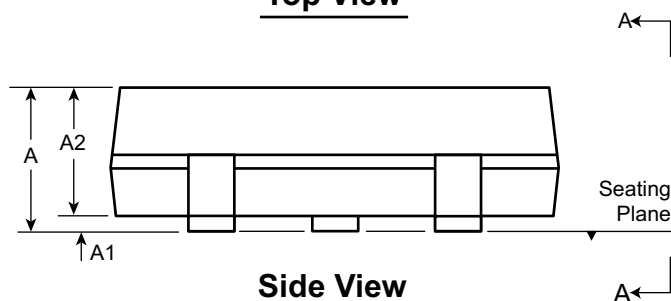
2.90x1.30mm body, 1.12mm height (max), 1.90mm pitch



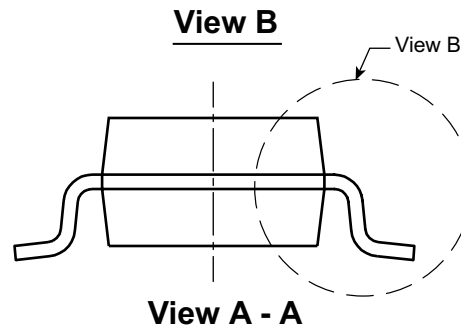
**Top View**



**View B**



**Side View**



**View A - A**

| Symbol         |     | A    | A1   | A2   | b    | D    | E    | E1   | e        | e1       | L                 | L1       | $\theta$ |
|----------------|-----|------|------|------|------|------|------|------|----------|----------|-------------------|----------|----------|
| 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 <sup>†</sup> | 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.

<sup>†</sup> 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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