

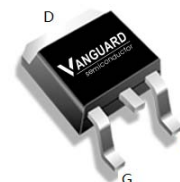
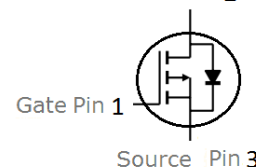
## Features

- P-Channel, -5V Logic Level Control
- Fast Switching
- Enhancement mode
- 100% Avalanche Tested
- Pb-free lead plating; RoHS compliant


**Halogen-Free**

| Part ID  | Package Type | Marking | Tape and reel information |
|----------|--------------|---------|---------------------------|
| VS4518AD | TO-252       | 4518AD  | 2500PCS/Reel              |

|                                |     |    |
|--------------------------------|-----|----|
| $V_{DS}$                       | -40 | V  |
| $R_{DS(on),TYP@ V_{GS}=-10V}$  | 26  | mΩ |
| $R_{DS(on),TYP@ V_{GS}=-4.5V}$ | 42  | mΩ |
| $I_D$                          | -33 | A  |

**TO-252**

**Drain Pin 2**


### Maximum ratings, at $T_j = 25^\circ\text{C}$ , unless otherwise specified

| Symbol                         | Parameter                                  | Rating                           | Unit               |
|--------------------------------|--------------------------------------------|----------------------------------|--------------------|
| $V_{(BR)DSS}$                  | Drain-Source breakdown voltage             | -40                              | V                  |
| $I_S$                          | Diode continuous forward current           | $T_C = 25^\circ\text{C}$<br>-33  | A                  |
| $I_D$                          | Continuous drain current @ $V_{GS} = -10V$ | $T_C = 25^\circ\text{C}$<br>-33  | A                  |
|                                |                                            | $T_C = 100^\circ\text{C}$<br>-23 | A                  |
| $I_{DM}$                       | Pulse drain current tested ①               | $T_C = 25^\circ\text{C}$<br>-132 | A                  |
| EAS                            | Avalanche energy, single pulsed ②          | 68                               | mJ                 |
| $P_D$                          | Maximum power dissipation                  | $T_C = 25^\circ\text{C}$<br>48   | W                  |
| $V_{GS}$                       | Gate-Source voltage                        | $\pm 20$                         | V                  |
| $T_{STG} T_J$                  | Storage and operating temperature range    | -55 to 175                       | $^\circ\text{C}$   |
| <b>Thermal Characteristics</b> |                                            |                                  |                    |
| $R_{\theta JC}$                | Thermal Resistance-Junction to Case        | 3.1                              | $^\circ\text{C/W}$ |
| $R_{\theta JA}$                | Thermal Resistance-Junction to Ambient     | 100                              | $^\circ\text{C/W}$ |

| Symbol                                                                               | Parameter                                              | Condition                                                                                         | Min. | Typ. | Max. | Unit |
|--------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------|------|------|------|------|
| Static Electrical Characteristics @ T <sub>J</sub> = 25°C (unless otherwise stated)  |                                                        |                                                                                                   |      |      |      |      |
| V <sub>(BR)DSS</sub>                                                                 | Drain-Source Breakdown Voltage                         | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA                                                       | -40  | --   | --   | V    |
| I <sub>DSS</sub>                                                                     | Zero Gate Voltage Drain Current                        | V <sub>DS</sub> =-40V,V <sub>GS</sub> =0V                                                         | --   | --   | -1   | μA   |
|                                                                                      | Zero Gate Voltage Drain Current(T <sub>J</sub> =125°C) | V <sub>DS</sub> =-40V,V <sub>GS</sub> =0V                                                         | --   | --   | -100 | μA   |
| I <sub>GSS</sub>                                                                     | Gate-Body Leakage Current                              | V <sub>GS</sub> =±20V,V <sub>DS</sub> =0V                                                         | --   | --   | ±100 | nA   |
| V <sub>GS(TH)</sub>                                                                  | Gate Threshold Voltage                                 | V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =-250μA                                          | -1.3 | -1.8 | -2.4 | V    |
| R <sub>DS(ON)</sub>                                                                  | Drain-Source On-State Resistance ③                     | V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A                                                       | --   | 26   | 34   | mΩ   |
| R <sub>DS(ON)</sub>                                                                  | Drain-Source On-State Resistance ③                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A                                                      | --   | 42   | 55   | mΩ   |
| Dynamic Electrical Characteristics @ T <sub>J</sub> = 25°C (unless otherwise stated) |                                                        |                                                                                                   |      |      |      |      |
| C <sub>iss</sub>                                                                     | Input Capacitance                                      | V <sub>DS</sub> =-20V,V <sub>GS</sub> =0V,<br>f=1MHz                                              | 1100 | 1310 | 1500 | pF   |
| C <sub>oss</sub>                                                                     | Output Capacitance                                     |                                                                                                   | 65   | 115  | 165  | pF   |
| C <sub>rss</sub>                                                                     | Reverse Transfer Capacitance                           |                                                                                                   | 50   | 90   | 130  | pF   |
| R <sub>g</sub>                                                                       | Gate Resistance                                        | f=1MHz                                                                                            | --   | 9.5  | --   | Ω    |
| Q <sub>g</sub>                                                                       | Total Gate Charge                                      | V <sub>DS</sub> =-20V,I <sub>D</sub> =-20A,<br>V <sub>GS</sub> =-10V                              | --   | 30   | --   | nC   |
| Q <sub>gs</sub>                                                                      | Gate-Source Charge                                     |                                                                                                   | --   | 4    | --   | nC   |
| Q <sub>gd</sub>                                                                      | Gate-Drain Charge                                      |                                                                                                   | --   | 6    | --   | nC   |
| Switching Characteristics                                                            |                                                        |                                                                                                   |      |      |      |      |
| t <sub>d(on)</sub>                                                                   | Turn-on Delay Time                                     | V <sub>DD</sub> =-20V,<br>I <sub>D</sub> =-20A,<br>R <sub>G</sub> =3.0Ω,<br>V <sub>GS</sub> =-10V | --   | 9    | --   | nS   |
| t <sub>r</sub>                                                                       | Turn-on Rise Time                                      |                                                                                                   | --   | 7    | --   | nS   |
| t <sub>d(off)</sub>                                                                  | Turn-Off Delay Time                                    |                                                                                                   | --   | 192  | --   | nS   |
| t <sub>f</sub>                                                                       | Turn-Off Fall Time                                     |                                                                                                   | --   | 64   | --   | nS   |
| Source- Drain Diode Characteristics@ T <sub>J</sub> = 25°C (unless otherwise stated) |                                                        |                                                                                                   |      |      |      |      |
| V <sub>SD</sub>                                                                      | Forward on voltage                                     | I <sub>SD</sub> =-20A,V <sub>GS</sub> =0V                                                         | --   | -1   | -1.2 | V    |
| t <sub>rr</sub>                                                                      | Reverse Recovery Time                                  | T <sub>J</sub> =25 °C,I <sub>sd</sub> =-20A,<br>V <sub>GS</sub> =0V                               | --   | 17   | --   | nS   |
| Q <sub>rr</sub>                                                                      | Reverse Recovery Charge                                | di/dt=-100A/μs                                                                                    |      | 7    |      | nC   |

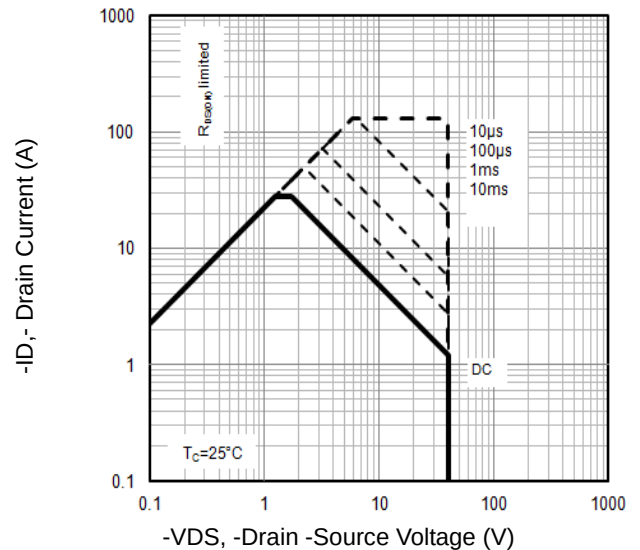
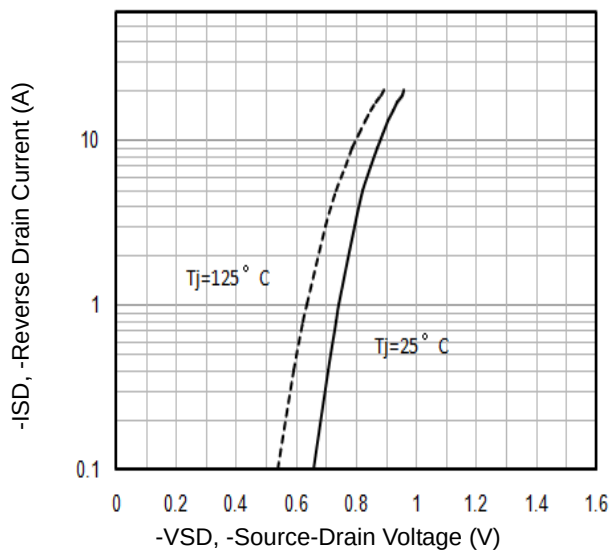
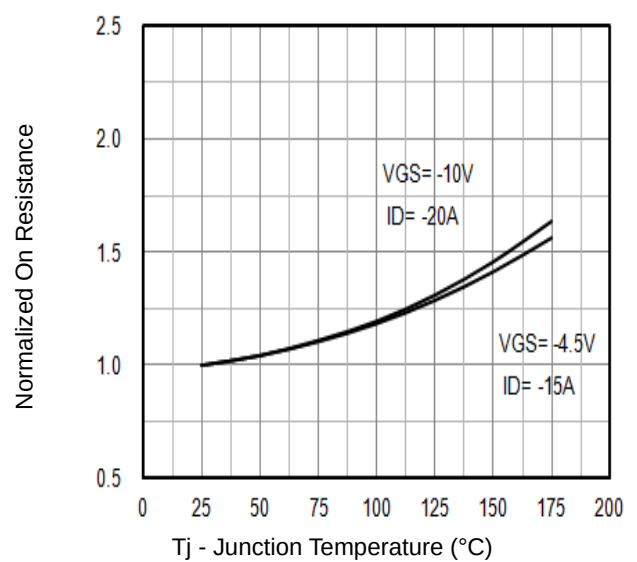
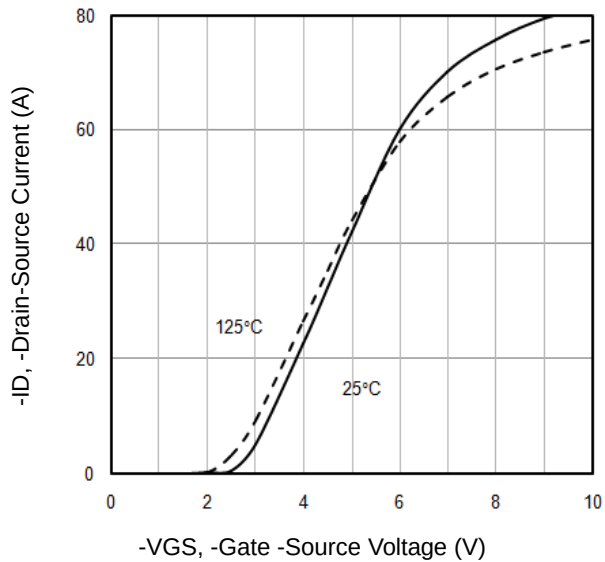
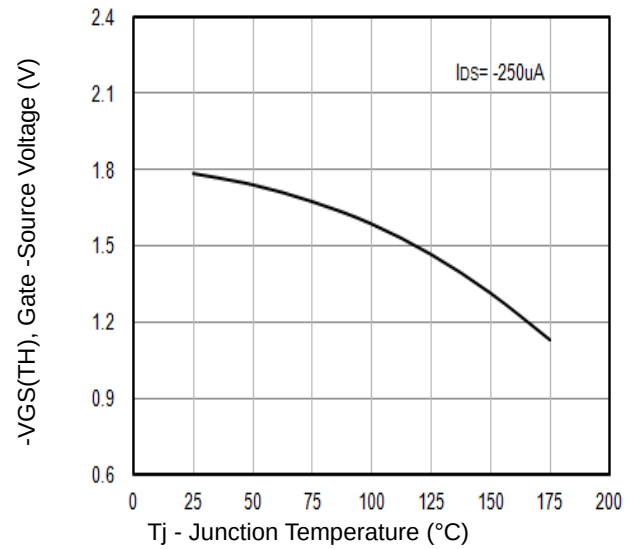
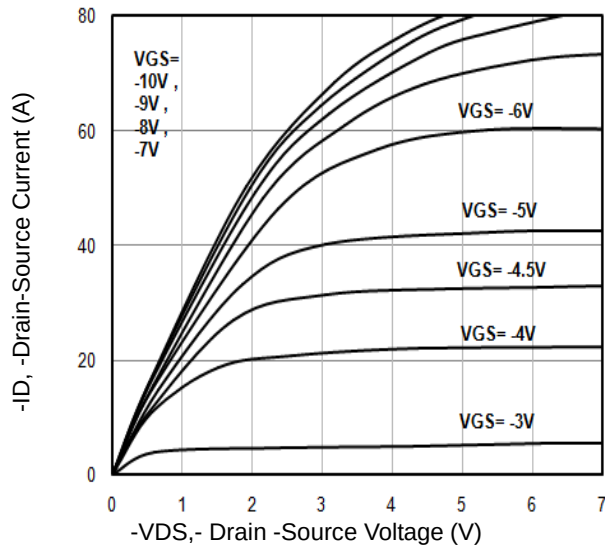
NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

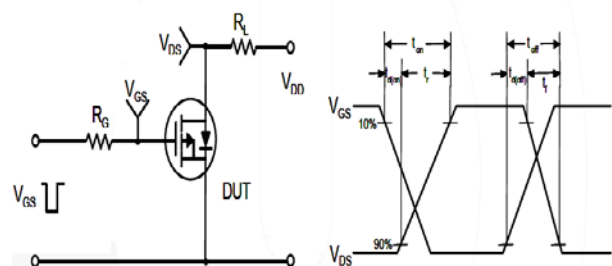
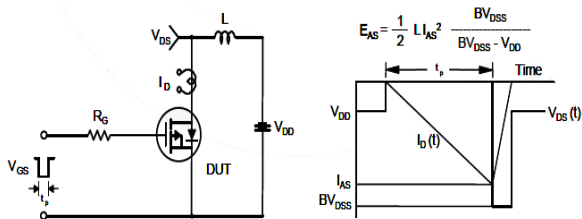
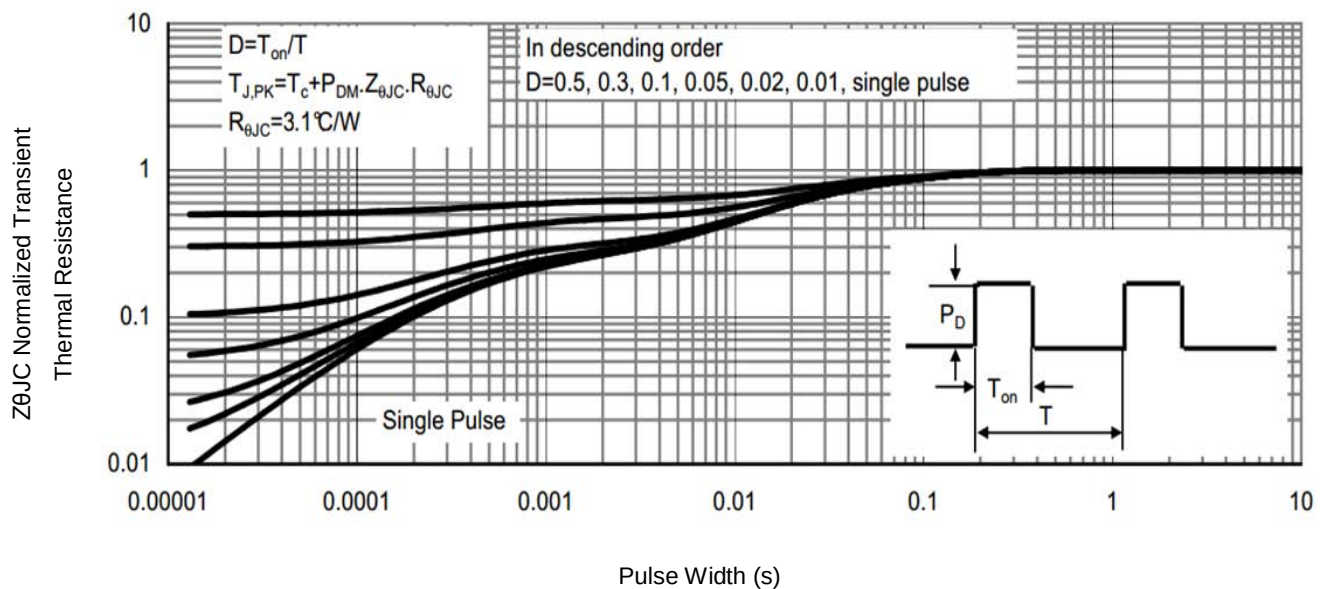
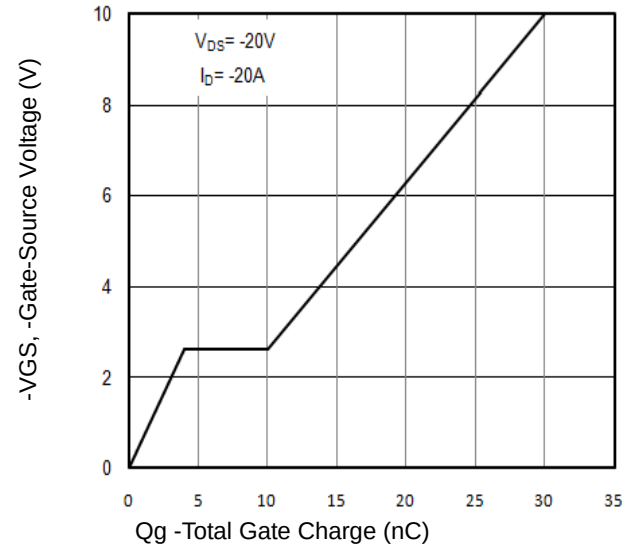
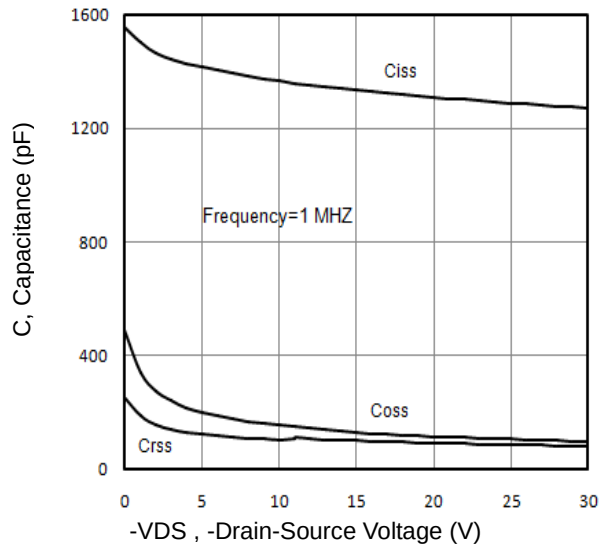
② Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 0.5mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = -13A, V<sub>GS</sub> = -10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycles ≤ 2%.

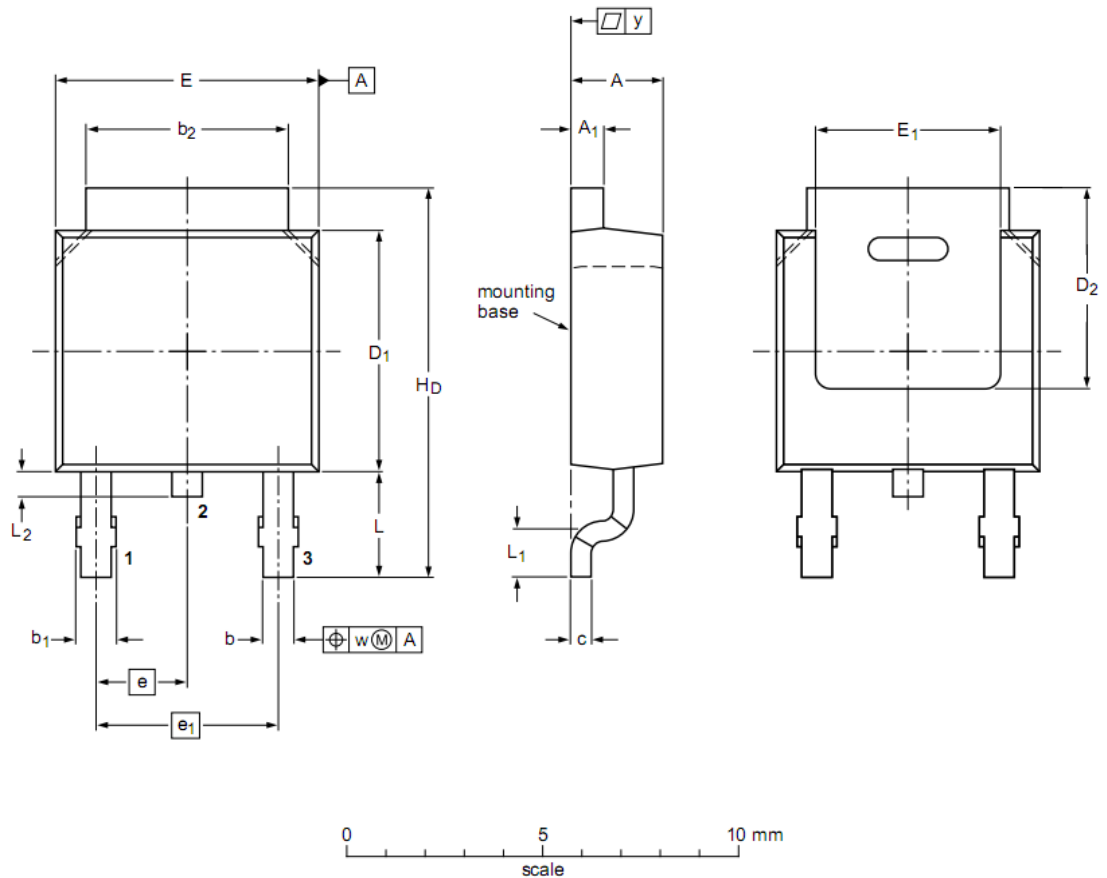
## Typical Characteristics



## Typical Characteristics



## TO-252 Package Outline Data



| Symbol               | Dimensions (unit: mm) |       |       |
|----------------------|-----------------------|-------|-------|
|                      | Min                   | Typ   | Max   |
| <b>A</b>             | 2.20                  | 2.30  | 2.38  |
| <b>A<sub>1</sub></b> | 0.46                  | 0.50  | 0.63  |
| <b>b</b>             | 0.64                  | 0.76  | 0.89  |
| <b>b<sub>1</sub></b> | 0.77                  | 0.85  | 1.14  |
| <b>b<sub>2</sub></b> | 5.00                  | 5.33  | 5.46  |
| <b>c</b>             | 0.458                 | 0.508 | 0.558 |
| <b>D<sub>1</sub></b> | 5.98                  | 6.10  | 6.223 |
| <b>D<sub>2</sub></b> | 5.21                  | --    | --    |
| <b>E</b>             | 6.40                  | 6.60  | 6.731 |
| <b>E<sub>1</sub></b> | 4.40                  | --    | --    |
| <b>e</b>             | 2.286 BSC             |       |       |
| <b>e<sub>1</sub></b> | --                    | 4.57  | --    |
| <b>H<sub>D</sub></b> | 9.40                  | 10.00 | 10.40 |
| <b>L</b>             | 2.743 REF             |       |       |
| <b>L<sub>1</sub></b> | 1.40                  | 1.52  | 1.77  |
| <b>L<sub>2</sub></b> | 0.50                  | 0.80  | 1.01  |
| <b>w</b>             | --                    | 0.20  | --    |
| <b>y</b>             | --                    | --    | 0.20  |

### Notes:

1. Refer to JEDEC TO-252 variation AA
2. Dimension "E" does NOT include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.1524mm per side.
3. Dimension "D<sub>1</sub>" does NOT include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.1524mm per end.

## Customer Service

### Sales and Service:

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