

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package
- Advanced trench cell design
- Extremely low threshold voltage

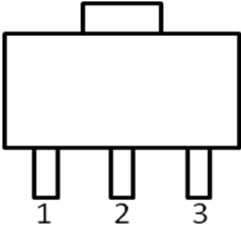
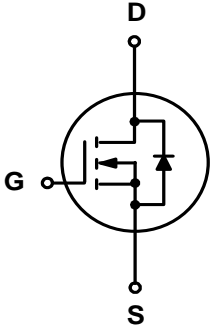
#### 1.2 Applications

- Portable appliances

#### 1.3 Quick reference

- $BV \geq 100\text{ V}$
- $P_{\text{tot}} \leq 0.83\text{ W}$
- $I_D \leq 5\text{ A}$
- $R_{\text{DS(ON)}} \leq 115\text{ m}\Omega @ V_{\text{GS}} = 10\text{ V}$
- $R_{\text{DS(ON)}} \leq 125\text{ m}\Omega @ V_{\text{GS}} = 4.5\text{ V}$

### 2. Pin Description

| Pin | Description | Simplified Outline  | Symbol  |
|-----|-------------|---|---|
| 1   | Gate(G)     |  <p>Top View<br/>SOT-89</p> |  |
| 2   | Source(S)   |   |   |
| 3   | Drain(D)    |   |   |



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### 3. Limiting Values

| Symbol            | Parameter                               | Conditions   | Min  | Max      | Unit                        |
|-------------------|---|--|------|----------|-----------------------------|
| $V_{DS}$          | Drain-Source Voltage                    | $T_A = 25\text{ }^\circ\text{C}$                       | 100  | -        | V                           |
| $V_{GS}$          | Gate-Source Voltage                     | $T_A = 25\text{ }^\circ\text{C}$                       | -    | $\pm 20$ | V                           |
| $I_D^*$           | Drain Current                           | $T_A = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$ | -    | 5        | A                           |
| $I_{DM}^{*,**}$   | Pulsed Drain Current                    | $T_A = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$ | -    | 8        | A                           |
| $P_{tot}^*$       | Total Power Dissipation                 | $T_A = 25\text{ }^\circ\text{C}$                       | -    | 0.83     | W                           |
| $T_{stg}$         | Storage Temperature                     |  | - 55 | 150      | $^\circ\text{C}$            |
| $T_J$             | Junction Temperature                    |  | -    | 150      | $^\circ\text{C}$            |
| $I_S^*$           | Diode Forward Current                   | $T_A = 25\text{ }^\circ\text{C}$                       | -    | 5        | A                           |
| $R_{\theta JA}^*$ | Thermal Resistance- Junction to Ambient |  | -    | 150      | $^\circ\text{C} / \text{W}$ |

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec}$
- \*\* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$
- \*\*\* Limited by bonding wire

### 4. Marking Information

| Product Name | Marking  |
|--------------|--|
| KJ5N10SA     | <div style="display: inline-block; border: 1px solid black; padding: 2px;">5N10<br/>YWWXXX</div> YWW:<br>Date Code |

### 5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity | Note |
|--------------|---------|-----------|------------|----------|------|
| KJ5N10SA     | SOT-89  |           |            | 3000     |      |

Note: KUAJIEXIN defines " Green " as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )



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## 6. Electrical Characteristics ( $T_A = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted )

| Symbol                                     | Parameter                      | Conditions  | Min | Typ  | Max       | Unit          |
|--|--------------------------------|---|-----|------|-----------|---------------|
| <b>Static Characteristics</b>              |                                |   |     |      |           |               |
| $BV_{DSS}$                                 | Drain-Source Breakdown Voltage | $V_{GS} = 0\text{ V}, I_{DS} = 250\text{ }\mu\text{A}$  | 100 | -    | -         | V             |
| $V_{GS(th)}$                               | Gate Threshold Voltage         | $V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$  | 1.0 | -    | 2.0       | V             |
| $I_{DSS}$                                  | Drain Leakage Current          | $V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$   | -   | -    | 1         | $\mu\text{A}$ |
|  |                                | $T_J = 85\text{ }^\circ\text{C}$  | -   | -    | 30        | $\mu\text{A}$ |
| $I_{GSS}$                                  | Gate Leakage Current           | $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$   | -   | -    | $\pm 100$ | nA            |
| $R_{DS(ON)}^a$                             | On-State Resistance            | $V_{GS} = 10\text{ V}, I_{DS} = 1\text{ A}$   | -   | 105  | 115       | m $\Omega$    |
|  |                                | $V_{GS} = 4.5\text{ V}, I_{DS} = 0.5\text{ A}$  | -   | 110  | 125       |               |
| <b>Diode Characteristics</b>               |                                |   |     |      |           |               |
| $V_{SD}^a$                                 | Diode Forward Voltage          | $I_{SD} = 1\text{ A}, V_{GS} = 0\text{ V}$  | -   | -    | 1.2       | V             |
| $t_{rr}$                                   | Reverse Recovery Time          | $I_{SD} = 1\text{ A}, dI_{SD}/dt = 100\text{ A}/\mu\text{s}$  | -   | 38.8 | -         | nS            |
| $Q_{rr}$                                   | Reverse Recovery Charge        |   | -   | 12.7 | -         | nC            |
| <b>Dynamic Characteristics<sup>b</sup></b> |                                |   |     |      |           |               |
| $C_{iss}$                                  | Input Capacitance              | $V_{GS} = 0\text{ V}, V_{DS} = 50\text{ V}$<br>Frequency = 1 MHz  | -   | 1100 | -         | pF            |
| $C_{oss}$                                  | Output Capacitance             |   | -   | 30   | -         |               |
| $C_{rss}$                                  | Reverse Transfer Capacitance   |   | -   | 27   | -         |               |
| $t_d(on)$                                  | Turn-on Delay Time             | $V_{DS} = 50\text{ V}, V_{GEN} = 10\text{ V},$<br>$R_G = 4.5\text{ }\Omega, R_L = 50\text{ }\Omega,$<br>$I_{DS} = 1\text{ A}$ | -   | 4.2  | -         | nS            |
| $t_r$                                      | Turn-on Rise Time              |   | -   | 17   | -         |               |
| $t_d(off)$                                 | Turn-off Delay Time            |   | -   | 18.2 | -         |               |
| $t_f$                                      | Turn-off Fall Time             |   | -   | 25.2 | -         |               |
| $Q_g$                                      | Total Gate Charge              | $V_{GS} = 10\text{ V}, V_{DS} = 50\text{ V},$<br>$I_{DS} = 1\text{ A}$  | -   | 20.4 | -         | pC            |
| $Q_{gs}$                                   | Gate-Source Charge             |   | -   | 4.2  | -         |               |
| $Q_{gd}$                                   | Gate-Drain Charge              |   | -   | 2.5  | -         |               |

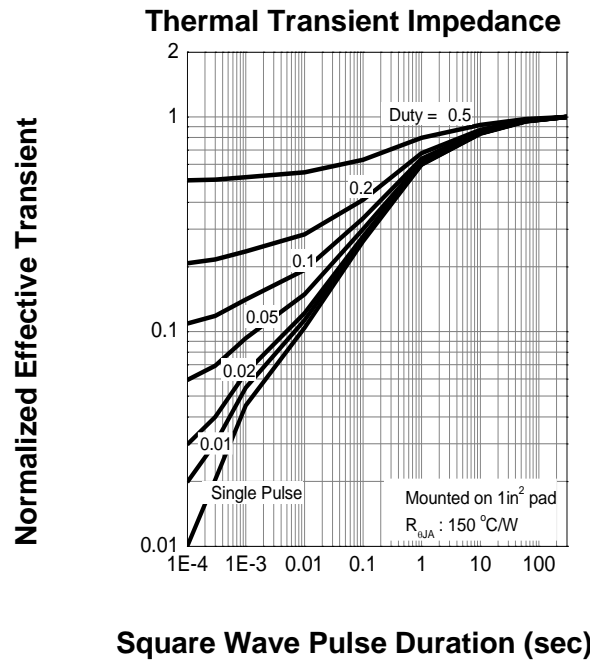
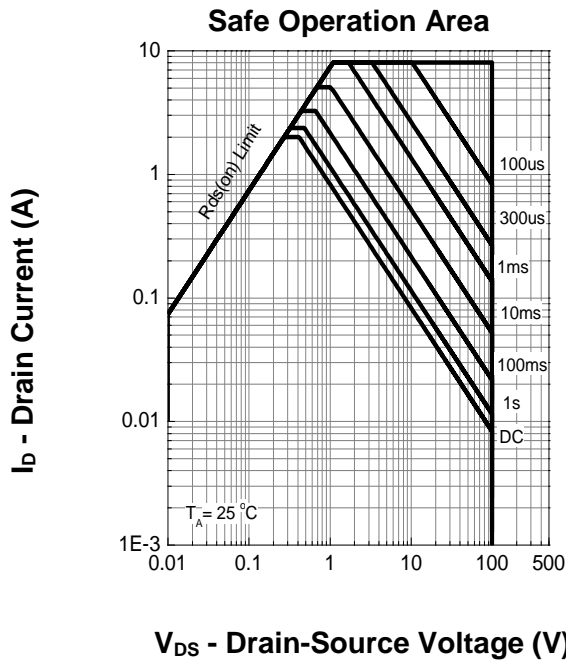
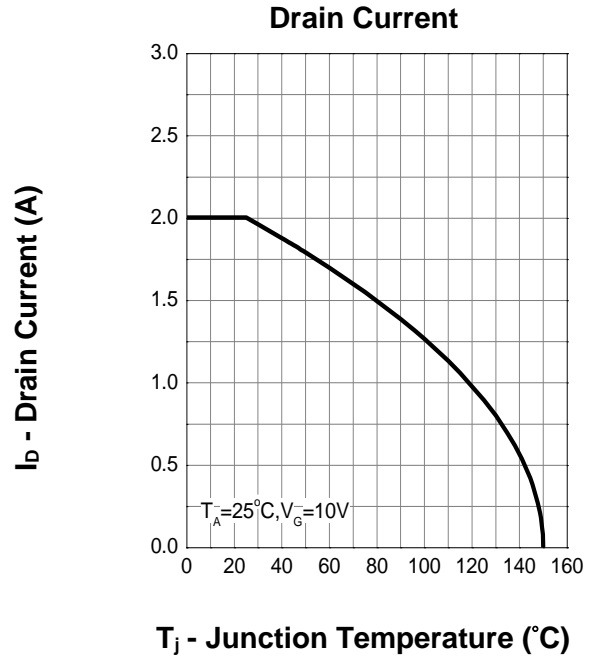
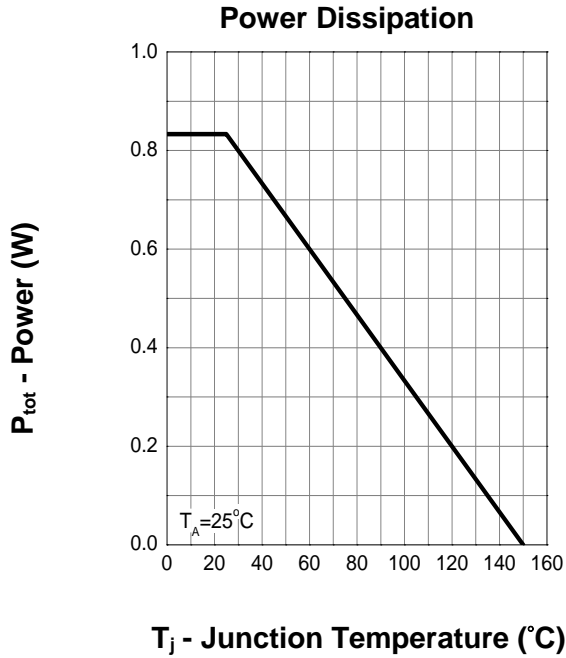
Notes :

a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

b : Guaranteed by design, not subject to production testing

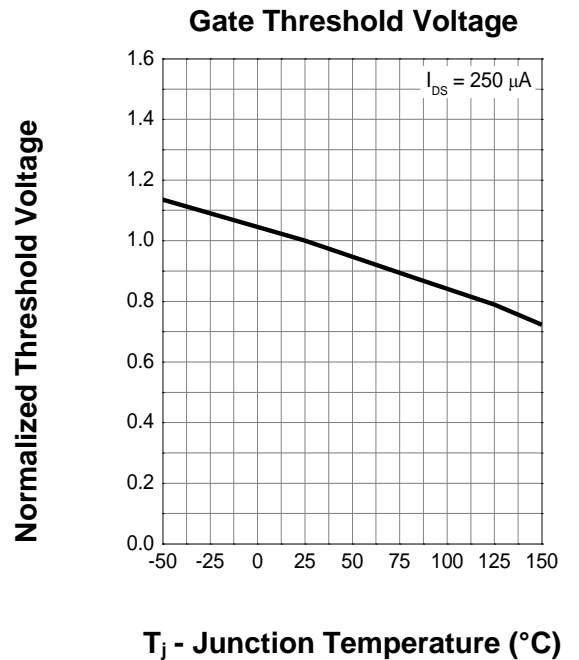
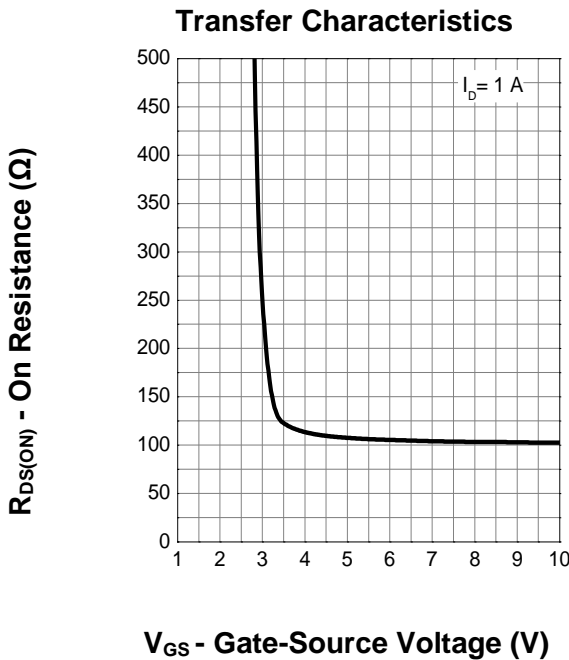
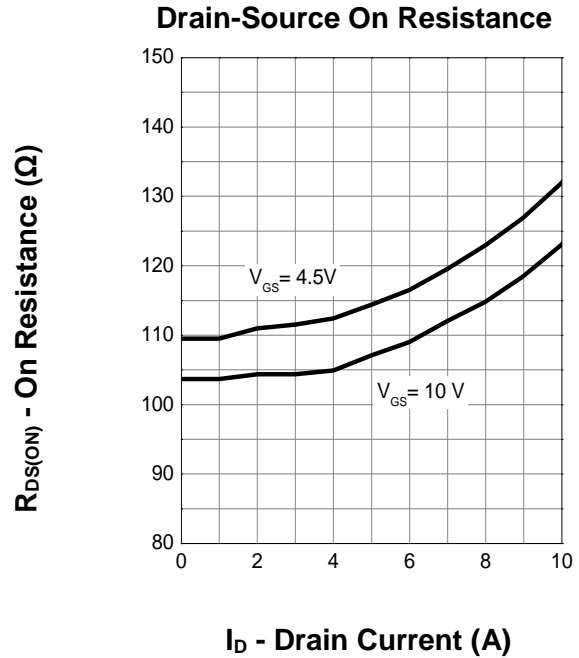
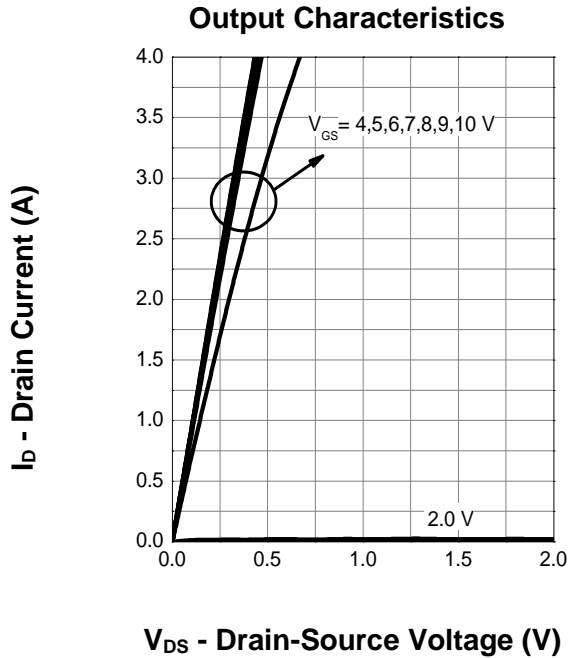


## 7. Typical Characteristics



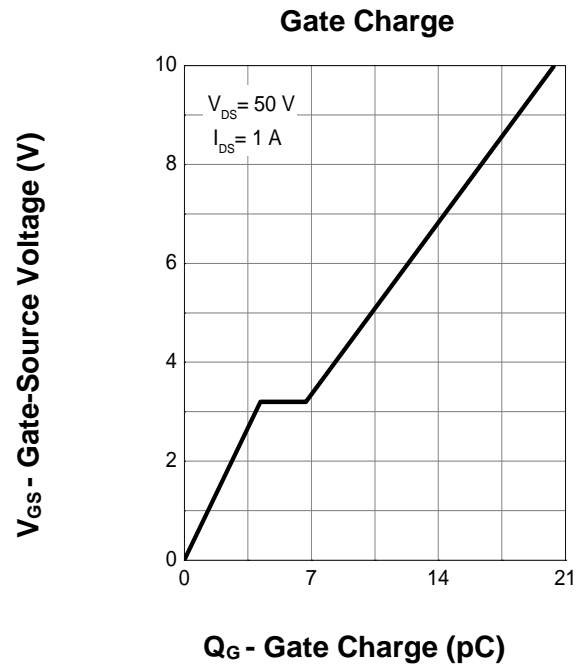
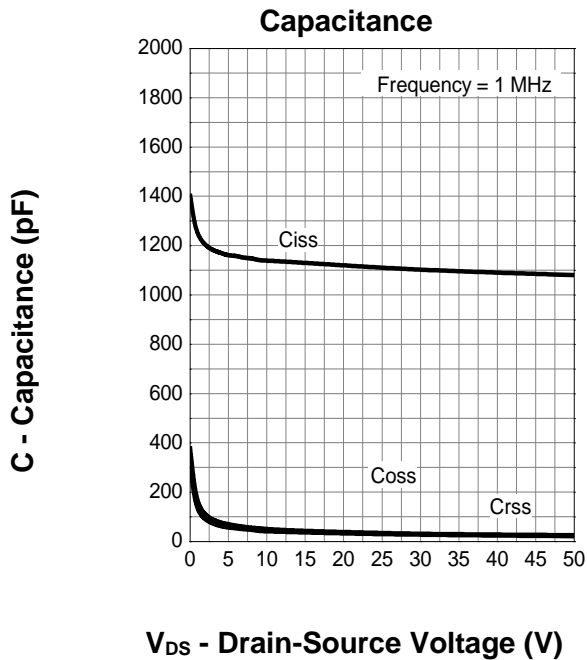
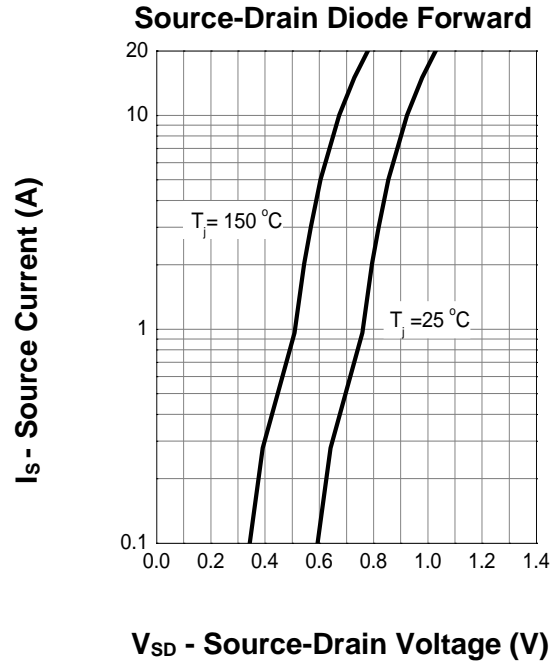
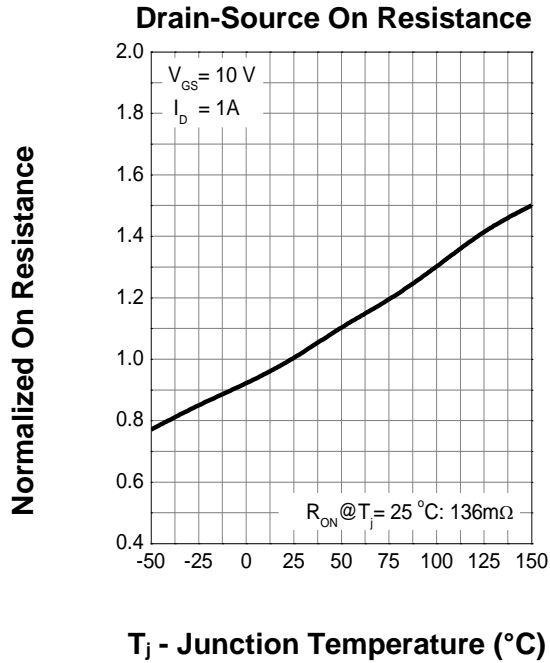


### 7. Typical Characteristics (cont.)





### 7. Typical Characteristics (cont.)



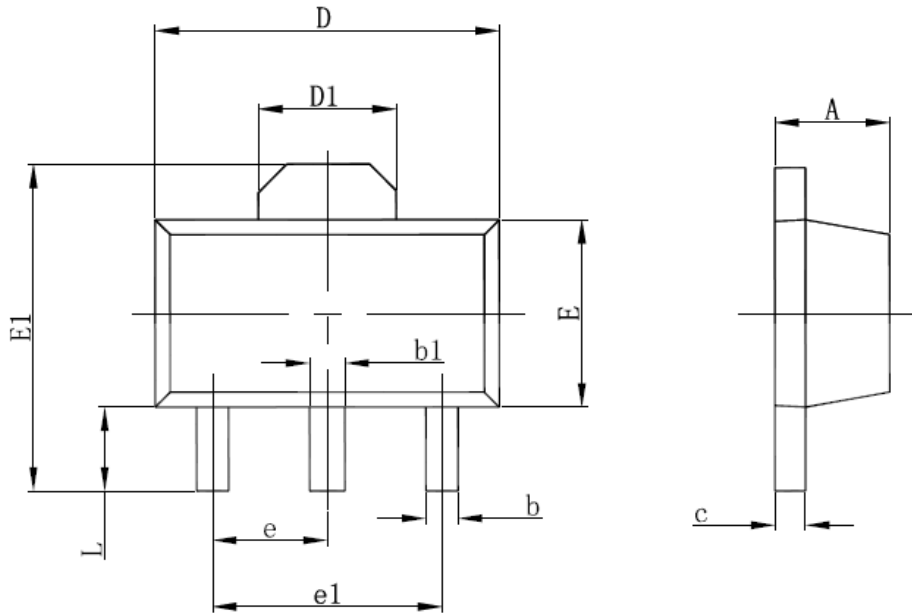


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## 8. Package Dimensions

SOT-89



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.320                     | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF.                |       | 0.061 REF.           |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP.                |       | 0.060 TYP.           |       |
| e1     | 3.000 TYP.                |       | 0.118 TYP.           |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |