

# N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- ✓ Surface-mounted package
- ✓ Super Trench
- ✓ Tj max 175°
- ✓ Advanced trench cell design
- ✓ MSL1

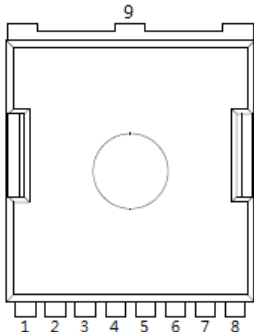
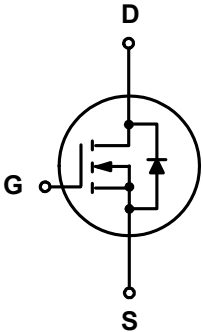
### 1.2 Applications

- ✓ Power Tool appliances
- ✓ BMS appliances
- ✓ High power inverter system

### 1.3 Quick reference

- ✓  $BV \geq 60\text{ V}$
- ✓  $P_{tot} \leq 500\text{ W}$
- ✓  $I_D \leq 400\text{ A}$
- ✓  $R_{DS(ON)} \leq 0.8\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ✓  $R_{DS(ON)} \leq 1.5\text{ m}\Omega @ V_{GS} = 6\text{ V}$

## 2. Pin Description

| Pin           | Description | Simplified Outline                                                                                       | Symbol                                                                                |
|---------------|-------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1             | Gate(G)     | <br>Top View<br>TOLL |  |
| 2,3,4,5,6,7,8 | Source(S)   |                                                                                                          |                                                                                       |
| 9             | Drain(D)    |                                                                                                          |                                                                                       |

### 3. Limiting Values

| Symbol               | Parameter                               | Conditions                                                | Min | Max      | Unit                 |
|----------------------|-----------------------------------------|-----------------------------------------------------------|-----|----------|----------------------|
| $V_{DS}$             | Drain-Source Voltage                    | $T_C = 25\text{ }^{\circ}\text{C}$                        | 60  | -        | V                    |
| $V_{GS}$             | Gate-Source Voltage                     | $T_C = 25\text{ }^{\circ}\text{C}$                        | -   | $\pm 20$ | V                    |
| $I_D$                | Drain Current ( DC )                    | $T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$  | -   | 400      | A                    |
|                      |                                         | $T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$ | -   | 267      | A                    |
| $I_{DM}^*$           | Drain Current ( Pulsed )                | $T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$  | -   | 1200     | A                    |
| $P_{tot}$            | Drain power dissipation                 | $T_C = 25\text{ }^{\circ}\text{C}$                        | -   | 500      | W                    |
| $T_{stg}$            | Storage Temperature                     |                                                           | -55 | 175      | $^{\circ}\text{C}$   |
| $T_J$                | Junction Temperature                    |                                                           | -   | 175      | $^{\circ}\text{C}$   |
| $I_S$                | Continuous-Source Current               | $T_C = 25\text{ }^{\circ}\text{C}$                        | -   | 300      | A                    |
| $E_{AS}$             | Single Pulsed Avalanche Energy          | $V_{DD}=20\text{V}, L=0.5\text{mH}$                       | -   | 2800     | mJ                   |
| $R_{\theta JA}^{**}$ | Thermal Resistance- Junction to Ambient |                                                           | -   | 40       | $^{\circ}\text{C/W}$ |
| $R_{\theta JC}^{**}$ | Thermal Resistance- Junction to Case    |                                                           | -   | 0.25     |                      |

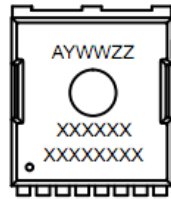
Notes :

\* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

\*\* Surface Mounted on minimum footprint pad area.

\*\*\* Limited by bonding wire

### 4. Marking Information

| Product Name | Marking                                                                               |
|--------------|---------------------------------------------------------------------------------------|
| KJ006N06T    |  |

### 5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity | Note |
|--------------|---------|-----------|------------|----------|------|
| KJ006N06T    | TOLL-8L |           |            | 2000     |      |

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 )

**6. Electrical Characteristics** (  $T_A=25^\circ$  Unless Otherwise Noted )

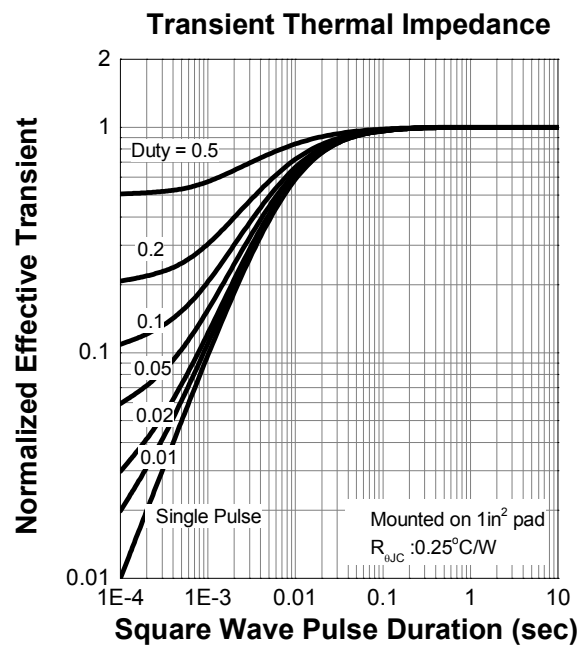
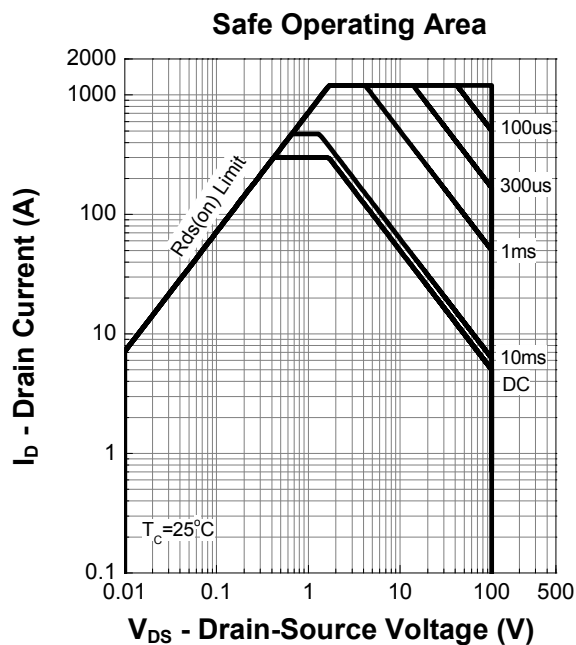
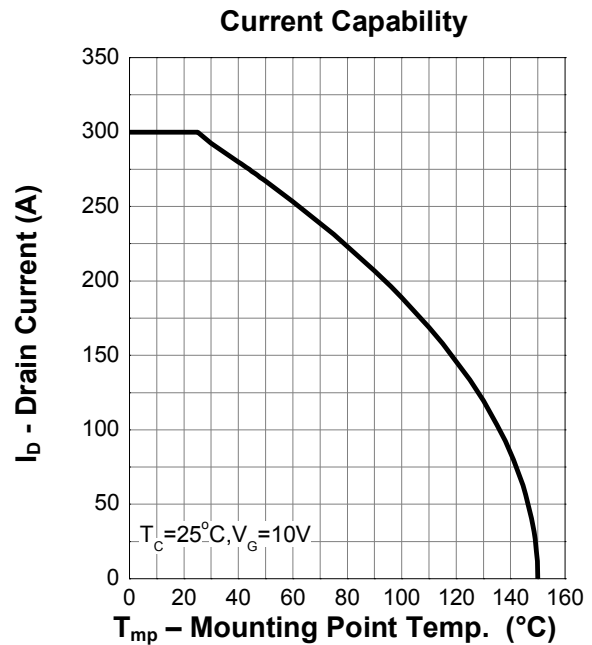
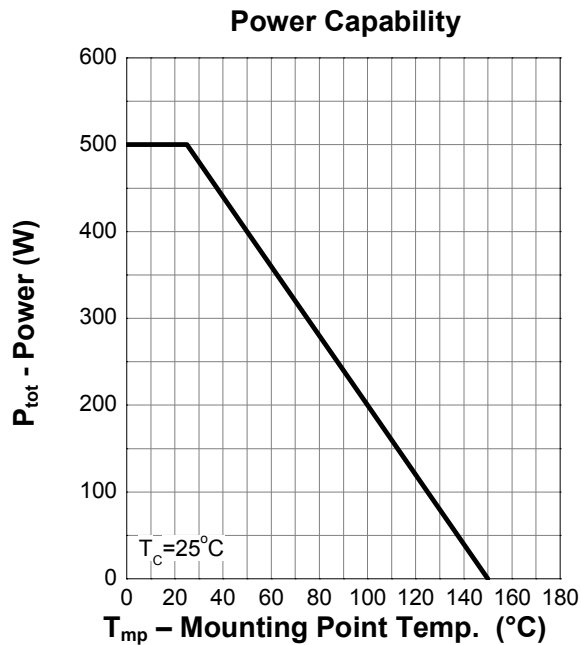
| Symbol                                   | Parameter                      | Conditions                                                                                                                  | Min | Typ   | Max  | Unit |
|------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----|-------|------|------|
| Static Characteristics                   |                                |                                                                                                                             |     |       |      |      |
| BV <sub>DSS</sub>                        | Drain-Source Breakdown Voltage | V <sub>GS</sub> = 0 V, I <sub>DS</sub> = 250 μA                                                                             | 60  | -     | -    | V    |
| V <sub>GS(th)</sub>                      | Gate Threshold Voltage         | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 250 μA                                                                | 2   | -     | 4    | V    |
| I <sub>DSS</sub>                         | Drain Leakage Current          | V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V                                                                               | -   | -     | 1    | μA   |
| I <sub>GSS</sub>                         | Gate Leakage Current           | V <sub>GS</sub> = 0 V, V <sub>GS</sub> = ± 20 V                                                                             | -   | -     | ±100 | nA   |
| R <sub>DS(ON)</sub> <sup>a</sup>         | On-State Resistance            | V <sub>GS</sub> = 10 V, I <sub>DS</sub> = 80 A                                                                              | -   | 0.65  | 0.8  | mΩ   |
|                                          |                                | V <sub>GS</sub> = 6 V, I <sub>DS</sub> = 50 A                                                                               | -   | 1.2   | 1.5  |      |
| Diode Characteristics                    |                                |                                                                                                                             |     |       |      |      |
| V <sub>SD</sub> <sup>a</sup>             | Diode Forward Voltage          | I <sub>SD</sub> = 50 A, V <sub>GS</sub> = 0 V                                                                               | -   | -     | 1.3  | V    |
| t <sub>rr</sub>                          | Reverse Recovery Time          | I <sub>DS</sub> = 50 A, V <sub>GS</sub> = 0 V<br>dI <sub>SD</sub> /dt = 100 A/μs                                            | -   | 117   | -    | nS   |
| Q <sub>rr</sub>                          | Reverse Recovery Charge        |                                                                                                                             | -   | 287   | -    | nC   |
| Dynamic Characteristics <sup>b</sup>     |                                |                                                                                                                             |     |       |      |      |
| C <sub>iss</sub>                         | Input Capacitance              | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 50 V<br>Frequency = 1 MHz                                                          | -   | 11574 | -    | pF   |
| C <sub>oss</sub>                         | Output Capacitance             |                                                                                                                             | -   | 1836  | -    |      |
| C <sub>rss</sub>                         | Reverse Transfer Capacitance   |                                                                                                                             | -   | 196   | -    |      |
| t <sub>d(on)</sub>                       | Turn-on Delay Time             | V <sub>DS</sub> = 50 V, V <sub>GEN</sub> = 10 V,<br>R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 1 Ω,<br>I <sub>DS</sub> = 50 A | -   | 44    | -    | nS   |
| t <sub>r</sub>                           | Turn-on Rise Time              |                                                                                                                             | -   | 132   | -    |      |
| t <sub>d(off)</sub>                      | Turn-off Delay Time            |                                                                                                                             | -   | 154   | -    |      |
| t <sub>f</sub>                           | Turn-off Fall Time             |                                                                                                                             | -   | 137   | -    |      |
| Gate Charge Characteristics <sup>b</sup> |                                |                                                                                                                             |     |       |      |      |
| Q <sub>g</sub>                           | Total Gate Charge              | V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 10 V,<br>I <sub>DS</sub> = 50 A                                                   | -   | 167   | -    | nC   |
| Q <sub>gs</sub>                          | Gate-Source Charge             |                                                                                                                             | -   | 71    | -    |      |
| Q <sub>gd</sub>                          | Gate-Drain Charge              |                                                                                                                             | -   | 58    | -    |      |

Notes :

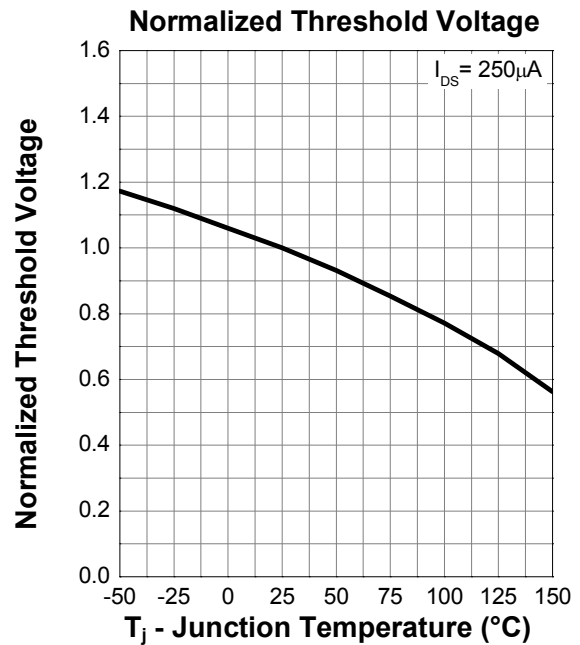
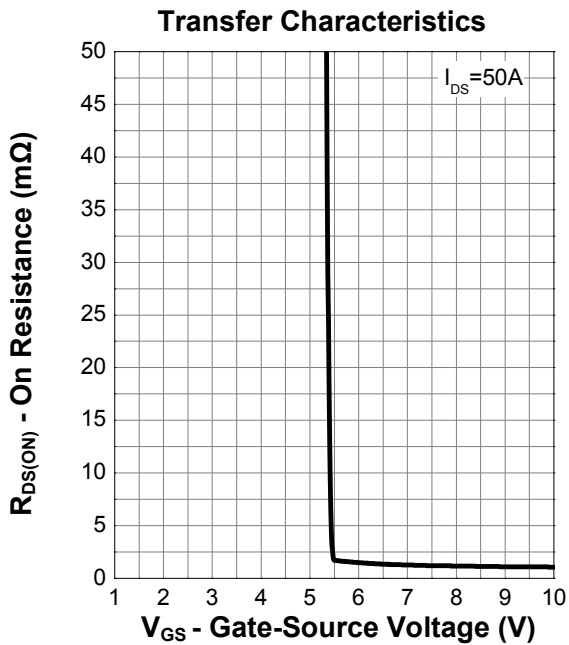
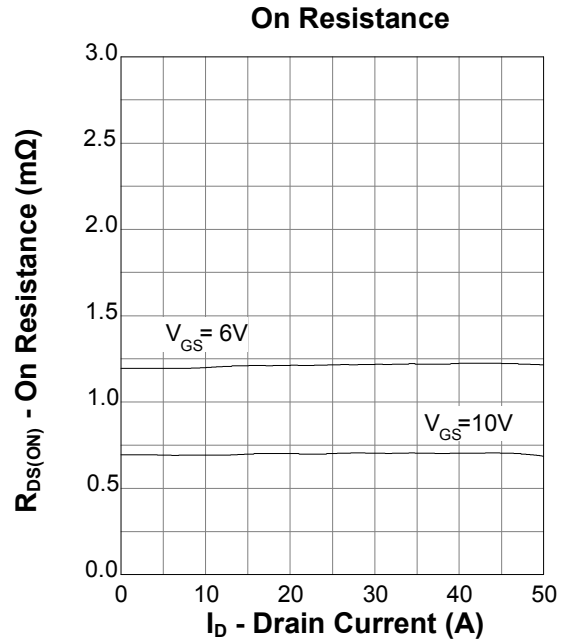
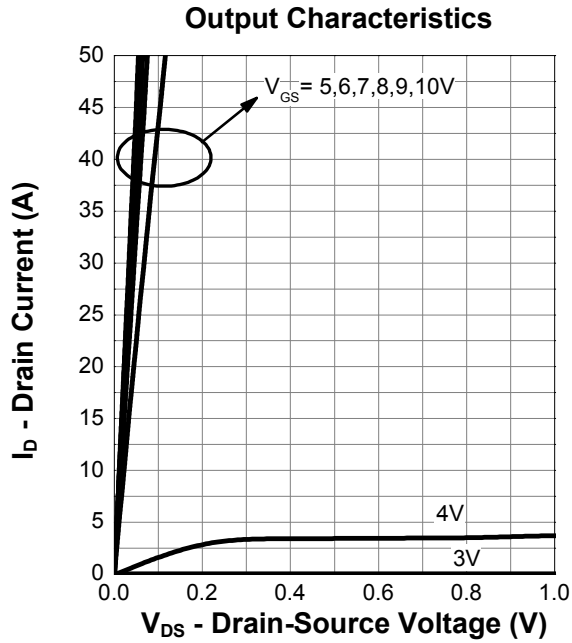
a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ 

b : Guaranteed by design, not subject to production testing

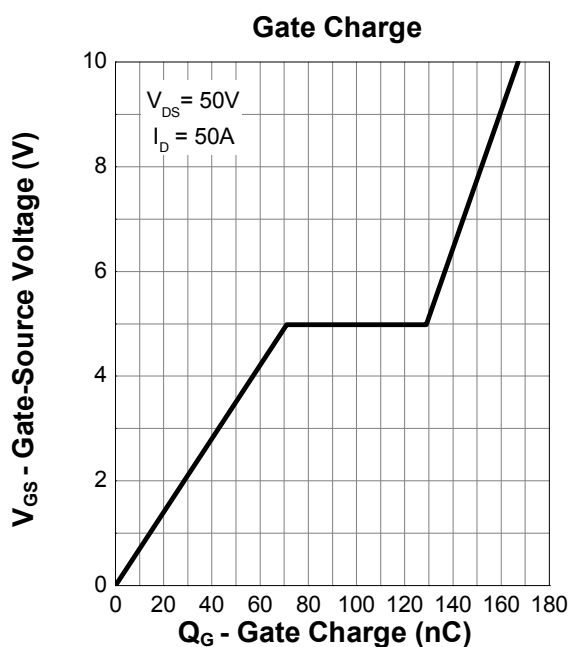
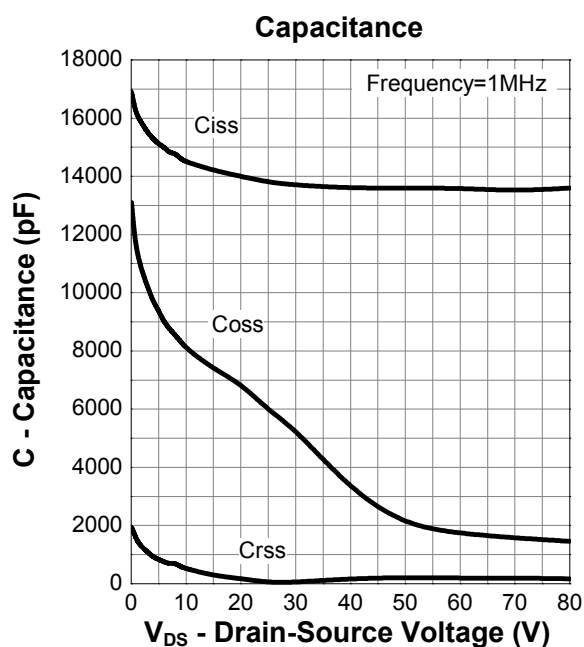
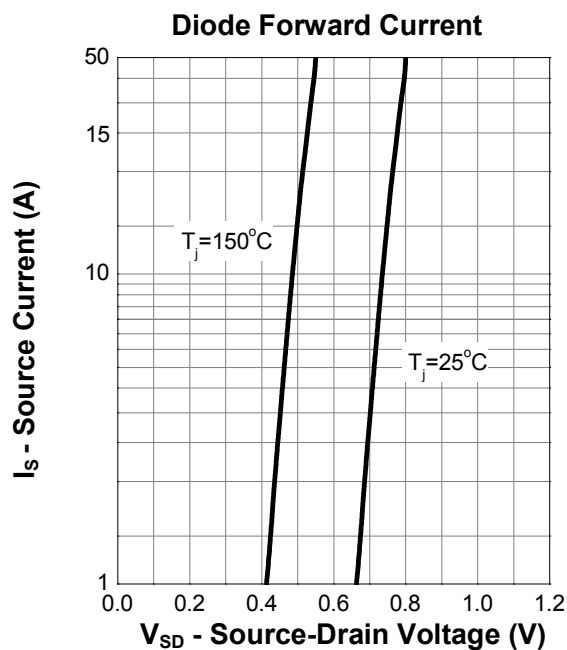
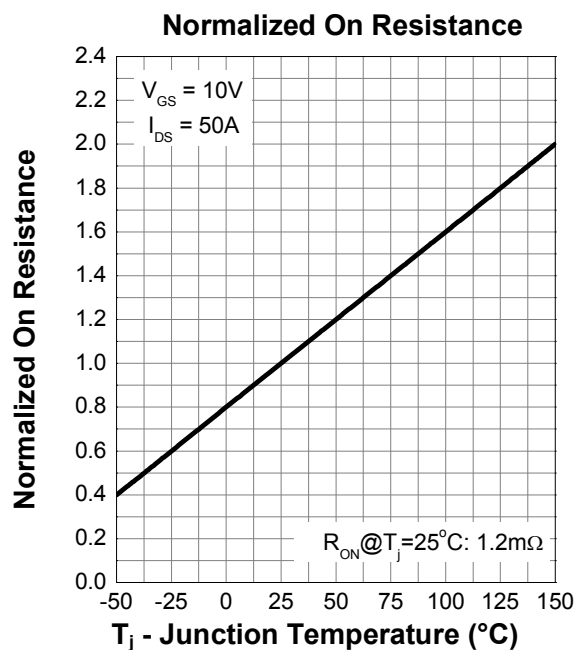
## 7. Typical Characteristics



## 7. Typical Characteristics (cont.)

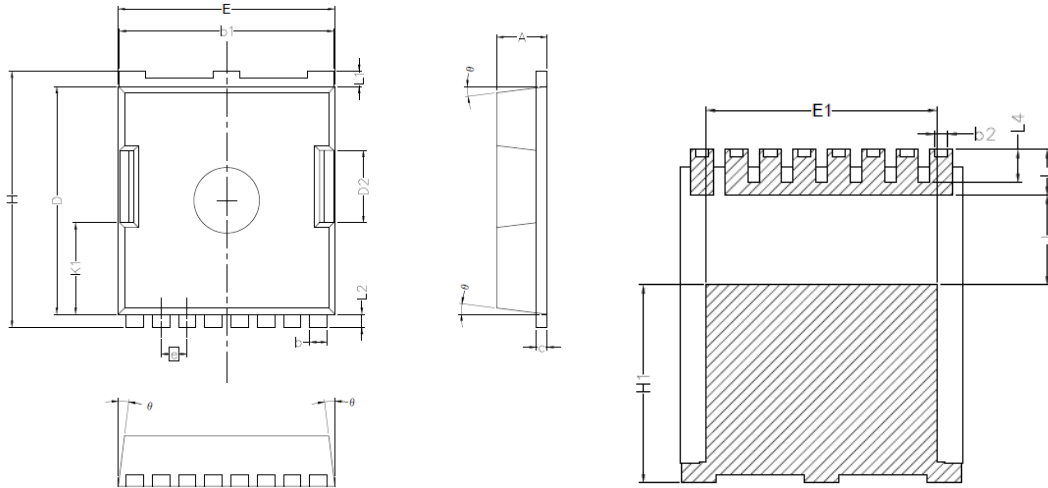


## 7. Typical Characteristics (cont.)



## 8. Package Dimensions

TOLL-8L Package



| Symbol   | Dimensions In Millimeters |       |
|----------|---------------------------|-------|
|          | MIN.                      | MAX.  |
| A        | 2.20                      | 2.40  |
| b        | 0.90                      | 0.90  |
| b1       | 9.70                      | 9.90  |
| b2       | 0.42                      | 0.50  |
| c        | 0.40                      | 0.60  |
| D        | 10.28                     | 10.58 |
| D2       | 3.10                      | 3.50  |
| E        | 9.70                      | 10.10 |
| E1       | 7.90                      | 8.30  |
| e        | 1.20BSC                   |       |
| H        | 11.48                     | 11.88 |
| H1       | 6.75                      | 7.15  |
| N        | 8                         |       |
| J        | 3.00                      | 3.30  |
| K1       | 3.98                      | 4.38  |
| L        | 1.40                      | 1.80  |
| L1       | 0.60                      | 0.80  |
| L2       | 0.50                      | 0.70  |
| L4       | 1.00                      | 1.30  |
| $\theta$ | 4°                        | 10°   |