

## 80V N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- ◇ Advanced TRENCH cell design
- ◇ Low Gate Charge
- ◇ Low On-Resistance
- ◇ RoHS and Halogen-Free Compliant
- ◇ 100%  $\Delta V_{DS}$  & UIS & Rg Tested

#### 1.2 Applications

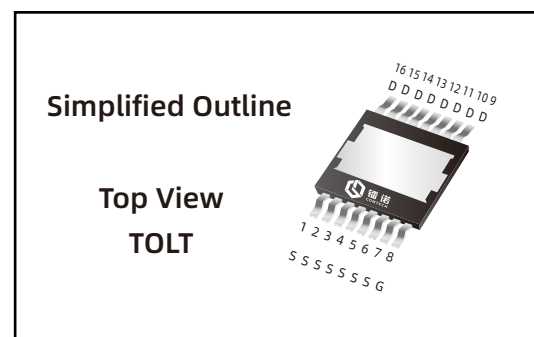
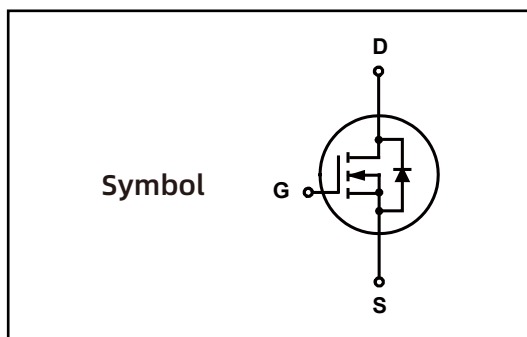
- ◇ DC-DC Converter
- ◇ Drones
- ◇ Motor drivers
- ◇ Light electric vehicles

#### 1.3 Quick reference

- ◇  $BV \cong 80\text{ V}$
- ◇  $P_{\text{tot}} \cong 535\text{ W}$
- ◇  $I_D \cong 304\text{ A}$
- ◇  $R_{DS(ON)} \cong 2.8\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ◇  $R_{DS(ON)} \cong 5.2\text{ m}\Omega @ V_{GS} = 6\text{ V}$



### 2. Pin Description



### 3.Limiting Values

| Symbol               | Parameter                      | Conditions  | Min | Max      | Unit             | Note   |
|----------------------|--------------------------------|---|-----|----------|------------------|--------|
| $V_{DS}$             | Drain-Source Voltage           | $T_C = 25\text{ }^\circ\text{C}$                        | -   | 80       | V                | -      |
| $V_{GS}$             | Gate-Source Voltage            | $T_C = 25\text{ }^\circ\text{C}$                        | -   | $\pm 20$ | V                | -      |
| $I_D^*$              | Drain Current ( DC )           | $T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$  | -   | 304      | A                | Fig.2  |
|                      |                                | $T_C = 100\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$ | -   | 215      | A                |        |
| $I_{DM}^{**},^{***}$ | Drain Current ( Pulsed )       | $T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$  | -   | 431      | A                | -      |
| $P_{tot}$            | Drain power dissipation        | $T_C = 25\text{ }^\circ\text{C}$                        | -   | 535      | W                | Fig.1  |
|                      |                                | $T_C = 100\text{ }^\circ\text{C}$                       | -   | 267      | W                |        |
| $T_{stg}$            | Storage Temperature            |   | -55 | 175      | $^\circ\text{C}$ | -      |
| $T_J$                | Junction Temperature           |   | -   | 175      | $^\circ\text{C}$ | -      |
| $I_S$                | Continuous-Source Current      | $T_C = 25\text{ }^\circ\text{C}$                        | -   | 304      | A                | -      |
| $E_{AS}^*$           | Single Pulsed Avalanche Energy | $V_{DD} = 80\text{ V}, L = 0.1\text{ mH}$               | -   | 1566     | mJ               | Fig.19 |

### 4.Thermal Characteristics

|                   |   |   |      |                           |        |
|-------------------|---|---|------|---------------------------|--------|
| $R_{\theta JA}^*$ | Thermal Resistance- Junction to Ambient | - | 21   | $^\circ\text{C}/\text{W}$ | Fig.16 |
| $R_{\theta JC}^*$ | Thermal Resistance- Junction to Case    | - | 0.28 |                           |        |

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

### 5.Marking Information

| Product Name | Package | Reel size | Tape width | Quantity | Note |
|--------------|---------|-----------|------------|----------|------|
| LN023N080LT  | TOLT    | 330mm     | 24mm       | 1800     |      |

Note: COMTECH 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 )

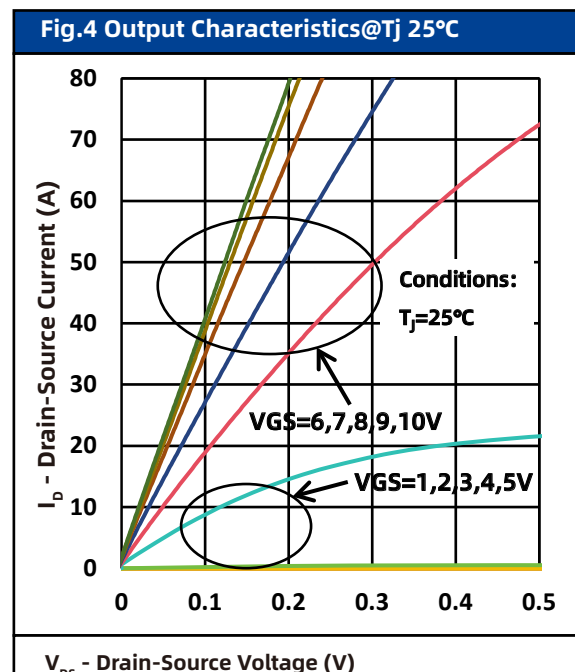
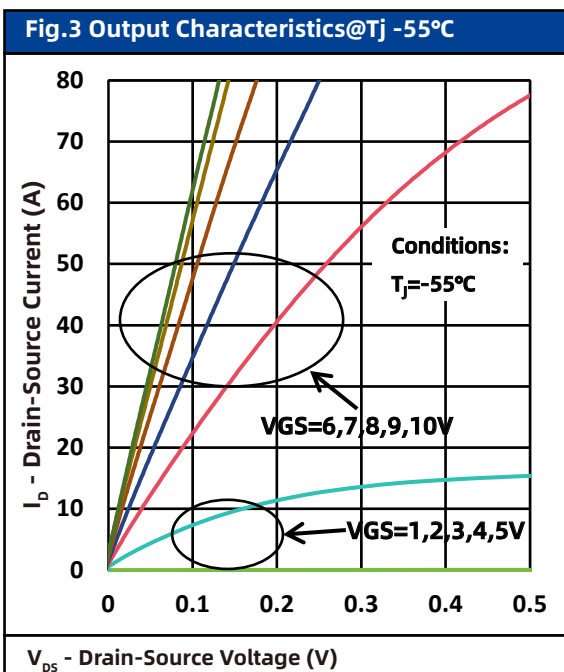
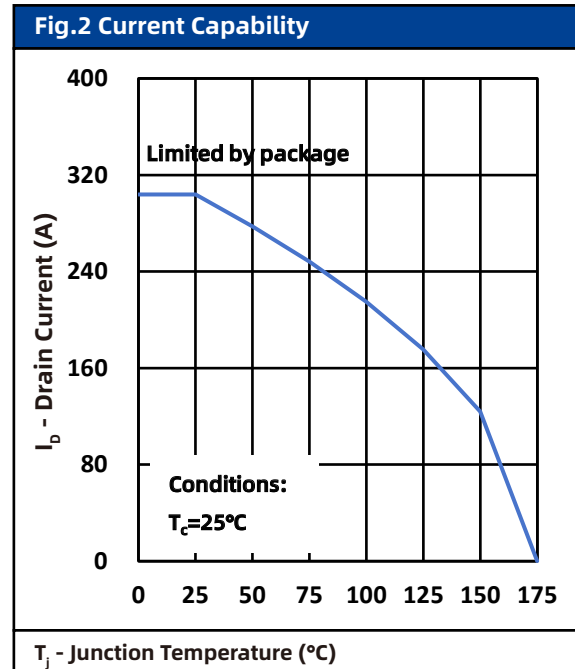
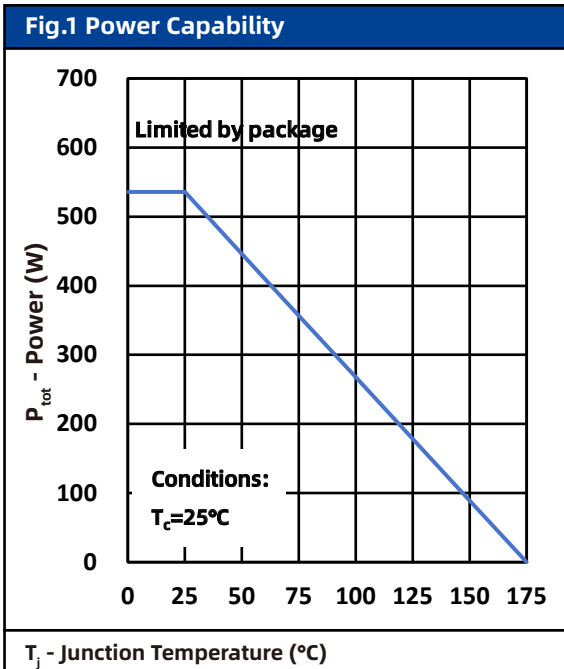
| Symbol   | Parameter                      | Conditions   | Min | Typ   | Max              | Unit          | Note   |
|--|--------------------------------|--|-----|-------|------------------|---------------|--------|
| <b>Static Characteristics</b>                  |                                |  |     |       |                  |               |        |
| $BV_{DSS}$                                     | Drain-Source Breakdown Voltage | $V_{GS} = 0\text{ V}, I_{DS} = 250\ \mu\text{A}$   | 80  | -     | -                | V             |        |
| $V_{GS(th)}$                                   | Gate Threshold Voltage         | $V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$   | 2   | -     | 4                | V             |        |
| $I_{DSS}$                                      | Drain Leakage Current          | $V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$  | -   | -     | 1                | $\mu\text{A}$ |        |
| $I_{GSS}$                                      | Gate Leakage Current           | $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$  | -   | -     | $\pm 100$        | nA            |        |
| $R_{DS(on)}^a$                                 | On-State Resistance            | $V_{GS} = 10\text{ V}, I_{DS} = 20\text{ A}$   | -   | 2.6   | 2.8              | m $\Omega$    | Fig.8  |
|  |                                | $V_{GS} = 6\text{ V}, I_{DS} = 10\text{ A}$  | -   | 5.0   | 5.2              |               |        |
| <b>Diode Characteristics</b>                   |                                |  |     |       |                  |               |        |
| $V_{SD}^a$                                     | Diode Forward Voltage          | $I_{SD} = 20\text{ A}, V_{GS} = 0\text{ V}$  | -   | -     | 1.3              | V             | Fig.7  |
| $t_{rr}$                                       | Reverse Recovery Time          | $I_{DS} = 20\text{ A}, V_{GS} = 0\text{ V}$  | -   | 57    | -                | nS            | Fig.20 |
| $Q_{rr}$                                       | Reverse Recovery Charge        | $di_{SD}/dt = 100\text{ A}/\mu\text{s}$  | -   | 189   | -                | nC            |        |
| <b>Dynamic Characteristics<sup>b</sup></b>     |                                |  |     |       |                  |               |        |
| $C_{ISS}$                                      | Input Capacitance              | $V_{GS} = 0\text{ V}, V_{DS} = 40\text{ V}$<br>Frequency = 1 MHz   | -   | 17113 | -                | pF            | Fig.10 |
| $C_{OSS}$                                      | Output Capacitance             |  | -   | 787   | -                |               |        |
| $C_{rSS}$                                      | Reverse Transfer Capacitance   |  | -   | 589   | -                |               |        |
| $R_G$  | Gate Resistance                | F= 1 MHz   | -   | 2.2   | -                | $\Omega$      |        |
| $t_d(on)$                                      | Turn-on Delay Time             | $V_{DS} = 40\text{ V}, V_{GS} = 10\text{ V},$<br>$R_G = 2.7\ \Omega, R_L = 20\ \mu\text{H},$<br>$I_{DS} = 20\text{ A}$ | -   | 53    | -                | nS            | Fig.18 |
| $t_r$  | Turn-on Rise Time              |  | -   | 107   | -                |               |        |
| $t_d(off)$                                     | Turn-off Delay Time            |  | -   | 142   | -                |               |        |
| $t_f$  | Turn-off Fall Time             |  | -   | 54    | -                |               |        |
| $dv/dt$  | Peak Diode Recovery            |  | -   | 0.298 | -                |               |        |
| $di/dt$  | Peak Diode Recovery            | -  | 320 | -     | A/ $\mu\text{s}$ |               |        |
| <b>Gate Charge Characteristics<sup>b</sup></b> |                                |  |     |       |                  |               |        |
| $Q_g$  | Total Gate Charge              | $V_{DS} = 40\text{ V}, V_{GS} = 10\text{ V},$<br>$I_{DS} = 20\text{ A}$  | -   | 245   | -                | nC            | Fig.17 |
| $Q_{gs}$                                       | Gate-Source Charge             |  | -   | 46    | -                |               |        |
| $Q_{gd}$                                       | Gate-Drain Charge              |  | -   | 109   | -                |               |        |
| $V_{plateau}$                                  | Gate plateau voltage           |  | -   | 4.3   | -                |               |        |

Notes :

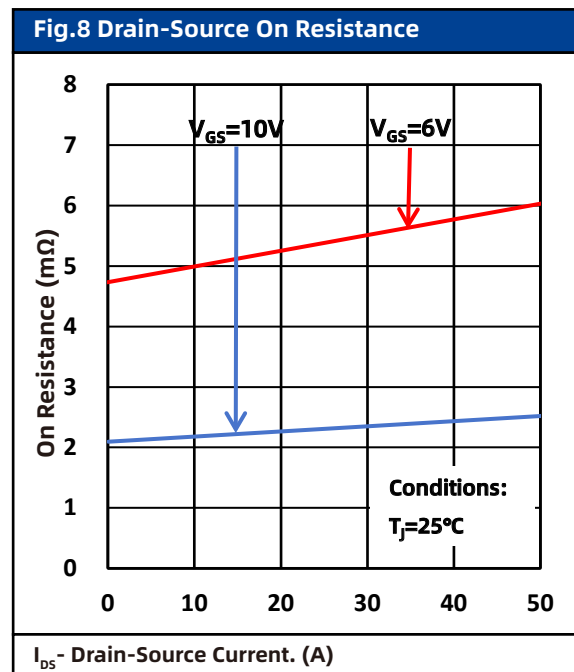
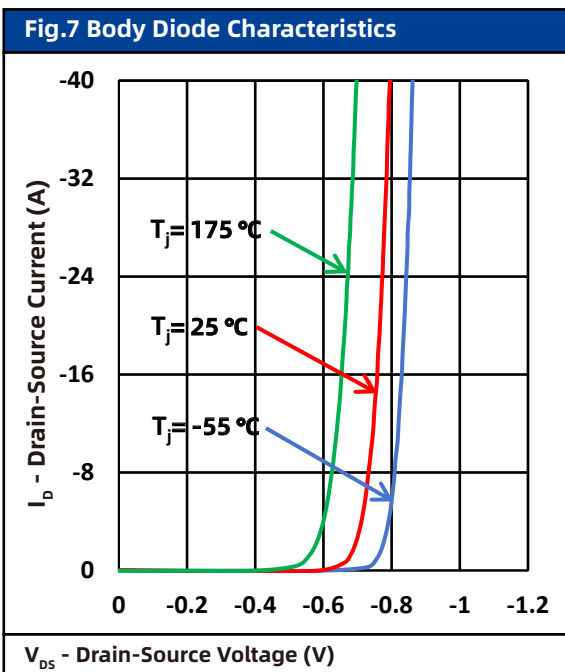
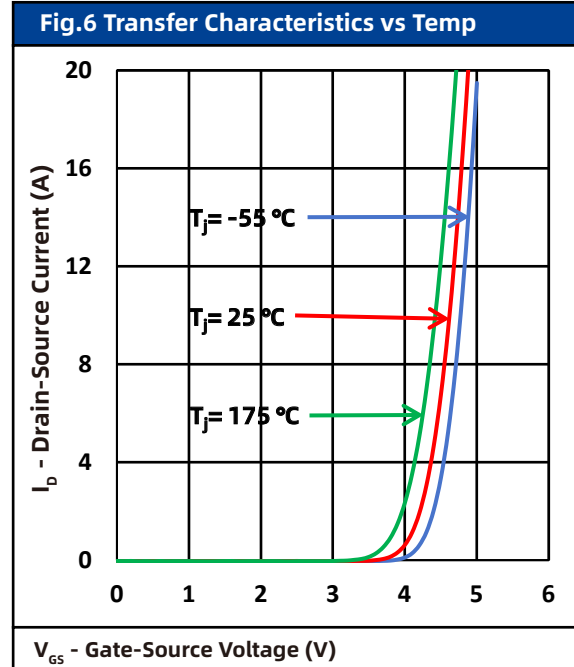
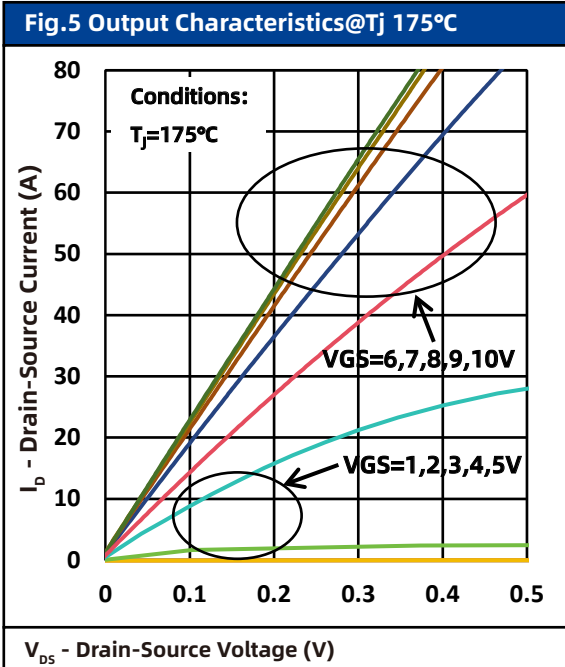
a : Pulse test ; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ 

b : Guaranteed by design, not subject to production testing

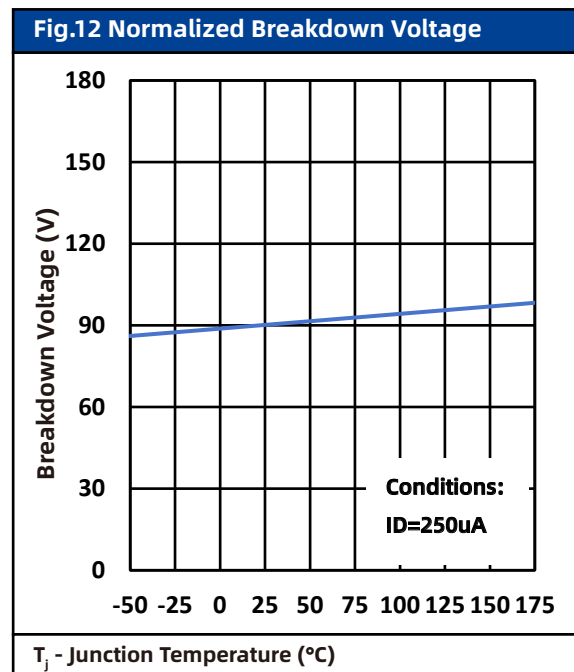
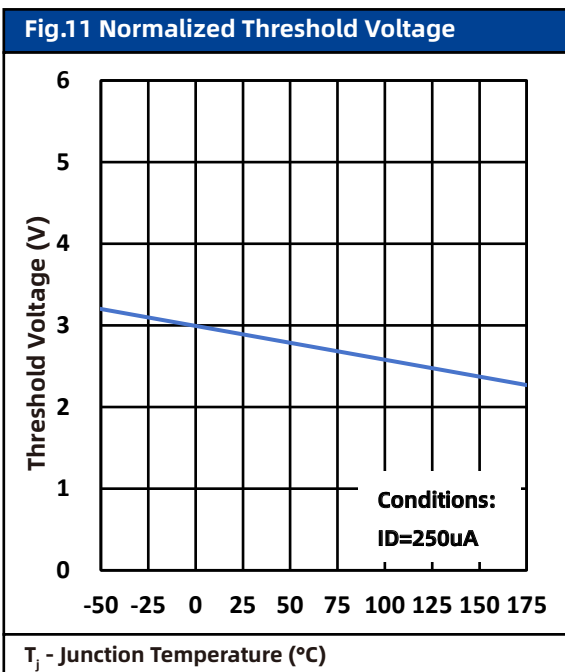
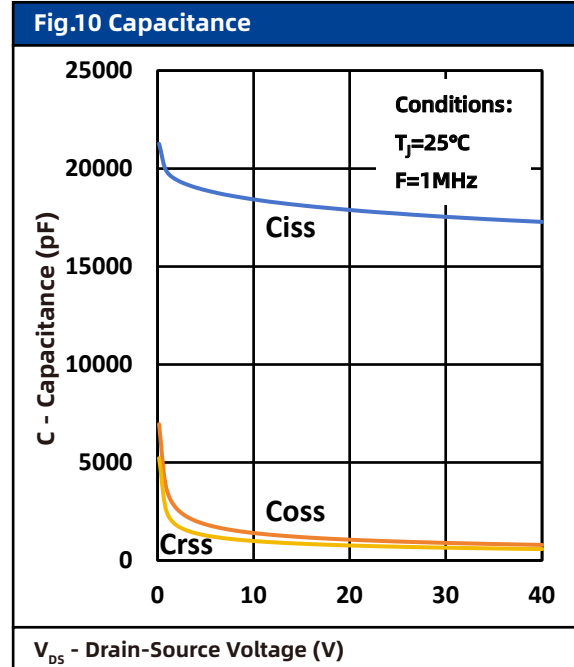
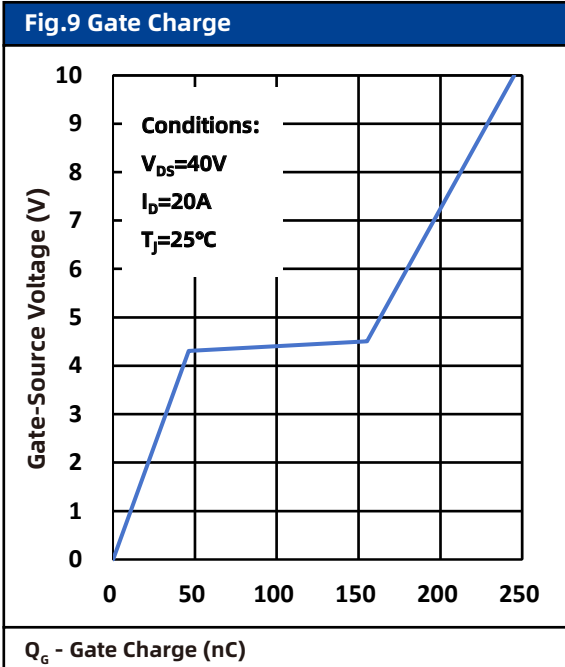
## 7. Typical Characteristics



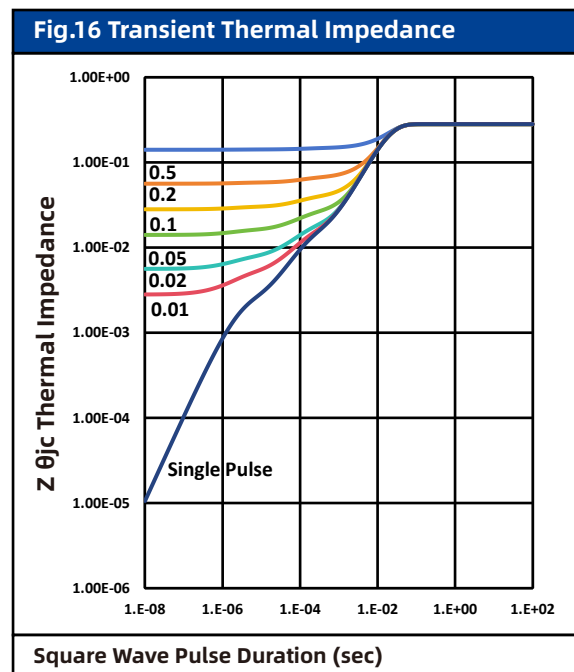
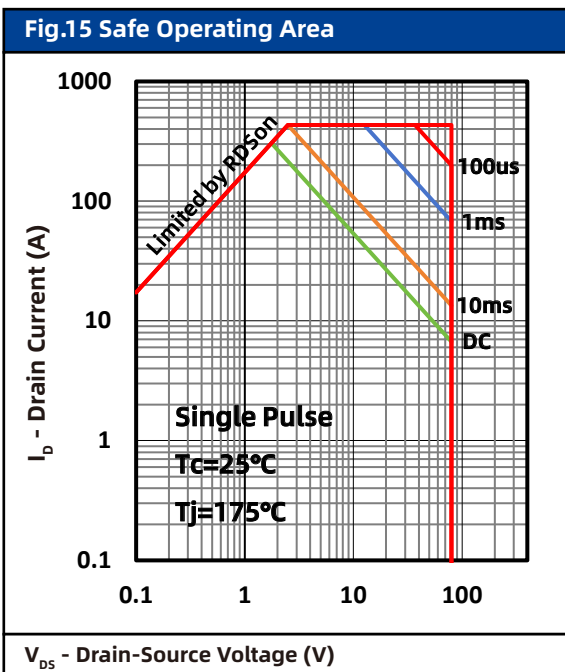
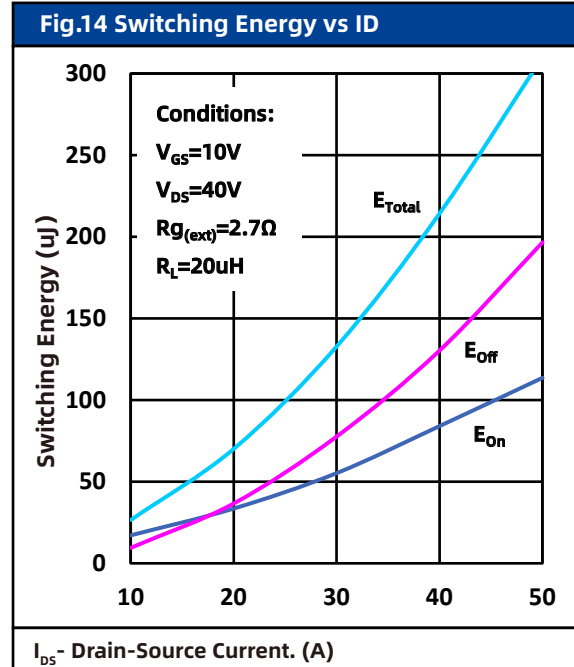
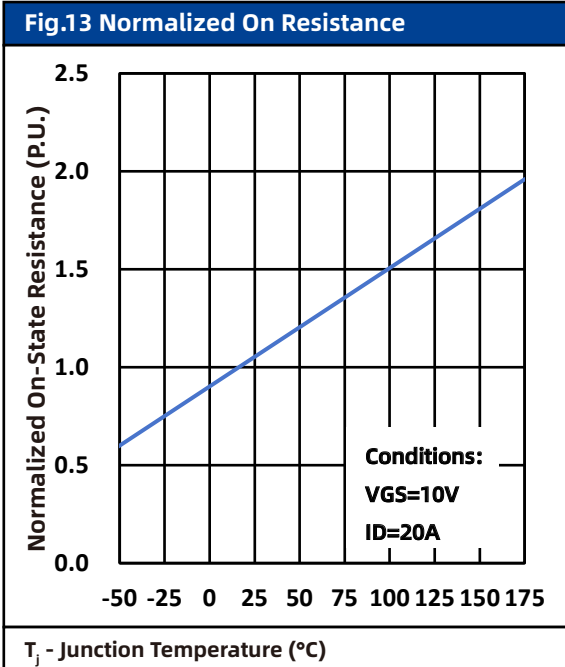
## 7. Typical Characteristics



## 7. Typical Characteristics



## 7. Typical Characteristics



## 7. Typical Characteristics

Fig.17 Gate Charge Test Circuit & Waveform

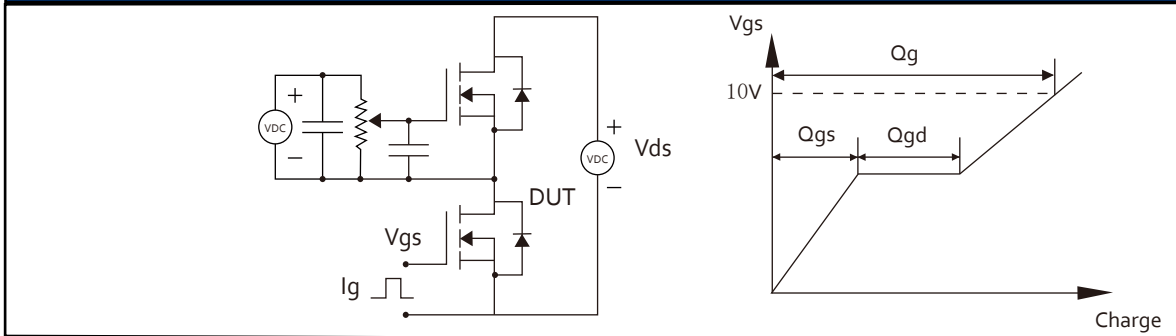


Fig.18 Resistive Switching Test Circuit & Waveforms

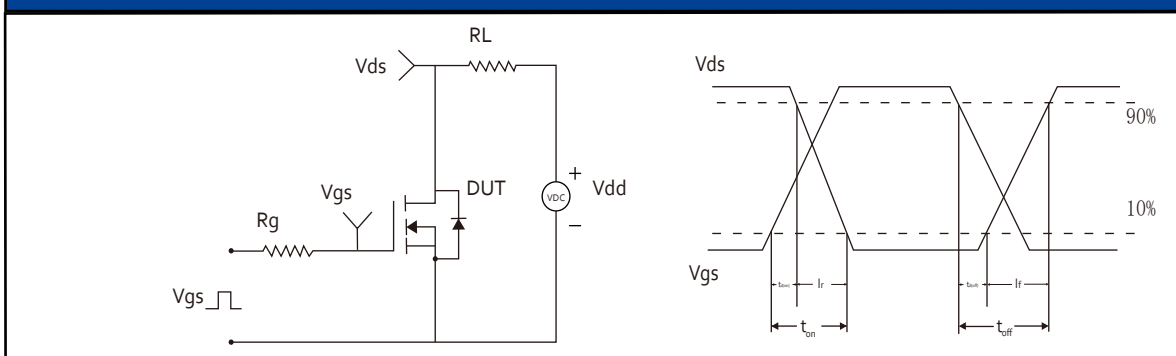


Fig.19 Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

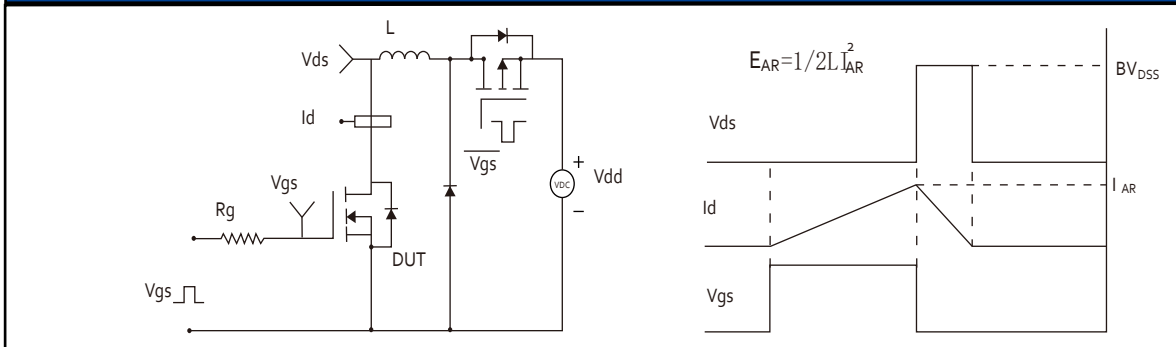
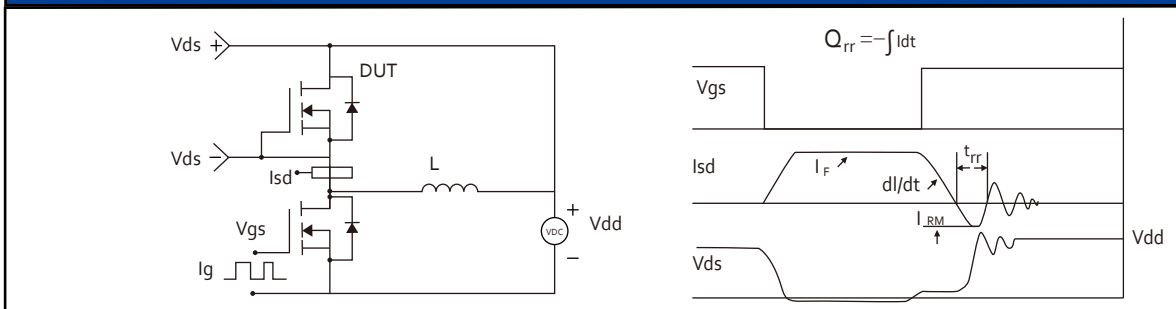
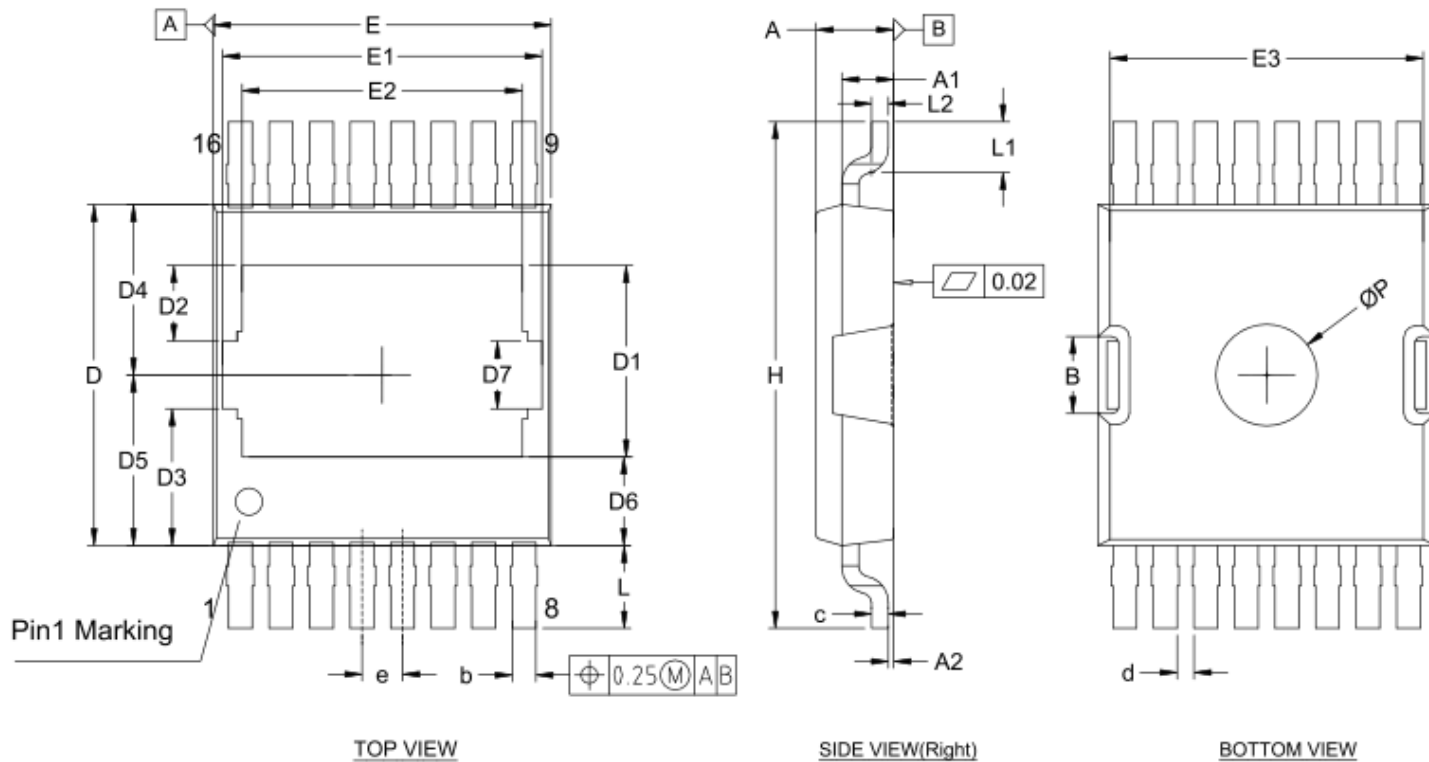


Fig.20 Diode Recovery Test Circuit & Waveforms



## 8. Package Dimensions

### TOLT Package



| Symbol   | Dimensions In Millimeters |            |        |
|----------|---------------------------|------------|--------|
|          | MIN.                      | NOM.       | MAX.   |
| A        | 2.250                     | 2.300      | 2.350  |
| A1       | 1.440                     | 1.540      | 1.640  |
| A2       | 0.010                     | -          | 0.160  |
| b        | 0.600                     | 0.700      | 0.800  |
| c        | 0.400                     | 0.500      | 0.600  |
| d        | 0.400                     | 0.500      | 0.600  |
| e        |                           |            |        |
| D        | 10.000                    | 10.100     | 10.300 |
| D1       | 5.470                     | 5.670      | 5.870  |
| D2       | 2.040                     | 2.240      | 2.440  |
| D3       |                           | 4.050 REF. |        |
| D4       |                           | 5.050 REF. |        |
| D5       |                           | 5.050 REF. |        |
| D6       |                           | 2.620 REF. |        |
| D7       |                           | 2.000 REF. |        |
| E        | 9.700                     | 10.000     | 10.100 |
| E1       |                           | 9.460 REF. |        |
| E2       | 8.100                     | 8.300      | 8.500  |
| E3       | 9.070                     | 9.270      | 9.470  |
| H        | 14.800                    | 15.000     | 15.200 |
| L        | 2.250                     | 2.450      | 2.650  |
| L1       | 1.350                     | 1.500      | 1.650  |
| L2       |                           | 0.500 BSC. |        |
| $\Phi P$ | 2.90                      | 3.000      | 3.100  |
| B        | 2.180                     | 2.280      | 2.380  |

## 9. Record of Document amendment

产品名称：LN023N080LT  
版权说明：镭诺电子（宁波）有限公司  
联系电话：4008887385

文档类型：产品手册  
公司主页：[www.leinuosemi.com](http://www.leinuosemi.com)

版本：01  
修改记录：  
1.初版发行