

General Description:

The LWN3016AD5D uses trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is PDFN5*6-8L, which accords with the ROHS standard and Halogen Free standard.

Features:

- Fast Switching
- Low Gate Charge and $R_{DS(ON)}$
- Low Reverse transfer capacitances

Applications:

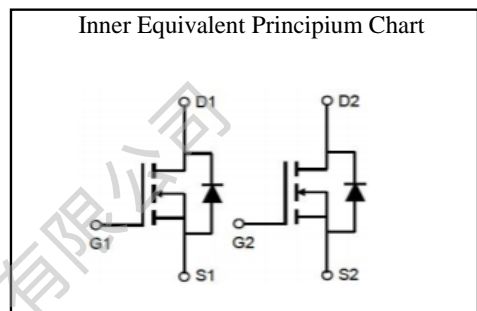
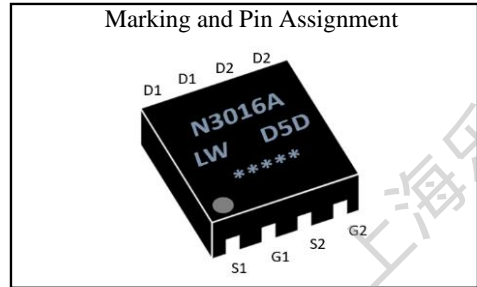
- DC-DC Converter
- Portable Equipment
- Power Management

100% DVDS Tested

100% Avalanche Tested



| | | |
|-------------------|-----|------------|
| V_{DSS} | 30 | V |
| I_D | 36 | A |
| P_D | 32 | W |
| $R_{DS(ON)}$ TYPE | 8.5 | m Ω |



Package Marking and Ordering Information:

| Marking | Part Number | Package | Packing | Qty. |
|--------------------|-------------|------------|---------|----------|
| N3016A/LW D5D/D.C. | LWN3016AD5D | PDFN5*6-8L | Reel | 5000 Pcs |

Absolute Maximum Ratings:

| Symbol | Parameter | Value | Units |
|----------------|--------------------------------------------------|-------------------------|------------------|
| V_{DSS} | Drain-to-Source Voltage | 30 | V |
| I_D | Continuous Drain Current | $T_C=25^\circ\text{C}$ | 36 |
| | Continuous Drain Current | $T_C=100^\circ\text{C}$ | 23 |
| I_{DM}^{a1} | Pulsed Drain Current | 144 | A |
| E_{AS}^{a2} | Single pulse avalanche energy | 50 | mJ |
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| P_D | Power Dissipation | 32 | W |
| T_J, T_{STG} | Operating Junction and Storage Temperature Range | 150, -55 to 150 | $^\circ\text{C}$ |
| T_L | Maximum Temperature for Soldering | 260 | $^\circ\text{C}$ |

Thermal Characteristics:

| Symbol | Parameter | Value | Units |
|-----------------|-----------------------------------------|-------|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case | 3.9 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 65 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristic ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified):

| Static Characteristics | | | | | | |
|------------------------|-----------------------------------|-------------------------------|-------|------|------|------------|
| Symbol | Parameter | Test Conditions | Value | | | Units |
| | | | Min. | Typ. | Max. | |
| V_{DSS} | Drain to Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 30 | -- | -- | V |
| I_{DSS} | Drain to Source Leakage Current | $V_{DS}=30V, V_{GS}=0V$ | -- | -- | 1.0 | μA |
| $I_{GSS(F)}$ | Gate to Source Forward Leakage | $V_{GS}=+20V, V_{DS}=0V$ | -- | -- | 100 | nA |
| $I_{GSS(R)}$ | Gate to Source Reverse Leakage | $V_{GS}=-20V, V_{DS}=0V$ | -- | -- | -100 | nA |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.0 | 1.5 | 2.0 | V |
| $R_{DS(ON)1}$ | Drain-to-Source On-Resistance | $V_{GS}=10V, I_D=20A$ | -- | 8.5 | 12 | m Ω |
| $R_{DS(ON)2}$ | Drain-to-Source On-Resistance | $V_{GS}=4.5V, I_D=10A$ | -- | 12 | 19.5 | m Ω |

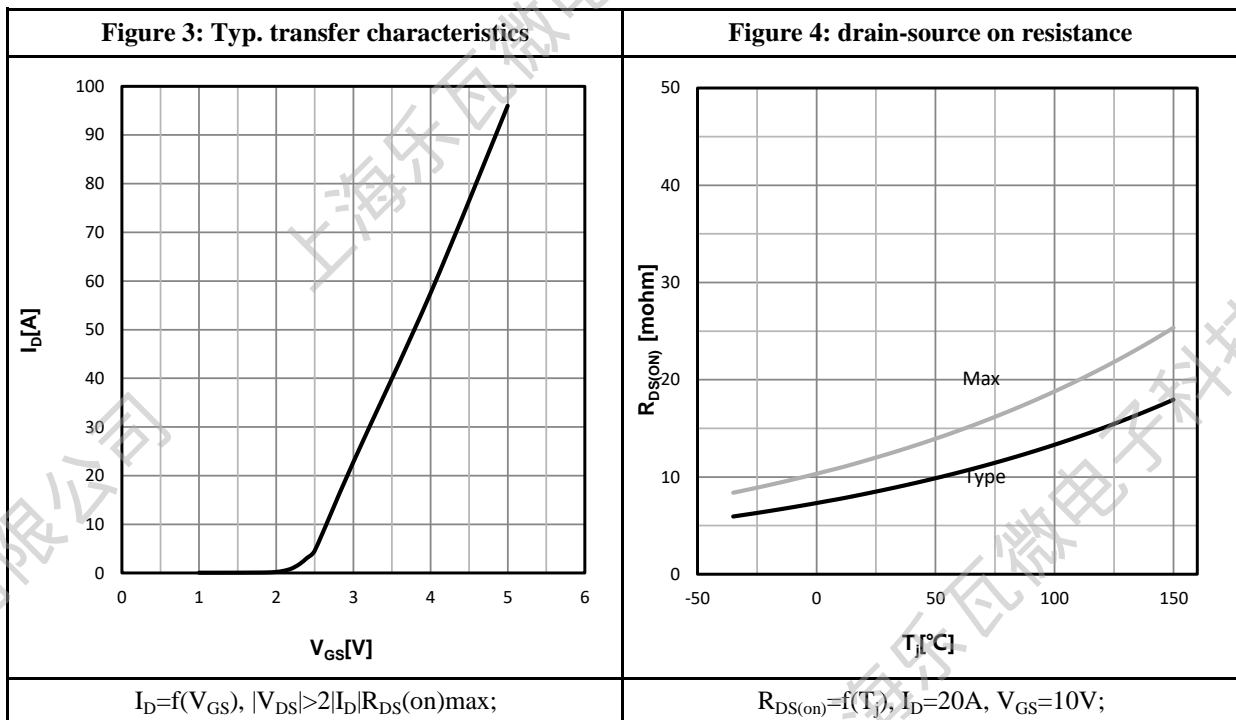
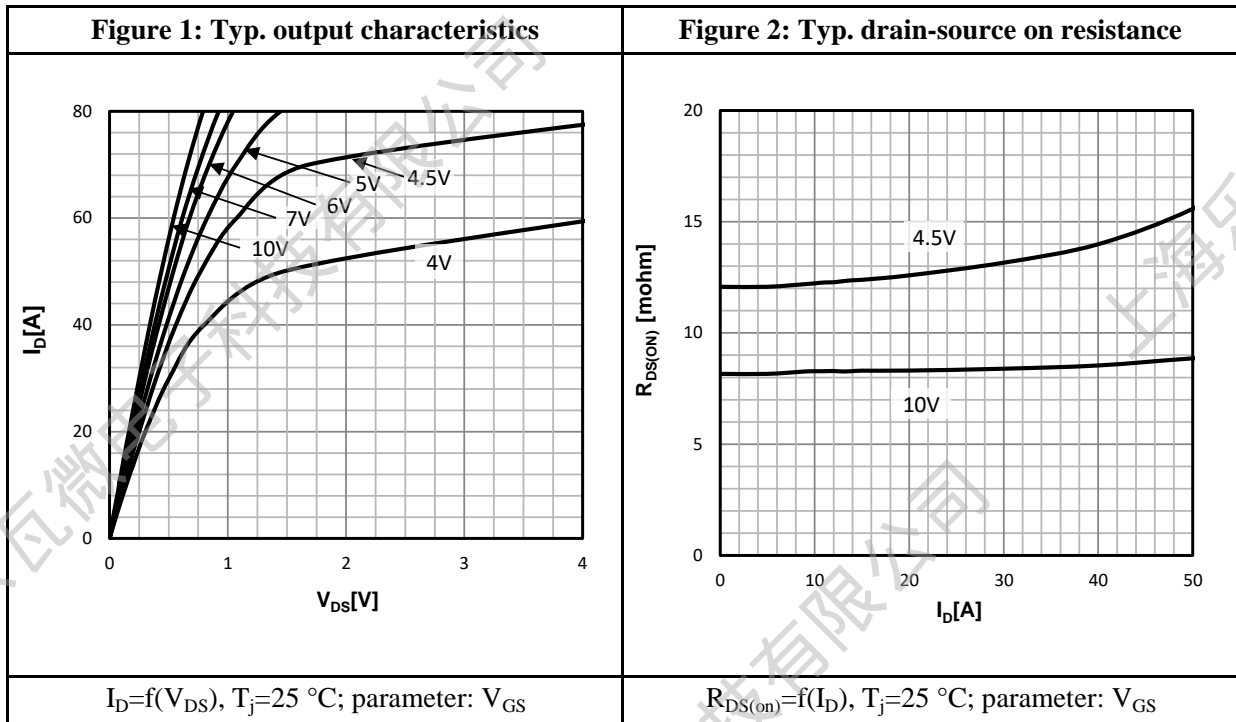
| Dynamic Characteristics | | | | | | |
|-------------------------|------------------------------|--------------------------|-------|------|------|----------|
| Symbol | Parameter | Test Conditions | Value | | | Units |
| | | | Min. | Typ. | Max. | |
| C_{iss} | Input Capacitance | $V_{GS} = 0V$ | -- | 758 | -- | pF |
| C_{oss} | Output Capacitance | $V_{DS} = 15V$ | -- | 111 | -- | |
| C_{riss} | Reverse Transfer Capacitance | $f = 1.0MHz$ | -- | 99 | -- | |
| R_G | Gate resistance | $V_{GS}=0V, V_{DS}$ Open | -- | 2.0 | -- | Ω |

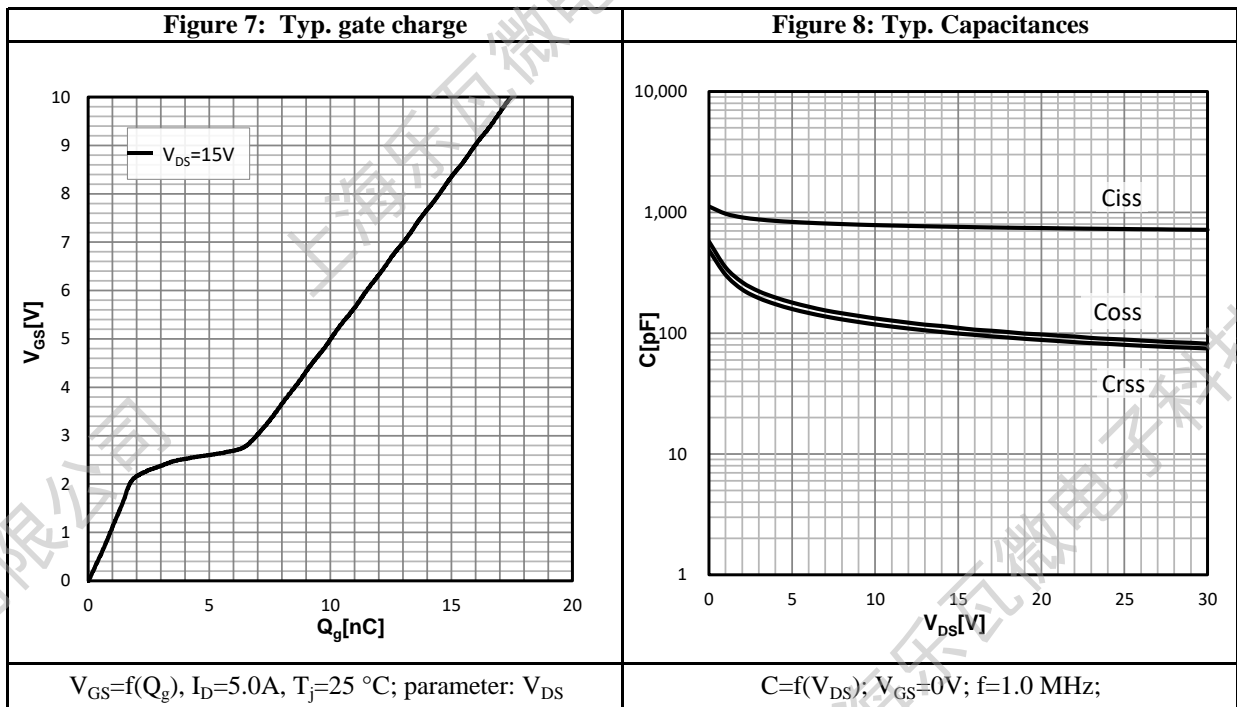
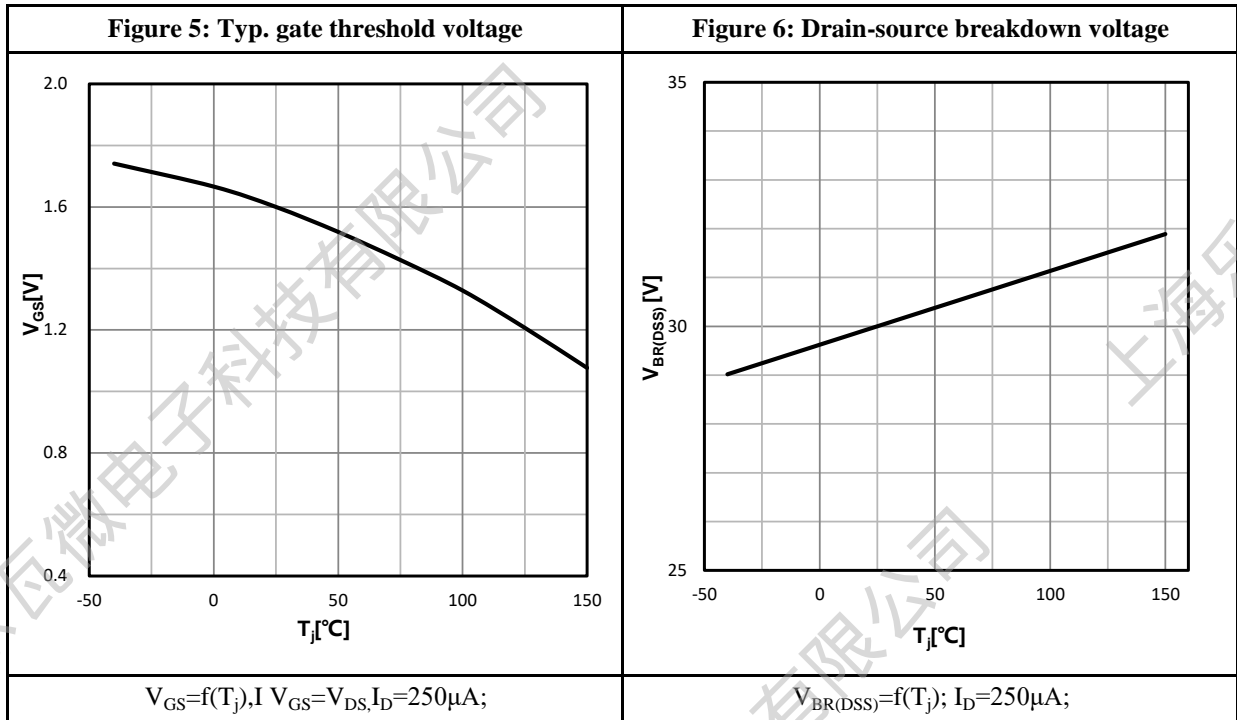
| Resistive Switching Characteristics | | | | | | |
|-------------------------------------|---------------------|-------------------|-------|------|------|-------|
| Symbol | Parameter | Test Conditions | Value | | | Units |
| | | | Min. | Typ. | Max. | |
| $t_{d(ON)}$ | Turn-on Delay Time | $I_D = 10A$ | -- | 5.0 | -- | ns |
| t_r | Rise Time | $V_{DS} = 15V$ | -- | 11.0 | -- | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | $V_{GS} = 10V$ | -- | 13.0 | -- | |
| t_f | Fall Time | $R_G = 4.0\Omega$ | -- | 6.0 | -- | |
| Q_g | Total Gate Charge | $V_{GS} = 10V$ | -- | 17.5 | -- | nC |
| Q_{gs} | Gate Source Charge | $V_{DS} = 15V$ | -- | 2.0 | -- | |
| Q_{gd} | Gate Drain Charge | $I_D = 5.0A$ | -- | 4.08 | -- | |

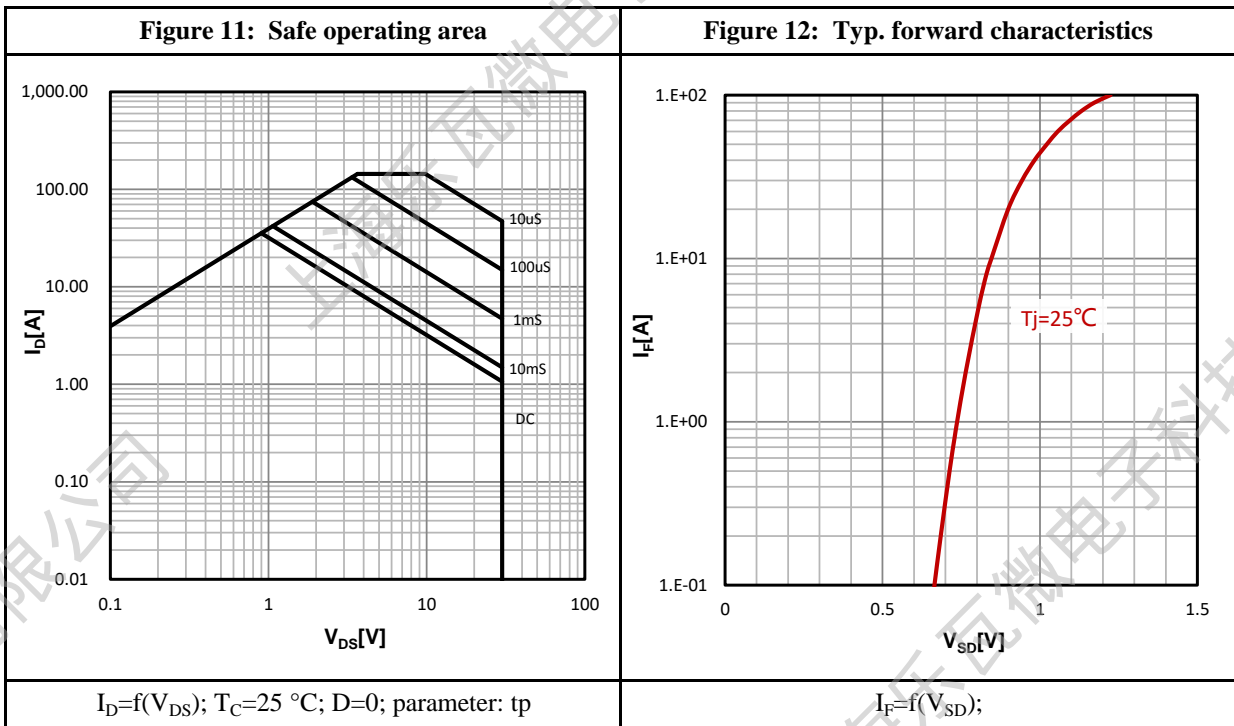
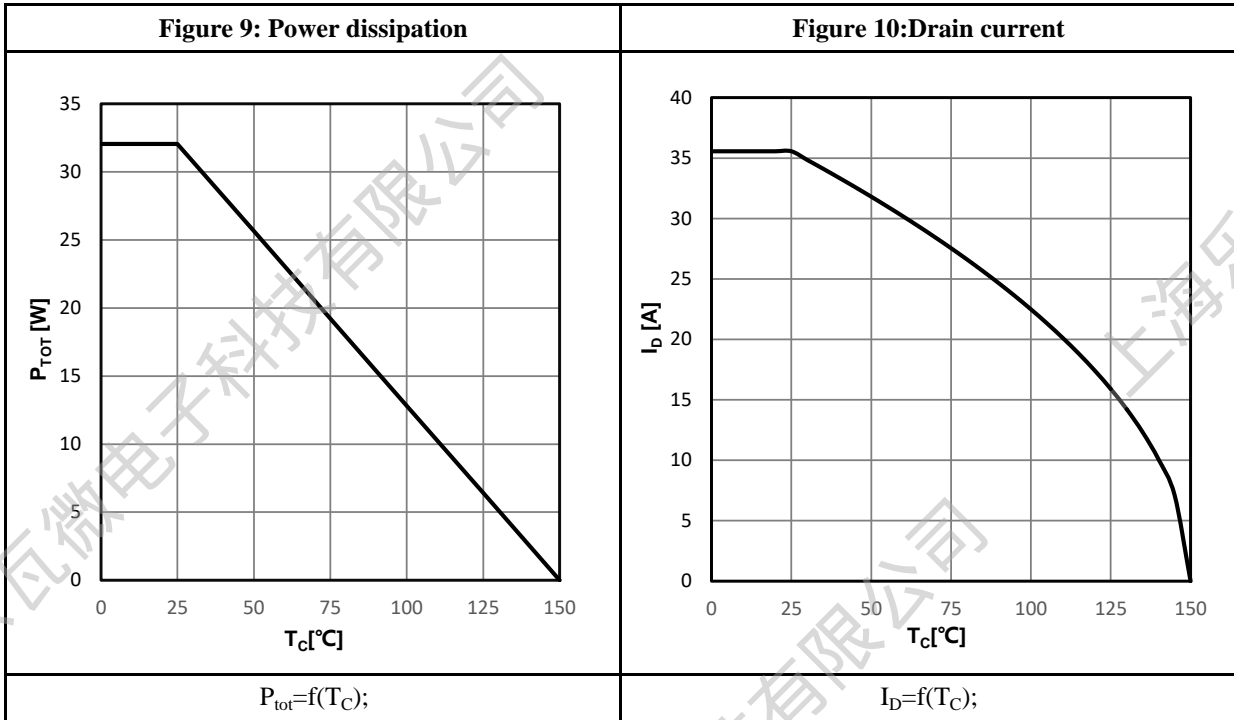
| Source-Drain Diode Characteristics | | | | | | |
|------------------------------------|-------------------------|----------------------------------|-------|------|------|-------|
| Symbol | Parameter | Test Conditions | Value | | | Units |
| | | | Min. | Typ. | Max. | |
| I_S | Diode Forward Current | $T_C = 25\text{ }^\circ\text{C}$ | -- | -- | 36 | A |
| V_{SD} | Diode Forward Voltage | $I_S=10A, V_{GS}=0V$ | -- | -- | 1.2 | V |
| t_{rr} | Reverse Recovery time | $I_S=10A, V_{DD}=15V$ | -- | 20 | -- | ns |
| Q_{rr} | Reverse Recovery Charge | $dI/dt=100A/\mu s$ | -- | 10 | -- | nC |

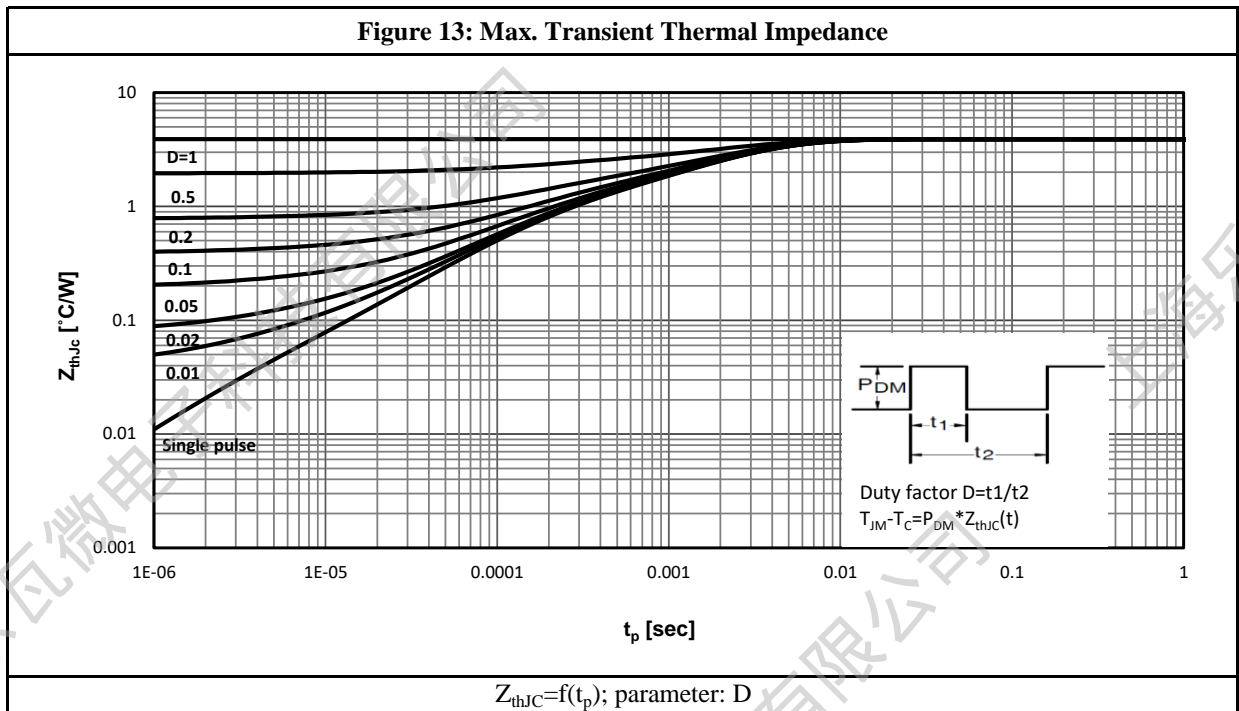
a1: Repetitive rating; pulse width limited by maximum junction temperature

a2: $V_{DD}=15V, L=0.5mH, R_G=25\Omega$, Starting $T_j=25\text{ }^\circ\text{C}$

Characteristics Curve:








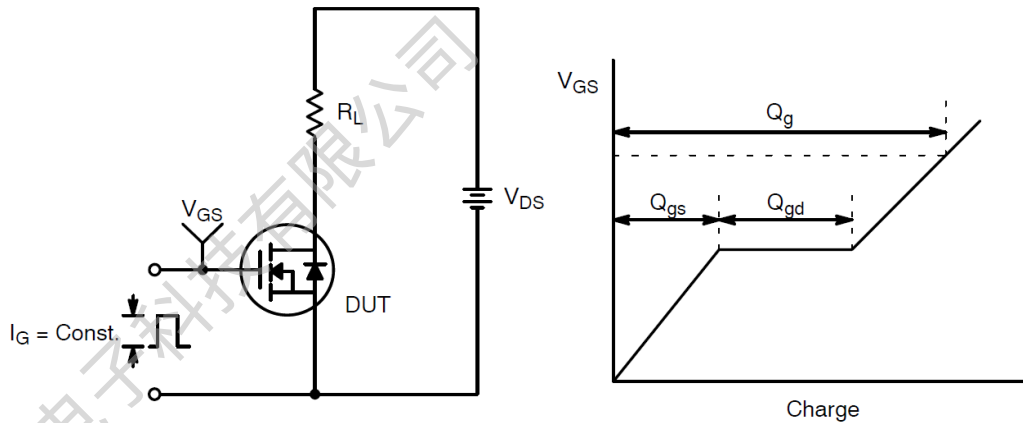
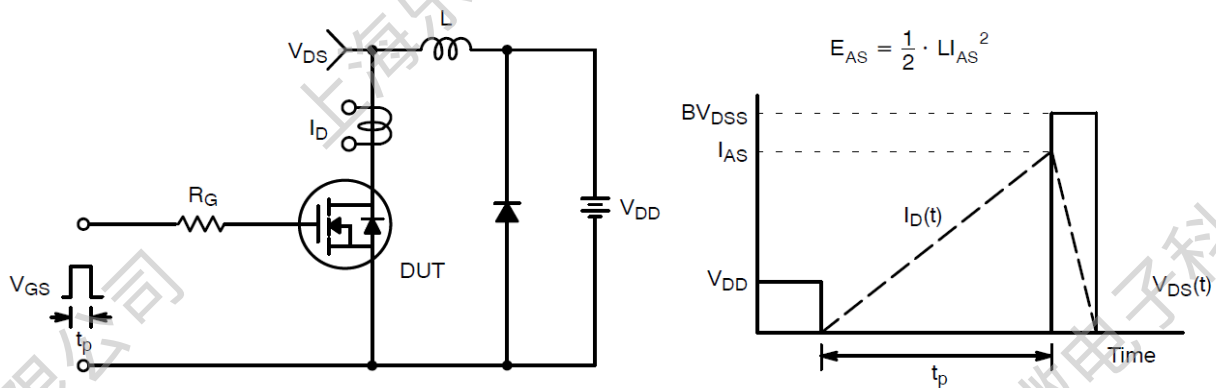
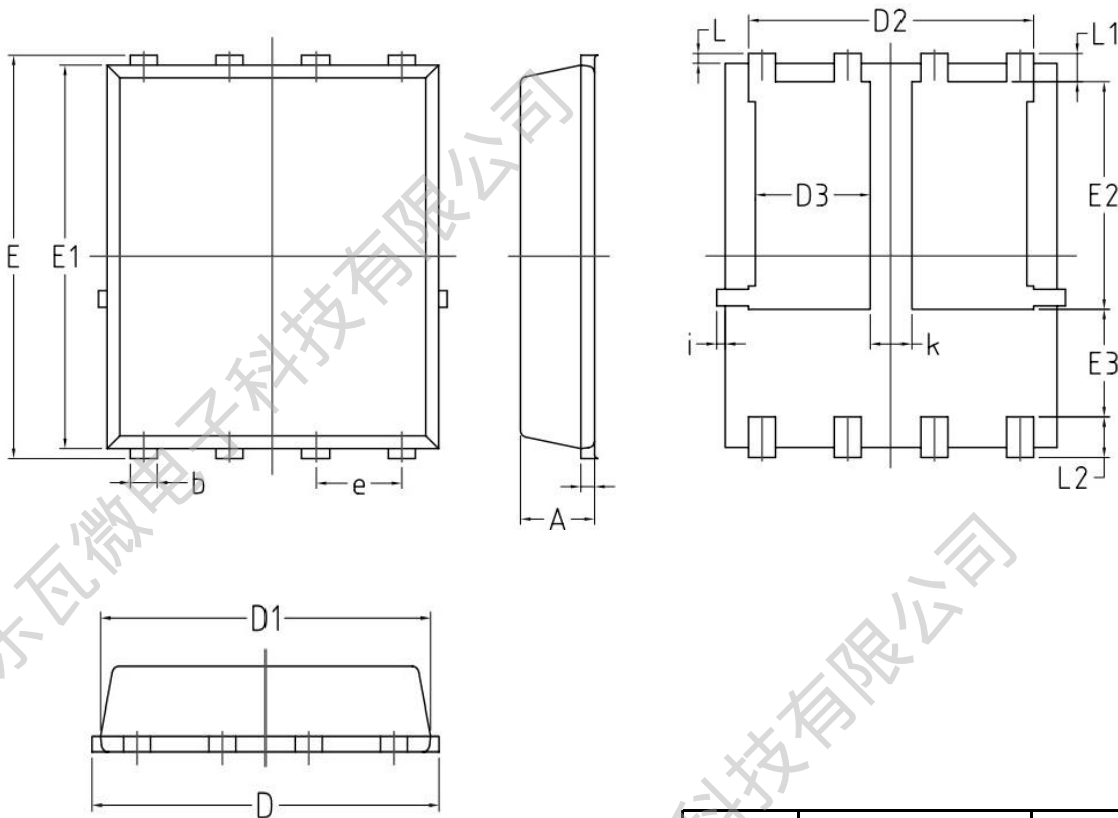
Test Circuit & Waveform:

Figure 14: Gate Charge Test Circuit & Waveform

Figure 15: Resistive Switching Test Circuit & Waveforms

Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline:


| Symbol | MM | | INCH | |
|-----------|-----------|------|------------|--------|
| | MIN | MAX | MIN | MAX |
| A | 1.03 | 1.17 | 0.0406 | 0.0461 |
| b | 0.34 | 0.48 | 0.0134 | 0.0189 |
| C | 0.203 BSC | | 0.0080 BSC | |
| D | 4.80 | 5.40 | 0.1890 | 0.2126 |
| D1 | 4.80 | 5.00 | 0.1890 | 0.1969 |
| D2 | 4.11 | 4.31 | 0.1620 | 0.1700 |
| D3 | 1.60 | 1.80 | 0.0629 | 0.0708 |
| E | 5.95 | 6.15 | 0.2343 | 0.2421 |
| E1 | 5.65 | 5.85 | 0.2224 | 0.2303 |
| E2 | 3.30 | 3.50 | 0.1300 | 0.1378 |
| E3 | 1.40 | / | 0.0551 | / |
| e | 1.27 BSC | | 0.05 BSC | |
| L | 0.05 | 0.25 | 0.0019 | 0.0098 |
| L1 | 0.38 | 0.50 | 0.0150 | 0.0197 |
| L2 | 0.38 | 0.71 | 0.0150 | 0.0280 |
| l | / | 0.18 | / | 0.0070 |
| k | 0.50 | 0.70 | 0.0197 | 0.0276 |

Revision History:

| Revison | Date | Descriptions |
|----------------|-------------|---------------------|
| Rev 1.0 | Feb.2024 | Initial Version |

Disclaimer:

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Mailing Address: Room 301, Building 2, No.1690 CaiLun Road, China (Shanghai) Pilot Free Trade Zone
Shanghai Lewa Micro-electronics Technology Co., Ltd