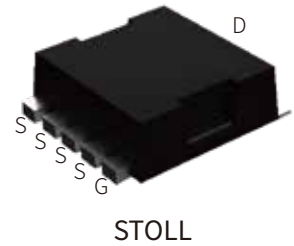


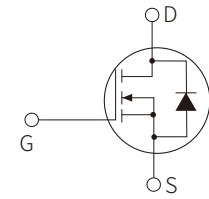
## FEATURES

- | Surface-mounted package
- | Super Trench
- | Advanced trench cell design
- | MSL3



## APPLICATION

- | BMS
- | Drones
- | High power inverter system
- | Light electric vehicles



Schematic Symbol

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## ABSOLUTE MAXIMUM RATINGS

| Parameter                                       |                         | Symbol            | Value      | Unit               |
|-------------------------------------------------|-------------------------|-------------------|------------|--------------------|
| Drain-Source Voltage $T_c=25^\circ\text{C}$     |                         | $V_{DS}$          | 40         | V                  |
| Drain Current ( Pulsed ) $T_c=25^\circ\text{C}$ |                         | $I_{DM}^{**}$     | 1400       | A                  |
| Drain Current ( DC )                            | $T_c=25^\circ\text{C}$  | $I_D^{***}$       | 350        | A                  |
|                                                 | $T_c=100^\circ\text{C}$ |                   | 255        | A                  |
| Gate-Source Voltage                             |                         | $V_{GS}$          | $\pm 20$   | V                  |
| Drain power dissipation $T_c=25^\circ\text{C}$  |                         | $P_{tot}$         | 174        | W                  |
| Diode Forward Current $T_c=25^\circ\text{C}$    |                         | $I_S$             | 350        | A                  |
| Junction Temperature                            |                         | $T_J$             | 150        | $^\circ\text{C}$   |
| Storage Temperature                             |                         | $T_{STG}$         | -55 to 150 | $^\circ\text{C}$   |
| Single Pulsed Avalanche Energy $L=1.0\text{mH}$ |                         | $E_{AS}$          | 1860       | mJ                 |
| Thermal Resistance – Junction to Ambient        |                         | $R_{\theta JA}^*$ | 48         | $^\circ\text{C/W}$ |
| Thermal Resistance- Junction to Case            |                         | $R_{\theta JC}$   | 0.72       | $^\circ\text{C/W}$ |

Notes:

\* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10$  sec

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

\*\*\* Limited by bonding wire

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

| Parameter                                | Symbol         | Test Conditions                                                              | Min. | Typ. | Max.      | Unit       |
|------------------------------------------|----------------|------------------------------------------------------------------------------|------|------|-----------|------------|
| Static Characteristics                   |                |                                                                              |      |      |           |            |
| Drain-source Breakdown Voltage           | $V_{(BR)DSS}$  | $V_{GS}=0V, I_{DS}=250\mu A$                                                 | 40   |      |           | V          |
| Gate Threshold Voltage                   | $V_{GS(th)}$   | $V_{DS}=V_{GS}, I_{DS}=250\mu A$                                             | 2    |      | 3         | V          |
| Drain Leakage Current                    | $I_{DSS}$      | $V_{DS}=32V, V_{GS}=0V$                                                      |      |      | 1         | $\mu A$    |
| Gate Leakage Current                     | $I_{GSS}$      | $V_{GS}=\pm 20V, V_{DS}=0V$                                                  |      |      | $\pm 100$ | nA         |
| On-State Resistance                      | $R_{DS(on)}^a$ | $V_{GS}=10V, I_{DS}=50A$                                                     |      | 0.5  | 0.55      | m $\Omega$ |
|                                          |                | $V_{GS}=6V, I_{DS}=30A$                                                      |      | 0.85 | 1.05      | m $\Omega$ |
| Diode Characteristics                    |                |                                                                              |      |      |           |            |
| Diode Forward Voltage                    | $V_{SD}^a$     | $I_{SD}=50A, V_{GS}=0V$                                                      |      |      | 1.3       | V          |
| Reverse Recovery Time                    | $t_{rr}$       | $I_{DS}=50A, V_{GS}=0V$<br>$di_{SD}/dt=100A/\mu s$                           |      | 61   |           | nS         |
| Reverse Recovery Charge                  | $Q_{rr}$       |                                                                              |      | 62   |           | nC         |
| Dynamic Characteristics <sup>b</sup>     |                |                                                                              |      |      |           |            |
| Input capacitance                        | $C_{iss}$      | $V_{GS}=0V, V_{DS}=20V,$<br>Frequency = 1 MHz                                |      | 8032 |           | pF         |
| Output capacitance                       | $C_{oss}$      |                                                                              |      | 3951 |           | pF         |
| Reverse transfer capacitance             | $C_{rss}$      |                                                                              |      | 76   |           | pF         |
| Turn-on Delay Time                       | $t_{d(on)}$    | $V_{DS}=20V, V_{GEN}=10V$<br>$R_G=3.9\Omega, R_L=0.4\Omega,$<br>$I_{DS}=50A$ |      | 18   |           | nS         |
| Turn-on Rise Time                        | $t_r$          |                                                                              |      | 133  |           | nS         |
| Turn-Off Delay Time                      | $t_{d(off)}$   |                                                                              |      | 98   |           | nS         |
| Turn-Off Fall Time                       | $t_f$          |                                                                              |      | 76   |           | nS         |
| Gate Charge Characteristics <sup>b</sup> |                |                                                                              |      |      |           |            |
| Total Gate Charge                        | $Q_g$          | $V_{DS}=20V, V_{GS}=10V, I_{DS}=50A$                                         |      | 133  |           | nC         |
| Gate-Source Charge                       | $Q_{gs}$       |                                                                              |      | 36   |           | nC         |
| Gate-Drain Charge                        | $Q_{gd}$       |                                                                              |      | 27   |           | nC         |

Notes:

a : Pulse test ; pulse width ≤ 300μs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

## PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

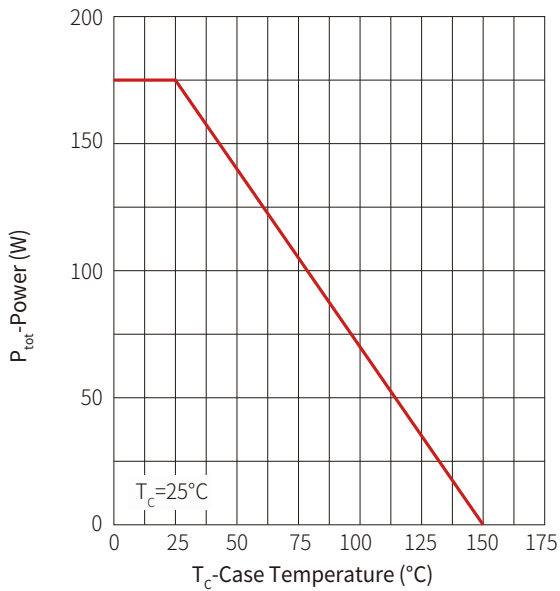


Figure2: Current Capability

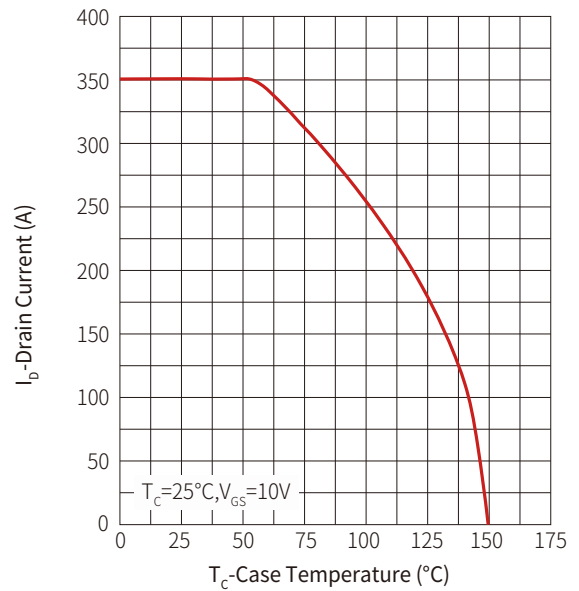


Figure3: Safe operating Area

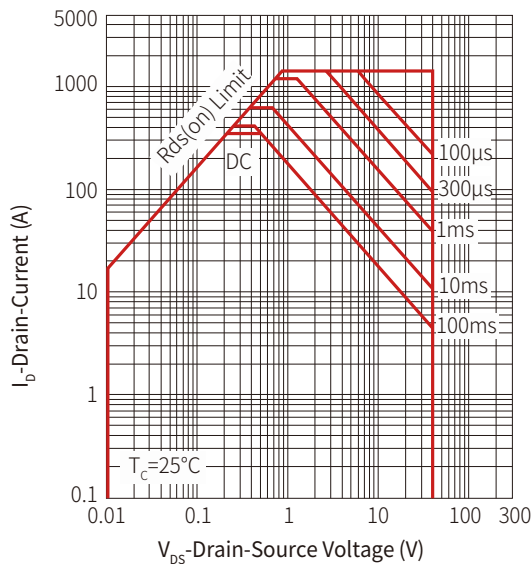
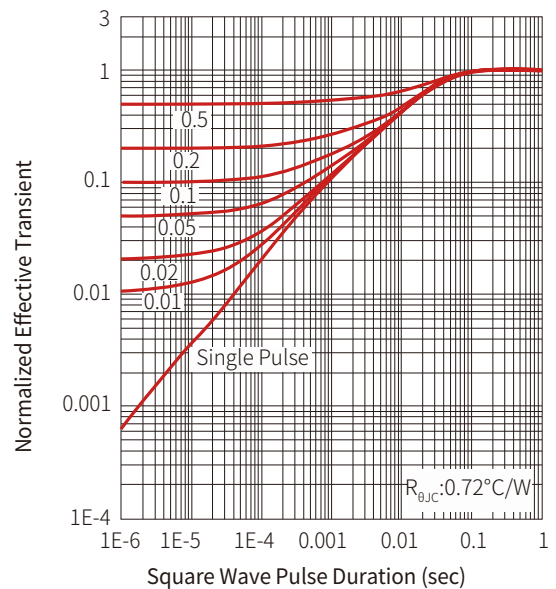
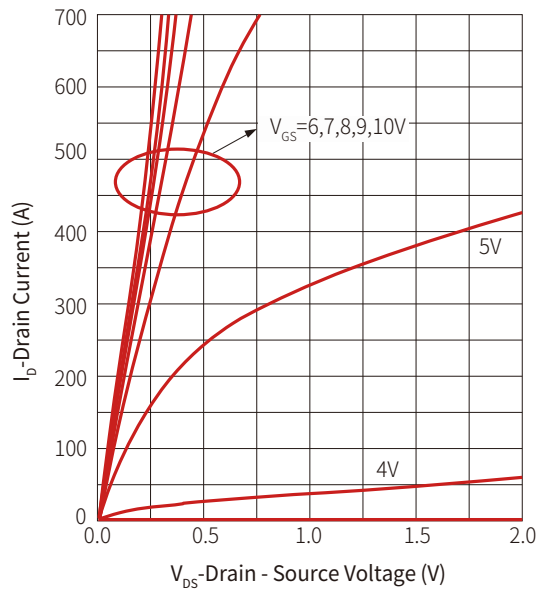
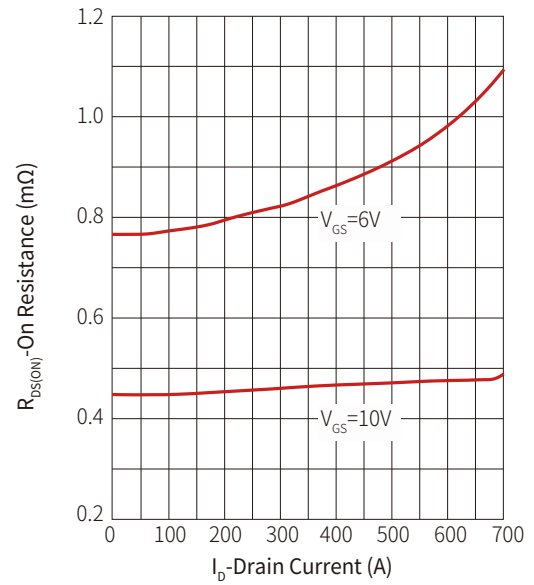
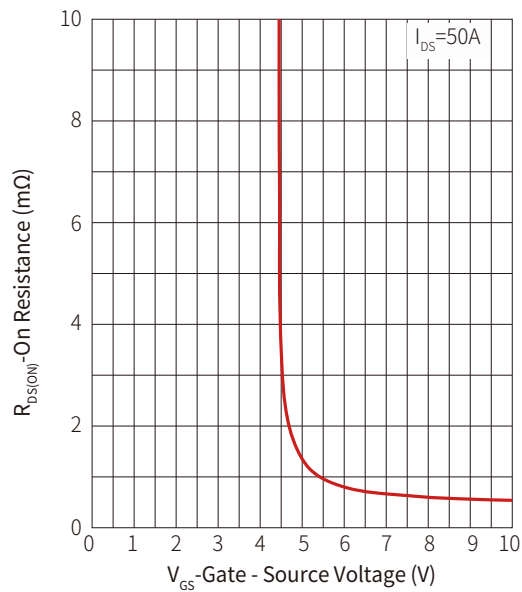
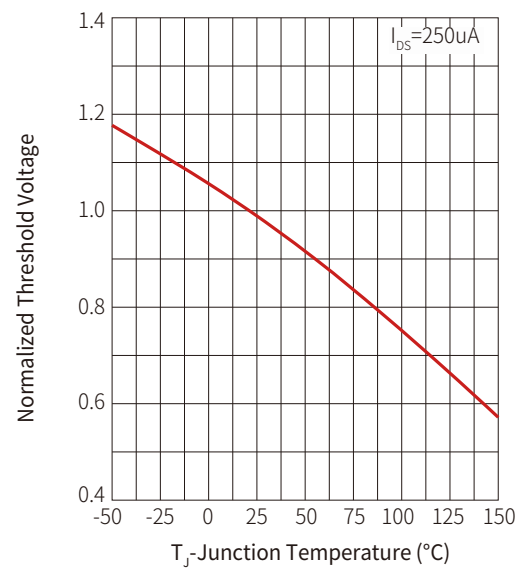
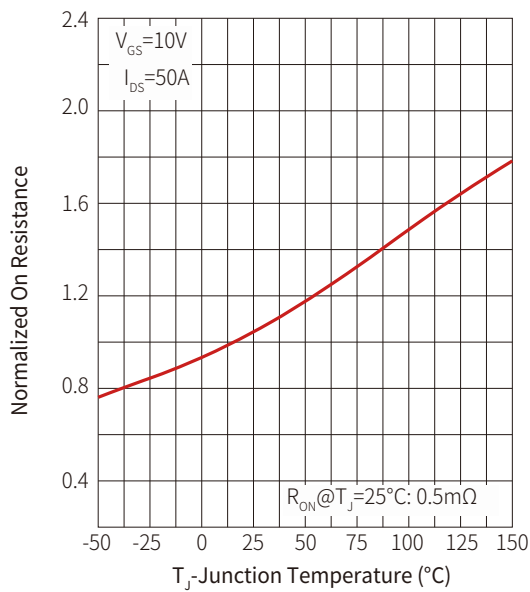
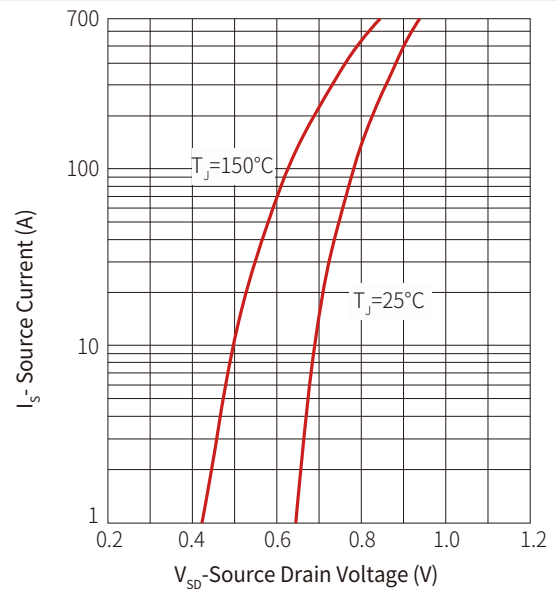
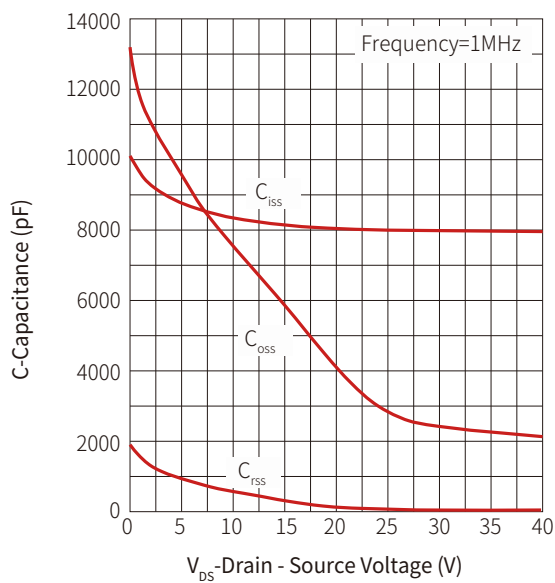
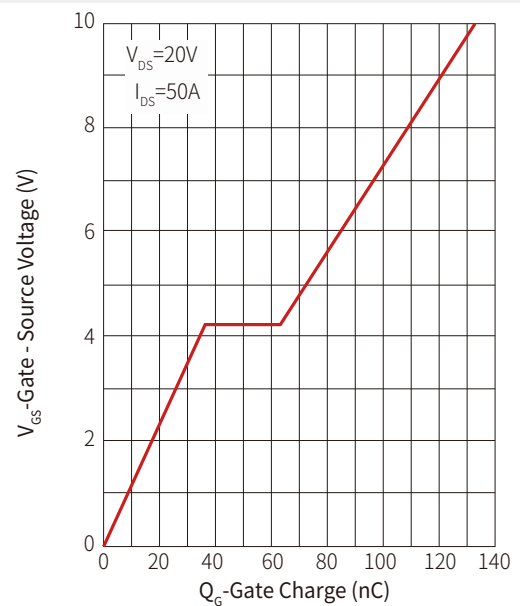


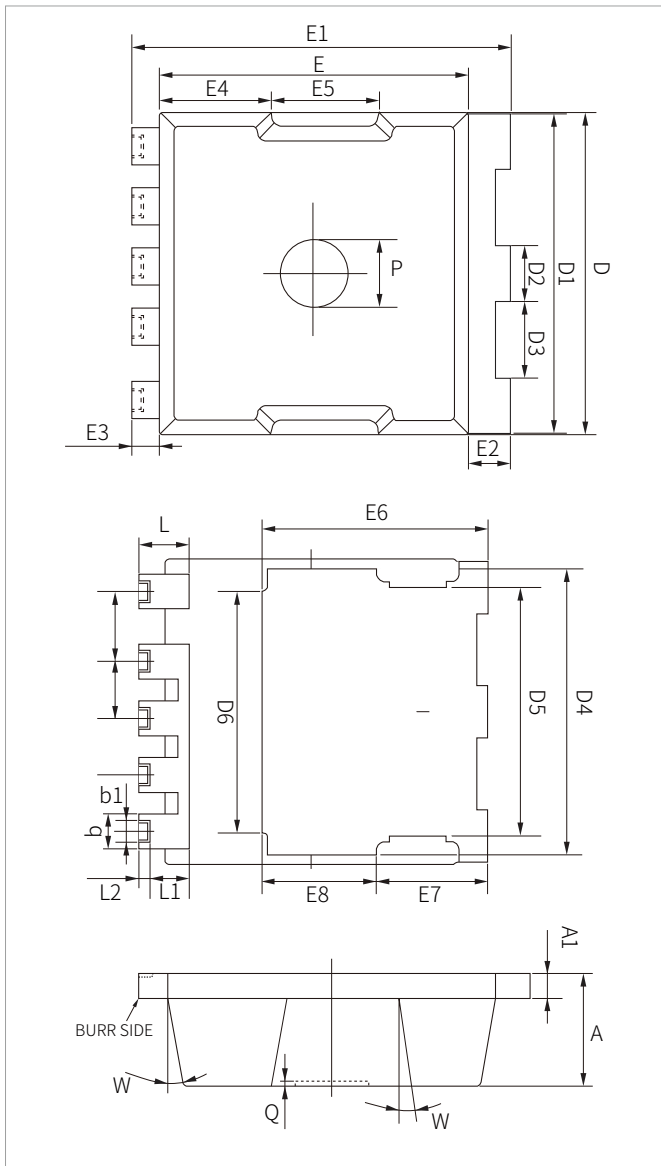
Figure 4: Transient Thermal Impedance



**Figure 5: Output Characteristics****Figure 6: On Resistance****Figure 7: Transfer Characteristics****Figure 8: Normalized Threshold Voltage**

**Figure 9: Normalized On Resistance**

**Figure 10: Diode Forward Current**

**Figure 11: Capacitance**

**Figure 12: Gate Charge**


## STOLL PACKAGE INFORMATION



| Ref. | Millimeters |      | Inches |        |
|------|-------------|------|--------|--------|
|      | Min.        | Max. | Min.   | Max.   |
| A    | 2.20        | 2.40 | 0.087  | 0.094  |
| A1   | 0.40        | 0.60 | 0.016  | 0.024  |
| b    | 0.70        | 0.90 | 0.028  | 0.035  |
| b1   | 0.40        | 0.60 | 0.016  | 0.024  |
| D    | 6.80        | 7.20 | 0.268  | 0.283  |
| D1   | 6.80        | 7.20 | 0.268  | 0.283  |
| D2   | 1.10        | 1.30 | 0.043  | 0.051  |
| D3   | 1.55        | 1.75 | 0.061  | 0.069  |
| D4   | 6.56        |      | 0.258  |        |
| D5   | 5.70        |      | 0.224  |        |
| D6   | 5.56        |      | 0.219  |        |
| E    | 6.50        | 6.90 | 0.256  | 0.272  |
| E1   | 7.80        | 8.20 | 0.307  | 0.323  |
| E2   | 0.60        | 0.80 | 0.024  | 0.031  |
| E3   | 0.50        | 0.70 | 0.020  | 0.028  |
| E4   | 2.43        |      | 0.096  |        |
| E5   | 2.30        |      | 0.091  |        |
| E6   | 5.18        |      | 0.204  |        |
| E7   | 2.55        |      | 0.100  |        |
| E8   | 2.50        |      | 0.098  |        |
| e    | 1.60        |      | 0.063  |        |
| e1   | 1.30        |      | 0.051  |        |
| L    | 1.05        | 1.25 | 0.041  | 0.049  |
| L1   | 0.80        | 1.00 | 0.031  | 0.039  |
| L2   | 0.15        | 0.35 | 0.006  | 0.014  |
| P    | 1.40        | 1.60 | 0.055  | 0.063  |
| Q    | 0           | 0.10 | 0      | 0.004  |
| W    | 8°          | 11°  | 0.315° | 0.433° |

## ORDERING INFORMATION

| Part Number | Component Package | Marking                                                                                         | QTY/Reel | QTY/Box  |
|-------------|-------------------|-------------------------------------------------------------------------------------------------|----------|----------|
| SNM005N04ST | STOLL             |  005N04 XXXX | 2000PCS  | 14000PCS |

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