

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 30V           | 0.65mΩ@10V      | 430A  |
|               | 0.9mΩ@4.5V      |       |



**合肥矽普半导体**

Siliup Semiconductor Technology Co., Ltd

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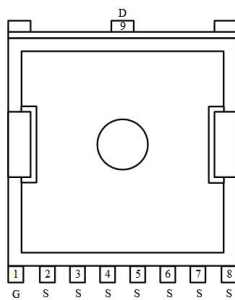
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

## Applications

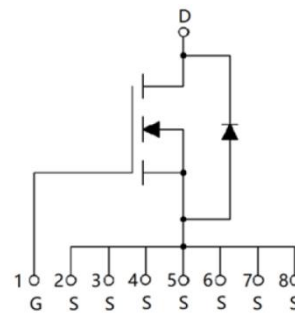
- PWM Application
- Hard switched and high frequency circuits
- Power Management

## Package

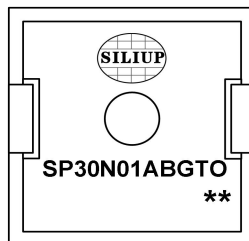


TOLL

## Circuit diagram



## Marking



SP30N01ABGTO :Device Code  
\*\* :Week Code

## Order Information

| Device       | Package | Unit/Tape |
|--------------|---------|-----------|
| SP30N01ABGTO | TOLL    | 2000      |

**Absolute maximum ratings (Ta=25°C, unless otherwise noted)**

| Parameter                                  | Symbol          | Rating     | Units |
|--------------------------------------------|-----------------|------------|-------|
| Drain-Source Voltage                       | $V_{DS}$        | 30         | V     |
| Gate-Source Voltage                        | $V_{GS}$        | $\pm 20$   | V     |
| Continuous Drain Current1 (Tc=25°C)        | $I_D$           | 430        | A     |
| Continuous Drain Current1 (Tc=100°C)       | $I_D$           | 282        | A     |
| Pulsed Drain Current                       | $I_{DM}$        | 1720       | A     |
| Single Pulse Avalanche Energy <sup>1</sup> | $E_{AS}$        | 1900       | mJ    |
| Power Dissipation (Tc=25°C)                | $P_D$           | 238        | W     |
| Thermal Resistance Junction-to-Case        | $R_{\theta JC}$ | 0.52       | °C/W  |
| Storage Temperature Range                  | $T_{STG}$       | -55 to 150 | °C    |
| Operating Junction Temperature Range       | $T_J$           | -55 to 150 | °C    |

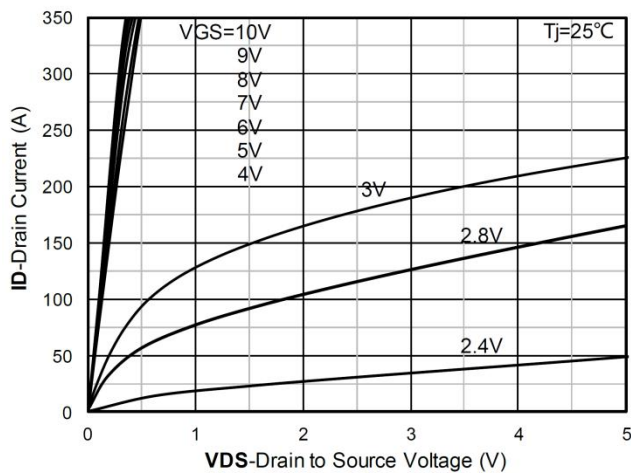
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

| Parameter                             | Symbol            | Conditions                           | Min. | Typ. | Max. | Unit |
|---------------------------------------|-------------------|--------------------------------------|------|------|------|------|
| Static Characteristics                |                   |                                      |      |      |      |      |
| Drain-Source Breakdown Voltage        | BV <sub>DSS</sub> | VGS=0V , ID=250uA                    | 30   | -    | -    | V    |
| Drain-Source Leakage Current          | IDSS              | VDS=24V , VGS=0V , TJ=25℃            | -    | -    | 1    | uA   |
| Gate-Source Leakage Current           | IGSS              | VGS=±20V , VDS=0V                    | -    | -    | ±100 | nA   |
| Gate Threshold Voltage                | VGS(th)           | VGS=VDS , ID =250uA                  | 1    | 1.6  | 2.5  | V    |
| Static Drain-Source On-Resistance     | RDS(ON)           | VGS=10V , ID=50A                     | -    | 0.65 | 0.8  | mΩ   |
|                                       |                   | VGS=4.5V , ID=30A                    | -    | 0.9  | 1.2  |      |
| Dynamic characteristics               |                   |                                      |      |      |      |      |
| Input Capacitance                     | Ciss              | VDS=15V , VGS=0V , f=1MHz            | -    | 6200 | -    | pF   |
| Output Capacitance                    | Coss              |                                      | -    | 3600 | -    |      |
| Reverse Transfer Capacitance          | Crss              |                                      | -    | 160  | -    |      |
| Total Gate Charge                     | Qg                | VDS=15V , VGS=10V , ID=20A           | -    | 98   | -    | nC   |
| Gate-Source Charge                    | Qgs               |                                      | -    | 18   | -    |      |
| Gate-Drain Charge                     | Qgd               |                                      | -    | 15   | -    |      |
| Switching Characteristics             |                   |                                      |      |      |      |      |
| Turn-On Delay Time                    | Td(on)            | VDD=15V , VGS=10V , RG=1.6Ω , ID=20A | -    | 16   | -    | nS   |
| Rise Time                             | Tr                |                                      | -    | 38   | -    |      |
| Turn-Off Delay Time                   | Td(off)           |                                      | -    | 88   | -    |      |
| Fall Time                             | Tf                |                                      | -    | 23   | -    |      |
| Diode Characteristics                 |                   |                                      |      |      |      |      |
| Diode Forward Voltage                 | VSD               | VGS=0V , IS=1A , TJ=25℃              | -    | -    | 1.2  | V    |
| Maximum Body-Diode Continuous Current | IS                |                                      | -    | -    | 430  | A    |
| Reverse Recovery Time                 | Trr               | IS=20A, di/dt=100A/us, TJ=25℃        | -    | 55   | -    | nS   |
| Reverse Recovery Charge               | Qrr               |                                      | -    | 125  | -    | nC   |

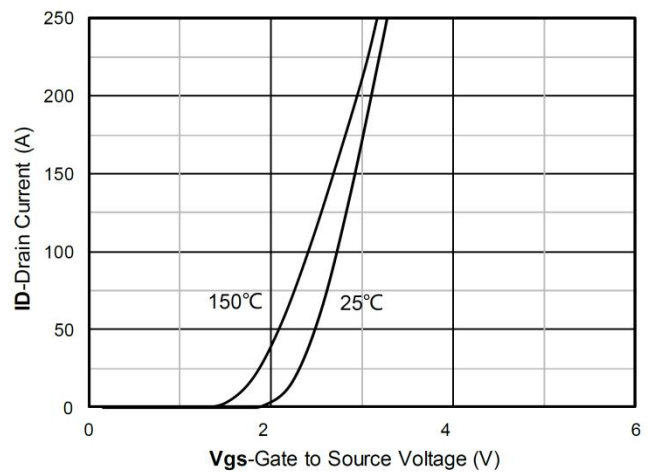
**Note :**

1. The test condition is  $V_{DD}=15V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

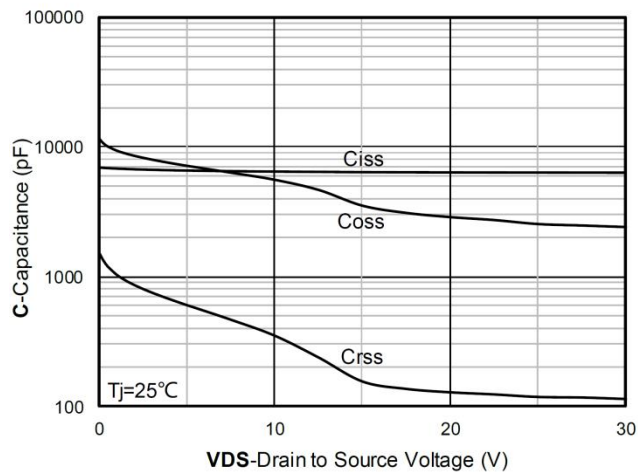
## Typical Characteristics



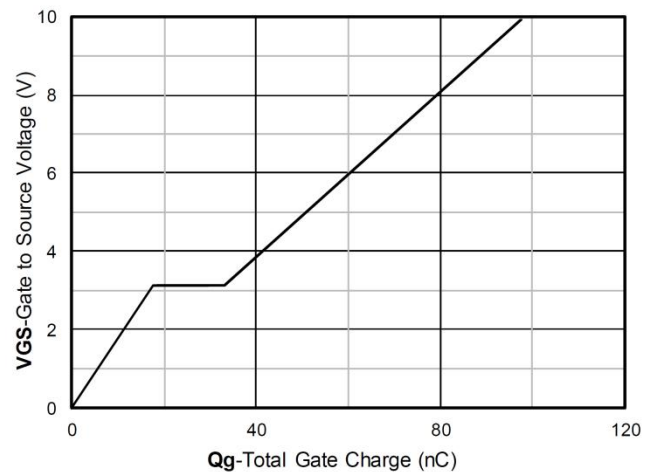
Output Characteristics



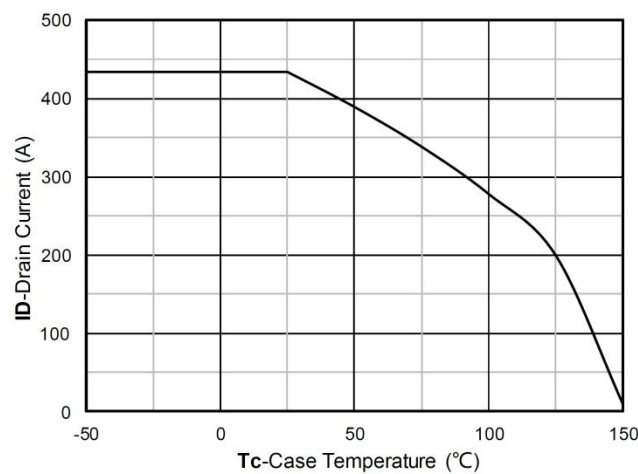
Transfer Characteristics



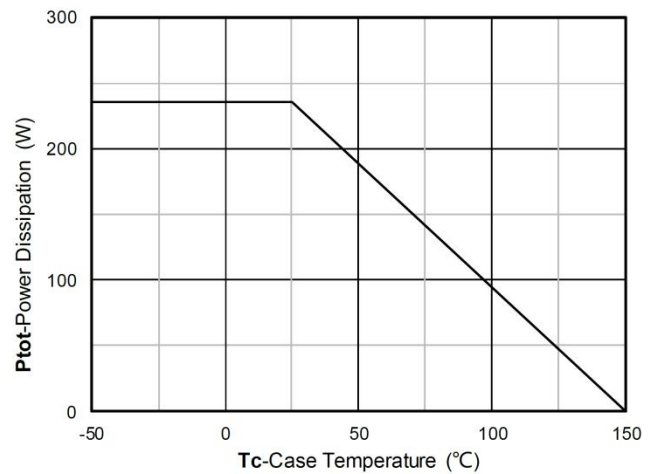
Capacitance Characteristics



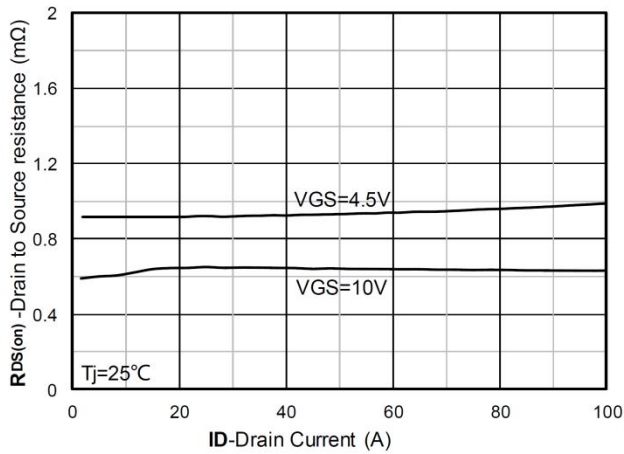
Gate Charge



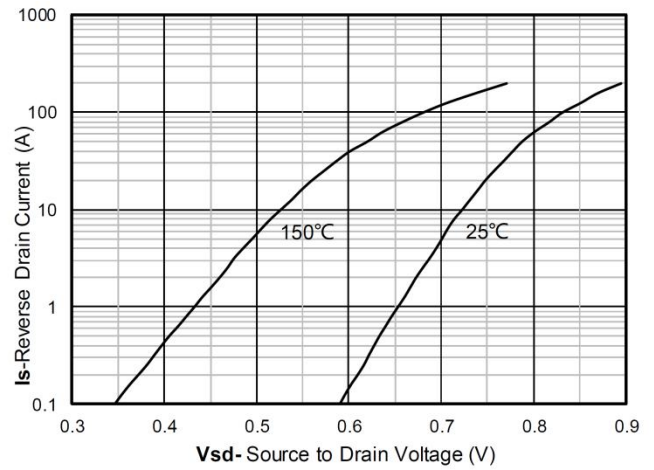
Current dissipation



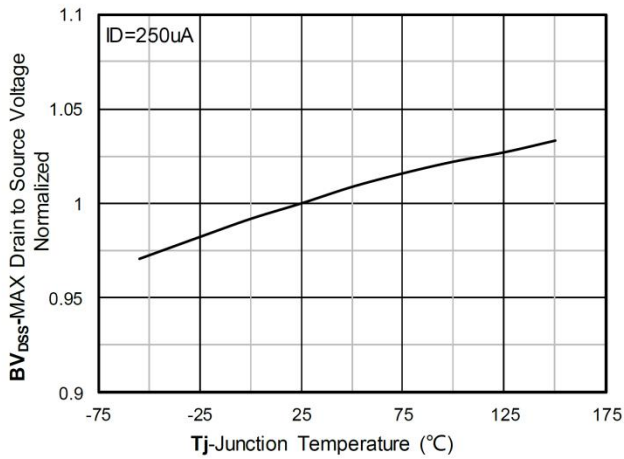
Power dissipation



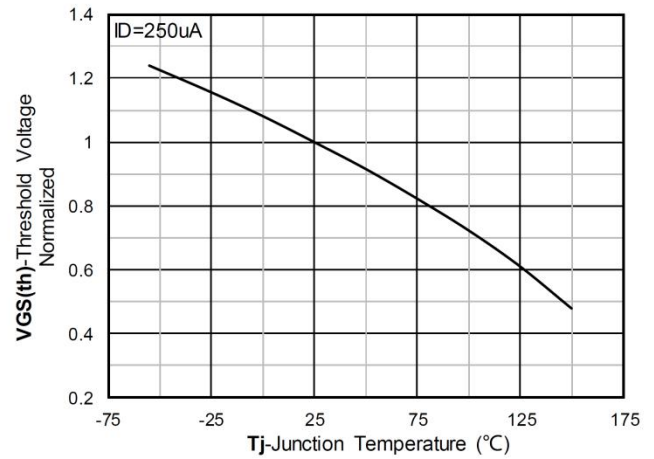
$R_{DS(on)}$  VS Drain Current



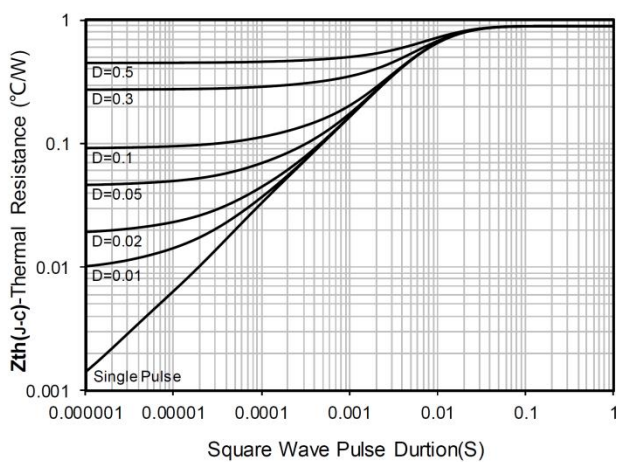
Forward characteristics of reverse diode



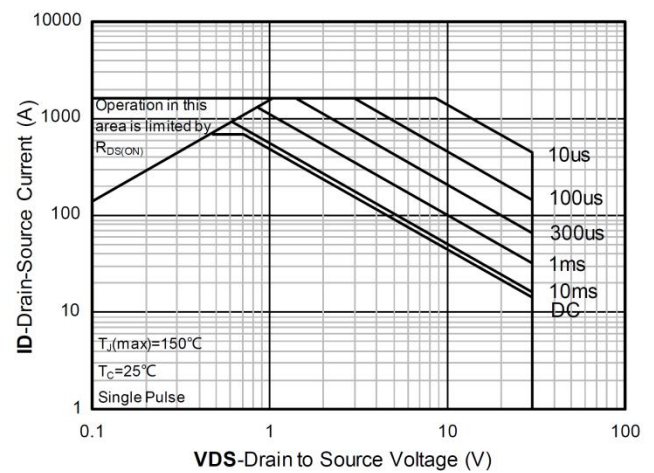
Normalized breakdown voltage



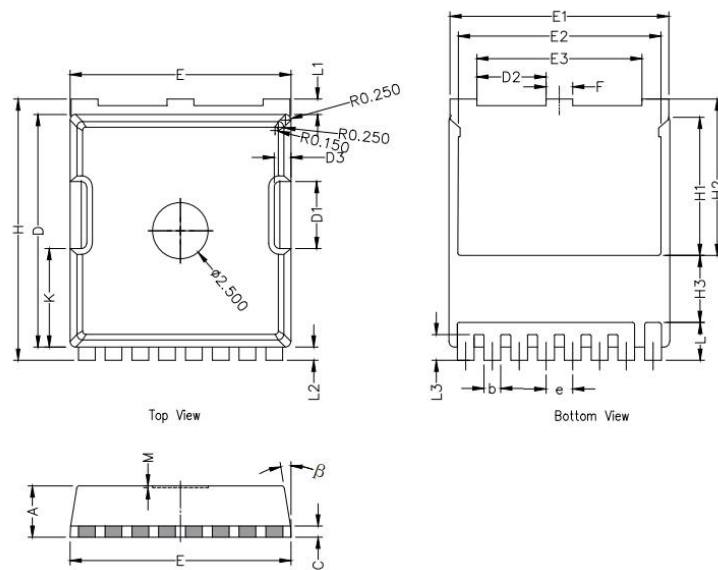
Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

**TOLL Package Information**


| Symbol  | Dimensions In Millimeters |       |       |
|---------|---------------------------|-------|-------|
|         | Min.                      | Nom.  | Max.  |
| A       | 2.20                      | 2.30  | 2.40  |
| b       | 0.65                      | 0.75  | 0.85  |
| C       | 0.508 REF                 |       |       |
| D       | 10.25                     | 10.40 | 10.55 |
| D1      | 2.85                      | 3.00  | 3.15  |
| E       | 9.75                      | 9.90  | 10.05 |
| E1      | 9.65                      | 9.80  | 9.95  |
| E2      | 8.95                      | 9.10  | 9.25  |
| E3      | 7.25                      | 7.40  | 7.55  |
| e       | 1.20 BSC                  |       |       |
| F       | 1.05                      | 1.20  | 1.35  |
| H       | 11.55                     | 11.70 | 11.85 |
| H1      | 6.03                      | 6.18  | 6.33  |
| H2      | 6.85                      | 7.00  | 7.15  |
| H3      | 3.00 BSC                  |       |       |
| L       | 1.55                      | 1.70  | 1.85  |
| L1      | 0.55                      | 0.7   | 0.85  |
| L2      | 0.45                      | 0.6   | 0.75  |
| M       | 0.08 REF.                 |       |       |
| $\beta$ | 8°                        | 10°   | 12°   |
| K       | 4.25                      | 4.40  | 4.55  |