

Product Summary

| | | |
|---------------|-----------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
| 150V | 13mΩ@10V | 55A |



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

技术 品质 服务

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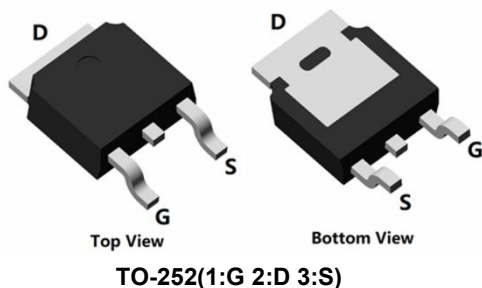
Feature

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

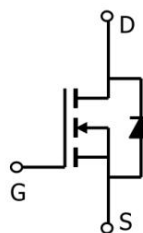
Applications

- Power switching application
- DC-DC Converter
- Power Management

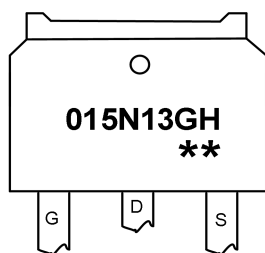
Package



Circuit diagram



Marking



015N13GH : Product code
** : Week code

Order Information

| Device | Package | Unit/Tube |
|--------------|---------|-----------|
| SP015N13GHTH | TO-252 | 2500 |

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

| Parameter | Symbol | Rating | Unit |
|--|-----------------|------------|------|
| Drain-Source Voltage | V_{DS} | 150 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current (Tc=25°C) | I_D | 55 | A |
| Continuous Drain Current (Tc=100°C) | I_D | 38 | A |
| Pulsed Drain Current | I_{DM} | 220 | A |
| Single Pulse Avalanche Energy ¹ | E_{AS} | 272 | mJ |
| Power Dissipation (Tc=25°C) | P_D | 135 | W |
| Thermal Resistance Junction-to-Case | $R_{\theta JC}$ | 0.93 | °C/W |
| Storage Temperature Range | T_{STG} | -55 to 150 | °C |
| Operating Junction Temperature Range | T_J | -55 to 150 | °C |

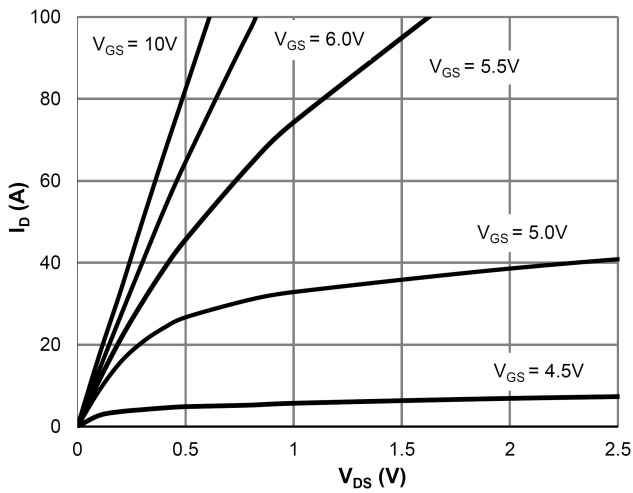
Electrical characteristics (Ta=25°C, unless otherwise noted)

| Characteristics | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|--------------|--|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $ID = 250\mu A, VGS = 0V$ | 150 | - | - | V |
| Drain Cut-Off Current | $IDSS$ | $VDS = 120V, VGS = 0V$ | - | - | 1 | μA |
| Gate Leakage Current | $IGSS$ | $VGS = \pm 20V, VDS = 0V$ | - | - | ± 0.1 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $VDS = VGS, ID = 250\mu A$ | 2.0 | 3.0 | 4.0 | V |
| Drain-Source ON Resistance | $R_{DS(ON)}$ | $VGS = 10V, ID = 20A$ | - | 13 | 16 | m Ω |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $VDS = 75V, VGS = 0V, f = 1.0MHz$ | - | 2230 | - | pF |
| Output Capacitance | C_{oss} | | - | 293 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 22 | - | |
| Total Gate Charge | Q_g | $VDS=75V, VGS=10V, ID=20A$ | - | 30 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 5.8 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 7 | - | |
| Switching Characteristics | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $VGS = 10V, VDS = 50V, ID = 20A$ $RG = 6\Omega$ | - | 13 | - | nS |
| Rise Time | t_r | | - | 25 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 31 | - | |
| Fall Time | t_f | | - | 25 | - | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Source-Drain Diode Forward Voltage | V_{SD} | $I_s = 1A, VGS = 0V$ | - | - | 1.2 | V |
| Maximum Body-Diode Continuous Current | I_s | | - | - | 55 | A |
| Body Diode Reverse Recovery Time | T_{rr} | $I_s=20A, di/dt=100A/us, T_J=25^{\circ}C$ | - | 65 | - | nS |
| Body Diode Reverse Recovery Charge | Q_{rr} | | - | 180 | - | nC |

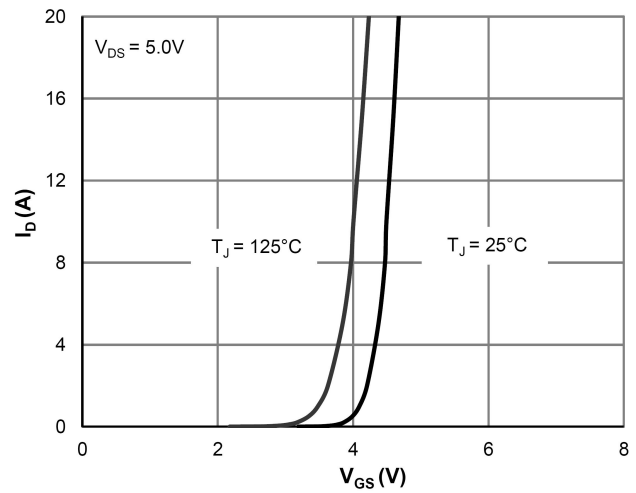
Note :

1. The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$;

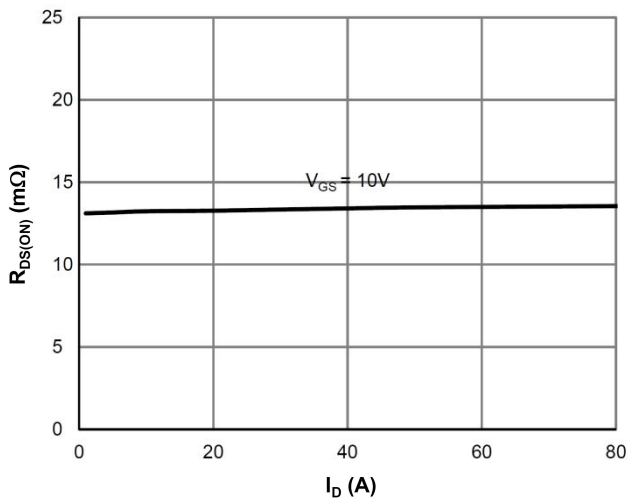
Typical Characteristic



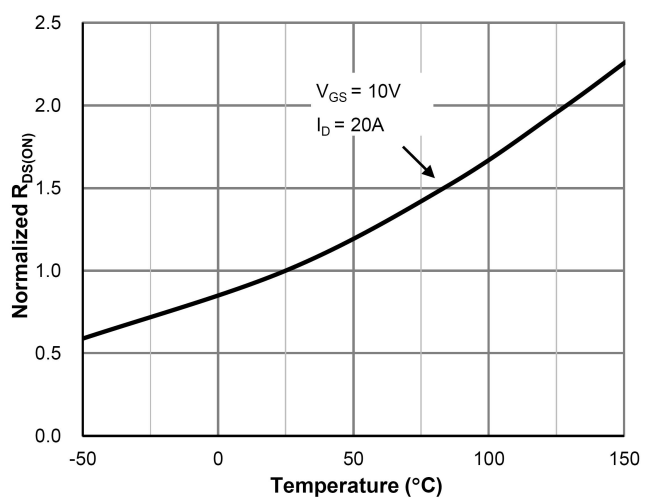
Saturation Characteristics



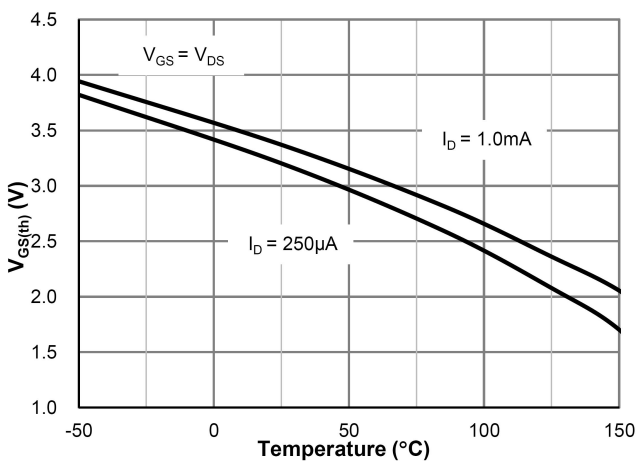
Transfer Characteristics



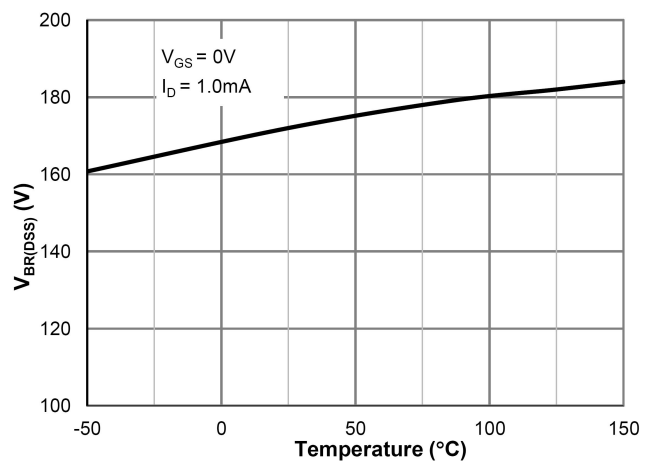
$R_{DS(ON)}$ vs. Drain Current



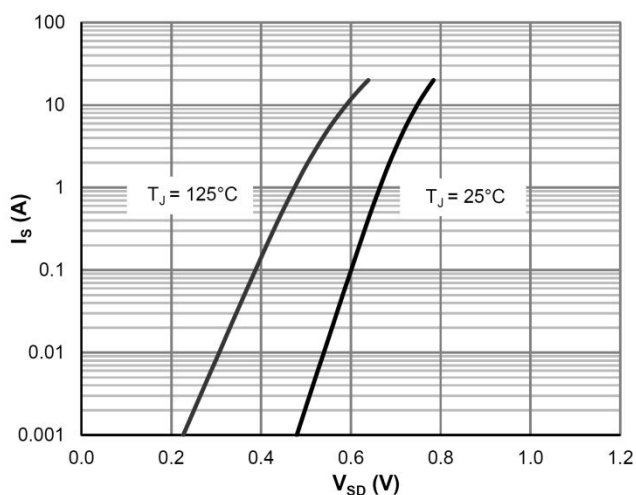
$R_{DS(ON)}$ vs. Junction Temperature



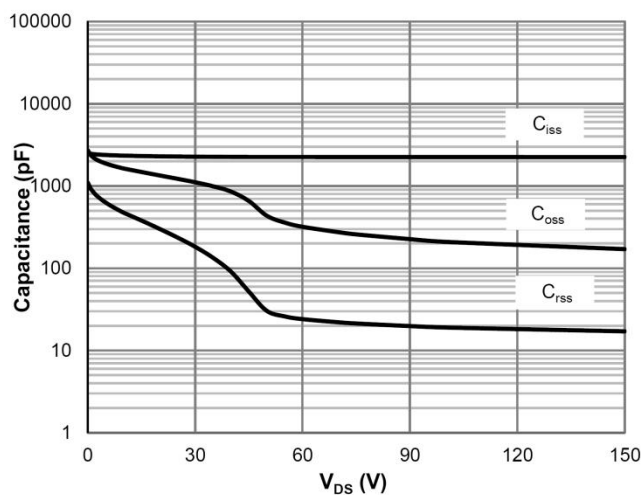
$V_{GS(th)}$ vs. Junction Temperature



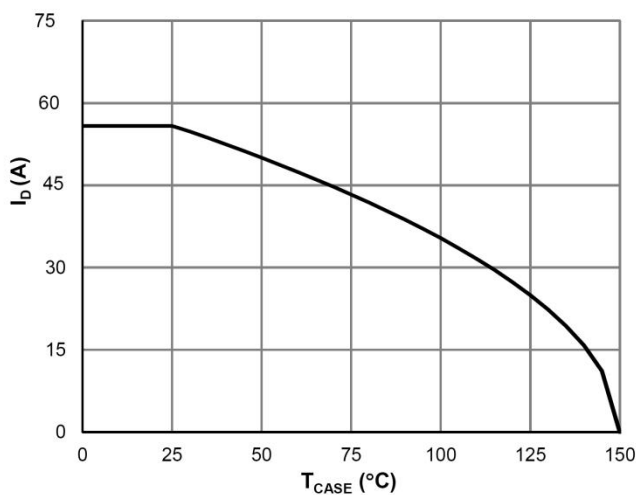
$V_{BR(DSS)}$ vs. Junction Temperature



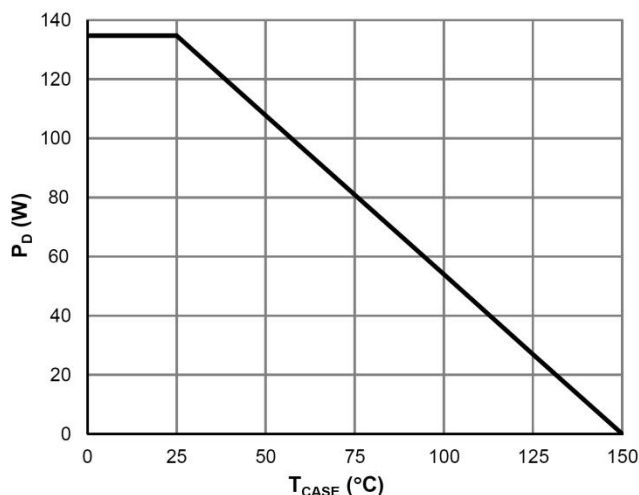
Body-Diode Characteristics



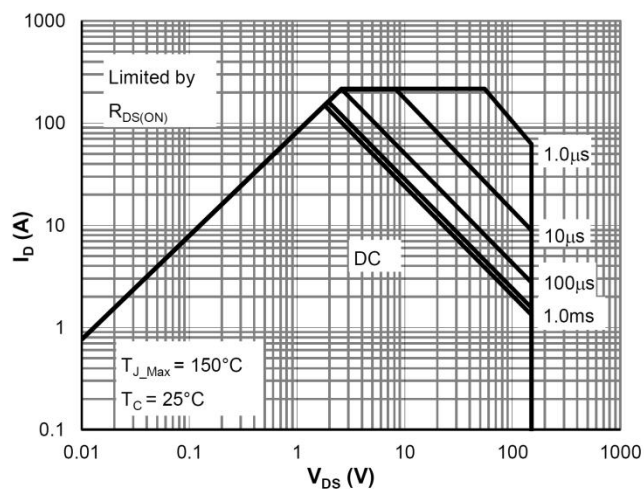
Capacitance Characteristics



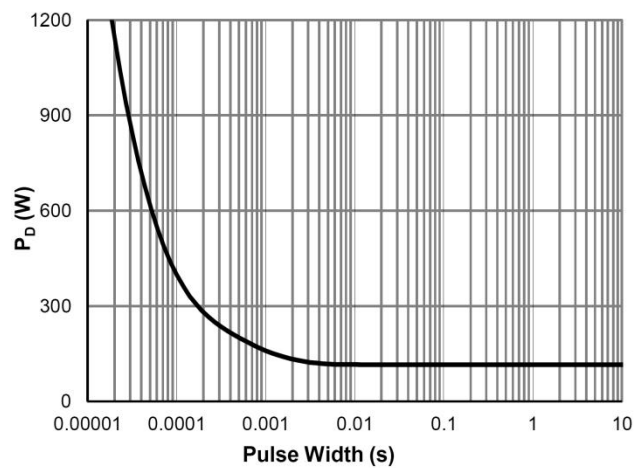
Current De-rating



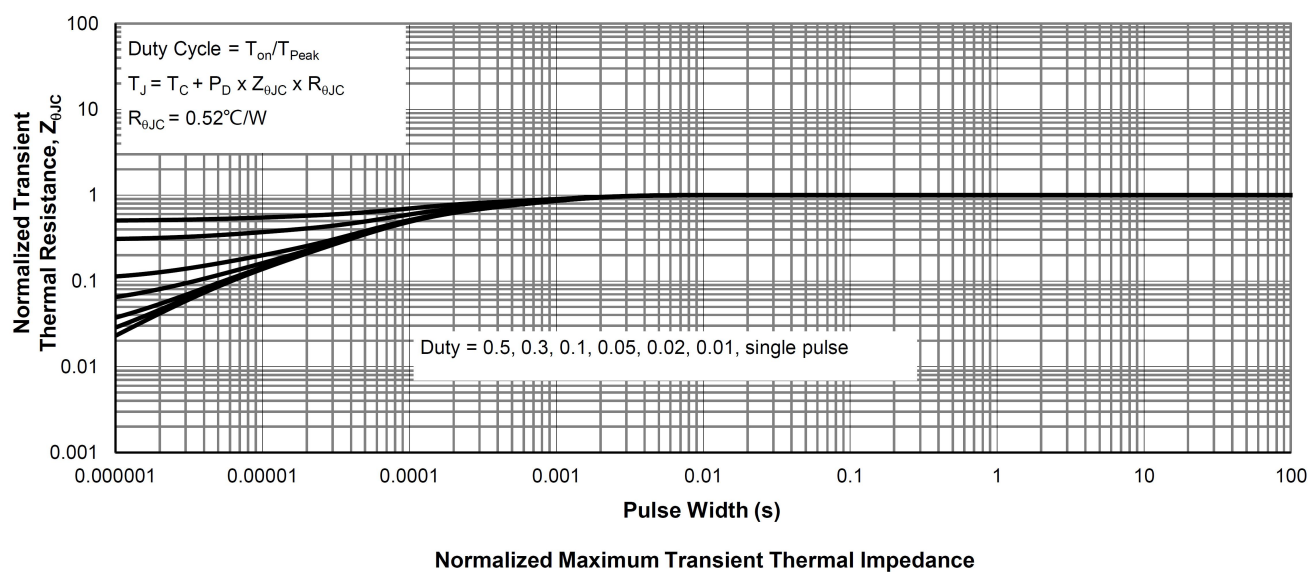
Power De-rating

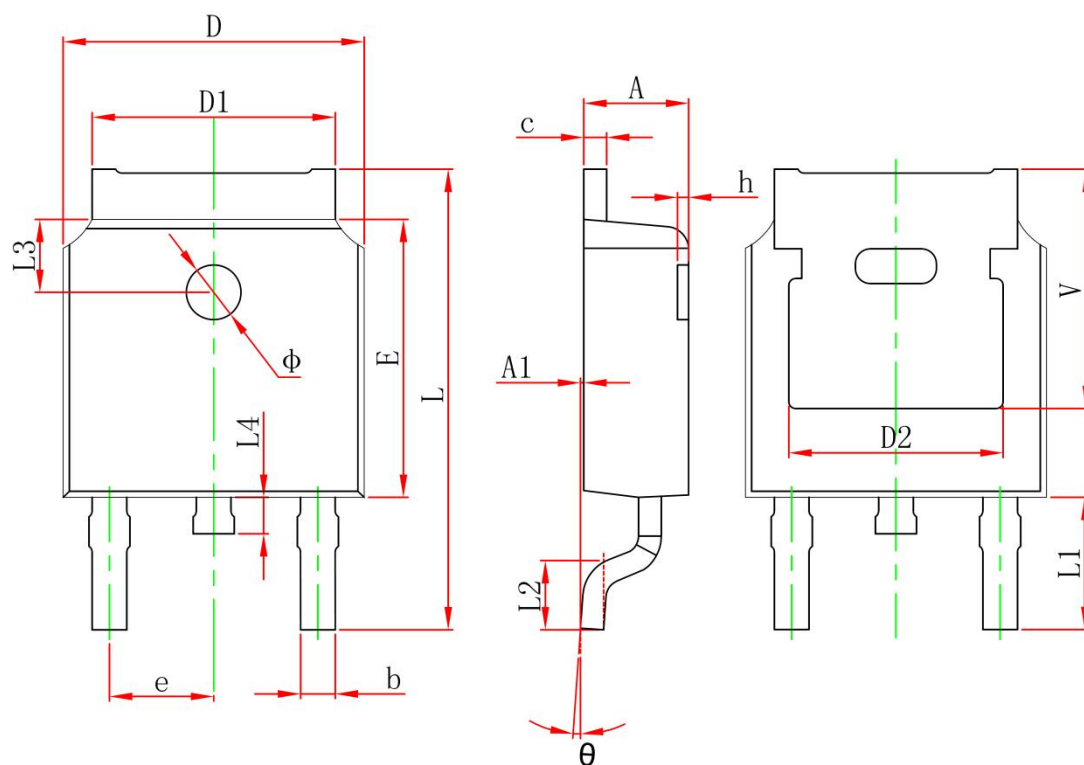


Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case



TO-252 Package Information


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.660 | 0.860 | 0.026 | 0.034 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| ϕ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.350 REF. | | 0.211 REF. | |