

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 150V          | 5.2mΩ@10V       | 185A  |



**合肥矽普半导体**

*Siliup Semiconductor Technology Co., Ltd*

技术 品质 服务

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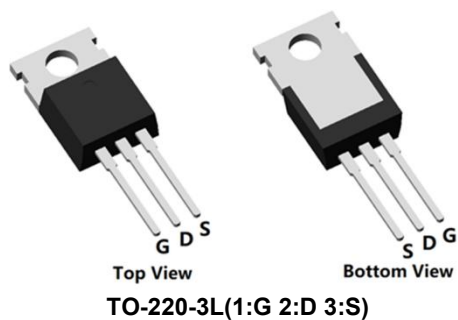
## Feature

- Fast Switching
- Low Gate Charge and  $R_{DS(on)}$
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

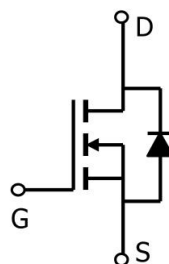
## Applications

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

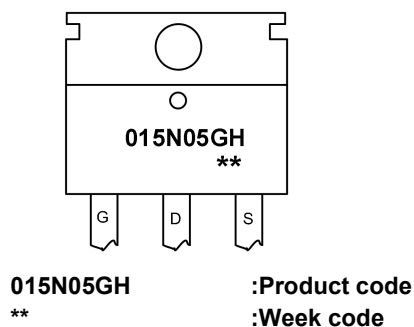
## Package



## Circuit diagram



## Marking



## Order Information

| Device       | Package   | Unit/Tube |
|--------------|-----------|-----------|
| SP015N05GHTQ | TO-220-3L | 50        |

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

| Parameter                                  | Symbol          | Rating     | Unit |
|--|-----------------|------------|------|
| Drain-Source Voltage                       | $V_{DS}$        | 150        | V    |
| Gate-Source Voltage                        | $V_{GS}$        | $\pm 20$   | V    |
| Continuous Drain Current (Tc=25°C)         | $I_D$           | 185        | A    |
| Continuous Drain Current (Tc=100°C)        | $I_D$           | 125        | A    |
| Pulsed Drain Current                       | $I_{DM}$        | 740        | A    |
| Single Pulse Avalanche Energy <sup>1</sup> | $E_{AS}$        | 1225       | mJ   |
| Power Dissipation (Tc=25°C)                | $P_D$           | 260        | W    |
| Thermal Resistance Junction-to-Case        | $R_{\theta JC}$ | 0.48       | °C/W |
| Storage Temperature Range                  | $T_{STG}$       | -55 to 150 | °C   |
| Operating Junction Temperature Range       | $T_J$           | -55 to 150 | °C   |

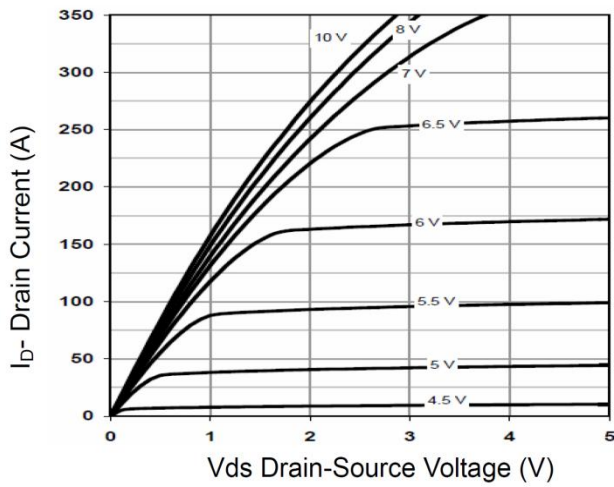
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

| 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         | $\mu A$    |
| Gate Leakage Current                    | $IGSS$     | $VGS = \pm 20V, VDS = 0V$                           | -   | -    | $\pm 0.1$ |            |
| Gate Threshold Voltage                  | $VGS(th)$  | $VDS = VGS, ID = 250\mu A$                          | 2.0 | 3.0  | 4.0       | V          |
| Drain-Source ON Resistance              | $RDS(ON)$  | $VGS = 10V, ID = 20A$                               | -   | 5.2  | 6.5       | m $\Omega$ |
| Dynamic Characteristics                 |            |   |     |      |           |            |
| Input Capacitance                       | $Ciss$     | $VDS = 75V, VGS = 0V, f = 1.0MHz$                   | -   | 5450 | -         | pF         |
| Output Capacitance                      | $Coss$     |   | -   | 690  | -         |            |
| Reverse Transfer Capacitance            | $Crss$     |   | -   | 26   | -         |            |
| Total Gate Charge                       | $Qg$       | $VDS=75V, VGS=10V, ID=104A$                         | -   | 78   | -         | nC         |
| Gate-Source Charge                      | $Qgs$      |   | -   | 34   | -         |            |
| Gate-Drain Charge                       | $Qgd$      |   | -   | 22   | -         |            |
| Switching Characteristics               |            |   |     |      |           |            |
| Turn-On Delay Time                      | $td(on)$   | $VGS = 10V, VDS = 50V, ID = 104A$<br>$RG = 6\Omega$ | -   | 24   | -         | nS         |
| Rise Time                               | $tr$       |   | -   | 35   | -         |            |
| Turn-Off Delay Time                     | $td(off)$  |   | -   | 46   | -         |            |
| Fall Time                               | $tf$       |   | -   | 15   | -         |            |
| Drain-Source Body Diode Characteristics |            |   |     |      |           |            |
| Source-Drain Diode Forward Voltage      | $VSD$      | $Is = 1A, VGS = 0V$                                 | -   | -    | 1.2       | V          |
| Maximum Body-Diode Continuous Current   | $Is$       |   | -   | -    | 185       | A          |
| Body Diode Reverse Recovery Time        | $Trr$      | $Is=50A, di/dt=100A/us, TJ=25^{\circ}C$             | -   | 108  | -         | nS         |
| Body Diode Reverse Recovery Charge      | $Qrr$      |   | -   | 312  | -         | nC         |

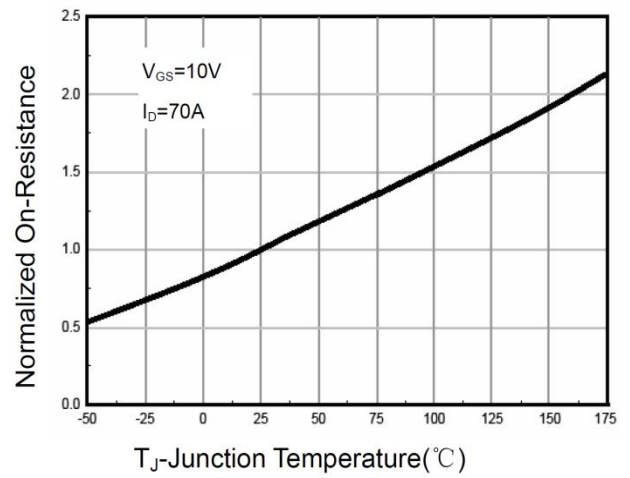
**Note :**

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

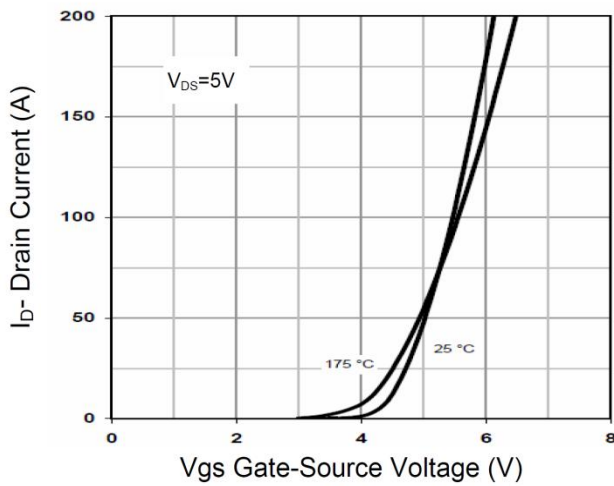
## Typical Characteristics



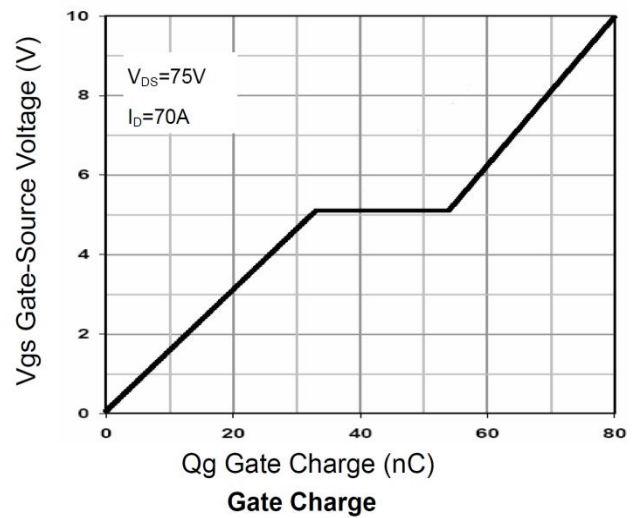
Output Characteristics



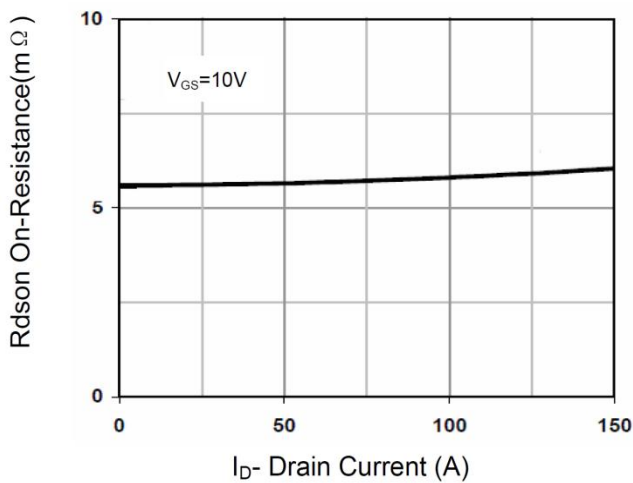
$R_{ds(on)}$ -Junction Temperature



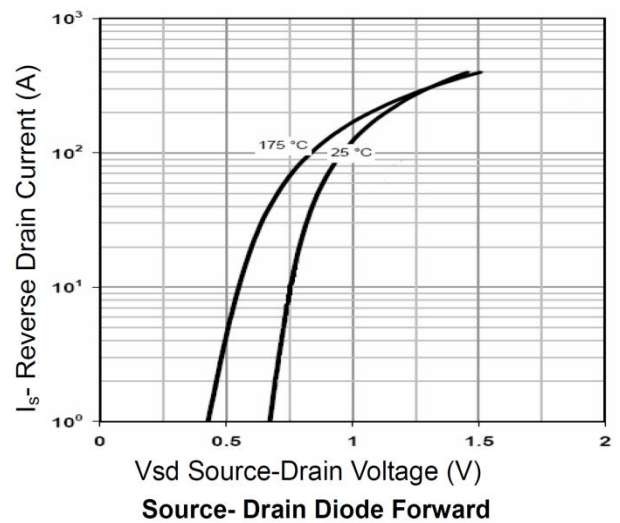
Transfer Characteristics



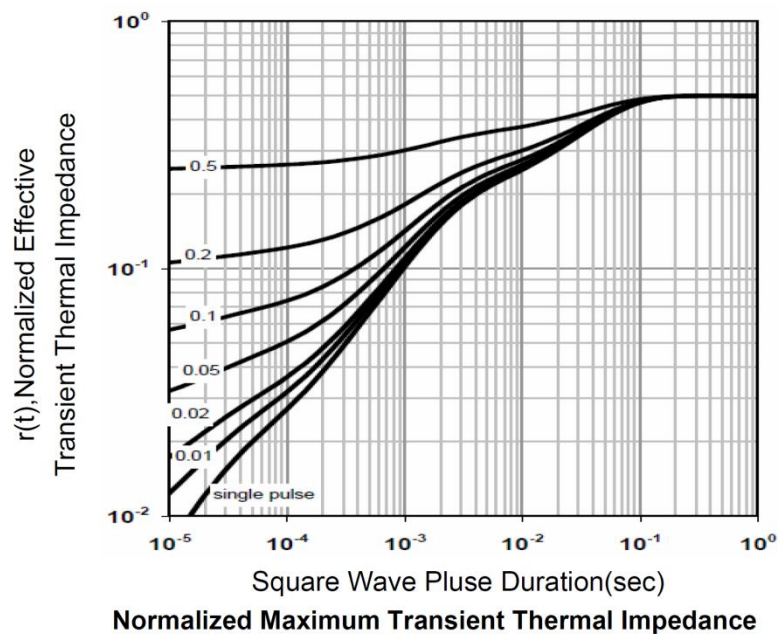
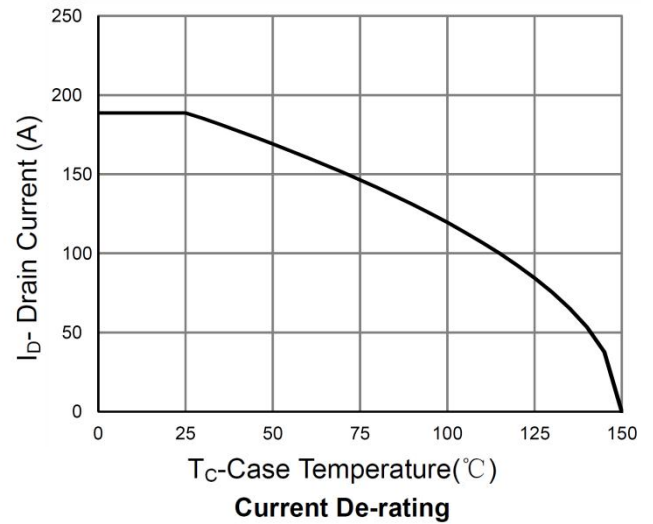
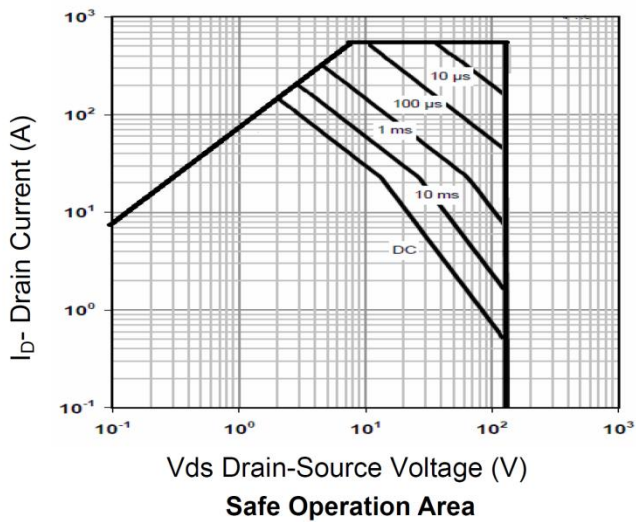
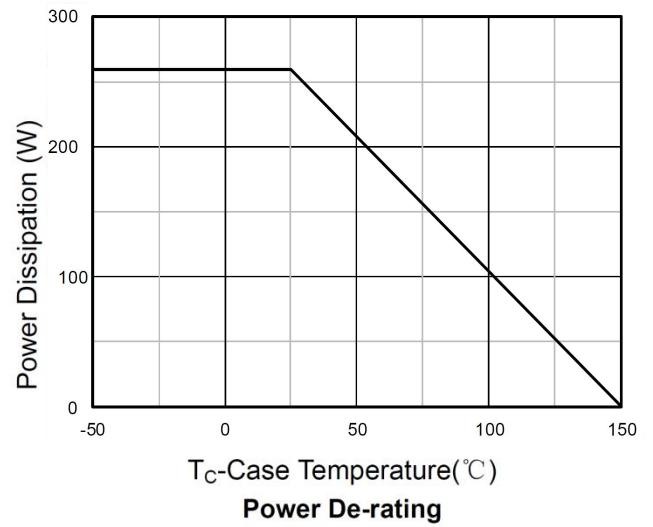
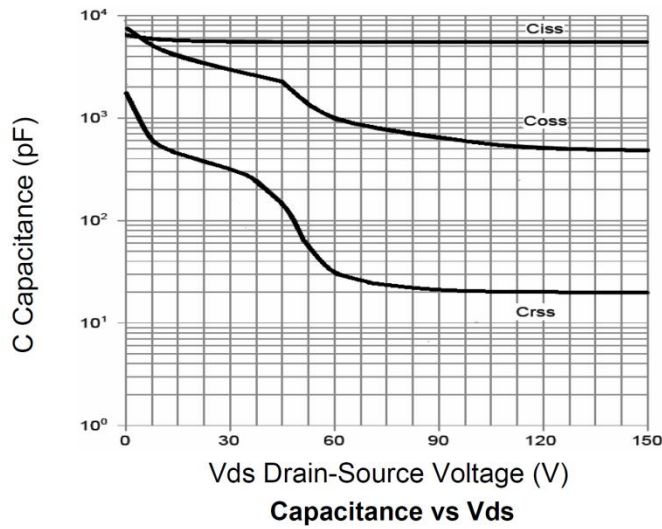
Gate Charge

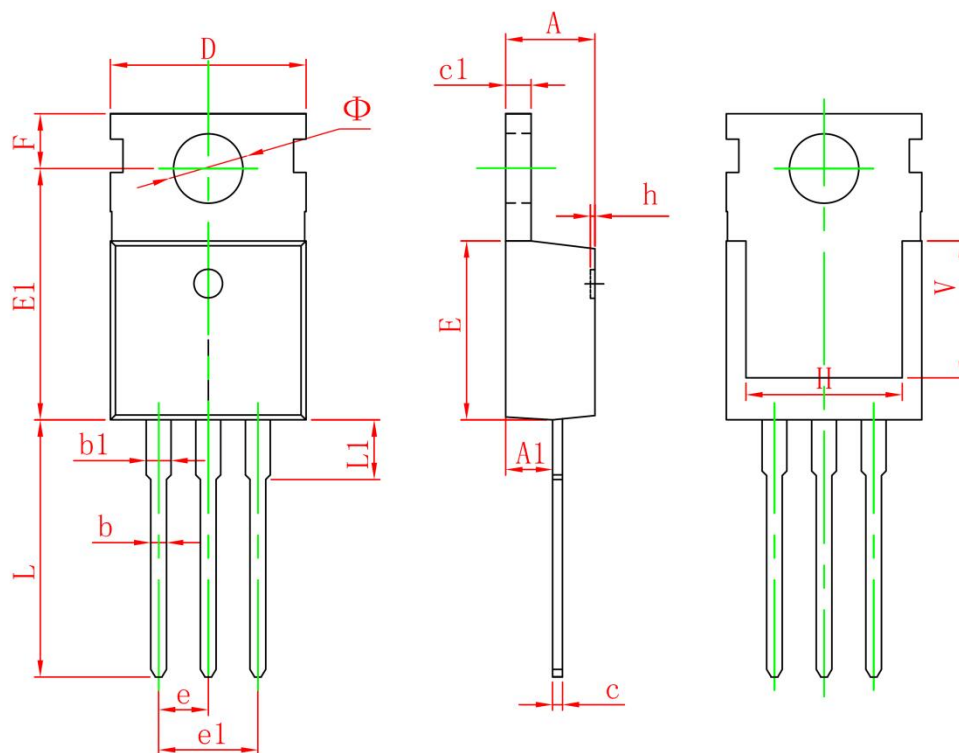


$R_{ds(on)}$ - Drain Current



Source- Drain Diode Forward



**TO-220-3L Package Information**


| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 4.400                     | 4.600  | 0.173                | 0.181 |
| A1     | 2.250                     | 2.550  | 0.089                | 0.100 |
| b      | 0.710                     | 0.910  | 0.028                | 0.036 |
| b1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| c      | 0.330                     | 0.650  | 0.013                | 0.026 |
| c1     | 1.200                     | 1.400  | 0.047                | 0.055 |
| D      | 9.910                     | 10.250 | 0.390                | 0.404 |
| E      | 8.950                     | 9.750  | 0.352                | 0.384 |
| E1     | 12.650                    | 13.050 | 0.498                | 0.514 |
| e      | 2.540 TYP.                |        | 0.100 TYP.           |       |
| e1     | 4.980                     | 5.180  | 0.196                | 0.204 |
| F      | 2.650                     | 2.950  | 0.104                | 0.116 |
| H      | 7.900                     | 8.100  | 0.311                | 0.319 |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| L      | 12.900                    | 13.400 | 0.508                | 0.528 |
| L1     | 2.850                     | 3.250  | 0.112                | 0.128 |
| V      | 6.900 REF.                |        | 0.276 REF.           |       |
| Φ      | 3.400                     | 3.800  | 0.134                | 0.150 |