## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| 80V | 3.8mΩ@10V | 130A |

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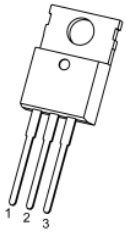
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

## Applications

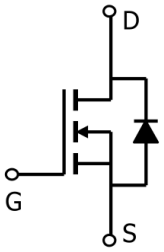
- Power switching application
- DC-DC Converter
- Uninterruptible power supply

## Package

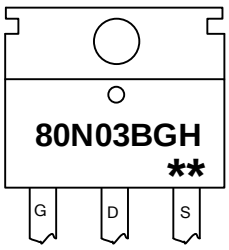



**TO-220-3L-C(1:G 2:D 3:S)**

## Circuit diagram




## Marking




**80N03BGH : Product code**
**** : Week code**

## Order Information

| Device | Package | Unite/Tube |
|---|---|---|
| SP80N03BGHTQ | TO-220 | 50 |

## Absolute maximum ratings (Ta=25℃,unless otherwise noted)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain source voltage | $V_{DS}$ | 80 | V |
| Gate source voltage | $V_{GS}$ | ±20 | V |
| Continuous drain current(Tc=25℃) | $I_D$ | 130 | A |
| Pulsed drain current | $I_{DM}$ | 520 | A |
| Power dissipation(Tc=25℃) | $P_D$ | 160 | W |
| Single pulsed avalanche energy1) | $E_{AS}$ | 625 | mJ |
| Thermal resistance, junction-case | $R_{\theta JC}$ | 0.78 | ℃/W |
| Operation and storage temperature | $T_{stg}$，$T_j$ | -55 to 150 | ℃ |

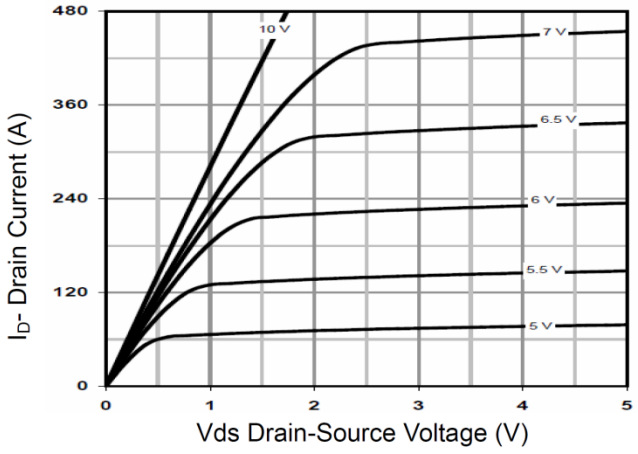
## Electrical characteristics (Ta=25℃, unless otherwise noted)

| Characteristics | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $I_D$ = 250μA, $V_{GS}$ = 0V | 80 | - | - | V |
| Drain Cut-Off Current | $I_{DSS}$ | $V_{DS}$ = 64V, $V_{GS}$ = 0V | - | - | 1 | μA |
| Gate Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | - | - | ±0.1 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 2.0 | 3.0 | 4.0 | V |
| Drain-Source ON Resistance | $R_{DS(ON)}$ | $V_{GS}$ = 10V, $I_D$ = 20A | - | 3.8 | 4.8 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =40V, $V_{GS}$ = 0V, f = 1.0MHz | - | 5360 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 850 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 56 | - | |
| **Switching Characteristics** | | | | | | |
| Total Gate Charge | $Q_g$ | VDS=40V , VGS=10V , ID=20A | - | 42 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 15 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 20 | - | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$ = 10V, $V_{DS}$ = 40V, RL=2.0Ω , $R_G$ = 3.0Ω | - | 17 | - | ns |
| Rise Time | $t_r$ | | - | 39 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 64 | - | |
| Fall Time | $t_f$ | | - | 42 | - | |
| **Drain-Source Body Diode Characteristics** | | | | | | |
| Source-Drain Diode Forward Voltage | $V_{SD}$ | $I_S$ = 1A, $V_{GS}$ = 0V | - | - | 1.2 | V |

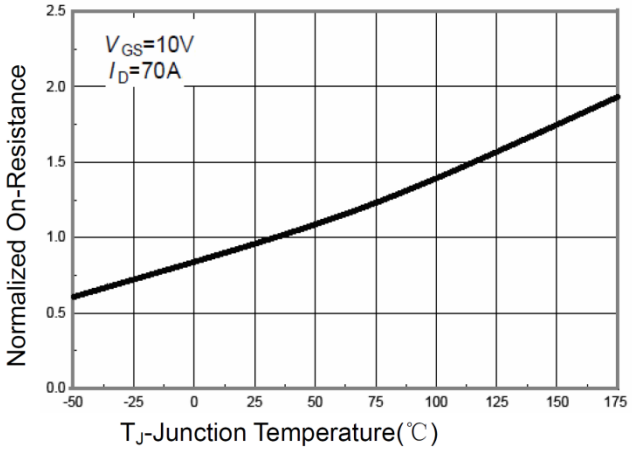
Note:

1. $E_{AS}$ is tested at starting Tj = 25℃, $V_{DD}$=40V,$V_{GS}$ = 10V,L = 0.5mH, Rg=25mΩ;

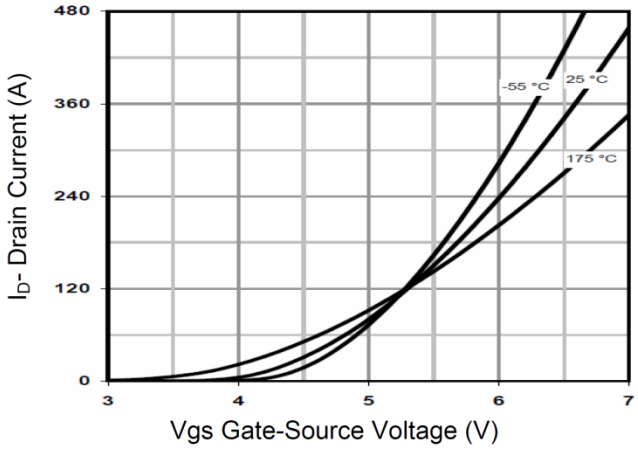
## Typical Characteristics



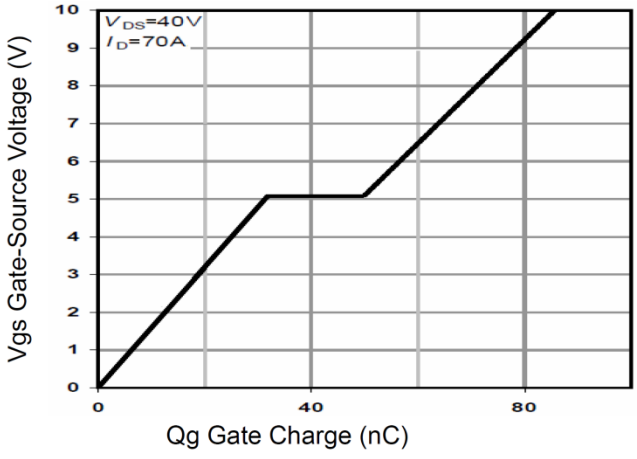

**Output Characteristics**



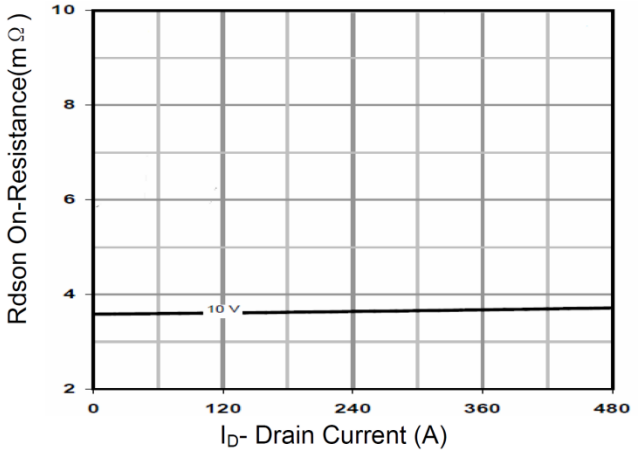

**Rdson-JunctionTemperature**



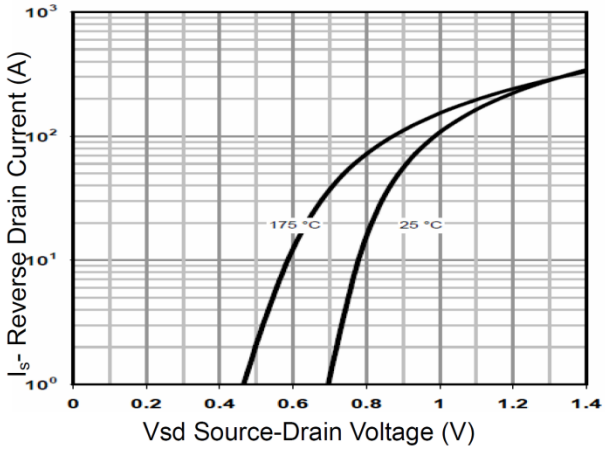

**Transfer Characteristics**



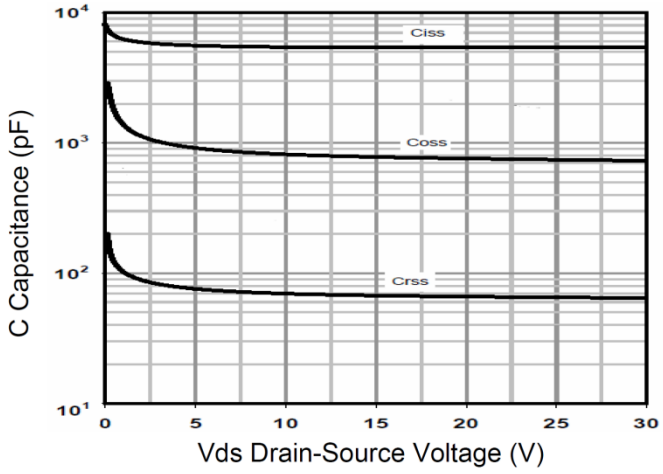

**Gate Charge**



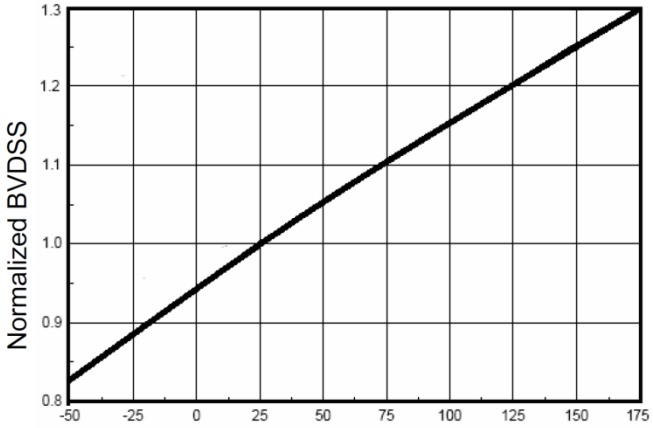

**Rdson- Drain Current**



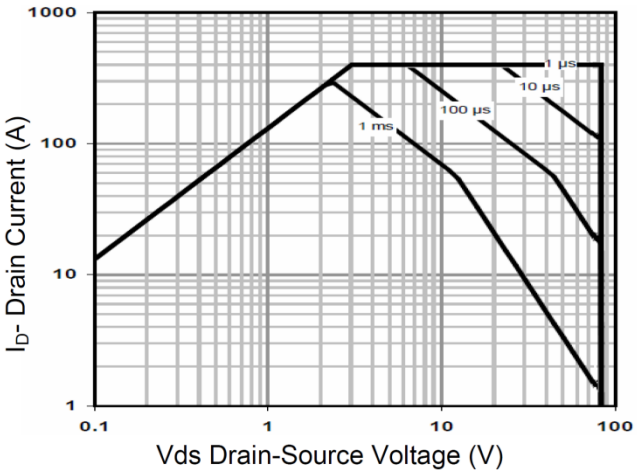

**Source- Drain Diode Forward**



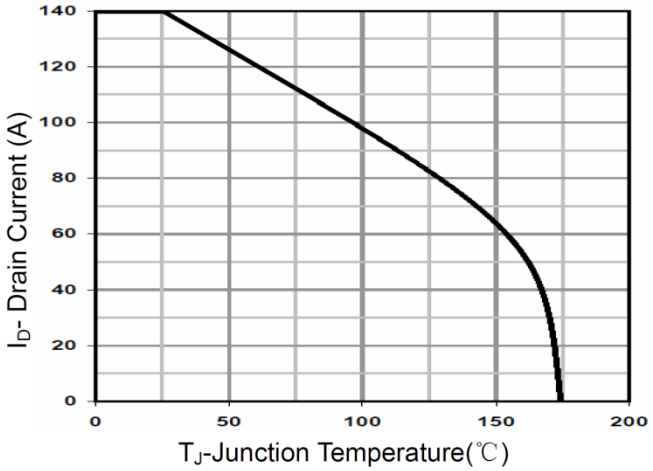

**Capacitance vs Vds**



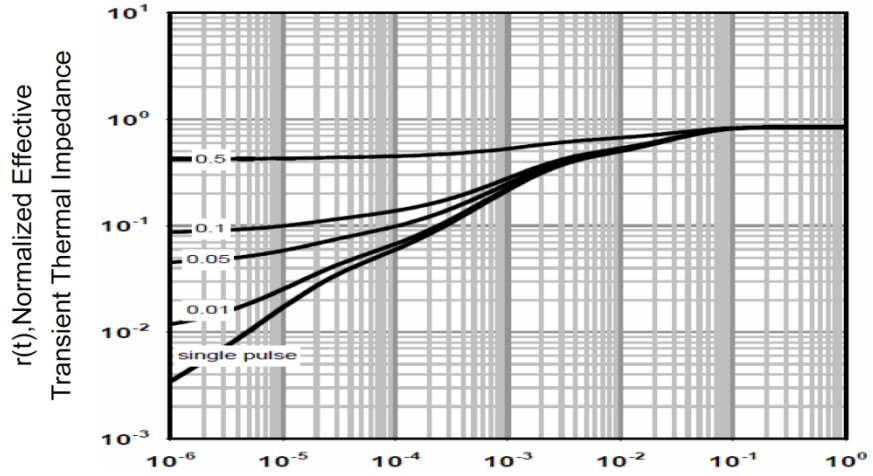

**BVDSS vs Junction Temperature**




**Safe Operation Area**

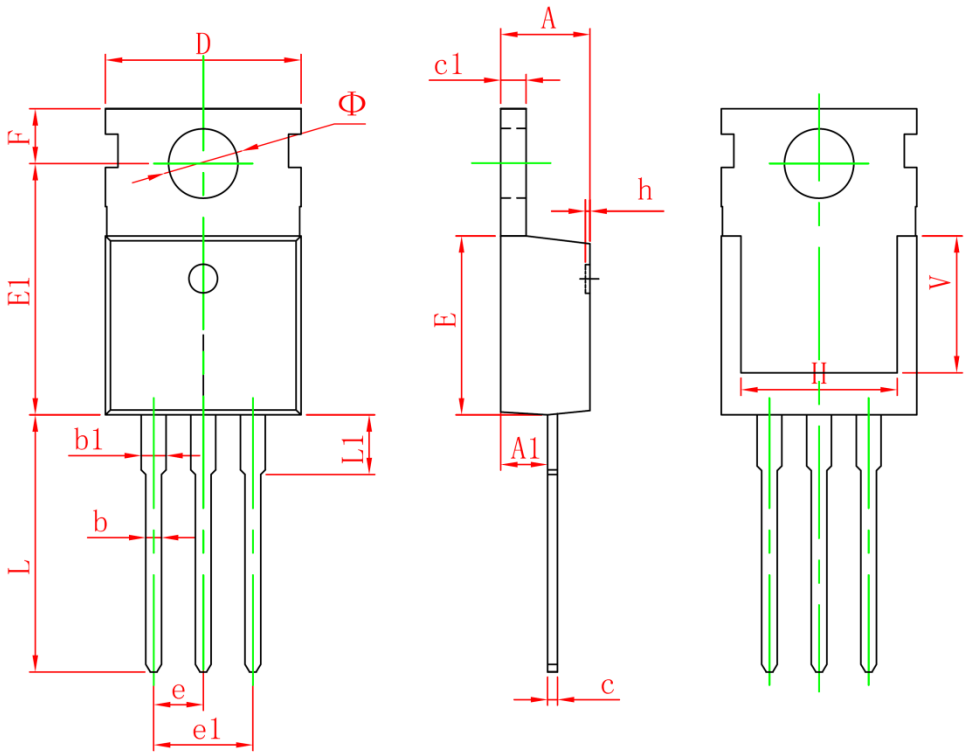



**Current De-rating**




**Normalized Maximum Transient Thermal Impedance**

## TO-220-3L-C 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 |