# N-Channel 30V(D-S) MOSFET, ESD Protected

## GENERAL DESCRIPTION

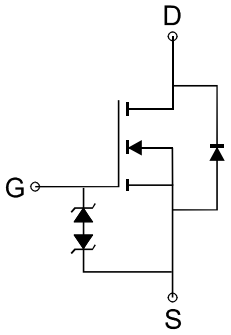
The SK90N03 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

## APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC

## FEATURES

- $R_{DS(ON)} \leqq 4.8m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leqq 9m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding




## Absolute Maximum Ratings ($T_A$=25℃ Unless Otherwise Noted)

| Parameter | Symbol | Maximum Ratings | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current - Continues | $I_D$ | 74 | A |



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## Electrical Characteristics ($T_j$ =25℃ Unless Otherwise Specified)

| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | 30 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.2 | | 3 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{DS}$=0V, $V_{GS}$=±16V | | | ±10 | μA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=30V, $V_{GS}$=0V | | | 1 | μA |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance [a] | $V_{GS}$=10V, $I_D$= 30A | | 4 | 4.8 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$= 15A | | 7 | 9 | |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=2.7A, $V_{GS}$=0V | | 0.8 | 1.2 | V |
| **DYNAMIC** | | | | | | |
| Qg | Total Gate Charge(10V) | $V_{DS}$=15V, $V_{GS}$=10V, $I_D$=17A | | 53 | | nC |
| Qg | Total Gate Charge(4.5V) | $V_{DS}$=15V, $V_{GS}$=4.5V, $I_D$=17A | | 27 | | |
| Qgs | Gate-Source Charge | | | 11 | | |
| Qgd | Gate-Drain Charge | | | 14 | | |
| Ciss | Input capacitance | $V_{DS}$=15V, $V_{GS}$=0V, f=1.0MHz | | 2400 | | pF |
| Coss | Output Capacitance | | | 350 | | |
| Crss | Reverse Transfer Capacitance | | | 110 | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=15V, $R_L$ =15Ω<br>$I_D$=1A, $V_{GEN}$=10V<br>$R_G$=6Ω | | 23 | | ns |
| $t_r$ | Turn-On Rise Time | | | 17 | | |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 76 | | |
| $t_f$ | Turn-Off Fall Time | | | 15 | | |

Notes: a. Based on epoxy or solder paste and bond wire Al 12mil×2(S), Au or Cu 1.5mil×1(G) on each die of TO-252 package.

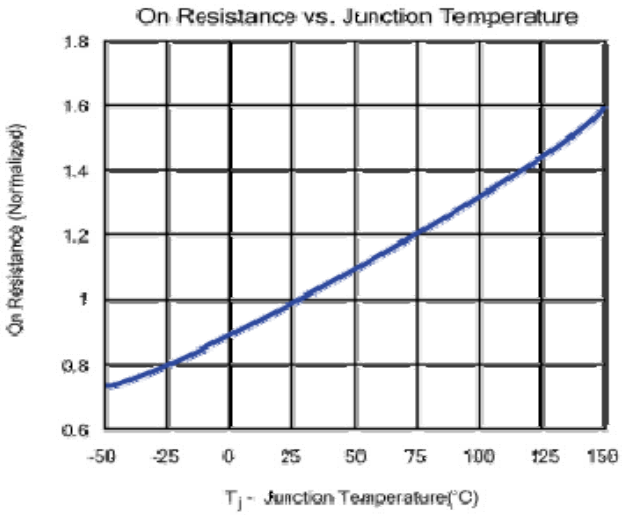
b. Pulse test; pulse width ≦ 300us, duty cycle≦ 2%.

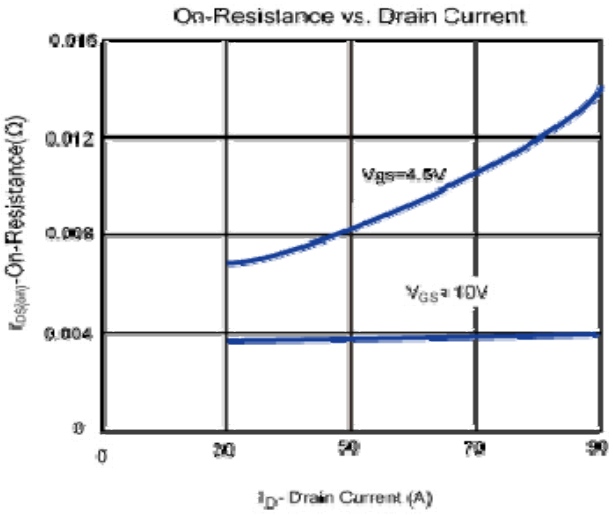
c. Force mos reserves the right to improve product design, functions and reliability without notice.

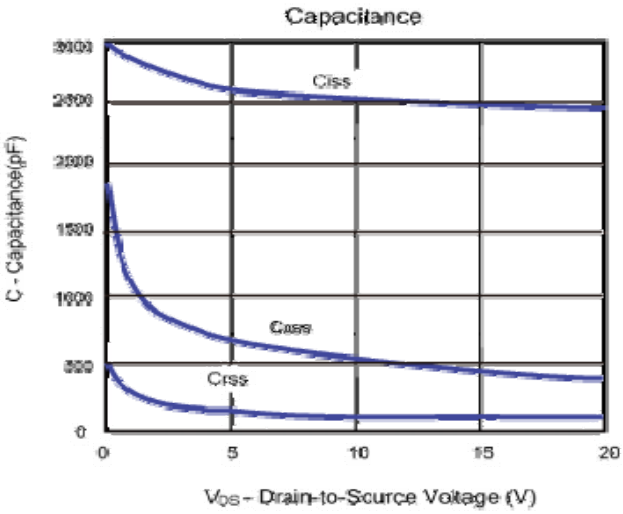


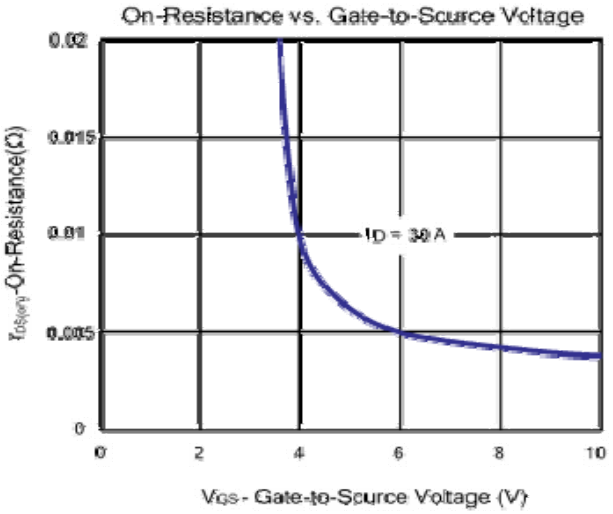
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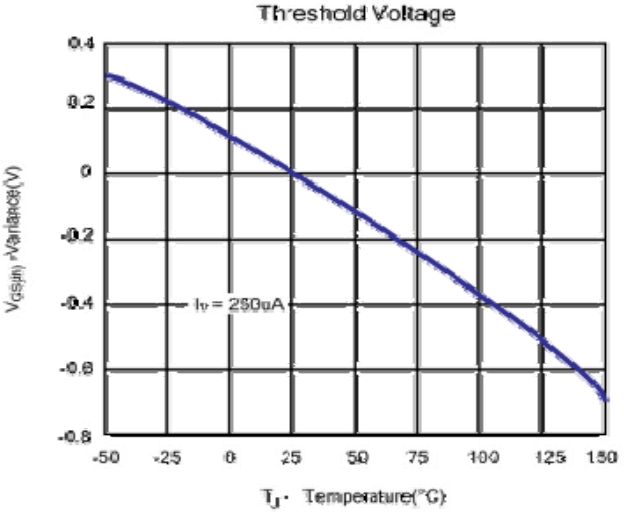
## Typical Characteristics ($T_J$ =25℃ Noted)

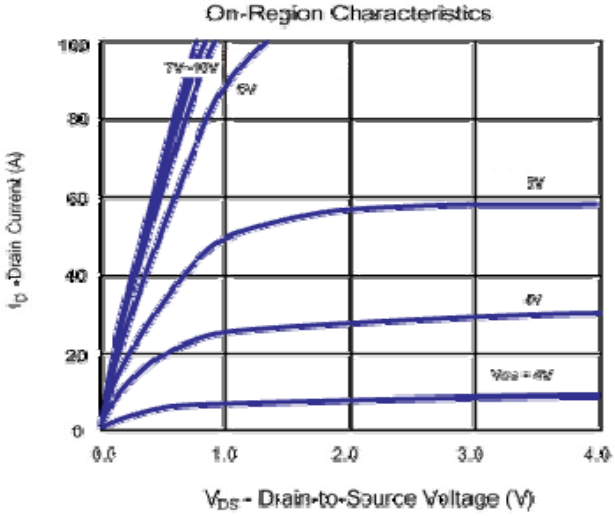


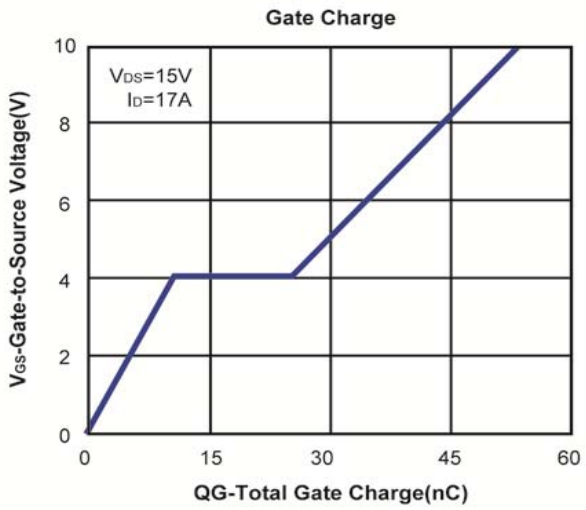



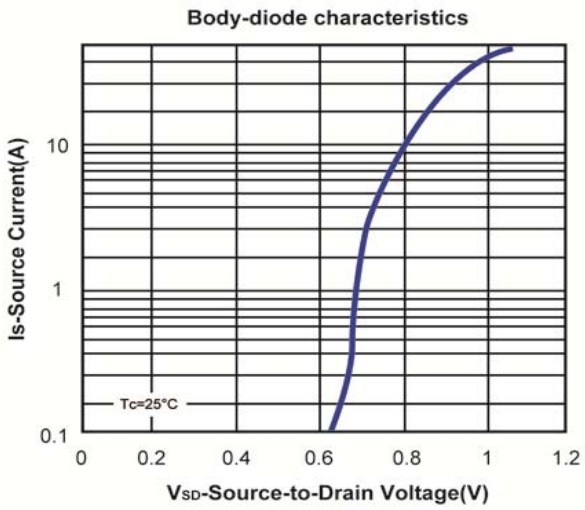






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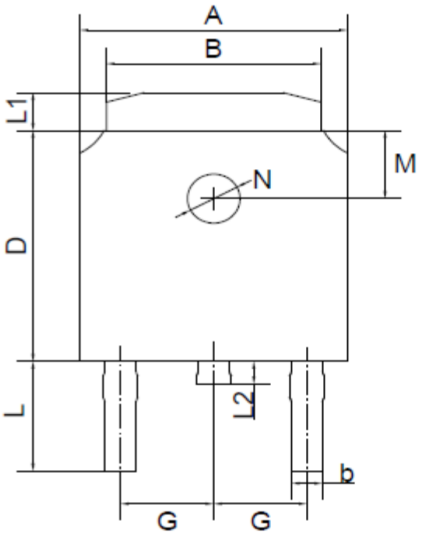
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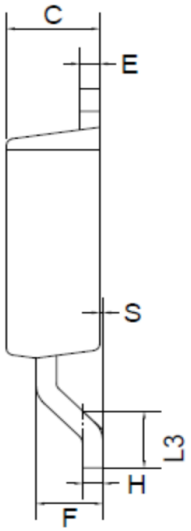


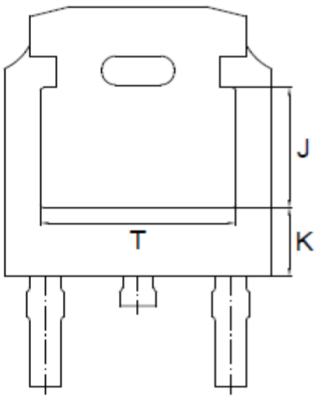




## PACKAGE OUTLINE

TO-252(D-PAK)




TO-252(D-PAK) mechanical data

| UNIT | | A | B | b | C | D | E | F | G | H | L | L1 | L2 | L3 | S | M | N | J | K | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 6.7 | 5.5 | 0.8 | 2.5 | 6.3 | 0.6 | 1.8 | 2.29 TYPICAL | 0.55 | 3.1 | 1.2 | 1.0 | 1.75 | 0.1 | 1.8 TYPICAL | 1.3 TYPICAL | 3.16 ref. | 1.80 ref. | 4.83 ref. |
| | min | 6.3 | 5.1 | 0.3 | 2.1 | 5.9 | 0.4 | 1.3 | | 0.45 | 2.7 | 0.8 | 0.6 | 1.40 | 0.0 | | | | | |
| mil | max | 264 | 217 | 31 | 98 | 248 | 24 | 71 | 90 TYPICAL | 22 | 122 | 47 | 39 | 69 | 4 | 71 TYPICAL | 51 TYPICAL | 124 ref. | 71 ref. | 190 ref. |
| | min | 248 | 201 | 12 | 83 | 232 | 16 | 51 | | 18 | 106 | 31 | 24 | 55 | 0 | | | | | |



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