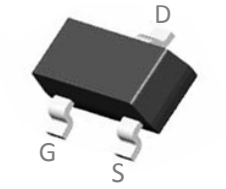
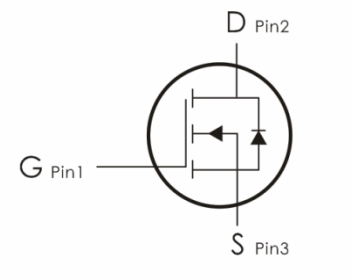
## Description：

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.




## Features：

1) $V_{DS}$=30V,$I_D$=8A,$R_{DS(ON)}$<14mΩ @$V_{GS}$=-10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

## Absolute Maximum Ratings：($T_A$=25℃ unless otherwise noted)

| Symbol | Parameter | Ratings | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ | Continuous Drain Current- $T_A$=25℃ | 8 | A |
| | Continuous Drain Current-$T_A$=100℃ | 5.5 | |
| $I_{DM}$ | Pulsed Drain Current note1 | 40 | A |
| $E_{AS}$ | Single Pulsed Avalanche Energy note2 | 17 | mJ |
| $P_D$ | Power Dissipation - $T_A$=25℃ | 2.2 | W |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | ℃ |

## Thermal Characteristics：

| Symbol | Parameter | Max | Units |
|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance,Junction to Ambient | 57 | ℃/W |

## Package Marking and Ordering Information：

| Part NO. | Marking | Package |
|---|---|---|
| DO3014AA | 3014A | SOT-23-3 |

## N-Channel Electrical Characteristics： ($T_A$=25℃ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Sourtce Breakdown Voltage | $V_{GS}$=0V,$I_D$=250μA | 30 | --- | --- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{GS}$=0V, $V_{DS}$=30V | --- | --- | 1 | μA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0A | --- | --- | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}$=$V_{DS}$, $I_D$=250μA | 1 | 1.4 | 2.5 | V |
| $R_{DS(ON)}$ | Drain-Source On Resistance[note3] | $V_{GS}$=10V,$I_D$=10A | --- | 10 | 14 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=5A | --- | 15 | 20 | |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V, $V_{GS}$=0V, f=1MHz | --- | 580 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 110 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 92 | --- | |
| Qg | Gate Charge | $V_{GS}$=10V $V_{DS}$=15V $I_D$=10A | --- | 15 | --- | nc |
| Qgs | Gate-Source Charge | | --- | 4.7 | --- | |
| Qgd | Gate-Drain Charge | | --- | 3.6 | --- | |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=30V, $I_D$= 20A, $R_{REN}$ =3Ω ,$V_{GS}$=10V | --- | 5 | --- | ns |
| $t_r$ | Rise Time | | --- | 8 | --- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | --- | 21 | --- | ns |
| $t_f$ | Fall Time | | --- | 7 | --- | ns |
| **Drain-Source Diode Characteristics** | | | | | | |
| $I_S$ | Continuous Drain to Source Diode | VD=VG=0V | --- | ---- | 8 | A |
| $I_{SM}$ | Pulsed Drain to Source Diode | VD=VG=0V | --- | --- | 40 | A |

| | | | | | | |
|---|---|---|---|---|---|---|
| $V_{SD}$ | Source-Drain Diode Forward Voltage | $V_{GS}$=0V,$I_S$=10 A | --- | --- | 1.2 | V |
| $t_{rr}$ | Body Diode Reverse Recovery Time | $I_F$=20A,dI/dt=100A/ μ s | --- | 7 | --- | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery | | --- | 5.9 | --- | nC |

## Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J$=25℃,$V_{DD}$=15V,$V_G$=10V,L=0.5mH,Rg=25Ω,$I_{AS}$=8.3A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

## Typical Characteristics：

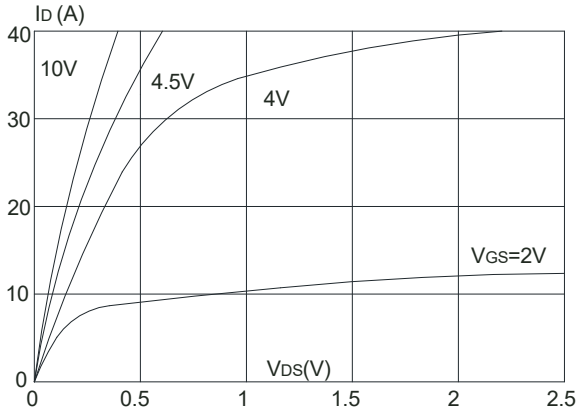



**Figure1:** Output Characteristics

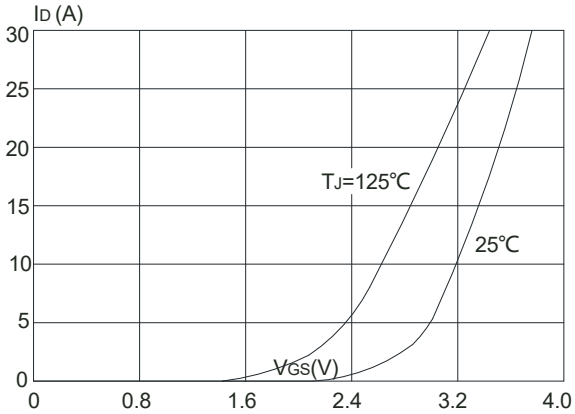



**Figure 2:** Typical Transfer Characteristics

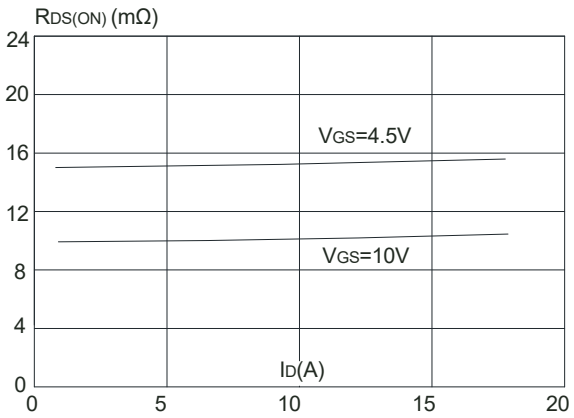



**Figure 3:**On-resistance vs. Drain Current

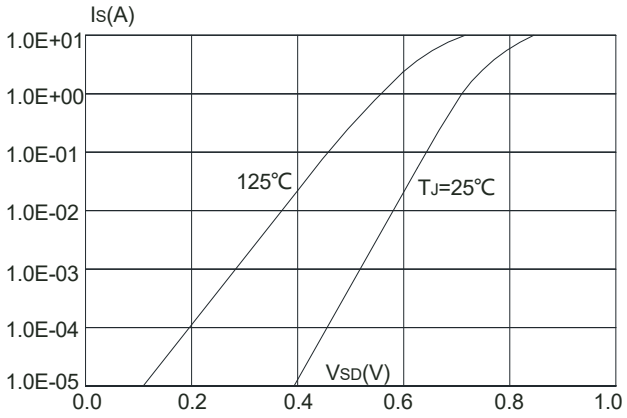



**Figure 4**: Body Diode Characteristics

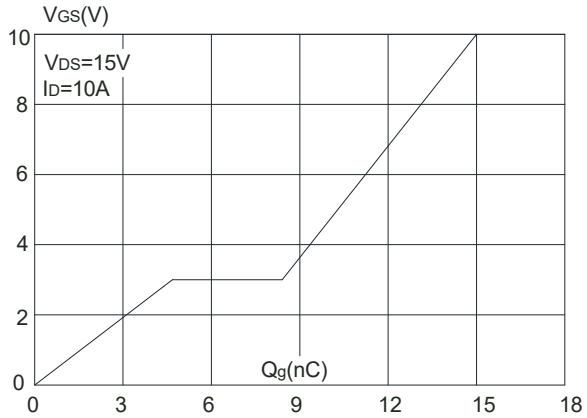



**Figure 5:** Gate Charge Characteristics

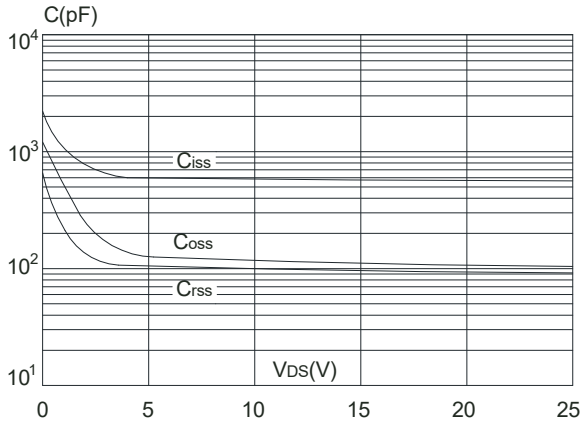



**Figure 6:** Capacitance Characteristics

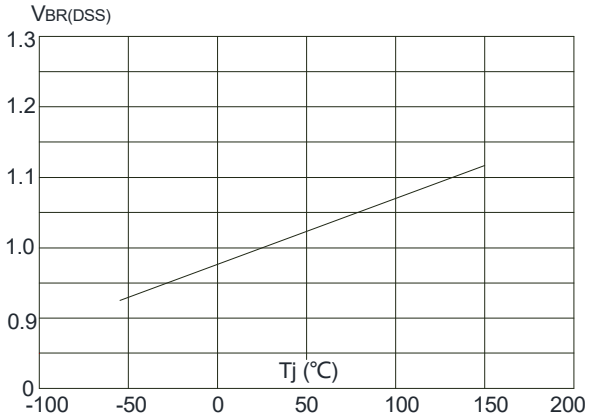



**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

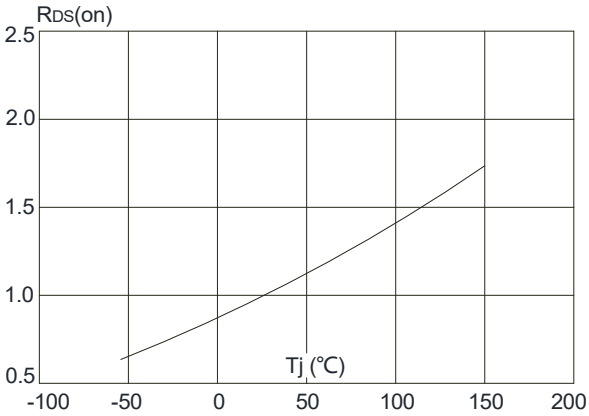



**Figure 8:** Normalized on Resistance vs. Junction Temperature

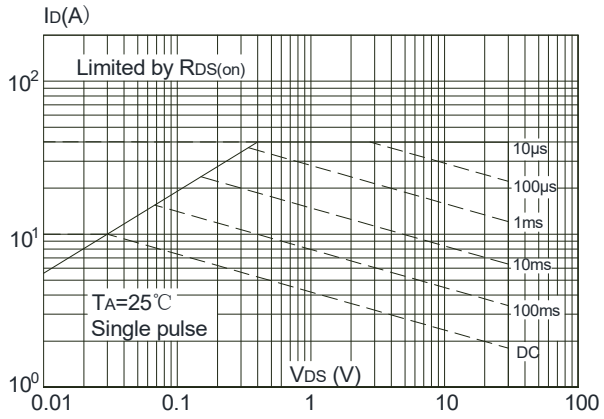



**Figure 9:** Maximum Safe Operating Area

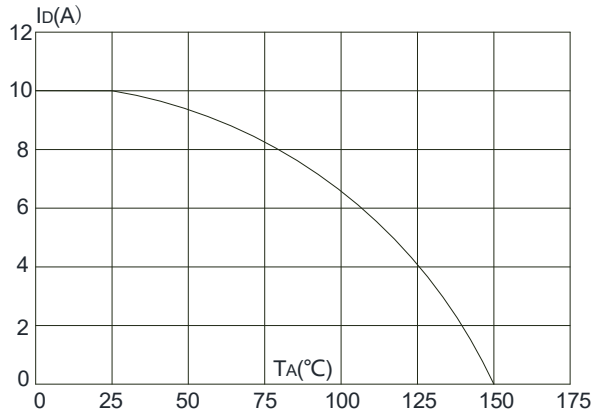



**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature

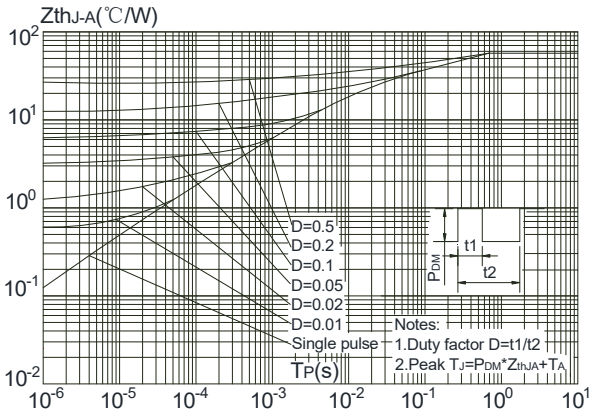



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient