# STN2018

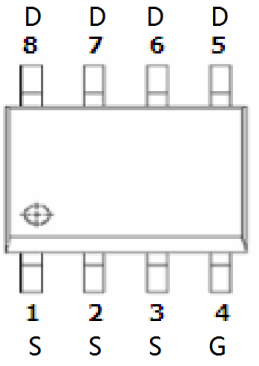
N Channel Enhancement Mode MOSFET

10.0A

## DESCRIPTION

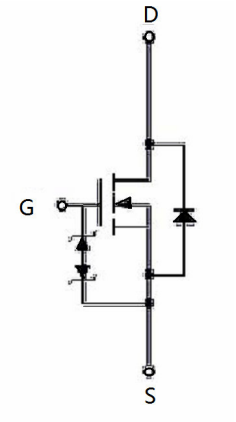
STN2018 is the N-Channel logic enhancement mode power field effect transistors which are produced using high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.
These devices are particularly suited for low voltage application, notbook computer power management and other battery powered circuits where high-side switching.

## PIN CONFIGURATION
## SOP-8

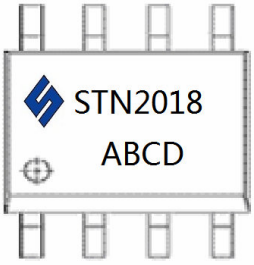



## FEATURE

- 20V/10A, $R_{DS(ON)}$ = 10mΩ @VGS = 4.5V
- 20V/7A, $R_{DS(ON)}$ = 15mΩ @VGS = 2.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP-8 package design




## PART MARKING
## SOP-8




A : Year B : Date Code

C : Manufacture D : Wafer Lot

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**ABSOULTE MAXIMUM RATINGS** (Ta = 25℃ Unless otherwise noted )

| **Parameter** | | **Symbol** | Typical | **Unit** |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 20 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±12 | V |
| Continuous Drain Current (TJ=150℃) | $T_A$=25℃<br>$T_A$=70℃ | $I_D$ | 10.0<br>8.0 | A |
| Pulsed Drain Current | | $I_{DM}$ | 35 | A |
| Continuous Source Current (Diode Conduction) | | $I_S$ | 2.3 | A |
| Power Dissipation | $T_A$=25℃<br>$T_A$=70℃ | $P_D$ | 2.5<br>1.6 | W |
| Operation Junction Temperature | | $T_J$ | -55/150 | ℃ |
| Storgae Temperature Range | | $T_{STG}$ | -55/150 | ℃ |
| Thermal Resistance-Junction to Ambient | | $R_{\theta JA}$ | 80 | ℃/W |

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**ELECTRICAL CHARACTERISTICS** ( Ta = 25℃ Unless otherwise noted )

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_D$=250uA | 20 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250 uA | 0.6 | | 1.4 | V |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$=0V,$V_{GS}$=±12V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20$V_{GS}$=0V | | | 1 | uA |
| | $T_J$=55℃ | $V_{DS}$=20$V_{GS}$=0V | | | 10 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}$≥5V,$V_{GS}$=4.5 | 6 | | | A |
| Drain-source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=4.5V, $I_D$=10A<br>$V_{GS}$=2.5V, $I_D$=7.0A | | 0.008<br>0.011 | 0.012<br>0.015 | Ω |
| Forward Tran Conductance | gfs | $V_{DS}$=15.0V,$I_D$=5.0A | | 30 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1.0A,$V_{GS}$=0V | | 0.8 | 1.2 | V |
| **Dynamic** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=10V,$V_{GS}$=4.5V<br>$I_D$=5.0A | | 18 | 25 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 4.2 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 6.8 | | |
| Input Capacitance | Ciss | VDS=10V,VGS=0V<br>f=1MHz | | 850 | | pF |
| Output Capacitance | Coss | | | 135 | | |
| Reverse TransferCapacitance | Crss | | | 105 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}$=10V,$R_L$=10Ω<br>$I_D$=1.0A,$V_{GEN}$=4.5V<br>$R_G$=6Ω | | 12 | 16 | nS |
| | tr | | | 10 | 28 | |
| Turn-Off Time | $t_{d(off)}$ | | | 30 | 55 | |
| | tf | | | 35 | 58 | |

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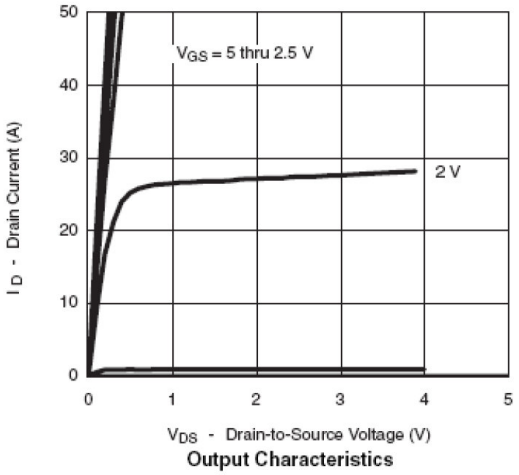
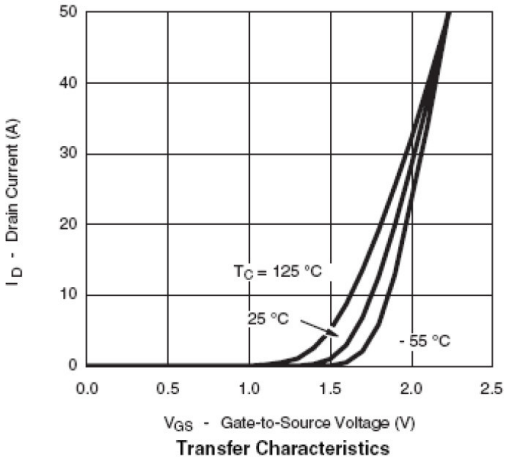
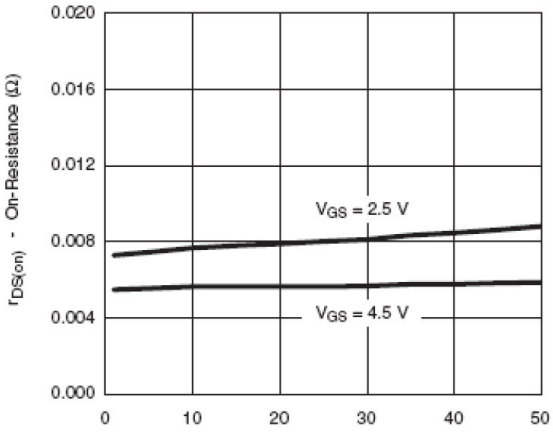
**TYPICAL CHARACTERICTICS** (25℃ Unless Note)



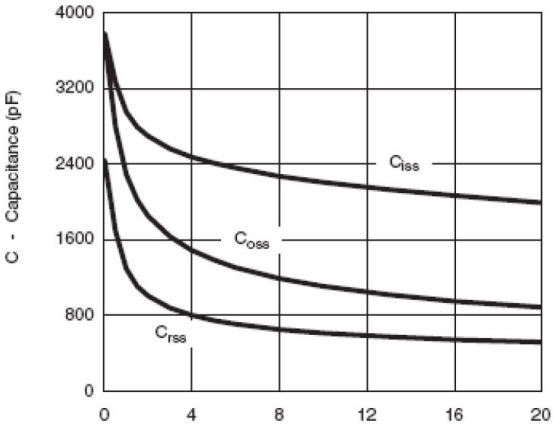
Output Characteristics



Transfer Characteristics



On-Resistance vs. Drain Current



Capacitance

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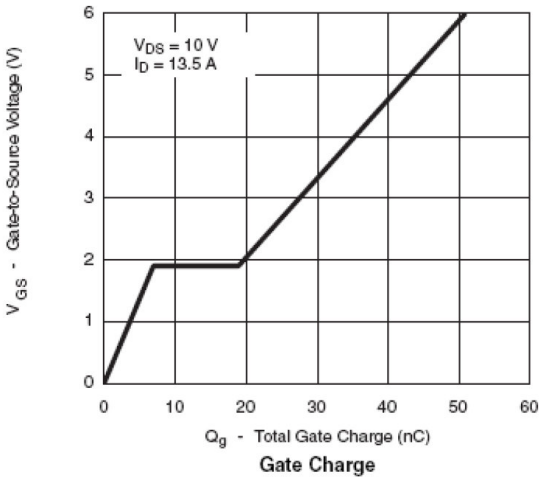
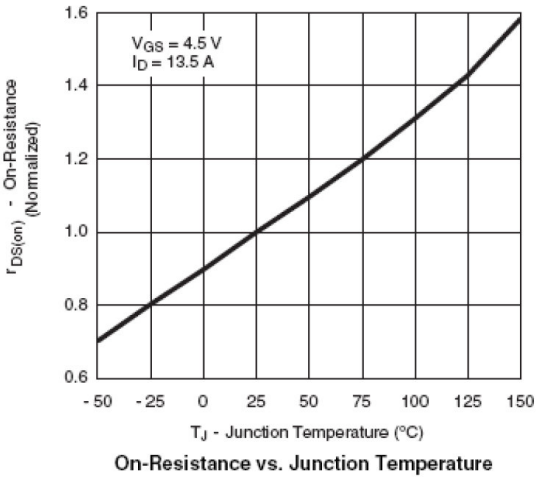
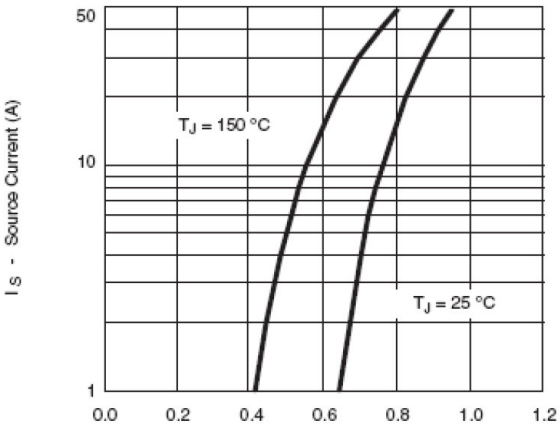


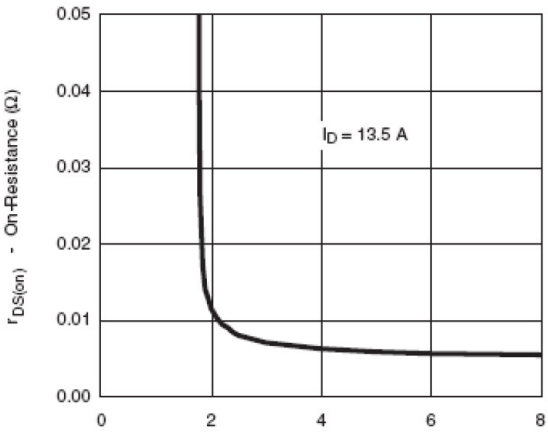
Gate Charge



On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

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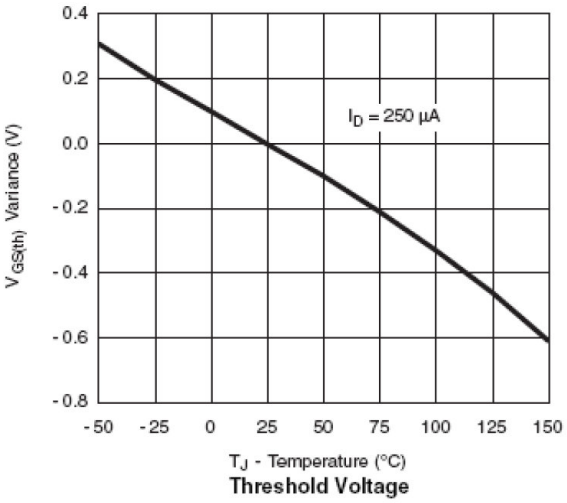
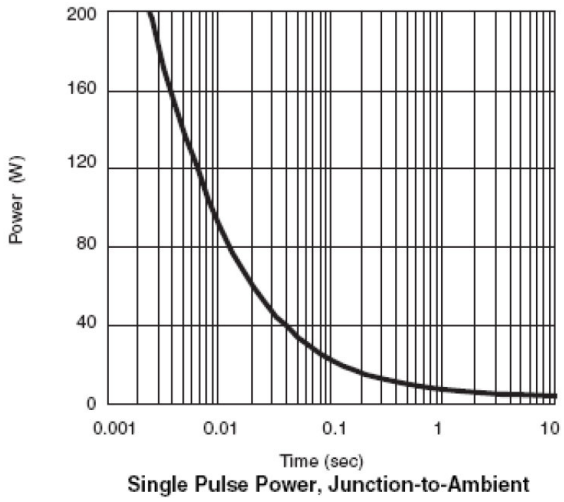
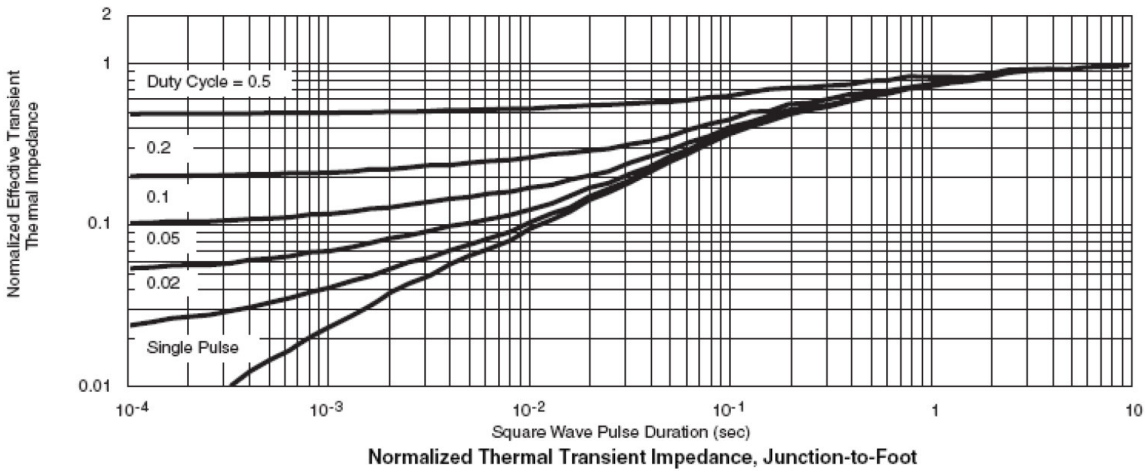


Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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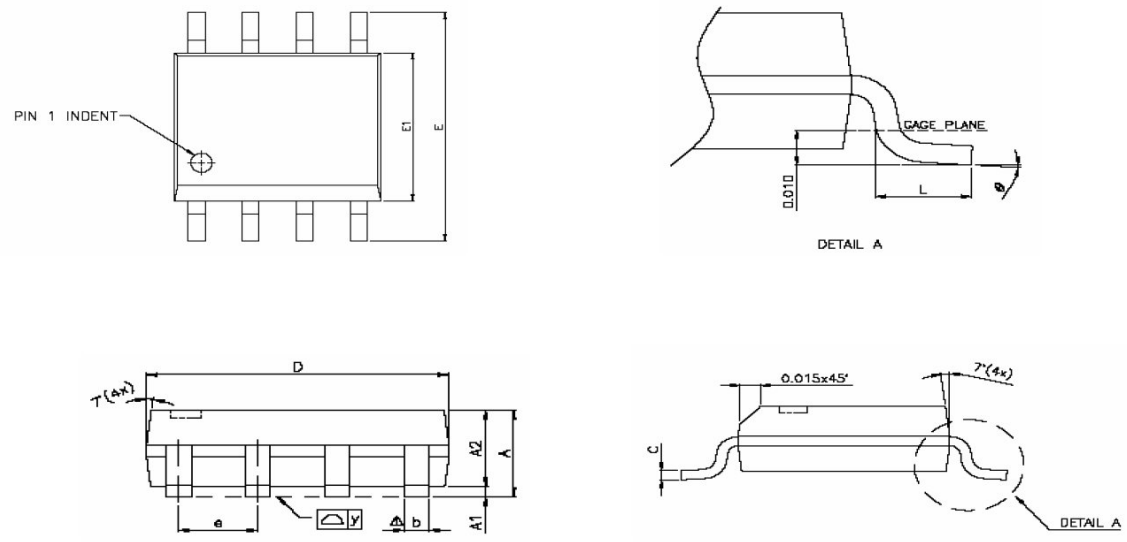
## SOP-8 PACKAGE OUTLINE




| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHES | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.47 | 1.60 | 1.73 | 0.058 | 0.063 | 0.068 |
| A1 | 0.10 | —— | 0.25 | 0.004 | —— | 0.010 |
| A2 | —— | 1.45 | —— | —— | 0.057 | —— |
| b | 0.33 | 0.41 | 0.51 | 0.013 | 0.016 | 0.020 |
| C | 0.19 | 0.20 | 0.25 | 0.0075 | 0.008 | 0.0098 |
| D | 4.80 | 4.85 | 4.95 | 0.189 | 0.191 | 0.195 |
| E | 5.80 | 6.00 | 6.20 | 0.228 | 0.236 | 0.244 |
| E1 | 3.80 | 3.90 | 4.00 | 0.150 | 0.154 | 0.157 |
| e | —— | 1.27 | —— | —— | 0.050 | —— |
| L | 0.38 | 0.71 | 1.27 | 0.015 | 0.028 | 0.050 |
| ⚠2 y | —— | —— | 0.076 | —— | —— | 0.003 |
| θ | 0° | —— | 8° | 0° | —— | 8° |

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