# STN4480

**N Channel Enhancement Mode MOSFET**
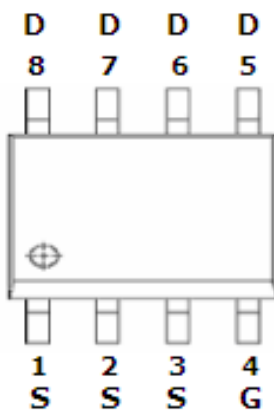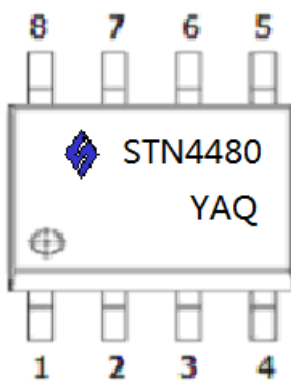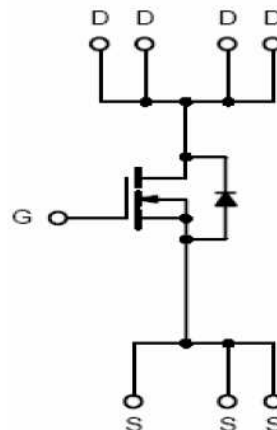
## 14.0A

## DESCRIPTION

STN4480 is the N-Channel logic enhancement mode power field effect transistor which is 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 such as power management and other battery powered circuits where high-side switching.

## PIN CONFIGURATION
## SOP-8



## FEATURE

- 40V/14.0A, $R_{DS(ON)}$ = 13mΩ (Typ.)
  @$V_{GS}$ = 10V
- 40V/5.0A, $R_{DS(ON)}$ = 15mΩ
  @$V_{GS}$ = 4.5V
- 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



STN4480
YAQ

**Y: Year Code**
**A: week Code**
**Q: Process Code**



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

| Parameter | | Symbol | Typical | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | VDSS | 40 | V |
| Gate-Source Voltage | | VGSS | ±20 | V |
| Continuous Drain Current (TJ=150℃) | TA=25℃<br>TA=70℃ | ID | 14.0<br>10.0 | A |
| Pulsed Drain Current | | IDM | 70 | A |
| Continuous Source Current (Diode Conduction) | | IS | 4.0 | A |
| Power Dissipation | TA=25℃<br>TA=70℃ | PD | 3.1<br>2.0 | W |
| Operation Junction Temperature | | TJ | 150 | ℃ |
| Storgae Temperature Range | | TSTG | -55/150 | ℃ |
| Thermal Resistance-Junction to Ambient | | RθJA | 59 | ℃/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,ID=250uA | 40 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,ID=250uA | 1.0 | | 3.0 | V |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$=0V,$V_{GS}$=±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=32V,$V_{GS}$=0V | | | 1 | uA |
| | | $V_{DS}$=32V,$V_{GS}$=0V $T_J$=55℃ | | | 5 | |
| Drain-source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V,$I_D$=14A $V_{GS}$=4.5V,$I_D$=8A | | 13 15 | 15.5 18.0 | mΩ |
| Forward Transconductance | gfs | $V_{DS}$=15V,$I_D$=6.2AV | | 50 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=2.3A,$V_{GS}$=0V | | | 1.0 | V |
| **Dynamic** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=20V,$V_{GS}$=10V $I_D$≡14A | | 22 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 10.5 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 4.8 | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =20V,VGS=0V F=1MHz | | 1600 | | pF |
| Output Capacitance | $C_{oss}$ | | | 320 | | |
| Reverse TransferCapacitance | $C_{rss}$ | | | 102 | | |
| Turn-On Time | $t_{d(on)}$ tr | $V_{DS}$=20V, $V_{GS}$=10V $R_L$= 1.5Ω $I_D$=5.0A,$V_{GEN}$=3Ω | | 3.5 6 | | nS |
| Turn-Off Time | $t_{d(off)}$ tf | | | 13.2 3.5 | | |

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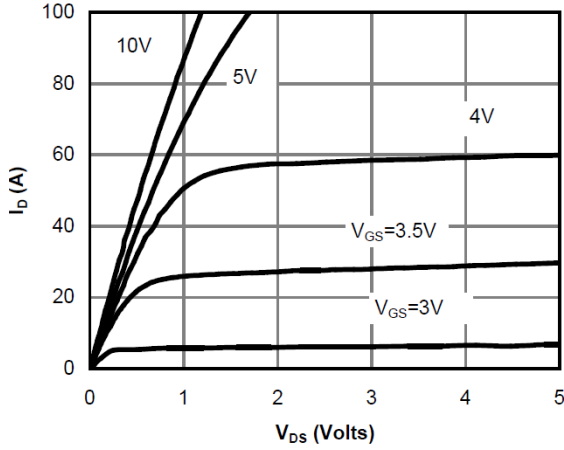www.stansontech.com

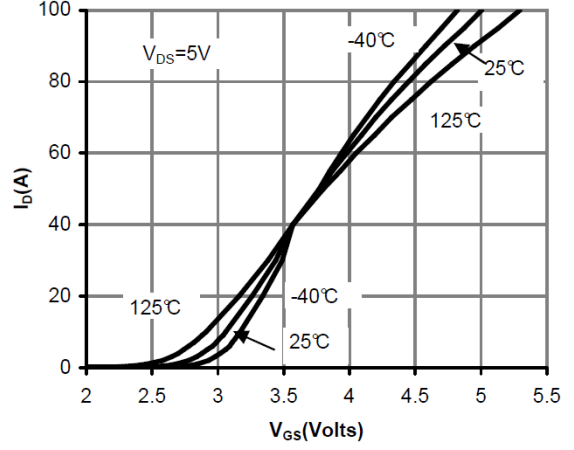## TYPICAL CHARACTERICTICS

Figure 1: On-Region Characteristics

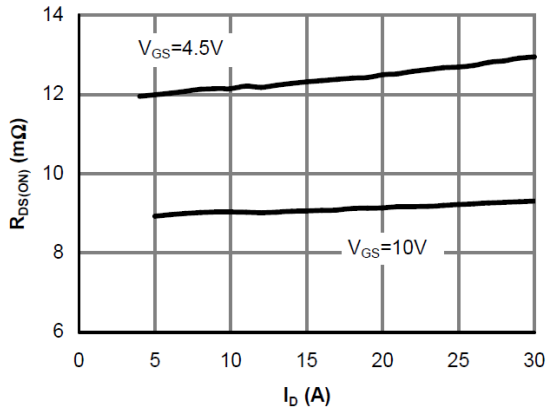Figure 2: Transfer Characteristics

Figure 3: On-Resistance vs. Drain Current and Gate Voltage
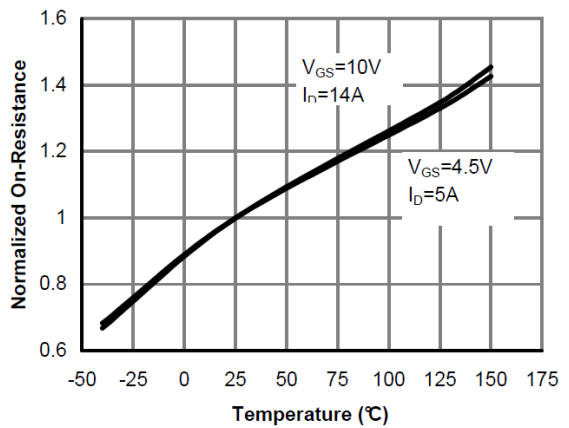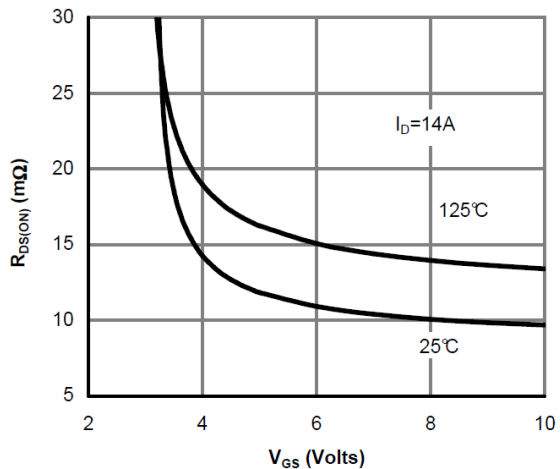
Figure 4: On-Resistance vs. Junction Temperature

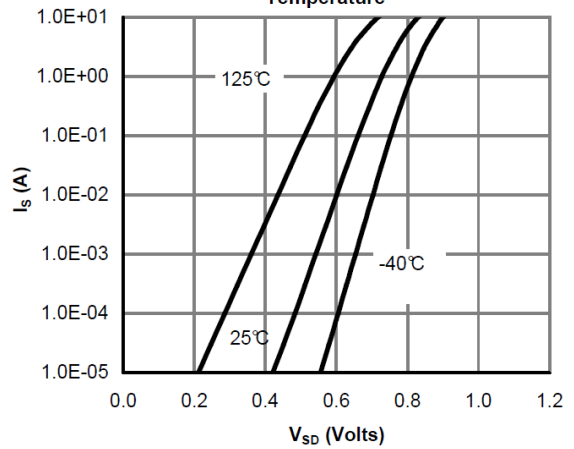Figure 5: On-Resistance vs. Gate-Source Voltage

Figure 6: Body-Diode Characteristics

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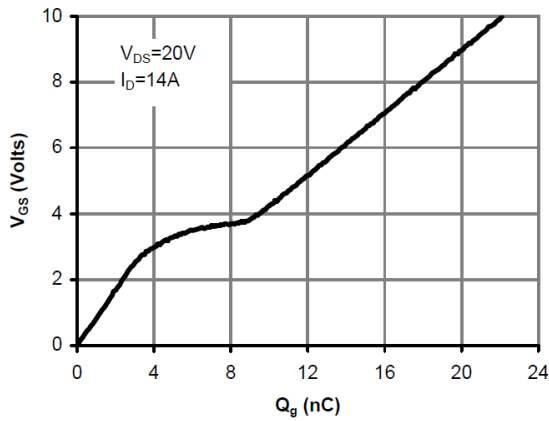
14.0A

## TYPICAL CHARACTERICTICS


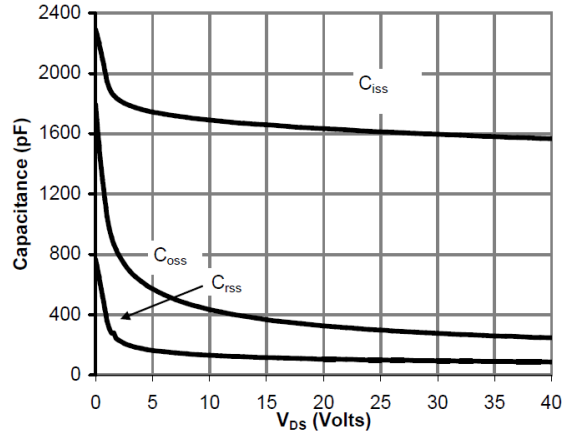Figure 7: Gate-Charge Characteristics


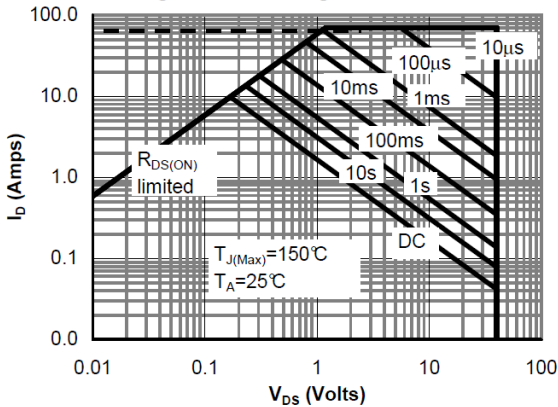Figure 8: Capacitance Characteristics
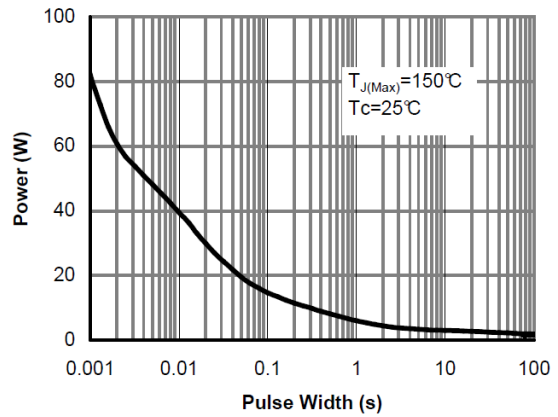

Figure 9: Maximum Forward Biased Safe Operating Area (Note F)


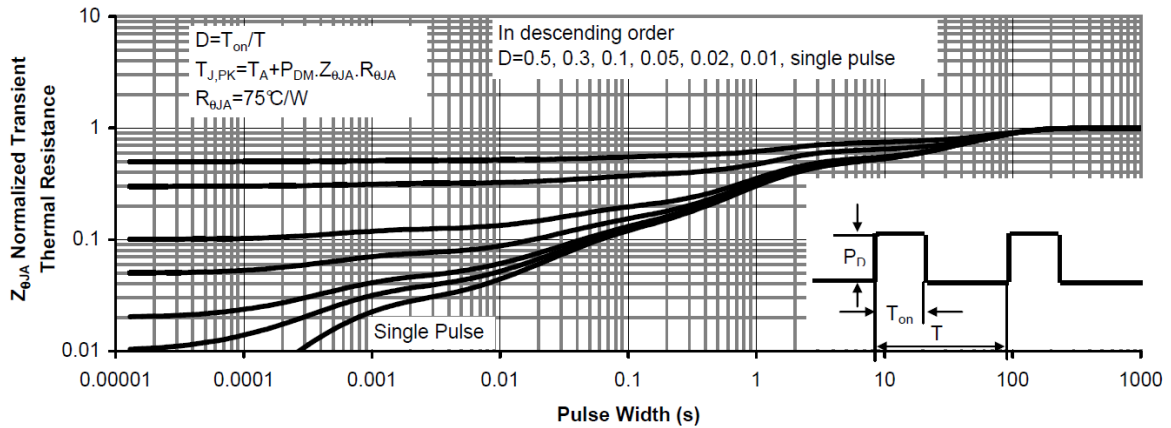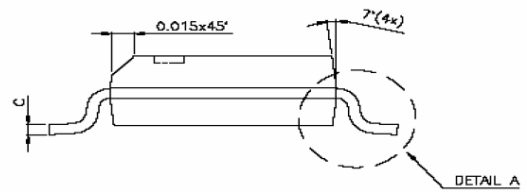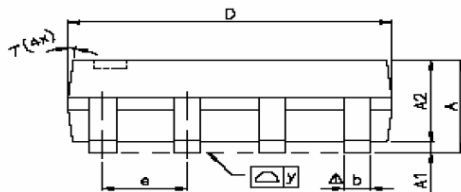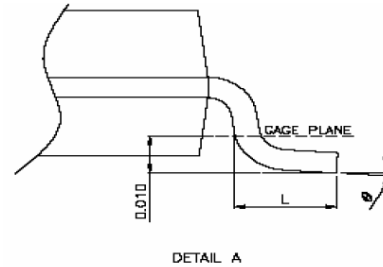Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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**PACKAGE OUTLINE SOP-8P**



| 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 |
| y | —— | —— | 0.076 | —— | —— | 0.003 |
| θ | 0° | —— | 8° | 0° | —— | 8° |

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