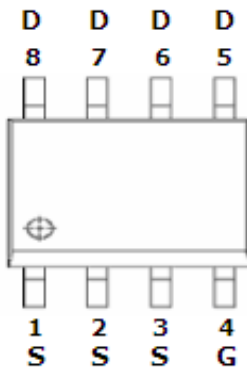


## DESCRIPTION

STN4526 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.

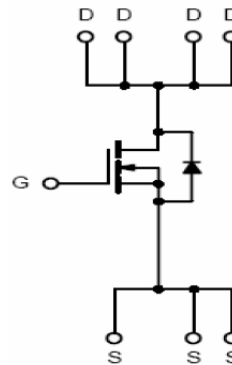
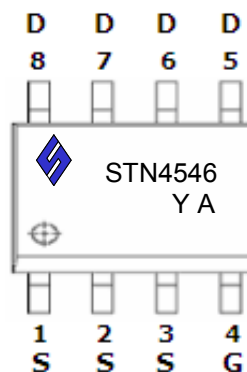
## PIN CONFIGURATION SOP-8



## FEATURE

- 40V/10.0A,  $R_{DS(ON)} = 20m\Omega$  (Typ.) @  $V_{GS} = 10V$
- 40V/8.0A,  $R_{DS(ON)} = 23m\Omega$  @  $V_{GS} = 4.5V$
- 40V/6.0A,  $R_{DS(ON)} = 27m\Omega$  @  $V_{GS} = 2.5V$
- 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



**Y: Year Code A: Process Code**

**STN4546**

N Channel Enhancement Mode MOSFET

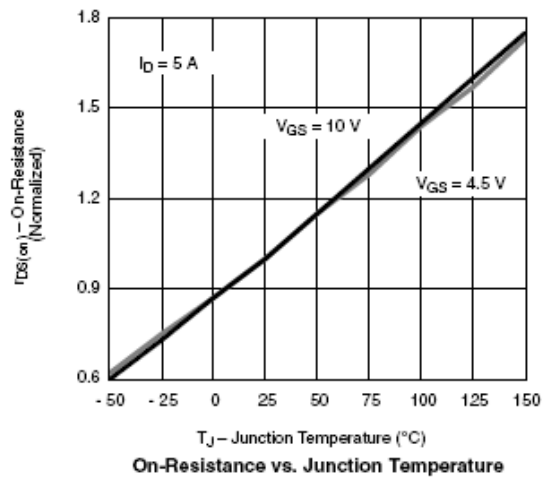
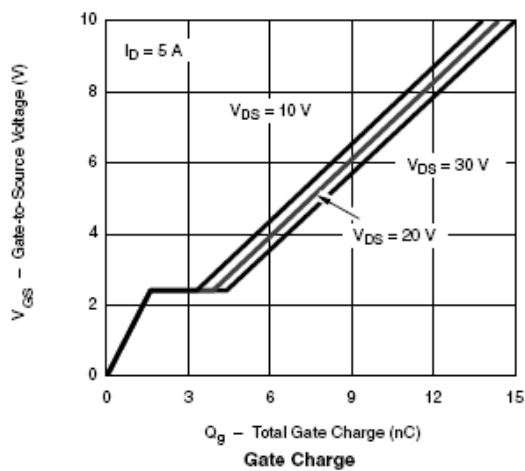
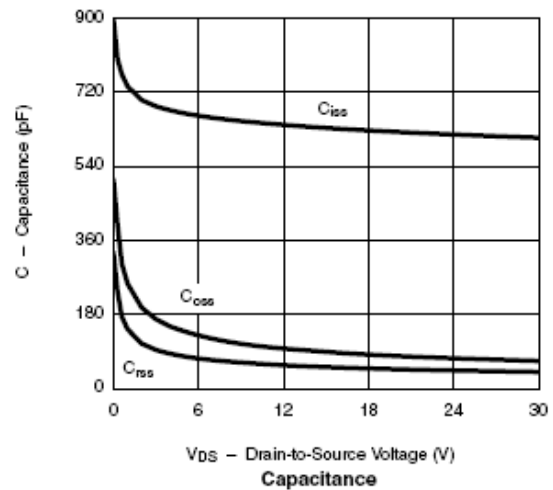
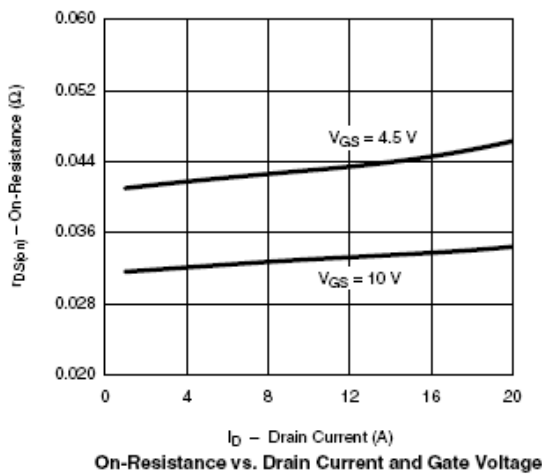
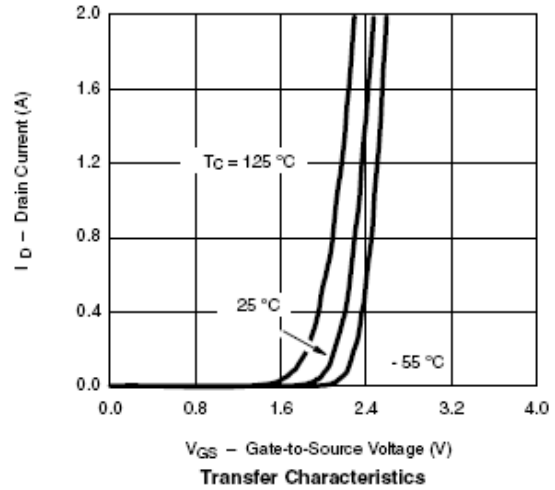
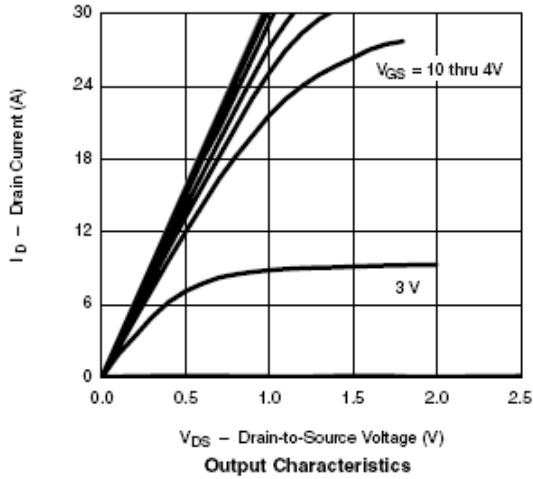
**6.0A****ABSOLUTE MAXIMUM RATINGS** (Ta = 25°C Unless otherwise noted )

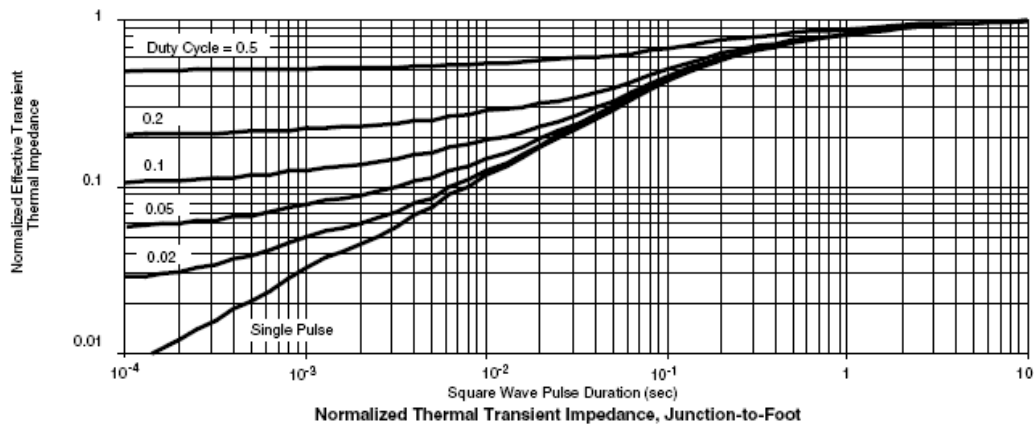
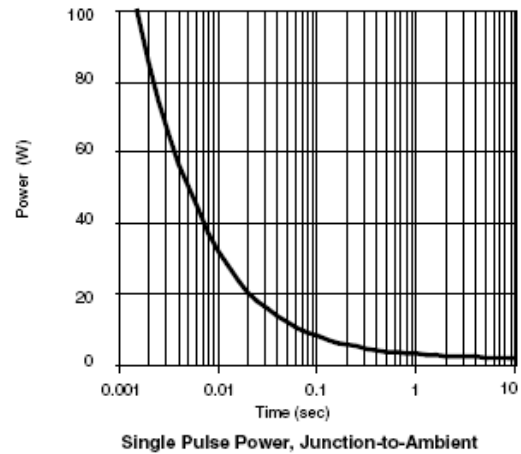
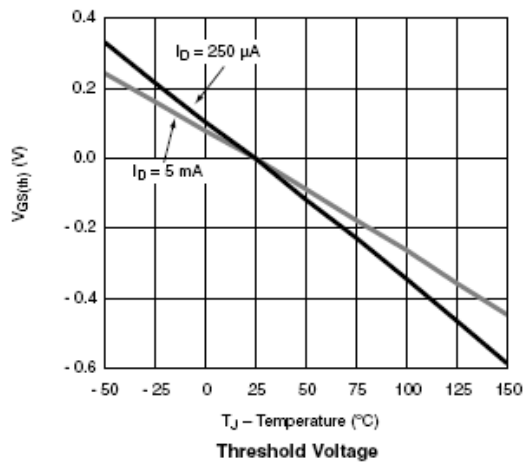
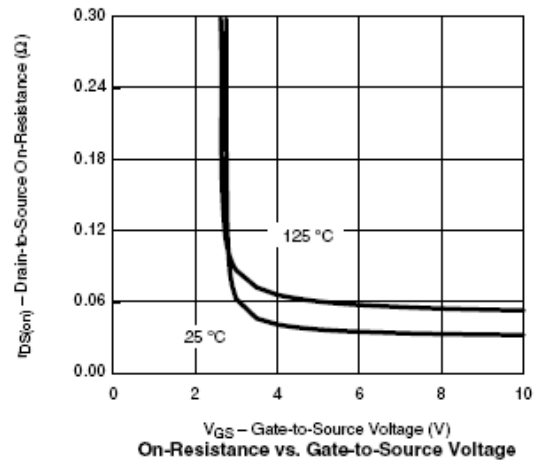
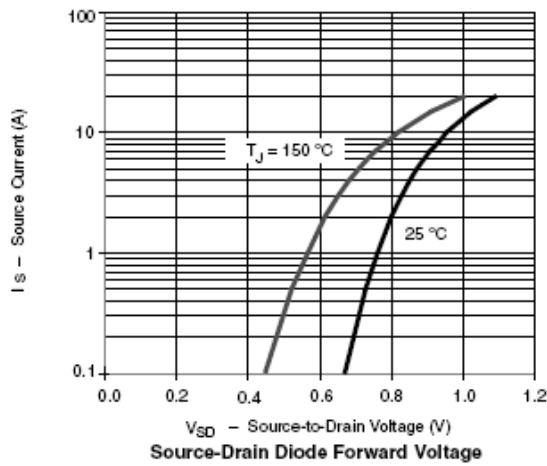
| Parameter                                    |         | Symbol | Typical | Unit |
|----------------------------------------------|---------|--------|---------|------|
| Drain-Source Voltage                         |         | VDSS   | 40      | V    |
| Gate-Source Voltage                          |         | VGSS   | ±12     | V    |
| Continuous Drain Current (TJ=150°C)          | TA=25°C | ID     | 6.0     | A    |
|                                              | TA=70°C |        | 5.0     | A    |
| Pulsed Drain Current                         |         | IDM    | 30      | A    |
| Continuous Source Current (Diode Conduction) |         | IS     | 2.3     | A    |
| Power Dissipation                            | TA=25°C | PD     | 2.5     | W    |
|                                              | TA=70°C |        | 1.6     | W    |
| Operation Junction Temperature               |         | TJ     | -55/150 | °C   |
| Storage Temperature Range                    |         | TSTG   | -55/150 | °C   |
| Thermal Resistance-Junction to Ambient       |         | RθJA   | 80      | °C/W |

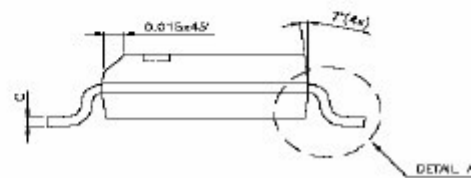
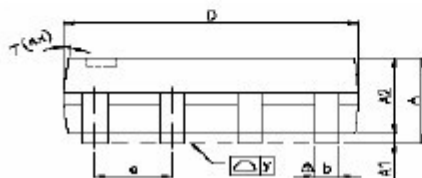
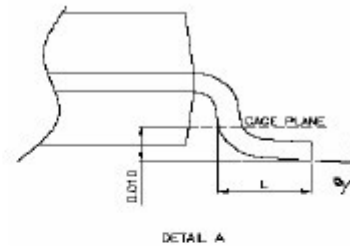
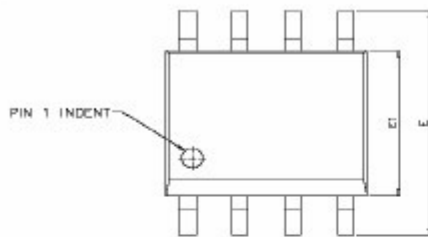
**ELECTRICAL CHARACTERISTICS** ( Ta = 25°C Unless otherwise noted )

| Parameter                       | Symbol                | Condition                                                                   | Min | Typ            | Max            | Unit |
|---------------------------------|-----------------------|-----------------------------------------------------------------------------|-----|----------------|----------------|------|
| Static                          |                       |                                                                             |     |                |                |      |
| Drain-Source Breakdown Voltage  | $V_{(BR)DSS}$         | $V_{GS}=0V, I_D=250\mu A$                                                   | 40  |                |                | V    |
| Gate Threshold Voltage          | $V_{GS(th)}$          | $V_{DS}=V_{GS}, I_D=250\mu A$                                               | 0.5 |                | 1.2            | V    |
| Gate Leakage Current            | $I_{GSS}$             | $V_{DS}=0V, V_{GS}=\pm 12V$                                                 |     |                | $\pm 100$      | nA   |
| Zero Gate Voltage Drain Current | $I_{DSS}$             | $V_{DS}=40V, V_{GS}=0V$                                                     |     |                | 1              | uA   |
|                                 |                       | $V_{DS}=40V, V_{GS}=0V$<br>$T_J=85^{\circ}C$                                |     |                | 5              |      |
| On-State Drain Current          | $I_{D(on)}$           | $V_{DS}\geq 5V, V_{GS}=10V$                                                 | 10  |                |                | A    |
| Drain-source On-Resistance      | $R_{DS(on)}$          | $V_{GS}=10V, I_D=6.0A$<br>$V_{GS}=4.5V, I_D=5.0A$<br>$V_{GS}=2.5, I_D=4.5A$ |     | 40<br>47<br>72 | 48<br>55<br>80 | mΩ   |
| Forward Transconductance        | $g_{fs}$              | $V_{DS}=15V, I_D=6.2AV$                                                     |     | 13             |                | S    |
| Diode Forward Voltage           | $V_{SD}$              | $I_S=2.3A, V_{GS}=0V$                                                       |     | 0.8            | 1.2            | V    |
| Dynamic                         |                       |                                                                             |     |                |                |      |
| Total Gate Charge               | $Q_g$                 | $V_{DS}=15V, V_{GS}=10V$<br>$I_D=5A$                                        |     | 10             | 15             | nC   |
| Gate-Source Charge              | $Q_{gs}$              |                                                                             |     | 1.6            |                |      |
| Gate-Drain Charge               | $Q_{gd}$              |                                                                             |     | 2.0            |                |      |
| Input Capacitance               | $C_{iss}$             | $V_{DS}=20V, V_{GS}=0V$<br>$F=1MHz$                                         |     | 500            |                | pF   |
| Output Capacitance              | $C_{oss}$             |                                                                             |     | 80             |                |      |
| Reverse TransferCapacitance     | $C_{rss}$             |                                                                             |     | 45             |                |      |
| Turn-On Time                    | $t_{d(on)}$<br>$t_r$  | $V_{DD}=15V, R_L=15\Omega$<br>$I_D=1.0A, V_{GEN}=10V$<br>$R_G=6\Omega$      |     | 15             | 20             | nS   |
| Turn-Off Time                   | $t_{d(off)}$<br>$t_f$ |                                                                             |     | 6              | 12             |      |
|                                 |                       |                                                                             |     | 10             | 20             |      |
|                                 |                       |                                                                             |     | 40             | 80             |      |

**TYPICAL CHARACTERISTICS**



**TYPICAL CHARACTERISTICS**


**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  |
| $\Delta y$ | —                         | —    | 0.076 | —                    | —     | 0.003  |
| $\theta$   | 0°                        | —    | 8°    | 0°                   | —     | 8°     |