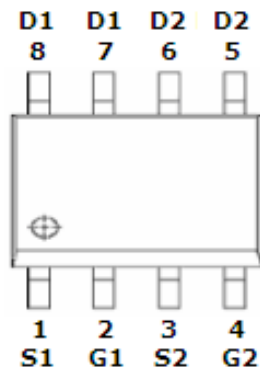
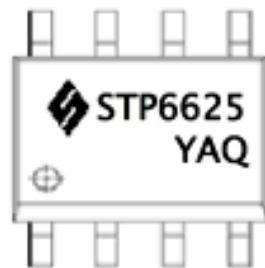


**DESCRIPTION**

STP6625 is the P-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, notebook power management and other battery powered circuits where high-side switching.

**PIN CONFIGURATION  
SOP-8**

**FEATURE**

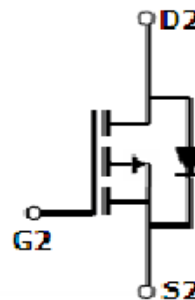
- -60V/-5.0A,  $R_{DS(ON)} = 60m\Omega$  (Typ.) @ $V_{GS} = -10$
- -60V/-3.0A,  $R_{DS(ON)} = 85m\Omega$  @ $V_{GS} = -4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP-8 package design

**PART MARKING  
SOP-8**


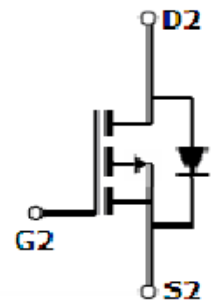
Y: Year Code

A: Date Code

Q: Process Code



P-Channel



P-Channel

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

| Parameter   |  | Symbol           | Typical      | Unit |
|---|--|------------------|--------------|------|
| Drain-Source Voltage                                |  | V <sub>DSS</sub> | -60          | V    |
| Gate-Source Voltage                                 |  | V <sub>GSS</sub> | ±20          | V    |
| Continuous Drain Current<br>(T <sub>J</sub> =150°C) | T <sub>A</sub> =25°C<br>T <sub>A</sub> =70°C | I <sub>D</sub>   | -5.0<br>-4.0 | A    |
| Pulsed Drain Current                                |  | I <sub>DM</sub>  | -25          | A    |
| Continuous Source Current<br>(Diode Conduction)     |  | I <sub>S</sub>   | -3           | A    |
| Power Dissipation                                   | T <sub>A</sub> =25°C<br>T <sub>A</sub> =70°C | P <sub>D</sub>   | 2.3<br>1.3   | W    |
| Operation Junction Temperature                      |  | T <sub>J</sub>   | -55/150      | °C   |
| Storage Temperature Range                           |  | T <sub>STG</sub> | -55/150      | °C   |
| Thermal Resistance-Junction to Ambient              |  | R <sub>θJA</sub> | 70           | °C/W |



**STP6625** 

P Channel Enhancement Mode MOSFET

-5.0A

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

| Parameter                       | Symbol         | Condition  | Min  | Typ            | Max            | Unit     |
|---------------------------------|----------------|--|------|----------------|----------------|----------|
| <b>Static</b>                   |                |  |      |                |                |          |
| Drain-Source Breakdown Voltage  | $V_{(BR)DSS}$  | $V_{GS}=0V, I_D=-250\mu A$                                     | -60  |                |                | V        |
| Gate Threshold Voltage          | $V_{GS(th)}$   | $V_{DS}=V_{GS}, I_D=-250\mu A$                                 | -0.8 |                | -2.5           | V        |
| Gate Leakage Current            | $I_{GSS}$      | $V_{DS}=0V, V_{GS}=\pm 20V$                                    |      |                | $\pm 100$      | nA       |
| Zero Gate Voltage Drain Current | $I_{DSS}$      | $V_{DS}=-48V, V_{GS}=0V$                                       |      |                | -1             | uA       |
|                                 |                | $V_{DS}=-48V, V_{GS}=0V$<br>$T_J=85^\circ C$                   |      |                | -10            |          |
| Drain-source On-Resistance      | $R_{DS(on)}$   | $V_{GS}=-10V, I_D=-5A$<br>$V_{GS}=-4.5V, I_D=-3A$              |      | 0.060<br>0.085 | 0.072<br>0.095 | $\Omega$ |
| Forward Tran Conductance        | $g_{fs}$       | $V_{DS}=-5V, I_D=-6.7A$  |      | 18             |                | S        |
| Diode Forward Voltage           | $V_{SD}$       | $I_S=-2.3A, V_{GS}=0V$   |      | -0.7           | -1.0           | V        |
| <b>Dynamic</b>                  |                |  |      |                |                |          |
| Total Gate Charge               | $Q_g$          | $V_{DS}=-30V, V_{GS}=-10V$<br>$I_D=-6.2A$                      |      | 45             |                | nC       |
| Gate-Source Charge              | $Q_{gs}$       |  |      | 5.2            |                |          |
| Gate-Drain Charge               | $Q_{gd}$       |  |      | 9.3            |                |          |
| Input Capacitance               | $C_{iss}$      | $V_{DS}=-30V, V_{GS}=0V$<br>$f=1MHz$                           |      | 2010           |                | pF       |
| Output Capacitance              | $C_{oss}$      |  |      | 130            |                |          |
| Reverse Transfer Capacitance    | $C_{rss}$      |  |      | 105            |                |          |
| Turn-On Time                    | $t_{d(on)tr}$  | $V_{DS}=-30V, R_L=4.7\Omega$<br>$V_{GS}=-10V, R_{GEN}=3\Omega$ |      | 9              |                | nS       |
|                                 |                |  |      | 6.1            |                |          |
| Turn-Off Time                   | $t_{d(off)tf}$ |  |      | 44             |                |          |
|                                 |                |  |      | 12.9           |                |          |

**TYPICAL CHARACTERISTICS**

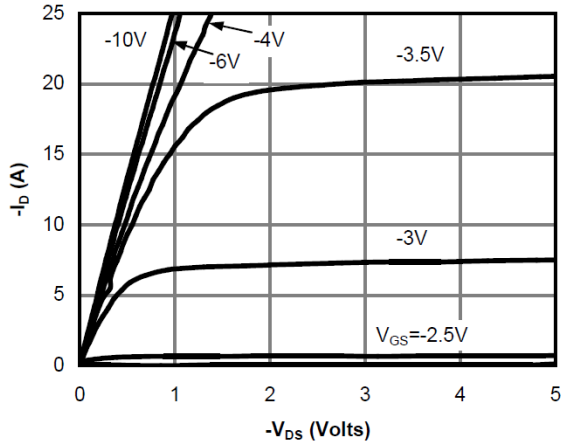


Fig 1: On-Region Characteristics

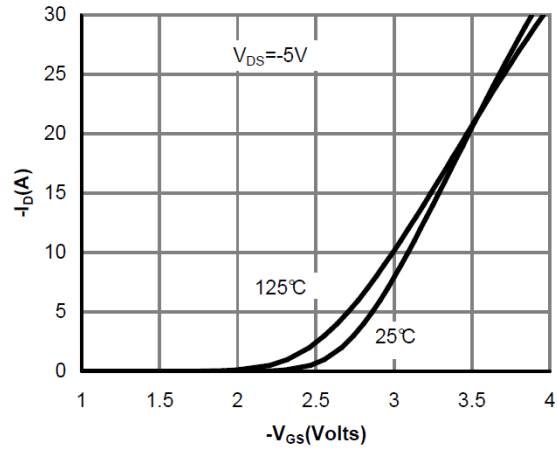


Figure 2: Transfer Characteristics

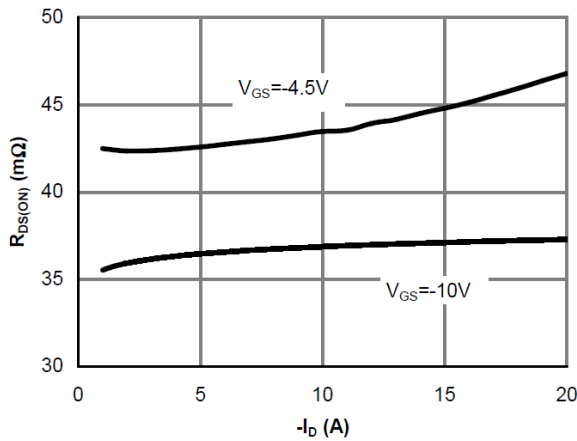


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

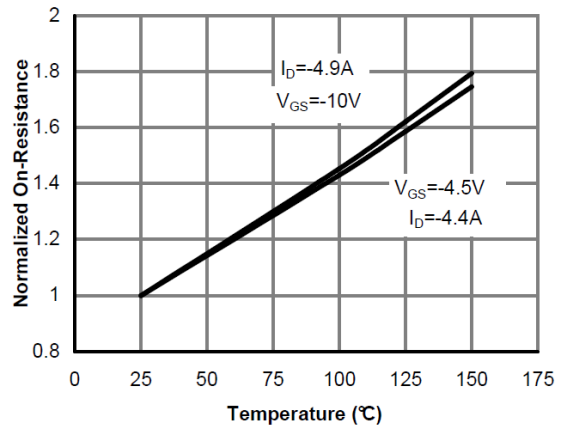


Figure 4: On-Resistance vs. Junction Temperature

**TYPICAL CHARACTERISTICS**

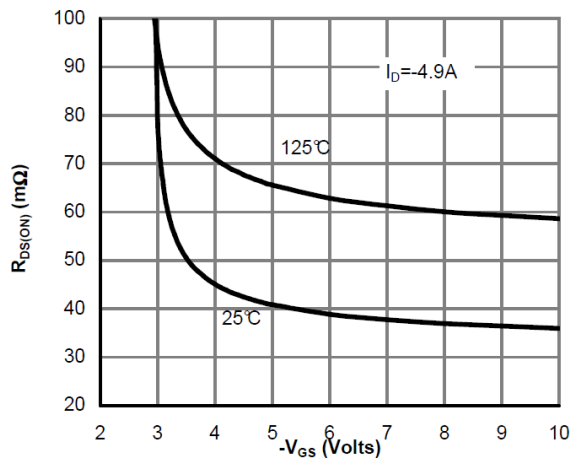


Figure 5: On-Resistance vs. Gate-Source Voltage

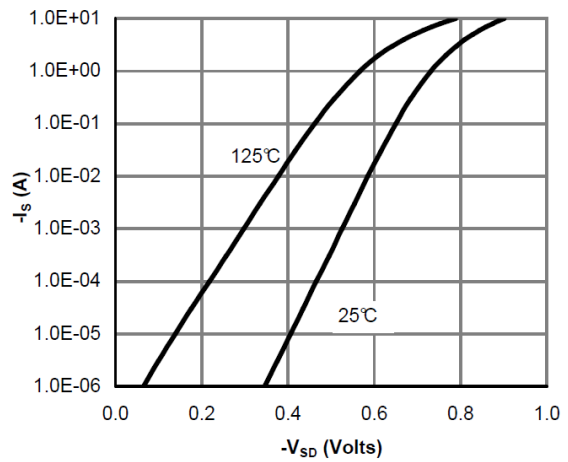


Figure 6: Body-Diode Characteristics

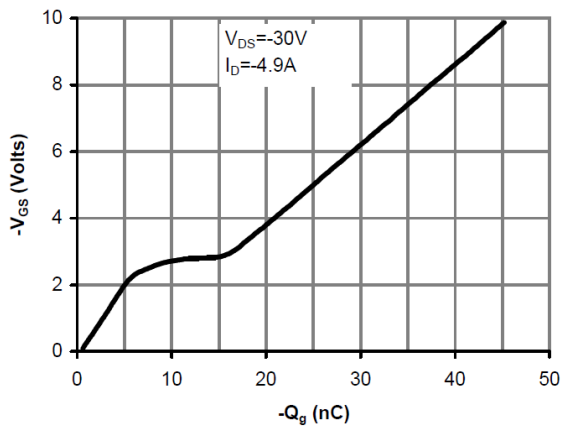


Figure 7: Gate-Charge Characteristics

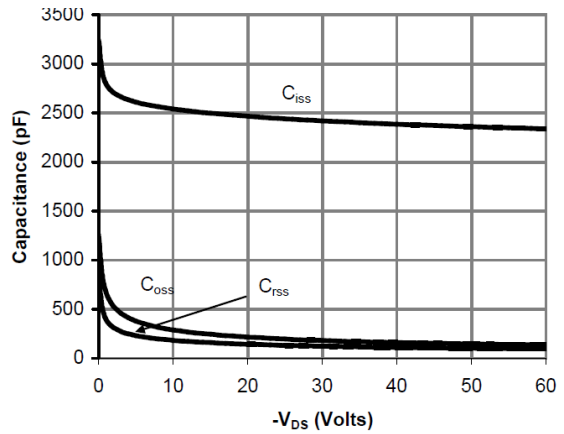


Figure 8: Capacitance Characteristics

**TYPICAL CHARACTERISTICS**

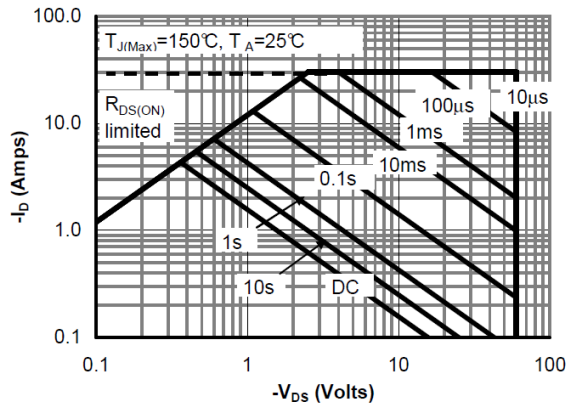


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

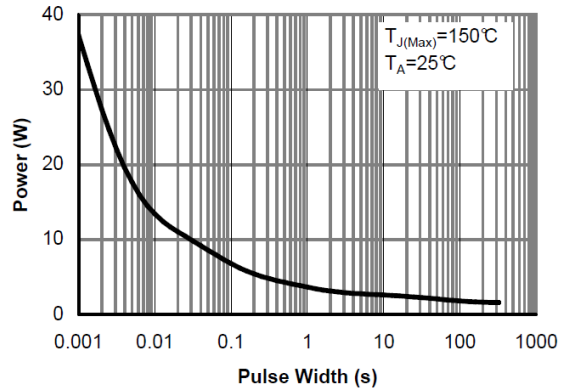


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

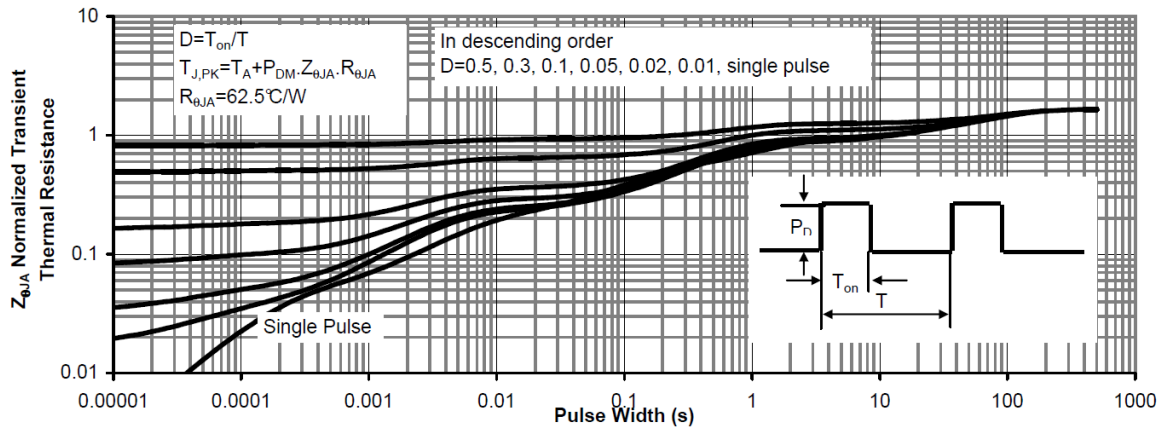
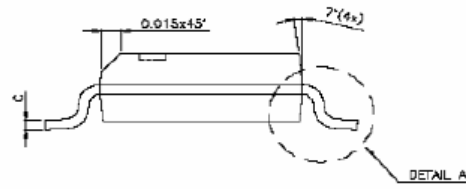
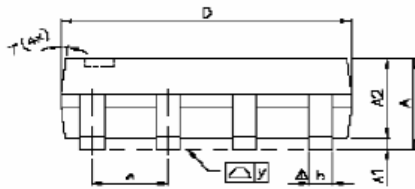
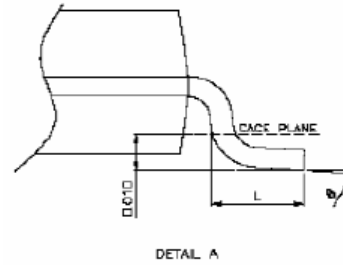
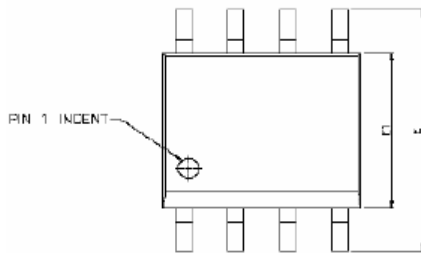


Figure 11: Normalized Maximum Transient Thermal Impedance

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