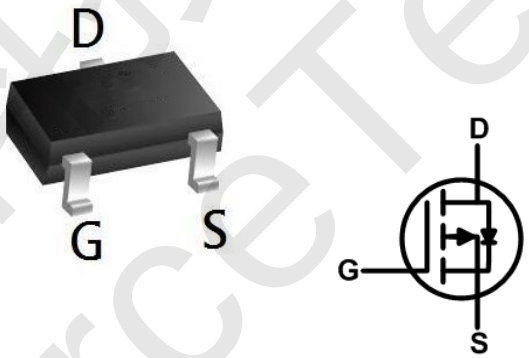
# CST2309 P-Ch 60V Fast Switching MOSFETs

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

**CST2309 Product Summary**

| BVDSS | RDSON | ID |
|---|---|---|
| -60V | 160 mΩ | -2 A |

**CST2309 SOT23 Pin Configuration**




## CST2309 Description

The CST2309 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The CST2309 meet the RoHS and Green Product requirement with full function reliability approved.

## CST2309 Absolute Maximum Rating

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source voltage | $V_{DS}$ | -60 | V |
| Gate-Source voltage | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $I_D$ | -2.0 | A |
| Pulsed Drain Current[1] | $I_{DM}$ | -5.2 | A |
| Power Dissipation | $P_D$ | 1 | W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55~ 150 | ℃ |
| Thermal Resistance from Junction to Ambient[2] | $R_{\theta JA}$ | 125 | °C/W |



TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com

## CST2309 Electrical Characteristics (T =25°C unless otherwise noted)

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V $I_D$=-250μA | -60 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current($T_A$=25℃) | $V_{DS}$=-60V, $V_{GS}$=0V | -- | -- | -1 | μA |
| | Zero Gate Voltage Drain Current($T_A$=125℃) | $V_{DS}$=-60V, $V_{GS}$=0V | -- | -- | -100 | uA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0V | -- | -- | ±100 | nA |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -1.0 | -1.5 | -2.5 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance② | $V_{GS}$=-10V, $I_D$=-2A | -- | 160 | 200 | mΩ |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance② | $V_{GS}$=-4.5V, $I_D$=-1A | -- | 200 | 300 | mΩ |
| **Dynamic Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-30V, $V_{GS}$=0V, f=1MHz | -- | 310 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 22 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 15 | -- | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-30V $I_D$=-2A, $V_{GS}$=-10V | -- | 5.4 | -- | nC |
| $Q_{gs}$ | Gate Source Charge | | -- | 1.1 | -- | nC |
| $Q_{gd}$ | Gate Drain Charge | | -- | 1.6 | -- | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn on Delay Time | $V_{DD}$=-30V, $I_D$=-2A, $R_G$=3.3Ω, $V_{GS}$=-10V | -- | 41 | -- | ns |
| $t_r$ | Turn on Rise Time | | -- | 22 | -- | ns |
| $t_{d(off)}$ | Turn Off Delay Time | | - | 25 | -- | ns |
| $t_f$ | Turn Off Fall Time | | -- | 32 | -- | ns |
| **Source Drain Diode Characteristics** | | | | | | |
| $I_{SD}$ | Source drain current(Body Diode) | $T_A$=25℃ | -- | -- | -2.0 | A |
| $V_{SD}$ | Forward on voltage② | $T_j$=25℃, $I_{SD}$=-2A, $V_{GS}$=0V | -- | -0.84 | -1.2 | V |

Notes:

① Pulse width limited by maximum allowable junction temperature

②Pulse test ; Pulse width≤300μs, duty cycle≤2%.

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com

## CST2309 Typical Characteristics

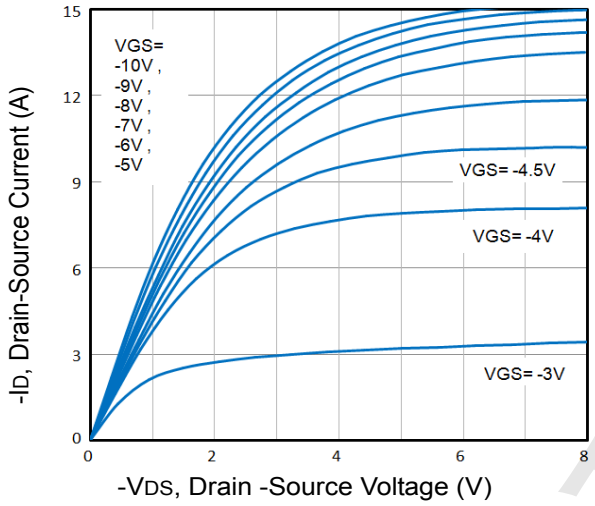



**Fig1.** Typical Output Characteristics

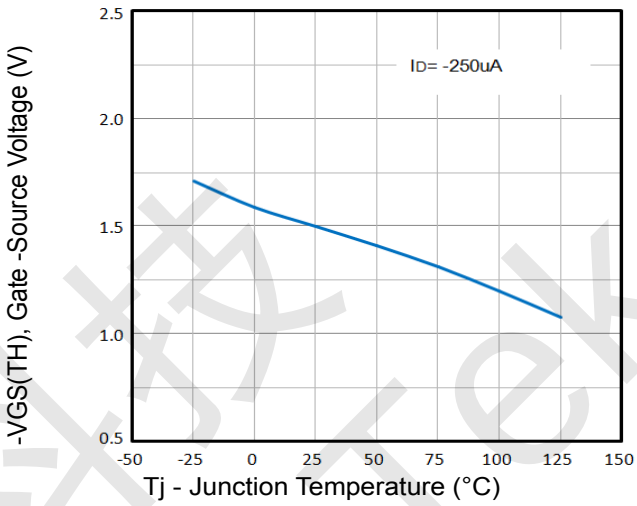



**Fig2.** Normalized Threshold Voltage Vs. Temperature

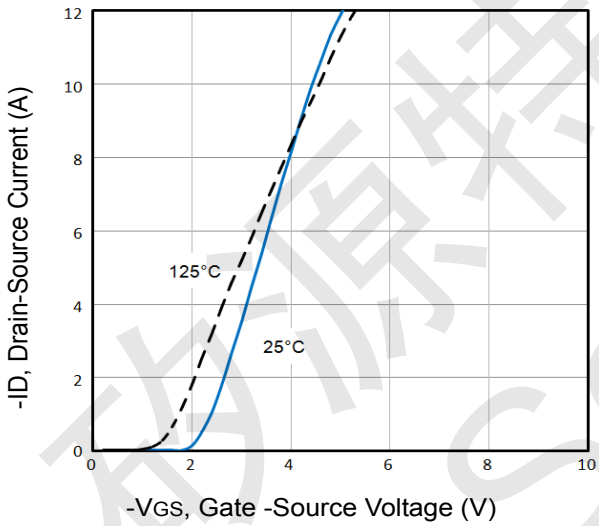



**Fig3.** Typical Transfer Characteristics

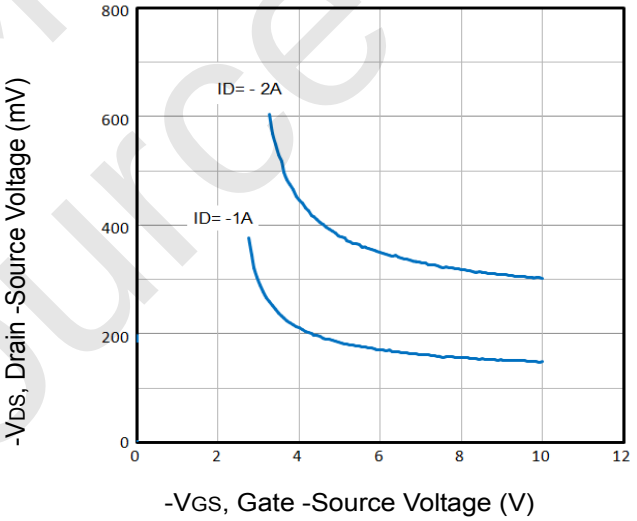



**Fig4.** Drain -Source Voltage vs Gate -Source Voltage

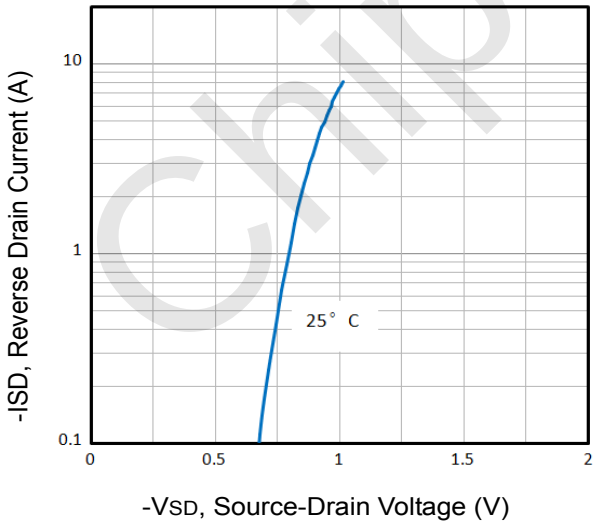



**Fig5.** Typical Source-Drain Diode Forward Voltage

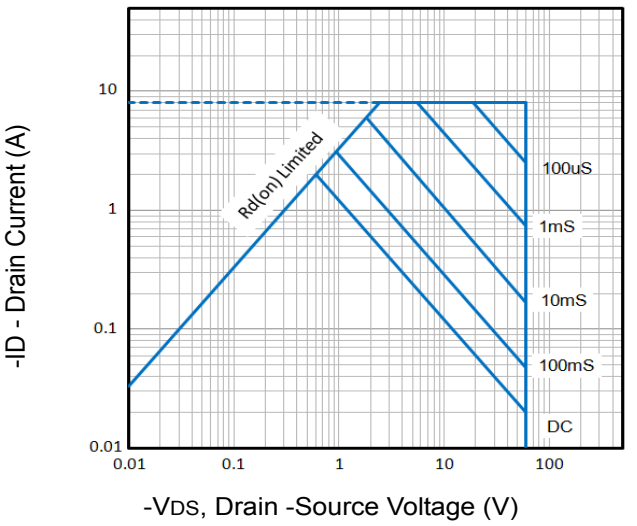



**Fig6.** Maximum Safe Operating Area

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com

## CST2309 Typical Characteristics

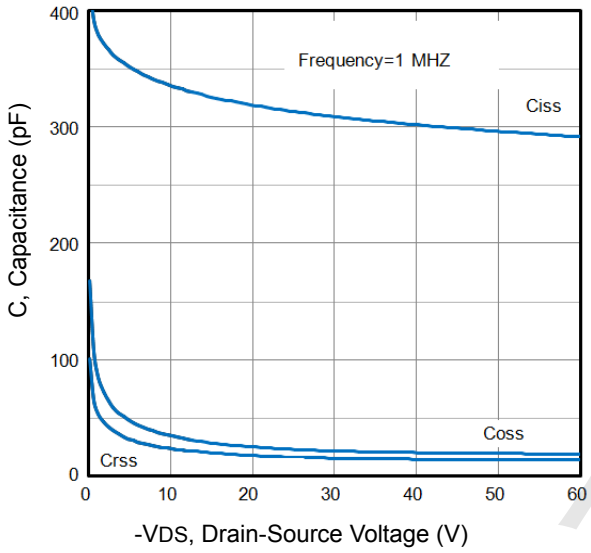



**Fig7.** Typical Capacitance Vs. Drain-Source Voltage

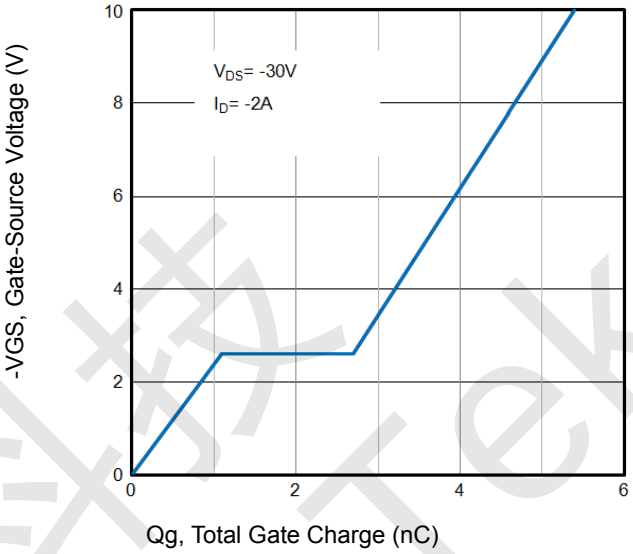



**Fig8.** Typical Gate Charge Vs. Gate-Source Voltage

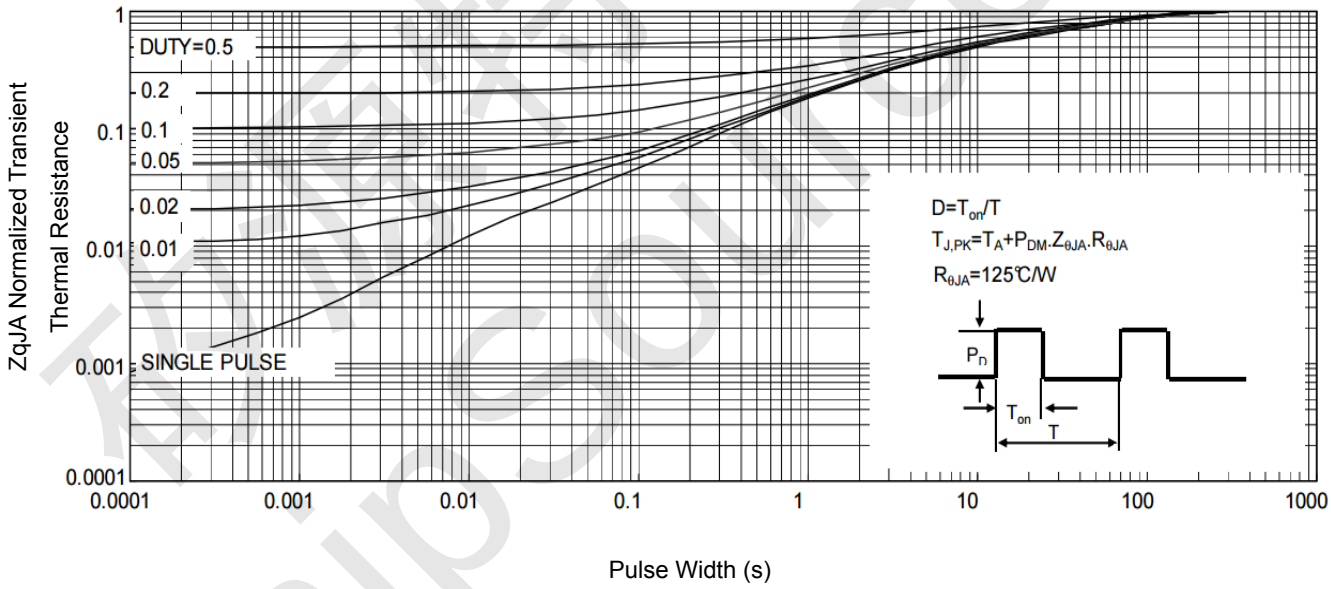



**Fig9.** Normalized Maximum Transient Thermal Impedance

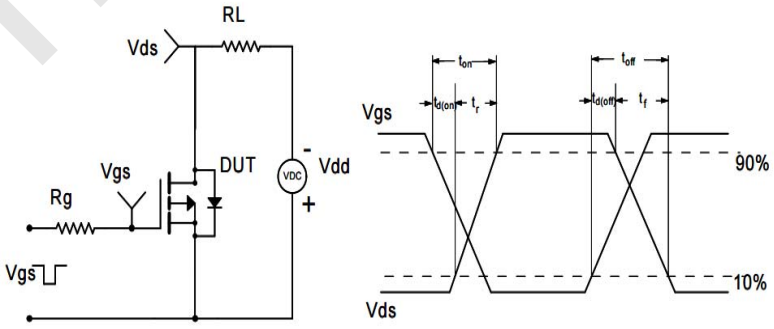
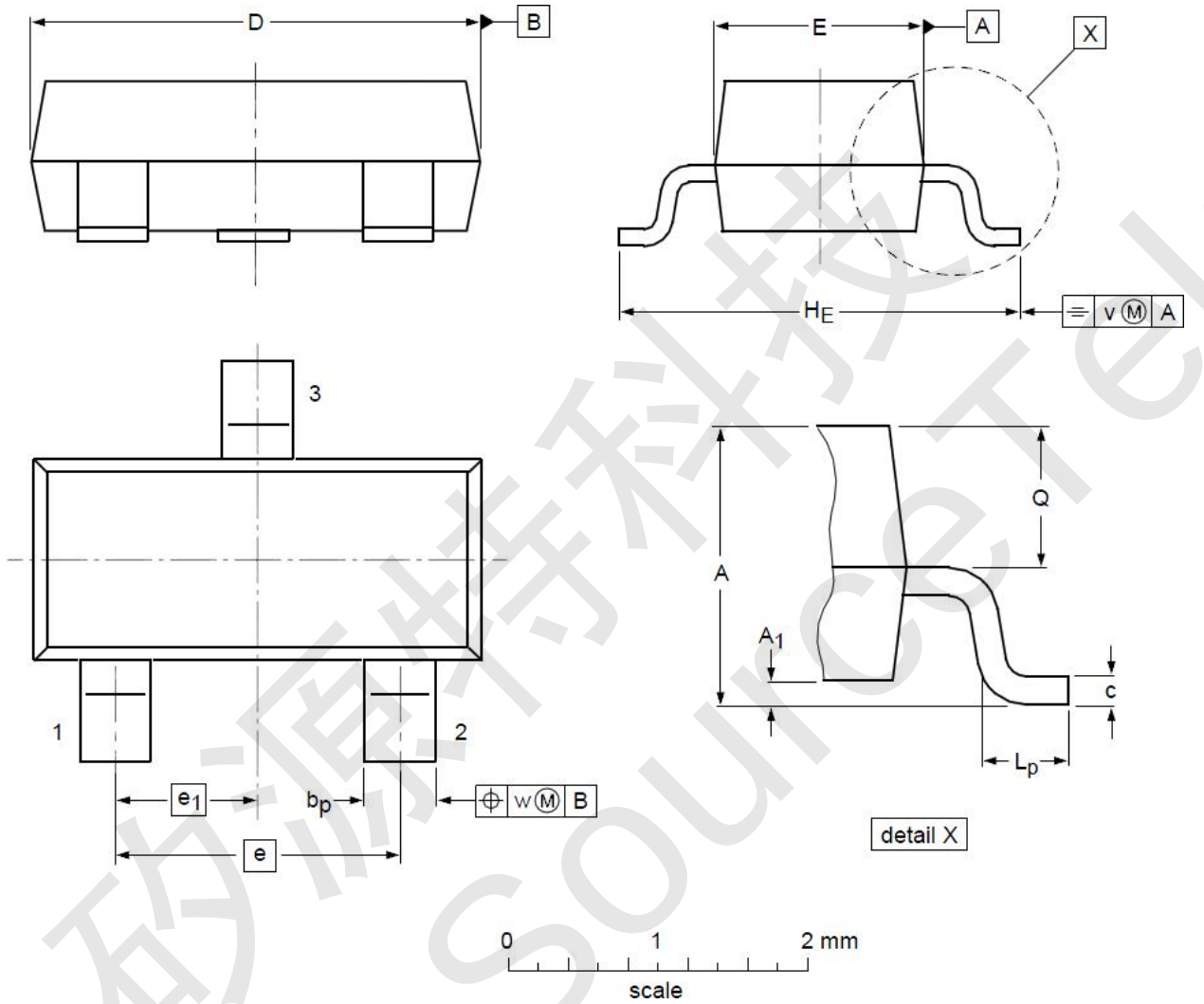



**Fig10.** Switching Time Test Circuit and waveforms

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com

## CST2309 Package Mechanical Data-SOT-23




**DIMENSIONS** ( unit : mm )

| Symbol | Min | Typ | Max | Symbol | Min | Typ | Max |
|---|---|---|---|---|---|---|---|
| **A** | 0.90 | 1.01 | 1.15 | **$A_1$** | 0.01 | 0.05 | 0.10 |
| **$b_p$** | 0.30 | 0.42 | 0.50 | **c** | 0.08 | 0.13 | 0.15 |
| **D** | 2.80 | 2.92 | 3.00 | **E** | 1.20 | 1.33 | 1.40 |
| **e** | -- | 1.90 | -- | **$e_1$** | -- | 0.95 | -- |
| **$H_E$** | 2.25 | 2.40 | 2.55 | **$L_p$** | 0.30 | 0.42 | 0.50 |
| **Q** | 0.45 | 0.49 | 0.55 | **v** | -- | 0.20 | -- |
| **w** | -- | 0.10 | -- | | | | |



TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com