# CST2SK3019 N-Ch 60V Fast Switching MOSFETs

## CST2SK3019 Features

- Low $R_{DS(on)}$ @$V_{GS}$=10V
- 5V Logic Level Control
- N Channel SOT523 Package
- HMB ESD Protection 1KV
- Pb−Free, RoHS Compliant

## CST2SK3019 Applications

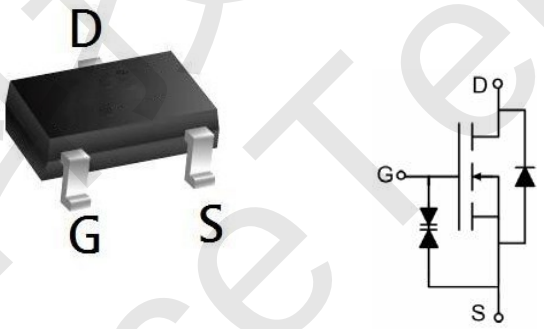
- LED Lighting Application,
- ON/OFF switch
- Networking

## CST2SK3019 Product Summary

Green

| BVDSS | RDSON | ID |
|---|---|---|
| 60V | 1.5mΩ | 0.5A |

## CST2SK3019 SOT-523 Pin Configuration




## CST2SK3019 Absolute Maximum Ratings ($T_A$=25℃ unless otherwise specified)

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| **Common Ratings ($T_A$=25°C Unless Otherwise Noted)** | | | | |
| $V_{GS}$ | Gate-Source Voltage | | ±20 | V |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | | 60 | V |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -50 to 150 | °C |
| Mounted on Large Heat Sink | | | | |
| $I_{DM}$ | Pulse Drain Current Tested① | $T_A$=25°C | 0.8 | A |
| $I_D$ | Continuous Drain Current($V_{GS}$=4.5V) | $T_A$=25°C | 0.3 | A |
| | | $T_A$=70°C | 0.24 | |
| $P_D$ | Maximum Power Dissipation | $T_A$=25°C | 0.9 | W |
| | | $T_A$=70°C | 0.6 | |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient | | 125 | °C/W |

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## CST2SK3019 Electrical Characteristics ($T_J$=25℃ unless otherwise specified)

| Symbol | Parame | 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 | $V_{GS}$=±12V, $V_{DS}$=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, $I_D$=0.3A | -- | 1.5 | 3 | Ω |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance② | $V_{GS}$=4.5V, $I_D$=0.2A | -- | 2.6 | 6 | Ω |
| **Dynamic Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=30V, $V_{GS}$=0V, f=1MHz | -- | 1 | | pF |
| $C_{oss}$ | Output Capacitance | | -- | 3 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 0 | -- | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$=30V $I_D$=0.3A, $V_{GS}$=4.5V | -- | 0.5 | -- | nC |
| $Q_{gs}$ | Gate Source Charge | | -- | 0.12 | -- | nC |
| $Q_{gd}$ | Gate Drain Charge | | -- | 0.21 | -- | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn on Delay Time | $V_{DD}$=30V, $I_D$=0.3A, $R_G$=3.3Ω, $V_{GS}$=10V | -- | 4.5 | -- | n |
| $t_r$ | Turn on Rise Time | | -- | 3.1 | -- | n |
| $t_{d(off)}$ | Turn Off Delay Time | | - | 15 | -- | n |
| $t_f$ | Turn Off Fall Time | | -- | 3.3 | -- | n |
| **Source Drain Diode Characteristics** | | | | | | |
| $I_{SD}$ | Source drain current(Body Diode) | $T_A$=25℃ | -- | - | 0.2 | A |
| $V_{SD}$ | Forward on voltage② | $T_j$=25℃, $I_{SD}$=0.2A, $V_{GS}$=0V | -- | 0 | 1.2 | V |

Notes:

① Pulse width limited by maximum allowable junction temperature

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

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## CST2SK3019 Typical Characteristics

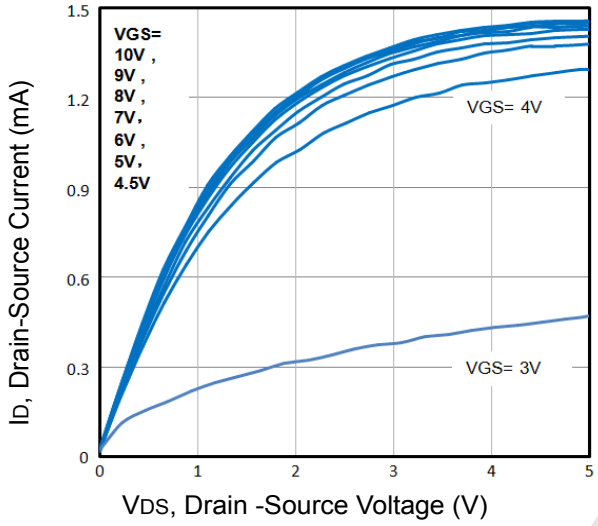


**Fig1.** Typical Output Characteristics

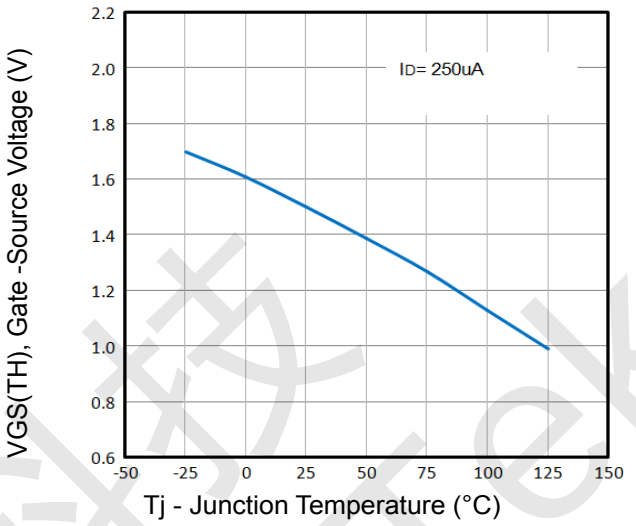


**Fig2.** Normalized Threshold Voltage Vs. Temperature

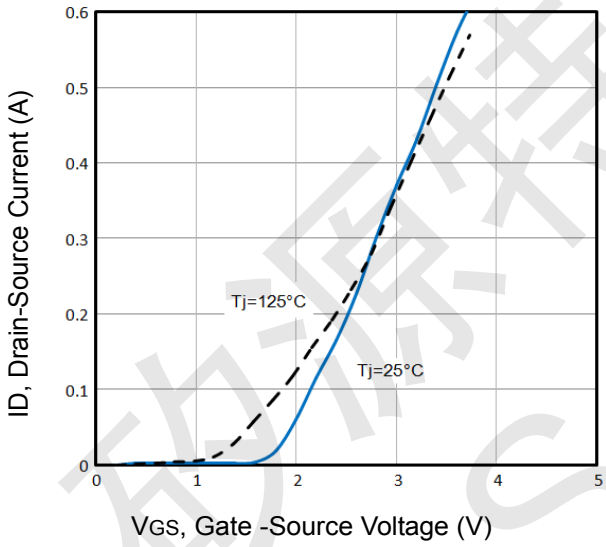


**Fig3.** Typical Transfer Characteristics

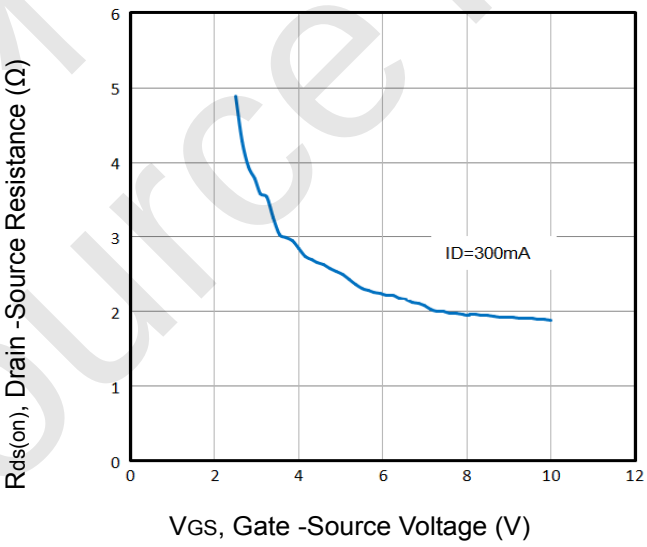


**Fig4.** Rds(on) vs Gate -Source Voltage

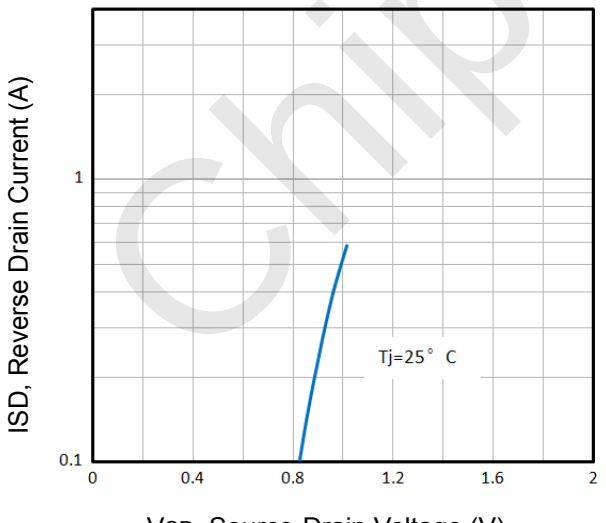


**Fig5.** Typical Source-Drain Diode Forward Voltage

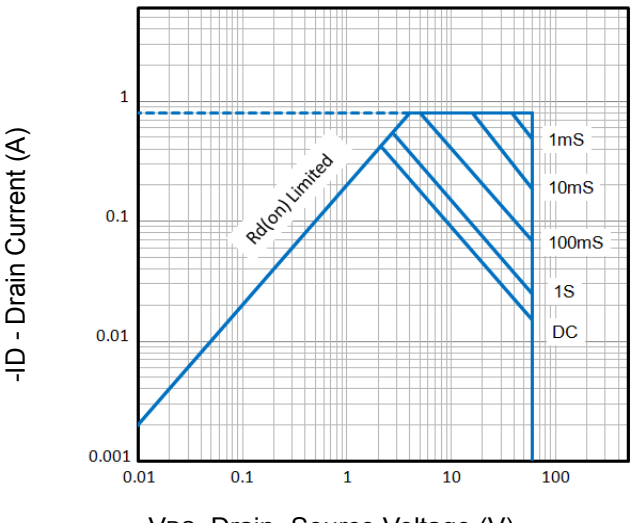


**Fig6.** Maximum Safe Operating Area



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## CST2SK3019 Typical Characteristics

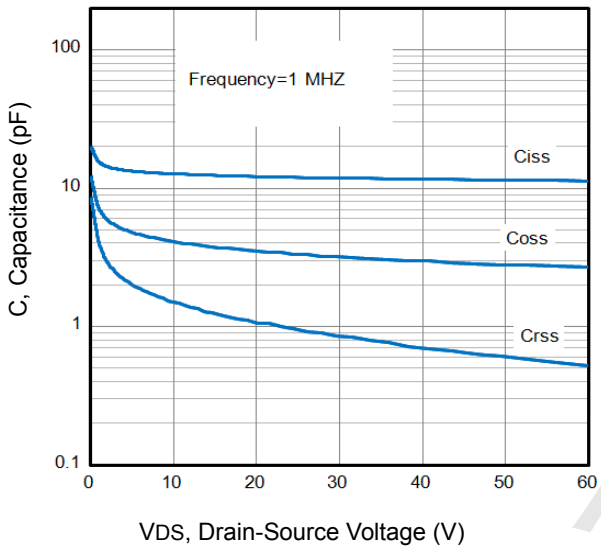



**Fig7.** Typical Capacitance Vs. Drain-Source Voltage

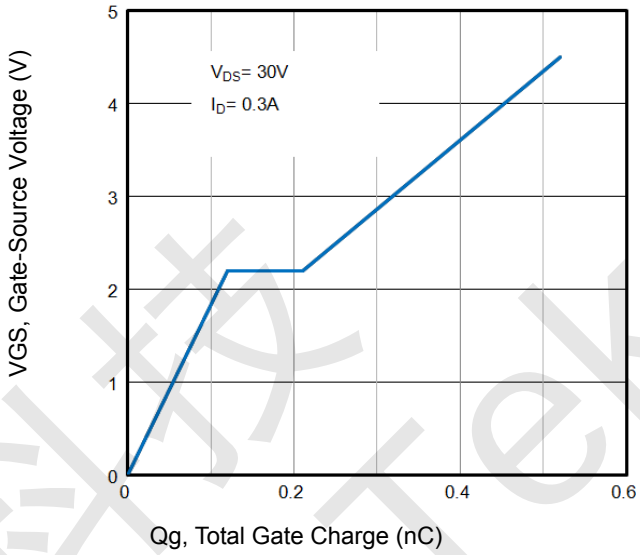



**Fig8.** Typical Gate Charge Vs. Gate-Source Voltage

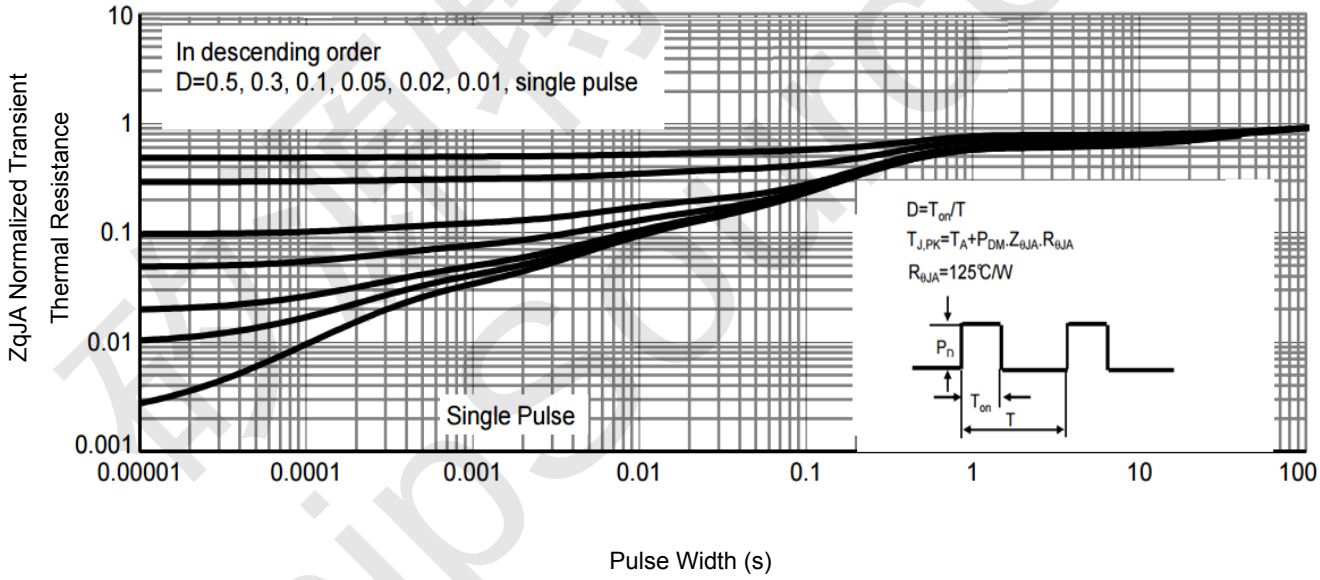



**Fig9.** Normalized Maximum Transient Thermal Impedance

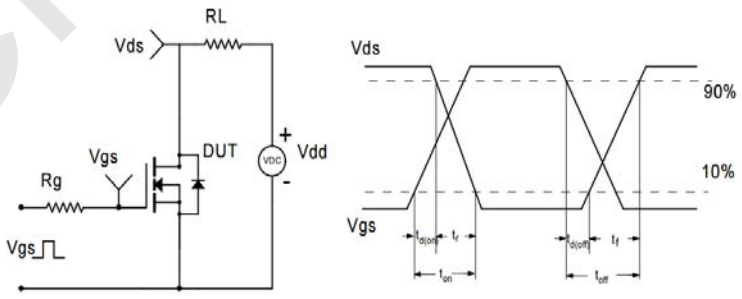
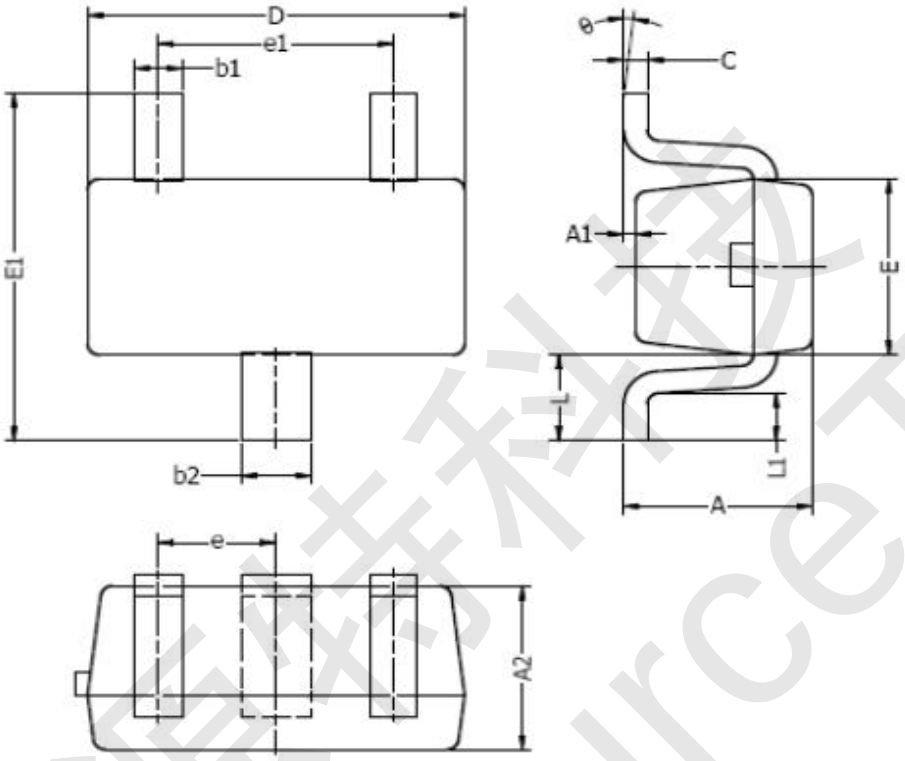



**Fig10.** Switching Time Test Circuit and waveforms

## CST2SK3019 Package Mechanical Data-SOT-523-3L




| DIM | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.70 | 0.90 | 0.028 | 0.035 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.70 | 0.80 | 0.028 | 0.031 |
| b1 | 0.15 | 0.25 | 0.006 | 0.010 |
| b2 | 0.25 | 0.35 | 0.010 | 0.014 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 1.50 | 1.70 | 0.059 | 0.067 |
| E | 0.70 | 0.90 | 0.028 | 0.035 |
| E1 | 1.45 | 1.75 | 0.057 | 0.069 |
| e | 0.50 TYP. | | 0.020 TYP. | |
| e1 | 0.90 | 1.10 | 0.035 | 0.043 |
| L | 0.40 REF. | | 0.016 REF. | |
| L1 | 0.10 | 0.30 | 0.004 | 0.012 |
| θ | 0° | 8° | 0° | 8° |

NOTES:
1. Above package outline conforms to JEITA EAIJ ED-7500A SC-75A.
2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.