

### Features

- $V_{DS} = 30V, I_D = 3A$
- $R_{DS(ON)} < 75m\Omega @ V_{GS}=2.5V$
- $R_{DS(ON)} < 65m\Omega @ V_{GS}=4.5V$

### Typical Applications

- Load switch
- PWM application

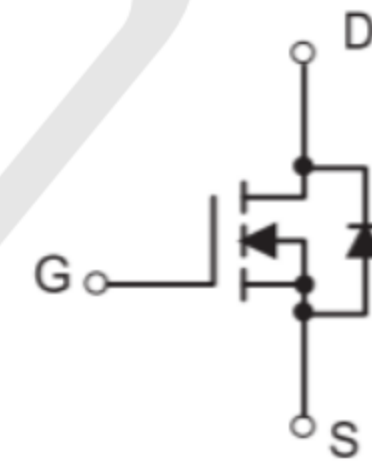
### Shipping Quantity

- 3000pcs / Tape & Reel



Marking: A29T

### Circuit Diagram



N-MOS

### Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise noted)

| Parameter  | Symbol         | Limit      | Unit       |
|--|----------------|------------|------------|
| Drain-Source Voltage                             | $V_{DS}$       | 30         | V          |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 20$   | V          |
| Drain Current-Continuous                         | $I_D$          | 3          | A          |
| Drain Current-Pulsed <sup>(Note 1)</sup>         | $I_{DM}$       | 20         | A          |
| Maximum Power Dissipation                        | $P_D$          | 0.9        | W          |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -55 To 150 | $^\circ C$ |

### Thermal Characteristic

|   |                 |     |              |
|---|-----------------|-----|--------------|
| Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup> | $R_{\theta JA}$ | 138 | $^\circ C/W$ |
|---|-----------------|-----|--------------|

**Electrical Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

| Parameter                                 | Symbol       | Condition   | Min | Typ  | Max       | Unit       |
|---|--------------|---|-----|------|-----------|------------|
| <b>Off Characteristics</b>                |              |   |     |      |           |            |
| Drain-Source Breakdown Voltage            | $BV_{DSS}$   | $V_{GS}=0V, I_D=250\mu A$                             | 30  | -    | -         | V          |
| Zero Gate Voltage Drain Current           | $I_{DSS}$    | $V_{DS}=20V, V_{GS}=0V$                               | -   | -    | 1         | $\mu A$    |
| Gate-Body Leakage Current                 | $I_{GSS}$    | $V_{GS}=\pm 20V, V_{DS}=0V$                           | -   | -    | $\pm 100$ | nA         |
| <b>On Characteristics</b> (Note 3)        |              |   |     |      |           |            |
| Gate Threshold Voltage                    | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$                         | 1   | 1.5  | 3.0       | V          |
| Drain-Source On-State Resistance          | $R_{DS(on)}$ | $V_{GS}=10V, I_D=3A$                                  | -   | 50   | 65        | m $\Omega$ |
|   |              | $V_{GS}=4.5V, I_D=3A$                                 | -   | 65   | 75        | m $\Omega$ |
| Forward Transconductance                  | $g_{FS}$     | $V_{DS}=5V, I_D=3A$                                   | 14  | -    | -         | S          |
| <b>Dynamic Characteristics</b> (Note 4)   |              |   |     |      |           |            |
| Input Capacitance                         | $C_{iss}$    | $V_{DS}=10V, V_{GS}=0V,$<br>$F=1.0MHz$                | -   | 235  | -         | PF         |
| Output Capacitance                        | $C_{oss}$    |   | -   | 35   | -         | PF         |
| Reverse Transfer Capacitance              | $C_{rss}$    |   | -   | 18   | -         | PF         |
| <b>Switching Characteristics</b> (Note 4) |              |   |     |      |           |            |
| Turn-on Delay Time                        | $t_{d(on)}$  | $V_{DD}=15V, I_D=1A$<br>$V_{GS}=10V, R_{GEN}=6\Omega$ | -   | 3.5  | -         | nS         |
| Turn-on Rise Time                         | $t_r$        |   | -   | 1.5  | -         | nS         |
| Turn-Off Delay Time                       | $t_{d(off)}$ |   | -   | 17.5 | -         | nS         |
| Turn-Off Fall Time                        | $t_f$        |   | -   | 2.5  | -         | nS         |
| Total Gate Charge                         | $Q_g$        | $V_{DS}=15V, I_D=3A, V_{GS}=10V$                      | -   | 10   | -         | nC         |
| Gate-Source Charge                        | $Q_{gs}$     |   | -   | 0.95 | -         | nC         |
| Gate-Drain Charge                         | $Q_{gd}$     |   | -   | 1.6  | -         | nC         |
| <b>Drain-Source Diode Characteristics</b> |              |   |     |      |           |            |
| Diode Forward Voltage (Note 3)            | $V_{SD}$     | $V_{GS}=0V, I_S=3A$                                   | -   | -    | 1.2       | V          |
| Diode Forward Current (Note 2)            | $I_S$        |   | -   | -    | 3         | A          |



Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)

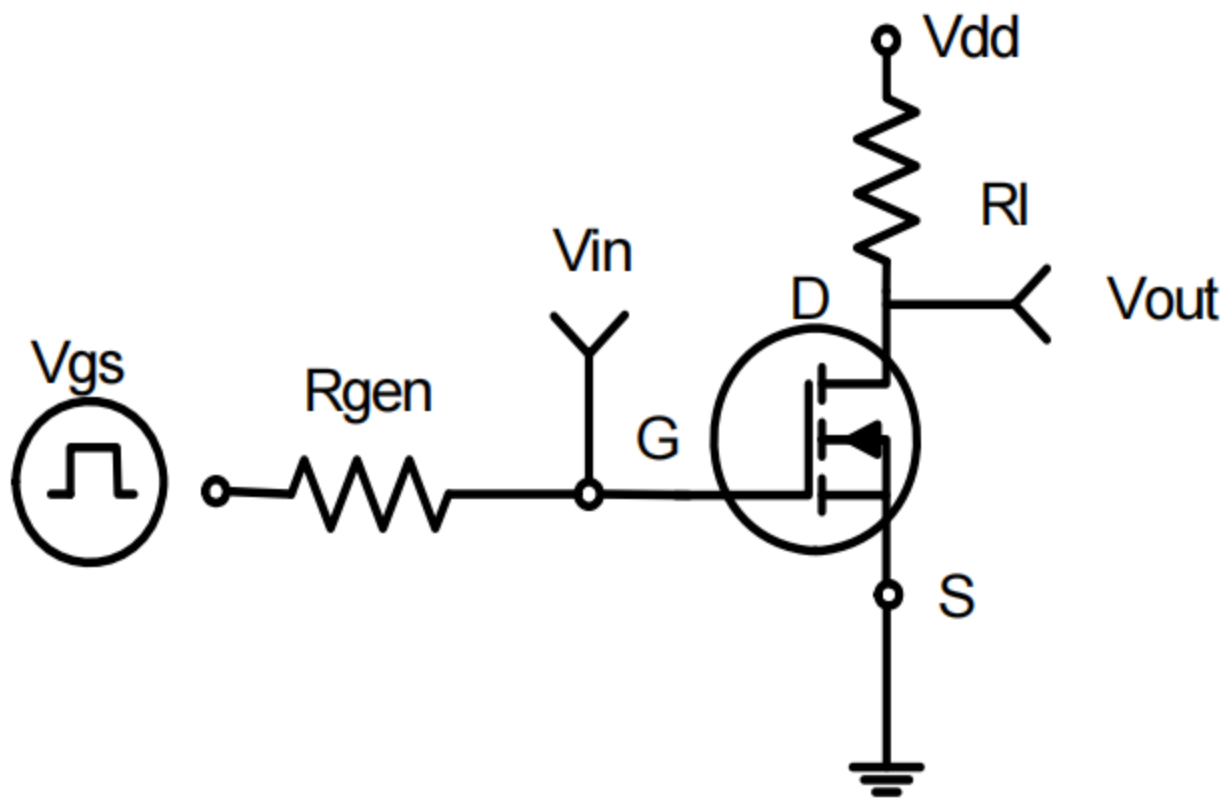


Figure 1: Switching Test Circuit

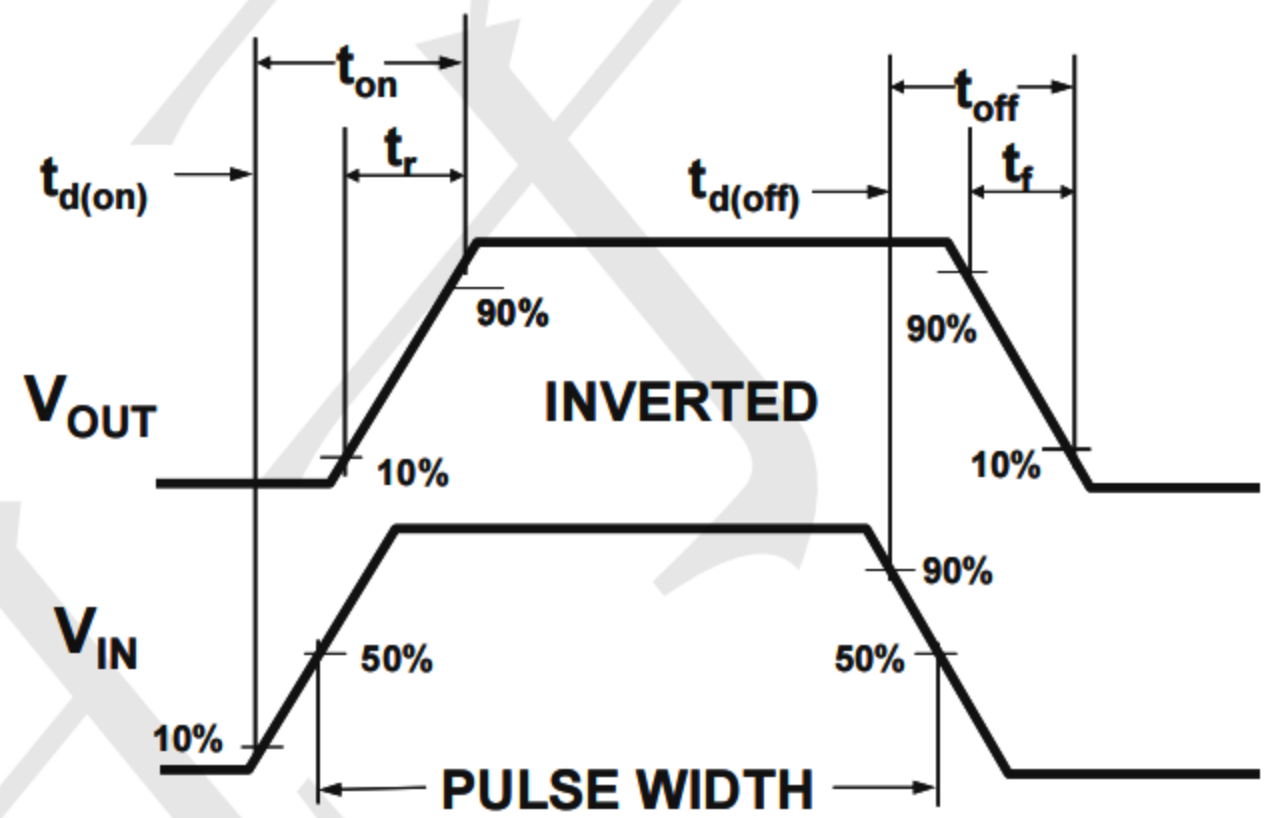


Figure 2: Switching Waveforms

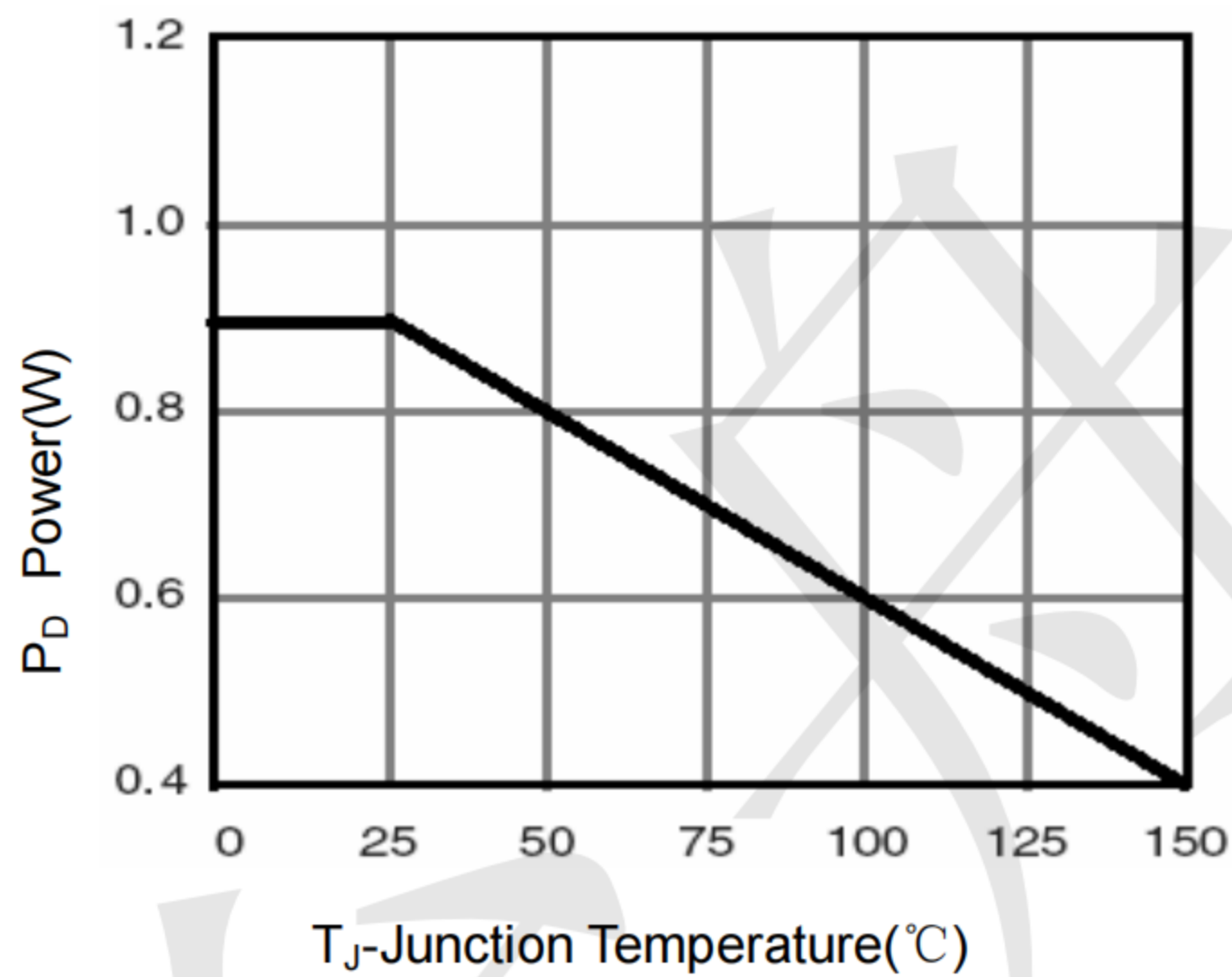


Figure 3 Power Dissipation

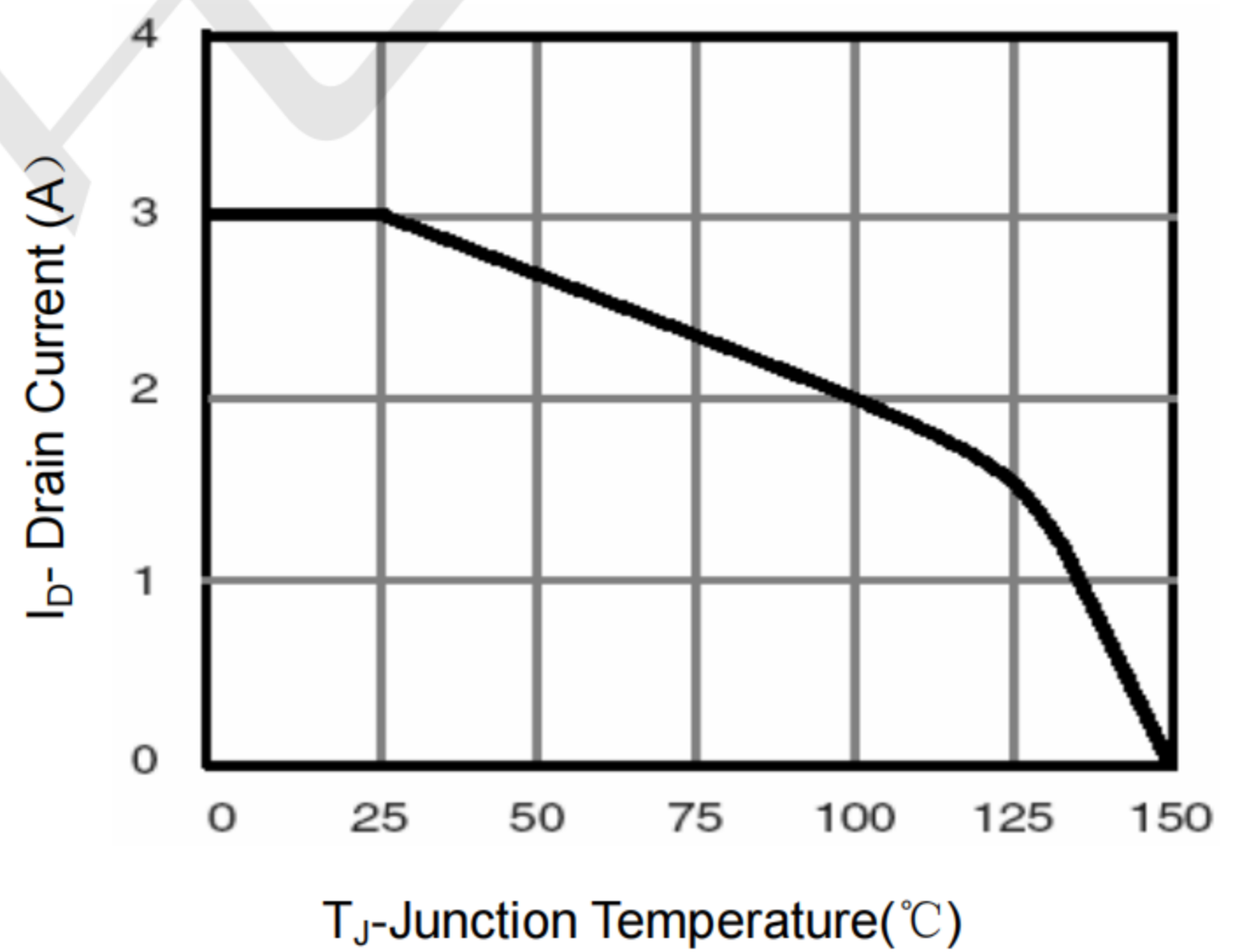


Figure 4 Drain Current

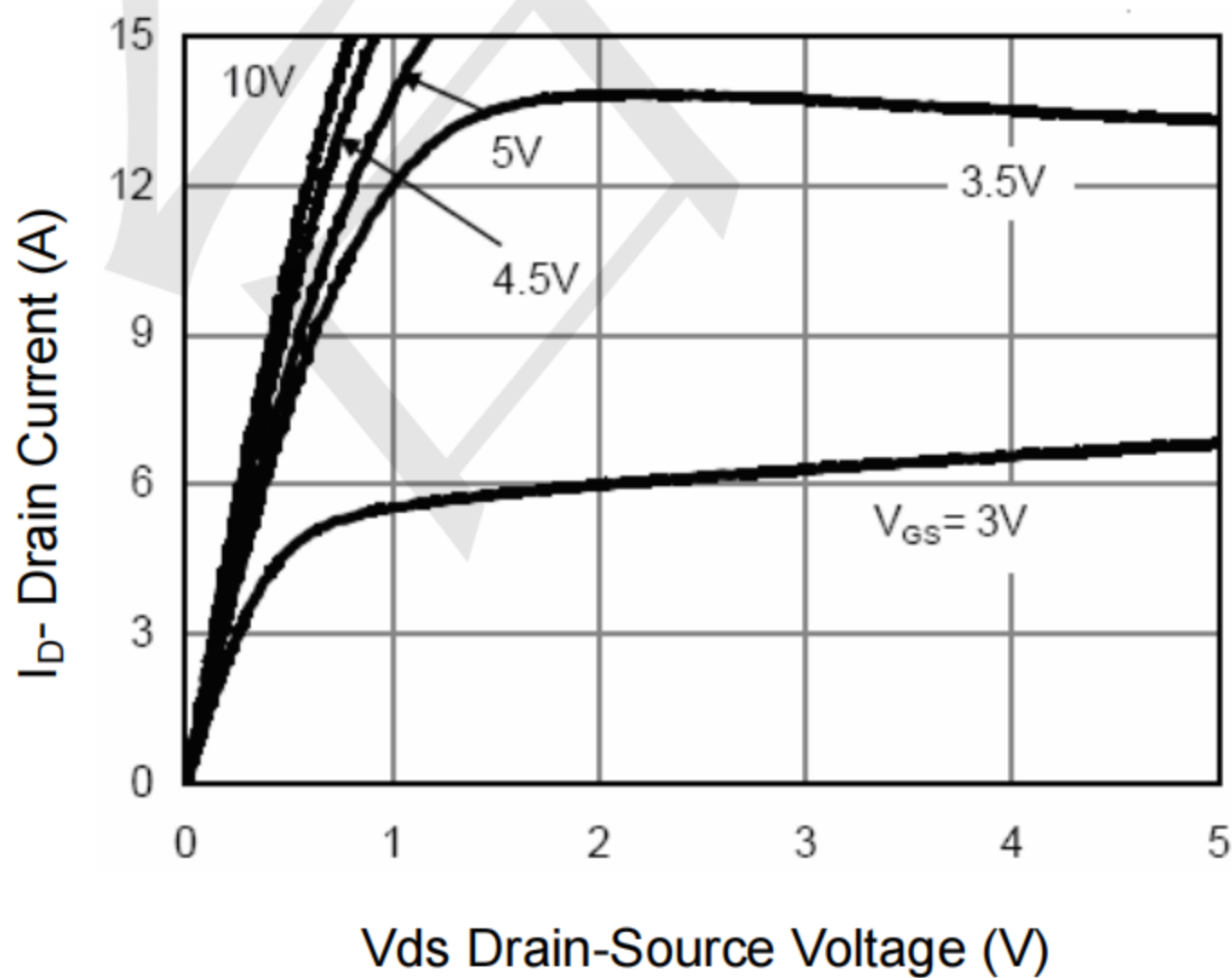


Figure 5 Output Characteristics

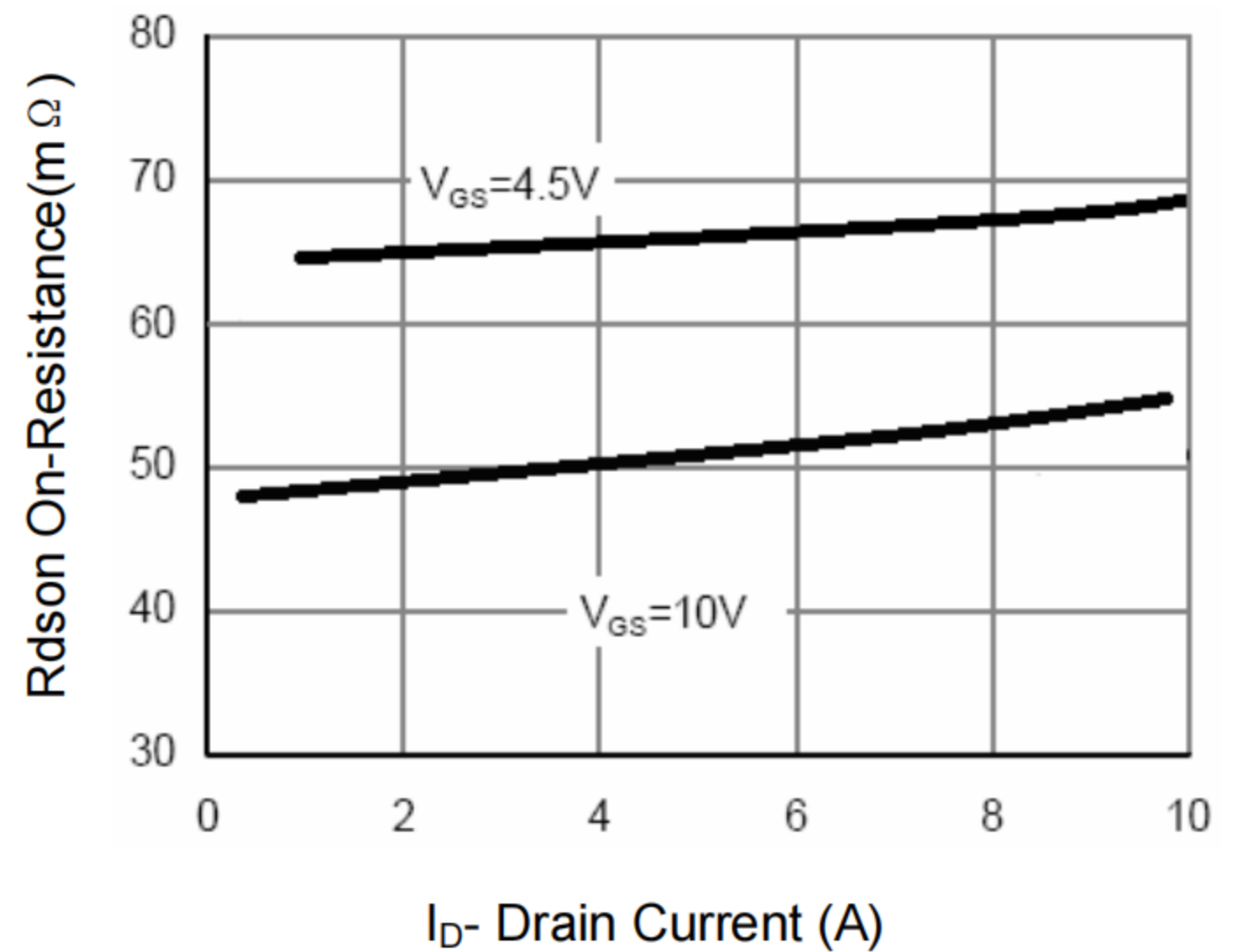


Figure 6 Drain-Source On-Resistance



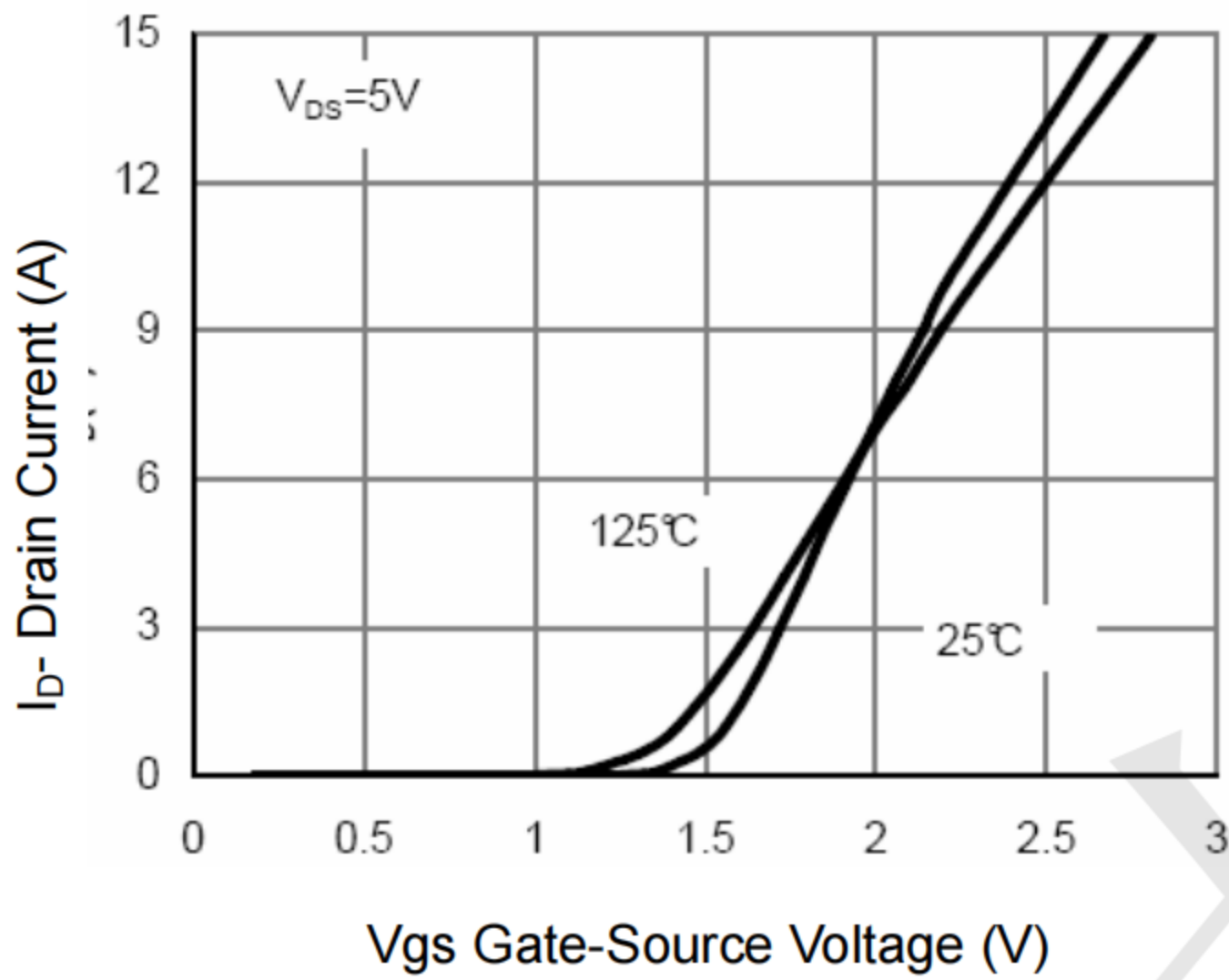


Figure 7 Transfer Characteristics

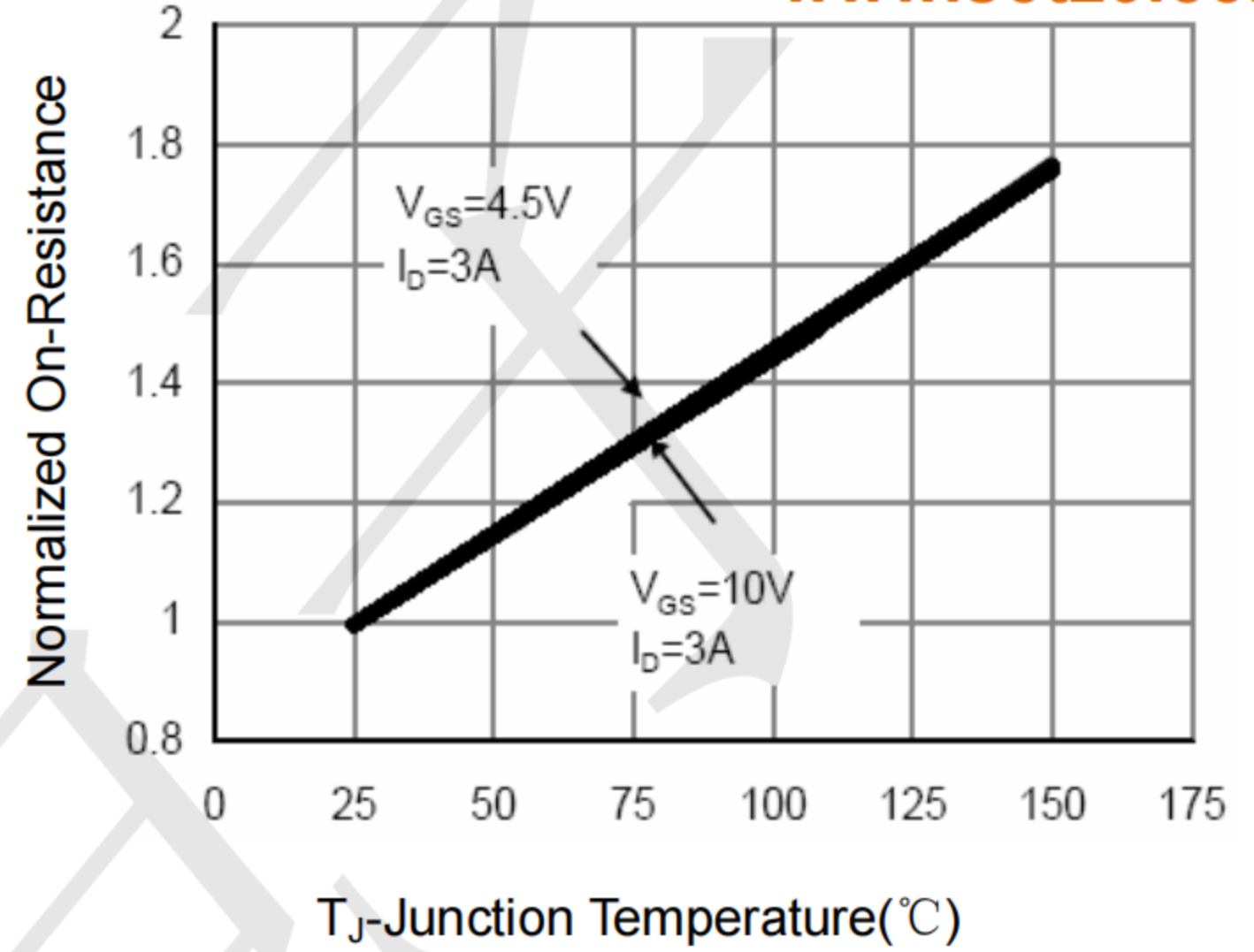


Figure 8 Drain-Source On-Resistance

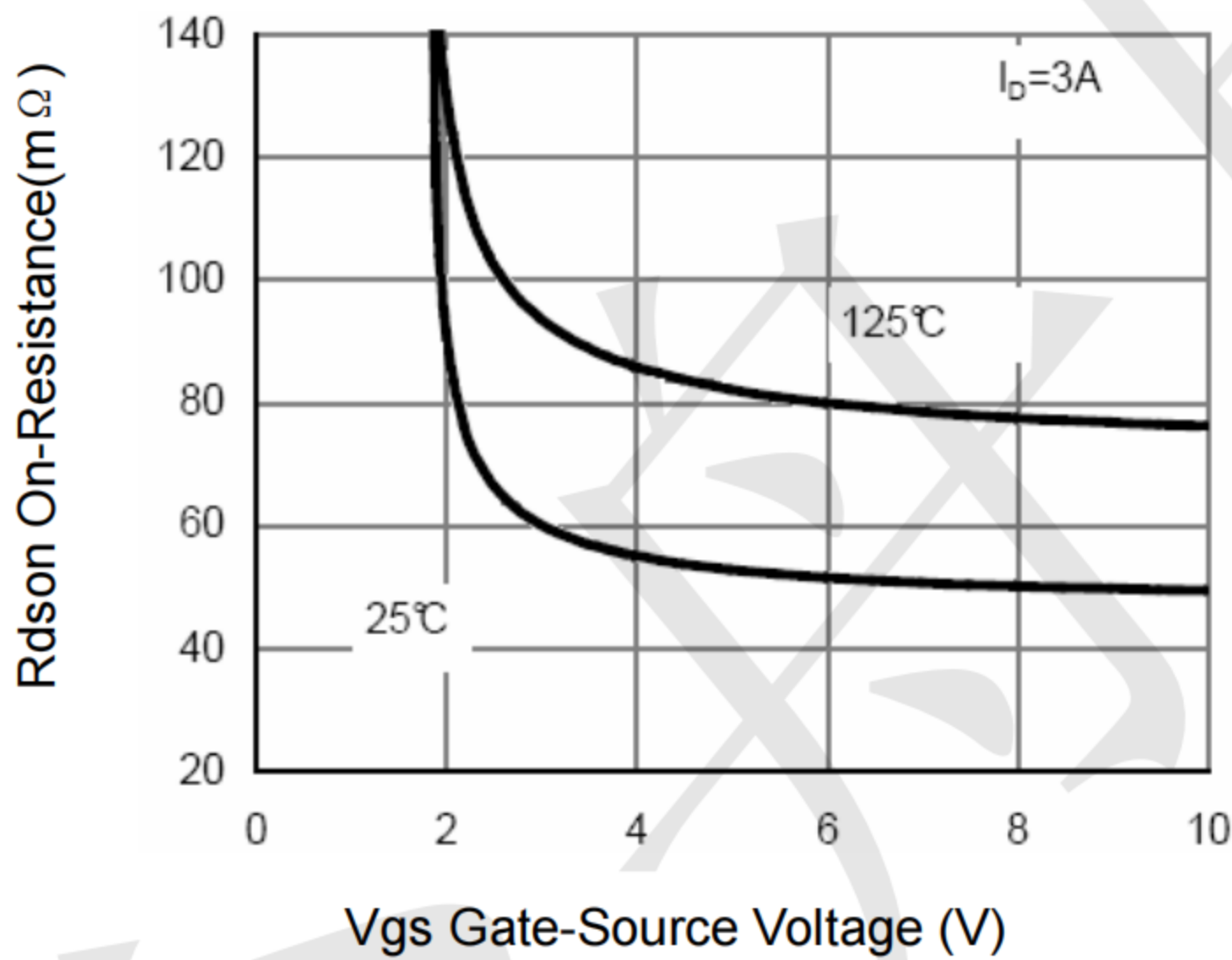


Figure 9 Rdson vs Vgs

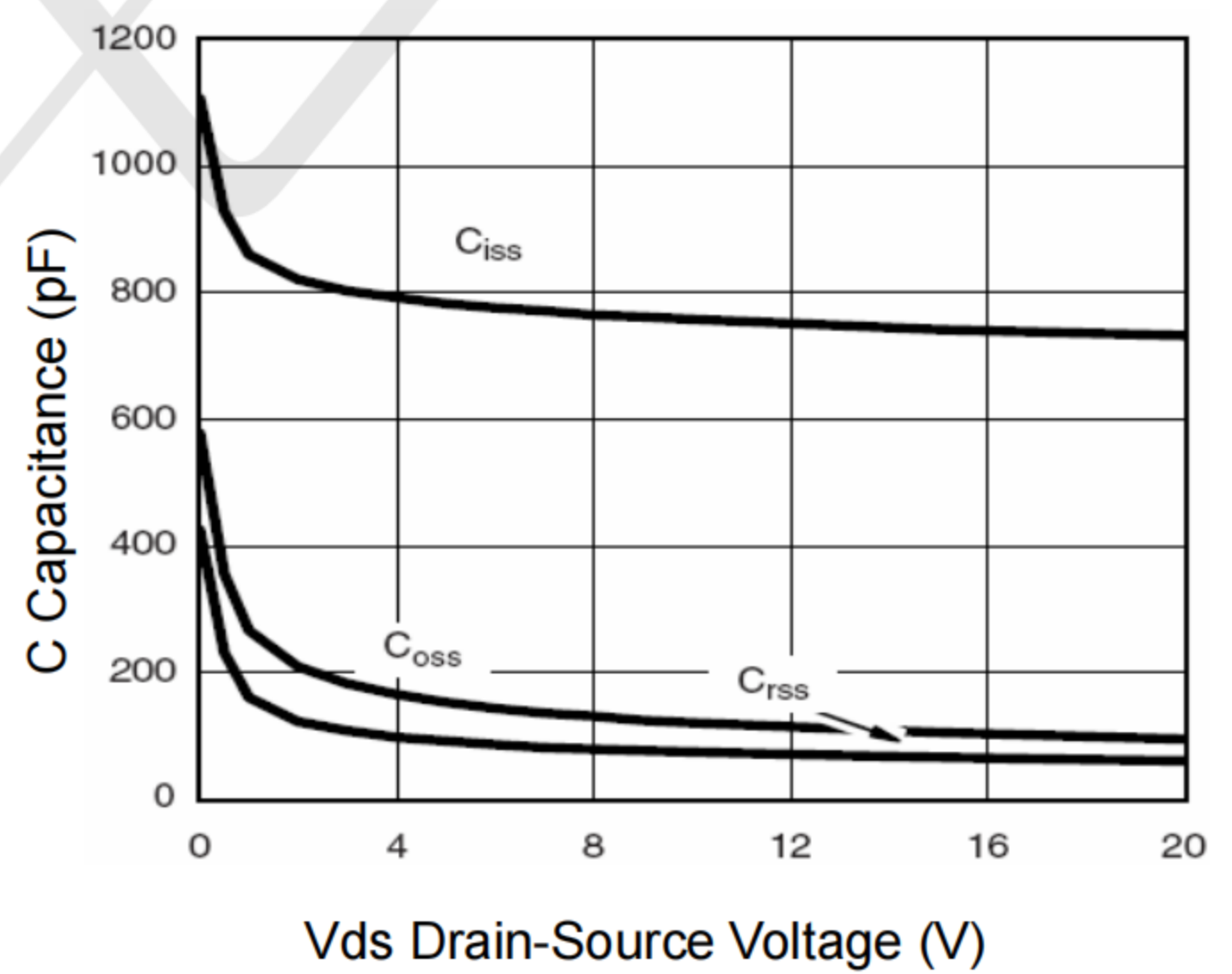


Figure 10 Capacitance vs Vds

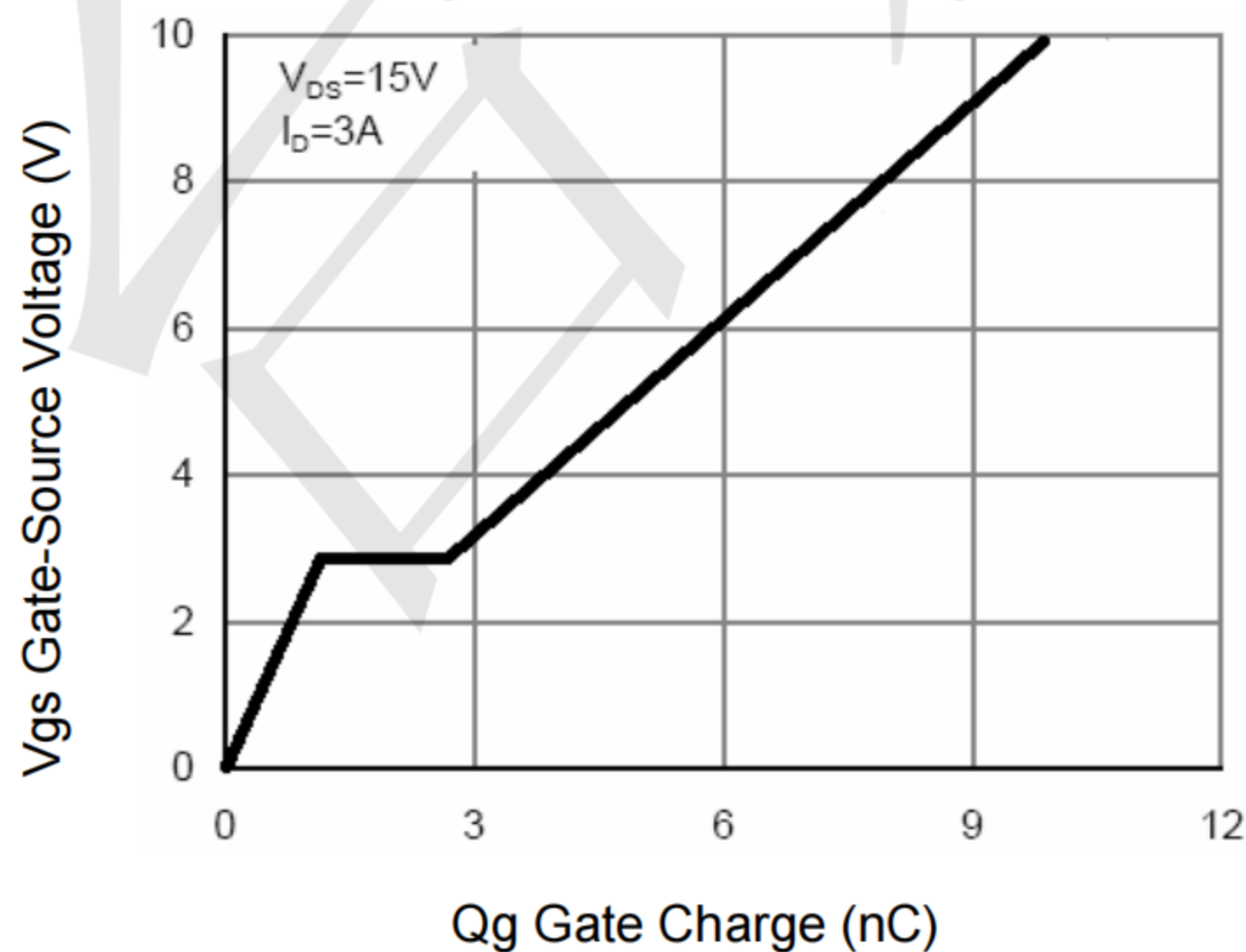


Figure 11 Gate Charge

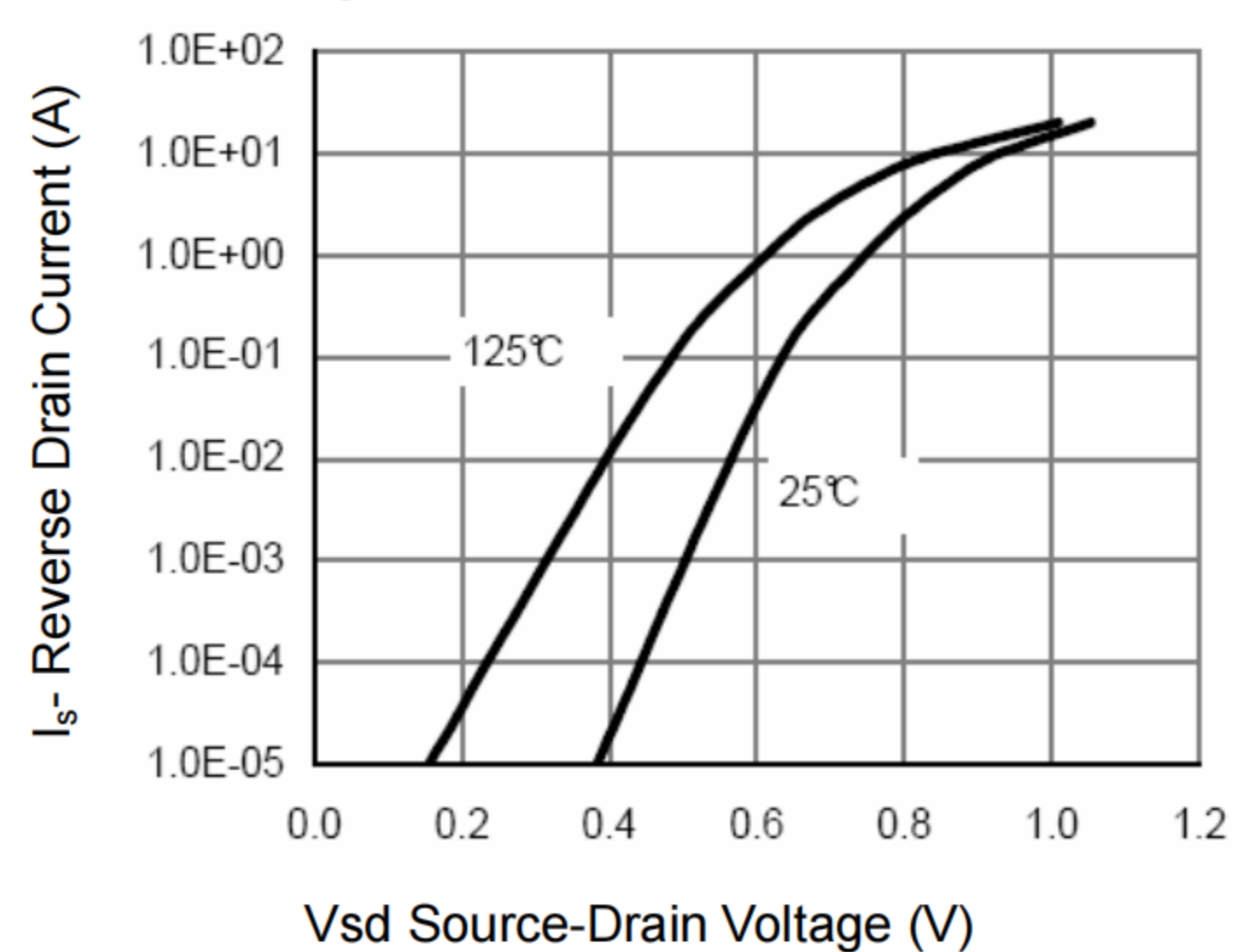
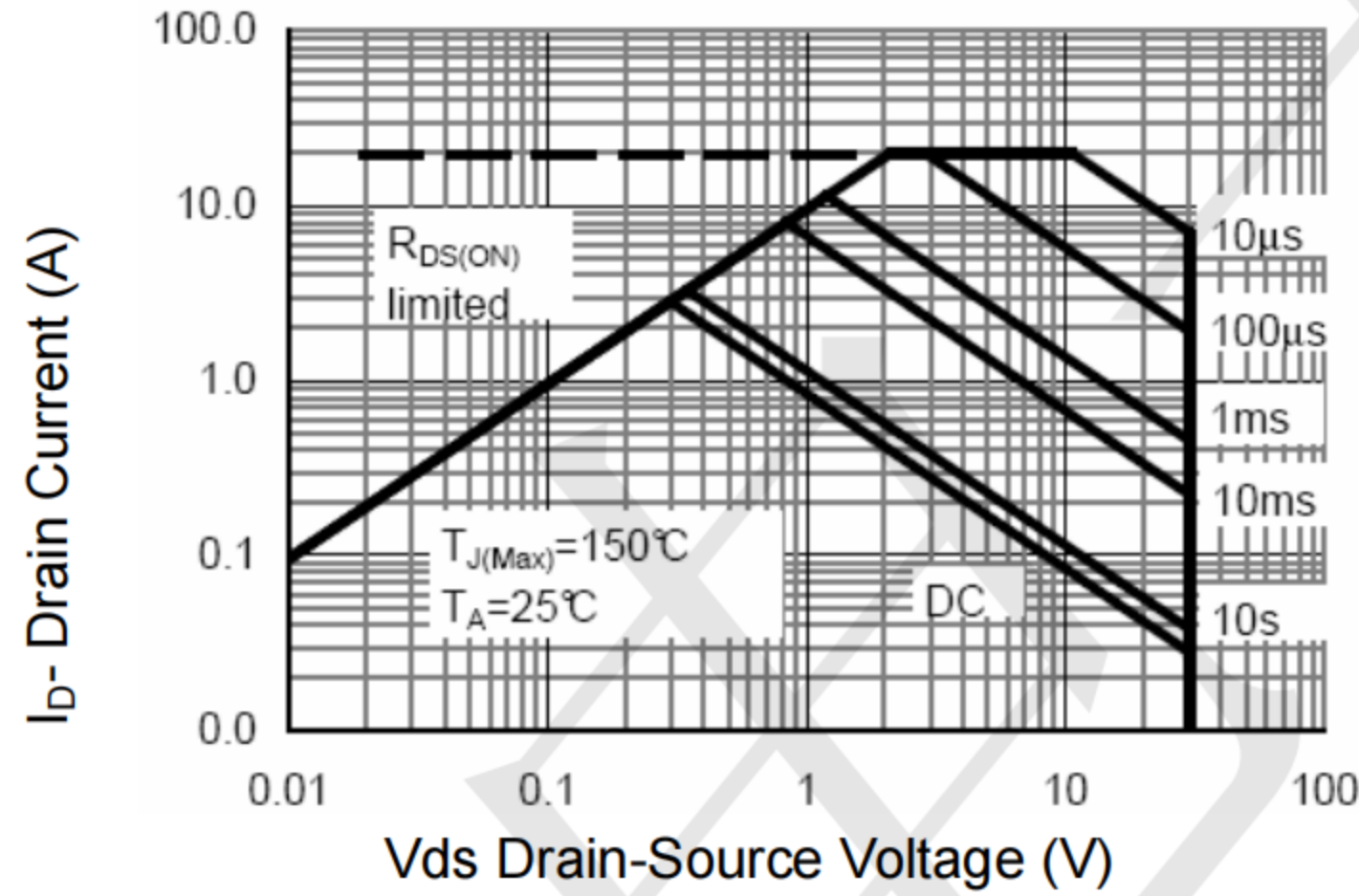
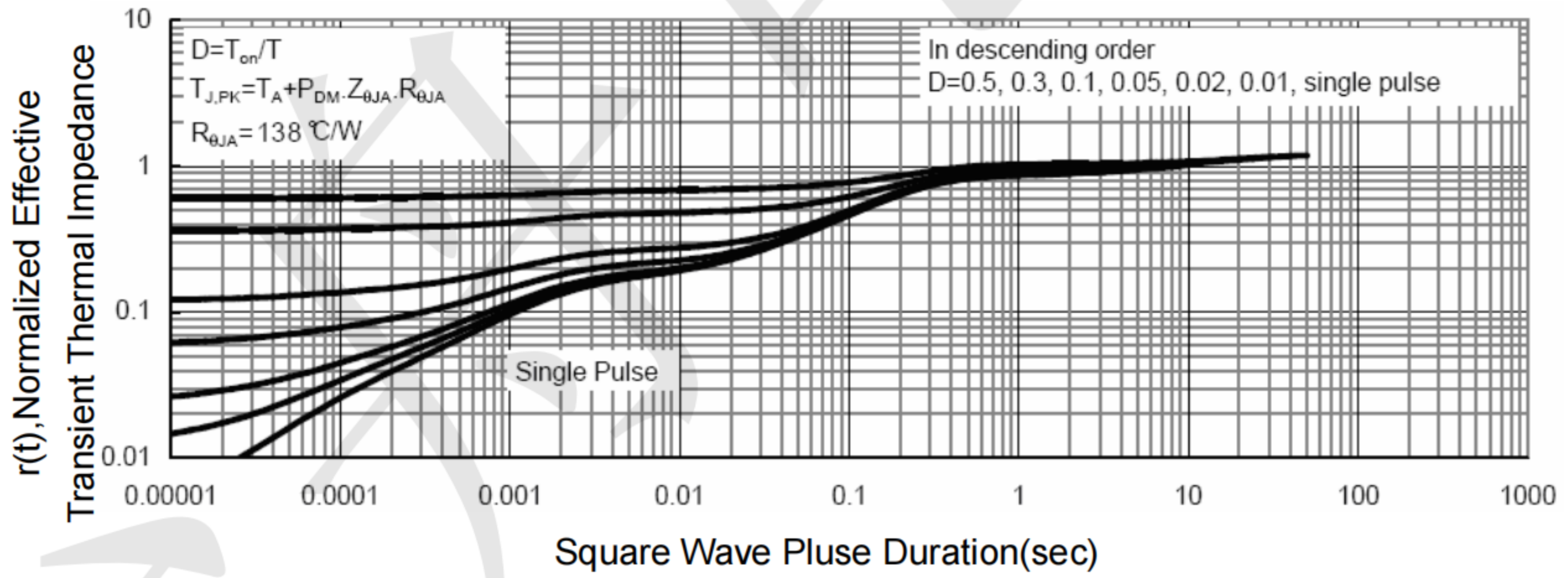


Figure 12 Source- Drain Diode Forward

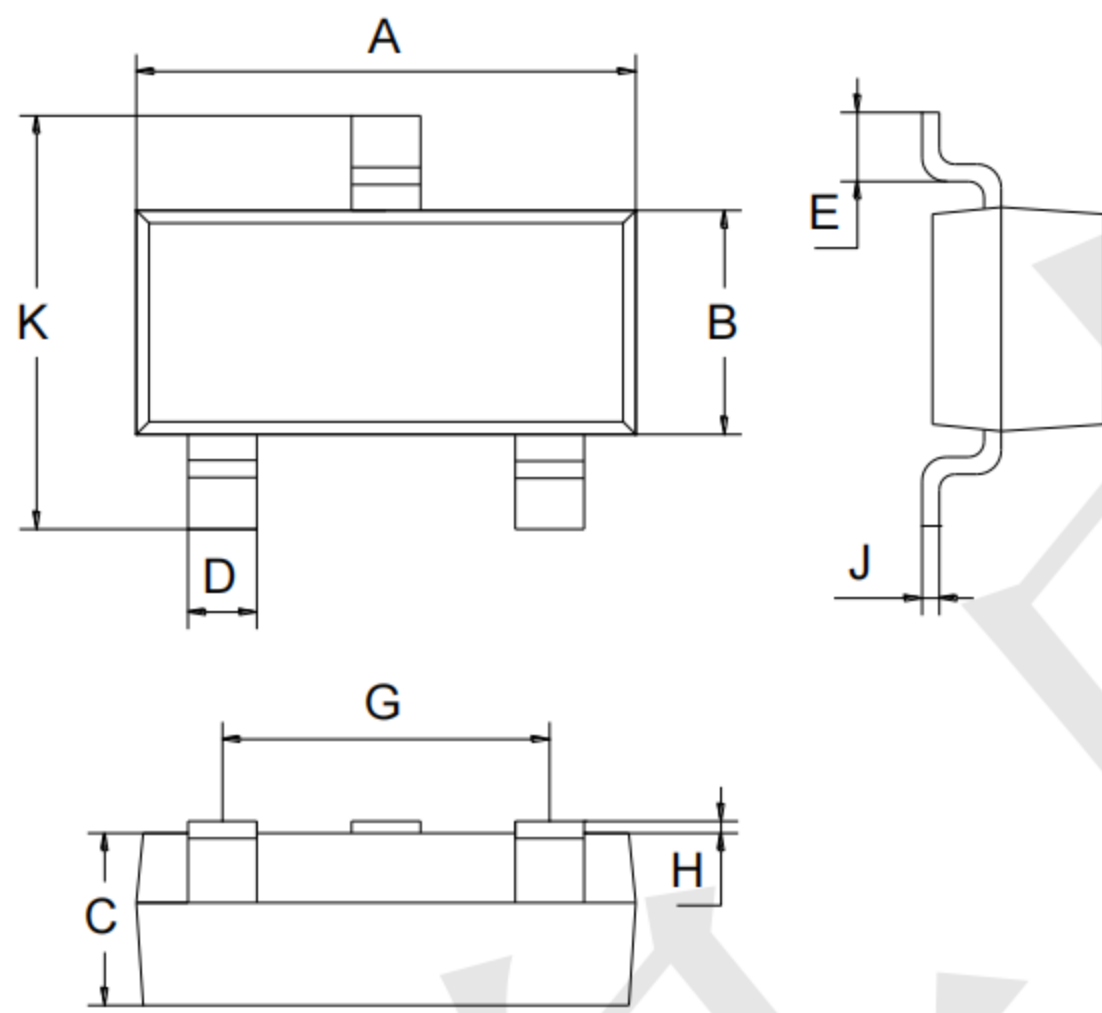


**Figure 13 Safe Operation Area**



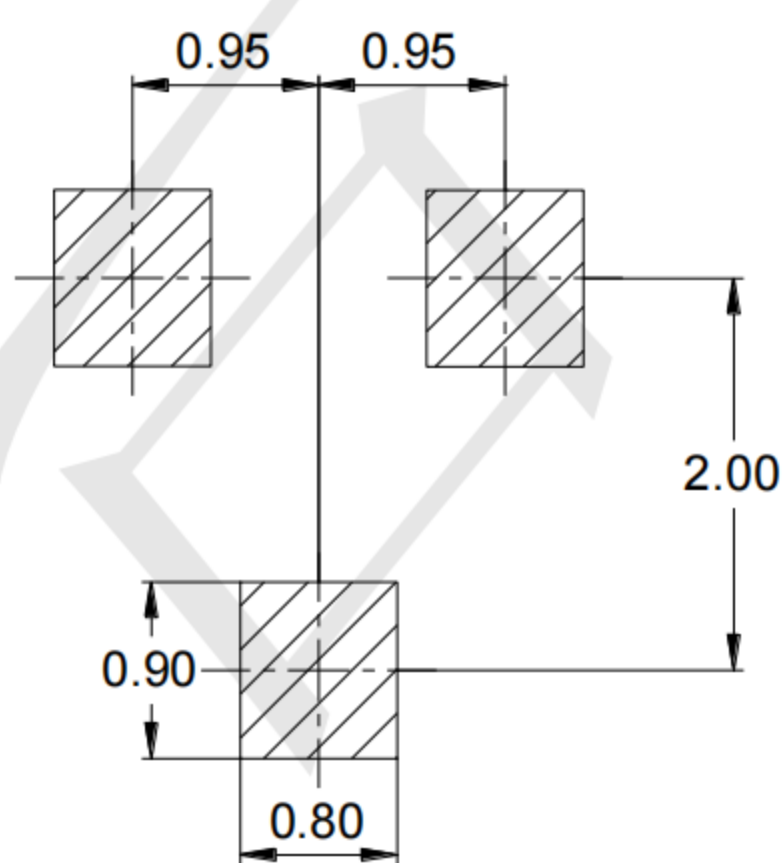
**Figure 14 Normalized Maximum Transient Thermal Impedance**

**Outline Drawing - SOT23**



| SOT-23    |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 2.70 | 3.10 |
| B         | 1.10 | 1.50 |
| C         | 0.90 | 1.10 |
| D         | 0.30 | 0.50 |
| E         | 0.35 | 0.48 |
| G         | 1.80 | 2.00 |
| H         | 0.02 | 0.10 |
| J         | 0.05 | 0.15 |
| K         | 2.20 | 2.60 |

**Land Pattern - SOT23**





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