

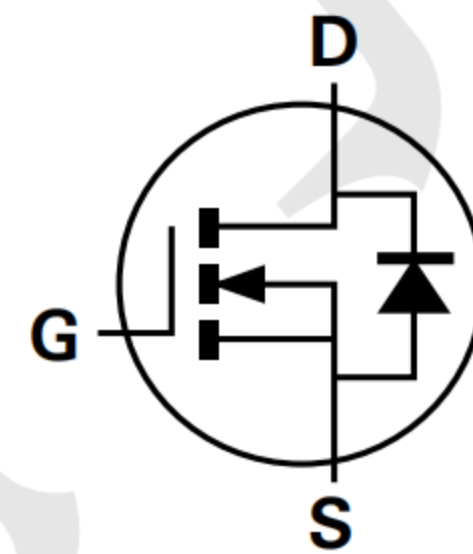
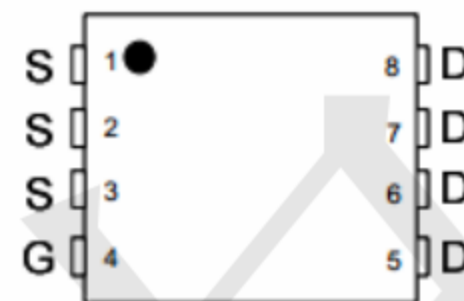
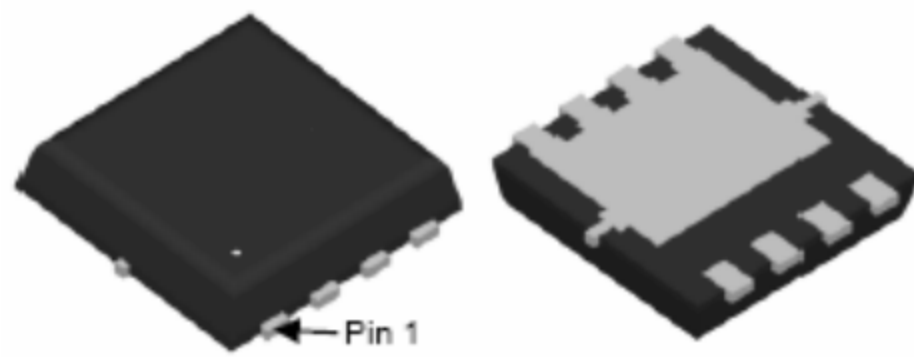
Features

- $R_{DS(ON)}, V_{GS}@10V, I_D@16A < 9m\Omega$
- $R_{DS(ON)}, V_{GS}@4.5V, I_D@8A < 13m\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0

Application

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

Package and Pin Configuration



Marking:4408

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

| PARAMETER | SYMBOL | LIMIT | UNITS |
|--|---------------------|-------------------|------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ C$ | 42 |
| | | $T_C=100^\circ C$ | 26 |
| Pulsed Drain Current ^(Note 1) | I_{DM} | 168 | A |
| Power Dissipation | P_D | $T_C=25^\circ C$ | 35 |
| | | $T_C=100^\circ C$ | 14 |
| Continuous Drain Current | I_D | $T_A=25^\circ C$ | 10 |
| | | $T_A=70^\circ C$ | 8 |
| Power Dissipation | P_D | $T_A=25^\circ C$ | 2.0 |
| Power Dissipation | | $T_A=70^\circ C$ | 1.3 |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ C$ |
| Typical Thermal Resistance ^(Note 4,5) | Junction to Case | $R_{\theta JC}$ | 3.6 |
| | Junction to Ambient | $R_{\theta JA}$ | 62.5 |

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

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|---|--------------|---|------|------|-----------|------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 30 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.0 | 1.7 | 2.5 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=16A$ | - | 6.5 | 9 | m Ω |
| | | $V_{GS}=4.5V, I_D=8A$ | - | 9.5 | 13 | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=30V, V_{GS}=0V$ | - | - | 1.0 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| Dynamic (Note 6) | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=15V, I_D=20A,$ $V_{GS}=4.5V$ (Note 2,3) | - | 7.1 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 3.1 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 2.0 | - | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHz}$ | - | 763 | - | pF |
| Output Capacitance | C_{oss} | | - | 132 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 81 | - | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}=15V, I_D=15A,$ $V_{GS}=10V, R_G=6\Omega$ (Note 2,3) | - | 5.4 | - | ns |
| Turn-On Rise Time | t_r | | - | 86 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 20 | - | |
| Turn-Off Fall Time | t_f | | - | 10 | - | |
| Drain-Source Diode | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | I_S | --- | - | - | 42 | A |
| Diode Forward Voltage | V_{SD} | $I_S=1A, V_{GS}=0V$ | - | 0.7 | 1.0 | V |

Typical Characteristics

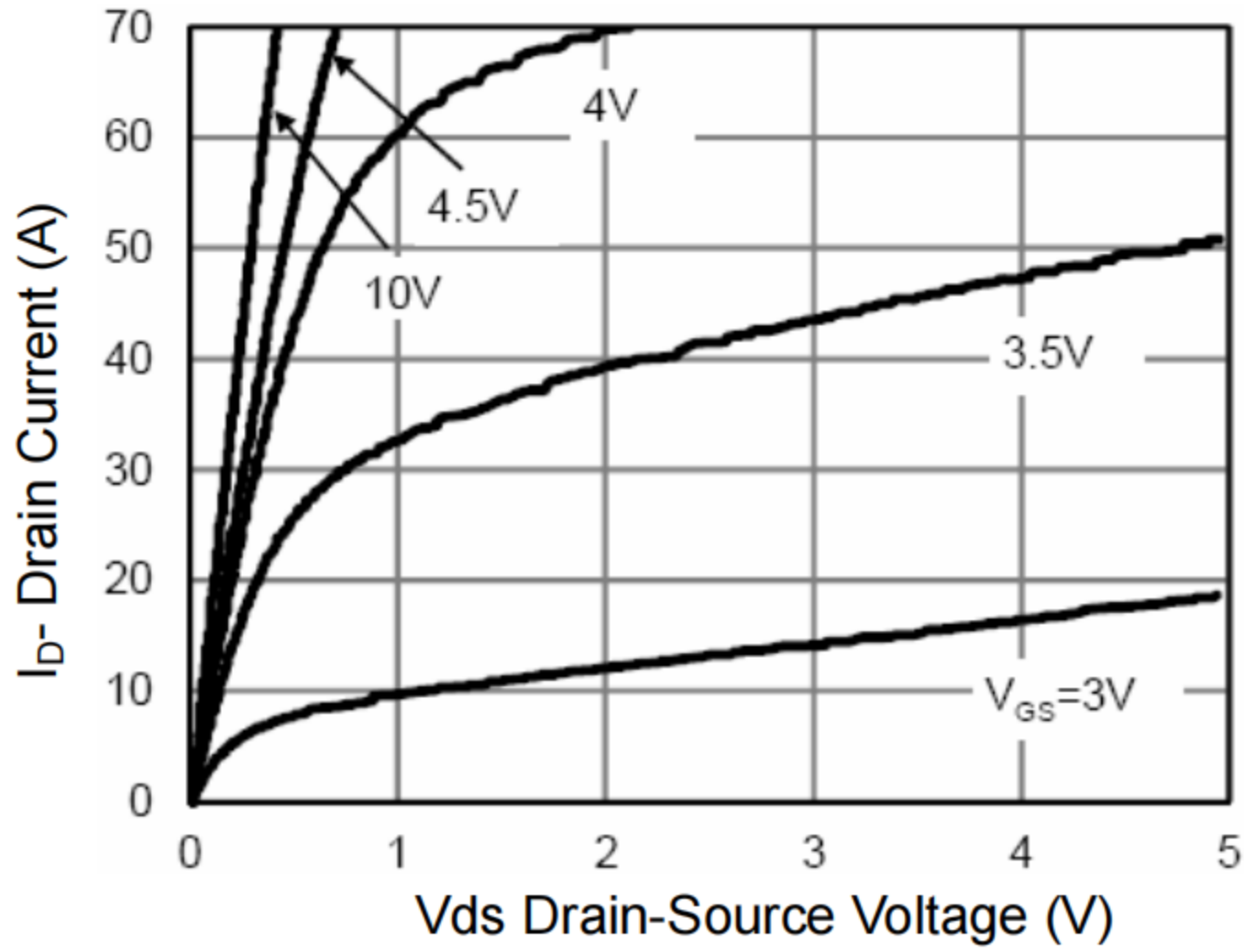


Figure 1 Output Characteristics

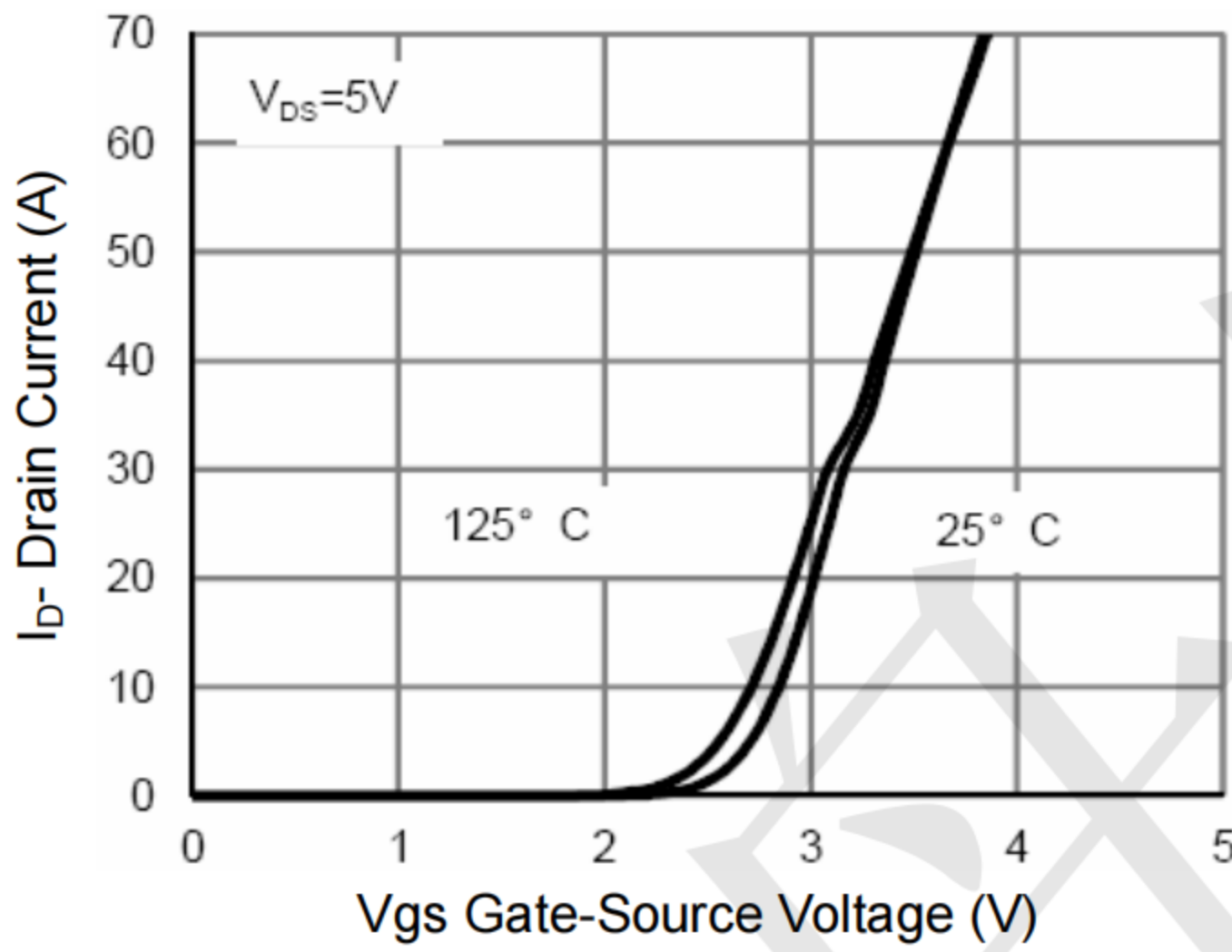


Figure 2 Transfer Characteristics

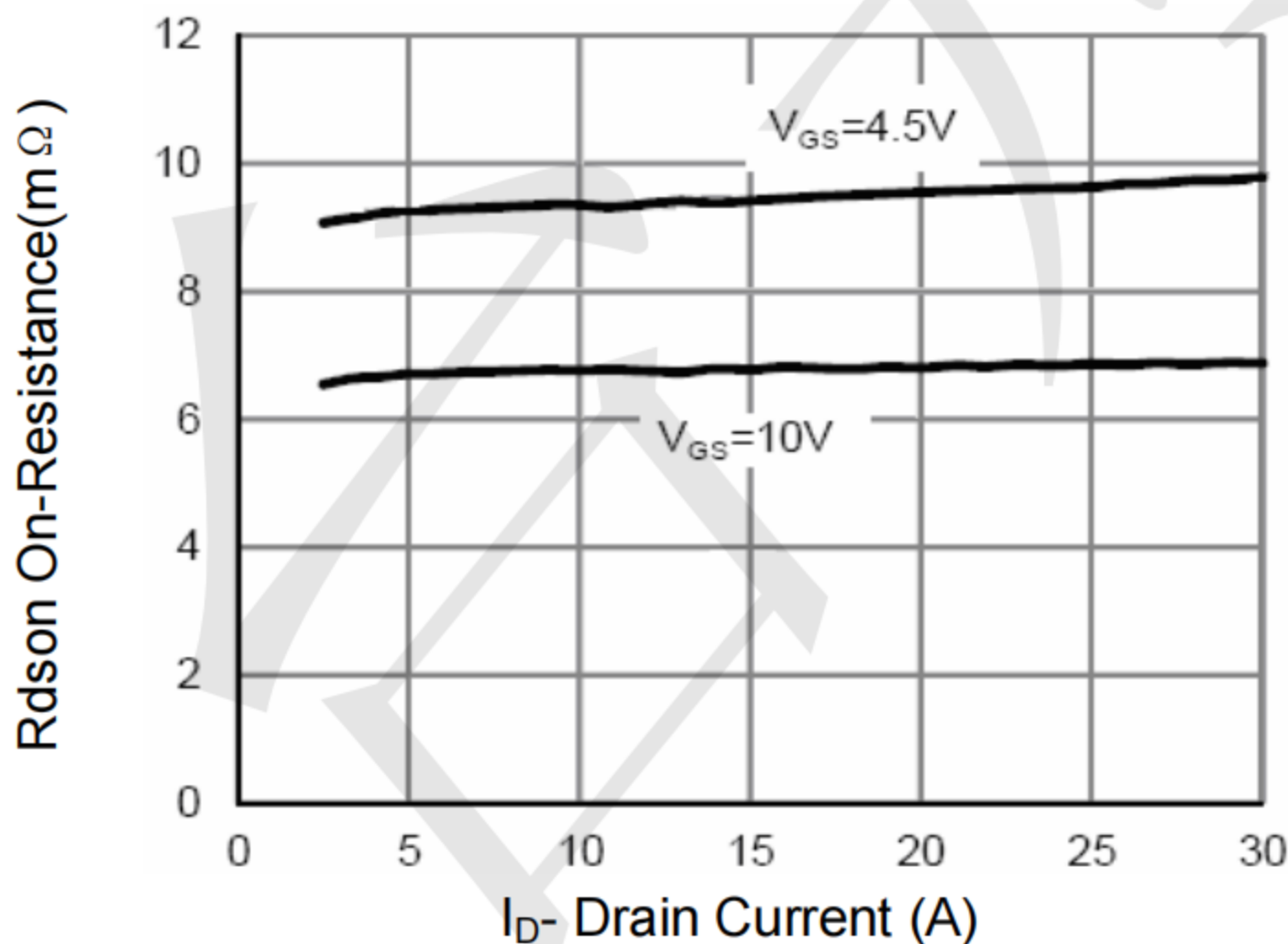


Figure 3 Rds(on)- Drain Current

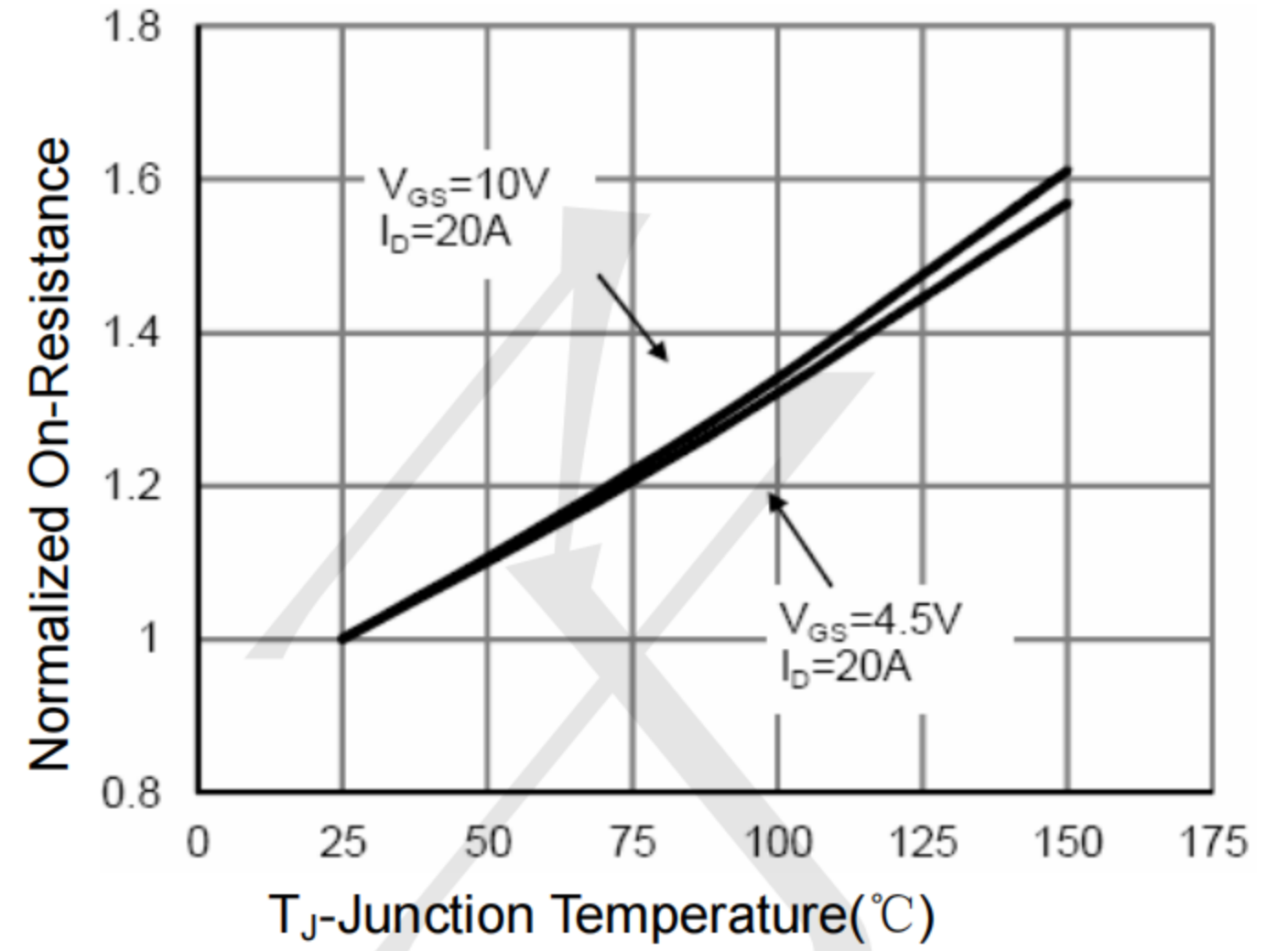


Figure 4 Rds(on)-Junction Temperature

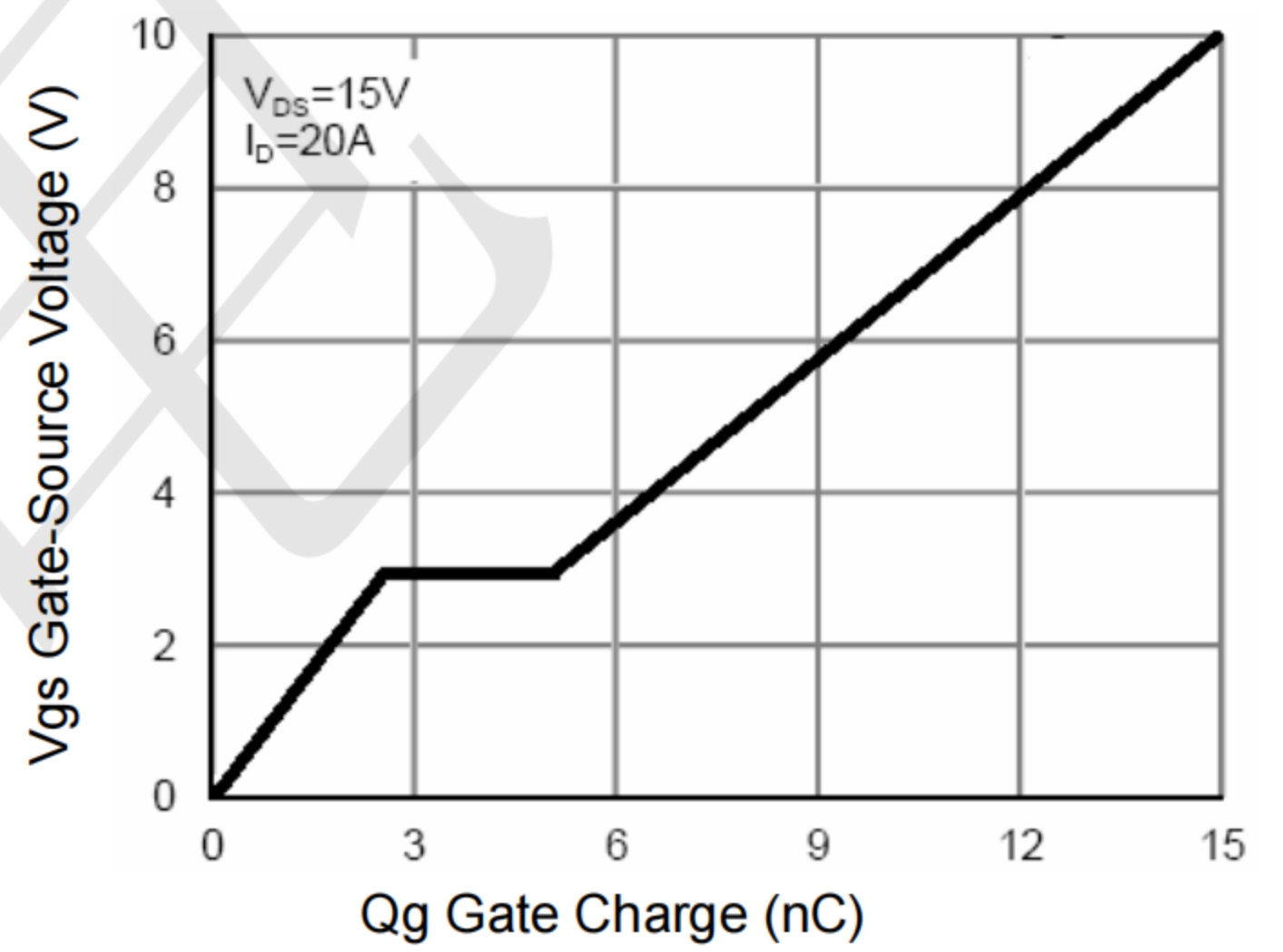


Figure 5 Gate Charge

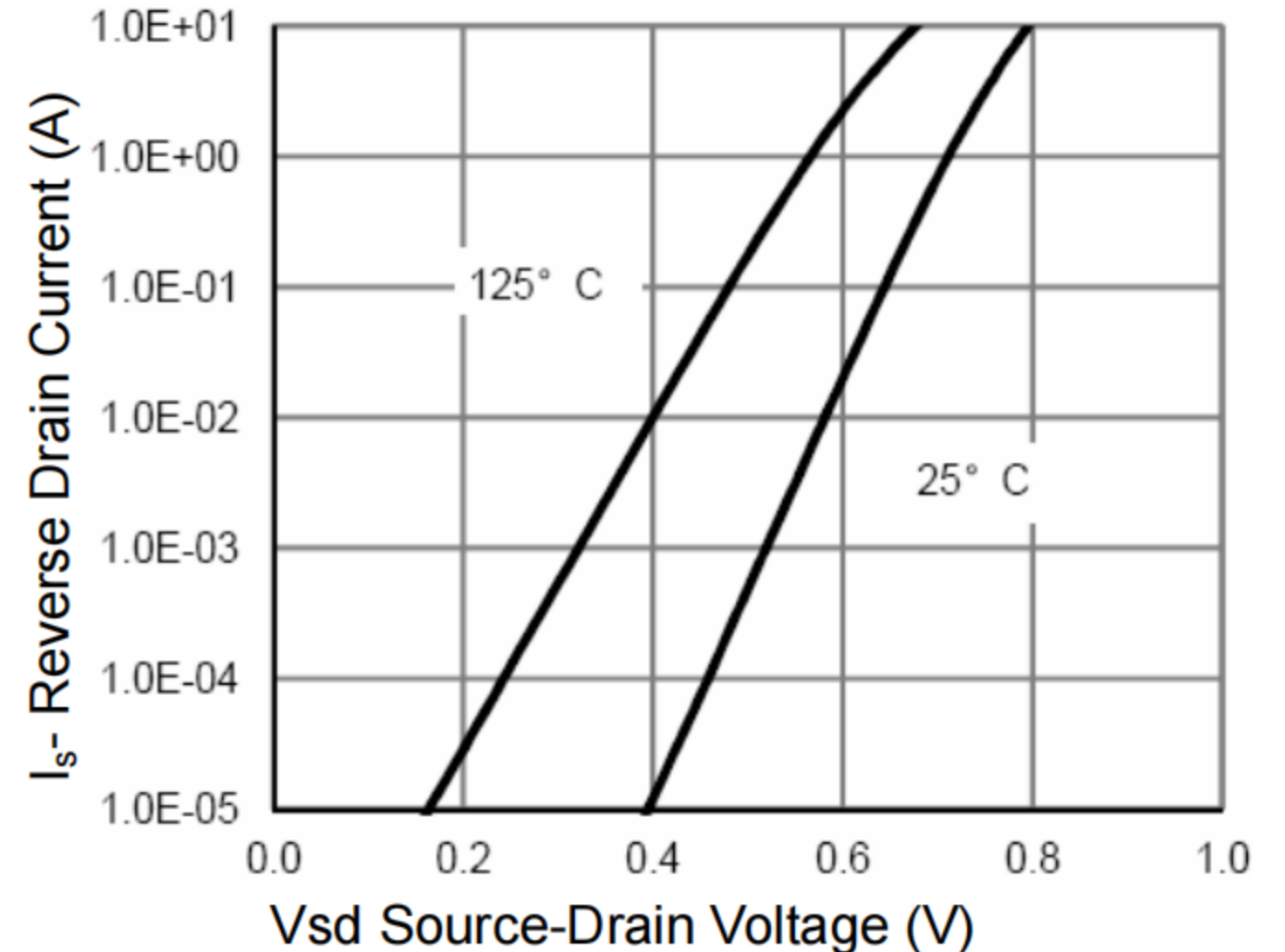


Figure 6 Source- Drain Diode Forward

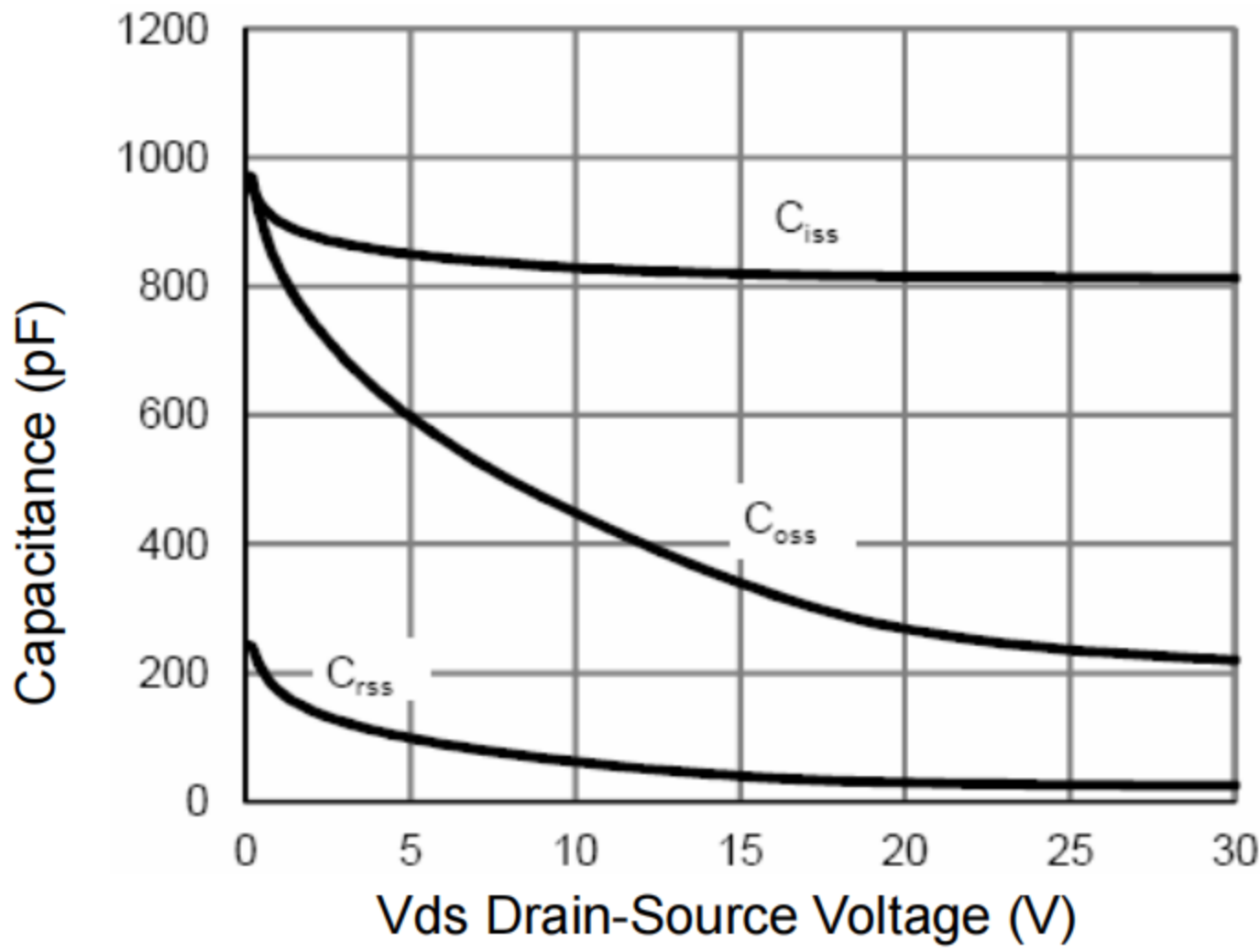


Figure 7 Capacitance vs Vds

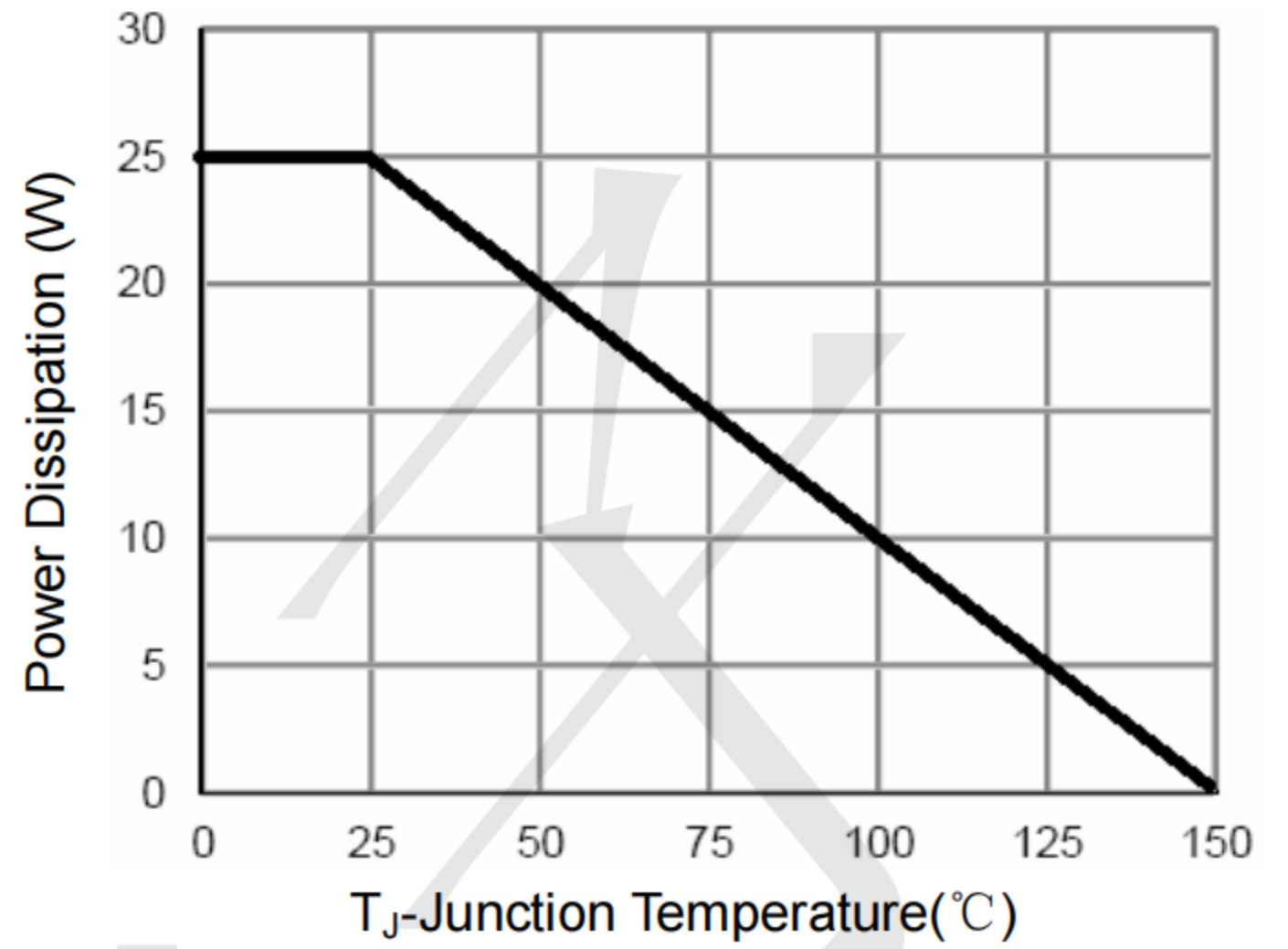


Figure 9 Power De-rating

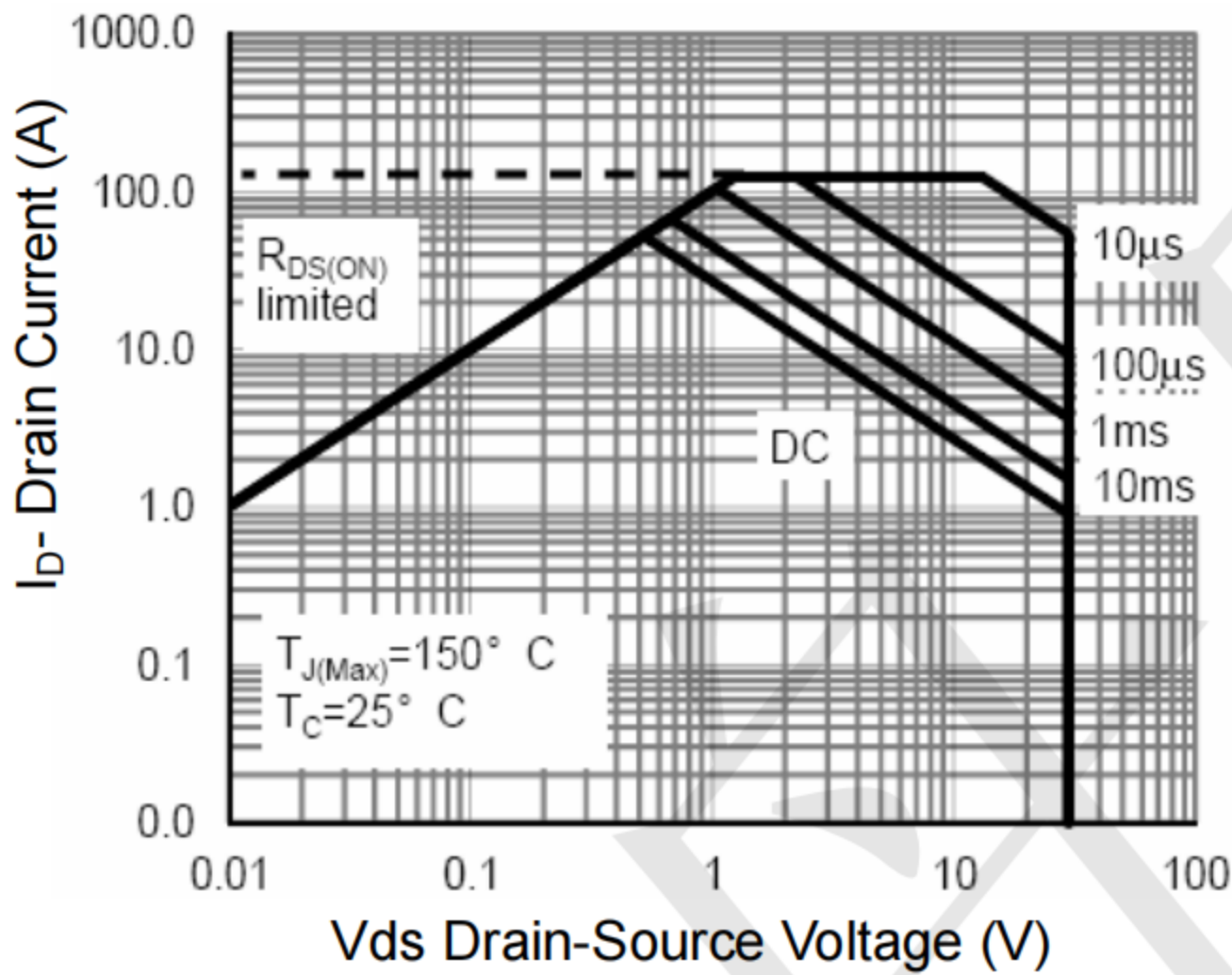


Figure 8 Safe Operation Area

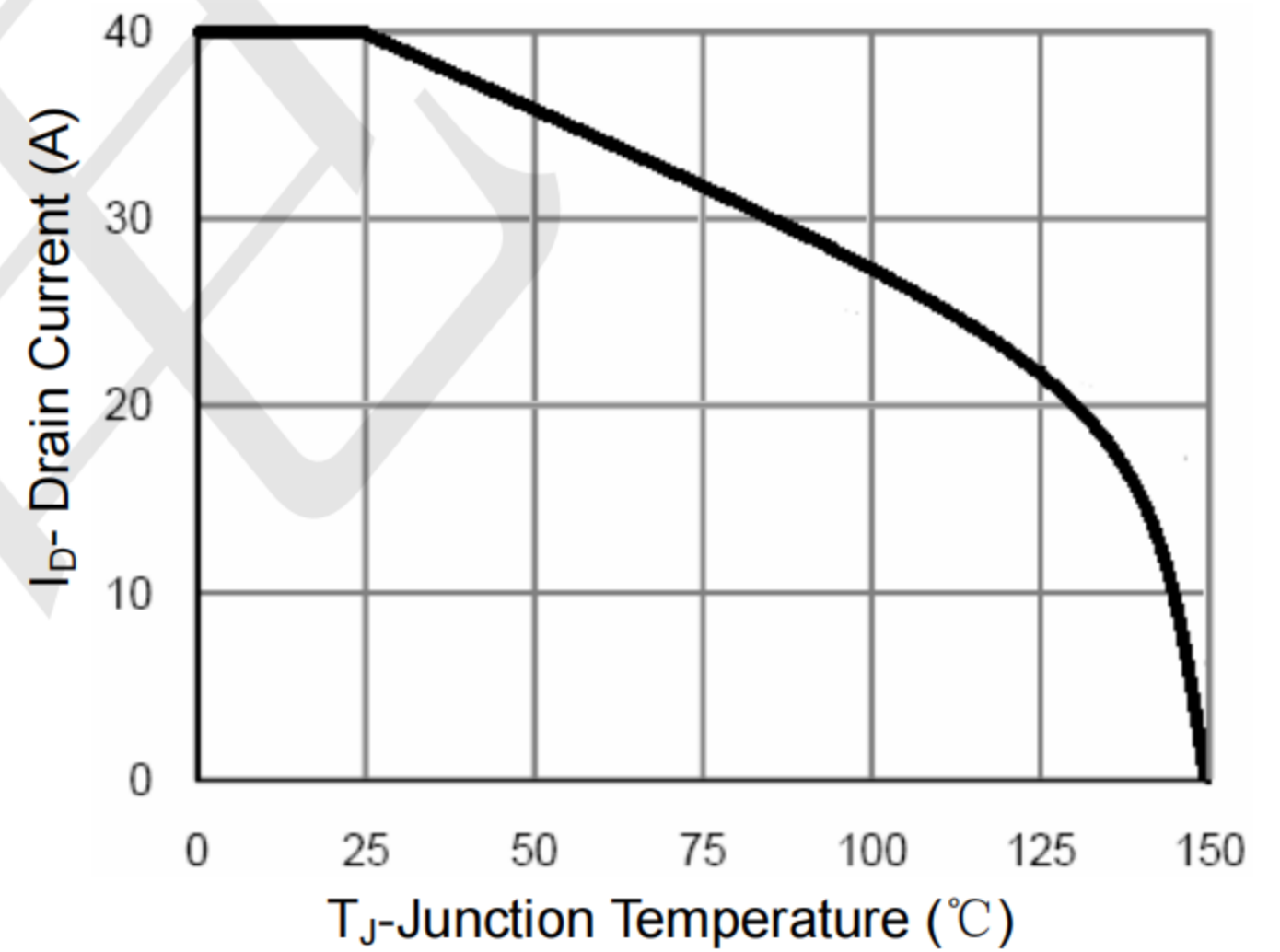


Figure 10 Current De-rating

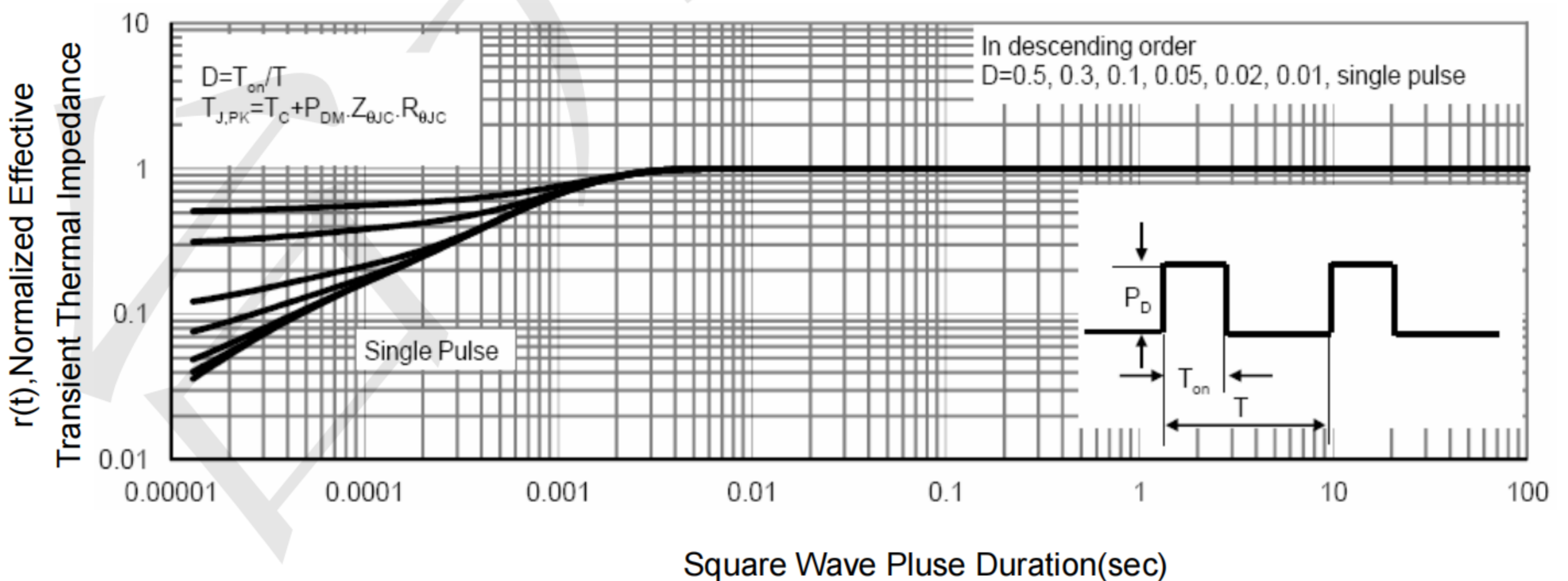
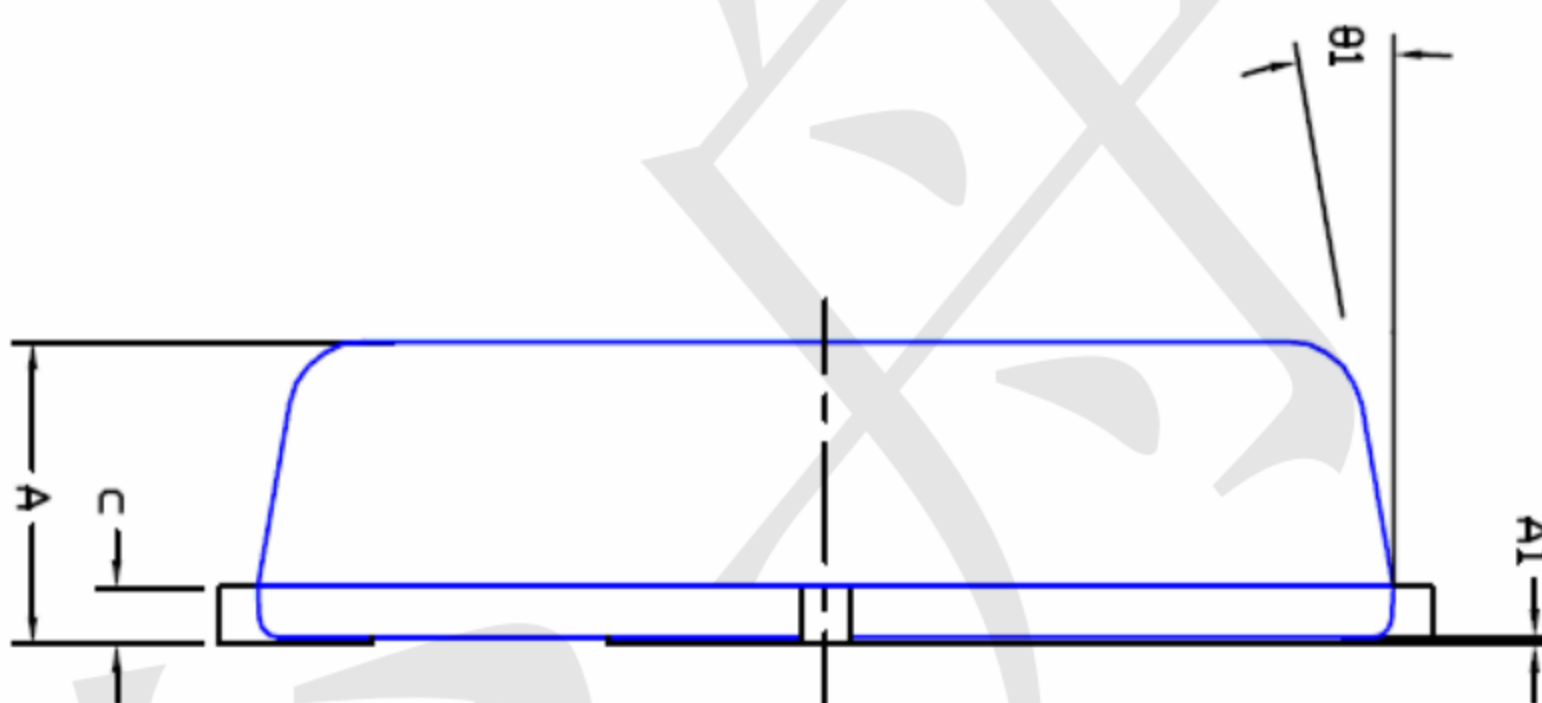
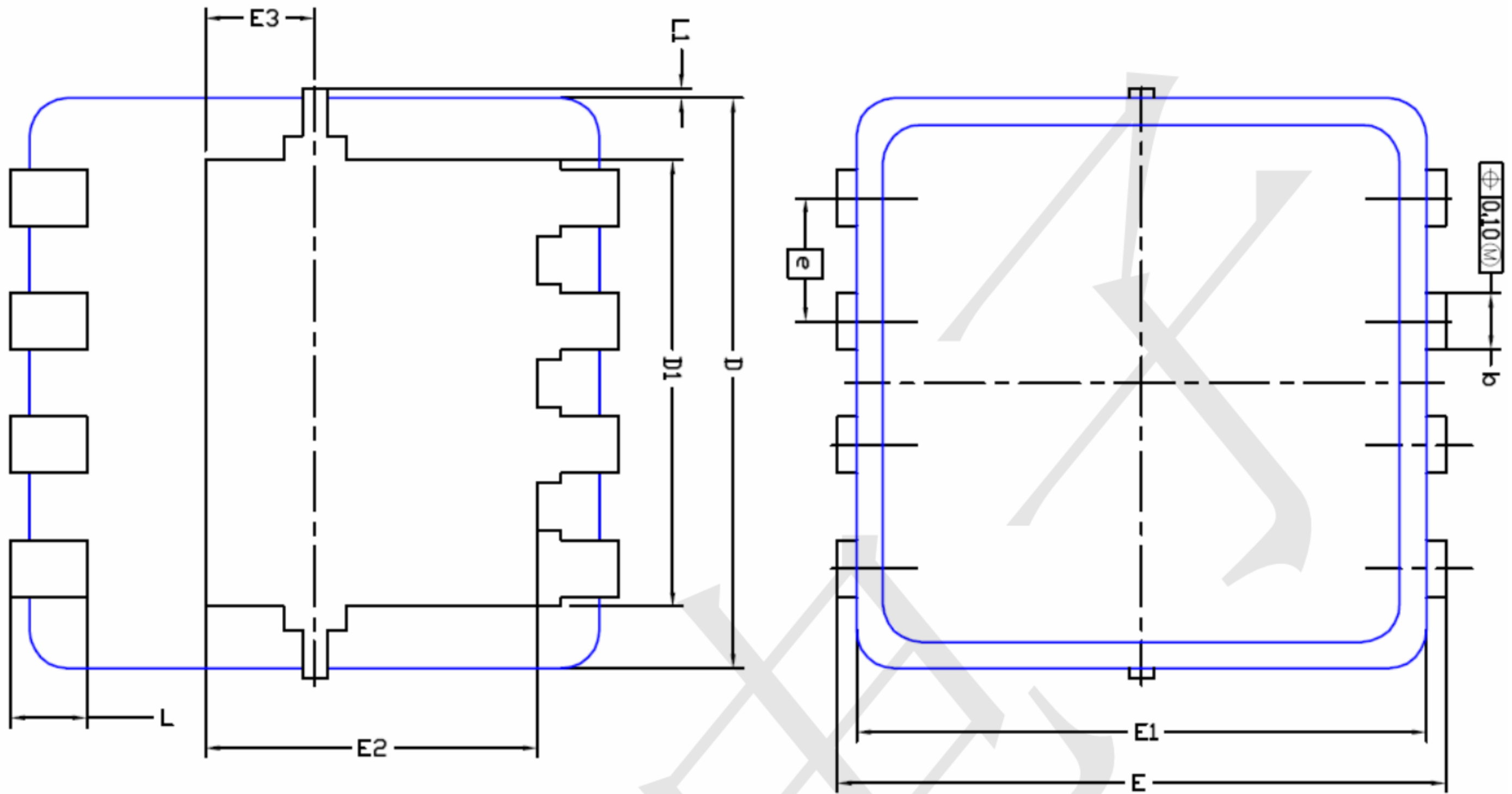


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN3X3 Package Information



| DIM. | MILLIMETERS | | | INCHES | | |
|-------|-------------|-------|-------|-----------|--------|--------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.700 | 0.80 | 0.900 | 0.0276 | 0.0315 | 0.0354 |
| A1 | 0.00 | --- | 0.05 | 0.000 | --- | 0.002 |
| b | 0.24 | 0.30 | 0.35 | 0.009 | 0.012 | 0.014 |
| c | 0.10 | 0.152 | 0.25 | 0.004 | 0.006 | 0.010 |
| D | 3.00 BSC | | | 0.118 BSC | | |
| D1 | 2.35 BSC | | | 0.093 BSC | | |
| E | 3.20 BSC | | | 0.126 BSC | | |
| E1 | 3.00 BSC | | | 0.118 BSC | | |
| E2 | 1.75 BSC | | | 0.069 BSC | | |
| E3 | 0.575 BSC | | | 0.023 BSC | | |
| e | 0.65 BSC | | | 0.026 BSC | | |
| L | 0.30 | 0.40 | 0.50 | 0.0118 | 0.0157 | 0.0197 |
| L1 | 0 | --- | 0.100 | 0 | --- | 0.004 |
| theta | 0° | 10° | 12° | 0° | 10° | 12° |

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