| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| **Thermal characteristics**[2] | | | | | | |
| Thermal resistance, junction - case | $R_{thJC}$ | | - | - | 1.1 | K/W |
| Thermal resistance, junction - ambient, leaded | $R_{thJA}$ | | - | - | 100 | |
| SMD version, device on PCB | $R_{thJA}$ | minimal footprint | - | - | 75 | |
| | | 6 cm$^2$ cooling area[3] | - | - | 50 | |
| **Electrical characteristics,** at $T_j$=25 °C, unless otherwise specified | | | | | | |
| **Static characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$=0 V, $I_D$= 1 mA | 75 | - | - | V |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=80 µA | 1.2 | 1.6 | 2.0 | |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=75 V, $V_{GS}$=0 V, $T_j$=25 °C | - | 0.01 | 1 | µA |
| | | $V_{DS}$=75 V, $V_{GS}$=0 V, $T_j$=125 °C[2] | - | 1 | 100 | |
| Gate-source leakage current | $I_{GSS}$ | $V_{GS}$=20 V, $V_{DS}$=0 V | - | 1 | 100 | nA |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS}$=4.5 V, $I_D$=25 A | - | 20.6 | 26 | mΩ |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS}$=10 V, $I_D$=25 A | - | 15.9 | 20.5 | mΩ |

| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| **Dynamic characteristics**[2] | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{GS}$=0 V, $V_{DS}$=25 V, $f$=1 MHz | - | 1650 | - | pF |
| Output capacitance | $C_{oss}$ | | - | 400 | - | |
| Reverse transfer capacitance | $C_{rss}$ | | - | 190 | - | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=40 V, $V_{GS}$=10 V, $I_D$=30 A, $R_G$=3.9 Ω | - | 9 | - | ns |
| Rise time | $t_r$ | | - | 30 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 44 | - | |
| Fall time | $t_f$ | | - | 11 | - | |
| **Gate Charge Characteristics**[2] | | | | | | |
| Gate to source charge | $Q_{gs}$ | $V_{DD}$=60 V, $I_D$=30 A, $V_{GS}$=0 to 10 V | - | 6 | 6.8 | nC |
| Gate to drain charge | $Q_{gd}$ | | - | 22 | 32 | |
| Gate charge total | $Q_g$ | | - | 56 | 72 | |
| Gate plateau voltage | $V_{plateau}$ | | - | 3.5 | - | V |
| **Reverse Diode** | | | | | | |
| Diode continous forward current[2] | $I_S$ | $T_C$=25 °C | - | - | 30 | A |
| Diode pulse current[2] | $I_{S,pulse}$ | | - | - | 120 | |
| Diode forward voltage | $V_{SD}$ | $V_{GS}$=0 V, $I_F$=30 A, $T_j$=25 °C | - | 0.9 | 1.3 | V |
| Reverse recovery time[2] | $t_{rr}$ | $V_R$=40 V, $I_F$=$I_S$, d$i_F$/d$t$=100 A/µs | - | 50 | - | ns |
| Reverse recovery charge[2] | $Q_{rr}$ | $V_R$=40 V, $I_F$=$I_S$, d$i_F$/d$t$=100 A/µs | - | 120 | - | nC |

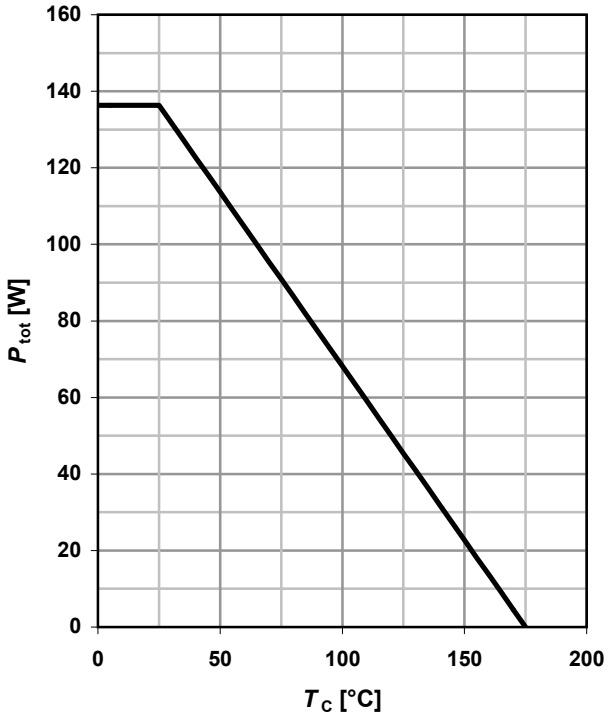
[1] Current limited by bondwire; with an RthJC = 1.1K/W the chip is able to carry ID= 54A at 25°C, for detailed information see app.-note ANPS071E available at www.infineon.com/optimos

[2] Defined by design. Not subject to production test.

[3] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

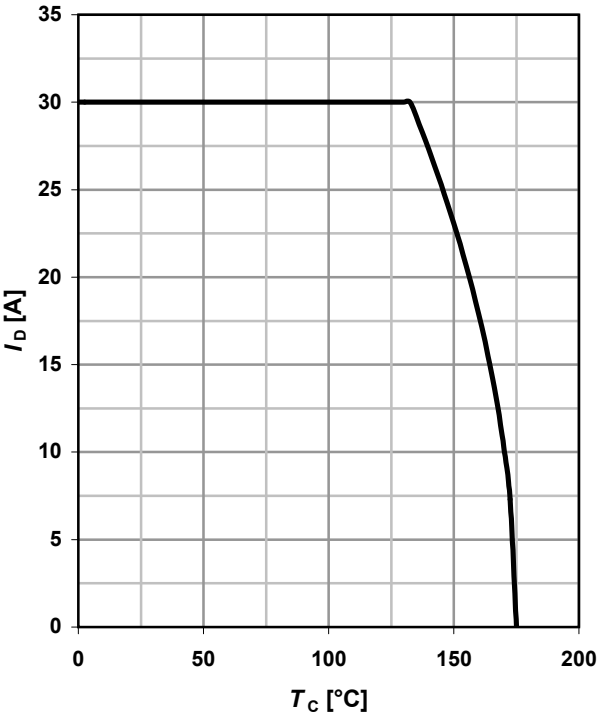
## 1 Power dissipation

$P_{tot} = f(T_C)$; $V_{GS} \geq 6$ V




## 2 Drain current

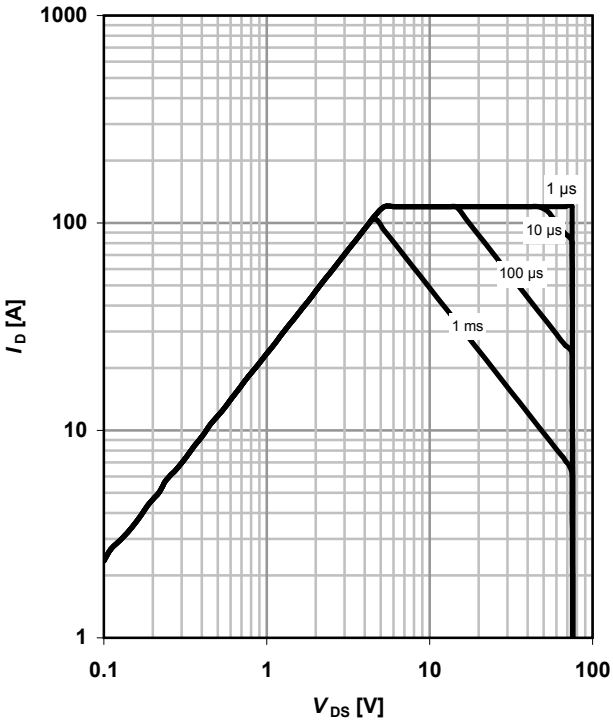
$I_D = f(T_C)$; $V_{GS} \geq 10$ V




## 3 Safe operating area

$I_D = f(V_{DS})$; $T_C = 25$ °C; $D = 0$

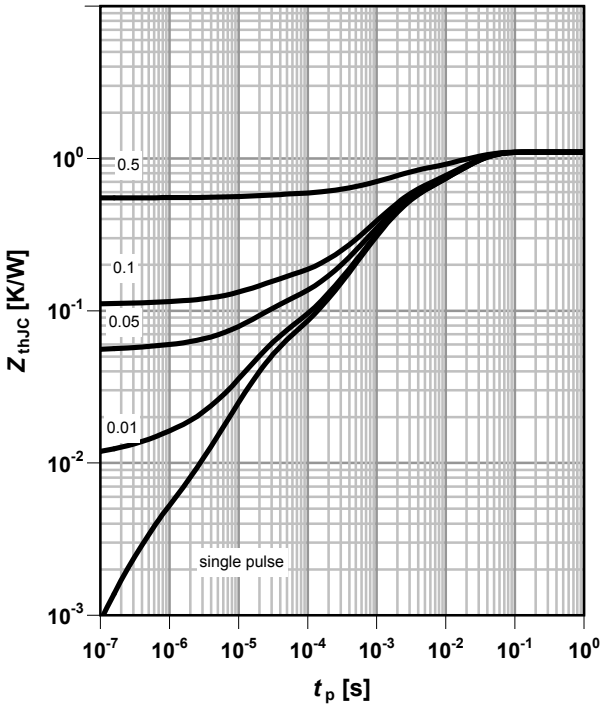
parameter: $t_p$




## 4 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

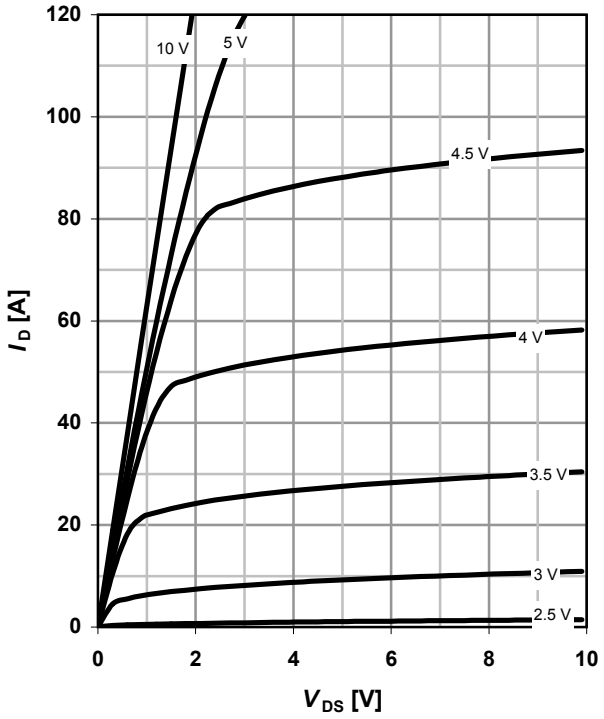
parameter: $D = t_p / T$



## 5 Typ. output characteristics

$I_D = f(V_{DS})$; $T_j = 25$ °C

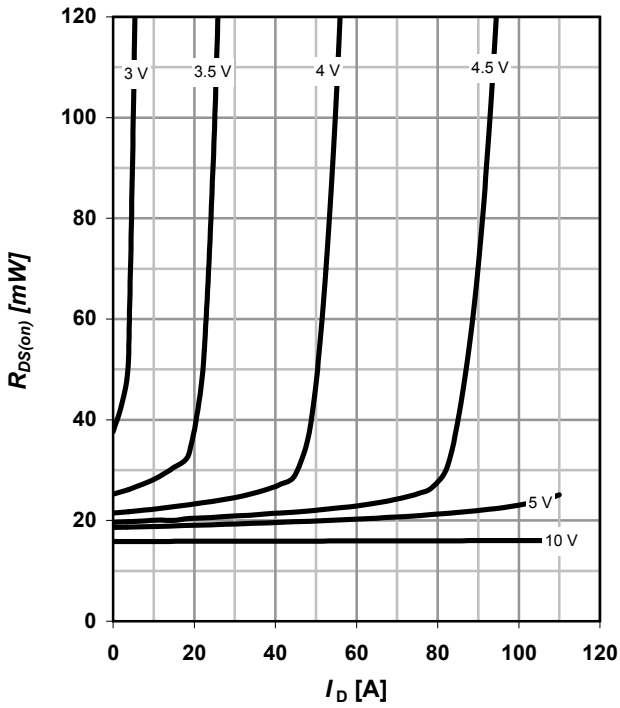
parameter: $V_{GS}$




## 6 Typ. drain-source on-state resistance

$R_{DS(on)} = (I_D)$; $T_j = 25$ °C

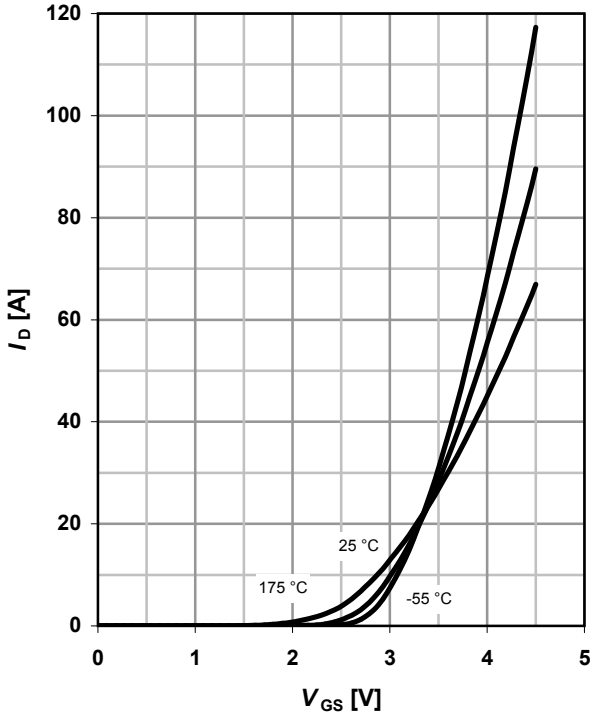
parameter: $V_{GS}$




## 7 Typ. transfer characteristics

$I_D = f(V_{GS})$; $V_{DS} = 6$V

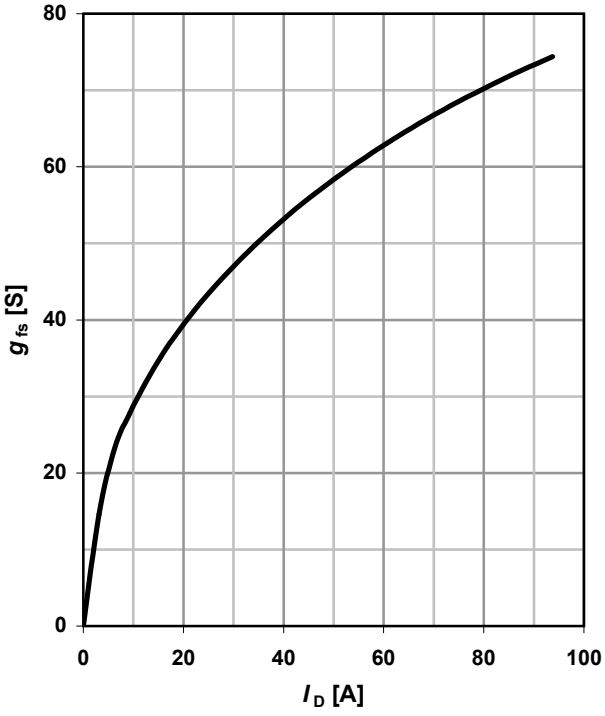
parameter: $T_j$




## 8 Typ. Forward transconductance

$g_{fs} = f(I_D)$; $T_j = 25$°C

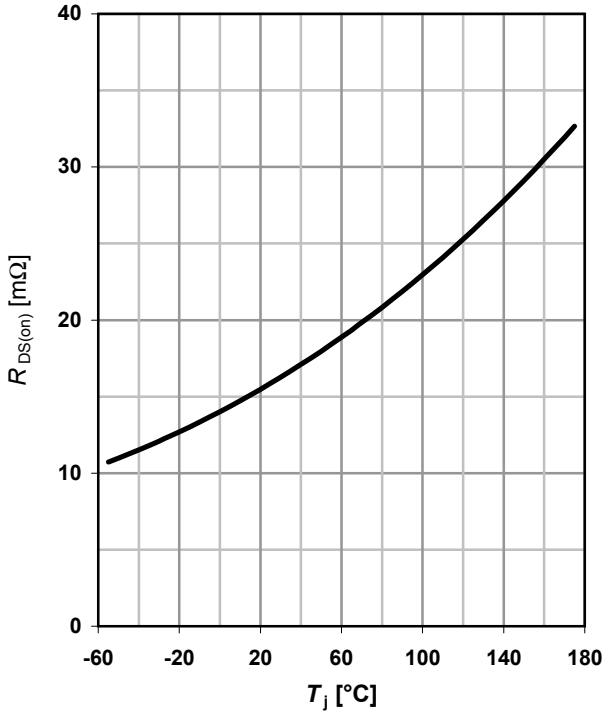
parameter: $g_{fs}$



### 9 Typ. Drain-source on-state resistance

$R_{DS(ON)} = f(T_j)$

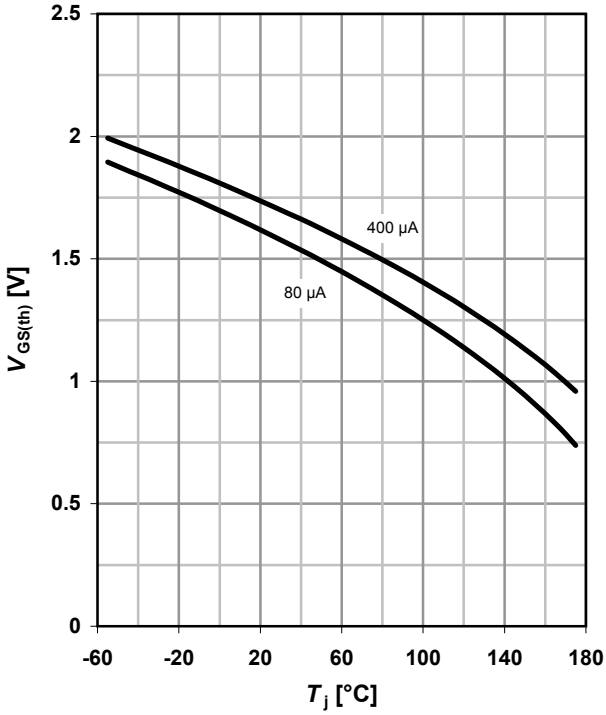
parameter: $I_D = 25$ A; $V_{GS} = 10$ V




### 10 Typ. gate threshold voltage

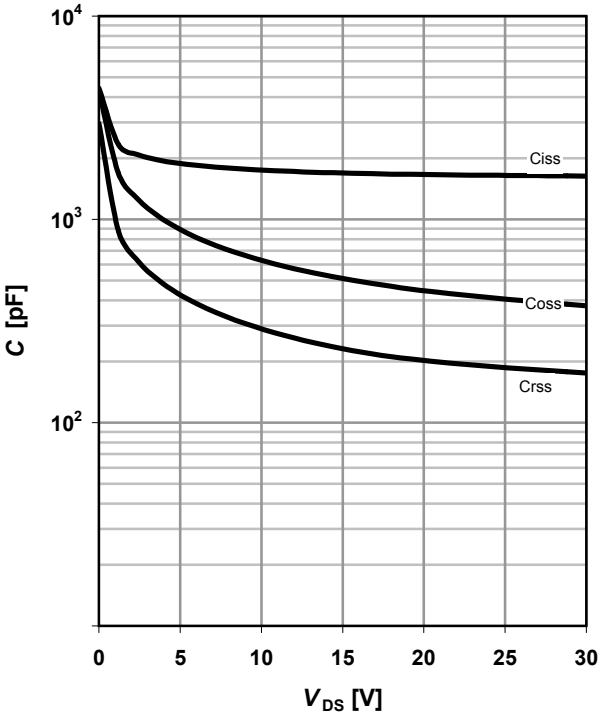
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: $I_D$




### 11 Typ. capacitances

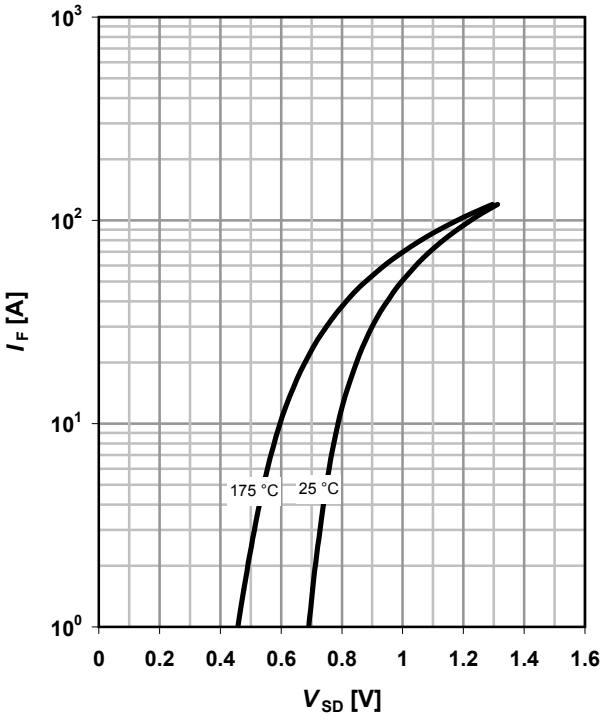
$C = f(V_{DS})$; $V_{GS} = 0$ V; $f = 1$ MHz




### 12 Typical forward diode characteristicis

IF = f($V_{SD}$)

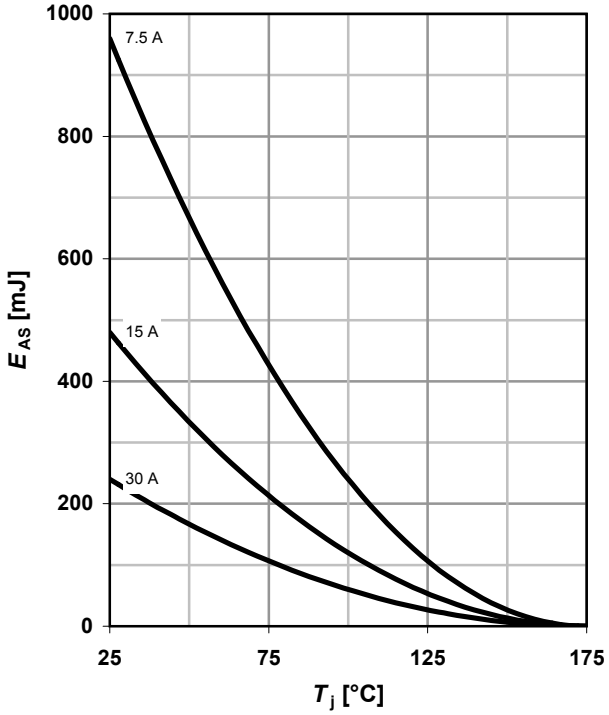
parameter: $T_j$



### 13 Typical avalanche energy

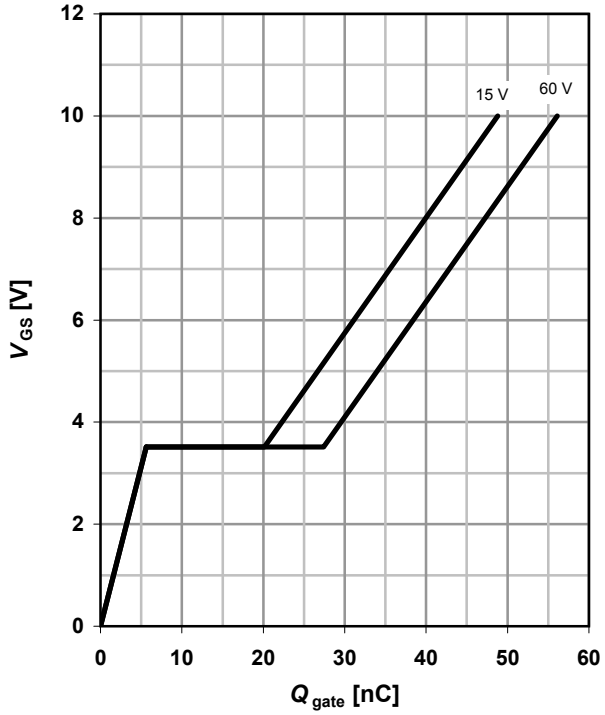
$E_{AS} = f(T_j)$

parameter: $I_D$



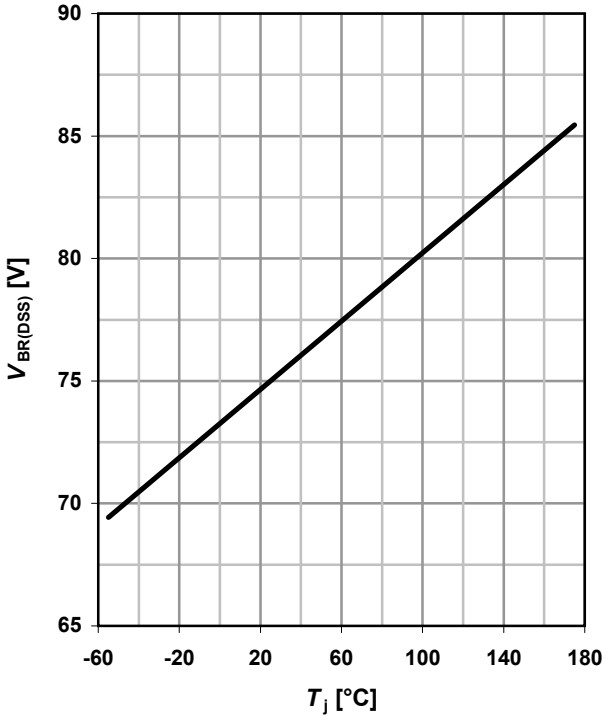

### 14 Typ. gate charge

$V_{GS} = f(Q_{gate})$; $I_D$ = 30 A pulsed

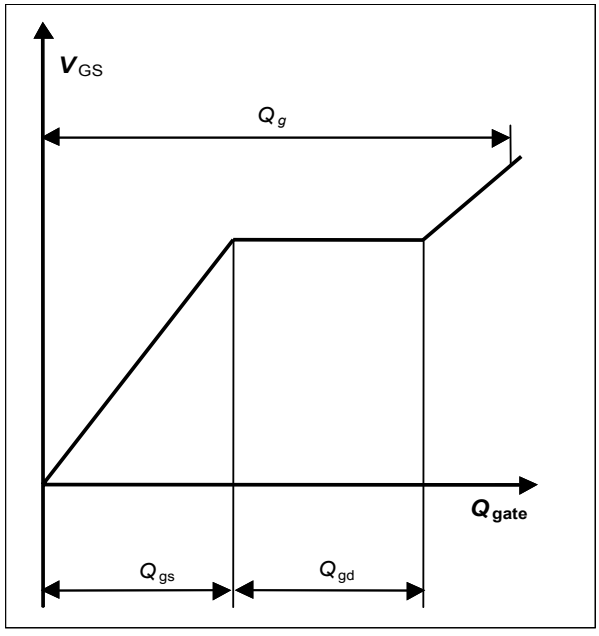



### 15 Typ. drain-source breakdown voltage

$V_{BR(DSS)} = f(T_j)$; $I_D$ = 1 mA




### 16 Gate charge waveforms



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