| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| **Thermal characteristics**[2] | | | | | | |
| Thermal resistance, junction - case | $R_{thJC}$ | - | - | - | 1.7 | K/W |
| SMD version, device on PCB | $R_{thJA}$ | minimal footprint | - | - | 62 | |
| | | 6 cm$^2$ cooling area[3] | - | - | 40 | |
| **Electrical characteristics,** at $T_j$=25 °C, unless otherwise specified | | | | | | |
| **Static characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$= -1mA | -40 | - | - | V |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-150µA | -2.0 | -3.0 | -4.0 | |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=-32V, $V_{GS}$=0V, $T_j$=25°C | - | -0.05 | -1 | µA |
| | | $V_{DS}$=-32V, $V_{GS}$=0V, $T_j$=125°C[2] | - | -20 | -200 | |
| Gate-source leakage current | $I_{GSS}$ | $V_{GS}$=-20V, $V_{DS}$=0V | - | - | -100 | nA |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS}$=-10V, $I_D$=-85A | - | 5.3 | 7.3 | mΩ |

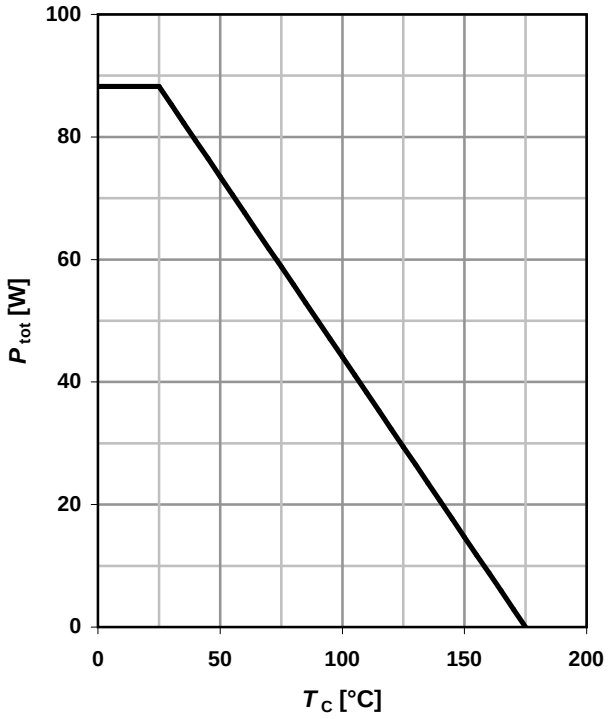
| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| **Dynamic characteristics**[1] | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=-25V, $f$=1MHz | - | 4681 | 6085 | pF |
| Output capacitance | $C_{oss}$ | | - | 1520 | 2280 | |
| Reverse transfer capacitance | $C_{rss}$ | | - | 45 | 91 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=-20V, $V_{GS}$=-10V, $I_D$=-85A, $R_G$=3.5Ω | - | 24 | - | ns |
| Rise time | $t_r$ | | - | 15 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 34 | - | |
| Fall time | $t_f$ | | - | 39 | - | |
| **Gate Charge Characteristics**[1] | | | | | | |
| Gate to source charge | $Q_{gs}$ | $V_{DD}$=-32V, $I_D$=-85A, $V_{GS}$=0 to -10V | - | 26 | 34 | nC |
| Gate to drain charge | $Q_{gd}$ | | - | 13 | 26 | |
| Gate charge total | $Q_g$ | | - | 69 | 89 | |
| Gate plateau voltage | $V_{plateau}$ | | - | -5.5 | - | V |
| **Reverse Diode** | | | | | | |
| Diode continous forward current[1] | $I_S$ | $T_C$=25°C | - | - | -85 | A |
| Diode pulse current[1] | $I_{S,pulse}$ | | - | - | -340 | |
| Diode forward voltage | $V_{SD}$ | $V_{GS}$=0V, $I_F$=-85A, $T_j$=25°C | - | -1 | -1.3 | V |
| Reverse recovery time[1] | $t_{rr}$ | $V_R$=-20V, $I_F$=-50A, d$i_F$/d$t$=-100A/µs | - | 48 | - | ns |
| Reverse recovery charge[1] | $Q_{rr}$ | | - | 54 | - | nC |

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

[2] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm$^2$ (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

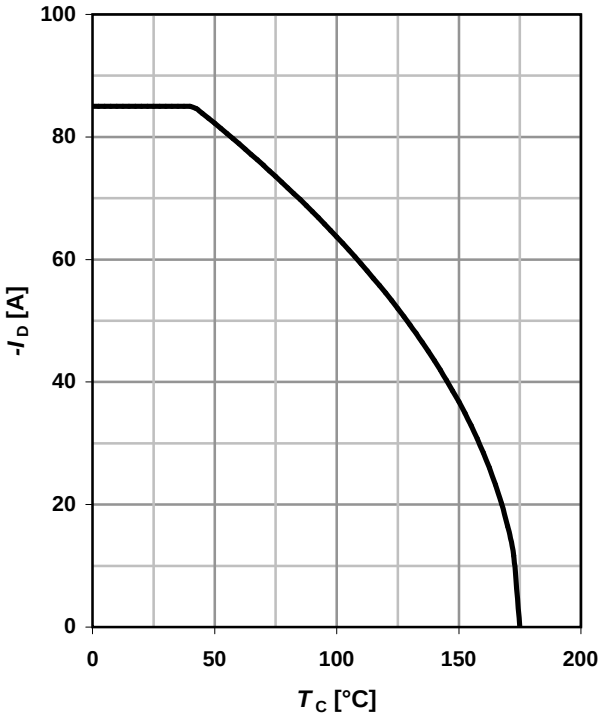
## 1 Power dissipation

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




## 2 Drain current

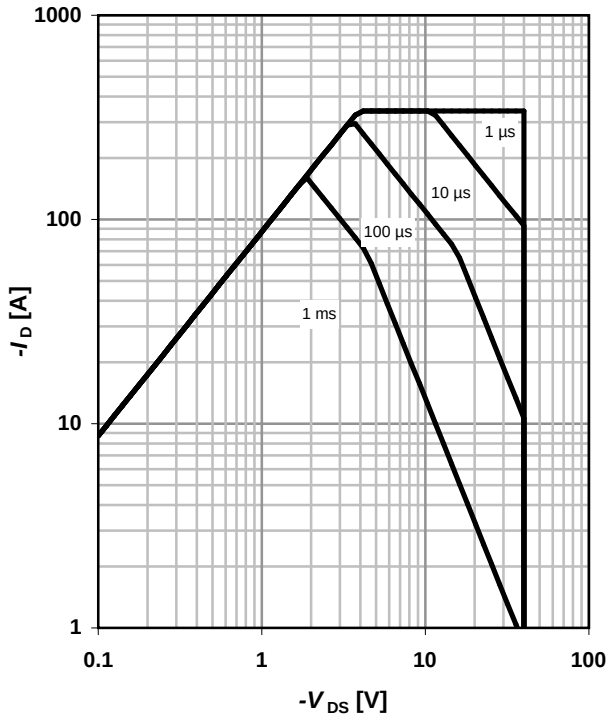
$I_D = f(T_C)$; $V_{GS} = -10V$




## 3 Safe operating area

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

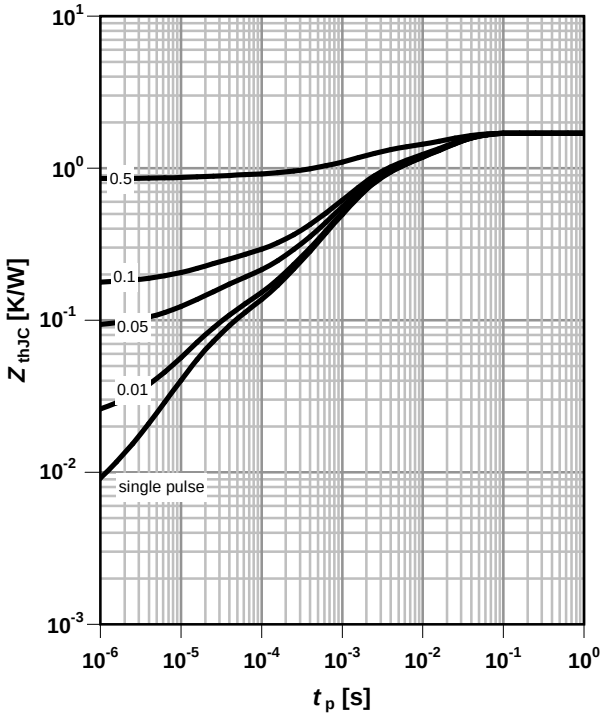
parameter: $t_p$




## 4 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

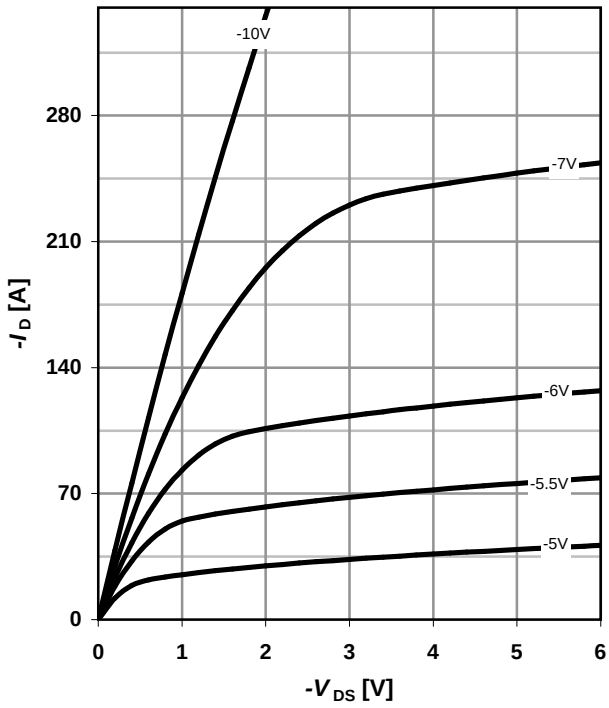
parameter: $D = t_p/T$



## 5 Typ. output characteristics

$I_D = f(V_{DS})$; $T_j = 25$ °C

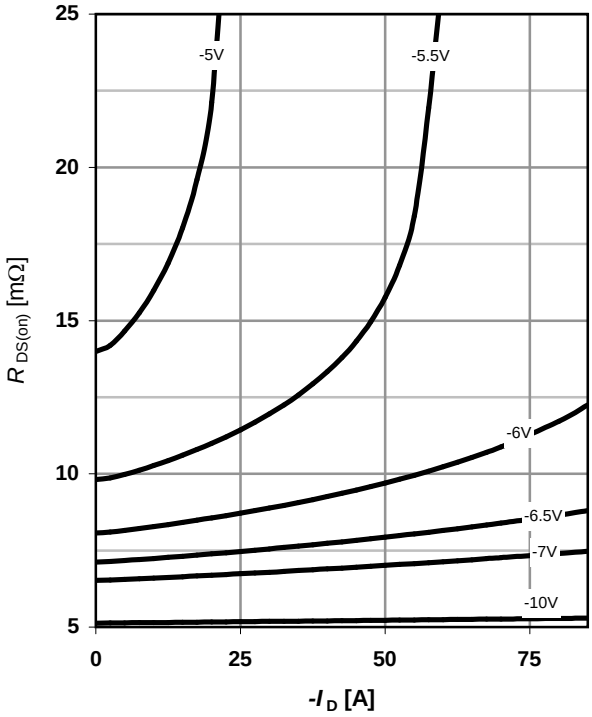
parameter: $V_{GS}$




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

$R_{DS(on)} = (I_D)$; $T_j = 25$ °C

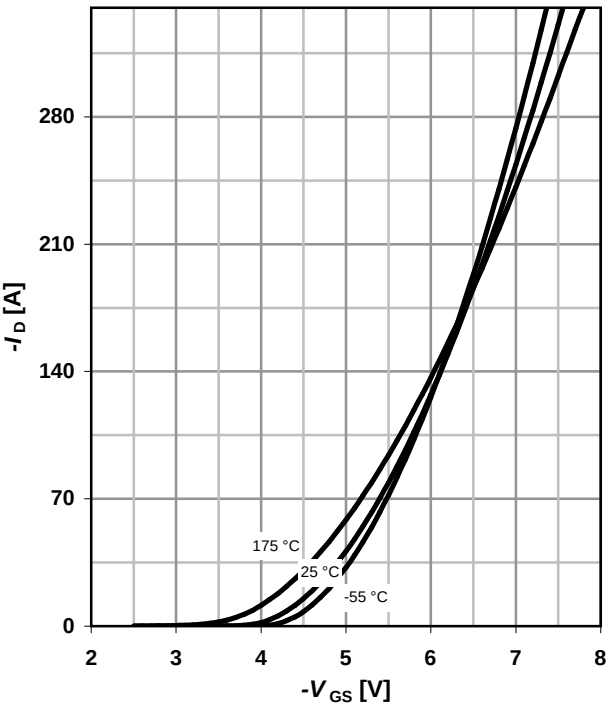
parameter: $V_{GS}$




## 7 Typ. transfer characteristics

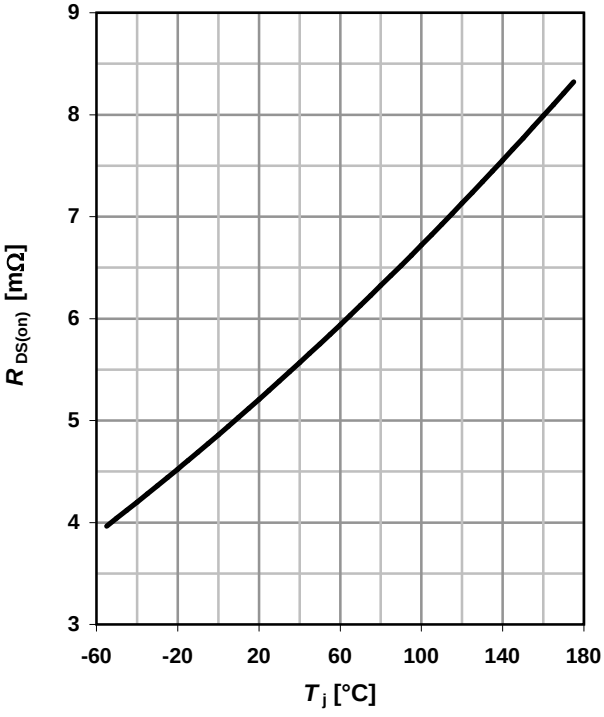
$I_D = f(V_{GS})$; $V_{DS} = -6$V

parameter: $T_j$




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

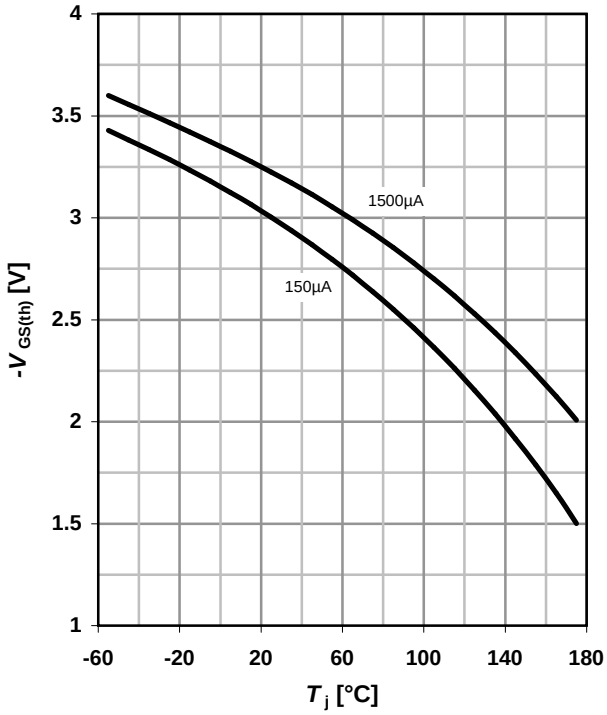
$R_{DS(on)} = f(T_j)$; $I_D = -85$ A; $V_{GS} = -10$ V



## 9 Typ. gate threshold voltage

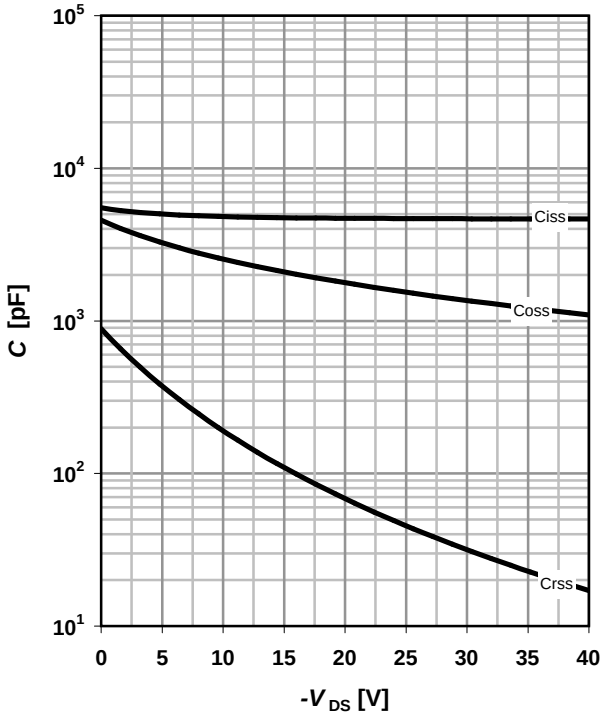
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: $-I_D$




## 10 Typ. capacitances

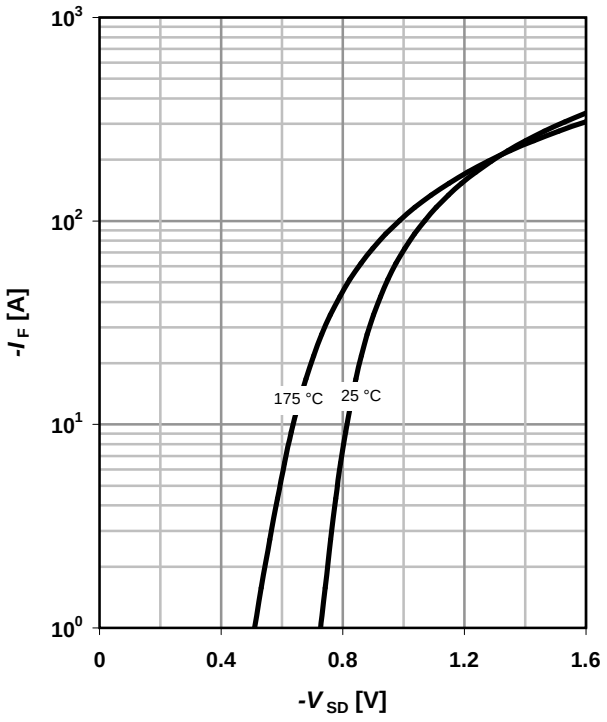
$C = f(V_{DS})$; $V_{GS} = 0$ V; $f = 1$ MHz




## 11 Typical forward diode characteristicis

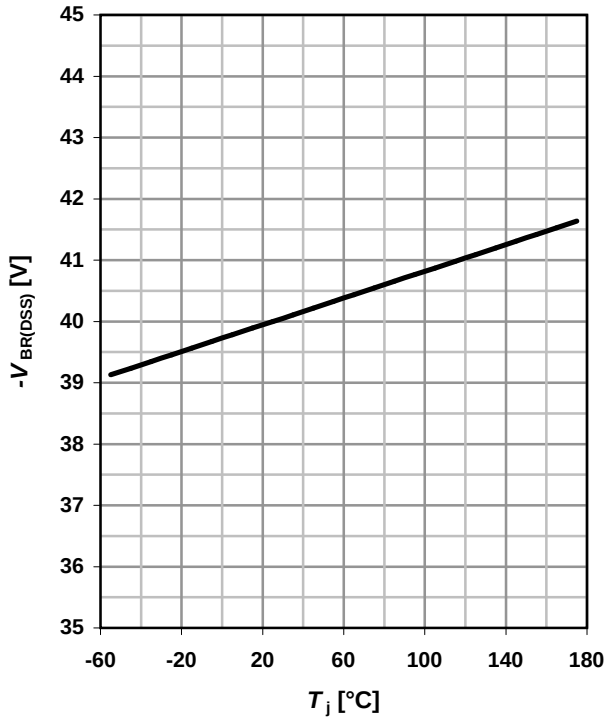
$I_F = f(V_{SD})$

parameter: $T_j$




## 12 Drain-source breakdown voltage

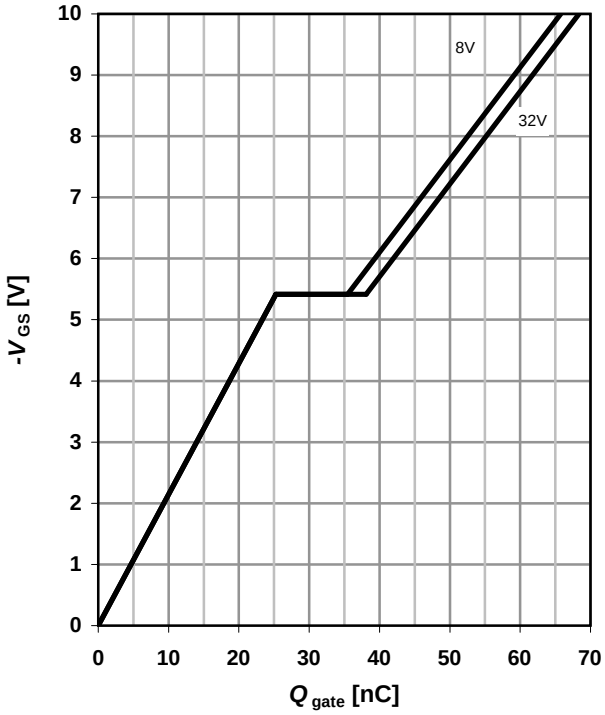
$V_{BR(DSS)} = f(T_j)$; $I_D = -1$ mA



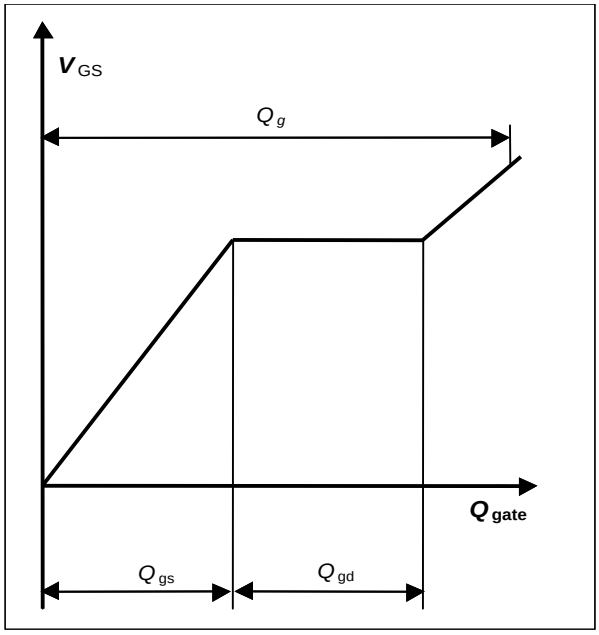
## 13 Typ. gate charge

$V_{GS} = f(Q_{gate})$; $I_D = -85$ A pulsed

parameter: $V_{DD}$




## 14 Gate charge waveforms



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Revision History

| **Version** | Date | Changes |
|---|---|---|
| 0.1 | 08.03.2010 | Initial Target Data Sheet |
| 0.2 | 10.12.2010 | Preliminary Data Sheet |
| 1.0 | 15.03.2011 | Final Data Sheet |