**Maximum ratings,** at $T_J$=25 °C, unless otherwise specified

| Parameter | Symbol | Conditions | Value | Unit |
|---|---|---|---|---|
| Continuous diode forward current | $I_S$ | $T_C$=25 °C | 4.1 | A |
| Diode pulse current[2] | $I_{S,pulse}$ | | 15 | |
| Reverse diode $dv/dt$[4] | $dv/dt$ | | 4 | V/ns |

| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| **Thermal characteristics** | | | | | | |
| Thermal resistance, junction - case | $R_{thJC}$ | | - | - | 1.2 | K/W |
| Thermal resistance, junction - ambient | $R_{thJA}$ | leaded | - | - | 62 | |
| Soldering temperature, wavesoldering only allowed at leads | $T_{sold}$ | 1.6 mm (0.063 in.) from case for 10 s | - | - | 260 | °C |

**Electrical characteristics,** at $T_J$=25 °C, unless otherwise specified

| **Static characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$=0 V, $I_D$=250 µA | 900 | - | - | V |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=0.46 mA | 2.5 | 3 | 3.5 | |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=900 V, $V_{GS}$=0 V, $T_j$=25 °C | - | - | 1 | µA |
| | | $V_{DS}$=900 V, $V_{GS}$=0 V, $T_j$=150 °C | - | 10 | - | |
| Gate-source leakage current | $I_{GSS}$ | $V_{GS}$=20 V, $V_{DS}$=0 V | - | - | 100 | nA |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS}$=10 V, $I_D$=4.1 A, $T_j$=25 °C | - | 0.62 | 0.8 | Ω |
| | | $V_{GS}$=10 V, $I_D$=4.1 A, $T_j$=150 °C | - | 1.7 | - | |
| Gate resistance | $R_G$ | $f$=1 MHz, open drain | - | 1.3 | - | Ω |

| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| **Dynamic characteristics** | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{GS}$=0 V, $V_{DS}$=100 V, $f$=1 MHz | - | 1100 | - | pF |
| Output capacitance | $C_{oss}$ | | - | 52 | - | |
| Effective output capacitance, energy related [5] | $C_{o(er)}$ | $V_{GS}$=0 V, $V_{DS}$=0 V to 500 V | - | 34 | - | |
| Effective output capacitance, time related [6] | $C_{o(tr)}$ | | - | 130 | - | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=400 V, $V_{GS}$=10 V, $I_D$=4.1 A, $R_G$=50 Ω | - | 70 | - | ns |
| Rise time | $t_r$ | | - | 20 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 400 | - | |
| Fall time | $t_f$ | | - | 32 | - | |
| Gate Charge Characteristics | | | | | | |
| Gate to source charge | $Q_{gs}$ | $V_{DD}$=400 V, $I_D$=4.1 A, $V_{GS}$=0 to 10 V | - | 5 | - | nC |
| Gate to drain charge | $Q_{gd}$ | | - | 18 | - | |
| Gate charge total | $Q_g$ | | - | 42 | tbd | |
| Gate plateau voltage | $V_{plateau}$ | | - | 4.6 | - | V |
| **Reverse Diode** | | | | | | |
| Diode forward voltage | $V_{SD}$ | $V_{GS}$=0 V, $I_F$=4.1 A, $T_J$=25 °C | - | 0.8 | 1.2 | V |
| Reverse recovery time | $t_{rr}$ | $V_R$=400 V, $I_F$=$I_S$, d$i_F$/d$t$=100 A/µs | - | 360 | - | ns |
| Reverse recovery charge | $Q_{rr}$ | | - | 5.3 | - | µC |
| Peak reverse recovery current | $I_{rrm}$ | | - | 24 | - | A |

[1] J-STD20 and JESD22

[2] Pulse width $t_p$ limited by $T_{J,max}$

[3] Repetitive avalanche causes additional power losses that can be calculated as $P_{AV}$=$E_{AR}$*$f$.

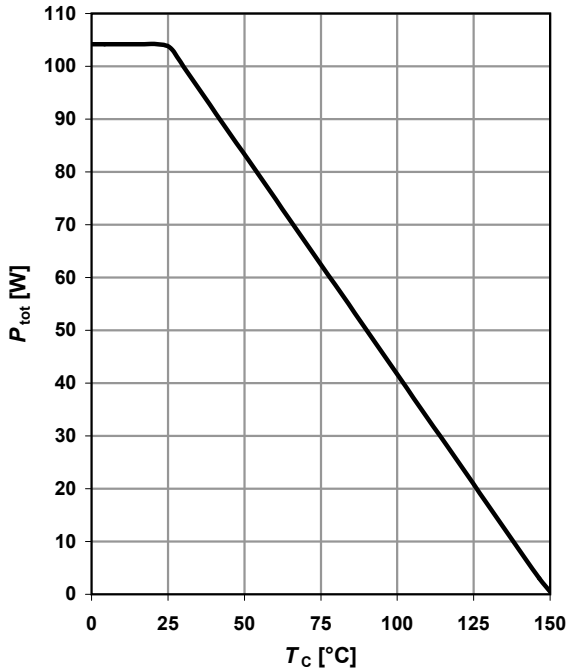
[4] $I_{SD}$≤$I_D$, di/dt≤ 200 A/µs, $V_{DClink}$=400V, $V_{peak}$<$V_{(BR)DSS}$, $T_J$<$T_{J,max}$, identical low side and high side switch

[5] $C_{o(er)}$ is a fixed capacitance that gives the same stored energy as $C_{oss}$ while $V_{DS}$ is rising from 0 to 50% $V_{DSS}$.

[6] $C_{o(tr)}$ is a fixed capacitance that gives the same charging time as $C_{oss}$ while $V_{DS}$ is rising from 0 to 50% $V_{DSS}$.

## 1 Power dissipation

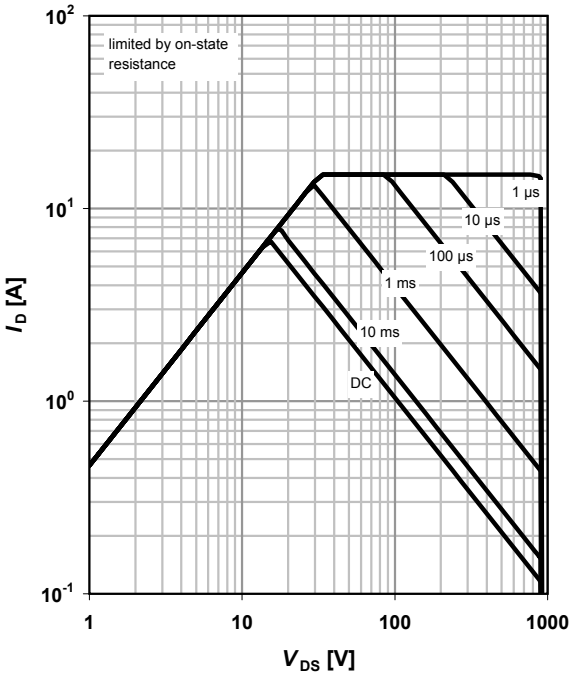
$P_{tot}=f(T_C)$




## 2 Safe operating area

$I_D=f(V_{DS})$; $T_C=25$ °C; $D=0$

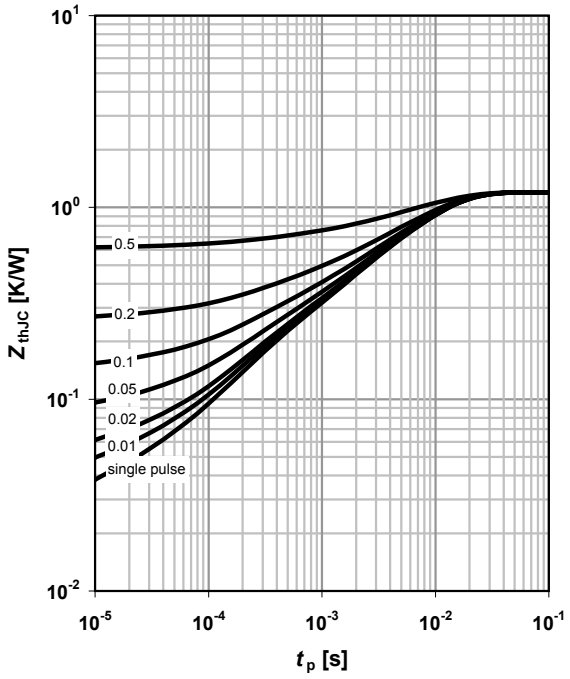
parameter: $t_p$




## 3 Max. transient thermal impedance

$Z_{thJC}=f(t_P)$

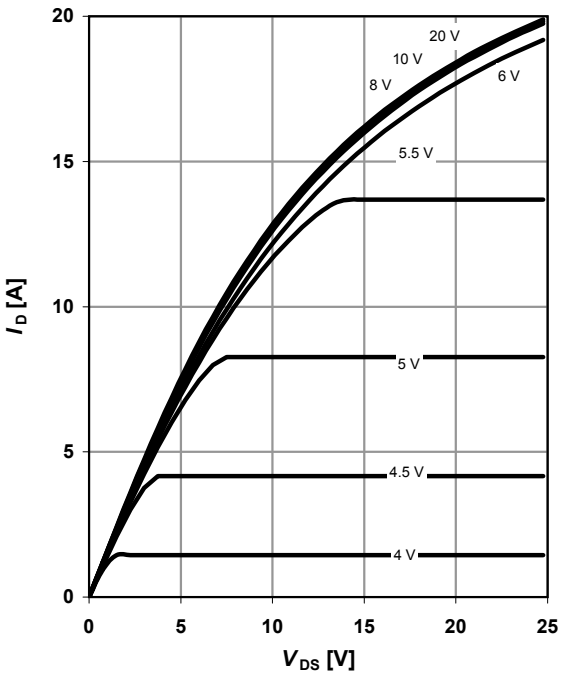
parameter: $D=t_p/T$




## 4 Typ. output characteristics

$I_D=f(V_{DS})$; $T_J=25$ °C

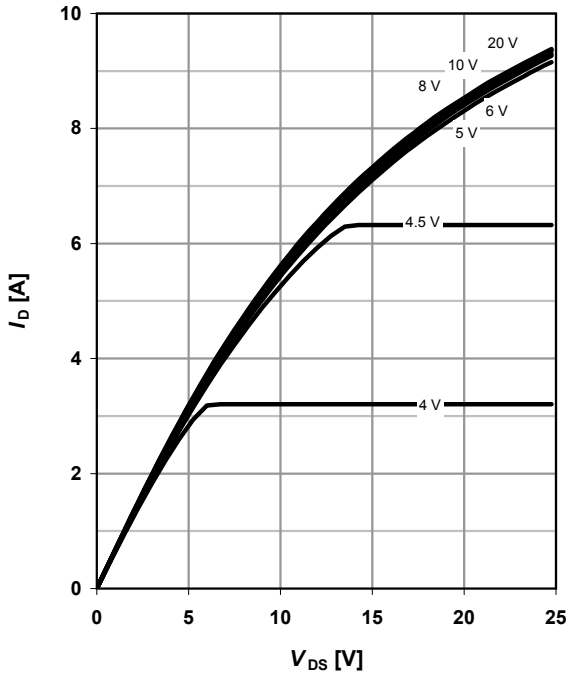
parameter: $V_{GS}$



## 5 Typ. output characteristics

$I_D$=f($V_{DS}$); $T_J$=150 °C

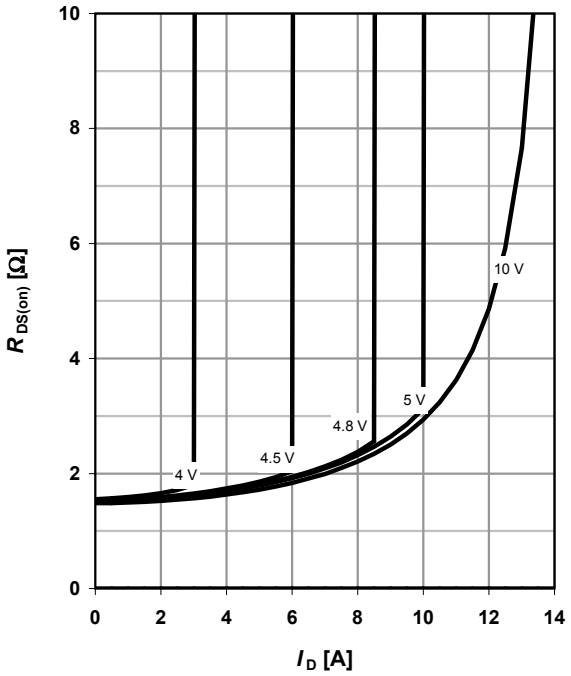
parameter: $V_{GS}$




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

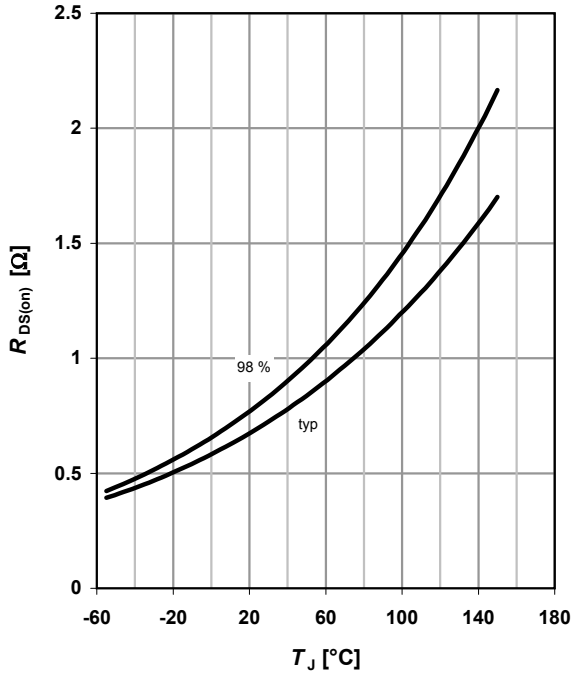
$R_{DS(on)}$=f($I_D$); $T_J$=150 °C

parameter: $V_{GS}$




## 7 Drain-source on-state resistance

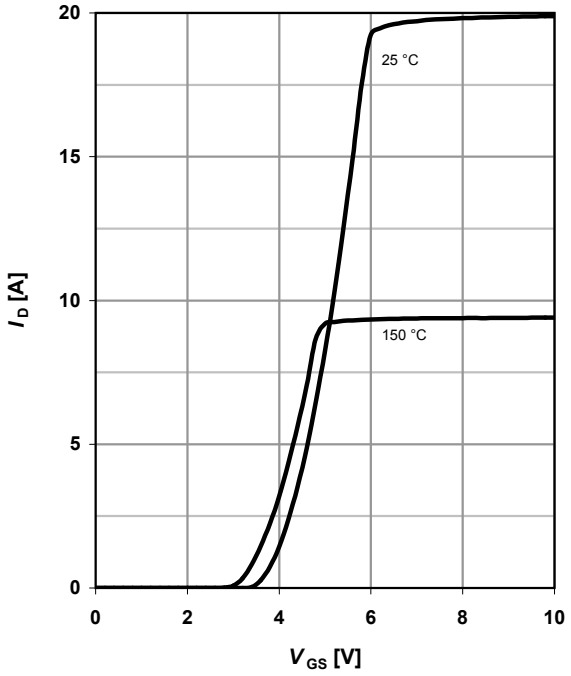
$R_{DS(on)}$=f($T_J$); $I_D$=4.1 A; $V_{GS}$=10 V




## 8 Typ. transfer characteristics

$I_D$=f($V_{GS}$); $V_{DS}$=20V

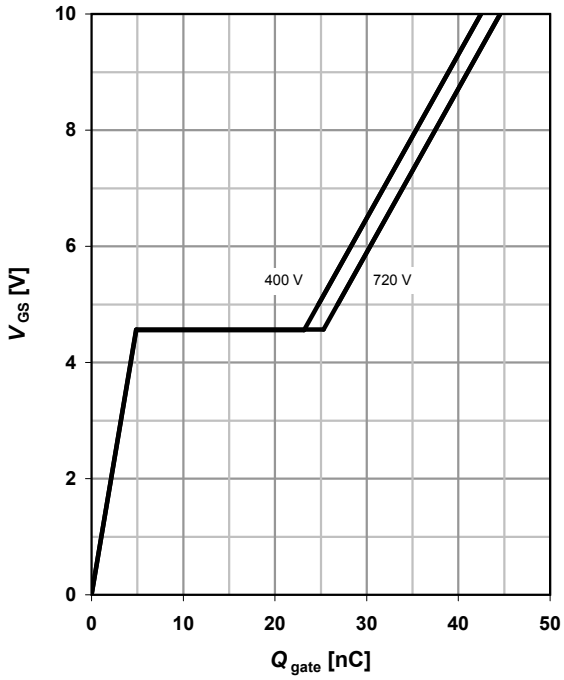
parameter: $T_J$



### 9 Typ. gate charge

$V_{GS}$=f($Q_{gate}$); $I_D$=4.1 A pulsed

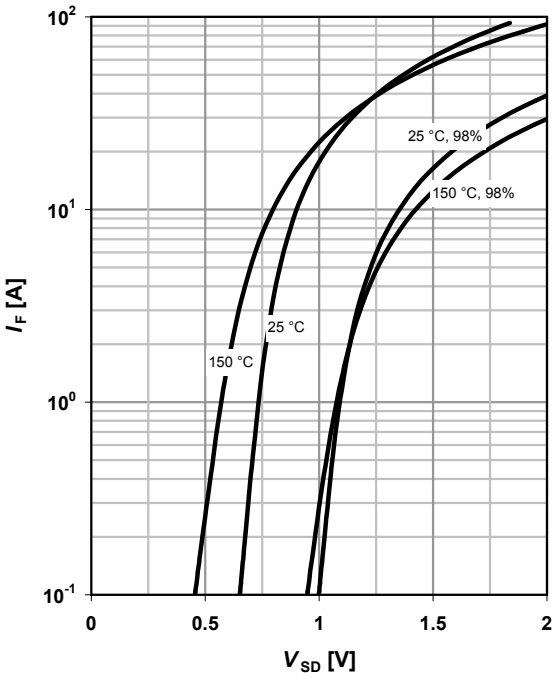
parameter: $V_{DD}$




### 10 Forward characteristics of reverse diode

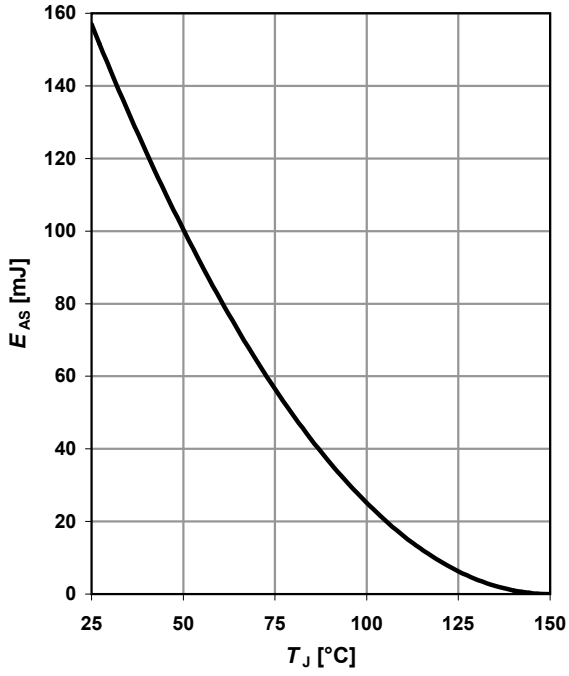
$I_F$=f($V_{SD}$)

parameter: $T_J$



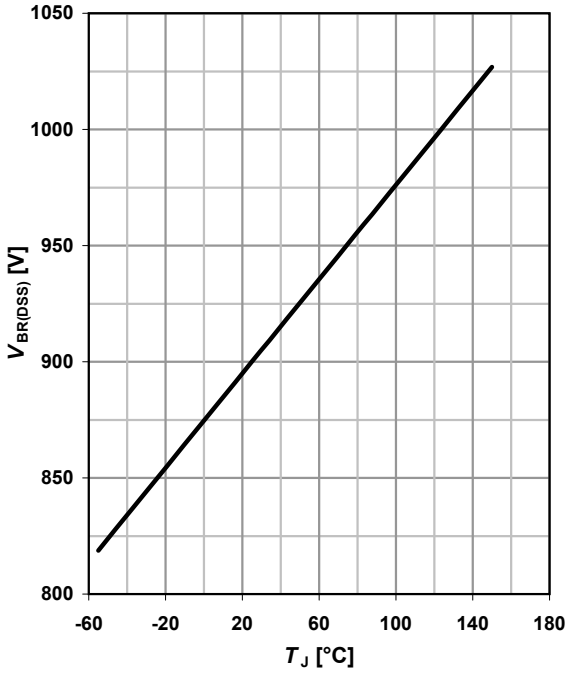

### 11 Avalanche energy

$E_{AS}$=f($T_J$); $I_D$=1.4 A; $V_{DD}$=50 V



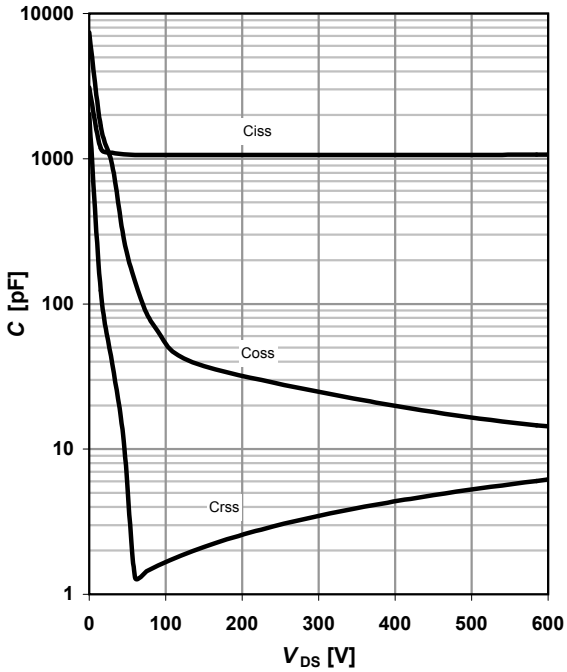

### 12 Drain-source breakdown voltage

$V_{BR(DSS)}$=f($T_J$); $I_D$=0.25 mA



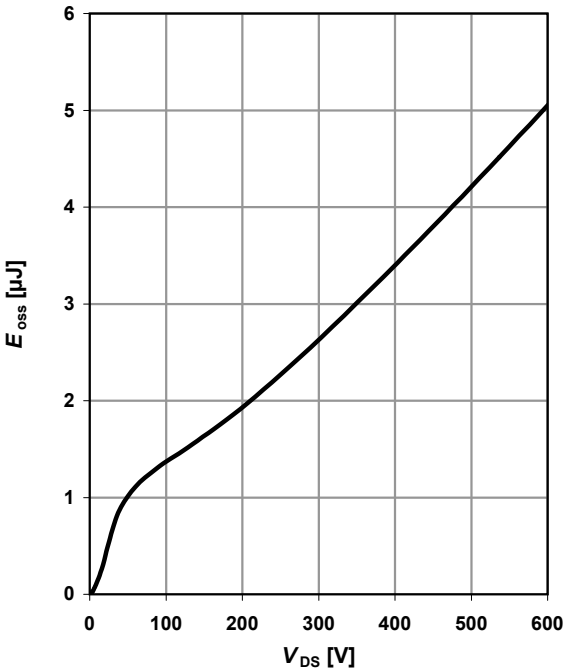
## 13 Typ. capacitances

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

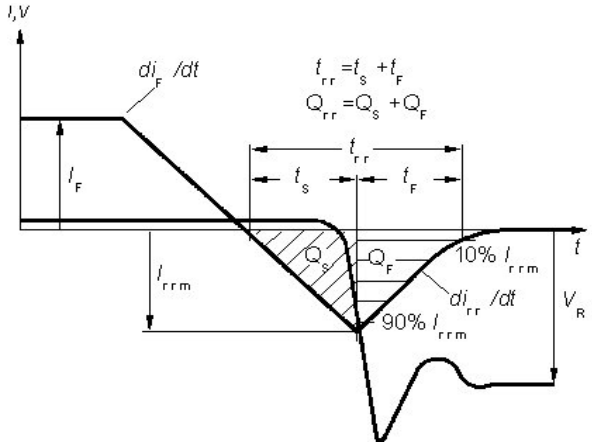



## 14 Typ. $C_{oss}$ stored energy

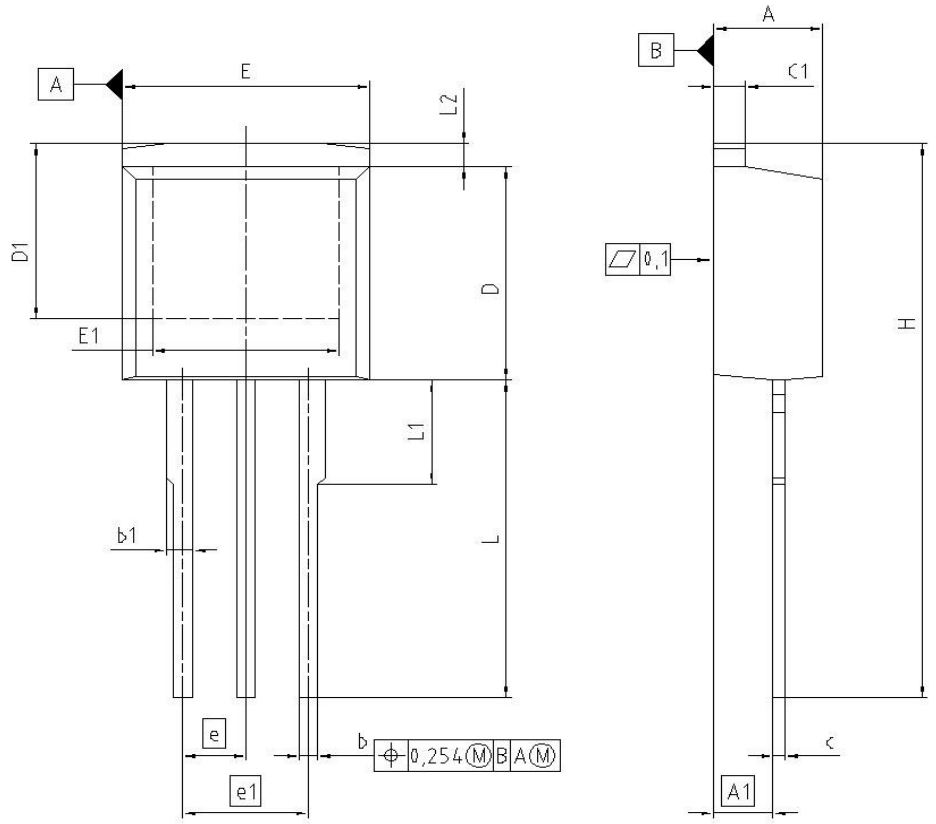
$E_{oss}$=f($V_{DS}$)



**Definition of diode switching characteristics**



## PG-TO262 Outlines




| DIM | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 4.300 | 4.500 | 0.169 | 0.177 |
| A1 | 2.150 | 2.650 | 0.085 | 0.104 |
| b | 0.650 | 0.850 | 0.026 | 0.033 |
| b1 | 0.635 | 1.400 | 0.025 | 0.055 |
| c | 0.400 | 0.600 | 0.016 | 0.024 |
| c1 | 1.170 | 1.370 | 0.046 | 0.054 |
| D | 9.050 | 9.450 | 0.356 | 0.372 |
| D1 | 6.900 | 7.650 | 0.272 | 0.301 |
| E | 9.800 | 10.200 | 0.386 | 0.402 |
| E1 | 7.250 | 8.600 | 0.285 | 0.339 |
| e | 2.540 | | 0.100 | |
| e1 | 5.080 | | 0.200 | |
| N | 3 | | 3 | |
| L | 13.000 | 14.000 | 0.512 | 0.551 |
| L1 | 4.350 | 4.750 | 0.171 | 0.187 |
| L2 | 0.700 | 1.300 | 0.028 | 0.051 |

| | |
|---|---|
| REFERENCE | JEDEC TO262 |
| SCALE | 0 2.5 0 2.5 5mm |
| EUROPEAN PROJECTION | |
| ISSUE DATE | 01-06-2005 |
| FILE | TO262_1 |

Dimensions in mm/inches

**Published by**
**Infineon Technologies AG**
**81726 Munich, Germany**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