

**Electrical Characteristics**, at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                                                                                                                                        | Symbol        | Values |           |          | Unit          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|-----------|----------|---------------|
|                                                                                                                                                                                                                  |               | min.   | typ.      | max.     |               |
| Static Characteristics                                                                                                                                                                                           |               |        |           |          |               |
| Drain- source breakdown voltage<br>$V_{GS} = 0\text{ V}$ , $I_D = 0.25\text{ mA}$ , $T_j = 25\text{ }^{\circ}\text{C}$                                                                                           | $V_{(BR)DSS}$ | 200    | -         | -        | V             |
| Gate threshold voltage<br>$V_{GS}=V_{DS}$ , $I_D = 1\text{ mA}$                                                                                                                                                  | $V_{GS(th)}$  | 1.2    | 1.6       | 2        |               |
| Zero gate voltage drain current<br>$V_{DS} = 200\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_j = 25\text{ }^{\circ}\text{C}$<br>$V_{DS} = 200\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_j = 125\text{ }^{\circ}\text{C}$ | $I_{DSS}$     | -<br>- | 0.1<br>10 | 1<br>100 | $\mu\text{A}$ |
| Gate-source leakage current<br>$V_{GS} = 20\text{ V}$ , $V_{DS} = 0\text{ V}$                                                                                                                                    | $I_{GSS}$     | -      | 10        | 100      | nA            |
| Drain-Source on-resistance<br>$V_{GS} = 5\text{ V}$ , $I_D = 3.5\text{ A}$                                                                                                                                       | $R_{DS(on)}$  | -      | 0.3       | 0.4      | $\Omega$      |

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| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

**Dynamic Characteristics**

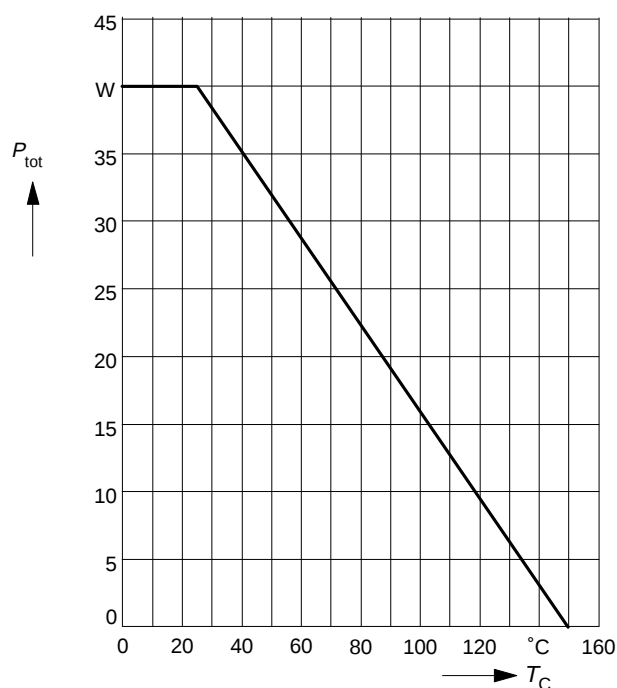
|                                                                                                                       |              |   |     |     |    |
|-----------------------------------------------------------------------------------------------------------------------|--------------|---|-----|-----|----|
| Transconductance<br>$V_{DS} \geq 2 * I_D * R_{DS(on)max}$ , $I_D = 3.5 \text{ A}$                                     | $g_{fs}$     | 5 | 6.5 | -   | S  |
| Input capacitance<br>$V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$                           | $C_{iss}$    | - | 630 | 840 | pF |
| Output capacitance<br>$V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$                          | $C_{oss}$    | - | 120 | 200 |    |
| Reverse transfer capacitance<br>$V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$                | $C_{rss}$    | - | 60  | 90  |    |
| Turn-on delay time<br>$V_{DD} = 30 \text{ V}$ , $V_{GS} = 5 \text{ V}$ , $I_D = 3 \text{ A}$<br>$R_{GS} = 50 \Omega$  | $t_{d(on)}$  | - | 15  | 20  | ns |
| Rise time<br>$V_{DD} = 30 \text{ V}$ , $V_{GS} = 5 \text{ V}$ , $I_D = 3 \text{ A}$<br>$R_{GS} = 50 \Omega$           | $t_r$        | - | 60  | 90  |    |
| Turn-off delay time<br>$V_{DD} = 30 \text{ V}$ , $V_{GS} = 5 \text{ V}$ , $I_D = 3 \text{ A}$<br>$R_{GS} = 50 \Omega$ | $t_{d(off)}$ | - | 100 | 130 |    |
| Fall time<br>$V_{DD} = 30 \text{ V}$ , $V_{GS} = 5 \text{ V}$ , $I_D = 3 \text{ A}$<br>$R_{GS} = 50 \Omega$           | $t_f$        | - | 40  | 50  |    |

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| Parameter                                                                                    | Symbol   | Values |      |      | Unit          |
|----------------------------------------------------------------------------------------------|----------|--------|------|------|---------------|
|                                                                                              |          | min.   | typ. | max. |               |
| Reverse Diode                                                                                |          |        |      |      |               |
| Inverse diode continuous forward current<br>$T_C = 25\text{ }^{\circ}\text{C}$               | $I_S$    | -      | -    | 7    | A             |
| Inverse diode direct current,pulsed<br>$T_C = 25\text{ }^{\circ}\text{C}$                    | $I_{SM}$ | -      | -    | 28   |               |
| Inverse diode forward voltage<br>$V_{GS} = 0\text{ V}, I_F = 14\text{ A}$                    | $V_{SD}$ | -      | 1.1  | 1.7  | V             |
| Reverse recovery time<br>$V_R = 100\text{ V}, I_F=I_S, di_F/dt = 100\text{ A}/\mu\text{s}$   | $t_{rr}$ | -      | 140  | -    | ns            |
| Reverse recovery charge<br>$V_R = 100\text{ V}, I_F=I_S, di_F/dt = 100\text{ A}/\mu\text{s}$ | $Q_{rr}$ | -      | 0.7  | -    | $\mu\text{C}$ |

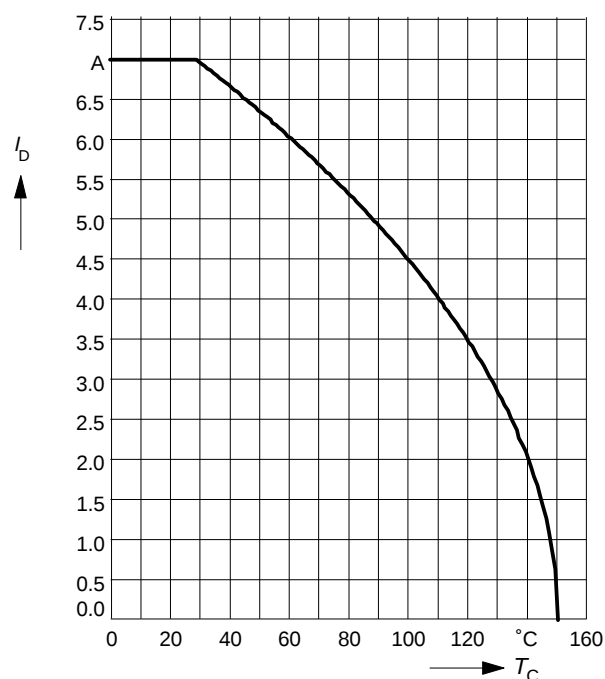
**Power dissipation**

$$P_{\text{tot}} = f(T_C)$$


**Drain current**

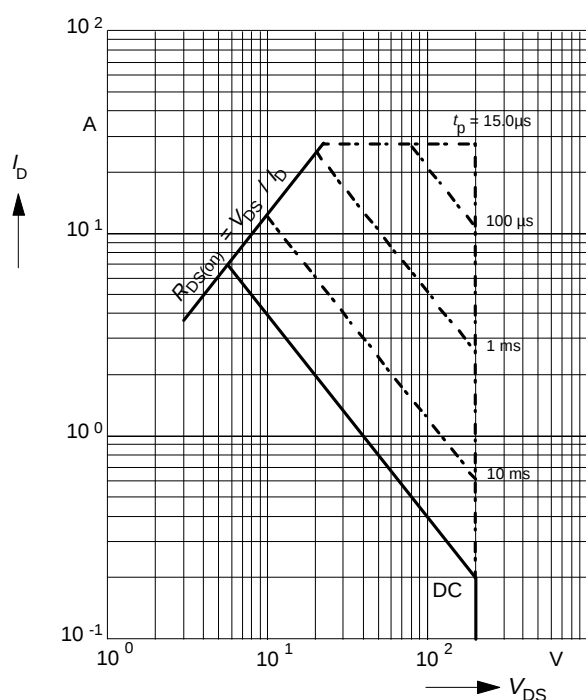
$$I_D = f(T_C)$$

parameter:  $V_{GS} \geq 5 \text{ V}$


**Safe operating area**

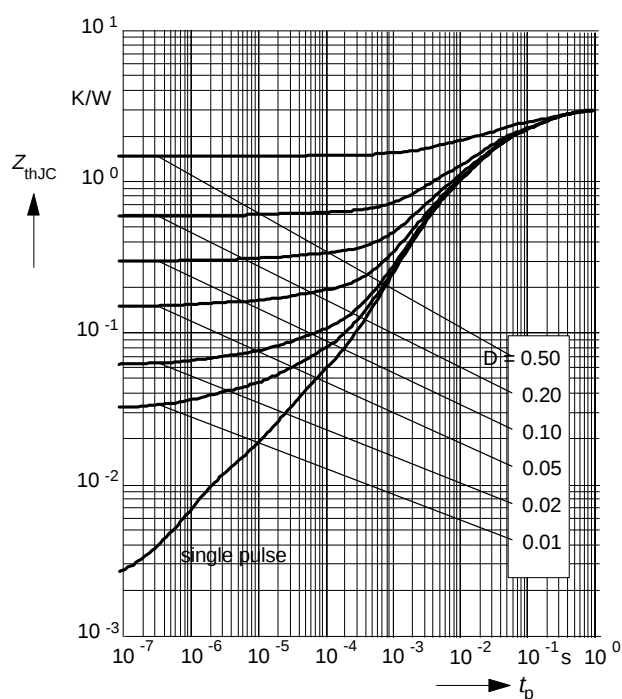
$$I_D = f(V_{DS})$$

parameter:  $D = 0.01$ ,  $T_C = 25^\circ\text{C}$


**Transient thermal impedance**

$$Z_{\text{thJC}} = f(t_p)$$

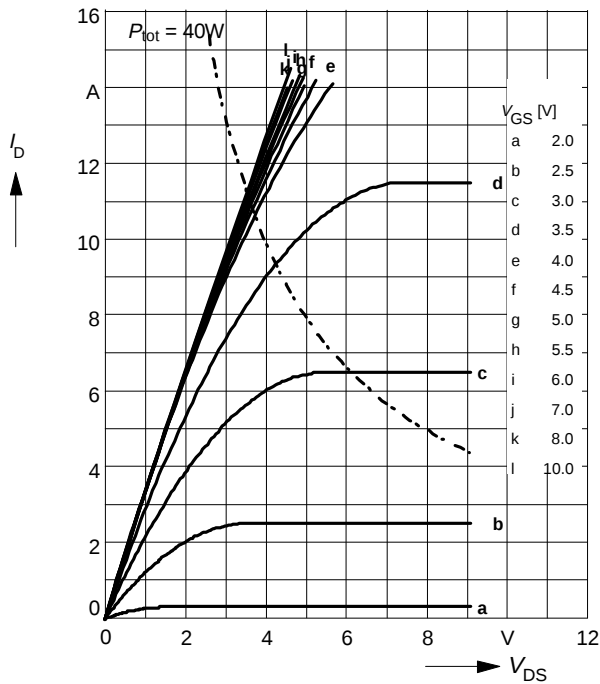
parameter:  $D = t_p / T$



**Typ. output characteristics**

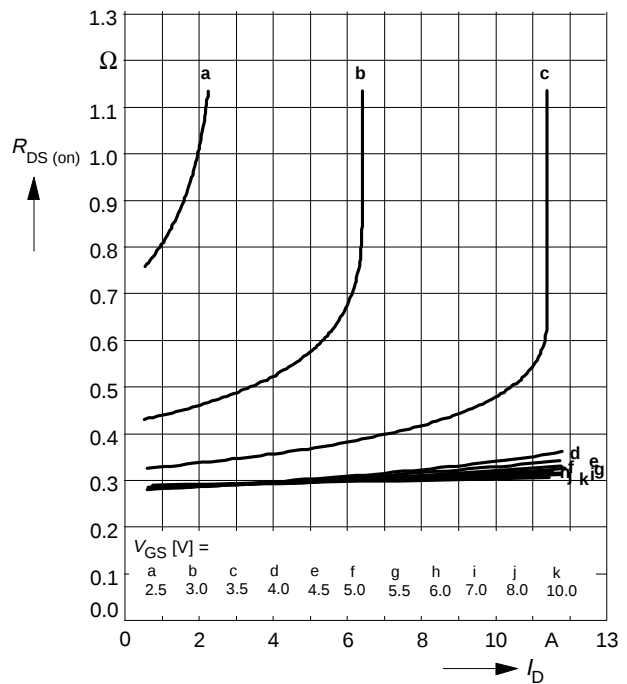
$$I_D = f(V_{DS})$$

parameter:  $t_p = 80 \mu s$


**Typ. drain-source on-resistance**

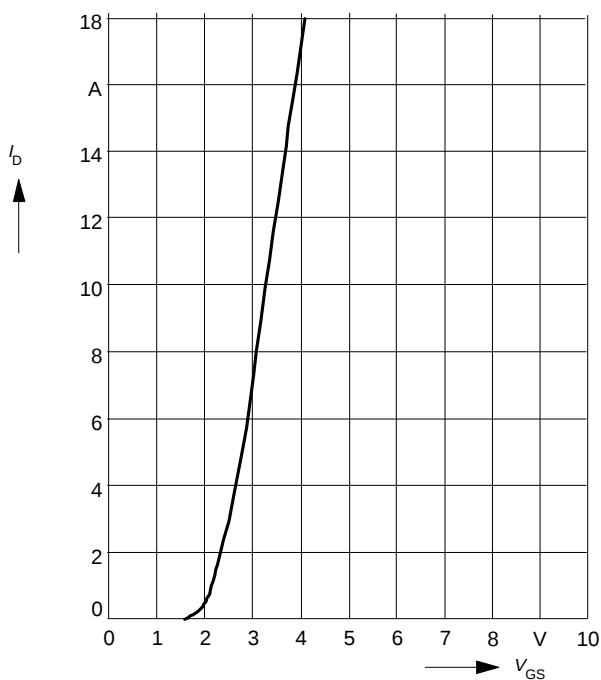
$$R_{DS(on)} = f(I_D)$$

parameter:  $V_{GS}$


**Typ. transfer characteristics**  $I_D = f(V_{GS})$ 

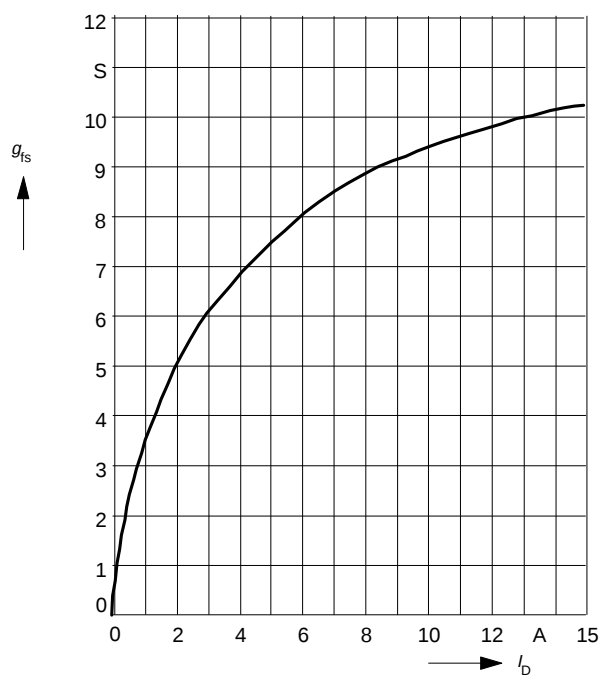
parameter:  $t_p = 80 \mu s$

$$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$


**Typ. forward transconductance**  $g_{fs} = f(I_D)$ 

parameter:  $t_p = 80 \mu s$ ,

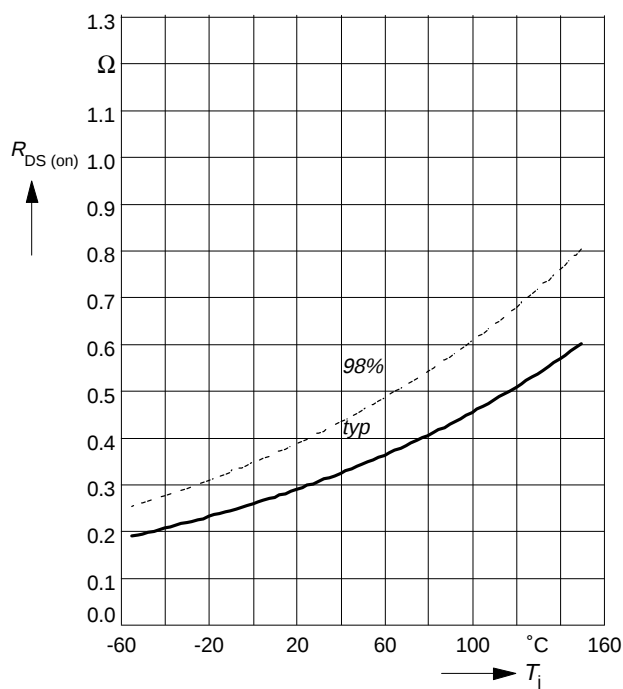
$$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$



**Drain-source on-resistance**

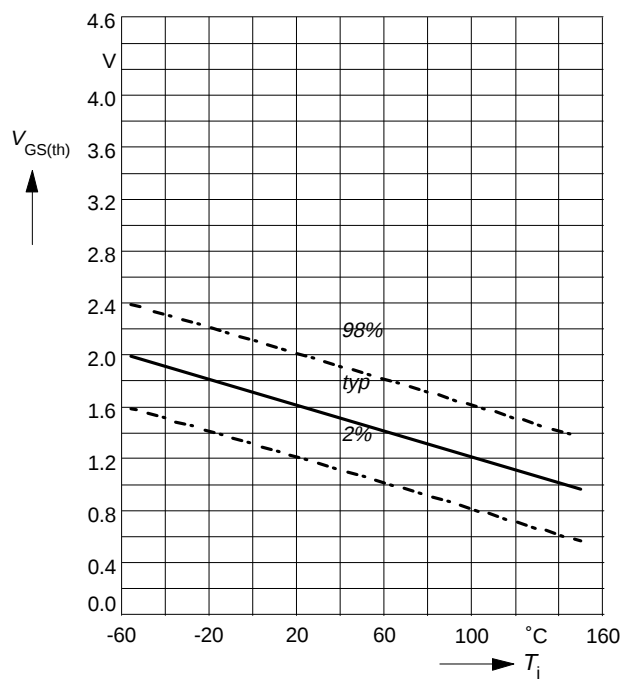
$$R_{DS(on)} = f(T_j)$$

parameter:  $I_D = 3.5\text{ A}$ ,  $V_{GS} = 5\text{ V}$


**Gate threshold voltage**

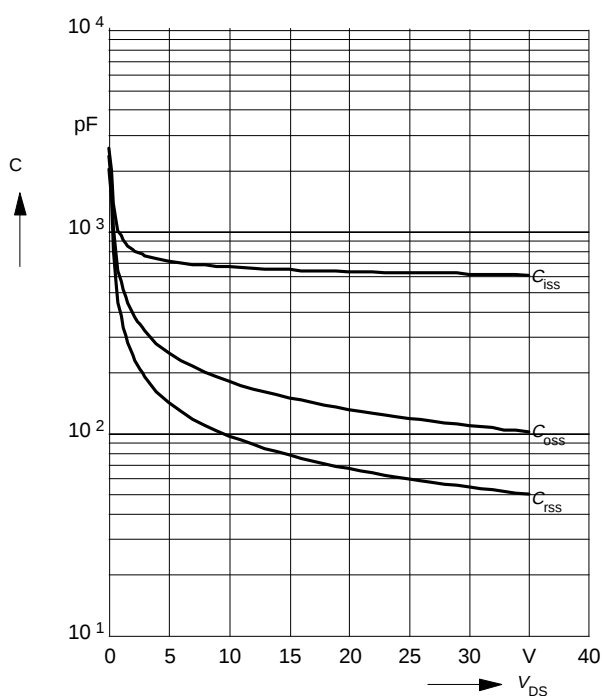
$$V_{GS(th)} = f(T_j)$$

parameter:  $V_{GS} = V_{DS}$ ,  $I_D = 1\text{ mA}$


**Typ. capacitances**

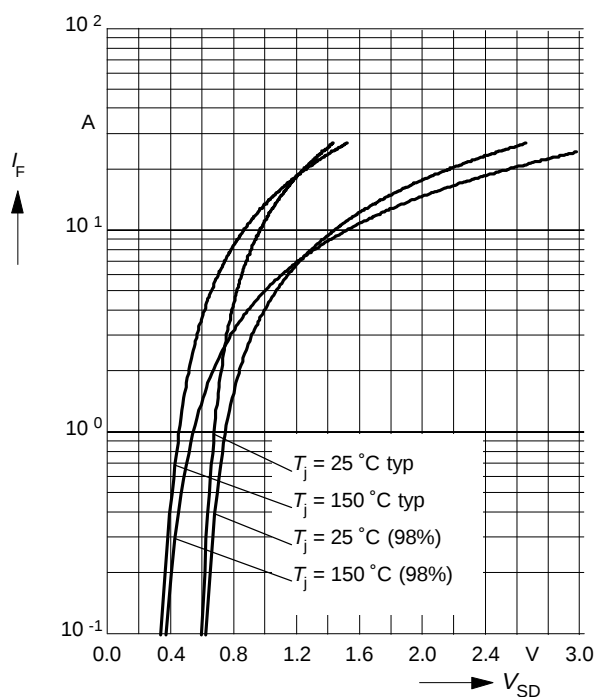
$$C = f(V_{DS})$$

parameter:  $V_{GS} = 0\text{ V}$ ,  $f = 1\text{ MHz}$

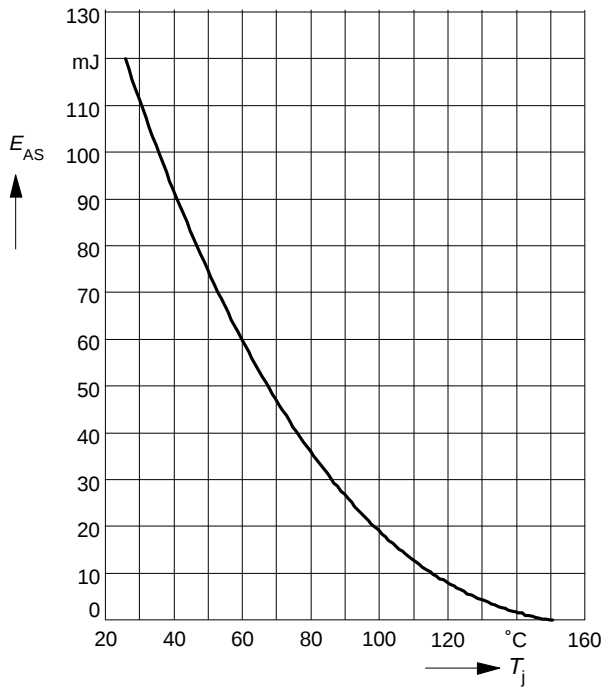

**Forward characteristics of reverse diode**

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

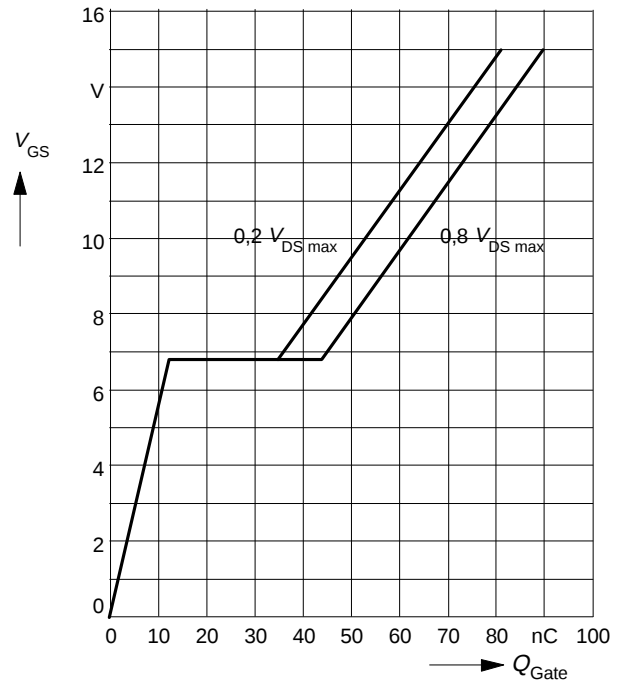
parameter:  $T_j$ ,  $t_p = 80\text{ }\mu\text{s}$



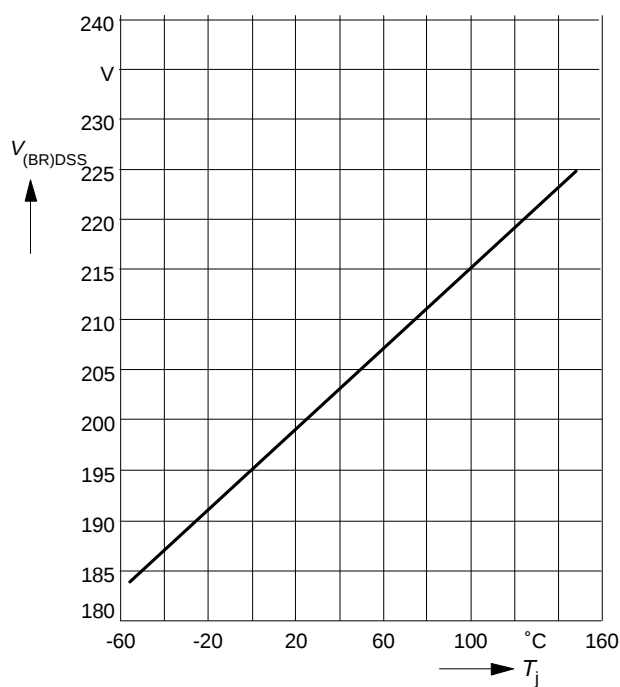
**Avalanche energy**  $E_{AS} = f(T_j)$   
 parameter:  $I_D = 7\text{ A}$ ,  $V_{DD} = 50\text{ V}$   
 $R_{GS} = 25\ \Omega$ ,  $L = 3.67\text{ mH}$

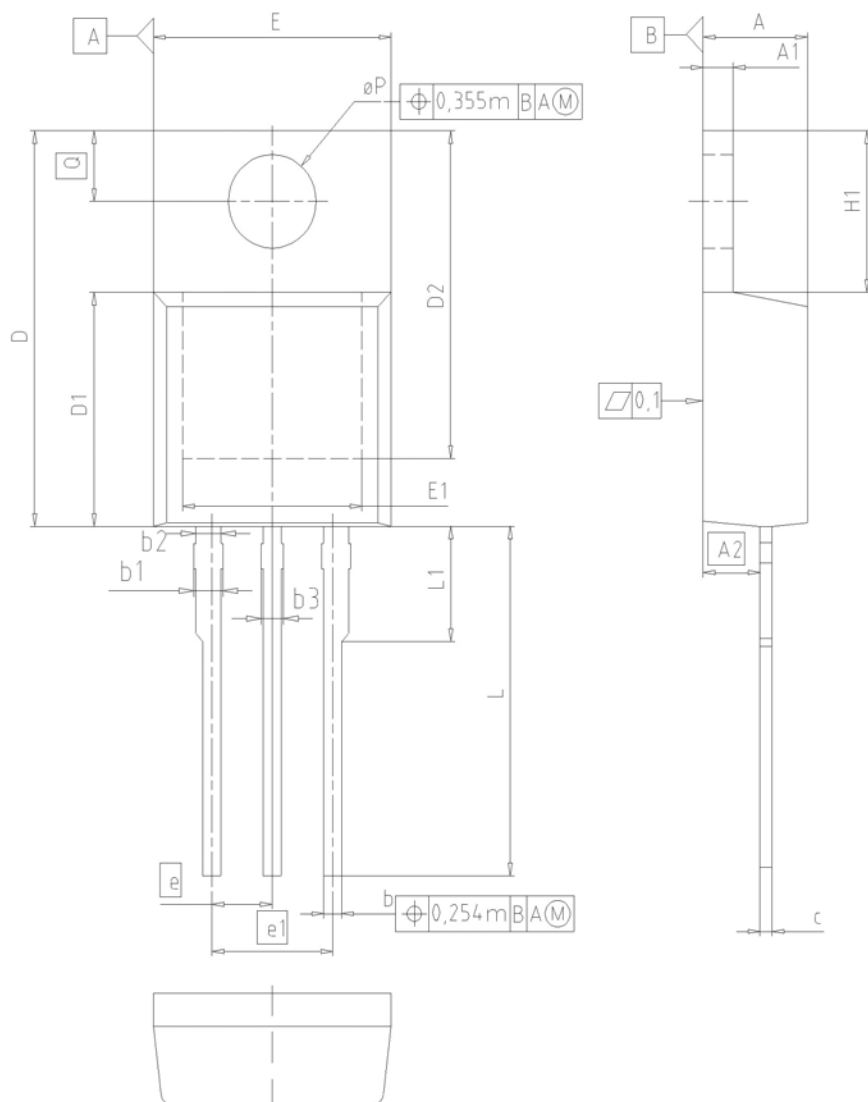


**Typ. gate charge**  
 $V_{GS} = f(Q_{Gate})$   
 parameter:  $I_{D\text{ puls}} = 63\text{ A}$



**Drain-source breakdown voltage**  
 $V_{(BR)DSS} = f(T_j)$





| DIM | MILLIMETERS |       | INCHES |       |
|-----|-------------|-------|--------|-------|
|     | MIN         | MAX   | MIN    | MAX   |
| A   | 4.30        | 4.57  | 0.169  | 0.180 |
| A1  | 1.17        | 1.40  | 0.046  | 0.055 |
| A2  | 2.15        | 2.72  | 0.085  | 0.107 |
| b   | 0.65        | 0.86  | 0.026  | 0.034 |
| b1  | 0.95        | 1.40  | 0.037  | 0.055 |
| b2  | 0.95        | 1.15  | 0.037  | 0.045 |
| b3  | 0.65        | 1.15  | 0.026  | 0.045 |
| c   | 0.33        | 0.60  | 0.013  | 0.024 |
| D   | 14.81       | 15.95 | 0.583  | 0.628 |
| D1  | 8.51        | 9.45  | 0.335  | 0.372 |
| D2  | 12.19       | 13.10 | 0.480  | 0.516 |
| E   | 9.70        | 10.36 | 0.382  | 0.408 |
| E1  | 6.50        | 8.60  | 0.256  | 0.339 |
| e   | 2.54        |       | 0.100  |       |
| e1  | 5.08        |       | 0.200  |       |
| N   | 3           |       | 3      |       |
| H1  | 5.90        | 6.90  | 0.232  | 0.272 |
| L   | 13.00       | 14.00 | 0.512  | 0.551 |
| L1  | -           | 4.80  | -      | 0.189 |
| øP  | 3.60        | 3.89  | 0.142  | 0.153 |
| Q   | 2.60        | 3.00  | 0.102  | 0.118 |

|                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------|
| <b>DOCUMENT NO.</b><br>Z8B00003318                                                                                  |
| <b>SCALE</b><br>0<br>2.5<br>5mm                                                                                     |
| <b>EUROPEAN PROJECTION</b><br> |
| <b>ISSUE DATE</b><br>23-08-2007                                                                                     |
| <b>REVISION</b><br>05                                                                                               |



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