

Final datasheet  
CoolSiC™ 1200 V SiC MOSFET G2 : Silicon Carbide MOSFET with .XT interconnection technology

Features

- $V_{DS} = 1200\text{ V}$  at  $T_{vj} = 25^{\circ}\text{C}$
- $I_{DC} = 39\text{ A}$  at  $T_C = 100^{\circ}\text{C}$
- $R_{DS(on)} = 34\text{ m}\Omega$  at  $V_{GS} = 18\text{ V}$ ,  $T_{vj} = 25^{\circ}\text{C}$
- Very low switching losses
- Overload operation up to  $T_{vj} = 200^{\circ}\text{C}$
- Short circuit withstand time  $2\text{ }\mu\text{s}$
- Benchmark gate threshold voltage,  $V_{GS(th)} = 4.2\text{ V}$
- Robust against parasitic turn on,  $0\text{ V}$  turn-off gate voltage can be applied
- Robust body diode for hard commutation
- .XT interconnection technology for best-in-class thermal performance
- Suitable Infineon gate drivers can be found under <https://www.infineon.com/gdfinder>

Potential applications

- General purpose drives (GPD)
- EV Charging
- Online UPS / Industrial UPS
- String inverter
- Energy Storage Systems (ESS)
- Welding

Product validation

- Qualified for industrial applications according to the relevant tests of JEDEC47/20/22

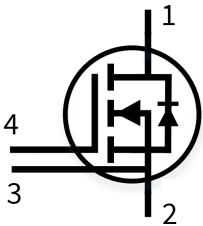
Description

- 1 – drain
- 2 – source
- 3 – Kelvin sense contact
- 4 – gate

Note: the source and sense pins are not exchangeable, their exchange might lead to malfunction



- Halogen-free
- Green
- Lead-free
- RoHS



| Type           | Package        | Marking  |
|----------------|----------------|----------|
| IMZC120R034M2H | PG-TO247-4-U07 | 12M2H034 |



Table of contents

|   |                                |    |
|---|--------------------------------|----|
|   | Description .....              | 1  |
|   | Features .....                 | 1  |
|   | Potential applications .....   | 1  |
|   | Product validation .....       | 1  |
|   | Table of contents .....        | 2  |
| 1 | Package .....                  | 3  |
| 2 | MOSFET .....                   | 3  |
| 3 | Body diode (MOSFET) .....      | 6  |
| 4 | Characteristics diagrams ..... | 8  |
| 5 | Package outlines .....         | 14 |
| 6 | Testing conditions .....       | 15 |
|   | Revision history .....         | 16 |
|   | Disclaimer .....               | 17 |

## 1 Package

**Table 1** Characteristic values

| Parameter                                           | Symbol        | Note or test condition                                                     | Values |      |      | Unit |
|-----------------------------------------------------|---------------|----------------------------------------------------------------------------|--------|------|------|------|
|                                                     |               |                                                                            | Min.   | Typ. | Max. |      |
| Storage temperature                                 | $T_{stg}$     |                                                                            | -55    |      | 150  | °C   |
| Soldering temperature                               | $T_{sold}$    | wave soldering only allowed at leads 1.6 mm (0.063 in.) from case for 10 s |        |      | 260  | °C   |
| Mounting torque                                     | $M$           | M3 screw, Maximum of mounting processes: 3                                 |        |      | 0.6  | Nm   |
| Thermal resistance, junction-ambient                | $R_{th(j-a)}$ |                                                                            |        |      | 62   | K/W  |
| MOSFET/body diode thermal resistance, junction-case | $R_{th(j-c)}$ |                                                                            |        | 0.47 | 0.61 | K/W  |

## 2 MOSFET

**Table 2** Maximum rated values

| Parameter                                                                    | Symbol    | Note or test condition                                                                                                   |                       | Values   | Unit          |
|------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------|-----------------------|----------|---------------|
| Drain-source voltage                                                         | $V_{DSS}$ | $T_{vj} \geq 25\text{ °C}$                                                                                               |                       | 1200     | V             |
| Continuous DC drain current for $R_{th(j-c,max)}$ , limited by $T_{vj(max)}$ | $I_{DDC}$ | $V_{GS} = 18\text{ V}$                                                                                                   | $T_c = 25\text{ °C}$  | 55       | A             |
|                                                                              |           |                                                                                                                          | $T_c = 100\text{ °C}$ | 39       |               |
| Peak drain current, $t_p$ limited by $T_{vj(max)}$ <sup>1)</sup>             | $I_{DM}$  | $V_{GS} = 18\text{ V}$                                                                                                   |                       | 117      | A             |
| Gate-source voltage, max. transient voltage                                  | $V_{GS}$  | $t_p \leq 0.5\text{ }\mu\text{s}$ , $D < 0.01$                                                                           |                       | -10...25 | V             |
| Gate-source voltage, max. static voltage <sup>2)</sup>                       | $V_{GS}$  |                                                                                                                          |                       | -7...23  | V             |
| Avalanche energy, single pulse                                               | $E_{AS}$  | $I_D = 20\text{ A}$ , $V_{DD} = 50\text{ V}$ , $L = 1.3\text{ mH}$ , $T_{vj(start)} = 25\text{ °C}$                      |                       | 257      | mJ            |
| Avalanche energy, repetitive                                                 | $E_{AR}$  | $I_D = 20\text{ A}$ , $V_{DD} = 50\text{ V}$ , $L = 6.4\text{ }\mu\text{H}$ , $T_{vj(start)} = 25\text{ °C}$             |                       | 1.28     | mJ            |
| Short-circuit withstand time                                                 | $t_{SC}$  | $V_{DD} \leq 800\text{ V}$ , $V_{DS,peak} < 1200\text{ V}$ , $V_{GS(on)} = 15\text{ V}$ , $T_{vj(start)} = 25\text{ °C}$ |                       | 2        | $\mu\text{s}$ |
| Power dissipation, limited by $T_{vj(max)}$                                  | $P_{tot}$ | $T_c = 25\text{ °C}$                                                                                                     |                       | 244      | W             |
|                                                                              |           | $T_c = 100\text{ °C}$                                                                                                    |                       | 122      |               |

1) Verified by design.

2) The maximum gate-source voltage in the application design should be in accordance to IPC-9592B.

**Table 3 Recommended values**

| Parameter                         | Symbol        | Note or test condition | Values  | Unit |
|-----------------------------------|---------------|------------------------|---------|------|
| Recommended turn-on gate voltage  | $V_{GS(on)}$  |                        | 15...18 | V    |
| Recommended turn-off gate voltage | $V_{GS(off)}$ |                        | -5...0  | V    |

**Table 4 Characteristic values**

| Parameter                                    | Symbol       | Note or test condition                                                                                                                  | Values |                                                          |      | Unit |
|----------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------|------|------|
|                                              |              |                                                                                                                                         | Min.   | Typ.                                                     | Max. |      |
| Drain-source on-state resistance             | $R_{DS(on)}$ | $I_D = 20\text{ A}$                                                                                                                     |        | $T_{vj} = 25\text{ °C}$ ,<br>$V_{GS(on)} = 18\text{ V}$  | 34   | mΩ   |
|                                              |              |                                                                                                                                         |        | $T_{vj} = 150\text{ °C}$ ,<br>$V_{GS(on)} = 18\text{ V}$ | 69   |      |
|                                              |              |                                                                                                                                         |        | $T_{vj} = 175\text{ °C}$ ,<br>$V_{GS(on)} = 18\text{ V}$ | 80   |      |
|                                              |              |                                                                                                                                         |        | $T_{vj} = 25\text{ °C}$ ,<br>$V_{GS(on)} = 15\text{ V}$  | 42   |      |
| Gate-source threshold voltage                | $V_{GS(th)}$ | $I_D = 6.4\text{ mA}$ , $V_{DS} = V_{GS}$<br>(tested after 1 ms pulse at $V_{GS} = 20\text{ V}$ )                                       |        | $T_{vj} = 25\text{ °C}$                                  | 3.5  | V    |
|                                              |              |                                                                                                                                         |        | $T_{vj} = 175\text{ °C}$                                 | 4.2  |      |
| Zero gate-voltage drain current              | $I_{DSS}$    | $V_{DS} = 1200\text{ V}$ , $V_{GS} = 0\text{ V}$                                                                                        |        | $T_{vj} = 25\text{ °C}$                                  | 180  | μA   |
|                                              |              |                                                                                                                                         |        | $T_{vj} = 175\text{ °C}$                                 | 3    |      |
| Gate leakage current                         | $I_{GSS}$    | $V_{DS} = 0\text{ V}$                                                                                                                   |        | $V_{GS} = 23\text{ V}$                                   | 120  | nA   |
|                                              |              |                                                                                                                                         |        | $V_{GS} = -10\text{ V}$                                  | -120 |      |
| Forward transconductance                     | $g_{fs}$     | $I_D = 20\text{ A}$ , $V_{DS} = 20\text{ V}$                                                                                            |        | 14                                                       |      | S    |
| Internal gate resistance                     | $R_{G,int}$  | $f = 1\text{ MHz}$ , $V_{AC} = 25\text{ mV}$                                                                                            |        | 6.1                                                      |      | Ω    |
| Input capacitance                            | $C_{iss}$    | $V_{DS} = 800\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 100\text{ kHz}$ , $V_{AC} = 25\text{ mV}$                                        |        | 1510                                                     |      | pF   |
| Output capacitance                           | $C_{oss}$    | $V_{DS} = 800\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 100\text{ kHz}$ , $V_{AC} = 25\text{ mV}$                                        |        | 64                                                       |      | pF   |
| Reverse transfer capacitance                 | $C_{rss}$    | $V_{DS} = 800\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 100\text{ kHz}$ , $V_{AC} = 25\text{ mV}$                                        |        | 6                                                        |      | pF   |
| $C_{oss}$ stored energy                      | $E_{oss}$    | $V_{DS} = 0...800\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 100\text{ kHz}$ ,<br>$V_{AC} = 25\text{ mV}$ , Calculated based on $C_{oss}$ |        | 27                                                       |      | μJ   |
| Output charge                                | $Q_{oss}$    | $V_{DS} = 0...800\text{ V}$ , $V_{GS} = 0\text{ V}$ ,<br>Calculated based on $C_{oss}$                                                  |        | 99                                                       |      | nC   |
| Effective output capacitance, energy related | $C_{o(er)}$  | $V_{DS} = 0...800\text{ V}$ , $V_{GS} = 0\text{ V}$                                                                                     |        | 84                                                       |      | pF   |
| Effective output capacitance, time related   | $C_{o(tr)}$  | $I_D = \text{constant}$ , $V_{DS} = 0...800\text{ V}$ , $V_{GS} = 0\text{ V}$                                                           |        | 124                                                      |      | pF   |

(table continues...)

**Table 4** (continued) **Characteristic values**

| Parameter            | Symbol       | Note or test condition                                                                                                                                                                                                      | Values                                |      |      | Unit          |
|----------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------|------|---------------|
|                      |              |                                                                                                                                                                                                                             | Min.                                  | Typ. | Max. |               |
| Total gate charge    | $Q_G$        | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ , $V_{GS} = 0/18 \text{ V}$ , turn-on pulse                                                                                                                                 |                                       | 45   |      | nC            |
| Plateau gate charge  | $Q_{GS(pl)}$ | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ , $V_{GS} = 0/18 \text{ V}$ , turn-on pulse                                                                                                                                 |                                       | 10   |      | nC            |
| Gate-to-drain charge | $Q_{GD}$     | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ , $V_{GS} = 0/18 \text{ V}$ , turn-on pulse                                                                                                                                 |                                       | 12   |      | nC            |
| Turn-on delay time   | $t_{d(on)}$  | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ ,<br>$V_{GS} = 0/18 \text{ V}$ ,<br>$R_{GS(on)} = 2.3 \Omega$ ,<br>$R_{GS(off)} = 2.3 \Omega$ ,<br>$L_\sigma = 12 \text{ nH}$ , diode: body diode at $V_{GS} = 0 \text{ V}$ | $T_{vj} = 25 \text{ }^\circ\text{C}$  | 8    |      | ns            |
|                      |              |                                                                                                                                                                                                                             | $T_{vj} = 175 \text{ }^\circ\text{C}$ | 6.1  |      |               |
| Rise time            | $t_r$        | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ ,<br>$V_{GS} = 0/18 \text{ V}$ ,<br>$R_{GS(on)} = 2.3 \Omega$ ,<br>$R_{GS(off)} = 2.3 \Omega$ ,<br>$L_\sigma = 12 \text{ nH}$ , diode: body diode at $V_{GS} = 0 \text{ V}$ | $T_{vj} = 25 \text{ }^\circ\text{C}$  | 4.8  |      | ns            |
|                      |              |                                                                                                                                                                                                                             | $T_{vj} = 175 \text{ }^\circ\text{C}$ | 4.3  |      |               |
| Turn-off delay time  | $t_{d(off)}$ | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ ,<br>$V_{GS} = 0/18 \text{ V}$ ,<br>$R_{GS(on)} = 2.3 \Omega$ ,<br>$R_{GS(off)} = 2.3 \Omega$ ,<br>$L_\sigma = 12 \text{ nH}$ , diode: body diode at $V_{GS} = 0 \text{ V}$ | $T_{vj} = 25 \text{ }^\circ\text{C}$  | 17.2 |      | ns            |
|                      |              |                                                                                                                                                                                                                             | $T_{vj} = 175 \text{ }^\circ\text{C}$ | 20.1 |      |               |
| Fall time            | $t_f$        | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ ,<br>$V_{GS} = 0/18 \text{ V}$ ,<br>$R_{GS(on)} = 2.3 \Omega$ ,<br>$R_{GS(off)} = 2.3 \Omega$ ,<br>$L_\sigma = 12 \text{ nH}$ , diode: body diode at $V_{GS} = 0 \text{ V}$ | $T_{vj} = 25 \text{ }^\circ\text{C}$  | 7.3  |      | ns            |
|                      |              |                                                                                                                                                                                                                             | $T_{vj} = 175 \text{ }^\circ\text{C}$ | 8.5  |      |               |
| Turn-on energy       | $E_{on}$     | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ ,<br>$V_{GS} = 0/18 \text{ V}$ ,<br>$R_{GS(on)} = 2.3 \Omega$ ,<br>$R_{GS(off)} = 2.3 \Omega$ ,<br>$L_\sigma = 12 \text{ nH}$ , diode: body diode at $V_{GS} = 0 \text{ V}$ | $T_{vj} = 25 \text{ }^\circ\text{C}$  | 140  |      | $\mu\text{J}$ |
|                      |              |                                                                                                                                                                                                                             | $T_{vj} = 175 \text{ }^\circ\text{C}$ | 256  |      |               |
| Turn-off energy      | $E_{off}$    | $V_{DD} = 800 \text{ V}$ , $I_D = 20 \text{ A}$ ,<br>$V_{GS} = 0/18 \text{ V}$ ,<br>$R_{GS(on)} = 2.3 \Omega$ ,<br>$R_{GS(off)} = 2.3 \Omega$ ,<br>$L_\sigma = 12 \text{ nH}$ , diode: body diode at $V_{GS} = 0 \text{ V}$ | $T_{vj} = 25 \text{ }^\circ\text{C}$  | 54   |      | $\mu\text{J}$ |
|                      |              |                                                                                                                                                                                                                             | $T_{vj} = 175 \text{ }^\circ\text{C}$ | 82   |      |               |

(table continues...)

**Table 4** (continued) Characteristic values

| Parameter                            | Symbol                | Note or test condition                                                                                                                                                                                                                                                    | Values                                         |      |      | Unit               |
|--------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------|------|--------------------|
|                                      |                       |                                                                                                                                                                                                                                                                           | Min.                                           | Typ. | Max. |                    |
| Total switching energy <sup>1)</sup> | $E_{\text{tot}}$      | $V_{\text{DD}} = 800 \text{ V}$ , $I_{\text{D}} = 20 \text{ A}$ ,<br>$V_{\text{GS}} = 0/18 \text{ V}$ ,<br>$R_{\text{GS(on)}} = 2.3 \Omega$ ,<br>$R_{\text{GS(off)}} = 2.3 \Omega$ ,<br>$L_{\sigma} = 12 \text{ nH}$ , diode: body diode at $V_{\text{GS}} = 0 \text{ V}$ | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  | 280  |      | $\mu\text{J}$      |
|                                      |                       |                                                                                                                                                                                                                                                                           | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ | 583  |      |                    |
| Virtual junction temperature         | $T_{\text{vj}}$       |                                                                                                                                                                                                                                                                           | -55                                            |      | 175  | $^{\circ}\text{C}$ |
| Virtual junction temperature         | $T_{\text{vj(over)}}$ | overload, cumulative max. 100 h <sup>2)</sup>                                                                                                                                                                                                                             |                                                |      | 200  | $^{\circ}\text{C}$ |

1) including  $E_{\text{fr}}$

2) up to 5000 cycles. Maximum  $\Delta T$  limited to 100 K.

**Note:** The chip technology was characterized up to 200 kV/ $\mu\text{s}$ . The measured  $dV/dt$  was limited by measurement test setup and package.

Characteristics at  $T_{\text{vj}} = 25^{\circ}\text{C}$ , unless otherwise specified.

### 3 Body diode (MOSFET)

**Table 5** Maximum rated values

| Parameter                                                                  | Symbol           | Note or test condition                           | Values | Unit |
|----------------------------------------------------------------------------|------------------|--------------------------------------------------|--------|------|
| Drain-source voltage                                                       | $V_{\text{DSS}}$ | $T_{\text{vj}} \geq 25 \text{ }^{\circ}\text{C}$ | 1200   | V    |
| Peak reverse drain current, $t_{\text{p}}$ limited by $T_{\text{vj(max)}}$ | $I_{\text{SM}}$  | $V_{\text{GS}} = 0 \text{ V}$                    | 117    | A    |

**Table 6** Characteristic values

| Parameter                            | Symbol           | Note or test condition                                                                                                                                                                   | Values                                         |      |      | Unit          |
|--------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------|------|---------------|
|                                      |                  |                                                                                                                                                                                          | Min.                                           | Typ. | Max. |               |
| Drain-source reverse voltage         | $V_{\text{SD}}$  | $I_{\text{SD}} = 20 \text{ A}$ , $V_{\text{GS}} = 0 \text{ V}$                                                                                                                           | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  | 4.2  | 5.5  | V             |
|                                      |                  |                                                                                                                                                                                          | $T_{\text{vj}} = 100 \text{ }^{\circ}\text{C}$ | 4.11 |      |               |
|                                      |                  |                                                                                                                                                                                          | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ | 4.05 |      |               |
| MOSFET forward recovery charge       | $Q_{\text{fr}}$  | $V_{\text{DD}} = 800 \text{ V}$ , $I_{\text{SD}} = 20 \text{ A}$ ,<br>$V_{\text{GS}} = 0 \text{ V}$ , $R_{\text{GS(on)}} = 2.3 \Omega$ ,<br>$Q_{\text{fr}}$ includes also $Q_{\text{C}}$ | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  | 0.18 |      | $\mu\text{C}$ |
|                                      |                  |                                                                                                                                                                                          | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ | 0.45 |      |               |
| MOSFET peak forward recovery current | $I_{\text{frm}}$ | $V_{\text{DD}} = 800 \text{ V}$ , $I_{\text{SD}} = 20 \text{ A}$ ,<br>$V_{\text{GS}} = 0 \text{ V}$ , $R_{\text{GS(on)}} = 2.3 \Omega$ ,<br>$Q_{\text{fr}}$ includes also $Q_{\text{C}}$ | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  | 28.8 |      | A             |
|                                      |                  |                                                                                                                                                                                          | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ | 48.1 |      |               |

(table continues...)

**Table 6** (continued) Characteristic values

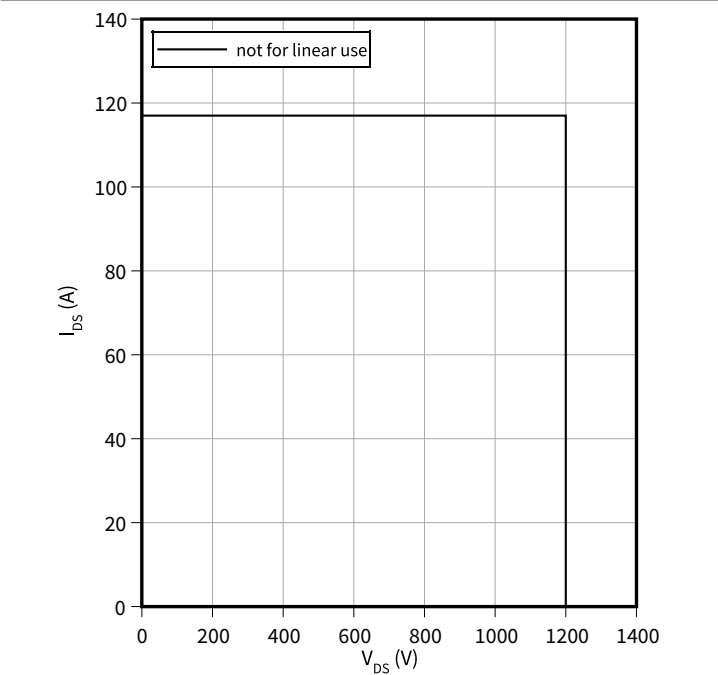
| Parameter                      | Symbol         | Note or test condition                                                                                                                       |                           | Values |      |      | Unit               |
|--------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------|------|------|--------------------|
|                                |                |                                                                                                                                              |                           | Min.   | Typ. | Max. |                    |
| MOSFET forward recovery energy | $E_{fr}$       | $V_{DD} = 800 \text{ V}$ , $I_{SD} = 20 \text{ A}$ ,<br>$V_{GS} = 0 \text{ V}$ , $R_{GS(on)} = 2.3 \Omega$ ,<br>$Q_{fr}$ includes also $Q_C$ | $T_{vj} = 25 \text{ °C}$  |        | 86   |      | $\mu\text{J}$      |
|                                |                |                                                                                                                                              | $T_{vj} = 175 \text{ °C}$ |        | 245  |      |                    |
| Virtual junction temperature   | $T_{vj}$       |                                                                                                                                              |                           | -55    |      | 175  | $^{\circ}\text{C}$ |
| Virtual junction temperature   | $T_{vj(over)}$ | overload, cumulative max. 100 h <sup>1)</sup>                                                                                                |                           |        |      | 200  | $^{\circ}\text{C}$ |

1) up to 5000 cycles. Maximum  $\Delta T$  limited to 100 K.

4 Characteristics diagrams

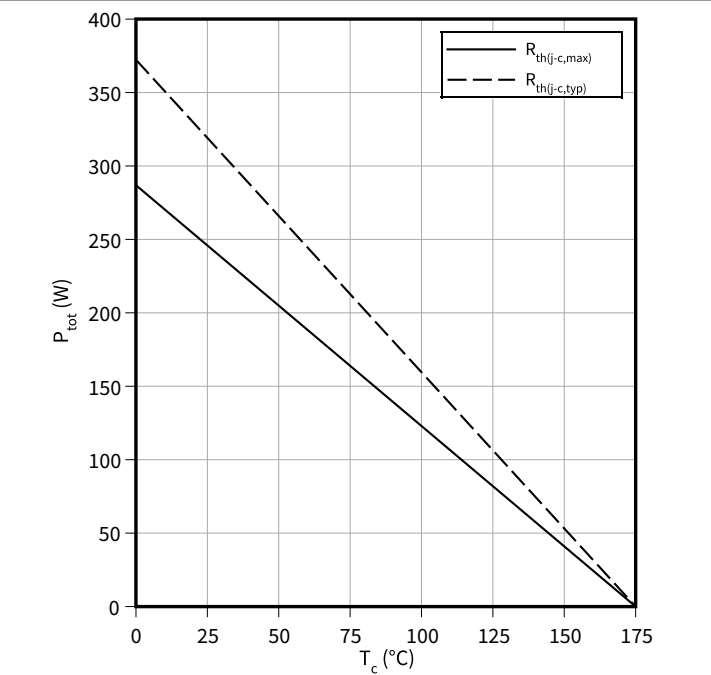
Reverse bias safe operating area (RBSOA)

$I_{DS} = f(V_{DS})$   
 $T_{vj} \leq 200\text{ }^{\circ}\text{C}$ ,  $V_{GS} = 0/18\text{ V}$ ,  $T_c = 25\text{ }^{\circ}\text{C}$



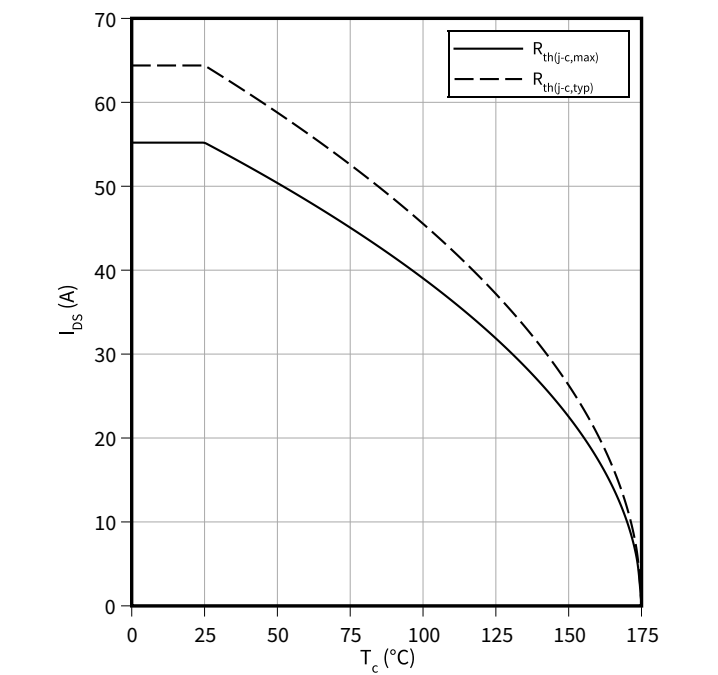
Power dissipation as a function of case temperature

$P_{tot} = f(T_c)$



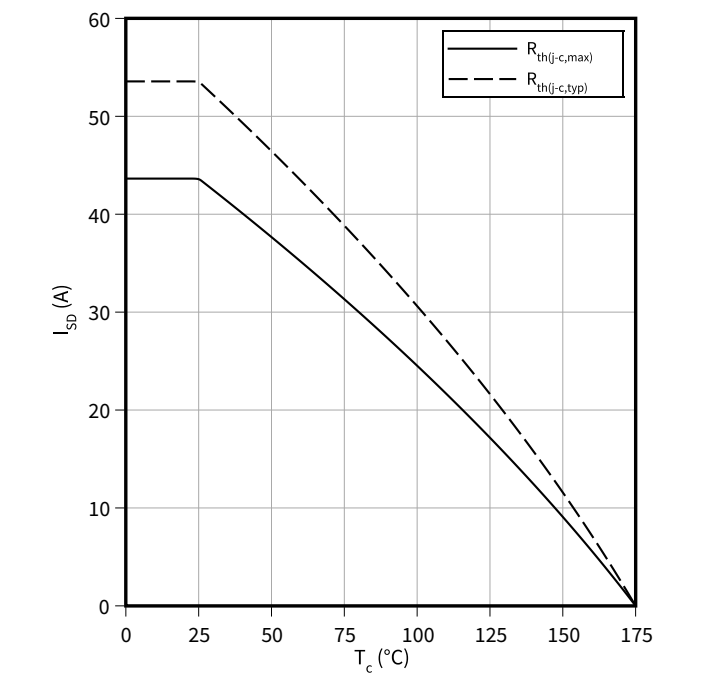
Maximum DC drain to source current as a function of case temperature limited by bond wire

$I_{DS} = f(T_c)$



Maximum source to drain current as a function of case temperature limited by bond wire

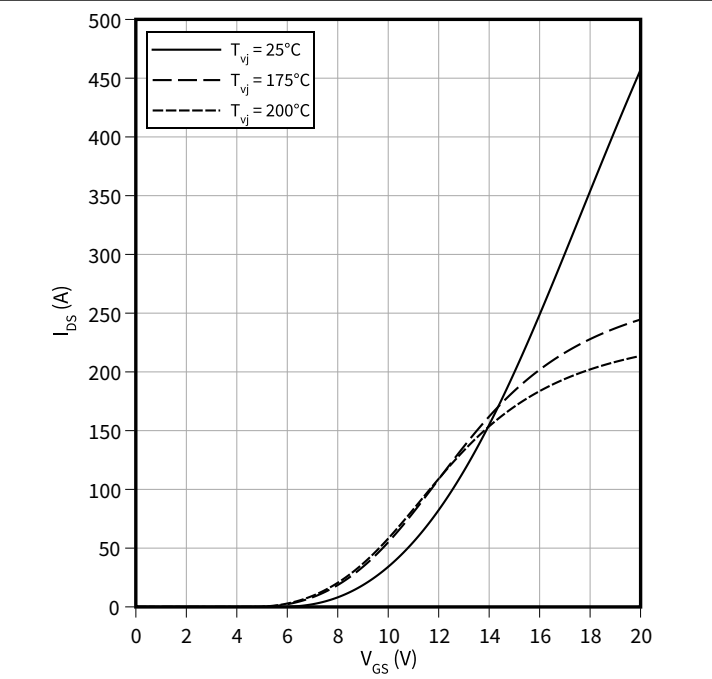
$I_{SD} = f(T_c)$   
 $V_{GS} = 0\text{ V}$



4 Characteristics diagrams

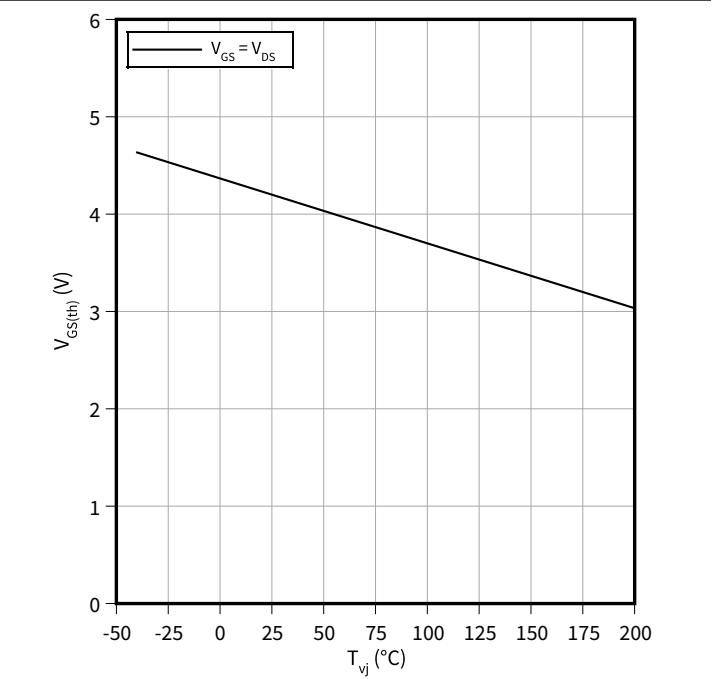
Typical transfer characteristic

$I_{DS} = f(V_{GS})$   
 $V_{DS} = 20\text{ V}$ ,  $t_p = 20\text{ }\mu\text{s}$



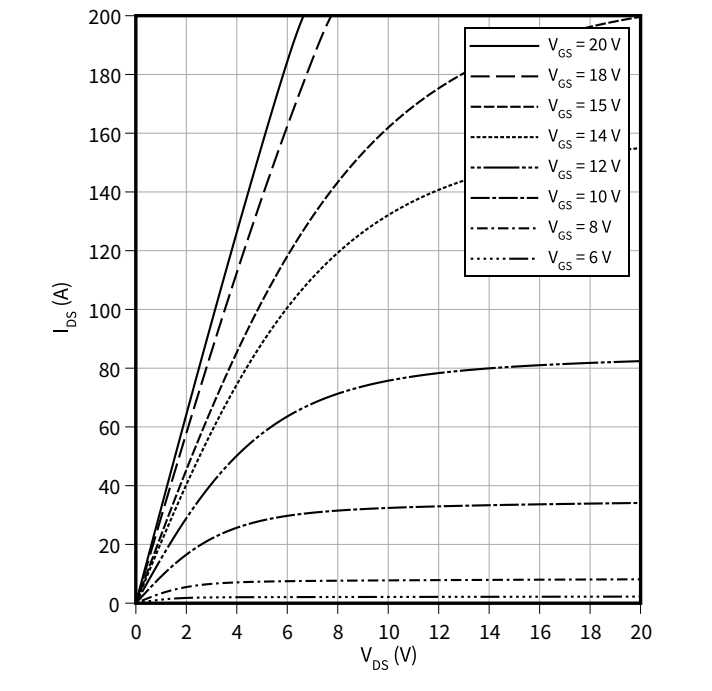
Typical gate-source threshold voltage as a function of junction temperature

$V_{GS(th)} = f(T_{vj})$   
 $I_D = 6.4\text{ mA}$



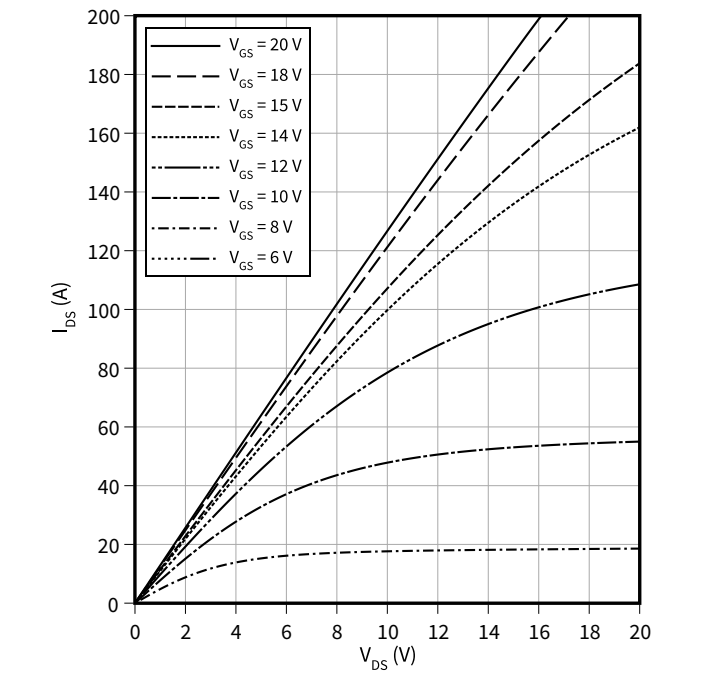
Typical output characteristic,  $V_{GS}$  as a parameter

$I_{DS} = f(V_{DS})$   
 $T_{vj} = 25\text{ }^\circ\text{C}$ ,  $t_p = 20\text{ }\mu\text{s}$



Typical output characteristic,  $V_{GS}$  as a parameter

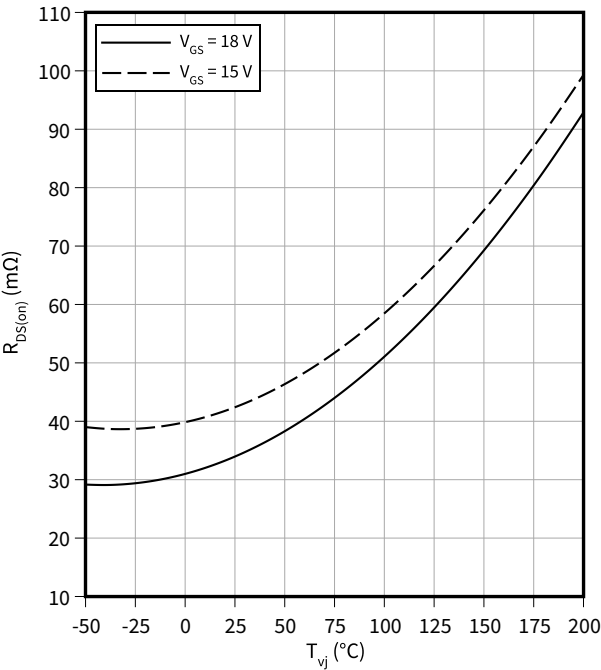
$I_{DS} = f(V_{DS})$   
 $T_{vj} = 175\text{ }^\circ\text{C}$ ,  $t_p = 20\text{ }\mu\text{s}$



4 Characteristics diagrams

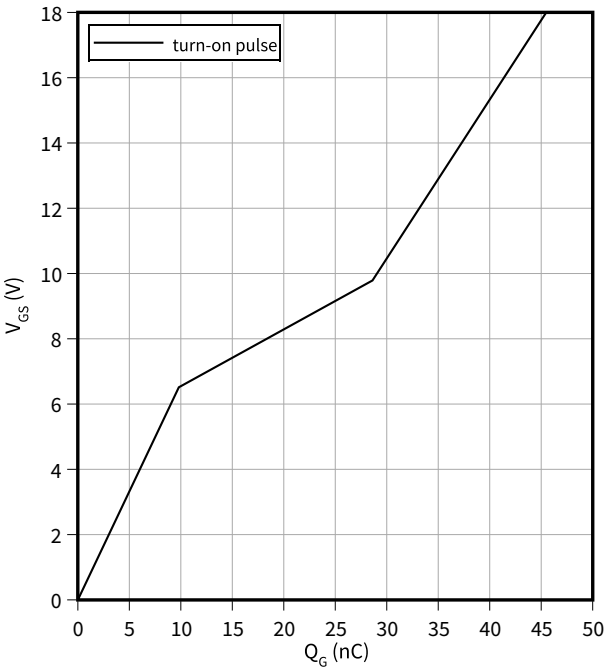
Typical on-state resistance as a function of junction temperature

$R_{DS(on)} = f(T_{vj})$   
 $I_D = 20\text{ A}$



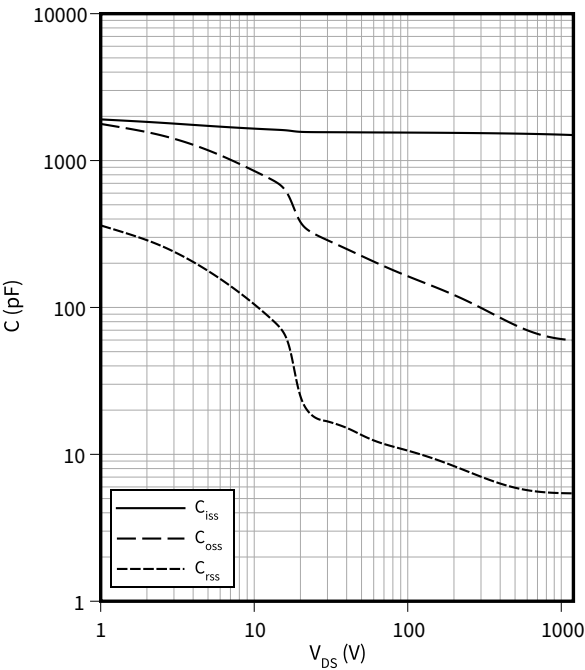
Typical gate charge

$V_{GS} = f(Q_G)$   
 $I_D = 20\text{ A}, V_{DS} = 800\text{ V}$



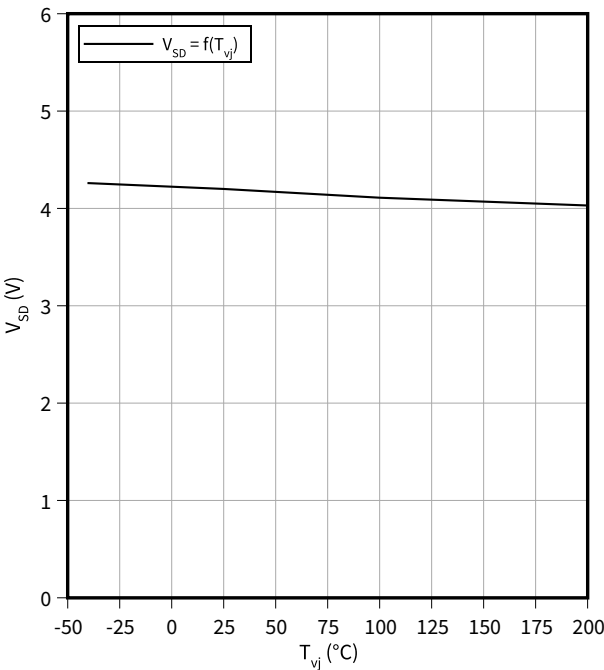
Typical capacitance as a function of drain-source voltage

$C = f(V_{DS})$   
 $f = 100\text{ kHz}, V_{GS} = 0\text{ V}$



Typical reverse drain voltage as a function of junction temperature

$V_{SD} = f(T_{vj})$   
 $I_{SD} = 20\text{ A}, V_{GS} = 0\text{ V}$

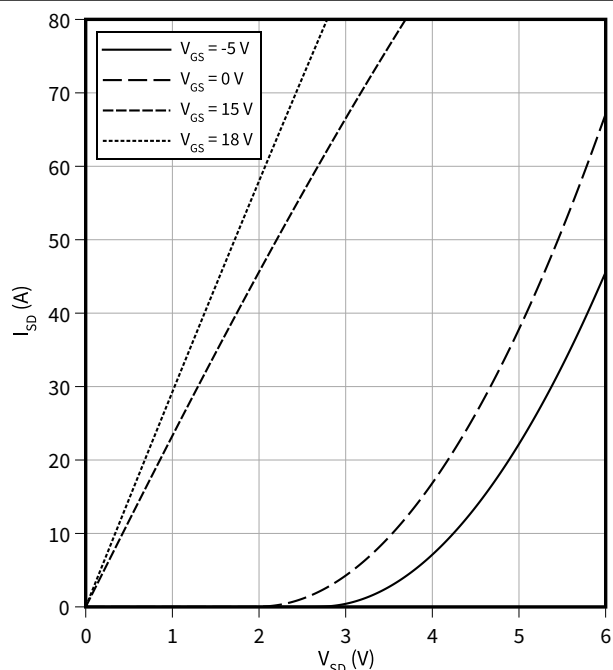


4 Characteristics diagrams

**Typical reverse drain current as a function of reverse drain voltage,  $V_{GS}$  as a parameter**

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

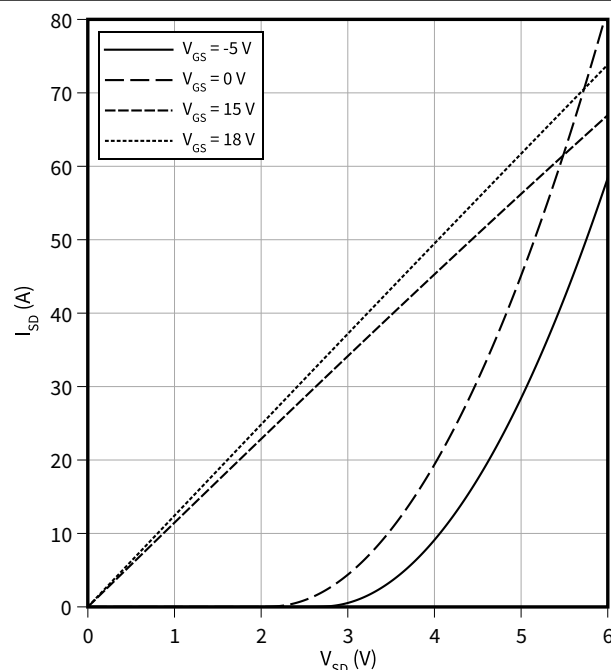
$T_{vj} = 25\text{ °C}$ ,  $t_p = 20\text{ }\mu\text{s}$



**Typical reverse drain current as a function of reverse drain voltage,  $V_{GS}$  as a parameter**

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

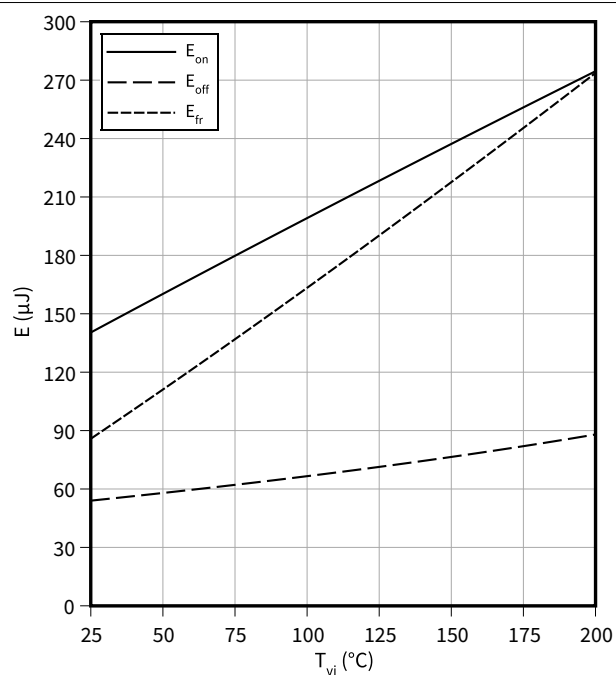
$T_{vj} = 175\text{ °C}$ ,  $t_p = 20\text{ }\mu\text{s}$



**Typical switching energy as a function of junction temperature, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0\text{ V}$**

$$E = f(T_{vj})$$

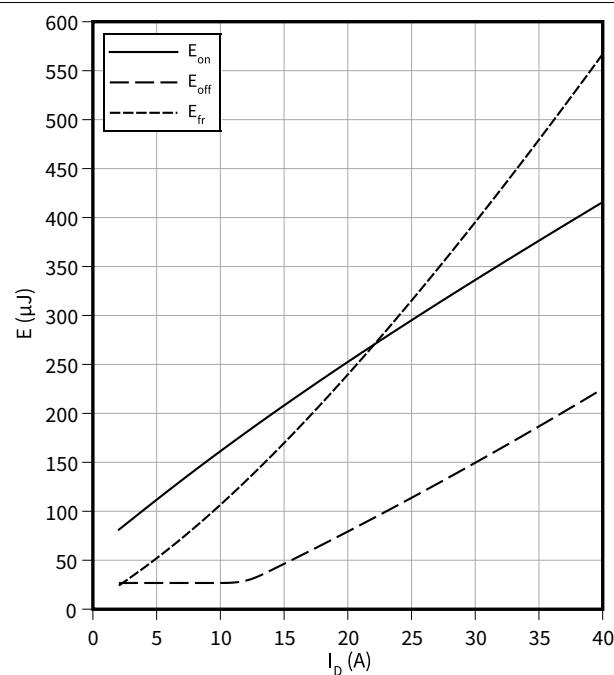
$V_{GS} = 0/18\text{ V}$ ,  $I_D = 20\text{ A}$ ,  $R_{G,ext} = 2.3\text{ }\Omega$ ,  $V_{DD} = 800\text{ V}$



**Typical switching energy as a function of drain current, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0\text{ V}$**

$$E = f(I_D)$$

$V_{GS} = 0/18\text{ V}$ ,  $T_{vj} = 175\text{ °C}$ ,  $R_{G,ext} = 2.3\text{ }\Omega$ ,  $V_{DD} = 800\text{ V}$

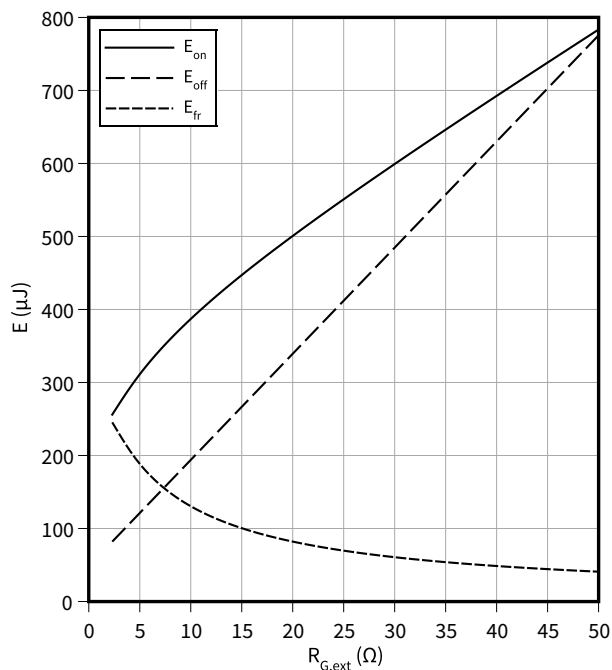


4 Characteristics diagrams

**Typical switching energy as a function of gate resistance, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

$$E = f(R_{G,ext})$$

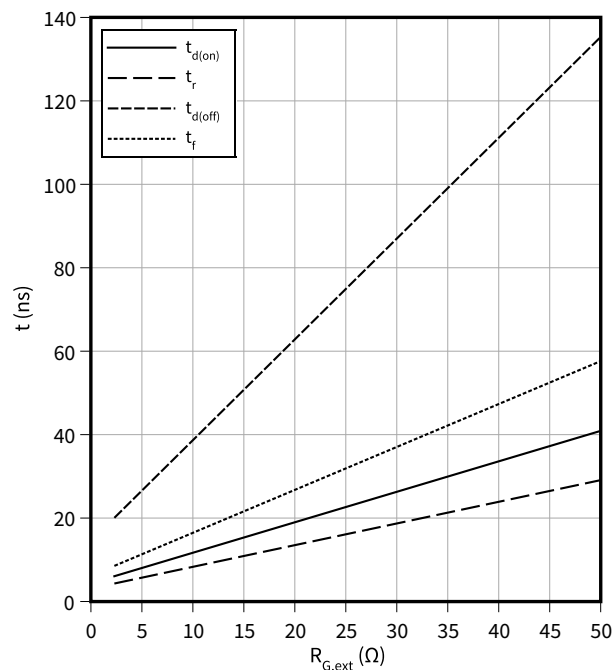
$V_{GS} = 0/18$  V,  $I_D = 20$  A,  $T_{vj} = 175$  °C,  $V_{DD} = 800$  V



**Typical switching times as a function of gate resistance, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

$$t = f(R_{G,ext})$$

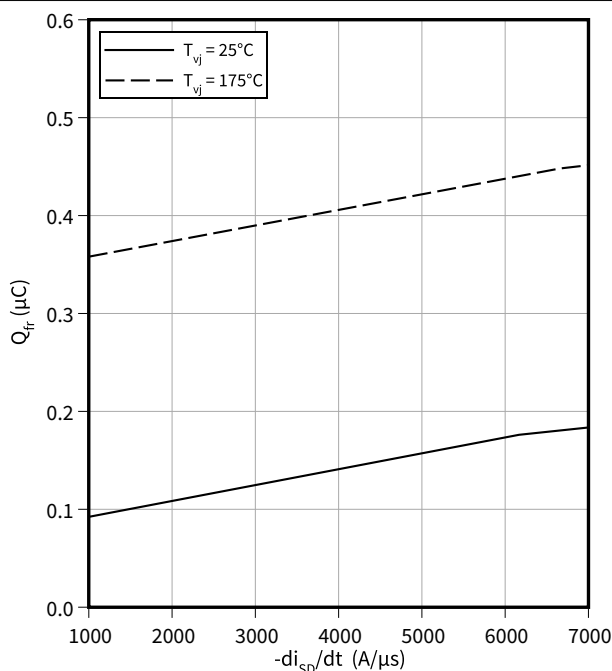
$V_{GS} = 0/18$  V,  $I_D = 20$  A,  $T_{vj} = 175$  °C,  $V_{DD} = 800$  V



**Typical reverse recovery charge as a function of reverse drain current slope, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

$$Q_{fr} = f(-di_{SD}/dt)$$

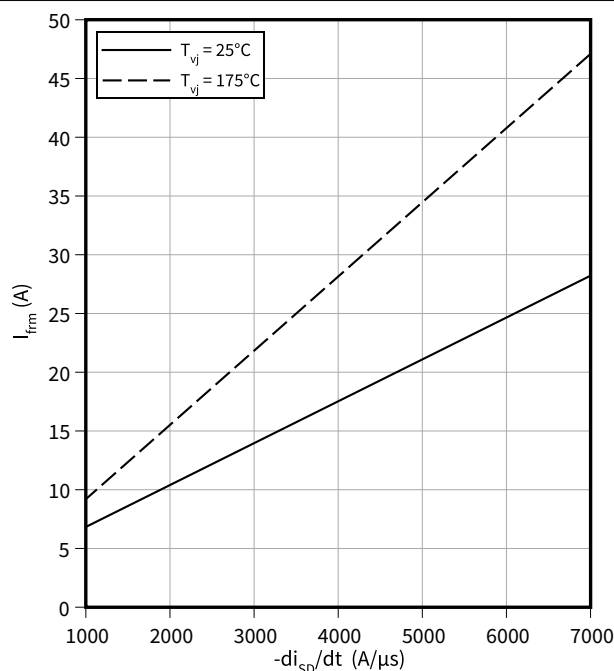
$V_{GS} = 0/18$  V,  $I_{SD} = 20$  A,  $V_{DD} = 800$  V



**Typical reverse recovery current as a function of reverse drain current slope, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

$$I_{frm} = f(-di_{SD}/dt)$$

$I_{SD} = 20$  A,  $V_{DD} = 800$  V,  $V_{GS} = 0/18$  V



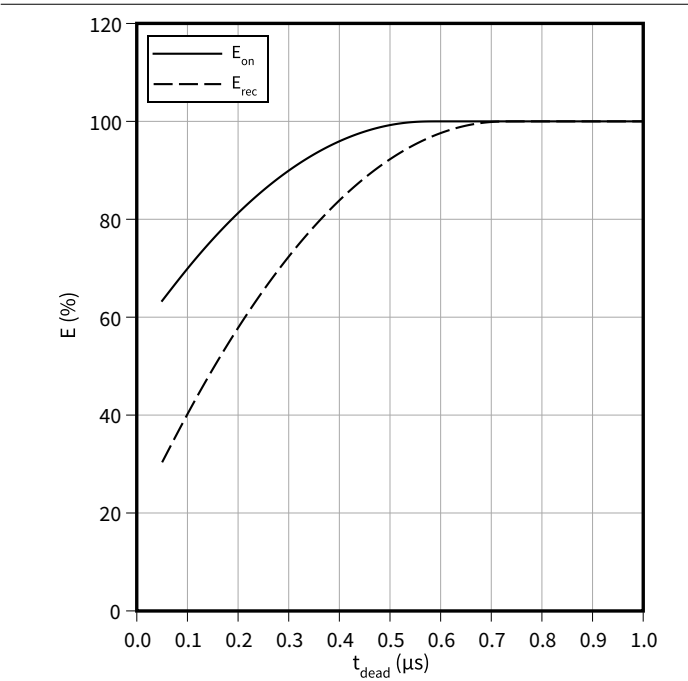
4 Characteristics diagrams

Typical switching energy as a function of dead time / blanking time, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0\text{ V}$

$E = f(t_{dead})$

$I_D = 20\text{ A}$ ,  $V_{GS} = 0/18\text{ V}$ ,  $T_{vj} = 175\text{ °C}$ ,  $R_{G,ext} = 2.3\text{ }\Omega$

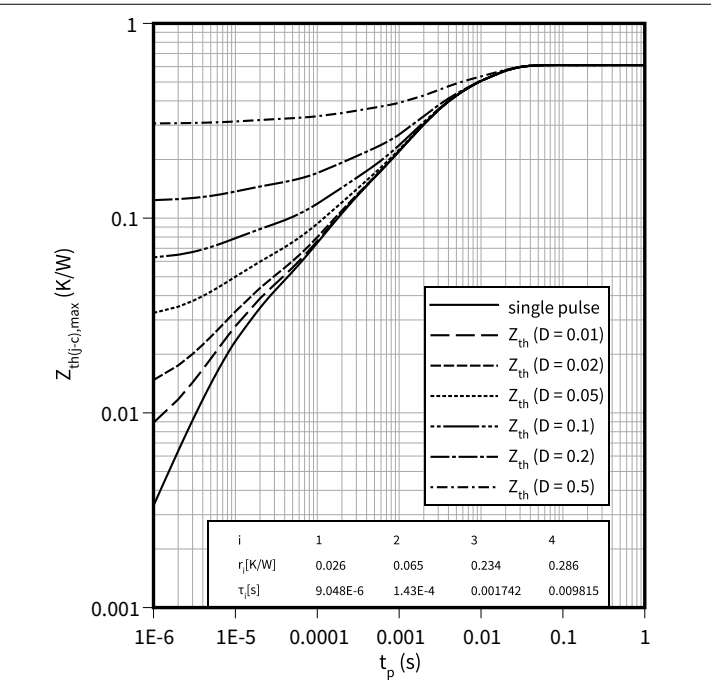
$V_{DD} = 800\text{ V}$



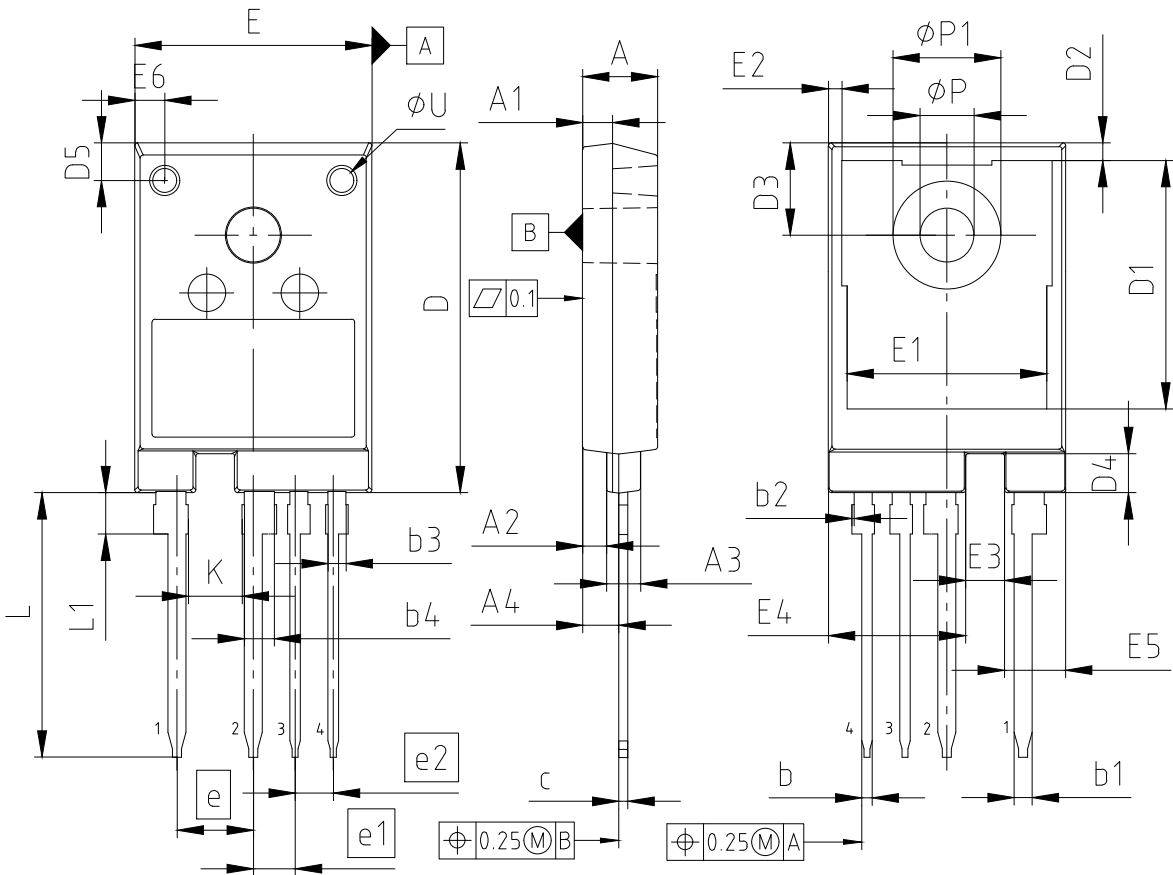
Max. transient thermal impedance (MOSFET/diode)

$Z_{th(j-c),max} = f(t_p)$

$D = t_p/T$



5 Package outlines



| PACKAGE - GROUP NUMBER: PG-T0247-4-U07 |             |       |            |             |       |
|----------------------------------------|-------------|-------|------------|-------------|-------|
| DIMENSIONS                             | MILLIMETERS |       | DIMENSIONS | MILLIMETERS |       |
|                                        | MIN.        | MAX.  |            | MIN.        | MAX.  |
| A                                      | 4.90        | 5.10  | E          | 15.60       | 16.00 |
| A1                                     | 1.90        | 2.10  | E1         | 13.10       | 13.50 |
| A2                                     | 1.50        | 1.70  | E2         | 0.60        | 1.20  |
| A3                                     | 2.16        | 2.36  | E3         | 2.48        | 2.68  |
| A4                                     | 2.31        | 2.51  | E4         | 9.05        | 9.25  |
| b                                      | 0.60        | 0.80  | E5         | 3.97        | 4.17  |
| b1                                     | 1.10        | 1.30  | E6         | 1.80        | 2.20  |
| b2                                     | ---         | 0.15  | e          | 5.08        |       |
| b3                                     | 1.10        | 1.30  | e1         | 2.79        |       |
| b4                                     | 1.90        | 2.10  | e2         | 2.54        |       |
| c                                      | 0.50        | 0.70  | K          | 3.50        | ---   |
| D                                      | 23.10       | 23.50 | L          | 17.50       | 17.80 |
| D1                                     | 16.25       | 16.85 | L1         | 2.61        | 2.91  |
| D2                                     | 0.97        | 1.37  | N          | 4           |       |
| D3                                     | 6.00        | 6.30  | ØP1        | 7.00        | 7.40  |
| D4                                     | 2.50        | 2.70  | ØP         | 3.50        | 3.70  |
| D5                                     | 2.30        | 2.70  | ØU         | 1.40        | 1.80  |

NOTES: DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURRS  
N IS THE NUMBER OF LEADS

Figure 1

## 6 Testing conditions

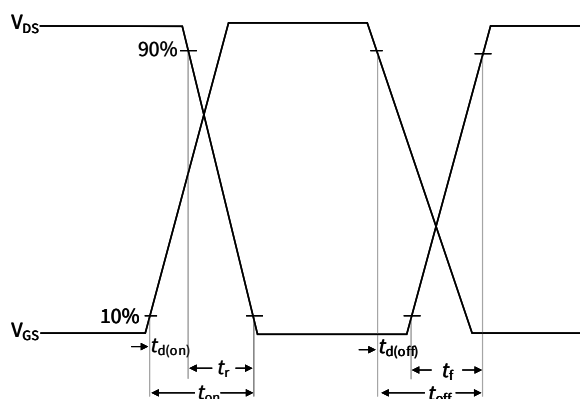


Figure A. Definition of switching times

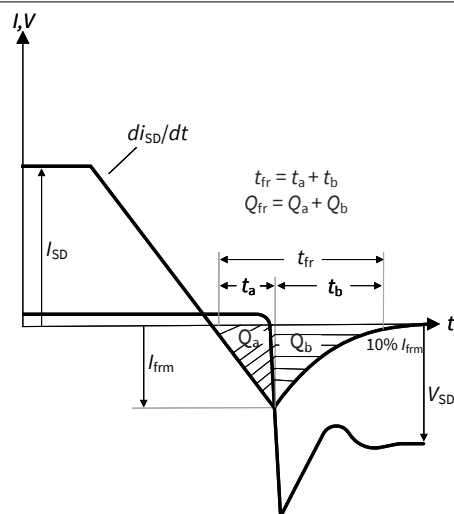


Figure B. Definition of body diode switching characteristics

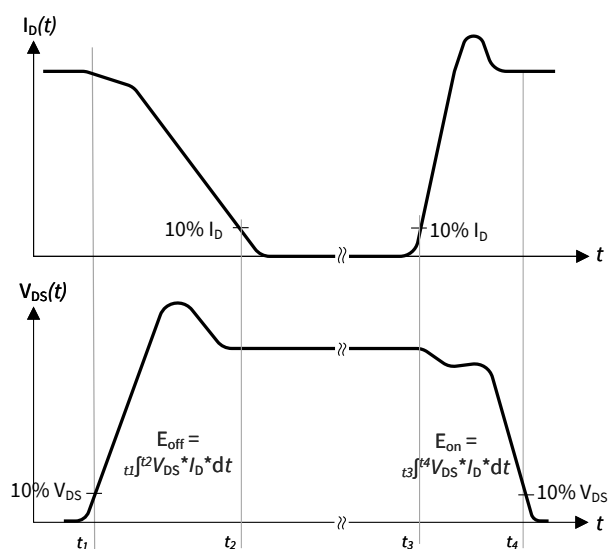


Figure C. Definition of switching losses

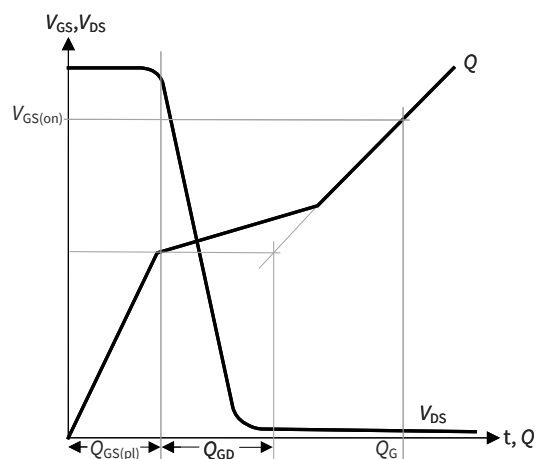


Figure D. Definition of QGD



Figure E. Thermal equivalent circuit

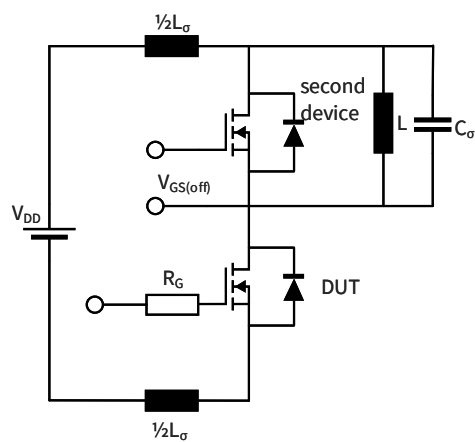


Figure F. Dynamic test circuit

Parasitic inductance  $L_{\sigma}$ ,  
Parasitic capacitor  $C_{\sigma}$ ,



Revision history

Revision history

| Document revision | Date of release | Description of changes                                                                                                                                                                                                          |
|-------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.10              | 2024-09-06      | Preliminary datasheet                                                                                                                                                                                                           |
| 1.00              | 2024-09-27      | Final datasheet                                                                                                                                                                                                                 |
| 1.10              | 2025-02-06      | Updated “Potential Applications” on Page 1<br>Correction of switching parameters in Table 4 and corresponding graphs<br>Correction of body diode characteristic values in Table 6 and corresponding graphs<br>Editorial changes |

## Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

**Edition 2025-02-06**

**Published by**

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

**© 2025 Infineon Technologies AG**  
**All Rights Reserved.**

**Do you have a question about any aspect of this document?**

**Email:** [erratum@infineon.com](mailto:erratum@infineon.com)

**Document reference**  
**IFX-ABL405-003**

## Important notice

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenhheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

Please note that this product is not qualified according to the AEC Q100 or AEC Q101 documents of the Automotive Electronics Council.

## Warnings

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.