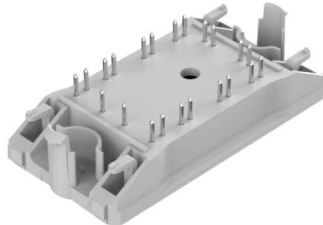
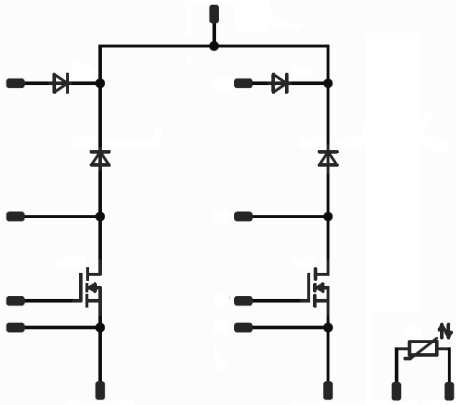




Vincotech

| <i>flow</i> BOOST 0 SiC  | 1200 V / 80 mΩ   |
|--|--|
| <div style="background-color: #eee; padding: 2px; margin-bottom: 5px;"><b>Features</b></div> <ul style="list-style-type: none"> <li>High efficiency dual boost</li> <li>Ultra fast switching frequency</li> <li>Low Inductive Layout</li> <li>1200V SiC MOSFET (Rohm) and 1200V SiC diode (Rohm)</li> <li>Integrated bypass diode</li> </ul> | <div style="background-color: #eee; padding: 2px; margin-bottom: 5px;"><b>flow 0 12mm housing</b></div>  |
| <div style="background-color: #eee; padding: 2px; margin-bottom: 5px;"><b>Target applications</b></div> <ul style="list-style-type: none"> <li>Solar Inverter</li> <li>UPS</li> </ul>  | <div style="background-color: #eee; padding: 2px; margin-bottom: 5px;"><b>Schematic</b></div>           |
| <div style="background-color: #eee; padding: 2px; margin-bottom: 5px;"><b>Types</b></div> <ul style="list-style-type: none"> <li>V23990-P629-L81-PM</li> </ul>   |  |

## Maximum Ratings

$T_j=25^{\circ}\text{C}$ , unless otherwise specified

| Parameter                    | Symbol     | Condition                                   | Value  | Unit               |
|------------------------------|------------|---|--------|--------------------|
| <b>Boost Switch</b>          |            |   |        |                    |
| Drain-source voltage         | $V_{DSS}$  |   | 1200   | V                  |
| Drain current                | $I_D$      | $T_j = T_{jmax}$ $T_s = 80^{\circ}\text{C}$ | 20     | A                  |
| Peak drain current           | $I_{DM}$   | $t_p$ limited by $T_{jmax}$                 | 140    | A                  |
| Total power dissipation      | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80^{\circ}\text{C}$ | 68     | W                  |
| Gate-source voltage          | $V_{GSS}$  |   | -6/+22 | V                  |
| Maximum Junction Temperature | $T_{jmax}$ |   | 175    | $^{\circ}\text{C}$ |



Vincotech

| Parameter                           | Symbol     | Condition                                 | Value | Unit             |
|-------------------------------------|------------|---|-------|------------------|
| <b>Boost Diode</b>                  |            |   |       |                  |
| Peak Repetitive Reverse Voltage     | $V_{RRM}$  |   | 1200  | V                |
| Continuous (direct) forward current | $I_F$      | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$ | 19    | A                |
| Repetitive peak forward current     | $I_{FRM}$  |   | 50    | A                |
| Total power dissipation             | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$ | 56    | W                |
| Maximum Junction Temperature        | $T_{jmax}$ |   | 175   | $^\circ\text{C}$ |

|  |            |   |      |                      |
|--|------------|---|------|----------------------|
| <b>Bypass Diode</b>                    |            |   |      |                      |
| Peak Repetitive Reverse Voltage        | $V_{RRM}$  |   | 1600 | V                    |
| Continuous (direct) forward current    | $I_F$      | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$                                       | 33   | A                    |
| Surge (non-repetitive) forward current | $I_{FSM}$  | 60 Hz Single Half Sine Wave<br>$t_p = 8,3 \text{ ms}$ $T_j = 150^\circ\text{C}$ | 200  | A                    |
| Surge current capability               | $I^2 t$    |   | 200  | $\text{A}^2\text{s}$ |
| Total power dissipation                | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$                                       | 43   | W                    |
| Maximum Junction Temperature           | $T_{jmax}$ |   | 150  | $^\circ\text{C}$     |

## Module Properties

| <b>Thermal Properties</b>                       |           |  |                            |                  |
|---|-----------|--|----------------------------|------------------|
| Storage temperature                             | $T_{stg}$ |  | -40...+125                 | $^\circ\text{C}$ |
| Operation temperature under switching condition | $T_{jop}$ |  | -40...+( $T_{jmax} - 25$ ) | $^\circ\text{C}$ |

## Isolation Properties

|                            |            |  |            |                 |          |    |
|----------------------------|------------|--|------------|-----------------|----------|----|
| Isolation voltage          | $V_{isol}$ |  | DC voltage | $t_p=2\text{s}$ | 4000     | V  |
| Creepage distance          |            |  |            |                 | min 12,7 | mm |
| Clearance                  |            |  |            |                 | 9,55     | mm |
| Comparative Tracking Index | CTI        |  |            |                 | >200     |    |



## Characteristic Values

| Parameter | Symbol | Conditions   |              |           |            | Value |     |     | Unit |
|-----------|--------|--------------|--------------|-----------|------------|-------|-----|-----|------|
|           |        | $V_{GE}$ [V] | $V_{CE}$ [V] | $I_C$ [A] | $T_j$ [°C] | Min   | Typ | Max |      |

### Boost Switch

#### Static

|                                  |              |                   |        |      |        |                  |      |                  |      |    |
|----------------------------------|--------------|-------------------|--------|------|--------|------------------|------|------------------|------|----|
| Drain-source on-state resistance | $r_{DS(on)}$ |                   | 18     |      | 10     | 25<br>125<br>150 |      | 79<br>108<br>121 | 111  | mΩ |
| Gate-source threshold voltage    | $V_{GS(th)}$ | $V_{GS} = V_{DS}$ |        |      | 0,0044 | 25<br>125        | 1,7* | 3                | 4**  | V  |
| Gate to Source Leakage Current   | $I_{GSS}$    |                   | -6/+22 | 0    |        | 25<br>125        |      |                  | ±100 | nA |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    |                   | 0      | 1200 |        | 25<br>125        |      |                  | 10   | μA |
| Internal gate resistance         | $r_g$        |                   |        |      |        |                  |      | 9                |      | Ω  |
| Gate charge                      | $Q_g$        |                   |        |      |        |                  |      | 110              |      | nC |
| Gate to source charge            | $Q_{GS}$     |                   | 18     | 400  | 10     | 25               |      | 24               |      |    |
| Gate to drain charge             | $Q_{GD}$     |                   |        |      |        |                  |      | 38               |      |    |
| Short-circuit input capacitance  | $C_{iss}$    | f=1MHz            |        |      |        |                  |      | 2070             |      | pF |
| Short-circuit output capacitance | $C_{oss}$    |                   | 0      | 800  |        | 25               |      | 80               |      |    |
| Reverse transfer capacitance     | $C_{rss}$    |                   |        |      |        |                  |      | 20               |      |    |

\*  $V_{GS} = -6V$  for 100msec is applied. Measuring time: 2.5msec.

\*\*  $V_{GS} = +22V$  for 100msec is applied. Measuring time: 2.5msec.

#### Thermal

|                                     |               |  |  |  |  |  |  |      |  |     |
|-------------------------------------|---------------|--|--|--|--|--|--|------|--|-----|
| Thermal resistance junction to sink | $R_{th(j-s)}$ | phase-change material $\lambda=3,4$ W/mK |  |  |  |  |  | 1,41 |  | K/W |
|-------------------------------------|---------------|--|--|--|--|--|--|------|--|-----|

#### MOSFET Switching

|                             |              |  |       |     |    |           |  |                |  |     |
|-----------------------------|--------------|--|-------|-----|----|-----------|--|----------------|--|-----|
| Turn-on delay time          | $t_{d(on)}$  | $R_{goff} = 4 \Omega$<br>$R_{gon} = 4 \Omega$    | +16/0 | 700 | 16 | 25<br>125 |  | 15<br>14       |  | ns  |
| Rise time                   | $t_r$        |  |       |     |    | 25<br>125 |  | 8<br>7         |  |     |
| Turn-off delay time         | $t_{d(off)}$ |  |       |     |    | 25<br>125 |  | 113<br>129     |  |     |
| Fall time                   | $t_f$        |  |       |     |    | 25<br>125 |  | 5<br>5         |  |     |
| Turn-on energy (per pulse)  | $E_{on}$     | $Q_{rFWD} = 0,1 \mu C$<br>$Q_{rFWD} = 0,1 \mu C$ |       |     |    | 25<br>125 |  | 0,399<br>0,303 |  | mWs |
| Turn-off energy (per pulse) | $E_{off}$    |  |       |     |    | 25<br>125 |  | 0,174<br>0,186 |  |     |



# Vincotech

## Boost Diode

| Parameter               | Symbol | Conditions   |              |           |                  | Value |                      |     | Unit |    |
|-------------------------|--------|--------------|--------------|-----------|------------------|-------|----------------------|-----|------|----|
|                         |        | $V_{GE}$ [V] | $V_{CE}$ [V] | $I_C$ [A] | $T_J$ [°C]       | Min   | Typ                  | Max |      |    |
| <b>Static</b>           |        |              |              |           |                  |       |                      |     |      |    |
| Forward voltage         | $V_F$  |              |              | 10        | 25<br>125<br>150 |       | 1,40<br>1,70<br>1,83 | 1,6 |      | V  |
| Reverse leakage current | $I_r$  |              | 1200         |           | 25<br>150        |       |                      | 200 |      | μA |

## Thermal

|                                     |               |   |  |  |  |  |  |     |  |     |
|-------------------------------------|---------------|---|--|--|--|--|--|-----|--|-----|
| Thermal resistance junction to sink | $R_{th(j-s)}$ | phase-change material<br>$\lambda=3,4\text{W/mK}$ |  |  |  |  |  | 1,7 |  | K/W |
|-------------------------------------|---------------|---|--|--|--|--|--|-----|--|-----|

## FWD Switching

|                                       |                      |  |       |     |    |     |  |                |  |      |
|---------------------------------------|----------------------|--|-------|-----|----|-----|--|----------------|--|------|
| Peak recovery current                 | $I_{RRM}$            | $di/dt = 1914\text{ A}/\mu\text{s}$<br>$di/dt = 2353\text{ A}/\mu\text{s}$ | +16/0 | 700 | 16 | 25  |  | 9              |  | A    |
| Reverse recovery time                 | $t_{rr}$             |  |       |     |    | 125 |  | 10             |  | ns   |
| Recovered charge                      | $Q_r$                |  |       |     |    | 25  |  | 9              |  | μC   |
| Reverse recovered energy              | $E_{rec}$            |  |       |     |    | 125 |  | 0,083<br>0,102 |  | mWs  |
| Peak rate of fall of recovery current | $(di_{rr}/dt)_{max}$ |  |       |     |    | 25  |  | 0,018<br>0,029 |  | A/μs |
|                                       |                      |  |       |     |    |     |  | 3218<br>3711   |  |      |

## Bypass Diode

### Static

|                         |       |  |      |    |           |  |              |            |  |    |
|-------------------------|-------|--|------|----|-----------|--|--------------|------------|--|----|
| Forward voltage         | $V_F$ |  |      | 25 | 25<br>125 |  | 1,22<br>1,21 | 1,9        |  | V  |
| Reverse leakage current | $I_r$ |  | 1600 |    | 25<br>150 |  |              | 50<br>1100 |  | μA |

### Thermal

|                                     |               |  |  |  |  |  |  |      |  |     |
|-------------------------------------|---------------|--|--|--|--|--|--|------|--|-----|
| Thermal resistance junction to sink | $R_{th(j-s)}$ | phase-change material<br>$\lambda = 3,4\text{ W/mK}$ |  |  |  |  |  | 1,61 |  | K/W |
|-------------------------------------|---------------|--|--|--|--|--|--|------|--|-----|

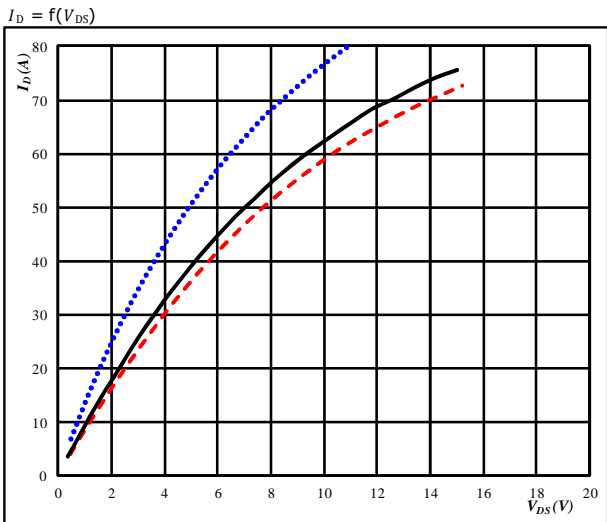
## Thermistor

|                            |                |             |  |  |     |      |      |      |  |      |
|----------------------------|----------------|-------------|--|--|-----|------|------|------|--|------|
| Rated resistance           | $R$            |             |  |  | 25  |      | 21,5 |      |  | kΩ   |
| Deviation of R100          | $\Delta_{R/R}$ | R100=1486 Ω |  |  | 100 | -4,5 |      | +4,5 |  | %    |
| Power dissipation          | $P$            |             |  |  | 25  |      | 210  |      |  | mW   |
| Power dissipation constant |                |             |  |  | 25  |      | 3,5  |      |  | mW/K |
| B-value                    | $B_{(25/50)}$  |             |  |  | 25  |      | 3884 |      |  | K    |
| B-value                    | $B_{(25/100)}$ |             |  |  | 25  |      | 3964 |      |  | K    |
| Vincotech NTC Reference    |                |             |  |  |     |      |      | F    |  |      |



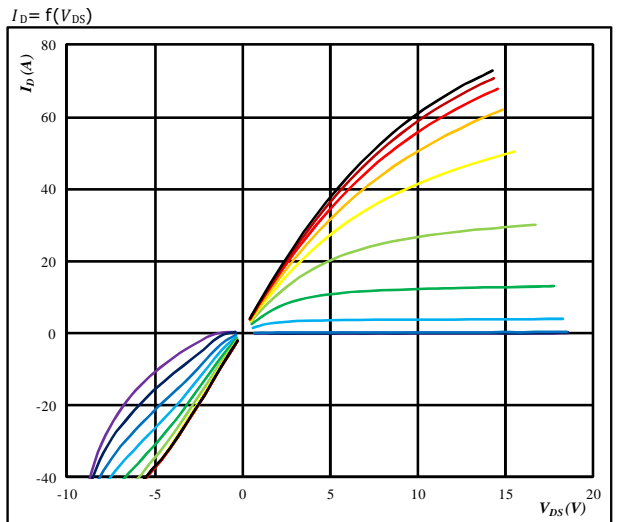
### Boost Switch Characteristics

Typical output characteristics MOSFET



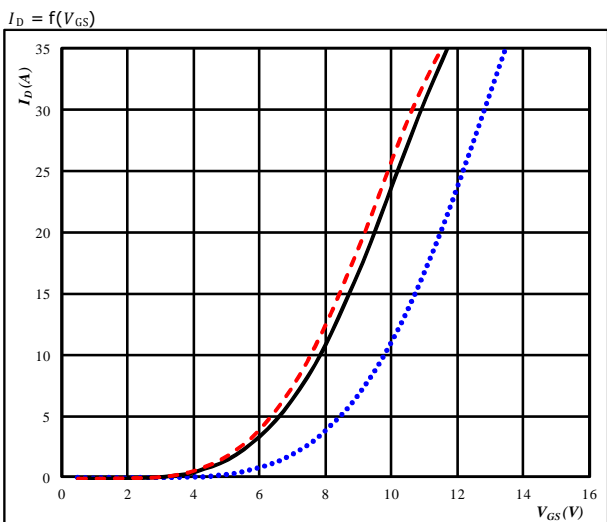
$t_p = 250 \mu s$   
 $V_{GS} = 18 V$   
 $T_j: 25 \text{ }^\circ C$  (dotted blue)  
 $125 \text{ }^\circ C$  (solid black)  
 $150 \text{ }^\circ C$  (dashed red)

Typical output characteristics MOSFET



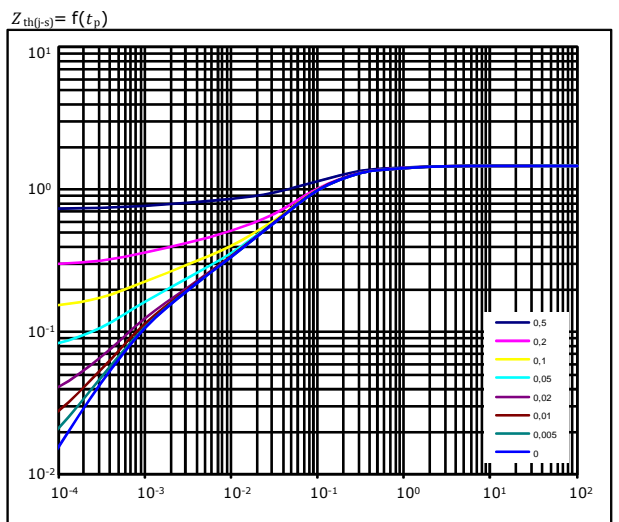
$t_p = 250 \mu s$   
 $T_j = 150 \text{ }^\circ C$   
 $V_{GS}$  from 0 V to 20 V in steps of 2 V

Typical transfer characteristics MOSFET



$t_p = 100 \mu s$   
 $V_{DS} = 10 V$   
 $T_j: 25 \text{ }^\circ C$  (dotted blue)  
 $125 \text{ }^\circ C$  (solid black)  
 $150 \text{ }^\circ C$  (dashed red)

Transient thermal impedance as a function of pulse width MOSFET



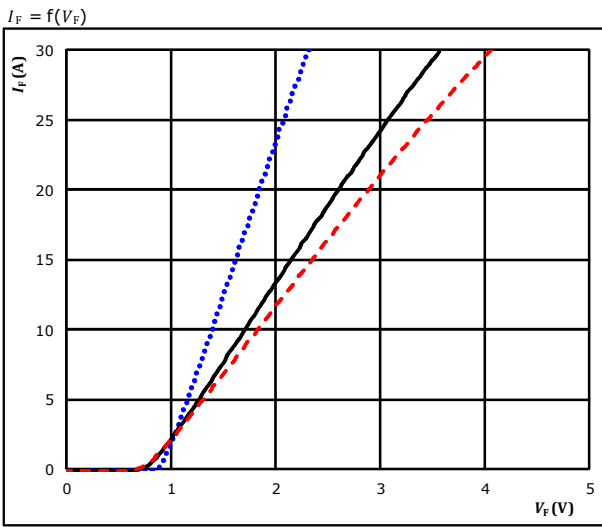
$D = t_p / T$   
 $R_{th(f-s)} = 1,48 K/W$

| R (K/W)  | Tau(s)   |
|----------|----------|
| 1,30E-01 | 1,00E+00 |
| 4,11E-01 | 1,66E-01 |
| 7,09E-01 | 6,11E-02 |
| 1,27E-01 | 5,50E-03 |
| 1,00E-01 | 8,02E-04 |

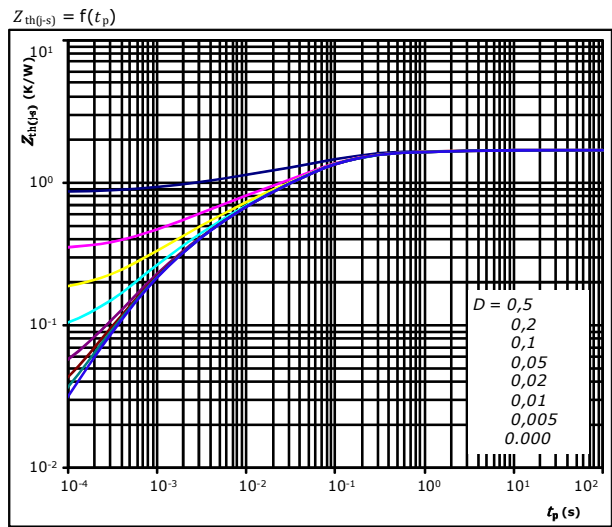


### Boost Diode Characteristics

Typical forward characteristics FWD



Transient thermal impedance as a function of pulse width FWD



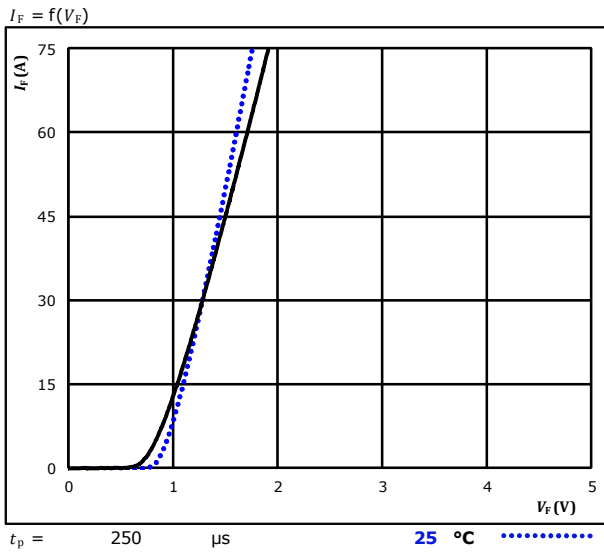
FWD thermal model values

| R (K/W)    | $\tau$ (s) |
|------------|------------|
| 4,5560E-02 | 3,2070E+00 |
| 1,6530E-01 | 3,8810E-01 |
| 7,8640E-01 | 6,5190E-02 |
| 3,2730E-01 | 1,1130E-02 |
| 2,5420E-01 | 2,7080E-03 |
| 1,2040E-01 | 6,1510E-04 |

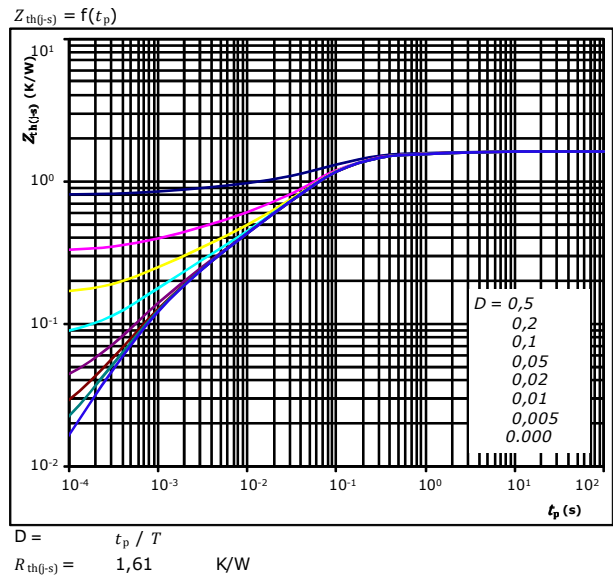


## Bypass Diode Characteristics

Typical forward characteristics Bypass diode



Transient thermal impedance as a function of pulse width Bypass diode



Diode thermal model values

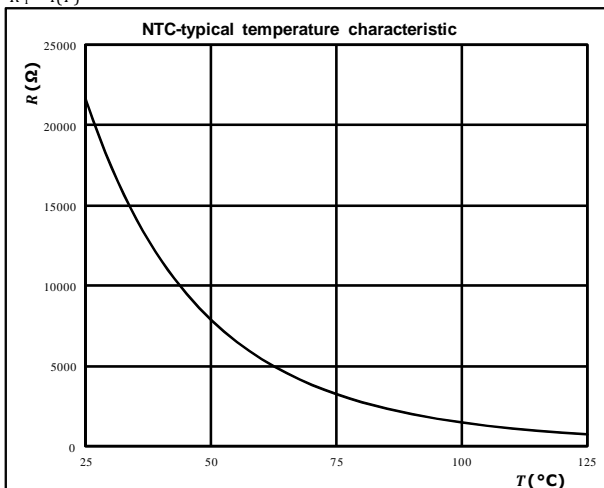
| R (K/W)    | $\tau$ (s) |
|------------|------------|
| 6,7170E-02 | 2,7200E+00 |
| 1,4760E-01 | 4,1400E-01 |
| 8,6760E-01 | 8,3320E-02 |
| 2,5310E-01 | 2,8890E-02 |
| 1,6900E-01 | 5,1460E-03 |
| 1,0640E-01 | 9,0980E-04 |

## Thermistor

Thermistor typical temperature characteristic

Typical NTC characteristic  
as a function of temperature

$R_T = f(T)$

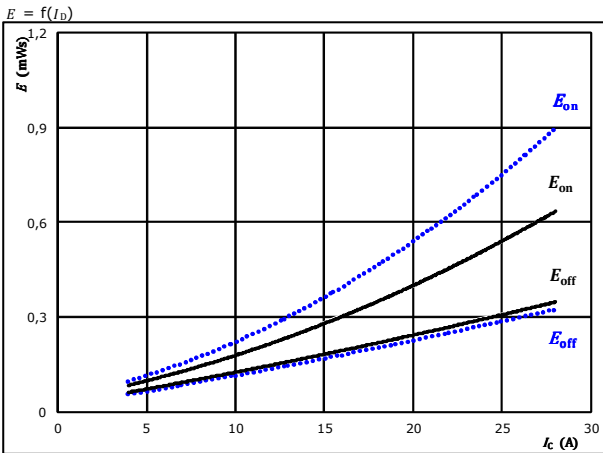




## Boost Switching Characteristics

**Figure 1.** MOSFET

Typical switching energy losses as a function of collector current

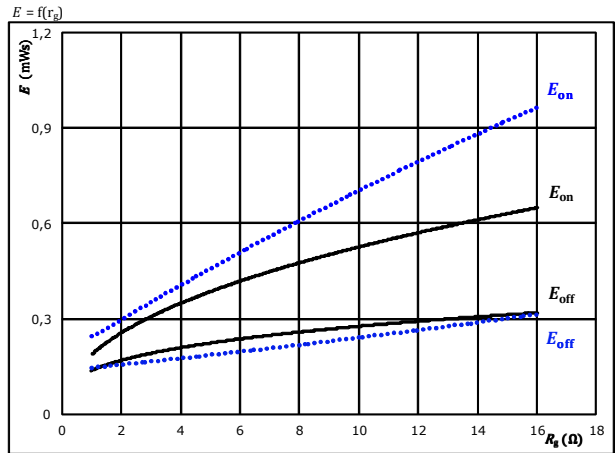


With an inductive load at

|                    |              |       |
|--------------------|--------------|-------|
| $V_{DS} = 700$ V   | $T_j: 25$ °C | ..... |
| $V_{GS} = +16/0$ V | $125$ °C     | ————  |
| $R_{gon} = 4$ Ω    | $150$ °C     | ----- |
| $R_{goff} = 4$ Ω   |              |       |

**Figure 2.** MOSFET

Typical switching energy losses as a function of gate resistor

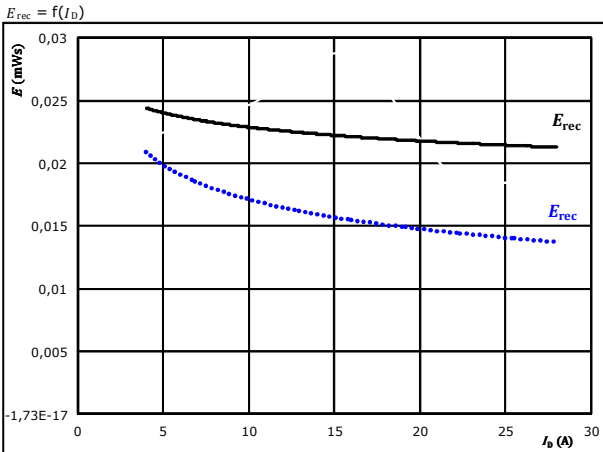


With an inductive load at

|                    |              |       |
|--------------------|--------------|-------|
| $V_{DS} = 700$ V   | $T_j: 25$ °C | ..... |
| $V_{GS} = +16/0$ V | $125$ °C     | ————  |
| $I_D = 16$ A       | $150$ °C     | ----- |

**Figure 3.** FWD

Typical reverse recovered energy loss as a function of collector current

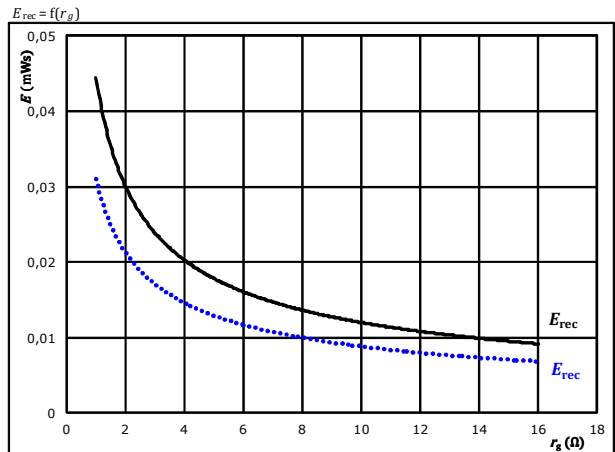


With an inductive load at

|                    |              |       |
|--------------------|--------------|-------|
| $V_{DS} = 700$ V   | $T_j: 25$ °C | ..... |
| $V_{GS} = +16/0$ V | $125$ °C     | ————  |
| $R_{gon} = 4$ Ω    | $150$ °C     | ----- |

**Figure 4.** FWD

Typical reverse recovered energy loss as a function of gate resistor



With an inductive load at

|                    |              |       |
|--------------------|--------------|-------|
| $V_{DS} = 700$ V   | $T_j: 25$ °C | ..... |
| $V_{GS} = +16/0$ V | $125$ °C     | ————  |
| $I_D = 16$ A       | $150$ °C     | ----- |



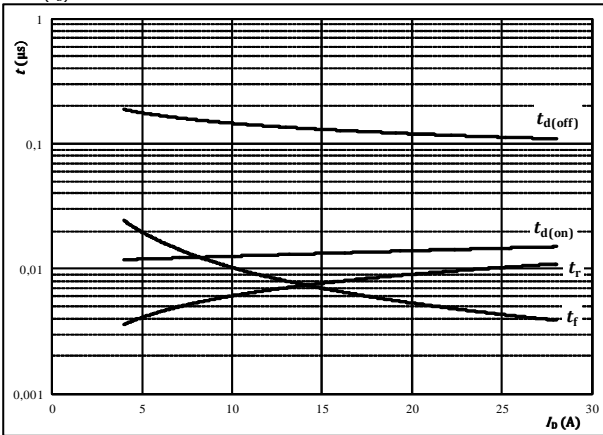


## Boost Switching Characteristics

**Figure 5.** MOSFET

Typical switching times as a function of collector current

$$t = f(I_D)$$



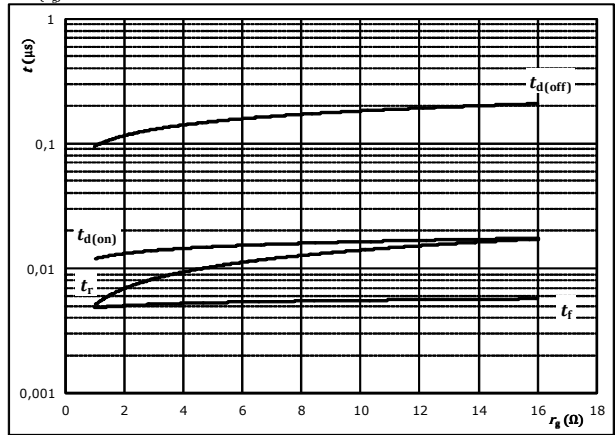
With an inductive load at

|              |       |    |
|--------------|-------|----|
| $T_j =$      | 125   | °C |
| $V_{DS} =$   | 700   | V  |
| $V_{GS} =$   | +16/0 | V  |
| $R_{gon} =$  | 4     | Ω  |
| $R_{goff} =$ | 4     | Ω  |

**Figure 6.** MOSFET

Typical switching times as a function of gate resistor

$$t = f(r_g)$$



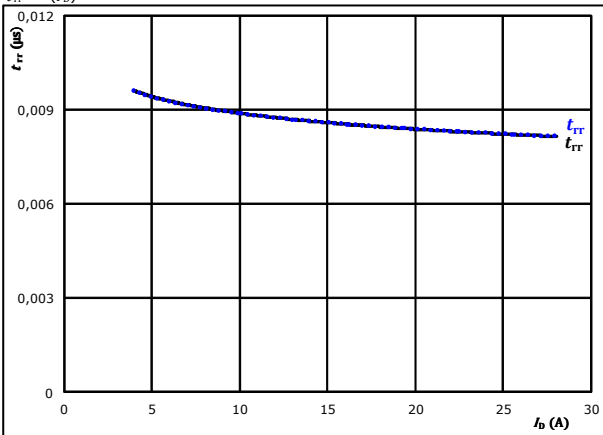
With an inductive load at

|            |       |    |
|------------|-------|----|
| $T_j =$    | 125   | °C |
| $V_{DS} =$ | 700   | V  |
| $V_{GS} =$ | +16/0 | V  |
| $I_D =$    | 16    | A  |

**Figure 7.** FWD

Typical reverse recovery time as a function of collector current

$$t_{rr} = f(I_D)$$

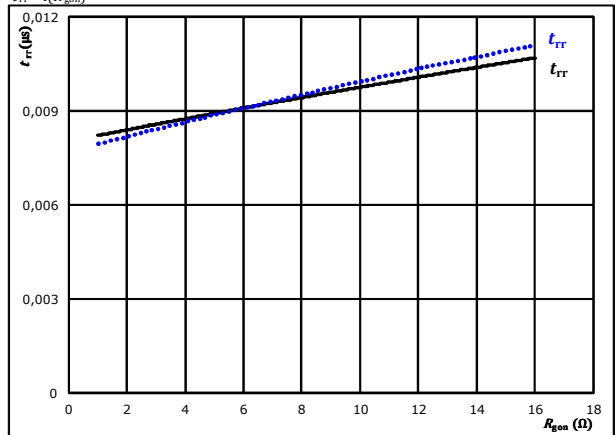


|    |             |       |   |        |        |       |
|----|-------------|-------|---|--------|--------|-------|
| At | $V_{DS} =$  | 700   | V | $T_j:$ | 25 °C  | ..... |
|    | $V_{GS} =$  | +16/0 | V |        | 125 °C | ————  |
|    | $R_{gon} =$ | 4     | Ω |        | 150 °C | ----- |

**Figure 8.** FWD

Typical reverse recovery time as a function of MOSFET turn on gate resistor

$$t_{rr} = f(R_{gon})$$

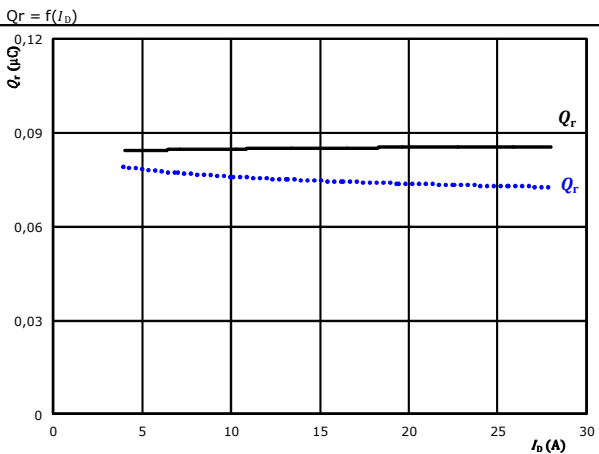


|    |            |       |   |        |        |       |
|----|------------|-------|---|--------|--------|-------|
| At | $V_{DS} =$ | 700   | V | $T_j:$ | 25 °C  | ..... |
|    | $V_{GS} =$ | +16/0 | V |        | 125 °C | ————  |
|    | $I_D =$    | 16    | A |        | 150 °C | ----- |



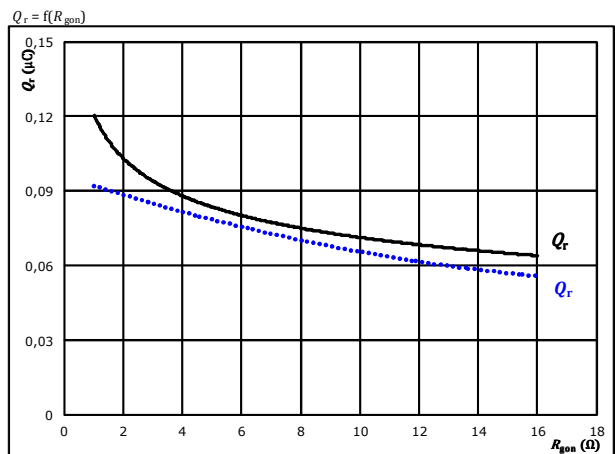
## Boost Switching Characteristics

**Figure 9.** FWD  
Typical recovered charge as a function of collector current



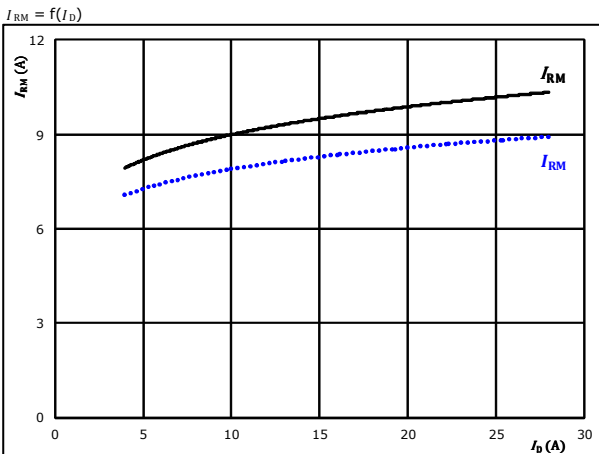
**A**  $V_{DS} = 700$  V  
 $V_{GS} = +16/0$  V  
 $R_{gon} = 4$  Ω  
 $T_j$ : 25 °C (dotted blue line)  
125 °C (solid black line)  
150 °C (dashed red line)

**Figure 10.** FWD  
Typical recovered charge as a function of MOSFET turn on gate resistor



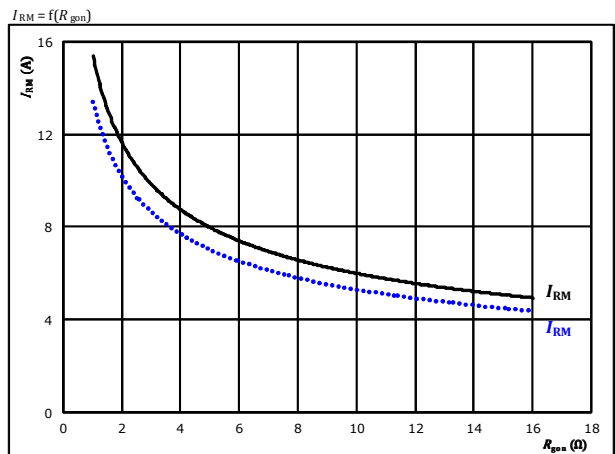
**At**  $V_{DS} = 700$  V  
 $V_{GS} = +16/0$  V  
 $I_D = 16$  A  
 $T_j$ : 25 °C (dotted blue line)  
125 °C (solid black line)  
150 °C (dashed red line)

**Figure 11.** FWD  
Typical peak reverse recovery current as a function of collector current



**At**  $V_{DS} = 700$  V  
 $V_{GS} = +16/0$  V  
 $R_{gon} = 4$  Ω  
 $T_j$ : 25 °C (dotted blue line)  
125 °C (solid black line)  
150 °C (dashed red line)

**Figure 12.** FWD  
Typical peak reverse recovery current as a function of MOSFET turn on gate resistor



**At**  $V_{DS} = 700$  V  
 $V_{GS} = +16/0$  V  
 $I_D = 16$  A  
 $T_j$ : 25 °C (dotted blue line)  
125 °C (solid black line)  
150 °C (dashed red line)

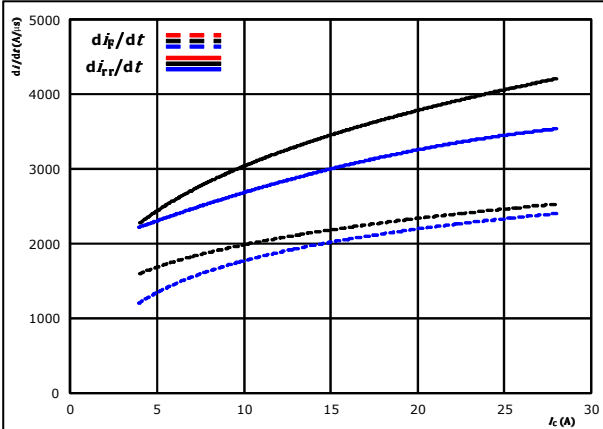


### Boost Switching Characteristics

**Figure 13.** FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current

$$di_f/dt, di_{rr}/dt = f(I_c)$$

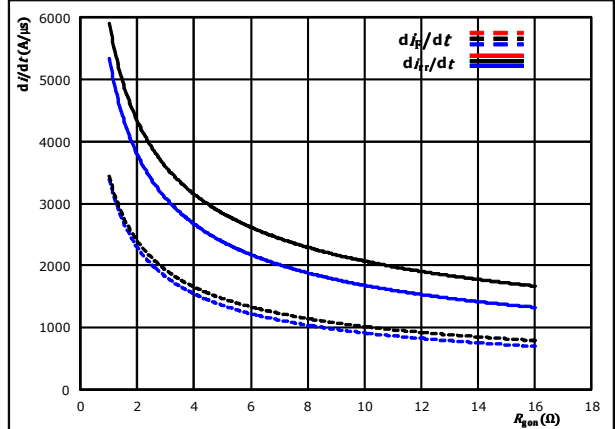


At  $V_{DS} = 700$  V  $T_j: 25$  °C .....  
 $V_{GS} = +16/0$  V  $T_j: 125$  °C ———  
 $R_{gon} = 4$  Ω  $T_j: 150$  °C - - - - -

**Figure 14.** FWD

Typical rate of fall of forward and reverse recovery current as a function of MOSFET turn on gate resistor

$$di_f/dt, di_{rr}/dt = f(R_g)$$



At  $V_{DS} = 700$  V  $T_j: 25$  °C .....  
 $V_{GS} = +16/0$  V  $T_j: 125$  °C ———  
 $I_D = 16$  A  $T_j: 150$  °C - - - - -

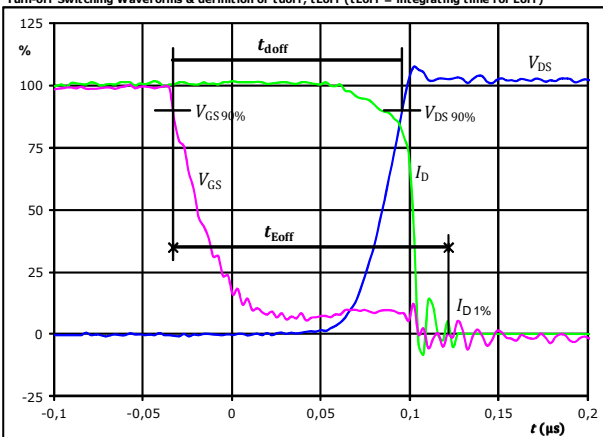


### Boost Switching Definitions

**General conditions**

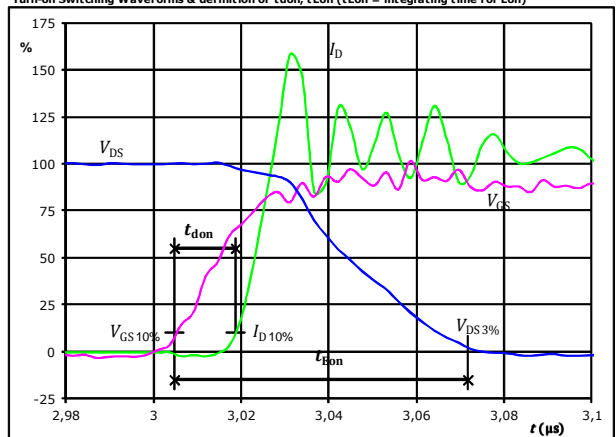
|            |   |            |
|------------|---|------------|
| $T_j$      | = | 125 °C     |
| $R_{gon}$  | = | 4 $\Omega$ |
| $R_{goff}$ | = | 4 $\Omega$ |

**Figure 1. MOSFET**  
Turn-off Switching Waveforms & definition of  $t_{doff}$ ,  $t_{Eoff}$  ( $t_{Eoff}$  = integrating time for Eoff)



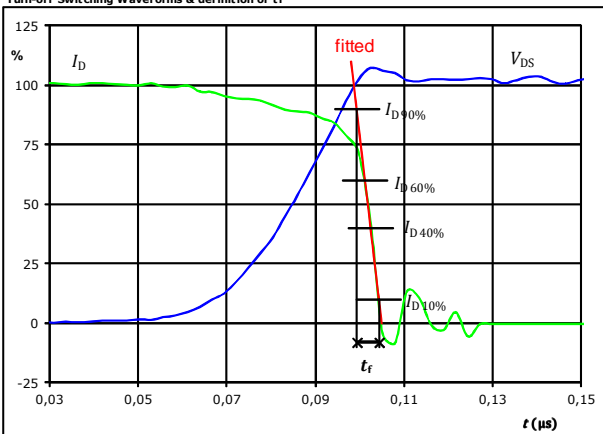
|                   |       |         |
|-------------------|-------|---------|
| $V_{GS}$ (0%) =   | 0     | V       |
| $V_{GS}$ (100%) = | 16    | V       |
| $V_{DS}$ (100%) = | 700   | V       |
| $I_D$ (100%) =    | 16    | A       |
| $t_{doff}$ =      | 0,129 | $\mu$ s |
| $t_{Eoff}$ =      | 0,155 | $\mu$ s |

**Figure 2. MOSFET**  
Turn-on Switching Waveforms & definition of  $t_{don}$ ,  $t_{Eon}$  ( $t_{Eon}$  = integrating time for Eon)



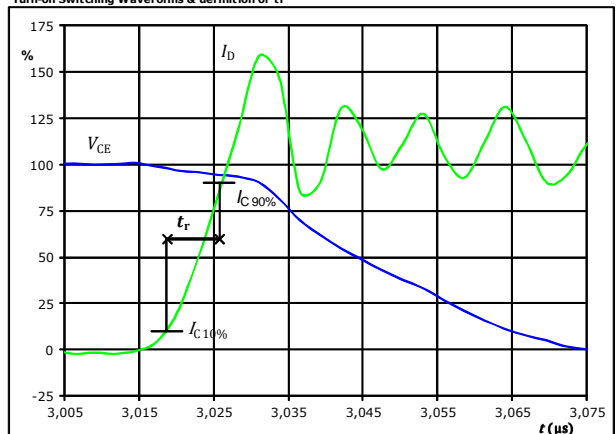
|                   |       |         |
|-------------------|-------|---------|
| $V_{GS}$ (0%) =   | 0     | V       |
| $V_{GS}$ (100%) = | 16    | V       |
| $V_{DS}$ (100%) = | 700   | V       |
| $I_D$ (100%) =    | 16    | A       |
| $t_{don}$ =       | 0,014 | $\mu$ s |
| $t_{Eon}$ =       | 0,067 | $\mu$ s |

**Figure 3. MOSFET**  
Turn-off Switching Waveforms & definition of  $t_f$



|                |       |         |
|----------------|-------|---------|
| $V_C$ (100%) = | 700   | V       |
| $I_D$ (100%) = | 16    | A       |
| $t_f$ =        | 0,005 | $\mu$ s |

**Figure 4. MOSFET**  
Turn-on Switching Waveforms & definition of  $t_r$

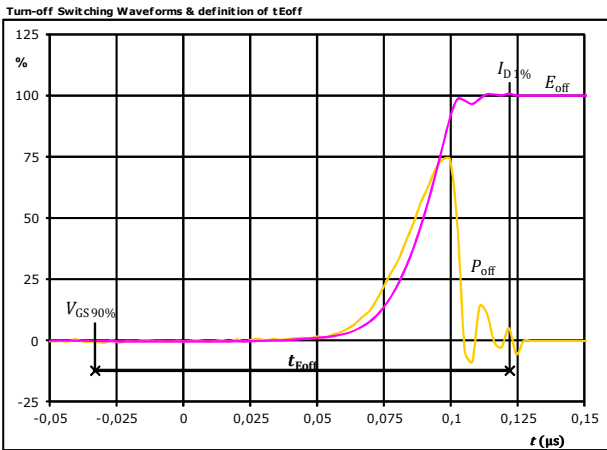


|                |       |         |
|----------------|-------|---------|
| $V_C$ (100%) = | 700   | V       |
| $I_D$ (100%) = | 16    | A       |
| $t_r$ =        | 0,007 | $\mu$ s |



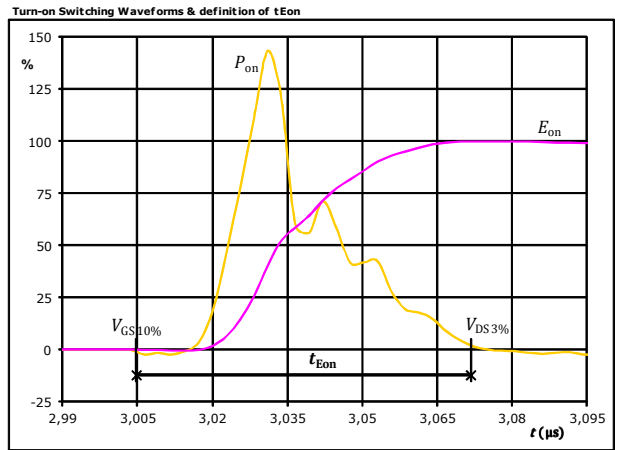
### Boost Switching Definitions

Figure 5. MOSFET



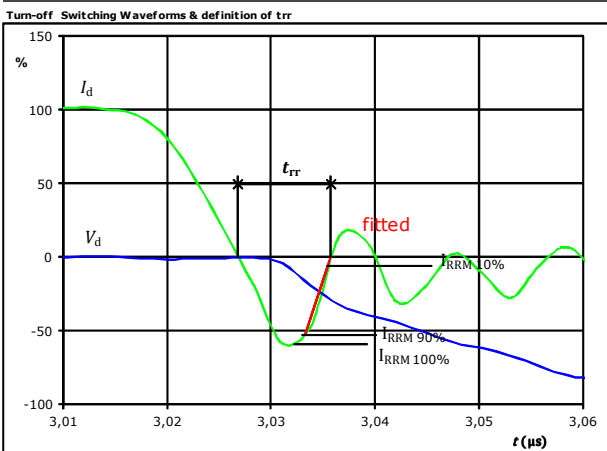
|                    |       |         |
|--------------------|-------|---------|
| $P_{off}$ (100%) = | 11,08 | kW      |
| $E_{off}$ (100%) = | 0,19  | mJ      |
| $t_{Eoff}$ =       | 0,155 | $\mu$ s |

Figure 6. MOSFET



|                   |       |         |
|-------------------|-------|---------|
| $P_{on}$ (100%) = | 11,08 | kW      |
| $E_{on}$ (100%) = | 0,30  | mJ      |
| $t_{Eon}$ =       | 0,067 | $\mu$ s |

Figure 7. FWD

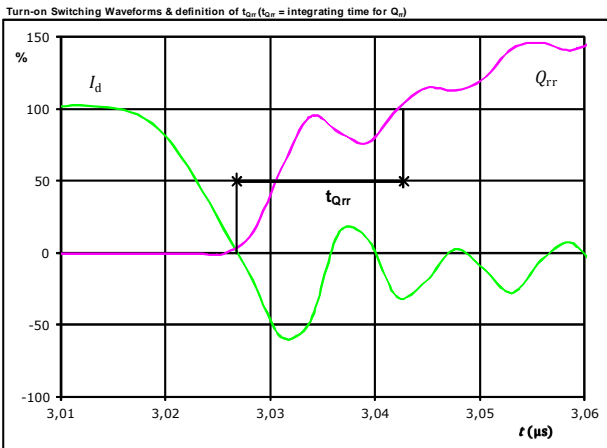


|                    |       |         |
|--------------------|-------|---------|
| $V_d$ (100%) =     | 700   | V       |
| $I_d$ (100%) =     | 16    | A       |
| $I_{RRM}$ (100%) = | -10   | A       |
| $t_{rr}$ =         | 0,009 | $\mu$ s |



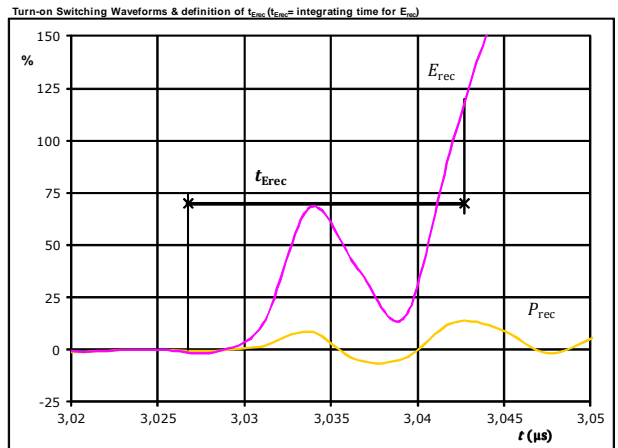
### Boost Switching Definitions

Figure 8. FWD



|                   |      |               |
|-------------------|------|---------------|
| $I_d$ (100%) =    | 16   | A             |
| $Q_{rr}$ (100%) = | 0,10 | $\mu\text{C}$ |
| $t_{Qrr}$ =       | 0,02 | $\mu\text{s}$ |

Figure 9. FWD



|                    |       |               |
|--------------------|-------|---------------|
| $P_{rec}$ (100%) = | 11,08 | kW            |
| $E_{rec}$ (100%) = | 0,03  | mJ            |
| $t_{Erec}$ =       | 0,02  | $\mu\text{s}$ |



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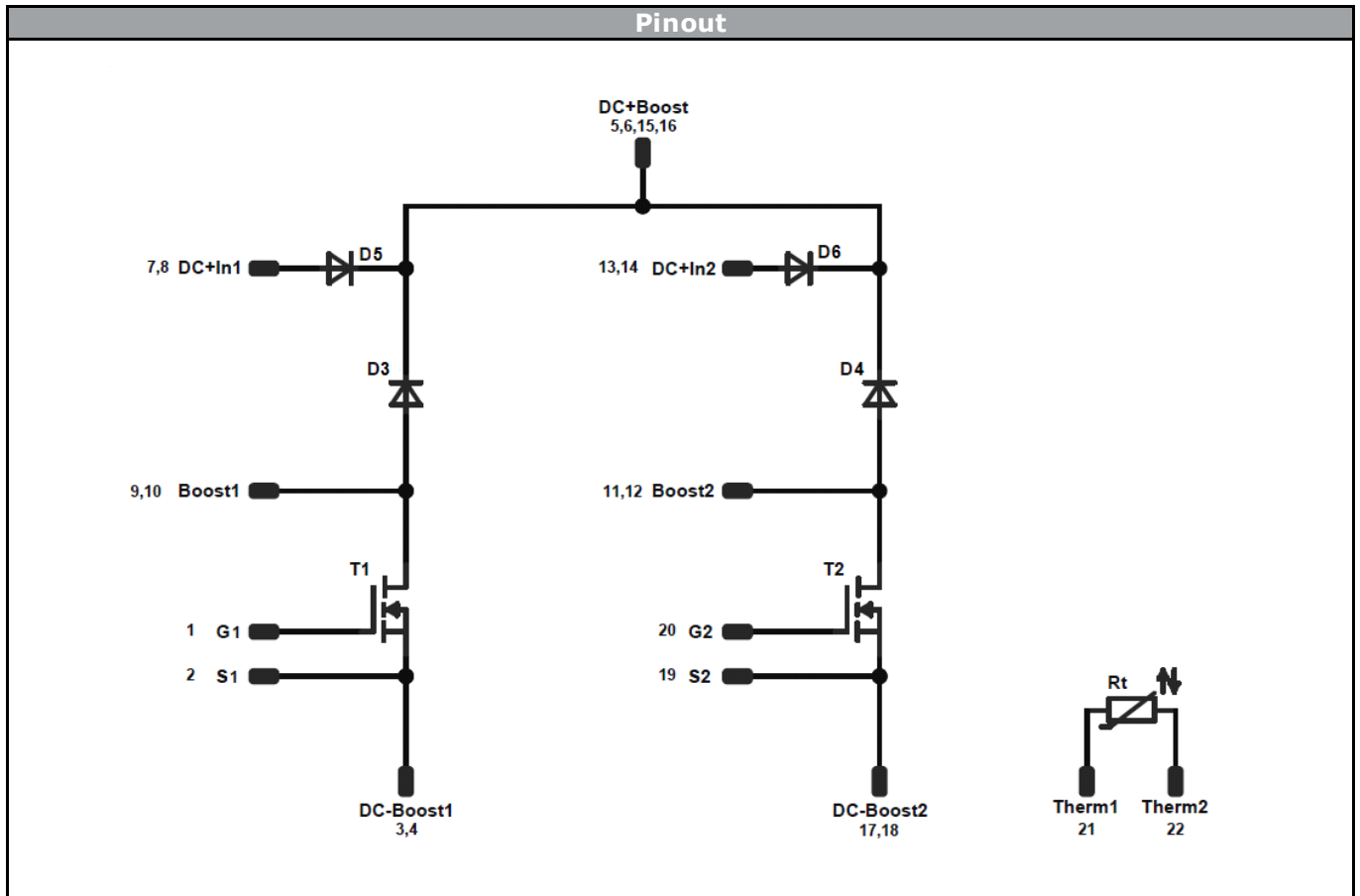
| Ordering Code & Marking                            |  |  |  |                      |                     |                   |                     |                  |            |               |
|--|--|--|--|----------------------|---------------------|-------------------|---------------------|------------------|------------|---------------|
| <b>Version</b>                                     |  |  |  | <b>Ordering Code</b> |                     |                   |                     |                  |            |               |
| without thermal paste 12mm housing and solder pins |  |  |  | V23990-P629-L81-PM   |                     |                   |                     |                  |            |               |
|  |  |  |  |                      |                     |                   |                     |                  |            |               |
|  |  |  |  |                      |                     |                   |                     |                  |            |               |
| Vinco WWYY<br>NNNNNNVV UL<br>LLLL SSSS             |  |  |  | <b>Text</b>          | <b>Vinco</b>        | <b>Date code</b>  | <b>Name&amp;Ver</b> | <b>UL</b>        | <b>Lot</b> | <b>Serial</b> |
|  |  |  |  |                      | Vinco               | WWYY              | NNNNNVV             | UL               | LLLL       | SSSS          |
|  |  |  |  | <b>Datamatrix</b>    | <b>Type&amp;Ver</b> | <b>Lot number</b> | <b>Serial</b>       | <b>Date code</b> |            |               |
|  |  |  |  |                      | TTTTTVV             | LLLL              | SSSS                | WWYY             |            |               |

| Pin table [mm] |      |      |           |
|----------------|------|------|-----------|
| Pin            | X    | Y    | Function  |
| 1              | 0    | 22,5 | G1        |
| 2              | 2,9  | 22,5 | S1        |
| 3              | 8,3  | 22,5 | DC-Boost1 |
| 4              | 10,8 | 22,5 | DC-Boost1 |
| 5              | 19,6 | 22,5 | DC+Boost  |
| 6              | 22,1 | 22,5 | DC+Boost  |
| 7              | 29,1 | 22,5 | DC+In1    |
| 8              | 32   | 22,5 | DC+In1    |
| 9              | 33,5 | 17,8 | Boost1    |
| 10             | 33,5 | 15,3 | Boost1    |
| 11             | 33,5 | 7,2  | Boost2    |
| 12             | 33,5 | 4,7  | Boost2    |
| 13             | 32   | 0    | DC+In2    |
| 14             | 29,1 | 0    | DC+In2    |
| 15             | 22,1 | 0    | DC+Boost  |
| 16             | 19,6 | 0    | DC+Boost  |
| 17             | 10,8 | 0    | DC-Boost2 |
| 18             | 8,3  | 0    | DC-Boost2 |
| 19             | 2,9  | 0    | S2        |
| 20             | 0    | 0    | G2        |
| 21             | 0    | 8    | Therm1    |
| 22             | 0    | 14,5 | Therm2    |

Tolerance of pinpositions: ±0,5mm at the end of pins  
Dimension of coordinate axis is only offset without tolerance



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| <b>Identification</b> |           |         |         |              |         |
|-----------------------|-----------|---------|---------|--------------|---------|
| ID                    | Component | Voltage | Current | Function     | Comment |
| T1,T2                 | MOSFET    | 1200V   | 80mΩ    | Boost Switch |         |
| D1,D3                 | FWD       | 1200V   | 10A     | Boost Diode  |         |
| D5,D6                 | Rectifier | 1600V   | 25A     | Bypass Diode |         |
| Rt                    | NTC       | -       | -       | Thermistor   |         |





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| Packaging instruction             |     |      |          |      |        |
|-----------------------------------|-----|------|----------|------|--------|
| Standard packaging quantity (SPQ) | 135 | >SPQ | Standard | <SPQ | Sample |

| Handling instruction  |  |
|---|--|
| Handling instructions for <i>flow</i> 0 packages see vincotech.com website. |  |

| Package data   |  |
|--|--|
| Package data for <i>flow</i> 0 packages see vincotech.com website. |  |

| Document No.:         | Date:        | Modification: | Pages |
|-----------------------|--------------|---------------|-------|
| V23990-P629-L81-D1-14 | 19 Nov. 2015 |               |       |

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.