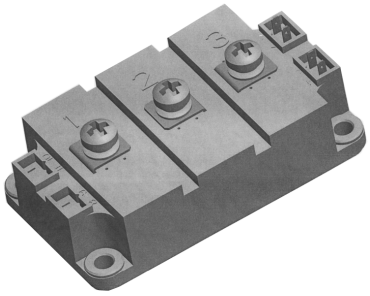
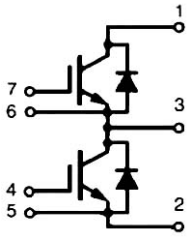
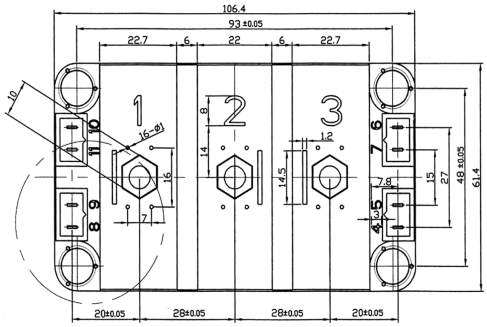
# SII300N12

## NPT IGBT Modules

Dimensions in mm (1mm = 0.0394")






**Absolute Maximum Ratings** $T_C$ = 25°C, unless otherwise specified

| Symbol | Conditions | Values | Units |
|---|---|---|---|
| **IGBT Wechselrichter/ IGBT Inverter** | | | |
| $V_{CES}$ | | 1200 | V |
| $I_C$ | $T_C$= 25(80)°C, $T_{vj}$= 150°C | 625(300) | A |
| $I_{CRM}$ | $T_C$= 80°C, $t_P$ =1ms | 600 | A |
| $P_{tot}$ | $T_C$= 25°C, $T_{vj}$= 150°C | 2500 | W |
| $V_{GES}$ | | ±20 | V |
| **Diode Wechselrichter/ Diode Inverter** | | | |
| $V_{RRM}$ | | 1200 | V |
| $I_F$ | | 300 | A |
| $I_{FRM}$ | $t_P$ =1ms | 600 | A |
| $I^2t$ | $V_R$=0V, $t_P$ =10ms; $T_{vj}$=125°C | 19000 | $A^2s$ |
| **Module Isolation/ Module Isolation** | | | |
| $V_{ISOL}$ | RMS, f=50Hz, t=1min, NTC connect to Baseplate | 2500 | V |

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**Characteristics** $T_C = 25^oC$, unless otherwise specified

| Symbol | Conditions | min. | typ. | max. | Units |
|---|---|---|---|---|---|
| **IGBT Wechselrichter/ IGBT Inverter** | | | | | |
| $V_{GEth}$ | $V_{GE} = V_{CE}$, $I_C$ =12mA | 4.5 | 5.5 | 6.5 | V |
| $I_{CES}$ | $V_{GE}$ = 0; $V_{CE}$ = 1200V | | | 5 | mA |
| $I_{GES}$ | $V_{CE}$=0; $V_{GE}$=20V | | | 400 | nA |
| $R_{Gint}$ | | | 1.0 | | Ω |
| $V_{CE(sat)}$ | $I_C$ =300A; $V_{GE}$ = 15V; $T_j$ = 25(125)$^o$C | | 2.1(2.4) | 2.6(2.9) | V |
| $C_{ies}$<br>$C_{res}$ | under following conditions<br>$V_{GE}$ = 0, $V_{CE}$ = 25V, f = 1MHz | | 21<br>1.4 | | nF |
| $Q_G$ | $V_{GE}$ = -15V...+15V | | 3.2 | | uC |
| $I_{sc}$ | $t_P \leqslant$ 10uS, $V_{GE} \leqslant$ 15V, Tvj = 125 $^o$C , Vcc = 900V | | 1800 | | A |
| <br>$t_{d(on)}$<br>$t_r$<br>$t_{d(off)}$<br>$t_f$ | under following conditions:<br>$V_{CE}$ = 600V, $I_C$ = 300A<br>$R_{Gon} = R_{Goff}$ =3.3Ω, , $T_j$ = 25(125)$^o$C<br>$V_{GE}$ = ± 15V | | <br>110(120)<br>60(70)<br>550(570)<br>70(80) | | <br>ns<br>ns<br>ns<br>ns |
| $E_{on}(E_{off})$ | $T_j$ = 25(125)$^o$C, $L_S$ = 60nH | | 35(36) | | mJ |
| $R_{thJC}$<br>$R_{thCH}$ | | | <br>0.03 | 0.05 | K/W |
| **Diode Wechselrichter/ Diode Inverter** | | | | | |
| $V_F$ | under following condition<br>$I_F$ = 300A; $V_{GE}$ = 0V; $T_j$ = 25(125)$^o$C | | | 1.8(1.7) 2.3(2.2) | V |
| $I_{RM}$ | $I_F$ = 300A; $T_j$ = 25(125)$^o$C | | 350(420) | | A |
| $Q_r$ | -di/dt = 5400A/us | | 28(58) | | uC |
| $E_{rec}$ | $V_{GE}$ = -15V, $V_R$=600V | | 9(21) | | mJ |
| $R_{thJC}$<br>$R_{thCH}$ | | | <br>0.06 | 0.125 | K/W |
| **Modul/ module** | | | | | |
| $R_{thCH}$ | under following conditions<br>$I_C$ = 15A; $V_{GE}$ = 15V; $T_j$ = 25(125)$^o$C | | 1.7(2.0) | 2.15 | V |
| $L_{sCE}$ | $V_{CE}=V_{GE}$, $I_C$=0.5mA | 5.0 | 5.8 | 6.5 | V |
| $R_{CC'+EE'}$ | f=1MHz, $V_{CE}$=25V, $V_{GE}$=0V | | 1.1 | | nF |
| $T_{VJ}$<br>$T_{VJM}$<br>$T_{stg}$ | | | -40...+125<br>150<br>-40...+125 | | $^o$C |
| **Mechanical Data** | | | | | |
| $M_s$ | to heatsink M6 | 3 | | 5 | Nm |
| $M_t$ | to terminals M5 | 2.5 | | 5 | Nm |
| w | | | | 325 | g |

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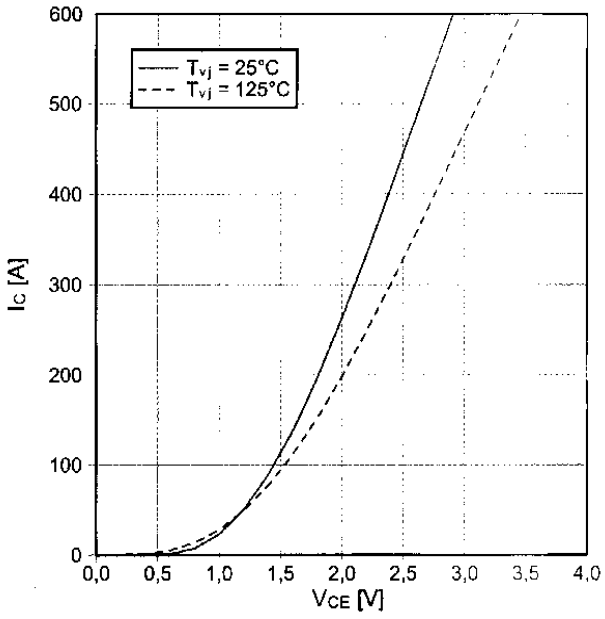
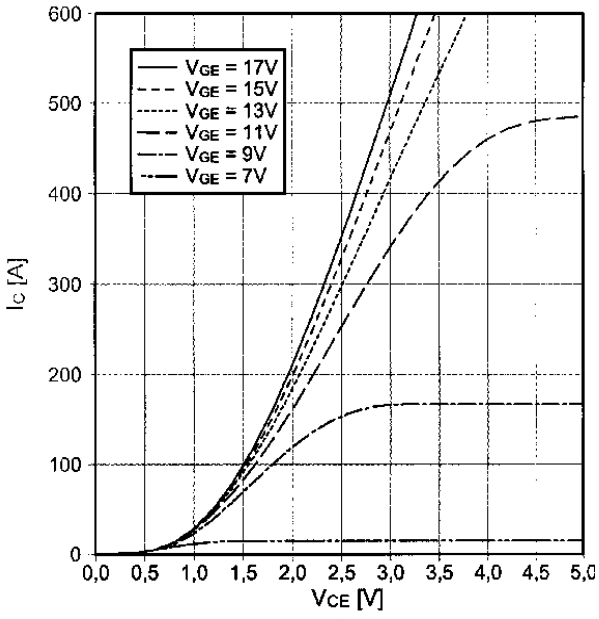
## NPT IGBT Modules

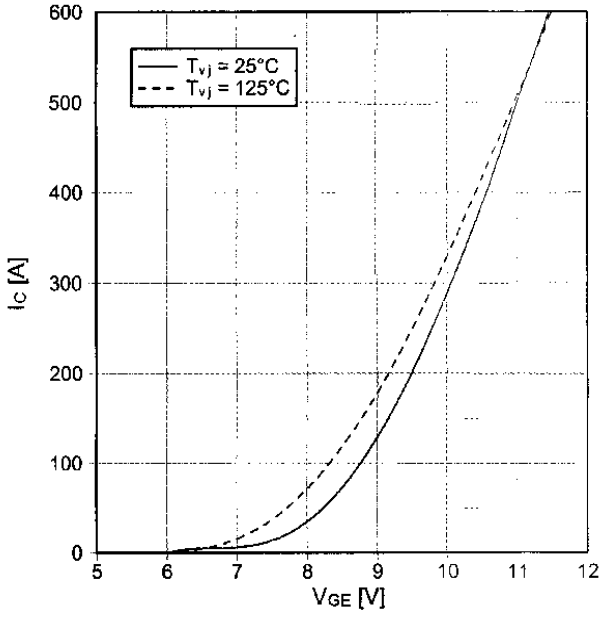
**Ausgangskennlinie IGBT-Wechselr.** (typisch)
**output characteristic IGBT-inverter (typical)**
$I_C = f(V_{CE})$
$V_{GE} = 15$ V



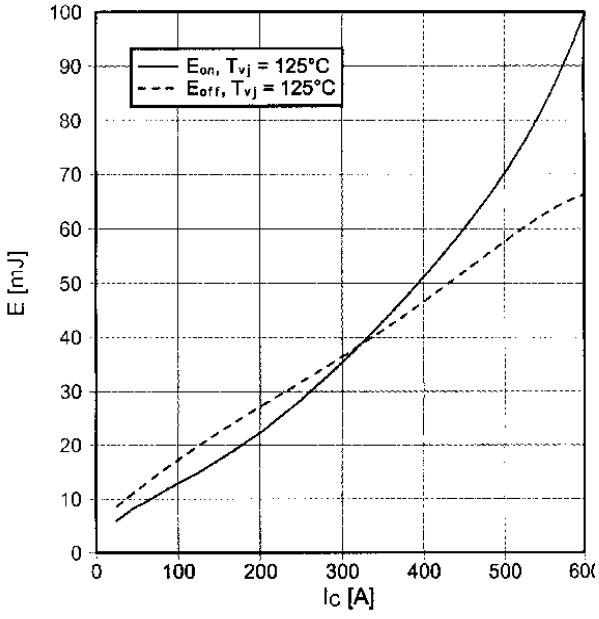

**Ausgangskennlinienfeld IGBT-Wechselr.** (typisch)
**output characteristic IGBT-inverter (typical)**
$I_C = f(V_{CE})$
$T_{vj} = 125°C$




**Übertragungscharakteristik IGBT-Wechselr.** (typisch)
**transfer characteristic IGBT-inverter (typical)**
$I_C = f(V_{GE})$
$V_{CE} = 20$ V



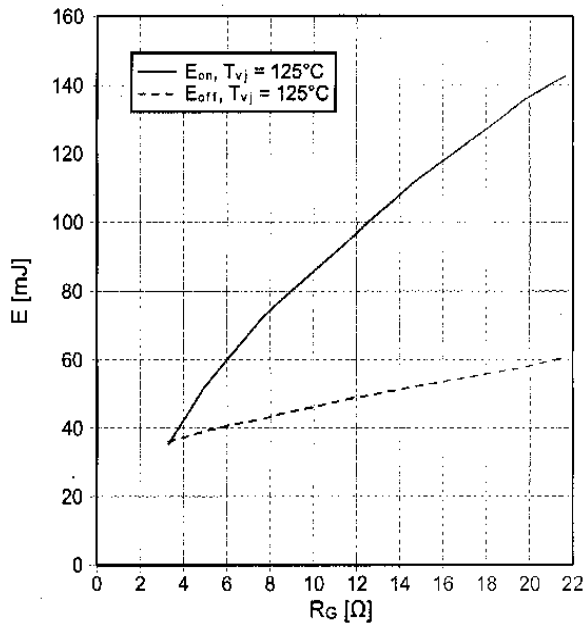

**Schaltverluste IGBT-Wechselr.** (typisch)
**switching losses IGBT-inverter (typical)**
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
$V_{GE} = \pm 15$ V, $R_{Gon} = 3{,}3\ \Omega$, $R_{Goff} = 3{,}3\ \Omega$, $V_{CE} = 600$ V



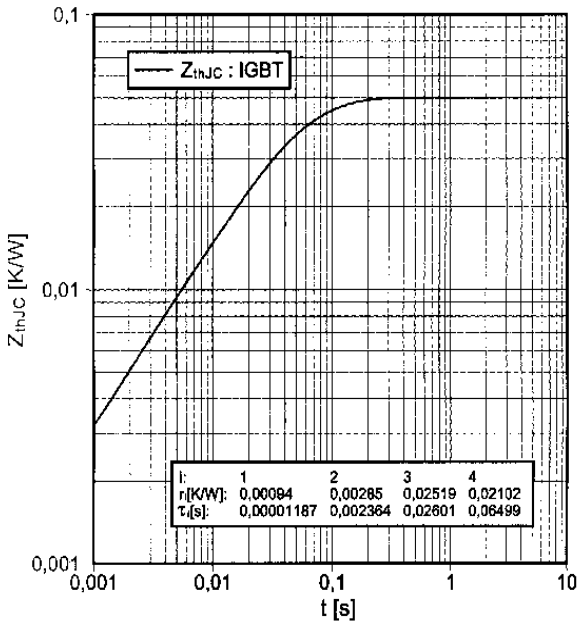
# SII300N12

## NPT IGBT Modules

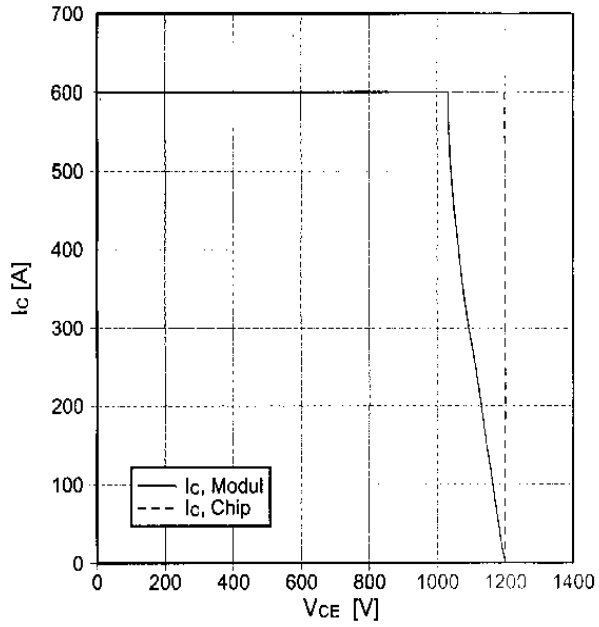
**Schaltverluste IGBT-Wechselr. (typisch)**
**switching losses IGBT-Inverter (typical)**
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
$V_{GE} = \pm 15$ V, $I_C = 300$ A, $V_{CE} = 600$ V



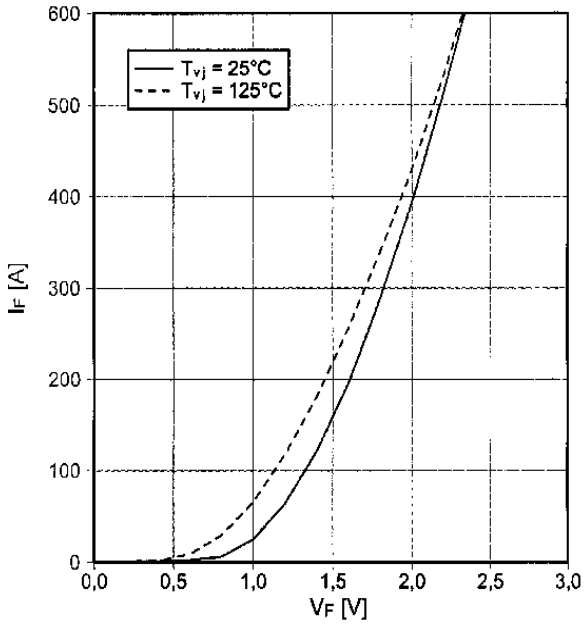

**Transienter Wärmewiderstand IGBT-Wechselr.**
**transient thermal impedance IGBT-inverter**
$Z_{thJC} = f(t)$




**Sicherer Rückwärts-Arbeitsbereich IGBT-Wr.** (RBSOA)
**reverse bias safe operating area IGBT-inv.** (RBSOA)
$I_C = f(V_{CE})$
$V_{GE} = \pm 15$ V, $R_{Goff} = 3{,}3\ \Omega$, $T_{vj} = 125°C$




**Durchlaßkennlinie der Diode-Wechselr. (typisch)**
**forward characteristic of diode-inverter (typical)**
$I_F = f(V_F)$

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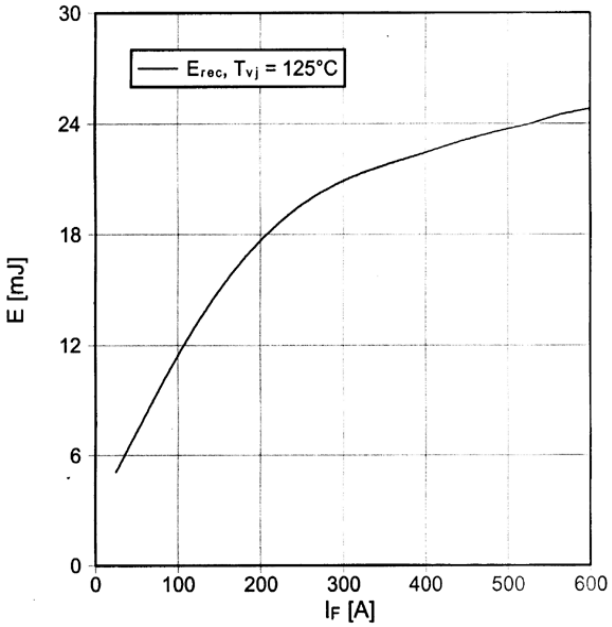
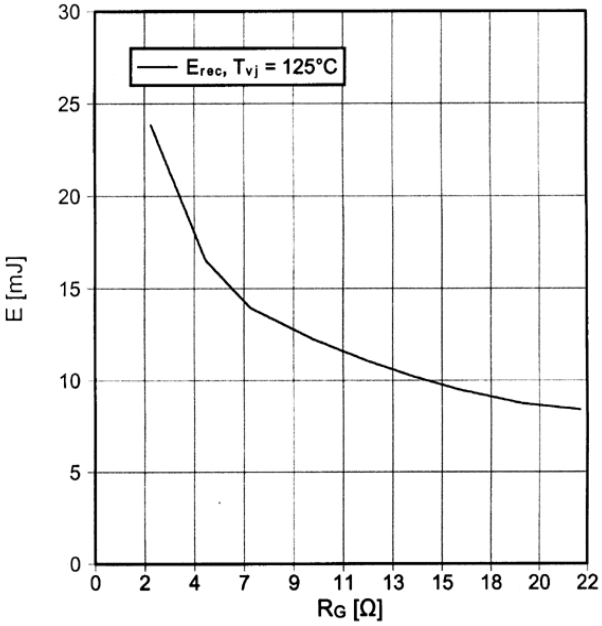
## NPT IGBT Modules

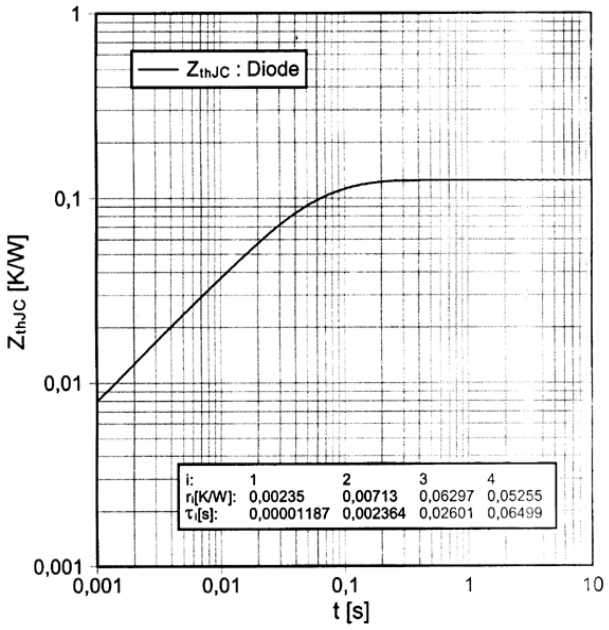
**Schaltverluste Diode-Wechselr. (typisch)**
**switching losses diode-inverter (typical)**
$E_{rec} = f(I_F)$
$R_{Gon} = 3{,}3\ \Omega$, $V_{CE} = 600$ V




**Schaltverluste Diode-Wechselr. (typisch)**
**switching losses diode-inverter (typical)**
$E_{rec} = f(R_G)$
$I_F = 300$ A, $V_{CE} = 600$ V




**Transienter Wärmewiderstand Diode-Wechselr.**
**transient thermal impedance diode-inverter**
$Z_{thJC} = f(t)$

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