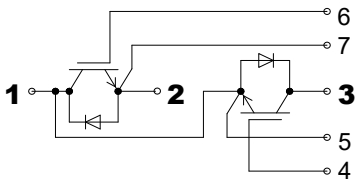
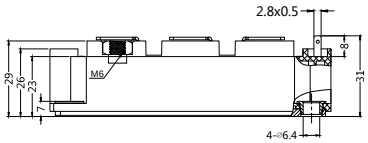
# SGG200T60UC2

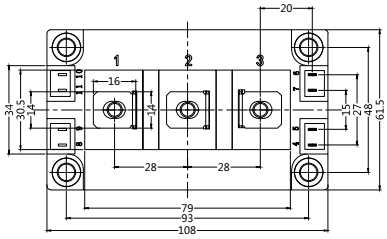
## IGBT Modules

**SGG200T60UC**
**2 (Half Bridge)**

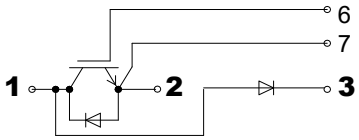



Dimensions in mm (1mm = 0.0394")

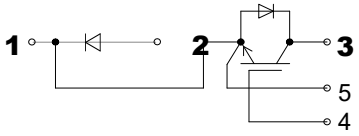



**SGD200T60UC2**
**(Boost Chopper)**




**SDG200T60UC2**
**(Buck Chopper)**




$T_C$ = 25°C, unless otherwise specified

| Symbol | Conditions | Values | Units |
|---|---|---|---|
| IGBT | | | |
| $V_{CES}$ | | 600 | V |
| $I_C$ | $T_C$=25(100)°C | 400(200) | A |
| $I_{CRM}$ | $T_C$=25°C,$t_P$=1ms | 400 | A |
| $V_{GES}$ | | ±20 | V |
| $T_{Vj}$ | | -40...+175 | °C |
| Inverse Diode | | | |
| $I_F$ =-$I_C$ | $T_C$=25(80)°C | 400(200) | A |
| $I_{FRM}$ | $T_C$=25°C,$t_P$=1ms | 400 | A |
| $I_{FSM}$ | $t_P$ =10ms;sin180°;$T_j$=25°C | 1450 | A |
| $V_{RRM}$ | | 600 | V |
| Module $I_{t(RMS)}$ | $T_{teminal}$=80°C | 200 | A |
| $T_{stg}$ | | -40~125 | °C |
| $V_{Isol}$ | AC,1min | 2500 | V |

### *Features*

- Trench FS IGBT technology
- Low switching losses
- Switching frequency up to 30kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- Soft switching diode Technology
- Package with copper baseplate
- Isolation voltage 2500 V

### *Application*

- Inverter welding Machines

### *Advantages*

- space and weight savings
- reduced protection circuits

RoHS Compliant

Sirectifier®





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# SGG200T60UC2

## IGBT Modules

**Characteristics** $T_C$ = 25°C, unless otherwise specified

| Symbol | Conditions | min. | typ. | max. | Units |
|---|---|---|---|---|---|
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE}$=$V_{CE}$,$I_C$=3mA | 4.5 | 5.5 | 6.5 | V |
| $I_{CES}$ | $V_{GE}$=0;$V_{CE}$=$V_{CES}$;$T_j$=25°C | | | 0.40 | mA |
| $V_{CE(TO)}$ | $T_j$=25°C | | 0.9 | 1.0 | V |
| $r_{CE}$ | $V_{GE}$=15V,$T_j$=25(150)°C | | 2.8(4.3) | 4.5(6.0) | mΩ |
| $V_{CE(sat)}$ | $I_C$=200A;$V_{GE}$=15V;chip level | | 1.65 | 1.90 | V |
| $C_{ies}$ | under following conditions | | 11.80 | | nF |
| $C_{oes}$ | $V_{GE}$=0,$V_{CE}$=25V,f=1MHz | | 0.70 | | |
| $C_{res}$ | | | 0.38 | | |
| $L_{CE}$ | | | | 30 | nH |
| $R_{CC'+EE'}$ | res., erminal-chip $T_C$=25(125)°C | | 0.75(1.02) | | mΩ |
| $t_{d(on)}$ | under following conditions: | | 128 | | ns |
| $t_r$ | $V_{CC}$=300V,$I_C$=200A | | 70 | | ns |
| $t_{d(off)}$ | $R_{Gon}$=$R_{Goff}$=Ω,$T_j$=150°C | | 505 | | ns |
| $t_f$ | $V_{GE}$=±15V | | 48 | | ns |
| $E_{on}$/$E_{off}$/$E_{ts}$ | | | 14/7.8/21.8 | | mJ |
| Inverse Diode | under following conditions: | | | | |
| $V_F$ = $V_{EC}$ | $I_F$=200A;$V_{GE}$=0V;$T_j$=25°C | | 1.55 | | V |
| $V_{(FO)}$ | $T_j$=25(125)°C | | 0.95(1.05) | 1.00(1.20) | V |
| $r_F$ | $T_j$=25(125)°C | | 22(24) | 25(27) | mΩ |
| $I_{RM}$ | $I_F$=300A;$T_j$=125°C | | 100 | | A |
| $Q_{rr}$ | di/dt=100A/us | | 30 | | uC |
| $E_{rr}$ | $V_{GE}$=±15V | | 5.8 | | mJ |
| Thermal Characteristics | | | | | |
| $R_{th(j-c)}$ | per IGBT | | | 0.20 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | | | 0.38 | K/W |
| $R_{th(c-s)}$ | per module | | | 0.065 | K/W |
| Mechanical Data | | | | | |
| $M_s$ | to heatsink M6 | 3 | | 5 | Nm |
| $M_t$ | to terminals M6 | 2.5 | | 5 | Nm |
| Weight | typical | | | 325 | g |



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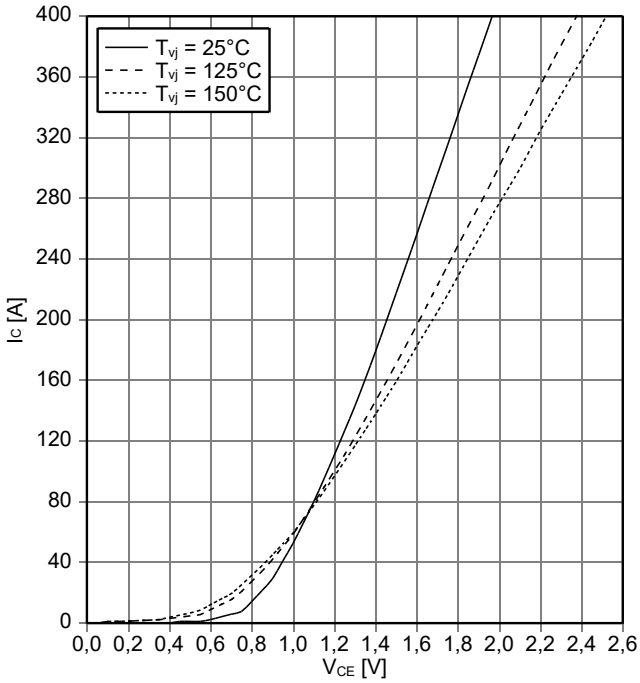


**Fig.1 Output haracteristic IGBT,Inverter (typical)** $I_C=f(V_{CE})$ $V_{GE}=15V$

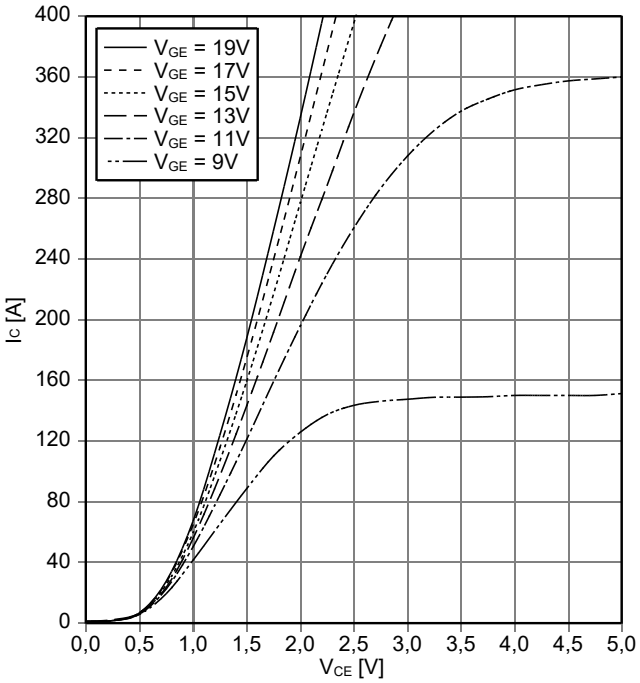


**Fig.2 Output haracteristic IGBT,Inverter (typical)** $I_C=f(V_{CE})$ $T_{vj}=150°C$

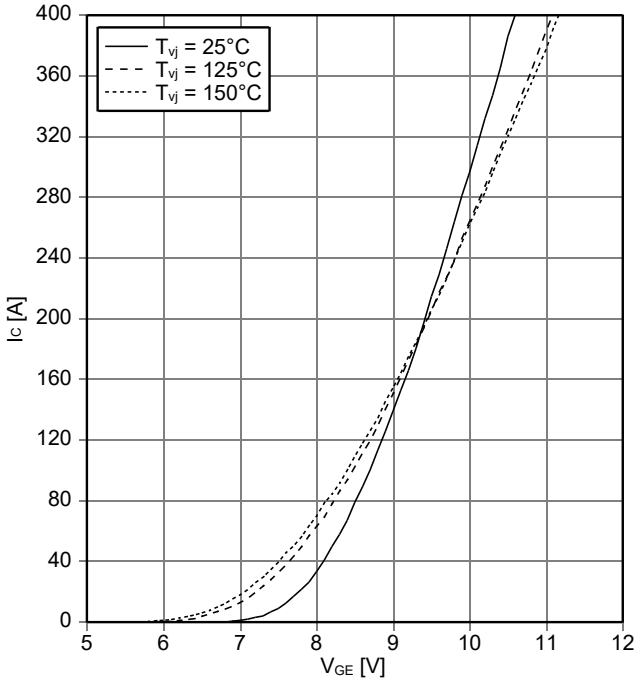


**Fig.3 Transfer characteristic IGBT,Inverter(typical)**
$I_C=f(V_{GE})$ $V_{CE}=20$ V

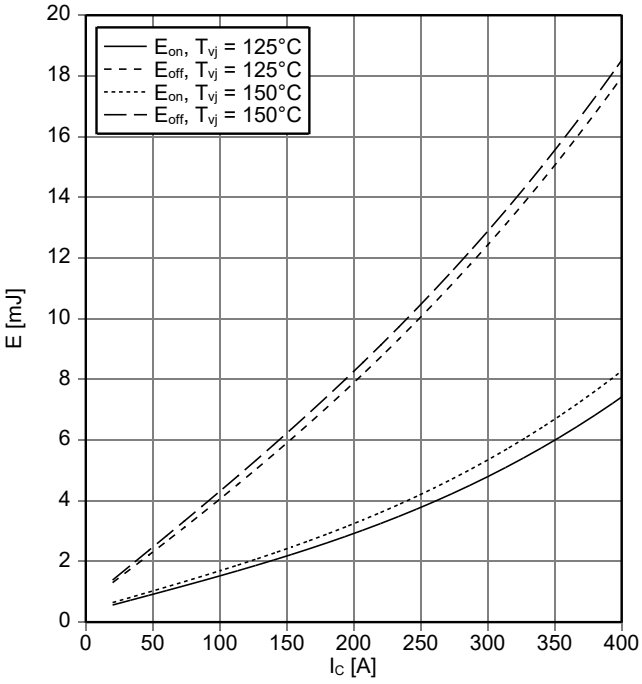


**Fig.4 Switching losses IGBT,Inverter (typical)**
$E_{on}= f(I_C)$,$E_{off} =f(I_C)$,$V_{GE}=\pm15V$,$R_{Gon}=3.9\ \Omega$,
$R_{Goff} =3.9\Omega$,$V_{CE}=300$ V



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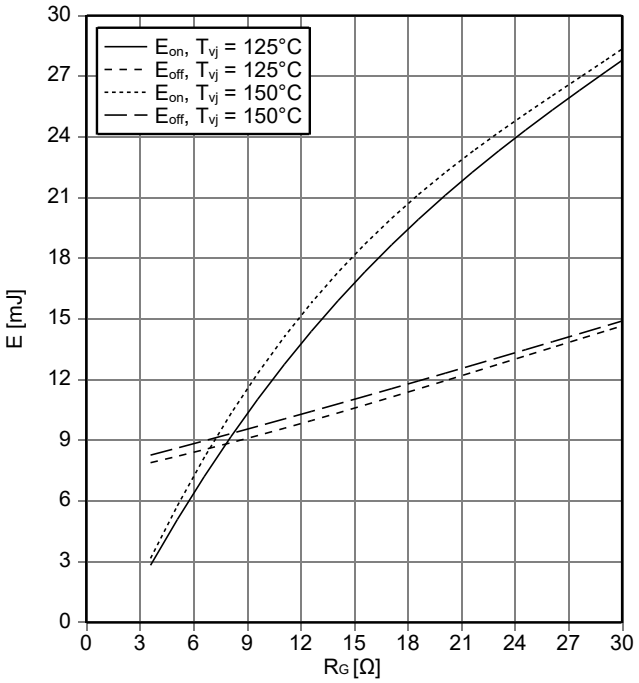


**Fig.5 Switching losses IGBT,Inverter (typical)**
$E_{on}=f(R_G),E_{off}=f(R_G),V_{GE}=\pm15V,I_C=200A,V_{CE}300V$

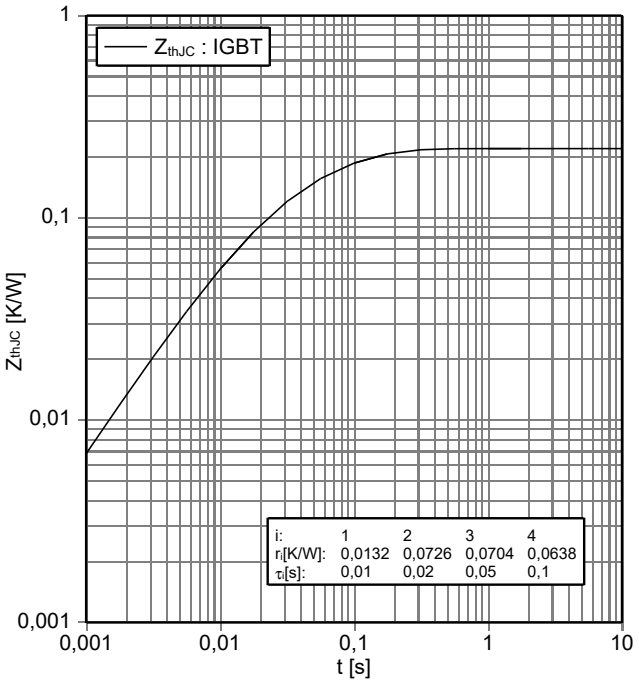


**Fig.6 Transient thermal impedance IGBT,Inverter**
$Z_{thJ}=f(t)$

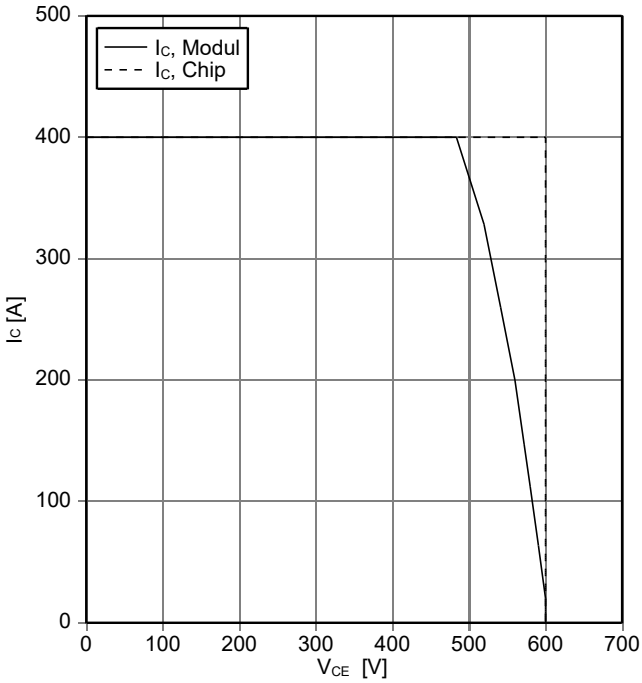


**Fig.7 Reverse bias safe operating area IGBT,Inverter (RBSOA)** $I_C=f(V_{CE}),V_{GE}=\pm15V,R_{Goff}=3.9\Omega,T_{vj}=150°C$

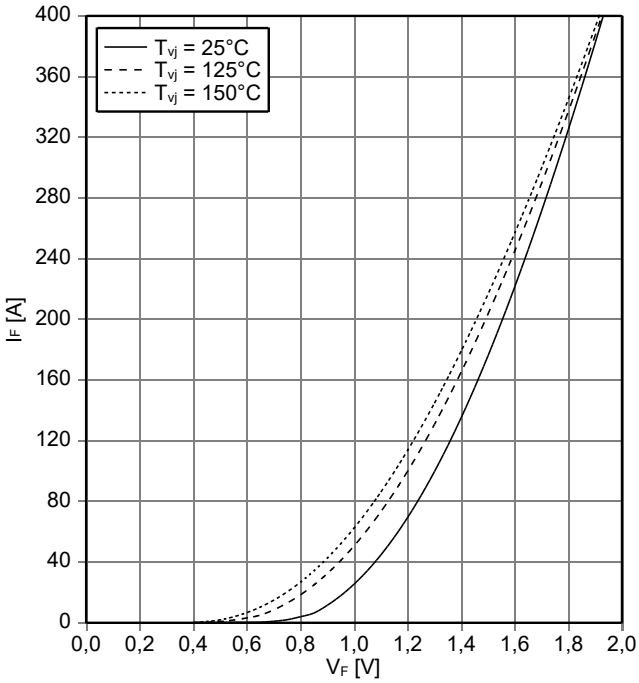


**Fig.8 Forward characteristic of Diode, Inverter (typical)**
$I_F=f(V_F)$



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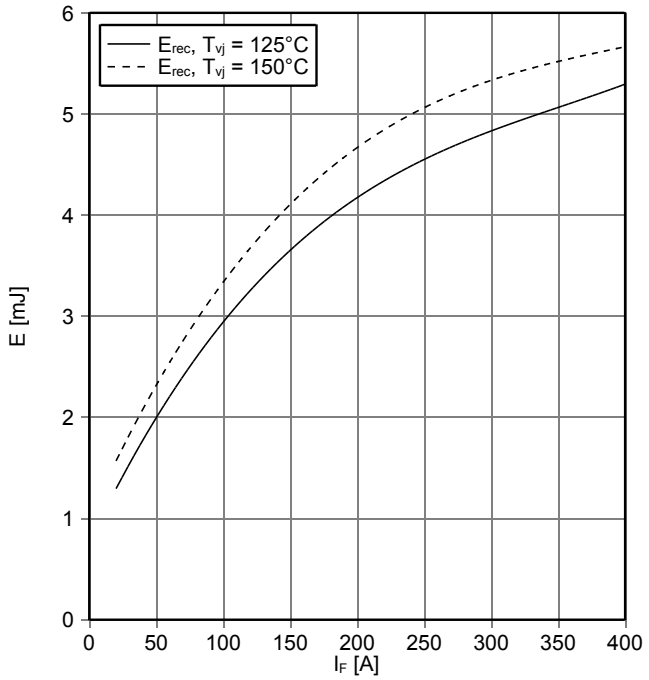


**Fig.9 Switching losses Diode, Inverter (typical)**
$E_{rec}=f(I_F)$,$R_{Gon}=3.9\Omega$,$V_{CE}=300V$

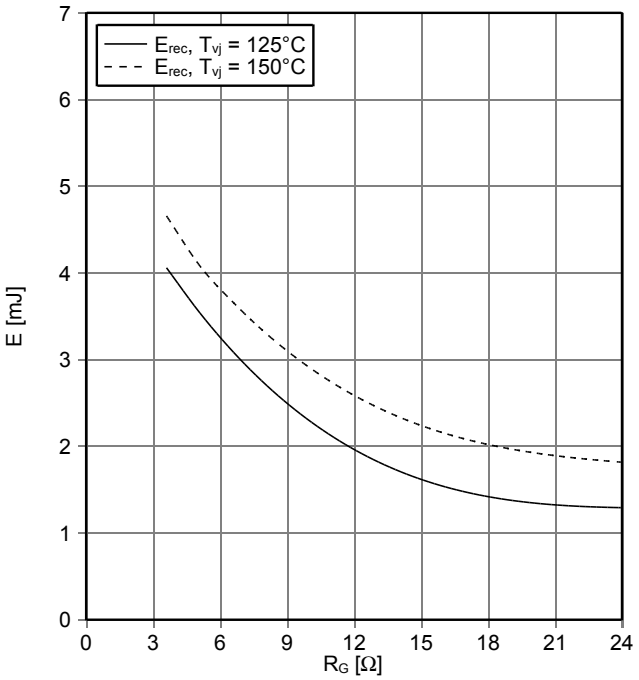


**Fig.10 Switching losses Diode, Inverter (typical)**
$E_{rec}=f(R_G)$,$I_F=200A$,$V_{CE}=300$ V

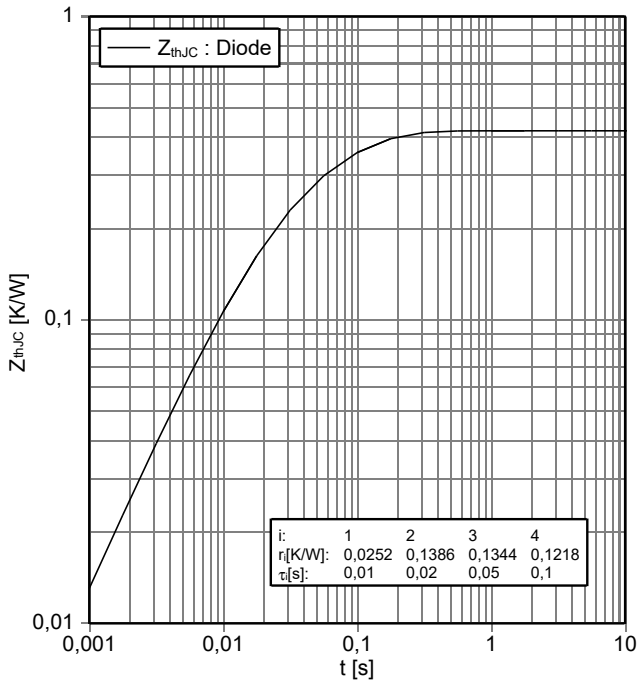


**Fig.11 Transient thermal impedance Diode, Inverter**
$Z_{thJC}=f(t)$



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