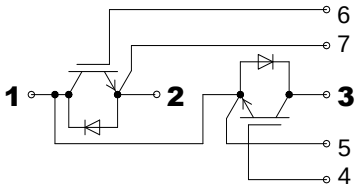
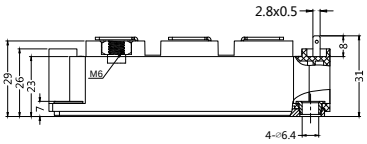
# SGG300T120UC2

## IGBT Modules

**SGG300T120UC2**




Dimensions in mm (1mm = 0.0394")

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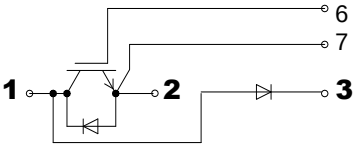
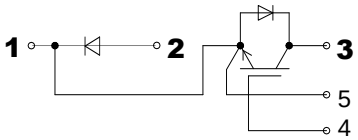
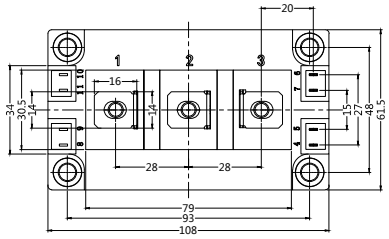



**SDG300T120UC2**




$T_C$ = 25°C, unless otherwise specified

| Symbol | Conditions | Values | Units |
|---|---|---|---|
| IGBT | | | |
| $V_{CES}$ | | 1200 | V |
| $I_{Cnom}$ | | 300 | A |
| $I_{CRM}$ | $T_C$= 25°C,$t_P$=1ms | 900 | A |
| $V_{GES}$ | | ±20 | V |
| $T_{Vj}$ | | -40...+175 | °C |
| Inverse Diode | | | |
| $I_F$ | $T_C$=25(80)°C | 350(260) | A |
| $I_{FRM}$ | $T_C$=25°C,$t_P$=1ms | 900 | A |
| $I_{FSM}$ | $t_P$=10ms; sin.;$T_j$=150°C | 1548 | A |
| Module | | | |
| $I_{t(RMS)}$ | $T_{teminal}$=80°C | 500 | A |
| $T_{stg}$ | | -40~125 | °C |
| $V_{Isol}$ | AC,1min | 4000 | V |

### *Features*

- Trench FS IGBT4 technology
- Low switching losses
- Switching frequency up to 20kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- Soft switching FRD diode Technology
- Package with copper base plate
- Isolation voltage 4000V

### *Application*

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters

### *Advantages*

- space and weight savings
- reduced protection circuits

RoHS Compliant

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# SGG300T120UC2

## IGBT Modules

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

| Symbol | Conditions | min. | typ. | max. | Units |
|---|---|---|---|---|---|
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE}$=$V_{CE}$,$I_C$=15.2mA | 5.3 | 5.8 | 6.3 | V |
| $I_{CES}$ | $V_{GE}$=0;$V_{CE}$=$V_{CES}$;$T_j$=25°C | | | 4.0 | mA |
| $V_{CE(TO)}$ | $T_j$=25°C | | 0.8 | 0.9 | V |
| $r_{CE}$ | $V_{GE}$=15V,$T_j$=25(150)°C | | 3.50(5.17) | 4.00(5.50) | mΩ |
| $V_{CE(sat)}$ | $I_C$=300A;$V_{GE}$=15V;chip level | | 1.80 | 2.05 | V |
| $C_{ies}$ | under following conditions | | 17.6 | | nF |
| $C_{oes}$ | $V_{GE}$=0,$V_{CE}$=25V,f=1MHz | | 1.16 | | |
| $C_{res}$ | | | 0.94 | | |
| $L_{CE}$ | | | 15 | | nH |
| $R_{CC'+EE'}$ | res.,terminal-chip $T_C$=25(125)°C | | 0.25(0.55) | | mΩ |
| $t_{d(on)}$ | under following conditions: | | 200 | | ns |
| $t_r$ | $V_{CC}$=600V,$I_C$=300A | | 44 | | ns |
| $t_{d(off)}$ | $R_{Gon}$= $R_{Goff}$ =1Ω,$T_j$=150°C | | 450 | | ns |
| $t_f$ | $V_{GE}$=±15V | | 90 | | ns |
| $E_{on}$($E_{off}$) | | | 27(29) | | mJ |
| Inverse Diode under following conditions: | | | | | |
| $V_F$ = $V_{EC}$ | $I_F$=300A;$V_{GE}$=0V;$T_j$=25°C | | 2.17 | 2.50 | V |
| $V_{(FO)}$ | $T_j$=25(150)°C | | 1.3(0.9) | 1.5(1.1) | V |
| $r_F$ | $T_j$=25(150)°C | | 2.9(4.0) | 3.3(4.4) | mΩ |
| $I_{RRM}$ | $I_F$=300A; $T_j$ =150°C | | 345 | | A |
| $Q_{rr}$ | di/dt=8800A/us | | 54 | | uC |
| $E_{rr}$ | $V_{GE}$=15V | | 23 | | mJ |
| Thermal Characteristics | | | | | |
| $R_{th(j-c)}$ | per IGBT | | | 0.11 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | | | 0.17 | K/W |
| $R_{th(c-s)}$ | per module | | | 0.038 | 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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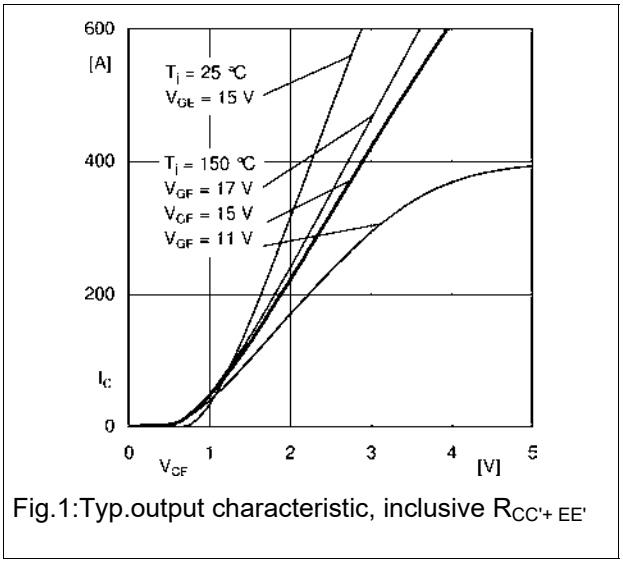


Fig.1:Typ.output characteristic, inclusive $R_{CC'+EE'}$

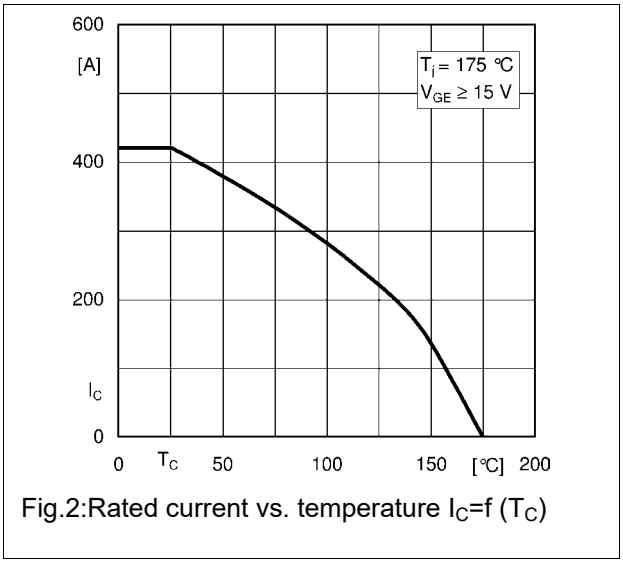


Fig.2:Rated current vs. temperature $I_C=f(T_C)$

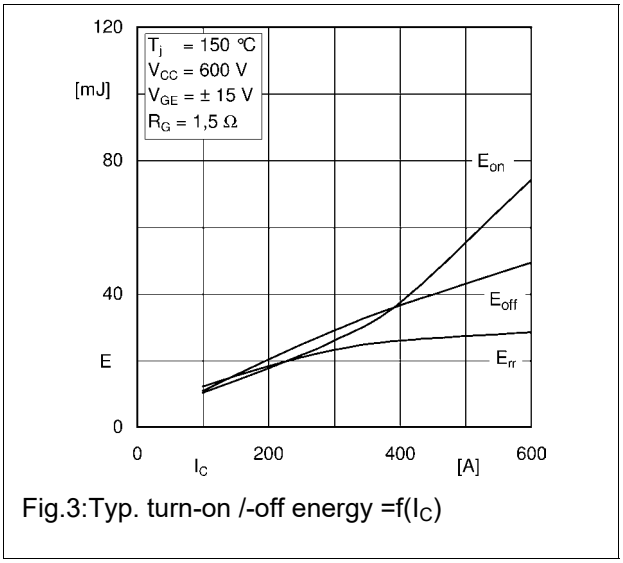


Fig.3:Typ. turn-on /-off energy =f($I_C$)

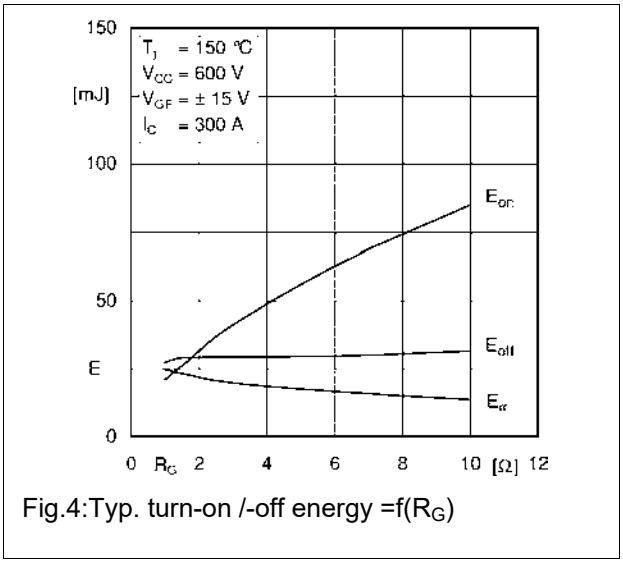


Fig.4:Typ. turn-on /-off energy =f($R_G$)

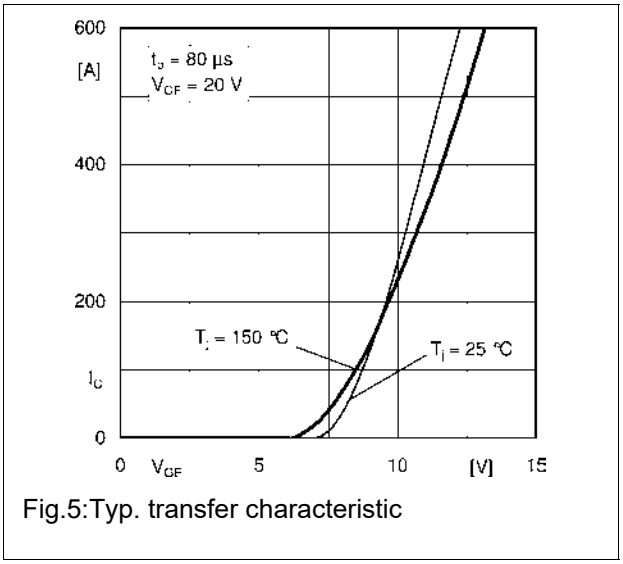


Fig.5:Typ. transfer characteristic

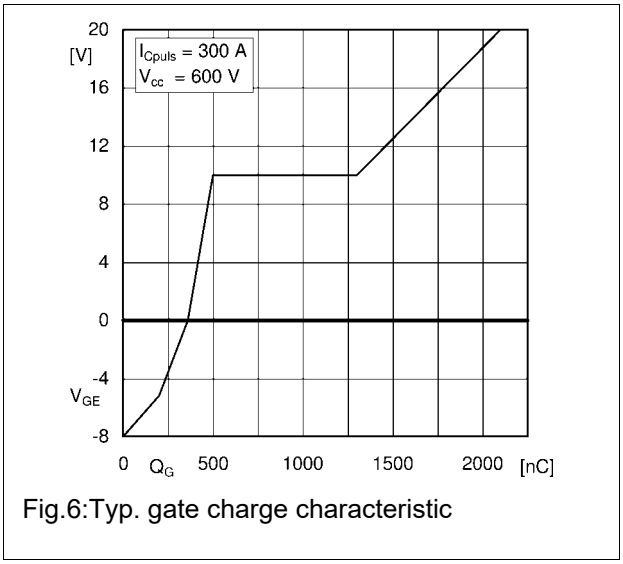


Fig.6:Typ. gate charge characteristic





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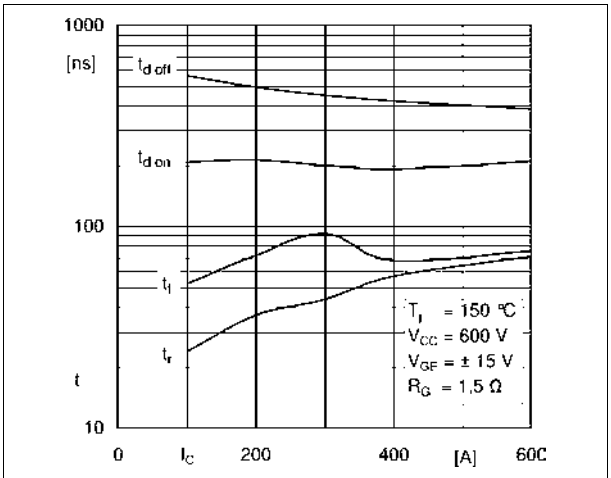


Fig.7:Typ.switching times vs. $I_C$

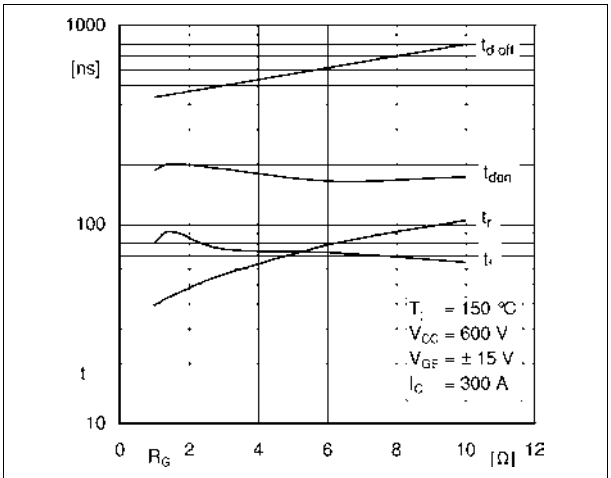


Fig.8:Typ. switching times vs. gate resistor $R_G$

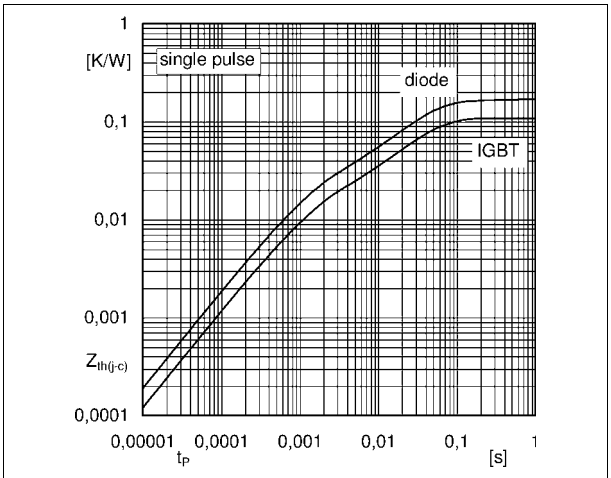


Fig.9:Transient thermal impedance

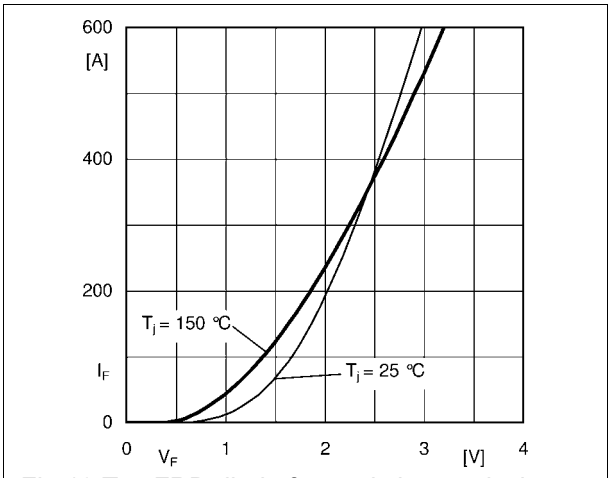


Fig.10:Typ.FRD diode forward charact.,incl. $R_{CC'+\,EE'}$

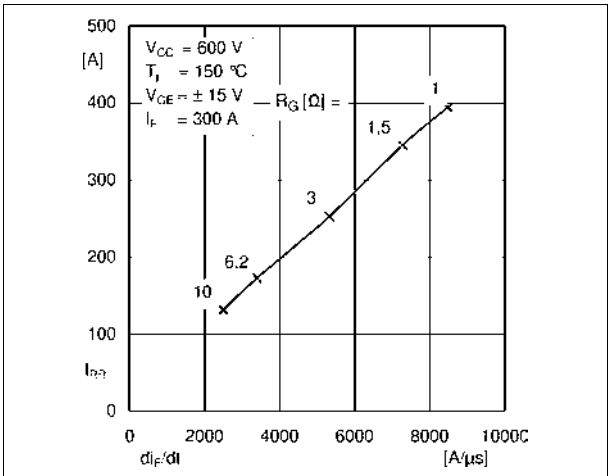


Fig.11:FRD diode peak reverse recovery current

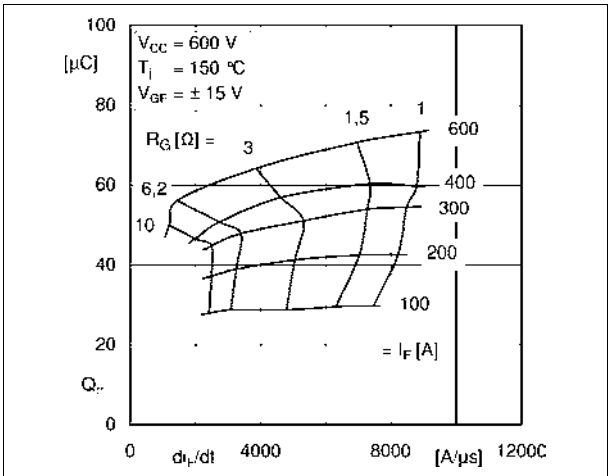


Fig.12:Typ. FRD diode peak reverse recovery charge





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