

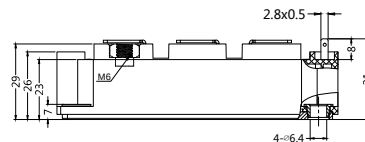
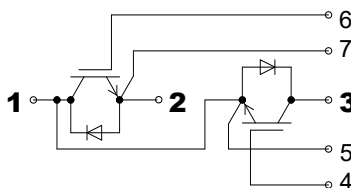
# SGG200T120UC2

## IGBT Modules

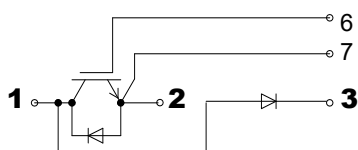


SGG200T120UC2

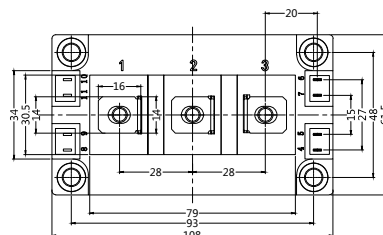
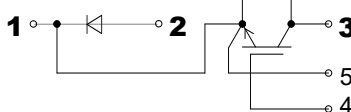
Dimensions in mm (1mm = 0.0394")



SGD200T120UC2



SDG200T120UC2



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

| Symbol               | Conditions                                          | Values           | Units            |
|----------------------|-----------------------------------------------------|------------------|------------------|
| <b>IGBT</b>          |                                                     |                  |                  |
| $V_{CES}$            |                                                     | 1200             | V                |
| $I_{Cnom}$           |                                                     | 200              | A                |
| $I_{CRM}$            | $T_c = 25^\circ\text{C}, t_p = 1\text{ms}$          | 400              | A                |
| $V_{GES}$            |                                                     | $\pm 20$         | V                |
| $T_{vj}$             |                                                     | $-40 \dots +175$ | $^\circ\text{C}$ |
| <b>Inverse Diode</b> |                                                     |                  |                  |
| $I_F$                | $T_c = 25(80)^\circ\text{C}$                        | 230(200)         | A                |
| $I_{FRM}$            | $T_c = 25^\circ\text{C}, t_p = 1\text{ms}$          | 400              | A                |
| $I_{FSM}$            | $t_p = 10\text{ms}; \sin.; T_j = 150^\circ\text{C}$ | 990              | A                |
| <b>Module</b>        |                                                     |                  |                  |
| $I_{t(RMS)}$         | $T_{terminal} = 80^\circ\text{C}$                   | 400              | A                |
| $T_{stg}$            |                                                     | $-40 \sim 125$   | $^\circ\text{C}$ |
| $V_{isol}$           | AC, 1min                                            | 4000             | V                |

### Features

- Trench Field Stop IGBT4 technology
- Low switching losses
- Switching frequency up to 20kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Soft switching Free wheeling 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

**Sirectifier®**

# SGG200T120UC2

## IGBT Modules

### Characteristics

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

| Symbol                                           | Conditions                                                                                                                                             | min. | typ.       | max.       | Units         |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------|------------|---------------|
| <b>IGBT</b>                                      |                                                                                                                                                        |      |            |            |               |
| $V_{GE(th)}$                                     | $V_{GE}=V_{CE}, I_C=8\text{mA}$                                                                                                                        | 5.0  | 5.8        | 6.5        | V             |
| $I_{CES}$                                        | $V_{GE}=0; V_{CE}=V_{CES}; T_j=25(125)^{\circ}\text{C}$                                                                                                |      | 0.1        | 0.3        | mA            |
| $V_{CE(TO)}$                                     | $T_j=25^{\circ}\text{C}$                                                                                                                               |      | 0.8        | 0.9        | V             |
| $r_{CE}$                                         | $V_{GE}=15\text{V}, T_j=25(150)^{\circ}\text{C}$                                                                                                       |      | 5.0(7.5)   | 5.8(8.0)   | m $\Omega$    |
| $V_{CE(sat)}$                                    | $I_C=200\text{A}; V_{GE}=15\text{V}; \text{chip level}$                                                                                                |      | 1.80       | 2.15       | V             |
| $C_{ies}$                                        | under following conditions<br>$V_{GE}=0, V_{CE}=25\text{V}, f=1\text{MHz}$                                                                             |      | 12.3       |            | nF            |
| $C_{oes}$                                        |                                                                                                                                                        |      | 0.81       |            |               |
| $C_{res}$                                        |                                                                                                                                                        |      | 0.69       |            |               |
| $L_{CE}$                                         |                                                                                                                                                        |      |            | 20         | nH            |
| $R_{CC'+EE'}$                                    | res., terminal-chip $T_c=25(125)^{\circ}\text{C}$                                                                                                      |      | 0.25(0.5)  |            | m $\Omega$    |
| $t_{d(on)}$                                      | under following conditions:<br>$V_{CC}=600\text{V}, I_C=200\text{A}$<br>$R_{Gon}=R_{Goff}=5\Omega, T_j=150^{\circ}\text{C}$<br>$V_{GE}=\pm 15\text{V}$ |      | 185        |            | ns            |
| $t_r$                                            |                                                                                                                                                        |      | 40         |            | ns            |
| $t_{d(off)}$                                     |                                                                                                                                                        |      | 425        |            | ns            |
| $t_f$                                            |                                                                                                                                                        |      | 82         |            | ns            |
| $E_{on}(E_{off})$                                |                                                                                                                                                        |      | 21(20)     |            | mJ            |
| <b>Inverse Diode</b> under following conditions: |                                                                                                                                                        |      |            |            |               |
| $V_F = V_{EC}$                                   | $I_F=200\text{A}; V_{GE}=0\text{V}; T_j=25(150)^{\circ}\text{C}$                                                                                       |      | 2.20(2.15) | 2.52(2.47) | V             |
| $V_{(FO)}$                                       | $T_j=25(150)^{\circ}\text{C}$                                                                                                                          |      | 1.30(0.90) | 1.50(1.10) | V             |
| $r_F$                                            | $T_j=25(150)^{\circ}\text{C}$                                                                                                                          |      | 4.5(6.3)   | 5.1(6.8)   | m $\Omega$    |
| $I_{RRM}$                                        | $I_F=200\text{A}; T_j=150^{\circ}\text{C}$                                                                                                             |      | 174        |            | A             |
| $Q_{rr}$                                         | $di/dt=4450\text{A/us}$                                                                                                                                |      | 33         |            | $\mu\text{C}$ |
| $E_{rr}$                                         | $V_{GE}=15\text{V}$                                                                                                                                    |      | 13         |            | mJ            |
| <b>FWD</b> under following conditions:           |                                                                                                                                                        |      |            |            |               |
| $V_F = V_{EC}$                                   | $I_F=200\text{A}; V_{GE}=0\text{V}; T_j=25(150)^{\circ}\text{C}$                                                                                       |      | 2.20(2.15) | 2.52(2.47) | V             |
| $V_{(FO)}$                                       | $T_j=25(150)^{\circ}\text{C}$                                                                                                                          |      | 1.30(0.90) | 1.50(1.10) | V             |
| $r_F$                                            | $T_j=25(150)^{\circ}\text{C}$                                                                                                                          |      | 4.5(6.3)   | 5.1(6.8)   | m $\Omega$    |
| $I_{RRM}$                                        | $I_F=200\text{A}; T_j=25(150)^{\circ}\text{C}$                                                                                                         |      | 174        |            | A             |
| $Q_{rr}$                                         | $di/dt=4450\text{A/us}$                                                                                                                                |      | 33         |            | $\mu\text{C}$ |
| $E_{rr}$                                         | $V_{GE}=15\text{V}$                                                                                                                                    |      | 13         |            | mJ            |
| <b>Thermal Characteristics</b>                   |                                                                                                                                                        |      |            |            |               |
| $R_{th(j-c)}$                                    | per IGBT                                                                                                                                               |      |            | 0.14       | K/W           |
| $R_{th(j-c)D}$                                   | per Inverse Diode                                                                                                                                      |      |            | 0.26       | K/W           |
| $R_{th(c-s)}$                                    | per module                                                                                                                                             |      |            | 0.038      | K/W           |
| <b>Mechanical Data</b>                           |                                                                                                                                                        |      |            |            |               |
| $M_s$                                            | to heatsink M6                                                                                                                                         | 3    |            | 5          | Nm            |
| $M_t$                                            | to terminals M6                                                                                                                                        | 2.5  |            | 5          | Nm            |
| Weight                                           | typical                                                                                                                                                |      |            | 325        | g             |

# SGG200T120UC2

## IGBT Modules

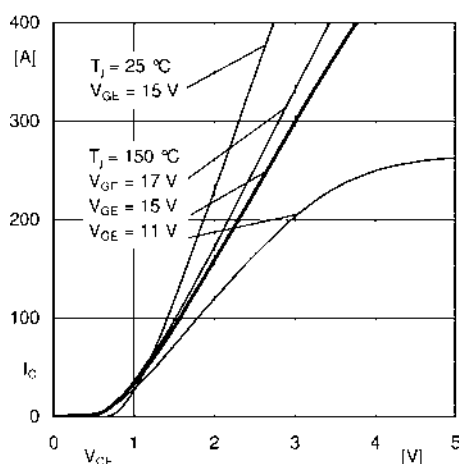


Fig.1:Typ. output characteristic, inclusive  $R_{CC} + EE'$

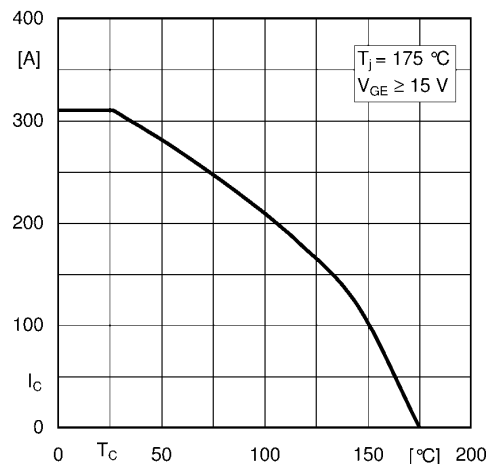


Fig.2:Rated current vs. temperature  $I_C = f(T_C)$

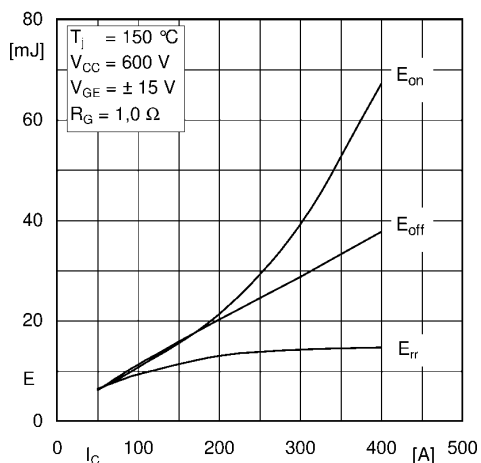


Fig.3:Typ. turn-on /-off energy =  $f(I_C)$

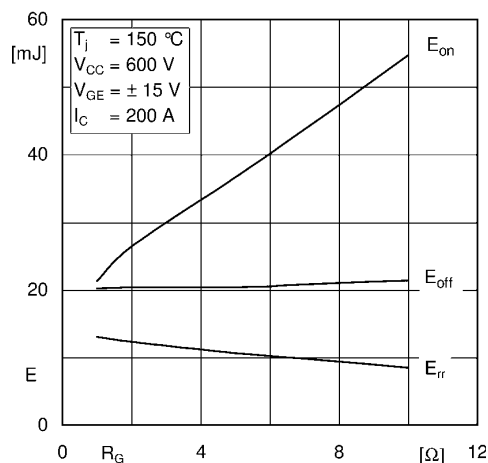


Fig.4:Typ. turn-on /-off energy =  $f(R_G)$

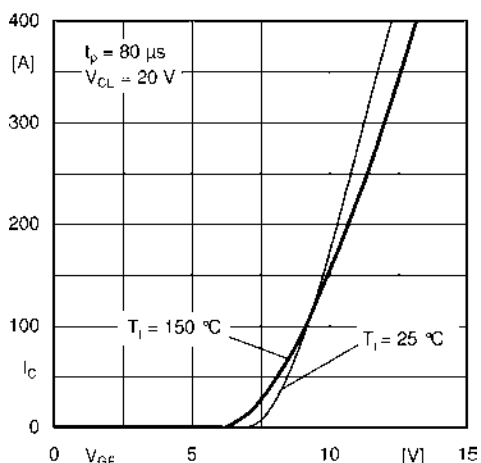


Fig.5:Typ. transfer characteristic

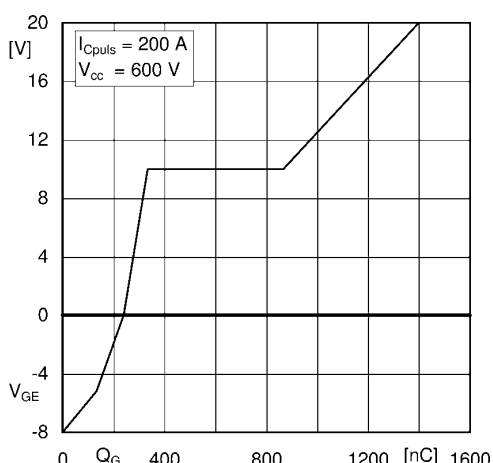


Fig.6:Typ. gate charge characteristic

# SGG200T120UC2

## IGBT Modules

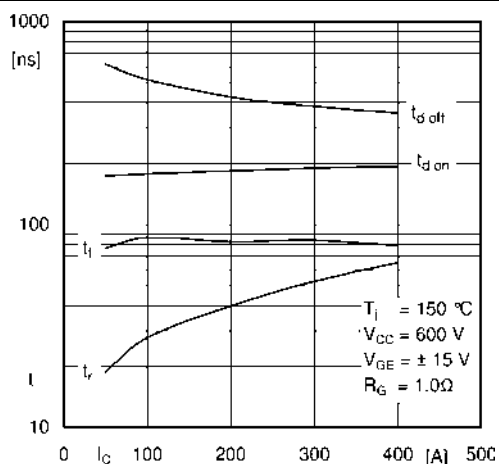


Fig.7:Typ. switching times vs.  $I_C$

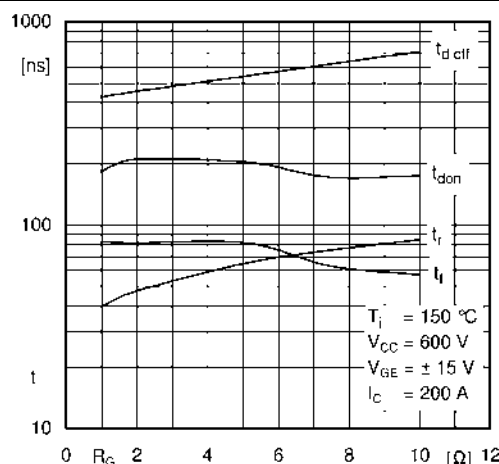


Fig.8:Typ. switching times vs. gate resistor  $R_G$

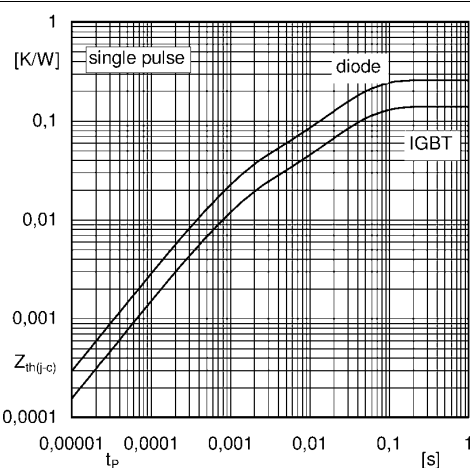


Fig.9:Transient thermal impedance

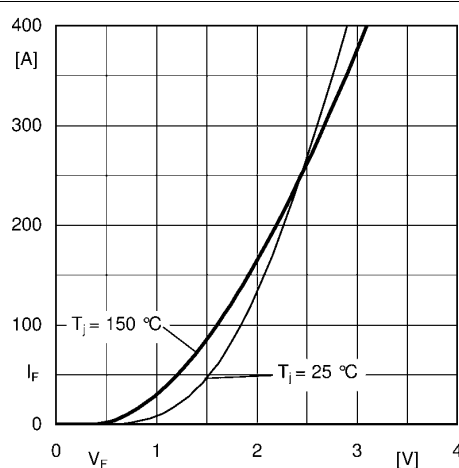


Fig.10:FWD diode forward characteristic

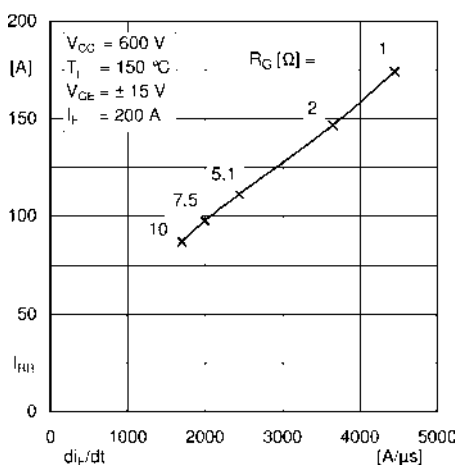


Fig.11:FWD diode peak reverse recovery current

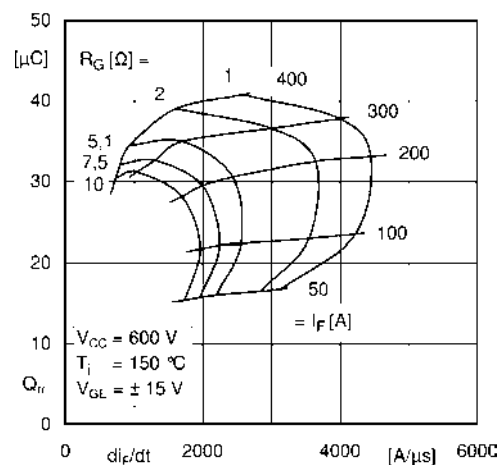


Fig.12:Typ. FWD diode peak reverse recovery charge