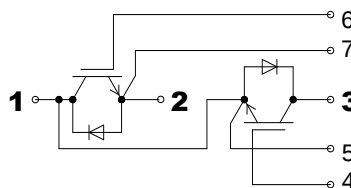


# SGG300T120UC2

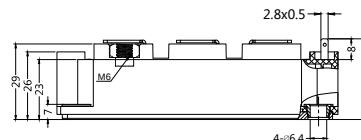
## IGBT Modules



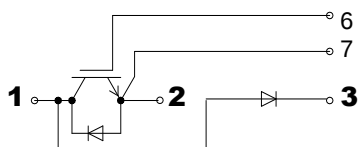
SGG300T120UC2



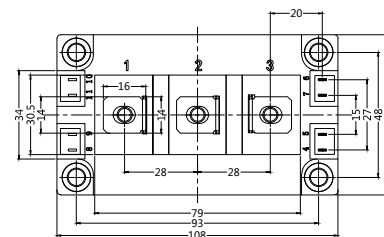
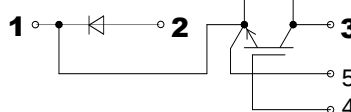
Dimensions in mm (1mm = 0.0394")



SGD300T120UC2



SDG300T120UC2



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

| Symbol               | Conditions                                            | Values           | Units              |
|----------------------|-------------------------------------------------------|------------------|--------------------|
| <b>IGBT</b>          |                                                       |                  |                    |
| $V_{CES}$            |                                                       | 1200             | V                  |
| $I_{Cnom}$           |                                                       | 300              | A                  |
| $I_{CRM}$            | $T_c = 25^{\circ}\text{C}, t_p = 1\text{ms}$          | 900              | A                  |
| $V_{GES}$            |                                                       | $\pm 20$         | V                  |
| $T_{vj}$             |                                                       | $-40 \dots +175$ | $^{\circ}\text{C}$ |
| <b>Inverse Diode</b> |                                                       |                  |                    |
| $I_F$                | $T_c = 25(80)^{\circ}\text{C}$                        | 350(260)         | A                  |
| $I_{FRM}$            | $T_c = 25^{\circ}\text{C}, t_p = 1\text{ms}$          | 900              | A                  |
| $I_{FSM}$            | $t_p = 10\text{ms}; \sin.; T_j = 150^{\circ}\text{C}$ | 1548             | A                  |
| <b>Module</b>        |                                                       |                  |                    |
| $I_{t(RMS)}$         | $T_{terminal} = 80^{\circ}\text{C}$                   | 500              | A                  |
| $T_{stg}$            |                                                       | $-40 \sim 125$   | $^{\circ}\text{C}$ |
| $V_{isol}$           | 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 paralleling
- 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



**Sirectifier®**

# SGG300T120UC2

## IGBT Modules

### Characteristics

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

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

# SGG300T120UC2

## IGBT Modules

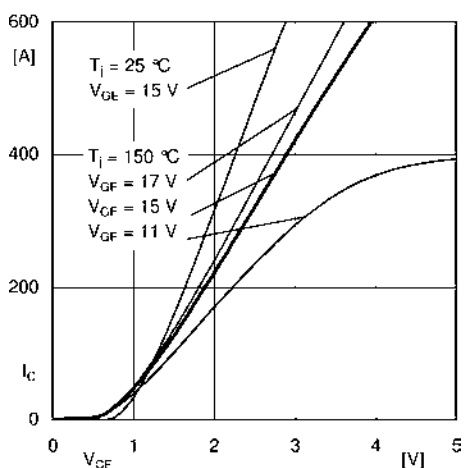


Fig.1: Typ. output characteristic, inclusive  $R_{CC} + EE'$

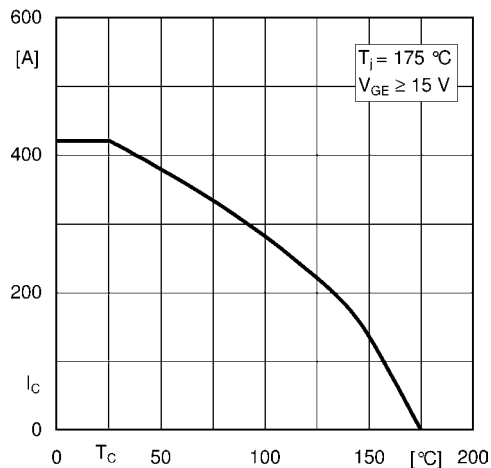


Fig.2: Rated current vs. temperature  $I_C = f(T_C)$

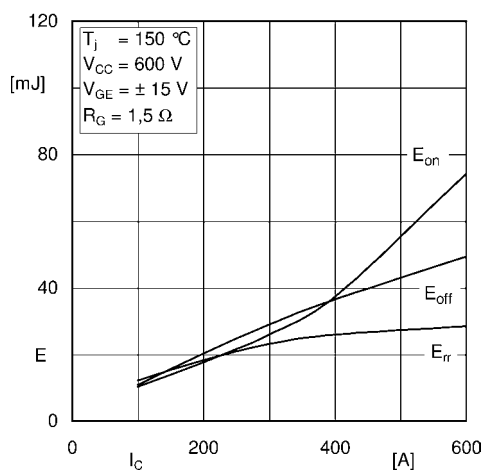


Fig.3: Typ. turn-on /-off energy  $= f(I_C)$

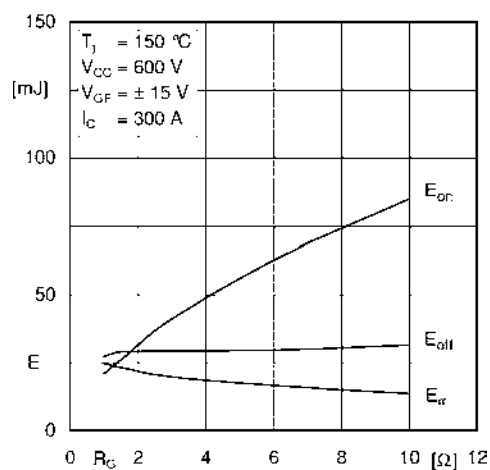


Fig.4: Typ. turn-on /-off energy  $= f(R_G)$

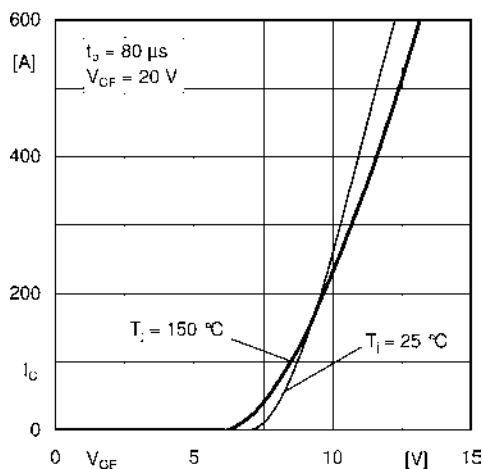


Fig.5: Typ. transfer characteristic

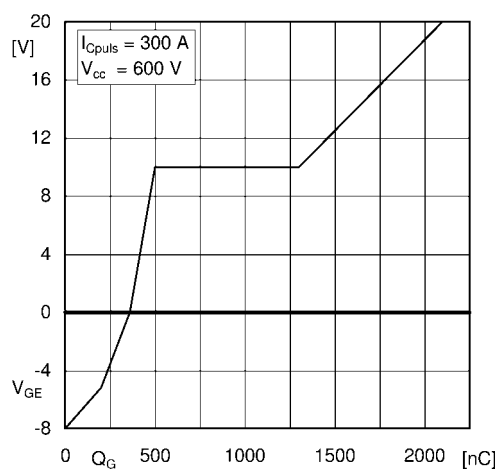


Fig.6: Typ. gate charge characteristic

# SGG300T120UC2

## IGBT Modules

