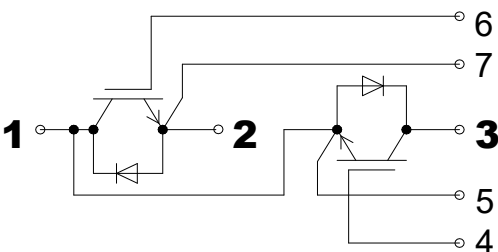


# SGG75NF120SC1

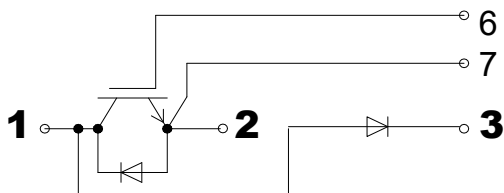
## IGBT Modules For Welding Application



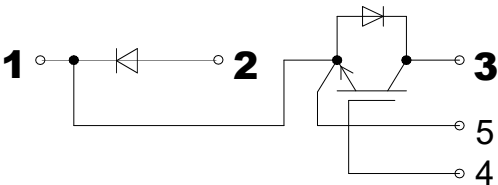
SGG75NF120SC1



SGD75NF120SC1



SDG75NF120SC1



| Symbol               | Test Condition                                                      | Value                | Unit                 |
|----------------------|---------------------------------------------------------------------|----------------------|----------------------|
| <b>IGBT</b>          |                                                                     |                      |                      |
| $V_{CES}$            |                                                                     | 1200                 | V                    |
| $I_C$                | $T_C = 100^{\circ}\text{C}$ per chip                                | 75                   | A                    |
| $V_{GES}$            |                                                                     | $\pm 20$             | V                    |
| $T_{vj} (T_{stg})$   |                                                                     | $-40 \sim +150(125)$ | $^{\circ}\text{C}$   |
| $P_{tot}$            |                                                                     | 300                  | W                    |
| <b>INVERSE DIODE</b> |                                                                     |                      |                      |
| $I_F$                | $T_C = 25^{\circ}\text{C}$ per chip                                 | 35                   | A                    |
| $I_{FSM}$            |                                                                     | 350                  | A                    |
| $V_{RRM}$            |                                                                     | 1200                 | V                    |
| $i^2_t$              | $T_j = 125^{\circ}\text{C}$ , $t = 10\text{ms}$ , $V_R = 0\text{V}$ | 350                  | $\text{A}^2\text{s}$ |

# SGG75NF120SC1

## IGBT Modules For Welding Application

| Symbol                                                                              | Test Conditions                                                    | Min | Typ       | Max        | Unit |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----|-----------|------------|------|
| IGBT <span style="float:right">Tc = 25°C unless otherwise specified</span>          |                                                                    |     |           |            |      |
| V <sub>GE(th)</sub>                                                                 | VGE=VCE, IC = 1mA                                                  | 4.5 | 5.0       | 5.7        | V    |
| I <sub>CES</sub>                                                                    | VGE = 0; VCE=VCES; Tj=25(125)°C                                    |     |           | 1          | mA   |
| V <sub>CE(TO)</sub>                                                                 | Tj=25(125)°C                                                       |     | 1.0(0.9)  | 1.15(1.05) | V    |
| r <sub>CE</sub>                                                                     | VGE=15V                                                            |     | 18(25)    | 24(29)     | mΩ   |
| V <sub>CE(sat)</sub>                                                                | IC=75A; VGE=15V; chip level                                        |     | 1.9       | 2.3        | V    |
| C <sub>ies</sub>                                                                    | VGE=0V, VCE=25V, f=1MHz                                            |     | 6.3       |            | nF   |
| C <sub>oes</sub>                                                                    |                                                                    |     | 0.86      |            |      |
| C <sub>res</sub>                                                                    |                                                                    |     | 0.55      |            |      |
| LCE                                                                                 |                                                                    |     |           | 30         | nH   |
| RCC'+EE'                                                                            | Termial to Case, Tc=25°C                                           |     | 0.75      |            | mΩ   |
| t <sub>d(on)</sub>                                                                  | Vcc = 600V, IC = 75A<br>RGON = RGOFF = 10Ω<br>Tj=125°C<br>VGE=±15V |     | 24        |            | ns   |
| t <sub>r</sub>                                                                      |                                                                    |     | 46        |            | ns   |
| t <sub>d(off)</sub>                                                                 |                                                                    |     | 276       |            | ns   |
| t <sub>f</sub>                                                                      |                                                                    |     | 87        |            | ns   |
| E <sub>on</sub> /E <sub>off</sub>                                                   |                                                                    |     | 4.30/2.10 |            | mJ   |
| INVERSE DIODE <span style="float:right">Tc = 25°C unless otherwise specified</span> |                                                                    |     |           |            |      |
| VF                                                                                  | IF =35A; VGE=0V; Tj = 25°C                                         |     | 1.9       | 2.2        | V    |
| Qrr                                                                                 | IF=35A; VR=300V; Tj=25°C<br>di/dt = 600A/us, VGE=-15V              |     | 6.5       |            | μC   |
| IRRM                                                                                |                                                                    |     | 35        |            | A    |
| Erec                                                                                |                                                                    |     | 2.00      |            | mJ   |
| THERMAL CHARACTERISTICS                                                             |                                                                    |     |           |            |      |
| Rth(j-c)                                                                            | per IGBT                                                           |     |           | 0.38       | K/W  |
| Rth(j-c)D                                                                           | per FRD                                                            |     |           | 1.60       | K/W  |
| Mechanical Data                                                                     |                                                                    |     |           |            |      |
| Ms                                                                                  |                                                                    | 2.5 |           | 4          | Nm   |
| Weight                                                                              |                                                                    |     | 158       |            | g    |

### Features

- Planar Gate Field Stop Technology IGBT
- Fast Recovery Free Wheeling Diode
- Low Switching Losses
- $V_{ce(sat)}$  with positive temperature coefficient
- Fast Switching and short tail current
- Switched mode power supplies at  $f_{sw}>20KHz$
- Resonant inverters up to 100KHz
- Electronic Welders at  $f_{sw}>20KHz$

### Application

- Welding inverters

### Advantages

- Space and weight savings
- Reduced protection circuits

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## IGBT Modules For Welding Application

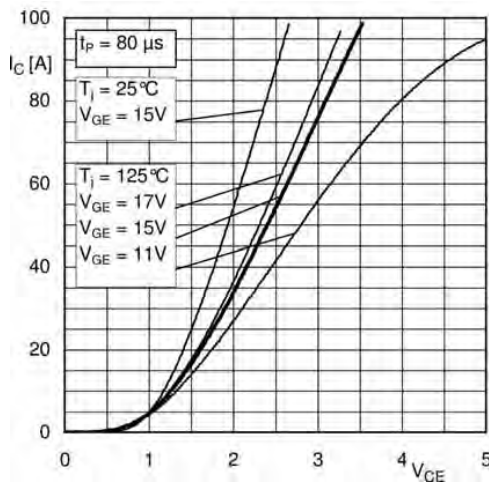


Fig. 1 Typ. output characteristic, inclusive  $R_{CC+EE'}$

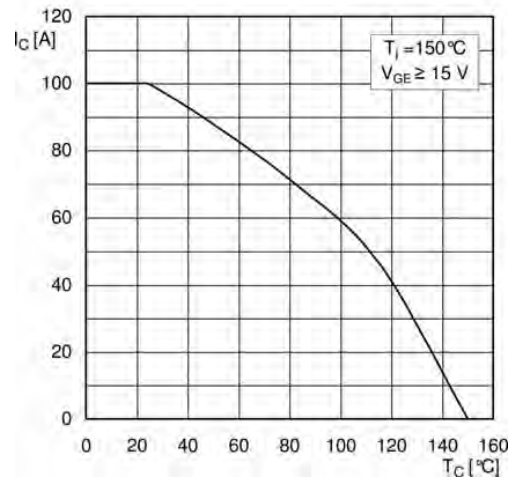


Fig. 2 Rated current vs. temperature  $I_C = f(T_C)$

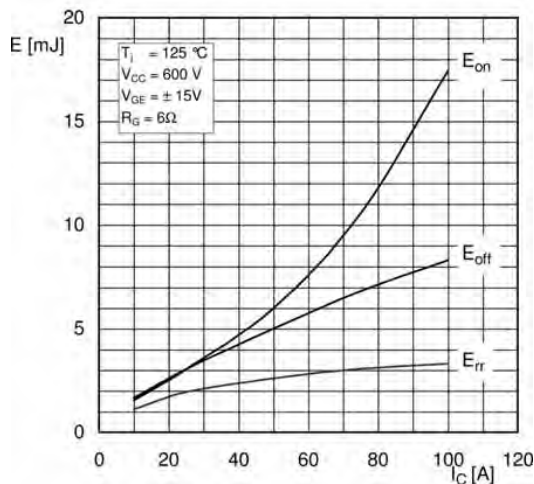


Fig. 3 Typ. turn-on /-off energy =  $f(I_C)$

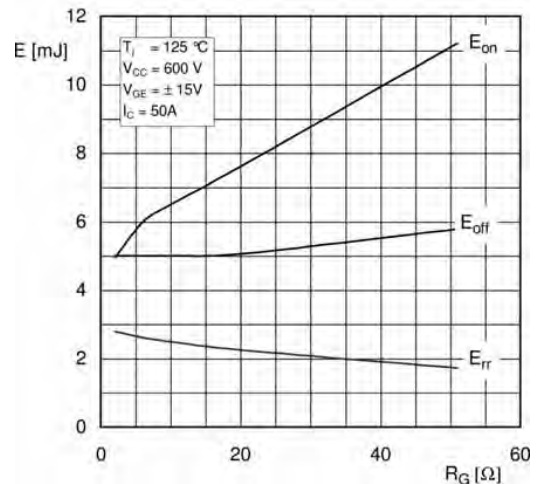


Fig. 4 Typ. turn-on /-off energy =  $f(R_G)$

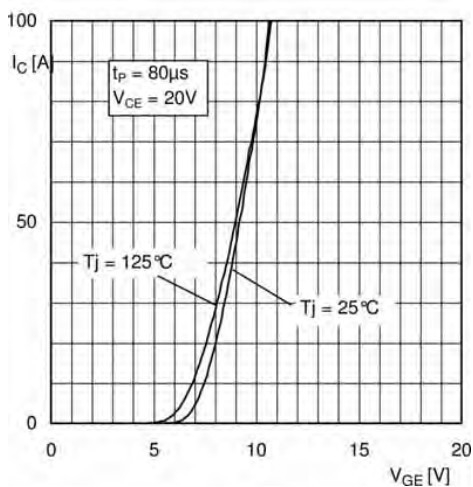


Fig. 5 Typ. transfer characteristic

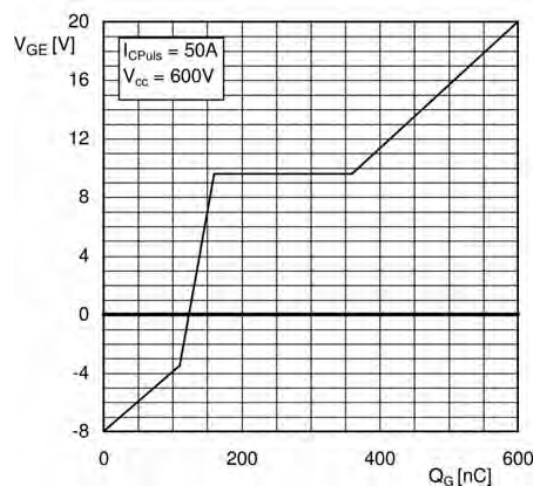


Fig. 6 Typ. gate charge characteristic

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## IGBT Modules For Welding Application

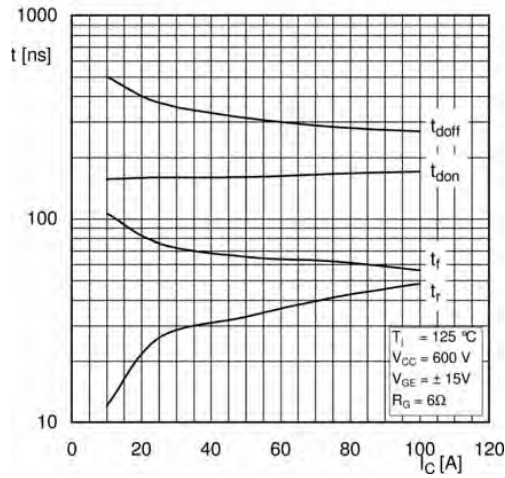


Fig. 7 Typ. switching times vs.  $I_C$

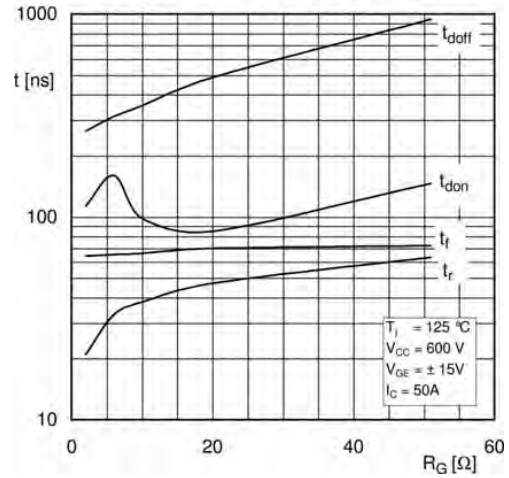


Fig. 8 Typ. switching times vs. gate resistor  $R_G$

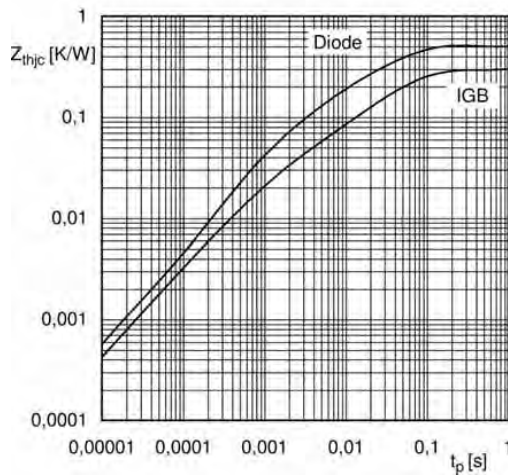


Fig. 9 Transient thermal impedance

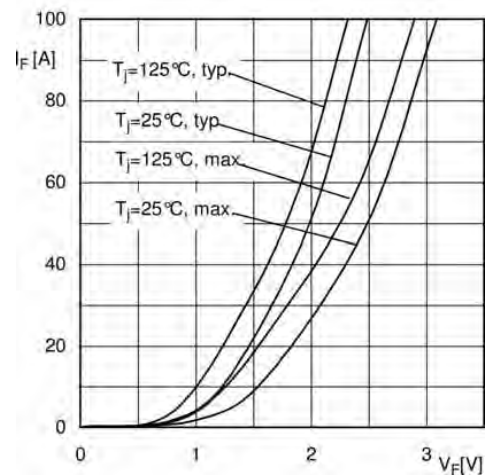


Fig. 10 FWD diode forward characteristic

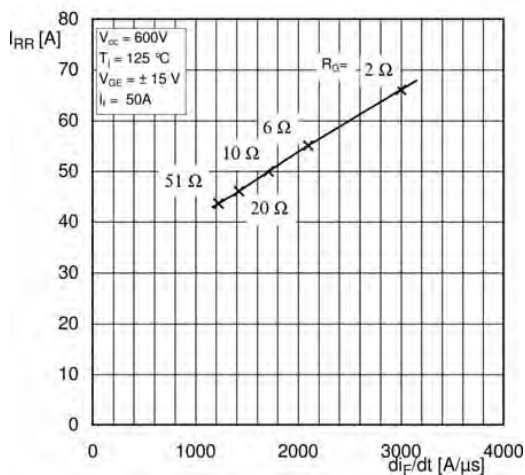


Fig. 11 Typ. FWD diode peak reverse recovery current

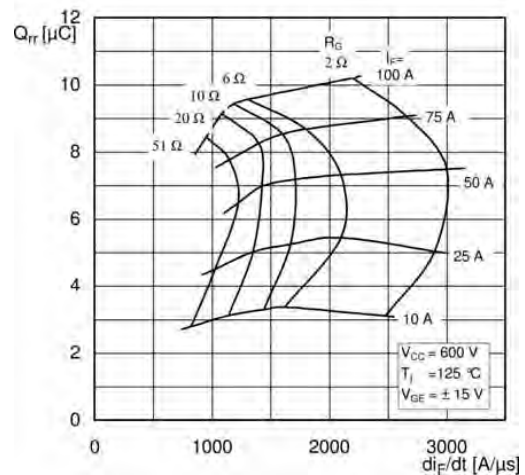


Fig. 12 Typ. FWD diode peak reverse recovery charge

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## IGBT Modules For Welding Application

