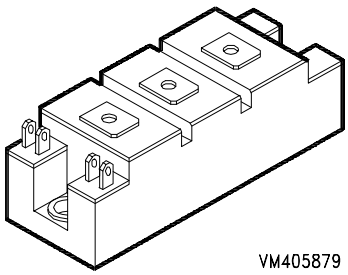
**IGBT Power Module**




- Single switch with chopper diode at collector
- Including fast free-wheeling diodes
- Package with insulated metal base plate

| Type | $V_{CE}$ | $I_C$ | Package | Ordering Code |
|---|---|---|---|---|
| BSM 25 GAL 120 DN2 | 1200V | 38A | HALF BRIDGE GAL 1 | C67076-A2009-A70 |

**Maximum Ratings**

| Parameter | Symbol | Values | Unit |
|---|---|---|---|
| Collector-emitter voltage | $V_{CE}$ | 1200 | V |
| Collector-gate voltage<br>$R_{GE}$ = 20 kΩ | $V_{CGR}$ | 1200 | |
| Gate-emitter voltage | $V_{GE}$ | ± 20 | |
| DC collector current<br>$T_C$ = 25 °C<br>$T_C$ = 80 °C | $I_C$ | 38<br>25 | A |
| Pulsed collector current, $t_p$ = 1 ms<br>$T_C$ = 25 °C<br>$T_C$ = 80 °C | $I_{Cpuls}$ | 76<br>50 | |
| Power dissipation per IGBT<br>$T_C$ = 25 °C | $P_{tot}$ | 200 | W |
| Chip temperature | $T_j$ | + 150 | °C |
| Storage temperature | $T_{stg}$ | -40 ... + 125 | |

| | | | |
|---|---|---|---|
| Thermal resistance, chip case | $R_{thJC}$ | ≤ 0.6 | K/W |
| Diode thermal resistance, chip case | $R_{thJCD}$ | ≤ 1 | |
| Diode thermal resistance, chip-case,chopper | $R_{THJCDC}$ | ≤ 0.8 | |
| Insulation test voltage, $t$ = 1min. | $V_{is}$ | 2500 | Vac |
| Creepage distance | - | 20 | mm |
| Clearance | - | 11 | |
| DIN humidity category, DIN 40 040 | - | F | sec |
| IEC climatic category, DIN IEC 68-1 | - | 40 / 125 / 56 | |

**Electrical Characteristics**, at $T_j$ = 25 °C, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **Static Characteristics** | | | | | |
| Gate threshold voltage<br>$V_{GE} = V_{CE}$, $I_C$ = 1 mA | $V_{GE(th)}$ | 4.5 | 5.5 | 6.5 | V |
| Collector-emitter saturation voltage<br>$V_{GE}$ = 15 V, $I_C$ = 25 A, $T_j$ = 25 °C<br>$V_{GE}$ = 15 V, $I_C$ = 25 A, $T_j$ = 125 °C | $V_{CE(sat)}$ | <br>-<br>- | <br>2.5<br>3.1 | <br>3<br>3.7 | |
| Zero gate voltage collector current<br>$V_{CE}$ = 1200 V, $V_{GE}$ = 0 V, $T_j$ = 25 °C<br>$V_{CE}$ = 1200 V, $V_{GE}$ = 0 V, $T_j$ = 125 °C | $I_{CES}$ | <br>-<br>- | <br>0.5<br>2 | <br>0.8<br>- | mA |
| Gate-emitter leakage current<br>$V_{GE}$ = 20 V, $V_{CE}$ = 0 V | $I_{GES}$ | - | - | 400 | nA |
| **AC Characteristics** | | | | | |
| Transconductance<br>$V_{CE}$ = 20 V, $I_C$ = 25 A | $g_{fs}$ | 10 | - | - | S |
| Input capacitance<br>$V_{CE}$ = 25 V, $V_{GE}$ = 0 V, $f$ = 1 MHz | $C_{iss}$ | - | 1.65 | - | nF |
| Output capacitance<br>$V_{CE}$ = 25 V, $V_{GE}$ = 0 V, $f$ = 1 MHz | $C_{oss}$ | - | 0.25 | - | |
| Reverse transfer capacitance<br>$V_{CE}$ = 25 V, $V_{GE}$ = 0 V, $f$ = 1 MHz | $C_{rss}$ | - | 0.11 | - | |

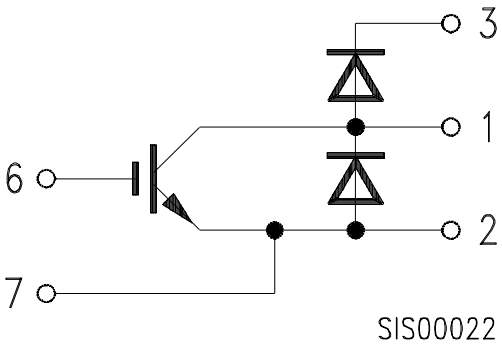
**Electrical Characteristics**, at $T_j$ = 25 °C, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **Switching Characteristics, Inductive Load at $T_j$ = 125 °C** | | | | | |
| Turn-on delay time<br>$V_{CC}$ = 600 V, $V_{GE}$ = 15 V, $I_C$ = 25 A<br>$R_{Gon}$ = 47 Ω | $t_{d(on)}$ | - | 75 | 150 | ns |
| Rise time<br>$V_{CC}$ = 600 V, $V_{GE}$ = 15 V, $I_C$ = 25 A<br>$R_{Gon}$ = 47 Ω | $t_r$ | - | 65 | 130 | |
| Turn-off delay time<br>$V_{CC}$ = 600 V, $V_{GE}$ = -15 V, $I_C$ = 25 A<br>$R_{Goff}$ = 47 Ω | $t_{d(off)}$ | - | 420 | 600 | |
| Fall time<br>$V_{CC}$ = 600 V, $V_{GE}$ = -15 V, $I_C$ = 25 A<br>$R_{Goff}$ = 47 Ω | $t_f$ | - | 50 | 75 | |
| **Free-Wheel Diode** | | | | | |
| Diode forward voltage<br>$I_F$ = 25 A, $V_{GE}$ = 0 V, $T_j$ = 25 °C<br>$I_F$ = 25 A, $V_{GE}$ = 0 V, $T_j$ = 125 °C | $V_F$ | -<br>- | 2<br>1.8 | 2.5<br>- | V |
| Reverse recovery time<br>$I_F$ = 25 A, $V_R$ = -600 V, $V_{GE}$ = 0 V<br>$di_F/dt$ = -800 A/µs, $T_j$ = 125 °C | $t_{rr}$ | - | 0.13 | - | µs |
| Reverse recovery charge<br>$I_F$ = 25 A, $V_R$ = -600 V, $V_{GE}$ = 0 V<br>$di_F/dt$ = -800 A/µs<br>$T_j$ = 25 °C<br>$T_j$ = 125 °C | $Q_{rr}$ | -<br>- | 2.3<br>6 | -<br>- | µC |

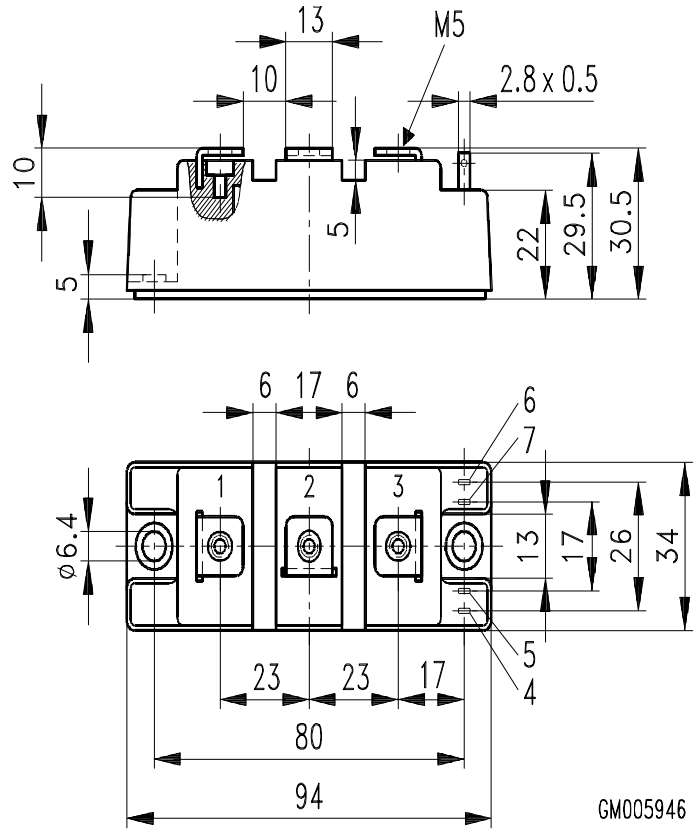
**Electrical Characteristics**, at $T_j$ = 25 °C, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **Chopper Diode** | | | | | |
| Chopper diode forward voltage | $V_{FC}$ | | | | V |
| $I_{FC}$ = 35 A, $V_{GE}$ = 0 V, $T_j$ = 25 °C | | - | 2 | 2.5 | |
| $I_{FC}$ = 35 A, $V_{GE}$ = 0 V, $T_j$ = 125 °C | | - | 1.8 | - | |
| Reverse recovery time, chopper | $t_{rrC}$ | | | | ns |
| $I_{FC}$ = 35 A, $V_R$ = -600 V, $V_{GE}$ = 0 V | | | | | |
| $di_F/dt$ = -800 A/µs, $T_j$ = 125 °C | | - | 250 | - | |
| Reverse recovery charge, chopper | $Q_{rrC}$ | | | | µC |
| $I_{FC}$ = 35 A, $V_R$ = -600 V, $V_{GE}$ = 0 V | | | | | |
| $di_F/dt$ = -800 A/µs | | | | | |
| $T_j$ = 25 °C | | - | 2 | - | |
| $T_j$ = 125 °C | | - | 5 | - | |

**Circuit Diagram**




**Package Outlines**

Dimensions in mm

Weight: 190 g