

SKM 75GB128D



SEMITRANS™ 2

SPT IGBT Module

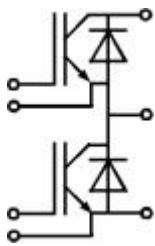
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Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz



GB

Absolute Maximum Ratings

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

| Symbol | Conditions | Values | Units |
|---------------------------|---------------------------------------|-----------------------|------------------|
| IGBT | | | |
| V_{CES} | | 1200 | V |
| I_C | $T_c = 25\text{ (80) }^\circ\text{C}$ | 100 (70) | A |
| I_{CRM} | $t_p = 1\text{ ms}$ | 100 | A |
| V_{GES} | | ± 20 | V |
| T_{vj} (T_{stg}) | $T_{OPERATION} \leq T_{stg}$ | - 40...+ 150 (125) | $^\circ\text{C}$ |
| V_{isol} | AC, 1 min. | 4000 | V |

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Inverse diode

| | | | |
|-----------|--|---------|---|
| I_F | $T_c = 25\text{ (80) }^\circ\text{C}$ | 75 (50) | A |
| I_{FRM} | $t_p = 1\text{ ms}$ | 100 | A |
| I_{FSM} | $t_p = 10\text{ ms}; \sin.; T_j = 150\text{ }^\circ\text{C}$ | 550 | A |

Characteristics

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

| Symbol | Conditions | min. | typ. | max. | Units |
|---------------|--|------|------|------|------------|
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 2\text{ mA}$ | 4,5 | 5,5 | 6,5 | V |
| I_{CES} | $V_{GE} = 0, V_{CE} = V_{CES}, T_j = 25\text{ (125) }^\circ\text{C}$ | 0,1 | 0,3 | | mA |
| $V_{CE(TO)}$ | $T_j = 25\text{ (125) }^\circ\text{C}$ | 1 | 1,15 | | V |
| r_{CE} | $V_{GE} = 15\text{ V}, T_j = 25\text{ (125) }^\circ\text{C}$ | 18 | 24 | | m Ω |
| $V_{CE(sat)}$ | $I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V, chip level}$ | 1,9 | 2,35 | | V |

| | | | | |
|-----------|----------------------------|-----|--|----|
| C_{ies} | under following conditions | 4,5 | | nF |
|-----------|----------------------------|-----|--|----|

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| | | | |
|--------------------------------|---|-------------|---------------|
| C_{oes} | $V_{GE} = 0, V_{CE} = 25$ $V, f = 1 \text{ MHz}$ | 0,6 | nF |
| C_{res} | | 0,55 | nF |
| L_{CE} | | 30 | nH |
| R_{CC+EE} | res., terminal-chip $T_c = 25 (125) \text{ }^\circ\text{C}$ | 0,75 (1) | m Ω |
| $t_{d(on)}$ | $V_{CC} = 600 \text{ V}, I_{Cnom}$ $= 50 \text{ A}$ | 160 | ns |
| t_r | $R_{Gon} = R_{Goff} = 6 \text{ } \Omega,$ $T_j = 125 \text{ }^\circ\text{C}$ | 35 | ns |
| $t_{d(off)}$ | $V_{GE} = \pm 15 \text{ V}$ | 310 | ns |
| t_f | | 65 | ns |
| E_{on} (E_{off}) | | 6 (5) | mJ |
| Inverse diode | | | |
| $V_F =$ | $I_{Fnom} = 50 \text{ A}; V_{GE}$ | 2 2,5 | V |
| V_{EC} | $= 0 \text{ V}; T_j = 25$ $(125) \text{ }^\circ\text{C}$ | (1,8) | |
| $V_{(TO)}$ | $T_j = 25 (125) \text{ }^\circ\text{C}$ | 1,1 1,2 | V |
| r_T | $T_j = 25 (125) \text{ }^\circ\text{C}$ | 18 26 | m Ω |
| I_{RRM} | $I_{Fnom} = 50 \text{ A}; T_j =$ $125 () \text{ }^\circ\text{C}$ | 55 | A |
| Q_{rr} | $di/dt = 2100 \text{ A}/\mu\text{s}$ | 7,3 | μC |
| E_{rr} | $V_{GE} = 0 \text{ V}$ | 2,6 | mJ |
| Thermal characteristics | | | |
| $R_{th(j-c)}$ | per IGBT | 0,3 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | 0,6 | K/W |
| $R_{th(c-s)}$ | per module | 0,05 | K/W |
| Mechanical data | | | |
| M_s | to heatsink M6 | 3 5 | Nm |
| M_t | to terminals M5 | 2,5 5 | Nm |
| w | | 160 | g |

Diagrams

錯誤! 引數選項無法識別。

Fig. 1 Typ. output characteristic, inclusive RCC'+ EE'

錯誤! 引數選項無法識別。

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

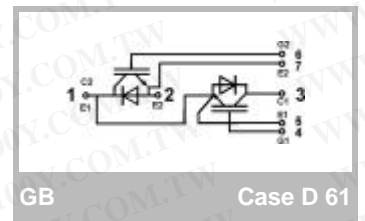
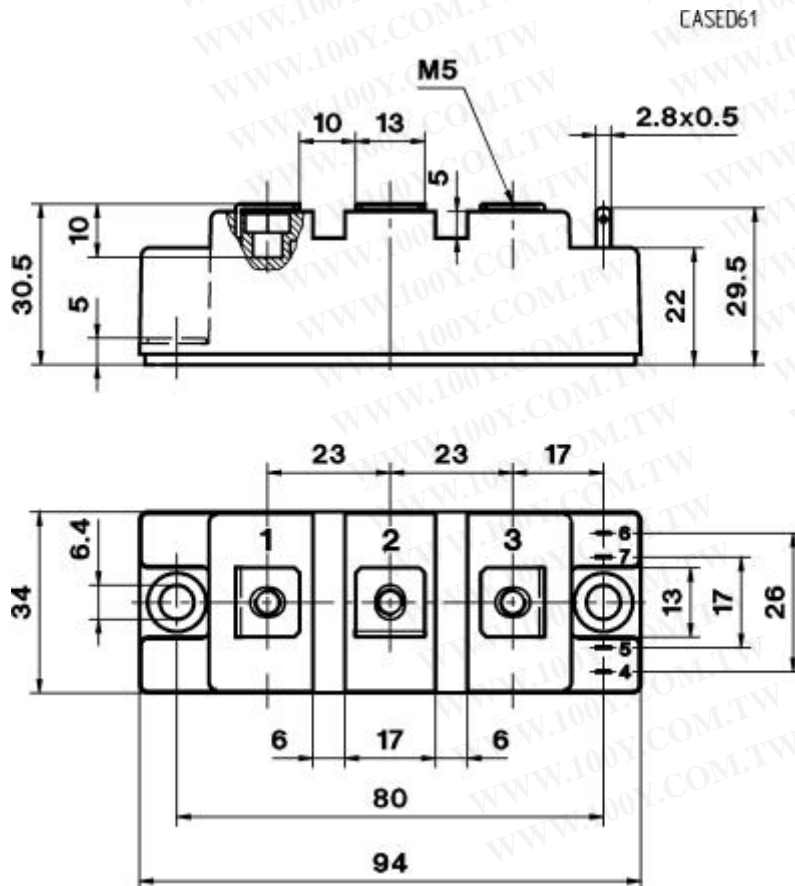
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| 錯誤! 引數選項無法識別。 |
| Fig. 3 Typ. turn-on /-off energy = f (IC) |
| 錯誤! 引數選項無法識別。 |
| Fig. 5 Typ. transfer characteristic |
| 錯誤! 引數選項無法識別。 |
| Fig. 7 Typ. switching times vs. IC |
| 錯誤! 引數選項無法識別。 |
| Fig. 9 Transient thermal impedance of IGBT $Z_{th(j-c)} = f(t_p)$; $D = t_p/t_c = t_p \cdot f$ |
| 錯誤! 引數選項無法識別。 |
| Fig. 11 CAL diode forward characteristic |
| 錯誤! 引數選項無法識別。 |
| Fig. 13 Typ. CAL diode recovered charge |

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| 錯誤! 引數選項無法識別。 |
| Fig. 4 Typ. turn-on /-off energy = f (RG) |
| 錯誤! 引數選項無法識別。 |
| Fig. 6 Typ. gate charge characteristic |
| 錯誤! 引數選項無法識別。 |
| Fig. 8 Typ. switching times vs. gate resistor RG |
| 錯誤! 引數選項無法識別。 |
| Fig. 10 Transient thermal impedance of FWD $Z_{th(j-c)} = f(t_p)$; $D = t_p/t_c = t_p \cdot f$ |
| 錯誤! 引數選項無法識別。 |
| Fig. 12 Typ. CAL diode peak reverse recovery current |

Cases / Circuits

UL Recognized File no. E 63 532

Dimensions in mm



Case D 61

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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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