

| Absolute Maximum Ratings           |                                                                                             | Values         | Units            |
|------------------------------------|---------------------------------------------------------------------------------------------|----------------|------------------|
| Symbol                             | Conditions <sup>1)</sup>                                                                    |                |                  |
| V <sub>CES</sub>                   | T <sub>heatsink</sub> = 25 / 80°C<br>t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25/80°C | 1200           | V                |
| V <sub>GES</sub>                   |                                                                                             | ± 20           | V                |
| I <sub>C</sub>                     |                                                                                             | 120 / 90       | A                |
| I <sub>CM</sub>                    |                                                                                             | 240 / 180      | A                |
| T <sub>j</sub>                     |                                                                                             | - 55 ... + 150 | °C               |
| T <sub>stg</sub>                   |                                                                                             | - 55 ... + 125 | °C               |
| V <sub>isol</sub>                  | AC, 1 min.                                                                                  | 2600           | V                |
| Inverse Diode                      |                                                                                             |                |                  |
| I <sub>F</sub> = -I <sub>C</sub>   | T <sub>heatsink</sub> = 25 / 80°C                                                           | 100 / 75       | A                |
| I <sub>FM</sub> = -I <sub>CM</sub> | t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25/80°C                                      | 240 / 180      | A                |
| I <sub>FSM</sub>                   | t <sub>p</sub> = 10 ms; sin., T <sub>j</sub> = 25 °C                                        | 720            | A                |
| I <sup>2</sup> t                   | t <sub>p</sub> = 10 ms; sin., T <sub>j</sub> = 25 °C                                        | 2600           | A <sup>2</sup> s |

**MiniSKiiP 8**  
**SK integrated**  
**intelligent Power**  
**SKiiP 83 AC 12**  
**SKiiP 83 AC 12 I** <sup>3)</sup>  
**IGBT**  
**3-phase bridge inverter**  
Preliminary Data  
Case M8

| Characteristics                                  |                                                                                                                                                                  | min. | typ.        | max.     | Units |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|----------|-------|
| Symbol                                           | Conditions <sup>1)</sup>                                                                                                                                         |      |             |          |       |
| IGBT - Inverter                                  |                                                                                                                                                                  |      |             |          |       |
| V <sub>CEsat</sub>                               | I <sub>C</sub> = 90 A { T <sub>j</sub> = 25 (125) °C }                                                                                                           | –    | 2,5(3,1)    | 3,0(3,7) | V     |
| V <sub>CEsat</sub>                               | I <sub>C</sub> = 120 A { T <sub>j</sub> = 25 (125) °C }                                                                                                          | –    | 2,9(3,7)    | –        | V     |
| t <sub>d(on)</sub>                               | V <sub>CC</sub> = 600 V; V <sub>GE</sub> = 15 V<br>I <sub>C</sub> = 90A; T <sub>j</sub> = 125 °C<br>R <sub>gon</sub> = R <sub>goff</sub> =15 Ω<br>inductive load | –    | 44          | 100      | ns    |
| t <sub>r</sub>                                   |                                                                                                                                                                  | –    | 70          | 140      | ns    |
| t <sub>d(off)</sub>                              |                                                                                                                                                                  | –    | 450         | 600      | ns    |
| t <sub>f</sub>                                   |                                                                                                                                                                  | –    | 70          | 100      | ns    |
| E <sub>on</sub> + E <sub>off</sub>               |                                                                                                                                                                  | –    | 18          | –        | mJ    |
| C <sub>ies</sub>                                 | V <sub>CE</sub> = 25 V; V <sub>GE</sub> = 0 V, 1MHz                                                                                                              | –    | 6,6         | –        | nF    |
| R <sub>thjh</sub>                                | per IGBT                                                                                                                                                         | –    | –           | 0,25     | K/W   |
| Diode <sup>2)</sup> - Inverter                   |                                                                                                                                                                  |      |             |          |       |
| V <sub>F</sub> = V <sub>EC</sub>                 | I <sub>F</sub> = 70 A { T <sub>j</sub> = 25 (125) °C }                                                                                                           | –    | 2,0(1,8)    | 2,5(2,3) | V     |
|                                                  | I <sub>F</sub> = 90 A { T <sub>j</sub> = 25 (125) °C }                                                                                                           | –    | 2,2(2,0)    | –        | V     |
| V <sub>TO</sub>                                  | T <sub>j</sub> = 125 °C                                                                                                                                          | –    | 1,0         | 1,2      | V     |
| r <sub>T</sub>                                   | T <sub>j</sub> = 125 °C                                                                                                                                          | –    | 11          | 15       | mΩ    |
| I <sub>RRM</sub>                                 | I <sub>F</sub> = 75 A, V <sub>R</sub> = - 600 V                                                                                                                  | –    | 40          | –        | A     |
| Q <sub>rr</sub>                                  | di <sub>F</sub> /dt = - 800 A/μs                                                                                                                                 | –    | 9,5         | –        | μC    |
| E <sub>off</sub>                                 | V <sub>GE</sub> = 0 V, T <sub>j</sub> = 125 °C                                                                                                                   | –    | 3           | –        | mJ    |
| R <sub>thjh</sub>                                | per diode                                                                                                                                                        | –    | –           | 0,8      | K/W   |
| Current sensor for three phase output ac current |                                                                                                                                                                  |      |             |          |       |
| I <sub>p</sub> RMS                               | Continuous current ,<br>T = 100 °C, V <sub>supply</sub> = ± 15V                                                                                                  | –    | 50          | –        | A     |
| I <sub>pmax</sub> RMS                            | t ≤ 2 s                                                                                                                                                          | –    | –           | 80       | A     |
| I <sub>p</sub> peak                              | t ≤ 10 μs                                                                                                                                                        | –    | 1000        | –        | A     |
| R <sub>out</sub>                                 | terminating resistance                                                                                                                                           | –    | 50          | –        | Ω     |
| I <sub>s</sub> RMS                               | rated sensor current<br>at I <sub>p</sub> = 50 A <sub>RMS</sub>                                                                                                  |      | 25          |          | mA    |
| I <sub>p</sub> : I <sub>s</sub>                  | transfer ratio                                                                                                                                                   |      | 1 : 2000    |          |       |
| Offset error                                     | I <sub>p</sub> = 0 A, T = -40 ... 100 °C                                                                                                                         | –    | ± 0,2       | –        | mA    |
| Linearity                                        |                                                                                                                                                                  | –    | 0,1         | –        | %     |
| delay time                                       | I <sub>p</sub> = 10 % - 80 %                                                                                                                                     | –    | < 1         | –        | μs    |
|                                                  | 90 % - 20 %                                                                                                                                                      | –    | < 1         | –        | μs    |
| Bandwidth                                        |                                                                                                                                                                  |      | 0 - 100     | (-3dB)   | kHz   |
| Temperature Sensor                               |                                                                                                                                                                  |      |             |          |       |
| R <sub>TS</sub>                                  | T = 25/100 °C                                                                                                                                                    |      | 1000 / 1670 |          | Ω     |
| Mechanical Data                                  |                                                                                                                                                                  |      |             |          |       |
| M1                                               | case to heatsink, SI Units                                                                                                                                       | 3    | –           | 4        | Nm    |
| Case                                             |                                                                                                                                                                  |      | M8          |          |       |

#### Features

- High level power integration
- Two-screws-mounting to the customer heatsink, compact design
- Low thermal impedance due to durable ceramic insulation
- Pressure contact technology with simple connection to DCB through pressure contact (no soldering) and with increased power cycling capability
- Low stray inductance
- High power density, low losses
- Integrated temperature sensor
- Three integrated compensated current sensors for the ac current (SKiiP 83 AC 12 I)
- Mechanical drawing available on disc for Auto CAD 12 (.DWG, .DXF)

<sup>1)</sup> T<sub>heatsink</sub> = 25 °C, unless otherwise specified

<sup>2)</sup> CAL = Controlled Axial Lifetime Technology (soft and fast recovery)

<sup>3)</sup> With integrated current sensors Available November 1996.

