



**SEMITRANS™ M1**

## Power MOSFET Modules

### SKM 111AR

#### Features

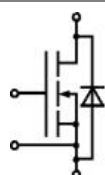
- N Channel, enhancement mode
- Avalanche characteristic
- Short connections and built-in gate resistors to suppress internal oscillations even in critical applications
- Isolated copper baseplate
- All electrical connections on top for easy busbaring
- Large clearances (10 mm) and creepage distances (20 mm)
- UL recognized, file no. E 63 532

#### Typical Applications

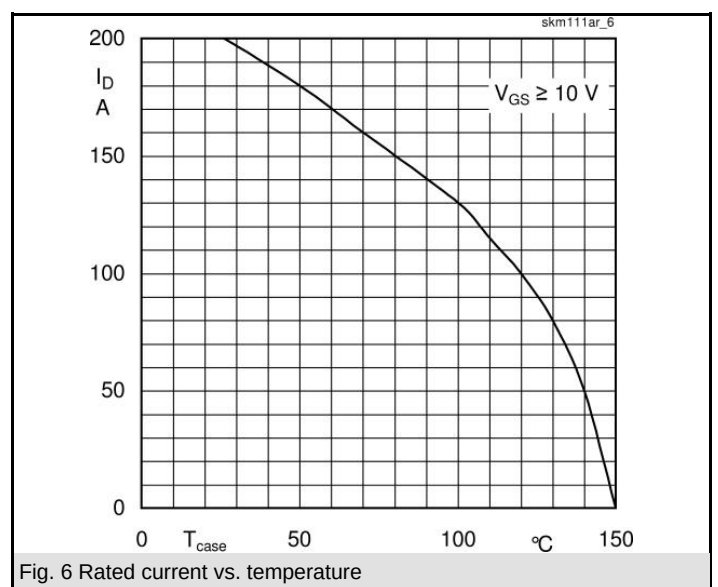
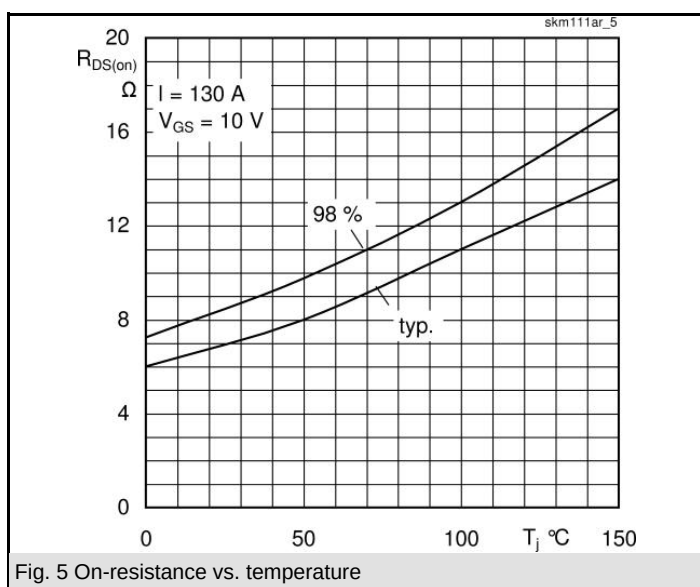
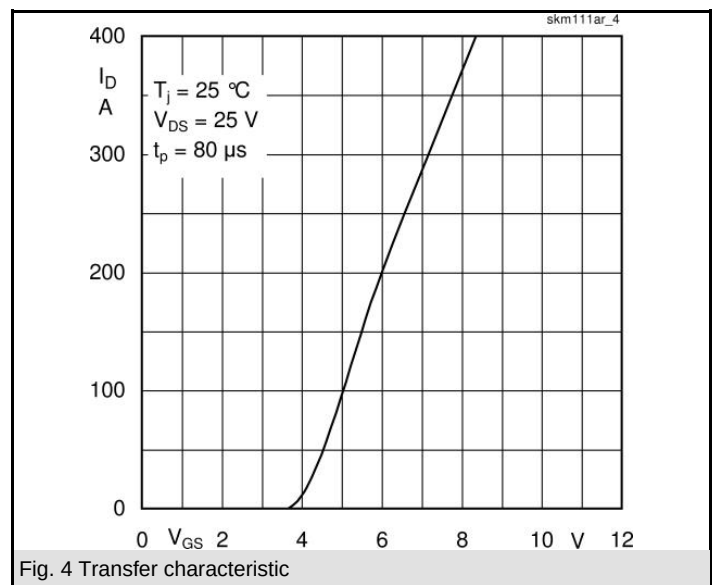
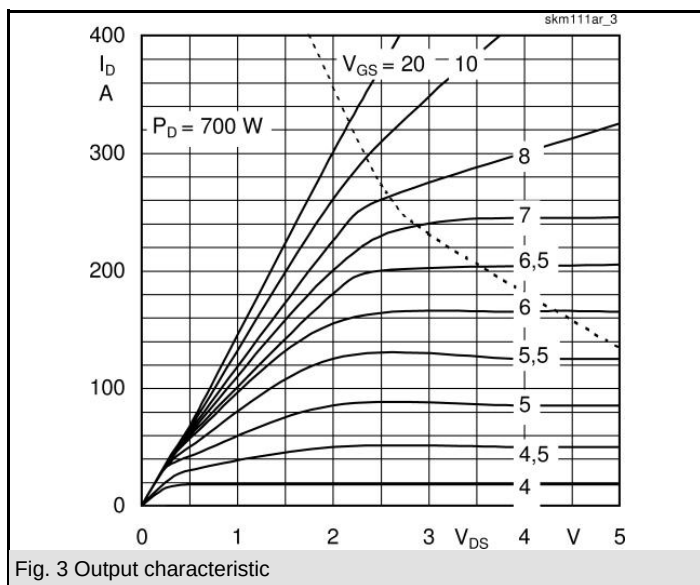
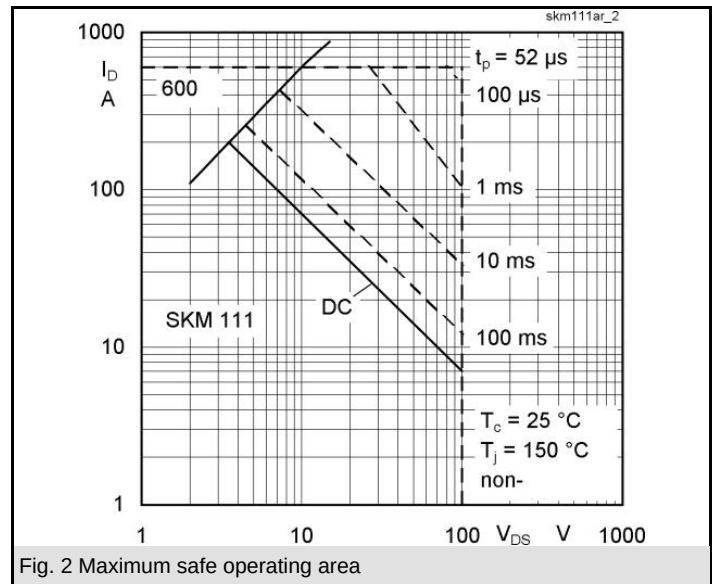
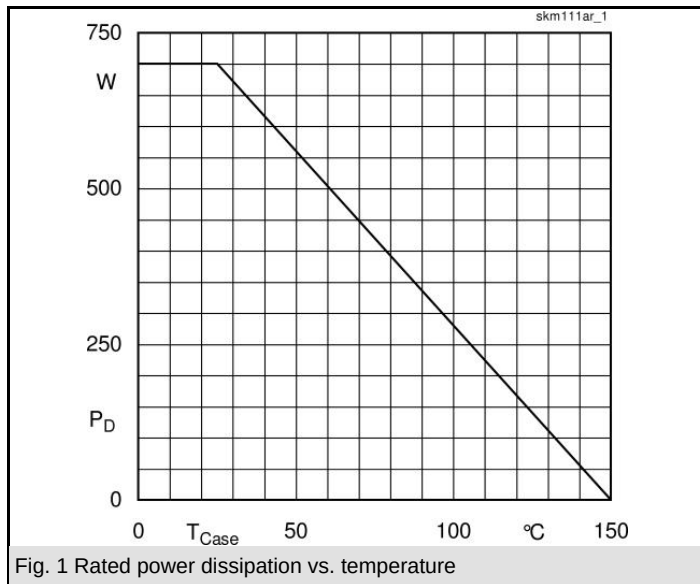
- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- UPS equipment
- Not suitable for linear amplification

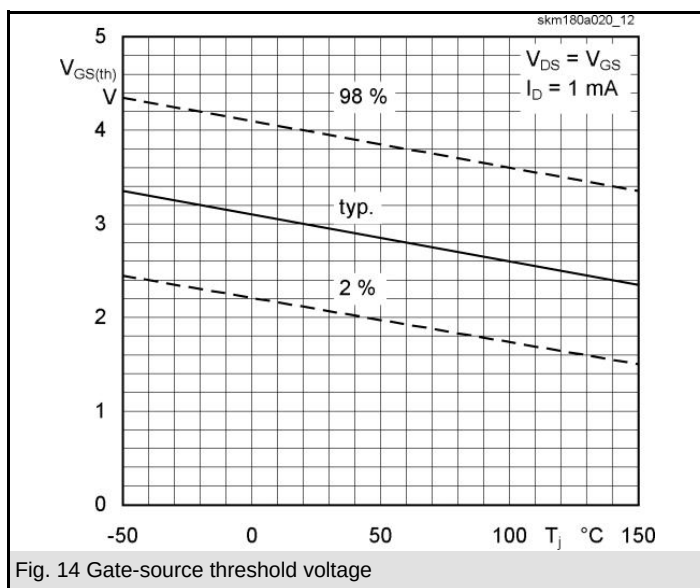
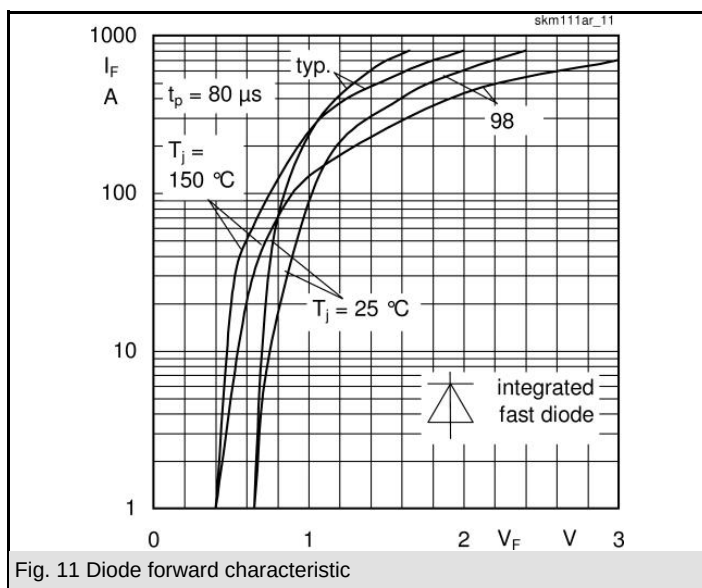
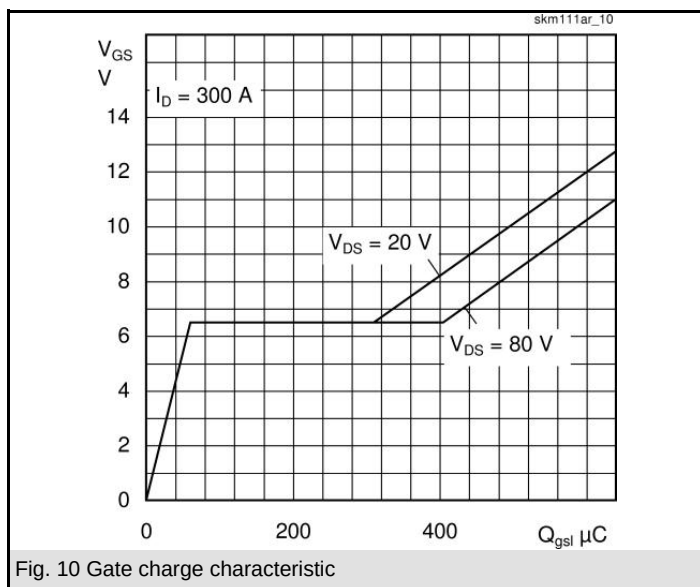
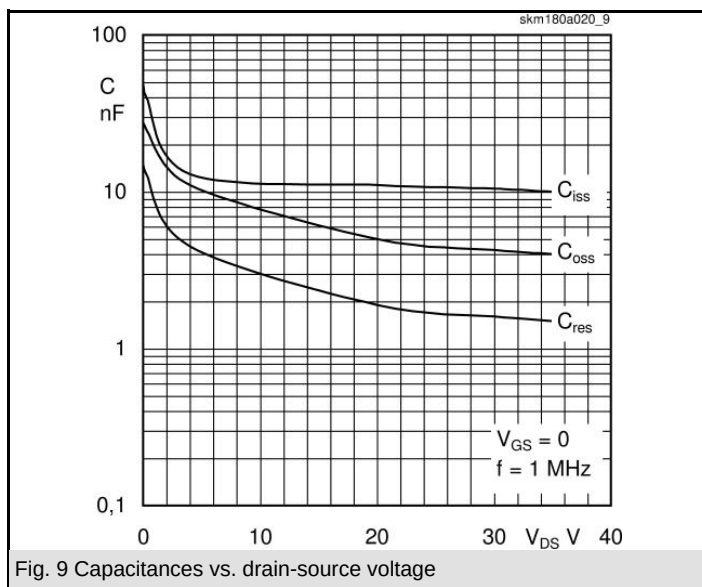
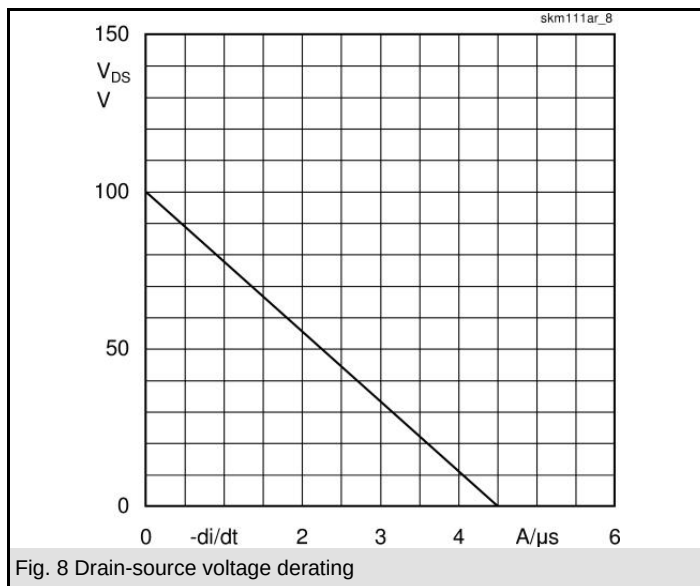
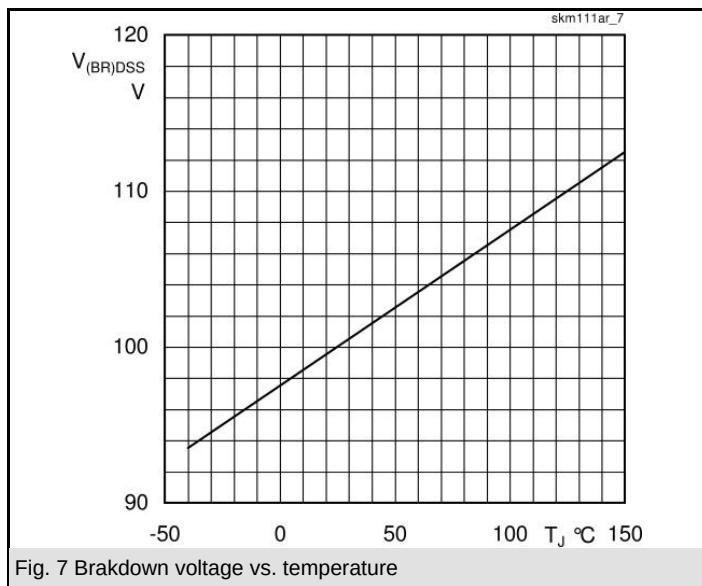
| Absolute Maximum Ratings              |                                     | T <sub>c</sub> = 25 °C, unless otherwise specified |       |
|---------------------------------------|-------------------------------------|----------------------------------------------------|-------|
| Symbol                                | Conditions                          | Values                                             | Units |
| V <sub>DS</sub>                       | T <sub>s</sub> = 25 (80) °C<br>1 ms | 100                                                | V     |
| I <sub>D</sub>                        |                                     | 200 (150)                                          | A     |
| I <sub>DM</sub>                       |                                     | 600                                                | A     |
| V <sub>GS</sub>                       |                                     | ± 20                                               | V     |
| T <sub>vj</sub> , (T <sub>stg</sub> ) |                                     | - 40 ... + 150 (125)                               | °C    |
| V <sub>isol</sub>                     | AC, 1 min.                          | 2500                                               | V     |
| Inverse diode                         |                                     |                                                    |       |
| I <sub>F</sub> = - I <sub>S</sub>     |                                     | 200                                                | A     |
| I <sub>FM</sub> = - I <sub>SM</sub>   |                                     | 600                                                | A     |

| Characteristics         |                                                                                                   | T <sub>c</sub> = 25 °C, unless otherwise specified |          |            |       |
|-------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------|----------|------------|-------|
| Symbol                  | Conditions                                                                                        | min.                                               | typ.     | max.       | Units |
| V <sub>(BR)DSS</sub>    | V <sub>GS</sub> = 0 V, I <sub>D</sub> = 0,25 mA                                                   | 100                                                |          |            | V     |
| V <sub>GS(th)</sub>     | V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 1 mA                                         | 2,1                                                | 3        | 4          | V     |
| I <sub>DSS</sub>        | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 100 V,<br>T <sub>j</sub> = 25 (125) °C                   |                                                    | 50 (300) | 250 (1000) | µA    |
| I <sub>GSS</sub>        | V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0 V                                                     |                                                    | 10       | 100        | nA    |
| R <sub>DS(on)</sub>     | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 130 A                                                    |                                                    | 7        | 8,5        | mΩ    |
| g <sub>fs</sub>         | V <sub>DS</sub> = 25 V, I <sub>D</sub> = 130 A                                                    | 60                                                 | 75       |            | S     |
| C <sub>CHC</sub>        | V <sub>GS</sub> = 0, V <sub>DS</sub> = 25 V, f = 1 MHz                                            |                                                    |          | 160        | pF    |
| C <sub>iss</sub>        |                                                                                                   |                                                    | 10       | 13         | nF    |
| C <sub>oss</sub>        |                                                                                                   |                                                    | 5        | 7,5        | nF    |
| C <sub>rss</sub>        |                                                                                                   |                                                    | 1,8      | 2,7        | nF    |
| L <sub>DS</sub>         |                                                                                                   |                                                    |          | 20         | nH    |
| t <sub>d(on)</sub>      | V <sub>DD</sub> = 50 V, I <sub>D</sub> = 130 A,<br>V <sub>GS</sub> = 10 V, R <sub>G</sub> = 3,3 Ω |                                                    | 60       |            | ns    |
| t <sub>r</sub>          |                                                                                                   |                                                    | 220      |            | ns    |
| t <sub>d(off)</sub>     |                                                                                                   |                                                    | 270      |            | ns    |
| t <sub>f</sub>          |                                                                                                   |                                                    | 200      |            | ns    |
| Inverse diode           |                                                                                                   |                                                    |          |            |       |
| V <sub>SD</sub>         | I <sub>F</sub> = 400 A; V <sub>GS</sub> = 0 V                                                     |                                                    | 1,25     | 1,6        | V     |
| t <sub>rr</sub>         | T <sub>j</sub> = 25 (150) °C                                                                      |                                                    | 400      |            | ns    |
| Q <sub>rr</sub>         | T <sub>j</sub> = 25 °C                                                                            |                                                    | 3,5      |            | µC    |
| I <sub>rr</sub>         | T <sub>j</sub> = 150 °C                                                                           |                                                    |          |            | A     |
| Thermal characteristics |                                                                                                   |                                                    |          |            |       |
| R <sub>th(j-c)</sub>    | per MOSFET                                                                                        |                                                    |          | 0,18       | K/W   |
| R <sub>th(c-s)</sub>    | M <sub>s</sub> , surface 10 µm, per module                                                        |                                                    |          | 0,05       | K/W   |
| Mechanical data         |                                                                                                   |                                                    |          |            |       |
| M <sub>s</sub>          | to heatsink (M6)                                                                                  | 4                                                  |          | 5          | Nm    |
| M <sub>t</sub>          | for terminals (M5)                                                                                | 2,5                                                |          | 3,5        | Nm    |
| w                       |                                                                                                   |                                                    |          | 130        | g     |



**MA**

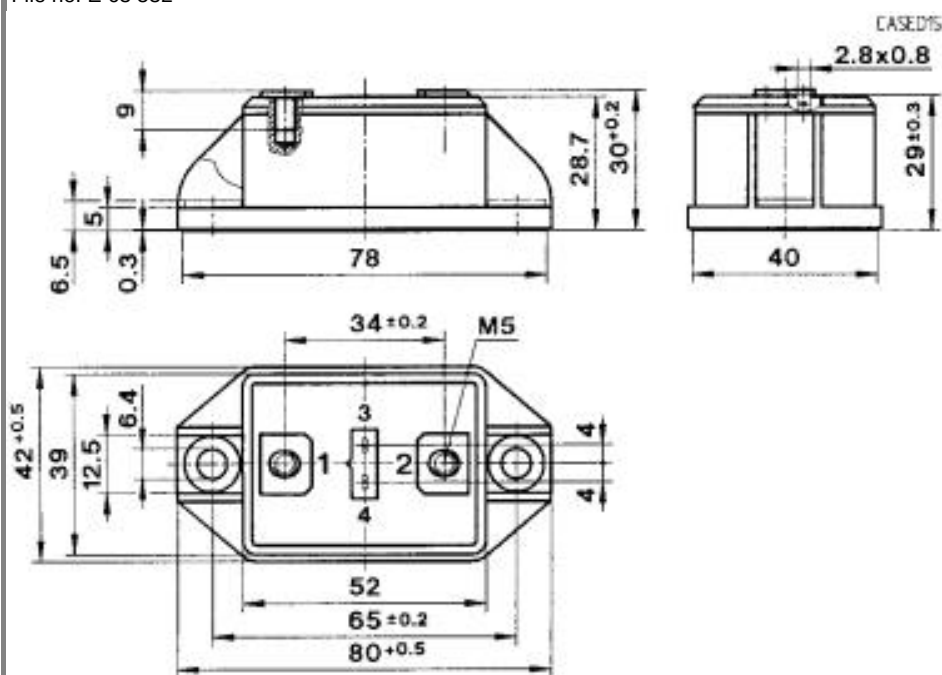




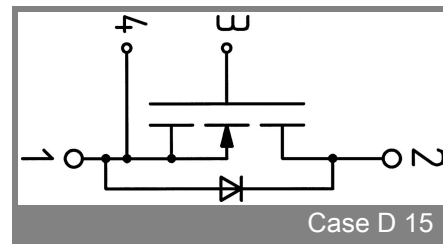
# SKM 111AR

UL Recognized  
File no. E 63 532

Dimensions in mm



Case D15



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

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