

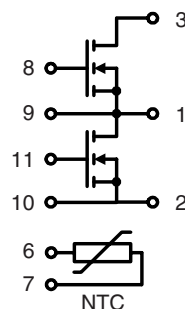
# Dual Power HiPerFET™ Module

## Phaseleg Configuration

$$V_{DSS} = 900 \text{ V}$$

$$I_{D25} = 85 \text{ A}$$

$$R_{DS(on)} = 76 \text{ m}\Omega$$



## MOSFET T1 + T2

| Symbol    | Conditions                                            | Maximum Ratings |   |
|-----------|-------------------------------------------------------|-----------------|---|
| $V_{DSS}$ | $T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$ | 900             | V |
| $V_{GS}$  |                                                       | $\pm 20$        | V |
| $I_{D25}$ | $T_C = 25^{\circ}\text{C}$                            | 85              | A |
| $I_{D80}$ | $T_C = 80^{\circ}\text{C}$                            | 65              | A |
| $I_{F25}$ | (diode) $T_C = 25^{\circ}\text{C}$                    | 85              | A |
| $I_{F80}$ | (diode) $T_C = 80^{\circ}\text{C}$                    | 65              | A |

## Features

- HiPerFET™ technology
  - low  $R_{DSon}$
  - unclamped inductive switching (UIS) capability
  - dv/dt ruggedness
  - fast intrinsic reverse diode
  - low gate charge
- thermistor for internal temperature measurement
- package
  - low inductive current path
  - screw connection to high current main terminals
  - use of non interchangeable connectors for auxiliary terminals possible
  - Kelvin source terminals for easy drive
  - isolated DCB ceramic base plate

## Applications

- converters with high power density and high switching speed for
  - power supplies
  - induction heating

| Symbol                                                                        | Conditions                                                                                                          | Characteristic Values                                                                                                               |                                                                           |                          |                      |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------|----------------------|
|                                                                               |                                                                                                                     | (T <sub>VJ</sub> = 25°C, unless otherwise specified)                                                                                |                                                                           |                          |                      |
|                                                                               |                                                                                                                     | min.                                                                                                                                | typ.                                                                      | max.                     |                      |
| R <sub>DSon</sub>                                                             | V <sub>GS</sub> = 10 V; I <sub>D</sub> = I <sub>D80</sub>                                                           |                                                                                                                                     |                                                                           | 76 mΩ                    |                      |
| V <sub>GStH</sub>                                                             | V <sub>DS</sub> = 20 V; I <sub>D</sub> = 30 mA                                                                      | 3                                                                                                                                   |                                                                           | 5 V                      |                      |
| I <sub>DSS</sub>                                                              | V <sub>DS</sub> = 0.8 • V <sub>DSS</sub> ; V <sub>GS</sub> = 0 V; T <sub>VJ</sub> = 25°C<br>T <sub>VJ</sub> = 125°C |                                                                                                                                     | 1.5                                                                       | 0.4 mA<br>mA             |                      |
| I <sub>GSS</sub>                                                              | V <sub>GS</sub> = ±20 V; V <sub>DS</sub> = 0 V                                                                      |                                                                                                                                     |                                                                           | 1 μA                     |                      |
| Q <sub>g</sub><br>Q <sub>gs</sub><br>Q <sub>gd</sub>                          | } V <sub>GS</sub> = 10 V; V <sub>DS</sub> = 450 V; I <sub>D</sub> = 50 A                                            |                                                                                                                                     | 960<br>225<br>430                                                         | nC<br>nC<br>nC           |                      |
| t <sub>d(on)</sub><br>t <sub>r</sub><br>t <sub>d(off)</sub><br>t <sub>f</sub> |                                                                                                                     | } V <sub>GS</sub> = 10 V; V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> ;<br>I <sub>D</sub> = I <sub>D80</sub> ; R <sub>G</sub> = 0.47 Ω |                                                                           | 150<br>180<br>330<br>140 | ns<br>ns<br>ns<br>ns |
| V <sub>F</sub>                                                                |                                                                                                                     |                                                                                                                                     | (diode) I <sub>F</sub> = 90 A; V <sub>GS</sub> = 0 V                      | 1.1                      | 1.6 V                |
| t <sub>rr</sub>                                                               |                                                                                                                     |                                                                                                                                     | (diode) I <sub>F</sub> = 90 A; -di/dt = 400 A/μs; V <sub>DS</sub> = 100 V | 250                      | ns                   |
| R <sub>thJC</sub><br>R <sub>thJS</sub>                                        | with heat transfer paste                                                                                            |                                                                                                                                     | 0.12                                                                      | 0.08 K/W<br>K/W          |                      |

IXYS reserves the right to change limits, test conditions and dimensions.

| Symbol       | Conditions               | Characteristic Values |      |          |
|--------------|--------------------------|-----------------------|------|----------|
|              |                          | min.                  | typ. | max.     |
| $R_{25}$     | $T = 25^{\circ}\text{C}$ |                       | 2200 | $\Omega$ |
| $B_{25/100}$ |                          |                       | 3560 | K        |

## Module

| Symbol     | Conditions                                     | Maximum Ratings |  |                    |
|------------|------------------------------------------------|-----------------|--|--------------------|
|            |                                                |                 |  |                    |
| $T_{vj}$   |                                                | -40...+150      |  | $^{\circ}\text{C}$ |
| $T_{stg}$  |                                                | -40...+125      |  | $^{\circ}\text{C}$ |
| $V_{ISOL}$ | $I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$ | 3600            |  | V~                 |
| $M_d$      | Mounting torque (M6)                           | 2.25 - 2.75     |  | Nm                 |
|            | Terminal connection torque (M6)                | 4.5 - 5.5       |  | Nm                 |

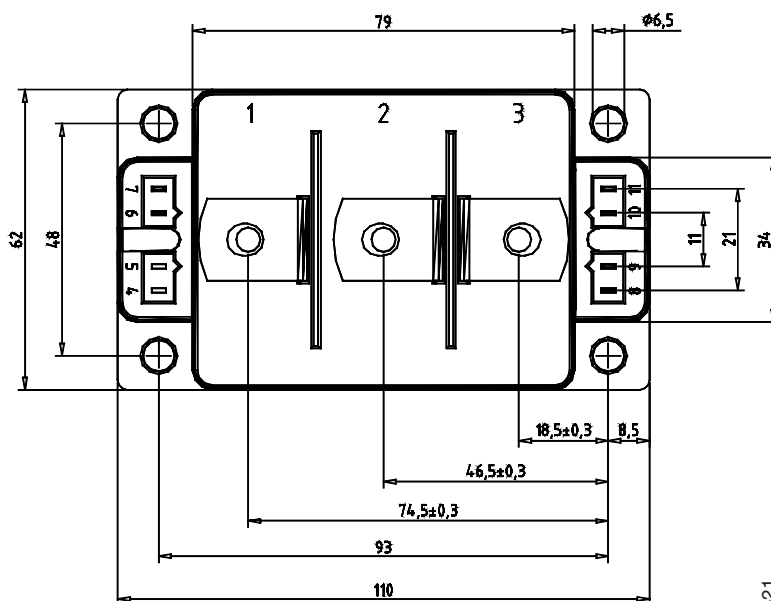
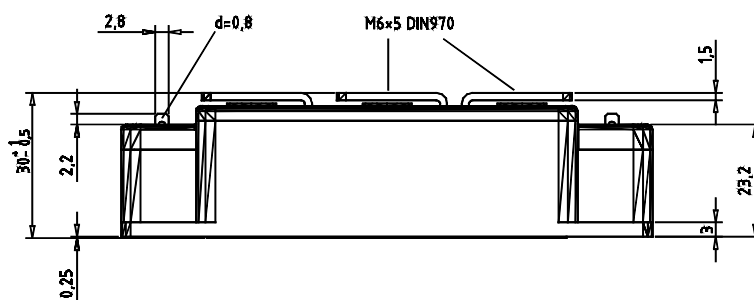
| Symbol | Conditions | Characteristic Values |      |      |
|--------|------------|-----------------------|------|------|
|        |            | min.                  | typ. | max. |
| Weight |            |                       | 250  | g    |

Dimensions in mm (1 mm = 0.0394")

## Optional accessories for modules

keyed twin plugs  
(UL758, style 1385, CSA class 5851,  
guide 460-1-1)

- Type ZY180L with wire length 350mm  
– for pins 4 (yellow wire) and 5 (red wire)  
– for pins 11 (yellow wire) and 10 (red wire)
- Type ZY180R with wire length 350mm  
– for pins 7 (yellow wire) and 6 (red wire)  
– for pins 8 (yellow wire) and 9 (red wire)



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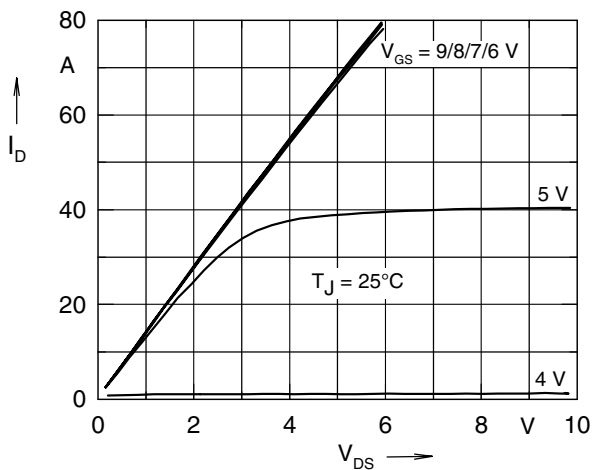


Fig. 1 Typical output characteristics

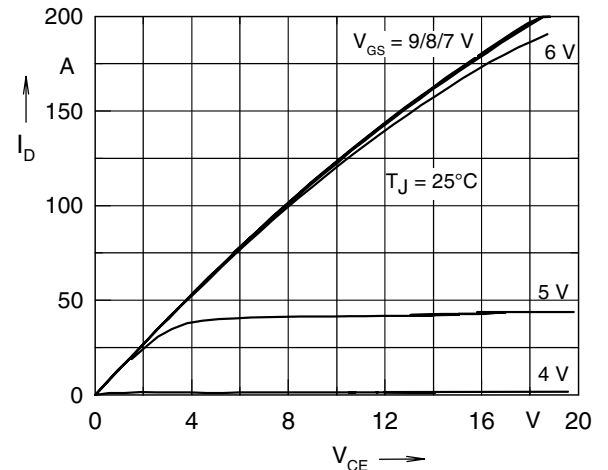


Fig. 2 Typical transfer characteristics

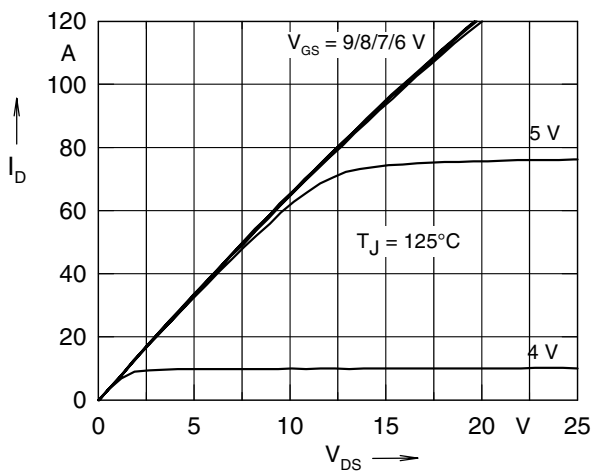


Fig. 3 Typical output characteristics

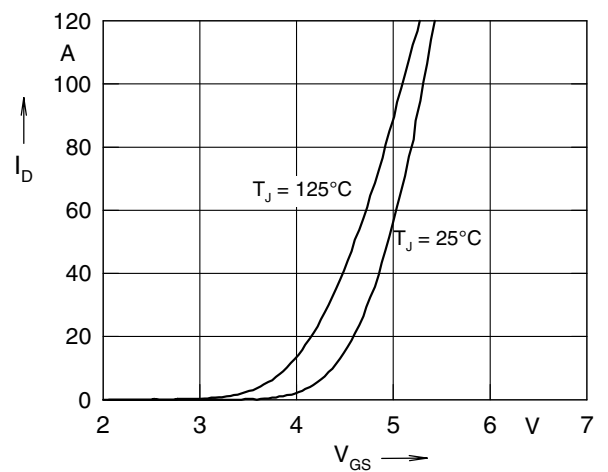


Fig. 4 Typical transfer characteristics

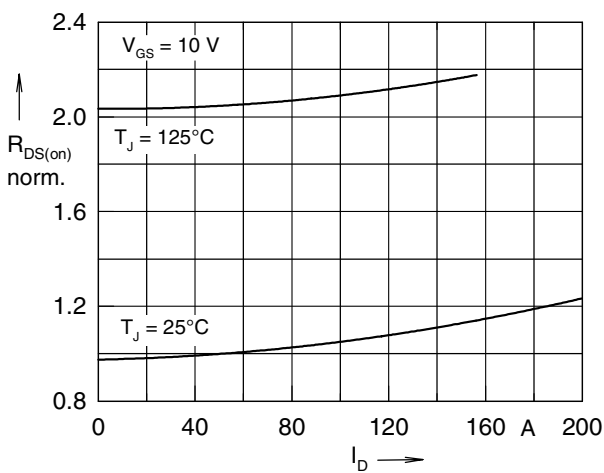


Fig. 5 Typical normalized  $R_{DS(on)}$  versus  $I_D$

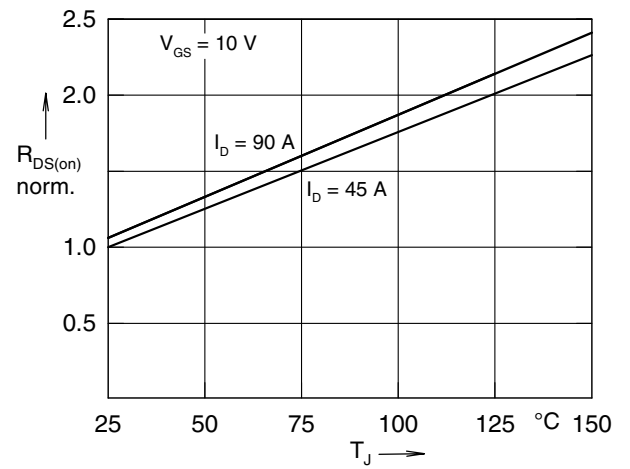


Fig. 6 Typical normalized  $R_{DS(on)}$  versus  $T_J$

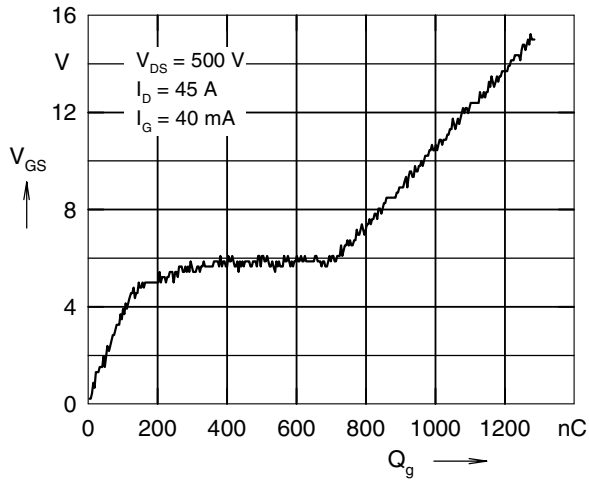


Fig. 7 Typical turn-on gate charge characteristics

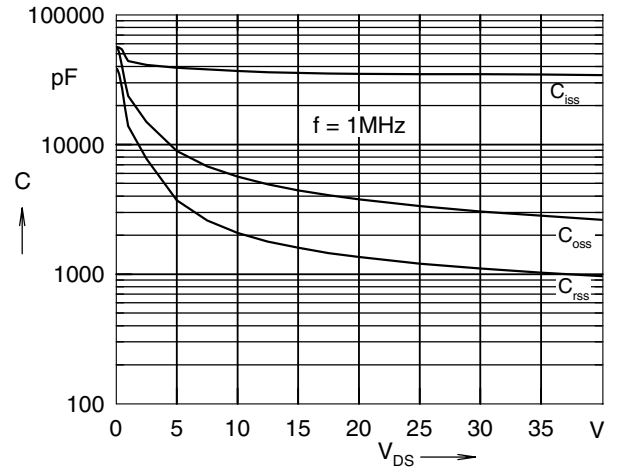


Fig. 8 Typical capacitances

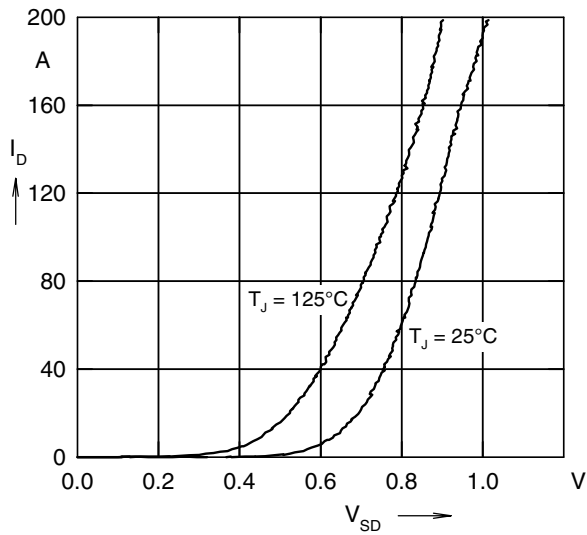


Fig. 9 Typical forward characteristics of diode

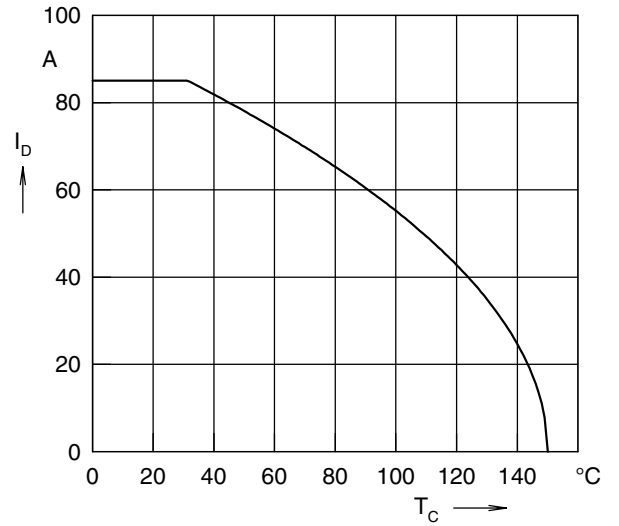


Fig. 10 Continuous drain current

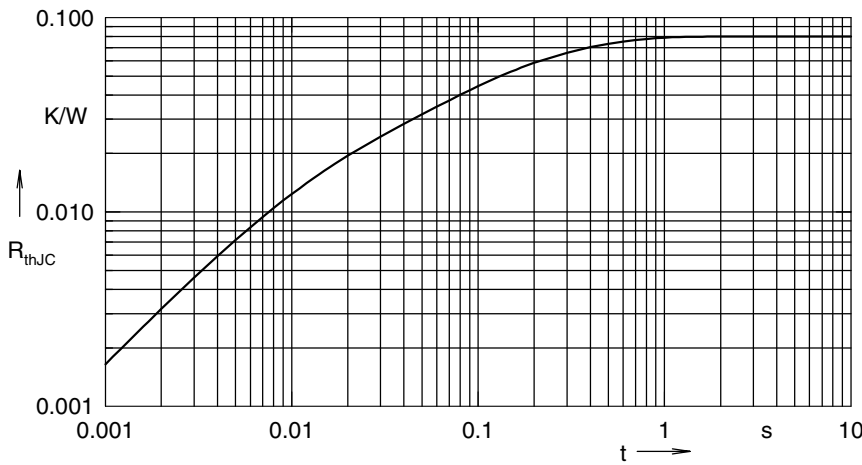


Fig. 11 Transient thermal resistance