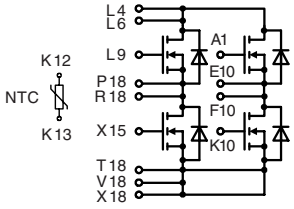
# HiPerFET™ Power MOSFET

H-Bridge Topology in ECO-PAC 2

N-Channel Enhancement Mode
High dv/dt, Low $t_{rr}$, HDMOS™ Family

$I_{D25}$ = 75 A
$V_{DSS}$ = 100 V
$R_{DSon}$ = 25 mΩ
$t_{rr}$ ≤ 200 ns






Pin arangement see outlines

**MOSFETs**

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 150°C | 100 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C; $R_{GS}$ = 1 MΩ | 100 | V |
| $V_{GS}$ | Continuous | ±20 | V |
| $V_{GSM}$ | Transient | ±30 | V |
| $I_{D25}$ | $T_C$ = 25°C | 75 | A |
| $I_{DM}$ | $T_C$ = 25°C, pulse width limited by $T_{JM}$ | 300 | A |
| $I_{AR}$ | $T_C$ = 25°C | 75 | A |
| $E_{AR}$ | $T_C$ = 25°C | 30 | mJ |
| dv/dt | $I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$, $R_G$ = 2 Ω | 5 | V/ns |
| $P_D$ | $T_C$ = 25°C | 300 | W |

| Symbol | Conditions ($T_J$ = 25°C, unless otherwise specified) | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $V_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 250 µA | 100 | | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = 4 mA | 2.0 | | 4 | V |
| $I_{GSS}$ | $V_{GS}$ = ±20 $V_{DC}$, $V_{DS}$ = 0 | | | ±100 | nA |
| $I_{DSS}$ | $V_{DS} = 0.8 \cdot V_{DSS}$; $T_J$ = 25°C | | | 250 | µA |
| | $V_{GS}$ = 0 V; $T_J$ = 125°C | | | 1 | mA |
| $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D = 0.5\ I_{D25}$ Pulse test, t ≤ 300 µs, duty cycle d ≤ 2% | | | 25 | mΩ |
| $g_{fs}$ | $V_{DS}$ = 10 V; $I_D = I_{D25}$, pulse test | 25 | 30 | | S |
| $C_{iss}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 25 V, f = 1 MHz | | 4500 | | pF |
| $C_{oss}$ | | | 1600 | | pF |
| $C_{rss}$ | | | 800 | | pF |
| $t_{d(on)}$ | $V_{GS}$ = 10 V, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5\ I_{D25}$ $R_G$ = 2 Ω, (External) | | 20 | 30 | ns |
| $t_r$ | | | 60 | 110 | ns |
| $t_{d(off)}$ | | | 80 | 110 | ns |
| $t_f$ | | | 60 | 90 | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 10 V, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5\ I_{D25}$ | | 180 | 260 | nC |
| $Q_{gs}$ | | | 36 | 70 | nC |
| $Q_{gd}$ | | | 85 | 160 | nC |
| $R_{thJC}$ | | | | 0.5 | K/W |
| $R_{thCK}$ | with heatsink compound (0.42 K/m.K; 50 µm) | | 0.25 | | K/W |

### Features

- HiPerFET™ technology
  - low $R_{DSon}$
  - low gate charge for high frequency operation
  - unclamped inductive switching (UIS) capability
  - dv/dt ruggedness
  - fast intrinsic reverse diode
- ECO-PAC 2 package
  - isolated back surface
  - enlarged creepage towards heatsink
  - application friendly pinout
  - low inductive current path
  - high reliability
  - solderable pins for PCB mounting

### Applications

- drives and power supplies
- battery or fuel cell powered
- automotive, industrial vehicle etc.
- secondary side of mains power supplies

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## Source-Drain Diode

| Symbol | Conditions | Characteristic Values ($T_J$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0 V | | | 75 | A |
| $I_{SM}$ | Repetitive; | | | 300 | A |
| $V_{SD}$ | $I_F = I_{D25}$, $V_{GS}$ = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2% | | | 1.75 | V |
| $t_{rr}$ | $I_F$ = 25 A, -di/dt = 100 A/µs, $T_J$ = 25°C | | | 200 | ns |
| | $V_R$ = 25 V $T_J$ = 125°C | | 300 | | ns |

## Temperature Sensor NTC

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $R_{25}$ | T = 25°C | 4.75 | 5.0 | 5.25 | kΩ |
| $B_{25/50}$ | | | 3375 | | K |

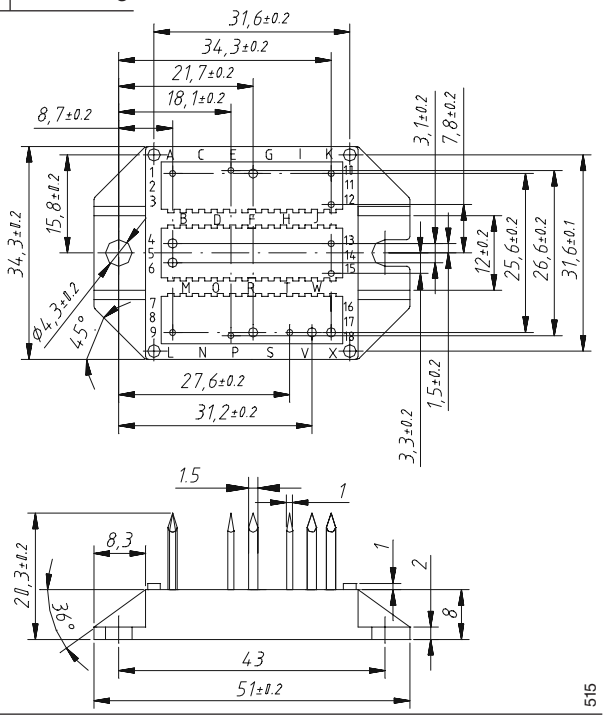
## Module

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $T_{VJ}$ | | -40...+150 | °C |
| $T_{stg}$ | | -40...+125 | °C |
| $V_{ISOL}$ | $I_{ISOL}$ ≤ 1 mA; 50/60 Hz; t = 1 s | 3600 | V~ |
| $M_d$ | mounting torque (M4) | 1.5 - 2.0 | Nm |
| | | 14 - 18 | lb.in. |
| a | Max. allowable acceleration | 50 | $m/s^2$ |

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $d_S$ | Creepage distance on surface (Pin to heatsink) | 11.2 | | | mm |
| $d_A$ | Strike distance in air (Pin to heatsink) | 11.2 | | | mm |
| **Weight** | | | 24 | | g |

Data according to IEC 60747 refer to a single diode or transistor unless otherwise stated

**Dimensions in mm (1 mm = 0.0394")**




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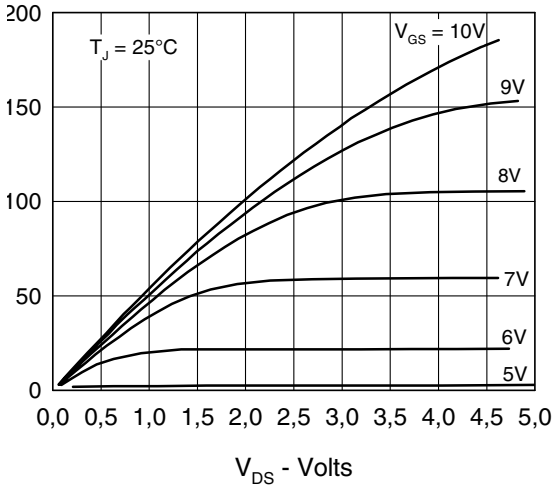



Fig. 1 Output Characteristics

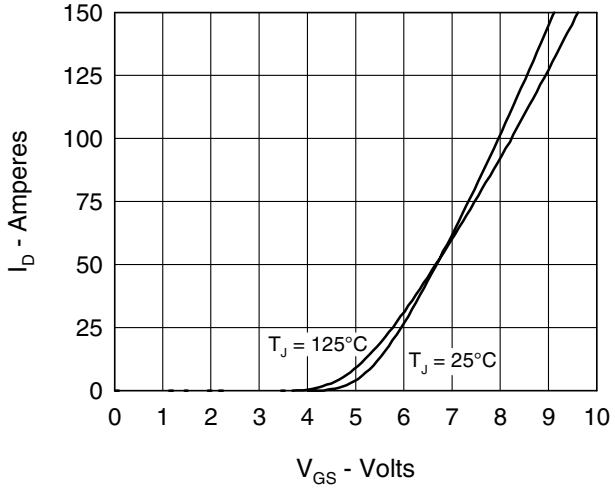



Fig. 2 Input Admittance

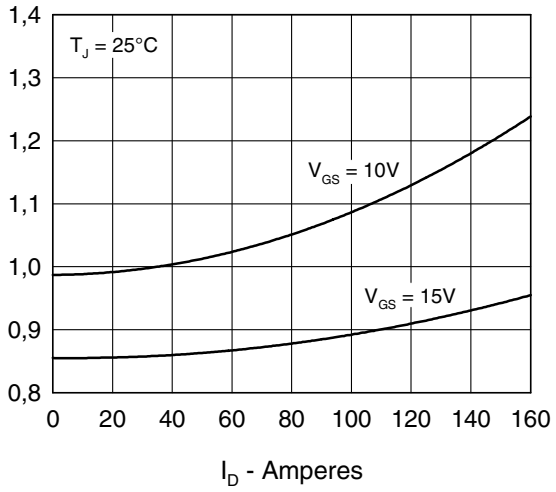



Fig. 3 $R_{DS(on)}$ vs. Drain Current

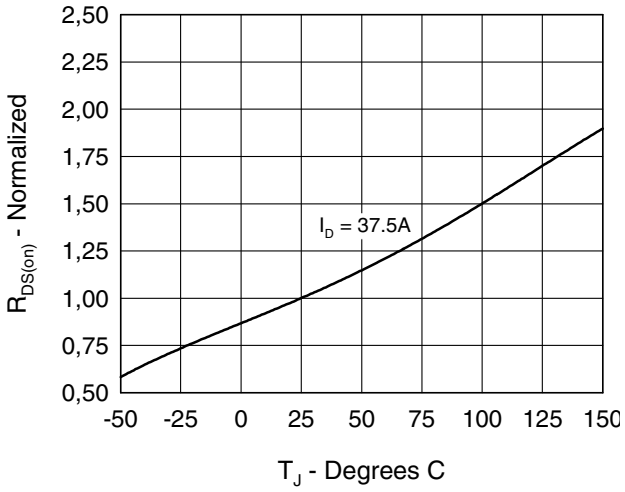



Fig. 4 Temperature Dependence of Drain to Source Resistance

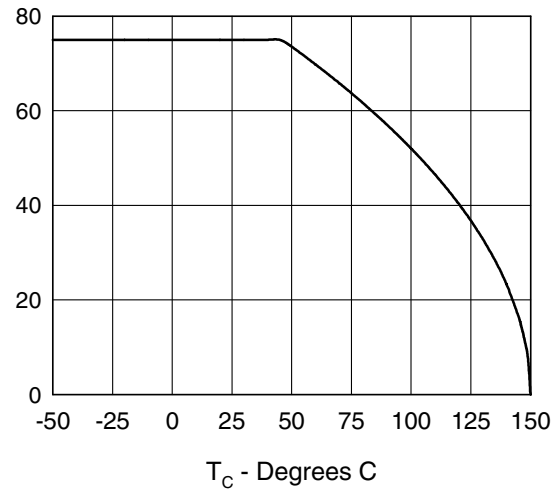



Fig. 5 Drain Current vs. Case Temperature

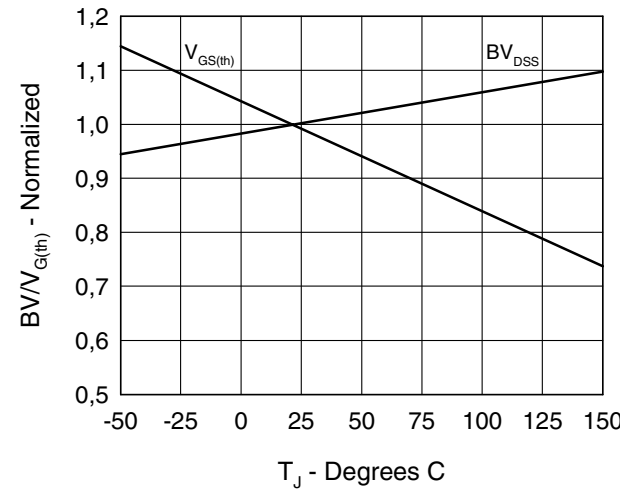



Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

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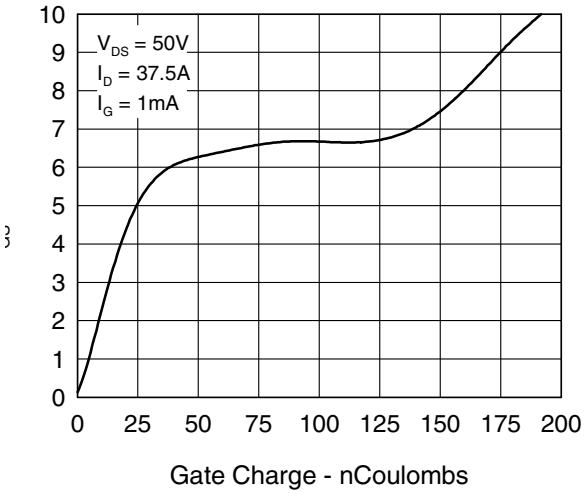



Fig.7 Gate Charge Characteristic Curve

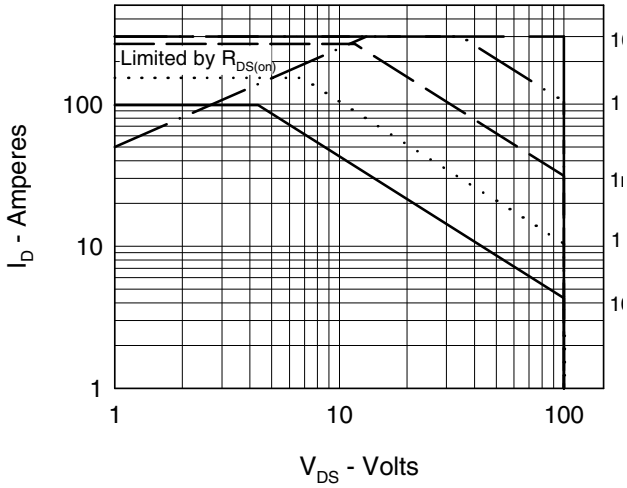



Fig.8 Forward Bias Safe Operating Area

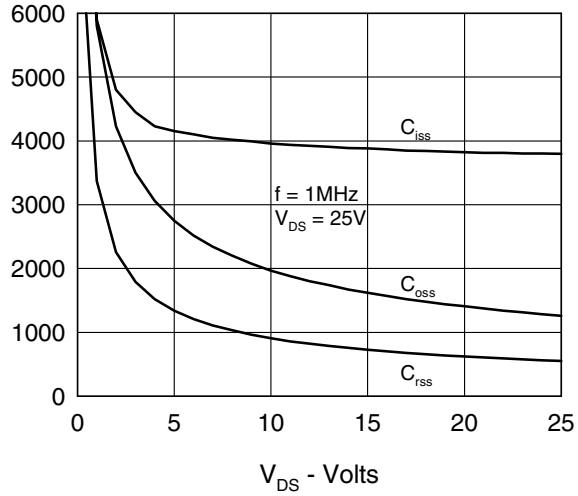



Fig.9 Capacitance Curves

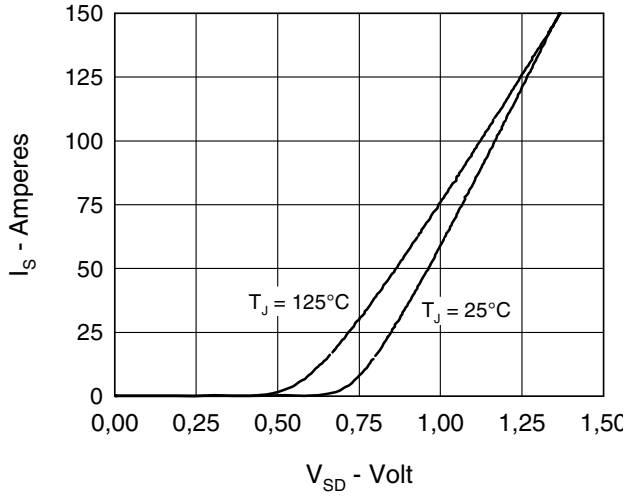



Fig.10 Source Current vs. Source to Drain Voltage

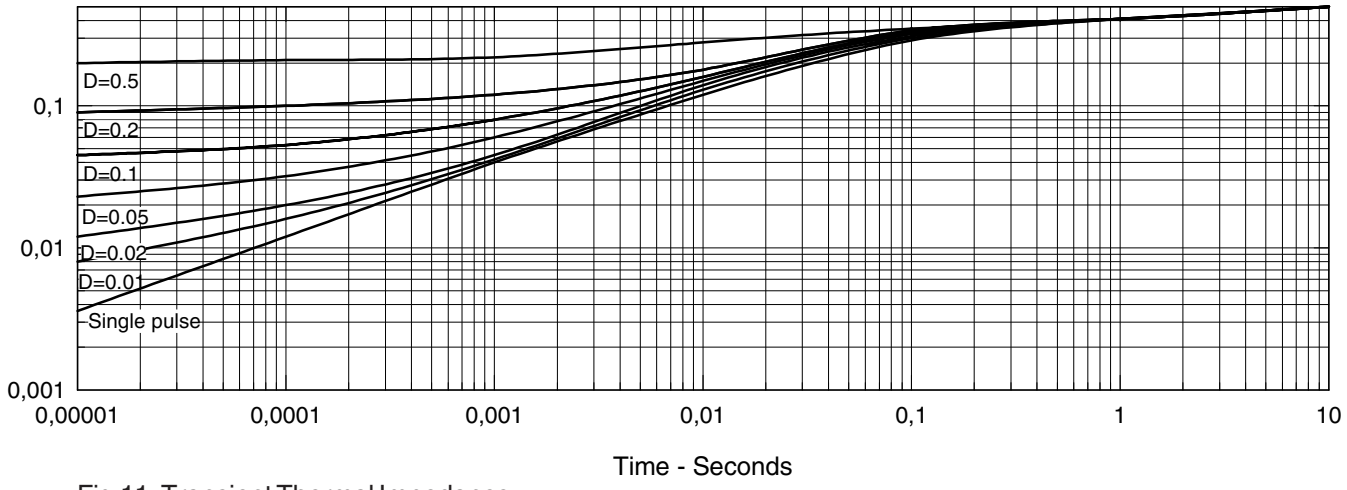



Fig.11 Transient Thermal Impedance

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