

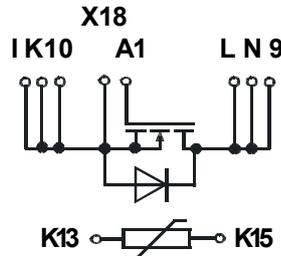
HiPerFET™ Power MOSFET

in ECO-PAC 2

PSMG 50/05*

(Electrically Isolated Back Surface)
Single MOSFET Die

I_{D25} = 43 A
 V_{DSS} = 500 V
 R_{DSon} = 100 mΩ
 t_{rr} < 250 ns



*NTC optional



Preliminary Data Sheet

MOSFET

| Symbol | Conditions | Maximum Ratings | |
|-----------|---|-----------------|------|
| V_{DSS} | $T_{VJ} = 25^{\circ}\text{C}$ to 150°C | 500 | V |
| V_{GS} | | ±20 | V |
| I_{D25} | $T_C = 25^{\circ}\text{C}$ | 43 | A |
| I_{D90} | $T_C = 90^{\circ}\text{C}$ | tbd | A |
| dv/dt | $V_{DS} < V_{DSS}$; $I_F \leq 50\text{A}$; $ di_F/dt \leq 100\text{A}/\mu\text{s}$ $T_{VJ} = 150^{\circ}\text{C}$ | 5 | V/ns |
| E_{AS} | $I_D = 10\text{A}$; $L = 36\text{mH}$; $T_C = 25^{\circ}\text{C}$ | 3 | J |
| E_{AR} | $I_D = 20\text{A}$; $L = 5\mu\text{H}$; $T_C = 25^{\circ}\text{C}$ | 60 | mJ |

Features

- ECO-PAC 2 with DCB Base
 - Electrical isolation towards the heatsink
 - Low coupling capacitance to the heatsink for reduced EMI
 - High power dissipation
 - High temperature cycling capability of chip on DCB
 - solderable pins for DCB mounting
- fast CoolMOS power MOSFET
 - 2nd generation
 - High blocking capability
 - Low on resistance
 - Avalanche rated for unclamped inductive switching (UIS)
 - Low thermal resistance due to reduced chip thickness
- Enhanced total power density
- UL certified, E 148688

| Symbol | Conditions | Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified) | | |
|---|---|--|------|----------------|
| | | min. | typ. | max. |
| R_{DSon} | $V_{GS} = 10\text{V}$; $I_D = I_{D90}$ | | 100 | mΩ |
| V_{GSth} | $V_{DS} = 20\text{V}$; $I_D = 8\text{mA}$ | 2 | | V |
| I_{DSS} | $V_{DS} = V_{DSS}$; $V_{GS} = 0\text{V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$ | | | 100 μA 2 mA |
| I_{GSS} | $V_{GS} = \pm 20\text{V}$; $V_{DS} = 0\text{V}$ | | | 100 nA |
| Q_g Q_{gs} Q_{gd} | $V_{GS} = 10\text{V}$; $V_{DS} = 250\text{V}$; $I_D = 50\text{A}$ | | 330 | nC |
| | | | 55 | nC |
| | | | 155 | nC |
| $t_{d(on)}$ t_r $t_{d(off)}$ t_f | $V_{GS} = 10\text{V}$; $V_{DS} = 380\text{V}$; $I_D = 25\text{A}$; $R_{\theta G} = 1.8^{\circ}\text{C/W}$ | | 45 | ns |
| | | | 60 | ns |
| | | | 120 | ns |
| | | | 45 | ns |
| V_F | (reverse conduction) $I_F = 20\text{A}$; $V_{GS} = 0\text{V}$ | | | V |
| R_{thJC} | per MOSFET | | | 0.3 K/W |

Applications

- Switched mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)
- Power factor correction (PFC)
- Welding
- Inductive heating

Caution: These Devices are sensitive to electrostatic discharge. Users should observe proper ESD handling precautions.

Module

| Symbol | Conditions | Maximum Ratings | |
|-------------|---|----------------------|------------------|
| T_{VJ} | | -40...+150 | °C |
| T_{stg} | | -40...+125 | °C |
| $V_{ISO L}$ | $I_{ISO L} \leq 1 \text{ mA}$; 50/60 Hz; $t = 1 \text{ s}$ | 3600 | V~ |
| M_d | Mounting torque (M4) | 1.5 - 2.0 14 - 18 | Nm 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 |

Dimensions in mm (1 mm = 0.0394")

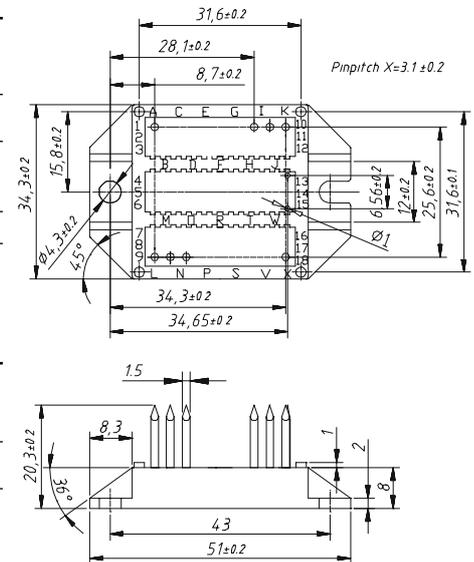


Figure 1. Output Characteristics at 25°C

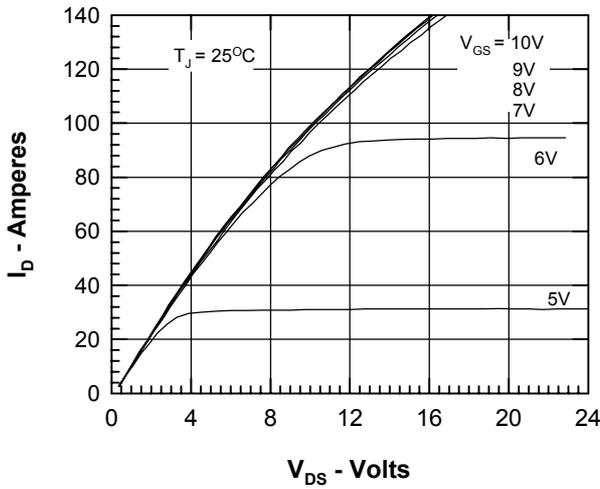


Figure 2. Output Characteristics at 125°C

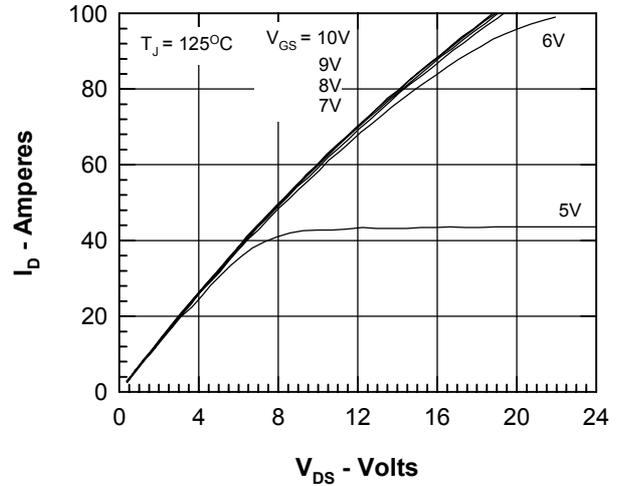


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

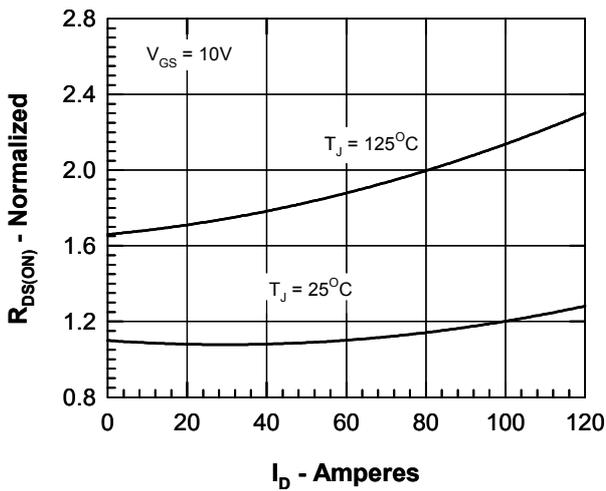


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

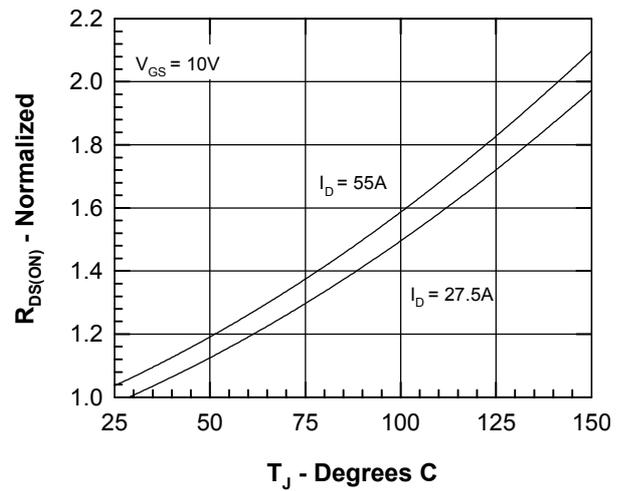


Figure 5. Drain Current vs. Case Temperature

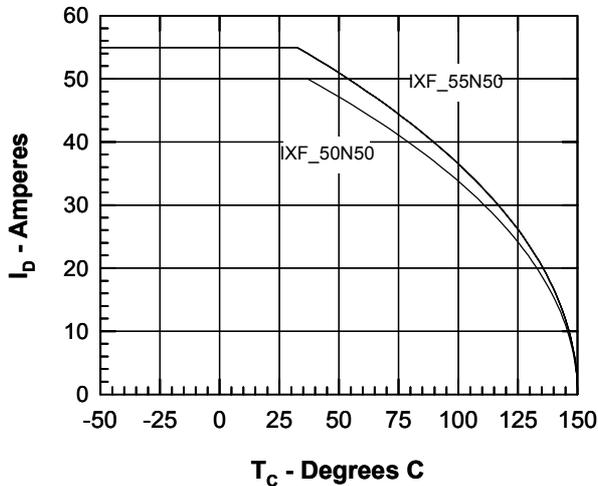


Figure 6. Admittance Curves

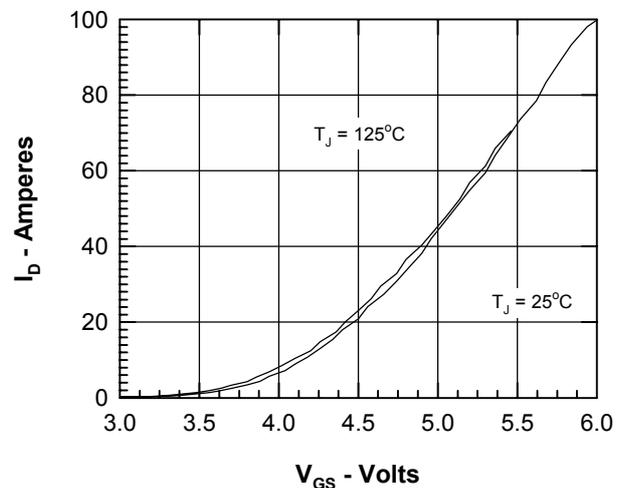


Figure 7. Gate Charge

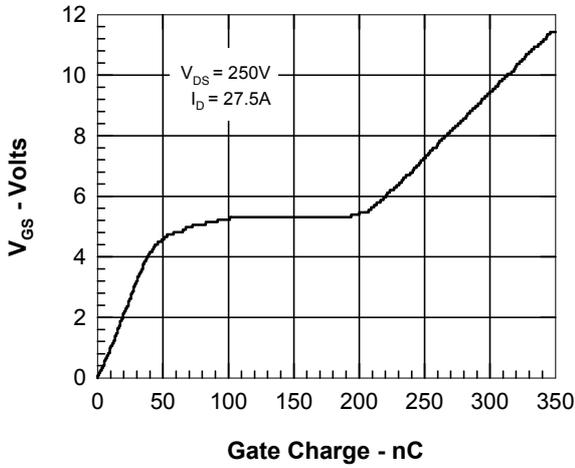


Figure 8. Capacitance Curves

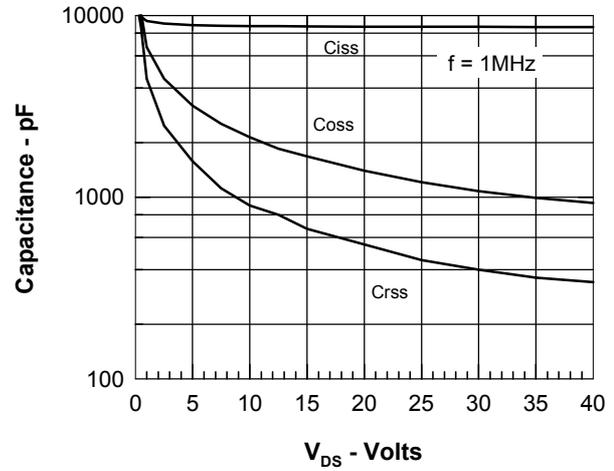


Figure 9. Forward Voltage Drop of the Intrinsic Diode

