POWERSEM

ECO-PAC™ 2

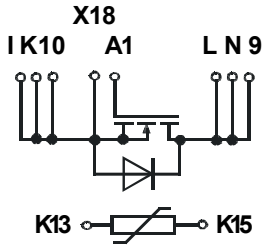
HiPerFET™ Power MOSFET

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

Preliminary Data Sheet



*NTC optional

MOSFET

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

Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
R_{DSon}	V_{GS} = 10 V; $I_D = I_{D90}$		100		mΩ
V_{GSth}	V_{DS} = 20 V; I_D = 8 mA;	2		4	V
I_{DSS}	$V_{DS} = V_{DSS}$; V_{GS} = 0 V; T_{VJ} = 25°C T_{VJ} = 125°C			100 2	µA mA
I_{GSS}	V_{GS} = ±20 V; V_{DS} = 0 V			100	nA
Q_g Q_{gs} Q_{gd}	V_{GS} = 10 V; V_{DS} = 250 V; I_D = 50 A		330 55 155		nC nC nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	V_{GS} = 10 V; V_{DS} = 380 V; I_D = 25 A; R_G = 1.8 Ω		45 60 120 45		ns ns ns ns
V_F	(reverse conduction) I_F = 20 A; V_{GS} = 0 V				V
R_{thJC}	per MOSFET			0.3	K/W

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

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.

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Module

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-40...+150	°C
T_{stg}		-40...+125	°C
V_{ISOL}	$I_{ISOL} \leq 1$ 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

Dimensions in mm (1 mm = 0.0394")

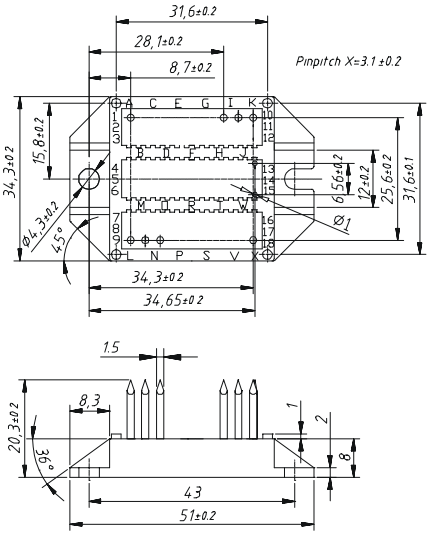

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Figure 1. Output Characteristics at 25°C

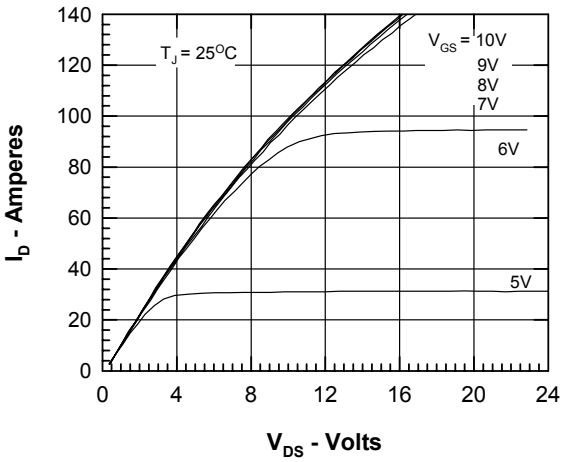

Figure 2. Output Characteristics at 125°C

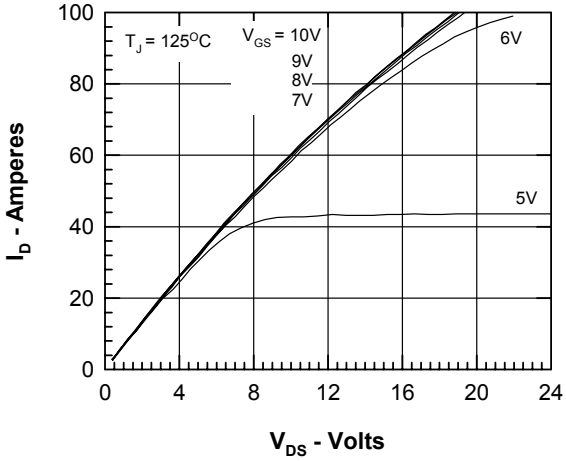

Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

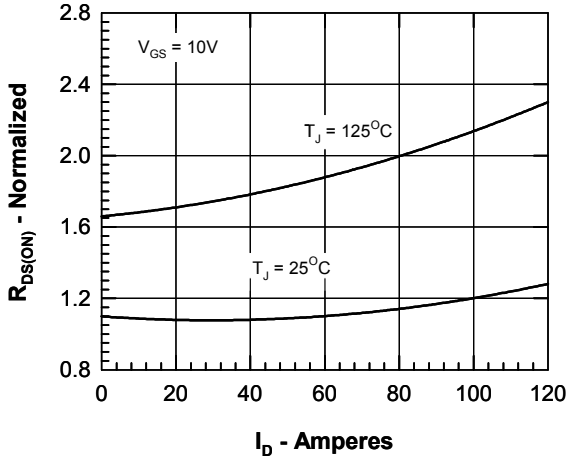

Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

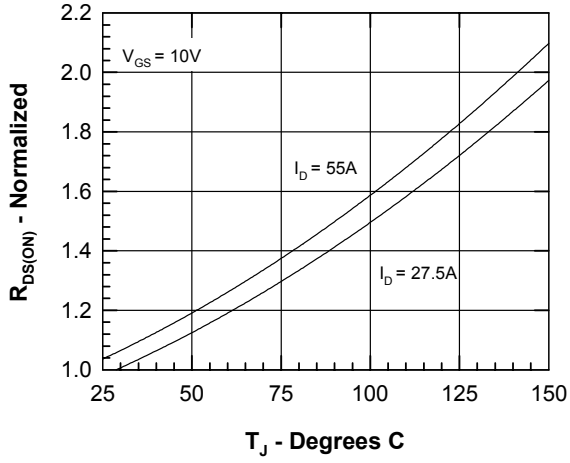

Figure 5. Drain Current vs. Case Temperature

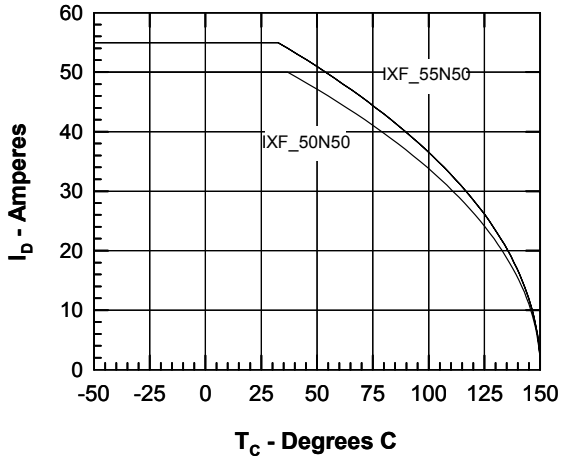

Figure 6. Admittance Curves

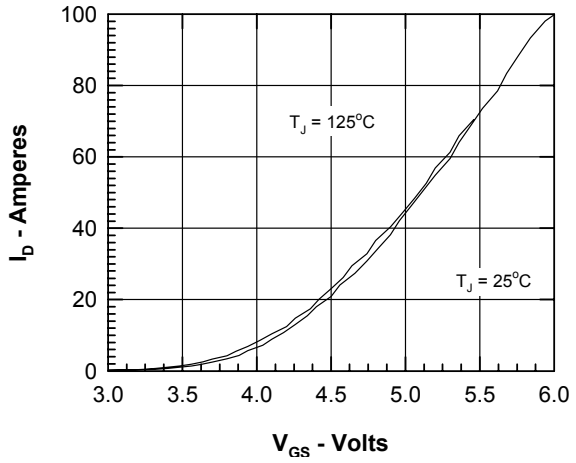

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Figure 7. Gate Charge

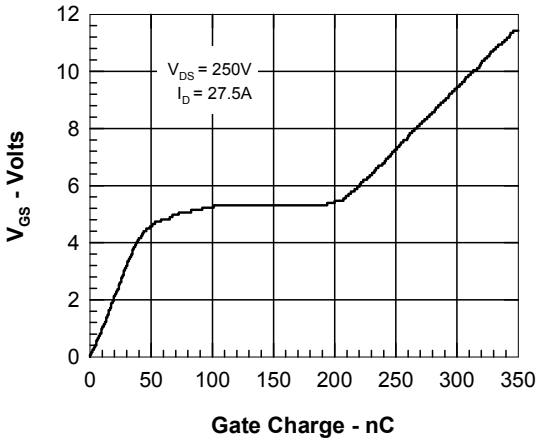


Figure 8. Capacitance Curves

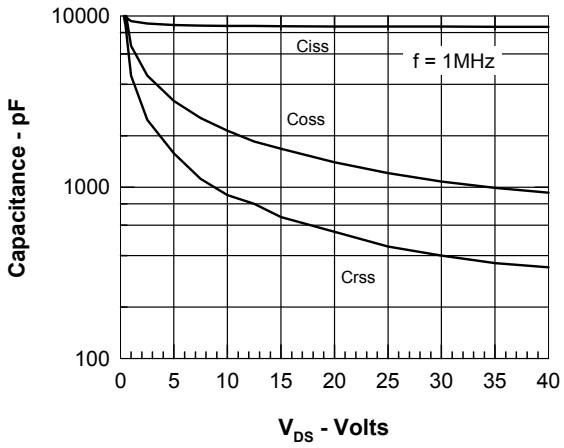
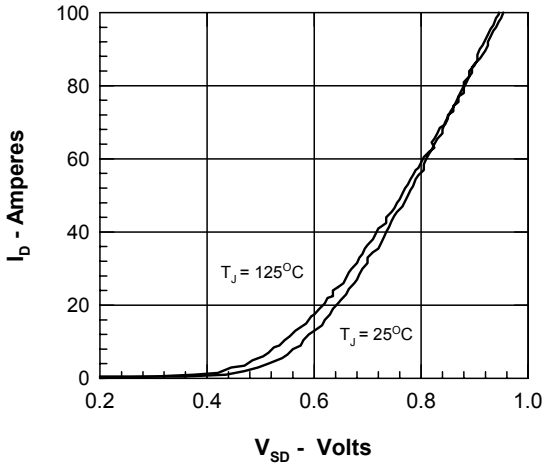
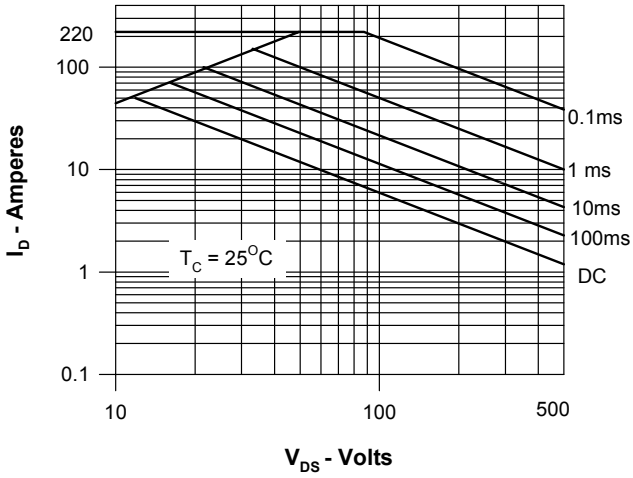


Figure 9. Forward Voltage Drop of the Intrinsic Diode





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