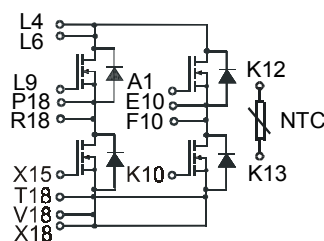


Power MOSFET

in ECO-PAC 2

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

PSHM 120/01



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



Preliminary Data Sheet

MOSFETs

Symbol	Test 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 ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C, R _G = 2 Ω	5		V/ns
P _D	T _C = 25°C	300		W
Symbol	Test Conditions	Characteristic Values (T _J = 25°C, unless otherwise specified)		
		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 • V _{DSS} ; T _J = 25°C V _{GS} = 0 V; T _J = 125°C			250 μA 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 • 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 • V _{DSS} , I _D = 0.5 I _{D25}		180	260 nC
Q _{gs}			36	70 nC
Q _{gd}			85	160 nC
R _{thJC}	with heatsink compound (0.42 K/m.K; 50 μm)			0.5 K/W
R _{thCK}			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
- UL registered, E 148688

Applications

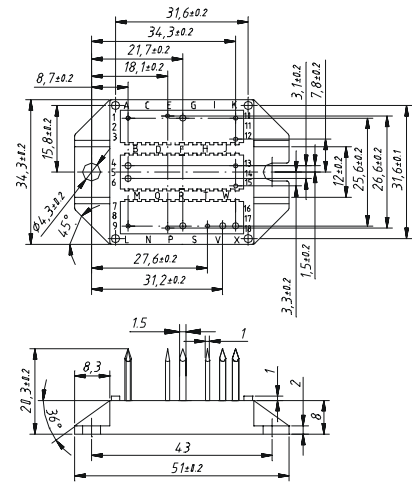
- drives and power supplies
- battery or fuel cell powered
- automotive, industrial vehicle etc.
- secondary side of mains power supplies

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

Source-Drain Diode

Symbol	Test 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 V _R = 25 V		300	200 ns ns

Dimensions in mm (1 mm = 0.0394")



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 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

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

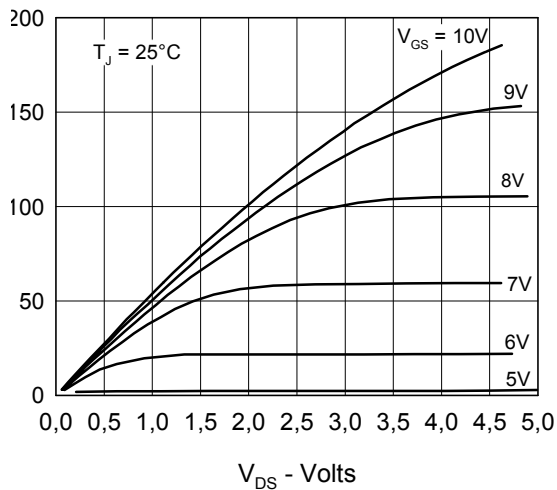


Fig. 1 Output Characteristics

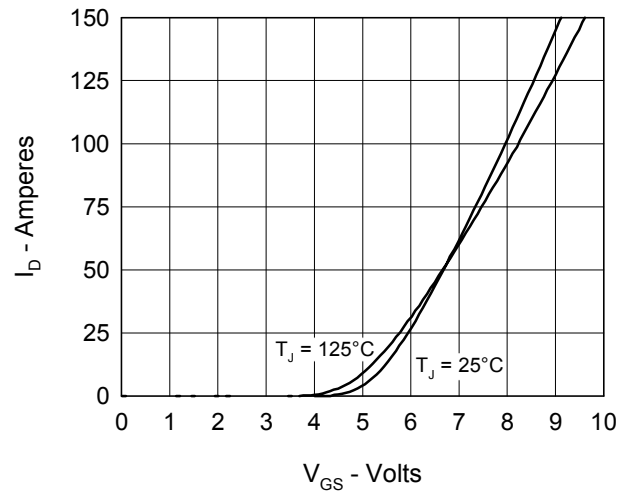


Fig. 2 Input Admittance

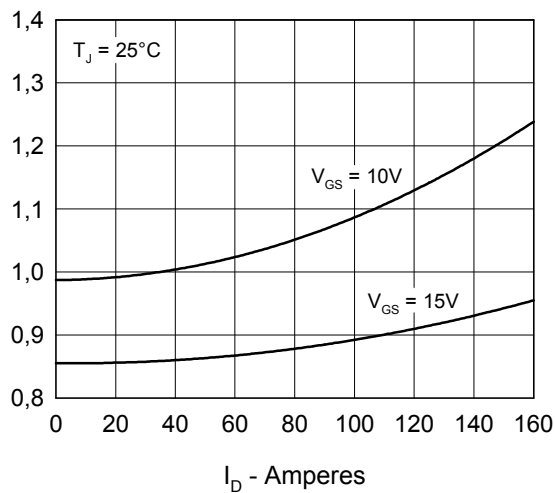


Fig. 3 $R_{DS(on)}$ vs. Drain Current

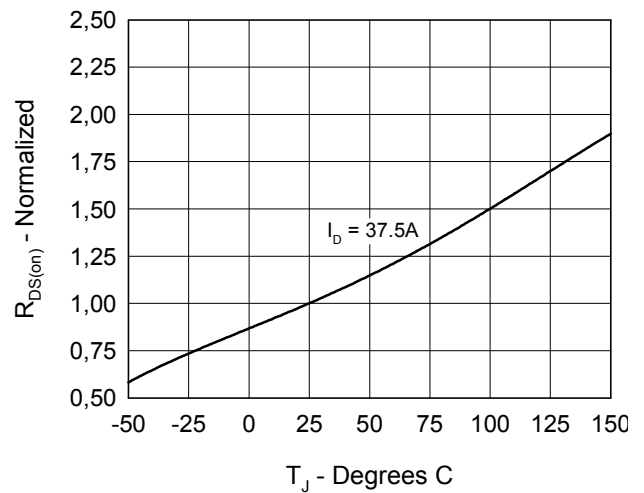


Fig. 4 Temperature Dependence of Drain to Source Resistance

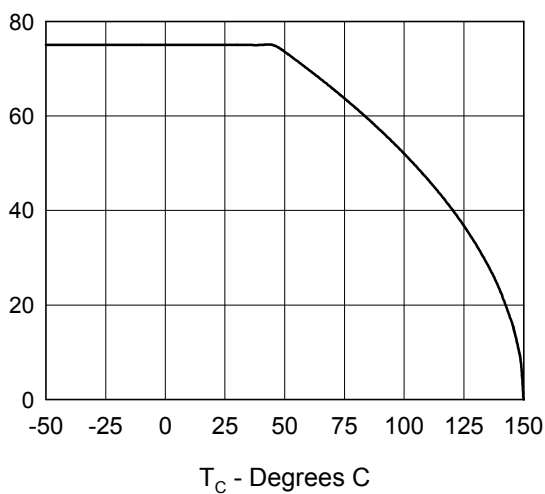


Fig. 5 Drain Current vs. Case Temperature

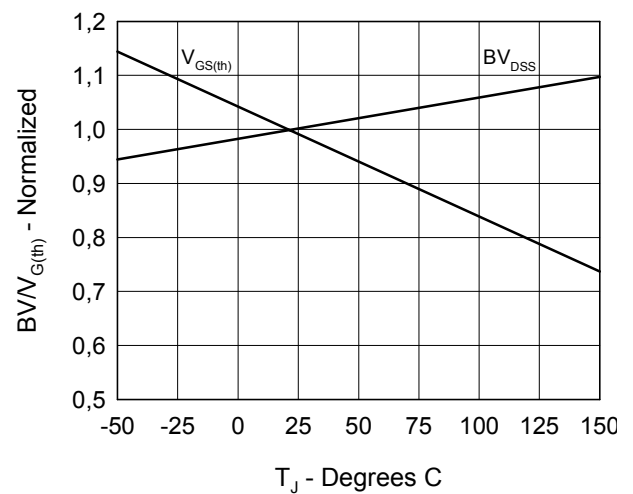


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

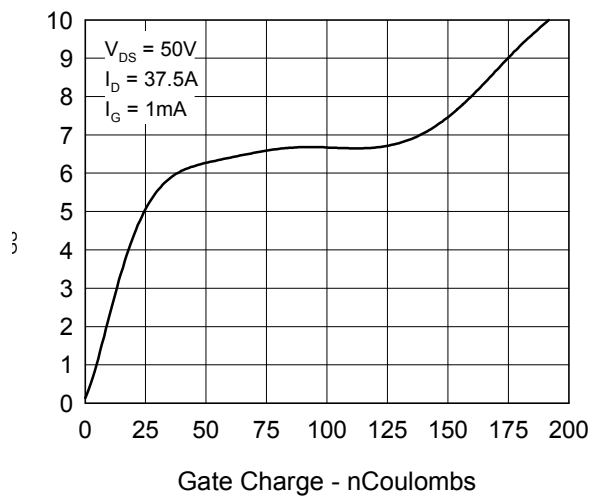


Fig.7 Gate Charge Characteristic Curve

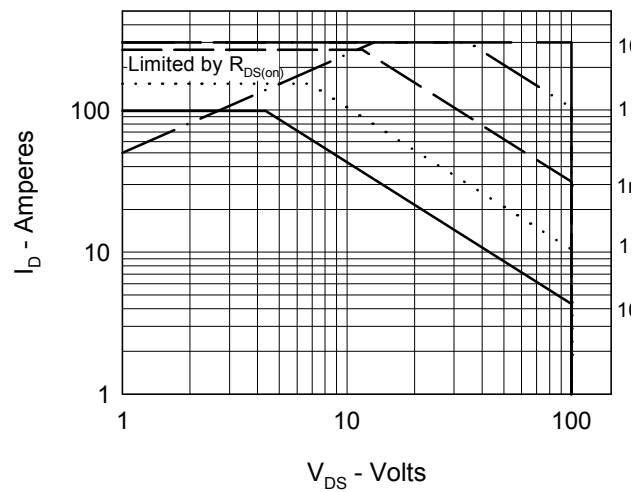


Fig.8 Forward Bias Safe Operating Area

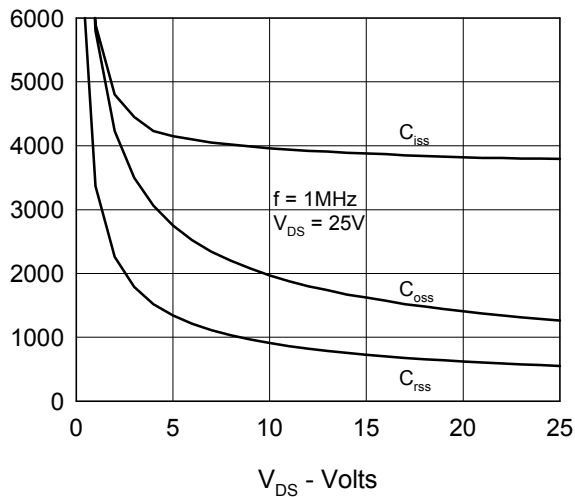


Fig.9 Capacitance Curves

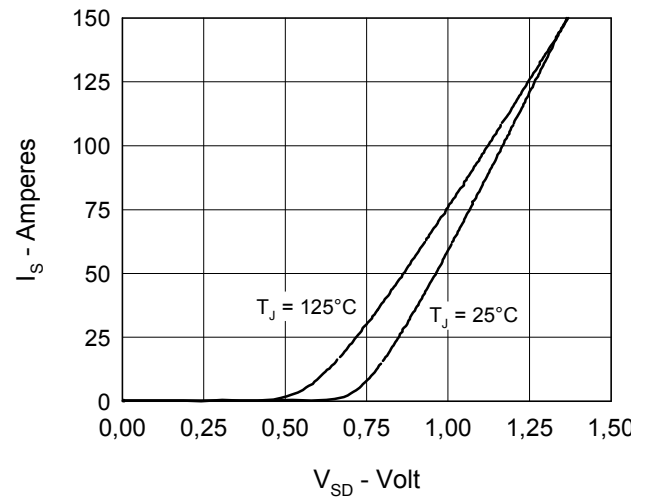


Fig.10 Source Current vs. Source to Drain Voltage

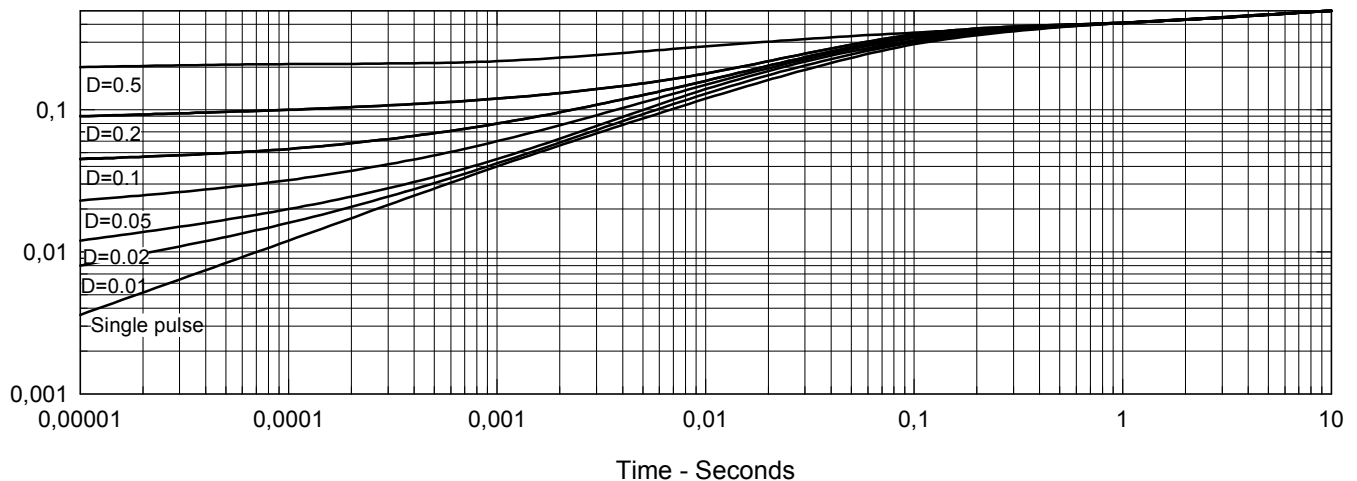


Fig.11 Transient Thermal Impedance