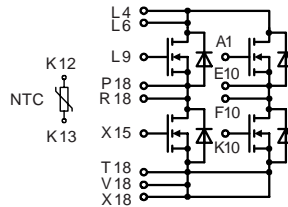


HiPerFET™ Power MOSFET

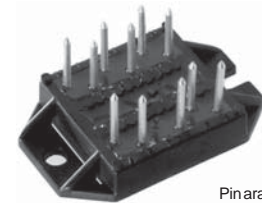
H-Bridge Topology in ECO-PAC 2

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

Preliminary data sheet



$I_{D25} = 75 \text{ A}$
 $V_{DSS} = 100 \text{ V}$
 $R_{DS(on)} = 25 \text{ m}\Omega$
 $t_{rr} \leq 200 \text{ ns}$



Pin arrangement see outlines

MOSFETs

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	100	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	100	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	75	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	300	A
I_{AR}	$T_C = 25^\circ\text{C}$	75	A
E_{AR}	$T_C = 25^\circ\text{C}$	30	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$	5	V/ns
P_D	$T_C = 25^\circ\text{C}$	300	W

Features

- HiPerFET™ technology
 - low $R_{DS(on)}$
 - 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

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2.0		V
I_{GSS}	$V_{GS} = \pm 20 V_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$; $T_J = 25^\circ\text{C}$ $V_{GS} = 0 \text{ V}$; $T_J = 125^\circ\text{C}$			250 μA 1 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2\%$			0.020 Ω
g_{fs}	$V_{DS} = 10 \text{ V}$; $I_D = I_{D25}$, pulse test	25	30	S
C_{iss}			4500	pF
C_{oss}	$V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$		1600	pF
C_{rss}			800	pF
$t_{d(on)}$			20	30 ns
t_r	$V_{GS} = 10 \text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 I_{D25}$		60	110 ns
$t_{d(off)}$	$R_G = 2 \Omega$, (External)		80	110 ns
t_f			60	90 ns
$Q_{g(on)}$			180	260 nC
Q_{gs}	$V_{GS} = 10 \text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 I_{D25}$		36	70 nC
Q_{gd}			85	160 nC
R_{thJC}				0.5 kW/KW
R_{thCK}	with heatsink compound (0.42 K/m.K; 50 μm)	0.25		KW/KW

Applications

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

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

Source-Drain Diode

Characteristic Values
($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			75 A
I_{SM}	Repetitive;			300 A
V_{SD}	$I_F = I_{D25}$, $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.75 V
t_{rr}	$I_F = 25\text{ A}$, $-di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$ $V_R = 25\text{ V}$ $T_J = 125^\circ\text{C}$		300	200 ns ns

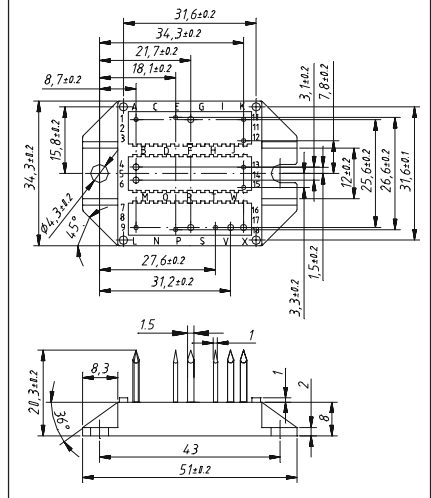
Temperature Sensor NTC

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R_{25}	$T = 25^\circ\text{C}$	4.75	5.0	5.25 k Ω
$B_{25/50}$			3375	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 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")


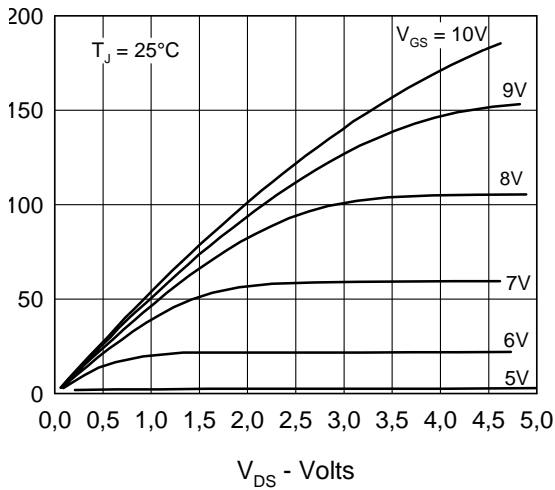


Fig. 1 Output Characteristics

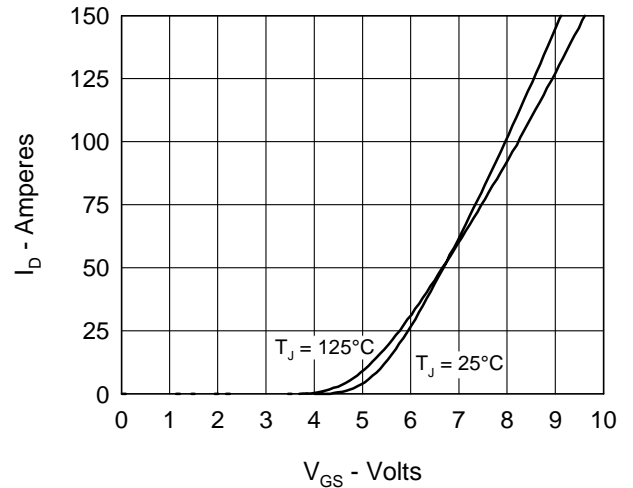


Fig. 2 Input Admittance

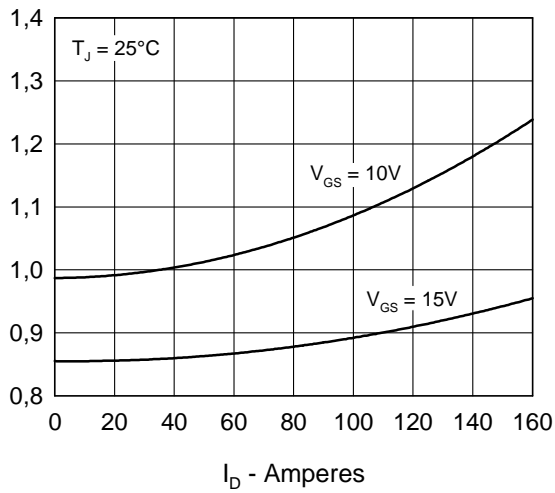


Fig. 3 $R_{DS(on)}$ vs. Drain Current

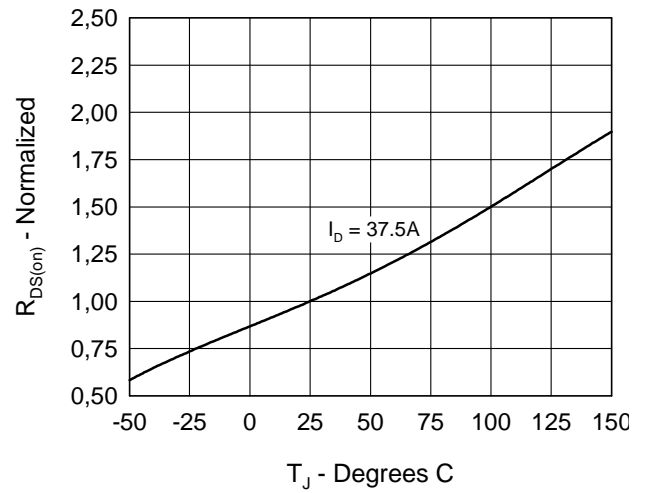


Fig. 4 Temperature Dependence of Drain to Source Resistance

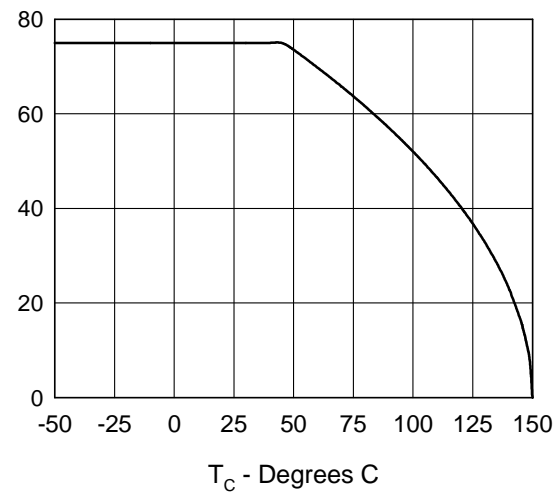


Fig. 5 Drain Current vs. Case Temperature

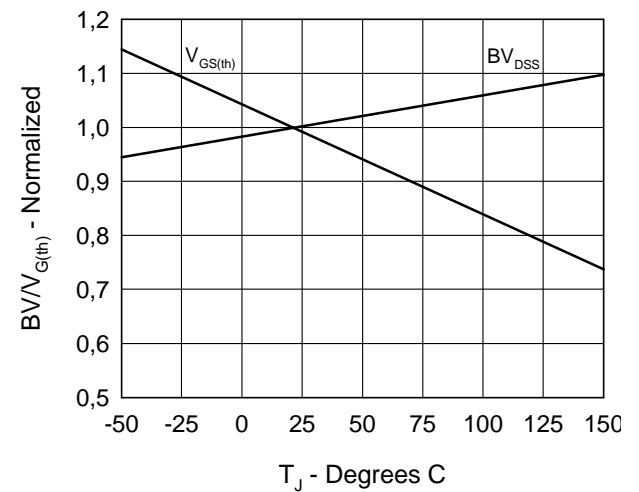


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

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

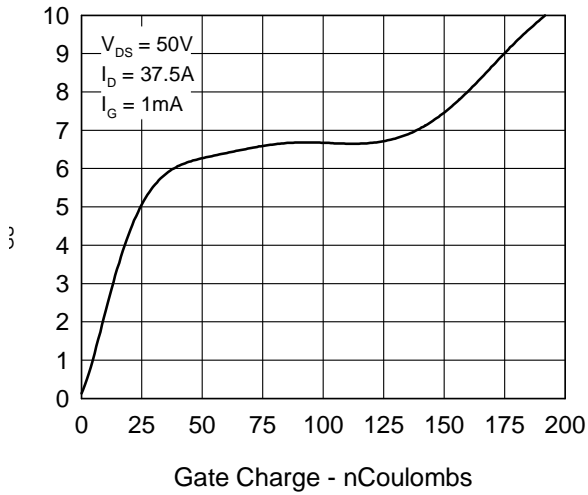


Fig.7 Gate Charge Characteristic Curve

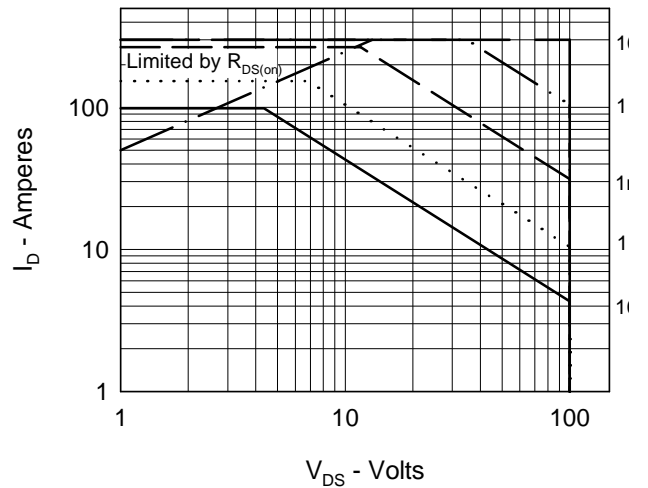


Fig.8 Forward Bias Safe Operating Area

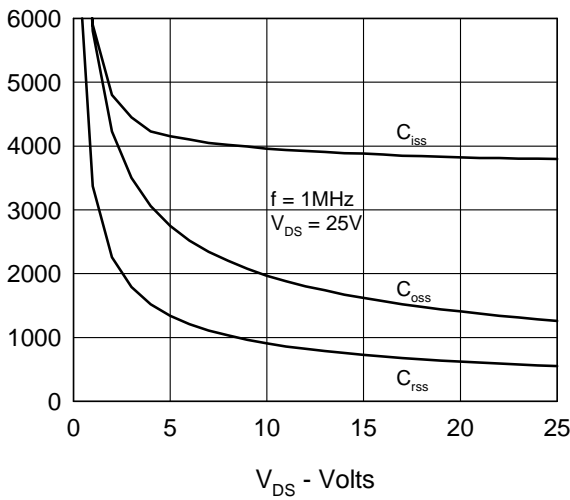


Fig.9 Capacitance Curves

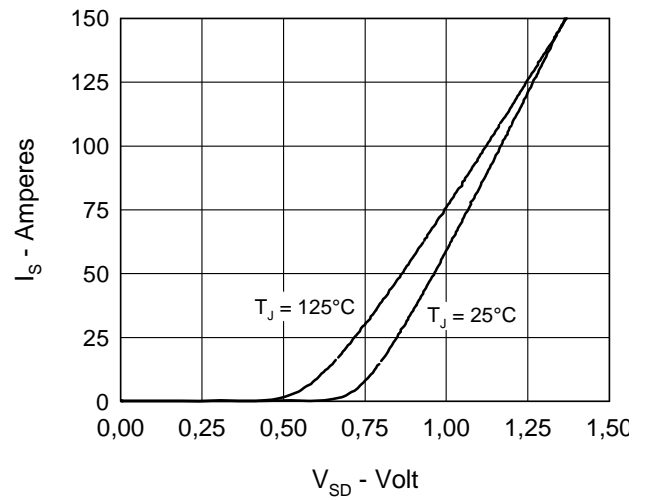


Fig.10 Source Current vs. Source to Drain Voltage

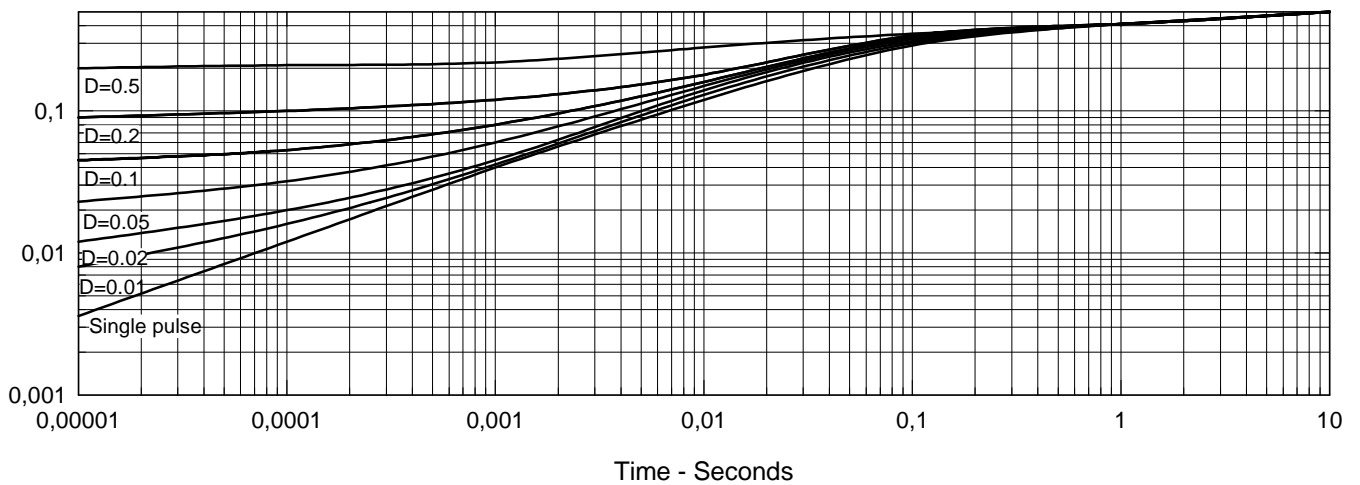


Fig.11 Transient Thermal Impedance