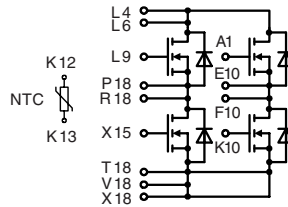


# HiPerFET™ Power MOSFET

## H-Bridge Topology in ECO-PAC 2

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



**$I_{D25} = 75 \text{ A}$**   
 **$V_{DSS} = 100 \text{ V}$**   
 **$R_{DSon} = 25 \text{ m}\Omega$**   
 **$t_{rr} \leq 200 \text{ ns}$**



Pin arrangement see outlines

MOSFETs				
Symbol	Conditions	Maximum Ratings		
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	100	V	
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	100	V	
$V_{GS}$	Continuous	$\pm 20$	V	
$V_{GSM}$	Transient	$\pm 30$	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	
<b>dv/dt</b>	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$	5	V/ns	
$P_D$	$T_C = 25^\circ\text{C}$	300	W	
Symbol	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
$I_{GSS}$	$V_{GS} = \pm 20 V_{DC}$ , $V_{DS} = 0$			$\pm 100$ 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 $\mu\text{A}$ 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 $d \leq 2\%$			25 m $\Omega$
$g_{fs}$	$V_{DS} = 10 \text{ V}$ ; $I_D = I_{D25}$ , 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
$C_{riss}$			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
$R_{thCK}$	with heatsink compound (0.42 K/m.K; 50 $\mu\text{m}$ )	0.25		KW

### 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

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	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 $\Omega$
$B_{25/50}$			3375	K

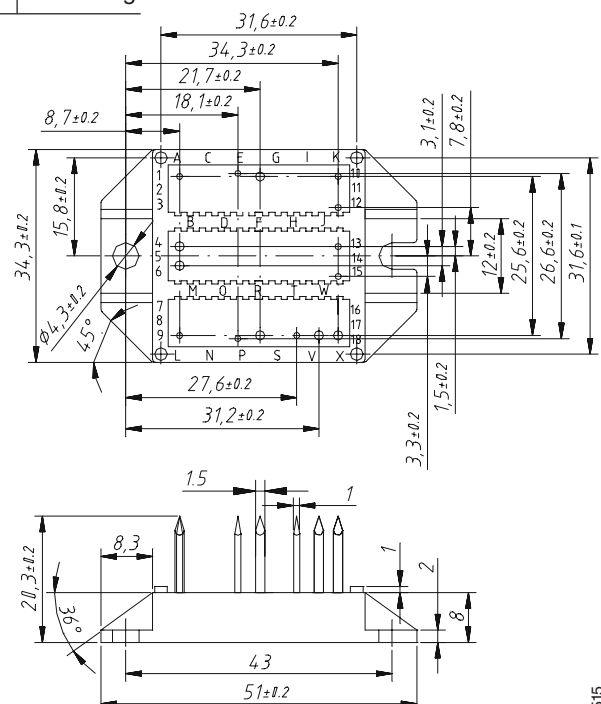
### Module

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	$\text{m/s}^2$

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
<b>Weight</b>		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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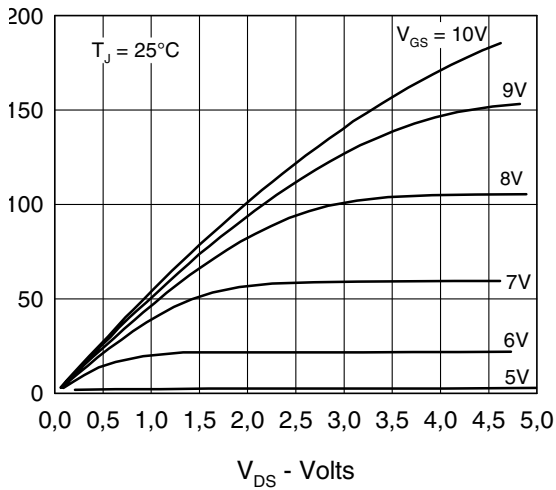


Fig. 1 Output Characteristics

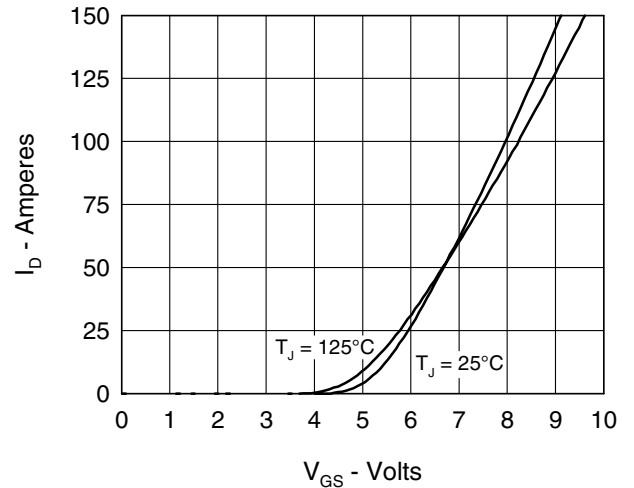


Fig. 2 Input Admittance

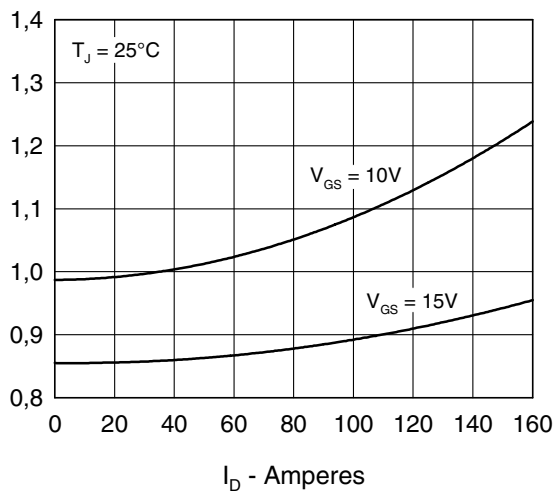


Fig. 3  $R_{DS(on)}$  vs. Drain Current

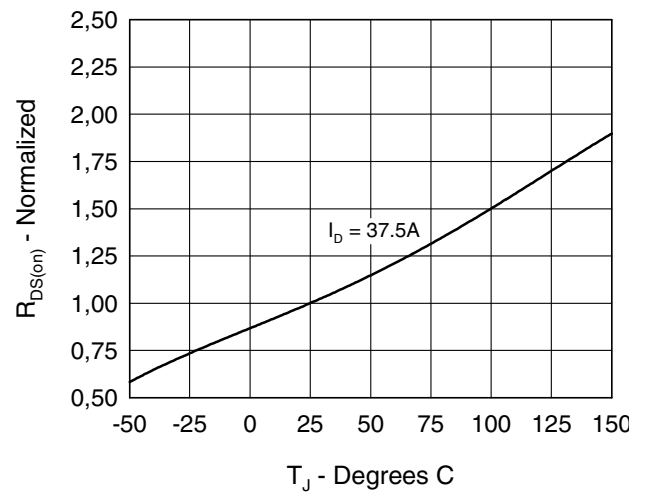


Fig. 4 Temperature Dependence of Drain to Source Resistance

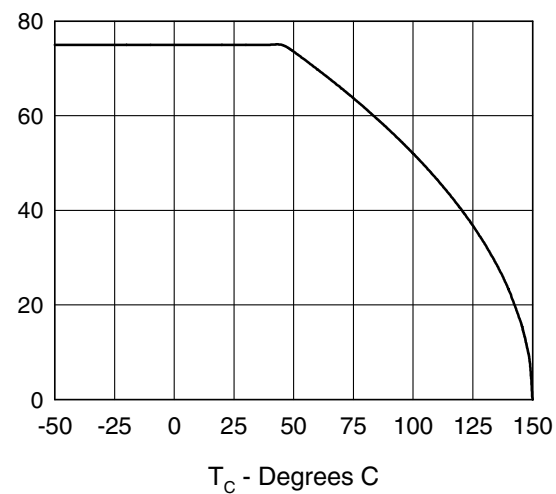


Fig. 5 Drain Current vs. Case Temperature

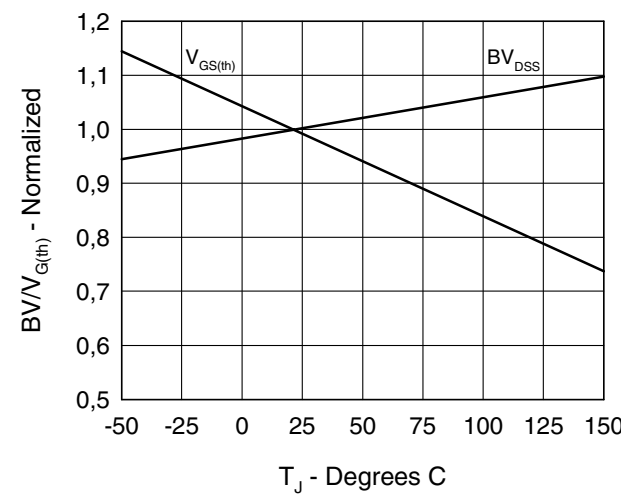


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

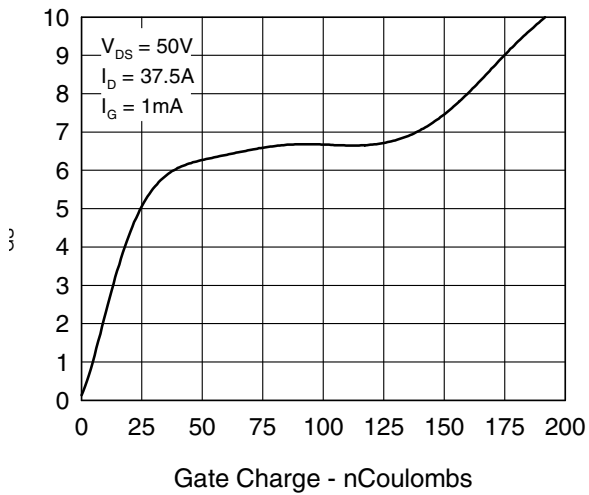


Fig.7 Gate Charge Characteristic Curve

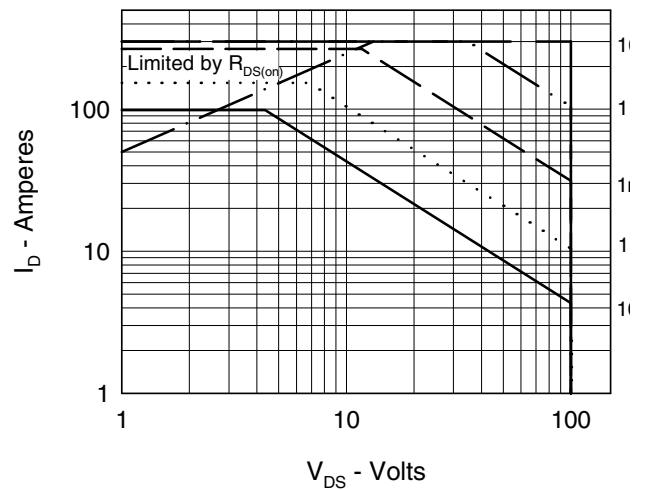


Fig.8 Forward Bias Safe Operating Area

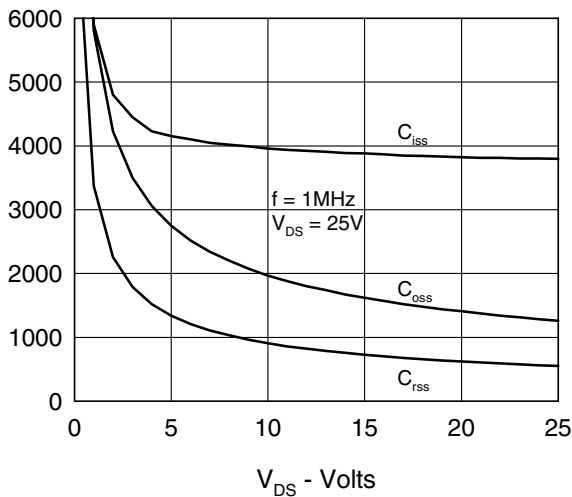


Fig.9 Capacitance Curves

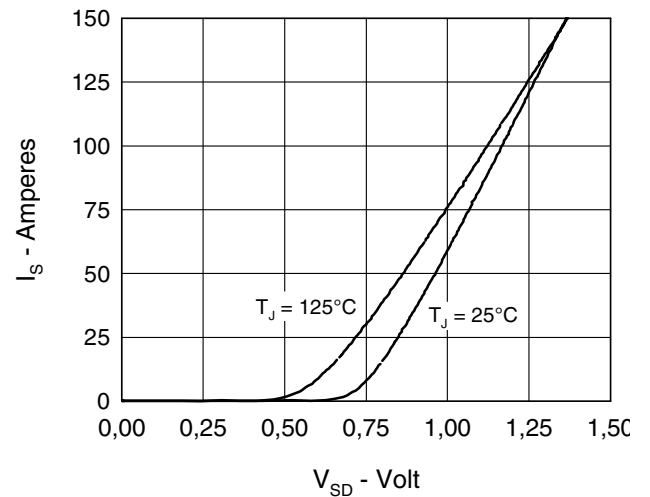


Fig.10 Source Current vs. Source to Drain Voltage

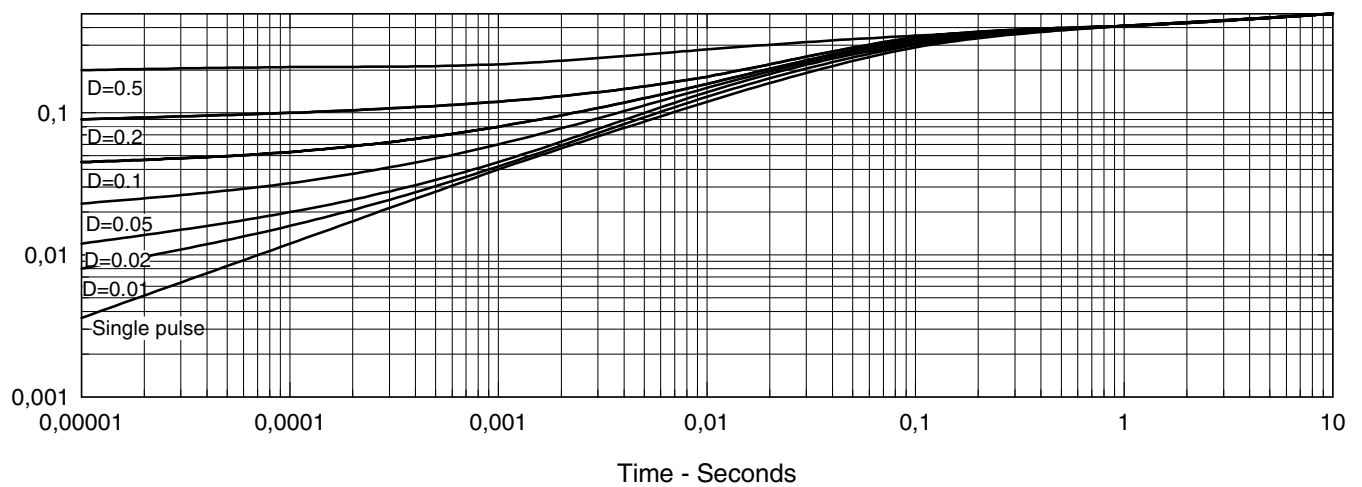


Fig.11 Transient Thermal Impedance