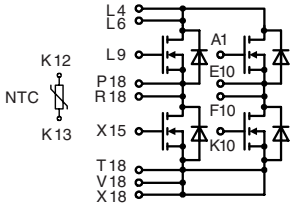
HiPerFET™ Power MOSFET

H-Bridge Topology in ECO-PAC 2

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

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



Pin arangement see outlines

MOSFETs

Symbol	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	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$, R_G = 2 Ω	5	V/ns
P_D	T_C = 25°C	300	W

Symbol	Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values 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}	$V_{DS} = 0.8 \cdot V_{DSS}$; T_J = 25°C			250	µA
	V_{GS} = 0 V; T_J = 125°C			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, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5\ I_{D25}$ 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, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5\ I_{D25}$		180	260	nC
Q_{gs}			36	70	nC
Q_{gd}			85	160	nC
R_{thJC}				0.5	K/W
R_{thCK}	with heatsink compound (0.42 K/m.K; 50 µm)		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

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.

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Source-Drain Diode

Symbol	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			200	ns
	V_R = 25 V T_J = 125°C		300		ns

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

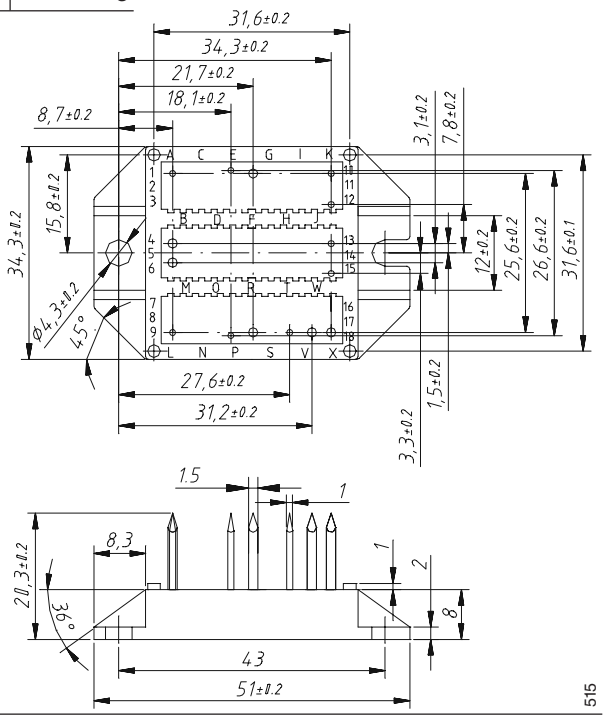
Module

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	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

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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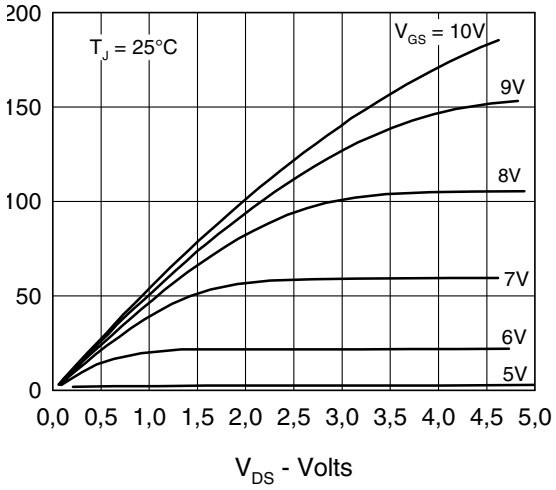

Fig. 1 Output Characteristics

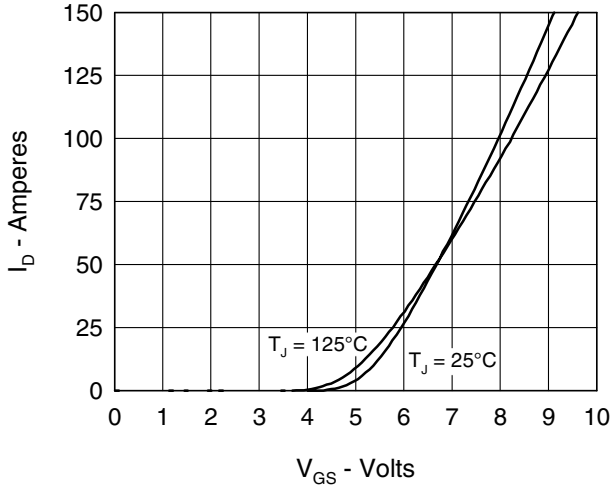

Fig. 2 Input Admittance

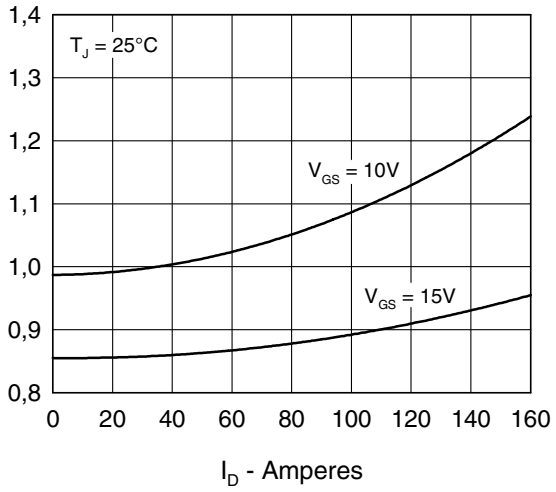

Fig. 3 $R_{DS(on)}$ vs. Drain Current

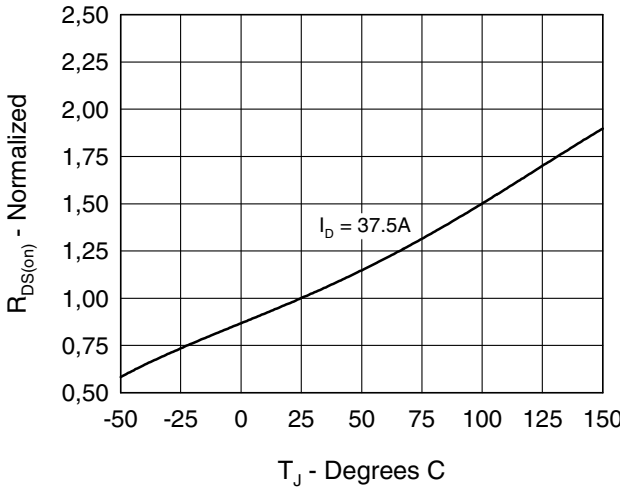

Fig. 4 Temperature Dependence of Drain to Source Resistance

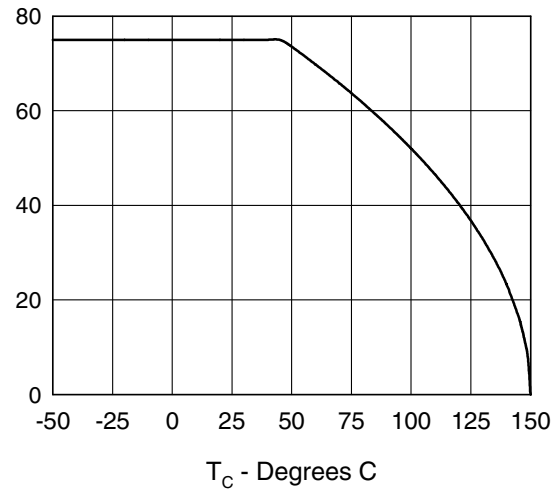

Fig. 5 Drain Current vs. Case Temperature

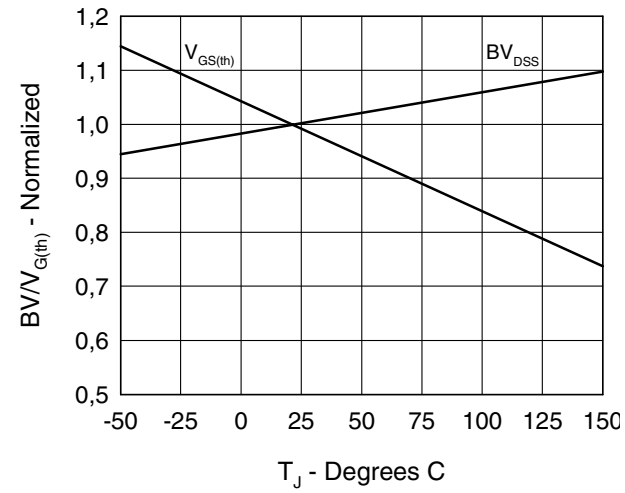

Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage