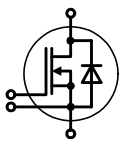
HiPerFET™ Power MOSFETs
in ECO-PAC 2

(Electrically Isolated Back Surface)

Single MOSFET

V_{DSS} = **100 V**
I_{D25} = **165 A**
$R_{DS(on)}$ = **8 mΩ**
t_{rr} ≤ **250 ns**



Pin arangement see outlines

MOSFET

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 (MOSFET chip capability)	165	A
$I_{D(RMS)}$	External lead (current limit)	76	A
I_{DM}	T_C = 25°C 1)	720	A
I_{AR}	T_C = 25°C	180	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	3	J
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	400	W

Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 3 mA	100			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8 mA	2.0		4.0	V
I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$; T_J = 25°C V_{GS} = 0 V; T_J = 125°C			100 2	µA mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 90 A 1)			8	mΩ
g_{fs}	V_{DS} = 10 V; I_D = 90 A 2)	60	90		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		9400		pF
C_{oss}			3200		pF
C_{rss}			1660		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 90 A R_G = 1 Ω (External)		50		ns
t_r			90		ns
$t_{d(off)}$			140		ns
t_f			65		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 90 A		400		nC
Q_{gs}			65		nC
Q_{gd}			220		nC
R_{thJC}				0.30	K/W
R_{thCK}	with heatsink compound (0.42 K/m.K; 50 µm)		0.2		K/W

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(< 25pF)
- Low $R_{DS\ (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic Rectifier

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

- Easy assembly
- Space savings
- High power density

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			180	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			720	A
V_{SD}	I_F = 100A, V_{GS} = 0 V, 1)			1.5	V
t_{rr}	I_F = 50A,-di/dt = 100 A/µs, V_R = 100 V			250	ns
Q_{RM}			1.1		µC
I_{RM}			13		A

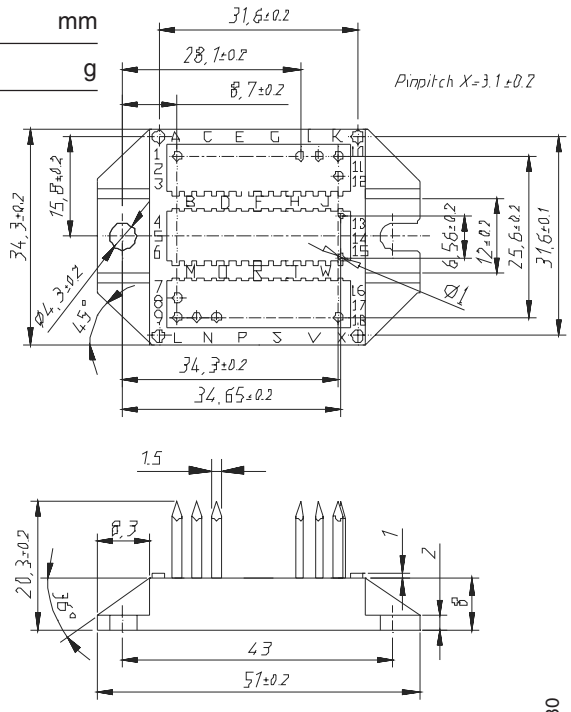
Note: 1) Pulse width limited by T_{JM}
2) Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %

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

Dimensions in mm (1 mm = 0.0394")



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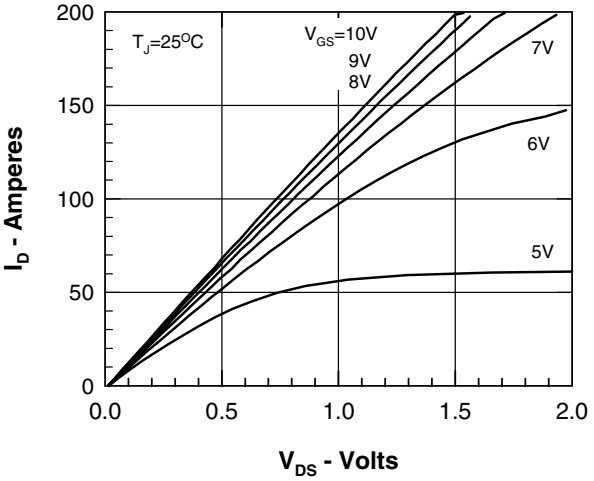

Figure 1. Output Characteristics at 25°C

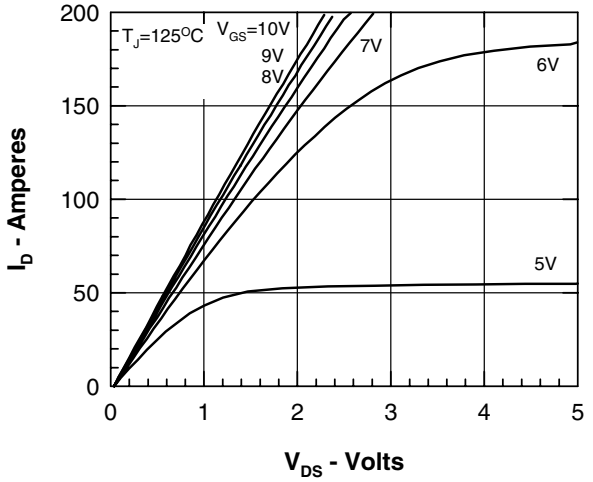

Figure 2. Output Characteristics at 125°C

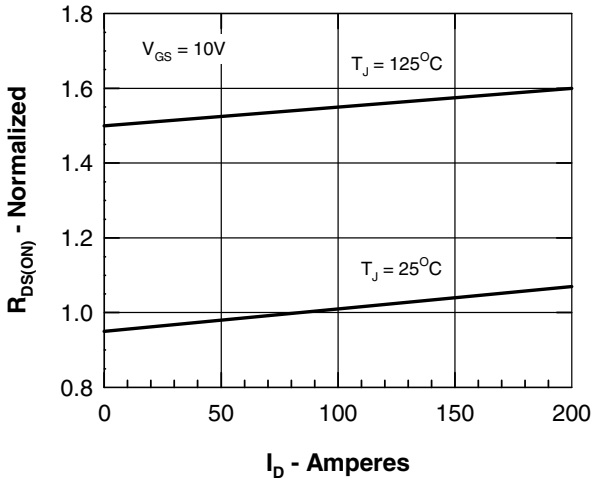

Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

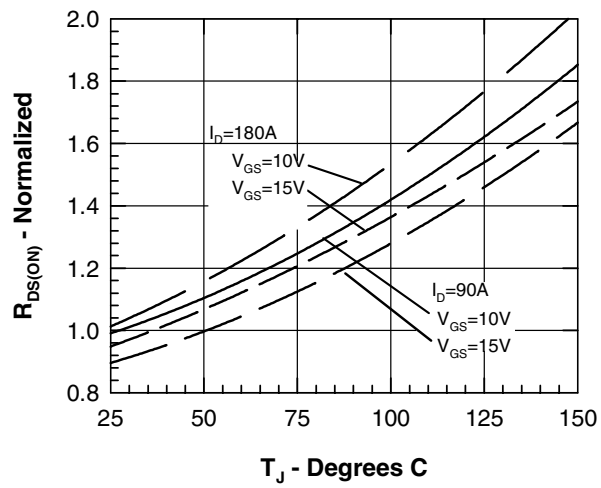

Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J

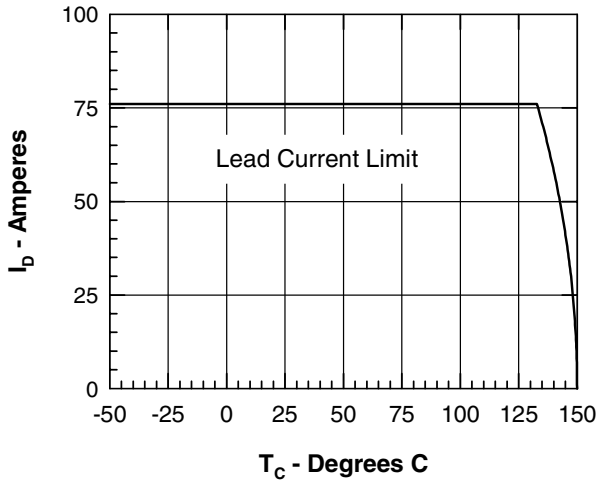

Figure 5. Drain Current vs. Case Temperature

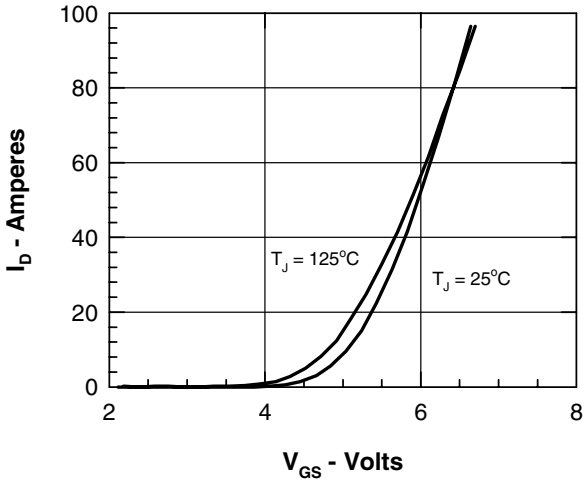

Figure 6. Admittance Curves

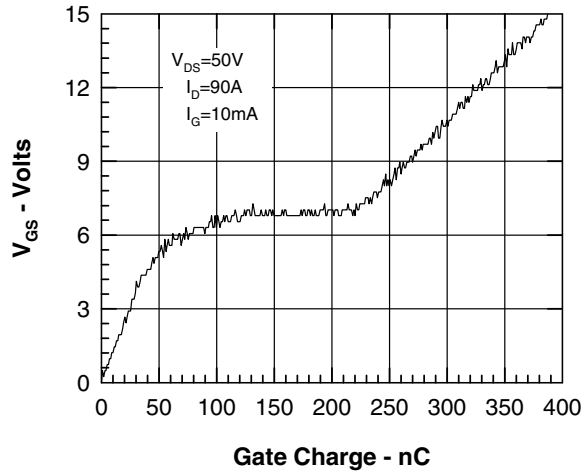

Figure 7. Gate Charge

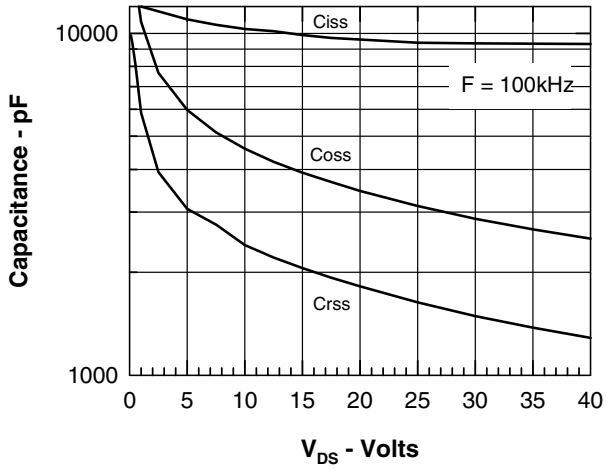

Figure 8. Capacitance Curves

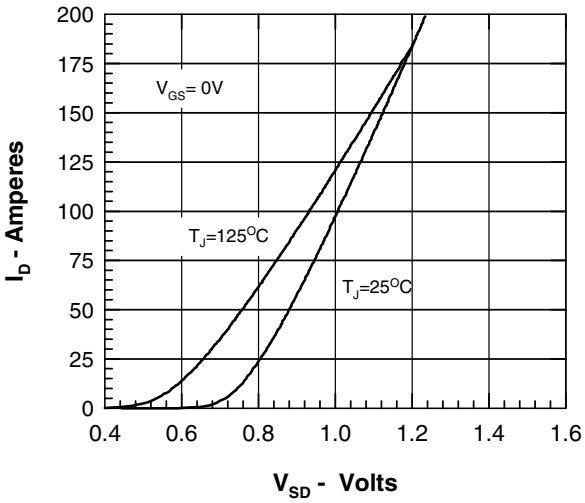

Figure 9. Forward Voltage Drop of the Intrinsic Diode

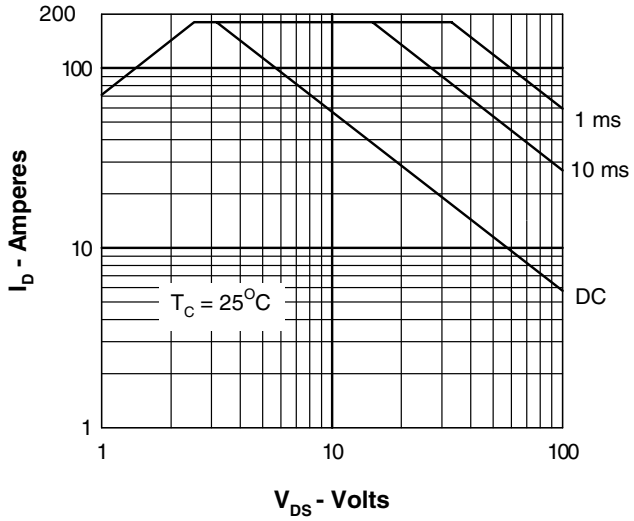

Figure 10. Forward Bias Safe Operating Area

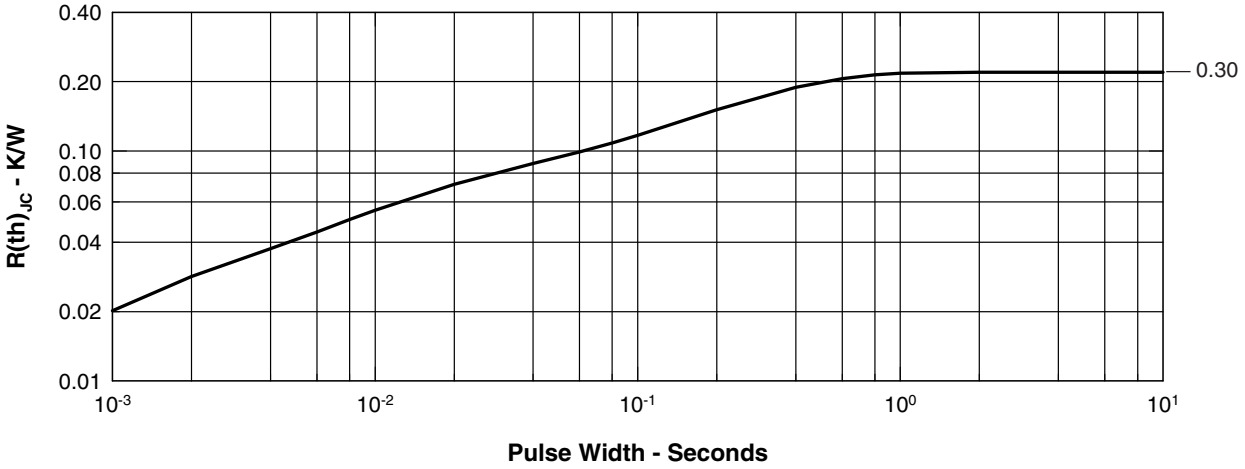

Figure 11. Typical Transient Thermal Resistance