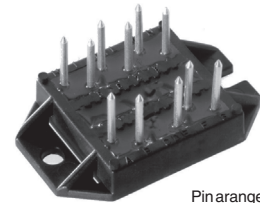
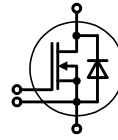


HiPerFET™ Power MOSFETs

in ECO-PAC 2

(Electrically Isolated Back Surface)

Single MOSFET



Pin arrangement see outlines

$V_{DSS} = 100\text{ V}$
 $I_{D25} = 165\text{ A}$
 $R_{DS(on)} = 8\text{ m}\Omega$
 $t_{rr} \leq 250\text{ ns}$

MOSFET

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

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

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	min.	typ.	max.	
I_S	$V_{GS} = 0\text{ V}$			180	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			720	A
V_{SD}	$I_F = 100\text{A}$, $V_{GS} = 0\text{ V}$, ¹⁾			1.5	V
t_{rr}	} $I_F = 50\text{A}$, $-di/dt = 100\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$			250	ns
Q_{RM}			1.1		μC
I_{RM}			13		A

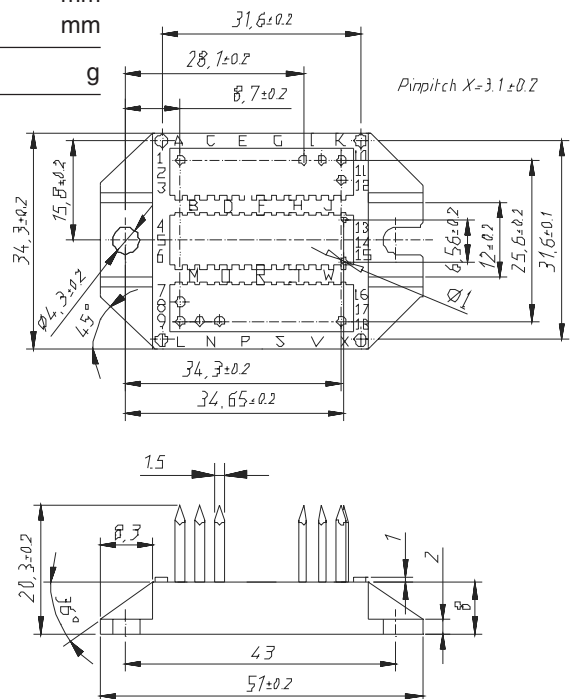
Note: ¹⁾ Pulse width limited by T_{JM}
²⁾ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

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	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")



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

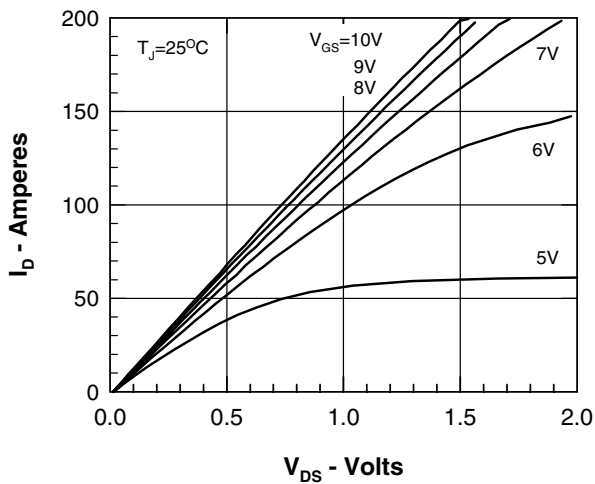


Figure 1. Output Characteristics at 25°C

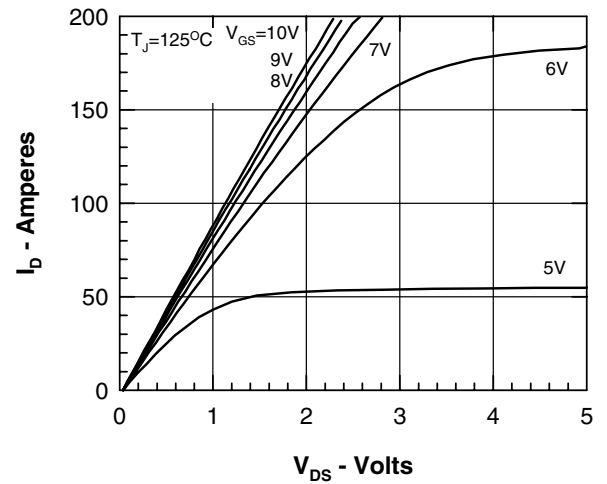


Figure 2. Output Characteristics at 125°C

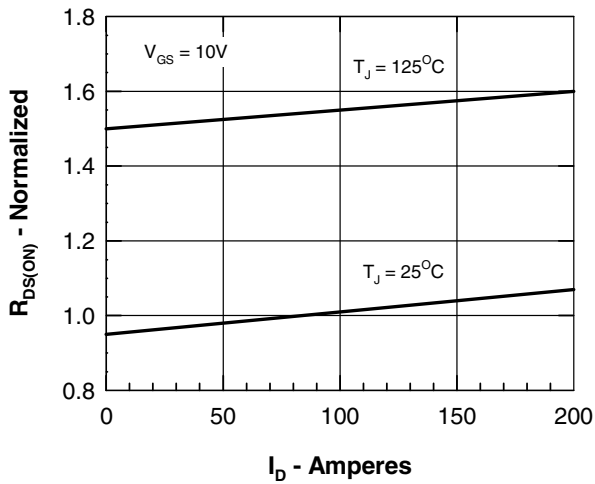


Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

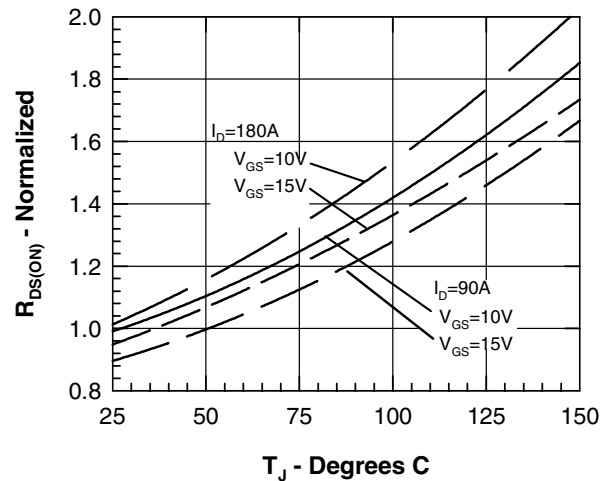


Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J

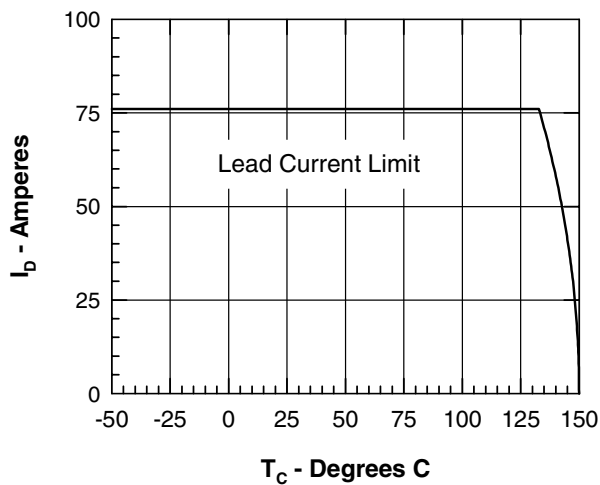


Figure 5. Drain Current vs. Case Temperature

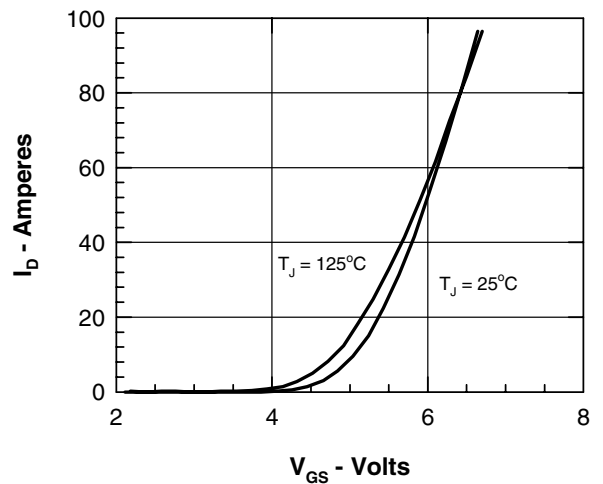


Figure 6. Admittance Curves

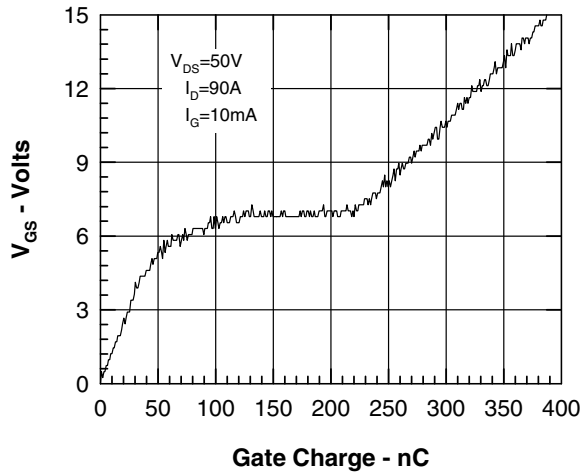


Figure 7. Gate Charge

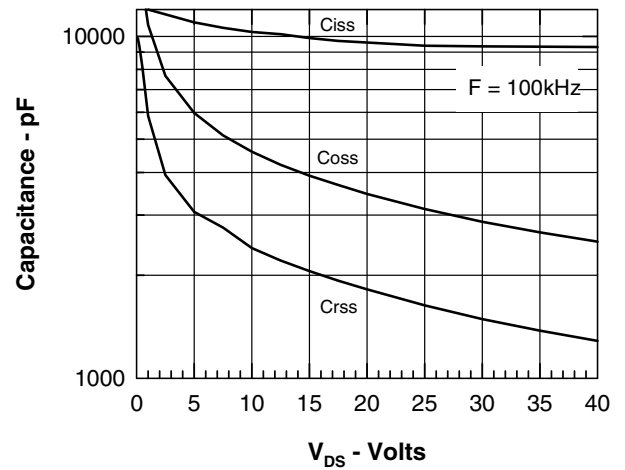


Figure 8. Capacitance Curves

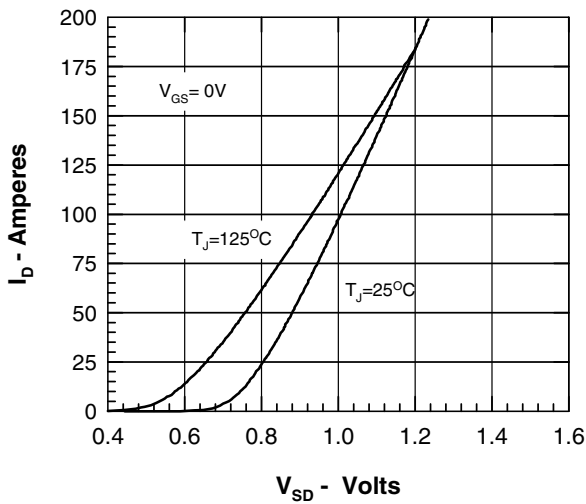


Figure 9. Forward Voltage Drop of the Intrinsic Diode

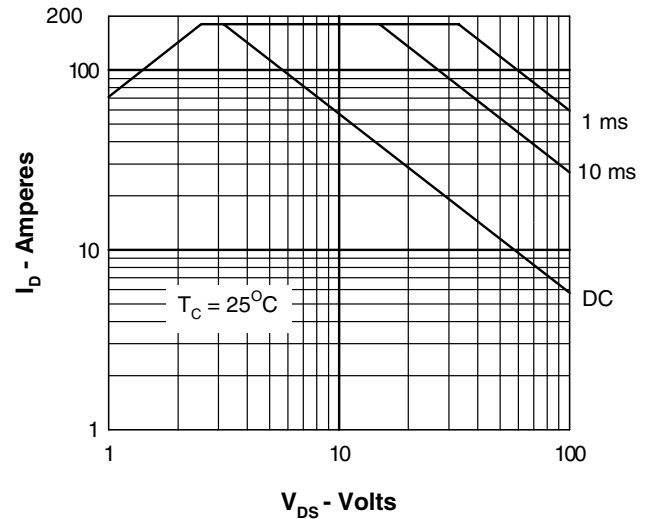


Figure 10. Forward Bias Safe Operating Area

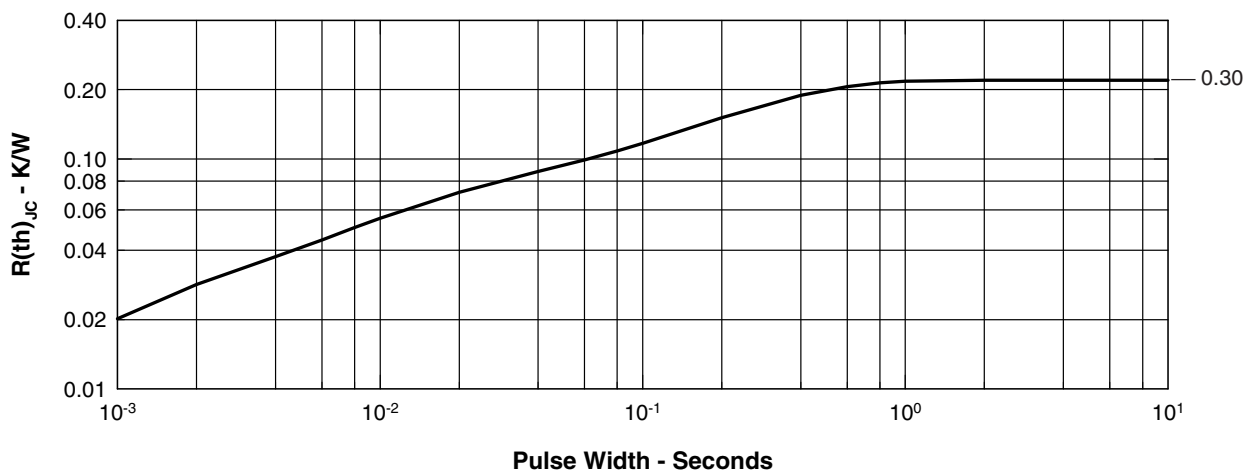


Figure 11. Typical Transient Thermal Resistance