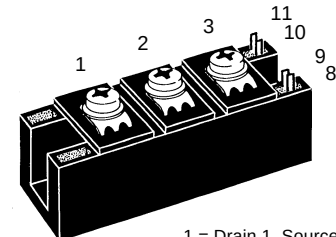
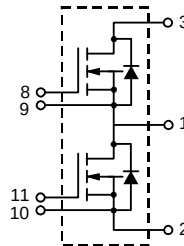


Dual Power HiPerFET™ Module

VMM 85-02F

$V_{DSS} = 200\text{ V}$
 $I_{D25} = 84\text{ A}$
 $R_{DS(on)} = 25\text{ m}\Omega$

Phaseleg Configuration
 High dv/dt, Low t_{rr} , HDMOS™ Family



1 = Drain 1, Source 2
 2 = Source 1
 3 = Drain 2
 8 = Gate 2
 9 = Kelvin Source 2
 10 = Kelvin Source 1
 11 = Gate 1

Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	200	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 10\text{ k}\Omega$	200	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	84	A
I_{D80}	$T_C = 80^\circ\text{C}$	63	A
I_{DM}	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ }\mu\text{s}$, pulse width limited by T_{JM}	335	A
P_{tot}	$T_C = 25^\circ\text{C}$	370	W
T_J		-40 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-40 ... +125	$^\circ\text{C}$
V_{ISOL}	50/60 Hz $I_{ISOL} \leq 1\text{ mA}$	$t = 1\text{ min}$ $t = 1\text{ s}$	3000 V~ 3600 V~
M_d	Mounting torque (M5 or 10-32 UNF) Terminal connection torque (M5)	2.25-2.75/20-25 2.5-4/22-35	Nm/lb.in. Nm/lb.in.
Weight	Typical including screws	130	g

Features

- Two MOSFET's in phaseleg config.
- International standard package
- Direct copper bonded Al_2O_3 ceramic base plate
- Isolation voltage 3600 V~
- Low $R_{DS(on)}$ HDMOS™ process
- Low package inductance for high speed switching
- Kelvin source contact

Applications

- Switched-mode and resonant-mode power supplies
- Uninterruptible power supplies (UPS)

Advantages

- Easy to mount with two screws
- Space and weight savings
- High power density
- Low losses

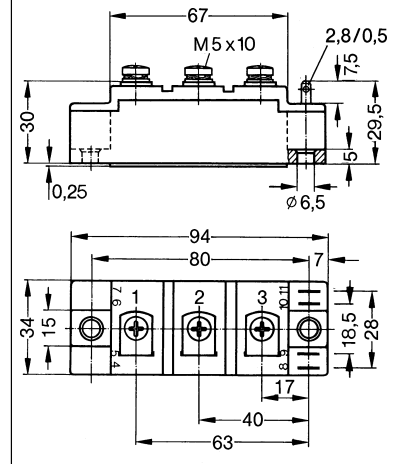
Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}$	200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8\text{ mA}$	2		4 V
I_{GSS}	$V_{GS} = \pm 20\text{ V DC}$, $V_{DS} = 0$			500 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0\text{ V}$, $T_J = 25^\circ\text{C}$ $V_{DS} = 0.8 \cdot V_{DSS}$, $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$			400 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $d \leq 2\%$		20	25 m Ω

Data per MOSFET unless otherwise stated.
 IXYS reserves the right to change limits, test conditions and dimensions

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Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 \cdot I_{D25}$ pulsed	40	60	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		9600	15000 pF
C_{oss}			1800	4500 pF
C_{rss}			620	1500 pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External), resistive load		70	ns
t_r			80	ns
$t_{d(off)}$			200	ns
t_f			100	ns
Q_g	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		380	450 nC
Q_{gs}			70	110 nC
Q_{gd}			190	230 nC
R_{thJC}				0.33 K/W
R_{thCH}	heatsink compound applied		0.2	K/W
d_s	Creepage distance on surface	12.7		mm
d_A	Strike distance through air	9.6		mm
a	Allowable acceleration			50 m/s ²

Dimensions in mm (1 mm = 0.0394")

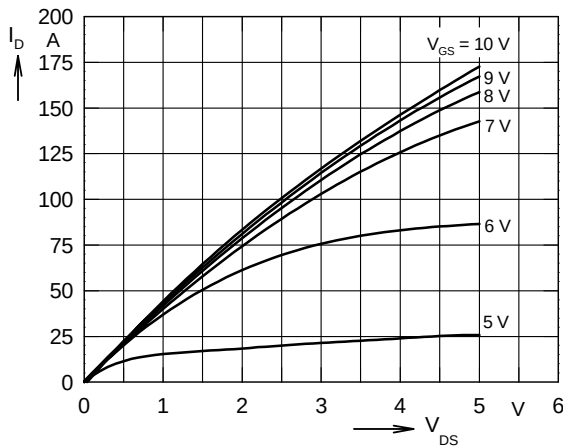
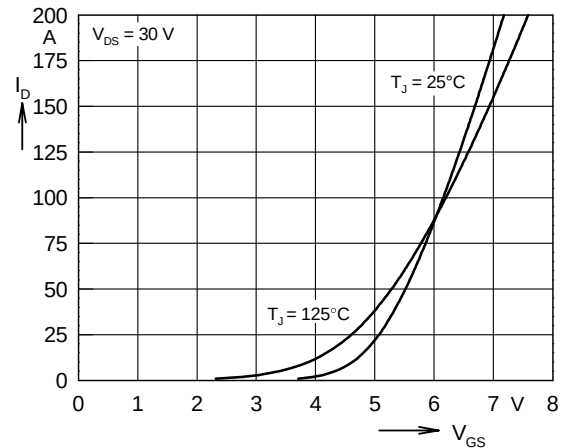
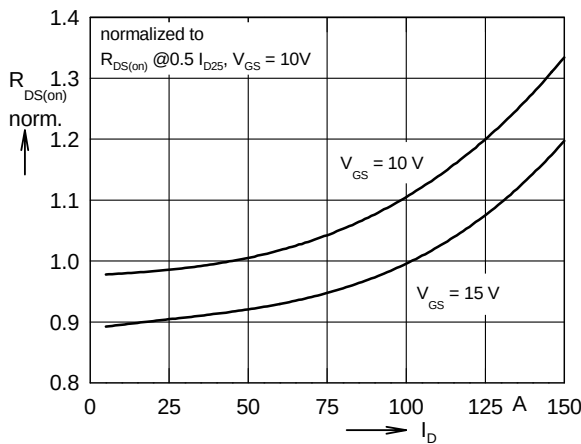
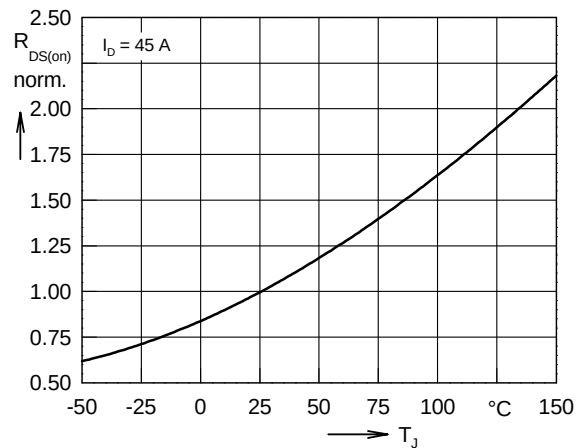
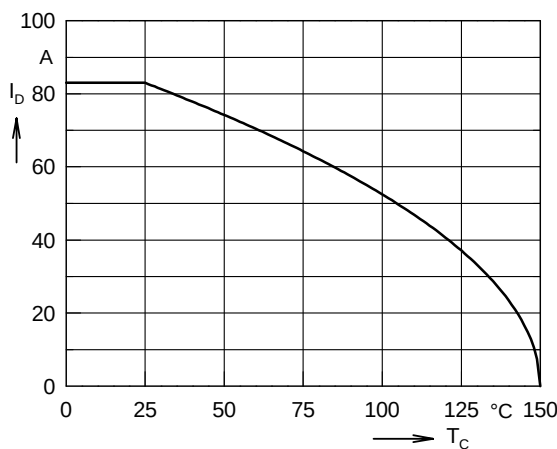
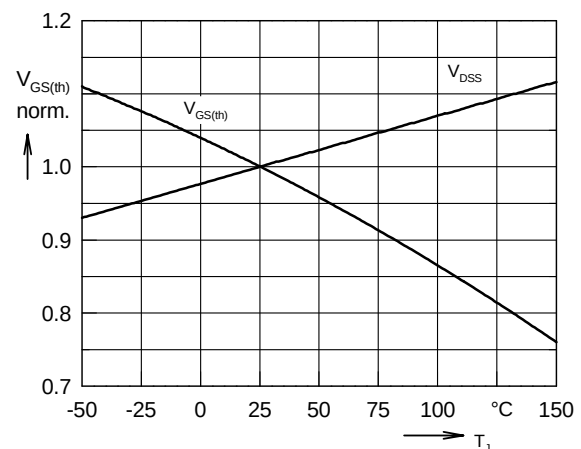


Source-Drain Diode

Characteristic Values

(T_J = 25°C, unless otherwise specified)

Symbol	Conditions	min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			84 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			335 A
V_{SD}	$I_F = I_S$; $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$		0.9	1.2 V
t_{rr}	$I_F = I_S$, $-di/dt = 100\text{ A}/\mu\text{s}$, $V_{DS} = 100\text{ V}$, $V_{GS} = 0\text{ V}$	200		400 ns


Fig. 1 Typical output characteristics $I_D = f(V_{DS})$

Fig. 2 Typical transfer characteristics $I_D = f(V_{GS})$

Fig. 3 Typical normalized $R_{DS(on)} = f(I_D)$

Fig. 4 Typical normalized $R_{DS(on)} = f(T_J)$

Fig. 5 Continuous drain current $I_D = f(T_C)$

Fig. 6 Typical normalized $V_{DS} = f(T_J)$, $V_{GS(th)} = f(T_J)$

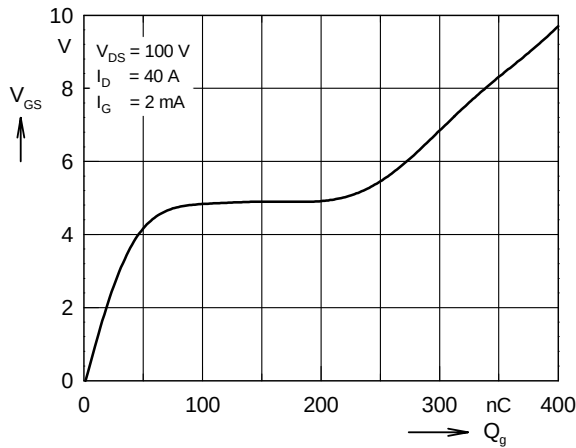


Fig. 7 Typical turn-on gate charge characteristics

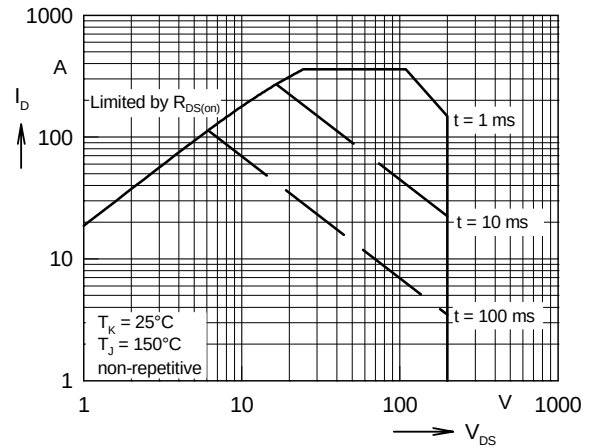


Fig. 8 Forward Safe Operating Area, $I_D = f(V_{DS})$

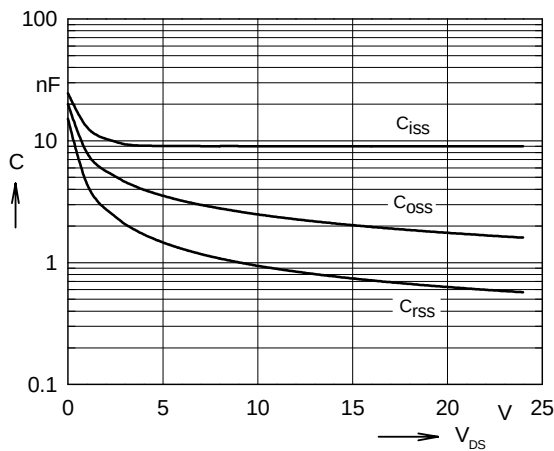


Fig. 9 Typical capacitances $C = f(V_{DS})$, $f = 1 \text{ MHz}$

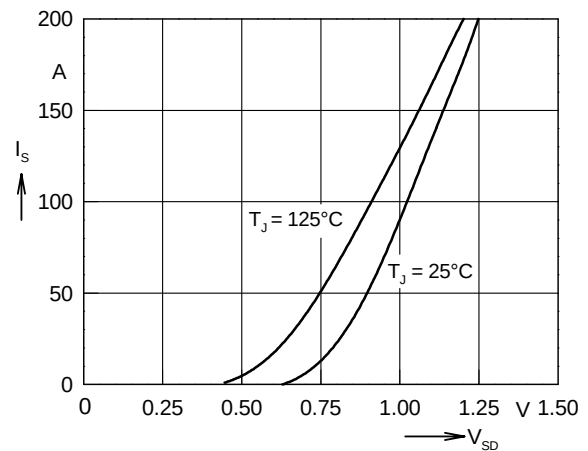


Fig. 10 Typical forward characteristics of reverse diode, $I_S = f(V_{SD})$

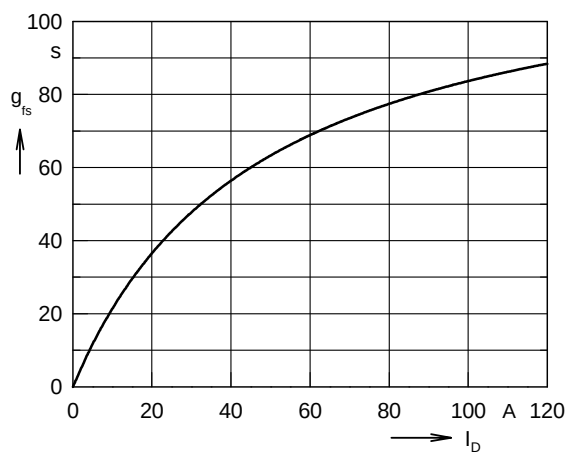


Fig. 11 Typical transconductance $g_{is} = f(I_D)$

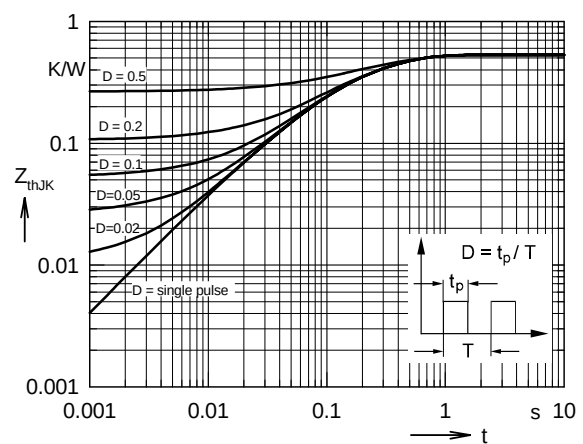


Fig. 12 Transient thermal resistance $Z_{thJK} = f(t_p)$