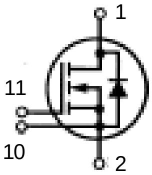
MegaMOS™FET Module

VMO 380-02 F

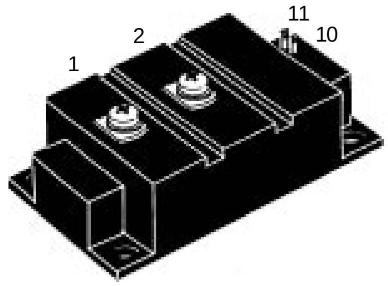
V_{DSS} = 200 V
I_{D25} = 385 A
$R_{DS(on)}$ = 4.6 mΩ

N-Channel Enhancement Mode

Preliminary data



Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		200	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 10 kΩ		200	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_K = 25°C		385	A
I_{DM}	T_K = 25°C, t_P = 10 µs		1540	A
P_D	T_C = 25°C T_K = 25°C		2230 1505	W W
T_J			-40 ...+150	°C
T_{JM}			150	°C
T_{stg}			-40 ... +125	°C
V_{ISOL}	50/60 Hz $I_{ISOL} \leq$ 1 mA	t = 1 min t = 1 s	3000 3600	V~ V~
M_d	Mounting torque (M6) Terminal connection torque (M5)		2.25-2.75/20-25 2.5-3.7/22-33	Nm/lb.in. Nm/lb.in.
Weight	typical including screws		250	g



1 = Drain
2 = Source
10 = Kelvin Source
11 = Gate

Features

- International standard package
- **D**irect **C**opper **B**onded 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 for easy drive

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 12 mA	200			V
$V_{GS(th)}$	V_{DS} = 20 V, I_D = 120 mA	3		6	V
I_{GSS}	V_{GS} = ±20 V DC, V_{DS} = 0			±500	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0 V T_J = 25°C V_{DS} = 0.8 • V_{DSS}, V_{GS} = 0 V T_J = 125°C			2,5 12	mA mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 • I_{D25} Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			4.6	mΩ

Applications

- AC motor speed control for electric vehicles
- DC servo and robot drives
- Switched-mode and resonant-mode power supplies
- DC choppers in fork lift trucks

Advantages

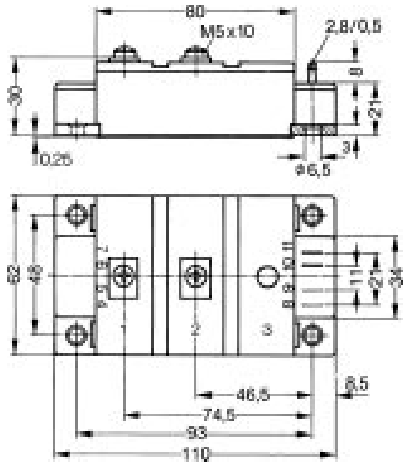
- Easy to mount
- Space and weight savings
- High power density
- Low losses

IXYS Corporation
3540 Bassett Street, Santa Clara,CA 95054
Tel: 408-982-0700 Fax: 408-496-0670

IXYS Semiconductor
Edisonstr. 15, D-68623 Lampertheim, Germany
Tel: +49-6206-5030 Fax: +49-6206-503629

Symbol	Test Conditions	Characteristic Values (T$_J$ = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} =10V; I_D=0.5•I_{D25} pulsed		TBD		S
C_{iss}	V_{GS} =0V, V_{DS}=25V, f=1 MHz		48		nF
C_{oss}			8.8		nF
C_{rss}			3.1		nF
$t_{d(on)}$	V_{GS}=10V, V_{DS}=0.5•V_{DSS}, I_D=0.5•I_{D25}		210		ns
t_r	R_G = 1 Ω (External)		500		ns
$t_{d(off)}$			900		ns
t_f			350		ns
Q_g	V_{GS}=10V, V_{DS}=0.5•V_{DSS}, I_D=0.5•I_{D25}		2090		nC
Q_{gs}			385		nC
Q_{gd}			1045		nC
R_{thJC}				0.056	K/W
R_{thJK}	with 30 µm heat transfer paste			0.083	K/W

Dimensions in mm (1 mm = 0.0394")



Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T$_J$ = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} =0			385	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			1540	A
V_{SD}	I_F=I_S; V_{GS}=0V, Pulse test, t≤300µs, duty cycle d≤2%		0.9	1.2	V
t_{rr}	I_F = I_S, -di/dt = 1200 A/				

IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents:
4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

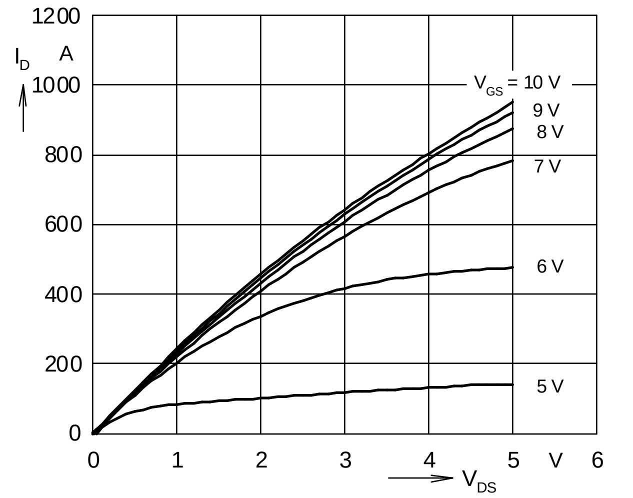


Fig. 1 Typical output characteristics $I_D = f(V_{DS})$

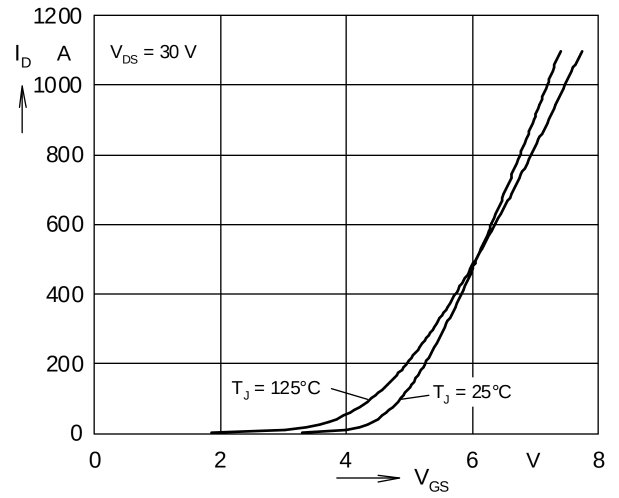


Fig. 2 Typical transfer characteristics $I_D = f(V_{GS})$

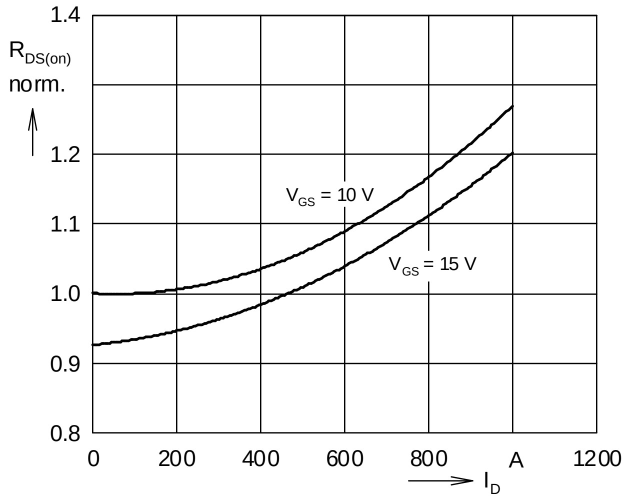


Fig. 3 Typical $R_{DS(on)} = f(I_D)$, normalized

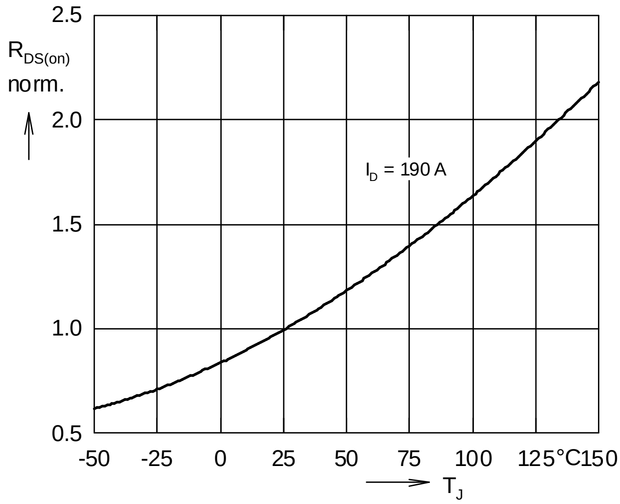


Fig. 4 $R_{DS(on)} = f(T_J)$, normalized

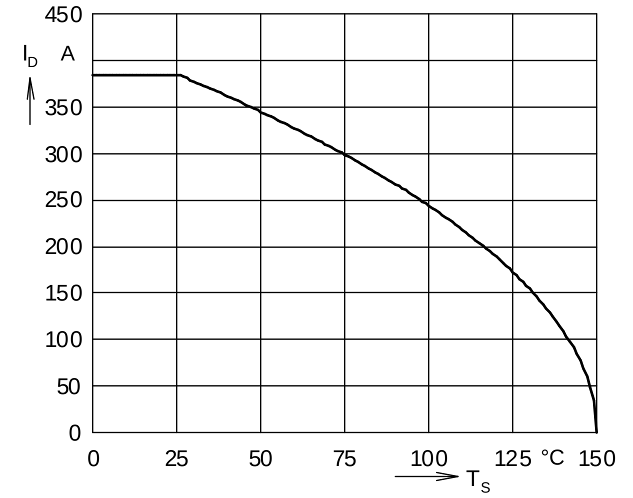


Fig. 5 Continuous drain current $I_D = f(T_K)$

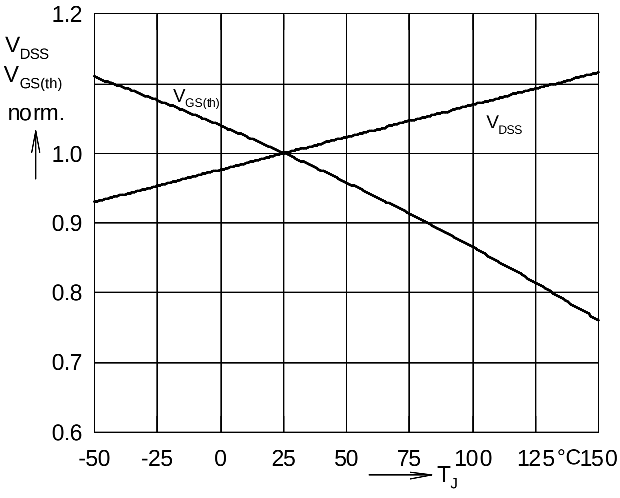


Fig. 6 $V_{DSS} = f(T_J)$, $V_{GS(th)} = f(T_J)$, normalized

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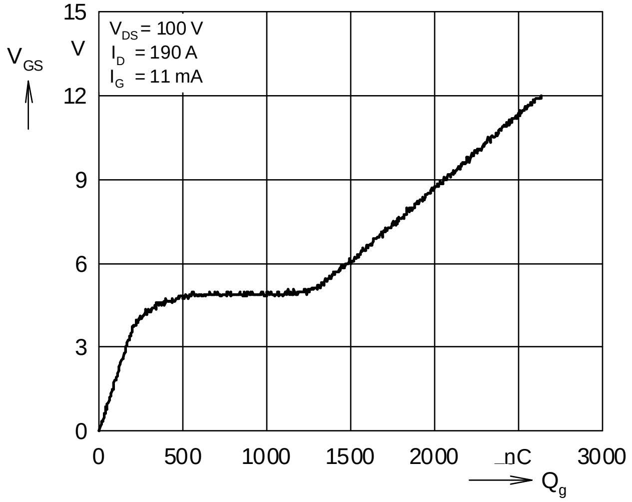

Fig. 7 Typical turn-on gate charge characteristics

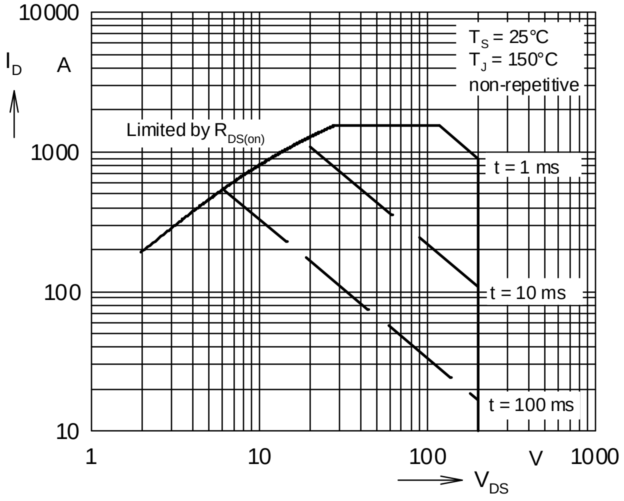

Fig. 8 Forward Bias Safe Operating Area, I_D = f (V_{DS})

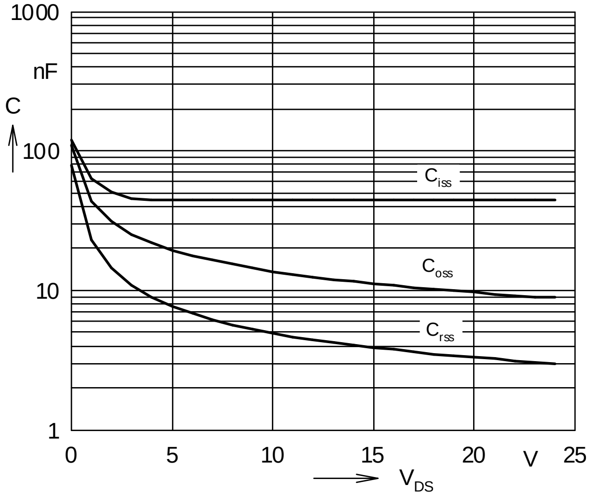

Fig. 9 Typical capacitances C = f (V_{DS}), f = 1 MHz

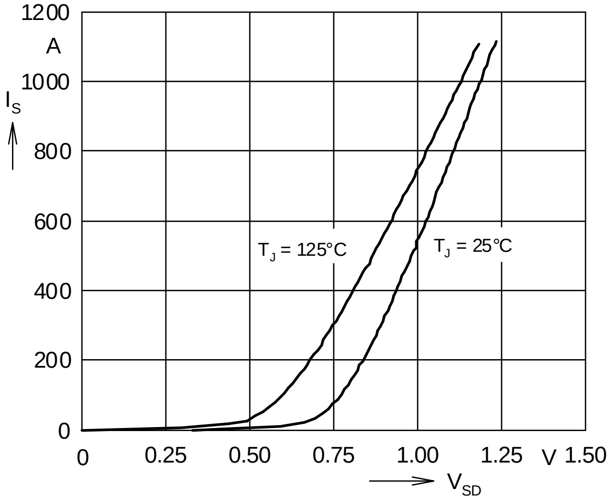

Fig. 10 Typical forward characteristics of reverse diode, I_S = f (V_{SD})

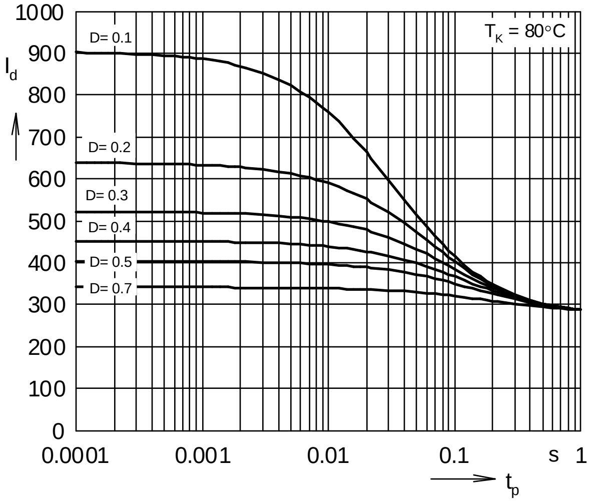

Fig. 11 Drain current versus pulse width and duty cycle

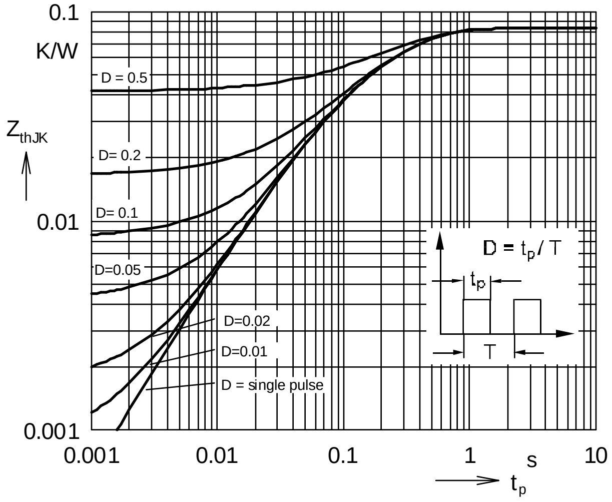

Fig. 12 Transient thermal resistance Z_{thJK} = f (t_p)

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