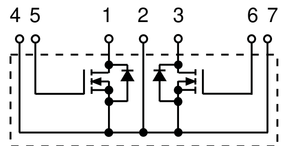
IXYS

Dual Power MOSFET Module

VMK 90-02T2

V_{DSS} = 200 V
I_{D25} = 83 A
$R_{DS(on)}$ = 25 mΩ

Common-Source connected
N-Channel Enhancement Mode

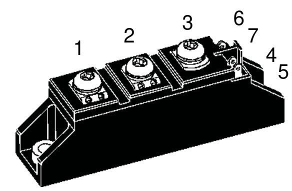


Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		200	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 6.8 kΩ		200	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C		83	A
I_{D80}	T_C = 80°C		62	A
I_{DM}	T_C = 25°C, t_p = 10 µs, pulse width limited by T_{JM}		330	A
P_D	T_C = 25°C, T_J = 150°C,		380	W
T_J			-40 ... +150	°C
T_{JM}			150	°C
T_{stg}			-40 ... +125	°C
V_{ISOL}	50/60 Hz	t = 1 min	2500	V~
	I_{ISOL} ≤ 1 mA	t = 1 s	3000	V~
M_d	Mounting torque(M5 or 10-32 UNF)		2.5-4.0/22-35	Nm/lb.in.
	Terminal connection torque (M5)		2.5-4.0/22-35	Nm/lb.in.
Weight	Typical including screws		90	g

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 1 mA	200			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 3 mA	2		4	V
I_{GSS}	V_{GS} = ±20 V DC, V_{DS} = 0			500	nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}, V_{GS} = 0 V, T_J = 25°C			400	µA
	V_{GS} = 0 V, T_J = 125°C			2	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

TO-240 AA

E 72873



1, 3 = Drain, 2 = Common Source
5, 6 = Gate, 4, 7 = Kelvin Source

Features

- Two MOSFET with common source
- International standard package JEDEC TO-240 AA
- Direct copper bonded Al_2O_3 ceramic base plate
- Isolation voltage 3000 V~
- Low $R_{DS(on)}$ HDMOS™ process
- Low package inductance for high speed switching
- Kelvin source contact
- Keyed twin plugs

Applications

- Push-pull inverters
- Switched-mode and resonant-mode power supplies
- Uninterruptible power supplies (UPS)
- AC static switches

Advantages

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

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

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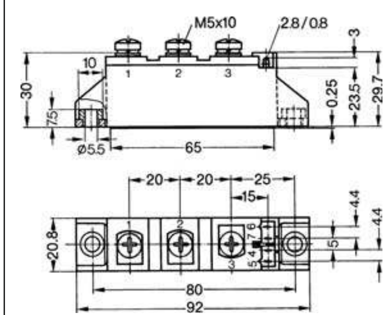
Symbol	Test Conditions	Characteristic Values ($T_J = 25°C$, unless otherwise specified) min.	typ.	max.	
g_{fs}	$V_{DS} = 10$ V; $I_D = 0.5 \cdot I_{D25}$ pulsed		60		S
C_{iss}	$V_{GS} = 0$ V, $V_{DS} = 25$ V, f = 1 MHz		9000	15000	pF
C_{oss}			1600	4500	pF
C_{rss}			600	1500	pF
$t_{d(on)}$	$V_{GS} = 10$ V, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$			70	ns
t_r	$R_G = 1\ \Omega$ (External), resistive load			80	ns
$t_{d(off)}$				200	ns
t_f				100	ns
Q_g	$V_{GS} = 10$ 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_{thJK}	with heat transfer paste			0.53	K/W
d_S	Creepage distance on surface	12.7			mm
d_A	Strike distance through air	9.6			mm
a	Max. allowable acceleration		50		m/s^2

TO-240 AA Outline



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	$V_{GS} = 0$ V			83	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			330	A
V_{SD}	$I_F = I_S$; $V_{GS} = 0$ V, Pulse test, $t \leq 300\ \mu s$, duty cycle $d \leq 2$ %		1.0	1.2	V
t_{rr}	$I_F = I_S$, -di/dt = 100 A/µs, $V_{DS} = 100$ V, $V_{GS} = 0$ V		400	750	ns

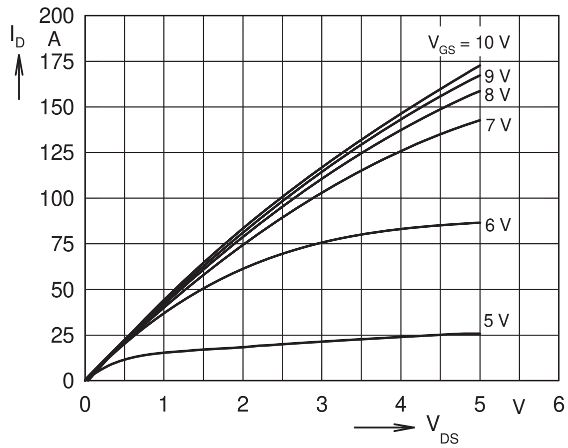


Fig. 1 Typical output characteristics $I_D = f(V_{DS})$

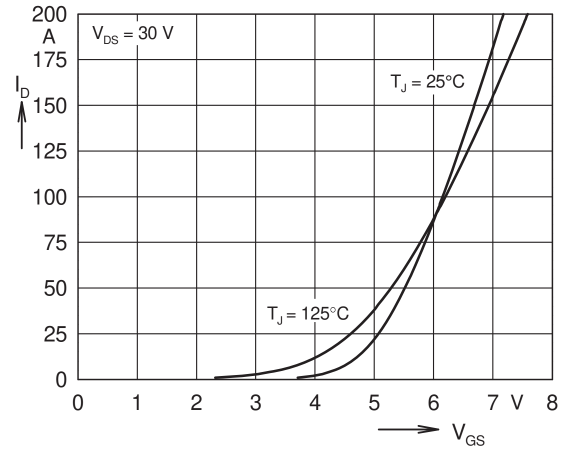


Fig. 2 Typical transfer characteristics $I_D = f(V_{GS})$

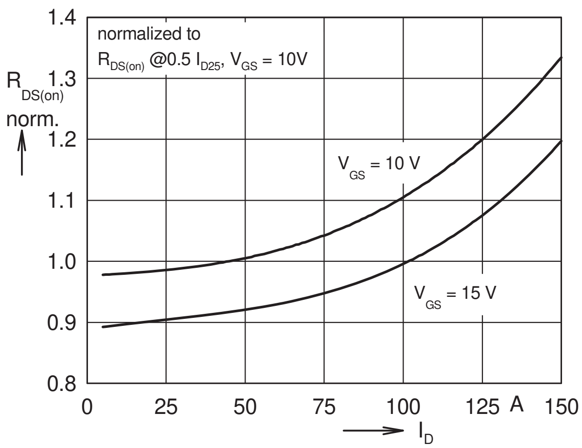


Fig. 3 Typical normalized $R_{DS(on)} = f(I_D)$

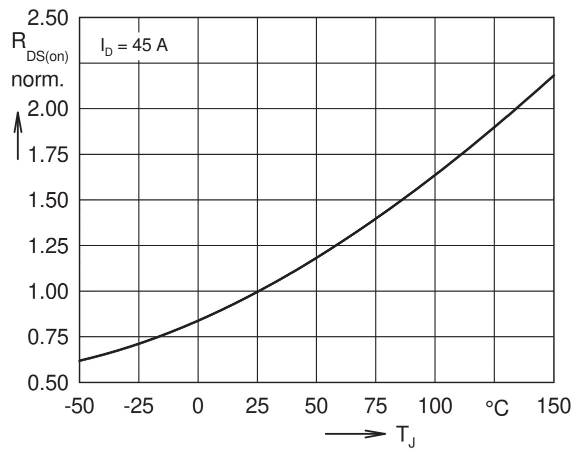


Fig. 4 Typical normalized $R_{DS(on)} = f(T_J)$

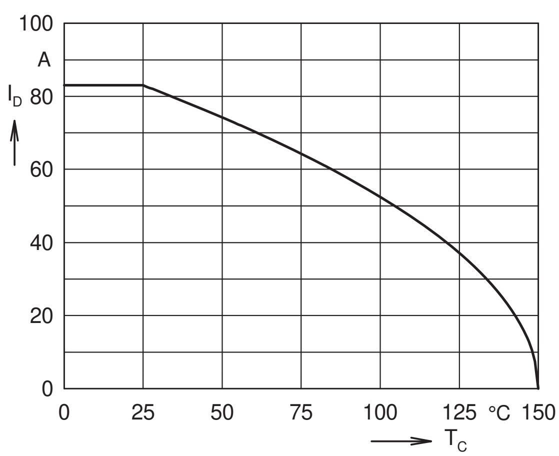


Fig. 5 Continuous drain current $I_D = f(T_C)$

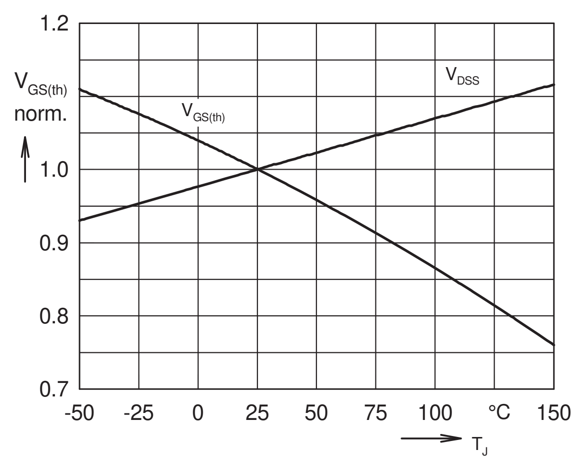


Fig. 6 Typical normalized $V_{DSS} = f(T_J)$, $V_{GS(th)} = f(T_J)$

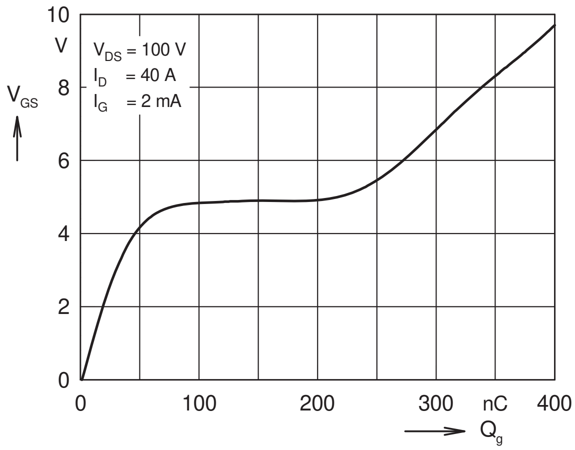


Fig. 7 Typical turn-on gate charge characteristics

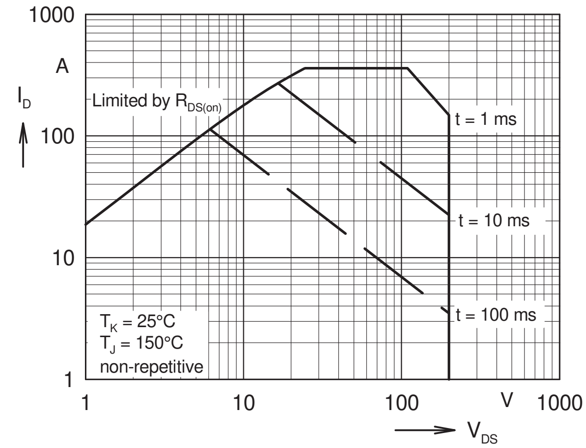


Fig. 8 Forward Safe Operating Area, $I_D = f(V_{DS})$

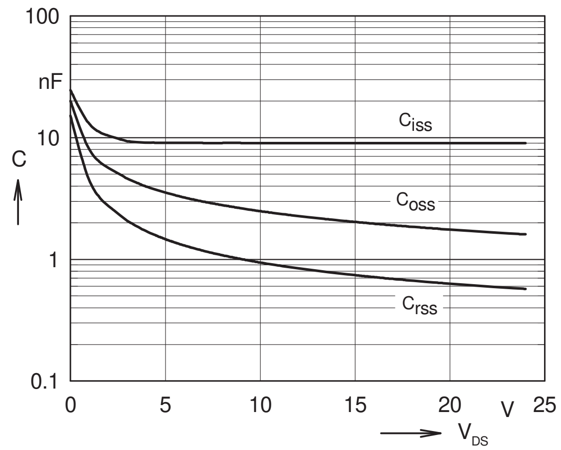


Fig. 9 Typical capacitances $C = f(V_{DS})$, f = 1 MHz

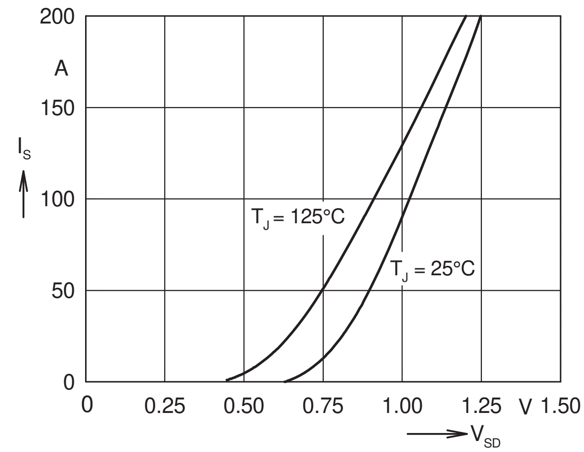


Fig. 10 Typical forward characteristics of reverse diode, $I_S = f(V_{SD})$

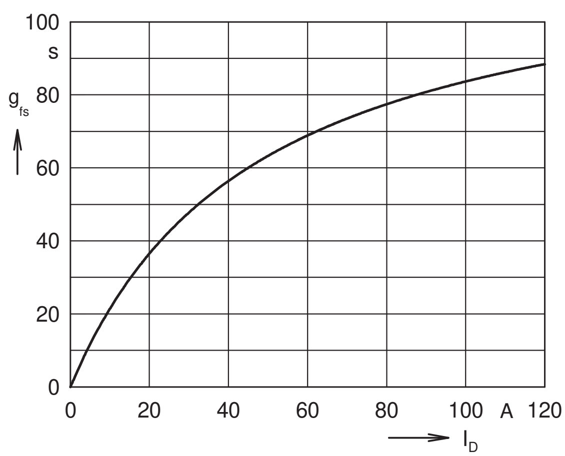


Fig. 11 Typical transconductance $g_{fs} = f(I_D)$

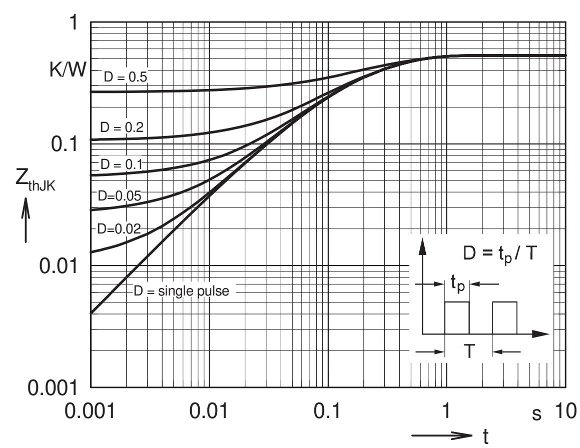


Fig. 12 Transient thermal resistance $Z_{thJK} = f(t_p)$