IXYS

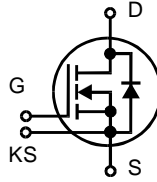## HiPerFET™ MOSFET Module

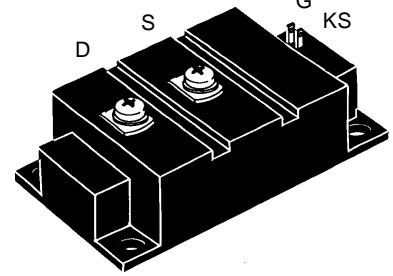## VMO 650-01F

V_{DSS} = 100 V
I_{D25} = 690 A
$R_{DS(on)}$ = 1.8 mΩ

N-Channel Enhancement Mode

Preliminary Data

E 72873

D = Drain   S = Source
KS = Kelvin Source   G = Gate

Symbol	Test 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} = 10 kΩ	100	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_S = 25°C	690	A
I_{D80}	T_S = 80°C	520	A
I_{DM}	T_S = 25°C pulse width limited by T_{JM}	2780	A
P_D	T_C = 25°C	2500	W
	T_S = 25°C	1740	W
T_J		-40 ...+150	°C
T_{JM}		150	°C
T_{stg}		-40 ... +125	°C
V_{ISOL}	50/60 Hz t = 1 min	3000	V~
	I_{ISOL} ≤ 1 mA t = 1 s	3600	
M_d	Mounting torque (M6)	2.25-2.75/20-25	Nm/lb.in.
	Terminal connection torque (M5)	2.5-3.7/22-33	Nm/lb.in.
Weight	typical including screws	250	g

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	V_{GS} = 0 V, I_D = 7 mA	100		V
$V_{GS(th)}$	V_{DS} = 20 V, I_D = 130 mA	3		6 V
I_{GSS}	V_{GS} = ±20 V DC, V_{DS} = 0			±500 nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS} T_J = 25°C			3.5 mA
	V_{GS} = 0 V T_J = 125°C			14 mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 • I_{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			1.8 mΩ

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

Applications

• AC motor speed control for electric vehicles
• DC servo and robot drives
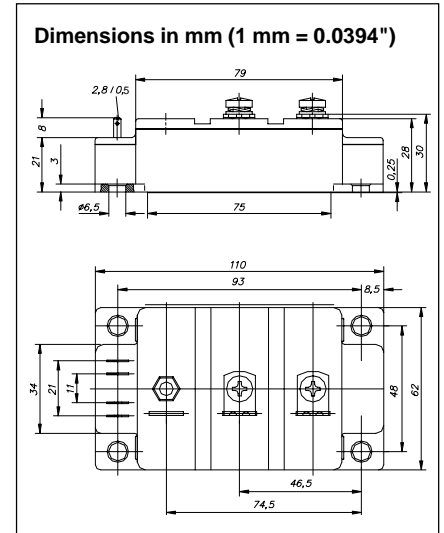• Switched-mode and resonant-mode power supplies
• DC choppers

Advantages

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

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

1 - 2

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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		390		S
C_{iss}			59		nF
C_{oss}	$V_{GS} = 0$ V, $V_{DS} = 25$ V, f = 1 MHz		20.8		nF
C_{rss}			10.4		nF
$t_{d(on)}$			250		ns
t_r	$V_{GS} = 10$ V, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		500		ns
$t_{d(off)}$	$R_G = 2\ \Omega$ (external)		800		ns
t_f			200		ns
Q_g			2300		nC
Q_{gs}	$V_{GS} = 10$ V, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		455		nC
Q_{gd}			1110		nC
R_{thJC}				0.048 K/W	
R_{thJS}	with 30 µm heat transfer paste			0.072 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	$V_{GS} = 0$ V			690	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			2760	A
V_{SD}	$I_F = I_S$; $V_{GS} = 0$ V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %	0.9		1.2	V
t_{rr}	$I_F = I_S$, -di/dt = 1000 A/µs, $V_{DS} = 0.5 \cdot V_{DSS}$		300		ns