

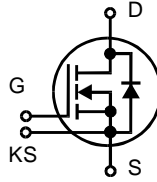
HiPerFET™ MOSFET Module

VMO 650-01F

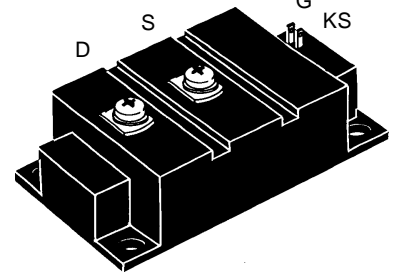
$V_{DSS} = 100\text{ V}$
 $I_{D25} = 690\text{ A}$
 $R_{DS(on)} = 1.8\text{ m}\Omega$

N-Channel Enhancement Mode

Preliminary Data



E 72873



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	100	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 10\text{ k}\Omega$	100	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_S = 25^\circ\text{C}$	690	A
I_{D80}	$T_S = 80^\circ\text{C}$	520	A
I_{DM}	$T_S = 25^\circ\text{C}$ pulse width limited by T_{JM}	2780	A
P_D	$T_C = 25^\circ\text{C}$	2500	W
	$T_S = 25^\circ\text{C}$	1740	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 $t = 1\text{ min}$	3000	V~
	$I_{ISOL} \leq 1\text{ mA}$ $t = 1\text{ s}$	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

Features

- 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 for easy drive

Applications

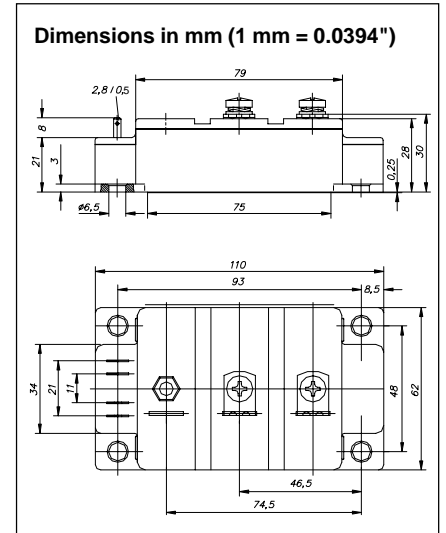
- AC motor speed control for electric vehicles
- DC servo and robot drives
- Switched-mode and resonant-mode power supplies
- DC choppers

Advantages

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

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 7\text{ mA}$	100		V
$V_{GS(th)}$	$V_{DS} = 20\text{ V}$, $I_D = 130\text{ mA}$	3		V
I_{GSS}	$V_{GS} = \pm 20\text{ V DC}$, $V_{DS} = 0$			$\pm 500\text{ nA}$
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0\text{ V}$	$T_J = 25^\circ\text{C}$		3.5 mA
		$T_J = 125^\circ\text{C}$		14 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 $d \leq 2\%$			1.8 m Ω

Symbol	Test 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		390	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		59	nF
C_{oss}			20.8	nF
C_{rss}			10.4	nF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 2\ \Omega$ (external)		250	ns
t_r			500	ns
$t_{d(off)}$			800	ns
t_f			200	ns
Q_g	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		2300	nC
Q_{gs}			455	nC
Q_{gd}			1110	nC
R_{thJC}				0.048 K/W
R_{thJS}	with 30 μm heat transfer paste			0.072 K/W



Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			690 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			2760 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}	$I_F = I_S, -di/dt = 1000\text{ A}/\mu\text{s}, V_{DS} = 0.5 \cdot V_{DSS}$		300	ns