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[VMO650-01F](#)

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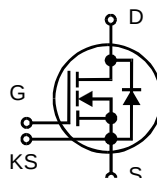
HiPerFET™ MOSFET Module

VMO 650-01F

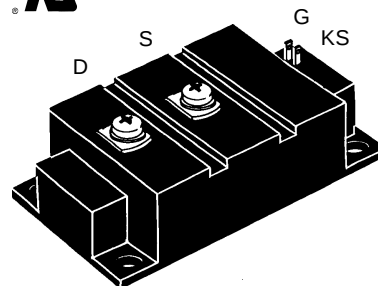
V_{DSS} = 100 V
I_{D25} = 690 A
R_{DS(on)} = 1.8 mΩ

N-Channel Enhancement Mode

Preliminary Data



UL 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

Features

- International standard package
- **Direct Copper Bonded** Al₂O₃ 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

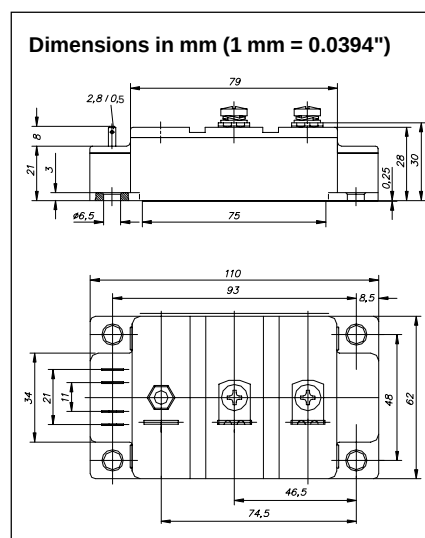
- AC motor speed control for electric vehicles
- DC servo and robot drives
- Switched-mode and resonant-mode power supplies
- DC choppers

Advantages

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

Symbol	Test Conditions	Characteristic Values (T _J = 25°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		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		3.5 mA
		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

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}	with 30 μm heat transfer paste			0.048 K/W
R_{thJS}				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