

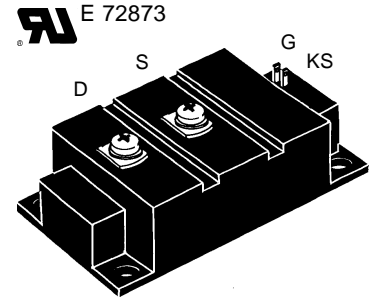
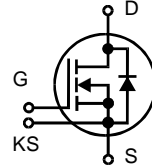
# HiPerFET™ MOSFET Module

## VMO 550-01F

$V_{DSS} = 100 \text{ V}$   
 $I_{D25} = 590 \text{ A}$   
 $R_{DS(on)} = 2.1 \text{ m}\Omega$

N-Channel Enhancement Mode

Preliminary Data



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

Symbol	Test Conditions	Maximum Ratings		
$V_{DSS}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	100	V	
$V_{DGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 10 \text{ k}\Omega$	100	V	
$V_{GS}$	Continuous	$\pm 20$	V	
$V_{GSM}$	Transient	$\pm 30$	V	
$I_{D25}$	$T_S = 25^\circ\text{C}$	590	A	
$I_{D80}$	$T_S = 80^\circ\text{C}$	440	A	
$I_{DM}$	$T_S = 25^\circ\text{C}$ pulse width limited by $T_{JM}$	2360	A	
$P_D$	$T_C = 25^\circ\text{C}$	2200	W	
	$T_S = 25^\circ\text{C}$	1470	W	
$T_J$		-40 ... +150	$^\circ\text{C}$	
$T_{JM}$		150	$^\circ\text{C}$	
$T_{sig}$		-40 ... +125	$^\circ\text{C}$	
$V_{ISOL}$	50/60 Hz	t = 1 min	3000	V~
	$I_{ISOL} \leq 1 \text{ mA}$	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.	
<b>Weight</b>	typical including screws	250	g	

### Features

- International standard package
- Direct Copper Bonded  $\text{Al}_2\text{O}_3$  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.
$V_{DSS}$	$V_{GS} = 0 \text{ V}, I_D = 6 \text{ mA}$	100		V
$V_{GS(th)}$	$V_{DS} = 20 \text{ V}, I_D = 110 \text{ mA}$	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 mA
		$T_J = 125^\circ\text{C}$		12 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2\%$			2.1 m $\Omega$

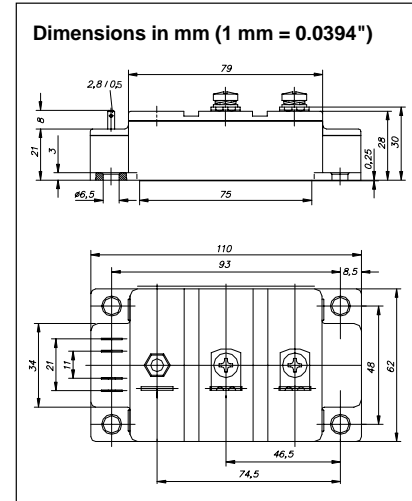
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Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ pulsed		330	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		50	nF
$C_{oss}$			17.6	nF
$C_{rss}$			8.8	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
$Q_g$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		2000	nC
$Q_{gs}$			385	nC
$Q_{gd}$			940	nC
$R_{thJC}$				0.057 K/W
$R_{thJS}$	with 30 $\mu\text{m}$ heat transfer paste			0.085 K/W



Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$I_S$	$V_{GS} = 0\text{ V}$			590 A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			2360 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