



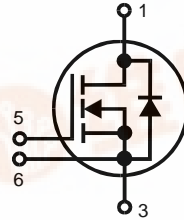
# HiPerFET™ Power Module

High dv/dt, Low  $t_{rr}$ , HDMOS™ Family

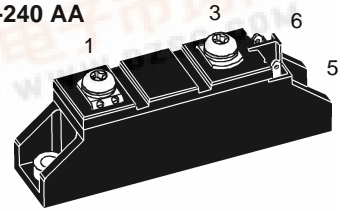
## VMO 60-05F

$V_{DSS} = 500\text{ V}$   
 $I_{D25} = 60\text{ A}$   
 $R_{DS(on)} = 65\text{ m}\Omega$

### Preliminary Data



TO-240 AA



1 = Drain                      3 = Source  
5 = Gate                        6 = Kelvin Source

Symbol	Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	500	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 10\text{ k}\Omega$	500	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	60	A
$I_{D100}$	$T_C = 100^\circ\text{C}$	37	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , $t_p = 10\ \mu\text{s}$ , pulse width limited by $T_{JM}$	240	A
$P_{tot}$	$T_C = 25^\circ\text{C}$	590	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	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.
<b>Weight</b>	Typical including screws	90	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

### Applications

- Switched-mode and resonant-mode power supplies
- Uninterruptible power supplies (UPS)
- DC servo and robot drives
- DC choppers

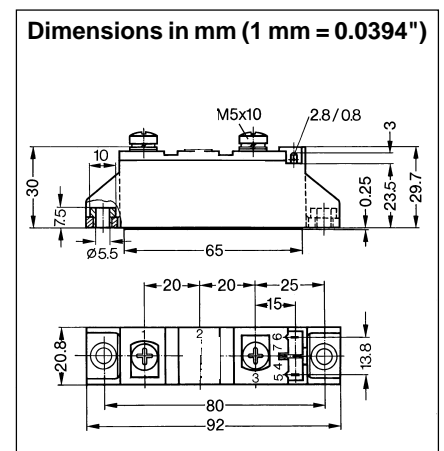
### Advantages

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

Symbol	Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0\text{ V}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 24\text{ mA}$	2		V
$I_{GSS}$	$V_{GS} = \pm 20\text{ V DC}$ , $V_{DS} = 0$			500 nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0\text{ V}$ , $T_J = 25^\circ\text{C}$ $V_{DS} = 0.8 \cdot V_{DSS}$ , $V_{GS} = 0\text{ V}$ , $T_J = 125^\circ\text{C}$			600 $\mu\text{A}$ 3 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 $d \leq 2\%$		65	75 m $\Omega$

Data per MOSFET unless otherwise stated.

Symbol	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	30	60	S	
$C_{iss}$ $C_{oss}$ $C_{rss}$	} $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		12.6	nF	
				1.35	nF
				0.405	nF
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$	} $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External), resistive load		50	ns	
				45	ns
				250	ns
				30	ns
$Q_g$ $Q_{gs}$ $Q_{gd}$	} $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		405	nC	
				90	nC
				180	nC
$R_{thJC}$ $R_{thCH}$	heatsink compound applied		0.2	0.21 K/W K/W	
$d_s$	Creepage distance on surface	12.7		mm	
$d_A$	Strike distance through air	9.6		mm	
$a$	Allowable acceleration			50 m/s <sup>2</sup>	



Symbol	Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$I_S$	$V_{GS} = 0\text{ V}$			60 A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			240 A
$V_{SD}$	$I_F = I_S; V_{GS} = 0\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$			1.5 V
$t_{rr}$	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			250 ns