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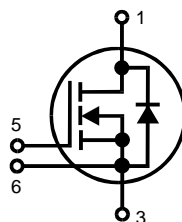
# HiPerFET™ Power Module

 High dv/dt, Low t<sub>rr</sub>, HDMOS™ Family

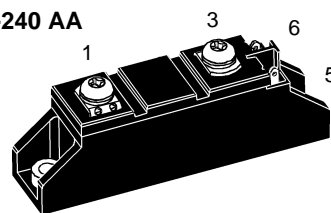
## VMO 60-05F

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

### 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

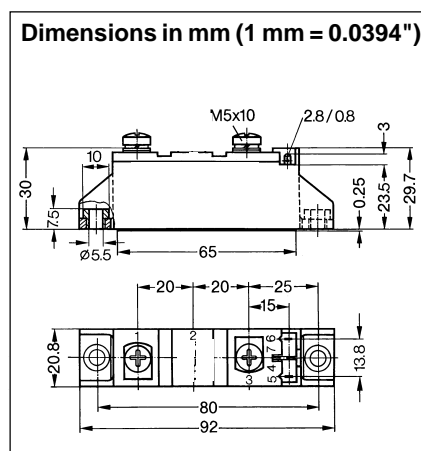
### Advantages

- 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		4 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 <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 10 V; I <sub>D</sub> = 0.5 • I <sub>D25</sub> pulsed	30	60	S
<b>C<sub>iss</sub></b> <b>C<sub>oss</sub></b> <b>C<sub>rss</sub></b>	} V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		12.6	nF
			1.35	nF
			0.405	nF
<b>t<sub>d(on)</sub></b> <b>t<sub>r</sub></b> <b>t<sub>d(off)</sub></b> <b>t<sub>f</sub></b>	} V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub> R <sub>G</sub> = 1 Ω (External), resistive load		50	ns
			45	ns
			250	ns
			30	ns
<b>Q<sub>g</sub></b> <b>Q<sub>gs</sub></b> <b>Q<sub>gd</sub></b>	} V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub>		405	nC
			90	nC
			180	nC
<b>R<sub>thJC</sub></b> <b>R<sub>thCH</sub></b>	heatsink compound applied		0.21	K/W K/W
<b>d<sub>s</sub></b>	Creepage distance on surface	12.7		mm
<b>d<sub>A</sub></b>	Strike distance through air	9.6		mm
<b>a</b>	Allowable acceleration			50 m/s <sup>2</sup>


**Source-Drain Diode**
**Characteristic Values**

 (T<sub>J</sub> = 25°C, unless otherwise specified)

Symbol	Conditions	min.	typ.	max.
<b>I<sub>S</sub></b>	V <sub>GS</sub> = 0 V			60 A
<b>I<sub>SM</sub></b>	Repetitive; pulse width limited by T <sub>JM</sub>			240 A
<b>V<sub>SD</sub></b>	I <sub>F</sub> = I <sub>S</sub> ; V <sub>GS</sub> = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2%			1.5 V
<b>t<sub>rr</sub></b>	I <sub>F</sub> = I <sub>S</sub> , -di/dt = 100 A/μs, V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V			250 ns