

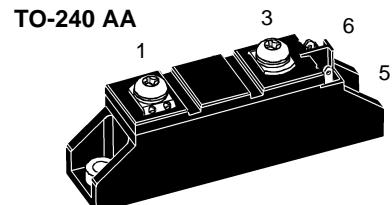
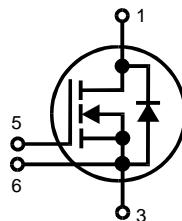
# HiPerFET™ Power Module

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



1 = Drain  
 5 = Gate  
 3 = Source  
 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		$^\circ\text{C}$
$V_{ISOL}$	$50/60 \text{ Hz}, t = 1 \text{ min}$	3000		V~
	$I_{ISOL} \leq 1 \text{ mA}, t = 1 \text{ s}$	3600		V~
$M_d$	Mounting torque(M5 or 10-32 UNF) Terminal connection torque (M5)	2.5-4.0/22-35 Nm/lb.in. 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 $\mu\text{A}$	$3 \text{ mA}$
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2 \%$	65		75	$\text{m}\Omega$

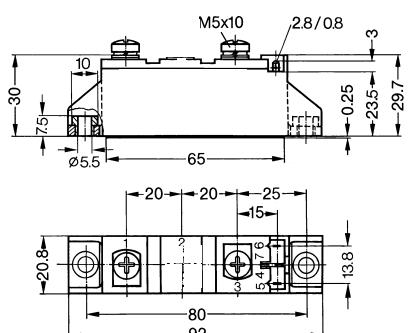
Data per MOSFET unless otherwise stated.

IXYS reserves the right to change limits, test conditions and dimensions.

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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 1.35 0.405	nF nF 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 45 250 30	ns ns ns 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 90 180	nC nC nC	
$R_{thJC}$ $R_{thCH}$	heatsink compound applied	0.2	0.21	K/W K/W
$d_s$ $d_A$ $a$	Creepage distance on surface Strike distance through air Allowable acceleration	12.7 9.6 50	mm mm $\text{m/s}^2$	

## Dimensions in mm (1 mm = 0.0394")



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