

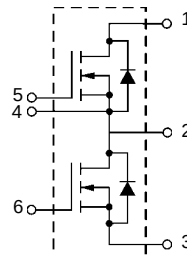
Dual Power HiPerFET™ Module

VMM 45-02F

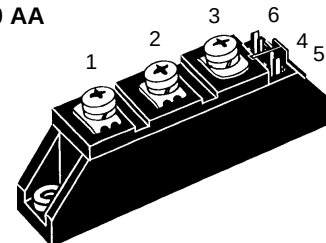
$V_{DSS} = 200\text{ V}$
 $I_{D25} = 45\text{ A}$
 $R_{DS(on)} = 45\text{ m}\Omega$

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

Preliminary Data



TO-240 AA



1 = Drain 1
 2 = Source 1, Drain 2
 3 = Source 2
 4 = Kelvin Source 1
 5 = Gate 1
 6 = Gate 2

Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	200	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 10\text{ k}\Omega$	200	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	45	A
I_{D80}	$T_C = 80^\circ\text{C}$	34	A
I_{DM}	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ }\mu\text{s}$, pulse width limited by T_{JM}	180	A
P_{tot}	$T_C = 25^\circ\text{C}$	190	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 $I_{ISOL} \leq 1\text{ mA}$	$t = 1\text{ min}$ $t = 1\text{ s}$	3000 3600 V~ 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.	
Weight	Typical including screws	90	g

Features

- Two MOSFET's in phaseleg config.
- International standard package
- Direct copper bonded Al_2O_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)

Advantages

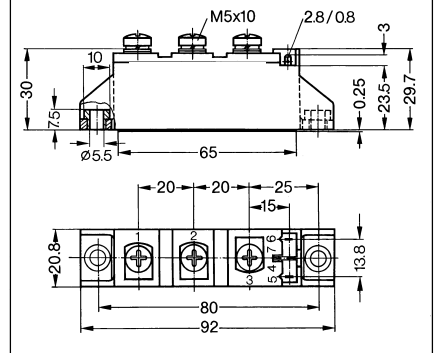
- Easy to mount with two screws
- Space and weight savings
- High power density
- Low losses

Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$	200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4\text{ mA}$	2		V
I_{GSS}	$V_{GS} = \pm 20\text{ V DC}$, $V_{DS} = 0$			500 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0\text{ V}$, $T_J = 25^\circ\text{C}$ $V_{DS} = 0.8 \cdot V_{DSS}$, $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$			15 μA 1 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $d \leq 2\%$		39	45 m Ω

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	20	30	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	4800	7500	pF
C_{oss}		900	2250	pF
C_{rss}		310	750	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External), resistive load	40		ns
t_r		45		ns
$t_{d(off)}$		300		ns
t_f		45		ns
Q_g	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$	190	225	nC
Q_{gs}		35	55	nC
Q_{gd}		95	115	nC
R_{thJC}				0.63 K/W
R_{thCH}	heatsink compound applied	0.3		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 ²

Dimensions in mm (1 mm = 0.0394")



Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Conditions	min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			45 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			180 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}	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}$, $V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$		200	400 ns