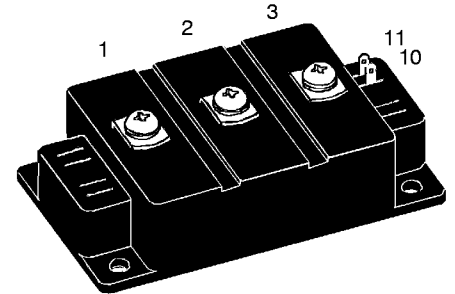
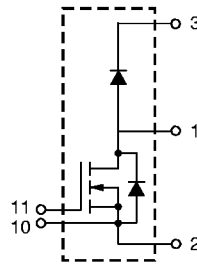


Dual Power HiPerFET™ Module with Schottky Diode

VMD 600-007S

$V_{DSS} = 70 \text{ V}$
 $I_{D25} = 620 \text{ A}$
 $R_{DS(on) \text{ typ.}} = 1.6 \text{ m}\Omega$

N-Channel Enhancement Mode



Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	70	V
V_{DGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 10 \text{ k}\Omega$	70	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$ ①	620	A
I_{D80}	$T_C = 80^\circ\text{C}$ ①	460	A
I_{DM}	$T_C = 25^\circ\text{C}; t_p = 10 \mu\text{s}$ ①	2480	A
P_D	$T_C = 25^\circ\text{C}$	1350	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~
M_d	Mounting torque (M6) Terminal connection torque (M5)	2.25-2.75/20-25 2.5-3.7/22-33	Nm/lb.in. Nm/lb.in.
Weight	typical including screws	250	g

Features

- International standard package
- Direct Copper Bonded Al_2O_3 ceramic base plate
- Low $R_{DS(on)}$ HDMOS™ process
- Low package inductance for high speed switching
- Kelvin Source contact for easy drive

Applications

- Motor speed control for electric vehicles
- DC servo and robot drives
- Switched-mode and resonant-mode power supplies
- DC choppers

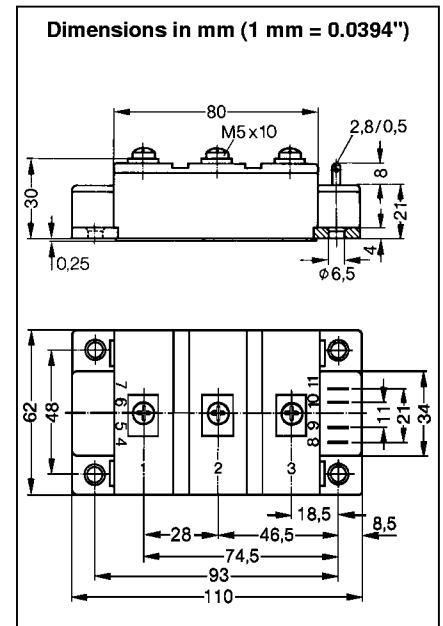
Advantages

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

Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}, I_D = 10 \text{ mA}$	70		V
$V_{GS(th)}$	$I_D = 30 \text{ mA}$	2		4 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V DC}, V_{DS} = 0$			$\pm 500 \text{ nA}$
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0 \text{ V}$			1 mA 4 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 $d \leq 2 \%$		1.6	2.1 $\text{m}\Omega$

① Additional current limitation by external leads

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		300	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		35	nF
C_{oss}			15	nF
C_{rss}			10	nF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$		150	ns
t_r			300	ns
$t_{d(off)}$			500	ns
t_f			200	ns
Q_g	$V_{GS} = 10\text{ V}, V_{DS} = 35\text{ V}, I_D = 300\text{ A}$		1900	nC
Q_{gs}			240	nC
Q_{gd}			950	nC
R_{thJC}				0.09 K/W
R_{thJS}	with heat transfer paste		0.13	K/W



Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Conditions	min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}, T_C = 25^\circ\text{C}, T_J = T_{JM}$ ②			620 A
I_{SM}	②			2480 A
V_{SD}	$I_F = 600\text{ A}, V_{GS} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$		1.2	1.4 V
t_{rr}	$I_F = 600\text{ A}, -di/dt = 700\text{ A}/\mu\text{s}, V_{DS} = 25\text{ V}$		300	ns

Free-Wheeling Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Conditions	min.	typ.	max.
I_{F25}	$V_{GS} = 0\text{ V}, T_C = 25^\circ\text{C}, T_J = T_{JM}$ ②			650 A
I_{F80}	②			500 A
V_F	$I_F = 300\text{ A}, V_{GS} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			0.9 V
I_R	$V_R = 0.8 \cdot V_{DSS}, T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			3 mA 60 mA
R_{thJC}				0.19 K/W
R_{thJS}	with heat transfer paste		0.28	K/W

② Additional current limitation by external leads