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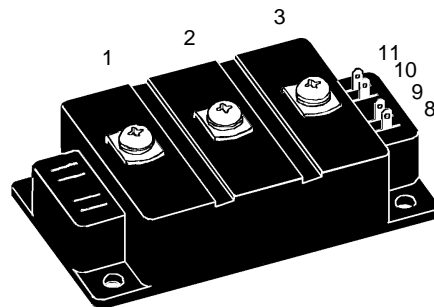
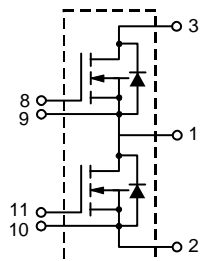
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# Dual Power HiPerFET™ Module

## VMM 300-03F

$V_{DSS} = 300\text{ V}$   
 $I_{D25} = 290\text{ A}$   
 $R_{DS(on) \text{ typ.}} = 7.4\text{ m}\Omega$

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



Symbol	Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	300	V
$V_{DGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 10\text{ k}\Omega$	300	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	290	A
$I_{D80}$	$T_C = 80^\circ\text{C}$	220	A
$I_{DM}$	$T_C = 25^\circ\text{C}; t_p = 10\text{ }\mu\text{s}$ ①	1160	A
$P_D$	$T_C = 25^\circ\text{C}$	1500	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.
<b>Weight</b>	typical including screws	250	g

### Features

- Low  $R_{DS(on)}$  HDMOS™ process
- International standard package
- Low package inductance for high speed switching
- Kelvin Source contact for easy drive
- Direct Copper Bonded  $\text{Al}_2\text{O}_3$  ceramic base plate

### Applications

- AC 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.
$V_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 12\text{ mA}$	300		V
$V_{GS(th)}$	$V_{DS} = 20\text{ V}, I_D = 30\text{ mA}$	2		V
$I_{GSS}$	$V_{GS} = \pm 20\text{ V DC}, V_{DS} = 0$			$\pm 500\text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0\text{ V}$			$0.5\text{ mA}$ $8\text{ mA}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$
$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$ , duty cycle $d \leq 2\%$		7.4	8.6 m $\Omega$

① Additional current limitation by external leads

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		280	S
<b>C<sub>iss</sub></b>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		40	nF
<b>C<sub>oss</sub></b>			7.2	nF
<b>C<sub>rss</sub></b>			2.8	nF
<b>t<sub>d(on)</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		200	ns
<b>t<sub>r</sub></b>			400	ns
<b>t<sub>d(off)</sub></b>			400	ns
<b>t<sub>f</sub></b>			150	ns
<b>Q<sub>g</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 150 V, I <sub>D</sub> = 150 A		1440	nC
<b>Q<sub>gs</sub></b>			240	nC
<b>Q<sub>gd</sub></b>			720	nC
<b>R<sub>thJC</sub></b>	with heat transfer paste			0.08 K/W
<b>R<sub>thJS</sub></b>			0.12	K/W

Symbol	Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
<b>I<sub>S</sub></b>	V <sub>GS</sub> = 0 V, T <sub>C</sub> = 25°C, T <sub>J</sub> = T <sub>JM</sub>			290 A
<b>I<sub>SM</sub></b>	②			1160 A
<b>V<sub>SD</sub></b>	I <sub>F</sub> = 300 A, V <sub>GS</sub> = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %		0.9	1.1 V
<b>t<sub>rr</sub></b>	I <sub>F</sub> = 300 A, -di/dt = 400 A/μs, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub>		300	ns

② Additional current limitation by external leads

