

Dual Power HiPerFET™ Module

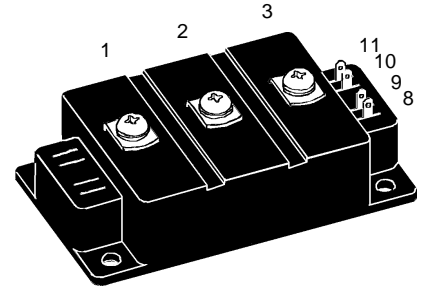
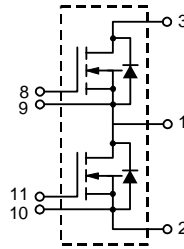
VMM 300-03F

$$V_{DSS} = 300 \text{ V}$$

$$I_{D25} = 290 \text{ A}$$

$$R_{DS(on) \text{ typ.}} = 7.4 \text{ m}\Omega$$

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	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	290	A
I_{D80}	$T_C = 80^\circ\text{C}$	220	A
I_{DM}	$T_C = 25^\circ\text{C}; t_p = 10 \mu\text{s}$ 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.
Weight	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 Al_2O_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}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$			$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ 0.5 mA 8 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 $d \leq 2 \%$		7.4	8.6 m Ω

① Additional current limitation by external leads

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

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Symbol	Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	V _{DS} = 10 V; I _D = 0.5 • I _{D25} pulsed		280	S
C_{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		40	nF
C_{oss}			7.2	nF
C_{rss}			2.8	nF
t_{d(on)}	V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} R _G = 1 Ω		200	ns
t_r			400	ns
t_{d(off)}			400	ns
t_f			150	ns
Q_g	V _{GS} = 10 V, V _{DS} = 150 V, I _D = 150 A		1440	nC
Q_{gs}			240	nC
Q_{gd}			720	nC
R_{thJC}				0.08 K/W
R_{thJS}	with heat transfer paste		0.12	K/W

Symbol	Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
I_S	V _{GS} = 0 V, T _C = 25°C, T _J = T _{JM}			290 A
I_{SM}	②			1160 A
V_{SD}	I _F = 300 A, V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %		0.9	1.1 V
t_{rr}	I _F = 300 A, -di/dt = 400 A/μs, V _{DS} = 0.5 • V _{DSS}		300	ns

② Additional current limitation by external leads

