Preliminary

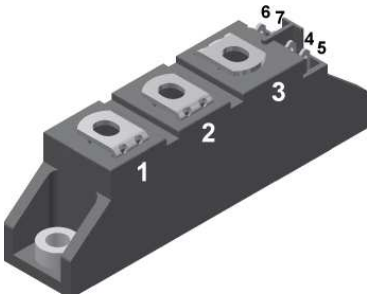
Dual Power HiPerFET™ Module

V_{DSS} = 200 V
I_{D25} = 45 A
$R_{DS(on)}$ = 45 mΩ

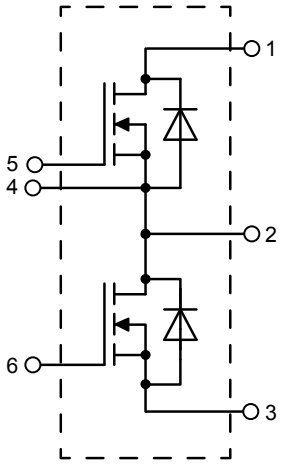
Phaseleg Configuration
High dv/dt, Low t_{rr}, HDMOS™ Family

Part number

VMM45-02F



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



Features / Advantages:

- Two MOSFET's in phaseleg configuration
- Direct copper bonded Al_2O_3 ceramic base plate
- Low $R_{DS(on)}$ HDMOS™ process
- Easy to mount with two screws
- Space and weight savings
- High power density
- Low losses

Applications:

- Switched-mode and resonant-mode power supplies
- Uninterruptible power supplies (UPS)

Package: TO-240AA

- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Preliminary

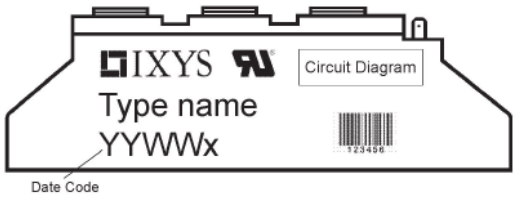
HiPerFET™s			Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.	Unit
V_{DSS}	*drain source breakdown voltage*	T_{VJ} = 25°C to125°C			200	V
V_{DGR}	*drain gate voltage*	R_{GS} = 10 kΩ T_{VJ} = 25°C to125°C			200	V
V_{GS}	*gate source voltage*	Continuous			±20	V
V_{GSM}	*max. transient gate source voltage*	Transient			±30	V
I_{D25}	*continuous drain current*	T_C = 25°C			45	A
I_{D80}	*drain current*	T_C = 80°C			34	A
I_{DM}	*maximum pulsed drain current*	t_p = 10 µs, pulse width limited by T_{JM} T_C = 25°C			180	A
P_{tot}	*total power dissipation*	T_C = 25°C			190	W
V_{DSS}	*drain source breakdown voltage*	V_{GS} = 0 V; I_D = 1 mA	200			V
$V_{GS(th)}$	*gate threshold voltage*	V_{DS} = V_{GS}; I_D = 4 mA	2		4	V
I_{GSS}	*gate source leakage current*	V_{GS} = ±20 V DC; V_{DS} = 0			500	nA
I_{DSS}	*drain source leakage current*	V_{DS} = V_{DSS}; V_{GS} = 0 V T_{VJ} = 25°C			15	µA
		V_{DS} = 0.8 • V_{DSS}; V_{GS} = 0 V T_{VJ} = 125°C			1	mA
$R_{DS(on)}$	*staticdrain source on resistance*	V_{GS} = 10 V; I_D = 0.5 • I_{D25} T_{VJ} = 25°C Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %		39	45	mΩ
g_{fs}	*forward transconductance*	V_{DS} = 10 V; I_D = 0.5 • I_{D25} pulsed	20	30		S
C_{iss}	*input capacitance*	V_{GS} = 0 V; V_{DS} = 25 V; f = 1 MHz		4800	7500	pF
C_{oss}	*output capacitance*			900	2250	pF
C_{rss}	*reverse transfer (Miller) capacitance*			310	750	pF
$t_{d(on)}$	*turn-on delay time*	V_{GS} = 10 V; V_{DS} = 0.5 • V_{DSS}; I_D = 0.5 • I_{D25} R_G = 1 Ω (external), resistive load		40		ns
t_r	*current rise time*			45		ns
$t_{d(off)}$	*turn-off delay time*			300		ns
t_f	*current fall time*			45		ns
Q_g	*total gate charge*	V_{GS} = 10 V; V_{DS} = 0.5 • V_{DSS}; I_D = 0.5 • I_{D25}		190	225	nC
Q_{gs}	*gate source charge*			35	55	nC
Q_{gd}	*gate drain (Miller) charge*			45	115	nC
R_{thJC}	*thermal resistance junction to case*				0.63	K/W
R_{thJH}	*thermal resistance junction to heatsink*	with heat transfer paste		0.93		K/W

Source-Drain Diodes			Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.	
I_S	*continuous source current*	V_{GS} = 0 V			45	A
I_{SM}	*maximum pulsed source current*	Repetitive; pulse width limited by T_{JM}			180	A
V_{SD}	*forward voltage drop*	I_F = I_S; V_{GS} = 0 V Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %		0.9	1.2	V
t_{rr}	*reverse recovery time*	I_F = I_S, -di/dt = 100 A/µs V_{DS} = 100 V; V_{GS} = 0 V		200	400	ns

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated. T_J = 25°C, unless otherwise specified

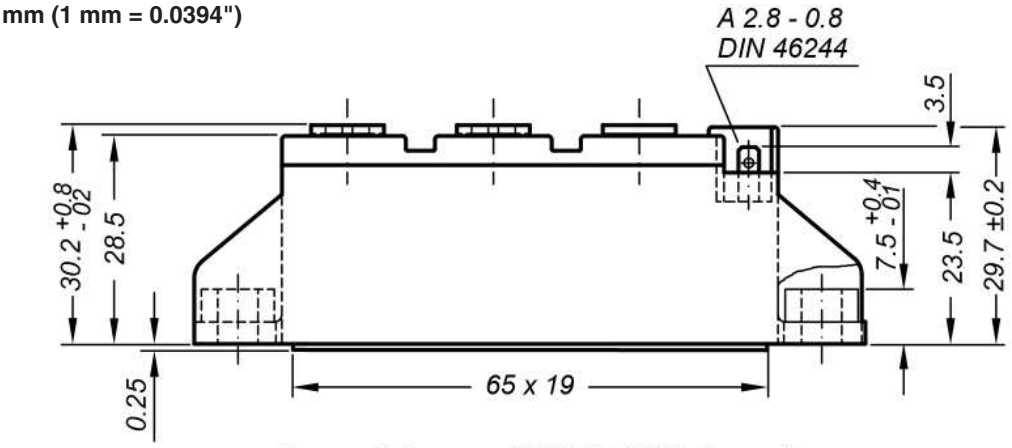
Preliminary

Package	TO-240AA				Ratings			
Symbol	Definitions	Conditions			min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					200	A
T_{VJ}	*virtual junction temperature*				-40		150	°C
T_{VJM}	*maximum virtual junction temperature*						150	°C
T_{stg}	*storage temperature*				-40		125	°C
Weight						81		g
M_D	*mounting torque*				2.5		4	Nm
M_T	*terminal torque*				2.5		4	Nm
$d_{Spp/App}$	*creepage distance on surface / striking distance through air*		*terminal to terminal*	13.0	9.7			mm
$d_{Spb/Apb}$			*terminal to backside*	16.0	16.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS, $I_{ISOL} \leq 1$ mA		4800			V
		t = 1 minute			4000			V

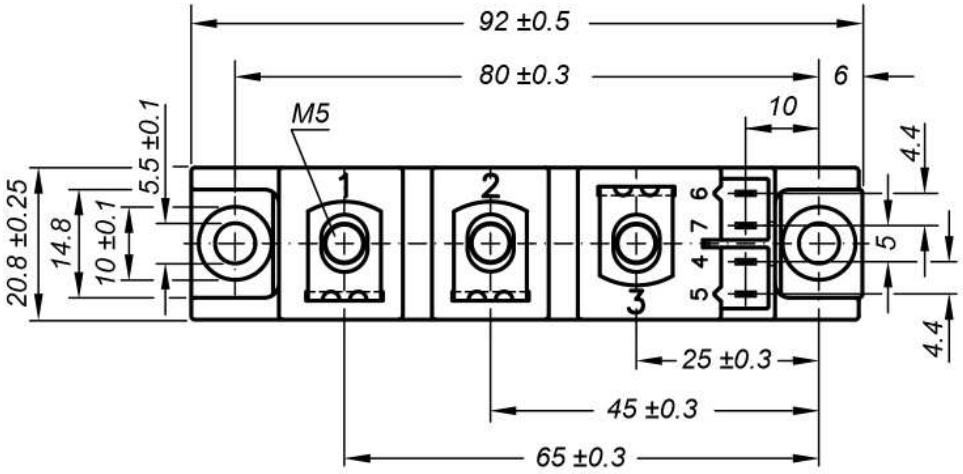


Outlines TO-240AA

Dimensions in mm (1 mm = 0.0394")



General tolerance: DIN ISO 2768 class „c“



Optional accessories for modules
Keyed gate/cathode twin plugs with wire length = 350 mm, gate = white, cathode = red
Type ZY 200L (L = Left for pin pair 4/5)
Type ZY 200R (R = Right for pin pair 6/7) } UL 758, style 3751