

Standard Rectifier Module

preliminary

$$V_{RRM} = 2 \times 1600 \text{ V}$$

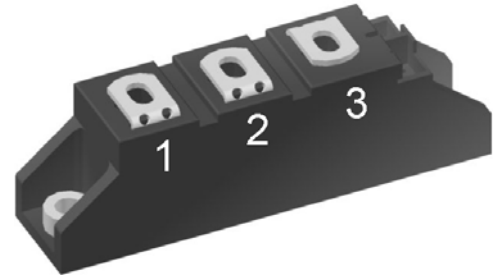
$$I_{FAV} = 50 \text{ A}$$

$$V_F = 1.11 \text{ V}$$

Phase leg

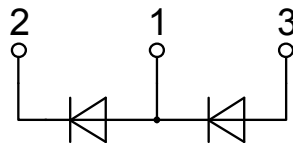
Part number

MDMA50P1600TG



Backside: isolated

 E72873



Features / Advantages:

- Package with DCB ceramic base plate
- Reduced weight
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current

Applications:

- Diode for main rectification
- For single and three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

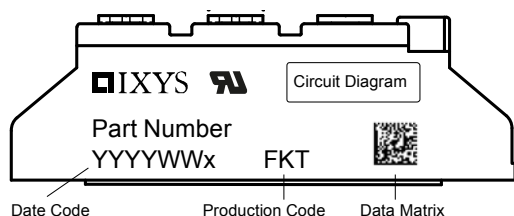
Package: TO-240AA

- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1600	V
I_R	reverse current, drain current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			100	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1.5	mA
V_F	forward voltage drop	$I_F = 50\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.18	V
		$I_F = 100\text{ A}$				1.39	V
		$I_F = 50\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.11	V
		$I_F = 100\text{ A}$				1.38	V
I_{FAV}	average forward current	$T_C = 100^{\circ}\text{C}$ sine 180°	$T_{VJ} = 150^{\circ}\text{C}$			50	A
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}\text{C}$			0.82	V
r_F	slope resistance					5.5	m Ω
R_{thJC}	thermal resistance junction to case					0.65	K/W
R_{thCH}	thermal resistance case to heatsink				0.20		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			190	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			850	A
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			920	A
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			725	A
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			780	A
I^2t	value for fusing	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			3.62	kA ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			3.52	kA ² s
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			2.63	kA ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			2.53	kA ² s
C_J	junction capacitance	$V_R = 400\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		27		pF

preliminary

Package TO-240AA				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal				200	A
T _{stg}	storage temperature			-40		125	°C
T _{VJ}	virtual junction temperature			-40		150	°C
Weight					90		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} ≤ 1 mA	4800			V
		t = 1 minute		4000			V



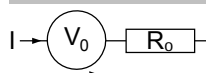
Part number

M = Module
 D = Diode
 M = Standard Rectifier
 A = (up to 1800V)
 50 = Current Rating [A]
 P = Phase leg
 1600 = Reverse Voltage [V]
 TG = TO-240AA

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA50P1600TG	MDMA50P1600TG	Box	6	513022

Equivalent Circuits for Simulation

* on die level

 $T_{VJ} = 150^\circ\text{C}$ 

Rectifier

$V_{0\max}$	threshold voltage	0.82	V
$R_{0\max}$	slope resistance *	4.3	mΩ

