

Rectifier Module Circuit Series- Package S



Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E71639

Circuit Diagram

B type



DK type



Features

- Low reverse recovery loss
- Low forward voltage
- High surge current capability
- Low inductance package

Applications

- Field supply for DC motors
- Line rectifiers for transistorized AC motor controllers
- Non-controllable rectifiers for AC/DC converter

Main Features

Symbol	Value	Unit
$I_{F(AV)}$	130 to 200	A
V_{RRM}	1600 to 1800	V
V_{RSM}	1700 to 1900	V

Absolute Maximum Rating ($T_c = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	MD16xxxS	1600	V
		MD18xxxS	1800	
V_{RSM}	Non-Repetitive Peak Reverse Voltage	MD16xxxS	1700	V
		MD18xxxS	1900	

Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Values				Unit
			MDxx130S	MDxx160S	MDxx180S	MDxx200S	
$I_{F(AV)}$	Average Forward Current	Single phase, half wave 180°C conduction, T_c^1	130	160	180	200	A
$I_{F(RMS)}$	RMS Forward Current		204	250	280	310	A
I_{FSM}	Non-Repetitive Surge Forward Current	$T_c=45^\circ\text{C}$, 50Hz, Single wave	3500	5500	6000	6500	A
		$T_c=45^\circ\text{C}$, 60Hz, Single wave	3800	6000	6500	7000	
I^2t	I^2t (For Fusing)	$T_c=45^\circ\text{C}$, 50Hz, Single wave	61.2	151.2	180.0	211.2	KA ² s
		$T_c=45^\circ\text{C}$, 60Hz, Single wave	60.0	149.4	175.3	203.3	
P_D	Power Dissipation		625	694	694	781	W
T_J	Junction Temperature		-40 to +150				$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-40 to +125				$^\circ\text{C}$
V_{ISO}	Insulation Test Voltage	AC, 50Hz, t=1min	3000				V

Note: 1. for MDxx130S & MDxx160S, $T_c=95^\circ\text{C}$; for MDxx180S, $T_c=90^\circ\text{C}$; for MDxx200S, $T_c=85^\circ\text{C}$

Electrical and Thermal Specifications ($T_c = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
I_{RM}	Reverse Leakage Current	$V_R=V_{RRM}$	-	-	500	μA
		$V_R=V_{RRM}, T_J=125^\circ\text{C}$	-	-	10	mA
V_F	Forward Voltage	MDxx130S $I_F=400\text{A}$	-	-	1.5	V
		MDxx160S $I_F=500\text{A}$	-	-	1.5	
		MDxx180S $I_F=600\text{A}$	-	-	1.5	
		MDxx200S $I_F=600\text{A}$	-	-	1.5	
V_{T0}	For power-loss calculations only $T_J=125^\circ\text{C}$	MDxx130S	-	-	0.85	V
		MDxx160S	-	-	0.85	
		MDxx180S	-	-	0.82	
		MDxx200S	-	-	0.80	
r_T		MDxx130S	-	-	1.6	m Ω
		MDxx160S	-	-	1.2	
		MDxx180S	-	-	1.1	
		MDxx200S	-	-	1.0	

Mechanical Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
Torque	Module-to-Sink	Recommended (M6)	3		5	N·m
Torque	Module Electrodes	Recommended (M6)	3		5	N·m

Electrical and Thermal Specifications ($T_c = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Max	Unit
R_{thJC}	Junction-to-Case	MDxx130S	0.20	K/W
		MDxx160S	0.18	
		MDxx180S	0.18	
		MDxx200S	0.16	

Figure 1: Forward current vs.voltage drop

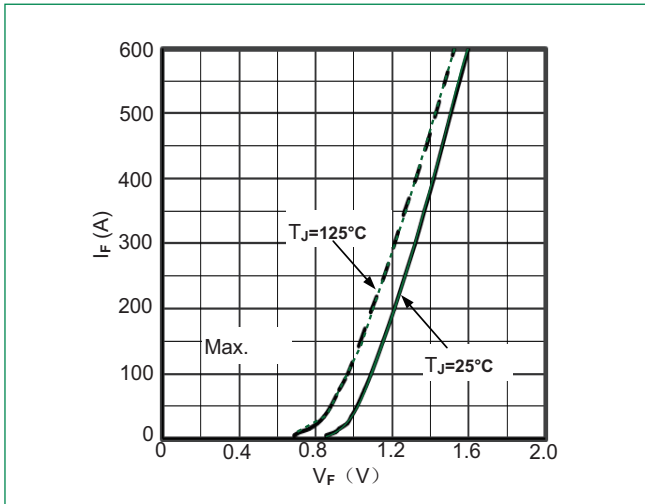


Figure 2: Max Non-Repetitive Forward Surge Current



Figure 3: Forward current vs.Case temperature

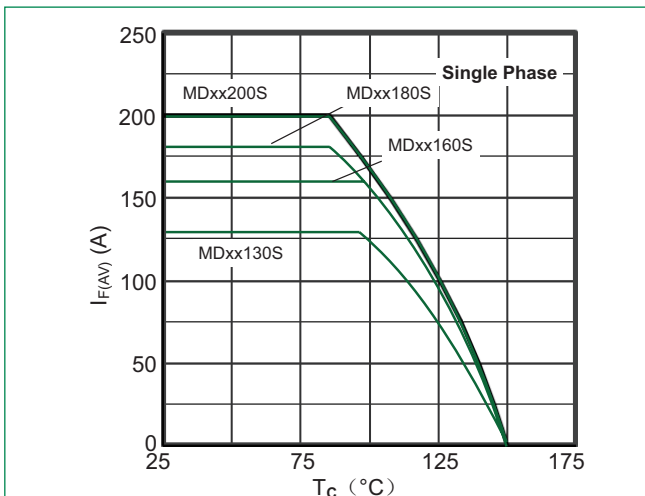


Figure 4: Transient Thermal Impedance



Figure 5: Power dissipation vs. $I_{F(AV)}$ for MDxx130S

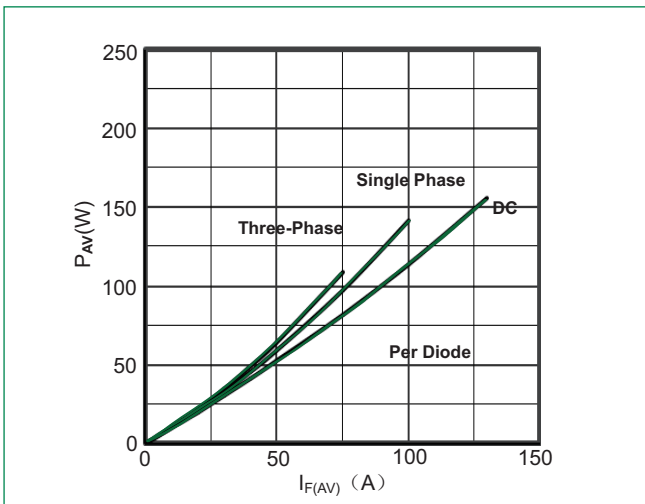


Figure 5: Power dissipation vs. $I_{F(AV)}$ for MDxx160S



Figure 5: Power dissipation vs. $I_{F(AV)}$ for MDxx180S



Figure 5: Power dissipation vs. $I_{F(AV)}$ for MDxx200S



Dimensions-Package S



Dimension	Inches		Millimeters	
	Max	Max	Min	Max
A	1.181	1.220	30.0	31.0
B	0.323	0.346	8.2	8.8
C	0.894	0.917	22.7	23.3
D	1.311	1.350	33.3	34.3
E	3.130	3.169	79.5	80.5
E1	3.681	3.720	93.5	94.5
E2	0.650	0.689	16.5	17.5
e	0.886	0.925	22.5	23.5
P	0.244	0.268	6.2	6.8

Packing Selector

Part Number	V_{RRM}		$I_{F(AV)}$	Circuit Type	Package
	1600V	1800V			
MDxx130S-BM2MM	X	X	130A	B	S
MDxx130S-DKM2MM	X	X		DK	
MDxx160S-BM2MM	X	X	160A	B	
MDxx160S-DKM2MM	X	X		DK	
MDxx180S-BM2MM	X	X	180A	B	
MDxx180S-DKM2MM	X	X		DK	
MDxx200S-BM2MM	X	X	200A	B	
MDxx200S-DKM2MM	X	X		DK	

Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MDxxxxxS-xM2MM	MDxxxxxS-xM2MM	170g	Bulk Pack	50

Part Numbering System



Part Marking System

