

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 <sup>2</sup> 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	$\mu\text{A}$
		$V_R=V_{RRM}, T_J=125^\circ\text{C}$	-	-	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 $\Omega$
		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

