

**MACMIC**

November 2012

**PRELIMINARY**

# MMD400S160U

1600V 400A Rectifier Diode Module  
RoHS Compliant

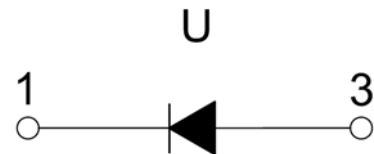
## PRODUCT FEATURES

- Glass Passivated Chip
- Aluminum Oxide Ceramic Isolated Metal Baseplate
- 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



## ABSOLUTE MAXIMUM RATINGS

 $T_C=25^\circ\text{C}$  unless otherwise specified

Symbol	Parameter	Test Conditions	Max.	Unit
$V_{RRM}$	Repetitive Reverse Voltage		1600	V
$I_{F(AV)}$	Average Forward Current	$T_C=85^\circ\text{C}$ Rectangular, $d=0.5$	400	A
$I_{F(RMS)}$	RMS Forward Current	$T_C=85^\circ\text{C}$ Rectangular, $d=0.5$	580	A
$I_{FSM}$	Non-Repetitive Surge Forward Current	$T_J=45^\circ\text{C}$ , $t=10\text{ms}$ , 50Hz, Sine	12000	A
		$T_J=45^\circ\text{C}$ , $t=8.3\text{ms}$ , 60Hz, Sine	13000	A
$I^2t$	$I^2t$ (For Fusing)	$T_J=45^\circ\text{C}$ , $t=10\text{ms}$ , 50Hz, Sine	720	$\text{KA}^2\text{s}$
		$T_J=45^\circ\text{C}$ , $t=8.3\text{ms}$ , 60Hz, Sine	701	$\text{KA}^2\text{s}$
$P_D$	Power Dissipation		1380	W
$T_J$	Junction Temperature		-40 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range		-40 to +125	$^\circ\text{C}$
$V_{isol}$	Insulation Test Voltage	AC, 50Hz, $t=1\text{min}$	3000	V
Weight			161	g

## ELECTRICAL AND THERMAL CHARACTERISTICS

 $T_C=25^\circ\text{C}$  unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{RM}$	Reverse Leakage Current	$V_R=1600\text{V}$	--	--	500	$\mu\text{A}$
		$V_R=1600\text{V}$ , $T_J=125^\circ\text{C}$	--	--	10	mA
$V_F$	Forward Voltage	$I_F=400\text{A}$	--	1.1	1.25	V
		$I_F=400\text{A}$ , $T_J=125^\circ\text{C}$	--	1.02	--	V
$V_{T0}$	For power-loss calculations only				0.9	V
$r_T$					0.8	m $\Omega$
$R_{\theta JC}$	Thermal Resistance	Junction-to-Case	--	--	0.09	$^\circ\text{C}/\text{W}$

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Version: 1

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**MECHANICAL CHARACTERISTICS**

Symbol	Parameter	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

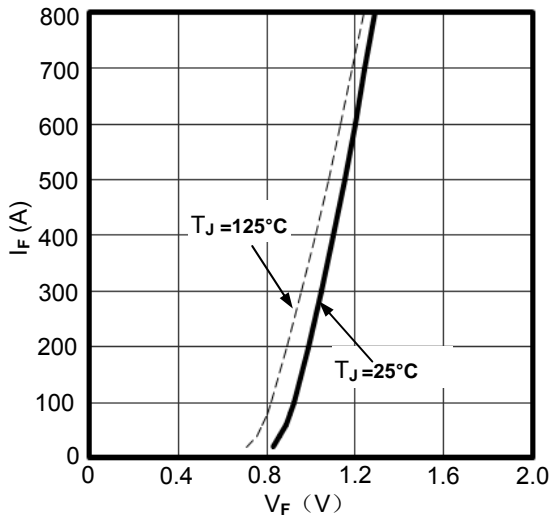


Figure1. Forward current vs.voltage drop

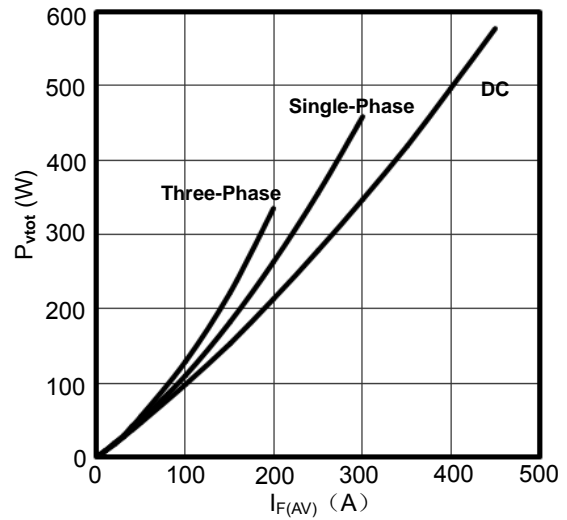


Figure2. Power dissipation vs.  $I_{F(AV)}$

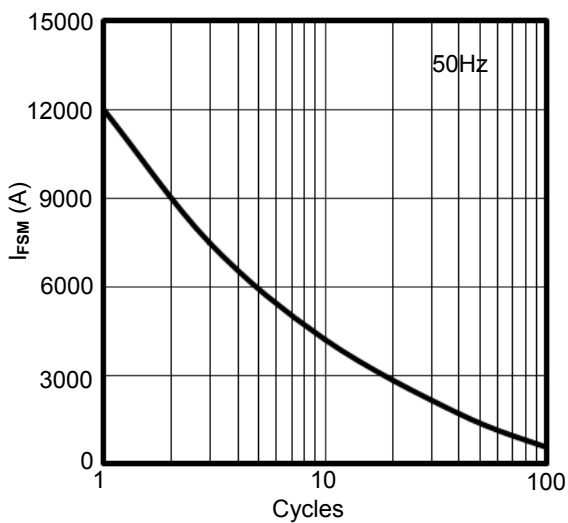


Figure3. Max Non-Repetitive Forward Surge Current

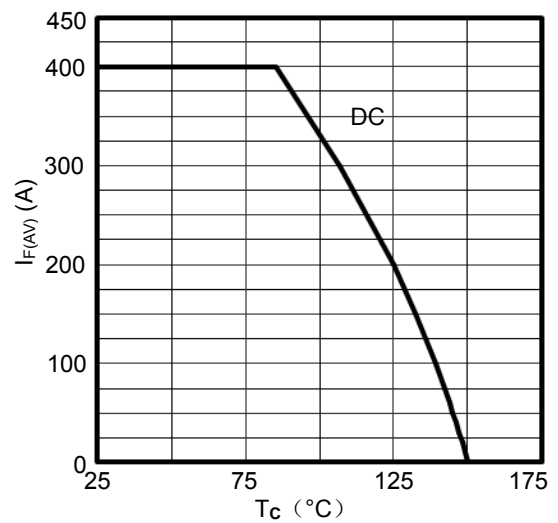


Figure4. Forward current vs. Case temperature

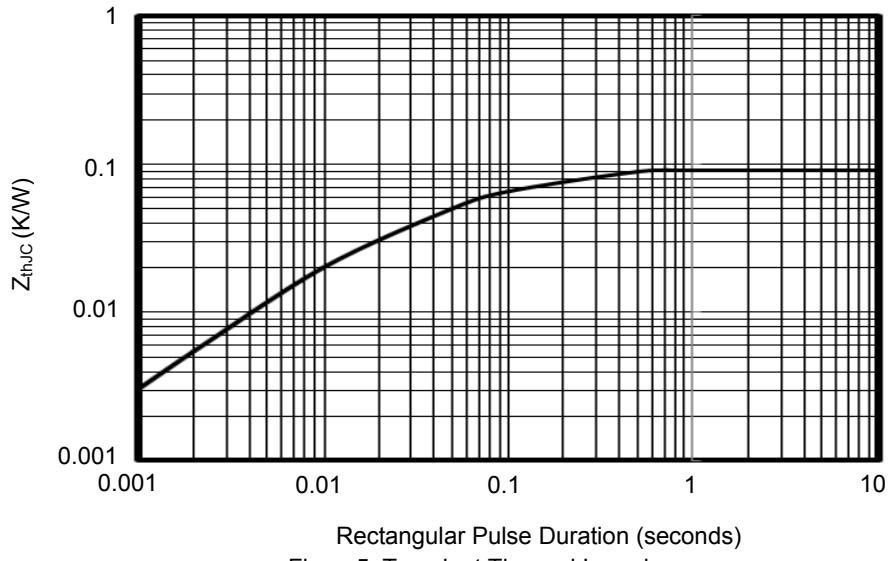


Figure5. Transient Thermal Impedance

Package Outline (Dimensions in mm)

