

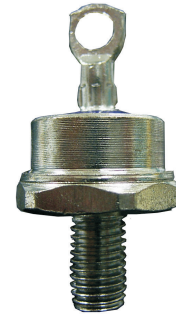
## Glass Passivated Standard Recovery Diodes (Stud Version), 40A

### FEATURES

- Glass passivated chips
- High surge current capability
- Stud cathode and stud anode version
- Wide current range
- Voltage up to 1600V  $V_{RRM}$
- RoHS compliant

### TYPICAL APPLICATIONS

- Battery charges
- Converters
- Power supplies
- Machine tool controls
- Welder



DO-203AB(DO-5)

PRODUCT SUMMARY	
$I_{F(AV)}$	40A

MAJOR RATINGS AND CHARACTERISTICS				
PARAMETER	TEST CONDITIONS	40D(R)		UNIT
		02 TO 12	16	
$I_{F(AV)}$	$T_C$	40	40	A
		140	110	°C
$I_{F(RMS)}$		63		A
$I_{FSM}$	50 HZ	570		A
	60 HZ	595		
$I^2t$	50 HZ	1625		A <sup>2</sup> s
	60 HZ	1473		
$V_{RRM}$	Range	200 to 1200	1600	V
$T_J$		-65 to 190	-65 to 160	°C

### ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	$V_{RRM, \text{MAXIMUM}}$ REPETITIVE PEAK REVERSE VOLTAGE V	$V_{RSM, \text{MAXIMUM}}$ NON-REPETITIVE PEAK VOLTAGE V	$V_{RRM, \text{MAXIMUM}}$ $T_J - T_J = \text{Maximum}$ mA
40D(R)	02	200	300	9
	04	400	500	
	06	600	700	
	08	800	900	
	10	1000	1100	
	12	1200	1300	
	16	1600	1700	4.5

FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		40D(R)		UNIT
				02 TO 12	16	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		40	40	A
				140	110	°C
Maximum RMS forward current	$I_{F(RMS)}$			63		A
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10ms	No voltage reappplied	570		A
		t = 8.3ms		595		
		t = 10ms	100% $V_{RRM}$ reappplied	480		
		t = 8.3ms		500		
Maximum $I^2t$ for fusing	$I^2t$	t = 10ms	No voltage reappplied	1625		A <sup>2</sup> s
		t = 8.3ms		1473		
		t = 10ms	100% $V_{RRM}$ reappplied	1150		
		t = 8.3ms		1050		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		16250		A <sup>2</sup> /s
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 125A, T_J = 25^\circ C, t_p = 400\mu s$ rectangular wave		1.30	1.50	V

FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		40D(R)		UNIT
				02 TO 12	16	
Maximum junction operating and storage temperature range	$T_J$			- 65 to190	- 65 to160	°C
Maximum thermal resistace, junction to case	$R_{thJC}$	DC operation		0.95		K/W
Maximum thermal resistance case to heatsink	$R_{thCS}$	Mounting surface, smooth, flat and greased		0.25		
Maximum allowable mounting torque (+0% , -10%)		Not lubricated thread ,tighting on nut <sup>(1)</sup>		3.4(30)		N · m (lbf · in)
		Lubricated thread ,tighting on nut <sup>(1)</sup>		2.3(20)		
		Not lubricated thread ,tighting on hexagon <sup>(2)</sup>		4.2(37)		N · m (lbf · in)
		Lubricated thread ,tighting on hexagon <sup>(2)</sup>		3.2(28)		
Approximate weight				15		g
				0.53		oz.
Case style		See dimensions - link at the end of datasheet		DO-203AB (DO-5)		

**Note**

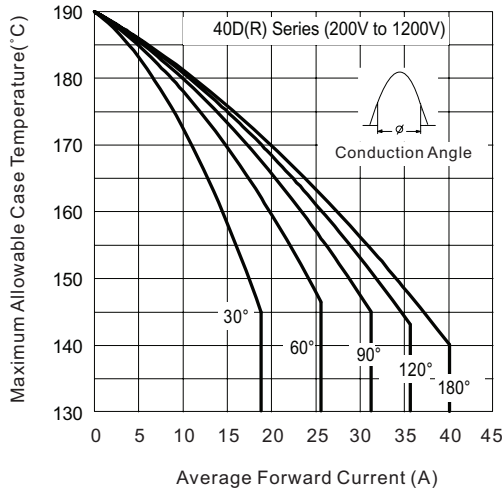
- (1) Recommended for pass-through holes.
- (2) Recommended for holed threaded heatsinks.

$\Delta R_{thJC}$ CONDUCTION					
CONDUCTION ANGEL	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDUCTIONS	UNITS	
180°	0.14	0.10	$T_J = T_J$ maximum	K/W	
120°	0.16	0.17			
90°	0.21	0.22			
60°	0.30	0.31			
30°	1.50	0.50			

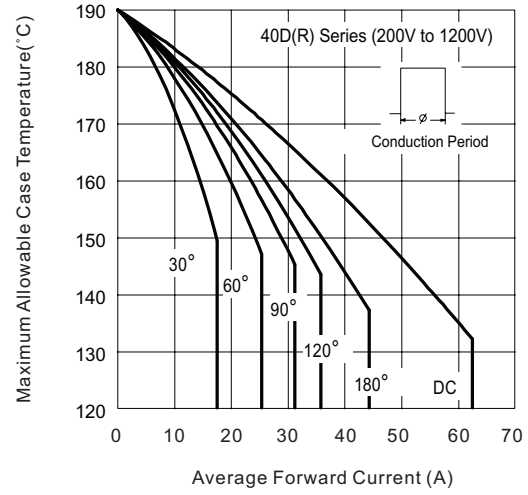
**Note**

- The table above shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC

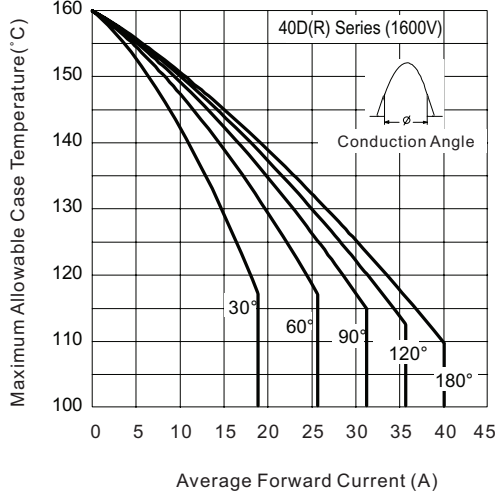
**Fig.1 Current Ratings Characteristics**



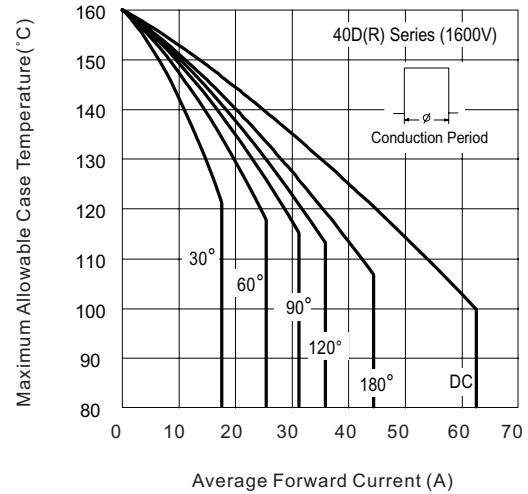
**Fig.2 Current Ratings Characteristics**



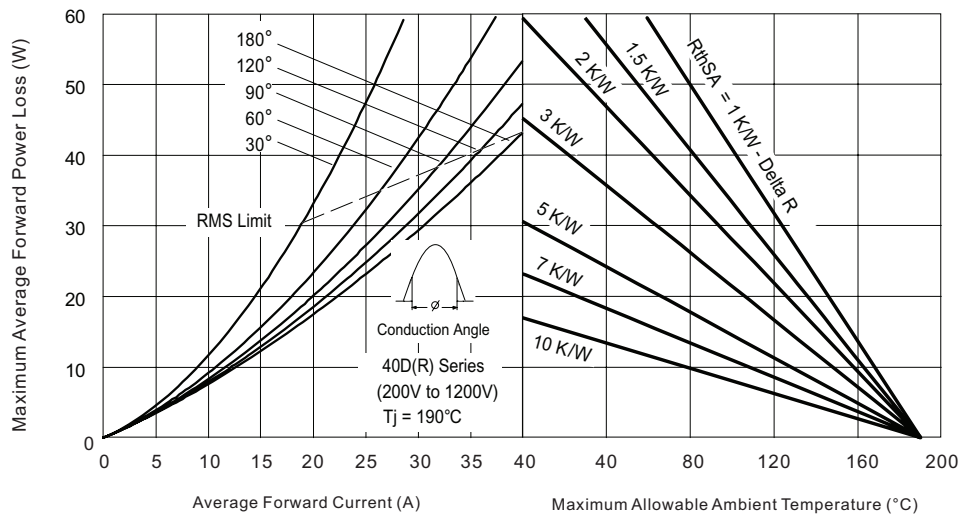
**Fig.3 Current Ratings Characteristics**



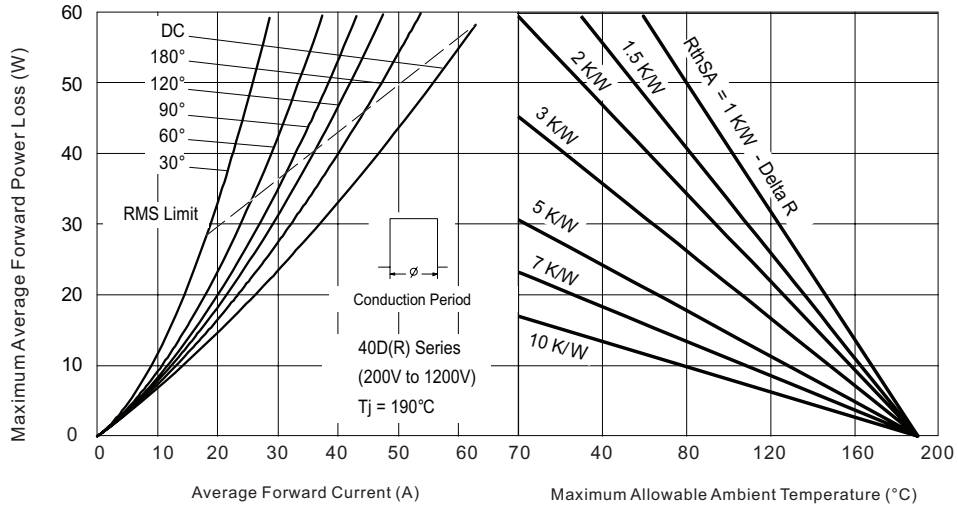
**Fig.4 Current Ratings Characteristics**



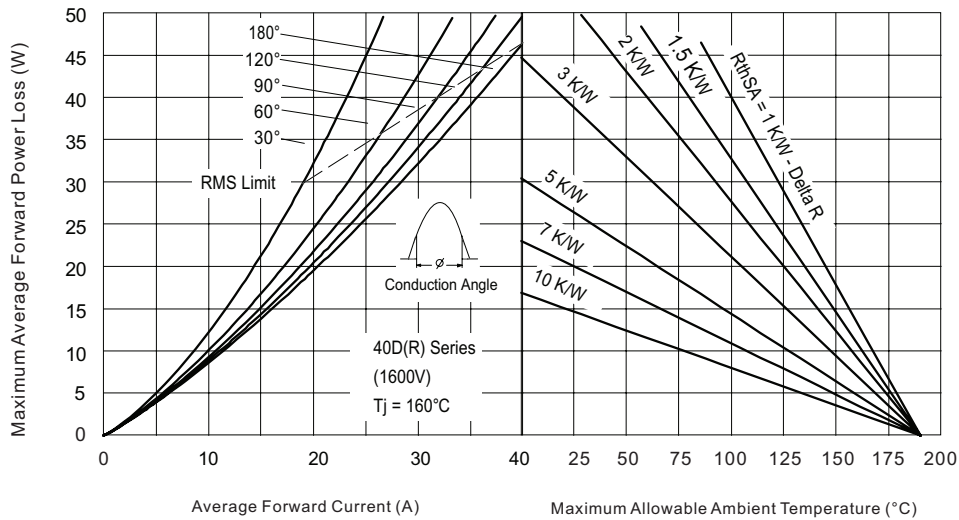
**Fig.5 Forward Power Loss Characteristics**



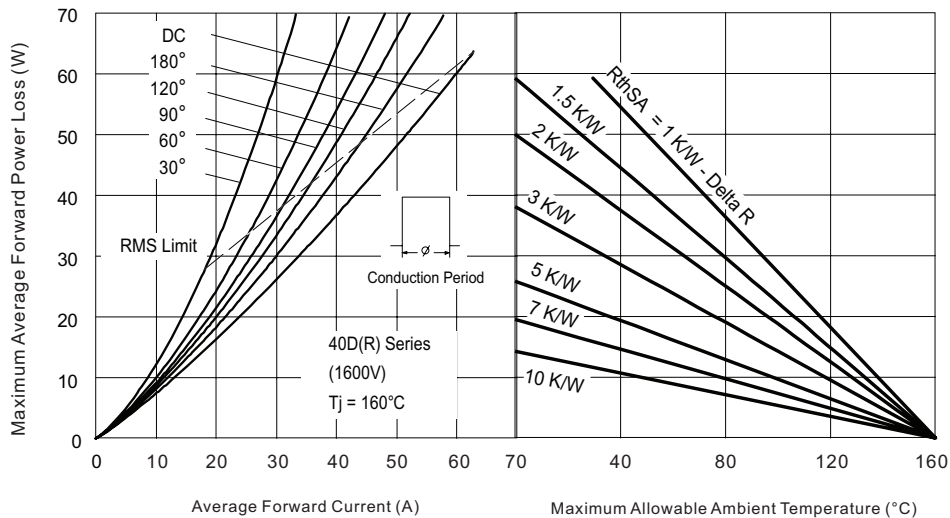
**Fig.6 Forward Power Loss Characteristics**



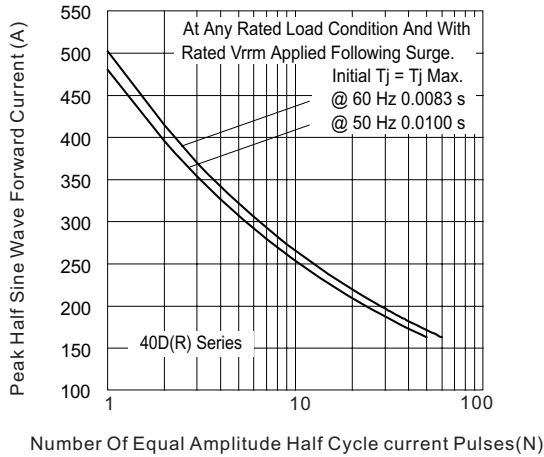
**Fig.7 Forward Power Loss Characteristics**



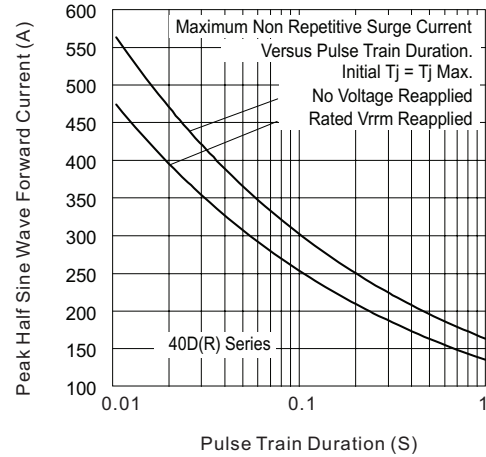
**Fig.8 Forward Power Loss Characteristics**



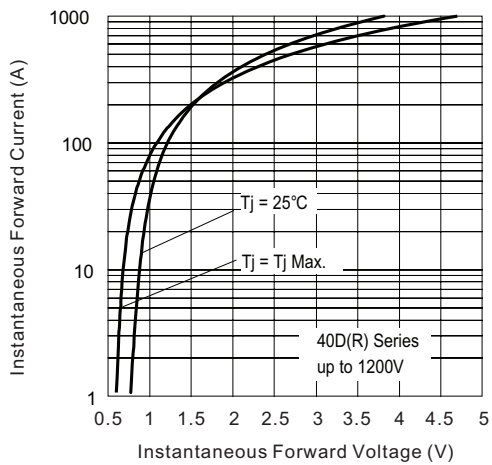
**Fig.9 Maximum Non-Repetitive Surge Current**



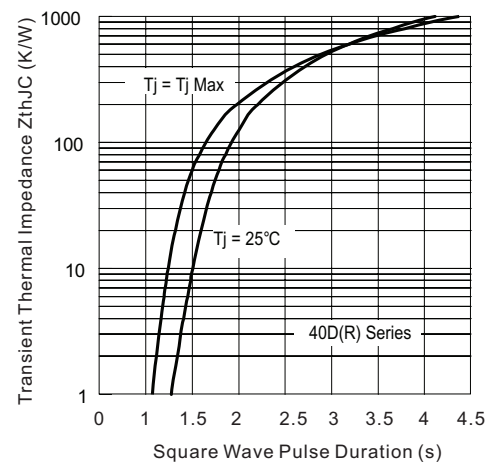
**Fig.10 Maximum Non-Repetitive Surge Current**



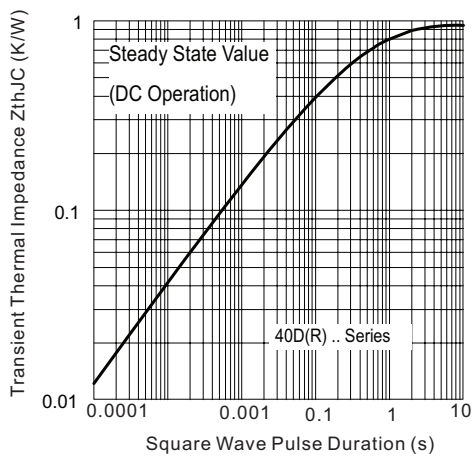
**Fig.11 Forward Voltage Drop Characteristics (Up To 1200V)**



**Fig.12 Thermal Impedance  $Z_{thJC}$  Characteristics (For 1600V)**



**Fig.13 Thermal Impedance  $Z_{thJC}$  Characteristics**



### ORDERING INFORMATION TABLE

Device code	<b>40</b>	<b>D</b>	<b>R</b>	<b>12</b>	<b>M</b>
	①	②	③	④	⑤

- ① - Current rating: Code =  $I_{F(AV)}$
- ② - D = Standard recovery device
- ③ - None = Stud normal polarity (cathode to stud)  
R = Stud reverse polarity (anode to stud)
- ④ - Voltage code 100 =  $V_{RRM}$  (see Voltage Ratings table)
- ⑤ - None = Stud base DO-203AB (DO-5) 1/4"-28 UNF-2A  
M = Stud base DO-230AB (DO-5) M6 1.0

