

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



DO-203AB(DO-5)

TYPICAL APPLICATIONS

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

PRODUCT SUMMARY

$I_{F(AV)}$	40A
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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^2s
	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} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK VOLTAGE V	V_{RRM} , MAXIMUM TJ-TJ=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	Sinusoidal half wave, initial $T_J = T_J$ maximum	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^2s
		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		$A^2\sqrt{s}$
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 resistance, 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 ⁽¹⁾			3.4(30)		N · m (lbf · in)
		Lubricated thread ,tighting on nut ⁽¹⁾			2.3(20)		
		Not lubricated thread ,tighting on hexagon ⁽²⁾			4.2(37)		N · m (lbf · in)
		Lubricated thread ,tighting on hexagon ⁽²⁾			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.

ΔR_{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

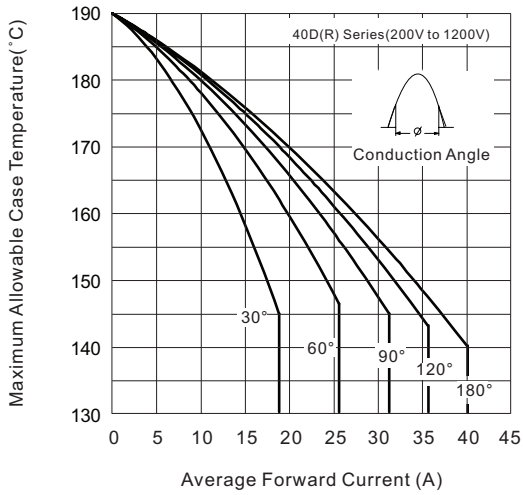


Fig.2 Current Ratings Characteristics

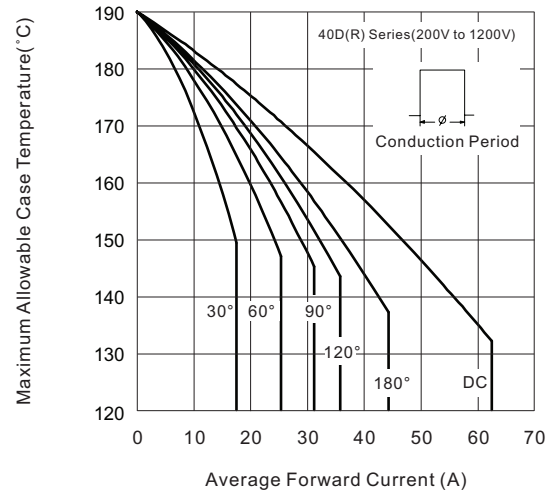


Fig.3 Current Ratings Characteristics

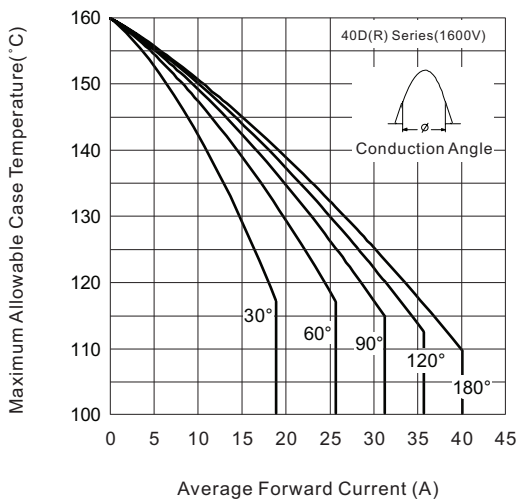


Fig.4 Current Ratings Characteristics

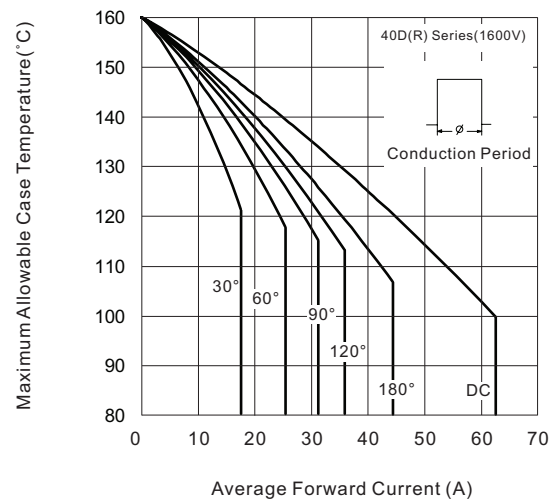


Fig.5 Forward Power Loss Characteristics

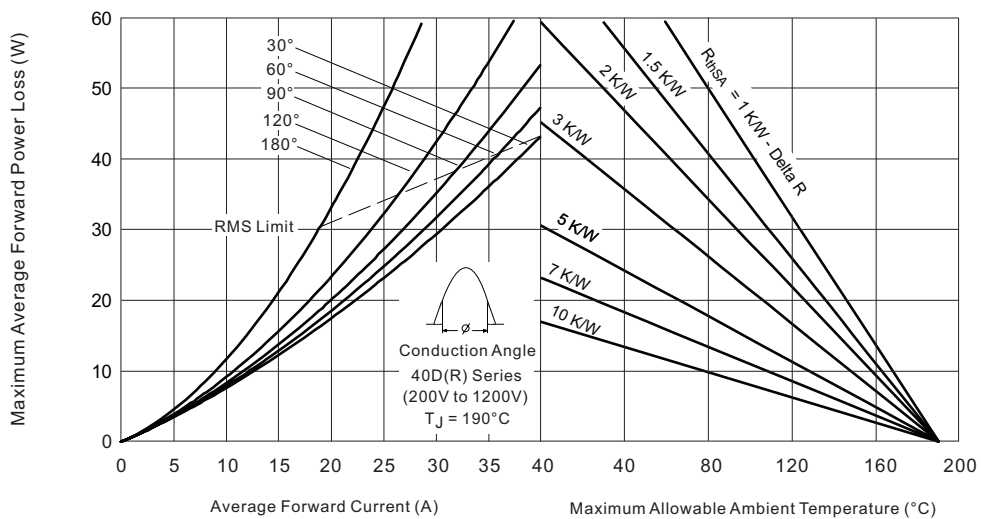


Fig.6 Forward Power Loss Characteristics

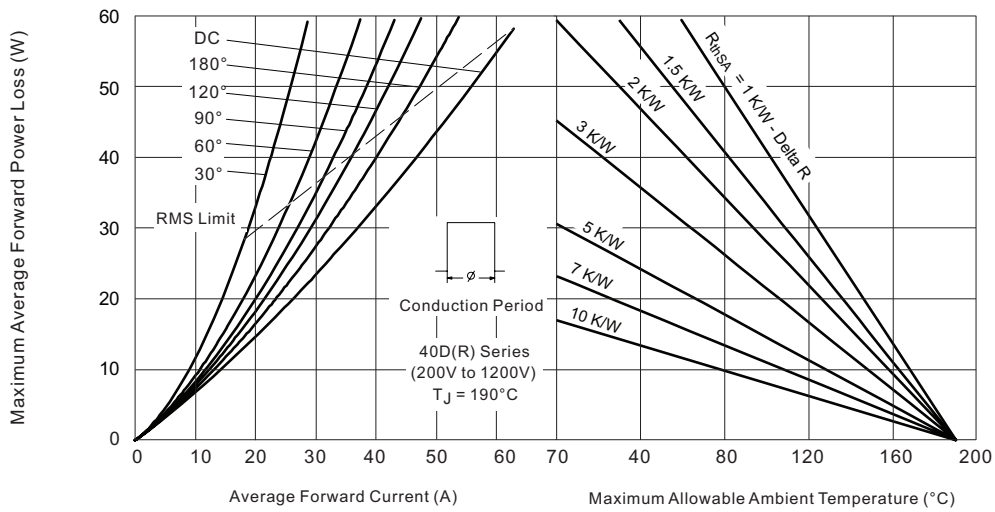


Fig.7 Forward Power Loss Characteristics

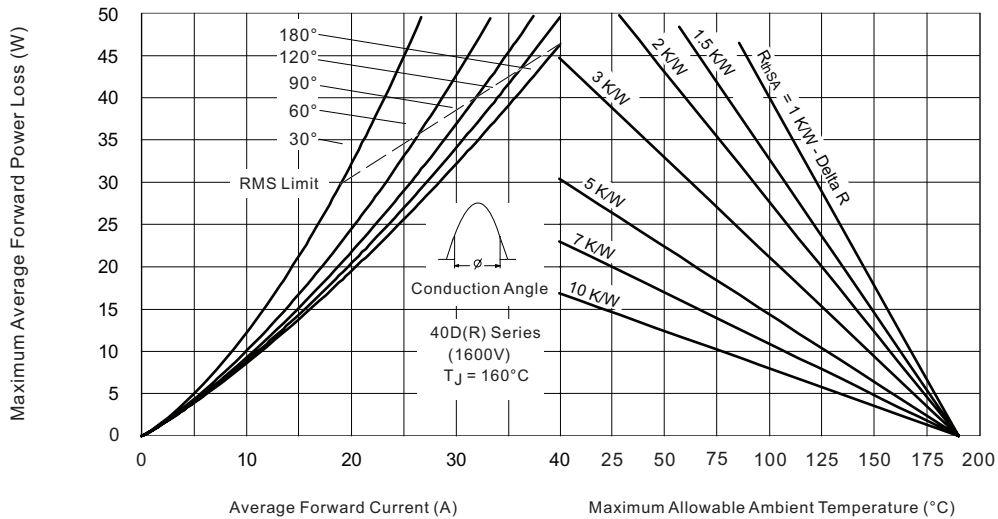


Fig.8 Forward Power Loss Characteristics

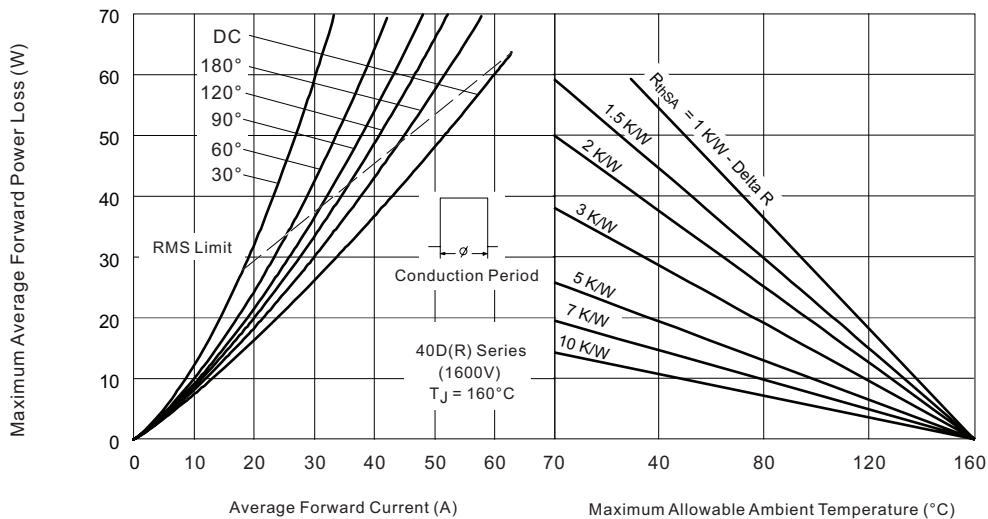
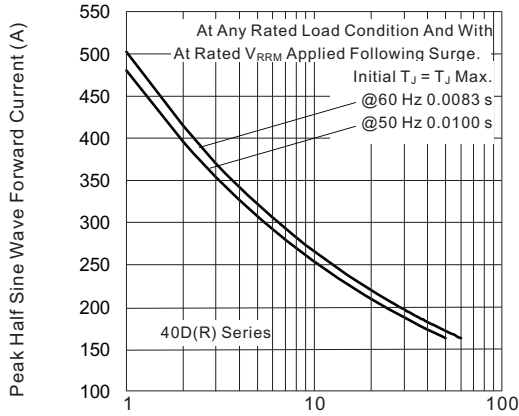
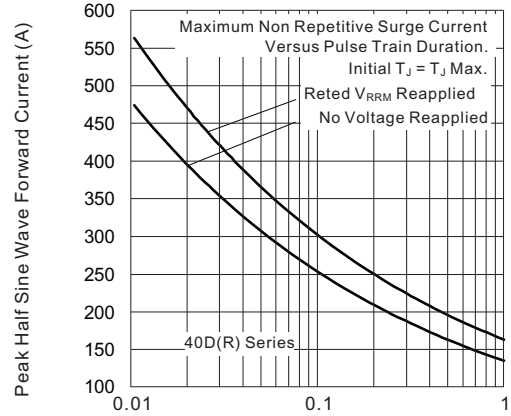


Fig.9 Maximum Non-Repetitive Surge Current



Number Of Equal Amplitude Half Cycle current Pulses(N)

Fig.10 Maximum Non-Repetitive Surge Current



Pulse Train Duration (S)

Fig.11 Thermal Impedance Z_{thJC} Characteristics (Up To 1200V)

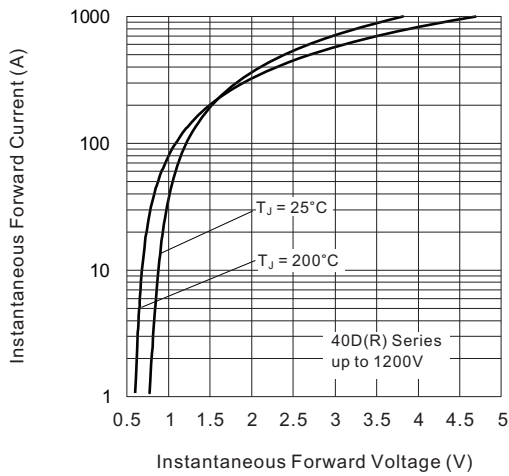


Fig.12 Forward Voltage Drop Characteristics (For 1600V)

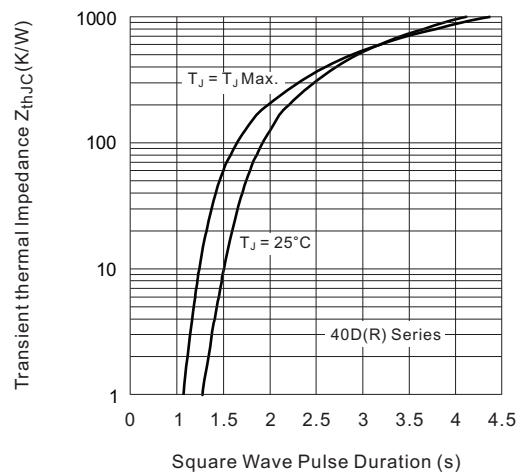
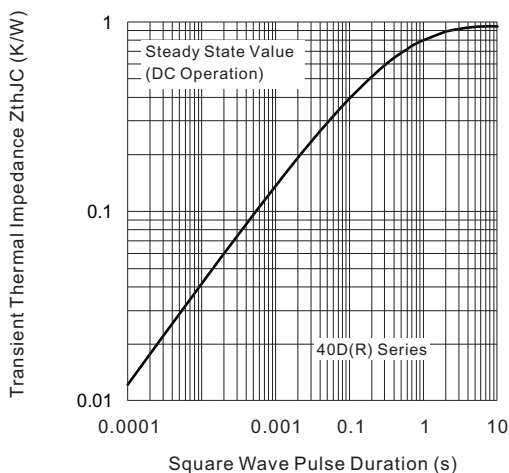


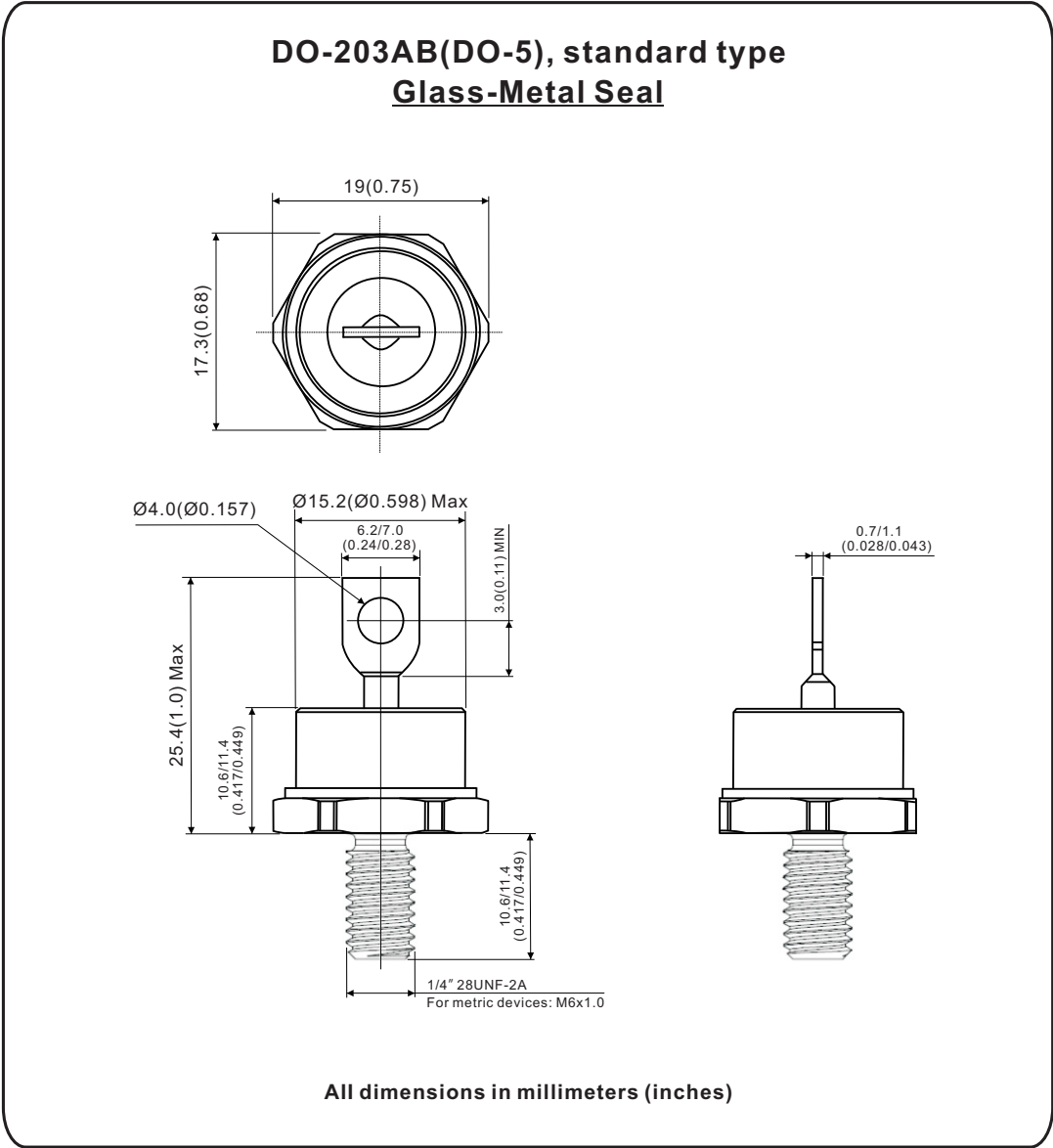
Fig.13 Thermal Impedance Z_{thJC} characteristic



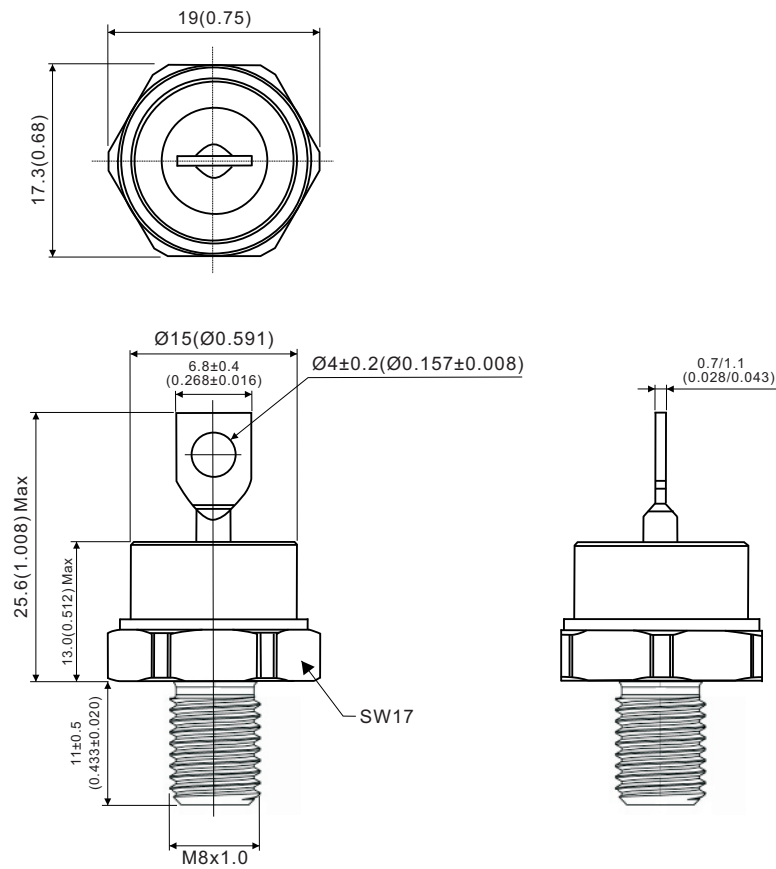
ORDERING INFORMATION TABLE

Device code	40	D	R	12	M
	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, standard type
M = Stud base DO-203AB (DO-5) M6×1.0, standard type
S = Stud base DO-203AB (DO-5) M8×1.0, "Semikron" type



**DO-203AB(DO-5), "Semikron" type
Glass-Metal Seal**



All dimensions in millimeters (inches)