Fast Recovery Diodes
Stud Version, 150A

FEATURES

- Alloy diode
- Popular series for rough service
- High voltage ratings up to 1200V
- Stud cathode and stud anode version
- RoHS compliant
- Designed and qualified for industrial level
- Glass passivated chip
- Reverse recovery time (t_{rr}) < 500 nS

Ceramic housing
(Metric stud)

DO-205AA(DO-8)

TYPICAL APPLICATIONS

- Welders
- Power supplies
- Motor controls
- Battery chargers
- General industrial current rectification
- Freewheeling diodes
- High power drives
- Fast recovery rectifier applications

PRODUCT SUMMARY	
$I_{F(AV)}$	150A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	150FD(R)	UNIT
$I_{F(AV)}$		150	A
	Maximum T_C	125	°C
I_{FSM}	50 HZ	3000	A
	60 HZ	3141	
I^2t	50 HZ	45	kA^2s
	60 HZ	40.9	
V_{RRM}	Range	400 to 1200	V
t_{rr}	T_j = 25°C	250 to 500	nS
T_J		-40 to 175	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM}, MAXIMUM AT T_J = 175 °C mA
150FD(R)	04	400	500	15
	06	600	700	
	08	800	900	
	10	1000	1100	
	12	1200	1300	

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			150D(R)	UNIT
Maximum average forward current at maximum case temperature	$I_{F(AV)}$	180° conduction, half sine wave			150	A
					125	°C
Maximum RMS forward current	$I_{F(RMS)}$	DC at 110°C			235.5	A
Maximum peak, one cycle forward, non-reptitive surge current	I_{FSM}	t = 10ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	3000	A
		t = 8.3ms			3141	
		t = 10ms	100%V_{RRM} reapplied		2519	
		t = 8.3ms			2635	
Maximum I^2t for fusing	I^2t	t = 10ms	No voltage reapplied		45	kA^2s
		t = 8.3ms			40.9	
		t = 10ms	100%V_{RRM} reapplied		31.7	
		t = 8.3ms			28.8	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			450	$kA^2\sqrt{s}$
Maximum value of threshold voltage	$V_{F(TO)}$	$T_J = T_J$ Maximum			0.95	V
Maximum value of forward slope resistance	r_F				1.05	mΩ
Maximum forward voltage drop	V_{FM}	I_{pk} = 470A, T_J = 25°C, t_p = 10ms sinusoidal wave			1.65	V

SWITCHING

PARAMETER	SYMBOL	TEST CONDITIONS	150FD(R)		UNIT
			04 to 06	08 to 12	
Typical reverse recovery time	t_{rr}	T_J = 25°C, I_F = 0.5A, I_R = 1.0A, I_{RR} = 250mA (RG#1 CKT)	250	500	ns
		T_J = 25°C, I_F = 1A to V_R = 30V, $-dI_F/dt$ = 100 A/µs	60	120	
		T_J = 25°C, $-dI_F/dt$ = 25 A/µs, I_{FM} = π x rated $I_{F(AV)}$	250	500	
Typical reverse recovered charge	Q_{rr}	T_J = 25°C, I_F = 1A to V_R = 30V, $-dI_F/dt$ = 100 A/µs	85	340	nC
		T_J = 25°C, $-dI_F/dt$ = 25 A/µs, I_{FM} = π x rated $I_{F(AV)}$	290	1300	

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS	150FD(R)	UNIT
Maximum junction operating and storage temperature range	T_J, T_{stg}		- 40 to175	°C
Maximum thermal resistace, junction to case	R_{thJC}	DC operation	0.3	K/W
Maximum thermal resistance case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.1	
Maximum allowable mounting torque (+0% , -20%)		Not lubricated threads	17	Nm
		Lubricated threads	14.5	
Approximate weight		Ceramic housing	100	g
		Glass-metal seal	95	
Case style		(JEDEC) see dimensions - link at the end of datasheet	DO-205AA (DO-8)	

△ R_{thJC} CONDUCTION				
CONDUCTION ANGEL	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDUCTIONS	UNITS
180°	0.031	0.023	$T_J = T_J$ maximum	K/W
120°	0.038	0.040		
90°	0.048	0.053		
60°	0.071	0.075		
30°	0.120	0.121		

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

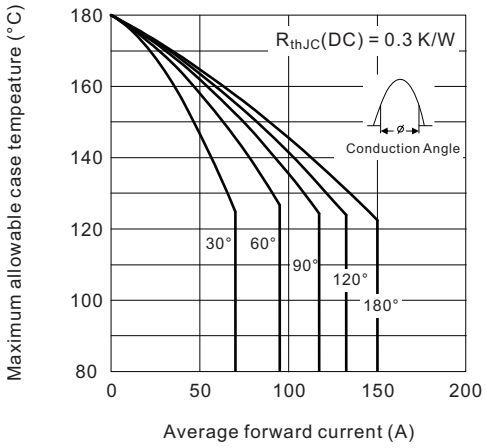


Fig.2 Current ratings characteristics

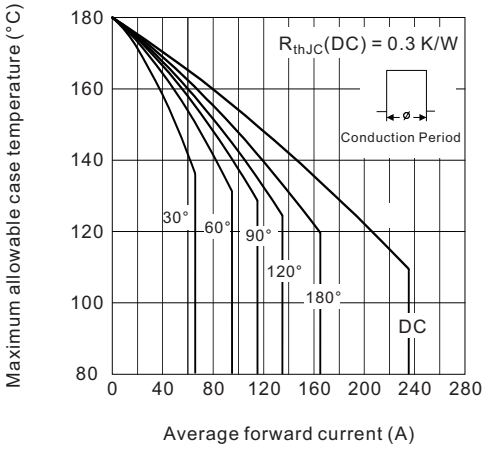


Fig.3 Forward power loss characteristics

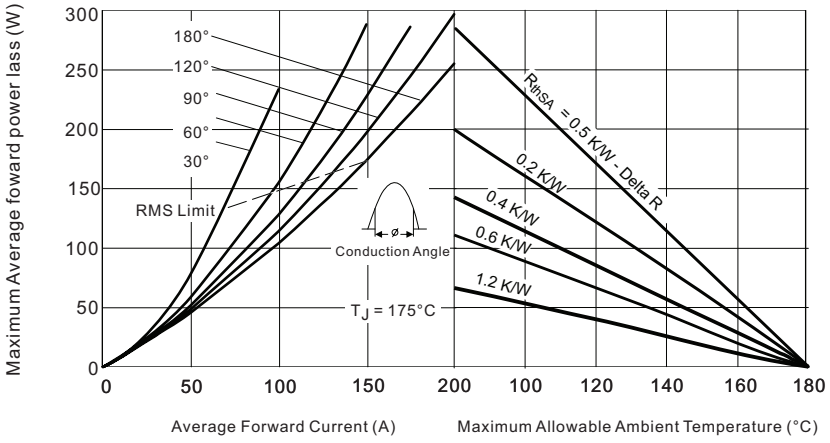


Fig.4 Forward power loss characteristics

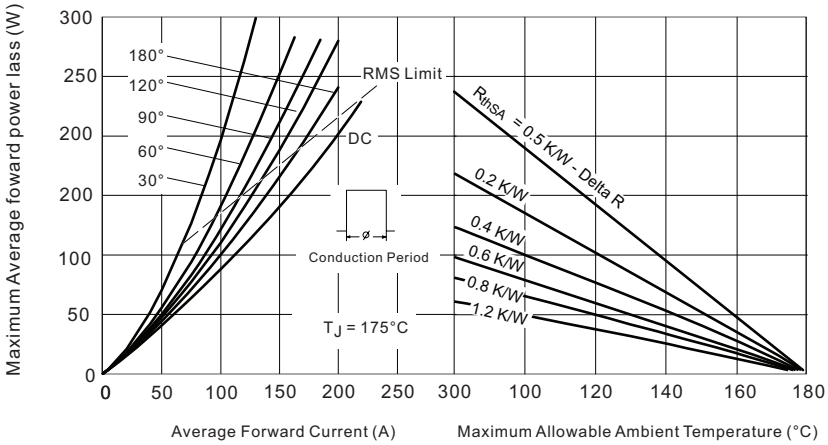


Fig.5 Maximum non-repetitive surge current

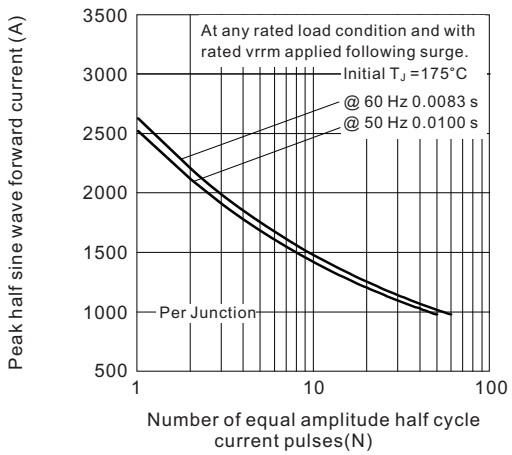


Fig.6 Maximum non-repetitive surge current

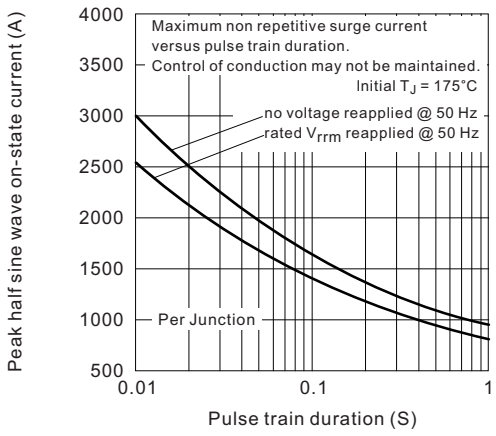


Fig.7 Forward voltage drop characteristics

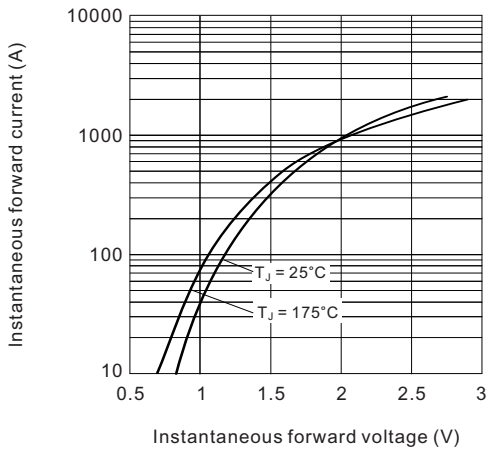


Fig.8 Thermal Impedance R_{thJC} characteristic

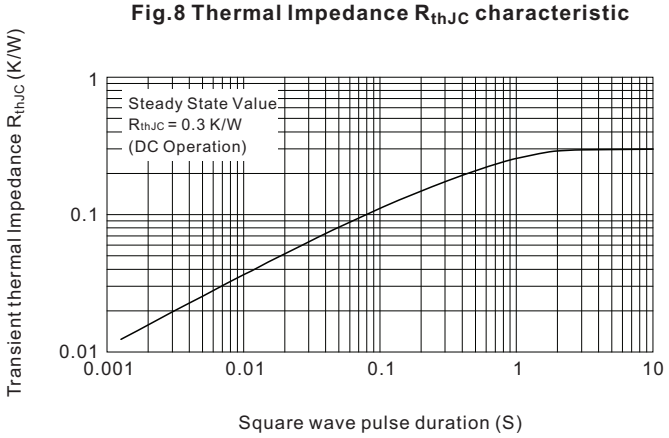


Fig .9 Typical reverse recovery time vs. rate of fall of forward current.

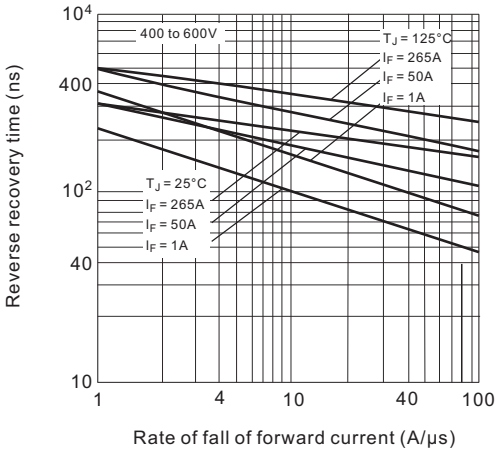


Fig .10 Typical recovered charge vs. rate of fall of forward current.

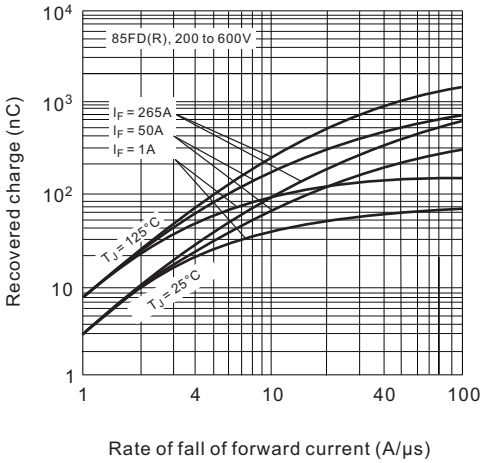


Fig .11 Typical reverse recovery time vs. rate of fall of forward current.

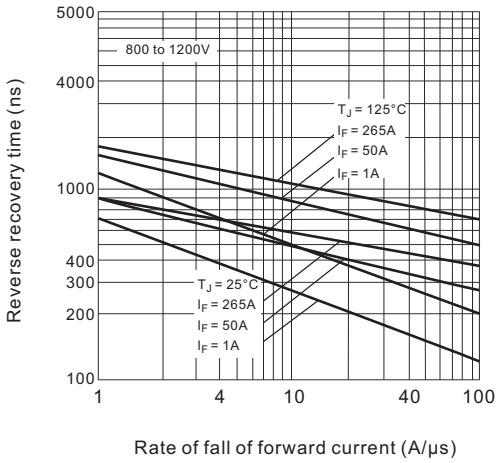
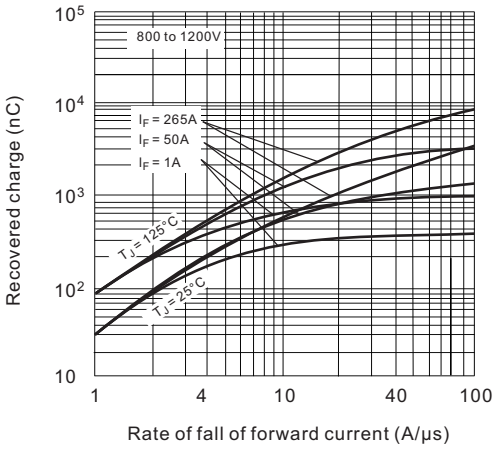


Fig .12 Typical recovered charge vs. rate of fall of forward current.



ORDERING INFORMATION TABLE

Device code

150	FD	R	10	M	A
1	2	3	4	5	6

1 - Current rating, 150 = 150A

2 - FD = Fast Recovery Diode

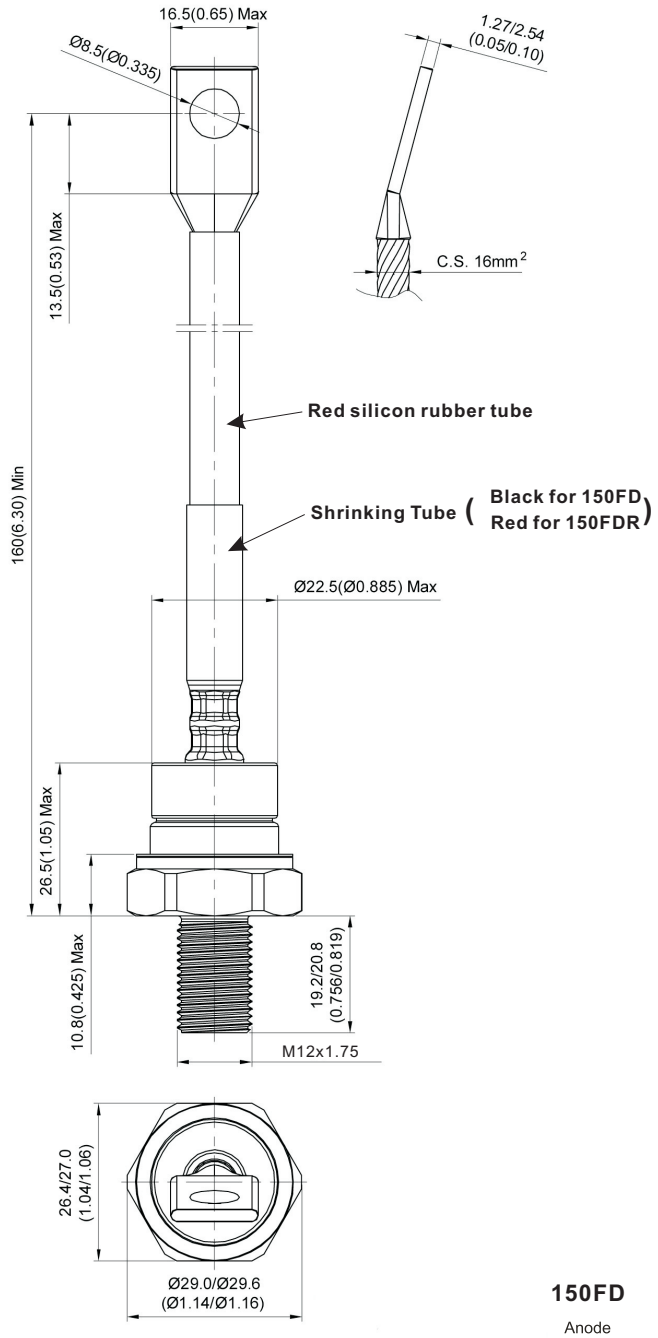
3 - None = Stud normal polarity (cathode to stud)
R = Stud reverse polarity (anode to stud)

4 - Voltage code × 100 = V_{RRM} (see Voltage Ratings table)

5 - DO-8, Ceramic housing type with M12x1.75 stud and insulated tube

6 - trr Value, A=250 nS Max.,
B=500 nS Max.,

DO-205AA (DO-8), Ceramic housing



All dimensions in millimeters (inches)