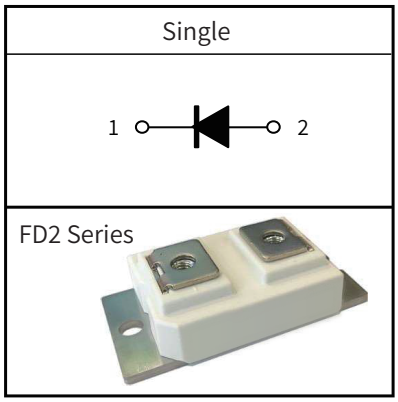
Ultra-Fast Soft Recovery Diode Module

ESA300BN120S

Features

- Repetitive Reverse Voltage : VRRM= 1200V
- Low Forward Voltage Drop : VF(typ.) = 2.1V
- Average Forward Current : IF(AV.) = 300A @ Tc = 100°C
- Ultra-Fast Reverse Recovery Time : trr(typ.) = 270ns
- Extensive Characterization of Recovery Parameters
- Reduced EMI and RFI
- Isolation Type Package

Equivalent Circuit and Package



Please see the package out line information

Applications

- Welding Machine
- Induction Heating
- UPS

Absolute Maximum Ratings@ Tc=25°C (Per Leg)

Symbol	Parameter	Conditions	Ratings	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1200	V
$V_{R(DC)}$	Reverse DC Voltage		960	V
$I_{F(AV)}$	Average Forward Current Tc = 25°	Resistive Load	600	A
	Average Forward Current Tc=100°C	Resistive Load	300	A
I_{FSM} (1)	Surge(non-repetitive) Forward Current	One Half Cycle at 60Hz, Peak Value	4200	A
I^2t	I^2t for Fusing	Value for One Cycle Current, t_w = 8.3ms, T_j= 25°C Start	$7.32*10^4$	A^2s
T_J (2)	Junction Temperature	-	-40～125	°C
T_{stg}	Storage Temperature	-	-40 ～125	°C
V_{isol}	Isolation Voltage	@ AC 1 minutes	2500	V
P_d	Maximum Power Dissipation			W
-	Mounting screw torque	M6	4.0	N.m
-	Mounting terminals screw torque	M6	3.0	N.m

(Note *1) Repetitive rating : Pulse width limited by max junction temperature

(Note *2) The maximum junction temperature of chip is 150°C

Electrical Characteristics of FRD @ Tc=25°C (unless otherwise specified)

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
V_R	Cathode Anode Breakdown Voltage	I_R = 100uA		1200	-	-	V
V_{FM}	Maximum Forward Voltage	I_{FM} = 300A	T_j =25 ℃	-	2.1	2.5	V
			T_j =125 ℃	-	2.2	-	
I_{RRM}	Repetitive Peak Reverse Current	T_C = 100℃ , V_{RRM} applied		-	-	15.0	mA
t_{rr}	Reverse Recovery Time	I_{FM} = 300A, V_R = 600V di/dt=-600A/us	T_j =25 ℃	-	270	320	ns
			T_j =125 ℃	-	430	-	

Thermal Characteristics and Weight

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction-to-Case	per FRD	-	-	0.13	°CW
Weight	Weight of Module		-	-	180	g

Performance Curves

Fig. 1 Typical Forward Voltage Drop vs. Instantaneous Current

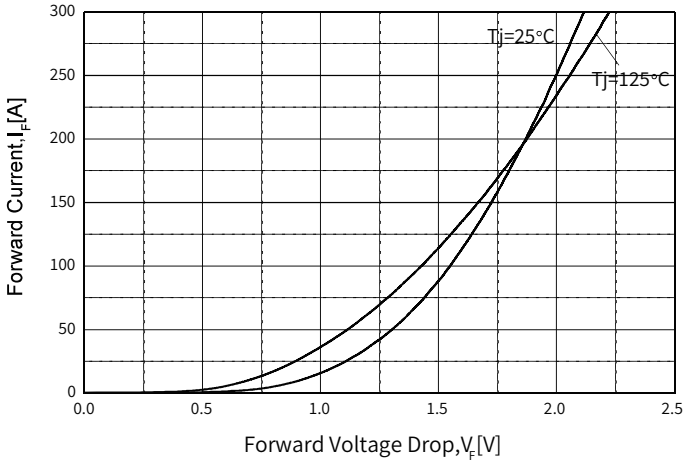


Fig. 2 Typical Reverse Recovery Time vs.–di/dt

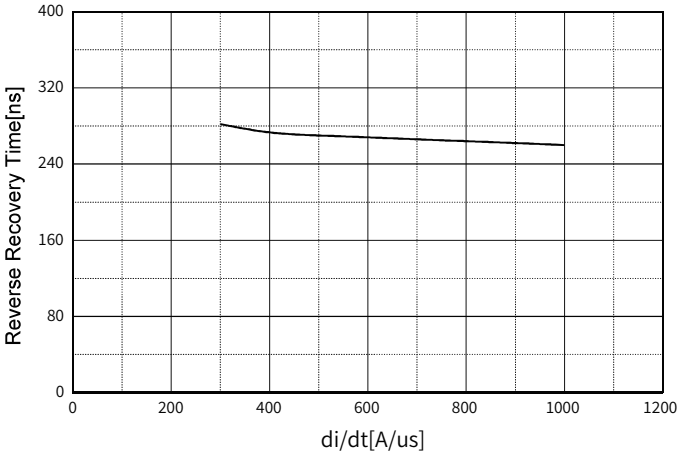


Fig. 3 Transient Thermal Impedance(Z_{thjc}) Characteristics

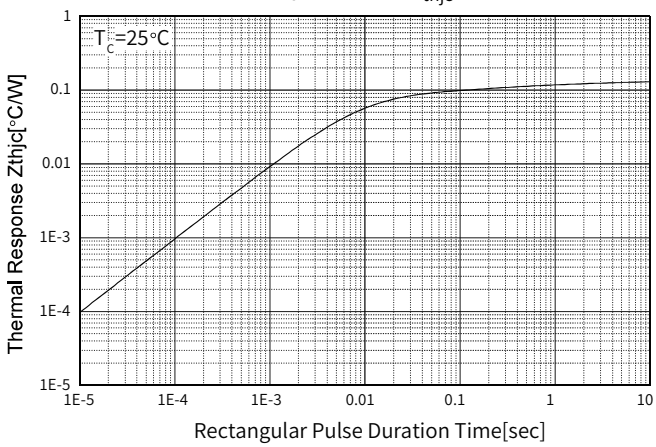
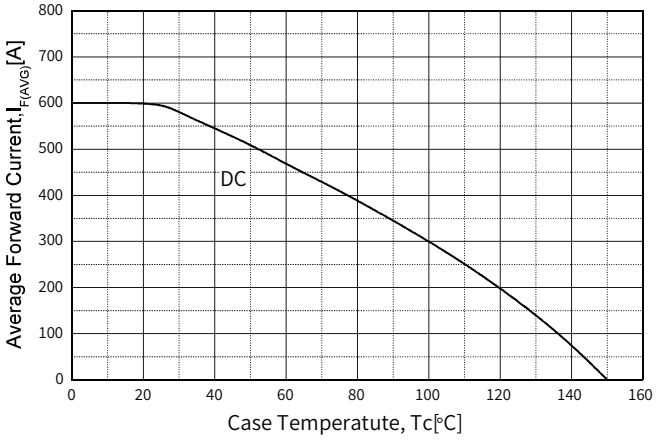


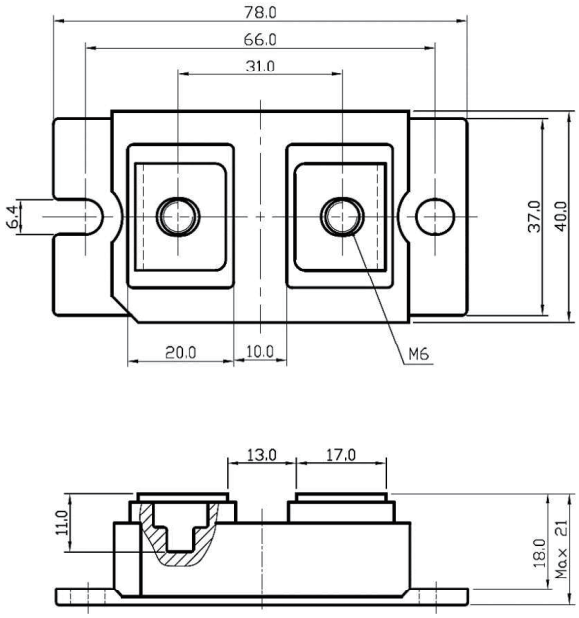
Fig. 4 Forward Current Derating Curve



Package Out Line Information

FD2 Package

Dimensions in mm



Internal Circuit