

# ESB150NH40SN

## Ultra-Fast Soft Recovery Diode Module

### Description

Ultra-FRD module devices are optimized to reduce losses and EMI/RFI in high frequency power conditioning electrical systems. These diode modules are ideally suited for power converters, motor drives and other applications where switching losses are a significant portion of the total losses.

### Features

- ☞ Repetitive Reverse Voltage :  $V_{RRM} = 400V$
- ☞ Low Forward Voltage Drop :  $V_F(\text{typ.}) = 1.05V$
- ☞ Average Forward Current :  $I_F(\text{AV.}) = 150A @ T_c = 100^\circ C$
- ☞ Ultra-Fast Reverse Recovery Time :  $t_{rr}(\text{typ.}) = 90 \text{ ns}$
- ☞ Extensive Characterization of Recovery Parameters
- ☞ Reduced EMI and RFI
- ☞ Non Isolation Type Package

### Applications

Motor Drives, Free wheel use, High Power Converters, Welders, Various Switching and Telecommunication Power Supply.

### Equivalent Circuit and Package

Equivalent Circuit
Package : FD3 Series
Non Isolation Type

Please see the package Out line information

### Absolute Maximum Ratings @ $T_j = 25^\circ C$ (Per Leg)

Symbol	Parameter	Conditions	Ratings	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage		400	V
$V_{R(DC)}$	Reverse DC Voltage		320	V
$I_{F(AV)}$	Average Forward Current	@ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$	Resistive Load 300 150	A A
$I_{FSM}$	Surge (non-repetitive) Forward Current	One Half Cycle at 60Hz, Peak Value	2100	A
$I^2_t$	$I^2t$ for Fusing	Value for One Cycle Current, $t_w = 8.3ms, T_j = 25^\circ C$ Start	$1.83 \times 10^4$	$A^2s$
$T_j$	Junction Temperature		-40 ~ 175	$^\circ C$
$T_{stg}$	Storage Temperature		-40 ~ 150	$^\circ C$
$P_d$	Maximum Power Dissipation		1250	W
-	Mounting Torque		4.0	N.m
-	Terminal Torque		3.0	N.m
-	Weight	Typical Including Screws	95	g

### Thermal Characteristics

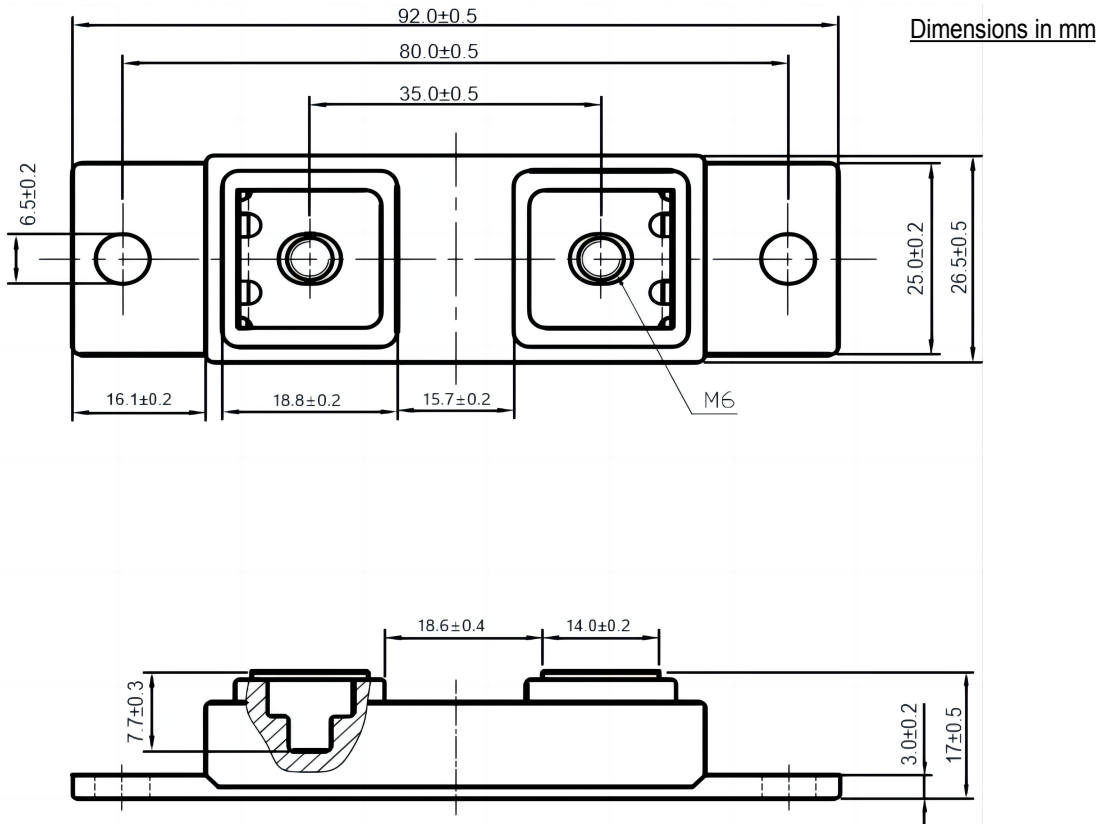
Symbol	Parameter	Conditions	Values			Unit
			Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance	Junction to Case	-	-	0.12	°C/W

### Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Conditions	Values			Unit	
			Min.	Typ.	Max.		
$V_R$	Cathode Anode Breakdown Voltage	$I_R = 100\mu\text{A}$	400	-	-	V	
$V_{FM}$	Maximum Forward Voltage	$I_{FM} = 150\text{A}, T_c = 25^{\circ}\text{C}$	-	1.05	1.4	V	
		$I_{FM} = 150\text{A}, T_c = 100^{\circ}\text{C}$	-	0.95	-	V	
$I_{RRM}$	Repetitive Peak Reverse Current	$T_c = 100^{\circ}\text{C}, V_{RRM}$ applied	-	-	1.0	mA	
$t_{rr}$	Reverse Recovery Time	$I_{FM} = 150\text{A}, V_R = 200\text{V}, di/dt = -300\text{A}/\mu\text{s}$	$T_c = 25^{\circ}\text{C}$	-	90	120	ns
			$T_c = 100^{\circ}\text{C}$	-	120	-	ns

## Package Out Line Information

FD3 Package



## Internal Circuit

