International IOR Rectifier

SERIES B40HF/B40HH

DIODES

Power Modules in B-package

40A

Features

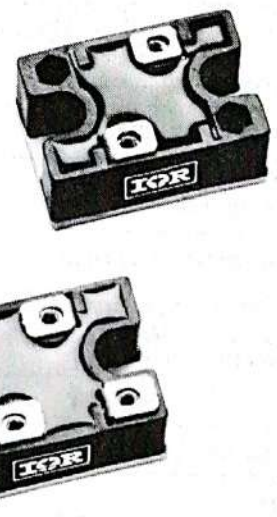
- Electrically isolated base plate (3500V RMS)
- Available up to 1200 V_{RRM}, V_{DRM}
- High surge capability
- Large creepage distances
- Simplified mechanical designs, rapid assembly
- B-package case style
- UL E78996 approved

Description

The B40HF../B40HH.. series of B-modules consist of power diodes configured in single and split diode configuration.
The semiconductors are electrically isolated from the metal base allowing common heatsink and compact assemblies to be built. They can be interconnected to form single or three phase bridges. These modules are intended for chargers, regulated power supplies and general purpose applications.

Major Ratings and Characteristics

Parameters		B40HF/B40HH	Units
$I_{F(AV)}$		40	A
	@ T_C	85	°C
I_{FSM}	50Hz	655	A
	60Hz	685	A
I^2t	50Hz	2140	A^2s
	60Hz	1950	A^2s
$I^2\sqrt{t}$		21400	$A^2\sqrt{s}$
V_{RRM} range		100 to 1200	V
T_J		-40 to 150	°C



ELECTRICAL SPECIFICATIONS

Voltage Ratings

Part number	Voltage code	V_{RRM} maximum repetitive peak reverse voltage V	V_{RSM} maximum non-repetitive peak reverse voltage V	I_{RRM} max @ T_J = 150 °C mA	I_{RRM} max @ T_J = 25 °C µA
B40HF	10	100	150	10	50
B40HH	20	200	300	10	50
	40	400	500	10	50
	60	600	700	10	50
	80	800	900	10	50
	100	1000	1100	10	50
	120	1200	1300	10	50

Forward Conduction

	Parameter	Value	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	40	A	180° conduction half sine wave @ T_C = 85°C		
I_{RMS}	Max. RMS forward current	63	A			
I_{FSM}	Maximum peak one half cycle non repetitive forward current	655	A	10ms	No voltage reapplied	Initial $T_J = T_J$max
		685	A	8.3ms		
		550	A	10ms	100% V_{RRM} reapplied	Initial $T_J = T_J$max
		575	A	8.3ms		
I^2t	Maximum I^2t for fusing	2140	A^2s	10ms	No voltage reapplied	Initial $T_J = T_J$max
		1950	A^2s	8.3ms		
		1510	A^2s	10ms	100% V_{RRM} reapplied	Initial $T_J = T_J$max
		1380	A^2s	8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing **(1)**	21400	$A^2\sqrt{s}$	t=0 to 10ms, no voltage reapplied		
V_{FM}	Maximum peak forward voltage	1.31	V	T_J=25°C, $I_{FM} = I_{F(AV)} \times \pi$, tp=400 µs, 180° conduction		
$V_{F(TO)}$	Max. value of threshold voltage	0.78	V	Low level **(2)**	T_J=150°C	
		0.91	V	High level **(3)**	T_J=150°C	
r_f	Max. value of forward slope resistance	4.42	mΩ	Low level **(2)**	T_J=150°C	
		3.50	mΩ	High level **(3)**	T_J=150°C	
V_{INS}	RMS isolation voltage	3500	V	50Hz, circuit to base, all terminals shorted ; t = 1 s		

Thermal and Mechanical Specifications

T_J	Junction temperature range		-40 to 150	°C	
T_{stg}	Storage temperature range		-40 to 150	°C	
R_{thJC}	Maximum thermal resistance, junction to case		1.2	K/W	Per junction - DC operation - (Per module)
R_{thC-S}	Max. thermal resistance case to heatsink		0.10/0.20	K/W	Mounting surface smooth flat and greased Per module/Per junction
T	Mounting torque ±10%	Module to heatsink	2	Nm	M4 mounting screws Non-lubricated threads **(4)**
		Terminals	0.8	Nm	M3 screw terminals; Non-lubricated threads
wt	Approximate weight		40	g	
	Case style		"B" Type		See outline table

(1) I^2t for time $t_x = I^2\sqrt{t} \times \sqrt{t_x}$ **(2)** $16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ **(3)** $\pi \times I_{F(AV)} < I < 20 \times \pi \times I_{F(AV)}$

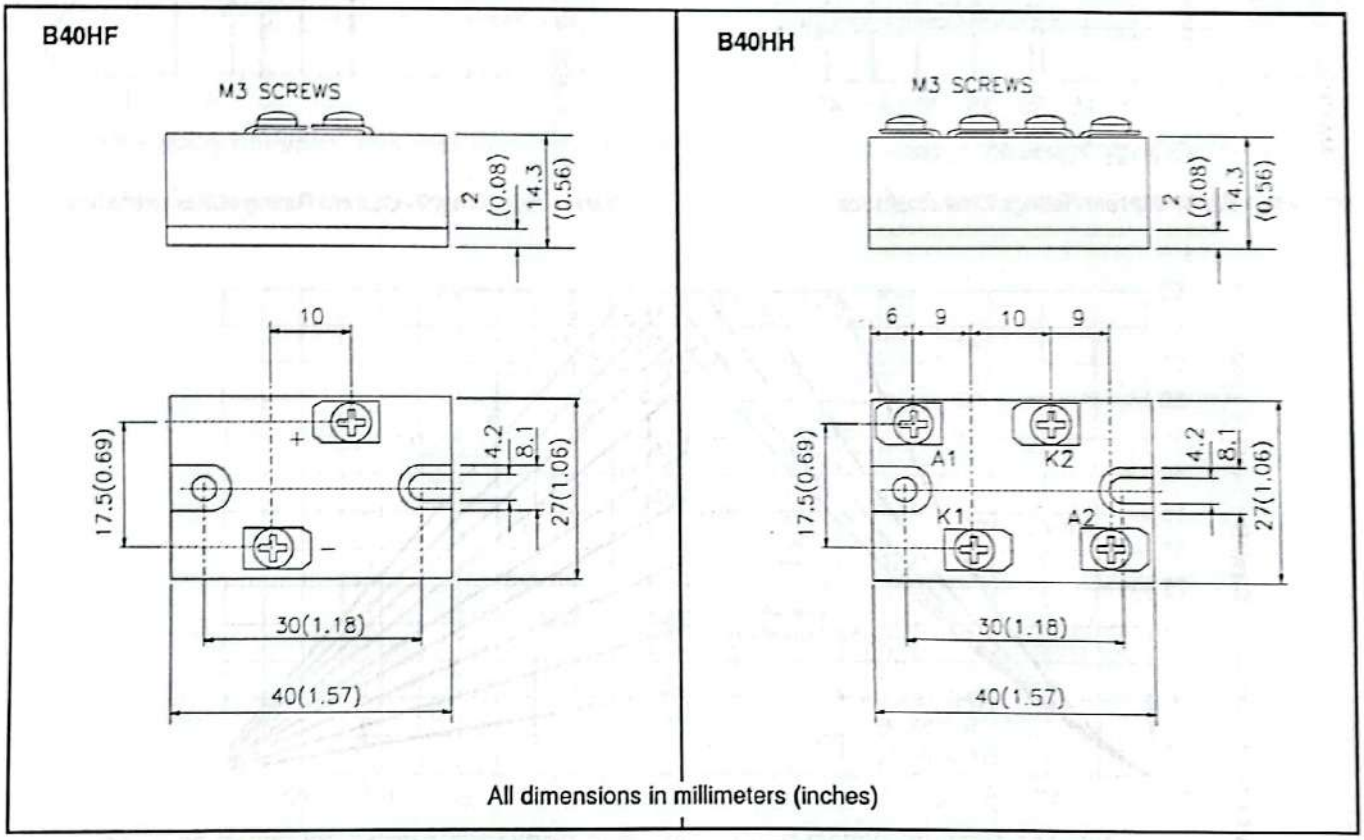
(4) A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound.

ΔR Conduction (per Junction)

(The following table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal	Rectangular	Units
180°	0.12	0.09	K/W
120°	0.15	0.16	K/W
90°	0.19	0.21	K/W
60°	0.29	0.30	K/W
30°	0.48	0.48	K/W

Outlines Table



Ordering Information Table

Device Code

B	40	HF	120
①	②	③	④

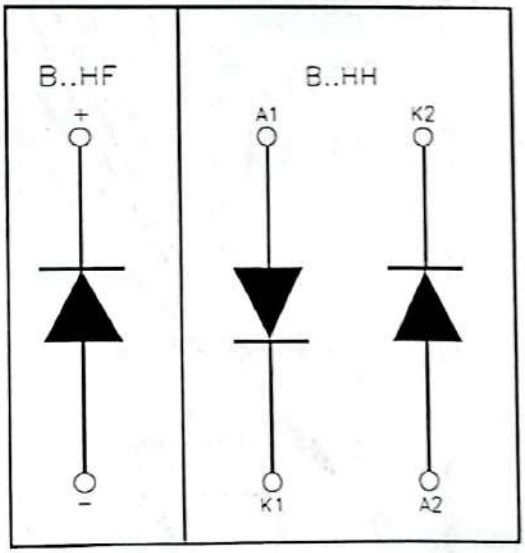
1 - Module type

2 - Average current

3 - Circuit configuration * *

4 - Voltage code (See Voltage Ratings Table)

Circuit configuration * *



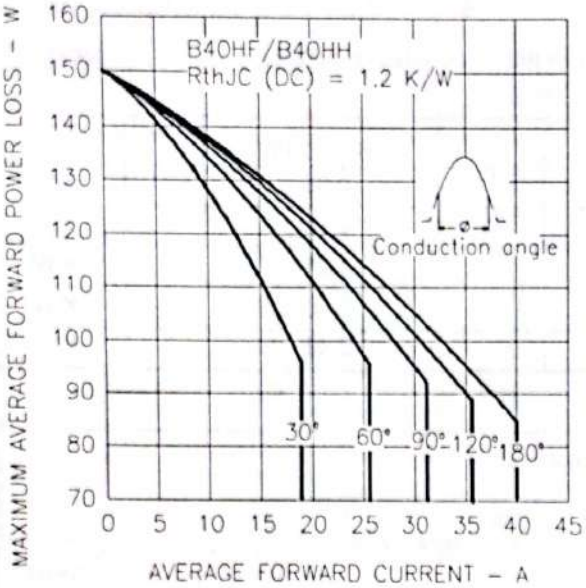


Fig. 1 - Current Ratings Characteristics

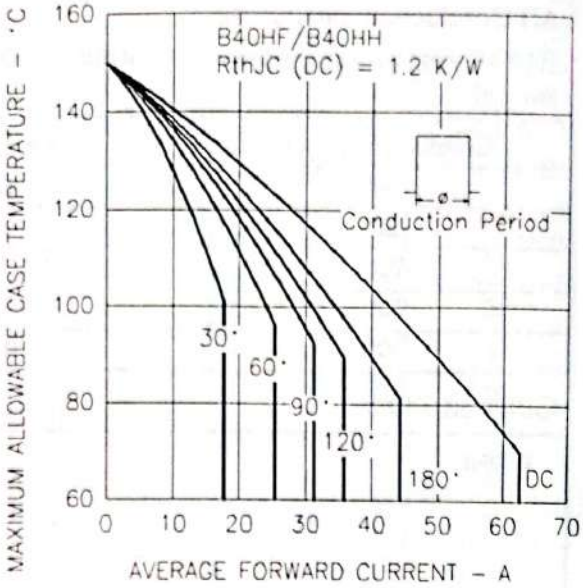


Fig. 2 - Current Ratings Characteristics

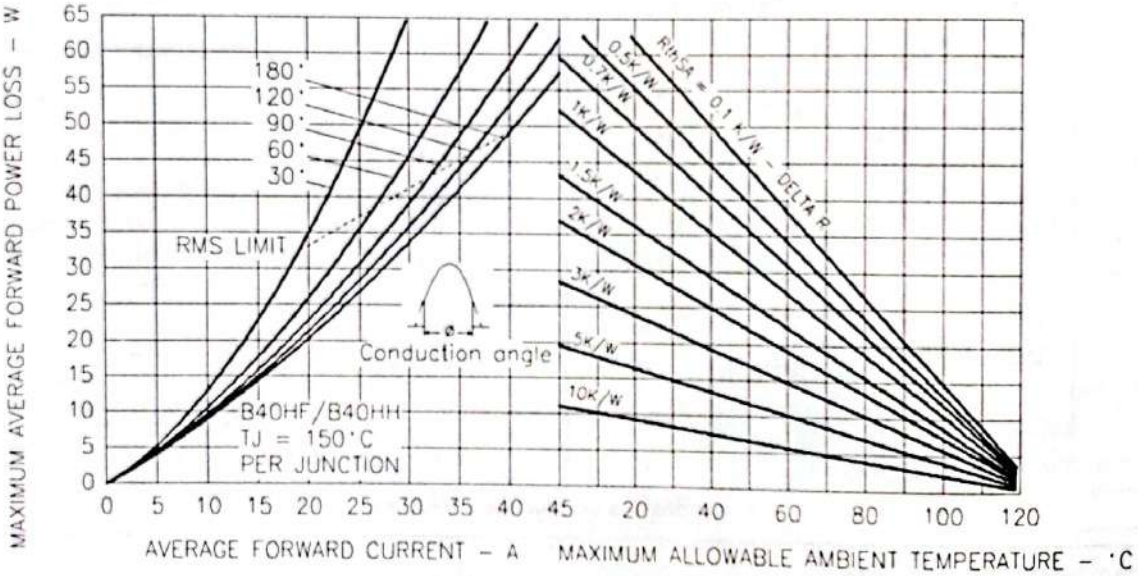


Fig. 3 - Forward Power Loss Characteristics

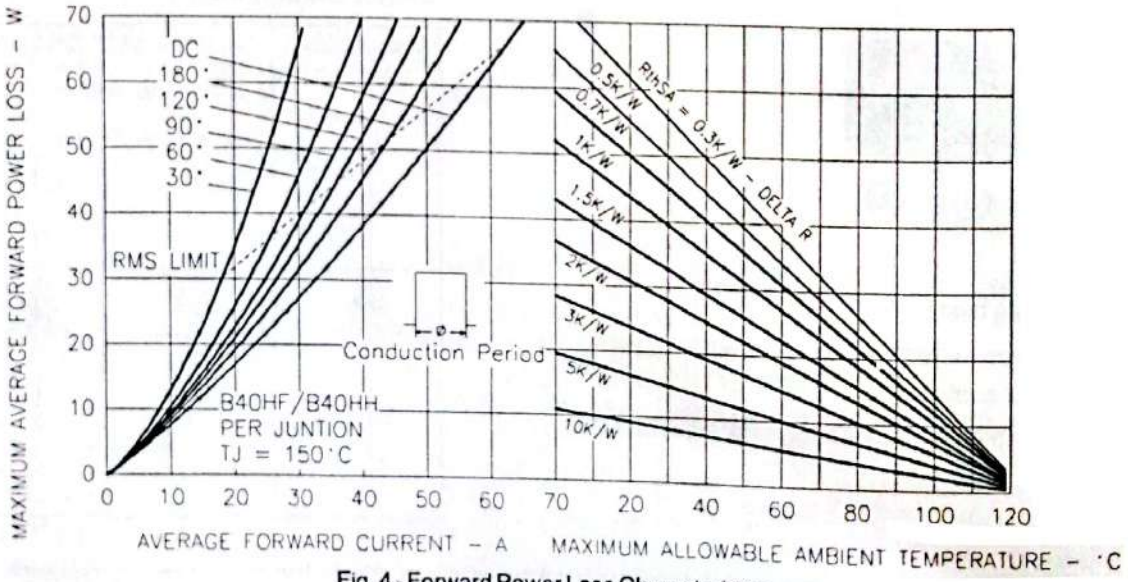


Fig. 4 - Forward Power Loss Characteristics

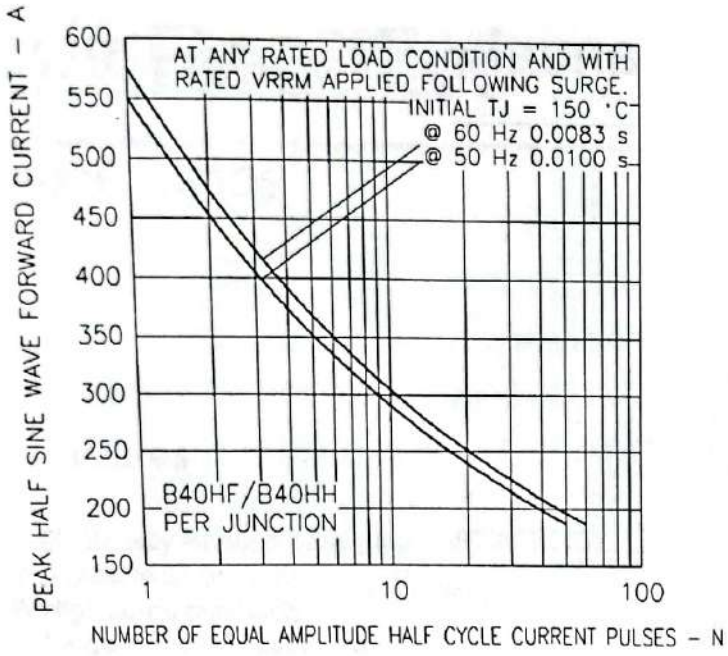


Fig. 5 - Maximum Non-Repetitive Surge Current

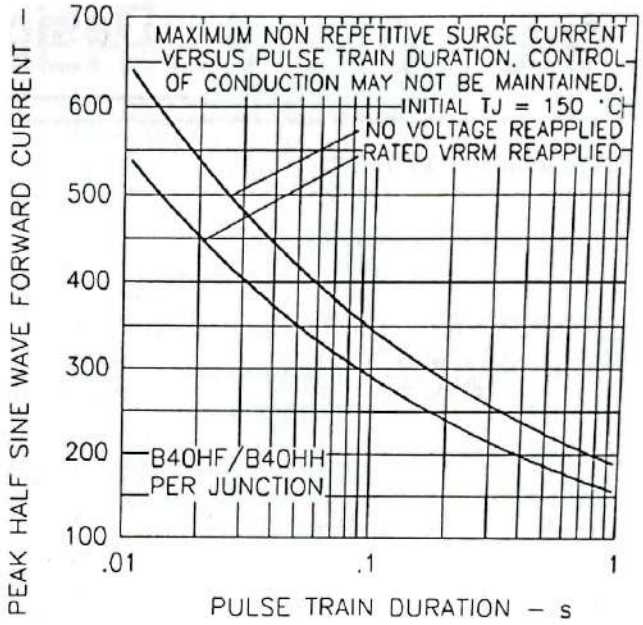


Fig. 6 - Maximum Non-Repetitive Surge Current

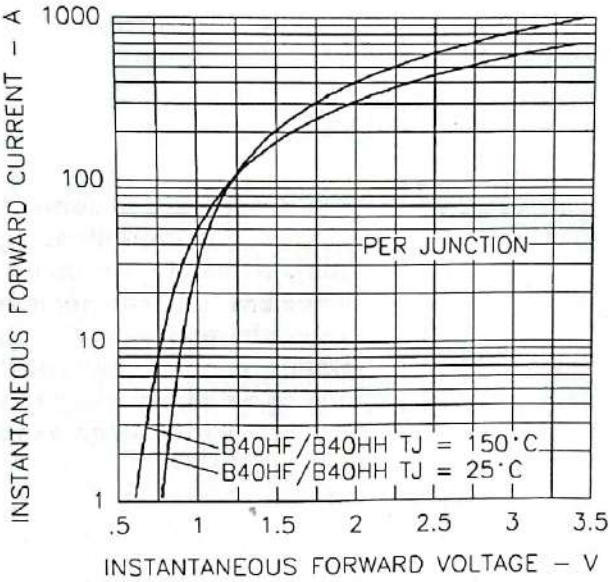


Fig. 7 - Forward Voltage Drop Characteristics

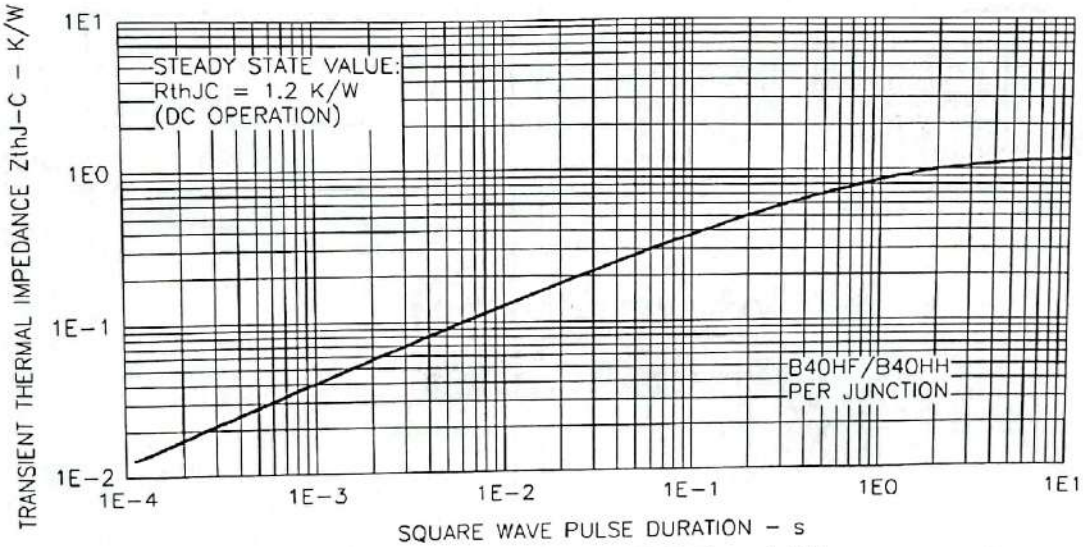


Fig. 8 - Thermal Impedance ZthJC Characteristics