

DIODE / DIODE

Power Modules

INTERNATIONAL RECTIFIER

65E D

40A

Features

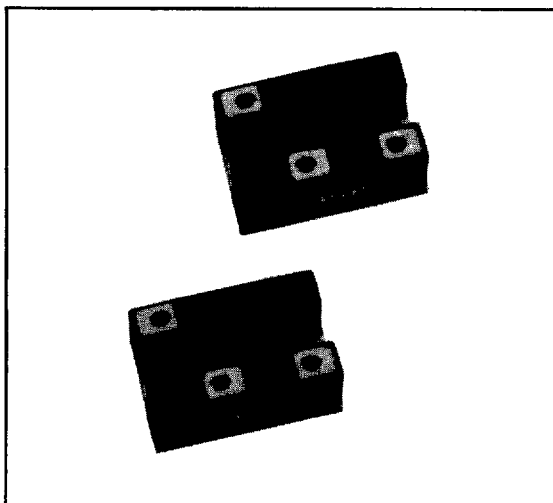
- Electrically isolated base plate (3500V RMS)
- Available up to 1200 V_{RRM}, V_{DRM}
- High surge capability
- Large creepage distances
- Simplified mechanical designs, rapid assembly
- B-package case style
- UL E 78996 approved

Description

The B40J../B40C../B40D.. series of B-modules use power diodes in half-bridge 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	Value	Units
$I_{F(AV)}$	40	A
@ T_C	85	°C
I_{FSM} 50Hz	655	A
60Hz	685	A
I^2_t 50Hz	2140	A ² s
60Hz	1950	A ² s
$I^2\sqrt{t}$	21400	A ² √s
V _{RRM} range	100 to 1200	V
T _J	-40 to 150	°C



ELECTRICAL SPECIFICATIONS

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b5E D

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 @ $T_J = 150^\circ\text{C}$ mA	I_{RRM} max @ $T_J = 25^\circ\text{C}$ μA
B40J	10	100	150	10	50
B40C	20	200	300	10	50
B40D	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 @ $T_C = 85^\circ\text{C}$
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 ² s	10ms No voltage reapplied Initial $T_J = T_{J,max}$
	1950	A ² s	8.3ms
	1510	A ² s	10ms 100% V_{RRM} reapplied Initial $T_J = T_{J,max}$
	1380	A ² s	8.3ms
I^2/t Maximum I^2/t for fusing (1)	21400	A ² /s	t=0 to 10ms, no voltage reapplied
V_{FM} Maximum peak forward voltage	1.31	V	$T_J = 25^\circ\text{C}$, $I_{FM} = I_{F(AV)} \times \pi$, tp=400 μs , 180° conduction
$V_{F(TH)}$ Max. value of threshold voltage	0.78	V	Low level (2) $T_J = 150^\circ\text{C}$
	0.91	V	High level (3) $T_J = 150^\circ\text{C}$
r_f Max. value of forward slope resistance	4.42	m Ω	Low level (2) $T_J = 150^\circ\text{C}$
	3.50	m Ω	High level (3) $T_J = 150^\circ\text{C}$
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	K/W	Mounting surface smooth flat and greased Per module/Per junction
T Mounting torque $\pm 10\%$	Module to heatsink	2	Nm M4 mounting screws (4) Non-lubricated threads
	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 $t_s = I^2/t \times \sqrt{t_s}$ (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.

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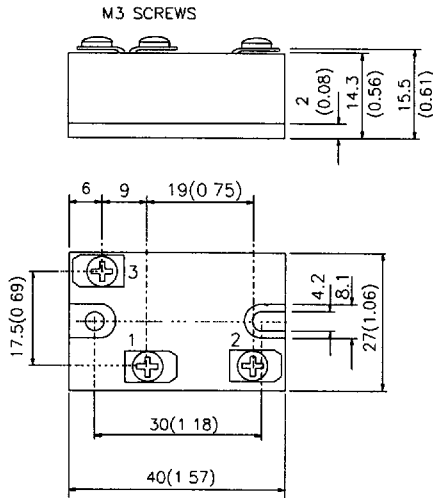
ΔR Conduction (per Junction)

(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

B40J../B40C../B40D..



Terminal Number	CONFIGURATION		
	J	C	D
1	1 +	1 -	+
2	2 +	2 -	-
3	-	+	-

All dimensions in millimeters (inches)

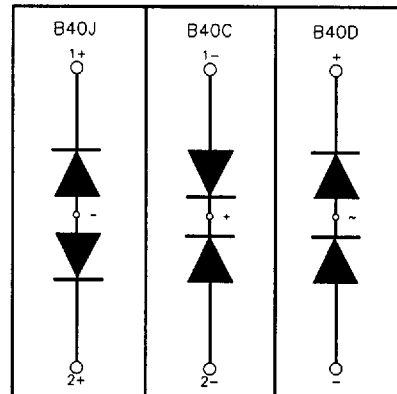
Ordering Information Table

Device Code

B	40	J	120
1	2	3	4

- 1 - Module type
- 2 - Average current
- 3 - Circuit configuration **
- 4 - Voltage code (See Voltage Ratings Table)

Circuit configuration **



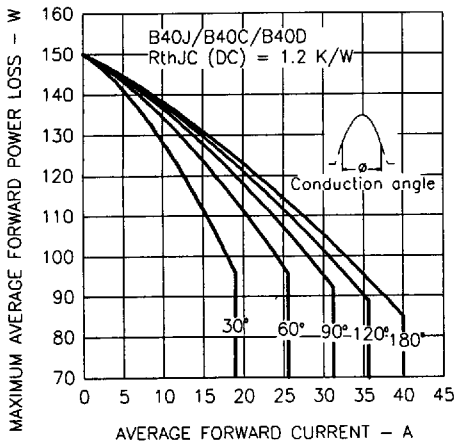


Fig. 1 - Current Ratings Characteristics

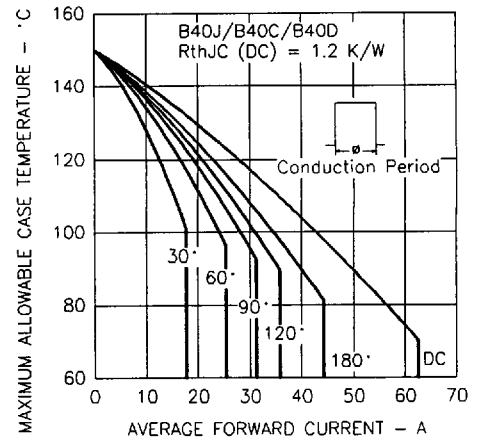


Fig. 2 - Current Ratings Characteristics

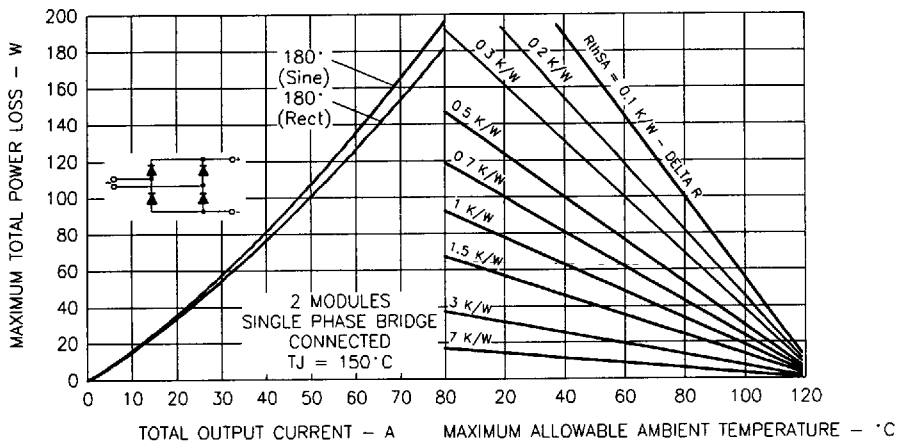


Fig. 3 - Forward Power Loss Characteristics

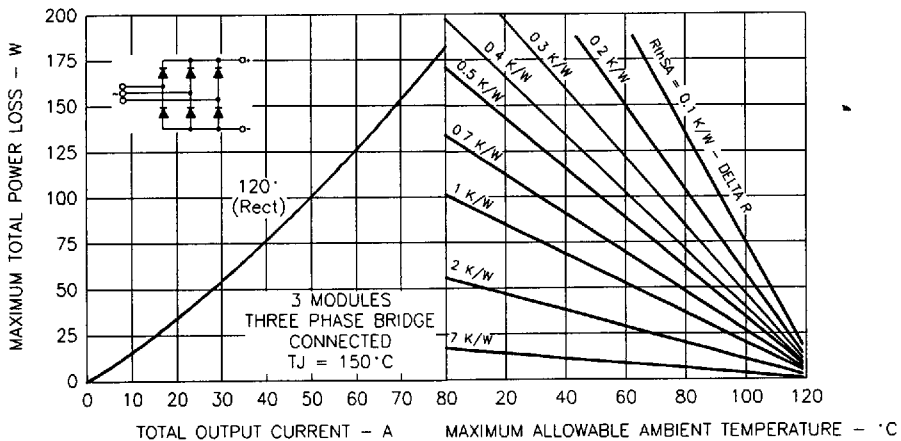


Fig. 4 - Forward Power Loss Characteristics

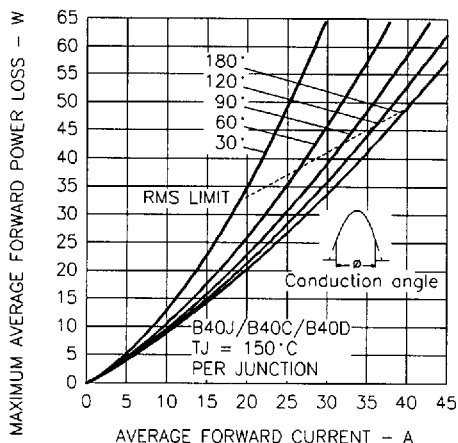


Fig. 5 - Forward Power Loss Characteristics

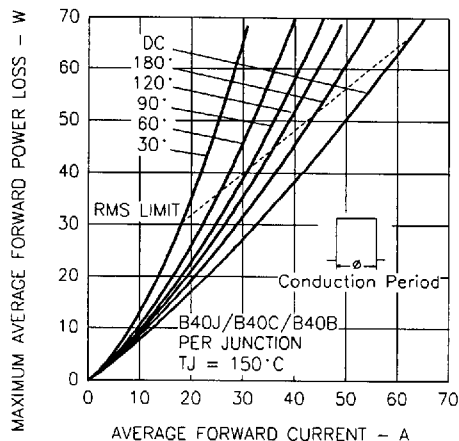


Fig. 6 - Forward Power Loss Characteristics

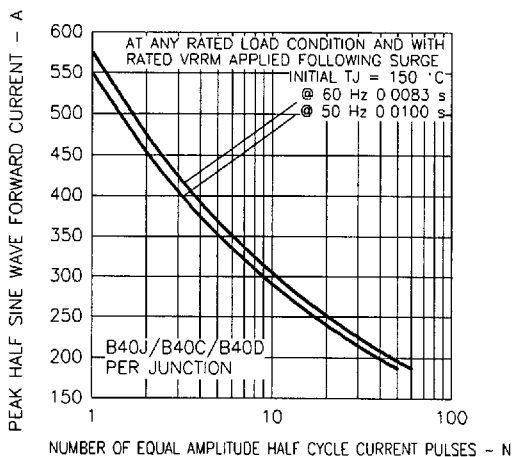


Fig. 7 - Maximum Non-Repetitive Surge Current

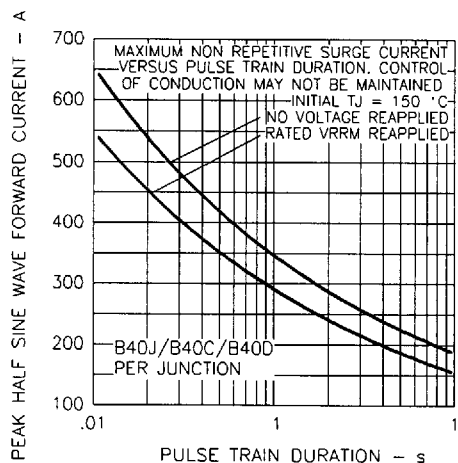


Fig. 8 - Maximum Non-Repetitive Surge Current

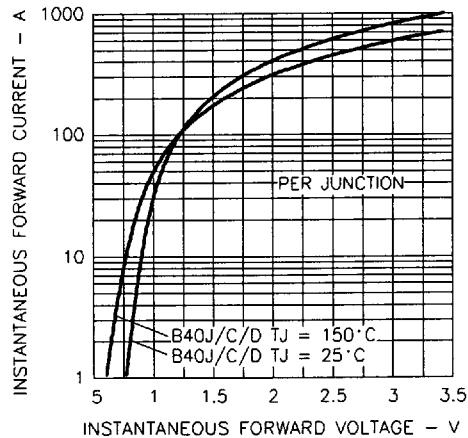
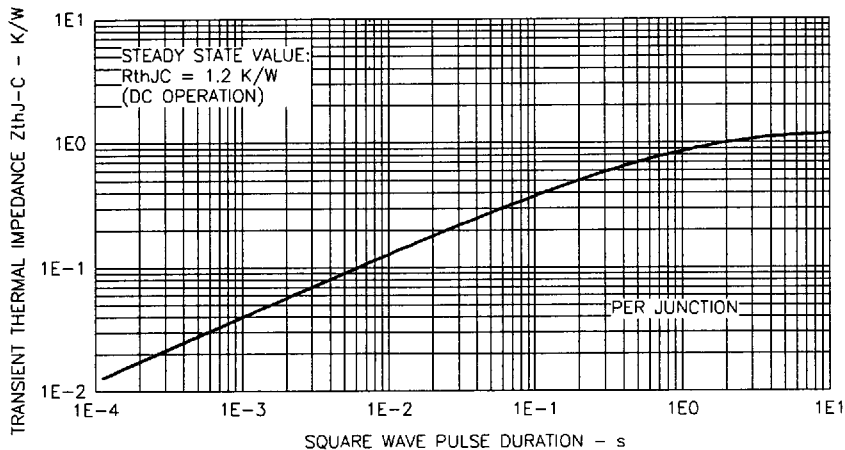


Fig. 9 - Forward Voltage Drop Characteristics

Fig. 10 - Thermal Impedance Z_{thJC} Characteristics