

## Rectifier Module for Power Factor Correction

PSBI 9/06

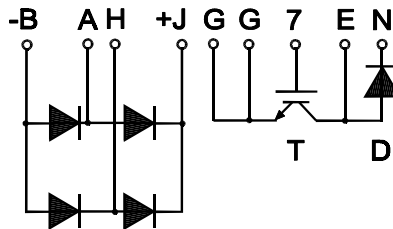
$I_{FAV25} = 15A$   
 $V_{RRM} = 1200 V$   
 $I_{C25} = 37A$   
 $V_{CES} = 600 V$

Preliminary Data Sheet

Fast Single Phase Rectifier  
 Ultra Fast Boost Chopper

### Typical Rectified Mains Power

$P_n = 900 W$  at  $V_n = 110 V$   
 $P_n = 2100 W$  at  $V_n = 240 V$   
 at  $V_{DC} = 400 V$ ,  $f_T = 75 kHz$ ,  
 $T_C = 80^\circ C$



### Input Rectifier Bridge

Symbol	Test Conditions	Maximum Ratings
$V_{RRM}$		1200 V
$I_{FAV25}$	$T_C = 25^\circ C$ ; 180° sine	15 A
$I_{FAV80}$	$T_C = 80^\circ C$ ; 180° sine	10 A
$I_{FSM}$	$T_{VJ} = 25^\circ C$ t = 10 ms (50 Hz), sine	75 A

Symbol	Test Conditions	Characteristic Value		
		typ.	max.	
$I_R$	$V_R = V_{RRM}$ , $T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$		0.05	mA
$V_F$	$I_F = 10A$ , $T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$	1.4	1.8	V
$t_{rr}$	$V_R = 100 V$ , $I_F = 10 A$ -di/dt = 5 A/μs	1		μs
$R_{thJC}$	per diode		2.5	K/W
$R_{thJS}$	with heat transfer paste	tbd		K/W

### Chopper T

Symbol	Test Conditions	Maximum Ratings
$V_{CES}$	$T_{VJ} = 25^\circ C$ to $150^\circ C$	600 V
$V_{GES}$	continuous	±20 V
$I_{C25}$	$T_C = 25^\circ C$ ;	37 A
$I_{C80}$	$T_C = 80^\circ C$ ;	25 A
<b>RBSOA</b>	$V_{CE} = 600 V$ , $R_G = 10 \Omega$ , $T_{VJ} = 125^\circ C$ Clamped inductive load, $L = 100 \mu H$	$I_{CM} = 100 A$ $V_{CEK} \leq V_{CES}$
$t_{sc}$	$V_{CE} = 600 V$ , $R_G = 10 \Omega$ , $V_{GE} = \pm 15 V$  $T_{VJ} = 125^\circ C$ , non-repetitive	10 μs

### Features

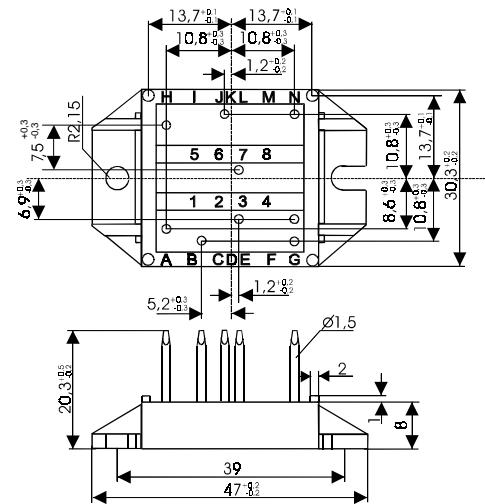
- Package with DCB ceramic base plate and soldering pins for PCB mounting
- Isolation voltage over 3000 V~
- Planar glasspassivated chips
- high level of integration- only one power semiconductor module required for the whole PFC rectifier
- standard PFC control ICs usable
- fast rectifier diodes for enhanced EMC behaviour
- NPT IGBT with low saturation voltage, ultra fast switching capability, high RBSOA and short circuit ruggedness
- internally series connected HiPerFRED free wheeling diode For fast and soft reverse recovery at high switching frequency
- leads suitable for PC board soldering
- UL registered, E 148688

### Applications

- single phase rectification with power factor correction (PFC)
- low harmonic content of mains current
- mains current and voltage in phase
- wide input voltage range, controlled output voltage

Symbol	Test Conditions	Characteristic Value		
		typ.	max.	
$I_{CES}$	$V_{CE} = V_{CES}, V_{GE} = 0 V, T_{VJ} = 25^{\circ}C$		0.04	mA
		$T_{VJ} = 125^{\circ}C$	1	mA
$I_{GES}$	$V_{CE} = 0 V, V_{GE} = \pm 20 V$		100	nA
$V_{CE(sat)}$	$I_C = 10A, V_{GE} = 15 V, T_{VJ} = 25^{\circ}C$		1.5	V
		$T_{VJ} = 125^{\circ}C$	1.6	V
$V_{GE(th)}$	$I_C = 1mA, V_{GE} = V_{CE}$	min. 3	5	V
$t_{d(on)}$		30		ns
$t_r$	Inductive load, $T_{VJ} = 125^{\circ}C$	50		ns
$t_{d(off)}$	$V_{CE} = 400 V, I_C = 10A$	320		ns
$t_f$	$R_G = 10 \Omega, V_{GE} = \pm 15 V$	70		ns
$E_{on}$		0.60		mJ
$E_{off}$		0.31		mJ
$C_{ies}$	$V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz$	1600		pF
$Q_{Gon}$	$V_{CE} = 480 V, V_{GE} = 15 V, I_C = 10A$	140		nC
$R_{thJC}$			0.96	K/W
$R_{thJS}$	with heat transfer paste	tbd		K/W

**Package style and outline**  
Dimensions in mm (1mm = 0.0394")



**Chopper D**

Symbol	Test Conditions	Maximum Ratings	
$V_{RRM}$		600	V
$I_{F25}$	$T_C = 25^{\circ}C; 180^{\circ}$ sine	35	A
$I_{F80}$	$T_C = 80^{\circ}C; 180^{\circ}$ sine	22	A

Symbol	Test Conditions	Characteristic Value		
		typ.	max.	
$I_R$	$V_R = V_{RRM}, T_{VJ} = 25^{\circ}C$		0.1	mA
		$T_{VJ} = 125^{\circ}C$	0.1	mA
$V_F$	$I_F = 10A, T_{VJ} = 25^{\circ}C$		2.2	V
		$T_{VJ} = 125^{\circ}C$		2.4
$I_{RM}$	$I_F = 10A, -di_f/dt = 400 A/\mu s, T_{VJ} = 125^{\circ}C$	tbd		A
$t_{rr}$	$V_R = 400 V$	tbd		$\mu s$
$R_{thJC}$			1.15	K/W
$R_{thJS}$	with heat transfer paste	tbd		K/W

**Module**

Symbol	Test Conditions	Maximum Ratings	
$T_{VJ}$		-40...+150	$^{\circ}C$
$T_{stg}$		-40...+125	$^{\circ}C$
$V_{ISOL}$	$I_{ISOL} \leq 1 mA, 50/60 Hz, t = 1 min$	3000	V~
$M_D$	Mounting torque (M4)	1.5-1.8	Nm

Symbol	Test Conditions	Characteristic Value		
		typ.	min.	
$d_s, d_A$	pin to heatsink		11.2	mm
<b>Weight</b>		16		g