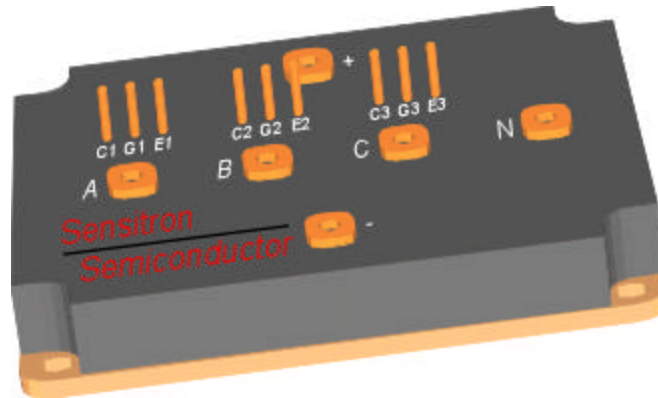


PRELIMINARY TECHNICAL DATA
 DATA SHEET 4173, REV. A

**10 KW, 3 Phase Module
 For
 Active Power Factor Correction**



- 3 Phase Single Package
- IGBT Switching, 600V, 40A, VCE (on) =2.1V
- FRED Diodes, 600V, 25A, trr=23ns, Qrr =112nC
- High Current Terminals
- Low profile
- Latest Generation IGBT Technology
- -55 to +150°C
- Access to all IGBT Leads
- Easy Heat Sink Mounting
- Cost Effective
- Large Surface Area
- Low Inductance

ELECTRICAL CHARACTERISTICS

(Tj=25°C UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
IGBT SPECIFICATIONS					
Collector to Emitter Breakdown Voltage I _C = 250 μA, V _{GE} = 0V	BV _{CES}	600	-	-	V
Continuous Collector Current	I _C	-	-	40 20	A
Pulsed Collector Current, 1mS	I _{CM}	-	-	160	A
Gate to Emitter Voltage	V _{GE}	-	-	+/-20	V
Gate-Emitter Leakage Current, V _{GE} = +/-20V	I _{GES}	-	-	+/- 100	nA
Gate Threshold Voltage, I _C =2mA	V _{GE(TH)}	3.0	-	6.0	V

SENSITRON

PRELIMINARY TECHNICAL DATA

DATA SHEET 4173, REV. A

ELECTRICAL CHARACTERISTICS (continued)

(T_j=25°C UNLESS OTHERWISE SPECIFIED)

Zero Gate Voltage Collector Current V _{CE} = 600 V, V _{GE} =0V T _i =25°C V _{CE} = 600 V, V _{GE} =0V T _i =150°C	I _{CES}	-	-	0.25 2.5	Ma mA
Collector to Emitter Saturation Voltage, I _C = 20A, V _{GE} = 15V, T _C = 25 °C I _C = 40A, V _{GE} = 15V, T _C = 25 °C I _C = 20A, V _{GE} = 15V, T _C = 150 °C	V _{CE(SAT)}	-	2.05 2.36 1.9	2.5 - -	V
Input Capacitance Output Capacitance Reverse Transfer Cap. V _{CE} = 30V, V _{GE} = 0 V, f = 1 MHz	C _{ies} C _{oes} C _{res}	-	1900 140 35	-	pF
Turn On Delay Time Rise Time Turn Off Delay Time Fall Time Total Energy Loss (T _j = 150 °C, I _C = 20A, V _{GE} = 15V, inductive load, V _{CC} = 480V, R _G = 10Ω	t _{d(on)} t _r t _{d(off)} t _f E _{ts}	-	25 23 170 124 .85	- - - -	nsec mJ
Maximum Thermal Resistance	R _{θJC}	-	-	1.77	°C/W

FRED MAXIMUM RATINGS

All ratings are @ T_A = 25 °c unless otherwise specified

RATING	SYMBOL	MAX.	UNITS
CATHODE-TO-ANODE VOLTAGE	V _r	600	Volts
CONTINUOUS FORWARD CURRENT (T _C =100°C)	I _F	25	Amps
SINGLE PULSE FORWARD CURRENT	I _{FSM}	225	Amps
MAXIMUM REPETITIVE FORWARD CURRENT	I _{FRM}	100	Amps
REVERSE RECOVERY TIME (I _f = 1A, di/dt = 200A/μsec, V _R = 30V, T _j =25 °C)	t _{rr} (typ)	23	nsec
(I _f = 25A, di/dt = 200A/μsec, V _R = 200V, T _j =25 °C)	t _{rr} (max)	75	nsec
(I _f = 25A, di/dt = 200A/μsec, V _R = 200V, T _j =125 °C)	t _{rr} (max)	160	nsec
MAXIMUM REVERSE RECOVERY CURRENT (V _R = 200V, I _F = 25A, di/dt= 200A / usec, T _j =25 °C) (V _R = 200V, I _F = 25A, di/dt= 200A / usec, T _j =125 °C)	I _{RM} (typ) I _{RM} (max)	4.5 15	Amps

PRELIMINARY TECHNICAL DATA

DATA SHEET 4173, REV. A

FRED MAXIMUM RATINGS (continued)

All ratings are @ $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified

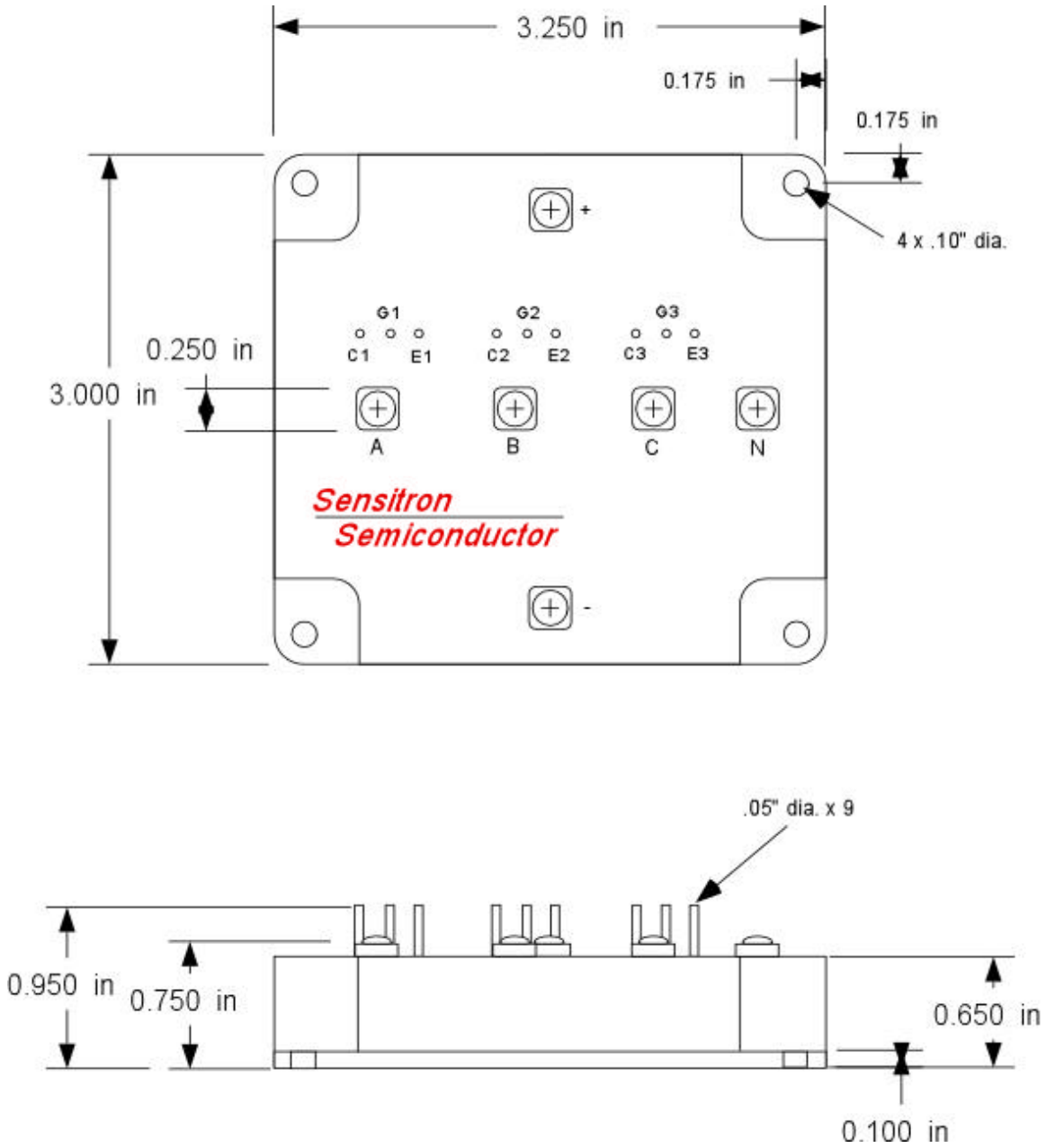
Reverse Recovery Charge ($V_R = 200\text{V}$, $I_F = 25\text{A}$, $dI/dt = 200\text{A} / \mu\text{sec}$, $T_j = 25\text{ }^\circ\text{C}$) ($V_R = 200\text{V}$, $I_F = 25\text{A}$, $dI/dt = 200\text{A} / \mu\text{sec}$, $T_j = 125\text{ }^\circ\text{C}$)	Qrr1 Qrr2	112 1200	nC
MAXIMUM THERMAL RESISTANCE	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$
MAXIMUM OPERATING AND STORAGE TEMPERATURE RANGE	Top/Tstg	-55 to +150	$^\circ\text{C}$

FRED ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNITS
MAXIMUM FORWARD VOLTAGE DROP, $T_C = 25\text{ }^\circ\text{C}$ ($I_f = 25\text{ Amps}$) $T_C = 25\text{ }^\circ\text{C}$ ($I_f = 50\text{ Amps}$) $T_C = 125\text{ }^\circ\text{C}$ ($I_f = 25\text{ Amps}$)	V_{FM}	1.7 2.0 1.7	Volts
MAXIMUM REVERSE CURRENT PER LEG $T_C = 25\text{ }^\circ\text{C}$ I_r @ 600V PIV $T_C = 125\text{ }^\circ\text{C}$ I_r @ 480V PIV	I_{RM}	20 2000	μA
LEAD INDUCTANCE	L_L	TBD	nH
JUNCTION CAPACITANCE	C_T	100	pF

Pin Number	Pin Description
A	AC IN, Phase A
B	AC IN, Phase B
C	AC IN, Phase C
N	DC Common
C1	Collector IGBT1/+Bridge 1
G1	Gate IGBT1
E1	Emitter IGBT1/-Bridge 1
C2	Collector IGBT2/+Bridge 2
G2	Gate IGBT2
E2	Emitter IGBT2/-Bridge 2
C3	Collector IGBT3/+Bridge 3
G3	Gate IGBT3
E3	Emitter IGBT3/-Bridge 3

Mechanical Dimensions: In Inches



TECHNICAL DATA

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