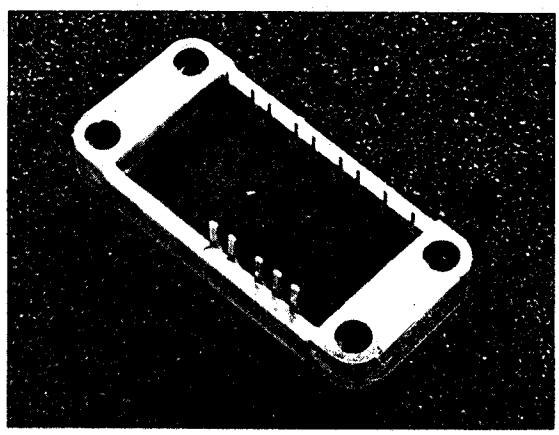
Solitron Devices, Inc.

SD11113

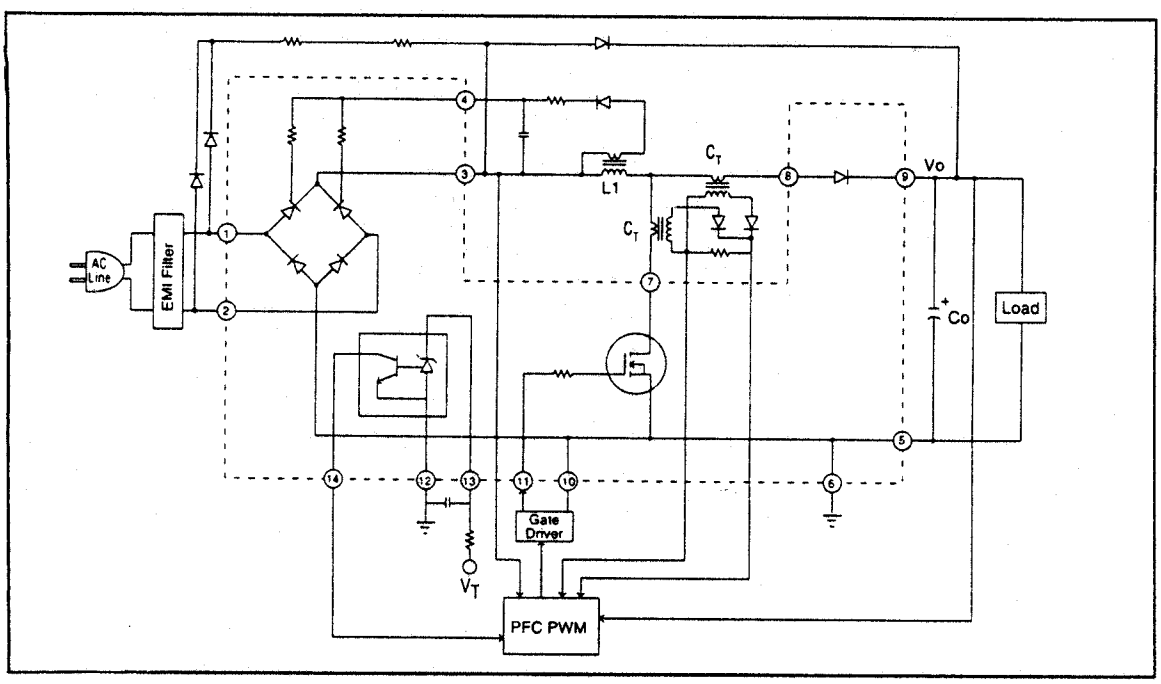
Power Factor Correction Module



This module is designed to optimally facilitate a 20 Amp boost type power factor correction (PFC) system.

- Module contains all power components necessary to build a power supply front end.
  - Rectifier bridge with SCRs for in rush current limiting
  - Ultra fast 24 Amp output diode
  - Temperature sensing switch
  - 500V .1Ω FET
- Provides optimum use of available line current.
- Allows power supply to meet requirements of IEC 555-2.
- Reduces cost of heat sink.
- Saves significant space and assembly time.
- Custom versions available to meet specific requirements.

TYPICAL APPLICATION



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ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions[1]	Min	Typ	Max	Units
Q1 (n-Channel Enhancement Mode FET)						
Drain Leakage Current	I_{DSS}	V_{DS} = 500V, V_{GS} = 0V			1.0	mA
On-State Voltage	$V_{DS(on)}$	I_{DS} = 28A, V_{GS} = 10V		2.6	2.8	V
Threshold Voltage	$V_{GS(th)}$	V_{DS} = 4V, I_{DS} = 1mA	2.0	3.0	4.0	V
Gate Leakage Current	I_{GSS}	V_{GS} = ±15V, V_{DS} = 0V			±400	nA
Diode Forward Voltage	V_{SD}	I_S = 50A, V_{GS} = 0V		.95	1.5	V
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz		12		nF
Junction Temperature	T_j				150	°C
Thermal Resistance	R_{thJC}			0.25		°C/W
SCR1 and SCR2						
Reverse Leakage Current	I_{ROM}	V_{ROM} = 600V			25	µA
Forward Blocking Current	I_{FSM}	V_{FSM} = 600V			25	µA
Forward On Voltage	V_F	I_F = 25A, I_G = 60mA		1.3	1.6	V
Gate Trigger Voltage	V_{GT}	V_A = 12V, R_L = 100Ω		1.4	2.0	V
Gate Trigger Current	I_{GT}	V_A = 12V, R_L = 100Ω		40	60	mA
Junction Temperature	T_j				125	°C
Thermal Resistance	R_{thJC}			1.4		°C/W
D1 and D2 (Standard Recovery)						
Reverse Leakage Current	I_R	V_R = 600V			100	µA
Forward Voltage	V_F	I_F = 25A		1.0	1.2	V
Temperature Junction	T_j				150	°C
Thermal Resistance	R_{thJC}			1.8		°C/W
D3 (Ultra-Fast)						
Reverse Leakage Current	I_R	V_R = 600V			250	µA
Forward Voltage	V_F	I_F = 24A		2.4	2.8	V
Reverse Recovery Time	t_{rr}	I_F = 1A, di/dt = 50A/µs		25		ns
Temperature Junction	T_j				175	°C
Thermal Resistance	R_{thJC}			1.0		°C/W
U1 (Astec AS273-G1 Temperature Switch)						
Reference Voltage	V_{REF}	I_{REF} = 2mA	2.500	2.525	2.550	V
Load Regulation	V_{ld}	0.65mA≤I_{REF}≤5.5mA		5	10	mV
Temperature Coefficient	$\Delta V_{REG}/\Delta T$	0.65mA≤I_{REF}≤5.5mA		75		ppm°C
Saturation Voltage	V_{OL}	I_{OUT} = 4mA, T_J>T_{OT}		200	400	mV
Breakdown Voltage	BV	I_{OUT} = 4µA, T_J<T_{OT}	18	30		V
Leakage Current	I_{OH}	V_{OUT} = 18V, T_J<T_{OT}		1	1,000	nA
Temperature Accuracy	$T_{OT(1)}$	0.7mA≤I_{REF}≤1.3mA	87	90	93	°C
	$T_{OT(2)}$	1.55mA≤I_{REF}≤2.6mA	92	95	98	°C
	$T_{OT(3)}$	3.0mA≤I_{REF}≤5.0mA	97	100	103	°C
Hysteresis	H_{OT}		7	10	13	°C

1 - TCase = 25°C unless otherwise specified.
Specifications subject to change without notice.

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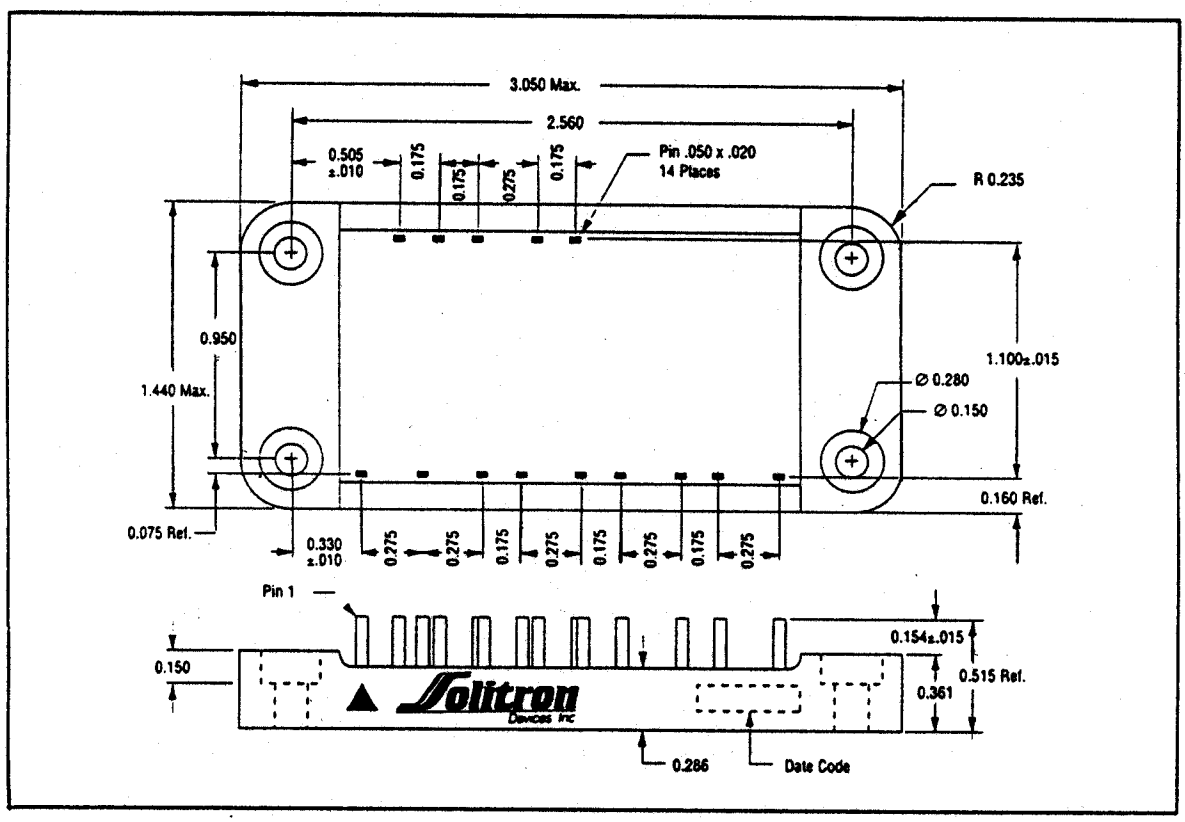
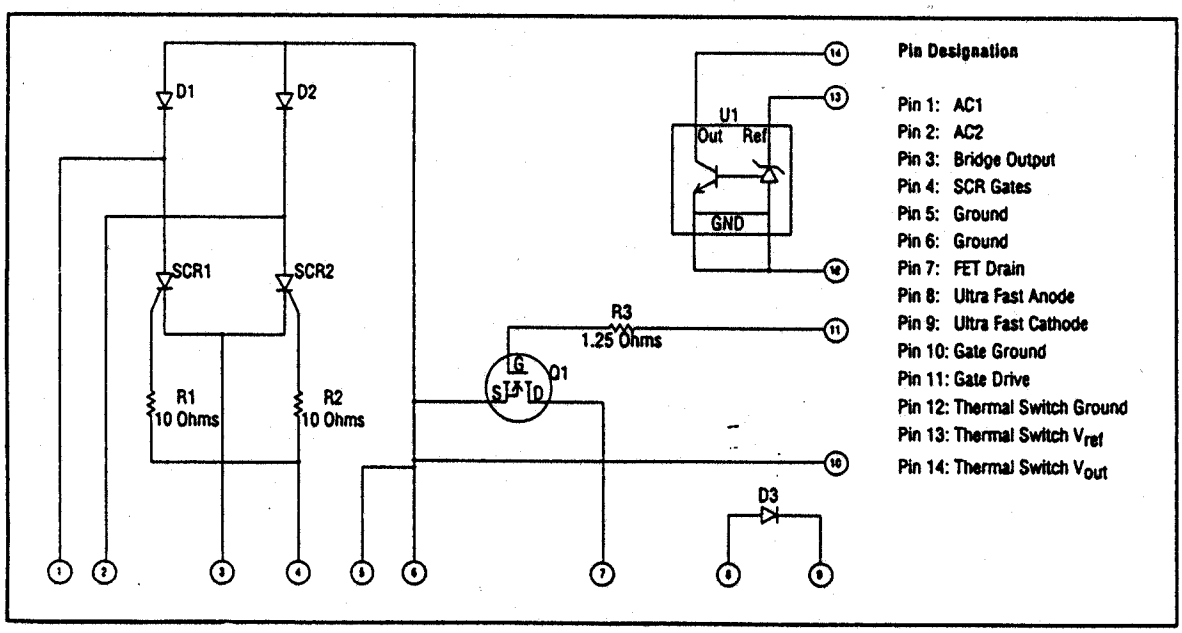
OUTLINE DIMENSIONS



SCHEMATIC



Pin Designation

Pin 1: AC1
Pin 2: AC2
Pin 3: Bridge Output
Pin 4: SCR Gates
Pin 5: Ground
Pin 6: Ground
Pin 7: FET Drain
Pin 8: Ultra Fast Anode
Pin 9: Ultra Fast Cathode
Pin 10: Gate Ground
Pin 11: Gate Drive
Pin 12: Thermal Switch Ground
Pin 13: Thermal Switch V_{ref}
Pin 14: Thermal Switch V_{out}

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