

TECHNICAL DATA  
DATA SHEET 5393, REV. B

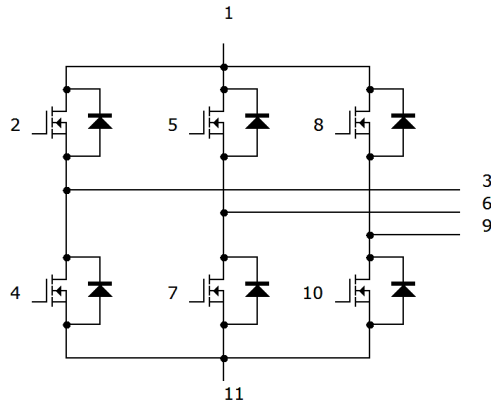
## 1200 VOLT, 29 AMP THREE PHASE SILICON CARBIDE MOSFET BRIDGE WITH SILICON CARBIDE DIODES

### FEATURES:

- 80mΩ typical on-resistance
- Low Vf silicon carbide Schottky barrier diode included in parallel with body diode
- Very fast switching and no reverse recovery
- Isolated base plate
- Aluminum Nitride substrate
- Light Weight Low Profile Standard Package
- High Temperature Engineering Plastic Shell Construction



### Schematic Diagram:



### MAXIMUM RATINGS

ALL RATINGS ARE @ T<sub>C</sub> = 25 °C UNLESS OTHERWISE SPECIFIED.

RATING	SYMBOL	MAX	UNITS
DRAIN-SOURCE VOLTAGE	V <sub>DSS</sub>	1200	V
CONTINUOUS DRAIN CURRENT	I <sub>D</sub>	29	A
CONTINUOUS DRAIN CURRENT, T <sub>C</sub> = 100 °C	I <sub>D</sub>	18	A
PULSED DRAIN CURRENT (t ≤ 10μs, dc ≤ 1%)	I <sub>D, pulse</sub>	80	A
GATE - SOURCE VOLTAGE	V <sub>GSS</sub>	-6 to 22	V
MAXIMUM POWER DISSIPATION, T <sub>C</sub> = 25 °C (MOSFET)	P <sub>d</sub>	125	W
MAXIMUM POWER DISSIPATION, T <sub>C</sub> = 25 °C (DIODE)	P <sub>d</sub>	96	W
MAXIMUM THERMAL RESISTANCE (MOSFET)	R <sub>θJC</sub>	1.0	°C/W
MAXIMUM THERMAL RESISTANCE (DIODE)	R <sub>θJC</sub>	1.3	°C/W
MAXIMUM STORAGE TEMPERATURE RANGE	T <sub>stg</sub>	-55 to 175	°C
MAXIMUM OPERATING TEMPERATURE RANGE	T <sub>op</sub>	-55 to 175	°C

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**ELECTRICAL CHARACTERISTICS**

ALL RATINGS ARE @  $T_c = 25^\circ\text{C}$  UNLESS OTHERWISE SPECIFIED.

CHARACTERISTIC	MIN	TYP	MAX	UNITS
DRAIN - SOURCE BREAKDOWN VOLTAGE (VGS = 0V, ID = 1mA)	1200			V
ZERO GATE VOLTAGE DRAIN CURRENT (VDS = 1200V, VGS = 0V)			400	$\mu\text{A}$
GATE - SOURCE LEAKAGE CURRENT (VGS = +22V, VDS = 0V)			100	nA
GATE - SOURCE LEAKAGE CURRENT (VGS = -6V, VDS = 0V)			-100	nA
GATE THRESHOLD VOLTAGE (VDS = VGS, ID = 4.4mA)	1.6		4.0	V
STATIC DRAIN - SOURCE ON - STATE RESISTANCE (VGS = 18V, ID = 10A) Tj = 125°C		80	125 135	m $\Omega$
TRANSCONDUCTANCE (VDS = 10V, ID = 10A)		3.7		S
INPUT CAPACITANCE (VGS = 0V, VDS = 800V, f = 1MHz)		1850		pF
OUTPUT CAPACITANCE (VGS = 0V, VDS = 800V, f = 1MHz)		175		pF
Turn - on delay time (VDD = 400V, VGS = 18V, ID = 10A, RL = 40 $\Omega$ , RG = 0 $\Omega$ )		37		ns
Rise time (VDD = 400V, VGS = 18V, ID = 10A, RL = 40 $\Omega$ , RG = 0 $\Omega$ )		33		ns
Turn - off delay time (VDD = 400V, VGS = 18V, ID = 10A, RL = 40 $\Omega$ , RG = 0 $\Omega$ )		70		ns
Fall time (VDD = 400V, VGS = 18V, ID = 10A, RL = 40 $\Omega$ , RG = 0 $\Omega$ )		28		ns
Total gate charge (VDD = 400V, VGS = 18V, ID = 10A)		106		nC
Gate - Source charge (VDD = 400V, VGS = 18V, ID = 10A)		27		nC
Gate - Drain charge (VDD = 400V, VGS = 18V, ID = 10A)		31		nC
Gate plateau voltage (VDD = 400V, VGS = 18V, ID = 10A)		9.7		V
INVERSE DIODE CONTINUOUS, FORWARD CURRENT			29	A
INVERSE DIODE DIRECT CURRENT, PULSED			80	A
FORWARD VOLTAGE (Vgs = 0V, Is = 10A)		1.3	1.5	V
REVERSE RECOVERY TIME (If = 10A, Vr = 400V, di/dt = 150A/ $\mu\text{s}$ )		37		ns
REVERSE RECOVERY CHARGE (If = 10A, Vr = 400V, di/dt = 150A/ $\mu\text{s}$ )		60		nC
PEAK REVERSE RECOVERY CURRENT (If = 10A, Vr = 400V, di/dt = 150A/ $\mu\text{s}$ )		2.4		A

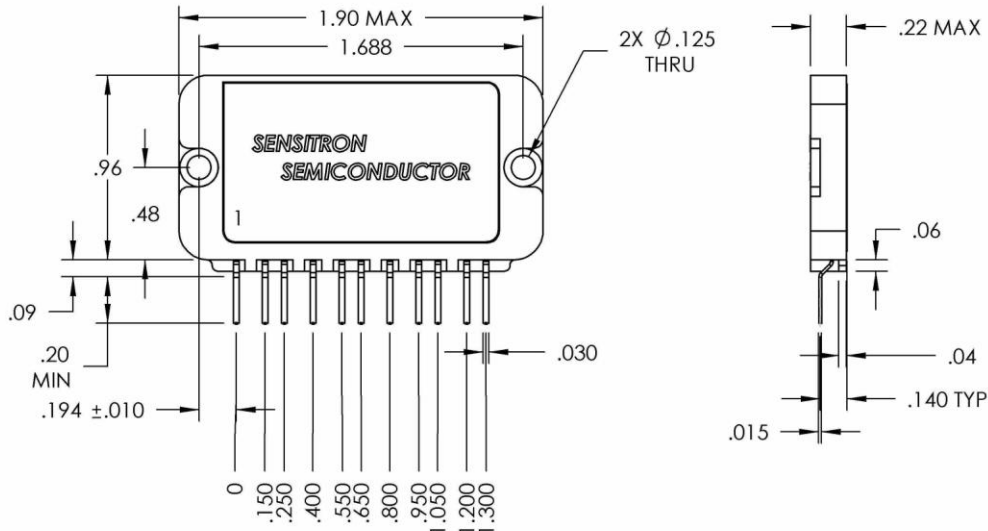
# SENSITRON SEMICONDUCTOR

SPM1007

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Mechanical Outline:

Package: EPAK1



NOTES:

1. TOLERANCE UNLESS OTHERWISE NOTED:  
.XX =  $\pm 0.010$   
.XXX =  $\pm 0.005$
2. MAXIMUM MOUNTING TORQUE = 4 IN-LB
3. PRE-TORQUE BOTH FASTENERS TO 2 IN-LB MAX BEFORE APPLYING FINAL TORQUE.
4. CONTACT FACTORY FOR THERMAL INTERFACE MATERIAL SUGGESTIONS AND COMPATIBILITY.

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