

TECHNICAL DATA  
DATASHEET 5287, Rev. C

**600 VOLT, 16 AMP LOW LOSS ULTRAFAST IGBT THREE PHASE BRIDGE MODULE WITH SiC FREEWHEELING DIODE**

**Features**

- SiC Free wheel diode – zero reverse recovery loss
- Isolated base plate
- Low thermal impedance
- Aluminum Nitride base
- Light weight low profile standard package
- High temperature engineering plastic shell construction



**ELECTRICAL CHARACTERISTICS PER IGBT LEG**

(T<sub>J</sub>=25°C UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
<b>IGBT SPECIFICATIONS</b>					
Collector to Emitter Breakdown Voltage I <sub>C</sub> = 200 μA, V <sub>GE</sub> = 0V	BV <sub>CES</sub>	600	-	-	V
Continuous Collector Current T <sub>C</sub> = 25 °C T <sub>C</sub> = 100 °C	I <sub>C</sub>	-	-	30 16	A
Pulsed Collector Current, 1ms	I <sub>CM</sub>	-	-	90	A
Gate to Emitter Voltage	V <sub>GE</sub>	-	-	+/-20	V
Gate-Emitter Leakage Current , V <sub>GE</sub> = +/-20V	I <sub>GES</sub>	-	-	+/- 100	nA
Gate Threshold Voltage, I <sub>C</sub> = 0.43 mA	V <sub>GE(TH)</sub>	4.1	-	5.7	V
Zero Gate Voltage Collector Current V <sub>CE</sub> = 600 V, V <sub>GE</sub> =0V T <sub>i</sub> =25°C V <sub>CE</sub> = 480 V, V <sub>GE</sub> =0V T <sub>i</sub> =125°C	I <sub>CES</sub>	-	-	0.1 1.0	mA
Collector to Emitter Saturation Voltage T <sub>C</sub> = 25 °C I <sub>C</sub> = 16A, V <sub>GE</sub> = 15V T <sub>C</sub> = 125 °C I <sub>C</sub> = 16A, V <sub>GE</sub> = 15V	V <sub>CE(SAT)</sub>	-	-	2.2 2.6	V
Input Capacitance Output Capacitance Reverse Transfer Cap. V <sub>CE</sub> = 25 V, V <sub>GE</sub> = 0 V, f = 1 MHz	C <sub>ies</sub> C <sub>oes</sub> C <sub>res</sub>	-	1630 108 50	-	pF
Turn On Delay Time Rise Time Turn Off Delay Time Fall Time	t <sub>d(on)</sub> t <sub>r</sub> t <sub>d(off)</sub> t <sub>f</sub>	-	23 35 220 26	-	ns
Turn on Energy Loss Turn off Energy Loss (T <sub>J</sub> = 25°C, I <sub>C</sub> = 16A, V <sub>GE</sub> = 15V, V <sub>CE</sub> = 400 V, R <sub>G</sub> = 10 Ω)	E <sub>on</sub> E <sub>off</sub>	-	0.69 0.33	-	mJ

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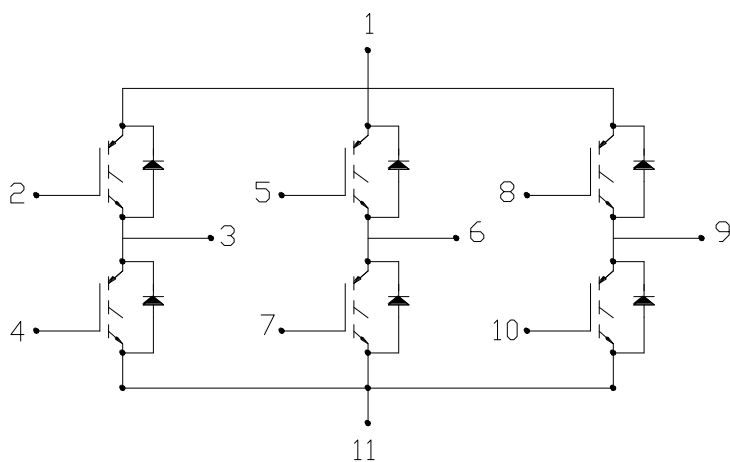
**SILICON CARBIDE DIODES RATING AND CHARACTERISTICS**

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Diode Peak Inverse Voltage	PIV	600	-		V
Continuous Forward Current, $T_C = 25\text{ }^\circ\text{C}$ $T_C = 100\text{ }^\circ\text{C}$	$I_F$			10 8	A
Forward Surge Current, $t_p = 1\text{ms}$	$I_{FSM}$			50	A
Diode Forward Voltage, $I_F = 16\text{A } T_C = 25\text{ }^\circ\text{C}$ $I_F = 16\text{A } T_C = 125\text{ }^\circ\text{C}$	$V_F$	- -	- -	2.4 2.5	V

**PACKAGE CHARACTERISTICS**

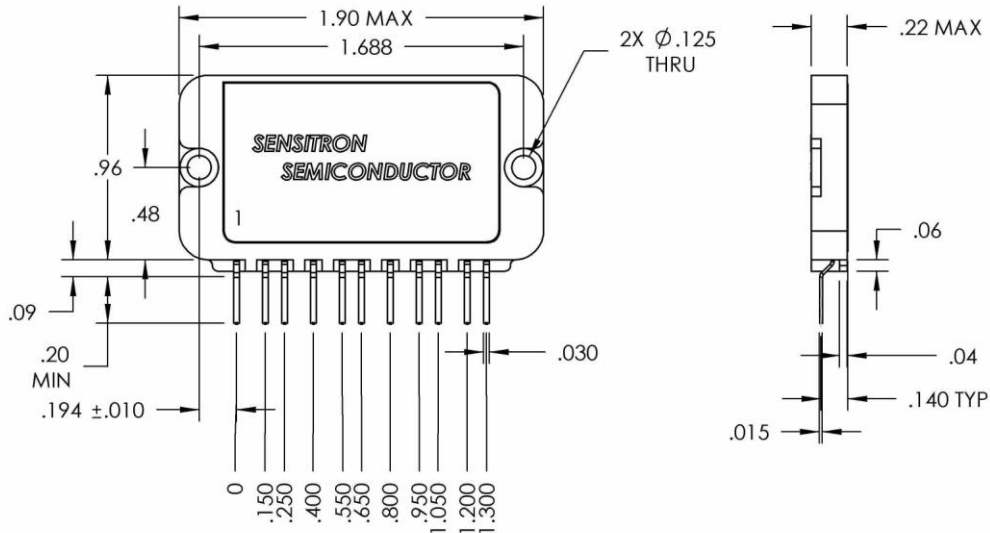
Diode Maximum Junction-to-Case Thermal Resistance Per Leg	$R_{\theta JC}$	-	-	3.0	$^\circ\text{C/W}$
IGBT Maximum Junction-to-Case Thermal Resistance Per Leg	$R_{\theta JC}$	-	-	1.0	
Maximum and Storage Junction Temperature	$T_{jmax}$	-55	-	150	$^\circ\text{C}$
Isolation to Base Plate	$V_{iso}$	-	-	2500	V

**Schematic Diagram:**



**Mechanical Outline (inches):**

**SPM1005**

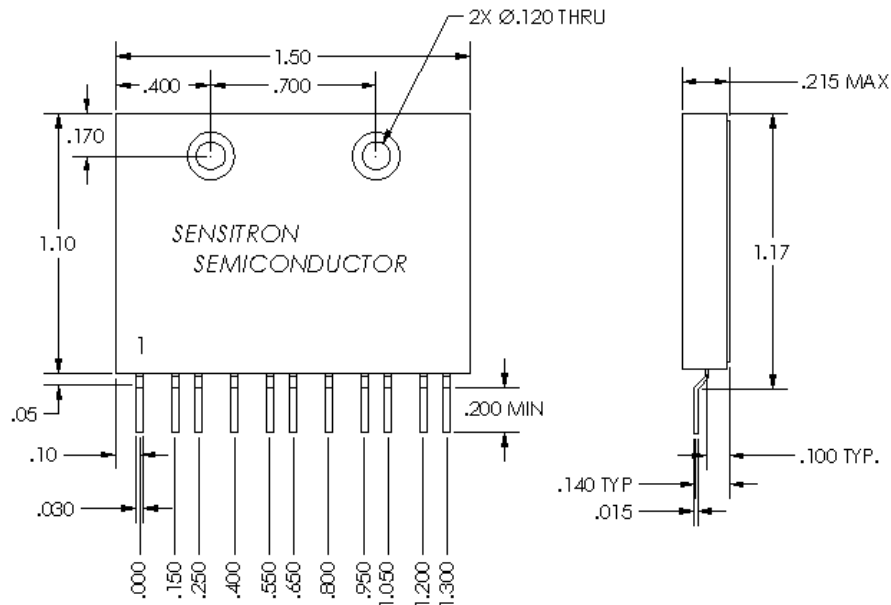


**NOTES:**

**Package: EPAK1**

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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**NOTES:**

1. TOLERANCE UNLESS OTHERWISE NOTED:  
.XX =  $\pm 0.10$   
.XXX =  $\pm 0.005$
2. MAXIMUM MOUNTING TORQUE = 3 IN-LB
3. PRE-TORQUE BOTH FASTENERS TO 1.5 IN-LB MAX BEFORE APPLYING FINAL TORQUE.
4. CONTACT FACTORY FOR THERMAL INTERFACE MATERIAL SUGGESTIONS AND COMPATIBILITY.

**Note:** SPM1005EM units use this legacy package.

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