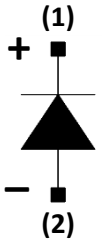
High Temperature Silicon Carbide Power Rectifier

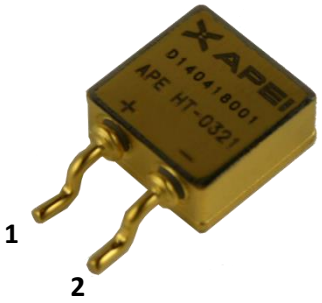
Silicon Carbide Schottky Diodes

1200 V / 10 A / 66 nC

FEATURES

- **High temperature: $T_{c(max)}$ = 225 °C, $T_{j(max)}$ = 225 °C**
- **AS9100:Rev. C-certified manufacturing, traceable throughout value chain**
- **Near zero forward and reverse recovery**
- **Extremely fast switching**
- **High system efficiency**
- **Hermetic seal; flux free, void free packaging**
- **Backside isolation**
- **High reliability**





APPLICATIONS

- **Downhole tools**
- **High efficiency converters**
- **Motor drives**
- **Aerospace: Military & Commercial**
- **Smart grid/grid-tie distributed generation**

Absolute Maximum Ratings[1] (at T_j = 25 °C unless otherwise stated)				
Symbol	**Parameter**	**Condition(s)**	**Value**	**Units**
V_{RRM}	Repetitive peak reverse voltage		1200	V
V_{DC}	DC blocking voltage		1200	
I_F	Average forward current	T_j = 175 °C	10	A
I_{FRM}	Repetitive peak forward surge current	T_j = 25 °C, t_p= 10 ms, Half Sine Wave	47[2]	
I_{FSM}	Non-repetitive peak forward surge current	T_j = 25 °C, t_p= 10 ms, Half Sine Wave	71[2]	
P_{tot}	Power dissipation	T_c = 25 °C	133[3]	W
		T_c = 100 °C	83[3]	
		T_c = 200 °C	17[3]	
T_j	Operating junction temperature		-50 to 225	°C
T_{stg}	Storage temperature		-50 to 225	

[1] Obtained from Cree, Inc. CPW4-1200S010B - datasheet
[2] Assumes thermal resistance of 1.1 °C/W or less
[3] Data obtained through APEI experimentation and/or calculation

SiC Diode Electrical Characteristics[1]						
Symbols	**Parameter**	**Condition(s)**	**Values**			**Units**
			Min.	**Typical**	**Max.**	
$V_{SD} = V_F$	Diode forward voltage	I_F = 10 A, T_j = 25 °C	-	1.5	1.8	V
		I_F = 10 A, T_j = 175 °C	-	2.2	3	
I_R	Reverse current	V_R = 1200 V, T_j = 25 °C	-	30	250	µA
		V_R = 1200 V, T_j = 175 °C	-	55	350	
Q_C	Total capacitive charge	V_R = 600 V, I_F = 2 A di_F/dt = 500 A/µs, T_j = 25 °C		66		nC
C	Total capacitance	V_R = 0 V, T_j = 25 °C, f = 1 MHz	-	754	-	pF
		V_R = 400 V, T_j = 25 °C, f = 1 MHz	-	45	-	
		V_R = 800 V, T_j = 25 °C, f = 1 MHz	-	38	-	

Thermal Characteristics (Per Die)						
Symbols	**Parameter**	**Condition(s)**	**Values**			**Units**
			Min.	**Typical**	**Max.**	
$R_{\theta(j-c)}$	Thermal resistance junction-case	Calculated at 200 °C		1.5		°C/W

Mechanical Characteristics						
Symbols	**Parameter**	**Condition(s)**	**Values**			**Units**
			Min.	**Typical**	**Max.**	
w	Weight			3.5		g

TYPICAL PERFORMANCE CURVES

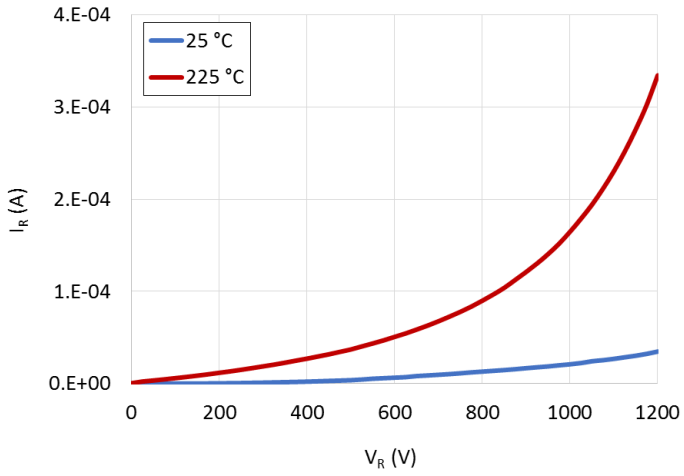


Fig. 1 – Reverse Leakage

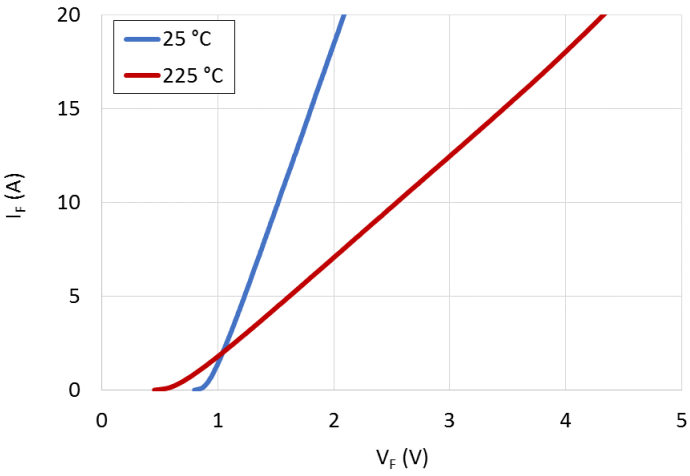
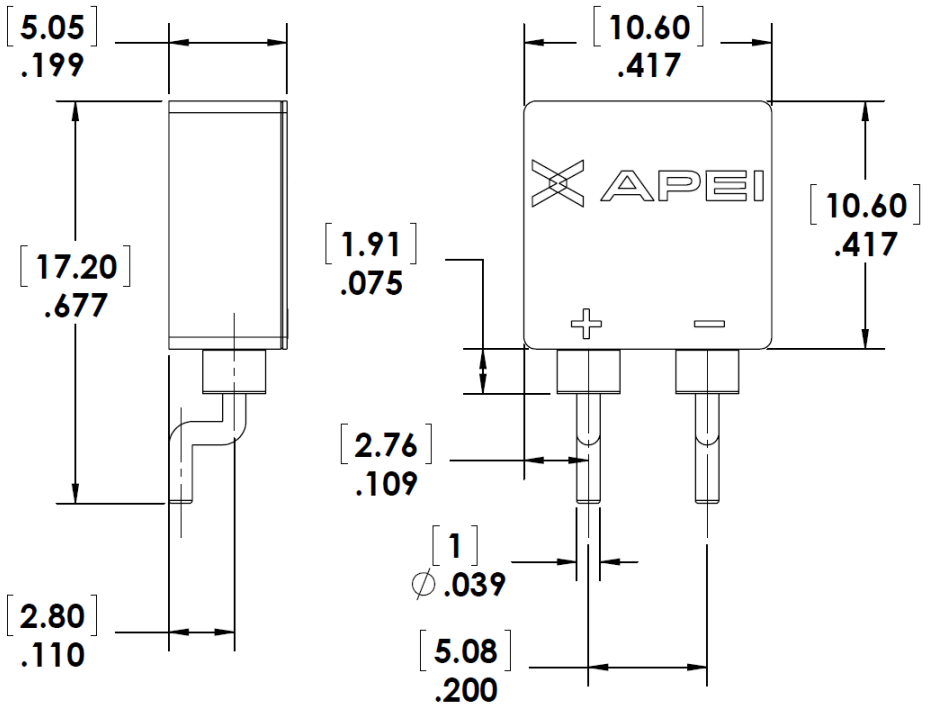


Fig. 2 – Forward Voltage

PACKAGE DIMENSIONS



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