

High Temperature Silicon Carbide Schottky Diode

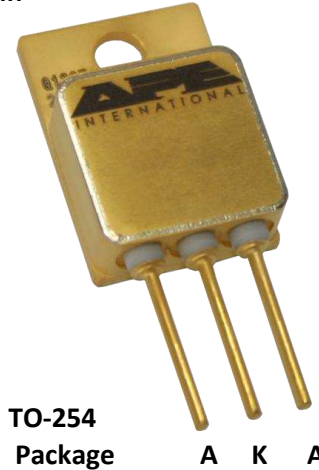
FEATURES

- High temperature: $T_{c(max)} = 225\text{ }^{\circ}\text{C}$
 $T_{j(max)} = 225\text{ }^{\circ}\text{C}$
- 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

1200 V / 10 A / 64 nC



TO-254
Package

A K A

Absolute Maximum Ratings¹ (at $T_j = 25\text{ }^{\circ}\text{C}$ 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	Continuous forward current	$T_j < 160\text{ }^{\circ}\text{C}$	10	A
I_{FRM}	Repetitive peak forward surge current	$T_j = 125\text{ }^{\circ}\text{C}, D = 0.1$	46	
I_{FSM}	Non-repetitive peak forward surge current	$T_c = 25\text{ }^{\circ}\text{C}, t_p = 10\text{ ms},$ $R_{th(j-c)} < 1.1\text{ }^{\circ}\text{C/W}$	45	
$I_{F(max)}$	Non-repetitive peak forward current	$T_c = 25\text{ }^{\circ}\text{C}, t_p = 10\text{ }\mu\text{s},$ $R_{th(j-c)} < 1.1\text{ }^{\circ}\text{C/W}$	250	
P_{tot}	Power dissipation	$T_j = 25\text{ }^{\circ}\text{C}$	TBD ²	W
		$T_j = 100\text{ }^{\circ}\text{C}$	TBD	
		$T_j = 225\text{ }^{\circ}\text{C}$	TBD	
T_j	Operating junction temperature		-50 to 205	$^{\circ}\text{C}$
T_{stg}	Storage temperature		-50 to 225	$^{\circ}\text{C}$
V_{isol}	Insulation test voltage	AC, 1 min.	TBD	V

¹ Obtained from SemiSouth Laboratories, Inc. SDC10S120 Rev. 1.1 (August 2008) datasheet

² Data verified through APEI experimentation and/or calculation



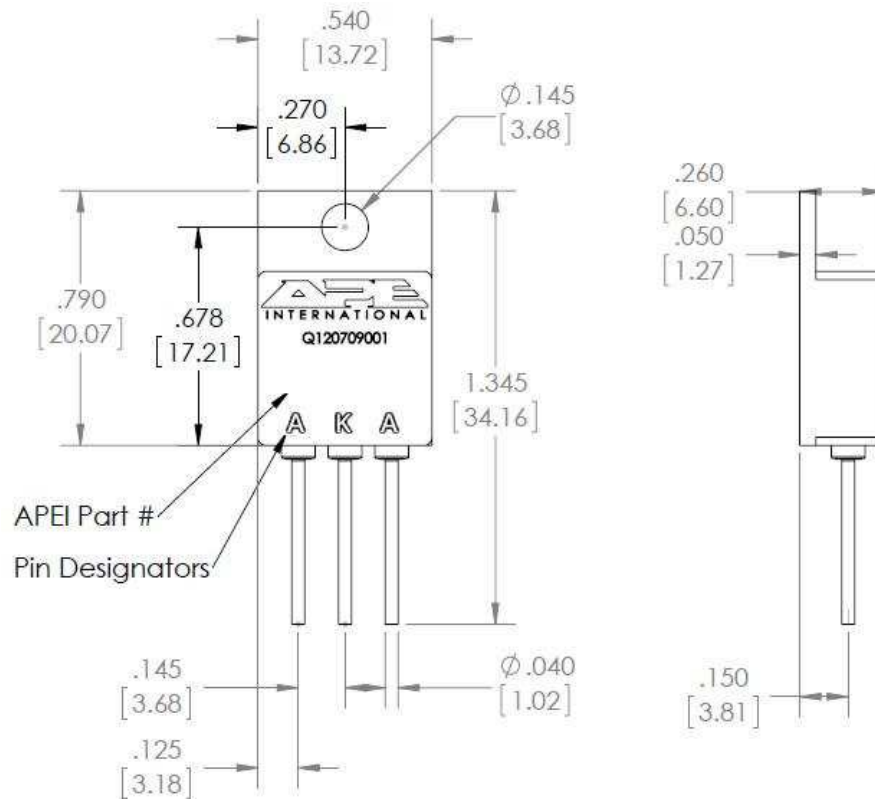
		AC, 1 s.	TBD	V		
SiC Diode Electrical Characteristics¹						
Symbols	Parameter	Condition(s)	Values			Units
			Min.	Typical	Max.	
$V_{SD} = V_F$	Diode forward voltage	$I_F = 10 \text{ A}, T_j = 25 \text{ }^\circ\text{C}$ (in TO-220)	-	1.6	1.8	V
		$I_F = 10 \text{ A}, T_j = 175 \text{ }^\circ\text{C}$ (in TO-220)	-	2.4	2.9	
I_R	Reverse current	$V_R = 1200 \text{ V}, T_j = 25 \text{ }^\circ\text{C}$ (on wafer)	-	10	100	μA
		$V_R = 1200 \text{ V}, T_j = 175 \text{ }^\circ\text{C}$ (in TO-220)	-	200	-	
Q_C	Total capacitive charge	$V_R = 1200 \text{ V}, I_F = 10 \text{ A}$ $di_F/dt = 500 \text{ A}/\mu\text{s}$, (in TO-220)		64		nC
C	Total capacitance	$V_R = 0 \text{ V}, T_j = 25 \text{ }^\circ\text{C}, f = 100 \text{ kHz}$	-	1137	-	pF
		$V_R = 300 \text{ V}, T_j = 25 \text{ }^\circ\text{C}, f = 100 \text{ kHz}$	-	42	-	
		$V_R = 600 \text{ V}, T_j = 25 \text{ }^\circ\text{C}, f = 100 \text{ kHz}$	-	35	-	

Thermal Characteristics						
Symbols	Parameter	Condition(s)	Values			Units
			Min.	Typical	Max.	
$R_{\theta(j-c)}$	Thermal resistance junction-case	Calculated at 200 °C		TBD	1.0	°C/W

Mechanical Characteristics						
Symbols	Parameter	Condition(s)	Values			Units
			Min.	Typical	Max.	
w	Weight			9.0		g
M_s	Mounting torque	6-32 steel screw into an Al heat sink		0.78	1.04	N-m

PACKAGE DIMENSIONS

All dimensions shown are in inches [millimeters]



PART NUMBER	PACKAGE	MARKING
APE HT-xxxx	TO-254	Q120709001

COMPANION PARTS

Silicon Carbide Schottky Diode, APE-HT-xxxx

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535 W. Research Center Blvd.
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