

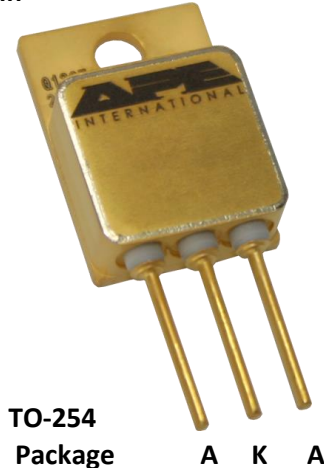
High Temperature Silicon Carbide Schottky Diode

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


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

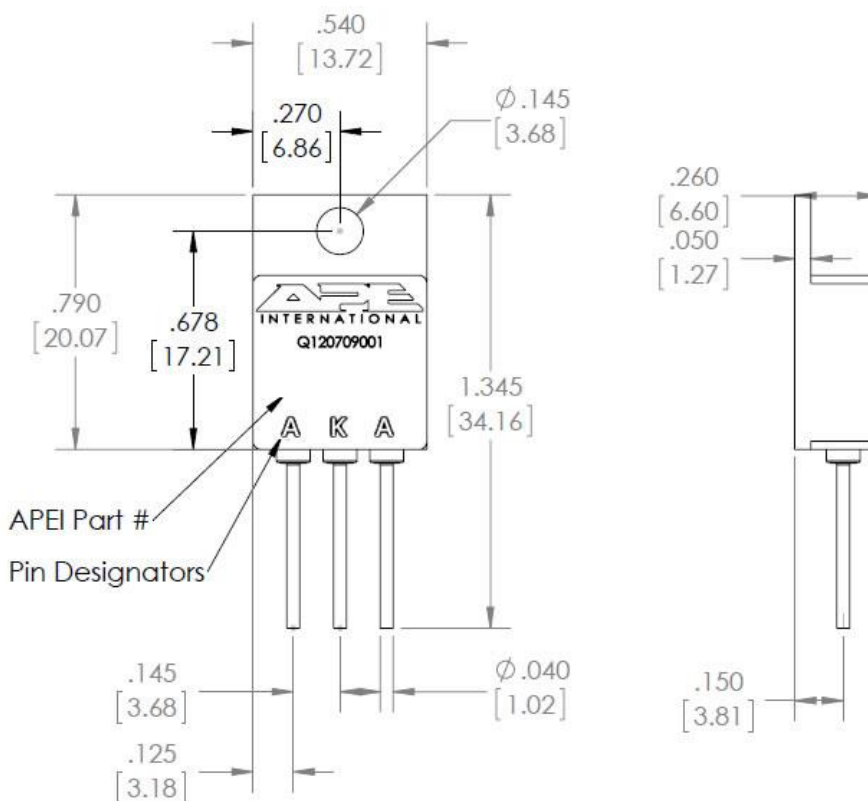
		AC, 1 s.	TBD	V		
SiC Diode Electrical Characteristics ¹						
Symbols	Parameter	Condition(s)	Values			Units
			Min.	Typical	Max.	
V _{SD} = V _F	Diode forward voltage	I _F = 10 A, T _j = 25 °C (in TO-220)	-	1.6	1.8	V
		I _F = 10 A, T _j = 175 °C (in TO-220)	-	2.4	2.9	
I _R	Reverse current	V _R = 1200 V, T _j = 25 °C (on wafer)	-	10	100	μA
		V _R = 1200 V, T _j = 175 °C (in TO-220)	-	200	-	
Q _C	Total capacitive charge	V _R = 1200 V, I _F = 10 A di _F /dt = 500 A/μs, (in TO-220)		64		nC
C	Total capacitance	V _R = 0 V, T _j = 25 °C, f = 100 kHz	-	1137	-	pF
		V _R = 300 V, T _j = 25 °C, f = 100 kHz	-	42	-	
		V _R = 600 V, T _j = 25 °C, f = 100 kHz	-	35	-	

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

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

DISCLAIMER

ALL PRODUCT, PRODUCT SECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION, DESIGN OR OTHERWISE.

Arkansas Power Electronics International, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "APEI"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

All product data sheets, product manuals and any other product related documentation, and all APEI products, courtesy samples and services are subject to APEI's Standard Terms and Conditions available online at <http://www.apei.net/termsandconditions.pdf>.



PRELIMINARY

APE HT-0103

ALL APEI PRODUCTS, PROTOTYPES AND ANY OTHER DEVICES MADE BY APEI SHALL BE TREATED AS ENGINEERING SAMPLES AND AS SUCH APEI DOES NOT ACCEPT ANY PRODUCT LIABILITY, CLAIMS OR DAMAGES OR FUTURE OBLIGATIONS TO SUPPLY. THE CONTENTS DISCLOSED IN ANY DATASHEET AND ALL OF APEI'S PRODUCTS, PROTOTYPES AND OTHER DEVICES SOLD OR PROVIDED BY APEI ARE "AS-IS" WITH NO WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED. APEI DOES NOT WARRANT THAT ITS ENGINEERING SAMPLES ARE FULLY VERIFIED, TESTED, OR WILL OPERATE IN ACCORDANCE WITH ANY DATA SHEET SPECIFICATIONS. APEI DISCLAIMS ANY OBLIGATIONS FOR TECHNICAL SUPPORT AND BUG FIXES. APEI SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING WITHOUT LIMITATION DIRECT, INDIRECT, INCIDENTAL, SPECIAL, RELIANCE, PUNITIVE, STATUTORY OR CONSEQUENTIAL DAMAGES ARISING FROM OR IN CONNECTION WITH THE CONTENTS OF ANY PRODUCT DATASHEET OR THE USE, INSTALLATION, OR IMPLEMENTATION OF ENGINEERING SAMPLES IN ANY MANNER WHATSOEVER, EVEN IF SELLER HAS BEEN ADVISED OF THE POSSIBILITY THEREOF. APEI MAKES NO REPRESENTATION THAT ITS ENGINEERING SAMPLES PROVIDE ANY PARTICULAR FUNCTIONALITY, OR THAT ITS ENGINEERING SAMPLES WILL MEET THE REQUIREMENTS OF A PARTICULAR USER APPLICATION. APEI DOES NOT WARRANT THAT ITS ENGINEERING SAMPLES ARE ERROR-FREE, NOR DOES APEI MAKE ANY OTHER REPRESENTATIONS OR WARRANTIES, WHETHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

APEI'S PRODUCTS AND PROTOTYPES ARE ENGINEERING SAMPLES AND ARE NOT DESIGNED OR INTENDED TO BE FAIL-SAFE, FAULT TOLERANT OR FOR USE IN ANY APPLICATION THAT COULD LEAD TO DEATH, PERSONAL INJURY OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE (INDIVIDUALLY AND COLLECTIVELY, "CRITICAL APPLICATIONS"), SUCH AS LIFE-SUPPORT OR SAFETY DEVICES OR SYSTEMS, CLASS III MEDICAL DEVICES, NUCLEAR FACILITIES, APPLICATIONS THAT AFFECT CONTROL OF A VEHICLE OR AIRCRAFT, APPLICATIONS RELATED TO THE DEPLOYMENT OF AIRBAGS, OR ANY OTHER CRITICAL APPLICATIONS. APEI SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING WITHOUT LIMITATION DIRECT, INDIRECT, INCIDENTAL, SPECIAL, RELIANCE, PUNITIVE OR CONSEQUENTIAL DAMAGES IN ANY MANNER WHATSOEVER, ARISING FROM OR IN CONNECTION WITH THE USE OF ITS PRODUCTS, SAMPLES OR PROTOTYPES IN CRITICAL APPLICATIONS, EVEN IF APEI HAS BEEN ADVISED OF THE POSSIBILITY THEREOF.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of APEI.

ORDERING INSTRUCTIONS

An order for one or more parts can be initiated by issuing a purchase order to APEI, Inc. Please e-mail or fax your purchase order to sales@apei.net or +1.866.515.6604, respectively.

APEI, Inc.
535 W. Research Center Blvd.
Fayetteville, AR 72701
Phone: 479.443.5759 / Fax: 866.515.6604
www.apei.net
Copyright © 2013 APEI, Inc.
All rights reserved.

