

## 5A, 1200V SiC Merged PIN Schottky Diode

### FEATURES

- AEC-Q101 qualified
- Max junction temperature 175°C
- High-speed switching possible
- High forward surge capability
- High-frequency operation
- Positive temperature coefficient on  $V_F$
- RoHS compliant
- Halogen-free

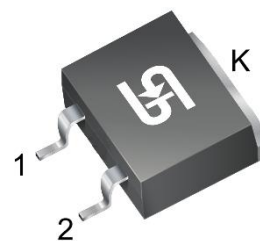
### APPLICATIONS

- General purpose
- Switch mode power supplies
- Power factor correction

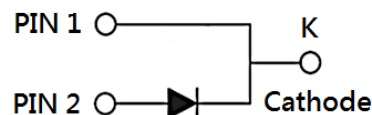
### MECHANICAL DATA

- Case: TO-263-2L (D<sup>2</sup>PAK-2L)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Polarity: As circuit diagram
- Weight: 1.51g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$I_F$	5	A
$V_{RRM}$	1200	V
$I_{FSM}$	68	A
$T_{J\ MAX}$	175	°C
Package	TO-263-2L (D <sup>2</sup> PAK-2L)	
Configuration	Single die	



TO-263-2L (D<sup>2</sup>PAK-2L)



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Repetitive peak reverse voltage	$V_{RRM}$	1200	V
Reverse voltage, total rms value	$V_{R(RMS)}$	840	V
Forward current	$I_F$	5	A
Surge peak forward current 10ms single half sine-wave superimposed on rated load	$T_C = 25^\circ\text{C}$	$I_{FSM}$	68
	$T_C = 150^\circ\text{C}$		62
Non-repetitive peak forward surge current	$t_p = 10\mu\text{s}$	$I_{F, MAX}$	580
Junction temperature	$T_J$	-55 to +175	°C
Storage temperature	$T_{STG}$	-55 to +175	°C

<b>THERMAL PERFORMANCE</b>				
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Junction-to-case thermal resistance	$R_{\theta JC}$	1.27	1.52	°C/W

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)					
<b>PARAMETER</b>	<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Forward voltage <sup>(1)</sup>	$I_F = 2.5\text{A}, T_J = 25^\circ\text{C}$	$V_F$	1.15	-	V
	$I_F = 5.0\text{A}, T_J = 25^\circ\text{C}$		1.38	1.50	V
	$I_F = 2.5\text{A}, T_J = 150^\circ\text{C}$		1.28	-	V
	$I_F = 5.0\text{A}, T_J = 150^\circ\text{C}$		1.77	2.10	V
	$I_F = 2.5\text{A}, T_J = 175^\circ\text{C}$		1.33	-	V
	$I_F = 5.0\text{A}, T_J = 175^\circ\text{C}$		1.90	-	V
Reverse current @ rated $V_R$ <sup>(2)</sup>	$T_J = 25^\circ\text{C}$	$I_R$	-	30	$\mu\text{A}$
	$T_J = 175^\circ\text{C}$		-	60	$\mu\text{A}$
Junction capacitance	$f = 1\text{MHz}, V_R = 1\text{V}$	$C_J$	394	-	pF
	$f = 1\text{MHz}, V_R = 800\text{V}$		21	-	pF
Capacitive Charge	$V_R = 800\text{V}$	$Q_C$	28	-	nC

**Notes:**

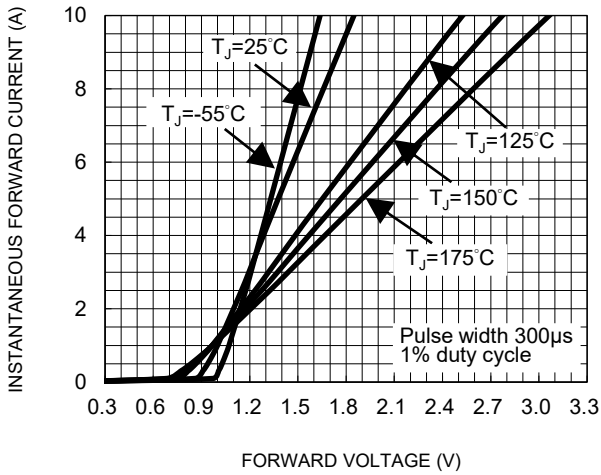
1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE</b>	<b>PACKAGE</b>	<b>PACKING</b>
TSCDK05120G2H	TO-263-2L (D <sup>2</sup> PAK-2L)	800 / 13" Tape & Reel

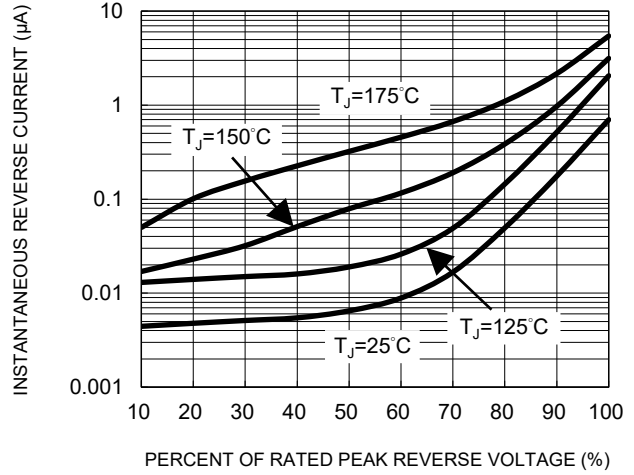
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

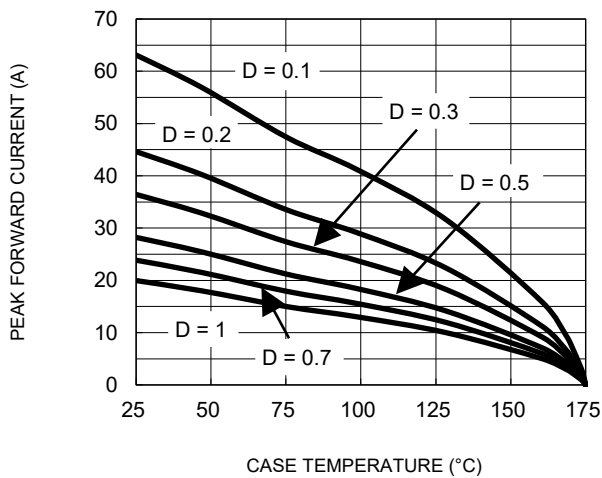
**Fig.1 Typical Forward Characteristics**



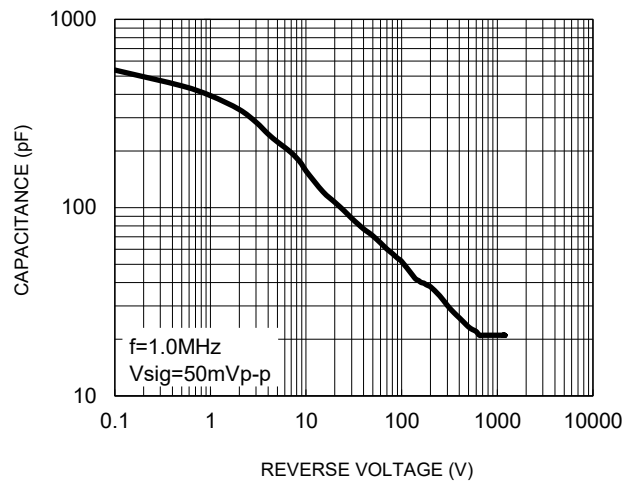
**Fig.2 Typical Reverse Characteristics**



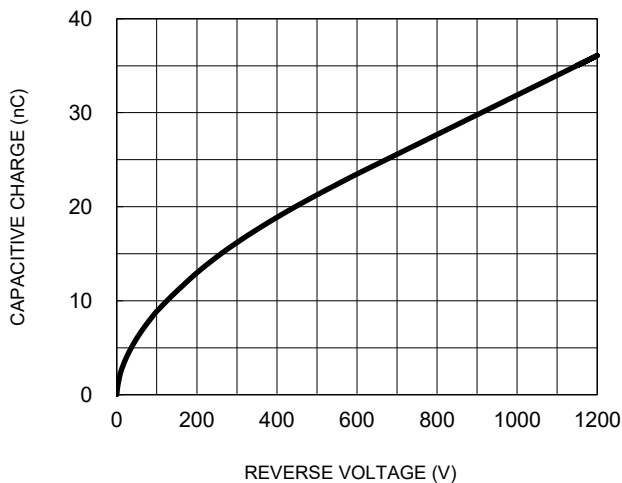
**Fig.3 Peak forward current versus case temperature**



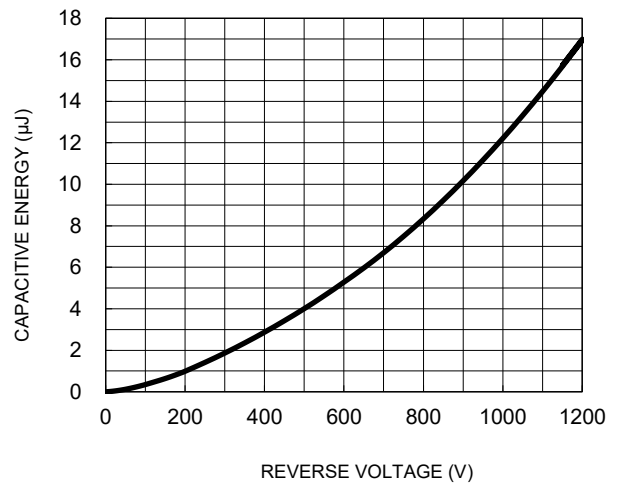
**Fig.4 Typical Junction Capacitance**



**Fig.5 Typical Capacitive Charge**



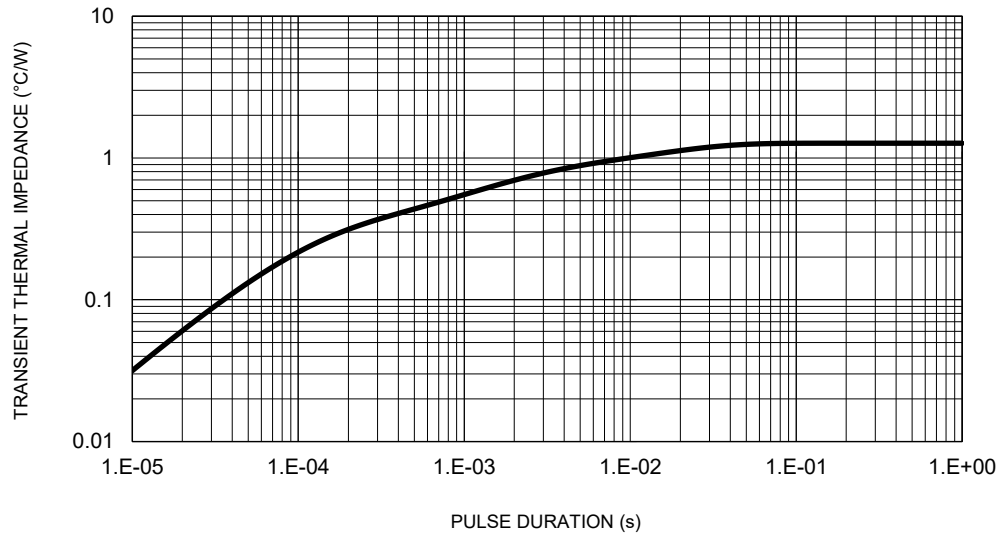
**FIG.6 Typical Capacitance Stored Energy**



**CHARACTERISTICS CURVES**

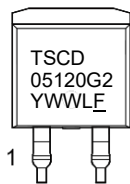
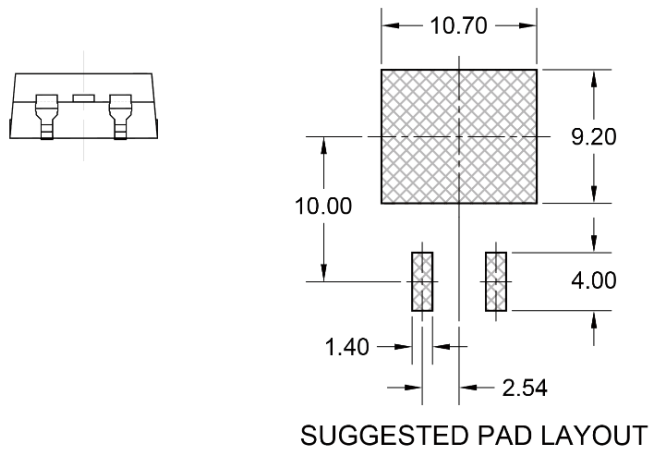
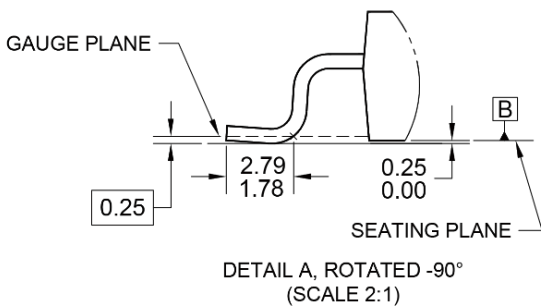
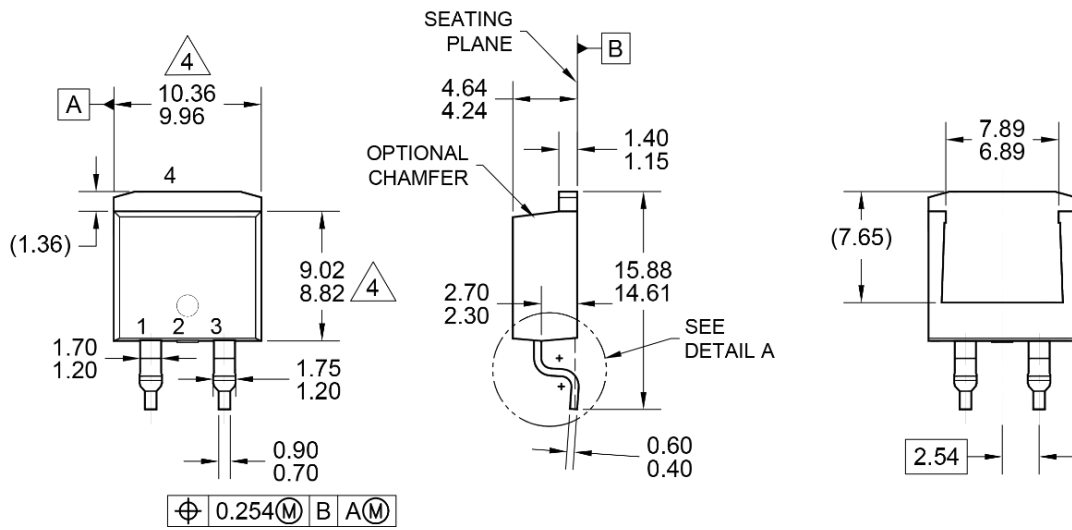
(T<sub>A</sub> = 25°C unless otherwise noted)

**Fig.7 Typical Transient Thermal Characteristics**



**PACKAGE OUTLINE DIMENSIONS**

**TO-263-2L (D<sup>2</sup>PAK-2L)**



**MARKING DIAGRAM**

- Y = Year Code
- WW = Week Code (01~52)
- L = Lot Code (1~9,A~Z)
- E = Factory Code

**NOTES: UNLESS OTHERWISE SPECIFIED**

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. THE PACKAGE OUTLINE REFERENCE: JEDEC TO-263, VARIATION AB, ISSUE F.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DWG NO REF: HQ2SD07-TO263ABSiC-137 REV A.

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