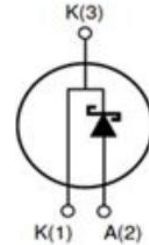




## Silicon Carbide Power Schottky Diode



TO-220AC



Features
<ul style="list-style-type: none"> <li>• 600-Volt Schottky Rectifier</li> <li>• Zero Reverse Recovery Current</li> <li>• Zero Forward Recovery Voltage</li> <li>• High-Frequency Operation</li> <li>• Temperature-Independent Switching Behavior</li> <li>• Extremely Fast Switching</li> <li>• Positive Temperature Coefficient on <math>V_F</math></li> <li>• Marking : ESIC0406S</li> </ul>

Benefits
<ul style="list-style-type: none"> <li>• Replace Bipolar with Unipolar Rectifiers</li> <li>• Essentially No Switching Losses</li> <li>• Higher Efficiency</li> <li>• Reduction of Heat Sink Requirements</li> <li>• Parallel Devices Without Thermal Runaway</li> </ul>

Ordering Information		
Part No.	Package	Packing
ESIC0406S	TO-220AC	50 / Tube

Applications
<ul style="list-style-type: none"> <li>• Switching power supply</li> <li>• Solar inverter</li> <li>• Uninterruptible power supply</li> <li>• Power factor correction</li> <li>• Motor drive</li> </ul>

Maximum Ratings				
Parameter	Conditions	Symbol	Limits	Unit
Repetitive Peak Reverse Voltage	$T_J = 25\text{ }^\circ\text{C}$	$V_{RRM}$	600	V
Surge Peak Reverse Voltage	$T_J = 25\text{ }^\circ\text{C}$	$V_{RSM}$	600	
DC Blocking Voltage	$T_J = 25\text{ }^\circ\text{C}$	$V_{DC}$	600	
Continuous Forward Current	$T_J = 150\text{ }^\circ\text{C}$	$I_F$	4	A
Repetitive Peak Forward Surge Current	$T_C = 25\text{ }^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half Sine Wave, $D = 0.3$	$I_{FRM}$	45	A
Non-Repetitive Peak Forward Surge Current	$T_C = 25\text{ }^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half Sine Wave, $D = 0.3$	$I_{FSM}$	75	A
Total Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_{TOT}$	90	W
	$T_C = 110\text{ }^\circ\text{C}$		39	
Reverse Recovery Time	$I_F = 4\text{ A}$ , $di/dt = 200\text{ A}/\mu\text{s}$	$T_{rr}$	10	ns
Operating Junction and Storage Temperature		$T_J, T_{STG}$	-55 to 175	$^\circ\text{C}$
Typical Thermal Resistance from Junction to Case		$R_{\theta JC}$	1.67	$^\circ\text{C}/\text{W}$

**Silicon Carbide Power Schottky Diode**

<b>Electrical Characteristics</b>						
<b>Parameter</b>	<b>Conditions</b>	<b>Symbol</b>	<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>	<b>Unit</b>
Forward Voltage	$I_F = 4\text{ A}, T_J = 25\text{ }^\circ\text{C}$	$V_F$	—	1.3	1.7	V
	$I_F = 4\text{ A}, T_J = 175\text{ }^\circ\text{C}$		—	1.7	2.3	
Reverse Current	$V_R = 600\text{ V}, T_J = 25\text{ }^\circ\text{C}$	$I_R$	—	7.1	100	$\mu\text{A}$
	$V_R = 600\text{ V}, T_J = 175\text{ }^\circ\text{C}$		—	15	200	
Total Capacitive Charge	$V_R = 600\text{ V}, I_F = 4\text{ A},$ $di/dt = 500\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$	$Q_C$	—	15	—	nC
Total Capacitance	$V_R = 0\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	C	—	230	—	pF
	$V_R = 200\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$		—	32	—	
	$V_R = 400\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$		—	30	—	



Rating and Characteristics Curves

Fig 1 Forward Characteristics

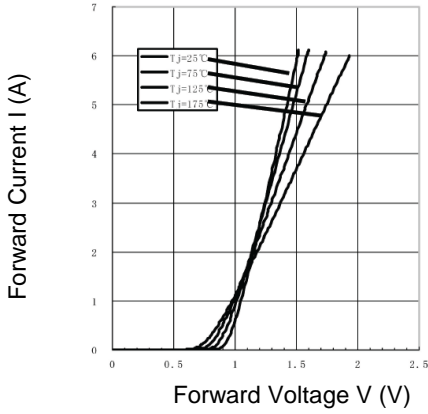


Fig 2 Reverse Characteristics

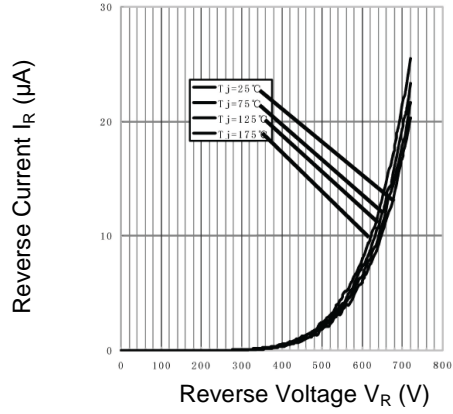


Fig 3 Capacitance vs. Reverse Voltage

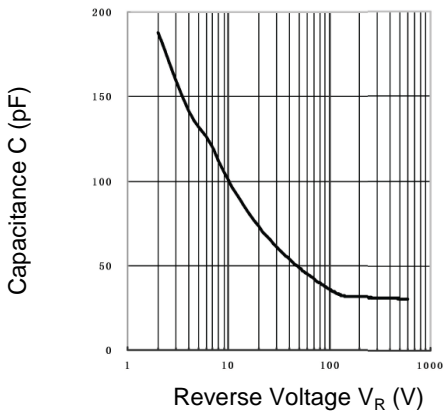


Fig 4 Power Derating

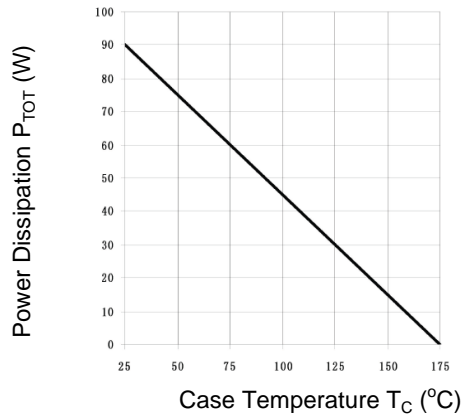
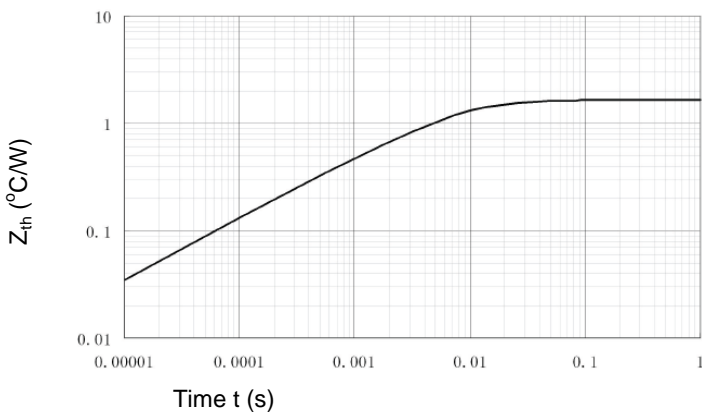
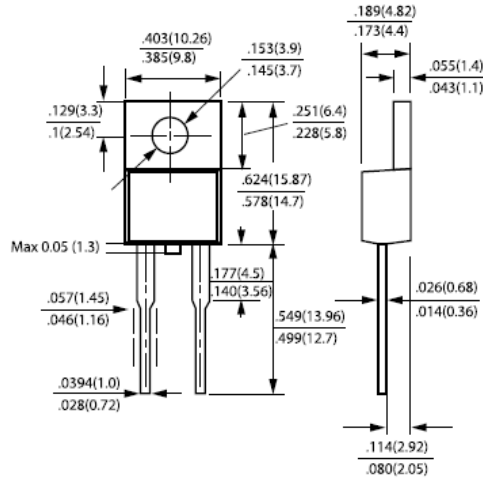


Fig 5 Transient Thermal Impedance

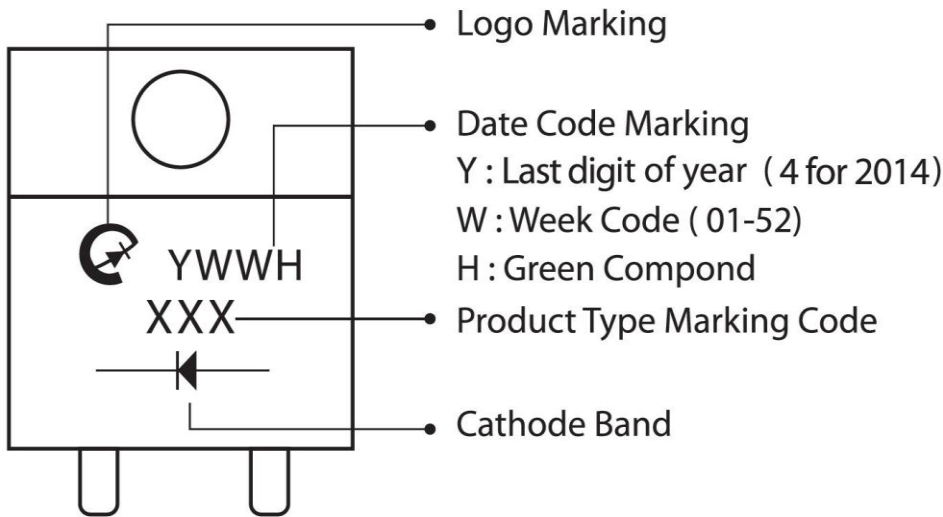




Package Outline Dimensions



Marking Information



Bulk Packing

Package	Inner Pack	Inner Box (EA)	Inner Box (mm)	Carton (EA)	Carton Size (mm)	Gross Weight (Kg)-Approx.
TO-220AC	Tube	2000	539x184x79	4000	558x180x200	11.9