

## Silicon Carbide Schottky Diode

### Features

- New Thin Wafer Technology
- Low Forward Voltage Drop ( $V_F$ )
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on  $V_F$
- Temperature-independent Switching

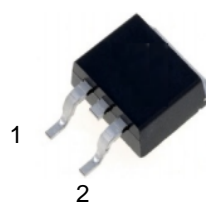
$V_{RRM}$	=	650	V
$I_F (T_C \leq 135^\circ\text{C})$	=	19	A
$Q_C$	=	25	nC

### Benefits

- Replace Bipolar with Unipolar Device
- Reduction of Heat Sink Size
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

### Applications

- Switch Mode Power Supplies
- Uninterruptible Power Supplies
- Motor drive, PV Inverter, Wind Power Station



TO-263-2  
**Package**



Part Number	Package	Marking
SC3S06510HD	TO-263-2	SC06510

### Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{RRM}$	Repetitive Peak Reverse Voltage	650	V	$T_C = 25^\circ\text{C}$	
$V_{RSM}$	Surge Peak Reverse Voltage	650	V	$T_C = 25^\circ\text{C}$	
$V_R$	DC Blocking Voltage	650	V	$T_C = 25^\circ\text{C}$	
$I_F$	Forward Current	38	A	$T_C \leq 25^\circ\text{C}$	
		19		$T_C \leq 135^\circ\text{C}$	
		10		$T_C \leq 158^\circ\text{C}$	
$I_{FSM}$	Non-Repetitive Forward Surge Current	86	A	$T_C = 25^\circ\text{C}, t_p = 8.3\text{ms}, \text{Half Sine Wave}$	
$P_{tot}$	Power Dissipation	150	W	$T_C = 25^\circ\text{C}$	Fig.3
$T_J, T_{STG}$	Operating Junction and Storage Temperature	-55 to 175	$^\circ\text{C}$		

## Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$V_F$	Forward Voltage	1.27 1.38	1.5 1.6	V	$I_F = 10A, T_J = 25^\circ C$ $I_F = 10A, T_J = 175^\circ C$	Fig.1
$I_R$	Reverse Current	6 25	50 200	$\mu A$	$V_R = 650V, T_J = 25^\circ C$ $V_R = 650V, T_J = 175^\circ C$	Fig.2
C	Total Capacitance	640 66 48	/	pF	$V_R = 0.1V, T_J = 25^\circ C, f = 1MHz$ $V_R = 200V, T_J = 25^\circ C, f = 1MHz$ $V_R = 400V, T_J = 25^\circ C, f = 1MHz$	Fig.5
$Q_C$	Total Capacitive Charge	25	/	nC	$V_R = 400V, I_F = 10A$ $di/dt = 200A/\mu s, T_J = 25^\circ C$	Fig.4

## Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1	$^\circ C/W$	Fig.6
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	80	$^\circ C/W$	
$T_{sold}$	Soldering Temperature	260	$^\circ C$	

## RATING AND CHARACTERISTICS CURVES (SC3S06510HD)

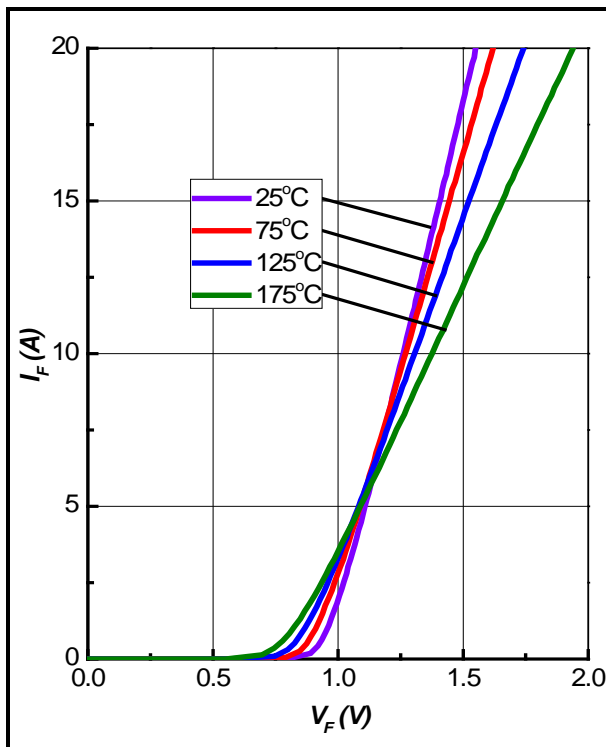


Figure 1. Forward Characteristics

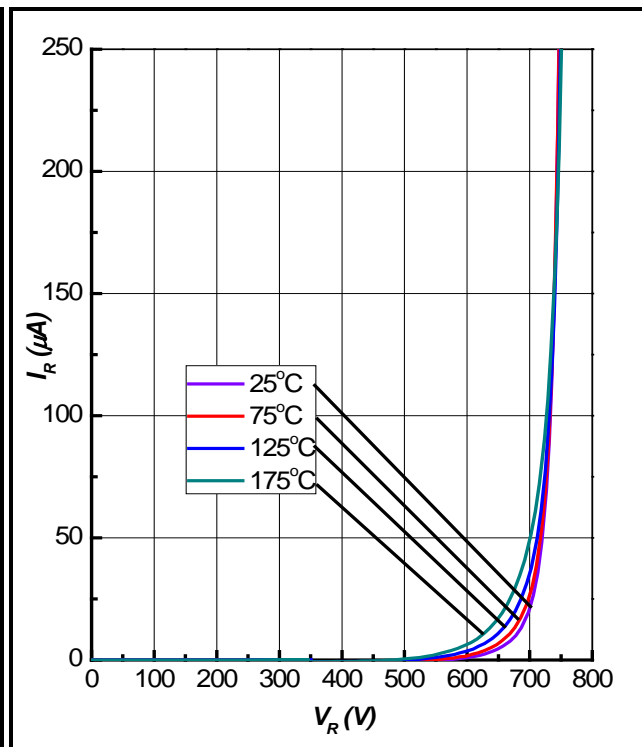


Figure 2. Reverse Characteristics

## RATING AND CHARACTERISTICS CURVES (SC3S06510HD)

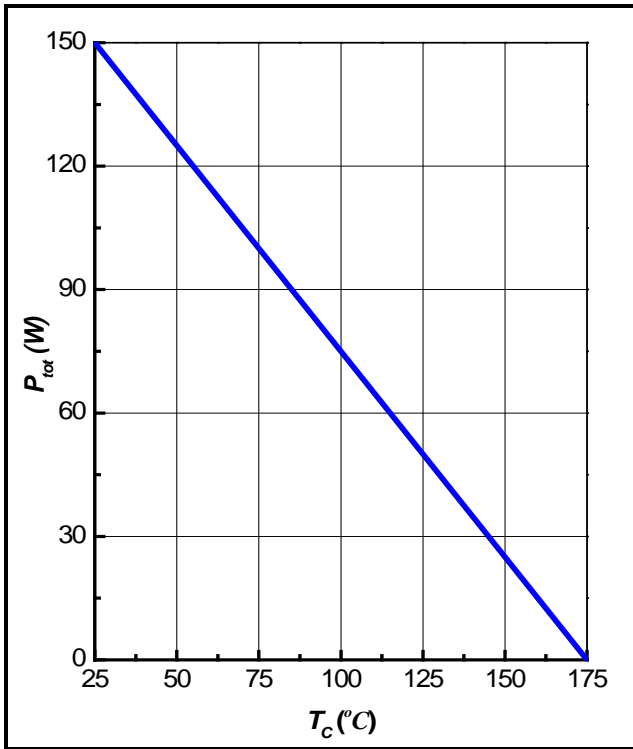


Figure 3. Power Derating

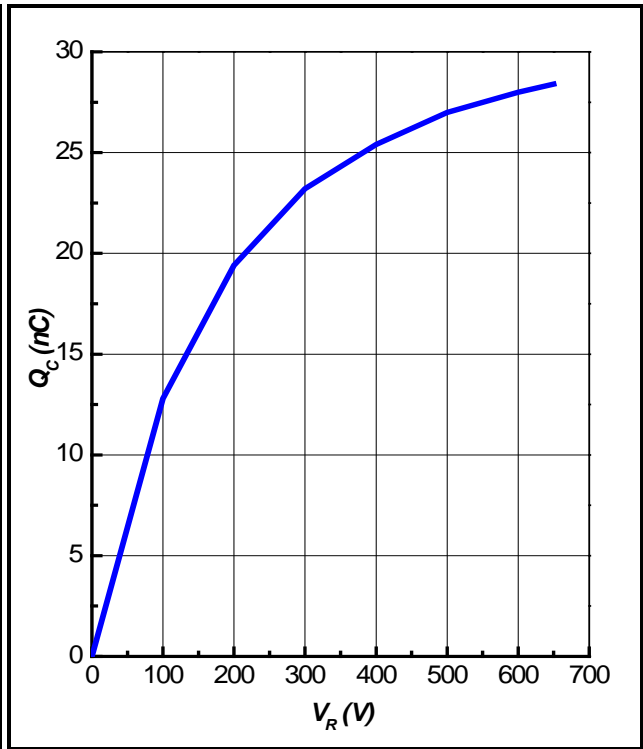


Figure 4. Total Capacitive Charge vs. Reverse Voltage

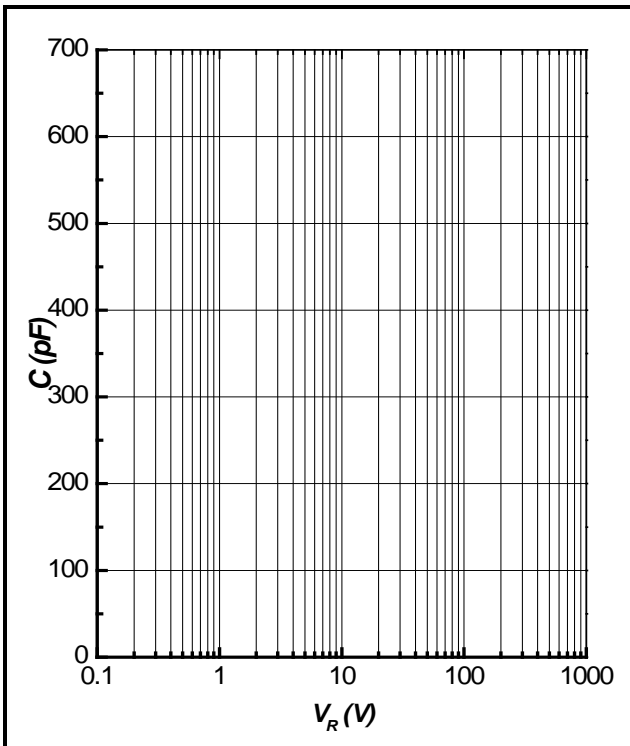


Figure 5. Total Capacitance vs. Reverse Voltage

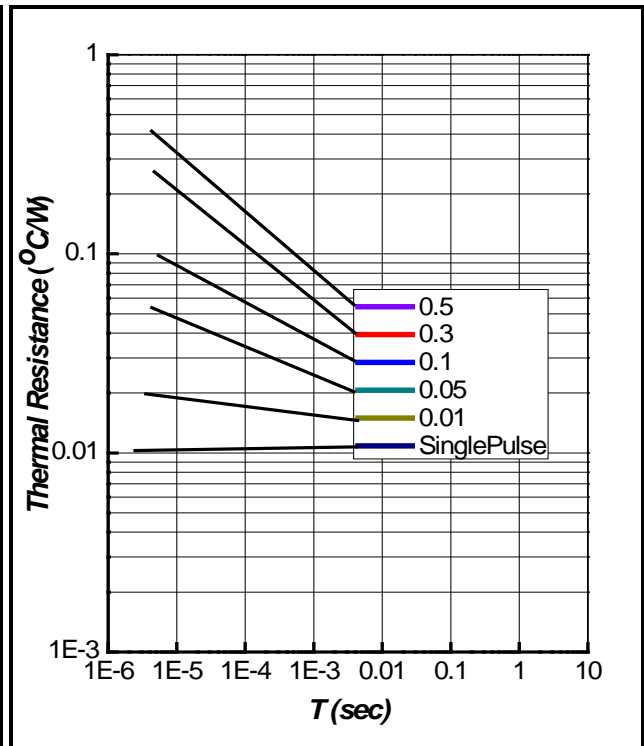
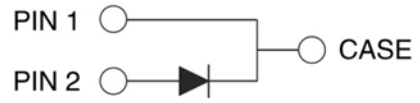
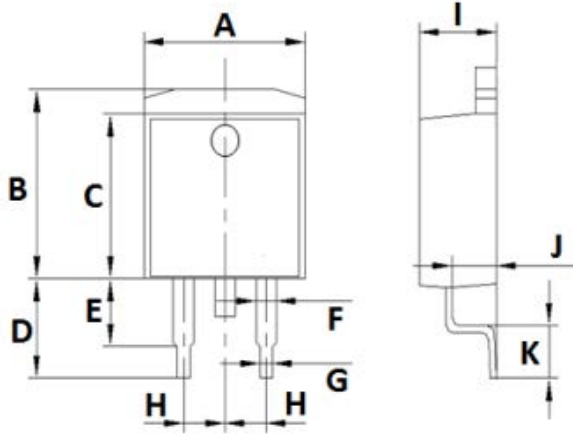


Figure 6. Transient Thermal Impedance

## Package Dimensions

Package TO-263-2



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	9.80	10.10	10.40
B	9.40	9.90	10.40
C	8.46	8.66	8.86
D	4.85	5.35	5.8
E	-	3.20	-
F	1.05	1.25	1.45
G	0.60	0.8	1.00
H	2.34	2.54	2.74
I	4.40	4.65	4.90
J	2.40	2.60	2.80
K	2.30	2.55	2.80

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