

Silicon Carbide Schottky Diode G4 MPS Technology

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

Benefits

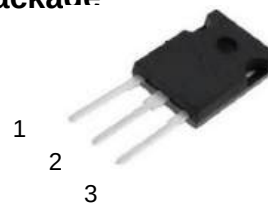
- Replace Bipolar with Unipolar Device
- Reduction of Heat Sink Size
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

Applications

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

V_{RRM}	=	650	V
I_F ($T_C \leq 135^\circ\text{C}$)	=	30	A**
Q_C	=	64	nC**

Package



TO-247-3



Part Number	Package	Marking	Packaging Code	Tube(Pcs)	Carton(Pcs)
SC4S06530B	TO-247-3	SC06530	-C	30	1800

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(Per Leg/Device)	15/30	A	$T_C \leq 156^\circ\text{C}$	
I_{FSM}	Non-Repetitive Forward Surge Current	120*	A	$T_C = 25^\circ\text{C}$, $t_p = 8.3\text{ms}$, Half Sine Wave	
P_{tot}	Power Dissipation(Per Leg/Device)	170/340	W	$T_C = 25^\circ\text{C}$	Fig.3
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to 175	$^\circ\text{C}$		
T_{sold}	Soldering Temperature	260	$^\circ\text{C}$		
Md	TO-247 Mounting Torque	1	Nm	M3 Screw	

*Per Leg, **Per Device

Electrical Characteristics(Per Leg)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.33 1.63	1.50 /	V	$I_F = 15A, T_J = 25^{\circ}C$ $I_F = 15A, T_J = 175^{\circ}C$	Fig.1
I_R	Reverse Current	2 10	20 /	μA	$V_R = 650V, T_J = 25^{\circ}C$ $V_R = 650V, T_J = 175^{\circ}C$	Fig.2
C	Total Capacitance	741 79 57	/	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.3
Q_C	Total Capacitive Charge	32	/	nC	$V_R = 400V, I_F = 15A$ $di/dt = 200A/\mu s, T_J = 25^{\circ}C$	Fig.4

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.88* 0.44**	$^{\circ}C/W$	Fig.6
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	80	$^{\circ}C/W$	

RATING AND CHARACTERISTICS CURVES (SC4S06530B)

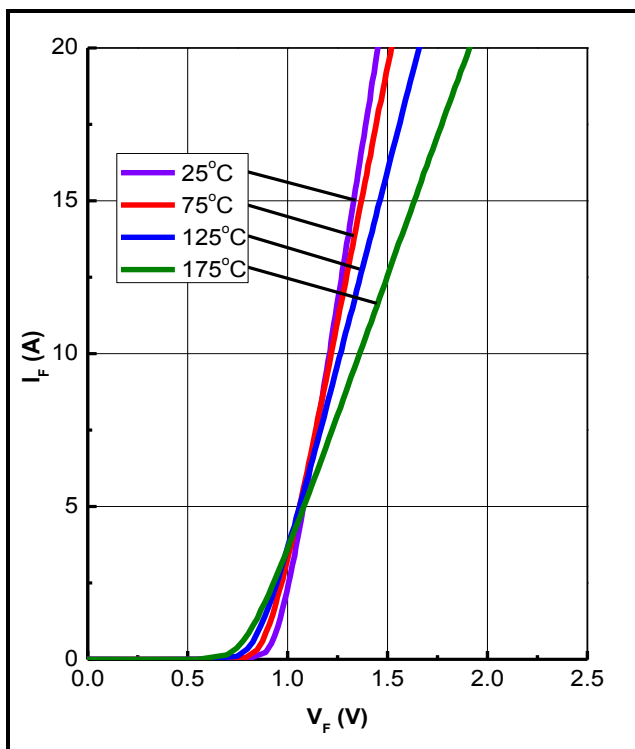


Figure 1. Forward Characteristics

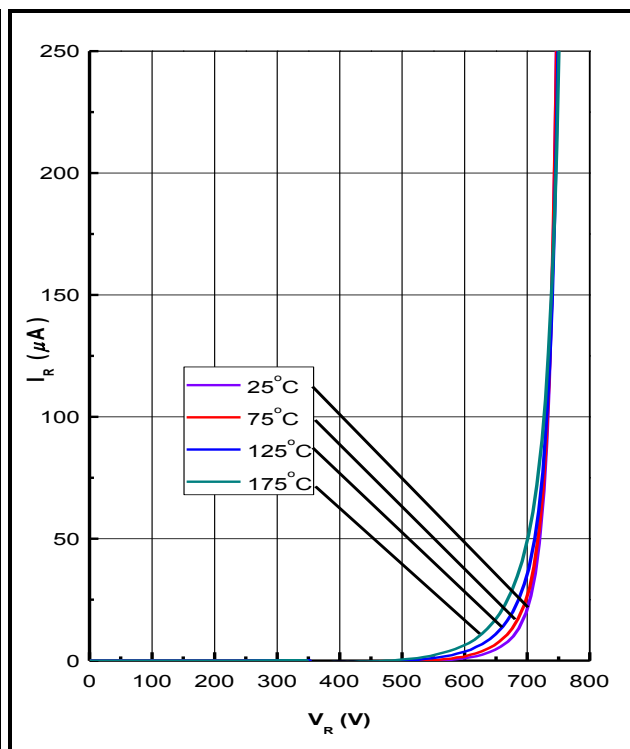


Figure 2. Reverse Characteristics

RATING AND CHARACTERISTICS CURVES (SC4S06530B)

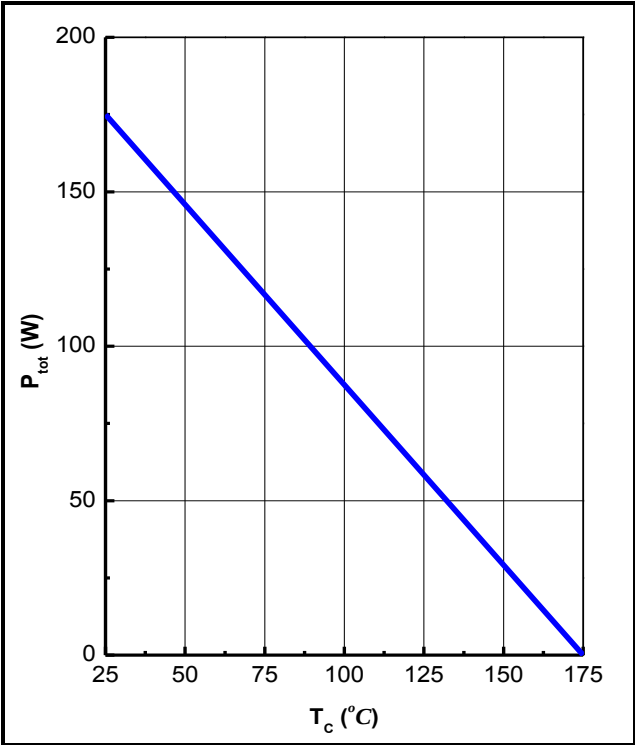


Figure 3. Power Derating

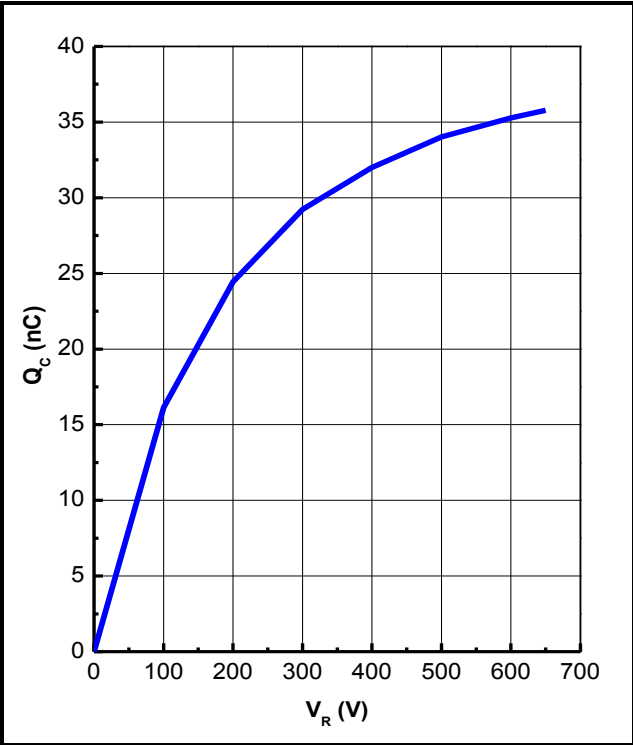


Figure 4. Total Capacitive Charge vs. Reverse Voltage

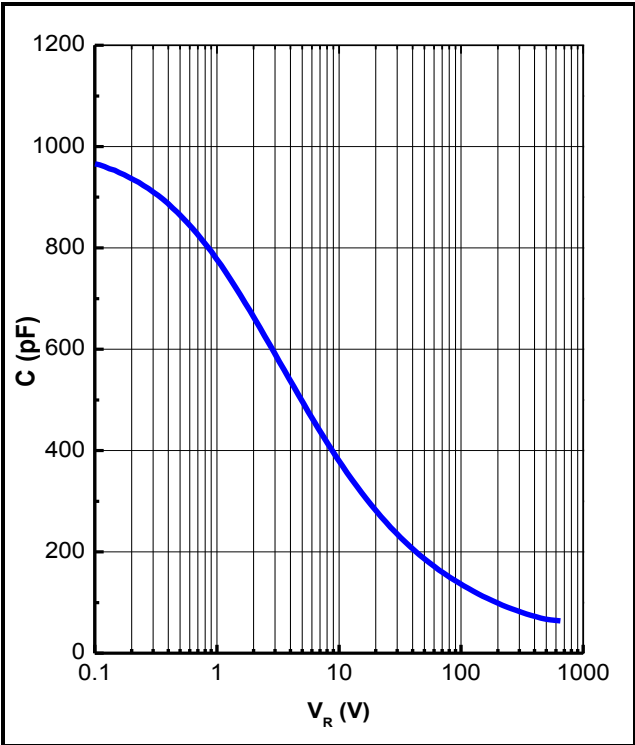


Figure 5. Total Capacitance vs. Reverse Voltage

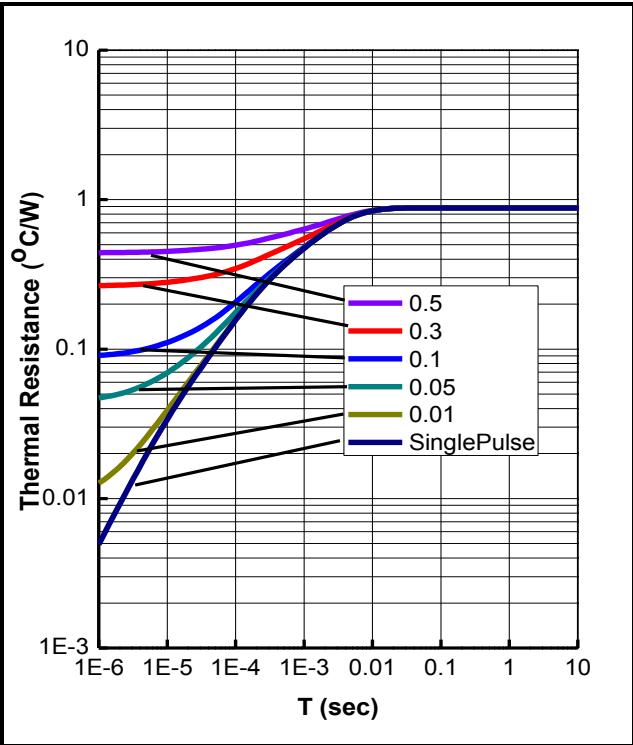
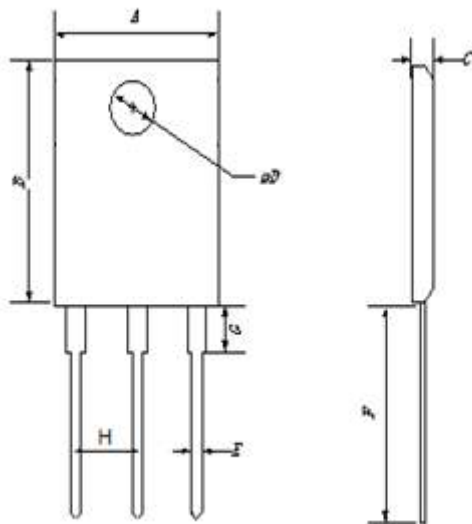


Figure 6. Transient Thermal Impedance

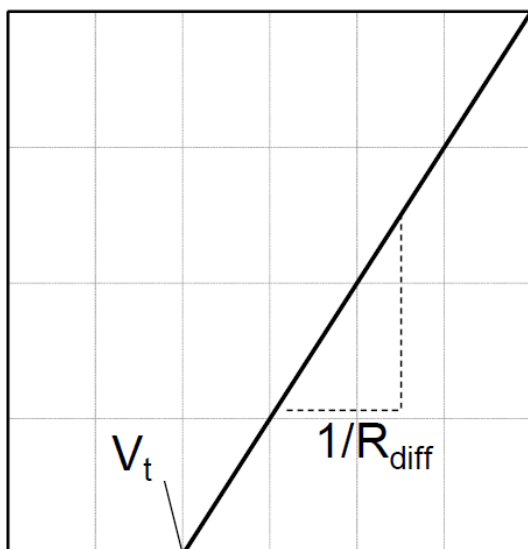
Package Dimensions

Package TO-247-3



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	14.18	15.75	17.33
B	18.45	20.5	22.55
C	4.50	5.00	5.50
D	3.15	3.50	3.85
E	1.08	1.20	1.32
F	18.27	20.30	22.33
G	4.21	4.68	5.15
H	4.91	5.46	6.01

Simplified Diode Model(Per Leg) Equivalent IV Curve for Model



Mathematical Equation

$$V_F = V_t + I_F \times R_{diff}$$

$$V_t = -0.001 \times T_j + 0.9968 \text{ [V]}$$

$$R_{diff} = 1.0 \times 10^{-6} \times T_j^2 + 6.0 \times 10^{-6} \times T_j + 0.0235 \text{ [\Omega]}$$

Note:

T_j = Diode Junction Temperature In Degrees Celsius,
valid from 25°C to 175°C

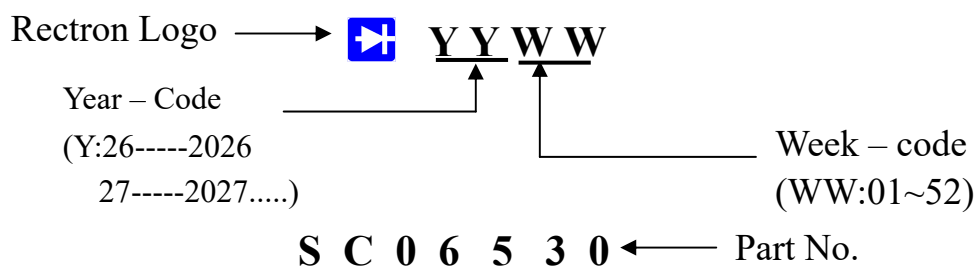
I_F = Forward Current

Less than 30A



RECTRON

Marking on the body



DISCLAIMER NOTICE

Rectron Inc reserves the right to make changes without notice to any product specification herein, to make corrections, modifications, enhancements or other changes. Rectron Inc or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies. Data sheet specifications and its information contained are intended to provide a product description only. "Typical" parameters which may be included on RECTRON data sheets and/ or specifications can and do vary in different applications and actual performance may vary over time. Rectron Inc does not assume any liability arising out of the application or use of any product or circuit.

Rectron products are not designed, intended or authorized for use in medical, life-saving implant or other applications intended for life-sustaining or other related applications where a failure or malfunction of component or circuitry may directly or indirectly cause injury or threaten a life without expressed written approval of Rectron Inc. Customers using or selling Rectron components for use in such applications do so at their own risk and shall agree to fully indemnify Rectron Inc and its subsidiaries harmless against all claims, damages and expenditures.