

## 20A 650V SiC Schottky Barrier Diode

### 1 Description

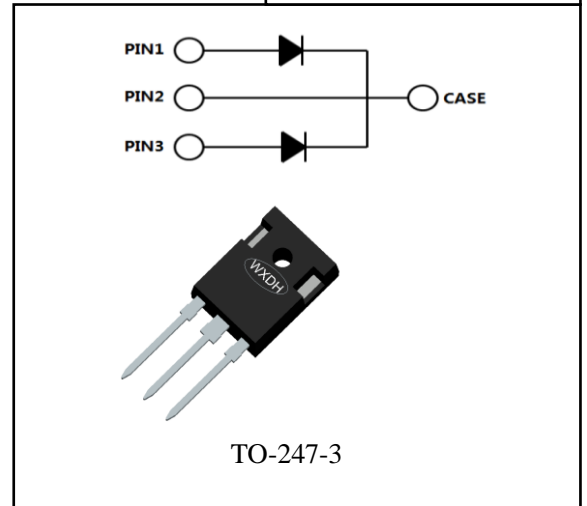
SiC Series products family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

### 2 Features

- high voltage
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on VF
- 175°C Operating Junction Temperature

### 3 Applications

- Switching Mode Power Supplies
- Power Factor Correction
- Motor drive, PV Inverter, Wind Power Station

 $V_{BRM}=650V$ 
 $I_F (T_C \leq 135^\circ C) = 36A$ 
 $Q_C = 50nC$ 


## 4 Electrical Characteristics

### 4.1 Absolute Maximum Ratings (T<sub>c</sub>=25°C, unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage	$V_{RRM}$	650	V
Working Peak Reverse Voltage	$V_{RWM}$	650	V
DC Blocking Voltage	$V_R$	650	V
Forward Current (Per leg/Device)	$I_F$	(T <sub>c</sub> ≤25°C)	35/70
		(T <sub>c</sub> ≤135°C)	18/36
		(T <sub>c</sub> ≤152°C)	10/20
Nonrepetitive Peak Surge Current(t=8.3ms)	$I_{FSM}$	86*	A
Power dissipation (Per leg/Device)	$P_{tot}$	150/300	W
Operating Junction Temperature Range	$T_j$	-55~175	°C
Storage Temperature Range	$T_{stg}$	-55~175	°C
Soldering Temperature	$T_{sold}$	260	°C

### 4.2 Thermal Characteristics

PARAMETER	SYMBOL	Typ	UNIT
Thermal Resistance from Junction to Case	$R_{thJC}$	1*/0.5**	°C/W
Thermal Resistance from Junction to Ambient	$R_{thJA}$	80	°C/W

\*Per Leg, \*\*Per Device

4.3 Electrical Characteristics(Per Leg) (Tc=25°C,unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Maximum Instantaneous Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10A	-	1.27	1.5	V
		I <sub>F</sub> = 10A, T <sub>J</sub> =175°C	-	1.38	1.6	V
Maximum Instantaneous Reverse	I <sub>R</sub>	V <sub>R</sub> = 650V	-	6	50	uA
		V <sub>R</sub> = 650V, T <sub>a</sub> =175°C	-	25	200	uA
Total capacitance	C <sub>tot</sub>	V <sub>R</sub> =0V, f=1MHz	-	640	-	pF
		V <sub>R</sub> =200V, f=1MHz	-	66	-	
		V <sub>R</sub> =400V, f=1MHz	-	48	-	
Total capacitive Charge	Q <sub>C</sub>	V <sub>R</sub> =400V,I <sub>F</sub> =10A,di/dt=200A/us	-	25	-	nC

DEFINITIONS

V<sub>F</sub> = Instantaneous forward voltage (pw = 300μs, D = 2%).

I<sub>R</sub> = Instantaneous reverse current.

RθJC = Thermal resistance junction to case.

pw = pulse width.

D = duty cycle.

5 Typical characteristics diagrams (Per Leg)

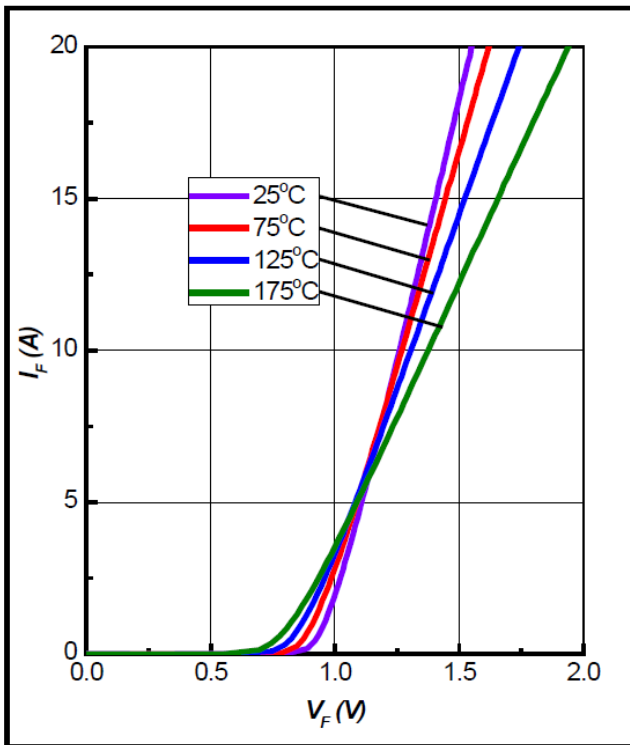


Figure 1. Forward Characteristics

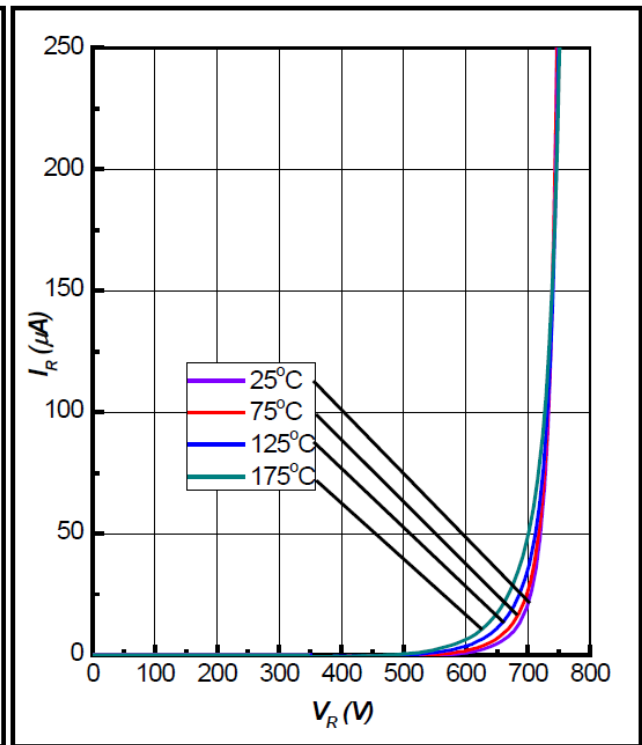


Figure 2. Reverse Characteristics

5 Typical characteristics diagrams (Per Leg)

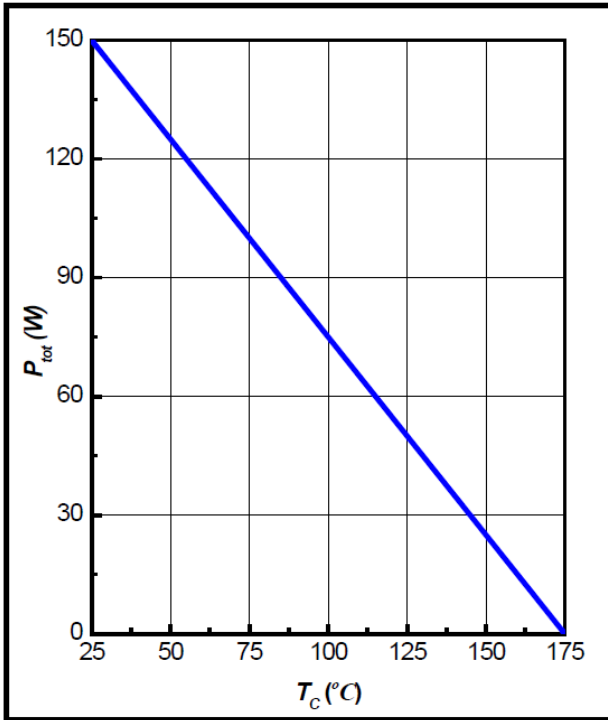


Figure 3. Power Derating

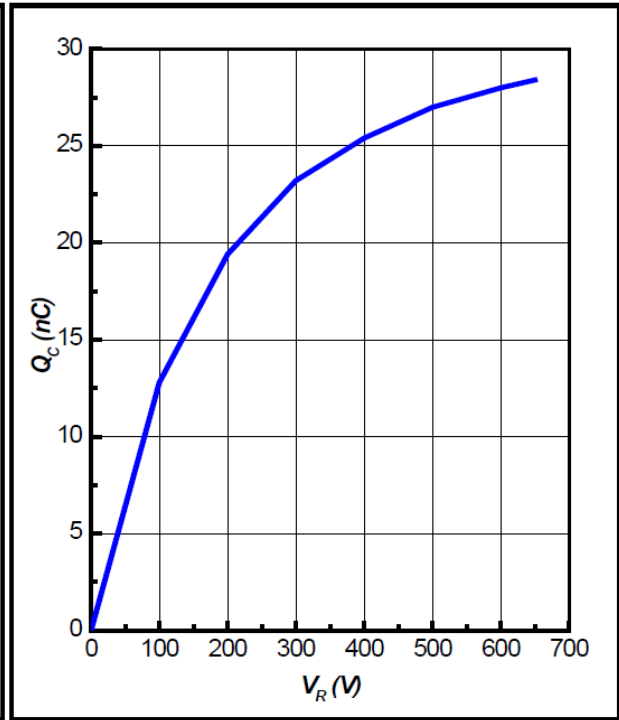


Figure 4. Total Capacitive Charge vs. Reverse Voltage

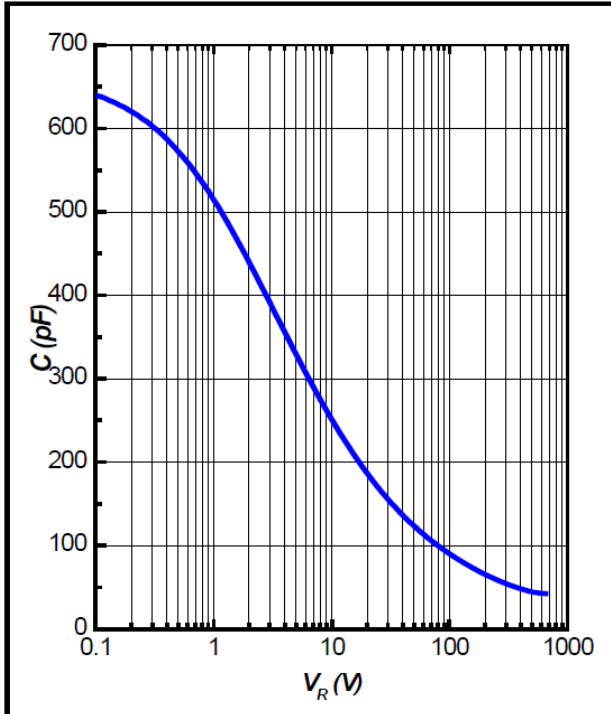


Figure 5. Total Capacitance vs. Reverse Voltage

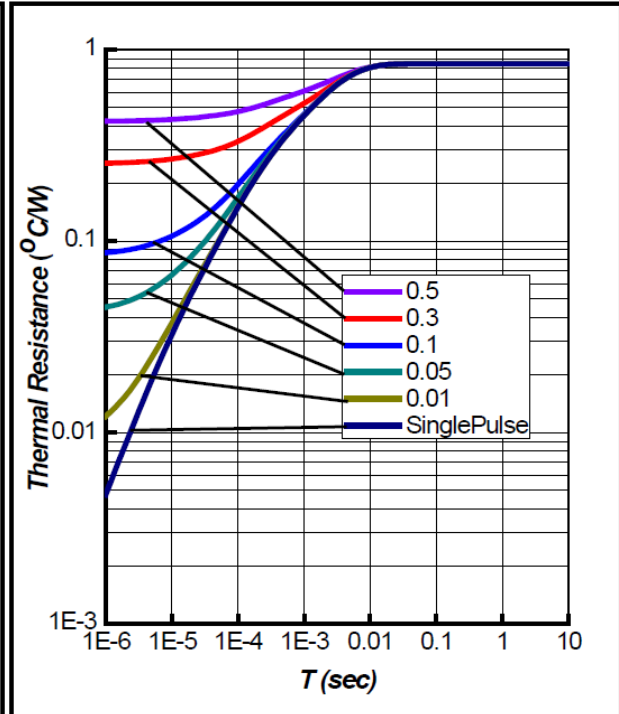


Figure 6. Transient Thermal Impedance

6 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name
DCC20D65G4	TO-247-3	DCC20D65G4

