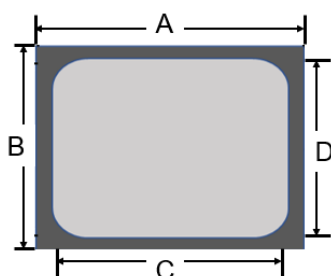




SPD20C65KM4 650V 20A SiC Schottky Diode

DESCRIPTION: SM provides leading edge technology for the SiC Schottky barrier diodes with the advanced thin-wafer technology. The new family of 650V products showing improved efficiency over all load conditions, attributed to its lower figure of merit ($Q_c \times V_f$).

DIE INFORMATION



FEATURES

- 650V Schottky Barrier Diode
- Zero Reverse Recovery/Zero Forward Recovery
- 100% UIS screened
- Temperature Independent Switching Behavior

TYPICAL APPLICATIONS

- Switch mode power supply
- Power factor correction
- Solar inverter
- Uninterruptible power supply

MAJOR RATINGS AND CHARACTERISTICS

Symbol	Parameter	Value	Unit	Test Conditions
V_{RRM}	Repetitive Peak Reverse Voltage	650	V	
V_R	DC Peak Blocking Voltage	650	V	
I_F	Continuous Forward Current	20	A	$T_C=150^\circ\text{C}$
I_{FRM}	Repetitive Peak Forward Surge Current	65	A	$T_C=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave
I_{FSM}	Non-Repetitive Peak Forward Surge Current	130	A	$T_C=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave
$\int i^2 dt$	$i^2 t$ value	84	A^2s	$T_C=25^\circ\text{C}$, $t_p=10$ ms, Half Sine Wave



T_j, T_{stg}	Operating Junction and Storage Temperature	-40 ~ +175	°C	
----------------	--	------------	----	--

ELECTRICAL CHARACTERISTICS (25 °C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{DC}	DC blocking voltage	650			V	$I_R = 250\mu A, T_J = 25\text{ °C}$
V_F	Forward Voltage		1.30 1.60	1.60	V	$I_F = 20A, T_J = 25\text{ °C}$ $I_F = 20A, T_J = 175\text{ °C}$
I_R	Reverse Current		30 220	200	μA	$V_R = 650V, T_J = 25\text{ °C}$ $V_R = 650V, T_J = 175\text{ °C}$
Qc	Total Capacitive Charge		44		nC	$V_R = 400V$
C	Total Capacitance		1.541 0.080 0.073		nF	$V_R = 0V, T_J = 25\text{ °C}, f = 1\text{ MHz}$ $V_R = 200V, T_J = 25\text{ °C}, f = 1\text{ MHz}$ $V_R = 400V, T_J = 25\text{ °C}, f = 1\text{ MHz}$
E_C	Capacitance Stored Energy		5.84		μJ	$V_R = 400V$

MECHANICAL PARAMETERS

PARAMETERS	TYP	UNIT
Die Size	2.443×1.767	mm
Anode Pad Opening	2.166×1.512	mm
Thickness	100	μm
Wafer Size	150	mm
Anode Metalization Al	4	μm
Cathode Metalization	Ti/Ni/Ag	/
Frontside Passivation	Polyimide	/



Typical Characteristics

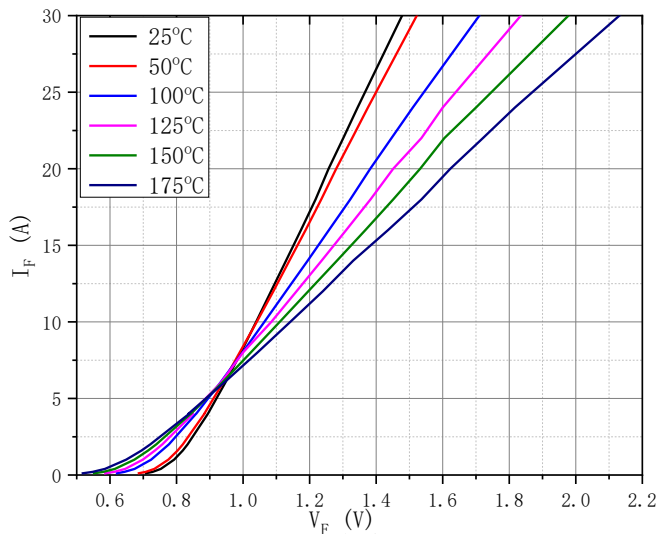


Figure 1. Forward Characteristics

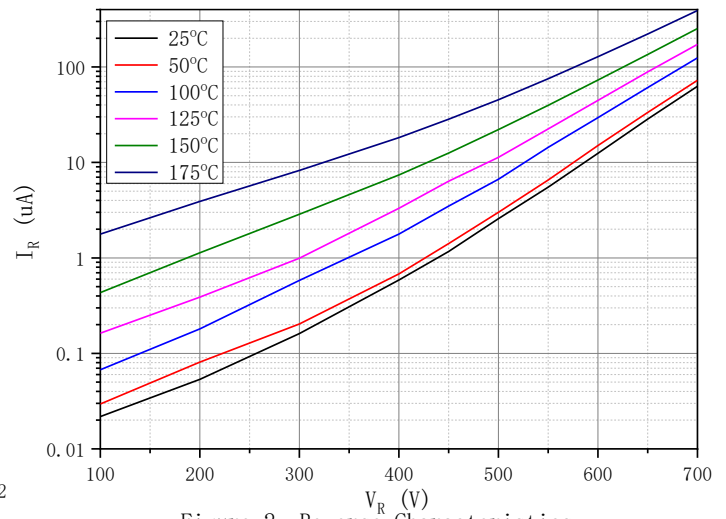


Figure 2. Reverse Characteristics

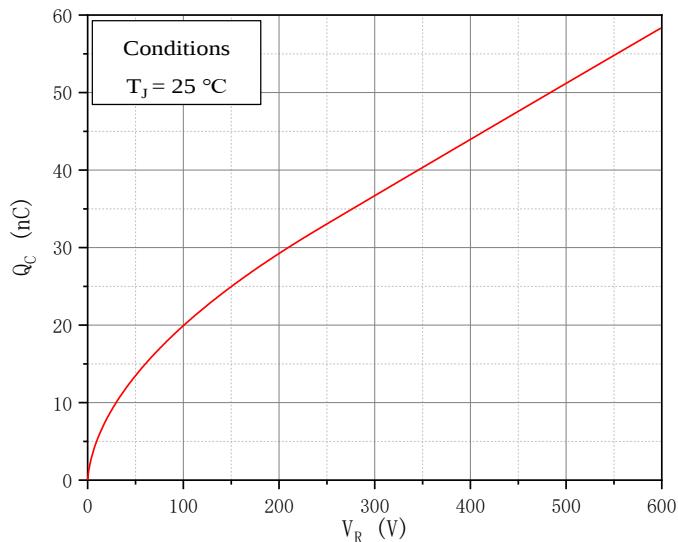


Figure 3. Total Capacitance Charge vs. Reverse Voltage

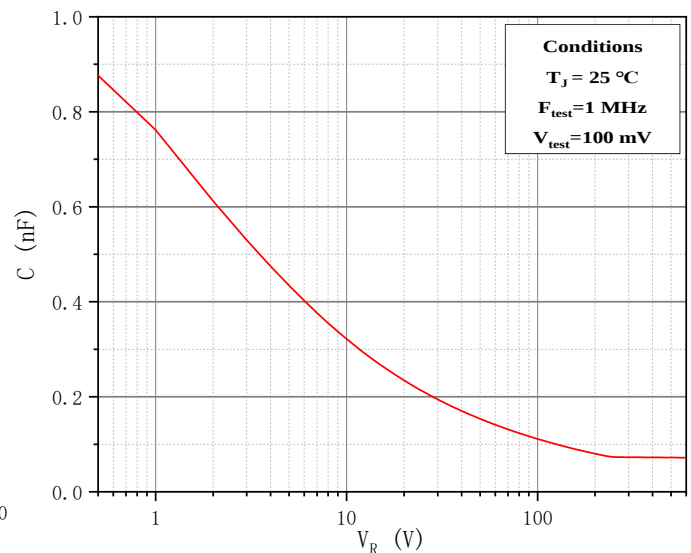
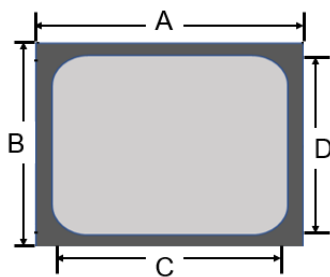


Figure 4. Capacitance vs. Reverse Voltage

Chip Dimensions



Symbol	Dimension	
	mm	inch
A (die size)	2.443	0.097
B (die size)	1.767	0.070
C (anode pad opening)	2.166	0.086
D (anode pad opening)	1.512	0.060

**Notes**

- Some data are test results of the die packaged by TO220.

This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control systems.
