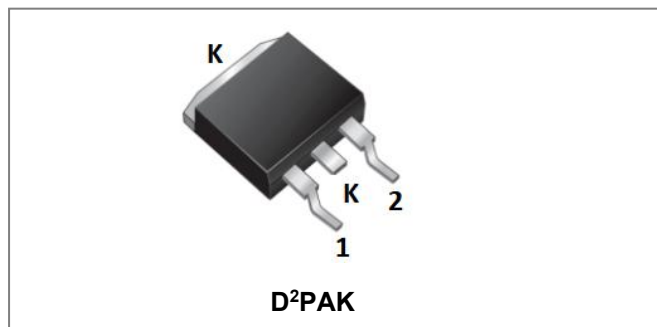


# SICRB20650A

## 650V SiC POWER SCHOTTKY RECTIFIER



### Description

SICRB20650A is single SiC Schottky rectifiers packaged in D<sup>2</sup>PAK case. The device is a high voltage Schottky rectifier pair that has very low total conduction losses and very stable switching characteristics over temperature extremes. The SICRB20650A are ideal for energy sensitive, high frequency applications in challenging environments.

### Circuit Diagram



### Applications

- Alternative energy inverters
- Power Factor Correction (PFC)
- Free-Wheeling diodes
- Switching supply output rectification
- Reverse polarity protection

### Features

- 175°C T<sub>J</sub> operation
- Ultra-low switching loss
- Switching speeds independent of operating temperature
- Low total conduction losses
- High forward surge current capability
- Guard ring for enhanced ruggedness and long term reliability
- Pb – Free Device
- All SMC parts are traceable to the wafer lot
- Additional electrical and life testing can be performed upon request

### Maximum Ratings:

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	-	650	V
Working Peak Reverse Voltage	V <sub>RWM</sub>			
DC Blocking Voltage	V <sub>R</sub>			
Average Rectified Forward Current	I <sub>F(AV)</sub>	50% duty cycle @T <sub>c</sub> =150°C, rectangular wave form	20	A
Peak One Cycle Non-Repetitive Surge Current	I <sub>FSM</sub>	8.3ms, Half Sine pulse, T <sub>c</sub> = 25 °C	70	A

**Electrical Characteristics:**

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V <sub>F1</sub>	@ 20A, Pulse, T <sub>J</sub> = 25 °C	1.50	1.70	V
	V <sub>F2</sub>	@ 20A, Pulse, T <sub>J</sub> = 175 °C	1.80	2.40	V
Reverse Current at DC condition*	I <sub>R1</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 25 °C	2	100	μA
Reverse Current *	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 175 °C	10	1000	μA
Junction Capacitance	C <sub>T</sub>	@V <sub>R</sub> = 0V, T <sub>C</sub> = 25 °C, f <sub>SIG</sub> = 1MHz	1190	-	pF
Total Capacitive Charge	Q <sub>C</sub>	I <sub>F</sub> = 20A, dI/dt=200A/μs, V <sub>R</sub> =650V, T <sub>J</sub> =25°C	40	-	nC

\* Pulse width < 300 μs, duty cycle < 2%

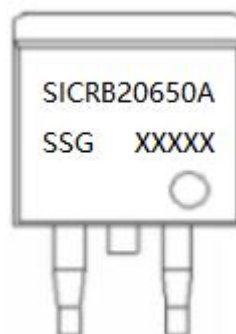
**Thermal-Mechanical Specifications:**

Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T <sub>J</sub>	-	-55 to +175	°C
Storage Temperature	T <sub>stg</sub>	-	-55 to +175	°C
Typical Thermal Resistance Junction to Case	R <sub>θJC</sub>	DC operation	1.36	°C/W
Approximate Weight	wt	-	1.85	g
Case Style	D <sup>2</sup> PAK			

**Ordering Information**

Device	Package	Weight	Shipping
SICRB20650A	D <sup>2</sup> PAK	1.85g	800pcs / reel

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

**Marking Diagram**


Where XXXXX is YYWWL

SICR = Device Type  
 B = Package type  
 20 = Forward Current (20A)  
 650 = Reverse Voltage (650V)  
 A = Configuration  
 SSG = SSG  
 YY = Year  
 WW = Week  
 L = Lot Number

**Cautions:** Molding resin  
 Epoxy resin UL:94V-0

**Ratings and Characteristics Curves**

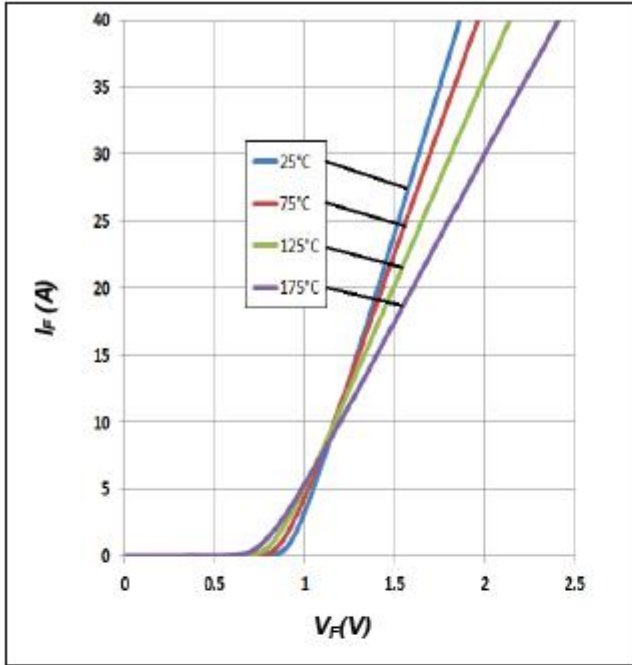


Figure 1. Forward Characteristics

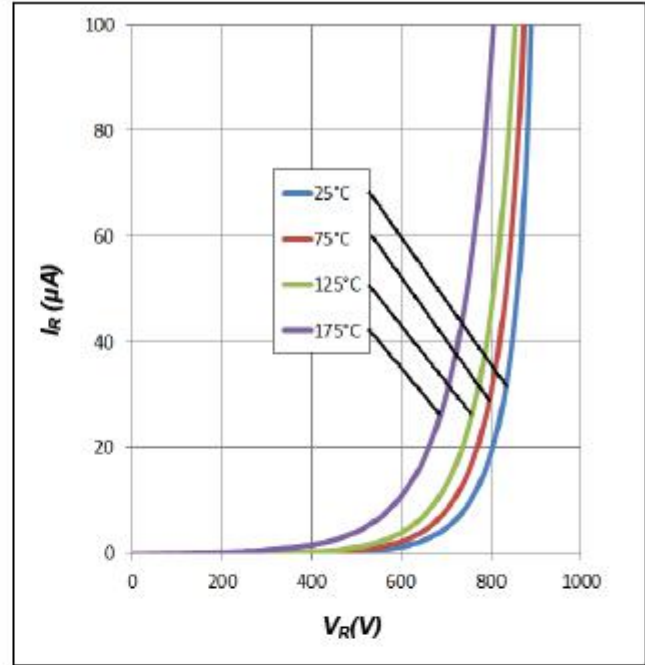


Figure 2. Reverse Characteristics

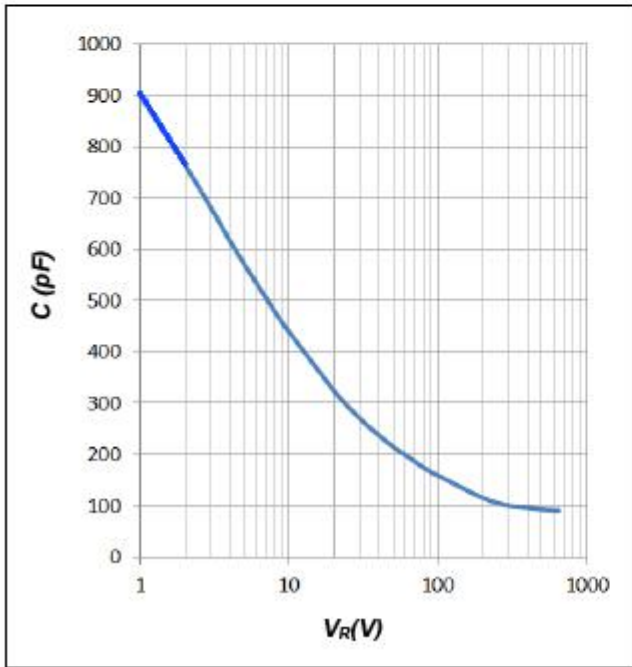


Figure 3. Total Capacitance vs. Reverse Voltage

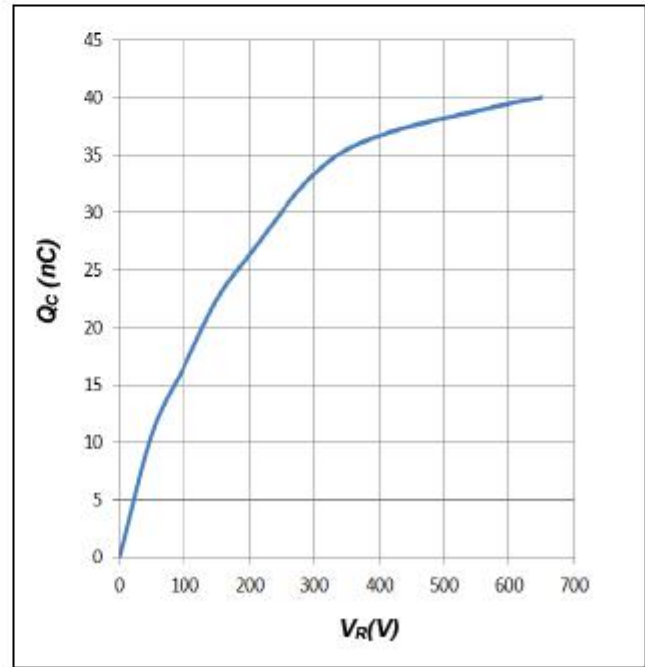
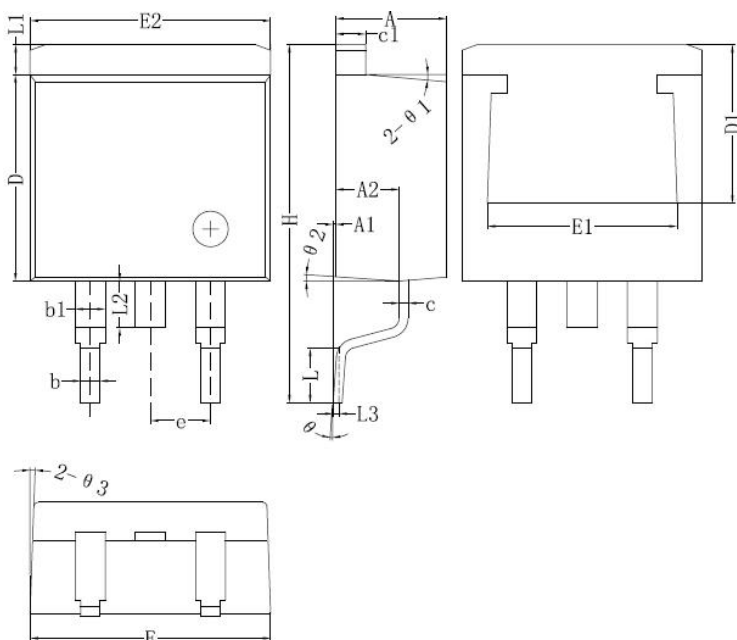


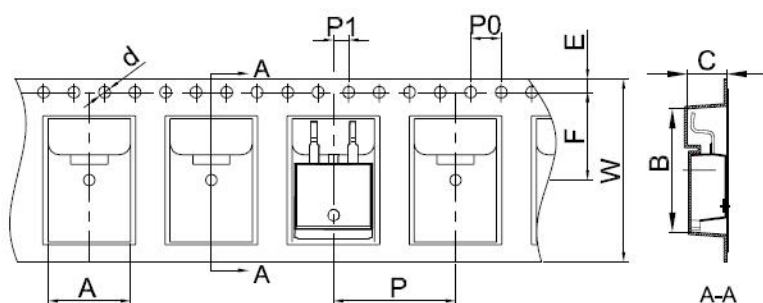
Figure 4. Total Capacitance Charge vs. Reverse Voltage

**Mechanical Dimensions D<sup>2</sup>PAK**



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.55	4.70	4.85
A1	0	0.10	0.25
A2	2.59	2.69	2.89
b	0.71	0.81	0.96
b1		1.27	
c	0.36	0.38	0.61
c1	1.17	1.27	1.37
D	8.55	8.70	8.85
D1	6.40		
E	10.01	10.16	10.31
E1	7.6		
E2	9.98	10.08	10.18
e		2.54	
H	14.6	15.1	15.6
L	2.00	2.30	2.70
L1	1.17	1.27	1.40
L2			2.20
L3		0.25BSC	
e	0	-	8°
e1		5°	
e2		4°	
e3		4°	

**Carrier Tape & Reel Specification D<sup>2</sup>PAK**



SYMBOL	Millimeters	
	Min.	Max.
A	10.70	10.90
B	16.03	16.23
C	5.11	5.31
d	1.45	1.65
E	1.65	1.85
F	11.40	11.60
P0	3.90	4.10
P	15.90	16.10
P1	1.90	2.10
W	23.90	24.30

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