

# SICR20650WT

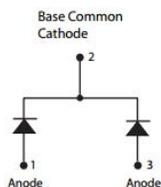
## 650V SiC POWER SCHOTTKY RECTIFIER



### Description

SICR20650WT is single SiC Schottky rectifiers packaged in TO-247AD 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 SICR20650WT 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> =115°C, rectangular wave form	10(Per Leg) 20(Per Device)	A
Peak One Cycle Non-Repetitive Surge Current (Per Leg)	I <sub>FSM</sub>	10ms, Half Sine pulse, T <sub>c</sub> = 25 °C	40	A

**Electrical Characteristics:**

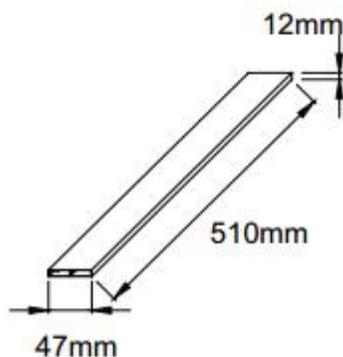
Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop(Per Leg)*	$V_{F1}$	@ 10A, Pulse, $T_J = 25\text{ }^\circ\text{C}$	1.5	1.7	V
	$V_{F2}$	@ 10A, Pulse, $T_J = 175\text{ }^\circ\text{C}$	1.6	2.1	V
Reverse Current at DC condition(Per Leg)*	$I_{R1}$	@ $V_R = \text{rated } V_R$ $T_J = 25\text{ }^\circ\text{C}$	30	150	$\mu\text{A}$
	$I_{R2}$	@ $V_R = \text{rated } V_R$ $T_J = 175\text{ }^\circ\text{C}$	210	1500	$\mu\text{A}$
Total Capacitive charge(Per Leg)	$Q_C$	$V_r = 400\text{ V}$ , $I_F = 10\text{ A}$ $dI_F/dt = -200\text{ A}/\mu\text{s}$ , $T_j = 150\text{ }^\circ\text{C}$	12	-	nC
Junction Capacitance(Per Leg)	$C_T$	@ $V_R = 0\text{ V}$ , $T_C = 25\text{ }^\circ\text{C}$ , $f_{SIG} = 1\text{ MHz}$	650	-	pF
Voltage Rate of Change	$dv/dt$	-	-	10,000	V/ $\mu\text{s}$

\* Pulse width < 300  $\mu\text{s}$ , duty cycle < 2%

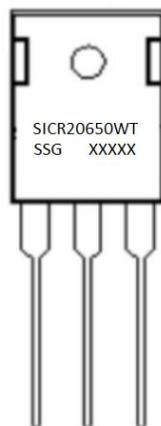
**Thermal-Mechanical Specifications:**

Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	$T_J$	-	-55 to +175	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-	-55 to +175	$^\circ\text{C}$
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	DC operation	0.84	$^\circ\text{C}/\text{W}$
Approximate Weight	wt	-	6.28	g
Case Style	TO-247AD			

**Tube Specification**



**Marking Diagram**

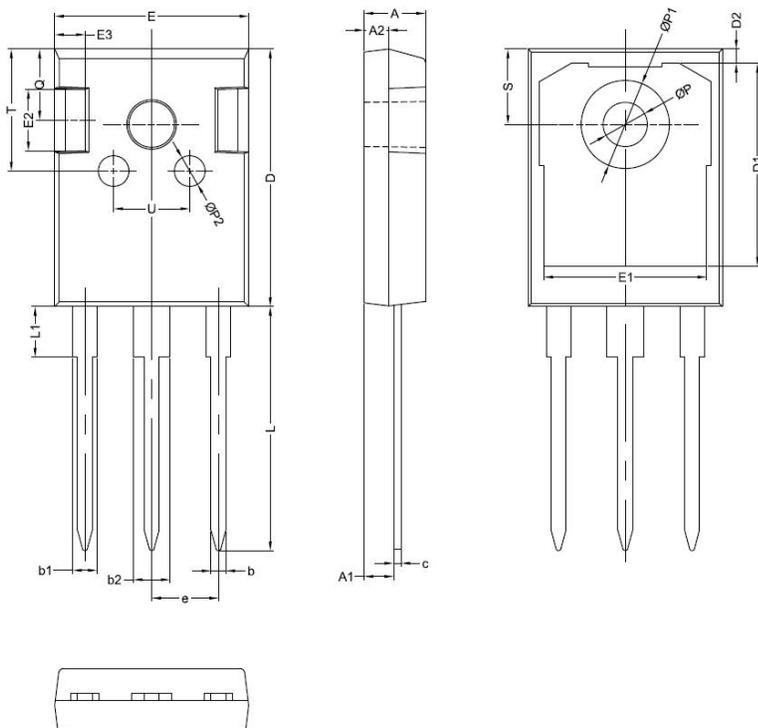


Where XXXXX is YYWWL

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

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

**Mechanical Dimensions TO-247AD**



SYMBOL	Millimeters		
	MIN.	TYP.	MAX.
A	4.80	5.00	5.20
A1	2.20	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.40
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.50	0.60	0.75
D	20.30	21.00	21.20
D1		16.55	
D2		1.20	
E	15.45	15.80	16.00
E1		13.30	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.70
L1		4.13	
P	3.50	3.60	3.70
P1	7.1		7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	

**Ordering Information**

Device	Package	Plating	Weight	Shipping
SICR20650WT	TO-247AD	Pure Sn	6.28g	25pcs / tube

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



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