

3300V, 50A SILICON CARBIDE SiC SCHOTTKY DIODE

FEATURES

- ▲ High Surge Current Capability SiC Schottky
- ▲ Maximum Operating Junction Temperature over 175°C
- ▲ Zero Reverse and Forward Recovery
- ▲ Fast and Temperature-independent Switching
- ▲ Positive Temperature Coefficient on V_F

ADVANTAGES AND BENEFITS

- ▲ Extremely Low Standby and Switching Power Losses
- ▲ Higher Efficiency than when using Si Diodes
- ▲ High Frequency Operation
- ▲ Very Low Heat-Sink Requirements
- ▲ Paralleling of Devices Without Thermal Runaway

DESCRIPTION

KE33DJ20 is a high performance 3300V, 50A Silicon Carbide (SiC) Schottky with enhanced surge current capabilities, able to operate at high frequencies and temperatures in excess 175°C. SiC Schottky diodes offer zero reverse and forward recovery, making them ideal for high frequency and high efficiency applications, with minimum heat sinking requirements.

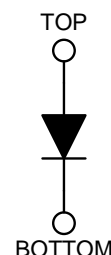
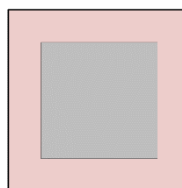
APPLICATIONS

- ▲ Rectification, Voltage Blocking, Boost and Free Wheeling
- ▲ Switching Mode Power Supplies (SMPS) and Converters
- ▲ Power Factor Correction (PFC)
- ▲ Wind Turbine and Solar Inverters
- ▲ Motor Drives
- ▲ High Voltage Multipliers
- ▲ Snubbers
- ▲ Welding, Railway, Ionizers, Power Grid, Motion Control, Construction and Agricultural Vehicles (CAV)

KEY PERFORMANCE

Parameter	Value
V_{RRM}	3300V
I_F	50A
Q_C	435nC

DIE OUTLINE



Top: anode
Bottom : cathode

QUICK ORDERING INFORMATION

Part Number	Package	Marking
KE33DJ50B	Bare die	
KE33DJ50T47	TO-247-2L	KE33DJ50

Other packages and packaging configurations available and also possible upon request.

ABSOLUTE MAXIMUM RATINGS

Unless otherwise stated, specification applies for $T_C=25^\circ\text{C}$.

Parameter	Symbol	Values	Unit	Note/Test Condition
DC Blocking Voltage	V_R	3300	V	
Repetitive Peak Reverse Voltage	V_{RRM}	3300	V	$T_J=25^\circ\text{C}$
Surge Peak Reverse Voltage	V_{RSM}	3300	V	
Continuous Forward Current	I_F	50	A	$T_C=125^\circ\text{C}$, $R_{\theta JC}<0.15^\circ\text{C/W}$
Repetitive Peak Forward Surge Current	I_{FRM}	TBD	A	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$ half sinewave
Non-repetitive Peak Forward Surge Current	I_{FSM}	TBD	A	$T_C=25^\circ\text{C}$, $t_p=10\mu\text{s}$, pulse
Operating Temperature Range	T_J	-55 to +175	$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 to +175	$^\circ\text{C}$	

ELECTRICAL CHARACTERISTICS

Unless otherwise stated, specification applies for $-55^{\circ}\text{C} < T_J < 175^{\circ}\text{C}$.

Parameter	Symbol	Values			Unit	Note/Test Condition	
		Min	Typ	Max			
Forward Voltage	V_F		1.75 3.40	1.95 4.20	V	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$I_F=30\text{A}$
			2.28 5.45	2.55 6.15		$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$I_F=50\text{A}$
Reverse Current	I_R		70 110	250 400	μA	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$V_R=3300\text{V}$
Total Capacitive Charge	Q_C	-	435	-	nC	$V_R=2000\text{V}$, $I_F=50\text{A}$ $di/dt=500\text{A}/\mu\text{s}$	$T_J=25^{\circ}\text{C}$
Total Capacitance	C		5650	6350	pF	$V_R=1\text{V}$	$f=1\text{MHz}$, $T_J=25^{\circ}\text{C}$
			168	185		$V_R=1000\text{V}$	
			122	130		$V_R=2000\text{V}$	

TYPICAL PERFORMANCE

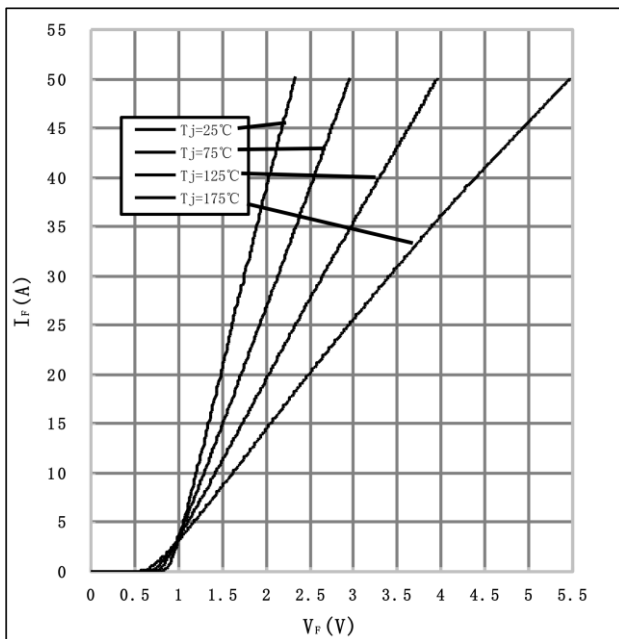


Fig 1. Typical Forward I-V characteristics vs T_J .

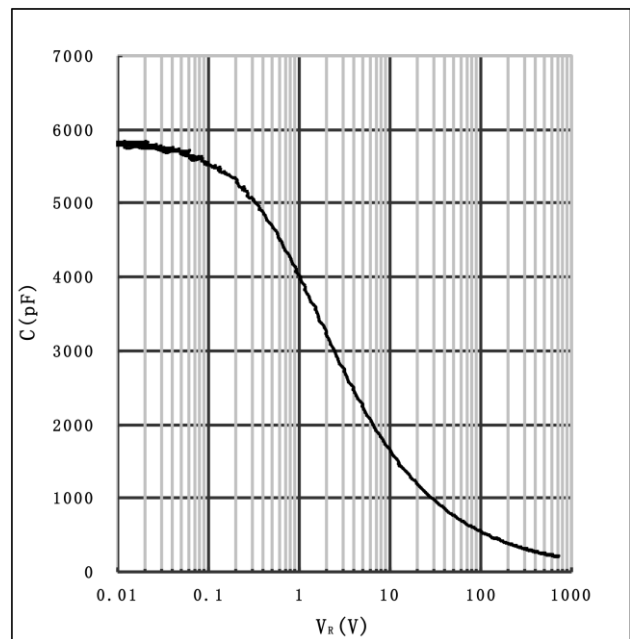


Fig 2. Diode Capacitance C(pF) versus reverse voltage.

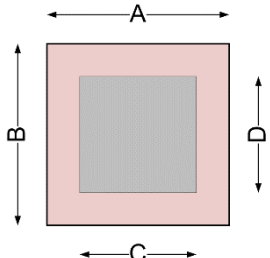
DETAILED ORDERING INFORMATION

K ↓ Source K = CALY Technologies	E ↓ Temperature range: E = -55°C to $+175^{\circ}\text{C}$	33 ↓ Rated Voltage: 33 = 3300V	DJ ↓ Device / Type DJ = Diode / JBS	50 ↓ Rated Current: 50 = 50A	B ↓ Package: B = Bare Die
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Part Number	Temperature Range	Package	Pin Count	Marking
KE33DJ50B	-55°C to $+175^{\circ}\text{C}$	Bare die		
KE33DJ50T47	-55°C to $+175^{\circ}\text{C}$	TO-247-2L	2	KE33DJ50

Other packages, packaging configurations and finishing materials possible upon request. MOQ may apply.

BARE DIE INFORMATION

	Ref.	Dimensions	
		Millimeters	Inches
	A	6.70	0.264
	B	6.70	0.264
	C	4.12	0.162
	D	4.12	0.162
	Top	Al (4 μm)	
Bottom	Ag (1.2 μm)		

REVISION HISTORY

Revision	Date	Description
1A	2018-Aug-23	First release

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CONTACT US

For more information on CALY Technologies' products, technical support or ordering:

Website: caly-technologies.com
 Email: sales@caly-technologies.com
info@caly-technologies.com

CALY Technologies SAS

CS52132
 56 Bd Niels Bohr, Bat CEI2
 69603 Villeurbanne Cedex
 France