

### 1200V, 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

KE12DJ50 is a family of high performance 1200V, 50A Silicon Carbide (SiC) Schottky with enhanced surge current capabilities, bale 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.

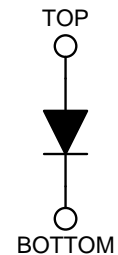
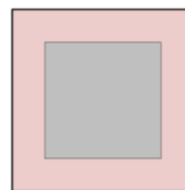
#### APPLICATIONS

- ▲ Rectification, Voltage Blocking, Boost and Free Wheeling
- ▲ Switching Mode Power Supplies (SMPS)
- ▲ Power Factor Correction (PFC)
- ▲ Uninterruptible Power Supplies (UPS)
- ▲ Wind Turbine and Solar Inverters
- ▲ Motor Drives
- ▲ High Voltage Multipliers
- ▲ Induction Heating
- ▲ Snubbers

#### KEY PERFORMANCE

Parameter	Value
$V_{RRM}$	1200V
$I_F$	50A
$Q_C$	336nC

#### DIE OUTLINE



Top: anode  
Bottom : cathode

#### QUICK ORDERING INFORMATION

Part Number	Package	Marking
KE12DJ50B	Bare die	
KE12DJ50T47	TO-247-2L	KE12DJ50

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	$V_R$	1200	V	
Repetitive Peak Reverse Voltage	$V_{RRM}$	1200	V	$T_J=25^\circ\text{C}$
Surge Peak Reverse Voltage	$V_{RSM}$	1200	V	
Continuous Forward Current	$I_F$	50	A	$T_C=145^\circ\text{C}$ , $R_{\theta JC}<0.27^\circ\text{C/W}$
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	$T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$ , 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	Min	Values		Unit	Note/Test Condition	
			Typ	Max			
Forward Voltage	$V_F$		1.6 2.1	1.8 2.5	V	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$I_F=50\text{A}$
Reverse Current	$I_R$		80 140	150 200	$\mu\text{A}$	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$V_R=1200\text{V}$
Total Capacitive Charge	$Q_C$	-	330	-	nC	$V_R=1200\text{V}$ , $I_F=50\text{A}$ $di/dt=500\text{A}/\mu\text{s}$	$T_J=25^{\circ}\text{C}$
Total Capacitance	C		6180 280 265	7320 320 310	pF	$V_R=1\text{V}$ $V_R=400\text{V}$ $V_R=800\text{V}$	$f=1\text{MHz}$ , $T_J=25^{\circ}\text{C}$

**TYPICAL PERFORMANCE**

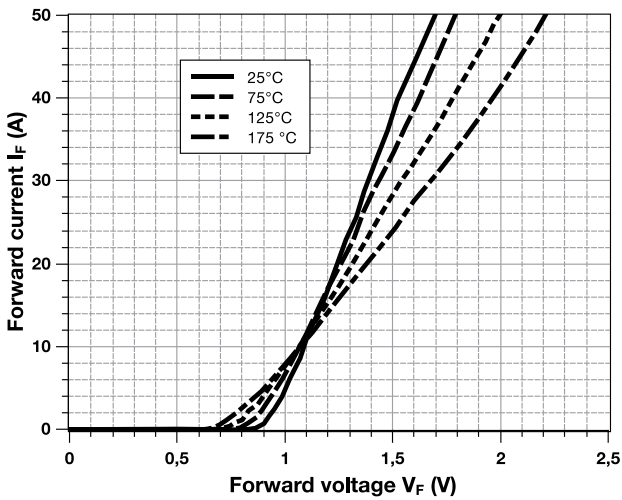


Fig 1. Typical Forward I-V characteristics vs  $T_J$ .

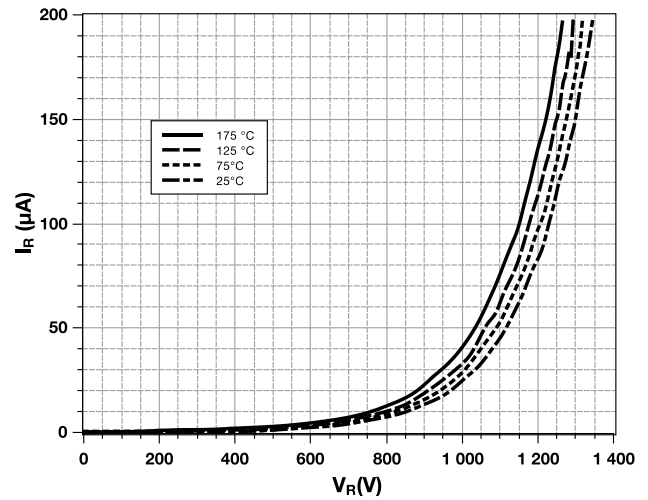


Fig 2. Typical Reverse I-V characteristics vs  $T_J$ .

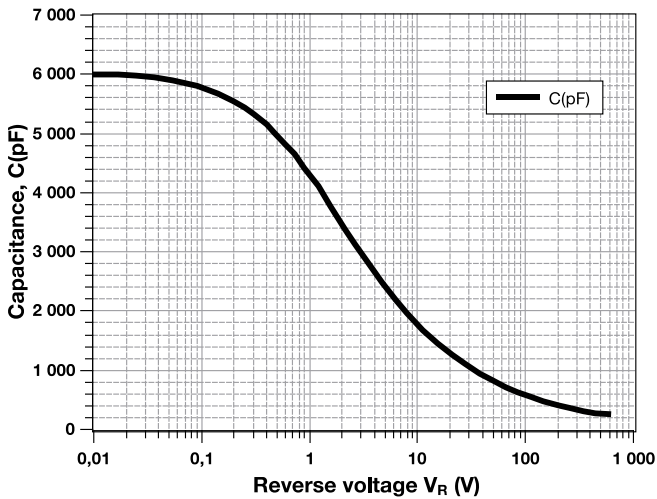


Fig 3. Diode Capacitance C(pF) versus reverse voltage.

## DETAILED ORDERING INFORMATION

<b>K</b> ↓ Source K = CALY Technologies	<b>E</b> ↓ Temperature range: E = -55°C to +175°C	<b>12</b> ↓ Rated Voltage: 12 = 1200V	<b>DJ</b> ↓ Device / Type DJ = Diode / JBS (MPS)	<b>50</b> ↓ Rated Current: 50 = 50A	<b>B</b> ↓ Package: B = Bare Die
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Part Number	Temperature Range	Package	Pin Count	Marking
KE12DJ50B	-55°C to +175°C	Bare die		
KE12DJ50T47	-55°C to +175°C	TO-247-2L	2	KE12DJ50

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

## BARE DIE INFORMATION

	Ref.	Dimensions	
		Millimeters	Inches
	A	8.3	0.33
	B	4.1	0.16
	C	7.7	0.3
	D	3.5	0.14
	Top	Al (4 μm)	
	Bottom	Ag (1.2 μm)	

## REVISION HISTORY

Revision	Date	Description
1A	2018-Jun-25	First issue
1B	2018-Aug-08	Amended reference for TO-247 packaged device and links in Contact Us Section

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