

### 1200V, 0.7A 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

KE12DJ01 is a high performance 1200V, 0.7A 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.

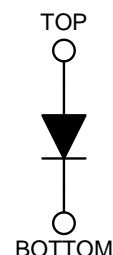
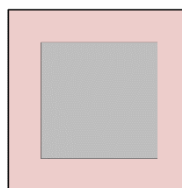
#### APPLICATIONS

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

#### KEY PERFORMANCE

Parameter	Value
$V_{RRM}$	1200V
$I_F$	0.7A
$Q_C$	5.2nC

#### DIE OUTLINE



Top: anode  
Bottom : cathode

#### QUICK ORDERING INFORMATION

Part Number	Package	Marking
KE12DJ01B	Bare die	
KE12DJ01W	Wafer	

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	$I_F$	0.7	A	$T_J=175^\circ\text{C}$
Repetitive Peak Forward Surge Current	$I_{FRM}$	4.5	A	$T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$ half sinewave
Non-repetitive Peak Forward Surge Current	$I_{FSM}$	9	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  $-55^{\circ}\text{C} < T < 175^{\circ}\text{C}$ .

Parameter	Symbol	Values			Unit	Note/Test Condition	
		Min	Typ	Max			
Forward Voltage	$V_F$		1.45 2.05	1.8 2.5	V	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$I_F=0.7\text{A}$
Reverse Current	$I_R$		0.32 7	25	$\mu\text{A}$	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$V_R=1200\text{V}$
Total Capacitive Charge	$Q_C$	-	5.2	-	nC	$V_R=1200\text{V}$ , $I_F=5\text{A}$ $di/dt=200\text{A}/\mu\text{s}$	$T_J=25^{\circ}\text{C}$
Total Capacitance	C		60 6 4.4		pF	$V_R=1\text{V}$ $V_R=400\text{V}$ $V_R=800\text{V}$	$f=1\text{MHz}$ , $T_J=25^{\circ}\text{C}$

**THERMAL CHARACTERISTICS**

Parameter	Symbol	Values			Unit	Note/Test Condition
		Min	Typ	Max		
Junction-case Thermal Resistance	$R_{TH-JC}$				$^{\circ}\text{C}/\text{W}$	

**TYPICAL PERFORMANCE**

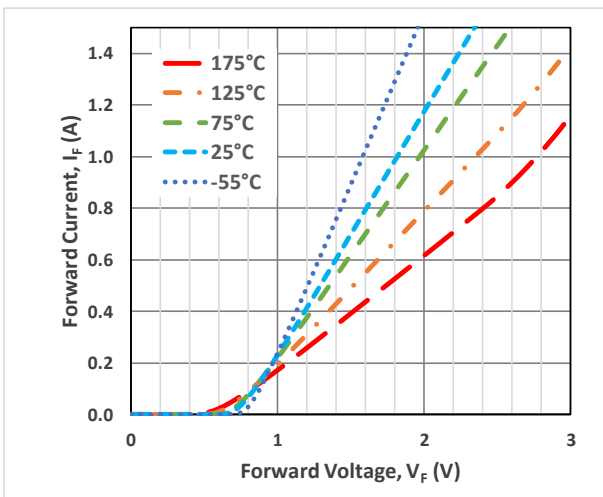


Fig 1. Typical Forward I-V characteristics vs  $T_J$ .

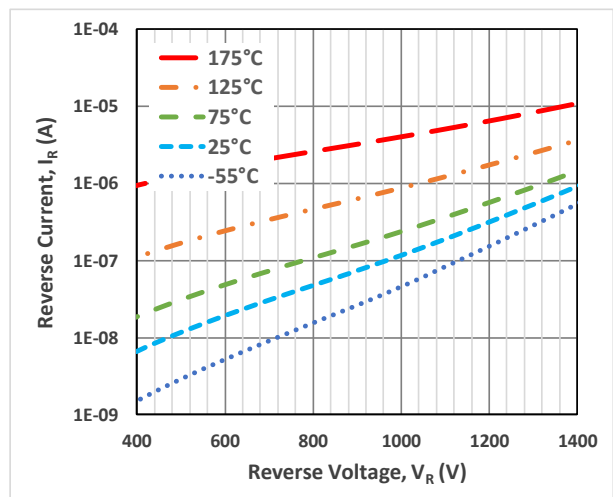


Fig 2. Typical Reverse I-V characteristics vs  $T_J$ .

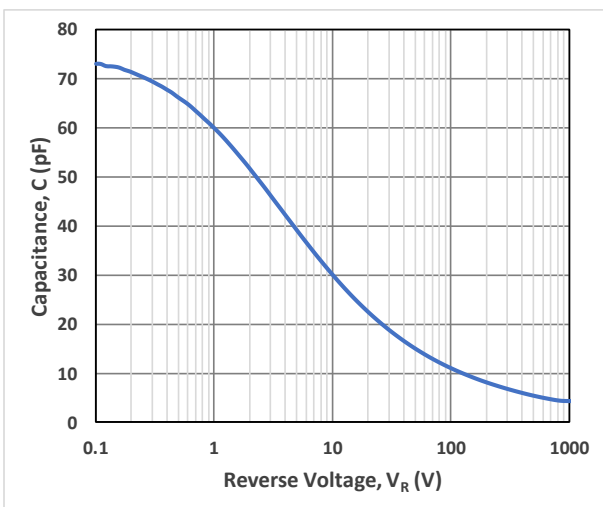


Fig 3. Diode Capacitance C(pF) versus reverse voltage.

**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>01</b> ↓ Rated Current: 01 = 0.7A	<b>B</b> ↓ Package: B = Bare Die
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Part Number	Temperature Range	Package	Pin Count	Marking
KE12DJ01B	-55°C to +175°C	Bare die		
KE12DJ01W	-55°C to +175°C	Wafer		

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

**BARE DIE DESCRIPTION**

	<b>Ref.</b>	<b>Dimensions</b>	
		<b>Millimeters</b>	<b>Inches</b>
	A	1.20	0.047
	B	1.20	0.047
	C	0.60	0.024
	D	0.60	0.024
	Top	Al (4 μm)	
Bottom	Ag (1.2 μm)		

**REVISION HISTORY**

Revision	Date	Description
1A	2019-Jan-24	First release
1B	2019-08-06	Amended few typos.

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